506170644 07/24/2020

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT6217381

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
DANIEL JENNER LICHTENWALNER	07/15/2020
SEI-HYUNG RYU	07/22/2020
KIJEONG HAN	07/16/2020
EDWARD ROBERT VAN BRUNT	07/22/2020

RECEIVING PARTY DATA

Name:	CREE, INC.
Street Address:	4600 SILICON DRIVE
City:	DURHAM
State/Country:	NORTH CAROLINA
Postal Code:	27703

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	16938032

CORRESPONDENCE DATA

Fax Number: (877)812-1249

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 919-238-2300 Email: jalkove@wt-ip.com

Correspondent Name: WITHROW & TERRANOVA, P.L.L.C. 106 PINEDALE SPRINGS WAY Address Line 1: Address Line 4: CARY, NORTH CAROLINA 27511

ATTORNEY DOCKET NUMBER:	1194-377CP
NAME OF SUBMITTER:	JENNIFER ALKOVE
SIGNATURE:	/Jennifer Alkove/
DATE SIGNED:	07/24/2020

Total Attachments: 8

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source=1194-377CP_Declaration_Assignment#page7.tif
source=1194-377CP_Declaration_Assignment#page8.tif

Title of

VERTICAL SEMICONDUCTOR DEVICE WITH IMPROVED

Invention	RUGGEDNESS	
As the below named inventor, I hereby declare that:		
This declaration is o	lirected to: The attached application; or United States application or PCT international application number, filed on.	
The above-identifie	d application is made or authorized to be made by me.	
I believe that I am t application.	he original inventor or an original joint inventor of a claimed invention in the	
1	ge that any willful false statement made in this declaration is punishable under 18 or imprisonment of not more than five (5) years, or both.	
	Inc., a corporation duly organized and existing under the laws of the State of North g a principal place of business at 4600 Silicon Drive, Durham, North Carolina	

NOW, THEREFORE, To All Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the said assignor, have sold, assigned, transferred and set over unto the said ASSIGNEE, its successors and assigns, the entire right, title and interest in and to the above-mentioned application and invention and in and to any and all Letters Patent of the United States which may hereafter be granted therefor, and in any and to any and all continuations, continuations-in-part, substitutions, divisions or reissues of said Letters Patent, the same to be held and enjoyed by the said ASSIGNEE, for its interest, and for its own use and behalf, and the use and behalf of its successors and assigns, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

27703 (hereinafter referred to as "ASSIGNEE"), is desirous of acquiring the entire right, title, and interest in and to said invention as described in the specification executed by me concurrently

herewith, and any and all Letters Patent which shall be granted therefor.

And for the consideration aforesaid, I hereby covenant and agree to and with the said ASSIGNEE, its successors and assigns, that at the time of the execution and delivery of these presents I am a joint and lawful owner of the entire right, title and interest in and to the invention, application and Letters Patent above-mentioned and that the same are unencumbered, and that I have good right and lawful authority to sell and convey the same in the manner herein set forth.

And for the consideration aforesaid, I hereby covenant and agree to and with the said ASSIGNEE, its successors and assigns, that I will, whenever its counsel or the counsel of its successors and assigns, learned in the law, shall advise that an amendment, division, continuation, continuation-in-part, or substitution of, or any other proceeding in connection with said application, including interference proceedings, is lawful and desirable, sign all papers and drawings, take all rightful oaths, and do all acts necessary or required to be done for the procurement of valid Letters Patent for said invention, or

I hereby request the Commissioner for Patents to issue the Letters Patent in accordance with this instrument.

For the consideration aforesaid, I have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, assigns or nominee, the entire right, title and interest in and to any and all Letters Patent for said invention which may be granted in countries foreign to the United States and in and to any applications for Letters Patent which may be filed for said invention in countries foreign to the United States and in and to the invention described in said application; and I hereby authorize and empower the said ASSIGNEE, its successors, assigns or nominees to apply for Letters Patent or other form of protection on said invention in its own name or in the name of its successor, assignee, or nominee, in any and all countries where it may desire to file such application and where said application may be filed by another than the inventor; and I hereby covenant and agree to sign all papers and drawings, take all rightful oaths, and do all acts necessary or required to be done for procurement of Letters Patent, or other form of protection, for said invention or inventions in countries foreign to the United States, and for further investing or confirming the right and title therein to the ASSIGNEE, its successors, assignee, or nominee, without charge to the said ASSIGNEE, its successor, assignee or nominee, but at its or their expense.

IN WITNESS WHEREOF, I hereunto set my hand and seal.

LEGAL NAME OF INVENTOR

Inventor: Daniel Jenner Lichtenwalner Date: / July 15, 2020 /

Signature: / Daniel J. Lichtenwalner /

Title of

VERTICAL SEMICONDUCTOR DEVICE WITH IMPROVED

ALUC OI	PERFORE SERVICE WITH IMIROVED	
Invention	RUGGEDNESS	
As the below named inventor, I hereby declare that:		
This declaration is o	lirected to: The attached application; or United States application or PCT international application number, filed on.	
The above-identifie	d application is made or authorized to be made by me.	
I believe that I am tapplication.	he original inventor or an original joint inventor of a claimed invention in the	
· ·	ge that any willful false statement made in this declaration is punishable under 18 or imprisonment of not more than five (5) years, or both.	
	Inc., a corporation duly organized and existing under the laws of the State of North g a principal place of business at 4600 Silicon Drive, Durham, North Carolina	

NOW, THEREFORE, To All Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the said assignor, have sold, assigned, transferred and set over unto the said ASSIGNEE, its successors and assigns, the entire right, title and interest in and to the above-mentioned application and invention and in and to any and all Letters Patent of the United States which may hereafter be granted therefor, and in any and to any and all continuations, continuations-in-part, substitutions, divisions or reissues of said Letters Patent, the same to be held and enjoyed by the said ASSIGNEE, for its interest, and for its own use and behalf, and the use and behalf of its successors and assigns, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

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I hereby request the Commissioner for Patents to issue the Letters Patent in accordance with this instrument.

For the consideration aforesaid, I have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, assigns or nominee, the entire right, title and interest in and to any and all Letters Patent for said invention which may be granted in countries foreign to the United States and in and to any applications for Letters Patent which may be filed for said invention in countries foreign to the United States and in and to the invention described in said application; and I hereby authorize and empower the said ASSIGNEE, its successors, assigns or nominees to apply for Letters Patent or other form of protection on said invention in its own name or in the name of its successor, assignee, or nominee, in any and all countries where it may desire to file such application and where said application may be filed by another than the inventor; and I hereby covenant and agree to sign all papers and drawings, take all rightful oaths, and do all acts necessary or required to be done for procurement of Letters Patent, or other form of protection, for said invention or inventions in countries foreign to the United States, and for further investing or confirming the right and title therein to the ASSIGNEE, its successors, assignee, or nominee, without charge to the said ASSIGNEE, its successor, assignee or nominee, but at its or their expense.

IN WITNESS WHEREOF, I hereunto set my hand and seal.

LEGAL NAME OF INVENTOR			
Inventor: Sei-Hyung Ryu		Date:	7/22/2020
Signature:	/Sei-Hyung Ryu/		

Title of

VERTICAL SEMICONDUCTOR DEVICE WITH IMPROVED

	,, ,, ,, ,, ,, ,, ,, ,	
Invention	RUGGEDNESS	
As the below named inventor, I hereby declare that:		
This declaration is o	lirected to: The attached application; or United States application or PCT international application number, filed on.	
The above-identifie	d application is made or authorized to be made by me.	
I believe that I am t application.	he original inventor or an original joint inventor of a claimed invention in the	
v	ge that any willful false statement made in this declaration is punishable under 18 or imprisonment of not more than five (5) years, or both.	
	Inc., a corporation duly organized and existing under the laws of the State of North g a principal place of business at 4600 Silicon Drive, Durham, North Carolina	

NOW, THEREFORE, To All Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the said assignor, have sold, assigned, transferred and set over unto the said ASSIGNEE, its successors and assigns, the entire right, title and interest in and to the above-mentioned application and invention and in and to any and all Letters Patent of the United States which may hereafter be granted therefor, and in any and to any and all continuations, continuations-in-part, substitutions, divisions or reissues of said Letters Patent, the same to be held and enjoyed by the said ASSIGNEE, for its interest, and for its own use and behalf, and the use and behalf of its successors and assigns, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

27703 (hereinafter referred to as "ASSIGNEE"), is desirous of acquiring the entire right, title, and interest in and to said invention as described in the specification executed by me concurrently

herewith, and any and all Letters Patent which shall be granted therefor.

And for the consideration aforesaid, I hereby covenant and agree to and with the said ASSIGNEE, its successors and assigns, that at the time of the execution and delivery of these presents I am a joint and lawful owner of the entire right, title and interest in and to the invention, application and Letters Patent above-mentioned and that the same are unencumbered, and that I have good right and lawful authority to sell and convey the same in the manner herein set forth.

And for the consideration aforesaid, I hereby covenant and agree to and with the said ASSIGNEE, its successors and assigns, that I will, whenever its counsel or the counsel of its successors and assigns, learned in the law, shall advise that an amendment, division, continuation, continuation-in-part, or substitution of, or any other proceeding in connection with said application, including interference proceedings, is lawful and desirable, sign all papers and drawings, take all rightful oaths, and do all acts necessary or required to be done for the procurement of valid Letters Patent for said invention, or

I hereby request the Commissioner for Patents to issue the Letters Patent in accordance with this instrument.

For the consideration aforesaid, I have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto the said ASSIGNEE, its successors, assigns or nominee, the entire right, title and interest in and to any and all Letters Patent for said invention which may be granted in countries foreign to the United States and in and to any applications for Letters Patent which may be filed for said invention in countries foreign to the United States and in and to the invention described in said application; and I hereby authorize and empower the said ASSIGNEE, its successors, assigns or nominees to apply for Letters Patent or other form of protection on said invention in its own name or in the name of its successor, assignee, or nominee, in any and all countries where it may desire to file such application and where said application may be filed by another than the inventor; and I hereby covenant and agree to sign all papers and drawings, take all rightful oaths, and do all acts necessary or required to be done for procurement of Letters Patent, or other form of protection, for said invention or inventions in countries foreign to the United States, and for further investing or confirming the right and title therein to the ASSIGNEE, its successors, assignee, or nominee, without charge to the said ASSIGNEE, its successor, assignee or nominee, but at its or their expense.

IN WITNESS WHEREOF, I hereunto set my hand and seal.

LEGAL NAME OF INVENTOR

Inventor: Kijeong Han		Date: / July 16, 2020 /
Signature:	/ Kijeong Han /	

Title of

VERTICAL SEMICONDUCTOR DEVICE WITH IMPROVED

A REEL OF	TERRETAIN SERVICES TO SERVICE THE RIVER AND THE RESTREET OF THE PERSON O	
Invention	RUGGEDNESS	
As the below named inventor, I hereby declare that:		
This declaration is o	lirected to: The attached application; or United States application or PCT international application number, filed on.	
The above-identifie	d application is made or authorized to be made by me.	
I believe that I am t application.	he original inventor or an original joint inventor of a claimed invention in the	
U	ge that any willful false statement made in this declaration is punishable under 18 or imprisonment of not more than five (5) years, or both.	
WHEREAS, <u>Cree, Inc.</u> , a corporation duly organized and existing under the laws of the State of North Carolina and having a principal place of business at 4600 Silicon Drive, Durham, North Carolina 27703 (hereinafter referred to as "ASSIGNEE"), is desirous of acquiring the entire right, title, and		

NOW, THEREFORE, To All Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I, the said assignor, have sold, assigned, transferred and set over unto the said ASSIGNEE, its successors and assigns, the entire right, title and interest in and to the above-mentioned application and invention and in and to any and all Letters Patent of the United States which may hereafter be granted therefor, and in any and to any and all continuations, continuations-in-part, substitutions, divisions or reissues of said Letters Patent, the same to be held and enjoyed by the said ASSIGNEE, for its interest, and for its own use and behalf, and the use and behalf of its successors and assigns, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

interest in and to said invention as described in the specification executed by me concurrently

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IN WITNESS WHEREOF, I hereunto set my hand and seal.

LEGAL NAME OF INVENTOR

Inventor: Edward I obert Van I runt

Signature

Date: 7/22/20