

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT4308723

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
APTINA IMAGING CORPORATION	12/17/2014
RECEIVING PARTY DATA	
Name:	SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC
Street Address:	5005 E. MCDOWELL ROAD
Internal Address:	MAILDROP A700
City:	PHOENIX
State/Country:	ARIZONA
Postal Code:	85008
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	15453038
CORRESPONDENCE DATA	
Fax Number:	(602)244-3169
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
Phone:	6022443574
Email:	patents@onsemi.com
Correspondent Name:	SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC
Address Line 1:	5005 E. MCDOWELL ROAD
Address Line 2:	MAILDROP A700
Address Line 4:	PHOENIX, ARIZONA 85008
ATTORNEY DOCKET NUMBER:	APT2013-0098C01US
NAME OF SUBMITTER:	SHARRON CASTILLO
SIGNATURE:	/Sharron Castillo/
DATE SIGNED:	03/08/2017
Total Attachments: 17	
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ASSIGNMENT

WHEREAS, Aptina Imaging Corporation, a Cayman Islands company with its office address at c/o Intertrust Corporation Services (Cayman) Limited, 190 Elgin Avenue, George Town, Grand Cayman KY1-9005, Cayman Islands (the "Assignor"), owns certain issued worldwide patents and patent applications as specifically set forth in the attached Schedule A;

WHEREAS, Assignor desires to assign any and all right, title and interest to said worldwide patents and patent applications set forth in Schedule A, which includes any and all past, present, and future, provisional, non-provisional, continuation, continuation-in-part, divisional, international, foreign, regional and convention applications corresponding thereto, and any and all Letters Patent of the U.S. and countries and regions foreign thereto which may grant or have granted thereto or be lodged in relation thereto, any reissue or reexamination thereof or to be obtained therefor, any renewals, or substitutes thereof, and any and all priority rights or priority claims, International Convention rights, any and all rights to collect past damages for infringement of any and all Letters Patent of the U.S. and countries and regions foreign thereto which may be published, which may grant, or have granted thereto or be lodged in relation thereto, and other benefits accruing to or to accrue to Assignor with respect to the filing of applications for patents or securing of patents in the U.S. and countries foreign thereto (the "Patent Rights");

WHEREAS, Semiconductor Components Industries, LLC, a limited liability company of the State of Delaware, U.S.A. with its principal place of business at 5005 East McDowell Road, Phoenix, Arizona 85008 U.S.A (the "Assignee") desires to obtain any and all, right, title, and interest of Assignor in and to the invention(s), the Patent Rights, and in, to, and under any and all Letters Patent to be obtained therefor;

WHEREAS, Aptina Imaging Corporation, a Cayman Islands company and an indirect wholly-owned subsidiary of Semiconductor Components Industries, LLC;

NOW THEREFORE, for the sum of \$10.00 and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor has assigned and transferred and by these presents does hereby assign and transfer to the said Assignee, and said Assignee's legal representatives, successors and assigns, any and all of the entire right, title and interest in and to the invention(s), Patent Rights, and any and all Letters Patent to be obtained therefor;

UPON SAID CONSIDERATION, the Assignor hereby covenants and agrees with the said Assignee that it will not execute any writing or do any act whatsoever conflicting with these presents, and that it will, at any time upon request, without further or additional consideration, execute such additional assignments and other writings and do such additional acts as said Assignee may deem reasonably necessary or desirable to perfect the Assignee's enjoyment of this grant, and render necessary assistance in making application for and obtaining original, provisionals, non-provisionals, continuations, continuations-in-part, continuing prosecutions, divisionals, renewals, reissues, reexamined or extended Letters Patent of the U.S., or of any and all foreign countries, on said Patent Rights, and execute confirmatory assignments or acknowledgments of this assignment as necessary for full enjoyment of the Patent Rights and for recording in foreign patent offices, and in enforcing any rights or causes in action accruing as a result of such Patent Rights, by giving testimony in any proceedings or transactions involving such Patent Rights, and by executing preliminary statements and other affidavits, it being understood that the foregoing covenant and agreement shall bind, and inure to the benefit of, the assigns and legal representatives of both parties;

UPON SAID CONSIDERATION, Assignor represents and warrants that Assignor has the right, title, and authority to execute this Assignment and to convey any and all right, title, and interest in the Patent Rights, and that Assignor has not conveyed nor will convey hereafter all or part of the Patent Rights to a third party;

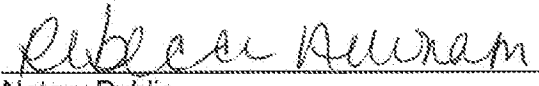
ASSIGNOR HEREBY AUTHORIZES said Assignee, its successors, and assigns, or anyone it may properly designate, to apply for Letters Patent in the U.S. and any and all foreign countries and regions, in its own name if desired, and additionally to claim priority to the filing date of the patents and/or patent applications and otherwise take advantage of the provisions of any international conventions. Assignor will take any and all steps required to effectuate recordation of the assignments in any country of the world. This Assignment will be governed by the laws of the State of Arizona of the United States of America.

IN WITNESS WHEREOF, the Assignor hereunto has executed this Assignment upon the date indicated below.

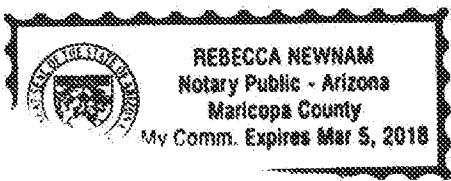
Date: December 17th, 2014 By: 
Keith Jackson
President and Director
Aptina Imaging Corporation

STATE OF ARIZONA §
 §
COUNTY OF MARICOPA §

On this 17th day of December, 2014, before me a Notary Public in and for said county, personally appeared Keith Jackson who executed the foregoing instrument and acknowledged that he signed, sealed and delivered the same instrument as a free and voluntary act for the purposes and considerations therein expressed.


Notary Public

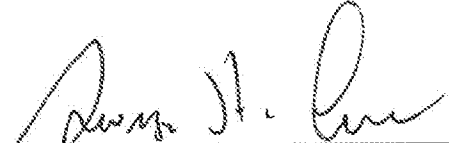
My commission expires: March 5, 2018



ACCEPTANCE OF ASSIGNMENT


The Assignee hereby acknowledges and accepts the foregoing assignment of rights by Assignor.

IN TESTIMONY WHEREOF, the Assignee, by its undersigned officer, confirms its acceptance on the date and in the place set forth below.

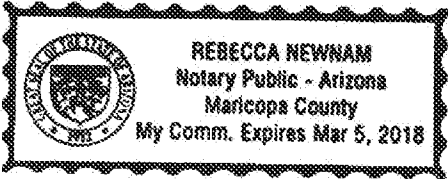
Date: December 17th, 2014 By: 
George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC

STATE OF ARIZONA §
 §
COUNTY OF MARICOPA §

On this 17th day of December, 2014, before me a Notary Public in and for said county, personally appeared George H. Cave who executed the foregoing instrument and acknowledged that he signed, sealed and delivered the same instrument as a free and voluntary act for the purposes and considerations therein expressed.



Notary Public


My commission expires: March 5, 2018




SCHEDULE A

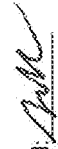
Docket No.	Co.	Filing Date	Appln No.	Status	Title
APT2013-0058	United States	November 21, 2013	14/086705	FILED	IMAGING SYSTEMS WITH VISIBLE LIGHT SENSITIVE PIXELS AND INFRARED LIGHT SENSITIVE PIXELS
APT2013-0086	United States	May 29, 2014	14/290814	FILED	SYSTEMS AND METHODS FOR OPERATING IMAGE SENSOR PIXELS HAVING DIFFERENT SENSITIVITIES AND SHARED CHAR
APT2013-0098	United States	February 27, 2014	14/191965	FILED	IMAGING SYSTEMS WITH THROUGH-OXIDE VIA CONNECTIONS
APT2013-0105	United States	April 16, 2014	14/254196	FILED	IMAGE SENSORS WITH THROUGH-OXIDE VIA STRUCTURES
APT2013-0106	United States	May 05, 2014	14/270236	FILED	IMAGING CIRCUITRY WITH ROBUST SCRIBE LINE STRUCTURES
APT2013-0107	United States	May 05, 2014	14/270233	FILED	IMAGE SENSORS WITH REDUCED STACK HEIGHT
APT2014-0010	United States	May 27, 2014	14/288201	FILED	IMAGERS WITH ERROR GENERATION CAPABILITIES
APT2014-0017	United States	June 26, 2014	14/316648	FILED	IMAGING SYSTEMS FOR INFRARED AND VISIBLE IMAGING WITH PATTERNED INFRARED CUTOFF FILTERS
APT2014-0018	United States	April 29, 2014	14/264984	FILED	IMAGING SYSTEMS AND METHODS FOR MITIGATING PIXEL DATA QUANTIZATION ERROR
APT2014-0032	United States	May 01, 2014	14/267695	FILED	IMAGING SYSTEMS WITH PHASE DETECTION PIXELS
APT2014-0046	United States	June 03, 2014	14/295203	FILED	IMAGING SYSTEMS HAVING IMAGE SENSOR PIXEL ARRAYS WITH SUB-PIXEL RESOLUTION CAPABILITIES
APT2014-0057	United States	May 30, 2014	14/291628	FILED	IMAGE SENSORS WITH METALLIC NANOPARTICLE OPTICAL FILTERS

Initialed: 
 George H. Cave
 Executive Vice President and General Counsel
 Semiconductor Components Industries, LLC
 Date: NOVEMBER 17, 2014


Initialed: 
 Keith Jackson
 President and Director
 Aptina Imaging Corporation
 Date: NOVEMBER 17, 2014


Docket No.	Co.	Filing Date	Appl. No.	Status	Title
APT2014-0079	United States	June 30, 2014	14/319867	FILED	IMAGE PROCESSING METHODS FOR IMAGE SENSORS WITH PHASE DETECTION PIXELS
APT2014-0079 US02	United States	June 30, 2014	14/319916	FILED	PIXEL ARRANGEMENTS FOR IMAGE SENSORS WITH PHASE DETECTION PIXELS
APT2007-0926	United States	July 30, 2008	12/182375	FILED	METHOD AND SYSTEM FOR SYNCHRONIZING A FLASH TO AN IMAGER
APT2009-0164	United States	April 07, 2011	13/082040	FILED	SYSTEMS FOR VERTICAL PERSPECTIVE CORRECTION
APT2009-0176	United States	August 20, 2010	12/860610	FILED	IMAGE SENSORS WITH ANTIREFLECTIVE LAYERS
APT2009-5002	United States	June 03, 2010	12/793645	FILED	IMAGING SYSTEMS WITH INTEGRATED STEREO IMAGERS
APT2009-5019	United States	April 25, 2011	13/093077	FILED	COMMON ELEMENT PIXEL ARCHITECTURE (CEPA) FOR FAST SPEED READOUT
APT2009-5044	United States	August 11, 2011	13/208282	FILED	SYSTEMS AND METHODS FOR LUMINANCE-BASED SCENE-CHANGE DETECTION FOR CONTINUOUS AUTOFOCUS
APT2009-5071	United States	May 10, 2012	13/469051	FILED	METHOD AND APPARATUS FOR DETERMINATION OF OBJECT TOPOLOGY
APT2009-5072	United States	October 25, 2012	13/660920	FILED	ELECTRONIC DEVICES WITH CAMERA-BASED USER INTERFACES
APT2009-5073	United States	February 02, 2012	13/365039	FILED	PLASMONIC LIGHT SENSORS
APT2009-5075	United States	October 25, 2012	13/660929	FILED	VIDEO OVERLAY SYSTEMS
APT2009-5076	United States	October 25, 2012	13/660939	FILED	OPTICAL INPUT DEVICES

Initiated: 
Keith Jackson
President and Director
Aptina Imaging Corporation
Date: November 17, 2014


Initiated: 
George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC
Date: November 17, 2014


Docket No.	Co.	Filing Date	Appln No.	Status	Title
APT2009-5079	United States	October 25, 2012	13/660911	FILED	METHODS OF OPERATING SYSTEMS HAVING OPTICAL INPUT DEVICES
APT2010-0030	United States	June 03, 2011	13/153369	FILED	CMOS IMAGE SENSOR WITH GLOBAL SHUTTER, ROLLING SHUTTER, AND A VARIABLE CONVERSION GAIN, HAVING PIXELS EMPLOYING SEVERAL BCMO TRANSISTORS COUPLED TO A SINGLE PHOTOIODE AND DUAL GATE BCMO TRANSISTORS FOR CHARGE STORAGE AND SENSING
APT2010-0047	United States	November 11, 2011	13/294951	FILED	DIELECTRIC BARRIERS FOR PIXEL ARRAYS
APT2010-0054	United States	June 03, 2011	13/153055	FILED	STACKED PIXELS FOR HIGH RESOLUTION CMOS IMAGE SENSORS WITH BCMO CHARGE DETECTORS
APT2010-6018	United States	September 01, 2011	13/223594	FILED	CFA RESIST SILYLATION FOR LIMITING COLOR INTERACTIONS AND IMPROVING CROSSTALK
APT2011-0003	United States	January 19, 2012	13/353593	FILED	STRUCTURED LIGHT IMAGING SYSTEM
APT2011-0005	United States	July 06, 2011	13/176945	FILED	HIGHLY SENSITIVE IMAGE SENSOR PIXEL WITH PIXEL PHOTOIODE ACTIVE REGION ARRANGED AS RESONATOR
APT2011-0007	United States	February 28, 2011	13/036334	FILED	ARRAY CAMERA HAVING LENSES WITH INDEPENDENT FIELDS OF VIEW
APT2011-0013	United States	August 30, 2011	13/221039	FILED	STEREOSCOPIC IMAGING MODULE PAIR TONE CONTRAST MATCH
APT2011-0021	United States	June 29, 2011	13/172105	FILED	FERROFLUID CONTROL AND SAMPLE COLLECTION FOR MICROFLUIDIC APPLICATION
APT2011-0028	United States	April 25, 2011	13/093298	FILED	CMOS IMAGE SENSOR WITH BUILT IN CORRECTION FOR COLUMN FAILURE
APT2011-0035	United States	September 09, 2011	13/228502	FILED	CMOS IMAGE SENSOR WITH MULTISAMPLING ADC USING SAR (SUCCESSIVE APPROXIMATION REGISTER) AND MULTIPLE RAMP

Initiated: 
George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC
Date: December 17, 2014


Initiated: 
Keith Jackson
President and Director
Aptina Imaging Corporation
Date: December 17, 2014

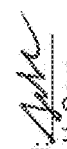
Docket No.	Co.	Filing Date	Appln No.	Status	Title
APT2011-0038	United States	June 16, 2011	13/161647	FILED	METHOD OF SELECTIVE APERTURE SHARPENING AND HALO SUPPRESSION USING CHROMA IN CMOS IMAGERS
APT2011-0039	United States	September 07, 2011	13/226820	FILED	CORRELATED DOUBLE SAMPLING
APT2011-0042	United States	August 16, 2012	13/587210	FILED	OPTICAL ISOLATION OF OPTICALLY BLACK PIXELS IN IMAGE SENSORS
APT2011-0043	United States	November 05, 2012	13/689180	FILED	RESONANCE ENHANCED ABSORPTIVE COLOR FILTERS
APT2011-0044	United States	July 23, 2012	13/556009	FILED	STACKED IMAGE SENSOR PACKAGING STRUCTURE
APT2011-0045	United States	July 20, 2011	13/187237	FILED	SUPER-RESOLUTION CAMERA WITH ON-CHIP OPTICS
APT2011-0046	United States	July 29, 2011	13/194023	FILED	METHOD AND APPARATUS FOR FRAME ROTATION IN THE JPEG COMPRESSED DOMAIN
APT2011-0056	United States	July 25, 2012	13/557656	FILED	COLOR IMAGING USING TIME-MULTIPLEXED LIGHT SOURCES AND MONOCHROME IMAGE SENSORS WITH MULTI-STORAGE-NODE PIXELS
APT2011-0061	United States	February 10, 2012	13/371312	FILED	METHOD AND APPARATUS FOR ARRAY CAMERA PIXEL READOUT
APT2011-0062	United States	April 24, 2012	13/454745	FILED	IMAGING SYSTEMS WITH COLUMN CURRENT MIRROR CIRCUITRY
APT2011-0065	United States	October 20, 2011	13/278019	FILED	TIME-OF-FLIGHT IMAGING SYSTEMS
APT2011-0067	United States	January 31, 2012	13/362323	FILED	METHOD OF DEPTH-BASED IMAGING USING AN AUTOMATIC TRILATERAL FILTER FOR 3D STEREO IMAGERS
APT2011-0073	United States	March 06, 2012	13/412730	FILED	SYSTEMS AND METHODS FOR COLOR COMPENSATION IN MULTI-VIEW VIDEO

Initialed: 
 George H. Cave
 Executive Vice President and General Counsel
 Semiconductor Components Industries, LLC
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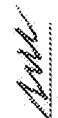
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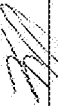
Docket No.	Co.	Filing Date	Appl. No.	Status	Title
APT2011-0081	United States	February 24, 2012	13/404319	FILED	ASYMMETRIC ANGULAR RESPONSE PIXELS FOR SINGLE SENSOR STEREO
APT2011-0083	United States	May 31, 2012	13/485867	FILED	IMAGING SYSTEMS WITH SELECTABLE COLUMN POWER CONTROL
APT2011-0090	United States	May 10, 2013	13/891480	FILED	METHOD AND APPARATUS FOR PIXEL CONTROL SIGNAL VERIFICATION
APT2011-0104	United States	September 30, 2011	13/249881	FILED	METHODS AND DEVICES FOR IMPROVING DYNAMIC RANGE IN IMAGE SENSORS
APT2011-0105	United States	April 11, 2012	13/444760	FILED	IMPLEMENTATION OF A CONFORMAL BUFFER FOR IMAGE TRANSFORMATIONS WITH AUTOMATIC INITIALISATION
APT2011-0109	United States	November 17, 2014	14/543582	FILED	STACKED-CHIP IMAGING SYSTEMS
APT2011-0110	United States	August 22, 2012	13/591642	FILED	IMAGE SENSOR WITH FLEXIBLE INTERCONNECT CAPABILITIES
APT2011-0111	United States	June 22, 2012	13/531444	FILED	FOVEA BASED IMAGING
APT2011-0114	United States	February 06, 2013	13/760569	FILED	SYSTEM FOR REDUCING DEPTH OF FIELD WITH DIGITAL IMAGE PROCESSING
APT2011-0115	United States	September 21, 2012	13/624695	FILED	IMAGE SENSORS WITH MULTIPLE LENSES OF VARYING POLARIZATIONS
APT2011-0117	United States	January 21, 2013	13/746211	FILED	IMAGING SENSORS WITH OPTICAL CAVITY PIXELS
APT2011-0118	United States	February 27, 2013	13/778859	FILED	SENSOR POWER SAVING AUTONOMY
APT2011-0121	United States	May 01, 2013	13/875100	FILED	IMAGING SYSTEMS AND METHODS

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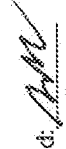
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George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC
Date: December 17, 2014


Docket No.	Co.	Filing Date	Appl. No.	Status	Title
APT2011-0130	United States	January 31, 2013	13/755988	FILED	IMAGING SYSTEMS AND METHODS FOR GENERATING AUTO-EXPOSED HIGH-DYNAMIC-RANGE IMAGES
APT2011-0132	United States	May 01, 2013	13/874771	FILED	IMAGING SYSTEMS WITH PLASMONIC COLOR FILTERS
APT2011-0133	United States	May 01, 2013	13/874872	FILED	REDUCED HEIGHT CAMERA MODULES
APT2011-0144	United States	April 25, 2013	13/870801	FILED	IMAGING SYSTEMS WITH PROGRAMMABLE FIXED RATE CODECS
APT2011-0145	United States	February 21, 2012	13/401607	FILED	DETECTING TRANSIENT SIGNALS USING STACKED-CHIP IMAGING SYSTEMS
APT2011-0147	United States	February 07, 2013	13/762042	FILED	SYSTEMS FOR CONSTANT HUE AND ADAPTIVE COLOR CORRECTION IMAGE PROCESSING
APT2011-0150	United States	March 05, 2013	13/786199	FILED	SYSTEMS AND METHODS FOR GENERATING INTERPOLATED HIGH-DYNAMIC-RANGE IMAGES
APT2011-0151	United States	November 28, 2012	13/687380	FILED	HIGH DYNAMIC RANGE IMAGING USING MULTI-STORAGE PIXEL
APT2011-0153	United States	May 02, 2013	13/875549	FILED	EXPOSURE TIME SELECTION USING STACKED-CHIP IMAGE SENSORS
APT2011-0155	United States	April 17, 2013	13/865100	FILED	IMAGE COMPRESSION USING STACKED-CHIP IMAGE SENSORS
APT2011-0156	United States	April 25, 2013	13/870367	FILED	IMAGE FOCUS ADJUSTMENT USING STACKED-CHIP IMAGE SENSORS
APT2011-0158	United States	May 03, 2013	13/886528	FILED	SYSTEMS AND METHODS FOR GENERATING METADATA IN STACKED-CHIP IMAGING SYSTEMS
APT2011-0159	United States	May 21, 2012	13/476784	FILED	VERTICAL JFET SOURCE FOLLOWER FOR SMALL PIXEL CMOS IMAGE SENSORS

Initialed: 
George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC
Date: December 17, 2014


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Keith Jackson
President and Director
Aptina Imaging Corporation
Date: December 17, 2014


Docket No.	Co.	Filing Date	Appin No.	Status	Title
APT2011-0161	United States	April 22, 2013	13/867971	FILED	IMAGING SYSTEMS WITH PER-COLUMN ANALOG-TO-DIGITAL CONVERTER NON-LINEARITY CORRECTION CAPABILITIES
APT2012-0001	United States	February 26, 2013	13/777991	FILED	METHOD AND APPARATUS FOR IMAGE BACKGROUND REMOVAL AND REPLACEMENT
APT2012-0002	United States	May 31, 2013	13/906982	FILED	OPTICALLY-CONTROLLED SPEAKER SYSTEM
APT2012-0008	United States	September 13, 2013	14/026731	FILED	IMAGERS WITH STACKED INTEGRATED CIRCUIT DIES
APT2012-0010	United States	February 26, 2013	13/777776	FILED	IMAGING SYSTEMS FOR INFRARED AND VISIBLE IMAGING
APT2012-0011	United States	April 10, 2013	13/860157	FILED	IMAGE SENSORS WITH PHOTOELECTRIC FILMS
APT2012-0014	United States	August 12, 2013	13/964462	FILED	IMAGE SENSORS HAVING BURIED LIGHT SHIELDS WITH ANTIREFLECTIVE COATING
APT2012-0017	United States	August 27, 2013	14/011560	FILED	BACKSIDE ILLUMINATED IMAGE SENSORS HAVING BURIED LIGHT SHIELDS WITH ABSORPTIVE ANTIREFLECTIVE COATING
APT2012-0020	United States	September 19, 2013	14/031691	FILED	PIXEL WITH ANTI-DOME AND STRATIFICATION
APT2012-0021	United States	December 27, 2012	13/728086	FILED	IMAGING PIXELS WITH DEPTH SENSING CAPABILITIES
APT2012-0024	United States	July 31, 2013	13/955765	FILED	IMAGING SYSTEMS WITH CROSSTALK CALIBRATION PIXELS
APT2012-0025	United States	July 30, 2013	13/954823	FILED	IMAGING SYSTEMS WITH FRONT SIDE ILLUMINATED NEAR INFRARED IMAGING PIXELS
APT2012-0027	United States	July 30, 2013	13/954844	FILED	BACK SIDE ILLUMINATED NEAR-INFRARED PIXEL

Initialed: 
George H. Cave
Executive Vice President and General Counsel
Semiconductor Components Industries, LLC
Date: October 17, 2014


Initialed: 
Keith Jackson
President and Director
Aptina Imaging Corporation
Date: October 17, 2014


Docket No.	Co.	Filing Date	App'n No.	Status	Title
APT2012-0028	United States	May 02, 2013	13/875905	FILED	IMAGING SYSTEMS WITH SEPARATED COLOR FILTER ELEMENTS
APT2012-0032	United States	July 26, 2013	13/952290	FILED	IMAGING SYSTEMS WITH IMAGE PIXELS HAVING VARYING LIGHT COLLECTING AREAS
APT2012-0035	United States	May 30, 2013	13/905930	FILED	METHOD AND APPARATUS FOR PIXEL DATA EXTREMA DETECTION AND HISTOGRAM GENERATION
APT2012-0039	United States	January 08, 2013	13/736768	FILED	IMAGING SYSTEMS WITH CLEAR FILTERS PIXELS
APT2012-0041	United States	July 11, 2013	13/940055	FILED	COLUMN-BASED HIGH DYNAMIC RANGE IMAGING SYSTEMS
APT2012-0045	United States	April 01, 2013	13/854834	FILED	OPTICAL AND INFRARED IMAGING SYSTEM
APT2012-0046	United States	April 01, 2013	13/854343	FILED	OPTICAL ACCELEROMETERS
APT2012-0048	United States	May 31, 2013	13/907574	FILED	IMAGING SYSTEMS AND METHODS FOR USER INPUT DETECTION
APT2012-0052	United States	March 28, 2013	13/852524	FILED	IMAGE SENSORS WITH COLUMN FAILURE CORRECTION CIRCUITRY
APT2012-0054	United States	August 27, 2013	14/011660	FILED	IMAGE SENSOR PIXELS WITH LIGHT GUIDES AND LIGHT SHIELD STRUCTURES
APT2012-0055	United States	September 23, 2013	14/033881	FILED	IMAGE SENSORS WITH IN-PIXEL ANTI-BLOOMING DRAINS
APT2012-0057	United States	May 09, 2013	13/890702	FILED	OFFSET INJECTION IN AN ANALOG-TO-DIGITAL CONVERTER
APT2012-0059	United States	September 23, 2013	14/034365	FILED	IMAGING SYSTEMS WITH VERIFICATION PIXELS

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Docket No.	Co.	Filing Date	Appl. No.	Status	Title
APT2012-0061	United States	August 14, 2014	14/460119	FILED	IMAGING SYSTEMS HAVING LENS SUBSTRATES WITH TOTAL INTERNAL REFLECTION MITIGATION STRUCTURES
APT2012-0062	United States	September 19, 2013	14/031797	FILED	SYMMETRY SHARED PIXEL WITH TRIPLE CONVERSION GAIN
APT2012-0063	United States	September 24, 2013	14/035794	FILED	BACK SIDE ILLUMINATED GLOBAL SHUTTER IMAGE SENSORS WITH BACK SIDE CHARGE STORAGE
APT2012-0064	United States	September 24, 2013	14/035863	FILED	CAPACITATOR IN BSI CARRIER
APT2012-0065	United States	August 20, 2014	14/464630	FILED	ARRAY CAMERAS WITH LIGHT BARRIERS
APT2012-0067	United States	September 18, 2013	14/030713	FILED	IMAGING SYSTEMS WITH HIGH DIELECTRIC CONSTANT BARRIER LAYER
APT2012-0071	United States	June 25, 2013	13/926657	FILED	IMAGING SYSTEMS WITH SWITCHABLE COLUMN POWER CONTROL
APT2012-0072	United States	September 11, 2013	14/024316	FILED	BACK SIDE ILLUMINATED IMAGE SENSORS WITH BACK SIDE CHARGE STORAGE
APT2012-0073	United States	August 21, 2013	13/972249	FILED	BACKSIDE ILLUMINATED IMAGE SENSORS WITH STACKED DIES
APT2012-0074	United States	August 20, 2014	14/464495	FILED	MULTIMODE PIXEL READOUT FOR ENHANCED DYNAMIC RANGE
APT2012-0075	United States	August 30, 2013	14/015548	FILED	IMAGING PIXELS WITH IMPROVED DYNAMIC RANGE
APT2012-0077	United States	August 28, 2013	14/012784	FILED	HIGH DYNAMIC RANGE IMAGING SYSTEMS HAVING CLEAR FILTER PIXEL ARRAYS
APT2012-0080	United States	August 15, 2014	14/460966	FILED	IMAGING SYSTEMS AND METHODS FOR PERFORMING COLUMN-BASED IMAGE SENSOR PIXEL GAIN ADJUSTMENTS

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APT2012-0090	United States	July 25, 2013	13/951211	FILED	IMAGING SYSTEMS WITH MODIFIED CLEAR IMAGE PIXELS
APT2012-0095	United States	August 13, 2014	14/459068	FILED	FLOATING POINT IMAGE SENSORS WITH TILE-BASED MEMORY
APT2013-0002	United States	November 27, 2013	14/092611	FILED	VIDEO AND 3D TIME-OF-FLIGHT IMAGE SENSORS
APT2013-0011	United States	January 16, 2014	14/157492	FILED	GLOBAL SHUTTER IMAGE SENSORS WITH LIGHT GUIDE AND LIGHT SHIELD STRUCTURES
APT2013-0012	United States	August 12, 2014	14/458108	FILED	FLOATING POINT IMAGE SENSORS WITH DIFFERENT INTEGRATION TIMES
APT2013-0013	United States	August 13, 2014	14/459213	FILED	IMAGING SYSTEMS AND METHODS FOR GENERATING BINNED HIGH-DYNAMIC-RANGE IMAGES
APT2013-0014	United States	August 28, 2013	14/012403	FILED	IMAGING SYSTEMS WITH DYNAMIC SHUTTER OPERATION
APT2013-0015	United States	November 26, 2013	14/090415	FILED	IMAGING PIXELS WITH IMPROVED ANALOG-TO-DIGITAL CIRCUITRY
APT2013-0018	United States	August 14, 2013	13/967272	FILED	IMAGERS WITH IMPROVED ANALOG-TO-DIGITAL CIRCUITRY
APT2013-0019	United States	February 25, 2014	14/189382	FILED	IMAGE SENSORS WITH SMALL PIXELS HAVING HIGH WELL CAPACITY
APT2013-0021	United States	February 25, 2014	14/189687	FILED	IMAGE SENSOR PIXELS WITH LATERAL ANTI-BLOOMING STRUCTURES
APT2013-0023	United States	August 13, 2013	13/965582	FILED	IMAGE SENSORS WITH PIXEL ARRAY SUB-SAMPLING CAPABILITIES
APT2013-0026	United States	August 20, 2014	14/464408	FILED	IMAGE SENSORS WITH SILICIDE LIGHT SHIELDS

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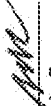
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APT2013-0029	United States	February 28, 2014	14/194119	FILED	IMAGING SYSTEMS WITH FLIP CHIP BALL GRID ARRAYS
APT2013-0032	United States	August 26, 2014	14/469498	FILED	IMAGE SENSORS WITH INTER-PIXEL LIGHT BLOCKING STRUCTURES
APT2013-0035	United States	August 08, 2014	14/455752	FILED	IMAGE SENSORS FOR GENERATING FLOATING POINT NUMBERS
APT2013-0039	United States	November 27, 2013	14/092613	FILED	IMAGE SENSORS WITH COLOR FILTER ELEMENTS OF DIFFERENT SIZES
APT2013-0040	United States	August 27, 2013	14/011369	FILED	SYSTEMS AND METHODS FOR MITIGATING IMAGE SENSOR PIXEL VALUE CLIPPING
APT2013-0043	United States	July 15, 2013	13/942201	FILED	METHOD AND APPARATUS FOR IMAGE FLARE MITIGATION
APT2013-0045	United States	August 20, 2013	13/971712	FILED	IMAGING SYSTEMS WITH REFERENCE PIXELS FOR IMAGE FLARE MITIGATION
APT2013-0047	United States	August 28, 2013	14/012835	FILED	IMAGING SYSTEMS WITH CROSSTALK REDUCTION STRUCTURES
APT2013-0050	United States	May 29, 2014	14/290615	FILED	IMAGING DEVICES FOR MOLECULE DETECTION
APT2013-0052	United States	August 15, 2014	14/461122	FILED	IMAGING SYSTEMS WITH STACKED IMAGE SENSORS
APT2013-0053	United States	November 21, 2013	14/086336	FILED	METHODS OF FORMING IMAGING DEVICE LAYERS USING CARRIER SUBSTRATES
APT2013-0057	United States	February 25, 2014	14/189311	FILED	IMAGE SENSORS HAVING PIXEL ARRAYS WITH NON-UNIFORM PIXEL SIZES
APT2013-0059	United States	November 25, 2013	14/089064	FILED	IMAGING SYSTEMS WITH BROADBAND IMAGE PIXELS FOR GENERATING MONOCHROME AND COLOR IMAGES

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APT2013-0060	United States	February 20, 2014	14/165816	FILED	ABSORBING ANGLED BAFFLES FOR STRAY LIGHT REJECTION
APT2013-0061	United States	November 26, 2013	14/090876	FILED	IMAGING SYSTEMS WITH IMAGE PIXELS HAVING ADJUSTABLE SPECTRAL RESPONSES
APT2013-0064	United States	February 11, 2014	14/178066	FILED	IMAGING SYSTEMS WITH INFRARED PIXELS HAVING INCREASED QUANTUM EFFICIENCY
APT2013-0066	United States	November 27, 2013	14/092501	FILED	IMAGING SYSTEMS AND METHODS FOR LOCATION-SPECIFIC IMAGE FLARE MITIGATION
APT2013-0067	United States	February 18, 2014	14/183042	FILED	IMAGE SENSOR ARRAY WITH EXTERNAL CHARGE DETECTION CIRCUITRY
APT2013-0069	United States	February 27, 2014	14/191891	FILED	IMAGING SYSTEMS WITH ACTIVATION MECHANISMS
APT2013-0071	United States	February 28, 2014	14/193548	FILED	IMAGING SYSTEMS AND METHODS FOR MONITORING USER SURROUNDINGS
APT2013-0074	United States	February 26, 2014	14/191209	FILED	BACKSIDE ILLUMINATED IMAGING SYSTEMS HAVING AUTO-FOCUS PIXELS
APT2013-0075	United States	February 25, 2014	14/189859	FILED	IMAGE SENSOR SYSTEMS AND METHODS FOR MULTIPLE EXPOSURE IMAGING
APT2013-0088	United States	February 21, 2014	14/196771	FILED	IMAGERS WITH ERROR CHECKING CAPABILITIES
APT2013-0090	United States	February 20, 2014	14/185542	FILED	IMAGE SENSORS WITH COLUMN MEMORY REPAIR CIRCUITRY
APT2013-0091	United States	February 25, 2014	14/189939	FILED	IMAGERS HAVING IMAGE PROCESSING CIRCUITRY WITH ERROR DETECTION CAPABILITIES
APT2013-0093	United States	February 20, 2014	14/185614	FILED	IMAGE SENSORS WITH ANTI-ECLIPSE CIRCUITRY

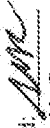
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Docket No.	Co.	Filing Date	Appin No.	Status	Title
APT2013-0095	United States	November 25, 2013	14/089557	FILED	IMAGING SYSTEMS WITH IMAGE PIXELS HAVING ADJUSTABLE RESPONSIVITY
APT2013-0103	United States	March 25, 2014	14/225129	FILED	MULTI-ARRAY IMAGING SYSTEMS AND METHODS
APT2013-0104	United States	February 13, 2014	14/180237	FILED	ADAPTIVE IMAGE SENSOR SYSTEMS AND METHODS
APT2014-0013	United States	March 31, 2014	14/231694	FILED	IMAGING SYSTEMS WITH PIXEL ARRAY VERIFICATION CIRCUITRY
APT2009-5062	United States	September 26, 2012	13/627920	FILED	TOUCH PANELS WITH DYNAMIC ZOOMING AND LOW PROFILE BEZELS
APT2013-0061	United States	February 04, 2014	14/172741	FILED	ARITHMETIC MEMORY WITH HORIZONTAL BINNING CAPABILITIES FOR IMAGING SYSTEMS
APT2011-0113	United States	September 22, 2014	14/492686	FILED	FAILSAFE IMAGE SENSOR WITH REAL TIME INTEGRITY CHECKING OF PIXEL ANALOG PATHS AND DIGITAL DATA PATHS
APT2009-0006	United States	March 17, 2014	14/215975	FILED	METHODS FOR FORMING BACKSIDE ILLUMINATED IMAGE SENSORS WITH FRONT SIDE METAL REDISTRIBUTION LAYERS
APT2010-0022	United States	May 27, 2014	14/287907	FILED	IMAGERS WITH DEPTH SENSING CAPABILITIES
APT2010-0123	United States	May 19, 2014	14/281263	FILED	METHOD OF FABRICATION OF AN ARRAY OF GRADED REFRACTIVE INDEX MICROLENSES INTEGRATED IN A IMAGER SENSOR
APT2011-0030	United States	February 03, 2014	14/171181	FILED	PUMPED PINNED PHOTODIODE PIXEL ARRAY
APT2011-0063	United States	May 15, 2014	14/279097	FILED	IMAGE SENSORS WITH DARK PIXELS FOR REAL-TIME VERIFICATION OF IMAGING SYSTEMS
APT2009-5074	United States	March 21, 2014	14/222215	FILED	PLASMONIC LIGHT COLLECTORS


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Docket No.	Co.	Filing Date	Appin. No.	Status	Title
APT2011-0057	United States	September 23, 2014	14/494215	FILED	ALIGNMENT MARKS AND ALIGNMENT METHODS FOR ALIGNING BACKSIDE COMPONENTS TO FRONTSIDE COMPONENTS IN INTEGRATED CIRCUITS
APT2011-0163	United States	February 8, 2013	13/763249	FILED	BACKSIDE TRENCH ISOLATION IN BSICIS TECHNOLOGY
APT2011-0098	United States	April 29, 2013	13/872665	FILED	IMAGING SYSTEMS WITH SIGNAL CHAIN VERIFICATION CIRCUITRY
APT2012-0034	United States	November 27, 2013	14/091827	FILED	COLOR FILTER ARRANGEMENTS FOR FUSED ARRAY IMAGING SYSTEMS
APT2012-0085	United States	August 27, 2014	14/470584	FILED	RANGE MODULATED IMPLANTS FOR IMAGE SENSORS

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