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POLARIS POWERLED TECHNOLOGIES, LLC
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18 UNITED STATES DISTRICT COURT
19 FOR THE CENTRAL DISTRICT OF CALIFORNIA
20

21 POLARIS POWERLED
22 TECHNOLOGIES, LLC,

23 Plaintiff,

24 v.

25 LG ELECTRONICS, INC. AND LG
26 ELECTRONICS U.S.A., INC.,

27 Defendants.
28

Case No. 8:20-cv-00125

**COMPLAINT FOR PATENT
INFRINGEMENT**

DEMAND FOR JURY TRIAL

1 Plaintiff Polaris PowerLED Technologies, LLC (“Polaris PowerLED”), by
2 and through its undersigned counsel, files this Complaint for Patent Infringement
3 relating to several U.S. patents as identified below (collectively, the “Patents-in-
4 Suit”) and alleges as follows:

5 **THE PARTIES**

6 1. Plaintiff Polaris PowerLED Technologies, LLC (“Polaris PowerLED”
7 or “Plaintiff”) is a Delaware limited liability company, with its address at 32932
8 Pacific Coast Highway #14-498, Dana Point, California, 92629.

9 2. Defendant LG Electronics, Inc. (“LG Electronics”), is a corporation
10 organized under the laws of the Republic of Korea with its principal place of
11 business at LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul,
12 Republic of Korea, 07736.

13 3. Defendant LG Electronics USA, Inc. (“LG USA”) is a corporation
14 organized under the laws of Delaware with its principal place of business at 1000
15 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (LG Electronics and LG USA
16 are collectively referred to as “LG” or “Defendants”).

17 **JURISDICTION AND VENUE**

18 4. Polaris PowerLED brings this civil action for patent infringement
19 pursuant to the Patent Laws of the United States, 35 U.S.C. § 1, *et seq.* This Court
20 has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and
21 1338(a).

22 5. Upon information and belief, LG transacts and conducts business in
23 this District and the State of California, and is subject to the personal jurisdiction of
24 this Court. Upon information and belief, LG has minimum contacts within the
25 State of California and this District and has purposefully availed itself of the
26 privileges of conducting business in the State of California and in this District.
27 Polaris PowerLED’s causes of action arise directly from LG’s business contacts and
28 other activities in the State of California and in this District.

1 6. Upon information and belief, LG has several regular and established
2 places of business in California.

3 7. Upon information and belief, LG has a regular and established place of
4 business at 9415 Kaiser Way, Fontana, CA, 94335.

5 8. Upon information and belief, LG has a regular and established place
6 of business at 5565 Sierra Ave, Fontana, CA, 92336.

7 9. Upon information and belief, LG has a regular and established place
8 of business at 2021 S. Archibald Ave, Ontario, CA 91761.

9 10. Upon information and belief, LG has a regular and established place
10 of business at 9050 Hermosa Ave, Rancho Cucamonga, CA, 91730.

11 11. Upon information and belief, LG has a regular and established place
12 of business at 11600 Millennium Ct, Rancho Cucamonga, CA, 91730.

13 12. Personal jurisdiction exists over each of the Defendants because each
14 Defendant has sufficient minimum contacts with this forum as a result of business
15 conducted within this State and this District, including doing business at the above
16 mentioned regular and established places of business.

17 13. Upon information and belief, LG has committed acts of infringement,
18 both directly and indirectly, within this District and the State of California by, *inter*
19 *alia*, using, selling, offering for sale, importing, advertising, and/or promoting
20 products that infringe one or more claims of the Patents-in-Suit.

21 14. LG, directly and/or through intermediaries, uses, sells, ships,
22 distributes, offers for sale, advertises, and otherwise promotes its products in the
23 United States, the State of California, and this District.

24 15. In addition, each of the Defendants, directly or through affiliates,
25 subsidiaries, agents, or intermediaries, places infringing televisions and mobile
26 devices into the stream of commerce knowing they will be sold and used in this
27 State, and economically benefits from the retail sale of infringing televisions and
28 mobile devices in this State. For example, Defendants' products have been sold

1 and are available for sale in this District at Best Buy, Target, Howard's, and Fry's
2 Electronics retail stores, and are also available for sale and offered for sale in this
3 District through online retailers such as Amazon, Best Buy, and Fry's Electronics.
4 Defendants also advertise their infringing products to consumers in this State and
5 this District through the LG USA website. *See, e.g.*, <https://www.lg.com/us/tvs>
6 and <https://www.lg.com/us/mobile>.

7 16. Upon information and belief, LG solicits customers in the State of
8 California and this District and has customers who are residents of the State of
9 California and this District and who use LG's products in the State of California
10 and in this District.

11 17. In addition, LG Electronics has availed itself of this Court by filing
12 patent litigation suits within this district.

13 18. LG Electronics has filed suit against a competitor, Hisense, in this
14 district, alleging patent infringement, in a case captioned *LG Electronics Inc. v.*
15 *Hisense Electronics Manufacturing Company of America Corporation; HISENSE*
16 *USA CORPORATION; HISENSE INTERNATIONAL (HONG KONG) AMERICA*
17 *INVESTMENT CO., LIMITED (f/k/a HISENSE INTERNATIONAL AMERICA*
18 *HOLDINGS CO., LIMITED); HISENSE INTERNATIONAL (HK) CO., LIMITED;*
19 *Hisense International Co. Ltd.; Qingdao Hisense Electronics Co. Ltd. (f/k/a*
20 *Hisense Electric Co., Ltd.); and Hisense Co., Ltd.*, Case No. 2:19-cv-9474, in the
21 Central District of California, Western Division.

22 19. To the extent any foreign Defendant is not subject to jurisdiction in
23 any state's court of general jurisdiction, exercising jurisdiction over the Defendant
24 in this State and this District would be consistent with due process and this State's
25 long-arm statute in light of facts alleged in this complaint.

26 20. Venue is proper in this district under 28 U.S.C. §§ 1391(b), (c) and
27 1400(b), based on LG's business registration in this State and physical presence and
28 business addresses in this District.

1 **THE PATENTS-IN-SUIT**

2 21. Polaris PowerLED owns the entire right, title, and interest in U.S.
3 Patent No. 7,239,087 titled “Method and Apparatus to Drive LED Arrays Using
4 Time Sharing Technique” (the “’087 Patent”). The ’087 Patent issued on July 3,
5 2007 to inventor Newton E. Ball from the U.S. Patent Application No. 11/011,752,
6 filed on Dec. 14, 2004. A true and correct copy of the ’087 Patent is attached as
7 **Exhibit A** to this Complaint.

8 22. Polaris PowerLED owns by the entire right, title, and interest in U.S.
9 Patent No. 8,223,117 titled “Method and Apparatus to Control Display Brightness
10 with Ambient Light Correction” (the “’117 Patent”). The ’117 Patent issued on
11 July 17, 2012 to inventor Bruce R. Ferguson from the U.S. Patent Application No.
12 12/336,990, filed on Dec. 17, 2008. A true and correct copy of the ’117 Patent is
13 attached as **Exhibit B** to this Complaint.

14 **COUNT I**

15 **(INFRINGEMENT OF U.S. PATENT NO. 7,239,087)**

16 23. Polaris PowerLED incorporates by reference paragraphs 1-22 above.

17 24. Mr. Newton E. Ball invented a novel manner of arranging and
18 controlling light sources that was a significant advance in improving display quality
19 in electronics products such as televisions. Mr. Ball patented these innovations in
20 the ’087 patent.

21 25. Claim 1 of the ’087 Patent, for example, reads as follows:

- 22 1. A multi-load time sharing driver comprising:
23 a current source configured to provide a regulated current;
24 a network of semiconductor switches coupled in series; and
25 a plurality of light sources in a backlight system, each light source
26 associated with a semiconductor switch, wherein the semiconductor
27 switch selectively opens to allow the associated light source to conduct
28 the regulated current.

1 26. LG has directly and indirectly infringed, and continues to directly and
2 indirectly infringe one or more claims of the '087 patent, including at least claim 1
3 of the '087 Patent, literally and/or under the doctrine of equivalents, by or through
4 making, using, offering for sale, selling within the United States, and/or importing
5 into the United States televisions, including, for example, LG's 55UJ7700 TVs and
6 other products that contain local dimming and TruMotion features in violation of 35
7 U.S.C. § 271(a). The devices listed in this paragraph are collectively referred to in
8 this Count as the "Accused Products."

9 27. The Accused Products have "a multi-load time sharing driver
10 comprising: a current source configured to provide a regulated current." The
11 Accused Products include, for example, an LED control board, power supply, and
12 main board which includes components (such as multi-channel LED drivers and
13 transistors) for individually controlling strings of LEDs in the TV backlight.

14 28. The exemplary LG 55UJ7700 includes an LED control board, power
15 supply, and main board which includes components (such as multi-channel LED
16 drivers and transistors) for individually controlling strings of LEDs in the TV
17 backlight.



28 [LED Control Board/Power Board and Mainboard for LG 55UJ7700]

29. The LED control board is coupled to several sections of LEDs. In the 55UJ7700, for example, there are six (6) different sections, each including twenty (20) LEDs. These six (6) zones are consistent with LG’s marketing of the product as featuring “Local Dimming,” as well as the TruMotion feature.

PICTURE QUALITY

ULTRA HD (3840x2160)	Yes	Refresh Rate	TruMotion 120 (Refresh Rate 60Hz)
Active HDR with Dolby Vision™	Yes	HDR Effect	Yes
Wider Color Gamut	Yes	True Color Accuracy	Yes
IPS Technology	Yes	Ultra Luminance	Yes
4K Upscaler	Yes	Local Dimming	Yes

[55UJ7700 specifications at <https://www.lg.com/us/tvs/lg-55UJ7700-4k-uhd-tv>]

LED Local Dimming

Maximizes the contrast ratio by making the bright areas of the screen brighter and the dark areas of the screen darker.

- **Off** : Disables the LED Local Dimming function.
- **Low / Medium / High** : Changes the contrast ratio.
- Turning this option **Off** may increase energy consumption.

TruMotion

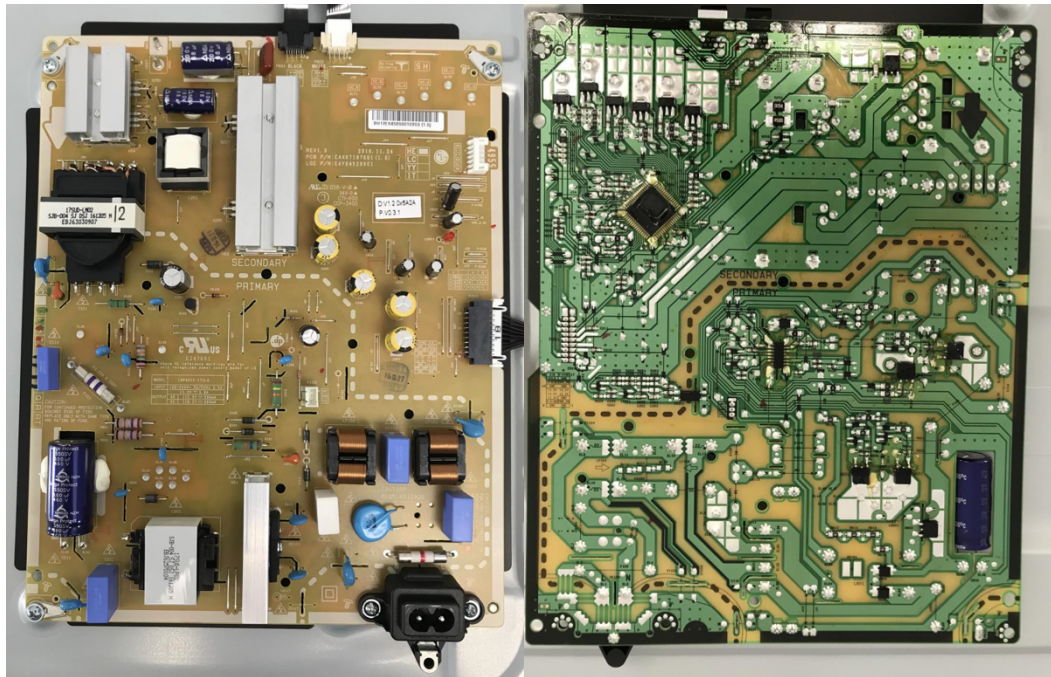
Optimizes the image quality of fast-moving pictures.

- **Off** : Turns off the **TruMotion**.
- **Smooth** : Softens fast-moving pictures.
- **Clear** : Makes fast-moving pictures clearer.
- **Clear Plus** : Makes fast-moving pictures clearer using the backlight control.
- **User** : Sets **De-Judder/De-Blur** manually.
 - **De-Judder** : Adjusts juddering on the screen.
 - **De-Blur** : Reduces the blurring effects of motion.

[LG 55UJ7700 manual, <https://www.lg.com/us/support/product/lg-55UJ7700.AUS>]

30. The Accused Products include a current source configured to provide a regulated current. The exemplary LG 55UJ7700 TVs include a power supply IC and associated circuitry that provide a resonant switch mode power supply.

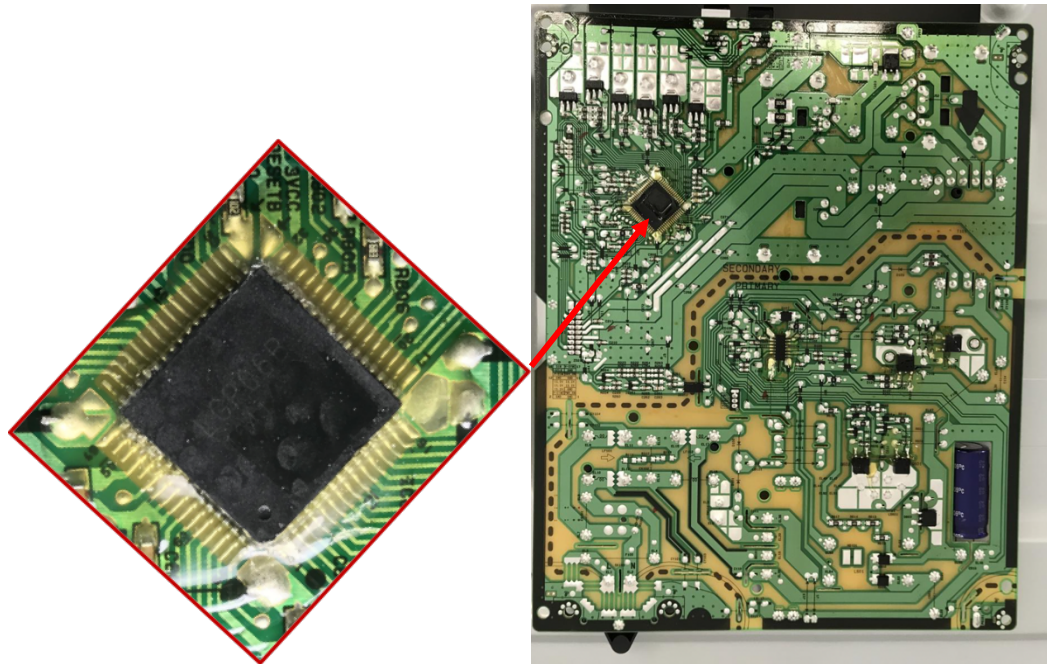
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[LG 55UJ7700 Power Supply Board]

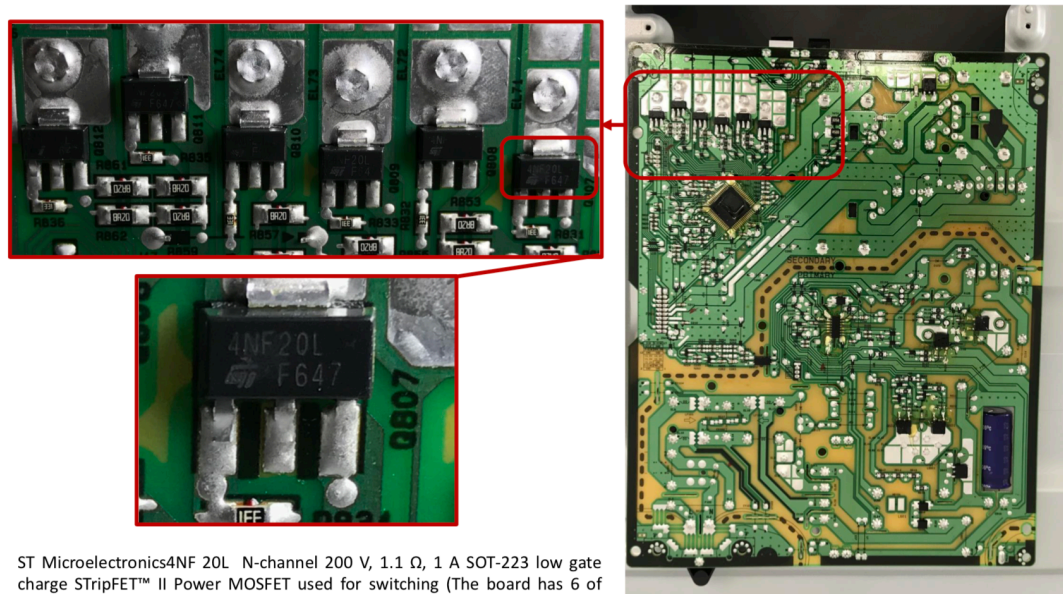
31. Through the LED power connection port, power is supplied from the power supply board to the LED control board that contains the LED driver, switches, and other circuitry. In addition, the resonant switch mode power supply in conjunction with each LED driver chip and their associated circuitry serve as a current source and provide a regulated current (through each of the respective LED strings). When the device is turned on, the power supply provides a regulated current that flows through each of the respective LED strings. The current through each of the strings can be individually controlled by the LGP06B LED driver chip depending on the needs of the display.

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[LGP06B LED Driver Chip in LG 55UJ7700]

32. The LED control board in the LG 55UJ7700, for example, includes components which provide a regulated current to the LEDs.



ST Microelectronics 4NF20L N-channel 200 V, 1.1 Ω , 1 A SOT-223 low gate charge STripFET™ II Power MOSFET used for switching (The board has 6 of these components)

[4NF20L N-Channel FETs and LGP06B Chip on LG 55UJ7700 LED Control Board]

1 33. LG advertises various features and functionality evidencing that this
 2 claim is present in the Accused Products. For example, LG advertises local
 3 dimming in the LG 55UJ7700.

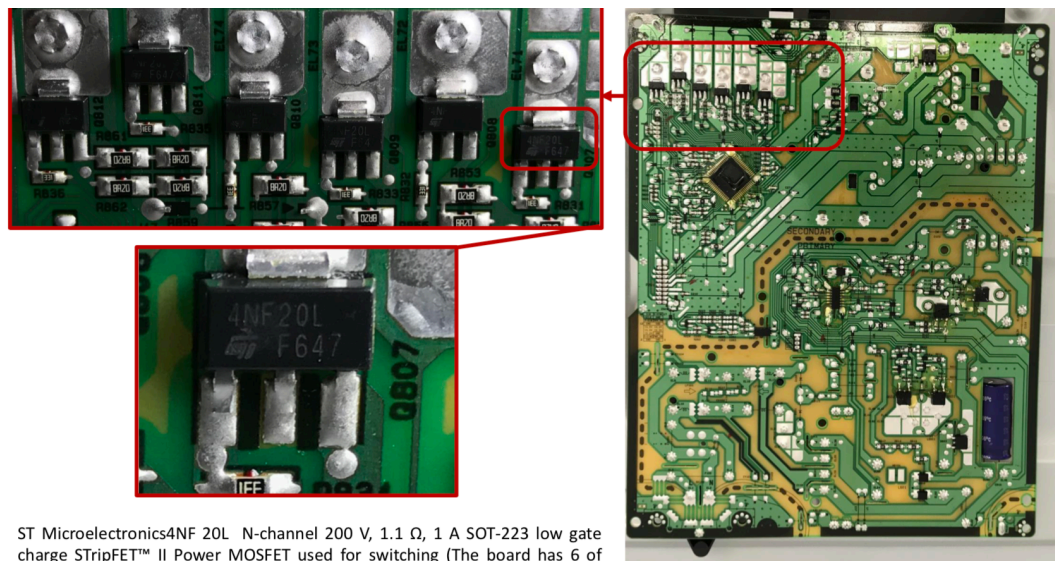
4
 5 PICTURE QUALITY

ULTRA HD (3840x2160)	Yes	Refresh Rate	TruMotion 120 (Refresh Rate 60Hz)
Active HDR with Dolby Vision™	Yes	HDR Effect	Yes
Wider Color Gamut	Yes	True Color Accuracy	Yes
IPS Technology	Yes	Ultra Luminance	Yes
4K Upscaler	Yes	Local Dimming	Yes

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 10 [55UJ7700 specifications at <https://www.lg.com/us/tvs/lg-55UJ7700-4k-uhd-tv>]

11 34. The Accused Products have “a network of semiconductor switches
 12 coupled in series.” For instance, the Accused Products include an LED control
 13 board with LED drivers coupled to both a switch mode power supply and one or
 14 more semiconductor switches.

15 35. The exemplary LG 55UJ7700 TV includes a network of
 16 semiconductor switches coupled in series, including as follows: The LED control
 17 board includes an LGP06B LED driver chip. The LGP06B LED driver includes a
 18 semiconductor switch for each section of LEDs. Each section comprises twenty
 19 (20) LEDs.
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ST Microelectronics 4NF 20L N-channel 200 V, 1.1 Ω , 1 A SOT-223 low gate charge STripFET™ II Power MOSFET used for switching (The board has 6 of these components)

[4NF20L N-Channel FETs and LGP06B Chip on LG 55UJ7700 LED Control Board]

36. The LGP06B LED driver supports six (6) sections of LEDs and is associated with semiconductor switches for each section, including six (6) 4NF20L N-Channel FETs. The 4NF20L N-Channel FETs (“N-Channel FETs”) are semiconductor switches. The LGP06B LED driver receives a regulated current from the resonant switch mode power supply. The resonant switch mode power supply comprises a power supply IC and associated circuitry, including a pair of semiconductor switches coupled in series. The LGP06B LED driver chip in the LG 55UJ7700 is coupled to the resonant switch mode power supply and its associated circuitry and the N-Channel FETs, such that the two semiconductor switches associated with the resonant switch mode power supply are coupled in series with each of the N-Channel FETs (i.e., semiconductor switches).

37. In addition, the N-Channel FETs are a network of semiconductor switches coupled in series with the “current source configured to provide a regulated current” (as identified above) and the plurality of light sources (as identified below). There is thus a “a network of semiconductor switches coupled in series.”

1 38. The Accused Products have “a plurality of light sources in a backlight
2 system, each light source associated with a semiconductor switch, wherein the
3 semiconductor switch selectively opens to allow the associated light source to
4 conduct the regulated current.”

5 39. The LG Accused Products include a plurality of light sources (LEDs)
6 in a backlight system, each light source associated with a semiconductor switch,
7 wherein the semiconductor switch selectively opens to allow the associated light
8 source to conduct the regulated current. Each of these semiconductor switches is
9 controlled by an associated LED driver. The control board is coupled to strings of
10 LEDs (e.g., light sources). In the LG 55UJ7700, for example, there are six (6)
11 sections of twenty (20) LEDs, comprising a total of six (6) zones. The
12 semiconductor switch selectively opens to allow the associated light source to
13 conduct the regulated current. Each semiconductor switch is associated with an
14 LED driver in the LG Accused Products. The LED drivers in the LG Accused
15 Products are configured to implement local dimming by selectively controlling
16 these semiconductor switches.

17 40. LG also has indirectly infringed and continues to indirectly infringe
18 the '087 patent by inducing and contributing to infringement by customers and third
19 parties of the '087 patent. LG's users, customers, agents or other third parties who
20 use those devices in accordance with LG's instructions infringe at least claim 1 of
21 the '087 Patent, in violation of 35 U.S.C. § 271(a). Because LG intentionally
22 instructs its customers to infringe through training videos, demonstrations,
23 brochures and user guides, such as those located at: www.lg.com,
24 <https://www.lg.com/us/support>, [https://www.lg.com/us/experience-tvs/local-](https://www.lg.com/us/experience-tvs/local-dimming)
25 [dimming](https://www.lg.com/us/experience-tvs/full-array-dimming), <https://www.lg.com/us/experience-tvs/full-array-dimming>,
26 [https://www.lg.com/us/support/video-tutorials/adjusting-picture-settings-webo-20-](https://www.lg.com/us/support/video-tutorials/adjusting-picture-settings-webo-20-video-CT10000018-1433250653383)
27 [video-CT10000018-1433250653383](https://www.lg.com/us/support/video-tutorials/adjusting-picture-settings-webo-20-video-CT10000018-1433250653383), [https://www.lg.com/ca_en/support/product-](https://www.lg.com/ca_en/support/product-help/CT20098005-20150226846632-poor-picture-quality-or-poor-color)
28 [help/CT20098005-20150226846632-poor-picture-quality-or-poor-color](https://www.lg.com/ca_en/support/product-help/CT20098005-20150226846632-poor-picture-quality-or-poor-color), and

1 [https://www.lg.com/us/support/help-library/tv-video-lag-CT10000020-](https://www.lg.com/us/support/help-library/tv-video-lag-CT10000020-20150774974899)
2 [20150774974899](https://www.lg.com/us/support/help-library/tv-video-lag-CT10000020-20150774974899), LG is liable for infringement of the '087 Patent under 35 U.S.C.
3 § 271(b).

4 41. LG is on notice of its infringement of the '087 Patent by no later than
5 August 29, 2019 by virtue of a letter from counsel for Polaris PowerLED to the
6 President of LG Electronics, Inc., the Chairmen & CEO of LG Corporation and the
7 CEO & President of LG Electronics U.S.A., Inc.

8 42. By the time of trial, LG will have known and intended (since receiving
9 such notice) that its continued actions would actively induce the infringement of at
10 least claim 1 of the '087 Patent.

11 43. Additionally, LG has been on notice of the '087 Patent since at least
12 January 17, 2008, when Patent Publication No. WO2008007925A1 to LG Innotek
13 Co., Ltd. was published, which cites the '087 Patent as prior art.

14 44. Upon information and belief, Defendants' past and continuing
15 infringement has been deliberate and willful, and this case is therefore an
16 exceptional case, which warrants an award of treble damages and attorneys' fees to
17 Plaintiff pursuant to 35 U.S.C. § 285.

18 45. By at least as early as August 29, 2019, Defendants had actual
19 knowledge or should have known of the '087 Patent and that their activities were
20 infringing this patent. After receiving actual knowledge of the '087 Patent,
21 Defendants have continued to make, use, sell, offer for sale, and/or import
22 infringing products into the United States despite knowing that there was a high
23 likelihood of infringement.

24 46. As a result of LG's infringement of the '087 Patent, Polaris PowerLED
25 has suffered monetary damages and is entitled to no less than a reasonable royalty
26 for LG's use of the claimed inventions of the '087 Patent, together with interest and
27 costs as determined by the Court. Polaris PowerLED will continue to suffer
28 damages in the future unless LG's infringing activities are enjoined by this Court.

1 47. Polaris PowerLED will be irreparably harmed unless a permanent
2 injunction is issued, enjoining LG and their agents, employees, representatives,
3 affiliates, and others acting in concert with LG from infringing the '087 Patent.

4 **COUNT II**

5 **(INFRINGEMENT OF U.S. PATENT NO. 8,223,117)**

6 48. Polaris PowerLED incorporates by reference paragraphs 1-47 above.

7 49. Mr. Bruce Ferguson invented a novel manner of adjusting the
8 brightness of a display screen in response to ambient light, conserving power,
9 reducing eye strain, and significantly improving the experience of the user. His
10 inventions were a significant advance in the field of display technology, power
11 conservation and power control for electronics products, including televisions and
12 other devices. Mr. Ferguson patented these innovations in the '117 Patent.

13 50. Claim 1 of the '117 Patent, for example, reads as follows:

14 1. A brightness control circuit with selective ambient light correction
15 comprising:

16 a first input configured to receive a user signal indicative of a user
17 selectable brightness setting;

18 a light sensor configured to sense ambient light and to output a sensing
19 signal indicative of the ambient light level;

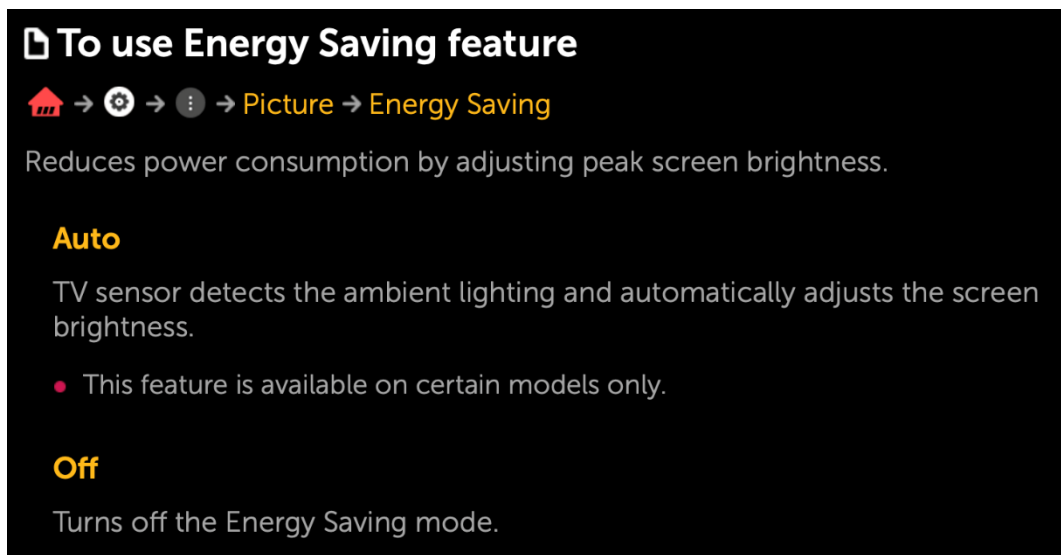
20 a multiplier configured to selectively generate a combined signal based
21 on both the user signal and the sensing signal; and

22 a dark level bias configured to adjust the combined signal to generate a
23 brightness control signal that is used to control a brightness level of a
24 visible display such that the brightness control signal is maintained
25 above a predetermined level when the ambient light level decreases to
26 approximately zero.

27 51. LG has directly and indirectly infringed, and continues to directly and
28 indirectly infringe one or more claims of the '117 patent, including at least claim 1
of the '117 Patent, literally and/or under the doctrine of equivalents, by or through

1 making, using, offering for sale, selling within the United States, and/or importing
2 into the United States televisions, including, for example, LG’s 55UJ7700 TVs (the
3 “Accused TV Products”) and other consumer electronics display products such as
4 mobile devices (the “Accused Smartphone Products”) that contain ambient light
5 sensors and automatic brightness control features in violation of 35 U.S.C. § 271(a).

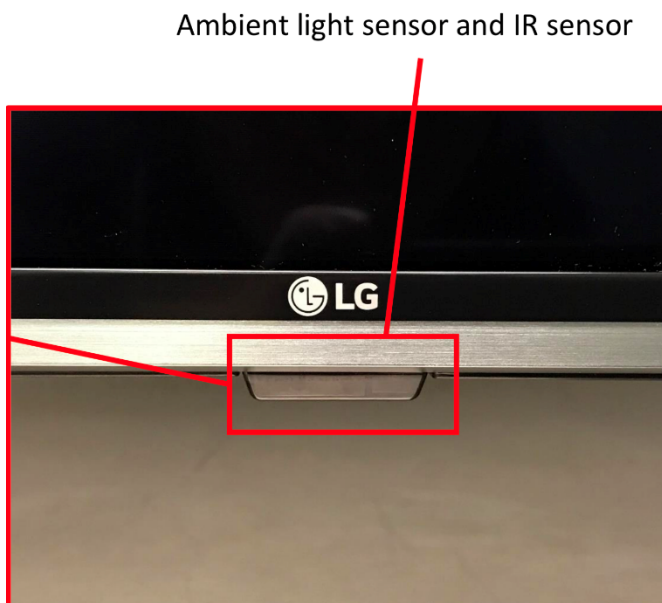
6 52. The Accused TV Products have “a brightness control circuit with
7 selective ambient light correction comprising: a first input configured to receive a
8 user signal indicative of a user selectable brightness setting,” including auto
9 brightness control, backlight and brightness circuitry, and associated user signals.
10 For example, the Accused TV Products direct users to adjust the Backlight level
11 and to enable or disable the “Energy Saving” feature described below via the
12 settings menus in the exemplary LG 55UJ7700 TV user manuals:



24 [LG 55UJ7700 manual, <https://www.lg.com/us/support/product/lg-55UJ7700.AUS>]

25 53. The Accused TV Products have “a light sensor configured to sense
26 ambient light and to output a sensing signal indicative of the ambient light level” as
27 shown below. The front portion of the Accused TV Products include an ambient
28 light sensor that outputs a sensing signal indicative of the ambient light level. For

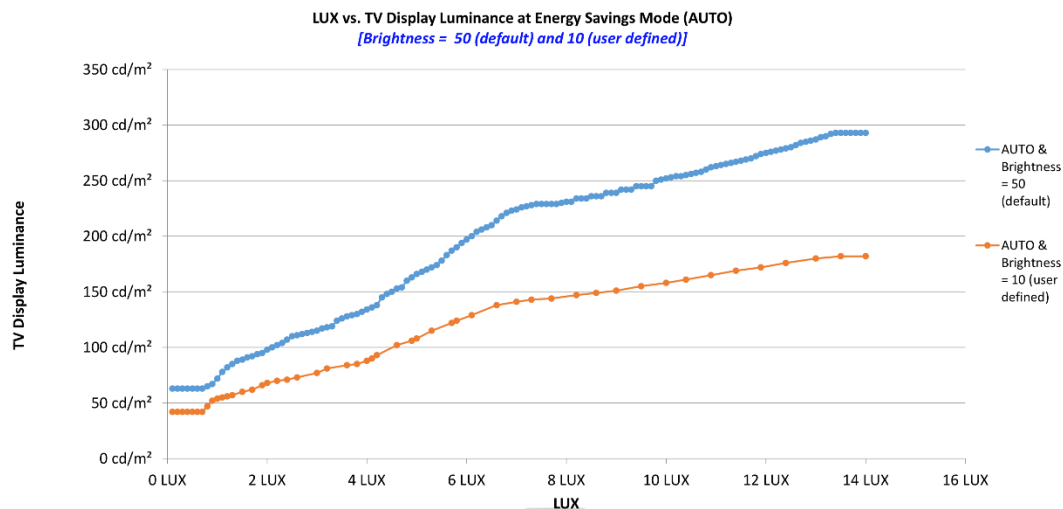
1 example, the exemplary LG 55UJ7700 has a light sensor facing the front of the
2 television, shown below.



12 54. The Accused TV Products have “a multiplier configured to selectively
13 generate a combined signal based on both the user signal and the sensing signal.”
14 The Accused TV Products include a multiplier implemented at least in part in
15 software to generate a combined signal based on the user signal, which includes the
16 brightness setting input by a user, and a sensing signal, including signaling from a
17 light sensor.

18 55. After receiving the user signal and the sensing signal, software on the
19 Accused TV Products processes software variables associated with the user signal
20 and/or the sensing signal. This processing includes, for example, scaling or
21 converting the variables. The processing also includes generating a combined
22 signal. The combined signal is generated based on both the user signal and the
23 sensing signal. The combined signal may also be generated based on variables that
24 are derived from the user signal and sensing signal. The process of generating the
25 combined signal includes multiplication. Software on the Accused TV Products
26 stores the combined signal in a software variable. The software variable can be, for
27 example, an integer or float.
28

1 56. For example, testing of the exemplary LG 55UJ7700 TV shows a
 2 multiplicative adjustment to the brightness curve based on the user-selectable
 3 Backlight setting when Auto Energy Saving is enabled. The scaling of the
 4 brightness curve shown in the data below plainly indicates the presence of a
 5 multiplier combining the Backlight setting with the ambient light signal in
 6 determining the brightness control signal.

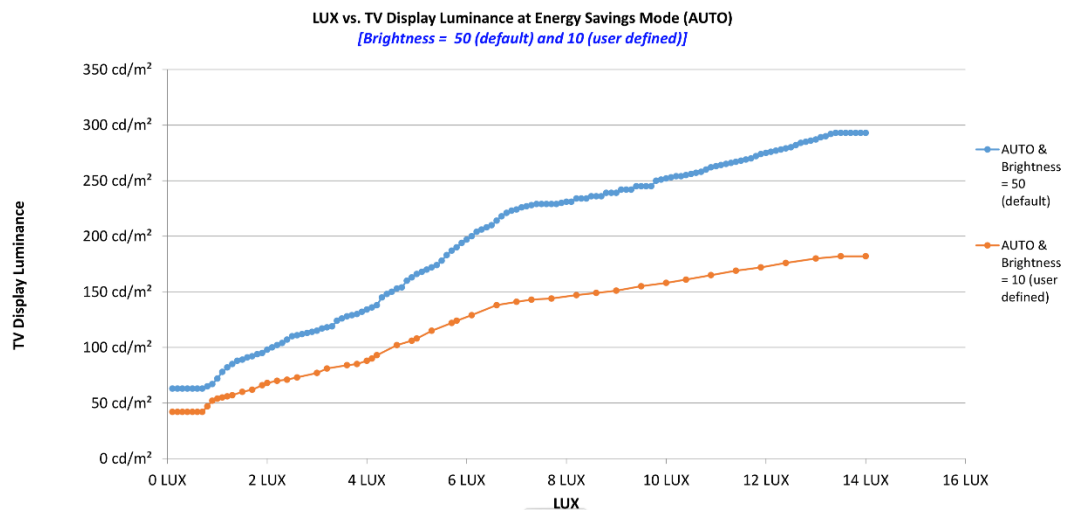


15 57. The Accused TV Products have “a dark level bias configured to adjust
 16 the combined signal to generate a brightness control signal that is used to control a
 17 brightness level of a visible display such that the brightness control signal is
 18 maintained above a predetermined level when the ambient light level decreases to
 19 approximately zero.” The software and/or hardware included in the Accused TV
 20 Products adjusts the combined based on the user and sensing signals to generate a
 21 signal that controls the brightness of the Accused TV Products maintaining the
 22 brightness level of the display above a predetermined level when the ambient
 23 brightness is approximately zero. These hardware components include, for
 24 example, a processor and solid-state storage that runs an operating system and/or
 25 additional software for adjusting a combined signal to generate a brightness control
 26 signal to control the brightness of the television display. The solid-state storage
 27 may be implemented in the form of a NAND-based flash drive.

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1 58. The dark level bias is a software variable that is used to adjust the
 2 combined signal, which is generated based on the user signal and the sensing
 3 signal. A software function or mathematical equation is used in conjunction with
 4 the dark level bias and the combined signal in order to generate a brightness control
 5 signal. For example, the dark level bias may be a variable or set of variables input
 6 into a function to maintain the brightness control signal above a predetermined
 7 value. The brightness control signal is a software variable or function that is used
 8 to control the brightness of the display in the Accused TV Products.

9 59. When the ambient light level decreases to approximately zero, the dark
 10 level bias is used to control the brightness control signal such that the brightness
 11 control signal is maintained above a predetermined level of brightness. As shown
 12 in testing of the exemplary LG 55UJ770 TV's brightness curve, the dark level bias
 13 prevents the brightness control signal from dropping below a predetermined level
 14 when the ambient light level decreases to approximately zero.



23 60. LG has directly and indirectly infringed, and continues to directly and
 24 indirectly infringe one or more claims of the '117 Patent, including at least claim 1
 25 of the '117 Patent, literally and/or under the doctrine of equivalents, by or through
 26 making, using, offering for sale, selling within the United States, and/or importing
 27 into the United States the Accused Smartphone Products including, for example,
 28 LG's V Series and G Series smartphones, and other consumer electronics display

1 products that contain ambient light sensors and automatic brightness control
2 features in violation of 35 U.S.C. § 271(a).

3 61. The Accused Smartphone Products have “a brightness control circuit
4 with selective ambient light correction comprising: a first input configured to
5 receive a user signal indicative of a user selectable brightness setting,” including
6 auto brightness control, backlight and brightness circuitry, and associated user
7 signals. For example, the Accused Smartphone Products direct users to adjust the
8 Backlight level and to enable or disable the “Energy Saving” feature described
9 below via the settings menus in the exemplary LG V40 ThinQ user manual:

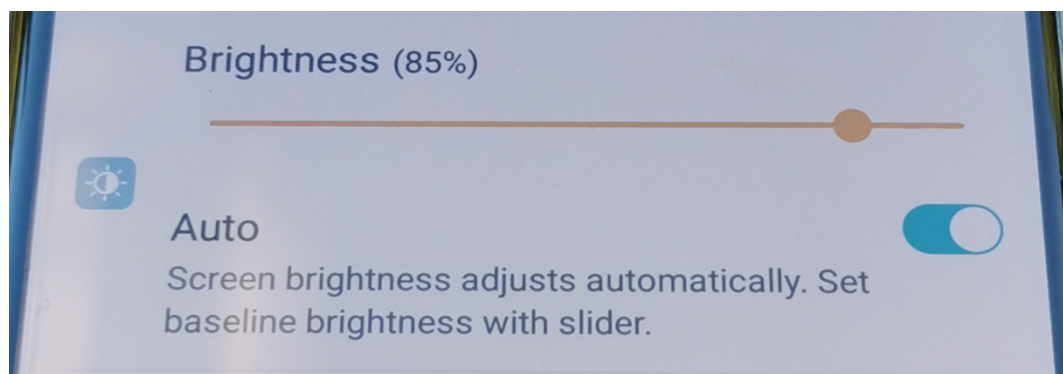
- 10 • Proximity/Ambient light sensor
 - 11 - Proximity sensor: During a call, the proximity sensor turns off the
 - 12 screen and disables touch functionality when the device is in close
 - 13 proximity to the human body. It turns the screen back on and enables
 - 14 touch functionality when the device is outside a specific range.
 - 15 - Ambient light sensor: The ambient light sensor analyzes the ambient
 - 16 light intensity when the auto-brightness control mode is turned on.

17 [LG V40 ThinQ manual, [https://www.lg.com/us/support/product/lg-](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)
18 [LMV405UA3.ASPRBK](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)]

- 19 • **Brightness:** Use the slide bar to change the device’s screen brightness.
20 To automatically adjust screen brightness according to ambient light
21 intensity, tap the **Auto** switch.

22 [LG V40 ThinQ manual, [https://www.lg.com/us/support/product/lg-](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)
23 [LMV405UA3.ASPRBK](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)]

24 62. This automatic brightness adjustment feature can be adjusted by
25 moving the brightness slider bar, as shown in the below photo of the brightness
26 adjustment screen. Additionally, this feature can be turned off. Thus, the Accused
27 Smartphone Products include a brightness control circuit with selective ambient
28 light correction.



7 [LG V40 ThinQ]

8 63. The Accused Smartphone Products have “a light sensor configured to
 9 sense ambient light and to output a sensing signal indicative of the ambient light
 10 level” as shown below. The light sensor may be mounted such that it faces the
 11 front or the back of the Accused Smartphone Products. The light sensor measures
 12 ambient light and outputs a sensing signal indicative of the ambient light. Software
 13 running on the Accused Smartphone Products stores the sensing signal. For
 14 example, the Accused Smartphone Products’ software may store the sensing signal
 15 in a software variable that represents the ambient light level. For example, the
 16 exemplary LG V40 ThinQ manual explicitly advertises that the light sensor is used
 17 in the “auto-brightness control mode”:

- 18 • Proximity/Ambient light sensor
 - 19 - Proximity sensor: During a call, the proximity sensor turns off the
 20 screen and disables touch functionality when the device is in close
 21 proximity to the human body. It turns the screen back on and enables
 22 touch functionality when the device is outside a specific range.
 - 23 - Ambient light sensor: The ambient light sensor analyzes the ambient
 24 light intensity when the auto-brightness control mode is turned on.

24 [LG V40 ThinQ manual, [https://www.lg.com/us/support/product/lg-](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)
 25 [LMV405UA3.ASPRBK](https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK)]

26 64. The Accused Products have “a multiplier configured to selectively
 27 generate a combined signal based on both the user signal and the sensing signal.”
 28 The user signal is indicative of a user selectable brightness setting. The Accused

1 Smartphone Products include, for example, a menu in which a user provides a user
2 signal indicative of a user selectable brightness setting.

3 65. A user navigates to a display menu to provide the user signal by using
4 the brightness slide bar to adjust the screen brightness.

- 5 • **Brightness:** Use the slide bar to change the device's screen brightness.
6 To automatically adjust screen brightness according to ambient light
7 intensity, tap the **Auto** switch.

8 [LG V40 ThinQ manual, <https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK>]

9 66. The light sensor may be mounted such that it faces the front or the
10 back of the Accused Smartphone Products. The light sensor measures ambient
11 light and outputs a sensing signal indicative of the ambient light. Software running
12 on the Accused Smartphone Products stores the sensing signal. For example, the
13 Accused Smartphone Products' software may store the sensing signal in a software
14 variable that represents the ambient light level.

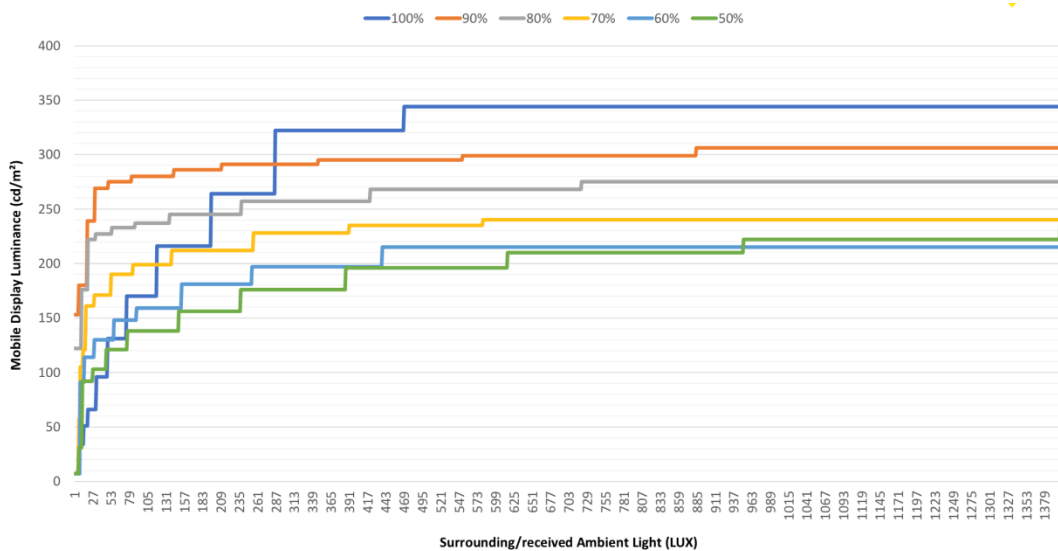
- 15 • Proximity/Ambient light sensor
 - 16 - Proximity sensor: During a call, the proximity sensor turns off the
17 screen and disables touch functionality when the device is in close
18 proximity to the human body. It turns the screen back on and enables
19 touch functionality when the device is outside a specific range.
 - 20 - Ambient light sensor: The ambient light sensor analyzes the ambient
21 light intensity when the auto-brightness control mode is turned on.

22 [LG V40 ThinQ manual, <https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK>]

23 67. The Accused Smartphone Products include hardware components for
24 running software which includes a multiplier configured to selectively generate a
25 combined signal based on both the user signal and the sensing signal. These
26 hardware components include, for example, a processor and solid-state storage that
27 runs an operating system and/or additional software for generating a combined
28

1 signal. The solid-state storage may be implemented in the form of a NAND-based
 2 flash drive.

3 68. After receiving the user signal and the sensing signal, software on the
 4 Accused Smartphone Products processes software variables associated with the user
 5 signal and/or the sensing signal. This processing includes, for example, scaling or
 6 converting the variables. The processing also includes generating a combined
 7 signal. The combined signal is generated based on both the user signal and the
 8 sensing signal. The combined signal may also be generated based on variables that
 9 are derived from the user signal and sensing signal. The process of generating the
 10 combined signal includes multiplication. Software on the Accused Smartphone
 11 Products stores the combined signal in a software variable. The software variable
 12 can be, for example, an integer or float. As shown below, the exemplary LG V40
 13 ThinQ combines the light sensor signal and user signal multiplicatively in order to
 14 generate the combined signal, to which a dark level bias is applied.



23 69. The Accused Smartphone Products have “a dark level bias configured
 24 to adjust the combined signal to generate a brightness control signal that is used to
 25 control a brightness level of a visible display such that the brightness control signal
 26 is maintained above a predetermined level when the ambient light level decreases to
 27 approximately zero.” The Accused Smartphone Products include hardware
 28

1 components for running software which includes a dark level bias configured to
2 adjust the combined signal to generate a brightness control signal that is used to
3 control a brightness level of a visible display such that the brightness control signal
4 is maintained above a predetermined level when the ambient light level decreases to
5 approximately zero. These hardware components include, for example, a processor
6 and solid-state storage that runs an operating system and/or additional software for
7 generating a combined signal. The solid-state storage may be implemented in the
8 form of a NAND-based flash drive.

9 70. After receiving the user signal and the sensing signal, software on the
10 Accused Smartphone Products processes software variables associated with the user
11 signal and/or the sensing signal. This processing includes, for example, scaling or
12 converting the variables. The processing also includes generating a combined
13 signal. The combined signal is generated based on both the user signal and the
14 sensing signal. The combined signal may also be generated based on variables that
15 are derived from the user signal and sensing signal.

16 71. The dark level bias is a software variable that is used to adjust the
17 combined signal, which is generated based on the user signal and the sensing
18 signal. A software function or mathematical equation is used in conjunction with
19 the dark level bias and the combined signal in order to generate a brightness control
20 signal. For example, the dark level bias may be a variable or set of variables input
21 into a function to maintain the brightness control signal above a predetermined
22 value. The brightness control signal is a software variable or function that is used
23 to control the brightness of the display in the Accused Smartphone Products.

24 72. When the ambient light level decreases to approximately zero, the dark
25 level bias is used to control the brightness control signal such that the brightness
26 control signal is maintained above a predetermined level of brightness.

27 73. LG also has indirectly infringed and continues to indirectly infringe
28 the '117 Patent by inducing and contributing to infringement by customers and

1 third parties of the '117 Patent. LG's users, customers, agents or other third parties
2 who use those devices in accordance with LG's instructions infringe at least claim 1
3 of the '117 Patent, in violation of 35 U.S.C. § 271(a). Because LG intentionally
4 instructs its customers to infringe through training videos, demonstrations,
5 brochures and user guides, such as those located at: www.lg.com,
6 [https://www.lg.com/us/support/help-library/lg-tv-picture-menu-settings-
7 CT10000018-1374855198623](https://www.lg.com/us/support/help-library/lg-tv-picture-menu-settings-CT10000018-1374855198623), [https://www.lg.com/us/support/video-tutorials/lg-tv-
8 troubleshooting-dark-or-blurry-picture-CT10000020-1441915401150](https://www.lg.com/us/support/video-tutorials/lg-tv-troubleshooting-dark-or-blurry-picture-CT10000020-1441915401150),
9 [https://www.lg.com/us/support/help-library/troubleshooting-dark-or-dim-picture-tv-
10 CT10000018-1432651636835](https://www.lg.com/us/support/help-library/troubleshooting-dark-or-dim-picture-tv-CT10000018-1432651636835), [https://www.lg.com/us/support/help-library/how-
11 can-i-improve-the-battery-life-of-my-android-device-CT10000025-
12 20150357036679](https://www.lg.com/us/support/help-library/how-can-i-improve-the-battery-life-of-my-android-device-CT10000025-20150357036679), <https://www.lg.com/us/support/product/lg-55UJ7700.AUS>,
13 <https://www.lg.com/us/support/product/lg-LMV405UA3.ASPRBK>,
14 [https://www.lg.com/uk/support/product-help/CT00008356-20150122818443-
15 others](https://www.lg.com/uk/support/product-help/CT00008356-20150122818443-others), [https://www.lg.com/eastafrica/support/product-help/CT20279022-
16 1440413459879-others](https://www.lg.com/eastafrica/support/product-help/CT20279022-1440413459879-others), and [https://www.lg.com/au/support/product-
17 help/CT32000461-1440406117105-others](https://www.lg.com/au/support/product-help/CT32000461-1440406117105-others), LG is liable for infringement of the '117
18 Patent under 35 U.S.C. § 271(b).

19 74. LG also received notice of its infringement of the '117 Patent by no
20 later than August 29, 2019 by virtue of a letter from counsel for Polaris PowerLED
21 to the President of LG Electronics, Inc., the Chairmen & CEO of LG Corporation
22 and the CEO & President of LG Electronics U.S.A., Inc.

23 75. By the time of trial, LG will have known and intended (since receiving
24 such notice) that its continued actions would actively induce the infringement of at
25 least claim 1 of the '117 Patent.

26 76. Additionally, LG has been on notice of the '117 Patent since at least
27 August 13, 2013, when Patent Publication No. KR101296564B1 to LG Display Co
28 Ltd. was published, which cites the '117 Patent as prior art. The '117 Patent was

1 cited as prior art in additional LG Patent Publications, such as KR101318081B1 to
2 LG Display Co Ltd., published on October 14, 2013, KR101631958B1 to LG
3 Electronics Inc., published on June 20, 2016, and KR20160139677A to LG Display
4 Co Ltd., published on December 7, 2016.

5 77. On information and belief, Defendants' past and continuing
6 infringement has been deliberate and willful, and this case is therefore an
7 exceptional case, which warrants award of treble damages and attorneys' fees to
8 Plaintiff pursuant to 35 U.S.C. § 285.

9 78. By at least as early as August 29, 2019, LG had actual knowledge or
10 should have known of the '117 Patent and that its activities were infringing this
11 patent. After receiving actual knowledge of the '117 Patent, Defendants have
12 continued to make, use, sell, offer for sale, and/or import infringing products into
13 the United States despite knowing that there was a high likelihood of infringement.

14 79. As a result of LG's infringement of the '117 Patent, Polaris PowerLED
15 has suffered monetary damages and is entitled to no less than a reasonable royalty
16 for LG's use of the claimed inventions of the '117 Patent, together with interest and
17 costs as determined by the Court. Polaris PowerLED will continue to suffer
18 damages in the future unless LG's infringing activities are enjoined by this Court.

19 80. Polaris PowerLED will be irreparably harmed unless a permanent
20 injunction is issued enjoining LG and their agents, employees, representatives,
21 affiliates, and others acting in concert with LG from infringing the '117 Patent.

22 **PRAYER FOR RELIEF**

23 WHEREFORE, Polaris PowerLED requests the following relief from this
24 Court:

25 (A) A judgment that Defendants have infringed one or more claims
26 of the '087 patent literally and/or under the doctrine of equivalents directly
27 and/or indirectly by inducing infringement;

28 (B) A judgment that Defendants have infringed one or more claims

1 of the '117 patent literally and/or under the doctrine of equivalents directly
2 and/or indirectly by inducing infringement;

3 (C) Compensatory damages in an amount according to proof, and in
4 any event no less than a reasonable royalty, including all pre-judgment and
5 post-judgment interest at the maximum rate allowed by law;

6 (D) Treble damages for willful infringement pursuant to 35 U.S.C.
7 § 284;

8 (E) An order and judgment permanently enjoining LG and its
9 officers, directors, agents, servants, employees, affiliates, attorneys, and all
10 others acting in privity or in concert with them, and their parents, subsidiaries,
11 divisions, successors and assigns from further acts of infringement of the
12 Patents-in-Suit;

13 (F) A judgment that this is an exceptional case and awarding Polaris
14 PowerLED its costs and reasonable attorneys' fees incurred in this action as
15 provided by 35 U.S.C. § 285; and

16 (G) A judgment granting Polaris PowerLED such further relief as
17 the Court may deem just and proper.

18 **JURY TRIAL DEMAND**

19 81. Polaris PowerLED hereby demands trial by jury on all issues so triable
20 pursuant to Fed. R. Civ. P. 38.

21 DATED: January 21, 2020
22

23
24 By: /s/ Robert F. Kramer
Robert F. Kramer

25 Attorneys for Plaintiff
26 POLARIS POWERLED TECHNOLOGIES,
27 LLC
28