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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. Electronically filed

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
<i>Additional inventors are being named on the _____ separately numbered sheets attached hereto.</i>		
TITLE OF THE INVENTION (500 characters max):		
Semiconductor Photodetecting Imagers and Methods for Making the Same		
<i>Direct all correspondence to:</i> CORRESPONDENCE ADDRESS		
☒ The address corresponding to Customer Number: 20,551		
OR ☐ Firm or Individual Name		
Address		
City	State	Zip
Country	Telephone	Email
ENCLOSED APPLICATION PARTS (check all that apply)		
☐ Application Data Sheet. See 37 CFR 1.76 ☐ CD(s), Number of CDs _____		
☒ Drawing(s) <i>Number of Sheets</i> <u>3</u> ☐ Other (specify) _____		
☒ Specification (e.g. description of the invention) <i>Number of Pages</i> <u>8</u>		
Fees Due: Filing Fee of \$220 (\$110 for small entity). If the specification and drawings exceed 100 sheets of paper, an application size fee is also due, which is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).		
METHOD OF PAYMENT OF THE FILING FEE AND APPLICATION SIZE FEE FOR THIS PROVISIONAL APPLICATION FOR PATENT		
☒ Applicant claims small entity status. See 37 CFR 1.27. 110		
☐ A check or money order made payable to the <i>Director of the United States Patent and Trademark Office</i> is enclosed to cover the filing fee and application size fee (if applicable).		TOTAL FEE AMOUNT (\$)
☐ Payment by credit card. Form PTO-2038 is attached.		
☐ The Director is hereby authorized to charge the filing fee and application size fee (if applicable) or credit any overpayment to Deposit Account Number: _____		

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PROVISIONAL APPLICATION COVER SHEET
Page 2 of 2

PTO/SB/16 (12-08)

Approved for use through 06/30/2010. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

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SIGNATURE /Todd B. Alder/ Date September 17, 2009

TYPED or PRINTED NAME Todd B. Alder, Ph.D. REGISTRATION NO. 54,598
(if appropriate)

TELEPHONE (801) 566-6633 Docket Number: 3035-009.PROV

SEMICONDUCTOR PHOTODETECTING IMAGERS AND METHODS FOR MAKING THE SAME

I. TECHNICAL FIELD

The present disclosure relates to semiconductor photodetecting imagers and methods for processing and making the same. More specifically, the present invention relates to CMOS images and methods for manufacturing the CMOS imager with pulsed laser.

II. BACKGROUND

The interaction of light with semiconductor devices is at the core of some of the most important innovations of our time. Silicon imaging devices are used in various technologies today, for example digital cameras, optical mice, video cameras, and cell phones. Charge-coupled devices (CCDs) had dominated the digital imaging world until complementary metal-oxide-semiconductor (CMOS) imagers improved in performance. CMOS sensors are typically manufactured from silicon and can covert visible incident light into photocurrent and ultimately into a digital image. To date, there is no good silicon based technology for detecting infrared incident electromagnetic radiation because silicon is an indirect bandgap semiconductor having a bandgap of about 1.1eV. The absorption of electromagnetic radiation having a wavelength of about 1100 nm is very low in silicon and even lower at longer wavelengths in the infrared spectrum.

There are other applications that could benefit from a silicon imager that is capable of detecting infrared electromagnetic radiation, such as military and security applications. FIG. 1 shows a graph that illustrates the approximate radiance of a night sky with no moon. For night vision military and security applications, it would be desirable to have a good responsivity at one of the peak wavelengths of around 1100 nm.

II. SUMMARY

The present invention provides methods of manufacturing photodetecting imagers that are able to detect visible as well as infrared electromagnetic radiation. More specifically, the present invention discloses methods of making or processing semiconductor photodetecting imagers. Such methods can include providing a semiconductor imager such as a CMOS or a CMOS APS imager and irradiating at least one surface of the imager. In

other embodiments of the present invention a step of annealing the imager may be used to repair any damaging effects of the irradiation step. The irradiation step can also include the addition of a dopant that can be introduced into the semiconductor device to increase the dopant species in at least a portion of the device.

In another aspect of the present invention a method of texturing the backside of a photodetecting imager is disclosed. The method may include providing a semiconductor imager; laser processing at least one surface to the semiconductor imager and annealing the imager. Alternatively, the method may be performed without a laser processing step. For example, a chemical etch can be performed on at least one surface of the semiconductor devices to create texturing features on the surface. The lasing step can further include simultaneously doping the semiconductor device with at least one dopant.

It should be noted that the semiconductor photodetecting imager can be a passive pixel sensor (PPS), an active pixel sensor (APS), or a digital pixel sensor imager (DPS). The main difference is the image sensor read out architecture. For example the semiconductor photodetecting imager can be a four transistor active pixel sensor (4T APS). FIG. 2 is a schematic of a 4T APS imager. In another embodiment the imager can be a three transistor active pixel sensor (3T APS). The 4T APS imager can be made and manufactured from a third party manufacture and further processed by the methods disclosed herein.

In one embodiment, a method for processing a photodetecting imager is provided. The method may include providing a 4T APS imager; removing a portion of material from the 4T APS imager and irradiating at least one surface of the 4T APS imager. It is preferred to irradiate the side of the imager that had material removed therefrom. The removing step is also commonly known by those skilled in the art as a thinning step.

Other uses for the methods and apparatus given herein can be developed by those skilled in the art upon comprehending the present disclosure.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and advantages of the present invention, reference is being made to the following detailed description of preferred embodiments and in connection with the accompanying drawings, in which:

FIG. 1 illustrates an approximate radiance of a night sky with no moon;

FIG. 2 is a schematic illustration of a 4T APS imager;

FIG. 3. illustrates a process flow of creating a 4T APS imager according to one embodiment of the present invention; and

FIG 4. illustrates a processed 4T imaging array according to another embodiment of the present invention.

V. DETAILED DESCRIPTION

As mentioned above, the present invention is drawn towards devices and methods of manufacturing photodetecting imagers that are able to detect visible as well as infrared electromagnetic radiation. More specifically, the present invention discloses methods of making or processing semiconductor photodetecting imagers. Such methods may include providing a semiconductor imager such as a CMOS or a CMOS APS imager and irradiating at least one surface of the imager. In other embodiments of the present invention a step of annealing the imager may be needed to fix any damaging effects of the irradiation step. The irradiation step can also include the addition of a dopant that can be introduced into the semiconductor device to increase the dopant species in at least a portion of the device.

In another aspect of the present invention a method of texturing the backside of a photodetecting imager is disclosed. The method may include providing a semiconductor imager; laser processing at least one surface to the semiconductor imager and annealing the imager. The annealing can be accomplished by a traditional furnace anneal or by a rapid thermal anneal (RTA). The rapid thermal anneal can be accomplished with a laser at the right wavelength and fluence. Alternatively, the method may be performed without a laser processing step. For example, a chemical etch may be performed on at least one surface of the semiconductor devices to create texturing features on the surface. The lasing step may further include simultaneously doping the semiconductor device with at least one dopant. The dopants can be an electron-donating or hole-donating dopants. The dopants can be introduced into the device via a gas, liquid or solid. A sulfur dopant can be introduced via SF_6 gas.

It should be noted that the semiconductor photodetecting imager can be a passive pixel sensor (PPS), an active pixel sensor (APS) or a digital pixel sensor imager (DPS). The main difference is the image sensor read out architecture. For example the semiconductor

photodetecting imager can be a four transistor active pixel sensor (4T APS). FIG. 2 is a schematic of a 4T APS imager. In another embodiment the imager can be a three transistor active pixel sensor (3T APS). The 4T APS imager can be made and manufactured from a third party manufacture and further processed by the methods disclosed herein.

In one embodiment, a method for processing a photodetecting imager is provided. The method may include providing a 4T APS imager; removing a portion of material from the 4T APS imager and irradiating at least one surface of the 4T APS imager. It is preferred to irradiate the side of the imager that had material removed therefrom. The removing step is also commonly known by those skilled in the art as a thinning step.

The imagers contemplated herein can be comprised of silicon material. The silicon material may be a monocrystalline silicon, microcrystalline silicon, multicrystalline silicon, amorphous silicon or combination thereof. Discussion of low oxygen silicon material is disclosed in U.S. Patent Application Number 61/174,387, which is incorporated herein by reference in its entirety.

FIG 3. illustrates a process flow of 4T APS imager. The first image depicts a cross-sectional view of a 4T imager having a P-MOS transfer gate. The follow image indicates a following step of forming trenches to at least partially isolate one pixel from another such that electrical and optical crosstalk is reduced or even virtually eliminated. This can be accomplished by various known trench isolation techniques. Typically the trench is back filled with a material that can prevent the crosstalk. The image in FIG. 3 demonstrates the step of including a carrier substrate and thinning the semiconductor imager. Further, the semiconductor material can be irradiated with a laser to create a textured region, also known as a black silicon region. Furthermore, the semiconductor material and/or device may be irradiated in the presence of a sulfur-containing gas. Exemplary laser-processed semiconductors are discussed in U.S. Patent No. 7,057,256 to Carey et al., which is incorporated herein by reference in its entirety. The remaining steps include attaching another carrier substrate near the black silicon region and removing the first carrier substrate to achieve a final product. It should be noted that not all the steps need be carried out in the order shown or described. Additionally, the 4T imager can be irradiated on either or even both the sides.

The region known as Black Silicon enable the absorption of electromagnetic radiation in the visible and infrared regions. The black silicon creates a microstructured textured region increases the chance that a photon that enters the device is absorbed, thereby increasing the quantum efficiency of the device.

FIG. 4 illustrates a 4T imaging sensor array which can lower the dark current of the device. The semiconductor photodetecting imaging device of FIG. 4 may include a 4T APS imager having a readout circuitry, a PMOS transfer gate, an n-type epitaxial layer or a silicon on insulator (SOI) layer, trenches to at least isolate a portion of each pixel, and an irradiated region. In this figure the irradiated black silicon region is on the back side of the device, however, it should be noted that it can be on other sides of the device as well. The device can be run in reverse, forward or no bias at all. When in passive mode the dark current can be at minimal levels.

In another embodiment of the present invention, a passivation layer may be applied at least one of the photodetecting device or pixels. Furthermore, an antireflection (AR) material can also be applied to the devices disclosed herein. The antireflection material can enhance the absorption properties by reducing the amount of incident electromagnetic radiation that is reflected from the device. It is also believed by creating textured surfaces on the device, the textured regions can also act as an antireflection coating.

The photodetecting imager may be maintained under constant conditions (fixed voltage or current) to provide enhanced linearity and uniformity. Connections between the imager and the underlying device layers may be achieved using vias fabricated from a refractory metal, such as tungsten or tantalum. Placing storage elements under the imager may provide many photonic benefits. For example, the entire pixel array may be dedicated to signal processing. This may enable higher performance by permitting access to the low level pixel signals. Furthermore, massively parallel operations may be performed by pixel processors. For example, analog to digital conversion, noise reduction (ie., true correlated double sampling), power conditioning, nearest neighbor pixel processing, compression, fusion, and color multiplexing operations may be performed.

The methods and devices described herein can have increased quantum efficiency over standard image sensors. Any increase in the quantum efficiency makes a large difference in the signal to noise ratio. Uniformity and quantum efficiency are the most

important issues in imager pixels. More complex structures can provide not only increased quantum efficiency but also good uniformity from pixel to pixel. Overall, an imager that can provide these benefits would be valuable in the many applications including night vision and military and security applications.

VII. ABSTRACT

The present disclosure is directed towards semiconductor photodetecting imagers and methods for manufacturing and further processing such imagers. In particular, the present invention discloses photodetecting imagers that have been processed with a laser or other methods to create a textured surface for extended wavelength absorption. The imagers disclosed herein can be used for military and security applications.

VIII. DRAWINGS (SEPARATE SHEETS FOLLOW)

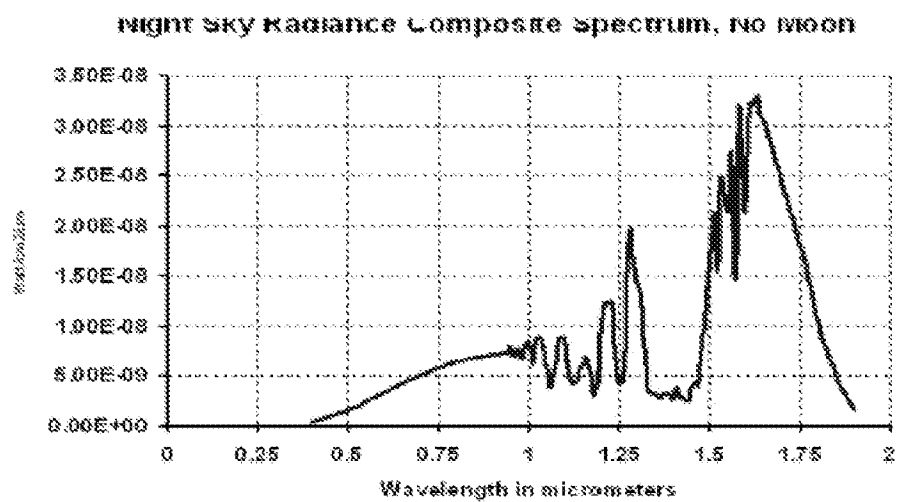


Fig. 1. Approximate radiance of a night sky with no moon.

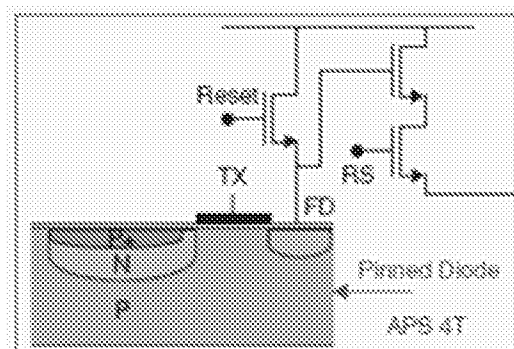


FIG 2. Schematic of a 4T APS Imager

Process of integration of a 4T Pixel with P-channel Transfer Gate to a Black Silicon sensor array –FSI option

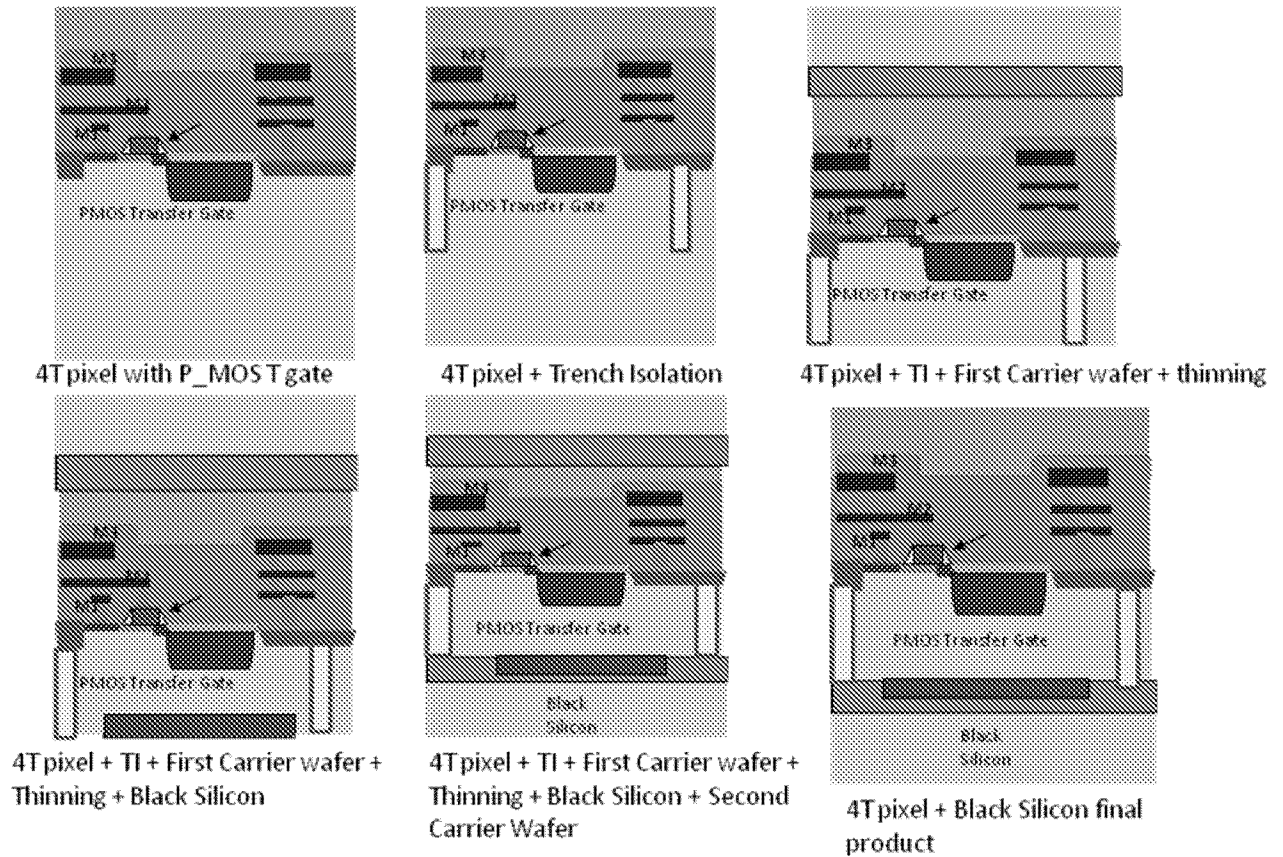
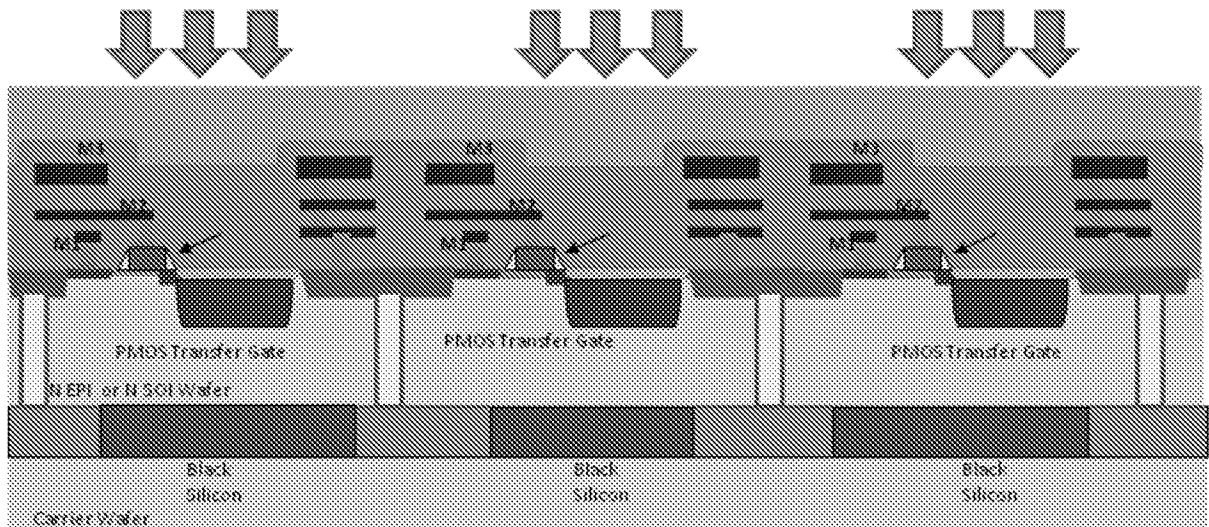


FIG 3. Process flow of creating a 4T APS Imager

Process of integration of a 4T Pixel with P-channel Transfer Gate to a Black Silicon sensor array –FSI option



4T integration FSI + Black silicon
used in a passive mode for lowest dark current

FIG 4. Processed 4T Imaging Array Having Low Dark Current

Electronic Acknowledgement Receipt

EFS ID:	6095665
Application Number:	61243434
International Application Number:	
Confirmation Number:	3255
Title of Invention:	Semiconductor Photodetecting Imagers and Methods for Making the Same
First Named Inventor/Applicant Name:	. .
Customer Number:	20551
Filer:	Todd Brent Alder/Nicole Solomon
Filer Authorized By:	Todd Brent Alder
Attorney Docket Number:	3035-009.PROV
Receipt Date:	17-SEP-2009
Filing Date:	
Time Stamp:	17:58:58
Application Type:	Provisional

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	3035009PROVtrans.pdf	916352 efcfd5b532e307585ef78233310498d06475870d	no	2

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	Specification		1	6	
	Abstract		7	7	
	Drawings-only black and white line drawings		8	11	
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
61/243,434	09/17/2009		0.00	3035-009.PROV		

CONFIRMATION NO. 3255

20551
THORPE NORTH & WESTERN, LLP.
P.O. Box 1219
SANDY, UT 84091-1219

FILING RECEIPT



Date Mailed: 10/28/2009

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Power of Attorney:
Todd Alder--54598

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Semiconductor Photodetecting Imagers and Methods for Making the Same

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
61/243,434	09/17/2009		3035-009.PROV

CONFIRMATION NO. 3255

FORMALITIES LETTER



OC000000038446011

20551
THORPE NORTH & WESTERN, LLP.
P.O. Box 1219
SANDY, UT 84091-1219

Date Mailed: 10/28/2009

NOTICE TO FILE MISSING PARTS OF PROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(c)

Filing Date Granted

An application number and filing date have been accorded to this provisional application. The items indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$110 to complete the basic filing fee for a small entity.
- The provisional application cover sheet under 37 CFR 1.51(c)(1), which may be an application data sheet (37 CFR 1.76), is required identifying:
 - the name(s) of the inventor(s).
 - either city and state, or city and foreign country, of the residence of each inventor.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee or cover sheet) as set forth in 37 CFR 1.16(g) of \$25 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$135** for a small entity

- **\$110** Statutory basic filing fee.
- **\$25** Surcharge.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

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/amanalac/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

SUPPLEMENTAL APPLICATION DATA SHEET

Under 37 CFR §1.76

Sheet 1 of 1

Section 1 APPLICANT INFORMATION

☐see continuation sheet(s)
for more applicants

Given Name(s)	Family Name or Surname	Residence (City & State or Country)	Mailing Address	Citizenship	Inventor ✓
Homayoon	Haddad	Beverly, MA		US	☒
Jeffrey	McKee	Beverly, MA		US	☒
Leonard	Forbes	Beverly, MA		US	☒
Chintamani	Palsule	Beverly, MA		US	☒

Any applicant which is not an inventor claims authority to apply on behalf of the inventor(s) for the reason(s) listed below:

Section 2 CORRESPONDENCE INFORMATION

Please address all correspondence to

at the address associated with Customer Number:

20,551

Section 3 APPLICATION INFORMATION

Application No.: 61/243,434

Filing Date: 9/17/2009

Title
Semiconductor Photodetecting Imagers and Methods for
Making the Same

Attorney Docket No.: 3035-009.PROV

Type of Application: Provisional

Drawings, total # sheets: 3

Designated Fig. for Publication:

Suggested Class & Subclass:

For plant applications:

Technology Center:

Latin Genus:

Latin Species:

Variety Denomination:

Does this application disclose any significant part of the subject matter of an application under a secrecy order pursuant to 37 CFR §5.2? ☐ Yes ☒ No

Section 4 REPRESENTATIVE INFORMATION

Applicant is represented by the attorneys and patent agents associated with Customer Number:

20,551

Section 5 DOMESTIC PRIORITY INFORMATION

☐see continuation sheet(s)
for more priority information

This application of App. No. filed with current status of:

App. No. of App. No. filed with current status of:

App. No. of App. No. filed with current status of:

Section 6 FOREIGN PRIORITY INFORMATION

☐see continuation sheet(s)
for more priority information

Country: Application No.: Filing Date:

Country: Application No.: Filing Date:

Country: Application No.: Filing Date:

Section 7 ASSIGNEE INFORMATION

Name:

Mailing Address:

Date Submitted: December 23, 2009

By: Todd B. Alder, Ph.D.

Electronic Patent Application Fee Transmittal

Application Number:	61243434			
Filing Date:	17-Sep-2009			
Title of Invention:	Semiconductor Photodetecting Imagers and Methods for Making the Same			
First Named Inventor/Applicant Name:				
Filer:	Todd Brent Alder/Nicole Solomon			
Attorney Docket Number:	3035-009.PROV			
Filed as Small Entity				
Provisional Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Provisional Application filing fee	2005	1	110	110
Pages:				
Claims:				
Miscellaneous-Filing:				
Late provisional filing fee/cover sheet	2052	1	25	25
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				135

Electronic Acknowledgement Receipt

EFS ID:	6703307
Application Number:	61243434
International Application Number:	
Confirmation Number:	3255
Title of Invention:	Semiconductor Photodetecting Imagers and Methods for Making the Same
First Named Inventor/Applicant Name:	
Customer Number:	20551
Filer:	Todd Brent Alder/Nicole Solomon
Filer Authorized By:	Todd Brent Alder
Attorney Docket Number:	3035-009.PROV
Receipt Date:	23-DEC-2009
Filing Date:	17-SEP-2009
Time Stamp:	16:39:10
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	\$ 135
RAM confirmation Number	3719
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Application Data Sheet	3035009PROVappdata.pdf	31865 e754b52855db7169b98705e236e8b491f120b908	no	1
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
2	Fee Worksheet (PTO-875)	fee-info.pdf	31395 fb501210e2e695d544066531eb04fda0c300c5e6	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			63260		
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
61/243,434	09/17/2009		135	3035-009.PROV		

20551
THORPE NORTH & WESTERN, LLP.
P.O. Box 1219
SANDY, UT 84091-1219

CONFIRMATION NO. 3255
UPDATED FILING RECEIPT



Date Mailed: 07/02/2010

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Homayoon Haddad, Beverly, MA;
Jeffrey McKee, Beverly, MA;
Leonard Forbes, Beverly, MA;
Chintamani Palsule, Beverly, MA;

Power of Attorney: The patent practitioners associated with Customer Number 20551

If Required, Foreign Filing License Granted: 07/01/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/243,434**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Semiconductor Photodetecting Imagers and Methods for Making the Same

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing

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Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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