UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INFINEON TECHNOLOGIES AMERICAS CORP.,
Petitioner,

v.

MOSAID TECHNOLOGIES INC.,
Patent Owner.

Case IPR2025-01171
Patent 7,051,306

DECLARATION OF TERENCE P. WOODSOME

INFINEON 1046
Infineon v. Mosaid
IPR2025-01171

I, Terence P. Woodsome, hereby declare as follows:

I. BACKGROUND

1. I was hired into the legal department at Cypress Semiconductor Corporation ("Cypress") in February of 2013 and served in a variety of roles during my time with the company, including Vice President and Deputy General Counsel.

2. I assumed the role of Vice President and Deputy General Counsel in March 2020, and I held this role until Infineon Technologies AG acquired Cypress in April 2020.

3. Following the acquisition, my role of Vice President and Deputy General Counsel transitioned to Infineon Technologies LLC, an indirect subsidiary of Infineon Technologies AG. I continue to serve in this role today.

II. INFINEON'S INVESTMENT IN THE UNITED STATES SEMICONDUCTOR INDUSTRY

4. Infineon Technologies AG ("Infineon"[1]) is a semiconductor manufacturer that designs, manufactures, and sells semiconductor products. Infineon's key focus areas include, among other things, the Internet-of-Things (IoT), Energy, Mobility, and Artificial Intelligence.[2]

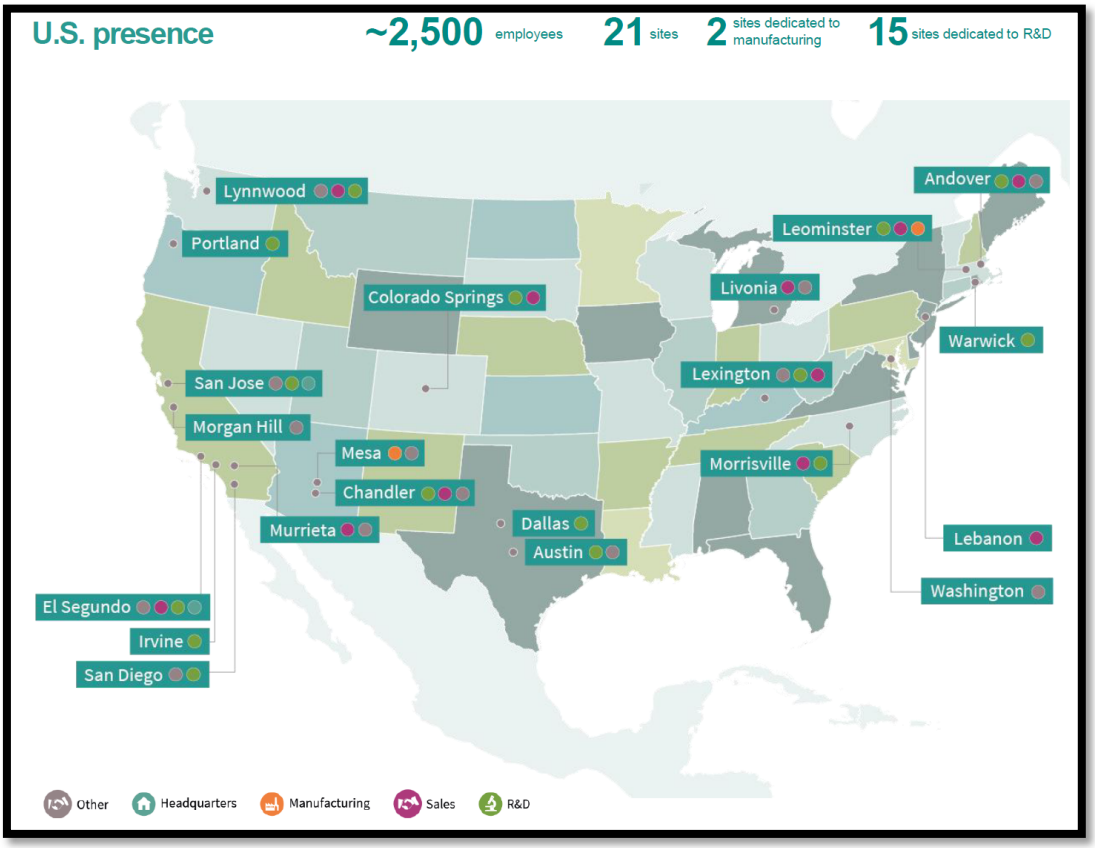
5. Infineon has and continues to pursue these key focus areas in the United States, making significant investments in domestic R&D, chip manufacturing, etc. The acquisition of Cypress—a longstanding American semiconductor design and manufacturing company

[1] Solely for the sake of simplicity and clarity within this declaration, and without characterizing or representing any legal or corporate relationship or status, I refer to Infineon Technologies AG and its subsidiaries, including those operating in the United States, such as Infineon Technologies Americas Corp. and Infineon Technologies, LLC, collectively as "Infineon."

[2] *See*, *e.g.*, Appx._T5 (*Infineon at a Glance, Fiscal Year 2024*) at 3–5, available at https://www.infineon.com/assets/row/public/documents/corporate/2024-flyer-about-infineon-en.pdf (last accessed Sep. 28, 2025); Appx._T2 (*Infineon at a Glance: Investor Fact Sheet – Q3 FY25*) at 1, available at https://www.infineon.com/assets/row/public/documents/corporate/investors/at-a-glance/2025/2025-08-05-q3-fy25-infineon-at-a-glance-v01-00-en.pdf (last accessed Sep. 29, 2025).

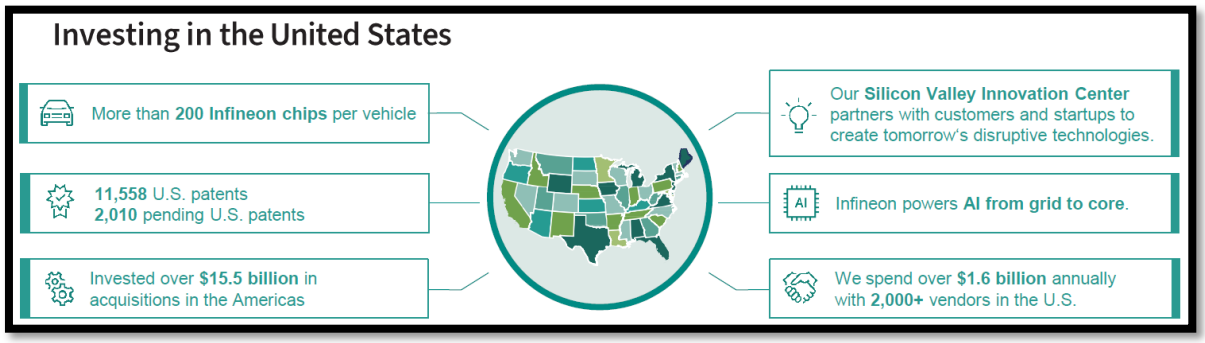
headquartered in San Jose, California—is a hallmark example of Infineon's investment in the United States semiconductor industry. Cypress continued to operate in the United States as an indirect subsidiary of Infineon Technologies AG until September 30, 2025.

6. As shown in the excerpt below from a document I obtained, and that was prepared by Infineon for general use as a public-facing flyer meant for public consumption outside of litigation, Infineon employs over 2,500 employees in the United States of America, across 21 total sites across the country, two of which are dedicated to manufacturing, and 15 of which are dedicated to R&D.



Appx._T1, p.1.

7. As shown in another excerpt from the same document, Infineon has made $15.5 billion in domestic acquisitions, such as the Cypress acquisition, and spends $1.6 billion annually with more than 2,000 vendors in the United States.



Appx._T1, p.2.

8. In short, Infineon has been a trusted partner and contributor to the United States semiconductor industry for years, injecting billions of dollars directly into the domestic economy, creating thousands of jobs for Americans, and strengthening onshore semiconductor manufacturing and supply chains. Infineon also closely guards semiconductor technologies deemed important to national security by the Committee on Foreign Investment in the United States ("CFIUS"). By abiding its national security agreements to protect critical semiconductor technologies, Infineon further demonstrates its strong ties to the United States.

III. THE PRODUCTS MOSAID ACCUSES OF INFRINGEMENT ARE TIED TO THE UNITED STATES SEMICONDUCTOR INDUSTRY AND ECONOMY

9. On March 10, 2025, MOSAID Technologies Inc. ("MOSAID") filed a complaint for patent infringement against Infineon (specifically, Infineon Technologies AG and Infineon Technologies Americas Corp.). Appx._T3, p.1. The complaint alleges that Infineon infringes United States Patent No. 7,051,306 ("the '306 Patent") and identifies "at least the PSoC 6 and AIROC products" as the "Accused Products." *Id.*, p.38.

10. On June 20, 2025, MOSAID served preliminary infringement contentions identifying the "PSoC 6 Arm Cortex-M4/M0+ Family Products" and "AIROC WiFi+Bluetooth Combo Device Family Products," as detailed below. Appx._T4, pp.2–3.

- **PSoC 6 Arm Cortex-M4 / M0+ Family Products, including at least:**
  - PSoC 61 – Entry-level Line, including at least:
    - PSoC 61x4
    - PSoC 61x5
    - PSoC 61x6
    - PSoC 61x7
    - PSoC 61x8
    - PSoC 61xA
  - PSoC 62 – Performance Line, including at least:
    - PSoC 62x4
    - PSoC 62x5
    - PSoC 62x6
    - PSoC 62x7
    - PSoC 62x8
    - PSoC 62xA
  - PSoC 63 Bluetooth LE MCU Line, including at least:
    - PSoC 63x6
    - PSoC 63x7
  - PSoC 64 – Secured MCU Line, including at least:
    - PSoC 64x5 Secure Boot
    - PSoC 64x7 Secure Boot
    - PSoC 64x7-BL Secure Boot BLE
    - PSoC 64xA Secure Boot
    - PSoC 64xA Standard Secure
  - Including, but not limited to, all products listed in **Exhibit G**

Id., p.6.

- **Defendants' AIROC Wi-Fi+Bluetooth Combo Device Family Products, including at least:**
  - **AIROC Wi-Fi 4 (802.11n) and Bluetooth 5.x combo products**
  - **AIROC Wi-Fi 5 (802.11ac) and Bluetooth 5.x combo products**
  - **AIROC Wi-Fi 6/6E (802.11ax) and Bluetooth 6.0 combo products**
  - Including, but not limited to, all products listed in **Exhibit L**

Id., p.7.

[redacted]

[redacted]

15. Many of the above-identified PSoC™ 6 and AIROC™ products are used extensively in the United States and specifically engineered for applications that either currently drive the U.S. economy or are critical to its future growth, including Internet of Things (IoT) devices (e.g., wearables, security cameras and video doorbells, portable medical devices, etc.), devices with Artificial Intelligence (AI) capabilities, and portable medical devices:

- Appx._P1 (discussing the "PSoC™ Artificial Intelligence Evaluation Kit" and explaining that "[d]ata collection is enabled via PSoC™ 6 MCU, which includes the accused PSoC 6 Arm Cortex-M4/M0+ Family Products);
- Appx._P2, p.1 (explaining "how to create and use the Matter Lock device using PSoC™ 6"), p.3 ("Matter is an open standard for smart home technology and IoT, which lets your device work with any Matter certified ecosystem using a single protocol. Matter is introduced by Connectivity Standards Alliance, an organization of hundreds of companies creating products for smart home and IOT.");

- Appx._P3, p.4 ("Cypress' PSoC 6 MCU architecture is purpose-built for the IoT, filling the gap between expensive, power-hungry applications processors and low-performance MCUs.");
- Appx._P4, pp.2–3 (discussing "smart stethoscopes" with "AI technology" that is "embedded in the device" and powered by "the PSOC™ 63 Bluetooth® LE MCU," which is among the accused PSoC 6 Arm Cortex-M4/M0+ Family Products); and
- Appx._A1, pp.1–2 (discussed the accused "AIROC™ CYW5557x single-chip device," which provides "robust, reliable, and secure wireless connectivity" and has key applications in "[w]ireless speakers, voice assistants,…video streaming" as well as "AI-enabled edge devices" and "security systems").

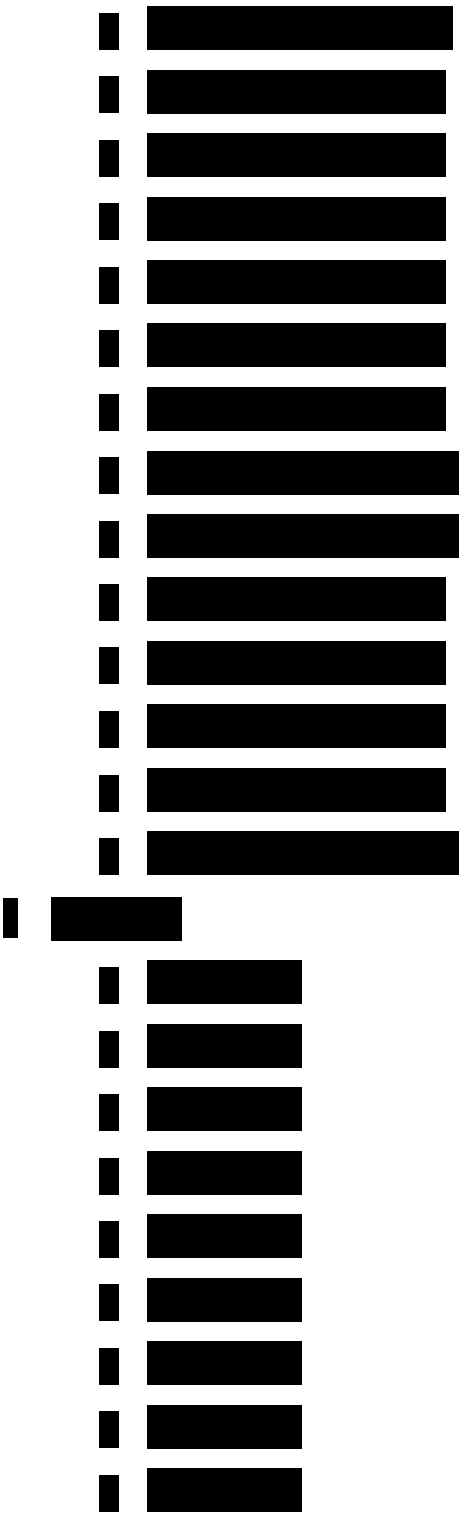
IV. LICENSING CAMPAIGNS AGAINST CYPRESS AND INFINEON

[redacted]

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V. CONCLUSION

I declare that all statements made in this declaration of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both (under Section 1001 of Title 18 of the United States Code).

Executed this 8th day of October, 2025,

Terence Woodsome

APPENDIX A1

PRODUCT BRIEF

AIROC™ CYW5557x Tri-Band Wi-Fi 6/6E + Bluetooth® 5.3 Combo

Robust, Secured Connectivity for IoT Applications

Infineon delivers market-proven AIROC™ Wi-Fi and Bluetooth® SoC combos with robust, reliable, and secure wireless connectivity. Infineon is the industry leader in Wi-Fi for the IoT with over 1 billion wireless devices in the field over the last 20 years, making AIROC™ the most deployed wireless IP in the industry. The CYW5557x product family consists of Wi-Fi 6/6E + Bluetooth® 5.3 combo devices including variants supporting SISO (1x1) or MIMO (2x2), dual-band 2.4/5 GHz, or tri-band 2.4/5/6 GHz in the same form factor to enable multiple end products in a single board design.

The AIROC™ CYW5557x single-chip device provides the highest level of integration for commercial and consumer IoT wireless systems, with integrated tri-band, 2x2 MIMO, IEEE 802.11ax WLAN MAC/baseband/radio, Bluetooth® 5.3 MAC/baseband/radio, and an integrated Power Management Unit. CYW5557x offers a host of differentiated feature sets including best-in-class range, robust network connection, smart coexistence, power efficiency, and multi-layer security to enhance the connectivity performance and improve the user experience.

The WLAN interfaces the host processor through a PCIe v3.0 Gen2 or an SDIO 3.0 interface, while the Bluetooth® host interface is provided through a high-speed, 4-wire UART interface. Additionally, the solution supports PCM and I²S interfaces for Bluetooth® audio applications. CYW5557x also supports coexistence interfaces for external LTE and 802.15.4 chips.

It comes in a small form-factor package with minimal external components to drive down cost and allows for platform design flexibility in size, form, and function. The WLAN and Bluetooth® radios also include on-chip power amplifiers and low-noise amplifiers to further reduce the need for external components.

AIROC™ CYW5557x is enabled in Linux and Android with software pre-integrated on several third-party processors. Infineon wireless module partners, including Murata, AzureWave, Laird, and USI, enable fast time-to-market. For a complete list, please see the module selection guide on the AIROC™ Wi-Fi + Bluetooth® Combos product page or visit the AIROC™ CYW5557x product page.

AIROC™ CYW5557x benefits

- Extreme low latency from greenfield 6 GHz bands and virtual simultaneous dual-band feature for seamless audio and video streaming
- Range boost to ensure devices stay connected to a remote access point
- Enhanced network robustness features to ensure best streaming of video/audio in congested or overlapping network environments
- Advanced power saving features to maximize battery life
- Network offload feature to relieve the host processor and save system power consumption
- Multi-Layer security for protection of individual subsystems through whole product lifecycle
- Best-in-class Bluetooth® receive sensitivity and multiple optimized transmission options of 0 dBm, 13 dBm, and 20 dBm of output power for various applications
- AIROC™ Bluetooth® stack and example code to shorten Bluetooth® development cycle
- Shorten time to market with globally certified module partners
- Wi-Fi support in the Infineon Developer Community with direct access to online application support engineers

Key features

Wi-Fi / WLAN features:

- Wi-Fi 6/6E release 1 and 2 compliant
- MU-MIMO, OFDMA, 1024QAM, BSS Coloring, OMI, TWT
- Dual-band (2.4/5 GHz) or Tri-band (2.4/5/6 GHz) capable
- 5/6 GHz: 20-/40-/80-MHz, 1024QAM, 2x2 MIMO, up to 1.2 Gbps
- 2.4 GHz: 20-/40-MHz, 1024QAM, 2x2MIMO, up to 574 Mbps
- 802.11ax STA and SoftAP modes
- Advanced power-saving features and offload features to conserve battery life
- Supports 802.11d/h/k/r/v/w/ai
- WPA3: AP and STA, Personal/Enterprise
- Encryption/decryption and authentication firmware, anti-rollback protection, and lifecycle management

Bluetooth® features:

- Bluetooth® 5.3 certification (Classic + LE)
- LE Audio for best audio quality
- Multiple Tx options: 0 dBm, 13 dBm, and 20 dBm

Interfaces:

- WLAN: PCIe, SDIO
- Bluetooth®: UART, PCM/I2S

Coexistence:

- Built-in advanced algorithms for Bluetooth®/ WLAN coexistence
- 2-wire SECI for external third-party Bluetooth®/GPS/LTE/802.15.4 radios

Packages:

- FCBGA: 0.65 mm pitch for easy design
- WLCSP: 0.2 mm pitch for module design
- WLBGA: 0.35 mm pitch for compact size

Temperature range:

- –40°C to +85°C

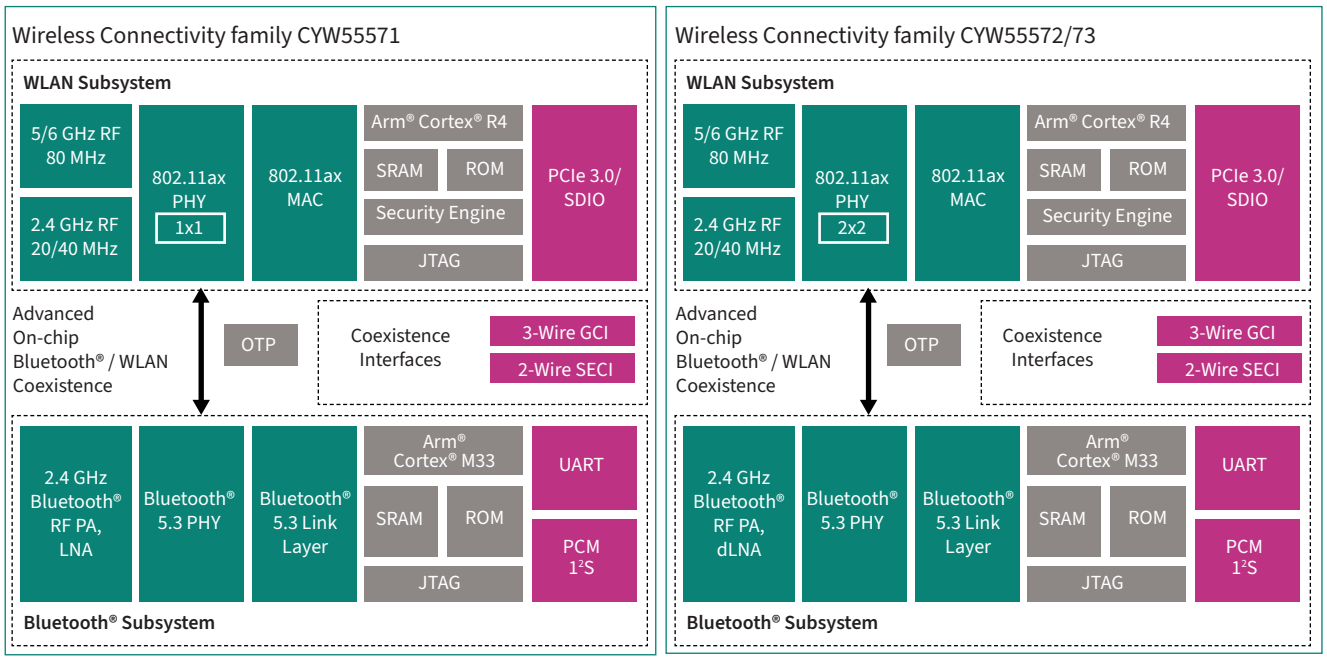
Key applications

Video and Audio	Wireless speakers, voice assistants, surveillance cameras, home entertainment, video streaming adapters, drones, digital cameras, conference bridges, gaming consoles
Commercial / Industrial	Indoor/warehouse asset tracking hubs, industrial gateways for Wi-Fi and Bluetooth® enabled lights/sensors, base stations for wireless cameras. Mobile POS, AI-enabled edge devices, medical imaging machines, security systems, smart city, robots, mobile gateway

Module options

Module partner	Part Number	Infineon base parts	Description	Type	Temp range	Package dimensions
AzureWave	AW-XH325	CYW55571	1x1 Tri-Band Wi-Fi 6/6E SISO/Bluetooth® 5.3	SiP	–40°C to +85°C	10 x 10 x 1.26
AzureWave	AW-XM612	CYW55572	2x2 Dual-Band Wi-Fi 6 MIMO/Bluetooth® 5.3	LGA	–40°C to +85°C	10 x 10 x 1.26
AzureWave	AW-XH323	CYW55573	2x2 Tri-Band Wi-Fi6/6E MIMO/Bluetooth® 5.2	SiP	–40°C to +85°C	13 x 15 x 1.95
Laird Connectivity	453-00117	CYW55573	2x2 Tri-Band Wi-Fi6/6E MIMO/Bluetooth® 5.4	M.2 1318 SMT	–40°C to +85°C	13 x 18 x 1.9
Murata	LBEE5X-V2EA-802	CYW55573	2x2 Tri-Band Wi-Fi 6/6E MIMO/Bluetooth® 5.3	Shielded Resin	–40°C to +85°C	12.5 x 9.4 x 1.2
USI	WM-BAC-CYW-51	CYW55572	2x2 Dual-Band Wi-Fi 6 MIMO/Bluetooth® 5.3	SiP	–40°C to +85°C	11 x 11 x 1.2
USI	WM-BAX-CYW-61	CYW55573	2x2 Tri-Band Wi-Fi6/6E MIMO/Bluetooth® 5.2	SiP	–40°C to +85°C	11 x 11 x 1.2

Note: *more module options



www.infineon.com

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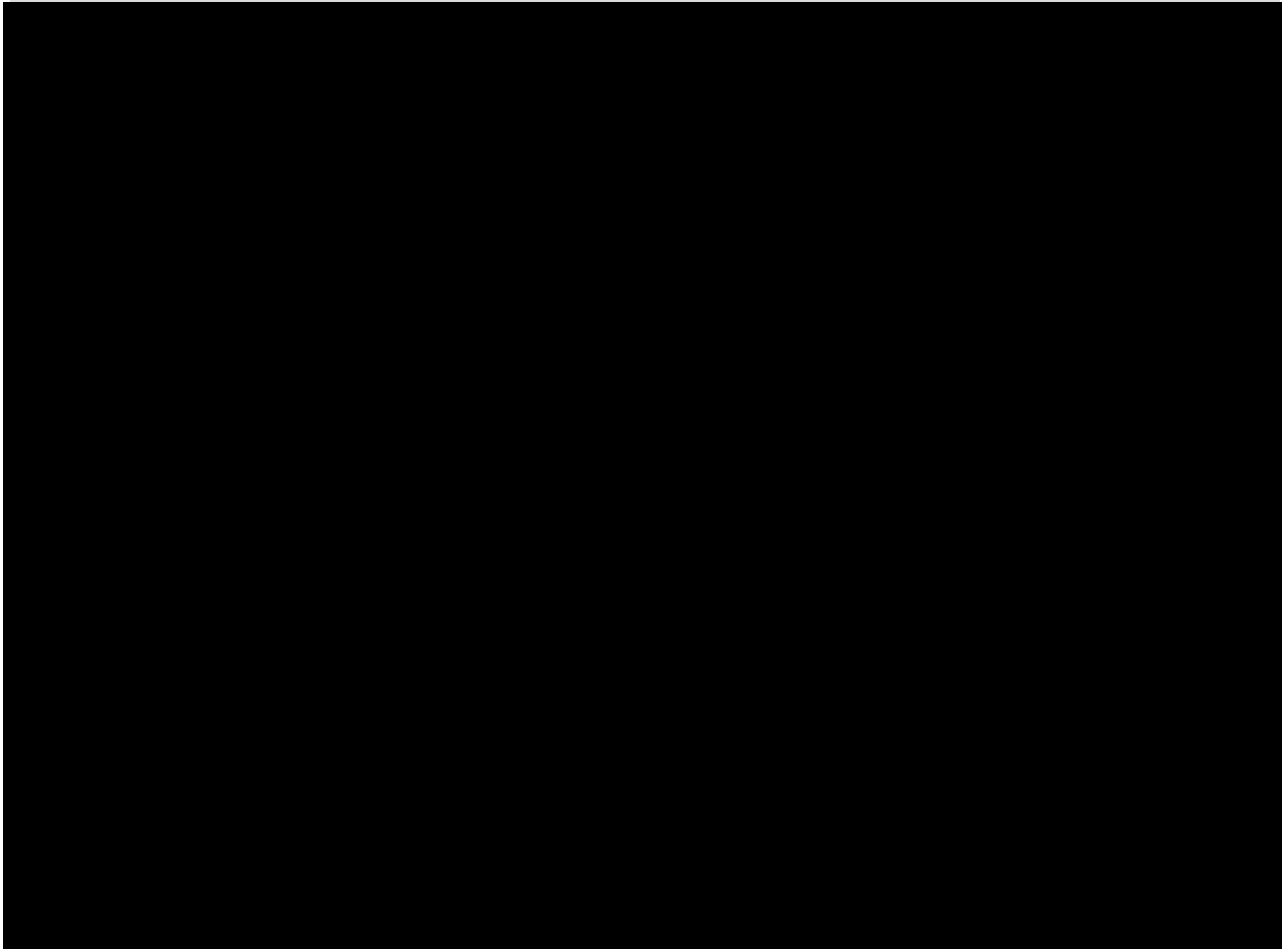
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APPENDIX L1

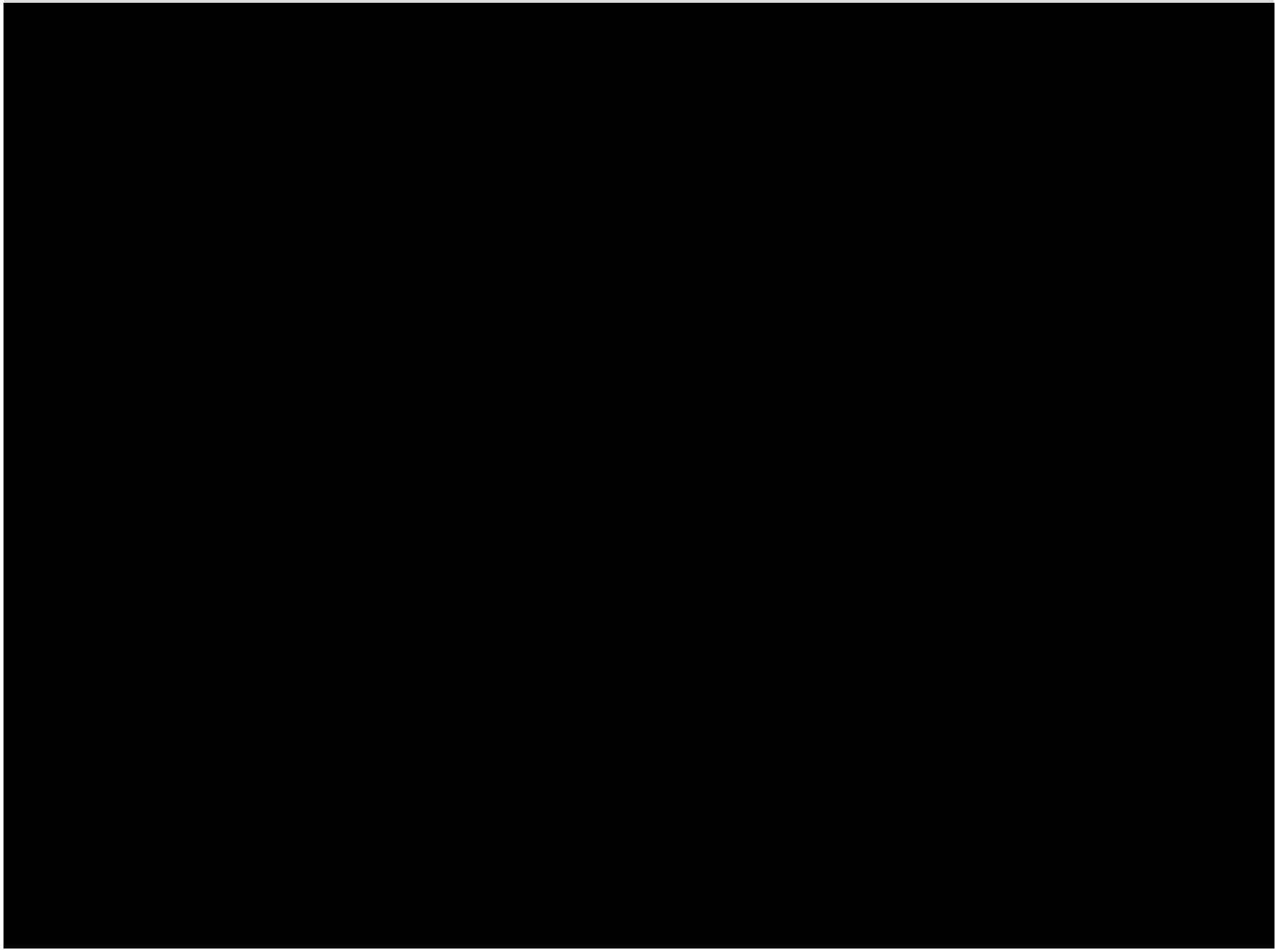






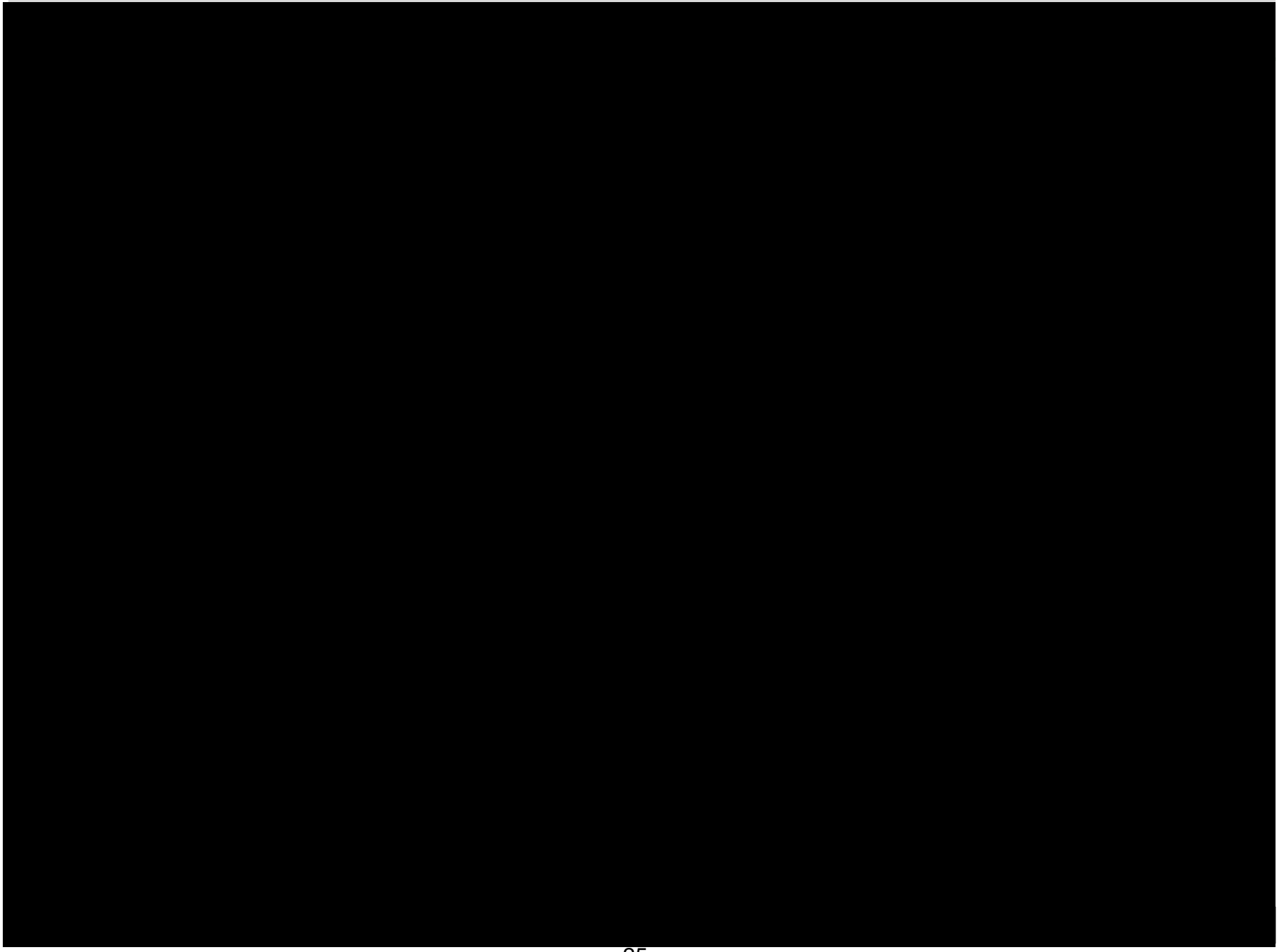


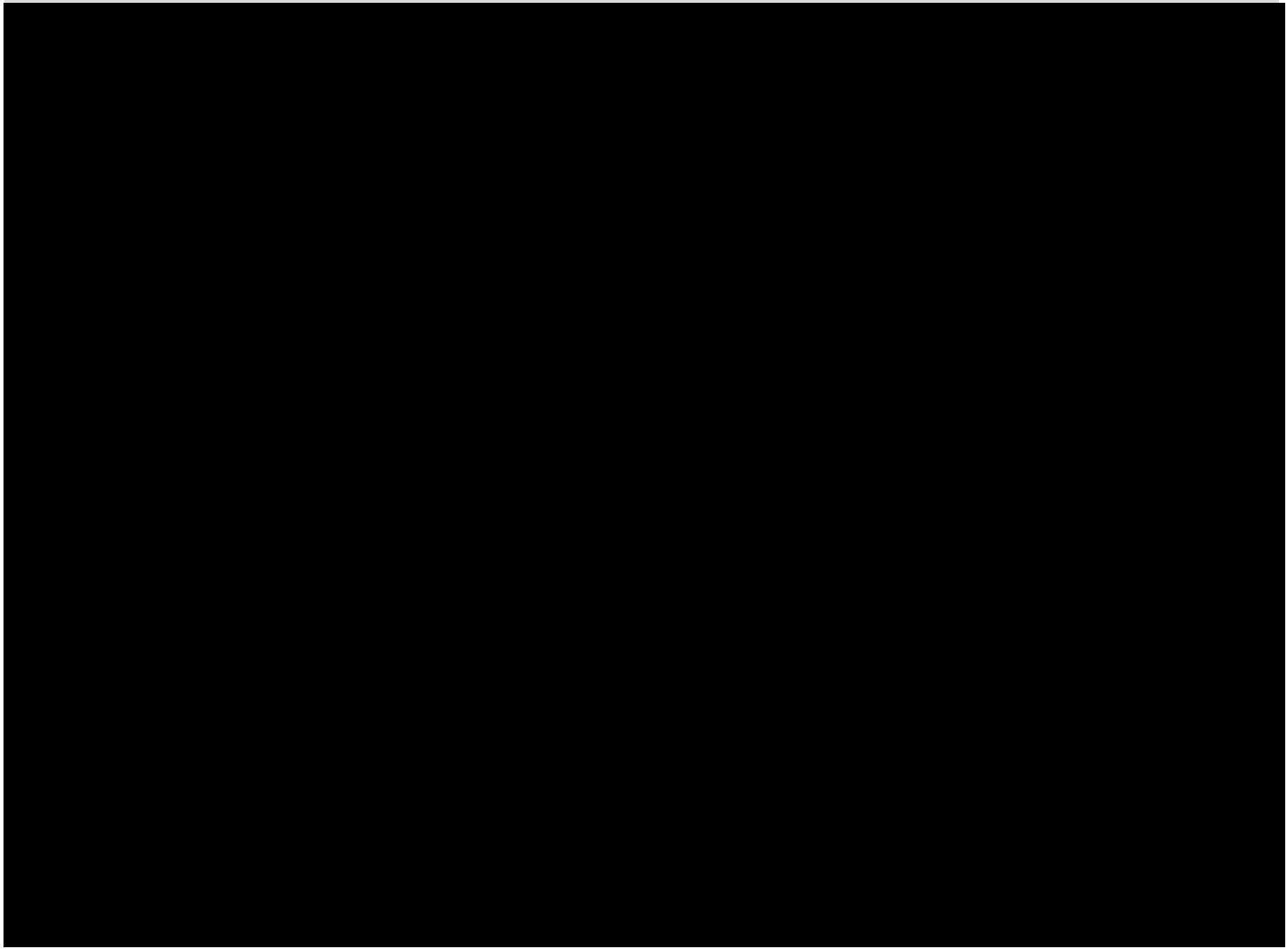
















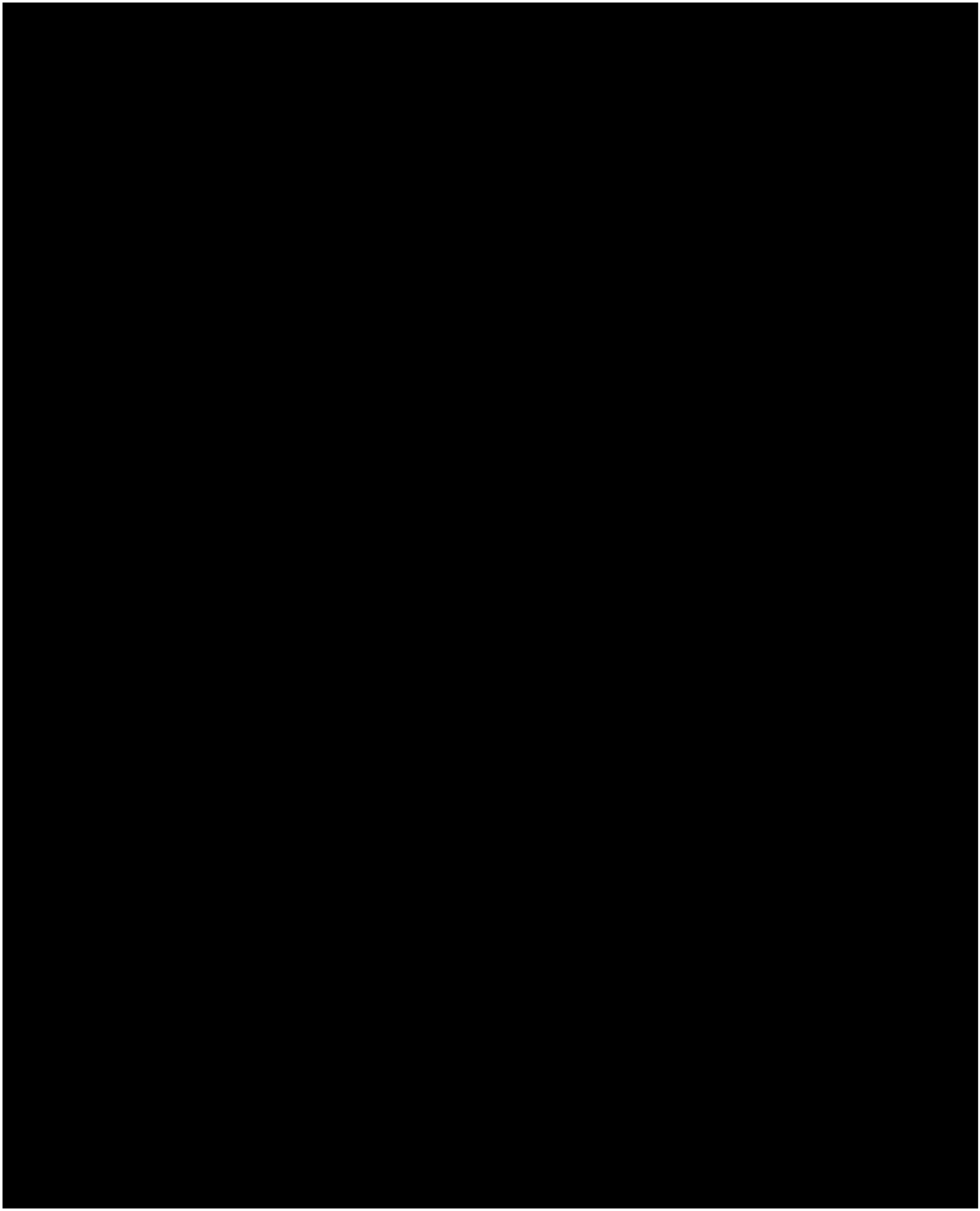


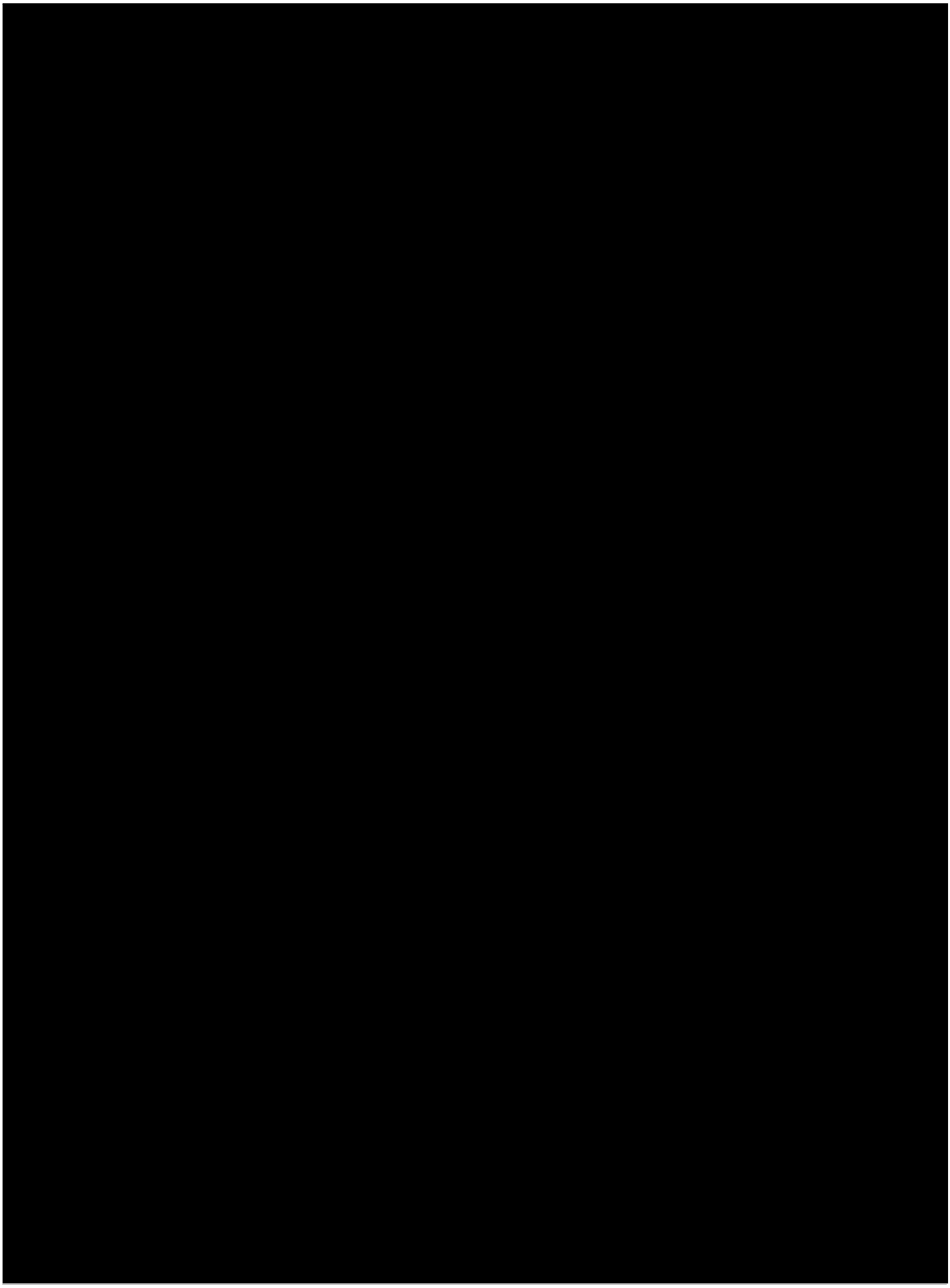


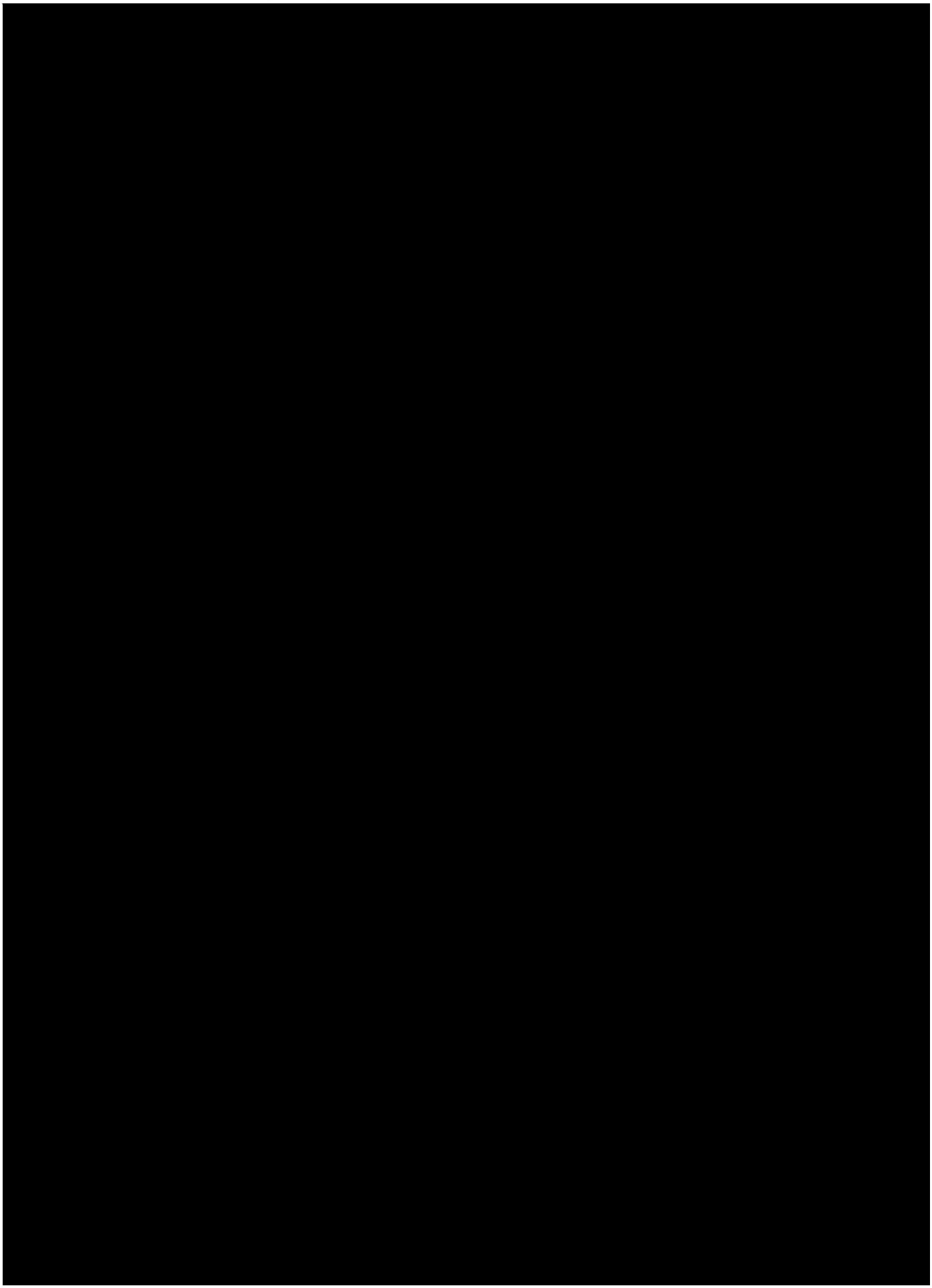


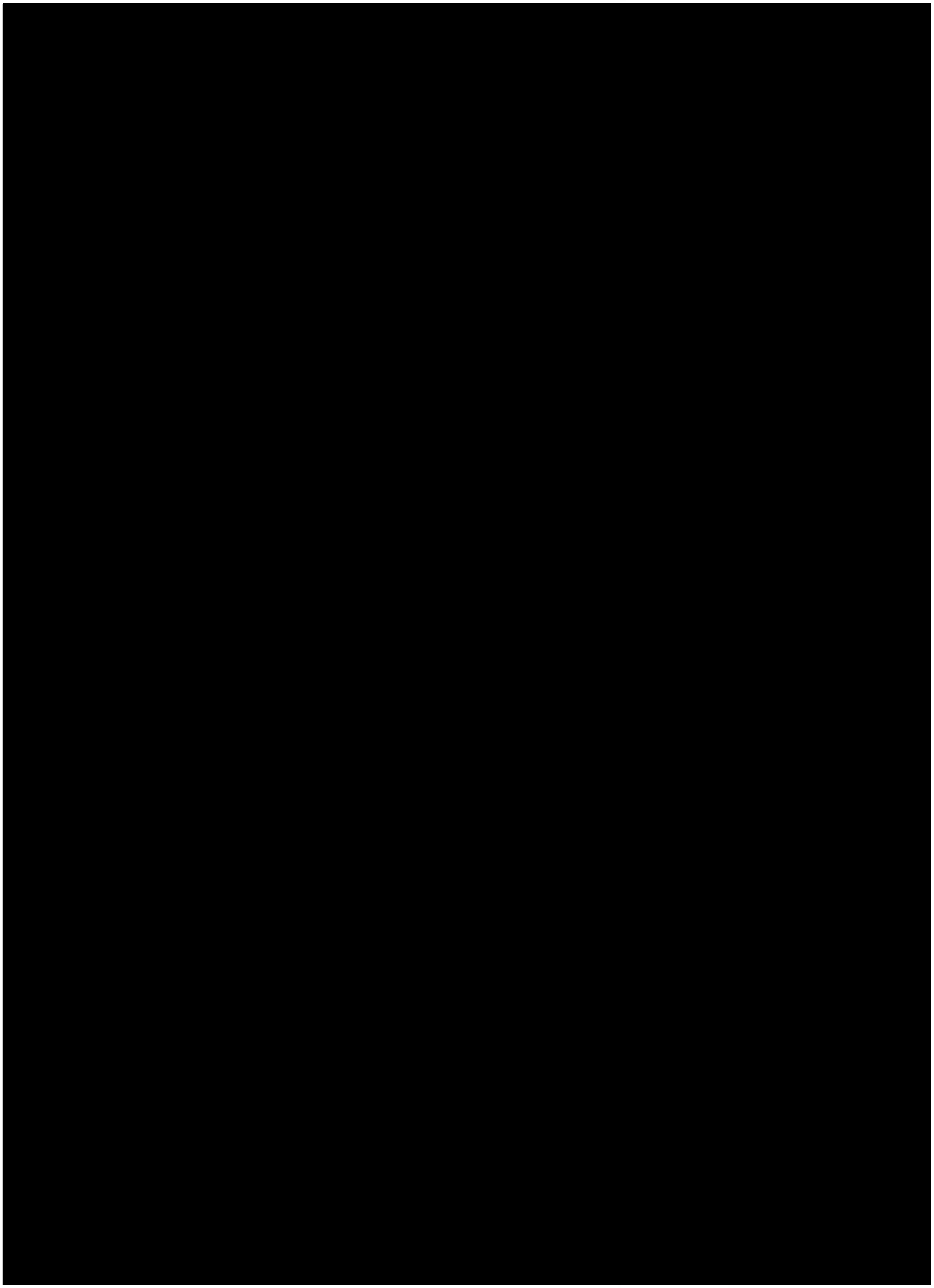


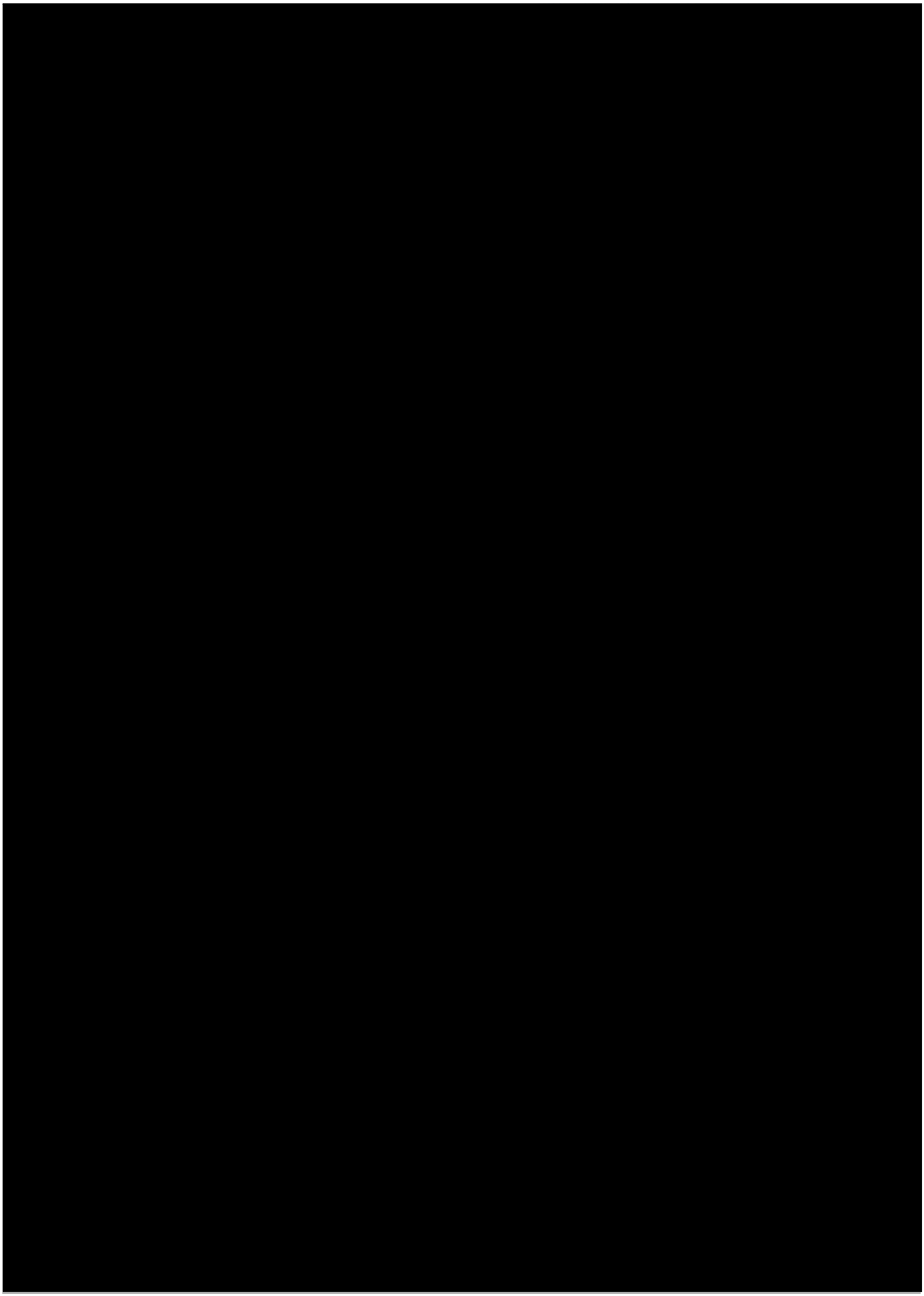
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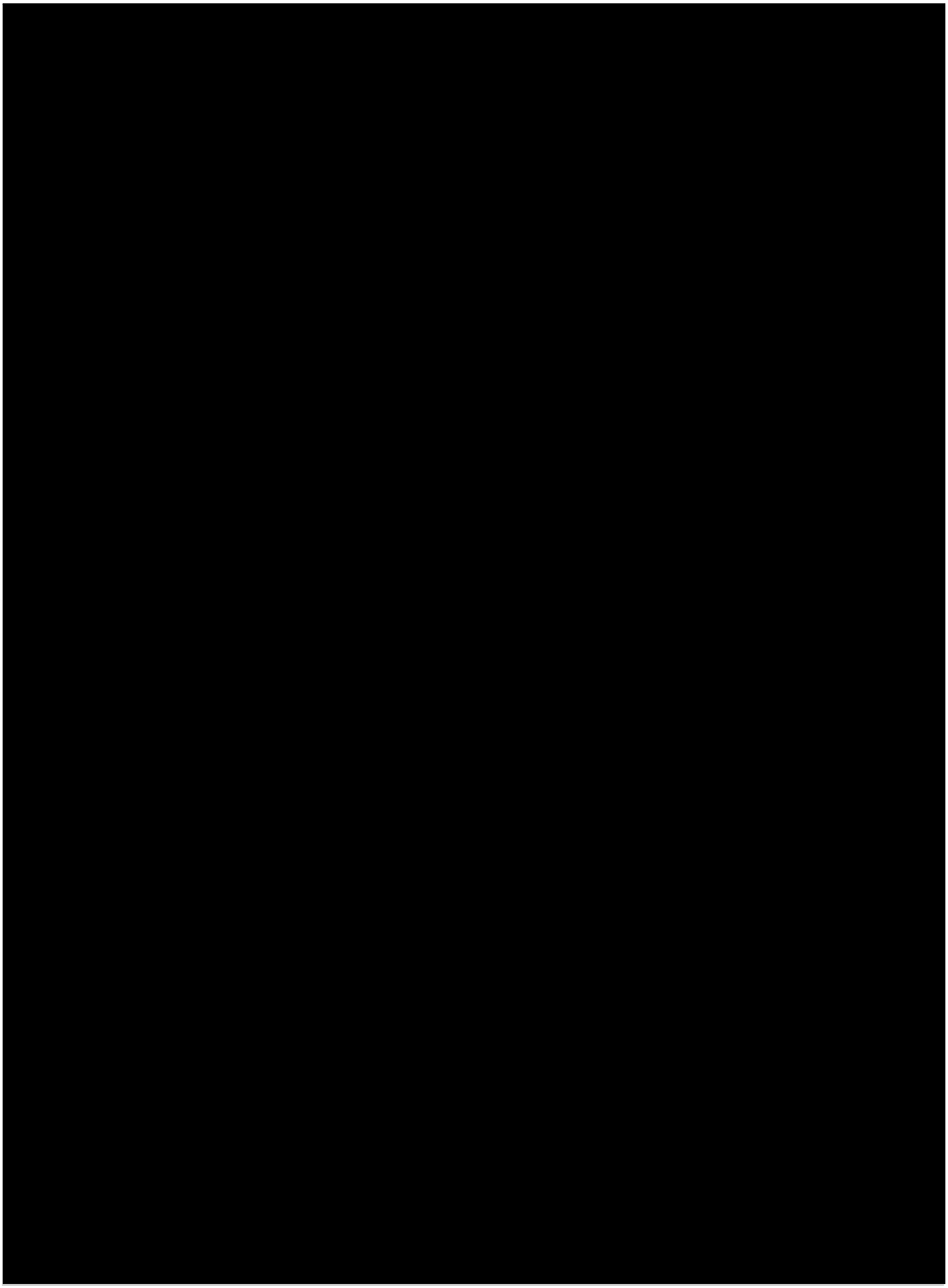


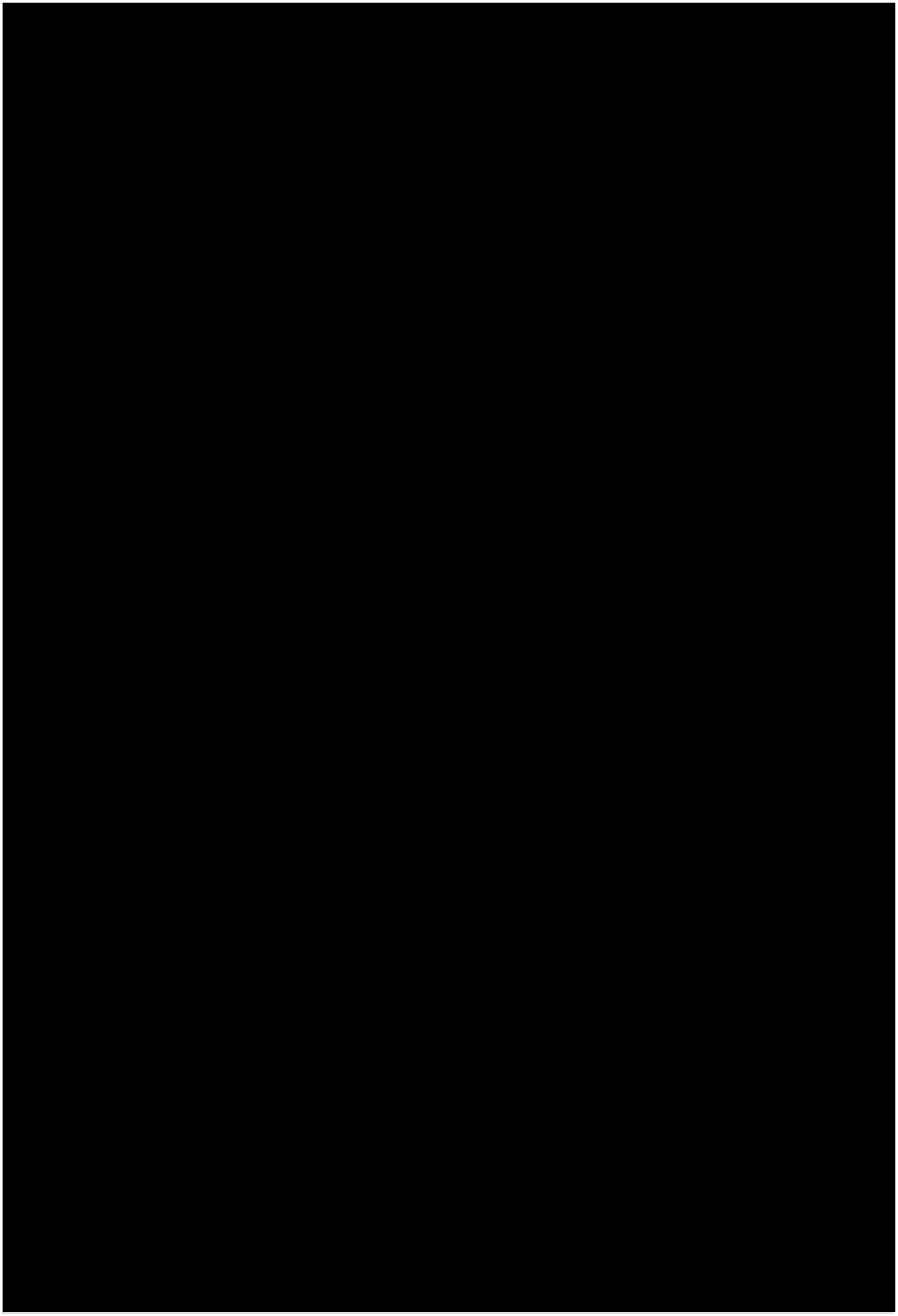


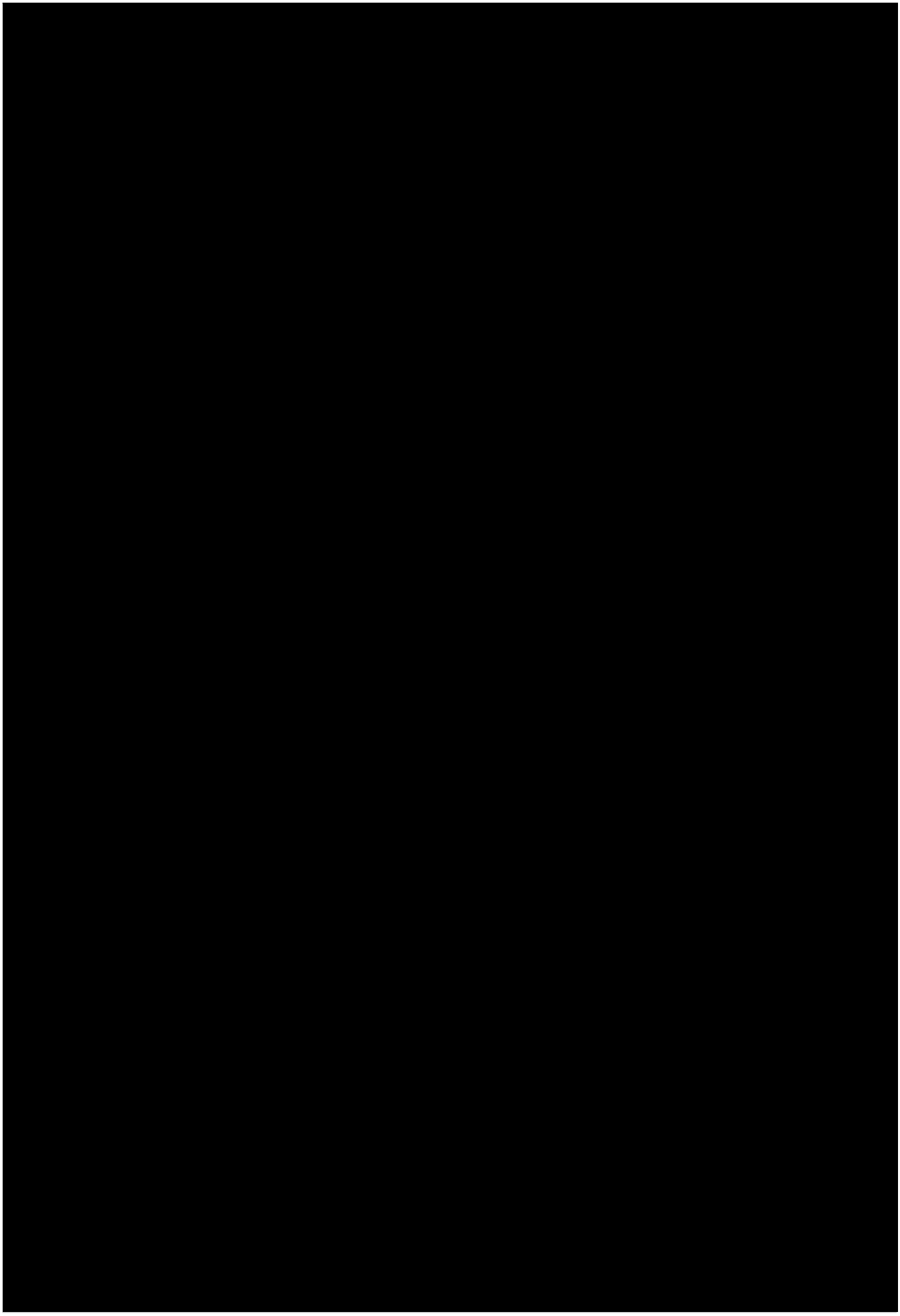


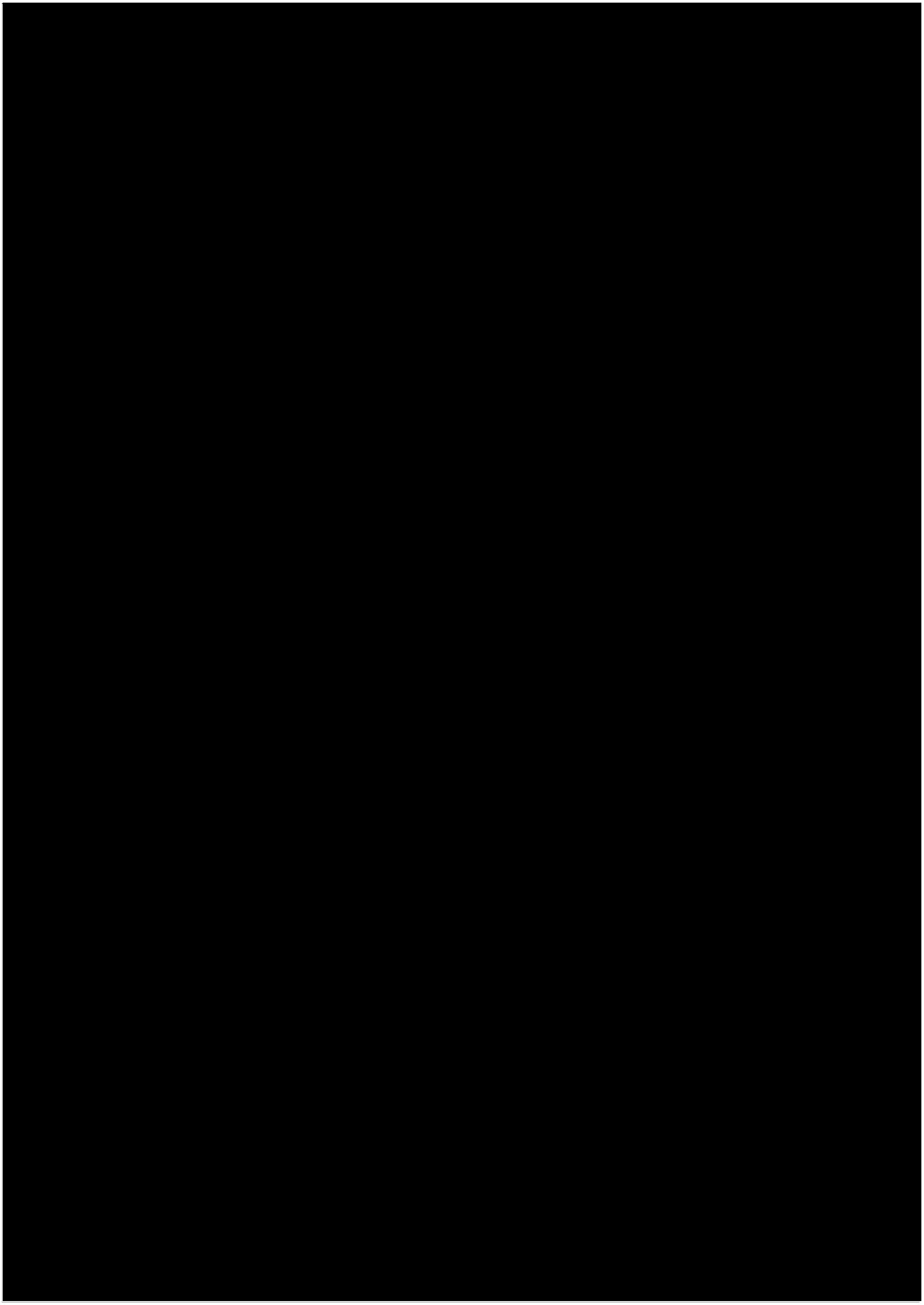




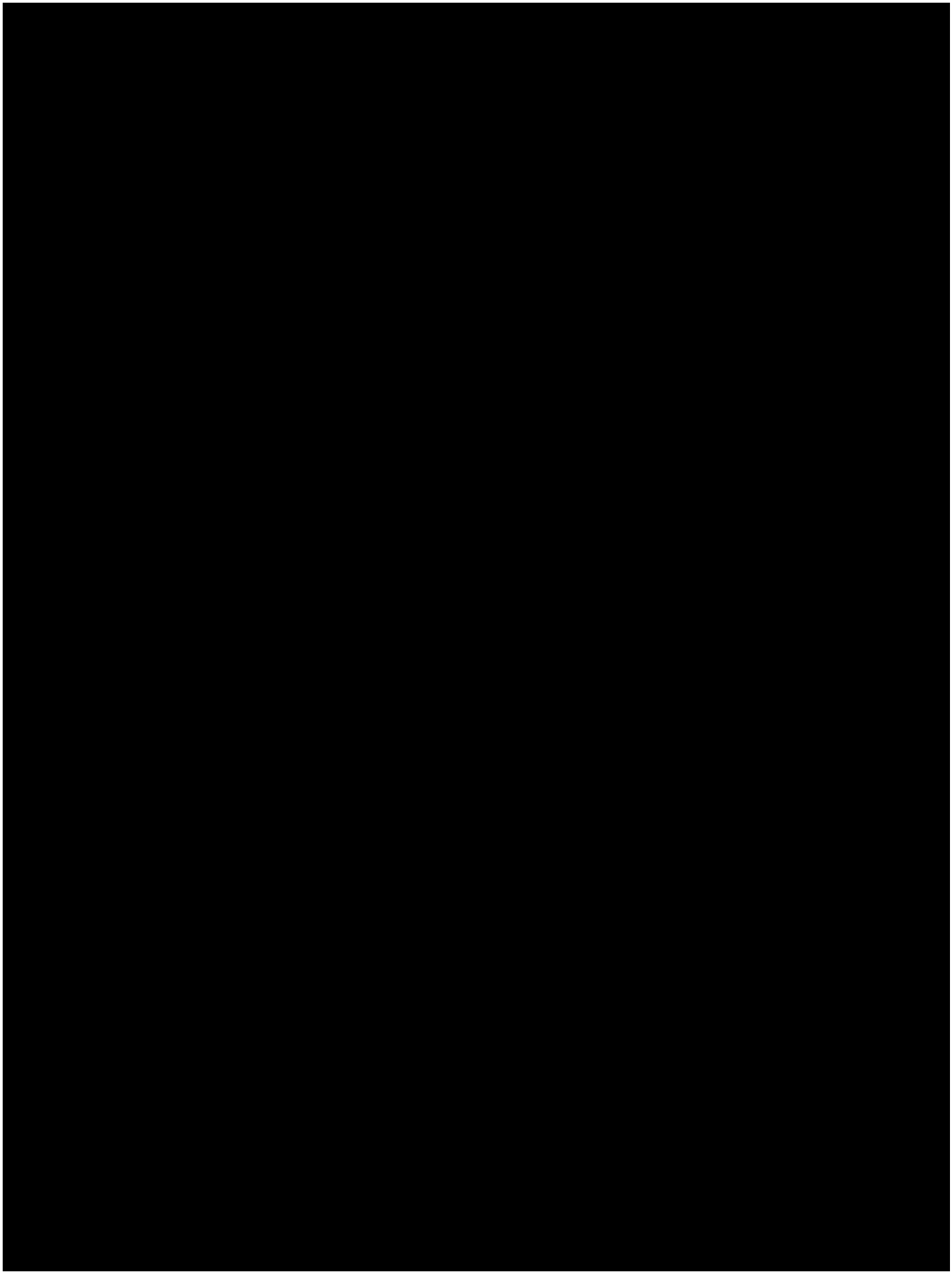


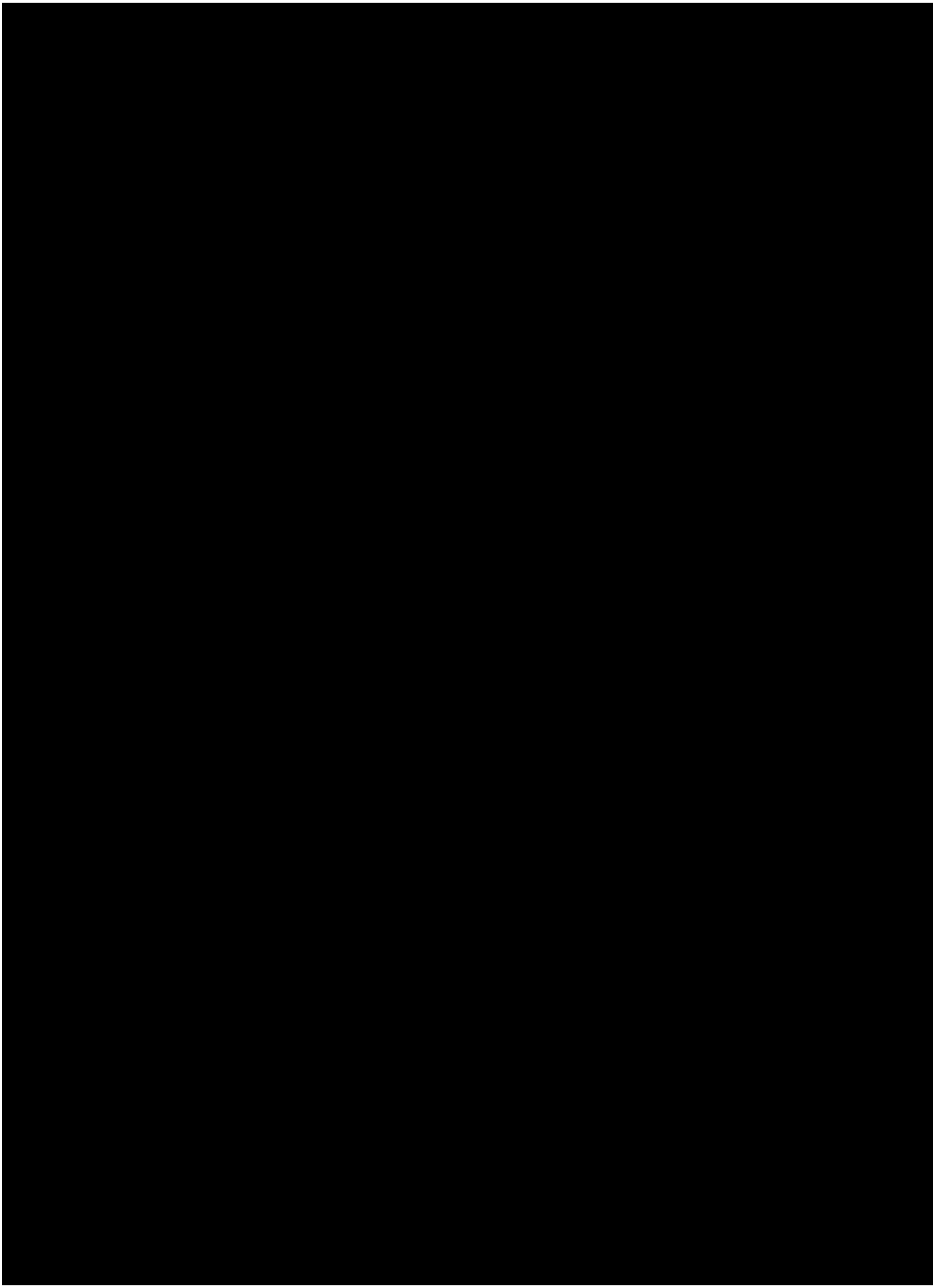


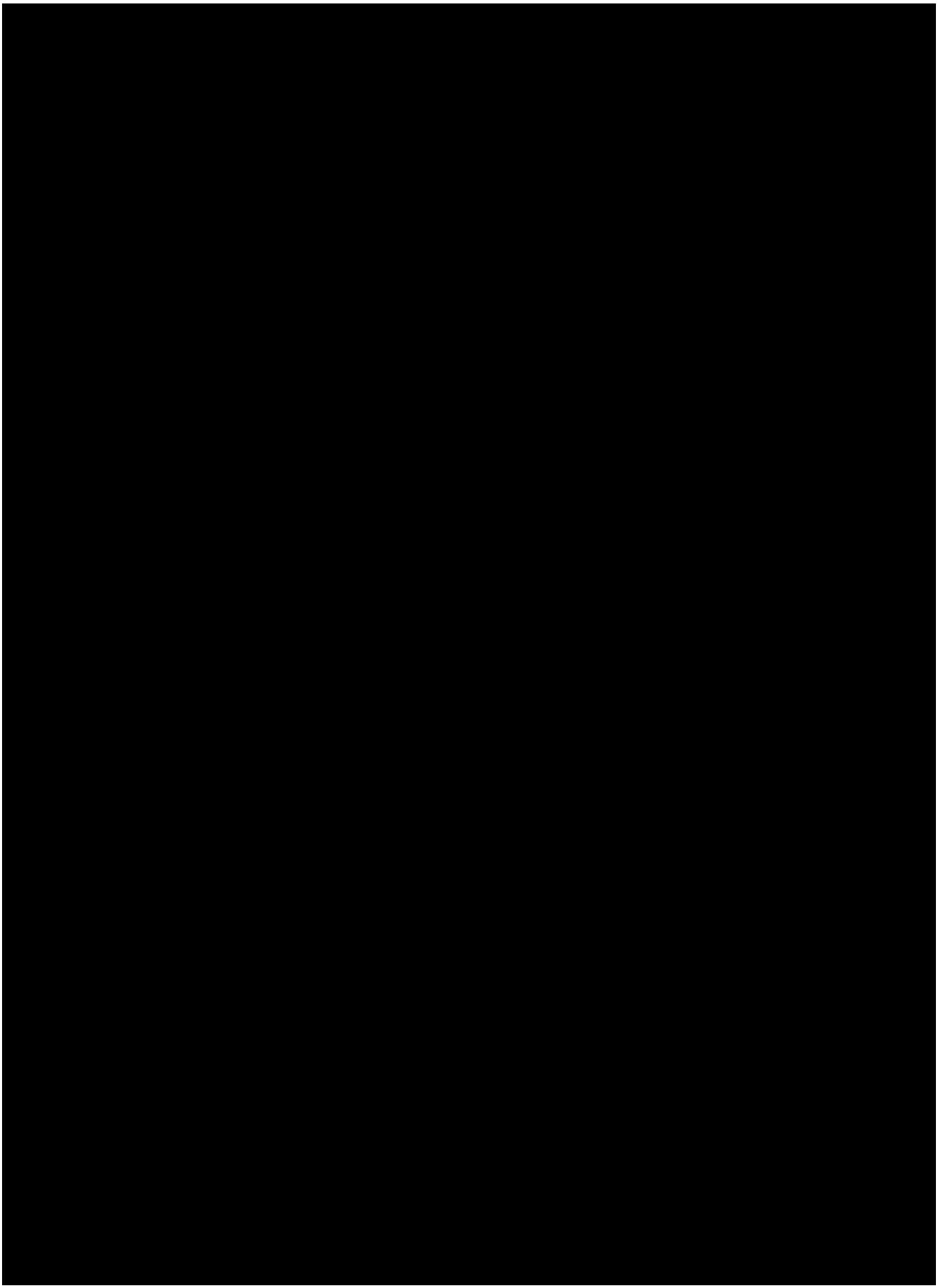


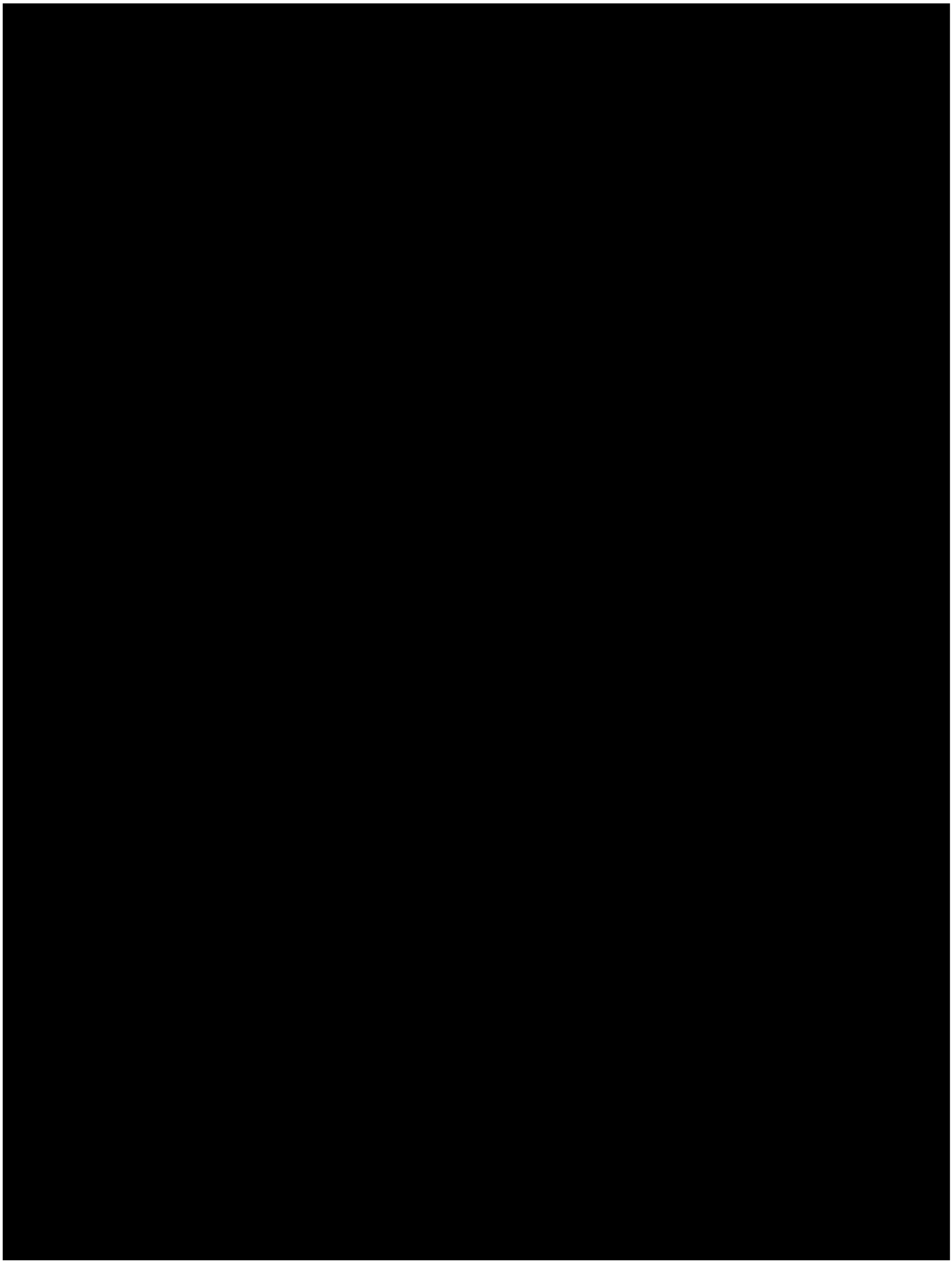


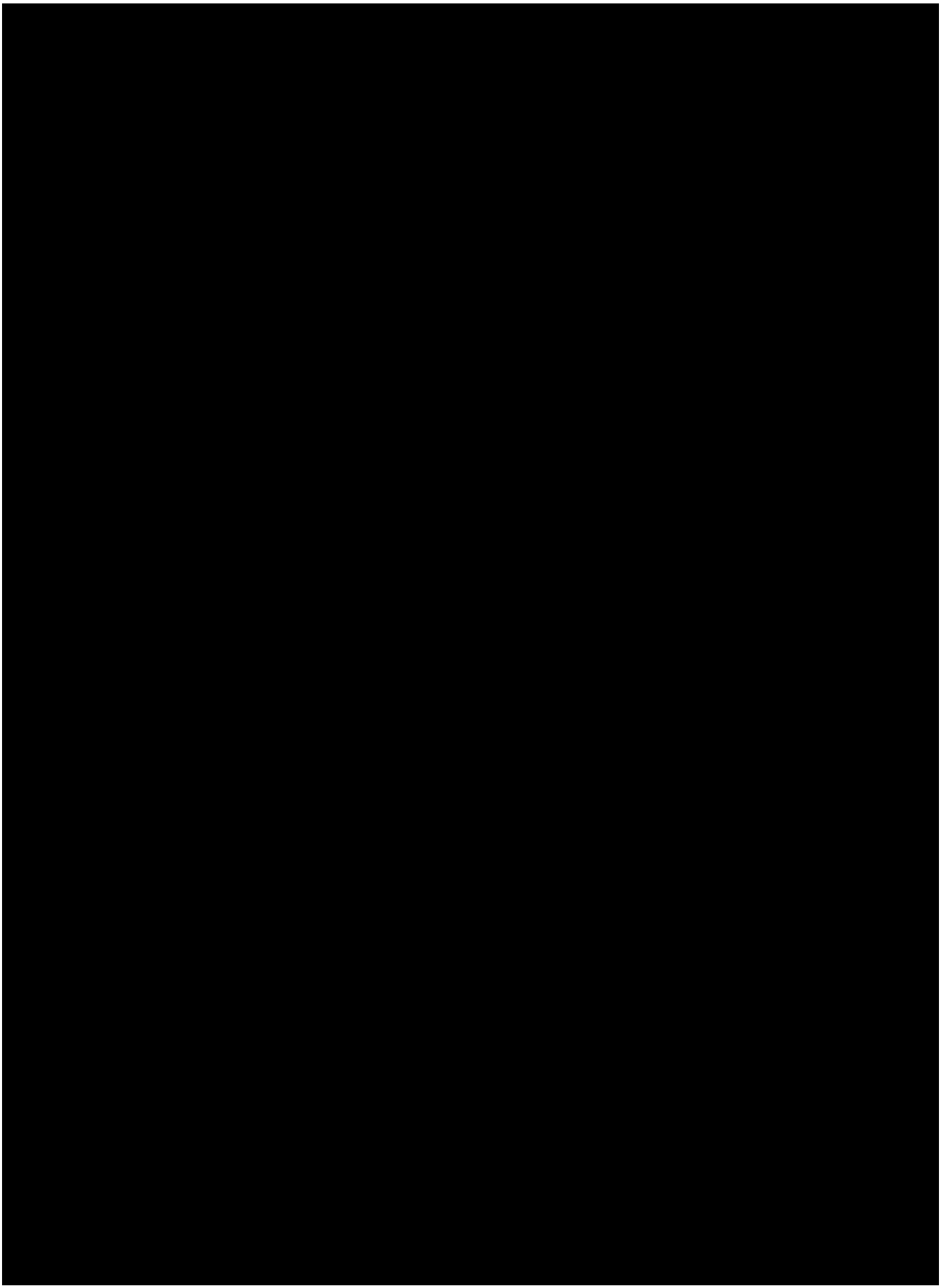
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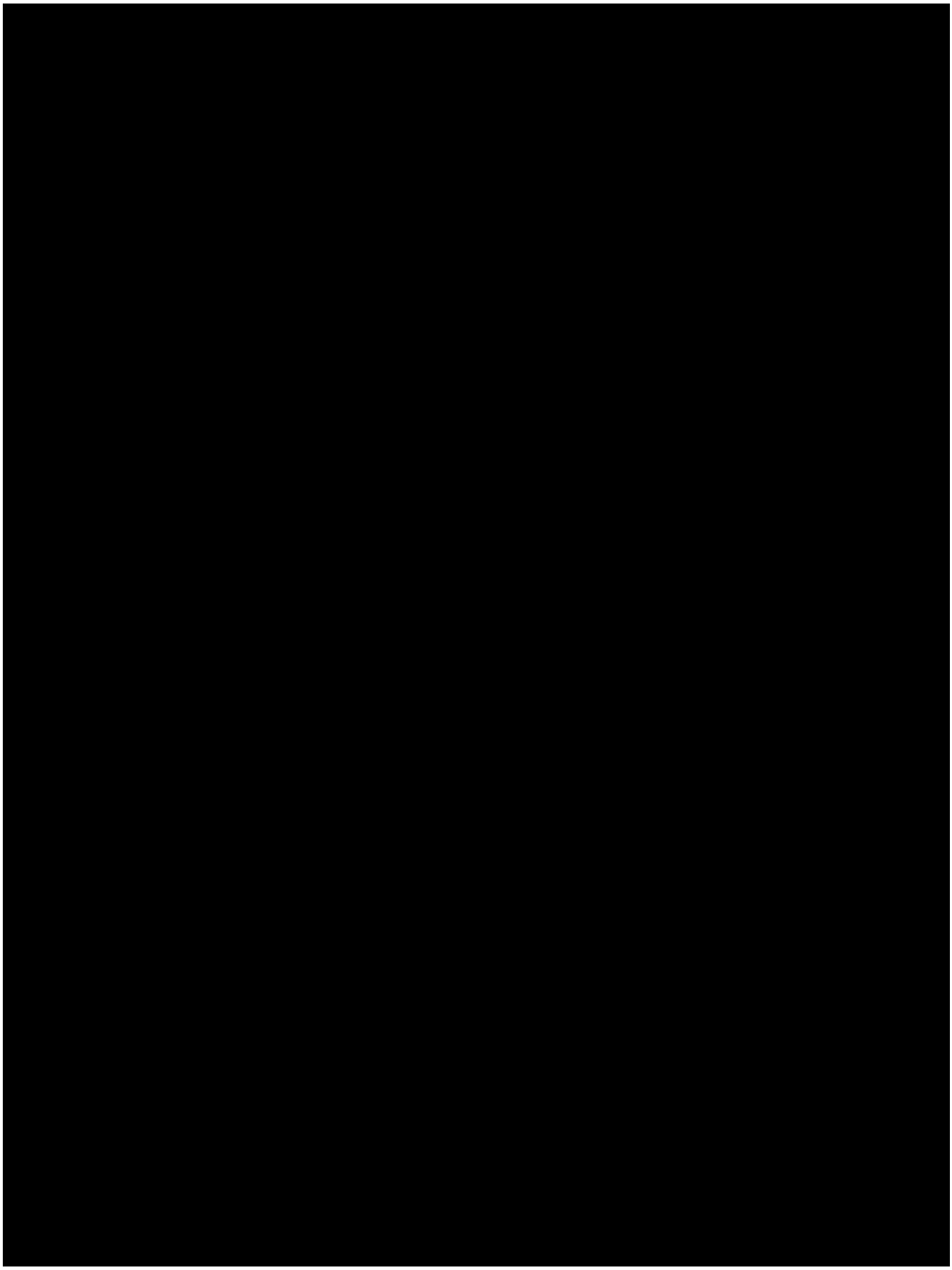


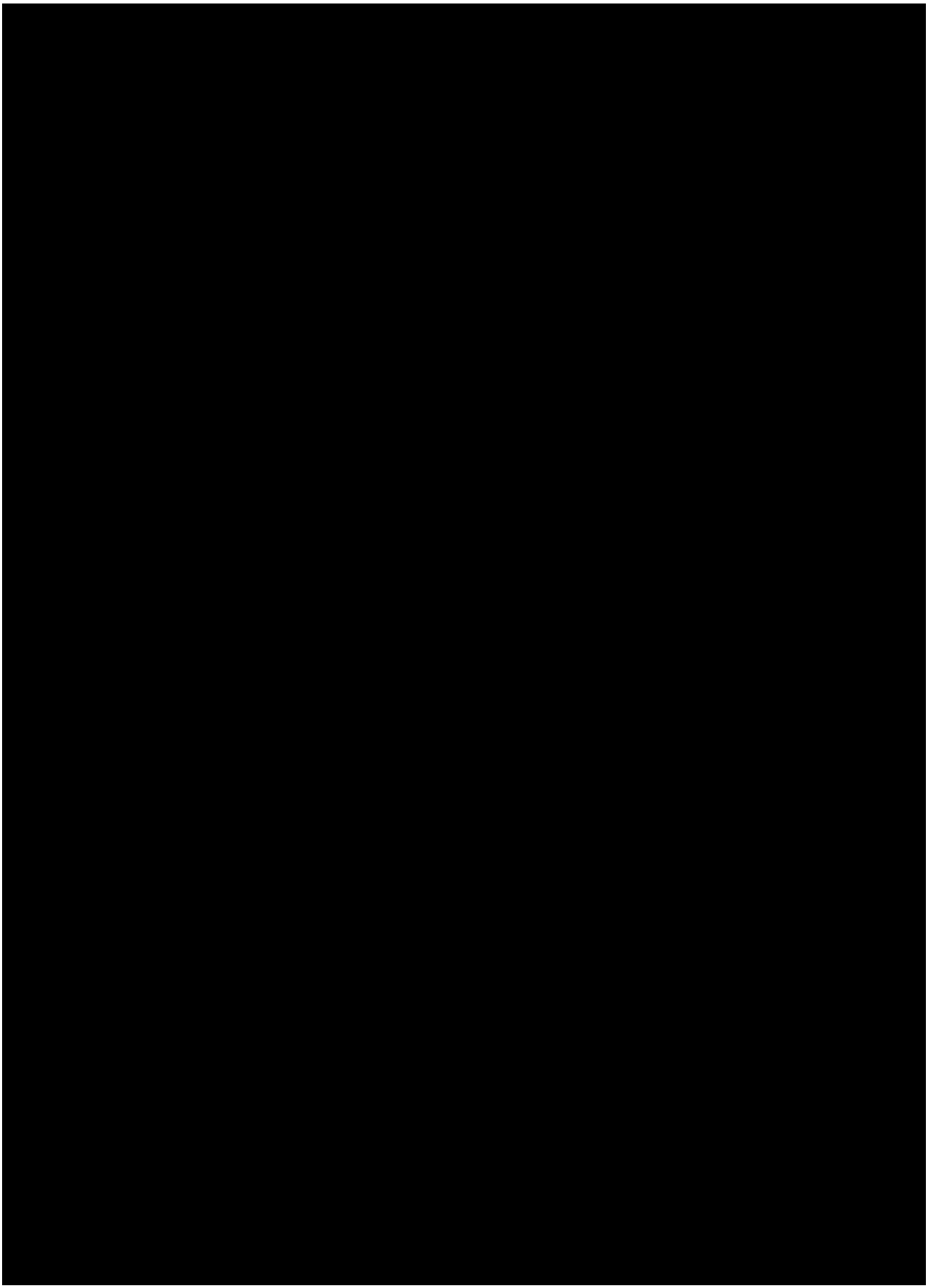


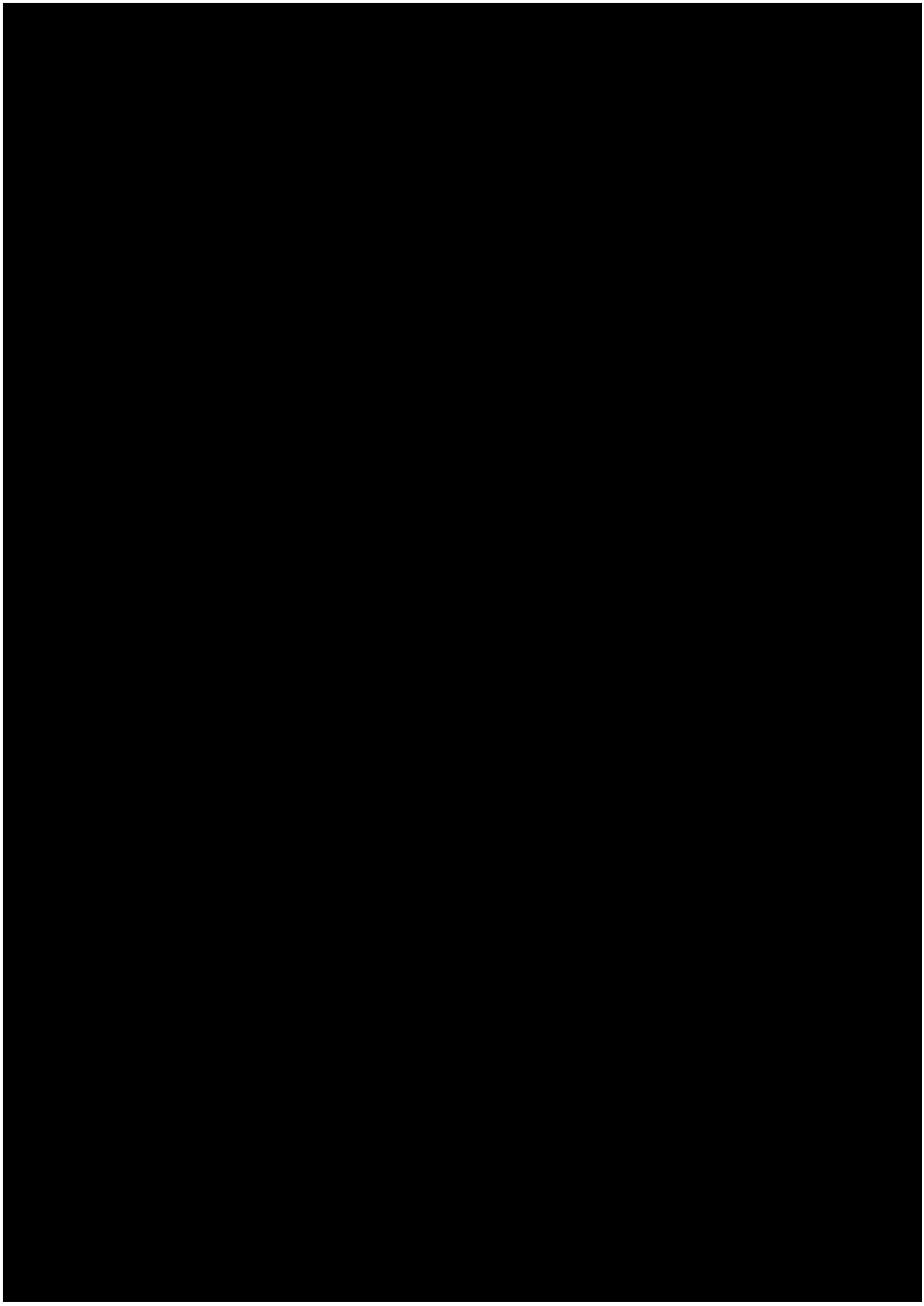


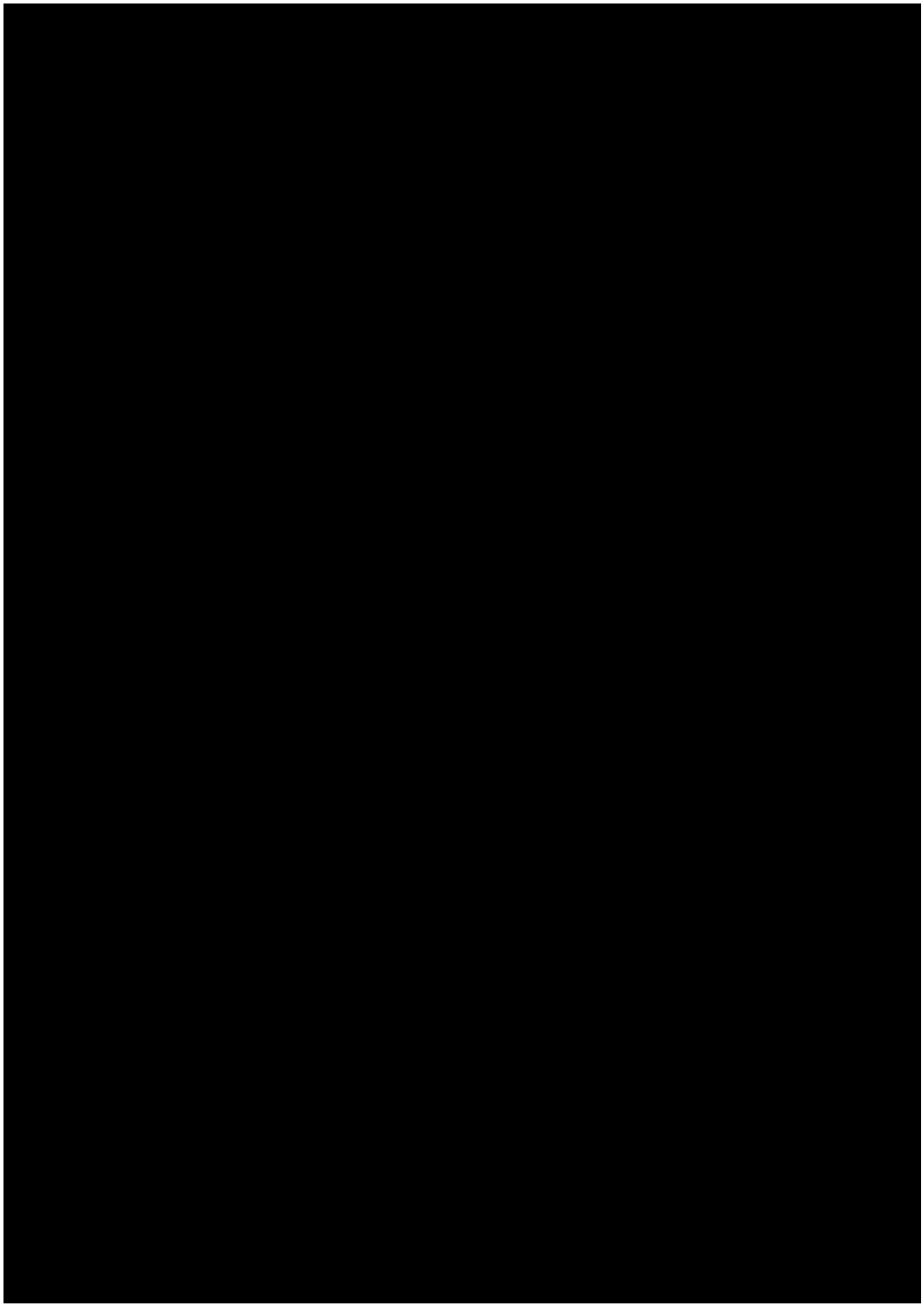












APPENDIX P1

PRODUCT BRIEF

CY8CKIT-062S2-AI

PSOC™ 6 Artificial Intelligence Evaluation Kit

Infineon's PSOC™ 6 Artificial Intelligence Evaluation Kit is your perfect partner for easy prototyping and collecting real-life data to build compelling ML products fast. Being only the size of a cracker, the hardware platform focused on Edge AI enables customers to evaluate Infineon's Machine Learning platform DEEPCRAFT™ Studio, as well as ready to deploy ML models, and other software products.

Data collection is enabled via PSOC™ 6 MCU, as well as Radar (BGT60TR13C), high-performance digital MEMS microphone (IM72D128), Barometric Air Pressure Sensor (DPS368) & IMU sensors (Bosch BMI-270, BMM-350). Connectivity is enabled with WiFi/BT BLE Combo (Murata LBEE5KL1YN).

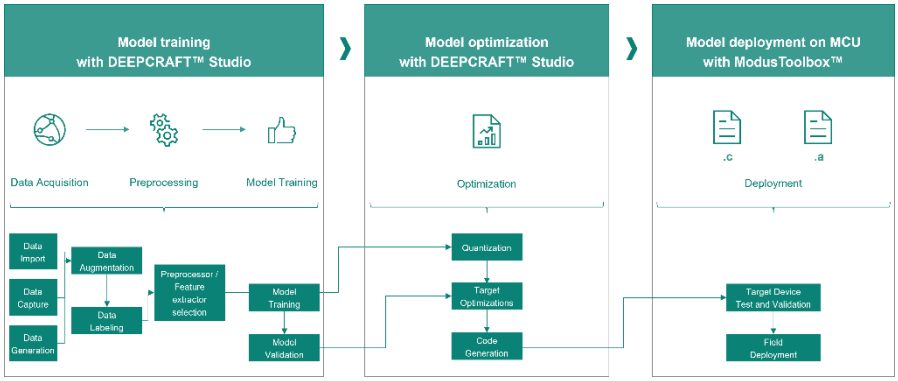






END-TO-END MACHINE LEARNING TO EMBEDDED SOFTWARE JOURNEY

No matter whether you have an ML model already and want to deploy on a target HW, or whether you want to create a new model, you can enter at any stage with DEEPCRAFT™ Studio.



CODE EXAMPLES (Highlights)

- DEEPCRAFT™ Data Collection with all onboard sensors: Collect your own data and feed it into DEEPCRAFT™ Studio for custom model creation.
- DEEPCRAFT™ Optimized Model Deployment: Deploy your newly created model optimized and quantized for the PSOC™ 6.
- Radar Presence Detection: Detect whether there is somebody within range of the kit.
- Wireless Connectivity for Cloud Connection and Reporting: Keep the edge informed of its intelligence by synchronizing within the cloud.

Key features

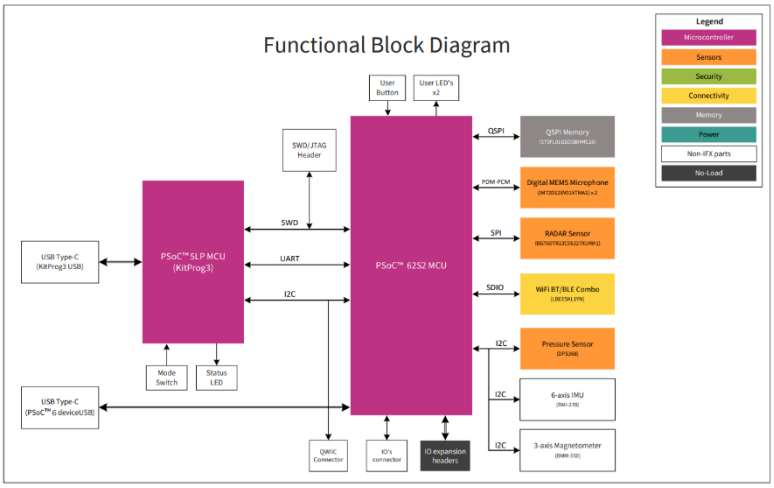
Designed for ease-of-use and end-to-end Machine Learning

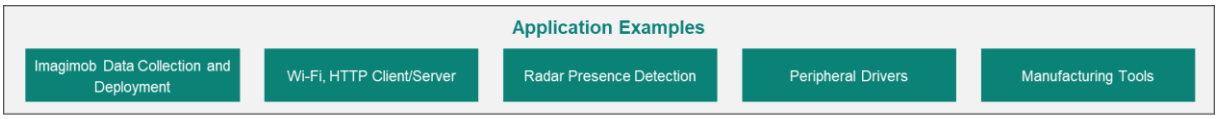
- Small form-factor (35x45mm), wireless, low cost
- Solution approach with PSOC™ 6, QSPI Flash + multi-sensor input (radar, microphone, pressure & 6-axis motion sensors)
- Production ready ML models: DEEPCRAFT™ Ready Models (baby cry, cough, factory alarm, fall, gesture, siren, snoring)
- Complete ML to embedded SW journey: ModusToolbox™ & DEEPCRAFT™ Studio compatible

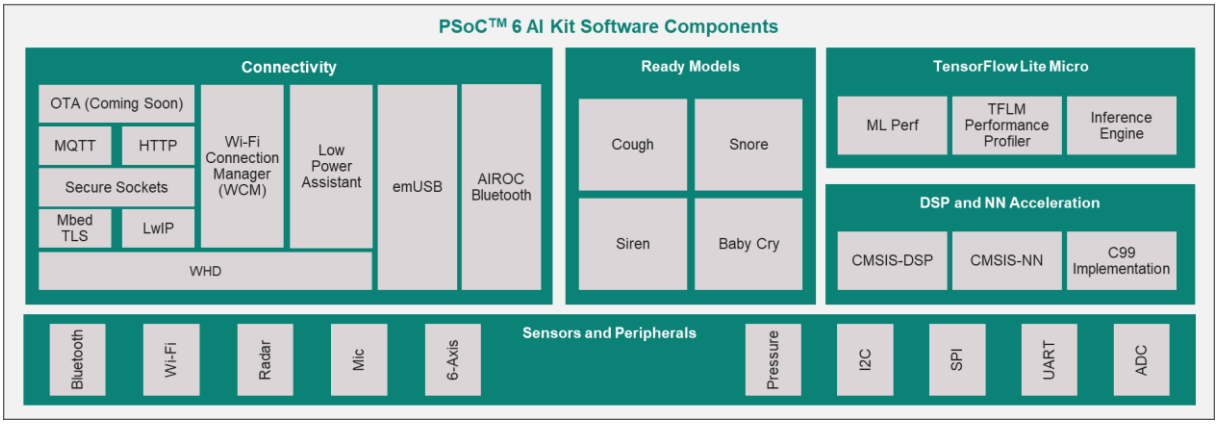
Key benefits

- Low-cost evaluation board with efficient form factor for easy prototyping
- Rapid prototyping: Easy creation of sensor fusion-, ML-, acoustic-, time series- and radar models
- Fast time to market at minimal development cost, direct launch for PSOC™ 6 & AURIX™
- End-to-end: Collect data, create, train, evaluate & deploy ML models fast
- Seamless integration to ModusToolbox™ and DEEPCRAFT™ Studio with application code examples

FUNCTIONAL BLOCK DIAGRAM & SOFTWARE ARCHITECTURE







Important Links

- Find out more about the kit here
- Download the DEEPCRAFT™ Studio development tool here
- Evaluate one of our Ready Machine Learning Models here

APPENDIX P2

Getting started with Matter over Wi-Fi on PSoC™ 6 MCUs in ModusToolbox™

About this document

Scope and purpose

AN237138 describes how to create and use the Matter Lock device using PSoC™ 6 with CYW43xxx. The topics covered include the Matter protocol introduction, PSoC™ 6 introduction, and tools & methods supported to achieve the necessary result.

Intended audience

This application note is intended for users who want to start Matter device development. Users must have basic knowledge about Matter protocol and terminologies defined under it. The device type mentioned in this document is 'Door Lock' and the component used is Infineon's PSoC™ 6 & CYW43xxx.

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1 Introduction to Matter Protocol

1.1 Overview of Matter

Matter is an open standard for smart home technology and IoT, which lets your device work with any Matter-certified ecosystem using a single protocol. Matter is introduced by Connectivity Standards Alliance, an organization of hundreds of companies creating products for smart home and IOT.

Matter's goal is to be an interoperable standard that fosters technology adoption and innovation, gradually replacing proprietary protocols for smart home ecosystems.

Matter is implemented by an open source SDK that contains not only the implementation of the specification but also a rich set of examples and interoperable code. The core Matter protocol fits on the top three layers in the context of OSIwhich means it can run over any type of IPv6 transport and network. While control and other operational communication is performed over IPv6, Bluetooth® Low Energy and NFC may be employed to commission new devices.

Figure 1 illustrates the Matter Protocol layer alongside TCP/IP and OSI layers.

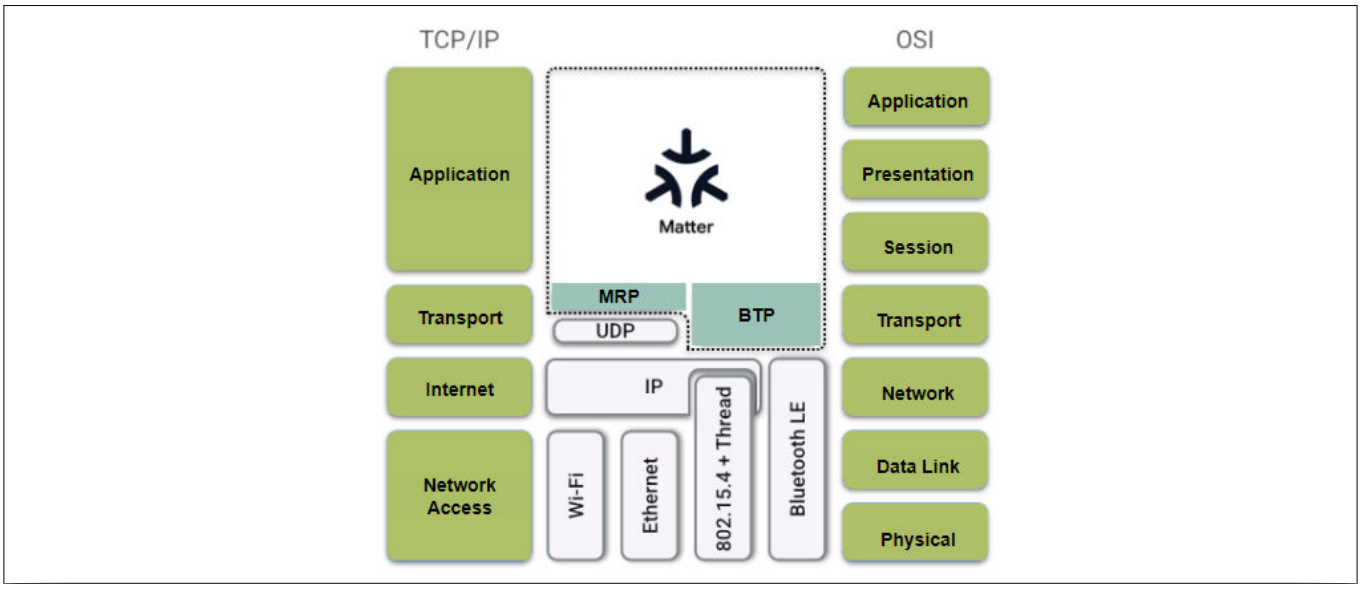


Figure 1 Matter Protocol layer alongside TCP/IP and OSI layers

Matter is flexible and interoperable. It builds upon years of challenges and successes of low-power 802.15.4 networks as well as Wi-Fi smart home devices. Like Thread, Matter builds atop IPv6. It includes strong cryptography, a well-defined modelling of device types and their data, and the support for multiple ecosystem administrators.

Matter also supports bridging of other Smart Home technologies such as Zigbee, Bluetooth Mesh and Z-Wave. This means that devices based on these protocols may be operated as if they were Matter devices through a Bridge, which is a member device of both a Matter network and the other, bridged, IoT technologies.

There is a dual advantage to Bridges. The devices that use other protocols gain access to technologies and ecosystems that target native Matter devices. Meanwhile Matter will leverage on mature technologies with large installed user bases to create a true web of connected things.

Reasons to build with Matter include:

- Lower latency and higher reliability than cloud-to-cloud connection, because Matter is an IP-based local connectivity protocol.
- Lower development costs: build once and it works for all Matter-certified ecosystems.
- Consistent setup experience across all Matter-enabled devices.

- Device sharing and control via other Matter-compatible ecosystems.
- Wide variety of supported devices with different hardware platforms (Wi-Fi-Thread-Ethernet) being interoperable.

1.2 Matter terminology

- **Node:** An addressable entity which supports the Matter protocol stack and (once commissioned) has its own Operational Node ID and Node Operational credentials. A device may host multiple nodes.
- **Fabric:** A logical collection of communicating nodes, sharing a common root of trust, and a common distributed configuration state.
- **Commissioning:** Sequence of operations to bring a node into a fabric by assigning an Operational Node ID and Node Operational credentials.
- **Commissionable Node:** A node that is able to be commissioned. Specific actions such as a button press may be required to put a Commissionable Node into Commissioning Mode for it to allow Commissioning.
- **Commissionable Node Discovery:** Discovery of a node that is able to be commissioned, but not necessarily in Commissioning Mode, for the purpose of performing commissioning. The node may be brand new, after factory reset, or it may have already been commissioned.
- **Commissioner:** A role of a node that performs commissioning.
- **Commissionee:** An entity that is being commissioned to become a node.
- **Commissioning Channel:** A Secure Channel used to perform commissioning (BLE, NFC etc.).
- **Cluster:** A specification defining one or more attributes, commands, behaviors, and dependencies, that supports an independent utility or application function. The term may also be used for an implementation or instance of such a specification on an endpoint.

1.3 Matter Door Lock application

Using a device type in the Matter ecosystem is important due to simplicity and clear guidance for a particular set of predefined devices. Door Lock is a device type defined in Matter implementation which shall contain all mandatory clusters and attributes listed under it. The function of a Door Lock device is to actuate a door lock by means of a manual or remote method.

To achieve this, CSA has defined following clusters under "Door Lock" device.

ID	Cluster name	Client/Server	Conformance
0x0003	Identify	Server	Mandatory
0x0004	Groups	Server	Optional
0x0005	Scenes	Server	Optional
0x0101	Door Lock	Server	Mandatory
0x0009	Alarms	Server	Optional
0x0020	Poll Control	Server	Optional
0x000A	Time	Client	Optional
0x0038	TimeSync	Client	-

Among these clusters, the Identify and Door Lock clusters are mandatory and the rest are user-implementation dependent. There are several attributes which support different action values. Please refer to the latest Matter Device library for further details. There are two commands supported under the Door Lock cluster which shall trigger door locking or unlocking where the user has to implement the actual action for door lock (driving actuator/motor).

ID	Name	Direction	Response	Access	Conformance
0x00	Lock Door	Client ⇒ Server	Y	T O	Mandatory
0x01	Unlock Door	Client ⇒ Server	Y	T O	Mandatory

Underlying dependent parameters like pin code and RFID code, if set, shall also be taken into consideration while operating with these commands.

Attributes serve the purpose of defining or setting/changing values of parameters such as Pin code, Day/Date, Timeout etc. These are available under each cluster and can be accessed when required. The following table provides a sample.

ID	Name	Type	Constraint	Quality	Default	Access	Conformance
0x0000	LockState	enum8	desc	X P S		R V	Mandatory
0x0001	LockType	enum8	desc	R V		M	
0x0002	ActuatorEnabled	bool	all	R V		M	
0x0003	DoorState	enum8	desc	X P		R V	

For more details on Clusters, Attributes, Endpoints, and related terminologies, please refer to the Matter specifications listed here.

2 Development ecosystem

2.1 PSoC™ 6 resources

A wealth of data is available at http://www.infineon.com/ to help you to select the right PSoC™ device and quickly and effectively integrate it into your design. The following is an abbreviated list of resources for PSoC™ 6 MCU:

- **Overview:** PSoC™ Portfolio
- **Product Selectors:** PSoC™ 6 MCU
- ModusToolbox™ Software for developing PSoC™ 6 MCU applications: ModusToolbox™ Software is a modern, extensible development environment supporting a wide range of Infineon microcontroller devices including PSoC™ 6 MCU.
- PSoC™ 6 Datasheets describe and provide electrical specifications for each device family.
- PSoC™ 6 Development Kits: Infineon provides a wide selection of hardware development kits for getting stated on PSoC™ 6, and to rapidly prototype applications.
- PSoC™ 6 Application Notes cover a broad range of topics, from basic to advanced level spanning hardware, firmware, software, and application level topics. Many of the application notes include associated code examples.
- Code examples: There are hundreds of code examples available in ModusToolbox™ software that enables you to easily get started on PSoC™ 6, and rapidly prototype your application. Each code example provides a README.md file to learn more about that code example, as well as how to use it to create an application.
- Technical Reference Manuals (TRMs) provide detailed descriptions of the architecture and registers in each device family.
- PSoC™ 6 Programming Specification provide the information necessary to program the nonvolatile memory of the PSoC™ 6 MCU devices.
- CAPSENSE™ Design Guides: Learn how to design capacitive touch-sensing applications with PSoC™ devices.
- Training videos: Infineon provides video training on our products and tools, including a dedicated series on PSoC™ 6 MCU.

2.2 Firmware/application development

For application development with the PSoC™ 6 family MCUs, use the ModusToolbox™ development platform. ModusToolbox™ software includes configuration tools, low-level drivers, middleware libraries, operating system support, and other packages for creating MCU.

2.2.1 Choosing an IDE

ModusToolbox™ software, the latest-generation toolset, includes the Eclipse IDE and is therefore supported across Windows, Linux, and macOS platforms. The Eclipse IDE for ModusToolbox™ is integrated with quick launchers for tools and design configurators in the Quick Panel. Third-party IDEs supported by ModusToolbox™ include Visual Studio Code, Arm® MDK (µVision), and IAR Embedded Work bench. The associated hardware and middleware configurators also work on all three host operating systems.

Use ModusToolbox™ to take advantage of the power and extensibility of an Eclipse-based IDE.

2.2.2 ModusToolbox™ software

ModusToolbox™ is a collection of tools and software that provides an immersive development experience for creating converged MCUs and allows you to integrate Infineon devices into your existing development methodology. To achieve this goal, ModusToolbox™ leverages popular third-party ecosystems such as FreeRTOS and Arm® Mbed OS, and adds specific features for security.

Eclipse IDE for ModusToolbox™ is a multi-platform development environment that supports application configuration and development.

Figure 2 shows a high-level view of the tools/resources included in the ModusToolbox™ software. For a more in-depth overview of the ModusToolbox™ software, see ModusToolbox™ user guide.

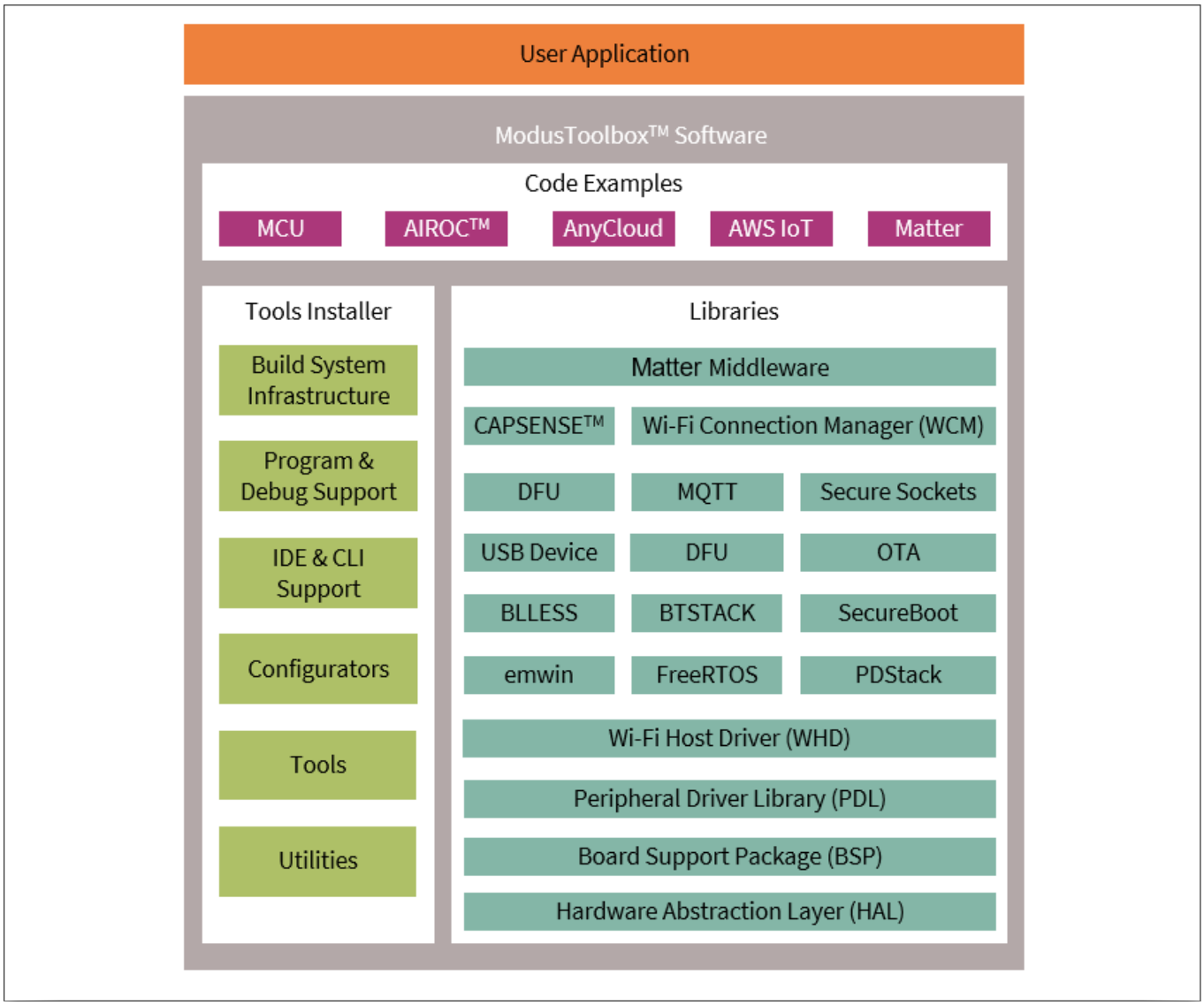


Figure 2 ModusToolbox™ software

The ModusToolbox™ installer includes the design configurators and tools, and the build system infrastructure.

The build system infrastructure includes the new project creation wizard that can be run independent of the Eclipse IDE, the make infrastructure, and other tools.

All the ModusToolbox™ development flows depend on the provided low-level resources. These include:

- Board support packages (BSP) – A BSP is the layer of firmware containing board-specific drivers and other functions. The board support package is a set of libraries that provide APIs to initialize the board and provide access to board level peripherals. It includes low-level resources such as Peripheral Driver Library (PDL) for PSoC™ 6 family MCU and has macros for board peripherals. It uses the HAL to configure the board. Custom BSPs can be created to enable support for end-application boards. Refer to the "Board Support Packages" section in ModusToolbox™ user guide for more information.
- Hardware Abstraction Layer (HAL) – HAL provides a high-level interface to configure and use hardware blocks on MCUs. It is a generic interface that can be used across multiple product families. The focus on ease-of-use and portability means that the HAL does not expose all the low-level peripheral functionality.

The HAL wraps the lower-level drivers and provides a high-level interface to the MCU. The interface is abstracted to work on any MCU. This helps you write application firmware independent of the target MCU.

The HAL can be combined with platform-specific libraries within a single application. You can leverage the HAL's simpler and more generic interface for most of an application, even if one portion requires lower-level control.

- Peripheral Driver Library (PDL) – The PDL integrates the device header files, startup code, and peripheral drivers into a single package. The PDL supports the PSoC™ 6 family MCU device family. The drivers abstract the hardware functions into a set of easy-to-use APIs. These are fully documented in the PDL API Reference.

The PDL reduces the need to understand register usage and bit structures, thus easing software development for the extensive set of peripherals in the PSoC™ 6 family MCU series. You configure the driver for your application, and then use API calls to initialize and use the peripheral.

- Middleware (MW) - Extensive middleware libraries that provides specific capabilities to an application. All the middleware is delivered as libraries and via GitHub repositories. All libraries are constantly developed and the production-ready latest version is pushed via an integrated update system which the user can opt for.

3 PSoC™ 62S2 Wi-Fi BT Pioneer Kit

3.1 Overview of PSoC™ 62S2 Wi-Fi BT Pioneer Kit (CY8CKIT-062S2-43012)

The PSoC™ 62S2 Wi-Fi BT Pioneer Kit enables you to evaluate and develop your applications using the PSoC™ 6 Series MCU (hereafter called "PSoC™ 6 MCU") and CYW43012 WICED Wi-Fi/BT combo device. The PSoC™ 6 BLE Pioneer Board offers compatibility with Arduino™ shields. The board features a PSoC™ 6 MCU, and a CYW43012 Wi-Fi/Bluetooth combo module.

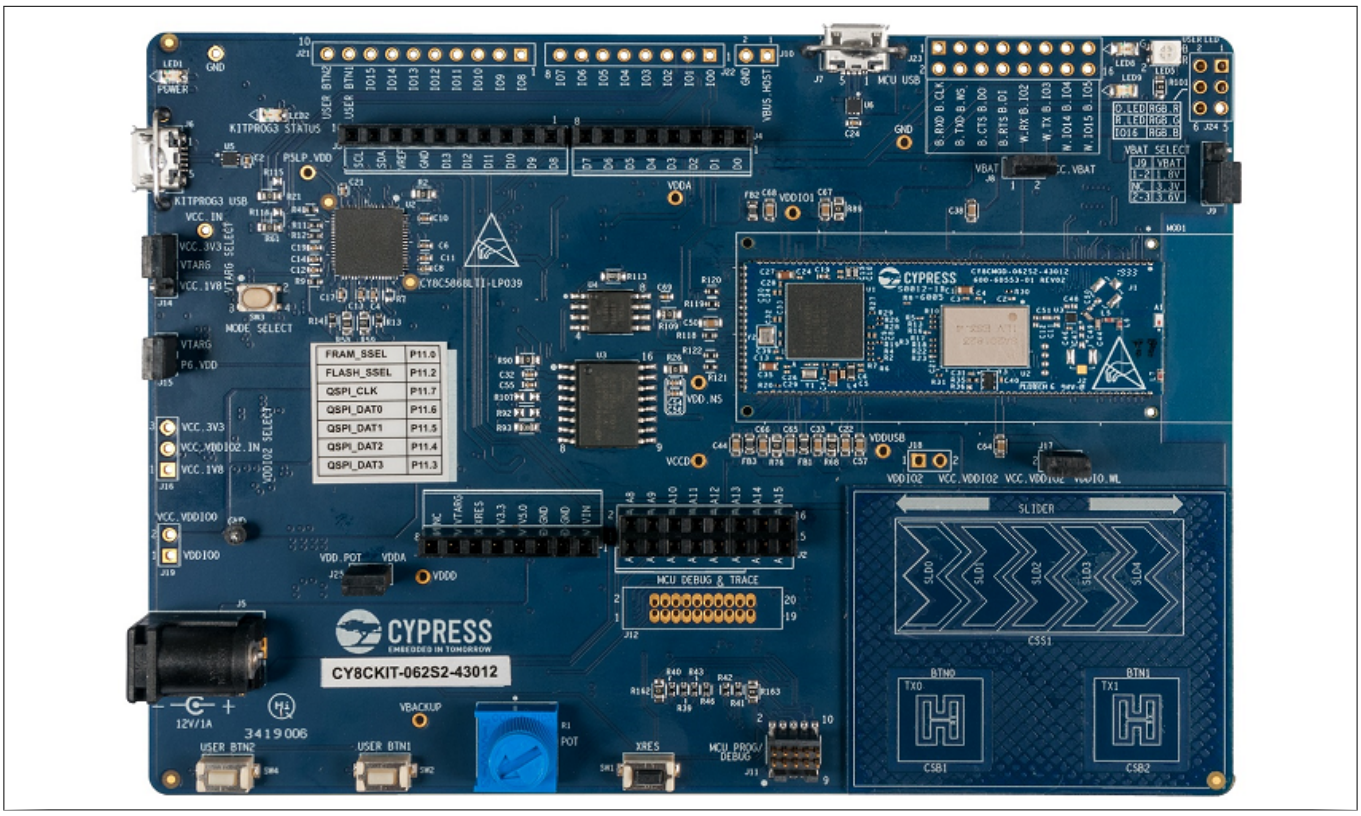


Figure 3 PSoC™ 62S2 Wi-Fi BT Pioneer Kit (CY8CKIT-062S2-43012)

PSoC™ 6 MCU is Infineon's latest, ultra-low-power PSoC™ specifically designed for wearables and IoT products. PSoC™ 6 MCU is a true programmable embedded system-on-chip, integrating a 150-MHz Arm® Cortex®-M4 as the primary application processor, a 100-MHz Arm® Cortex®-M0+ that supports low-power operations, up to 2 MB Flash and 1 MB SRAM, Secure Digital Host Controller (SDHC) supporting SD/SDIO/eMMC interfaces, CAPSENSE™ touch-sensing, and programmable analog and digital peripherals that allow higher flexibility, in-field tuning of the design, and faster time-to-market.

Infineon's CYW43012 is a 28-nm, ultra-low-power device that supports single-stream, dual-band IEEE 802.11n-compliant Wi-Fi MAC/ baseband/radio and Bluetooth® 5.0 BR/EDR/LE. The WLAN section supports SDIO interface to the host MCU (PSoC™ 6 MCU), and the Bluetooth section supports high-speed 4-wire UART interface to the host MCU.

In addition, the board features an onboard programmer/debugger (KitProg3), a 512-Mbit Quad SPI NOR flash, a 4-Mbit Quad SPI F-RAM, a micro-B connector for USB device interface, a 5-segment CAPSENSE™ slider, two CAPSENSE™ buttons, a microSD card holder, an RGB LED, two user LEDs, one potentiometer, and two push buttons. The board supports operating voltages from 1.8 V to 3.3 V for PSoC™ 6 MCU.

Refer here for the PSoC™ 62S2 Wi-Fi BT Pioneer Kit guide.

4 Lock application with PSoC™ 62S2 Wi-Fi BT Pioneer Kit

This section demonstrates how to build a lock application on the PSoC™ 62S2 Wi-Fi BT Pioneer Kit

4.1 Methods for creating and building the Lock application

There are currently two ways to build and flash the Lock for Matter in a PSoC™ 6 device: standard GitHub repository (provided and maintained by CSA members) and Infineon's IDE ModusToolbox™. The user can avail any method to develop a Lock app but it is strongly suggested to use ModusToolbox™ to get full code and device support for the Matter Lock app or any other related app functionality. The following sections describe the methods available to develop the Lock app.

4.1.1 Connectedhomeip & Infineon GitHub repository

4.1.1.1 CHIP repository

CSA has its own repository for creating sample apps and change base code for Matter protocol development. There are different branches created for different levels of development. Every device-specific code will be available under 'Examples'. The user can choose any project available from Infineon and start developing for the same. In this scenario, the user should navigate to 'psoc6'

Visit this page to get started with Infineon's Lock App example on PSoC™ 6. Make sure to use the latest branch and updates (v1.0 onwards).

4.1.1.2 Infineon GitHub repository

Infineon has a separate GitHub repository along with the one on CSA, which includes the Lock app, Lighting app, all basic cluster apps, and a few apps that are under development.

Please navigate to this repository in Infineon GitHub page and proceed with the mentioned instructions. The latest tested (auto build and verify) code will be available in this repository.

4.1.1.3 Build process

The build process for both repositories is the same since the base device is PSoC™ 6.

- User has to download the code from GitHub (clone) and fulfil all prerequisites mentioned.
- These methods are mainly based on Linux and Mac environment; WSL or similar tools may be required if the user is working on a Windows system.
- Run the mentioned commands in sequence in order to get the desired output.



- Few processes may fail due to the underlying system dependency. The user might need to install additional packages as instructed in the script output or in the GitHub process.
- Flashing can also be done via the script available and uses no additional components like Jlink, Cypress Programmer etc. unless the user wants to debug the code (which is only possible via ModusToolbox™ Software).

4.1.2 ModusToolbox™

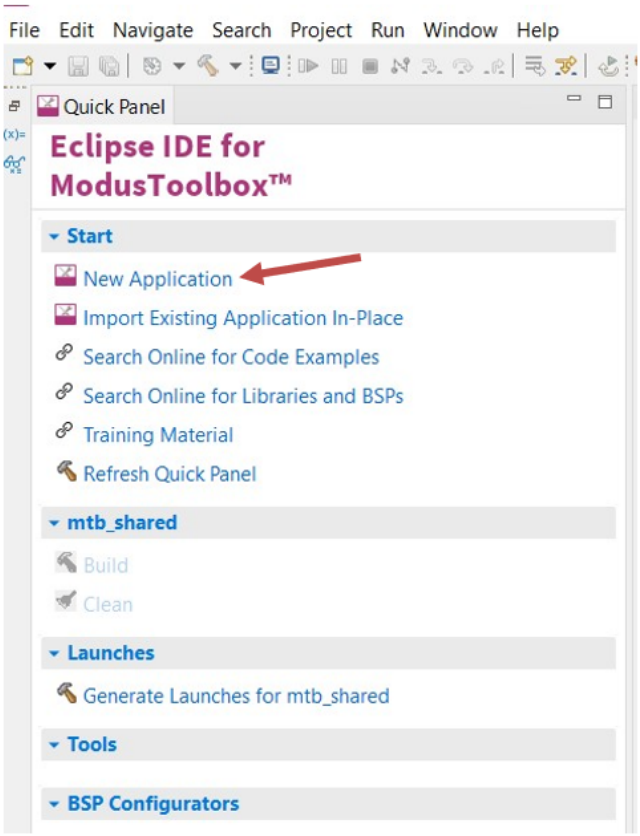
4.1.2.1 Dependencies

Infineon's ModusToolbox™ is a complete package to get started with the PSoC™ 6 Matter Lock application. The Lock application supports ModusToolbox™ version 3.0 and above. The user can download the code from GitHub and use in ModusToolbox™ and/or use the existing sample Lock application in the ModusToolbox™ application creation process. All other desired configurators like GPIO, ADC, PWM, SPI, and many more are readily available for the same.

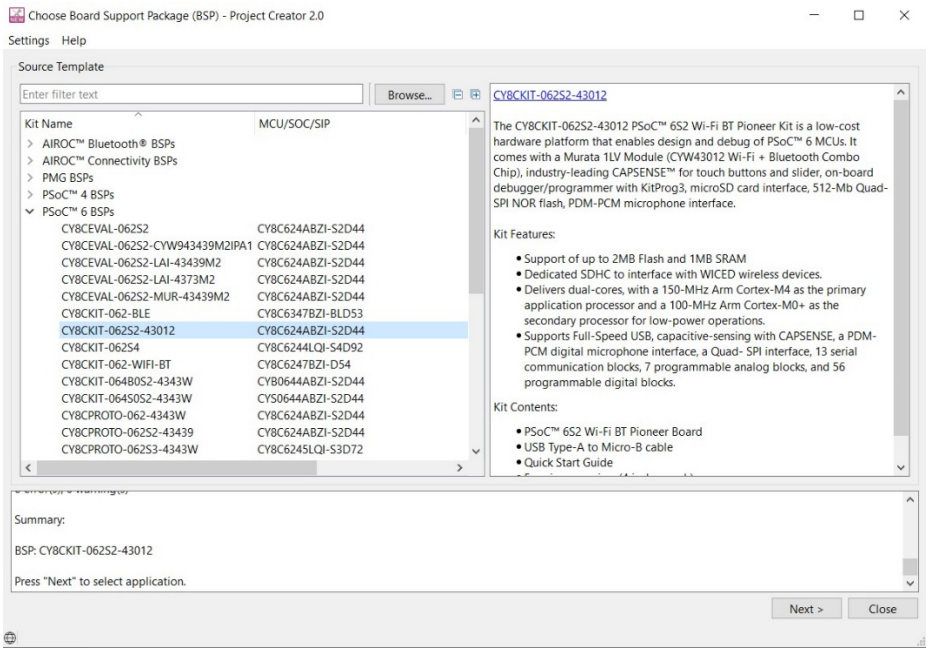
The user has the flexibility to add or remove any component suitable for the project using the inbuilt tools manager. Results and memory analysis of the built application can be viewed under different output window tabs in ModusToolbox™. Debugging is available by using additional tools like Jlink or using the inbuilt tool.

4.1.2.2 Project creation, build, and flash process

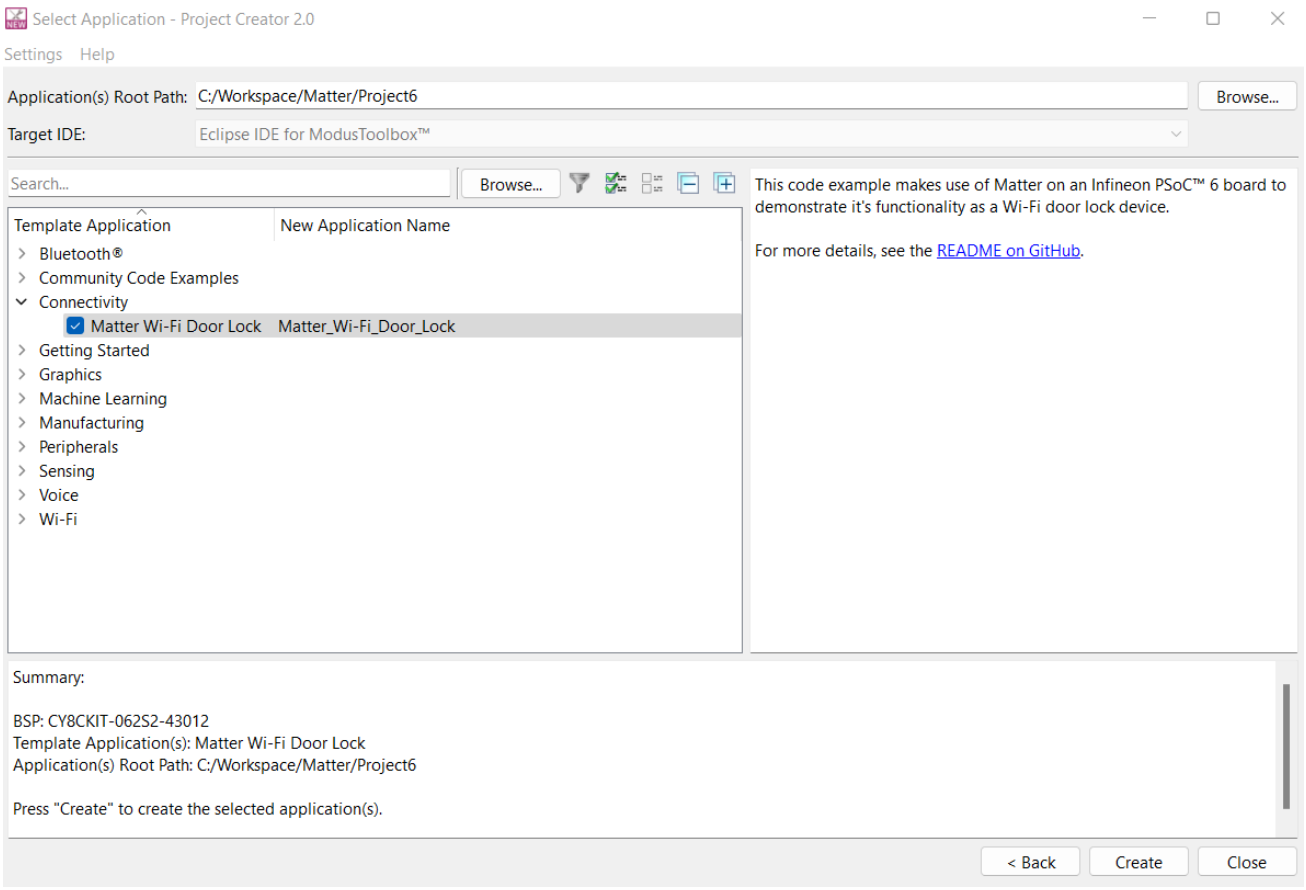
- The user can create an application using the example creation mentioned in the ModusToolbox™ project creation process.



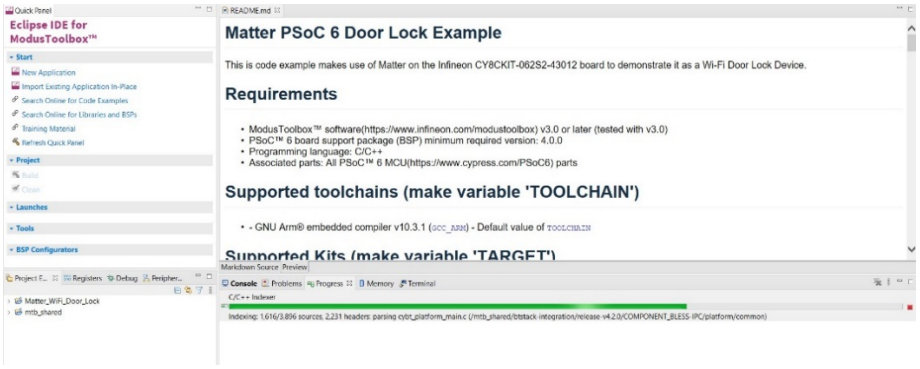
- Please select BSP as which will be used in this sample Lock application (click Next).



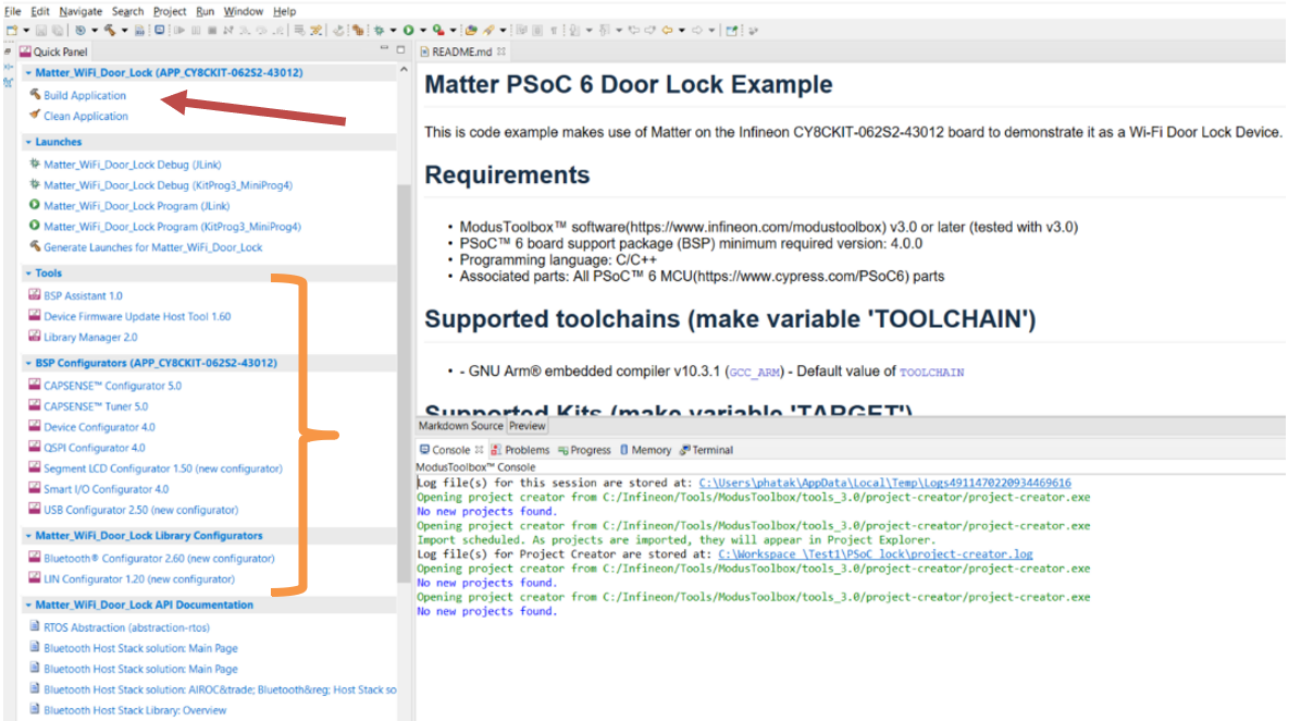
- Under the Connectivity section, select "Matter Wi-Fi Door Lock" sample application and click Create.



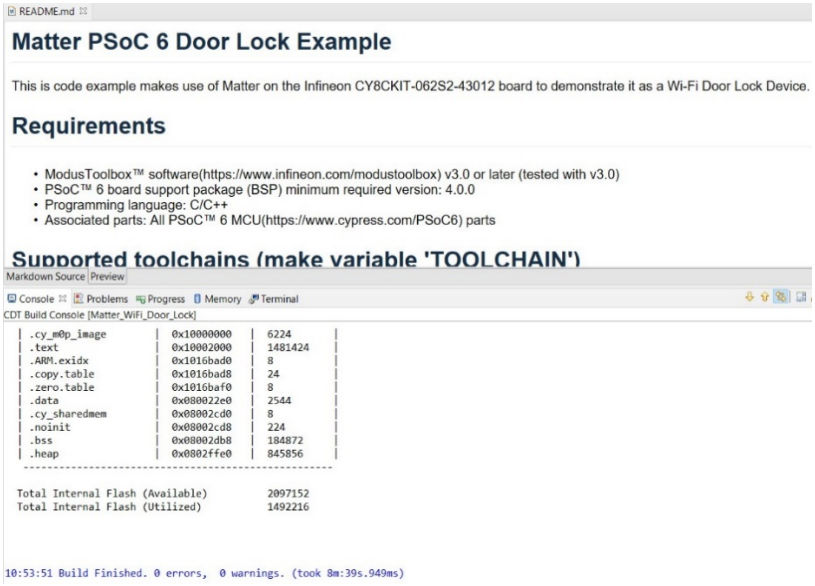
- Project creation will take some time and the user can view the status in the progress window



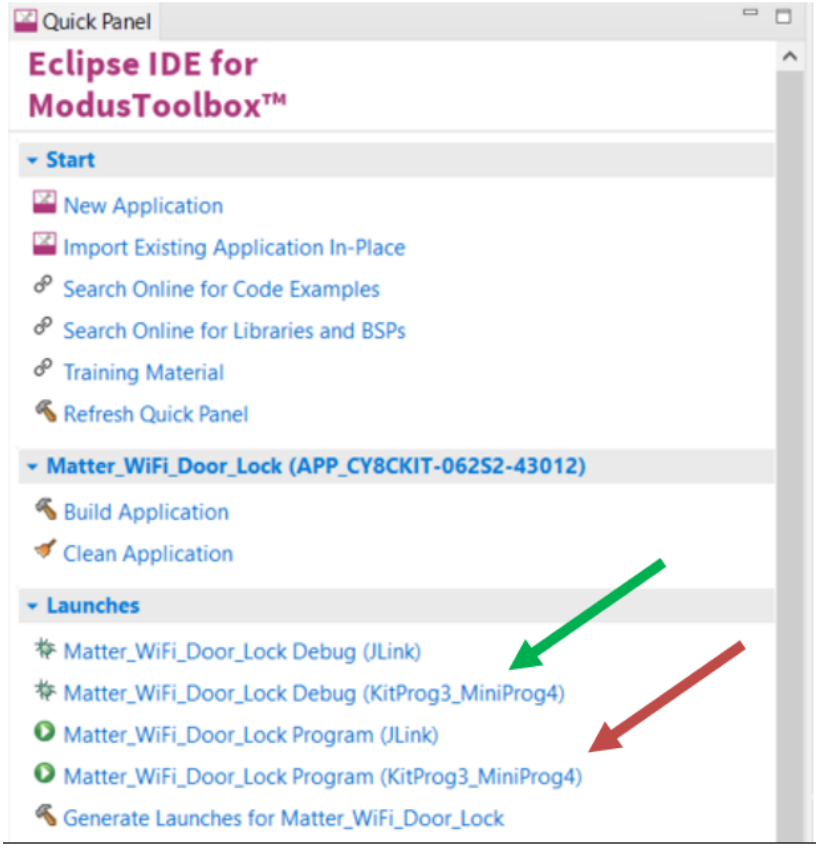
- After successful creation, the user can modify the contents of the project, if required, by using tools like BSP assistant, Library Manager, CAPSENSE™ Configurator etc.The user can build the project using the "Build Application" GUI button.



- After successful build, the user can view the following output in the Console tab.



- The user can flash the same using the following GUI button. This will initiate flashing via the inbuilt KitProg on the development board. The GUI button pointed by a green arrow can be used to debug the application by the inbuilt KitProg. There are options to flash and debug via standard JLINK.



- After a successful flash process, the user can connect the board to the computer and run any serial terminal software (Putty, Tera-Term etc.) with the following parameters:

  Baud: 115200, **Parity**: None, **Stop bit**: 1, **Data bit**: 8, **COMxx**. (xx is actual number of connected port).
- The user can view the logs and get boot and connection information from the connected serial terminal software and can use some information from it while connecting the device to the Matter ecosystem.
- USER BTN1 (SW2) on the CY8CKIT-062S2-43012 Wi-Fi BT Pioneer Kit can be used to toggle lock and unlock states. The Lock/Unlock status of door can be observed with LED9 on the board.

4.2 Ecosystem

Connecting PSoC™ 6 to any Matter ecosystem is the aim behind all the above processes. Many ecosystems in the market allow Matter devices to connect and control. As explained in section Overview of Matter connecting to matter involves certain secured steps like connection via Bluetooth® LE or NFC. The required connection data gets exchanged securely in these methods and PSoC™ 6 can be commissioned into the desired ecosystem.

4.2.1 Process to connect to ecosystem

Infineon's CY8CKIT-062S2-43012 kit has two wireless interfaces, Bluetooth® and Wi-Fi. Matter will work over Wi-Fi and Bluetooth® will be used to commission the device into the Matter network. Various ecosystem providers use a GUI system like mobile phones to scan nearby devices and commission into existing Matter network.

This process uses the phone's camera to scan the QR code, which initiates transactions on the Bluetooth® interface to securely send the Wi-Fi connection data to the device. Once the device is connected, Bluetooth® is no longer required and hence turned OFF. The other process requires scanning of the NFC tag, which is out of scope for this document.

Logs provided by the Infineon device contain the QR code hyperlink which, when entered in the browser, displays the QR code. As mentioned above, the user can scan the QR code and initiate the joining process,

which may sometimes fail for one or more reasons. When connected, the user can seamlessly control and view the CY8CKIT-062S2-43012 device parameters in the GUI provided by the ecosystem. Similarly, the operational logs can be viewed during run-time on the console of the connected computer when the user controls the device.

References

- PSoC™ 6 code examples
- 32-bit PSoC™ 6 Arm® Cortex®-M4 / M0+

Table 1 lists the application notes, datasheets, and technical reference manuals for PSoC™ 6 family MCU. Contact to obtain these documents.

Table 1 General and system-level application notes

Documents	Description
Application notes	
Hardware design guide for the PSoC™ 6 family	Describes how to set up a hardware environment
Getting started with PSoC™ 6 MCU on ModusToolbox™ software	Describes how to get started with PSoC™ 6 on ModusToolbox™ Software
Device datasheet	
PSoC™ 6 MCU: CY8C62X4 Datasheet	Describes the functions and electrical specifications of the target product. It also includes product-specific information such as address map, I/O map, pin assignment, alternate function pin assignments, interrupt source list, trigger group, peripheral clocks, faults, and bus masters.
Technical reference manual	
CY8CKIT-062S2-43012 PSoC™ 62S2 Wi-Fi BT Pioneer Kit Guide	Describes details about the board, pins, operation and hardware configuration for the CY8CKIT-062S2-43012 PSoC™ 62S2 Wi-Fi BT Pioneer Kit

Glossary

This section lists the most commonly used terms that you might encounter while working with PSoC™ 6 family of devices.

Board support package (BSP): A BSP is the layer of firmware containing board-specific drivers and other functions. The board support package is a set of libraries that provide firmware APIs to initialize the board and provide access to board level peripherals.

Hardware Abstraction Layer (HAL): The HAL wraps the lower-level drivers (like MTB-PDL-CAT1) and provides a high-level interface to the MCU. The interface is abstracted to work on any MCU.

KitProg: Onboard programmer/debugger with USB-I2C and USB-UART bridge functionality. KitProg is integrated onto most PSoC™ 6 development kits.

MiniProg3/MiniProg4: Programming hardware for development that is used to program PSoC™ 6 devices on your custom board or PSoC™ 6 development kits that do not support a built-in programmer.

Personality: Expresses the configurability of a resource for a functionality. For example, the SCB resource can be configured to be an UART, SPI, or I2C personalities.

Middleware: Middleware is a set of firmware modules that provide specific capabilities to an application. Some middleware may provide network protocols (e.g., MQTT), and some may provide high-level software interfaces to device features (e.g., USB, audio).

Peripheral Driver Library (PDL): Simplifies software development for the PSoC™ 6 MCU architecture. The PDL reduces the need to understand register usage and bit structures, thus easing software development for the extensive set of peripherals available.

Revision history

Document revision	Date	Description of changes
**	2023-02-22	New application note.
*A	2023-07-03	Updated link references.
*B	2023-08-03	Updated template; no content updated.

Trademarks

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Document reference
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APPENDIX P3

Cypress PSoC® 6 Microcontrollers

Purpose-Built for the Internet of Things

WWW.CYPRESS.COM/PSOC6



INCREASING DEMANDS FOR THE INTERNET OF THINGS

The IoT is exploding, with more that 30 billion devices projected to be in service by 2020. At the heart of every IoT device lies a mixed-signal embedded system that is taking on an increased amount of data processing, fueled by cloud connectivity. Devices such as door locks, factory machinery, and wearables are becoming smart — sensing, connecting, learning and responding — to make life easier. With connectivity, security becomes critical to protect users from malicious activity. These next-generation IoT devices require increased processing and security without incurring power and cost penalties.

Increased Data Processing

Today's IoT devices are collecting and processing more data than ever. Even wearable devices can contain more than a dozen sensors, including biometric, environmental, and motion sensors. Sensor data is collected and processed in real-time requiring a processor capable of sensor aggregation.





Flexible Connectivity

IoT devices connect to the cloud via various wired and wireless protocols including USB, Bluetooth Low Energy (BLE), Wi-Fi, and LPWAN. Having the flexibility to connect via different connectivity options is essential.

Security

Security and privacy are significant IoT concerns. Users must be confident that their personal data is always protected while their IoT devices are connected to the Internet. Similarly, IoT developers must be able to ensure the authenticity of their products to eliminate counterfeits and perform secure over-the-air updates to keep their products current.





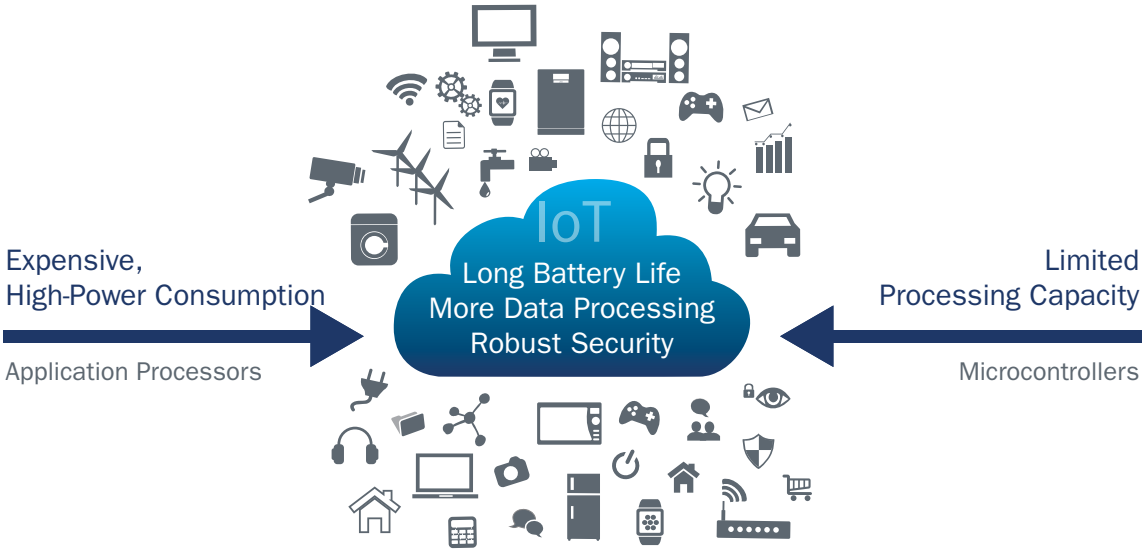
Extended Battery Life

From wearables to remote sensors, more and more IoT devices are running on batteries. Extending the time between battery charges is a key requirement for battery-powered IoT devices.

PSoC® 6 MICROCONTROLLERS

Purpose-Built for the Internet of Things

Cypress' PSoC 6 MCU architecture is purpose-built for the IoT, filling the gap between expensive, power-hungry applications processors and low-performance MCUs. The ultra-low power PSoC 6 MCU architecture offers the processing performance needed by IoT devices. Security is built-in, enabling a single-chip solution. PSoC 6 enables engineers to uniquely create innovative, next-generation IoT devices leveraging the unique PSoC fabric with its easy-to-use, software-defined peripherals.



LOWEST POWER

IoT devices are often portable, making battery life a critical factor. The PSoC 6 MCU architecture is built on a cutting-edge, ultra-low-power, 40-nm process technology with a dual Arm® Cortex®-M core architecture. Active power consumption is as low as 22-µA/MHz for the M4 core, and 15-µA/MHz for the M0+ core. PSoC 6 delivers extended battery life without sacrificing performance.

MOST FLEXIBILITY

The rapid growth of the IoT is sparking a need for innovation in IoT products. The PSoC 6 MCU architecture's best-in-class flexibility enables the addition of new features, and addresses the need for unique IoT products with multiple connectivity options, such as USB and BLE. PSoC 6 also offers software-defined peripherals to create custom analog and digital circuits, and the industry's best capacitive-sensing solution, CapSense®. In addition, a flexible dual-core architecture is used to optimize for system power consumption and performance. The possibilities are endless.

BUILT-IN SECURITY

With a growing number of devices connecting to the IoT, security must be established between hardware, cloud applications, and servers, and finally users and services. The PSoC 6 MCU architecture supports multiple, simultaneous secure environments without the need for external memories or secure elements, and offers scalable secure memory for multiple, independent user-defined security policies, preventing your IoT device from becoming a security liability. PSoC 6 provides you with a new standard for IoT security.

UNMATCHED SOLUTIONS FOR THE INTERNET OF THINGS

The Oura Ring

ŌURA

The Oura Ring is the world's most-advanced wearable that helps you achieve restorative sleep. This innovation is delivered through PSoC 6 MCUs, enabling the following features:

SMALL FORM FACTOR

Integration of several functions into a single PSoC 6 MCU helped reduce the size of the ring over the prior generation by 50%.

DATA STORAGE

PSoC 6's on-chip flash memory enables storage of up to six weeks of user data.

BLUETOOTH LOW ENERGY

The built-in BLE wireless connectivity in PSoC 6 provides communication to the mobile app device.





EXTENDED BATTERY LIFE

PSoC 6's ultra-low power was able to extend battery life to seven days, 3X longer than the prior generation ring.

SENSOR FUSION

PSoC 6, as the host processor, connects different biometric sensors in the ring to collect and process data.

DATA PROCESSING

The dual Cortex-M4 and Cortex-M0+ cores in PSoC 6 enabled 10X more processing capability vs. the prior-generation ring.

"The Oura ring required long-lasting battery life, increased processing capacity, and the use of advanced sensors, all in a stylish and comfortable form factor. Choosing Cypress as our partner helped us meet these requirements and redefine what is possible for wearable health products."

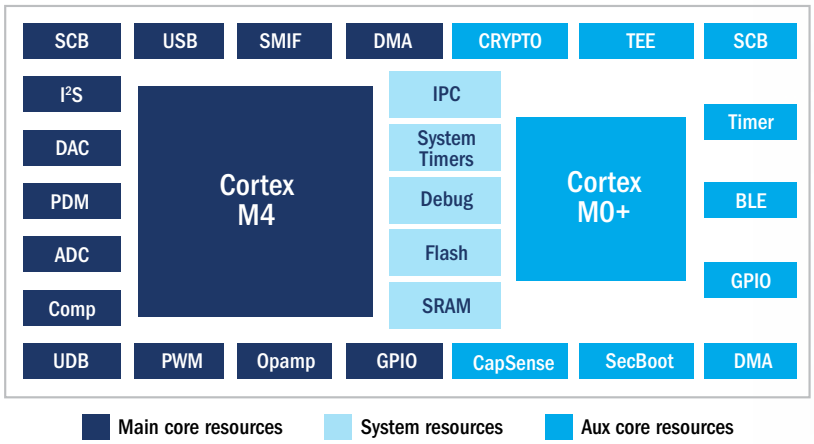
Petteri Lahtela
CEO and Co-founder at Oura Health

For more information on the Oura Ring, please visit: **www.ouraring.com**

PSoC 6 MCU PORTFOLIO

Value Line	Programmable Line	Performance Line	Connectivity Line	Security Line
PSoC 60	PSoC 61	PSoC 62	PSoC 63	PSoC 64
Arm Cortex-M4 (50 MHz) Up to 2MB Flash / 1MB SRAM	Arm Cortex-M4 (150 MHz) Up to 2MB Flash / 1MB SRAM	Arm Cortex-M4 (150 MHz) & Cortex-M0+ (100 MHz) Up to 2MB Flash / 1MB SRAM	Arm Cortex-M4 (150 MHz) & Cortex-M0+ (100 MHz) Up to 1MB Flash / 288KB SRAM	Arm Cortex-M4 (150 MHz) & Cortex-M0+ (100 MHz) Up to 2MB Flash / 1MB SRAM
				Rich Execution Environment Secure Execution Environment Hardware-based Root-of-Trust and Trusted Services
			BLE	
		ULP/LP		
	CapSense, UDBs, Opamps, Crypto, PDM-PCM			
SCBs, TCPWMs, QSPI, I2S, USB, DMA, SAR ADC, DAC, LCD, LP COMP, RTC, Efuse, PLLs, OSCs, GPIOs, SmartIO				

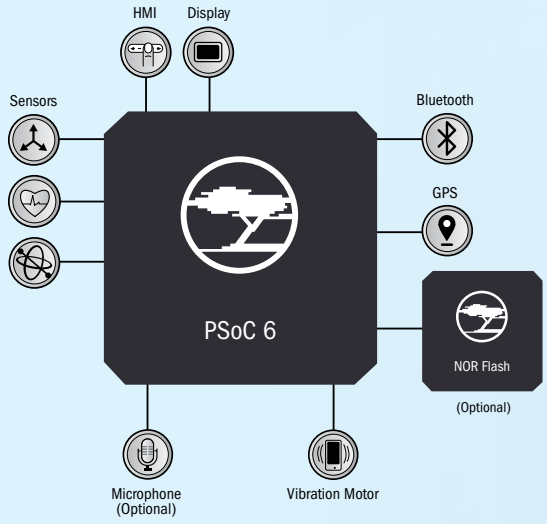
PSoC 6 DUAL-CORE MCU ARCHITECTURE



WEARABLE EXAMPLE

Modern wearables incorporate a growing number of functions and capabilities while maximizing battery life. Functions such as sleek user interfaces with sliders and proximity sensors, voice command support, seamless BLE connectivity, display driving, and process-intensive sensor aggregation can all be achieved in a single PSoC 6 MCU without sacrificing battery life.





KEY FEATURES

LOW POWER

PSoC 6 was designed for ultra-low power consumption. Starting with the dual-core architecture, the Cortex-M4 core can be put to sleep to conserve power, while monitoring functions can be managed by the Cortex-M0+ core. Dynamic voltage and frequency scaling can be controlled by the user to optimize power for different operating environments. With multiple sleep and hibernate modes, users can fine-tune their power profiles.

BUILT-IN SECURITY

PSoC 6 is designed to provide a hardware-based root of trust for secure applications. A hardware-based root of trust provides extra protection against unauthorized access to keys. In addition, hardware accelerated cryptography and true random-number generation are provided, which are needed for secure boot, authentication, secure over-the-air updates and other functions.

CONNECTIVITY

PSoC 6 supports multiple wired and wireless connectivity options including Bluetooth Low Energy, Wi-Fi, and USB.

CAPSENSE

PSoC 6 leverages Cypress' industry-leading CapSense solution for capacitive sensing with state-of-the-art noise immunity and water rejection used for applications including touch buttons and sliders, proximity detection and liquid-level sensing.

SOFTWARE-DEFINED PERIPHERALS

Cypress' software-defined peripherals can be configured using pre-built library functions or customized using the programmable architecture inside of PSoC 6 devices:

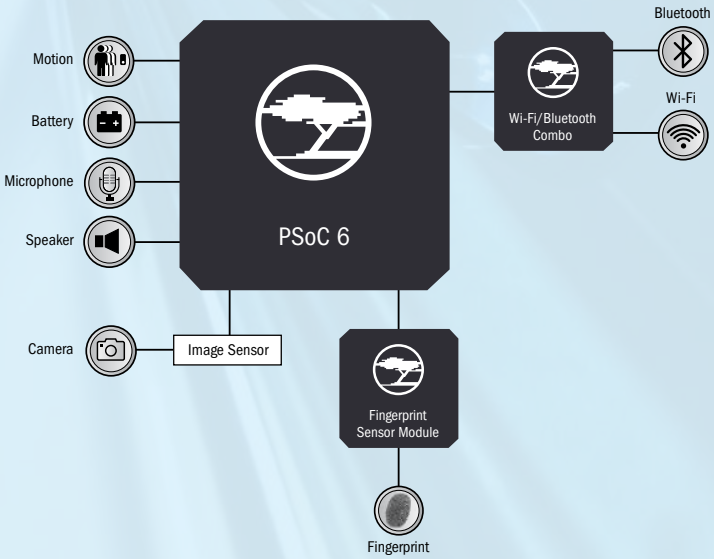
Programmable analog blocks are composed of an assortment of opamps, comparators, ADCs, and DACs, enabling complex analog signal flows.

Programmable digital blocks are composed of Universal Digital Blocks (UDBs), Serial Communication Blocks (SCBs), and Timer / Counter / Pulse Width Modulators (TCPWMs). These blocks can be configured to set-up custom digital interfaces, state machines, and custom logic functions.

VIDEO DOORBELL EXAMPLE

For a smart home application like a video doorbell, PSoC 6, with its dual Cortex-M4 and Cortex-M0+ cores, can transmit real-time video as well as incorporate proximity detection, capture and play audio, and interface to a Cypress fingerprint sensor module or Cypress WICED Wi-Fi chipset. The PSoC 6 MCU's ultra-low-power profile enables smart applications to run off batteries.





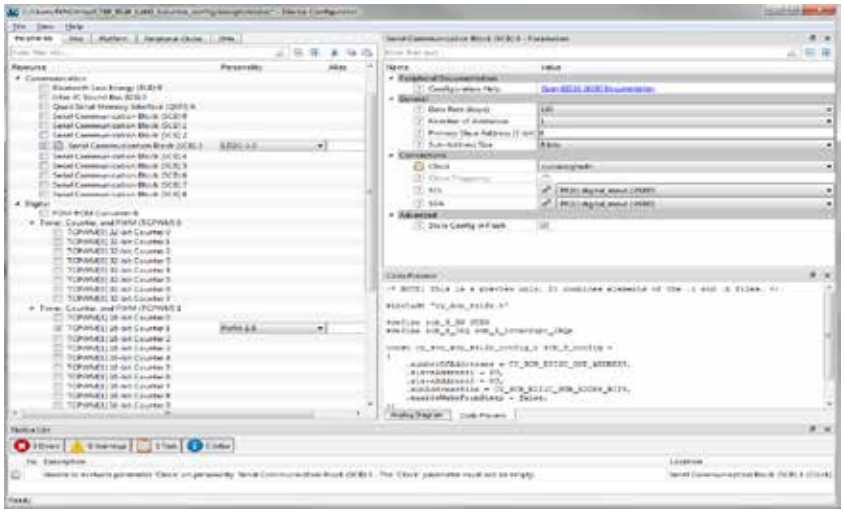
ACCELERATE YOUR NEXT IOT DESIGN CYCLE

ModusToolbox™ Software Environment

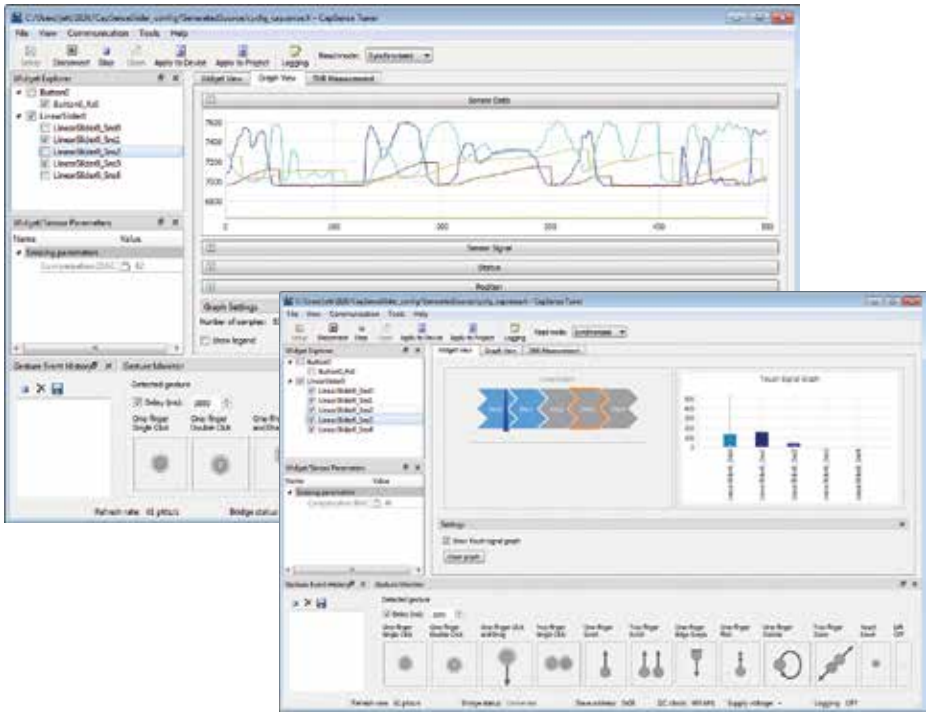
ModusToolbox simplifies development for IoT designers, delivering easy-to-use tools and a familiar IDE, with support for Windows®, macOS®, and Linux. It provides a powerful suite of tools for system and peripheral set-up. Code examples, documentation, RTOS and Cloud service support, and technical support forums are available to help your IoT development process along.

Graphical Configuration Tools:

GUI-based configuration tools used to configure peripherals such as Smart I/O, CapSense, and wireless connectivity to quickly design and develop IoT systems.



PSoC 6 MCU Peripherals Configurator



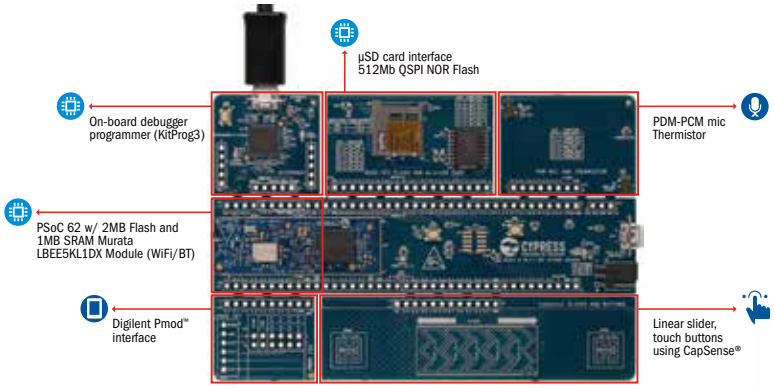
CapSense Configurator Tool

To start designing with the ModusToolbox Software Environment, please visit www.cypress.com/ModusToolbox

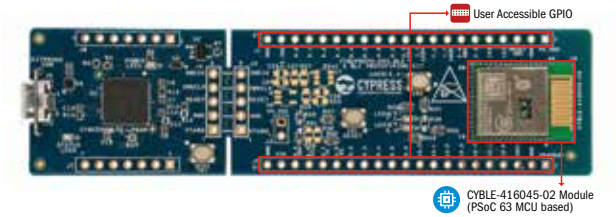
PSoC 6 DEVELOPMENT KITS

Cypress offers award winning development kits along with hundreds of code examples allowing you to evaluate, prototype and debug designs with PSoC 6. The PSoC 6 development kits are pin-compatible with various 3rd party expansion boards including Arduino™ shield boards and Digilent® Pmod™ daughter cards.

PSoC 6 WI-FI BT PROTOTYPING KIT (CY8CPROTO-062-4343W)



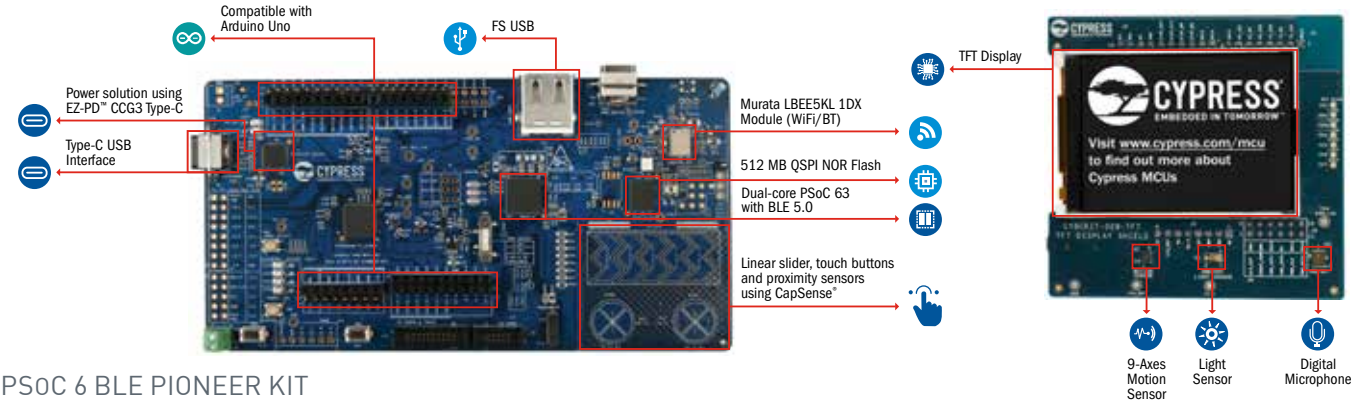
PSoC 6 BLE PROTOTYPING KIT (CY8CPROTO-063-BLE)



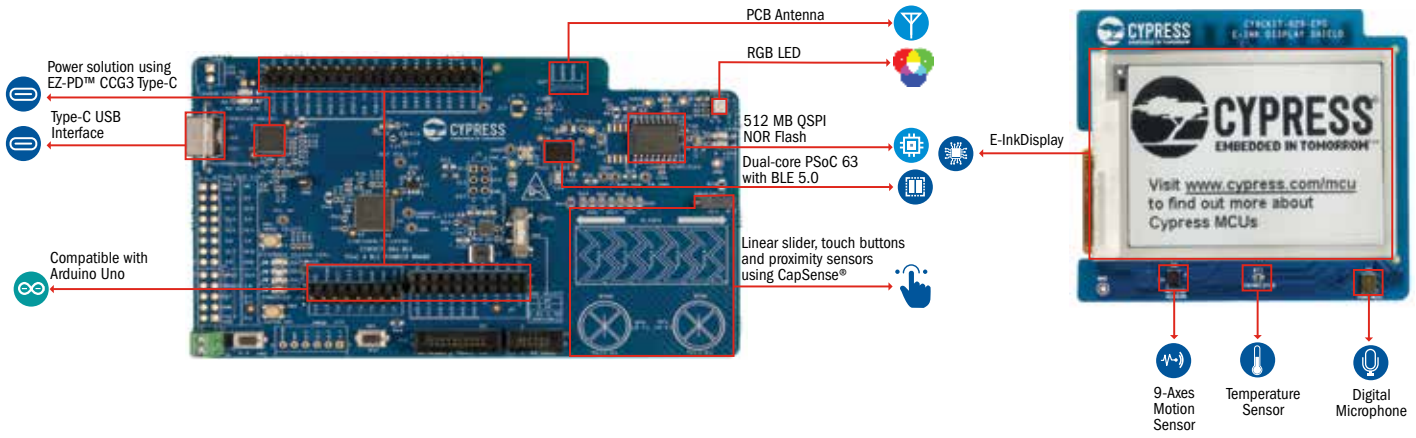
PSoC 64 SECURE BOOT PROTOTYPING KIT (CY8CPROTO-064-SB)



PSoC 6 WIFI-BT PIONEER KIT (CY8CKIT-062-WIFI-BT)



PSoC 6 BLE PIONEER KIT (CY8CKIT-062-BLE)



For more information on PSoC 6 kits, go to:

http://www.cypress.com/microcontrollers-mcus-kits

SOLVE YOUR IoT PROBLEM HERE

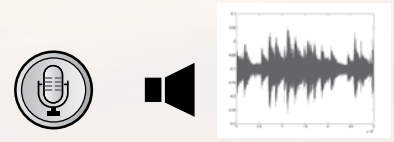
What's your next game-changing application?

Graphic Display



Incorporate a slick graphics display to your next IoT application with the use of the Universal Digital Blocks (programmable logic).

Audio Processing



Digital Microphone | Speaker | Signal Processing

Add an audio subsystem with an I²S interface and two Pulse Density Modulation (PDM) channels.

Sensor Fusion



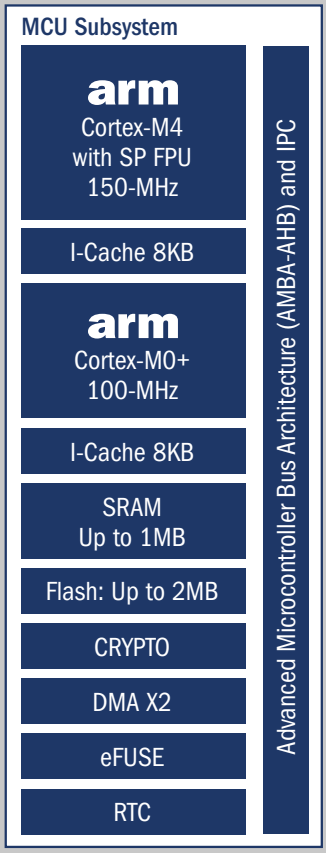
Analog Sensors

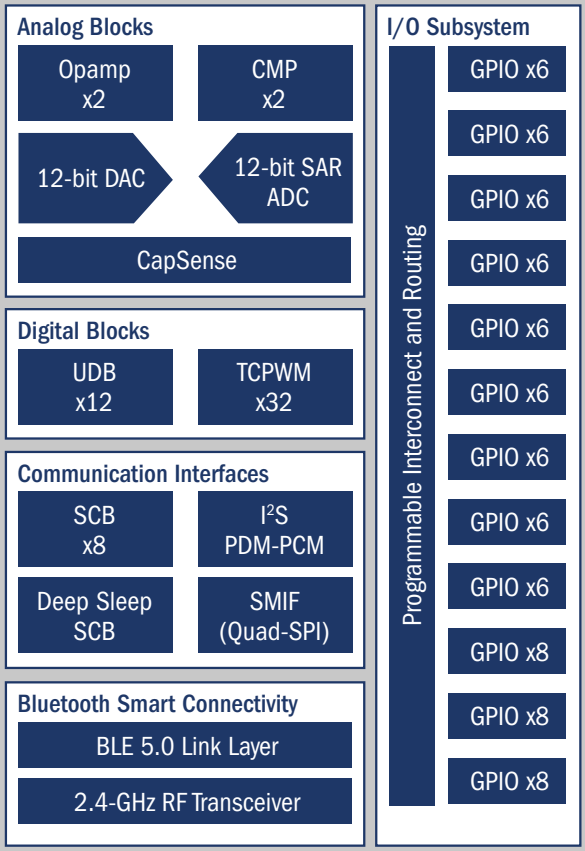


Digital Sensors

Interface to analog sensors with the programmable analog block functions of PSoC 6, which includes op-amps, comparators, and a 12-bit SAR ADC. Digital sensors can easily be connected via the Serial Communication Blocks (SCBs).

PSoC 63 Connectivity Line





Human Machine Interface



Sliders | Buttons | Proximity | Vibration Motor | Multiple LEDs

Replace traditional buttons with touch, add touch sliders, or add proximity detection with Cypress' CapSense technology. Use the TCPWM to drive motors, actuators or LEDs.

Interface Bridging and Port Expansion



Full-speed USB Host or Device

Serial Interfaces

Serial Communication Blocks (SCBs) can be configured to support serial interfaces such as UART, I²C and SPI. USB 2.0 host and device support is available with PSoC 6.

Wireless Connectivity



Bluetooth | Wi-Fi

Add Bluetooth Low Energy connectivity with built-in BLE radio and sub-system. Add Wi-Fi or Bluetooth with Cypress' WICED portfolio.



ABOUT CYPRESS

Cypress is the leader in advanced embedded system solutions for the world's most-innovative automotive, industrial, home automation and appliances, consumer electronics and medical products. Cypress' programmable and general-purpose microcontrollers, analog ICs, wireless and USB-based connectivity solutions and reliable, high-performance memories help engineers design differentiated products and get them to market first. To learn more, go to www.cypress.com.

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002-18961*D

APPENDIX P4



Detecting heart diseases with AI-precision

Infineon's semiconductor solutions bring smart wearables and AI-powered healthcare devices anywhere

25 years Infineon

Article • 5 min read • Aug 11, 2025

When the stethoscope was invented over 200 years ago, it revolutionized healthcare – making the invisible audible and saving lives just by listening. Yet its design has hardly changed since then.

Karl Larson and his colleagues at Eko Health reimagine what healthcare devices can be in a smarter, more connected world, equipping them with advanced sensors to make early detection possible anywhere.



I'm driven to one day empower every rural healthcare worker, in every corner of the world to detect cardiac and pulmonary diseases – at the level of a specialized cardiologist.

Karl Larson, VP of Supply Chain and Logistics Operations at Eko Health





Eko Health's smart stethoscopes work like the ones you know from your first visit to the doctor. Thanks to sound amplification and noise cancellation, however, healthcare professionals now hear your heart and lungs up to 8 times better. **AI technology**, embedded in the device, can discover the tiniest patterns, e.g. in heart murmurs, and thus help doctors and nurses diagnose correctly.

With experts like Karl taking the lead, we're on the fast track to rethinking healthcare tools from the ground up and keeping patients healthier, longer. From **smart wearables** that track heart rhythms in real time, to **AI-enabled healthcare devices** that monitor our sleep or flag early signs of cancer, intelligent technology is reshaping diagnostics and care across the board.

Infineon's ultra-efficient chips open up the next chapter in healthcare. With sleek design, secured data protection, high-end processing, and low power consumption, smart devices deliver expert healthcare – even to remote areas.

2x better at detection

Eko Health's smart device doubles the likelihood of detecting heart disease.*

8x better noise levels

Eko Health's device reduces background noise 8x better vs. a typical analog stethoscope.

400,000 doctors and nurses

Eko Health's smart device is used by over 400,000 doctors and nurses worldwide.

Source: Rancier, M. A., Israel, I., Monickam, V., Prince, J., Verschoore, B., & Currie, C. (2023). Real World Evaluation of an Artificial Intelligence Enabled Digital Stethoscope for Detecting Undiagnosed Valvular Heart Disease in Primary Care. Circulation, 148, A13244.



From health to home, PSOC™ 63 Bluetooth® LE MCU brings intelligence to IoT devices

New standard for IoT security

Longer battery life

Small and highly integrated

Whether it's a healthcare device that tracks your heart rate or a smart home gadget that responds to touch, the PSOC™ 63 Bluetooth® LE MCU helps make products smarter, smaller and more connected – with the performance and reliability needed for the future. A small, yet powerful chip, the **PSOC™ 63 Bluetooth® LE MCU** turns all kinds of everyday devices into powerful smart tools, while consuming very little power.



It also comes with built-in Bluetooth® for easy wireless connections, and can sense touch, temperature, and other signals from the world around it – all in one compact, efficient package. To make life easier for developers, Infineon offers tools and ready-made libraries to streamline the creation of new products. Infineon even goes a step further by offering a plug-and-play module for anyone who would rather skip the hassle of designing from scratch.

Find out more



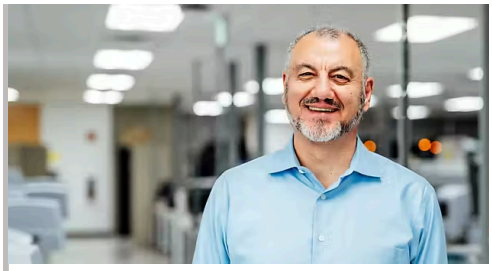


Our vision is to have smart stethoscopes around the neck of every doctor in the world. Preventing diseases, ensuring longer, better lives. Together with Infineon, we can shape the future of health tech.

Karl Larson, VP of Supply Chain and Logistics Operations at Eko Health

25 Years Infineon Matters to me

Further stories



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Making the world run smoother with invisible intelligence

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The role of semiconductors Artificial Intelligence

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APPENDIX S1

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

NEODRON LTD., Plaintiff, v. CYPRESS SEMICONDUCTOR CORP., Defendant.	Case No. 6:20-cv-523 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT
AGAINST CYPRESS SEMICONDUCTOR CORP.

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. §1 *et seq.*, in which Plaintiff Neodron Ltd. ("Plaintiff" or "Neodron") makes the following allegations against Defendant Cypress Semiconductor Corp. ("Defendant"):

INTRODUCTION

1. This complaint arises from Defendant's unlawful infringement of the following United States patents owned by Neodron, each of which generally relate to touchscreen technology: United States Patent Nos. 8,054,090 ("'090 Patent"); 8,253,706 ("'706 Patent"); 8,432,173 ("'173 Patent"); and 9,411,472 ("'472 Patent") (collectively, the "Asserted Patents").

2. Touchscreen technology plays a ubiquitous and important role in countless electronic devices today. Beyond just providing greater usability to smartphones, tablets and notebooks, touchscreens now fill our lives in public and private spaces, from our homes and cars to the restaurants and stores we visit.

3. But just a few decades ago, touchscreen technology could only be found in science fiction books and film. Although the underlying science behind touch technology can be traced

back to the 1940s, working touchscreens were not conceived and feasible until the mid-1960s, when the first finger-driven touchscreen was invented by E.A. Johnson in 1965 at the Royal Radar Establishment in Malvern, United Kingdom. Since then, it took several generations and major technological advancements for touchscreens to achieve the level of complexity—and convenience—we see and enjoy today.

4. Built on the fundamental breakthrough that our hands and fingers can form changes in the capacitance of electrodes and electrode-connections when they are in close proximity to them, touch technology has developed rapidly over the years. Along the way, engineers have worked tirelessly to try to overcome the limitations and roadblocks touch technology presents. From conceiving various ways to detect (and correctly ignore) unintentional touches, to minimizing signal "noise," to reducing the latency and power consumption that comes with any complex, multi-part electrical process, there have been many advances to various aspects of the technology—each building a little on a related advancement before it—to get us to the highly advanced state we enjoy today.

5. These advancements range from fundamental ones, which make basic touch technology work, to optional improvements, which typically represent one technological option that improves aspects of the user experience and functionality of a touchscreen. This infringement action is about the latter: several patented improvements—which took years of research and millions of dollars in U.S. investments to develop, and which are infringed by Defendant's accused products.

PARTIES

6. Plaintiff Neodron Ltd. is an Irish company, having its principal place of business at Suite 23, The Hyde Building, Carrickmines, Dublin 18, Ireland. Neodron is the sole owner by

assignment of all right, title, and interest in each Asserted Patent.

7. On information and belief, Defendant Cypress Semiconductor Corp. is a corporation organized under the laws of the State of Delaware, with its principal place of business at 198 Champion Court, San Jose, California 95134.

JURISDICTION AND VENUE

8. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has original subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Defendant in this action because Defendant has committed acts within this District giving rise to this action, and has established minimum contacts with this forum such that the exercise of jurisdiction over Defendant would not offend traditional notions of fair play and substantial justice. Defendant, directly and through subsidiaries or intermediaries, has committed and continues to commit acts of infringement in this District by, among other things, importing, offering to sell, and selling products that infringe the asserted patents.

10. Venue is proper in this District under 28 U.S.C. §1400 (b). Defendant is registered to do business in Texas, and upon information and belief, Defendant has transacted business in this District and has committed acts of direct and indirect infringement in this District by, among other things, importing, offering to sell, and selling products that infringe the asserted patents. Defendant has regular and established places of businesses in this District, including at 5204 East Ben White Boulevard, Austin, Texas 78741. *See* Exhibit 1.

COUNT I

INFRINGEMENT OF U.S. PATENT NO. 8,054,090

11. Neodron realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

12. Neodron owns by assignment all rights, title, and interest in U.S. Patent No. 8,054,090, entitled "Noise Handling in Capacitive Touch Sensors." The '090 Patent was duly and legally issued by the United States Patent and Trademark Office on November 8, 2011. A true and correct copy of the '090 Patent is attached as Exhibit 2.

13. On information and belief, Defendant makes, uses, offers for sale, sells, and/or imports certain products ("Accused Products"), including Capsense enabled Cypress products, such as MBR3, CY8CMBR2110, CY8CMBR2044, CY8CMBR2016, CY8CMBR2010, CY8CMBR3XXX, and Capsense-enabled PSoC, that directly infringe, literally and/or under the doctrine of equivalents, claims 1-18 of the '090 Patent.

14. Defendant also knowingly and intentionally induces infringement of claims 1-18 of the '090 Patent in violation of 35 U.S.C. §271 (b). Through the filing and service of this Complaint, Defendant has had knowledge of the '090 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '090 Patent, Defendant continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website) to use the Accused Products in ways that directly infringe the '090 Patent. Defendant does so knowing and intending that its customers and end users will commit these infringing acts. Defendant also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '090 Patent, thereby specifically intending for and inducing its customers to infringe the '090 Patent through the customers' normal and customary

use of the Accused Products.

15. The Accused Products satisfy all claim limitations of claims 1-18 of the ’090 Patent. A claim chart comparing independent claim 1 of the ’090 Patent to a representative Accused Product, Cypress PSoC with CapSense, is attached as Exhibit 3.

16. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Defendant has injured Neodron and is liable for infringement of the ’090 Patent pursuant to 35 U.S.C. §271.

17. As a result of Defendant’s infringement of the ’090 Patent, Neodron is entitled to monetary damages in an amount adequate to compensate for Defendant’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court.

18. Defendant’s infringing activities have injured and will continue to injure Neodron, unless and until this Court enters an injunction prohibiting further infringement of the ’090 Patent, and, specifically, enjoining further manufacture, use, sale, importation, and/or offers for sale that come within the scope of the patent claims.

COUNT II

INFRINGEMENT OF U.S. PATENT NO. 8,253,706

19. Neodron realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

20. Neodron owns by assignment all rights, title, and interest in U.S. Patent No. 8,253,706 (the “’706 Patent”), entitled “Apparatus Using a Differential Analog-to-Digital Converter.” The ’706 Patent was duly and legally issued by the United States Patent and Trademark Office on August 28, 2012. A true and correct copy of the ’706 Patent is attached as

Exhibit 4.

21. On information and belief, Defendant makes, uses, offers for sale, sells, and/or imports certain products ("Accused Products"), including Capsense enabled Cypress products, such as MBR3, CY8CMBR2110, CY8CMBR2044, CY8CMBR2016, CY8CMBR2010, CY8CMBR3XXX, and Capsense-enabled PSoC, that directly infringe, literally and/or under the doctrine of equivalents, claims 1-18 of the '706 Patent.

22. Defendant also knowingly and intentionally induces infringement of claims 1-18 of the '706 Patent in violation of 35 U.S.C. §271 (b). Through the filing and service of this Complaint, Defendant has had knowledge of the '706 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '706 Patent, Defendant continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website) to use the Accused Products in ways that directly infringe the '706 Patent. Defendant does so knowing and intending that its customers and end users will commit these infringing acts. Defendant also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '706 Patent, thereby specifically intending for and inducing its customers to infringe the '706 Patent through the customers' normal and customary use of the Accused Products.

23. The Accused Products satisfy all claim limitations of claims 1-18 of the '706 Patent. A claim chart comparing independent claim 1 of the '706 Patent to a representative Accused Product, Cypress PSoC with CapSense, is attached as Exhibit 5.

24. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Defendant has injured Neodron and is liable for infringement of the '706 Patent pursuant to 35 U.S.C. §271.

25. As a result of Defendant's infringement of the '706 Patent, Neodron is entitled to monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court.

26. Defendant's infringing activities have injured and will continue to injure Neodron, unless and until this Court enters an injunction prohibiting further infringement of the '706 Patent, and, specifically, enjoining further manufacture, use, sale, importation, and/or offers for sale that come within the scope of the patent claims.

COUNT III

INFRINGEMENT OF U.S. PATENT NO. 8,432,173

27. Neodron realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

28. Neodron owns by assignment all rights, title, and interest in U.S. Patent No. 8,432,173 (the "'173 Patent"), entitled "Capacitive Position Sensor." The '173 Patent was duly and legally issued by the United States Patent and Trademark Office on April 30, 2013. A true and correct copy of the '173 Patent is attached as Exhibit 6.

29. On information and belief, Defendant makes, uses, offers for sale, sells, and/or imports certain products ("Accused Products"), including Capsense enabled Cypress products, such as MBR3, CY8CMBR2110, CY8CMBR2044, CY8CMBR2016, CY8CMBR2010, CY8CMBR3XXX, and Capsense-enabled PSoC, that directly infringe, literally and/or under the doctrine of equivalents, claims 1-19 of the '173 Patent.

30. Defendant also knowingly and intentionally induces infringement of claims 1-19 of the '173 Patent in violation of 35 U.S.C. §271 (b). Through the filing and service of this Complaint,

Defendant has had knowledge of the ’173 Patent and the infringing nature of the Accused Products. Despite this knowledge of the ’173 Patent, Defendant continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website) to use the Accused Products in ways that directly infringe the ’173 Patent. Defendant does so knowing and intending that its customers and end users will commit these infringing acts. Defendant also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the ’173 Patent, thereby specifically intending for and inducing its customers to infringe the ’173 Patent through the customers’ normal and customary use of the Accused Products.

31. The Accused Products satisfy all claim limitations of claims 1-19 of the ’173 Patent. A claim charts comparing independent claim 1 of the ’173 Patent to a representative Accused Product, Cypress CY8CMBR3106 with CapSense, is attached as Exhibit 7.

32. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Defendant has injured Neodron and is liable for infringement of the ’173 Patent pursuant to 35 U.S.C. §271.

33. As a result of Defendant’s infringement of the ’173 Patent, Neodron is entitled to monetary damages in an amount adequate to compensate for Defendant’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court.

34. Defendant’s infringing activities have injured and will continue to injure Neodron, unless and until this Court enters an injunction prohibiting further infringement of the ’173 Patent, and, specifically, enjoining further manufacture, use, sale, importation, and/or offers for sale that come within the scope of the patent claims.

COUNT IV

INFRINGEMENT OF U.S. PATENT NO. 9,411,472

35. Neodron realleges and incorporates by reference the foregoing paragraphs as if fully set forth herein.

36. Neodron owns by assignment all rights, title, and interest in U.S. Patent No. 9,411,472 (the "'472 Patent"), entitled "Touch Sensor with Adaptive Touch Detection Thresholding." The '472 Patent was duly and legally issued by the United States Patent and Trademark Office on August 9, 2016. A true and correct copy of the '472 Patent is attached as Exhibit 8.

37. On information and belief, Defendant makes, uses, offers for sale, sells, and/or imports certain products ("Accused Products"), including Capsense enabled Cypress products, such as MBR3, CY8CMBR2110, CY8CMBR2044, CY8CMBR2016, CY8CMBR2010, CY8CMBR3XXX, and Capsense-enabled PSoC, that directly infringe, literally and/or under the doctrine of equivalents, claims 1-23 of the '472 Patent.

38. Defendant also knowingly and intentionally induces infringement of claims 1-23 of the '472 Patent in violation of 35 U.S.C. §271 (b). Through the filing and service of this Complaint, Defendant has had knowledge of the '472 Patent and the infringing nature of the Accused Products. Despite this knowledge of the '472 Patent, Defendant continues to actively encourage and instruct its customers and end users (for example, through user manuals and online instruction materials on its website) to use the Accused Products in ways that directly infringe the '472 Patent. Defendant does so knowing and intending that its customers and end users will commit these infringing acts. Defendant also continues to make, use, offer for sale, sell, and/or import the Accused Products, despite its knowledge of the '472 Patent, thereby specifically intending for and

inducing its customers to infringe the ’472 Patent through the customers’ normal and customary use of the Accused Products.

39. The Accused Products satisfy all claim limitations of claims 1-23 of the ’472 Patent. A claim charts comparing independent claim 1 of the ’472 Patent to a representative Accused Product, Cypress PSoC with CapSense, is attached as Exhibit 9.

40. By making, using, offering for sale, selling and/or importing into the United States the Accused Products, Defendant has injured Neodron and is liable for infringement of the ’472 Patent pursuant to 35 U.S.C. §271.

41. As a result of Defendant’s infringement of the ’472 Patent, Neodron is entitled to monetary damages in an amount adequate to compensate for Defendant’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court.

42. Defendant’s infringing activities have injured and will continue to injure Neodron, unless and until this Court enters an injunction prohibiting further infringement of the ’472 Patent, and, specifically, enjoining further manufacture, use, sale, importation, and/or offers for sale that come within the scope of the patent claims.

PRAYER FOR RELIEF

WHEREFORE, Neodron respectfully requests that this Court enter:

a. A judgment in favor of Neodron that Defendant has infringed, either literally and/or under the doctrine of equivalents, the ’090 Patent, the ’706 Patent, the ’173 Patent, and the ’472 Patent;

b. A permanent injunction prohibiting Defendant from further acts of infringement of the ’090 Patent, the ’706 Patent, the ’173 Patent, and the ’472 Patent;

c. A judgment and order requiring Defendant to pay Neodron its damages, costs, expenses, and pre-judgment and post-judgment interest for Defendant's infringement of the '090 Patent, the '706 Patent, the '173 Patent, and the '472 Patent; and

d. A judgment and order requiring Defendant to provide an accounting and to pay supplemental damages to Neodron, including without limitation, pre-judgment and post-judgment interest;

e. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Neodron its reasonable attorneys' fees against Defendant; and

f. Any and all other relief as the Court may deem appropriate and just under the circumstances.

DEMAND FOR JURY TRIAL

Neodron, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable by right.

Dated: June 12, 2020

Respectfully submitted,

/s/ Reza Mirzaie

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APPENDIX S2

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

BANDSPEED, LLC, Plaintiff, v. CYPRESS SEMICONDUCTOR CORP. Defendant.	§ § § § § § § § §	CASE NO. 1:19-cv-936

COMPLAINT

Plaintiff Bandspeed, LLC ("Bandspeed"), by and through its attorneys, files its Complaint against defendant Cypress Semiconductor Corp. ("Defendant"), and hereby alleges as follows:

I. NATURE OF ACTION

1. This is a patent infringement action to end Defendant's unauthorized and infringing manufacture, use, sale, offering for sale, and/or importation of methods and products incorporating Bandspeed's patented inventions.

2. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 7,027,418 ("the '418 Patent"), issued on April 11, 2006 for "Approach for Selecting Communications Channels Based on Performance."

3. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 7,477,624 ("the '624 Patent"), issued on January 13, 2009 for "Approach for Managing the Use of Communications Channels Based on Performance."

4. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 7,570,614 ("the '614 patent"), issued on August 4, 2009 for "Approach for Managing Communications Channels Based on Performance."

5. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 7,903,608 ("the '608 Patent"), issued on March 8, 2011 for "Approach for Managing the Use of Communications Channels Based on Performance."

6. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 8,542,643 ("the '643 Patent), issued on September 24, 2013 for "Approach for Managing the Use of Communications Channels Based on Performance."

7. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 8,873,500 ("the '500 Patent), issued on October 28, 2014 for "Approach for Managing the Use of Communications Channels Based on Performance."

8. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 9,379,769 ("the '769 Patent), issued on June 28, 2016 for "Approach for Managing the Use of Communications Channels Based on Performance."

9. Bandspeed is the owner of all right, title, and interest in and to United States Patent No. 9,883,520 ("the '520 Patent), issued on January 30, 2018 for "Approach for Managing the Use of Communications Channels Based on Performance."

10. The'418 Patent, '624 Patent, '614 Patent,'608 Patent, '643 Patent, '500 Patent, '769 Patent, and '520 Patent are, collectively, the "Bluetooth Classic Patents."

11. The '608 Patent, '643 Patent, '500 Patent, '769 Patent, and '520 Patent are, collectively, the "Bluetooth LE Patents."

12. The Bluetooth Classic Patents and the Bluetooth LE Patents are, collectively, the "Patents."

13. Upon information and belief, Defendant has been and currently is infringing, contributing to the infringement of, and/or inducing the infringement of Bandspeed's Patents, by,

among other things, making, using, selling, importing, and/or offering for sale, within the territorial boundaries of the United States, products that are covered by one or more claims of Bandspeed's Patents.

14. Defendant manufactures, provides, sells, offers for sale, imports, and/or distributes infringing products and services; and/or induces others to make and use its products and services in an infringing manner; and/or contributes to the making and use of infringing products and services by others, including its customers, who directly infringe the Patents.

II. THE PARTIES

15. Plaintiff Bandspeed is a Texas limited liability company with its principal place of business located in Austin, Texas.

16. Upon information and belief, Defendant is a Delaware corporation with its principal places of business located at 9442 North Capital of Texas Highway, Austin, Texas 78759 and 5204 Ben White Boulevard, Austin, Texas 78741. Upon information and belief, Defendant is authorized to do business in Texas. Defendant may be served by serving its registered agent Corporation Service Company d/b/a CSC-Lawyers Incorporating Service Company, 211 E. 7th Street, Suite 620, Austin, TX 78701.

17. On information and belief, Defendant has had knowledge of some or all of the Patents and the infringing nature of its products in connection with Defendant's acquisition of Broadcom's Wireless Internet of Things (IoT) business. Bandspeed previously asserted more than one of the Patents against Broadcom and Cypress received information about Bandspeed's Patents and the infringing nature of Cypress's products from Broadcom in or around June or July 2016.

18. Defendant has knowledge of the Patents by virtue of a letter sent by Bandspeed to Cypress on January 15, 2019 notifying Cypress of its infringement of Bandspeed's Patents (the "Notice Letter").

19. Finally, Defendant has knowledge of the Patents and the infringing nature of its activities at least as early as the date when Bandspeed effected service of the Complaint.

III. JURISDICTION AND VENUE

20. This is an action for patent infringement arising under the Patent Laws of the United States, in particular 35 U.S.C. §271, 281, 283, 284, and 285. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §1331 and 1338(a).

21. This Court has personal jurisdiction over Defendant and venue is proper in this Court pursuant to 28 U.S.C. §1391(c).

IV. PLAINTIFF'S PATENTS

22. The claims of the Patents describe inventive features and combinations relating to adaptive frequency hopping and the ability to avoid interference over communications channels that improved upon prior art systems and methods. In other words, the claims of the Patents generally describe novel techniques "for selecting sets of communications channels based on channel performance." '418 Patent at 4:49-50.

23. The Patents improve upon frequency hopping communications systems that existed at the time of the invention. One problem with frequency hopping communications systems is that coexistence problems arise between the frequency hopping communications system and non-frequency hopping communications systems that operate in the same frequency band. While the frequency hopping communications system hops over the entire frequency band, the non-frequency hopping communications systems occupy separate parts of the frequency band. When the frequency hopping communications system hops over part of the frequency band occupied by a non-frequency hopping communications system, there may be interference between the systems. Although the use of a frequency hopping protocol helps to lessen the interference problem because not all of the frequency hopping channels will interfere with other communications systems, there

nevertheless remains interference on those channels that coincide with the non-frequency hopping communications systems. An example of the interference situation is the coexistence problem between the frequency hopping IEEE 802.15.1 WPAN and the non-frequency hopping IEEE 802.11b Wireless Local Area Network (WLAN) because both share the 2.4 GHz ISM band. ’418 Patent at 2:51-3:2. Interference results in data transmission errors, such as an increase in the bit error rate (BER) or the loss of data packets, resulting in reduced transmission quality and performance and the need to retransmit the data. ’418 Patent at 3:17-20.

24. One approach for managing the coexistence problem is to increase the power used in the transmissions so that the other interfering system have less of an impact on the system transmitting at the increased power. However, this increased power approach drains batteries used by the participants, and thus the required power increase may be impractical. Also, the increased power approach only benefits the system using the increased power and results in a bigger interference impact on other systems. ’418 Patent at 3:12-29.

25. Another approach for managing the coexistence problem is to skip a "bad" channel that suffers from interference, such as by moving onto the next channel in the sequence or by jumping to another randomly selected channel. However, this skipping approach does not necessarily avoid other bad channels because the next channel used may also have an interference problem. Also, known "bad" and "good" channels may change over time due to the transient nature of some types of interference. ’418 Patent at 3:30-38.

26. The claims of the Patents solve the coexistence problem by using a method or system not conventional at the time of the invention: adaptive frequency hopping. As described in the Patents, a set of channels is used for communication between devices according to a frequency hopping (“FH”) protocol. Another set of communications channels is selected in a similar manner

when a specified criterion is satisfied after expiration of a specified length of time, when the performance of at least one of the channels in the set of channels satisfies another performance criterion, or when a specified number of the set of channels satisfies yet another performance criterion. *See, e.g.*, '608 Patent at 4:64-5:6. "For example, the selection criteria may be to select the good channels but not the bad channels." *Id*. at 6:62-64. The claimed system first selects an initial set of channels, and then periodically selects sets of channels based on later performance of the communications channels. *Id*. at 6:28-30; 4:22-24. The claimed system classifies a communication channel based on channel performances and one or more classification criteria. *Id*. at 15:8-10. "For example, a channel may be classified as 'good' or 'bad' based on the results of the channel performance testing by applying one or more performance measurements." *Id*. at 15:10-14.

27. The Patents teach a method or device using a frequency hopping protocol that "transmits data on one channel, hops to the next channel in the hopping sequence to transmit more data, and continues by transmitting data on subsequent channels in the hopping sequence." *See, e.g.*, '500 Patent at 2:34-38. "When the FH communications system hops over part of the frequency band occupied by an NFH [non-frequency hopping] communications system, there may be interference between the systems." *Id*. at 3:33-36. "Interference results in data transmission errors, such as an increase in the bit error rate (BER) or the loss of data packets, resulting in reduced transmission quality and performance and the need to retransmit the data." *Id*. at 3:58-61. The invention avoids these problems by testing the plurality of communications channels and using a subset of channels that have been identified as good after testing for communications between participants using an adapted hopping sequence. *Id*. at 12:34-41 and 18:8-12. "Each channel of a communications system may be tested repeatedly by using master test packet 360 and slave test

packet 380 described herein." *Id*. at 12:34-36. For example, in a Bluetooth or IEEE 802.15.1 FH communications system, the frequency hopping rate is 1,600 hops per second, and there are 79 channels. Therefore, in one second, each of the 79 channels may be tested both from the master to the slave and from the slave to the master 20 times." *Id*. at 12:36-41. "[A] master may select the channels classified as 'good,' generate a special packet that identifies the selected set of good communications channels in the payload, and send the special packet to one or more other participants in the communications network." *Id*. at 18:8-12.

28. The Patents specifically include a particular embodiment labeled the "referendum" approach that considers the channel performance as determined by a master and a certain number of slaves (collectively "participants"). *See, e.g.*, '624 Patent at 16:47-49. Using the "referendum" approach, a participant has a vote on whether to use a given channel or not to use the channel. *Id*. at 16:65-66. "A certain number of votes (*e.g.*, the 'passing mark') is required for the channel to be judged 'good' and therefore available for use by the frequency hopping communications system." *Id*. at 17:5-7.

29. The invention described in the Patents generally includes a device loading a set of default channels into a default channel register and a set of good channels into a good channel register. When a selection kernel addresses a bad channel stored in the default channel register, the bad channel is replaced by a good channel from the good channel register. *See, e.g.*, '643 Patent at 20:1-21:14.

V. DEFENDANT'S ACTS

A. Infringing Bluetooth Classic (BR/EDR) Products

30. Defendant manufactures, provides, sells, offers for sale, and/or distributes products that that use, practice and/or comply with the Bluetooth Core Specification Version 2.0+EDR or

higher and other products that operate in a reasonably similar manner ("Infringing Bluetooth Classic Products").

31. The CYW20819 Bluetooth (BT) MCU shall be referred to as the "Exemplary Infringing Bluetooth Classic Product."

32. Through its actions, Defendant has infringed the Patents and actively induced others to infringe and contributed to the infringement by others of the Patents, throughout the United States.

33. Adaptive frequency hopping is material to practicing the invention described by the Patents.

34. Defendant intentionally manufactures and sells Infringing Bluetooth Classic Products that are designed to provide adaptive frequency hopping in a manner that infringes the Patents.

35. On information and belief, Defendant takes steps to test the Infringing Bluetooth Classic Products to ensure compliance with the Bluetooth Core Specification and to qualify an Infringing Bluetooth Classic Product for Bluetooth certification.

36. The Infringing Bluetooth Classic Products are certified as compliant with the Bluetooth Core Specification Version 2.0+EDR or higher. In connection with compliance, for qualifying Bluetooth products, Defendant submitted a Core Implementation Compliance Statement (or Core ICS). The Core ICS requires Defendant to disclose certain product capabilities, including adaptive frequency hopping (AFH), which is found in Table 26 of the Link Manager Protocol section.

37. On information and belief, Defendant has submitted Core ICSs that indicate "Yes" for support of certain features of adaptive frequency hopping that infringe the Patents.

38. On information and belief, Defendant has certified that the Infringing Bluetooth Classic Products are compliant with "Adaptive Frequency Hopping Kernel" as defined by Item 2 of the Physical Channel table within the Baseband section of the Implementation Conformance Statement (ICS). For example, on information and belief, the Exemplary Infringing Bluetooth Classic Product implements an "Adaptive Frequency Hopping Kernel" as defined by Item 2 of the Physical Channel table within the Baseband section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

39. On information and belief, the Infringing Bluetooth Classic Products implement "Adaptive Frequency Hopping" as defined by Item 16 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS. On information and belief, Defendant has certified that the Infringing Bluetooth Classic Products are compliant with "Adaptive Frequency Hopping" as defined by Item 16 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS.

40. On information and belief, the Exemplary Infringing Bluetooth Classic Product implements "Adaptive Frequency Hopping" as defined by Item 16 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product. On information and belief, Defendant has certified that the Exemplary Infringing Bluetooth Classic Product is compliant with "Adaptive Frequency Hopping" as defined by Item 16 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

41. On information and belief, the Infringing Bluetooth Classic Products implement "AFH Switch as master" as defined by Item 1 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS. On information and belief, Defendant has certified

that the Infringing Bluetooth Classic Products are compliant with "AFH Switch as master" as defined by Item 1 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS.

42. On information and belief, the Exemplary Infringing Bluetooth Classic Product implements "AFH Switch as master" as defined by Item 1 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product. On information and belief, Defendant has certified that the Exemplary Infringing Bluetooth Classic Product is compliant with "AFH Switch as master" as defined by Item 1 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

43. On information and belief, the Infringing Bluetooth Classic Products include "Support of Channel Classification" as defined by Item 6 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS. On information and belief, Defendant has certified that the Infringing Bluetooth Classic Products are compliant with "Support of Channel Classification" as defined by Item 6 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS.

44. On information and belief, the Exemplary Infringing Bluetooth Classic Product includes "Support of Channel Classification" as defined by Item 6 of the Adaptive Frequency Hopping table (i.e., Table 26) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product. On information and belief, Defendant has certified that the Exemplary Infringing Bluetooth Classic Product is compliant with "Support of Channel Classification" as defined by Item 6 of the Adaptive Frequency Hopping table (i.e., Table 26)

within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

45. On information and belief, the Infringing Bluetooth Classic Products implement "Power Control" as defined by Item 10 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS. On information and belief, Defendant has certified that the Infringing Bluetooth Classic Products are compliant with "Power Control" as defined by Item 10 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS.

46. On information and belief, the Exemplary Infringing Bluetooth Classic Product implements "Power Control" as defined by Item 10 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product. On information and belief, Defendant has certified that the Exemplary Infringing Bluetooth Classic Product is compliant with "Power Control" as defined by Item 10 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

47. On information and belief, the Infringing Bluetooth Classic Products implement "Enhanced Power Control" as defined by Item 20 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS. On information and belief, Defendant has certified that the Infringing Bluetooth Classic Products are compliant with "Enhanced Power Control" as defined by Item 20 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS.

48. On information and belief, the Exemplary Infringing Bluetooth Classic Product implements "Enhanced Power Control" as defined by Item 20 of the Supported Features table (i.e.,

Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

49. On information and belief, Defendant has certified that the Exemplary Infringing Bluetooth Classic Product is compliant with "Enhanced Power Control" as defined by Item 20 of the Supported Features table (i.e., Table 2) within the Link Manager section of the ICS for the Exemplary Infringing Bluetooth Classic Product.

50. The Infringing Bluetooth Classic Products are capable of performing adaptive frequency hopping.

51. The Exemplary Infringing Bluetooth Classic Product is capable of performing adaptive frequency hopping.

52. The Infringing Bluetooth Classic Products are capable of operating in the 2.4 GHz ISM frequency band.

53. The Exemplary Infringing Bluetooth Classic Product is capable of operating in the 2.4 GHz ISM frequency band.

54. The Infringing Bluetooth Classic Products are capable of participating in Bluetooth piconets with one or more other devices.

55. The Exemplary Infringing Bluetooth Classic Product is capable of participating in Bluetooth piconets with one or more other devices.

56. The Infringing Bluetooth Classic Products are capable of transmitting data packets to other devices.

57. The Exemplary Infringing Bluetooth Classic Product is capable of transmitting data packets to other devices.

58. The Infringing Bluetooth Classic Products are capable of receiving data packets from other devices.

59. The Exemplary Infringing Bluetooth Classic Product is capable of receiving data packets from other devices.

60. The Infringing Bluetooth Classic Products are capable of transmitting and/or receiving data packets on multiple frequencies.

61. The Exemplary Infringing Bluetooth Classic Product is capable of transmitting and/or receiving data packets on multiple frequencies.

62. The Infringing Bluetooth Classic Products are capable of transmitting and/or receiving data packets using a sequence of fewer than the total number of frequencies in the available band for a particular period of time.

63. The Exemplary Infringing Bluetooth Classic Product is capable of transmitting and/or receiving data packets using a sequence of fewer than the total number of frequencies in the available band for a particular period of time.

64. The Infringing Bluetooth Classic Products are capable of transmitting and/or receiving data in defined time slots.

65. The Exemplary Infringing Bluetooth Classic Product is capable of transmitting and/or receiving data in defined time slots.

66. The Infringing Bluetooth Classic Products are capable of changing the set of channels on which they transmit and/or receive data packets with other devices in a particular piconet during the connection lifetime of that piconet.

67. The Exemplary Infringing Bluetooth Classic Product is capable of changing the set of channels on which they transmit and/or receive data packets with other devices in a particular piconet during the connection lifetime of that piconet.

68. The Infringing Bluetooth Classic Products are capable of sending and/or receiving the LMP_set_AFH PDU (packet data unit) or functional equivalent as it is defined in the Bluetooth Core Specification version 2.0+EDR.

69. The Exemplary Infringing Bluetooth Classic Product is capable of sending and/or receiving the LMP_set_AFH PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 2.0+EDR.

70. The Infringing Bluetooth Classic Products are capable of sending and/or receiving any packet that includes the AFH_Instant parameter or functional equivalent as it is defined in the Bluetooth Core Specification version 2.0+EDR.

71. The Exemplary Infringing Bluetooth Classic Product is capable of sending and/or receiving any packet that includes the AFH_Instant parameter or functional equivalent as it is defined in the Bluetooth Core Specification version 2.0+EDR.

72. The Infringing Bluetooth Classic Products are capable of sending and/or receiving data packets that include the AFH_Channel_Map parameter or functional equivalent as it is defined in the Bluetooth Core Specification version 2.0+EDR.

73. The Exemplary Infringing Bluetooth Classic Product is capable of sending and/or receiving data packets that include the AFH_Channel_Map parameter or functional equivalent as it is defined in the Bluetooth Core Specification Version 2.0+EDR.

74. The Infringing Bluetooth Classic Products are capable of selecting channels for transmission of data using the basic hop selection kernel in conformance with the Bluetooth Core Specification Version 2.0+EDR.

75. The Exemplary Infringing Bluetooth Classic Product is capable of selecting channels for transmission of data using the basic hop selection kernel in conformance with the Bluetooth Core Specification Version 2.0+EDR.

76. The Infringing Bluetooth Classic Products are capable of classifying channels in the available frequency band as at least used or unused for communication within a particular piconet at a particular time.

77. The Exemplary Infringing Bluetooth Classic Product is capable of classifying channels in the available frequency band as at least used or unused for communication within a particular piconet at a particular time.

78. The Infringing Bluetooth Classic Products are capable of using index and/or other data structures that represent frequency channels.

79. The Exemplary Infringing Bluetooth Classic Product is capable of using index and/or other data structures that represent frequency channels.

80. The Infringing Bluetooth Classic Products are capable of using one or more registers or functionally equivalent data structures to store representations of frequency channels.

81. The Exemplary Infringing Bluetooth Classic Product is capable of using one or more registers or functionally equivalent data structures to store representations of frequency channels.

82. The Infringing Bluetooth Classic Products are capable of using one or more remapping and/or substitution functions to select a channel for transmission of data.

83. The Exemplary Infringing Bluetooth Classic Product is capable of using one or more remapping and/or substitution functions to select a channel for transmission of data.

84. The Infringing Bluetooth Classic Products are capable of using one or more reindexing and/or substitution operations to select a channel for transmission of data.

85. The Exemplary Infringing Bluetooth Classic Product is capable of using one or more reindexing and/or substitution operations to select a channel for transmission of data.

86. The Infringing Bluetooth Classic Products are capable of representing a channel's status as at least good, bad, and/or unknown for transmission using a single bit.

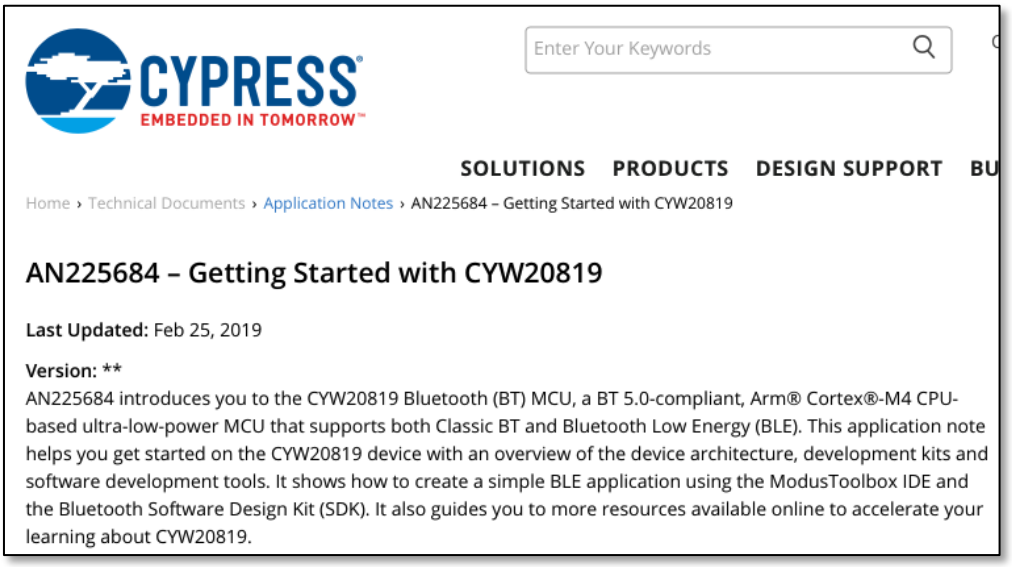
87. The Exemplary Infringing Bluetooth Classic Product is capable of representing a channel's status as at least good, bad, and/or unknown for transmission using a single bit.

88. The Infringing Bluetooth Classic Products are capable of representing a channel's status as at least used or unused for transmission using a single bit.

89. The Exemplary Infringing Bluetooth Classic Product is capable of representing a channel's status as at least used or unused for transmission using a single bit.

90. Certain of Defendant's customers request, require, and/or engage features and capabilities, including adaptive frequency hopping, that comply with the Bluetooth Core Specification, and Defendant markets and advertises one or more of its Infringing Bluetooth Classic Products' compliance with the Bluetooth Core Specification regarding such features and capabilities.

91. Defendant advertises and provides a downloadable manual for the Exemplary Infringing Bluetooth Classic Product on its website.



https://www.cypress.com/documentation/application-notes/an225684-getting-started-cyw20819

92. Defendant's website for the Exemplary Infringing Bluetooth Classic Product touts the infringing Bluetooth functionality by marketing the product as a "a BT 5.0-compliant, Arm® Cortex®-M4 CPU-based ultra-low-power MCU that supports both Classic BT and Bluetooth Low Energy (BLE)." *See id.*

93. Defendant states that the Exemplary Infringing Product "Complies with Bluetooth Core Specification version 5.0." https://www.cypress.com/file/463076/download.

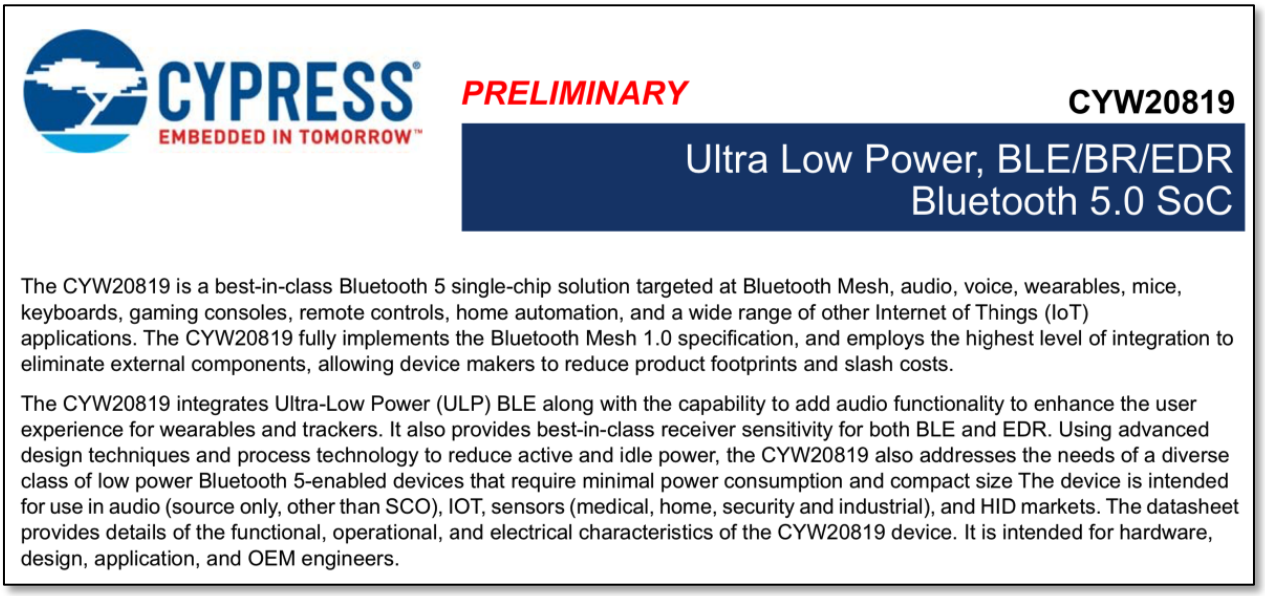
94. Defendant encourages customers to use the infringing Bluetooth functionality in the Exemplary Infringing Bluetooth Classic Product by marketing the product as follows:

Introduction

Applications featuring Bluetooth connectivity are trending towards lower power, more application-level features, and smaller BoM cost and board space. The CYW20819 Bluetooth Wireless MCU enables you to meet all these critical requirements. In terms of the core Bluetooth functionality, the device is Bluetooth 5.0-compliant with support for dual-mode Bluetooth operation, and it supports BLE (1 Mbps & 2 Mbps) and (EDR 2 Mbps & 3 Mbps) data rates. CYW20819 also fully implements the Bluetooth Mesh 1.0 specification. CYW20819 also supports value-add application features by having a powerful Arm Cortex-M4 CPU and a host of peripheral blocks like ADC, SPI, UART, and I^2C that aid in interfacing with external on-board sensors. The presence of these peripheral blocks, on-chip flash memory, and integrated buck and LDO regulators also enables reduced BoM cost and PCB footprint. Cypress' advanced CMOS manufacturing process and the support for various system power modes enable you to design battery-operated, low-power applications using CYW20819.

The device is intended for use in audio (source), sensors (medical, home, security), HID and remote-control functionality, as well as a host of other IoT applications.

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PRELIMINARY

CYW20819

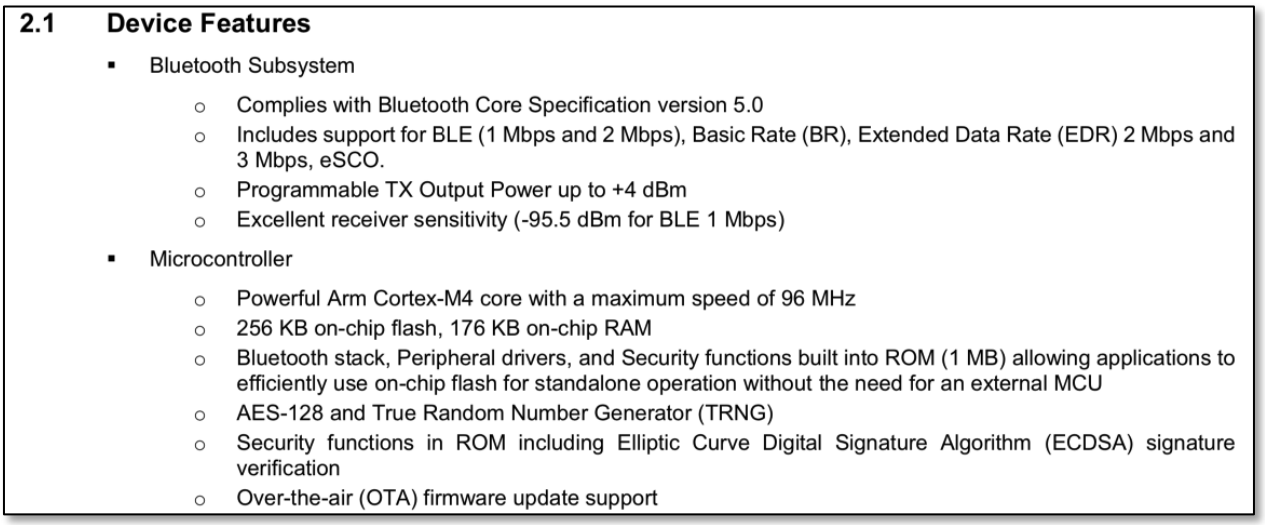
Ultra Low Power, BLE/BR/EDR Bluetooth 5.0 SoC

The CYW20819 is a best-in-class Bluetooth 5 single-chip solution targeted at Bluetooth Mesh, audio, voice, wearables, mice, keyboards, gaming consoles, remote controls, home automation, and a wide range of other Internet of Things (IoT) applications. The CYW20819 fully implements the Bluetooth Mesh 1.0 specification, and employs the highest level of integration to eliminate external components, allowing device makers to reduce product footprints and slash costs.

The CYW20819 integrates Ultra-Low Power (ULP) BLE along with the capability to add audio functionality to enhance the user experience for wearables and trackers. It also provides best-in-class receiver sensitivity for both BLE and EDR. Using advanced design techniques and process technology to reduce active and idle power, the CYW20819 also addresses the needs of a diverse class of low power Bluetooth 5-enabled devices that require minimal power consumption and compact size The device is intended for use in audio (source only, other than SCO), IOT, sensors (medical, home, security and industrial), and HID markets. The datasheet provides details of the functional, operational, and electrical characteristics of the CYW20819 device. It is intended for hardware, design, application, and OEM engineers.

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95. Defendant further encourages customers to use the infringing Bluetooth functionality in the Exemplary Infringing Bluetooth Classic Product by advertising to customers the "Device Features":

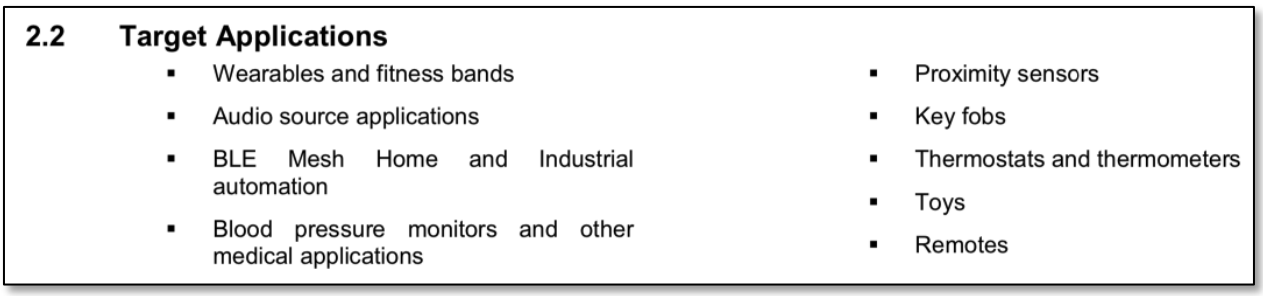


2.1 Device Features

- Bluetooth Subsystem
  - Complies with Bluetooth Core Specification version 5.0
  - Includes support for BLE (1 Mbps and 2 Mbps), Basic Rate (BR), Extended Data Rate (EDR) 2 Mbps and 3 Mbps, eSCO.
  - Programmable TX Output Power up to +4 dBm
  - Excellent receiver sensitivity (-95.5 dBm for BLE 1 Mbps)
- Microcontroller
  - Powerful Arm Cortex-M4 core with a maximum speed of 96 MHz
  - 256 KB on-chip flash, 176 KB on-chip RAM
  - Bluetooth stack, Peripheral drivers, and Security functions built into ROM (1 MB) allowing applications to efficiently use on-chip flash for standalone operation without the need for an external MCU
  - AES-128 and True Random Number Generator (TRNG)
  - Security functions in ROM including Elliptic Curve Digital Signature Algorithm (ECDSA) signature verification
  - Over-the-air (OTA) firmware update support

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96. Defendant further encourages customers to use the Exemplary Infringing Bluetooth Classic Product in certain "Target Applications:"



2.2 Target Applications

- Wearables and fitness bands
- Audio source applications
- BLE Mesh Home and Industrial automation
- Blood pressure monitors and other medical applications
- Proximity sensors
- Key fobs
- Thermostats and thermometers
- Toys
- Remotes

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97. The Exemplary Infringing Bluetooth Classic Product is backward compatible to Bluetooth 2.0 or 1.2 systems.

98. In its marketing materials, Defendant states that "Adaptive Frequency Hopping" is one of the "Key Bluetooth Features Supported By CYW2819:

Table 1 lists key BT features supported by the CYW20819.

Table 1. Key Bluetooth Features Supported By CYW20819

Bluetooth 1.0	Bluetooth 1.2	Bluetooth 2.0
Basic Rate	Interlaced Scans	EDR 2 Mbps and 3 Mbps
SCO	Adaptive Frequency Hopping	–
Paging and Inquiry	eSCO	–
Page and Inquiry Scan	–	–
Sniff	–	–

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99. Defendant markets and instructs its users about the Exemplary Infringing Bluetooth Classic Product, including how to engage Bluetooth functionality.

100. Upon information and belief, Defendant's customers follow the instructions provided by Defendant to activate the Bluetooth functionality, and therefore intends for its customers to use the Exemplary Infringing Bluetooth Classic Product in a manner that infringes the Patents.

101. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing instructions to set up and engage infringing Bluetooth functionality in the Exemplary Infringing Bluetooth Classic Product.

102. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing instructions to set up and engage infringing Bluetooth functionality in the Infringing Bluetooth Classic Products.

103. Defendant induces its customers to infringe and contributes to such infringement by instructing or specifying that its customers engage Bluetooth functionality such that the Infringing Bluetooth Classic Products operate in an infringing manner. Defendant specifies that the Infringing Bluetooth Classic Products operate in an infringing manner by providing source code or firmware on the integrated circuit that causes it to operate in an infringing manner.

104. The normal, intended operation of the Infringing Bluetooth Classic Products is to provide certain capabilities and features, including adaptive frequency hopping, in compliance with Version 1.2 or later of the Bluetooth Core Specification, that infringe the Patents. The Infringing Products therefore have no substantial non-infringing uses.

105. Therefore, Defendant induces its customers to directly infringe or contribute to the direct infringement of its customers.

106. Bandspeed has been and will continue to suffer damages as a result of Defendant's infringing acts.

B. Infringing Bluetooth Low Energy Products

107. Defendant manufactures, provides, sells, offers for sale, and/or distributes infringing products, such as integrated circuits, or a set of integrated circuits for wireless communications devices, that use, practice and/or comply with the Bluetooth low energy protocol

as described in Version 4.0 and any later version of the Bluetooth Core Specification ("Infringing Bluetooth LE Products").

108. The Infringing Bluetooth LE Products infringe the '608 Patent, '643 Patent, '500 Patent, '769 Patent and '520 Patent ("LE Patents"). The PSoC MCU with Bluetooth Low Energy (BLE) Connectivity product shall be referred to as the "Exemplary Infringing Bluetooth LE Product."

109. Through its actions, Defendant has infringed the LE Patents, has actively induced others to infringe, and has contributed to the infringement by others of the LE Patents, throughout the United States.

110. Defendant manufactures, provides, sells, offers for sale, and/or distributes integrated circuits, or sets of integrated circuits, that are compliant with the low energy protocol in Version 4.0 and any later version of the Bluetooth Core Specification.

111. Bluetooth low energy is material to practicing the invention described by the LE Patents.

112. Defendant intentionally manufactures and sells Infringing Bluetooth LE Products that are designed to provide low energy functionality.

113. Defendant certifies that the Infringing Bluetooth LE Products are compliant with Version 4.0 or later of the Bluetooth Core Specification.

114. On information and belief, Defendant takes steps to test these products to ensure compliance with the Bluetooth Core Specification and to qualify an Infringing Bluetooth LE Product for Bluetooth certification. On information and belief, in connection with compliance, for qualifying Bluetooth products, Defendant prepares a Core ICS. On information and belief, portions

of the Core ICS require Defendant to acknowledge whether the product supports certain capabilities, including compliance and features consistent with the Bluetooth low energy protocol.

115. The Exemplary Infringing LE Product is capable of performing adaptive frequency hopping.

116. The Infringing LE Products are capable of performing adaptive frequency hopping.

117. The Exemplary Infringing Bluetooth LE Product is capable of communicating wirelessly.

118. The Infringing Bluetooth LE Products are capable of communicating wirelessly.

119. The Exemplary Infringing Bluetooth LE Product is capable of participating in a Bluetooth piconet.

120. The Infringing Bluetooth LE Products are capable of participating in a Bluetooth piconet.

121. The Exemplary Infringing Bluetooth LE Product is capable of performing as a master in a Bluetooth piconet.

122. The Infringing Bluetooth LE Products are capable of performing as a master in a Bluetooth piconet.

123. The Exemplary Infringing Bluetooth LE Product is capable of performing as a slave in a Bluetooth piconet.

124. The Infringing Bluetooth LE Products are capable of performing as a slave in a Bluetooth piconet.

125. The Exemplary Infringing Bluetooth LE Product is compliant with Bluetooth Core Specification Version 4.0 or higher.

126. The Infringing Bluetooth LE Products are compliant with Bluetooth Core Specification Version 4.0 or higher.

127. The Exemplary Infringing Bluetooth LE Product has been certified as compliant with Bluetooth Core Specification Version 4.0 or higher.

128. The Infringing Bluetooth LE Products are certified as compliant with Bluetooth Core Specification Version 4.0 or higher.

129. The Exemplary Infringing Bluetooth LE Product is compliant with Bluetooth Low Energy.

130. The Infringing Bluetooth LE Products are compliant with Bluetooth Low Energy.

131. The Exemplary Infringing Bluetooth LE Product has been certified as compliant with Bluetooth Low Energy.

132. The Infringing Bluetooth LE Products have been certified as compliant with Bluetooth Low Energy.

133. The Exemplary Infringing Bluetooth LE Product is capable of transmitting and/or receiving packets wirelessly.

134. The Infringing Bluetooth LE Products are capable of transmitting and/or receiving packets wirelessly.

135. The Exemplary Infringing Bluetooth LE Product is capable of operating in the 2.4 GHz ISM band.

136. The Infringing Bluetooth LE Products are capable of operating in the 2.4 GHz ISM band.

137. The Exemplary Infringing Bluetooth LE Product is capable of using a frequency hopping transceiver.

138. The Infringing Bluetooth LE Products are capable of using a frequency hopping transceiver.

139. The Exemplary Infringing Bluetooth LE Product is capable of Bluetooth frequency hopping.

140. The Infringing Bluetooth LE Products are capable of Bluetooth frequency hopping.

141. The Exemplary Infringing Bluetooth LE Product is capable of Bluetooth adaptive frequency hopping.

142. The Infringing Bluetooth LE Products are capable of Bluetooth adaptive frequency hopping.

143. The Exemplary Infringing Bluetooth LE Product uses a random or pseudo-random ordering of channels in the 2.4 GHz ISM band for data transmission.

144. The Infringing Bluetooth LE Products uses a random or pseudo-random ordering of channels in the 2.4 GHz ISM band for data transmission.

145. The Exemplary Infringing Bluetooth LE Product uses a random or pseudo-random ordering of 37 channels in the 2.4 GHz ISM band for data transmission.

146. The Infringing Bluetooth LE Products use a random or pseudo-random ordering of 37 channels in the 2.4 GHz ISM band for data transmission.

147. The Exemplary Infringing Bluetooth LE Product uses a frequency hopping pattern that is capable of being adapted to exclude one or more channels where interference is observed or measured.

148. The Infringing Bluetooth LE Products use a frequency hopping pattern that is capable of being adapted to exclude one or more channels where interference is observed or measured.

149. The Exemplary Infringing Bluetooth LE Product uses a frequency hopping pattern that is capable of being adapted to exclude channels on which interference is observed or suspected.

150. The Infringing Bluetooth LE Products use a frequency hopping pattern that is capable of being adapted to exclude channels on which interference is observed or suspected.

151. The Exemplary Infringing Bluetooth LE Product uses a frequency hopping pattern that is capable of being adapted to exclude channels based at least in part on the performance of those channels.

152. The Infringing Bluetooth LE Products use a frequency hopping pattern that is capable of being adapted to exclude channels based at least in part on the performance of those channels.

153. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving a CONNECT_PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0.

154. The Infringing Bluetooth LE Products are capable of sending and/or receiving a CONNECT_PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0.

155. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving a CONNECT_PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 that contains an LLData field or functional equivalent.

156. The Infringing Bluetooth LE Products are capable of sending and/or receiving a CONNECT_PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 that contains an LLData field or functional equivalent.

157. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains a ChM field or functional equivalent.

158. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains a ChM field or functional equivalent.

159. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains a Hop field or functional equivalent.

160. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains a Hop field or functional equivalent.

161. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving a ChM field or functional equivalent that contains a subset of channels to be used for communication.

162. The Infringing Bluetooth LE Products are capable of sending and/or receiving a ChM field or functional equivalent that contains a subset of channels to be used for communication.

163. The Exemplary Infringing Bluetooth LE Product is capable of classifying channels used or unused for communication at a particular time.

164. The Infringing Bluetooth LE Products are capable of classifying channels used or unused for communication at a particular time.

165. The Exemplary Infringing Bluetooth LE Product is capable of classifying channels used or unused for communication at a particular time based at least in part on performance measurements.

166. The Infringing Bluetooth LE Products are capable of classifying channels used or unused for communication at a particular time based at least in part on performance measurements.

167. The Exemplary Infringing Bluetooth LE Product is capable of indexing channels to be used for communication at a particular time.

168. The Infringing Bluetooth LE Products are capable of indexing channels to be used for communication at a particular time.

169. The Exemplary Infringing Bluetooth LE Product uses a Hop field or functional equivalent that contains an increment value as input to the channel selection algorithm of the frequency hopping implementation.

170. The Infringing Bluetooth LE Products use a Hop field or functional equivalent that contains an increment value as input to the channel selection algorithm of the frequency hopping implementation.

171. The Exemplary Infringing Bluetooth LE Product uses an LLData field or functional equivalent that contains timing information that includes the sent or transmission time of the packets.

172. The Infringing Bluetooth LE Products use an LLData field or functional equivalent that contains timing information that includes the sent or transmission time of the packets.

173. The packet data transmitted by the Exemplary Infringing Bluetooth LE Product includes timing information indicative of the number of time slots to wait between packet transmissions.

174. The packet data transmitted by the Infringing Bluetooth LE Products includes timing information indicative of the number of time slots to wait between packet transmissions.

175. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains an Interval field or functional equivalent.

176. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains an Interval field or functional equivalent.

177. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains a Latency field or functional equivalent.

178. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains a Latency field or functional equivalent.

179. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that is usable for establishing a timing reference point and time period that is used to determine the timing of subsequent packet transmissions.

180. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that is usable for establishing a timing reference point and time period that is used to determine the timing of subsequent packet transmissions.

181. The Exemplary Infringing Bluetooth LE Product is capable of measuring time in the number of transmission slots or events.

182. The Infringing Bluetooth LE Products are capable of measuring time in the number of transmission slots or events.

183. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains on or more fields determinative of a frequency hopping pattern.

184. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains one or more fields determinative of a frequency hopping pattern.

185. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LLData field or functional equivalent that contains one or more fields usable as inputs to a frequency hopping algorithm.

186. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LLData field or functional equivalent that contains one or more fields usable as inputs to a frequency hopping algorithm.

187. The Exemplary Infringing Bluetooth LE Product is capable of using a frequency hopping pattern for data transmission that is a specific ordering of data channels by index position in a data structure.

188. The Infringing Bluetooth LE Products are capable of using a frequency hopping pattern for data transmission that is a specific ordering of data channels by index position in a data structure.

189. The Exemplary Infringing Bluetooth LE Product is capable of using a hopping pattern for data transmission that can be adapted to exclude a portion of the frequencies that are used by interfering devices.

190. The Infringing Bluetooth LE Products are capable of using a hopping pattern for data transmission that can be adapted to exclude a portion of the frequencies that are used by interfering devices.

191. The Exemplary Infringing Bluetooth LE Product is capable of reducing the number of channels used for data transmission through the channel map indicating only the used channels.

192. The Infringing Bluetooth LE Products are capable of reducing the number of channels used for data transmission through the channel map indicating only the used channels.

193. The Exemplary Infringing Bluetooth LE Product is capable of adjusting the channel set to exclude one or more channels from use by the frequency hopping implementation.

194. The Infringing Bluetooth LE Products are capable of adjusting the channel set to exclude one or more channels from use by the frequency hopping implementation.

195. The Exemplary Infringing Bluetooth LE Product is capable of using a data structure for indexing channels to be used for frequency hopping communication.

196. The Infringing Bluetooth LE Products are capable of using a data structure for indexing channels to be used for frequency hopping communication.

197. The Exemplary Infringing Bluetooth LE Product is capable of using a register for indexing channels to be used for frequency hopping communication.

198. The Infringing Bluetooth LE Products are capable of using a register for indexing channels to be used for frequency hopping communication.

199. The Exemplary Infringing Bluetooth LE Product is capable of loading channel indices into a register.

200. The Infringing Bluetooth LE Products are capable of loading channel indices into a register.

201. The Exemplary Infringing Bluetooth LE Product is capable of storing channel indices in a register.

202. The Infringing Bluetooth LE Products are capable of storing channel indices in a register.

203. The Exemplary Infringing Bluetooth LE Product is capable of updating the subset of channels to be used for communication in a piconet.

204. The Infringing Bluetooth LE Products are capable of updating the subset of channels to be used for communication in a piconet.

205. The Exemplary Infringing Bluetooth LE Product is capable of updating a channel map by sending an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0.

206. The Infringing Bluetooth LE Products are capable of updating a channel map by sending an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0.

207. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 containing a new channel map with an associated indexing and initial index position.

208. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 containing a new channel map with an associated indexing and initial index position.

209. The Exemplary Infringing Bluetooth LE Product is capable of sending and/or receiving an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 containing an Instant field or functional equivalent, which indicates when the new channel map shall take effect.

210. The Infringing Bluetooth LE Products are capable of sending and/or receiving an LL_CHANNEL_MAP_REQ PDU or functional equivalent as it is defined in the Bluetooth Core Specification version 4.0 containing an Instant field or functional equivalent, which indicates when the new channel map shall take effect.

211. The Exemplary Infringing Bluetooth LE Product uses a hop index and channel map to identify a physical channel. If the identified channel is identified as to be used and is the next usable channel according to the channel selection and hopping algorithms, it is used for communication. If the identified channel is not identified as to be used, it is not used and instead the next available used channel according to the channel selection, hopping, and remapping algorithms and procedures is selected.

212. The Infringing Bluetooth LE Products use a hop index and channel map to identify a physical channel. If the identified channel is identified as to be used and is the next usable channel according to the channel selection and hopping algorithms, it is used for communication. If the identified channel is not identified as to be used, it is not used and instead the next available used channel according to the channel selection, hopping, and remapping algorithms and procedures is selected.

213. Certain of Defendant's customers request, require, and/or engage features and capabilities, including the low energy protocol, that comply with the Bluetooth Core Specification, and Defendant markets and advertises its Infringing Bluetooth LE Products' compliance with the Bluetooth Core Specification regarding such features and capabilities.

214. Defendant induces its customers to infringe and contributes to such infringement by instructing or specifying that its customers install the infringing integrated circuits in products such that the Infringing Bluetooth LE Products operate in an infringing manner. Defendant

specifies that the Infringing Bluetooth LE Products operate in an infringing manner by providing source code or firmware on the integrated circuit that causes it to operate in an infringing manner.

215. Defendant markets Exemplary Infringing Bluetooth LE Product and other similar Bluetooth Low Energy devices on its website. https://www.cypress.com/ .

216. Defendant markets the Exemplary Infringing Bluetooth LE Product to customers as follows:

> AN210781 introduces you to PSoC® 6 MCU with Bluetooth Low Energy (BLE) Connectivity, a dual-CPU Arm® Cortex®-M4 and Cortex-M0+ based programmable system-on-chip that integrates a BLE 5.0 system, the latest-generation of CapSense® technology, and a host of security features. This application note helps you explore the PSoC 6 MCU with BLE architecture and development tools and shows you how to create your first project using PSoC Creator, export the project to a third-party integrated development environment (IDE), and continue your firmware development. It also guides you to more resources available online to accelerate your learning about PSoC 6 MCU with BLE Connectivity. To get started with the PSoC 6 MCU device family, see AN221774 – Getting Started with PSoC 6 MCU.

https://www.cypress.com/file/385696/download.

217. The Exemplary Infringing Bluetooth LE Product is compliant with the BLE 5.0 specification.

> BLE is an ultra-low-power wireless standard defined by the Bluetooth Special Interest Group (SIG) for short-range communication. PSoC 6 BLE integrates a BLE 4.2 radio and a royalty-free protocol stack with enhanced security, privacy, and throughput compliant with the BLE 5.0 specification.

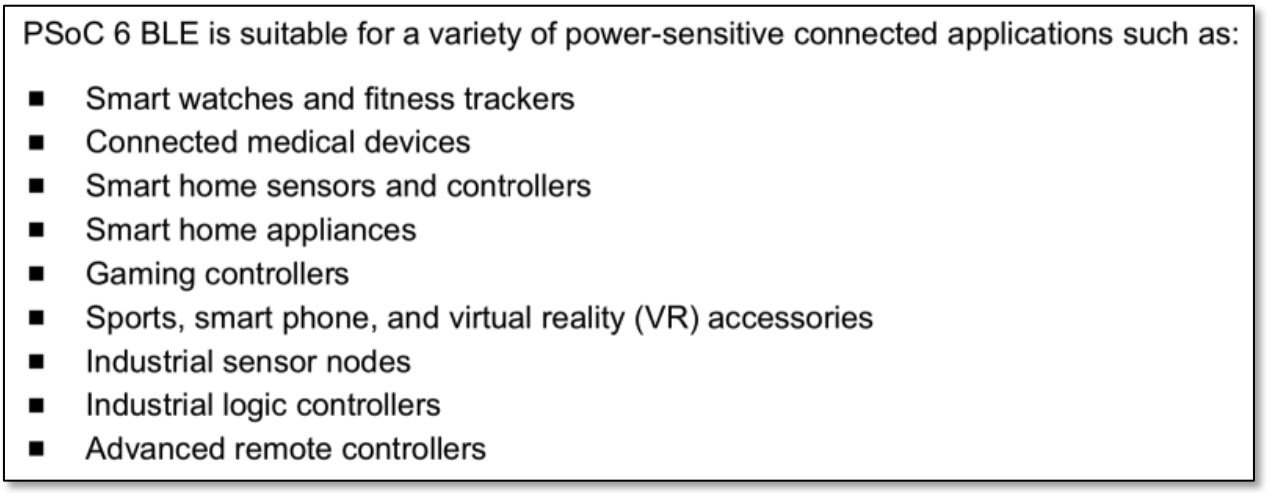
https://www.cypress.com/file/385696/download.

218. The Exemplary Infringing Bluetooth LE Product includes link layer functions such as Adaptive Frequency Hopping (AFH), which Defendant states "changes the communication channel used for packet transmission so that the interface from other devices is reduced."

> **B.3 Link Layer (LL)**
>
> The link layer implements key procedures to establish a reliable physical link (using an acknowledgement and flow-control-based architecture) and features that help make the BLE protocol robust and low-power. Some link layer functions include:
>
> - Advertising, scanning, creating, and maintaining connections to establish a physical link
> - 24-bit CRC and AES-128-bit encryption for robust and secure data exchange
> - Establishing fast connections and low-duty-cycle advertising for low-power operation
> - Adaptive Frequency Hopping (AFH), which changes the communication channel used for packet transmission so that the interference from other devices is reduced

https://www.cypress.com/file/385696/download.

219. Defendant markets the Exemplary Infringing Bluetooth LE Product as suitable for a variety of applications:


PSoC 6 BLE is suitable for a variety of power-sensitive connected applications such as:

- Smart watches and fitness trackers
- Connected medical devices
- Smart home sensors and controllers
- Smart home appliances
- Gaming controllers
- Sports, smart phone, and virtual reality (VR) accessories
- Industrial sensor nodes
- Industrial logic controllers
- Advanced remote controllers

https://www.cypress.com/file/385696/download.

220. The normal, intended operation of the Infringing Bluetooth LE Products is to provide certain capabilities and features that infringe the LE Patents, including Bluetooth Low Energy capabilities and features in compliance with Version 4.0 or later of the Bluetooth Core Specification. The Infringing Bluetooth LE Products have no substantial non-infringing uses.

221. Therefore, Defendant induces its customers to directly infringe or contribute to the direct infringement of its customers.

222. Bandspeed has been and will continue to suffer damages as a result of Defendant's infringing acts.

COUNT ONE

PATENT INFRINGEMENT – U.S. PATENT NO. 7,027,418 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

223. Bandspeed realleges and incorporates preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

224. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the ’418 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Bluetooth Classic Products and Infringing Bluetooth LE Products (collectively, “Infringing Products”).

225. For example, claim 5 of the ‘418 Patent states:

1. A method for selecting communications channels for a communications system, the method comprising the computer-implemented steps of:

> selecting, based upon performance of a plurality of communications channels at a first time and channel selection criteria, a first set of two or more communications channels from the plurality of communications channels;
>
> selecting, based upon performance of the plurality of communications channels at a second time that is later than the first time and the channel selection criteria, a second set of two or more communications channels from the plurality of communications channels;
>
> wherein the communications system is a frequency hopping communications system and the plurality of communications channels correspond to a set of frequencies to be used based on a hopping sequence according to a frequency hopping protocol; and
>
> wherein at each hop in the hopping sequence, only one communications channel is used for communications between a pair of participants.

5. The method as recited in claim 1, further comprising the steps of:

> generating first channel identification data that identifies the first set of two or more communications channels;
>
> transmitting the first channel identification data to one or more participants in the communications system over one communications channel of the plurality of communications channels based on the hopping sequence according to the frequency hopping protocol;

generating second channel identification data that identifies the second set of two or more communications channels; and

transmitting the second channel identification data to one or more participants in the communications system over one communications channel of the plurality of communications channels based on the hopping sequence according to the frequency hopping protocol.

226. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of claim 5 of the '418 Patent.

227. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of other claims of the '418 Patent.

228. Defendant jointly infringes the '418 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

229. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

230. Defendant has indirectly infringed and continues to indirectly infringe, the ’418 Patent by inducing direct infringement of the ’418 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Bluetooth Classic Products in this District and elsewhere in the United States.

231. On information and belief, despite having knowledge of the ’418 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’418 Patent.

232. Defendant knew or should have known that its actions were inducing infringement.

233. Defendant had knowledge of the ’418 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

234. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’418 Patent.

235. With knowledge of the ’418 Patent, Defendant directs and aids third parties to infringe the ’418 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their

customary way; (iii) advertising the Infringing Bluetooth Classic Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '418 Patent, all with knowledge that the induced acts constitute patent infringement.

236. With knowledge of the '418 Patent, Defendant directs and aids third parties to infringe the '418 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing Bluetooth LE Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '418 Patent, all with knowledge that the induced acts constitute patent infringement.

237. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

238. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '418 patent by contributing to the infringement of the '418 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

239. Defendant has knowledge of the '418 Patent by virtue of the Notice Letter and the Complaint.

240. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’418 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’418 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

241. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’418 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’418 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

242. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the ’418 Patent. Bandspeed has been damaged as a result of

Defendant's infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT TWO

PATENT INFRINGEMENT – U.S. PATENT NO. 7,477,624 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS)

243. Bandspeed realleges and incorporates the preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

244. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the '624 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Bluetooth Classic Products.

245. For example, claim 15 of the '624 Patent states:

13. A communications device for use in a network of devices, comprising:

a memory for storing instructions;

a processor that is communicatively coupled to the memory, wherein the memory includes instructions which, when processed by the processor, causes:

selecting, based upon performance of a plurality of communications channels at a first time, a first set of two or more communications channels from the plurality of communications channels;

selecting, based upon performance of the plurality of communications channels at a second time that is later than the first time, a second set of two or more communications channels from the plurality of communications channels; and

a transceiver that is communicatively coupled to the memory and that is configured to transmit to and receive from another communications device, wherein:

for a first period of time, the first set of two or more communications channels is used to transmit to and receive from the other communications device; and

for a second period of time that is after the first period of time, the second set of two or more communications channels is used to transmit to and receive from the other communications device instead of the first set of two or more communications channels, and

wherein the memory further includes instructions, which when processed by the processor, causes:

after selecting the first set of two or more communications channels, causing the first set of two or more communications channels to be loaded into a first register of the communications device and a second register of the other communications device; and

after selecting the second set of two or more communications channels, causing the second set of two or more communications channels to be loaded into the first register of the communications device and the second register of the other communications device.

15. A communications device as recited in claim 13, wherein:

the instructions for selecting the first set of two or more communications channels further includes instructions which, when processed by the processor, cause selecting, based upon the performance of the plurality of communications channels at the first time and channel selection criteria, the first set of two or more communications channels from the plurality of communications channels;

the instructions for selecting the second set of two or more communications channels further includes instructions which, when processed by the processor, cause selecting, based upon the performance of the plurality of communications channels at the second time and the channel selection criteria, the second set of two or more communications channels from the plurality of communications channels; and

the channel selection criteria specifies that for a particular communications channel to be selected, the particular communications channel receives a specified number of votes to use the particular communications channel from among a plurality of votes.

246. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of claim 15 of the '624 Patent.

247. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of other claims of the '624 Patent.

248. Defendant jointly infringes the '624 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

249. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Bluetooth Classic Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Bluetooth Classic Products. *See, e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Bluetooth Classic Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

250. Defendant has indirectly infringed and continues to indirectly infringe, the ’624 Patent by inducing direct infringement of the ’624 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Bluetooth Classic Products in this District and elsewhere in the United States.

251. On information and belief, despite having knowledge of the ’624 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Bluetooth Classic Products, including without limitation end-users of the Infringing Bluetooth Classic Products, to acquire and use such devices in such a way that infringes one or more claims of the ’624 Patent.

252. Defendant knew or should have known that its actions were inducing infringement.

253. Defendant had knowledge of the ’624 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

254. Direct infringement is the result of activities performed by third parties, including Defendant's customers, in relation to the Infringing Bluetooth Classic Products, including without limitation by third parties, including Defendant's customers, enabled and encouraged by Defendant to use the Infringing Bluetooth Classic Products in their normal, customary way to infringe the '624 Patent.

255. With knowledge of the '624 Patent, Defendant directs and aids third parties to infringe the '624 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality communication protocol in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '624 Patent, all with knowledge that the induced acts constitute patent infringement.

256. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Bluetooth Classic Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

257. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '624 patent by contributing to the infringement of the '624 Patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Bluetooth Classic Products.

258. Defendant has knowledge of the '624 Patent by virtue of the Notice Letter and the Complaint.

259. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’624 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’624 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

260. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the ’624 Patent. Bandspeed has been damaged as a result of Defendant’s infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT THREE

PATENT INFRINGEMENT – U.S. PATENT NO. 7,570,614 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS)

261. Bandspeed realleges and incorporates preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

262. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the ’614 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Bluetooth Classic Products.

263. For example, claim 100 of the ‘614 Patent states:

1. A method for selecting communications channels for a communications system, the method comprising the computer-implemented steps of:

selecting, based upon performance of a plurality of communications channels and at least one performance criterion, a first communications channel from the plurality of communications channels;

generating channel identification data that identifies the first communications channel;

providing the channel identification data to a first participant;

receiving a first communication from the first participant over a second communications channel from the plurality of communications channels;

wherein the plurality of communications channels correspond to a set of frequencies and the first communication received from the first participant is based on a hopping sequence among at least two communications channels of the plurality of communications channels, according to a frequency hopping protocol; and

wherein the channel identification data specifies that the first communications channel is not to be used by the first participant for the first communication;

sending a second communication to the first participant over a third communications channel;

receiving a third communication from the first participant that includes first performance quality data for the third communications channel, wherein the first performance quality data specifies the performance quality of the third communications channel between the particular participant and the first participant, and is generated by the first participant based on information contained in the second communication; and

updating a set of channel data maintained by the particular participant using the first performance quality data.

100. The method of claim l, wherein the particular participant is a master and the first participant is a slave.

264. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of claim 100 of the '614 Patent.

265. Defendant's Infringing Bluetooth Classic Products meet each and every claim limitation of other claims of the '614 Patent.

266. Defendant jointly infringes the '614 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can

be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

267. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Bluetooth Classic Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Bluetooth Classic Products. *See, e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Bluetooth Classic Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

268. Defendant has indirectly infringed and continues to indirectly infringe, the ’614 Patent by inducing direct infringement of the ’614 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Bluetooth Classic Products in this District and elsewhere in the United States.

269. On information and belief, despite having knowledge of the ’614 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Bluetooth Classic Products, including without limitation end-users of the Infringing Bluetooth Classic Products, to acquire and use such devices in such a way that infringes one or more claims of the ’614 Patent.

270. Defendant knew or should have known that its actions were inducing infringement.

271. Defendant had knowledge of the ’614 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

272. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Bluetooth Classic Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Bluetooth Classic Products in their normal, customary way to infringe the ’614 Patent.

273. With knowledge of the ’614 Patent, Defendant directs and aids third parties to infringe the ’614 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products’ support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’614 Patent, all with knowledge that the induced acts constitute patent infringement.

274. Defendant possesses specific intent to encourage infringement by third parties, including Defendant’s customers and end users of the Infringing Bluetooth Classic Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

275. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the ’614 patent by contributing to the infringement of the ’614 patent under 35 U.S.C. §

271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Bluetooth Classic Products.

276. Defendant has knowledge of the ‘614 Patent by virtue of the Notice Letter and the Complaint.

277. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’614 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’614 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

278. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the ’614 Patent. Bandspeed has been damaged as a result of Defendant’s infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT FOUR

PATENT INFRINGEMENT – U.S. PATENT NO. 7,903,608 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

279. Bandspeed realleges and incorporates preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

280. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the ’608 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Products.

281. For example, claim 1 of the ‘608 Patent states:

1. A communications device for use in a network of devices, comprising:

a memory for storing instructions;

a processor that is communicatively coupled to the memory, wherein the memory includes instructions which, when processed by the processor, causes:

selecting, based upon performance of a plurality of communications channels at a first time, a first set of two or more communications channels from the plurality of communications channels;

selecting, based upon performance of the plurality of communications channels at a second time that is later than the first time, a second set of two or more communications channels from the plurality of communications channels; and

a transceiver that is communicatively coupled to the memory and that is configured to transmit to and receive from another communications device, wherein:

for a first period of time, the first set of two or more communications channels is used to transmit to and receive from the other communications device; and

for a second period of time that is after the first period of time, the second set of two or more communications channels is used to transmit to and receive from the other communications device instead of the first set of two or more communications channels, and

wherein the number of distinct channels in the first set of two or more communications channels varies from the number of distinct channels in the second set of two or more communications channels.

282. Defendant’s Infringing Products meet each and every claim limitation of claim 1 of the ‘608 Patent.

283. Defendant’s Infringing Products meet each and every claim limitation of other claims of the ‘608 Patent.

284. Defendant jointly infringes the ’608 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

285. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

286. Defendant has indirectly infringed and continues to indirectly infringe, the ’608 Patent by inducing direct infringement of the ’608 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Products in this District and elsewhere in the United States.

287. On information and belief, despite having knowledge of the ’608 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’608 Patent.

288. Defendant knew or should have known that its actions were inducing infringement.

289. Defendant had knowledge of the ’608 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

290. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’608 Patent.

291. With knowledge of the ’608 Patent, Defendant directs and aids third parties to infringe the ’608 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products’ support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’608 Patent, all with knowledge that the induced acts constitute patent infringement.

292. With knowledge of the ’608 Patent, Defendant directs and aids third parties to infringe the ’608 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for

using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing Bluetooth LE Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '608 Patent, all with knowledge that the induced acts constitute patent infringement.

293. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

294. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '608 patent by contributing to the infringement of the '608 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

295. Defendant has knowledge of the '608 Patent by virtue of the Notice Letter and the Complaint.

296. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '608 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '608 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the

infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

297. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '608 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '608 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

298. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the '608 Patent. Bandspeed has been damaged as a result of Defendant's infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT FIVE

PATENT INFRINGEMENT – U.S. PATENT NO. 8,542,643 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

299. Bandspeed realleges and incorporates preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

300. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the '643 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Products.

301. For example, claim 5 of the ‘643 Patent states:

1. A method, comprising:

loading a set of default channels into a default channel register;

loading a set of good channels into a good channel register;

if a selection kernel addresses a bad channel stored in a particular location of the default channel register, then replacing, by the selection kernel, the bad channel stored in the particular location of the default channel register with a good channel selected from the set of good channels loaded in the good channel register;

wherein the method is performed using one or more computing devices.

5. The method of claim 1, further comprising: rescanning the default channels, based at least in part on the number of good channels.

302. Defendant’s Infringing Products meet each and every claim limitation of claim 5 of the ‘643 Patent.

303. Defendant’s Infringing Products meet each and every claim limitation of other claims of the ‘643 Patent.

304. Defendant jointly infringes the ’643 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

305. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in

the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

306. Defendant has indirectly infringed and continues to indirectly infringe, the ’643 Patent by inducing direct infringement of the ’643 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Products in this District and elsewhere in the United States.

307. On information and belief, despite having knowledge of the ’643 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’643 Patent.

308. Defendant knew or should have known that its actions were inducing infringement.

309. Defendant had knowledge of the ’643 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

310. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’643 Patent.

311. With knowledge of the ’643 Patent, Defendant directs and aids third parties to infringe the ’643 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2

and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '643 Patent, all with knowledge that the induced acts constitute patent infringement.

312. With knowledge of the '643 Patent, Defendant directs and aids third parties to infringe the '643 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing Bluetooth LE Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '643 Patent, all with knowledge that the induced acts constitute patent infringement.

313. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

314. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '643 patent by contributing to the infringement of the '643 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

315. Defendant has knowledge of the ‘643 Patent by virtue of the Notice Letter and the Complaint.

316. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’643 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’643 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

317. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’643 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’643 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

318. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the ’643 Patent. Bandspeed has been damaged as a result of Defendant’s infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT SIX

PATENT INFRINGEMENT – U.S. PATENT NO. 8,873,500 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

319. Bandspeed realleges and incorporates preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

320. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the ’500 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Products.

321. For example, claim 28 of the ‘500 Patent states:

16. A frequency hopping wireless communication device comprising:
at least one processor;

a memory storing instructions which, when executed by the at least one processor, causes:

communicating with another frequency hopping wireless communication device over a plurality of communication channels according to a default hopping sequence;

testing the plurality of communication channels;

selecting a subset of the plurality of communication channels based on results of the testing;

communicating with the other device over the subset of communication channels according to an adapted hopping sequence;

monitoring the subset of communications channels;

based on results of the monitoring or after a specified period of time, reverting back to communicating with the other device over the plurality of communication channels according to the default hopping sequence.

28. The device of claim 16, wherein monitoring the subset of communications channels is performed while communicating with the other device over the subset of communication channels according to the adapted hopping sequence.

322. Defendant's Infringing Products meet each and every claim limitation of claim 28 of the '500 Patent.

323. Defendant's Infringing Products meet each and every claim limitation of other claims of the '500 Patent.

324. Defendant jointly infringes the '500 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

325. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

326. Defendant has indirectly infringed and continues to indirectly infringe, the ’500 Patent by inducing direct infringement of the ’500 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Products in this District and elsewhere in the United States.

327. On information and belief, despite having knowledge of the ’500 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’500 Patent.

328. Defendant knew or should have known that its actions were inducing infringement.

329. Defendant had knowledge of the ’500 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

330. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’500 Patent.

331. With knowledge of the ’500 Patent, Defendant directs and aids third parties to infringe the ’500 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products’ support and

compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’500 Patent, all with knowledge that the induced acts constitute patent infringement.

332. With knowledge of the ’500 Patent, Defendant directs and aids third parties to infringe the ’500 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing Bluetooth LE Products’ support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’500 Patent, all with knowledge that the induced acts constitute patent infringement.

333. Defendant possesses specific intent to encourage infringement by third parties, including Defendant’s customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

334. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the ’500 patent by contributing to the infringement of the ’500 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

335. Defendant has knowledge of the ‘500 Patent by virtue of the Notice Letter and the Complaint.

336. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency

hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’500 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’500 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

337. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the ’500 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the ’500 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

338. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the ’500 Patent. Bandspeed has been damaged as a result of Defendant’s infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT SEVEN

PATENT INFRINGEMENT – U.S. PATENT NO. 9,379,769 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

339. Bandspeed realleges and incorporates the preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

340. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the '769 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Products.

341. For example, claim 1 of the '769 Patent states:

1. A wireless communications device for use in a frequency hopping communication system, the wireless communications device comprising:

one or more processors; and

one or more memories storing instructions which, when processed by the one or more processors, cause the wireless communications device to perform:

monitoring a plurality of communication channels, the plurality of communication channels used by the wireless communications device for communicating, according to a frequency hopping sequence, with another wireless communications device in the frequency hopping communication system;

based at least on results of the monitoring, classifying one or more communications channels of the plurality of communication channels as good and classifying one or more communications channels of the plurality of communication channels as bad;

transmitting information to the other wireless communications device identifying at least one of: a) the one or more communication channels classified as good, or b) the one or more communication channels classified as bad;

communicating, according to a frequency hopping sequence, with the other wireless communications device over the one or more communication channels classified as good while avoiding communicating with the other wireless communications device over the one or more communication channels classified as bad.

342. Defendant's Infringing Products meet each and every claim limitation of claim 1 of the '769 Patent.

343. Defendant's Infringing Products meet each and every claim limitation of other claims of the '769 Patent.

344. Defendant jointly infringes the '769 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

345. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

346. Defendant has indirectly infringed and continues to indirectly infringe, the '769 Patent by inducing direct infringement of the '769 Patent by third parties, including Defendant's customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Products in this District and elsewhere in the United States.

347. On information and belief, despite having knowledge of the '769 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including

without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’769 Patent.

348. Defendant knew or should have known that its actions were inducing infringement.

349. Defendant had knowledge of the ’769 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

350. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’769 Patent.

351. With knowledge of the ’769 Patent, Defendant directs and aids third parties to infringe the ’769 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products’ support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’769 Patent, all with knowledge that the induced acts constitute patent infringement.

352. With knowledge of the ’769 Patent, Defendant directs and aids third parties to infringe the ’769 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the

Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing Bluetooth LE Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '769 Patent, all with knowledge that the induced acts constitute patent infringement.

353. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

354. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '769 patent by contributing to the infringement of the '769 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

355. Defendant has knowledge of the '769 Patent by virtue of the Notice Letter and the Complaint.

356. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '769 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '769 Patent. Moreover, the Bluetooth combination of hardware and

software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

357. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '769 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '769 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

358. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the '769 Patent. Bandspeed has been damaged as a result of Defendant's infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

COUNT EIGHT

PATENT INFRINGEMENT – U.S. PATENT NO. 9,883,520 (AGAINST INFRINGING BLUETOOTH CLASSIC PRODUCTS AND INFRINGING BLUETOOTH LE PRODUCTS)

359. Bandspeed realleges and incorporates the preceding paragraphs herein.

A. Direct Infringement (35 U.S.C. § 271(a))

360. Defendant has directly infringed, and continues to directly infringe, individually and/or jointly with others, one or more claims of the ’520 Patent by, among other things, making, using, offering for sale, selling, and/or importing Infringing Products.

361. For example, claim 1 of the ‘520 Patent states:

1. A wireless communications device configured to:

> send packet data to another wireless communications device in a wireless communications network, the packet data specifying a subset of communications channels used for frequency hopping communications of a set of communications channels in a frequency band, the packet data further comprising timing information indicating when to begin using the subset of communications channels for frequency hopping communications;
>
> identify a communications channel from the set of communications channels;
>
> use the identified communications channel for frequency hopping communications with the other wireless communications device at a time slot at or after the wireless communications device and the other wireless communications device begin using the subset of communications channels for frequency hopping communications, if the identified communications channel is used for frequency hopping communications; and
>
> use a communications channel in the subset of communications channels for frequency hopping communications with the other wireless communications device at the time slot, if the identified communications channel is not used for frequency hopping communications.

362. Defendant’s Infringing Products meet each and every claim limitation of claim 1 of the ‘520 Patent.

363. Defendant’s Infringing Products meet each and every claim limitation of other claims of the ‘520 Patent.

364. Defendant jointly infringes the ’520 Patent to the extent that the acts necessary to give rise to liability for direct infringement are shared between Defendant and a third party but can be legally attributed to Defendant. Defendant conditions participation in an activity or receipt of a

benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance.

365. Specifically, Defendant provides third parties, including customers and/or end-users, with Infringing Products. Defendant directs and controls its customers to use Bluetooth functionality in an infringing manner by providing user manuals containing instructions about how to activate, pair, set up and engage infringing Bluetooth functionality in the Infringing Products. *See*, *e.g.*, SP230 User Manual; Downloadable SP230 User Manual. When an Infringing Bluetooth Classic Product or Infringing Bluetooth LE Product is engaged to use Bluetooth functionality in the manner designed and established by Defendant, the performance of the infringing functionality occurs. Defendant dictates when and how infringement occurs by virtue of providing software and hardware in the Infringing Products that dictate when and how the performance of the infringing functionality occurs.

B. Indirect Infringement (Inducement - 35 U.S.C. § 271(b))

366. Defendant has indirectly infringed and continues to indirectly infringe, the ’520 Patent by inducing direct infringement of the ’520 Patent by third parties, including Defendant’s customers, including without limitation manufacturers, resellers, and/or end users of the products that contain Infringing Products in this District and elsewhere in the United States.

367. On information and belief, despite having knowledge of the ’520 Patent, Defendant has specifically intended for persons who acquire and use the Infringing Products, including without limitation end-users of the Infringing Products, to acquire and use such devices in such a way that infringes one or more claims of the ’520 Patent.

368. Defendant knew or should have known that its actions were inducing infringement.

369. Defendant had knowledge of the ’520 Patent and the infringing nature of its activities when it received the Notice Letter or at least as early as the date when Plaintiff effected service of the original Complaint.

370. Direct infringement is the result of activities performed by third parties, including Defendant’s customers, in relation to the Infringing Products, including without limitation by third parties, including Defendant’s customers, enabled and encouraged by Defendant to use the Infringing Products in their normal, customary way to infringe the ’520 Patent.

371. With knowledge of the ’520 Patent, Defendant directs and aids third parties to infringe the ’520 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth Classic Products to use adaptive frequency hopping and associated functionality in Version 1.2 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth Classic Products in their customary way; (iii) advertising the Infringing Bluetooth Classic Products’ support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the ’520 Patent, all with knowledge that the induced acts constitute patent infringement.

372. With knowledge of the ’520 Patent, Defendant directs and aids third parties to infringe the ’520 Patent by, among other things, (i) enabling a user of the Infringing Bluetooth LE Products to use Bluetooth low energy functionality in Version 4.0 and any later version of the Bluetooth Core Specification; (ii) providing instructions (including, by way of example, the tutorials, user guides, product guides, help library, and other documentation) to third parties for using the Infringing Bluetooth LE Products in their customary way; (iii) advertising the Infringing

Bluetooth LE Products' support and compliance with the Bluetooth Core Specification; and (iv) providing to third parties the products and software and related equipment that may be required for or associated with infringement of the '520 Patent, all with knowledge that the induced acts constitute patent infringement.

373. Defendant possesses specific intent to encourage infringement by third parties, including Defendant's customers and end users of the Infringing Products.

C. Indirect Infringement (Contribution - 35 U.S.C. §§ 271(c) and/or 271(f))

374. Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '520 patent by contributing to the infringement of the '520 patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the Infringing Products.

375. Defendant has knowledge of the '520 Patent by virtue of the Notice Letter and the Complaint.

376. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the adaptive frequency hopping communication functionality as described in Version 1.2 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '520 Patent. The combination of hardware and software used to provide Bluetooth functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '520 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing Bluetooth Classic Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

377. Defendant sells, or offers to sell, a component of a patented combination or material, and more specifically, components used for or in systems that use the low energy protocol in Version 4.0 and later versions of the Bluetooth Core Specification, and other infringing Bluetooth functionality. The infringing Bluetooth low energy functionality in the Infringing Bluetooth Classic Products constitutes a material part of the inventions claimed in the '520 Patent. The combination of hardware and software used to provide Bluetooth low energy functionality in the Infringing Bluetooth Classic Products is especially made or adapted to infringe the '520 Patent. Moreover, the Bluetooth combination of hardware and software used in the Infringing LE Products are specially designed such that the infringing Bluetooth functionality has no non-infringing use, and therefore are not staple articles or commodities of commerce suitable for non-infringing use.

378. Bandspeed is informed and believes that Defendant intends to and will continue to directly and indirectly infringe the '520 Patent. Bandspeed has been damaged as a result of Defendant's infringing conduct described in this Count. Defendant is, thus, liable to Bandspeed in an amount that adequately compensates Bandspeed for its infringement.

VI. WILLFULNESS

379. Bandspeed realleges and incorporates the preceding paragraphs herein.

380. On information and belief, Defendant has had knowledge of some or all of the Patents and the infringing nature of its products in connection with Defendant's acquisition of Broadcom's Wireless Internet of Things (IoT) business. Bandspeed previously asserted more than one of the Patents against Broadcom and Cypress received information about Bandspeed's Patents and the infringing nature of Cypress's products from Broadcom in or around June or July 2016. Despite having knowledge of the Patents in connection with Defendant's acquisition of Broadcom's Wireless Internet of Things (IoT) business, Defendant nonetheless continued to make,

use, sell and/or import Infringing Products despite knowing that its actions constituted infringement of a valid patent.

381. Further, Defendant has knowledge of the Patents by virtue of a letter sent by Bandspeed to Cypress on January 15, 2019 notifying Cypress of its infringement of Bandspeed's Patents. Despite being notified of the Patents in the Notice Letter, Defendant nonetheless continued to make, use, sell and/or import Infringing Products despite knowing that its actions constituted infringement of a valid patent.

382. Accordingly, Defendant acted egregiously and/or knowingly or intentionally when it infringed the Patents.

383. Bandspeed seeks enhanced damages pursuant to 35 U.S.C. §284.

VII. JURY DEMAND

384. Plaintiff Bandspeed hereby demands a jury on all issues so triable.

VIII. REQUEST FOR RELIEF

WHEREFORE, Plaintiff Bandspeed respectfully requests that the Court:

A. Enter judgment that Defendant infringes one or more claims of the Patents literally and/or under the doctrine of equivalents;

B. Award Plaintiff Bandspeed past and future damages together with prejudgment and post-judgment interest to compensate for the infringement by Defendant of the Patents in accordance with 35 U.S.C. §284, and increase such award by up to three times the amount found or assessed in accordance with 35 U.S.C. §284;

C. Award plaintiff Bandspeed its costs, disbursements, attorneys' fees, and such further and additional relief as is deemed appropriate by this Court.

Dated: September 23, 2019

Respectfully submitted,

By: /s/ *Adam G. Price*

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ATTORNEYS FOR PLAINTIFF BANDSPEED, LLC

APPENDIX S3

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

SENTIENT SENSORS, LLC, Plaintiff, v. CYPRESS SEMICONDUCTOR CORPORATION, Defendant.	**Civil Action No._____** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Plaintiff Sentient Sensors, LLC ("Sentient" or "Plaintiff") by and for its Complaint against Defendant Cypress Semiconductor Corporation ("Cypress" or "Defendant") hereby makes the following allegations:

THE PARTIES

1. Sentient Sensors, LLC is a New Mexico Limited Liability Corporation, with its principal place of business at 6022 Constitution Ave. NE, Albuquerque, New Mexico.

2. SS was founded by inventor and entrepreneur Kenneth Blemel. Mr. Blemel has been operating in Albuquerque, New Mexico for over 30 years. Mr. Blemel, an engineer by training and vocation, has developed numerous technologies in the areas of programmable logic devices, instrumentation and embedded systems over his long career. Mr. Blemel has successfully guided multiple research and development programs in several electronic hardware sub-disciplines, including the program culminating in the issuance of the patent described herein.

3. Cypress Semiconductor Corporation is a Delaware corporation with its principal place of business at 198 Champion Court, San Jose, California 95134. Cypress may be served through its registered agent Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

4. Cypress is registered to do business in the State of Delaware and has been since at least September 26, 1986.

JURISDICTION AND VENUE

5. This is an action for patent infringement arising under 35 U.S.C. §100, et seq., §§ 271-81, and §§ 284-85, among others. This Court has subject matter over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

6. Venue is proper in this judicial district pursuant to 28 U.S.C. §1400(b). Upon information and belief, Cypress maintains a regular and established place of business within this district and has committed acts of infringement within this judicial district by selling the accused instrumentalities here. According to public records, Cypress is a corporation organized under the laws of the State of Delaware, and therefore resides in this judicial district

7. More specifically, personal jurisdiction is proper because, Cypress resides in this judicial district and transacts business from this district, including infringing activities, and also targets customers within this district for its infringing products, such that the Court's exercise of personal jurisdiction would not offend traditional notions of fair play and substantial justice.

BACKGROUND

6. This lawsuit asserts causes of action for infringement of United States Patent No. 6,938,177 (the '177 Patent). A true and correct copy of the '177 patent is attached hereto as Exhibit A.

7. The technology described and claimed in the ’177 Patent was invented by Kenneth G. Blemel.

8. The ’177 Patent was properly assigned to Sentient Sensors, LLC; and Sentient Sensors, LLC has all rights, title and interest in and to the ’177 Patent and to any and all other future inventions that disclose and claim improvements over the subject matter disclosed, including the right to sue for and recover or otherwise collect damages in respect of past acts of infringement thereof.

9. The inventions described and claimed in the ’177 Patent have been used to provide instrumentation for monitoring and control of systems and components of instruments, aircraft, ships, homes and machinery. A few examples include:

- Monitoring signals on UH-60 helicopters
- Instrumentation for prognostic health monitoring of aircraft propulsion systems
- Instrumentation interface to paired flight data recorders
- Instrumentation monitoring health signatures of aircraft propulsion systems
- Instrumentation for monitoring and control of diesel generator sets
- Instrumentation for monitoring health of ballistic missiles
- Instrumentation of hybrid micro-grids
- Edge node flight data collection and analysis for B-52 and other military aircraft

10. The teachings of the ’177 Patent enable the rapid prototyping and deployment of complex hardware and software platforms, providing enhanced flexibility for various real-world applications. As just one example, the ’177 Patent describes and claims an instrument controller containing a microprocessor for controlling inputs and outputs, a separate field programmable gate array (“FPGA”) which can be used as a freely re-configurable parallel processor, and a real- time quartz controlled clock for time-stamping of data before it is stored in non-volatile memory, all of which contribute to the creation of a development platform that allows for a wide range of hardware controller solutions.

11. At the time of the filing of the patent application that resulted in the ’177 Patent, the

technology provided for a novel and innovative in-field control and monitoring system with time-stamped selectable collection and digitizing of multiple analog and digital data streams at variable bit depths. The technology enabled, *inter alia*, real-time concurrent processing of data to measure and control stresses on components and generating alerts for anomalous conditions. The use of FPGA-based instrumentation is now widespread in diverse applications including machinery control, field programmable automation of process lines, telecommunications, and diagnostic and prognostic health monitoring of equipment.

12. The research and development program that led to the innovations described and claimed in the ’177 Patent was funded in part by the U.S. Air Force and conducted at Kirtland Air Force base in Albuquerque, New Mexico. These advancements were initially directed toward use in the Strategic Defense Initiative program initiated in the 1980s, colloquially known at the time as “Star Wars.” As a result of a collaborative research and development agreement (“CRADA”) with the U.S. government, the Air Force secured a license to practice the inventions of the ’177 Patent. Hardware purveyors such as Cypress have adapted the inventions of the ’177 Patent for their own commercial exploitation, for example, as automotive control devices, and are used for controllers of wide array of electronic devices ranging from electric tooth brushes to touch screen and set top box controllers.

COUNT I
Direct Infringement of the ’177 Patent

13. Sentient incorporates by reference the allegations set forth in the preceding paragraphs.

14. On August 30, 2005, the ’177 Patent, entitled “Multi-Chip Module Smart Controller,” was duly and legally issued by the United States Patent and Trademark Office to Kenneth Blemel as the sole named inventor.

15. Sentient is the assignee and the owner of the ’177 Patent, holding all rights, title and interest in and to the ‘177 Patent, and Sentient has the right to sue and recover damages for infringement thereof.

16. The ’177 Patent and its underlying patent application have been cited by 23 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’177 Patent and its underlying patent application as relevant prior art:

- Intel Corp.
- Advanced Micro Devices (AMD)
- STM Microelectronics S.r.L.
- Trend Micro Corp.
- Benq Inc.
- Emerson Electric GmbH
- SPM Instrumentation AB
- RMT, Inc.
- NXP B.V.
- Verily Life Sciences, LLC

17. Cypress is not licensed under the ’177 Patent, yet Cypress actively practices the ’177 Patent for its own profit and financial benefit.

18. Upon information and belief, Cypress has directly infringed, and is now directly infringing, at least Claim 1 of the ’177 Patent by making, using, importing, providing, supplying, distributing, selling, and offering to sell infringing products and systems, and is thus liable to Sentient for Cypress’s infringement pursuant to 35 U.S.C. § 271. Cypress’s infringing products and systems include at least the Programmable System on a Chip (“PSoC®”) lines of system-on-a- chip (SoC) products including the PSoC 3, PSoC 4, PSoC 5, and PSoC 6 product lines. Cypress

is therefore liable for direct infringement of the ’177 Patent pursuant to 35 U.S.C. § 271(a). Collectively referred to herein as the “’177 PSoC Products.”

19. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress ’177 Products in regular business operations.

20. For example, Cypress’s ‘177 PSoC products meets all limitations of at least Claim 1 of the ’177 Patent.

21. One or more of the Cypress ’177 Products include technology for an instrument controller such as a Developer Kit.

CY8CKIT-001 PSoC® Development Kit

Last Updated:
Nov 01, 2018

The CY8CKIT-001 PSoC® Development Kit (DVK) provides a common development platform where you can prototype and evaluate different solutions using any one of the PSoC 1, PSoC 3, PSoC 4, or PSoC 5 architectures.

The PSoC DVK gives you a practical understanding of PSoC technology. In addition, the kit includes several example projects with step-by-step instructions to enable you to easily get started developing PSoC solutions. This kit includes PSoC 1, PSoC 3, PSoC 4 and PSoC 5LP Family Processor Modules.



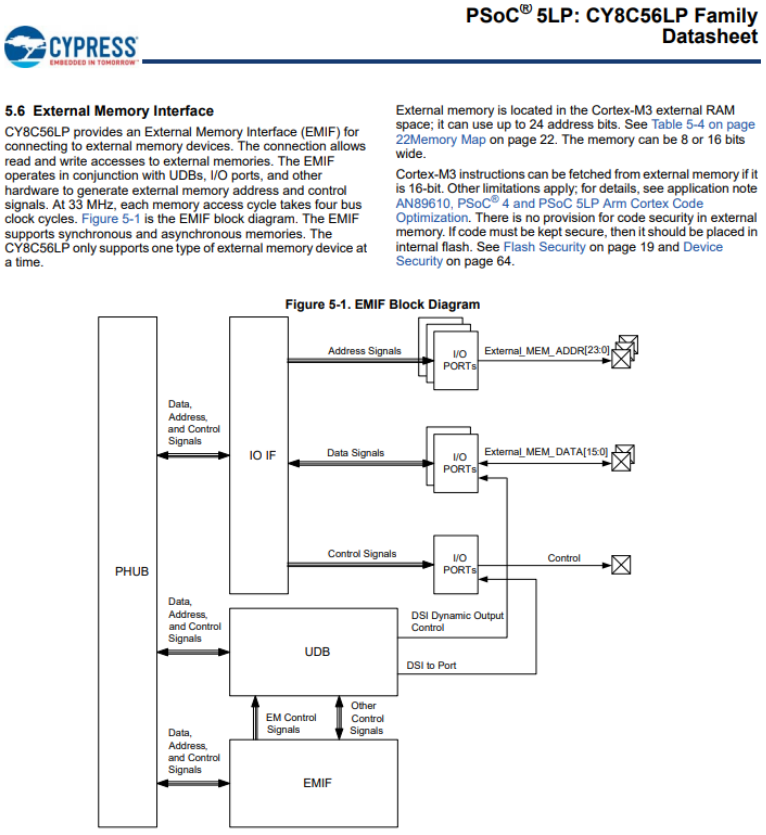
Kit Contents:

- PSoC Development Board

- PSoC 1 CY8C28 Family Processor Module
- PSoC 3 CY8C38 Family Processor Module
- PSoC 4 CY8C42 Family Processor Module (Sold Separately)
- PSoC 5 CY8C58LP Family Processor Module
- MiniProg3 Program/Debug Device
- Program/Debug Ribbon Cable
- USB Cable
- 12V AC Power Adapter
- Quick Start Guide
- Kit CDs, which includes: PSoC Creator™, PSoC Designer™, PSoC Programmer, Projects, and Documentation

https://www.cypress.com/documentation/development-kitsboards/cy8ckit-001-psoc-development-kit

22. Cypress documentation describes one or more of the Cypress '177 Products as including SRAM.



PSoC® 5LP: CY8C56LP Family Datasheet

5.6 External Memory Interface

CY8C56LP provides an External Memory Interface (EMIF) for connecting to external memory devices. The connection allows read and write accesses to external memories. The EMIF operates in conjunction with UDBs, I/O ports, and other hardware to generate external memory address and control signals. At 33 MHz, each memory access cycle takes four bus clock cycles. Figure 5-1 is the EMIF block diagram. The EMIF supports synchronous and asynchronous memories. The CY8C56LP only supports one type of external memory device at a time.

External memory is located in the Cortex-M3 external RAM space; it can use up to 24 address bits. See Table 5-4 on page 22Memory Map on page 22. The memory can be 8 or 16 bits wide.

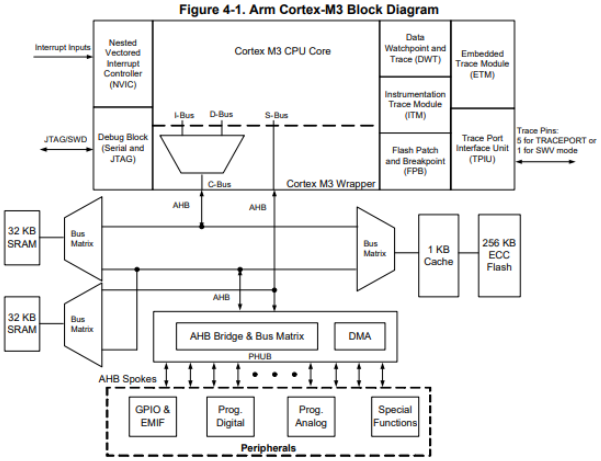
Cortex-M3 instructions can be fetched from external memory if it is 16-bit. Other limitations apply; for details, see application note AN89610, PSoC® 4 and PSoC 5LP Arm Cortex Code Optimization. There is no provision for code security in external memory. If code must be kept secure, then it should be placed in internal flash. See Flash Security on page 19 and Device Security on page 64.

Figure 5-1. EMIF Block Diagram

23. Cypress documentation describes one or more of the Cypress '177 Products as including an ARM Cortex processing core which interfaces with both volatile and non-volatile

memory.

Figure 4-1. Arm Cortex-M3 Block Diagram



The Cortex-M3 CPU subsystem includes these features:

- Arm Cortex-M3 CPU
- Programmable Nested Vectored Interrupt Controller (NVIC), tightly integrated with the CPU core
- Full featured debug and trace modules, tightly integrated with the CPU core
- Up to 256 KB of flash memory, 2 KB of EEPROM, and 64 KB of SRAM
- Cache controller
- Peripheral HUB (PHUB)
- DMA controller
- External Memory Interface (EMIF)

4.1.1 Cortex-M3 Features

The Cortex-M3 CPU features include:

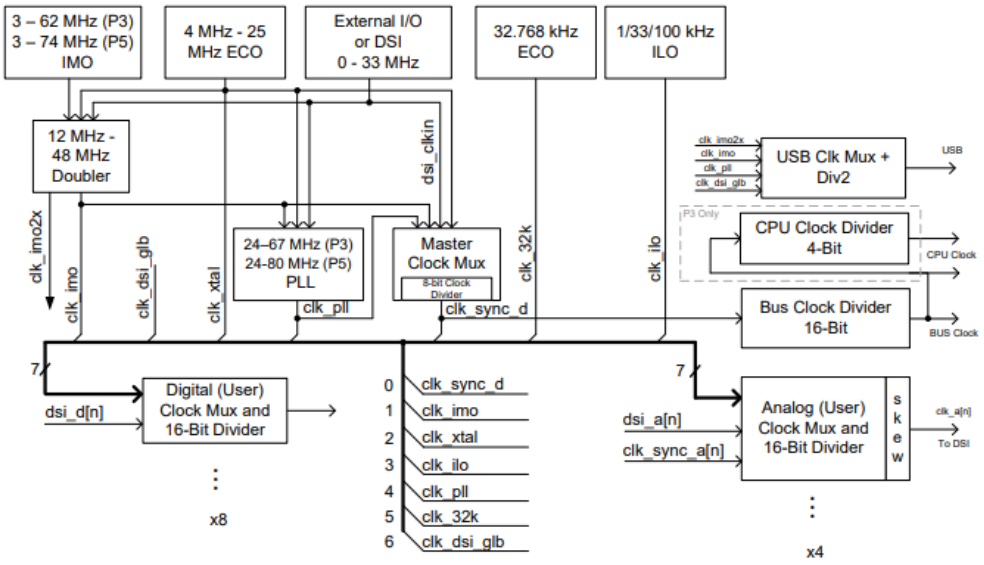
- 4 GB address space. Predefined address regions for code, data, and peripherals. Multiple buses for efficient and simultaneous accesses of instructions, data, and peripherals.
- The Thumb®-2 instruction set, which offers Arm-level performance at Thumb-level code density. This includes 16-bit and 32-bit instructions. Advanced instructions include:
  - Bit-field control
  - Hardware multiply and divide
  - Saturation
  - If-Then
  - Wait for events and interrupts
  - Exclusive access and barrier
  - Special register access

  The Cortex-M3 does not support Arm instructions.
- Bit-band support for the SRAM region. Atomic bit-level write and read operations for SRAM addresses.
- Unaligned data storage and access. Contiguous storage of data of different byte lengths.
- Operation at two privilege levels (privileged and user) and in two modes (thread and handler). Some instructions can only be executed at the privileged level. There are also two stack pointers: Main (MSP) and Process (PSP). These features support a multitasking operating system running one or more user-level processes.
- Extensive interrupt and system exception support.

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24. Cypress documentation describes one or more of the Cypress ’177 Products as including an ARM Cortex processing core which is capable of both high and low frequency operations.

- Programmable clocking
  - 3- to 74-MHz internal oscillator, 1% accuracy at 3 MHz
  - 4- to 25-MHz external crystal oscillator
  - Internal PLL clock generation up to 80 MHz
  - Low-power internal oscillator at 1, 33, and 100 kHz
  - 32.768-kHz external watch crystal oscillator
  - 12 clock dividers routable to any peripheral or I/O



25. Cypress documentation describes one or more of the Cypress ’177 Products as including having an SRAM memory and the ARM processing core can boot independently without first retrieving a program stored in non-volatile memory.

- Memories
  - Up to 256 KB program flash, with cache and security features
  - Up to 32 KB additional flash for error correcting code (ECC)
  - Up to 64 KB RAM
  - 2 KB EEPROM

26. Cypress documentation describes one or more of the Cypress ’177 Products as including several general-purpose clock sources for low frequency and high frequency operation.

- Programmable clocking
  - 3- to 74-MHz internal oscillator, 1% accuracy at 3 MHz
  - 4- to 25-MHz external crystal oscillator
  - Internal PLL clock generation up to 80 MHz
  - Low-power internal oscillator at 1, 33, and 100 kHz
  - 32.768-kHz external watch crystal oscillator
  - 12 clock dividers routable to any peripheral or I/O

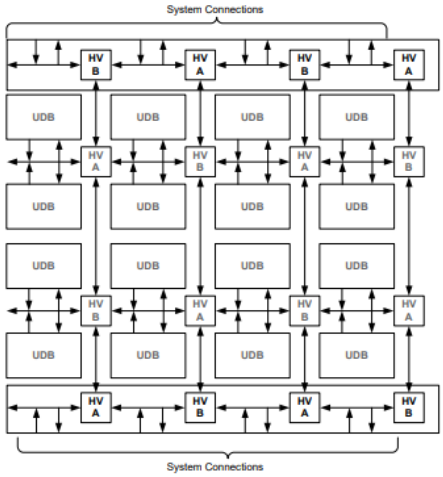
27. Cypress documentation describes one or more of the Cypress ’177 Products as including multiple programmable logic devices based on universal digital blocks that can be configured to run independent processes in parallel with the ARM processing core.

- 20 to 24 universal digital blocks (UDB), programmable to create any number of functions:
  - 8-, 16-, 24-, and 32-bit timers, counters, and PWMs
  - I^2C, UART, SPI, I2S, LIN 2.0 interfaces
  - Cyclic redundancy check (CRC)
  - Pseudo random sequence (PRS) generators
  - Quadrature decoders
  - Gate-level logic functions

7.3 UDB Array Description

Figure 7-7 shows an example of a 16 UDB array. In addition to the array core, there are a DSI routing interfaces at the top and bottom of the array. Other interfaces that are not explicitly shown include the system interfaces for bus and clock distribution. The UDB array includes multiple horizontal and vertical routing channels each comprised of 96 wires. The wire connections to UDBs, at horizontal/vertical intersection and at the DSI interface are highly permutable providing efficient automatic routing in PSoC Creator. Additionally the routing allows wire by wire segmentation along the vertical and horizontal routing to further increase routing flexibility and capability.

Figure 7-7. Digital System Interface Structure

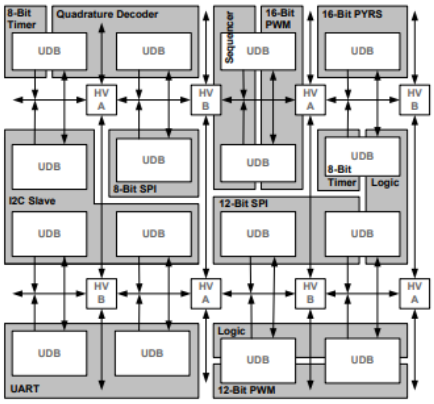


7.3.1 UDB Array Programmable Resources

Figure 7-8 shows an example of how functions are mapped into a bank of 16 UDBs. The primary programmable resources of the UDB are two PLDs, one datapath and one status/control register. These resources are allocated independently, because they have independently selectable clocks, and therefore unused blocks are allocated to other unrelated functions.

An example of this is the 8-bit Timer in the upper left corner of the array. This function only requires one datapath in the UDB, and therefore the PLD resources may be allocated to another function. A function such as a Quadrature Decoder may require more PLD logic than one UDB can supply and in this case can utilize the unused PLD blocks in the 8-bit Timer UDB. Programmable resources in the UDB array are generally homogeneous so functions can be mapped to arbitrary boundaries in the array.

Figure 7-8. Function Mapping Example in a Bank of UDBs



7.4 DSI Routing Interface Description

The DSI routing interface is a continuation of the horizontal and vertical routing channels at the top and bottom of the UDB array core. It provides general purpose programmable routing between device peripherals, including UDBs, I/Os, analog peripherals, interrupts, DMA and fixed function peripherals.

Figure 7-9 illustrates the concept of the digital system interconnect, which connects the UDB array routing matrix with other device peripherals. Any digital core or fixed function peripheral that needs programmable routing is connected to this interface.

Signals in this category include:

- Interrupt requests from all digital peripherals in the system.
- DMA requests from all digital peripherals in the system.
- Digital peripheral data signals that need flexible routing to I/Os.
- Digital peripheral data signals that need connections to UDBs.
- Connections to the interrupt and DMA controllers.
- Connection to I/O pins.
- Connection to analog system digital signals.

28. Cypress documentation describes one or more of the Cypress ’177 Products as including a delta sigma ADC that may be programmed to multiple bit depths.

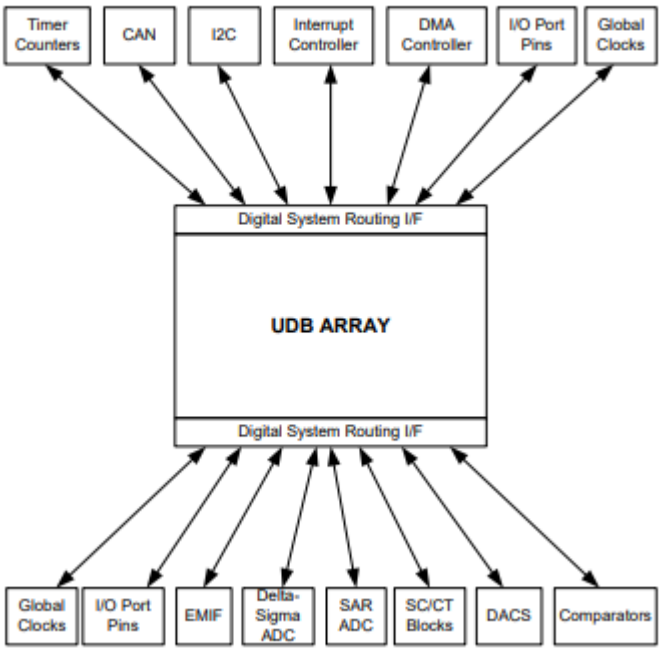
- Analog peripherals
  - Configurable 8- to 12-bit delta-sigma ADC
  - Up to two 12-bit SAR ADCs

29. Cypress documentation describes one or more of the Cypress ’177 Products as including programmable logic for signal processing applications.

- 20 to 24 universal digital blocks (UDB), programmable to create any number of functions:
  - 8-, 16-, 24-, and 32-bit timers, counters, and PWMs
  - I^2C, UART, SPI, I2S, LIN 2.0 interfaces
  - Cyclic redundancy check (CRC)
  - Pseudo random sequence (PRS) generators
  - Quadrature decoders
  - Gate-level logic functions

30. Cypress documentation describes one or more of the Cypress ’177 Products as including a flexible and configurable routing architecture for internal signal distribution and routing.

Figure 7-9. Digital System Interconnect



31. Cypress's other accused PSoC products infringe in a similar way.

COUNT II
Inducement of Infringement of the '177 Patent

32. Sentient incorporates by reference the allegations set forth in the preceding paragraphs.

33. Upon information and belief, Cypress also has indirectly infringed and is currently indirectly infringing the '177 Patent under 35 U.S.C. § 271(b) by inducing others, including its customers, to make, use, import, provide, supply, distribute, sell and offer to sell products and systems that it is aware infringe one or more claims of the '177 Patent in the United States generally, and in Texas and within this judicial district in particular.

34. On information and belief, Cypress has intentionally induced infringement, or at least has been willfully blind to infringement of the '177 Patent, by its customers since at least the service date of this complaint.

35. By way of example, Cypress provides use instructions and product literature to its customers that induce infringement of the ’177 Patent.

36. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress ’177 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement, for example in its Development Kit. Cypress was aware that the normal and customary use of the accused products would infringe the ‘177 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the ’177 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress ’177 Products which have the capability of operating in a manner that infringe one or more of the claims of the ’177 Patent, including at least claim 1, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress ’177 Products to utilize the products in a manner that directly infringe one or more claims of the ’177 Patent. By providing instructions and training to customers and end-users on how to use the Cypress ’177 Products in a manner that directly infringes one or more claims of the ’177 Patent, including at least claim 1, Cypress specifically intended to induce infringement of the ’177 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress ’177 Products, *e.g.*, through Cypress’s for example in its Development Kit and related materials, user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the ’177 Patent. Accordingly, Cypress has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’177 Patent, knowing that such use constitutes infringement of the ’177 Patent.

37. The ’177 Patent is well-known within the industry as demonstrated by multiple citations to the ’177 Patent in published patents and patent applications assigned to technology companies and academic institutions as well as previous infringement litigations in Eastern District of Texas against other well-known semiconductor companies. Cypress is utilizing the technology claimed in the ’177 Patent without paying a reasonable royalty. Cypress is infringing the ’177 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

38. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’177 Patent.

39. As a result of Cypress’s infringement of the ’177 Patent, Sentient has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Cypress’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

COUNT III
Contributory Infringement of the ’177 Patent

40. Sentient incorporates by reference the allegations set forth in the preceding paragraphs.

41. Upon information and belief, Cypress also has indirectly infringed and is currently indirectly infringing the ’177 Patent under 35 U.S.C. §271(c) by contributing to the infringement of others, including its customers, by making, using, importing, providing, supplying, distributing, selling, and offering to sell at least the ‘177 Cypress products and systems that infringe one or more claims of the ’177 Patent in the United States generally, and in Delaware and in this judicial district in particular.

42. On information and belief, end users have used, and continue to use, the ‘177 Cypress products in an infringing manner. More specifically, Cypress sells and offers to sell infringing products to its customers that are not staple articles of commerce and that have no substantial uses outside of those that infringe the ’177 Patent.

43. The acts of infringement by Cypress have caused and will continue to cause damage to Sentient in its capacity as assignee of the ’177 Patent, and Sentient is entitled to recover damages from Cypress in an amount no less than a reasonable royalty pursuant to 35 U.S.C. §284. The full measure of damages sustained as a result of Cypress's wrongful acts will be proven at trial.

44. The infringement of Sentient’s exclusive rights under the ’177 Patent by Cypress has damaged Sentient, and unless enjoined will continue to damage Sentient, causing irreparable harm, for which there is no adequate remedy at law.

45. Upon information and belief, Cypress has infringed and continues to infringe the ’177 Patent despite having knowledge of the ’177 Patent and its applicability to Cypress’s PSoC products.

46. Upon information and belief, Cypress’s infringement of the ’177 Patent has been, and continues to be, willful.

47. At least as early as the service date of this complaint, Cypress had knowledge of the ’177 Patent, which is entitled to a statutory presumption of validity under 35 U.S.C. §282. Sentient intends to seek discovery on the issue of willfulness and reserves the right to seek a willfulness finding and treble damages under 35 U.S.C. § 284, as well as its attorneys’ fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

JURY DEMAND

48. Pursuant to Fed. R. Civ. P. 38, Plaintiff Sentient demands a trial by jury of any and all issues properly triable to a jury.

PRAYER FOR RELIEF

Wherefore, Sentient prays for judgment and requests that the Court find in its favor and against Cypress, and that the Court grant Sentient the following relief:

a. Judgment that one or more claims of the '177 Patent have been or are infringed, either literally or under the doctrine of equivalents, by Cypress and by others whose infringement has been induced by Cypress and to whose infringement Cypress has contributed;

b. Judgment that the '177 Patent is not invalid and is not unenforceable;

c. Preliminary and permanent injunctive relief enjoining Cypress and its officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in concert therewith from infringing, inducing infringement or, or contributing to infringement of the '177 Patent;

d. Judgment that Cypress account for and pay to Sentient all damages and costs incurred by Sentient as a result of Cypress's infringing activities under 35 U.S.C. 284, such that Sentient is adequately compensated for Cypress's infringement of the '177 Patent, but in no event less than a reasonable royalty for the use made by Cypress of the inventions claimed in the '177 Patent, including supplemental damages for any continuing post-verdict infringement up until entry of final judgment, with an accounting, as needed, and enhanced damages as provided by 35 U.S.C. 284;

e. Pre-judgment and post-judgment interest on the damages caused by Cypress's infringing activities and other conduct complained of herein or otherwise;

f. A declaration that this is an exceptional case and an award of SS's reasonable attorneys' fees and costs in accordance with 35 U.S.C. 285 or as otherwise permitted by law;

g. All costs of suit; and,

h. Such other and further relief as the Court may deem just and proper under the circumstances.

Dated: October 4, 2019

Respectfully submitted,

ECKERT SEAMANS CHERIN & MELLOTT LLC

/s/ Francis G.X. Pileggi

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Attorneys for Plaintiff
Sentient Sensors, LLC

APPENDIX S4

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

DIFF SCALE OPERATION RESEARCH, LLC, Plaintiff, v. CYPRESS SEMICONDUCTOR CORPORATION, Defendant.	**Civil Action No._____** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

DIFF Scale Operation Research, LLC ("Plaintiff"), by its undersigned counsel, brings this action and make the following allegations of patent infringement relating to U.S. Patent Nos.: 7,881,413 (the "'413 Patent"); 6,664,827 (the "'827 Patent"); and 6,721,328 (the "'328 Patent") (collectively, the "Patents-in-Suit"). Defendant Cypress Semiconductor Corporation ("Cypress" or "Defendant") infringes each of the Patents-in-Suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq*.

INTRODUCTION

1. This case arises from Cypress's infringement of a portfolio of semiconductor and network infrastructure patents. This patent portfolio arose from the groundbreaking work of ADC Telecommunications, Inc. ("ADC Telecommunications").

2. In 1935, ADC Telecommunications, then known as the Audio Development Company[1] was founded in Minneapolis, Minnesota by two Bell Laboratory engineers to create

[1] Audio Development Company was later renamed ADC Telecommunications, Inc. *U.S. Senate Executive Reports*, U.S. PRINTING OFFICE at 39 (1999) ("The story of ADC Telecommunications begins in 1935, the height of the great depression . . . . The company got its start with a new innovation called the audiometer, an electronic device designed to test hearing.").

custom transformers and amplifiers for the broadcast radio industry. In the 1950s, ADC Telecommunications began to produce jacks, plugs, patch cords, and jack fields, which would be cornerstones for ADC Telecommunications' later entry into telecommunications equipment.[2]

3. In the late 1990s, ADC Telecommunications pioneered the development of microchips and network switches for the burgeoning telecommunications industry.[3] ADC Telecommunications' products included fiber-optic video, data, and voice transmission systems, and its clients included all the major domestic cable TV operators, numerous phone companies, and a majority of TV broadcasters.[4]

4. Prior licensing of ADC Telecommunications' patents confirms the significant value of ADC Telecommunications' innovations. In 2011, HTC the Taiwan based smartphone manufacturer, bought a portfolio of 82 patents and 14 pending applications related to mobile technology from ADC Telecommunications.[5] HTC asserted two of these patents against Apple before the International Trade Commission.

> Apple Inc. may face a difficult task invalidating two HTC Corp. patents for data transmission in wireless devices, a U.S. Trade Judge said at a trial that could lead to import bans on the newest iPad and the next version of the iPhone. … In this case, though, HTC acquired the patents at issue in April 2011, around the same

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[2] *High Fidelity Audio Devices Boost Capitol Diskery Sales*, BILLBOARD MAGAZINE at 12 (August 8, 1950) (describing Audio Development Company's amplifiers).

[3] David Beal, *Seeing the Light; ADC Telecommunications Has Grown From Making Telephone Jacks And Plugs Into A Force For The Global Fiber-Optic Future*, ST. PAUL PIONEER PRESS at E1 (December 25, 1995).

[4] George Lawton, *Fiber Optic Architecture Evolution Evident at Cable-TV Exhibition*, LIGHTWAVE MAGAZINE (August 1, 1995) ("Cable-Tec Expo's exhibition area featured new fiber-optic products and technologies for the optical-fiber and cable-TV industries. For example, Minneapolis-based ADC Telecommunications Inc.").

[5] *HTC Buys Patents from ADC Telecommunications for $75 million*, THE NATIONAL LAW REVIEW (April 19, 2011), *available at*: https://www.natlawreview.com/article/htc-buys-patents-adc-telecommunications-75-million ("HTC, the Taiwan based smartphone manufacturer, has bought a portfolio of 82 patents and 14 pending applications related to mobile technology from US based ADC Telecommunications.").

> time it began selling its first LTE phone, the Thunderbolt. ***The patents are part of a portfolio HTC bought for $75 million from ADC Telecommunications Inc.*** [Judge] Pender told McKeon. "They are a property right."

Susan Decker, *HTC Patents Challenged by Apple Probably Valid, Judge Says*, BLOOMBERG NEWS (September 7, 2012) (emphasis added).

5. HTC's assertion of two patents acquired from ADC Telecommunications was described by commentators as forcing Apple to the negotiating table following a series of lawsuits between Apple and HTC:

> A separate case before the ITC may have ***forced Mr. Cook to the negotiating table*** after a judge at the agency said Apple would be likely to face difficulty getting a series of HTC patents invalidated. ***HTC bought those patents, which covered technology used in LTE high-speed wireless devices, from ADC Telecommunications for US $75 million***. "The settlement is a big surprise and is likely due to HTC's LTE patents, which is bought from ADC last year, as Apple's LTE patents are relatively weak," said Jeff Pu, an analyst from Fubon Financial Holding Co.

Apple Settles HTC Patent Suits, Signaling Shift from Jobs' War Plan, FINANCIAL POST / BLOOMBERG NEWS (November 12, 2012) (emphasis added).

6. ADC Telecommunication's revolutionary products included Homeworx Hybrid Fiber/Coax Access Platform ("ADC Homeworx").[6] ADC Homeworx was an integrated broadband transport system that could deliver video, telephony, data, and other services over a network of fiber optic and coaxial cables.[7] The ADC Homeworx network utilized fiber-optic and radio frequency transmission technologies for transporting various services over a network.[8]

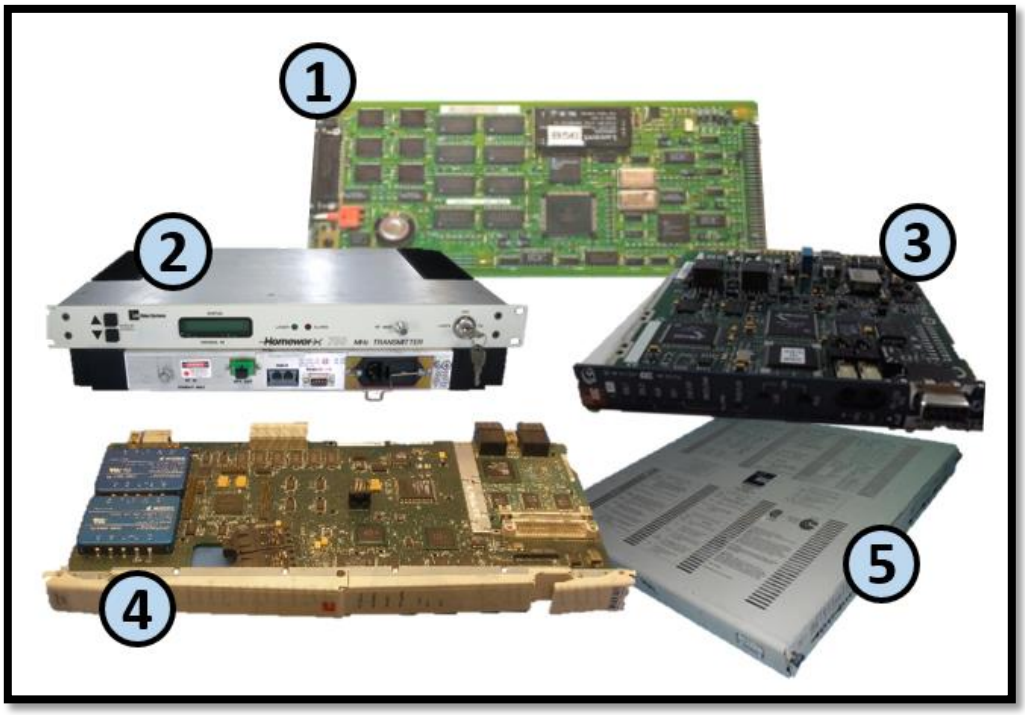
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[6] Sue Boyle, *Cable-Telephony Platform*, LIGHTWAVE MAGAZINE Vol. 17; No. 16 at 185 (September 1, 2000) ("The Homeworx cable-telephony system adds new features to the carrier-class hybrid fiber/coaxial telephony platform. The system offers improvements in flexibility, manageability, and robustness.").

[7] *Homeworx HFC Access Platform Outdoor ISU-32 Integrated Services Unit Installation Manual*, ADC Telecommunications Manual at 1-1 (July 1999).

[8] *ADC AT&T Bis Team for Cable Telephony*, CABLE WORLD MAGAZINE Vol. 11 at 28 (May 31, 1999) ("The company's Homeworx cable telephony platform has the largest capacity in the fledgling 6 MHz bandwidth channel compared to conventional telephone carriers.").

ADC Telecommunications' groundbreaking products also included: the Soneplex Platform, CityCell, Cellworx STN Service, the EZT1 Voice Multiplexer, FOLENS (Fiber Optic Local Exchange Network System), and the DS3 Fiber Loop Converter. [9]



ANNOTATED GRAPHIC OF SELECTED ADC TELECOMMUNICATIONS PRODUCTS (numbered annotations showing: (1) ADC Soneplex SPX MPU Board MC68302; (2) ADC Homeworx 750MHz XMTR; (3) ADC HiGain HDSL4 Remote Unit H4TUR402L53; (4) ADC Cellworx BA4IKKLBAA; and (5) ADC Telecommunications EZT1 Access Multiplexer).

7. By 1999, ADC Telecommunications had almost 10,000 employees and annual sales of 1.5 billion dollars. Although ADC Telecommunications was a leading innovator in its field, it was a mid-sized company in a market dominated by multinational corporations.[10]

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[9] *Modems, Test Gear, Return Path Hot at Expo*, CED MAGAZINE (June 30, 1997), *available at:* https://www.cedmagazine.com/article/1997/06/modems-test-gear-return-path-hot-expo ("ADC Telecommunications introduced a new forward path receiver that extends performance to 860 MHz for cable TV and telephony applications.").

[10] Barnaby J. Feder, *Optical Fiber (Almost at Home)*, N.Y. TIMES at F-6 (March 24, 1991) ("AT&T's competitors range from giants like Alcatel of France and Fujitsu of Japan to mid-sized companies like ADC Telecommunications Inc.").

8. A 1999 New York Times article on the telecommunication industry foreshadowed the difficulties that ADC Telecommunications would face when competing against much larger competitors who were able to use their market power to dominate the market at the expense of smaller players:

> Cisco's is not the only approach in the M.M.D.S. broad-band data market, however. The company's wireless competitors will include Spike Technologies, ADC Telecommunications and Adaptive Broadband. But ***Cisco's prominence as an Internet technology vendor, along with the powerful alliance it has built, could give the company an inside edge,*** some analysts said.

John Markoff, *Cisco to Offer More Details on Wireless Technology*, N.Y. TIMES a C-1 (November 29, 1999) (emphasis added).

9. In 2015, ADC Telecommunications (including its foundational intellectual property) were acquired by CommScope, Inc. ("CommScope"). CommScope, a spin-off of General Instrument Corporation, manufactures optical fiber cabling, multiplexers, and telecommunications antennas.

10. To facilitate the licensing of ADC Telecommunications' technology, CommScope assigned 73 patents and patent applications covering ADC Telecommunications' pioneering innovations relating to electronic circuits for timing and network traffic management to DIFF Scale Operation Research. DIFF Scale Operation Research protects and licenses ADC Telecommunications' inventions, which are widely adopted by leading technology companies.

11. Highlighting the importance of the Patents-in-Suit is the fact that the Patents-in-Suit have been cited by over 600 U.S. Patents and Patent Applications by a wide variety of the largest companies operating in the field. For example, the Patents-in-Suit have been cited by companies such as:

- International Business Machines Corporation[11]
- Apple, Inc.[12]
- Intel Corporation[13]
- Broadcom Corporation[14]
- Microsoft Corporation[15]
- Sony Corporation[16]
- Cisco Systems, Inc.[17]
- Hewlett-Packard Enterprise Company[18]
- Huawei Technologies Co., Ltd.[19]
- Alcatel-Lucent S.A.[20]
- Fujitsu Ltd.[21]
- Panasonic Corporation[22]
- Telefonaktiebolaget L.M. Ericsson[23]
- NEC Corporation[24]
- Marvell Technology Group, Limited[25]

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[11] *See, e.g.*, U.S. Patent Nos. 7,894,478; 8,270,296; 8,559,460; 7,398,326; 7,827,317; 7,321,648; and 7,746,777.

[12] *See, e.g.*, U.S. Patent Nos. 9,026,680; 7,457,302; and 8,275,910.

[13] *See, e.g.*, U.S. Patent Nos. 7,248,246; 7046675; 7,263,557; 7,903,560; 8,233,506; 7,248,246; 6,507,915; 6,996,632; 7,346,099; and 7,673,073.

[14] *See, e.g.*, U.S. Patent Nos. 7,161,935; 7,203,227; 7,436,849; 7,724,661; 8,401,025; 8,411,705; 8,462,819; and 9,544,638.

[15] *See, e.g.*, U.S. Patent Nos. 7,526,677; 7,533,407; 7,793,096; 7,827,545; and 9,225,684.

[16] *See, e.g.*, U.S. Patent No. 8,200,873.

[17] *See, e.g.*, U.S. Patent Nos. 7,023,883; 7,523,185; 7,631,055; 7,653,924; 7,751,412; 8,144,591; 8,289,873; 8,379,648; and 8,811,281.

[18] *See, e.g.*, U.S. Patent Nos. 7,103,654; 7,187,674; 7,266,598; and 7,478,260.

[19] *See, e.g.*, U.S. Patent Nos. 7,664,051 and 7,916,758.

[20] *See, e.g.*, U.S. Patent Nos. 6,798,741; 6,895,004; 7,209,530; 7,525,913; 7,536,716; 7,583,689; 7,602,701; and 8,379,509.

[21] *See, e.g.*, U.S. Patent Nos. 6,647,012; 7,330,057; 7,450,505; 7,469,298; and 7,664,217.

[22] *See, e.g.*, U.S. Patent Nos. 8,648,632 and 7,457,979.

[23] *See, e.g.*, U.S. Patent Nos. 8,780,695 and 7,215,664.

[24] *See, e.g.*, U.S. Patent Nos. 6,218,875; 6,707,823; 6,810,497; 6,885,676; and 7,486,663.

[25] *See, e.g.*, U.S. Patent Nos. 7,733,588; 7,737,793; and 7,944,313.

THE PARTIES

DIFF SCALE OPERATION RESEARCH, LLC

12. DIFF Scale Operation Research, LLC ("DIFF Scale Operation Research") is a limited liability company formed under the laws of Delaware. DIFF Scale Operation Research is committed to advancing the current state of electronic circuitry and network infrastructure.

13. Brooks Borchers, a former leader of research and development divisions at Boston Scientific Corporation, is the president and owner of DIFF Scale Operation Research, LLC.

14. In an effort to obtain compensation for ADC Telecommunications' pioneering work in the fields of semiconductors, electronic circuitry, and network infrastructure, CommScope assigned the following patents and patent application to DIFF Scale Operation Research: U.S. Patents and Application Nos. 5,986,486; 6,008,734; 6,157,646; 6,216,166; 6,233,221; 6,363,073; 6,407,983; 6,433,988; 6,664,827; 6,721,328; 6,757,247; 6,847,609; 6,859,430; 6,940,810; 6,959,006; 6,980,565; 6,990,110; 7,106758; 7,170,894; 7,239,627; 7,881,413; 8,121,455; US20010000071A1; US20020150108A1; US20020163886A1; US20020176411A1; US20020180498A1; US20020190764A1; US20030063625A1; US20030118033A1; US20070019686A1; US20100061686A1; US20100150515A1 and International Patents and Application Nos. AT519138T; AU199914551A; AU199923274A; AU199923353A; AU200134402A; AU2002309562A1; CA2442738A1; CA2447983A1; CA2447983C; CN1278969A; CN1289489A; CN1291414A; DE102007010863A1; DE102007010863B4; DE102007032186A1; DE202007008151U1; DK2132589T3; EP1031185A1; EP1050125A1; EP1057361A1; EP1386450A2; EP1386450A4; EP2132589A1; EP2132589B1; ES2368361T3; JP03811007B2; JP2001523059A; JP2002502146A; JP2002504793A; JP3811007B2; WO1999025066A1; WO1999038285A1; WO1999043184A1;

WO2001037468A2; WO2001037468A3; WO2002084927A2; WO2002084927A3; WO2002101959A1; WO2008104282A1; WO2008104284A1.[26]

15. DIFF Scale Operation Research pursues the reasonable royalties owed for Cypress's use of ADC Telecommunications' and CommScope's groundbreaking technology both here in the United States and throughout the world.

CYPRESS SEMICONDUCTOR CORPORATION

16. On information and belief, Cypress Semiconductor Corporation ("Cypress"), is a Delaware corporation with its principal place of business at 198 Champion Court, San Jose, California 95134. Cypress may be served through its registered agent Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

JURISDICTION AND VENUE

17. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

18. Upon information and belief, this Court has personal jurisdiction over Cypress in this action because Cypress resides in the District of Delaware, and because Cypress has committed acts within the District of Delaware giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Cypress would not offend traditional notions of fair play and substantial justice. Defendant Cypress, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has

[26] The patents were assigned to DIFF Scale Operation Research by CommScope DSL Systems, LLC and CommScope Technologies, LLC.

committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the Patents-in-Suit.

19. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Defendant Cypress is a Delaware corporation, and upon information and belief, has transacted business in the District of Delaware and has committed acts of direct and indirect infringement in the District of Delaware.

ADC TELECOMMUNICATIONS LANDMARK SEMICONDUCTOR AND NETWORKING TECHNOLOGIES

20. In 1935, ADC Telecommunications, then known as the Audio Development Company was founded in Minneapolis, Minnesota by two Bell Laboratory engineers to create custom transformers and amplifiers for the radio broadcast industry. In 1941, while participating in a project to develop a sophisticated audio system for Coffman Union at the University of Minnesota, ADC Telecommunications began to produce jacks, plugs, patch cords, and jack fields, which would be cornerstones for ADC Telecommunications' later entry into telecommunications equipment.[27]

[27] James F. Mauk, INDUSTRIAL RESEARCH LABORATORIES OF THE UNITED STATES at 47 (1947) (listing the research activities of the Audio Development Company as "high temperature electronic transformers; miniaturization of electronic transformers; high frequency electrical wave filters, encapsulation techniques; epoxies").



The Billboard

High-Fidelity Audio Devices Boost Capitol Diskery Sales

WASHINGTON, July 29. — High fidelity listening equipment to spur disk sales and please the customers is fast becoming a byword in retail diskeries here, with considerable credit for the trend going to a local firm, the Shrader Manufacturing Company, which specializes in high-fidelity installations. The Shrader company is doing a land-office business not only in store installations but in even greater volume in high fidelity custom sets for homes, a two-way course of operation which, as one enthusiastic dealer has commented, "has been literally filling the Washington air with good music and filling the record shops with good customers."

With customers showing more and more discrimination in choosing recordings ever since the battle of the disk speeds, disk dealers figure that by using high-fidelity equipment in their listening booths they are satisfying a natural trade need. They point out that results of high-fidelity gear are being shown not only in volume of improved high-fidelity recordings.

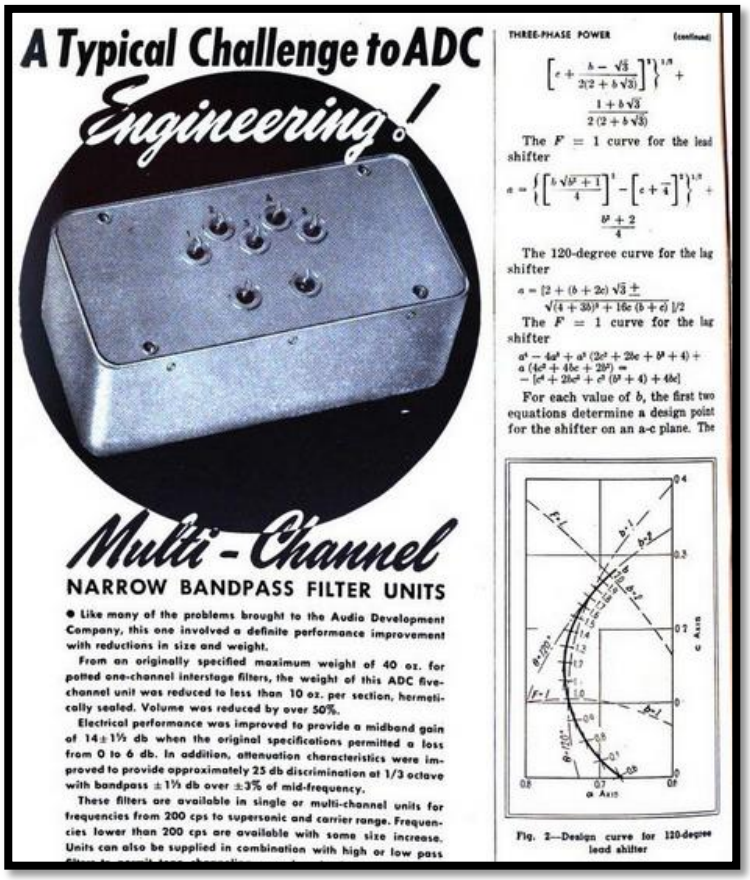
Among numerous retail diskeries here equipped by Shrader with high-fidelity gear are the Super Music Company, which has three outlets in the city; the Disc Shop, the Hollywood Music Shop and the John Learmont record and book store. The Super Music Company group and the Disc Shop have recently undergone expansion (*The Billboard*, July 22) and are completely rigged with high-fidelity equipment. The Disc Shop alone has half a dozen listening booths, each equipped with individual high-fidelity amplifiers and speakers. The Super Music group has a total of nearly 70 disk listening posts rigged to high-fidelity equipment. Particularly popular with dealers who have installed high-fidelity gear are the Livingston tone arm, the Rek-O-Kut heavy transcription turntable, Audio Development Company (ADC) amplifiers and Altec 15-inch speakers.

High-fidelity gear is considered by (*See High-Fidelity Audio, page 38*)

High Fidelity Audio Devices Boost Capitol Diskery Sales, BILLBOARD MAGAZINE at 12 (August 8, 1950) (describing Audio Development Company's amplifiers).

21. In 1961, ADC Telecommunications released the Bantam jack. This product was an amalgam of miniaturized components and became standard for telephone circuit access and patching.[28]

[28] Steven Titch, *ADC Unveils Loop Product Strategy*, TELEPHONY at 9 (February 24, 1992).



A Typical Challenge to ADC Engineering!

Multi-Channel

NARROW BANDPASS FILTER UNITS

● Like many of the problems brought to the Audio Development Company, this one involved a definite performance improvement with reductions in size and weight.

From an originally specified maximum weight of 40 oz. for potted one-channel interstage filters, the weight of this ADC five-channel unit was reduced to less than 10 oz. per section, hermetically sealed. Volume was reduced by over 50%.

Electrical performance was improved to provide a midband gain of 14±1½ db when the original specifications permitted a loss from 0 to 6 db. In addition, attenuation characteristics were improved to provide approximately 25 db discrimination at 1/3 octave with bandpass ±1½ db over ±3% of mid-frequency.

These filters are available in single or multi-channel units for frequencies from 200 cps to supersonic and carrier range. Frequencies lower than 200 cps are available with some size increase. Units can also be supplied in combination with high or low pass

THREE-PHASE POWER (continued)

$$\left[c+\frac{b-\sqrt{3}}{2(2+b\sqrt{3})}\right]^2\Bigg\}^{1/3}+\frac{1+b\sqrt{3}}{2(2+b\sqrt{3})}$$

The $F = 1$ curve for the lead shifter

$$a=\left\{\left[\frac{b\sqrt{b^2+1}}{4}\right]^2-\left[c+\frac{\overline{}}{4}\right]^2\right\}^{1/3}+\frac{b^2+2}{4}$$

The 120-degree curve for the lag shifter

$$a=[2+(b+2c)\sqrt{3}\pm\sqrt{(4+3b)^2+16c(b+c)}\,]/2$$

The $F = 1$ curve for the lag shifter

$$a^4-4a^3+a^2(2c^2+2bc+b^2+4)+a(4c^2+4bc+2b^2)=-[c^4+2bc^2+c^2(b^2+4)+4bc]$$

For each value of b, the first two equations determine a design point for the shifter on an a-c plane. The

Fig. 2—Design curve for 120-degree lead shifter

A Typical Challenge to ADC Engineering!, ELECTRONICS MAGAZINE Vol. 18 at 288 (August 1945) (describing one of the early innovations of ADC Telecommunications).

22. In the 1960s, ADC Telecommunications began an ongoing partnership with NASA's space missions, designing and manufacturing sensors for the Columbia space shuttle.

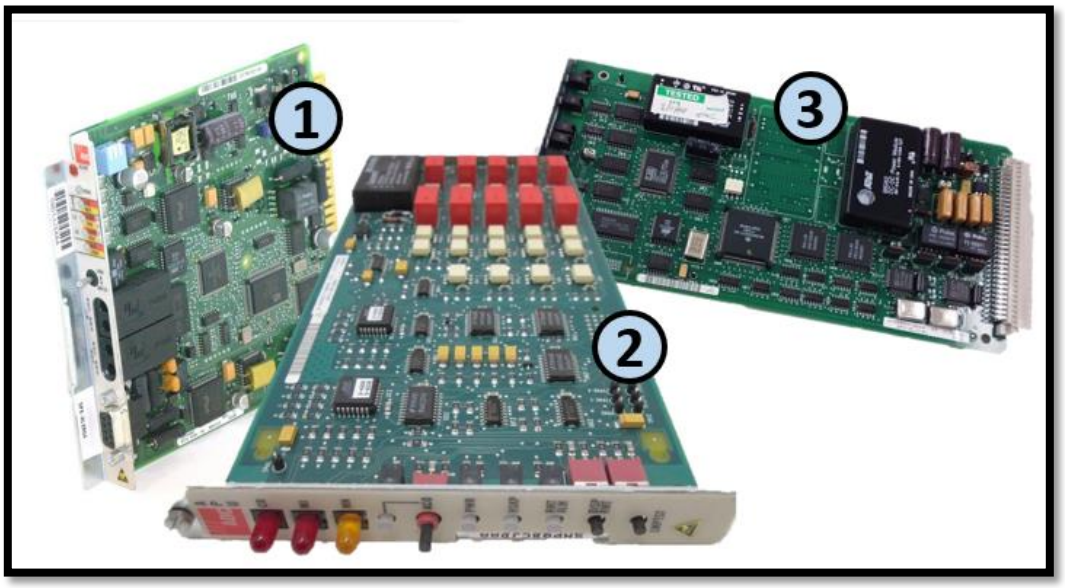
power supply board. The transceivers used are the CAF model manufactured by ADC Telecommunications, Inc.. The transceiver use bidirectional, full-duplex signal transmission over a single optic fiber. The transceiver is a self-contained, circuit-board-mountable device that contains the transmitting LED, the receiving photodetector, and the beam splitter. The transceivers are a matched pair which utilize two different light frequencies for receiving and transmitting. This configuration allows for full-duplex and bidirectional operation over a single fiber optic line. The optic fiber connects to the transceivers with SMA-type connectors.

R. L. Glassell et al., *Custom Electronic Subsystems For The Laboratory Telerobotic Manipulator*, PROCEEDINGS OF THE FOURTH ANS TOPICAL MEETING ON ROBOTICS AND REMOTE SYSTEMS at 151 (1991) (describing the work ADC Telecommunications was doing for NASA).

23. The 1970s and 1980s ushered in technological advancement in all areas of telecommunications and data processing. Public and private computer use increased, and telecommunications evolved into the computer age, with telephonic digital transmission and the expansion of data communications. As a leading innovator in these fields, ADC Telecommunications grew dramatically. ADC Telecommunications entered the video services delivery market and was a leading supplier of fiber-optic video transmission equipment for cable operators.[29]

24. In the 1990's ADC Telecommunications utilized its fiber-optics expertise to develop a local loop system with the goal of providing economical fiber directly to private homes. ADC Telecommunications also created Networx, a novel transmission platform that integrated cable management and private networking products, using synchronous optical network and the asynchronous transfer mode (ATM). The cornerstone of Networx was Sonoplex, a multi-rate, multimedia system that brought fiber to the customer's work or residence site, while making use of existing copper lines.

[29] Carol Wilson, *ADC Launches Fiber-Coax Platform*, TELEPHONY AT 11 (May 24, 1993).



ANNOTATED GRAPHIC OF SELECTED ADC SONOPLEX TELECOMMUNICATIONS PRODUCTS (numbered annotations showing: (1) SPX-HLXRG4 Sonoplex HDSL Module; (2) ADC SPX-APU0B1 SONEPLEX ALM Processor Module; and (3) ADC SPX-RLX1B1 CARD.).

25. In the 1990s, ADC Telecommunications partnered with South Central Bell, Mississippi Educational Television, Northern Telecom, IBM, and Apple Computer to create Fibernet, a network linking students at four high schools in Clarksville, Corinth, West Point, and Philadelphia, Mississippi, with teachers at Mississippi State University, Mississippi University for Women, and Mississippi School for Mathematics and Science to create "electronic classrooms."

26. ADC Telecommunications became an "early leader" in the asynchronous transfer mode (ATM) market, developing some of the first ATM switches. The ADC Telecommunications ATM switch enabled the handling of the massive flows of simultaneous high-speed digital information that the industry projected would be generated during the latter half of the 1990s and into the 21st century, arising from the blending of the communications, computing, and entertainment industries. ADC Telecommunications also landed a coup in March 1994 when Ameritech chose ADC to supply equipment for its fiber-optic video system.

This $4.4 billion project would bring 70 channels of analog television and 40 channels of digital video to customers, with unlimited program choices and interactive, customer-controllable programming. By 1999, ADC Telecommunications employed 9,700 people and was selling $1.5 billion dollars in communications equipment.

THE ASSERTED PATENTS

U.S. PATENT NO. 7,881,413

27. U.S. Patent No. 7,881,413 entitled, *Digital PLL with Conditional Holdover*, was filed on March 1, 2002, and claims priority to March 2, 2001. The ’413 Patent is subject to a 35 U.S.C. § 154(b) term extension of 2,127 days. DIFF Scale Operation Research is the owner by assignment of the ’413 Patent. A true and correct copy of the ’413 Patent is attached hereto as Exhibit A.

28. The ’413 Patent teaches novel phase locked loops (PLL) that provide for conditional holdover that is especially suited for use in communications networks.

29. The ’413 Patent and its underlying patent application have been cited by 24 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’413 Patent and its underlying patent application as relevant prior art:

- Fujitsu Ltd.
- Infineon Technologies AG
- Mediatek Inc.
- Schweitzer Engineering Laboratories, Inc.
- Silicon Laboratories Inc
- Sony Corporation
- Thomas & Betts International, LLC
- National Semiconductor Corporation
- L3 Communications Integrated Systems, L.P.
- Xilinx, Inc.
- Nortel Networks Limited
- Lattice Semiconductor

- Emerson Electric Co., Ltd.
- Furuno Electric Co., Ltd.
- Panasonic Corporation
- Huawei Technologies Co., Ltd

U.S. PATENT NO. 6,664,827

30. U.S. Patent No. 6,664,827 entitled, *Direct Digital Synthesizer Phase Locked Loop*, was filed on March 1, 2002, and claims priority to March 2, 2001. DIFF Scale Operation Research is the owner by assignment of the ’827 Patent. A true and correct copy of the ’827 Patent is attached hereto as Exhibit B.

31. The ’827 Patent discloses phase locked loops for establishing a timing signal for signal communication synchronization. The various embodiments of the invention make use of phase locked loops adapted to filter and store data indicative of the control signal applied to an oscillator. Such phase locked loops permit suppression of tracking in the event of a step change in the phase difference between the reference clock signal and the feedback signal in the phase locked loop. Such phase locked loops further facilitate compensation for drift of the oscillator.

32. The ’827 Patent teaches, in one embodiment, a phase locked loop that includes a digital phase comparator having a first input for receiving a reference clock signal, a second input for receiving a feedback signal, and an output for providing an error signal; a digital loop filter having an input for receiving the error signal and an output for providing a control signal; a numerically-controlled oscillator having an input for receiving the control signal and an output for providing a timing signal, wherein the feedback signal is derived from the timing signal.

33. The ’827 Patent teaches detecting a step change in a phase relationship between the reference clock signal and the feedback signal, and to recenter the digital phase comparator if a step change is detected.

34. The ’827 Patent teaches the sampling of data from a low-pass filter indicative of an average control signal and comparing the average control signal to a threshold limit. The ’827 Patent describes trimming the oscillator if the average control signal is outside the threshold limit.

35. The ’827 Patent further teaches monitoring a phase comparator for a step change in the phase difference between the reference clock signal and the feedback signal; and recentering the phase comparator if a step change in the phase difference between the reference clock signal and the feedback signal is detected.

36. The ’827 Patent and its underlying patent application have been cited by 48 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’827 Patent and its underlying patent application as relevant prior art:

- Advantest Corporation
- Agilent Technologies Inc.
- Air Products and Chemicals, Inc.
- Broadcom Corporation
- Datang Group
- Freescale Semiconductor, Inc.
- NXP Semiconductors
- Infineon Technologies AG
- International Business Machines Corporation
- Marvell International Ltd.
- Cavium
- Metrotech Corporation
- Nvidia Corporation
- Siemens Aktiengesellschaft
- Standard Microsystems Corporation
- Western Digital Technologies, Inc.
- Hewlett-Packard Development Company, L.P.
- Rambus, Inc.
- Panasonic Corporation
- National Semiconductor Corporation

- Alcatel
- Lightlab Imaging, Inc.
- Matsushita Electric Industrial Co., Ltd.
- National Aeronautics and Space Administration ("NASA")
- Advanced Micro Devices, Inc.
- Nihon Dempa Kogyo Co., Ltd.

U.S. PATENT NO. 6,721,328

37. U.S. Patent No. 6,721,328 entitled, *Adaptive Clock Recovery for Circuit Emulation Service*, was filed on November 19, 1999. DIFF Scale Operation Research is the owner of all right, title, and interest in the '328 Patent. A true and correct copy of the '328 Patent is attached hereto as Exhibit C.

38. The '328 Patent claims specific methods and systems for clock recovery in a packet network. The system includes a network which receives data packets at a destination node. Further, the data packets are stored in a buffer and read out of the buffer using a locally generated clock. The fill level of the buffer is monitored over a first period. A relative maximum fill level for the buffer is identified during the first period of time. Further, the relative maximum fill level is used to control the frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

39. The '328 Patent teaches a method and system for adaptive clock recovery.

40. The '328 Patent further teaches the use of a peak buffer fill level as an indicator to lock a local clock at a destination node with the service clock at a source node.

41. Another insight for improving the performance of clock recovery in a packet network described by the '328 Patent is using the relative maximum fill level to control a frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

42. Among the inventions disclosed in the ’328 Patent is a system comprising a peak fill detector that compares a read address and a write address for the buffer and stores the maximum buffer fill level observed over a period of time.

43. The inventions taught in the ’328 Patent achieve improvements in clock recovery systems by using adaptive clock recovery using a buffer. Implementation of the system and methods disclosed in the ’328 Patent are directed to a specific improvement in computer technology – clock recovery. Further, the claims of the ’328 Patent are directed to specific asserted improvements in computer capabilities. For example, the claims recite specific steps – controlling the frequency of a recovered clock signal based on the relative maximum fill level – that accomplish the desired result.

44. The ’328 Patent claims a technical solution to a problem unique to computer systems: clock recovery in a packet network.

45. The ’328 Patent and its related patents have been cited by 35 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’328 Patent family as relevant prior art:

- Axerra Networks, Inc.
- Broadcom Corporation
- Cisco Systems, Inc.
- ENENSYS Technologies SA
- Gennum Corporation (now part of Semtech Corporation)
- Hewlett-Packard Development Company, L.P.
- Infineon Technologies AG
- Lantiq Deutschland GmbH (now part of Intel Corporation)
- Lycium Networks (B.V.I.) Ltd.
- Network Equipment Technologies, Inc. (now part of Ribbon Communications, Inc.)
- RAD Data Communications Ltd.
- Rohde & Schwarz GmbH & Co. KG
- Siverge Networks, Ltd.
- Sony Corporation
- Yamaha Corporation

- Zarlink Semiconductor Limited (now part of Microsemi Corporation)
- Semtech Corporation
- Microsemi Corporation

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 7,881,413

46. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

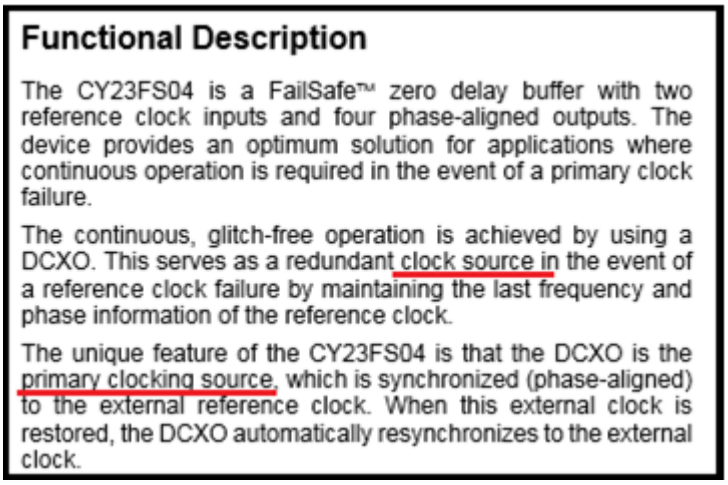
47. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for generating a timing signal in a phase locked loop.

48. Cypress designs, makes, sells, offers to sell, imports, and/or uses timing devices, including timing devices with the following product numbers: CY2292; CY23FS04; CY26049-36; CY7B9945V; CYP15G0401DXB; and CYV15G0401DXB (collectively, the "Cypress '413 Product(s)").

49. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress '413 Products in regular business operations.

50. On information and belief, one or more of the Cypress '413 Products include technology for generating a timing signal from a reference clock signal.

51. On information and belief, Cypress documentation describes one or more of the Cypress '413 Products as a "redundant clock source in the event of a reference clock failure."



Functional Description

The CY23FS04 is a FailSafe™ zero delay buffer with two reference clock inputs and four phase-aligned outputs. The device provides an optimum solution for applications where continuous operation is required in the event of a primary clock failure.

The continuous, glitch-free operation is achieved by using a DCXO. This serves as a redundant clock source in the event of a reference clock failure by maintaining the last frequency and phase information of the reference clock.

The unique feature of the CY23FS04 is that the DCXO is the primary clocking source, which is synchronized (phase-aligned) to the external reference clock. When this external clock is restored, the DCXO automatically resynchronizes to the external clock.

CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer, CYPRESS DATASHEET at 1 (December 2017) (emphasis added).

52. On information and belief, one or more of the Cypress ’413 Products contain a phase comparator.

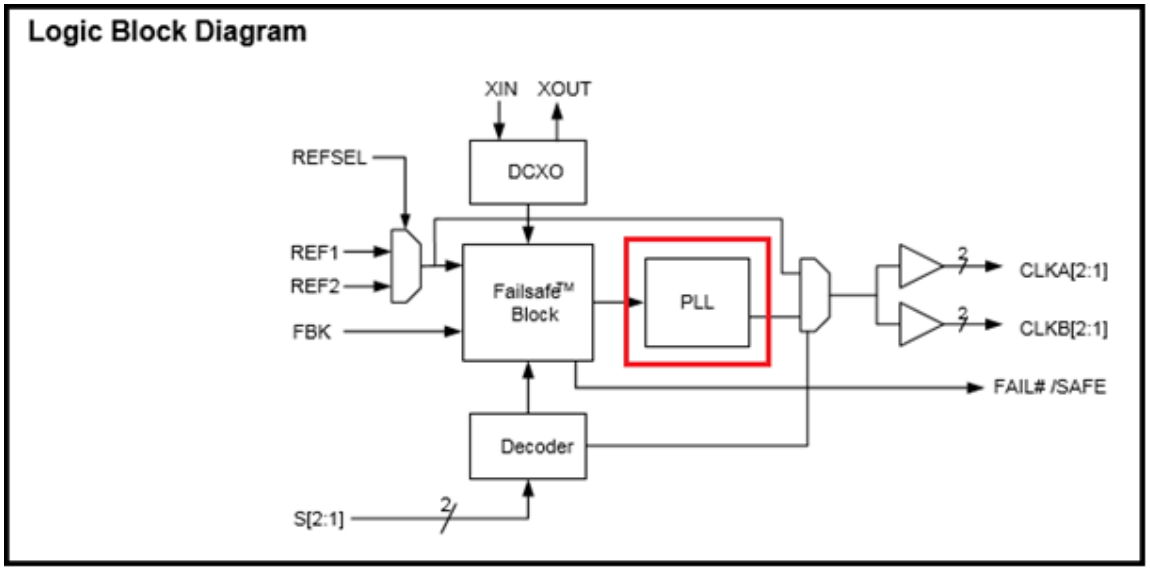
53. On information and belief, one or more of the Cypress ’413 Products contain a low-pass filter.

54. On information and belief, one or more of the Cypress ’413 Products comprise an oscillator coupled in a feedback arrangement.

55. On information and belief, one or more of the Cypress ’413 Products comprise a control system that generates an output signal where the phase of the output signal is related to the phase of an input signal.

56. On information and belief, the Cypress ’413 Products are available to businesses and individuals throughout the United States.

57. On information and belief, Cypress documentation shows that the Cypress ’413 Products use a phase locked loop (PLL) to generate the timing signal as shown in the below figure.



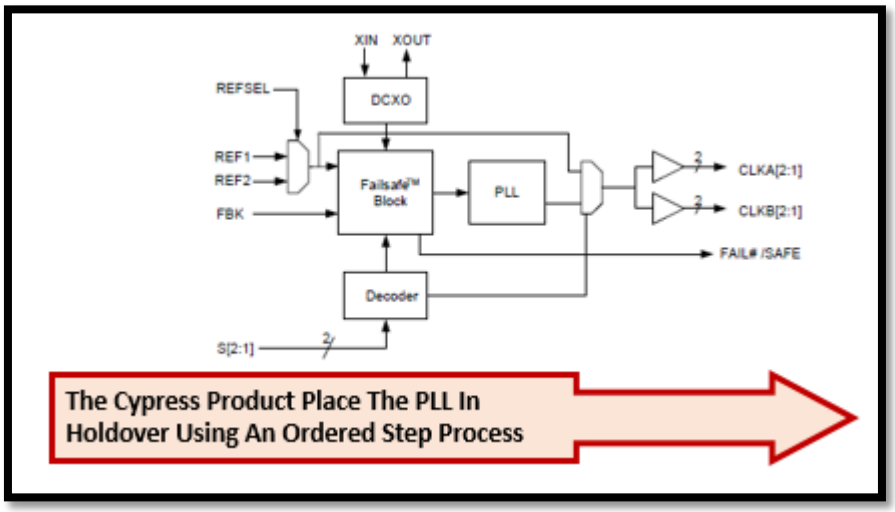
CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer, CYPRESS DATASHEET at 1 (December 2017) (emphasis added).

58. On information and belief, the Cypress ’413 Products are provided to businesses and individuals located in the District of Delaware.

59. On information and belief, Cypress has directly infringed and continues to directly infringe the ’413 Patent by, among other things, making, using, offering for sale, and/or selling technology for generating a timing signal in a phase locked loop, including but not limited to the Cypress ’413 Products, which include infringing technology for generating a timing signal in a phase locked loop. Such products and/or services include, by way of example and without limitation, the Cypress ’413 Products.

60. On information and belief, the Cypress ’413 Products comprise a system for generating a timing signal from a reference clock signal in a phase locked loop.

61. On information and belief, documentation from Cypress establishes that the Cypress Products place the PLL in holdover based on an ordered series of steps. This ordered series is identical to the order presented in the claims of the ’413 Patent.



CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer, CYPRESS DATASHEET at 1 (December 2017) (annotation added).

62. On information and belief, the Cypress ’413 Products include functionality for monitoring a status message received from a source of the reference clock signal indicative of a quality level of the reference clock signal.

63. On information and belief, the Cypress ’413 Products are a system containing functionality for placing the phase locked loop in a holdover condition if the quality level indicated by the status message is below a target level.

64. The Cypress ‘413 Products comprise a system for performing the elements in a proscribed order.

65. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress ’413 Products, Cypress has injured DIFF Scale Operation Research and is liable to the Plaintiff for directly infringing one or more claims of the ‘413 patent, including at least claim 21 pursuant to 35 U.S.C. § 271(a).

66. On information and belief, Cypress also indirectly infringes the ’413 Patent by actively inducing infringement under 35 USC § 271(b).

67. Cypress has had knowledge of the '413 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '413 Patent and knew of its infringement, including by way of this lawsuit.

68. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '413 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '413 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '413 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '413 Products that have the capability of operating in a manner that infringe one or more of the claims of the '413 Patent, including at least claim 21, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '413 Products to utilize the products in a manner that directly infringe one or more claims of the '413 Patent.[30] By providing instruction and training to customers and end-users on how to use the Cypress '413 Products in a manner that directly infringes one or more claims of the '413 Patent, including at least claim 21, Cypress specifically intended to induce infringement of the '413 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '413 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '413 Patent. Accordingly, Cypress has induced and

[30] *See, e.g.*, CYB9945V ROBOCLOCK, HIGH SPEED MULTI-PHASE PLL CLOCK BUFFER (Nov. 14, 2014); CY23FS04, FAILSAFE 2.5V/3.3 V ZERO DELAY BUFFER (Dec. 14, 2017); CY2292, THREE-PLL GENERAL-PURPOSE EPROM-PROGRAMMABLE CLOCK GENERATOR (Dec. 7, 2017); and CYP15G0401DXB CYV15G0401DXB QUAD HOTLINK II TRANSCEIVER (Aug. 18, 2017).

continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’413 Patent, knowing that such use constitutes infringement of the ’413 Patent.

69. The ’413 Patent is well-known within the industry as demonstrated by multiple citations to the ’413 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the ’413 Patent without paying a reasonable royalty. Cypress is infringing the ’413 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

70. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’413 Patent.

71. As a result of Cypress’s infringement of the ’413 Patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Cypress’s infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 6,664,827

72. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

73. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for timing circuitry.

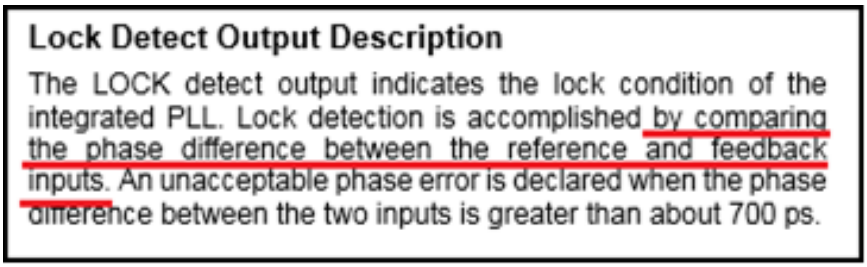
74. Cypress designs, makes, sells, offers to sell, imports, and/or uses timing devices, including timing devices with the following product numbers: CY7B9973V; CY7B9945V;

CY7B993V; CY7B994V; CY7B9930V; CY7B9940V; CY7B9911V; CY7B995; and CY7B9950 (collectively, the "Cypress '827 Product(s)").

75. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress '827 Products in regular business operations.

76. On information and belief, one or more of the Cypress '827 Products include technology for a phase locked loop.

77. On information and belief, Cypress documentation states that one or more of the Cypress '827 Products contain functionality for lock detection that is "accomplished by comparing the phase difference between the reference and feedback inputs."



Lock Detect Output Description

The LOCK detect output indicates the lock condition of the integrated PLL. Lock detection is accomplished by comparing the phase difference between the reference and feedback inputs. An unacceptable phase error is declared when the phase difference between the two inputs is greater than about 700 ps.

CY7B9973V RoboClock® High-Speed Multi-Output PLL Clock Buffer, CYPRESS DATASHEET at 6 (November 2017) (emphasis added).

78. On information and belief, the Cypress '827 Products are available to businesses and individuals throughout the United States.

79. On information and belief, the Cypress '827 Products are provided to businesses and individuals located in the District of Delaware.

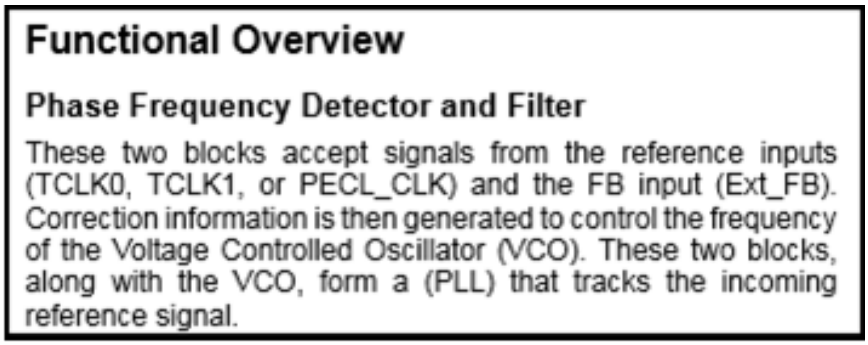
80. On information and belief, the Cypress '827 Products comprise a phase locked loop adapted to filter and store data indicative of a control signal.

81. On information and belief, the Cypress '827 Products comprise a control system that generates an output signal whose phase is related to the phase of an input signal.

82. On information and belief, the Cypress ’827 Products comprise a frequency-selective circuit.

83. On information and belief, the Cypress ’827 Products include a phase comparator.

84. On information and belief, the Cypress ’827 Products contain a Phase Frequency Detector which contains the same functionality as the phase comparator taught in the ’827 patent claims.



Functional Overview

Phase Frequency Detector and Filter

These two blocks accept signals from the reference inputs (TCLK0, TCLK1, or PECL_CLK) and the FB input (Ext_FB). Correction information is then generated to control the frequency of the Voltage Controlled Oscillator (VCO). These two blocks, along with the VCO, form a (PLL) that tracks the incoming reference signal.

CY7B9973V RoboClock® High-Speed Multi-Output PLL Clock Buffer, CYPRESS DATASHEET at 6 (November 2017).

85. On information and belief, the Cypress ’827 Products contain a low-pass filter.

86. On information and belief, the Cypress ’827 Products comprise an oscillator coupled in a feedback arrangement.

87. On information and belief, the Cypress ’827 Products include a phase comparator having a first input for the reference clock signal and a second input for the feedback signal.

88. On information and belief, the Cypress ’827 Products contain functionality for sampling values of an error signal.

89. On information and belief, the Cypress ’827 Products contain functionality for sampling an error signal where the error signal is indicative of a phase relationship between a reference clock signal and a feedback signal.

90. On information and belief, Cypress documentation states that one or more of the Cypress '827 Products will go into an "out-of-lock state" and attempt to recenter if a step change in the phase difference has occurred for four of more consecutive cycles. Once the device has recentered (*e.g.*, no more phase errors) for 32 consecutive cycles, the Cypress '827 Product will go back to a lock condition.

> When in the locked state, after four or more consecutive feedback clock cycles with phase-errors, the LOCK output is forced LOW to indicate out-of-lock state.
>
> When in the out-of-lock state, 32 consecutive phase-errorless feedback clock cycles are required to allow the LOCK output to indicate lock condition (LOCK = HIGH).

CY7B9973V RoboClock® High-Speed Multi-Output PLL Clock Buffer, CYPRESS DATASHEET at 6 (November 2017).

91. On information and belief, Cypress has directly infringed and continues to directly infringe the '827 Patent by, among other things, making, using, offering for sale, and/or selling timing circuitry, including but not limited to the Cypress '827 Products, which include infringing technology for monitoring the sampled error signal values for a step change in the phase difference between the reference clock signal and the feedback signal. Such products and/or services include, by way of example and without limitation, the Cypress '827 Products.

92. On information and belief, the '827 Products comprise a system for monitoring the sampled error signal values for a step change in the phase difference between the reference clock signal and the feedback signal.

93. On information and belief, the '827 Products include functionality for recentering a phase comparator if a step change in the phase difference between the reference clock signal and the feedback signal is detected.

94. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress '827 Products, Cypress has injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '827 Patent, including at least claim 28, pursuant to 35 U.S.C. § 271(a).

95. On information and belief, Cypress also indirectly infringes the '827 Patent by actively inducing infringement under 35 USC § 271(b).

96. On information and belief, Cypress has had knowledge of the '827 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '827 Patent and knew of its infringement, including by way of this lawsuit.

97. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '827 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '827 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '827 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '827 Products that have the capability of operating in a manner that infringe one or more of the claims of the '827 Patent, including at least claim 28, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '827 Products to utilize the products in a manner that directly infringe one or more claims of the '827 Patent.[31] By providing instruction and training to customers and end-

[31] *See, e.g.*, CY7B993V/CY7B994V ROBOCLOCK, HIGH-SPEED MULTI-PHASE PLL CLOCK BUFFER (Nov. 27, 2017); CY7B9930V/CY7B9940V ROBOCLOCK II JUNIOR, HIGH-SPEED MULTI-FREQUENCY PLL CLOCK BUFFER (Nov. 15, 2016); CY7B9945V ROBOCLOCK, HIGH-

users on how to use the Cypress '827 Products in a manner that directly infringes one or more claims of the '827 Patent, including at least claim 28, Cypress specifically intended to induce infringement of the '827 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '827 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '827 Patent. Accordingly, Cypress has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '827 Patent, knowing that such use constitutes infringement of the '827 Patent.

98. The '827 Patent is well-known within the industry as demonstrated by multiple citations to the '827 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the '827 Patent without paying a reasonable royalty. Cypress is infringing the '827 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

99. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '827 Patent.

100. As a result of Cypress's infringement of the '827 Patent, DIFF Scale Operation Research has suffered monetary damages, and seek recovery in an amount adequate to compensate for Cypress's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

SPEED MULTI-PHASE PLL CLOCK BUFFER (June 19, 2017); and CY7B9973V ROBOCLOCK, HIGH-SPEED MULTI-OUTPUT PLL CLOCK BUFFER (Nov. 29, 2017).

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 6,721,328

101. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

102. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for clock recovery in a packet network.

103. Cypress designs, makes, sells, offers to sell, imports, and/or uses Backplane Physical Layer (PHY) devices including the following PHYs: CYV15G0204RB, CYP15G0401DXB, CYV15G0401DXB, CYP15G0101DXB, CYV15G0101DXB, CYV15G0104TRB, CYP15G0201DXB, CYP15G0401DXB, CYP15G0403DXB, and CYV15G0404DXB (collectively, the "Cypress '328 Products").

104. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress '328 Products in regular business operations.

105. On information and belief, one or more of the Cypress '328 Products include technology for clock recovery in a packet network.

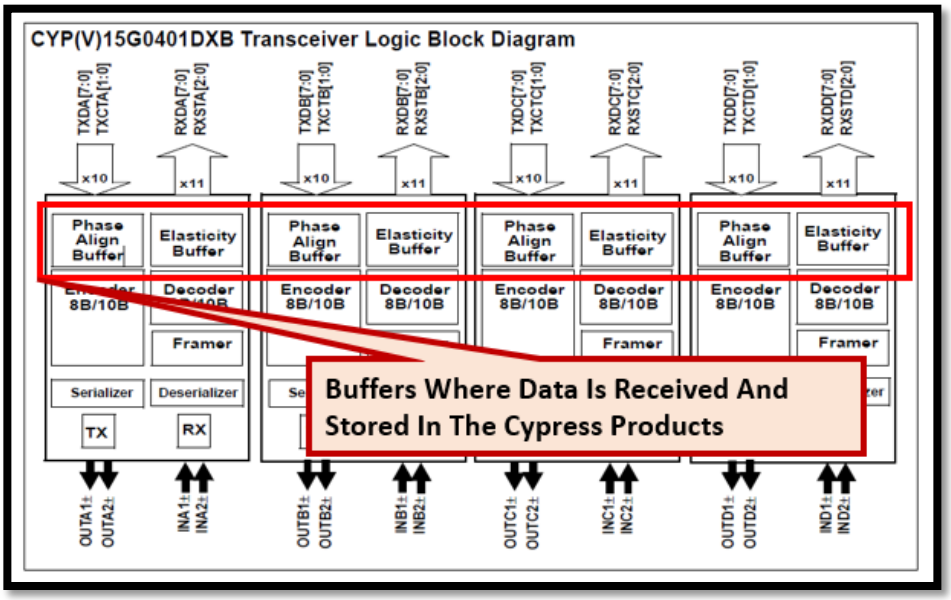
106. On information and belief, the Cypress '328 Products are available to businesses and individuals throughout the United States.

107. On information and belief, the Cypress '328 Products are provided to businesses and individuals located in the District of Delaware.

108. On information and belief, Cypress has directly infringed and continues to directly infringe the '328 Patent by, among other things, making, using, offering for sale, and/or selling technology for clock recovery, including but not limited to the Cypress '328 Products, which include infringing technology for clock recovery in a packet network. Such products and/or services include, by way of example and without limitation, the Cypress '328 Products.

109. On information and belief, the Cypress ’328 Products comprise a system for receiving data packets at a destination node.

110. On information and belief, Cypress documentation shows that the Cypress ’328 Products enable data to be received into a buffer where the data packets are stored.



Cypress CYP15G0401DXB Data Sheet, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 4 (August 18, 2017) (annotations added).

111. On information and belief, the Cypress ’328 Products comprise a system for storing data packets in a buffer.

112. On information and belief, the Cypress ’328 Products enable reading the data packets out of the buffer using a locally generated clock.

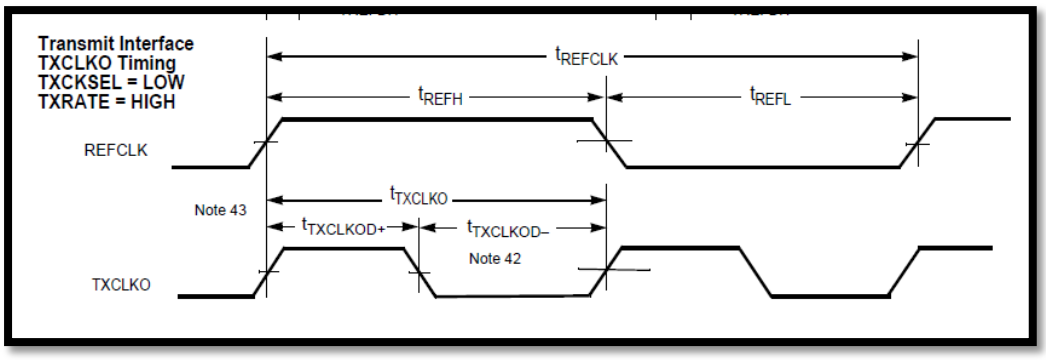
113. On information and belief, the Cypress ’328 Products monitor a fill level of the buffer over a first period of time.

114. On information and belief, the Cypress ’328 Products identify a relative maximum fill level for the buffer during the first period of time.

115. On information and belief, Cypress documentation states that data packets are read out of the buffer using a local clock that, "[w]hen sampled LOW, the transmit Phase-align Buffers are allowed to adjust their data-transfer timing (relative to the selected input clock) to allow clean transfer of data from the Input Register to the Encoder or Transmit Shifter. When TXRST is sampled HIGH, the internal phase relationship between the associated TXCLKx and the internal character-rate clock is fixed and the device operates normally." *Cypress CYP15G0401DXB Data Sheet*, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 10 (August 18, 2017).

116. On information and belief, the Cypress '328 Products identify a relative maximum fill level by comparing read and write address for the buffer and updating a register for a period of time when a buffer fill level, based on the difference between the read and write addresses is larger than a value previously stored in the register.

117. On information and belief, the Cypress '328 Product documentation shows that the Cypress '328 Products use the clocking information generated in the clock recovery function to control the rate at which data is transmitted out of the buffer.



Cypress CYP15G0401DXB Data Sheet, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 39 (August 18, 2017).

118. On information and belief, the Cypress '328 Products use the relative maximum fill level to control a frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

119. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress '328 Products, Cypress has injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '328 Patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

120. On information and belief, Cypress also indirectly infringes the '328 Patent by actively inducing infringement under 35 USC § 271(b).

121. On information and belief, Cypress has had knowledge of the '328 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '328 Patent and knew of its infringement, including by way of this lawsuit.

122. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '328 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '328 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '328 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '328 Products that have the capability of operating in a manner that infringe one or more of the claims of the '328 patent, including at least claim 1, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '328 Products to utilize the products in a manner that directly infringe one

or more claims of the '328 Patent.[32] By providing instruction and training to customers and end-users on how to use the Cypress '328 Products in a manner that directly infringes one or more claims of the '328 Patent, including at least claim 1, Cypress specifically intended to induce infringement of the '328 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '328 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '328 Patent. Accordingly, Cypress has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '328 Patent, knowing that such use constitutes infringement of the '328 Patent.

123. The '328 Patent is well-known within the industry as demonstrated by multiple citations to the '328 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the '328 Patent without paying a reasonable royalty. Cypress is infringing the '328 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

124. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '328 Patent.

125. As a result of Cypress's infringement of the '328 Patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to

[32] *See, e.g.*, CYP15G0401DXB CYV15G0401DXB, QUAD HOTLINK II TRANSCEIVER (Aug. 18, 2017); CYP15G0101DXB CYV15G0101DXB, SINGLE-CHANNEL HOTLINK II TRANSCEIVER (Nov. 9, 2017); and CYP15G0403DXB, INDEPENDENT CLOCK QUAD HOTLINK II TRANSCEIVER (June 9, 2014).

compensate for Cypress's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, DIFF Scale Operation Research respectfully requests that this Court enter:

A. A judgment in favor of DIFF Scale Operation Research that Cypress has infringed, either literally and/or under the doctrine of equivalents, the '413, '827, and '328 Patents;

B. An award of damages resulting from Cypress's acts of infringement in accordance with 35 U.S.C. § 284;

C. A judgment and order finding that Cypress's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, or flagrant, within the meaning of 35 U.S.C. § 284 and awarding to DIFF Scale Operation Research enhanced damages.

D. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to DIFF Scale Operation Research their reasonable attorneys' fees against Cypress.

E. Any and all other relief to which DIFF Scale Operation Research may show themselves to be entitled.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, DIFF Scale Operation Research, LLC requests a trial by jury of any issues so triable by right.

Dated: March 8, 2018

OF COUNSEL:

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Attorneys for Plaintiff
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APPENDIX S5

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

LUCIO DEVELOPMENT LLC,	§	
	§	
Plaintiff,	§	Case No: 1:17-cv-1150
	§	
vs.	§	PATENT CASE
	§	
CYPRESS SEMICONDUCTOR CORPORATION	§	
	§	
	§	
Defendant.	§	
	§	

COMPLAINT

Plaintiff Lucio Development LLC ("Plaintiff" or "Lucio") files this Complaint against Cypress Semiconductor Corporation ("Defendant" or "Cypress") for infringement of United States Patent No. 7,069,546 (hereinafter "the '546 Patent").

PARTIES AND JURISDICTION

1. This is an action for patent infringement under Title 35 of the United States Code. Plaintiff is seeking injunctive relief as well as damages.

2. Jurisdiction is proper in this Court pursuant to 28 U.S.C. §§ 1331 (Federal Question) and 1338(a) (Patents) because this is a civil action for patent infringement arising under the United States patent statutes.

3. Plaintiff is a Texas limited liability company with its office address at 555 Republic Dr., Suite 200, Plano, Texas 75074.

4. On information and belief, Defendant is a Delaware corporation with a place of business at 198 Champion Ct., San Jose, CA 95134-1709. Defendant may be served with process in this judicial district by serving its registered agent for service of process:

Corporation Service Company, 2711 Centerville Rd., Suite 400, Wilmington, DE 19808.

5. This Court has personal jurisdiction over Defendant because Defendant has committed, and continues to commit, acts of infringement in this District, has conducted business in this District, and/or has engaged in continuous and systematic activities in this District.

6. On information and belief, Defendant's instrumentalities that are alleged herein to infringe were and continue to be used, imported, offered for sale, and/or sold in this District.

VENUE

7. Venue is proper in this District pursuant to 28 U.S.C. §1400(b) because acts of infringement are occurring in this District and Defendant has a regular and established place of business in this District. For instance, on information and belief, Defendant has a regular and established place of business at 5204 E. Ben White Blvd., Austin, TX 78741 and at 9442 N. Capital of Texas Hwy, Austin, TX 78759.

COUNT I
(INFRINGEMENT OF UNITED STATES PATENT NO. 7,069,546)

8. Plaintiff incorporates paragraphs 1 through 7 herein by reference.

9. This cause of action arises under the patent laws of the United States and, in particular, under 35 U.S.C. §§ 271, *et seq*.

10. Plaintiff is the owner by assignment of the '546 Patent with sole rights to enforce the '546 Patent and sue infringers.

11. A copy of the '546 Patent, titled "Generic Framework for Embedded Software Development," is attached hereto as Exhibit A.

12. The '546 Patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

13. On information and belief, Defendant has infringed and continues to infringe one or more claims, including at least Claim 1, of the '546 Patent by making, using, importing, selling, and/or offering for sale a software platform for embedded software development, which is covered by at least Claim 1 of the '546 Patent. Defendant has infringed and continues to infringe the '546 Patent directly in violation of 35 U.S.C. § 271.

14. Defendant, sells, offers to sell, and/or uses embedded software development packages including, without limitation, the PSoC platform, PSoC Creator, and any similar products ("Product"), which infringe at least Claim 1 of the '546 Patent.

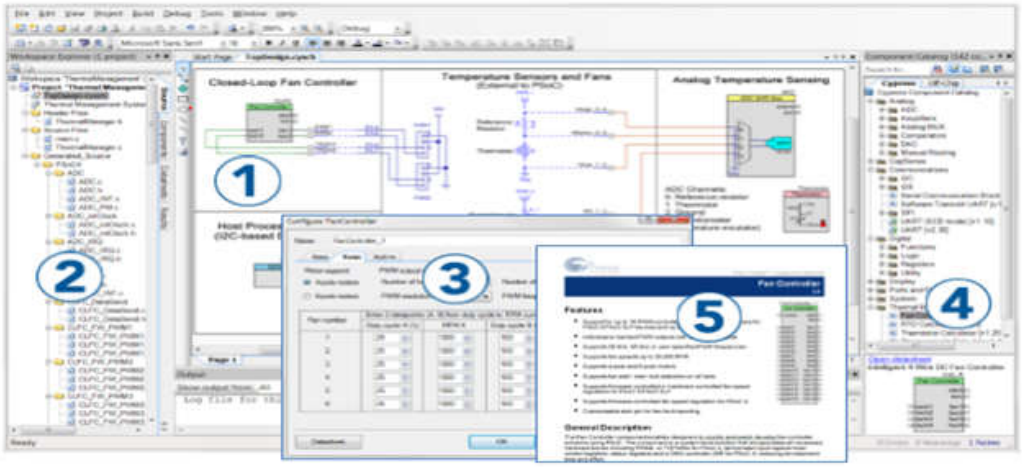
15. The Product is a framework that is configured to create embedded software for multiple hardware modules (e.g., versions of a microcontroller, such as ARM Cortex-Mo or Cortex Mo+). Defendant and/or its customers use the Product (e.g., PSoC and/or WICED) to produce embedded software. Certain elements of this limitation are illustrated in the screenshots below and in the screenshots referenced in connection with other elements herein.

PSoC Creator

PSoC Creator is a free Windows-based Integrated Development Environment (IDE). It enables concurrent hardware and firmware design of PSoC 3, PSoC 4, and PSoC 5LP systems. See Figure 1 – with PSoC Creator, you can:

1. Drag and drop Components to build your hardware system design
2. Co-design your application firmware with the PSoC hardware
3. Configure Components with config tools
4. Explore the library of 100+ Components
5. Review Component datasheets

Figure 1. PSoC Creator Features



Source: http://www.cypress.com/file/46106/download

USB-Serial Software Development Kit

Last Updated: Jun 02, 2016

Cypress delivers the complete library and driver stack for USB-Serial Bridge Controller devices, in order to easily integrate USB interface into any embedded application. The Software Development Kit (SDK) comes with configuration tool (Windows only), drivers (Windows only), libraries and application examples.

In CDC mode (CDC device class) the device will come up as Virtual COM Port (VCP) device. Native APIs can be used to access the device in CDC mode for all the OS. In Vendor mode, the device enumerates as a USB device and is accessed using the Cypress provided library (for all OS).

For Linux and OS-X, there are no installation steps necessary to use products with USB ports powered by Cypress' USB-Serial products. Linux and OS-X does not need separate driver or library in CDC device class operation. Please use native Serial communication API's for accessing the CDC mode device. There is no special driver needed for Vendor mode device operation in Linux and OS-X. Please refer to API documentation for accessing device using Cypress provided library.

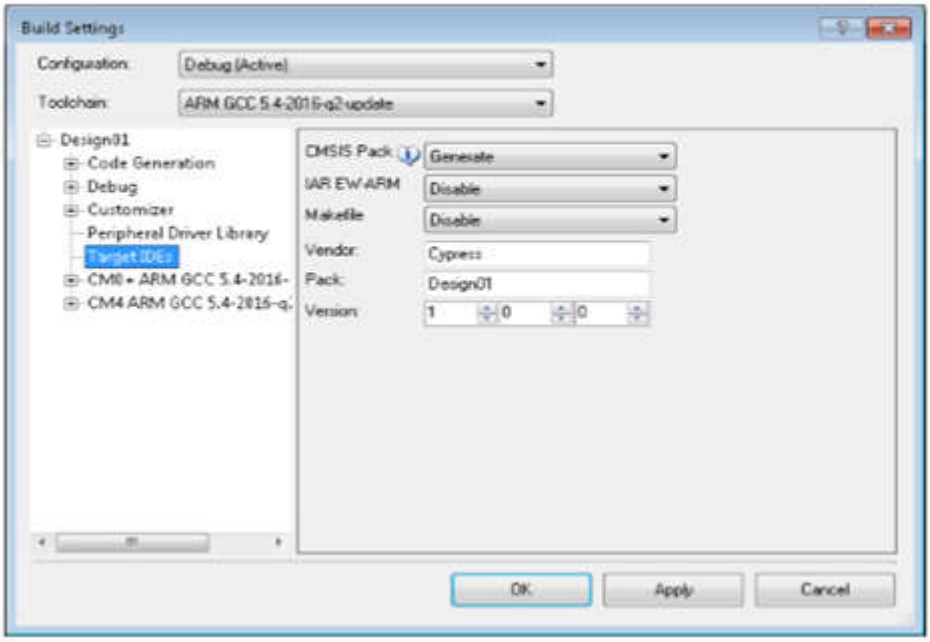
For Android, the user must have root access to use the Cypress library.

Source: http://www.cypress.com/documentation/software-and-drivers/usb-serial-software-development-kit

16. The Product provides one or more generic application handler programs (e.g., PSoC provides a CMSIS Pack containing CMSIS Hardware Abstraction Layer (CMSIS) containing programs, functions and data structures which are common and uniform across all supported ARM Cortex Mo or Cortex Mo+ processors). The generic programs comprise computer program code for performing generic application functions common to multiple types of hardware modules used in a communication environment (e.g., the generic code provides common and generic functions to multiple hardware modules (versions of a microcontroller, such as ARM Cortex-Mo or Cortex Mo+)). Certain elements of this limitation are illustrated in the screenshots below and in the screenshots referenced in connection with other elements herein.

Target IDEs Build Settings

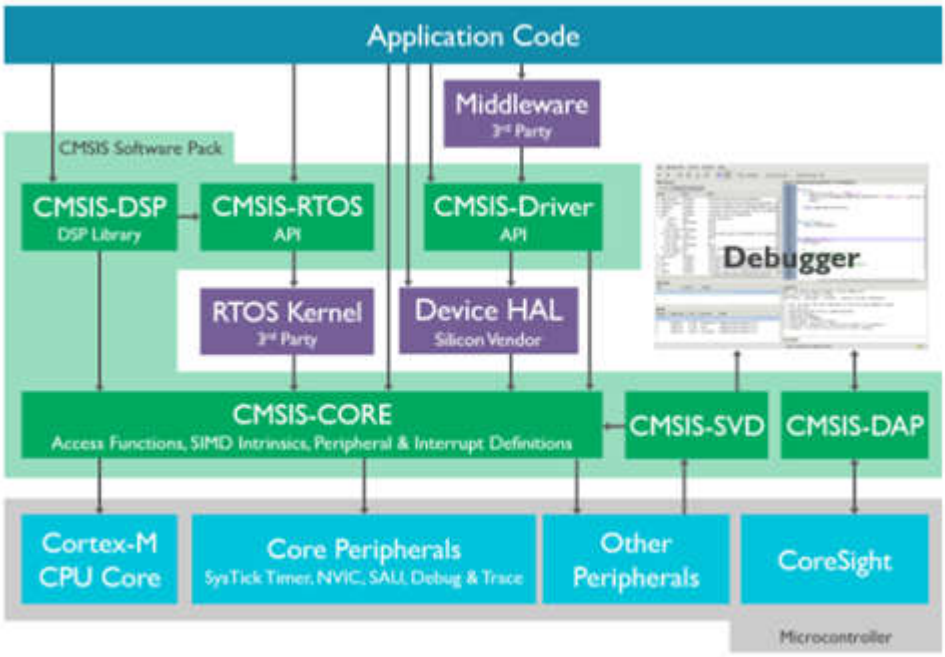
The Target IDEs section of the Build Settings dialog applies to **PSoC 6 devices only**. Use the pull-down menus to select one or more IDEs for which to generate files. You will then use these files to further develop the PSoC Creator design in those selected IDEs. For more information, refer to Integrating into 3rd Party IDEs.



Source: http://www.cypress.com/file/137441/download

Starting from CMSIS-CORE, a vendor-independent hardware abstraction layer for Cortex-M processors, CMSIS has since expanded into areas such as software component management and reference debugger interfaces. Creation of software is a major cost factor in the embedded industry. Standardizing the software interfaces across all Cortex-M silicon vendor products, especially when creating new projects or migrating existing software to a new device, means significant cost reductions.

CMSIS is defined in close cooperation with various silicon and software vendors and provides a common approach to interface to peripherals, real-time operating systems, and middleware components. It simplifies software reuse, reducing the learning curve for new microcontroller developers and cutting the time-to market for devices.



Source: https://developer.arm.com/embedded/cmsis

17. The Product includes generating specific application handler code to associate the generic functions with the specific functions at a device driver for at least one of the types of hardware modules. For example, in addition to the generic drivers and CMSIS Pack, PSoC also includes specific application handler code that is specific to the application and specific to particular processor families. Certain elements of this limitation are illustrated in the screenshots below and in the screenshots referenced in connection with other elements herein.

Generated Files (PSoC 3, PSoC 4, PSoC 5LP)

Upon a successful build, PSoC Creator generates various files that become a part of your design. These files are listed in the Workspace Explorer under the **Source** tab. These files are specific to the device family (PSoC 3, PSoC 4, or PSoC 5LP) and the selected compiler. The following lists and describes the files generated from a build.

File(s)	Description
cy_boot (Refer also to the System Reference Guide.)	
CyBootAsmKeil.a51 (PSoC 3) CyBootAsmIar.s (PSoC 4/5LP IAR) CyBootAsmGnu.s (PSoC 4/5LP GCC) CyBootAsmRv.s (PSoC 4/5LP MDK)	Provides device- and toolchain-specific assembly implementations for startup and time critical routines.
CyDmac.c /.h	The software API for using the DMA Controller.
CyFlash.c /.h	The software API for writing to flash.
CyLib.c /.h	The software APIs for power management, string/character routines, memory manipulation, as well as enabling/disabling selected portions of the PSoC device.
cypins.h	Contains the function prototypes and constants used for port/pin access and control.
cyPm.c/.h	Provides the function definitions for the power management API.
CySpc.c /.h	The software API for writing to the System Performance Controller.
cytypes.h	Provides macros and defines to allow code to be written tool chain and processor agnostic.
cyutils.c	Implements low-level utility functions used to provide tool chain/processor agnostic functions. Exposed in cytypes.h.
cymem.a51 (PSoC 3)	Specialized memory routines for Keil boot-up.
KeilStart.a51 (PSoC 3)	Bootup code for PSoC 3 chips using Keil tools.
Cm3Start.c/Cm0Start.c/Cm0pStart.c	Startup code for the ARM CM3/CM0/CM0+.

Source: http://www.cypress.com/file/355131/download

File(s)	Description
PSoC3_8051.h / .inc (PSoC 3)	8051 register definitions for the PSoC 3 architecture.
cm3gcc.ld/cm0gcc.ld	Linker script for the GCC toolchain
Cm3RealView.scat/Cm0RealView.scat	Scatter file for the RealView & MDK toolchains
core_cm0.h or core_cm3.h core_cmFunc.h and core_cmInstr.h	CMSIS standard libraries for Cortex-M series of processors: core_cm0.h for PSoC 4/core_cm3.h for PSoC 5LP. Both files included for PSoC 4/PRoC BLE and PSoC 5LP.
core_cm0_psoc4.h or core_cm3_psoc5.h	PSoC 4/PRoC BLE or PSoC 5LP specific interrupt information for CMSIS libraries.
General	
cydevice_trm.h	Defines all of the addresses in the configuration space of the device. These addresses do not contain any context information related to instances drawn in your design(s). You should not need to use any of these addresses directly.
cydevice.h (PSoC 3/PSoC 5LP)	Deprecated version of cydevice_trm.h.
cydevicekeil_trm.inc (PSoC 3) cydevicegnu_trm.inc (PSoC 5LP / PSoC 4 GCC) cydevicerv_trm.inc (PSoC 5LP / PSoC 4 MDK) cydeviciar_trm.inc (PSoC 5LP / PSoC 4 IAR)	Defines all of the addresses in the configuration space of the device for the specific toolchain. These addresses do not contain any context information related to instances drawn in your design(s). You should not need to use any of these addresses directly.
cydevicekeil.inc (PSoC 3) cydevicegnu.inc (PSoC 5LP GCC) cydevicerv.inc (PSoC 5LP Real View)	Deprecated version of cydevicekeil_trm.inc, cydevicegnu_trm.inc, or cydevicerv_trm.inc.
cyfitter.h	Defines all of the instance specific addresses calculated by the Code Generation step. This file is mainly intended for use by instance API implementations, although advanced users may find interesting information in this file.
cyfitter_cfg.c	Implements the methods and logic necessary to configure the device before main. You should not need to use anything implemented in this file.
cyfitter_cfg.h	Contains definitions used by the boot firmware to configure the device before main. You should not need to use anything defined in this file.

Source: http://www.cypress.com/file/355131/download

18. The Product generates specific application handler code and defines a specific element in the specific code to be handled by one of the generic application functions for that hardware module. For example**,** PSoC generates system-specific application handler code by defining a specific element such as functions and data structure that connect to or extend the generic application functions. When specific functions are written for handling defined specific elements, the specific functions must be registered. PSoC accordingly contains data structures that register and embed the required functions. Certain elements of this limitation are illustrated in the screenshots below and in the screenshots referenced in connection with other elements herein.

File(s)	Description
PSoC3_8051.h /.inc (PSoC 3)	8051 register definitions for the PSoC 3 architecture.
cm3gcc.ld/cm0gcc.ld	Linker script for the GCC toolchain
Cm3RealView.scat/Cm0RealView.scat	Scatter file for the RealView & MDK toolchains
core_cm0.h or core_cm3.h core_cmFunc.h and core_cmInstr.h	CMSIS standard libraries for Cortex-M series of processors: core_cm0.h for PSoC 4/core_cm3.h for PSoC 5LP. Both files included for PSoC 4/PRoC BLE and PSoC 5LP.
core_cm0_psoc4.h or core_cm3_psoc5.h	PSoC 4/PRoC BLE or PSoC 5LP specific interrupt information for CMSIS libraries.
General	
cydevice_trm.h	Defines all of the addresses in the configuration space of the device. These addresses do not contain any context information related to instances drawn in your design(s). You should not need to use any of these addresses directly.
cydevice.h (PSoC 3/PSoC 5LP)	Deprecated version of cydevice_trm.h.
cydevicekeil_trm.inc (PSoC 3) cydevicegnu_trm.inc (PSoC 5LP / PSoC 4 GCC) cydevicerv_trm.inc (PSoC 5LP / PSoC 4 MDK) cydeviciar_trm.inc (PSoC 5LP / PSoC 4 IAR)	Defines all of the addresses in the configuration space of the device for the specific toolchain. These addresses do not contain any context information related to instances drawn in your design(s). You should not need to use any of these addresses directly.
cydevicekeil.inc (PSoC 3) cydevicegnu.inc (PSoC 5LP GCC) cydevicerv.inc (PSoC 5LP Real View)	Deprecated version of cydevicekeil_trm.inc, cydevicegnu_trm.inc, or cydevicerv_trm.inc.
cyfitter.h	Defines all of the instance specific addresses calculated by the Code Generation step. This file is mainly intended for use by instance API implementations, although advanced users may find interesting information in this file.
cyfitter_cfg.c	Implements the methods and logic necessary to configure the device before main. You should not need to use anything implemented in this file.
cyfitter_cfg.h	Contains definitions used by the boot firmware to configure the device before main. You should not need to use anything defined in this file.

Source: http://www.cypress.com/file/355131/download

Generated Files (FM0+)

Upon a successful build, PSoC Creator generates various files that become a part of your design. These files are listed in the Workspace Explorer under the **Source** tab. These files are specific to the device series (FM0+) and the selected compiler. The following lists and describes the files generated from a build.

File(s)	Description
pdl	
All files in this folder are copied from the installed peripheral driver library (PDL). See Options Dialog.	
General Files	
cydisabledsheets.h	File of defines for disabled schematic pages.
cyfitter.h	Defines all of the instance specific addresses calculated by the Code Generation step. This file is mainly intended for use by instance API implementations, although advanced users may find interesting information in this file.
cymetadata.c	This file defines all extra memory spaces that need to be included. This file is automatically generated by PSoC Creator.
pdl_user.h	User settings header file for Peripheral Driver Library.

PSoC® Creator™ User Guide, Document # 001-93417 Rev *G 378

CYPRESS

Building a PSoC Creator Project

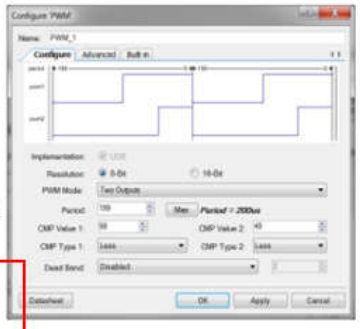
File(s)	Description
project.h	This file includes all of the other header files found in this directory and its sub-directories. It exists for convenience sake, allowing you to include all of the generated headers with just one #include statement.
<device>_rom.icf	Generated IAR linker file for the device. Do not touch.
<device>_rom.id	Generated GCC linker file for the device.

Source: http://www.cypress.com/file/355131/download

19. When a specific application is needed for a particular hardware, the generic functions and the specific functions are compiled together to yield a machine readable code. Cypress and/or its customers compile the generic functions and the specific functions using PSoC and/or any other compiling IDE supported by Cypress Semiconductor. Certain elements of this limitation are illustrated in the screenshots below and in the screenshots referenced in connection with other elements herein.

PSoC Creator is an Integrated Design Environment (IDE) that enables concurrent hardware and firmware editing, compiling and debugging of PSoC and FM0+ systems. Applications are created using schematic capture and over 150 pre-verified, production-ready peripheral Components.

Components are analog and digital peripherals represented by a symbol that users drag-and-drop into their designs and configure to suit a broad array of application requirements. Each Component in the rich mixed-signal Cypress Component Catalog is configured with a customizer dialog and includes a full set of dynamically generated API libraries. After configuring all the peripherals, firmware can be written, compiled, and debugged within PSoC Creator or exported to leading 3rd party IDEs such as IAR Embedded Workbench®, ARM® Microcontroller Development Kit, and Eclipse™.



PSoC and FM0+ Systems are energy optimized beyond a typical MCU because PSoC Creator optimizes designs to enable only the required functionality. Users can even create custom Components using state machine diagrams or Verilog to further optimize hardware and energy usage.

PSoC Creator is a free Windows-based IDE that includes:

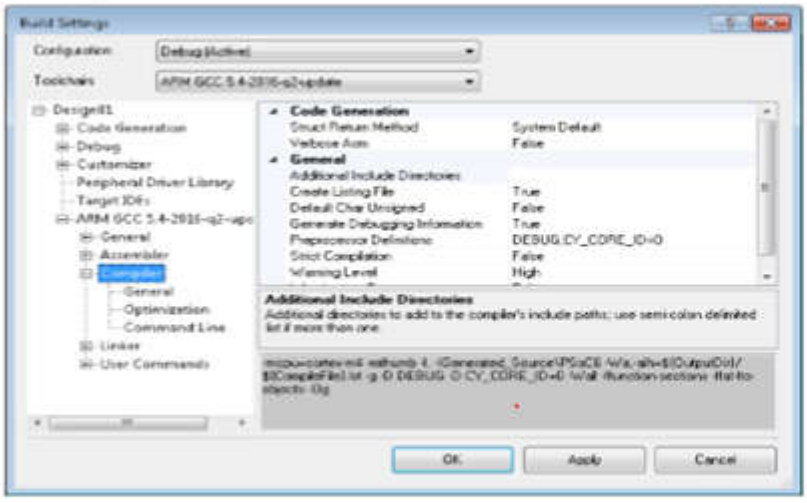
- Hardware design with complete schematic capture and easy-to-use wiring tool
- Over 150 pre-verified, production-ready Components
  - Full communications library including I2C, USB, UART, SPI, CAN, LIN, and Bluetooth Low Energy
  - Digital peripherals with powerful graphical configuration tools
  - Extensive analog signal chain support with amplifiers, filters, ADC and DAC
  - Dynamically generated API libraries
- Free C source code compiler with no code size limitations
- Integrated source editor with inline diagnostics, auto-complete and code snippets
- Built-in debugger

Source: http://www.cypress.com/products/psoc-creator-integrated-design-environment-ide#tabs-0-bottom_side-1

Compiler Build Settings

The Compiler section of the Build Settings dialog is used to control various options that will vary depending on the CPU and compiler.

ARM Options:



Code Generation

- **Struct Return Method** – Specify the method used for returning short structs/methods: system default, register, or memory.
- **Verbose Asm** – Enable extra commentary information in the generated assembly code to make it more readable: true or false.

Source: http://www.cypress.com/file/137441/download

20. Defendant's actions complained of herein will continue unless Defendant is

enjoined by this court.

21. Defendant's actions complained of herein are causing irreparable harm and monetary damage to Plaintiff and will continue to do so unless and until Defendant is enjoined and restrained by this Court.

22. Plaintiff is in compliance with 35 U.S.C. § 287.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff asks the Court to:

(a) Enter judgment for Plaintiff on this Complaint on all causes of action asserted herein;

(b) Enter an Order enjoining Defendant, its agents, officers, servants, employees, attorneys, and all persons in active concert or participation with Defendant who receive notice of the order from further infringement of United States Patent No. 7,069,546 (or, in the alternative, awarding Plaintiff a running royalty from the time of judgment going forward);

(c) Award Plaintiff damages resulting from Defendant's infringement in accordance with 35 U.S.C. § 284;

(d) Award Plaintiff pre-judgment and post-judgment interest and costs; and

(e) Award Plaintiff such further relief to which the Court finds Plaintiff entitled under law or equity.

Dated: December 11, 2017 Respectfully submitted,

/s/ Jay Johnson

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D. BRADLEY KIZZIA
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ATTORNEYS FOR PLAINTIFF

EXHIBIT A

APPENDIX S6

UNITED STATES DISTRICT COURT

DISTRICT OF DELAWARE

CODING TECHNOLOGIES, LLC, Plaintiff, vs. CYPRESS SEMICONDUCTOR CORPORATION, Defendant.	§	Case No.: _____ **COMPLAINT** **INJUNCTIVE RELIEF DEMANDED** **JURY TRIAL DEMANDED**

Plaintiff, CODING TECHNOLOGIES, LLC, sues Defendant, CYPRESS SEMICONDUCTOR CORPORATION, and alleges as follows:

NATURE OF THE ACTION

1. This is an action for infringement of United States Patent No. 8,540,159 under the Patent Act, 35 U.S.C. § 271, *et seq.*, based on Defendant's unauthorized commercial manufacture, use, importation, offer for sale, and sale of infringing products and services in the United States.

PARTIES

2. Plaintiff, CODING TECHNOLOGIES, LLC, is a foreign limited liability company, organized under the laws of the State of Texas.

3. Defendant, CYPRESS SEMICONDUCTOR CORPORATION, is a domestic corporation with its headquarters located in San Jose, California. Defendant uses, sells, and/or offers to sell products and services in interstate commerce that infringe the '159 Patent.

SUBJECT MATTER JURISDICTION

4. This court has original jurisdiction over the subject matter of this action, pursuant to 28 U.S.C. §§ 1331 and 1338(a), because this action involves a federal question relating to patents.

PERSONAL JURISDICTION

5. The court has general *in personam* jurisdiction over Defendant because Defendant is a citizen of the State of Delaware and is found in this state.

VENUE

6. Venue is proper in this court, pursuant to 28 U.S.C. § 1400(b), because Defendant resides in this judicial district.

COUNT I
PATENT INFRINGEMENT

7. Plaintiff repeats and re-alleges paragraphs 2 through 6 by reference, as if fully set forth herein.

8. On September 24, 2013, the United States Patent & Trademark Office (USPTO) duly and legally issued the '159 Patent, entitled "Method for Providing Mobile Service Using Code Pattern." A true and authentic copy of the '159 Patent is attached hereto as **Exhibit "A"** and incorporated herein by reference.

9. The '159 Patent teaches a method and apparatus for providing a mobile service with the use of code pattern.

10. The '159 Patent is directed to computerized decoding technologies to provide users with access to and use of various content more conveniently. Traditionally, companies simply provided their URL information to the consuming public, but this is effective only if a consumer memorized the name and spelling of the URL. Thus, there was a need in the art to

provide an effective product or method to assist consumers with recalling website or URL information.

11. The '159 Patent claims, among other things, a method of providing content with the use of code pattern by a user terminal; a user terminal for providing content with the use of code pattern; a non-transitory machine-readable storage medium having encoded thereon program code; and, a method of providing content with the use of an image captured by a user terminal.

12. Collectively, the claimed embodiments in the '159 Patent provide new solutions to problems related to transmitting information from a mobile service provider to a mobile device.

13. The '159 Patent solves a problem with the art that is rooted in computer technology that uses mobile service providers. The '159 Patent does not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet.

14. Plaintiff is the assignee of the entire right, title, and interest in the '159 Patent at the USPTO, including the right to assert causes of action arising under the '159 Patent.

15. Upon information and belief, Defendant has and continues to directly infringe, contributorily infringe, or actively induce the infringement of the '159 Patent by making, using (including by at least internally testing the Accused Products as defined herein), selling, offering for sale, importing in the United States, including this judicial district, a user terminal designed to capture certain code pattern information and convert same into embedded content, which embodies or uses the invention claimed in the '159 Patent (the "Accused Products"), all in violation of 35 U.S.C. § 271.

16. The Accused Products infringe at least claims 1, 2, 3, 8, 9, 10, 15, and 16 of the '159 Patent.

Claim 1

17. Through claim 1, the '159 Patent claims a method of providing content with the use of a code pattern by a user terminal, the method comprising: obtaining a photographic image of a code pattern by a camera of the user terminal; processing, by a processor of the user terminal, the photographic image of the code pattern to extract the code pattern from the photographic image; decoding the extracted code pattern by the processor of the user terminal into code information; transmitting a content information request message to a server based on the code information; and receiving content information from the server in response to the content information request message.

18. Defendant infringes claim 1.

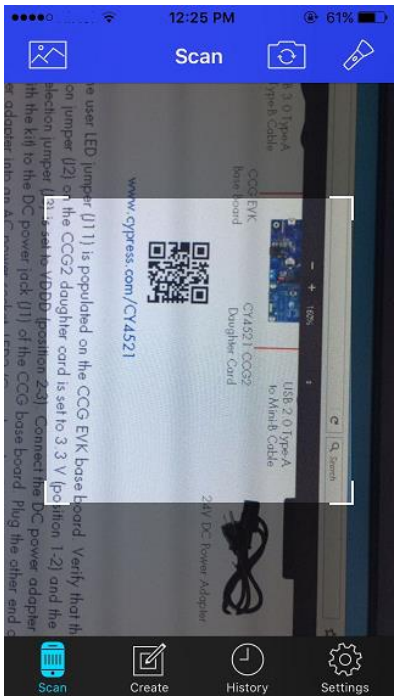
19. Defendant, at least in internal use and testing, practices a method of providing content (*e.g.*, a web page associated with the defendant) with the use of a code pattern (*e.g.*, a QR code) by a user terminal (*e.g.*, a smartphone), as demonstrated in the following images:





20. Defendant, at least in internal use and testing, obtains a photographic image of a code pattern (*e.g.*, QR code) by a camera of the user terminal (*e.g.*, smartphone), as shown below:





21. Defendant, at least in internal use and testing, processes by a processor of the user

terminal (*e.g.*, smartphone), the photographic image of the code pattern (*e.g.*, QR code) to view and extract the code pattern from the photographic image, as shown below:

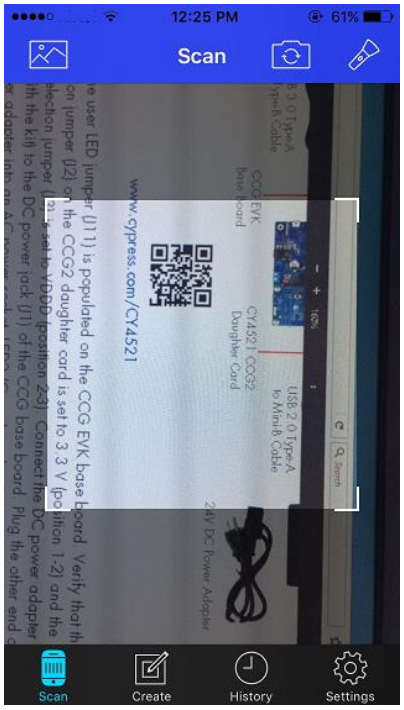
iPhone 7 Overview

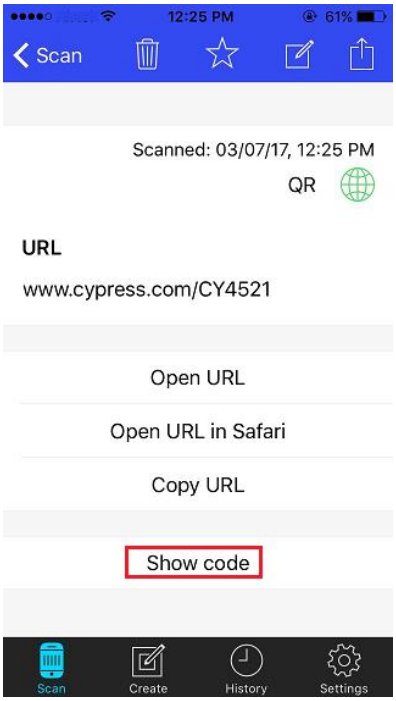
Chip



A10 Fusion chip with 64-bit architecture

Embedded M10 motion coprocessor

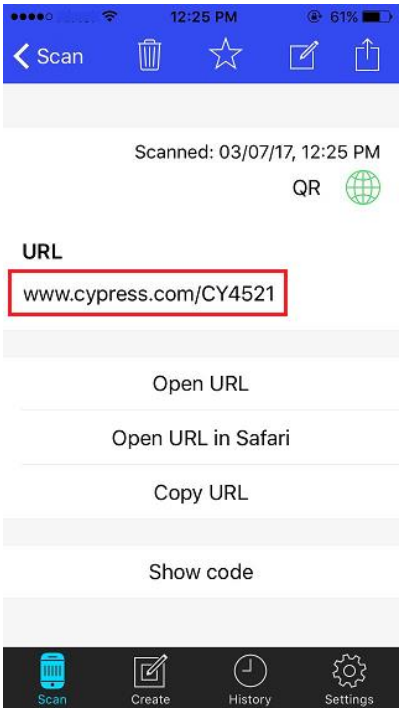






22. Defendant, at least in internal use and testing, decodes the extracted code pattern by the processor of the user terminal from the QR code into code information (*e.g.*, URL of web page associated with the defendant), as shown below:





23. Defendant, at least in internal use and testing, transmits a content information request message (*e.g.*, http request message for accessing the webpage associated with Defendant) to a server (*e.g.*, Defendant's server) based on the code information (*e.g.*, URL of the webpage associated with Defendant). As shown below, once the URL is decoded from the extracted QR code, a request for accessing a webpage associated with Defendant is sent to Defendant's server.





24. Defendant, at least in internal use and testing, receives content information (*e.g.*, a web page associated with Defendant) from the server (*e.g.*, Defendant's server) in response to the content information request message (*e.g.*, http request message for accessing the webpage associate with Defendant). As shown below, the terminal (*e.g.*, smartphone) receives content information (*e.g.*, webpage associated with Defendant).



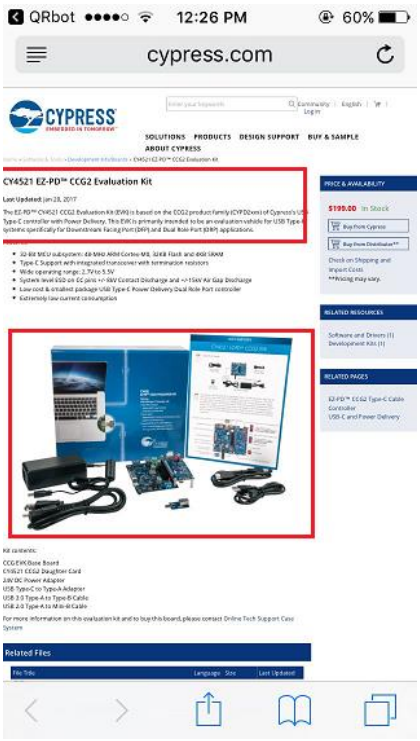


Claim 2

25. Through claim 2, the '159 Patent claims the method of claim 1, wherein the content information comprises at least one of the following: image, sound, moving picture, and text data.

26. Defendant infringes claim 2.

27. Defendant uses a user terminal to receive content information that comprises image and text data, as shown below:



Claim 3

28. Through claim 3, the '159 Patent claims the method of claim 1, wherein the transmitting a content information request message includes: extracting a uniform resource locator (URL) of the server from the code information; and transmitting the content information request message to the server based on the extracted URL.

29. Defendant infringes claim 3.

30. Defendant transmits a content information request message (*e.g.*, http request message for accessing the webpage associate with Defendant) which includes extracting URL of the server and transmitting the content information request message (*e.g.*, http request message for accessing the webpage associate with Defendant) to the server (*e.g.*, Defendant's server) based on the extracted URL.

Claim 8

31. Through claim 8, the '159 Patent claims a user terminal for providing content

with the use of a code pattern, the user terminal comprising: a camera configured to obtain a photographic image of a code pattern; a processor comprising: an image processor configured to process the photographic image of the code pattern to extract the code pattern from the photographic image; and a decoder configured to decode the extracted code pattern into code information; and a transceiver configured to (i) transmit a content information request message to a server based on the code information; and (ii) receive content information from the server in response to the content information request message.

32. Defendant infringes claim 8.

33. Defendant, at least in internal use and testing, uses a user terminal (*e.g.*, smartphone) for providing content (*e.g.*, a web page associated with Defendant) with the use of a code pattern (*e.g.*, QR code).

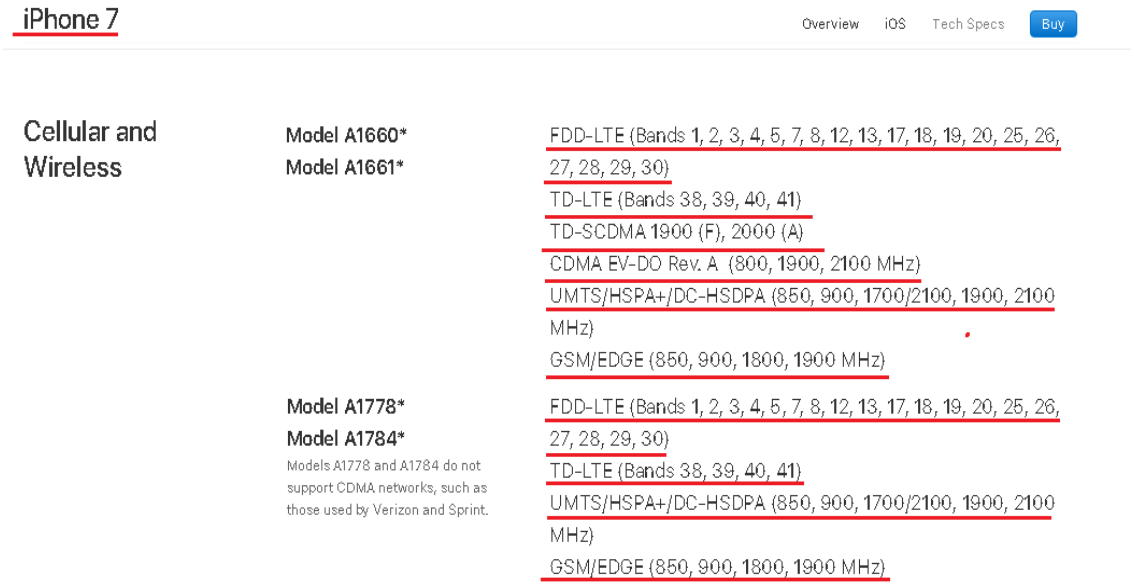
34. Defendant uses a user terminal comprising a camera configured to obtain a photographic image of a code pattern (*e.g.*, QR code).

35. Defendant uses a user terminal comprising a processor which in turn comprises an image processor configured to process the photographic image of the code pattern (*e.g.*, QR code) to extract the code pattern (*e.g.*, QR code) from the photographic image. Once the photographic image of the QR code is captured by the camera of the smartphone, the photographic image is processed to retrieve the QR code. The retrieved QR code can be viewed on the user interface screen of the smartphone.

36. Defendant uses a user terminal (*e.g.*, smartphone) comprising a decoder that is configured to decode the extracted code pattern (*e.g.*, QR code) into code information (*e.g.*, URL of web page associated with Defendant).

37. Defendant uses a user terminal comprising a transceiver (*e.g.*, FDD- LTE/TDD -

LTE/CDMA//EDGE transceiver) which is configured to transmit or receive a content information request message (*e.g.*, http request message for accessing the webpage associated with Defendant) to a server (*e.g.*, Defendant's server) based on the code information (*e.g.*, URL of the webpage associated with Defendant). As shown below, once the URL is decoded from the extracted QR code, a request or response for accessing a webpage associated with Defendant is sent to Defendant's server by means of transceiver of the smartphone:



iPhone 7

Overview iOS Tech Specs Buy

Cellular and Wireless	Model A1660* Model A1661*	FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30) TD-LTE (Bands 38, 39, 40, 41) TD-SCDMA 1900 (F), 2000 (A) CDMA EV-DO Rev. A (800, 1900, 2100 MHz) UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz) GSM/EDGE (850, 900, 1800, 1900 MHz)
	Model A1778* Model A1784* Models A1778 and A1784 do not support CDMA networks, such as those used by Verizon and Sprint.	FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30) TD-LTE (Bands 38, 39, 40, 41) UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz) GSM/EDGE (850, 900, 1800, 1900 MHz)





Claim 9

38. Through claim 9, the '159 Patent claims the user terminal of claim 8, wherein the content information comprises at least one of the following: image, sound, moving picture, and text data.

39. Defendant infringes claim 9.

40. Defendant uses a user terminal to receive content information that comprises

image and text data.

Claim 10

41. Through claim10, the '159 Patent claims the user terminal of claim 8, wherein: the processor is further configured to extract a uniform resource locator (URL) of the server from the code information; and the transceiver is further configured to transmit the content information request message to the server based on the extracted URL.

42. Defendant infringes claim 10.

43. Defendant uses a user terminal (*e.g.*, smartphone) that is configured to extract a uniform resource locator (URL) of the server (*e.g.*, Defendant's server) from the code information (*e.g.*, URL of web page associated with Defendant).

44. Defendant uses a user terminal (*e.g.*, smartphone) comprising a transceiver configured to transmit the content information request message (*e.g.*, http request message for accessing the webpage associate with Defendant) to the server (*e.g.*, Defendant's server) based on the extracted URL.

Claim 15

45. Through claim 15, the '159 Patent claims a non-transitory machine-readable storage medium, having encoded thereon program code, wherein, when the program code is executed by a machine, the machine implements a method for providing content with the use of a code pattern by a user terminal, comprising the steps of: obtaining a photographic image of a code pattern by a camera of the user terminal; processing, by a processor of the user terminal, the photographic image of the code pattern to extract the code pattern from the photographic image; decoding the extracted code pattern by the processor of the user terminal into code information; transmitting a content information request message to a server based on the code information;

and receiving content information from the server in response to the content information request message.

46. Defendant infringes claim 15.

47. Defendant, at least in internal use and testing, practices a method of providing content (*e.g.*, a webpage associated with Defendant) with the use of a code pattern (*e.g.*, a QR code) by a user terminal (*e.g.*, a smartphone).

48. Defendant, at least in internal use and testing, obtains a photographic image of a code pattern (*e.g.*, QR code) by a camera of the user terminal (*e.g.*, smartphone).

49. Defendant, at least in internal use and testing, uses a processor of the user terminal (*e.g.*, smartphone) to processes the photographic image of the code pattern (*e.g.*, QR code) to extract the code pattern from the photographic image.

50. Defendant, at least in internal use and testing, decodes the extracted code pattern by the processor of the user terminal into code information (*e.g.*, URL of web page associated with Defendant).

51. Defendant, at least in internal use and testing, transmits and receives a content information request message (*e.g.*, http request message for accessing the webpage associated with Defendant) to and from a server (*e.g.*, Defendant's server) based on the code information (*e.g.*, URL of the webpage associated with Defendant).

Claim 16

52. Through claim 16, the '159 Patent claims a method of providing content with the use of an image captured by a user terminal, the method comprising: obtaining a photographic image by a camera of the user terminal; processing, by a processor of the user terminal, the photographic image to extract characteristic information from the photographic image;

transmitting a content information request message with the extracted characteristic information to a server; and receiving content information from the server in response to the content information request message.

53. Defendant infringes claim 16.

54. Defendant, at least in internal use and testing, practices a method of providing content (*e.g.*, a webpage associated with Defendant) with the use of a code pattern (*e.g.*, a QR code) by a user terminal (*e.g.*, a smartphone).

55. Defendant, at least in internal use and testing, obtains a photographic image of a code pattern (*e.g.*, QR code) by a camera of the user terminal (*e.g.*, smartphone).

56. Defendant, at least in internal use and testing, processes by a processor of the user terminal (*e.g.*, smartphone), the photographic image of the code pattern (*e.g.*, QR code) to extract characteristic information from the photographic image.

57. Defendant, at least in internal use and testing, transmits and receives a content information request message (*e.g.*, http request message for accessing the webpage associated with Defendant) to or from a server (*e.g.*, Defendant's server) based on the extracted characteristic information (*e.g.*, URL of the webpage associated with Defendant).

58. Upon information and belief, Defendant has known of the existence of the '159 Patent, and its acts of infringement have been willful and in disregard for the '159 Patent, without any reasonable basis for believing that it had a right to engage in the infringing conduct.

59. Defendant's acts of infringement of the '159 Patent have caused and will continue to cause Plaintiff damages for which Plaintiff is entitled to compensation pursuant to 35 U.S.C. § 284.

60. Defendant's acts of infringement of the '159 Patent have caused and will continue

to cause Plaintiff immediate and irreparable harm unless such infringing activities are also enjoined by this court pursuant to 35 U.S.C. § 283. Plaintiff has no adequate remedy at law.

61. Upon information and belief, the '159 Patent, at all times material, was and is in compliance with 35 U.S.C. § 287.

62. Plaintiff retained the law firms of WATSON LLP and STAMOULIS & WEINBLATT, LLC to represent its interests in this action, and is obligated to pay such firm reasonable attorneys' fees for its services. Plaintiff may recover its attorneys' fees and costs from Defendant, pursuant to 35 U.S.C. § 285, because this case is exceptional.

WHEREFORE, Plaintiff, CODING TECHNOLOGIES, LLC, demands judgment against Defendant, CYPRESS SEMICONDUCTOR CORPORATION, and respectfully seeks the entry of an order (i) adjudging that Defendant has infringed the '159 Patent, in violation of 35 U.S.C. § 271; (ii) granting an injunction enjoining Defendant, its employees, agents, officers, directors, attorneys, successors, affiliates, subsidiaries and assigns, and all of those in active concert and participation with any of the foregoing persons or entities from infringing, contributing to the infringement of, or inducing infringement of the '159 Patent; (iii) ordering Defendant to account and pay damages adequate to compensate Plaintiff for Defendant's infringement of the '159 Patent, with pre-judgment and post-judgment interest and costs, pursuant to 35 U.S.C. § 284; (iv) ordering that the damages award be increased up to three times the actual amount assessed, pursuant to 35 U.S.C. § 284; (v) declaring this case exceptional and awarding Plaintiff its reasonable attorneys' fees, pursuant to 35 U.S.C. § 285; and, (vi) awarding such other and further relief as this court deems just and proper.

DATED on October 16, 2017

Respectfully submitted,

/s/ Stamatios Stamoulis
STAMOULIS & WEINBLATT LLC
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Richard C. Weinblatt #5080
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CODING TECHNOLOGIES, INC.

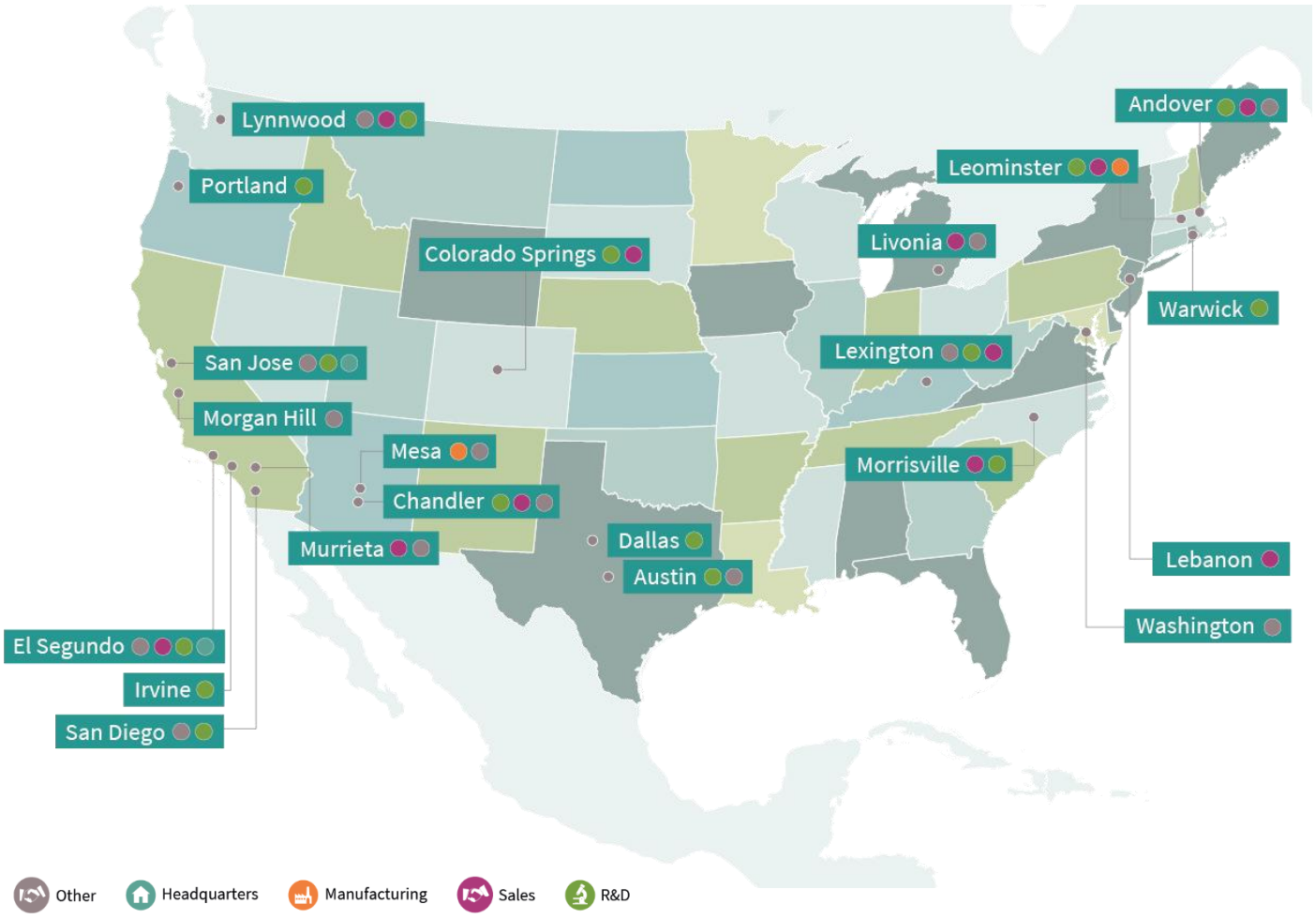
APPENDIX T1

Infineon in the United States

A global semiconductor leader in power systems and IoT

U.S. presence

~2,500 employees | **21** sites | **2** sites dedicated to manufacturing | **15** sites dedicated to R&D



To learn more about Infineon, visit www.infineon.com

Investing in the United States

More than **200 Infineon chips** per vehicle

11,558 U.S. patents
2,010 pending U.S. patents

Invested over **$15.5 billion** in acquisitions in the Americas



Our **Silicon Valley Innovation Center** partners with customers and startups to create tomorrow's disruptive technologies.

Infineon powers **AI from grid to core**.

We spend over **$1.6 billion** annually with **2,000+** vendors in the U.S.

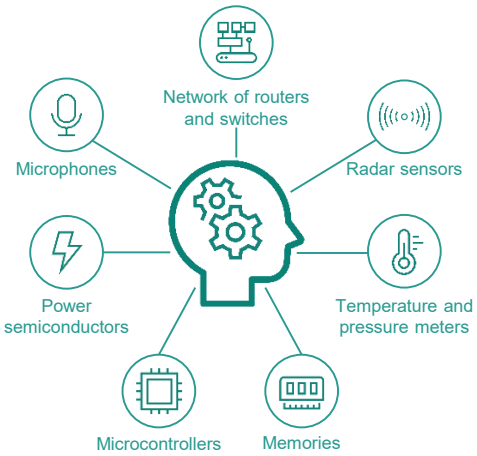
Key focus areas

AI · Electrification · Energy · Mobility · IoT · Security

Enabling innovation

Infineon **"smartifies"** lives by enabling **"things"** to **"see," "hear," "feel"** and **"understand"** their environment.

Barely visible, semiconductors have become an indispensable part of everyday life. Infineon plays a key role in shaping a better future – with microelectronics that link the real and the digital world.



Infineon: a trusted partner

Semiconductors in the modern economy*

The U.S. semiconductor industry's labor productivity has **more than doubled** since 2001.

Semiconductor companies employ over **345,000 Americans** and generate almost **2 million jobs** in the U.S.

American semiconductor companies invest about **one-fifth of their annual sales into R&D** ($70.0 billion in 2024).

The U.S. semiconductor industry has half of the **global market share**.

Source: SIA 2025 Factbook



America exported **$57 billion** in semiconductors in 2024, making it the **6th largest** export industry in the U.S.

APPENDIX T2

Infineon at a Glance

Investor Fact Sheet – Q3 FY25

Our Company

Infineon Technologies AG is a world leader in semiconductor solutions with about 58,060 employees at more than 100 locations. We are leading in all our major end markets: automotive, power semiconductors, and security ICs, thereby enabling solutions for green and efficient energy, clean and safe mobility, as well as smart and secure IoT.

Our Mission

We make life easier, safer, and greener – with technology that achieves more, consumes less and is accessible to everyone. Our products power decarbonization and digitalization. Microelectronics from Infineon is the key to a better future.

Our Divisions

In the **Automotive** (ATV) segment, we develop products and solutions for classical applications while also advancing the digitalisation and decarbonisation of vehicles. Core applications: powertrain, ADAS, comfort electronics, security, infotainment.

In the **Green Industrial Power** (GIP) division, we specialize in the smart, green and efficient conversion of electric energy along the entire supply chain and enable its decarbonization. Main applications: solar and wind, energy storage, industrial applications, robotics, charging stations.

In the **Power & Sensor Systems** (PSS) division, we focus on power semiconductors for power supplies, smart sensitivity as well as components for cellular infrastructure and mobile devices. Main applications: BLDC motors, charging stations, power management, IoT, high-reliability applications.

The **Connected Secure Systems** (CSS) division specializes in hardware-based IT security solutions. CSS is also responsible for connectivity solutions as well as all non-automotive microcontrollers. Main applications: Authentication, governmental IDs, payment systems, mobile devices, consumer electronics, IoT.

Target Operating Model (average-cycle targets)

>10%	25%	10-15%
Revenue Growth	Segment Result Margin	Adj. Free Cash Flow Margin

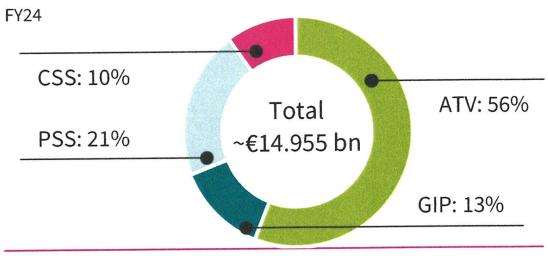
Market Position

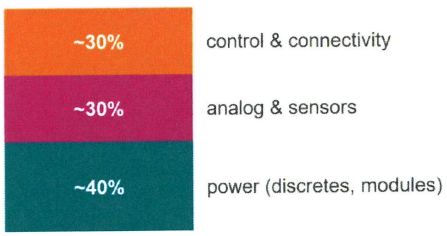
Automotive	Power	Security ICs
		
# 1	# 1	# 1

See also www.infineon.com/cms/en/about-infineon/investor/

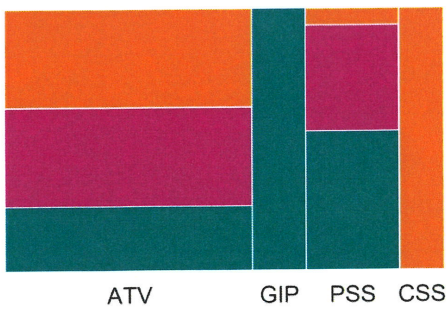
Revenue distribution

(by segment and product category)





of total revenue



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Infineon at a Glance

Investor Fact Sheet – Q3 FY25

Sustainability at Infineon

MSCI AA Rating

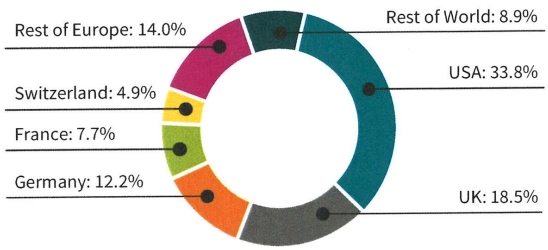
MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM — Listed in the DJSI since 2010

CDP DISCLOSURE INSIGHT ACTION — A- climate scoring, B water scoring

See also www.infineon.com/cms/en/about-infineon/sustainability/

Inst. Shareholder Structure

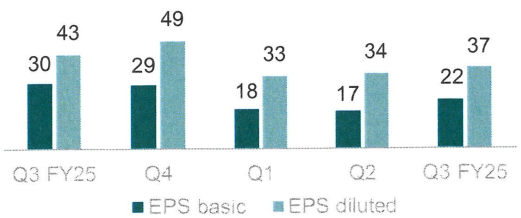
(by region, 30 Sep 2024)



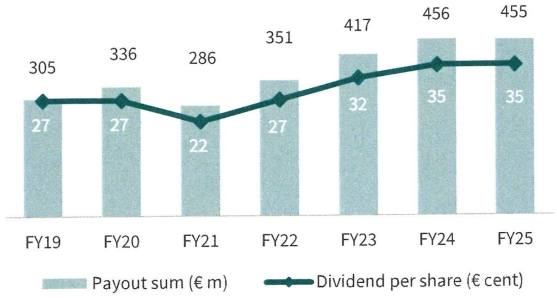
Infineon Stock & Financial Data (30 Jun 2025)

Ticker symbol	IFX (share), IFNNY (ADS)
Stock exchange listings	FSE, OTCQX
ISIN / WKN	DE0006231004 / 623100
Share capital	€2,611,842,274
Shares issued	1,305,921,137
Own shares	3,476,590
52-week high / low	€38.51 / €29.81 (Xetra)
Market cap	€47.04 bn

Earnings-per-share development (€ cent, diluted)



Dividend Development



Relative Share Price Performance

(1 Jul 2025 – 30 Jun 2025)



Key Financials

€ millions	Q3 FY25	FY24	FY23
Revenue	3,704	14,955	16,309
Segment result	668	3,105	4,399
SR margin	18.0%	20.8%	27.0%
Free cash flow	288	23	1,158
RoCE	6.0%	8.7%	16.6%

See also www.infineon.com/cms/en/about-infineon/investor/

Outlook

~ €3.9bn
Q4 FY25 revenue expectation

~ €14.6bn
FY25 revenue expectation

high-teens %
Q4 FY25 Segment Result Margin

high-teens %
FY25 Segment Result Margin

Investor Contact

Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Investor Hotline: +49 89 234 26655
Mail: investor.relations@infineon.com

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APPENDIX T3

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

MOSAID TECHNOLOGIES INC., *Plaintiff*, v. INFINEON TECHNOLOGIES AG and INFINEON TECHNOLOGIES AMERICAS CORP., *Defendants*.	Civil No. 1:25-cv-00358 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff MOSAID Technologies Inc. ("Plaintiff" or "MOSAID") files this Complaint for Patent Infringement against Defendants Infineon Technologies AG ("Infineon AG") and Infineon Technologies Americas Corp. ("Infineon Americas") (collectively, "Defendants" or "Infineon") alleging as follows:

NATURE OF SUIT

1. This is a claim for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code.

PARTIES, JURISDICTION, AND VENUE

2. This action arises under the patent laws of the United States, 35 U.S.C. § 101, *et seq.* This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

I. MOSAID

3. MOSAID (f/k/a Conversant Intellectual Property Management, Inc.) is a Canadian company having a principal place of business at 515 Legget Drive, Suite 100, Ottawa, ON, Canada.

4. MOSAID was founded in 1975 by engineers Richard Foss and Robert Harland. MOSAID focused its early efforts on inventing ways to improve Dynamic Random Access

Memory (DRAM) semiconductor chips. MOSAID's engineers also designed and built test equipment for debugging prototype memory chips.

5. MOSAID is now a leading patent management company with a world-class licensing team and an enviable record of success. MOSAID's success is defined by the numerous licenses it has signed with industry leaders. MOSAID prides itself on its patent expertise, a determination to engage in meaningful negotiation, and a commitment to transparency and the principled enforcement of high-quality patents.

6. MOSAID owns approximately 800 active patents as of February 2025. A large portion of the portfolio was developed in-house from research and development efforts focusing on flash memory technologies. MOSAID's microcomponents patents also include marquee patents relating to power management, based on various inventions derived from MOSAID's own R&D and product development businesses.

7. MOSAID is the assignee and owns all right, title, and interest to United States Patent No. 7,111,179 ("the '179 Patent"), United States Patent No. 7,051,306 ("the '306 Patent"), and United States Patent No. 7,349,448 ("the '448 Patent"). The '179 Patent, '306 Patent, and '448 Patent are collectively referred to herein as the "Asserted Patents."

II. INFINEON

8. Defendant Infineon Technologies AG ("Infineon AG") is a corporation organized and existing under the laws of the Federal Republic of Germany, and is located at Am Campeon 1-15, 85579 Neubiberg, Germany.

9. Infineon AG is listed on the Frankfurt Stock Exchange (ticker symbol: IFX) and in the USA on the over-the-counter market OTCQX International Premier (ticker symbol: IFNNY).

10. On information and belief, with a global presence, Infineon AG operates through its subsidiaries in the U.S.

11. Defendant Infineon Technologies Americas Corp. ("Infineon Americas") is a corporation duly organized and existing under the laws of the state of Delaware and may be served with process through its Texas registered agent, Corporation Service Company d/b/a CSC – Lawyers Incorporating Service Company, 211 E. 7th Street, Suite 620, Austin, Texas 78701. Infineon Americas has a regular and established place of business in the Western District of Texas, including at 5204 E. Ben White Blvd, Austin, Texas 78741. On information and belief, Infineon Americas also maintains other offices in the State of Texas, including in Houston, Texas.

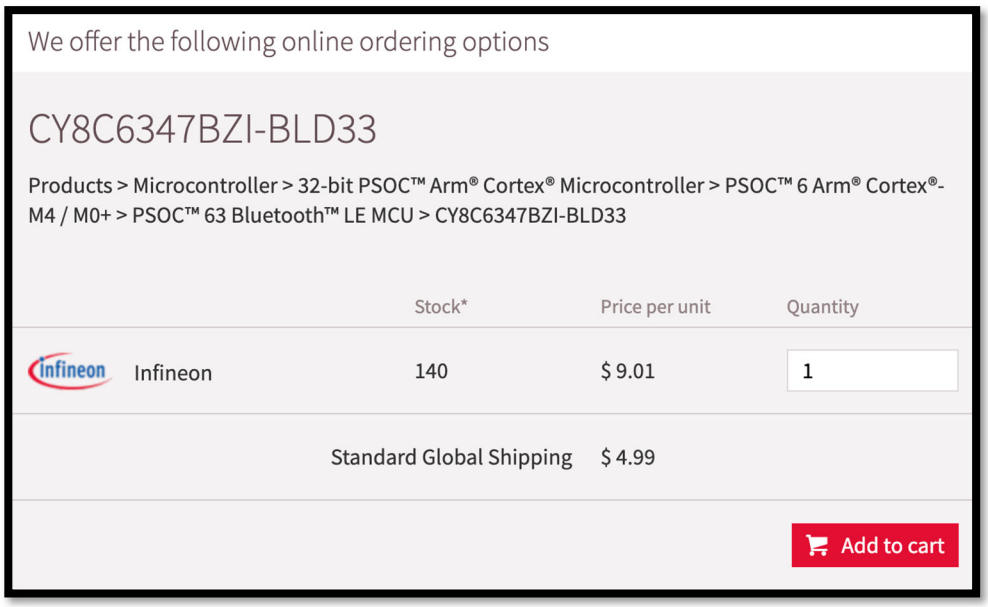
12. On information and belief, Infineon Americas is a wholly owned subsidiary of Infineon AG.

13. Cypress Semiconductor Corporation ("Cypress") was an American semiconductor design and manufacturing company offering products such as NOR flash memories, F-RAM and SRAM Traveo microcontrollers, PSoCs, and others. On or around April 16, 2020, Infineon AG acquired 100% ownership of Cypress. On information and belief, at the time of the acquisition, Cypress was registered to do business in Texas, was transacting business in Texas and in this District, and maintained a regular and established place of business in this District at 5204 E. Ben White Blvd, Austin, Texas 78741. On information and belief, at least Infineon Americas took over Cypress's operations at 5204 E. Ben White Blvd, Austin, Texas 78741 following Infineon AG's acquisition of Cypress.

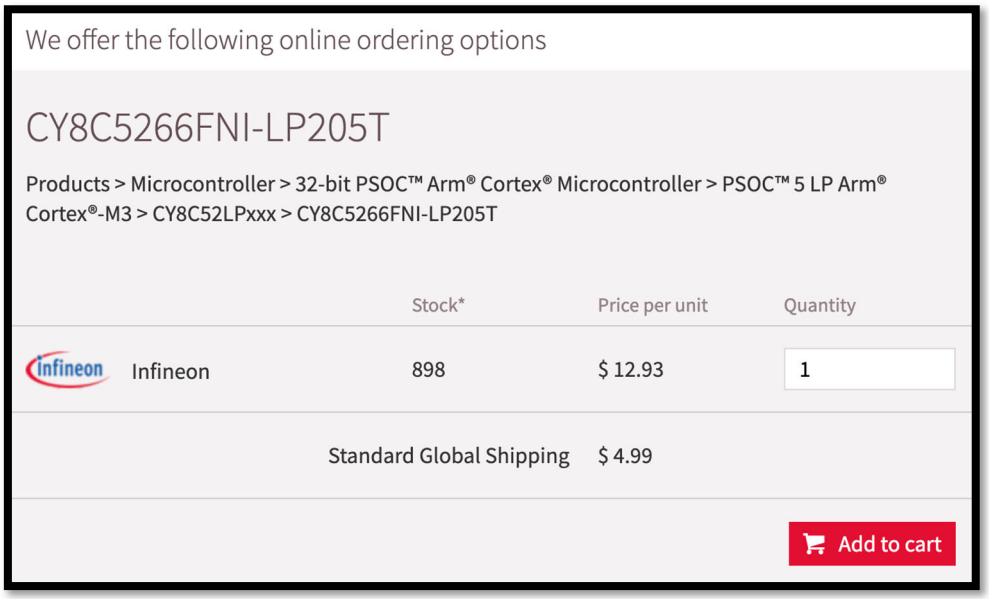
14. On information and belief, each Defendant, Infineon AG and Infineon Americas (collectively, "Infineon"), is a semiconductor company that designs, develops, makes, uses, offers for sale, sells in the United States, and/or imports into the United States, a variety of semiconductor products for the communications, Internet of Things ("IoT"), automotive, computer, and/or consumer electronics industries.

15. On information and belief, Infineon designs, develops, makes, uses, offers for sale, sells in the United States, and/or imports into the United States, certain processor products such as programmable system on a chip ("PSoC") products including at least the PSoC 3, PSoC 4, PSoC 5, and PSoC 6 families, and wireless connectivity SoCs including at least the AIROC Wi-Fi and Bluetooth Combo products, among other substantially similar processor products (hereinafter, the "Accused Products").

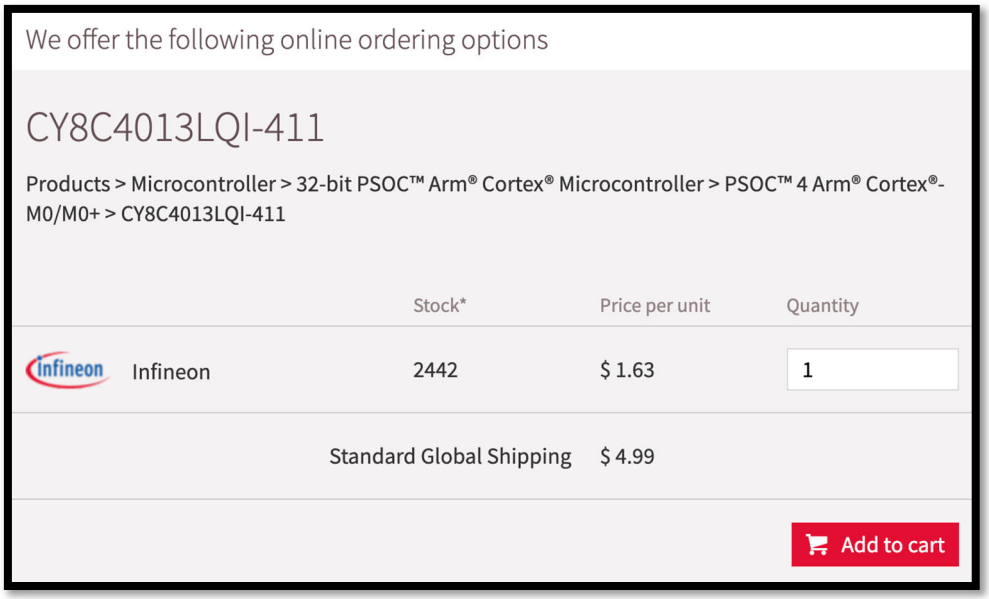
16. On information and belief, Infineon offers for sale and sells its products, including the Accused Products, directly to consumers in the United States, including in this District. For example, Infineon AG offers for sale and sells its products, including the Accused Products, in the United States via its website https://www.infineon.com:



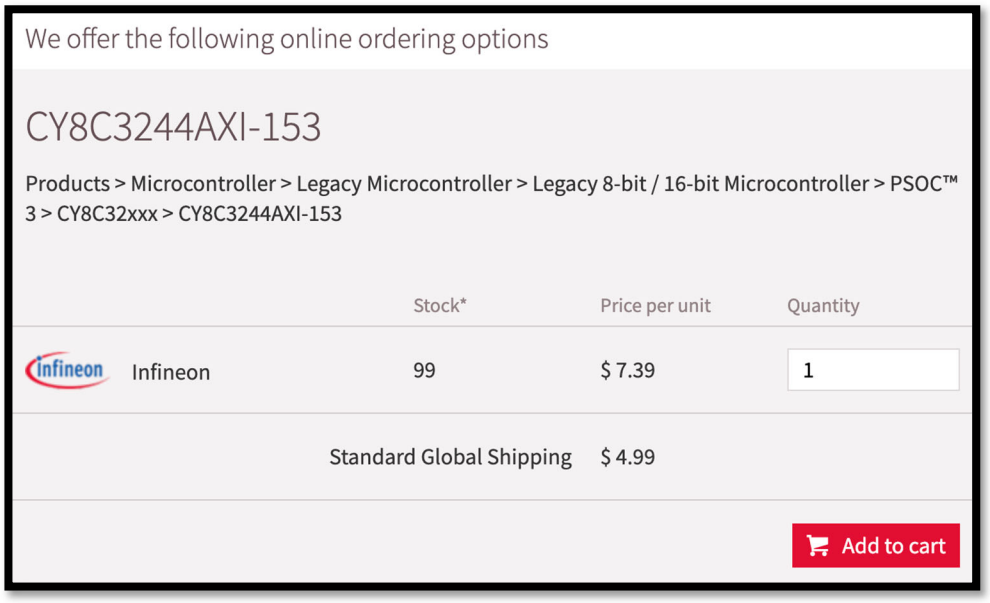
(Exemplary PSoC 6 product available for purchase on Infineon's website.)



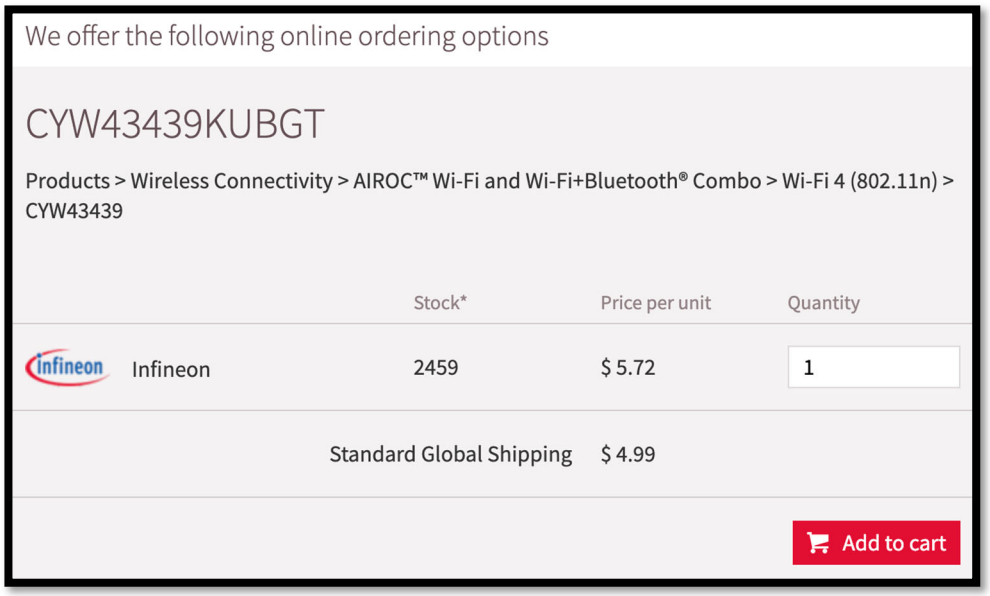
(Exemplary PSoC 5 product available for purchase on Infineon's website.)



(Exemplary PSoC 4 product available for purchase on Infineon's website.)



(Exemplary PSoC 3 product available for purchase on Infineon's website.)



(Exemplary AIROC Wi-Fi and Bluetooth Combo product available for purchase on Infineon's website.)

17. Infineon AG operates https://www.infineon.com, as stated in the website's footer and linked Terms of Use:



(https://www.infineon.com.)



(https://www.infineon.com/cms/en/about-infineon/usage-terms.)

18. Infineon AG is also the Registrant Contact in the domain registration record for https://www.infineon.com.

19. Infineon also sells its Accused Products in the United States through Infineon Distribution Partners, including eCommerce Partners, Franchised Distributors, and Specialty Distributors.

20. On information and belief, Infineon sells its Accused Products to numerous companies in the United States, including companies in this District, for use in consumer end products.

21. On information and belief, Infineon AG has substantial connections to the State of Texas. For example, Infineon AG has sold products to companies in Texas, including in this District, for use in consumer end products. For example, Infineon's NOR Flash memory products

are used in Tesla vehicles, including at least the display system for the Tesla Model Y, which are manufactured in Austin, Texas at Tesla, Inc.'s global headquarters.

22. As another example, Infineon AG has partnered with Texas companies to provide products to customers in the United States, including in this District. For example, in 2023, Infineon AG announced its partnership with Spark Connected to provide a 500W wireless charging solution named Yeti. On information and belief, Spark Connected is a company organized under the laws of Texas and headquartered in Dallas, Texas. The Yeti 500W is a ready-to-integrate wireless charging module intended for the powering and charging of industrial machinery, autonomous mobile robots, automated guided vehicles, light electric vehicles, e-Mobility and other power-intensive applications. The module integrates at least Infineon's dual-core PSoC 63 Bluetooth Low Energy MCU, a microcontroller unit within Infineon's PSoC 6 product family, which infringes at least the '306 Patent.

23. In addition, on information and belief, Infineon AG has been collaborating with Siemens Industry Software Inc. (d/b/a Siemens Digital Industries Software) since at least November 19, 2024, to integrate Siemens' automotive embedded software platform with Infineon's AURIX microcontroller. Siemens Digital Industries Software is headquartered in Plano, Texas.

24. On information and belief, Infineon AG has showcased its products at trade shows in Texas, including at the Applied Power Electronics Conference ("APEC"). For example, Infineon AG showed several new products, including new packaging for its MOSFET family of products, at APEC 2022 held in Houston, Texas, and played a large role as a contributor to the conference program, participating in over 20 sessions. Infineon AG also had an exhibit at the APEC 2018 conference in San Antonio, Texas, where Infineon AG showcased its power

semiconductor technologies and participated in 15 sessions and seminars. In addition, Infineon AG attended the APEC 2011 conference in Fort Worth, Texas, where Infineon AG highlighted its OptiMOS 60-150V in CanPAK product. Infineon AG also showed its families of OptiMOS 3 power semiconductors and other products at the APEC 2008 conference held in Austin, Texas. At the APEC 2006 conference held in Dallas, Texas, Infineon AG introduced its OptiMOS 2 100V family of MOSFET devices and its second-generation silicon carbide Schottky diodes. In addition, at APEC 2005 held in Austin, Texas, Infineon AG introduced its CoolMOS CS Server series of high-performance power transistors.

25. Infineon AG is subject to specific and general personal jurisdiction in this Court. This Court has personal jurisdiction over Infineon AG because, on information and belief, Infineon AG has engaged in continuous, systematic, and substantial activities within this State, including substantial marketing and sales of products and services within this State and District. Furthermore, on information and belief, this Court has personal jurisdiction over Infineon AG because Infineon AG has committed acts of infringement giving rise to MOSAID's claims for patent infringement within and directed to this District.

26. On information and belief, Infineon AG has conducted, and does conduct, substantial business in this District, directly and/or through subsidiaries, agents, representatives, or intermediaries, including, but not limited to: (i) at least a portion of the acts of infringement alleged herein; (ii) purposefully and voluntarily placing one or more Accused Products into the stream of commerce with the expectation that they will be purchased by consumers in this District; and/or (iii) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services provided to individuals in this State and

in this District. Thus, Infineon AG is subject to this Court's specific and general personal jurisdiction pursuant to due process and the Texas Long-Arm Statute.

27. To the extent Infineon AG is not subject to jurisdiction in any state's courts of general jurisdiction, this Court has personal jurisdiction over Infineon AG pursuant to Federal Rule of Civil Procedure 4(k)(2) because MOSAID's claims arise under federal law and exercising jurisdiction is consistent with the United States Constitution and laws.

28. The exercise of personal jurisdiction over Infineon AG would not offend traditional notions of fair play and substantial justice.

29. Infineon AG has acknowledged that this Court has personal jurisdiction over it. *See, e.g.*, *Staktek Group, L.P. v. Infineon Technologies AG*, No. 1:03-cv-00219-LY (W.D. Tex.) (Dkt. No. 3). Infineon AG has also admitted that personal jurisdiction existed over it in cases filed in other Texas district courts. *See, e.g.*, *Third Dimension Semiconductor, Inc. v. Infineon Technologies North America Corp. & Infineon Technologies AG*, No. 6:08-cv-00129-LED (E.D. Tex.) (Dkt. No. 24).

30. Infineon AG has also previously filed suit in this District. *See, e.g.*, *Infineon Technologies AG v. Harthcock*, No. 1:10-cv-00316-LY (W.D. Tex.) (Dkt. No. 1); *Infineon Technologies AG v. Infixeon, L.L.C.*, No. 1:07-cv-00039-SS (W.D. Tex.) (Dkt. No. 1).

31. Under 28 U.S.C. §§ 1391(b)-(d) and 1400(b), venue is proper in this District as to Infineon AG at least because Infineon AG is a foreign corporation subject to personal jurisdiction in this District and has committed acts of infringement within this District giving rise to this action.

32. To the extent that there is no district in which an action may otherwise be brought against Infineon AG, venue is proper in this District as to Infineon AG under 28 U.S.C. § 1391(b)(3) because Infineon AG is subject to personal jurisdiction in this Court.

33. On information and belief, Infineon Americas has substantial connections to the State of Texas, including this District. For example, Infineon Americas has a regular and established place of business in this District at 5204 E. Ben White Blvd, Austin, Texas 78741. This Austin location is a Production site for Infineon products.

34. Infineon operates its largest North American semiconductor factory, also known as "Fab25," in Austin, Texas. Infineon's Fab25 employs more than 1,000 people and plays a critical role in the global semiconductor supply chain, producing up to one billion semiconductor chips per year for major automotive, industrial, and communications companies throughout the world. On information and belief, the Infineon products manufactured at Fab25 include high-speed NOR Flash memory products and custom microcontrollers that include one or more of the Accused Products.

35. On information and belief, a number of Infineon's Austin employees are former Cypress employees who joined Infineon through the Cypress acquisition in 2020. On information and belief, these Austin employees include engineers, managers, technicians, and/or other personnel who work on research, development, design, manufacturing, testing, support, marketing, and/or sales of Accused Products.

36. On information and belief, Infineon Americas operates Fab25.

37. On information and belief, Infineon AG plays a role in the operation of Fab25, including because Infineon AG represents itself to the public as having a semiconductor manufacturing facility in Austin, Texas. For example, in March 2021, Infineon AG issued a press release from Munich stating that "Infineon Technologies (FSE: IFX / OTCQX: IFNNY) continues ramping up its manufacturing facility in Austin, Texas." In addition, in May 2022, Infineon AG issued a press release stating "Infineon Technologies AG (FSE: IFX / OTCQX: IFNNY), today

announced that it has switched the operation of its Austin, Texas semiconductor factory, also known as 'Fab25,' to 100 percent renewable power."

38. Infineon Americas is subject to specific and general personal jurisdiction in this Court. This Court has personal jurisdiction over Infineon Americas because it has engaged in continuous, systematic, and substantial activities within this State, including substantial research, development, production, marketing, and/or sales of products and services within this State and District. Furthermore, on information and belief, this Court has personal jurisdiction over Infineon Americas because Infineon Americas has committed acts of infringement giving rise to MOSAID's claims for patent infringement within and directed to this District.

39. On information and belief, Infineon Americas has conducted and does conduct substantial business in this District, directly and/or through subsidiaries, agents, representatives, or intermediaries, such substantial business including, but not limited to: (i) at least a portion of the acts of infringement alleged herein; (ii) purposefully and voluntarily placing one or more Accused Products into the stream of commerce with the expectation that they will be purchased by consumers in this forum; and/or (iii) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services provided to individuals in Texas and in this District. Thus, Infineon Americas is subject to this Court's specific and general personal jurisdiction pursuant to due process and the Texas Long-Arm Statute.

40. The exercise of personal jurisdiction over Infineon Americas would not offend traditional notions of fair play and substantial justice.

41. On information and belief, Infineon Americas has committed acts of infringement in this District and has regular and established places of business within this District under

28 U.S.C. § 1400(b). Thus, venue is proper in this District as to Infineon Americas under 28 U.S.C. § 1400(b).

42. Infineon maintains a permanent physical presence within this District. For example, Infineon maintains regular and established places of business at 5204 E. Ben White Blvd, Austin, Texas 78741.

43. On information and belief, Infineon's location(s) in this District are regular and established places of business under 28 U.S.C. § 1391, 28 U.S.C. § 1400(b), and *In re Cray, Inc.*, 871 F.3d 1355, 1360 (Fed. Cir. 2017).

a. On information and belief, Infineon's location(s) in this District are physical, geographical locations in this District. Each office location comprises one or more buildings or office spaces from which the business of Infineon is carried out. On information and belief, the location(s) are set apart for the purpose of carrying out Infineon's business, including, but not limited to, making, using, selling, offering for sale, and/or supporting Accused Products. On information and belief, Infineon advertises its physical location(s) in this District as places of its business.

b. On information and belief, Infineon's location(s) in this District are regular and established. Infineon identifies on its website (https://www.infineon.com/cms/en/about-infineon/company/find-a-location/) its address in this District as a regular and established place of Infineon's business.

c. On information and belief, Infineon's location(s) in this District are places of business of Infineon. On information and belief, Infineon conducts business from its location(s) in this District, including but not limited to, making, using, selling, offering for sale, and/or supporting Accused Products.

d. On information and belief, Infineon's location(s) in this District are physical, geographical location(s) in this District from which Infineon carries out its business.

e. On information and belief, Infineon employees work at Infineon's location(s) in this District. On information and belief, these Infineon employees are regularly and physically present at Infineon's location(s) during business hours and conduct Infineon's business while working there.

FACTUAL ALLEGATIONS

I. ASSERTED PATENTS

A. THE '179 PATENT

44. United States Patent No. 7,111,179 ("the '179 Patent") is entitled "Method and Apparatus for Optimizing Performance and Battery Life of Electronic Devices Based on System and Application Parameters." The United States Patent and Trademark Office duly and legally issued the '179 Patent on September 19, 2006, from U.S. Patent Application No. 10/268,914, filed on October 11, 2002.

45. The '179 Patent claims the priority benefit of U.S. Provisional Application No. 60/333,535, filed October 11, 2001.

46. MOSAID is the current owner of all rights, title, and interest in and to the '179 Patent, including the right to sue for past damages.

47. A true and correct copy of the '179 Patent is attached hereto as **Exhibit A** and is incorporated by reference herein.

48. The '179 Patent generally relates to an electronic device that adjusts power consumption in accordance with an analysis of parameters and events occurring over one or more time-periods. The electronic device monitors microprocessor, operating system, peripheral, and/or

device-level events and adjusts run-time parameters, such as microprocessor clock frequency and voltage, to reduce power consumption with minimal perceived degradation in performance.

49. Claim 1 of the ’179 Patent is directed to:

> 1. A system for dynamically managing power within an electronic device comprising:
>
> a power management device including:
>
> a sampling module to ascertain and store a plurality of parameter values associated with said electronic device during at least one sampling interval;
>
> an analysis module to combine said plurality of parameter values to produce an overall parameter value and to evaluate said overall parameter value to determine at least one control value to adjust power consumption of said electronic device in response to said parameter evaluation, wherein said plurality of parameters are arranged into a series of successive stages with each stage including at least one parameter, and said analysis module includes:
>
> a normalization module to normalize said parameter values relative to a numeric range; and
>
> a combination module to mathematically combine said normalized parameters of each subordinate stage with a succeeding stage to produce an overall value to determine said at least one control value to adjust said power consumption of said electronic device; and
>
> an adjustment module to adjust power consumption of said electronic device in accordance with said at least one control value to control electronic device power consumption.

50. The ’179 Patent solves a technological problem relating to power management for processing systems or devices. For example, the ’179 Patent explains that portable and autonomously powered electronic devices (*e.g.*, computer systems, telephones, PDAs, etc.) are becoming more and more sophisticated, while at the same time, becoming smaller. However, while

the technology for portable electronic devices has progressed rapidly, improvements in battery capacity and energy density have not been as rapid. As a result, a gap has developed between the processing capabilities of portable electronic devices and the battery life of those devices. This gap has constrained the "autonomy" of portable electronic devices, reducing the amount of time between battery recharge or replacement, and thus limiting the true portability of these devices. Often, designers of portable electronic devices must delicately balance battery parameters such as size, weight, and cost against the portability and operational characteristics of the device.

51. In an attempt to overcome these problems, computer electronics manufacturers have incorporated many features into their hardware and software designs to extend battery life. A feature that has been introduced is frequency and voltage adjustment for microprocessors. Since power consumption is related to the clock frequency of the microprocessor and to the corresponding applied voltage, reductions in both parameters can have an effect on overall power consumption of the device. However, reducing clock frequency may also reduce instruction-processing performance. The prior art attempted to overcome this problem through practices such as: shutting off or deactivating hardware components of the computer system when activity fell below a threshold for a certain period of time, reducing or increasing the clock frequency of a microprocessor depending on the level of computer system activity, or monitoring the types of activities that a computer system performs to determine whether clock frequency and voltage are to be reduced or increased. However, as the '179 Patent notes, such techniques suffered from several disadvantages, including limited power savings and/or power conversation states that occurred at inopportune times and consequently adversely affected performance.

52. The inventions of the '179 Patent overcome the aforementioned problems and provide several advantages. In particular, the inventions significantly reduce power consumption

(effectively increasing battery life by a factor of two or more), while not appreciably affecting electronic device performance. These power consumption reductions are achieved through a combination of optimizations, aggregated together and analyzed over plural time-periods. The optimizations are based on very low-level system parameters related to the microprocessor hardware and operating system software, and high-level parameters related to the application and end-user operating environment.

53. Infineon is not licensed to the '179 Patent and was not licensed during the six years preceding this action.

B. THE '306 PATENT

54. United States Patent No. 7,051,306 ("the '306 Patent") is entitled "Managing Power on Integrated Circuits Using Power Islands." The United States Patent and Trademark Office duly and legally issued the '306 Patent on May 23, 2006, from U.S. Patent Application No. 10/840,893, filed on May 7, 2004.

55. The '306 Patent claims the priority benefit of U.S. Provisional Application No. 60/468,742, filed May 7, 2003.

56. MOSAID is the current owner of all rights, title, and interest in and to the '306 Patent, including the right to sue for past damages.

57. A true and correct copy of the '306 Patent is attached hereto as **Exhibit B** and is incorporated by reference herein.

58. The '306 Patent generally relates to managing power in an integrated circuit using power islands. For example, the integrated circuit includes a plurality of power islands where power consumption is independently controlled within each of the power islands. A power manager determines a target power level for one of the power islands. The power manager then determines an action to change a consumption power level of the one of the power islands to the

target power level. The power manager performs the action to change the consumption power level of the one of the power islands to the target power level. Power control circuitry controls the power of the one of the power islands. The power islands may be delineated based on geographic factors or functional circuitry of the integrated circuit. The action performed may be selecting a clock frequency for one of the power islands or selecting a clock for one of the power islands, modifying voltage for one of the power islands, or powering on or off one of the power islands.

59. Claim 16 of the ’306 Patent is directed to:

> 16. A system for an integrated circuit comprising a plurality of power islands where power consumption is independently controlled within each of the power islands, the system comprising:
>
> power control circuitry configured to control power for one of the power islands; and
>
> a power manager configured to determine a target power level for the one of the power islands based on needs and operation of the integrated circuit, determine at least one of actions to change a power consumption level of the one of the power islands to the target power level, and perform the at least one of the actions to change the power consumption level of the one of the power islands to the target power level where one of the actions comprises selecting a frequency for the one of the power islands.

60. The ’306 Patent solves a technological problem relating to managing power on an integrated circuit. As the ’306 Patent explains, one design goal for integrated circuits is to reduce power consumption. Devices with batteries such as cell phones and laptops especially need a reduction in power consumption in the integrated circuit to extend the charge of the battery, as well as prevent overheating and lower heat dissipation. However, as the ’306 Patent notes, one problem with many integrated circuits in the prior art was that power consumption was not efficiently utilized. For example, the entire integrated circuit may operate at a maximum frequency just to support an application needing that maximum frequency, while other portions of the

integrated circuit can operate at a lower frequency. In another example, inactive circuitry within the integrated circuit consumes power and increases the likelihood of leakage. Inefficient power consumption may also adversely affect performance of the integrated circuit. With the growing complexity of integrated circuits, the reduction of power consumption is even more important when the integrated circuit employs more functionality. Systems-on-a-chip, for example, employ many different types of functionalities within a single chip and consume even more power than single function integrated circuits.

61. Some prior integrated circuits have employed voltage islands or multiple clocks to lower power consumption. One problem with these integrated circuits is that the voltages in the power island and the frequencies of the multiple clocks are static. The voltages and the frequencies do not dynamically change based on the needs and operation of the integrated circuit. The invention addresses the above problems by managing power in an integrated circuit using power islands, where power consumption is independently controlled within each of the power islands.

62. Infineon is not licensed to the ’306 Patent and was not licensed during the six years preceding this action.

C. THE ’448 PATENT

63. United States Patent No. 7,349,448 (“the ’448 Patent”) is entitled “Distributed Multiplexing Circuit with Built-In Repeater.” The United States Patent and Trademark Office duly and legally issued the ’448 Patent on March 25, 2008, from U.S. Patent Application No. 10/632,885, filed on August 1, 2003.

64. MOSAID is the current owner of all rights, title, and interest in and to the ’448 Patent, including the right to sue for past damages.

65. A true and correct copy of the ’448 Patent is attached hereto as **Exhibit C** and is incorporated by reference herein.

66. The ’448 Patent generally relates to systems and methods for distributing multiplexor (“MUX”) functionality. For example, generally, a distributed multiplexor circuit can select between multiple data connections, each of which is separated from multiplexor logic by some distance on an integrated circuit (“IC”). In such a system, each data connection transmits its data word to an associated distributed multiplexor logic stage. For example, a first stage logic is configured to receive a first data word from one of the connections and to transmit the first data word received. A second stage logic is configured to receive the first data word from the first stage logic and to select a selected data word between the first data word and a second data word received from another of the plurality of data connections based upon a set of select signals. The second stage logic is further configured to transmit the selected data word.

67. Claim 4 of the ’448 Patent is directed to:

> 4. A multiplexor circuit, comprising:
>
> a plurality of data connections;
>
> first stage logic configured to receive a first data word from one of the connections and to transmit the first data word received based on a set of select signals; and
>
> second stage logic configured to receive the first data word from the first stage logic and to select a selected data word between the first data word and a second data word received from another of the plurality of data connections based upon a set of select signals, the second stage logic configured to transmit the selected data word to a third stage logic and to increase a signal strength of the first data word when the first data word is transmitted, if the first data word is selected.

68. The ’448 Patent solves a technological problem relating to routing congestion in MUX circuits such as those implemented on an IC and used to select a particular data connection from multiple connections. For example, a MUX circuit within an IC may comprise eight data connections that transmit 128-bit data words. Typically, each of the 128-bit data words may be

routed to multiplexor logic on the IC via a connection that comprises 128 routing wires, *e.g.*, a wire for each bit that is transmitted. Therefore, in this particular example, 1,024 routing wires on the IC would be used to route eight data words from eight data connections to the multiplexor logic. Such a MUX circuit was prone to routing congestion and the inherent problems associated therewith, *e.g.*, difficulty in designing and fabricating. Making matters worse, the number of routing wires increased as the number of data connections increased.

69. In the past, dynamic MUXs and tristate MUXs have been employed in an attempt to address routing congestion caused by large numbers of routing wires. However, a dynamic MUX typically requires more power, has smaller noise margins, and takes more time to design correctly. Further, usage of tristate MUXs could be acceptable when the distances between the data connections and the MUX logic are small, but speed and noise degradation typically increases as the distances between the data connections increase.

70. The ’448 Patent discloses and claims staged multiplexer circuitry to improve MUX design and address the above problems. For example, as the ’448 Patent explains, the distributed multiplexor circuitry includes distributed multiplexor logic (“DML”) stages associated with each data connection as well as select logic. A DML stage receives a data word from an associated data connection as well as a data word from a previous DML stage. Select logic indicates which data word from the multiple data connections is outputted by transmitting a set of select signals to each DML stage. The select signals are indicative of which data word is to be selected for further transmission. In accordance with these select signals, each DML stage selects either the data word it receives from a previous DML stage, if any, or another data word it receives from another data connection. In the final stage of the plurality of consecutive stages, the distributed multiplexor

circuit drives the resulting selected data word indicated by the select logic onto a system bus or some other type of conductive connection.

71. Infineon is not licensed to the ’448 Patent and was not licensed during the six years preceding this action.

II. DEFENDANTS’ KNOWLEDGE OF THE ASSERTED PATENTS

72. Infineon had knowledge of the Asserted Patents prior to the filing of this suit.

73. Between at least November 2017 and August 26, 2024, MOSAID (f/k/a Conversant Intellectual Property Management) engaged in many discussions, including through emails, letters, and business and technical meetings, with Cypress and/or Infineon regarding their infringement of MOSAID’s patents, including the Asserted Patents.

74. On or about November 3, 2017, MOSAID sent a letter and exemplary claim charts to Cypress exhibiting Cypress’s infringement of several patents, including the ’179, ’306, and ’448 Patents. MOSAID’s November 3, 2017 exemplary claim charts included infringement assertions for at least Claim 1 of the ’179 Patent, Claim 1 of the ’306 Patent, and Claim 8 of the ’448 Patent. Receipt was confirmed by Terence Woodsome, Cypress’s then-Deputy General Counsel.

75. On January 24, 2018, MOSAID followed up with Cypress regarding Cypress’s response to MOSAID’s letter and with a request to schedule a face-to-face meeting to further discussions.

76. On April 17, 2018, MOSAID sent Cypress additional information and updated exemplary claim charts regarding Cypress’s infringement of the ’179, ’306, and ’448 Patents. MOSAID’s updated exemplary claim chart for the ’306 Patent included infringement assertions for at least Claim 16.

77. On June 29 and July 30, 2018, MOSAID followed up with Cypress regarding MOSAID’s infringement allegations and again requested a face-to-face meeting.

78. On August 2 and August 22, 2018, MOSAID again contacted Cypress to request a face-to-face meeting to occur sometime in September 2018.

79. On September 26, 2018, MOSAID met with Cypress for further discussion. During the meeting, MOSAID shared additional information and updated exemplary claim charts regarding Cypress's infringement of at least the '179 and '306 Patents. MOSAID sent copies of the updated exemplary claim charts for the '179, '306, and '448 Patents to Cypress by email on October 2, 2018.

80. On February 27, 2019, MOSAID followed up with Cypress after having received no further responses from Cypress following the September 2018 meeting. In that February 27 correspondence, MOSAID also provided new exemplary claim charts for new infringement assertions and asked to continue discussions. The new exemplary claim charts included charts for the '306 Patent (which identified additional products accused of infringing the '306 Patent).

81. Between February 2019 and February 2020, MOSAID and Cypress exchanged numerous communications and materials regarding Cypress's infringement. MOSAID also requested another meeting to discuss any outstanding technical matters and present its thoughts on business terms for a license to MOSAID's patent portfolio.

82. The parties engaged in another year of back and forth between February 2020 and February 2021. By then, Infineon had completed its acquisition of Cypress, and Cypress's personnel, including Mr. Woodsome, became employees of Infineon and transitioned to using Infineon email addresses.

83. MOSAID and Infineon held meetings on February 24 and March 10, 2021. MOSAID indicated its desire to work on a formal license proposal based on the active patents still in discussion, which included the Asserted Patents.

84. On February 28, 2023, MOSAID reconnected with Infineon on the parties' outstanding discussions, and for the next year the parties exchanged further communications regarding Infineon's infringement of the Asserted Patents.

85. In February and April 2024, MOSAID noted that technical discussions between MOSAID and Infineon (including Cypress) had been going on for many years, so MOSAID was now at a point where it would appreciate knowing whether Infineon was ready and willing to take a license or provide feedback on MOSAID's business proposal.

86. On May 23, 2024, MOSAID again reached out to Infineon in an effort to license Infineon to the Asserted Patents, and requested "business discussions to finally resolve these issues." However, Infineon ignored MOSAID's request and did not respond.

87. Ultimately, since at least November 3, 2017, MOSAID and Infineon (including Cypress) have engaged in numerous technical and business discussions relating to a license for MOSAID's patent portfolio, including each of the Asserted Patents. During those discussions, MOSAID offered to provide a license to the Asserted Patents. But to date, Infineon has not made any offer to license MOSAID's patent portfolio, including the Asserted Patents. Nor has Infineon ceased its infringing conduct.

88. Before filing this lawsuit, on August 26, 2024, MOSAID attempted one last time to resolve this dispute and suggested "a call so that we don't misunderstand your position on this matter." MOSAID again offered to license its patent portfolio, including the Asserted Patents, to Infineon on reasonable terms. But again, Infineon ignore MOSAID's correspondence.

III. THE ACCUSED PRODUCTS

89. Infineon manufactures, uses, offers for sale, and/or sells in the United States, and/or imports into the United States, PSoCs and wireless connectivity SoCs, including the Accused Products, for use in a variety of end-products in the communications, IoT, automotive, computer,

and/or consumer electronics industries. Both the Accused Products and the consumer end-products incorporating the Accused Products have been, and continue to be, widely available for sale in the United States.

90. Infineon's Accused Products include at least the Accused Products, and substantially similar products, made, used, sold, or offered for sale in the United States, and/or imported into the United States.

91. Infineon has advertised, offered for sale, and sold—and continues to advertise, offer for sale, and sell—the Accused Products on Infineon's website.

92. Infineon advertises, offers for sale, and sells the accused PSoC 3 product family on its website, including for example at https://www.infineon.com/cms/en/product/microcontroller/legacy-microcontroller/legacy-8-bit-16-bit-microcontroller/psoc-3/, and as shown above in paragraph 16.

93. Infineon advertises, offers for sale, and sells the accused PSoC 4, PSoC 5, and PSoC 6 product families on its website, including for example at https://www.infineon.com/cms/en/product/microcontroller/32-bit-psoc-arm-cortex-microcontroller/, and as shown above in paragraph 16.

94. Infineon advertises, offers for sale, and sells accused wireless connectivity products on its website, including for example at https://www.infineon.com/cms/en/product/wireless-connectivity/airoc-wi-fi-plus-bluetooth-combos/, and as shown above in paragraph 16.

COUNT I: INFRINGEMENT OF THE '179 PATENT

95. MOSAID incorporates by reference and realleges paragraphs 1 through 94 as if specifically set forth herein.

96. In violation of 35 U.S.C. § 271(a), Infineon has directly infringed one or more of the claims of the '179 Patent, including at least Claim 1, either literally and/or under the doctrine

of equivalents, by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authority, at least one of the Accused Products.

97. Claim 1 of the ’179 Patent recites:

> 1. A system for dynamically managing power within an electronic device comprising:
>
> a power management device including:
>
> a sampling module to ascertain and store a plurality of parameter values associated with said electronic device during at least one sampling interval;
>
> an analysis module to combine said plurality of parameter values to produce an overall parameter value and to evaluate said overall parameter value to determine at least one control value to adjust power consumption of said electronic device in response to said parameter evaluation, wherein said plurality of parameters are arranged into a series of successive stages with each stage including at least one parameter, and said analysis module includes:
>
> a normalization module to normalize said parameter values relative to a numeric range; and
>
> a combination module to mathematically combine said normalized parameters of each subordinate stage with a succeeding stage to produce an overall value to determine said at least one control value to adjust said power consumption of said electronic device; and
>
> an adjustment module to adjust power consumption of said electronic device in accordance with said at least one control value to control electronic device power consumption.

98. The Accused Products, including at least the PSoC 3, PSoC 4, and PSoC 5 families, practice each element of Claim 1 of the ’179 Patent.

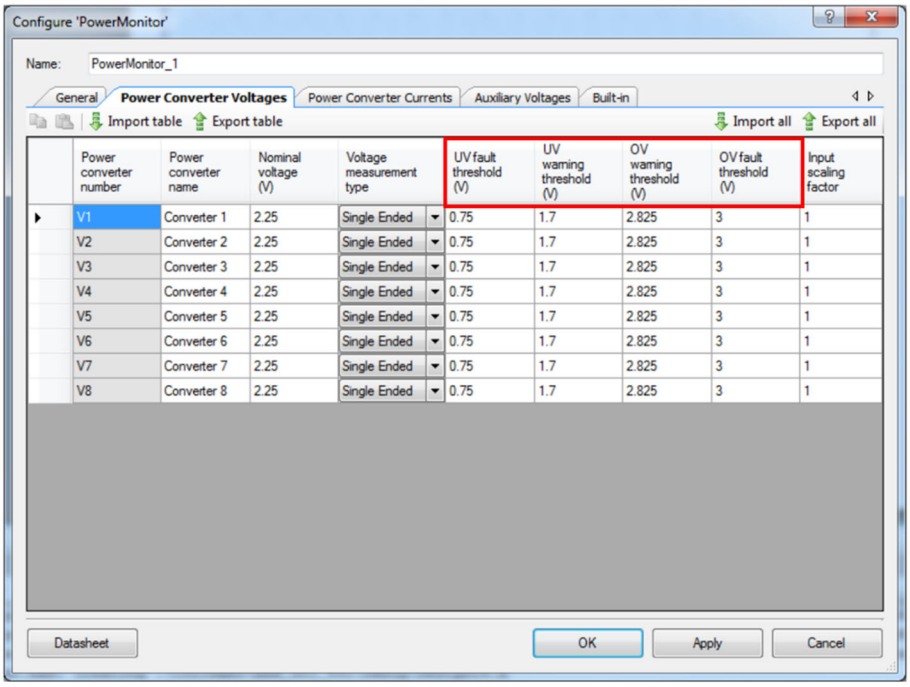
99. The Accused Products include a power management device. For example, at least the PSoC 3, 4, and 5 include a Power Monitor component that monitors the health of power converters and is capable of generating warnings and faults based on user-defined thresholds.

100. The power management device includes a sampling module to ascertain and store a plurality of parameter values associated with said electronic device during at least one sampling interval. For example, the Power Monitor is configured to measure power converter output voltages and supports averaging of both voltage and current measurements. The average value is calculated as a running average, which produces a new average with each scan that is the average of the previous *N* scans.

101. The power management device also includes an analysis module to combine said plurality of parameter values to produce an overall parameter value and to evaluate said overall parameter value to determine at least one control value to adjust power consumption of said electronic device in response to said parameter evaluation, wherein said plurality of parameters are arranged into a series of successive stages with each stage including at least one parameter. For example, the Power Monitor is capable of combining the sampled voltage parameter values into an overall running average. The average value is calculated as a running average, which produces a new average with each scan. The analysis module uses the average overall voltage value to evaluate fault and warning thresholds.

Power Converter Voltages Tab

This enables the user to describe the power converter voltages in the system. The figure below shows the voltage tab when Number of Converters is set to **8** in the General Tab.



(Power Monitor 1.20 PSoC® Creator Component Datasheet, at 12.)
(annotation in red added)

102. The analysis module includes a normalization module to normalize said parameter values relative to a numeric range. For example, at least the PSoC 3, 4, and 5 can be configured with a voltage scaling factor (*e.g.*, between 0.001 and 1) for a specified power converter that controls the amount of attenuation applied to the converter output voltage external to the PSoC.

103. The analysis module also includes a combination module to mathematically combine said normalized parameters of each subordinate stage with a succeeding stage to produce an overall value to determine said at least one control value to adjust said power consumption of said electronic device. For instance, on information and belief, at least the PSoC 3, 4, and 5 mathematically combine the normalized voltage values as a running average for use when evaluating faults or warning conditions.

104. In addition, the Accused Products include an adjustment module to adjust power consumption of said electronic device in accordance with said at least one control value to control electronic device power consumption. For example, at least the PSoC 3, 4, and 5 include a voltage sequencer connectable to the Power Monitor that supports sequencing and monitoring of up to 32 power converter rails.

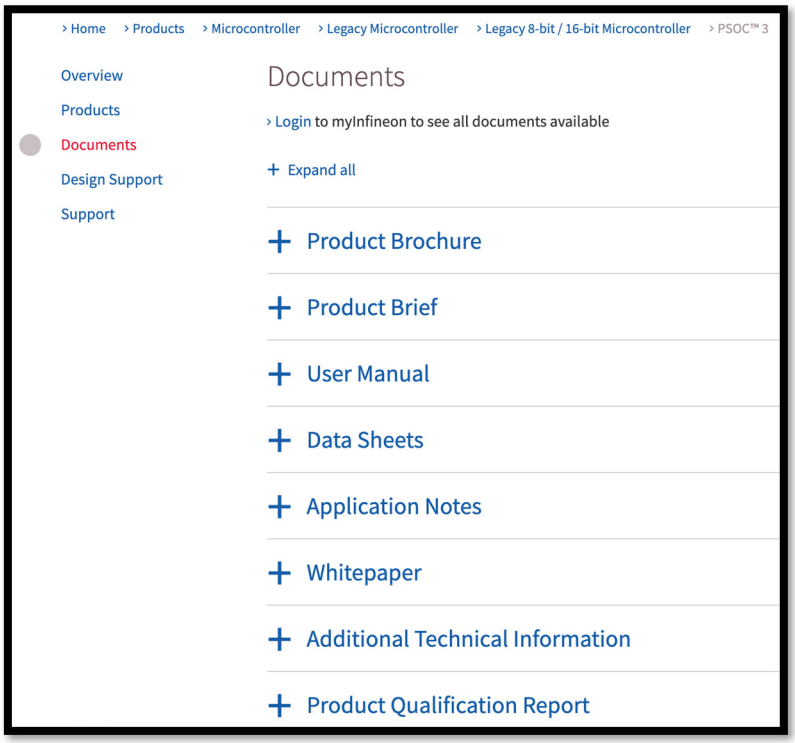
105. During license discussions, MOSAID provided Infineon with exemplary claim charts explaining in detail Infineon's infringement of the '179 Patent, including at least Claim 1.

106. In violation of 35 U.S.C. § 271(b), Infineon has infringed one or more of the claims of the '179 Patent, including at least Claim 1, indirectly by inducing infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 3, 4, and 5, in this District and elsewhere in the United States. For example, on information and belief, at least the PSoC 3, 4, and 5 have been used by Infineon's customers and/or end-users in consumer products including at least wearables, hearables, fitness products, mobile devices, automotives, IoT devices, home automation, home appliances, small kitchen appliances, coffee machines, washing machines, and industrial control systems. Direct infringement by Infineon's customers and/or end-users occurred at least by the use of the Accused Products, including at least the PSoC 3, 4, and 5, including use of consumer products incorporating them.

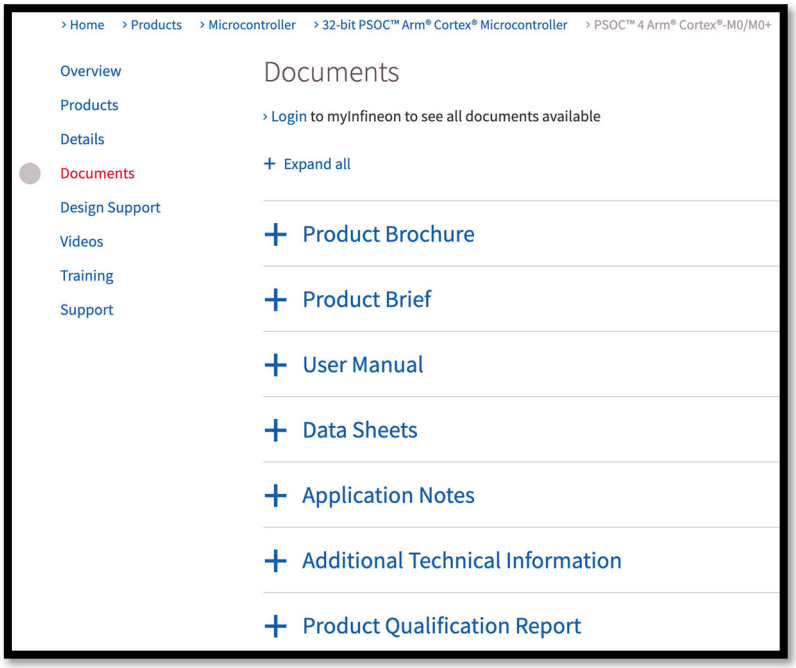
107. On information and belief, Infineon supplied hardware, firmware, and/or software that were especially made or especially adapted to practice the inventions claimed in the '179 Patent, including at least Claim 1, to induce third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 3, 4, and 5, to use such products in a manner that would infringe one or more claims of the '179 Patent, including at least Claim 1.

108. On information and belief, Infineon marketed and advertised the Accused Products, including at least the PSoC 3, 4, and 5, including on its website, to induce third parties, including Infineon's customers and/or end-users, to use the products in a manner that would infringe one or more claims of the '179 Patent, including at least Claim 1. *See, e.g.*, https://www.infineon.com/cms/en/product/microcontroller/legacy-microcontroller/legacy-8-bit-16-bit-microcontroller/psoc-3; https://www.infineon.com/cms/en/product/microcontroller/32-bit-psoc-arm-cortex-microcontroller/psoc-4-32-bit-arm-cortex-m0-mcu; https://www.infineon.com/cms/en/product/microcontroller/32-bit-psoc-arm-cortex-microcontroller/32-bit-psoc-5-lp-arm-cortex-m3; https://www.infineon.com/cms/en/design-support/tools/sdk/psoc-software/psoc-3-5-components/power-monitor; https://www.infineon.com/cms/en/design-support/tools/sdk/psoc-software/psoc-4-components/psoc-4-power-monitor.

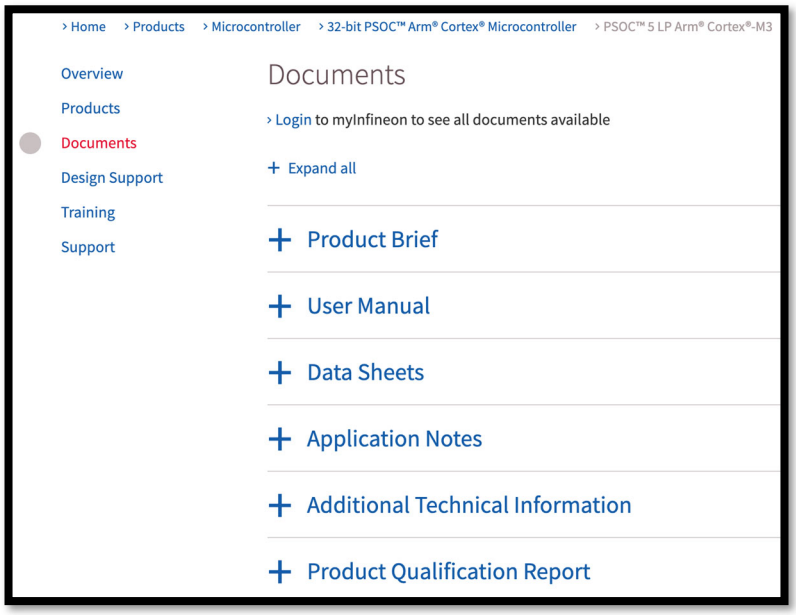
109. On information and belief, Infineon furnished instructive materials, technical support, and information concerning the operation and use of the Accused Products, including at least the PSoC 3, 4, and 5, to induce third parties, including Infineon's customers and/or end-users, to use the products in a manner that would infringe one or more claims of the '179 Patent, including at least Claim 1. For example, on its website, Infineon furnishes at least product brochures, product briefs, user manuals, data sheets, application notes, whitepapers, product qualification reports, and additional technical information such as architecture technical reference manuals:



(Exemplary categories of instructive materials provided for the PSoC 3, with additional materials provided for each product subcategory under their respective web subpages.)

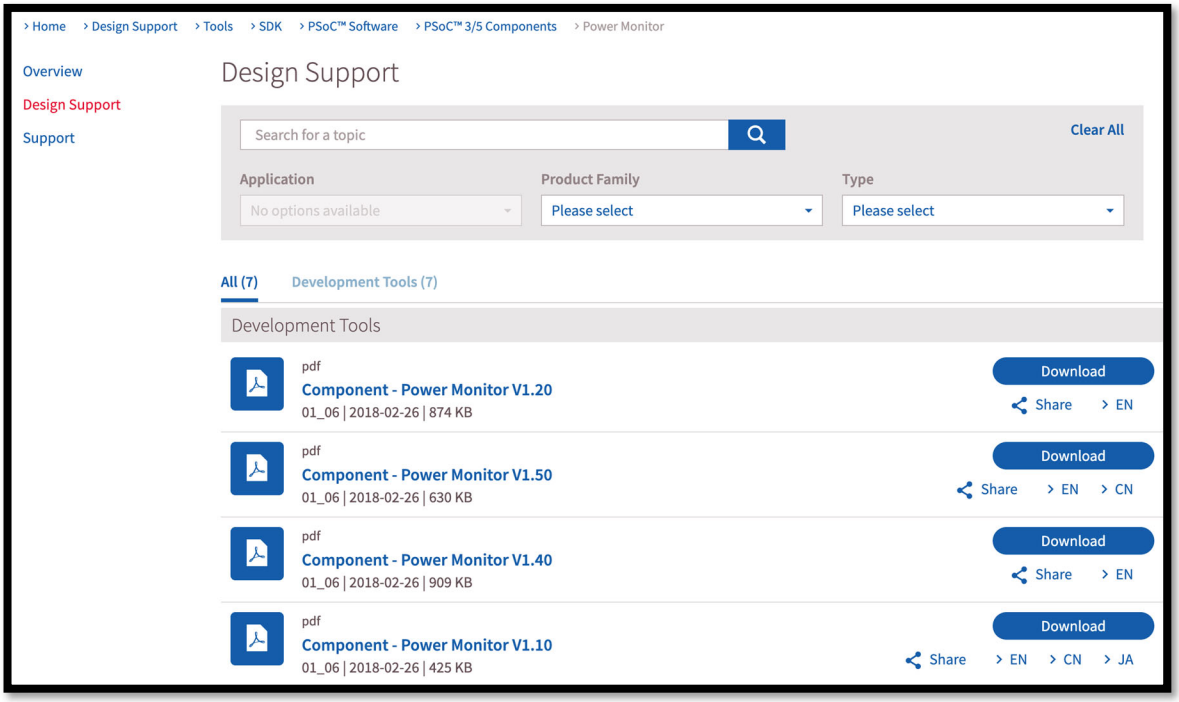


(Exemplary categories of instructive materials provided for the PSoC 4, with additional materials provided for each product subcategory under their respective web subpages.)

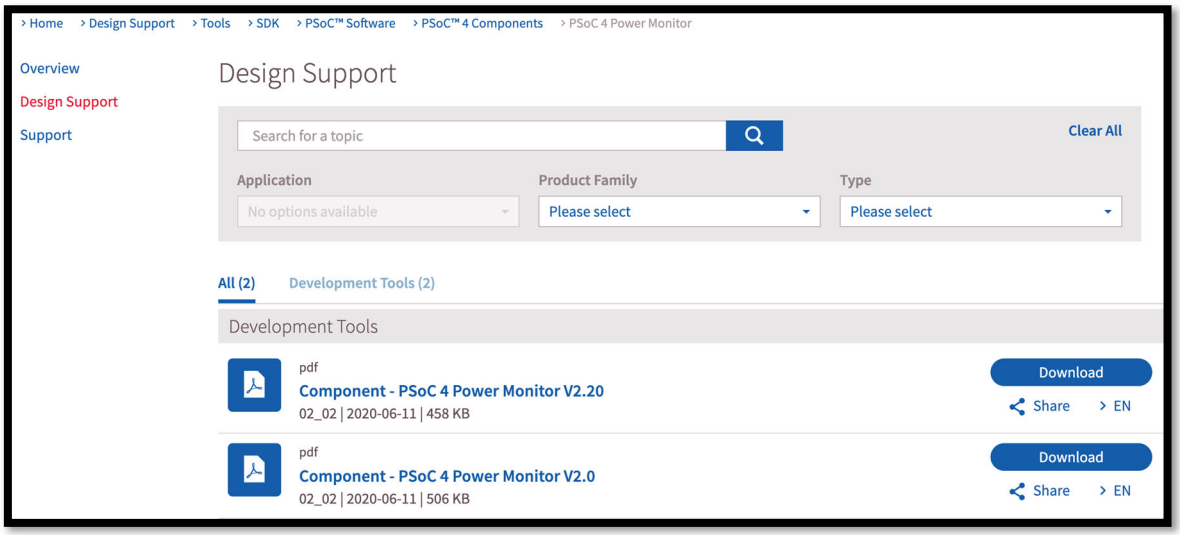


(Exemplary categories of instructive materials provided for the PSoC 5, with additional materials provided for each product subcategory under their respective web subpages.)

110. On its website, Infineon also furnishes development tools and design support materials for the Accused Products, including at least the PSoC 3, 4, and 5:



(Exemplary design support materials for the Power Monitor component for PSoC 3/5.)



(Exemplary design support materials for the Power Monitor component for PSoC 4.)

111. Further, Infineon provides APIs and sample firmware source code:

Application Programming Interface

Application Programming Interface (API) routines allow you to configure the component using software. The following table lists and describes the interface to each function. The subsequent sections cover each function in more detail.

By default, PSoC Creator assigns the instance name "PowerMonitor_1" to the first instance of a component in a given design. You can rename it to any unique value that follows the syntactic rules for identifiers. The instance name becomes the prefix of every global function name, variable, and constant symbol. For readability, the instance name used in the following table is "PowerMonitor."

Note: When using PSoC3 silicon, the user should create a Keil .cyre reentrancy file and should add the CyIntSetVector(), CyIntSetPriority(), PowerMonitor_PM_AMux_Current_Unset() and PowerMonitor_PM_AMux_Voltage_Unset() APIs in this file to avoid reentrancy related warnings during project compilation.

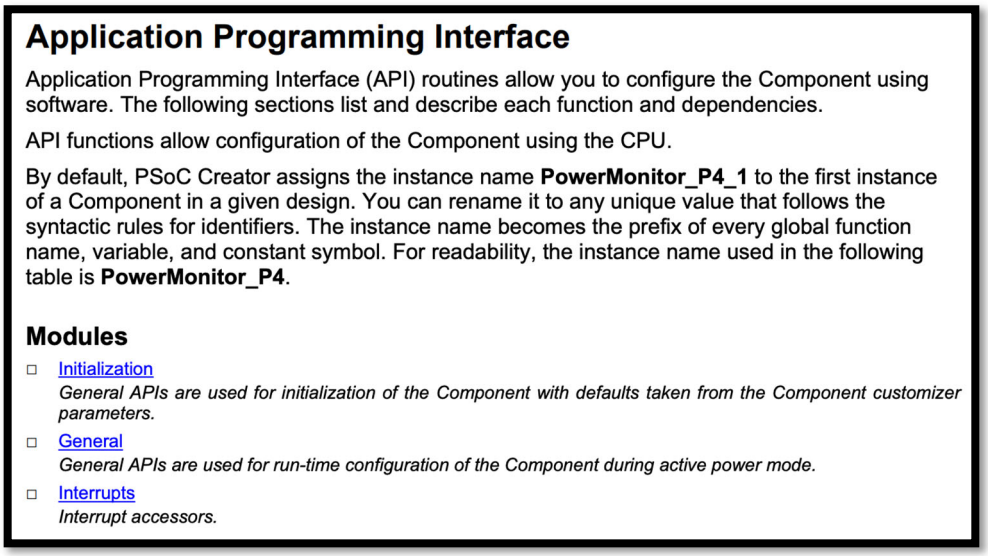
(Power Monitor 1.20 PSoC® Creator Component Datasheet, at 16.)

Sample Firmware Source Code

PSoC Creator provides numerous example projects that include schematics and example code in the Find Example Project dialog. For component-specific examples, open the dialog from the Component Catalog or an instance of the component in a schematic. For general examples, open the dialog from the Start Page or **File** menu. As needed, use the **Filter Options** in the dialog to narrow the list of projects available to select.

Refer to the "Find Example Project" topic in the PSoC Creator Help for more information.

(Power Monitor 1.20 PSoC® Creator Component Datasheet, at 36.)



Application Programming Interface

Application Programming Interface (API) routines allow you to configure the Component using software. The following sections list and describe each function and dependencies.

API functions allow configuration of the Component using the CPU.

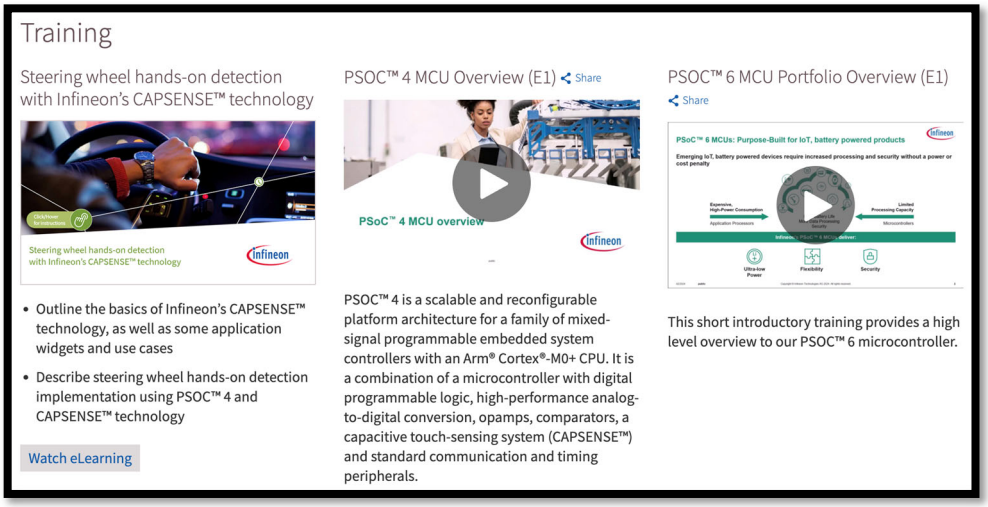
By default, PSoC Creator assigns the instance name **PowerMonitor_P4_1** to the first instance of a Component in a given design. You can rename it to any unique value that follows the syntactic rules for identifiers. The instance name becomes the prefix of every global function name, variable, and constant symbol. For readability, the instance name used in the following table is **PowerMonitor_P4**.

Modules

- Initialization
  General APIs are used for initialization of the Component with defaults taken from the Component customizer parameters.
- General
  General APIs are used for run-time configuration of the Component during active power mode.
- Interrupts
  Interrupt accessors.

(PSoC 4 Power Monitor 2.20 PSoC® Creator Component Datasheet, at 6.)

112. In addition, on its website, Infineon provides training materials and help from Infineon support engineers:



(Exemplary Training Materials.)



(Link to the Infineon Developer Community for the PSoC 4.)



(Link to the Infineon Developer Community for the PSoC 5.)

113. Infineon knew or should have known of the '179 Patent and its infringement through a series of correspondence and meetings expressly notifying Infineon of the '179 Patent and Infineon's infringement thereof. As a result, Infineon knew or should have known it infringed one or more claims of the '179 Patent, including at least Claim 1, at least as early as November 3, 2017, when MOSAID began discussions with Cypress regarding the '179 Patent and provided actual notice of infringement.

114. At a minimum, Infineon knew or should have known of the '179 Patent and its infringement no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID regarding the '179 Patent and Infineon's infringement thereof.

115. Despite this knowledge, Infineon continued to induce third parties, including Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 3, 4, and 5, to infringe one or more claims of the '179 Patent, including at least Claim 1, with the specific intent to cause infringement. Infineon knew or should have known that those acts would

induce actual infringement by third parties, including Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 3, 4, and 5, of one or more of the claims of the '179 Patent, including at least Claim 1.

116. Therefore, Infineon has induced infringement by others of one or more of the claims of the '179 Patent, including at least Claim 1, with the specific intent to induce acts that constitute infringement of the '179 Patent and with knowledge that such acts infringed one or more claims of the '179 Patent, including at least Claim 1.

117. In violation of 35 U.S.C. § 271(c), Infineon has infringed one or more of the claims of the '179 Patent, including at least Claim 1, indirectly by contributing to infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 3, 4, and 5, in this District and elsewhere in the United States. Direct infringement by Infineon's customers and/or end-users occurred at least by the use of the Accused Products, including at least the PSoC 3, 4, and 5, including use of consumer products incorporating them.

118. On information and belief, Infineon made and sold hardware, firmware, and/or software components (*e.g.*, processors and/or software drivers) especially made or especially adapted to practice the invention claimed in the '179 Patent, including at least Claim 1. For example, as explained above, Infineon made and sold PSoC hardware, including the PSoC 3, 4, and 5 architectures, and accompanying APIs and firmware code. On information and belief, such hardware, firmware, and/or software components (i) are a material part of the invention and (ii) are not staple articles or commodities of commerce suitable for substantial non-infringing use at least because they are specifically designed to perform the claimed functionality. Any other use of such

hardware, firmware, and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

119. Therefore, Infineon has contributed to the infringement by others of one or more of the claims of the '179 Patent, including at least Claim 1.

120. Infineon's infringement of one or more claims of the '179 Patent, including at least Claim 1, was willful.

121. As explained above, Infineon had actual knowledge of the '179 Patent and its infringement thereof at least as early as November 3, 2017, when MOSAID began discussions with Cypress regarding the '179 Patent, and in any event no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID.

122. As explained above, on several occasions beginning at least as early as November 3, 2017, MOSAID notified Infineon (including Cypress) of the '179 Patent and Infineon's infringement thereof, including infringement of at least Claim 1.

123. Despite knowing of the '179 Patent at least as early as November 3, 2017 (and no later than April 2020), Infineon did not cease its infringing activities. Infineon continued to infringe one or more claims of the '179 Patent, including at least Claim 1, in disregard of MOSAID's patent rights. As a result, Infineon deliberately and intentionally infringed the '179 Patent, and continued to do so, after receiving express and actual knowledge of both the '179 Patent and its infringement thereof.

124. Therefore, Infineon's infringement of the '179 Patent, including at least Claim 1, was willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate, entitling MOSAID to increased damages pursuant to 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

COUNT II: INFRINGEMENT OF THE '306 PATENT

125. MOSAID incorporates by reference and realleges paragraphs 1 through 124 as if specifically set forth herein.

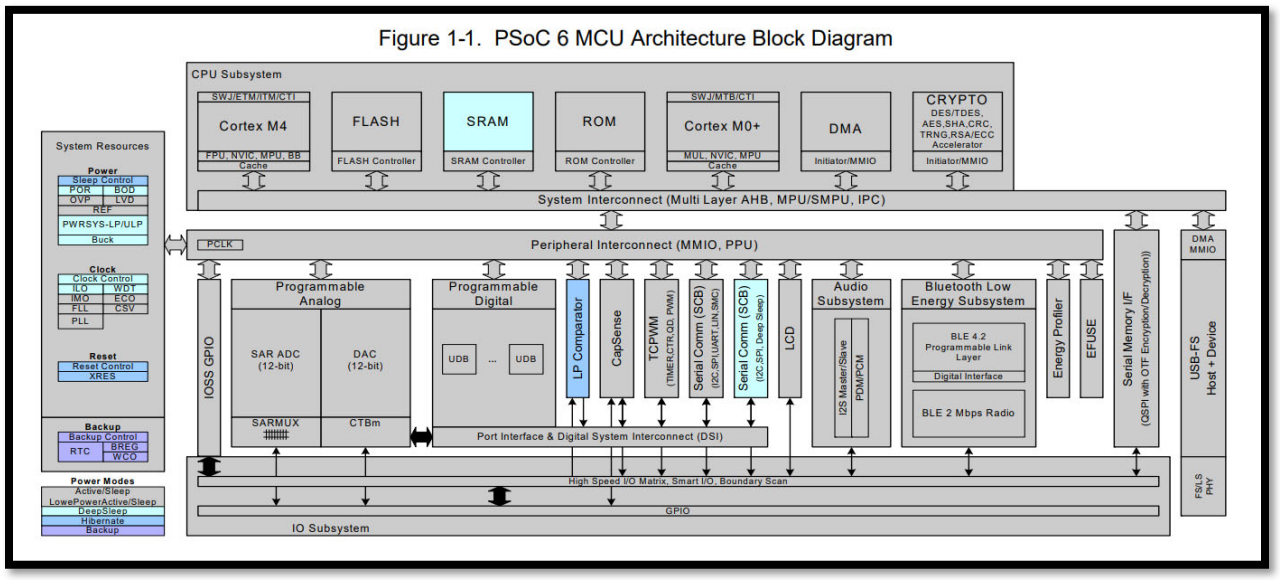
126. In violation of 35 U.S.C. § 271(a), Infineon has directly infringed one or more of the claims of the '306 Patent, including at least Claim 16, either literally and/or under the doctrine of equivalents, by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authority, at least one of the Accused Products.

127. Claim 16 of the '306 Patent recites:

> 16. A system for an integrated circuit comprising a plurality of power islands where power consumption is independently controlled within each of the power islands, the system comprising:
>
> power control circuitry configured to control power for one of the power islands; and
>
> a power manager configured to determine a target power level for the one of the power islands based on needs and operation of the integrated circuit, determine at least one of actions to change a power consumption level of the one of the power islands to the target power level, and perform the at least one of the actions to change the power consumption level of the one of the power islands to the target power level where one of the actions comprises selecting a frequency for the one of the power islands.

128. The Accused Products, including at least the PSoC 6 and AIROC products, practice each element of Claim 16 of the '306 Patent.

129. The Accused Products include a system for an integrated circuit comprising a plurality of power islands where power consumption is independently controlled within each of the power islands. For example, the PSoC 63 Bluetooth®LE Line of processors (in Infineon's PSoC 6 family) include multiple power islands as illustrated in the following diagram.

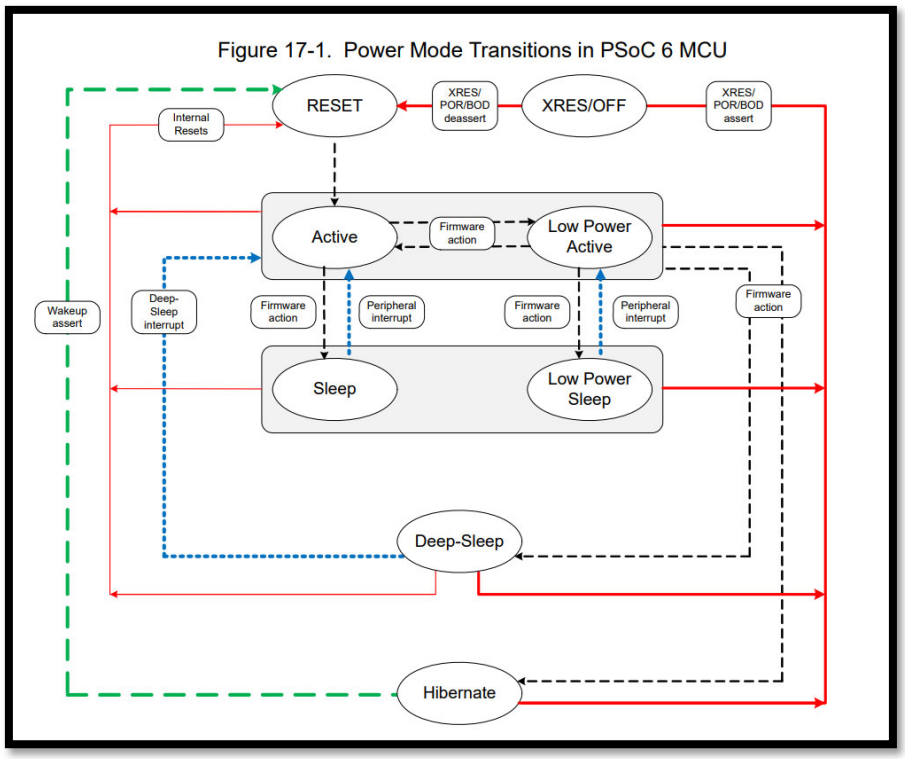


(PSoC 63 with BLE Architecture Technical Reference Manual (TRM), at 22.)

130. On the PSoC MCU, Cortex M-4 and Cortex-M0+ both support their own CPU sleep modes and each CPU can be in sleep independent of the state of the other CPU.

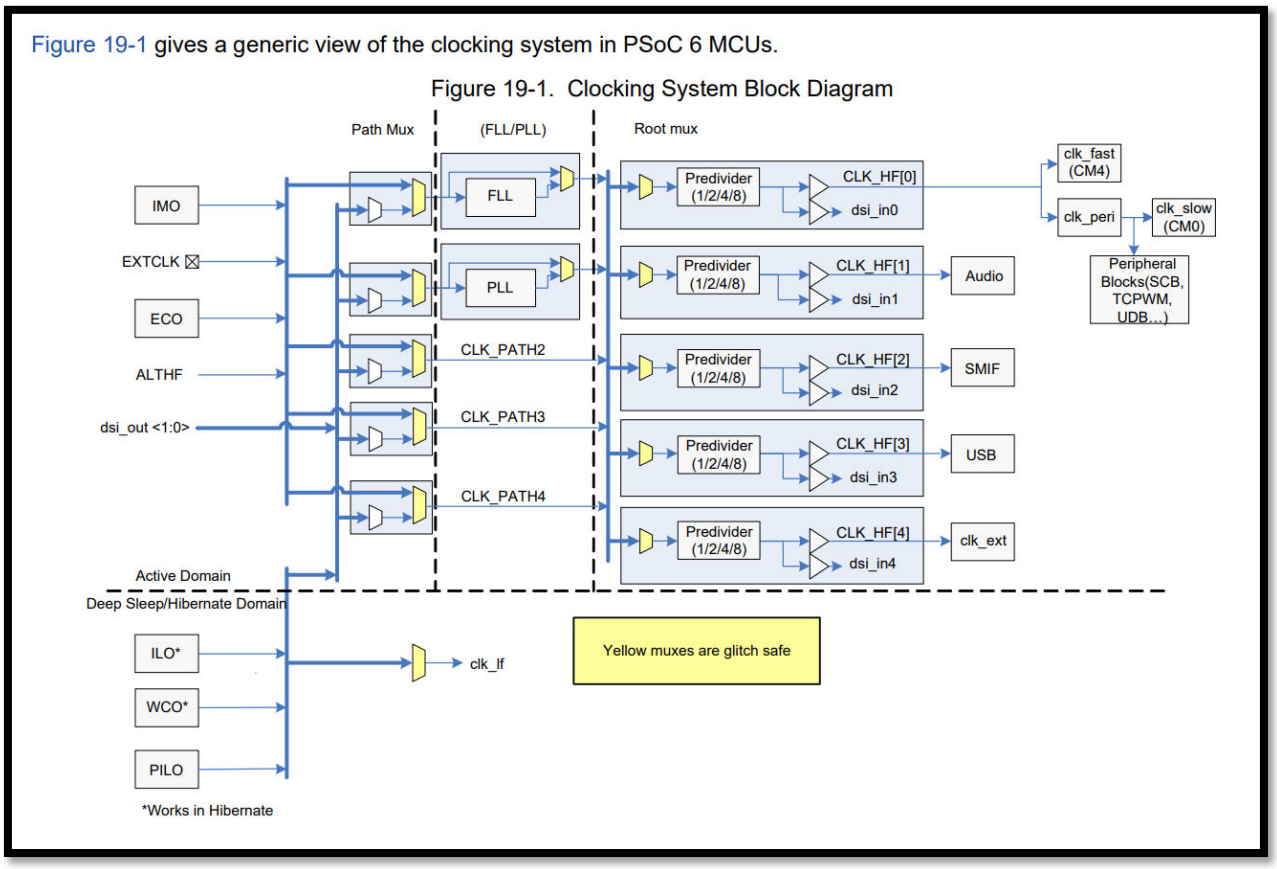
131. The Accused Products, including at least the PSoC 6 and AIROC products, include power control circuitry configured to control power for one of the power islands. For example, the PSoC 63 line includes circuitry for enabling and disabling clocks to peripherals, powering on and off clock sources, and powering on and off peripherals and parts inside the PSoC 6 MCU.

132. As illustrated in the below figure, the Accused Products, including at least the PSoC 6 and AIROC products, include a power manager configured to determine a target power level for the one of the power islands based on needs and operation of the integrated circuit. The firmware may decide to enable or disable specific peripherals and power domains depending on the application and power requirement.



(PSoC 63 with BLE Architecture Technical Reference Manual (TRM), at 137.)

133. The power manager is also configured to determine at least one of actions to change a power consumption level of the one of the power islands to the target power level and perform the at least one of the actions to change the power consumption level of the one of the power islands to the target power level where one of the actions comprises selecting a frequency for the one of the power islands. For example, the PSoC 6 MCU architecture supports dynamic voltage and frequency scaling. When the power manager transitions between power states, it will determine an action to change the power consumption level of a power island to the target power level, including by adjusting the frequency.



(PSoC 63 with BLE Architecture Technical Reference Manual (TRM), at 153.)

134. During license discussions, MOSAID provided Infineon with exemplary claim charts explaining in detail Infineon's infringement of the '306 Patent, including at least Claim 16.

135. In violation of 35 U.S.C. § 271(b), Infineon has infringed one or more of the claims of the '306 Patent, including at least Claim 16, indirectly by inducing infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 6 and AIROC products, in this District and elsewhere in the United States. For example, on information and belief, at least the PSoC 6 and AIROC products have been used by Infineon's customers and/or end-users in consumer products including at least IoT devices, such as wearables, smart rings, fitness trackers, eBikes, home appliances, home automation devices, smart home accessories, cordless power tools, industrial IoT devices, anomaly detection tags,

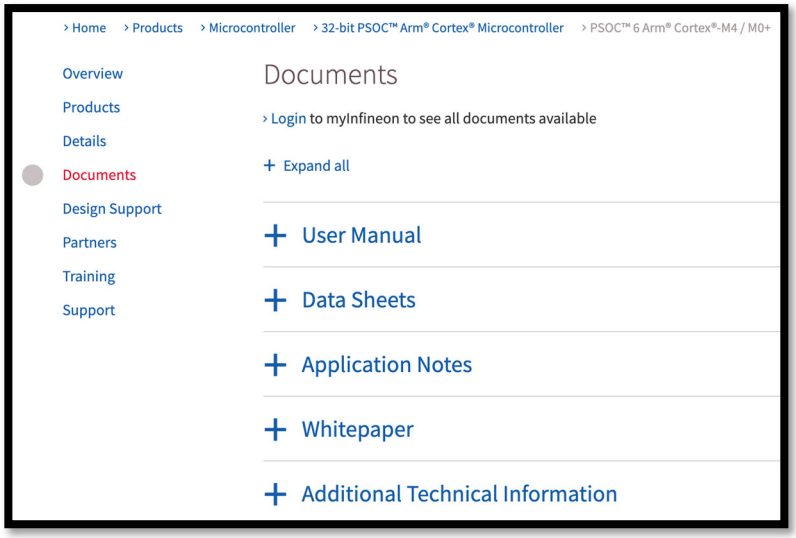
portable medical devices, and medical wearables such as vitals monitoring devices. Direct infringement by Infineon's customers and/or end-users occurred at least by the use of the Accused Products, including at least the PSoC 6 and AIROC products, including use of consumer products incorporating them.

136. On information and belief, Infineon supplied hardware, firmware, and/or software that were especially made or especially adapted to practice the inventions claimed in the '306 Patent, including at least Claim 16, to induce third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 6 and AIROC products, to use such products in a manner that would infringe one or more claims of the '306 Patent, including at least Claim 16.

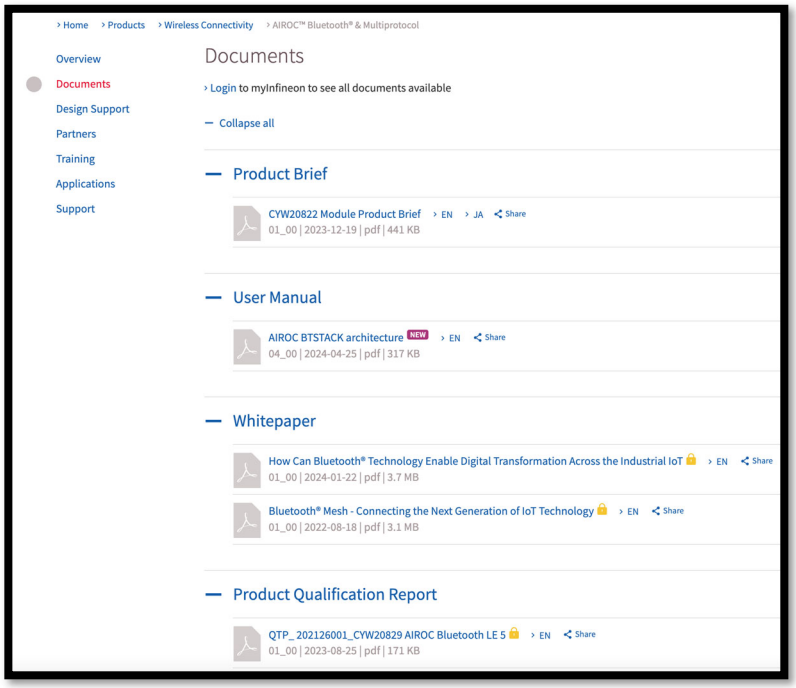
137. On information and belief, Infineon marketed and advertised the Accused Products, including at least the PSoC 6 and AIROC products, including on its website, to induce third parties, including Infineon's customers and/or end-users, to use the products in a manner that would infringe one or more claims of the '306 Patent, including at least Claim 16. *See, e.g.*, https://www.infineon.com/cms/en/product/microcontroller/32-bit-psoc-arm-cortex-microcontroller/psoc-6-32-bit-arm-cortex-m4-mcu; https://www.infineon.com/cms/en/product/wireless-connectivity/airoc-bluetooth-le-bluetooth-multiprotocol.

138. On information and belief, Infineon furnished instructive materials, technical support, and information concerning the operation and use of the Accused Products, including at least the PSoC 6 and AIROC products, to induce third parties, including Infineon's customers and/or end-users, to use the products in a manner that would infringe one or more claims of the '306 Patent, including at least Claim 16. For example, on its website, Infineon furnishes at least

product brochures, product briefs, user manuals, data sheets, application notes, whitepapers, product qualification reports, and additional technical information such as architecture technical reference manuals:

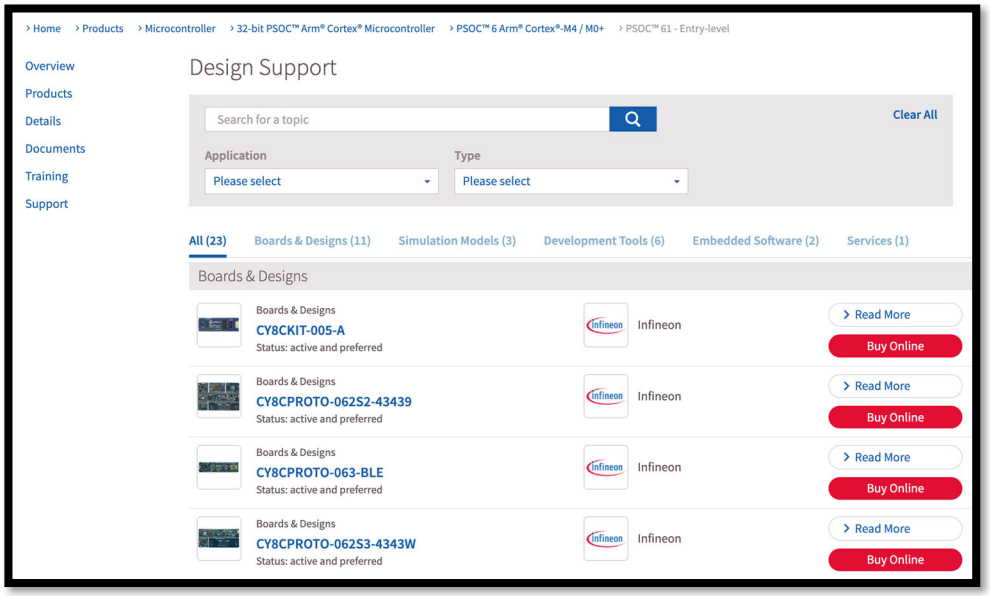


(Exemplary categories of instructive materials provided for the PSoC 6, with additional materials provided for each product subcategory under their respective web subpages.)

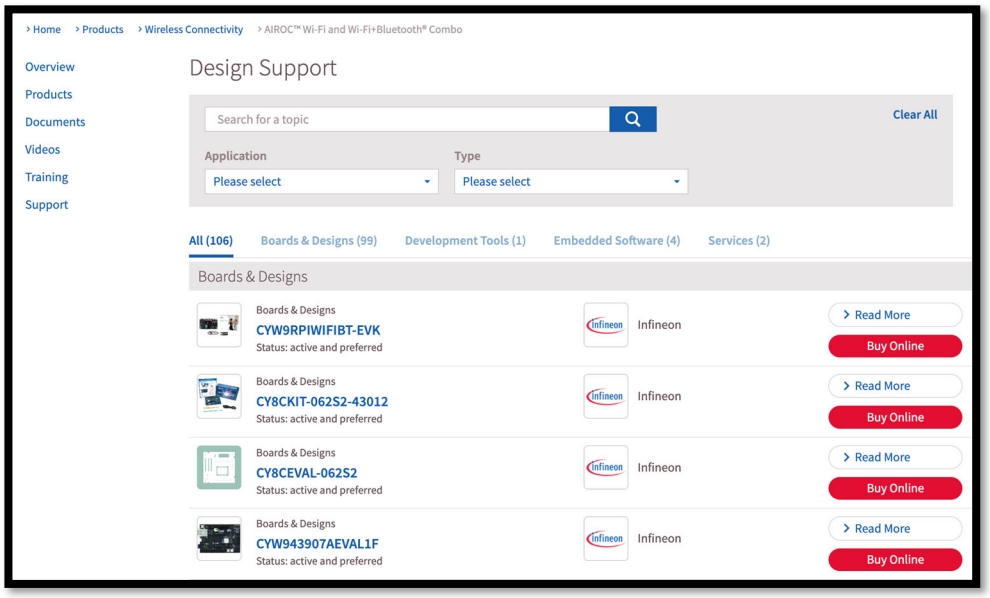


(Exemplary instructive materials provided for the AIROC products, with additional materials provided for each product subcategory under their respective web subpages.)

139. On its website, Infineon also furnishes development tools and design support materials for the Accused Products, including at least the PSoC 6 and AIROC products:

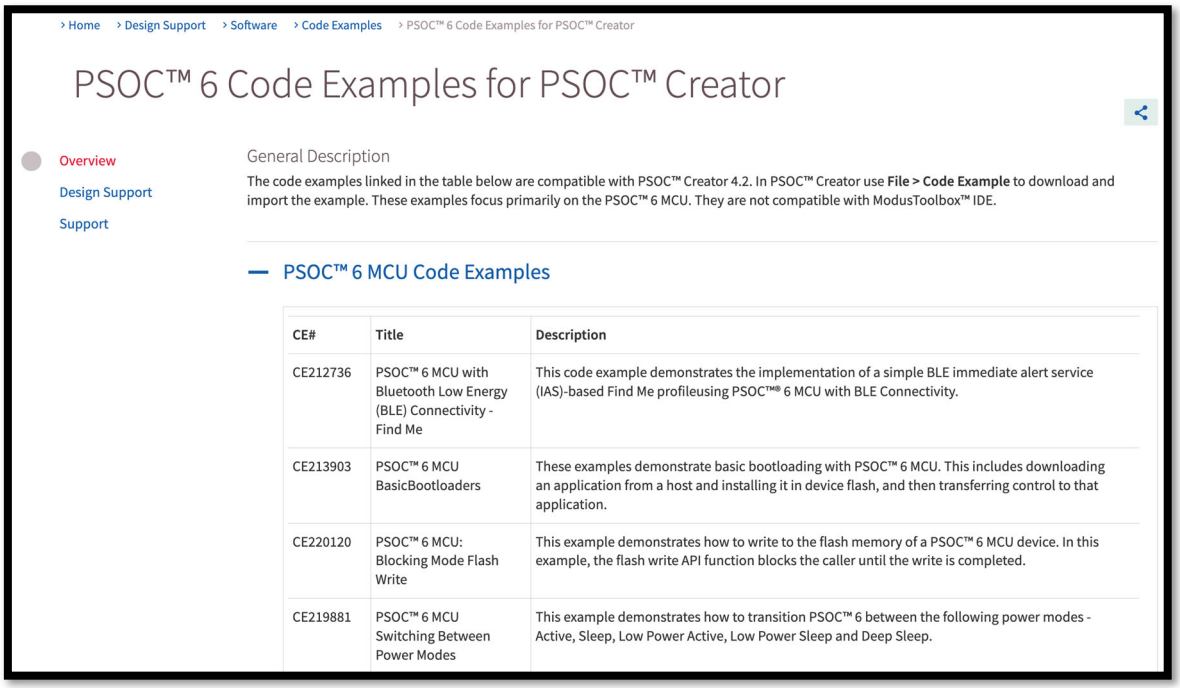


(Exemplary design support materials for PSoC 6.)

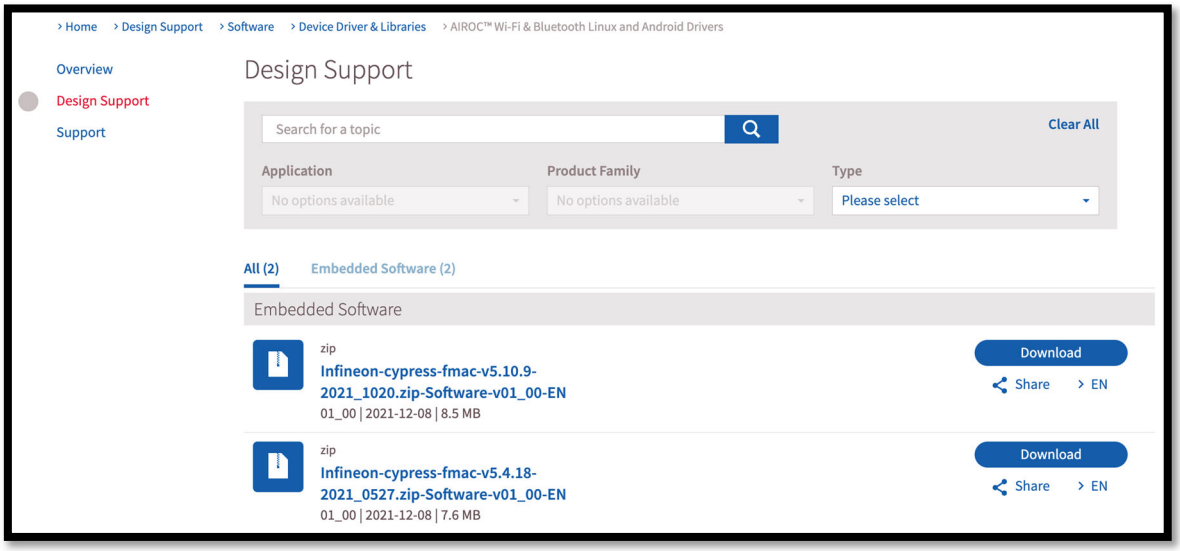


(Exemplary design support materials for AIROC products.)

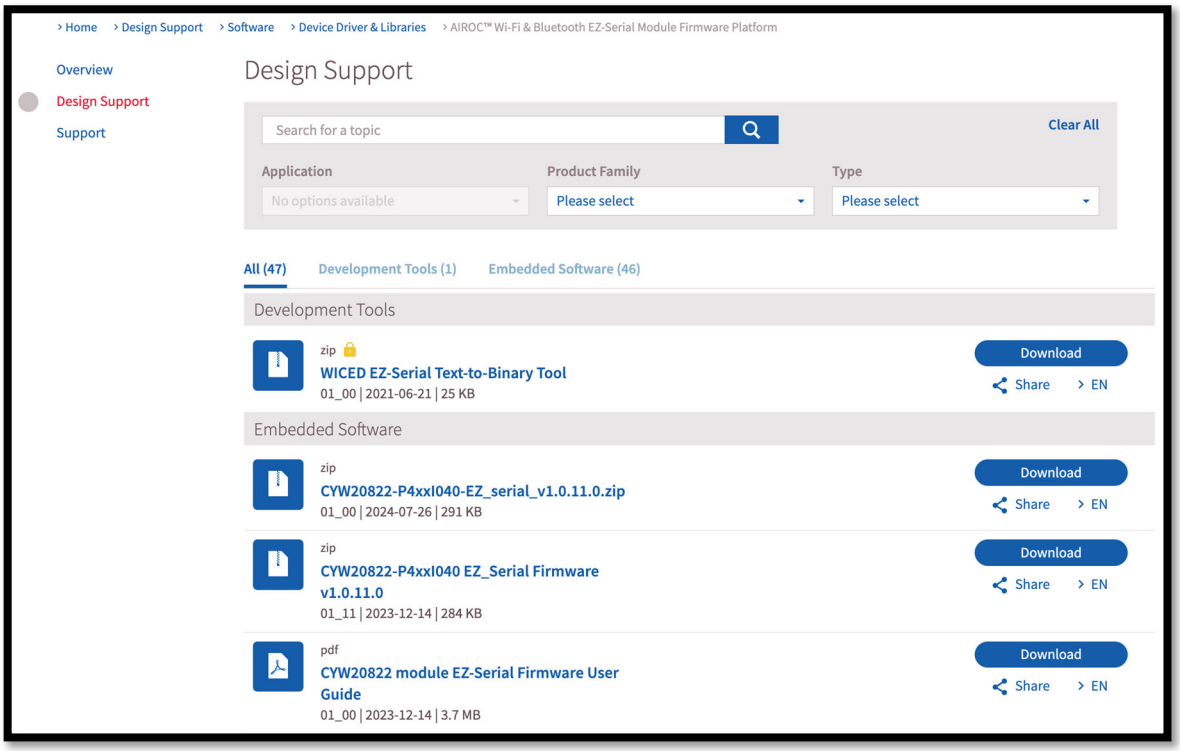
140. Further, Infineon provides software, including code examples, drivers, and firmware:



(Exemplary code examples for PSoC 6.)

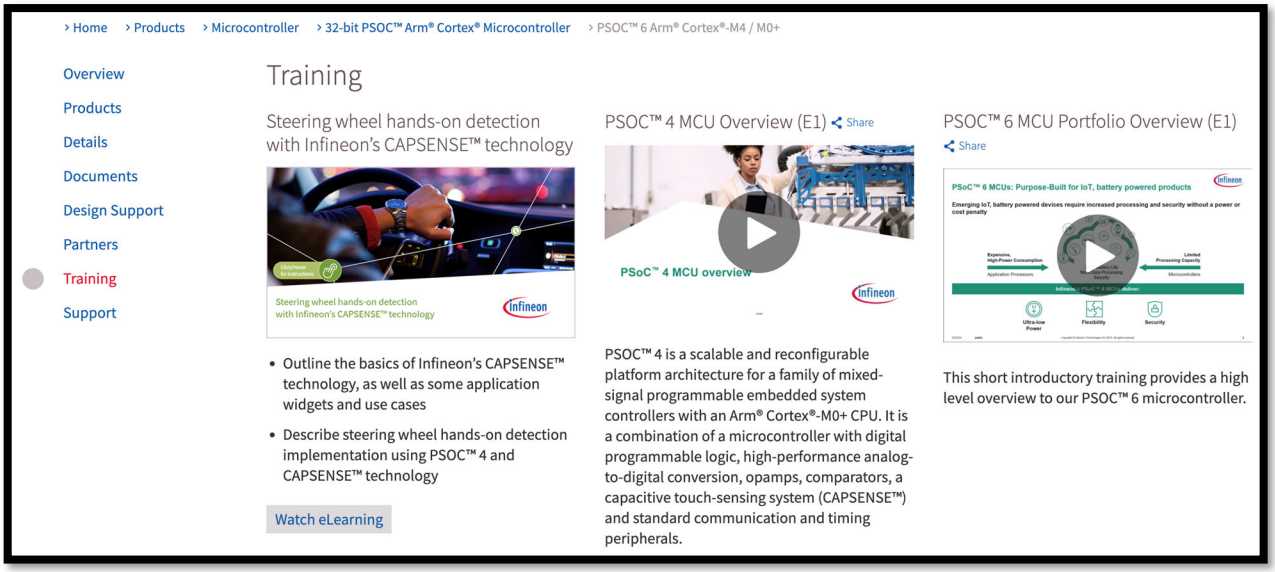


(AIROC™ Wi-Fi & Bluetooth Linux and Android Drivers.)

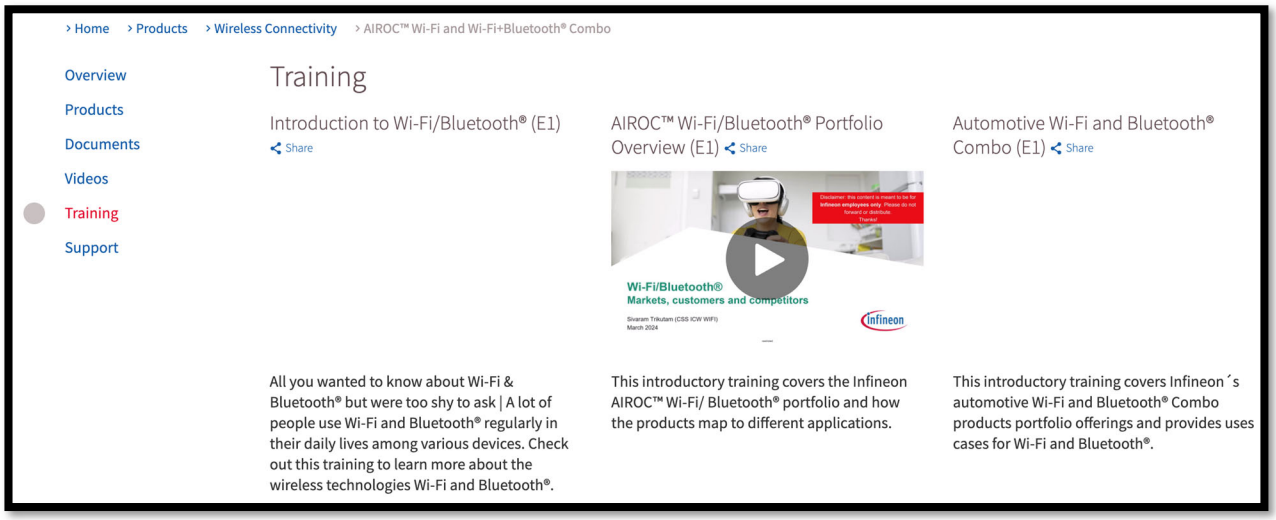


(AIROC™ Wi-Fi & Bluetooth EZ-Serial Module Firmware Platform.)

141. In addition, on its website, Infineon provides training materials and help from Infineon support engineers:



(Exemplary Training Materials for PSoC 6.)



(Exemplary Training Materials for AIROC products.)



(Link to the Infineon Developer Community for the PSoC 6.)



(Link to the Infineon Developer Community for the AIROC products.)

142. Infineon knew or should have known of the ’306 Patent and its infringement through a series of correspondence and meetings expressly notifying Infineon of the ’306 Patent

and Infineon's infringement thereof. As a result, Infineon knew or should have known it infringed one or more claims of the '306 Patent, including at least Claim 16, at least as early as November 3, 2017, when MOSAID began discussions with Cypress regarding the '306 Patent and provided actual notice of infringement.

143. Alternatively, Infineon knew or should have known it infringed one or more claims of the '306 Patent, including at least Claim 16, at least as early as April 17, 2018.

144. At a minimum, Infineon knew or should have known of the '306 Patent and its infringement no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID regarding the '306 Patent and Infineon's infringement thereof.

145. Despite this knowledge, Infineon continued to induce third parties, including Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 6 and AIROC products, to infringe one or more claims of the '306 Patent, including at least Claim 16, with the specific intent to cause infringement. Infineon knew or should have known that those acts would induce actual infringement by third parties, including Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 6 and AIROC products, of one or more of the claims of the '306 Patent, including at least Claim 16.

146. Therefore, Infineon has induced infringement by others of one or more of the claims of the '306 Patent, including at least Claim 16, with the specific intent to induce acts that constitute infringement of the '306 Patent and with knowledge that such acts infringed one or more claims of the '306 Patent, including at least Claim 16.

147. In violation of 35 U.S.C. § 271(c), Infineon has infringed one or more of the claims of the '306 Patent, including at least Claim 16, indirectly by contributing to infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products,

including at least the PSoC 6 and AIROC products, in this District and elsewhere in the United States. Direct infringement by Infineon's customers occurred at least by the use of the Accused Products, including at least the PSoC 6 and AIROC products, including use of consumer products incorporating them.

148. On information and belief, Infineon made and sold hardware, firmware, and/or software components (*e.g.*, processors and/or software drivers) especially made or especially adapted to practice the invention claimed in the '306 Patent, including at least Claim 16. For example, as explained above, Infineon made and sold PSoC and MCU hardware, including the PSoC 6 and AIROC product architectures, and accompanying software, firmware, and driver code. On information and belief, such hardware, firmware, and/or software components (i) are a material part of the invention and (ii) are not staple articles or commodities of commerce suitable for substantial non-infringing use at least because they are specifically designed to perform the claimed functionality. Any other use of such hardware, firmware, and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

149. Therefore, Infineon has contributed to the infringement by others of one or more of the claims of the '306 Patent, including at least Claim 16.

150. Infineon's infringement of one or more claims of the '306 Patent, including at least Claim 16, was willful.

151. As explained above, Infineon had actual knowledge of the '306 Patent and its infringement thereof at least as early as November 3, 2017, when MOSAID began discussions with Cypress regarding the '306 Patent, and in any event no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID.

152. As explained above, on several occasions beginning at least as early as November 3, 2017, MOSAID notified Infineon (including Cypress) of the '306 Patent and Infineon's infringement thereof, including infringement of at least Claim 16.

153. Despite knowing of the '306 Patent at least as early as November 3, 2017 (and no later than April 2020), Infineon did not cease its infringing activities. Infineon continued to infringe one or more claims of the '306 Patent, including at least Claim 16, in disregard of MOSAID's patent rights. As a result, Infineon deliberately and intentionally infringed the '306 Patent, and continued to do so, after receiving express and actual knowledge of both the '306 Patent and its infringement thereof.

154. Therefore, Infineon's infringement of the '306 Patent, including at least Claim 16, was willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate, entitling MOSAID to increased damages pursuant to 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

COUNT III: INFRINGEMENT OF THE '448 PATENT

155. MOSAID incorporates by reference and realleges paragraphs 1 through 154 as if specifically set forth herein.

156. In violation of 35 U.S.C. § 271(a), Infineon is and has been directly infringing one or more of the claims of the '448 Patent, including at least Claim 4, either literally and/or under the doctrine of equivalents, by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, without authority, at least one of the Accused Products.

157. Claim 4 of the '448 Patent recites:

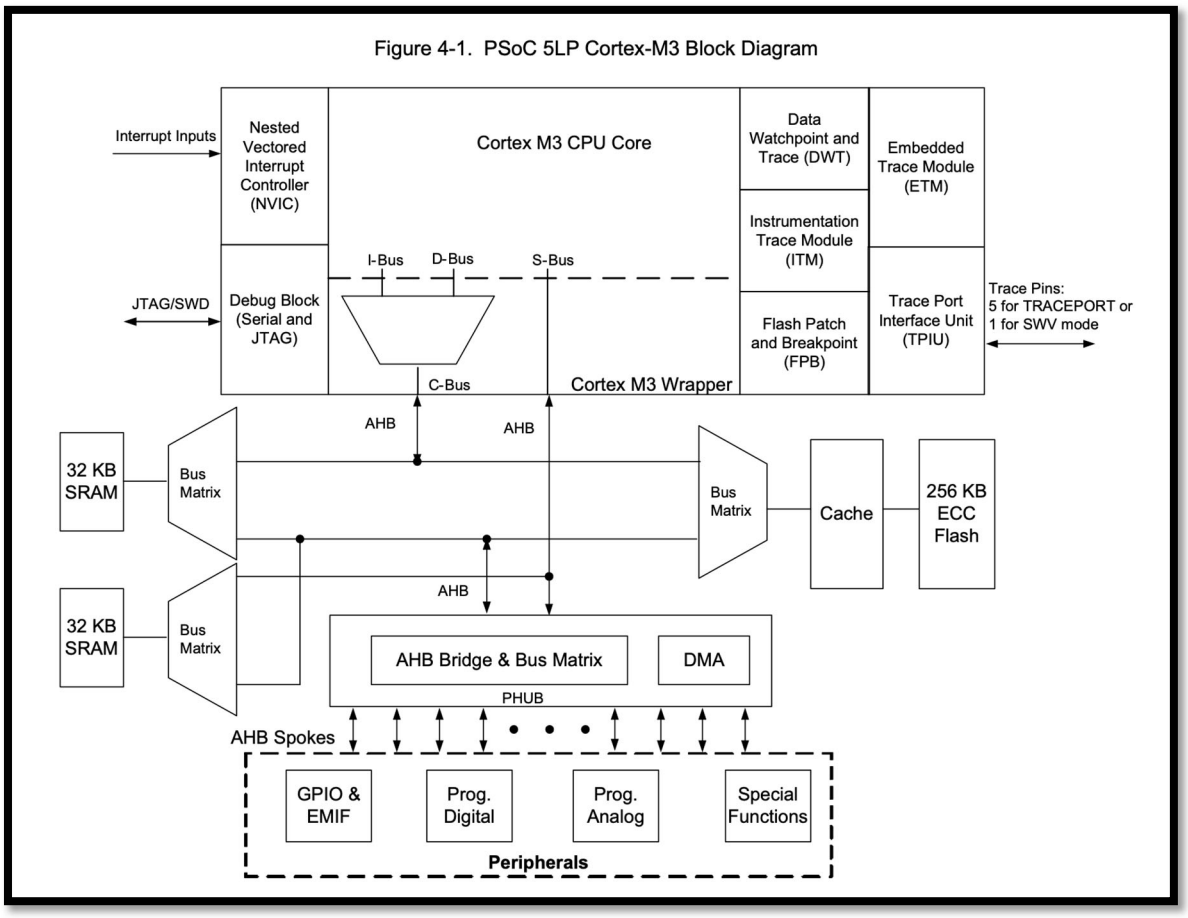
> 4. A multiplexor circuit, comprising:
>
> a plurality of data connections;

first stage logic configured to receive a first data word from one of the connections and to transmit the first data word received based on a set of select signals; and

second stage logic configured to receive the first data word from the first stage logic and to select a selected data word between the first data word and a second data word received from another of the plurality of data connections based upon a set of select signals, the second stage logic configured to transmit the selected data word to a third stage logic and to increase a signal strength of the first data word when the first data word is transmitted, if the first data word is selected.

158. The Accused Products, including at least the PSoC 5LP family of processors, practice each element of Claim 4 of the ’448 Patent.

159. The Accused Products include a multiplexor circuit comprising a plurality of data connections. For example, at least the PSoC 5LP includes circuitry allowing for signal multiplexing and logic operations. As shown below, the circuitry includes data connections to and from various system components including at least an ARM Cortex-M3 CPU, a peripheral hub (“PHUB”) with a direct memory access (“DMA”) controller, and memory components, among others.



(PSoC 5LP Architecture Technical Reference Manual, at 34.)

160. The Accused Products include a first stage logic configured to receive a first data word from one of the connections. For example, at least the PSoC 5LP includes multiplexer logic (e.g., a bus matrix) configured to receive a first data word via at least the D-Bus and/or S-Bus of the Cortex-M3 CPU.

161. Further, the first stage logic is configured to transmit the first data word received based on a set of select signals. For example, the bus matrix logic of the CPU can decode the access request and assert a select signal for transmission to the appropriate destination. If the bus matrix determines that the CPU wants to access the SRAM or a certain region of SRAM, for example, the bus matrix transmits the first data word to the SRAM/region. In addition, for simultaneous

accesses, the bus matrix logic can determine which access takes priority and transmit the data word accordingly.

162. The Accused Products include a second stage logic configured to receive the first data word from the first stage logic. For example, at least the PSoC 5LP contains additional bus matrix logic for various slave components, including at least SRAM and Flash memory modules. As shown in Figure 4-1, above, the PSoC 5LP uses bus interfaces based on ARM's Advanced High Performance Bus ("AHB") specification. As shown in the figure below, the AHB bus matrix module generally consists of an input stage, a decoder stage, and an output stage. On information and belief, the bus matrices of the Accused Products, including at least the PSoC 5LP, follow this configuration. In the example of an SRAM access by the CPU, the input/decoder stage of the SRAM bus matrix logic will receive the first data word from the first stage logic of the CPU.

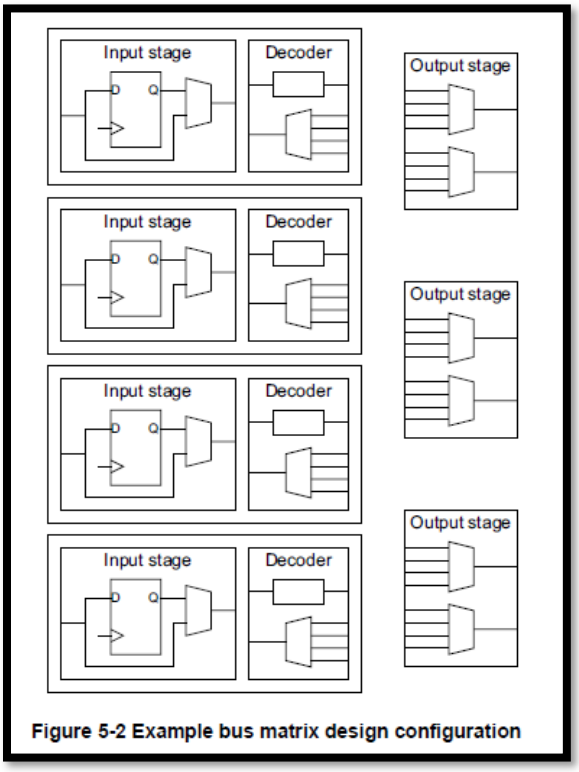


Figure 5-2 Example bus matrix design configuration

(ARM Cortex-M System Design Kit Technical Reference Manual, at 5-6.)

163. Further, the second stage logic is configured to select a selected data word between the first data word and a second data word received from another of the plurality of data connections based upon a set of select signals. For example, the input/decoder stage of the SRAM bus matrix can receive a second data word from another data connection, such as the DMA controller, because the CPU and DMA share bandwidth as dual bus masters. The decoder stage will generate and assert a select signal for the appropriate master-slave connection. In addition, when the CPU and DMA controller attempt to access the same region of SRAM simultaneously, the bus matrix logic can determine which access to permit first. For example, the priority decoder gives a higher priority to the CPU for certain SRAM accesses but gives a higher priority to the DMA controller for other SRAM accesses.

164. In addition, the second stage logic is configured to transmit the selected data word to a third stage logic and to increase a signal strength of the first data word when the first data word is transmitted, if the first data word is selected. For example, the selected data is transmitted to a third logic stage as it is further transmitted to the SRAM. On information and belief, when the first data word is selected and transmitted, there is an increase to its signal strength.

165. During license discussions, MOSAID provided Infineon with exemplary claim charts explaining in detail Infineon's infringement of the '448 Patent.

166. In violation of 35 U.S.C. § 271(b), Infineon is and has been infringing one or more of the claims of the '448 Patent, including at least Claim 4, indirectly by inducing infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products, in this District and elsewhere in the United States. For example, on information and belief, at least the PSoC 5LP has been and is being used by Infineon's customers and/or end-users in consumer products, including wearables, fitness products, and mobile devices. Direct

infringement by Infineon's customers and/or end-users occurs at least by the use of the Accused Products, including at least the PSoC 5LP, including use of consumer products incorporating them.

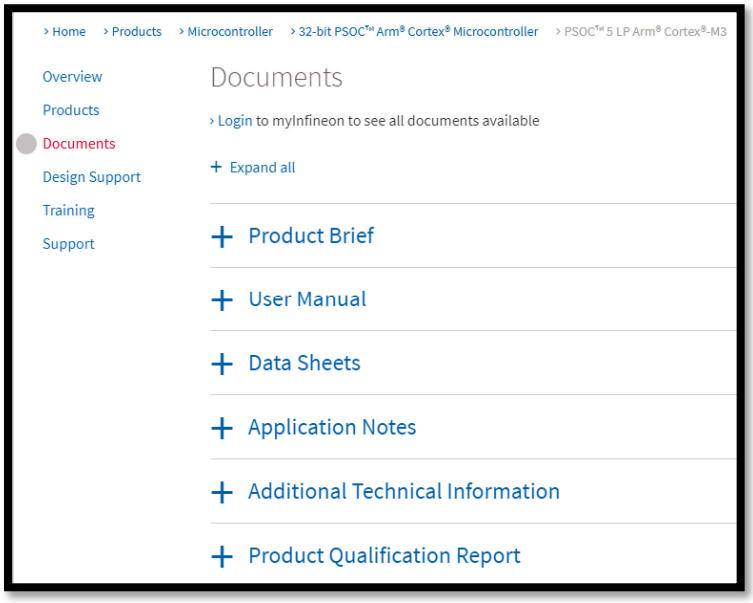
167. On information and belief, Infineon supplies hardware, firmware, and/or software, including software drivers, that are especially made or especially adapted to practice the inventions claimed in the '448 Patent, including at least Claim 4, to induce third parties, including for example Infineon's customers and/or end-users of at least one of the Accused Products, to use the Accused Products in a manner that would infringe one or more claims of the '448 Patent, including at least Claim 4.

168. On information and belief, Infineon supplies hardware, firmware, and/or software that are especially made or especially adapted to practice the inventions claimed in the '448 Patent, including at least Claim 4, to induce third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 5LP, to use such products in a manner that would infringe one or more of the claims of the '448 Patent, including at least Claim 4.

169. On information and belief, Infineon markets and advertises the Accused Products, including at least the PSoC 5LP, including on its website, to induce third parties, including Infineon's customers and/or end-users, to use the products in a manner that would infringe one or more claims of the '448 Patent, including at least Claim 4. *See, e.g.*, https://www.infineon.com/cms/en/product/microcontroller/32-bit-psoc-arm-cortex-microcontroller/32-bit-psoc-5-lp-arm-cortex-m3.

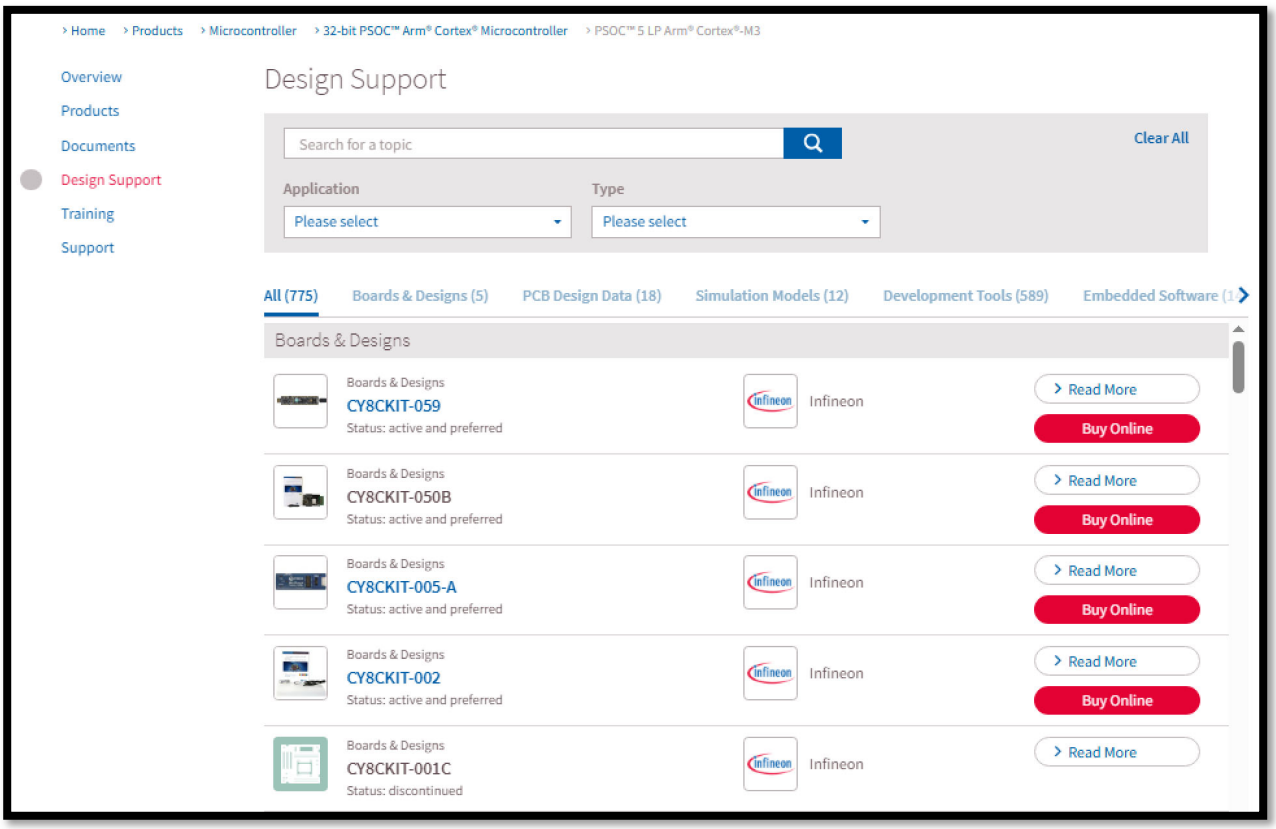
170. On information and belief, Infineon furnishes instructive materials, technical support, and information concerning the operation and use of the Accused Products, including at least the PSoC 5LP, to induce third parties, including Infineon's customers and/or end-users, to

use the products in a manner that would infringe one or more claims of the '448 Patent, including at least Claim 4. For example, on its website, Infineon furnishes at least product briefs, user manuals, data sheets, application notes, additional product and technical information (such as architecture technical reference manuals), and product qualification reports:



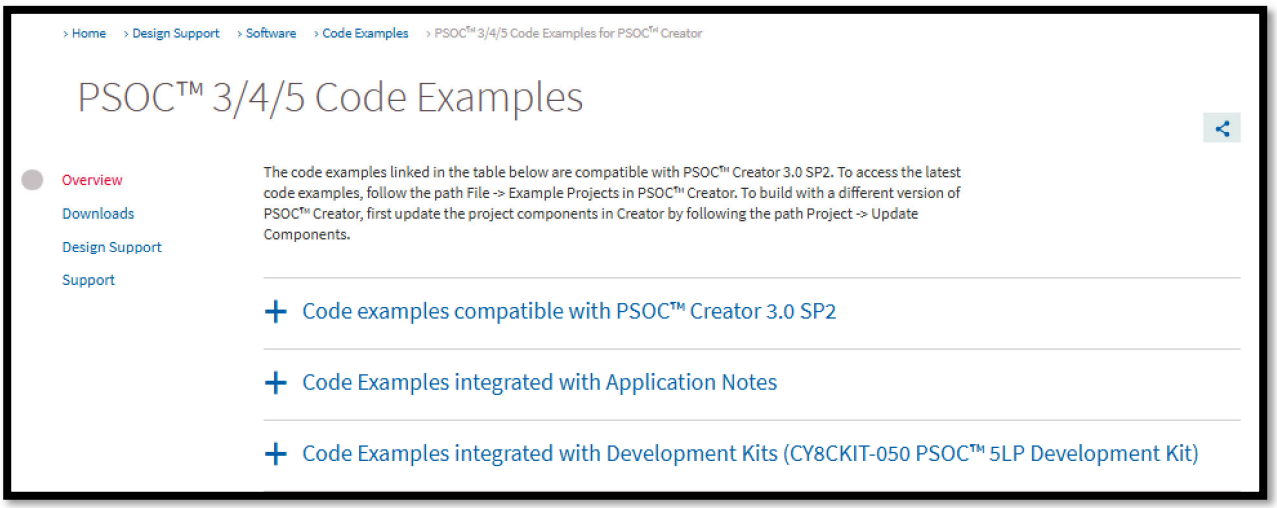
(Exemplary categories of instructive materials provided for the PSoC 5LP, with additional materials provided for each product subcategory under their respective web subpages.)

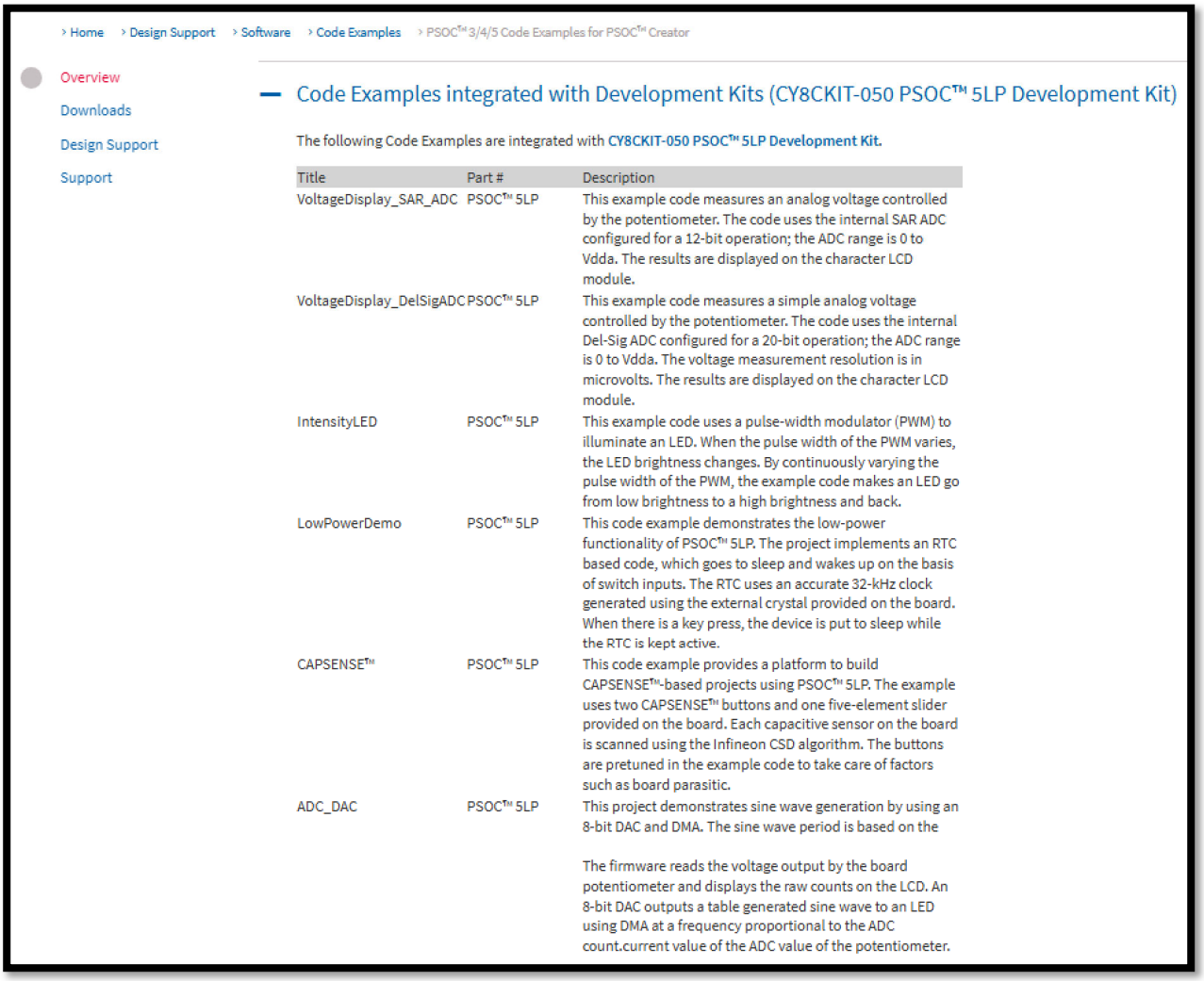
171. On its website, Infineon also furnishes development tools and design support materials for the Accused Products, including at least the PSoC 5LP:



(Exemplary design support materials for PSoC 5LP.)

172. Further, Infineon provides software, including code examples and drivers:





(Infineon PSOC 3/4/5 Code Examples, including code examples integrated with PSoC 5LP Development Kit.)

4 Code Examples

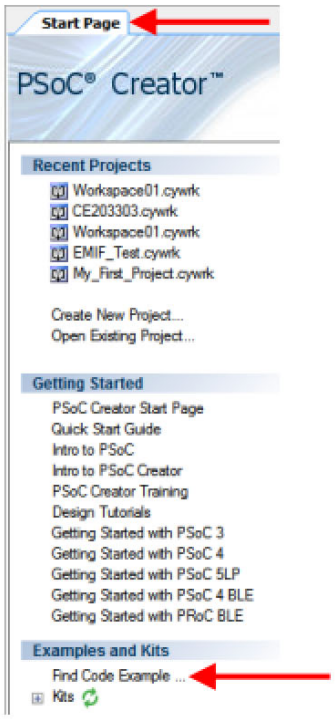
PSoC Creator includes a large number of code example projects. These code examples are available from the PSoC Creator Start Page, as Figure 2 shows.

Code examples can speed up your design process by starting you off with a complete design, instead of a blank page. The code examples also show how PSoC Creator Components are used in various applications. Code examples and datasheets are included, as Figure 3 shows.

In the Find Code Example dialog shown in Figure 3, you have several options:

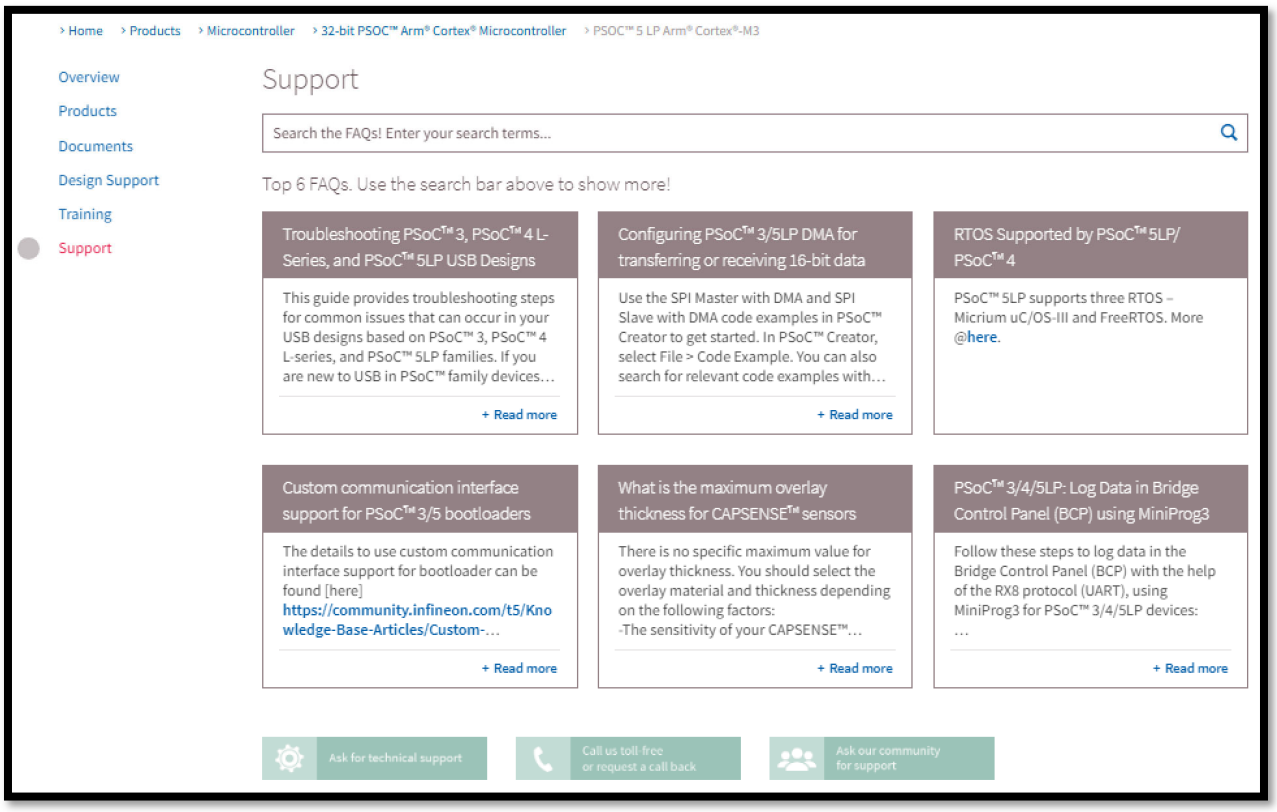
- Filter for examples based on architecture or device family, such as, PSoC 3, PSoC 4 or PSoC 5LP; category; or keyword
- Select from the menu of examples offered based on the Filter Options
- Review the datasheet for the selection (on the **Documentation** tab)
- Review the code example for the selection. You can copy and paste code from this window to your project, which can help speed up code development, or
- Create a new project (and a new workspace if needed) based on the selection. This can speed up your design process by starting you off with a complete, basic design. You can then adapt that design to your application.

Figure 2. Code Examples in PSoC Creator

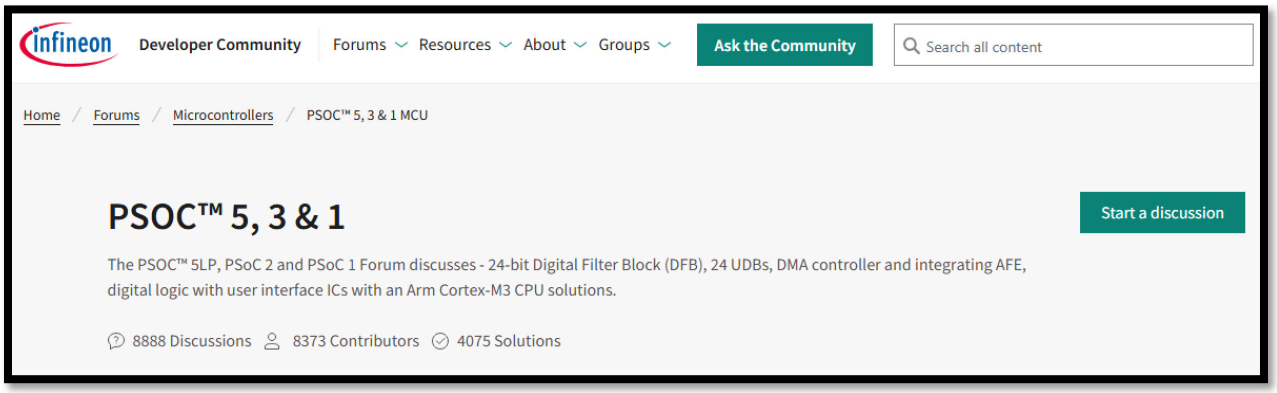


(Getting Started with PSoC 5LP, at 4.)

173. In addition, on its website, Infineon provides training materials and help from Infineon support engineers:



(Exemplary Training Materials for PSoC 5LP.)



(Infineon Developer Community for PSoC 5LP.)

174. Infineon knew or should have known of the ’448 Patent and its infringement through a series of correspondence and meetings expressly notifying Infineon of the ’448 Patent and Infineon’s infringement thereof. As a result, Infineon knew or should have known it infringed one or more claims of the ’448 Patent, including at least Claim 4, at least as early as November 3,

2017, when MOSAID began discussions with Cypress regarding the '448 Patent and provided actual notice of infringement.

175. Alternatively, Infineon knew or should have known of the '448 Patent and its infringement no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID regarding the '448 Patent and Infineon's infringement thereof.

176. At a minimum, both Infineon Defendants have had actual knowledge of the '448 Patent, and their infringement thereof, at least as of the date of filing of this Complaint.

177. Despite this knowledge, Infineon has continued to induce third parties, including Infineon's customers and/or end-users of at least one of the Accused Products, including at least the PSoC 5LP, to infringe one or more claims of the '448 Patent, including at least Claim 4, with the specific intent to cause infringement. Infineon knew or should have known that those acts would induce actual infringement by third parties, including Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 5LP, of one or more of the claims of the '448 Patent, including at least Claim 4.

178. Therefore, Infineon has induced infringement by others of one or more of the claims of the '448 Patent, including at least Claim 4, with the specific intent to induce acts that constitute infringement of the '448 Patent and with knowledge that such acts infringe one or more claims of the '448 Patent, including at least Claim 4.

179. In violation of 35 U.S.C. § 271(c), Infineon is and has been infringing one or more of the claims of the '448 Patent, including at least Claim 4, indirectly by contributing to infringement by third parties, including for example Infineon's customers and/or end-users of the Accused Products, including at least the PSoC 5LP, in this District and elsewhere in the United States. Direct infringement by Infineon's customers and/or end-users occurs at least by the use of

the Accused Products, including at least the PSoC 5LP, including use of consumer products incorporating them.

180. On information and belief, Infineon made and sold hardware, firmware, and/or software components (*e.g.*, processors and/or software drivers) especially made or especially adapted to practice the invention claimed in the '448 Patent, including at least Claim 4. For example, as explained above, Infineon made and sold PSoC hardware, including the PSoC 5LP architecture, and accompanying code. On information and belief, such hardware, firmware, and/or software components (i) are a material part of the invention and (ii) are not staple articles or commodities of commerce suitable for substantial non-infringing use at least because they are specifically designed to perform the claimed functionality. Any other use of such hardware, firmware, and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

181. Therefore, Infineon has contributed to the infringement by others of one or more of the claims of the '448 Patent, including at least Claim 4.

182. Infineon's infringement of one or more claims of the '448 Patent, including at least Claim 4, has been, and continues to be, willful.

183. As explained above, Infineon had actual knowledge of the '448 Patent and its infringement thereof at least as early as November 3, 2017, when MOSAID began discussions with Cypress regarding the '448 Patent, and in any event no later than April 2020, when Infineon acquired Cypress and continued discussions with MOSAID.

184. As explained above, on several occasions beginning at least as early as November 3, 2017, MOSAID notified Infineon (including Cypress) of the '448 Patent and Infineon's infringement thereof.

185. Despite knowing of the ’448 Patent at least as early as November 3, 2017 (and no later than April 2020), Infineon did not cease its infringing activities. Infineon has continued to infringe one or more claims of the ’448 Patent, including at least Claim 4, in disregard of MOSAID’s patent rights. As a result, Infineon deliberately and intentionally infringed the ’448 Patent, and continues to do so, after receiving express and actual knowledge of both the ’448 Patent and its infringement thereof.

186. Therefore, Infineon’s infringement of the ’448 Patent, including at least Claim 4, has been and continues to be willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate, entitling MOSAID to increased damages pursuant to 35 U.S.C. § 284 and to attorneys’ fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

DAMAGES

187. Defendants’ acts of infringement have caused damages to MOSAID, and MOSAID is entitled to recover the damages it has sustained as a result of Defendants’ wrongful acts in an amount to be determined at trial.

188. MOSAID is entitled to, and now seeks to, recover damages in an amount not less than the maximum amount permitted by law caused by Defendants’ acts of infringement.

189. As a result of Defendants’ acts of infringement, MOSAID has suffered actual and consequential damages. To the fullest extent permitted by law, MOSAID seeks recovery of damages in an amount to compensate for Defendants’ infringement. MOSAID further seeks any other damages to which MOSAID would be entitled to in law or in equity.

INJUNCTIVE RELIEF

190. Defendants’ acts of infringement have caused—and unless restrained and enjoined, Defendants’ acts of infringement will continue to cause—irreparable injury and damage to

MOSAID for which MOSAID has no adequate remedy at law. Unless enjoined by this Court, Defendants will continue to infringe the claims of the Asserted Patents.

ATTORNEYS' FEES

191. MOSAID is entitled to recover reasonable and necessary attorneys' fees under applicable law.

DEMAND FOR JURY TRIAL

192. Pursuant to Rule 38 of the Federal Rules of Civil Procedure, MOSAID demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, MOSAID prays for judgment and requests that the Court find in its favor and against Defendants. MOSAID respectfully requests that the Court enter preliminary and final orders, declarations, and judgments against Defendants as are necessary to provide MOSAID with the following relief:

a. A judgment that Defendants have infringed and/or are infringing one or more claims of the Asserted Patents, literally or under the doctrine of equivalents, as alleged above;

b. A judgment that Defendants have infringed and/or are infringing one or more claims of the Asserted Patents, directly, as alleged above;

c. A judgment that Defendants have infringed and/or are infringing one or more claims of the Asserted Patents, indirectly, as alleged above;

d. A judgment that Defendants' infringement of the claims of the Asserted Patents has been willful;

e. An award for all damages and costs arising out of Defendants' infringement, to adequately compensate MOSAID for Defendants' infringement of the Asserted Patents,

but in no event less than a reasonable royalty, including supplemental damages for any continuing post-verdict infringement up until entry of the final judgment, with an accounting, as needed;

f. Pre-judgment and post-judgment interest, jointly and severally, in an amount according to proof;

g. Treble damages based on Defendants' willful infringement;

h. An accounting of damages and any future compensation due to MOSAID for Defendants' infringement (past, present, or future) not specifically accounted for in a damages award (or other relief), and/or permanent injunctive relief;

i. A judgment that this case is exceptional and an award of reasonable attorneys' fees as provided by 35 U.S.C. § 285 and enhanced damages as provided by 35 U.S.C. § 284;

j. An award of costs of suit;

k. The entry of an order enjoining and restraining Defendants and their parents, affiliates, subsidiaries, officers, agents, servants, employees, attorneys, successors, and assigns and all persons in active concert or participation therewith, from making, importing, using, offering for sale, selling, or causing to be sold any product falling within the scope of any claim of the Asserted Patents, or otherwise infringing or inducing infringement of any claim of the Asserted Patents; and

l. All further relief in law or in equity as the Court may deem just and proper.

Dated: March 10, 2025

Respectfully submitted,

/s/ Jamie H. McDole

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Attorneys for Plaintiff
MOSAID Technologies Inc.

APPENDIX T4

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

MOSAID TECHNOLOGIES INC., *Plaintiff,* v. INFINEON TECHNOLOGIES AG and INFINEON TECHNOLOGIES AMERICAS CORP., *Defendants.*	Civil No. 1:25-cv-358-ADA **JURY TRIAL DEMANDED**

MOSAID TECHNOLOGIES INC.'S
PRELIMINARY INFRINGEMENT CONTENTIONS

Plaintiff MOSAID Technologies Inc. ("Plaintiff" or "MOSAID") hereby serves its Preliminary Infringement Contentions concerning Defendants Infineon Technologies AG ("Infineon AG") and Infineon Technologies Americas Corp. ("Infineon Americas") (collectively, "Defendants" or "Infineon") and their infringement of U.S. Patent No. 7,111,179 ("the '179 Patent"), U.S. Patent No. 7,051,306 ("the '306 Patent"), and U.S. Patent No. 7,349,448 ("the '448 Patent") (collectively, the "Asserted Patents").

These Preliminary Infringement Contentions are based on available information obtained to date. MOSAID has not obtained any formal discovery in this case from Defendants or third parties who have relevant information regarding the Accused Products (defined below). MOSAID reserves the right to supplement and amend its Infringement Contentions, including pursuant to the Court's Standing Order Governing Proceedings (OGP)—Patent Cases and any other applicable rules or orders of the Court, including based on additional information obtained through discovery or other means concerning Defendants' products or services, including specifically source code related to each Accused Product. MOSAID contends that software is relevant to a number of the

limitations of the Asserted Patents. MOSAID will seasonably amend these Preliminary Infringement Contentions after Defendants produce the relevant source code for inspection and after MOSAID has identified such relevant material.

I. ASSERTED CLAIMS

Subject to ongoing discovery and investigation, and based on available information obtained to date, MOSAID hereby contends that the Defendants infringe the following claims of the Asserted Patents (collectively, the "Asserted Claims"):

Asserted Patent	Exhibit	Asserted Claims	Accused Products
'179 Patent	179-A	1–7, 15–27, 35–40	PSoC 3 Microcontroller Device Family Products, PSoC 4 Arm Cortex-M0/M0+ Family Products, PSoC 4 HV Arm Cortex-M0+ Family Products, Automotive PSoC 4 Arm Cortex-M0/M0+ MCU Family Products, and PSoC 5 LP Arm Cortex-M3 Family Products
	179-B	8–13, 28–33	Presence Detection Solutions, including sensors (e.g. XENSIV PAS CO_2 Sensors, XENSIV 24 GHz Radar Sensors, and 60 GHz Radar Sensor) and microcontrollers or application processors (e.g. PSoC 4 Arm Cortex-M0/M0+ Family Products, PSoC 4 HV Arm Cortex-M0+ Family Products, Automotive PSoC 4 Arm Cortex-M0/M0+ MCU Family Products, and PSoC 6 Arm Cortex-M4 / M0+ Family Products)
'306 Patent	306-A	1–51	PSoC 6 Arm Cortex-M4 / M0+ Family Products

Asserted Patent	Exhibit	Asserted Claims	Accused Products
	306-B	1–51	AIROC Wi-Fi+Bluetooth Combo Device Family Products
'448 Patent	448-A	4, 8	32-bit PSoC Arm Cortex Microcontroller Device Family Products
	448-B	4, 8	32-bit TRAVEO T2G Arm Cortex Microcontroller Device Family Products
	448-C	4, 8	32-bit XMC Arm Cortex Industrial Microcontroller Device Family Products

The above-described Exhibits 179-A–B, 306-A–B, and 448-A–C, attached hereto, contain charts setting forth where in the Accused Products each element of each of the Asserted Claims are found. The corresponding chart/exhibit for each of the Asserted Patents is identified in the table above.

II. ACCUSED PRODUCTS

Subject to ongoing discovery and investigation, MOSAID contends that (1) as to the '179 Patent and '306 Patent, Defendants have infringed the Asserted Claims, and (2) as to the '448 Patent, Defendants have infringed and continue to infringe the Asserted Claims, as follows:

(i) under 35 U.S.C. § 271(a), by making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, each of the Accused Products listed below, as shown in Exhibits 179-A–B, 306-A–B, and 448-A–C;

(ii) under 35 U.S.C. § 271(b), by (1) inducing Defendants' customers and/or end users of the Accused Products to use the Accused Products in a manner that infringes the Asserted Claims, as shown in Exhibits 179-A–B, 306-A–B, and 448-A–C, and (2) as to Infineon AG, by inducing Infineon Americas to make, use, sell, and/or offer for sale in the United States, and/or import into the United States, the Accused Products; and

(iii) under 35 U.S.C. § 271(c), by contributing to the infringement of the Asserted Claims by third parties, including for example Defendants' customers and/or end-users of the Accused Products.

The "Accused Products" are processor products made, used, sold, and/or offered for sale in the United States, and/or imported into the United States, by Defendants, including but not limited to Defendants' PSoC 3 family microcontrollers, PSoC Arm Cortex family microcontrollers, AIROC Wi-Fi+Bluetooth Combo products, TRAVEO T2G Arm Cortex family microcontrollers, XMC Arm Cortex Industrial family microcontrollers, XENSIV 24 GHz Radar Sensors, XENSIV 60 GHz Radar Sensors, XENSIV PAS CO_2 Sensors, and any products including or incorporating the Accused Products, as well as other substantially similar processors made, used, sold, and/or offered for sale in the United States, and/or imported into the United States by Defendants, or as a result of Defendants' induced or contributory infringement.

On information and belief, MOSAID currently asserts that the structure, functionality, and operation of each category of Accused Product is substantially similar for purposes of infringement of the Asserted Claims, and thus, each Accused Product charted for a particular category is representative of each Accused Product in that category.

Specifically, subject to ongoing discovery and investigation, the Accused Products include at least the following:

- **Defendants' PSoC 3 Microcontroller Device Family Products, including at least:**
    - **PSoC 3 Family Products, including at least:**
        - PSoC 32xxx / CY8C32xxx Line
        - PSoC 34xxx / CY8C34xxx Line
        - PSoC 36xxx / CY8C36xxx Line
        - PSoC 38xxx / CY8C38xxx Line
        - Including, but not limited to, all products listed in **Exhibit A**

- **Defendants' 32-bit PSoC Arm Cortex Microcontroller Device Family Products, including at least:**

    - **PSoC 4 Arm Cortex-M0/M0+ Family Products, including at least:**

        - PSoC 4000 – Entry-Level Line
        - PSoC 4100 – Intelligent Analog Line
        - PSoC 4200 – Programmable Digital Line
        - PSoC 4 MCU with AIROC Bluetooth LE
        - PSoC Analog Coprocessor Arm Cortex-M0+ MCU
        - Including, but not limited to, all products listed in **Exhibit B**

    - **PSoC 4 HV Arm Cortex-M0+ Family Products, including at least:**

        - PSoC 4 HV PA, including PSoC 4 HVPA 144k
        - PSoC 4 HV MS, including PSoC 4 HV MS 64k and PSoC 4 HV MS 128K
        - Including, but not limited to, all products listed in **Exhibits C and D**

    - **Automotive PSoC 4 Arm Cortex-M0/M0+ MCU Family Products, including at least:**

        - Automotive PSoC 4 series, including at least:
            - Automotive PSoC 4000
            - Automotive PSoC 4100
            - Automotive PSoC 4200
        - Automotive PSoC 4 S-Series, including at least:
            - Automotive PSoC 4000S
            - Automotive PSoC 4100S
            - Automotive PSoC 4100S Plus
            - Automotive PSoC 4100S Max
            - Automotive PSoC 4700S Plus
        - Automotive PSoC 4 M series, including at least:
            - Automotive PSoC 4100M
            - Automotive PSoC 4200M
        - Automotive PSoC 4 L series, including at least:
            - Automotive PSoC 4100L
            - Automotive PSoC 4200L
        - Including, but not limited to, all products listed in **Exhibit E**

    - **PSoC 5 LP Arm Cortex-M3 Family Products, including at least:**

        - PSoC 52LPxxx / CY8C52LPxxx Line
        - PSoC 54LPxxx / CY8C54LPxxx Line
        - PSoC 56LPxxx / CY8C56LPxxx Line
        - PSoC 58LPxxx / CY8C58LPxxx Line

- Including, but not limited to, all products listed in **Exhibit F**

- **PSoC 6 Arm Cortex-M4 / M0+ Family Products, including at least:**
  - PSoC 61 – Entry-level Line, including at least:
    - PSoC 61x4
    - PSoC 61x5
    - PSoC 61x6
    - PSoC 61x7
    - PSoC 61x8
    - PSoC 61xA
  - PSoC 62 – Performance Line, including at least:
    - PSoC 62x4
    - PSoC 62x5
    - PSoC 62x6
    - PSoC 62x7
    - PSoC 62x8
    - PSoC 62xA
  - PSoC 63 Bluetooth LE MCU Line, including at least:
    - PSoC 63x6
    - PSoC 63x7
  - PSoC 64 – Secured MCU Line, including at least:
    - PSoC 64x5 Secure Boot
    - PSoC 64x7 Secure Boot
    - PSoC 64x7-BL Secure Boot BLE
    - PSoC 64xA Secure Boot
    - PSoC 64xA Standard Secure
  - Including, but not limited to, all products listed in **Exhibit G**

- **PSoC Automotive Multitouch Arm Cortex-M0 Family Products, including at least:**
  - PSoC Automotive Multitouch Gen6, including at least:
  - PSoC Automotive Multitouch Gen6L
  - PSoC Automotive Multitouch Gen6XL
  - PSoC Automotive Multitouch Gen7, including at least:
  - PSoC Automotive Multitouch Gen7L
  - PSoC Automotive Multitouch Gen7XL
  - PSoC Automotive Multitouch Gen8, including at least:
  - PSoC Automotive Multitouch Gen8XL
  - Including, but not limited to, all products listed in **Exhibits H and I**

- **PSoC Control Arm Cortex-M33 MCU Family Products, including at least:**
  - PSoC Control C3M

- PSoC Control C3P
- Including, but not limited to, all products listed in **Exhibit J**

- **PSoC Fingerprint Arm Cortex-M0+ Family Products, including at least:**

  - PSoC Fingerprint FPG1
  - Including, but not limited to, all products listed in **Exhibit K**

- **PSoC Edge Arm Cortex Multicore Family Products, including at least:**

  - PSoC Edge E81
  - PSoC Edge E83
  - PSoC Edge E84

➢ **Defendants' AIROC Wi-Fi+Bluetooth Combo Device Family Products, including at least:**

- **AIROC Wi-Fi 4 (802.11n) and Bluetooth 5.x combo products**

- **AIROC Wi-Fi 5 (802.11ac) and Bluetooth 5.x combo products**

- **AIROC Wi-Fi 6/6E (802.11ax) and Bluetooth 6.0 combo products**

- Including, but not limited to, all products listed in **Exhibit L**

➢ **Defendants' 32-bit TRAVEO T2G Arm Cortex Microcontroller Device Family Products, including at least:**

- **32-bit TRAVEO T2G Arm Cortex for Body, including at least:**

  - TRAVEO T2G CYT4BF Series
  - TRAVEO T2G CYT3BB/CYT4BB Series
  - TRAVEO T2G CYT2BL Series
  - TRAVEO T2G CYT2B9 Series
  - TRAVEO T2G CYT2B7 Series
  - TRAVEO T2G CYT2B6 Series

- **32-bit TRAVEO T2G Arm Cortex for Cluster, including at least:**

  - TRAVEO T2G CYT2CL
  - TRAVEO T2G CYT3DL
  - TRAVEO T2G CYT4DN

- Including, but not limited to, all products listed in **Exhibit M**

➢ **Defendants' 32-bit XMC Arm Cortex Industrial Microcontroller Device Family Products, including at least:**

- **32-bit XMC1000 Industrial Microcontroller Arm Cortex-M0, including at least:**
  - XMC1100
  - XMC1200
  - XMC1300
  - XMC1400
- **32-bit XMC4000 Industrial Microcontroller Arm Cortex-M4, including at least:**
  - XMC4100
  - XMC4200
  - XMC4300
  - XMC4400
  - XMC4500
  - XMC4700
  - XMC4800
- **32-bit XMC7000 Industrial Microcontroller Arm Cortex-M7, including at least:**
  - XMC7100
  - XMC7200
- **XMC SC Wireless Power Controllers**
- Including, but not limited to, all products listed in **Exhibit N**

➢ **Defendants' Presence Detection Solutions, including at least:**

- **Microcontrollers, including at least:**
  - PSoC 4 microcontrollers as listed above and in **Exhibits B, C, D, and E**
  - PSoC 6 as listed above and in **Exhibit G**
- **XENSIV Sensors, including at least:**
  - 24 GHz Radar Sensors
  - 60 GHz Radar Sensors
  - XENSIV PAS CO_2 Sensors

- Including, but not limited to, all products listed in **Exhibits O, P, and Q**

- **Evaluation Boards and Kits, including at least:**

  - XENSIV™ KIT CSK BGT60TR13C
  - XENSIV DEMO BGT60TR13C
  - XENSIV™ KIT CSK PAS CO_2

The Accused Products also include other substantially similar processors and products made, used, sold, and/or offered for sale in the United States, and/or imported into the United States, by Defendants, or as a result of Defendants' induced or contributory infringement.

The attached Exhibits 179-A–B, 306-A–B, and 448-A–C set forth representative claim charts detailing how Defendants infringe with respect to the Accused Products for the Asserted Claims. MOSAID reserves the right to supplement its Infringement Contentions and representative claim charts as new information becomes available in fact discovery.

III. PRELIMINARY INFRINGEMENT CLAIM CHARTS

Subject to ongoing discovery and investigation, and based on available information obtained to date, MOSAID contends that each element of the Asserted Claims is found within each Accused Product as shown in the infringement claim charts attached hereto as Exhibits 179-A–B, 306-A–B, and 448-A–C. MOSAID asserts that each element of the Asserted Claims is literally present in each Accused Product. To the extent that any element of the Asserted Claims is found not to be literally present in any Accused Product, MOSAID asserts that such element in the Accused Product is insubstantially different from the Asserted Claims and present under the doctrine of equivalents. To the extent that the Asserted Claims charted herein are method claims, MOSAID discloses that use of the Accused Products involves performing the identified claim step or steps.

MOSAID reserves the right to supplement and amend its Infringement Contentions, including pursuant to the Court's Standing Order Governing Proceedings (OGP)—Patent Cases and any other applicable rules or orders of the Court, including based on additional information obtained through discovery or other means concerning Defendants' products or services, including specifically source code related to each Accused Product.

IV. PRIORITY DATES

After a reasonable and diligent search and collection, MOSAID asserts that the priority date for the Asserted Claims is as specified below. MOSAID reserves the right to revise and update the priority date for the Asserted Claims as its investigation advances and/or new information becomes available.

Asserted Patent	Priority Date(s)
'179 Patent	The Asserted Claims of the '179 Patent are entitled to a priority date of October 11, 2001, based on the filing of U.S. Provisional Application No. 60/333,535. Alternatively, the Asserted Claims of the '179 Patent are entitled to a priority date of October 11, 2002, based on the filing of U.S. Patent Application No. 10/268,914.
'306 Patent	The Asserted Claims of the '306 Patent are entitled to a priority date of May 7, 2003, based on the filing of U.S. Provisional Application No. 60/468,742. Alternatively, the Asserted Claims of the '306 Patent are entitled to a priority date of May 7, 2004, based on the filing of U.S. Patent Application No. 10/840,893.
'448 Patent	The Asserted Claims of the '448 Patent are entitled to a priority date of August 1, 2003, based on the filing of U.S. Patent Application No. 10/632,885.

V. DOCUMENT PRODUCTION ACCOMPANYING PRELIMINARY INFRINGEMENT CONTENTIONS

Along with these Preliminary Infringement Contentions, MOSAID is producing a copy of each file history for each of the Asserted Patents (MOSAID_INF_358_00000432 – MOSAID_INF_358_00002397).

Dated: June 20, 2025

Respectfully submitted,

/s/ Nadia E. Haghighatian

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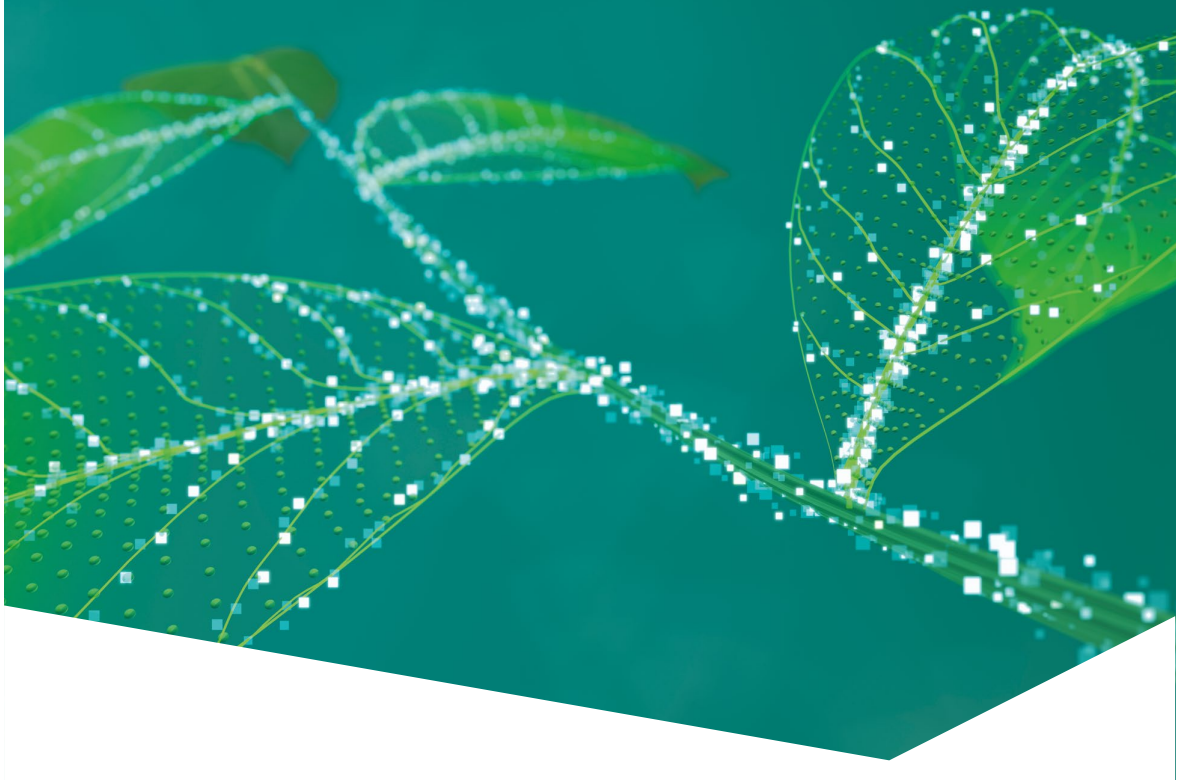
Attorneys for Plaintiff
MOSAID Technologies Inc.

CERTIFICATE OF SERVICE

I hereby certify that, on June 20, 2025, I caused this document, along with all attachments and exhibits, to be served on all counsel of record for Defendants by email.

/s/ Nadia E. Haghighatian
Nadia E. Haghighatian

APPENDIX T5



Infineon at a glance
Fiscal year 2024

www.infineon.com

Driving decarbonization and digitalization. Together.

Semiconductors are crucial to solve the energy challenges of our time and shape the digital transformation. This is why Infineon is committed to actively driving decarbonization and digitalization. As a global semiconductor leader in power systems and IoT, we enable game-changing solutions for green and efficient energy, clean and safe mobility, as well as smart and secure IoT.
We make life easier, safer, and greener. Together with our customers and partners.
For a better tomorrow.

Decarbonization

The world must reduce carbon emissions and use energy much more efficiently to secure quality of life for future generations.

With our power system solutions, we are a key enabler in the move to harness renewable energy resources and deliver energy-efficient solutions along the entire electrical energy chain.

Together with our customers and partners, we make more out of less to actively shape a greener future.

Digitalization

Digital transformation is changing the way we live, work, produce, and consume.

With our smart IoT devices and systems solutions, we link the real and the digital world, and play a key role in unleashing the full potential of digitalization.

Together with our customers and partners, we make the world smarter so we can all look forward to a better tomorrow.

Our Growth areas

Energy, mobility, and IoT

Energy – green and efficient

Rising demand for energy, depleted natural resources, and climate change call for more efficient ways of generating, transmitting, storing, and consuming energy.
Our semiconductor solutions allow energy to be created and used more efficiently.
We play a major role in the journey towards a net zero world.
We make green energy happen.

Mobility – clean and safe

Today, we are facing a new era of mobility with rising expectations around electrification, automation, convenience, and reliable connectivity.
Our semiconductor solutions drive the transformation towards clean, safe, and smart mobility services across all means of transport.
We shape the future of mobility.

IoT – smart and secure

As the digital transformation advances, demand for intuitive, secure, and smart ‘things’ is rising across everything from buildings and homes to factories and cities.
Our semiconductor solutions make connected ‘things’ context-aware, intelligent, energy-efficient, and secure.
We make IoT work.

Infineon's business segments and target applications

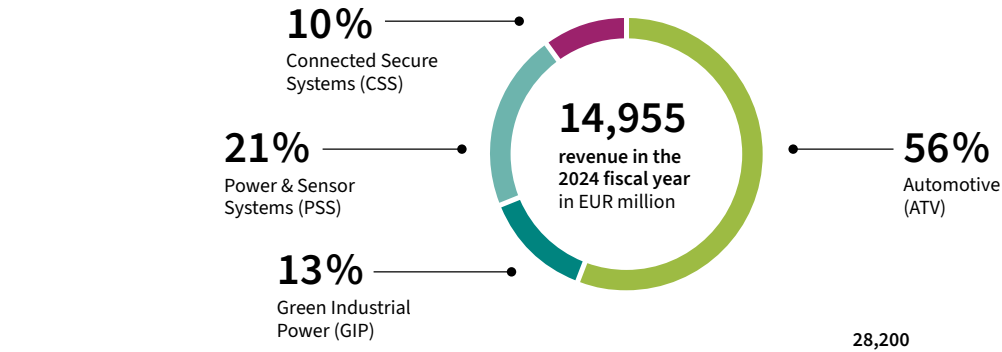
Automotive (ATV)
The ATV division is shaping the future of mobility by enabling clean, safe, and smart cars. Our product and solution offering is powering the decarbonization and digitalization of vehicles, while our deep system understanding and know-how in dependable electronics are helping to reduce system complexity. By driving the transition to all kinds of hybrid and pure electric vehicles, we are making a valuable contribution to cleaner roads. We are increasingly digitalizing cockpit, infotainment, comfort, and lighting applications as we take automated driving to the next stage with higher levels of computation performance, connectivity, security, and safety. Supporting the transition towards electrical/electronic (E/E) vehicle architectures and thus to software-defined vehicles, we are pushing the boundaries of edge artificial intelligence (AI). Our technology portfolio includes sensors, microcontrollers, high-performance memories for specific applications, power semiconductors based on silicon (Si), silicon carbide (SiC), and gallium nitride (GaN), as well as components for human-machine interaction and vehicle connectivity. Infineon is the world leader in automotive semiconductors.

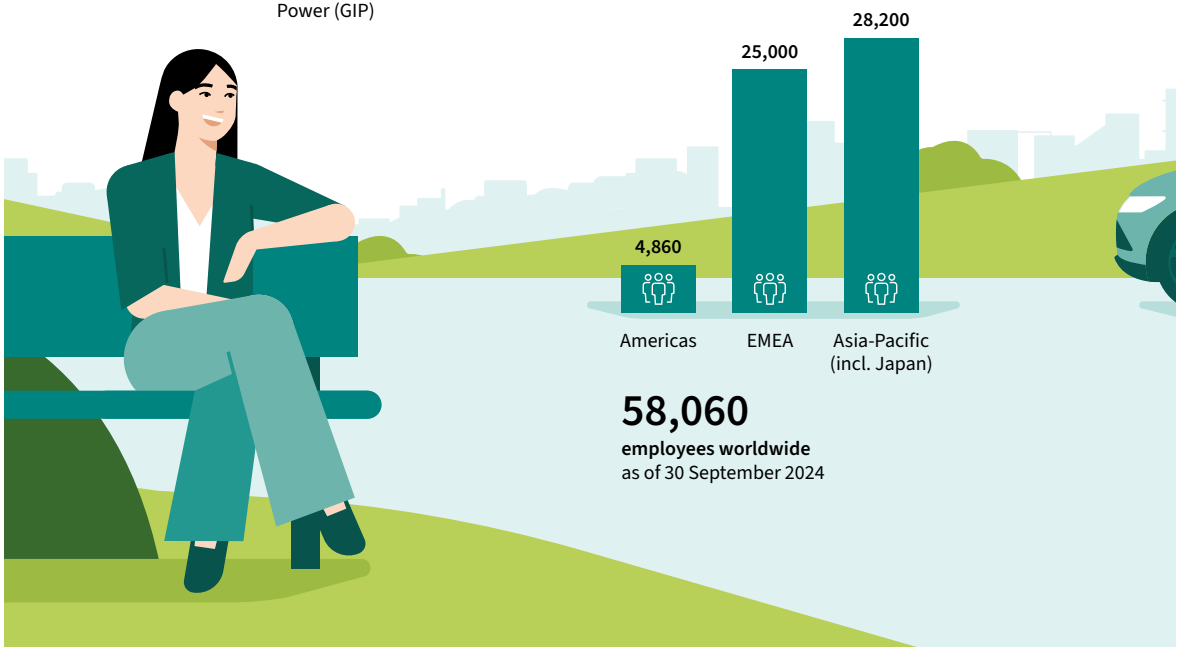
Green Industrial Power (GIP)
The GIP division is driving the global energy transition towards a more electrified and sustainable future. Spanning everything from generation through transmission to storage and consumption, we strive to make the entire energy chain smarter and more efficient. Main target applications range from renewable energy generation, power infrastructure, and transportation to automation and drives, heating, ventilation, air conditioning (HVAC), and home appliances. Our product portfolio encompasses IGBT and silicon carbide (SiC) power transistors as well as the driver ICs that control them. Our growing analytics, service, and software offering complements this wide spectrum – reaching beyond products to create additional value for customers. Infineon is the world leader in power semiconductors with the broadest SiC portfolio for industrial applications. Our solutions handle energy more intelligently and efficiently – driving decarbonization for a better tomorrow.

Power & Sensor Systems (PSS)
The PSS division powers Infineon's decarbonization and digitalization vision with a wide range of energy-efficient and digital solutions. Our Si-, SiC- and GaN-based semiconductors help avoid carbon emissions, use resources sustainably, manage power effectively and intelligently, give 'things' smart senses, and process data quickly and reliably. Our portfolio includes power, connectivity, RF, and sensor system technologies to develop smaller, lighter, smarter, and more efficient solutions for data centers, consumer and charging devices, smart home/building applications, robotics, solar systems, and more. Highly precise sensor solutions are enabling IoT devices to react intuitively to their surroundings for seamless user interactions. The next generation of silicon and wide-bandgap (i.e. SiC- and GaN-based) solutions is bringing unparalleled performance and reliability to power AI, consumer, and renewable energy applications. These materials are paving the way for further energy and carbon savings.

Connected Secure Systems (CSS)
The CSS division is at the core of the IoT and edge AI, offering microcontroller, connectivity (Wi-Fi, Bluetooth®/Bluetooth® Low Energy, and ultra-wideband (UWB) technologies), security, and AI/ML solutions. By combining hardware and software, we are addressing the needs of a diverse customer base with easy-to-use, trusted, and scalable systems. Our portfolio serves a broad range of applications, including industrial, smart home, automotive, health and lifestyle, home appliances, media and gaming, payment, and ID. Driven by the vision of a sustainable future, we are constantly optimizing the energy efficiency of our products, making use of sustainable materials, reducing our carbon footprint, and offering solutions to drive trends like the circular economy. We are proud that our technology drives innovation for society today, while paving the way to a green, trusted, and digital tomorrow.

Facts and figures





58,060
employees worldwide
as of 30 September 2024

Market shares

#1 in security ICS[1]

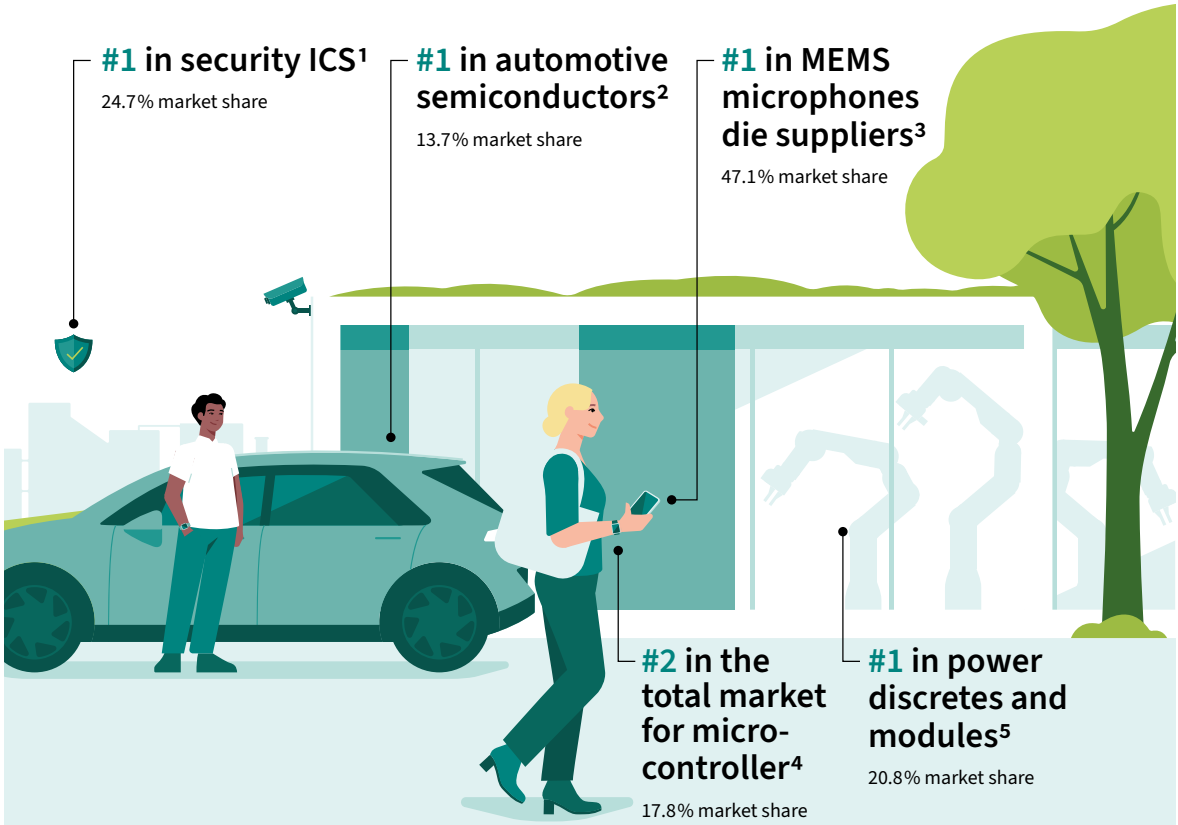
24.7% market share

#1 in automotive semiconductors[2]

13.7% market share

#1 in MEMS microphones die suppliers[3]

47.1% market share



#2 in the total market for micro-controller[4]

17.8% market share

#1 in power discretes and modules[5]

20.8% market share

1 Source: Distributed with permission of ABI Research – Source: ABI Research Custom: Secure IC Revenues by Manufacturer (excluding NFC). September 2024.
2 Source: TechInsights: Automotive Semiconductor Vendor 2023 Market Shares. April 2024.
3 Source: Based on or includes research from Omdia: MEMS Microphone Report – 2024 Database. October 2024. | MEMS Microphone Die Suppliers.
4 Source: Based on or includes research from Omdia: Annual 2001-2023 Semiconductor Market Share Competitive Landscaping Tool – 2Q24. August 2024.
5 Source: Based on or includes research from Omdia: Power Semiconductor Market Share Database – 2023. October 2024.
Results are not an endorsement of Infineon Technologies AG. Any reliance on these results is at the third party's own risk.

Sustainability

In line with the UN's position, we see sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Consequently, our Corporate Social Responsibility (CSR) concept covers the following areas:

Business ethics: Integrity shapes the way we do business and interact with customers, investors, business partners, employees, and the general public. This commitment forms the basis of our Business Conduct Guidelines.

Environmental sustainability and climate protection: We have set ourselves the target of becoming carbon-neutral by 2030. We focus on avoiding direct emissions, increasing energy efficiency, and switching to 100% green electricity by 2025. Our ISO-certified IMPRES Program for Environment, Energy, Safety & Health covering our largest EU production facilities and our headquarters supports continuous process improvements (including water and waste recycling).

Corporate citizenship: Our corporate citizenship activities are centered on engagement projects benefitting the communities in which we operate, focusing on Environmental Sustainability, Education, Local Needs, and Natural and Humanitarian Disasters.

CSR in the supply chain: Our suppliers have to comply with our Business Conduct Guidelines and our Supplier Code of Conduct.

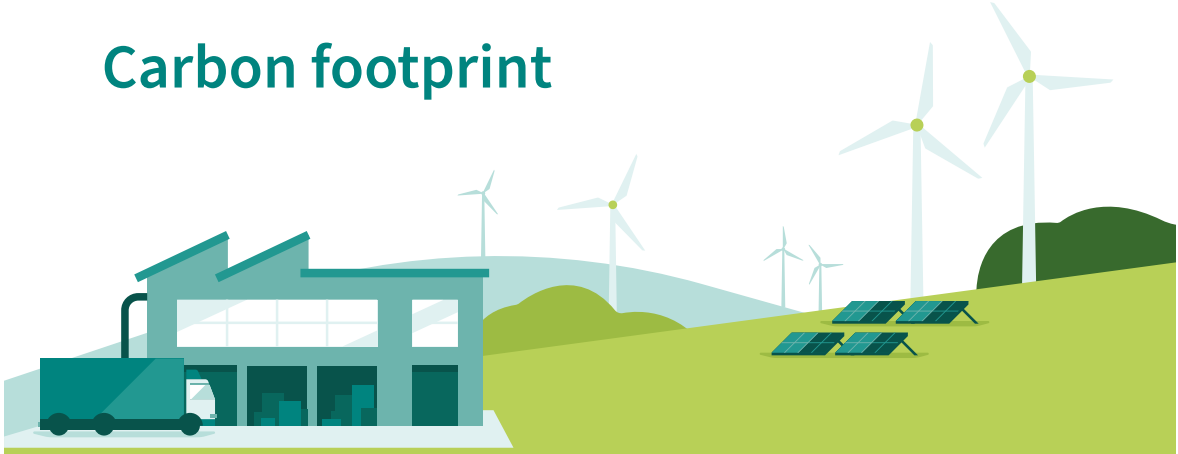
Occupational health and safety: Our Occupational Health and Safety Management System is certified to the ISO 45001 standard.

Human resources management: Our employees are the focus of our actions. We want to attract and retain the best talent available. Diversity & inclusion are hardwired into our corporate culture. We work to create an integrative working environment offering equal opportunities where everyone can make a contribution.

Human rights: Respect for human rights and the promotion of fair working conditions are key priorities for us. The Infineon Human Rights Policy details how we promote human rights in our activities and with our partners worldwide.

Infineon is listed in major sustainability indices. For further information, visit: www.infineon.com/sustainability

Carbon footprint



CO_2 burden

2.9 million[6]

tons of CO_2 equivalents

Ratio around 1 : 45

CO_2 savings

130.3 million[7]

tons of CO_2 equivalents

Net ecological benefit: CO_2 emissions reduction of more than 127 million tons

In various areas of application (automotive electronics, industrial drives, photovoltaics as well as wind energy), our products can achieve CO_2 savings during their lifetime of around 130 million tons of CO_2 equivalents. Compared with the European electricity mix, this is around 17.6 percent of the annual net electricity production of the European Union.

6 This figure takes into account manufacturing, transportation, own vehicles, travel, supplier-specific emissions, water/waste water, direct emissions, energy consumption, waste etc. as well as direct and indirect energy-related emissions by manufacturing service providers. It is based on data collected internally and publicly available conversion factors and relates to the 2024 fiscal year.

7 This figure is based on internally established criteria, which are described in the explanatory notes. The figure relates to the 2023 calendar year and takes into account the following application areas: automotive electronics, industrial drives, photovoltaics as well as wind energy. CO_2 savings are calculated based on the potential savings generated by technologies in which semiconductors are used. The CO_2 savings are allocated based on Infineon's market share, semiconductor share and the lifetime of the technologies concerned, based on internal and external experts' estimations. Despite the fact that carbon footprint calculations are subject to imprecision due to the complex issues involved, the results are nevertheless clear.

Experience Infineon in motion

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Germany

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Public

Date: 12/2024

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