

**TRADEMARK ASSIGNMENT**

Electronic Version v1.1  
 Stylesheet Version v1.1

|                                  |  |                       |                       |
|----------------------------------|--|-----------------------|-----------------------|
| <b>SUBMISSION TYPE:</b>          | NEW ASSIGNMENT   |                       |                       |
| <b>NATURE OF CONVEYANCE:</b>     | SECURITY INTEREST  |                       |                       |
| <b>CONVEYING PARTY DATA</b>      |  |                       |                       |
| <b>Name</b>                      | <b>Formerly</b>  | <b>Execution Date</b> | <b>Entity Type</b>    |
| Axcelis Technologies, Inc.       |  | 04/23/2008            | CORPORATION: DELAWARE |
| <b>RECEIVING PARTY DATA</b>      |  |                       |                       |
| <b>Name:</b>                     | Silicon Valley Bank  |                       |                       |
| <b>Street Address:</b>           | 3003 Tasman Drive  |                       |                       |
| <b>City:</b>                     | Santa Clara  |                       |                       |
| <b>State/Country:</b>            | CALIFORNIA   |                       |                       |
| <b>Postal Code:</b>              | 95054  |                       |                       |
| <b>Entity Type:</b>              | Chartered Bank: CALIFORNIA   |                       |                       |
| <b>PROPERTY NUMBERS Total: 2</b> |  |                       |                       |
| <b>Property Type</b>             | <b>Number</b>  | <b>Word Mark</b>      |                       |
| Registration Number:             | 2589955  | AXCELIS               |                       |
| Registration Number:             | 2652725  | AXCELIS               |                       |
| <b>CORRESPONDENCE DATA</b>       |  |                       |                       |
| <b>Fax Number:</b>               | (703)415-1557  |                       |                       |
|                                  | <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i> |                       |                       |
| <b>Phone:</b>                    | 703-415-1555   |                       |                       |
| <b>Email:</b>                    | mail@specializedpatent.com   |                       |                       |
| <b>Correspondent Name:</b>       | Christopher E. Kondracki   |                       |                       |
| <b>Address Line 1:</b>           | 2001 Jefferson Davis, Hwy., Suite 1007   |                       |                       |
| <b>Address Line 4:</b>           | Arlington, VIRGINIA 22202  |                       |                       |
| <b>ATTORNEY DOCKET NUMBER:</b>   | 8040810  |                       |                       |
| <b>NAME OF SUBMITTER:</b>        | Christopher E. Kondracki   |                       |                       |
| <b>Signature:</b>                | /Christopher E. Kondracki/   |                       |                       |
| <b>Date:</b>                     | 05/07/2008   |                       |                       |

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**TRADEMARK**

**Total Attachments: 23**

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## INTELLECTUAL PROPERTY SECURITY AGREEMENT

This Intellectual Property Security Agreement (this "IP Agreement") is made as of the 23rd day of April, 2008 by and between **AXCELIS TECHNOLOGIES, INC.**, a Delaware corporation with its principal place of business at 108 Cherry Hill Drive, Beverly, Massachusetts 01915 ("Grantor"), and **SILICON VALLEY BANK**, a California-chartered bank, with its principal place of business at 3003 Tasman Drive, Santa Clara, California 95054 and with a loan production office located at One Newton Executive Park, Suite 200, 2221 Washington Street, Newton, Massachusetts 02462 ("Lender").

### RECITALS

A. Lender has agreed to make advances of money and to extend certain financial accommodations to Grantor (the "Loan"), pursuant to a certain Loan and Security Agreement dated as of the date hereof between Grantor and Lender, as amended from time to time (as amended, the "Loan Agreement"). The Loan is secured pursuant to the terms of the Loan Agreement. Lender is willing to enter into certain financial accommodations with Grantor, but only upon the condition, among others, that Grantor shall grant to Lender a security interest in certain Copyrights, Trademarks, Patents, and Mask Works, and other assets, to secure the Obligations of Grantor under the Loan Agreement. Defined terms used but not defined herein shall have the same meanings as in the Loan Agreement.

B. Pursuant to the terms of the Loan Agreement, Grantor has granted to Lender a security interest in all of Grantor's right title and interest, whether presently existing or hereafter acquired in, to and under all of the Collateral (as defined therein).

**NOW, THEREFORE**, for good and valuable consideration, receipt of which is hereby acknowledged and intending to be legally bound, as collateral security for the prompt and complete payment when due of the Obligations, Grantor hereby represents, warrants, covenants and agrees as follows:

1. Grant of Security Interest. As collateral security for the prompt and complete payment and performance of all of the Obligations, including, without limitation, under the Loan Agreement, Grantor hereby grants a security interest in all of Grantor's right, title and interest in, to and under its registered and unregistered intellectual property collateral (all of which shall collectively be called the "Intellectual Property Collateral"), including, without limitation, the following:

(a) Any and all copyright rights, copyright applications, copyright registrations and like protections in each work or authorship and derivative work thereof, whether published or unpublished, registered or unregistered, and whether or not the same also constitutes a trade secret, now or hereafter existing, created, acquired or held, including without limitation those set forth on **EXHIBIT A** attached hereto (collectively, the "Copyrights");

(b) Any and all trade secret rights, including any rights to unpatented inventions, know-how, operating manuals, license rights and agreements, and confidential information, and any and all intellectual property rights in computer software and computer software products now or hereafter existing, created, acquired or held;

(c) Any and all design rights which may be available to Grantor now or hereafter existing, created, acquired or held;

(d) All patents, patent applications and like protections including, without limitation, improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same, including without limitation the patents and patent applications set forth on **EXHIBIT B** attached hereto (collectively, the "Patents");

(e) Any trademark and service mark rights, slogans, trade dress, and tradenames, trade styles, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of Grantor connected with and symbolized by such trademarks, including without limitation those set forth on EXHIBIT C attached hereto (collectively, the "Trademarks");

(f) All mask works or similar rights available for the protection of semiconductor chips, now owned or hereafter acquired, including, without limitation those set forth on EXHIBIT D attached hereto (collectively, the "Mask Works");

(g) Any and all claims for damages by way of past, present and future infringements of any of the rights included above, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the intellectual property rights identified above;

(h) All licenses or other rights to use any of the Copyrights, Patents, Trademarks, or Mask Works and all license fees and royalties arising from such use to the extent permitted by such license or rights (collectively, the "Licenses"); and

(i) All amendments, extensions, renewals and extensions of any of the Copyrights, Trademarks, Patents, or Mask Works; and

(j) All proceeds and products of the foregoing, including without limitation all payments under insurance or any indemnity or warranty payable in respect of any of the foregoing.

2. Authorization and Request. Grantor authorizes and requests that the Register of Copyrights and the Commissioner of Patents and Trademarks record this IP Agreement, and any amendments thereto, or copies thereof.

3. Intent. This IP Agreement is being executed and delivered by the Grantor in conjunction with the security interest granted to Bank under the Loan Agreement and for the purpose of recording and confirming the grant of the security interest of the Lender in the Intellectual Property Collateral with the United States Patent and Trademark Office and the United States Copyright Office, as applicable. It is intended that the security interest granted pursuant to this IP Agreement is granted in conjunction with, and not in addition to or limitation of, the security interest granted to the Lender under the Loan Agreement. All provisions of the Loan Agreement shall apply to the Intellectual Property Collateral. The Lender shall have the same rights, remedies, powers, privileges and discretions with respect to the security interests created in the Intellectual Property Collateral as in all other Collateral.

[SIGNATURE PAGES FOLLOW]

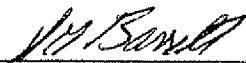
**EXECUTED** as a sealed instrument under the laws of the Commonwealth of Massachusetts on the day and year first written above.

**Address of Grantor:**

108 Cherry Hill Drive  
Beverly, Massachusetts 01915

**GRANTOR:**

AXCELIS TECHNOLOGIES, INC.

By: 

Name: Stephen G. Bassett  
Title: Chief Financial Officer  
and Executive Vice President

SILICON VALLEY BANK

By: Michael J. Tramack  
Name: Michael Tramack  
Title: Senior Vice President

*Signature Page to Intellectual Property Security Agreement*

**TRADEMARK**  
**REEL: 003773 FRAME: 0532**

Exhibit "A" attached to that certain Intellectual Property Security Agreement dated April 23, 2008.

EXHIBIT "A"

COPYRIGHTS

SCHEDULE A - ISSUED COPYRIGHTS

| <u>COPYRIGHT<br/>DESCRIPTION</u> | <u>REGISTRATION<br/>NUMBER</u> | <u>DATE OF<br/>ISSUANCE</u> |
|----------------------------------|--------------------------------|-----------------------------|
| None                             |                                |                             |

SCHEDULE B - PENDING COPYRIGHT APPLICATIONS

| <u>FIRST DATE<br/>COPYRIGHT<br/>DESCRIPTION</u> | <u>APPLICATION<br/>NUMBER</u> | <u>DATE OF<br/>FILING</u> | <u>DATE OF<br/>CREATION</u> | <u>OF PUBLIC<br/>DISTRIBUTION</u> |
|---|-------------------------------|---------------------------|-----------------------------|-----------------------------------|
| None  |                               |                           |                             |                                   |

Exhibit "B" attached to that certain Intellectual Property Security Agreement dated April 23, 2008.

EXHIBIT "B"

SCHEDULE A - ISSUED PATENTS

| US PATENT NO. | FILED/<br>ISSUED    | TITLE   |
|---------------|---------------------|---|
| 4,883,968     | 6/3/88<br>11/28/89  | Electron cyclotron resonance ion source                                       |
| 4,891,525     | 11/14/88<br>1/2/90  | SKM ion source  |
| 4,914,305     | 1/4/89<br>4/3/90    | Uniform cross section ion beam system   |
| 4,923,584     | 10/31/88<br>5/8/90  | Sealing apparatus for a vacuum processing system                              |
| 4,929,840     | 2/28/89<br>5/29/90  | Wafer rotation control for an ion implanter                                   |
| 4,943,728     | 2/28/89<br>7/24/90  | Beam pattern control system for an ion implanter                              |
| 4,944,860     | 11/4/88<br>7/31/90  | Platen assembly for a vacuum processing system                                |
| 4,952,299     | 10/31/88<br>8/28/90 | Wafer handling apparatus  |
| 4,971,653     | 3/14/90<br>11/20/90 | Temperature controlled chuck for elevated temperature etch processing         |
| 4,975,586     | 2/28/89<br>12/4/90  | Ion implanter end station   |
| 4,978,891     | 4/17/89<br>12/18/90 | Electrodeless lamp system with controllable spectral output                   |
| 4,987,933     | 3/3/89<br>1/29/91   | Fluid flow control method and apparatus for minimizing particle contamination |
| 5,005,519     | 3/14/90<br>4/9/91   | Reaction chamber having non-clouded window                                    |
| 5,015,331     | 8/10/90<br>5/14/91  | Method of plasma etching with parallel plate reactor having a grid            |
| 5,019,233     | 11/8/89<br>5/28/91  | Sputtering system   |
| 5,023,458     | 3/1/90<br>6/11/91   | Ion beam control system   |
| 5,026,997     | 11/13/89<br>6/25/91 | Elliptical ion beam distribution method and apparatus                         |
| 5,031,674     | 9/21/90<br>7/16/91  | Fluid flow control method and apparatus for minimizing particle contamination |
| 5,091,655     | 2/25/91<br>2/25/92  | Reduced path ion beam implanter   |
| 5,113,074     | 1/29/91<br>5/12/92  | Ion beam potential detection probe  |
| 5,118,989     | 12/11/89<br>6/2/92  | Surface discharge radiation source  |
| 5,134,299     | 3/13/91<br>7/28/92  | Ion beam implantation method and apparatus for particulate control            |
| 5,156,681     | 5/28/91<br>10/20/92 | Process module dispense arm   |



| US PATENT NO. | FILED/<br>ISSUED     | TITLE  |
|---------------|----------------------|--|
| 5,160,846     | 12/9/91<br>11/3/92   | Method and apparatus for reducing tilt angle variations in an ion implanter          |
| 5,164,599     | 7/19/91<br>11/17/92  | Ion beam neutralization means generating diffuse secondary emission electron shower  |
| 5,177,366     | 3/6/92<br>1/5/93     | Ion beam implanter for providing cross plane focusing                                |
| 5,198,676     | 9/27/91<br>3/30/93   | Ion beam profiling method and apparatus  |
| 5,209,803     | 1/18/91<br>5/11/93   | Parallel plate reactor and method of use   |
| 5,218,210     | 2/18/92<br>6/8/93    | Broad beam flux density control  |
| 5,227,698     | 3/12/92<br>7/13/93   | Microwave lamp with rotating field   |
| 5,229,615     | 3/5/92<br>7/20/93    | End station for a parallel beam ion implanter  |
| 5,240,046     | 7/15/92<br>8/31/93   | Fluid flow control method and apparatus for minimizing particle contamination        |
| 5,308,989     | 12/22/92<br>5/3/94   | Fluid flow control method and apparatus for an ion implanter                         |
| 5,361,274     | 3/12/92<br>11/1/94   | Microwave discharge device with TM.sub.NMO cavity                                    |
| 5,373,164     | 2/18/94<br>12/13/94  | Ion beam conical scanning system   |
| 5,406,088     | 12/22/93<br>4/11/95  | Scan and tilt apparatus for an ion implanter   |
| 5,412,684     | 3/10/93<br>5/6/95    | Microwave excited gas laser  |
| 5,420,415     | 6/29/94<br>5/30/95   | Structure for alignment of an ion source aperture with a predetermined ion beam path |
| 5,432,352     | 2/8/94<br>7/11/95    | Ion beam scan control  |
| 5,436,790     | 1/15/93<br>7/25/95   | Wafer sensing and clamping monitor   |
| 5,438,242     | 6/24/93<br>8/1/95    | Apparatus for controlling the brightness of a magnetron-excited lamp                 |
| 5,444,597     | 3/10/93<br>8/22/95   | Wafer release method and apparatus   |
| 5,497,006     | 11/15/94<br>3/5/96   | Ion generating source for use in an ion implanter                                    |
| 5,498,308     | 2/25/94<br>3/12/96   | Plasma asher with microwave trap   |
| 5,523,652     | 9/26/94<br>6/4/96    | Microwave energized ion source for ion implantation                                  |
| 5,525,807     | 6/5/95<br>6/11/96    | Ion implantation device  |
| 5,531,420     | 7/1/94<br>7/2/96     | Ion beam electron neutralizer  |
| 5,554,854     | 7/17/95<br>9/10/96   | In situ removal of contaminants from the interior surfaces of an ion beam implanter  |
| 5,554,857     | 10/19/95<br>10/10/96 | Method and apparatus for ion beam formation in an ion implanter                      |
| 5,571,439     | 4/27/95              | Magnetron variable power supply with moding prevention                               |

| US PATENT NO. | FILED/<br>ISSUED     | TITLE   |
|---------------|----------------------|---|
|               | 11/5/96              |   |
| 5,608,223     | 6/2/95<br>3/4/97     | Ion implantation device   |
| 5,633,506     | 8/28/95<br>5/27/97   | Method and apparatus for in situ removal of contaminants from ion beam neutralization and implantation apparatuses  |
| 5,654,043     | 10/10/96<br>8/5/97   | Pulsed plate plasma implantation system and method  |
| 5,656,092     | 12/18/95<br>8/12/97  | Apparatus for capturing and removing contaminant particles from an interior region of an ion implanter              |
| 5,661,308     | 5/30/96<br>8/26/97   | Method and apparatus for ion formation in an ion implanter  |
| 5,670,217     | 12/9/96<br>9/23/97   | Method for capturing and removing contaminant particles from an interior region of an ion implanter                 |
| 5,674,039     | 8/21/96<br>10/7/97   | System for transferring articles between controlled environments  |
| 5,691,537     | 1/22/96<br>11/25/97  | Method and apparatus for ion beam transport   |
| 5,703,372     | 12/31/96<br>12/30/97 | Endcap for indirectly heated cathode of ion source  |
| 5,703,375     | 8/2/96<br>12/30/97   | Method and apparatus for ion beam neutralization  |
| 5,736,743     | 8/13/96<br>4/7/98    | Method and apparatus for ion beam formation in an ion implanter   |
| 5,751,003     | 1/7/97<br>5/12/98    | Loadlock assembly for an ion implantation system  |
| 5,760,405     | 11/26/96<br>6/2/98   | Plasma chamber for controlling ion dosage in ion implantation   |
| 5,760,409     | 1/17/97<br>1/2/98    | Dose control for use in an ion implanter  |
| 5,763,890     | 10/30/96<br>6/9/98   | Cathode mounting for ion source with indirectly heated cathode  |
| 5,767,626     | 12/6/95<br>6/16/98   | Electrodeless lamp starting/operation with sources at different frequencies   |
| 5,780,863     | 4/29/97<br>7/14/98   | Accelerator-decelerator electrostatic lens for variably focusing and mass resolving an ion beam in an ion implanter |
| 5,791,782     | 9/21/96<br>8/11/98   | Contact temperature probe with unrestrained orientation   |
| 5,793,050     | 11/26/96<br>8/11/98  | Ion implantation system for implanting workpieces   |
| 5,811,823     | 11/26/96<br>9/22/98  | Control mechanisms for dosimetry control in ion implantation systems  |
| 5,814,819     | 7/11/97<br>9/29/98   | System and method for neutralizing an ion beam using water vapor  |
| 5,814,823     | 7/12/97<br>9/29/98   | System and method for detecting neutral particles in an ion beam  |
| 5,820,366     | 8/23/96<br>10/13/98  | Dual vertical thermal processing furnace  |
| 5,821,677     | 12/5/96<br>10/13/98  | Ion source block filament with labyrinth conductive path  |
| 5,825,038     | 11/26/96<br>10/20/98 | Large area uniform ion beam formation   |
| 5,828,070     | 11/26/96<br>10/27/98 | System and method for cooling workpieces processed by an ion implantation system                                    |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE   |
|---------------|---------------------|---|
| 5,856,674     | 9/16/97<br>1/5/99   | Filament for ion implanter plasma shower  |
| 5,895,923     | 11/26/96<br>4/20/99 | Ion beam shield for implantation systems  |
| 5,900,177     | 6/11/97<br>5/4/99   | Furnace sidewall temperature control system   |
| 5,903,009     | 9/8/97<br>5/11/99   | Biased and serrated extension tube for ion implanter electron shower                              |
| 5,909,031     | 9/8/97<br>6/1/99    | Ion implanter electron shower having enhanced secondary electron emission                         |
| 5,911,832     | 1/9/97<br>6/15/99   | Plasma immersion implantation with pulsed anode   |
| 5,959,305     | 6/19/98<br>9/28/99  | Method and apparatus for monitoring charge neutralization operation                               |
| 5,961,323     | 8/11/98<br>10/5/99  | Dual vertical thermal processing furnace  |
| 5,961,851     | 4/2/96<br>10/5/99   | Microwave plasma discharge device   |
| 5,962,858     | 7/10/97<br>10/5/99  | Method of implanting low doses of ions into a substrate   |
| 5,980,638     | 1/20/97<br>11/9/99  | Double window exhaust arrangement for wafer plasma processor                                      |
| 5,998,798     | 6/11/98<br>12/7/99  | Ion dosage measurement apparatus for an ion beam implanter and method                             |
| 6,016,036     | 1/28/98<br>1/18/00  | Magnetic filter for ion source  |
| 6,023,555     | 8/17/98<br>2/800    | Radiant heating apparatus and method  |
| 6,025,602     | 4/23/98<br>2/15/00  | Ion implantation system for implanting workpieces   |
| 6,031,320     | 1/27/98<br>2/29/00  | Device for cooling electrodeless lamp with supersonic outlet jets and a staggered manifold        |
| 6,040,518     | 12/22/98<br>3/21/00 | Wafer temperature monitoring device utilizing flexible thermocouple                               |
| 6,050,218     | 9/28/98<br>4/18/00  | Dosimetry cup charge collection in plasma immersion ion implantation                              |
| 6,057,084     | 10/3/97<br>5/2/00   | Controlled amine poisoning for reduced shrinkage of features formed in photoresist                |
| 6,057,645     | 12/31/97<br>5/2/00  | Plasma discharge device with dynamic tuning by a movable microwave trap                           |
| 6,060,718     | 2/26/98<br>5/9/00   | Ion source having wide output current operating range   |
| 6,065,499     | 12/21/98<br>5/23/00 | Lateral stress relief mechanism for vacuum bellows  |
| 6,082,374     | 9/24/97<br>7/4/00   | Fluorine assisted stripping and residue removal in sapphire downstream plasma asher               |
| 6,101,971     | 12/22/98<br>8/15/00 | Ion implantation control using charge collection, optical emission spectroscopy and mass analysis |
| 6,107,634     | 4/30/98<br>8/22/00  | Decaborane vaporizer  |
| 6,110,288     | 12/28/94<br>8/29/00 | Temperature probe and measurement method for low pressure process                                 |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE  |
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| 6,117,622     | 9/5/97<br>9/12/00   | Controlled shrinkage of photoresist  |
| 6,122,440     | 1/27/99<br>9/19/00  | Optical heating device for rapid thermal processing (RTP) system   |
| 6,135,128     | 3/27/98<br>10/24/00 | Method for in-process cleaning of an ion source  |
| 6,137,112     | 9/10/98<br>10/24/00 | Time of flight energy measurement apparatus for an ion beam implanter  |
| 6,180,954     | 5/22/97<br>1/30/01  | Dual-walled exhaust tubing for vacuum pump   |
| 6,183,127     | 3/29/99<br>2/6/01   | System and method for the real time determination of the in situ emissivity of a workpiece during processing                 |
| 6,194,734     | 2/19/99<br>2/27/01  | Method and system for operating a variable aperture in an ion implanter  |
| 6,204,508     | 8/7/98<br>3/20/01   | Toroidal filament for plasma generation  |
| 6,207,963     | 12/23/98<br>3/27/01 | Ion beam implantation using conical magnetic scanning  |
| 6,207,964     | 2/19/98<br>3/27/01  | Continuously variable aperture for high-energy ion implanter   |
| 6,208,095     | 12/23/98<br>3/27/01 | Compact helical resonator coil for ion implanter linear accelerator  |
| 6,214,524     | 5/12/99<br>4/10/01  | Controlled amine poisoning for reduced shrinkage of features formed in photoresist   |
| 6,221,169     | 5/10/99<br>4/24/01  | System and method for cleaning contaminated surfaces in an ion implanter   |
| 6,222,196     | 11/19/98<br>4/24/01 | Rotatable workpiece support including cylindrical workpiece support surfaces for an ion beam implanter                       |
| 6,225,745     | 12/17/99<br>5/1/01  | Dual plasma source for plasma process chamber  |
| 6,228,773     | 4/14/98<br>5/8/01   | Synchronous multiplexed near zero overhead architecture for vacuum processes   |
| 6,231,054     | 12/21/98<br>5/15/01 | Elastomeric sliding seal for vacuum bellows  |
| 6,237,527     | 8/26/99<br>5/29/01  | System for improving energy purity and implant consistency, and for minimizing charge accumulation of an implanted substrate |
| 6,242,747     | 6/18/99<br>6/05/01  | Method and system for optimizing linac operational parameters  |
| 6,242,750     | 11/25/98<br>6/5/01  | Ion implantation device  |
| 6,255,662     | 10/27/98<br>7/3/01  | Rutherford backscattering detection for use in Ion implantation  |
| 6,259,072     | 11/9/99<br>7/10/01  | Zone controlled radiant heating system utilizing focused reflector   |
| 6,259,105     | 5/10/99<br>7/10/01  | System and method for cleaning silicon-coated surfaces in an ion implanter   |
| 6,262,638     | 9/28/98<br>7/17/01  | Tunable and matchable resonator coil assembly for ion implanter linear accelerator   |
| 6,263,830     | 4/11/00<br>7/24/01  | Microwave choke for remote plasma generator  |
| 6,273,956     | 8/14/01             | Synchronous multiplexed near zero overhead architecture for  |

| US PATENT NO. | FILED/<br>ISSUED     | TITLE  |
|---------------|----------------------|--|
|               | 5/19/99              | vacuum processes   |
| 6,281,135     | 8/5/99<br>8/28/01    | Oxygen free plasma stripping process   |
| 6,288,403     | 10/11/99<br>9/11/01  | Decaborane ionizer   |
| 6,291,828     | 12/21/99<br>9/18/01  | Glass-like insulator for electrically isolating electrodes from ion implanter housing  |
| 6,294,862     | 5/19/98<br>9/25/01   | Multi-cusp ion source  |
| 6,302,963     | 12/21/99<br>10/16/01 | Bell jar having integral gas distribution channeling   |
| 6,305,316     | 7/20/00<br>10/23/01  | Integrated power oscillator RF source of plasma immersion ion implantation system  |
| 6,332,709     | 2/1/00<br>12/25/01   | Contact temperature probe with thermal isolation   |
| 6,347,919     | 12/17/99<br>2/19/02  | Wafer processing chamber having separable upper and lower halves   |
| 6,352,050     | 12/22/00<br>3/5/02   | Remote plasma mixer  |
| 6,352,936     | 2/25/99<br>3/5/02    | Method for stripping ion implanted photoresist layer   |
| 6,375,348     | 11/13/00<br>4/23/02  | System and method for the real time determination of the in situ emissivity and temperature of a workpiece during processing |
| 6,406,836     | 3/21/00<br>6/18/02   | Method of stripping photoresist using re-coating material  |
| 6,409,932     | 12/27/00<br>6/25/02  | Method and apparatus for increased workpiece throughput  |
| 6,412,438     | 12/22/00<br>7/2/02   | Downstream sapphire elbow joint for remote plasma generator  |
| 6,414,329     | 7/25/00<br>7/2/02    | Method and system for microwave excitation of plasma in an ion beam guide  |
| 6,417,115     | 5/26/98<br>7/9/02    | Treatment of dielectric materials  |
| 6,429,139     | 12/17/99<br>8/6/02   | Serial wafer handling mechanism  |
| 6,439,155     | 12/22/00<br>8/27/02  | Remote plasma generator with sliding short tuner   |
| 6,441,382     | 5/21/99<br>8/27/02   | Deceleration electrode configuration for ultra-low energy ion implanter  |
| 6,452,196     | 12/20/99<br>9/17/02  | Power supply hardening for ion beam systems  |
| 6,458,430     | 12/22/99<br>10/01/02 | Pretreatment process for plasma immersion ion implantation   |
| 6,461,036     | 10/6/99<br>10/8/02   | System and method for determining stray light in a thermal processing system   |
| 6,461,801     | 5/26/00<br>10/8/02   | Rapid heating and cooling of workpiece chucks  |
| 6,476,399     | 9/1/00<br>11/05/02   | System and method for removing contaminant particles relative to an ion beam   |
| 6,479,828     | 12/15/00<br>11/12/02 | Method and system for icosaborane implantation   |
| 6,485,534     | 12/20/00             | Contaminant collector trap for ion implanter   |

| US PATENT NO. | FILED/<br>ISSUED     | TITLE  |
|---------------|----------------------|--|
|               | 11/26/02             |  |
| 6,492,186     | 11/5/99<br>12/10/02  | Method for detecting an endpoint for an oxygen free plasma process   |
| 6,499,777     | 5/5/2000<br>12/31/02 | End-effector with integrated cooling mechanism   |
| 6,503,366     | 12/7/00<br>1/7/03    | Chemical plasma cathode  |
| 6,503,693     | 12/2/99<br>1/7/03    | UV assisted chemical modification of photoresist   |
| 6,515,290     | 9/5/00<br>2/4/03     | Bulk gas delivery system for ion implanters  |
| 6,524,936     | 12/22/00<br>2/25/03  | Process for removal of photoresist after post ion implantation   |
| 6,525,326     | 9/1/00<br>2/25/03    | System and method for removing particles entrained in an ion beam  |
| 6,534,775     | 9/1/00<br>2/25/03    | Electrostatic trap for particles entrained in an ion beam  |
| 6,541,781     | 7/25/00<br>2/25/03   | Waveguide for microwave excitation of plasma in an ion beam guide  |
| 6,547,458     | 11/24/99<br>2/25/03  | Optimized optical system design for endpoint detection   |
| 6,548,416     | 7/24/01<br>2/25/03   | Plasma ashing process  |
| 6,552,892     | 5/9/01<br>2/25/03    | Method and apparatus for the grounding of process wafers by the use of conductive regions created by ion implantation into the surface of an electrostatic clamp |
| 6,558,755     | 3/19/01<br>2/25/03   | Plasma curing process for porous silica thin film  |
| 6,576,300     | 3/20/00<br>6/10/03   | High modulus, low dielectric constant coatings<br><br>N.B. Co-owned with Dow Corning Corporation   |
| 6,580,082     | 9/26/00<br>6/17/03   | System and method for delivering cooling gas from atmospheric pressure to a high vacuum through a rotating seal in a batch ion implanter                         |
| 6,582,891     | 11/14/00<br>6/24/03  | Process for reducing edge roughness in patterned photoresist   |
| 6,583,428     | 9/26/00 6/24/03      | Apparatus for the backside gas cooling of a wafer in a batch ion implantation system   |
| 6,583,429     | 8/21/02 6/24/03      | Method and apparatus for improved ion bunching in an ion implantation system   |
| 6,583,544     | 8/07/00<br>6/24/03   | Ion source having replaceable and sputterable solid source material  |
| 6,585,908     | 7/13/01<br>7/01/03   | Shallow angle interference process and apparatus for determining real-time etching rate  |
| 6,593,699     | 11/7/01<br>7/15/03   | Method for molding a polymer surface that reduces particle generation and surface adhesion forces while maintaining a high heat transfer coefficient             |
| 6,597,003     | 7/12/01<br>7/22/03   | Tunable radiation source providing a VUV wavelength planar illumination pattern for processing semiconductor wafers  |
| 6,605,226     | 6/10/02<br>8/12/03   | Method for increased workpiece throughput  |
| 6,605,484     | 11/30/01<br>8/12/03  | Process for optically erasing charge buildup during fabrication of an integrated circuit   |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE  |
|---------------|---------------------|--|
| 6,610,968     | 9/27/00<br>8/26/03  | System and method for controlling movement of a workpiece in a thermal processing system   |
| 6,630,406     | 5/14/01<br>10/7/03  | Plasma ashing process  |
| 6,635,117     | 4/26/00<br>10/21/03 | Actively-cooled distribution plate for reducing reactive gas temperature in a plasma processing system                               |
| 6,635,890     | 8/21/02<br>10/21/03 | Slit double gap buncher and method for improved ion bunching in an ion implantation system   |
| 6,638,875     | 6/7/01<br>10/28/03  | Oxygen free plasma stripping process   |
| 6,653,643     | 12/26/01 11/25/03   | Method and apparatus for improved ion acceleration in an ion implantation system   |
| 6,653,803     | 5/30/00 11/25/03    | Integrated resonator and amplifier system  |
| 6,657,209     | 1/29/01<br>12/2/03  | Method and system for determining pressure compensation factors in an ion implanter  |
| 6,660,975     | 8/16/02<br>12/9/03  | Method for producing flat wafer chucks   |
| 6,663,333     | 7/13/01<br>12/16/03 | Wafer transport apparatus  |
| 6,664,547     | 5/1/02<br>12/16/03  | Ion source providing ribbon beam with controllable density profile   |
| 6,664,548     | 7/31/02<br>12/16/03 | Ion source and coaxial inductive coupler for ion implantation system   |
| 6,664,737     | 6/21/02<br>12/16/03 | Dielectric barrier discharge apparatus and process for treating a substrate  |
| 6,673,197     | 1/03/03<br>1/06/04  | Chemical plasma cathode  |
| 6,677,598     | 5/29/03<br>1/13/04  | Beam uniformity and angular distribution measurement system  |
| 6,695,886     | 8/22/02<br>2/24/04  | Optical path improvement, focus length change compensation, and stray light reduction for temperature measurement system of RTP tool |
| 6,709,807     | 10/9/02<br>3/23/04  | Process for reducing edge roughness in patterned photoresist   |
| 6,710,360     | 07/10/02<br>3/23/04 | Adjustable implantation angle workpiece support structure for an ion beam implanter  |
| 6,734,120     | 2/17/00 5/11/04     | Method of photoresist ash residue removal  |
| 6,735,378     | 5/29/03<br>5/11/04  | Pressure controlled heat source and method for using such for RTP  |
| 6,740,894     | 2/21/03<br>5/21/04  | Adjustable implantation angle workpiece support structure for an ion beam implanter utilizing a linear scan motor                    |
| 6,753,506     | 8/23/01<br>6/22/04  | System and method of fast ambient switching for rapid thermal processing   |
| 6,756,085     | 07/21/03<br>6/29/04 | Ultraviolet curing processes for advanced low-k materials  |
| 6,759,098     | 7/16/01<br>7/06/04  | Plasma curing of MSQ-based porous low-k film materials   |
| 6,759,665     | 5/24/01<br>7/06/04  | Method and system for ion beam containment in an ion beam guide  |
| 6,761,796     | 7/13/01<br>7/13/04  | Method and apparatus for micro-jet enabled, low-energy ion generation transport in plasma processing                                 |
| 6,768,084     | 9/30/02<br>7/27/04  | Advanced rapid thermal processing (RTP) using a linearly-moving heating assembly with an axisymmetric and radially-                  |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE  |
|---------------|---------------------|--|
|               |                     | tunable thermal radiation profile  |
| 6,768,121     | 3/11/03<br>9/27/04  | Ion source having replaceable and sputterable solid source material  |
| 6,770,888     | 6/25/03<br>8/3/04   | High mass resolution magnet for ribbon beam ion implanters   |
| 6,774,373     | 7/28/03<br>8/10/04  | Adjustable implantation angle workpiece support structure for an ion beam implanter  |
| 6,774,377     | 6/26/03<br>8/10/04  | Electrostatic parallelizing lens for ion beams   |
| 6,774,378     | 10/08/03<br>8/10/04 | Method of tuning electrostatic quadrupole electrodes of an ion beam implanter  |
| 6,777,687     | 5/21/01<br>9/27/04  | Substrate positioning system   |
| 6,777,696     | 2/21/03 8/17/04     | Deflecting acceleration/deceleration gap   |
| 6,779,263     | 4/30/03<br>8/24/04  | Method for molding a polymer surface that reduces particle generation and surface adhesion forces while maintaining a high heat transfer coefficient |
| 6,782,843     | 4/1/03<br>8/31/04   | Actively-cooled distribution plate for reducing reactive gas temperature in a plasma processing system   |
| 6,783,630     | 8/27/02<br>8/31/04  | Segmented cold plate for rapid thermal processing (RTP) tool for conduction cooling  |
| 6,794,664     | 09/04/03<br>9/21/04 | Umbilical cord facilities connection for an ion beam implanter   |
| 6,796,711     | 3/29/02<br>9/28/04  | Contact temperature probe and process  |
| 6,803,319     | 2/18/03<br>10/12/04 | Process for optically erasing charge buildup during fabrication of an integrated circuit   |
| 6,828,572     | 4/1/03<br>12/7/04   | Ion beam incident angle detector for ion implant systems   |
| 6,831,280     | 2/19/03<br>12/14/04 | Methods and apparatus for precise measurement of time delay between two signals  |
| 6,833,710     | 9/27/01<br>12/21/04 | Probe assembly for detecting an ion in a plasma generated in an ion source   |
| 6,834,656     | 5/23/01 12/28/04    | Plasma process for removing polymer and residues from substrates   |
| 6,835,930     | 1/8/04 12/28/04     | High mass resolution magnet for ribbon beam ion implanters   |
| 6,855,916     | 12/10/03 2/15/05    | Wafer temperature trajectory control method for high temperature ramp rate applications using dynamic predictive thermal modeling                    |
| 6,872,953     | 5/20/04<br>3/29/05  | Two dimensional stationary beam profile and angular  |
| 6,877,946     | 9/16/03<br>4/12/05  | Wafer transport apparatus  |
| 6,879,109     | 6/20/03<br>4/12/05  | Thin magnetron structures for plasma generation in ion implantation systems  |
| 6,881,966     | 6/13/03<br>4/19/05  | Hybrid magnetic/electrostatic deflector for ion implantation systems   |
| 6,881,967     | 1/22/04 4/19/05     | Method of correction for wafer crystal cut error in semiconductor processing   |
| 6,885,014     | 7/31/02<br>4/26/05  | Symmetric beamline and methods for generating a mass-analyzed ribbon ion beam  |
| 6,891,174     | 7/31/03             | Method and system for ion beam containment using   |



| US PATENT NO. | FILED/<br>ISSUED    | TITLE   |
|---------------|---------------------|---|
|               | 5/10/05             | photoelectrons in an ion beam guide   |
| 6,897,615     | 11/1/01<br>5/24/05  | Plasma process and apparatus  |
| 6,900,444     | 6/16/04<br>5/31/05  | Adjustable implantation angle workpiece support structure for an ion beam implanter   |
| 6,903,350     | 6/10/04<br>6/7/05   | Ion beam scanning systems and methods for improved ion implantation uniformity  |
| 6,905,333     | 9/10/03<br>6/14/05  | Method of heating a substrate in a variable temperature process using a fixed temperature chuck   |
| 6,905,984     | 9/10/03<br>6/14/05  | MEMS based contact conductivity electrostatic chuck   |
| 6,913,796     | 9/14/01<br>7/5/05   | Plasma curing process for porous low-k  |
| 6,914,251     | 3/7/03<br>7/5/05    | Alignment structure and method for mating a wafer delivery device to a wafer treatment tool materials   |
| 6,921,907     | 7/12/04<br>7/26/05  | Substrate positioning system  |
| 6,940,079     | 12/8/04<br>9/6/05   | Method of correction for wafer crystal cut error in semiconductor processing  |
| 6,946,403     | 10/28/03<br>9/20/05 | Method of making a MEMS electrostatic chuck   |
| 6,947,274     | 9/8/03<br>9/20/05   | Clamping and de-clamping semiconductor wafers on an electrostatic chuck using wafer inertial confinement by applying a single-phase square wave AC clamping voltage |
| 6,947,665     | 2/10/03<br>9/20/05  | Radiant heating source with reflective cavity spanning at least two heating elements  |
| 6,949,895     | 9/3/03<br>9/27/05   | Unipolar electrostatic quadrupole lens and switching methods for charged beam transport   |
| 6,951,823     | 8/11/03<br>10/4/05  | Plasma ashing process   |
| 6,953,942     | 9/20/04<br>10/11/05 | Ion beam utilization during scanned ion implantation  |
| 6,956,225     | 4/1/04<br>10/18/05  | Method and apparatus for selective pre-dispersion of extracted ion beams in ion implantation systems  |
| 6,958,481     | 8/22/01<br>10/25/05 | Decaborane ion source   |
| 6,984,832     | 4/15/04<br>1/10/06  | Beam angle control in a batch ion implantation system   |
| 6,987,269     | 12/16/02<br>1/17/06 | Apparatus and process for measuring light intensities   |
| 6,987,272     | 3/5/04<br>1/17/06   | Work piece transfer system for an ion beam implanter  |
| 6,989,545     | 7/7/04<br>1/24/06   | Device and method for measurement of beam angle and divergence  |
| 6,992,308     | 2/27/04<br>1/31/06  | Modulating ion beam current   |
| 6,992,309     | 8/13/04<br>1/31/06  | Ion beam measurement systems and methods for ion implant dose and uniformity control  |
| 6,992,310     | 8/13/04<br>1/31/06  | Scanning systems and methods for providing ions from an ion beam to a workpiece   |
| 6,992,311     | 1/18/05<br>1/31/06  | In-situ cleaning of beam defining apertures in an ion implanter   |
| 7,010,388     | 5/22/03             | Work-piece treatment system having load lock and buffer   |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE   |
|---------------|---------------------|---|
|               | 3/7/06              |   |
| 7,011,868     | 5/24/03<br>3/14/06  | Fluorine-free plasma curing process for porous low-k materials  |
| 7,019,314     | 10/18/04<br>3/28/06 | Systems and methods for ion beam focusing   |
| 7,022,984     | 1/31/05<br>4/4/06   | Biased electrostatic deflector  |
| 7,026,581     | 8/22/03<br>4/11/06  | Apparatus for positioning an elevator tube  |
| 7,030,395     | 8/6/04<br>4/18/06   | Workpiece support structure for an ion beam implanter featuring spherical sliding seal vacuum feedthrough   |
| 7,033,443     | 3/28/03<br>4/25/06  | Gas-cooled clamp for RTP  |
| 7,037,846     | 1/6/04<br>5/2/06    | Method and apparatus for micro-jet enabled, low energy ion generation and transport in plasma processing  |
| 7,059,817     | 11/27/02<br>6/13/06 | Wafer handling apparatus and method   |
| 7,064,340     | 12/15/04<br>6/20/06 | Method and apparatus for ion beam profiling   |
| 7,070,661     | 8/22/03<br>7/4/06   | Uniform gas cushion wafer support   |
| 7,072,165     | 8/18/03<br>7/4/06   | MEMS based multi-polar electrostatic chuck  |
| 7,072,166     | 9/12/03<br>7/4/06   | Clamping and de-clamping semiconductor wafers on a J-R electrostatic chuck having a micromachined surface by using force delay in applying a single-phase square wave AC clamping voltage |
| 7,078,161     | 2/11/03<br>7/18/06  | Plasma ashing process for removing photoresist and residues during ferroelectric device fabrication   |
| 7,078,707     | 1/4/05<br>7/18/06   | Ion beam scanning control methods and systems for ion implantation uniformity   |
| 7,078,712     | 3/18/04<br>7/18/06  | In-situ monitoring on an ion implanter  |
| 7,100,759     | 8/9/04<br>9/5/06    | Magnetic support structure for an elevator tube of a vertical rapid thermal processing unit   |
| 7,102,146     | 6/3/04<br>9/5/06    | Dose cup located near bend in final energy filter of serial implanter for closed loop dose control  |
| 7,105,840     | 2/3/05<br>9/12/06   | Ion source for use in an ion implanter  |
| 7,112,808     | 2/25/04<br>9/26/06  | Wafer 2D scan mechanism   |
| 7,112,809     | 7/19/04<br>9/26/06  | Electrostatic lens for ion beams  |
| 7,119,343     | 5/6/04<br>10/10/06  | Mechanical oscillator for wafer scan with spot beam   |
| 7,135,691     | 4/5/05<br>11/14/06  | Reciprocating drive for scanning a workpiece through an ion beam  |
| 7,141,809     | 4/5/05<br>1/28/06   | Method for reciprocating a workpiece through an ion beam  |
| 7,151,658     | 4/22/03<br>12/19/06 | High-performance electrostatic clamp comprising a resistive layer, micro-grooves, and dielectric layer  |
| 7,163,587     | 2/8/02<br>1/16/07   | Reactor assembly and processing method  |

| US PATENT NO. | FILED/<br>ISSUED    | TITLE   |
|---------------|---------------------|---|
| 7,166,187     | 6/29/04<br>1/23/07  | Segmented cold plate for rapid thermal processing (RTP) tool for conduction cooling         |
| 7,166,963     | 9/10/04<br>12/23/07 | Electrodeless lamp for emitting ultraviolet and/or vacuum ultraviolet radiation             |
| 7,173,260     | 12/22/04<br>2/6/07  | Removing byproducts of physical and chemical reactions in an ion implanter                  |
| 7,183,514     | 1/29/04<br>2/27/07  | Helix coupled remote plasma source  |
| 7,205,231     | 10/29/04<br>4/17/07 | Method for in-situ uniformity optimization in a rapid thermal processing system             |
| 7,205,556     | 10/1/04<br>4/17/07  | Bellows liner for an ion beam implanter   |
| 7,227,160     | 9/13/06<br>6/5/07   | Systems and methods for beam angle adjustment in ion implanters                             |
| 7,239,242     | 1/26/05<br>7/3/07   | Parts authentication employing radio frequency identification                               |
| 7,246,985     | 4/16/04<br>7/24/07  | Work-piece processing system  |
| 7,267,520     | 4/5/05<br>9/11/07   | Wafer scanning system with reciprocating rotary motion utilizing springs and counterweights |
| 7,276,712     | 7/1/05<br>10/2/07   | Method and apparatus for scanning a workpiece in a vacuum chamber of an ion beam implanter  |
| 7,321,299     | 6/8/05<br>1/22/08   | Workpiece handling alignment system   |
| 7,323,695     | 4/5/05<br>1/29/08   | Reciprocating drive for scanning a workpiece  |
| 7,329,882     | 11/29/05<br>2/12/08 | Ion implantation beam angle calibration   |
| 7,338,575     | 9/10/04<br>3/4/08   | Hydrocarbon dielectric heat transfer fluids for microwave plasma generators                 |
| 7,344,352     | 9/2/05<br>3/18/08   | Workpiece transfer device   |

**SCHEDULE B - PENDING PATENT APPLICATIONS**

| US APPLICATION NUMBER | FILING DATE | TITLE  |
|-----------------------|-------------|--|
| 10/395,720            | 07JA2003    | MOUNTING MECHANISM FOR PLASMA EXTRACTION APERTURE  |
| 60/299,895            | 21JE2001    | METHOD AND SYSTEM FOR CHARGE NEUTRALIZATION IN PLASMA IMMERSION ION IMPLANTATION             |
| 90/007,367            | 20JA2005    | PLASMA ASHING PROCESS  |
| 10/065,861            | 26NO2002    | METHOD FOR DRYING AND REMOVING CONTAMINANTS FROM LOW-K DIELECTRIC FILMS                      |
| 10/305,731            | 26NO2002    | ROBOT END-EFFECTOR VACUUM PLUMBING DESIGN IN ALUMINA CERMAIC FOR MICRO CIRCUIT MANUFACTURING |
| 10/762,114            | 21JA2004    | METHOD AND SYSTEM FOR PERFORMING SIMOX IMPLANTS USING ION SHOWER                             |
| 11/343,760            | 31JA2006    | IMPROVED ION IMPLANTER HAVING A SUPERCONDUCTING MAGNET                                       |
| 10/669,186            | 24SE2003    | ION BEAM SLIT EXTRACTION WITH MASS SEPARATION  |

|                          |          |  |
|--------------------------|----------|--|
| 10/843,858               | 13MY2003 | ELECTROSTATIC BEAM PLASMA CONFINEMENT  |
| 10/702,368               | 06NO2003 | SEGMENTED RESONANT ANTENNA FOR RADIO FREQUENCY INDUCTIVELY COUPLED PLASMA  |
| 11/544,971<br>DIVISIONAL | 06NO2003 | SEGMENTED RESONANT ANTENNA FOR RADIO FREQUENCY INDUCTIVELY COUPLED PLASMA  |
| 11/059,202<br>DIVISIONAL | 10SE2002 | METHOD OF HEATING A SUBSTRATE IN A VARIABLE TEMPERATURE PROCESS USING A FIXED TEMPERATURE CHUCK                        |
| 10/624,728               | 10JL2002 | DUAL CHAMBER VACUUM PROCESS SYSTEM   |
| 10/249,964               | 22MY2003 | PLASMA ASHING APARATUS AND ENDPOINT DETECTION PROCESS  |
| 11/146,742               | 09JE2004 | ULTRAVIOLET ASSISTED POROGEN REMOVAL AND/OR CURING PROCESSES FOR FORMING POROUS LOW-K DIELECTRICS                      |
| 10/249,962               | 22MY2003 | PLASMA APPARATUS, GAS DISTRIBUTION ASSEMBLE FOR A PLASMA APPARATUS AND PRCESSES THEREWITH                              |
| 10/708,251               | 19FE2004 | DETECTION OF SOLID MATERIAL IN MIRCROWAVE PLASMA CIRCUIT   |
| 11/053,731               | 08FE2004 | NON-INTRUSIVE, IN-SITU ABSOLUTE FILM THICKNESS MEASURMENT, ABSOLUTE ASH RATE AND NON-UNIFORMITY MEASUREMENT, ENDPOINT  |
| 10/755,617               | 12JA2004 | GAS DISTRIBUTION PLATE ASSEMBLY FOR PLASMA REACTORS  |
| 11/217,247               | 01SE2004 | PROCESS FOR INCREASING PHOTORESIST REMOVAL RATE IN HELIUM/HYDROGEN PLASMAS   |
| 10/830,734               | 23AP2004 | METHOD OF SIMPLIFIED WAFER ALIGNMENT IN SEMICONDUCTOR PROCESSING   |
| 11/765,499 CIP           | 16AP2004 | HIGH THROUGHPUT SERIAL WAFER HANDLING END STATION  |
| 10/983,461               | 08NO2004 | IMPROVED DOSE UNIFORMITY DURING SCANNED ION IMPLANTATION   |
| 11/479,652 CIP           | 30NO2004 | OPTIMIZATION OF BEAM UTILIZATION   |
| 10/940,263               | 14SE2004 | CONTROLLED DOSE ION IMPLANTATION   |
| 10/840,502               | 07MY2003 | WIDE TEMPERATURE RANGE CHUCK SYSTEM  |
| 10/836,516               | 30AP2004 | SEGMENTED BAFFLE PLATE ASSEMBLY FOR PLASMA PROCESSING SYSTEM   |
| 11/146,744               | 07JE2004 | CURING OF PRE-METAL DIELECTRIC PMD MATERIALS   |
| 10/987,276               | 12NO2004 | ULTRAVIOLET ASSISTED PORE SEALING OF POROUS LOW-K DIELECTRIC FILMS   |
| 11/702,465<br>DIVISIONAL | 12NO2004 | ULTRAVIOLET ASSISTED PORE SEALING OF POROUS LOW-K DIELECTRIC FILMS   |
| 11/155,525               | 18JE2004 | APPARATUS FOR CURING AND/OR REMOVING POROGENS FROM LOW-K AND/OR PREMETAL DIELECTRIC MATERIALS                          |
| 11/295,273               | 06DE2004 | MEDIUM PRESSURE PLASMA SYSTEM FOR RBISIT AND ORGANICS REMOVAL WITH ZERO SUBSTRATE LOSS                                 |
| 11/390,039               | 01AP2005 | METHOD OF MEASURING BEAM ANGLE   |
| 11/074,435               | 08MR2005 | HIGH CONDUCTANCE ION SOURCE  |
| 11/074,434               | 08MR2005 | MICROCHANNEL ION GUN   |
| 11/739,314               | 26AP2006 | DOSE UNIFORMITY CORRECTION FOR SWINGING PENDULUM SINGLE WAFER IMPLANTER  |
| 11/386,327               | 22MR2006 | PROCESS FOR MONITORING THE LEVELS OF IXYGEN AND/OR NITROGEN SPECIES IN A SUBSTANTIALLY OXYGEN AND NITROGEN-FREE PLASMA |
| 11/446,052               | 03JE2005 | ULTRAVIOLET CURING PROCESS FOR LOW-K   |

|            |          |   |
|------------|----------|---|
|            |          | DIELECTRIC FILMS  |
| 11/635,227 | 06DE2006 | WIDE AREA RADIO FREQUENCY PLASMA APPARATUS FOR PROCESSING MULTIPLE SUBSTRATES   |
| 11/445,677 | 03JE2005 | CHARGED BEAM DUMP AND PARTICLE ATTRACTOR  |
| 11/739,934 | 26AP2006 | METHOD AND APPARATUS FOR COMBINED TRAPPING OF ION BEAM AND FOCUSING OF THE ION BEAM   |
| 11/235,754 | 27SE2005 | BEAM PROFILER   |
| 11/374,945 | 14MR2006 | IN-SITU PARTICLE MONITORING IN AN ION IMPLANTER USING A CAMERA  |
| 11/299,593 | 12DE2005 | ION BEAM ANGLE MEASUREMENT SYSTEM FOR ION IMPLANTERS  |
| 11/445,722 | 02JE2005 | BEAM STOP AND BEAM TURNING METHODES   |
| 11/445,667 | 02JE2005 | PARTICULATE PREVENTION IN ION IMPLANTATION  |
| 11/294,975 | 06DE2005 | ION IMPLANTER WITH IONIZATION CHMABER ELECTODE DESIGN   |
| 11/290,346 | 30NO2005 | MEANS TO STABILIZE BEAM CURRENT USING A GAS FEED CONTROL LOOP   |
| 11/313,319 | 21DE2005 | ION BEAM ANGLE MEASUREMENT DEVICES FOR ION IMPLANT SYSTEMS  |
| 11/272,529 | 10NO2005 | TEXTURED PARTICLE TRAP LINERS IN AN ION BEAM IMPLANTER  |
| 11/290,344 | 20NO2005 | MEANS TO MEASURE BEAM ANGLE ORTHOGONAL TO A SCANNED OR RIBBON BEAM AND CORRECT ANGLE ERRORS BY TILTING THE TARGET   |
| 11/437,547 | 19MY2006 | NEW AND IMPROVED ION SOURCE   |
| 11/432,977 | 12MY2006 | RIBBON BEAM ION IMPLANTER CLUSTER TOOL  |
| 11/273,039 | 21SE2005 | METHOD FOR THE MODIFICATION OF MATERIALS AND ELECTRICAL PROPERTIES OF CMOS TRANSISTORS THROUGH THE INTRODUCTION OF REACTIVE GASES DURING ION IMPLANTATION |
| 11/540,469 | 20DE2005 | IMPROVED METHOD OF NF3 CLEANING OF AN ION SOURCE  |
| 11/334,265 | 18JA2006 | APPLICATION OF DIGITAL FREQUENCY AND PHASE SYNTHESIS FOR CONTROL OF ELECTRODE VOLTAGE PHASE IN AN HIGH-ENERGY ION   |
| 11/540,469 | 20DE2005 | FLUORINE BASED CLEANING OF AN ION SOURCE  |
| 11/432,923 | 12MY2006 | COMBINATION LOAD LOCK FOR HANDLING OF SEMICONDUCTOR WAFERS OR SUBSTRATES  |
| 11/540,449 | 29SE2006 | METHOD OF RAPIDLY SWITCHING OFF THE OUTPUT OF AN ION SOURCE   |
| 11/541,087 | 29SE2006 | METHOD FOR BEAM CURRENT MODULATION BY ION SOURCE PARAMETER MODULATION   |
| 60/952,895 | 31JL2007 | CONSTANT TEMPERATURE ION SOURCE   |
| 11/784,709 | 10AP2006 | METHODS AND APPARATUS FOR SCANNED BEAM UNIFORMITY ADJUSTMENT IN ION IMPLANTERS  |
| 11/506,998 | 18AU2006 | CONDUCTION COOLING ION STRIKE PLATE FOR FLAG FARADAY USED IN ION IMPLANTER  |
| 11/523,144 | 19SE2006 | BEAM TUNING WITH AUTIMATICALLY MAGNET POLE ROTATION FOR ION IMPLANTERS  |
| 11/377,841 | 15MR2006 | THERMAL CHUCK AND PROCESSES FOR MANUFACTURING THE THERMAL CHUCK   |
| 11/757,063 | 12JE2006 | SYSTEM AND METHOD FOR BEAM ANGLE ADJUCTMENT IN ION IMPLANTERS   |
| 11/634,697 | 96DE2006 | HIGH THROUGHPUT WAFER NOTCH ALIGNER   |

|            |          |   |
|------------|----------|---|
| 11/543,346 | 02JE2006 | DOSE CONTROL LOOP FOR ION IMPLANTATION  |
| 11/829,243 | 28JL2006 | METHOD FOR REDUCING TRANSIENT WAFER TEMPERATURE DURING IMPLANTATION   |
| 11/582,814 | 18OC2006 | SLIDING WAFER RELEASE GRIPPER/WAFER PEELING GRIPPER   |
| 11/947,632 | 29NO2007 | STRUCTURES AND METHODS FOR MEASURING ENERGY CONTAMINATION IN AN ION IMPLANTER   |
| 60/781,977 | 14MR2006 | THE METHOD TO QUENCH THE BEAM GLITCH  |
| 11/441,609 | 22MR2006 | A SYSTEM AND METHOD OF ION BEAM CONTROL IN RESPONSE TO A BEAM GLITCH  |
| 11/540,064 | 29SE2006 | BEAM LINE ARCHITECTURE FOR ION IMPLANTER  |
| 11/523,148 | 19SE2006 | SYSTEM FOR MAGNETIC SCANNING OF ION BEAMS   |
| 11/924,166 | 25OC2006 | LOW-COST ELECTROSTATIC CLAMP WITH FAST DECLAMP TIME   |
| 11/409,759 | 24AP2006 | LOADLOCK FAST VENT  |
| 11/716,622 | 13SE2006 | SYSTEM AND METHOD FOR BEAM ANGLE ADJUSTMENT IN ION IMPLANTERS   |
| 11/644,623 | 22DE2006 | SYSTEM AND METHOD FOR TWO-DIMENSIONAL BEAM SCAN ACROSS A WORKPIECE OF AN ION IMPLANTER  |
| 11/540,897 | 29SE2006 | BROAD BEAM ION IMPLANTATION ARCHITECTURE  |
| 11/633,694 | 04DE2006 | USE OF ION INDUCED LUMINESCENCE (IIL) FOR FEEDBACK CONTROL OF ION IMPLANTATION  |
| 11/831,744 | 31JL2007 | ION IMPLANTER HAVING A COMBINED HYBRID AND DOUBLE MECHANICAL SCAN ARCHITECTURE  |
| 11/503,685 | 14AU2006 | THROUGHPUT ENHANCEMENT FOR SCANNED BEAM ION IMPLANTERS  |
| 11/703,427 | 07FE2007 | OFFSET PHASE OPERATION ON A MULTIPHASE AC ELECTROSTATIC CHUCK CLAMP   |
| 11/704,033 | 08FE2007 | VARIABLE FREQUENCY ELECTROSTATIC CLAMPING   |
| 11/742,178 | 30AP2007 | METHOD OF MEASURING TWO-DIMENSIONAL ION BEAM CURRENT DENSITY PROFILES BY USING ARBITRARILY SHAPED OBJECT SWEEPING                               |
| 11/548,295 | 11OC2006 | HONEY COMBED FARADAY STRUCTURE  |
| 11/687,184 | 16MR2007 | IMPACT DAMPENING/COMPLIANT IDC WAFER CLAMP CHUCK  |
| 11/840,888 | 17AU2006 | MODULAR SCAN ARM ASSEMBLY   |
| 11/641,334 | 19DE2006 | ANNULUS CLAMPING AND BACKSIDE GAS COOL ELECTROSTATIC CHUCK  |
| 11/689,769 | 22MR2007 | THE METHOD TO SEAL THE GAS AND PLASMA LEAKAGE FROM ION SOURCE ARC CHAMBER   |
| 60/952,916 | 31JL2007 | HYBRID ION SOURCE/MULTIMODE ION SOURCE  |
| 11/648,979 | 03JA2007 | METHODS OF REDUCING PARTICLE CONTAMINATION FOR ION IMPLANTERS   |
| 11/752,118 | 22MY2007 | AIRFLOW MANAGEMENT SYSTEM FOR PARTICLE ABATEMENT IN SEMICONDUCTOR MANUFACTURING EQUIPMENT   |
| 12/022,300 | 30JA2008 | REMOTE WAFER PRESENCE DETECTION WITH PASSIVE RFID   |
| 11/935,738 | 06NO2007 | PLASMA ELECTRON FLOOD FOR RIBBON BEAM IMPLANTER   |
| 12/037,222 | 26FE2008 | UV CURE OF LOW-K MATERIALS IN A CONTROLLED OXIDATIVE ENVIRONMENT TO PREVENT SUB-OXIDIZED SILICON FORMATION AND DETERIORATION IN FILM PRIORITIES |

|            |          |   |
|------------|----------|---|
| 11/932,117 | 31OC2007 | BROAD RIBBON BEAM ION IMPLANTER ARCHITECTURE WITH HIGH MASS-ENERGY CAPABILITY                 |
| 12/030,306 | 13FE2008 | INCORPORATION OF A SURFACE TREATMENT/PASSIVATION PROCESS INSITU TO AN ION IMPLANTATION SYSTEM |
| 60/981,576 | 22OC2007 | DOUBLE PLASMA ION SOURCE  |
| 60/954,949 | 09AU2007 | WAFER GRIPPING INTEGRITY SENSOR   |

Exhibit "C" attached to that certain Intellectual Property Security Agreement dated April 23, 2008.

EXHIBIT "C"

SCHEDULE A - REGISTERED TRADEMARKS

| <u>TRADEMARK DESCRIPTION</u>     | <u>SERIAL NO.</u> | <u>REG. NO.</u> | <u>STATUS</u> |
|----------------------------------|-------------------|-----------------|---------------|
| AXCELIS (and Design) (CL. 9, 37) | 78032739          | 2589955         | Active        |
| AXCELIS (CL. 9, 37)              | 78006112          | 2652725         | Active        |

SCHEDULE B - PENDING TRADEMARK APPLICATIONS

| <u>TRADEMARK DESCRIPTION</u> | <u>SERIAL NO.</u> | <u>REG. NO.</u> | <u>STATUS</u> |
|------------------------------|-------------------|-----------------|---------------|
| None                         |                   |                 |               |



Exhibit "D" attached to that certain Intellectual Property Security Agreement dated April 23, 2008.

EXHIBIT "D"

MASK WORKS

| <u>MASK WORK</u>   |                |                   |                 |               |
|--------------------|----------------|-------------------|-----------------|---------------|
| <u>DESCRIPTION</u> | <u>COUNTRY</u> | <u>SERIAL NO.</u> | <u>REG. NO.</u> | <u>STATUS</u> |
| None               |                |                   |                 |               |