NA Silicon Wafer TC Chapter Meeting Minutes

NA Fall Standards Meeting 2014
Tuesday, 4th November, 2014, 2:00 PM - 5:00 PM
Intel, Santa Clara, CA

Next Committee Meeting
Tuesday, March 31, 2015, San Jose, CA in conjunction with NA Spring Standards Meetings. Check www.semi.org/standards for the latest update.

Attendees:

SEMI Staff
Kevin Nguyen – SEMI HQ

Co-chair – Noel Poduje (SMS)

Table 1 – Meeting Attendees

Last Name	*First Name*	*Company*
Bullis	Murray	Materials & Metrology*
Goldstein	Mike	Intel
Gupta	Dinesh	STA
Haller	Kurt	KLA-Tencor
Mashiro	Supika	Tokyo Electron
Nakai	Tetsuya	SUMCO
Perroots	Len	Supersight
Sinha	Jaydeep	KLA-Tencor
Sinton	Ron	Sinton Instruments*
Starikov	Alexander	I&I Consulting
Yoshise	Masanori	Self*

*Attended via teleconference

Table 2 – Task Force Changes

Group	*Previous Leader*	*New Leader*
Int'l Polished Wafer Task Force	Murray Bullis (Materials & Metrology) is stepping down	TBD

Table 3 – Ballot Summary
None

Table 4 – Authorized Ballots

#	*When*	*SC/TF/WG*	*Details*
5313C	Cycle 1-2015	Int'l Test Methods TF	Revision of SEMI MF1535-0707 Test Method for Carrier Recombination Lifetime in Silicon Wafers by Noncontact Measurement of Photoconductivity Decay by Microwave Reflectance

Table 5 – Authorized Activities

#	Type	SC/TF/WG	Details
5540	SNARF	Int'l AWG TF	The SNARF was modified to Line Item Revision to SEMI M1-1013, Specification for Polished Single Crystal Silicon Wafers (Addition to Appendices 1 and 3: Illustration of Flatness and Shape Metrics for Silicon Wafers)
5705	SNARF	Int'l AWG TF	The SNARF was modified from Reapproval to Revision of SEMI M67-1109 Practice for Determining Wafer Near-Edge Geometry from a Measured Thickness Data Array Using the ESFQR, ESFQD, and ESBIR Metrics with Title Change to Test Method
5706	SNARF	Int'l AWG TF	The SNARF was modified from Reapproval to Revision of SEMI M70-1109 Practice for Determining Wafer-Near-Edge Geometry Using Partial Wafer Site Flatness with Title Change to Test Method
5806	SNARF	Int'l AWG TF	Revision of SEMI M68-1214, Practice for Determining Wafer Near-Edge Geometry from a Measured Thickness Data Array Using a curvature metric, ZDD with Title Change to Test Method
5807	SNARF	Int'l AWG TF	Revision for SEMI M77 -1110 Practice For Determining Wafer Near-Edge Geometry Using Roll-Off Amount. ROA With Change Of Title From Practice To Test Method.
5746	SNARF	Int'l AASI TF	The SNARF was revised from Reapproval to Line Item Revision of SEMI ME1392-1109, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
5804	SNARF	Int'l AASI TF	Line Item Revision of SEMI M53-0310, Practice for Calibrating Scanning Surface Inspection Systems Using Certified Depositions of Monodisperse Reference Spheres on Unpatterned Semiconductor Wafer Surfaces
5805	SNARF	Int'l AASI TF	Line Item Revision of SEMI M50-0310, Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method

Note: SNARFs and TFOFs are available for review on the SEMI Web site at:
http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF

Table 6 – Previous Meeting Actions Items

Item #	Assigned to	Details	Status
0714-1	Kevin Nguyen (SEMI Staff)	To request Pinyen Lin (TSMC) filling out a Letter of Assurance (LOA) for ballot 5604 (450 mm notchless)	Completed

Table 7 – New Actions Items

None

1. Call to Order

Noel Poduje called the meeting to order and welcomed everyone who attended. A round of self introduction was made. All SEMI standards meetings are subjected to SEMI Anti-Trust Reminder and Guidelines concerning Patentable Technology. SEMI Regulations now require all attendees to be members of SEMI standards. Membership enrollment is at www.semi.org/standardsmembership. Agenda was reviewed and proceed.

2. Review of Schedule for the Next Meeting (NA Spring Standards Meeting, March 30-31, 2015)

The next meeting is scheduled at the NA Spring Standards Meeting, March 30-31, 2015 in San Jose, CA. Check www.semi.org/standards on the calendar of entry for the latest schedule and meeting location. See attachment for tentative schedule.

Attachment – 1, Sch Si Wfr 0315 Tentative

3. Review and Approval of the Minutes from SEMICON West Standards meetings, July 8, 2014 in San Francisco, CA

The meeting minutes were reviewed. No correction was made.

Motion: Accept the minutes of the previous meeting as written.
By / 2nd: Kurt Haller (KLA-Tencor)/Len Perroots (Supersight)
Discussion: None
Vote: 6/0 in favor. Motion passed

Attachment – 2, Minutes NA SiWfr 20140708

4. Liaison Reports

4.1. Europe Committee

Kevin Nguyen reported. Highlights
Ballot results

- Doc. 5403: Withdrawal of SEMI MF534-0707, Test method for bow of silicon wafers
    - Passed as balloted
- Doc. 5604: Line Item Revision to SEMI M1-0414 specifications for polished single crystal silicon wafers and SEMI M20-1110 practice for establishing a wafer coordinate system
    - Passed as balloted
- Doc. 5702: Line Item Revision to SEMI M68-1109, practice for determining wafer near-edge geometry from a measured height data array using a curvature metric, zdd
    - Passed with editorial changes

International 450 mm Wafer Task Force

- New SNARF #5794: New Standard: Specification Of Developmental 450mm Diameter Polished Single Crystal Notchless Silicon Wafers With Back Surface Fiducial Marks

Attachment – 3, 141023_Europe_SW_LiaisonReport

4.2. Japan Committee

Nakai-san reported. Highlights.

- Last Meeting
    - September 11, 2014 during Japan Fall Meetings 2014 at SEMI Japan, Tokyo
- Next Meeting
    - December 3, 2014 in conjunction with SEMICON Japan 2014, at Tokyo Big Sight, Tokyo, Japan
- JEITA Silicon Wafer Technical Committee, with which we had collaboration since 1981, was disbanded at 2013/03 and JEITA Standards will be abolished around 2015/03.

- As a joint activity with JEITA, we started to transfer selected JEITA/JEIDA standards into SEMI following SEMI standard making/revision algorithm. As the results, new SNARFs were approved
    - Doc. #5769, New Standard: Test Method for Nitrogen Content in Silicon by Infrared Absorption
    - Doc. #5770, New Standard: Test Methods for Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers
    - Doc. #5774, New Standard: Sample Preparation Method for Minority Carrier Diffusion Length Measurement in Silicon Wafers by Surface Photovoltage Method

Attachment – 4, 1410_JA_SiW_LiaisonR_for_NAFall_R1.0

5. Regulations Change Report

Supika Mashiro, Regs Subcommittee chair, presented the proposed changes to the Regulations, pending the approval of the ISC. The official version of the Regulations is anticipated for use by SEMICON Japan meeting. Significant change includes group 1, 2, 4 and 10. See attachment for details.

- Group 1 - Standards Document Development Project Period
    - Project must be completed in 3 yrs, a year extension is allowed
- Group 2 - SNARF Review Period
    - New/Major Revision SNARF shall be issued to TC Members two weeks for feedback
- Group 3 - Official Virtual Meeting
- Group 4 - GCS Voting on Minority Reports
    - GCS voting will be issued in a standardized template. No vote or abstain vote is considered in favor of the minority report.
- Group 5 - Voting Interest Definition Improvement
- Group 6 - Additional Miscellaneous Subtype Example/ Appendix 4 for Procedure for Title Correction
- Group 7 - Clarification of Safety Guideline Meaning in Title
- Group 8 - Preventing SNARF and TFOF Being Approved Outside of the Global TC's Charter and Scope
- Group 9 – Clarify Usage of Originating vs. Responsible TC Chapter
- Group 10 – Ballot Adjudication Improvements
    - Ballots with reject will be sent back to TC members as Ratification ballots. Complex procedures depicted in a diagram shown in the attached slides
- Group 11 – TC Chapter Formation Procedures

Attachment – 5, Regs_SC_to_NARSC2014_1102

6. Staff Report

Report was given by Kevin Nguyen. Highlights:

- 2014 Event

Event Name	***Event Details***
SEMICON Japan	December 3-5, 2014 Tokyo

- 2015 Event

Event Name	***Event Details***
SEMICON West	July 14-16 San Francisco

Event Name	*Event Details*
SEMICON Europa	October 6-8 Dresden, Germany
SEMICON Japan	December 16-18 Tokyo

- NA Standards 2015 Meetings
  - March 30 – April 2 [SEMI HQ in San Jose, California]
- Technical Ballot Critical Dates
  - Cycle 8, 2014
    - Ballot Submission Date: Nov 17
    - Voting Period Starts: Dec 1
    - Voting Period Ends: Dec 31
  - Cycle 1, 2015
    - Ballot Submission Date: Nov 17
    - Voting Period Starts: Dec 1
    - Voting Period Ends: Dec 31

- Total SEMI Standards in portfolio: 917
    - Includes 108 Inactive Standards

Attachment – 6, SEMI Staff Report (Fall 2014)

6.0 Ballot Review

6.1 There was no ballot to review.

7.0 Task Force Reports

7.1 Int'l 450 mm Wafer TF/Mike Goldstein (Intel)

Mike Goldstein reported.

- Doc. 5604, Line Item Revision to SEMI M1-0114, Specification for Polished Single Crystal Silicon Wafer and SEMI M20-0110, Practice for Establishing a Wafer Coordinate System, was reviewed.
  - Approved at SEMICON Europa, pending publication
  - Some comments for ballot 5604 from Alex Starikov (I&I Consulting) were discussed in the meeting. However, the ballot was already approved. These comments will be discussed as new business.
- Discussed document 5794, New Standard: Specification of Developmental 450mm Diameter Polished Single Crystal Notchless Silicon Wafers With Back Surface Fiducial Marks. The draft will be presented at SEMICON Japan 2014 next month.

Attachment – 7, RE Line Item Revision to

7.2 Int'l Advanced Wafer Geometry TF/Noel Poduje (SMS), Jaydeep Sinha (KLA-Tencor)

- Minutes were presented by Noel.
  - Jaydeep presented "Wafer Geometry Control for Advanced Semiconductor Manufacturing", first given at the Grenoble meeting. The concepts presented (e.g., Higher Order Shape, In-Plane Distortion) will form the basis for new metrics to be standardized which apply to in-process wafers. Jaydeep is soliciting further input from device manufacturers.

  - SNARFs

- Noel presented a revised SNARF 5540 from Peter Wagner specifying that the figures be added to the Flatness and Shape Decision Trees in Appendices 1 and 2 of M1.
  Motion: To approved revised SNARF
  By / 2nd: Mike Goldstein (Intel)/Jaydeep Sinha (KLA-Tencor)
  Discussion: None
  Vote: 6-0 in favor. Motion passed

- Revision to M67 - ESFQR - change from Practice to Test Method SNARF was presented

  Motion: To approved revised SNARF 5705
  By / 2nd: Len Perroots (Supersight)/ Jaydeep Sinha (KLA-Tencor)
  Discussion: Section 6 of Intellectual Property Considerations of the SNARF form needs to be revised since the Letter of Assurance (LOA) was submitted and handled previously. This issue is raised to the Regs Subcommittee. And the SNARF will be revised.
  Vote: 6-0 in favor. Motion passed

- Revision to M68 - ZDD - change from Practice to Test Method SNARF was presented.

  Motion: To approved revised SNARF 5705
  By / 2nd: Len Perroots (Supersight)/ Jaydeep Sinha (KLA-Tencor)
  Discussion: None
  Vote: 6-0 in favor. Motion passed

- Revision to M70 - Partial Site Flatness - change from Practice to Test Method SNARF was presented.

  Motion: To approved revised SNARF 5706
  By / 2nd: Mike Goldstein (Intel)/ Jaydeep Sinha (KLA-Tencor)
  Discussion: None
  Vote: 6-0 in favor. Motion passed

- Revision to M77 - ROA - change from Practice to Test Method SNARF was presented.

  Motion: To approved SNARF
  By / 2nd: Len Perroots (Supersight)/ Mike Goldstein (Intel)
  Discussion: None
  Vote: 6-0 in favor. Motion passed

Attachment – 8, AWG Attachments

7.3 Int'l Automated Advanced Surface Inspection TF/Kurt Haller (KLA-Tencor)

- Kurt reported the draft for 5 year review of SEMI ME1392-1109, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surface. The SNARF needs to be revised since it is not a reapproval ballot.

  Motion: To approve revised SNARF for line item revision of SEMI ME1392
  By / 2nd: Kurt Haller (KLA-Tencor)/Dinesh Gupta (STA)
  Discussion: None
  Vote: 5-0 in favor. Motion passed

- M50 and M53 are coming up for 5 year review. TF will review and report at the next meeting.

o SNARF for Line Item Revision of SEMI M50-0310 - Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method was presented.

Motion: To approve revised SNARF for line item revision of SEMI ME1392
By / 2nd: Kurt Haller (KLA-Tencor)/Jaydeep Sinha (KLA-Tencor)
Discussion: None
Vote: 5-0 in favor. Motion passed

o SNARF for Line Item Revision of SEMI M53-0310 - Practice for Calibrating Scanning Surface Inspection Systems Using Certified Depositions of Monodispere Reference Spheres on Unpatterned Semiconductor Wafer Surfaces was presented

Motion: To approve revised SNARF for line item revision of SEMI ME1392
By / 2nd: Kurt Haller (KLA-Tencor)/Mike Goldstein (Intel)
Discussion: None
Vote: 5-0 in favor. Motion passed

Attachment – 9, ASI Zip

7.4 Int'l SOI TF/Bich-Yen Nguyen (SOITEC USA)

- Dinesh Gupta reported for Bich-Yen Nguyen. The TF is looking at high resistivity for SOI for revision of M71. It was reported that Philippe Absil, Director at IMEC, will be invited for speaking at SEMICON West 2015 next year to speak on feasibility study for SOI.

Attachment – 10, SOI TF Report_Nov 3, 2014

7.5 Int'l Annealed Wafer TF/Dinesh Gupta (STA)

- Dinesh Gupta reported SEMI M57-0414, Specifications for Silicon Annealed Wafers, is recently published in April 2014. No future revision is anticipated. The TF is on the standby mode until further notice.

7.6 Int'l Epitaxial Wafer TF/ Dinesh Gupta (STA)

- Dinesh reported doc. 5742, Line Item Revision to SEMI M62-0514, Specifications for Silicon Epitaxial Wafers (Re: 16 nm technology node) was issued in cycle 7-14 for review at SEMICON Japan..

Attachment – 11, Min AW-EPI Mtg 1114

7.7 Int'l Test Methods TF/Dinesh Gupta (STA)

- Dinesh reported Doc 5313C (Rev to MF1535) – After substantial discussion, it was decided that the document, after a few minor changes, is ready to go to ballot in 2015 Cycle 1 (for adjudication @ SEMICON West, July 2015).
  Motion: To authorize doc. 5313C for cycle 1 for review at SEMICON West 2015
  By / 2nd: Dinesh Gupta (STA)/Ron Sinton (Sinton Instruments)
  Discussion: None
  Vote: 5/0 in favor. Motion passed
- Documents for 5-year review
- Capitalize Test Method, Practice or Guide throughout the document (Strictly editorial)
  M66, MF1153, MF1771, MF1389, MF1529, MF1618, MF1725,
  MF1726, MF1727, MF1809 and MF1810
- Submit to reapproval "as is": M16, M17
- Submit for withdrawal: MF2166
- May require minor changes: M21 (change to Practice), MF533, MF1771
- Review the following documents and determine what needs to be done: MF1617, MF2139

Attachment – 12, Min Test Methods Mtg 1114

7.8 Int'l Polished Wafer TF/Murray Bullis (Materials & Metrology)

- Murray reported.
- Drafting
  - Doc. 5655, Line Item Revision of SEMI M1-1014, Specifications for Polished Single Crystal Silicon Wafers (Re: Edge Exclusion for 450 mm wafer)
  - Need input from 450 mm TF for future action
- Outstanding action items needed for SEMI M1
  - Update to include SEMI M85 (Trace metal by ICPMS), formerly doc. 4844C
  - Remove citations of SEMI MF657 (Warp and TTV) and MF534 (Bow), that were approved and withdrawn at SEMICON West and SEMICON Europa
  - Proposing additional fiducial term

7.9 Int'l Terminology TF/Murray Bullis (Materials and Metrology)

- No meeting, no report.

8.0 Old Business

None

9.0 New Business

No other new business was reported.

10.0 Action Item Reviews

Kevin Nguyen reviewed the old action items. There were two new actions items at this meeting noted in **table 7**.

11.0 Adjourn

The meeting was adjourned at 5:00 PM.

These minutes are respectfully submitted by:

Kevin Nguyen,
SEMI Int'l Standards Operation Manager
Phone: 408-943-7997
Email: knguyen@semi.org

Minutes approved by:

Noel Poduje (SMS) – Co-chair	Date: December 1, 2014
Dinesh Gupta (STA) – Co-chair	Date: December 1, 2014

Table 8 – Index of Attachment Summary

#	*Title*	#	*Title*
1	Sch Si Wfr 0315 Tentative	7	RE Line Item Revision to
2	Minutes NA SiWfr 20140708	8	AWG Attachments
3	141023_Europe_SW_LiaisonReport	9	ASI Zip
4	1410_JA_SiW_LiaisonR_for_NAFall_R1.0	10	SOI TF Report_Nov 3, 2014
5	Regs_SC_to_NARSC2014_1102	11	Min AW-EPI Mtg 1114
6	SEMI Staff Report (Fall 2014)	12	Min Test Methods Mtg 1114

#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 Kevin Nguyen at the contact information above