UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of

CERTAIN INFOTAINMENT SYSTEMS,
COMPONENTS THEREOF, AND
AUTOMOBILES CONTAINING THE
SAME

Investigation No. 337-TA-1119

COMMISSION OPINION

TABLE OF CONTENTS

The Commission has determined that there has been no violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("section 337"), with respect to U.S. Patent Nos. 6,937,187 ("the '187 patent"); 8,902,104 ("the '104 patent"); 7,512,752 ("the '752 patent"); 7,530,027 ("the '027 patent"); 8,284,844 ("the '844 patent"); and 7,437,583 ("the '583 patent") ("the Asserted Patents") on review of the presiding administrative law judge's ("ALJ") final initial determination ("FID"). This opinion sets forth the Commission's reasoning in support of that determination. In addition, the Commission adopts the findings in the FID that are not inconsistent with this opinion.

I.   BACKGROUND

A.   Procedural History

On June 12, 2018, the Commission instituted this investigation based on a complaint filed by Broadcom Corporation ("Broadcom"). 83 Fed. Reg. 27349 (June 12, 2018). The complaint alleges a violation of section 337 based on the importation into the United States, the sale for importation, and the sale in the United States after importation of automobile information and entertainment systems and components thereof that allegedly infringe one or more claims of the Asserted Patents. FID at 1-2. Broadcom also alleges the existence of a domestic industry.

The notice of investigation names 15 respondents, including: Toyota Motor Corporation of Aichi, Japan; Toyota Motor North America, Inc. of Plano, TX; Toyota Motor Sales, U.S.A., Inc. of Plano, TX; Toyota Motor Engineering & Manufacturing North America, Inc. of Plano, TX; Toyota Motor Manufacturing, Indiana, Inc. of Princeton, IN; Toyota Motor Manufacturing, Kentucky, Inc. of Erlanger, KY; Toyota Motor Manufacturing, Mississippi, Inc. of Tupelo, MS; and Toyota Motor Manufacturing, Texas, Inc. of San Antonio, TX (collectively, "Toyota"); Panasonic Corporation of Osaka, Japan and Panasonic Corporation of North America of Newark, NJ (collectively, "Panasonic"); DENSO TEN Limited of Kobe City, Japan and DENSO TEN

AMERICA Limited of Torrance, CA (collectively, "DENSO TEN"); Renesas Electronics

Corporation of Tokyo, Japan and Renesas Electronics America, Inc. of Milpitas, CA

(collectively, "Renesas"); and Japan Radio Co., Ltd. of Tokyo, Japan ("JRC"). *Id.* The

complaint and notice of investigation were later amended to add ten more respondents, namely:

Pioneer Corporation of Tokyo, Japan and Pioneer Automotive Technologies, Inc. of Farmington

Hills, MI (collectively, "Pioneer"); DENSO Corporation of Aichi, Japan; DENSO International

America, Inc. of Southfield, MI; DENSO Manufacturing Tennessee, Inc. of Maryville, TN; and

DENSO Wireless Systems America, Inc. of Vista, CA (collectively, "DENSO Corp."); u-blox

AG of Thalwil, Switzerland; u-blox America, Inc. of Reston, VA; u-blox San Diego, Inc. of San

Diego, CA; and Socionext Inc. of Kanagawa, Japan ("Socionext"). Order No. 14 (Oct. 3, 2018),

not rev'd in relevant part, Comm'n Notice (Nov. 1, 2018); *see also* FID at 2.[1] The Office of

Unfair Import Investigations was not named as a party. *Id.*

The ALJ held a tutorial and *Markman* hearing on February 6, 2019. FID at 2. The

disputed claim terms are construed in the FID. The ALJ held an evidentiary hearing on June 3-7,

2019. *Id.* at 2.

On November 13, 2019, the presiding ALJ issued the FID finding no violation of section

337 with respect to each of the Asserted Patents. The relevant findings are summarized as

follows:

Respondent Socionext (no violation – no importation)

- The importation requirement as to Socionext was not met. FID at 14-16, 271.

---

[1] Hereinafter, all named respondents are referred to collectively as "Respondents." In general, Respondents are Toyota and Toyota's suppliers.

'583 patent (no violation – technical prong of domestic industry not met):

- Claims 17 and 18 of the '583 patent are infringed by Renesas, DENSO Corp., and Toyota. FID at 30-36, 40-41, 271.

- Claims 25 and 26 of the '583 patent are not infringed by any respondent. *Id*. at 36-39.

- Technical prong of the domestic industry ("DI") requirement was not met for any claim of the '583 patent. *Id*. at 42-48, 271.

- No asserted claims of the '583 patent were shown to be invalid. *Id*. at 48-54.

'752 patent (no violation – asserted claims are invalid):

- Claims 1, 2, 5, 7, and 8 of the '752 patent are infringed by Renesas, Panasonic, Pioneer, DENSO TEN, and Toyota. *Id*. at 63-78, 272.

- The DI requirement was satisfied for the '752 patent as to claims 1, 2, 4, 5, 6, and 7. *Id*. at 78-81, 272.

- Claims 1, 2, 4, 5, 7, and 8 of the '752 patent are invalid as anticipated by U.S. Patent No. 6,240,492 to Foster, et al. ("Foster") or are obvious in view of Foster or U.S. Patent Pub. No. 2003/0106053 ("Sih") in combination with additional prior art. *Id*. at 81-113, 272.

'844 patent (no violation – no infringement or domestic industry):

- No claims of the '844 patent are infringed. *Id*. at 272.

- The DI requirement was not satisfied for any claim of the '844 patent. *Id*. at 272.

- No asserted claims of the '844 patent were shown to be invalid. *Id*. at 272.

'187 patent (no violation – no infringement or domestic industry, invalid claims):

- No claims of the '187 patent are infringed. *Id*. at 272.

- The DI requirement was not satisfied for any claim of the '187 patent. *Id*. at 272.

- Claims 1, 3, 5, and 9 of the '187 patent are invalid. *Id*. at 272.

'027 patent (no violation – no infringement or domestic industry, invalid claims):

- No claims of the '027 patent are infringed. *Id*. at 272.

- The DI requirement was not satisfied for any claim of the '027 patent. *Id*. at 272.

- Claims 11 and 20 of the '027 patent are invalid. *Id*. at 272.

'104 patent (no violation – no infringement, claim 12 invalid):

- Claim 12 of the '104 patent is not infringed. *Id*. at 272.

- The DI requirement was satisfied as to claim 12 of the '104 patent. *Id*. at 272.

- Claim 12 of the '104 patent is invalid. *Id*. at 272.

In addition, Broadcom alleged indirect infringement of the Asserted Patents, but the FID finds

Broadcom failed to carry its burden as to indirect infringement. *Id.* at 41-42, 78.

The FID also includes the ALJ's recommended determination ("RD") on remedy and

bonding. FID at 259-71. Specifically, the RD recommends, in the event a violation is found, the

issuance of a limited exclusion order and cease and desist orders as to each of the domestic

Respondents, and that no bond be imposed for products imported during the period of

Presidential review. *Id.*

On November 26, 2019, Broadcom petitioned the Commission to review certain of the

FID's findings related to only the '583 patent and the '752 patent.[2] On the same day,

Respondents filed a contingent petition for review of issues related to all of the Asserted Patents

except the '027 patent and the '104 patent. *Id*. On December 4, 2019, the parties filed responses

to each other's petitions.[3]

On December 16, 2019, Broadcom and respondents Toyota, Renesas, and the Tier 1

Suppliers[4] filed submissions on the public interest pursuant to Commission Rule 210.50(a)(4)

---

[2] Complainant Broadcom Corporation's Petition for Commission Review (Nov. 26, 2019) ("Broadcom Pet.").

[3] Complainant Broadcom Corporation's Response to Respondents' Contingent Petition for Commission Review (Dec. 4, 2019) ("Broadcom Reply"); Respondents' Reply to Complainant's Petition for Commission Review (Dec. 4, 2019) ("Resp. Reply").

[4] DENSO Corp.; DENSO TEN; Panasonic; and Pioneer.

(19 C.F.R. § 210.50(a)(4)). On December 18, 2019, two non-parties, Peter Morici and the Reshoring Initiative, filed submissions on the public interest in response to the Commission's notice requesting such responses (84 Fed. Reg. 64104 (Nov. 20, 2019)).

On February 26, 2020, the Commission determined to review the FID in part. *See* Notice (Feb. 26, 2020); 85 Fed. Reg. at 12576-78. Specifically, the Commission determined to review: (1) the FID's construction of the term "at least one processor" in claims 25 and 26 of the '583 patent; (2) the FID's infringement and technical prong findings regarding the '583 patent; (3) the FID's infringement findings regarding the '752 patent, in particular, whether the accused Pioneer head units meet the limitations of claims 2 and 5; and (4) the FID's findings regarding invalidity of the '752 patent. *Id.* The Commission determined not to review the FID's findings of no violation as to the '187 patent, the '104 patent, the '027 patent, and the '844 patent. *Id.* The Commission also requested briefing on certain questions related to the issues under review, as well as remedy, bonding, and the public interest.

On March 11, 2020, Broadcom filed its initial written response to the Commission's request for briefing.[5] Respondents filed their initial written response that same day.[6] On March 18, 2020, the parties filed their reply submissions.[7]

---

[5] Complainant Broadcom Corporation's Written Submission on the Issues Identified in the Notice of Commission Determination to Review in Part a Final Initial Determination (March 11, 2020) ("Broadcom Sub.").

[6] Respondents' Additional Briefing on the Questions Posed by the Commission in the Notice of a Commission Determination to Review in Part a Final Initial Determination Finding No Violation of Section 337 (March 11, 2020) ("Resp. Sub.").

[7] Complainant Broadcom Corporation's Reply to Respondents' Additional Briefing on the Questions Posed by the Commission in Notice of Commission Determination to Review in Part a Final Initial Determination (March 18, 2020) ("Broadcom Sub. Reply"); Respondents' Reply Brief on the Questions Posed by the Commission in Notice of a Commission Determination to Review in Part a Final Initial Determination Finding No Violation of Section 337 and on Public Interest, Remedy and Bonding (March 18, 2020) ("Resp. Sub. Reply").

PUBLIC VERSION

On March 11, 2020, the Commission received submissions on remedy, bonding, and the

public interest from the parties[8] and the following non-parties: Representatives and Senators

from Kentucky[9]; Representatives and Senators from Texas[10]; Harman International Industries,

Incorporated (a Tier 1 supplier for Toyota); and the Alliance for Automotive Innovation.

B.   The Asserted Patents

Broadcom asserted six patents in this investigation, which fall broadly into three

categories: (1) the '583 patent relates to electronics architecture; (2) the '752, '027, and

'844 patents relate to electronics for video processing and have overlapping inventors; and

(3) the '187 and '104 patents relate to navigation satellite systems. FID at 6. Because the

Commission determined not to review the FID's findings of no violation as to the '187, '104,

'027, and '844 patents, those patents have been terminated from the investigation, and this

opinion does not address them.

1. The '583 Patent

The '583 patent is entitled "Method and System for Flexible Clock Gating Control" and

issued on October 14, 2008. '583 patent (JX-0004), cover; FID at 7. The '583 patent relates to

electronics architecture and discloses a system for controlling clock signals by using software to

control gates. *Id*. at Abstract. The '583 patent describes a processor that can more flexibly

---

[8] Broadcom Sub. at 39-50; Respondents' Initial Joint Submission on the Public Interest, Remedy, and Bonding (March 11, 2020).

9 Letter from Congressman Aaron Barr, Congressman Hal Rogers, Congressman John Yarmuth, Congressman James Comer, Congressman Brett Guthrie, Senator Mitch McConnell, and Senator Rand Paul from Kentucky (March 11, 2020).

10 Letter from Congressman Van Taylor, Congressman Will Hurd, Congressman Michael C. Burgess, M.D., and Congressman Vincente Gonzalez from Texas (March 11, 2020); Letter from Senator John Cornyn from Texas (March 11, 2020).

control gates, as compared to the prior art, by reading and writing to registers mapped to the gates. *Id*. at 5:3-33.

An exemplary clock signal control system is depicted in Figure 3 of the specification. *Id*. at Fig. 3.
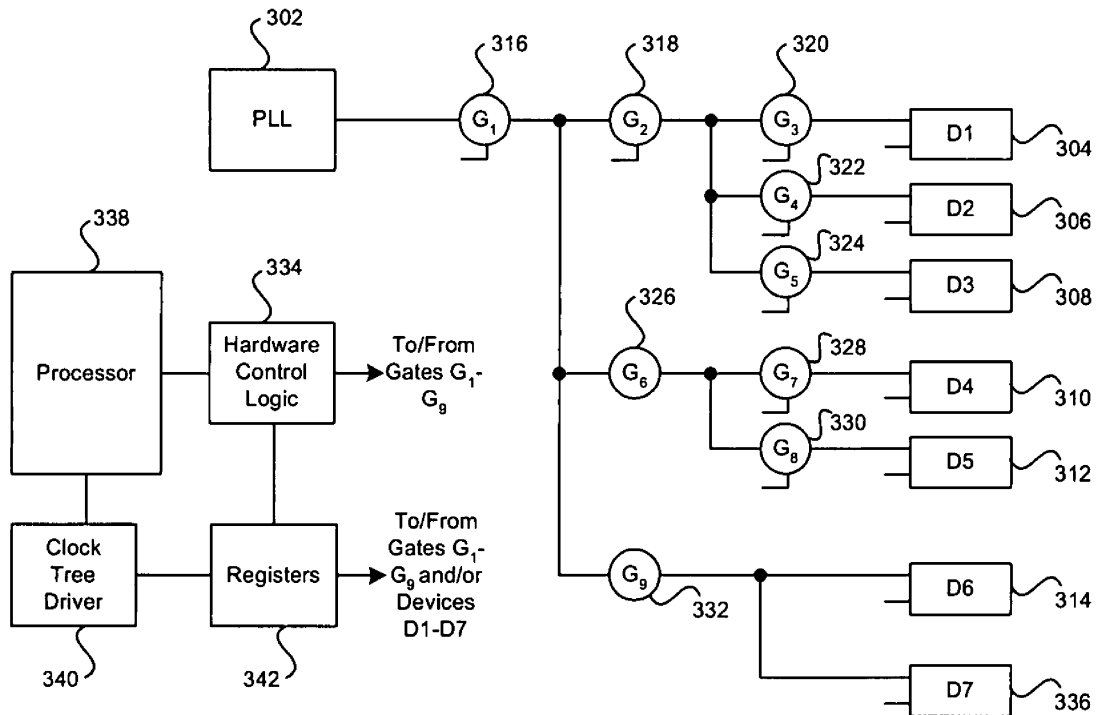
FIG. 3

In operation, the hardware control logic **334** turns the gates (G1-G9) on and off to supply clock signals to the devices (D1-D7), but the processor **338** can also control the gates and devices through the clock tree driver **340** and registers **342**. *Id*. at 4:63-5:13. This feature allows the gates to be "more flexibly controlled in order to cover scenarios that were not anticipated when hardware control logic **334** was designed." *Id*.

7

Broadcom asserts claims 17-18 and 25-26 of the '583 patent for infringement and claims

25 and 26 of the '583 patent for purposes of satisfying the technical prong of the DI requirement.

FID at 5, 27-28, 42.

Claim 17 is an independent claim and recites the following:

> 17. A system for distributing clock signals within an electronic device, the system comprising:
>
> > at least one processor that determines a status of at least one gate that controls flow of a clock signal to at least one device coupled to said at least one gate; and
> >
> > said at least one processor controls said at least one gate based on said determined status.

'583 patent at 7:83-8:2.

Claim 18 depends from claim 17 and recites the following:

> 18. The system according to claim 17, wherein said at least one processor determines whether said at least one device coupled to said at least one gate is active or inactive.

Id. at 8:3-5.

Claim 25 is also an independent claim and recites the following:

> 25. A system for distributing clock signals within an electronic device, the system comprising:
>
> > a clock tree having a plurality of gates;
> >
> > a hardware control logic block coupled to said clock tree that controls at least a portion of said plurality of gates;
> >
> > at least one register that is controlled by a clock tree driver; and
> >
> > at least one processor that overwrites a status of at least a portion of said plurality of gates which is controlled by said hardware control logic block.

Id. at 8:28-37 (emphasis added for disputed limitations).

Claim 26 depends from claim 25 and recites the following:

> 26. The system according to claim 25, wherein said processor via said clock tree driver asserts or de-asserts a current value of said at least one register.

Id. at 8:38-40.

2. The '752 Patent

The '752 patent is entitled "Systems, Methods, and Apparatus for Pixel Fetch Request Interface," and generally relates to a memory access unit ("MAU"), which is an interface between clients that are requesting access to data in memory and a memory controller that controls the access to the memory. '752 patent (JX-0005), cover, 2:51-3:67; FID at 7. The invention of the '752 patent is embodied in an MAU and addresses problems in the prior art of accessing a variety of different, and potentially non-consecutive, addresses within a shared memory. FID at 8 (citing '752 patent at 1:25-2:9).

The MAU can comprise a queue for access requests and logic for generating lists of addresses from the requests and reordering the lists of addresses to optimize access to the memory. *Id.* at 56 (citing '752 patent at 3:20-34). This can "relieve the internal video decoding modules . . . from the burden of knowing the detail of the memory pixel data arrangement and access control." *Id.* (citing '752 patent at 6:16-20).

Broadcom asserts claims 1, 2, 5, 7, and 8 of the '752 patent for infringement purposes and claims 1, 2, 4, 5, 6, and 7 for DI purposes. *Id.* at 57 (citing CIB[11] at 79, 95). The asserted claims follow:

> 1. A memory access unit for accessing data for a module, said memory access unit comprising:
>
> > an output port for providing access requests for lists of addresses in a memory over a link to a memory controller; and
>
> > a queue for queuing the access requests for the lists of addresses.

'752 patent at 8:61-67.

---

[11] Complainant Broadcom Corporation's Post-Hearing Brief (June 21, 2019) ("CIB").

2. The memory access unit of claim 1, further comprising:

an input port for receiving requests for blocks of pixels from a motion prediction
   processing unit; and

logic for generating the lists of addresses from the requests for blocks of pixels,
   wherein the lists of addresses correspond to addresses in a memory that store
   pixels in the blocks of pixels.

Id. at 9:1-7.

4. The memory access unit of claim 2, wherein the logic generates the access requests
based on the list of addresses and based on row-bank accesses needed to access the
addresses.

Id. at 9:13-16.

5. The memory access unit of claim 2, wherein the logic generates the access requests
based on the list of addresses and based on sizes of each of the requests for blocks of
pixels from the motion prediction processing unit.

Id. at 9:17-20.

6. The memory access unit of claim 1, wherein the memory access unit receives data
stored at the addresses in the memory from the lists of addresses in the memory over a
bus shared with one or more clients.

Id. at 9:21-24.

7. The memory access unit of claim 1, wherein the addresses are non-contiguous.

Id. at 9:25-26.

8. The memory access unit of claim 1, wherein the memory access unit receives data
stored at the addresses in the memory from the lists of addresses in the memory over said
link.

Id. at 9:27-30.

C.   **The Accused Products**[12]

The accused products include certain system-on-chip ("SoC")[13] products, Global

Navigation Satellite System ("GNSS") products, head units that incorporate these products, and

automobiles in which the head units are installed. The specific allegations of infringement as to

the SoCs and GNSS chips are set forth in the table below:

Patent (Asserted Claims)	Accused Products
'583 patent, claims 17-18	Renesas SH7769 SoCs
'583 patent, claims 25-26	Renesas ▮▮▮▮▮▮ SoCs[14]
'752 patent, claims 1, 2, 5, 7, 8	Renesas ▮▮▮▮▮ SoCs
	Renesas ▮▮▮▮▮ SoCs
	Renesas ▮▮▮▮▮ SoCs

FID at 27, 57.

The Renesas SH7769 SoCs are incorporated in head units manufactured by DENSO

Corporation, which are installed in Toyota automobiles, specifically, Lexus-branded vehicles.

Id. at 40. The Renesas ▮▮▮▮▮ SoCs, ▮▮▮▮▮▮ SoCs, and ▮▮▮▮ SoCs are

incorporated in Pioneer, Panasonic, and DENSO TEN head units, which are installed in general

Toyota automobiles. *Id.*

---

[12] As noted above, the Commission determined not to review the FID's finding of no violation as to the '187, '104, '027, and '844 patents. Therefore, the accused products alleged to infringe those patents are not addressed.

[13] A Broadcom engineer, Mr. Hellman, testified that an SoC refers to a "single chip that incorporates a bunch of components that previously would have been implemented in many discrete chips." CX-0003C at Q9.

[14] The accused ▮▮▮▮▮ products include the ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, and ▮▮▮▮▮. FID at 64.

D.   The Domestic Industry Products[15]

For the purpose of satisfying the technical prong of the DI requirement, 19 U.S.C.

§ 1337(a)(2), Broadcom alleged that several of its SoCs, for use in its customers' set top boxes

("STB"), practice claims 25 and 26 of the '583 patent and claims 1, 2, and 4-7 of the '752 patent.

FID at 42, 78; *see also* CIB at App. 3.

II.   STANDARD ON REVIEW

With respect to the issues under review, "the Commission may affirm, reverse, modify,

set aside or remand for further proceedings, in whole or in part, the initial determination of the

administrative law judge." 19 C.F.R. § 210.45(c). The Commission also "may take no position

on specific issues or portions of the initial determination," and "may make any finding or

conclusions that in its judgment are proper based on the record in the proceeding." *Id.*; *see also*

Beloit Corp. v. Valmet Oy, 742 F.2d 1421, 1423 (Fed. Cir. 1984).

III.   ANALYSIS

The Commission determines to make the findings, conclusions, and supporting analysis

set forth below. Any findings, conclusions, and supporting analysis in the FID regarding issues

that are under review that are not inconsistent with these findings, conclusions, and supporting

analysis are affirmed and adopted herein.

A.   '583 Patent Issues Under Review

The Commission determined to review three findings related to the '583 patent: (1) the

claim construction of the limitation "at least one processor" recited in claims 25 and 26; (2) the

finding that Broadcom failed to satisfy the technical prong of the DI requirement; and (3) the

---

[15] As noted above, the Commission determined not to review the FID's findings of no
violation as to the '187, '104, '027, and '844 patents, therefore the alleged DI products for those
patents are not addressed.

infringement findings, which includes findings that the Renesas SH7769 SoCs meet the limitations of claims 17 and 18 and the accused ████████ products do not meet the limitations of claims 25 and 26. 85 Fed. Reg. at 12576-77.

For the reasons set forth below, the Commission has determined to modify the FID's construction of "at least one processor" in claims 25 and 26 of the '583 patent but finds that this modified construction does not affect the FID's infringement, invalidity, or DI findings for the '583 patent. The Commission affirms, under a modified analysis explained below, the FID's finding that Broadcom failed to satisfy the technical prong of the DI requirement for the '583 patent. The Commission also affirms the FID's finding that Respondents Renesas, DENSO Corp., and Toyota infringe claims 17 and 18. The Commission further affirms, with the modified reasoning detailed below, the FID's finding that Respondents Renesas, Pioneer, Panasonic, DENSO TEN, and Toyota do not infringe claims 25 and 26 of the '583 patent because the accused products lack the specific processor recited in those claims. Thus, the Commission affirms the finding of no violation for the '583 patent.

1. **Construction of "at least one processor" in Claims 25 and 26**

Claim terms are normally construed according to their ordinary and customary meaning in the art, as understood by a person of ordinary skill in the art ("POSA") in the context of the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (*en banc*), *cert. denied*, 546 U.S. 1170 (2006). Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *Id.* at 1313-17. In addition to the intrinsic evidence, extrinsic evidence may also be considered. *Id*. at 1317, 1319 (noting that extrinsic evidence may be "less significant" and "less reliable" than the intrinsic record). Extrinsic evidence consists of all evidence external to the patent and the

prosecution history, and includes inventor testimony, expert testimony, dictionaries, and learned treatises. *Id.*

a. The FID

Respondents argued before the ALJ that the limitation "at least one processor" should be construed such that the processor is separate from both: (1) the clock tree driver and (2) the hardware control block. FID at 28-29. Broadcom argued that the term should have its plain and ordinary meaning. *Id.* The FID construes the term "at least one processor" in claims 25 and 26 as having its plain and ordinary meaning. *Id.*

b. Analysis

The Commission has determined to modify the construction of the term "at least one processor" recited in claims 25 and 26 of the '583 patent to mean "at least one processor separate from the hardware control block." We see no error in the FID's refusal to adopt Respondents' first proposed limitation that the processor be separate from the clock tree driver. *See* FID at 28-29. However, the parties' submissions in response to the Commission's notice of review, the intrinsic record, and certain findings in the FID support construing the term to include Respondents' second proposed limitation that the processor be separate from the hardware control block.

The parties agree that the modified construction is supported by the intrinsic record. Broadcom Sub. at 2, 6-8; Resp. Sub. at 1-4. Specifically, the plain language of claim 25 separately recites a "hardware control logic block" and "at least one processor." '583 patent at claim 25. Further, Figure 3 shows a processor that is separate from the hardware control logic block. *Id.* at Fig. 3, 2:63-66, 3:12-22, 4:1-27, 4:67-5:18. In addition, Broadcom admitted that it argued during prosecution that "the claimed overwriting by the processor is not performed by the hardware control logic block." FID at 51; CIB at 72-74, 110.

Accordingly, the Commission has determined to modify the claim construction of "at least one processor" recited in claims 25 and 26 of the '583 patent to mean "at least one processor separate from the hardware control block." As acknowledged by the parties, the modified claim construction does not affect the FID's relevant findings with respect to the '583 patent. *See* Broadcom Sub. at 2, 6-8; Resp. Sub. at 1-4; *see also* Broadcom Sub. Reply at 2-3.

2. Domestic Industry – Technical Prong for the '583 Patent

a. The FID

The FID finds that Broadcom failed to demonstrate that its DI products, as represented by the Broadcom ███████[16] SoC, satisfy the technical prong of the DI requirement because the asserted SoCs do not meet the limitations of claims 25 or 26 of the '583 patent, in particular, the limitation "at least one register that is controlled by a clock tree driver" recited in claim 25. FID at 42-48. The FID finds that Broadcom does not dispute that the claimed "clock tree driver" is stored on external memory separate from Broadcom's SoC. *Id.* at 44. The FID also finds that Broadcom has not identified any particular set-top box or any specific memory that contains the clock tree driver software relied on by Broadcom's expert. *Id.* at 46.

The FID relies on *Certain Mobile Devices, Associated Software, and Components Thereof*, Inv. No. 337-TA-744 ("*Mobile Devices*"), in which the Commission considered the issue of Microsoft software provided for use on mobile devices in the context of the technical prong for DI. *Id.* at 44-46 (citing *Mobile Devices*, Final ID at 196-206 (Dec. 20, 2011), *not rev'd in relevant part by* Comm'n Op. (May 18, 2012)). In *Mobile Devices*, the Commission

---

[16] There was no dispute that the Broadcom ███████ is representative of the other asserted Broadcom DI products. FID at 42.

affirmed, in relevant part, that Microsoft failed to satisfy the technical prong because it failed to

confirm how the devices on which it relied actually operated. *Id.*[17]

The FID concludes that Broadcom failed to identify any specific external memory or any

set-top box integrating Broadcom's SoC DI products that meet the "clock tree driver" limitation

and thus failed to satisfy the technical prong of the DI requirement with respect to the

'583 patent. *Id.* at 45-46 (citing *Microsoft Corp.*, 731 F.3d at 1363).

b. Analysis

The Commission determined to review the FID's findings regarding the technical prong

of the DI requirement for the '583 patent. 85 Fed. Reg. at 12576-77. For the reasons below, the

Commission has determined to affirm, with a modified reasoning, the FID's finding that

Broadcom has failed to satisfy the technical prong with respect to the '583 patent.

The "domestic industry requirement" consists of a so-called "technical prong" and a so-

called "economic prong." The technical prong requires that the complainant practice the asserted

patent claims. *Crocs, Inc. v. Int'l Trade Comm'n*, 598 F.3d 1294, 1306-07 (Fed. Cir. 2010);

Certain Microsphere Adhesives, Process for Making Same and Products Containing Same,

Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm'n Op. at 8 (Jan. 16,

1996). The test for "practicing" a patent is essentially the same as it is for infringement, only it

involves comparing the complainant's own "domestic industry products" to one or more claims

of the patent. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). "In

order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show

that the domestic industry practices any claim of that patent, not necessarily an asserted claim of

---

[17] The Federal Circuit affirmed the Commission's determination. *See Microsoft Corp. v. Int'l Trade Comm'n*, 731 F.3d 1354, 1362-64 (Fed. Cir. 2013).

that patent." *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm'n Op. at

55 (Jan. 5, 2004) (citing *Certain Microsphere Adhesives, Process for Making Same, and

Products Containing Same, Including Self-stick Repositionable Notes*, Inv. No. 337-TA-366,

USITC Pub. No. 2949 (Jan. 1996), Comm'n Op. at 16, 1996 WL 1056095 at *8, *aff'd sub nom.

Minnesota Mining & Mfg. Co. v. U.S. Int'l Trade Comm'n*, 91 F.3d 171 (Fed. Cir. 1996)).

In its petition for review, Broadcom argued that the development and testing of its

"Broadcom DI system," which Broadcom alleged includes both hardware (physical SoC) and

firmware (software that runs on SoC), meets the limitations of claim 25. Broadcom Pet. at 44-

55. Broadcom further argued that, when the firmware is executed, the clock tree driver software

(the ▮▮▮▮▮ file) that is initially stored on the external memory of its customer's set-top box

is brought into the SoC's internal memory. *Id*. Broadcom contended that its hardware and

firmware are implemented together and tested, and that both are needed for the system to be

operational. *Id.* at 47 (citing CX-0006C at Q/A180-209; RX-00014C at Q/A27). Broadcom

concluded that the clock tree driver software, once executed, meets the limitations of claim 25.

The Commission specifically finds that Broadcom's DI product with respect to the

'583 patent is only the SoC and does not include customer set-top boxes or a larger system.

Thus, as the FID finds, Broadcom's SoC DI products do not meet the limitation in claim 25, "at

least one register that is controlled by a clock tree driver." FID at 42-48. Further, to the extent

that Broadcom sought in its petition to rely on a customer set-top box or larger system, as

opposed to only the SoC, as its DI product, the Commission finds such reliance waived because

Broadcom did not present it before the ALJ.

1) Broadcom's DI Products are the SoCs Only

In its post-hearing brief, Broadcom stated that its "STB DI Products that practice one or

more claims of the '583 patent include products with the following Core/Die Part Numbers:

███

██████████. The STB DI Products are listed in Appendix 3." CIB at 15-16, App. 3.

Broadcom's "████████ Hardware Data Module" document describes the representative

"████████" as "a next-generation *single-chip* High Definition TV (HDTV) SoC delivering high-performance and low-power solutions for IP, cable, satellite, terrestrial, and over-the-top (OTT) ultra-small form factor set-top box (STB) applications." RX-0337C.18 (BCMTOY0055591) (emphasis added). The following are two examples of system block diagrams of the Broadcom SoC DI products:
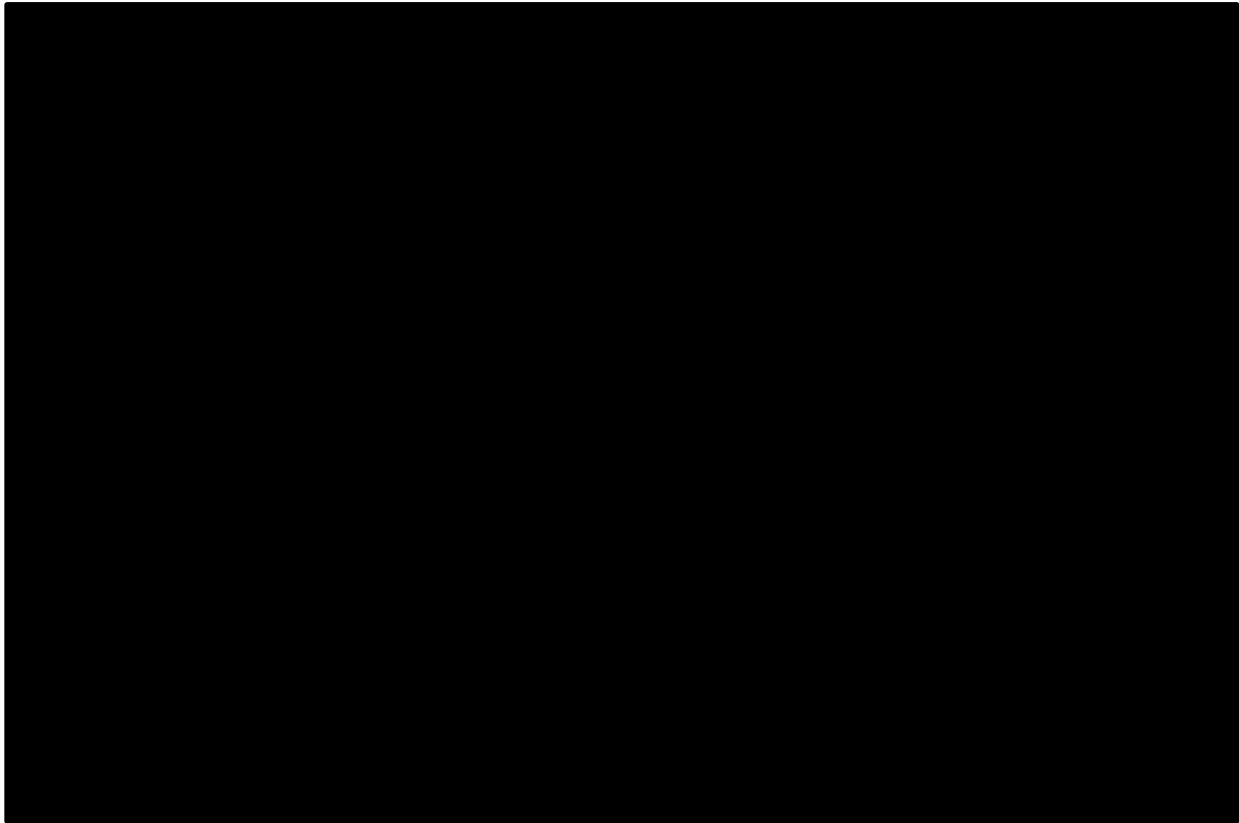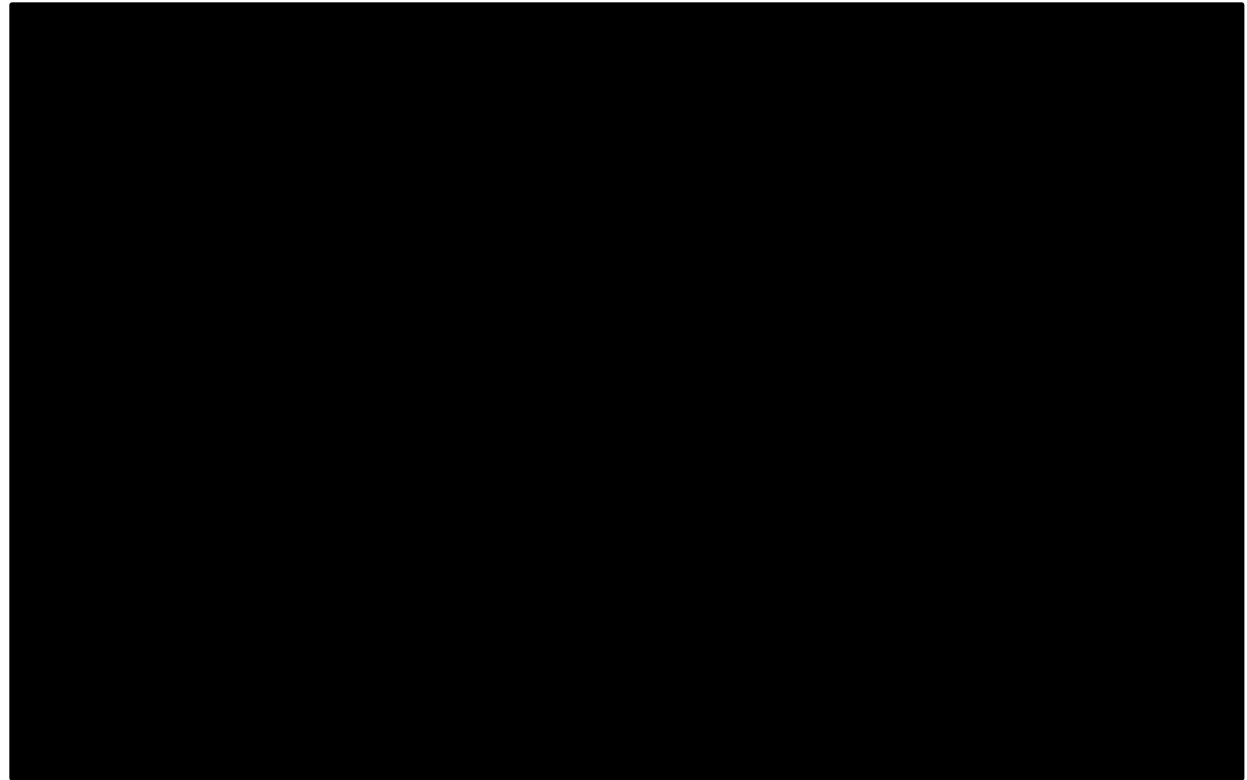
RX-0337C.22 (BCMTOY0055595); RX-0023C.18 (BCMTOY0033113) (respectively). From

the Broadcom system block diagrams, it is clear that the Broadcom DI products, ▮▮▮▮▮ and

▮▮▮▮▮ are only the "single-chip" SoCs at the center of the diagram. *Id.*; RX-0337C.18

(BCMTOY0055591). Further, as explained by Respondents' expert, Dr. Przybylski, the

Broadcom SoCs are not complete systems but instead are complex integrated circuits. RX-

0014C at Q/A20.

Broadcom and its expert relied on the testimony of a Broadcom engineer, Mr. Hellman,

who testified about Broadcom's SoCs. CIB at 59 (citing CX-0003C at Q/A71-77). When asked,

"[w]hat is an SoC?", Mr. Hellman testified that,

> SoC stands for "System on a Chip." It refers to a single chip that incorporates a
> bunch of components that previously would have been implemented in many
> discrete chips. It usually refers to a chip tailored for a specific market or
> application, as opposed to things like general-purpose CPU chips that can be used
> for many different applications. A SoC gives a low-cost solution for an
> application because all the necessary functions are incorporated in a single device.

CX-0003C at Q/A9. Mr. Hellman also testified regarding Broadcom's clock gating technology, which is referred to as " ███████████ " functionality and is relevant to the invention claimed in the '583 patent. *Id.* at Q/A71-77. Mr. Hellman's testimony regarding clock gating technology focused on only the SoCs (the "chips") and did not address the customers' set-top boxes. *Id.*

Broadcom's expert, Dr. McNair, analyzed the ████████ SoC in his technical prong analysis for the '583 patent. CX-0006C at Q/A180; *see also id.* at Q/A174-209 (DI technical prong analysis). In particular, Dr. McNair relied on Mr. Hellman's testimony that the " ██████ ██ " and " ██████ ██ ██████████ ." *Id.* at Q/A178 (emphasis added). At the hearing, Dr. McNair confirmed that the ████████ is a Broadcom SoC and is physically a chip. Tr. 109:3-25.

Based on the evidence of record, it is clear that Broadcom's DI products are only the asserted SoCs and do not include the customers' set-top boxes or a larger system. To the extent that Broadcom argued in its petition that its DI products are a system or something other than the SoCs, Broadcom waived that argument because it was not presented to the ALJ. *Certain Wireless Consumer Electronics Devices and Components Thereof*, Inv. No. 337-TA-853, Comm'n Op. at 41 (Pub. Ver. Mar. 21, 2014); *Broadcom Corp. v. Int'l Trade Comm'n*, 542 F.3d 894, 900-01 (Fed. Cir. 2008) (finding waiver where "Broadcom did not adequately present to the administrative law judge the argument it now presents on appeal[.]").

2) Broadcom's Evidence of Alleged Testing and Use by Customers is Insufficient to Satisfy the Technical Prong

Even if the system described in Broadcom's petition (*see* Broadcom Pet. at 44) is considered, there is a lack of evidence to support a finding that the alleged system meets the limitations of claims 25 and 26 of the '583 patent. Broadcom's evidence is not specific, not

PUBLIC VERSION

corroborated by documents or testimonial evidence, and does not show that the clock tree driver

is actually present on either the Broadcom DI products or any of its customers' set-top boxes.

Broadcom argued that its testing of the "firmware and hardware of the DI System"

satisfies claim 25. Broadcom Pet. at 45-46 (citations omitted). Specifically, Broadcom

contended that its hardware and firmware are implemented together and tested, and that both are

needed for the system to be operational. *Id.* at 47 (citing CX-0006C at Q/A180-209; RX-00014C

at Q/A27). However, Broadcom's development and testing allegations are supported by only the

vague testimony of a Broadcom engineer, Mr. Hellman, who testified generally about

development. CX-0003C at Q/A13, 16 (stating that the firmware and hardware "must be fully

functional to validate the operation of the core before tapeout"). Broadcom failed, however, to

cite to any explanation of what makes the product "fully functional" or what is included in the

various steps in the validation process, specifically showing the practice of each limitation of

claims 25 and 26. Broadcom Pet. at 45-47.

Broadcom also relied on Mr. Hellman's general statements regarding testing, including

the following:
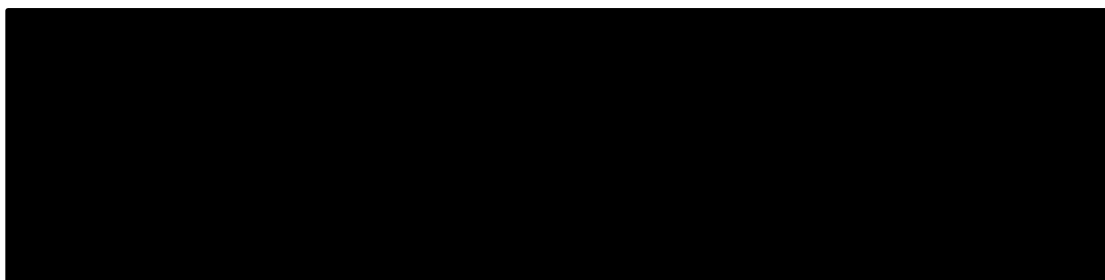
Id. at 45-46 (citing CX-0003C at Q/A13) (emphasis omitted). However, Broadcom presented no

evidence of a prototype or product incorporating the SoCs, no evidence of development or

testing beyond Mr. Hellman's testimony, and no evidence of the specifically identified clock tree

driver software allegedly installed on the SoCs during development or testing. *See* CX-0003C at

Q/A13, 16; Tr. 110:23-111:8.

We agree with the FID's reliance on *Mobile Devices*. FID at 43-46 (citing Inv. No. 337-TA-744, ID at 196-206). Pursuant to section 337(a)(2) and (3), a complainant must identify "actual 'articles protected by the patent'" in order to establish a domestic industry. *See Microsoft Corp.*, 731 F.3d at 1361-62. In *Mobile Devices*, the ALJ found that, because Microsoft did not point to evidence that its expert examined client applications running on third-party mobile phones or confirmed how they operated, Microsoft failed to show that there was a domestic industry product that actually practiced the patent Microsoft asserted. *Microsoft*, 731 F.3d at 1361-62. The Federal Circuit affirmed the Commission's determination that there was "insufficient proof that the [Microsoft] patent covers the articles on which Microsoft relied to prove a domestic industry." *Id.* at 1363-64.

Here, even under Broadcom's new "system" argument, Broadcom has not offered any analysis of its customers' products. Broadcom Pet. at. 51-54; *see also* FID at 43-46. Broadcom asserted that it provides actual firmware to its customers, including Comcast, DirecTV, SKY, EchoStar, and TiVo, but fails to provide any evidence beyond stating its customers' names. *Id*. at 53. Broadcom failed to identify any specific customer set-top boxes or particular memory that is incorporated in the customer's set-top boxes and satisfies the "clock tree driver" limitation recited in claim 25. *Id.* at 51-54; *see also* CX-0003C at Q/A12, 53–60; Tr. 113:1–114:13 (Hellman). Broadcom also failed to offer any detailed evidence regarding its alleged use and testing of the SoCs, such as what the testing entails or when it occurs in the development process. *Id.* Neither does Broadcom present any specific evidence or documents to substantiate the alleged customer use (including customer requests for help), what software or hardware required assistance from Broadcom, or how Broadcom allegedly "knows what software is running on its customers' products." *Id*. at 53-54 (citing CX-003C at Q/A51, 53, 55, 59; Tr.

114:2–13; Tr. 113:1-9; Tr. 111:4–8; Tr. 106:10-17). Thus, even if Broadcom's new system argument is considered, there is insufficient proof that the '583 patent covers the system. *Id.*; *see also Microsoft*, 731 F.3d at 1363-64.

Because the Broadcom SoC DI products do not meet all of the limitations of claims 25 and 26 of the '583 patent, the Commission affirms, with the additional reasoning provided above, the FID's finding that Broadcom failed to satisfy the technical prong of the DI requirement with respect to the '583 patent.

3. Non-Infringement of Claims 25 and 26 of the '583 Patent

Section 337 prohibits "the importation into the United States, the sale for importation, or the sale within the United States after importation . . . of articles that infringe a valid and enforceable United States patent . . . ." 19 U.S.C. § 1337(a)(1)(B). Direct infringement includes making, using, offering to sell, or selling a patented invention or importing a patented invention into the United States, without consent of the patent owner. 35 U.S.C. § 271(a). To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the asserted patent read on the accused product or process, either literally or under the doctrine of equivalents. *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 261 F.3d 1329, 1336 (Fed. Cir. 2001). Each limitation in a patent claim is considered material and essential to an infringement determination. *See London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991).

a. FID

The FID finds that the accused Renesas ███████ SoCs do not satisfy the limitations of claims 25 or 26[18] of the '583 patent. FID at 36-42. Specifically, those accused SoCs do not

---

[18] Broadcom accused products incorporating the Renesas ███████ SoCs, the ████
████████████████████████ models, of infringing only claims 25 and 26 of the

meet the limitation, "at least one processor that overwrites a status of at least a portion of said plurality of gates which is controlled by said hardware control logic block" from claim 25. *Id.* at 37-38. Claim 26 depends from claim 25; thus, the accused products also do not meet the limitations of claim 26. *Id.* at 38; *Ferring B.V. v. Watson Labs., Inc.-Fla.*, 764 F.3d 1401, 1411 (Fed. Cir. 2014) ("Because we hold that the asserted independent claims of [plaintiff's] patents are not infringed, the asserted dependent claims are likewise not infringed.").

The FID finds that Broadcom's expert identified only a hypothetical scenario that allegedly meets the overwriting limitation and, moreover, did not identify any software that performs the overwriting function. *Id.* at 37-39. The hypothetical called for the ▮▮▮▮▮▮ ▮▮▮▮ to change ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, and, as a result, the processor's software would perform the overwriting function in response to the change in ▮▮▮▮▮▮▮▮ *Id.* at 37-39 (citing CX-0006X at Q/A121). Broadcom's expert admitted that his alleged "overwriting" hypothetical would occur only when the ▮▮▮▮▮▮▮▮▮▮ changes during ▮▮▮▮▮ and that he could not identify any specific source code in the accused products where that sequence "actually happened." *Id.* Respondents' expert testified that ▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮." *Id.*; RX-0008C at Q/A102-04.

Before the ALJ, the parties argued as to which Federal Circuit case provided the proper standard for evaluating infringement. *Id.* at 39. The FID finds that the "overwrites a status"

'583 patent. FID at 30-31 (citing CIB at 37), 36 (citing CIB at 44-45). Broadcom accused the Renesas SH7769 SoCs, and products that incorporate them, of infringing claims 17 and 18 of the '583 patent. *Id.* The FID finds infringement of claims 17 and 18, and, on review, the Commission affirms that finding without modification. *Id.* at 31-36; 85 Fed. Reg. at 12576-77.

limitation is closer to the claim at issue in *Nazomi*, as argued by Respondents, than the claim at issue in *Silicon Graphics*, as argued by Broadcom. *Id.* at 39 (citing *Nazomi Commc'ns, Inc. v. Nokia Corp.*, 739 F.3d 1339, 1343-45 (Fed. Cir. 2014) (finding non-infringement where claimed functionality was not enabled without modification); *Silicon Graphics Inc. v. ATI Techs., Inc.*, 607 F.3d 784, 794-95 (Fed. Cir. 2010) (finding infringement where "a product includes the structural means for performing the claimed function")).

The FID explains that in *Nazomi*, the Federal Circuit distinguished *Silicon Graphics* because the claims at issue in *Nazomi* included limitations that "recite specific claim functionalities that cannot be practiced in hardware alone and require enabling software," as opposed to the claim limitations in *Silicon Graphics*, where hardware would be used with a standard operating system to perform the claimed processes. *Id.* at 38-39 (citing *Nazomi*, 739 F.3d at 1343-45). The FID finds that the processor in the ████████ SoCs requires ████████ ███████████████████████████████████████, to perform the claimed function. *Id.* at 39 (citing Tr. At 167:2-5; RX-0008C at Q/A106). The FID further finds that Broadcom did not identify software that actually performs the overwriting function, and thus failed to carry its burden to show claims 25 and 26 are infringed. *Id.*

b. Analysis

The Commission determined to review the FID's findings that Respondents do not infringe claims 25 and 26 of the '583 patent. 85 Fed. Reg. at 12576-78. The Commission hereby affirms, with the modified analysis set forth below, the FID's determination that Respondents do not infringe claims 25 and 26 of the '583 patent and adopts the FID's findings to the extent they are not inconsistent with this opinion.

In its petition for review, Broadcom argued that infringement of claims 25 and 26 requires hardware and software capable of practicing the claimed functionality of "overwrites a

25

status," but that there is no requirement that the functionality is actually performed. Broadcom Pet. at 55-62. Although we agree with this general statement, Broadcom has failed to show that the accused products have the required functionality.

The FID correctly finds that Broadcom's expert identified a hypothetical scenario that would occur only when the ▮▮▮▮▮▮▮▮ changes ▮▮▮▮▮▮▮▮▮▮▮▮▮▮. FID at 37-39; *see also* '583 patent at 8:27-37. Broadcom's expert admitted, however, that he could not identify any specific source code in the accused products where that sequence of events actually happened or could happen. *Id.* at 38 (citing Tr. 165-67). This lack of evidence is fatal to Broadcom's infringement theory for claims 25 and 26.

Moreover, Broadcom's hypothetical is illogical. As noted in the FID, Respondents' expert, Dr. Colwell, testified that ▮▮." FID at 37-38 (RX-0008C at Q/A103-04); *see also* RX-0008C at Q/A77-81 (Dr. Colwell reviewed a hardware manual and source code). Thus, the evidence shows that the hypothetical software overwrite could not happen in a functional system because such a system does not ▮▮▮▮▮▮▮▮▮▮▮▮▮. Tr. 164:7-165:20; RX-0008C at Q/A102-104. Instead, the ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, and then the ▮▮▮▮▮▮ ▮▮▮▮▮▮ *Id.* Notably, Broadcom did not identify any possible source material, such as a manual, product specifications, or software, that discloses the alleged ▮▮▮▮▮▮ of the ▮▮▮▮▮▮. Tr. 166:12-167:17; CIB at 48-52; CRB[19] at 11-16; RX-0008C at Q/A105-06. Thus, Broadcom failed to present evidence of the prerequisite necessary for the hypothetical.

---

[19] Complainant Broadcom Corporation's Post-Hearing Reply Brief (July 1, 2019) ("CRB").

In *Nazomi*, the Federal Circuit found that the asserted apparatus claim required both hardware and software capable of practicing the claimed functionality. 739 F.3d at 1343-45. The Court then found that non-infringement was appropriate because the accused Jazelle hardware was not functional without the enabling Jazelle Technology Enabling Kit ("JTEK") software and the JTEK software was not installed by the alleged infringers. *Nazomi*, 739 F.3d at 1345. The Federal Circuit distinguished its prior holding in *Silicon Graphics* that "an apparatus claim directed to a computer that is claimed in functional terms is nonetheless infringed so long as the product is designed in such a way as to enable the user of that [product] to utilize the function *without having to modify the product*," and further reasoned that "[t]he purchase and installation of the JTEK software clearly constitutes a 'modification' of the accused products." *Id.* (citing *Silicon Graphics*, 607 F.3d at 794) (emphasis in original).

Here, Broadcom asserted both software and hardware were required to practice claims 25 and 26, yet it failed to present evidence of any software or other enabling functionality present on the accused SoCs that results in a change in the ███████████████████████████, and thus, there is no evidence of Broadcom's hypothetical overwriting capability. Thus, the FID's finding that claims 25 and 26 are not infringed comports with *Nazomi* because functionality that allows for changing the ████████████████████████████████ process would be a necessary modification.

Accordingly, the Commission affirms, with the modified reasoning described above, the FID's finding that Respondents do not infringe claims 25 and 26 of the '583 patent.

B.   '752 Patent Issues Under Review

The Commission determined to review two findings related to the '752 patent: (1) whether the asserted claims are invalid and (2) whether the accused Pioneer head units meet the limitations of claims 2 and 5. 85 Fed. Reg. at 12576-77.

1. Invalidity Findings for Claims 1, 2, 4, 5, 6, 7, and 8 of the '752 Patent

A party cannot be held liable for infringement if the asserted patent claim is invalid. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Patent claims are presumed valid (35 U.S.C. § 282), so a respondent challenging validity must overcome this statutory presumption by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995); *see also Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011).

The FID makes the following invalidity findings for the '752 patent's asserted claims:

1. Foster anticipates claims 1, 2, 4, and 7; Foster does not anticipate claims 5 and 8. *See* FID at 82-94.

2. Foster alone renders claims 1, 2, 4, 7, and 8 obvious; Foster combined with U.S. Patent Publication No. 2002/00331179 A1 to Rovati, et al. ("Rovati") does not render claim 5 obvious. *See id.* at 94-100.

3. Sih in combination with several other prior art references, including Foster and/or U.S. Patent No. 6,075,899 to Yoshioka, et al. ("Yoshioka"), render claims 1, 2, 4, 5, and 7 obvious (*see id.* at 100-108; 110-111); Sih in combination with Foster does not render claim 6 obvious (*see id*. at 109-110); Sih in combination with Foster does not render claim 8 obvious (*see id.* at 111).

Thus, the FID finds that every asserted claim, except for claim 6,[20] of the '752 patent is invalid.

The Commission hereby affirms the FID's determination that claims 1, 2, 4, 5, 7, and 8 of the '752 patent are invalid for the reasons discussed herein and adopts the FID's findings to the extent they are not inconsistent with this opinion. Specifically, the Commission:

- Reverses the FID's finding that claim 8 is not anticipated by Foster, affirms that claims 1, 2, 4, and 7 are anticipated by Foster, and affirms that claim 5 is not anticipated by Foster.

---

[20] Broadcom relied on claim 6 for only its domestic industry allegations and does not allege that any Respondent infringes claim 6. FID at 57 (citing CIB at 79, 95). The FID finds that Broadcom satisfied the technical prong of the DI requirement for the '752 patent, and this finding is not under review. *Id.* at 78-81; 85 Fed. Reg. at 12576-77.

- Affirms, with the modified analysis below, the FID's findings that claims 1, 2, 4, 7, and 8 are obvious based on Foster alone and that claim 5 is not obvious based on Foster in combination with Rovati.

- Affirms without modification the FID's obviousness findings based on Sih in combination with other prior art references, including that claim 5 is invalid as obvious.

a. Anticipation of Claim 8 of the '752 Patent by Foster

1) The FID

The FID finds that Foster anticipates claims 1, 2, 4, and 7, but not claims 5 and 8, of the '752 patent. FID at 82-94. Foster describes the integration of multiple functions onto a single chip system and identifies "a need in the art for a memory interface for a functional unit of an integrated system which allows the functional unit to simultaneously access both dedicated memory and shared memory through multiple ports." *Id.* at 82 (citing Foster at 1:29-2:10, 2:31-37).

Specifically, the FID finds that Foster's dedicated bus **22** and general system bus **16** disclose the "link" limitation recited in claim 1. *Id.* at 94. Foster further provides that "the depicted data buses in practice may each comprise an associated read bus and write data bus," and Figure 3 depicts memory data paths going to and from the memory interface **28**. *Id.* (citing RX-0109 at 6:16-18, RX-0005C at Q/A 93). The FID also finds that "[o]n cross-examination, [Broadcom's expert] admitted that the arrows in Foster's figures indicate that data is provided in both directions." *Id.* (citing Tr. 994). The FID agrees with Respondents that Foster "discloses a memory access unit that is capable of receiving data over a link." *Id.*

The FID concludes with respect to claim 5, however, that Foster does not disclose that "the logic generates the access requests based on the list of addresses and based on sizes of each of the requests for blocks of pixels from the motion prediction processing unit" based on Respondents' argument regarding Foster's lookahead request generator **46** and alternative

argument regarding additional applications. FID at 91-93. As to claim 8, the FID finds that

"Foster does not explicitly disclose that the memory access unit actually 'receives data stored at

the addresses in the memory from the lists of addresses in the memory,'" as claim 8 requires. *Id.*

at 94 (citing CIB at 104-05; CX-0014C at Q/A 63).[21]

2) Analysis

Based on the evidence of record, the FID's findings, and the parties' submissions, the

Commission reverses the FID's finding that claim 8 is not anticipated by Foster. The

Commission finds that Foster anticipates claim 8 because Foster has figures that exactly illustrate

claim 8's limitation of a link that receives data and there is no dispute that Foster's figures are

enabled and operable. In general, both the '752 patent and Foster describe a system with an

interface and methods for requesting data from and accessing a memory. CIB at 75-76

(describing the '752 patent); 96-97 (describing Foster).

While the FID finds that "Foster does not explicitly disclose that the memory access unit

actually 'receives data . . . ,'" it further finds that Foster's system "may be capable of practicing

the claimed limitation." FID at 94 (citing CIB at 104-05; CX-0014C at Q/A63). The FID further

finds that Respondents' expert "makes a convincing case for obviousness by explaining how one

of ordinary skill in the art would recognize that Foster's memory interface is capable of receiving

the requested data." FID at 100 (RX-0005C at Q/A93). Claim 8, however, is an apparatus claim

and is anticipated by Foster even if Foster's disclosure is only capable of receiving, or configured

to receive, data over a link.

---

[21] However, as discussed below, the FID later finds that Foster alone renders claim 8 obvious because Foster discloses a limited number of data paths and both parties' experts agreed that memory data can be sent and received from the memory interface, therefore, receiving the requested data at the memory interface would be one of a finite number of identified, predictable options. FID at 100.

Specifically, the Federal Circuit has explained that "[a]pparatus claims cover what a device is, not what a device does." *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2008) (citing *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990)). "[D]epending on the claims, 'an accused device may be found to infringe if it is reasonably capable of satisfying the claim limitations, even though it may also be capable of noninfringing modes of operation.'" *Id.* (citations omitted). "Similarly, a prior art reference may anticipate . . . an apparatus claim—depending on the claim language—if the reference discloses an apparatus that is reasonably capable of operating so as to meet the claim limitations, even if it does not meet the claim limitations in all modes of operation." *Id.*

The parties agree that the "data" recited in claim 8 must be received over the same link used to request it and it must be the same "data" that was requested over the link. Resp. Sub. Reply at 3-4; Broadcom Sub. at 5. Moreover, both parties' experts agree that Figure 3 of Foster "indicates that *memory data* can be sent and received from the memory interface." *Id.* at 100 (emphasis added) (citing RX-0005C at Q/A93; Tr. 993-94 (Wolf)). Importantly, the FID finds that the MAU disclosed in Foster "is capable of receiving data over a link," although it also finds that "Foster does not explicitly disclose that the memory access unit actually 'receives *data stored at the addresses in the memory* from the lists of addresses in the memory.'" *Id.* at 94 (emphasis added).

Broadcom, however, did not identify any deficiency in the "link" (dedicated bus **22**) disclosed in Foster that would need to be modified in order for the memory interface to receive the data that it requested from dedicated memory. Broadcom Sub. at 13-15.[22] Rather, as the FID

---

[22] Instead of substantively addressing alleged deficiencies in Foster's disclosure of a "link," Broadcom argues that: (1) there is no evidence in the record regarding how a POSA could or would need to modify the link; and (2) Respondents did not argue that Foster could be

finds, Foster is already configured to, and capable of, meeting the claim 8 limitations. FID at 94, 100. Thus, the FID correctly finds that the "data" which the link disclosed in Foster is capable of receiving is the requested data as required by claim 8. *Id.*

Finally, Broadcom's statement that "claim 8 recites a 'memory access unit' configured to **both** (1) 'receive[] data stored at the addresses in the memory from the lists of address in the memory' . . . **and** (2) receive the data over 'said link[,][23]'" supports an anticipation finding. Broadcom Sub. at 10 (emphasis in original); *see also id*. at 12. Broadcom argued in its post-hearing briefs that Foster did not "discuss the memory interface **28** receiving data" and "none of Respondents' evidence establishes that the MAU, memory interface **28**, receives data." CIB at 106; CRB at 44. However, in its brief on review, Broadcom concedes that the MAU need only be "configured to" receive the data over said link. This admission, combined with the FID's finding that Foster's MAU is "capable of receiving data," further supports a finding that the disclosure in Foster meets claim 8's requirement that the memory be "configured to" receive the data. FID at 94.

Accordingly, the Commission reverses the FID's anticipation analysis and finds that the evidence shows that Foster discloses every limitation of, and thus anticipates, claim 8 of the '752 patent.

---

modified to disclose the limitations of claim 8, so Respondents waived any arguments regarding modifying Foster. Broadcom Sub. at 13-15.

[23] The "said link" that Broadcom mentions is the "link" in claim 1. Specifically, claim 1 of the '752 patent requires, "an output port for providing access requests for lists of addresses in a memory over **a link to a memory controller**." '752 patent at claim 1 (emphasis added). Claim 8 depends from claim 1 and further requires, "wherein the memory access unit receives data stored at the addresses in the memory from the lists of addresses in the memory over **said link**." *Id.* at claim 8 (emphasis added).

b. Obviousness of Claims 1, 2, 4, 5, 7, and 8 of the '752 Patent Over Foster Alone

The FID finds that claims 1, 2, 4, 7, and 8 are obvious over Foster alone and claim 5 is not obvious over the combination of Foster and Rovati. FID at 94-100. Broadcom argued in its petition that Respondents allegedly did not argue for obviousness of the asserted claims over Foster alone and thus such a finding violated the Administrative Procedures Act ("APA"). Broadcom Pet. at 17-20 (citing 5 U.S.C. § 554(c); 5 U.S.C. § 556(d); 19 C.F.R. § 210.36(a)), 22-23, 26 n.10, 30 n.14, 31 n.15, 36 n.16.

The Commission has determined to affirm, based on the modified reasoning discussed below, the FID's findings that claims 1, 2, 4, 7, and 8 of the '752 patent are rendered obvious by Foster alone, and that claim 5 is not obvious over Foster in combination with Rovati. The Commission adopts the FID's findings to the extent they are not inconsistent with the modified reasoning. This determination does not violate the APA because Broadcom had both notice of, and an opportunity to respond to, the invalidity arguments based on Foster, as explained below.

1) The FID

Respondents argued "that Foster renders obvious claims 1, 2, 4, 5, 7, and 8 of the '752 patent, alone or in combination with additional prior art references." FID at 94 (citing RIB at 98-104). The FID finds that claims 1, 2, 4, 7, and 8 are invalid as obvious over Foster alone, but does not find claim 5 invalid as obvious over the combination of Foster and Rovati. *Id.* at 94-100.

The FID finds that Foster alone renders claims 1, 2, and 4 obvious for the same reasons it finds that Foster anticipates those claims. *Id.* at 95. The FID further finds that Foster "provides explicit guidance for how one of ordinary skill in the art would combine the various features that it discloses, explicitly stating that the memory interface depicted in Figure 4 can be incorporated

into the system depicted in Figures 1 and 2." *Id.* (citing Foster at 7:54-56). Thus, the FID finds

that claims 1, 2, and 4 of the '752 patent are obvious in view of Foster. *Id.* at 96.

The FID finds that claim 5 is not obvious in view of the combination of Foster and

Rovati. *Id.* at 96-98. Specifically, the FID finds that Respondents' identified motivation to

combine is unsupported and conclusory. *Id.*

The FID finds that Foster renders claim 7 obvious for the same reasons that Foster

anticipates claim 7. *Id.* at 98. The FID also analyzes Respondents' argument that claim 7 is

obvious in view of Foster in combination with Yoshioka. *Id.* (citing RIB at 102-04). The FID

finds that modifying the memory interface in Foster to output such requests would have been

obvious to one of ordinary skill in the art, and the system of Foster is compatible with the motion

processing described in Yoshioka. *Id.* at 99-100.

For claim 8, the FID finds that Foster alone renders claim 8 obvious. *Id.* at 100. The FID

finds that Foster discloses that its data buses "may each comprise an associated read bus and

write data bus," and further finds that a POSA would recognize that the memory interface in

Foster is capable of receiving the requested data. *Id.* (citing Foster at 6:16-18; RX-0005C at

Q/A93). The FID reasons that Figure 3 in Foster shows a limited number of data paths,

including two-way paths between the memory interface and memory and both experts agree that

Figure 3 indicates that memory data can be sent and received from the memory device. *Id.*

(citing Foster at Fig. 3; RX-0005C at Q/A93; Tr. 993-94). Thus, the FID finds that "receiving

the requested data at the memory interface would be one of a finite number of identified,

predictable options" and Foster renders claim 8 obvious. *Id.*

2) Analysis

The Commission has determined to affirm the FID's finding that claims 1, 2, 4, 7, and 8

are obvious over Foster alone, but with the modified reasoning below. The Commission also

finds that the FID's obviousness findings based on Foster alone do not violate the APA.

Moreover, the Commission gave the parties an opportunity to brief the issue further in response

to the Commission's notice of review.

i. The FID's Obviousness Findings Based on Foster Alone Are Affirmed

Broadcom argues, regarding whether Foster alone renders claims 1, 2, 4, 5, 7, and 8

obvious, that the FID errs by failing to make findings regarding: (1) whether a person of

ordinary skill in the art would have been motivated to modify or combine teachings in the prior

art; and (2) whether a person of ordinary skill in the art would have had a reasonable expectation

of success in making the proposed modification/combination. Broadcom Sub. at 15-16 (citing *In

re Stepan*, 868 F.3d 1342, 1345-46 (Fed. Cir. 2017)); Broadcom Sub. Reply at 16-22. Broadcom

maintains that those two findings are required even when obviousness is based on a single

reference. *Id.*   However, we agree with Respondents that Broadcom improperly focuses on

whether the FID uses particular words in its analysis and findings, which is inconsistent with

KSR Int'l v. Teleflex Inc., 550 U.S. 398, 417 (2007). Resp. Sub. Reply at 9-10.[24]

Regarding the alleged lack of a motivation to combine, in response to the Commission's

request for analysis of *Realtime Data*, Broadcom argues that *Realtime Data* does not change the

requirement that a single-reference obviousness analysis must include factual determinations as

to both a motivation to combine and a reasonable expectation of success. Broadcom Sub. at 19-

20 (citing *Realtime Data*, 912 F.3d 1368, 1370-72 (Fed. Cir. 2019)); *see also* Broadcom Sub.

Reply at 18-19. According to Broadcom, "*Realtime Data* addressed whether a proper

obviousness analysis is required when one reference, in a two-reference combination, is found by

---

[24] Respondents also pointed out that Broadcom does not dispute that where a claim is anticipated, it is also obvious. *Id.* at 9, n.3.

itself to anticipate the claim." *Id.* Broadcom interprets the decision as determining "that the

[Patent Trial and Appeal Board's ("PTAB")] obviousness determination did not require a finding

regarding a motivation to combine because their determination was based on the factual finding

that O'Brien *alone* disclosed every claim limitation at issue and therefore anticipated the claim."

Id. (emphasis in original). Broadcom concludes that *Realtime Data* does not overrule the

holding in *In re Stepan*, requiring a finding of a motivation to combine in an obviousness

determination, but merely explains there is no need to find a motivation to combine references if

one reference anticipates the claims at issue. *Id.; see In re Stepan*, 868 F.3d 1342, 1345-46 (Fed.

Cir. 2017).

We disagree with Broadcom that a specific, articulated motivation to combine is

necessary for obviousness over a single reference, such as Foster. In *Realtime Data*, the Federal

Circuit concluded that, where a single reference alone rendered the claims obvious, the PTAB

was not required to find a motivation to combine. *See Realtime Data*, 912 F.3d at 1373-74.

Broadcom's interpretation of *Realtime Data* is untenable and directly contrary to the decision

itself. Broadcom Sub. at 19-20; Broadcom Sub. Reply at 18-19; *cf. Realtime Data*, 912 F.3d at

1373-76. Contrary to Broadcom's assertion that the court's opinion was based on a finding that

the single reference is anticipatory (*see* Broadcom Sub. at 19-20), the court never found that the

single reference at issue **anticipated** the claim at issue. *Realtime Data*, 912 F.3d at 1373-76.

Specifically, the court "conclude[d] that the Board did not err in concluding that the claims

would have been obvious in view of a single reference." 912 F.3d at 1376.

Further, for claims 1, 2, 4, and 7, the Commission has determined to affirm that Foster

anticipates these claims. *See* Section III.B.1. above; *see also* FID at 82-91, 93-96, 98-100. "[I]t

is well settled that 'a disclosure that anticipates under § 102 also renders the claim invalid under

§ 103, for 'anticipation is the epitome of obviousness.'" *Realtime Data*, 912 F.3d at 1373.

Further, for claims 1, 2, and 4, the FID finds that in addition to Foster's substantive disclosures,

Foster also provides explicit guidance for how a POSA would combine the various features that

it discloses. FID at 94-96. For claim 7, the FID finds that Respondents' expert offers an opinion

that Foster discloses the "noncontiguous" limitation and for the same reasons that these

disclosures anticipate claim 7, Foster also renders claim 7 invalid for obviousness. *Id.* at 98

(citing RX-0005C at Q/A84). Thus, Foster renders claims 1, 2, 4, and 7 obvious.

With respect to claim 8, the FID finds that Broadcom's expert "makes a convincing case

for obviousness by explaining how one of ordinary skill in the art would recognize that Foster's

memory interface is capable of receiving the requested data." *Id.* at 100 (citing RX-0005C at

Q/A93). This finding may not use the specific term "motivation," but it is supported by expert

testimony and does provide a reason for a POSA to modify Foster's disclosure as the FID finds

necessary. *Id*.

Respondents' expert further testified:

Foster also discloses that its memory interface may receive requests from a
motion compensation unit "for a block of data it is processing," and that a series
of eight requests would typically be generated to access that data. (RX-0109
(Foster) at 9:32-35.) A person of ordinary skill in the art would understand that
these blocks of data are used by the motion compensation unit to create reference
images used in motion.

RX-0005C at Q/A92; *see also id*. at Q/A93-94 (providing additional explanation of how the

memory link operates and discloses the claimed subject matter). Unless the memory interface is

capable of receiving and actually does receive data over the link, Foster's motion compensation

unit cannot process it. *Id.* Respondents' expert confirmed that the motion compensation unit's

need for the data is a reason to make sure the memory interface actually receives the data. FID at

100 (citing RX-0005C at Q/A93); RX-0005C at Q/A92-94. Thus, the record evidence fully supports the FID's finding that claim 8 is obvious over Foster alone.

The FID identifies both a motivation and a reasonable expectation of success that Foster's MAU is configured to and actually "receives data stored at the addresses in the memory from the lists of addresses in the memory over said link." FID at 100. Obviousness does not require that the motivation be the ***best*** option, only that it be a ***suitable*** option from which the prior art did not teach away. *Bayer Pharma AG v. Watson Labs.*, 874 F.3d 1316, 1328 (Fed. Cir. 2017) (emphasis in original); *see also Certain Magnetic Data Storage Tapes and Cartridges Containing the Same (II)* ("*Magnetic Data Storage Tapes*"), Inv. No. 337-TA-1076, Comm'n Op. at 55-57 (June 20, 2019). Here, Foster's drawings and both experts' testimony demonstrates that there are two possible options for receiving data at the memory interface, and thus, there is a reasonable expectation of success. FID at 82-91, 93-100; *see also* Resp. Sub. at 14-16.

The following findings in the FID further support a reasonable expectation of success and the conclusion that Foster alone renders claim 8 obvious:

- In [Respondents' expert's] opinion, these disclosures are sufficient for Foster to meet the limitation in claim 8 requiring that "the memory access unit receives data stored at the addresses in the memory for the lists of addresses in the memory."

- Respondents' expert's testimony "makes a convincing case for obviousness by explaining how one of ordinary skill in the art would recognize that Foster's memory interface is capable of receiving the requested data."

- "Figure 3 depicts a limited number of data paths for the system in Foster, including two-way paths between the memory interface and the memory."

- "Both [parties' experts] agree that this figure indicates that memory data can be sent and received from the memory interface."

- "Based on these disclosures and expert testimony, it is clear that receiving the requested data at the memory interface would be one of a finite number of identified, predictable options."

FID at 100; *see also* RX-0005C at Q/A93 (quoting Foster at 5:6-8, Fig. 3). The FID's findings specifically include citations to and are supported by Respondents' expert's testimony. *Id.* Further, Broadcom never argued that the prior art taught away from using Foster's data paths to receive data. CIB at 106-110; CRB at 44-46; Broadcom Pet. at 15-23; Broadcom Sub. at 15-23; Resp. Sub. at 14-16, 16-22.

Regarding claim 5, Respondents argue that, because Foster anticipates claim 5, Foster also renders claim 5 obvious for the same reasons. Resp. Sub. at 21-22. However, the FID finds that the adjustment of burst size described in Foster does not meet the limitations of claim 5 because "Foster only describes adjusting the size of bursts based on the destination for the requests, while claim 5 requires generating access requests based on the size of the requests." FID at 91-93 (citing CRB at 43). Respondents' arguments do not address the FID's finding that Foster's size adjustment is based on destination and repeat their previous arguments. Resp. Sub. at 21-22.[25] The Commission affirms that Foster does not render claim 5 invalid.

Based on the preceding discussion, the Commission finds that Respondents have made a *prima facie* showing of obviousness of claims 1, 2, 4, 7, and 8, but not claim 5, over Foster alone.

Broadcom alleged one secondary consideration of non-obviousness, specifically commercial success, with respect to the '752 patent. *See* Broadcom Pet.; FID at 112-113. We find that the FID correctly concludes that Broadcom failed to establish a nexus between the commercial success of its products and the alleged invention of the '752 patent. FID at 112

---

[25] Respondents argue, "if a burst is too long, it must be adjusted before being sent to the **shared memory**. But for **dedicated memory**, requests must be optimized for 'long bursts.'" Resp. Sub. at 21-22 (emphasis added). Thus, the destination is the basis for Foster's alleged size adjustment. *See* FID at 91-93.

(citing RIB at 122-23); *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000) (the patentee must establish "[a] nexus between the merits of the claimed invention and evidence of secondary considerations . . . in order for the evidence to be given substantial weight in an obviousness decision."). Here, Broadcom's employee's testimony and its reliance on the same evidence for multiple patents falls short of showing that the alleged success is attributable to the asserted claims. *See Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018) ("[w]hen the thing that is commercially successful is not coextensive with the patented invention—for example, if the patented invention is only a component of a commercially successful machine or process—the patentee must show prima facie a legally sufficient relationship between that which is patented and that which is sold.'"); *see also J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997) ("the asserted commercial success of the product must be due to the merits of the claimed invention beyond what was readily available in the prior art."). Broadcom thus failed to show that any alleged commercial success was due to the memory access unit recited in claims 1-8, and, accordingly, Broadcom's evidence falls short of demonstrating secondary considerations that weigh against a finding of obviousness of claims 1, 2, 4, 7, and 8. *Id.*

Based on the preceding discussion, the Commission affirms, with the additional reasoning discussed above, the FID's finding that Foster alone renders claims 1, 2, 4, 7, and 8 invalid as obvious.

ii. The FID's Findings of Obviousness Based on Foster Alone Do Not Violate the APA

The FID's findings that Foster alone renders claims 1, 2, 4, 7, and 8 obvious do not violate the APA because Respondents argued invalidity based on Foster before the ALJ and Broadcom had ample opportunity to respond. FID at 94-100 (RIB at 98-104); *cf.* Broadcom Pet.

at 22.[26] Specifically, Respondents argued in their post-hearing brief that "Foster discloses every

element of claims 1 and 8 (which depends on claim 1) under Broadcom's construction of access

requests for lists of addresses." *Id.* (citing RIB at 104). Further, Respondents stated in their

post-hearing brief that "even if the ALJ finds that Foster by itself does not disclose all elements

of claims 1, 2, and 4-8, those claims are still rendered obvious by Foster or Sih in combination

with other references." RIB at 97. Further, in their post-hearing reply brief, Respondents stated,

> As demonstrated by Dr. Subramanian's testimony, because all elements of the
> asserted claims are disclosed in Foster in a way that suggests they are or should be
> combined, "a person of skill in the art, reading the reference, would 'at once
> envisage' the claimed arrangement or combination" of claims 1, 2, 4, 5, 7, and 8.
> *Blue Calypso* at 1341, 1344; *see also Respironics, Inc. v. Invacare Corp.*, 437 F.
> App'x 917, 925 (Fed. Cir. 2011) (claim anticipated based on combination of two
> figures that included elements common to the same apparatus); *CSR, PLC v.
> Skullcandy, Inc.*, 594 F. App'x 672, 679–80 (Fed. Cir. 2014) (anticipation based
> on combination of two figures).

RRB[27] at 35-36.

Respondents' expert also provided an element by element analysis of the asserted claims

as compared to Foster. RX-0005C at Q/A35, 39-94. Respondents' expert testified that it is his

opinion that "(1) Patent No. 6,240,492 to Foster anticipates claims 1, 2, 4-5, and 7-8, or in the

alternative, renders obvious claims 1, 2, 4-5, and 7-8 in view of Rovati and Yoshioka; and

(2) U.S. 2003/0106053 to Sih renders obvious claims 1, 2, and 4-8 in view of Foster, Rovati,

Yoshioka, and Matsui." *Id.* at Q/A35. Taken together, it is clear that Respondents made a

specific and supported argument that Foster invalidates claims 1, 2, 4, 5, 7, and 8. Thus,

---

[26] Broadcom argued that the APA requires an agency to give "all interested parties
opportunity for – the submission and consideration of facts [and] arguments ... [and] hearing and
decision on notice," 5 U.S.C. § 554(c), and to permit a party "to submit rebuttal evidence, and to
conduct such cross-examination as may be required for a full and true disclosure of the facts." 5
U.S.C. § 556(d); *see also* 19 C.F.R. § 210.36(a) ("An opportunity for a hearing shall be provided
in each investigation under this part, in accordance with the Administrative Procedure Act.").

[27] Respondents' Joint Reply Post-Hearing Reply Brief (July 1, 2019) ("RRB").

Broadcom had notice of Respondents' invalidity arguments and evidence based on Foster's disclosures. Moreover, before the ALJ, Broadcom had an opportunity and did respond to Respondents' invalidity arguments based on Foster. CIB at 96-110; CRB at 38-46. In fact, Broadcom voluntarily waived its cross-examination of Respondents' expert who opined that the '752 patent was invalid. Tr. 619:4-5. Broadcom also presented evidence of alleged secondary considerations of non-obviousness. CIB at 17, 124.

The Commission also finds that the additional briefing requested in the Commission's March 3, 2020 notice resolves any alleged APA violation in any event. Broadcom argues that because Respondents allegedly did not argue that claim 8 is obvious based on Foster alone in the post-hearing briefing, Respondents have waived their right to make the argument on review. Broadcom Pet. at 20 n.7 (citing *Certain Prods. Having Laminated Packaging, Laminated Packaging, and Components Thereof*, Inv. No. 337-TA-874, Comm'n Op. (2013 WL 11041479 at *9) (Sept. 3, 2013) ("Insofar as these arguments were not presented to the ALJ in [Complainant's] posthearing brief, they have been waived"); *see also* Ground Rule 11.1). The Federal Circuit, however, rejected a similar argument in *Ajinomoto Co., Inc. v. Int'l Trade Comm'n*, 932 F.3d 1342, 1354 n.8 (Fed. Cir. 2019), where the appellant failed to cite any authority that barred the Commission from exercising discretion to raise an issue and give the parties an adequate opportunity to address it. Here, Broadcom did not cite any authority that would limit the Commission's ability to request a response from all parties and allow an additional opportunity to address the issue.

Id. Further, where a party has adequate notice and an opportunity to respond, there is no APA

issue. *TQ Delta, LLC v. DISH Network LLC*, 929 F.3d 1350, 1355-56 (Fed. Cir. 2019) (citing

Intellectual Ventures II LLC v. Ericsson Inc., 686 Fed. Appx. 900, 906 (Fed. Cir. 2017)).

Here, there was no unfair surprise. Broadcom had notice of and an opportunity to

respond to the Respondents' invalidity arguments, and it is undisputed that Respondents argued

before the ALJ that claims 1, 2, 4, 5, 7, and 8 are invalid based on Foster. RIB at 98-104; RRB

at 35-36; RX-0005C at Q/A35, 39-94. The FID properly relies on the same reference, Foster, the

same disclosures in Foster, and the same invalidity theories argued by Respondents before the

ALJ. FID at 94-100; *Arthrex*, 935 F.3d at 1328.

Also, Broadcom had an opportunity to respond to the Commission's Question D, which

sought an analysis of whether Foster alone renders claims 1, 2, 4, 5, 7, and 8 obvious. 85 Fed.

Reg. at 12577. Thus, the request for additional information further resolves any alleged APA

issue. *Id.*

c. Obviousness of Claims 1, 2, 4, 5, 7, and 8 of the '752 Patent Over Sih in Combination with Other Prior Art

The Commission adopts, without modification, the FID's findings with regard to

obviousness based on Sih combined with Foster and other prior art and thus, affirms that claims

1, 2, 4, 5, 7, and 8 are obvious based on those combinations. *See* FID at 100-111.

2. Non-Infringement of Claims 2 and 5 By Accused Pioneer Head Units Containing ███████ SoCs

Subject to the additional analysis provided below, the Commission affirms and adopts the

FID's analysis and conclusion that Pioneer does not infringe claims 2 and 5 of the '752 patent

because the accused Pioneer head units do not meet the limitations of those claims. The

Commission further affirms the remainder of the FID's findings with respect to infringement of

the asserted claims of the '752 patent to the extent they are not inconsistent with the reasoning herein.

a. The FID

The FID finds that the accused Pioneer head units, which contain infringing ████████ SoCs, do not infringe claims 2 and 5 of the '752 patent. FID at 76-77; *see also id.* at 72, 74-75 (finding ████████ SoCs infringe claims 2 and 5). Respondents disputed whether the Pioneer head units infringed claims 2 and 5 because the Pioneer head units do not include ████████ functionality. *Id.* at 77. Respondents argued that in the Pioneer head units, the ████████ functionality is disabled and the specific ████████ that is necessary for ████████ ████████. *Id.* (citing RX-0009C at Q/A83). Broadcom argued that because claims 2 and 5 are apparatus claims, the actual performance of any actions are not needed for infringement. *Id.* (citing CIB at 94).

The FID finds that ████████████████████████ in the accused products and concludes that, "without this source code, the accused products do not have the ***capability*** to infringe these claims." *Id.* at 77 (emphasis added) (citing RRB at 33-34). The FID notes that the Federal Circuit has found non-infringement in cases like this one where the asserted claims "recite specific claim functionalities that cannot be practiced in hardware alone and require enabling software." *Id.* (citing *Nazomi*, 739 F.3d at 1343). Thus, the FID concludes that Pioneer does not infringe claims 2 and 5.

b. Analysis

Broadcom's main argument is that if the accused Renesas ████████ SoCs satisfy claims 2 and 5 alone, then the Pioneer head unit in which the infringing SoC is incorporated must also satisfy those claims. Broadcom Sub. at 23-29. However, this argument ignores any possible additions or changes to software or code that may come from installing the infringing SoC in the

head unit. *Nazomi*, 739 F.3d at 1343; *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d
1316 (Fed. Cir. 2001); *see also Certain Television Sets, Television Receivers, Television Tuners,
and Components Thereof*, Inv. No. 337-TA-910, Comm'n Op., at 27 n.28 (Oct. 30, 2015)
(considering the functionality of a component and how that component performs when it is
incorporated into a finished product).

As noted in the FID, the Federal Circuit has held that a finding of non-infringement is
appropriate where the asserted claims "recite specific claim functionalities that cannot be
practiced in hardware alone and require enabling software." *Nazomi*, 739 F.3d at 1343. Thus,
the ███████, once placed in the Pioneer head units is no longer "an input port for receiving
requests for blocks of pixels," as required by claims 2 and 5 of the '752 patent.

Further, in *Telemac*, the claim term "complex billing algorithm" was construed as "a
function that includes the means to store phone rates for local, long distance, international, and
roaming calls" and "includes means to identify the appropriate rate category and to selectively
apply those rates to each call." 247 F.3d at 1322. The Federal Circuit affirmed a finding of non-
infringement "[d]ue to a restriction built into the software program stored in the telephone's
memory, a user of the accused system is prevented from directly placing international calls." *Id*.
at 1330. The court reasoned, "that a device is capable of being modified to operate in an
infringing manner is not sufficient, by itself, to support a finding of infringement." *Id.* (citing
247 F.3d at 1330). Thus, *Telemac* also supports the FID's finding of non-infringement because
the ██ such that the embedded
Renesas SoC is not capable of performing the function of the recited "input port." FID at 76-77
(citing RX-0009C at Q/A83); Resp. Sub. Reply at 21 (citing RX-0018C at Q/A123).

46

In *Intel Corp. v. Int'l Trade Comm'n*, upon which Broadcom relies, the Federal Circuit noted that the accused products "are *capable* of performing page mode addressing" and held that "the accused device, to be infringing, need only be capable of operating in the page mode." 946 F.2d 821, 832 (Fed. Cir. 1991) (emphasis in original); *see also* Broadcom Sub. at 26. In this investigation, however, the FID finds that, "without [the missing source code libraries], the accused products ***do not have the capability*** to infringe these claims." FID at 77 (emphasis added). Thus, *Intel*, where the accused products were capable of infringement, differs from this investigation, as the accused Pioneer head units are not capable of infringement because they lack an input port with the claimed capability for receiving requests for blocks of pixels from a motion prediction processing unit. *Id.*; *see also* RRB at 33-34.

Broadcom is also incorrect that its expert provided testimony showing "that claims 2 and 5 are infringed by hardware alone." Broadcom Sub. Reply at 25 (citing CX-0009C at Q/A62-72, 108-116, 153-67). Rather, Broadcom admitted that "Dr. Wolf identified deposition testimony, documentation, and *hardware code*." *Id.*[29] (emphasis added). Further, the cited portion of Broadcom's expert's demonstrative is titled, "***Source Code*** for Renesas Accused ▮▮▮▮▮ ▮▮▮▮▮ Products." CDX-0006C.00014-20 (emphasis added); *see also* CX-0009C at Q/A159[30]. Broadcom also contended in its petition for review that "Broadcom develops *both*

---

[29] Broadcom's expert testified that, "I confirmed this functionality in the ▮▮▮▮▮ for the ▮▮▮▮▮ SoC, which implements ▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮. I have described my detailed analysis in my demonstratives. [CDX-0006C.00014-20]." CX-0009C at Q/A47.

[30] Q159. Now turning to the Renesas *source code*, please explain the bases for your opinion.

(1) hardware consisting of the physical SoC itself, that includes a processor, registers, internal memory, and circuitry, *and* (2) firmware, which is software that runs on the SoC processor to control clock gating (among other functions)." Broadcom Pet. at 41 (emphasis in original) (citing CX-0003C at Q/A16, 20; CIB at 278). Thus, Broadcom admitted that firmware, "hardware code," source code, and software each include code necessary to provide the infringing functionality or capabilities for hardware. As the FID finds, however, this necessary code is missing from the accused Pioneer head units. FID at 76-77.

Accordingly, the Commission determines to affirm, with the modified reasoning above, the FID's finding that the Pioneer head units do not practice the claims 2 and 5 of the '752 patent.

IV. CONCLUSION

For the reasons set forth above, the Commission affirms the FID's finding that Broadcom has failed to show that Respondents have violated section 337. Accordingly, the investigation is terminated with a finding of no violation of section 337.

By order of the Commission.

Lisa R. Barton
Secretary to the Commission

Issued: May 28, 2020

A. The   for the   SoC confirms that the   SoC includes a

CX-0009C at Q/A159 (emphasis added).

<u>**PUBLIC CERTIFICATE OF SERVICE**</u>

       I, Lisa R. Barton, hereby certify that the attached **COMMISSION OPINION** has been served by hand upon the following parties as indicated, on May 28 2020.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

<u>On Behalf of Complainant Broadcom Corporation:</u>

John M. Caracappa, Esq.	☐ Via Hand Delivery
STEPTOE & JOHNSON LLP	☐ Via Express Delivery
1330 Connecticut Avenue, N.W.	☐ Via First Class Mail
Washington, DC 20036	☒ Other: Email Notification
Email: Jcaracappa@steptoe.com	of Availability to Download

<u>On Behalf of Respondents Renesas Electronics Corporation and Renesas Electronics America, Inc. :</u>

Daniel P. Muino, Esq.	☐ Via Hand Delivery
MORRISON & FOERSTER LLP	☐ Via Express Delivery
2000 Pennsylvania Ave., NW	☐ Via First Class Mail
Suite 60000	☒ Other: Email Notification
Washington, DC 20006	of Availability to Download
Email: Dmuino@mofo.com	

<u>On Behalf of Respondents Toyota Motor Corporation, Toyota Motor North America, Inc., Toyota Motor Sales, U.S.A., Inc., Toyota Motor Engineering & Manufacturing North America, Inc., Toyota Motor Manufacturing, Indiana, Inc., Toyota Motor Manufacturing, Kentucky, Inc., Toyota Motor Manufacturing, Mississippi, Inc., Toyota Motor Manufacturing, Texas, Inc., Panasonic Corporation, Panasonic Corporation of North America, Denso Ten Limited, Denso Ten America Limited, Japan Radio Corporation, Denso Corporation, Denso International America, Inc., Denso Manufacturing Tennessee, Inc, and Denso Wireless Systems America, Inc.:</u>

Paul Steadman, Esq.	☐ Via Hand Delivery
DLA PIPER LLP	☐ Via Express Delivery
444 West Lake Street	☐ Via First Class Mail

Suite 900
Chicago, IL 60606
Email: paul.steadman@dlapiper.com

☒ Other: Email Notification of Availability to Download

On Behalf of Respondents Pioneer Corporation and Pioneer Automotive Technologies, Inc.

Lora A. Brzezynski, Esq.
FAEGRE DRINKER BIDDLE & REATH LLP
1500 K Street, NW, Suite 1100
Washington, DC 20005
Email: lora.brzezynski@faegredrinker.com

☐ Via Hand Delivery
☐ Via Express Delivery
☐ Via First Class Mail
☒ Other: Email Notification of Availability to Download

On Behalf of Respondents Socionext, Inc.

G. Brian Busey, Esq.
MORRISON & FOERSTER LLP
2000 Pennsylvania Ave., NW
Suite 6000
Washington, DC 20006
Email: Gbusey@mofo.com

☐ Via Hand Delivery
☐ Via Express Delivery
☐ Via First Class Mail
☒ Other: Email Notification of Availability to Download

On Behalf of Respondents u-blox AG, u-blox America, Inc., and u-blox San Diego, Inc.

Smith Brittingham IV, Esq.
FINNEGAN, HENDRESON, FARABOW, GARRETT & DUNNER LLP
901 New York Avenue, NW
Washington, DC 20001
Email: smith.brittingham@finnegan.com

☐ Via Hand Delivery
☐ Via Express Delivery
☐ Via First Class Mail
☒ Other: Email Notification of Availability to Download