

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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SAMSUNG ELECTRONICS CO., LTD.  
Petitioner

v.

NETWORK SYSTEM TECHNOLOGIES, LLC  
Patent Owner

Patent No. 8,086,800

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*Inter Partes* Review No. IPR2024-00339

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**LISTING OF EXHIBITS**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                              |
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| 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), <a href="https://www.arteris.com/blog/busses-crossbars-and-nocs-the-3-eras-of-soc-interconnect-history/">https://www.arteris.com/blog/busses-crossbars-and-nocs-the-3-eras-of-soc-interconnect-history/</a> |
| 2009               | Kurt Shuler, <i>The SoC Interconnect Fabric: A Brief History</i> , ARTERISIP (Aug. 6, 2013), <a href="https://www.arteris.com/blog/the-soc-interconnect-fabric-a-brief-history/">https://www.arteris.com/blog/the-soc-interconnect-fabric-a-brief-history/</a>                                                                  |
| 2010               | William Stallings, DATA & COMPUTER COMMUNICATIONS (6th ed. 1999)                                                                                                                                                                                                                                                                |
| 2011               | RESERVED                                                                                                                                                                                                                                                                                                                        |
| 2012               | United States District Courts — National Judicial Caseload Profile                                                                                                                                                                                                                                                              |
| 2013-2016          | RESERVED                                                                                                                                                                                                                                                                                                                        |
| 2017               | U.S. Patent No. 7,373,449                                                                                                                                                                                                                                                                                                       |

| Exhibit No. | Description                                                                                                                                                                                                                          |
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| 2018-2020   | RESERVED                                                                                                                                                                                                                             |
| 2021        | Order Resetting Jury Trial, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-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        | Plaintiff Network System Technologies, LLC's Opening Claim Construction Brief, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 98 (Sept. 27, 2023)  |
| 2024        | Defendant Texas Instruments Incorporated's Responsive Claim Construction Brief, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 107 (Oct. 11, 2023) |
| 2025        | Plaintiff Network System Technologies, LLC's Reply Claim Construction Brief, <i>Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 110 (Oct. 18, 2023)                                        |
| 2026        | Claim Construction Hearing Transcript, <i>Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), (Nov. 8, 2023)                                                                                        |
| 2027        | Complaint, <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. 1 (Dec. 19, 2022)                                                                  |
| 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)         |

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| 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)           |
| 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        | Complaint, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) Dkt. 1 (Dec. 19, 2022)                                                                                    |
| 2038        | First Amended Complaint, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-                                                                                                            |

| Exhibit No. | Description                                                                                                                                                                                                                          |
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|             | DAE (W.D. Tex.) Dkt. 57 (Aug. 7, 2023)                                                                                                                                                                                               |
| 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)                                  |
| 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)                               |

| Exhibit No. | Description                                                                                                                                                                                                                                                        |
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| 2047-2049   | RESERVED                                                                                                                                                                                                                                                           |
| 2050        | Defendants' Invalidity and Ineligibility Contentions And Disclosures Pursuant to Patent Rule 3-3 Cover Pleading, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023) |
| 2051        | Defendants' Invalidity and Ineligibility Contentions Cover Pleading, <i>Network System Technologies, LLC v. Qualcomm Incorporated, et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) (Sep. 22, 2023)                                                      |
| 2052-2054   | RESERVED                                                                                                                                                                                                                                                           |
| 2055        | Statutory Disclaimer dated March 25, 2024                                                                                                                                                                                                                          |
| 2056        | Exhibit F-1 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)                                                               |
| 2057        | Exhibit F-2 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)                                                               |
| 2058        | Exhibit F-6 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)                                                               |
| 2059        | Exhibit F-19 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)                                                              |
| 2060        | Exhibit F-20 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)                                                              |

| Exhibit No. | Description                                                                                                                                                                                           |
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| 2061        | Exhibit F-23 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023) |

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. 8,086,800 (“the ‘800 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, claim 12, the only pending, challenged claim, of the ‘800 Patent has been found indefinite by a district court. Petitioner, in co-pending litigation, argues the same limitations found to be indefinite are indefinite for similar reasons. In the co-pending litigation, Petitioner also argues for a means-plus-function construction of the “determination unit” limitation. The Petition does not propose any claim constructions for the limitations found indefinite or the alleged means-plus-function limitation. The Board has previously denied institution under these circumstances. 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 set forth in the Board’s precedential *Fintiv* decision weigh in favor of denying institution.

Further, Petitioner has not demonstrated a reasonable likelihood of success on the merits. Petitioner failed to show that several claim limitations are disclosed in

the references, including the limitations that were found to be indefinite. Petitioner also failed to demonstrate a person of skill in the art would have combined the cited references.

Accordingly, Patent Owner respectfully submits that institution should be denied.

## **II. RELATED MATTERS**

As summarized below, the '800 Patent is asserted in five district court proceedings in the Eastern and Western Districts of Texas.

### **A. The TI Litigation**

As of this Response, claim 12 of the '800 Patent was asserted in *Network System Technologies, LLC v. Texas Instruments, Inc.*, No. 2:22-cv-00482-RWS (E.D. Tex.) (hereinafter, "the TI Litigation"). The court issued a *Markman* order on January 3, 2024, finding limitations in the '800 Patent indefinite. EX2028, 1; *Infra*, §V, §VI, §VII.

### **B. The Samsung Litigation**

As of this Response, claim 12 of the '800 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, 1.

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. This listing is reproduced below.

| <b>Claim Terms, Phrases, or Clauses for Construction</b> | <b>Claims</b>         |
|----------------------------------------------------------|-----------------------|
| “optimal amount of data to be buffered”                  | ’800 patent, claim 12 |
| “optimal moment for sending the data”                    | ’800 patent, claim 12 |
| “determination unit”                                     | ’800 patent, claim 12 |
| “said first wrapper” / “said second wrapper”             | ’800 patent, claim 12 |

*Id.*

On December 19, 2023—just one day after the Petition was filed—Petitioner disclosed its preliminary claim constructions for the terms identified above. EX2032. Notably, Petitioner contended that the “optimal” and “wrapper” limitations are indefinite and the “determination unit” is subject to Section 112, ¶ 6 and indefinite. *Id.*, 12-14.

The parties filed a Joint Claim Construction and Prehearing Statement with disputed and agreed claim constructions for the ’800 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 filed March 12, 2024 (EX2035), and Patent Owner’s Reply Claim Construction Brief was filed

March 19, 2024 (EX2036). EX2028, 3. Petitioner continues to maintain its indefiniteness and Section 112, ¶ 6 positions. A *Markman* hearing is scheduled for April 9, 2024. EX2028, 3.

### **C. The Qualcomm Litigation**

As of this Response, claim 12 of the '800 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; EX2012, 35.

The parties completed claim construction briefing (EX2040–EX2045) and conducted *Markman* hearings on December 21, 2023 and February 21, 2023. EX2039, 6; EX2045, 1. The court is expected to issue a *Markman* order imminently. EX2039.

### **D. Other Litigations**

As of this Response, the '800 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.), *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 THE '800 PATENT**

The '800 patent generally relates to integrated circuits having a plurality of circuitry modules that are communicatively interconnected via NoCs. EX2001, ¶¶71; EX1001, 1:7-10, 6:7-17, 6:47-53. The '800 patent discloses systems for Quality of Service ("QoS"), called "connection properties" in the '800 patent, which are mechanisms to prioritize and manage communication between different circuitry modules. EX2001, ¶¶74-76. QoS allows for the allocation of network resources according to the specific requirements of different applications or tasks, ensuring, for example, that critical communications get higher priority while lower-priority communications do not unnecessarily consume resources. *Id.* Examples of QoS include minimum throughput or bandwidth, maximum latency, and priority. *Id.*

The '800 patent discloses network on chip (NoC) buffers to increase network efficiency and resolve synchronization issues between fast and slow communication channels. EX2001, ¶73. The '800 Patent concerns aspects of data storage and buffering. EX2001, ¶¶72-73. The '800 Patent discloses a NoC network interface that has buffers to store data until an optimal amount of data is available for transmission on the network. EX1001, 4:18-28, 4:50-57; EX2001, ¶73. Rather than inefficiently transmitting data in small packages as it is generated by the circuitry modules, the buffers aggregate data until an optimal amount of data is ready to be transmitted over

the network, increasing overall network utilization and efficiency. EX1001, 3:1-3, 7:44-46; EX2001, ¶73.

#### **IV. THE '800 PATENT'S PROSECUTION HISTORY**

Petitioner provides a cursory summary of the prosecution history in the Petition. Pet., 3. Although Petitioner later acknowledges that Bahadiroglu was cited by the Examiner during prosecution and, in fact, allowed the claim over Bahadiroglu (in combination with other references), Petitioner mischaracterizes the prosecution history. Pet. 74-75.

In an Amendment dated April 25, 2011, Patent Owner amended each of the independent claims to incorporate the limitations of a dependent claim which the examiner had indicated to be allowable if rewritten in independent form. EX1004, 474-488.

In a Notice of Allowance dated May 5, 2011 and a subsequent Notice of Allowance dated August 26, 2011, the examiner stated that the prior art (i.e., Bahadiroglu) failed to teach or suggest the “communication properties of the communication between the master and slave used to determine the optimal moment for sending data” or the claimed extensive list of “communication properties.” *Id.*, 495-499, 650-655.

## V. CLAIM CONSTRUCTION

Petitioner argues that “the Board does not need to construe any term for purposes of evaluating” the Petition and offers no claim constructions. Petition, 8-9. Notably, on November 28, 2023, three weeks before the instant Petition was filed, Samsung identified the following terms as requiring construction: “optimal amount of data to be buffered,” “optimal moment for sending the data,” “determination unit” and “said first wrapper” / “said second wrapper.” EX2020, 3. And, on December 19, the day after the instant Petition was filed, Samsung identified its proposed claim constructions, identifying each of these terms as indefinite. EX2032, 12-14.

### A. Constructions in the Samsung Litigation

#### 1. “optimal amount of data to be buffered”/“optimal moment for sending the data”

In the TI litigation, the court held that these limitations are indefinite. EX2022, 52-57, 60.

In the Samsung Litigation, Petitioner argued the “optimal amount of data to be buffered” and “optimal moment for sending the data” limitations in claim 12 are indefinite.

| Term                                                                            | Petitioner's Construction | Patent Owner's Construction |
|---------------------------------------------------------------------------------|---------------------------|-----------------------------|
| “optimal amount of data to be buffered” / “optimal moment for sending the data” | Indefinite.               | Plain and ordinary meaning  |

## 2. “determination unit”

Petitioner also argued the “determination unit” in claim 12 is indefinite.

| Term                 | Petitioner's Construction                                                                                                                                                                                                                                                                                                  | Patent Owner's Construction                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “determination unit” | <p>Subject to Section 112, ¶ 6</p> <p><b>Function:</b> “determine a first/second amount of data to be buffered by the first/second memory” and for at least one of the first determination unit and the second determination unit “determine an optimal moment for sending data.”</p> <p><b>Structure:</b> Indefinite.</p> | <p>“circuit that makes determinations based on stored or received information” NST disagrees that this term is governed by Section 112 ¶ 6.</p> <p>Nevertheless, if the Court holds that this term is so governed, NST proposes the following construction:</p> <p><b>Function:</b> “determine an optimal amount of data to be buffered” and “determine an optimal moment for sending the data”</p> <p><b>Structure:</b> circuit</p> |

EX2032, 14; EX2033, 15.

## 3. “said first wrapper”/“said second wrapper”

Petitioner also argued the “said first wrapper” and “said second wrapper” in claim 12 are indefinite.

| <b>Term</b>                                  | <b>Petitioner's Construction</b> | <b>Patent Owner's Construction</b>         |
|----------------------------------------------|----------------------------------|--------------------------------------------|
| "said first wrapper" / "said second wrapper" | Indefinite.                      | "said first memory" / "said second memory" |

EX2032, 15; EX2033, 16. However, Petitioner later agreed to Patent Owner's construction as for "said first wrapper"/"said second wrapper" as "said first memory"/"said second memory." EX2035, 2, n.2.

#### **4. "flow control"**

In the Samsung Litigation, the parties agreed that "flow control" in claim 12 as follows:

| <b>Term</b>    | <b>Agreed Construction</b>                                                                                                                                                                         |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "flow control" | "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.

#### **5. "integrated circuit"**

In the Samsung Litigation, the parties agreed that "integrated circuit" in claim 12 as follows:

| <b>Term</b>          | <b>Agreed Construction</b>           |
|----------------------|--------------------------------------|
| "integrated circuit" | "interconnected circuitry on a chip" |

EX2033, 5.

**B. Construction of “network” in the TI Litigation**

In the TI Litigation the court construed “network” in claim 12 as follows:

| Term      | District Court Construction                                                        |
|-----------|------------------------------------------------------------------------------------|
| “network” | “multi-hop interconnection between modules separated by one or more network nodes” |

EX2022, 58. In the Samsung Litigation, Samsung agreed to this same construction of “network” for the other asserted patents, but the parties did not identify the ‘800 patent in the Joint Claim Construction Prehearing Statement. EX2033, 5.

As discussed above, Samsung does not set forth any claim construction for any of these terms. Petition, 8-9. Yet, throughout the Petition, Samsung acknowledges these claim constructions in footnotes and purportedly applies those constructions in its analysis without substantively addressing the claim constructions themselves. See, e.g., Petition, 19, 20, 24, n. 3, 29, n. 4.

**VI. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION PURSUANT TO 35 U.S.C. § 314(A) IN VIEW OF THE DISTRICT COURT’S INDEFINITENESS FINDING IN THE TI LITIGATION**

The Board is granted the discretion to decline to institute *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.""). The Board has exercised its discretion to deny institution where the claims have been found indefinite in the district court. *Samsung Electronics v. Acorn Semi*, IPR2020-01182, Paper 17 (Feb. 10, 2021); *Facebook v. Sound View Innovations*, IPR2017-00998, Paper 13 (Sept. 5, 2017); *H-E-B v. Digital Retail Apps*, IPR2020-00348, Paper 16 (July 6, 2020).

As discussed above, on January 3, 2024, Judge Schroeder issued a Claim Construction Memorandum Opinion and Order in the TI litigation finding, among other things, that the limitations "an optimal amount of data to be buffered" and "an optimal amount for sending the data" in claim 12 of the '800 patent are indefinite. See EX2022, 52-57, 60.

In the Samsung and Qualcomm Litigations, Samsung and Qualcomm have made similar arguments that these limitations are indefinite. EX2032, 12-14; EX2033, 15; *see also* EX2035, 27-34; EX2040, 39-52; EX2042, 26-31; EX2044, 10. Patent Owner has disputed that the claims are indefinite. EX2032, 12-14; EX2033, 15; *see also* EX2023, 32-35; EX2025, 11-12; EX2034, 27-35; EX2036, 8-11; EX2041, 34-41, 44-51; EX2043, 21-29; EX2045, 9-12. The district courts in the Samsung and Qualcomm Litigations have not yet ruled on this issue.

The fact that the challenged claims currently stand invalid as indefinite according to the court's claim construction ruling is a reason to exercise discretion

to deny institution in this case. Although it is possible that the district court in the Samsung Litigation or the Federal Circuit will reverse that ruling, the petitioner will then have the opportunity to bring its other invalidity arguments against the '800 Patent in court – including the exact same ones as presented in the petition – if it matters at that point. Until then, there is very little sense in having the Board expend its precious resources “beating a dead horse” to possibly find the same claims unpatentable for another reason. The time and place to deal with this horse (the '800 Patent), if it comes back to life, is in the court, not here.

Although the District Court's finding is subject to appeal and the District Court in the Samsung Litigation has not reached its decision, proceeding with an *inter partes* review of claims already determined to be indefinite by a District Court would require the Board to assign a meaning to the claim language that is necessarily inconsistent with the determination by the District Court and the position advocated by Petitioner in the Samsung Litigation. It would be particularly problematic in this case, because the claims are patentable over the prior art at least in part due the same language the District Court has found to be indefinite. *See infra*. §§ VIII.C-VIII.F.

Under these particular circumstances, instituting an *inter partes* review to consider claims that have already been held indefinite in the TI litigation and which Petitioner similarly argues are indefinite in the Samsung litigation would not be in

the interests of justice or efficiency, and the Board should exercise its discretion to deny institution.

**VII. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY INSTITUTION PURSUANT TO 35 U.S.C. § 314(A) IN VIEW OF THE PARALLEL DISTRICT COURT PROCEEDING**

**A. The Board Has Discretion to Deny Institution**

The Board is granted the discretion to decline to institute *inter partes* review whenever it deems the circumstances warrant doing so. *Harmonic Inc.*, 815 F.3d at 1367 (“the PTO is permitted, but never compelled, to institute an IPR proceeding”); *see also* 35 U.S.C. §314(a); *Oil States*, 138 S. Ct. at 1371 (“The decision whether to institute *inter partes* review is committed to the Director’s discretion.”). The Board has declined to institute in cases where a parallel district court trial would determine the issues *before* the requested Board trial, rendering the review cumulative.

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](https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf)) (“Interim Guidance”); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5-6 (Mar. 20, 2020) (precedential) (hereinafter, “*Fintiv*”); *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 II*”).

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 (PTAB Feb. 27, 2023) (“In circumstances where, however, the Board's analysis of *Fintiv* factors 1–5 favors denial of institution, the Board shall then assess compelling merits.”), *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102 at 49 (PTAB Oct. 4, 2022) (“[A] compelling-merits challenge is a higher standard than the reasonable

likelihood required for the institution of an IPR under 35 U.S.C. § 314(a).”) 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.” *Id.*, at 50. “A challenge can only ‘plainly lead to a conclusion that one or more claims are unpatentable’ if it is highly likely that the petitioner would prevail with respect to at least one challenged claim.” *Id.* For the reasons discussed above, Petitioner has not presented a compelling challenge to the patentability of at least one claim. *Supra*, §VI-VII.

Patent Owner respectfully asserts that the Interim Guidelines are improper because the *Fintiv* instructions were issued in violation of the notice-and-comment rulemaking set forth in 5 U.S.C. § 553(b). Under the APA, the Director may adopt substantive rules only through notice-and-comment rulemaking. *See* 5 U.S.C. § 553. In particular, Patent Owner respectfully submits that the Interim Guidelines statement that a *Sotera* stipulation alone (factor 4) is sufficient for discretionary denial is improper and inconsistent with the statute. *See* Interim Guidelines, pp. 7-8. Patent Owner also respectfully submits that the compelling evidence standard (factor 6) is also improper and inconsistent with the statute. *See* Interim Guidelines, pp. 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 to the district court to review the specific issue of whether the Interim Guidelines were issued without compliance with notice-and-comment rulemaking requirements under the APA. The parties in that case are currently awaiting the district court's opinion on cross-motions for summary judgment, which is expected to address the merits of this remaining challenge to the Interim Guidelines. 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 these IPR proceedings.

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 respectfully 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 choose to apply the Interim Guidelines, Patent Owner maintains that the factors outlined in the rule favor denying institution in this case.

**B. Parallel District Court Proceedings Will Determine the Issues Raised in the Petition Before the Board**

The parallel district court proceeding is in an advanced stage – *Markman* briefing has been complete with the Markman hearing is scheduled 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.*, 3. The 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, the Federal District Court where the parallel litigation resides, show that the trial in this matter is likely to happen before a final written decision is rendered. EX2012, 35.

Claim 12 of the '800 patent is currently asserted in co-pending litigation between Patent Owner and Petitioner in Federal District Court in the parallel Samsung litigation. EX2027, 1-2. The case was initiated on December 19, 2022. *Id.* Contrary to Samsung's assertions that the parallel case is relatively early (Petition, 76), it is currently at a relatively advanced stage: infringement contentions were served May 16, 2023, invalidity contentions were served July 7, 2023, the parties' proposed claim constructions were served December 19, 2023; NST's opening claim construction brief was filed February 20, 2024; and, Samsung's responsive claim construction brief was filed March 12, 2024. EX2028, 3. The *Markman* hearing is scheduled for April 9, 2024. *Id.* Additionally, dispositive motions will be fully briefed by August 5, 2024. *Id.*

Samsung concedes trial is scheduled for October 28, 2024, which will pre-date the Board's final written decision by nearly eight months. Petition, 77. Samsung argues, without any evidence or basis, that the trial date is not set in stone and could easily change. Indeed, the federal trial statistics for the Eastern District

of Texas confirm that the time to trial will pre-date the Board's final written decision by nearly eight months. EX2012, 35.

**C. The First Factor is Neutral**

The first *Fintiv* factor is at least neutral because Samsung 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, Samsung does not indicate that it would seek a stay if the Petition was instituted. Petition, 71.

**D. The Second Factor Favors Denial**

In this case, the Board will decide whether to institute an IPR on or before June 28, 2024 and its final written decision will be due around June 28, 2025. 35 U.S.C. § 314(b). However, trial will be complete around November 4, 2024, more than seven months in advance of a final written decision. 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. There is no reason for the Board to hold proceedings that would duplicate those in the district court and that would take longer to complete. The Board's scarce resources should be deployed instead where they can increase efficiency and provide the faster alternative proceeding contemplated by the AIA.

The Board's precedential decision in *NHK Spring* recognized that the Board can and should deny institution in its discretion under Section 314(a) 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.” See, e.g., *NHK Spring Co., Ltd. v. Intri-Plex Technologies, Inc.*, IPR2018-00752, Paper 8, slip op. at 20 (PTAB Sept. 12, 2018) (Precedential) (quotations omitted).

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).”). The *NHK Spring* petitioner had “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.*, 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.*, 20.

Additionally, in *E-One, Inc. v. Oshkosh Corp.*, IPR2019-00161, Paper 16 (PTAB May 15, 2019), the Board observed the same factual circumstances as were present in *NHK Spring*, and denied institution. *Id.*, 4, 6-9. 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.

Just as in *NHK Spring* and *E-One*, the parallel district court proceeding here (i) is between the same parties, (ii) will apply the same claim construction standard, (iii) is currently considering the same or significantly overlapping claim construction issues and invalidity challenges, and (iv) will likely go to trial in months before the Board's statutory deadline.

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.

**E. 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 May 15, 2019). Petitioner addresses only the work performed as of the filing of the Petition. Petitioner does not address the investment by the District Court and the parties by the time the Board issues its institution decision. As discussed above, a significant investment into the district court proceedings has already taken place. *Supra*, §VIII.B.

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.*

The Court has scheduled its *Markman* hearing for April 9, 2024, which is prior to the Board's deadline for issuing the institution decision. EX2028, 3. There will thus be significant investment in the parallel proceedings by the Court and the parties before the institution decision deadline.

Further, the Scheduling Order demonstrates that trial 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 parallel litigation before the Board issues a final written decision.

Thus, this factor favors denial.

**F. The Fourth Factor Should Favor Denial or Only Marginally Favors Institution**

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 includes substantially the same claims, arguments, and evidence as has been presented in the district court litigation. Claim 12 of the ‘800 patent is asserted in the litigation. EX2027, 1-2. Claim 12 has been raised in the Petition. Patent Owner has disclaimed claims 1, 2, 4-5, 8-11, 13 and 18-21.

EX2055. Petitioner's initial invalidity contentions allege invalidity on the basis of each of Radulescu, Rădulescu-WO, Bahadiroglu, and Petersen. EX2050, *see e.g.*, pp. 105-111. These are the same grounds asserted here. In fact, Petitioner submitted claim charts for those references in its district court invalidity contentions that duplicate the substance of the Petition. EX2056-EX2061. All of the art and the arguments were raised and are being litigated in the district court. This weighs in favor of denying the Petition.

Although Samsung purports to stipulate that it will not pursue the specific grounds raised in the Petition or could have been reasonably raised if Institution is granted, Samsung has not filed the stipulation or otherwise formalized the stipulation. Further, opening expert reports are due June 3, 2024, prior to the deadline for the Board's Institution Decision, and rebuttal expert reports are due July 1, 2024, days after that deadline. That is, the parties will have expended significant resources in District Court Litigation on these same invalidity arguments before the stipulation becomes effective. This reduces the benefit of the so-called *Sotera* stipulation and increases inefficiency.

#### **G. The Fifth Favor Favors Denial**

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

## **H. 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 district court litigation and these issues will likely be decided 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 Technologies, LLC*, IPR2022-01242, Paper 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.

## **VIII. PETITIONER HAS NOT ESTABLISHED CLAIM 12 IS UNPATENTABLE**

For the reasons set forth below, the Board should deny institution because Petitioner has not met its burden of showing that claim 12 of the '800 Patent is unpatentable.

On March 25, 2024, Patent Owner filed a statutory disclaimer with the U.S. Patent and Trademark Office disclaiming claims 1, 2, 4-5, 8-11, 13 and 18-21 of the '800 Patent. EX2055. Accordingly, the Board need to not address these claims when considering the Petition. 37 C.F.R. § 42.107(e).

**A. Insufficiency of Petition – Claim Construction**

In this proceeding, the construction of the “optimal” limitations is at issue. See, e.g., *Infra*, §§ VIII.C-VIII.F (arguing that the cited references do not disclose these limitations). Accordingly, in order to resolve the controversy, the Board must construe these limitations. *Orthopediatrics v. K2M*, IPR2018-01548, Paper 9 at 9 (PTAB Mar. 1, 2019).

The Board's Rules specifically require that a petition for inter partes review set forth how each challenged claim is to be construed. *See* 37 C.F.R. § 42.104(b)(3). Petitioner does not set forth how the “optimal” limitations should be construed. Rather, Petitioner argues “the Board does not need to construe any term for purposes of evaluating” the Petition. Pet. 8-9. However, Petitioner also states: “While Petitioner believes the claimed ‘optimal amount of data’ is indefinite because the scope of what is ‘optimal’ is subjective, PO disagrees and has represented in litigation that this term would have been understood to ‘equate[] to’ the amount of data that is optimal under certain conditions.’ *Whatever the scope of ‘optimal amount of data,’* it is clearly disclosed by Bahadiroglu, which expressly describes determining the ‘optimum packet size,’ as discussed further below.” *Id.* at 24-25 (fn. 3) (internal citations omitted) (emphasis added); *see also id.* at 29, n. 4. Petitioner similarly states: “While parties in parallel district court litigation have taken the position that ‘determination unit’ is a means-plus-function term, PO contends that

this term is '[n]ot subject to § 112 ¶ 6.' *If the Board finds it is governed by § 112(6)*, PO contends its structure is 'circuit,' which is disclosed by Rădulescu's scheduler. *Id.* at 22-23, n. 2 (internal citations omitted) (emphasis added). Petitioner did not inform the Board that it contends that the "first wrapper" and "second wrapper" are indefinite but seemingly argues for Patent Owner's construction in the Petition. Pet. at 29. Petitioner's expert makes similar statements: "I understand Petitioner believes the claimed 'optimal moment' is indefinite, and Patent Owner disagrees. I have not analyzed whether these terms are definite. ***Regardless of the precise scope of these terms***, in my opinion, this limitation is clearly disclosed by Rădulescu, and rendered obvious by Rădulescu in view of Bahadiroglu." EX1002, p. 54 (n. 4) (emphasis added); *see also id.*, p. 47 (n. 2), p. 48 (n. 3), p. 55-56 (n. 5). Petitioner's positions, however, do not set forth what the plain and ordinary meaning of these limitations are or, in at least one instance, set forth Patent Owner's position in the related District Court litigation. The Board's rules place an affirmative burden on petitioners to "set forth: . . . How the challenged claim is to be construed." *Medicines Co. v. Mylan, Inc.*, 853 F.3d 1296, 1308 (Fed. Cir. 2017); 37 C.F.R. § 42.104(b)(3). This burden continues by requiring petitioners to adequately explain "[h]ow the construed claim is unpatentable." 37 C.F.R. § 42.104(b)(4) (emphasis added). The Petition fails to identify how the challenged claims are to be construed and applied to the prior art, and Petitioner also takes conflicting positions between this proceeding and the

related district court litigation. Specifically, in the related district court litigation, Petitioner advocated that the “optimal” limitations are indefinite and that the “determination unit” is subject to § 112 ¶ 6 and is also indefinite. EX2032, 12-14; EX2033, 15.

Given Petitioner's prior factual and legal positions as to these limitations being indefinite and subject to § 112 ¶ 6, Petitioner should have known that the question of whether or not the “optimal” limitations and “determination unit” are indefinite and a means-plus-function limitation was likely to be at issue in this proceeding. Accordingly, Petitioner should have either provided reasons why these limitations are not indefinite and not governed by 35 U.S.C. § 112 ¶ 6, or Petitioner should have provided an explicit claim construction as required by the Board's rules.

Because Petitioner advocated for a different claim construction in the related district court litigation, the Board should determine that construction of the claim terms in dispute is necessary for the resolution of issues before it. Lacking such claim construction, the Petition fails to comply with 37 C.F.R. § 42.104(b)(3).

Petitioner's failure to provide a claim construction is, in this instance, further compounded by the fact that Petitioner takes an inconsistent position before the District Court, and the key limitations at issue have also been construed by the District Court in the TI litigation as indefinite, and Samsung's basis for arguing the claims are indefinite in the district court proceeding are the same as in the TI

litigation. The Board's claim construction has generally been informed by a district court's claim construction. *Kiosoft Techs., LLC v. PayRange, Inc.*, IPR2021-00086, Paper 12 at 16 (PTAB Mar. 22, 2021) (recognizing a lack of uniformity in claim constructions would “undermine the ‘predictability’” of a patent's claim scope, as well as the “‘integrity of the patent system’ overall.”); *see also Google LLC v. Virentem Ventures, LLC*, IPR2019-01247, Paper 34 at 11 (PTAB Mar. 5, 2021) (rejecting construction where it would result in “construing the claims in a manner inconsistent with the District Court”). Notably, Petitioner's expert offers no testimony on the proper scope of the claims. *Supra* (citing EX1002, p. 54 (fn 4), p. 47 (fn 2), p. 48 (fn 3), p. 55-56 (fn 5)). Keeping in mind that Petitioner has the burden to show a reasonable likelihood of prevailing in showing that at least one claim is unpatentable, it is incumbent upon Petitioner to address substantively the District Court's claim construction of a limitation when construction of that limitation is likely to be a focal point of the inter partes review proceeding. *Orthopediatrics*, at 11. By failing to reconcile its proffered claim construction here with its very different construction proffered in District Court—which the District Court agreed with—Petitioner fails to satisfy this burden. *Id.*

**B. Insufficiency of Petition – Prior Art**

**1. Rădulescu (EX1005)**

Petitioner contends that Rădulescu (EX1005) is a printed publication pursuant to 35 U.S.C. § 311(b) because it was published and publicly available before the '800 Patent's priority date, citing EX1017. Pet. 4. Petitioner has not met its burden of showing Rădulescu (EX1005) is prior art to the '800 patent.

First, Petitioner's identification of Rădulescu's alleged publication date—without any further explanation or argument—does not establish public accessibility. 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).

Petitioner offers EX1017—a IEEE declaration discussing Rădulescu (“the IEEE Declaration”)—but cites to it *only once* and fails to state its relevance. Pet. 4 (citing EX1017); 37 C.F.R. § 42.204(b)(5); 37 C.F.R. § 42.22(a)(2). In fact, the

Petition does not even cite specific paragraphs of the IEEE Declaration – it merely invites the Board to review the entire document. *Id.* Petitioner's blanket citation to the IEEE Declaration amounts to improper incorporation by reference, as it is impermissible to cite a declaration "to support conclusory statements for which the Petition does not otherwise provide an argument or explanation." *Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 9 (PTAB Aug. 29, 2014) (informative); *Red Diamond, Inc. v. S. Visions, LLP*, IPR2019-01671, Paper 35 at 41 (PTAB Mar. 31, 2021) (directing the Board to review exhibits on its own violates the "rules on incorporation by reference"); *Kaz Usa, Inc. v. Exergen Corp.*, IPR2016-01437, Paper 43 at 36 (PTAB Dec. 22, 2017) ("[i]nformation contained in exhibits or portions of exhibits, but not discussed in the Patent Owner's Response, is not incorporated in that Response merely by the exhibits' presence in the record").

Second, the Petition does not identify **any** factual or legal basis for its conclusion that Rădulescu satisfies the "public accessibility" standard for prior art. *See*, Pet. 3-4. Petitioner's approach is akin to a petition offering only a conclusion that a claim is obvious and referring to the entirety of an expert declaration for the reasons why. This is prohibited under the Board's rules and good cause does not exist for waiving or suspending those rules. 37 C.F.R. § 42.5(b). Petitioner should not be allowed to rectify its non-compliance with the Board's rules in its reply; it would be fundamentally unfair and prejudicial to Patent Owner if Petitioner were

allowed to keep its theories concerning public accessibility in reserve until reviewing Patent Owner's Response. *See Intelligent Bio-Sys.*, 821 F.3d at 1369 (finding Petitioner failed to meet its burden where it did not adhere to the requirement that the initial petition set out the evidence supporting the challenge with particularity).

On its face and as noted by the IEEE declarant, Rădulescu is a paper prepared by a presenter at a conference held in 2004. EX1005, 1; EX1017. However, neither the Petition nor the declarant provide any evidence concerning how the conference was publicized and promoted and to whom, whether the paper was in fact presented at the conference or how it was made available to conference attendees. Without sufficient evidence regarding the publication of and attendance at the conference, public accessibility cannot be shown. *See SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1197 (Fed. Cir. 2008) (prior art not shown to be publicly accessible when it is “analogous to placing posters at an unpublicized conference with no attendees,” prior art must be “publicized or placed in front of the interested public”). This is not the necessary threshold showing that Rădulescu was a printed publication before the earliest filing date of the '800 patent. *Power Integrations v. Semiconductor Components Industries*, IPR2017-01904, Paper 9 at 14-15, 18 (PTAB March 12, 2018).

Third, Petitioner does not provide evidence regarding who presented at the conference and who attended the conference and whether those persons satisfied

Petitioner's assessment of a person of ordinary skill in the art. The IEEE Declarant does not purport to be a person of ordinary skill in the art at the time of the conference. *See* EX1017. Petitioner does not provide sufficient evidence that any person attending the conference satisfied Petitioner's assessment of a person of ordinary skill in the art. *See id.*; *cf. LG Electronics, Inc. v. Core Wireless Licensing S.A.R.L.*, IPR2015-01986, Paper 34, slip op. at 29 (PTAB Mar. 16, 2017) ("As explained above, in this proceeding, the papers in question were handed out without restriction *to at least dozens of skilled artisans*, with more being alerted, by email, to the posting of the documents on 3GPP's server." (emphasis added)); *Suffolk Techs., LLC v. AOL Inc.*, 752 F.3d 1358, 1365 (Fed. Cir. 2014) (relying on "at least six responses" to a reference posted to an online newsgroup *including persons of ordinary skill in the art* and noting that "[m]any more people may have viewed the post"); *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004) ("In this case, the Liu reference was displayed to the public approximately two years before the '950 application filing date. The reference was shown to a wide variety of viewers, *a large subsection of whom possessed ordinary skill in the art of cereal chemistry and agriculture.*" (emphasis added)). Because Petitioner failed to show Rădulescu was available to persons of ordinary skill in the art at the time of the conference, it has not sufficiently shown that Rădulescu was a printed publication before the earliest filing date of the '800 patent. *Power Integrations* at 15-16, 18.

Fourth, limited distribution, even to those skilled in the art, may not amount to “publication” under the statute unless the material is otherwise so situated that “any one who chooses may avail himself of the information it contains.” *In re Bayer*, 568 F.2d 1357, 1360, 1362 (CCPA 1978) (quoting 1 W. Robinson, *The Law of Patents* 327 at 448 (1890); holding that the distribution of alleged prior art to three members of a graduate committee, concededly members of the “interested public,” for purposes of assessing appellant’s entitlement to a degree did not, as a matter of law, “transmute[ ] . . . [the thesis] into a patent-defeating publication.”). The IEEE Declarant fails to address whether distribution was restricted or not or identify anyone who attended the conference. Neither Petitioner nor the IEEE Declarant provide evidence of the conditions, if any, under which the technical papers were distributed to the conference attendees. Petitioner provides no evidence regarding whether the paper was provided to conference attendees with or without restriction. Because Petitioner failed to present sufficient evidence of distribution of Rădulescu, it has not sufficiently shown that Rădulescu was a printed publication before the earliest filing date of the ‘800 patent. *Power Integrations* at 15-18.

At most, the IEEE Declaration establishes that Rădulescu (EX1005) was available for public download from the IEEE digital library as of October 30, 2023, which is more than a decade *after* the priority date of the ‘800 patent.

Thus, Petitioner has not met its burden of showing Rădulescu (EX1005) is prior art under U.S.C. 102(a) or (b).

## **2. Rădulescu-WO (EX1008)**

Petitioner also contends that Rădulescu-WO (EX1008) is prior art under 35 U.S.C. 102(a), (b) *and* (e) and uses Rădulescu-WO as the basis for its rejection under 35 U.S.C. 103. Although Patent Owner does not presently dispute Rădulescu-WO is prior under 35 U.S.C. 102(b), Patent Owner notes that Rădulescu-WO (EX1008) is not prior art under 35 U.S.C. 102(a) because it is not a publication *by another*. 35 U.S.C. 102(a). The inventors of both Rădulescu-WO and the '800 patent are: Andrei Rădulescu and Kees Goossens. EX1008; EX1001. Because the inventors of the '800 patent are identical to the authors of Rădulescu-WO (EX1008), Rădulescu-WO (EX1008) is not prior art under 35 U.S.C. 102(a). Applicant also notes that Rădulescu-WO (EX1008), as a 35 U.S.C. 102(e) reference, cannot be used in a rejection under 35 U.S.C. §103 as a 102(e) reference because Rădulescu-WO (EX1008) and the '800 patent were at the time of the invention owned by Koninklijke Philips Electronics N.V., the assignee of both Rădulescu-WO (EX1008) and the '800 patent. 35 U.S.C. § 103(c).

## **C. Ground 1 Deficiencies**

In Ground 1, Petitioner alleges that claims 1, 2, 4, 6, 8–12, 13, 18–21 are rendered obvious by Rădulescu and Bahadiroglu. *See* Petition, 9-46. As discussed

above, Patent Owner filed a statutory disclaimer with the U.S. Patent and Trademark Office disclaiming claims 1, 2, 4-5, 8-11, 13 and 18-21 of the '800 Patent. EX2055. Accordingly, the Board need to not address these claims when considering the Petition. 37 C.F.R. § 42.107(e). Petitioner has also not established Rădulescu is prior art. The Petition is also deficient because it has not established a POSITA would combine Rădulescu and Bahadiroglu or that the prior art discloses all of the limitations of the independent claims, as set forth below. As discussed above, the examiner considered Bahadiroglu during the prosecution and granted the '800 Patent. *Supra*, § IV.

**1. A POSITA Would Not Combine Rădulescu and Bahadiroglu**

A POSITA would not combine Rădulescu and Bahadiroglu because Rădulescu is directed to on-chip networks for communication between IP modules where “the size of IP modules attached to the NoC is relatively small,” (EX1005, 1), while Bahadiroglu is directed to computer networks for communication between nodes, such as “a computer, network server or router, a network or, for example, a more specialized data display or presentation device such as a telephone, mobile phone or processing device, television or audio system,” (EX1006, ¶73). EX2001, ¶¶85-86. Bahadiroglu's “adaptive packet mechanism” is directed to computer networks, not on-chip networks (Rădulescu, and the '800 Patent, are directed to on-chip networks). EX2001, ¶86. FIG. 2 of Bahadiroglu (reproduced below) is “an

exemplary Network 10 in which the present invention may be implemented.”

EX1006, ¶73; EX2001, ¶86.

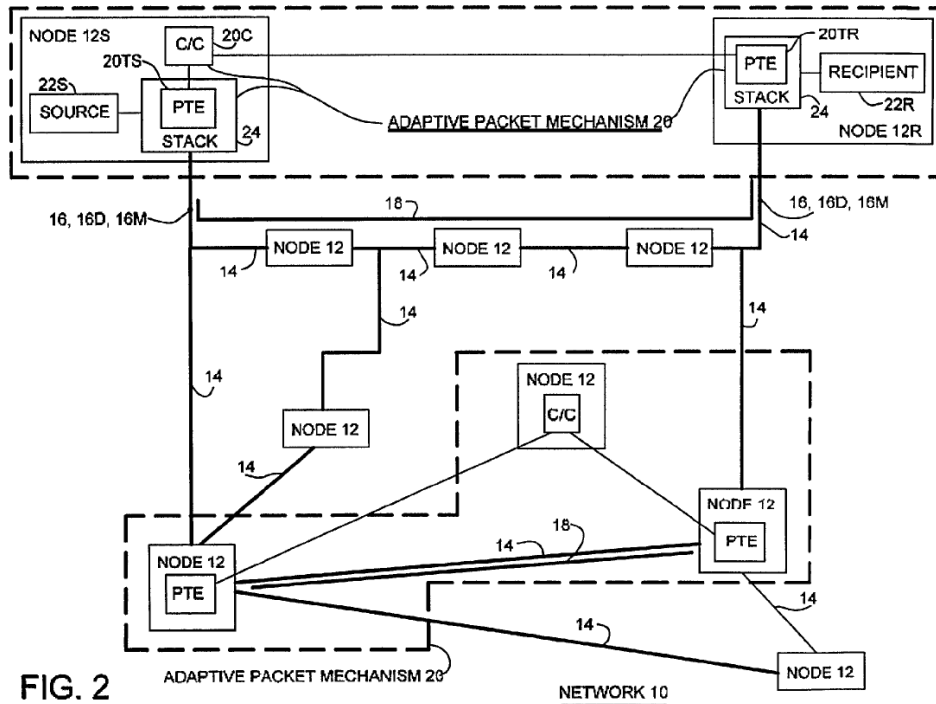


FIG. 2

EX1006, Fig. 2

Bahadiroglu explains that “networks specifically oriented to intercomputer communications typically provide individual computers shared access to a common communication backbone having relatively broad bandwidth, such as fiber optic cables or coaxial or twisted pair cable.” EX1006, ¶6; EX2001, ¶87.

A typical example of such a computer network is a personal computer (“PC”) network as PCs are used for a wide range of applications requiring the PCs to communicate with each other over a computer network. Typical computer networks connecting PCs, as well as other computers, nodes and related devices and systems, include local area networks (“LANs”) interconnecting PCs located in relatively close proximity and wide area networks (“WANs”), which are typically comprised of a network of separate LANS and provide communications

over wider areas. The “Web”, for example, is a very extensive WAN interconnecting LANS as well as PCs, larger computers, nodes and related devices.

EX1006, ¶6; EX2001, ¶87. Referring to FIG. 2, Bahadiroglu teaches: “[a] Network 10 is comprised of a plurality of Nodes 12 . . . . A Node 12, in turn, may be comprised of a computer, network server or router, a network or, for example, a more specialized data display or presentation device such as a telephone, mobile phone or processing device, television or audio system.” EX1006, ¶73; EX2001, ¶87. A POSITA would lack motivation to combine elements developed for off-chip networks into an on-chip network environment. EX2001, ¶¶53-70, 87.

A POSITA would also lack motivation to combine Rădulescu and Bahadiroglu because Rădulescu emphasizes the necessity to keep on-chip network interfaces (where the scheduler is located) small and simple, while Bahadiroglu teaches an extremely complex adaptive packet mechanism. EX2001, ¶¶88-91. Rădulescu explains that “[t]he pressure to keep the protocol stack small is higher on-chip than off-chip, because the size of the IP modules attached to the NoC is relatively small.” EX1005, 1; EX2001, ¶89. To that end, Rădulescu discusses the need for simple network interfaces. EX2001, ¶89; EX1005, 1 (“On-chip network interfaces must provide a low-area overhead, because the size of IP modules attached to the NoC is relatively small.”); *see also* EX1005, 1 (“Our NI is intended for systems on chip (SoC), hence, it must have low area. . . . we also have to provide a

simple and flexible configuration.”). In contrast, Bahadiroglu teaches “[a]n adaptive packet mechanism and method for optimizing data packet transmission through a network [where] measurements of latency and jitter are used to determine an optimum packet size and an optimum inter-packet interval,” (EX1006, Abstract), which is extremely complex and where the number of possible combinations of values of network variable is extremely large. EX2001, ¶89; EX1006, ¶68 ([T]he latency and jitter of a network are **extremely complex** or virtually impossible to predict or determine”) (emphasis added); EX1006, ¶70 (“the latency and jitter of a network are **extremely complex** or virtually impossible to predict”) (emphasis added); EX1006, ¶153 (the relationship of these variables to the current optimum packet size and inter-packet interval is **complex**, often nonlinear and variable with time. In addition, and as a consequence, the **number of possible combinations of values of these network variable will be extremely large**) (emphasis added).

FIG. 6A of Bahadiroglu (reproduced below and annotated in red) is a diagrammatic representation of the adaptive packet mechanism, where “the optimum packet size and inter packet interval are determined by a fuzzy logic analyzer, a neural network analyzer or a combined fuzzy logic/neural network analyzer” shown as Network Analyzer 48. EX1006, ¶153; EX2001, ¶90.

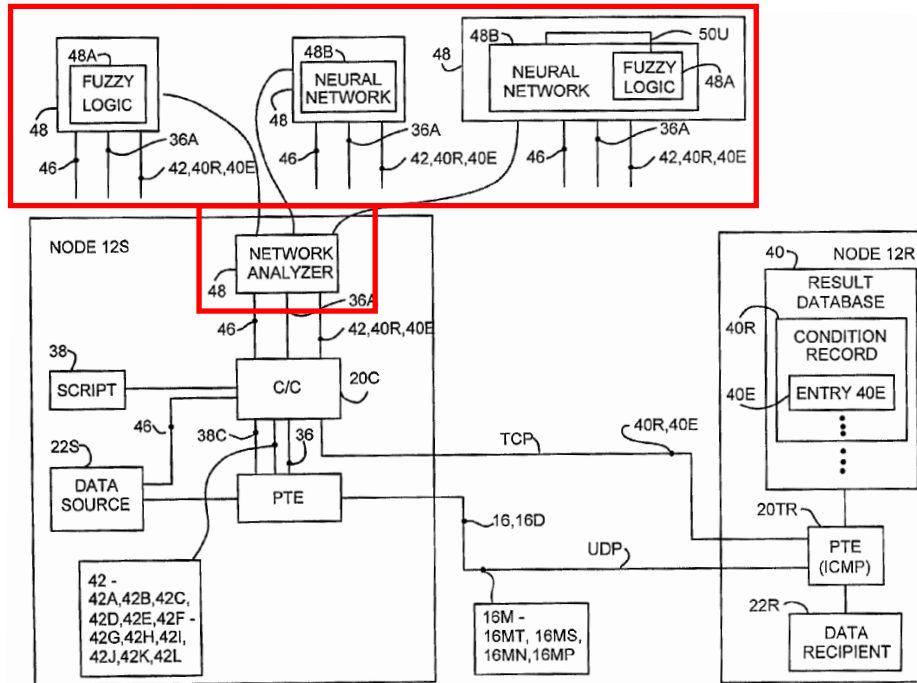


FIG. 6A

EX1006, Fig. 6A

A POSITA would lack motivation to implement Bahadiroglu's complex adaptive packet mechanism, e.g., the Network Analyzer 48, where "[t]he measurements of latency and jitter are used to determine an optimum packet size and an optimum inter-packet interval," (EX1006, Abstract), in Rădulescu's simple network interface as a way to configure Rădulescu's threshold mechanism as proposed in paragraph 90 of the Mowry Declaration (EX1002). EX2001, ¶91. Moreover, because of the stark differences between on-chip and off-chip environments, a POSITA would not have a reasonable expectation of success to implement Bahadiroglu's complex adaptive packet mechanism, e.g., the Network Analyzer 48, in Rădulescu's relatively simple network interface as a way to

configure Rădulescu's threshold mechanism as proposed in paragraph 90 of Dr. Mowry's Declaration. EX2001, ¶91.

A POSITA would also lack motivation to combine Rădulescu and Bahadiroglu because Rădulescu teaches that "[t]o optimize the NoC utilization, it is preferable to send longer packets," (EX1005, 4), while Bahadiroglu's adaptive packet mechanism determines an optimum packet size that yields the highest probability of successful delivery (EX1006, ¶77). EX2001, ¶¶92-94. Bahadiroglu explicitly states that the optimum packet size could be a minimally sized packet that contains only the control or header fields; or the optimum packet size could be a maximally sized packet that contains the maximum allowable payload for a given communication protocol; or the optimum packet could have a size anywhere within that range. EX2001, ¶92; EX1006, ¶126.

A POSITA would lack motivation to implement Bahadiroglu's adaptive packet mechanism, where the optimum packet size is based on probability of successful delivery, to configure Rădulescu's configurable threshold for optimizing NoC utilization based on sending longer packets. EX2001, ¶¶92-93. Further, a POSITA would not have a reasonable expectation of success at least because Bahadiroglu's optimum packet size, which could be a minimally sized packet, would not yield the results alleged in Dr. Mowry's Declaration. EX2001, ¶93. Indeed, the implementation of Bahadiroglu's adaptive packet mechanism to configure

Rădulescu's configurable threshold would frustrate the purpose of Rădulescu's optimization of NoC utilization. EX2001, ¶93.

A POSITA would have been dissuaded from attempting to modify the prior art to arrive at the claimed invention. EX2001, ¶¶53-70, 115-121. Modifying prior art systems that do not provide the characteristics described above, for example, quality of service guarantees, would require extensive redesign. EX2001, ¶¶53-70, 116. Nothing in Rădulescu or Bahadiroglu suggests or alludes to how such a redesign could be implemented. EX2001, ¶116.

Dr. Mowry opines that it would have been obvious to implement Rădulescu's NoC using Bahadiroglu's adaptive control and threshold mechanism implementation. EX1002, ¶¶57-63. Dr. Mowry provides no details of why a POSITA would have any motivation to combine these references. EX2001, ¶117. Dr. Mowry's discussion treats the references at a generic level without looking at the specific disclosures. EX2001, ¶117. Rădulescu and Bahadiroglu are fundamentally different. EX2001, ¶¶117-118. For example, as discussed above, Rădulescu is directed to a NoC, while Bahadiroglu is directed to a computer network. EX2001, ¶118. The '800 Patent details the differences between a NoC compared to a bus-based interconnect and a multi-hop interconnect compared to an off-chip computer network. EX2001, ¶118; EX1001, 1:65-2:10. For example, the '800 Patent teaches: "NoC's premises are different from off-chip networks, and,

therefore, most of the network design choices must be evaluated” 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, ¶118. An on-chip multi-hop network differs from an off-chip computer network with respect to: (1) data ordering; (2) time-related guarantees; (3) communication reliability; and (4) constraints and synchronization. EX2001, ¶¶53-70, 118. A POSITA would not look to an off-chip computer network (such as the network disclosed in Bahadiroglu) to arrive at the claimed inventions. *Id.*

Dr. Mowry opines that “a POSITA would have reasonably expected that using Bahadiroglu’s known technique for optimizing data communication in a network through its adaptive packet mechanism would improve Rădulescu’s NoC in the same way.” EX1002, ¶ 61. However, Dr. Mowry ignores that implementation of end-to-end performance guarantees in a multi-hop interconnect in an on-chip environment is drastically different compared to an off-chip computer network. EX2001, ¶119. The type of end-to-end performance guarantees, and the implementation of such guarantees, differs drastically in a multi-hop interconnect in an on-chip environment compared to a computer network. EX2001, ¶¶53-70, 1119. Due to the differences between buses and computer networks compared to multi-hop interconnects, a

person of skill in the art would have been dissuaded from attempting to modify a bus or a computer network to arrive at the claimed invention. EX2001, ¶¶120-121.

For at least these reasons, a POSITA would not combine Rădulescu and Bahadiroglu as alleged in the Petition. EX2001, ¶¶53-70, 80-100, 115-121.

## **2. Petitioner Has Not Established the Combination Discloses the “optimal” Limitations**

Claim 12 recites: “wherein at least one of the first *determination unit* and the second determination unit is further configured to determine *an optimal moment* for sending the data in said first wrapper or said second wrapper according to *communication properties of the communication between the master and the slave* wherein *the communication properties include* ordering of data transport, flow control including when a remote buffer is reserved for a connection, then a data producer will be allowed to send data only when it is guaranteed that space is available for the produced data at the remote buffer, throughput where a lower bound on throughput is guaranteed, latency where an upper bound for latency is guaranteed, lossiness including dropping of data, transmission termination, transaction completion, data correctness, priority, and data delivery.” EX1001, claim 12 (emphasis added). Claim 12 recites similar elements and functions with respect to a second interconnect module, a second processing module, a second memory, a second determination unit, and a second optimal amount of data. *Id.* In claim 12, the determination unit *determines* the optimal amount of data to be

buffered. The specification of the '800 Patent, which uses terms like “optimal burst length,” “optimal packet,” “optimal transfer,” and “optimal first or second amount of data” when discussing an optimal amount of data to be buffered, explains that “determination of the optimal burst length can be performed statically or dynamically, during the initial phases of the required processing or during predetermined time intervals.” EX1001, 6:52–56. The specification further explains:

Alternatively, the optimal burst length may be determined dynamically (1) every time a connection is set up for transferring data over the network, (2) for every transaction, (3) whenever an IP switches to another connection, (4) for every packet, (5) when the state of the network on chip changes (e.g., reconfiguration, NoC load, buffer fillings, etc.). The determination of the optimal burst length may be performed based on information stored in the determination units BDLU 1, 2 or on information received from the network N or IP blocks.

EX1001, 6:56–65.

**a. The limitation 12[d] combination fails**

The Petition alleges Rădulescu in view of Bahadiroglu renders this limitation obvious, citing paragraphs 80-90 of EX1002. Petition, 20. This argument fails. EX2001, ¶¶82-84. While Rădulescu discloses a “configurable threshold,” it does not disclose or suggest any circuit or device capable of configuring the threshold, e.g., capable of determining an optimal amount of data to be buffered. EX2001, ¶¶82-84; EX1005, 4 (“[W]e implemented a configurable threshold mechanism.”); *id.*, 4 (“[A] queue becomes eligible for scheduling when either the amount of sendable data are above a first threshold, or when the amount of credits is above a

second threshold”). Thus, Rădulescu does not disclose or suggest either the first determination unit or the second determination unit as recited in claim 12. EX2001, ¶84. Further, as discussed above, a POSITA would not combine Rădulescu and Bahadiroglu to arrive at this limitation. *Supra*, § VIII.C.1; EX2001, ¶¶53-70, 80-100, 115-121.

**b. The limitation 12[e] combination fails**

The Petition alleges that Rădulescu in view of Bahadiroglu renders this claim limitation obvious, citing paragraphs 91-93 of the Mowry Declaration, in a single paragraph. Petition, 27-28. These arguments fail. EX2001, ¶¶95-102.

First, Rădulescu describes a system in which channels, or queues, are scheduled for transmission by a scheduler. EX1005, 3. When the scheduler selects a channel (either when a guaranteed-throughput channel's time slot arrives or via an arbitration scheme for best-effort channels), the selected channel is granted transmission if it has data to send and there is space in the destination queue. EX1005, 4; EX2001, ¶96. To optimize NoC utilization, Rădulescu explains that it is preferable to send longer packets. EX1005, 4; EX2001, ¶96. A configurable threshold mechanism causes the scheduler to skip a channel if the “sendable data” for the channel is below the threshold, where sendable data refers to how much data can be sent before overflowing the destination queue, and skipping a channel refers to not granting transmission to a guaranteed-throughput channel when its

transmission slot arrives or not granting transmission to a best-effort channel when it is selected by the arbitration scheme. EX1005, 3–4; EX2001, ¶96.

In Rădulescu's system, no channels, or queues, are included in the scheduler's scheduling process unless the channel's sendable data exceeds the threshold (or there are enough credits). EX1005, 3; EX2001, ¶97. A channel becomes "eligible for scheduling" when its sendable data exceeds the threshold (or there are enough credits). Rădulescu at 4. Eligible for scheduling means the channel is selectable by the scheduler for scheduling; eligible for scheduling does not mean that sendable data (or any data in the queue) of the channel is sent. EX1005, 4; EX2001, ¶97. Rather, the scheduler may eventually select the channel for transmission according to the scheduler's scheduling (e.g., guaranteed-throughput time slots or best-effort arbitration). EX1005, 3–4; EX2001, ¶97. When the channel is eventually selected, a packet is created that contains the largest possible amount of data (and credits). EX1005, 4; EX2001, ¶97. The size of this packet is the lesser of the channel's sendable data or a predetermined maximum packet length. EX1005, 4; EX2001, ¶97. This is materially different from claim 12 for at least two reasons. EX2001, ¶97.

In claim 12, when the data in the buffer reaches the optimal amount, the data in the buffer will be sent (i.e., transferred to a processing module via the network). EX1001, claim 12; EX2001, ¶98. On the other hand, Rădulescu teaches that when the amount of sendable data in a queue for a channel exceeds the configurable

threshold, that channel is merely *eligible for scheduling*. EX1005, 4; EX2001, ¶98.

Eligible for scheduling means that the channel may eventually be selected by the scheduler according to the selection, or arbitration, scheme. EX2001, ¶98.

In claim 12, when the data in the buffer reaches the optimal amount, *that data* in the buffer will be sent. EX1001, claim 12; EX2001, ¶99. On the other hand, Rădulescu teaches that when the amount of sendable data in a queue for a channel exceeds the configurable threshold, that channel becomes *eligible for scheduling*, which does not mean data in the queue will be sent or that any specific data in the queue will be sent. EX1005, 4; EX2001, ¶99. A POSITA would recognize that while the eligible channel is waiting to be selected by the scheduler, the eligible channel's queue will continue to fill up with data it receives from the IP block to be sent across the network. EX2001, ¶99. Thus, when the eligible channel is eventually selected by the scheduler, the amount of data in the queue is likely more than the amount that was in the queue when it became eligible for scheduling. EX2001, ¶99. To be clear, claim 12 of the '800 Patent specifies that *the specifically buffered optimal amount of data will be sent* after that optimal amount of data is reached; Rădulescu specifies that a channel is eligible for scheduling when the configurable threshold is exceeded, but doesn't specify which data may eventually be sent. EX1001, claim 12; EX1005, 4; EX2001, ¶99. Indeed, in Rădulescu, the size of the packet that is formed for transmission when a channel is eventually selected is the lesser of the channel's

sendable data or a predetermined maximum packet length. EX1005, 4; EX2001, ¶¶99.

Such packet likely contains less than the amount in the queue when the channel was finally selected, and therefore, it is unknown what data from the queue is actually sent. EX2001, ¶¶99. While Rădulescu discloses sending a packet whose data is taken from the eligible channel's queue, Rădulescu does not disclose or suggest that the data buffered according to the configurable threshold is the data that is packetized and sent. EX2001, ¶¶99. For at least these reasons, Rădulescu does not disclose or suggest this limitation. EX2001, ¶¶99-100.

Further, a POSITA would not combine Bahadiroglu's adaptive packet mechanism with Rădulescu because it would frustrate the purpose of Rădulescu. EX2001, ¶¶101. Bahadiroglu describes determining an optimum packet size that yields the highest probability of successful delivery. EX2001, ¶¶101; EX1006, ¶¶77 ("As described, this optimum packet size and inter-packet interval will, as a consequence, yield the highest probability of packets arriving successfully at a given Receiving Node 12R."). Bahadiroglu's "optimum packet size and an optimum inter-packet interval for transmission of packet data between the sending node and the receiving node . . . are used in the transmission of data packets from the sending node to the receiving node" EX1006, Abstract; EX2001, ¶¶101. However, as discussed above, Bahadiroglu's optimum packets that are sent are not "longer packets" for optimizing NoC utilization as specified by Rădulescu. *Supra*, §

VIII.C.1; EX2001, ¶101. Thus, a POSITA would lack motivation to combine Rădulescu and Bahadiroglu, a POSITA would not have a reasonable expectation of success, and the combination would frustrate the purpose of Rădulescu's optimization of NoC utilization. EX2001, ¶101. For at least reasons, Petitioner has not met its burden for limitation 12[e]. EX2001, ¶¶95-101.

**c. The limitation 12[f] combination fails**

The Petition contends Rădulescu discloses this claim limitation and Rădulescu in view of Bahadiroglu renders this limitation obvious. Petition, 28-31. These arguments fail. EX2001, ¶¶103-114.

As discussed above, Rădulescu's schedulers do not disclose the first and second determination units because no scheduler is "configured to determine an optimal amount of data to be buffered." *Supra*, § VIII.C.1.a; EX2001, ¶¶82-84. For at least this reason, Rădulescu does not disclose this limitation. EX2001, ¶104.

Rădulescu's scheduler schedules, or arbitrates between, channels, or queues, for transmission. EX1005, 3; EX2001, ¶105. When the scheduler selects a channel (either when a guaranteed-throughput channel's time slot arrives or via an arbitration scheme for best-effort channels), the selected channel is granted transmission if it has data to send and there is space in the destination queue. EX1005, 4; EX2001, ¶105. Arbitration schemes include round-robin, weighted round-robin, and based on queue filling. EX1005, 4; EX2001, ¶105.

In Rădulescu's system, no channels, or queues, are included in the scheduler's scheduling process unless the channel's sendable data exceeds the threshold (or there are enough credits). EX1005, 3; EX2001, ¶106. A channel becomes "eligible for scheduling" when its sendable data exceeds the threshold (or there are enough credits). EX1005, 4; EX2001, ¶106. Eligible for scheduling means the channel is selectable by the scheduler for scheduling; eligible for scheduling does not mean that sendable data (or any data in the queue) of the channel is sent. EX1005, 4; EX2001, ¶106. Rather, the scheduler may eventually select the channel for transmission according to the scheduler's scheduling (e.g., guaranteed-throughput time slots or best-effort arbitration). EX1005, 3–4; EX2001, ¶106. When the channel is eventually selected, a packet is created that contains the largest possible amount of data (and credits). EX1005, 4; EX2001, ¶106. The size of this packet is the lesser of the channel's sendable data or a predetermined maximum packet length. EX1005, 4; EX2001, ¶106.

In claim 12, when the data in the buffer reaches the optimal amount, the data in the buffer will be sent (i.e., transferred to a processing module via the network) at the optimal moment. EX1001, claim 12; EX2001, ¶107. On the other hand, Rădulescu teaches that when the amount of sendable data in a queue for a channel exceeds the configurable threshold, that channel is merely *eligible for scheduling*,

and whenever that channel is eventually selected, a packet is sent. EX2001, ¶107; EX1005, 4.

Further, in claim 12, when the data in the buffer reaches the optimal amount, *that data* in the buffer will be sent at the optimal moment. EX1001, claim 12; EX2001, ¶108. On the other hand, Rădulescu teaches that when the amount of sendable data in a queue for a channel exceeds the configurable threshold, that channel becomes *eligible for scheduling*, which does not mean data in the queue will be sent or that any specific data in the queue will be sent. EX1005, 4; EX2001, ¶108. A POSITA would recognize that while the eligible channel is waiting to be selected by the scheduler, the eligible channel's queue will continue to fill up with data it receives from the IP block to be sent across the network. EX2001, ¶108. Thus, when the eligible channel is eventually selected by the scheduler, the amount of data in the queue is likely more than the amount that was in the queue when it became eligible for scheduling. EX2001, ¶108. Claim 12 requires that *the specifically buffered optimal amount of data will be sent* at the optimal moment after that optimal amount of data is reached. EX1001, 12:18–19; EX2001, ¶108. In contrast, Rădulescu specifies that a channel is eligible for scheduling when the configurable threshold is exceeded, but does not specify which data may eventually be sent. EX1005, 4; EX2001, ¶108. Indeed, in Rădulescu, the size of the packet that is formed for transmission when a channel is eventually selected is the lesser of the channel's

sendable data or a predetermined maximum packet length. EX1005; 4; EX2001, ¶108. Such packet likely contains less than the amount in the queue when the channel was finally selected, and therefore, it is unknown what data from the queue is actually sent. EX2001, ¶108. While Rădulescu discloses sending a packet whose data is taken from the eligible channel's queue, Rădulescu does not disclose or suggest that the data buffered according to the configurable threshold is the data that is packetized and sent. EX2001, ¶108. Thus, even if the moment at which transmission is granted for the eligible channel (e.g., when the channel is selected) is an "optimal moment for sending the data" as alleged, Rădulescu does not disclose or suggest "an optimal moment for sending the [specifically buffered optimal amount of] data in said first wrapper or said second wrapper." EX2001, ¶108. Thus, Rădulescu does not disclose or suggest this limitation. EX2001, ¶¶108-109.

The combination of Bahadiroglu's adaptive packet mechanism with Rădulescu's scheduler does not disclose or suggest the first and second determination units because, inter alia, using Bahadiroglu's adaptive packet mechanism, where the optimum packet size is based on probability of successful delivery, to configure Rădulescu's configurable threshold for optimizing NoC utilization based on sending longer packets, would frustrate the purpose of Rădulescu's optimization of NoC utilization. EX2001, ¶110.

Bahadiroglu's adaptive packet mechanism determines an optimum packet size and an optimum inter-packet interval that yields the highest probability of successful delivery. EX1006, ¶ 77 ("As described, this optimum packet size and inter-packet interval will, as a consequence, yield the highest probability of packets arriving successfully at a given Receiving Node 12R."). A POSITA would not understand that by determining the optimum interval between transmission of data, Bahadiroglu's mechanism determines the optimal moment to transmit each data packet. EX2001, ¶111.

A POSITA would understand that there is a difference between an optimal moment and an optimal interval. EX2001, ¶112. A POSITA would recognize that there are many moments within an interval. EX2001, ¶112. That is, there would be many optimal moments within an optimal interval. EX2001, ¶112. However, that would be contrary to the concept of an optimal moment, because any moment could be an optimal moment, and therefore, no one moment is any better than any other moment (hence, no moment is an optimal moment). EX2001, ¶112.

Bahadiroglu explains that the "inter-packet interval" is "the interval between packets that are transmitted consecutively through the connection." EX2001, ¶113; EX1006, ¶68; *see also id.*, ¶69 (describing "inter-packet delay of 10 msec" and "inter-packet delay of 20 ms"). However, Bahadiroglu does not disclose or suggest *when* the inter-packet interval starts, i.e., when the first packet of a quantity of

packets is sent. EX2001, ¶113. Therefore, even if Bahadiroglu's inter-packet interval were somehow incorporated into Rădulescu's scheduler, a POSITA would recognize that such interval would be of no use in informing the scheduler as to when data should be sent. EX2001, ¶113. Indeed, once Rădulescu's scheduler finally grants transmission to a channel whose sendable data exceeded the configurable threshold, a *single* packet is transmitted. EX2001, ¶113; EX1006, 4 (“[O]nce a queue is selected, a packet containing the largest possible amount of credits and data will be produced.”). A POSITA would understand, however, that an inter-packet interval requires at least two packets. EX2001, ¶113. Thus, Rădulescu in view of Bahadiroglu does not disclose or suggest this limitation EX2001, ¶¶103-114.

#### **D. Ground 2 Deficiencies**

In Ground 2, Petitioner alleges that claims 1, 2, 4, 6, 8–12, 13, 18–21 are rendered obvious by Rădulescu and Petersen. *See* Petition, 47-59. As discussed above, the Board need not address claims 1, 2, 4-5, 8-11, 13 and 18-21. *Supra*, § VIII.C. Petitioner has also not established Rădulescu is prior art. The Petition is also deficient because it has not established a POSITA would combine Rădulescu and Petersen or that the prior art discloses all of the limitations of the independent claims, as set forth below.

**1. The limitation 12[d] combination fails**

As discussed above in relation to Ground 1, Rădulescu fails to disclose this limitation. *Supra*, § VIII.C.2.a. Petitioner further alleges that this limitation would be obvious in view of Petersen, which Petitioner alleges discloses a determination unit configured to determine an optimal amount of data to be buffered in a network interface memory, citing paragraphs 160-163 of EX1002 (Mowry Declaration). Pet, 51. Petitioner also offers a purported motivation to combine Rădulescu and Petersen, citing paragraphs 147-153 of EX1002. This argument fails. EX2001, ¶¶122-133.

First, a POSITA would lack motivation to combine Rădulescu and Petersen because Rădulescu is directed to on-chip networks for communication between IP modules where “the size of IP modules attached to the NoC is relatively small,” (EX1005, 1), while Petersen is directed to computer networks and “the interfaces between communications networks and data processing systems,” (EX1007, 1:17–18), where “[t]he host computer or sending system 30 communicates with a host interface logic 31,” (EX1007, 4:26–27). EX2001, ¶128. Peterson explains that representative prior art systems include a local-area network (LAN) network interface controller microchip and a LAN coprocessor microchip. EX1007, 2:3–6. EX2001, ¶128. Petersen’s “threshold logic” is directed to computer networks, not on-chip networks, whereas Rădulescu, and the ’800 Patent, are directed to on-chip networks. EX2001, ¶128; EX1007, FIG. 2, 3:1-3, 4:2-7. As discussed above in

relation to Ground 1, a POSITA would lack motivation to combine elements developed for off-chip networks into an on-chip network environment. EX2001, ¶¶53-70, 128-129.

Second, a POSITA would lack motivation to combine Rădulescu and Petersen because Rădulescu teaches that “[t]o optimize the NoC utilization, it is preferable to send longer packets,” (EX1005, 4), while Petersen’s transmit logic uses a threshold value that seeks to balance an input rate of a transmit buffer, for data of a frame provided by a host computer, to an output rate of the data of the frame to a communication network (EX1007, 4:56–5:13). EX2001, ¶130. Petersen explains that “the threshold value may be set by the host system to optimize performance using the alterable threshold store and the posted status information.” EX1007, 2:31–34; *see also* EX1007, 29:39–40 (“The value for this [threshold] register may be programmed by the host to optimize performance.”). EX2001, ¶130. Petersen further explains that “[i]f set too low, system latencies or bandwidth limitations may cause the adapter to underrun the network during transmission, causing a partial frame with a guaranteed bad CRC to be transmitted. If the value is set too high, then unnecessary delays will be incurred before the start of transmission.” EX1007, 29:40–44; EX2001, ¶130. A POSITA would recognize that, while Petersen’s transmit-buffer rate balancing technique is not divorced from the properties of the communication network, it is not commensurate to optimizing network utilization

as taught by Rădulescu. EX2001, ¶130. Thus, a POSITA would lack motivation to combine elements developed for transmit-buffer rate balancing into a system for optimizing network utilization, and a POSITA would not have a reasonable expectation of success. EX2001, ¶130.

Third, Claim 12 requires that the determination unit, which *determines* the optimal amount of data, be included in the interconnect module, not in the processing module. EX1001, claim 12; EX2001, ¶131. Rădulescu explains the importance to “separate the IP requirements and their implementation, and make application quality of service independent of the IP and NoC implementations.” EX1005, 1; *see also* EX1005, 2 (“Decoupling computation from communication is a key ingredient in managing the complexity of designing chips with billions of transistors, because it **allows the IP modules and the interconnect to be designed independently.**” (emphasis added)). EX2001, ¶131. Rădulescu also explains that “[t]he pressure to keep the protocol stack small is higher on-chip than off-chip, because the size of the IP modules attached to the NoC is relatively small.” Rădulescu also discusses the need for simple network interfaces. EX1005, 1. EX2001, ¶131. In Petersen, on the other hand, the host computer, e.g., a processing module, performs the function of determining the value of the threshold for use by the transmit logic (external to the host computer) in the transmit-buffer rate balancing. EX2001, ¶132; EX1007, 29:39–40 (“[T]he threshold value may be set by the host system to optimize

performance using the alterable threshold store and the posted status information.”); see also EX1007, 29:39–40, 4:46–47, and 4:56–60. Accordingly, a POSITA would lack motivation to incorporate a technique for determining a threshold value for transmit-buffer rate matching that is implemented by a host computer into Rădulescu’s small and simple network interfaces, and further, a POSITA would not have a reasonable expectation of success in doing so. EX2001, ¶¶132-133.

## **2. The limitation 12[e] combination fails**

As discussed above in relation to Ground 1, Rădulescu fails to disclose this limitation. *Supra*, § VIII.C.2.b. The Petition also alleges that this limitation is obvious in a single paragraph of the Petition. Petition, 54. As discussed above, Rădulescu merely discloses that channels are eligible for scheduling, not that sendable data (or any data in the queue) of the channel is sent. EX1005, 4; EX2001, ¶¶136-139. Instead, the scheduler may eventually select the channel for transmission according to the scheduler’s scheduling (e.g., guaranteed-throughput time slots or best-effort arbitration). EX1005, 3–4; EX2001, ¶139. And, when the channel is eventually selected, a packet is created that contains the largest possible amount of data (and credits) (EX1005, 4). EX2001, ¶139. While Rădulescu discloses sending a packet whose data is taken from the eligible channel’s queue, Rădulescu does not disclose or suggest specifically what data is actually packetized and sent. EX2001, ¶139. As discussed above, Petersen’s transmit logic uses a threshold value that seeks

to balance an input rate of a transmit buffer, for data of a frame provided by a host computer, to an output rate of the data of a frame having a predetermined length to a communication network. EX2001, ¶141; EX1007, 4:56–5:13, 2:31–34, 29:39–44, 14:43–46. In Petersen, the length values are provided by the host computer. EX2001, ¶141; EX1007, 16:1–2, 14:27–29, 14:19–20, Petersen 15:35–36. A POSITA would lack motivation to incorporate Petersen's threshold logic, which relies on frames, e.g., packets, being of a predetermined length dictated by the host computer, into Rădulescu's configurable threshold mechanism, which relies on increasing the length of packets to optimize NoC utilization. EX2001, ¶141. Further, a POSITA would not have a reasonable expectation of success in doing so. For example, a POSITA would not understand how to modify Rădulescu's channel scheduling scheme, which selects queues for transmission, to accommodate Petersen's partially-filled transmit-buffers. EX2001, ¶141. For at least these reasons, the combination fails. EX2001, ¶¶141-142.

### **3. The limitation 12[f] combination fails**

The Petition relies in part on its prior analysis of Rădulescu for this limitation. Petition, 54. As discussed above in Ground 1, Rădulescu does not disclose or suggest this limitation. *Supra*, § VIII.C.2.c. Further, as discussed above, a POSITA would not combine Rădulescu and Petersen as alleged in the Petition. *Supra*, §§ VIII.D.1, VIII.D.2; *see also* EX2001, ¶¶143-149.

**E. Ground 3 Deficiencies**

As discussed above, Petitioner has not established a POSITA would combine Rădulescu and Bahadiroglu. *Supra*, § VIII.C. For at least this reason, Ground 3 is deficient. The motivation to combine for Ground 3 fails for at least the same reasons as Ground 1. EX2001, ¶¶158-162.

**F. Ground 4 Deficiencies**

For at least the reasons discussed above with respect to Grounds 1-3, the combination of Ground 4 is deficient. *Supra*, §§ VIII.C, VIII.D, VIII.E; EX2001, ¶163.

**IX. 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.

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Patent Owner's Preliminary Response

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 13,293 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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