Silicon Wafer Japan TC Chapter

Meeting Summary and Minutes

Japan Standards Summer 2017 Meetings
Friday, June 16, 14:00 – 16:30
SEMI Japan Office, Ichigaya, Tokyo

TC Chapter Announcements

Next TC Chapter Meeting
September 21, 2017, 14:00-17:00
SEMI Japan, Tokyo, Japan

Table 1 Meeting Attendees

*Italics* indicate virtual participants

Co-Chairs: Nao Kawai (Meiji University), Tetsuya Nakai (SUMCO)
SEMI Staff: Junko Collins

<table>
<thead>
<tr>
<th>Company</th>
<th>Last</th>
<th>First</th>
<th>Company</th>
<th>Last</th>
<th>First</th>
</tr>
</thead>
<tbody>
<tr>
<td>ShinEtsu Handotai</td>
<td>Toda</td>
<td>Naohisa</td>
<td>Consultant</td>
<td>Kumai</td>
<td>Sado</td>
</tr>
<tr>
<td>Meiji University</td>
<td>Kawai</td>
<td>Naoyuki</td>
<td>SUMCO</td>
<td>Nakai</td>
<td>Tetsuy</td>
</tr>
<tr>
<td>Global Wafers Japan</td>
<td>Takeda</td>
<td>Ryuji</td>
<td>Individual</td>
<td>Yoshise</td>
<td>Masanori</td>
</tr>
<tr>
<td>Hitachi High technologies</td>
<td>Ikota</td>
<td>Masami</td>
<td>Tokyo Electron</td>
<td>Mashiro</td>
<td>Supika</td>
</tr>
</tbody>
</table>

Table 2 Leadership Changes: None

<table>
<thead>
<tr>
<th>WG/TF/SC/TC Name</th>
<th>Previous Leader</th>
<th>New Leader</th>
</tr>
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<tbody>
<tr>
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</table>

Table 3 Committee Structure Changes: None

<table>
<thead>
<tr>
<th>Previous WG/TF/SC Name</th>
<th>New WG/TF/SC Name or Status Change</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Table 4 Ballot Results: No ballot review

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

#1 Passed ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

#2 Failed ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

Table 5 Activities Approved by the GCS between meetings of the TC Chapter: None

Table 6 Authorized Activities

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
</table>
*Need two weeks review for official approval |
| 5774 | Revised | Test Method | SNARF for Practice for Sample Preparation Method for Minority Carrier Diffusion Length Measurement in Silicon Wafers by Surface Photovoltage Method 
*Need two weeks review for official approval |

Table 7 Authorized Ballots: None

Table 8 SNARF(s) Granted a One-Year Extension

<table>
<thead>
<tr>
<th>#</th>
<th>TF</th>
<th>Title</th>
<th>Expiration Date</th>
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</thead>
</table>
Table 8 SNARF(s) Granted a One-Year Extension

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<th>TF</th>
<th>Title</th>
<th>Expiration Date</th>
</tr>
</thead>
</table>

Table 9 SNARF(s) Abolished: None

Table 10 Standard(s) to receive Inactive Status: None

Table 11 New Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiW170616-01</td>
<td>Junko Collins</td>
<td>To ask Shipping Box Task Force to start the line-item revision activity of M31 (per APPENDIX 4 of P.M.)</td>
</tr>
<tr>
<td>SiW170616-02</td>
<td>Junko Collins</td>
<td>To conduct the 2 weeks review of SNARF for New Auxiliary Information: Round-Robin Testing of Sample Preparation Methods for Minority Carrier Diffusion Length Measurements by Surface Photovoltage Methods</td>
</tr>
<tr>
<td>SiW170616-03</td>
<td>Junko Collins</td>
<td>To conduct the 2 weeks review of SNARF 5774: Sample Preparation Method for Minority Carrier Diffusion Length Measurement in Silicon Wafers by Surface Photovoltage Method</td>
</tr>
</tbody>
</table>

Table 12 Previous Meeting Action Items: None

1 Welcome, Reminders, and Introductions

N. Kawai (Meiji Univ.) called the meeting to order at 14:00. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

Attachment: Required_Elements_Reg_20150327_E+J_2016NewStdTemplate,
2 Review of Previous Meeting Minutes

The TC Chapter reviewed the minutes of the previous meeting.

**Motion:** To approve the meeting minutes of March 10, 2017 as is
**By / 2nd:** T. Nakai (SUMCO) / M. Yoshise (Independent)
**Discussion:** None
**Vote:** 7/0, Motion passed

**Attachment:** Si Japan TC Chapter 2017.03.10 R0.2,

3 Liaison Reports

3.1 Silicon Wafer GCS

T. Nakai (SUMCO) reported for GCS. Of note:

Maintenance of M59, Terminology for Silicon Technology is continuously under the discussion among GCS. Detailed is described at the Terminology Task Force Report Section.

**Action Item:** None,
**Attachment:** None,

3.2 Silicon Wafer North America TC Chapter

T. Nakai (SUMCO) reported for the Silicon Wafer North America TC Chapter.

**Action Item:** None,
**Attachment:** 03.01_NA Silicon Wafer TC Liaison Report June 2017,

3.3 Silicon Wafer Europe TC Chapter

No liaison report, since Silicon Wafer Europe TC Chapter Meeting has not occurred since previous Japan TC Chapter Meeting

**Action Item:** None,
**Attachment:** None,

3.4 JSNM / M4S (Material Standards Study Group for Semiconductor Supply Chain) Report

M. Yoshise (Independent) reported. The reports contained the current activities of M4S.

- The test method of low carbon concentration up to 5E14 atoms/cm3 in silicon by FT-IR
- The test method of low carbon concentration up to 1E13 atoms/cm3 in silicon by PL
  - Test sample preparation and round robin test for above two activities are on going.
- The test method of resistivity measurement of Si epitaxial layer with 1% accuracy
  - The activity above is just planned and not yet started

**Action Item:** None,
**Attachment:** None,
3.5 SEMI Staff Report

J. Collins (SEMI) gave the SEMI Staff Report. Of note, new Standards staff, Mizue Iwamura (Ms.) introduced herself to participants.

This report contained information on

- SEMI Global 2017 Calendar of Events
- Global Standards Meeting Schedule
- SEMICON West
- 2017 Critical Dates for SEMI Standards Ballots
- A&R Ballot Review
- SEMI Standards Publications
- JRSC (news from JRSC)
- JRSC Organization Chart
- SEMI Tsushin
- Global Staff Assignment
- Staff Contact (Japan)

Action Item: None,
Attachment: 03.05_SEMI Staff Report 20170614_r3a,

4 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (A&R) Subcommittee Forms for procedural review. The A&R forms are available as attachments to these minutes. The attachment number for each balloted document is provided under each ballot review section below.

No ballot review

5 Task Force Reports

5.1 International 450mm Shipping Box Task Force (Komatsu-san/Nagashima-san)/ JA Shipping Box Task Force (Komatsu-san/Nagashima-san)

No special report, because there is no task force meeting since the previous TC Chapter Meeting.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

5.2 International Advanced Wafer Geometry Task Force/Japan Advanced Wafer Geometry Task Force

M. Yoshise (independent) reported for the International Advanced Wafer Geometry Task Force. This report contained following information.

Previous meeting was held on April 3 during NA Spring Meeting Week, see details in the attachment

Following three presentations will be introduced at the next task force meeting on July 10.

- Geometry Metrology Development Focus
- Process issues near the notch on 300 mm wafers
- 200mm geometry metrology development and requirements

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: 05.02_AWG TF Report,

5.3 International Polished Wafers Task Force
R. Takeda (Global Wafers Japan) reported on behalf of Y. Takamori (Global Wafers Japan). There is no special report.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

5.4 International Epitaxial Wafers Task Force (Toda-san)
T. Toda (SHE) reported there is no special report.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

5.5 International Annealed Wafers Task Force (Araki-san)
There is no special report since there is no current activity.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,
5.6 International SOI Wafers Task Force (Ogura-san/ Nakai-san)

There is no special report since there is no current activity.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

5.7 International Terminology Task Force (Nakai-san)

Current discussion is about how to maintain terminologies for Silicon Wafer related document, currently maintained in the M59.

One of the options was development of Aux document. It is possible according to Regulations, however, there are a couple of issues such as i) Aux Document is not admitted as SEMI Standards, ii) maintenance to be difficult more than expectation.

After some discussion at this meeting, Japan TC Chapter reached the conclusion to keep current mechanism.
1) New terminologies have to be included in original document balloted.
2) Once the balloted document has published, those terminologies would be transferred into the M59 with removal of them from the original document by line-item ballot. This consistent process shall be done by the document owner.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: 05.07_SEMI M59 Discussion_170606 修正 河合,

5.8 International Test Methods Task Force (Takeda-san) Japan Test Method Task Force (Takeda-san/ Otsuki-san/ Omata-san)

R. Takeda (Global Wafers Japan) reported. The last task force meeting in Japan was held on June15 at SEMI Japan office. The task force is currently working on the following documents. See details in the attachment.

Attachment: 05.08_Test Method TF Meeting Minutes_20170615,

  - SNARF needs to be revised since title of the document changes to “Practice” from “Guide”
  - Information from the round robin should be Aux. Information and new SNARF is submitted to the TC Chapter at the meeting today.

- Doc. 5770: Test Methods for Bulk micro defect density and denuded zone width in annealed silicon wafers
  - There is some discussion on the document title whether if “Test Method” is appropriate subtype for this proposal. Task Force discusses to divide current 5770 into two different proposals but does not reach consensus yet.
Although the task force has worked on the following document (see details in the attached task force report), project period for those documents needs to be expanded one more year.

- 5981: New Standard, TEST METHOD FOR RECOMBINATION LIFETIME OF THE EPILAYER OF THE SILICON EPITAXIAL WAFER (p/p+, n/n+) BY THE SHORT WAVELENGTH EXCITATION MICROWAVE PHOTOCONDUCTIVE DECAY METHOD
- 5737: Revision of SEMI MF1391-1107, Test Method for Substitutinal Atomic Carbon Content of Silicon by Infrared spectroscopy
- 5769: New Standard, Test Method for Nitrogen Content in Silicon by Infrared spectroscopy and Charged Particle Activation Analysis


By / 2nd: R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)

Discussion:

Vote: 6/0, motion passed


Action Item: SiW170616-03
Junko Collins
Conduct the 2 weeks review of SNARF 5774: New Standard: Practice for Sample Preparation Method for Minority Carrier Diffusion Length Measurement in Silicon Wafers by Surface Photovoltage Method,

Attachment: 05.08_SNARF5774 rev2_2017.06.16,

Approval of New Auxiliary Information: Round-Robin Testing of Sample Preparation Methods for Minority Carrier Diffusion Length Measurements by Surface Photovoltage Methods

Motion: To approve the SNARF for New Auxiliary Information: Round-Robin Testing of Sample Preparation Methods for Minority Carrier Diffusion Length Measurements by Surface Photovoltage Methods

By / 2nd: R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)

Discussion:

Vote: 5/0, motion passed

Action Item: SiW170616-02
Junko Collins
Conduct the 2 weeks review of SNARF for New Auxiliary Information: Round-Robin Testing of Sample Preparation Methods for Minority Carrier Diffusion Length Measurements by Surface Photovoltage Methods,

Attachment: 05.08_SNARFXXXX rev1_2017.06.16,
Doc. 6096: Line Item Revision to SEMI M53-0216 Practice for Calibrating Scanning Surface Inspection Systems Using Certified Depositions of Monodisperse Reference Spheres on Unpatterned Semiconductor Wafer Surfaces was submitted to Cycle 5, ballot review is conducted at the SEMICON West meeting.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

5.10 Fiducial Mark Interoperability Task Force (Nakai-san)
T. Nakai (SUMCO) reported that this task force will be disbanded by the end of this year. Japan Silicon Wafer TC Chapter decided disbandment of this task force. Japan Si TC Chapter is waiting for the other TC Chapter decision to disband the task force.

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

6 Old Business

6.1 Previous Action items

- SiW170310-1: SNARF for Reapproval of M31

J. Collins (SEMI) reported that reapproval ballot is not appropriate action for M31 due to P.M. Appenx4. This action item was removed from the list and J. Collins will contact to Shipping Box Task Force to start revision activity (line-item ballot for changing the title).

Action Item: SiW170616-01
To ask Shipping Box Task Force to start the line-item revision activity of M31 (per APPENDIX 4 of P.M.),

Attachment: None,

6.2 3-years project Period Check

- Approval of project period expansion
  - 5769: New Standard: Test Method for Nitrogen Content in Silicon by Infrared Absorption

Motion: To expand project period for this SNARF one year
By / 2nd: R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)
Discussion:
Vote: 6/0, Motion passed
Action Item: None,
Attachment: None,

- **5770: New Standard, Test Method for Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers**
  
  **Motion:** To expand project period for this SNARF one year
  
  **By / 2nd:** R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)
  
  **Discussion:** There is a possibility to propose two different documents under current discussion. Once reaching the consensus to develop two different documents, the 5770 has to be withdrawn for proposing two new SNARF.
  
  **Vote:** 6/0, Motion passed

Action Item: None,
Attachment: None,

- **5772: Revision of MF391-0310: Test Methods for Minority Carrier Diffusion Length in Extrinsic Semiconductors by Measurement of Steady-state Surface photovoltage**
  
  **Motion:** To expand project period for this SNARF one year
  
  **By / 2nd:** R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)
  
  **Discussion:**
  
  **Vote:** 6/0, Motion passed

Action Item: None,
Attachment: None,

  
  **Motion:** To expand project period for this SNARF one year
  
  **By / 2nd:** R. Takeda (Global Wafers Japan) / T. Nakai (SUMCO)
  
  **Discussion:**
  
  **Vote:** 6/0, Motion passed

Action Item: None,
Attachment: None,

6.3 Consideration of 5-year Review

- SEMI M31 Mechanical Specification for Front-Opening Shipping Box Used to Transport and Ship 300 mm Wafers with non-conforming title change
  
  - See § 6.1

7 New Business

7.1 New Activity
SNARF for New Auxiliary Information: Round-Robin Testing of Sample Preparation Methods for Minority Carrier Diffusion Length Measurements by Surface Photovoltage Methods

See § 5.8

Motion:
By / 2nd:
Discussion:
Vote:

Action Item: None,
Attachment: None,

8 Next Meeting and Adjournment

The next meeting is scheduled for September 21, 2017 (Japan Fall Standards meeting) at SEMI Japan Office. See http://www.semi.org/standards-events for the current list of events.

Adjournment: 16:30.

Respectfully submitted by:
Junko Collins
Director, Standards & EHS
SEMI Japan
Phone: 81.3.3222.5819
Email: jcollins@semi.org

Minutes tentatively approved by:
Nao Kawai (Meiji University), Co-chair <Date approved>
Tetsuya Nakai (SUMCO), Co-chair <Date approved>

Table 13 Index of Available Attachments*1

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</table>

*1 Due to file size and delivery issues, attachments must be downloaded separately. A .zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.