

Japan Silicon Wafer Committee Meeting Summary and Minutes

SEMICON Japan 2013
December 5, 2013, 10:30a.m. – 6:00p.m.
International Conference Hall, Makuhari Messe, Chiba, Japan

Next Committee Meeting

March 6, 2013, 1:00 p.m. – 5:30 p.m. Japan Standard Time
Japan Standards Spring Meetings 2014, SEMI Japan Office, Tokyo, Japan

Table 1 Meeting Attendees

Co-Chairs: Naoyuki Kawai (The University of Tokyo), Tetsuya Nakai (SUMCO)

SEMI Staff: Hirofumi Kanno

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
SUMCO	Nakai	Tetsuya	The University of Tokyo	Kawai	Naoyuki
Hitachi High Technologies	Ikota	Masami	Kumai Consulting	Kumai	Sadao
GlobalWafers Japan	Takeda	Ryuji	G450C	Lee	Kay
G450C	Lin	Pinyen	HST Vision	Sasaki	Kunihiko
SHE	Otsuki	Tsuyoshi	Shimizu Consulting	Shimizu	Yasuhiro
Takenaka Consulting	Takenaka	Takao	Intel	Mike	Goldstein
Siltronic AG	Passek	Friedrich	Kuroda Precision	Naoi	Kaoru
SCAS	Machida	Ryo	SCAS	Omata	Mikako
Self	Yoshise	Masanori			

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
Reclaim Wafer TF *This TF was disbanded.	Hisashi Taniguchi - Hamada Heavy Industries	--
	Kenji Konno - Mimasu Semiconductor Industry	--
Japan Test Method TF	Ryuji Takeda - GlobalWafers Japan	Ryuji Takeda - GlobalWafers Japan remains.
	Ohtsuki Tsuyoshi - Shin-Etsu Handotai	Ohtsuki Tsuyoshi - Shin-Etsu Handotai remains.
	Yoshimi Shiramizu	Mikako Omata - SCAS becomes a new co-leader of the TF
International Advanced Surface Inspection TF	Hideo Ohta - Hitachi High Technologies	Masami Ikota - Hitachi High Technologies becomes a new co-leader of the TF
	Yusuke Tamaki - ATMI Japan	Yusuke Tamaki - ATMI Japan remains.

Table 3 Ballot Results (or move to Section 4, Ballot Review)

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

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

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
5583	Line Items Revision to SEMI M57-0413, Specifications for Silicon Annealed Wafers	
Line Item 1	Table R1-1, Line 2-6.1 Column for 32 nm Technology Generation: Delete superscript #4	Passed as balloted (Super clean)

Table 3 Ballot Results (or move to Section 4, Ballot Review)

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

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

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
Line Item 2	Table R1-2, Line 2-6.1 Column for 22 nm Technology Generation: Delete superscript #4 and related note.	Passed as balloted (Super clean)
5542	Line Items Revision to SEMI M62-0413, Specifications for Silicon Epitaxial Wafers	
Line Item 1	Table R2-7: 1) Add missing Diameter for ¶2-6.1, and 2) Change Nanotopography value for ¶3-2.7. Remove “Or As agreed between supplier and customer” and change related explanation #9	Passed as balloted
Line Item 2	Table R2-8: 1)Add substrate category in ¶2-6, 2) Add missing diameter for ¶2-6.1, and 3) Change Nanotopography value for ¶3-2.7. Remove “Or As agreed between supplier and customer” and change related explanation #9	Passed as balloted
4844B	New Standard: Guide for the Measurement of Trace Metal Contamination on Silicon Wafer Surface by Inductively Coupled Plasma Mass Spectrometry	Failed ballots were returned to the originating task forces for re-work and re-balloting.
5389A	Revision to MF1982-1110, Test Methods for Analyzing Organic Contaminants on Silicon Wafer Surfaces by Thermal Desorption Gas Chromatography	Passed as balloted
5500	New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications	Passed as balloted
5605	Line Item Revision to SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj:Flatness/SFQR change for 16nm technology generation)	
Line Item 1	Change Row 2-6 and footnote 6 of Table R1-1	Passed as balloted (Super clean)
5651	Line Item Revision of SEMI M80-0812, Mechanical Specification for Front-Opening Shipping Box Used to Transport and Ship 450 mm Wafers	
Line Item 1	Correct the Formula of Paragraph A3-1.6 in Appendix 3 (Method for Measuring Carrier Center of Gravity) of SEMI M80-0812	Passed as balloted (Super clean)
5653	Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj: To correct errors from previous ballot)	
Line Item 1	Change ¶6.6.3.2 and the last sentence in ¶6.6.3.2.2.1	Passed as balloted (Super clean)

Table 4 Authorized Ballots (or move to Section 7, New Business)

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
5655	Cycle 2 - 2014	International Polished Wafers TF	Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers, to update 450 mm wafers edge exclusion
5687	Cycle 1 - 2014	International Test Methods TF	Line Item Revision of SEMI M60-1113, Test Method for Time Dependent Dielectric Breakdown Characteristics of Amorphous SiO ₂ Films for Silicon Wafer Evaluation
5654	Cycle 2 - 2014	International Advanced Wafer Geometry TF	Line Item Revision of M49-0613, Guide for Specifying Geometry Measurements Systems for Silicon Wafers for the 130 nm to 16 nm Technology Generations (EE from 2mm to 1.5mm at 16nm technology generation) *This ballot results is to be adjudicated at SEMI NA spring meeting.

Table 5 Authorized Activities (or move to Section 7, New Business)

#	Type	SC/TF/WG	Details
5687	SNARF	International Test Methods TF	Line Item Revision of SEMI M60-1113, Test Method for Time Dependent Dielectric Breakdown Characteristics of Amorphous SiO ₂ Films for Silicon Wafer Evaluation

Note: SNARFs and TFOFs are available for review on the SEMI Web site at:

<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

Table 6 New Action Items (or move to Section 8, Action Item Review)

None

Table 7 Previous Meeting Actions Items (or move to Section 8, Action item Review)

Item #	Assigned to	Details
09032013-1	SEMI Staff	To confirm whether SEMI HQ has any measurement data for reference sample materials for oxygen and carbon or not. → Done
09032013-2	Yasuhiro Shimizu (Shimizu Consulting) and SEMI Staff	After the Task Force consensus, the draft document for Revision of M80 is forwarded to Silicon Wafer Committee and PIC Committee joint GCS to get approval for the ballot issuance in Cycle 7. → Done

1 Welcome, Reminders, and Introductions

Naoyuki Kawai (The University of Tokyo) called the meeting to order at 10:30 a.m. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

2 Review of Previous Meeting Minutes

The committee reviewed the minutes of the previous meeting.

Motion: To approve the minutes of the previous meeting
By / 2nd: Tetsuya Nakai (SUMCO) / Friedrich Passek (Siltronic AG)
Discussion: None
Vote: 12:0

3 Liaison Reports

3.1 Europe Silicon Wafer Committee

Friedrich Passek (Siltronic AG) reported for the Europe Silicon Wafer Committee. Of note:

- Task Forces with European Participation
- Meeting Information
- Leadership Changes
- Ballot Results
- New SNARFs
- Ballots Approved for Cycle 7 – 2013

- Task Force Reports

Attachment: 01, EU Si Wafer liaison report_October 2013

3.2 North America Silicon Wafer Committee

Kevin Nguyen (SEMI HQ) reported for the North America Silicon Wafer Committee. Of note:

- Meeting Information
- Leadership Changes
- Ballot Results
- New SNARFs
- Ballots Approved for Cycle 1 – 2014
- Task Force Reports

Attachment: 02, NA Si Wafer Liaison Report 20131107

3.3 JEITA Report

Naoyuki Kawai (The University of Tokyo) reported for JEITA activity. Of note:

- Disbandment of Silicon Technology Committee
- History and Background
- Standards with JEITA
- JIS Standards

Attachment: 03, 20131205 JEITA Report

3.3 Silicon Wafer GCS Report

Tetsuya Nakai (SUMCO) reported. Of note:

- JA proposal - Wafer specifications in documents (e.g., M1, M57, etc.) should be in appendix and not related information so it cannot be changed without ballot
- Clarification of procedure for SNARF submission and simultaneous ballot voting. Is it ok to approve both SNARF and ballot in case of consensus in TF.
- Line item review/ballot:
- GCS vote:
- Maintenance of Task Force Member List

Attachment: 04, GCS_meeting minutes_4_Dec_2013_Japan

3.3 JSPS Report

Takao Takenaka (Takenaka Consulting) reported there was no update at this moment.

3.4 SEMI Staff Report

Hirofumi Kanno (SEMI) gave the SEMI Staff Report. Of note:

- Global SEMI Events
- Global Standards Meetings Schedule

- Ballot Critical Dates
- Publication Update
- SEMICON Japan 2013
- Contact Information

Attachment: 05_SEMI Staff Report 2013 Dec._R0.1

4 Ballot Review

4.1 Document # 5583, Line Items Revision to SEMI M57-0413, Specifications for Silicon Annealed Wafers

- Attachment: 06, 5583_Ballotreport

4.2 Document #5542, Line Items Revision to SEMI M62-0413, Specifications for Silicon Epitaxial Wafers

- Attachment: 07, 5542_Ballotreport

4.3 Document #4844B, New Standard: Guide for the Measurement of Trace Metal Contamination on Silicon Wafer Surface by Inductively Coupled Plasma Mass Spectrometry

- Attachment: 08, 4844B_Ballotreport

4.4 Document #5389A, Revision to MF1982-1110, Test Methods for Analyzing Organic Contaminants on Silicon Wafer Surfaces by Thermal Desorption Gas Chromatography

- Attachment: 09, 5389A_Ballotreport

4.5 Document #5500, New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications

- Attachment: 10, 5500_Ballotreport

4.6 Document #5605, Line Item Revision to SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj:Flatness/SFQR change for 16nm technology generation)

- Attachment: 11, 5605_Ballotreport

4.7 Document #5651, Line Item Revision of SEMI M80-0812, Mechanical Specification for Front-Opening Shipping Box Used to Transport and Ship 450 mm Wafers

- Attachment: 12, 5651_Ballotreport

4.8 Document #5653, Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj: To correct errors from previous ballot)

- Attachment:13, 5653_Ballotreport

5 Subcommittee & Task Force Reports

5.1 International Polished Wafer Task Force (Actually this was joint meeting of International Polished wafer TF and International 450mm Wafer TF)

Masanori Yoshise temporarily chair due to absence of Koji Izunome of IPW Co-Leader.

Masanori Yoshise reported for the Task Force. Of notes:

- Task Force Ballot preview
 - Doc 5500 New Standard: Specifications for Polished Single Crystal Silicon Wafers for Gallium Nitride On Silicon Applications
 - ◇ No reject with one comments
 - Comments from Nakai SUMCO, “Do we need to consider possibilities for 6 inch notched wafers and 6 & 8 inch (110) wafers ? “ →New business
 - Doc. #5653, Line Item Revision of SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj: To correct errors from previous ballot)
 - ◇ Super clean
 - Doc. #5605, Line Item Revision to SEMI M1-1013, Specifications for Polished Single Crystal Silicon Wafers (Subj: Flatness/SFQR change for 16nm technology generation) Line Item 1 - Change Row 2-6 and footnote 6 of Table R1-1
 - ◇ Super clean
- Ballot Development
 - Doc 5655 Line item M1-1013 update 450mm wafers edge exclusion for approval for ballot
 - ◇ Add note & Error correction
- Flatness Decision Discussion
 - To select flatness metrics at M1 Appendix 1 for add illustration due to many metrics is not practically used.
 - Based on questionnaire 6 Metrics of Flatness are selected to add illustration with explanation. The metrics are SFQR, GBIR, SBIR, SFQD, GFLR, SBID.

Motion: To approve the ballot issuance of the Doc. 5655 in Cycle 2, 2014

By / 2nd: Masanori Yoshise (Self) / Mike Goldstein (Intel)

Discussion: None

Vote: 15:0

Attachment: 14, 20131205 PW 450 Joint for SiC

5.2 International Epitaxial Wafers Task Force

Takao Takenaka (Takenaka Consulting) reported for the Task Force. Of notes:

- **Task Force Ballot preview**
 - Pre-adjudication of Ballot Result of Doc. 5542 (Revision to M62) for SWC on Dec.5
- **New Business**
 - Two comments form Nakai-san(nanotopography measurement area) and M.Bullis-san(removal of EDI code) will be taken as new business items at the next NA meeting.
 - M62 should be expanded to include 16nm guide for 300mm & 450mm wafer diameter.

Attachment: 15, I Epi Wafer TF Report for SWC on Dec.5, 2013

5.3 International Annealed Wafers Task Force

No Report

5.4 International SOI Wafers Task Force

Tetsuya Nakai (SUMCO) reported for the Task Force. This report contained information on:

- Photonics: feasibility study / market watch
 - Contact: Michael Hochberg-Director, OpSIS. Ask if Opsis is willing to present & discuss specs in the next meeting
- 2. Feedback from the chair of the MEMS committee on activities/needs related to SOI wafers
 - Bring-in MEMS committee update on thick SOI wafer. Discuss with MEMS TF leader how we can collaborate/help
- 3. High Resistivity SOI: Check if M71 standard includes high resistivity handle substrate spec
 - Start discussion around building a new spec
- 4. 3D-IC: understand the needs & application of SOI

Attachment: 16, SOI TF Report_131206

5.5 Reclaim Wafer Task Force

Takao Takenaka (Takenaka Consulting) reported for the Task Force. This report contained information on .

Motion: To approve the disbandment of the Reclaim Wafer Task Force
By / 2nd: Takao Takenaka (Takenaka Consulting) / Tetsuya Nakai (SUMCO)
Discussion: None
Vote: 9:0

5.6 International Terminology Task Force

Tetsuya Nakai (SUMCO) briefly reported for the Task Force. There was no meeting at this time. The document for revision of M59 will be balloted in Cycle 1, 2014.

5.7 International Test Methods Task Force

Tsuyoshi Otsuki (SEH) reported for the Task Force. This report contained information on .

Motion: To approve the SNARF for: *Line Item Revision of SEMI M60-1113, Test Method for Time Dependent Dielectric Breakdown Characteristics of Amorphous SiO₂ Films for Silicon Wafer Evaluation*
By / 2nd: Tsuyoshi Otsuki (SEH) / Ryuji Takeda (GlobalWafers Japan)
Discussion: None
Vote: 15:0

Motion: To approve the ballot issuance of Doc.5687 for: *Line Item Revision of SEMI M60-1113, Test Method for Time Dependent Dielectric Breakdown Characteristics of Amorphous SiO₂ Films for Silicon Wafer Evaluation* in Cycle 1, 2014

By / 2nd: Tsuyoshi Otsuki (SEH) / Ryuji Takeda (GlobalWafers Japan)

Discussion: None

Vote: 15:0

Attachment: 17, Draft SNARF_Line Item Rev M60_v0.2

5.8 Japan Test Method Task Force

Ryuji Takeda (GlobalWafers Japan) reported for the Task Force. Yoshimi Shiramizu step down from the co-leader of Japan Test Method Task Force.

Motion: To approve that Mikako Omata is appointed as a new co-leader of the Japan Test Methods Task Force

By / 2nd: Ryuji Takeda (GlobalWafers Japan) / Takao Takenaka (Takenaka Consulting)

Discussion: None

Vote: 15:0

Attachment: 18, Meeting minutes of Int'l Test Method TF on Dec 4 2013_v1

5.9 International 450mm Shipping Box Task Force / JA Shipping Box Task Force

Yasuhiro Shimizu (Shimizu Consulting) reported for the Task Force. This report contained information on the 450mm Wafer Shipping System and error correction of SEMI M80-0812.

Attachment: 19, SHIPPING BOX TF REPORT 2013_12_06

5.10 International 450mm Wafer Task Force

Naoyuki Kawai briefly reported for the Task Force.

5.11 International Advanced Wafer Geometry Task Force / Japan AWG Task Force

Masanori Yoshise briefly reported for the Task Force. Of Notes:

- Doc5539 - Revision to SEMI MF1390 adding Bow Measurement
- Aligning ITRS with AWG
- Guide for Wafer Dimensional Metrology Based on Interferometric Areal Image Acquisition Technology
- Doc5654 Line item for 1.5 mm EE for 450mm wafers in M49

Attachment: 20 20131205 AWG Report for Si Comm

Motion: To approve ballot issuance of the Doc. 5654 *LINE ITEM REVISION TO SEMI M49-0613 GUIDE FOR SPECIFYING GEOMETRY MEASUREMENT SYSTEMS FOR SILICON WAFERS FOR THE 130 nm TO 16 nm TECHNOLOGY GENERATIONS* in Cyle 2, 2014. This ballot will be adjudicated at SEMI North America meeting in March.

By / 2nd: Masanori Yoshise (Self) / Mike Goldstein (Intel)

Discussion: None

Vote: 15:0

5.12 International Advanced Surface Inspection Task Force

Masami Ikota (Hitachi High Technologies) reported for the Task Force. Of notes:

- M35 Draft Revision
 - Distributed to TF membership on 30 Nov 2013
 - Summary of changes
 - ◇ Section 7, Specifications, and Table 1
 - Adds two discriminate-able features
 - Sliplines
 - Epi stacking faults
 - One new explanatory note & other minor changes
 - ◇ Section 8, Related Document eliminated
 - Referenced doc, SEMATECH 95082941A-TR, apparently no longer available at www.sematech.org
 - Feedback to date:
 - ◇ Precisely define the term edge-referenced edge exclusion

Attachment: 22 International Advanced Wafer Inspection Task Force131204_revised(3)

Motion: To approve that Masami Ikota become a new co-leader of the International ASI Task Force

By / 2nd: Masami Ikota (Hitachi High Technologies) / Tetsuya Nakai (SUMCO)

Discussion: None

Vote: 15:0

5.13 Fiducial Mark Interoperability Task Force

Tetsuya Nakai (SUMCO) reported for the Task Force. This report contained information on the TF leadership and the TF activity.

Attachment: 21, 20131204FMI-TF-Report_r1

6 Old Business

None

7 New Business

None

8 Action Item Review

8.1 Open Action Items

None

8.2 New Action Items

None

9 Next Meeting and Adjournment

March 6, 2013, 1:00 p.m. – 5:30 p.m. Japan Standard Time

Japan Standards Spring Meetings 2014, SEMI Japan Office, Tokyo, Japan

Respectfully submitted by:
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Minutes approved by:

<Name> (<Company>), Co-chair	<Date approved>
<Name> (<Company>), Co-chair	<Date approved>

Table 8 Index of Available Attachments #1

#	<i>Title</i>	#	<i>Title</i>
01	EU Si Wafer liaison report_October 2013	02	NA Si Wafer Liaison Report 20131107
03	20131205 JEITA Report	04	GCS_meeting minutes_4_Dec_2013_Japan
05	SEMI Staff Report 2013 Dec._R0.1	06	5583_Ballotreport
07	5542_Ballotreport	08	4844B_Ballotreport
09	5389A_Ballotreport	10	5500_Ballotreport
11	5605_Ballotreport	12	5651_Ballotreport
13	5653_Ballotreport	14	20131205 PW 450 Joint for SiC
15	I Epi Wafer TF Report for SWC on Dec.5, 2013	16	SOI TF Report_131206
17	Draft SNARF_Line Item Rev M60_v0.2	18	Meeting minutes of Int'l Test Method TF on Dec 4 2013_v1
19	SHIPPING BOX TF REPORT 2013_12_06	20	20131205 AWG Report for Si Comm
21	20131204FMI-TF-Report_r1	22	International Advanced Wafer Inspection Task Force131204_revised(3)

#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.