

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

NETWORK SYSTEM TECHNOLOGIES, LLC
Patent Owner

Patent No. 7,373,449

Inter Partes Review No. IPR2024-00338

PATENT OWNER'S PRELIMINARY RESPONSE

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LISTING OF EXHIBITS

Exhibit No.	Description
2001	Declaration of Dr. Erik Chmelar
2002	<i>Curriculum vitae</i> of Dr. Erik Chmelar
2003	Neil Weste & David Harris, CMOS VLSI DESIGN: A CIRCUIT AND SYSTEMS PERSPECTIVE (4th ed. 2010)
2004	Jan Rabaey, Anantha Chandrakasan & Borivoje Nikolic, DIGITAL INTEGRATED CIRCUITS: A DESIGN PERSPECTIVE (2nd ed. 2003)
2005	William J. Dally & Brian Towles, <i>Route Packets, Not Wires: On-Chip Interconnection Networks</i> , PROC. 38TH DESIGN AUTOMATION CONF. (2001)
2006	John F. Wakerly, DIGITAL DESIGN: PRINCIPLES AND PRACTICES (4th ed. 2005)
2007	Fayez Gebali, Haytham Elmiligi & Mohamed Watheq El-Kharashi, NETWORKS-ON-CHIPS: THEORY AND PRACTICE (2009)
2008	Kurt Shuler, <i>Busses, Crossbars and NoCs: The 3 Eras of SoC Interconnect History</i> , ARTERISIP (Oct. 22, 2010), https://www.arteris.com/blog/busses-crossbars-and-nocs-the-3-eras-of-soc-interconnect-history/
2009	Kurt Shuler, <i>The SoC Interconnect Fabric: A Brief History</i> , ARTERISIP (Aug. 6, 2013), https://www.arteris.com/blog/the-soc-interconnect-fabric-a-brief-history/
2010	William Stallings, DATA & COMPUTER COMMUNICATIONS (6th ed. 1999)
2011	RESERVED
2012	United States District Courts — National Judicial Caseload Profile
2013-2020	RESERVED
2021	Order Resetting Jury Trial, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-

Exhibit No.	Description
	RWS (E.D. Tex.), Dkt. 182 (Mar. 18, 2024)
2022	Claim Construction Order, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 150 (Jan. 3, 2024)
2023-2027	RESERVED
2028	Docket Control Order, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd. et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.), Dkt. 59 (Jun. 16, 2023)
2029	Samsung's First Amended Answer and Counterclaims, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd. et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.), Dkt. 96 (Jan. 24, 2024) (Public Version)
2030	Samsung's P.R. 4-1 Identification of Proposed Terms and Claim Elements for Construction, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.) (Nov. 28, 2023)
2031	Samsung's Amended P.R. 4-1 Identification of Proposed Terms and Claim Elements for Construction, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.) (Dec. 18, 2023)
2032	Samsung's Preliminary Claim Construction and Extrinsic Evidence Pursuant to Local Patent Rule 4-2, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.) (Dec. 19, 2023)
2033	P.R. 4-3 Claim Construction and Prehearing Statement, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 91 (Jan. 9, 2024)
2034	Plaintiff Network System Technologies, LLC's Opening Claim Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 100 (Feb. 20, 2024)

Exhibit No.	Description
2035	Defendant Samsung Electronics Co., Ltd.'s Responsive Claim Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 112 (March 12, 2024)
2036	Plaintiff Network System Technologies, LLC's Reply Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 116 (March 19, 2024)
2037	RESERVED
2039	Second Amended Scheduling Order, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) Dkt. 80 (Oct. 23, 2023)
2040	Defendants' Joint Opening Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 77 (Oct. 12, 2023)
2041	Plaintiff Network System Technologies, LLC's Responsive Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 81 (Nov. 16, 2023)
2042	Defendants' Joint Reply Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 83 (Nov. 30, 2023)
2043	Plaintiff Network System Technologies, LLC's Sur-Reply Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 86 (Dec. 14, 2023)
2044	Defendants' Supplemental Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 105 (Mar. 1, 2024)

Exhibit No.	Description
2045	Plaintiff Network System Technologies, LLC's Supplemental Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 106 (Mar. 1, 2024)
2046	Defendants' Supplemental Invalidity Contention Cover Pleading, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) (Jan. 23, 2024)
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2051-2061	RESERVED.
2062	Statutory Disclaimer dated March 25, 2024

Network System Technologies, LLC (“NST” or “Patent Owner”) submits this preliminary response under 37 C.F.R. § 42.207 to the Petition for *Inter Partes* Review (“Petition”) of U.S. Patent No. 7,373,449 (“the ‘449 Patent”), filed by Samsung Electronics Co., Ltd. (“Samsung” or “Petitioner”).

I. INTRODUCTION

Patent Owner respectfully requests that the Board deny institution.

The Board should exercise its discretion to deny institution pursuant to 35 U.S.C. § 314(a) for two reasons. First, the Petition does not propose any claim constructions even though Petitioner is currently advocating for a means-plus-function construction for the term “communication manager” in co-pending district court litigation. The Board has held that it is appropriate to deny institution where, as here, a petitioner takes inconsistent positions on whether a term is subject to means-plus-function treatment. Second, the district court case is set for trial prior to the time of a final written decision, and claim construction will be fully briefed and argued before an institution decision. On balance, the factors in the Board’s precedential *Fintiv* decision weigh in favor of denying discretion.

Further, Petitioner has not demonstrated a reasonable likelihood of success on the merits. Petitioner failed to show that several claim limitations are disclosed in either reference in its obviousness combinations, and it also failed to demonstrate that a person of skill in the art would have combined its asserted references.

II. RELATED MATTERS

The '449 Patent is asserted in five pending district court proceedings in the Eastern District of Texas and Western District of Texas.

A. The Samsung Litigation

As of this Preliminary Response, the '449 Patent is asserted against Petitioner in *Network System Technologies, LLC v. Samsung Electronics Co., Ltd. et al.*, No. 2:22-cv-00481-JRG (E.D. Tex.) (hereinafter, "the Samsung Litigation"). A jury trial is scheduled for October 28, 2024. EX2028.

On November 28, 2023, Petitioner served a listing of "claim terms, phrases, or clauses that [Petitioner] contend[s] should be construed or found indefinite by the Court, including an identification of the claim elements that [Petitioner] contend[s] should be governed by 35 U.S.C. § 112(f)." EX2030, 1. Petitioner subsequently amended its listing of claim terms and phrases for construction on December 18, 2023 (the same day the Petition was filed). EX2031.

On December 19, 2023—just one day after the Petition was filed—Petitioner served preliminary claim constructions. EX2032. Notably, Petitioner contended that the term "communication manager" is subject to means-plus-function treatment 35 U.S.C. § 112, ¶ 6 and identified "forwarding a request to a resource manager" as the function and "portion of the circuit configured to implement the scheme disclosed in the '449 Patent at 10:19-24, 10:41-54" as the corresponding structure. *Id.*, 8.

Petitioner also contended “communication manager” is indefinite if the Court did not adopt its construction. *Id.*

The parties filed a Joint Claim Construction and Prehearing Statement with disputed and agreed constructions for the ‘449 Patent on January 10, 2024. EX2033. Patent Owner's Opening Claim Construction Brief was filed February 20, 2024 (EX2034), Petitioner's Responsive Claim Construction Brief was served on March 12, 2024 (EX2035), and Patent Owner's Reply Claim Construction Brief was served on March 19, 2024 (EX2036). A *Markman* hearing is scheduled for April 9, 2024. EX2028.

B. The TI Litigation

As of this Preliminary Response, the ‘449 Patent is asserted in *Network System Technologies, LLC v. Texas Instruments, Inc.*, No. 2:22-cv-00482-RWS (E.D. Tex.) (hereinafter, “the TI Litigation”). A jury trial is scheduled for October 21, 2024. EX2021. The court issued a *Markman* order on January 3, 2024 construing several terms in the ‘449 Patent. EX2022. The parties have served expert reports and are currently engaged in expert discovery.

C. The Qualcomm Litigation

As of this Preliminary Response, the ‘449 Patent is asserted in *Network System Technologies, LLC v. Qualcomm Inc. et al.*, No. 2:22-cv-01331-DAE (W.D. Tex.) (hereinafter, “the Qualcomm Litigation”). There is no trial date yet, but it is expected

to be in early 2025. EX2039. The parties completed claim construction briefing (EX2040-EX2045) and conducted a *Markman* hearing on December 21, 2023. EX2039, 6.

D. Other Litigations

As of this Preliminary Response, the '449 Patent is asserted in *Network System Technologies, LLC v. Lenovo Group Ltd.*, No. 2:23-cv-00167-JRG (E.D. Tex.), *Network System Technologies, LLC v. Ford Motor Co.*, No. 2:23-cv-00440-DAE (W.D. Tex.), and *Network System Technologies, LLC v. OnePlus Technology (Shenzhen) Co., Ltd.*, 2:23-cv-00520 (E.D. Tex.). These cases are currently stayed.

III. OVERVIEW OF NETWORK-ON-CHIP TECHNOLOGY

A. Technical Background

A network-on-chip ("NoC") is a data communication network on a microchip. EX2001, ¶49. In some ways, NoCs are similar to traditional computer networks like local area networks ("LANs") or wide area networks ("WANs") that interconnect discrete devices like computers, printers, and servers. *Id.* NoCs are different in that they interconnect integrated components (e.g., processors, cores, caches, memories, input/output (I/O) interfaces, and peripherals) typically on a very large-scale integrated ("VLSI") circuit, such as a system-on-chip ("SoC"). *Id.*, ¶¶49-50.

Prior to NoCs, SoCs used interconnects, traces, wires, and signal lines to connect two components. EX2001, ¶51. Typically, interconnections that carry

similar signals are grouped as buses (e.g., a dedicated bus or a shared bus). *Id.* There are numerous technical challenges associated with shared buses, which require bus arbitration methods and may require a complicated crossbar. *Id.*, ¶¶52-53. In large and/or complex SoCs, shared buses may not be sufficiently scalable nor provide enough bandwidth. *Id.*

A NoC interconnect paradigm radically changes the on-chip communication compared to direct interconnects like buses. EX2001, ¶54. This is due to the multi-hop nature of a network, where components are not directly connected, but separated by one or more network nodes. *Id.*, ¶¶54-62. In an SoC that implements a NoC, modules are connected to a network that routes packets between them, as opposed to using dedicated wires between the modules. *Id.* In other words, NoC technology packetizes address and data information on the same wires, thereby allowing transactions to be sent over a smaller number of wires compared to prior interconnect solutions while maintaining high quality of service. *Id.*

B. Differences Between On-Chip and Off-Chip Networks

The inventors of the '449 Patent recognized and described the problems described above and explained using multi-hop interconnects “radically changes the communication when compared to direct interconnects, such as buses or switches.” EX1001, 3:46–57; EX2001, ¶66; *see also id.*, ¶¶62-65. The inventors also described the advantages of NoCs:

NoCs help resolve the electrical problems in new deep-submicron technologies, as they structure and manage global wires. At the same time they share wires, lowering their number and increasing their utilization. ... NoCs also decouple computation from communication, which is essential in managing the design of billion-transistor chips.

EX1001, 1:38–49. The differences between NoCs and prior bus solutions “reside in the arbitration (which must change from centralized to distributed), and in the communication properties (e.g., ordering, or flow control).” *Id.* Differences between a multi-hop interconnect (like those in the ‘449 Patent) and a bus include: (1) media arbitration; (2) data routing; (3) data formatting; (4) latency; and (5) flow control for input buffers. EX2001, ¶67.

First, regarding media arbitration, “[i]n a bus, master modules request access to the interconnect, and the arbiter grants the access for the whole interconnect at once,” whereas in a NoC, “the arbitration is distributed, because it is performed in every router, and is based only on local information.” EX1001, 5:25–42; EX2001, ¶67.

Second, regarding data routing, “[f]or a bus, the command, address, and data are broadcasted on the interconnect. They arrive at every destination, of which one activates based on the broadcasted address, and executes the requested command,” whereas in a NoC, “it is not feasible to broadcast information to all destinations, because it must be copied to all routers and network interfaces. This floods the

network with data. The address is better decoded at the source to find a route to the destination module.” EX1001, 5:43–54; EX2001, ¶68.

Third, regarding data formatting, “[i]n modern bus interfaces the data format is defined by separate wire groups for the transaction type, address, write data, read data, and return acknowledgements/errors (e.g., VCI, OCP, AMBA, or CoreConnect),” whereas in a NoC, “there is typically no distinction between different kinds of data. Data is treated uniformly, and passed from one router to another.” EX1001, 6:8–25; EX2001, ¶69.

Fourth, regarding latency, in buses, “the arbitration is centralized [and] the access time is proportional to the number of masters connected to the bus,” meaning that “the speed of transfer is limited by the bus speed, which is relatively low.” EX1001, 5:55–6:7; EX2001, ¶70. However, “in a NoC, arbitration is performed at each router for the following link” and “[t]he access time per router is small.” *Id.* The ‘449 Patent explains that “network links are unidirectional and point to point, and hence can run at higher frequencies than buses, thus lowering the latency.” *Id.* Fifth, with respect to flow control for input buffers, unlike buses, “the destination of a transaction cannot signal directly to a source that its input buffer is full” in an NoC, which can lead to “network congestion.” EX1001, 6:48–62; EX2001, ¶71.

Another distinction between an on-chip and off-chip networks is that “[a]n off-chip network interface usually contains a dedicated processor to implement the

protocol stack up to network layer or even higher, to relieve the host processor from the communication processing,” however, “[i]ncluding a dedicated processor in a network interface is not feasible on chip, as the size of the network interface will become comparable to or larger than the IP to be connected to the network.” EX1001, 2:16–25; EX2001, ¶72. Further, data sent via a NoC may be subject to out-of-order arrival, diverse routing paths, and retransmission after dropping. EX2001, ¶73. The ‘449 Patent explains that “[f]or off-chip networks[,] out-of-order data deliver[y] is typical.” EX1001, 3:8–17; EX2001, ¶73. “However, for NoCs where no data is dropped, data can be forced to follow the same path between a source and a destination (deterministic routing) with no reordering,” which “requires less buffer-space, and reordering modules are no longer necessary.” *Id.*

On-chip and off-chip networks also differ with respect to time-related guarantees. EX2001, ¶74. In particular, “[o]ff-chip networks typically use packet switching and offer best-effort services,” but “latency guarantees [are] very hard to offer” and require “high buffering costs.” EX1001, 3:34–46; EX2001, ¶74. On-chip networks can also provide more reliable communication compared to off-chip networks and “avoid the considerable overhead incurred by off-chip networks for providing reliable communication.” EX1001, 2:43–53; EX2001, ¶75. Given “the tight on-chip resource constraints,” “the network components . . . must be fairly simple to minimize computation and memory requirements.” *Id.*

In view of the foregoing, the '449 Patent emphasizes that "NoC's premises are different from off-chip networks, and, therefore, most of the network design choices must be reevaluated" because "[o]n-chip networks have different properties (e.g., tighter link synchronization) and constraints (e.g., higher memory cost) leading to different design choices, which ultimately affect the network services." EX1001, 1:66–2:5; EX2001, ¶72.

IV. OVERVIEW OF THE '449 PATENT

The '449 Patent relates to "an integrated circuit having a plurality of processing modules and a network arranged for providing connections between processing modules and a method for exchanging messages in such an integrated circuit." EX1001, 1:7–11; EX2001, ¶77.

For example, FIG. 3 illustrates "a communication manager CM and a resource manager RM." EX1001, 9:66–10:3; EX2001, ¶78. The "communication manager CM and the resource manager RM are arranged in the router network RN, but they can also be arranged in one or some of the network interfaces NI." EX1001, 10:3–6; EX2001, ¶78.

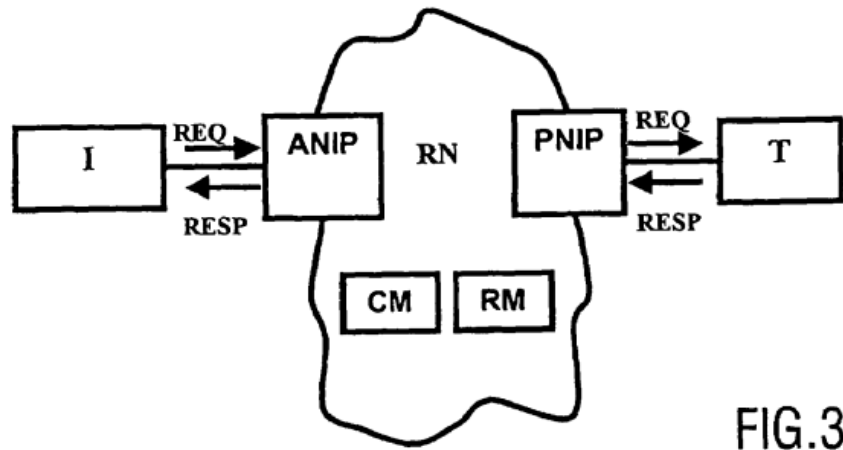


FIG.3

EX1001, FIG. 3

“The communication manager request[s] a connection with a set of properties between two modules from the resource manager RM” and the “resource manager RM allocates the necessary resources and enquires if such a connection based on these resources is possible.” EX1001, 10:19–26; EX2001, ¶79. “After enquiring of the available connection properties, the resource manager RM reserves the available connection, i.e. the required resources, and responds to the communication manager CM which connection is available, i.e. which connection properties or the required resources thereof are available for the desired channels.” EX1001, 10:41–46; EX2001, ¶79. If the CM accepts the connection, “the resource manager RM sets the connection properties, and establishes a connection with accepted properties between said initiator and target modules.” EX1001, 10:51–57; EX2001, ¶79. After the initiator and target modules complete the transaction, “the communication

manager CM issues a request to said resource manager RM to reset the connection or the connection properties.” EX1001, 10:57–61; EX2001, ¶79.

The specification explains that “connections . . . must be first created or established with the desired properties before being used,” which “may result in resource reservations inside the network (e.g., buffer space, or percentage of the link usage per time unit.” EX1001, 10:62–66; EX2001, ¶80. “To allow more flexibility in configuring connections, and, hence, better resource allocation per connection, the outgoing and return parts of connections can be configured independently.” EX1001, 11:4–7; EX2001, ¶80. Independently configuring connections allows for “a different amount of buffer space [to] be allocated in the NIPs at the master and slaves, or different bandwidths can be reserved for requests and responses.” EX1001, 11:7–10; EX2001, ¶80. As a result, “the connection properties of request part of a connection can be best effort, while the connection properties of response can have guaranteed throughput (or vice versa).” EX1001, 11:22–26; EX2001, ¶80.

In sum, the '449 Patent discloses and claims an integrated circuit including an on-chip network where a resource manager is configured to provide a communication channel between modules that have connection properties, where connection properties between different communication channels are independently configurable. EX2001, ¶81.

V. THE '449 PATENT'S PROSECUTION HISTORY

During prosecution, the Examiner rejected the claims as allegedly obvious over Lin in view of Barr. EX1002, 53-59. In response, the applicant made minor claim amendments and explained that “Lin and Barr fail to disclose or suggest . . . an Integrated circuit comprising a plurality of processing module (M; I; S; T) and a network (N; RN)” because “Lin describes a ‘cluster’ which is two or more separate computer systems” and “Barr describes a telematics client framework.” EX1002, 48-49; EX2001, ¶85.

The Examiner then rejected the claims as allegedly obvious over Emerson in view of Adams. EX1002, 31-37. In response, the Applicant amended the claims and argued that Emerson and Adams do not disclose several limitations relating to the communication and resource managers. EX1002, 20-27; EX2001, ¶86. Thereafter, the Examiner withdrew the rejections and allowed the claims.

VI. THE '449 PATENT'S PRIORITY DATE

Petitioner argues that the challenged claims are “not entitled to a priority date earlier than October 7, 2003.” Petition, 6-7. While Patent Owner disagrees and reserves the right to identify an earlier priority date if an IPR is instituted, the Board need not determine whether the challenged claims are entitled to an earlier priority date to deny institution.

VII. CLAIM CONSTRUCTION

Petitioner argues that “the Board does not need to construe any term for purposes of evaluating” its Petition and proposes no claim constructions. Petition, 15. This argument is very different from Petitioner’s litigation positions, where it is arguing that the term “communication manager” is a means-plus-function construction term. *See infra*, §VII.A.

Patent Owner has also been engaged in claim construction proceedings in the TI and Qualcomm Litigations involving terms in the ‘449 Patent. The court issued a *Markman* order in the TI Litigation construing certain terms in the ‘449 Patent, including the term “communication manager.”

A. The Communication and Resource Managers are Separate and Distinct

The terms “[first/second] module,” “resource manager” and “communication manager” are recited in all challenged claims.¹ Claim 10 recites that the first module issues “a request for a connection with the second module to a communication

¹ Patent Owner has statutorily disclaimed claims 1 and 3-5. EX2062. The Board has held that such disclaimers are not a request for adverse judgment and do not give rise to estoppel as to the remaining challenged claims. *Daikin Industries, Ltd. v. Chemours Co. FC, LLC*, IPR2018-00993, Paper 12 at 2-7 (PTAB Nov. 13, 2018); *see also* 37 C.F.R. § 42.107(e).

manager.” EX1001, 19:33-35. The communication manager “forward[s] the request to a resource manager.” *Id.*, 19:36-37. The resource manager “determine[es] whether a target connection with the desired connection properties is available” and “respond[s] with the availability of the target connection to the communication manager.” Dependent claims 2 and 6 contain similar limitations. EX1001, 19:38-20:2; EX2001, ¶91.

It is well-settled that where, as here, “a claim lists elements separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention.” *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010); *see also Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008). In this case, the claims separately recite a “[first/second] module,” “resource manager” and “communication manager,” which means that they are separate and distinct components of the invention. EX2001, ¶¶92-93. In other words, one “manager” or logical component cannot be both the “resource manager” and the “communication manager.” *Id.* Similarly, something cannot be both the “first module” and the “communication manager.” *Id.*

This construction is reinforced by “the surrounding words of the claims.” *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003). In claim 10, the first module issues a request to the communication manager, which forwards the

request to the resource manager. EX2001, ¶94. The fact that the claim specifies that the first module issues a request to the communication manager—not the resource manager—which then forwards the request to the resource manager reinforces that these components are distinct. *Id.* Similarly, claim 10 requires that the resource manager—not the communication manager—determines whether a target connection is available and then responds to the communication manager. *Id.*, ¶95. A construction that allows for the first/second module and the communication and resource managers to be the same thing would vitiate these specific interactions and functionalities.

Patent Owner's construction is also consistent with the specification. FIG. 3 illustrates separate and distinct “CM” (communication manager) and “RM” (resource manager) elements in router network RN. EX2001, ¶96.

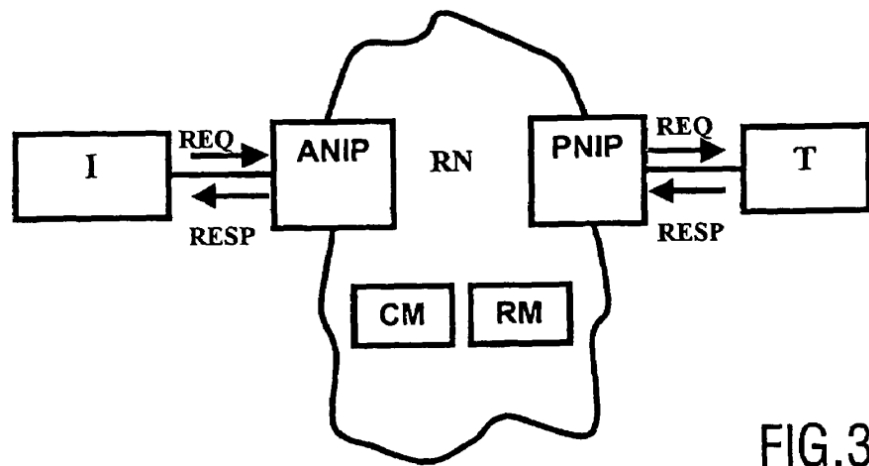


FIG.3

EX1001, FIG. 3

The specification explains that “the communication manager CM and the resource manager RM are arranged in the router network RN, but they can also be arranged in one or some of the network interfaces NI.” EX1001, 10:3–6; EX2001, ¶97. The ‘449 Patent refers to the CM and RM as plural elements, not as a singular element, and these elements can be arranged in various parts of the NoC. *Id.*

The ‘449 Patent also teaches that the communication module should not be disposed in, for example, the initiator module “I” in FIG. 3 (an example of the first module). EX2001, ¶98. Specifically, the ‘449 Patent teaches that it is important to decouple “the computation from communication, which allows IPs (the computation part), and the interconnect (the communication part) to be designed independently from each other.” EX1001, 17:59–18:1; EX2001, ¶98. The ‘449 Patent also refers to “well-defined interfaces separating communication service usage from service implementation.” EX1001, 1:44–49; EX2001, ¶98. This confirms that the “first module” (computation) and the “communication manager” (communication) must be distinct. EX2001, ¶98.

B. Petitioner's Litigation Means-Plus-Function Construction for Communication Manager

In the TI Litigation, the court held that “the term ‘communication manager’ does not connote sufficiently definite structure” and is governed by 35 U.S.C. § 112, ¶ 6. EX2022, 40. The court construed “communication manager” as follows:

Function: forwarding a request to a resource manager.

Corresponding Structure: portion of the circuit configured to implement the scheme disclosed in the '449 Patent at 10:19-24, 10:41-54.

Id. at 42.

Patent Owner and Petitioner have proposed the following competing constructions for “communication manager” in the Samsung Litigation:²

Term	Petitioner's Construction	Patent Owner's Construction
“communication manager”	Subject to Section 112, ¶ 6 Function: forwarding a request to a resource manager Structure: portion of the circuit configured to implement the scheme disclosed in the '449 Patent at 10:19-24, 10:41-54 Otherwise, indefinite.	Plain and ordinary meaning If subject to Section 112, ¶ 6: Function: forward a request for a connection to the resource manager Structure: circuit

EX2033, 11-12; *see also* EX2034; EX2035; EX2036.

In its claim construction brief, Petitioner advocated for the same construction the court adopted in the TI Litigation, arguing that “communication manager” recites function without reciting sufficient structure for performing that function. EX2035, 11. Petitioner offered testimony from a different expert alleging “that

² Qualcomm also proposed a means-plus-function construction for “communication manager” in the Qualcomm Litigation. EX2052, 5.

‘communication manager’ is ‘not a term of art identifying a particular structure or class of structures’ and that ‘there is no particular class of structures that implements the generic function of managing communications.” *Id.* Petitioner also argued that “[t]o the extent the corresponding is not what was identified in” the court in the TI Litigation, “there is no corresponding structure clearly linked to the claimed function . . . and this term is indefinite.” *Id.*, 13.

While Patent Owner disagrees with Petitioner’s litigation construction and the court’s construction in the TI Litigation, the Board need not decide whether “communication manager” is a means-plus-function term to deny institution. Rather, the Board should exercise its discretion and deny institution because Petitioner is taking inconsistent positions and failed to sufficiently disclose its litigation construction to the Board. *Infra*, §VIII.A.

C. The Preamble of Claim 10 is Limiting

In the Samsung Litigation, Patent Owner and Petitioner agreed that the preamble of independent claim 10 is limiting. EX2033, 6. The parties also agreed in the TI and Qualcomm Litigations that the preamble is limiting. EX2022, 58; EX2052, 2.

Consistent with the parties’ agreement in the co-pending district court litigations, the Board should construe the preamble of claim 10 as limiting. The preamble provides antecedent basis for several terms recited in the body of claim 10,

including the “first module,” “second module,” “connection properties,” and “sets of communication channels,” which supports construing the preamble as limiting. *See, e.g., In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) (“We have repeatedly held a preamble limiting when it serves as antecedent basis for a term appearing in the body of a claim”); *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (“dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention”).

D. Other District Court Constructions

The parties in the various district court cases have proposed, and in some cases agreed to, various constructions. While Patent Owner summarizes these below, the Board need not construe any of these terms to deny institution. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

1. “resource manager” (claims 2, 6, and 9-16)

In the Samsung Litigation, the parties agreed that “resource manager” should be afforded its plain and ordinary meaning. EX2033, 7. The same construction was adopted by the court in the TI Litigation. EX2022, 46.

2. “network” (claims 2, 6, and 9-16)

In the Samsung Litigation, the parties agreed that “network” should be construed as “multi-hop interconnection between modules separated by one or more

network nodes.” EX2033, 5. The same construction was adopted by the court in the TI Litigation. EX2022, 58.

3. “integrated circuit” (claims 2, 6, and 9-16)

In the Samsung Litigation, the parties agreed that “integrated circuit” should be construed as “interconnected circuitry on a chip.” EX2033, 5-6. In the TI Litigation, the court construed “integrated circuit” as “a combination of interconnected circuit elements inseparably associated on or within a continuous substrate.” EX2022, 59.

4. “connection properties” (claims 2, 6, and 9-16)

In the Samsung Litigation, the parties agreed that “connection properties” should be construed as “properties of a connection, including ordering (data transport in order), flow control (a remote buffer is reserved for a connection, and a data producer will be allowed to send data only when it is guaranteed that space is available for the produced data), throughput (a lower bound on throughput is guaranteed), latency (upper bound for latency is guaranteed), latency (upper bound for latency is guaranteed), the lossiness (dropping of data), transmission termination, transaction completion, data correctness, priority, or data delivery.” EX2033, 5-6. The parties agreed to the same construction in the TI and Qualcomm Litigations. EX2022, 57; EX2052, 2.

5. “connection” (claims 2, 6, and 9-16)

In the Qualcomm Litigation, Qualcomm proposed that “connection” should be construed as “one or more channels, each having a set of connection properties, between a first module and at least one second module, that are created before use and closed after use.” EX2052, 1. Patent Owner proposed that “connection” should be construed as “one or more communication channels.” *Id.*

6. “independently configurable” (claim 10)

In the Qualcomm Litigation, the parties agreed that “independently configurable” should be construed as “able to be configured with connection properties that do not depend on those of another configuration.” EX2052, 1.

7. “at least one of a switch and a router” (claim 11)

In the TI and Qualcomm Litigations, the parties agreed that “at least one of a switch and a router” should be construed as “at least one switch and at least one router.” EX2022, 57; EX2052, 2.

8. “flow control” (claim 13)

In the Samsung Litigation, the parties agreed that “flow control” should be construed as “controlling flow whereby a remote buffer is reserved for a connection, and a data producer will be allowed to send data only when it is guaranteed that space is available for the produced data.” EX2033, 5. The parties agreed to the same construction in the TI and Qualcomm Litigations. EX2022, 58; EX2052, 1.

VIII. THE BOARD SHOULD EXERCISE ITS DISCRETION PURSUANT TO 35 U.S.C. 314(a) AND DENY INSTITUTION

The Board is granted the discretion to decline to institute an *inter partes* review whenever it deems the circumstances warrant doing so. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“the PTO is permitted, but never compelled, to institute an IPR proceeding”); *see also* 35 U.S.C. § 314(a); *Oil States Energy Servs. LLC v. Green's Energy Grp., LLC*, 138 S. Ct. 1365, 1371 (2018) (“The decision whether to institute *inter partes* review is committed to the Director's discretion.”). For the reasons discussed below, the Board should do so in this case.

A. Petitioner's Failure to Sufficiently Disclose its District Court Means-Plus-Function Claim Construction Warrants Discretionary Denial

Petitioner's argument that no claim terms in the '449 Patent require construction in this proceeding is inconsistent with its litigation positions, including its proposed means-plus-function construction for the term “communication manager.” *Supra*, § VII.B. The Board should exercise its discretion and deny institution based on Petitioner's failure to sufficiently disclose its litigation means-plus-function construction for “communication manager.”

In *Facebook, Inc. v. Sound View Innovations, LLC*, the Board exercised its discretion to deny institution under nearly identical circumstances: the petitioner proposed no claim constructions even though it was advocating for a means-plus-

function construction in district court litigation. *Facebook, Inc. v. Sound View Innovations, LLC*, IPR2017-00998, Paper 13 at 14-18 (PTAB Sept. 5, 2017). In rejecting the petitioner's argument that it was merely adopting the patent owner's litigation construction for purposes of an IPR, the Board explained that "the challenged claim either contains means-plus function terms or it doesn't, and a word in the challenged claim either is a 'nonce' word or it isn't." *Id.* at 16. Further, the petitioner failed to set forth the specific analysis for means-plus-function terms required under the Board's rules. *Id.* (citing 37 C.F.R. § 42.104(b)(3)). The Board also found it "troubling" that the petitioner "did not inform the panel that [it] had taken a very different position before the district court . . . nor did it explain the reasons for Petitioner's change of heart regarding the presence of means-plus-function terms." *Id.* at 17.

Similarly, in *Orthopediatrics Corp., v. K2M, Inc.*, the petition offered no claim constructions even though "in the related district court litigation, Petitioner advocated that the 'grasping members' limitation be subject to means-plus-function claim construction." *Orthopediatrics Corp., v. K2M, Inc.*, IPR2018-01546, Paper 10 at 11 (PTAB Feb. 14, 2019). The Board found that because "Petitioner advocated for a different claim construction in the related district court litigation . . . construction of the claim term in dispute [is] necessary." *Id.* And because the petition

did not propose a § 112, ¶ 6 construction and failed “to comply with 37 C.F.R. § 42.104(b)(3),” the Board denied institution. *Id.*

As in *Facebook*, it is clear that “based on its arguments to the district court,” Petitioner “believes that” the challenged claims “contain[] a means-plus-function . . . limitation.” *Facebook*, Paper 13 at 16. And like the petitioners in *Facebook* and *Orthopediatrics*, Petitioner failed to propose that construction here, let alone inform the Board of its position that “communication manager” is a means-plus-function term in the Samsung Litigation. *Supra*, § VII.B. While Patent Owner disagrees with that construction in the parallel district court proceedings, *Facebook* held that this is not an excuse for Petitioner’s failure to propose its means-plus-function construction in the Petition. *Facebook*, Paper 13 at 16.

In a footnote, the Petition mentions that “parties in parallel proceedings have argued” that the communication manager term “is a means-plus-function term.” Petition, 33 n.3. Petitioner then identifies the corresponding structure for “communication manager” from the court’s construction in the TI Litigation and argues that “these structures are disclosed and/or rendered obvious” without any citation to its expert’s declaration or explanation. *Id.* Petitioner’s inclusion of this footnote does not warrant an outcome different from *Facebook* or *Orthopediatrics* for several reasons.

First, Petitioner refers to unspecified “parties in parallel proceedings” having proposed a means-plus-function construction for communication manager but fails to inform the Board that Petitioner is one of those parties. Petition, 33 n.3. While Petitioner did not serve its proposed claim constructions in the Samsung Litigation until the day after the Petition was filed, Petitioner undoubtedly knew that it was going to propose a means-plus-function construction for “communication manager” the following day. *Supra*, § II.A. The Board should infer that Petitioner chose to file the Petition the day before its proposed constructions were due in the Samsung Litigation in an attempt to avoid disclosing its inconsistent claim construction positions.

Second, the Board's rules require that the petition sets forth “[h]ow the challenged claim is to be construed.” 37 C.F.R. § 42.104(b)(3). If the claim “contains a means-plus-function . . . limitation[,] . . . the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function.” *Id.* In view of this requirement, when the petition does not propose a means-plus-function construction, “the majority approach is to deny institution or find that the petitioner failed to carry its burden as to the challenges impacted by the means-plus-function issue.” *Becton, Dickinson and Co. v. Baxter Int’l, Inc.*, IPR2018-01741, Paper 8 at 13 (PTAB Mar. 18, 2019); *see also Kingston Tech. Co. v. SPEX Techs., Inc.*, IPR2017-00824, Paper 8 at 18-19

(PTAB Aug. 17, 2017) (denying institution because petitioner failed to perform structural comparison). In this case, the Board should deny institution because Petitioner did not affirmatively propose a means-plus-function construction or otherwise comply with 37 C.F.R. § 42.104(b)(3).

Third, and perhaps most fatal to the Petition, Dr. Mowry did not apply Petitioner's litigation means-plus-function construction for "communication manager" in rendering his opinions. EX1003, ¶¶117-122. Unlike the Petition—which at least acknowledges the possibility of a means-plus-function construction in a footnote—Dr. Mowry never even considers this possibility. *Id.* In fact, Dr. Mowry's declaration contains no opinions on the proper construction for any term. This failure is especially glaring because Dr. Mowry does acknowledge Patent Owner's proposed constructions in the district court litigation throughout his declaration. *See, e.g., id.*, ¶¶86, 89, 102, 139, 148, 172. Thus, even if Petitioner's footnote were credited with providing an alternative argument for the communication manager under a means-plus-function construction, (which it should not), that would amount to conclusory and unsupported attorney argument.

B. The Board Should Deny Institution in View of Parallel District Court Litigation

The Board has declined to institute in cases where a parallel district court trial would determine the issues *before* the requested IPR would be completed, rendering the review by the Board cumulative. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019,

Paper 11 (PTAB Mar. 20, 2020) (precedential) (hereinafter, “*Fintiv*”). The Board considers the following set of six nonexclusive factors to determine on a case-by-case basis whether to deny institution based on a parallel proceeding:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, dated June 21, 2022 (available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf) (“Interim Procedures”); *Fintiv*, Paper 11 at 5-6; *see also Apple Inc. v. Fintiv, Inc.*, IPR2020-

00019, Paper 15 (PTAB May 13, 2020) (informative) (applying the *Fintiv* factors and denying institution) (hereinafter, “*Fintiv IP*”).

Where *Fintiv* factors 1-5 favor discretionary denial, a Petitioner must meet a higher standard for institution; they must present a compelling, meritorious, challenge to the patentability of at least one claim. *CommScope Technologies, LLC v. Dali Wireless Inc.*, IPR2022-01242, Paper 23 at 4-5 (PTAB Feb. 27, 2023). A “[c]ompelling, meritorious challenges are those in which the evidence, if unrebutted at trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence,” i.e., “it is highly likely that the petitioner would prevail with respect to at least one challenged claim.” *Id.* at 50. For the reasons discussed above, Petitioner has not presented a compelling challenge to the patentability of at least one claim. *Supra*, § IX.

Patent Owner respectfully submits that the Interim Guidelines are improper because they were issued in violation of the notice-and-comment rulemaking set forth in 5 U.S.C. § 553(b). The Director may adopt substantive rules only through notice-and-comment rulemaking. *See* 5 U.S.C. § 553. In particular, the Interim Guidelines’ suggestion that a *Sotera* stipulation alone precludes discretionary denial is improper and inconsistent with the statute. *See* Interim Guidelines at 7-8. Patent Owner also submits that the compelling evidence standard is improper and inconsistent with the statute. *Id.* at 3-5.

The legality of the Interim Guidelines is currently being challenged in *Apple Inc. v. Iancu*, No. 5:20-cv-06128-EJD (N.D. Cal.). The Federal Circuit has remanded the case for the district court to consider whether the Interim Guidelines were issued without compliance with the APA's notice-and-comment rulemaking requirements. The parties' cross-motions for summary judgment are currently pending. If the district court finds that Interim Guidelines were issued in violation of the APA's notice-and-comment procedures, it could invalidate or limit the application of the Interim Guidelines in this proceeding.

In light of these concerns and the ongoing *Apple Inc. v. Iancu* case, Patent Owner respectfully requests that the Board refrain from relying on the Interim Guidelines in its decision on whether to institute IPR in this case. Instead, Patent Owner submits the Board should focus its analysis on the statutory requirements for institution set forth in 35 U.S.C. § 314. Nevertheless, should the Board apply the Interim Guidelines, those factors favor denying institution.

1. The Parallel Samsung Litigation is at an Advanced Stage

The parallel Samsung Litigation is in an advanced stage: *Markman* briefing is complete, and the hearing is scheduled for April 9, 2024, less than two weeks after the deadline for filing this Preliminary Response. EX2028, 3. Expert discovery will be nearly complete by the time for entry of the Institution Decision. *Id.* The jury trial will be completed more than seven months before a final written decision. *Id.*, 1.

Statistics from the United States District Court for the Eastern District of Texas show that the trial in this matter is likely to happen before a final written decision is rendered. Interim Guidance at 2, 8-9; EX2012, 35.

Petitioner's assertion that "it is still relatively early in the Samsung district court case" does not square with the facts. Petition, 71. Patent Owner served infringement contentions on May 16, 2023 and Petitioner served invalidity contentions on July 11, 2023. The parties exchanged claim constructions on December 19, 2023, Patent Owner filed its opening claim construction brief on February 20, 2024 (EX2034), Petitioner filed its responsive claim construction brief on March 12, 2025 (EX2035), and Patent Owner filed its claim construction reply brief on March 19, 2024 (EX2036). The *Markman* hearing is scheduled for April 9, 2024. EX2028, 3. Additionally, fact discovery closes on May 24, 2024, expert discovery closes on July 15, 2024, and dispositive motions will be fully briefed by August 5, 2024. *Id.* In short, by the time the Board decides whether to institute an IPR, the parties will have completed fact discovery, claim construction, and will be nearly done with expert discovery.

Petitioner concedes that trial in the Samsung litigation "will likely pre-date the Board's final written decision," but speculates, without any evidence or basis, that "the trial date is not set in stone and could easily change." Petition, 71. The scheduling order provides that the trial date can only be changed for "good cause."

EX2028, 4-5. Indeed, statistics from the Eastern District of Texas confirms that trial will occur well before a final written decision is rendered. Interim Guidance, 2, 8-9; EX2012, 35.

2. The First Factor is Neutral

The first *Fintiv* factor is at least neutral because Petitioner has not requested a stay. *Fintiv II*, Paper 15 at 12 (determining that Factor 1 is neutral when neither party has requested a stay and the issue has not been addressed in the case by the district court). Further, Petitioner does not indicate that it would seek a stay if an IPR is instituted. Petition, 70-71.

3. The Second Factor Favors Denial

“If the court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this [second] factor in favor of exercising authority to deny institution.” *Fintiv*, Paper 11 at 9. In this case, the Board will decide whether to institute an IPR on or before June 28, 2024, and thus its final written decision will be due around June 28, 2025. 35 U.S.C. § 314(b). This means that the Board will not issue a final written decision until more than 2.5 years after the Samsung Litigation was initiated and more than ***8 months after the scheduled jury trial***. EX2028, 1. Further, the median time to trial in the Eastern District of Texas for similar cases is 21.4 months. EX2012, 35. This timeline is consistent with the governing Scheduling

Order. EX2028. The Board should decline to initiate a proceeding that that would duplicate those in the district court and that would take longer to complete.

The Board's precedential decision in *NHK Spring* recognized that the Board can and should exercise its discretion to deny institution when, as here, earlier completion of parallel district court litigation of the same issues would moot the "objective of the AIA . . . to provide an effective and efficient alternative to district court litigation." *NHK Spring Co., Ltd. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential) (quotations omitted). The Board's resources should be deployed where they can increase efficiency and provide the faster alternative proceeding contemplated by the AIA, but that is not this case.

In *NHK Spring*, the Board denied institution in part because of the duplicative nature and the advanced stage of a parallel district court proceeding. IPR2018-00752, Paper 8 at 19-20, explaining that "the advanced state of [a] district court proceeding is an additional factor that weighs in favor of denying the Petition under §314(a)." *Id.* at 20. In *NHK Spring*, the petitioner "assert[ed] the same prior art and arguments" in a parallel district court proceeding, which was "nearing its final stages" and was scheduled to complete a jury trial about five to six months before a final written decision from the Board would have been due. *Id.* The district court and the Board were also applying the same claim construction standard. *Id.* at 6-7. The

Board explained that “instituting a trial under the facts and circumstances ...would be an inefficient use of Board resources,” and would not be consistent with “an objective of the AIA . . . to provide an effective and efficient alternative to district court litigation.” *Id.* at 20.

Additionally, in *E-One, Inc. v. Oshkosh Corp.*, the Board observed the same factual circumstances as were present in *NHK Spring* and denied institution. IPR2019-00161, Paper 16 at 4, 6-9 (PTAB May 15, 2019). The Board looked at whether “a district court proceeding involving the same patent was scheduled to go to trial before a final decision would have been due in the Board proceeding, and the Board proceeding would involve the same claim construction standard, the same prior art references, and the same arguments as in the district court.” *Id.*, 6.

Under these facts and circumstances, which were also present and were dispositive in *NHK Spring* and *E-One*, institution of a duplicative parallel (and trailing) *inter partes* review proceeding would be an inefficient and wasteful use of the Board's limited resources. As in those cases, the Board should deny institution in its discretion under Section 314(a). This will allow the identical art and arguments to continue to be litigated and determined in district court, where substantial resources have already been expended and the district court stands ready to decide the issues urged here. Institution of an *inter partes* review here cannot provide the

“effective and efficient alternative to district court litigation” contemplated by the AIA. *NHK Spring*, IPR2018-00752, Paper 8 at 20.

4. The Third Factor Favors Denial

The third factor concerns “the amount and type of work already completed in the parallel litigation by the court and the parties and the time of the institution decision.” *Fintiv*, Paper 11 at 9. The focus of this factor is on “the actual investment by the district court and the parties” “at the time [the PTAB] decide[s] whether to institute this proceeding.” *Dolby Labs., Inc. v. Intertrust Techs. Corp.*, IPR2020-01106, Paper 12 at 14 (PTAB Jan. 5, 2021).

Petitioner argues that “[n]o claim construction opinions have been issued, no depositions have been taken, and no expert reports have been submitted.” Petition, 71. While that may have been true when the Petition was filed, this ignores that claim construction (including a *Markman* order), fact discovery (including depositions), and opening expert reports will be completed by the time the Board issues its Institution Decision. *Supra*, § VIII.B.1. The Scheduling Orders demonstrates that trial for the Samsung Litigation will be eight months in advance of the final written decision statutory deadline. EX2028, 1. An enormous amount of resources will have been invested in the Samsung Litigation before the Board issues a final written decision.

The third *Fintiv* factor also considers Petitioner's diligence: if "the petitioner did not file the petition expeditiously, such as at or around the same time that the patent owner responds to the petitioner's invalidity contentions, or even if the petitioner cannot explain the delay in filing its petition, these facts have favored denial." *Fintiv*, Paper 11 at 11-12. Petitioner does not explain why it waited one year after the Samsung Litigation was initiated to file the Petition. Petition, 70-71; *Cisco Sys., Inc. v. Estech Sys., Inc.*, IPR2021-00329, Paper 13 at 11 (PTAB July 6, 2021) (8-month delay between complaint and IPR petition favored denial). Nor does Petitioner explain why it waited more than 5 months after serving initial invalidity contentions to file the Petition. *Id.*; EX2050. Moreover, Petitioner filed the Petition one day before serving its proposed claim constructions in the Samsung Litigation. EX2032. The Board should infer that Petitioner deliberately chose this filing date in an attempt to avoid having to disclose its inconsistent claim construction positions on, for example, the term "communication manager." *Supra*, §VIII.A.

Thus, this factor favors denial.

5. The Fourth Factor Favors Denial

The "concerns of inefficiency and the possibility of conflicting decisions [are] particularly strong" where a petition "includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding."

Fintiv at 12. Here, the Petition challenges the same claims of the '449 Patent that are asserted in the Samsung Litigation.

While Petitioner's invalidity contentions do not assert the references in the Petition as of this Preliminary Response, Petitioner is nonetheless raising the exact same grounds as the Petition through its inequitable conduct defense. Specifically, Petitioner is arguing in the Samsung Litigation that Goossens2002 and Goossens2003 are "material to patentability of the claims of the" '449 Patent and "as explained in IPR petitions, when combining with secondary prior art references such as but not limited to . . . Drake" the '449 Patent is unpatentable. EX2029, 58-59. Thus, Petitioner's inequitable conduct allegations will require the district court to evaluate the same issues as the Board regarding the disclosures in Goossens2002, Goossens2003, and Drake. This weighs in favor of denying the Petition.

Petitioner purportedly stipulates that if an IPR is instituted, it will not pursue the specific grounds asserted in the Petition or any other ground that could have reasonably raised if institution is granted. Petition, 70 (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 13-14 (PTAB Dec. 1, 2020)). However, this case is distinguishable from *Sotera* for at least three reasons.

First, the specific grounds in the Petition will remain at issue in the Samsung Litigation regardless of Petitioner's purported stipulation because they are part of Petitioner's inequitable conduct allegations. EX2029, 58-59. That is, the purported

stipulation does not extend to unenforceability grounds based on the grounds specifically raised in the Petition and does not “mitigate[] concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB.” Interim Guidelines at 7.

Second, opening expert reports in the Samsung Litigation are due prior to the deadline for the Board's Institution Decision, and rebuttal expert reports are due July 1, 2024, just days after the Institution Decision deadline. EX2028. The parties will have already expended significant resources litigating invalidity grounds that Petitioner could have been raised in an IPR even they eventually become subject to the purported stipulation. What is more, the parties may dispute what invalidity grounds in “could have been raised” in an IPR at a late stage of the litigation, adding more complexity to the Samsung Litigation – not less.

Third, Petitioner has not filed or otherwise formalized the stipulation. In *Sotera*, the Board the petitioner “***filed*** a stipulation in the District Court.” *Sotera*, Paper 12 at 13.³ Petitioner has not done that in this case.

Petitioner suggests that under the Interim Guidelines, its stipulation forecloses denying institution pursuant to the *Fintiv*. Petition, 70-71. However, the Interim

³ Unless otherwise stated, all emphasis shown in case cites and evidence cites is added.

Guidelines instruct that the type of stipulation that weighs against exercising discretion to deny institution “mitigates concerns of potentially conflicting decisions and duplicative efforts.” Interim Guidance at 7. Petitioner’s stipulation does not address those concerns because Petitioner’s inequitable conduct allegations require the parties to litigate the same grounds in the Petition regardless of the stipulation. Moreover, even if the Interim Guidelines suggest that a *Sotera* stipulation is always dispositive (which they do not), the Board should refrain from relying on them for the reasons discussed above. *Supra*, §VIII.B.

For all the foregoing reasons, on balance, this factor favors denying institution or is at best neutral.

6. The Fifth Factor Favors Denial

Both Petitioner and Patent Owner are parties to the parallel Samsung Litigation, which further weighs against institution. *Fintiv*, Paper 11 at 13-14.

7. The Sixth Factor Favors Denial

Fintiv factors 1-5 are neutral or favor discretionary denial. Many of the issues in the Petition or substantially the same issues will be decided in the Samsung Litigation prior to the time a final written decision would be rendered. Petitioner has not demonstrated a substantial likelihood of success as to any challenged claim and has not met its statutory burden for institution. Petitioner has therefore not presented compelling evidence of unpatentability. The Petition should therefore be

discretionarily denied. *CommScope*, Paper No. 23 at 4-5. In these circumstances, efficiency and the integrity of the system are best served by denying institution. *Fintiv*, Paper 11 at 6.

IX. PETITIONER HAS NOT ESTABLISHED ANY CLAIM IS UNPATENTABLE

The Board should deny institution because Petitioner has not met its burden of showing a reasonable likelihood of success in connection with Grounds 1 or 2.

A. Petitioner Did Not Establish that Goossens2002 and Goossens2003 Were Publicly Available

Grounds 1 and 2 rely on two non-patent references: Goossens2002 and Goossens2003. To establish that these references qualify as prior art, Petitioner must show that “persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence” could have located them. *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 772 (Fed. Cir. 2018). However, the Petition baldly states, without more, that (1) these references were published in August 2002 and January 2003, respectively and (2) “[s]upporting documentation and testimonial evidence demonstrate that Goossens2002 and Goossens2003 are printed publications that were publicly available.” Petition, 9. Petitioner never explains *where* Goossens2002 and Goossens2003 were allegedly available, and *how* a skilled artisan would have located these references through reasonable diligence. *Id.*

While Petitioner cites to Exhibits 1025 and 1027, doing so in this manner violates multiple Board rules. The Board “may exclude or give no weight to the evidence where a party has failed to state its relevance or to identify specific portions of the evidence that support the challenge.” 37 C.F.R. § 42.204(b)(5). The Board’s rules also provide that a petition “must include,” among other things, “a detailed explanation of the significance of the evidence including material facts.” 37 C.F.R. § 42.22(a)(2); *see also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (that the petition identifies evidence with particularity is “of the utmost importance”). The rules also provide that “arguments must not be incorporated by reference from one document into another document.” 37 C.F.R. § 42.6(3).

The Petition does not comply with these rules. For example, the Petition does not state relevant of Exhibits 1025 or 1027. 37 C.F.R. § 42.204(b)(5); 37 C.F.R. § 42.22(a)(2). In fact, the Petition does not even identify which exhibit addresses which reference. Instead, the Petition invites the Board to review the entirety of the declarations to divine the possible bases for Goossens2002 and Goossens2003 allegedly being accessible. This amounts to impermissible incorporation by reference and an improper attempt to circumvent the word limit for the Petition. *Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 9 (PTAB Aug. 29, 2014) (“the practice of citing the Declaration to support conclusory statements

that are not otherwise supported in the Petition . . . amounts to [improper] incorporation by reference”) (informative). Petitioner’s approach for proving public accessibility is akin to offering only a conclusion that a claim is obvious and referring to the entirety of an expert declaration for the reasons why. Good cause does not exist for waiving or suspending the rules prohibiting such an approach. 37 C.F.R. § 42.5(b).

What is more, Petitioner’s conclusory allegations in the Petition are inconsistent with the exhibits it cites for details. For example, Petitioner alleges that Goossens2003 “published no later than January 31, 2003.” Petition, 8. However, Mr. O’Bryan’s declaration refers to a catalogue date of April 16, 2003. EX1027, ¶5. Petitioner offers no explanation for this inconsistency.

B. Ground 1: Purported Obviousness Over Goossens2002 and Drake

In Ground 1, Petitioner alleges that claims 1-6 and 9-16⁴ are rendered obvious by Goossens2002 in view of Drake. Petition, 15-48. Petitioner has failed to meet its burden for Ground 1 at least because neither Goossens2002 nor Drake disclose the claimed communication manager and resource manager. Nor do Goossens2002 and Drake disclose channels that are independently configurable or a request that

⁴ As discussed above, Patent Owner statutorily disclaimed claims 1 and 3-5 such that only claims 2, 6, and 9-16 are at issue. EX2062.

includes desired connection properties for a set of channels. Further, a POSITA would not have combined Goossens2002's on-chip network with aspects of Drake's very different off-chip network.

1. Independent Claim 10

a. Goossens2002 and Drake do not disclose the claimed communication manager and resource manager

Claim 10 recites “the first module issuing a request for a connection with the second module to a communication manager” and “the communication manager forwarding the request to a resource manager.” EX1001, 19:32-37; EX2001, ¶118. As set forth below, Goossens2002 and Drake, either alone or in combination, fail to disclose each of the claimed “communication manager” and “resource manager.” EX2001, ¶119.

(i) Goossens2002 does not disclose a communication or resource manager

Petitioner effectively admits that Goossens2002 does not disclose a communication manager and only relies on Drake for this limitation. *See* Petition, 32-33 (claim 2), 37-40 (claim 6), 44-45 (claim 10)1; *infra*, §IX.B.1.ii; EX2001, ¶136.

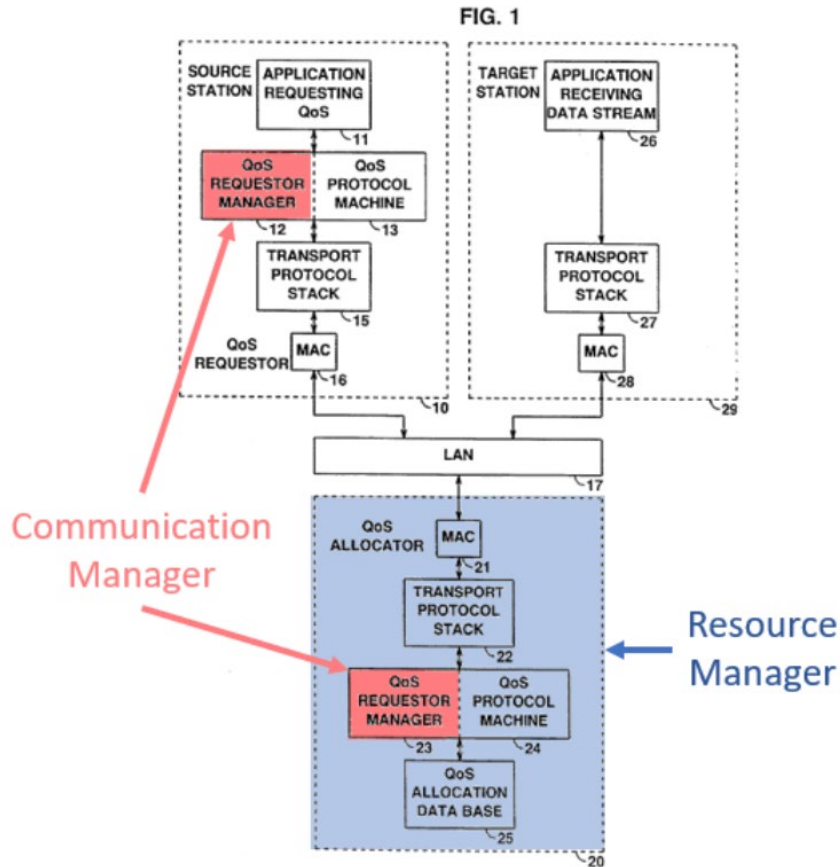
Goossens2002 does not disclose the claimed “resource manager.” While Petitioner contends that Goossens2002's “quality-of-service manager” is a “resource manager” in connection with claim 1, Petitioner does not argue that this alleged “resource manager” performs the step of “determining whether a target connection

with the desired connection properties is available” or “responding with the availability of the target connection to the communication manager” as required in claim 10. *See* Petition, 38-40 (claim 6), 44-45 (claim 10); *see also id.*, 31-32 (claim 1). Indeed, because Goossens2002 does not disclose a communication manager, Goossens2002 necessarily does not disclose the claimed resource manager, which must “respond[] with the availability of the target connection to the communication manager.” EX1001, 20:1-2.

(ii) Drake does not disclose a distinct first module, communication manager, and resource manager

In attempt to address these deficiencies in Goossens2002, Petitioner alleges that Drake discloses the claimed communication and resource managers. *See* Petition, 22-24, 31-35, 37-40, 44-45. As discussed in further detail below, these alleged communication and resource managers in Drake do not perform the steps claimed in the ‘449 Patent. *Infra*, §IX.B.2. But even if they did, Petitioner still failed to meet its burden because Drake does not disclose an alleged communication manager that is distinct from the alleged resource manager.

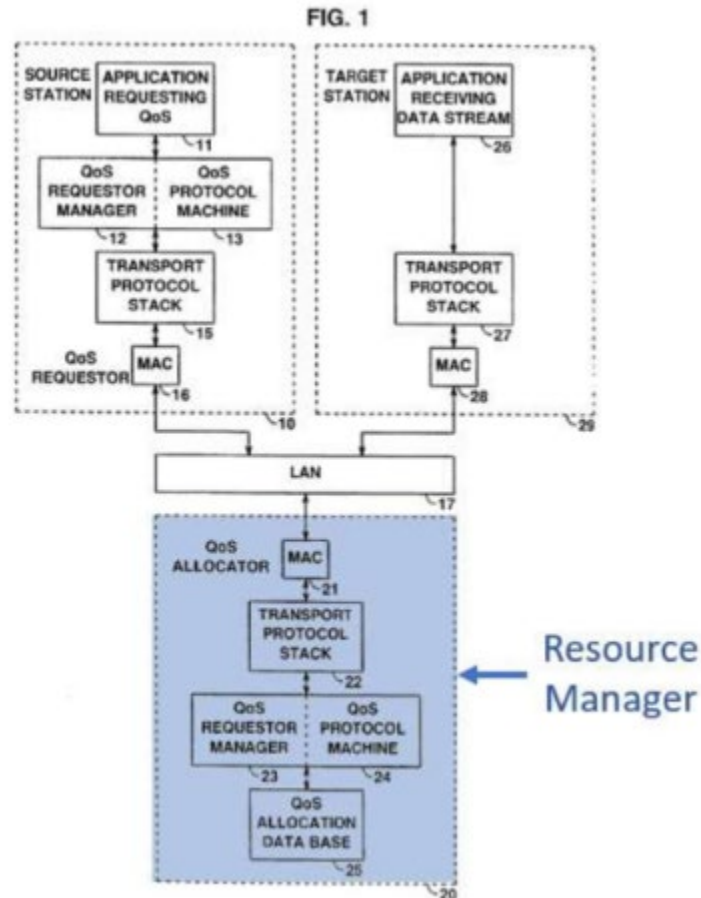
With respect to the claimed communication manager, Petitioner alleges that “Drake discloses a ‘communication manager’ in the form of a ‘QoS requestor manager [12].” Petition, 32-33 (citing EX1006, 4:32-37); EX1003, ¶¶118-19; EX2001, ¶138.



Petition, 34 (annotating EX1006, FIG. 1)

Drake's QoS requestor manager 12 (the alleged communication manager) is included in source station 10, and together with the QoS protocol machine 13, assembles a request for a QoS data stream. EX1006, 4:26-37, 14:2-7; EX2001, ¶139. In other words, the source station 10 issues a request for a data stream via the QoS requestor manager 12 (the alleged communication manager). EX2001, ¶¶139-141.

With respect to the claimed "resource manager," Petitioner relies on Drake's QoS allocator 20. *See* Petition, 22-24, 39; EX2001, ¶128.

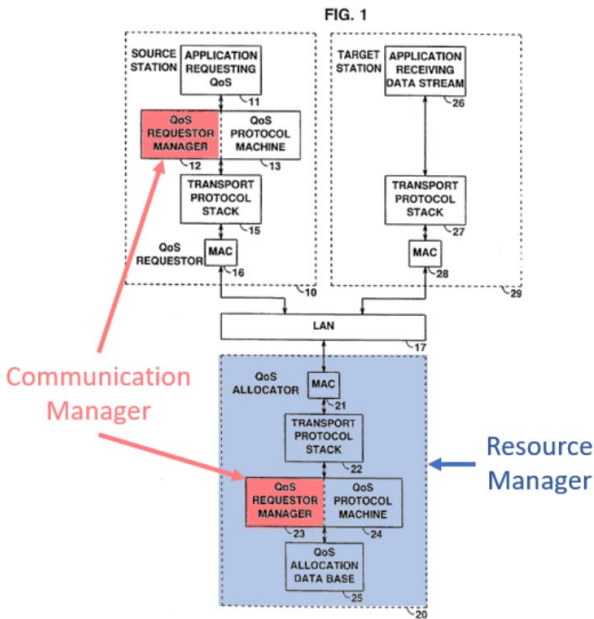


Petition, 24 (annotating EX1006, FIG. 1)

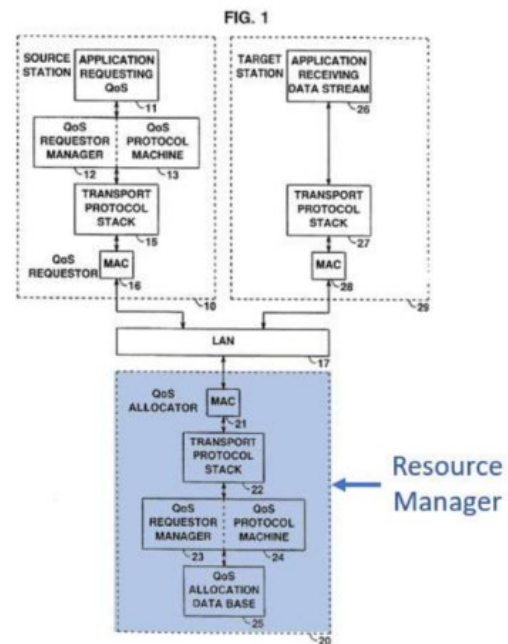
Drake explains that the allocator station 20 includes “a QoS requestor manager 23 which, together with QoS protocol machine 24 receives, decodes and acts upon the QoS request from source station 10.” EX1006, 5:5–8; EX2001, ¶145. In other words, the QoS requestor manager 23 receives and acts on the QoS request from source station 10. *Id.*

As shown by Petitioner’s annotations to Drake’s FIG. 1, Petitioner is relying on (1) the QoS requestor manager 12 in the source station 10 **and** the QoS requestor manager 23 in the QoS allocator 20 as the claimed communication manger and (2)

also relying on the entire QoS allocator 20, including the QoS requestor manager 23, as the claimed resource manager. Petition, 34; EX2001, ¶146.



Petition, 34



Petition, 24

In other words, Petitioner alleges that the QoS requestor manager 23, which receives the request for a data stream, is **both** the communication manager and the resource manager. Petitioner failed to meet its burden because claim 10 requires a “communication manager” and a “resource manager” that are separate and distinct. *Supra*, § VII.A; *Workspot, Inc. v. Citrix Systems, Inc.*, IPR2019-01002, Paper 39 at 43 (PTAB Nov. 17, 2020) (finding that a single element in the prior art could not satisfy two distinct components in the claims).

b. Goossens2002 and Drake do not disclose independently configurable channels or a request

**including desired connection properties associated
with the sets of communication channels**

Claim 10 recites “messages between the modules being exchanged over connection . . . wherein said connections comprise a set of communication channels each having a set of connection properties” and “any communication channel being independently configurable.” EX1001, 19:21-27. Claim 10 also recites “a request” that “comprises desired connection properties associated with the sets of communication channels.” *Id.*, 19:32-35. As set forth below, Goossens2002 and Drake, either alone or in combination, fail to disclose or render obvious these limitations.

**(i) Goossens2002 does not disclose “any
communication channel being independently
configurable”**

The Petition alleges that Goossens2002 discloses multiple channels and certain connection properties. *See* Petition, 26-27. Petitioner also alleges that “a POSITA would have understood that the connection properties of the different channels are ‘adjustable independently.’”⁵ *Id.*, 28 (citing EX1003, ¶¶103-105). This argument should be rejected for two reasons.

⁵ Petitioner treats the phrases “independently configurable” in claim 10 and “adjustable independently” in claim 1 interchangeably. *See* Petition, 43-44.

First, the Petition provides no explanation as to why a POSITA would supposedly have understood that the connection properties for the channels in Goossens2002 are adjustable independently. Petition, 28. Petitioner's citation to Dr. Mowry's declaration "to support conclusory statements for which the Petition does not otherwise provide an argument or explanation" is an improper incorporation by reference. *Cisco Sys.*, Paper 12 at 9; *see also* 37 C.F.R. § 42.6(3). This yet another attempt by Petitioner to circumvent the word limit for the Petition. *Supra*, §IX.A.

Second, contrary to Petitioner's assertion, Goossens2002 does not expressly disclose channels that are independently configurable. EX2001, ¶¶122. While not explained in the Petition, Dr. Mowry alleges that a POSITA would have understood that the properties of each alleged channel in Goossens2002 is adjustable independently because "rather than describing that each connection has certain properties, Goossens2002 describes that each channel has certain properties." EX1003, ¶103. This mischaracterizes Goossens2002's disclosure. Goossens2002 does not say "***each*** channel" has certain connection properties; instead, it states that "***[a] channel*** can have a combined throughput and latency guarantee (GT), or be best effort (BE), with an unspecified finite latency upper bound." EX1005, 3; EX2001, ¶122.

In short, nowhere does Goossens2002 expressly disclose that channels are independently configurable.

(ii) Drake does not disclose a set of communication channels or the claimed request

Petitioner argues that even if “Goossens2002 does not explicitly disclose that its channels are adjustable independently” (which it does not), then “this would have been obvious in view of Drake.” Petition, 28. In attempting to map Drake onto the claims, Petitioner alleges that Drake’s “data stream” corresponds to the claimed connection and that Drake’s description of “forward direction” and “backward direction” parameters means that there are multiple channels. Petition, 25; EX2001, ¶¶129, 132-133.

Specifically, Petitioner argues that “Drake describes two different channels: one in the ‘forward direction,’ for communications ‘from source station 10 to target station 29,’ and a second in the ‘backward direction,’ for communications ‘from the target station 29 to the source station 10.’” Petition, 28 (citing EX1006, 5:30-50). Drake explains that these are “quality-of-service parameters that describe the service expected from the network.” EX1006, 5:30–34; EX2001, ¶133. However, Drake never describes the forward or backward direction as a “channel” in a data stream (connection). *Id.* Drake’s references to “forward direction” and “backward direction” parameters do not suggest that a data stream (connection) can be partitioned into a set of channels. *Id.*, ¶133. Thus, Drake does not expressly disclose a connection comprising a set of communication channels as required in claim 10.

Additionally, Drake does not disclose a request including desired connection properties associated with the sets of communication channels. To this point, Petitioner alleges that a “POSITA would have understood . . . that the requests described by . . . Drake include desired connection properties.” Petition, 37. While Drake generally describes “quality of service requirements,” Drake is clear that these requirements apply to a “particular data stream.” EX1006, 2:14–18; *see also id.*, 10:4-8 (referring to “a specification of the minimum quality of service which is acceptable for this data stream”); EX2001, ¶¶129-131. Drake’s “AllocationRequest” is used to “request an allocation of a QoS path *for a particular data stream.*” EX1006, 8:31–32; *see also id.*, 10:42–46 (“the source station 10 actually sends a request to the allocator 26 to determine if the QoS parameters required *for the data stream* is available”); EX2001, ¶¶129-131. Specifically, the “AllocationRequest” includes a “QoSAcceptable” field, which indicates “[t]he quality of service acceptable *for this data stream.*” EX1006, 8:43–46; EX2001, ¶147. If the quality of service is acceptable, it is “granted to the data stream.” EX1006, 8:49–61; EX2001, ¶131.

Drake does not disclose or suggest that a request for a data stream comprises “desired connection properties [e.g., QoS parameters] associated with the *sets of communication channels*. Instead, Drake’s request for QoS parameters only applies to a single data stream (i.e., a connection). EX2001, ¶127. Nothing in Drake suggests

that the request for QoS parameters is for a set of channels or even for a set of data streams (connections). *Id.* To the contrary, in Drake, a data stream from a source to a target (e.g., in a forward direction) with first QoS parameters is achieved via a first allocation request, while a second data stream from the target to the source (e.g., in a reverse direction) with second QoS parameters is achieved via a second allocation request. *See, e.g.,* EX1006, 4:27–30; EX2001, ¶132. Drake does not disclose a single allocation request comprising QoS parameters for both an alleged forward channel (e.g., forward data stream) and an alleged backward channel (e.g., backward data stream). Drake's system would need to issue two requests: one for each data flow (connection). EX2001, ¶132.

In contrast, in claim 10 of the '449 Patent, a “request comprises desired connection properties associated with *the sets of communication channels.*” EX1001, 19:34–35; EX2001, ¶132. In other words, the request in claim 10 of the '449 Patent comprises the connection properties (e.g., QoS parameters) for the channels of the connection (e.g., for both a request channel and a response channel). Drake does not disclose this.

c. A POSITA would not have combined Goossens2002 and Drake

Even if, *arguendo*, Goossens2002 and Drake disclosed all elements of claim 10 (which they do not), a POSITA would not have combined Goossens2002's on-

chip teachings and Drake off-chip network as set forth in the Petition. EX2001, ¶¶151-158.

Goossens2002 relates to systems on silicon (SoSs) that comprise numerous IP cores. EX1005, 1 (“We advocate a network on silicon (NOS) as a hardware architecture to implement communication between IP cores.”); EX2001, ¶152. Goossens2002 explains that “[i]t will soon be possible to manufacture systems on silicon (SOSs) containing 10M gates and megabytes of embedded software. The complexity of these systems will be overwhelming.” EX1005, 1; EX2001, ¶152. To this end, Goossens2002 describes “a network on silicon (NOS) [that] eases the design of systems on silicon (SOSs) at the levels of hardware design and software programming.” EX1005, 3; EX2001, ¶152.

Unlike Goossens2002, Drake does not relate to a NoC. EX2001, ¶153. Instead, Drake concerns “[a] management system for local area networks [that] is attached to the network and receives requests from all other stations on the network.” EX1006, Abstract; EX2001, ¶153. More specifically, Drake is directed to “multimedia data streams are managed in a local area network (LAN), or in a bridged LAN environment” and “provide[s] quality of service management in bridged LAN environments.” EX1006, 2:25–28, 2:57–59; EX2001, ¶153. In other words, Drake is directed to an off-chip network.

As detailed above (*supra*, §III), the '449 Patent explains that on-chip networks like Goossens2002 differ drastically from off-chip networks like Drake. EX1001, 1:66–2:1; EX2001, ¶154. The '449 Patent teaches that in this context, “most of the network design choices must be reevaluated” because on-chip networks have different properties (e.g., tighter link synchronization) and constraints (e.g., higher memory cost) leading to different design choices, which ultimately affect the network services.” EX1001, 1:66–2:5; EX2001, ¶154. Using multi-hop interconnects “radically changes the communication when compared to direct interconnects, such as buses or switches.” EX1001, 3:46–57; EX2001, ¶154.

In a NoC like Goossens2002, “[t]he number of wires and pins to connect network components is an order of magnitude larger on chip than [an] off chip” network like Drake’s. EX1001, 2:28–29; EX2001, ¶154. Additionally, in contrast to off-chip networks like Drake, “the tight-on chip resource constraints” in on-chip networks requires “that the network components (i.e., routers and network interfaces) must be fairly simple to minimize computation and memory requirements.” EX1001, 2:43–46; EX2001, ¶154. Unlike Goossens2002, “[a]n off-chip network interface usually contains a dedicated processor to implement the protocol stack up to network layer or even higher, to relieve the host processor from the communication processing;” however, “[i]ncluding a dedicated processor in a network interface is not feasible on chip, as the size of the network interface will

become comparable to or larger than the IP to be connected to the network.”

EX1001, 2:16–25; EX2001, 154.

Consistent with the ‘449 Patent’s teachings, a POSITA would understand that the design considerations for on and off chip networks are drastically different and as a result, a POSITA would not be motivated to combine the on-chip teachings of Goossens2002 with the off-chip teachings of Drake. EX2001, ¶154. In arguing that “mature networking technologies like those described by Drake could be usefully applied” to NoCs, Petitioner quotes portions of the ‘449 Patent stating that the field of local and wide area networks are “related” to NoCs. Petition, 18-19 (quoting EX1001, 1:50-66). However, Petitioner omits the next sentence, which states that “NoC’s premises are different from off-chip networks, and, therefore, most of the network design choices must be reevaluated,” including for the reasons described herein. EX1001, 1:66-2:1. Petitioner’s assertion that Drake’s system “is consistent with and would have worked with the system of Goossens2002” is a gross oversimplification and ignores these differences. Petition, 17.

Additionally, the requestor manager 12 in Drake (the alleged communication manager) that Petitioner proposes to insert into Goossens2002 is disposed within Drake’s source station 10 along with the application 11 (the alleged first module). Petition, 37; EX1006, FIG. 1. Goossens2002 emphasizes the importance of decoupling computation from communication by re-using *premade* IP blocks in

systems on silicon rather than custom-designing IP blocks. EX1005, 1 (expressing preference for “the intellectual-property block (IP) re-use model), 2 (calling the IP re-use strategy “essential”); EX2001, ¶156. The ‘449 Patent similarly teaches the importance of decoupling “computation from communication” to “allow[] IPs (the computation part), and the interconnect (the communication part) to be designed independently from each other.” EX1001, 17:59–18:1; EX2001, ¶156.

In light of these teachings, a POSITA would not modify Goossens2002's IP blocks to implement Drake's QoS requestor manager 12 because the requestor manager 12 is implemented in the station 10. EX2001, ¶156. A POSITA would understand that Drake's source station 10 corresponds to Goossens2002's IP block or processing module, which Goossens2002 teaches should be separate from the communication network to allow it to be reused. *Id.* A POSITA would also recognize that Drake's requestor manager 12 concerns the communication network, and because it is within the source station 10, a POSITA would not be motivated to modify Goossens2002 with such an architecture that is contrary to Goossens2002's teachings. *Id.* In other words, in Drake, the requester manager 12 (communication) is disposed within the source station 10 (computation), whereas Goossens2002 stresses the importance of decoupling communication and computation.

2. Claims 2, 6, 9, and 11-16

Because Petitioner failed to show that Goossens2002 and Drake render obvious independent claim 10, it also failed to meet its burden for claims 11-16. *See Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1344 (Fed. Cir. 2009). Similarly, because Petitioner's arguments for claim 10 refer back to and rely on the same arguments for claims 2, 6, and 9, Petitioner also failed to meet its burden for those claims. Petition, 43-45.

C. Ground 2: Purported Obviousness Over Goossens2003 and Drake

In Ground 2, Petitioner alleges that claims 1-6 and 9-16 are rendered obvious by Goossens2003 in view of Drake. *See* Petition, 48-68. Petitioner has failed to demonstrate a reasonable likelihood of success in connection with Ground 2.

1. Independent Claim 10

a. Goossens2003 and Drake do not disclose or render obvious the claimed communication manager and resource manager

(i) Goossens2003 does not disclose a communication manager or a resource manager

Petitioner concedes that Goossens2003 does not disclose the claimed resource manager, admitting that Goossens2003 “does not describe a specific component or mechanism for tracking resource usage within the NOC or for determining the availability of the resources required for a requested connection.” Petition, 55; *see also id.*, 48-49, 59, 66; EX2001, ¶172.

While Petitioner alleges in connection with claim 2 that Goossens2003 discloses a communication manager (Petition, 59-60), the claim requires that the communication manager forwards the request to the resource manager. If there is no resource manager in Goossens2003, as Petitioner concedes, then there is necessarily no communication manager as claimed. Indeed, in connection with claim 6, Petitioner does not allege that Goossens2003 alone discloses the required steps that are performed by the communication manager. Petition, 62-64.

(ii) Drake does not disclose distinct communication and resource managers

As discussed above for Ground 1, Drake does not disclose distinct communication and resource managers. *Supra*, § IX.B.1.a.i. In Ground 2, Petitioner refers back to the same arguments regarding Drake's purported disclosure of a communication manager and resource manager. *See* Petition, 55, 58-60, 63-67. Thus, Petitioner's arguments for Ground 2 fails for at least the same reasons discussed above for Ground 1. *Supra*, § IX.B.1.a.i; EX2001, ¶¶174-179.

b. Goossens2003 and Drake do not disclose or render obvious "communication channels being independently configurable" or a request including desired connection properties associated with the sets of communication channels

(i) Goossens2003 does not disclose independently configurable communication channels

Petitioner argues that "Goossens2003 describes that its connections comprise 'request' and 'response' channels, and explains these channels have 'connection

properties' . . . that 'can be independently configured.'" Petition, 57 (quoting EX1007, 74). That is incorrect: Goossens2003 does not expressly or inherently disclose request and response channels that can be independently configured as required in the '449 Patent. EX2001, ¶160.

Petitioner's contention rests on a single sentence in Goossens2003, which comes from a paragraph describing "connection-based service provision [that] allows better differentiation of services," in which request and response *communications*—i.e., connections—are independently configurable. EX1007, 74; EX2001, ¶160. Goossens2003 does **not** disclose that request and response *channels* of connections are independently configurable. *Id.* Indeed, Goossens2003 never mentions or suggests channels of a connection, or that a connection can comprise a set of channels. *Id.*

Goossens2003 further explains that its differentiated services are achieved via connections (not channels), that connections (not channels) are created with a requested service level, and that different connections (not channels) are created and closed independently. EX2001, ¶161. For example, Goossens2003 states that "[c]onnections must be created stating the requested service," but never states that a channel within a connection has particular connection properties, let alone that its connection properties are independently configurable. EX1007, 71; EX2001, ¶161. Goossens2003 also provides an example of differentiated services achieved via

connections (not channels) where a microprocessor requests a first connection with a first bandwidth and a second connection with a second bandwidth. EX1007, 67; EX2001, ¶162.

In sum, Goossens2003 does not disclose (1) that a connection can comprise a set of channels or (2) that channels comprising a connection (can be independently configurable. EX2001, ¶163.

(i) Drake does not disclose a set of communication channels or the claimed request

Petitioner argues that even if Goossens2003 does not disclose independently configurable channels, “Drakes describes connections with two channels . . . [that] can be adjusted independently.” Petition, 58. However, for the reasons discussed above in connection with Ground 1, Drake does not disclose (1) that a connection comprises a set of channels, (2) a set of channels that are independently configurable, or (3) a request comprising comprises desired connection properties associated with the sets of communication channels as required in claim 10 of the ‘449 Patent. *Supra*, § IX.B.1.b.ii; EX2001, ¶¶166, 169-170.

c. A POSITA would not combine Goossens2003 and Drake

Even if, *arguendo*, Goossens2003 and Drake disclosed all limitations of claim 10 (which they do not), Petitioner failed to establish that it would have been obvious to combine Goossens2003 and Drake. EX2001, ¶¶189-196.

Like Goossens2002 (*see supra*, § IX.B.1.c), Goossens2003 concerns systems on silicon (“SoSs”) that enable IP re-use. EX1007, 61; EX2001, ¶190. Goossens2003 explains that “IP re-use and platform-based design aim to re-use applications and architectures by decoupling them. The use of NOCs and their associated network protocol stacks are a way to achieve this.” EX1007, 65; *see also id.*, 66 (“NOCs help IP re-use and platform-based design to combine IPs, and NOC services aid in decoupling applications and architectures.”); EX2001, ¶190. As discussed above, by contrast, Drake is directed to an off-chip network, which differs drastically from Goossens2003’s on-chip network. *Supra*, § IX.B.1.c; EX2001, ¶191.

As detailed above (*see supra*, §§III, IX.B.1.c), on-chip networks like Goossens2003 differ drastically from off-chip networks like Drake. EX1001, 1:66–2:1; EX2001, ¶192. This is confirmed by a detailed explanation in the ‘449 Patent itself confirming that “most of the network design choices must be reevaluated” because on-chip networks have different properties (e.g., tighter link synchronization) and constraints (e.g., higher memory cost) leading to different design choices, which ultimately affect the network services.” EX1001, 1:66–2:5; EX2001, ¶192.

In a NoC like Goossens2003, “[t]he number of wires and pins to connect network components is an order of magnitude larger on chip than [an] off chip”

network like Drake's. EX1001, 2:28–29; EX2001, ¶192. Additionally, in contrast to off-chip networks like Drake, “the tight-on chip resource constraints” in on-chip networks requires “that the network components (i.e., routers and network interfaces) must be fairly simple to minimize computation and memory requirements.” EX1001, 2:43–46; EX2001, ¶192. Unlike Goossens2003, “[a]n off-chip network interface usually contains a dedicated processor to implement the protocol stack up to network layer or even higher, to relieve the host processor from the communication processing;” however, “[i]ncluding a dedicated processor in a network interface is not feasible on chip, as the size of the network interface will become comparable to or larger than the IP to be connected to the network.” EX1001, 2:16–25; EX2001, ¶192.

Consistent with the '449 Patent's teachings, a POSITA would understand that the design considerations for on and off chip networks are drastically different and as a result, a POSITA would not be motivated to combine the on-chip teachings of Goossens2003 with the off-chip teachings of Drake. EX2001, ¶192. In arguing that “mature networking technologies like those described by Drake could be usefully applied” to NoCs, Petitioner quotes portions of the '449 Patent stating that the field of local and wide area networks is “related” to NoCs. Petition, 51 (quoting EX1001, 1:50-66). However, Petitioner omits the next sentence, which states that “NoC's premises are different from off-chip networks, and, therefore, most of the network

design choices must be reevaluated,” including for the reasons described herein. EX1001, 1:66-2:1. Petitioner's assertion that Drake's system “is consistent with and would have worked with the system of Goossens2003” is a gross oversimplification and ignores these differences. Petition, 50.

Additionally, as described above, the requestor manager 12 in Drake (the alleged communication manager) that Petitioner proposes to insert into Goossens2003 is disposed within Drake's source station 10 along with the application 11 (the alleged first module). *Supra*, §IX.B.1.c; EX1006, FIG. 1. Goossens2003 emphasizes the importance of decoupling computation from communication by re-using IP blocks rather than custom-designing IP blocks. EX1007, 61, 64, 65, 66; EX2001, ¶194. The '449 Patent similarly teaches the importance of decoupling “computation from communication” to “allow[] IPs (the computation part), and the interconnect (the communication part) to be designed independently from each other.” EX1001, 17:59–18:1.

In light of these teachings, a POSITA would not modify Goossens2002's IP blocks to implement Drake's QoS requestor manager 12 because the requestor manager 12 is implemented in the station 10. EX2001, ¶194. A POSITA would understand that Drake's source station 10 corresponds to Goossens2003's IP block or processing module, which Goossens2003 teaches should be separate from the communication network to allow it to be reused. *Id.* A POSITA would also recognize

that Drake's requestor manager 12 concerns the communication network, and because it is within the source station 10, a POSITA would not be motivated to modify Goossens2003 with such an architecture that is contrary to Goossens2003's teachings. *Id.* In other words, in Drake, the requester manager 12 (application) is disposed within the source station 10 (architectures), whereas Goossens2003 stresses the importance of decoupling architectures and applications. *Id.*

For at least the above reasons, a POSITA would not be motivated to modify the IP blocks disclosed in Goossens2003 to implement the QoS requestor manager 12 of Drake. EX2001, ¶195.

2. Claims 2, 6, 9, and 11-16

Because Petitioner has failed to show that any of the references identified in Ground 1 render obvious independent claim 10, it also fails to meet its burden for claims 11-16. Similarly, because Petitioner's arguments for claim 10 refer back to and rely on the same arguments for claims 2, 6, and 9, Petitioner also failed to meet its burden for those claims. Petition, 65-67.

X. CONCLUSION

For at least the foregoing reasons, the Petition should be denied as to each of the requested grounds. For brevity, Patent Owner may not have addressed all characterizations of the applied references and the challenged claims and reserves the right to do so should institution be granted. The absence of a response by Patent

Owner to any of the positions presented in the Petition or the associated expert declaration does not constitute a concession to those positions. The fact that Patent Owner's Preliminary Response has focused on particular arguments does not constitute a concession that there are no other arguments for patentability of the challenged claims.

Respectfully submitted,

Dated: March 28, 2024

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CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Preliminary Response is produced using a 14-point Times New Roman font and contains approximately 13,182 words, which is less than the 14,000 total words permitted by the U.S. Patent Trial and Appeal Board rules. Counsel relies on the word count of the computer program used to prepare the response on March 28, 2024.

Dated: March 28, 2024

By: /s/ Jennifer Hayes

Lead Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Patent Owner's Preliminary Response** was served on March 28, 2024, by email:

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