

Investor/Analyst Day 2018



Forward Looking Statements

This presentation includes forward-looking statements that involve risks and uncertainties, including our belief in continued expansion of our product lines, advances in our technology, anticipated market opportunities, gross margin targets, net & operating margin targets, inventory targets, continuing business diversification, growth and opportunities in China and Taiwan, and increasing sales penetration in Japan, Korea, the U.S., Singapore and Europe. Other forward-looking statements can be identified by terms such as “would,” “could,” “may,” “will,” “should,” “expect,” “Wall Street estimates,” “intend,” “plan,” “anticipate,” “believe,” “estimate,” “predict,” “potential,” “targets,” “target ranges”, “seek,” or “continue,” the negative of these terms or other variations of such terms. These statements are only predictions based on our current expectations and projections about future events. Because these forward-looking statements involve risks and uncertainties, there are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from the results, level of activity, performance or achievements expressed or implied by the forward-looking statements. In this regard, you should specifically consider the risks identified in our most recent 10-K in the section entitled “Risk Factors,” including the risks, uncertainties and cost of litigation and risks related to fluctuations in our operating results.

Agenda

- Computing Power Evolution
- Battery Management
- Automotive Break
- e.Motion: A Market in Motion
- \$1B to \$2B
- E to E through eCommerce
- Financial Summary
- Q&A
- Event Summary

Computing Power Evolution

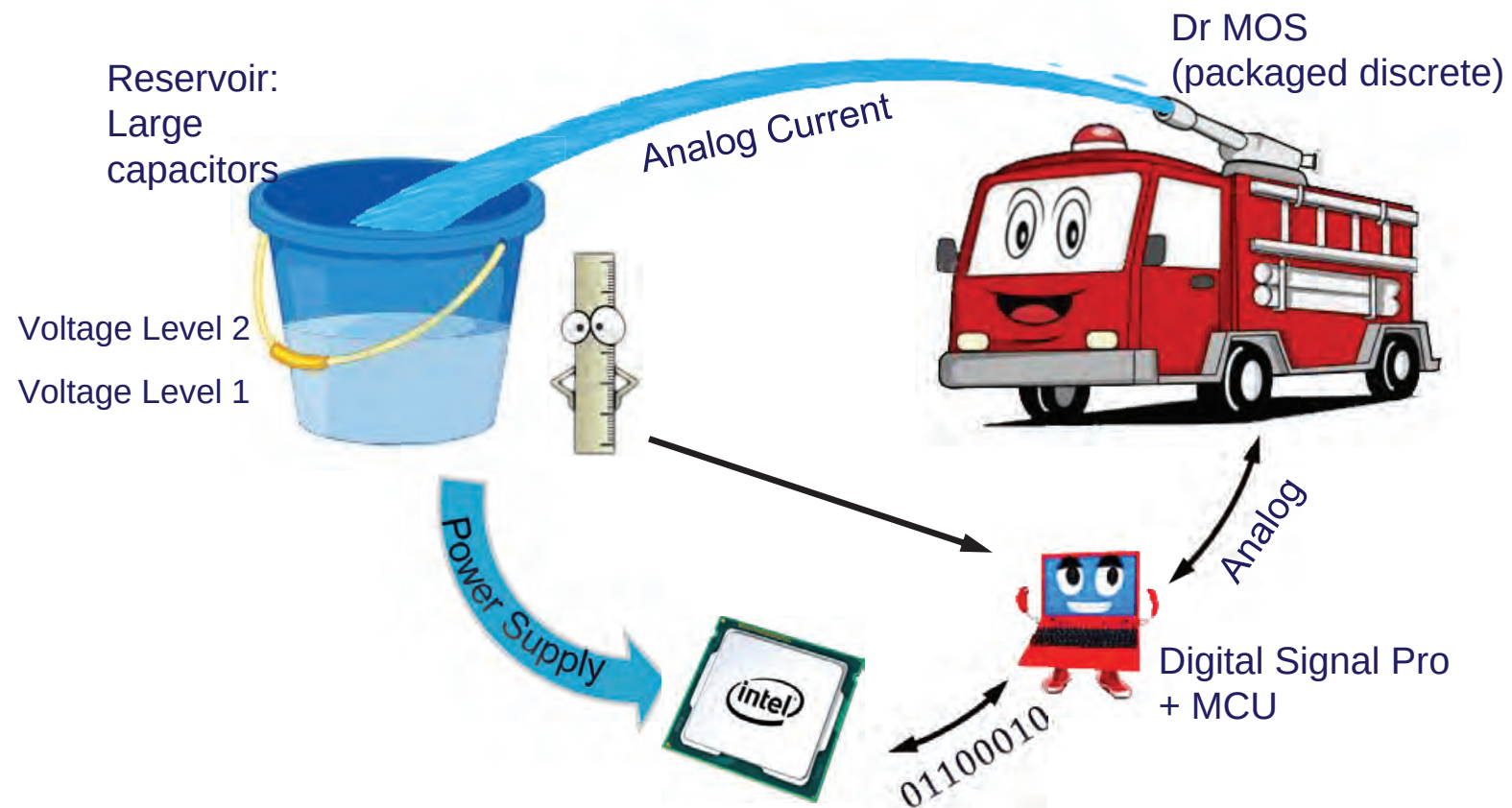
Jinghai Zhou



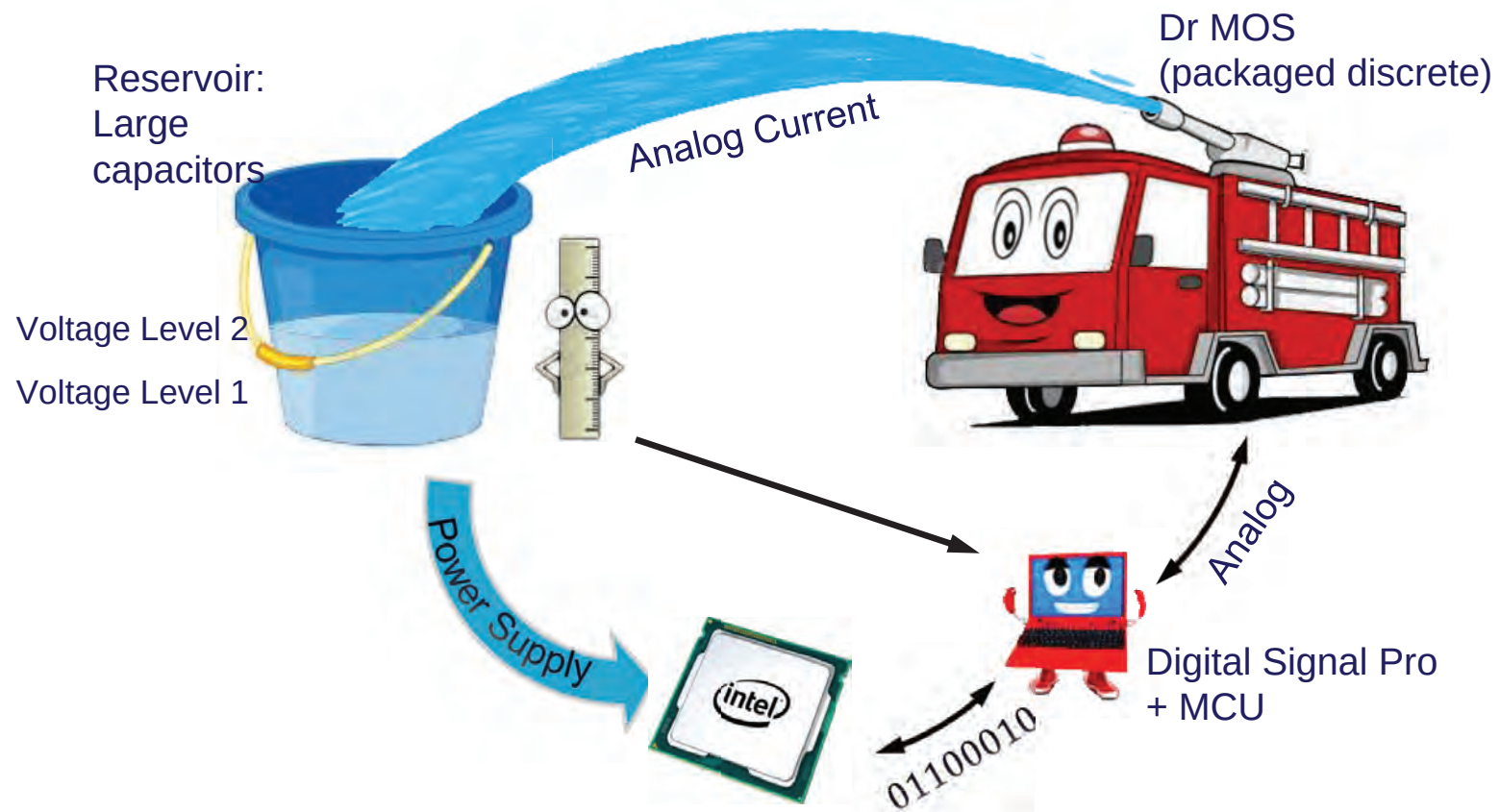
It All Started with Two Innovations

- **MPS Invented Intelli-phase in 2010**
World first monolithic power stage with integrated Accu-sense.
- **MPS Invented QSMOD in 2012**
Quantum State Modulation- Modulation based on finest digital steps to determine the real-time output voltage.
- **MPS First Server Core Power Solution Successfully Powered Intel Grantley Platform in June 2014.**

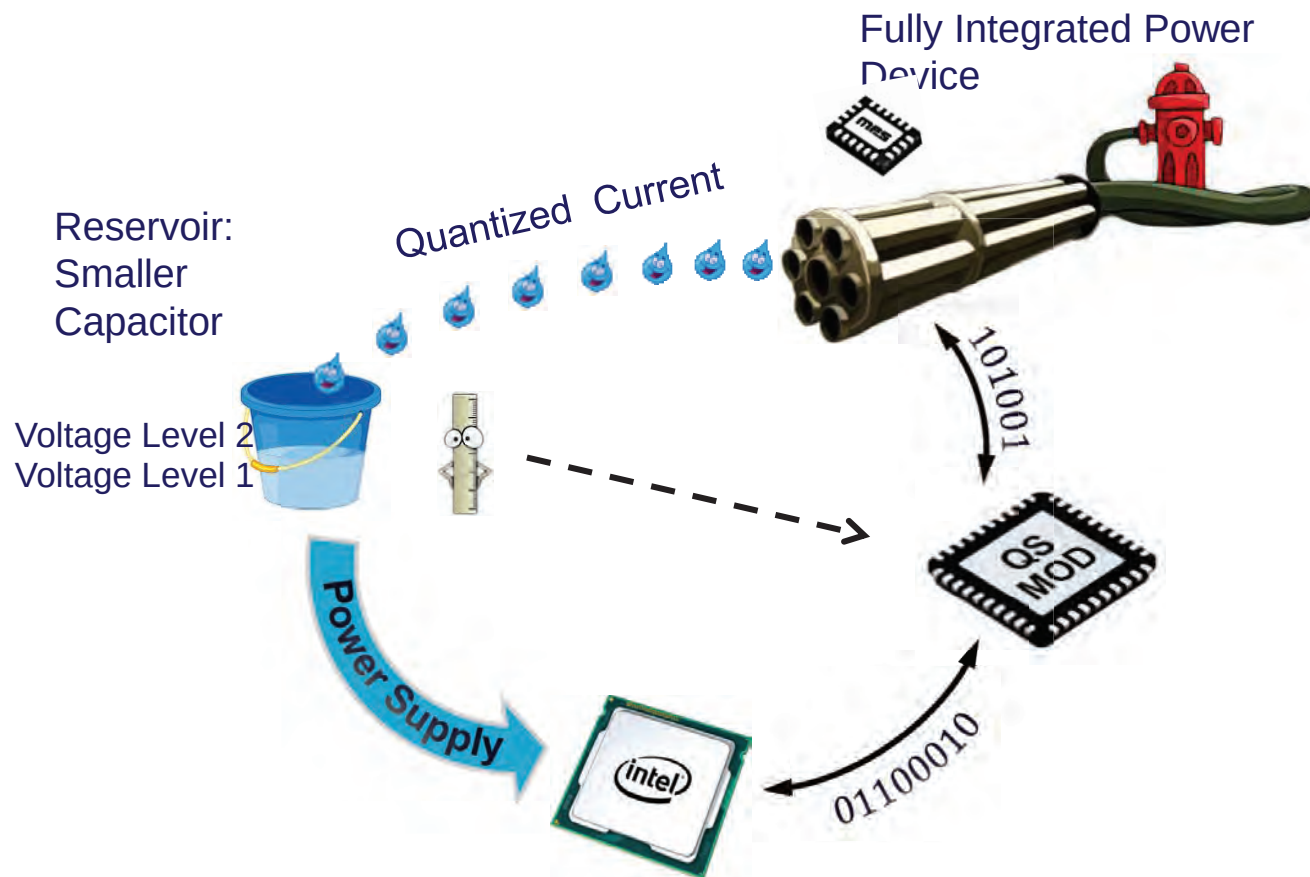
Existing Solutions – Discrete + Analog + Digital



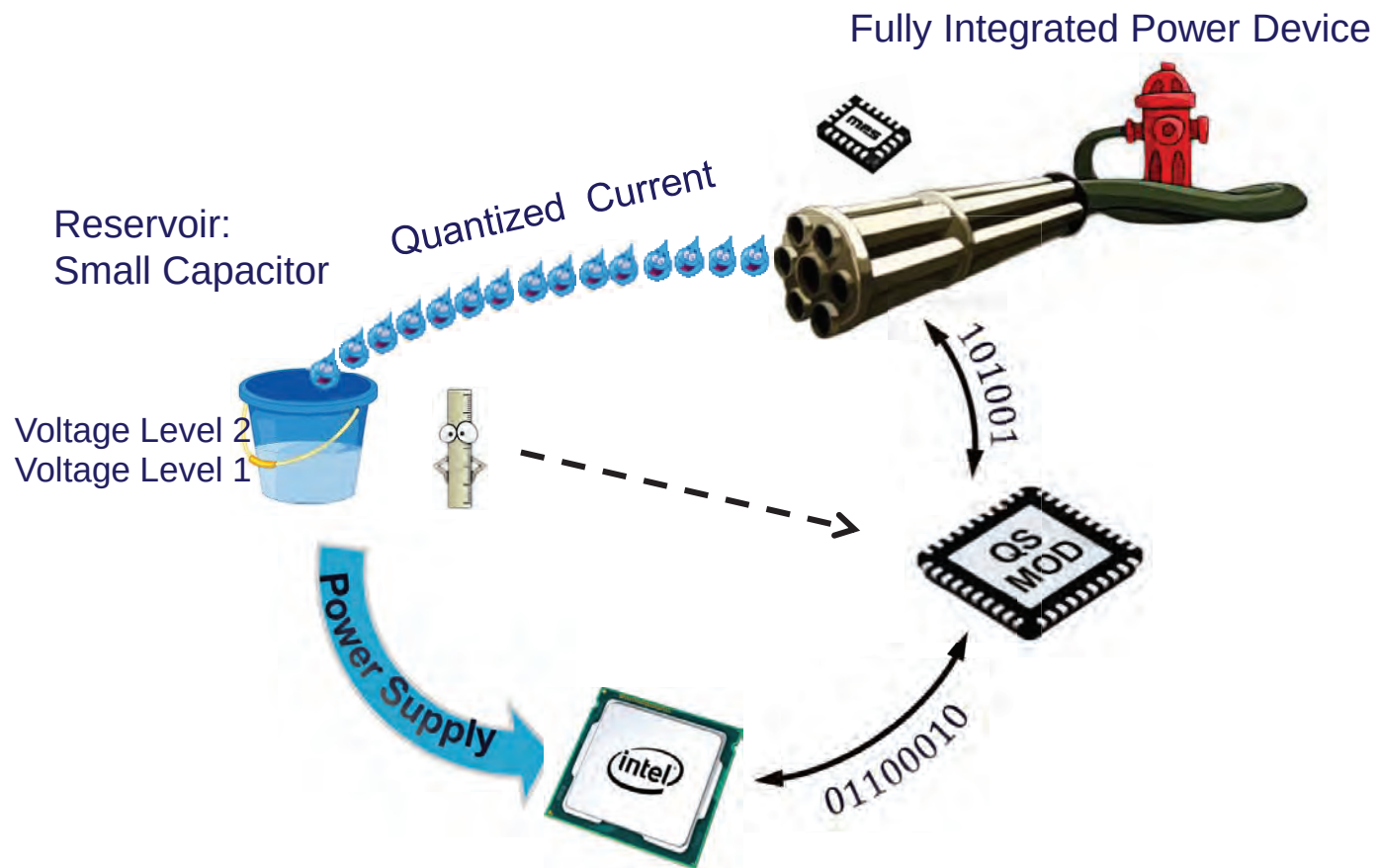
Existing Solutions – Discrete + Analog + Digital



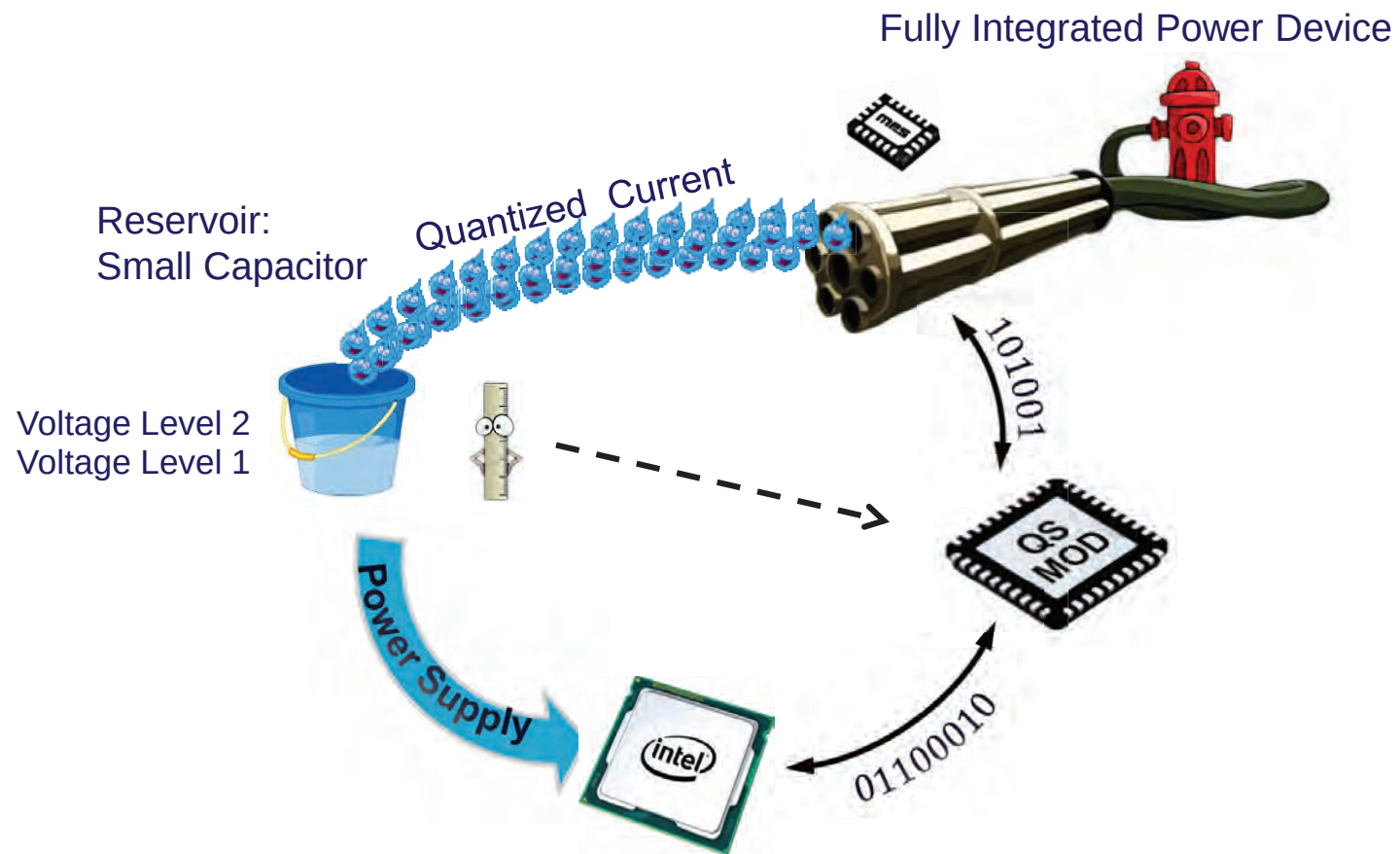
QS MOD Solution: Fully Integrated + GUI



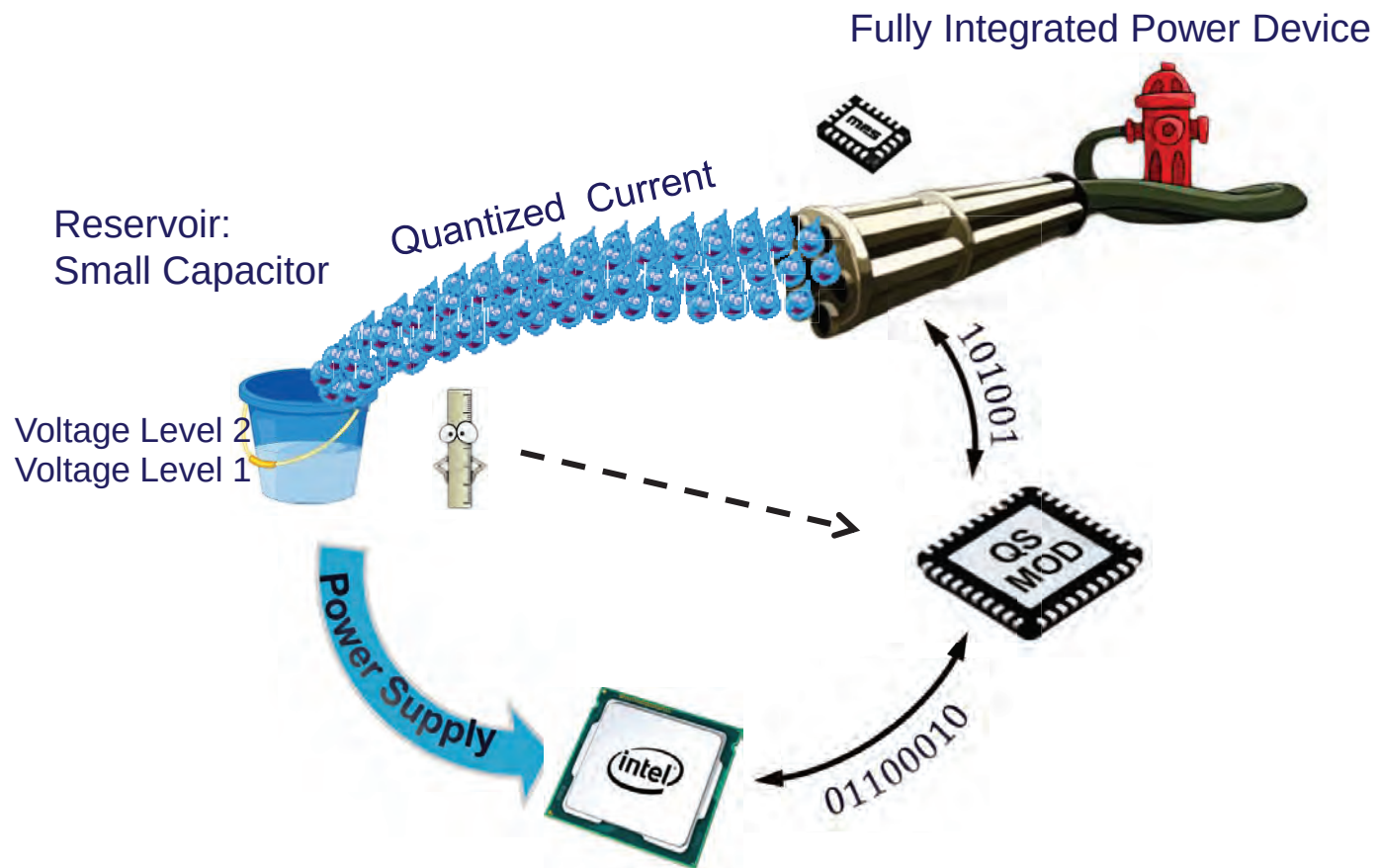
MPS' Quantum State Modulation__ QS Mod



MPS' Quantum State Modulation__ QS Mod



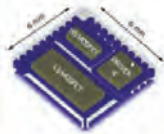
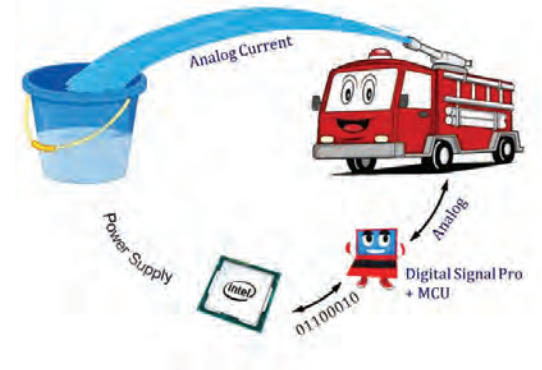
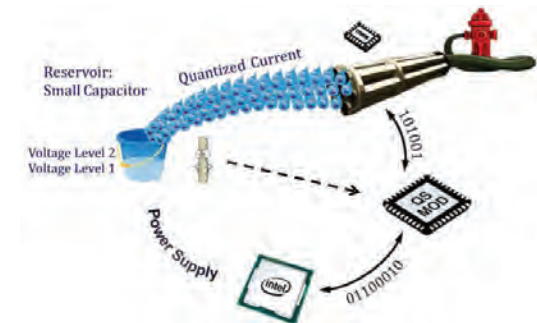
MPS' Quantum State Modulation__ QS Mod



The Concept is Simple

Competitors

DrMOS
Discrete Solution



MPS

MPS
Intelli-Phase

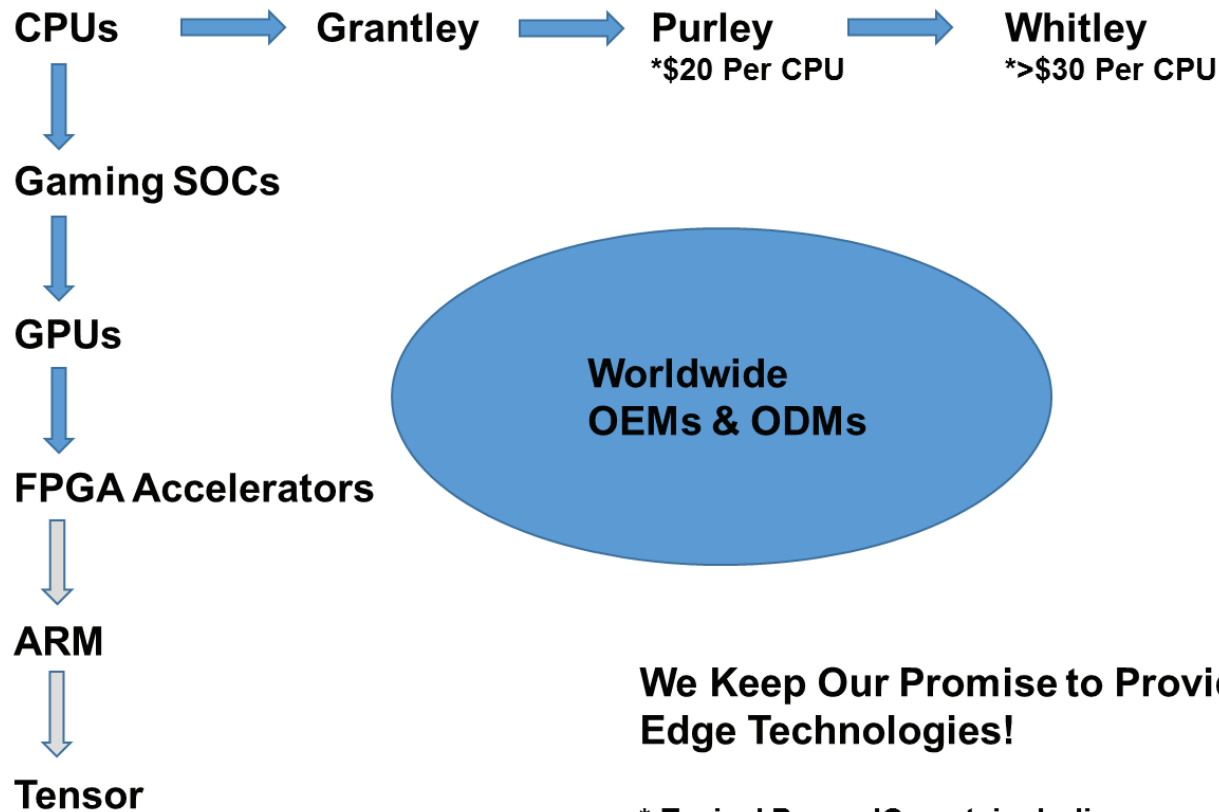


Fast



Accurate

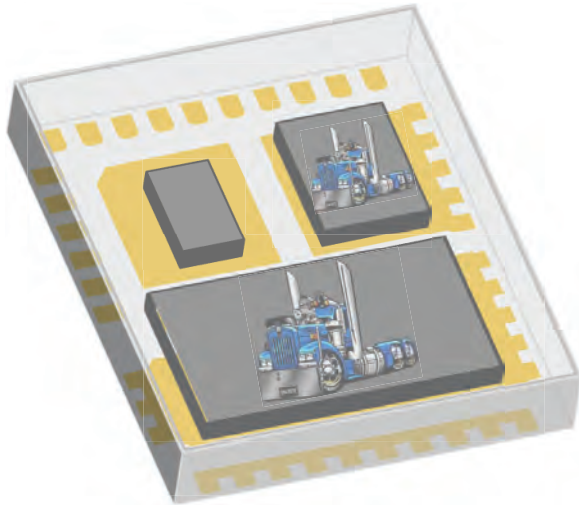
Great Technology Wins Its Own Way



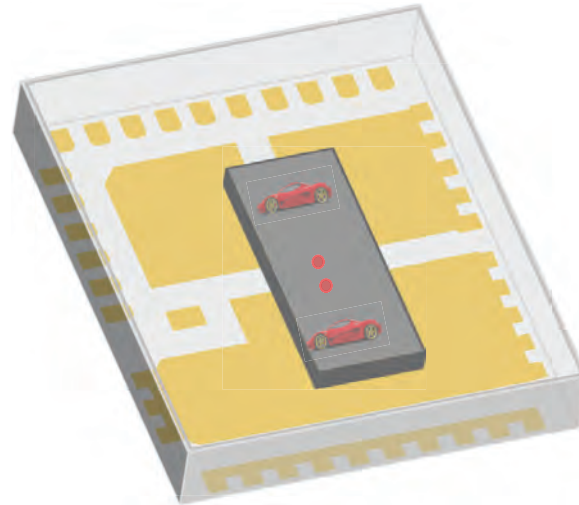
* Typical Power IC cost, including associated DDR Power

Common Footprint, Uncommon Performance

- Discrete Die DrMOS

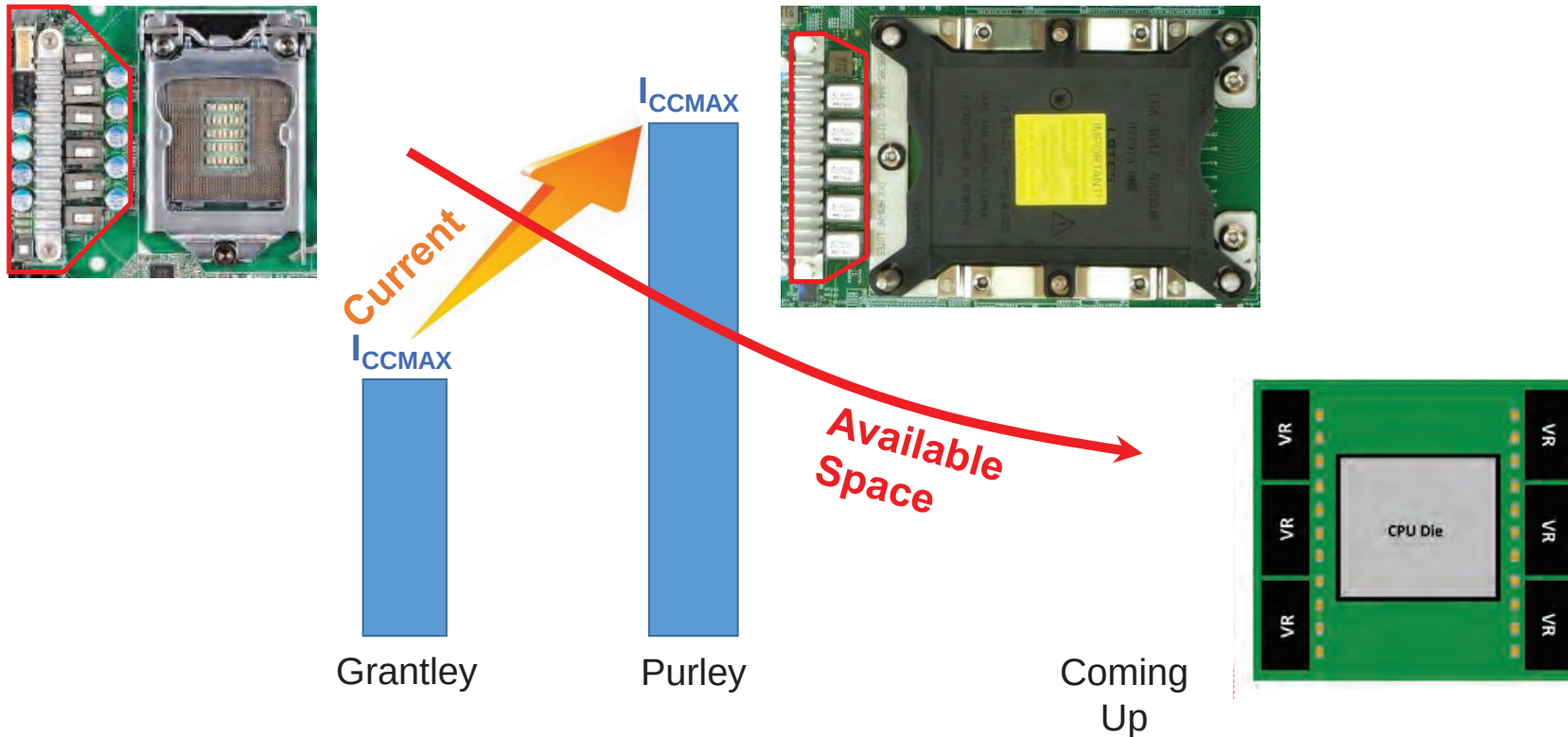


- Monolithic Intelli-Phase



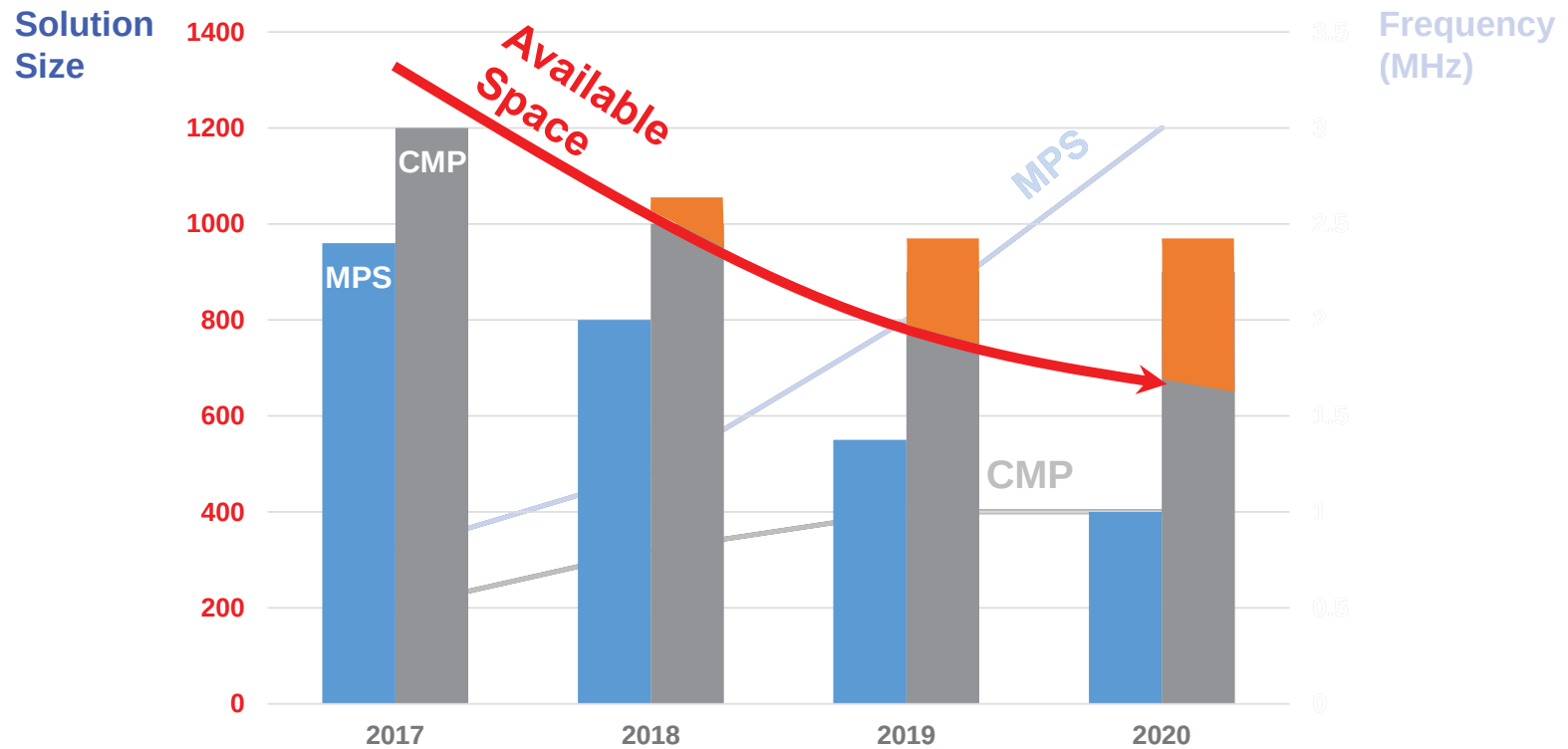
- Common Footprint Allows Access to Today's Markets
- Monolithic Die Provides Superb Switching Performance and Intelligence

CPU Demands Huge Current, with Much Less Available Space



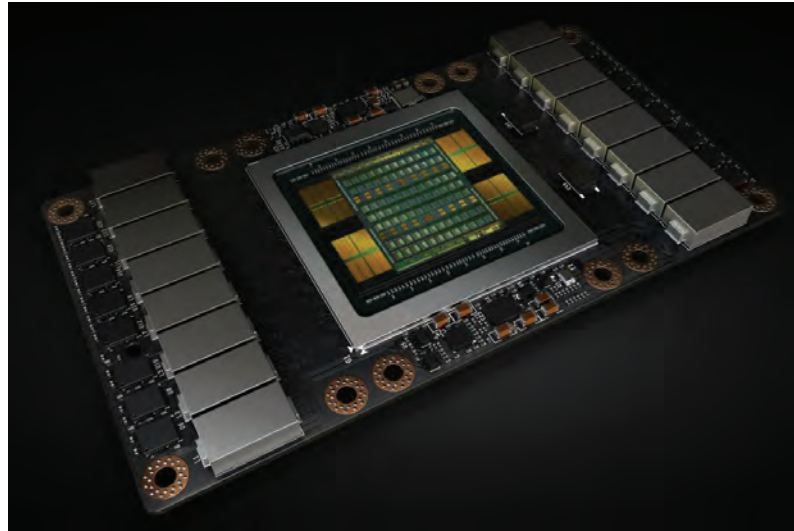
Bigger CPU Socket, More Memory DIMMs, The needs to Pull VR Closer to CPU- All Require Much Dense VRs

Why MPS is Winning?



While Others Hitting Size and Frequency Boundaries, MPS Monolithic Solution Takes Off

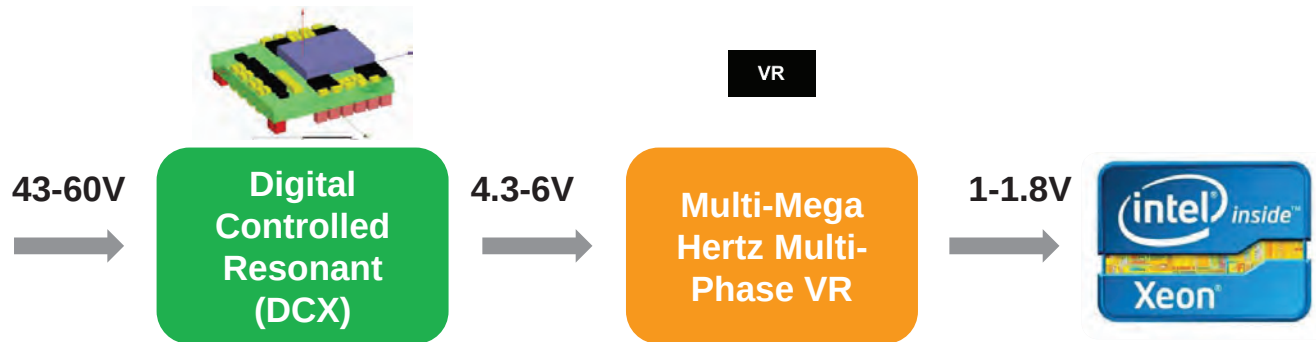
GPU as an AI Engine Gets Power Hungry



* Source: Nvidia GPU Conference, 2017

AI Engine Powered by MPS QSMOD-
Integration Brings Unprecedented Feature Sets to the System

Ready for the 48V Power Architecture for Data Centers



2-Stage Structure

- **Simplicity** – well-understood architecture
- **Scalability** – can address different power levels
- **Transient performance** – independent second-stage offers superior performance
- **Interchangeability** – each stage can be upgraded independently
- **Efficiency. Size. Cost** – Optimized.

Intel image source: https://en.wikipedia.org/wiki/Xeon#/media/File:Intel_xeon_inside.jpg

Autonomous Driving

**MPS Powered AI
Datacenters Allow
Autonomous Vehicles
to Learn...**



↑ Learning

Perception

Prediction

Policy

↓ Inferencing



**Next step- the
inference engine that
resides on the AV
itself is what MPS will
power!**

The Evolving of the Computing Eco-System

Datacenter, Cloud

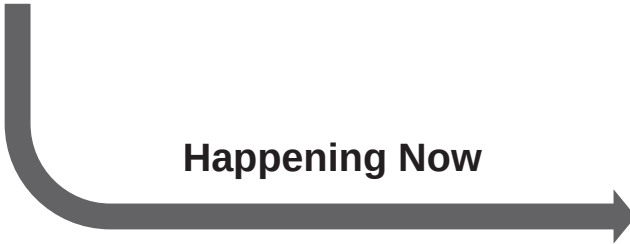


5G Network, Coming Soon



**5G Enabled
Cloud 2.0**

Happening Now



Hyper Converged
-Storage
-Computing
-Networking

**MPS High Speed, High Density Power Solutions- Well Suited for
Computing Infrastructure Now and Beyond**

We Are the Champion



Proudly Powering Olympics

Battery Management

Chris Sporck



MPS Battery Management Applications

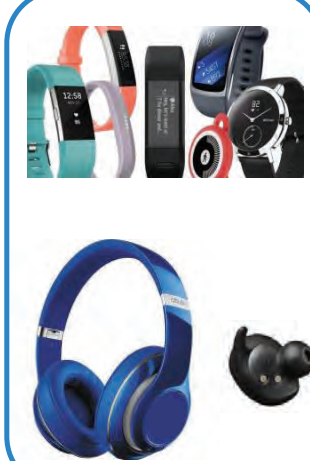
Portable Power



2-6 Cell non-USB Applications



Wearable Devices



Connected Devices



Mobile Computing

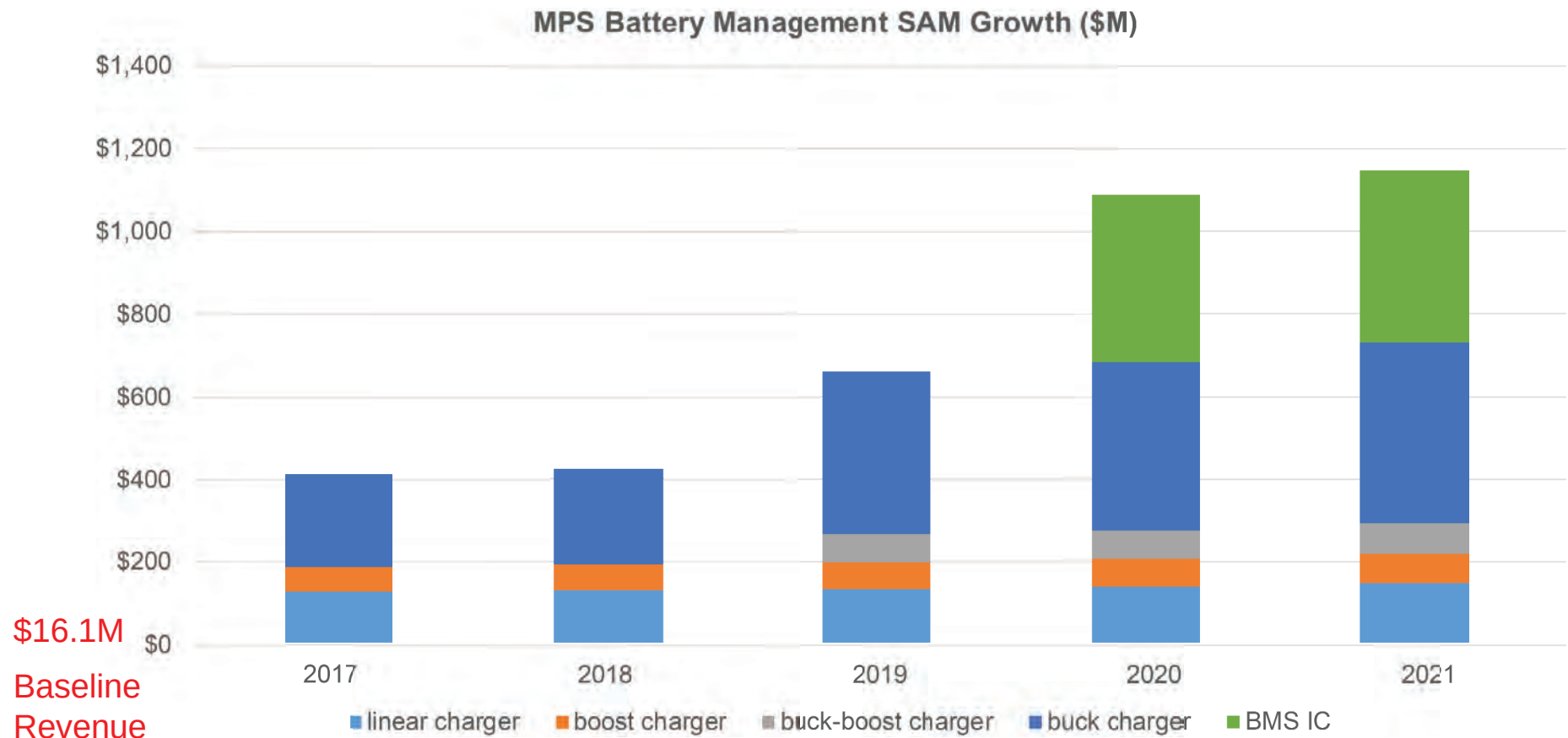


Battery Management Systems (BMS)



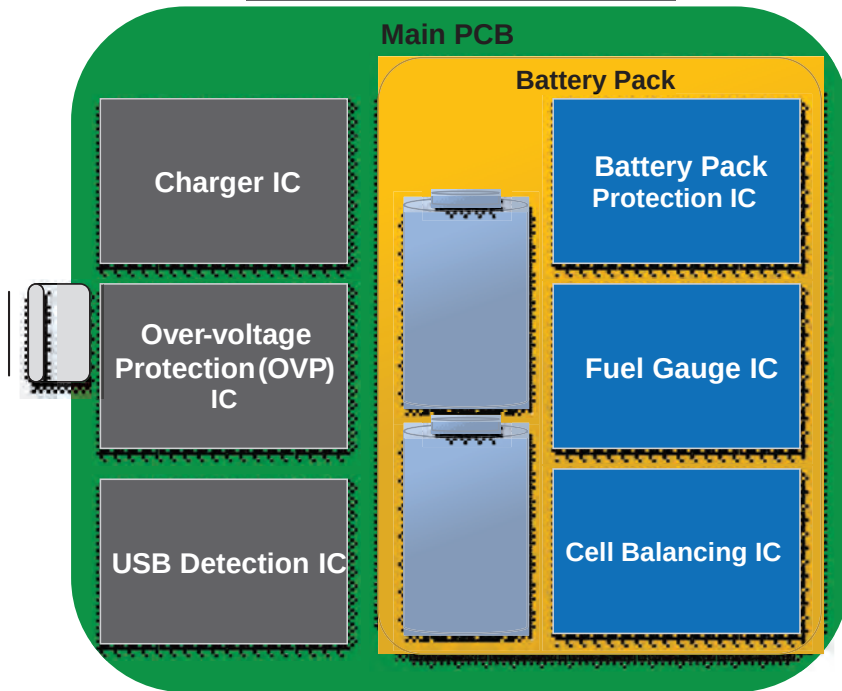
Increasing Value

MPS Battery Management SAM Growth

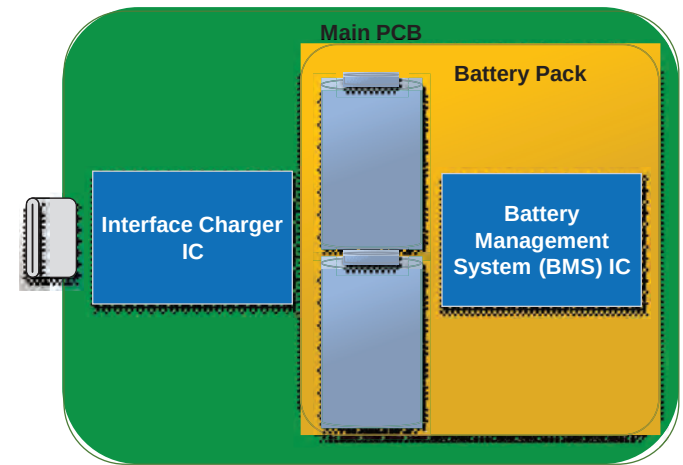


MPS Battery Management Advantages

Competitor Solution



MPS Solution



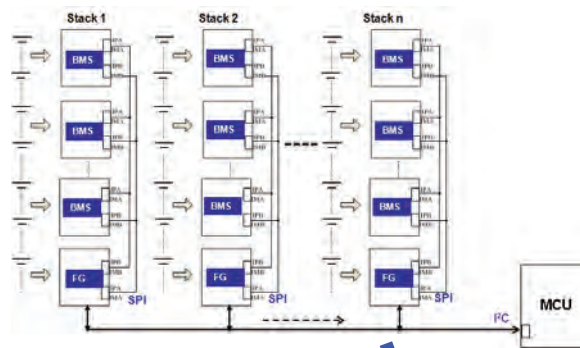
- MPS solutions use our leading power FET technology to offer a high level of integration which means smaller total solution size, easier system design, and better cost structure

Battery Management System (BMS) Growth Markets

Power Tools



MPS BMS Solutions



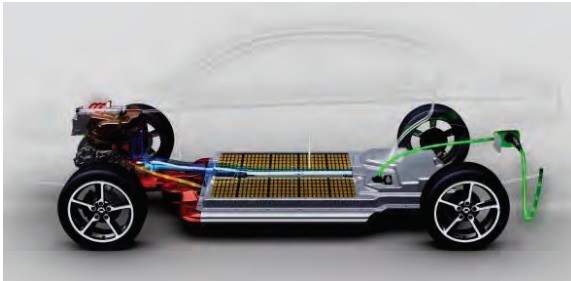
E-Bike



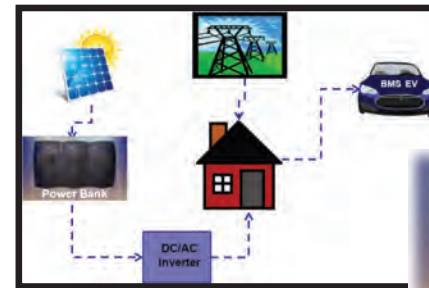
Factory Robots



EV



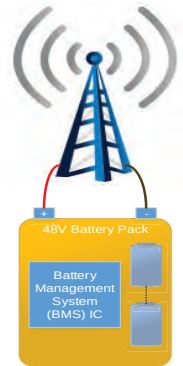
Home Backup



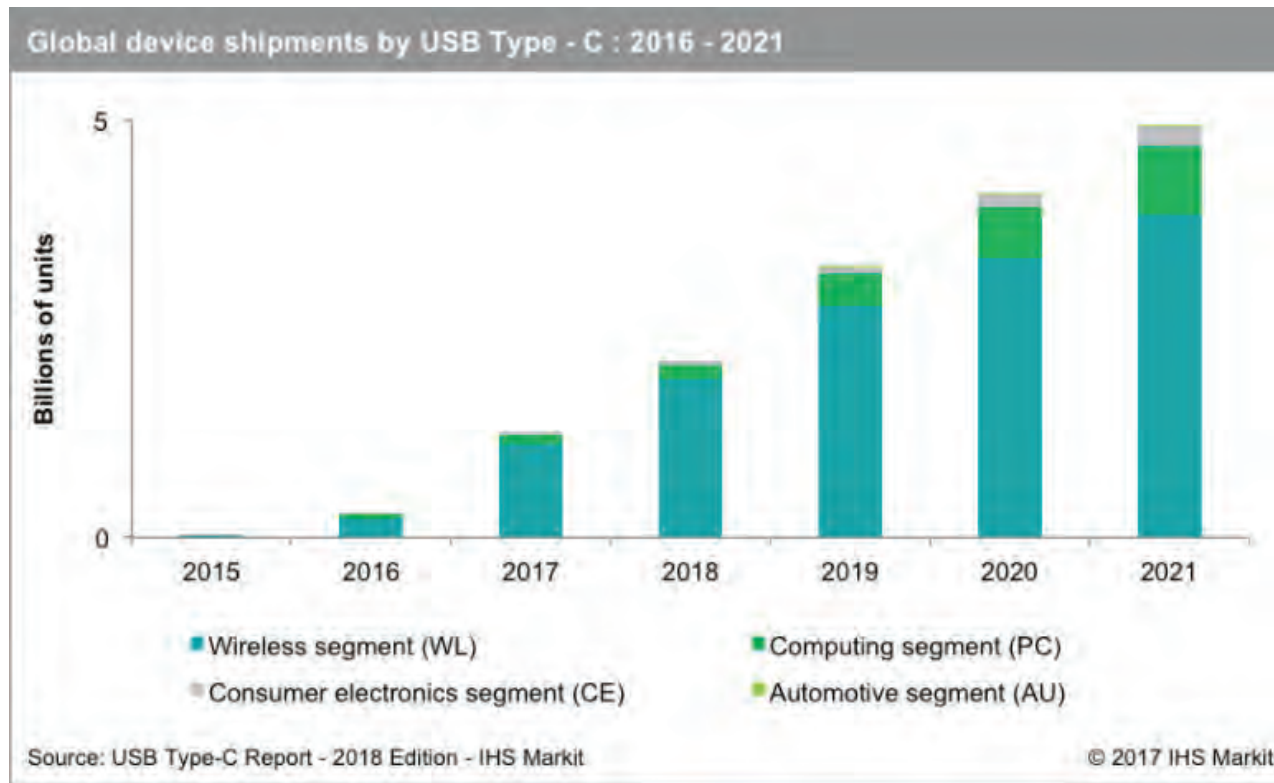
15KW Pack



4G/5G Towers



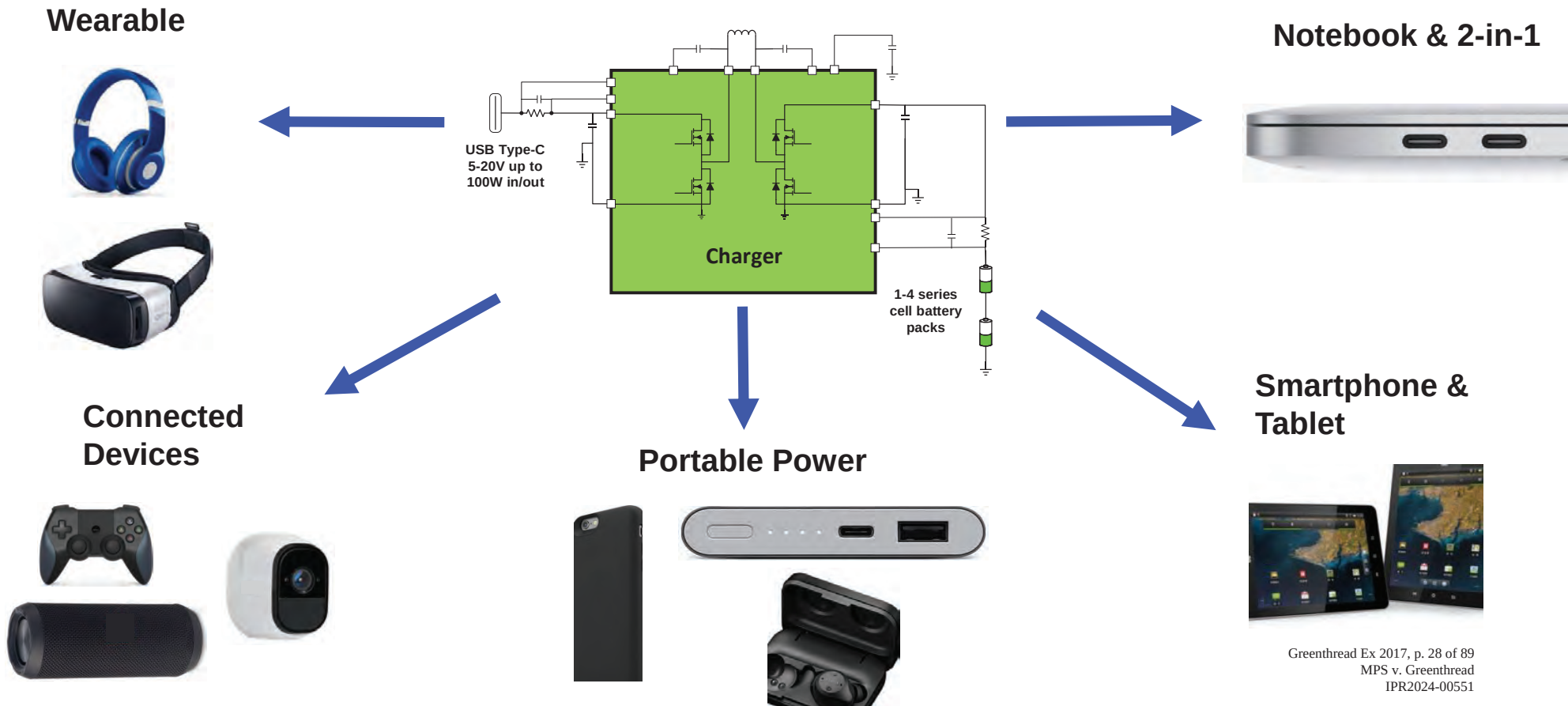
Capitalizing on USB Type-C and PD Expansion



- CAGR of 105% over the next 5 years and \$3B TAM in semiconductor IC revenue in 2021
- MPS currently has key design wins in the Wireless and Consumer electronics segments

USB Type-C and PD Charging Growth Markets

MPS USB-C Charging Solutions



Why MPS Battery Management Will Win

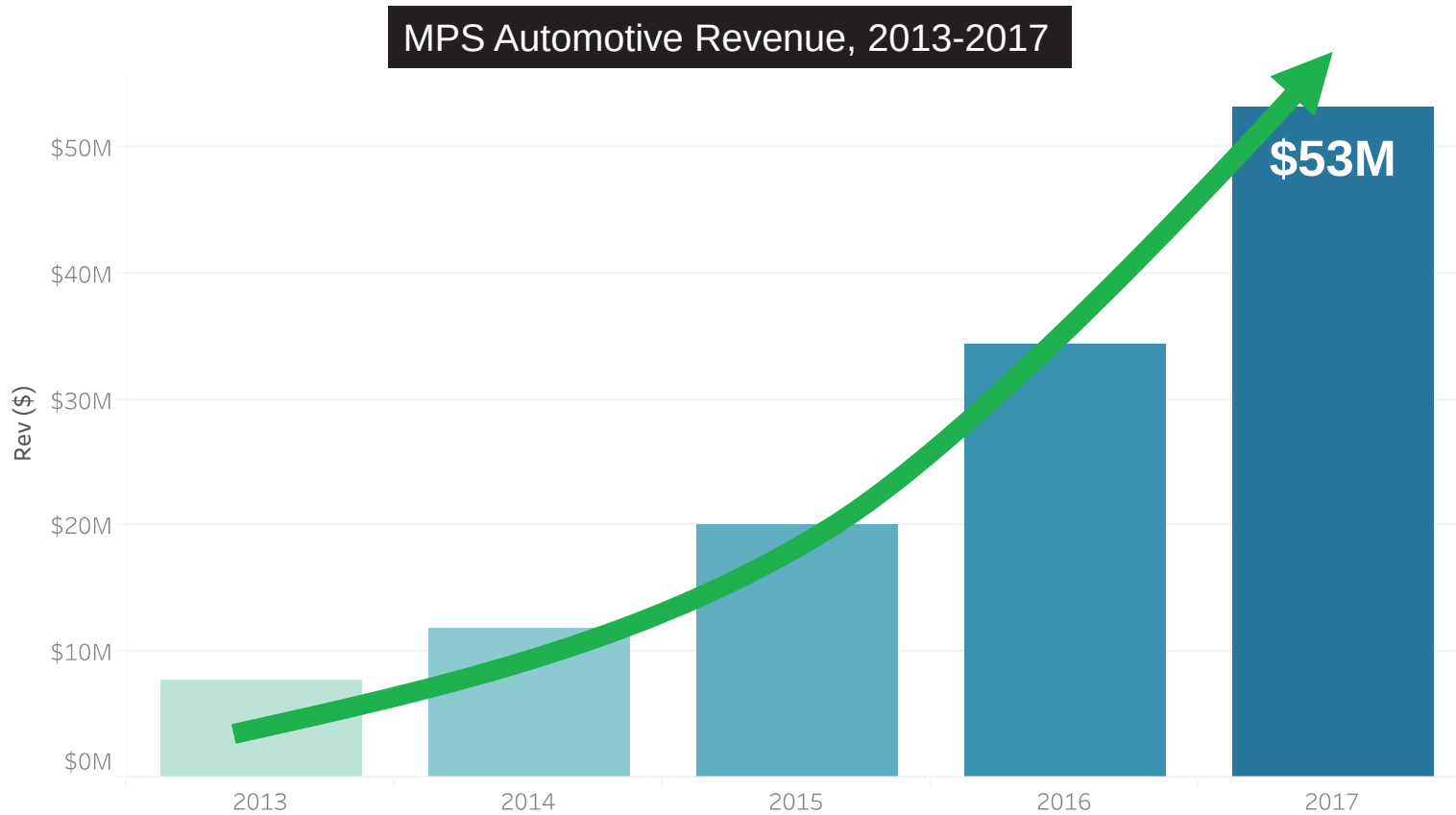
- Increasing product offering diversity driving SAM expansion
- Growth strategy focused on high level of integration of charger, BMS, USB, and protection functions
- Fully monolithic chargers for high-power USB Power Delivery applications
- R & D investment on precision accuracy monitoring and protection circuits for BMS

Automotive

Allen Chen

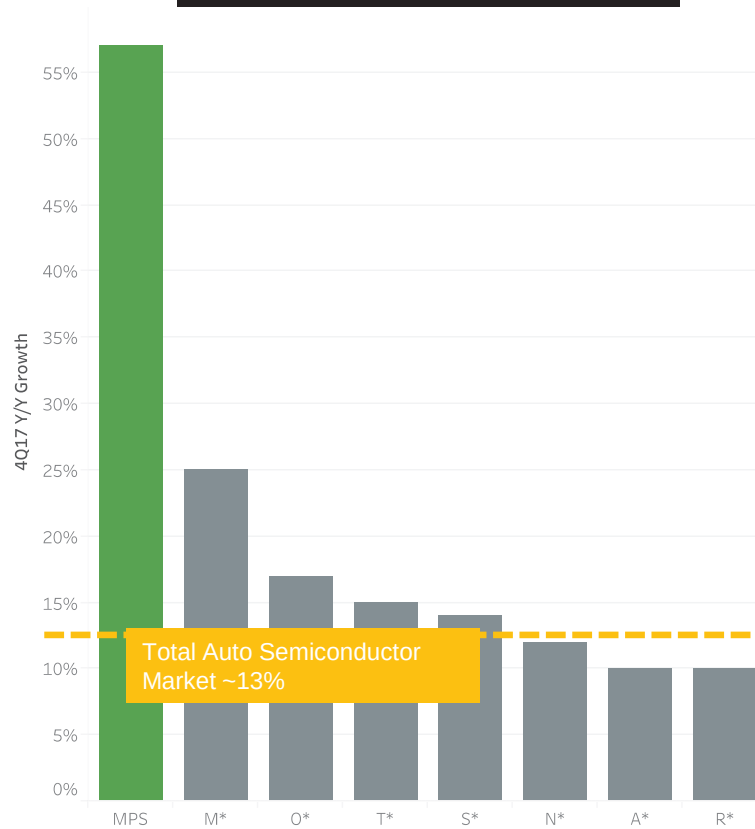


MPS Automotive Growth is Accelerating



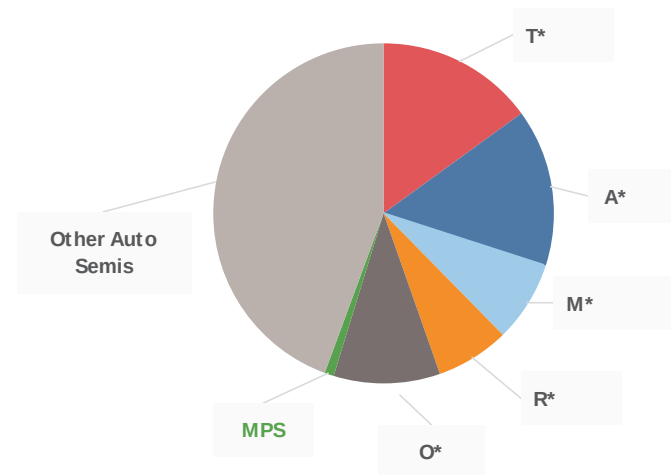
MPS Automotive Growing Over 4x Market

4Q17 Auto Revenue Growth, YoY



Source: Deutsche Bank automotive semiconductor market tracker

Auto Power Management Market Share

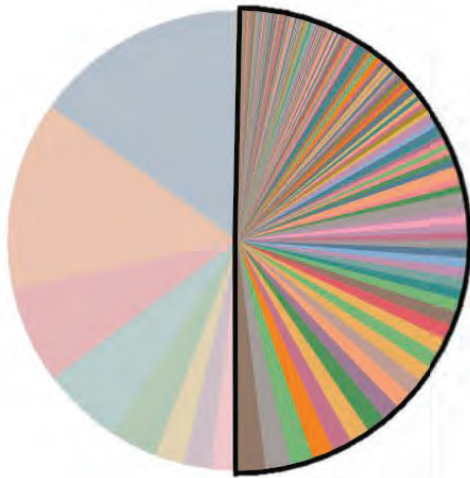


**Power TAM:
\$7B**

Source: MPS internal analysis, competitor annual reports

Great Revenue Diversification

Revenue Mix by Customer



50% of automotive revenue comes from 'long tail' customers

Key Regions



Automotive revenue shared amongst Europe, China, Japan, South Korea

MPS Ramping At Half of Top 50 Tier 1s

...and engaged with most of the rest

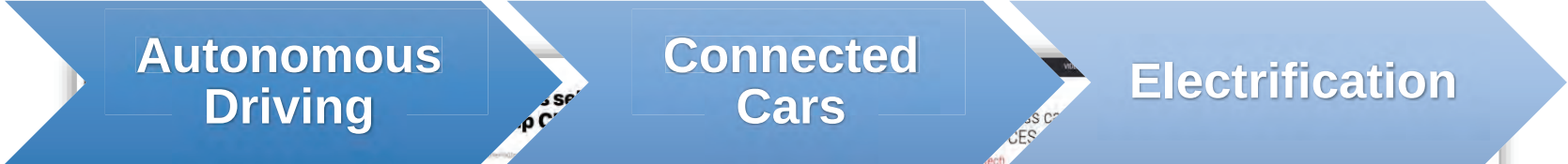
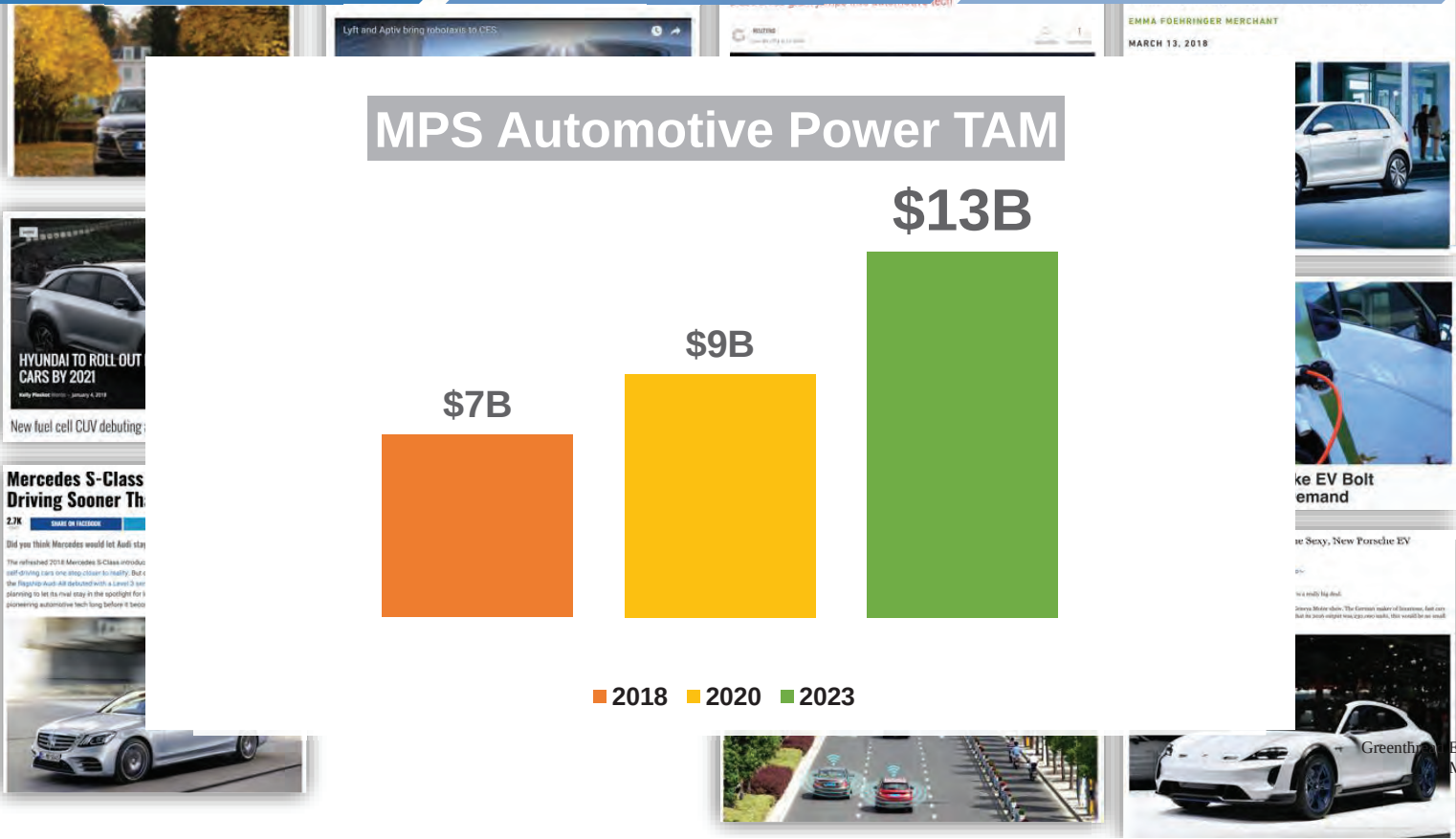
Tier 1 Automotive Suppliers



OEMs



Three Major Automotive Trends



Our Target Automotive Applications



Digital Cockpit
Infotainment,
Cluster, HUD, USB
Charging



Lighting
Matrix Headlamp,
Dynamic Lighting,
Interior



Body Electronics
HVAC, Seat, Lift
Gate, Auto Door
Handle, Moonroof

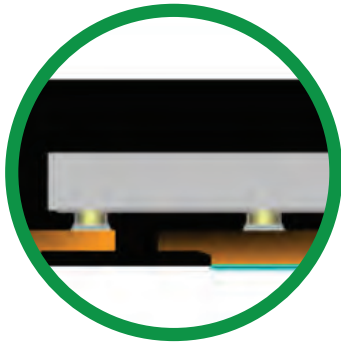


**Battery
Management**
48V, HEV, EV



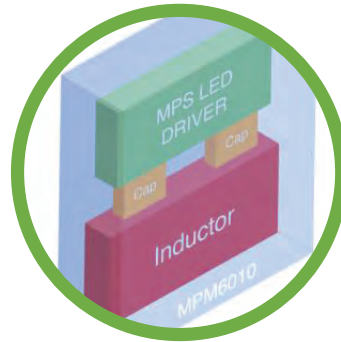
ADAS
Radar, Camera,
Lidar, Self-Driving
Compute

Technology is Our Core Advantage



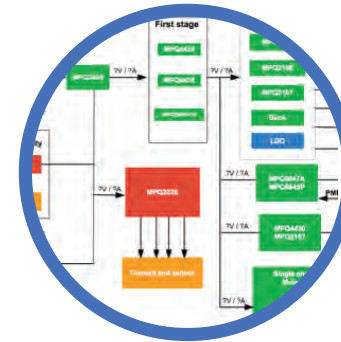
Packaging

- **1ST AUTO QUALIFIED FLIP-CHIP POWER PART** approved by a major Tier 1 (top 5)
- **2X POWER DENSITY** vs competition
- **BILLIONS** of units shipped – solid track record



Integration

- **WORLD'S MOST COMPACT** integrated LED driver module (with inductor)
- **4X SMALLER** than similar automotive solution from competition

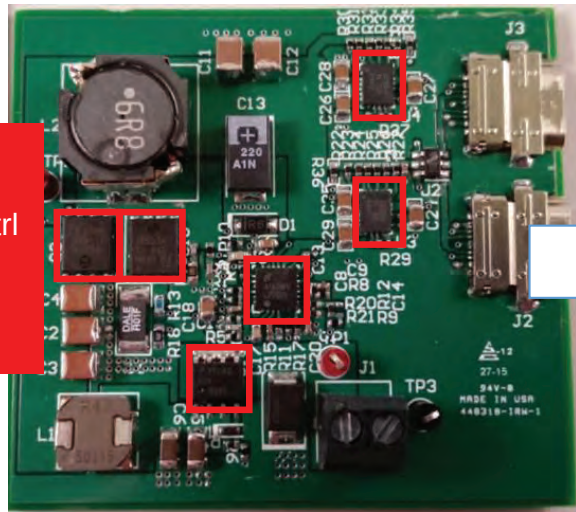


Full Power Tree

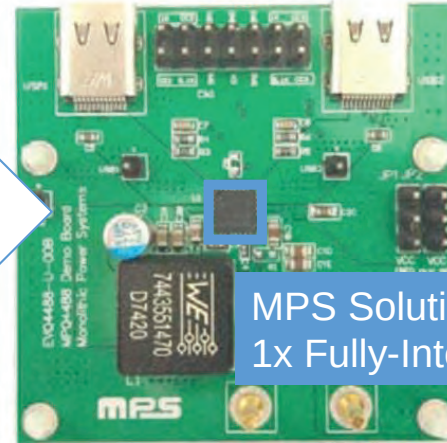
- **ONE-STOP SHOPPING** for every power rail
- **ADVANCED FEATURES** like digital programmability
- **RESIDENT EXPERTS** on hot topics like EMI and Thermal Management

Higher Integration: USB Charging, Power Modules

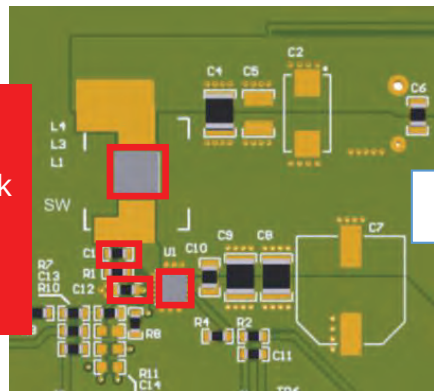
Competitor:
1x Buck Ctrl
2x Type-C Ctrl
1x DCP Ctrl
2x FETs
= 6 Parts



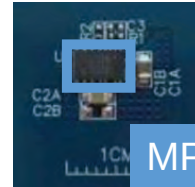
MPS Solution:
1x Fully-Integrated IC



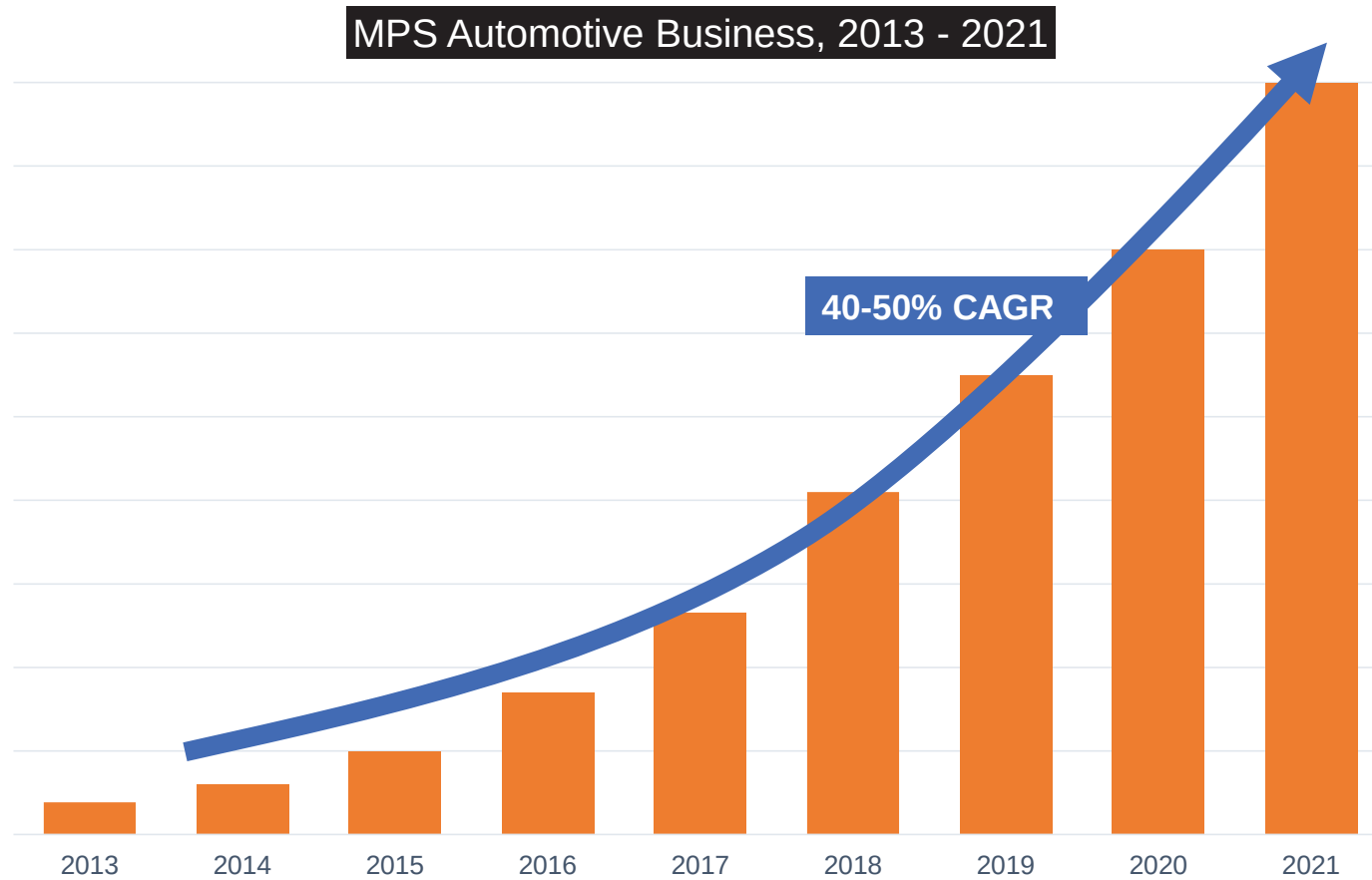
Traditional
Solution:
1x Sync Buck
1x Inductor
2x Caps
= 4 Parts



MPS Solution:
1x Module



Automotive Long Term Goal



Michael Hsing

CEO

MPS

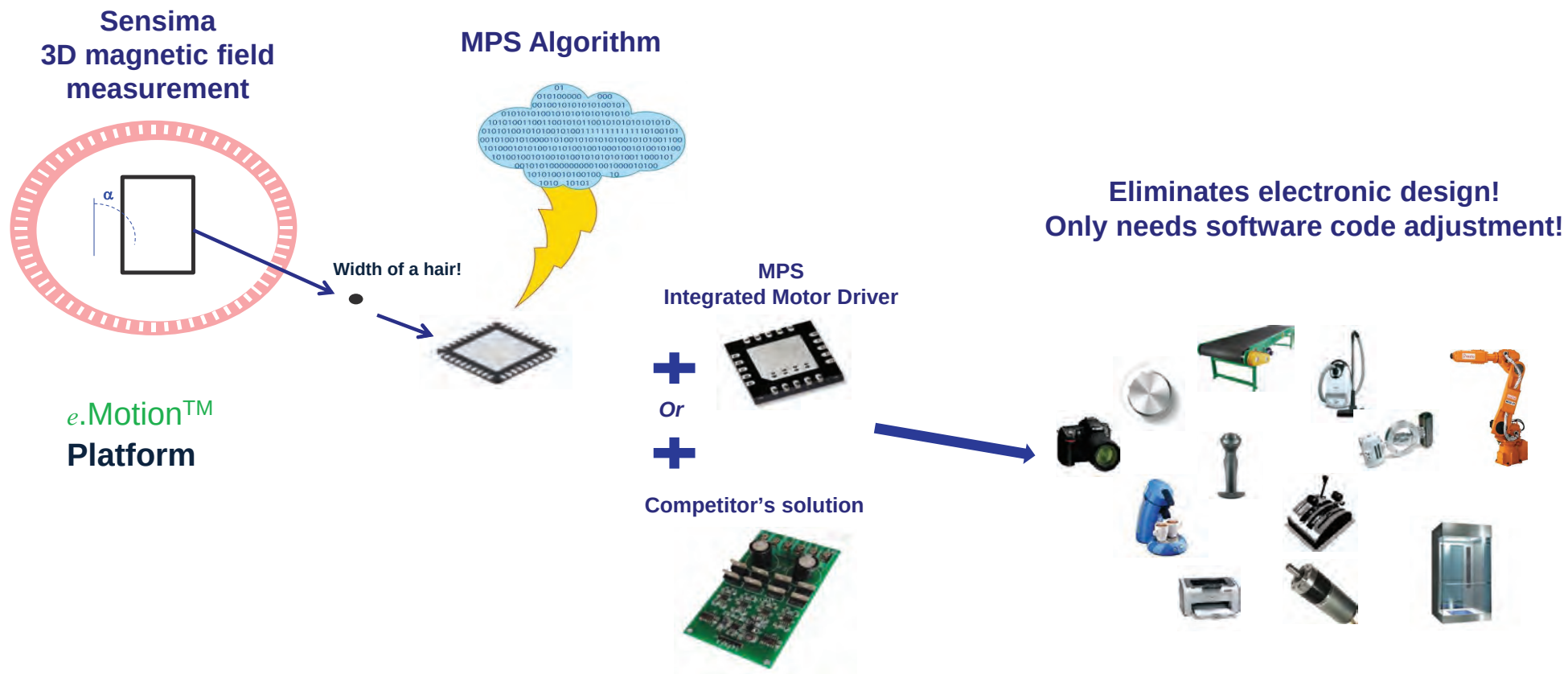
e.Motion™

A Market in Motion

Jens Muttersbach



How does *e.Motion*TM work?



*e.*Motion™

Our Solution for Integrated Motion Control

One-stop Solution for Advanced Drive Tasks

POSITION SENSING

Angle Feedback

Magnetic

Small & Robust

MOTOR DRIVERS

Energizing the Windings

Efficiency

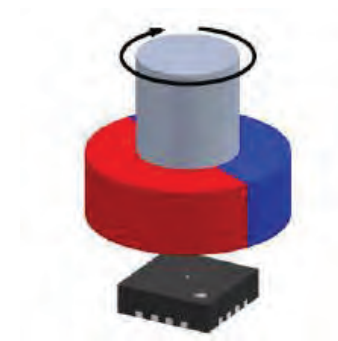
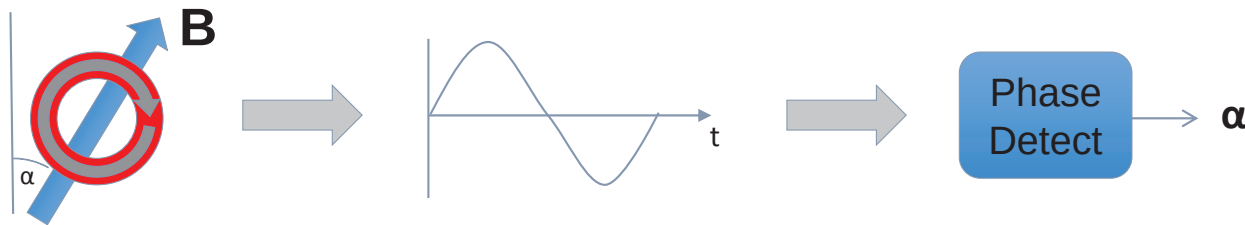
Size

Huge and Diverse Market

	Consumer	Industrial	Automotive
Pure Sensing			
Controlled Motion			

MPS Spinaxis Technology– Our Unique Advantage

- MPS proprietary
- Integrated angle sensor
- Based on a simple time measurement



Customer Benefits

Replace bulky optical encoders
Fast sensing
Robust setup

Lower power consumption
Small components
Attractive price

MagAlpha Angle Sensor Family has Promising Growth

20+ products already have design wins:

Consumer

Industrial

Automotive

Medical



Controlled Motion

Leveraging MPS' strength in power semiconductors

Technology

Packaging

Testing

Support

Customer benefits

Size

Efficiency

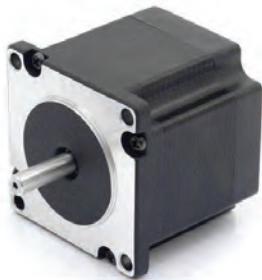
Thermal

Cost

Stepper

Brushed DC

Brushless DC



A lot of Drive in Motor Drivers

Portfolio addressing stepper, brushed and brushless DC motors
Providing high integration and efficiency in small footprints

Design wins:

Consumer



Industrial



Automotive



Greenthread Ex 2017, p. 48 of 89
MPS v. Greenthread
IPR2024-00551

A Market in Motion

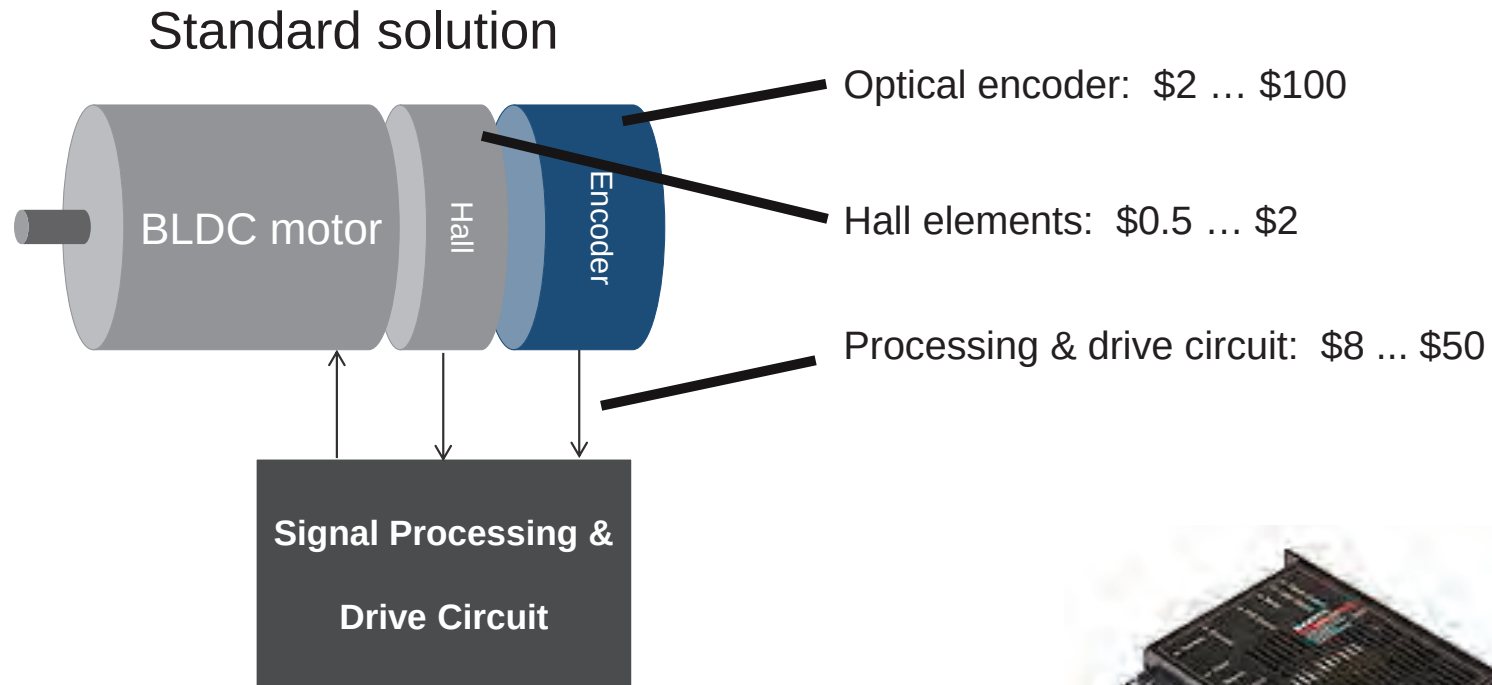
*e.Motion*TM

Addresses the challenges & benefits of a growing market

Motion control market trends

- Overall number of electric motors growing
- Strong trend towards brushless DC motors
 - **Efficiency**
 - **Space**
 - **Noise**
 - **Torque ripple**
- Challenge: cost for controlling BLDC motors

Typical Motion Control

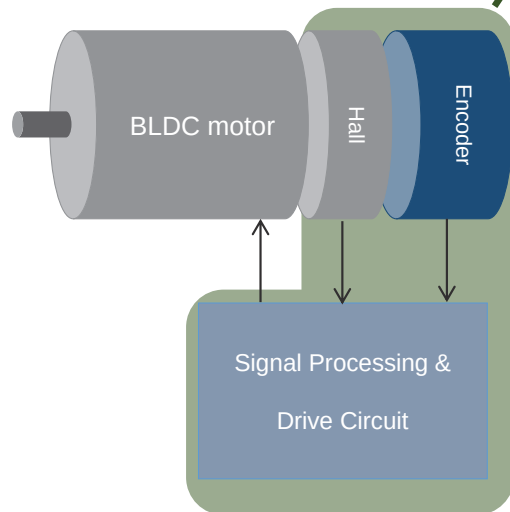


Overall System Size:
2x ... 5x Volume of the Motor

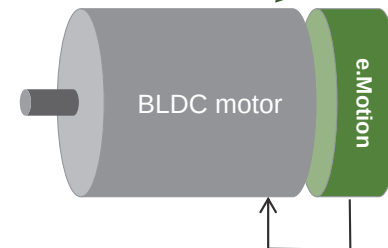


Integrated Motion Control – e.Motion

Standard Solution

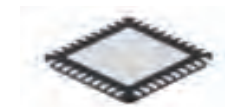


e.Motion™ solution



Position sensing
Signal processing
Motor driver

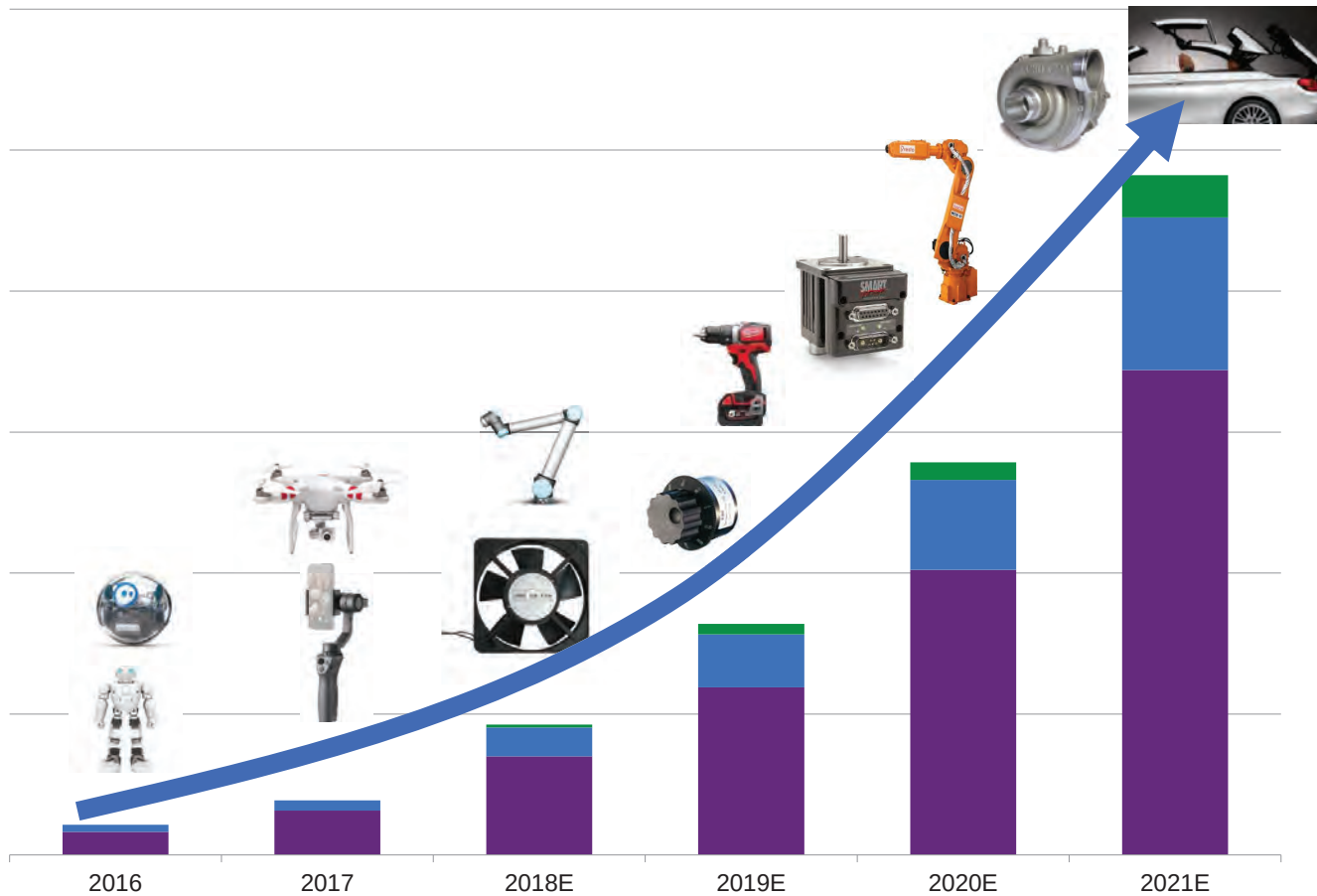
**Combined into
single e.Motion chip**



4x4mm²

Providing field-oriented control (FOC) algorithm to achieve best performance and efficiency

Motion Control Long Term Goal



60-80% CAGR

- Motor Drivers
- Position Sensors
- e.Motion™

Key Take-aways

- **Well positioned by unique technologies in both**
 - Magnetic position sensing
 - Motor drivers and pre-drivers
- **High growth rates in these markets**
- **Convergence into e.Motion**
 - Unique bundle for integrated motion control
 - High value for customers
- **Technical & cost advantage for customer**
- **Higher \$ amount per application**

Michael Hsing

CEO

MPS

Product Families

AC/DC Power Conversion

- High-Voltage Buck Regulator
- High-Voltage LDO
- Flyback Controller
- Flyback Synchronous Rectifier
- Active PFC Controller
- LLC Resonant Converter Controller
- LLC Synchronous Rectifier
- PFC&LLC Combo Controller
- X Cap Bleeder

DC/DC Power Conversion

- Step-Up (Boost)
- Step-Down (Buck)
- Buck/Boost
- CPU Core Power
 - 50A DrMOS in a 5x5mm QFN

Battery Management

- Li-Ion Single and Multi-Cell
- USB Complaint Chargers
- Switching Chargers
- Linear Chargers
- Integrated Power Bank Solutions

Class-D Audio

- Analog Input Class-D Amplifiers
- PWM Input Power Stages

Display Backlighting Power

- Backlight Drivers
- Electro-Luminescent Drivers
- Photo Flash Drivers
- LCD Power Supplies

E-Fuse, USB & Load Switches

- Programmable Current Limit up to 50A per Device
- Adjustable Slew Rate
- Reverse Current Blocking
- Output Discharge (Load Switch)
- Integrated Auto Detection
- Pin Compatible
- Parallel able up to 10 Devices
- PMBus Command and Control

Automotive & Industrial

- AEC-Q100
 - DC/DC
 - LED Lighting
 - Power Modules
 - Motor Drivers
 - USB Charging
 - Display Backlighting
 - Precision Analog

LED Lighting & Illumination

- TRIAC Dimmable AC/DC LED Controller
- PWM and Analog Dimmable AC/DC LED Controller
- DC/DC LED Controller: Buck, Boost, & Buck-Boost
- LED Protection IC

Computing Power

- CPU Core Power
- High current DrMOS
 - 60A DrMOS in a 4x5mm QFN
- POL

Motor Drivers & Position Sensors

- Brushless DC Motor Driver
- Stepper Motor Driver
- Brushed DC Motor/Solenoid Driver
- Half-bridge/Full-bridge/Three-phase Power Stages
- Magnetic Angular Position Sensors

Power Modules

- 6V, 600mA- 4A
- 16V, 600mA – 60A
- 21V, 600mA – 2A
- 36V, 600mA – 5A
- 55V, 1A – 3A
- 75V, 300mA

Precision Analog

- Analog Switches
- Current Sense Amplifiers
- Operational Amplifiers
- Voltage Reference

\$1B to \$2B

MPS





Parcel Sorters



Motor

Motor Control
& DCDC



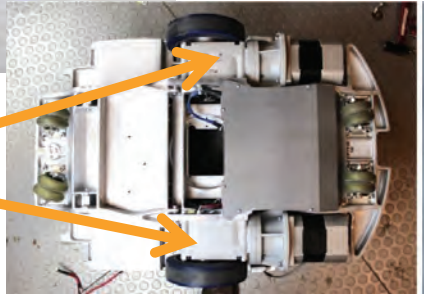
Optical
Encoder



Warehouse



Motor



Motor Control
DCDC
BMS



Battery



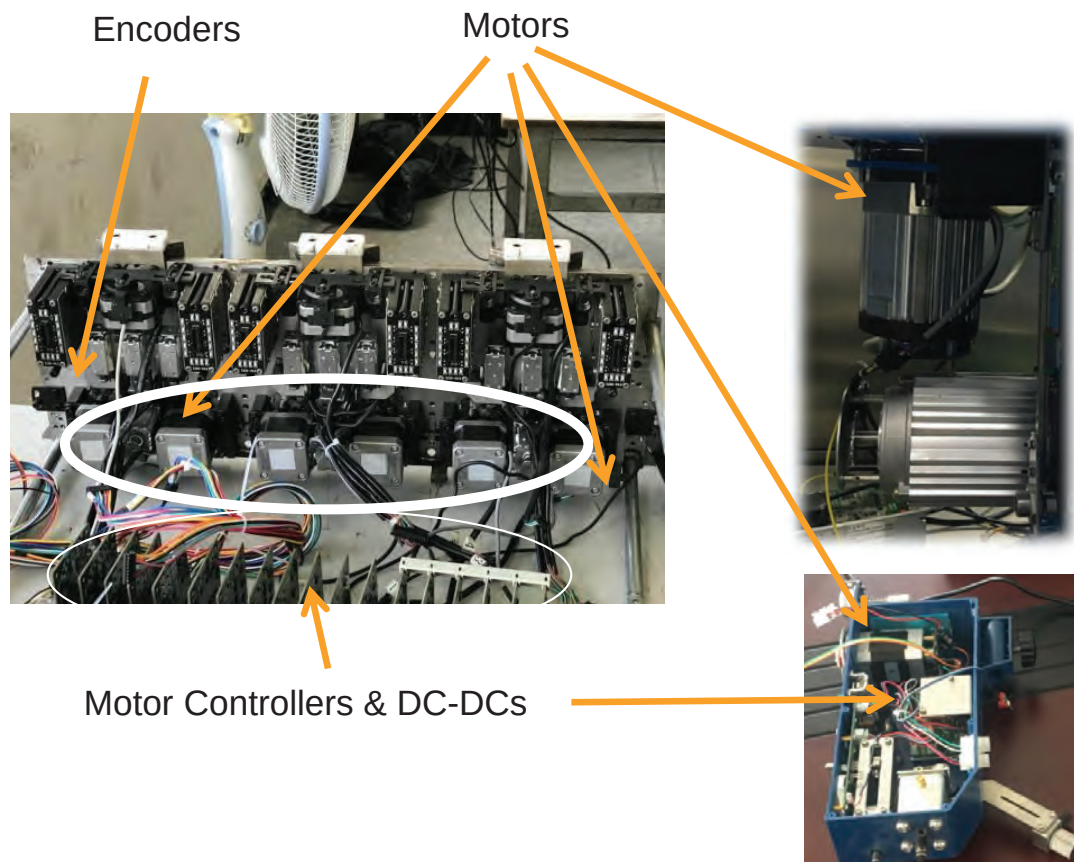
Textile Machinery Modernization



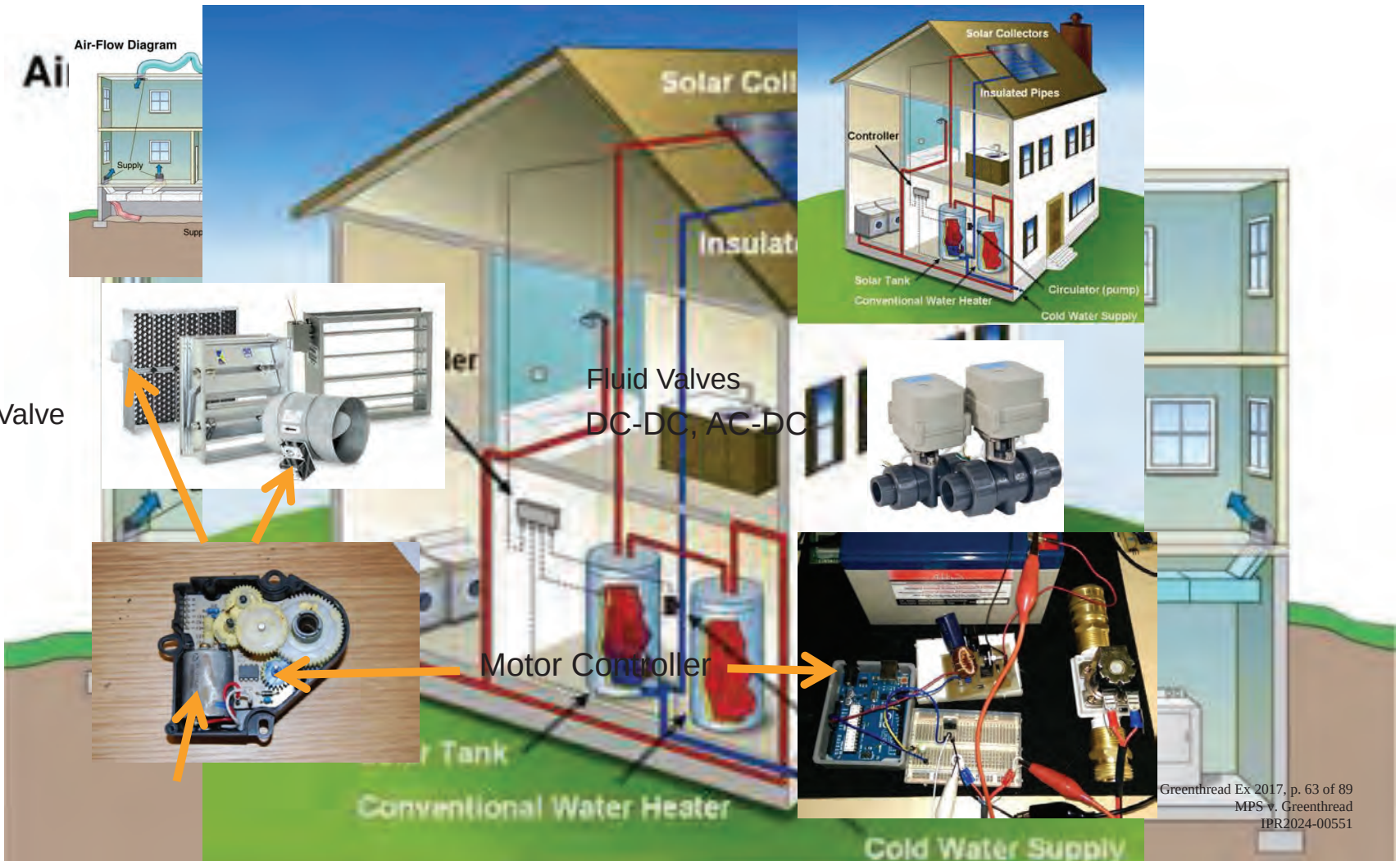
Motor control / DC-DC



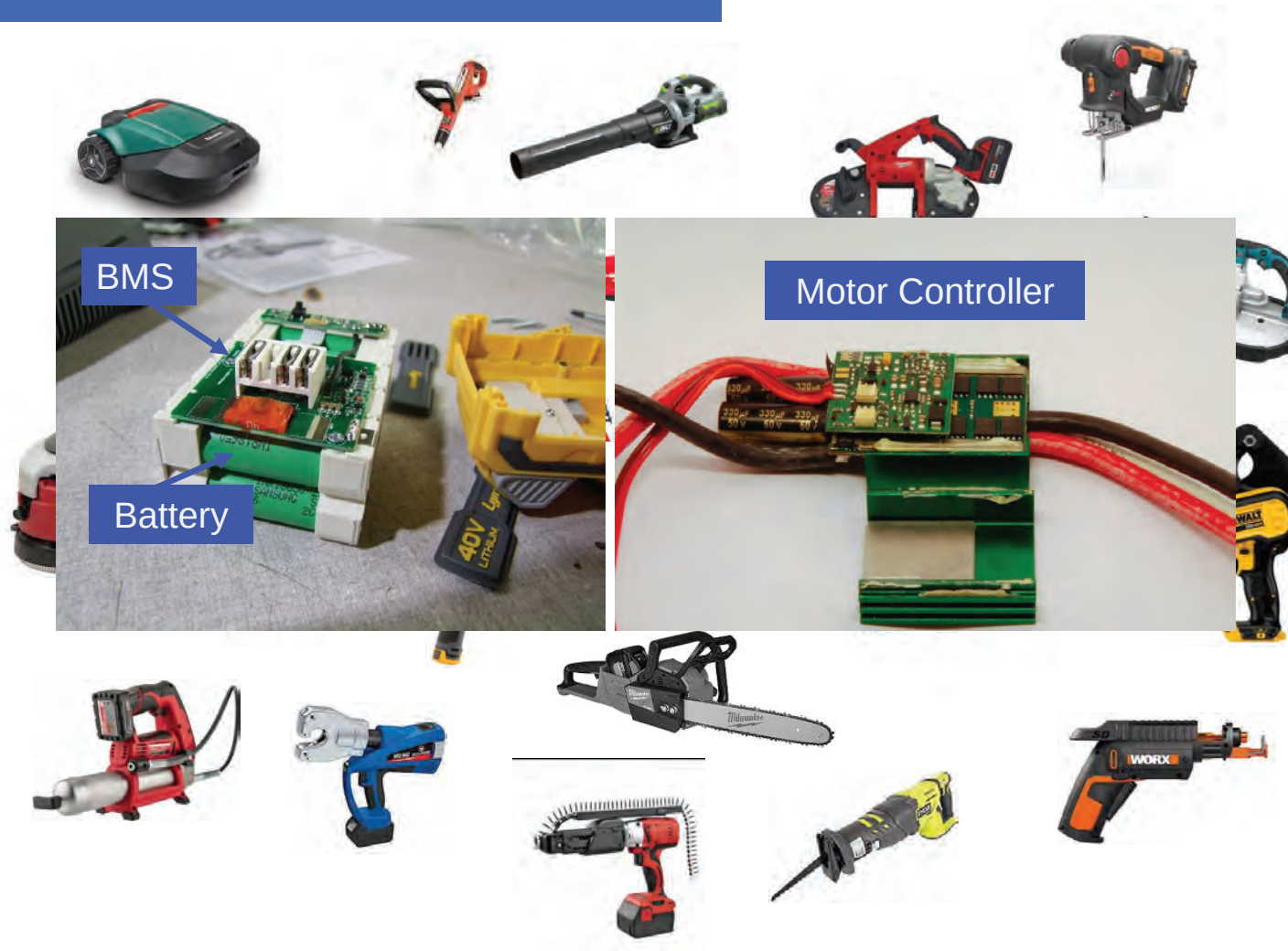
Textile Machine Teardown



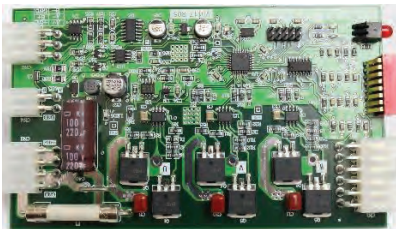
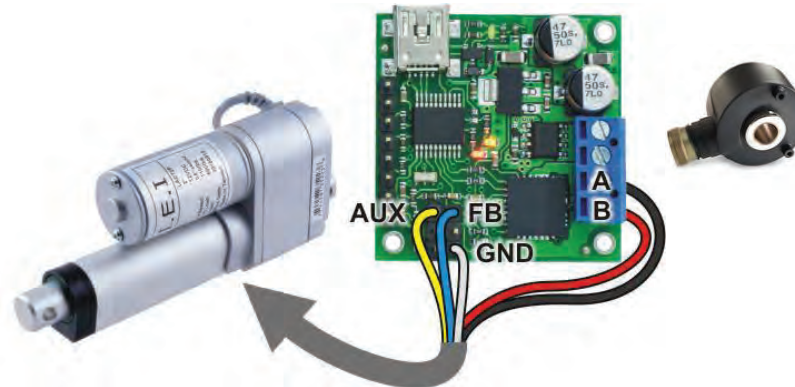
Building Automation



Industrial Hand Tool Electrification

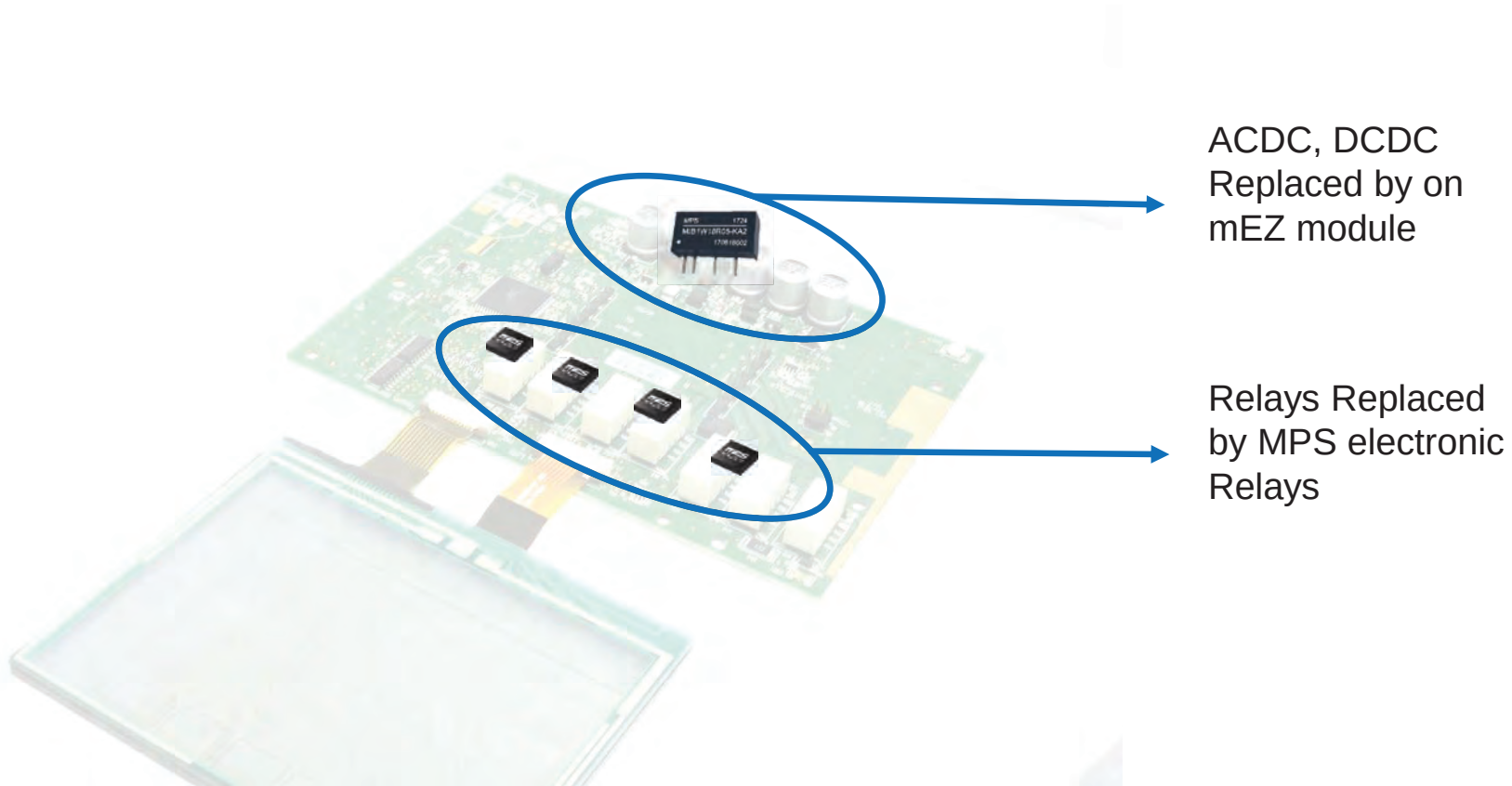


Others



Motor Control, DC-DC
AC-DC

Other Large Market Segment



Leveraging 2000+ Products

AC/DC Power Conversion

- High-Voltage Buck Regulator
- High-Voltage LDO
- Flyback Controller
- Flyback Synchronous Rectifier
- Active PFC Controller
- LLC Resonant Converter Controller
- LLC Synchronous Rectifier
- PFC&LLC Combo Controller
- X Cap Bleeder

DC/DC Power Conversion

- Step-Up (Boost)
- Step-Down (Buck)
- Buck/Boost
- CPU Core Power
 - 50A DrMOS in a 5x5mm QFN

Battery Management

- Li-Ion Single and Multi-Cell
- USB Complaint Chargers
- Switching Chargers
- Linear Chargers
- Integrated Power Bank Solutions

Class-D Audio

- Analog Input Class-D Amplifiers
- PWM Input Power Stages

Display Backlighting Power

- Backlight Drivers
- Electro-Luminescent Drivers
- Photo Flash Drivers
- LCD Power Supplies

E-Fuse, USB & Load Switches

- Programmable Current Limit up to 50A per Device
- Adjustable Slew Rate
- Reverse Current Blocking
- Output Discharge (Load Switch)
- Integrated Auto Detection
- Pin Compatible
- Parallel able up to 10 Devices
- PMBus Command and Control

Automotive & Industrial

- AEC-Q100
 - DC/DC
 - LED Lighting
 - Power Modules
 - Motor Drivers
 - USB Charging
 - Display Backlighting
 - Precision Analog

LED Lighting & Illumination

- TRIAC Dimmable AC/DC LED Controller
- PWM and Analog Dimmable AC/DC LED Controller
- DC/DC LED Controller: Buck, Boost, & Buck-Boost
- LED Protection IC

Computing Power

- CPU Core Power
- High current DrMOS
 - 60A DrMOS in a 4x5mm QFN
- POL

Motor Drivers & Position Sensors

- Brushless DC Motor Driver
- Stepper Motor Driver
- Brushed DC Motor/Solenoid Driver
- Half-bridge/Full-bridge/Three-phase Power Stages
- Magnetic Angular Position Sensors

Power Modules

- 6V, 600mA- 4A
- 16V, 600mA – 60A
- 21V, 600mA – 2A
- 36V, 600mA – 5A
- 55V, 1A – 3A
- 75V, 300mA

Precision Analog

- Analog Switches
- Current Sense Amplifiers
- Operational Amplifiers
- Voltage Reference

MPS Reconfigurable Standard Products

DC-DC



AC-DC



Motion Control



LED Lighting



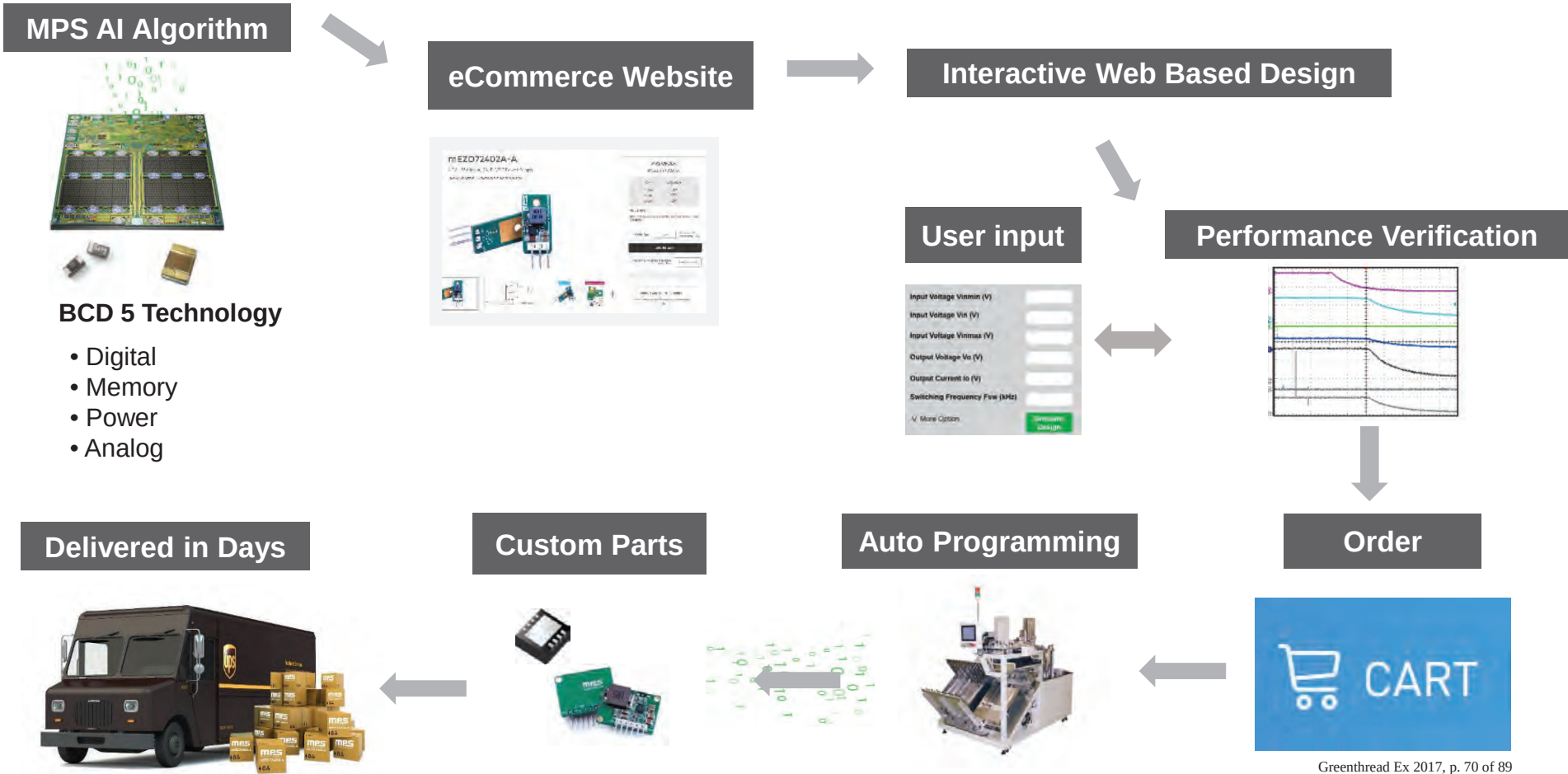
Audio Amp



Sensors

E to E through eCommerce

E to E through eCommerce



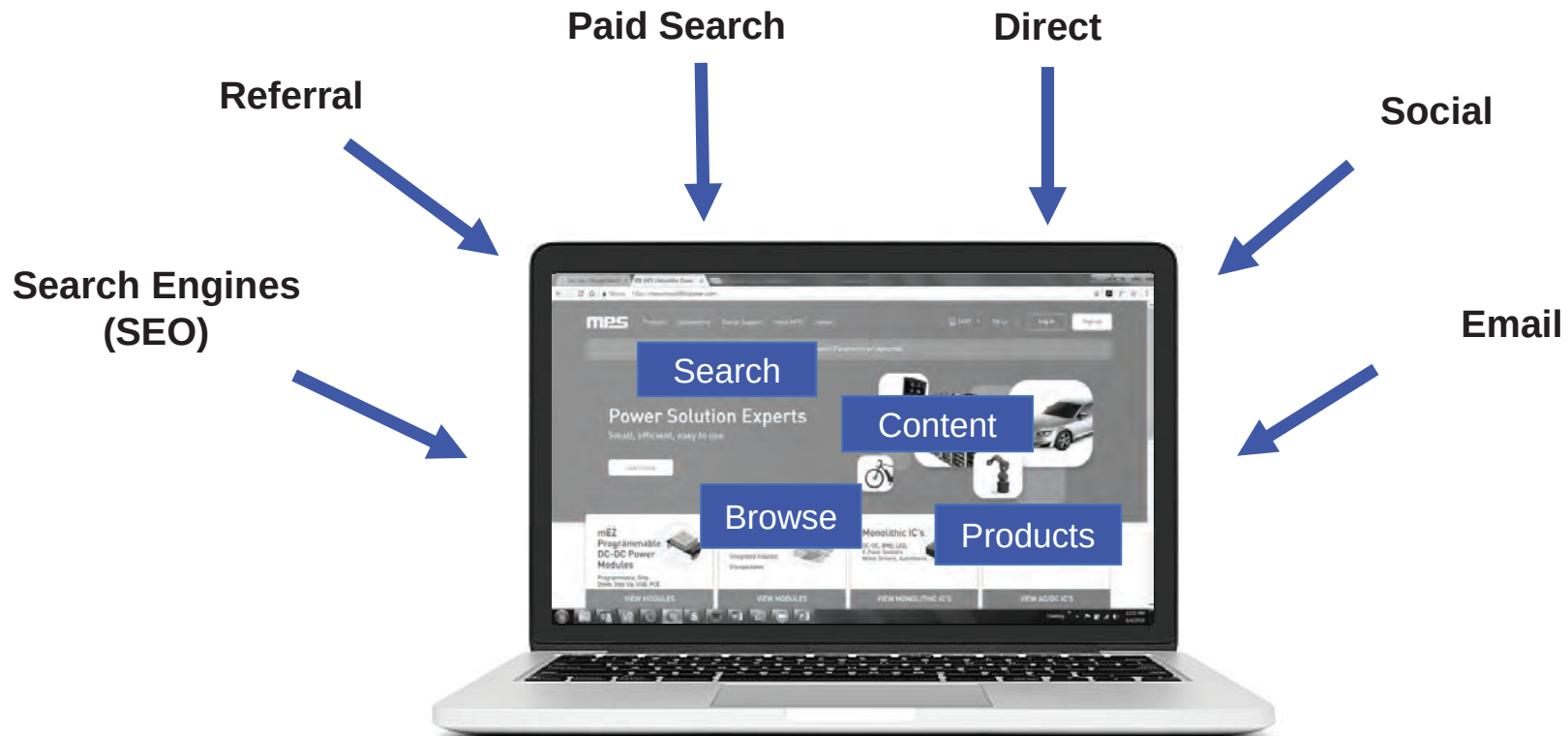
How MPS Wins with Field Programmable Modules and e-Commerce

Dean Gannon

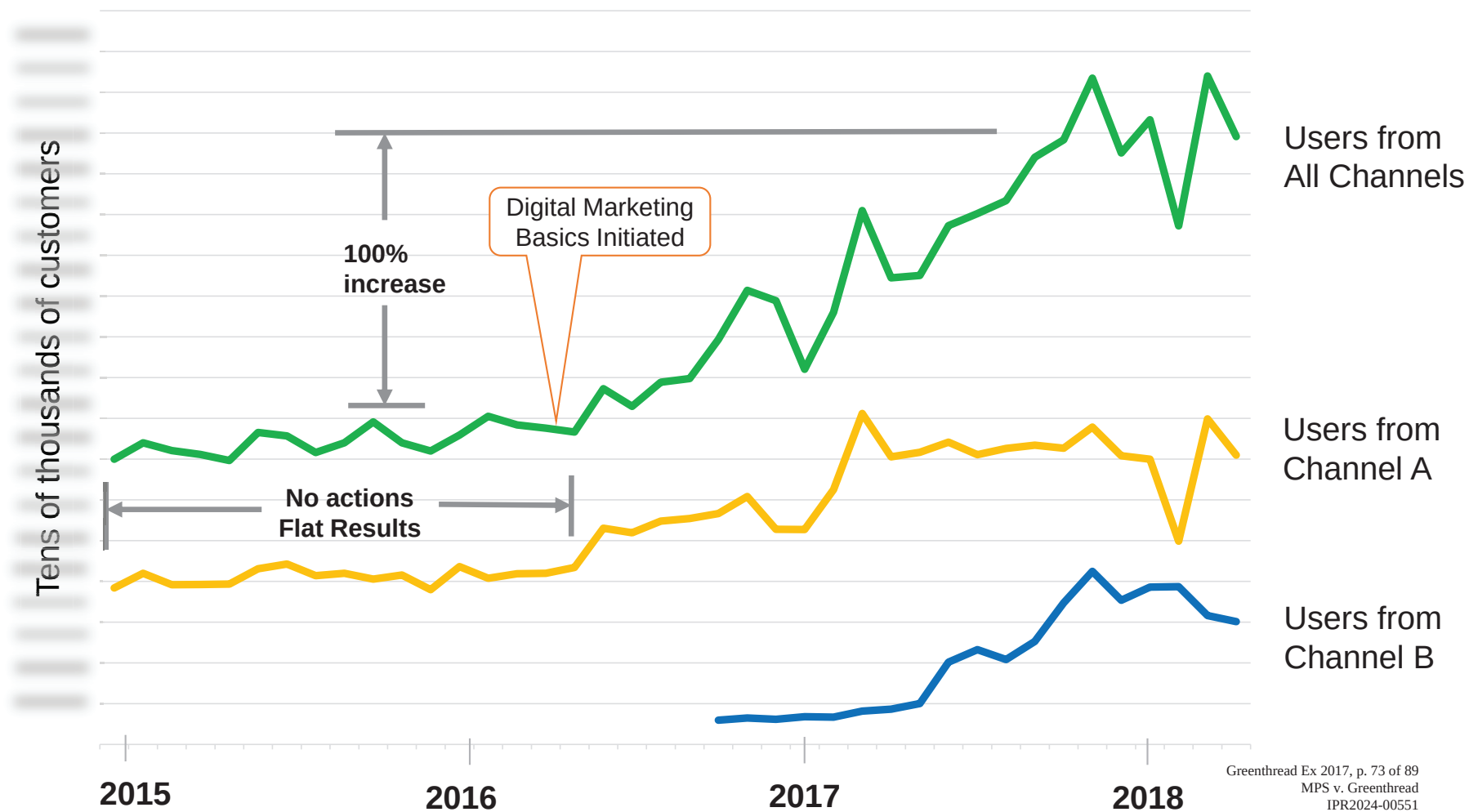


Reaching Customers at Scale

Website Customer Acquisition



Website User Growth



STEP 1
Create Your Design

STEP 2
Evaluate Your Design

STEP 3
Get Production Ready

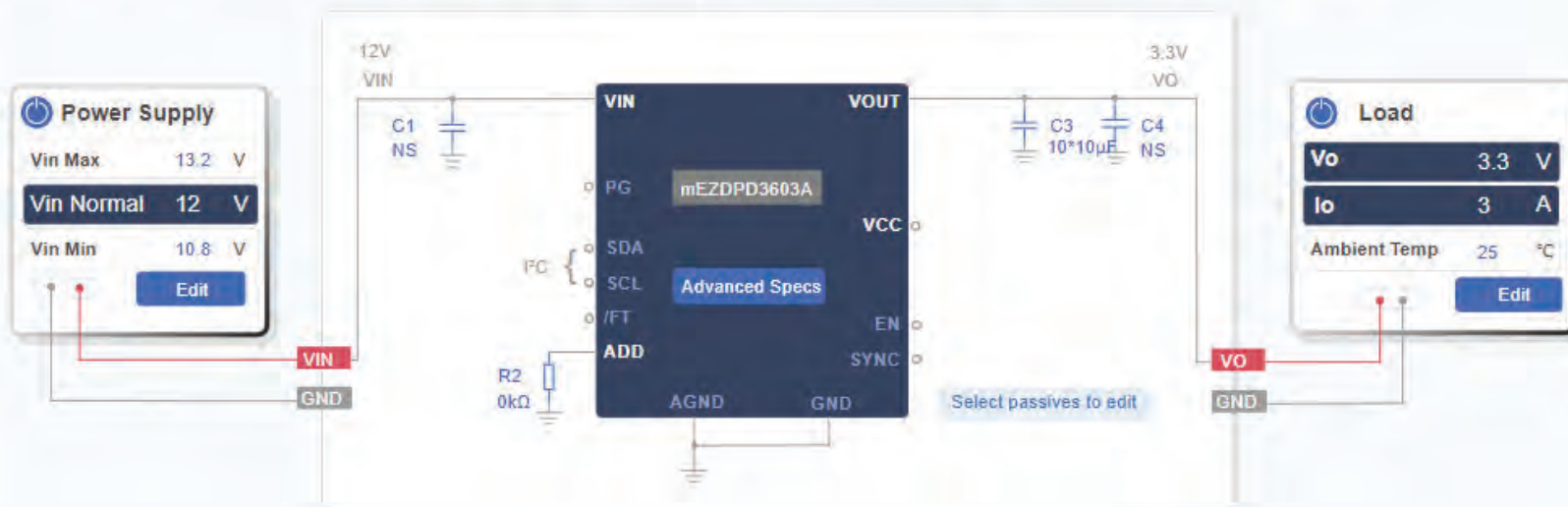
Name of Customer's Design v1.0



My Design: 2 Orderable 0 Modified

+NEW

Save



E to E Service/Solution through eCommerce

Every Design Customized

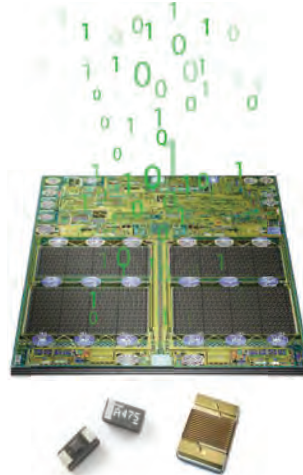


Input Voltage V_{inmin} (V)
Input Voltage V_{in} (V)
Input Voltage V_{inmax} (V)
Output Voltage V_o (V)
Output Current I_o (V)
Switching Frequency F_{sw} (kHz)

∨ More Option

Simulate
Design

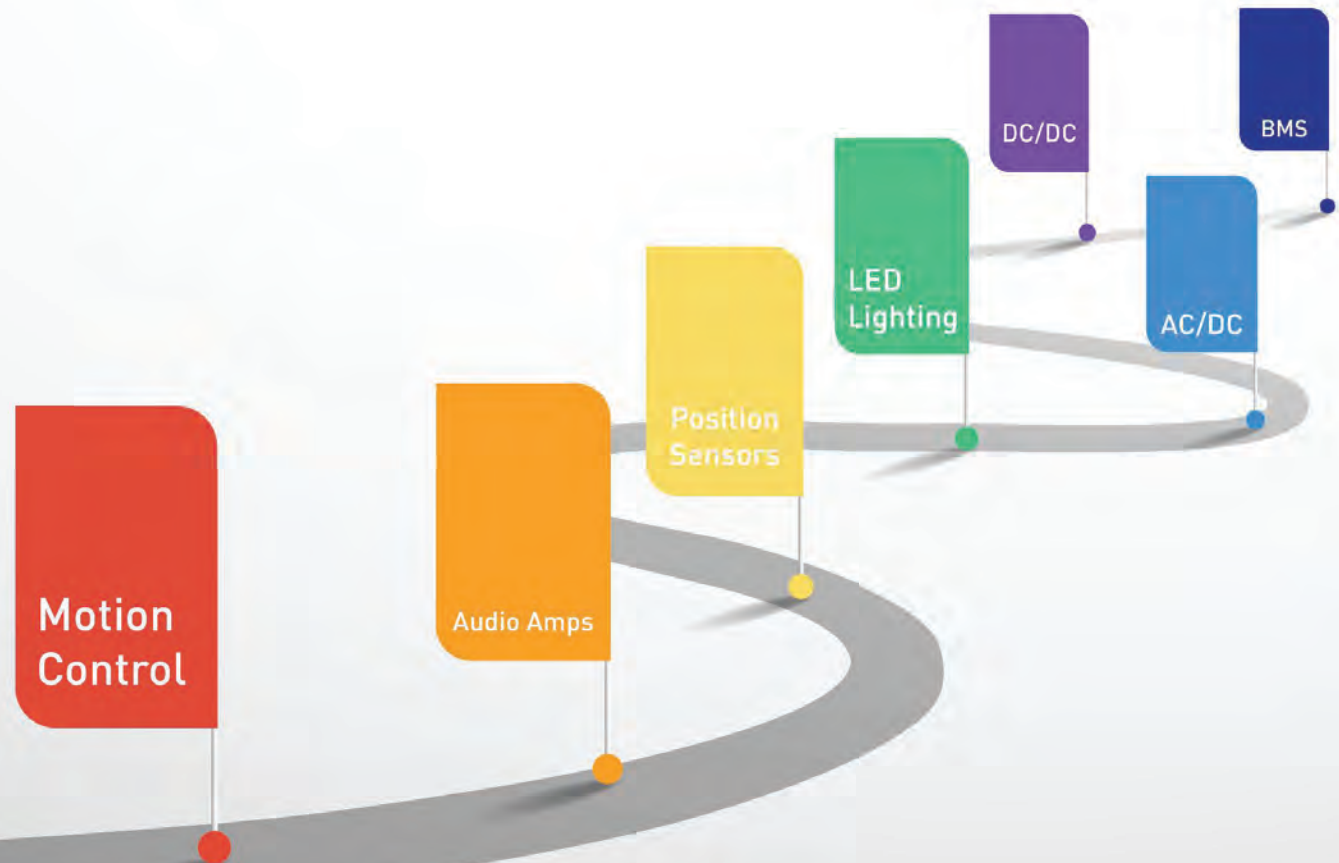
MPS Algorithm



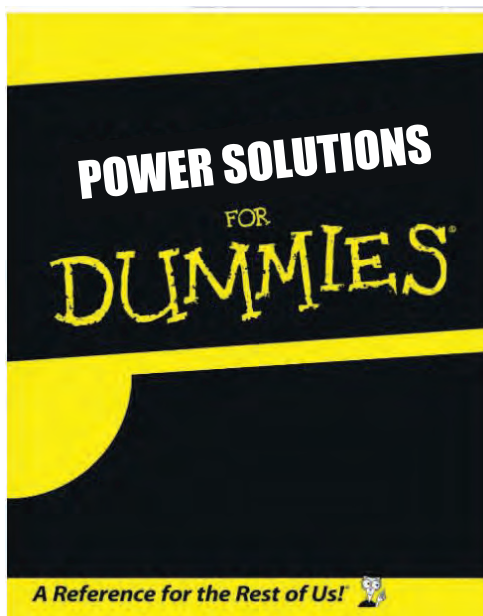
Custom Parts Delivered in Days



Product Roadmap



Turnkey Power Solutions



\$9B Addressable Market

Financial Summary

Bernie Blegen

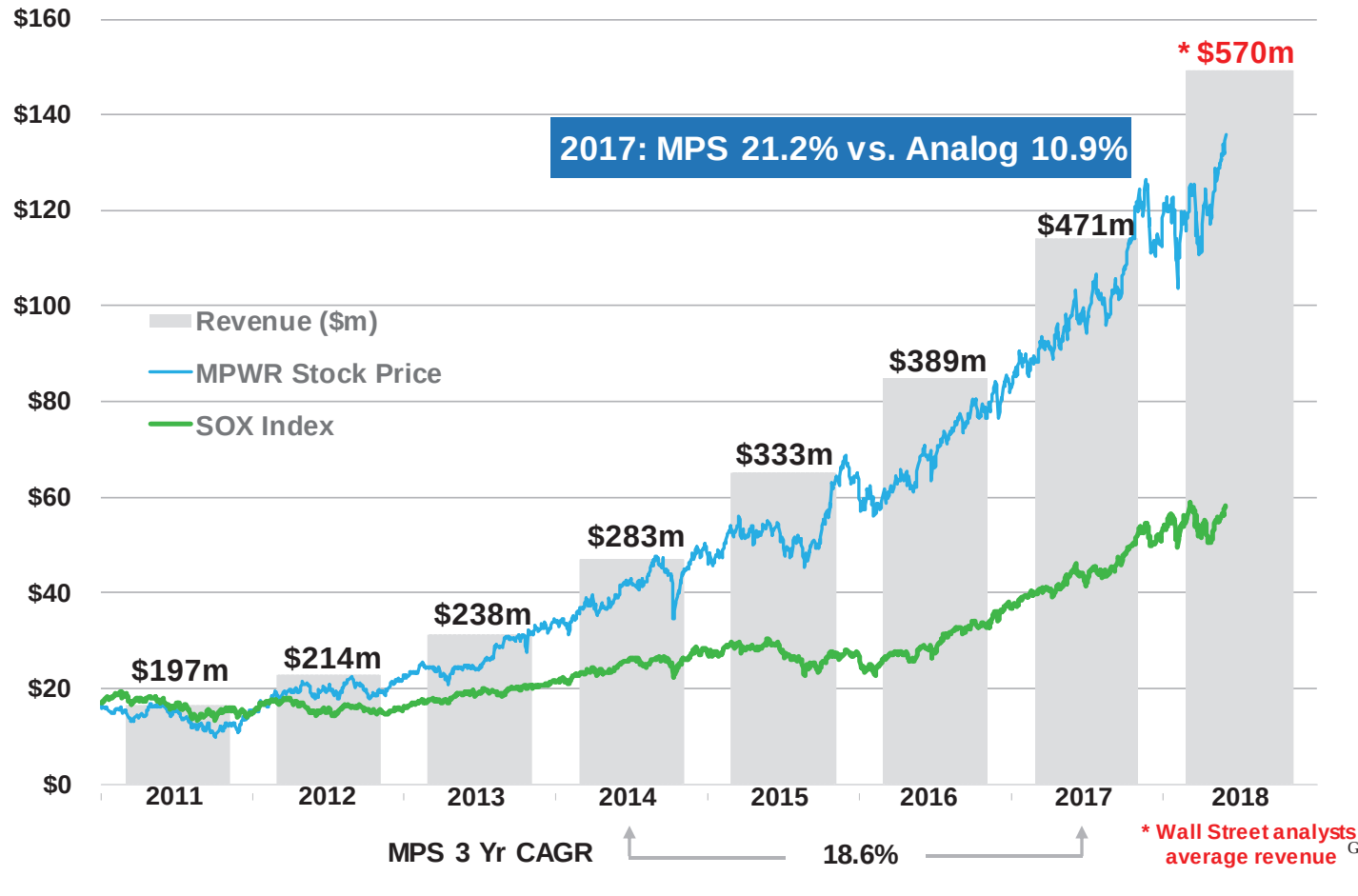


Q2 '18 Guidance

	Initial Guide April 26, '18	Updated June 7, '18
Revenue	\$135 – \$141M	\$138 – 141\$M
Non-GAAP Gross Margin%	55.4% - 56.4%	55.6% – 56.4%
Non-GAAP R&D + SG&A	\$33.7 – \$36.7M	\$34.7 – \$36.7M
Stock Comp	\$15.2 – \$17.2M	\$15.2 – \$17.2M
Fully diluted shares	43.9 – 44.9M	43.9 – 44.9M

Consistent Revenue Growth & Shareholders' Return

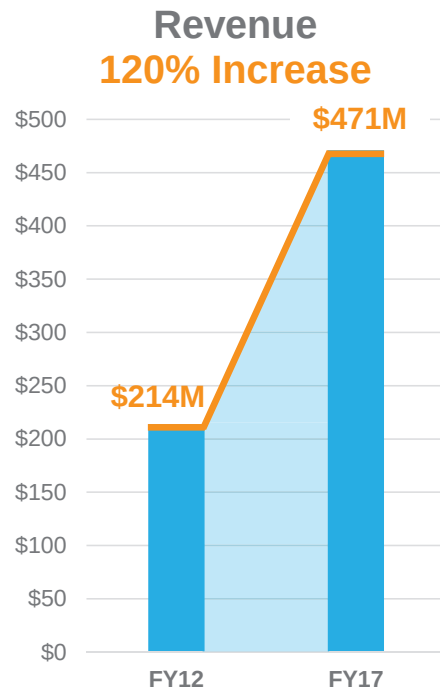
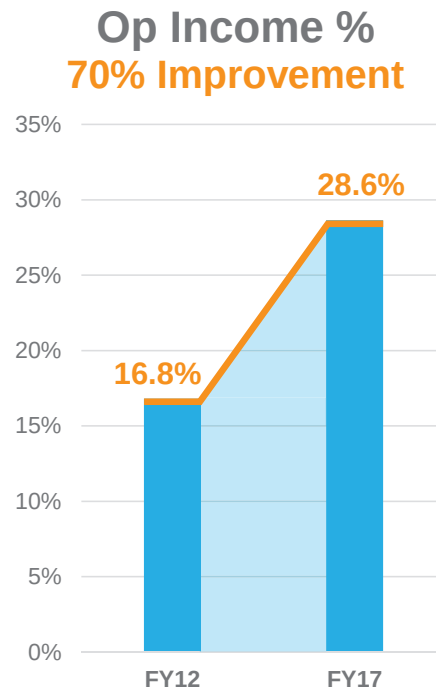
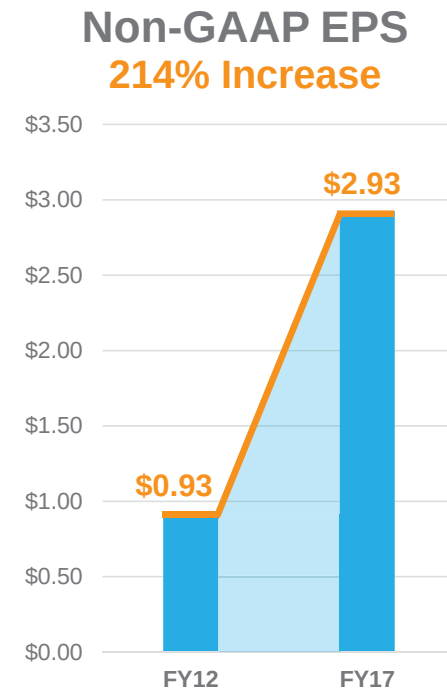
Stock Price



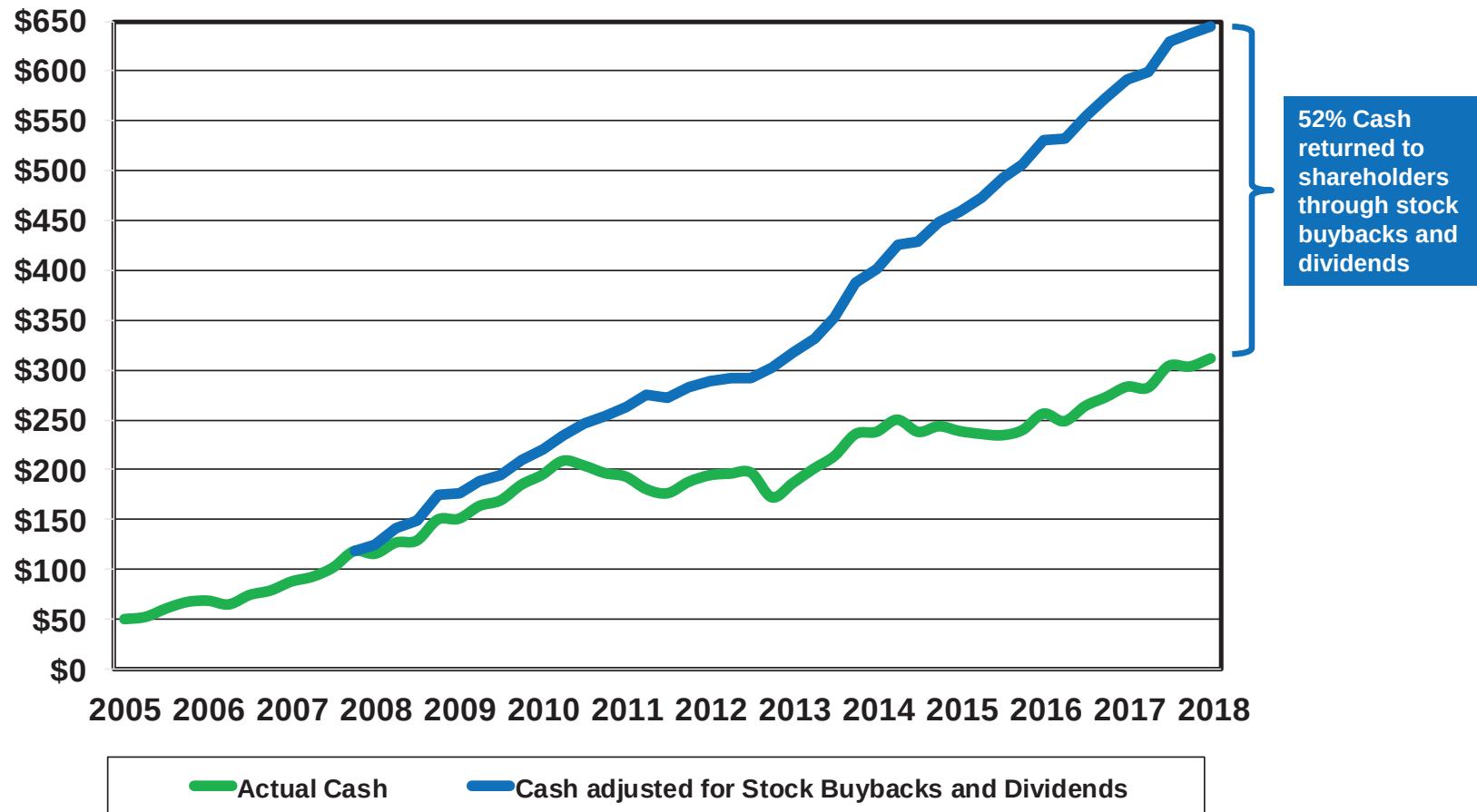
Diverse End Markets

% of Revenue	2010	2014	2017	18Q1	2014-2017 CAGR
Automotive	1.9%	4.2%	11.4%	15.5%	65.4%
Storage / Computing	10.4%	16.3%	21.4%	23.5%	29.7%
Industrial / Other	4.8%	13.2%	13.4%	12.6%	19.2%
Consumer	65.1%	43.4%	40.3%	36.7%	15.6%
Communications	17.8%	22.9%	13.5%	11.7%	-0.5%
Total	100%	100%	100%	100%	18.6%

Operating Leverage and Margin Expansion



Capital Allocation



Growth Drivers by End Market

Computing

Cloud Based
Data Center

GPU's

Portable

Storage

Artificial
Intelligence

Automotive

Body Controls

LED Lighting

ADAS

Battery
Management

Infotainment

Industrial

Instrumentation

Factory & Bldg
Automation

Robotics

Healthcare

Commercial
Lighting

Infrastructure

5G and Wireless

Base Stations

Networking

Optical

Consumer

IOT

Wireless
Charging

Power
Management

Augmented
Reality

SAM Expansion

Market	2015 SAM	2018 SAM
Automotive	\$6B	\$7B
Motion Control	\$2B	\$3B
ACDC	\$1B	\$2B
Modules	\$1B	\$2B
Cloud Computing (Server / Storage)	\$800M	\$1B
Networking / Telecom	\$600M	\$1B
Battery Management	\$600M	\$1B
Total Market SAM	\$12B	\$17B

Strategic Goals



Full digital solutions – Synthetic Analog



Integrated, software based, control with 3D sensor motor drive



Advanced power analog processes



Continued Compute and Automotive gains



Future Network Infrastructure and Industrial wins

Financial Model (Non-GAAP) June 2018

Financial Model			2017	2021	
	2015	2018	Actual	Target	Chg v '17
Revenue, YoY	20+% growth	20+% growth	\$470.9m	\$1BN	114%
Gross Margin	Mid to High 50's	Mid to High 50's	55.6%	57.5%	1.9 pts
R&D & SG&A	50% – 60% of annual revenue growth%	50% – 60% of annual revenue growth%	27.0%	21.5%	(5.5) pts
Operating Margin			28.6%	36.0%	7.4 pts
Capital Allocation		30% – 40% of free cash flow	34.0%		

Greenthread Ex 2017, p. 87 of 89
MPS v. Greenthread
IPR2024-00551

Q&A

Michael Hsing

CEO

Bernie Blegen

CFO

Maurice Sciammas

VP of Sales and Marketing

Jinghai Zhou

Cloud Computing

Chris Sporck

Battery Management

Allen Chen

Automotive

Dean Gannon

e-Commerce

Jens Muttersbach

e.Motion

Closing Summary

- Disruptive new products allowing unprecedented levels of integration, efficiency and ease of use.
- Pressing ahead with process technology lead
- Expanding in high growth, end markets of Automotive, Industrial, Cloud Computing and Networking
- Significant operating leverage while continuing to invest in next generation products and markets