



HB-LED North America TC Chapter Meeting Summary and Minutes

NA Standards Spring 2016 Meetings

April 7, 2016, 10:30 – 12:00

SEMI Headquarters in San Jose, California

TC Chapter Announcements

Next TC Chapter Meeting

SEMICON West 2016 Meetings

Thursday, July 14, 2016, 10:30 – 12:00

SF Marriott Marquis in San Francisco, California

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Chris Moore (BayTech-Resor), Iain Black (Philips), Mike Feng (Silian)

SEMI Staff: Laura Nguyen, Kathleen Johnson

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
BayTech-Resor	Moore	Chris	Sonoscan	Martell	Steve
<i>BayTech-Resor</i>	<i>Baylies</i>	<i>Winthrop</i>	Super Sight	Perroots	Len
Lumileds	Kim	Andrew	SEMI	Johnson	Kathleen
<i>Peter Wagner Consulting</i>	<i>Wagner</i>	<i>Peter</i>	SEMI	Nguyen	Laura

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
NA HB-LED TC Chapter	Eric Armour (Veeco) - retired	Andrew Kim – pending approval from NARSC

Table 3 Ballot Results

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>
5818	Line Item Revision to SEMI HB1, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices	
Line Item 1	Correct the title of this standard from “Specifications” to “Specification”	Passed , Superclean
Line Item 2	Modify and update Table 1, 2-3,3 Flat length	Passed , Superclean
Line Item 3	Implement r-plan direction in Table 1, Table 2 and Table R1-1, Part 2	Passed , Superclean

Table 4 Authorized Ballots

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
None			

Table 5 Authorized Activities

#	Type	SC/TF/WG	Details
5984	SNARF	HB-LED Source Material TF	New Standard: Guide for Biscyclopentadienylmagnesium for HB-LED Manufacturing
5985	SNARF	HB-LED Source Material TF	New Standard: Guide for Triethylgallium for HB-LED Manufacturing
5986	SNARF	HB-LED Source Material TF	New Standard: Guide for Trimethylaluminum for HB-LED Manufacturing
5987	SNARF	HB-LED Source Material TF	New Standard: Guide for Trimethylgallium for HB-LED Manufacturing
5988	SNARF	HB-LED Source Material TF	New Standard: Guide for Guide for Trimethylindium for HB-LED Manufacturing

NOTE 1: 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

Item #	Assigned to	Details
2016April#01	Laura Nguyen	Send word docs to Andrew Kim [copy of China SNARF information]. CLOSED.
2016April#02	Laura Nguyen	Email Kris Shen about potentially transferring NA SNARF 5629 to the China Chapter. Request for GCS approval. CLOSED.
2016April#03	Laura Nguyen	Find out why HB3 is a nonconforming title document. CLOSED.

Table 7 Previous Meeting Action Items

Item #	Assigned to	Details	Action
2015July#07	Natalie Shim	Edit the other four SNARFs with similar changes as done to the TMGa SNARF.	Four SNARFs got GCS approval on Jan 24, 2016. Natalie to create SNARFs in Lotus Notes. CLOSED.
2015July#08	Natalie Shim	Have the TF check the existing Liquid Chemicals Standards to ensure no overlap of these proposed Standards with theirs.	The TF reviewed this action item in Jan 27 meeting. As NA TC chapter mentioned there is C66-0308 which explains TMAI spec but it is for semiconductor. Usually HB-LED industry requests higher purity spec for TMAI so TF thinks no overlap between two documents. CLOSED.

1 Welcome, Reminders, and Introductions

Chris Moore, TC Chapter cochair, called the meeting to order at 10:38. After welcoming all attendees, a round of introductions followed. The SEMI meeting reminders on membership requirements, antitrust, patentable technology, and meeting guidelines were then presented and explained.

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: Steve Martell (Sonoscan)/Andrew Kim (Lumileds)

Discussion: None.

Vote: 2-0 in favor. Motion passed.

Attachment: NA HB-LED Minutes 2015 Fall Final

3 Liaison Reports

3.1 China HB-LED Committee Chapter

Laura Nguyen (SEMI) reported for the China HB-LED Committee Chapter. The key items were as follows:

- Cochairs: Yong Ji (GHOT), Weizhi Cai (SANAN)
- Meeting Information
 - Last meeting: September 18, 2016 – China Standards Fall Meeting 2015 in Huangshan, Anhui, China
 - Next meeting: April 22, 2016 – China Standards Spring Meeting 2016 in Xuzhou, Jiangsu, China
- Single Crystal Sapphire Task Force
 - Charter:
 - Draft the standards on specifications for single crystal sapphire intended for use for manufacturing HB-LED wafers.
 - Working on:
 - Doc. 5723, New Standard: Specification for Single Crystal Sapphire Intended for Use for Manufacturing HB-LED Wafers
 - Failed in Cycle 8-2015
 - Doc. 5946, New Standard: Test Method for Grain Boundary of Single Crystal Sapphire by Optical Homogeneity Technique (OHT) (new SNARF)
- Sapphire Single Crystal Ingot Task Force
 - Charter:
 - Define the key parameters of LED sapphire ingot, including dimension, orientation of the end face and flat, surface quality, bulk defects, etc.
 - Formulate the inspection methods of the key parameters for LED sapphire ingot.
 - Formulate and establish inspection standards of the key parameters for LED sapphire ingot.
 - Working on:
 - Doc. 5775, New Standard: Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers
 - Failed in Cycle 8-2015
- GaN based LED Epitaxial Wafer Task Force
 - Charter:
 - This Task Force is chartered to develop test methods and specifications for GaN based HB-LED epitaxial wafer in order to increase the production efficiency.
 - Working on:
 - Doc. 5776, New Standard: Test Method for Detecting Surface Defects of GaN based LED Epitaxial Wafer Used for Manufacturing HB-LED
- Sapphire Single Crystal Orientation Task Force
 - Charter:
 - Develop the standards and measurement methods for the determination of orientations of sapphire single crystal products to enhance the consistency in measurement data and to provide the solutions for increasing measurement precision as well.
 - Working on:
 - Doc. 5945, New Standard: Test Method for Determining Orientation of A Sapphire Single Crystal (new SNARF)
- Staff Contact: Kris Shen (kshen@semi.org)

Action Item: 2016April#01, Laura Nguyen to send word docs to Andrew Kim

Attachment: Liaison Report CH Spring2016 (HB-LED)

3.2 Korea HB-LED Chapter Formation Group

Laura Nguyen (SEMI) reported for the Korea HB-LED Chapter Formation Group. The key items were as follows:

- Meeting Information
 - Last meeting: January 27, 2016 – LED Korea 2016 in COEX, Seoul
 - meeting: April 8, 2016 – SEMI Korea Office (tentative)
- Major Updates
 - HB-LED Wafer Task Force
 - 5818 (HB1 Revision) in cycle 9. The result will be reviewed in 2016 Spring NA HB-LED TC Chapter meeting
 - HB-LED Source Material Task Force
 - 5 SNARFs were approved by GCS on Jan 25
 - The ballots approval request will be made in upcoming NA HB-LED TC Chapter meeting
 - Target ballot schedule is cycle 4, 2016
- Staff Contact: Natalie Shim (eshim@semi.org)

Attachment: Liaison Report KR Spring2016 (HB-LED)

3.3 SEMI Staff Report

Laura Nguyen (SEMI) gave the SEMI Staff Report. The key items were as follows:

- SEMI Global 2016 Calendar of Events
 - SEMICON Southeast Asia (April 26-28, Penang, Malaysia)
 - SEMICON West (July 12-14, 2016, San Francisco, California)
 - SEMICON Taiwan (September 7-9, Taipei, Taiwan)
 - SEMICON Europa (October 25-27, Grenoble, France)
 - SEMICON Japan (December 14-16, Tokyo, Japan)
- Upcoming North America Standards Meetings
 - SEMICON West 2016 (July 11-14, 2016, San Francisco, California)
 - NA Standards Fall 2016 Meetings (November 7-10, 2016, SEMI HQ in San Jose, California)
 - NA Standards Spring 2016 Meetings (April 3-6 [tentative], SEMI HQ in San Jose, California)
- Letter Ballot Critical Dates for 2016
 - West 2016 adjudication
 - Cycle 4: ballot submission due: April 15/Voting Period: April 26 – May 26
 - Cycle 5: ballot submission due: May 10/Voting Period: May 24 – June 23
 - Fall 2016 adjudication
 - Cycle 6: ballot submission due: July 22/Voting Period: August 1 – September 1
 - Cycle 7: ballot submission due: August 17/Voting Period: August 31 – September 30

- Standards Publications Report

<i>Cycle</i>	<i>New</i>	<i>Revised</i>	<i>Reapproved</i>	<i>Withdrawn</i>
December 2015	0	3	2	0
January 2016	6	7	0	0
February 2016	4	4	3	0
March 2016	2	21	4	0

- Total in portfolio – 962 (includes 131 Inactive Standards)

- New Standards *{list of new Standards can be found on Slide 11-13 of the Staff Report, see the attachments of these minutes}*
- Inactive Standards *{list of inactive Standards can be found on Slide 14-15 of the Staff Report, see the attachments of these minutes}*
- New Requirements/Process Reminders for TC Chapter Meetings
 - Standards Document Development Project Period
 - Project period shall not exceed 3 years (Regs 8.3.2)
 - SNARF approval to TC Chapter approval
 - If document development activity is found to be continuing, but cannot completed with the project period, TC Chapter may grant one-year extension at a time, as many times as necessary.
 - The TC Chapter should review the expiration dates for all applicable SNARFs at each TC Chapter meeting. (PM Note 10)
 - SNARF Review Period
 - A submitted SNARF for a new, or for a major revision to an existing, Standard or Safety Guideline is made available to all members of a TC Chapter's parent global technical committee for two weeks for their review and comment. (Regs 8.2.1)
 - If the SNARF is submitted at a TC Chapter meeting, the committee can review and approve, but the SNARF will need to be distributed for two weeks and then approved via GCS.
 - New SNARF & TFOF forms *{embedded in Staff Report, see the attachments of these minutes}*
 - Procedures for Correcting Nonconforming Titles of Published Standards Document (*Procedure Manual* Appendix 4)
 - Some Standards qualify for a special procedure where a line item change can be used to correct the titles. Otherwise, the corrective action will likely require a major revision.
 - Nonconforming Titles
 - Refer to Procedure Manual (PM) Appendix Table A4-1 for details on nonconforming titles
 - SEMI HB3-1113 Mechanical Interface Specification for 150 mm HB-LED Load Port
 - HB-LED Standards needing Five-Year Review
 - None for NA HB-LED
 - SNARF 3 Year Status
 - Doc. 5629, New Standard: Guide for Identification Defects on Bare Surfaces of Sapphire Wafers
 - SNARF was approved on 7/11/2013



- Action needed by West 2016
 - TC Chapter may grant a one-year extension
- Staff Contact: Laura Nguyen (Inguyen@semi.org)

Attachment: Staff Report April 2016 (HB-LED)

Discussion: SNARF 3 Year Status – Doc 5629

Doc 5629 is up for renewal.

Peter Wagner informed the TC Chapter images were collected to illustrate what certain kinds of defects would look like. The idea was to generate some terminology that describes those defects, but there has not been any progress since.

Chris Moore then initiated a further discussion on Doc 5629. The people who were working on this Document are no longer members. Chris has the images, but the images requires scaling.

The TC Chapter is discussing whether this activity should be renewed for another year. Since most of this type of activity is done overseas, mainly in China, there is no precedence for this activity in the North America region.

Chris Moore suggested since most of this type of activity is done in China, he would get in touch with the cochairs from the China chapter and see whether they would like to take over this activity – transferring SNARF's from NA to China.

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.

NOTE 2: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Reviews (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.

4.1 Document #5818, Line Items Revision to SEMI HB1: Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices

4.1.1 Line Item #1: Correct the title of this standard from “Specifications” to “Specification”

- The ballot passed as balloted. See attachment for ballot adjudication.

4.1.2 Line Item #2: Modify and update Table 1, 2-3,3 Flat length

- The ballot passed as balloted. See attachment for ballot adjudication.

4.1.3 Line Item #3: Implement r-plan direction in Table 1, Table 2 and Table R1-1, Part 2

- The ballot passed as balloted. See attachment for ballot adjudication.

Attachment: 5818ProceduralReviewRev1

5 Subcommittee & Task Force Reports

The task forces are lumped together and majority of the meeting was spent reviewing ballots from Korea.

5.1 *Sapphire Wafer Marking Experiment Task Force*

5.2 *Impurities and Defects in Sapphire Wafer Task Force*

5.3 *DSP/PSS Wafers Task Force*

5.4 *Test Methods Task Force*

5.5 *Wafer Task Force*



6 Old Business

Previous action items have been closed. There is no further old business.

7 New Business

7.1 Co-Chair Leadership Change

Eric Armour (Veeco) retired from the co-chair position of the HB-LED TC Chapter, and Andrew Kim (Lumileds) kindly offered to take his position. The TC Chapter will nominate Andrew Kim as the new co-leader, in place of Eric Armour, pending NARSC approval at West.

Motion: To nominate Andrew Kim as new Co-Chair of the HB-LED TC Chapter.

By / 2nd: Steve Martell (Sonoscan) / Chris Moore (BayTech-Resor)

Discussion: None

Vote: 3-0 in favor. Motion passed.

7.2 Korea Ballots

Natalie Shim (SEMI Korea) requested the NA HB-LED Chapter to approve five SNARFs (5984-5988) to go out for Cycle 5 balloting. Unfortunately, the Documents need many revisions that need to be addressed before going out for ballot. The title of each SNARF is also not to include the chemical short form so the SNARFs will need to be revised.

Motion: To modify the following SNARF's: 5984 – 5988 to remove the chemical short form from the title.

By / 2nd: Chris Moore (BayTech-Resor)/Steve Martell (Sonoscan)

Discussion: None

Vote: 2-0 in favor. Motion passed.

Attachment: 5985(TMIn)_v1 - Spring 2016 Updates

7.3 China SNARF for feedback

Kris Shen (SEMI China) has asked the NA HB-LED TC Chapter to review one of their SNARF's and gather feedback before it is sent out for member review. Chris Moore is looking for clarification on the test methods, scope and the # of procedures. Andrew Kim is interested in clarification on the specifics they are looking to measure.

Action Item: Laura Nguyen to send Andrew Kim a copy of the SNARF review.

Attachment: SNARF_Test Method for Al composition (x) of the AlxGa1-xN Alloys in Epitaxy Wafer v1

8 Next Meeting and Adjournment

The next meeting is scheduled for July 14, 2016 at SEMICON West 2016 Standards Meetings in San Francisco, California. See <http://www.semi.org/en/events> for the current list of meeting schedules.

Having no further business, a motion was made to adjourn. Adjournment was at 11:25.

Respectfully submitted by:

Laura Nguyen
International Standards Coordinator
SEMI North America
Phone: +1.408.942.7019
Email: lnguyen@semi.org



Minutes approved by:

Chris Moore (BayTech-Resor), Co-chair	June 22, 2016
Iain Black (Philips), Co-chair	<Date approved>
Mike Feng (Silian), Co-chair	June 20, 2016

Table 8 Index of Available Attachments^{#1}

<i>Title</i>	<i>Title</i>
SEMI Standards Required Meeting Elements	5818ProceduralReviewRev1
NA HB-LED Minutes 2015 Fall Final	SEMI Standards Staff Report
Liaison Report CH Spring2016 (HB-LED)	SNARF_Test Method for Al composition (x) of the AlxGa1-xN Alloys in Epitaxy Wafer v1
Liaison Report KR Spring2016 (HB-LED)	

#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.