

John M. Caracappa

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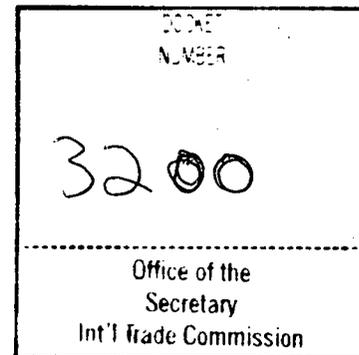
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**Steptoe**  
STEPTOE & JOHNSON LLP

March 7, 2017

**Via Hand Delivery**

The Honorable Lisa R. Barton  
Secretary to the Commission  
U.S. International Trade Commission  
500 E Street, S.W.,  
Room 112-A,  
Washington, D.C. 20436



Re: *Certain Semiconductor Devices and Consumer Audiovisual Products Containing the Same*, Inv. No. 337-TA-\_\_\_\_\_

Dear Secretary Barton,

Enclosed for filing on behalf of Complainant Broadcom Corporation (“Broadcom” or “Complainant”), please find the following documents in support of Complainant’s requests that the Commission commence an Investigation pursuant to Section 337 of the Tariff Act of 1930, as amended. Pursuant to the Commission Rules of Practice and Procedure, a request for confidential treatment of Confidential Exhibits 1C, 4C, 75C to 78C, 80C, and 88C to 94C is also included with this submission.

Complainant submits the following documents to accompany the Complaint filing:

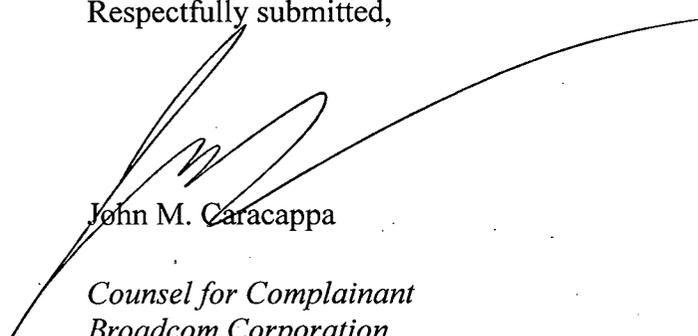
1. An original and eight (8) copies of Complainant’s verified non-confidential Complaint, and (1) copy of the accompanying non-confidential exhibits in electronic form, with (1) copy of the Confidential Exhibits 1C, 4C, 75C to 78C, 80C, and 88C to 94C, in electronic form segregated from the non-confidential exhibits (Commission Rules 201.6(c), 210.4(f)(3)(i) and 210.8(a));
2. Certified copies of U.S. Patent Nos. 8,284,844; 7,590,059; 7,310,104; 8,068,171; and 7,342,967 (individually and respectively, “the ’844 patent,” “the ’059 patent,” “the ’104 patent,” “the ’171 patent,” and “the ’967 patent”; collectively, the “Asserted

Patents”) (included in the Complaint as Exhibits 9, 12, 18, 15, and 22 respectively) (Rule 210.12(a)(9)(i));

3. Certified copies of the assignment histories for the '844, '059, '104, '171, and '967 patents; respectively referenced in the Complaint as Exhibits 10, 13, 19, 16, 23 (Commission Rule 210.12(a)(9)(ii));
4. One certified copy of the prosecution history of each of the Asserted Patents and four (4) additional copies of the prosecution histories in electronic form (on a CD) (Commission Rule 210.12(c)(1));
5. A statement concerning the public interest pursuant to Commission Rule 210.8(b); and
6. A letter and certificate pursuant to Commission Rules 201.6(b) and 210.5(d) requesting confidential treatment of information appearing in Confidential Exhibits 1C, 4C, 75C to 78C, 80C, and 88C to 94C to Complainant's Verified Complaint.

Please contact me if you have any questions, or if you require additional documents or information.

Respectfully submitted,



John M. Caracappa

*Counsel for Complainant  
Broadcom Corporation*

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Dear Secretary Barton,

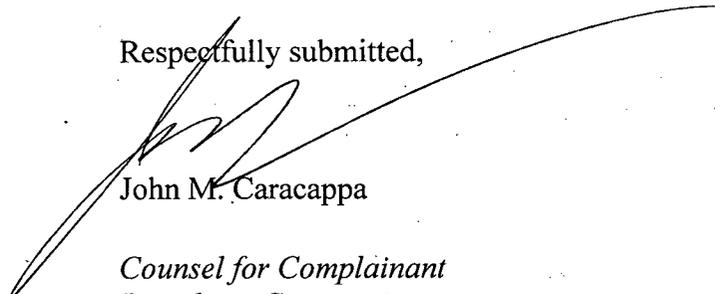
Steptoe & Johnson LLP represents Broadcom Corporation ("Broadcom" or "Complainant") in connection with a complaint filed pursuant to section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

Pursuant to Commission Rules 201.6 and 210.5, 19 C.P.R. §§ 201.6 and 210.5, Complainant respectfully requests confidential treatment of the business information contained in Confidential Exhibits 1C, 4C, 75C to 78C, 80C, and 88C to 94C, and Complainant's Confidential Statement of Public Interest. Complainant seeks confidential treatment of the information contained in these documents because the information discloses proprietary commercial information, proprietary commercial relationships, proprietary business information, and/or proprietary business relationships that are not otherwise publicly available, and the disclosure of such information would cause substantial harm to Complainant.

The information in Confidential Exhibits 1C, 4C, 75C to 78C, 80C, and 88C to 94C, and Complainant's Confidential Statement of Public Interest qualifies as confidential information pursuant to 19 C.F.R. § 201.6 in that the information concerns or relates to, or would otherwise disclose, proprietary commercial information and/or relationships, the disclosure of which would result in substantial harm to the competitive position of Complainant and certain third parties and

also would impair the Commission's ability in the future to obtain such types of information in performance of its statutory function. Specifically, the confidential exhibits contain confidential proprietary information relating to Complainant's practice of the asserted patents and Complainant's investments relating to the exploitation of the asserted patents. I certify that substantially identical information is not reasonably available to the public.

Respectfully submitted,



John M. Caracappa

*Counsel for Complainant  
Broadcom Corporation*

**UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, DC**

**In the Matter of**

CERTAIN SEMICONDUCTOR DEVICES  
AND CONSUMER AUDIOVISUAL  
PRODUCTS CONTAINING THE SAME

Inv. No. 337-TA-\_\_\_\_\_

**STATEMENT OF PUBLIC INTEREST UNDER § 210.8(b)**

Pursuant to Commission Rule 210.8(b), Complainant Broadcom Corporation (“Complainant” or “Broadcom”) respectfully submits this separate statement regarding the potential effects to the public interest caused by the concurrently filed Complaint, titled “In the Matter of Certain Semiconductor Devices and Consumer Audiovisual Products Containing the Same” (the “Complaint”). As discussed below, exclusion of the infringing products identified in the Complaint would not have an adverse effect on public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, or United States consumers.

**I. HOW THE ARTICLES POTENTIALLY SUBJECT TO THE ORDERS ARE USED IN THE UNITED STATES**

The infringing articles are certain semiconductor devices and consumer audiovisual products containing the same, including, without limitation, certain System-on-Chip (“SoC”) and similar processing components and circuits used in digital televisions and other substantially similar systems and products (collectively, the “Accused Products”) that infringe one or more claims of U.S. Patent Nos.: 8,284,844 (“the ‘844 patent”); 7,590,059 (“the ‘059 patent”); 8,068,171 (“the ‘171 patent”); 7,310,104 (“the ‘104 patent”); and 7,342,967 (“the ‘967 patent”) (collectively, the “Asserted Patents”).

The infringing semiconductor devices, including, without limitation, certain SoCs and similar processing components and circuits, allow devices to encode/decode multimedia streams, display and blend images and related content, and speed up or slow down video streams, among other things. The infringing semiconductor devices are incorporated into digital televisions and other consumer audiovisual products. Consumers typically use these products for home entertainment, including, for example, watching cable or satellite programs and streaming multimedia content.

Proposed Respondents MediaTek Inc. and MediaTek USA Inc. (collectively, “MediaTek”); MStar Semiconductor Inc. (“MStar”); Sigma Designs, Inc. (“Sigma”); LG Electronics Inc. and LG Electronics U.S.A., Inc. (collectively, “LG”); and Vizio, Inc. (“Vizio”) (collectively, the “Component-Supplier Respondents”) design, manufacture, import, sell for importation, sell after importation, and distribute the infringing semiconductor devices, including, without limitation, certain SoCs and similar processing components and circuits. Vizio and LG also incorporate infringing semiconductor devices into Vizio-branded and LG-branded digital televisions, respectively, and other consumer audiovisual products.

Proposed Respondents Funai Electric Company, Ltd., Funai Corporation, Inc., and P&F USA, Inc. (collectively, “Funai”); Vizio; and LG (collectively, the “Downstream-Product Respondents”) design, manufacture, import, sell for importation, sell after importation, and distribute digital televisions and other consumer audiovisual products that incorporate the infringing semiconductor devices and, therefore, likewise infringe the Asserted Patents.

## **II. PUBLIC HEALTH, SAFETY, AND WELFARE CONCERNS RELATING TO THE REQUESTED REMEDIAL ORDERS**

The issuance of an exclusion order and cease-and-desist orders against the Component-Supplier Respondents and Downstream-Product Respondents (collectively, “Proposed Respondents”) would have no material adverse impact upon the public health, safety, or welfare in the United States. Traditionally, the Commission’s public health, safety, or welfare concern has been limited to medical devices or pharmaceutical drugs. *See, e.g., Certain Toothbrushes and the Packaging Thereof*, Inv. No. 337-TA-391, Commission Opinion on Remedy, the Public Interest, and Bonding, 1997 WL 696291, at \*2 (Oct. 15, 1997) (explaining that the articles at issue “are not the type of product that have in the past raised public interest concerns (such as, for example, drugs or medical devices)”). Such products are not at issue here.

The Accused Products are used in or as consumer audiovisual products. They are not believed to implicate significant public health, safety, or welfare concerns in the United States. Rather, should the Commission issue an exclusion order and cease-and-desist orders, it would have the beneficial effect of protecting Complainant's intellectual property rights and eliminating Proposed Respondents' unfair competition. *See, e.g., id.* (explaining that "the public interest favors the protection of U.S. intellectual property rights"); *see also Certain Hardware Logic Emulation Systems and Components Thereof*, Inv. No. 337-TA-383, Commission Opinion on Remedy, the Public Interest, and Bonding, 1996 WL 1056217, at \*5 (Oct. 15, 1996).

**III. LIKE OR DIRECTLY COMPETITIVE ARTICLES THAT COMPLAINANT, ITS LICENSEES, OR THIRD PARTIES MAKE THAT COULD REPLACE THE SUBJECT ARTICLES IF THEY WERE TO BE EXCLUDED**

Upon information and belief, there are numerous companies that supply semiconductor devices similar to those implicated in this action. Similarly, there are ample third-party suppliers who manufacture and sell digital televisions and other substantially similar systems and products that are outside the scope of this investigation. Manufacturers of downstream products, such as digital televisions and other substantially similar systems and products, therefore have access to competitive, substitute devices to incorporate into their end products. Accordingly, exclusion of the infringing articles would not materially harm public interests.

**IV. ABILITY OF COMPLAINANT, ITS LICENSEES, OR THIRD PARTIES TO REPLACE THE VOLUME OF ARTICLES SUBJECT TO THE REQUESTED REMEDIAL ORDERS IN A COMMERCIALY REASONABLE TIME IN THE UNITED STATES**

Upon information and belief, there are third party component suppliers and consumer audiovisual product manufacturers with the capacity to replace the volume of articles subject to the requested remedial orders within a commercially reasonable time in the United States.

**V. HOW THE REQUESTED REMEDIAL ORDERS WOULD IMPACT CONSUMERS**

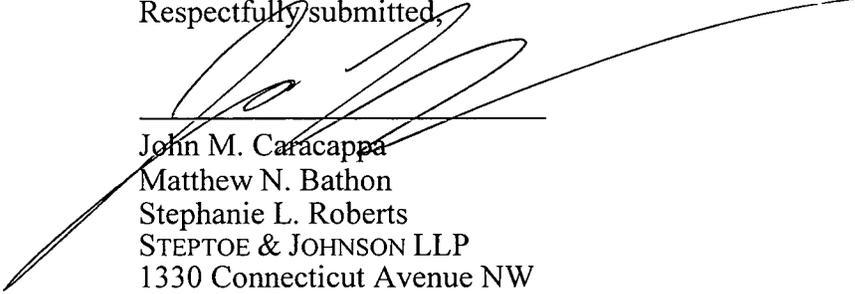
The issuance of an exclusion order or cease-and-desist orders in this investigation will not adversely impact consumers. Other component and consumer audiovisual product manufacturers can adequately service the United States market.

**VI. CONCLUSION**

The proposed investigation, titled “In the Matter of Certain Semiconductor Devices and Consumer Audiovisual Products Containing the Same,” will not adversely affect the public interest.

Dated: March 7, 2017

Respectfully submitted,



---

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*Counsel for Complainant  
Broadcom Corporation*

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, DC

**In the Matter of**

CERTAIN SEMICONDUCTOR DEVICES  
AND CONSUMER AUDIOVISUAL  
PRODUCTS CONTAINING THE SAME

Inv. No. 337-TA-\_\_\_\_\_

**VERIFIED COMPLAINT OF BROADCOM CORPORATION  
UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED**

**COMPLAINANT**

Broadcom Corporation  
5300 California Avenue  
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*Counsel for Complainant  
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(Cont'd on next page)

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**DOCUMENT EXHIBIT LIST**

<b>Exhibit No.</b>	<b>Description</b>	<b>Designation</b>
1C	Licensee List	Confidential
2	Broadcom Limited 2016 Form 10-K	Public
3	Broadcom Corporation 2014 Form 10-K	Public
4C	Confidential Declaration of Nicholas Aberle in Support of the Complaint of Broadcom Corporation	Confidential
5	2015 MediaTek Annual Report	Public
6	2015 Sigma 10-K	Public
7	2015 LG Annual Report	Public
8	2015 Funai Annual Report	Public
9	Certified Copy of U.S. Patent No. 8,284,844	Public
10	Certified Copy of Assignment Records for U.S. Patent No. 8,284,844	Public
11	Status of Foreign Patents and Applications in the Family of U.S. Pat. No. 8,284,844	Public
12	Certified Copy of U.S. Patent No. 7,590,059	Public
13	Certified Copy of Assignment Records for U.S. Patent No. 7,590,059	Public
14	Status of Foreign Patents and Applications in the Family of U.S. Pat. No. 7,590,059	Public
15	Certified Copy of U.S. Patent No. 8,068,171	Public
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17	Status of Foreign Patents and Applications in the Family of U.S. Pat. No. 8,068,171	Public
18	Certified Copy of U.S. Patent No. 7,310,104	Public
19	Certified Copy of Assignment Records for U.S. Patent No. 7,310,104	Public
20	Certified copy of reexamination certificate for U.S. Patent No. 7,310,104	Public
21	Status of Foreign Patents and Applications in the Family of U.S. Pat. No. 7,310,104	Public
22	Certified Copy of U.S. Patent No. 7,342,967	Public
23	Certified Copy of Assignment Records for U.S. Patent No. 7,342,967	Public
24	Status of Foreign Patents and Applications in the Family of U.S. Pat. No. 7,342,967	Public
25	<i>Intentionally omitted</i>	
26	<i>Intentionally omitted</i>	
27	<i>Intentionally omitted</i>	
28	Purchase records	Public
29	Photo of LG1312 ARM 1610 B1 TGP807.00B in LG OLED55C6P OLED 4K HDR Smart TV	Public

Exhibit No.	Description	Designation
30	Photo of LG XD Engine LGE6551-AA2 G5E73E1 GG23C in LG 55UH7700 Smart LED TV	Public
31	Photo of LG1312 ARM 1645 B1 TMM460.00C in LG 60UH8500 Smart LED TV	Public
32	Photo of physical casing of the LG OLED55C6P OLED 4K HDR Smart TV	Public
33	Photo of physical casing of the LG 55UH7700 Smart LED TV	Public
34	Photo of physical casing of the LG 60UH8500 Smart LED TV	Public
35	Invoice for LG OLED55C6P OLED 4K HDR Smart TV	Public
36	Invoice for LG 55UH7700 Smart LED TV	Public
37	Invoice for LG 60UH8500 Smart LED TV	Public
38	<i>Intentionally omitted</i>	
39	Photo of MStar ARM MSD95M2D-3-004E ATHC353B 1617A in Magnavox 50MV376Y/F7 TV	Public
40	<i>Intentionally omitted</i>	
41	Photo of physical casing of the Magnavox 50MV376Y/F7 TV	Public
42	<i>Intentionally omitted</i>	
43	Invoice for Magnavox 50MV376Y/F7 TV	Public
44	Photo of Sigma Designs HiDTV-PRO SX7 STV7701A04-CFE3 NRP021.00 TAIWAN 1528 in Vizio P50-C1 SmartCast 50" Home Theater Display TV	Public
45	Photo of Vizio V6 7603B0-CFE3 NVF378.00 TAIWAN 1634 in Vizio D50U-D1 50" Class Ultra HD Full-Array LED Smart TV	Public
46	Photo of Mediatek MT5580KUF1 1633-BCSH ACMKYLGT in Vizio D24-D1 24" Class Edge-Lit LED Smart TV	Public
47	Photo of physical casing of the Vizio P50-C1 SmartCast 50" Home Theater Display TV	Public
48	Photo of physical casing of the Vizio D50U-D1 50" Class Ultra HD Full-Array LED Smart TV	Public
49	Photo of physical casing of the Vizio D24-D1 24" Class Edge-Lit LED Smart TV	Public
50	Invoice for Vizio P50-C1 SmartCast 50" Home Theater Display TV	Public
51	Invoice for Vizio D50U-D1 50" Class Ultra HD Full-Array LED Smart TV	Public
52	Invoice for Vizio D24-D1 24" Class Edge-Lit LED Smart TV	Public
53	Claim Chart Demonstrating Infringement of U.S. Patent No. 8,284,844 by Representative MediaTek components and products incorporating those components	Public

Exhibit No.	Description	Designation
54	Claim Chart Demonstrating Infringement of U.S. Patent No. 8,284,844 by Representative MStar components and products incorporating those components	Public
55	Claim Chart Demonstrating Infringement of U.S. Patent No. 8,284,844 by Representative LG components and products incorporating those components	Public
56	Claim Chart Demonstrating Infringement of U.S. Patent No. 8,284,844 by Representative Vizio components and products incorporating those components	Public
57	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,590,059 by Representative MediaTek components and products incorporating those components	Public
58	Claim Chart Demonstrating Infringement of U.S. Patent 7,590,059 by Representative MStar components and products incorporating those components	Public
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60	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,590,059 by Representative Vizio components and products incorporating those components	Public
61	Claim Chart Demonstrating Infringement of U.S. Patent 8,068,171 by Representative MStar components and products incorporating those components	Public
62	Claim Chart Demonstrating Infringement of U.S. Patent No. 8,068,171 by Representative LG components and products incorporating those components	Public
63	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,310,104 by Representative MediaTek components and products incorporating those components	Public
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66	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,310,104 by Representative LG components and products incorporating those components	Public
67	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,310,104 by Representative Vizio components and products incorporating those components	Public
68	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,342,967 by Representative MediaTek components and products incorporating those components	Public

<b>Exhibit No.</b>	<b>Description</b>	<b>Designation</b>
69	Claim Chart Demonstrating Infringement of U.S. Patent No. 7,342,967 by Representative LG components and products incorporating those components	Public
70	<i>Intentionally omitted</i>	
71	<i>Intentionally omitted</i>	
72	<i>Intentionally omitted</i>	
73	<i>Intentionally omitted</i>	
74	<i>Intentionally omitted</i>	
75C	Confidential DI Chart of U.S. Patent No. 7,310,104	Confidential
76C	Confidential DI Chart of U.S. Patent No. 8,068,171	Confidential
77C	Confidential DI Chart of U.S. Patent No. 7,590,059	Confidential
78C	Confidential DI Chart of U.S. Patent No. 8,284,844	Confidential
79	<i>Intentionally omitted</i>	
80C	Confidential DI Chart of U.S. Patent No. 7,342,967	Confidential
81	Declaration of Scott Acton	Public
82	Declaration of Iain Richardson	Public
83	<i>Intentionally omitted</i>	
84	LG OLED55C6P Webpage	Public
85	LG Play Other Device File User Guide	Public
86	2015 MediaTek Paper	Public
87	2012 MediaTek paper	Public
88C	Broadcom HEVD Top level Firmware Architecture Specification	Confidential
89C	Broadcom Hardware Data Module 74371-3HDM100-R	Confidential
90C	Broadcom Hardware Data Module 7268-1HDM104	Confidential
91C	Broadcom overview of "trick modes"	Confidential
92C	Broadcom STB Power Management Overview Slideshow, © 2014	Confidential
93C	Broadcom Power Management Hardware/Software Interface	Confidential
94C	Broadcom Hardware Data Module 74371-1HDM105-R	Confidential
95	Photo of LG1312 chip contained within LG 60UH8500 TV	Public
96	Photo of MSD95M2D-3-004E chip contained within Magnavox TV	Public
97	MediaTek MT5592 Webpage	Public
98	MediaTek MT5596 Webpage	Public
99	2014 MediaTek Paper	Public
100	MStar product page	Public
101	Sigma Q1 2013 Product Selection Guide	Public
102	Sigma EM8622L Datasheet	Public
103	Sigma SMP8654 Datasheet	Public
104	Press Release: Vizio Reveals Highly Anticipated P-Series Ultra HD Full-Array LED Smart TV (Sept. 23, 2014)	Public
105	Tran CEO Letter to Shareholders	Public
106	Webpage for LG 60UH8500 TV	Public

Exhibit No.	Description	Designation
107	Webpage for LG 55UH7700 TV	Public
108	MediaTek MT5580 Webpage	Public

## APPENDICES

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F	Cited References for U.S. Pat. No. 8,068,171	Public
G	Certified Copy of Prosecution History for U.S. Pat. No. 7,310,104	Public
H	Cited References for U.S. Pat. No. 7,310,104	Public
I	Certified Copy of Prosecution History for U.S. Pat. No. 7,342,967	Public
J	Cited References for U.S. Pat. No. 7,342,967	Public

## I. INTRODUCTION

1. Broadcom Corporation (“Broadcom” or “Complainant”) respectfully requests that the United States International Trade Commission commence an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, to remedy the unlawful and unauthorized importation into the United States, the sale for importation, or the sale within the United States after importation, of certain semiconductor devices and consumer audiovisual products containing the same (collectively, the “Accused Products”), including, without limitation, certain System-on-Chip and similar processing components and circuits used in digital televisions and other consumer audiovisual products that infringe one or more claims of U.S. Patent Nos.: 8,284,844 (“the ’844 patent”); 7,590,059 (“the ’059 patent”); 8,068,171 (“the ’171 patent”); 7,310,104 (“the ’104 patent”); and 7,342,967 (“the ’967 patent”) (collectively, the “Asserted Patents”).

2. The Asserted Patents can be broken down into the following general categories:

Asserted Patents	Category
'844, '059, and '171 patents	“Decoding Patents”
'104 patent and '967 patents	“Video Processing Patents”

3. The Asserted Patents claim extraordinarily valuable technology in the field of multimedia data processing. Complainant owns by assignment each of the Asserted Patents, which are valid and enforceable United States patents. These patents have been licensed to leading technology companies in the United States and throughout the world, as listed in Confidential Exhibit 1C.

4. Complainant has invested considerable resources into the development of a domestic industry that exploits the Asserted Patents within the United States. This domestic industry includes semiconductor products (such as wafers, chips (including System-on-Chip

("SoC"), and chipsets) that practice one or more of the Asserted Patents and are used in various consumer audiovisual products, including set-top boxes, digital televisions, Blu-ray disc players/recorders, and DVD players/recorders.

5. The Proposed Respondents are: MediaTek Inc. and MediaTek USA Inc. ("MediaTek USA") (collectively, "MediaTek"); MStar Semiconductor Inc. ("MStar"); Sigma Designs, Inc. ("Sigma"); LG Electronics Inc. ("LG Korea") and LG Electronics U.S.A., Inc. ("LG USA") (collectively, "LG"); Funai Electric Company, Ltd. ("Funai Japan"), Funai Corporation, Inc. ("Funai USA"), and P&F USA, Inc. ("P&F") (collectively, "Funai"); and Vizio, Inc. ("Vizio").

6. The Proposed Respondents directly and/or indirectly infringe one or more claims of the Asserted Patents identified below and as further detailed below. The asserted claims are:

<b>U.S. Patent No.</b>	<b>Asserted Claims<sup>1</sup></b>
8,284,844	<b>1-14</b>
7,590,059	<b>11-20, 21-30</b>
8,068,171	<b>1, 2, 3, 4, 5, 7</b>
7,310,104	<b>1, 10, 11, 16, 17, 22</b>
7,342,967	<b>1, 2, 3, 4</b>

7. Proposed Respondents' activities with respect to the importation into the United States, the sale for importation into the United States, and/or the sale within the United States after importation of the Accused Products, as defined above and as described more fully in Section VI below, are unlawful under 19 U.S.C. § 1337(a)(1)(B)(i), in that they constitute the infringement of one or more valid and enforceable claims of the Asserted Patents. Additionally, a domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) exists in the United States relating to the technology protected by the Asserted Patents.

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<sup>1</sup> Independent claims are indicated in bold type.

8. Complainant seeks relief from the Commission in the form of a limited exclusion order specifically directed to each Proposed Respondent, pursuant to 19 U.S.C. § 1337(d), excluding from entry into the United States any articles, including semiconductor components (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing the same that infringe one or more of the '844, '059, '171, '104, and '967 patents.

9. Complainant further seeks as relief cease-and-desist orders, pursuant to 19 U.S.C. § 1337(d), that prohibit each domestic Proposed Respondent from, *inter alia*, importing, selling, offering for sale (including via the Internet or electronic mail), advertising (including via the Internet or electronic mail), or distributing articles, including semiconductor components (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing the same that infringe one or more of the '844, '059, '171, '104, and '967 patents.

10. Complainant further seeks that the Commission impose a bond upon Proposed Respondents who continue to import infringing articles, including infringing semiconductor components (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing the same, during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(j).

11. Complainant further seeks any other relief the Commission is authorized to grant and deems appropriate.

## II. THE PARTIES

### A. Complainant

12. Broadcom Corporation is a California corporation with its principal place of business at 5300 California Avenue, Irvine, CA 92617. It was acquired by Avago Technologies, Ltd. in 2016 and currently operates as a wholly-owned subsidiary of the merged entity now known as Broadcom Limited.

13. Founded by Henry Samueli and Henry Nicholas in 1991 in Los Angeles, California, Broadcom has grown to be a global leader in the semiconductor industry. Broadcom provides one of the industry's broadest portfolios of highly-integrated SoCs that seamlessly deliver voice, video, data, and multimedia connectivity in the home, office, and mobile environments. From its headquarters in Irvine, California, Broadcom has expanded its footprint across the United States and around the world, employing thousands of individuals globally and in the United States. A brief overview of Broadcom's history can be found on its website at: <https://www.broadcom.com/company/about-us/company-history/>.

14. Broadcom's continued success depends in substantial part upon its constant attention to research and development. From 2015 to 2016, Broadcom spent \$3.7 billion on research and development for its products. \$2.7 billion of this \$3.7 billion was spent in 2016 alone. Exhibit 2 (Broadcom Limited 2016 Form 10-K), at 47. Prior to its acquisition, Broadcom Corporation's research and development expense was \$2.37 billion, \$2.49 billion and \$2.32 billion in 2014, 2013, and 2012, respectively. Exhibit 3 (Broadcom Limited 2014 Form 10-K), at 6.

15. Broadcom relies on the patent system as an important part of its intellectual property program to protect the valuable technology and inventions resulting from this research

and development. As of October 30, 2016, Broadcom Limited had approximately 27,640 U.S. and international patents and approximately 3,020 U.S. and international pending patent applications. Broadcom Limited's research and development efforts are presently resulting in approximately 350 new patent applications per year. Exhibit 2 (Broadcom Limited 2016 Form 10-K), at 8.

16. Broadcom's Set-Top Box Solutions is one of five major applications for Broadcom Limited's wired infrastructure segment. Broadcom's Set-Top Box Division ("STB Division") is responsible for the design, development, and distribution of complete SoC platform solutions for cable, satellite, Internet Protocol, over-the-top, and terrestrial set-top boxes. *See* Confidential Exhibit 4C (Aberle Declaration) ¶5. As described more fully below, Broadcom SoCs, and Broadcom set-top boxes containing such SoCs, practice the Asserted Patents.

## **B. Proposed Respondents**

### **1. Component Supplier Respondents**

17. Collectively, MediaTek, MStar, Sigma, LG, and Vizio are referred to as the "Component Supplier Respondents." They design, manufacture, import, sell for importation, sell after importation, and distribute the infringing semiconductor devices. LG also incorporates its infringing semiconductor devices into LG-branded downstream consumer audiovisual products. Similarly, Vizio incorporates its infringing semiconductor devices into Vizio-branded downstream consumer audiovisual products.

#### **(a) MediaTek**

18. On information and belief, MediaTek Inc. is a corporation organized under the laws of Taiwan headquartered at No. 1, Dusing 1st Road, Hsinchu Science Park, Hsinchu City 30078, Taiwan. MediaTek Inc. is a fabless semiconductor company that develops SoCs for mobile devices, home entertainment, network and connectivity, automated driving, and the

internet of things (IoT). See <http://www.mediatek.com/about/about-mediatek>. On information and belief, MediaTek Inc. is the worldwide parent corporation for other MediaTek entities and is responsible, directly and/or indirectly, for at least Respondents MStar Semiconductor Inc.'s, and MediaTek USA Inc.'s infringing activities and products. See, e.g., Exhibit 5 at 79 (“MediaTek Affiliated Companies Chart”).

19. On information and belief, MediaTek Inc. designs, manufactures, sells for importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) that infringe the Asserted Patents and are included in consumer audiovisual products that also infringe the Asserted Patents. See, e.g., Exhibit 5 at 53-54 (“MediaTek’s major products include chipsets for . . . digital TV, consumer electronics, [and] optical storage . . .for applications such as . . .digital TVs [and] various consumer electronics . . .”).

20. On information and belief, MediaTek USA is a corporation organized under the laws of Delaware, headquartered at 2840 Junction Avenue, San Jose, CA 95134. MediaTek USA Inc. provides advanced analog and digital semiconductor research and development (R&D). See <http://topics.mediatek.com/en/about/contact/mediatek-usa-inc-san-jose>.

21. On information and belief, MediaTek USA is a wholly owned subsidiary of MediaTek Inc. engaged in sales and R&D. See, e.g., Exhibit 5 at 79 (“MediaTek Affiliated Companies Chart”); *id.* at 82-83 (listing major business for MediaTek USA as “Research”; “Business scope of MediaTek and its affiliates include the investment, R&D, promotion, after-sale service for optical storage products, digital consumer products, wireless communication, digital TV, networking, analog, etc.”); *id.* at 92 (listing net sales and operational income for MediaTek USA). On information and belief, MediaTek USA designs, manufactures, sells for

importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) that infringe the Asserted Patents and are included in consumer audiovisual products that also infringe the Asserted Patents.

**(b) MStar**

22. On information and belief, MStar is a corporation organized under the laws of Taiwan headquartered at 4F-1, No. 26, Tai-Yuan Street, ChuPei Hsinchu Hsien 302, Taiwan. MStar supplies application specific integrated circuits (ICs or ASICs) for the consumer and image processing product markets. See <http://www.mstarsemi.com/company.php>; see also <http://www.mstarsemi.com/products.php> (MStar products include controller SoCs for various consumer audiovisual products, including digital and smart TVs).

23. On information and belief, MStar is a subsidiary of MediaTek Inc. engaged in R&D, manufacturing, and sales. See, e.g., Exhibit 5 at 79 (“MediaTek Affiliated Companies Chart”); *id.* at 81, 83 (listing major business for MStar as “Research, manufacturing and sales”; “Business scope of MediaTek and its affiliates include the investment, R&D, promotion, after-sale service for optical storage products, digital consumer products, wireless communication, digital TV, networking, analog, etc.”); *id.* at 91 (listing net sales and operational income for MStar). On information and belief, MStar designs, manufactures, sells for importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) that infringe the Asserted Patents and are included in consumer audiovisual products that also infringe the Asserted Patents.

**(c) Sigma**

24. On information and belief, Sigma is a corporation organized under the laws of California headquartered at 47467 Fremont Boulevard, Fremont, CA 94538. Sigma is a provider of SoC solutions used to enable set top boxes, smart TVs, media connectivity devices, and IoT

devices. See <http://www.sigmadesigns.com/company-overview>. On information and belief, Sigma is the worldwide parent corporation for other Sigma entities, and is responsible, directly and/or indirectly, for at least its and its subsidiaries' infringing activities and products. See, e.g., Exhibit 6 at Exhibit 21.1 ("Sigma Designs, Inc. Listing of Subsidiaries").

25. On information and belief, Sigma designs, manufactures, sells for importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) that infringe the Asserted Patents and are included in consumer audiovisual products that also infringe the Asserted Patents. See, e.g., Exhibit 6 at 4-7, 10 ("We sell our products into four primary or target markets: (i) Smart TV, (ii) Media Connectivity, (iii) Set-Top Box and (iv) Internet of Things ("IoT") Devices."; "We sell our products principally to designers and manufacturers (OEMs and ODMs) as well as to distributors who, in turn, sell to manufacturers."); *id.* at 16 ("[A] significant number of our chipsets are incorporated in televisions deployed by VIZIO and Roku.").

**(d) LG<sup>2</sup>**

26. On information and belief, LG Korea is a corporation organized under the laws of South Korea with its principal place of business at Twin Tower 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Korea 150-721. LG's Home Entertainment business unit produces and sells flat panel TVs, including LED TVs, OLED TVs, OLED 4K TVs, Smart TVs, and 3D TVs. See <http://www.lg.com/global/about-lg/our-brand>; <http://www.lg.com/us/tvs>.

27. On information and belief, LG USA is a corporation organized under the laws of Delaware with its principal place of business at 1000 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. On information and belief, LG USA is a wholly-owned subsidiary of LG Korea.

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<sup>2</sup> LG Electronics Inc. and LG Electronics U.S.A., Inc. are referred to collectively as "LG" or the "LG Respondents."

28. On information and belief, LG Korea is the parent company for other LG entities, and is responsible, directly and/or indirectly, for at least Respondent LG USA's infringing activities and products. *See* Exhibit 7 at 6.

29. On information and belief, LG designs, manufactures, sells for importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing such semiconductor devices that infringe the Asserted Patents.

**(e) Vizio**

30. On information and belief, Vizio is a corporation organized under the laws of California with its principal place of business at 39 Tesla, Irvine, CA 92618. Vizio designs, manufactures, and markets electronic goods in North America, including high-definition LCD/LED flat panel TVs.

<http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=27650657>. In July 2016, Vizio agreed to be purchased by LeEco, a Chinese conglomerate, for \$2 billion.

<http://www.wsj.com/articles/chinas-leeco-to-buy-vizio-for-2-billion-1469562739>.

31. On information and belief, Vizio designs, manufactures, sells for importation, imports, and/or sells after importation semiconductor devices (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing such semiconductor devices that infringe the Asserted Patents.

**2. Downstream Product Respondents**

32. Collectively, LG, Vizio, and Funai are referred to as the "Downstream Product Respondents." They design, manufacture, import, sell for importation, sell after importation, and distribute downstream consumer products that incorporate the infringing semiconductor components and, therefore, likewise infringe Broadcom's patents.

(a) **Funai**<sup>3</sup>

33. On information and belief, Funai Japan is a corporation organized under the laws of Japan with its principal place of business at 7-7-1 Nakagaito, Daito City, Osaka 574-0013, Japan. On information and belief, Funai Japan is the worldwide parent company for other Funai entities and is responsible, directly and/or indirectly, for at least Respondents Funai Corporation, Inc.'s; P&F USA, Inc.'s; and Funai Service Corporation's infringing activities and products. *See* Exhibit 8 at 21, 24 (Funai Japan has 23 consolidated subsidiaries, including Funai Corporation, Inc. and P&F USA, Inc.); <http://www.funai.jp/en/company/network.html> (Funai's global network includes sales subsidiaries Funai Corporation, Inc. and P&F USA, Inc., and affiliated subsidiary Funai Service Corporation). Funai Japan offers products under several of its licensed brands, including Funai, Philips, Magnavox, Emerson, Sanyo, and Kodak. *See* <http://www.funai.jp/en/products/indExhibithtml>.

34. On information and belief, Funai Japan owns and/or controls, directly and/or indirectly, manufacturing and sales subsidiaries that manufacture, sell for importation, import, sell after importation, and/or distribute the Accused Products sold under brand names that Funai owns or licenses. *See, e.g.*, Exhibit 8 at 9 ("We manufacture and sell our principal products, such as audiovisual equipment (LCD TVs, DVD-related products, etc.) . . ."). Funai Japan also provides products to customers on an OEM basis for the manufacture and provision of products under the customer's brand. *See* <http://www.funai.jp/en/products/indExhibithtml>.

35. On information and belief, Funai Japan owns and/or controls, directly and/or indirectly, manufacturing facilities at which the Accused Products may be made under contract. *See, e.g.*, Exhibit 8 at 7, 10 ("LCD-TVs increased year on year due to a strong sale in large size-

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<sup>3</sup> Funai Electric Company, Ltd.; Funai Corporation, Inc.; and P&F USA, Inc. are referred to collectively as "Funai" or the "Funai Respondents."

screen models for OEM business.”; “The [Funai] Group purchases products from overseas production subsidiaries and sells them to overseas sales subsidiaries or sells directly to OEM supply partners mainly in the North America.”).

36. On information and belief, Funai USA is a corporation organized under the laws of New Jersey with its principal place of business at 201 Route 17 North, Suite 903, Rutherford, NJ 07070. Funai USA is the North American sales and marketing company for consumer electronic products manufactured by Funai Japan. *See* <http://www.funai.us/about-us>. On information and belief, Funai USA is a wholly owned subsidiary of Funai Japan engaged in sales of electrical equipment. *See, e.g.*, Exhibit 8 at 24. On information and belief, Funai USA imports, sells after importation, and/or distributes the Accused Products sold under brand names including Funai, Magnavox, Emerson, and Sanyo. *See* <http://www.funai.us/our-brands>; <http://www.funaiamerica.com/support/about.php>; Exhibit 8 at 25 (in the United States, manufacture and sale of electrical equipment and devices are managed by Funai USA and P&F USA, Inc.).

37. On information and belief, P&F is a corporation organized under the laws of Georgia with its principal place of business at 2555 Marconi Drive, Suite 300, Alpharetta, GA 30005. On information and belief, P&F is a wholly owned subsidiary of Funai Japan engaged in sales of electrical equipment. *See, e.g.*, Exhibit 8 at 24. On information and belief, P&F imports, sells after importation, and/or distributes the Accused Products sold under brand names including Philips. *See* <http://www.funai.us/archives/category/pf-usa> (“P&F USA, Inc. [is] the exclusive North American licensee for Philips consumer televisions and home video products.”); Exhibit 8 at 25 (in the United States, manufacture and sale of electrical equipment and devices are managed by Funai USA and P&F).

### III. THE TECHNOLOGY AND PRODUCTS AT ISSUE<sup>4</sup>

#### A. The Technology

38. Complainant Broadcom's Asserted Patents generally relate to multimedia data processing. They concern technologies used in a variety of audiovisual and communications products, including consumer audiovisual products imported into the United States, sold for importation into the United States, or sold within the United States after importation by or on behalf of the Proposed Respondents.

#### B. The Accused Products<sup>5</sup>

39. The Accused Products are generally semiconductor components (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products containing the same, including, without limitation, digital televisions ("DTVs"), set-top boxes, Blu-ray disc players, DVD players/recorders, DTV/DVD combinations, DTV/Blu-Ray combinations, multimedia streaming players, home theater systems, and other similar audiovisual devices and systems imported, marketed, and/or sold by Proposed Respondents in the United States.

40. The chart below sets forth some examples of Representative Accused Products that are imported, sold for importation, or sold within the United States after importation by the Proposed Respondents:

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<sup>4</sup> The non-technical description of the patented technology provided herein is provided solely to comply with the Commission Rules and is not intended to limit, define, or otherwise effect the construction and/or application of any of the Asserted Patents.

<sup>5</sup> Complainant believes that the general familiarity of the Accused Products, along with the charts and photographs provided with this Complaint, make the provision of physical exhibits unnecessary. Should the Commission request physical samples, however, Complaint will provide physical exhibits to the extent practicable.

<b>Proposed Component Supplier Respondent</b>	<b>Representative Accused Products</b>
MediaTek	MediaTek ARM MT5651AP01 1545-BCSH ACMKPSWH; MediaTek ARM MT5580KUF1 1543-BCSH AC4KKFQF
MStar	MStar ARM MSD6488EVU-8-000J ATMC141D 1637B; MStar ARM MSD95M2D-3-004E ATHC353B 1617A
Sigma	Sigma Designs HiDTV-PRO UXL UXL7038B09-CFE3 N021154.00 TAIWAN 1630; Sigma Designs HiDTV-PRO UXL UXL7038B08-CFE3 NRR568.00 TAIWAN 1528
LG	LG XD Engine LGE6551-AA2 G5E73E1 GG23C;
Vizio	Vizio V6 7603B0-CFE3 NRG557.00

<b>Proposed Downstream Product Respondent</b>	<b>Representative Accused Products</b>
LG	LG 55UH7700 Smart LED TV
Funai	Magnavox 50" Class Smart LED TV 50MV376Y/F7
Vizio	Vizio D50u-D1 50" Class Ultra HD Full-Array LED Smart TV

#### IV. THE PATENTS AT ISSUE

41. Broadcom hereby asserts five patents. None are related, but, as previously explained, they can be generally divided into two groups:

<b>Asserted Patents</b>	<b>Category</b>
'844, '059 patent, and '171 patents	"Decoding Patents"
'104 and '967 patents	"Video Processing Patents"

**A. The Decoding Patents**

**1. The '844 Patent**

**(a) Identification of the Patent and Ownership by Complainant**

42. Broadcom owns by assignment the entire right, title, and interest in the '844 patent entitled "Video Decoding System Supporting Multiple Standards," which issued on October 9, 2012. The '844 patent issued to inventors Alexander MacInnis, Jose Alvarez, Sheng Zhong, Xiaodong Xie, and Vivian Hsiun from United States Patent Application No. 10/114,798, filed on April 1, 2002. It expires on January 29, 2031. Pursuant to Commission Rule 210.12(a)(9)(i), a certified copy of the '844 patent is attached as Exhibit 9. Pursuant to Commission Rule 210.12(a)(9)(ii), certified copies of the recorded assignments of the '844 patent are attached as Exhibit 10.

43. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution history of the '844 patent, as well as four copies of each patent and applicable pages of each technical reference mentioned in the prosecution history, are provided in Appendices A and B, respectively.

**(b) Non-Technical Description of the '844 Patent**

44. The '844 patent has 14 claims: one independent claim and 13 dependent claims.

45. The '844 patent presented a new system for decoding digital video using hardware accelerators. The invention was the result of the first successful effort to develop a cost-effective multi-format decoding system that could accommodate a variety of encoded bitstream formats, including existing and future video coding standards. The hardware accelerators assist a core processor in performing certain decoding tasks that might otherwise be bottlenecks for real-time decoding if they were handled by the core processor alone, and they are configurable to support multiple existing as well as future encoding/decoding formats.

**(c) Foreign Counterparts to the '844 Patent**

46. Pursuant to Commission Rule 210.12(a)(9)(v), Exhibit 11 identifies the foreign patents or patent applications related to the '844 patent that have been filed, granted, abandoned, withdrawn, or rejected.

**2. The '059 Patent**

**(a) Identification of the Patent and Ownership by Complainant**

47. Broadcom owns by assignment the entire right, title, and interest in the '059 patent entitled "Multistandard Video Decoder," which issued on September 15, 2009. The '059 patent issued to inventor Stephen Gordon from United States Patent Application No. 11/000,731, filed on December 1, 2004. It expires on November 27, 2027. Pursuant to Commission Rule 210.12(a)(9)(i), a certified copy of the '059 patent is attached as Exhibit 12. Pursuant to Commission Rule 210.12(a)(9)(ii), certified copies of the recorded assignments of the '059 patent are attached as Exhibit 13.

48. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution history of the '059 patent, as well as four copies of each patent and applicable pages of each technical reference mentioned in the prosecution history, are provided in Appendices C and D, respectively.

**(b) Non-Technical Description of the '059 Patent**

49. The '059 patent has 30 claims: three independent claims and 27 dependent claims.

50. The '059 patent presented a new system for decoding digital video streams encoded according to varying standards. Conventional video decoders at the time were designed to decode digital video streams according to only one standard, but application spaces were evolving to support digital video streams encoded using one of many coding standards.

Conventional decoding systems then were adapted to include multiple decoders to support the many standards, but decoding efficiency substantially decreased. The inventions of the '059 patent solved this problem. As described in the '059 patent, a decoder receives, on a single chip, packets of data within an encoded video stream, determines on the chip an identifier with the stream that defines the encoding type associated with the packets, selects on the chip a decoding process based on the identifier, and decodes on the chip at least a portion of the packets utilizing the selected decoding process.

**(c) Foreign Counterparts to the '059 Patent**

51. Pursuant to Commission Rule 210.12(a)(9)(v), Exhibit 14 identifies the foreign patents or patent applications related to the '059 patent that have been filed, granted, abandoned, withdrawn, or rejected.

**3. The '171 Patent**

**(a) Identification of the Patent and Ownership by Complainant**

52. Broadcom owns by assignment the entire right, title, and interest in the '171 patent entitled "High Speed for Digital Video," which issued on November 29, 2011. The '171 patent issued to inventors Gaurav Aggarwal, M K Subramanian, Sandeep Bhatia, Santosh Savekar, and K Shivapirakasan from United States Patent Application No. 12/730,911, filed on March 24, 2010. It expires on June 22, 2024. Pursuant to Commission Rule 210.12(a)(9)(i), a certified copy of the '171 patent is attached as Exhibit 15. Pursuant to Commission Rule 210.12(a)(9)(ii), certified copies of the recorded assignments of the '171 patent are attached as Exhibit 16.

53. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution history of the '171 patent, as well as four copies of each patent and

applicable pages of each technical reference mentioned in the prosecution history, are provided in Appendices E and F, respectively.

**(b) Non-Technical Description of the '171 Patent**

54. The '171 patent has eight claims: three independent claims and five dependent claims.

55. The '171 patent generally relates to fast-forward functionality of digital video streams, and more particularly to systems and methods that display pictures at a high speed, where, for example, the inventive systems include, among other components, a buffer, a decoder, and a display manager. The buffer stores pictures that have been decoded by the decoder. In some embodiments, a constant time-lapse is present between multiple pictures displayed in high speed. In yet further embodiments of the invention, the system decodes and displays at high speed non-reference pictures, also referred to as B pictures.

56. The patent distinguishes prior-art systems, which it describes as using a “common scheme for implementing the high speed function involv[ing] skipping only B-pictures.” '171 patent, 2:10-11. It explains that a drawback to such schemes is that “in cases where B-pictures are back to back, the pictures are not dropped uniformly.” *Id.*, 2:12-13.

**(c) Foreign Counterparts to the '171 Patent**

57. Pursuant to Commission Rule 210.12(a)(9)(v), Exhibit 17 identifies the foreign patents or patent applications related to the '171 patent that have been filed, granted, abandoned, withdrawn, or rejected.

**B. The Video Processing Patents**

**1. The '104 Patent**

**(a) Identification of the Patent and Ownership by Complainant**

58. Broadcom owns by assignment the entire right, title, and interest in the '104 patent entitled "Graphics Display System with Anti-Flutter Filtering and Vertical Scaling," which issued on December 18, 2007. The '104 patent issued to inventors Alexander MacInnis, Chengfuh Jeffrey Tang, Xiaodong Xie, James Patterson, and Greg Kranawetter from United States Patent Application No. 11/511,042, filed on August 28, 2006. It expires on November 9, 2019. Pursuant to Commission Rule 210.12(a)(9)(i), a certified copy of the '104 patent is attached as Exhibit 18. Pursuant to Commission Rule 210.12(a)(9)(ii), certified copies of the recorded assignments of the '104 patent are attached as Exhibit 19.

59. The '104 patent went through an *ex parte* reexamination, which concluded on August 11, 2009. All claims were confirmed as patentable without any amendments. A certified copy of the reexamination certificate is attached as Exhibit 20.

60. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution history of the '104 patent, as well as four copies of each patent and applicable pages of each technical reference mentioned in the prosecution history, are provided in Appendices G and H, respectively.

**(b) Non-Technical Description of the '104 Patent**

61. The '104 patent has 22 claims: three independent claims and 19 dependent claims.

62. The '104 patent presents a new system for blending graphics and video images. Generally, layers of graphics and/or video images were blended by blending the back-most layer with the layer immediately in front of it, blending the result with the layer immediately in front

of it, and so on. However, this method was not practical when some layers needed to be processed, for example in spatial dimensions, prior to blending. Processing each of those layers first is prohibitively expensive, particularly when there are multiple layers to be processed in front of one or more layers that are not to be processed. The invention solved this problem. In one form, layers that are to be processed are blended together first, even if there is one or more layers behind them over which they should be blended. Those layers may then be processed as desired, and the result of this processing, a composite intermediate image, is blended with the other layers.

**(c) Foreign Counterparts to the '104 Patent**

63. Pursuant to Commission Rule 210.12(a)(9)(v), Exhibit 21 identifies the foreign patents or patent applications related to the '104 patent that have been filed, granted, abandoned, withdrawn, or rejected.

**2. The '967 Patent**

**(a) Identification of the Patent and Ownership by Complainant**

64. Broadcom owns by assignment the entire right, title, and interest in the '967 patent entitled "System and Method for Enhancing Performance of Personal Video Recording (PVR) Functions on HITS Digital Video Streams," which issued on March 11, 2008. The '967 patent issued to inventors Gaurav Aggarwal, Marcus Kellerman, David Erickson, Jason Demas, Sandeep Bhatia, Girish Hulmani, and Arun Gopalakrishna Rao from United States Patent Application No. 10/317,642, filed on December 11, 2002. It expires on October 27, 2023. Pursuant to Commission Rule 210.12(a)(9)(i), a certified copy of the '967 patent is attached as Exhibit 22. Pursuant to Commission Rule 210.12(a)(9)(ii), certified copies of the recorded assignments of the '967 patent are attached as Exhibit 23.

65. Pursuant to Commission Rule 210.12(c), a certified copy and three additional copies of the prosecution history of the '967 patent, as well as four copies of each patent and applicable pages of each technical reference mentioned in the prosecution history, are provided in Appendices I and J, respectively.

**(b) Non-Technical Description of the '967 Patent**

66. The '967 patent has five claims: one independent claim and four dependent claims.

67. The '967 patent generally relates to a system for displaying pictures that includes, among other components, a host processor for transmitting transport packets providing a plurality of instructions and a video decoder for executing those instructions. The instructions cause the decoder to (1) select a picture comprising an intracoded slice, at least one slice above the intracoded slice, and at least one slice below the intracoded slice; (2) decode the intracoded slice and the slice above the intracoded slice; and (3) decode at least a portion of another picture after decoding the intracoded slice and the slice above the intracoded slice, without having decoded the slice below the intracoded slice. The patent explains that omitting “decoding the portion of the P-pictures below the intracoded slice advantageously reduces the processing required to build a clean reference picture.” '967 patent, 3:8-10.

**(c) Foreign Counterparts to the '967 Patent**

68. Pursuant to Commission Rule 210.12(a)(9)(v), Exhibit 24 identifies the foreign patents or patent applications related to the '967 patent that have been filed, granted, abandoned, withdrawn, or rejected.

**C. Licensees under the Asserted Patents**

69. Pursuant to Commission Rule 210.12(a)(9)(iii), a list identifying each licensee specifically licensed under each of the Asserted Patents is attached as Confidential Exhibit 1C.

The scope and duration of each license, and the rights associated with the license, are dependent on the specific terms of each agreement.

## **V. SPECIFIC INSTANCES OF IMPORTATION AND SALE**

70. On information and belief, Proposed Respondents manufacture the Accused Products and pertinent components thereof overseas. On further information and belief, Proposed Respondents, directly or through agents, manufacture, import into the United States, sell or offer for sale for importation into the United States, and/or sell within the United States after importation the Accused Products. The specific instances of importation of the Accused Products set forth below are representative examples of the unlawful importation and/or sale after importation of infringing articles.<sup>6</sup>

71. **LG.** LG imports, sells for importation, or sells after importation into the United States semiconductor devices, including SoCs and similar processing components and circuits and other consumer audiovisual products that infringe the Asserted Patents. Exhibit 29 (photo of LG1312 ARM 1621 B1 TGV098.00A in LG OLED55C6P OLED 4K HDR Smart TV); Exhibit 30 (photo of LG XD Engine LGE6551-AA2 G5E73E1 GG23C in LG 55UH7700 Smart LED TV); Exhibit 31 (photo of LG1312 ARM 1645 B1 TMM460.00C in LG 60UH8500 Smart LED TV). Said Representative Accused Products were manufactured abroad. Exhibit 32 (photo of physical casing of the LG OLED55C6P OLED 4K HDR Smart TV marked as “Assembled in

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<sup>6</sup> Complainant purchased a number of the Accused Products for testing. Upon information and belief, all of the Accused Products are imported into the United States. Attached as Exhibit 28 is purchase information for the certain of the tested televisions, along with information demonstrating that those televisions were manufactured overseas and imported into the United States. For purposes of satisfying the importation requirement, however, Complainant relies on the information set forth in Section V, Specific Instances of Importation and Sale. As discussed therein, Complainant provides proof of importation for a number of the televisions tested for infringement as well as proof of importation for the same model television as was used to demonstrate infringement in the infringement charts.

Mexico”); Exhibit 33 (photo of physical casing of the LG 55UH7700 Smart LED TV marked as “Assembled in Mexico”); Exhibit 34 (photo of physical casing of the LG 60UH8500 Smart LED TV marked as “Assembled in Mexico”). Said Representative Accused Products have been imported into the United States. Exhibit 35 (invoice indicating that the LG OLED55C6P OLED 4K HDR Smart TV was shipped for delivery in the United States); Exhibit 36 (invoice indicating that the LG 55UH7700 Smart LED TV was shipped for delivery in the United States); Exhibit 37 (invoice indicating that the LG 60UH8500 Smart LED TV was shipped for delivery in the United States).

72. Complainant believes that the LG OLED55C6P OLED 4K HDR Smart TV and LG 55UH7700 Smart LED TV are exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation into the United States by LG because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patents have been imported, sold for importation, or sold within the United States after importation, into the United States, by LG.

73. **Funai.** Funai imports, sells for importation, or sells after importation into the United States at least one consumer audiovisual product that infringes the Asserted Patents. Exhibit 39 (photo of MStar ARM MSD95M2D-3-004E ATHC353B 1617A in Magnavox 50MV376Y/F7 TV). Said Representative Accused Product was manufactured abroad. Exhibit 41 (photo of physical casing of the Magnavox 50MV376Y/F7 TV marked as "Made in China"). Said Representative Accused Product has been imported into the United States. Exhibit 43 (invoice indicating that the Magnavox 50MV376Y/F7 TV was shipped for delivery in the United States).

74. Complainant believes that Magnavox 50MV376Y/F7 TV is exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation into the United States by Funai because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patents have been imported, sold for importation, or sold within the United States after importation, into the United States, by Funai.

75. **Vizio.** Vizio imports, sells for importation, or sells after importation into the United States semiconductor devices, including SoCs and similar processing components and circuits and other consumer audiovisual products that infringe the Asserted Patents. Exhibit 44 (photo of Sigma Designs HiDTV-PRO SX7 STV7701A04-CFE3 NRP021.00 TAIWAN 1528 in Vizio P50-C1 SmartCast P-Series 50” Class Ultra HD HDR Home Theater Display TV); Exhibit 45 (photo of Vizio V6 7603B0-CFE3 NVF378.00 TAIWAN 1634 in Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV); Exhibit 46 (photo of Mediatek ARM MT5580KUF1 1633-BCSH ACMKYLGT in Vizio D24-D1 24” Class Edge-Lit LED Smart TV). Said Representative Accused Products were manufactured abroad. Exhibit 47 (photo of physical casing of the Vizio P50-C1 SmartCast P-Series 50” Class Ultra HD HDR Home Theater Display TV marked as "Made in China"); Exhibit 48 (photo of physical casing of the Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV marked as "Assembled in Mexico"); Exhibit 49 (photo of physical casing of the Vizio D24-D1 24” Class Edge-Lit LED Smart TV marked as "Made in China"). Said Representative Accused Products have been imported into the United States. Exhibit 50 (invoice indicating that the Vizio P50-C1 SmartCast P-Series 50” Class Ultra HD HDR Home Theater Display TV was shipped for delivery in the United States); Exhibit 51 (invoice indicating that the Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV was

shipped for delivery in the United States); Exhibit 52 (invoice indicating that the Vizio D24-D1 24” Class Edge-Lit LED Smart TV was shipped for delivery in the United States).

76. Complainant believes that the Vizio D24-D1 24” Class Edge-Lit LED Smart TV and Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV are exemplary of numerous other Accused Products imported, sold for importation, or sold within the United States after importation into the United States by Vizio because such other devices feature the same or substantially similar infringing functionality. Accordingly, on information and belief, numerous other devices that are covered by the Asserted Patents have been imported, sold for importation, or sold within the United States after importation, into the United States, by Vizio.

**VI. UNLAWFUL AND UNFAIR ACTS COMMITTED BY PROPOSED RESPONDENTS—PATENT INFRINGEMENT**

77. Proposed Respondents unlawfully sell for importation, import, and/or sell after importation into the United States the Accused Products – semiconductor components (such as, for example, various SoCs and similar processing components and circuits) and consumer audiovisual products – that directly or indirectly infringe at least the patent claims listed below:

<b>U.S. Patent No.</b>	<b>Asserted Claims</b>	<b>Accused Parties</b>
8,284,844	1-14	MediaTek MStar LG Vizio Funai
7,590,059	11-30	MediaTek MStar LG Vizio Funai
8,068,171	1-5, 7	LG MStar Funai
7,310,104	1, 10, 11, 16, 17, 22	All Proposed Respondents

U.S. Patent No.	Asserted Claims	Accused Parties
7,342,967	1- 4	MediaTek LG Vizio

78. On information and belief, Proposed Respondents manufacture abroad, sell for importation into the United States, import into the United States, and/or sell within the United States after importation, Accused Products that infringe one or more claims of the Asserted Patents.

79. On information and belief, the Component-Supplier Respondents<sup>7</sup> directly infringe, induce infringement of, and contributorily infringe one or more of the Asserted Patents by making, using, selling, offering for sale, and importing articles, including specific SoCs and any processing components and circuits that feature the same or substantially similar infringing functionality, which are covered by the claims of the Asserted Patents.

80. On information and belief, the Downstream Product Respondents<sup>8</sup> directly infringe, induce infringement of, and contributorily infringe one or more of the Asserted Patents by making, using, selling, offering for sale, and importing articles, including consumer audiovisual products that incorporate the above accused SoCs manufactured by the Component-Supplier Respondents, which are covered by the claims of the Asserted Patents.

81. The Proposed Respondents are aware of the Asserted Patents at least because they were provided with a copy of this Complaint via registered mail as of the date of its filing.

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<sup>7</sup> The Component-Supplier Respondents are MediaTek, MStar, Sigma Designs, Vizio, and LG.

<sup>8</sup> Funai, LG, and Vizio.

**A. Direct Infringement**

**1. The Decoding Patents**

**(a) The '844 Patent<sup>9</sup>**

82. On information and belief, and by way of example only, the following

Representative Accused Products infringe at least claims 1-14 of the '844 patent:

- a. Component-Supplier Respondents
  - i. MediaTek SoCs: ARM MT5580KUF1 1546-BCSH ACMKPTKR; ARM MT5580KUF1 1543-BCSH AC4KKFQF.
  - ii. MStar SoC: ARM MSD95M2D-3-004E ATHC353B 1617A.
  - iii. LG SoC: LG XD Engine LGE6551-AA2 G5E73E1 GG23C; LG LG1312 ARM 1614 B1 TGP816.00A; LG LG1312 ARM 1621 B1 TGV098.00A.
  - iv. Vizio SoCs: Vizio V6 7603B0-CFE3 NPR143.00; Vizio V6 7603B0-CFE3 NRG557.00.
- b. Downstream Product Respondents
  - i. LG products incorporating the accused SoCs: LG 55UH7700 Smart LED TV (incorporates the LG XD Engine LGE6551-AA2 G5E73E1 GG23C); LG 60UH8500 Smart LED TV (incorporates the LG LG1312 ARM 1614 B1 TGP816.00A); LG OLED55C6P OLED 4K HDR Smart TV (incorporates the LG LG1312 ARM 1621 B1 TGV098.00A).

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<sup>9</sup>In addition to the specific SoCs and televisions listed below, any processing components and circuits manufactured by the Component-Supplier Respondents that feature the same or substantially similar infringing functionality and any consumer audiovisual products of the Downstream Product Respondents that incorporate such SoCs, or similar processing components and circuits, infringe at least claims 1-14 of the '844 patent.

- ii. Vizio products incorporating the accused SoCs: Vizio M-Series 43” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NPR143.00); Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NRG557.00); Vizio E28H-C1 E-Series 28” Class Full-Array LED Smart TV (incorporates MediaTek ARM MT5580KUF1 1546-BCSH ACMKPTKR); Vizio D24-D1 24” Class Edge-Lit LED Smart TV (incorporates Mediatek ARM MT5580KUF1 1543-BCSH AC4KKFQF).
- iii. Funai products incorporating the accused SoCs: Magnavox 50MV376Y/F7 TV (incorporates MStar ARM MSD95M2D-3-004E ATHC353B 1617A).

83. Additionally, on information and belief, users of the above-mentioned Representative Accused Products, including Proposed Respondents, their sales and service subsidiaries, their authorized dealers and repair service providers, and consumers infringe at least claims 1-14 of the '844 patent.

84. On information and belief, the identified Component-Supplier Respondents directly infringe at least claims 1-14 of the '844 patent by making, using, selling, offering for sale, and importing the above-listed SoCs.

85. On information and belief, the identified Downstream Product Respondents directly infringe at least claims 1-14 of the '844 patent by making, using, selling, offering for sale, and importing the above-listed products incorporating the accused SoCs.

86. Sample claim charts comparing the asserted independent claims of the '844 patent to a Representative Accused Product for each Proposed Respondent are attached as Exhibits 53, 54, 55, and 56.

**(b) The '059 Patent<sup>10</sup>**

87. On information and belief, and by way of example only, the following Representative Accused Products infringe at least claims 11-30 of the '059 patent:

- a. Component-Supplier Respondents
  - i. MediaTek SoCs: ARM MT5580KUF1 1546-BCSH ACMKPTKR; ARM MT5580KUF1 1543-BCSH AC4KKFQF.
  - ii. MStar SoCs: ARM MSD95M2D-3-004E ATHC353B 1617A.
  - iii. LG SoCs: LG XD Engine LGE6551-AA2 G5E73E1 GG23C; LG LG1312 ARM 1614 B1 TGP816.00A; LG LG1312 ARM 1621 B1 TGV098.00A.
  - iv. Vizio SoCs: Vizio V6 7603B0-CFE3 NPR143.00; Vizio V6 7603B0-CFE3 NRG557.00.
- b. Downstream Product Respondents
  - i. LG products incorporating the accused SoCs: LG 55UH7700 Smart LED TV (incorporates the LG XD Engine LGE6551-AA2 G5E73E1 GG23C); LG 60UH8500 Smart LED TV (incorporates the LG LG1312 ARM 1614 B1 TGP816.00A); LG OLED55C6P OLED 4K

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<sup>10</sup>In addition to the specific SoCs and televisions listed below, any processing components and circuits manufactured by the Component-Supplier Respondents that feature the same or substantially similar infringing functionality and any consumer audiovisual products of the Downstream Product Respondents that incorporate such SoCs, or similar processing components and circuits, infringe at least claims 11-30 of the '059 patent.

HDR Smart TV (incorporates the LG LG1312 ARM 1621 B1 TGV098.00A).

- ii. Vizio products incorporating the accused SoCs: Vizio M-Series 43” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NPR143.00); Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NRG557.00); Vizio E28H-C1 E-Series 28” Class Full-Array LED Smart TV (incorporates MediaTek ARM MT5580KUFI 1546-BCSH ACMKPTKR); Vizio D24-D1 24” Class Edge-Lit LED Smart TV (incorporates Mediatek ARM MT5580KUFI 1543-BCSH AC4KKFQF).
- iii. Funai products incorporating the accused SoCs: Magnavox 50MV376Y/F7 TV (incorporates MStar ARM MSD95M2D-3-004E ATHC353B 1617A).

88. Additionally, on information and belief, users of the above-mentioned Representative Accused Products, including Proposed Respondents, their sales and service subsidiaries, their authorized dealers and repair service providers, and consumers infringe at least claims 11-30 of the '059 patent.

89. On information and belief, the identified Component-Supplier Respondents directly infringe at least claims 11-30 of the '059 patent by making, using, selling, offering for sale, and importing the above-listed SoCs.

90. On information and belief, the identified Downstream Product Respondents directly infringe at least claims 11-30 of the '059 patent by making, using, selling, offering for sale, and importing the above-listed products incorporating the accused SoCs.

91. Sample claim charts comparing the asserted independent claims of the '059 patent to a Representative Accused Product for each Proposed Respondent are attached as Exhibits 57, 58, 59, and 60.

**(c) The '171 Patent<sup>11</sup>**

92. On information and belief, and by way of example only, the following Representative Accused Products infringe at least claims 1-5 and 7 of the '171 patent:

- a. Component-Supplier Respondents
  - i. MStar SoCs: ARM MSD95M2D-3-004E ATHC353B 1617A.
  - ii. LG SoCs: LG LG1312 ARM 1614 B1 TGP816.00A; LG LG1312 ARM 1621 B1 TGV098.00A; LG XD Engine LGE6551-AA2 G5E73E1 GG23C.
- b. Downstream Product Respondents
  - i. LG products incorporating the accused SoCs: LG 60UH8500 Smart LED TV (incorporates LG LG1312 ARM 1614 B1 TGP816.00A); LG OLED55C6P OLED 4K HDR Smart TV (incorporates LG LG1312 ARM 1621 B1 TGV098.00A); LG 55UH7700 Smart LED TV (incorporates LG XD Engine LGE6551-AA2 G5E73E1 GG23C).

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<sup>11</sup> In addition to the specific SoCs and televisions listed below, any processing components and circuits manufactured by the Component-Supplier Respondents that feature the same or substantially similar infringing functionality and any consumer audiovisual products of the Downstream Product Respondents that incorporate such SoCs, or similar processing components and circuits, infringe at least claims 1-7 of the '171 patent.

- ii. Funai products incorporating the accused SoCs: Magnavox 50” Class Smart LED TV 50MV376Y/F7 (incorporates the MSD95M2D-3-004E ATHC353B 1617A).

93. Additionally, on information and belief, users of the above-mentioned Representative Accused Products, including Proposed Respondents, their sales and service subsidiaries, their authorized dealers and repair service providers, and consumers infringe at least claims 1-5 and 7 of the '171 patent.

94. On information and belief, the identified Component-Supplier Respondents directly infringe at least claims 1-5 and 7 of the '171 patent by making, using, selling, offering for sale, and importing the above-listed SoCs.

95. On information and belief, the identified Downstream Product Respondents directly infringe at least claims 1-5 and 7 of the '171 patent by making, using, selling, offering for sale, and importing the above-listed products incorporating the accused SoCs.

96. Sample claim charts comparing the asserted independent claims of the '171 patent to a Representative Accused Product for each identified Proposed Respondent are attached as Exhibits 61 and 62.

## 2. The Video Processing Patents

### (a) The '104 Patent<sup>12</sup>

97. On information and belief, and by way of example only, the following Representative Accused Products infringe at least claims 1, 10, 11, 16, 17, and 22 of the '104 patent:

- a. Component-Supplier Respondents
  - i. MediaTek SoCs: ARM MT5580KUF1 1546-BCSH ACMKPTKR; ARM MT5580KUF1 1543-BCSH AC4KKFQF.
  - ii. MStar SoCs: ARM MSD95M2D-3-004E ATHC353B 1617A.
  - iii. Sigma Designs SoCs: HiDTV-PRO SX7 STV7701A04-CFE3 N6K070.00 TAIWAN 1548.
  - iv. LG SoCs: LG XD Engine LGE6551-AA2 G5E73E1 GG23C; LG LG1312 ARM 1614 B1 TGP816.00A; LG LG1312 ARM 1621 B1 TGV098.00A.
  - v. Vizio SoCs: Vizio V6 7603B0-CFE3 NPR143.00; Vizio V6 7603B0-CFE3 NRG557.00.
- b. Downstream Product Respondents
  - i. LG products incorporating the accused SoCs: LG 55UH7700 Smart LED TV (incorporates the LG XD Engine LGE6551-AA2 G5E73E1 GG23C); LG 60UH8500 Smart LED TV (incorporates the LG LG1312 ARM 1614 B1 TGP816.00A; LG OLED55C6P OLED 4K

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<sup>12</sup> In addition to the specific SoCs and televisions listed below, any processing components and circuits manufactured by the Component-Supplier Respondents that feature the same or substantially similar infringing functionality and any consumer audiovisual products of the Downstream Product Respondents that incorporate such SoCs, or similar processing components and circuits, infringe at least claims 1, 10, 11, 16, 17, and 22 of the '104 patent.

HDR Smart TV (incorporates the LG1312 ARM 1621 B1 TGV098.00A).

- ii. Vizio products incorporating the accused SoCs: Vizio M-Series 43” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NPR143.00); Vizio D50u-D1 50” Class Ultra HD Full-Array LED Smart TV (incorporates the Vizio V6 7603B0-CFE3 NRG557.00); Vizio E28H-C1 E-Series 28” Class Full-Array LED Smart TV (incorporates MediaTek ARM MT5580KUFI 1546-BCSH ACMKPTKR); Vizio D24-D1 24” Class Edge-Lit LED Smart TV (incorporates MediaTek ARM MT5580KUFI 1543-BCSH AC4KKFQF); Vizio P50-C1 SmartCast P-Series 50” Class Ultra HD HDR Home Theater Display TV (incorporates Sigma Designs HiDTV-PRO SX7 STV7701A04-CFE3 N6K070.00 TAIWAN 1548).
- iii. Funai products incorporating the accused SoCs: Magnavox 50” Class Smart LED TV 50MV376Y/F7 (incorporates MStar ARM MSD95M2D-3-004E ATHC353B 1617A).

98. Additionally, on information and belief, users of the above-mentioned Representative Accused Products, including Proposed Respondents, their sales and service subsidiaries, their authorized dealers and repair service providers, and consumers infringe at least claims 1, 10, 11, 16, 17, and 22 of the ’104 patent.

99. On information and belief, the identified Component-Supplier Respondents directly infringe at least claims 1, 10, 11, 16, 17, and 22 of the ’104 patent by making, using, selling, offering for sale, and importing the above-listed SoCs.

100. On information and belief, the identified Downstream Product Respondents directly infringe at least claims 1, 10, 11, 16, 17, and 22 of the '104 patent by making, using, selling, offering for sale, and importing the above-listed products incorporating the accused SoCs.

101. Sample claim charts comparing the asserted independent claims of the '104 patent to a Representative Accused Product for each Proposed Respondent are attached as Exhibits 63, 64, 65, 66, and 67.

**(b) The '967 Patent<sup>13</sup>**

102. On information and belief, and by way of example only, the following Representative Accused Products infringe at least claims 1, 2, 3, and 4 of the '967 patent:

- a. Component-Supplier Respondents
  - i. MediaTek SoCs: ARM MT5580KUF1 1546-BCSH ACMKPTKR;  
ARM MT5580KUF1 1543-BCSH AC4KKFQF.
  - ii. LG SoCs: LG XD Engine LGE6551-AA2 G5E73E1 GG23C; LG  
LG1312 ARM 1614 B1 TGP816.00A; LG LG1312 ARM 1621 B1  
TGV098.00A.
- b. Downstream Product Respondents
  - i. LG products incorporating the accused SoCs: LG 60UH8500 Smart  
LED TV (incorporates LG LG1312 ARM 1614 B1 TGP816.00A); LG  
OLED55C6P OLED 4K HDR Smart TV (LG LG1312 ARM 1621 B1

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<sup>13</sup> In addition to the specific SoCs and televisions listed below, any processing components and circuits manufactured by the Component-Supplier Respondents that feature the same or substantially similar infringing functionality and any consumer audiovisual products of the Downstream Product Respondents that incorporate such SoCs, or similar processing components and circuits, infringe at least claims 1-4 of the '967 patent.

TGV098.00A); LG 55UH7700 Smart LED TV (incorporates LG XD Engine LGE6551-AA2 G5E73E1 GG23C).

- ii. Vizio products incorporating the accused SoCs: Vizio E28H-C1 E-Series 28” Class Full-Array LED Smart TV (incorporates MediaTek ARM MT5580KUF1 1546-BCSH ACMKPTKR); Vizio D24-D1 24” Class Edge-Lit LED Smart TV (incorporates MediaTek ARM MT5580KUF1 1543-BCSH AC4KKFQF).

103. Additionally, on information and belief, users of the above-mentioned Representative Accused Products, including Proposed Respondents, their sales and service subsidiaries, their authorized dealers and repair service providers, and consumers infringe at least claims 1, 2, 3, and 4 of the '967 patent.

104. On information and belief, the identified Component-Supplier Respondents directly infringe at least claims 1, 2, 3, and 4 of the '967 patent by making, using, selling, offering for sale, and importing the above-listed SoCs.

105. On information and belief, the identified Downstream Product Respondents directly infringe at least claims 1, 2, 3, and 4 of the '967 patent by making, using, selling, offering for sale, and importing the above-listed products incorporating the accused SoCs.

106. Sample claim charts comparing the asserted independent claims of the '967 patent to a Representative Accused Product for each identified Proposed Respondent are attached as Exhibits 68 and 69.

#### **B. Indirect Infringement**

107. On information and belief, all Proposed Respondents are aware of the Asserted Patents at least as of the date they were served with this Complaint.

108. On information and belief, the Component-Supplier Respondents induce other users of the Accused Products, including, for instance, the Downstream Product Respondents, to infringe one or more claims of the Asserted Patents with the specific intent to encourage their infringement by, among other things, marketing the above-listed SoCs, and by creating and/or distributing drivers, data sheets, application notes, and/or similar materials with instructions on using or rendering operable the Downstream Product Respondents' products that incorporate the SoCs.

109. On information and belief, the Downstream Product Respondents induce other users of the Accused Products, including, for instance, end-users of their products, to infringe one or more claims of the Asserted Patents with the specific intent to encourage their infringement by, among other things, marketing the above-listed products that incorporate the accused SoCs, and by creating and/or distributing specifications, marketing materials, drivers, data sheets, application notes, and/or similar materials with instructions on using or rendering operable the accused downstream products.

110. On information and belief, the Component-Supplier Respondents contribute to the infringement of one or more claims of the Asserted Patents by, among others, the Downstream Product Respondents, because they know that the Accused Products – and, by way of example, the above-mentioned SoCs – embody a material part of the claimed inventions of the Asserted Patents, that they are specially made or specially adapted for use in an infringement of the claims, and that they are not staple articles of commerce suitable for substantial non-infringing use.

111. On information and belief, the Downstream Product Respondents contribute to the infringement of one or more claims of the Asserted Patents by, among others, end users,

because they know that the Accused Products – and, specifically, their above-mentioned products that incorporate the accused SoCs – embody a material part of the claimed inventions of the Asserted Patents, that they are specially made or specially adapted for use in an infringement of the claims, and that they are not staple articles of commerce suitable for substantial non-infringing use.

## **VII. THE DOMESTIC INDUSTRY**

112. As required by Section 337(a)(2) and defined by Section 337(a)(3), an industry in the United States exists in connection with articles protected by the Asserted Patents.

### **A. Technical Prong**

113. The Asserted Patents are important to Broadcom's success in the market for Set-Top Box SoC products, and the claimed technology is widely incorporated into Broadcom's chips. A significant majority of Broadcom's Set-Top Box SoC products incorporate the inventions of the Asserted Patents. Claim charts showing how representative Broadcom Set-Top Box SoCs practice the Asserted Patents are attached as Confidential Exhibits 75C, 76C, 77C, 78C, and 80C.

114. Given that a significant majority of the SoC devices and set-top box products containing those SoCs produced by Broadcom's Set-Top Box Division (the "STB Division") are protected by the Asserted Patents (*see* Confidential Exhibits 75C, 76C, 77C, 78C, and 80C), Broadcom's Set-Top Box SoC products – including the products in the Cable Set-Top Box, Satellite Set-Top Box, and IP Set-Top Box product lines – constitute Broadcom's "Domestic Industry Products."

### **B. Economic Prong**

115. Broadcom has a long history of significant investments in research, development, and engineering of technologies incorporated in its products. For example, Broadcom Limited's

total research and development expense was \$2.7 billion for Fiscal Year 2016.<sup>14</sup> Prior to the Acquisition, Broadcom's research and development expense was \$2.37 billion, \$2.49 billion, and \$2.32 billion in 2014, 2013, and 2012, respectively.<sup>15</sup> Broadcom Limited's research and development expense as a percentage of net revenue was 20% for Fiscal Year 2016.<sup>16</sup> As of October 31, 2016, Broadcom had approximately 10,500 research and development employees (approximately 67% of Broadcom's total employees), including hundreds of employees with Ph.D.s, primarily working out of its principal design facilities located in Irvine, California and Santa Clara County, California. *See* Exhibit 4C (Confidential Declaration of Mr. Nicholas Aberle "Aberle Declaration") ¶15. The facilities in Irvine, California occupy over 900,000 square feet of space. *Id.*

116. In particular, Broadcom conducts significant domestic industry activities in the United States in developing and bringing to market its Domestic Industry Products. As explained in further detail in the accompanying confidential declaration of Mr. Nicholas Aberle, Broadcom has made significant investments in its plant and equipment, employs a significant amount of labor and capital, and conducts engineering, research, design, and development as to Broadcom's Set-Top Box SoC products embodying the claims of the Asserted Patents. *See* Exhibit 4C (Aberle Declaration).

117. Specifically, Broadcom has conducted and continues to conduct extensive activities in the United States relating to its Domestic Industry Products, including significant activities within Broadcom's Set-Top Box Division directed to research and development and other technically-focused activities. Relevant U.S. investments and expenditures of the STB

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<sup>14</sup> *See* Ex. 2, Broadcom Limited 2016 Form 10-K, at 49. This is a GAAP figure (*see id.* at 46).

<sup>15</sup> *See* Ex. 3, Broadcom Limited 2014 Form 10-K, at 6.

<sup>16</sup> *See* Ex. 2, Broadcom Limited 2016 Form 10-K, at 48.

Division as to Broadcom Domestic Industry products totaled well over \$100 million in Fiscal Year 2016 alone. *See* Exhibit 4C (Aberle Declaration) ¶18.

118. More specifically and as further detailed in the Aberle declaration, Broadcom's STB Division devotes significant resources to the research and development of the Domestic Industry Products. For example, the STB Division employs hundreds of employees dedicated to research and development in the United States. These hundreds of employees account for many millions of dollars annually in employee costs. *See* Exhibit 4C (Aberle Declaration) ¶13.

119. Broadcom also employs a technically-focused team in the United States that works closely with Broadcom's existing and potential customers to develop semiconductor products for customer applications. This team takes an active role in the design of specific Broadcom chipsets and works directly with Broadcom's research and development group to develop products that meet customer specifications and performance demands. These employees account for millions of dollars annually in employee costs. *See* Exhibit 4C (Aberle Declaration) ¶14.

120. Broadcom also has significant investment in various locations across the United States that support Broadcom's STB Division. Indeed, the STB Division currently devotes approximately hundreds of thousands square feet of space to its research and development efforts in the United States, including significant space in Broadcom's facilities in Irvine, California. *See* Exhibit 4C (Aberle Declaration) ¶15.

121. As a final example, Broadcom's STB Division also has made significant investment in equipment in the United States that it uses to design and develop its products. This equipment includes emulators, testing equipment, verification equipment, design workstations, servers, lab consumables, and the costs associated with this equipment include purchase costs,

depreciation, and maintenance costs. These equipment-related costs, all incurred by the STB Division, account for millions of dollars annually. See Exhibit 4C (Aberle Declaration) ¶17.

### **VIII. HARMONIZED TARIFF SCHEDULE INFORMATION**

122. The articles subject to this complaint are classified under at least the following headings and subheadings of the Harmonized Tariff Schedule (“HTS”) of the United States: 8542.31.0000 or 8542.39.0000. These HTS numbers are illustrative only and are not intended to restrict the scope of this investigation.

### **IX. RELATED LITIGATION**

123. The Asserted Patents are also the subject of Civil Actions in the United States District Court for the Central District of California, filed contemporaneously herewith by Complainant, naming the Proposed Respondents as Defendants. Specifically, Broadcom will be filing a complaint for patent infringement in that District against each of MediaTek, MStar, Sigma, LG, Vizio, and Funai.

124. On September 23, 2016, Broadcom Corporation and Avago Technologies General IP Singapore Pte Ltd (“Avago”) brought an action in the United States District Court of the Central District of California against Amazon.com, Inc., and Amazon Web Services, Inc. *Broadcom Corp. v. Amazon.com, Inc.*, No. 8:16-cv-01774 (C.D. Cal.). Broadcom Corporation and Avago allege infringement of, among others, the ’844 patent. The action is pending.

125. On May 14, 2008, Broadcom Corporation brought an action in the United States District Court for the Central District of California against SiRF Technology, Inc., and CSR plc alleging infringement of the ’104 patent. *Broadcom Corporation v. SiRF Technology, Inc.*, No. 8:08-cv-00546 (C.D. Cal.). The case ended on January 13, 2011.

126. Other than the foregoing, and on information and belief, the Asserted Patents have not been the subject of any other court or agency litigation, domestic or foreign.

**X. RELIEF REQUESTED**

WHEREFORE, by reason of the foregoing, Complainant respectfully requests that the United States International Trade Commission:

(a) institute an immediate investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, into the violations by Proposed Respondents of Section 337 arising from the importation into the United States, and/or sale for importation, and/or sale within the United States after importation, of Proposed Respondents' products that infringe one or more claims of the Asserted Patents;

(b) schedule and conduct a hearing, pursuant to 19 U.S.C. § 1337(c), for purposes of receiving evidence and hearing argument concerning whether there has been a violation of Section 337 of the Tariff Act of 1930, as amended; and, following the hearing, determine that there has been a violation of Section 337 of the Tariff Act of 1930, as amended;

(c) issue a limited exclusion order, pursuant to 19 U.S.C. § 1337(d)(1), excluding from entry for consumption into the United States, entry for consumption from a foreign trade-zone, or withdrawal from a warehouse for consumption, semiconductor components and products containing the same that infringe one or more claims of the Asserted Patents and which are manufactured by or on behalf of, or imported by or on behalf of Proposed Respondents, or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns, for the remaining terms of the Asserted Patents, except under license of Complainant or as provided by law;

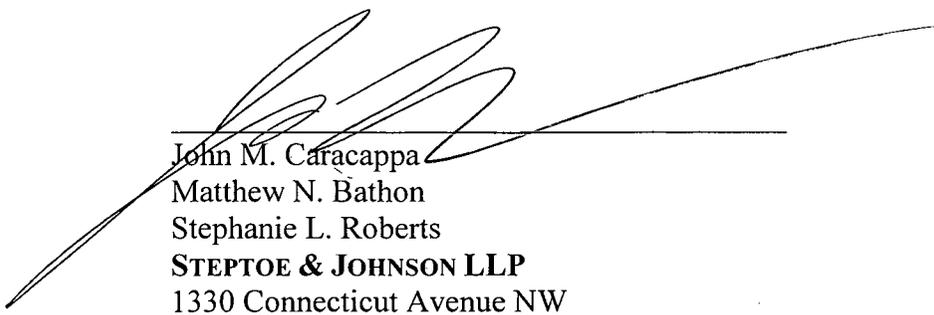
(d) issue permanent cease-and-desist orders, pursuant to 19 U.S.C. § 1337(f), preventing Proposed Respondents and any of their principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) or majority-owned business entities, successors, and assigns, from either directly engaging in or for, with, or otherwise on behalf of Proposed Respondents, (A) importing or selling for importation into the United States certain semiconductor devices and audiovisual products containing the same that infringe one or more claims of the Asserted Patents; (B) marketing, distributing, offering for sale, selling, or otherwise transferring, in the United States imported certain semiconductor devices and audiovisual products containing the same that infringe one or more claims of the Asserted Patents; (C) advertising imported certain semiconductor devices and audiovisual products containing the same in the United States that infringe one or more claims of the Asserted Patents; (D) soliciting U.S. agents or distributors for certain semiconductor devices and audiovisual products containing the same that infringe one or more claims of the Asserted Patents; or (E) aiding or abetting other entities in the importation, sale for importation, sale after importation, transfer, or distribution of certain semiconductor devices and audiovisual products containing the same that infringe one or more claims of the Asserted Patents;

(e) impose a bond during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(e)(1) and (f)(1) to prevent further injury to the domestic industry of Complainant relating to the Asserted Patents; and

(f) grant all such other and further relief as the Commission has authority to grant and deems appropriate under the law, based upon the facts complained of herein and as determined by the Investigation.

Dated: March 7, 2017

Respectfully submitted,



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John M. Caracappa

Matthew N. Bathon

Stephanie L. Roberts

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*Counsel for Complainant*

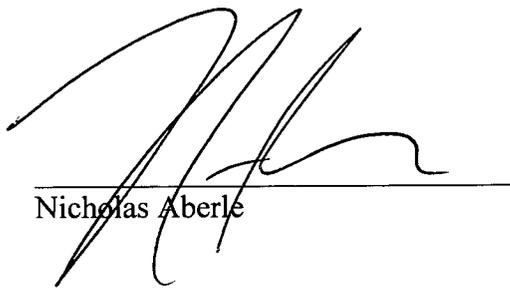
*Broadcom Corporation*

## VERIFICATION

I, Nicholas Aberle, affirm that I am employed by Broadcom Corporation and hold the title of Division Finance Controller. I have read the Verified Complaint of Broadcom Corporation under Section 337 of the Tariff Act of 1930, as Amended. I am informed and believe that the facts stated in the foregoing complaint are true as of this date and on that basis verify the foregoing complaint on behalf of Broadcom Corporation.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

3/7/17  
Dated

  
Nicholas Aberle