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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	One	of	One
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Complete if Known

Application Number

Filing Date

First Named Inventor

FU-YUAN HSIFH

Art Unit

Examiner Name

Attorney Docket Number

US 200801015

U. S. PATENT DOCUMENTS

[illegible]

FOREIGN PATENT DOCUMENTS

[illegible]

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 801.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT			
First Named Inventor/Applicant Name:	Fu-Yuan Tsieh			
Filer:	Han-Yi Lee			
Attorney Docket Number:	UAS200801015			
Filed as Small Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	75	75
Utility Search Fee	2111	1	255	255
Utility Examination Fee	2311	1	105	105
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				435

Electronic Acknowledgement Receipt

EFS ID:	2900877
Application Number:	12036243
International Application Number:	
Confirmation Number:	1604
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT
First Named Inventor/Applicant Name:	Fu-Yuan Tsieh
Customer Number:	60491
Filer:	Han-Yi Lee
Filer Authorized By:	
Attorney Docket Number:	UAS200801015
Receipt Date:	23-FEB-2008
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RAM confirmation Number	11190
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi-Part Part / .zip	Pages (if applicable)
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1		Specification.pdf	154586 f8877fd93024a57ef5e0ebd3988d5cbe4228fbfa	yes	27
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	13	
	Claims		14	16	
	Abstract		17	17	
	Drawings-only black and white line drawings		18	27	
Warnings:					
Information:					
2	Application Data Sheet	Application_Data_Sheet.pdf	75666 b3b42ee19093d3e5a225c95d29d6d657310c6c56	no	3
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
3	Oath or Declaration filed	Declaration_Power_Attorney.pdf	859332 a012620b5b8070d96ce74304824994c29f46b8e7	no	3
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Filed	IDS.pdf	72775 b9212b5f10b725553f3442ac17e8045a657cfc45	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
5	Fee Worksheet (PTO-06)	fee-info.pdf	8359 8ef22af6e82c159819f817726847de916c89d992	no	2
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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

FIELD OF THE INVENTION

[0001] This invention relates to a trench MOSFET with trench source contact and, in particular, to provide a lateral contact layer in the MOSFET for avalanche improvement.

BACKGROUND OF THE INVENTION

[0002] In the structure of a trench Metal-Oxide-Semiconductor Field Effect Transistor (MOSFET) or vertical transistor, the gate of the transistor is formed in a trench on top of an epitaxial layer—and the source/drain regions are formed on both sides of the gate. This type of vertical transistor allows high current to pass through and channel to be turned on/off at a low voltage.

[0003] Referring to Fig. 1, a cross-sectional diagram of the structure of a trench MOSFET is shown. In the prior art, the trench MOSFET has a MOSFET structure comprises a N⁺-type silicon substrate (101), a N-type epitaxial layer (102), a plurality of trenches (121), an oxide film (122), a polysilicon (123), a plurality of gate oxide films (103), a plurality of trench gates (104), a P-type base layer (105), a N⁺-type source layer (106), an interlayer oxide film (107), a plurality of source contact trenches (124), a P⁺-type base contact layer (108), a barrier metal layer (110), a plurality of contact metal plugs (111), a front metal layer (112), and a rear metal

layer (113). The N⁺-type silicon substrate (101), the N-type epitaxial layer (102), the P-type base layer (105), and the N⁺-type source layer (106) are stacked in sequence; and each of the source contact trenches (124) has a P⁺-type base contact layer (108) at a bottom thereof. However, the P⁺-type region of prior art is located only at source contact trench bottom. The sidewall of source contact trench has no ohmic contact (due to low doping concentration of P base) with the contact metal plug resulting in poor ruggedness performance during UIS (Unclamp Inductance Switching) test. A parasitic N⁺/P/N is easily turned on when P base resistance from channel to the contact metal plug is high enough, causing device destroyed.

[0004] The present invention provides a new structure of trench MOSFET structure with a trench source contact which improves the lack of the prior art.

SUMMARY OF THE INVENTION

[0005] The present invention is to provide a trench MOSFET (Metal-Oxide-Semiconductor Field Effect Transistor) with trench source contact, comprising: a semiconductor region, further comprising a silicon substrate, a epitaxial layer corresponding to the drain region of the trench MOSFET, a base layer corresponding to the body region of the trench MOSFET, and a source layer

corresponding to the source region of the trenched MOSFET; an interlayer oxide film formed on the source layer; a front metal layer formed on an upper surface of the semiconductor region; a back metal layer formed on a lower surface of the semiconductor region; a plurality of trenched gates formed to reach the epitaxial layer through the source layer and the base layer, and is covered by the interlayer oxide film; and a plurality of source contact trenches formed to reach the base layer through the interlayer oxide film and the source layer, and is covered by the front metal layer; wherein the silicon substrate, the epitaxial layer, the base layer, and the source layer are stacked in sequence; and each of the source contact trenches has a lateral contact layer at a sidewall thereof.

[0006] According to the present invention, the silicon substrate, the epitaxial layer, and the source layer are N-type; the base layer and lateral contact layer P^* are P-type; and each of the source contact trenches further has a P^+ -type base contact layer at a bottom thereof, and the lateral contact layer P^* has less doping concentration than the P^+ base contact layer at the source contact trench but higher doping concentration than P-base layer to achieve ohmic contact between the P^* -type region, which is lower doping concentration than P^+ -type region, and the contact metal plug while threshold voltage V_{th} is not significantly affected by P^* -type region.

[0007] Moreover, the trench MOSFET further comprises a barrier metal layer and a plurality of contact metal plugs. The barrier metal layer is Ti/TiN or Co/TiN and the contact metal plug is Tungsten.

[0008] In the said above, the description has been directed to the N-channel MOSFET structure. However, by inverting the conductive type, this invention is also applicable to a P-channel MOSFET structure. Moreover, in the MOSFET of this invention, the source contact trenches of the MOSFET are not restricted to have vertical shape but may be a sloped shape respective to the surface of epitaxial layer.

[0009] Compared with the conventional trench MOSFET, the present invention provides good ohmic contact to sidewall of the source contact and the base resistance R_p between channel and the source contact trench is thus reduced. Otherwise, the parasitic vertical bipolar (N^+ -P-N bipolar, N^+ is the N^+ -type source layer, P is the P-type base layer, N is the N-type epitaxial layer) will be turned on when the avalanche current (I_{av}) product the resistance (R_p) underneath N^+ -type source layer between the trenched gate and the trenched contact is equal to 0.7V. A feature of the description above is that the I_{av} is higher as the R_p is lower.

BRIEF DESCRIPTION OF THE DRAWINGS

[00010] The present invention can be more fully understood by reading the following detailed description of the preferred embodiments, with reference made to the accompanying drawings, wherein:

[00011] FIG. 1 is a sectional view of a conventional vertical trench MOSFET;

[00012] FIGS. 2A to 2G are sectional views for describing the processes in accordance with an embodiment of the present invention;

[00013] FIGS. 3A and 3B are schematic sectional views for describing ion implantation into a source contact trench of the present invention; and

[00014] FIG. 4 shows an impurity concentration profile taken along a line I-I in FIG. 2G of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[00015] The present invention is described by the following specific embodiments. Those with ordinary skills in the arts can readily understand the other advantages and functions of the present invention after reading the disclosure of this specification. The present invention can also be implemented with different embodiments. Various details described in this specification can be modified based on different viewpoints and applications without departing from the scope of the present invention.

[00016] Referring to FIGS. 2A to 2F, description will be made of a method of producing a trench MOSFET with a trench source contact according to an embodiment of the present invention.

[00017] Referring to Fig. 2A, a silicon substrate comprises a N^+ -type silicon substrate (201) which is strongly n-doped and has an N-type epitaxial layer (202) which is weakly n-doped thereon. A trench mask, a sacrificial oxide (not shown in figure), is applied, and lithography and silicon etching processes are performed to form a plurality of gate trenches (221) in the N-type epitaxial layer (202). Thereafter, the trench mask, sacrificial oxide is removed by wet etching. The depth and the width of each gate trench (221) and the distance between the adjacent gate trenches (221) must be selected to optimum sizes because the breakdown voltage and the on-resistance characteristic of the MOSFET depend thereupon. However, these sizes are also related to the state of formation of an impurity diffusion layer and have some degrees of freedom.

[00018] Referring to Fig. 2B, a deposition or thermally grown process is performed to form an oxide film (222) on the surface of the N-type epitaxial layer (202) and on inner surfaces of the gate trenches (221). Thereafter, a heavily doped

polysilicon (223) is deposited by CVD procedure. In order to sufficiently fill the gate trenches (221) with the polysilicon (223), the thickness of the polysilicon (223) must be equal to or greater than half of an aperture width of the gate trenches (221). The polysilicon (223) preferably has a low resistance because it is used as a gate electrode.

[00019] Referring to Fig. 2C, the oxide film (222) and the polysilicon (223), showed in Fig. 2B, are etched back to be left only in the interior of each of the gate trenches (221) respectively to form a plurality of gate oxide films (203) and a plurality of trenched gates (204) corresponding to the gate trenches (221) which act as gate regions of trenched MOSFET. It is noted here that, in a MOSFET chip structure, extraction of the gate electrode by the polysilicon (223) is required. A P-type base layer (205) is formed in the N-type epitaxial layer (202) by an ion implantation procedure, e.g. an implantation of B (boron) or BF₂ (boron fluoride) ions, and a N⁺-type source layer (206) is formed on the P-type base layer (205) to the depth shallower than the gate trenches (221) by another ion implantation procedure, e.g. an implantation of As (arsenic) ions, and followed with source diffusion.

[00020] Referring to Fig. 2D, an interlayer oxide film (207) is deposited by CVD procedure. Thereafter, a patterning is carried out by photolithography and the

interlayer oxide film (207) is etched by dry Oxide while the P-type base layer (205) and the N⁺-type source layer (206) are etched by silicon etching. The silicon etching is etched to the depth reaching the P-type base layer (205) through the interlayer oxide film (207) and the N⁺-type source layer (206), and a plurality of source contact trenches (224) are formed.

[00021] Referring to Figs. 2E and 3A, an implantation procedure of BF₂ with ninety degree (90°) respective to epitaxial layer surface and dose ranging from 5E14 to 5E15 cm⁻² and an activation by heat treatment are carried out to form a P⁺-type base contact layer (208) under the bottom of the source contact trench (224). Referring to Figs. 2E and 3B, thereafter, another implantation procedure of BF₂ with angle ranging from 45 to 80 degree respective to the surface of the epitaxial layer (202) and dose ranging from 1E14 to 4E14 cm⁻², and another activation by heat treatment are carried out to form a P^{*}-type lateral contact layer (209) at the sidewall of the source contact trench (224) and corresponding to the P-type base layer (205) while the implantation angle of the implantation procedure respective to the surface of the epitaxial layer (202) is less than the implantation angle of the implantation procedure of the P⁺-type base contact layer (208). The said P^{*}-type lateral contact layer (209) has less doping concentration than the P⁺-type base contact layer (208) while the

implantation procedure parameters of the P⁺-type base contact layer (208) and the P^{*}-type lateral contact layer (209) are considered. For example, the implantation procedure of the P⁺-type base contact layer (208) has higher doping concentration of BF₂ (boron fluoride) than the P^{*}-type lateral contact layer (209).

[00022] Referring to Fig. 2F, after the P⁺-type base contact layer (208) and the P^{*}-type lateral contact layer (209) are formed, a barrier metal layer (210), which has ingredient selected from one of Ti (titanium), TiN (titanium nitride), or synthetic of Ti and TiN, is deposited by sputtering and is formed on the surface of the source contact trenches (224) and interlayer oxide film (207).

[00023] Referring to Fig. 2G, the source contact trenches (224) are filled with one metal or an electrically conductive material to form a plurality of contact metal plugs (211). The contact metal plugs (211) can be formed on the surface of the barrier metal layer (210) by depositing metal, which preferably is tungsten metal. After etch back of the contact metal plug (211), a front metal layer (212) is formed on the surfaces of the barrier metal layer (210) and the contact metal plugs (211) and is defined a region for metal connections of the trenched MOSFET. The contact metal plug (211) is deposited by CVD or one deposition procedure. Besides tungsten metal, the material

of the contact metal plug (211) can although be selected from aluminum metal or copper metal, and so the front metal layer (212) of the trench MOSFET is.

[00024] The said front metal layer (212) can also be deposited by sputtering AlSi (aluminum silicon) or AlSiCu (aluminum copper silicon) on the surface of the barrier metal layer (210). The front metal layer (212) is preferably as thick as possible in order to reduce the resistance component of AlSi or AlSiCu. In the MOSFET chip structure, the front metal layer (212) is used not only as a source electrode, one part of the front metal layer (212), but also as a gate electrode, another part of the front metal layer (212), connected to the polysilicon (223). Therefore, in an area except the cell region, patterning by photolithography and etching are required (not shown). Subsequently, a covering material such as PSG (phosphosilicate glass) or a nitride film is deposited as a surface protection film. In order to form a bonding region, patterning by photolithography and etching are carried out (not shown). Finally, the other surface of the N⁺-type silicon substrate (201) is ground by a desired thickness. Several kinds of metals are deposited by vapor deposition to form a back metal layer (213) as a drain electrode.

[00025] In the said embodiment, description has been directed to the N-channel MOSFET structure. However, by inverting the conductive type, this invention is also

applicable to a P-channel MOSFET structure. Moreover, in the MOSFET of this invention, the trenches of the MOSFET are not restricted to have vertical shape but may be a tapered shape.

[00026] Referring to Fig. 2G again, the N⁺-type silicon substrate (201), the N-type epitaxial layer (202), the P-type base layer (205), and the N⁺-type source layer (206) construct the semiconductor region of the trenched MOSFET. The gate trench (221) is formed to reach the N-type epitaxial layer (202) through the N⁺-type source layer (206) and the P-type base layer (205), and is covered by the interlayer oxide film (207). The source contact trenches (224) is formed to reach the P-type base layer (205) through the interlayer oxide film (207) and the N⁺-type source layer (206), and is covered by the front metal layer (212). The N-type epitaxial layer (202) are corresponding to the drain region of the trenched MOSFET, the N-type trenched gates (204) are corresponding to the gate region of the trenched MOSFET, the N⁺-type source layer (206) are corresponding to the source region of the trenched MOSFET, and the P-type base layer (205) are corresponding to the body region of the trenched MOSFET. Furthermore, the front metal layer (212) is formed as the source metal, and the gate and field plate metal of the trenched MOSFET. The interlayer oxide film (207) is formed between the front metal layer (212) and the trenched gates (204) for

insulating, and the contact metal plugs (211) are penetrated through the interlayer oxide film (207) and contacted with the front metal layer (212). The P⁺-type base contact layer (208) and the P^{*}-type lateral contact layer (209) are formed at the bottom and sidewall of the source contact trenches (224), respectively. The P^{*}-type lateral contact layer (209) doping concentration is optimized to have ohmic contact to the barrier metal layer (210)/ the contact metal plug (211) without significantly increasing threshold voltage of device, causing higher R_{ds}.

[00027] Referring to Fig. 4, a depth from top surface of the N⁺-type source layer (206) to the bottom of the source contact trenches (224) is preferably different from the peak depth in an impurity concentration profile of the P-type base layer (205) in FIG. 4 taken along the line I-I in FIG. 2G. That is, the peak depth is defined as a position having a maximum impurity-concentration depth (205a) which determinates V_{th}, in a depth direction of the P-type base layer (205). As described above, the depth of the contact trench bottom (205b) in the MOSFET is different from the maximum impurity-concentration depth (205a). Thus, it is possible to suppress the influence upon the channel region and to reduce the cell size without increasing threshold voltage.

[00028] Although various embodiments are specifically illustrated and described herein, it will be appreciated that modifications and variations of the present invention are covered by the above teachings and are within the purview of the appended claims without departing from the spirit and intended scope of the invention.

CLAIMS

WHAT IS CLAIMED IS:

1. A trench MOSFET with a trench source contact, comprising:
 - a semiconductor region, further comprising a silicon substrate, an epitaxial layer corresponding to the drain region of the trench MOSFET, a base layer corresponding to the body region of the trench MOSFET, and a source layer corresponding to the source region of the trench MOSFET;
 - an interlayer oxide film formed on the source layer;
 - a front metal layer formed on an upper surface of the semiconductor region;
 - a back metal layer formed on a lower surface of the semiconductor region;
 - a plurality of trench gates formed to reach the epitaxial layer through the source layer and the base layer, and is covered by the interlayer oxide film; and
 - a plurality of source contact trenches formed to reach the base layer through the interlayer oxide film and the source layer, and is covered by the front metal layer;wherein the silicon substrate, the epitaxial layer, the base layer, and the source layer are stacked in sequence; and each of the source contact trenches has a lateral contact layer

at a sidewall and a base contact layer at bottom of source contact trench thereof.

2. The trench MOSFET of claim 1, wherein the silicon substrate, the epitaxial layer, and the source layer are N-type; the base layer and lateral contact layer are P-type; and each of the source contact trenches further has a P-type base contact layer at a bottom thereof, and the lateral contact layer has less doping concentration than the base contact layer at bottom.
3. The trench MOSFET of claim 2, wherein further comprises a barrier metal layer and a plurality of contact metal plugs.
4. The trench MOSFET of claim 3, wherein the barrier metal layer is Ti/TiN and the contact metal plug is Tungsten.
5. The trench MOSFET of claim 4, wherein the source contact trench is selected from one of a vertical shape and a tapered shape.
6. The trench MOSFET of claim 1, wherein the silicon substrate, the epitaxial layer, and the source layer are P-type; the base layer and lateral contact layer are N-type; and each of the source contact trenches further has a N-type base contact layer at a bottom thereof, and the lateral contact layer has less doping concentration than the base contact

layer at bottom.

7. The trench MOSFET of claim 6, wherein further comprises a barrier metal layer and a plurality of contact metal plugs.
8. The trench MOSFET of claim 7, wherein the barrier metal layer is Ti/TiN and the contact metal plug is Tungsten.
9. The trench MOSFET of claim 8, wherein the source contact trench is selected from one of a vertical shape and a tapered shape.

ABSTRACT OF THE DISCLOSURE

A trench MOSFET with a trench source contact, comprising: a semiconductor region, further comprising a silicon substrate, an epitaxial layer corresponding to the drain region of the trench MOSFET, a base layer corresponding to the body region of the trench MOSFET, and a source layer corresponding to the source region of the trench MOSFET; an interlayer oxide film formed on the source layer; a front metal layer formed on an upper surface of the semiconductor region; a back metal layer formed on a lower surface of the semiconductor region; a plurality of trench gates formed to reach the epitaxial layer through the source layer and the base layer, and is covered by the interlayer oxide film; and a plurality of source contact trenches formed to reach the base layer through the interlayer oxide film and the source layer, and is covered by the front metal layer; wherein the silicon substrate, the epitaxial layer, the base layer, and the source layer are stacked in sequence; and each of the source contact trenches has a lateral contact layer at a sidewall thereof.

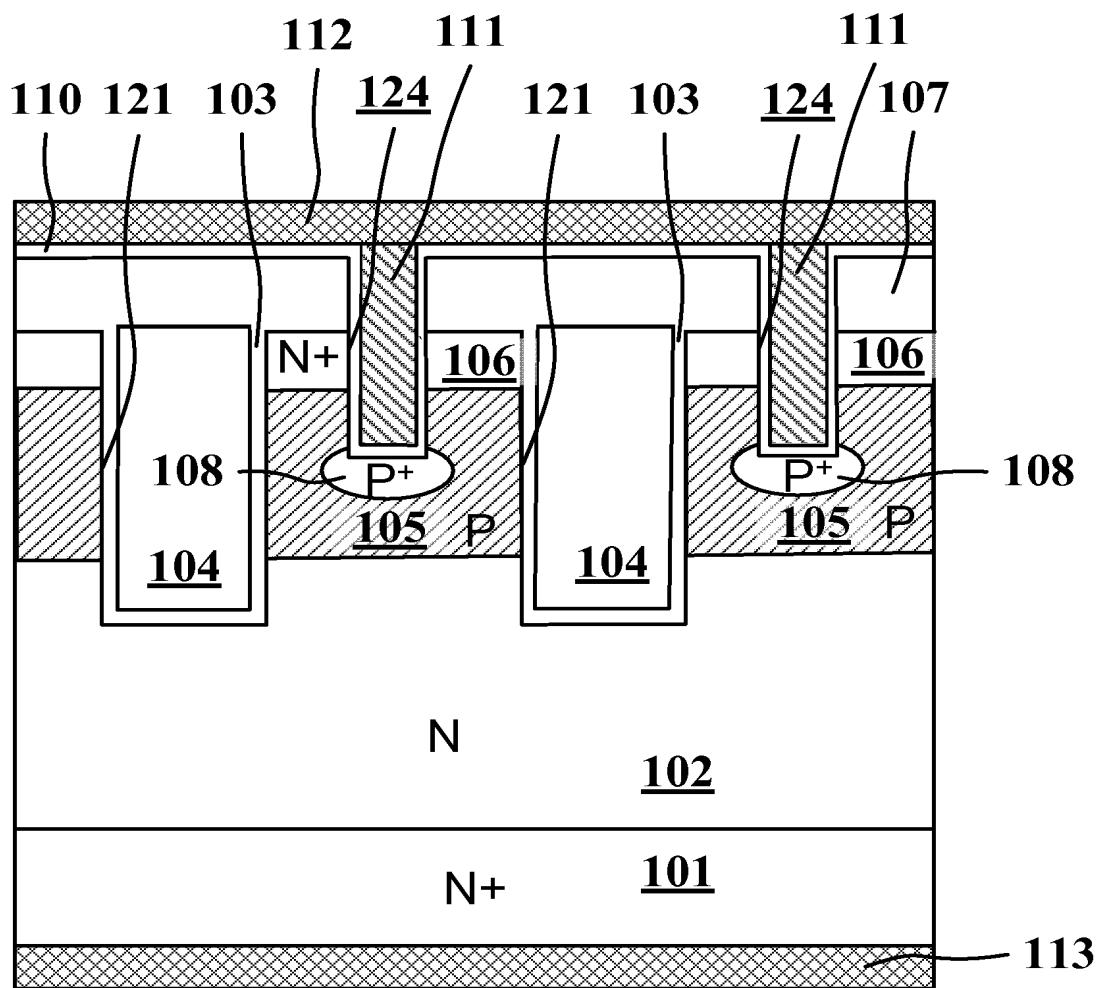
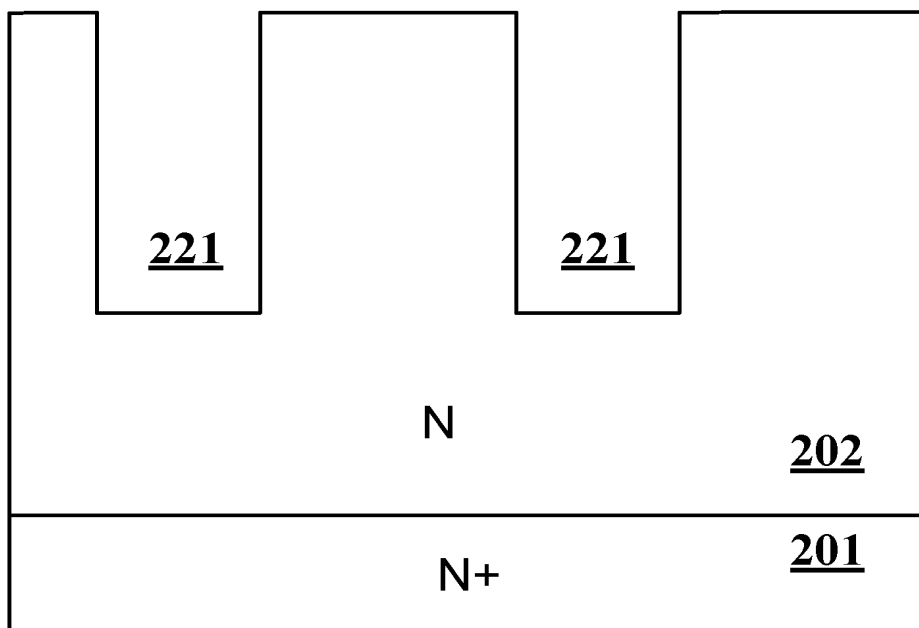
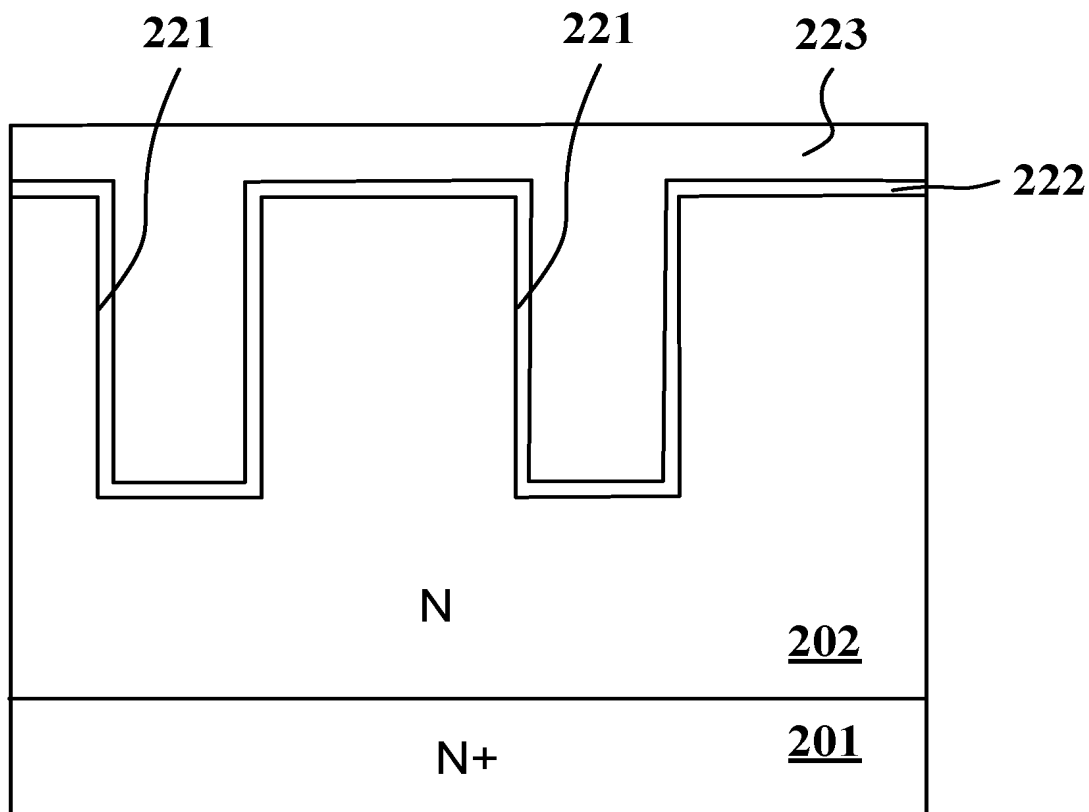
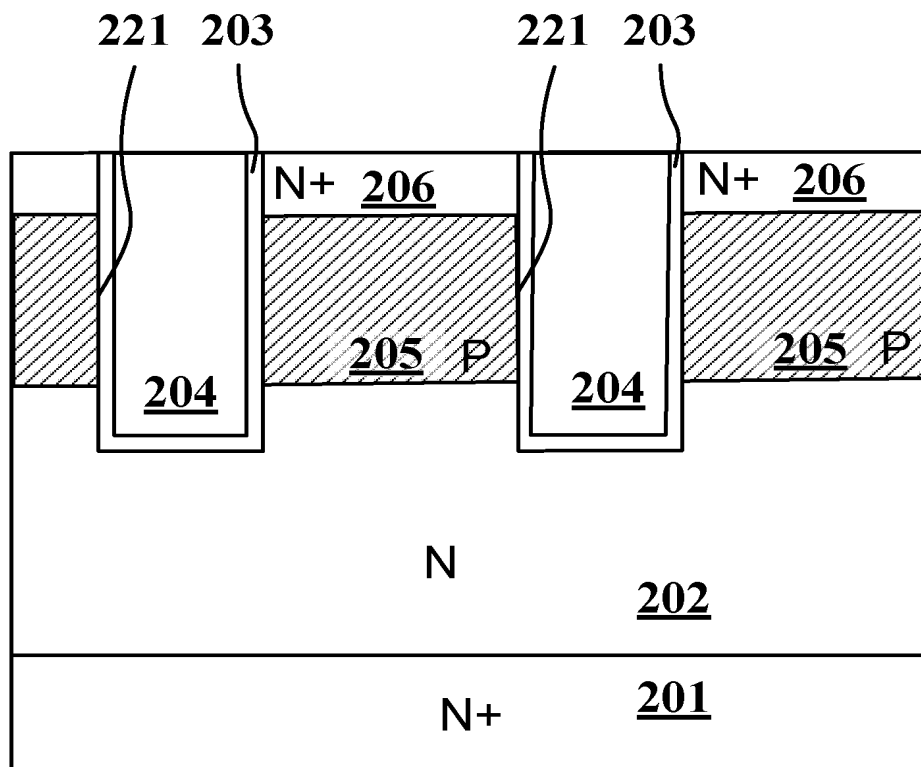


Fig. 1 (PRIOR ART)

**Fig. 2A**

**Fig. 2B**

**Fig. 2C**

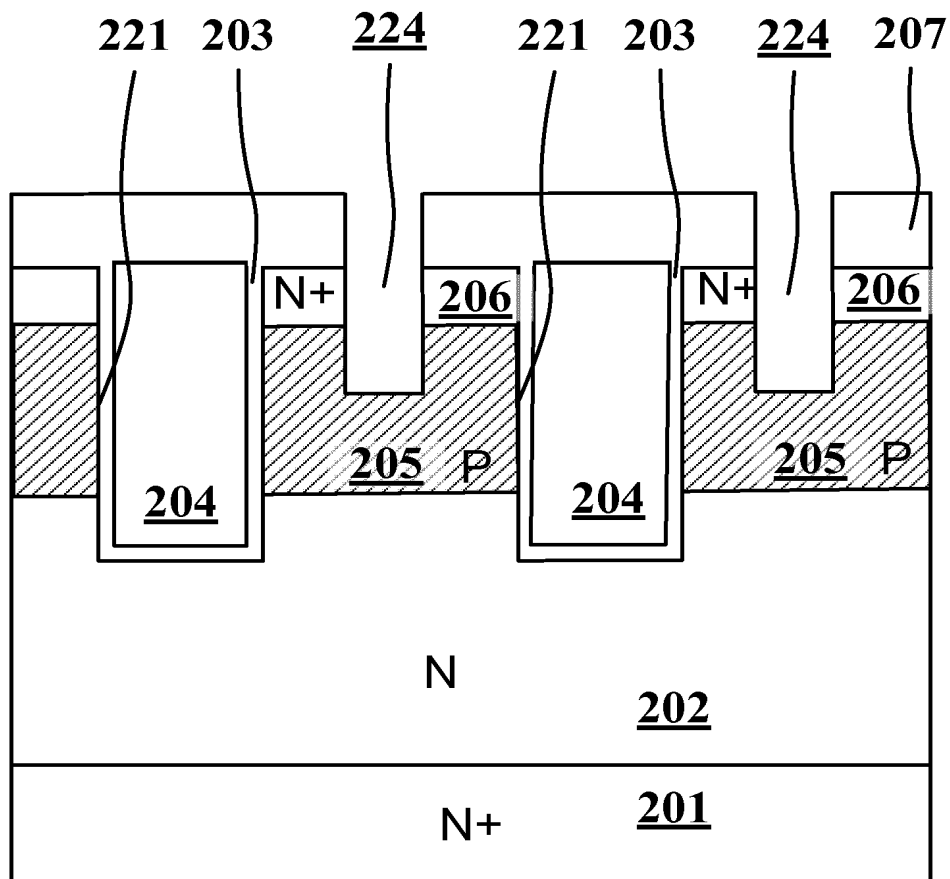


Fig. 2D

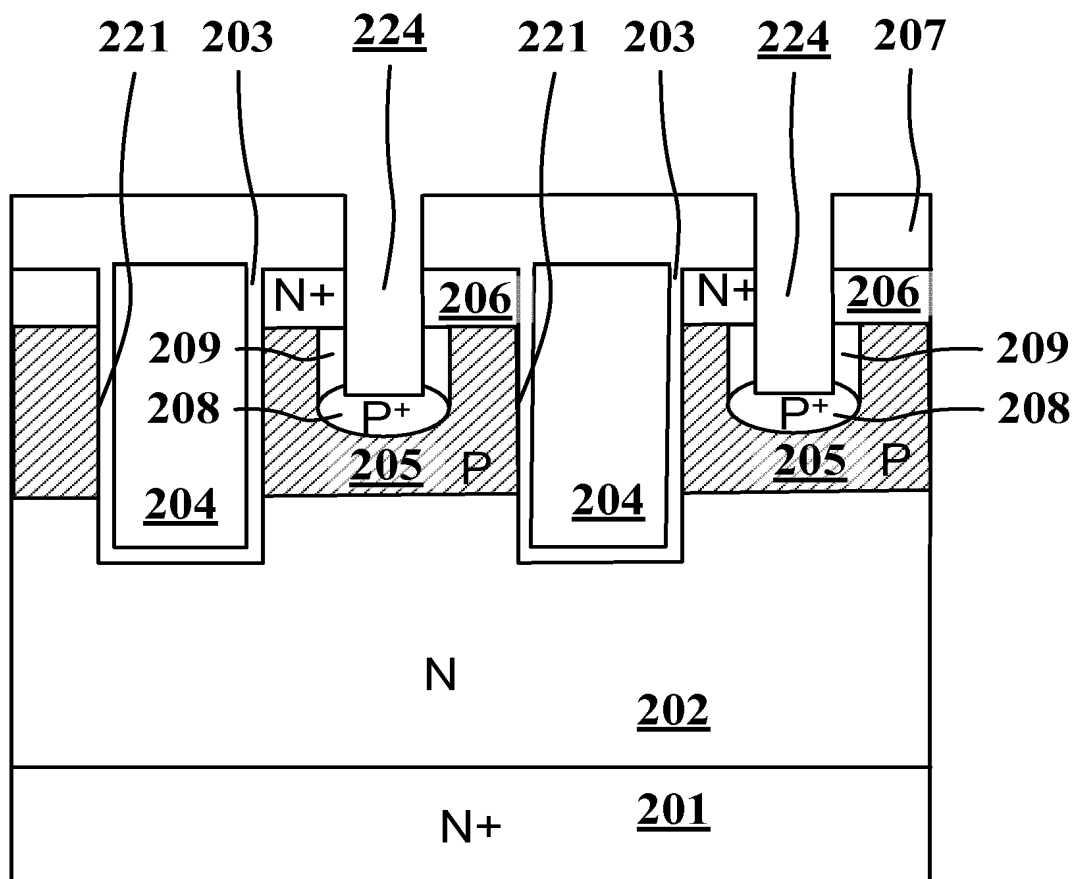


Fig. 2E

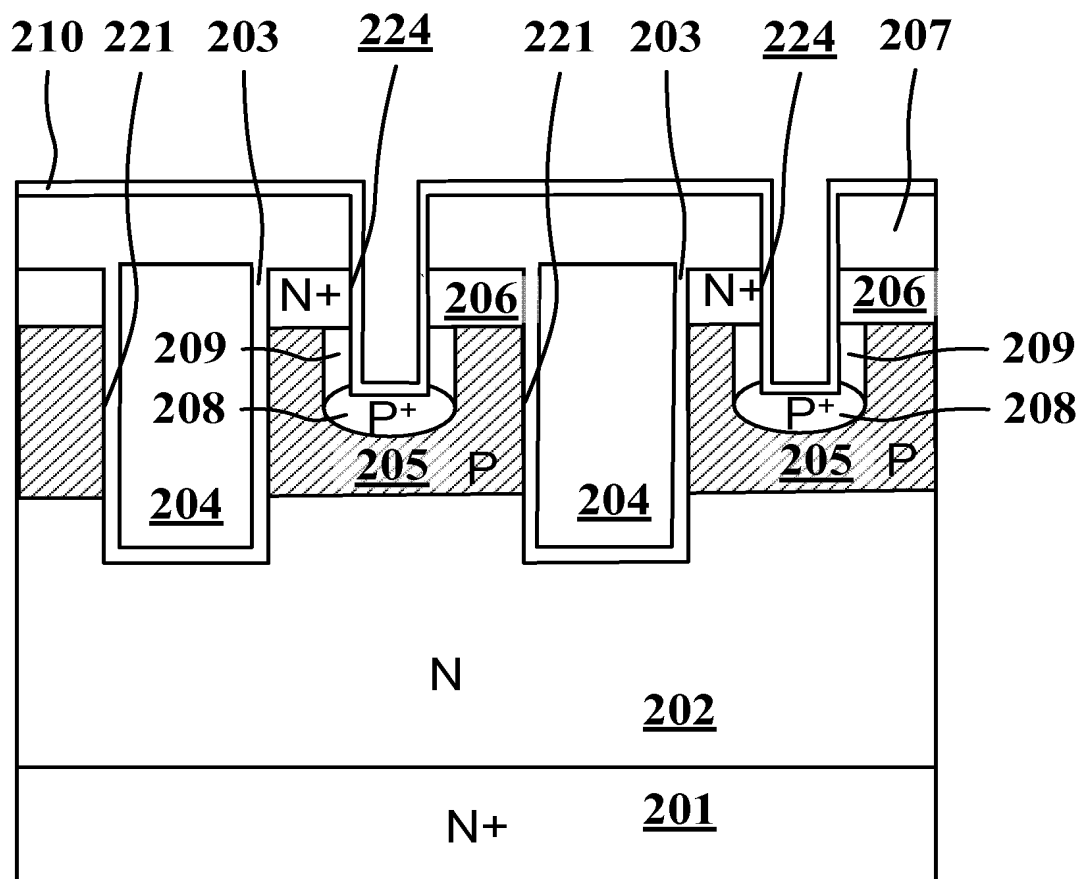


Fig. 2F

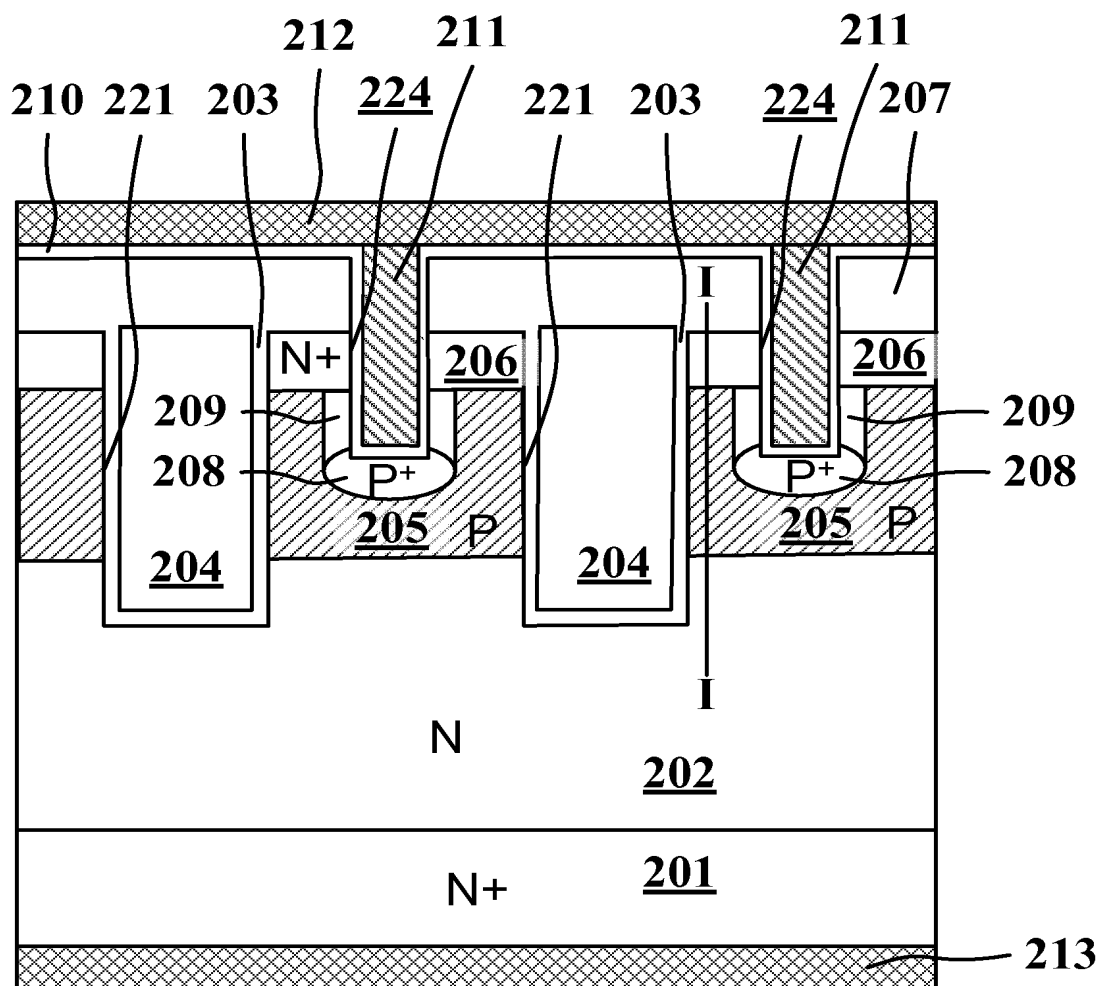


Fig. 2G

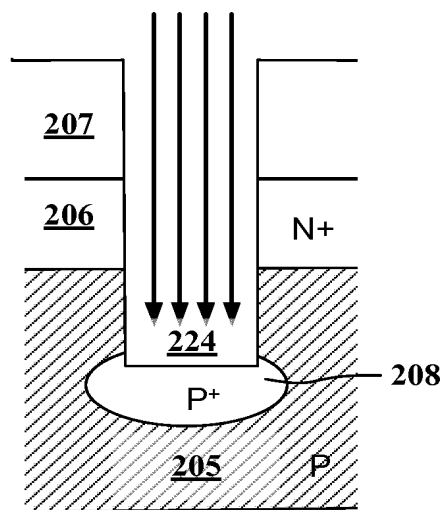


Fig. 3A

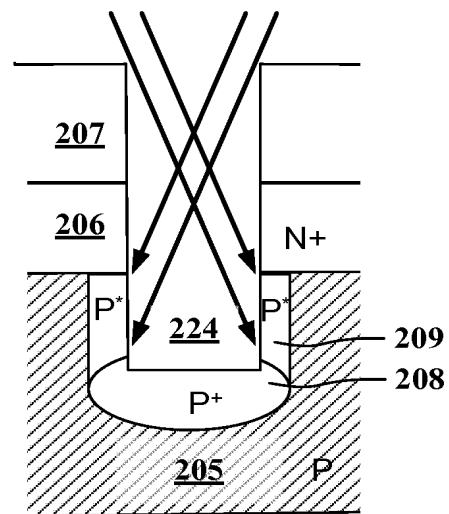
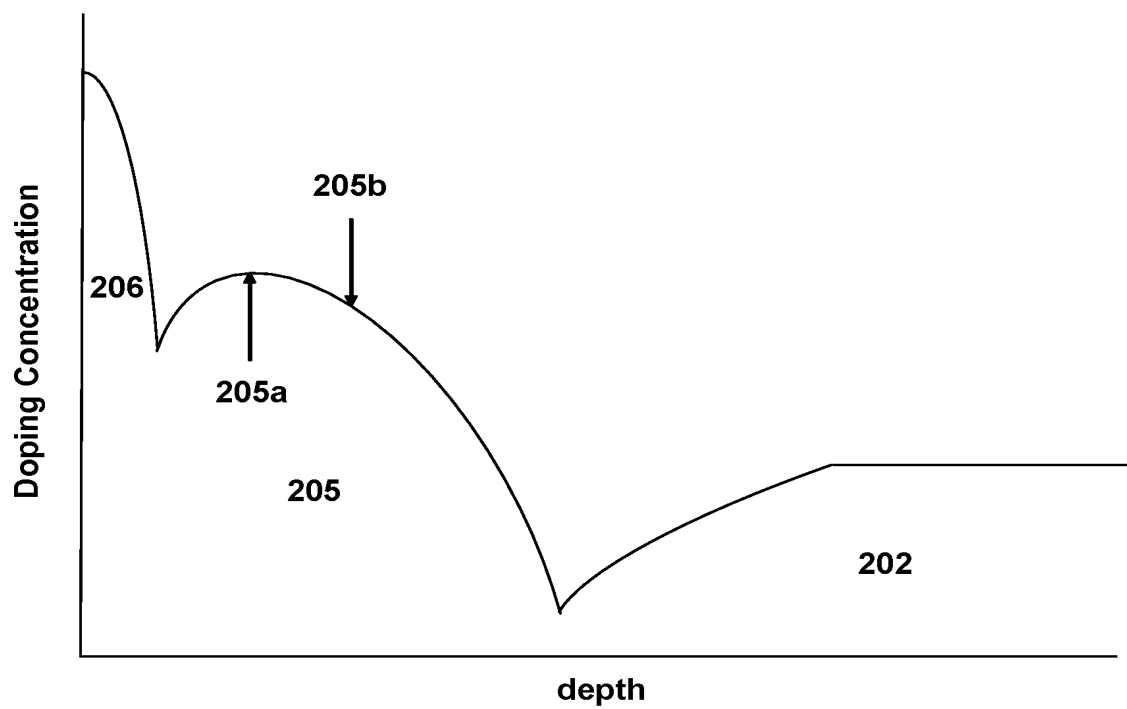


Fig. 3B

**Fig. 4**

APPLICATION DATA SHEET**Application Information**

Application Type::	Nonprovisional
Subject Matter::	Utility
CD-ROM or CD-R?::	None
Title::	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT
Attorney Docket No.::	200801015
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	FIG. 2A
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Small Entity?::	Yes
Petition included?::	No
Secrecy Order in Parent Appl.?	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	Taiwan (TW)
Status::	Full Capacity
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City of Mailing Address::	HsinChu
State of Mailing Address::	N/A

Country of Mailing Address:: TAIWAN (TW)

Postal or Zip Code of Mailing Address:: 300

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Representative Information

Representative Customer Number:	60491
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Assignee Name:: FORCE MOS TECHNOLOGY CO. LTD.

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HsinChu

City of Mailing Address::

State of Mailing Address::

Country of Mailing Address:: TAIWAN, R.O.C

Signature

Representative's Signature::



Date::

2008-01-10

First Name::

Han-Yi Lee

Last Name::

Lee

Registration Number::

53,192

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled: TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT, the specification of which

 X is attached hereto.
 was filed on _____ at United States Application Number _____
or PCT international Application Number _____
and was amended on _____ (if applicable), or
 is a Continuation-In-Part (CIP) of Application Number _____, filed

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56 including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35, United States Code, Section 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent or inventor's or plant breeder's right certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's or plant breeder's rights certificate, or any PCT international application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Number	Country	Day/Month/Year filed	Priority Claimed
--------	---------	----------------------	------------------

I hereby claim the benefit under 35 United States Code, Section 119(e) of any United States provisional application(s) listed below,

Prior Provisional Application(s):

I hereby claim the benefit under 35, United States Code, Section 120 of any United States application(s) or 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States Code, Section 112. I acknowledge the duty to disclose information which is material to patentability as defined in 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. Application(s):

Application No.	Filing Date	Status: Patented, Pending, Abandoned
-----------------	-------------	--------------------------------------

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY:

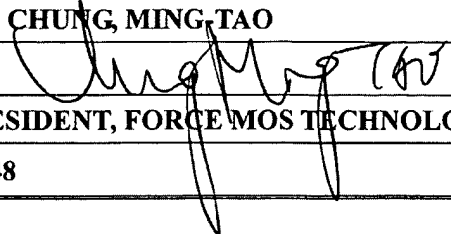
As a named applicant, I hereby appoint the registered practitioner of Bayshore Patent Group, LLC, included in the Customer Number provided below, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

CUSTOMER CUMBER: 60491

Send correspondence to the address associated with the above-mentioned Customer Number.

SIGNATURE OF APPLICANT

Full Name of Applicant: **CHUNG, MING, TAO**

Applicant's Signature: 

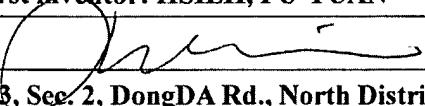
Date:

Title and Company: **PRESIDENT, FORCE MOS TECHNOLOGY CO. LTD.**

Telephone: **886-285123848**

NAME OF SOLE OR FIRST INVENTOR

Full Name of sole or first inventor: **HSIEH, FU-YUAN**

Inventor's Signature: 

Date:

Residence: **4F-5, No. 83, Sec. 2, DongDA Rd., North District**

City: **HSINGCHU**

Country: **TAIWAN**

Citizenship: **TAIWAN, R.O.C**

Filing Date: 02/23/08

Approved for use through 7/31/2006; OMB 0651-0032

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD
 Substitute for Form PTO-875

Application or Docket Number
12/036,243

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)
FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A
TOTAL CLAIMS (37 CFR 1.16(i))	9 minus 20 =	0
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))		
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))		

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	*	Minus **	=
Independent (37 CFR 1.16(h))	*	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	*	Minus **	=
Independent (37 CFR 1.16(h))	*	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

RATE (\$)	FEE (\$)
N/A	75
N/A	255
N/A	105
X\$ 25	0
X\$105	0
185	
TOTAL	435

RATE (\$)	FEE (\$)
N/A	
N/A	
N/A	
X\$50	
X\$210	
370	
TOTAL	0

RATE (\$)	ADDI- TIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL	
ADD'T FEE	

RATE (\$)	ADDI- TIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL	
ADD'T FEE	

RATE (\$)	ADDI- TIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL	
ADD'T FEE	

RATE (\$)	ADDI- TIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL	
ADD'T FEE	

This collection of information is required by 37 CFR 1.16. 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 1.14. This collection is estimated to take 12 minutes 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.



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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
12/036,243	02/23/2008	2811	435	200801015	9	1

CONFIRMATION NO. 1604

60491
BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539

FILING RECEIPT



OC00000028910998

Date Mailed: 03/19/2008

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. 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 write to the Office of Initial Patent Examination's Filing Receipt Corrections. 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)

Fu-Yuan Hsieh, HsinChu, TAIWAN;

Assignment For Published Patent Application

FORCE MOS TECHNOLOGY CO. LTD., HsinChu, TAIWAN

Power of Attorney: The patent practitioners associated with Customer Number 60491

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 03/17/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/036,243**

Projected Publication Date: 08/27/2009

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

Preliminary Class

257

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).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Fu-Yuan Hsieh

Serial No.: 12/036,243

Filing Date: February 23, 2008

For: TRENCH MOSFET WITH TRENCH GATES UNDERNEATH CONTACT
AREAS OF ESD DIODE FOR PREVENTION OF GATE AND SOURCE
SHORTCIRCUIT

**INFORMATION DISCLOSURE
STATEMENT UNDER 37 C.F.R. §1.97 & 1.98**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

May 16, 2008

Dear Sir:

Pursuant to 37 C.F.R. §1.97 and §1.98, Applicant submits for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of U.S. Patents 6,884,683 and 6,657,256 are not included herewith. This protocol conforms with the waiver of the requirement under 37 C.F.R. §1.98(a)(2) to provide copies of U.S. Patents or pending U.S. Patent Applications. The Examiner is requested to make these documents of record.

This Information Disclosure Statement is Submitted:

- ☐ With the application; accordingly, no fee or separate requirements are required.
- ☐ Before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114. However, if applicable, a certification under 37 C.F.R. §1.97 (e)(1) has been provided.
- **Within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required.**
- ☐ After receipt of a first Office Action on the merits but before mailing of a final Office Action or Notice of Allowance.
 - ☐ A fee is required. A check in the amount of ___ is enclosed.
 - ☐ A fee is required. Accordingly, a Fee Transmittal form (PTO/SB/17) is attached to this submission in duplicate.
 - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above; accordingly; no fee is believed to be due.
- ☐ After mailing of final Office Action or Notice of Allowance, but before payment of the issue fee.
 - ☐ A Certification under 37 C.F.R. §1.97(e) is provided above and a check in the amount of ___ is enclosed.
 - ☐ A Certification under 37 C.F.R. §1.97(e) is provided above and a Fee Transmittal form (PTO/SB/17) is attached to this submission in duplicate.

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

The information contained in this Information Disclosure Statement under 37 C.F.R. §1.97 and §1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this

application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. §1.17(p)) is required, Applicant petitions for any required relief including extensions of time. Should this happen please inform Applicant at your earliest convenience.

Dated: May 16, 2008

Respectfully submitted,

By Grace Lee Huang
Grace Lee Huang (also known as
Han-Yi Lee)
Registration No.: 53,192

Bayshore Patent Group, LLC
520 Chantecler Dr.
Fremont, CA 94539
(510) 378-8558



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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
12/036,243		2826	



Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 60491 on 09/04/2008

- Correspondence Address
- Maintenance Fee Address
- Power of Attorney Address

The address of record for Customer Number 60491 is:

60491
BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539



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NOTICE OF ALLOWANCE AND FEE(S) DUE

60491 7590 07/28/2009

BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539

EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 07/28/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

12/036,243

02/23/2008

Fu-Yuan Hsieh

200801015

1604

TITLE OF INVENTION: TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	10/28/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

60491 7590 07/28/2009

**BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539**

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

12/036,243 02/23/2008 Fu-Yuan Hsieh 200801015 1604

TITLE OF INVENTION: TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$755 \$300 \$0 \$1055 10/28/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
----------	----------	----------------

BLUM, DAVID S 2813 257-288000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. 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 1.14. This collection is estimated to take 12 minutes 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015	1604
60491	7590	07/28/2009	EXAMINER	
BAYSHORE PATENT GROUP, LLC 520 CHANTECLER DR. FREMONT, CA 94539			BLUM, DAVID S	
			ART UNIT	PAPER NUMBER
			2813	
DATE MAILED: 07/28/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 96 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 96 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	12/036,243	HSIEH, FU-YUAN	
	Examiner	Art Unit	
	DAVID S. BLUM	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/23/08.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. ☒ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>2/23/08,5/19/08</u> 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. ☐ Notice of Informal Patent Application 6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date <u>5/20/09</u> . 7. ☒ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____. |
|--|--|

/David S Blum/
Primary Examiner, Art Unit 2813

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	12/036,243	HSIEH, FU-YUAN	
	Examiner	Art Unit	
	DAVID S. BLUM	2813	

All Participants:

(1) DAVID S. BLUM.

(2) Grace Huang.

Date of Interview: 15 July 2009

Type of Interview:
☒ Telephonic
☐ Video Conference
☐ Personal (Copy given to: ☐ Applicant ☐ Applicant's representative)

Exhibit Shown or Demonstrated: ☐ Yes ☐ No
 If Yes, provide a brief description: .

Part I.

Rejection(s) discussed:

Claims discussed:
 1

Prior art documents discussed:
Kobayashi (US6,888,196)

Status of Application: Allowed

(3) _____

(4) _____

Time: 2PM

Part II.

SUBSTANCE OF INTERVIEW DESCRIBING THE GENERAL NATURE OF WHAT WAS DISCUSSED:
Discussed novelty of invention (lateral contact covering entire trench sidewall)), prior art and claim language on 7/15/09 resulting in proposed claim language (via e-mail) 7/20/09, and further telephone conversation of 7/20/09

Part III.

☒ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview directly resulted in the allowance of the application. The examiner will provide a written summary of the substance of the interview in the Notice of Allowability.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview did not result in resolution of all issues. A brief summary by the examiner appears in Part II above.

(Applicant/Applicant's Representative Signature – if appropriate)

This action is in response to the application filed 2/23/08.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Grace Huang on 7/15/09 and by e-mail and telephone interview on 7/20/09.

The application has been amended as follows:

1. A trench MOSFET with a trench source contact, comprising:
 - a semiconductor region having a drain region, a body region and a source region, comprising a silicon substrate, an epitaxial layer corresponding to said drain region disposed on the top of said silicon substrate, a base layer corresponding to said body region disposed on the top of said epitaxial layer, and a source layer corresponding to said source region disposed on the top of said base layer;
 - a front metal layer formed on the upper surface of said semiconductor region;
 - an interlayer oxide film formed between said source layer and said front metal layer,

a bottom metal layer formed on the lower surface of said semiconductor region;

a plurality of trenched gates covered by said interlayer oxide film are formed on top of said source layer extending downwardly through said base layer to a portion of said epitaxial layer; and

a plurality of source contact trenches formed on the top of said interlayer oxide film extending downwardly through said source layer to a portion of said base layer; wherein the sidewalls of said trenches in said base layer are covered by the lateral contact layer; wherein the bottom base of said trenches in said base layer are covered by the base contact layer.

Reasons for Allowance

2. Claims 1-9 are allowed.
3. The following is an examiner's statement of reasons for allowance:

Claim 1 limits the trenched MOSFET to having a trench in which the base and entire sidewall are covered with the lateral contact layer. Kobayashi (US 6,888,196) covers the base and only a portion of the trench sidewall with the lateral contact layer.

Claims 2-9 are allowed as being properly dependent upon allowed claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (571)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Landau, can be reached at (571)-272-1731. Our facsimile number all patent correspondence to be entered into an application is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David S Blum/

Primary Examiner, Art Unit 2813

July 27, 2009

Notice of References Cited	Application/Control No. 12/036,243	Applicant(s)/Patent Under Reexamination HSIEH, FU-YUAN	
	Examiner DAVID S. BLUM	Art Unit 2813	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,888,196	05-2005	Kobayashi, Kenya	257/330
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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BIB DATA SHEET

CONFIRMATION NO. 1604

SERIAL NUMBER 12/036,243	FILING or 371(c) DATE 02/23/2008 RULE	CLASS 257	GROUP ART UNIT 2813	ATTORNEY DOCKET NO. 200801015	
APPLICANTS Fu-Yuan Hsieh, HsinChu, TAIWAN; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 03/17/2008					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/DAVID S BLUM/</u> Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY TAIWAN	SHEETS DRAWINGS 10	TOTAL CLAIMS 9	INDEPENDENT CLAIMS 1
ADDRESS BAYSHORE PATENT GROUP, LLC 520 CHANTECLER DR. FREMONT, CA 94539 UNITED STATES					
TITLE TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT					
FILING FEE RECEIVED 435	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

Search Notes 	Application/Control No. 12036243	Applicant(s)/Patent Under Reexamination HSIEH, FU-YUAN
	Examiner DAVID S BLUM	Art Unit 2813

SEARCHED			
Class	Subclass	Date	Examiner
257	288,330,E21.41,E29.262	7/15/09	DSB

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (attached)	7/15/09	DSB
Inventor name search	7/15/09	DSB

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
257	88,330,E21.41,E29.262	7/15/09	DSB

	/DAVID S BLUM/ Primary Examiner.Art Unit 2813
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"6888196".pn.	US-PGPUB; USPAT	ADJ	ON	2009/07/15 15:01
L2	30	semiconductor and MOSFET and silicon and epitaxial and oxide and ((front or upper) near2 metal) and ((back or lower) near2 metal) and (trench\$2 adj gate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2009/07/15 15:16
L3	14983	Hsieh.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2009/07/15 15:21
L4	30	L2 and Mosfet	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2009/07/15 15:21
L5	230	L3 and Mosfet	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2009/07/15 15:22
L6	11	L5 and ((trench or trenched) near3 contact)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2009/07/15 15:23
L8	1992	(257/288,330,).CCLS.	USPAT	OR	OFF	2009/07/15 15:29
L9	2410	(257/288,330,E29.262,E21.41).CCLS.	USPAT	OR	OFF	2009/07/15 15:32
L10	4570	(257/288,330,E29.262,E21.41).CCLS.	US-PGPUB; USPAT	OR	OFF	2009/07/15 15:32

7/ 15/ 09 4:34:19 PM

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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	One	of	One
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Complete if Known

Application Number	12/036243
Filing Date	2/23/08
First Named Inventor	FU-YUAN HSIEH
Art Unit	3813
Examiner Name	Blum
Attorney Docket Number	US 200801015

U. S. PATENT DOCUMENTS

[illegible]

FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	1 ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				

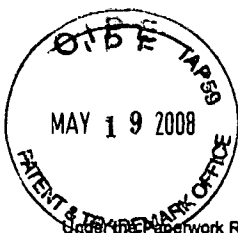
Examiner Signature	/David Blum/	Date Considered	07/15/2009
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 801.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1.14. This collection is estimated to take 2 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, 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 (1-800-786-9199) and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.B./



IT-W

PTO/SB/08A (01-08)

Approved for use through 01/31/2008. OMB 0651-0031

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number	12/036,243
Filing Date	2/23/08
First Named Inventor	FU-YUAN HSIEH
Art Unit	2813
Examiner Name	Blum
Attorney Docket Number	US 200801015

Sheet One of One

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
		US-0,888,198	03-03-2005	Kobayashi et al.	Considered on IDS filed 2/23/08
		US-			
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	7 ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				

Examiner
Signature

/David Blum/

Date
Considered

07/15/2009

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1.14. This collection is estimated to take 2 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, 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 (1-800-786-9199) and select option 2.



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015

CONFIRMATION NO. 1604

PUBLICATION NOTICE



OC000000037539696

60491
BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539

Title:TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

Publication No.US-2009-0212359-A1

Publication Date:08/27/2009

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

60491 7590 07/28/2009

BAYSHORE PATENT GROUP, LLC
 520 CHANTECLER DR.
 FREMONT, CA 94539



Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmittal

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Grace Lee Huang (Depositor's name)
 10/26/2009 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015	1604

TITLE OF INVENTION: TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	10/28/2009
EXAMINER	ART UNIT	CLASS-SUBCLASS				
BLUM, DAVID S	2813	257-288000				

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

- 1 GRACE LEE HUANG
 2 ARCH EQUITY HOLDING
 3 LLC

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

FORCE MOS Technology Co., Ltd.

Hsinchu, TAIWAN

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Grace Lee Huang

Date 10/27/2009

Typed or printed name

Grace Lee Huang

Registration No.

53,192

755.00 OP

This collection of information is required by 37 CFR 1.311. 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 1.14. This collection is estimated to take 12 minutes 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/036,243	12/08/2009	7629634	200801015	1604

60491 7590 11/18/2009
BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 96 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Fu-Yuan Hsieh, HsinChu, TAIWAN;

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	12/036243
	Filing Date	February 23, 2008
	First Named Inventor	Fu-Yuan Hsieh
	Title	Trench Mosfet with Trenched Source...
	Art Unit	2813
	Examiner Name	David S. Blum
	Attorney Docket Number	HSIE3188

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

23364

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City State Zip

Country

Telephone Email

I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature	<i>Vincent Wei</i>	Date	2014-09-09
Name	Vincent Wei	Telephone	02 8512-4831
Title and Company	General Manager of Force Mos Technology Co., Ltd.		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 minutes 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.

Electronic Acknowledgement Receipt

EFS ID:	20081385
Application Number:	12036243
International Application Number:	
Confirmation Number:	1604
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT
First Named Inventor/Applicant Name:	Fu-Yuan Hsieh
Customer Number:	60491
Filer:	Thomas J. Moore/Dana Logan
Filer Authorized By:	Thomas J. Moore
Attorney Docket Number:	200801015
Receipt Date:	09-SEP-2014
Filing Date:	23-FEB-2008
Time Stamp:	08:45:40
Application Type:	Utility under 35 USC 111(a)

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	Power of Attorney	7629634POA.pdf	70376 7f217df68367086d821e9c8be2e315c3f7332ee8	no	1

Warnings:

Information:

Excelliance Mos Corporation
Ex. 1002

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PETITION TO ACCEPT UNINTENTIONALLY DELAYED PAYMENT OF MAINTENANCE FEE IN AN EXPIRED PATENT (37 CFR 1.378(b))

Patent Number	Issue Date (YYYY-MM-DD)	Application Number	Filing Date (YYYY-MM-DD)	Docket Number (if applicable)
7629634	2009-12-08	12036243	2008-02-23	HSIE3188

CAUTION: Maintenance fee payment must correctly identify: (1) the patent number and (2) the application number of the actual U.S. application leading to issuance of that patent to ensure the fee(s) is/are associated with the correct patent. 37 CFR 1.366(c) and (d).

SMALL ENTITY

☒ Patentee claims, or has previously claimed, small entity status. See 37 CFR 1.27.

LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS

☐ Patentee is no longer entitled to small entity status. See 37 CFR 1.27(g)

NOT Small Entity

	Fee	Code
☐	3 ½ year	(1551)
☐	7 ½ year	(1552)
☐	11 ½ year	(1553)

Small Entity

	Fee	Code
☒	3 ½ year	(2551)
☐	7 ½ year	(2552)
☐	11 ½ year	(2553)

PETITION FEE

The petition fee required by 37 CFR 1.17(m) (Fee Code 1558 /2558) must be paid as a condition of accepting unintentionally delayed payment of the maintenance fee.

MAINTENANCE FEE (37 CFR 1.20(e)-(g))

The appropriate maintenance fee must be submitted with this petition.

STATEMENT

THE UNDERSIGNED CERTIFIES THAT THE DELAY IN PAYMENT OF THE MAINTENANCE FEE TO THIS PATENT WAS UNINTENTIONAL

PETITIONER(S) REQUEST THAT THE DELAYED PAYMENT OF THE MAINTENANCE FEE BE ACCEPTED AND THE PATENT REINSTATED

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

37 CFR 1.378(c) states: "Any petition under this section must be signed in compliance with 37 CFR 1.33(b)."

I certify, in accordance with 37 CFR 1.4(d)(4) that I am

- ☒ An attorney or agent registered to practice before the Patent and Trademark Office
- ☐ A sole patentee
- ☐ A joint patentee; I certify that I am authorized to sign this submission on behalf of all the other patentees as evidenced by the power of attorney in the application
- ☐ A joint patentee; all of whom are signing this e-petition
- ☐ The assignee of record of the entire interest that qualifies as an authorized party under 37 CFR 1.33(b)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays valid OMB control number.

Patent Practitioner

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature

Signature	/Thomas J. Moore, Reg.# 28974/	Date (YYYY-MM-DD)	2014-09-09
Name	Thomas J. Moore	Registration Number	28974

This collection of information is required by 37 CFR 1.378(b). 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 1 hour 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. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in reinstating the patent.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	12036243			
Filing Date:	23-Feb-2008			
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT			
First Named Inventor/Applicant Name:	Fu-Yuan Hsieh			
Filer:	Thomas J. Moore/Dana Logan			
Attorney Docket Number:	200801015			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Maintenance Fee Due at 3.5 years	2551	1	800	800
Pet. Delay Pymt Maintain Patent in Force	2558	1	850	850
Pages:				
Claims:				
Miscellaneous-Filing:				
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 (\$)				1650



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Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
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In re Patent No.	7629634	:
Issue Date:	December 8, 2009	:
Application No.	12036243	:DECISION GRANTING PETITION
Filed:	February 23, 2008	:UNDER 37 CFR 1.378(b)
Attorney Docket No.	200801015	:

This is a decision on the electronic petition, filed September 9, 2014, under 37 CFR 1.378(b) to accept the unintentionally delayed payment of the 3.5 year maintenance fee for the above-identified patent.

The petition is **GRANTED**.

The maintenance fee is accepted, and the above-identified patent reinstated as of September 9, 2014. This decision also constitutes notice that the fee has been accepted. An electronic copy of the petition and this decision has been created as an entry in the Image File Wrapper. Nevertheless, petitioner should print and retain an independent copy.

Telephone inquiries related to this electronic decision should be directed to the Electronic Business Center at 1-866-217-9197.

Electronic Acknowledgement Receipt

EFS ID:	20081427
Application Number:	12036243
Patent Number:	7629634
Confirmation Number:	1604
Petition Issued Date:	September 9,2014
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT
First Named Inventor/Applicant Name:	Fu-Yuan Hsieh
Customer Number:	60491
Filer:	Thomas J. Moore/Dana Logan
Filer Authorized By:	Thomas J. Moore
Attorney Docket Number:	200801015
Receipt Date:	09-SEP-2014
Filing Date:	23-FEB-2008
Time Stamp:	08:54:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 1650
RAM confirmation Number	8736
Deposit Account	020200
Authorized User	

File Listing:

Excelliance Mos Corporation
Ex. 1002

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	7629634.pdf	764993	no	3
			d14db72c98a671729b7f83ac8d2341bcf6e91d66		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	31615	no	2
			96f12efc9ac2e16dc464189bb63feeb6f269b74f		

Warnings:

Information:

Total Files Size (in bytes):			796608
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015

60491
BAYSHORE PATENT GROUP, LLC
520 CHANTECLER DR.
FREMONT, CA 94539

CONFIRMATION NO. 1604 MISCELLANEOUS NOTICE



Date Mailed: 09/11/2014

A communication which cannot be delivered in electronic form has been mailed to the applicant.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015

CONFIRMATION NO. 1604

60491
 BAYSHORE PATENT GROUP, LLC
 520 CHANTECLER DR.
 FREMONT, CA 94539



OC000000070705869

Cc: BACON & THOMAS, PLLC
 625 SLATERS LANE
 FOURTH FLOOR
 ALEXANDRIA, VA 22314-1176

Date Mailed: 09/11/2014

DENIAL OF REQUEST FOR POWER OF ATTORNEY

The request for Power of Attorney filed 09/09/2014 is acknowledged. However, the request cannot be granted at this time for the reason stated below.

- ☐ The Power of Attorney you provided did not comply with the new Power of Attorney rules that became effective on June 25, 2004. See 37 CFR 1.32.
- ☐ The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.
- ☒ The Power of Attorney is from an assignee and the Certificate required by 37 CFR 3.73(b) has not been received.
- ☐ The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.
- ☐ The inventor(s) is without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.
- ☐ The signature(s) of _____, a co-inventor in this application, has been omitted. The Power of Attorney will be entered upon receipt of confirmation signed by said co-inventor(s).
- ☐ The person(s) appointed in the Power of Attorney is not registered to practice before the U.S. Patent and Trademark Office.

Questions relating to this Notice should be directed to the Application Assistance Unit.

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	12/036243
	Filing Date	February 23, 2008
	First Named Inventor	Fu-Yuan Hsieh
	Title	Trench Mosfet with Trenched Source...
	Art Unit	2813
	Examiner Name	David S. Blum
	Attorney Docket Number	HSIE3188

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

23364

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature	<i>Vincent Wei</i>	Date	2014-09-09
Name	Vincent Wei	Telephone	02 8512-4831
Title and Company	General Manager of Force Mos Technology Co., Ltd.		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 minutes 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.

Electronic Acknowledgement Receipt

EFS ID:	20227725
Application Number:	12036243
International Application Number:	
Confirmation Number:	1604
Title of Invention:	TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT
First Named Inventor/Applicant Name:	Fu-Yuan Hsieh
Customer Number:	60491
Filer:	Thomas J. Moore/Dana Logan
Filer Authorized By:	Thomas J. Moore
Attorney Docket Number:	200801015
Receipt Date:	24-SEP-2014
Filing Date:	23-FEB-2008
Time Stamp:	11:39:25
Application Type:	Utility under 35 USC 111(a)

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	Assignee showing of ownership per 37 CFR 3.73.	statement_for_7629634.pdf	70627 f40b0934b20b5c82213b036ebe3e2cccd91fb372	no	1

Warnings:

Information:

Excelliance Mos Corporation
Ex. 1002

2	Power of Attorney	7629634POA.pdf	70376 7f217df68367086d821e9c8be2e315c3f7332ee8	no	1
Warnings:					
Information:					
Total Files Size (in bytes):				141003	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: FORCE MOS TECHNOLOGY CO., LTD.

Application No./Patent No.: 12036243/ 7629634 Filed/Issue Date: February 23, 2008/ December 8, 2009

Entitled: TRENCHED MOSFET WITH TRENCHED SOURCE CONTACT

FORCE MOS TECHNOLOGY CO., LTD., a CORPORATION
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is _____ %)

in the patent application/patent identified above by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 020549, Frame 0022, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

(NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Amy Ho
Signature

2014-09-16

Date

Amy Ho

02 8512-4831

Printed or Typed Name

Telephone Number

Secretary

Title

This collection of information is required by 37 CFR 3.73(b). 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 12 minutes 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-8199 and select option 2.



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/036,243	02/23/2008	Fu-Yuan Hsieh	200801015

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CONFIRMATION NO. 1604 POWER OF ATTORNEY NOTICE



OC000000071050233

Date Mailed: 10/02/2014

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2014.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/sleutchit/

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



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/036,243	02/23/2008	Fu-Yuan Hsieh	HSIE3188

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CONFIRMATION NO. 1604
POA ACCEPTANCE LETTER



Date Mailed: 10/02/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/sleutchit/

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