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NOTICE OF ALLOWANCE AND FEE(S) DUE

95496 7590 11/24/2023
Hauptman Ham, LLP (TSMC)
2318 Mill Road
Suite 1400
Alexandria, VA 22314

EXAMINER
NARAGHI, ALI

ART UNIT	PAPER NUMBER
2895	

DATE MAILED: 11/24/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/027,032	09/21/2020	Chu Fu CHEN	T5057-1303UA	9930

TITLE OF INVENTION: TRANSISTOR HAVING ASYMMETRIC THRESHOLD VOLTAGE AND BUCK CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	02/26/2024

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 ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

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. 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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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 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. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

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

95496 7590 11/24/2023
Hauptman Ham, LLP (TSMC)
2318 Mill Road
Suite 1400
Alexandria, VA 22314

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 transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/027,032	09/21/2020	Chu Fu CHEN	T5057-1303UA	9930

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APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	02/26/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
NARAGHI, ALI	2895	257-299000

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/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or 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_____
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ❑Issue Fee ❑Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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.

PTOL-85 (Rev. 11/23)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B 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 30 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. 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.

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.

Notice of Allowability	Application No. 17/027,032	Applicant(s) CHEN et al.	
	Examiner ALI N NARAGHI	Art Unit 2895	AIA (FITF) Status Yes

-- 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 09/07/2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   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.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ 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)

1. ☑ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ALI NARAGHI/
Examiner, Art Unit 2895

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Terminal Disclaimer

The terminal disclaimer filed on 09/07/2023 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of **US Patent No. 10784781** has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

Claim 1-20 are allowed.

The following is the reason for allowance of claim 1, pertinent arts do not alone or in combination disclose: a gate structure over a substrate, wherein the substrate includes a channel region; a source/drain (S/D) in the substrate adjacent to the gate structure; a lightly doped drain (LDD) region adjacent to the S/D, wherein a dopant concentration in the LDD region is less than a dopant concentration in the S/D; and a doping extension region adjacent the LDD region, wherein the doping extension region extends farther under the gate structure than the LDD region, and a maximum depth of the doping extension region is 10-times to 30-times greater than a maximum depth of the LDD.

The following is the reason for allowance of claim 10, pertinent arts do not alone or in combination disclose: a first transistor configured to receive a supply voltage; and a second transistor connected to the first transistor, wherein the second transistor is configured to receive a reference voltage, and the second transistor comprises: a gate structure over a substrate, wherein the substrate includes a channel region; a source/drain (S/D) in the substrate adjacent to the gate structure; a lightly doped drain (LDD) region adjacent to the S/D, wherein a dopant concentration in the LDD region is less than a dopant concentration in the S/D; and a doping

extension region adjacent the LDD region, wherein the doping extension region extends farther under the gate structure than the LDD region, and a maximum depth of the doping extension region is 10-times to 30-times greater than a maximum depth of the LDD.

The following is the reason for allowance of claim 19, pertinent arts do not alone or in combination disclose: a gate structure over a substrate; a source/drain (S/D) in the substrate; a lightly doped drain (LDD) region in direct contact with the S/D, wherein a dopant concentration in the LDD region is less than a dopant concentration in the S/D; and a doping extension region in direct contact with the LDD region, wherein a maximum depth of the doping extension region is 10-times to 30-times greater than a maximum depth of the LDD.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al (US Pub No. 20020151145), Fukuda (US Pub No. 20040201063), Power et al (US Pub No. 20110070725), Ho et al (US Patent No. 9793278), Nie et al (US Patent No. 8039375), Tsai et al (US Pub No. 20110111571), Huang (US Pub No. 20070029608), Hirase et al (US Pub No. 20070032007), Nandakumar et al (US Pub No. 20070287274).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALI N NARAGHI whose telephone number is (571)270-5720. The examiner can normally be reached 10am-6pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on 571-272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ALI NARAGHI/
Examiner, Art Unit 2895

Notice of References Cited	Application/Control No. 17/027,032	Applicant(s)/Patent Under Reexamination CHEN et al.	
	Examiner ALI N NARAGHI	Art Unit 2895	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20020151145-A1	10-2002	Lee, Kam Leung	H01L21/32137	438/303
*	B	US-20040201063-A1	10-2004	Fukuda, Koichi	H01L29/78621	438/149
*	C	US-20110070725-A1	03-2011	Power; John	H10B41/30	257/E21.645
*	D	US-9793278-B1	10-2017	Ho; Yen-Ting	H01L29/7835	1/1
*	E	US-8039375-B2	10-2011	Nieh; Chun-Feng	H01L21/26586	438/518
*	F	US-20110111571-A1	05-2011	TSAI; Chun Hsiung	H01L21/26506	438/305
*	G	US-20070029608-A1	02-2007	Huang; Chien-Chao	H01L21/823814	438/301
*	H	US-20070032007-A1	02-2007	Hirase; Junji	H01L29/4983	257/E29.152
*	I	US-20070287274-A1	12-2007	Nandakumar; Mahalingam	H01L21/2658	438/514
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC 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.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/027,032	CHEN et al.
	Examiner	**Art Unit**
	ALI N NARAGHI	2895

CPC

Symbol					Type	Version
H02M	/	3	/	1582	F	2013-01-01
H01L	/	29	/	4232	I	2013-01-01
H01L	/	21	/	84	I	2013-01-01
H01L	/	29	/	80	I	2013-01-01
H01L	/	29	/	0847	I	2013-01-01
H01L	/	29	/	7836	I	2013-01-01
H01L	/	29	/	7835	I	2013-01-01
H01L	/	29	/	66659	I	2013-01-01
H02M	/	3	/	158	A	2013-01-01
H01L	/	21	/	26586	A	2013-01-01

CPC Combination Sets

Symbol					Type	Set	Ranking	Version
	/		/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/ALI NARAGHI/ Examiner, Art Unit 2895 (Primary Examiner)	18 November 2023 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office

Part of Paper No.: 20231118

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/027,032	CHEN et al.
	Examiner	**Art Unit**
	ALI N NARAGHI	2895

INTERNATIONAL CLASSIFICATION				
CLAIMED				
	/		/	

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/ALI NARAGHI/ Examiner, Art Unit 2895 (Primary Examiner)	18 November 2023 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office

Part of Paper No.: 20231118

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	17/027,032	CHEN et al.
	Examiner	**Art Unit**
	ALI N NARAGHI	2895

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10	19	19										
2	2	11	11	20	20										
3	3	12	12												
4	4	13	13												
5	5	14	14												
6	6	15	15												
7	7	16	16												
8	8	17	17												
9	9	18	18												

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/ALI NARAGHI/ Examiner, Art Unit 2895 (Primary Examiner)	18 November 2023 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office Part of Paper No.: 20231118

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/027,032	CHEN et al.
	Examiner	**Art Unit**
	ALI N NARAGHI	2895

CPC - Searched*		
Symbol	**Date**	**Examiner**

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Used Search in Dav	06/03/2023	AN
Used Search in PE2E	11/18/2023	AN

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	Please refer to search report	11/18/2023	AN

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	"17027032"	(US-PGPUB; USPAT)	OR	ON	ON	2023/06/03 05:37 PM
L2	3	"15938482"	(US-PGPUB; USPAT)	OR	ON	ON	2023/06/03 05:40 PM
L3	26	"7910413"	(US-PGPUB; USPAT)	OR	ON	ON	2023/06/03 06:18 PM
L4	129	"5595919"	(US-PGPUB; USPAT)	OR	ON	ON	2023/06/03 06:18 PM
L5	134	("4757026" | "5032535" | "5089435" | "5439839" | "5491099" | "5498555" | "5534447" | "5552329").pn. OR ("5595919").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:20 PM
L6	12	"6274906"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:44 PM
L7	22	"5396098"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:46 PM
L8	43	"715779"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:48 PM
L9	5	"7157779"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:51 PM
L10	3	"20060197129"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:54 PM
L11	3	"20120217467"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:54 PM
L12	2	"20090090980"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:57 PM
L13	3	"20180219553"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 06:57 PM
L14	253253	(h01l29/$$$$$).cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 07:47 PM
L15	613	L14 AND lateral AND (LDD SAME halo)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/06/03 07:47 PM
L16	253734	(h01l29/$$$$$).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/15 01:03 AM
L17	2894	L16 AND LDD AND (extension adj2 region)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/15 01:03 AM
L18	2502	L17 AND @ad<"20171129"	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/15 01:04 AM
L19	128	L16 AND (LDD WITH depth) AND ((extension adj2 region) WITH depth)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/15 01:19 AM
L20	124	L19 AND	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/15

		@ad<"20171129"					01:53 AM
L21	6	("2007/0200185").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/09/16 12:42 AM
L22	440	L16 AND (LDD near2 depth)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 12:50 AM
L23	127359	H02M 3/1582.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 12:51 AM
L24	4	L23 AND (LDD near2 depth)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 12:51 AM
L25	1210949	(H01L 29/0847.cpc.) OR (H01L 29/4232.cpc.) OR (H01L 29/66659.cpc.) OR (H01L 29/7835.cpc.) OR (H01L 29/7836.cpc.)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 01:59 AM
L26	508	L25 AND (LDD near2 depth)	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 02:00 AM
L27	444	L26 AND @ad<"20171129"	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/16 02:11 AM
L28	3	"17027043"	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:36 PM
L29	1	"17027032"	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:36 PM
L30	5512	LDD WITH exten$4	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:42 PM
L31	298	LDD WITH exten$4 WITH depth	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:42 PM
L32	514	(LDD WITH exten$4) AND ((exten$4 adj2 region) WITH depth)	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:49 PM
L33	434	L32 AND @ad<"20171129"	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 06:56 PM
L34	6	("2011/0070725").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/18 08:13 PM
L35	0	("2007/0287274").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/18 09:29 PM
L36	13	("6258644" | "20020151145" | "20070029608" | "20070059874" | "20070238234").pn. OR ("7557022").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/18 09:29 PM
L37	4	("2002/0151145").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/18 09:40 PM
L38	100	(LDD WITH halo) AND	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18

		(Ldd WITH depth) AND (halo WITH depth)					09:58 PM
L39	81	L38 AND @ad<"20171129"	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 09:58 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	203	(LDD WITH depth).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/18 10:06 PM

Bibliographic Data

Application No: 17/027,032

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No | ☐ Met After Allowance

Verified and Acknowledged: /ALI NARAGHI/ | Examiner's Signature | Initials

Title: TRANSISTOR HAVING ASYMMETRIC THRESHOLD VOLTAGE AND BUCK CONVERTER

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/21/2020 **RULE**	257	2895	T5057-1303UA

APPLICANTS

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CONTINUING DATA

This application is a CON of 15938482 03/28/2018 PAT 10784781

15938482 has PRO of 62591871 11/29/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/28/2020

STATE OR COUNTRY

TAIWAN

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$1,720