#### UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

CERTAIN DIGITAL VIDEO-CAPABLE DEVICES AND COMPONENTS THEREOF

Inv. No. 337-TA-1224

# INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Administrative Law Judge Cameron Elliot

(October 21, 2021)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Digital Video-Capable Devices And Components Thereof*, Investigation No. 337-TA-1224.

<u>TAB</u>	LE OF	<u>ECONTENTS</u>	Page	
I.	INT	RODUCTION	1	
	A.	Procedural Background	1	
	B.	The Parties	3	
	C.	The Asserted Patents and Claims	5	
		1. U.S. Patent No. 10,091,186	6	
		2. U.S. Patent No. 10,298,564	6	
		3. The Patents' Common Specification	6	
	D.	Encryption Technology	9	
	E.	Products at Issue	11	
		1. Domestic Industry Transmitter Products	11	
		2. Accused Transmitter Products	12	
		3. Domestic Industry Receiver Products	13	
		4. Accused Receiver Products	13	
II.	STANDARDS OF LAW			
	A.	Standing		
	B.	Claim Construction		
	C.	Infringement	17	
	D.	Domestic Industry	20	
		1. Technical Prong	20	
		2. Economic Prong	21	
	E.	Invalidity	22	
		1. Patent Eligibility Under 35 U.S.C. §101	22	
		2. 35 U.S.C. § 102	23	
		3. 35 U.S.C. § 103	24	
		4. 35 U.S.C. § 112	26	
III.	STA	NDING, IMPORTATION, AND JURISDICTION	27	
IV.	U.S.	PATENT NO. 10,091,186 – The Transmitter Patent	28	
	A.	Level of Ordinary Skill in the Art	28	
	В.	Claims-at-Issue	28	
	C.	Claim Construction	29	
	D.	Infringement	29	

		1.	Claim	1	30
			a.	1[Pre] "A first device for controlling delivery of protected content to a second device,"	
			b.	1[a] "the first device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"	
			c.	1[b] "receive a second device certificate from the second device prior to sending a first signal"	
			d.	1[c] "provide the first signal to the second device when the second device certificate indicates that the second device is compliant with at least one compliance rule;"	
			e.	1[d] "receive a second signal from the second device after providing the first signal;"	
			f.	1[e] "provide the protected content to the second device when the second signal is derived from a secret and a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time,"	
			g.	1[f] "wherein the secret is known by the first device."	48
		2.	second signal	9: "The first device of claim 1, wherein the determining that the d signal is derived from the secret comprises: modifying the first, wherein the modifying requires the secret; and determining that odified first signal is identical to the second signal."	
		3.	Claim	11: "The first device of claim 1, further comprising instructions ged to provide the secret to the second device."	
		4.		12: "The first device of claim 1, wherein the second signal rises the first signal modified by the secret."	
		5.		14: "The first device of claim 1 wherein the secret is encrypted public key."	
		6.	Doctri	ne of Equivalents	51
		7.	Indire	ct Infringement of the 186 Patent	52
V.	U.S. F	PATEN	T NO.	10,298,564	. 55
	A.	Level	of Ordi	nary Skill in the Art	55
	B.	Claim	s-at-Issi	ue	55
	C.	Claim	Constr	uction	56
		1.	"first o	device"	57
		2.	"signa	1"	61

		3.	"arran	ged to"	.63
	D.	Infring	gement.		.64
		1.	Claim	1	.66
			a.	1[Pre] "A second device for receiving delivery of a protected content from a first device,"	.67
			b.	1[a] "the second device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"	.68
			c.	1[b] "provide a certificate to the first device prior to receiving a first signal, wherein the first signal is sent by the first device, wherein the certificate is associated with the second device;"	.73
			d.	1[c] "receive the first signal when the certificate indicates that the second device is compliant with at least one compliance rule;"	.75
			e.	1[d] "create a second signal, wherein the second signal is derived from a secret known by the second device;"	.76
			f.	1[e] "provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and"	.77
			g.	1[f] "receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time."	.77
		2.	Claim instruc	18: "The second device of claim 1, further comprising tions arranged to receive the secret from the first device."	.79
		3.		19: "The second device of claim 1, wherein the second signal ises the first signal modified by the secret."	.80
		4.		21: "The second device of claim 1, wherein the secret is ted with a public key."	.80
		5.	genera	25: "The second device of claim 1, wherein the secret is used for ting a secure channel between the first device and the second ."	.81
		6.	Indired	et Infringement of the 564 Patent	.83
VI.	DOM	ESTIC	INDUS	STRY TECHNICAL PRONG	85
	A.	The 18	36 Pater	ıt	.85

	1.	second device,"8	5
	2.	1[a] "the first device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"8	6
	3.	1[b] "receive a second device certificate from the second device prior to sending a first signal"	7
	4.	1[c] "provide the first signal to the second device when the second device certificate indicates that the second device is compliant with at least one compliance rule;"	8
	5.	1[d] "receive a second signal from the second device after providing the first signal;"	8
	6.	1[e]/1[f] "provide the protected content to the second device when the second signal is derived from a secret and a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time, wherein the secret is known by the first device."8	19
	7.	Claim 9: "The first device of claim 1, wherein the determining that the second signal is derived from the secret comprises: modifying the first signal, wherein the modifying requires the secret; and determining that the modified first signal is identical to the second signal."	2
	8.	Claim 11: "The first device of claim 1, further comprising instruction arranged to provide the secret to the second device."	13
	9.	Claim 12: "The first device of claim 1, wherein the second signal comprises the first signal modified by the secret."9	13
	10.	Claim 14: "The first device of claim 1 wherein the secret is encrypted with a public key."	4
В.	The 56	54 Patent9	4
	1.	1[Pre] "A second device for receiving delivery of a protected content from a first device,"	4
	2.	1[a] "the second device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"9	
	3.	1[b] provide a certificate to the first device prior to receiving a first signal, wherein the first signal is sent by the first device, wherein the certificate is associated with the second device;	5
	4.	1[c] "receive the first signal when the certificate indicates that the second device is compliant with at least one compliance rule;"9	6
	5.	1[d] "create a second signal, wherein the second signal is derived from a secret known by the second device;"	7
	6.	1[e] "provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and"9	7

		7.	1[f] "receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time."	d e
		8.	Claim 18: "The second device of claim 1, further comprising instructions arranged to receive the secret from the first device."	
		9.	Claim 19: "The second device of claim 1, wherein the second signal comprises the first signal modified by the secret."	
		10.	Claim 21: "The second device of claim 1, wherein the secret is encrypted with a public key."	
		11.	Claim 25: "The second device of claim 1, wherein the secret is used for generating a secure channel between the first device and the second device."	d
VII.	VALI	DITY (	OF BOTH THE 186 AND 564 PATENTS	
	A.	Patent	Eligibility under 35 U.S.C. § 101	.100
	B.	Antici	pation and Obviousness Under 35 U.S.C. §§ 102 and 103	.104
		1.	Summary of Prior Art	.106
		2.	Claim 1 – OCPS	.108
		3.	Claim 1 – TLS	.114
		4.	Dependent Claims	.119
		5.	Secondary Considerations of Non-Obviousness	.123
		6.	Summary	.123
	C.	Requi	rements of 35 U.S.C. § 112	.124
		1.	Written Description	.124
			a. "predetermined time"	.125
			b. "certificate" indicating compliance	.129
		2.	Indefiniteness of Claim 1 of the 564 Patent	.131
VIII.	DOM	ESTIC	INDUSTRY - ECONOMIC PRONG	136
	A.	Qualif	ying Expenditures	.138
		1.	Subsection (A) - Plant and Equipment	.138
		2.	Subsection (B) - Labor or Capital	.143
			a. Roku	.143
			b. Samsung	.150

		3. Subsection (C) - Exploitation [of the patent], including research and development, or licensing	0
	B.	"Significant" or "Substantial"	162
		1. Roku	163
		2. Samsung	168
IX.	CON	NCLUSIONS OF LAW	169
X.	REC	COMMENDED DETERMINATION ON REMEDY AND BOND	170
	A.	Limited Exclusion Order	172
	В.	Cease and Desist Order	175
	C.	Bond	177
	D.	Public Interest	177
XI.	INIT	TIAL DETERMINATION AND ORDER	180

# **TABLE OF ABBREVIATIONS**

CDX	Complainant's Demonstrative Exhibit
CIB	Complainant's Initial Post-Hearing Brief
СРВ	Complainant's Pre-Hearing Brief
CSB	Complainant's Supplemental Pre-Hearing Brief
CPX	Complainant's Physical Exhibit
CRB	Complainant's Reply Post-Hearing Brief
CX	Complainant's Exhibit
Tr.	Hearing or Deposition Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RSB	Respondents' Supplemental Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RRB	Respondents' Reply Post-Hearing Brief
RX	Respondents' Exhibit
SIB	Staff's Initial Post-Hearing Brief
SPB	Staff's Pre-Hearing Brief
SRB	Staff's Reply Post-Hearing Brief

#### I. INTRODUCTION

#### A. Procedural Background

Complainants Koninklijke Philips N.V. and Philips North America LLC (together "Philips" or "Complainants") filed the complaint underlying this investigation on September 18, 2020. The complaint identified Dell Technologies Inc. and Dell Inc. (together "Dell" or the "Dell Respondents"); Hisense Co. Ltd., Hisense Visual Technology Co., Ltd., Hisense Electronics Manufacturing Company of America Corporation, Hisense USA Corporation, Hisense Import & Export Co. Ltd., Hisense International Co., Ltd., Hisense International (HK) Co., Ltd., and Hisense International (Hong Kong) America Investment Co., Ltd. (together "Hisense" or the "Hisense Respondents"); HP, Inc. ("HP"); Lenovo Group Ltd. and Lenovo (United States), Inc. (together, "Lenovo" or the "Lenovo Respondents"); LG Electronics, Inc. and LG Electronics USA, Inc. (together, "LG" or the "LG Respondents"); TCL Industries Holdings Co., Ltd., TCL Electronics Holdings Ltd., TCL King Electrical Appliances (Huizhou) Co. Ltd., TTE Technology, Inc., TCL Moka International Ltd., TCL Moka Manufacturing S.A. de C.V., TCL Smart Device (Vietnam) Company Ltd. (together, "TCL" or the "TCL Respondents"); MediaTek Inc. and MediaTek USA Inc. (together, "MediaTek" or the "MediaTek Respondents"); Realtek Semiconductor Corp. ("Realtek"); and Intel Corporation ("Intel") (together, "the Respondents") as Respondents. The complaint alleges that each of the named Respondent entities plays a material role in the design, development, manufacture, production, marketing, sale for importation into the United States, importation into the United States, and/or sale after importation within the United States of the accused digital video-capable devices and/or components thereof that infringe one or more of claims of U.S. Patent Nos. 9,436,809 (the "809 patent"), 9,590,977 (the "977 patent"), 10,091,186 (the "186 patent"), and 10,298,564 (the "564 patent"). By publication of a notice in the Federal Register on October 16, 2020, the U.S. International Trade Commission commenced an

### investigation into:

[W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1-6, 9, 11, 12, 14, 15, 17, 22, 23, 26, 49, 50, and 52-54 of the '809 patent; claims 1-3, 8-12, and 14-20 of the '977 patent; claims 1-7, and 9-16 of the '186 patent; and claims 1-11, 14-23, 25, and 28 of the '564 patent; and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

85 Fed. Reg. 67373 (October 16, 2020). On November 10, 2020, I set a target date of February 22, 2022 for completion of this investigation. Order No. 7. On November 18, 2020, I set a *Markman* hearing date of January 26-27, 2021 and an evidentiary hearing date of July 19-23, 2021. Order No. 10.

On January 26-27, 2021, I held a technology tutorial and *Markman* hearing. On March 16, 2021 I issued Order No. 16, construing certain claim terms of the patents at issue ("*Markman* Order").

With a number of motions, Philips moved to terminate the investigation as to various claims, patents, and respondents. All of the motions were granted by non-final initial determinations, and the Commission did not review these non-final ID's. *See* Orders 19, 21, 26, 32, 40, 46, and Commission decisions not to review, EDIS Doc. Nos. 740018, 742301, 745132, 747829, 748452, and 749189, respectively. Thus, the only remaining respondents are the Dell Respondents, the Hisense Respondents, HP, the Lenovo Respondents, the TCL Respondents, Realtek, and Intel; and the remaining asserted patent claims are: claims 1, 9, 11, 12, and 14 of the 186 patent; and claims 1, 18, 19, 21, and 25 of the 564 patent.

The evidentiary hearing took place as scheduled on July 19-23, 2021.

Pursuant to the procedural schedule, the parties submitted initial and reply post-hearing briefs on August 6, 2021 and August 20, 2021, respectively. As of the date of this initial determination, no motions remain pending.

#### **B.** The Parties

Complainant Koninklijke Philips N.V. ("Philips N.V.") is a Dutch corporation with a principal place of business at High Tech Campus 5, 5656 AE Eindhoven, The Netherlands. Complaint, ¶ 19.

Philips North America LLC ("Philips N.A.") is a Delaware limited liability company with a principal place of business at 222 Jacobs Street, Cambridge, Massachusetts, and is a subsidiary of Philips N.V. Complaint, ¶ 20.

There are seven groups of Respondents, which are discussed separately:

**Intel**: Intel Corporation is a Delaware corporation with its principal place of business at 2200 Mission College Boulevard, Santa Clara, CA 95054. RIB at xix, n.1.

**Dell**: Dell Technologies Inc. is a Delaware corporation with a principal place of business located at One Dell Way, Round Rock, TX 78682. Dell Inc. is also a Delaware corporation with a principal place of business at One Dell Way, Round Rock, TX 78682. *Id.* at xx, n.1

**HP**: HP, Inc. is a California corporation with a principal place of business at 1501 Page Mill Road, Palo Alto, CA 94304. *Id*.

**Lenovo**: Lenovo Group Ltd. is a Hong Kong limited liability company with its principal place of business at 23rd Floor, Lincoln House, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong. Its subsidiary, Lenovo (United States), Inc., is a Delaware corporation with a principal place of business at 8001 Development Drive, Morrisville, NC 27560. *Id.* 

**Realtek**: Realtek Semiconductor Corporation is a Taiwanese corporation with its principal place of business at No. 2 Innovation Rd. II, Hsinchu Science Park, Hsinchu 300, Taiwan. *Id*.

TCL: TCL Industries Holdings Co., Ltd. is a Chinese foreign limited liability company with a place of business at 9 Floor, TCL Elecs. Holdings Ltd. Bldg., TCL Int'l E City, #1001 Zhongshan Park Road, Nanshan Dist., Shenzhen, Guangdong, 518067, P.R.C. TCL Electronics Holdings Ltd. is a Cayman Islands corporation and Moka International Ltd. is a Hong Kong corporation, both of which have their place of business at 7th Floor, Bldg. 22E, 22 Science Park East Ave., Hong Kong Science Park, Hong Kong. TTE Technology, Inc. is a Delaware corporation with a place of business at 1860 Compton Ave., Corona, CA 92881. TCL Moka Manufacturing, S.A. de C.V. is a Mexican corporation, with a place of business at Calle 4ta. No. 55, Cd. Industrial, Tijuana, B.C., Mexico. TCL King Electrical Appliances (Huizhou) Co. Ltd. is a Chinese corporation with a place of business at No. 78 Zhongkai Dev. Zone, Huizhou, 516006, P.R.C. TCL Smart Device (Vietnam) Company Ltd. is a Chinese corporation with a principal place of business located at No. 26 Vietnam Singapore Industrial Park II-A, Street 32, Tan Binh Commune, Bac Tan Uyen District, Binh Duong Province, 75000, Vietnam. *Id.* 

Hisense: Hisense Co., Ltd., Hisense International Co., Ltd., and Hisense Import & Export Co. Ltd. are Chinese corporations with places of business at Hisense Tower No. 17, Donghaixi Rd., Qingdao, Shandong, 266071, P.R.C. Hisense Visual Technology Co., Ltd. is a Chinese corporation with a place of business at 218 Qianwangang Rd., Qingdao Econ. & Tech. Dev. Zone, Qingdao, Shandong, 266555, P.R.C. Hisense Electronics Manufacturing Company of America Corporation and Hisense USA Corporation are Georgia corporations with places of business at 7310 McGinnis Ferry Rd., Suwanee, GA 30024. Hisense International (HK) Co., Ltd. and Hisense International (HK) America Investments are Hong Kong corporations with places of business

located at Room 3101-3105, Singga Commercial Ctr., No. 148 Connaught Rd. West, Hong Kong.. RIB at 5-7. *Id*.

The different parties have different products and categories of products that are accused of violating section 337. Realtek and Intel design, make, and supply semiconductor chips and thus, are the "Chip Respondents." MediaTek also supplies semiconductor chips, although it has been terminated as a respondent. Hisense and TCL incorporate the accused semiconductor chips into certain of the televisions they design, manufacture, and import into the United States, and are the "TV Respondents." Dell, HP, and Lenovo incorporate the accused semiconductor chips into certain of the personal computers that they design, manufacture, and import into the United States, and are thus the "PC Respondents."

#### C. The Asserted Patents and Claims

The Asserted Patents relate to a technique for determining whether content stored on a first device (such as a laptop) may be sent to a second device (such as a television) by "perform[ing] authenticated distance measurement between a first communication device and a second communication device." JX-0002 (186 patent) at Abstract, 1:31-37. The following patent claims are at issue in this investigation:

Asserted Patent	Product Group	Asserted Claims
U.S. Pat. No. 10,091,186	Accused Intel-Based Products	1, 9, 11, 12, 14
	Domestic Industry	1, 9, 11, 12, 14
U.S. Pat. No. 10,298,564	Accused MediaTek-Based Products	1, 18, 19, 21, 25
	Accused Realtek-Based Products	1, 18, 19, 21, 25
	Domestic Industry	1, 18, 19, 21, 25

RIB at 11.

#### 1. U.S. Patent No. 10,091,186

U.S. Patent No. 10,091,186 was filed on November 16, 2016, issued on October 2, 2018, and is entitled "Secure Authenticated Distance Measurement." The 186 patent is assigned on its face to Koninklijke Philips N.V. JX-0002 (186 patent) at cover page. The 186 patent generally relates to a "method for a first communication device to [perform] authenticated distance measurements between a first communication device and a second communication device . . . [for] determining whether data stored on a first communication device is to be accessed by a second device." *Id.* at 1:31-37. The 186 patent relates mainly to the first communication, or transmitter, device. *Markman* Order at 9, 14.

#### 2. U.S. Patent No. 10,298,564

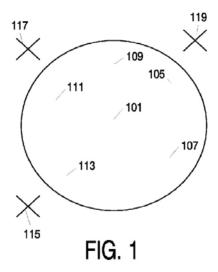
U.S. Patent No. 10,298,564 issued on May 21, 2019 from an application filed on August 30, 2018 (the application is a continuation of an application resulting in the 186 patent). JX-0003 (564 patent) at cover page. The 564 patent is entitled "Secure Authenticated Distance Measurement," and is assigned on its face to Koninklijke Philips N.V. *Id.*. The 564 patent, like the 186 patent, relates to a "method for a first communication device to [perform] authenticated distance measurements between a first communication device and a second communication device . . . [for] determining whether data stored on a first communication device is to be accessed by a second device." *Id.* at 1:33-39. The 564 patent, however, has "its main focus on the second communication [receiver] device." *Markman* Order at 12, 16.

#### 3. The Patents' Common Specification

The 186 patent and the 564 patent both claim priority to PCT Patent Application PCT/IB03/02932 (filed on June 27, 2003) and European Patent Application EP02078076 (filed on July 26, 2002) and share a common specification. Thus, generally only the 186 patent specification will be cited. The 186 patent specification discloses that (i) "[i]t is an object of the invention to

obtain a solution to the problem of performing a secure transfer of content within a limited distance"; and (ii) "[t]his [solution] is obtained by a method for a first communication device to perform[] authenticated distance measurement between the first communication device and a second communication device, wherein the first and the second communication devices share a common secret and the common secret is used for performing the distance measurement." JX-0002 (186 patent) at 2:39-49. The specification additionally discloses that (i) "[t]he invention also relates to a method of determining whether data stored on a first communication device are to be accessed by a second communication device, the method comprising . . . performing a distance measurement between the first and the second communication devices and checking whether the measured distance is within a predefined distance interval;" and (ii) "[b]y using the authenticated distance measurement in connection with sharing data between devices, unauthorized distribution of content can be reduced." Id. at 3:67-4:9. The specification further discloses that (i) "[t]he invention also relates to a communication device for performing authenticated distance measurement to a second communication device, where the communication device shares a common secret with the second communication device and where the communication device comprises means for measuring the distance to the second communication device using the common secret"; and (ii) "[t]he invention also relates to an apparatus for playing back multimedia content comprising [such] a communication device." *Id.* at 4:29-36, 4:49-51.

Figure 1 of the 186 patent, which is reproduced below, illustrates an embodiment wherein "authenticated distance measurement is being used for content protection." *Id.* at 4:62-63.



As shown, a computer with content (such as video and/or audio) is placed in the center of the circle 101, and "only devices within a predefined distance illustrated by the devices 105, 107, 109, 111, 113 inside the circle 101 are allowed to receive the content," while "the devices 115, 117, 119 having a distance to the computer being larger than the predefined distance are not allowed to receive the content." *Id.* at 4:64-5:10.

Figure 2 of the 186 patent, which is reproduced below, is a flow diagram illustrating the method of "performing authenticated distance measurement between two devices 201 and 203." JX-0002 (186 patent) at 5:21-23.

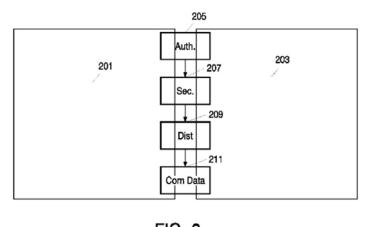


FIG. 2

The first device 201 has content that the second device 203 requested. As shown in Fig. 2, step 205, the first device 201 authenticates the second device 203, which could comprise "checking whether the second device 203 is a compliant device and might also comprise the step of checking whether the second device 203 really is the device identified to the first device 201." *Id.* at 5:27-32. In step 207, "the first device 201 exchanges a secret with the second device 203, which e.g. could be performed by transmitting a random generated bit word to second device 203. The secret should be shared securely, e.g. according to some key management protocol as described in e.g. ISO 11770." *Id.* at 5:32-37. In step 209, "a signal for distance measurement is transmitted to the second device 203; the second device modifies the received signal according to the secret and retransmits the modified signal back to the first device. The first device 201 measures the round trip time between the signal leaving and the signal returning and checks if the returned signal was modified according to the exchanged secret." *Id.* at 5:38-46. After the distance has been measured in a secure authenticated way, content can be sent between the first device and the second device in step 211. *Id.* at 6:24-27.

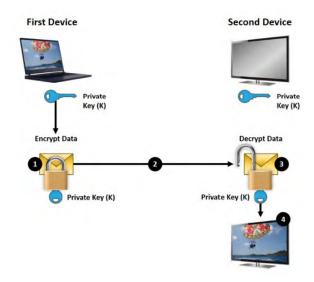
The disclosed method of "performing authenticated distance measurement" includes the suggestion that the distance "calculated between the first device and the second device" can be performed, for example, by a microprocessor in the first device. *Id.* at 6:52-60. The first device measures the time when the transmitter in the first device transmits the signal to the second device and when the receiver in the first device receives the signal from the second device, and "[t]he time difference between a transmittal time and a reception time can then be used for determining the physical distance between the first device and the second device." *Id.* 

#### D. Encryption Technology

All asserted claims pertain to preventing or minimizing unauthorized copying and pirating of digital media. The asserted patents' method of protecting digital media "is to ensure that content will only be transferred between devices if the receiving device has been authenticated as being a compliant device, and the user of the content has the right to transfer (move, copy) that content to another device." JX-0002 (186 patent) at 2:1-8. The patents' focus is on authentication and encrypted transfer involving two devices, usually referred to in the claims as the "first" (or transmitter) and "second" (or receiver) devices. *Id.* at cl. 1. Encryption techniques, such as private key encryption and public key encryption, also are part of the authentication, and protect digital data from unauthorized copying during transmission. *See id.* at 2:9-11, 6:8-23.

Private key encryption, illustrated below, uses a private key to encrypt and decrypt data exchanged between two devices. As Philips explains:

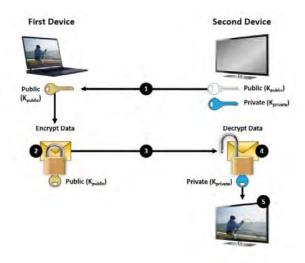
When a transmitting device ["first device" as claimed in the asserted patents] wishes to send protected digital media to a receiving device ["second device" as claimed] over a secure channel, both devices possess the same private key that is unknown by other devices. The [first device] encrypts the protected digital media using the private key and sends the encrypted data to the [second device]. The [second device] retrieves the protected digital media by decrypting the encrypted data using the private key. This process is an example of symmetric-key encryption because the same key is used to both encrypt and decrypt data.



CIB at 10-11; see SIB at 14.

Public key encryption, on the other hand, uses a private and public key pair to encrypt and decrypt data exchanged between two devices. Philips states:

When a [first] device wishes to send protected digital media to a [second] device over a secure channel, the [first device] encrypts the protected digital media using the [second device's] public key and sends the encrypted data to the [second device]. The [second device] retrieves the protected digital media by decrypting the encrypted data using its private key. Because two different keys are used for encryption and decryption the process is called asymmetric-key encryption.



CIB at 11; see SIB at 15.

#### E. Products at Issue

The products at issue in this investigation comprise both digital video-enabled transmitters and receivers, and components, such as integrated circuits, that are incorporated in the transmitters and receivers.

# 1. **Domestic Industry Transmitter Products**

Complainants allege that their licensee Roku, Inc. ("Roku") practices one or more of the asserted claims of the 186 patent with certain Roku streaming players that support HDCP 2+ over

an HDMI interface (collectively, "the DI Transmitter Products"). See CIB at 14; CX-2031C.0001. Each DI Transmitter Product includes a System-on-Chip ("SoC") manufactured or supplied by MediaTek or Realtek. See CX-2031C.0001.

#### 2. Accused Transmitter Products

Respondents' Accused Transmitter Products include Intel processor circuits that support HDCP 2+, and are identified by Complainants in CPX-79C. Tr. (Mangione-Smith) at 167:16-173:15.

See Order No. 24 (May 3, 2021) (citing Certain Human Milk Oligosaccharides and Methods of Producing the Same, Inv. No. 337-TA-1120, Comm'n Op., p. 18 (June 8, 2021)). It is undisputed that supports HDCP 1.4 (which is not accused of infringing), and that Philips does not assert that it infringes. See Tr. (Mangione-Smith) at 291:20-292:3; RX-1541C.5.

Respondent Dell confirmed that its Transmitter Products identified in CPX-79C support HDCP 2+, and it additionally lists its accused products in JX-10C. RIB at 11.

Respondent HP also confirmed that its Transmitter Products identified in CPX-79C support HDCP 2+, and its accused products are listed in CX-253C. *Id*.

Similarly, Lenovo confirmed the identity of the Lenovo Transmitter Products, and their corresponding Intel processor chips, in CPX-79C. Lenovo further states that JX-11C is a correct

12

<sup>&</sup>lt;sup>1</sup> "HDCP 2+" protocol refers to the "High-bandwidth Digital Content Protection" protocol for protecting digital content from unauthorized distribution (Version 2 or higher). CX-0233; *see also* Tr. (Mangione-Smith) at 123:18-124:21 (describing HDCP 2+ protocol) and 130:10-131:24 (describing different implementations of HDCP 2+ protocol).

list of its accused products; however, the "products listed in JX-11C do not all support HDCP 2.x." *Id.* at 11, n. 6.

The evidence also showed that all Intel NUC "Mini-PC" products listed in CPX-79C support HDCP 2+ over wired<sup>3</sup> interfaces. *See* CX-294C (Intel ROG Resp. Appx. A); JX-37C (Herrgott Tr.) at 19:2-19:6, 71:14-19; CX-1527; Tr. (Mangione-Smith) at 172:20-173:15.

# 3. **Domestic Industry Receiver Products**

Roku products identified in CX-2031C support HDCP 2+, and are alleged to practice the 564 patent. *See*, *e.g.*, CX-859C (Roku spreadsheet); JX-0056C (Perry) at 16:18-23; Tr. (Mangione-Smith) at 175:14-176:1.

Samsung's televisions identified in CX-2031C are HDCP 2+ receivers, and thus, also are alleged to practice the 564 patent. *See*, *e.g.*, CX-574 through CX-616 (TechInsights reports); Tr. (Mangione-Smith) at 163:25-165:9.

#### 4. **Accused Receiver Products**

The receiver products accused of infringing the 564 patent employ certain semiconductor chips manufactured or supplied (i) by MediaTek and incorporated into certain products (i.e., television products and monitor products) sold by Dell, Hisense, HP, and TCL (collectively, "the MediaTek-Based Accused Receiver Products"); and (ii) by Realtek and incorporated into certain products (i.e., television products and monitor products) sold by Dell, Hisense, HP, Lenovo, and TCL (collectively, "the Realtek-Based Accused Receiver Products"). *See* Tr. (Mangione-Smith) at 155:7-21, 156:2-4; CDX-0010C.47; CX-2032C.

# II. STANDARDS OF LAW

<sup>2</sup> Some of the parties in this investigation refer to the protocol as "HDCP 2x," while others use the equivalent "HDCP 2+."

<sup>&</sup>lt;sup>3</sup> Philips withdrew its allegations against the wireless implementations of HDCP 2+ at the beginning of the hearing. *See* Tr. at 33:14-34:16.

#### A. Standing

Commission Rule 210.12 requires the complainant(s) filing an intellectual property-based complaint to show that "at least one complainant is the owner or exclusive licensee of the subject intellectual property." 19 C.F.R. § 210.12(a)(7); see also IpVenture, Inc. v. ProStar Computer, Inc., 503 F.3d 1324, 1325 (Fed. Cir. 2007) (the only entity(ies) that can enforce the rights protected by a patent is the entity(ies) that owns or controls all substantial rights in that patent). Standing is ordinarily a question of law, which may rest on underlying findings of jurisdictional fact. Abraxis Bioscience, Inc. v. Navinta LLC, 625 F.3d 1359, 1363-64 (Fed. Cir. 2010).

#### **B.** Claim Construction

"The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Although most of the disputed claim terms were construed in an earlier order, some of the issues presented below are only resolvable with additional claim construction.

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the "ordinary and customary meaning of a claim term" as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. "Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude." Phillips, 415 F.3d at 1312 (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004)). "Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms." *Id.* at 1314; see Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, 1331 (Fed. Cir. 2001) ("In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention."). The context in which a term is used in an asserted claim can be "highly instructive." Phillips, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. Id. "Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee." K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1364 (Fed. Cir. 1999). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315 (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." Id. at 1316.

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips*, 415 F.3d at 1317; *see Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can "often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the

invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Phillips*, 415 F.3d at 1317; *see Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.").

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (i.e., all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* "The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence." *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) "the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention;" or (2) "the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history." *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see GE Lighting Sols.*, *LLC v. AgiLight*, *Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal."); *Omega Eng'g, Inc, v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("[W]here the patentee has unequivocally

disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender."); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) ("The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution."). Nevertheless, there is a "heavy presumption that a claim term carries its ordinary and customary meaning." *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is "exacting" and requires "a clear and unmistakable disclaimer." *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); *see Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring "expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope" to deviate from the ordinary meaning) (citation omitted).

# C. Infringement

"An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing." *Markman*, 52 F.3d at 976. A patentee may prove infringement either literally or under the doctrine of equivalents, and infringement of either sort must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard "requires proving that infringement was more likely than not to have occurred." *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). "To establish literal infringement, every limitation set forth in a claim

must be found in an accused product, exactly." *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

One rubric for evaluating the doctrine of equivalents is the function-way-result test. Under this test, the accused feature is equivalent to the claim limitation when "it performs substantially the same function in substantially the same way to obtain the same result." *Duncan Parking Techs.*, *Inc. v. IPS Grp.*, *Inc.*, 914 F.3d 1347, 1362 (Fed. Cir. 2019) (quoting *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950)). Another test is known as the insubstantial differences test, where "[a]n element in the accused device is equivalent to a claim limitation if the only differences between the two are insubstantial." *Voda v. Gordia Corp.*, 536 F.3d 1311, 1139 (Fed. Cir. 2008). The Supreme Court has further instructed that "the proper time for evaluating equivalency . . . is at the time of infringement, not at the time the patent was issued." *Warner-Jenkinson Co.*, *Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 37 (1997).

In addition to direct infringement, Section 271 of the Patent Act defines two categories of indirect infringement, inducement of infringement and contributory infringement. 35 U.S.C. § 271. For indirect infringement violations under Section 337, the direct infringement element may occur after importation, so long as all the other elements of indirect infringement are met at the time of importation. *See Certain Vision-Based Driver Assistance System Cameras and Components Thereof*, Inv. No. 337-TA-907, Comm'n Op. at 19 (Dec. 1, 2015) (citing *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1348 (Fed. Cir. 2015)). It is well settled that "[a]bsent direct infringement of the patent claims, there can be neither contributory infringement ... nor

inducement of infringement." *Met–Coil Sys. Corp. v. Korners Unltd., Inc.*, 803 F.2d 684, 687 (Fed.Cir.1986) (citations omitted).

As to the first category, "[w]hoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b); *see DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1305 (Fed. Cir. 2006) (en banc) ("To establish liability under section 271(b), a patent holder must prove that once the defendants knew of the patent, they actively and knowingly aided and abetted another's direct infringement.") (citations omitted). "The mere knowledge of possible infringement by others does not amount to inducement; specific intent and action to induce infringement must be proven." *Id.* (citations omitted). A defendant's belief regarding patent validity is not a defense to a claim of induced infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920 (2015). A defendant's willful blindness on the question of infringement will satisfy the knowledge requirement. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 765, 768-771 (2011).

As to the second category, "a party who sells a component with knowledge that the component is especially designed for use in a patented invention, and is not a staple article of commerce suitable for substantial noninfringing use, is liable as a contributory infringer." Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc., 609 F.3d 1308, 1316 (Fed. Cir. 2010). Contributory infringement is premised upon a finding that: (1) the entity sells, offers to sell, or imports into the United States a component of a product; (2) the component has no substantial non-infringing use; (3) the component constitutes a material part of the claimed invention; (4) the entity was aware of the patent and knew that the product may be covered by a claim of the patent; and (5) the use of the component in the product directly infringes the claim. See Certain Gaming & Entm't Consoles, Related Software, & Components Thereof, Inv. No. 337-TA-752, Final Initial Remand Determination at 8 (Mar. 22, 2013). As with inducement, willful blindness on the

question of infringement will satisfy the knowledge requirement. *Global-Tech*, 563 U.S. at 765, 768-771.

# D. Domestic Industry

In an investigation based on a claim of patent infringement, Section 337 requires that an industry in the United States, relating to the articles protected by the patent, exist or be in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic industry requirement has been divided into (i) a "technical prong" (which requires articles covered by the asserted patent) and (ii) an "economic prong" (which requires certain levels of activity with respect to the protected articles or patent itself). *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op. at 6-7 (April 14, 2011).

## 1. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant establishes that it is practicing or exploiting valid claims of the patents at issue. See 19 U.S.C. §§ 1337 (a)(2), (3); Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm'n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). "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 that patent." Certain Ammonium Octamolybdate Isomers, Inv. No. 337-TA-477, Comm'n Op. at 55 (U.S.I.T.C. Aug. 28, 2003). Historically, the Commission permits the complainant's products, and those of its licensees, to be considered for technical prong purposes. See Certain Magnetic Tape Cartridges and Components Thereof, Inv. No. 337-TA-1058, Comm'n Op. at 28-29 (April 9, 2019).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d

1361, 1375 (Fed. Cir. 2003). As with infringement, the technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, ID at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992). In short, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent.

# 2. **Economic Prong**

The "economic prong" of the domestic industry requirement is satisfied when there exists in the United States, in connection with products practicing at least one claim of the patent at issue: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, and licensing. 19 U.S.C. § 1337(a)(3). Establishment of the "economic prong" is not dependent on any "minimum monetary expenditure" and there is no need for complainant "to define the industry itself in absolute mathematical terms." Certain Stringed Musical Instruments and Components Thereof, Inv. No. 337-TA-586, Comm'n Op. at 25-26 (May 16, 2008). However, a complainant must substantiate the significance of its activities with respect to the articles protected by the patent. Certain Printing and Imaging Devices and Components Thereof, Inv. No. 337-TA-690, Comm'n Op. at 30 (Feb. 17, 2011). Further, a complainant can show that its activities are significant by showing how those activities are important to the articles protected by the patent in the context of the company's operations, the marketplace, or the industry in question. *Id.* at 27-28. That significance, however, must be shown in a quantitative context. Lelo Inc. v. Int'l Trade Comm'n, 786 F.3d 879, 886 (Fed. Cir. 2015). The word "significant' denote[s] an assessment of the *relative* importance of the domestic activities." *Id.* at 883-4 (internal citation omitted) (emphasis added). In general, "[t]he purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving disputes brought by foreign complainants whose

only connection with the United States is ownership of a U.S. patent." *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Initial Determination at 21 (Aug. 1991).

#### E. Invalidity

# 1. Patent Eligibility Under 35 U.S.C. §101

35 U.S.C. § 101 provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor." In defining exactly what is patentable subject matter, the Supreme Court has held that abstract ideas form the "basic tools of scientific and technological work" and are therefore unpatentable subject matter under 35 U.S.C. § 101. Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 216 (2014). The Supreme Court provided a two-part test for assessing patent eligibility under Section 101. First, a court must determine whether the claims are directed to a patentineligible concept. *Id.* at 217. If not, the inventions are patent-eligible, and the inquiry ends. Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1339 (Fed. Cir. 2016). If the claims are directed to a patent-ineligible concept, the court must then "consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent eligible application." Alice, 573 U.S. at 217-218. Claims are patent-eligible under step two if they contain limitations that "involve more than performance of well-understood, routine, and conventional activities previously known to the industry." Berkheimer v. HP Inc., 881 F.3d 1360, 1367 (Fed. Cir. 2018).

At step one, courts examine the claims to determine whether their "character as a whole," or their "focus," is an abstract idea. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). Claims focused "on collecting information, analyzing it, and displaying certain results of the collection and analysis, . . . fall into a familiar class of claims 'directed to' a patent-

ineligible concept." *Id.* The key inquiry is whether the claims recite "a specific means or method that improves the relevant technology' or are 'directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery." *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016). Furthermore, "mere automation of manual processes using generic computers does not constitute a patentable improvement in computer technology." *Credit Acceptance Corp. v. Westlake Services*, 859 F.3d 1044, 1055 (Fed. Cir. 2017); *FairWarning IP, LLC v. Iatric Sys.*, 839 F.3d 1089, 1095 (Fed. Cir. 2016). By contrast, a claim that recites a specific technique that "improve[s] the functioning of the computer itself" may be patent eligible if appropriately claimed. *Enfish*, 822 F.3d at 1335.

If the claims at issue are directed to a patent-ineligible concept, step two requires that the claim elements be scrutinized "both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Enfish.* 822 F.3d at 1354 (quoting *Alice*, 573 U.S. at 217). What is required to establish eligibility, under both steps one and two, is an element of technological innovation that amounts to more than the abstract idea itself. "[I]t is 'relevant to ask whether the claims are directed to an improvement in computer functionality versus being directed to an abstract idea, even at the first step of the *Alice* analysis." *Procter & Gamble Co. v. QuantifiCare Inc.*, 288 F. Supp. 3d 1002, 1022 (N.D. Cal. 2017) (quoting *Enfish*, 822 F.3d at 1335). A patentee may be required to present "an arguably inventive set of components or methods, such as measurement devices or techniques, that would generate new data." *Electric Power*, 830 F.3d at 1355.

#### 2. **35 U.S.C.** § **102**

Pursuant to 35 U.S.C. § 102, a patent claim is invalid as anticipated if:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant [or]

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

35 U.S.C. § 102 (pre-AIA). "A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference." *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted); *see Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1354 (Fed. Cir. 2012). "A century-old axiom of patent law holds that a product 'which would literally infringe if later in time anticipates if earlier." *Upsher-Smith Labs., Inc. v. Pamlab, L.L.C.*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (quoting *Schering Corp.*, 339 F.3d at 1322). Anticipation, and all other grounds of patent invalidity, must be proved by clear and convincing evidence. *Microsoft Corp. v. 141 Ltd. P'ship*, 564 U.S. 91, 95, (2011).

#### 3. **35 U.S.C.** § 103

Section 103 of the Patent Act states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (pre-AIA). "Obviousness is a question of law based on underlying questions of fact." *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include: "(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness." *Id.* (citing *Graham v. John Deere Co. of* 

*Kansas City*, 383 U.S. 1, 17-18 (1966)). These factual determinations are often referred to as the "Graham factors."

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In *KSR*, the Supreme Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does," using a flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue . . . . As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

*Id.* at 418.

Since *KSR*, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399 ("The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor."). In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-4 (Fed. Cir. 2010)

(abrogated on other grounds by *Nautilus*, *Inc. v. Biosig Instruments*, *Inc.*, 134 S.Ct. 2120 (2014)) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim limitation); *Velander v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that "all the elements of an invention are found in a combination of prior art references").

An obviousness determination should also include a consideration of "secondary considerations," that is, "commercial success, long felt but unsolved needs, failure of others, etc.," which shed light on "the circumstances surrounding the origin of the subject matter sought to be patented." *Graham*, 338 U.S. at 17-18. "For [such] objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention." *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *see Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015). "Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention." *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1054-1056 (Fed. Cir. 2016).

#### 4. 35 U.S.C. § 112

Pursuant to 35 U.S.C. § 112, a patent claim is invalid for lack of written description if the patent's specification fails to "reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). "[T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art" (*id.*), and "the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology" (*id.* (citing *Capon v. Eshar*, 418 F.3d 1349, 1357-58 (Fed. Cir. 2005))).

Additionally, under 35 U.S.C. § 112, a patent claim is invalid for indefiniteness if "its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." Nautilus, Inc. v. Biosig Instruments, Inc., 134 S. Ct. 2120, 2124 (2014). Indefiniteness can result from a single claim covering both an apparatus and a method of use of that apparatus, as "a manufacturer or seller of the claimed apparatus would not know from the claim whether it might also be liable for contributory infringement because a buyer or user of the apparatus later performs the claimed method using the apparatus." IPXL Holdings v. Amazon.com, 430 F.3d 1377, 1384 (Fed. Cir. 2005); see UltimatePointer, L.L.C. v. Nintendo Co., 816 F.3d 816, 826 (Fed. Cir. 2016) (holding these types of claims may make it "unclear whether infringement . . . occurs when one creates an infringing system, or whether infringement occurs when the user actually uses the system in an infringing manner") (citation omitted). "[A]pparatus claims are not necessarily indefinite for using functional language," however, as in, for example, means-plus-function claims. MasterMine Software, Inc. v. Microsoft Corp., 874 F.3d 1307, 1313 (Fed. Cir. 2017) (citing Microprocessor Enhancement Corp. v. Tex. Instruments Inc., 520 F.3d 1367, 1375 (Fed. Cir. 2008)). Overall, "the written description is key to determining whether a term of degree is indefinite." Guangdong Alison Hi-Tech Co. v. Int'l Trade Comm'n, 936 F.3d 1353, 1361 (Fed. Cir. 2019) (citing Sonix Tech. Co. v. Publ'ns Int'l, Ltd., 844 F.3d 1370, 1378 (Fed. Cir. 2017)) (emphasis in original).

#### III. STANDING, IMPORTATION, AND JURISDICTION

All Respondents import products accused of infringement, so the Commission has *in rem* jurisdiction. *See* JX-0010C (Dell); JX-0011C (Lenovo); JX-0012C (Hisense); CX-0115C.74 (Intel); CX-0153C.127 (Realtek); CX-0162C.18-.20 (TCL); CX-0253C (HP). Subject-matter jurisdiction exists because Philips alleges that Respondents have engaged in unlawful and unfair

acts in conjunction with the importation, sale for importation, and/or sale after importation of articles into the United States. *See Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm'n Op. at 15-16 (Jan. 5, 2004). The patents in suit are assigned to one of the two Complainants, so standing also exists. *See* Tr. (Wieghaus) at 55:17-22. And personal jurisdiction exists because Respondents have appeared and participated in this investigation.

#### IV. U.S. PATENT NO. 10,091,186 – The Transmitter Patent

#### A. Level of Ordinary Skill in the Art

A person having ordinary skill in the art for both the 186 patent and the 564 patent at the time of invention "would have at least a bachelor's degree in electrical engineering, computer science, or the equivalent, with at least two to three years of experience with digital rights management, cryptography, and some combination of digital media, communications, and/or information technology, with additional education in a relevant field substituting for relevant industry experience and vice versa." *Markman* Order at 9. The parties do not challenge this definition.

#### B. Claims-at-Issue

Claims 1, 9, 11, 12, and 14 of the 186 patent remain at issue in this investigation, either through allegations of infringement or of domestic industry. *See* CIB at 40. These claims are:

- 1. A first device for controlling delivery of protected content to a second device, the first device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:
- receive a second device certificate from the second device prior to sending a first signal;
- provide the first signal to the second device when the second device certificate indicates that the second device is compliant with at least one compliance rule;
- receive a second signal from the second device after providing the first signal; and provide the protected content to the second device when the second signal is derived from a secret and a time between the providing of the first signal and the

- receiving of the second signal is less than a predetermined time, wherein the secret is known by the first device.
- 9. The first device of claim 1, wherein determining that the second signal is derived from the secret comprises: modifying the first signal, wherein the modifying requires the secret; and determining that the modified first signal is identical to the second signal.
- 11. The first device of claim 1, further comprising instructions arranged to provide the secret to the second device.
- 12. The first device of claim 1, wherein the second signal comprises the first signal modified by the secret.
- The first device of claim 1 wherein the secret is encrypted with a public key.
   JX-0002 (186 patent).

### C. Claim Construction

As part of the *Markman* process, the following claim terms of the 186 patent were construed, either as agreed between the parties or as determined by the *Markman* Order:

Claim Term	Construction
Certificate	information containing at least the entity's distinguishing identifier and public key, and signed by a certification authority to guard against forgery
Provide the secret to the second device	securely [transmits/transmitting] the common secret with the second device according to a key transport protocol or key agreement protocol
Predetermined time	Accorded its plain and ordinary meaning, with no required purpose or selection criteria
Second signal is derived from [a/the] secret	Accorded its plain and ordinary meaning
Secret is known by the first device	Accorded its plain and ordinary meaning, with no requirement that the secret be exchanged or transmitted between devices

See Markman Order at 18, 23, 24, 26, 34, 36.

# D. Infringement

Philips accuses the transmitter devices manufactured by Dell, Lenovo, and HP that include an Intel processor of directly infringing claims 1, 9, 11, 12, and 14 of the 186 patent. CPX-79C.

Philips also generally asserts that Chip Respondent Intel indirectly infringes the Asserted Patents by contributing to and inducing the direct infringement of their customers. CRB at 39-40.

Claim 1 is the only independent claim asserted, and the remaining asserted claims all depend from claim 1.

### 1. **Claim 1**

Philips annotates claim 1 with identifiers for ease in discussing the elements of independent claim 1, as follows:

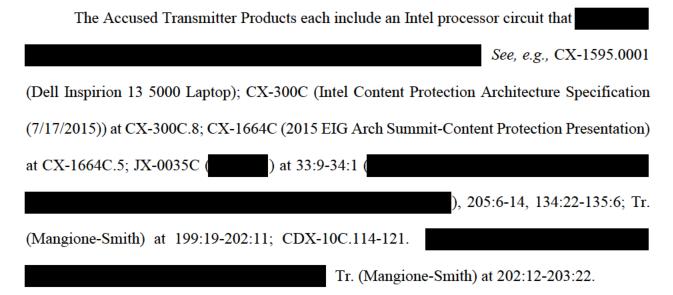
- 1[pre] A first device for controlling delivery of protected content to a second device,
- 1[a] the first device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:
- 1[b] receive a second device certificate from the second device prior to sending a first signal;
- 1[c] provide the first signal to the second device when the second device certificate indicates that the second device is compliant with at least one compliance rule;
- 1[d] receive a second signal from the second device after providing the first signal; and
- 1[e] provide the protected content to the second device when the second signal is derived from a secret and a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time,
- 1[f] wherein the secret is known by the first device.

See generally CIB at 41-98; but see SIB at 32-53 (employing a different annotation). Respondents and Staff apparently do not dispute that the Accused Transmitter Products meet limitations 1[pre], 1[a], 1[b], 1[d], and 1[f], and the evidence shows that these elements are satisfied. See SIB at 33, 34, 45, 53; RIB at 15-42. The Parties disagree as to whether the Accused Transmitter Products meet elements 1[c] and 1[e].

a. 1[Pre] "A first device for controlling delivery of protected content to a second device,"

Each Accused Transmitter Product is a "first device" that supports HDCP 2+ as a transmitter for controlling delivery of protected content to a second, receiver device. *See* Tr. (Mangione-Smith) at 198:23-199:17. The HDCP 2+ protocol is "designed to protect the transmission of Audiovisual Content between an HDCP Transmitter and an HDCP Receiver." *Id.*; CX-233 (HDCP 2.2 over HDMI) at CX-0233.8; CDX-10C.111-113.

b. 1[a] "the first device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"



c. 1[b] "receive a second device certificate from the second device prior to sending a first signal"

The processor circuit in each of the Accused Transmitter Products includes a processor circuit arranged to execute instructions for receiving an AKE\_Send\_Cert message from a receiver during the HDCP 2+ AKE stage of the HDCP 2+ protocol, shown below:

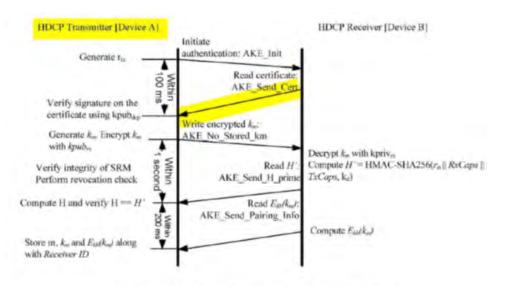


Figure 2.1. Authentication and Key Exchange (Without Stored kn)

CX-0233.12. The AKE\_Send\_Cert message "contain[s] cert<sub>rx</sub>," the receiver's certificate:

Name	Size (bits)	Bit position	Function	
Receiver ID	40	4175:4136	Unique receiver identifier. It has the same format as an HDCP 1.x KSV i.e. it contains 20 ones and 20 zeroes	
Receiver Public Key	1048	4135:3088	Unique RSA public key of HDCP Receiver denoted by $kpub_m$ . The first 1024 bits is the big-endian representation of the modulus n and the trailing 24 bits is the big-endian representation of the public exponent e	
Reserved2	4	3087:3084	Reserved for future definition. Must be 0x0 or 0x1.	
Reserved1	12	3083:3072	Reserved for future definition. Must be 0x000	
DCP LLC Signature	3072	3071:0	A cryptographic signature calculated over all preceding fields of the certificate. RSASSA-PKCS1-v1_5 is the signature scheme used as defined by PKCS #1 V2.1: RSA Cryptography Standard. SHA-256 is the underlying hash function	

CX-0233.13 and Table 2.1; RX-1241C ( ) at Q/A 31.

"Certificate" has been construed to mean "information containing at least the entity's distinguishing identifier and public key, and signed by a certification authority to guard against forgery." *Markman* Order at 18. The "certificate" used in the Accused Transmitter Products (cert<sub>rx</sub>) includes (i) a "Receiver ID," which is a "[u]nique receiver identifier in the form of "Receiver ID"; (ii) a "Receiver Public Key," which is a "[u]nique RSA public key of HDCP

receiver denoted by *kpubrx*; and (iii) a "DCP LLC Signature," which is a "cryptographic signature," to guard against forgery. CX-0233 at Table 2.1.

d. 1[c] "provide the first signal to the second device when the second device certificate indicates that the second device is compliant with at least one compliance rule;"

Philips asserts that all Accused Transmitter Products practice the "indicates" portion of this element because each product includes a processor circuit arranged to verify two things: that a certificate is received in response to an AKE\_Init message from the transmitter, and that the certificate is signed by DCP LLC, the trust and licensing authority for the HDCP 2+ content protection regime. *See* CIB at 48, 50. The "provide" portion of this element is practiced, according to Philips, because if and only if the "indicates" element is satisfied, each product then provides a first signal, "r<sub>n</sub>," at the start of the next phase of the HDCP 2+ protocol. *See id.* at 48-50.

Respondents do not expressly dispute the details of the HDCP 2+ protocol. *See* RIB at 32-36. Instead, the parties disagree on how the "certificate," properly construed, actually "indicates that the second device is compliant with at least one compliance rule." *See* SIB at 31. The first compliance rule Philips identifies is that the second device (i.e., the HDCP 2+ receiver) must send an "AKE\_Send\_Cert" message with the "second device certificate" to the "first device" (i.e., transmitter) "in response to [receiving an] AKE\_Init message." CIB at 50. There are two problems with this proposed compliance rule. First, although transmitting the certificate in response to the first device's interrogation does indicate that the second device is prepared to participate in the HDCP 2+ protocol, it is the transmission itself, not the certificate, that gives that indication. *See* SIB at 43-44. And the certificate has already been transmitted, in accordance with the claim, so a compliance rule that merely duplicates element 1[b] "effectively eliminates" the "indicates" portion of element 1[c]. *Id.* Second, the proposed compliance rule does not match Complainants' own expert's testimony: Philips argues that the rule is "the receiver must provide the certificate

to the transmitter in response to the AKE\_Init message" (CIB at 50), but Dr. Mangione-Smith opined that the rule is "when the AKE\_Init message is sent, only after that, the receiver has to respond within 100 milliseconds [with] the signed certificate" (Tr. (Mangione-Smith) at 213:6-15). So this proposed compliance rule does not conform to the evidence.

The second proposed compliance rule is "the certificate must be signed by the trust and licensing authority for the HDCP 2+ content protection regime, namely, DCP, LLC." CIB at 50. DCP's signature is not merely that of any "certification authority" for the purpose of "guard[ing] against forgery," because "other meaning" is attached to DCP's specific signature. *Markman* Order at 18; Tr. (Mangione-Smith) at 439:15-21. In particular, it is undisputed that "DCP issues Public Key Certificates to any adopter that has signed the HDCP License and paid for device key sets." RIB at 33. And as noted above, a DCP-signed certificate contains the "Unique RSA public key of [the] HDCP Receiver." CX-0233.13 and Table 2.1. Therefore, a signature by DCP, LLC on the certificate indicates, at minimum, that the receiver uses a public key issued by DCP, which is only issued when the "adopter" associated with the receiver has been licensed by DCP.

Admittedly, Philips' identification of the alleged compliance rule is a bit imprecise. Technically, if the "indicat[ion]" provided by the certificate is that the receiver uses a public key issued by DCP, or that the receiver is associated with an adopter licensed by DCP, then the fact that the certificate must be signed by DCP is more of a compliance rule for the transmitter than for the receiver. Indeed, in their Reply Post-Hearing Brief Complainants argue that a DCP-signed certificate "indicates to the transmitter that the receiver is compliant with at least one compliance rule of the HDCP 2+ content protection regime," rather than that the compliance rule is simply that the certificate is signed by DCP, LLC. CRB at 26. But neither Respondents nor Staff quibble with this ambiguity. *See* RIB at 31-36; SIB at 36-43.

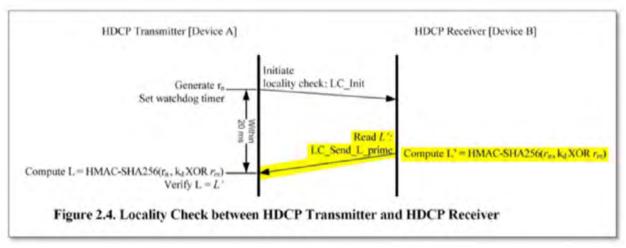
Their disagreement with Philips on this claim element is more fundamental: they contend that certificates signed by DCP "are entirely unrelated to any device's compliance (or lack thereof) with the HDCP Compliance Rules." RIB at 33; see SIB at 40. This contention lacks merit. The definition of a certificate, as agreed to by the parties during the *Markman* proceeding, is "information containing at least the *entity's* distinguishing identifier and public key . . .." *Markman* Order at 18 (emphasis added). And the certificates at issue here are even more precise, because they include the "*Unique* RSA public key of [the] HDCP *Receiver*." CX-0233.13 and Table 2.1 (emphasis added). Respondents' allegation that "[n]one of the fields of the DCP's Public Key Certificates includes information about any particular device," and Dr. Jeffay's testimony to the same effect, are inconsistent with the undisputed facts. RIB at 33; Tr. (Jeffay) at 581:21-582:8.

Even taking as true Respondents' claim that a DCP-signed certificate does not guarantee that the associated device actually complies with the HDCP compliance rules recited in the HDCP License, such a certificate still "indicates" that the receiver is compliant with at least one compliance rule. *See* RIB at 33. The claim language only requires an "indicat[ion]," not complete certainty; inasmuch as this dispute implicates claim construction, the plain and ordinary meaning of "indicates" is adopted. The HDCP 2+ protocol requires a certificate signed by DCP, LLC, rather than some other certifying authority, to "indicate[]" that the receiver is reasonably likely to have a DCP-issued public key and an associated adopter licensed by DCP (which, in turn, indicates that the receiver is reasonably likely to comply with the HDCP compliance rules). And if the certificate is not signed by DCP, LLC, the "HDCP Transmitter aborts the protocol," because in that case the certificate does not "indicate[]" that the receiver complies with at least one compliance rule. CX-0233.13. That is sufficient to satisfy the claim language.

Therefore, the Accused Transmitter Products meet element 1[c] of claim 1 of the 186 patent.

e. 1[d] "receive a second signal from the second device after providing the first signal;"

The processor circuit of each of the Accused Transmitter Products includes instructions arranged to receive a second signal, i.e., L' contained within the message LC\_Send\_L\_Prime, from the second device after providing the first signal, i.e.,  $r_n$  contained within the message LC\_Init:



CX-0233 at Fig. 2.4; Tr. (Mangione-Smith) at 181:6-182:17, 184:3-185:4.

f. 1[e] "provide the protected content to the second device when the second signal is derived from a secret and a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time,"

Discussion of this element is easiest if the element is split into two separate parts. The first part, "provide the protected content to the second device when the second signal is derived from a secret," is practiced by the Accused Transmitter Products because each product implements functionality of the HDCP 2+ specification. *See* Tr. (Mangione-Smith) at 181:6-182:22, 184:3-185:4. Under that specification, the processor circuit in each of the Accused Transmitter Products includes instructions to implement an SKE stage after successful completion of the AKE and LC stages. *See* CX-0233.17. In the SKE stage, the first and second devices establish an encrypted

session wherein the first device can provide the content, protected by the encryption, to the second device. *See* CX-0233.17 ("Content encrypted with the Session Key k<sub>s</sub> starts to flow between the HDCP Transmitter and HDCP Receiver. HDCP Encryption must be enabled only after successful completion of AKE, locality check and SKE stages."); *id.* at .24 ("After successful completion of SKE, HDCP Encryption is enabled and encrypted content starts to flow between the HDCP Transmitter and the HDCP Receiver.").

Furthermore, the processor circuit in each of the Accused Transmitter Products includes

instructions arranged to determine whether the second signal L' is derived from a secret, i.e., k<sub>m</sub>, as a condition precedent to providing the protected content to the second device. *See* Tr. (Mangione-Smith) at 223:3-224:15. During the AKE stage, the Accused Transmitter Products (1) generate the secret k<sub>m</sub> (at least in one embodiment), (2) store the secret k<sub>m</sub> as corresponding to the receiver's Receiver ID identifier, and (3) use the secret k<sub>m</sub> to derive another key, k<sub>d</sub>. *See* CX-233.11-.16; *see also* JX-0034C ( ) at 125:9-13 ( ). The second signal, L', is then generated by the second device using k<sub>d</sub>. *See* CX-0233.17 and Fig. 2.4. The first device, in parallel, calculates a third signal, L, based on the same formula as L' (i.e., likewise derived from secret k<sub>m</sub>), and upon receipt of L' confirms that L = L'. *Id.* at .16-.17. Both L and L' are derived from k<sub>m</sub> because L and L' are derived from k<sub>d</sub>, which in turn is derived from k<sub>m</sub>, and if L does not equal L', the LC stage (and thus the protocol) fails. *Id.* No party disputes that the Accused Transmitter Products perform this process.

Whether the Accused Transmitter Products perform the second part of this element, however, is in dispute. Philips, citing the HDCP 2.2 over HDMI protocol (CX-0233), asserts that "each Transmitter Product includes instructions arranged to determine whether a time between the providing the first signal, i.e.,  $r_n$ , and the receiving of the second signal, i.e., L', is less than a

predetermined time." CIB at 77-78. Using the figure below, Philips submits that "each of the Transmitter Products implements a round trip time ('RTT') check [that is a] required aspect of the HDCP 2+ protocol":

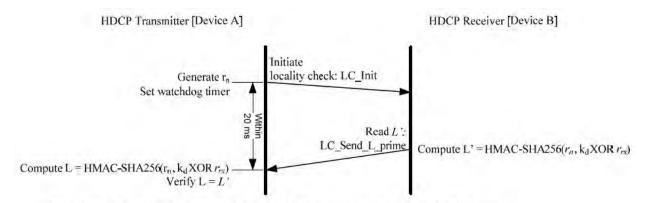
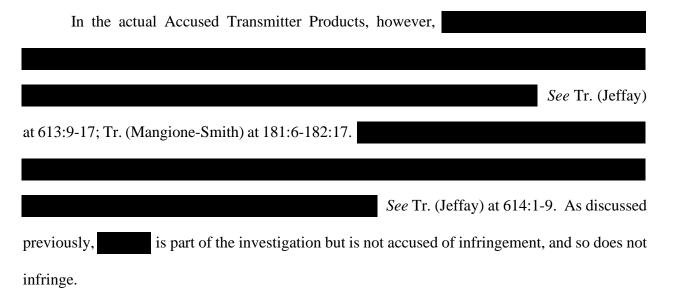


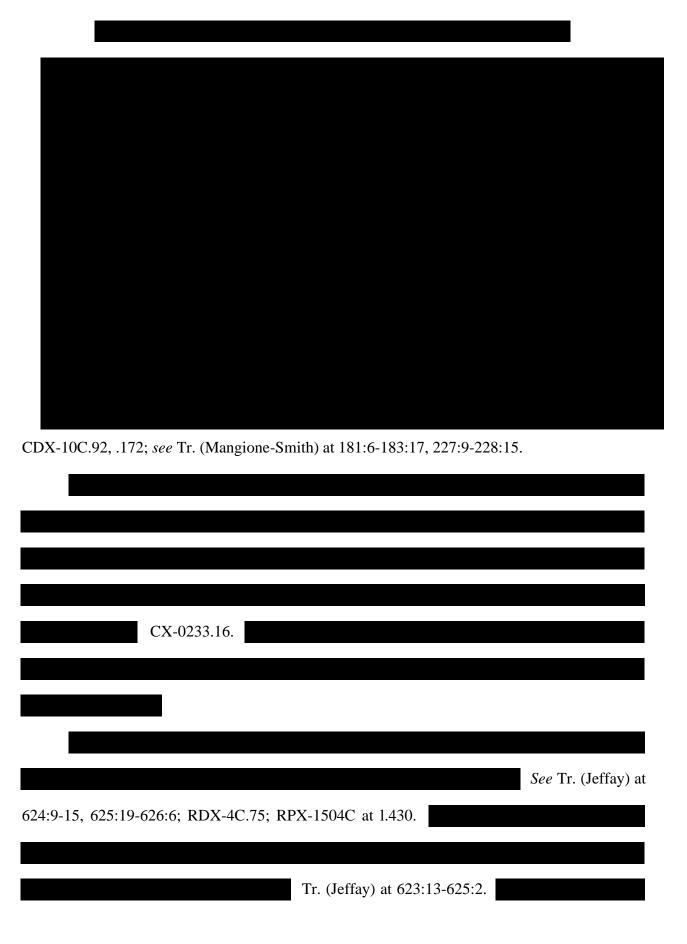
Figure 2.4. Locality Check between HDCP Transmitter and HDCP Receiver

CX-0233.17 (annotated). The description accompanying this figure is specific: the "message [containing L'] must be received by the transmitter within 20 ms from the time the transmitter finishes writing the LC\_Init message parameters to the HDCP Receiver." CX-0233.16. The transmitter "aborts the authentication protocol" if "the watchdog timer expires before the last byte of [the message containing L'] is received by the transmitter." *Id*.

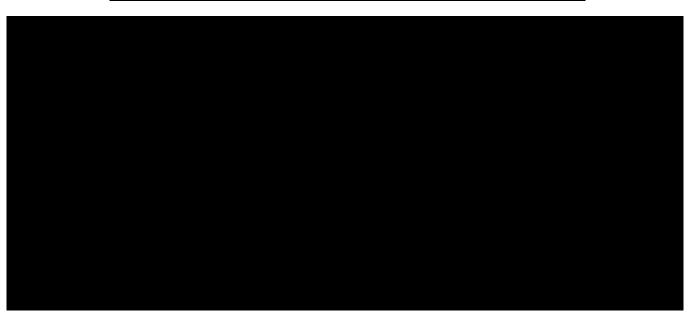


With respect to Intel's		



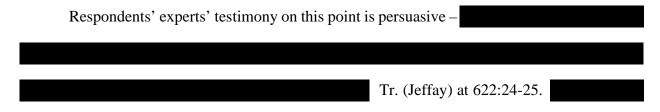


See Tr. (Jeffay) at 624:16-22; RDX-4C.76.
See Tr. (Jeffay) at 626:7-22.
See Tr. (Jeffay) at 626:23-627:3; RDX-4C.76.
Tr. (Jeffay) at 624:23-625:2, 627:4-6, 713:2-14.
(Tr.
(Jeffay) at 627:19-628:19; RDX-4C.78; RX-1884.1)
(To (Loffers)
(Tr. (Jeffay)
at 628:3-19).
See Tr. (Jeffay) at 626:23-627:6.
See Tr. (Jeffay) at 630:7-22; RPX-1505C at ll. 466-67, 552-53; RDX-4C.82.

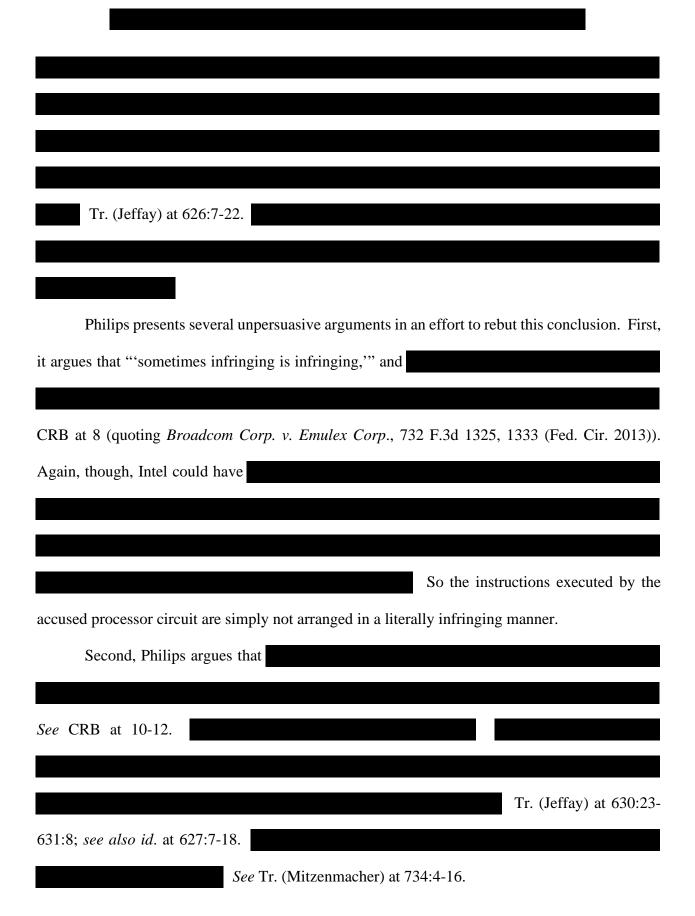


RDX-0004C.82.

Another possible<sup>4</sup> example of delay was explained by Dr. Mitzenmacher: "the HDCP standard . . . utilize[s] a certain type of interface [called] I2C or sometimes as I squared C," and when using this interface, "you cannot start the timer" until the receiver sends an "I2C acknowledgement" acknowledging receipt of the message. Tr. (Mitzenmacher) at 768:2-770:13 (citing RX-0379.0008 (CX-0233.0008)). This introduces "a variable and [] non-zero amount of delay caused by that acknowledgement" between the transmission of r<sub>n</sub> and the start of the watchdog timer. *Id.* at 769:8-770:13. Moreover, testing of actual products suggests that the timer does not always timeout when it is supposed to, such that the round trip time alone may exceed the specifications' requirements without causing the protocol to abort. *See id.* at 770:14-23.



<sup>4</sup> This point is raised by Respondents only in discussing the corresponding element of the 564 patent, and is ignored by Complainants, so it is not clear to what extent use of an I2C bus is duplicative of the multiple sources of delay to which Dr. Jeffay testified. *See* RIB at 95-98; CRB at 46-51, 56.

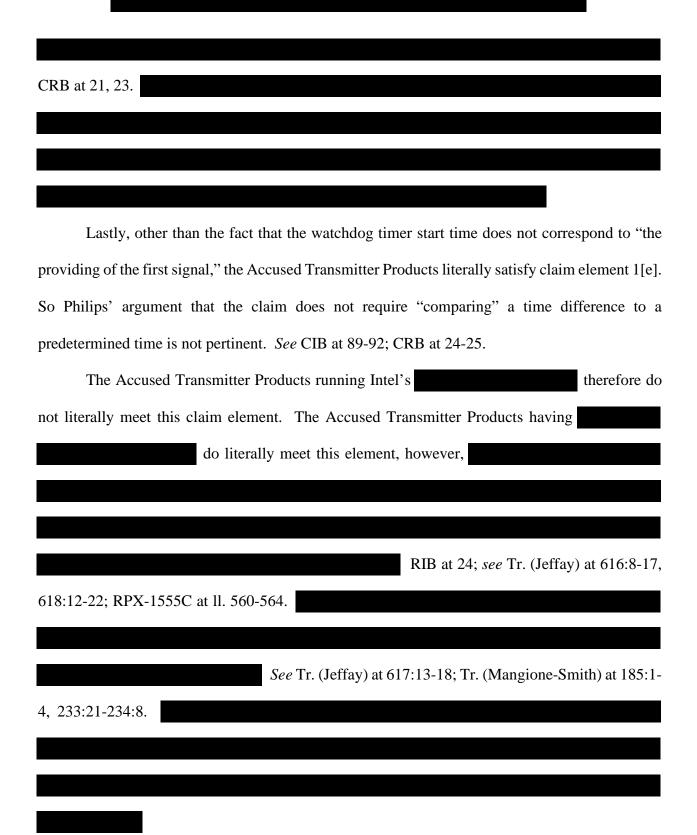


Third, Philips argues that its experts' "test results confirm that [the products] function without such delay" is not persuasive. CRB at 13. The test results did "not directly measure [Philips' alleged] 20 ms timeout (for HDMI) or 16 ms timeout (for DisplayPort) . . . [instead, the tests measured] the time between the [protocol analyzer's] (i) receipt of an LC\_Init message from the Transmitter Product and (ii) receipt of a new AKE\_Init message from the Transmitter Product (i.e., the transmitter restarting the HDCP 2+ authentication protocol from the beginning) following a deliberate timeout." *Id.* That is, "the [analyzer] purposely did not send an L' second signal back to the Transmitter Product in order to confirm that the Transmitter Product would in fact enforce a predetermined time, timeout, and then restart the protocol as expected and required by the HDCP 2+ specification." *Id.* at 13; *see* Tr. (Mangione-Smith) at 229:13-233:1 (discussing test results and methodology). Other than demonstrating that

neither of which are disputed, these test results are beside the point, because they do not show at what point in the process the watchdog timer starts.

Next, Philips presents a variety of related arguments to the effect that any delay between actually sending the first signal and starting the watchdog timer is "speculative," predicated on "conclusory" expert testimony, and in any event "not of material magnitude." *See* CRB at 16-20. This point might be relevant to a doctrine of equivalents analysis, but it has no bearing on literal infringement. Moreover, neither Dr. Jeffay's nor Dr. Mitzenmacher's testimony is conclusory, but is well explained and well supported.

Philips further argues, more precisely, that





Tr. (Mangione-Smith) at 233:21-234:8; CDX-0010C.178.

This satisfies the requirement that "a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time." JX-0002 (186 patent) at cl. 1.

Respondents nonetheless argue that

RIB at 24.

Respondents contend that the claim language does require such measurement, as well as a comparison to a predetermined time, relying principally on expert evidence and certain statements in Order No. 28 (Denying Respondents' Motion for Summary Determination Regarding Priority Date) (June 4, 2021). See RIB at 24-26; RRB at 10-11. But the dispute here is purely over claim construction, and the relevant claim language has only been "accorded its plain and ordinary meaning, with no required purpose or selection criteria." Markman Order at 24. To be sure, Orders issued after the Markman Order used various formulations of this element that reference measurement, but these were merely shorthand or summary descriptions to distinguish the first part of the element from the "less than a predetermined time" part. See Order No. 27 (Denying

Respondents' Motion for Summary Determination of Patent Ineligibility) at 2 (May 24, 2021) ("determining whether a measured time difference exceeds a threshold value"); Order No. 28 at 2 ("The independent claims require measuring a time difference between sending and receiving two signals that is 'less than a predetermined time."); *id.* at 3 ("the requirement that there be both a time difference measurement and a comparison to a 'predetermined time'"). That these Orders used terms found nowhere in the claim language – including "measured," "threshold," "difference," and "comparison" – without any briefing on claim construction demonstrates that they were not formal constructions.

Respondents' reliance on Order No. 28 in particular is unfounded because it did not focus on time difference measurement; it was instead about whether "predetermined time," as opposed to "predetermined distance," has adequate written description support. *See* Order No. 28 at 2. And that Order expressly noted that "predetermined time' has been construed such that 'any determination as to whether the relevant time difference is less than a predetermined time satisfies this particular claim limitation." Order No. 28 at 2 (quoting *Markman* Order at 23). Moreover, at least one Order issued after the *Markman* Order suggests (again, without any formal claim construction) that use of a watchdog timer "seemingly meets the requirements" of the claim language. Order No. 29 (Denying Respondents' Motion for Summary Determination of Noninfringement of U.S. Patent No. 10,298,564) at 3-4 (June 7, 2021). And a watchdog timer does not measure time difference, as Respondents emphasize. *See* RIB at 4.

In any event, the exact claim construction dispute presented here was not presented for adjudication before the hearing, so the parties have never briefed, and I have never resolved, such a dispute. Starting with the existing construction – the "plain and ordinary meaning, with no required purpose or selection criteria" – the question presented is whether that plain and ordinary

meaning "requires a time difference measurement 'between the providing of the first signal' and the receiving of the second signal." RIB at 25-26. Although the specification recites only examples of "measuring the time," as opposed to use of a watchdog timer (i.e., where the protocol aborts unless the second signal is received before the timer runs out), the specification suggests that measuring the time is only one possible embodiment. JX-0002 (186 patent) at 6:51-54 ("measuring the distance...could *e.g.* be performed by measuring the time" difference) (emphasis added). No party points to anything in the prosecution history that sheds light on this issue, and the language of the claim is straightforward enough that extrinsic evidence, particularly the dueling expert evidence, is neither needed nor appropriate.

Particularly significant is the fact that neither the term "measurement," nor any variation of it, is found in the claim language. So the plain and ordinary meaning of "when . . . a time between the providing of the first signal and the receiving of the second signal is less than a predetermined time" is exactly what the language denotes: "any determination as to whether the relevant time difference is less than a predetermined time satisfies this particular claim limitation," even when the time difference is not expressly measured. *Markman* Order at 23. That is precisely what a watchdog timer does,

See Tr. (Jeffay) at 617:6-618:11. Therefore,

Accordingly, the meet element 1[e], but the Accused Transmitter Products do not.

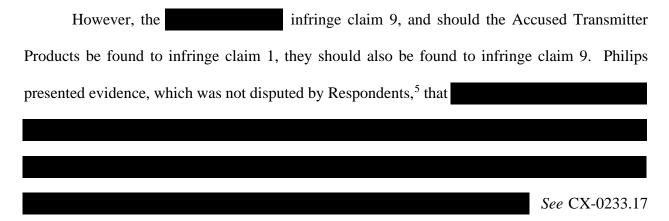
## g. 1[f] "wherein the secret is known by the first device."

The secret,  $k_m$ , is known to the first device because the first device generates it. See CX-0233.13.

In summary, the \_\_\_\_\_ meet elements 1[c] and 1[e], as well as the remaining elements, and so infringe claim 1 of the 186 patent. The Accused Transmitter Products lack element 1[e], and, as with the \_\_\_\_\_ do not infringe claim 1 of the 186 patent.

2. Claim 9: "The first device of claim 1, wherein the determining that the second signal is derived from the secret comprises: modifying the first signal, wherein the modifying requires the secret; and determining that the modified first signal is identical to the second signal."

Claim 9 depends from independent claim 1. The Accused Transmitter Products do not literally infringe claim 1, and thus do not literally infringe claim 9 since it includes the limitations of claim 1.



("Verify L = L"); Tr. (Mangione-Smith) at 245:24-246:16. Dr. Mangione-Smith further discussed source code having the instructions to perform the specific limitations of the claim. Tr. (Mangione-Smith) at 181:6-182:22, 184:3-185:4.

3. Claim 11: "The first device of claim 1, further comprising instructions arranged to provide the secret to the second device."

49

<sup>&</sup>lt;sup>5</sup> As Staff points out, Respondents did not present any evidence of non-infringement of the dependent claims of the 186 patent beyond those raised for claim 1 in the Initial Post Trial Brief. *See* SRB at 33, n. 17. Thus, pursuant to Ground Rule 13.2, all arguments presented in Respondents' Reply Post Trial Brief that Philips fails to make a *prima facie* showing of infringement of the dependent claims have been waived.

Claim 11 depends from independent claim 1. The Accused Transmitter Products do not literally infringe claim 1, and thus the products do not literally infringe claim 11 since it includes the limitations of claim 1.

However, infringe claim 11, and should the Accused Transmitter Products be found to infringe claim 1, they should also be found to infringe claim 11. Philips presented evidence, which was not disputed by Respondents, that the processor circuit in each of the Transmitter Products includes instructions arranged to provide the secret  $k_m$  to the second device. CX-0233.12; Tr. (Mangione-Smith) at 246:17-247:5. Dr. Mangione-Smith further testified that the processor circuit of each Accused Transmitter Product is arranged to execute instructions that satisfy this claim element. *See* Tr. (Mangione-Smith) at 180:25-181:5, 184:3-185:4.

4. Claim 12: "The first device of claim 1, wherein the second signal comprises the first signal modified by the secret."

Claim 12 depends from independent claim 1. The Accused Transmitter Products do not literally infringe claim 1, and thus the products do not literally infringe claim 12 since it includes the limitations of claim 1.

However, infringe claim 12, and should the Accused Transmitter

Products be found to infringe claim 1, they should also be found to infringe claim 12. Philips presented evidence, which was not disputed by Respondents, that

See CX-0233.12, .17; RX-7074C.4; Tr. (Mangione-Smith) at 247:6-248:7.

See CX-0233.12, .17; RX-7074C.4; Tr. (Mangione-Smith) at 247:6-248:7.

0233.12, .17; RX-7074C.4; Tr. (Mangione-Smith) at 247:6-248:7. In view of the broad

construction accorded the similar language in claim 1, "derived from a secret," this process satisfies the claim language. *See* Markman Order at 26 ("derived from" includes indirect application of the secret to the signal and generation or modification of the signal using a byproduct of the secret).

# 5. Claim 14: "The first device of claim 1 wherein the secret is encrypted with a public key."

Claim 14 depends from independent claim 1. The Accused Transmitter Products do not literally infringe claim 1, and thus the products do not literally infringe claim 14 since it includes the limitations of claim 1.

However, the infringe claim 14, and should the Accused Transmitter

Products be found to infringe claim 1, they should also be found to infringe claim 14. Philips

presented evidence, which was not disputed by Respondents, that

See CX-0233.12;

Tr. (Mangione-Smith) at 248:8-19. Dr. Mangione-Smith further testified, citing the source code regarding clam 11 discussed above ("further comprising instructions arranged to provide the secret to the second device"), that the processor circuit of each Accused Transmitter Product is arranged to execute instructions that satisfy this claim element. *See* Tr. (Mangione-Smith) at 248:8-19.

## 6. **Doctrine of Equivalents**

Philips advances only a perfunctory doctrine of equivalents argument. CIB at 88. In particular with respect to element 1[e], Philips argues that the "Transmitter Products' aforementioned HDCP 2+ functionality alternatively practices [the] element under the doctrine of equivalents because any difference between this limitation and the Transmitter Products' implementations of HDCP 2+ is insubstantial." *Id.* The only evidence cited is the testimony of

Dr. Mangione-Smith, who offered exactly three words regarding whether the Accused Transmitter Products' functionality is substantially different from the claimed limitations: "No, it's not." Tr. (Mangione-Smith) at 226:18-22. And the only specific argument presented is that "[t]he accused products all assess whether a time difference in relation to the first and second signals is less than a preset time threshold irrespective of how precisely they do so or specifically when the various implementations start and stop the time check." CIB at 88.

This is insufficient to establish infringement under a theory of equivalence. *See, e.g., Certain Smart Thermostats, Smart Hvac Sys.*, & Components Thereof, Initial Determination, Inv. No. 337-TA-1185, 2021 WL 1997747 at \*70 (Apr. 20, 2021) (expert's "testimony is devoid of any function-way-result analysis on how the temperature estimates perform substantially the same function, in substantially the same way to achieve substantially the same result as temperature measurements. These conclusory allegations cannot establish infringement under the doctrine of equivalents.") (citations omitted). Moreover, Philips failed to rebut Dr. Jeffay's testimony, and the evidence on which he relies:



Tr. (Jeffay) 635:22-638:7. Therefore, Philips has not shown infringement by the Accused Transmitter Products under the doctrine of equivalents.

### 7. Indirect Infringement of the 186 Patent

As a first step in proving induced or contributory infringement, Philips must prove that the asserted claims of the 186 patent are directly infringed. *See BMC Res. v. Paymentech*, 498 F.3d 1373, 1379 (Fed. Cir. 2007) ("Indirect infringement [] requires, as a predicate, a finding that some

party amongst the accused actors has committed the entire act of direct infringement."). Philips proved direct infringement only by and thus, as a matter of law, Philips cannot prevail on a claim of indirect infringement as to any other products.

However, should the Commission find that the Accused Transmitter Products infringe the asserted claims of the 186 patent, and in any event with respect to in order to prove that Respondents induced infringement, Philips must prove that once Respondents knew of the patent, they actively and knowingly aided and abetted another's direct infringement. *See DSU Med. Corp.*, 471 F.3d at 1305. To prove that Respondents contributed to the direct infringement of the asserted patent, Philips must prove that Respondents sold the Accused Transmitter Products "with knowledge that the component is especially designed for use in a patented invention, and is not a staple article of commerce suitable for substantial noninfringing use." *Wordtech Sys.*, 609 F.3d at 1316.

Philips asserts that Intel induced infringement of the 186 patent through advertising and providing to customers all or substantially all of the hardware, software and/or firmware for implementing HDCP 2+ despite its pre-suit knowledge of infringement. *See* CIB at 39-40. Philips argues that "Intel's decision to continue inducing its customers to make, use, sell, and import infringing Transmitter Products notwithstanding Intel's knowledge of its customers' direct infringement demonstrates conduct from which [specific] intent [to induce infringement] can be inferred." CRB at 39 (citing *Global-Tech*, 563 U.S. at 766 ("Accordingly, we now hold that induced infringement under § 271(b) requires knowledge that the induced acts constitute patent infringement.")).

Philips also asserts that Intel is liable for contributory infringement because its products allegedly do not have "substantial noninfringing uses." *Id.* Philips submits more precisely that

the "accused Intel functionality, i.e., the Intel hardware, software, and/or firmware that supports HDCP 2+ over wired HDMI and DisplayPort interfaces has no substantial noninfringing uses." *Id.* at 39-40.

Philips' case for indirect infringement is only slightly less perfunctory than its case for doctrine of equivalents infringement. Philips' expert testified that Respondent Intel had knowledge of its infringement of the 186 patent as a result of its awareness of the filing of Complainants' request (i.e., the Complaint) for this investigation. *See* Tr. (Mangione-Smith) at 282:24-283:3. However, he also testified that he did not know whether Intel understood that its actions infringed the 186 patent (Tr. (Mangione-Smith) at 285:25-286:6), and that he had "no knowledge of the actual good faith intentions of Intel" (*id.* at 285:19-24). This testimony falls short of showing the requisite intent for inducement of infringement. *Global-Tech*, 563 U.S. at 766. Nor is there any other evidence that Intel specifically intended that its customers infringe a claim of the 186 patent, as opposed to merely "inten[ding] to cause the acts that produce direct infringement." *DSU Med. Corp.*, 471 F.3d at 1306.

With respect to the requirement for contributory infringement that there be no substantial non-infringing uses, Dr. Mangione-Smith asserted that an Intel manual states

Tr. (Mangione-Smith) at 282:10-23. He also testified that a product need not even follow the written HDCP 2+ specifications in order to "support" HDCP 2+ by providing or receiving HDCP 2+ protected content. *See* Tr. (Mangione-Smith) at 330:14-18 ("I've seen numerous cases where, despite [companies'] statements that they follow [the HDCP specifications] and are compliant, where they're not.").

Respondents, on the other hand, presented persuasive evidence that the accused Intel technology – processor chips and associated driver software – has substantial noninfringing uses.

Of greatest significance is that Intel's

See Tr. (Jeffay) at 615:15-18;

JX-35C at 99:11-100:13, 105:6-107:11.

See Tr. (Philips Counsel) at 34:13-14.

See Tr. (Mangione-Smith) at 291:20-292:1; Tr. (Jeffay) at 616:1-3; RX-1541C.5.

Therefore, Philips has not met its burden of proving indirect infringement as to any accused product.

# V. U.S. PATENT NO. 10,298,564

# A. Level of Ordinary Skill in the Art

As stated earlier, a person skilled in the art of the invention of the 564 patent at the time of invention "would have at least a bachelor's degree in electrical engineering, computer science, or the equivalent, with at least two to three years of experience with digital rights management, cryptography, and some combination of digital media, communications, and/or information technology, with additional education in a relevant field substituting for relevant industry experience and vice versa." *Markman* Order at 9. The parties do not challenge this definition.

## B. Claims-at-Issue

Claims 1, 18, 19, 21, and 25 of the 564 patent remain at issue in this investigation, either through allegations of infringement or of the domestic industry technical prong. *See* CIB at 101. All of these claims (given below) depend directly from claim 1:

- 1. A second device for receiving delivery of a protected content from a first device, the second device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:
- provide a certificate to the first device prior to receiving a first signal, wherein the first signal is sent by the first device, wherein the certificate is associated with the second device;
- receive the first signal when the certificate indicates that the second device is compliant with at least one compliance rule;
- create a second signal, wherein the second signal is derived from a secret known by the second device;
- provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and
- receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time.
- 18. The second device of claim 1, further comprising instructions arranged to receive the secret from the first device.
- 19. The second device of claim 1, wherein the second signal comprises the first signal modified by the secret.
- 21. The second device of claim 1, wherein the secret is encrypted with a public key.
- 25. The second device of claim 1, wherein the secret is used for generating a secure channel between the first device and the second device.

JX-0003 (564 patent).

#### C. Claim Construction

As part of the *Markman* process, the following claim terms of the 564 patent were construed, either as agreed between the parties or as determined by the *Markman* Order:<sup>6</sup>

Claim Term	Construction
Certificate	information containing at least the entity's
	distinguishing identifier and public key, and

<sup>&</sup>lt;sup>6</sup> A number of terms are present in both the 186 and 564 patents, and they are repeated here.

	signed by a certification authority to guard
	against forgery
Predetermined time	Accorded its plain and ordinary meaning, with
	no required purpose or selection criteria
Second signal is derived from [a/the] secret	Accorded its plain and ordinary meaning
Processor circuit arranged to execute	"a processor [that] may include other hardware
instructions, the instructions arranged to	components" but "whether software or
	firmware is required as an element of the
	claimed processor circuit will be resolved after
	the evidentiary hearing"
Secret is known by the first device	Accorded its plain and ordinary meaning, with
	no requirement that the secret be exchanged or
	transmitted between devices

Markman Order at 18, 23, 24, 26, 34, 36.

The parties present several disputes that purport to be over claim construction.

#### 1. "first device"

During the hearing it became apparent that the term "first device," which appears in claim 1 of the 564 patent, needs to be construed. *See* Tr. 956:23-958:2. Respondents argue that "[i]n addition to structural limitations of a 'second device' (receiver), the claims recite certain functional limitations or 'conditions' that must be satisfied by a 'first device.'" RIB at 52. Respondents recognize that the first device has been found to not be a "structural limitation" of the 564 claims (Order No. 36 at 3), but they nonetheless assert that the "first device" clauses are "limiting and dictate that a 'second device' does not infringe unless a 'first device' makes the recited determinations" (such as sending a first signal). *Id.* at 53. Thus, in order to prove infringement, Respondents assert that the claims, "'read in the context of the entire patent, [indicate] that the claimed invention' requires that the claimed 'second device' be placed into an infringing configuration with a separate 'first device' that performs the recited functions." *Id.* at 55 (citing *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006)).

Philips and Staff argue that a first device is not a required element of the claims. *See* CRB at 49; SIB at 60-64. Staff asserts that "the plain and ordinary meaning of 'first device' does not

require construing it as a functional limitation of the asserted claims." SRB at 40. The recitations of "first device" in the asserted claims of the 564 patent are similar to the recitations in the 977 patent, which have been construed. *See* Markman Order at 61-62. Claim 1 of the 977 patent recites, for instance, "a receiving device, comprising . . . means for receiving over the secure authenticated channel a protected content after the first device determines that the second signal is derived using the secret and a time between a transmission of the first signal and receipt of the second signal by the first device is less than a predetermined time." CX-0733 (977 patent) at cl.

1. Recognizing that "all functions must be performed by the claimed invention," and that the first device is not itself the claimed "receiving device," the element "after the first device . . . less than a predetermined time" was construed as a condition to be satisfied rather than a function performed by the claimed receiving device. *Markman* Order at 61.

Claim 1 of the 564 patent similarly recites a "second device" that comprises a processor circuit that executes instructions arranged to perform certain functions, the most hotly-disputed of which is "receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermine time." JX-0003 (564 patent) at 7:22-26. Clearly, there are differences between this language and the corresponding language of the 977 patent, but in substance they are the same. So the starting point for any construction of the 564 patent's "first device" elements should be that the functions to be executed using the claimed instructions are performed only upon satisfaction of the recited conditions. In the case of the final element of claim 1 of the 564 patent, that condition is "when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermine time." This language does not recite a

function performed by the claimed second device, or any other structural element of the claim; it instead recites a condition that must be satisfied before the instructions executed by the second device's processor circuit permit "recei[pt]" of the protected content.

This construction is what Philips proposes. *See* CIB at 49. As Respondents correctly point out, Complainants have not briefed any infringement theory other than this. *See id.*; RRB at 35. Such an all-or-nothing approach means that infringement can only be shown based on Complainants' proposed construction. For their part, Respondents do not oppose construing the claim as requiring satisfaction of certain conditions, but argue that the second device must be "placed in an infringing configuration with a 'first device'" that performs the operations that satisfy the conditions. RIB at 53.

Respondents' proposal is more consistent with a "system" claim than a "device," or "apparatus," claim. *E.g., IPXL Holdings, LLC v. Amazon.com, Inc.*, 430 F.3d 1377, 1379 (Fed. Cir. 2005) (discussing a claim for an "electronic financial transaction system" comprising multiple individual devices). And no party has pointed to any lexicography, disavowal, or other reason to deviate from the plain language. Admittedly, no party has identified any cases construing an apparatus claim to require a condition to be performed, either. *See* RRB at 36 n.9. But the case law is not entirely silent. *See Certain Radio Frequency Identification ("RFID") Products*, Inv. No. 337-TA-979 ("*Certain RFID Products*"), Final Initial Determination (Public) (June 22, 2017), *not reviewed in pertinent part*, Comm'n Op. (Oct. 30, 2017), *aff'd sub. nom.*, *Neology v. ITC*, 767 F.3d 937 (Fed. Cir. 2019). In *Certain RFID Products*, one of the independent claims (claim 1 of the "'436 patent") recited an apparatus (an "RFID reader") comprising a "processor configured to . . . receive" certain data "in response to [a] second communication and as a result of validation of [a] security key." *Id.* at 44. The second communication was sent to, and the security key was

validated by, a "tag," or "RFID transponder." *Id.* at 30 (referring to "tags or transponders"), 75 ("after the tag validates . . . the security key it receives from the reader, it sends the identifier in its memory to the reader"). Although the precise claim construction dispute in *Certain RFID Products* differed from the present dispute, the claim language was accorded its plain and ordinary meaning, with the recited function being performed by the tag: "as a result of validation of the security key" . . . [means] as a result of confirmation of the security key." *Id.* at 60-61. As another example, the Federal Circuit construed similar functional language in *UltimatePointer*, *L.L.C. v. Nintendo Co.*, 816 F.3d 816 (Fed. Cir. 2016). The claim in that case recited an "apparatus comprising . . . an image sensor, said image sensor generating data related to the distance between a first point [related to a computer generated image] and a second point [related to a handheld enclosure]." *Id.* at 819. Rejecting a claim of indefiniteness, the Court held that the claim covered an "apparatus with particular capabilities." *Id.* at 828.

Although claim 1 of the 564 patent is formally an apparatus claim, it covers (in essence) a processor programmed to carry out certain functions in a certain order, and where some functions are not performed unless certain conditions are satisfied. As in *Certain RFID Products*, under the plain language of the claim those conditions are satisfied by a structure not encompassed within the claim itself. And as in *UltimatePointer*, where the claim also referenced structures not within the scope of the claim, the claimed apparatus here merely needs to be capable of performing the claimed functions.

Thus, the "second device" of claim 1 of the 564 patent comprises "a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to . . . receive the protected content from the first device" when the condition described above is satisfied, a first

device is not a required structural element, an "infringing configuration" is not a required element, and infringement need not be analyzed under alternative constructions.

## 2. "signal"

Respondents raise two arguments regarding the term "signal," one which implicates claim construction and one which does not. They first argue that  $r_n$  and L' are not "signals" within the meaning of the claims. See RIB at 98-99. They base their argument on the cross-examination of Philips' expert, where he testified that there is no difference between a message and a signal, and testimony that he "would not call Rn a message" because it is merely a "data value" that can be carried by a signal. See id. at 98 (citing Tr. (Mangione-Smith) at 378:16-379:16). Therefore, Respondents submit that  $r_n$  cannot be the "first signal" in the asserted claims and Philips' infringement assertion fails.

Dr. Mangione-Smith did not testify that  $r_n$  is not a "signal" as Respondents claim. The specific cross examination was:

- Q: Would you agree with me that there is no difference between a message and a signal in the context of these patents in the accused products?
- A. I've certainly previously taken the opinion that Rn is a signal and that LC\_Init is a signal and LC\_Init is specifically a message. I would not call Rn a message, so, yeah, with regard -- I mean, does "message" appear in the claims? I don't think so. I'm sorry. Maybe you need to ask the question again, and I'll try to orient my thoughts better.
- Q. Let's just pull up your deposition transcript, page 374, lines 12 through 18. You were asked the question: "Is there any difference between a message and a signal?" Your answer: "There can be. In this case, I don't think in -- in this situation and context, I don't know that I've identified any differences. I think that can be the same thing, yeah." So, yes or no, Dr. Mangione-Smith, did I read that correctly?
  - A. Yes, you did read that correctly, sir.
- Q. And you would agree with me that a signal can include data values, correct?
  - A. Yes.

Q. And Rn is a data value, isn't it?

A. Yes, Rn is a data value.

Tr. (Mangione-Smith) at 378:16-379:14.

Thus, Dr. Mangione-Smith's testimony was that  $r_n$  is a data value, and a signal can include data values. And on direct examination he opined that  $r_n$  and L' are signals. *See* Tr. (Mangione-Smith) at 268:18-24, 273:2-8. To be sure, there is also expert testimony that "a data value within an application message [is] not a signal." Tr. (Stubblebine) at 916:19-917:11. But the specification of the 564 patent discloses a broad range for the contemplated "signal," including a "normal data bit signal," "special signals other than for data communication," and a "direct sequence spread spectrum signal." JX-0003 (564 patent) at 5:52-58. Moreover, the specification contemplates a random number of a particular length as the first signal, because it discloses "XORing the chips (e.g. spreading code consisting of 127 chips) of the direct sequence code by the bits of the secret (e.g. secret consists also of 127 bits)." *Id.* at 5:59-61. So a pseudo-random number like  $r_n$ , even when embedded within a message, falls comfortably within the scope of "signal." *See* CX-0233.0016.

Second, Respondents argue that the limitation "wherein the second signal is received by the first device" must be treated as a claim limitation. RIB at 99 (citing JX-0003 (564 patent) at cl.1. This limitation appears in the second to last element of claim 1, immediately before the "first device determines" element: "provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device." *Id.* Certainly the plain and ordinary meaning of this language is that the instructions must be arranged so that the second signal is both "provide[d]" to and "received" by the first device. But the very next claim element implicitly requires exactly that, because it requires the second device's instructions to be arranged to receive protected content when the first device makes two determinations about the second

signal, regarding the secret and the round trip time. So putting the various limitation in a slightly different order gives clearer effect to the "wherein" clause but does not change the substance of the claim language:

provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and

receive the protected content from the first device when the second signal is received by the first device and the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time.

JX-0003 (564 patent) at 7:19-26. This is the plain and ordinary meaning of the claim language.

# 3. "arranged to"

Respondents also argue that the term "arranged to" in claim 1 should be construed as requiring "configuration" rather than "capable of." RIB at 56. Thus, Respondents submit that Philips' position that the second device, standing alone, need only be capable of performing certain recited functionalities, is incorrect. RIB at 55.

The weight of authority is to the contrary. The Federal Circuit has expressly held that "arranged to" is analogous to "adapted to" and can have "a broader meaning of 'capable of' or 'suitable for." *In re Chudik*, 851 F.3d 1365, 1373 (Fed. Cir. 2017) (citing *In re Man Mach. Interface Techs. LLC*, 822 F.3d 1282, 1286 (Fed. Cir. 2016)). Similarly, in *Aspex Eyewear*, the Federal Circuit recognized that "the phrase 'adapted to' ... can [] be used in a broader sense to mean 'capable of' or 'suitable for.'" *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012). To be sure, the Federal Circuit also noted that the term "adapted to" could have a narrower meaning, depending on the context. *See id*.

But in the context of the 564 patent, "the processor circuit arranged to execute instructions, the instructions arranged to" refers to, in short, the programming of the processor. And programming denotes a capability, not an actual two-device configuration that would transform

the apparatus claim into a system claim. See Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1217 (Fed. Cir. 2014) (holding that the limitation, "a processor for arranging information for transmission . . . which identifies a type of payload information," "used language reciting capability"); Finjan, Inc. v. Secure Computing Corp., 626 F.3d 1197, 1204-05 (Fed. Cir. 2010) (holding that the limitations, "a logical engine for preventing execution," "a communications engine for obtaining a Downloadable," or "a linking engine . . . for forming a sandbox package" "describe capabilities without requiring that any software components be 'active' or 'enabled'"). In essence, the Accused Receiver Products must be programmed to "receive the protected content from the first device," to infringe, which implies only capability; they need not actually be placed into communication with such a first device. See Ericsson, 773 F.3d at 1216-17 ("[W]hen the asserted claims recite capability, our case law supports finding infringement by a 'reasonably capable' accused device on a case-by-case basis."); Finjan, 626 F.3d at 1204-05 (affirming infringement verdict for "non-method claims describ[ing] capabilities without requiring that any software components be 'active' or 'enabled'" because "software for performing the claimed functions existed in the products when sold"). Therefore, inasmuch as this issue implicates claim construction, "the instructions arranged to" is construed as "the instructions making said second device able to."

## D. Infringement

As noted, Philips accuses certain semiconductor chips manufactured or supplied (i) by MediaTek and incorporated into certain products (i.e., television products and monitor products) sold by Dell, Hisense, HP, and TCL (the MediaTek-Based Accused Receiver Products); and (ii) by Realtek and incorporated into certain products (i.e., television products and monitor products) sold by Dell, Hisense, HP, Lenovo, and TCL (the Realtek-Based Accused Receiver Products) of

directly infringing claims 1, 18, 19, 21, and 25 of the 564 patent. CPX-79C; *see* CIB at 102. Respondents raise multiple preliminary issues. Philips also asserts that Respondent Realtek indirectly infringe the Asserted Patents by contributing to and inducing the direct infringement of their customers. CRB at 57-58.

Respondents argue that Philips improperly relies on "shortcuts" to show infringement. RIB at 45-52. Respondents assert that "Philips' allegations against the `564 Accused and Alleged DI Products are, at bottom, based on the HDCP 2.x Specification," which allegedly is improper because "deviations from the HDCP 2.x Specification are rampant" and other sections of the HDCP 2.x specification are not "mandatory." RIB at 45-49. Thus, Respondents assert that "Philips cannot rely upon the HDCP 2.x Specification to show infringement, and must instead compare each asserted claim to each `564 Accused Product." *Id.* at 49. To a certain degree, Respondents are correct; as with any proof for which it bears the burden, Philips must prove infringement on the basis of the technology that the Accused Receiver Products truly use. Thus, the evidence that Philips presents, including but not limited to how and if the HDCP 2+ protocol is relied upon, will be evaluated on that basis.

Respondents also preliminarily argue that Philips cannot show that any accused product is representative of all other Accused Receiver Products. RIB at 49-51 ("there are many displays that can only support the HDCP 1.x protocol (and not the HDCP 2.x protocol")); *id*. ("there are accused Dell monitors that have no HDMI port and cannot support HDCP 2.x over HDMI, and other Dell monitors that have no DisplayPort port and cannot support HDCP 2.x over DisplayPort"); *id*. ("there are accused products that reuse a Device Key Set across multiple devices"). Again, Philips bears the burden of proving infringement, and thus, each claim element and accused product is discussed below.

Respondents further argue that Complainants rely on incorrect Realtek source code. *See*RIB at 70-72. The evidence does show that the televisions with Realtek SoCs are configured to run their software under

See Tr.

(de la Iglesia) at 867:15-869:14. However, Dr. Mangione-Smith opined that the Realtek

Tr. (Mangione-Smith) at 447:7-

13. Respondents' expert had no opinion on that point. Tr. (de la Iglesia) at 876:13-19. Therefore, this point is immaterial.

Claim 1 is the only independent claim asserted, and the remaining asserted claims all depend from claim 1.

## 1. **Claim 1**

Like with the 186 patent, Philips annotates claim 1 with identifiers for ease in discussing the elements of independent claim 1:

- 1[Pre] A second device for receiving delivery of a protected content from a first device,
- 1[a] the second device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:
- 1[b] provide a certificate to the first device prior to receiving a first signal, wherein the first signal is sent by the first device, wherein the certificate is associated with the second device;
- 1[c]receive the first signal when the certificate indicates that the second device is compliant with at least one compliance rule;
- 1[d] create a second signal, wherein the second signal is derived from a secret known by the second device;
- 1[e] provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and
- 1[f] receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time.

See CIB at 101-13.

## a. 1[Pre] "A second device for receiving delivery of a protected content from a first device,"

Respondent TCL does not dispute that its Accused Receiver Products identified in CX-2032C support HDCP 2+. See CX-162C at CX-162C.24-59, 84-102 (TCL ROG Resp.); CX-1942C (43S403 Specification Sheets) at CX-1942C.2 (HDMI input); Tr. (Mangione-Smith) at 173:17-174:1, 271:15-23. Respondent Hisense does not dispute that its Accused Receiver Products identified in CX-2032C support HDCP 2+. See CX-83C at CX-83C.16-21, 23-24 (Hisense ROG Resp.); Tr. (Mangione-Smith) at 174:2-11. Respondent Dell does not dispute that its Accused Receiver Products identified in CX-2032C support HDCP 2+. See CX-1488C (UP2720Q User's Guide) at CX-1488.15 (HDMI and DisplayPort inputs); Tr. (Mangione-Smith) at 174:12-19. Respondent HP does not dispute that its Accused Receiver Products identified in CX-2032C support HDCP 2+. See CX-253C (HP ROG Resp.); CX-153C (Realtek ROG Resp.); CX-2027C (MediaTek ROG Resp. CX-1941C (Envy 27 specification) at CX-1941C.33 ; Tr. (Mangione-Smith) at 174:22-175:4. Respondent Lenovo does not dispute that its Accused Receiver Products identified in CX-2032C support HDCP 2+. See CX-126C at CX-126C.262-264 (Lenovo ROG Resp.); CX-34C (Lenovo monitor teardown); CX-1499 (P32p-20 spec sheet) at CX-1499.1-22 (HDMI and DisplayPort inputs); Tr. (Mangione-Smith) at 175:5-13.

The MediaTek-Based Accused Receiver Products include MediaTek systems-on-chips ("SoCs") running MediaTek source code that support HDCP 2+ receiver functions over HDMI and/or DisplayPort. *See* CX-2027C (MediaTek ROG Resp.); Tr. (Mangione-Smith) at 249:7-254:13; CPX-257SC, CPX-328SC, CPX-331SC, CPX-335SC (MediaTek TV source code); CPX-506SC, CPX-508SC (MediaTek TV source code); CPX-277SC, CPX-471SC, CPX-472SC, CPX-4

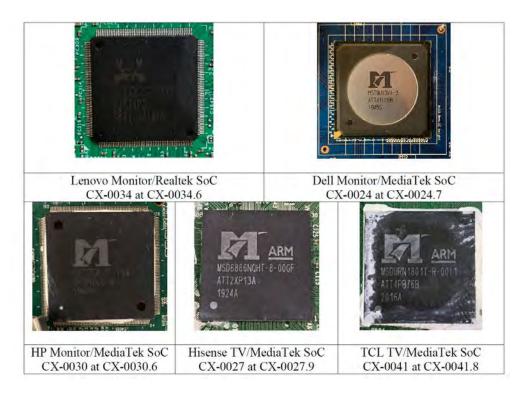
474SC (MediaTek monitor source code); CPX-552SC, CPX-553SC, CPX-555SC (MediaTek monitor source code). The Realtek-Based Accused Receiver Products, listed in CX-2032C, Section II, include monitor SoCs and TV SoCs that support HDCP 2+ receiver functions over HDMI and/or DisplayPort. *See* CX-153C at CX-153C.14-16, 28-31, 35-40, 43-48 (Realtek ROG Resp.); CX-1534C (Realtek LGE0551 datasheet); CX-1535C (Realtek RTD2795T-CG datasheet); CPX-656SC, CPX-657SC, CPX-697SC, CPX-698SC, CPX-700SC (Realtek monitor source code); CPX-672SC, CPX-676SC, CPX-1055SC, CPX-1058SC, CPX-1067SC, CPX-1069SC, CPX-1073SC (Realtek TV source code); Tr. (Mangione-Smith) at 254:14-258:18.

The Accused Receiver Products thus support HDCP 2+ as a receiver for receiving delivery of protected content from a transmitter (a first device), and therefore, meet the preamble element of claim 1 of the 564 patent.

b. 1[a] "the second device comprising a processor circuit, the processor circuit arranged to execute instructions, the instructions arranged to:"

The Accused Receiver Products include a MediaTek-based SoC or a Realtek-based SoC running MediaTek or Realtek software and thus include "a processor circuit arranged to execute instructions" to implement the required aspects of HDCP 2+ for receiving protected content. *See* Tr. (Mangione-Smith) at 259:18-265:16. Each of these SoC's includes at least one central processing unit (*e.g.*, ARM Cortex CPU, 8051 core, or MIPS CPU), cryptography modules (*e.g.*, RSA, SHA, and AES modules), and on-chip memory for executing software to implement relevant required HDCP 2+ receiver functions. *See* Tr. (Mangione-Smith) at 259:23-261:13.

Below are "teardown images" of some Accused Receiver Products:



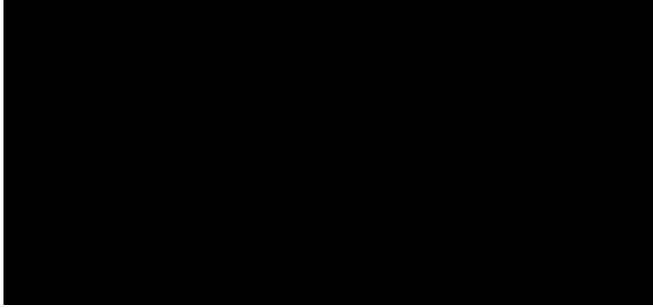
The only Respondent disputing this evidence is Realtek, who argues that its products do not meet this limitation because "in order for the Realtek Accused Products to infringe claim 1, Philips was required to show the presence of software or firmware that is arranged to execute each limitation of claim 1," and

RIB at 65. Respondents reason that the "processor circuit" of claim 1 may include both a processor/CPU and fixed-function hardware, but that claim 1 also requires "instructions" that are arranged to perform each of the claimed functions. *Id.*; *see* Tr. (Mangione-Smith) 363:20-364:9 ("the claim requires that there be instructions arranged to satisfy all five of these limitations"). And Respondents' expert testified that "instructions have to be performed by [a] CPU [whereas] fixed-function hardware does not execute instructions." Tr. (Stubblebine) 899:1-903:14. Respondents further submit that the claim term "instructions" means "software and firmware." *See* RIB at 65 (citing Tr. (Mangione-Smith) 363:7-11). Accordingly, Respondents conclude, in order for the Realtek-Based Accused Receiver Products to infringe claim

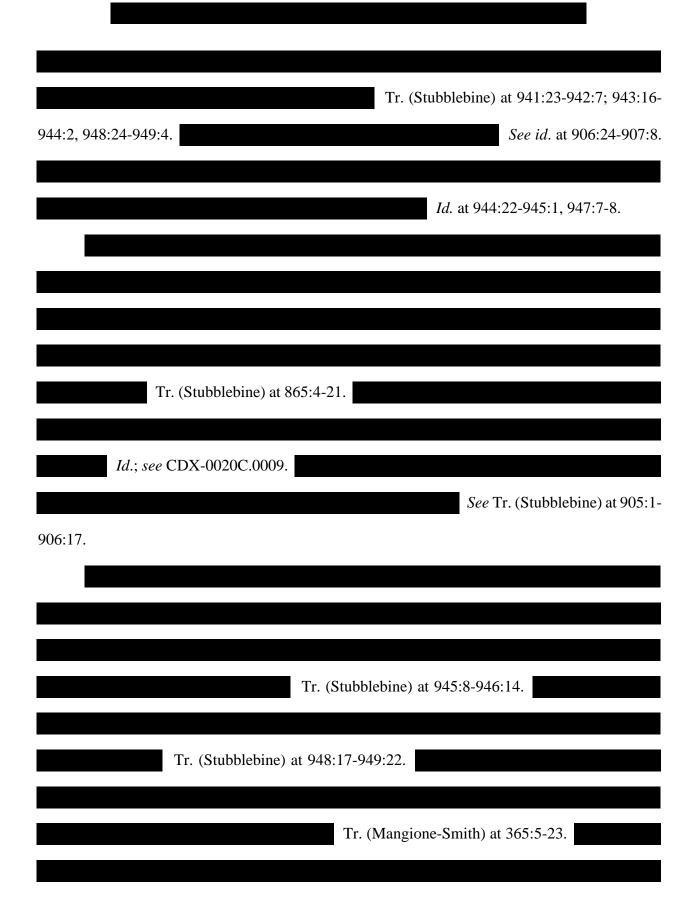
1, Philips was required to show the presence of software or firmware that is arranged to execute each limitation of claim 1. *Id*.

In the *Markman* order, "processor circuit" was construed to optionally include "other hardware components" than merely a processor. *Markman* Order at 33-34. And it is undisputed that one skilled in the art would understand that fixed-function hardware may be part of the claimed processor circuit. Tr. (Stubblebine) at 929:24-934:1. However, the parties disputed "whether software or firmware is required to meet the 'processor circuit arranged to execute instructions' limitation," and resolution of that dispute was deferred. *Id.* at 33.

In light of the evidence, this particular claim construction dispute is moot, because



CDX-0020C.0009. Realtek's expert, Dr. Stubblebine, testified that the Realtek SoCs include a "CPU with software interacting with various components" of the hardware,



RIB at 68 (emphasis omitted).

Complainants address this issue as one of claim construction – "Realtek[] attempt[s] to narrowly construe the meaning of 'receive' within the claim such that it only refers to accepting a signal as it arrives over a hardware interface" – while Respondents apparently address it as one of noninfringement. CIB at 106; see RIB at 68. It is not clear that this issue does implicate claim construction, but to the extent it does, the specification discloses a hardware arrangement similar to Realtek's: "In order to perform the distance measurement, a signal is transmitted to the second device [which] receives the signal via a receiver." JX-0003 (564 patent) at 6:33-35. Moreover, "[t]he device 401 comprises a receiver 403 and a transmitter 411 [and] further comprises means for performing the steps described above, which could be by executing software using a microprocessor 413 connected to memory 415 via a communication bus 417." Id. at 6:62-67. And it stands to reason that any "receiver" in such a hardware arrangement must be capable of receiving signals essentially at any time, and then transferring them to memory, because otherwise the device may easily miss a crucial message. So the Realtek hardware configuration is sufficiently akin to the configuration disclosed in the specification that it falls within the scope of claim 1. In other words, "instructions arranged to . . . receive the first signal" encompasses an incoming signal on an interface bus being stored in memory, followed by notification to the CPU, followed by the CPU executing instructions to retrieve the signal from memory,

Thus, the Accused Realtek-Based Receiver Products, as well the other Accused Receiver Products, meet the limitations of element 1[a] because the claimed instructions are arranged to

perform the claimed functions or to cause fixed-function hardware to perform the claimed functions.

c. 1[b] "provide a certificate to the first device prior to receiving a first signal, wherein the first signal is sent by the first device, wherein the certificate is associated with the second device;"

The evidence shows that the Accused Receiver Products each have a processor circuit that includes instructions arranged to provide a certificate, cert<sub>rx</sub>, to a first device during the AKE stage and prior to receiving a first signal r<sub>n</sub>. *See* CX-0233.12; Tr. (Mangione-Smith) at 265:17-267:23. For the Accused MediaTek-Based Receiver Products (for Respondents Dell, Hisense, HP, and TCL) the evidence showed that each MediaTek-based processor circuit is arranged to execute instructions, including the message

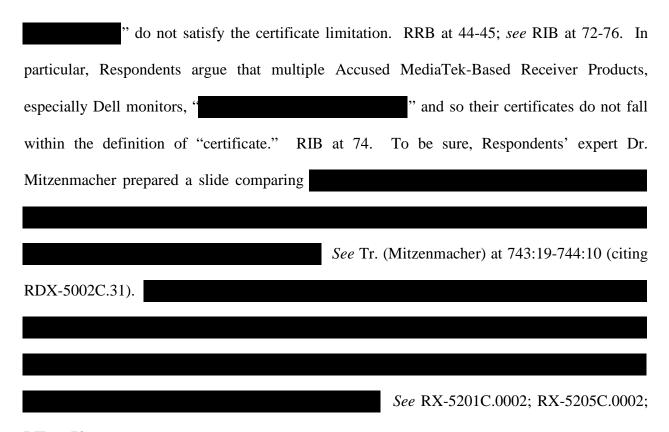
See Tr. (Mangione-Smith) at 249:7-250:18; CPX-0331SC at 1. 344; CPX-0335SC at 1l. 993-1039. For the Accused Realtek-Based Receiver Products (for Respondents Dell, Hisense, HP, Lenovo, TCL, and Realtek), the evidence showed that each Realtek-based processor circuit is arranged to execute instructions including in the monitor products and, apparently, comparable code in the TV products. *See* Tr. (Mangione-Smith) at 254:17-255:11, 257:5-258:18.

Respondents raise two arguments regarding this element. First, they argue that

See

RIB at 72. This is irrelevant, because the claim only requires that the processor circuit be arranged to execute instructions, where the instructions are "arranged to [] provide" the certificate, regardless of when the certificate is actually loaded into memory. *See* JX-0003 (564 patent) at cl. 1.

Second, Respondents argue that under the proper construction of "certificate," which is "information containing at least the entity's distinguishing identifier and public key, and signed by a certification authority to guard against forgery," any receiver devices that "



RIB at 72.

The evidence does show, however, that some Dell monitors

See RX-3038C at 123; CX-0233.0006. The question presented, then, is whether the certificates associated with these Dell monitors fall within the scope of the term "certificate." Again, that term has been construed, in relevant part, as "information containing at least the entity's distinguishing identifier and public key," a construction the parties agreed on. *Markman* Order at 18. Complainants take the position that "[t]wo or more receivers having the same identifier corresponding to an entity, such as Dell, would meet this limitation"; Respondents take the position that "entity" . . . refers to the device being authenticated" and that, in any event, there is no evidence that "the Receiver ID identifies . . . [some entity] other than the particular receiver device with which it is associated." CIB at 108; RIB at 76.

The parties agreed to the term "entity," even though it does not appear in the specification of the 564 patent in connection with the term "certificate," and it is plainly broad enough to encompass the company with which an Accused Receiver Product is associated. And the evidence shows that

See RX-3038C at 123. Moreover, Dr. Mangione-Smith did not testify that the Receiver ID "needs to be a unique receiver identifier." RIB at 76 (emphasis omitted). He instead testified that "according to the [HDCP] specification, it needs to be a unique receiver identifier," which is both undisputed and irrelevant. Tr. (Mangione-Smith) at 329:20-23. So the Dell certificates in question fall within the scope of "certificate," and there is no need to "construe the construction." See RIB at 73 (arguing that a skilled artisan would understand the term "entity" to refer to the receiving device).

Therefore, the Accused Receiver Products meet this element of claim 1 of the 564 patent.

d. 1[c] "receive the first signal when the certificate indicates that the second device is compliant with at least one compliance rule;"

As with the Accused Transmitter Products, the Accused Receiver Products practice this claim limitation because the processor circuit in each of the products includes instructions arranged to receive the first signal  $r_n$  contained within the LC\_Init message after the certificate  $cert_{rx}$  indicates that the receiver is compliant with at least one compliance rule, namely, that the certificate is signed by DCP, LLC. *See* CIB at 109-10; CX-0233.12, .16-.17.

See Tr. (Mangione-Smith) at 250:19-251:5,

253:10-254:13.

See id. at 255:23-256:19, 258:11-14; CDX-0010C.0214.

This satisfies the claim requirements. Respondents only argument against this conclusion repeats the same argument about compliance rules rejected above in connection with the Accused Transmitter Products. *See* RIB at 76-86; RRB at 47-53. Therefore, the Accused Receiver Products meet this element of claim 1 of the 564 patent.

## e. 1[d] "create a second signal, wherein the second signal is derived from a secret known by the second device;"

The processor circuit in each of Respondents' Accused Receiver Products are capable of executing instructions to create a second signal (L'), that is derived from secret k<sub>m</sub>, and the secret is known by the receiver because the transmitter has transmitted it. *See* Tr. (Mangione-Smith) at 272:5-273:15. Specifically, the Accused MediaTek-Based Receiver Products (for Respondents Dell, Hisense, HP, and TCL) execute instructions including and the Accused Realtek-Based Receiver Products (for Respondents Dell, Hisense, HP, Lenovo, TCL, and Realtek) execute instructions including

256:19; CDX-0010C.0214.

Respondents argue that this element requires that the second device must include specific instructions that are "arranged to" create a second signal and that the second device must know the secret. RIB at 86. Respondents further submit that to "know" the secret requires more than "merely pointing to the capability of a device to possibly acquire the secret at some point in the future." *Id.* Again, though, "arranged to" means "capable of," and does not require that the secret be known at the time of importation. *See, e.g., Ericsson,* 773 F.3d at 1216-17. Thus, this element requires that the second device be capable of creating the second signal by deriving the second signal from a secret known by the second device, which has been established. Furthermore, "[the Accused Receiver Products] know the 'secret' when used as designed." Order No. 29 at 4.

Therefore, the Accused Receiver Products meet this element of claim 1 of the 564 patent.

f. 1[e] "provide the second signal to the first device after receiving the first signal, wherein the second signal is received by the first device; and"

The processor circuit in each of the Accused Receiver Products includes instructions arranged to provide the second signal L' to the transmitter after receiving the first signal  $r_n$ , wherein the second signal L' is received by the transmitter. See CX-0233.17; Tr. (Mangione-Smith) at 272:5-273:15. Specifically, the Accused MediaTek-Based Receiver Products execute instructions including and the Accused Realtek-Based Receiver Products execute instructions, identified by Dr. Mangione-Smith See Tr. (Mangione-Smith) at

251:12-23 and 254:17-256:19.

Therefore, the Accused Receiver Products meet this element of claim 1 of the 564 patent.

g. 1[f] "receive the protected content from the first device when the first device determines that the second signal is derived from the secret and a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time."

This element corresponds to the first part of claim element 1[e] in the 186 patent, and there is no dispute that the Accused Receiver Products meet the first part of this element, "receive the protected content from the first device when the first device determines that the second signal is derived from the secret." The evidence shows that the processor circuit in each of the Accused Receiver Products includes instructions arranged to receive the protected content from the first device when the first device determines that the second signal L' is derived from the secret k<sub>m</sub>. See CX-0233.5; Tr. (Mangione-Smith) at 273:25-275:1. In the Accused MediaTek-Based Receiver Products,

See Tr. (Mangione-Smith) at 222:5-11, 251:24-254:3. In the Accused Realtek-Based Receiver Products, the corresponding source code is found in file See id. at 256:20-258:18; CDX-0010C.0216.

Philips submits that the Accused Receiver Products also meet the second part of this element, "a time between the sending of the first signal and the receiving of the second signal is less than a predetermined time," and relies on essentially the same evidence proving the existence of the first part of the element. *See* CIB at 113-15. Philips specifically alleges that each Accused Receiver Product "is arranged to receive an SKE\_send\_EKS signal, which indicates to the Receiver Product that the HDCP 2+ Locality Check has passed and both such conditions have been met." CIB at 113 (citing Tr. (Mangione-Smith) at 274:9-17). Philips further argues that all of the Accused Receiver Products are "configured and adapted to compute [L'] and send it back to a first device within a predetermined time." Tr. (Mangione-Smith) at 276:12-17. Thus, according to Philips, the Accused Receiver Products "are arranged to satisfy the conditions of the HDCP 2+ Locality Check when placed in communication with an HDCP 2+ transmitter." CIB at 114.

As Dr. Stubblebine explains, however, the instructions in the Accused Receiver Products are not so arranged:

"Tr. (Stubblebine) at 915:23-916:18. It is undisputed that

See Tr. (Mangione-Smith) at 222:5-11, 251:24-254:3, 273:16-274:17.



Although Respondents do not expressly rely on Dr. Stubblebine's opinion, and otherwise do not focus on the "instructions" aspect of the claim language, they do argue that "when the [Accused Receiver Products] are communicating over HDMI, there is no measurement of a time difference beginning with the 'sending of the first signal' as required." CIB at 97. Philips, by contrast, essentially ignores this issue. *See* CIB at 113-15; CRB at 46-51, 55. So it is unrebutted that the Accused Receiver Products lack a processor circuit executing instructions arranged to receive protected content only when the "predetermined time" condition is met.

Therefore, the Accused Receiver Products do not meet element 1[f] of claim 1, and therefore do not infringe claim 1 of the 564 patent.

2. Claim 18: "The second device of claim 1, further comprising instructions arranged to receive the secret from the first device."

Claim 18 depends from independent claim 1. The Accused Receiver Products do not infringe claim 1, and thus the products do not infringe claim 18 since it includes the limitations of claim 1.

However, should claim 1 be found to be infringed by the Accused Receiver Products, claim 18 also should be found to be infringed. Philips presented evidence that the processor circuit in each of the Accused Receiver Products includes instructions arranged to receive the secret k<sub>m</sub> from the first device. *See* CX-0233.12; Tr. (Mangione-Smith) at 276:24-277:18. Respondent Realtek disputes this because in the Realtek Accused Products the alleged secret is

However, as previously discussed, the Realtek Accused Receiver Products

execute instructions to

3. Claim 19: "The second device of claim 1, wherein the second signal comprises the first signal modified by the secret."

Claim 19 depends from independent claim 1. The Accused Receiver Products do not infringe claim 1, and thus the products do not infringe claim 19 since it includes the limitations of claim 1.

However, should claim 1 be found to be infringed by the Accused Receiver Products, claim 19 also should be found to be infringed. Philips presented evidence, which was not disputed by Respondents, that the processor circuit in each of the Accused Receiver Products includes instructions arranged to create the second signal L', which includes the first signal r<sub>n</sub> modified by the secret k<sub>m</sub> (which is used to derive k<sub>d</sub>) using HMAC-SHA256 computation. *See* CX-0233.12, 17; RX-7074C (HMAC-SHA256) at RX-7074C.6; Tr. (Mangione-Smith) at 277:19-278:14.

4. Claim 21: "The second device of claim 1, wherein the secret is encrypted with a public key."

Claim 21 depends from independent claim 1. The Accused Receiver Products do not infringe claim 1, and thus the products do not infringe claim 21 since it includes the limitations of claim 1.

However, should claim 1 be found to be infringed by the Accused Receiver Products, claim 21 also should be found to be infringed. Philips presented evidence that the processor circuit in each of the Receiver Products includes instructions arranged to receive the secret k<sub>m</sub> from the first device encrypted with the receiver's public key. *See* CX-0233.12; Tr. (Mangione-Smith) at 278:15-279:4. Respondents dispute this evidence, stating that claim 21 requires a first device. RIB at 101. However, as found previously, a first device is not a required element of the claims of the 564 patent but need only meet the condition claimed, which it does.

5. Claim 25: "The second device of claim 1, wherein the secret is used for generating a secure channel between the first device and the second device."

Claim 25 depends from independent claim 1. The Accused Receiver Products do not infringe claim 1, and thus the products do not infringe claim 25 since it includes the limitations of claim 1.

However, should claim 1 be found to be infringed by the Accused Receiver Products, claim 25 also should be found to be infringed. Philips presented evidence that each of the Accused Receiver Products includes the capability to use the secret k<sub>m</sub> to generate a secure channel between a first device and the second device, by computing a session key k<sub>s</sub> that can then be used to establish the HDCP 2+ encrypted session between the transmitter and the receiver for transfer of content, as protected by such encryption, for decryption by the receiver. *See* CX-0233.0017-18, 24-25, 50; Tr. (Mangione-Smith) at 279:5-281:19.

Respondents dispute this, stating that a first device is required by the claim (this position has been rejected), and also that the first device "is required to have the capability to generate a

secure channel, but Philips' alleged 'secret' k<sub>m</sub>, is not used to generate the 'HDCP 2.x encrypted session' (the alleged secure channel')." RIB at 101. Respondents allege that the session key k<sub>s</sub> is used to generate the secure channel and key k<sub>m</sub> is used to derive dkey2, which is then used to transmit key k<sub>s</sub> to the receiver. Thus, according to Respondents, k<sub>s</sub> (not k<sub>m</sub>) may be used to generate the channel. *Id.* (citing Tr. (Mitzenmacher) at 784:6-785:1; RX-1130C at 141; RX-0379.17-.18). And according to Respondents, key k<sub>s</sub> does not correspond to the claimed "secret," and key k<sub>s</sub> is not generated using k<sub>m</sub> but rather is independently generated by the HDCP Transmitter. *Id.* (citing Tr. (Mitzenmacher) at 783:22-785:5; RX-0379.0017, .45). Finally, Respondents assert that Philips' contention that k<sub>m</sub> is used by extension through dkey2 is also incorrect because "the HDCP 2.x Specification indicates that dkey2 is used to decrypt the already generated k<sub>s</sub> during transport from the transmitter to the receiver. CX-0233.0017-18. As such, neither k<sub>m</sub> nor dkey2 has a role in the generating of the HDCP 2.x encrypted session." *Id* at 101-102 (citing Tr. (Mitzenmacher) at 784:6-785:5).

The claim merely requires that the secret, here  $k_m$ , be "used for generating a secure channel," with no particular restriction on how directly or indirectly that is accomplished. The HDCP specification requires the first signal,  $r_n$ , to be "XORed with the least-significant 64-bits of [secret/master key]  $k_m$  during generation of dkey2," with dkey0 and dkey1 generated the same way but with  $r_n$  set to 0 rather than pseudo-random. CX-0233.0025. The derived key, dkey2, is then used to "send" and decrypt the session key,  $k_s$ , which is the key used to encrypt the protected content. *See id.* at .0017-.18 ("Content encrypted with the Session Key  $k_s$  starts to flow"); Tr. (Mitzenmacher) at 784:6-785:5. Message SKE\_Send\_Eks contains  $k_s$  and is decrypted by the receiver using dkey2, which the receiver has derived using the same method as the transmitter. *See* CX-0233.0017-.18, .25.