

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.**

**Before the Honorable Bryan F. Moore
Administrative Law Judge**

In The Matter Of

**CERTAIN ACTIVE MATRIX ORGANIC
LIGHT-EMITTING DIODE DISPLAY PANELS
AND MODULES FOR MOBILE DEVICES,
AND COMPONENTS THEREOF**

Investigation No. 337-TA-1351

RESPONDENTS' NOTICE OF PRIOR ART

Pursuant to Order No. 14 (Issuing Replacement Ground Rules), Ground Rule 8, and Order No. 11 (Amending the Procedural Schedule), Respondents Mianyang BOE Optoelectronics Technology Co., Ltd., Apt-Ability, LLC d/b/a MobileSentry, and Mobile Defenders LLC (collectively "Respondents") hereby submit their Notice of Prior Art. Respondents may rely on the references listed below, either singly or in combination, to establish the invalidity and/or unenforceability of each respective Asserted Patent. Respondents may also rely on Complainant's employees, former employees, consultants and/or other persons affiliated with Complainant who may have knowledge of, or have previously used or offered for sale, the alleged inventions of the Asserted Patents and the prior art identified by Respondents in this proceeding, including but not limited to those identified herein.

In addition to the specific prior-art references listed below, Respondents also give notice that they may rely upon the following: (i) prior art contained within its July 14, 2023 Invalidity Contentions, and supplements thereto; (ii) any earlier publications of the same patent application resulting in a publication identified herein; (iii) prior art referenced by the Asserted Patents or contained within the prosecution histories of the Asserted Patents; and (iv) prior art referenced

by or contained within the prosecution histories of patents or patent applications related to the Asserted Patents.

The list of prior art and related disclosures provided below is based on Respondents' present understanding and investigation. Discovery in this Investigation is ongoing; depositions of Complainant's corporate witnesses relating to the Asserted Patents, and other witnesses concerning prior art to the Asserted Patents, have not yet occurred. Respondents reserve the right to amend and/or supplement this Notice of Prior Art upon written notice for good cause shown to identify prior-art references that may be discovered after the date of this Notice. Respondents also reserve the right to rely on intervening prior art, including other related patents and published applications as well as prior art not listed in the tables below in the event one or more claims of the Asserted Patent is not entitled to the earliest claimed priority date.

I. PRIOR ART FOR U.S. PATENT NO. 7,414,599

A. Patents

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US5666 046A	Reference voltage circuit having a substantially zero temperature coefficient	8/24/1995	9/9/1997	Mietus
US	US6229 506B1	Active matrix light emitting diode pixel structure and concomitant method	4/22/1998	5/8/2001	Dawson
US	US6362 798B1	Transistor circuit, display panel and electronic apparatus	3/17/1999	3/26/2002	Kimura
US	US6091 203A	Image display device with element driving device for matrix drive of multiple active elements	3/25/1999	7/18/2000	Kawashima
US	US6525 704B1	Image display device to control conduction to extend the life of organic EL elements	6/8/2000	2/25/2003	Kondo

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US20010019327A1	Active driving circuit for display panel	3/5/2001	9/6/2001	Kim
US	US20010022565A1	Electronic device and method of driving electronic device	3/5/2001	9/20/2001	Kimura
US	US20020101172A1	OLED active driving system with current feedback	3/29/2001	8/1/2002	Bu
JP	JP2002032035A	EL display device and its inspecting method	5/10/2001	1/31/2002	Koyama
JP	JP2002341829A	Display pixel circuit	5/17/2001	11/29/2002	Sakurai
JP	JP2003005710A	Current driving circuit and image display device	6/25/2001	1/8/2003	Nishitoba
US	US20020021293A1	Circuit, driver circuit, electro-optical device, organic electroluminescent display device electronic apparatus, method of controlling the current supply to a current driven element, and method for driving a circuit	7/9/2001	2/21/2002	Tam
KR	KR1020020032570A	Current sampling circuit for organic electroluminescent display	7/9/2001	5/3/2002	Tam
US	US20020005825A1	Electro-luminescence panel	7/13/2001	1/17/2002	Lee
JP	JP2003076327A	Driving circuit of current driven element, driving method and image display device	9/5/2001	3/14/2003	Iguchi
JP	JP2003084689A	EL display device and electronic equipment	9/14/2001	3/19/2003	Nakamura
JP	JP4815727B2	EL display device and electronic apparatus	9/14/2001	11/16/2011	Nakamura

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2002 004783 9A1	Driving circuit for active matrix type display, drive method of electronic equipment and electronic apparatus, and electronic apparatus	9/20/2001	4/25/2002	Kasai
US	US2002 007458 0A1	Thin film transistor for supplying power to element to be driven	9/28/2001	6/20/2002	Anzai
JP	JP2003 108067 A	Display device	9/28/2001	4/11/2003	Matsumoto
JP	JP2003 122303 A	EL display panel and display device using the same, and its driving method	10/16/2001	4/25/2003	Takahara
CN	CN136 1510A	Organic electric lighting displaying device and its driving method and picture element circuit	11/2/2001	7/31/2002	Kwon
JP	JP2003 150104 A	Method for driving EL display device, and EL display device and information display device	11/15/2001	5/23/2003	Takahara
TW	TW529 006B	Array circuit of light emitting diode display	11/28/2001	4/21/2003	Chen
US	US2002 011815 0A1	Organic electroluminescent display, driving method and pixel circuit thereof	12/7/2001	8/29/2002	Kwon
US	US2002 010117 7A1	Electro-luminescence panel	12/21/2001	8/1/2002	Bae
US	US2003 011708 2A1	Organic electroluminescent device compensated pixel driver circuit	12/21/2001	6/26/2003	Tam
CN	CN136 3916A	Drive circuit for displaying active matrix method in device	1/5/2002	8/14/2002	Pae
US	US2002 013530 9A1	Pixel driving circuit for light emitting display	1/22/2002	9/26/2002	Okuda
US	US2002 015858 7A1	Organic EL pixel circuit	2/12/2002	10/31/2002	Komiya

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2003 011220 8A1	Self-luminous display	3/15/2002	6/19/2003	Okabe
US	US2002 013531 2A1	Light emitting device, driving method for the same and electronic apparatus	3/21/2002	9/26/2002	Koyama
US	US2002 019596 8A1	OLED current drive pixel circuit	6/21/2002	12/26/2002	Sanford
US	US2003 001158 4A1	Light emitting device	7/16/2002	1/16/2003	Azami
CN	CN142 7385A	Driving of data line used in control of unit circuit	8/1/2002	7/2/2003	Kasai
US	US2003 003060 3A1	Drive circuit for display device	8/5/2002	2/13/2003	Shimoda
US	US2003 006742 4A1	Image display device	8/6/2002	4/10/2003	Akimoto
US	US2004 004175 0A1	Current load device and method for driving the same	8/27/2002	3/4/2004	Abe
CN	CN140 7629A	Luminous device and its driving method, element substrate and electronic apparatus	8/28/2002	4/2/2003	Kimura
CN	CN140 2211A	Current load device and driving method thereof	8/29/2002	3/12/2003	Abe
US	US2003 006252 4A1	Light emitting device, method of driving a light emitting device, element substrate, and electronic equipment	8/29/2002	4/3/2003	Kimura
US	US2003 009882 9A1	Active matrix led pixel driving circuit	9/3/2002	5/29/2003	Chen
WO	WO200 302799 7A1	Display apparatus and its driving method	9/12/2002	4/3/2003	Kimura
KR	KR102 004003 9395A	Display apparatus and its driving method	9/12/2002	5/10/2004	Kimura

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
CN	CN155 6976A	Display device and driving method thereof	9/12/2002	12/22/2004	Kimura
KR	KR100 924739 B1	Display apparatus and its driving method	9/12/2002	11/5/2009	Kimura
CN	CN102 290005 A	Display device and driving method thereof	9/12/2002	12/21/2011	Kimura
CN	CN102 290005 B	The driving method of organic LED display device	9/12/2002	6/20/2017	Kimura
CN	CN107 230450 A	Display device and its driving method	9/12/2002	10/3/2017	Kimura
JP	JP2003 173165 A	Display device	9/13/2002	6/20/2003	Aoki
US	US2003 005868 7A1	Semiconductor device	9/17/2002	3/27/2003	Kimura
US	US2003 009044 7A1	Display device and driving method thereof	9/18/2002	5/15/2003	Kimura
US	US7138 967B2	Display device and driving method thereof	9/18/2002	11/21/2006	Kimura
WO	WO200 302799 8A1	EL display panel and EL display apparatus comprising it	9/20/2002	4/3/2003	Yamano
TW	TW569 176B	Display device and driving method thereof	9/20/2002	1/1/2004	Kimura
CN	CN140 9289A	Semiconductor device	9/23/2002	4/9/2003	Kimura
US	US2003 006674 0A1	Switching element, display device, light emitting device using the switching element, and semiconductor device	10/9/2002	4/10/2003	Inukai
US	US2003 011735 2A1	Semiconductor device and driving method thereof	10/24/2002	6/26/2003	Kimura
US	US2004 008047 4A1	Light-emitting device and driving method thereof	10/24/2002	4/29/2004	Kimura

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2003 013293 1A1	Semiconductor device and driving method thereof	10/30/2002	7/17/2003	Kimura
US	US7429 985B2	Semiconductor device and driving method thereof	10/30/2002	9/30/2008	Kimura
EP	EP1310 937A1	Active matrix electroluminescent display device and method for driving the same	11/13/2002	5/14/2003	Kimura
US	US7306 981B2	Semiconductor manufacturing method	11/14/2002	12/11/2007	Kuwabara
US	US2003 012274 5A1	Pixel circuit for light emitting element	12/11/2002	7/3/2003	Miyazawa
US	US2003 021449 3A1	Image display	1/10/2003	11/20/2003	Akimoto
US	US2003 013750 3A1	Semiconductor device and method of driving the semiconductor device	1/24/2003	7/24/2003	Kimura
US	US7221 342B2	Electroluminescent display device	2/7/2003	5/22/2007	Fish
US	US2004 004616 4A1	Display unit, drive circuit, amorphous silicon thin-film transistor, and method of driving OLED	2/25/2003	3/11/2004	Kobayashi
US	US2003 021424 5A1	Light emitting device	2/27/2003	11/20/2003	Yamazaki
US	US2003 016468 5A1	Display device, light emitting device, and electronic equipment	2/28/2003	9/4/2003	Inukai
US	US2004 017434 9A1	Driving circuits for displays	3/4/2003	9/9/2004	Libsch
US	US2004 004175 2A1	Display apparatus and driving method thereof	5/16/2003	3/4/2004	Kimura
US	US7345 685B2	Electronic circuit, optoelectronic device, method for driving optoelectronic device, and electronic apparatus	5/27/2003	3/18/2008	Miyazawa

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2004 005625 7A1	Light-emitting device, method for driving light-emitting device and element board	5/29/2003	3/25/2004	Sakamoto
US	US2004 003666 4A1	Electronic device, method of driving electronic device, and electronic apparatus	6/9/2003	2/26/2004	Miyazawa
US	US2004 005625 2A1	System and method of driving electro-optical device	7/30/2003	3/25/2004	Kasai
US	US2004 010042 7A1	Electronic circuit, electro-optical device, method for driving electro-optical device and electronic apparatus	7/31/2003	5/27/2004	Miyazawa
US	US2004 009533 8A1	Electronic circuit, method of driving electronic circuit, electro-optical device, method of driving electro-optical device, and electronic apparatus	8/22/2003	5/20/2004	Miyazawa
US	US2004 007055 7A1	Active-matrix display device and method of driving the same	9/23/2003	4/15/2004	Asano
US	US2004 019622 3A1	Light emitting display, display panel, and driving method thereof	12/4/2003	10/7/2004	Kwon
JP	JP4496 852B2	Color image display device and electronic apparatus	6/10/2004	7/7/2010	Murai
JP	JP2006 018195 A	Display device	7/5/2004	1/19/2006	Kusakabe
US	US2007 005263 5A1	Display device and driving method thereof	11/13/2006	3/8/2007	Kimura
US	US7859 520B2	Display device and driving method thereof	11/13/2006	12/28/2010	Kimura
US	US2011 013416 3A1	Display device and driving method thereof	12/23/2010	6/9/2011	Kimura
US	US8599 109B2	Display device and driving method thereof	12/23/2010	12/3/2013	Kimura

B. Publications

Title	Date	First Named Author	Pages
Physics and Technology of Semiconductor Devices	1967	Grove	329-330
Modeling and Simulation of Insulated-Gate Field-Effect Transistor Switching Circuits, IEEE Journal of Solid-State Circuits, Vol. SC-3, No. 3	9/1968	Shichman	285-289
Analog Integrated Circuit Design	1997	Johns	16-23, 125-126
The Impact of the Transient Response of Organic Light Emitting Diodes on the Design of Active Matrix OLED Displays, IEEE IEDM 98 Technical Digest, pp. 875-878 (1998)	9/1998	Dawson	875-878
Current-Writing Active-Matrix Circuit for Organic Light-Emitting Diode Display Using a-Si:H Thin-Film-Transistors	2000	Hattori	779-782
A New Pixel Circuit for Active Matrix Organic Light Emitting Diodes, IEEE Electron Device Letters vol. 23	2002	Goh	544-546
DOI:1.1830415, P-101: Current Driving Pixel Circuitries for Active Matrix Organic Light Emitting Diode Display, SID Symposium Digest of Technical Papers 33(1) (2002)	5/2002	Lin	
CMOS Digital Integrated Circuits: Analysis and Design, (third edition)	2003	Kang	71, 198
4.2: TFT AMOLED Pixel Circuits and Driving Methods, SID 03 Digest, pp. 10-13 (2003)	5/2003	Sanford	10-13
P-72: A Novel Pixel Circuit for Active-Matrix Organic Light-Emitting Diodes	5/2003 or at the latest 7/2/2003	Goh	494-497

II. PRIOR ART FOR U.S. PATENT NO. 9,330,593

A. Patents

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
EP	EP0179 605A2	Semiconductor memory device having a serial data	10/14/1985	4/30/1986	Ogawa

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
		input circuit and a serial data output circuit			
US	US4740 922A	Semiconductor memory device having a read-modify-write configuration	10/17/1985	4/26/1988	Ogawa
US	US4720 815A	Semiconductor memory device in form of shift register with two-phase clock signal supply	5/19/1986	1/19/1988	Ogawa
JP	JP2001 160299 A	Shift register and electronic device	12/2/1999	6/12/2001	Morosawa
JP	JP2002 197885 A	Shift register circuit, its drive control method, display driving device, and readout driving device	12/28/2000	7/12/2002	Sumi
US	US2003 013293 1A1	Semiconductor device and driving method thereof	10/30/2002	7/17/2003	Kimura
US	US2004 004672 9A1	Shift register and liquid crystal display having the same	6/4/2003	3/11/2004	Moon
US	US2003 022743 3A1	Shift register, liquid crystal display device having the shift register and method of driving scan lines using the same	6/10/2003	12/11/2003	Moon
JP	JP2005 149624 A	Shift register circuit and display device	11/17/2003	6/9/2005	Jinda
US	US7202 863B2	Semiconductor device, and display device and electronic device utilizing the same	12/22/2003	4/10/2007	Kimura
CN	CN160 9939A	Shift register	1/21/2004	4/27/2005	Zebedee
US	US2005 000811 4A1	Shift register, scan driving circuit and display apparatus having the same	6/10/2004	1/13/2005	Moon
US	US7486 269B2	Shift register, scan driving circuit and display apparatus having the same	6/10/2004	2/3/2009	Moon

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
TW	TW200502891A	Shift register, scan driving circuit and display apparatus having the same	6/14/2004	1/16/2005	Moon
TW	TWI373744B	Shift register, scan driving circuit and display apparatus having the same	6/14/2004	10/1/2012	Moon
JP	JP2005050502A	Shift register, scan driving circuit and display apparatus having the same	7/8/2004	2/24/2005	Moon
JP	JP5048917B2	Shift register, scan drive circuit and display device having the same	7/8/2004	10/17/2012	Moon
US	US7420536B2	Active matrix display device	10/15/2004	9/2/2008	Jang
US	US7120221B2	Shift register	11/15/2004	10/10/2006	Moon
US	US20050185752A1	Shift register for pulse-cut clock signal	12/6/2004	8/25/2005	Sasaki
CN	CN1674442A	Level conversion circuit and serial/parallel conversion circuit with level conversion function	12/20/2004	9/28/2005	Tobita
US	US20050264505A1	Shift register and liquid crystal display device using the same	12/30/2004	12/1/2005	Kim
US	US7203264B2	High-stability shift circuit using amorphous silicon thin film transistors	6/28/2005	4/10/2007	Lo
US	US20060001637A1	Shift register, display device having the same and method of driving the same	6/30/2005	1/5/2006	Pak
US	US20060038754A1	Pixel circuit and organic light emitting display using the same	7/20/2005	2/23/2006	Kim
US	US20060056267A1	Driving unit and display apparatus having the same	9/12/2005	3/16/2006	Kim
US	US20070085808A1	Systems involving signal driving circuits for driving displays	10/19/2005	4/19/2007	Lee

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2006 022058 7A1	Shift register and image display apparatus containing the same	10/26/2005	10/5/2006	Tobita
KR	KR102 007007 1703A	Hybrid gate driver for liquid crystal panel	12/30/2005	7/4/2007	Kim
CN	CN100 530438 C	Shift register circuit and image display apparatus containing the same	1/26/2006	8/19/2009	Tobita
KR	KR102 007010 3182A	Scan driving circuit and organic light emitting display using the same	4/18/2006	10/23/2007	Shin
KR	KR100 776510 B1	Scan driving circuit and organic light emitting display using the same	4/18/2006	11/16/2007	Shin
JP	JP2006 351165 A	Bootstrap circuit, and shift register, scanning circuit, and display device using bootstrap circuit	4/19/2006	12/28/2006	Shimoda
KR	KR100 707618 B1	Data driver and organic light emitting display using the same	5/9/2006	4/6/2007	Shin
US	US2007 013934 8A1	Systems for displaying images	7/10/2006	6/21/2007	Lee
US	US2007 004077 1A1	Shift register circuit	7/27/2006	2/22/2007	Chung
US	US2007 010340 4A1	Shift register circuit	8/17/2006	5/10/2007	Shin
US	US2007 006395 0A1	Scan driving circuit and organic light emitting display using the same	8/18/2006	3/22/2007	Shin
US	US7920 109B2	Emission driving device of organic light emitting display device	8/23/2006	4/5/2011	Chung
US	US2007 005265 3A1	Scan driving circuit and organic light emitting display device using the same	8/29/2006	3/8/2007	Shin

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2007 006393 3A1	Emission control line driver and organic light emitting display using the emission control line driver	9/12/2006	3/22/2007	Chung
CN	CN193 7022A	Scan driving circuit and organic light emitting display using the same	9/19/2006	3/28/2007	Shin
CN	CN100 541577 C	Scan driving circuit and organic light emitting display using the same	9/20/2006	9/16/2009	Shin
US	US2007 008900 0A1	Scan driving circuit and organic light emitting display using the same	9/28/2006	4/19/2007	Shin
JP	JP2007 279667 A	Scan driving circuit and organic light emitting display using same	10/11/2006	10/25/2007	Shin
KR	KR102 008003 3630A	Shift Register and Organic Light Emitting Display Device Using the Same	10/12/2006	4/17/2008	Jeong
JP	JP2007 286582 A	Scan driving circuit and organic light emitting display using the same	10/24/2006	11/1/2007	Shin
US	US2007 010338 9A1	Data driving circuit and electroluminescent display using the same	11/6/2006	5/10/2007	Shin
CN	CN101 013556 A	Scan driving circuit and organic light emitting display using the same	11/7/2006	8/8/2007	Shin
JP	JP2008 140490 A	Shift register, scanning line drive circuit, electro-optical device, and electronic device	12/4/2006	6/19/2008	Yamazaki
JP	JP2007 279684 A	Data driver and organic light emitting display using same	1/9/2007	10/25/2007	Shin
US	US2007 022940 9A1	Scan driving circuit and electroluminescent display using the same	1/19/2007	10/4/2007	Shin
US	US2007 024200 0A1	Scan driving circuit and organic light emitting display using the same	1/23/2007	10/18/2007	Shin
CN	CN101 241765 A	Shift register and LCD device	2/9/2007	8/13/2008	Chiang

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2007 024002 4A1	Scan driving circuit and organic light emitting display using the same	2/15/2007	10/11/2007	Shin
US	US2007 021661 2A1	Data driver and organic light emitting display using the same	3/13/2007	9/20/2007	Shin
US	US2007 024200 1A1	Scan driving circuit and organic light emitting display using the same	3/28/2007	10/18/2007	Shin
US	US7920 118B2	Scan driving circuit comprising a plurality of stages, each stage configured to receive multiple clocks	3/28/2007	4/5/2011	Shin
EP	EP1848 000A1	Scan driving circuit and organic light emitting display using the same	3/30/2007	10/24/2007	Shin
EP	EP1848 000B1	Scan driving circuit and organic light emitting display using the same	3/30/2007	10/19/2011	Shin
CN	CN101 051442 B	Data driver and organic light emitting display using the same	4/3/2007	9/1/2010	Shin
CN	CN101 059934 A	Scan driving circuit and organic light emitting display using the same	4/17/2007	10/24/2007	Shin
CN	CN101 059934 B	Scan driving circuit and organic light emitting display using the same	4/17/2007	1/26/2011	Shin
US	US2007 024793 2A1	Shift register circuit and image display comprising the same	4/24/2007	10/25/2007	Tobita
CN	CN101 064194 B	Shift register circuit and image display apparatus equipped with the same	4/25/2007	6/23/2010	Tobita
CN	CN100 592425 C	Shifting register and LCD	4/27/2007	2/24/2010	Yang
US	US2007 025855 7A1	Shift register circuit and pull high element thereof	5/2/2007	11/8/2007	Tseng
JP	JP2008 077051 A	Display device	5/29/2007	4/3/2008	Lee

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
CN	CN101093647 A	Gate driving circuit and display apparatus having the same	6/20/2007	12/26/2007	Lee
JP	JP2008003602 A	Gate driving circuit and display apparatus having the same	6/20/2007	1/10/2008	Lee
US	US2008006209 7A1	Shift register and organic light emitting display using the same	7/12/2007	3/13/2008	Jeong
US	US2007026376 3A1	Shift register and driving method thereof	7/19/2007	11/15/2007	Moon
CN	CN101145398 A	Shift register and organic light emitting display using the same	7/30/2007	3/19/2008	Jeong
CN	CN101122720 A	Gate driver and display apparatus having the same	7/31/2007	2/13/2008	Lee
US	US2008010152 9A1	Shift register and image display apparatus containing the same	7/31/2007	5/1/2008	Tobita
US	US2008005520 8A1	Emission driver and electroluminescent display including such an emission driver	8/29/2007	3/6/2008	Chung
US	US7893894B2	Organic light emitting display and driving circuit thereof	9/19/2007	2/22/2011	Lee
CN	CN101174070 A	Gate driving circuit, display apparatus having the same, and method thereof	10/30/2007	5/7/2008	Na
CN	CN101192391 A	Semiconductor circuit, scanning circuit and display device using these circuits	11/27/2007	6/4/2008	Otose
CN	CN101465165 A	Shift register	12/20/2007	6/24/2009	Tsai
JP	JP2009015291 A	Display device and driving method thereof	1/30/2008	1/22/2009	Lee
CN	CN101261881 A	Shift register circuit and image display apparatus containing the same	3/5/2008	9/10/2008	Tobita

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
CN	CN101261881 B	Shift register circuit and image display apparatus containing the same	3/5/2008	10/5/2011	Tobita
TW	TW200941441 A	Shift registers	3/21/2008	10/1/2009	Cheng
JP	JP2009229683 A	Display	3/21/2008	10/8/2009	Edo
JP	JP2009252269 A	Shift register circuit, display panel, and electronic apparatus	4/3/2008	10/29/2009	Jinda
CN	CN101556832 A	Shift register and liquid crystal display grid electrode driving device	4/10/2008	10/14/2009	Shang
US	US2008029749 5A1	Apparatus for driving a display device, display device including the same, and method thereof	6/2/2008	12/4/2008	Jung
JP	JP2008310317 A	Drive unit for liquid crystal display, and liquid crystal display containing the same	6/10/2008	12/25/2008	Nam
US	US2009002710 0A1	Level shifter and flat panel display using the same	6/11/2008	1/29/2009	Choi
US	US2008021940 1A1	Display device and electronic equipment	7/22/2008	2/19/2009	Tobita
JP	JP2009054273 A	Gate drive circuit, and display provided therewith	8/4/2008	3/12/2009	Kim
US	US2009011579 2A1	Bidirectional shift register and display device using the same	11/4/2008	5/7/2009	Otose
TW	TW201023156 A1	Shift register with pre-pull-down circuit	12/12/2008	6/16/2010	Tsai
JP	JP2010020279 A	Gate driver and display device having the same	1/9/2009	1/28/2010	Kwon
US	US2009025144 3A1	Shift register circuit, display panel, and electronic apparatus	2/24/2009	10/8/2009	Jinta

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2009 026205 1A1	Organic light emitting display device	4/6/2009	10/22/2009	Kim
CN	CN102 132356 A	Shift register circuit, display device and shift register circuit driving method	5/27/2009	7/20/2011	Iwamoto
CN	CN101 908381 A	Shift register	6/4/2009	12/8/2010	Chan
TW	TW201 044359 A1	Shift register	6/4/2009	12/16/2010	Hsu
JP	JP2010 044382 A	Liquid crystal display device	8/5/2009	2/25/2010	Son
US	WO201 006764 1A1	Scanning signal line driving circuit, shift register, and method of driving shift register	8/5/2009	6/17/2010	Iwase
US	US2010 017702 3A1	Shift register and organic light emitting display device using the same	9/28/2009	7/15/2010	Han
US	US2010 017708 7A1	Shift register and organic light emitting display device using the same	9/28/2009	7/15/2010	Han
US	US8284 150B2	Shift register and organic light emitting display device using the same	9/28/2009	10/9/2012	Han
JP	JP2011 085664 A	Driving circuit and display device	10/13/2009	4/28/2011	Ochiai
US	US2010 018831 6A1	Emission control driver and organic light emitting display device using the same	10/29/2009	7/29/2010	Jang
US	US2010 018838 1A1	Emission control driver and organic light emitting display device using the same	10/29/2009	7/29/2010	Jang
US	US2010 017168 9A1	Shift register and organic light emitting display device using the same	11/16/2009	7/8/2010	Jeong

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
JP	JP2011 123963 A	Shift register circuit	12/11/2009	6/23/2011	Hida
KR	KR101 056434 B1	Display device and driving method thereof	2/5/2010	8/11/2011	Eom
KR	KR102 011010 9473A	Apparatus for driving liquid crystal display device	3/31/2010	10/6/2011	Ha
KR	KR102 011012 0705A	Gate driving circuit and display apparatus having the same	4/29/2010	11/4/2011	Kim
KR	KR101 710661 B1	Gate driving circuit and display apparatus having the same	4/29/2010	2/28/2017	Kim
JP	JP2011 232697 A	Liquid crystal display device	4/30/2010	11/17/2011	Kita
US	US2011 011583 5A1	Pixel circuit and organic light- emitting diode display using the pixel circuit	7/26/2010	5/19/2011	Lee
US	US2011 018769 1A1	Scan driver and flat panel display apparatus including the same	8/30/2010	8/4/2011	Chung
KR	KR101 705370 B1	Light emitting control unit and display device using the same	9/6/2010	2/9/2017	Yoon
US	US8427 417B2	Driver circuit, display device including the driver circuit, and electronic device including the display device	9/8/2010	4/23/2013	Koyma
JP	JP2011 138100 A	Gate drive circuit and display device including the same	9/22/2010	7/14/2011	Kim
KR	KR102 012003 3672A	Driver, display device comprising the same	9/30/2010	4/9/2012	Chung
US	US2011 026732 6A1	Gate driving circuit and display apparatus having the same	10/5/2010	11/3/2011	Kim
US	US8810 498B2	Gate driving circuit and display apparatus having the same	10/5/2010	8/19/2014	Kim

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2011 022788 4A1	Scan driver and organic light emitting display using the scan driver	10/14/2010	9/22/2011	Chung
CN	CN102 479476 A	Shifting register unit and grid drive circuit as well as display device	11/26/2010	5/30/2012	Wu
CN	CN102 479477 A	Shifting register unit and grid drive circuit as well as display device	11/26/2010	5/30/2012	Wu
CN	CN102 237062 A	Gate driving circuit and display apparatus having the same	12/8/2010	11/9/2011	Kim
CN	CN102 237062 B	Gate driving circuit and display apparatus having the same	12/8/2010	5/20/2015	Kim
JP	JP2011 232730 A	Gate drive circuit and display device having the same	12/21/2010	11/17/2011	Kim
JP	JP5718 040B2	Gate drive circuit and display device having the same	12/21/2010	5/13/2015	Kim
US	US2012 001358 8A1	Display, Scan Driving Apparatus for the Display, and Driving Method Thereof	1/5/2011	1/19/2012	Chung
WO	WO201 114865 5A1	Shift register	1/6/2011	12/1/2011	Kikuchi
US	US2012 006252 5A1	Scan driver and organic light emitting display using the same	1/13/2011	3/15/2012	Kim
US	US2012 007525 9A1	Scan Driver and Driving Method Thereof	1/14/2011	3/29/2012	Chung
US	US9013 456B2	Scan driver and driving method thereof	1/14/2011	4/21/2015	Chung
WO	WO201 114865 8A1	Scanning signal line drive circuit and display device provided with same	1/18/2011	12/1/2011	Takahashi
US	US8922 471B2	Driver and display device using the same	1/21/2011	12/30/2014	Chung
US	US2011 029171 2A1	Scanning-line drive circuit	2/8/2011	12/1/2011	Tobita

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2011 021687 4A1	Pulse signal output circuit and shift register	2/22/2011	9/8/2011	Toyotaka
US	US2012 005023 4A1	Bi-directional scan driver and display device using the same	2/25/2011	3/1/2012	Jang
US	US9275 580B2	Driver and display device including the same	3/2/2011	3/1/2016	Chung
TW	TWI77 9333B	Pulse signal output circuit, shift register, semiconductor device, display module and electric device	3/2/2011	10/1/2022	Amano
CN	CN102 651186 A	Shift register and grid line driving device	4/7/2011	8/29/2012	Chen
US	US2011 018239 9A1	Shift register circuit and image display comprising the same	4/7/2011	7/28/2011	Tobita
US	US8493 309B2	Shift register circuit and image display comprising the same	4/7/2011	7/23/2013	Tobita
CN	CN102 629444 A	Circuit of gate drive on array, shift register and display screen	8/22/2011	8/8/2012	Chen
US	US2012 006254 5A1	Display device and driving method thereof	9/9/2011	3/15/2012	Kim
US	US2012 017641 7A1	Emission control line driver and organic light emitting display using the same	9/28/2011	7/12/2012	Jang
US	US2013 000230 6A1	Stage circuit and scan driver using the same	9/29/2011	1/3/2013	Chung
US	US2013 000263 0A1	Scan driver and organic light emitting display using the same	10/7/2011	1/3/2013	Lee
US	US2012 009880 7A1	Active level shift driver circuit and liquid crystal display apparatus including the same	10/20/2011	4/26/2012	Lee
US	US2013 002737 7A1	Gate driver and display device including the same	11/9/2011	1/31/2013	Yang

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2012 013357 4A1	Shift register unit, gate drive circuit, and display apparatus	11/25/2011	5/31/2012	Wu
US	US8553 026B2	Scan driver and driving method thereof	12/1/2011	10/8/2013	Park
US	US2012 032713 1A1	Stage circuit and emission driver using the same	2/23/2012	12/27/2012	Jang
CN	CN102 629463 A	Shift register unit, shift register circuit, array substrate and display device	3/29/2012	8/8/2012	Ma
JP	JP2012 160255 A	Shift register, scan driving circuit and display apparatus having the same	3/30/2012	8/23/2012	Moon
JP	JP5461 612B2	Shift register, scan drive circuit and display device having the same	3/30/2012	4/2/2014	Moon
US	US2013 012780 5A1	Scan driving device and driving method thereof	4/10/2012	5/23/2013	Chung
US	US8952 943B2	Scan driving device and driving method thereof	4/10/2012	2/10/2015	Chung
CN	CN102 682689 A	Shift register, grid drive circuit and display device	4/13/2012	9/19/2012	Wu
US	US2013 012780 7A1	Scan driver and driving method thereof	4/18/2012	5/23/2013	Kim
US	US8912 996B2	Scan driver and driving method thereof	4/18/2012	12/16/2014	Kim
US	US2013 012032 6A1	Scan driving device and method of driving the same	5/11/2012	5/16/2013	Chung
US	US8493 312B2	Shift register	8/10/2012	7/23/2013	Furuta
US	US2013 028588 8A1	Scan driving device and driving method thereof	8/24/2012	10/31/2013	Chung
US	US2013 016960 9A1	Shift Register and Gate Driving Circuit Using the Same	12/17/2012	7/4/2013	Son

Country	Number	Title	Filing Date	Publication Date	First Named Inventor
US	US2013 026611 3A1	Buffer circuit and buffer circuit driving method	1/7/2013	10/10/2013	Tsuge
US	US8816 949B2	Shift register circuit and image display comprising the same	6/10/2013	8/26/2014	Tobita

B. Publications

Title	Date	First Named Author	Pages
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27.1 Integrated pMOS Gate Driver for a 3D AMOLED Display, SID 11 Digest, pp. 349-352 (2011)	2011	Chung	349-352

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Dong-Beom Lee	On information and belief, may be contacted through counsel for SDC
Min-Hyuk Choi	On information and belief, may be contacted through counsel for SDC

III. PRIOR ART FOR U.S. PATENT NOS. 9,818,803, 10,854,683, AND 11,594,578

A. Patents

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US3971 065A	Color imaging array	3/5/1975	7/20/1976	Bayer
US	US4491 863A	Color display apparatus	12/3/1980	1/1/1985	Kurahashi
JP	JP1991 036239 B2	Color display unit	12/15/1982	5/30/1991	Seigo
JP	JPS591 11196A	Color display unit	12/15/1982	6/27/1984	Seigo
JP	JP1988 174378 U	Display device	12/5/1986	11/11/1988	Hara
US	US4965 565A	Liquid crystal display panel having a thin-film transistor array for displaying a high quality picture	5/6/1988	10/23/1990	Noguchi
JP	JP1996 335060 A	Driving method for matrix type color liquid crystal display device	6/13/1988	12/17/1996	Takahashi

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
JP	JP1998 091088 A	Matrix display device	9/1/1988	4/10/1998	Takashimizu
JP	JP1990 000826 A	Display device	11/28/1988	1/5/1990	Gibbons
US	US5113 274A	Matrix-type color liquid crystal display device	6/8/1989	5/12/1992	Takahashi
JP	JP1991 078390 A	Liquid crystal display device	8/21/1989	4/3/1991	Ishtani
JP	JP1991 269567 A	Large-sized display device	3/20/1990	12/2/1991	Akihiro
JP	JP1992 165331 A	Color liquid crystal display device	10/30/1990	6/11/1992	Toyoki
JP	JP1992 282554 A	Fluorescent lamp for display	3/11/1991	10/7/1992	Hitoshi
US	US5142 392A	Color liquid crystal display having light shielding layers and method of manufacturing thereof	4/30/1991	8/25/1992	Ueki
US	US5485 293A	Liquid crystal display including color triads with split pixels	9/29/1993	1/16/1996	Robinder
JP	JP3203 907B2	Display device	10/29/1993	9/4/2001	Kanai
US	US5461 503A	Color matrix display unit with double pixel area for red and blue pixels	4/7/1994	10/24/1995	Deffontaines
CN	CN106 2076C	Color liquid crystal display	12/23/1994	2/14/2001	Miyamoto
US	US5808 594A	Driving method for display device and display apparatus	9/26/1995	9/15/1998	Tsuboyama
US	US5742 129A	Organic electroluminescent display panel with projecting ramparts and method for manufacturing the same	2/16/1996	4/21/1998	Nagayama
JP	JP1998 039791 A	Organic electroluminescence display device	7/22/1996	2/13/1998	Nakamura

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US6014 121A	Display panel and apparatus capable of resolution conversion	12/24/1996	1/11/2000	Aratani
CN	CN118 7083A	Colour video frequency display scanning method	12/28/1996	7/8/1998	Ding
US	US6072 555A	Display apparatus capable of gradational display	1/28/1997	6/6/2000	Mizutome
FR	FR2760 559A1	Liquid crystal screen with asymmetric coloured pixels	3/7/1997	9/11/1998	Lopez
US	US6198 507B1	Solid-state imaging device, method of driving solid-state imaging device, camera device, and camera system	8/21/1997	3/6/2001	Ishigami
US	US5899 550A	Display device having different arrangements of larger and smaller sub-color pixels	8/26/1997	5/4/1999	Masaki
JP	JP1999 185654 A	Display board and image display device with display board	12/25/1997	7/9/1999	Masuda
US	US6326 981B1	Color display apparatus	8/28/1998	12/4/2001	Mori
US	US6882 364B1	Solid-state imaging apparatus and signal processing method for transforming image signals output from a honeycomb arrangement to high quality video signals	12/2/1998	4/19/2005	Inuiya
US	US6897 855B1	Tiled electronic display structure	2/16/1999	5/24/2005	Matthies
JP	JP2001 054127 A	Solid-state image pickup device and pixel defect compensation method	8/5/1999	2/23/2001	Osada
JP	JP2001 076881 A	Organic light-emitting device and manufacture therefor	9/7/1999	3/23/2001	Fujita
WO	JP2000 235891 A	Organic electroluminescent device	12/10/1999	8/29/2000	Fujimori
US	US6366 025B1	Electroluminescence display apparatus	2/24/2000	4/2/2002	Yamada

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JP	JP2001 326942 A	Solid-state image pickup device and signal processing method	5/12/2000	11/22/2001	Osada
US	US6570 584B1	Broad color gamut display	5/15/2000	5/27/2003	Cok
US	US6552 706B1	Active matrix type liquid crystal display apparatus	7/19/2000	4/22/2003	Ikeda
US	US7274 383B1	Arrangement of color pixels for full color imaging devices with simplified addressing	7/28/2000	9/25/2007	Brown Elliot
US	US6933 976B1	Solid-state image pickup device	9/1/2000	8/23/2005	Suzuki
KR	KR100 358502 B1	Organic Electro Luminescent Element Panel Materializing With Multiplex-Cell Structure	11/17/2000	10/30/2002	Lee
US	US6838 819B2	Full color organic EL display panel, manufacturing method thereof and driving circuit thereof	6/18/2001	1/4/2005	Kim
KR	KR100 807524 B1	Data wire structure of pentile matrix panel	10/12/2001	2/26/2008	Choo
US	US6768 482B2	Active matrix type display apparatus	11/21/2001	7/27/2004	Asano
US	US6714 206B1	Method and system for spatial-temporal dithering for displays with overlapping pixels	12/10/2001	3/30/2004	Martin
US	US6787 987B2	Electroluminescent color display panel	12/13/2001	9/7/2004	Duineveld
US	US2002 011319 5A1	Method of processing an image signal with the result from decision on a correlation corrected	12/19/2001	8/22/2002	Osada
US	US7110 031B2	State image pickup apparatus having pixel shift layout	12/20/2001	9/19/2006	Kondo
JP	JP2003 203770 A	Image display device	1/8/2002	7/18/2003	Saitoh

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2002 014083 3A1	Signal processing apparatus, signal processing method of the apparatus, operation process program of the method, and storage medium storing the program	2/4/2002	10/3/2002	Hirai
JP	JP2003 271076 A	Display device	3/19/2002	9/25/2003	Aoki
US	US2003 012817 9A1	Color flat panel display sub-pixel arrangements and layouts for sub-pixel rendering with split blue sub-pixels	10/22/2002	7/10/2003	Credelle
US	US7492 379B2	Color flat panel display sub-pixel arrangements and layouts for sub-pixel rendering with increased modulation transfer function response	10/22/2002	2/17/2009	Credelle
US	US7129 955B2	Image displaying method and image displaying device	10/23/2002	10/31/2006	Motomura
JP	JP2004 179028 A	Organic electroluminescent display device and its manufacturing method	11/28/2002	6/24/2004	Takahashi
JP	JP2004 192813 A	Organic electroluminescent display device	12/6/2002	7/8/2004	Yamashita
US	US2004 010881 8A1	Color OLED display having repeated patterns of colored light emitting elements	12/10/2002	6/10/2004	Cok
US	US6867 549B2	Color OLED display having repeated patterns of colored light emitting elements	12/10/2002	3/15/2005	Cok
US	US7230 594B2	Color OLED display with improved power efficiency	12/16/2002	6/12/2007	Miller
US	US2004 008047 9A1	Sub-pixel arrangements for striped displays and methods and systems for sub-pixel rendering same	1/16/2003	4/29/2004	Credelle
US	US7301 273B2	Display element array for emissive, fixed format display	2/20/2003	11/27/2007	Dedene

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US6835953B2	Desiccant structures for OLED displays	4/8/2003	12/28/2004	Cok
US	US20040201558A1	Color OLED display with improved power efficiency	4/11/2003	10/14/2004	Arnold
US	US6919681B2	Color OLED display with improved power efficiency	4/30/2003	7/19/2005	Cok
KR	KR1020040096706A	Liquid crystal display panel and driving apparatus thereof	5/10/2003	11/17/2004	Chae
US	US20040246426A1	Color pixel arrangement of display	6/3/2003	12/9/2004	Wang
US	US6987355B2	Stacked OLED display having improved efficiency	6/11/2003	1/17/2006	Cok
JP	JP2005005227A	Organic EL light-emitting display device	6/16/2003	1/6/2005	Kawachi
TW	TWI277930B	Color organic light emitting diode display with improved lifetime	7/2/2003	4/1/2007	Arnold
US	US7456827B2	Active matrix display with variable duty cycle	8/8/2003	11/25/2008	Rosmalen
JP	JP2005063787A	Organic EL display device	8/11/2003	3/10/2005	Arai
CN	CN100510883C	Improved four color arrangements of emitters for subpixel rendering	9/11/2003	7/8/2009	Brown Elliott
JP	JP2005100724A	Top emission type organic EL display device	9/24/2003	4/14/2005	Matsumoto
US	US20050078377A1	Method and apparatus for balancing color response of imagers	10/9/2003	4/14/2005	Li
US	US7525526B2	System and method for performing image reconstruction and subpixel rendering to effect scaling for multi-mode display	10/28/2003	4/28/2009	Brown Elliott
US	US7091986B2	Dynamic pixel resolution, brightness and contrast for	12/5/2003	8/15/2006	Phan

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
		displays using spatial elements			
CN	CN155 6543A	Plasma display structure	1/8/2004	12/22/2004	Chen
US	US8228 275B2	Optimal subpixel arrangement for displays with more than three primary colors	1/13/2004	7/24/2012	Langendijk
US	US7045 963B2	Plasma display panel	3/3/2004	5/16/2006	Chen
US	US2004 018376 4A1	Method and apparatus for calculating an average picture level and plasma display using the same	3/19/2004	9/23/2004	Kim
US	US7333 080B2	Color OLED display with improved power efficiency	3/29/2004	2/19/2008	Miller
CN	CN101 110444 A	Organic electroluminescent device and electronic apparatus	4/29/2004	1/23/2008	Kiguchi
JP	JP4496 852B2	Color image display device and electronic equipment	6/10/2004	7/7/2010	Murai
US	US2004 026365 2A1	Image-taking apparatus and solid-state image-taking element	6/24/2004	12/30/2004	Oda
JP	JP2006 018195 A	Display device	7/5/2004	1/19/2006	Kusakabe
US	US7187 425B2	Pixel structure, electro-optical apparatus, and electronic instrument	7/26/2004	3/6/2007	Yamazaki
US	US7612 811B2	Solid state imaging device incorporating a light shielding film having openings of different sizes	9/9/2004	11/3/2009	Takeuchi
US	US2005 008774 0A1	Organic electroluminescent display device of top emission type	9/15/2004	4/28/2005	Matsumoto
US	US7733 359B1	Pixel structure for electrical flat panel displays	9/15/2004	6/8/2010	Hagge
KR	KR102 005003 0165A	Top-emission type organic EL display device	9/24/2004	3/29/2005	Matsumoto

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2005 011661 5A1	Light emissive display device	9/29/2004	6/2/2005	Matsumoto
US	US2005 022557 5A1	Novel subpixel layouts and arrangements for high brightness displays	10/7/2004	10/13/2005	Brown Elliott
US	US7505 053B2	Subpixel layouts and arrangements for high brightness displays	10/7/2004	3/17/2009	Brown Elliott
US	US7663 299B2	Full-color organic electroluminescence display panel having sub pixel regions	10/26/2004	2/16/2010	Chao
US	US2006 011955 6A1	OLED displays with varying sized pixels	12/7/2004	6/8/2006	Winters
JP	JP2006 163316 A	Method for manufacturing color filter array	12/10/2004	6/22/2006	Takeichi
US	US7248 314B2	Liquid crystal display with the red, green, blue, and yellow sub-pixels surrounding the white sub-pixel	12/16/2004	7/24/2007	Yun
WO	WO200 506735 2A1	Display device, and method of manufacturing the display device	12/24/2004	7/21/2005	Chung
US	US2006 017071 2A1	Color display device with enhanced pixel pattern	2/1/2005	8/3/2006	Miller
CN	CN182 5424A	Pixel driving method for active display and system thereof	2/23/2005	8/30/2006	Lin
US	US2005 016207 9A1	Display device and manufacturing method thereof	3/18/2005	7/28/2005	Sakamoto
US	US7286 136B2	Display and weighted dot rendering method	4/12/2005	10/23/2007	Phan
KR	KR102 006011 8868A	Organic light emitting diode	5/17/2005	11/24/2006	Joo
US	US7250 722B2	OLED device	6/20/2005	10/27/2005	Cok

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US7990496B2	Pixel structure for flat panel display apparatus	7/22/2005	8/2/2011	Kwak
JP	JP3879766B2	Image display device	8/5/2005	2/14/2007	Naito
KR	KR1020070018631A	Plasma display panel	8/10/2005	2/14/2007	Son
US	US8063852B2	Light emitting display and light emitting display panel	9/29/2005	11/22/2011	Kwak
US	US7375464B2	Full-color organic light emitting display having red, green, blue, cyan, magenta, and yellow color modulation layers	10/18/2005	5/20/2008	Chin
CN	CN1773663A	Plasma display panel	11/14/2005	5/17/2006	Kwon
US	US7880698B2	Delta pixel circuit and light emitting display	11/14/2005	2/1/2011	Park
US	US7948506B2	Method and apparatus for defect correction in a display	11/15/2005	5/24/2011	Cok
KR	KR100742370B1	Fabrication Method of Organic Electro Luminescence Device	11/28/2005	7/24/2007	Kang
US	US20060119738A1	Image sensor, image capturing apparatus, and image processing method	12/5/2005	6/8/2006	Kido
US	US20090244101A1	Pixel layout for displays	12/5/2005	10/1/2009	Langendijk
JP	JP2007156126A	Electro-optical apparatus and electronic device	12/6/2005	6/21/2007	Iljima
US	US20060152531A1	Method and system for driving pixel in active matrix display	1/10/2006	7/13/2006	Lin
US	US20070024183A1	Full-color organic electroluminescence panel with high resolution	1/24/2006	2/1/2007	Lih
US	US7688368B2	Image sensor with improved light sensitivity	1/27/2006	3/30/2010	Kijima

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
JP	JP2006 309182 A	Display and electronic equipment using the same	3/23/2006	11/9/2006	Koyama
US	US2007 023081 8A1	Optimal hiding for defective subpixels	4/4/2006	10/4/2007	Messing
JP	JP2006 318898 A	Light emitting device	4/28/2006	11/24/2006	Jongman
US	US7755 569B2	Method for adjusting the visual qualities of images displayed on a monitor and related monitor	5/5/2006	7/13/2010	Wang
US	US7965 305B2	Color display system with improved apparent resolution	5/8/2006	6/21/2011	Miller
EP	EP1882 234B1	Multiprimary color subpixel rendering with metameric filtering	5/19/2006	1/2/2019	Brown Elliott
WO	WO200 612755 5A2	Multiprimary color subpixel rendering with metameric filtering	5/19/2006	11/30/2006	Brown Elliot
US	US7705 855B2	Bichromatic display	6/15/2006	4/27/2010	Brown Elliott
CN	CN187 4000A	Display faceplate of full color organic electroluminescence, and manufacturing method	6/26/2006	12/6/2006	Chao
US	US7646 430B2	Display system having improved multiple modes for displaying image data from multiple input source formats	6/28/2006	1/12/2010	Brown Elliott
US	US2008 000152 5A1	Arrangements of color pixels for full color OLED	6/30/2006	1/3/2008	Chao
US	US2007 236134 A1	OLED pixel structure and method for manufacturing the same	7/6/2006	10/11/2007	Ho
US	US7710 484B2	Driving method for CCD image sensor, and imaging method	7/10/2006	5/4/2010	Oda

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
CN	CN101009304 A	Pixel structure and organic EL component	1/9/2007	8/1/2007	Chao
US	US2007016433 5A1	Pixel cells in a honeycomb arrangement	3/5/2007	7/19/2007	Mckee
US	US8026669B2	Display device	3/30/2007	9/27/2011	Kawasaki
CN	CN101449382 A	Optoelectronic display and method of manufacturing the same	4/5/2007	6/3/2009	Smith
US	US2009030233 1A1	Optoelectronic display and method of manufacturing the same	4/5/2007	12/10/2009	Smith
CN	CN100448020 C	Electroluminescent display device	4/6/2007	12/31/2008	Lee
TW	TWI328207B	Display panels capable of displaying color images and method for forming the same and displays and full color displays comprising three-color pixel elements	4/20/2007	8/1/2010	Chao
CN	CN101051648 A	Organic lighting element color pixel array mode and its forming method	5/8/2007	10/10/2007	Chao
JP	JP2008298966 A	Image display device	5/30/2007	12/11/2008	Takasugi
US	US2008030881 9A1	Light-Emitting Diode Arrays and Methods of Manufacture	6/15/2007	12/18/2008	Louwsma
JP	JP2008015521 A	Color display panel and its forming method	6/28/2007	1/24/2008	Chao
US	US2008001876 5A1	CMOS image sensor and image sensing method using the same	7/17/2007	1/24/2008	Choi
US	US2008023155 4A1	Electro-luminescence display	7/17/2007	9/25/2008	Lee

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US	US20080042939A1	Image display device and electronic appliance	8/9/2007	2/21/2008	Yamashita
US	US20100171440A1	Illuminating device	8/9/2007	7/8/2010	Satou
KR	KR1020090017910A	Shadow mask and method of forming organic electroluminescence device using the same	8/16/2007	2/19/2009	Park
US	US20090051984A1	Image sensor having checkerboard pattern	8/23/2007	2/26/2009	O' Brien
US	US20080001527A1	Flat panel display with improved white balance	9/12/2007	1/3/2008	Koo
US	US2010045860A1	Color subtractive display	11/27/2007	2/25/2010	Roosendaal
US	US20080129195A1	Color EL display and method for producing the same	12/3/2007	6/5/2008	Ishizaki
WO	WO2008072704A1	Image display device	12/13/2007	6/19/2008	Kobayashi
US	US20080129853A1	Solid-state image sensing device driving method and solid-state image sensing apparatus	12/31/2007	6/5/2008	Watanabe
KR	KR1020090081825A	Method and apparatus for reproducing disc	1/25/2008	7/29/2009	Sik
US	US20100039011A1	Display apparatus and production method thereof	1/29/2008	2/18/2010	Karaki
JP	JP2009186876A	Electrooptical device and electronic device	2/8/2008	8/20/2009	Nozawa
US	US8118633B2	Color image display panel and method of producing the same, and color image display apparatus	4/1/2008	2/21/2012	Yuasa

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US	US2010 004569 5A1	Subpixel rendering area resample functions for display device	4/16/2008	2/25/2010	Brown Elliott
TW	TW200 945314 A	Subpixel rendering area resample functions for display devices	4/24/2008	11/1/2009	Brown Elliott
US	US2008 027379 3A1	Signal processing apparatus and method, noise reduction apparatus and method, and program therefor	4/30/2008	11/6/2008	Oishi
US	US2009 002737 7A1	Organic light emitting display and method of driving the same	5/6/2008	1/29/2009	Kwon
JP	JP2009 300748 A	Display and liquid crystal display	6/13/2008	12/24/2009	Tanno
JP	JP2010 003880 A	Display and electronic apparatus	6/20/2008	1/7/2010	Sagawa
WO	WO200 902555 4A1	A flexible display and a method of manufacturing a flexible display	8/22/2008	2/26/2009	Veenendaal
JP	JP2009 230096 A	Image display device and display unit for image display device	9/4/2008	10/8/2009	Hara
US	US8203 572B2	Organic light emitting display device and processing method of image signals thereof	10/1/2008	6/19/2012	Park
US	US2009 012198 3A1	Organic light emitting diode display and method for manufacturing the same	10/13/2008	5/14/2009	Sung
US	US2009 109172 A1	Electrophoretic display device having improved color gamut	10/22/2008	4/30/2009	Lee
US	US7982 786B2	Solid-state imaging device for color imaging	10/28/2008	7/19/2011	Nishida
US	US8564 700B2	Image processing device, image processing method, and imaging device using a patterned polarizer	11/28/2008	10/22/2013	Kanamori

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GB	GB2458340B	Three-dimensional image display device and method of driving the same	12/1/2008	7/21/2010	Hong
US	US20090267494A1	Organic light emitting diode display and manufacturing method thereof	12/4/2008	10/29/2009	Lee
US	US8390646B2	Subpixel rendering filters for high brightness subpixel layouts	12/12/2008	3/5/2013	Brown Elliott
JP	JP2010153173A	Substrate for film-formation, and method of manufacturing light emitting device	12/25/2008	7/8/2010	Ikeda
US	US20090195144A1	Light emitting device and electronic apparatus	1/29/2009	8/6/2009	Kitabayashi
US	US8008859B2	Organic light emitting display device	2/10/2009	8/30/2011	Yang
US	US8619008B2	Dividing pixels between chiplets in display device	2/13/2009	12/31/2013	Cok
US	US8253323B2	Organic light emitting device, method of manufacturing the same, and shadow mask therefor	4/1/2009	8/28/2012	Sung
US	US8237633B2	Electro-luminescent display with adjustable white point	5/12/2009	8/7/2012	Miller
US	US8446092B2	Self-light emitting display unit and electronic device	6/8/2009	5/21/2013	Tomida
US	US8896505B2	Display with pixel arrangement	6/12/2009	11/25/2014	Cok
US	US8350468B2	Organic electroluminescence display including a spacer and method for fabricating the same	6/22/2009	1/8/2013	Ko
US	US20090321727A1	Organic transistor array, display device and method of fabricating display device	6/24/2009	12/31/2009	Yutani
US	US8164605B2	Liquid crystal display panel and display devices	7/7/2009	4/24/2012	Hsieh
KR	KR1020110006343A	Pixel array for organic light emitting display device	7/14/2009	1/20/2011	Kim

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US	US2010 013399 4A1	Organic light emitting diode display and method for manufacturing the same	7/20/2009	6/3/2010	Song
US	US8542 432B2	Autostereoscopic display system with efficient pixel layout	8/14/2009	9/24/2013	Robinson
US	US8203 582B2	Subpixel rendering with color coordinates' weights depending on tests performed on pixels	8/24/2009	6/19/2012	Brown Elliott
US	US8405 672B2	Supixel [sic] rendering suitable for updating an image with a new portion	8/24/2009	3/26/2013	Han
KR	KR102 011002 3996A	Organic light emitting display device	9/1/2009	3/9/2011	Kim
US	US2010 011793 6A1	Organic light emitting display device and method of manufacturing the same	9/3/2009	5/13/2010	Lhee
US	US2011 005786 1A1	Tiled display with overlapping flexible substrates	9/8/2009	3/10/2011	Cok
JP	JP2011 076760 A	Organic EL device and method of manufacturing the same	9/29/2009	4/14/2011	Oshinomi
KR	KR102 011003 9773A	Organic light emitting display device	10/12/2009	4/20/2011	Kim
US	US2010 031531 8A1	Top emission type organic electroluminescent display device and method of fabricating the same	10/19/2009	12/16/2010	Lee
US	US2010 011752 8A1	Display device	11/11/2009	5/13/2010	Fukuda
US	US8120 020B2	Organic light emitting device	11/18/2009	2/21/2012	Kho
US	US8651 910B2	Organic electroluminescent display device and method of fabricating the same	12/24/2009	2/18/2014	Oh
US	US2010 025360 8A1	Pixel and organic light emitting display device using the same	1/13/2010	10/7/2010	Kim

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US	US7977870B2	OLED pixel structure and method for manufacturing the same	1/15/2010	7/12/2011	Ho
US	US20110018858A1	Organic light emitting display and method of driving the same	3/12/2010	1/27/2011	Ryu
KR	KR1020110106565A	Touch screen panel	3/23/2010	9/29/2011	Kim
US	US8570272B2	Electrophoresis display panel	4/1/2010	10/29/2013	Hsieh
US	US8797231B2	Display controller, display device, image processing method, and image processing program for a multiple viewpoint display	4/14/2010	8/5/2014	Satou
US	US20110025723A1	Pixel structure and organic light emitting display using the same	5/7/2010	2/3/2011	Kim
US	US20110025669A1	Organic light emitting display device	5/19/2010	2/3/2011	Kwak
KR	KR101332495B1	Image processing method and display device using the same	5/20/2010	11/26/2013	Park
US	US20120086330A1	Formation method of an organic layer, manufacturing method of an organic electroluminescent element, organic electroluminescent element, and organic electroluminescent display device	6/1/2010	4/12/2012	Umeda
US	US8519917B2	Organic light emitting display and method of driving the same	6/3/2010	8/27/2013	Ryu
US	US20120092536A1	Solid-state image pickup apparatus and camera	6/4/2010	4/19/2012	Hirota
US	US8139129B2	High sensitivity color filter array	6/14/2010	3/20/2012	Kozłowski

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KR	KR1020120000887A	Organic light emitting display and driving method thereof	6/28/2010	1/4/2012	Sung
JP	JP2011142289A	Organic light emitting display device	7/5/2010	7/21/2011	Lee
US	US20110115772A1	Pixel Circuit and Organic Electroluminescent Display Apparatus Using the Same	7/8/2010	5/19/2011	Chung
US	US20110215302A1	Organic light emitting diode (OLED) display	7/14/2010	9/8/2011	Lhee
US	US8405748B2	CMOS image sensor with improved photodiode area allocation	7/16/2010	3/26/2013	Mao
JP	JP2012028170A	Organic electroluminescent display device	7/23/2010	2/9/2012	Akimoto
US	US20110234550A1	Organic electroluminescent display device and method of fabricating the same	8/13/2010	9/29/2011	Hong
US	US9398205B2	Auto-focus control using image statistics data with coarse and fine auto-focus scores	9/1/2010	7/19/2016	Cote
US	US9799303B2	Display device	9/15/2010	10/24/2017	Mizukoshi
US	US20110216056A1	Organic light emitting display and driving method thereof	9/22/2010	9/8/2011	Yoo
US	US20110025582A1	Display device	9/27/2010	2/3/2011	Roh
US	US8786625B2	System and method for processing image data using an image signal processor having back-end processing logic	9/30/2010	7/22/2014	Cote
US	US20120268354A1	Display device	10/20/2010	10/25/2012	Mizukoshi

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US	US2011 017764 0A1	Method for manufacturing an organic light emitting diode display	12/8/2010	7/21/2011	Han
CN	CN102 054435 A	Organic light-emitting diode display and driving method of its display panel	1/21/2011	5/11/2011	Yang
US	US2011 029883 6A1	Organic light emitting diode display and driving method thereof	1/25/2011	12/8/2011	Komiya
CN	CN102 163615 A	Organic light emitting device display and method of manufacturing the same	1/27/2011	8/24/2011	Lee
US	US8547 507B2	Liquid crystal display device	1/28/2011	10/1/2013	Roh
US	US2011 029154 9A1	Pixel arrangement of an organic light emitting display device	1/31/2011	12/1/2011	Kim
US	US2011 029155 0A1	Pixel arrangement of an organic light emitting display device	1/31/2011	12/1/2011	Kim
US	US8354 789B2	Pixel arrangement of an organic light emitting display device	1/31/2011	12/1/2011	Kim
US	US8154 678B2	Display device, electronic device and method of driving display device	2/23/2011	4/10/2012	Kimura
JP	JP2011 198761 A	Mask assembly for thin-film deposition, organic light-emitting device using the same, and its manufacturing method	3/18/2011	10/6/2011	Lee
US	US8334 859B2	Electroluminescent display and method of driving same	3/28/2011	12/18/2012	Liu
US	US8902 245B2	Method for driving quad-subpixel display	4/7/2011	12/2/2014	So
US	US2011 026095 1A1	Subpixel arrangement structure of display device	4/12/2011	10/27/2011	Hwang
US	US2012 028760 5A1	Display with color control	5/9/2011	11/15/2012	Chen

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US	US2012 028714 8A1	Method and apparatus for improved subpixel rendering	5/13/2011	11/15/2012	Brown Elliott
US	US8698 834B2	Method and apparatus for selectively reducing color values	5/13/2011	4/15/2014	Brown Elliott
US	US8872 861B2	Apparatus for selecting backlight color values	5/13/2011	10/28/2014	Botzas
US	US8884 994B2	Method and apparatus for blending display modes	5/13/2011	11/11/2014	Brown Elliott
US	US2013 000291 1A1	Imaging device and image processing method	5/19/2011	1/3/2013	Miyashita
US	US8278 817B2	Display device with a plurality of picture elements and electronic device with display device	7/13/2011	10/2/2012	Kimura
US	US9583 034B2	Subpixel arrangement structure for display device	7/27/2011	2/28/2017	Hwang
US	US2013 003782 7A1	OLED light panel with controlled brightness variation	8/9/2011	2/14/2013	Levermore
US	US2012 004972 6A1	Organic electroluminescent device	8/26/2011	3/1/2012	Yoo
US	US2012 005653 1A1	Organic electroluminescent display device	9/7/2011	3/8/2012	Park
US	US8810 567B2	Image display apparatus	9/12/2011	8/19/2014	Niioka
US	US2013 008308 0A1	Optical system and method to mimic zero-border display	9/30/2011	4/4/2013	Rappoport
JP	JP2012 015129 A	Light-emitting device, display device, and lighting device	10/21/2011	1/19/2012	Kuwabara
CN	CN102 354702 A	Pixel structure of organic light emitting diode (OLED)	10/31/2011	2/15/2012	Chen
US	US2013 010689 1A1	Method of sub-pixel rendering for a delta-triad structured display	11/1/2011	5/2/2013	Matsueda

Country	Number	Patent Title	Filing Date	Publication Date	First Named Inventor
US	US2012 017629 8A1	Organic light emitting diode (OLED) display apparatus having light sensing function	11/15/2011	7/12/2012	Suh
US	US2013 013533 8A1	Method and system for subpixel-level image multitoneing	11/30/2011	5/30/2013	Gille
US	US9437 132B2	Devices and methods for providing access to internal component	11/30/2011	9/6/2016	Rappoport
US	US8736 641B2	Apparatus and method for driving organic light emitting display device	12/7/2011	5/27/2014	Byun
KR	KR102 012001 4074A	Pixel array for organic light emitting display device	1/4/2012	2/15/2012	Kim
US	US8405 689B2	Wide color gamut displays	1/12/2012	3/26/2013	Seetzen
CN	CN103 620666 B	Light output panel and device having same	4/10/2012	5/11/2018	Kroon
US	US2013 005752 1A1	Organic light emitting diode display	5/10/2012	3/7/2013	Kim
US	US2012 031384 4A1	Organic light-emitting display device and method of manufacturing the same	5/21/2012	12/13/2012	Im
US	US2012 032728 1A1	Electronic apparatus and driving method therefor	5/31/2012	12/27/2012	Mabuchi
US	US2013 012047 0A1	Shifted quad pixel and other pixel mosaics for displays	6/11/2012	5/16/2013	Djordjev
US	US2012 031956 4A1	Color organic light-emitting diode display device	6/15/2012	12/20/2012	Ghosh
US	US2013 012768 9A1	Multi-Colored Pixelated Display with Sparkle Reduction Surface	10/15/2012	5/23/2013	Gollier
US	US8853 016B2	Double gate thin-film transistor and OLED display apparatus including the same	2/4/2013	10/7/2014	Park

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US	US2013 017175 6A1	Organic EL display device and manufacturing method of the same	2/27/2013	7/4/2013	Ando
US	US2014 019120 2A1	OLED micro-cavity structure and method of making	4/10/2013	7/10/2014	Shim
US	US2015 019283 4A1	Liquid crystal display device	7/17/2013	7/9/2015	Morinaga

B. Publications

Title	Date	First Named Author	Pages
Developments in colour display devices, Rev. Prog. Color., 33, pp. 1-14 (2003)	2003	Dawson	1-14
SGD2003658FS, Display apparatus, portion of display apparatus	9/15/2003	Clairvoyante, Inc.	
Demosaicking: Color Filter Array Interpolation, IEEE Signal Processing Magazine (2005), pp. 44-54, available at https://www.ece.lsu.edu/ip/papers/IEEE_SPM_2005.pdf	1/2005	Gunturk	44-54
53.2: Invited Paper: Large Area Color Patterning Technology for AMOLED, SID 09 Digest, pp. 794-797 (2009)	2009	Suh	794-797
A High Resolution Display, available at https://bernd-paysan.de/hires.html	Created 11/17/2009; Last modified: 9/1/2016	Paysan	
Pretty as a pixel: it's called Q67, The Sony Tech Guy (2010), available at https://www.provideocoalition.com/pixels_vs-_pixels/	9/9/2010	ProVideo Coalition, a Filmtools Company	
TI DLP "Diamond" Pixel, KGOntech (2012), available at https://kguttag.com/2012/02/09/ti-dlp-diamond-pixel/	2/9/2012	KGOntech	

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