3D Packaging & Integration North America TC Chapter

Meeting Summary and Minutes

NA Standards Spring Meetings 2019
Thursday, April 4, 14:00 – 16:00
SEMI Global Headquarters, Milpitas, California

TC Chapter Announcements

Next TC Chapter Meeting

SEMICON West Standards Meetings 2019
Thursday, July 11, 14:00 – 16:00
Moscone Center, San Francisco, California

Table 1 Meeting Attendees

*Italics* indicate virtual participants

<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>ASM-NEXX</td>
<td>Chu</td>
<td>Cristina Intel</td>
<td>Radloff</td>
<td>Stefan</td>
<td></td>
</tr>
<tr>
<td>BW &amp; Associates</td>
<td>Wu</td>
<td>Bevan</td>
<td>Nordson SONOSCAN</td>
<td>Martell</td>
<td>Steve</td>
</tr>
<tr>
<td>Corning</td>
<td>Schmidt</td>
<td>Ilona Shin-Etsu Polymer Co., Ltd.</td>
<td>Shida</td>
<td>Hiroyuki</td>
<td></td>
</tr>
<tr>
<td>Intel</td>
<td>O’Brien</td>
<td>Michael SEMI</td>
<td>Nguyen</td>
<td>Laura</td>
<td></td>
</tr>
</tbody>
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Table 2 Leadership Changes

<table>
<thead>
<tr>
<th>WG/TF/SC/TC Name</th>
<th>Previous Leader</th>
<th>New Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>3DP&amp;I TC Chapter</td>
<td>Richard Allen/NIST</td>
<td>Stepped down</td>
</tr>
</tbody>
</table>

Table 3 Committee Structure Changes

None

Table 4 Ballot Results

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6175A</td>
<td>New Standard: Guide on Measurements of Openings and Vias in Glass</td>
<td>Failed</td>
</tr>
</tbody>
</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 abandonment.
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>
<tbody>
<tr>
<td>6511</td>
<td>SNARF</td>
<td>NA 3DP&amp;I Committee</td>
<td>Reapproval of SEMI 3D8-0514, Guide for Describing Silicon Wafers for Use as 300 mm Carrier Wafers in a 3DS-IC Temporary Bond-Debond (TBDB) Process</td>
</tr>
<tr>
<td>6513</td>
<td>SNARF</td>
<td>NA 3DP&amp;I Committee</td>
<td>Reapproval of SEMI G83-0912, Specification for Bar Code Marking of Product Packages</td>
</tr>
</tbody>
</table>

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

Table 7 Authorized Ballots

<table>
<thead>
<tr>
<th>#</th>
<th>When</th>
<th>TF</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>6175B</td>
<td>Cycle 4 or 5-2019</td>
<td>Inspection &amp; Metrology TF</td>
<td>New Standard: Guide on Measurements of Openings and Vias in Glass</td>
</tr>
<tr>
<td>6511</td>
<td>Cycle 4 or 5-2019</td>
<td>NA 3DP&amp;I Committee</td>
<td>Reapproval of SEMI 3D8-0514, Guide for Describing Silicon Wafers for Use as 300 mm Carrier Wafers in a 3DS-IC Temporary Bond-Debond (TBDB) Process</td>
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</tbody>
</table>

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

None

Table 9 SNARF(s) Abolished

None

Table 10 Standard(s) to receive Inactive Status

None

Table 11 New Action Items

None

Table 12 Previous Meeting Action Items

None
1 Welcome, Reminders, and Introductions
Steve Martell (Nordson SONOSCAN) called the meeting to order at 1:55. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.
Attachment: SEMI Standards Required Meetings Elements

2 Review of Previous Meeting Minutes
The TC Chapter reviewed the minutes of the previous meeting.
Motion: To accept the previous meeting minutes as written.
By / 2nd: Bevan Wu (BW & Associates) / Ilona Schmidt (Corning)
Discussion: None.
Vote: 5-0 in favor. Motion passed.
Attachment: [2018Fall] 3DP&I NA Minutes FINAL

3 Liaison Reports
3.1 3D Packaging & Integration Japan TC Chapter
Laura Nguyen (SEMI) reported for the Japan TC Chapter. Of note:
Meeting Information
- Last meeting
  - February 22, 2019 at the Japan Winter 2019 Meetings; SEMI Japan office, Tokyo
- Next meeting
  - June 7, 2019 at the Japan Summer 2019 Meetings; SEMI Japan office, Tokyo
Leadership
- Committee Co-Chairs
  - Kazunori Kato – AiT
    - 1st GCS voting member; 1st 3D Packaging & Integration representative to the JRSC
  - Masahiro Tsuriya – iNEMI
    - 2nd GCS voting member; 3rd 3D Packaging & Integration representative to the JRSC
  - Haruo Shimamoto – AIST
    - 2nd 3D Packaging & Integration representative to the JRSC
Current Organization Chart of Japan TC Chapter [See attachment for Org Chart]
Ballot Results [See attachment for full details]
Activities Approved via GCS between Meetings [See attachment for full details]
Authorized Activities [See attachment for full details]
Authorized Ballots [See attachment for full details]
Task Force Highlights
Thin Chip Handling Task Force
- #6424: New Standard: Test method for Adhesive Strength for Adhesive Tray Used for Thin Chip Handling
  - Ballot reviewed and passed with editorial change at the TC Chapter meeting on October 15 and also passed A&R in December 2018
  - Waiting for proof
3D Packaging & Integration 5 Year Review Task Force
Ballot reviewed and passed as balloted at the TC Chapter meeting on October 15 and also passed A&R in December 2018

Waiting for proof

Report

The TC Chapter exposed its activity at SEMICON Japan 2018 as follows.

- Exhibition at "SEMI Standards" Booth
  - FO-PLP used materials such as PLP FOUP and PLP panels were exhibited in the booth. SEMI related documents and PLP technical documents are displayed in the booth.

- Workshop at TechSPOT
  - Focus on FO-PLP
  - “What Industry STD are needed to be accepted by the users?”
  - Panelist: TOWA / Fujifilm / Panasonic
  - More than 30 attended

Five-Year Review

<table>
<thead>
<tr>
<th>Designation</th>
<th>Standard Title</th>
<th>Action By</th>
<th>Assigned to</th>
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</thead>
<tbody>
<tr>
<td>SEMI G63-95 (Reapproved 0811)</td>
<td>Test Method for Measurement of Die Shear Strength</td>
<td>Past due</td>
<td>3D Packaging &amp; Integration 5 Year Review TF</td>
</tr>
<tr>
<td>SEMI G95-0314</td>
<td>*Mechanical Interface Specification for 450 mm Load Port for Tape Frame Cassettes in the Backend Process</td>
<td>Spring 2019</td>
<td>JA 450mm Assembly and Test Die Preparation TF</td>
</tr>
<tr>
<td>SEMI G96-1014</td>
<td>Test Method for Measurement of Chip (Die) Strength by Mean of Cantilever Bending</td>
<td>Fall 2019</td>
<td>3D Packaging &amp; Integration 5 Year Review TF</td>
</tr>
</tbody>
</table>

Staff Contact: Chie Yanagisawa; cyanagiswa@semi.org

Attachment: 201903_3DP&I-Japan_Liaison_v1.0

3.2 3D Packaging & Integration Taiwan TC Chapter

Laura Nguyen (SEMI) reported for the 3D Packaging & Integration Taiwan TC Chapter. Of note:

Meeting Information

- Previous meeting:
  - March 26, 2019 at the SEMI Standards Taiwan Spring 2019 Meetings; SEMI Taiwan office, Hsinchu

- Next meeting:
  - June 6, 2019 at the SEMI Standards Taiwan Summer 2019 Meetings; SEMI Taiwan office, Hsinchu

Leadership

- Committee Co-Chairs:
  - Wendy Chen (King Yuan Electronics)
  - Roger Hwang (ASE)
  - Chien-Chung Lin (ITRI)

Organization Chart [See attachment for Org Chart]

Ballot Results [See attachment for full details]

Abolished SNARFs

- Testing Task Force
New Standards: Guideline for Chip ID registering and tracing

- The scope of this SNARF is similar with SEMI T23-0119 “New Standard: Specification for Single Device Traceability for the Supply Chain” which was submitted by Traceability TC/ Single Device Traceability Task Force

Task Force Highlights

3DP&I Middle-End Process Task Force

- #5800A: New Standard: Guide for Wafer Edge Trimming for 3DS-IC Process
  - Approved by A&R on 2018/07/06, Publication pending
- #6405: Reapproval of SEMI 3D7-0913, GUIDE FOR ALIGNMENT MARK FOR 3DS-IC PROCESS
  - Approved by A&R on 2018/10/19, Publication pending
- #6411: Line Item Revision of SEMI 3D6-0913 Guide for CMP and Micro-bump Processes for Frontside Through Silicon Via (TSV) Integration
  - Passed technical ballot Cycle 6-18 and forward to A&R for procedural review

Testing Task Force

- Studying the feedback of SNARF “New Standards: Guideline for Chip ID registering and tracing” from global TC members’ two weeks review
  - The scope of this SNARF is similar with SEMI T23-0119 “New Standard: Specification for Single Device Traceability for the Supply Chain” which was submitted by Traceability TC/ Single Device Traceability Task Force
  - Abolished this SNARF “SNARF “New Standards: Guideline for Chip ID registering and tracing”

Staff Contact: Dean Chang, E-mail: dchang@semi.org, Tiffany Huang, E-mail: thuang@semi.org

Attachment: 20190331_TW_ 3D P&I TC Liaison Report v1

3.3 SEMI Staff Report

Laura Nguyen (SEMI) gave the SEMI Staff Report. Of note:

SEMI Global 2019 Calendar of Events

- SEMICON SEA (May 7-9, Kuala Lumpur, Malaysia)
- SEMICON West (July 9-11, San Francisco, California)
- SEMICON Europa (November 12-15; Munich, Germany)
- SEMICON Japan (December 11-13; Tokyo, Japan)

Upcoming North America Standards Meetings

- SEMICON West 2018 (July 8-11, 2019, San Francisco, California)
- NA Standards Fall 2019 Meetings (November 4-7, 2019, SEMI HQ in Milpitas, California)
- NA Standards Spring 2020 Meetings (March 30-April 2, 2020, SEMI HQ in Milpitas, California)

Letter Ballot Critical Dates for 2019

- Cycle 3-2019: ballot submission due: Mar 12/Voting Period: Mar 26 – Apr 25
- Cycle 4-2019: ballot submission due: Apr 16/Voting Period: Apr 20-May 30
- Cycle 5-2019: ballot submission due: May 10/Voting Period: May 24-Jun 24
- Cycle 6-2019: ballot submission due: Jul 19/Voting Period: Jul 31-Aug 30


### Standards Publications Report

<table>
<thead>
<tr>
<th>Cycle</th>
<th>New</th>
<th>Revised</th>
<th>Reapproved</th>
<th>Withdrawn</th>
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<tr>
<td>November 2018</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>December 2018</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>0</td>
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<tr>
<td>January 2019</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>February 2019</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>0</td>
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Total in portfolio – 1,000 (includes 268 Inactive Standards)

### New Standards

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Designation</th>
<th>Title</th>
<th>Committee</th>
<th>Region</th>
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<tbody>
<tr>
<td>November 2018</td>
<td>SEMI C97</td>
<td>Specification for Determination of Particle Levels of Gases Delivered as Pipeline Gas or by Pressurized Gas Cylinder</td>
<td>Gases</td>
<td>NA</td>
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<td>January 2019</td>
<td>SEMI M88</td>
<td>Practice for Sample Preparation Methods for Measuring Minority Carrier Diffusion Length in Silicon Wafers by Surface Photovoltage Methods</td>
<td>Silicon Wafer</td>
<td>JA</td>
</tr>
<tr>
<td>January 2019</td>
<td>SEMI T23</td>
<td>Specification for Single Device Traceability for the Supply Chain</td>
<td>Traceability</td>
<td>NA</td>
</tr>
<tr>
<td>February 2019</td>
<td>SEMI PV89</td>
<td>Test Method for Current-Voltage Measurement in Indoor Lighting for Dye-Sensitized Solar Cell and Organic Photovoltaic</td>
<td>Photovoltaic</td>
<td>TW</td>
</tr>
</tbody>
</table>

### Inactive Standards

<table>
<thead>
<tr>
<th>Committee</th>
<th>Number of Inactive Standards</th>
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</thead>
<tbody>
<tr>
<td>Assembly &amp; Packaging</td>
<td>48</td>
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<tr>
<td>Automated Test Equipment</td>
<td>2</td>
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<tr>
<td>Compound Semiconductor Materials</td>
<td>4</td>
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<tr>
<td>Environmental Health &amp; Safety</td>
<td>8</td>
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<tr>
<td>Facilities</td>
<td>15</td>
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<tr>
<td>FPD – Equipment</td>
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<tr>
<td>FPD – Factory Automation</td>
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<tr>
<td>FPD – Materials &amp; Components</td>
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<tr>
<td>FPD – Substrate</td>
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<tr>
<td>Gases</td>
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<tr>
<td>Information &amp; Control</td>
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<td>Liquid Chemicals</td>
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<td>MEMS</td>
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<tr>
<td>Metrics</td>
<td>9</td>
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<tr>
<td>Micropatterning</td>
<td>29</td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>1</td>
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</tbody>
</table>
Physical Interfaces & Carriers | 19
---|---
Silicon Wafer | 11
Traceability | 8

connect@SEMI
- Web link - https://connect.semi.org
  - Login using Standards account (username and password)
- Program Member
  - Join any task forces; Post discussion thread
- TF Leader/Community Admin
  - Add member
  - Upload meeting minutes
  - Communicate TF members
  - Contact your staff if a TF Site is desired
- Details
  - www.semi.org/standards >> Committee Info >> Collaboration Community

New Forms, Regulations & Procedure Manual
- Regulations (Feb 28, 2019)
  - Latest version clarifies procedures applicable for Copyrighted Items and trademarks
- Procedure Manual (Feb 28, 2019)
- SNARF (Feb 2019)
- www.semi.org/standards
  - Bottom left, under Resources

Style Manual Update
- Style Manual Version 6 (March 25, 2019)
  - Additions and revisions to harmonize with updated Regulations and Procedure Manual
- Updates
  - Company or Organization Trademarks (Table 1, #1-24)
  - Active vs. Passive Voice (Table 4, #4-4)
  - Word Usage (Table 4, #4-5)
  - New Safety Guideline Conformance Notice (Table 8, #8-1)
- www.1semi.org/standards/standardspublications
  - Under Document Authoring Tools

Nonconforming Titles (See PM Appendix 4) {None}

Five-Year Review {See attachment for details}

SNARF 3 Year Status, TC Chapter may grant a one-year extension {None}

Attachment: Staff Report April 2019_3DP&I

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.

- The ballot passed TC Chapter review with technical changes. Ratification Ballot to be issued. See attachment for ballot adjudication.

Attachment: 6075A_Motions

Attachment: 6075A_Ballot Review
4.2 Document # 6175A, New Standard: Guide on Measurements of Openings and Vias in Glass

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle.

Attachment: 6175A_Motions

4.3 Document # 6322A, New Standard: Specification for Panel Substrate Characteristics for Panel Level Packaging (PLP) Applications

- The ballot passed TC Chapter review with technical changes. Ratification Ballot to be issued. See attachment for ballot adjudication.

Attachment: 6322A_Motions
Attachment: 6322A_Ballot Review

5 Subcommittee and Task Force Reports

5.1 Fan-Out Panel Level Packaging (FO-PLP) Panel Task Force

Cristina Chu (ASM-NEXX) reported for this Task Force. This report contained information on the ballot review. Please see attachment for minutes. Motions can also be found in the attachment mentioned in Section 4 of these minutes.

Attachment: FO-PLP Panel TF Meeting_2019Apr_v2

5.2 3DP&I Inspection & Metrology and Bonded Wafer Stacks Task Force

Task Force Leaders reported for both the 3DP&I Inspection & Metrology and 3DP&I Bonded Wafer Stacks Task Forces.

Of note, during the task force meeting, the task force reviewed the ballot results that can be found in Section 4 of these minutes.

6 Old Business

6.1 Leadership Changes

Rich Allen (NIST) addressed the committee on this topic.

- Rich Allen is intending to step down from co-chair position of the 3DP&I.
  - Looking for replacement/notify other chairs if they intend to take over (Chris/Sesh)

7 New Business

7.1 Authorized Activities

7.1.1 Standards due for Five-Year Review

The committee reviewed the Standards due for Five-Year Review. The committee discussed these documents and decided to ballot for reapproval. The following actions were taken below.

Motion: Motion to approve and authorize SNARF for SEMI 3D8 for Reapproval Ballot in Cycle 4 or 5-2019.

By / 2nd: Stefan Radloff (Intel) / Cristina Chu (ASM-NEXX)

Discussion: None.
Vote: 5-0 in favor. Motion passed.

Motion: Motion to approve and authorize SNARF for SEMI G83 for Reapproval Ballot in Cycle 4 or 5-2019.
By / 2nd: Ilona Schmidt (Corning) / Bevan Wu (BW & Associates)
Discussion: None.
Vote: 5-0 in favor. Motion passed.

8 Next Meeting and Adjournment

The next meeting is scheduled for Thursday, July 11th in conjunction with SEMICON West 2019 at the Moscone Center in San Francisco, California. See http://www.semi.org/standards-events for the current list of events.

Tentative Schedule:

Thursday, July 11
10:30-11:30 Joint 3DP&I Bonded Wafer Stacks (TF) and 3DP&I Inspection and Metrology (TF)
13:00-14:00 Fan-Out Panel Level Packaging (FO-PLP) Panel (TF)
14:00-16:00 3DP&I (C)

Adjournment: 15:14.

Respectfully submitted by:
Laura Nguyen
Sr. Coordinator, International Standards
SEMI Global Headquarters
Phone: +1.408.943.7019
Email: lnguyen@semi.org

Minutes tentatively approved by: 3DP&I NA TC Chapter on July 11, 2019

Richard Allen (NIST), Co-chair June 27, 2019
Sesh Ramaswami (Applied Materials), Co-chair <Date approved>
Chris Moore (Covalent Metrology), Co-chair <Date approved>

Table 13 Index of Available Attachments#1

<table>
<thead>
<tr>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>SEMI Standards Required Meetings Elements</td>
<td>6075A_Ballot Review</td>
</tr>
<tr>
<td>[2018Fall] 3DP&amp;I NA Minutes FINAL</td>
<td>6175A_Motions</td>
</tr>
<tr>
<td>201903_3DP&amp;I-Japan_Liaison_v1.0</td>
<td>6332A_Motions</td>
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<td>20190331_TW_3D_P&amp;I_TC_Liaison_Report_v1</td>
<td>6332A_Ballot Review</td>
</tr>
<tr>
<td>Staff Report April 2019_3DP&amp;I</td>
<td>FO-PLP Panel TF Meeting_2019Apr_v2</td>
</tr>
<tr>
<td>6075A_Motions</td>
<td></td>
</tr>
</tbody>
</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 Laura Nguyen at the contact information above.