PATENT ASSIGNMENT

Electronic Version v1.1 Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
Marty W. DeGroot	06/08/2011
Gregory M. Kimball	03/09/2011
Harry A. Atwater	03/14/2011
Nathan S. Lewis	08/23/2011

RECEIVING PARTY DATA

Name:	Dow Global Technologies Inc.	
Street Address:	2040 Dow Center	
City:	Midland	
State/Country:	MICHIGAN	
Postal Code:	48674	

PROPERTY NUMBERS Total: 1

Property Type	Number	
Application Number:	13160681	

CORRESPONDENCE DATA

Fax Number: (651)351-2954

Correspondence will be sent via US Mail when the fax attempt is unsuccessful.

Email: jbarnes@kaganbinder.com Correspondent Name: Kagan Binder, PLLC Address Line 1: 221 Main St North

Address Line 2: Suite 220

Address Line 4: Stillwater, MINNESOTA 55082

ATTORNEY DOCKET NUMBER: 69941 NAME OF SUBMITTER: Jennifer Barnes

Total Attachments: 3

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> **PATENT** REEL: 026880 FRAME: 0561

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FORM 110 (8 50%)

INDIVIDUAL ASSIGNMENT AND INVENTOR'S DECLARATION

(with Priority Rights)

I/we verily believe I am/we are the original, first and sole/joint inventor(s) of the subject matter which is embraced by and for which a patent is sought on the invention entitled: IMPROVED GROUP BB/VA SEMICONDUCTORS SUITABLE FOR USE IN PHOTOVOLTAIC

which invention was made and invented by me/us out of and in the course of my/our employment with my/our respective employers as stated below my/our name(s). Uwe acknowledge that I/we hold the invention and all patent and other rights and powers obtainable or exercisable in respect thereof in trust for our respective employers. As trustee(s), and for good and valuable consideration and/or the remuneration received for my/our work, I/we sell, assign and transfer unto:

Dow Global Technologies Inc. 2040 Dow Center Midland, Michigan 48674 United States of America

a corporation organized and existing under the laws of the State of Delaware (hereinafter referred to as the "Assignee"); my/our entire right, title and interest throughout the world, in and to the invention and all rights and powers to make applications, including provisional applications when permitted by law, for Letters Patent in its own name, or in the name of its designee (or nominee(s)); and all rights and powers to file any corresponding or equivalent applications in any and all countries, including all rights to claim priority under all United States domestic laws, International Convention(s) and Treaties in the name of Assignee, and do hereby authorize Assignee or its designee to insert here the Priority Number, Filing Date, and Filing Country

Priority Number	Filing Date	Filing Country
61/355,344	June 16, 2010	United States of America

of the application, on which the claim for priority will be based; and in and to any Letters Patent that may be issued for the invention in any and all which may arise involving the invention or the patent or patents thereon, and to execute for any and all countries any document relating to applications derived from, corresponding to or equivalent to the above identified application as Assignee may request.

I/we authorize Assignee or its designee to translate this Assignment into all languages necessary, and we request that any such Letters Patent be issued to Assignee; and consent to the recordal of this Assignment, or a Notarial True Copy thereof, being under covenant not only that I/we have full power to make the same, but also that such assigned rights are not encumbered by any grant, license, or other right heretofore given.

Subscribed and Declared by me/us.

At Midland MI	At:
this 8th day of June . 20 11	this day of , 20
Effective as of June 16, 2010	
Signature:	Signature:
Full Name: Marty W. DeGroot	Full Name:
Residence: 4604 Pinewood Drive	Residence:
Midland, Michigan 48640	Trestaurice.
Country: United States of America	Country:
Citizenship: Canada	Citizenship:
P.O. Address: Same as Residence	P.O. Address:
Employed By: The Dow Chemical Company	Employed By:
Of Country: United States of America	Of Country:
At:	At:
this day of , 20	this day of , 20
Signature:	Signature:
Full Name:	Full Name:
Residence:	Residence:
<u> </u>	
Country:	Country:
Citizenship;	Citizenship:
P.O. Address:	P.O. Address:
Employed By:	Employed By:
Of Country;	Of Country:

Additional names and signatures are attached.

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FORM 110 (R 5-17)

INDIVIDUAL ASSIGNMENT AND INVENTOR'S DECLARATION

(with Priority Rights)

I/we verily believe I ann/we are the original, first and sole/joint inventor(s) of the subject matter which is embraced by and for which a patent is sought on the invention entitled: IMPROVED GROUP HB/VA SEMICONDUCTORS SUFFABLE FOR USE IN PHOTOVOLTAIC

which invention was made and invented by me/us out of and in the course of my/our employment with my/our respective employers as stated below my/our name(s). I/we acknowledge that I/we hold the invention and all patent and other rights and powers obtainable or exercisable in respect thereof in trust for our respective employers. As trustee(s), and for good and valuable consideration and/or the remuneration received

California Institute of Technology

Office of Technology Transfer

1200 East California Blvd., M/C 210-85

Pasadena, CA 91125

a private research university organized and existing under the laws of the State of California (heremafter referred to as the "Assignee"); my/our entire right, title and interest throughout the world, in and to the invention and all rights and powers to make applications, including provisional applications when permitted by law, for Letters Patent in its own name, or in the name of its designee (or nominee(s)); and all rights and powers to file any corresponding or equivalent applications in any and all countries, including all rights to claim priority under all United States domestic laws, International Convention(s) and Treaties in the name of Assignee, and do hereby authorize Assignee or its designee to insert here the Priority

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United States of America

of the application, on which the claim for priority will be based; and in and to any Letters Patent that may be issued for the invention in any and all or the application, on which the charm for priority with de based, and in and to any fletters maken may be assisted for the application. If we do hereby agree to assist Assignee in the prosecution of the applications) and in any interference, conflict, opposition or litigation which may arise involving the invention or the patent or patents thereon, and to execute for any and all countries any document relating to applications derived from, corresponding to or equivalent to the above identified application as Assignee may request.

I/we authorize Assignee or its designee to translate this Assignment into all languages necessary; and we request that any such Letters Patent be issued to Assignee; and consent to the recordal of this Assignment, or a Notarial True Copy thereof, being under covenant not only that I/we have full power to make the same, but also that such assigned rights are not encumbered by any grant, license, or other right heretofore given.

Subscribed and Declared by me/us

this all a california plyd Puradina 9112	At:
day of America	this
Effective as of June 16, 2010	Effective as of June 16, 2010
h 11/10	Execute as of Julie 16, 2010
Signature:	Company
Full Name: Gregory M. Kimball	Signature.
Residence: 1724 E Del Mar Apt A	Full Name: Nathan S. Lewis
Pasadena, California 91106	Residence: 4808 Gould Avenue
Country: United States of America	La Canada, California 91011
Citizenship: United States of America	Country United States of America
P.O. Address: Same as Residence	Citizenship: United States of America
Employed By: California Institute of Technology	P.O. Address: Same as Residence
Of Country, United States of America	Employed By: California Institute of Technology
	Of Country, United States of America
At: 1200 & California 8 4	At
this 14 day of March ,20	this desired
Effective as of June 16, 2019	
a Htunt An	
Signature: Aug A	Signature.
Full Name Harry A. Aswater	Full Name:
Residence: 1945 Leman Street	Residence
South Pasadena. California 91030	
Country United States of America	Country
Citizenship. United States of America	Citizenship
O. Address: Same as Residence	PO Address
Employed By, California Institute of Technology Of Country: United States of America	Employed By
	Of Country:

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PATENT REEL: 026880 FRAME: 0563

CASE NO. 69941 US PSP asp FORM 110 (8 5-97)

INDIVIDUAL ASSIGNMENT AND INVENTOR'S DECLARATION

(with Priority Rights)

I/we verily believe I am/we are the original, first and sole/joint inventor(s) of the subject matter which is embraced by and for which a patent is sought on the invention entitled: IMPROVED GROUP IIB/VA SEMICONDUCTORS SUITABLE FOR USE IN PHOTOVOLTAIC

which invention was made and invented by me/us out of and in the course of my/our employment with my/our respective employers as stated which invention was made and invented by merus out or and in the course of my/our employment with my/our respective employers as stated below my/our name(s). I/we acknowledge that I/we hold the invention and all patent and other rights and powers obtainable or exercisable in respect thereof in frust for our respective employers. As trustee(s), and for good and valuable consideration and/or the remuneration received California Institute of Technology

Office of Technology Transfer

a private research university organized and existing under the laws of the State of California (hereinafter referred to as the "Assignee"): my/our a private research university organized and existing under the laws of the State of Camor the (neterimiter related to as the Assignee), my/our entire right, title and interest throughout the world, in and to the invention and all rights and powers to make applications, including provisional applications when permitted by law, for Letters Patent in its own name, or in the name of its designee (or nominee(s)); and all rights and powers to approximate when permitted by new, for Letters Lateritaries own manie, or in the name of its designed for nonnineess), and an ingress and powers like any corresponding or equivalent applications in any and all countries, including all rights to claim priority under all United States domestic the any corresponding of equivarent approximations in any and an countries, mentioning an argues to craim parority under an emicor states comestic laws, international Convention(s) and Treaties in the name of Assignee, and do hereby authorize Assignee or its designee to insert here the Priority

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Priority Number			ssignee or its designee to insert here	the Date
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	June 16, 2010		Filing Country	
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countries. I/We do hereby over a	aim for priority will be based; and in a	4.	A MANAGE ICE	

of the application, on which the claim for priority will be based; and in and to any Letters Patent that may be issued for the invention in any and all of the application, un which the claum for priority will be based, and in and to any centers reach that may be assed for the diversity of the application of the appl countries. Twe no nereby agree to assist Assignee at the prosecution of the applications; and in any unerterence, contrict, opposition or it which may arise involving the invention or the patent or patents thereon, and to execute for any and all countries any document relating to which may arise involving the invention or the patent of patents increase, and in execute for any and an extendition application as Assignee may request.

I/we authorize Assignee or its designee to translate this Assignment into all languages necessary; and we request that any such Letters Patent be issued to Assignee; and consent to the recordal of this Assignment, or a Notarial True Copy thereof, being under coverant not only that I/we have full power to Assignee, and consent to the recordar or this Assignment, or a retournal area copy under, ocuing under coverant not only a to make the same, but also that such assigned rights are not encumbered by any grant, license, or other right heretofore given.

Subscribed and Declared by me/us:

this day of	At Page
Effective as of June 16, 2010 20	The state of the s
	this 23rd day of August 30 cd
Signature:	Diffective as of June 16, 2010
Full Name: Gregory M. Kimball	
Residence: 450 c. C. S. Kimball	
Residence: 450 S. Calalina Avenue, Apt. 102	Full Name: Nathan S. Lewis
Pasadena, California 91 106 Country: United States of America	1 Residence: 4808 Gould Avenue
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fective as of June 16, 2010	
10, 2010	this day of
inature:	, 40
Il Name: Harry A. Atwater	l lav.
Sidence: 1945 Leman Street	Signature:
South Daniel	Full Name:
South Pasadena, California 91030 untry: United States of America	Residence:

	Country:
MUVUU ISV: California t	Citizenship:
ountry: United States of America	P.O. Address:
names and signatures are attached.	Employed By: Of Country:

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PATENT REEL: 026880 FRAME: 0564