

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT4156273

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
MARCIE R. BLACK	05/14/2015
NEW ENTERPRISE ASSOCIATES 12, LP	04/16/2015
MASSACHUSETTS GREEN ENERGY FUND I LP	04/27/2015
TRACY ADAMS	04/14/2015
RICHARD CHLEBOSKI	04/16/2015
ROBERT W. SHAW JR.	04/16/2015
DANE SHULMAN ASSOCIATES, LLC	04/20/2015
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	ADVANCED SILICON GROUP, INC.
<b>Street Address:</b>	173 BEDFORD ROAD
<b>City:</b>	LINCOLN
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	01773
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14468219
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(617)395-7070
<i>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.</i>	
<b>Phone:</b>	(617) 395-7048
<b>Email:</b>	GKGPatents@LALaw.com
<b>Correspondent Name:</b>	LANDO & ANASTASI, LLP
<b>Address Line 1:</b>	RIVERFRONT OFFICE PARK
<b>Address Line 2:</b>	ONE MAIN STREET, SUITE 1100
<b>Address Line 4:</b>	CAMBRIDGE, MASSACHUSETTS 02142
<b>ATTORNEY DOCKET NUMBER:</b>	B2138-700540
<b>NAME OF SUBMITTER:</b>	GREGORY K. GERSTENZANG
<b>SIGNATURE:</b>	/Gregory K. Gerstenzang/
<b>DATE SIGNED:</b>	11/23/2016

PATENT

**Total Attachments: 14**

source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page1.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page2.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page3.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page4.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page5.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page6.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page7.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page8.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page9.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page10.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page11.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page12.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page13.tif  
source=Patent Rights Assignment - Mass Green Energy et al. to Advanced Silicon#page14.tif

**Patent Rights Assignment**

This Patent Right Assignment (this "Assignment") is made between Advanced Silicon Group, Inc., 173 Bedford Rd., Lincoln, MA 01773 ("Assignee") and each of the persons and entities, other than Assignee, listed as signatories below ("Assignors"). Assignee and the Assignors together are the "Parties" and any of them is a "Party." This Assignment is effective as of that date that Assignee and all of the Assignors have all executed this Assignment.

WITNESSETH:

WHEREAS, Assignors and Assignee are Parties to a certain Patent Rights Transfer and Payment Assignment Agreement substantially contemporaneous herewith, which provides for the grant, conveyance, and assignment by Assignors to Assignee of certain patents, patent applications, and patent rights.

NOW, THEREFORE, in consideration of the premises set forth herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignors agree as follows:

1. Assignment. Assignors hereby grant, convey, and assign to Assignee absolutely all of Assignors' right, title, and interest (whether separate or joint) in and to all of the inventions described in and all the patents, patent applications, and/or patentable inventions listed on Schedule 1 attached hereto and all claims therein, including in such grant, conveyance and assignment all of the following:
  - a. Any present or future reissues, divisions, continuations, renewals, extensions, continuations-in-part of any patent or any applications therefor;
  - b. Foreign counterparts of any of the above;
  - c. Any priority rights or other patent-related rights with regard to any of the above under any law or treaty, including, without limitation, all Patent Cooperation Treaty applications or filings referred to in the United States patents listed on Schedule 1 and all resulting patent applications and patents;
  - d. Any patents or patent applications claiming priority from any of the foregoing, and including any provisional applications from which the listed patents and/or foreign counterparts claim priority;
  - e. Any accrued and future income and payments from any of the above; and
  - f. Any rights to sue and recover for past, present, and future infringements under any of the above.
2. Legal Equivalent. This Assignment, and any copy hereof, will be deemed a full legal and formal equivalent of any assignment, consent to file or like document which may be required in any country for any purpose and more particularly in proof of the right of the Assignee or its nominee to claim any right of priority provided by any international convention or treaty or by any national law.
3. General Provisions
  - a. Severability. The provisions of this Assignment are severable, and if any clause or provision will be held invalid or unenforceable in whole or in part in any jurisdiction, then such invalidity or unenforceability will affect only such clause or provision, or part thereof, in such jurisdiction,

COPY FROM PARENT CASE

and will not in any manner affect such clause or provision in any other jurisdiction, or any other clause or provision of this Assignment.

- b. *Waivers.* No course of dealing between Assignors and Assignee, nor any failure to exercise or delay in exercising, on the part of the Assignee, any right, power, or privilege hereunder will operate as a waiver thereof.
  - c. *Modification.* This Assignment cannot be altered, amended, or modified in any way, except by a writing signed by the Parties hereto.
  - d. *Cumulative Remedies.* All of Assignee's rights and remedies with respect to the patent rights will be cumulative and may be exercised individually or concurrently.
  - e. *Binding Effect; Benefits.* This Assignment will be binding upon Assignors and their respective successors and assigns and will inure to the benefit of Assignee, its nominees, successors, and assigns.
  - f. *Applicable Law; Jurisdiction.* This Assignment will be deemed to have been executed and delivered in Massachusetts, and will be governed by and construed in accordance with the internal laws (as opposed to conflicts of law provisions) of the Commonwealth of Massachusetts. The state and federal courts located in Suffolk County, Massachusetts will have exclusive jurisdiction and venue for any litigation, dispute, claim or issue that arises from this Assignment or its subject matter.
  - g. *Notices.* All notices, including but not limited to, demands, requests and other communications required or permitted hereunder will be in writing and will be deemed given: (i) when delivered in person, (ii) twenty-four (24) hours after deposit with an overnight delivery service for next day delivery, (iii) the same day when sent by facsimile or email transmission to the Party's facsimile number or email address with receipt confirmed by sender's facsimile equipment or email system, or (iv) seventy-two (72) hours after deposit in the United States mail, postage prepaid, registered or certified mail, return receipt requested, and addressed to the recipient Party at the address set forth in the Agreement, or such other address as a Party may, by written notice, designate.
4. Assignors swear and attest to the Bill of Sale executed by the Assignors or Authorized Representative(s) of the Assignors transferring title in the IP assets listed, in part on Schedule 1, from BANDGAP Engineering, Inc. to the Assignors.

WITNESS the due execution hereof as of the dates stated below.

[The rest of this page is blank]

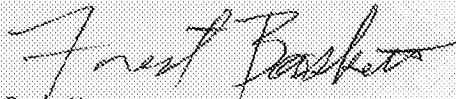
Assignors:

New Enterprise Associates 12, Limited Partnership (a.k.a. NEA), by its duly authorized agent:

By: NEA Partners 12, LP,  
Its General Partner

By: NEA 12 GP, LLC,  
Its General Partner

By:



Name: Forest Baskett

Title: General Partner

Date: 4/16/2015

See attached for Notary

COPY FROM PARENT CASE

Mass Green Energy Fund (a.k.a. MGEF), by its duly authorized agent:

Signature: William Osborn

Print Name and Title: William Osborn, Managing Member, GP

Date: 27 April 2015

Commonwealth of Massachusetts )

) SS:

County of Norfolk )

On this 27<sup>th</sup> day of April, 2015, before me, the undersigned notary public, personally appeared William Osborn as agent of Mass Green Energy Fund, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.

Meredith A. Puelak  
(Notary Public)

Seal



45

Tracy Adams, Individually

Signature: *Tracy Adams*

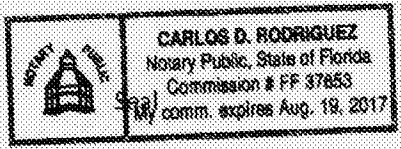
Date: *4/14/15 tea*

State of Florida )

) ss:

County of *COLLIER* )

On this *14* day of *APRIL*, 2015, before me, the undersigned notary public, personally appeared Tracey Adams, an individual, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.



*Carla D. Rodriguez*  
(Notary Public)

COPY FROM PARENT CASE

**Marcie Black**, Individually

Signature: *Marcie Black*

Date: *5-14-15*

Commonwealth of Massachusetts )

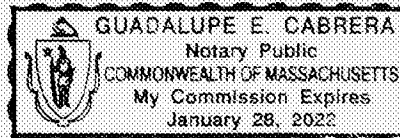
) SS:

County of MIDDLESEX )

On this *14<sup>th</sup>* day of *MAY*, 2015, before me, the undersigned notary public, personally appeared Marcie Black, an individual, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.

*Guadalupe E. Cabrera*  
\_\_\_\_\_  
(Notary Public)

Seal





COPY FROM PARENT CASE

Richard Chleboski, Individually

Signature: Richard Chleboski

Date: 16 April 2015

Commonwealth of Massachusetts )

)SS:

County of Middlesex

On this 16<sup>th</sup> day of April, 2015, before me, the undersigned notary public, personally appeared Richard Chleboski an individual, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.

Nancy Manchester

(Notary Public)

Seal



NANCY A. MANCHESTER  
NOTARY PUBLIC  
Commonwealth of Massachusetts  
My Commission Expires  
March 27, 2020

42

COPY FROM PARENT CASE

Robert W. Shaw, Jr., Individually

Signature: Robert W. Shaw Jr.

Date: 16 APRIL 2015

State of New Hampshire )

) SS:

County of Carron )

On this 16th day of April, 2015, before me, the undersigned notary public, personally appeared Robert W. Shaw, Jr. an individual, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.

Debra A. Sturgeon  
\_\_\_\_\_  
(Notary Public)

Seal

DEBRA A. STURGEON, Notary Public  
My Commission Expires February 20, 2018

Dane Shulman Associates LLC, by its duly authorized agent:

Signature: 

Print Name and Title: Daniel E. Pagoda, Esq., Managing Member

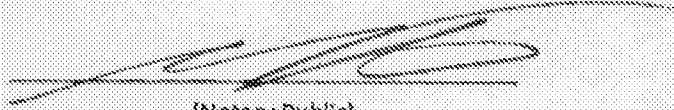
Date: 4/29/15

Commonwealth of Massachusetts )

) SS:

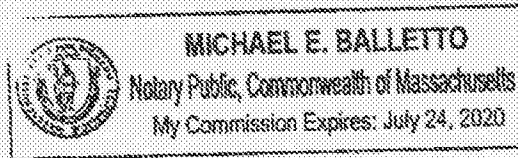
County of Suffolk )

On this 29th day of April, 2015, before me, the undersigned notary public, personally appeared Daniel E. Pagoda as agent of Dane Shulman Associates LLC, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.



(Notary Public)

Seal



Assignee:

**Advanced Silicon Group, Inc.**, by its duly authorized agent:

Signature: *Marie Black*

Name (Print): MARIE BLACK

Title: CEO

Date: 5-14-15

Commonwealth of Massachusetts )

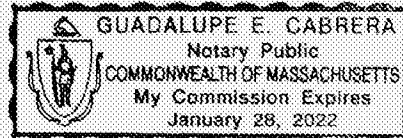
) SS:

County of MIDDLESEX )

On this 14<sup>th</sup> day of MAY, 2015, before me, the undersigned notary public, personally appeared MARIE BLACK as agent of Dane Shulman Associates LLC, proved to me to be the person whose name is signed on the preceding document, through satisfactory evidence of identification, and acknowledged to me that he/she signed it voluntarily in both instances for its stated purpose.

*Guadalupe E. Cabrera*  
(Notary Public)

Seal



**Schedule 1 to Patent Rights Assignment**

Listed Patents

US Patent number 7973995, Designing the host of nano-structured optoelectronic devices to improve performance, granted July 5<sup>th</sup>, 2011

US Patent number 8416485, Designing the host of nano-structured optoelectronic devices to improve performance, granted April 9<sup>th</sup>, 2013

Chinese patent number ZL200980120567.X, Designing the host of nano-structured optoelectronic devices to improve performance, granted Date November 21st, 2012

European Patent Convention application, publication number 2269227, Designing the host of nano-structured optoelectronic devices to Improve performance

Hong Kong patent number 1155559, Designing the host of nano-structured optoelectronic devices to improve performance, granted August 16<sup>th</sup> 2013

India patent application number 6296/Chenp/2010, Designing the host of nano-structured optoelectronic devices to improve performance, filed April 3<sup>rd</sup> 2009

US patent application number 13-353080, Method of electrically contacting nanowire arrays, filed January 18<sup>th</sup> 2012

US patent application number 13-353087, Nanowire device with alumina passivation layer and methods of making same, filed January 18<sup>th</sup> 2012

US patent number 8829485, Selective emitter nanowire array and methods of making same, granted September 9<sup>th</sup>, 2014

US patent application number 14/467029, Selective emitter nanowire array and methods of making same, filed August 24<sup>th</sup>, 2014

US patent application number 14/338752, Screen printing electrical contacts to nanowire areas, filed July 23<sup>rd</sup>, 2014

US patent number 8450599, Nanostructured devices, granted May 28<sup>th</sup>, 2013

US patent application number 13/902332, Nanostructured devices, filed May 24<sup>th</sup> 2013

Australian patent application number 2009314576, Nanostructured devices, filed November 16<sup>th</sup>, 2009

Canadian patent application number 2743743, Nanostructured devices, filed November 16<sup>th</sup>, 2009

Chinese patent application number 200980154592.X (patent number not assigned yet) Nanostructured devices, granted April 2015

European Patent Convention application number 09826444.3, Nanostructured devices, filed November 16<sup>th</sup> 2009

Hong Kong patent application number 12105194.9, Nanostructured devices, filed November 16<sup>th</sup>, 2009

COPY FROM PARENT CASE

India patent application number 3312/CHENP/2011, Nanostructured devices, filed November 16<sup>th</sup>, 2009

Israel patent application number 212825, Nanostructured devices, filed November 16<sup>th</sup>, 2009

Japan patent number 5612591, Nanostructured devices, granted September 12<sup>th</sup>, 2014

Korean patent application number 10-2011-7013501, Nanostructured devices, filed November 16<sup>th</sup>, 2009

US patent number 8143143, Process for fabricating nanowire arrays, granted March 27<sup>th</sup>, 2012

US patent number 8791449, Nanostructured silicon for battery anodes, granted July 29<sup>th</sup>, 2014

US patent application number 14/444361, Process for fabricating nanowire arrays, filed July 28<sup>th</sup>, 2014

European patent convention application number 09743228.0, Process for fabricating nanowire arrays, filed April 14<sup>th</sup>, 2009

India patent application number 6570/chenp2010, Process for fabricating nanowire arrays, filed April 14<sup>th</sup>, 2009

US patent number 8852981, Electrical contacts to nanostructured areas, granted October 7<sup>th</sup>, 2014

US patent application number 14/468219, Electrical contacts to nanostructured areas, filed August 25<sup>th</sup>, 2014

European Patent Convention application number 12833982.7, Electrical contacts to nanostructured areas, filed September 19<sup>th</sup> 2012

Japan patent application number 2014-530959, Electrical contacts to nanostructured areas, filed September 19<sup>th</sup>, 2012

Taiwan patent application number 101134325, Electrical contacts to nanostructured areas, filed September 19<sup>th</sup> 2012

US patent number 8945794, Process for forming silver films on silicon, granted February 3<sup>rd</sup>, 2015

US patent application number 14/61255, Process for forming silver films on silicon, filed February 3<sup>rd</sup> 2015

US patent number 8734659, Process for structuring silicon, granted May 27<sup>th</sup>, 2014

US patent application number 14/286581, Process for structuring silicon, filed May 23<sup>rd</sup> 2014

US patent application number 12/845557, Silicon nanowire arrays on an organic conductor, filed July 28<sup>th</sup> 2010

PCT patent application number PCT/US2014/013677, Necklaces of silicon nanowires, filed January 29<sup>th</sup>, 2014

COPY FROM PARENT CASE

PCT patent application number PCT/US2013/076151, Metal backed nanowire arrays, filed December 13<sup>th</sup> 2013

US patent application number 14/329975, Double-etch nanowire process, filed July 13<sup>th</sup> 2014

PCT application number PCT/US2014/053000 Metal assisted etch combined with regularizing etch, filed August 27<sup>th</sup>, 2014

**CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT**

**CIVIL CODE § 1189**

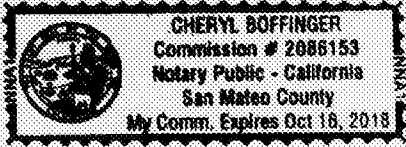
A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California )  
County of San Mateo )  
On 4-16-2015 before me, Cheryl Boffinger  
Date Here Insert Name and Title of the Officer  
personally appeared Forest Baskett  
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) (is)are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature Cheryl Boffinger  
Signature of Notary Public

Place Notary Seal Above

**OPTIONAL**

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

**Description of Attached Document**

Title or Type of Document Patent Rights Transfer and Payment Agreement Document Date: 4-16-2015  
Number of Pages: 27 Signer(s) Other Than Named Above: \_\_\_\_\_

**Capacity(ies) Claimed by Signer(s)**

Signer's Name: Forest Baskett  
 Corporate Officer -- Title(s): \_\_\_\_\_  
 Partner --  Limited  General  
 Individual  Attorney in Fact  
 Trustee  Guardian or Conservator  
 Other: \_\_\_\_\_  
Signer Is Representing: \_\_\_\_\_

Signer's Name: \_\_\_\_\_  
 Corporate Officer -- Title(s): \_\_\_\_\_  
 Partner --  Limited  General  
 Individual  Attorney in Fact  
 Trustee  Guardian or Conservator  
 Other: \_\_\_\_\_  
Signer Is Representing: \_\_\_\_\_