UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of **CERTAIN LIGHT-EMITTING DIODES AND PRODUCTS CONTAINING THE SAME**	**Investigation No. 337-TA-_____**

COMPLAINT OF OSRAM GMBH UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED

COMPLAINANT

OSRAM GmbH
Hellabrunner Strasse 1
81543 Munich
Germany
Tel: +49 89 62 13 0

COUNSEL FOR COMPLAINANT

Charles H. Sanders
Kelley E. Walsh
GOODWIN PROCTER LLP
Exchange Place
53 State Street
Boston, MA 02109-2802
Tel: (617) 570-1000
Fax: (617) 523-1231

Jennifer A. Albert
GOODWIN PROCTER LLP
901 New York Avenue, N.W.
Washington, DC 20001-4332
Tel: (202) 346-4000
Fax: (202) 346-4444

PROPOSED RESPONDENTS

LG Electronics, Inc.
LG Twin Towers
20, Yeouido-dong
Yeongdungpo-gu
Seoul, 150-721, South Korea

LG Innotek Co., Ltd.
Seoul Square 20F
Namdaemunno 5-ga
Jung-gu
Seoul, 100-714, South Korea

LG Electronics U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, New Jersey 07632

LG Innotek U.S.A., Inc.
10225 Willow Creek Road
San Diego, California 92131

Mark J. Abate
Jonathan A. Auerbach
Timothy J. Rousseau
GOODWIN PROCTER LLP
The New York Times Building
620 Eighth Avenue
New York, NY 10018-1405
Tel: (212) 813-8800
Fax: (212) 355-3333

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3	Certified Copy of U.S. Patent No. 7,126,162
4	Certified Copy of U.S. Patent No. 7,151,283
5	Certified Copy of U.S. Patent No. 7,629,621
6	Certified Copy of U.S. Patent No. 6,975,011
7	Certified Copy of U.S. Patent No. 7,199,454
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105	**Confidential** License Agreement with Philips Lumileds Lighting Company, LLC
106	**Confidential** License Agreement with Vishay Intertechnology, Inc.
107	**Confidential** License Agreement with ROHM Semiconductor, USA LLC

INDEX OF PHYSICAL EXHIBITS

Exhibit No.	Description
1	LEMWS37P80LZ00 LG Innotek Co., Ltd. LEDs
2	LEMWS59T80LZ00 LG Innotek Co., Ltd. LEDs
3	LEMWS59T70GZ00 LG Innotek Co., Ltd. LEDs
4	LEMWS52P80LZ00 LG Innotek Co., Ltd. LEDs
5	LEMWH51W80LZ00 LG Innotek Co., Ltd. LEDs
6	LEMW51X75GZ00 LG Innotek Co., Ltd. LEDs
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I. INTRODUCTION

1.1 Complainant OSRAM GmbH ("OSRAM") 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 importation into the United States, the sale for importation, and/or the sale within the United States after importation by the owner, importer, or consignee (or agents thereof), of certain light-emitting diodes ("LEDs") and products containing the same ("the Accused Products") that infringe claims of twelve valid and enforceable United States patents assigned to OSRAM GmbH (collectively "the OSRAM patents" or "the Asserted Patents").

1.2 The proposed Respondents are LG Electronics, Inc. ("LGE"), LG Innotek Co., Ltd. ("LGIT"), LG Electronics U.S.A., Inc. ("LGE USA"), and LG Innotek U.S.A., Inc. ("LGIT USA") (collectively "LG"). LG has engaged in unlawful activities in violation of Section 337 through and in connection with the unlicensed importation into the United States, the sale for importation, and/or the sale within the United States after importation of certain LEDs and products containing the same, which infringe one or more claims of the OSRAM patents.

1.3 The Accused Products include, for example, LG branded flat screen televisions and monitors that are backlit by LEDs.

1.4 OSRAM asserts that the Accused Products infringe at least the claims of the OSRAM patents identified below:

#	U.S. Patent	Asserted Claims
1	6,459,130 ("'130 patent")	1, 5, 8-9, 13, 16-17, 21
2	6,812,500 ("'500 patent")	1, 3, 5, 7, 11, 13-17, 21, 27, 32, 34-38, 40-44, 48, 54, 59, 61-63, 66-67, and 69
3	6,849,881 ("'881 patent")	1 and 10-11

4	6,927,469 ("'469 patent")	1-4, and 6
5	6,975,011 ("'011 patent")	1-2
6	7,078,732 ("'732 patent")	1-2, 7, 13, 30, and 32
7	7,106,090 ("'090 patent")	1 and 6-7
8	7,126,162 ("'162 patent")	1-9, 11-12, and 16-38
9	7,151,283 ("'283 patent")	1-4, 6-8, 11, 17, 19, 22, 24-26, 29, and 32-35
10	7,199,454 ("'454 patent")	1, 4-16, and 19-20
11	7,271,425 ("'425 patent")	1-4, 6-9, and 16-17
12	7,629,621 ("'621 patent")	1-7, 9-11, 27, 29, 32, 35-37, 40-41, and 43-44

1.5 Certified copies of the OSRAM patents accompany this Complaint as **Exhibits 1-12**, and certified copies of the recorded assignments for the OSRAM patents accompany this Complaint as **Exhibits 13-24**. The '425 patent was subject to a recent assignment to OSRAM GmbH which was not available in the certified copy, but is included in the assignment records for the '425 patent contained in **Exhibit 20**.

1.6 An industry as required by Section 337(a)(2) and defined by Section 337(a)(3) exists in the United States relating to articles protected by the OSRAM patents.

1.7 OSRAM seeks a permanent exclusion order, pursuant to Section 337(d), excluding from entry into the United States the Accused Products that infringe one or more claims of the OSRAM patents. OSRAM also seeks orders, pursuant to Section 337(f), directing the proposed Respondents to cease and desist from importing, marketing, advertising, testing,

demonstrating, installing, servicing, repairing, selling, offering for sale, or using Accused Products that infringe one or more claims of the OSRAM patents, or moving, shipping, distributing, or warehousing inventory of such infringing Accused Products.

II. COMPLAINANT

2.1 OSRAM GmbH is a German corporation with its headquarters located at Hellabrunner Strasse 1, 81543 Munich, Germany. Information about OSRAM GmbH is available on its website: http://www.osram.com.

2.2 OSRAM was founded over 100 years ago and is one of the two largest lighting manufacturers in the world. Light from OSRAM shines in about 150 countries. OSRAM has 40,000 employees worldwide, supplying customers around the globe from its 46 production sites in 17 countries.

2.3 OSRAM is a high-tech company in the lighting industry and has maintained a strong commitment to research and development, particularly in the field of LEDs. Business in this area is growing rapidly and has taken on major strategic importance. LEDs are also an energy-efficient "green" technology. OSRAM's milestones in the development of LED technology include the first surface-mounted LEDs and the first LEDs that emit white light ("white LEDs") using conversion technology, and these innovative technologies are the subject of patents asserted in this Complaint.

2.4 OSRAM developed novel conversion technology for white LEDs, which enables production of white LEDs using blue-emitting semiconductors and suitable phosphor converters, and first introduced white LEDs using conversion technology in 1996.

2.5 There is enormous demand within the lighting industry for the technologies developed by OSRAM, in part because white LEDs are becoming the most widespread type of LED. Typical applications include backlighting of displays and both interior and exterior vehicle lighting, and white LEDs are now being used increasingly for general illumination.

2.6 With several thousand patents and patent applications, OSRAM holds a strong intellectual property position in the field of LED technology. As a result of the enormous

demand for the technologies developed by OSRAM, OSRAM has licensed many major companies around the world.

III. PROPOSED RESPONDENTS

3.1 LG Electronics, Inc. ("LGE") is a Korean corporation with its principal place of business at LG Twin Towers, 20, Yeouido-dong, Yeongdungpo-gu, Seoul 150-721, Korea. LGE manufactures and provides a wide range of products incorporating LEDs, including, e.g., televisions, computer monitors, and mobile devices, which are manufactured outside the United States and imported into the United States, and offered for sale and sold within the United States. These products manufactured by LGE and imported into the United States include LEDs. A copy of LGE's consolidated 1Q 2011 Earnings Release accompanies this Complaint as **Exhibit 26**. As of the first quarter of 2011, LGE shipped 17% of its flat-panel televisions and 32% of its mobile handsets to North America. *See* **Exhibit 26**. Upon information and belief, LGE's products containing LEDs are manufactured, assembled, packaged and/or tested outside the United States, mainly in Korea, China, Poland, Mexico, Indonesia, Vietnam, and Brazil. *See* **Exhibit 27**.

3.2 LG Innotek Co., Ltd. ("LGIT") is a Korean corporation with its principal place of business at Seoul Square 20F, Namdaemunno 5-ga, Jung-gu, Seoul 100-714, Korea. LGIT is included in LGE's consolidated 1Q 2011 Earnings Release. *See* **Exhibit 26**. LGIT manufactures semiconductors for LEDs and LED packages outside the United States including in Korea and China. *See* **Exhibit 28**. LGIT LEDs are imported into the United States. In addition to LEDs, LGIT manufactures products containing LEDs, such as displays, lighting modules for use, e.g., in LED luminaires, and backlight units for use in, e.g., televisions, computer monitors, and mobile devices, which LGIT has imported into the United States, offered for sale, and/or sold within the United States. *See* **Exhibit 29**.

3.3 LG Electronics U.S.A., Inc. ("LGE USA") is a Delaware corporation with its principal place of business at 1000 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. Upon information and belief, LGE USA is a wholly owned subsidiary of LGE. LGE USA oversees

LGE's operations in the United States, and maintains inventory in the United States of, and offers to sell and sells in the United States, consumer electronics incorporating LEDs (e.g., televisions and computer monitors).

3.4 LG Innotek U.S.A., Inc. ("LGIT USA") is a California corporation with its principal place of business at 10225 Willow Creek Road, San Diego, California 92131. Upon information and belief, LGIT USA is a wholly owned subsidiary of LGIT. Upon information and belief, LGIT USA oversees LGIT's operations in the United States and offers LED-containing products manufactured by LGIT for sale in the United States. Upon information and belief, LGIT USA maintains an inventory of LEDs and/or products containing LEDs within the United States.

IV. THE TECHNOLOGY AND PRODUCTS AT ISSUE

4.1 The products at issue are certain LEDs and products containing the same. LEDs are small semiconductor devices that emit light.

4.2 An LED has a semiconductor that emits incoherent narrow-spectrum light when an electrical current is applied. The semiconductor material used in an LED determines the color of light that it emits, e.g., amber, blue, green, orange, red, or yellow light.

4.3 To create LEDs which emit white light ("white LEDs"), the light from a blue-emitting semiconductor is passed through a phosphor composition. The phosphor absorbs some of the blue light and emits light at longer wavelengths, e.g., yellow light. This combination appears white to the human eye. OSRAM pioneered the development of white LEDs which utilize this "conversion principle" technology, and several of OSRAM patents relate to this technology. One class of products at issue is white LEDs, and products containing the same, that use OSRAM's patented "conversion principle" technology.

4.4 The semiconductor in an LED is typically mounted on a leadframe, which can serve to provide electricity to the semiconductor and to dissipate heat away from the semiconductor. While LEDs are more efficient than traditional incandescent bulbs in producing light, a far higher portion of the supplied electrical energy is converted into heat in LEDs, and

therefore thermal management of LEDs is particularly important to avoid failure or degradation, and to optimize optical performance. Thermal management can be accomplished for example through the use of certain leadframe structures, and several of the OSRAM patents relate to this technology. Another class of products at issue is LEDs, and products containing the same, that use OSRAM's patented leadframe and thermal management structures.

4.5 The semiconductor in an LED is composed of several layers of semiconductor material, and the structure of these layers is an important determinant of efficiency. Two of the OSRAM patents relate to a structure of the semiconductor layers in the vicinity of the active region, called a pre-well structure, which enhances light emission from the active region. A third class of products at issue is LEDs, and products containing the same, that contain semiconductors which use OSRAM's patented pre-well technology.

4.6 OSRAM's patented technologies at issue are non-exclusive, and a particular type of LED, or product containing this LED, may infringe one, two or all three classes of OSRAM's patented technologies at issue.

4.7 LEDs have a tremendous variety of applications including, for example, backlighting for mobile devices, flat-screen televisions, flat-screen computer monitors, tablets, and laptops; interior and exterior automotive lighting; large displays; specialty lighting in commercial and architectural contexts; and general lighting.

4.8 Due to their superior longevity and efficiency, white LEDs are expected to replace incandescent bulbs and fluorescent bulbs as the standard for general-purpose lighting. Use of LED bulbs provides substantial energy savings. For example, OSRAM Sylvania recently unveiled a LED lamp designed to replace a 100-watt incandescent lamp that provides up to 86 percent energy savings, compared to traditional incandescent technology. *See* **Exhibit 30**. The Energy Independence and Security Act of 2007 set efficiency standards that are not met by traditional incandescent bulbs. These standards became effective on January 1, 2011, in California and will become effective nationwide on January 1, 2012. LED-based lighting also offers other advantages such as greater design flexibility and environmentally friendly design.

V. THE ASSERTED PATENTS

A. The '732 Patent

1. Identification of the Patent and Ownership by OSRAM

5.1 U.S. Patent No. 7,078,732 ("the '732 patent"), entitled "Light-Radiating Semiconductor Component with a Luminescence Conversion Element," issued on July 18, 2006, naming inventors Ulrike Reeh, Klaus Höhn, Norbert Stath, Günter Waitl, Peter Schlotter, Jürgen Schneider, and Ralf Schmidt. *See* **Exhibit 2**.

5.2 A certified copy and three additional copies of the prosecution history of the '732 patent accompany this Complaint. *See* **Appendix B**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix N**.

2. Non-Technical Description of the Patented Invention[1]

5.3 The patent generally relates to a white light-emitting semiconductor component having a semiconductor body that emits blue light and a luminescence conversion layer that converts some of this light to light of a different wavelength range of green, yellow or red light. The unconverted blue light from the semiconductor passes through the luminescence conversion layer along with the radiation of a different wavelength from the luminescence conversion layer. Accordingly, the semiconductor emits white light.

B. The '500 Patent

1. Identification of the Patent and Ownership by OSRAM

5.4 U.S. Patent No. 6,812,500 ("the '500 patent"), entitled "Light-Radiating Semiconductor Component with a Luminescence Conversion Element," issued on November 2, 2004, naming inventors Ulrike Reeh, Klaus Höhn, Norbert Stath, Günter Waitl, Peter Schlotter, Jürgen Schneider, and Ralf Schmidt. *See* **Exhibit 1**.

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[1] All non-technical descriptions of the inventions herein are presented for general background purposes only. These descriptions are not intended to, and do not, construe either the specification or claims of any OSRAM patent.

5.5 A certified copy and three additional copies of the prosecution history of the '500 patent accompany this Complaint. *See* **Appendix A**. Four copies of each reference document mentioned in the prosecution history accompany this Complaint. *See* **Appendix M**.

2. Non-Technical Description of the Patented Invention

5.6 As a divisional of the '732 patent, the '500 patent shares the same specification as the '732 patent, and much of the general non-technical description of the '732 patent above also applies to the '500 patent.

5.7 The patent generally relates to a light-radiating semiconductor component having a semiconductor body that emits light in a first wavelength range of blue, green and/or ultraviolet light, electrical terminals connected to the semiconductor body, and a luminescence conversion element that converts some of this light to a second, different wavelength range. The converted light and the light emitted from the semiconductor combine to produce polychromatic light (e.g., white light). The luminescence conversion element can be produced from a silicone and can contain inorganic luminescent material selected from, *inter alia*, garnets and orthosilicates doped with rare earth elements.

C. The '162 Patent

1. Identification of the Patent and Ownership by OSRAM

5.8 U.S. Patent No. 7,126,162 ("the '162 patent"), entitled "Light-Radiating Semiconductor Component with a Luminescence Conversion Element," issued on October 24, 2006, naming inventors Ulrike Reeh, Klaus Höhn, Norbert Stath, Günter Waitl, Peter Schlotter, Jürgen Schneider, and Ralf Schmidt. *See* **Exhibit 3**.

5.9 A certified copy and three additional copies of the prosecution history of the '162 patent accompany this Complaint. *See* **Appendix C**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix O**.

2. Non-Technical Description of the Patented Invention

5.10 As a continuation of the '732 patent, the '162 patent shares the same specification as the '732 patent, and much of the general non-technical description of the '732 patent above also applies to the '162 patent.

5.11 The patent generally relates to a light-radiating semiconductor component having a semiconductor body that emits blue, green and/or ultraviolet light and a luminescence conversion element that converts some of this light to a different color. The converted light and the light emitted from the semiconductor body combine to produce a light output that has a mixture of colors which is substantially homogenous for different radiation directions.

D. The '283 Patent

1. Identification of the Patent and Ownership by OSRAM

5.12 U.S. Patent No. 7,151,283 ("the '283 patent"), entitled "Light-Radiating Semiconductor Component with a Luminescence Conversion Element," issued on December 19, 2006, naming inventors Ulrike Reeh, Klaus Höhn, Norbert Stath, Günter Waitl, Peter Schlotter, Jürgen Schneider, and Ralf Schmidt. *See* **Exhibit 4**.

5.13 A certified copy and three additional copies of the prosecution history of the '283 patent accompany this Complaint. *See* **Appendix D**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix P**.

2. Non-Technical Description of the Patented Invention

5.14 As a continuation of the '500 patent, which was itself a divisional of the '732 patent, the '283 patent shares the same specification as those patents, and much of the general non-technical description of those patents above also applies to the '283 patent.

5.15 The patent generally relates to a polychromatic light emitting semiconductor component having a semiconductor body that emits light in a first wavelength range of blue, green, and/or ultraviolet light and a luminescence conversion layer applied directly to the semiconductor body that contains luminescent material which converts some of this light to a

second, different wavelength range. The converted light and the light emitted from the semiconductor are both emitted by the component in perceptible amounts to produce polychromatic radiation.

E. The '621 Patent

1. Identification of the Patent and Ownership by OSRAM

5.16 U.S. Patent No. 7,629,621 ("the '621 patent"), entitled "Light-Radiating Semiconductor Component with a Luminescence Conversion Element," issued on December 8, 2009, naming inventors Ulrike Reeh, Klaus Höhn, Norbert Stath, Günter Waitl, Peter Schlotter, Jürgen Schneider, and Ralf Schmidt. *See* **Exhibit 5**.

5.17 A certified copy and three additional copies of the prosecution history of the '621 patent accompany this Complaint. *See* **Appendix E**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix Q**.

2. Non-Technical Description of the Patented Invention

5.18 As a continuation of the '732 and '162 patents, the '621 patent shares the same specification as those patents, and much of the general non-technical description of those patents above also applies to the '621 patent.

5.19 The patent generally relates to a light-radiating semiconductor component having a semiconductor body that emits light in a first wavelength range of blue, green and/or ultraviolet and a luminescence conversion element that converts some of this light to a second, different wavelength range. The converted light and the light emitted from the semiconductor combine to produce a light output having a mixture of colors which contains perceptible amounts of light in both the first and second wavelength ranges.

F. The '130 Patent

1. Identification of the Patent and Ownership by OSRAM

5.20 U.S. Patent No. 6,459,130 ("the '130 patent"), entitled "Optoelectronic Semiconductor Component," issued on October 1, 2002, naming inventors Karlheinz Arndt, Herbert Brunner, Franz Schellhorn, and Günter Waitl. *See* **Exhibit 11**.

5.21 A certified copy and three additional copies of the prosecution history of the '130 patent accompany this Complaint. *See* **Appendix K**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix W**.

2. Non-Technical Description of the Patented Invention

5.22 The patent generally relates to a radiation-emitting and/or receiving semiconductor component in which a radiation-emitting and/or receiving semiconductor is secured in a trough formed in a chip carrier part of the component's leadframe and is surrounded by an encapsulation. The trough has a reflective inner surface that reflects radiation that is either emitted and/or received by the semiconductor.

G. The '469 Patent

1. Identification of the Patent and Ownership by OSRAM

5.23 U.S. Patent No. 6,927,469 ("the '469 patent"), entitled "Optoelectronic Semiconductor Component," issued on August 9, 2005, naming inventors Karlheinz Arndt, Herbert Brunner, Franz Schellhorn, and Günter Waitl. *See* **Exhibit 12**.

5.24 A certified copy and three additional copies of the prosecution history of the '469 patent accompany this Complaint. *See* **Appendix L**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix X**.

2. Non-Technical Description of the Patented Invention

5.25 As a continuation of the '130 patent, the '469 patent shares the same specification as the '130 patent, and much of the general non-technical description of the '130 patent above also applies to the '469 patent.

5.26 The patent generally relates to a surface mountable device having a chip carrier part, a trough positioned at the chip carrier part having a reflective inner surface, a semiconductor secured in the trough, a connection part located some distance away from the chip carrier part which is electrically connected to the semiconductor, and an encapsulation. The chip carrier part is used to provide an electrical and/or thermal connection.

H. The '011 Patent

1. Identification of the Patent and Ownership by OSRAM

5.27 U.S. Patent No. 6,975,011 ("the '011 patent"), entitled "Optoelectronic Semiconductor Component Having Multiple External Connections," issued on December 13, 2005, naming inventors Karlheinz Arndt, Herbert Brunner, Franz Schellhorn, and Günter Waitl. *See* **Exhibit 6**.

5.28 A certified copy and three additional copies of the prosecution history of the '011 patent accompany this Complaint. *See* **Appendix F**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix R**.

2. Non-Technical Description of the Patented Invention

5.29 As a continuation of the '130 and '469 patents, the '011 patent shares the same specification as the '130 and '469 patents, and much of the general non-technical description of the '130 and '469 patents above also applies to the '011 patent.

5.30 The patent generally relates to a radiation-emitting and/or receiving semiconductor component in which the component's leadframe is formed by a chip carrier part and a connection part. A radiation-emitting and/or receiving semiconductor is secured on the chip carrier part, and an encapsulation surrounds the semiconductor and at least some of the chip

carrier part. The chip carrier part and the connection part are arranged at a distance from one another, and each has two external connections that project from the encapsulation at opposite sides.

I. The '454 Patent

1. Identification of the Patent and Ownership by OSRAM

5.31 U.S. Patent No. 7,199,454 ("the '454 patent"), entitled "Optoelectronic Semiconductor Component," issued on April 3, 2007, naming inventors Karlheinz Arndt, Herbert Brunner, Franz Schellhorn, and Günter Waitl. *See* **Exhibit 7**.

5.32 A certified copy and three additional copies of the prosecution history of the '454 patent accompany this Complaint. *See* **Appendix G**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix S**.

2. Non-Technical Description of the Patented Invention

5.33 As a continuation of the '130, '469 and '011 patents, the '454 patent shares the same specification as the '130, '469 and '011 patents, and much of the general non-technical description of the '130, '469 and '011 patents above also applies to the '454 patent.

5.34 The patent generally relates to semiconductor component having a chip carrier part, radiation-emitting and/or receiving semiconductor which is secured on a chip carrier part, and an encapsulation covering the semiconductor. The chip carrier part projects from the component.

J. The '425 Patent

1. Identification of the Patent and Ownership by OSRAM

5.35 U.S. Patent No. U.S. Patent No. 7,271,425 ("the '425 patent"), entitled "Optoelectronic Component," issued on September 18, 2007, naming inventors Karlheinz Arndt, Georg Bogner, Günter Waitl, and Mattias Winter. *See* **Exhibit 8**.

5.36 A certified copy and three additional copies of the prosecution history of the '425 patent accompany this Complaint. *See* **Appendix H**. A certificate of correction was filed on

May 13, 2011, to replace "central point, of said chip" in column 8, line 53, with "central point of said chip" and to replace "arc directly" in column 10, line 2, with "are directly." It appears that the certificate of correction issued on May 19, 2011, but the certificate itself is not yet available. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix T**.

2. Non-Technical Description of the Patented Invention

5.37 The patent generally relates to an optoelectronic component in which a semiconductor is secured on a chip carrier. The chip carrier has a central region and terminals that extend outwardly to the outside from the central portion. A body envelops the semiconductor and portions of the chip carrier. There is a plane defined by the component where the terminals are substantially point-symmetrical with respect to the central point of the semiconductor, so that the heat-induced forces substantially cancel each other out at the central point of the semiconductor.

K. The '881 Patent

1. Identification of the Patent and Ownership by OSRAM

5.38 U.S. Patent No. 6,849,881 ("the '881 patent"), entitled "Optical Semiconductor Device Comprising a Multiple Quantum Well Structure," issued on February 1, 2005, naming inventors Volker Harle, Berthold Hahn, Hans-Jürgen Lugauer, Helmut Bolay, Stefan Bader, Dominik Eisert, Uwe Strauss, Johannes Völkl, Ulrich Zehnder, Alfred Lell, and Andreas Weimar. *See* **Exhibit 9**.

5.39 A certified copy and three additional copies of the prosecution history of the '881 patent accompany this Complaint. *See* **Appendix I**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix U**.

2. Non-Technical Description of the Patented Invention

5.40 The patent generally relates to an optical semiconductor device with a multiple quantum well structure in which well layers and barrier layers, comprising various

semiconductor layers, are alternatively layered on top of one another in the direction of growth toward a radiation-active (light-emitting) quantum well layer. The well layers of the superlattice below a radiation-active well layer are essentially non-radiating.

L. The '090 Patent

1. Identification of the Patent and Ownership by OSRAM

5.41 U.S. Patent No. 7,106,090 ("the '090 patent"), entitled "Optical Semiconductor Device With Multiple Quantum Well Structure," issued on September 12, 2006, naming inventors Volker Harle, Berthold Hahn, Hans-Jurgen Lugauer, Helmut Bolay, Stefan Bader, Dominik Eisert, Uwe Strauss, Johannes Volkl, Ulrich Zehnder, Alfred Lell, and Andreas Weimer. *See* **Exhibit 10**.

5.42 A certified copy and three additional copies of the prosecution history of the '090 patent accompany this Complaint. *See* **Appendix J**. Four copies of each reference document mentioned in the prosecution history which was available from the Patent Office accompany this Complaint. *See* **Appendix V**.

2. Non-Technical Description of the Patented Invention

5.43 As a continuation of the '881 patent, the '090 patent shares the same specification as the '881 patent, and much of the general non-technical description of the '881 patent above also applies to the '090 patent.

5.44 The patent generally relates to an optical semiconductor device with a multiple quantum well structure in which well layers and barrier layers, comprising various semiconductor layers, are alternatively layered on top of one another. A radiation-active (light-emitting) well layer is disposed over the alternating essentially non-radiating well layers and barrier layers.

M. Foreign Counterparts to the Asserted Patents

5.45 The foreign patents and patent applications corresponding to the Asserted Patents are listed in **Exhibit 25**, with a description of the status of each one.

N. Additional Patents

5.46 OSRAM reserves the right to amend its Complaint to add additional patents, including without limitation patents which have not yet issued as of the filing of this Complaint and patents which are found to be infringed based on later-acquired information.

VI. UNLAWFUL AND UNFAIR ACTS – PATENT INFRINGEMENT

6.1 LG directly infringes, contributorily infringes, and/or induces infringement of the OSRAM patents. Examples of such infringement are identified below. The identification of specific models below is not intended to limit the scope of the investigation; the Accused Products are LG's unlicensed LEDs and LG's products containing unlicensed LEDs.

6.2 Upon information and belief, LGE manufactures, assembles, packages and/or tests Accused Products outside the United States, mainly in Korea, China, Poland, Mexico, Indonesia, Vietnam, and Brazil. *See* **Exhibit 27**. Upon information and belief, these Accused Products are imported into the United States, sold for importation, and offered for sale and/or sold within the United States after importation. *See* **Exhibit 26** (indicating LGE shipped 17% of its flat-panel televisions and 32% of its mobile handsets to North America).

6.3 Upon information and belief, LGIT manufactures Accused Products outside the United States, including in Korea and China. *See* **Exhibits 28**. Infringing LGIT LEDs have been imported into the United States, and specific instances of importation are identified in the next section. Upon information and belief, LGIT supplies a substantial portion of the LEDs used in LGE's products containing LEDs, such as flat panel televisions. *See* **Exhibit 60** (indicating that LGIT was expected to provide LEDs for 60% of LGE's 7 million LED-backlit televisions in 2010). Upon information and belief, LGIT LEDs are also incorporated into LGIT's products, such as LED luminaires, which have been imported into the United States and offered for sale after importation, including in connection with LGIT's exhibition at the May 17-19, 2011 LightFair trade show in Philadelphia, PA. *See* **Exhibit 61**.

6.4 Upon information and belief, LGE USA imports LG-branded Accused Products (e.g., flat-panel televisions and monitors) into the United States, maintains inventory of such

Accused Products in the United States, and offers to sell and sells such Accused Products in the United States. *See* **Exhibit 62.**

6.5 Upon information and belief, LGIT USA maintains inventory of LGIT-branded Accused Products in the United States, and offers to sell such Accused Products in the United States. *See* **Exhibits 28 and 61**.

6.6 OSRAM provides technical information regarding representative Accused Products in **Exhibits 31-47**, which are referenced in the claim charts discussed below.[2] The infringement charts presented below are exemplary; the particular Accused Products identified below may infringe more patents than those identified. In addition, other Accused Products, including those of the same nature, may infringe additional patents and/or additional claims of the same patents identified below.

A. Infringement of the '500 Patent

6.7 An LED manufactured by LGIT, LEMWS37P80LZ00, infringes at least claims 1, 3, 5, 7, 11, 13-17, 21, 27, 36-38, 40-44, 48, 54, 62-63, and 66 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1, 3, and 5 of the '500 patent by LEMWS37P80LZ00 is contained within **Exhibit 49**.

6.8 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1, 5, 7, 37-38, 40-44, 48, and 62-63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMWS59T80LZ00 is contained within **Exhibit 49**.

6.9 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1, 5, 37-38, 40, 42-44, 48, and 63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMWS59T70GZ00 is contained within **Exhibit 49**.

[2] The infringement claim charts discussed herein reference technical information including product specifications from LGIT's website. *See, e.g.,* **Exhibit 47,** *available at* http://ledlighting.lginnotek.com/admin/upload/(101216)%2520LEMWS52P75HZ00%2520preliminaryl%2520Specification%2520(Rev%25200.0).pdf. These product specifications are thus publicly available, notwithstanding being marked as "LGIT Confidential and Proprietary."

6.10 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1, 5, 7, 37-38, 40-44, 48, and 62-63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMWS52P80LZ00 is contained within **Exhibit 49**.

6.11 An LED manufactured by LGIT, LEMWH51W80LZ00, infringes at least claims 1, 5, 7, 37-38, 40-44, 48, and 62-63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMWH51W80LZ00 is contained within **Exhibit 49**.

6.12 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1, 5, 37-38, 40, 42-44, 48, and 63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMW51X75GZ00 is contained within **Exhibit 49**.

6.13 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1, 5, 37-38, 40, 42-44, 48, and 63 of the '500 patent. An exemplary claim chart showing infringement of independent claims 1 and 5 of the '500 patent by LEMWS52P75GZ00 is contained within **Exhibit 49**.

6.14 A LGE monitor, the E2290, upon information and belief infringes at least claims 3, 5, 11, 13-15, 17, 21, 27, 32, 34-35, 37-38, 40-42, 44, 48, 54, 59, 61, 63, 66-67, and 69 of the '500 patent. An exemplary claim chart showing infringement of independent claims 3 and 5 of the '500 patent by the E2290 is contained within **Exhibit 49**.

B. Infringement of the '732 Patent

6.15 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1-2, 7, 30, and 32 of the '732 patent. An exemplary claim chart showing infringement of independent claim 1 of the '732 patent by LEMWS59T70GZ00 is contained within **Exhibit 48**.

6.16 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1-2, 7, 13, 30, and 32 of the '732 patent. An exemplary claim chart showing infringement of independent claim 1 of the '732 patent by LEMWS52P80LZ00 is contained within **Exhibit 48**.

6.17 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1-2, 7, 30, and 32 of the '732 patent. An exemplary claim chart showing infringement of independent claim 1 of the '732 patent by LEMW51X75GZ00 is contained within **Exhibit 48**.

6.18 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1-2, 7, 30, and 32 of the '732 patent. An exemplary claim chart showing infringement of independent claim 1 of the '732 patent by LEMWS52P75GZ00 is contained within **Exhibit 48**.

C. Infringement of the '162 Patent

6.19 An LED manufactured by LGIT, LEMWS37P80LZ00, infringes at least claims 1-3, 6-8, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWS37P80LZ00 is contained within **Exhibit 50**.

6.20 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1-3, 6-7, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWS59T80LZ00 is contained within **Exhibit 50**.

6.21 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1-7, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWS59T70GZ00 is contained within **Exhibit 50**.

6.22 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1-7, 12, and 16-17, 19-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWS52P80LZ00 is contained within **Exhibit 50**.

6.23 An LED manufactured by LGIT, LEMWH51W80LZ00, infringes at least claims 1-3, 6-7, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWH51W80LZ00 is contained within **Exhibit 50**.

6.24 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1-7, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMW51X75GZ00 is contained within **Exhibit 50**.

6.25 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1-3, 6-7, 12, and 16-26 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by LEMWS52P75GZ00 is contained within **Exhibit 50**.

6.26 A LGE monitor, the E2290, upon information and belief infringes at least claims 1-3, 6-9, 11-12, and 16-38 of the '162 patent. An exemplary claim chart showing infringement of independent claims 1, 20, and 26 of the '162 patent by the E2290 is contained within **Exhibit 50**.

D. Infringement of the '283 Patent

6.27 An LED manufactured by LGIT, LEMWS37P80LZ00, infringes at least claims 1-4, 6-8, 11, 17, 19, 22, 24-26, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMWS37P80LZ00 is contained within **Exhibit 51**.

6.28 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1-4, 6-8, 11, 17, 19, 22, 24-26, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMWS59T80LZ00 is contained within **Exhibit 51**.

6.29 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1-4, 6, 8, 11, 17, 22, 24-26, 29, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMWS59T70GZ00 is contained within **Exhibit 51**.

6.30 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1-4, 6-8, 11, 17, 22, 24-26, and 32-35 of the '283 patent. An exemplary claim chart showing

infringement of independent claims 1 and 34 of the '283 patent by LEMWS52P80LZ00 is contained within **Exhibit 51**.

6.31 An LED manufactured by LGIT, LEMWH51W80LZ00, infringes at least claims 1-4, 6-8, 11, 17, 22, 24-26, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMWH51W80LZ00 is contained within **Exhibit 51**.

6.32 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1-2, 4, 6, 8, 11, 17, 22, 24-26, 29, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMW51X75GZ00 is contained within **Exhibit 51**.

6.33 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1-2, 4, 6, 8, 11, 22, 24-26, 29, and 32-35 of the '283 patent. An exemplary claim chart showing infringement of independent claims 1 and 34 of the '283 patent by LEMWS52P75GZ00 is contained within **Exhibit 51**.

E. Infringement of the '621 Patent

6.34 An LED manufactured by LGIT, LEMWS37P80LZ00, infringes at least claims 1-7, 9-10, 27, 35-37, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWS37P80LZ00 is contained within **Exhibit 52**.

6.35 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1-7, 9, 27, 35-37, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWS59T80LZ00 is contained within **Exhibit 52**.

6.36 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1-5, 7, 9, 11, 27, 35-37, 40, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWS59T70GZ00 is contained within **Exhibit 52**.

6.37 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1-7, 9, 27, 35-37, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWS52P80LZ00 is contained within **Exhibit 52**.

6.38 An LED manufactured by LGIT, LEMWH51W80LZ00, infringes at least claims 1-7, 9, 27, 35-37, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWH51W80LZ00 is contained within **Exhibit 52**.

6.39 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1-5, 7, 9, 11, 27, 35-37, 40, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMW51X75GZ00 is contained within **Exhibit 52**.

6.40 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1-5, 7, 9, 11, 27, 35-37, 40, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by LEMWS52P75GZ00 is contained within **Exhibit 52**.

6.41 A LGE monitor made, the E2290, upon information and belief infringes at least claims 1-2, 4-7, 9-11, 27, 29, 32, 35-37, 40-41, and 43-44 of the '621 patent. An exemplary claim chart showing infringement of independent claim 1 of the '621 patent by the E2290 is contained within **Exhibit 52**.

F. Infringement of the '130 Patent

6.42 A LGE television, the 47LW5600, upon information and belief infringes at least claims 1, 5, 8-9, 13, 16-17 and 21 of the '130 patent. An exemplary claim chart showing infringement of independent claims 1, 8 and 16 of the '130 patent by the 47LW5600 is contained within **Exhibit 53**.

G. Infringement of the '469 Patent

6.43 A LGE television, the 47LW5600, infringes at least claims 1-4 and 6 of the '469 patent. An exemplary claim chart showing infringement of independent claim 1 of the '469 patent by the 47LW5600 is contained within **Exhibit 54**.

H. Infringement of the '011 Patent

6.44 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1 and 2 of the '011 patent. An exemplary claim chart showing infringement of independent claim 1 of the '011 patent by LEMWS52P80LZ00 is contained within **Exhibit 55**.

6.45 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1 and 2 of the '011 patent. An exemplary claim chart showing infringement of independent claim 1 of the '011 patent by LEMWS52P75GZ00 is contained within **Exhibit 55**.

6.46 A LGE television marketed, the 47LW5600, infringes at least claims 1 and 2 of the '011 patent. An exemplary claim chart showing infringement of independent claim 1 of the '011 patent by the 47LW5600 is contained within **Exhibit 55**.

I. Infringement of the '454 Patent

6.47 An LED manufactured by LGIT, LEMWS37P80LZ00, infringes at least claims 1, 4-5, 10, and 19 of the '454 patent. An exemplary claim chart showing infringement of independent claim 1 of the '454 patent by LEMWS37P80LZ00 is contained within **Exhibit 56**.

6.48 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1, 4-6, 8, 10-11, 15-16, and 19-20 of the '454 patent. An exemplary claim chart showing infringement of independent claims 1 and 11 of the '454 patent by LEMWS59T80LZ00 is contained within **Exhibit 56**.

6.49 An LED manufactured by LGIT, LEMWS59T70GZ00, infringes at least claims 1, 4-6, 8, 10-11, 15-16, and 19-20 of the '454 patent. An exemplary claim chart showing infringement of independent claims 1 and 11 of the '454 patent by LEMWS59T70GZ00 is contained within **Exhibit 56**.

6.50 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1, 4-16, and 19-20 of the '454 patent. An exemplary claim chart showing infringement of independent claims 1 and 11 of the '454 patent by LEMWS52P80LZ00 is contained within **Exhibit 56**.

6.51 An LED manufactured by LGIT, LEMWH51W80LZ00, infringes at least claims 1, 4-5, 10, and 19 of the '454 patent. An exemplary claim chart showing infringement of independent claim 1 of the '454 patent by LEMWH51W80LZ00 is contained within **Exhibit 56**.

6.52 An LED manufactured by LGIT, LEMW51X75GZ00, infringes at least claims 1, 4-5, 10, and 19 of the '454 patent. An exemplary claim chart showing infringement of independent claim 1 of the '454 patent by LEMW51X75GZ00 is contained within **Exhibit 56**.

6.53 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1, 4-16, and 19-20 of the '454 patent. An exemplary claim chart showing infringement of independent claims 1 and 11 of the '454 patent by LEMWS52P75GZ00 is contained within **Exhibit 56**.

6.54 A LGE monitor, the E2290, infringes at least claims 1, 4-5, 10, and 19 of the '454 patent. An exemplary claim chart showing infringement of independent claim 1 of the '454 patent by the E2290 is contained within **Exhibit 56**.

6.55 A LGE television, the 47LW5600, infringes at least claims 1, 4-6, 8, 10-11, 15-16, and 19-20 of the '454 patent. An exemplary claim chart showing infringement of independent claims 1 and 11 of the '454 patent by the 47LW5600 is contained within **Exhibit 56**.

6.56 A LGE television, the 32LE5300, infringes at least claims 1, 4-5, 10, and 19 of the '454 patent. An exemplary claim chart showing infringement of independent claim 1 of the '454 patent by the 32LE5300 is contained within **Exhibit 56**.

J. Infringement of the '425 Patent

6.57 An LED manufactured by LGIT, LEMWS52P80LZ00, infringes at least claims 1-4, 6-9, and 16-17 of the '425 patent. An exemplary claim chart showing infringement of independent claim 1 of the '425 patent by LEMWS37P80LZ00 is contained within **Exhibit 57**.

6.58 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claims 1-4, 6-9, and 16-17 of the '425 patent. An exemplary claim chart showing infringement of independent claim 1 of the '425 patent by LEMWS52P75GZ00 is contained within **Exhibit 57**.

K. Infringement of the '881 Patent

6.59 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1, 10, and 11 of the '881 patent. An exemplary claim chart showing infringement of independent claim 1 of the '881 patent by LEMWS59T80LZ00 is contained within **Exhibit 58**.

6.60 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claim 1 of the '881 patent. An exemplary claim chart showing infringement of independent claim 1 of the '881 patent by LEMWS52P75GZ00 is contained within **Exhibit 58**.

L. Infringement of the '090 Patent

6.61 An LED manufactured by LGIT, LEMWS59T80LZ00, infringes at least claims 1, 6, and 7 of the '090 patent. An exemplary claim chart showing infringement of independent claim 1 of the '090 patent by LEMWS59T80LZ00 is contained within **Exhibit 59**.

6.62 An LED manufactured by LGIT, LEMWS52P75GZ00, infringes at least claim 1 of the '090 patent. An exemplary claim chart showing infringement of independent claim 1 of the '090 patent by LEMWS52P75GZ00 is contained within **Exhibit 59**.

VII. SPECIFIC INSTANCES OF UNFAIR IMPORTATION AND SALE

7.1 LEDs manufactured by LGIT, model number LEMWS37P80LZ00, were purchased from within the United States and samples of this product accompany this complaint as **Physical Exhibit 1**. The LEDs were imported into the United States from China, as indicated by the purchase order. *See* **Exhibit 63**. The package and spool of LEDs indicates that it was

manufactured by LGIT. *See* **Exhibit 65** (photographs of LEDs). On information and belief, these LEDs were made overseas, and subsequently imported into the United States.

7.2 LEDs manufactured by LGIT, model numbers LEMWS59T80LZ00, LEMWS59T70GZ00, LEMWS52P80LZ00, LEMWH51W80LZ00, LEMW51X75GZ00, LEMWS52P75GZ00, were purchased from within the United States and samples of this product accompany this complaint as **Physical Exhibits 2-7**. The LEDs were imported into the United States from China, as indicated by the purchase order. *See* **Exhibit 64**. Each package and spool of LEDs indicates that it was manufactured by LGIT. *See* **Exhibit 65** (photographs of LEDs). On information and belief, these LEDs were made overseas, and subsequently imported into the United States.

7.3 A LGE monitor marketed by LGE USA, LGE model number E2290, was purchased from a domestic online retailer within the United States. A copy of the record of the payment receipt for the E2290 is attached as **Exhibit 66**. The E2290 monitor was first shipped to the retailer from an LGE USA facility in Fontana, California, and then shipped to the purchaser, as indicated by shipping labels. *See* **Exhibit 67** (photographs of E2290 monitor and packaging).[3] A label on the underside of the product identifies LGE as the manufacturer. *See* **Exhibit 67**. On information and belief, this E2290 monitor was made in China, as indicated on the product packaging and on the monitor itself, and was subsequently imported into the United States. *See* **Exhibit 67**.

7.4 A LGE television marketed by LGE USA, LGE model number 47LW5600, was purchased from a retailer within the United States. A copy of the record of the payment receipt for the product is attached as **Exhibit 68**. The packaging bears a label for LGE USA, and the product label identifies the LGE as the manufacturer. On information and belief, this television was made overseas, and was at least assembled in Mexico by LGE as indicated on the product, and was subsequently imported into the United States. *See* **Exhibit 69**.

[3] Complainant has provided photographs in lieu of physical exhibits for the computer monitor and televisions referenced herein because it was not practicable to provide samples at the time of filing. *See* Commission Rule 210.12(b).

7.5 A LGE television marketed by LGE USA, LGE model number 32LE5300, was purchased from a domestic online retailer within the United States. A copy of the record of the payment receipt for the product is attached as **Exhibit 70**. The 32LE5300 television was first shipped to the retailer from an LGE USA facility in Fontana, California, and then shipped to the purchaser, as indicated by shipping labels. *See* **Exhibit 71** (photographs of 32LE5300 television and packaging). A label on the back of the product identifies LGE as the manufacturer. *See* **Exhibit 71**. On information and belief, this television was made in China by LGE, as indicated on the product packaging and on the television itself, and was subsequently imported into the United States.

7.6 Further discovery likely will reveal additional specific acts of LG's importation, sale for importation, and/or sale after importation of the Accused Products.

VIII. HARMONIZED TARIFF SCHEDULE NUMBERS

8.1 Upon information and belief, the Harmonized Tariff Schedule of the United States item numbers under which the infringing products have been imported into the United States are HTUS 8541 and subsections thereof (including 8541.40.20); HTUS 8528 and subsections thereof (including 8528.59.15, 8528.59.20, 8528.59.25, 8528.59.30.50, 8528.72.62, 8528.72.64, 8528.72.68, and 8528.72.72.50); and HTUS 8517 and subsections thereof (including 8517.12.20-80). These classifications are intended for illustrative purposes only and are not intended to restrict the scope or type of Accused Product.

IX. LICENSEES

9.1 The licensees of the OSRAM patents, and the specific patents licensed by each licensee, are identified in **Confidential Exhibit 72**. For completeness, **Confidential Exhibit 72** reflects all agreements granting rights under the OSRAM patents to third parties, regardless of whether the agreement is styled as a license or otherwise (e.g., as a non-assertion agreement), without prejudice to any party's right to assert that such agreements do not constitute licensees.

X. DOMESTIC INDUSTRY

10.1 A domestic industry exists as defined by 19 U.S.C. §§ 1337(a)(3)(A), (B), and (C) relating to significant investment in plant and equipment; significant employment of labor and capital; and substantial investment in the exploitation of the patents, including engineering, research and development, all relating to OSRAM's own domestic industry products, and there are also domestic industry activities of OSRAM's licensees under the OSRAM patents.

A. Technical Aspects

10.2 OSRAM's domestic industry products covered by the claims of the OSRAM Patents include (1) white LEDs, (2) white LEDs using chip-level conversion ("CLC") technology, (3) Dragon LEDs, (4) Advanced Power TOPLEDs, and (5) Advanced Power TOPLED Plus LEDs, as described below.[4] OSRAM, through its domestic subsidiaries, distributes, markets, and offers for domestic sale these LEDs, and/or products containing these LEDs, in the United States.

1. White LEDs

10.3 OSRAM's white LEDs practice the inventions claimed in five of the Asserted Patents: the '500, '162, '621, '881 and '090 patents (collectively, "the White LED patents"). As discussed above, the '500, '162, and '621 patents relate to "conversion principle" technology for emitting white light, while the '881 and '090 patents relate to pre-well technology used in the blue light-emitting semiconductors included in white LEDs.

10.4 OSRAM offers white LEDs in a number of different product families including, e.g., TOPLED, Mini TOPLED, Power TOPLED, Advanced Power TOPLED, Dragon, OLSON, CERAMOS, OSTAR, PointLED, SmartLED, and CHIPLED families.

10.5 The Golden Dragon Plus LUW W5AM is one example of OSRAM's white LEDs. Charts applying exemplary claims of the '500 and '621 patents to the LUW W5AM are contained within **Exhibit 73**. Labeled figures to be read with these charts are attached as

[4] While it was not practicable to submit samples of these domestic articles at the time of filing, *see* Commission Rule 210.12(b), detailed product information accompanies this complaint and samples will be available in discovery.

Exhibit 74. Datasheets and other publications with technical information for the LUW W5AM are attached as **Exhibits 75 and 76**.

10.6 The Power TOPLED LW E6SG is another example of OSRAM's white LEDs. A chart applying exemplary claims of the '162 patent to the LW E6SG is contained within **Exhibit 73**. Labeled figures to be read with this chart are attached as **Exhibit 77**. Datasheets and other publications with technical information for the LW E6SG are attached as **Exhibit 78.**

10.7 A chart applying exemplary claims of the '881 and '090 patents to the semiconductor layer sequence used in a blue light-emitting semiconductor for use in white LEDs is attached as **Exhibit 85**. Labeled figures to be read with this chart are attached as **Confidential Exhibit 86**.

2. White LEDs with CLC technology

10.8 There are two technologies used in OSRAM's white LEDs to produce white light. In one technology, known as volume conversion, the semiconductor that emits blue light is surrounded by a casting or molding material where particles are dispersed which absorb light from the semiconductor and emit, e.g., yellow light, such that the combined light output appears white to the human eye. The other technology, known as chip-level conversion ("CLC"), involves applying a layer of material containing the conversion particles directly on top of the blue light-emitting semiconductor.

10.9 White LEDs using CLC technology practice the inventions claimed in additional Asserted Patents: the '732 and '283 patents. One example of a white LED which uses CLC technology is the Golden Dragon Plus LUW W5AM. Charts applying exemplary claims of the '732 and '283 patents to the LUW W5AM are contained within **Exhibit 73**. Labeled figures to be read with these charts are attached as **Exhibit 74**. Datasheets and other publications with technical information for this product are attached as **Exhibits 75 and 76**. As demonstrated by reference to the LUW W5AM product in this section and the section above, a product using CLC technology to produce white light not only practices the '732 and '283 patents but also White LED patents, discussed above.

3. Dragon LEDs

10.10 OSRAM's Dragon LEDs include a leadframe structure such that these products practice the inventions claimed in the '469, '130 and '454 patents. One example of OSRAM's Dragon LEDs is the Golden Dragon Plus LUW W5AM. Charts applying exemplary claims of the '130, '469, and '454 patents to the LUW W5AM are contained within **Exhibit 79**. Labeled figures to be read with these charts are attached as **Exhibit 74**. Datasheets and other publications with technical information for this product are attached as **Exhibit 75 and 76**.

10.11 Dragon LEDs are available in a variety of colors including, e.g., red, yellow, green, blue, and white. As demonstrated by the reference to a white Dragon LED in this section and in the sections above, white Dragon LEDs not only practice the '469, '130 and '454 patents but also White LED patents and patents relating to CLC technology, as discussed above.

4. Advanced Power TOPLEDs

10.12 OSRAM's Advanced Power TOPLEDs include a leadframe structure such that these products practice the invention claimed in the '425 patent. One example of OSRAM's Advanced Power TOPLEDs is the Advanced Power TOPLED LCW G6CP. A chart applying an exemplary claim of the '425 patent to the LCW G6CP is contained within **Exhibit 79**. Labeled figures to be read with this chart are attached as **Exhibit 80**. Datasheets and other publications with technical information for this product are attached as **Exhibit 81 and 82**.

10.13 Advanced Power TOPLEDs are also available in a variety of colors. White Advanced Power TOPLEDs, such as the LCW G6CP, not only practice the '425 patent but also White LED patents and patents relating to CLC technology, as discussed above.

5. Advanced Power TOPLED Plus LEDs

10.14 OSRAM's Advanced Power TOPLED Plus LEDs include a leadframe structure such that these products practice the invention claimed in the '011 patent. One example of OSRAM's Advanced Power TOPLED Plus LEDs is the Advanced Power TOPLED Plus LUW G5GP. A chart applying an exemplary claim of the '011 patent to the LUW G5GP is contained

within **Exhibit 79**. Labeled figures to be read with this chart are attached as **Exhibit 83**. A datasheet for this product is attached as **Exhibit 84**.

10.15 Advanced Power TOPLED Plus LEDs are similarly available in a variety of colors. White Advanced Power TOPLED Plus LEDs, such as the LUW G5GP, not only practice the '011 patent but also White LED patents, as discussed above.

B. Economic Aspects

10.16 OSRAM has a domestic subsidiary OSRAM Opto Semiconductors Inc. ("OOS Inc.") headquartered in Sunnyvale, California and having a facility in Northville, Michigan. OOS Inc. has substantial activities in the United States and is increasing its activities in the United States as demand for its products grows. **Confidential Exhibit 87** includes information regarding OOS Inc.'s LED revenue. A summary of FY 2009/2010 sales of white LEDs, white LEDs using CLC technology, Dragon LEDs, Advanced Power TOPLEDs, and Advanced Power TOPLED Plus LEDs accompanies this Complaint as **Confidential Exhibit 88**, and an apportionment of the sales of these LEDs in comparison to OOS Inc.'s total LED sales and total sales is included in **Confidential Exhibit 88**. Significant growth in demand for white LEDs is expected as these devices begin to replace traditional lighting sources, i.e., incandescent and fluorescent light bulbs, for general-purpose lighting in homes and offices. Moreover, the Advanced Power TOPLED Plus is a fairly new product for white color released about 18 months ago. It is used in lighting and in automobiles, and OOS Inc. expects its volume to increase.

10.17 OSRAM's other domestic entity, OSRAM Sylvania Inc. ("OSRAM Sylvania"), is headquartered in Danvers, Massachusetts. OSRAM Sylvania sells modules containing LEDs in the United States. OSRAM Sylvania's modules are used in a wide variety of applications, including automotive lighting, professional lighting, and consumer lighting. In addition to its Danvers headquarters, OSRAM Sylvania has a facility focusing on automotive lighting in Hillsboro, NH; a plant in St. Mary's, PA that assembles LED-products; a new facility in Exeter, NH that will install converter plates for white LEDs; a 54 Cherry Hill location (in Danvers, MA) involved in research and development with LEDs; and a 71 Cherry Hill location (in Beverly,

MA) that also focuses on research and development with LEDs. Information about modules sold by the Automobile Lighting Group covered by the OSRAM patents is contained in **Confidential Exhibit 89**. Information containing modules sold by the Professional Lighting Group covered by the OSRAM patents is contained in **Confidential Exhibit 90**.

10.18 Both last fiscal year and this fiscal year, OSRAM Sylvania's Consumer Lighting Group sold modules containing OSLON white LEDs and Golden Dragon Plus LEDs. These products include the D11 Post Top Retrofit (Golden Dragon Plus LED) and the D6 Post Top Retrofit (OSLON white LED). Information concerning these modules, including their use of the patented LEDs, is included in **Confidential Exhibit 91**.

1. Significant investment in plant and equipment

10.19 OOS Inc. invests significantly in plant and equipment used for manufacturing LEDs covered by the Asserted patents. **Confidential Exhibit 92** contains a listing of the Sunnyvale and Northville facilities' costs, including rent, operating expenses, electricity, insurance, and property tax. **Confidential Exhibit 92** also contains information regarding the apportionment of these facility costs to OSRAM's patented domestic industry products.

10.20 OOS Inc. spent significant funds to acquire equipment used in application engineering of LEDs. **Confidential Exhibit 93** contains the acquisition costs associated with this equipment and other building and facility costs, including the apportionment of the equipment acquisition costs attributed to OSRAM's patented domestic industry products.

10.21 OSRAM Sylvania also invests significantly in plant and equipment used for manufacturing of LEDs and products containing LEDs covered by the OSRAM patents. **Confidential Exhibit 94** includes plant and equipment information regarding OSRAM Sylvania's Hillsboro facility, including information regarding square footage and investment in equipment relating to LEDs. **Confidential Exhibit 95** includes plant and equipment information regarding OSRAM Sylvania's Exeter facility, including information regarding square footage and investments in equipment dedicated to white LEDs. **Confidential Exhibit 96** includes plant and equipment information regarding OSRAM Sylvania's St. Mary's facility, including square

footage and manufacturing costs. **Confidential Exhibit 97** includes plant and equipment information regarding OSRAM Sylvania's 54 Cherry Hill facility, including information regarding square footage dedicated to LEDs and investment dollars allocated to LEDs. **Confidential Exhibit 98** includes plant and equipment information regarding OSRAM Sylvania's 71 Cherry Hill facility, including square footage and capital expenditures on LEDs.

10.22 OSRAM Sylvania's Specialty Products (SP) business unit, which contains the automotive (AM) and display optics (DO) business units, also invested in significant labor and capital relating to the OSRAM LEDs. **Confidential Exhibit 99** contains information regarding sales of products containing LEDs covered by the OSRAM patents and the R&D research and development resources, in human hours, devoted to these products.

2. Significant employment of labor and capital

10.23 OOS Inc. employs significant labor and capital to its manufacturing and distribution, sales, marketing, engineering and research and development of white LEDs, white LEDs using CLC technology, Dragon LEDs, Advanced Power TOPLED, and Advanced Power TOPLED Plus LEDs. Information regarding OOS's significant employment of labor and capital is contained in **Confidential Exhibit 93**, including the apportionment of the labor and capital attributed to products covered by the OSRAM patents.

10.24 OSRAM Sylvania also employs significant labor and capital for researching and developing, manufacturing and selling modules containing LEDs covered by the OSRAM patents. **Confidential Exhibit 94** includes labor and capital expenses regarding OSRAM Sylvania's Hillsboro facility. **Confidential Exhibit 95** includes labor and capital expenses regarding OSRAM Sylvania's Exeter facility, which entirely relates to white LEDs. **Confidential Exhibit 96** includes labor and capital expenses regarding OSRAM Sylvania's St. Mary's facility. **Confidential Exhibit 97** includes labor and capital expenses regarding OSRAM Sylvania's 54 Cherry Hill facility. **Confidential Exhibit 98** includes labor and capital expenses regarding OSRAM Sylvania's 71 Cherry Hill facility.

3. Substantial investment in exploitation, including engineering, research and development, and licensing

10.25 OSRAM incorporates paragraphs 10.1 to 10.16 above, which detail OSRAM's investment in plant, equipment, space, and personnel for engineering and research and development by reference here.

10.26 OSRAM invests substantially in exploitation of LEDs covered by the OSRAM patents in the United States. For example, OOS invests in the plant and equipment used to manufacture its patented LEDs at its Sunnyvale and Northville locations, including devoting substantial square footage and leasing funds to LED-related purposes. *See* **Confidential Exhibit 92**. In addition, OOS Inc. expends substantial investment capital in application engineering of its LEDs, including investment in acquiring equipment for application engineering and employees to work on the application engineering, as depicted in **Confidential Exhibit 93**.

10.27 OSRAM Sylvania also invests substantially in exploitation of OSRAM's patented LEDs. OSRAM Sylvania, has invested in plants, equipment and employment at five locations throughout the United States to work with the patented LEDs. *See* **Confidential Exhibits 94, 95, 96, 97, and 98**. As further described in **Confidential Exhibits 97 and 98**, OSRAM Sylvania's two Cherry Hill locations are involved in research and development and/or testing of LEDs. OSRAM Sylvania's Specialty Products business unit, which contains the automotive and display optics business units, also devotes substantial research and development resources to products containing LEDs covered by the OSRAM patents. Further information regarding the Specialty Products business unit's investment of person hours toward this research and development is contained in **Confidential Exhibit 99**. Furthermore, OSRAM Sylvania recently opened an expanded clean room dedicated to solid-state research and has received research and product development awards from the U.S. Department of Energy, which will fund a research project regarding white LEDs. *See* **Exhibit 100**.

10.28 Besides its own domestic industry activities in the United States, OSRAM has invested substantial resources toward licensing its patented technology, and OSRAM's licensees

upon information and belief engage in domestic industry activities in the United States. **Confidential Exhibit 101** provides a listing of OSRAM's licensees that, upon information and belief, have engaged in substantial domestic industry activities in the United States, and identifies at least one facility in the United States for each licensee. **Confidential Exhibits 102-107** contain the license agreements between OSRAM and the licensees identified in **Confidential Exhibit 101**. **Confidential Exhibit 101** also includes information identifying a third party whose products contain LEDs manufactured to OSRAM's specifications using technology covered by the OSRAM patents.

XI. RELATED LITIGATION

11.1 In this forum, OSRAM was also a Complainant in Investigation No. 337-TA-512, but that investigation did not involve any of the patents asserted in this Complaint. The Commission found a violation of Section 337 in that investigation and ultimately issued limited exclusion orders prohibiting importation of Respondent's products covered by claims of nine patents.

11.2 A declaratory judgment action involving the '500 patent asserted in this Complaint, among other patents, was filed against OSRAM in the District of District of Columbia: *Citizen Electronics Company, Ltd. v. OSRAM GmbH, et al.*, No. 1:05-cv-01560 (ESH). This lawsuit was terminated due to lack of declaratory judgment jurisdiction.

11.3 OSRAM previously filed suit against Citizen Watch Co., Ltd., Citizen Electronics Co., Ltd., and Cecol, Inc. in the District of Delaware asserting the '500 patent and '162 patent, which are asserted in this Complaint, in *OSRAM GmbH, et al. v. Citizen Watch Co. Ltd. et al.*, No. 1:06-cv-00710-SLR. Citizen entered into a license with OSRAM early in the case, and the case was terminated.

11.4 Concurrently with the filing of this Complaint, OSRAM is filing another complaint in this forum against other respondents which involves many of the OSRAM patents, and OSRAM is filing suit against the proposed Respondents in the Northern District of California asserting infringement of the OSRAM patents.

XII. REQUESTED RELIEF

12.1 WHEREFORE, by reason of the foregoing, Complainant OSRAM 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 unlawful importation into the United States, sale for importation into the United States, and/or sale within the United States after importation of LEDs, and products containing the same, that infringe one or more claims of any of United States Patent Nos. 7,078,732; 6,812,500; 7,126,162; 7,151,283; 7,629,621; 6,459,130; 6,927,469; 6,975,011; 7,199,454; 7,271,425; 6,849,881; and 7,106,090;

(b) Set a target date of no more than fifteen months;

(c) Determine that there has been a violation of Section 337;

(d) Issue a permanent exclusion order pursuant to Section 337(d), excluding from entry into and sale within the United States all proposed Respondents' LEDs, and products containing the same, that infringe one or more claims of any of United States Patent Nos. 7,078,732; 6,812,500; 7,126,162; 7,151,283; 7,629,621; 6,459,130; 6,927,469; 6,975,011; 7,199,454; 7,271,425; 6,849,881; and 7,106,090;

(e) Issue permanent orders pursuant to Section 337(f), directing the proposed Respondents, their affiliates, subsidiaries, successors, or assigns, to cease and desist from importing, marketing, advertising, testing, demonstrating, installing, servicing, repairing, selling, offering for sale, or using LEDs, and products containing the same, or moving, shipping, or warehousing inventory of LEDs, and products containing the same, that infringe one or more claims of any of United States Patent Nos. 7,078,732; 6,812,500; 7,126,162; 7,151,283; 7,629,621; 6,459,130; 6,927,469; 6,975,011; 7,199,454; 7,271,425; 6,849,881; and 7,106,090; and

(f) Grant such other and further relief as the Commission deems just and proper based on the facts determined in the investigation and by the authority of the Commission.

Respectfully submitted,

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Charles H. Sanders

Charles H. Sanders
Kelley E. Walsh
M. Frank Bednarz
GOODWIN PROCTER LLP
Exchange Place
53 State Street
Boston, MA 02109-2802
Tel: (617) 570-1000
Fax: (617) 523-1231

Jennifer A. Albert
GOODWIN PROCTER LLP
901 New York Avenue, N.W.
Washington, DC 20001-4332
Tel: (202) 346-4000
Fax: (202) 346-4444

Mark J. Abate
Jonathan A. Auerbach
Timothy J. Rousseau
GOODWIN PROCTER LLP
The New York Times Building
620 Eighth Avenue
New York, NY 10018-1405
Tel: (212) 813-8800
Fax: (212) 355-3333

Attorneys for Complainant OSRAM GmbH