IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PHENIX LONGHORN LLC, Plaintiff, v. AU OPTRONICS CORPORATION, HISENSE ELECTRONICA MEXICO, S.A. DE C.V., HISENSE USA CORPORATION, and DOES 1–10, Defendants.	Case No.: 2:23-cv-00477-RWS-RSP **JURY TRIAL DEMANDED**
PHENIX LONGHORN LLC Plaintiff, v. INNOLUX CORPORATION, Defendant.	Case No.: 2:23-cv-00478-RWS-RSP **JURY TRIAL DEMANDED**

DEFENDANTS' P.R. 3-3 INVALIDITY CONTENTIONS AND
SUBJECT MATTER ELIGIBILITY CONTENTIONS

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Pursuant to P.R. 3-3 and the Court's Docket Control Order (Dkt. 67, Case No. 2:23-CV-00477-RWS-RSP; Dkt. 34, Case No. 2:23-CV-00478-RWS-RSP), Defendants AUO Corporation ("AUO")[1], Hisense Electronica Mexico, S.A. DE C.V, and Hisense USA Corporation ("Hisense"), and Innolux Corporation ("Innolux") (collectively "Defendants") hereby provide these P.R. 3-3 Invalidity Contentions ("Invalidity Contentions") to Plaintiff Phenix Longhorn LLC, ("Plaintiff" or "Phenix").

I. INTRODUCTION

These Invalidity Contentions are based on Defendants' current knowledge and understanding of U.S. Patent No. 7,233,305 ("the '305 Patent") and U.S. Patent No. 7,557,788 ("the '788 Patent" or collectively "the Asserted Patents") and the prior art, along with Defendants' understanding of Plaintiff's infringement allegations and apparent claim interpretations based on those allegations, as set forth in Plaintiff's Disclosure of Asserted Claims & Infringement Contentions ("Infringement Contentions"). These Invalidity Contentions should not be construed as a waiver by Defendants of any objections to Plaintiff's Infringement Contentions or as an admission that the Infringement Contentions were adequate or that Plaintiff's apparent claim interpretations therein are correct, have merit, or should be adopted. Additionally, and as further explained below, where these Invalidity Contentions disclose that a prior art reference meets a claim limitation, such position may be based on Plaintiff's apparent claim interpretations in its Infringement Contentions; Defendants do not necessarily agree that such interpretations are correct, have merit, or should be adopted.

[1] AUO was previously known as "AU Optronics Corporation," the name that Phenix used in filing this suit, but changed its name to AUO Corporation in June 2022.

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Defendants' investigation of the Asserted Patents, their file history, and the prior art is ongoing, and Defendants expressly reserve the right to supplement these Invalidity Contentions based on further discovery and in a manner consistent with the Federal Rules of Civil Procedure, the Local Patent Rules for the Eastern District of Texas, and any Docket Control Order, or otherwise in accordance with any order or direction of this Court or agreement of the parties. Defendants' ongoing investigation includes, but is not limited to, serving subpoenas regarding prior art and inventors of prior art, seeking additional information related to the references and prior art systems disclosed in these Invalidity Contentions, and seeking additional information regarding Plaintiff's Infringement Contentions and the products and services accused of infringing therein. Additionally, Defendants have not yet had the benefit of taking the deposition of the named inventors or those that worked with the named inventors, or of the named inventors, authors, and entities listed on any references or systems identified in these Invalidity Contentions.

II. ASSERTED PATENT AND CLAIMS

Plaintiff asserts the following claims from the '305 Patent (with independent claims identified in **bold**): **1**, 2, and 5. Plaintiff also asserts the following claim from the '788 Patent (identified in **bold**): **1** (collectively "the Asserted Claims"). Plaintiff asserts a priority date for the Asserted Patents of June 11, 2003—the date of filing for U.S. Provisional Patent Application No. 60/477,680 for which the Asserted Patents allegedly claim priority to. Reference to an "asserted priority date" should not be construed to mean that Defendants agree that the Asserted Patents are in fact entitled to such priority date, or that Plaintiff has provided proper notice as to its contentions for a priority date.

P.R. 3-2(b) requires Plaintiff to produce, contemporaneously with its Disclosure of Asserted Claims and Infringement Contentions," "[a]ll documents evidencing the conception, reduction to practice, design, and development of each claimed invention, which were created on

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or before the date of application for the patent in suit or the priority date identified pursuant to P.R. 3-1(e), whichever is earlier." Based on Plaintiff's production purportedly pursuant to P.R. 3-2(b), Defendants understand that Plaintiff is not asserting an invention date, or conception, reduction to practice, design, and/or development of the claimed invention, prior to June 11, 2003, as it pertains to the Asserted Patents. To the extent Plaintiff later alleges that any such activities occurred prior to June 11, 2003, Defendants reserve the right to supplement these Invalidity Contentions to address any such contention, including by identifying and/or charting additional prior art that may become relevant in view of such assertion. Likewise, to the extent Plaintiff successfully establishes an invention date before any of the prior-art references relied on by Defendants, then those references serve as evidence of secondary considerations of obviousness, particularly, contemporaneous invention by others. To the extent Plaintiff alleges that any prior art relied on in these Invalidity Contentions does not actually qualify as prior art to the Asserted Patent, Defendants reserve the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date and/or date of invention for a particular Asserted Claim). Defendants also reserve the right to rely on additional documents, information, and evidence to demonstrate public availability or public availability by a certain date of a prior art reference or to rebut any efforts by Plaintiff to allege any reference was not publicly available or publicly available by a certain date or otherwise available as prior art.

Defendants reserve the right to amend or supplement these disclosures as necessary in view of any changes or amendments made, for any reason, to Plaintiff's infringement theories, infringement contentions, or Asserted Claims, including to Plaintiff's asserted priority and/or invention date(s).

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III. CLAIM CONSTRUCTION

To the extent that these Invalidity Contentions rely on or otherwise embody particular constructions of terms or phrases in the Asserted Claims, Defendants are not conceding to any such constructions as proper constructions of those terms or phrases at this time. For purposes of these Invalidity Contentions, Defendants may adopt alternative claim construction positions. In particular, portions of these Invalidity Contentions, including the claim charts attached as exhibits, may be based on the underlying claim constructions and/or interpretations in Plaintiff's Infringement Contentions, to the extent such constructions and/or interpretations are understood by Defendants. Defendants do not concede that any such constructions or interpretations by Plaintiff are proper, and expressly reserves the right to contest any such constructions.

Throughout the attached Exhibits, Defendants provide examples of where references disclose subject matter recited in preambles, without regard to whether the preambles are properly considered to be limitations of the Asserted Claims. Defendants reserve the right to argue, at the appropriate stage of this case, that the preambles are or are not limitations. Further, the fact that Defendants provide examples of any limitation does not mean that Defendants believe that the limitation is defined, or otherwise enabled, or comports with the requirements of the patent statute, including, but not limited to, 35 U.S.C. § 112.

Nothing disclosed herein is an admission or acknowledgement that any of Defendants' products or services infringes any of the Asserted Claims. Defendants reserve the right to supplement, modify, or otherwise amend these Invalidity Contentions, including based on the Court's claim construction rulings or opinions or the parties' positions or arguments taken in connection with the claim construction process. Moreover, Defendants reserve the right to rely on any disclosures in the accompanying P.R. 3-4(b) production as it believes necessary in view of positions Plaintiff may take with respect to the scope and meaning of the Asserted Claims.

IV. P.R. 3-3(A) – IDENTIFICATION OF PRIOR ART[2]

A. Prior Art Patents

Patent / Publication No.	Name	Country of Origin	Date of Issue / Publication[3]
U.S. 6,466,189	Albu '189	United States	October 15, 2002
U.S. 6,690,383	Braudaway '383	United States	February 10, 2004
U.S. 7,336,285	Hendry '285	United States	February 26, 2008
U.S. 7,348,946	Booth '946	United States	March 25, 2008
U.S. 8,471,841	Evanicky '841	United States	June 25, 2013
U.S. 2003/0067435	Liu '435	United States	April 10, 2003
U.S. 2003/0179211	Wada '211	United States	September 25, 2003
U.S. 4,061,999	Proebsting '999	United States	December 6, 1977
U.S. 5,729,297	Kwon '297	United States	March 17, 1998
U.S. 5,734,364	Hirai '364	United States	March 31, 1998
U.S. 5,737,032	Stenzel '032	United States	April 7, 1998
U.S. 6,094,502	Hirata '502	United States	July 25, 2000
U.S. 6,275,207	Nitta '207	United States	August 14, 2001
U.S. 6,275,209	Yamamoto '209	United States	August 14, 2001
U.S. 6,292,165	Lin '165	United States	September 18, 2001
U.S. 6,304,300	Warren '300	United States	October 16, 2001
U.S. 6,339,411	Miyazaki '411	United States	January 15, 2002
U.S. 6,340,996	Nakamura '996	United States	January 22, 2002
U.S. 6,429,841	Lee '841	United States	August 6, 2002
U.S. 6,559,826	Mendelson '826	United States	May 6, 2003
10-0741379	Kwon '379	Korea	July 20, 2007
U.S. 6,628,424	Sakurai '424	United States	September 30, 2003

[2] Defendants also hereby identify any systems or products that embody the technology described in any patent or publication identified in these Invalidity Contentions. Defendants reserve the right to rely on any documents or other evidence regarding any such systems.

[3] The dates in this column are the latest dates on which the patents or publications were publicly available. Defendants reserve the right to identify earlier dates should such dates be ascertained through discovery.

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Patent / Publication No.	Name	Country of Origin	Date of Issue / Publication[3]
U.S. 6,801,178	Nitta ’178	United States	October 5, 2004
U.S. 7,006,065	Sugawara ’065	United States	February 28, 2006
EP 0205294	Shu ’294	EPO	December 17, 1986
JP 2001-016602	Kima ’602	Japan	January 1, 2001
U.S. 7,023,458	Kudo ’458	United States	April 4, 2006
U.S. 7,403,182	Lee ’182	United States	July 22, 2008
U.S. 8,421,742	Yoshida ’742	United States	April 16, 2013
U.S. 8,823,618	Lee ’618	United States	September 2, 2014
U.S. 9,336,733	Kudo ’733	United States	May 10, 2016
U.S. 2002/0011979	Nitta ’979	United States	January 31, 2002
U.S. 2002/0027551	Nitta ’551	United States	March 7, 2002
U.S. 2002/0060656	Okuzono ’656	United States	May 23, 2002
U.S. 2002/0063666	Kang ’666	United States	May 30, 2002
U.S. 2002/0158834	Blankenship ’834	United States	October 31, 2002
U.S. 2002/0158882	Liaw ’882	United States	October 31, 2002
U.S. 2002/0171614	Sakaguchi ’614	United States	November 21, 2002
U.S. 2003/0085865	Lee ’865	United States	May 8, 2003
U.S. 2003/0132906	Tanaka ’906	United States	July 17, 2003
U.S. 2003/0132907	Lee ’907	United States	July 17, 2003
U.S. 2003/0142084	Chang ’084	United States	July 31, 2003
U.S. 2003/0156086	Maeda ’086	United States	August 21, 2003
U.S. 2003/0160743	Yasuda ’743	United States	August 28, 2003
U.S. 2004/0104878	Tsutsui ’878	United States	June 3, 2004
U.S. 2004/0113923	Ha ’923	United States	June 17, 2004
U.S. 2005/0024508	Okisu ’508	United States	February 3, 2005
U.S. 2007/0182695	Shimizu ’695	United States	August 9, 2007
U.S. 5,376,962	Zortea ’962	United States	December 27, 1994
U.S. 2003/0169279	Oberoi ’279	United States	September 11, 2003
WO 96/18890	Van Geloven ’890	United States	June 20, 1996
WO 02/069259	Huston ’259	United States	September 6, 2002

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Patent / Publication No.	Name	Country of Origin	Date of Issue / Publication[3]
US 6,760,068	Petropoulos ‘068	United States	July 6, 2004
U.S. 6,100,897	Da Costa ‘879	United States	August 8, 2000
U.S. 2003/0132906	Tanaka ‘906	United States	July 17, 2003
US 7,859,524	Lee ‘524	United States	December 28, 2010
US 6,335,716	Yamazaki ‘716	United States	January 1, 2002
US 6,987,499	Yamaguchi ‘499	United States	January 17, 2006
U.S. 7,298,352	Kang ‘352	United States	November 20, 2007
US 7,180,530	Whittington ‘530	United States	February 20, 2007
U.S. 5,739,805	Dingwall ‘805	United States	April 14, 1998
U.S. 2004/0090409	Nakata ‘409	United States	May 13, 2004
US 6,731,259	Yer ‘259	United States	May 4, 2004
US 6,185,127	Myers ‘127	United States	February 6, 2001
U.S. 7,224,351	Lee ‘351	United States	May 29, 2007
US 5,974,528	Tsai ‘528	United States	October 26, 1999
US 6,806,861	Sakaguchi ‘861	United States	October 19, 2004
US 6,836,232	Bu ‘232	United States	December 28, 2004
US 7,050,028	Morita ‘028	United States	May 23, 2006
US 6,593,934	Liaw ‘934	United States	July 15, 2003
US 6,437,716	Nakao ‘716	United States	August 20, 2002
US 6,271,825	Greene ‘825	United States	August 7, 2001
US 5,754,150	Matsui ‘150	United States	May 19, 1998
US 6,680,733	Woo ’733	United States	January 20, 2004
US 7,038,721	Stessen ’72	United States	May 2, 2006
US 6,373,478	Steffensmeier ’478	United States	April 16, 2002
US 6,046,719	Dingwall ’719	United States	April 4, 2000
US 6,700,561	Christensen ’561	United States	March 2, 2004
US 6,388,928	Myers ’928	United States	May 14, 2002
US 6,765,961	Segawa ’961	United States	July 20, 2004
US 6,359,389	Medina ’389	United States	March 19, 2002
US 6,727,874	Okuzono ’874	United States	April 27, 2004

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Patent / Publication No.	Name	Country of Origin	Date of Issue / Publication[3]
US 5,667,869	Beretta ’869	United States	September 16, 1997
US 6,078,684	Inoue ’684	United States	June 20, 2000
US 6,160,532	Kaburagi ’532	United States	December 12, 2000
US 6,756,961	Hector ’961	United States	June 29, 2004
US 7,176,862	Baek ’862	United States	February 13, 2007
US 6,856,306	Ito ’306	United States	February 15, 2005
US 8,072,473	Kim ’473	United States	December 6, 2011
US 5,251,017	Riviere ’017	United States	October 5, 1993
US 8,253,671	Kim ’671	United States	August 28, 2012
US 7,173,597	Kato ’597	United States	February 6, 2007
US 7,248,254	Kato ’254	United States	July 24, 2007
US 7,113,156	Hashimoto ’156	United States	September 26, 2006
US 7,277,078	Sato ’078	United States	October 2, 2007
US 6,844,839	Lee ’839	United States	January 18, 2005
US 7,187,375	Ha ’839	United States	March 6, 2007
US 7,859,524	Lee ’524	United States	December 28, 2010
US 6,778,161	Chen ’161	United States	August 17, 2004
US 6,963,323	Sakurai ’323	United States	November 8, 2005
US 7,136,039	Bu ’039	United States	November 14, 2006
US 6,762,737	Kajihara ’737	United States	July 13, 2004
US 6,373,497	McKnight ’497	United States	April 16, 2002
US 7,233,305	Orlando ’305	United States	June 19, 2007
US 4,061,999	Proebsting ’999	United States	December 6, 1977
US 4,694,205	Shu ’205	United States	September 15, 1987
US 2003/0058235	Moon ’235	United States	March 27, 2003
US 2003/0151578	Morita ’578	United States	August 14, 2003
EP 1335344	Morita ’344	EPO	August 13, 2003
JP 2003316333	Sakaguchi ’333	Japan	November 7, 2003
JP 2001195031	Sakaguchi ’031	Japan	July 19, 2001
JP 2004165749	Nakada ’749	Japan	June 10, 2004

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Patent / Publication No.	Name	Country of Origin	Date of Issue / Publication[3]
JP 2002262313	Ryo ’313	Japan	September 13, 2002
JP H10333648	Suzuki ’648	Japan	December 18, 1998
JP 2003216125	Sakaguchi ’125	Japan	July 30, 2003
JP 2002372958	Kudo ’958	Japan	December 26, 2002
JP 2003186457	Lee ’457	Japan	July 4, 2003
JP 2002258813	Tanaka ’813	Japan	September 11, 2002
JP 2003295842	Ota ’842	Japan	October 15, 2003
JP 2003084727	Yano ’727	Japan	March 19, 2003
KR 100824415	Shin ’415	Korea	April 23, 2008
KR 20040062199	Baek ’199	Korea	July 7, 2004
KR 20040038411	Hyeon ’411	Korea	May 8, 2004
KR 100569734	Kim ’734	Korea	August 18, 2006
KR 20040087449	Lee ’449	Korea	October 14, 2004
KR 100682357	Jang ’357	Korea	February 15, 2007
KR 100788387	Yoon ’387	Korea	December 31, 2007
US 5,796,384	Kim ’384	United States	August 18, 1998
US 2002/0109655	Yer ’655	United States	August 15, 2002
US 2003/0090580	Petropoulos ’580	United States	May 15, 2003
CN 1359098	Yuze ’098	China	July 17, 2002
EP 0213638	Yamaguchi ’638	EPO	March 9, 1986
JPH06245222	Ito ’222	Japan	September 2, 1994
JP2001147673	Matsumoto ’673	Japan	May 29, 2001
JPH06333075	Tani ’075	Japan	December 2, 1994
KR19990059997	Kim ’997	Korea	July 26, 1999
KR20020004279	Kwon ’279	Korea	January 16, 2002
TW 406281	Yamazaki ’281	Taiwan	September 21, 2000
WO 2002047397	Evanicky ’397	WO	June 13, 2002
JP1995152347	Uehara ’347	Japan	June 16, 1995

B. Prior Art Publications

Title, Author(s), and Publisher	Date of Publication[4]
Milster et al., *A Full-Field Modular Gamma Camera*, The Journal of Nuclear Medicine, pp. 632-639	April 1990
Meinstein et al., *A 9-Channel Programmable Power Reference Generator for Use With Resistor-String-DAC-Based TFT-LCD Source Drivers,* The Institute of Image Information and Television Engineers	1995
Irazabal et al., *AN10216-01 I^2C Manual,* Philips Semiconductor	March 24, 2003
A 6-Bit Multi-Resolution Digital to Analogue Converter for Low Temperature Poly-Silicon Digital Drivers, Proceedings of SPIE Vol. 4295, pp. 85-94	2001
Hornbeck, *Digital Light Processing for High-Brightness, High Resolution Applications,* Texas Instruments	1997
Blozis, *I^2C Device Overview*, Philips Semiconductor	2002
Munson et al., *Video Circuit Collection*, Linear Technology	January 1994
Yoneda et al., *Development Trends of LTPS TFT LCDs for Mobile Applications*, Symposium on VLSI Circuits Digest of Technical Papers, pp. 85-90	2001
D'Luna et al., *A Systems Approach to Custom VLSI for a Digital Color Imaging System,* IEEE Journal of Solid-State Circuits Vol. 26 No. 5, pp. 727-737	May 1991
Nakamura et al., *Low-temperature poli-Si TFT-LCD with an integrated analog circuit*, Journal of the SID 10/3, 2002, pp. 203-207	2002
Mino et al., *Development of ASIC for VGA Display*, Fujitsu Ten Technical Journal No. 19 (2002), pp. 11-16	2002
McCartney et al., *WhisperBus^{TM} An Advanced Interconnect Link For TFT Column Driver Data*, Society For Information Display 01, pp. 106-109	July 5, 2012
Matherson et al., *Progress in the Development of Large-Area Modular 64x64 CdZnTe Imaging Arrays for Nuclear Medicine*, IEEE Transactions On Nuclear Science Vo. 45 No. 31998	June 1998
Reference Voltage Generator for LCD Gamma Correction, Burr-Brown Products from Texas Instruments,	December 2007
Lee et al., *A VLSI Controller for Active-Matrix LCDs* (ISSCC94), IEEE International Solid-State Circuits Conference, pp. 156-157	1994

[4] The dates in this column are the latest dates on which the publications were publicly available. Defendants reserve the right to identify earlier dates should such dates be ascertained through discovery.

Title, Author(s), and Publisher	Date of Publication[4]
Introduction to Driving LED Matrices (Application Note 1216), Agilent Technologies	May 7, 2001
PCA9544 4-channel I^2C multiplexer with interrupt logic, Philips Semiconductor	February 20, 2002
Irazabal et al., *I^2C Bus Overview*, Philips Semiconductor ("DesignCon 2003 Tec Forum")	January 27, 2003
La Hei, *TriMedia in signal processing for plasma-display panels*, Graduate Thesis, Eindhoven University of Technology	January 25, 2000

V. P.R. 3-3(B) – ANTICIPATION AND OBVIOUSNESS

The primary prior art references that Defendants rely on for the Asserted Patents are identified below. The exhibits to these Invalidity Contentions contain claim charts for the primary prior art references. Obviousness combinations of the primary prior art references are separately identified throughout these Invalidity Contentions (including below and in and in the accompanying claim charts).

Defendants' reliance on each prior art reference identified throughout these Invalidity Contentions (whether primary references or obviousness references) includes the reference itself, anything incorporated by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as named authors and inventors.[5] All such documents and information shall be considered one prior art reference to the extent they describe a single prior art system or solution, or the closely related work of a single prior art author. In addition to the specific references below, Defendants reserve the right to rely on all admitted prior art in the Asserted Patents and their respective file histories, as well as anything admitted as prior

[5] For example, for each patent identified as a prior art reference in these Invalidity Contentions, Defendants reserve the right to rely on the patent itself and/or any system that practices or embodies the patent to demonstrate invalidity.

art by Plaintiff or its experts or representatives. Defendants reserve the right to supplement these Invalidity Contentions as discovery reveals further information about prior use and/or prior public knowledge of products, methods, or systems that Defendants have reason to believe anticipate or render obvious one or more Asserted Claims. Defendants further reserve the right to identify and rely on additional prior art in Plaintiff's possession, custody, or control that has not yet been produced or identified to Defendants, including prior art identified and/or produced in prior litigations or in post-grant proceedings at the U.S. Patent and Trademark Office.

A. Primary References for the '305 Patent

The following prior art references, alone or in combination with any other reference identified in this subsection, render invalid one or more of the Asserted Claims of the '305 Patent.

1. U.S. Patent Publication No. 2002/0063666 ("Kang '666")

U.S. Patent Publication No. 2002/0063666, titled "Apparatus and Method for Correcting Gamma Voltage and Video Data in Liquid Crystal Display," was filed on June 28, 2001. Kang '666 qualifies as prior art to the Asserted '305 Patent under at least pre-AIA 35 U.S.C. § 102(e)(1). Kang '666 anticipates and/or renders obvious (in combination with the knowledge of a person of ordinary skill in the art) all asserted claims of the '305 Patent. The claim charts attached in at least Exhibits Kang '666 in view of Yoon '738, Kang '666 in view of Lee '839, Kang '666 in view of Ha '923, and Kang '666 in view of PCA9544 provides representative, non-limiting examples of where Kang '666 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Kang '666 does not anticipate any asserted of claims of the '305 Patent, such asserted claim would be obvious in view of Kang '666 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Kang '666 with concepts from other prior art, including any of the other primary references

or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness), and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

2. Korean Patent Publication No. KR2004/0038411 ("Hyeon '411")

Korean Patent Publication No. KR2004/0038411, titled "Liquid Crystal Display and Method of Driving the Same," was filed on November 1, 2001. Hyeon '411 qualifies as prior art to the Asserted '305 Patent under at least pre-AIA 35 U.S.C. § 102(b). Hyeon '411 anticipates and/or renders obvious (in combination with the knowledge of a person of ordinary skill in the art) all asserted claims of the '305 Patent. The claim chart attached as Exhibit Hyeon '411 provides representative, non-limiting examples of where Hyeon '411 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Hyeon '411 does not anticipate any asserted of claims of the '305 Patent, such asserted claim would be obvious in view of Hyeon '411 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Hyeon '411 with concepts from other prior art, including any of the other primary references or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness), and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

3. Japanese Patent Publication No. JP2001/147673 A ("Matsumoto '673")

Japanese Patent Publication No. 2001147673 A, titled "Liquid crystal display," was filed on November 11, 1999. Matsumoto '673 qualifies as prior art to the Asserted '305 Patent under at least pre-AIA 35 U.S.C. § 102(a), (b), and (e). Matsumoto '673 anticipates and/or renders obvious (in combination with the knowledge of a person of ordinary skill in the art) all asserted claims of

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the ’305 Patent. The claim chart attached as Exhibit Matsumoto ’673 provides representative, non-limiting examples of where Matsumoto ’673 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Matsumoto ’673 does not anticipate any asserted of claims of the ’305 Patent, such asserted claim would be obvious in view of Matsumoto ’673 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Matsumoto ’673 with concepts from other prior art, including any of the other primary references or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness), and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

4. Additional Primary References for the ’305 Patent

See Exhibits Petropoulous’068, Da Costa ’879, Tanaka ’906, Lee ’524, Yamaguchi ’499, Kang ’352, Whittington ’530, Dingwall ’805, Nakata ’409, Yer ’259, Myers ’127, Lee ’351, Bu ’232, and Morita ’028.

B. Primary References for the ’788 Patent

The following prior art references, alone or in combination with any other reference identified in this subsection, render invalid one or more of the Asserted Claim of the ’788 Patent.

1. Japanese Patent Publication No. JP1995/152347A (“Uehara ’347”)

Japanese Patent Publication No. JP1995/152347A, titled “Gamma Characteristic Correcting Method for Liquid Crystal Display Device,” was filed on November 29, 1993. Uehara ’347 qualifies as prior art to the Asserted ’788 Patent under at least pre-AIA 35 U.S.C. § 102(a) and (b). Uehara ’347 anticipates and/or renders obvious (in combination with the knowledge of a

person of ordinary skill in the art) all asserted claims of the ’788 Patent. The claim chart attached as Exhibit Uehara ’347 provides representative, non-limiting examples of where Uehara ’347 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Uehara ’347 does not anticipate any asserted of claims of the ’788 Patent, such asserted claim would be obvious in view of Uehara ’347 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Uehara ’347 with concepts from other prior art, including any of the other primary references or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness), and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

2. Japanese Patent Publication No. JP2001/016602A (“Kima ’602”)

Japanese Patent Publication No. JP2001/016602A, titled “Projection Liquid Crystal Display Device and Automatic Hue Adjustment System,” was filed on June 28, 1999. Kima ’602 qualifies as prior art to the Asserted ’788 Patent under at least pre-AIA 35 U.S.C. § 102(a) and (b). Kima ’602 anticipates and/or renders obvious (in combination with the knowledge of a person of ordinary skill in the art) all asserted claims of the ’788 Patent. The claim chart attached as Exhibit Kima ’602 provides representative, non-limiting examples of where Kima ’602 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Kima ’602 does not anticipate any asserted of claims of the ’788 Patent, such asserted claim would be obvious in view of Kima ’602 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Kima ’602 with concepts from other prior art, including any of the other primary references or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness),

and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

3. WIPO Publication No. WO 02/047397 A2 ("Evanicky '397")

WIPO Publication No. WO 02/047397 A2, titled "COMPACT FLAT PANEL COLOR CALIBRATION SYSTEM," was filed on December 10, 2001, and published on June 13, 2002. Evanicky '397 qualifies as prior art to the Asserted '788 Patent under at least pre-AIA 35 U.S.C. § 102(a) and (e). Evanicky '397 anticipates and/or renders obvious (in combination with the knowledge of a person of ordinary skill in the art) all asserted claims of the '788 Patent. The claim chart attached as Exhibit Evanicky '397 provides representative, non-limiting examples of where Evanicky '397 discloses, either expressly or inherently, each element, thereby anticipating those claims. To the extent Plaintiff asserts that Evanicky '397 does not anticipate any asserted of claims of the '788 Patent, such asserted claim would be obvious in view of Evanicky '397 alone and/or in view of the knowledge of one of ordinary skill in the art, and it would have been obvious to combine or modify Evanicky '397 with concepts from other prior art, including any of the other primary references or the references identified in the accompanying claim charts or Section V.C (State of the Art and Obviousness), and/or in view of the knowledge of one of ordinary skill in the art, including as explained herein, to achieve the claimed inventions.

4. Additional Primary References for the '788 Patent

See Exhibits Yamazaki '716, Whittington '530, Yer '259, Liaw '934, Petropoulos '068, and Matsui '150.

C. State of the Art and Obviousness

The primary references identified above, as further described in the Exhibits, each discloses, either expressly or inherently, every element of the Asserted Claims, thereby

anticipating those claims. Additionally, each of the primary references alone (including in combination with the knowledge of a person of ordinary skill in the art) renders obvious the Asserted Claims. To the extent Plaintiff contends that any primary reference does not anticipate or render obvious the Asserted Claims as set forth above, it would have been obvious to combine or modify the primary references with concepts from other prior art, as explained throughout these Invalidity Contentions. In particular, for each limitation of the Asserted Claims that Plaintiff contends is not met by a particular primary reference, Defendants contend that the limitation (and claim as a whole) is obvious based on a combination of that particular primary reference with (1) any other primary reference disclosing that limitation, (2) any reference identified in the accompanying claim charts as disclosing that limitation, (3) any statements made in the intrinsic record of the Asserted Patent, and/or (4) the knowledge of one of ordinary skill in the art (as explained in additional detail below).

Defendants do not yet have the benefit of Plaintiff's positions regarding the prior art, including what element(s), if any, Plaintiff contends are not disclosed by each prior art reference, whether Plaintiff contends that a reference is not in fact prior art, and whether Plaintiff contends that a person of ordinary skill in the art would not be motivated to combine specific references. Defendants reserve the right to supplement these obviousness positions (including identifying additional prior art combinations and the associated reasons to combine) in view of such positions and/or as discovery in the case, including expert discovery, progresses.

The information discussed in the prior art raised in these Invalidity Contentions forms the background knowledge of a person of ordinary skill in the art at the time the Asserted Patents were filed and would have been used in determining whether and how to combine references to achieve

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the claimed invention(s), as discussed herein.[6] Indeed, the existence, nature, and content of each prior art reference, including the prior art references cited herein, provide further evidence regarding the knowledge of a person of ordinary skill in the art at the relevant time. Defendants expressly reserve the right to rely on each of the prior art references, systems, concepts, and technologies discussed in these Invalidity Contentions, including to demonstrate that a particular claim element was known at the time of the Asserted Patents to a person of ordinary skill in the art, to show that the differences between a claimed invention and a prior art reference would have been obvious to a person of ordinary skill in the art, and to establish that a person of ordinary skill in the art would have been motivated to combine teachings of one or more references to achieve a claimed invention.

1. Motivations for Making Combinations of Prior Art

Defendants believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed in the attached charts; there was a reason to make each combination, each combination of art would have produced no unexpected results, and each combination at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 414–18 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like a pieces of a puzzle." *Id*. at 420–21.

[6] *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (stating that "the knowledge [of a person of ordinary skill in the art] is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious").

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Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify additional motivations and reasons to combine the cited art. A person of ordinary skill in the art would have been motivated to combine the primary and additional prior art references as set forth above and in the accompanying claim charts. Multiple teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references come from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or knowledge possessed by one of ordinary skill in the art.[7] In addition, the patentee admits in the intrinsic record, including the specification and prosecution history of the Asserted Patents, that many of the claimed features were conventional and known in the art (as described in further detail below).

In general, a claimed invention is unpatentable if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a); *Graham v. John Deere Co.*, 383 U.S. 1, 13–14 (1966). The ultimate determination of whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including: "(1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 877 (Fed. Cir. 1993) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18, 86 S.Ct. 684, 693–694, 15 L.Ed.2d 545 (1966)).

[7] Defendants reserve the right to present qualified expert testimony on any or all of these items.

KSR International Co. v. Teleflex Inc., et al., 550 U.S. 398 (2007) ("*KSR*"), reaffirmed *Graham*, holding that a claimed invention can be obvious even if there is no teaching, suggestion, or motivation for combining the prior art to produce that invention. In determining whether a claim is obvious, "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.* at 418. In determining whether a claim is obvious, "a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* When prior art elements are combined according to known methods to yield predictable results, the claimed invention is obvious. *Id.* at 417. In addition, "[o]ne of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims." *Id.* at 419–20. "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 420.

Any suggested obviousness combinations set forth herein are in the alternative to Defendants' anticipation contentions and are not to be construed to suggest that any reference included in any combination is not anticipatory in its own right or is not the basis for a single-reference obviousness defense. In particular, Defendants are currently unaware of the extent, if any, to which Plaintiff will contend that certain limitations of the Asserted Claims are not disclosed in the art identified by Defendants as anticipatory. To the extent that an issue arises with respect to any such claim limitation, Defendants reserve the right to identify other references and

combinations, which may make obvious the allegedly missing limitation in the disclosed system or method.

The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well. *In re Inland Steel Co.*, 265 F.3d 1354, 1362–64 (Fed. Cir. 2001).

In view of the Supreme Court's *KSR* decision, the PTO issued, and updated, a set of Examination Guidelines. *See* Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex, Inc.*, 72 Fed. Reg. 57526 (October 10, 2007); Examination Guidelines Update: Development in the Obviousness Inquiry After *KSR v. Teleflex*, 75 Fed. Reg. 53643-60 (September 2010); *see also* MPEP § 2141 (https://www.uspto.gov/web/offices/pac/mpep/s2141.html) (accessed January 13, 2021). These Guidelines summarized the *KSR* decision and subsequent case law, as well as identified various rationales for finding a claim obvious, including those based on other precedents. Those rationales include:

(1) Combining prior art elements according to known methods to yield predictable results;

(2) Simple substitution of one known element for another to obtain predictable results;

(3) Use of known technique to improve similar devices (methods, or products) in the same way;

(4) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(5) "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(6) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; and

(7) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

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Defendants contend that one or more of these rationales apply in considering the obviousness of the Asserted Claims of the Asserted Patents.

To the extent that prior art identified by Defendants as anticipatory are found not to anticipate the Asserted Claims: (1) the prior art establishes that the claimed subject matter was obvious to a person of ordinary skill in the art at the time of the alleged invention; (2) the claims are nevertheless unpatentable because the Asserted Claims contain nothing that goes beyond "ordinary innovation"; (3) no Asserted Claim goes beyond combining known elements to achieve predictable results (particularly in the predictable art(s) of the Asserted Patents) or does more than choose between clear alternatives known to those of skill in the art; and/or (4) the prior art renders the Asserted Claims obvious either alone or in combination with each other or one or more of the other references identified in these Invalidity Contentions.

2. Specific Motivations

Motivation to make the proposed combinations of prior art references and knowledge of one skilled in the art generally exists within the references themselves as well as within the knowledge of one skilled in the art in the relevant time frame. Below are exemplary specific motivations to combine references.

a. <u>Finite number of predictable solutions</u>

It would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Each of the references identified in these Invalidity Contentions are directed to the same field of endeavor (*e.g.*, gamma correction for manufactures of thin film transistor flat panel displays). *See* '305 Patent at 1:19-21. More specifically, each of the references identified herein are directed toward improvements in gamma correction systems

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that address limitations in the prior art identified by the Asserted Patents. Moreover, each of the references identified in these Invalidity Contentions are directed to solving the same alleged problems that the Asserted Patents identify in the prior art. *See e.g.*, '305 Patent at 2:10-12 ("Accordingly, it is desirable to design a gamma reference architecture that automates gamma adjustment and provides reprogrammable capability and achieves acceptable cost."); '788 Patent at 2:29-35 ("In the preferred embodiment, the present invention allows automated assembly of an entire PC board, automated test and gamma adjustment, smaller and thinner physical size, lower power consumption, reprogrammable and non-volatile settings. Furthermore, the present invention advantageously allows a stand-alone solution such that it is not necessary to incorporate a micro controller unit (MCU).").

The prior art identified herein solves the aforementioned problems identified in the Asserted Patents in the same way using the same equipment. Thus, as set forth in the aforementioned claim charts, a person of ordinary skill in the art would be motivated to look for solutions in other references in that field or that solve the same alleged problems.

Relatedly, one of ordinary skill in the art would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become smaller, become less expensive, become more commonly used, provide better performance, reduce costs, or predictably achieve other clearly desirable results.

b. Inherent motivation to combine

Many of these prior art references cite to, rely upon, incorporate, or are described as an inherent part of one another (*e.g.*, reliance or citations to generation of gamma reference signals used in conjunction with liquid crystal displays, gamma voltage control methods for achieving improved liquid crystal display performance, or the calibration of liquid crystal displays to a desired gamma curve), including as set forth in the aforementioned claim charts. By way of example, U.S. Patent Publication No. 2002/0063666 ("Kang '666"), titled "Apparatus and Method for Correcting Gamma Voltage and Video Data in Liquid Crystal Display," expressly refers to "a technique for driving a liquid crystal display, and more particularly to an apparatus and method for correcting a gamma voltage and a video data in a liquid crystal display that is capable of improving a display quality of the liquid crystal display." *See* Kang '666 at [0001]. Similarly, Korean Patent Publication No. KR2004/0038411 ("Hyeon '411"), titled "Liquid Crystal Display and Method of Driving the Same," provides a "liquid crystal display device including a liquid crystal panel in which a liquid crystal cell is formed at an intersection of gate lines and data lines, a gamma voltage generator for generating at least two sets of gamma voltages having different voltage ranges; and a control unit for controlling the gamma voltage generator in response to the identification signal from the identification signal generator, and a data driver for converting digital data into analog data using the selected gamma voltage set and supplying the analog data to the data lines." Hyeon '411 at [0049]. Moreover, Japanese Patent Publication No. JP1995/152347A ("Uehara '347"), titled "Gamma Characteristic Correcting Method for Liquid Crystal Display Device," discloses a gamma-characteristic adjustment method "which measures the light transmittance of the liquid crystal panel which applied voltage, and generates sequentially different voltage which should be applied to the aforementioned liquid crystal panel in the gamma-characteristics method of amendment of the liquid crystal display which asks for the gamma

characteristics of a liquid crystal panel based on the measured light transmittance, and corrects the gamma characteristics of a liquid crystal panel, and a step of calculating γ correction data in consideration of the γ characteristic of the γ - corrected video signal by multiplying the inverse function of the γ characteristic of the liquid crystal panel obtained based on the light transmittance by the inverse function of the γ characteristic of the γ - corrected video signal." Uehara '347 at [0007] [Machine Translated].

Many other references raised in these Invalidity Contentions rely on, incorporate, or cite to the generation of gamma reference signals used liquid crystal displays, gamma voltage control methods for achieving improved liquid crystal display performance, or calibration of liquid crystal displays to a desired gamma curve. *See, e.g.*, Kima '602 at Abstract, [0002] – [0003], [0023] – [0047].

c. <u>Overlapping authorship, inventorship, or assignees</u>

A person of ordinary skill in the art would be motivated to combine the work of the same prior art author. Similarly, certain of the prior art references involved the same firms or entities in their development, such as Hitachi (U.S. Patent Nos. 7,277,078; 7,023,458; and Japanese Patent Publication No. JP2002/372958), Philips (U.S. Patent Nos. 7,038,721; 6,762,737; US. Patent Publication No. 2002/0063666; Korean Patent Publication Nos. 2004/0062199; 2004/0038411; 100824415; and 100788387), Mitsubishi (U.S. Patent No. 6,765,961 and Japanese Patent Publication No. H10333648), Rohm (U.S. Patent Publication No. 2004/0090409 and Japanese Patent Publication No. 2004/165749), Samsung (U.S. Patent Nos. 8,253,671; 8,072,473; and U.S. Patent Publication No. 2003/0058235), Seiko (U.S. Patent No. 6,160,532; U.S. Patent Publication No. 2003/0151578; and European Patent Publication No. 1335344), and Sharp (U.S. Patent No. 6,762,737; and Japanese Patent Publication Nos. 2003/084727; and 2003/316333).

d. References from the same field

As shown in the attached charts, each of the references identified comes from the same field—*e.g.*, gamma correction for LCD panels. The problems sought to be solved by the identified references and systems were the same ones that had already been solved in the prior art. Indeed, the Asserted Claims recite one of a fine number of known, available alternatives to solve these known problems. The Asserted Claims simply combine previously known methods in a way that was explicitly and implicitly taught and suggested in the prior art. Implementing the teachings of the references identified herein would achieve improved performance.

e. Motivations based on admitted prior art

The Asserted Claims are further obvious in view of the admitted prior art in the specification and file history of the Asserted Patents. The Asserted Patents describe the conventional technology as of the alleged priority date:

> **Gamma Correction has long been a problem for the manufacturers of Thin Film Transistor (TFT) Flat Panel Displays. The Gamma Correction curve becomes more complex as the display resolution increases.** Each display often has a different response to the gamma correction reference Voltages, resulting in the need to generate specific gamma reference Voltages for each model of display as well as compensating for display to display variation due to manufacturing process variations.
>
> A traditional approach to the Gamma Reference Generation problem has been to use Select-On-Test Resistors. These resistors allow the reference voltages to be fine-tuned to the requirements of the individual display. The testing, selection and mounting of these resistors has become a major production problem since the process is a manual one and prohibits automated assembly and test. In addition, once the resistors are mounted on the display PC board, the resistors cannot be easily changed to meet the growing requirements of individual customers for a specific Gamma characteristic.
>
> Of course, even with the manual labor involved, Select-On-

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Test resistors are still the least expensive solution to this problem. **Devices such as potentiometers, Electrically Erasable Potentiometers (E2POTS), digitally-controlled potentiometers (DCPs) and Digital to Analog Converters (DACs) all could perform this function in some ways better than the Select-On-Test resistors, but the cost is unacceptable.**

FIG. 1 is a block diagram illustrating a conventional gamma reference circuit for a TFT display 105 using Select-On-Test-Resistors. In this case, source drivers 110, 111, . . . and 112 require a total of 16 gamma reference voltages 121 GM_1, 122 GM_2, 123 GM_3, 124 GM_4, 125 GM_5, 126 GM_6, 127 GM_7, 128 GM_8, 129 GM_9, 130 GM_{10}, 131 GM_{11}, 132 GM_{12}, 133 GM_{13}, 134 GM_{14}, 135 GM_{15} and, 136 GM_{16}. **The gamma reference voltages are derived by a resistive divider of 17 resistors** 141 R_1, 142 R_2, 143 R_3, 144 R_4, 145 R_5, 146 R_6, 147 R_7, 148 R_8, 149 R_9, 150 R_{10}, 151 R_{11}, 152 R_{12}, 153 R_{13}, 154 R_{14}, 155 R_{15}, 156 R_{16}, 157 R_{17} connected between a reference voltage 160 and ground 161. Since the loading of the source drivers 110, 111, and 112 changes dynamically, it is not possible to simply connect the resistive divider 141 R_1, 142 R_2, 143 R_3, 144 R_4, 145 R_5, 146 R_6, 147 R_7, 148 R_8, 149 R_9, 150 R_{10}, 151 R_{11}, 152 R_{12}, 153 R_{13}, 154 R_{14}, 155 R_{15}, 156 R_{16}, 157 R_{17} to the inputs of the source drivers 110, 111, and 112, and some type of buffering are used, such gamma reference buffer ICs 170 and 171.

. . .

More recently quite complex approaches to Gamma correction have been published. U.S. Pat. No. 6,593,934 (1) and U.S. Pat. No. 6,046,719 (2) are examples of inventions which eliminate the “select-on-test” resistors. **Both inventions teach quite complex digital approaches to this “analog” problem; consequently both inventions are quite expensive.** Accordingly, it is desirable to design a gamma reference architecture that automates gamma adjustment and provides reprogrammable capability and achieves acceptable cost.

. . .

In the preferred embodiment, the present invention allows automated assembly of an entire PC board, automated test and gamma adjustment, smaller and thinner physical size, lower power consumption, reprogrammable and non-volatile settings. **Furthermore, the present invention advantageously allows**

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> **a stand-alone solution such that it is not necessary to incorporate a micro controller unit (MCU)**.
>
> . . .
>
> The first gamma reference controller 210 and second gamma reference controller 220 provide the manufacturers of TFT displays a solution to the setting of the gamma reference voltages. Automated testing of the displays and re-programming of the gamma characteristics is enabled, even after the display is completed. **The first gamma reference controller 210 and second gamma reference controller 220 provide reduced overall implementation costs, reduced power consumption, reduced physical size and flexibility over the traditional Select-On-Test resistor techniques**.

See, e.g., '305 Patent and '788 Patent at 1:19 to 3:47 (emphasis added).

The Asserted Patents describe conventional methods for generating gamma reference voltages for TFT Flat Panel Displays, which were commonly used prior to the patent. The Asserted Patents mention the use of "select-on-test resistors," a process by which resistors were carefully chosen and manually mounted during the testing phase to meet the gamma correction requirements. This was a labor-intensive procedure, one not feasible for automated assembly and testing process, and once mounted, these resistors could not be easily adapted to meet various customer requirements.

Additionally, there were complex digital approaches, as captured in patents like U.S. Patent Nos. 6,593,934 and 6,046,719, which addressed gamma correction without needing select-on-test resistors but introduced significant cost due to their complexity. Persons skilled in the art were familiar with these methodologies, equipment, and the challenges associated with them. Techniques for generating and buffering gamma reference voltages using resistors and gamma reference buffer ICs were well understood, routine, and conventional. Implementing these in the way claimed by the Asserted Patents, with programmable buffers and non-volatile memory, aimed

to refine and simplify these fundamental concepts that dated back to earlier technologies. *See, e.g.*, Kang '666 at [0003] – [0020], Figs. 1 and 6; Hyeon '411 at [0024] – [0032], Fig. 1.

Defendants reserve the right to rely on any admissions in the Asserted Patents as part of any obviousness combination, as part of the motivation to combine, and also to explain the state of the art at the time of the Asserted Patents. Plaintiff has admitted—including in the Asserted Patents itself—that certain features and claim elements were known in the prior art before the effective date of the Asserted Patents.

3. State of the Art and Motivations to Combine

As explained above, Defendants contend that a person of ordinary skill in the art would have been motivated to combine any of the primary references in these Invalidity Contentions with (1) any other primary reference, (2) any reference disclosed in the accompanying claim charts as disclosing a limitation missing in a primary reference, (3) any statements made in the intrinsic record of the Asserted Patents, and/or (4) the knowledge of one of ordinary skill in the art.

The subsections below illustrate the state of the art and the knowledge of a person of ordinary skill in the art at the relevant times with respect to specific limitations, elements, or concepts either claimed in the Asserted Patents or alleged to be claimed in the Asserted Patents under Plaintiff's apparent view of the scope of the claims of the Asserted Patents. To the extent it is asserted that a specific limitation or element discussed below is not found in a reference charted in the attached charts, that missing limitation or element would have been well known to one of ordinary skill in the art, and the person of ordinary skill in the art would have been motivated to provide that missing limitation or element, based on his or her knowledge of the state of the art, as explained below.

a. "circuits for programming coupled to a multiplexer for addressing and programming said storage cells"

The idea of circuits "coupled to a multiplexer or addressing and programming storage cells" was well known in the art at the time of the '305 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach the circuits "coupled to a multiplexer": Ha '923; Lee '839; Yoon '738; the Philips PCA9544 Data Sheet; Matsumoto '673; Yamaguchi '638; Ito '222; Kwon '279; Tani '0775; Yamazaki '281; Petropoulous '068; Da Costa '879; Tanaka '906; Lee '524; Yamazaki '716; Yamaguchi '499; Kang '352; Whittington '530; Dingwall '805; Nakata '409; Yer '259; Myers '127; Lee '351; Tsai '528; Sakaguchi '861; Bu '232; Morita '028. Exemplary citations of where each of the prior art discloses circuits "coupled to a multiplexer" are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

Multiplexers are a common circuit component used to selectively connect one of several input signals to a single output based on a control signal or control signals. This functionality allows for efficient addressing and control of multiple storage locations, as evidenced by widespread use across various electronic systems and applications.

A person of ordinary skill in the art would have been motivated to implement a multiplexer such that the multiplexer is coupled to circuits for programming and addressing storage cells. The use of such technology would be the application of a known technique to a known system (*i.e.*, the prior art) ready for improvements to yield predictable results (*e.g.*, improved gamma correction).

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b. **"non-volatile storage cells are organized into two or more banks of cells wherein each bank contains a predetermined gamma reference voltage signal display condition"**

The idea of storage cells being "organized into two or more banks of cells" was well known in the art at the time of the '305 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach the storage cells being "organized into two or more banks of cells": A 9-Channel Programmable Power Reference Generator for Use With Resistor-String-DAC-Based TFT-LCD Source Drivers ("Meinstein"); Stenzel '032; Matsumoto '673; Yamazaki '281; Petropoulous '068; Da Costa '879; Tanaka '906; Lee '524; Yamazaki '716; Yamaguchi '499; Kang '352; Whittington '530; Dingwall '805; Nakata '409; Yer '259; Myers '127; Lee '351; Tsai '528; Sakaguchi '861; Bu '232; Morita '028. Exemplary citations of where each of the prior art discloses circuits storage cells being "organized into two or more banks of cells" are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement multiple banks of non-volatile storage cells for gamma reference voltage signals, as the architecture allows for efficient switching between predetermined display conditions while minimizing memory requirements and allowing for dynamic gamma correction based on different viewing conditions. The use of such technology would be the application of a known technique to a known system (*i.e.*, the prior art) ready for improvements to yield predictable results (*e.g.*, improved gamma correction).

c. "non-volatile storage cells are reprogrammable"

The idea of a non-volatile storage cells being "reprogrammable" was well known in the art at the time of the '305 Patent and had been accomplished in the context of many systems. By way

of non-limiting example, the following references teach circuits reprogrammable with non-volatile storage cells: Kang ’666; Evanicky ’397; Yamazaki ’281; Tani ’075; Jung-hwan ’997; Petropoulous ’068; Da Costa ’879; Tanaka ’906; Lee ’524; Yamazaki ’716; Yamaguchi ’499; Kang ’352; Whittington ’530; Dingwall ’805; Nakata ’409; Yer ’259; Myers ’127; Tsai ’528. Exemplary citations of where each of the prior art discloses circuits with reprogrammable non-volatile storage cells are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement non-volatile storage cells that are reprogrammable, as the ability to reprogram the gamma reference voltage signals stored in the non-volatile cells would allow the system to be updated and optimized throughout the life cycle of the system. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

d. <u>“drivers connected to said storage cells and to the plurality of outputs”</u>

The idea of “drivers connected to said storage cells and to the plurality of outputs” was well known in the art at the time of the ’305 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach drivers connected to storage cells and a plurality of outputs: Matsumoto ’673; Yamazaki ’281; Tani ’075. Exemplary citations of where each of the prior art discloses circuits with drivers connected to storage cells and to a plurality of outputs are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to connect drivers to both the storage cells and the outputs, thereby providing direct voltage translation from stored values to display column inputs. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

e. <u>"circuits for programming require an external source for the high voltage programming means"</u>

The idea of a circuits requiring "an external source for high voltage programming" was well known in the art at the time of the '305 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach the circuits reprogrammable non-volatile storage cells: The PCA9544 Data Sheet; Jung-hwan '997; Yamazaki '281; Petropoulous '068; Da Costa '879; Tanaka '906; Lee '524; Yamazaki '716; Yamaguchi '499; Kang '352; Whittington '530; Dingwall '805; Lee '351; Sakaguchi '861. Exemplary citations of where each of the prior art discloses circuits for programming requiring an external high voltage source are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement a programming circuit "requiring an external source for high voltage programming means" as an external voltage source allows for the programming circuitry to leverage a dedicated high voltage supply and simplifying the programming circuits design. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

f. "methods of calibrating a liquid crystal display to a desired gamma curve to compensate for panel to panel manufacturing variations"

The idea of calibrating liquid display panels to compensate for panel to panel manufacturing variations via desired gamma curves was well known in the art at the time of the '788 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach drivers connected to storage cells and a plurality of outputs: Evanicky '397; Jung-hwan '997; Liu '435. Exemplary citations of where each of the prior art discloses methods for calibrating liquid crystal displays to a desired gamma curve to compensate panel to panel manufacturing variations are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement a calibration method whereby a liquid crystal display would compensate for panel to panel manufacturing variations by selecting a desired gamma curve because manual gamma calibration using select-on-test resistors was a well-known bottleneck in liquid crystal display manufacturing that increased production costs and time. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

g. "gamma reference control capability which is electrically reprogrammable and nonvolatile"

The idea of having electrically reprogrammable and nonvolatile gamma reference control capabilities was well known in the art at the time of the '788 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach drivers connected to storage cells and a plurality of outputs: Evanicky '397; Jung-hwan '997; Liu

’435. Exemplary citations of where each of the prior art discloses electrically reprogrammable and nonvolatile gamma reference control capabilities are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement electrically reprogrammable and nonvolatile gamma reference control capability, eliminating the need to physically replace or adjust components like select-on-test resistors when gamma correction is needed. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

h. <u>“sensor is separate from said display”</u>

The idea of an optical sensor “separate from said display” was well known in the art at the time of the ’788 Patent and had been accomplished in the context of many systems. Such a feature would have been an obvious extension of existing sensors, and requires no inventive step to merely move a sensor out of the display. By way of non-limiting example, the following references teach an optical sensor “separate from said display”: Evanicky ’397; Tani ’075; Yamazaki ‘716; Whittington ‘530; Yer ‘259; Liaw ‘934; Petropoulous ’068; Greene ’825; Matsui ’150; Liu ’435. Exemplary citations of where each of the prior art discloses a sensor that is separate from a display are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement a sensor separate from the display, allowing for flexible positioning and replacement of optical

measurement equipment during calibration without requiring modifications to the display itself. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

i. <u>"wherein said means for executing said predictable algorithm is separate from said display to achieve the desired gamma curve"</u>

Similarly, the idea of having a means for executing a predetermined algorithm "separate from said display" was well known in the art at the time of the '788 Patent and had been accomplished in the context of many systems. Such a feature would have been an obvious extension of existing systems, and requires no inventive step to merely move certain components out of the display. By way of example, the following references teach a means for executing a predetermined algorithm "separate from said display": Yamazaki '716; Whittington '530; Yer '259; Liaw '934; Petropoulous '068; Nakao '716; Greene '825; Nakata '409; Tanaka '906; Matsui '150; Liu '435.

j. <u>"optimizing said gamma reference voltage levels using means for executing a predetermined algorithm"</u>

The idea of optimizing gamma reference voltage levels by means of executing "a predetermined algorithm" was well known in the art at the time of the '788 Patent and had been accomplished in the context of many systems. By way of non-limiting example, the following references teach drivers connected to storage cells and a plurality of outputs: Evanicky '397; Kwon '279; Liu '435. Exemplary citations of where each of the prior art discloses optimizing gamma reference voltage levels using a predetermined algorithm are provided in the attached charts. Although Defendants have identified at least one exemplary citation per element for each reference, each and every disclosure of the same or similar elements in said reference is not necessarily identified.

A person of ordinary skill in the art would have been motivated to implement an optimization methodology that applies a predetermined algorithm to enhance gamma calibration capabilities. The use of such technology would be the application of a known technique to a known system (i.e., the prior art) ready for improvements to yield predictable results (e.g., improved gamma correction).

4. Secondary Considerations

A patentee bears the burden of production with respect to evidence of secondary considerations of non-obviousness. *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018). As of the date of these Invalidity Contentions, Plaintiff has not identified any secondary considerations of non-obviousness. Defendants reserve all rights to respond to any secondary considerations of non-obviousness raised by Plaintiff, including by updating, modifying, and/or adding to these Invalidity Contentions. Defendants are not aware of any unexpected results (none is mentioned in the Asserted Patents or their file histories), long felt need, commercial success (or any nexus to any allegedly successful commercial embodiment), or awards for the Asserted Patents. Indeed, as shown in these Invalidity Contentions, dozens of other companies and individuals described, built, and/or patented the exact same concepts in the Asserted Patents before the original Assignee of the Asserted Patents ever did—often many years before. Even where others' inventions occurred at approximately the same time as the alleged invention in the Asserted Patents, such simultaneous invention further demonstrates the obviousness of the Asserted Patents.

VI. P.R. 3-3(C) – CLAIM CHARTS

The accompanying claim charts are based, in whole or in part, on Plaintiff's asserted theories of infringement in this case, to the extent discernible from Plaintiff's Disclosure of Asserted Claims and Infringement Contentions. As an initial matter, all portions of each prior art

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reference cited in each of the attached claim charts are relied upon to support the disclosure of each patent claim limitation, as all portions provide general support. Representative descriptions and supporting citations are nevertheless provided, but are merely exemplary; they do not necessarily reflect every instance where a particular claim term or claim limitation may be disclosed in or taught by the prior art reference. References to figures or drawings refer to the figures/drawings themselves, as well as to any accompanying text or text necessary to understand the figures or drawings. References to text refers to the text itself, as well as the accompanying figures or drawings that accompany the text. Defendants reserve the right to rely on additional, or different, portions of the prior art references, other publications and expert testimony to establish what these references would have taught one of ordinary skill in the art, or in what manner they would have motivated a particular combination of references. Moreover, in certain instances, representative documents for certain prior art systems are cited, but, again, are merely exemplary; they do not necessarily reflect or include every document relating to the prior art system that exists and that discloses or teaches a particular claim term or claim limitation. Defendants reserve the right to rely on any and all documents that describe or relate to prior art systems, including relying on the system itself. Defendants also reserve the right to rely on the testimony of the authors, named inventors, or anyone else with knowledge of the prior art references and systems identified herein, as well as expert testimony regarding any such references or systems.

VII. P.R. 3-3(D) – INVALIDITY UNDER 35 U.S.C. § 112

Defendants provide the following grounds for invalidity under 35 U.S.C. § 112, ¶¶ 1–2, and 6. Defendants' investigation of the Asserted Patents is ongoing, and Defendants reserve the right to amend or supplement these disclosures based on further investigation and in a manner consistent with the Federal Rules of Civil Procedure, the Local Patent Rules for the Eastern District of Texas, and the Docket Control Orders governing each respective case, or otherwise in

accordance with any order or direction of this Court or agreement of the parties. Further, Plaintiff's Infringement Contentions fail to provide sufficient detail to fully understand its proposed application of the Asserted Claims, and Defendants reserve the right to assert additional grounds for invalidity under 35 U.S.C. § 112 in response to Plaintiff's claim interpretations. Defendants also reserve the right to supplement, modify, or otherwise amend these grounds for invalidity under 35 U.S.C. § 112 based on the Court's claim construction rulings or opinions or the parties' positions or arguments taken in connection with the claim construction process.

In addition, Defendants identify claims below that are indefinite under 35 U.S.C. § 112 ¶¶ 2 and 6, which Defendants will more fully address these grounds as part of claim construction.[8] Defendants reserve the right to provide additional explanation and/or argument for their Invalidity Contentions under Section 112, including, for example, based on expert testimony.

A. Invalidity Based on Indefiniteness, Enablement, and Written Description

Defendants identify the below grounds upon which it presently contends the Asserted Claims of the Asserted Patents are invalid for failure to meet one or more of the requirements of 35 U.S.C. § 112. A more detailed basis for Defendants' indefiniteness, enablement, and/or written description defenses will be set forth in expert reports on invalidity, to be served in accordance with the Court's Scheduling Orders, or in its claim construction briefing. Defendants have not yet taken any depositions related to these issues. Defendants specifically reserve the right to amend and/or supplement these Invalidity Contentions based on a failure to comply with the requirements of 35 U.S.C. § 112.

[8] Any dependent claim is invalid if it depends, directly or indirectly, on another claim that is invalid under 35 U.S.C. § 112.

Indefiniteness: Section 112 includes a definiteness requirement. *See* 35 U.S.C. § 112 ¶ 2 ("[T]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.") The definiteness requirement of Section 112 requires that "a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S.Ct. 2120, 2129 (2014). Claims that depend from claims that are indefinite inherit the indefiniteness of the claims from which they depend and are also indefinite.

Written Description and Enablement: 35 U.S.C. § 112 ¶ 1 requires a patent to describe "the manner and process of making and using [the claimed invention], in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." A patent must disclose enough to permit a person of skill in the art, after reading the specification, to practice the claimed invention without undue experimentation. *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008). Moreover, "[t]he full scope of the claimed invention must be enabled." *Id.* at 999-1000 ("Because the asserted claims are broad enough to cover both movies and video games, the patents must enable both embodiments.") "Enabling the full scope of each claim is part of the quid pro quo of the patent bargain." *Id.*

35 U.S.C. § 112 further includes a written description requirement. 35 U.S.C. § 112 ¶ 1 ("The specification shall contain a written description of the invention . . . .") To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the

claimed invention at the time of filing the patent application. *See generally AriadPharms.*, *Inc. v. Eli Lilly and Co.,* 598 F. 3d 1336 (Fed. Cir. 2010).

Claims that depend from claims that are invalid for lack of enablement or written description support inherit the deficiencies of the claims from which they depend and are also invalid.

Indefiniteness Due to Lack of Corresponding Structure: 35 U.S.C. § 112 ¶ 6 requires a patent to claim an invention by specifying the corresponding structure, material, or acts that perform the function, rather than using purely functional terms to capture every possible way of performing the function. Claim terms that recite an invention using functional terms are invalid as indefinite, except for those adequately claimed and supported in accordance with § 112 ¶ 6. Under paragraph 6, an element in a claim may be expressed as a "means or step for performing a specified function without recital of structure, material, or acts in support thereof, and such claims shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." "The standard [for determining whether Section 112 paragraph 6 applies] is whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015). Although use of the word "means" in a claim creates a "presumption that § 112, ¶ 6 applies," "[w]hen a claim term lacks the word 'means,' the presumption can be overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function." *Id.* at 1348–49 (internal quotation marks omitted).

Subject to the reservation of rights above, Defendants provide below an identification of Asserted Claims that are, at least as apparently construed by Plaintiff in their Infringement Contentions, invalid pursuant to 35 U.S.C. § 112 as indefinite, not enabled, lacking sufficient written description or indefinite due to lack of corresponding structure.

1. Indefiniteness (35 U.S.C. § 112, ¶2)

One or more of the Asserted Claims are invalid because they fail to particularly point out and distinctly claim the subject matter that the listed inventors regarded as their inventions. Defendants contend that a person of ordinary skill in the art to which the purported invention pertains would not understand the scope of the below-identified claim language read in light of the pertinent specification. Accordingly, each of the claims incorporating the language identified below is indefinite under 35 U.S.C. § 112, ¶ 2:

The ’305 Patent

- All claims reciting “circuits for programming.” *See e.g.*, Claims 1,5.
- All claims reciting “non-volatile storage cells are reprogrammable.” *See e.g.*, Claim 2
- All claims reciting “high voltage programming means.” *See e.g.*, Claim 5.
- All claims reciting “an external source for high voltage programming means.” *See e.g.*, Claim 5.
- All claims reciting “gamma reference voltage signals for determining actual driving voltages of columns on a display.” *See e.g.*, Claim 1.
- All claims reciting “actual driving voltages.” *See e.g.*, Claim 1.
- All claims reciting “predetermined gamma reference voltage signal display condition.” *See e.g.*, Claim 1

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- All claims reciting "gamma reference control capability." *See e.g.*, Claim 1.
- All claims reciting "testing said display with at least one sensor with optical input, wherein said sensor is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "control circuit." *See e.g.*, Claim 1.
- All claims reciting "varying gamma reference voltage levels on columns of said display by a control circuit." *See e.g.*, Claim 1.
- All claims reciting "wherein said control circuit is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "optimizing said gamma reference voltage levels." *See e.g.*, Claim 1.
- All claims reciting "a predetermined algorithm." *See e.g.*, Claim 1.
- All claims reciting "means for executing a predetermined algorithm according to a predetermined criteria and data sensed by said at least one sensor." *See e.g.*, Claim 1.
- All claims reciting "means for executing said predetermined algorithm is separate from said display to achieve the desired gamma curve." *See e.g.*, Claim 1.

2. Written Description (35 U.S.C. § 112, ¶1)

Defendants contend that Plaintiff's apparent claim constructions render the Asserted Claims extremely broad in scope and well beyond the purported inventions described in the Asserted Patents. Plaintiff is attempting to construe the Asserted Patents in an idiosyncratic manner that is entirely inconsistent with the written specification of the Asserted Patents as well as with the understanding of one of ordinary skill in the art at the time the applications that issued as the Asserted Patents were filed. These allegations are inconsistent with the plain language of the claims, the supporting description, and the prosecution history.

The Asserted Claims are invalid because the specification of the Asserted Patents does not include sufficient written description of the purported inventions allegedly claimed in the Asserted Patents, and the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use any of the allegedly claimed inventions. 35 U.S.C. § 112, ¶ 1. Moreover, the patent applications that issued as the Asserted Patents did not contain a written description of the purported invention sufficiently clear and complete to enable one of ordinary skill in the art to which the purported invention pertains to make and use the purported inventions as claimed without undue experimentation. *Id.* To the extent any of the Asserted Claims are found to cover one or more of the Accused Instrumentalities identified in Plaintiff's Infringement Contentions, such Asserted Claims are also invalid under 35 U.S.C. § 112, ¶ 1 because their full scope is not enabled by the specifications of the relevant Asserted Patents.

Defendants contend that the full scope of each Asserted Claim was not described with particularity in the specification to which priority is sought, so as not to set forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the Asserted Patents is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1. The following claim terms are invalid for lack of written description under 35 U.S.C. § 112, ¶ 1:

The '305 Patent

- All claims reciting "circuits for programming." *See e.g.*, Claims 1,5.
- All claims reciting "non-volatile storage cells are reprogrammable." *See e.g.*, Claim 2
- All claims reciting "high voltage programming means." *See e.g.*, Claim 5.

- All claims reciting "an external source for high voltage programming means." *See e.g.*, Claim 5.
- All claims reciting "gamma reference voltage signals for determining actual driving voltages of columns on a display." *See e.g.*, Claim 1.
- All claims reciting "actual driving voltages." *See e.g.*, Claim 1.
- All claims reciting "predetermined gamma reference voltage signal display condition." *See e.g.*, Claim 1

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- All claims reciting "gamma reference control capability." *See e.g.*, Claim 1.
- All claims reciting "testing said display with at least one sensor with optical input, wherein said sensor is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "control circuit." *See e.g.*, Claim 1.
- All claims reciting "varying gamma reference voltage levels on columns of said display by a control circuit." *See e.g.*, Claim 1.
- All claims reciting "wherein said control circuit is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "optimizing said gamma reference voltage levels." *See e.g.*, Claim 1.
- All claims reciting "a predetermined algorithm." *See e.g.*, Claim 1.
- All claims reciting "means for executing a predetermined algorithm according to a predetermined criteria and data sensed by said at least one sensor." *See e.g.*, Claim 1.
- All claims reciting "means for executing said predetermined algorithm is separate from said display to achieve the desired gamma curve." *See e.g.*, Claim 1.

3. Lack of Enablement under 35 U.S.C. § 112 ¶ 1

The enablement requirement of 35 U.S.C. § 112, ¶ 1, requires that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). "[T]he scope of the claims must be less than or equal to the scope of the enablement." *Nat'l Recovery Tech., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999). Defendants contend that the following claim limitations fail to comply with 35 U.S.C. § 112, ¶ 1 due to lack of enablement and thus render the claims in which they are recited invalid:

The '305 Patent

- All claims reciting "circuits for programming." *See e.g.*, Claims 1,5.
- All claims reciting "non-volatile storage cells are reprogrammable." *See e.g.*, Claim 2
- All claims reciting "high voltage programming means." *See e.g.*, Claim 5.
- All claims reciting "an external source for high voltage programming means." *See e.g.*, Claim 5.
- All claims reciting "gamma reference voltage signals for determining actual driving voltages of columns on a display." *See e.g.*, Claim 1.
- All claims reciting "actual driving voltages." *See e.g.*, Claim 1.
- All claims reciting "predetermined gamma reference voltage signal display condition." *See e.g.*, Claim 1

The '788 Patent

- All claims reciting "gamma reference control capability." *See e.g.*, Claim 1.

- All claims reciting "testing said display with at least one sensor with optical input, wherein said sensor is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "control circuit." *See e.g.*, Claim 1.
- All claims reciting "varying gamma reference voltage levels on columns of said display by a control circuit." *See e.g.*, Claim 1.
- All claims reciting "wherein said control circuit is separate from said display." *See e.g.*, Claim 1.
- All claims reciting "optimizing said gamma reference voltage levels." *See e.g.*, Claim 1.
- All claims reciting "a predetermined algorithm." *See e.g.*, Claim 1.
- All claims reciting "means for executing a predetermined algorithm according to a predetermined criteria and data sensed by said at least one sensor." *See e.g.*, Claim 1.
- All claims reciting "means for executing said predetermined algorithm is separate from said display to achieve the desired gamma curve." *See e.g.*, Claim 1.

4. Lack of Corresponding Structure under 35 U.S.C. § 112 ¶ 6

One or more of the Asserted Claims are invalid because they fail to particularly point out and distinctly claim the subject matter that the listed inventors regarded as their inventions. Defendants contend that a person of ordinary skill in the art to which the purported invention pertains would not understand the scope of the below-identified claim language, as the specification does not disclose sufficient corresponding structure, material, or acts to perform the claimed function. Accordingly, each of the claims incorporating the language identified below is indefinite under 35 U.S.C. § 112 ¶ 6:

The '305 Patent

- All claims reciting "means to switch between the banks based on one or more external signals." *See e.g.*, Claim 1.
- All claims reciting "circuits for programming." *See e.g.*, Claims 1, 5.

The '788 Patent

- All claims reciting "varying gamma reference voltage levels on columns of said display by a control circuit." *See e.g.*, Claim 1.
- All claims reciting "means for executing said predetermined algorithm." *See e.g.*, Claim 1.
- All claims reciting "means for executing a predetermined algorithm according to a predetermined criteria and data sensed by said at least one sensor." *See e.g.*, Claim 1.

VIII. PATENT SUBJECT MATTER INELIGIBILITY CONTENTIONS

Defendants provide the following pursuant to the Court's Standing Order Regarding Subject Matter Eligibility Contentions, subject to supplementation, revision and amendment pursuant to Federal Rule of Civil Procedure 26(e) and the Orders of record in this matter to the extent appropriate in light of further investigation and discovery regarding the defenses below, the Court's construction of the claims at issue, and/or the review and analysis of expert witnesses.

Section 101 lists four broad categories of patent-eligible subject matter. 35 U.S.C. §101. In *Alice Corporation Pty. Limited v. CLS Bank International*, 573 U.S. 208, 216 (2014), the Court identified an exception to these categories— "[l]aws of nature, natural phenomena, and abstract ideas," which form the "basic tools of scientific and technological work," are not eligible for patent protection. *Id.* *Alice*'s two-step inquiry asks first whether the claims are issue are directed to a patent-ineligible idea, and if so, whether the court's search can uncover an "inventive concept"

"sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself." *Id*. at 218 (quoting *Mayo Collaborative Servs. v. Prometheus Labs.*, *Inc.*, 566 U.S. 66, 73 (2016)).

Claim 1 of the '788 Patent, considered as a whole, is ineligible under 35 U.S.C. § 101 because it is "directed to an abstract idea" and does not contain an "inventive concept" sufficient to "'transform the nature of the claim' into a patent-eligible application." *Alice Corp. Pty. v. CLS Bank Int'l*, 573 U.S. 208, 217-18 (2014) (quoting *Mayo Collaborative Servs. v. Prometheus Labs.*, *Inc.*, 566 U.S. 66, 73 (2016)). Claim 1 of the '788 Patent is directed to the abstract idea of optimization using a sensor and a circuit. Nothing in claim 1 of the '788 Patent transforms this abstract idea into a patent-eligible invention.

Moreover, all of the various limitations set forth in claim 1 of the '788 Patent were well-understood, routine, and conventional at the time of the priority date of the '788 Patent. Claim 1 of the '788 Patent therefore provides no inventive concept. *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1364 (Fed. Cir. 2015) ("These processes are well-understood, routine, conventional data-gathering activities that do not make the claims patent eligible"). The bases for Defendants' subject-matter eligibility contentions for claim 1 of the '788 Patent are set forth more fully in the chart attached hereto as Exhibit A.

IX. DOCUMENT PRODUCTION ACCOMPANYING INVALIDITY CONTENTIONS

Pursuant to Local Patent Rule 3-4, Defendants concurrently produce a copy of each item of prior art identified which does not appear in the file history of the asserted patent. To the extent any items are not in English, an English translation of the portions relied upon are being produced. Defendants hereby incorporate into their production all documents produced collectively herein

by each Defendant. Additionally, Defendants incorporate into their production all prior art previously produced by Defendants in related litigation.

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Dated: November 15, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing document was served on all counsel of record via email on this 15th day of November 2024.

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