Compound Semiconductor Materials Committee China TC Chapter

HB-LED Committee China TC Chapter

Joint Meeting Summary and Minutes

China Winter Standards Meeting 2022

December 14th, 2022, 13:30-17:00

Virtual Meeting

TC Chapter Announcements

Next TC Chapter Meeting

China Spring Standards Meeting 2022

TBD, China, 2022

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: *Jiangbo Wang (HC SEMITEK), Liu Guoyou (CRRC TIMES)*
SEMI Staff: *Cassie Li (SEMI China) Isadora Jin (SEMI China), Ein Wu (SEMI China)*

Company	*Last*	*First*	*Company*	*Last*	*First*
HC SEMITEK	*Wang*	*Jiangbo*	*Epiworld*	*Feng*	*Gan*
CRRC TIMES	*Liu*	*Guoyou*	*TDG*	*Wei*	*Mingde*
NAURA	*Wang*	*Xiangang*	*CETC13*	*Sun*	*Niefeng*
SICC	*Yang*	*Shixing*	*Dynax*	*Qian*	*Hongtu*
BST	*Liu*	*Jianzhe*	*Perfect Crystal*	*Zheng*	*Hongjun*
Sinopatt	*Zhang*	*Neng*	*AMEC*	*Liu*	*Yingbin*
Perfect Crystal	*Lu*	*Min*	*CRRC SEMICONDUCTOR*	*Li*	*Chengzhan*
CIAC-HIM	*Liu*	*Zhibin*	*TANKEBLUE*	*Peng*	*Tonghua*
SAN'AN	*Zhang*	*Jie*	*TOPE*	*Ni*	*Weijiang*
HIT	*Gan*	*Yang*	*CWT*	*Zheng*	*Songsen*
CETC46	*Lin*	*Jian*	*AK OPTICS*	*Ma*	*Tiezhong*
Chipjet	*Zhao*	*Dan*	*Enkris*	*Tao*	*Guoqiao*
Nata	*Chen*	*Huabin*	*Jing'an*	*Zhang*	*Heng*
CLP	*Wang*	*Yang*	*Beijing Huikun*	*Liu*	*Zhenzhou*

Table 2 Leadership Changes

WG/TF/SC/TC Name	*Previous Leader*	*New Leader*
Compound Semiconductor Materials		
SiC Substrate Task Force	Min LU — Perfect Crystal Hongjun ZHENG — SPTAIKE Fangliang YAN — MigeLab	Min LU — Perfect Crystal Hongjun ZHENG —Perfect Crystal Fangliang YAN — MigeLab
HB-LED		
None		

Table 3 Committee Structure Changes

Previous WG/TF/SC Name	*New WG/TF/SC Name or Status Change*
Compound Semiconductor Materials	
None	
HB-LED	
None	

Table 4 Ballot Results

Document #	*Document Title*	*Committee Action*
Compound Semiconductor Materials		
None		
HB-LED		
None		

#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

#	*Type*	*SC/TF/WG*	*Details*
Compound Semiconductor Materials			
None			
HB-LED			
None			

Table 6 Authorized Activities

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

#	Type	SC/TF/WG	Details
Compound Semiconductor Materials			
6767	Revise SNARF	Silicon Carbide Substrate Task Force	SNARF Title from: New Standard: Test Method for Flatness of Silicon Carbide Wafers by Optical Interference To: New Standard: Test Method for GBIR, SBIR, GF3R, SFQR and SORI of Silicon Carbide Wafers by Oblique Incident Interference Method
6769	Revise SNARF	Silicon Carbide Substrate Task Force	SNARF Title from: New Standard: Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic To: New Standard: Test Method Qualitative for Residual Stress of Silicon Carbide Wafers by Photoelastic
HB-LED			
None			

#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

#	When	TF	Details
Compound Semiconductor Materials			
6768	Cycle 1-23 or Cycle 2-23	Silicon Carbide Substrate Task Force	New Standard: Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection
6769	Cycle 1-23 or Cycle 2-23	Silicon Carbide Substrate Task Force	New Standard: Test Method Qualitative for Residual Stress of Silicon Carbide Wafers by Photoelastic
HB-LED			
None			

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

#	TF	Title	Expiration Date
Compound Semiconductor Materials			
None			
HB-LED			
None			

Table 9 SNARF(s) Abolished

#	TF	Title
Compound Semiconductor Materials		
None		
HB-LED		
None		

Table 10 Standard(s) to receive Inactive Status

Standard Designation	*Title*
Compound Semiconductor Materials	
None	
HB-LED	
None	

Table 11 New Action Items

Item #	*Assigned to*	*Details*
Compound Semiconductor Materials		
None		
HB-LED		
None		

Table 12 Previous Meeting Action Items

Item #	*Assigned to*	*Details*
Compound Semiconductor Materials		
None		
HB-LED		
None		

1 Welcome, Reminders, and Introductions

Committee co-chair Jiangbo Wang chaired the meeting and welcomed all attendees. All the attendees introduced themselves. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed.

Agenda was reviewed.

Attachment: 2 Compound&HB-LED TC Winter Meeting 2022 Agenda

2 Review of Previous Meeting Minutes

The TC Chapter reviewed the minutes of the previous meeting.

Motion: To approve the minutes of the previous meeting as written
By / 2nd: Yang Gan (HIT) / Tiezhong Ma (*AK OPTICS*)
Discussion: None
Vote: 22Y - 0 N, (Total 22 companies.) Motion Passed.

Attachment: 3 China CSM&HB-LED TC Joint Spring Meeting Minutes 20220427

3 Liaison Reports

3.1 *Compound Semiconductor Materials North America TC Chapter*

Cassie Li (SEMI) reported for the Compound Semiconductor Materials North America TC Chapter. Of note:

Action Item: Next meeting –May 17, 2023

- The Co-chair of North America Compound Semiconductor Materials TC is Russ Kremer (Consultant) and Jim Oliver (Northrup Grumman).
- Ballot Results
  - Doc. 6952, Reapproval of SEMI M10-0218 Terminology For Identification Of Structures And Features Seen On Gallium Arsenide Wafers

    Passed as balloted
  - Doc. 6953, Line Item Revision of SEMI M79-0218 Specification For Round 100 mm Polished Monocrystalline Germanium Wafers For Solar Cell Applications

    Passed as balloted
  - Doc. 6954, Line Item Revision of SEMI M23-0811 (Reapproved 0218) Specification For Polished Monocrystalline Indium Phosphide Wafers

    Passed as balloted

- Task Force Updates
  - M86 (GaN) Revision TF
    - Doc. 6806, Revision of M86, Specification for Polished Monocrystalline c-Plane Gallium Nitride Wafers (Subject: To revise 1-4 inches diameter)
    - Passed in June 2022 and published as M86-0922

Attachment: 5 NA CSM TC Chapter Liaison report Nov 2022 v1

3.2 Compound Semiconductor Materials Europe TC Chapter

Cassie Li (SEMI) reported for the Compound Semiconductor Materials Europe TC Chapter. Of note:

Action Item: Next meeting –Spring 2023

- The Co-chair of Europe Compound Semiconductor Materials TC is Arnd Weber (SiCrystal).
- Task Force Highlights
  - SiC TF
    - Leader
      - Arnd Weber (SiCrystal)
    - Doc. 6615, Revision of M55-0817 Specification for Polished Monocrystalline Silicon Carbide Wafers
      - To include 200 mm wafer for Silicon Carbide
    - Ballot passed and forwarded to ISC A&R
    - Document is published as SEMI M55-0921
  - Test Methods TF
    - Leader
      - Christian Kranert (Fraunhoffer)
    - Drafting doc. 6870, New Standard: Test Method for Quantifying Basal Plane Dislocations in 4H-SiC by X-ray Topography
  - 5 Year Review TF

- Leaders
  - Hans Christian – Munich University of Applied Sciences
  - Arnd Weber (SiCrystal)
- Reviewing Standards due for 5 year review
  - SEMI M63 - Test Method for Measuring the Al Fraction in AlGaAs on GaAs Substrates by High Resolution X-Ray Diffraction
    - Needs experts to review

Attachment: 6 CSM EU TC Chapter Dec 2022

3.3 *Compound Semiconductor Materials Japan TC Chapter*

Cassie Li (SEMI) reported for the Compound Semiconductor Materials Japan TC Chapter. Of note:

Action Item: Next meeting –2023 Spring

- The Co-chair of Japan Compound Semiconductor Materials TC is Masayoshi Obara (Shin-Etsu Handotai Co., Ltd.).
- Committee Structure Changes
  - ➢ SiC Epitaxial Wafer liaison TF (New TF)
- New TFOF
  - ➢ Charter: Discussions will be held in Japan to support and complement Silicon Carbide Epitaxial Wafer revision and new standards development activities in other regions.
  - ➢ Scope: To cover the scope of the SiC Epitaxial Wafer Task Force for its on existing SEMI Silicon Carbide Standards and new Standards as such become necessary.
- Ballot Review
  - ➢ None
- Authorized Activities
  - ➢ None
- Task Force Highlights
  - ➢ The Japan TC Chapter approved a New TFOF 'SiC Epitaxial Wafer Liaison TF'. Please refer the New TFOF page.
- 5-Year Review
  - ➢ None

Attachment: 7 Japan CSM Liaison Report Feb2022 v1

3.4 *SEMI Staff Report*

Cassie Li (SEMI China) gave the SEMI Staff Report. Of note:

Action Item:

- SEMI International Standards Overview
- SEMI Standards Publications
- 2022 Critical Dates for SEMI Standards Ballots

- 2023 Critical Dates for SEMI Standards Ballots
- NARSC Members
- Organization chart

Attachment: 4 SEMI Starf Report

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.

None

5 Subcommittee and Task Force Reports

5.1 *SiC Epitaxial Wafer Task Force*

Feng Gan (Epiworld) reported for the 4H-SiC Epitaxial Wafer Task Force. This report contained information on:

Action Item:

- Introduced the task force's leaders and members.
- Progress of Documents work:
  - ➢ Doc. 6693, New Standard:Specification for 4H-SiC Homoepitaxial Wafer
    - Oct. 2022: Passed A&R review stage, publication pending.

Attachment: 8 Report of 4h-sic homo-epitaxial wafer specification task force_20221031

5.2 *Silicon Carbide Substrate Task Force*

Min Lu (Perfecr Crystal) reported for the Silicon Carbide Substrate Task Force. This report contained information on:

Action Item:

- Introduced the task force's leaders and members.
- Documents in Development:
  - ➢ Doc.6767: Test Method for Flatness of Silicon Carbide Wafers by Optical Interference
  - ➢ Doc.6768: Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection
  - ➢ Doc.6769: Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic
- Specific Work
  - June 14,2022, Online TF meeting, Arrange comparison test work
  - Sep 21, 2022, Online TF meeting, The suggestions for the modification of three standards
  - Nov 8,2022, Online TF meeting, more suggestions for the modification of three standards

Attachment: 9 SEMI China CSM Std. Technical Committee Silicon Carbide substrate Task Force 20221118

6 Old Business

6.1 *Refer to Table 12 Previous Meeting Action Items*

7 New Business

7.1 *Requests for ballots in Cycle 1 or 2 of 2023*

7.1.1 Doc. 6768, New Standard: Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection

Motion:	Approve Document 6768 for Letter Ballot in Cycle 1-23 or Cycle 2-23.
By / 2nd:	Min LU (Mige Lab) / Niefeng SUN (CETC 13)
Discussion:	Yang GAN (HIT): Such repetitive tests should not be considered, it is better not to use the current coordinates. Min LU (Mige Lab): This is parametric method borrowed from silicon.
Vote:	19 in favor and 2 opposed. (Total 21 companies. 0 companies abstain.) Motion passed.

7.1.2 Doc. 6769, New Standard: Test Method Qualitative for Residual Stress of Silicon Carbide Wafers by Photoelasic

Motion:	Approve Document 6769 for Letter Ballot in Cycle 1-23 or Cycle 2-23.
By / 2nd:	Min LU (Mige Lab) / Niefeng SUN (CETC 13)
Discussion:	Yang GAN (HIT): If the popularity is not high, you can suspend this standard. Min LU (Mige Lab): The technology is very mature, and Fabs have also begun to use it, which has a certain leading and driving effect Yingbin LIU(AMEC): Is there a second way to verify the previously measured value. This needs to be verified at least once.
Vote:	20 in favor and 0 opposed. (Total 20 companies. 0 companies abstain.) Motion passed.

7.2 *Revise SNARF*

7.2.1 Doc. 6767, New Standard: Test Method for Flatness of Silicon Carbide Wafers by Optical Interference

Motion:	Approve Document 6767 SNARF for revision
By / 2nd:	Min LU (Mige Lab) / Niefeng SUN (CETC 13)
Discussion:	Jiangbo WANG(HC Semitec): Does the title needs to be really specific. It should have a general term to conclude these parameters? Niefeng SUN (CETC 13): Now we should only consider these parameters. Tiezhong MA(AK OPTICS): The degree of adsorption must be very tight, and the lower surface must be kept flat, which is almost impossible. Min LU (Mige Lab): The technology is developing.
Vote:	22 in favor and 0 opposed. (Total 22 companies. 0 companies abstain.) Motion passed.

Attachment: SNARF_Test Method for Flatness of Silicon Carbide Wafers by Optical Interference

7.2.2 DOC. 6769, New Standard: Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic

Motion:	Approve Document 6769 SNARF for title revision
By / 2nd:	Min LU (Mige Lab) / Niefeng SUN (CETC 13)
Discussion:	Min LU (Mige Lab): It is better to add qualitative in the title of 6769
Vote:	21 in favor and 0 opposed. (Total 21 companies. 0 companies abstain.) Motion passed.

7.3 *Five-Year-Review*

- None

8 Next Meeting and Adjournment

The next meeting of the Compound Semiconductor Materials & HB-LED China TC Chapter is scheduled for TBD, 2023 in China.

For more information, please visit Standards Calendar at http://www.semi.org/en/standards

Adjournment: 17:00.

Respectfully submitted by:

Cassie Li

SEMI China

Phone: 86-21-60277645

Email: cassieli@semi.org

Minutes tentatively approved by:

Jiangbo Wang (HC SEMITEK), Compound Semiconductor Materials Committee and HB-LED Committee China TC Chapter Co-chair	2022.12.23
Guoyou Liu (CRRC TIMES), Compound Semiconductor Materials Committee and HB-LED Committee China TC Chapter Co-chair	2022.12.24

Table 13 Index of Available Attachments[#1]

Title	*Title*
2 Compound&HB-LED TC Winter Meeting 2022 Agenda	SNARF_Test Method for Flatness of Silicon Carbide Wafers by Optical Interference
4 SEMI Starf Report	5 NA CSM TC Chapter Liaison report Nov 2022 v1
6 CSM EU TC Chapter Dec 2022	7 Japan CSM Liaison Report Feb2022 v1
8 Report of 4h-sic homo-epitaxial wafer specification task force_20221031	9SEMI China CSM Std. Technical Committee Silicon Carbide substrate Task Force 20221118
3 China CSM&HB-LED TC Joint Spring Meeting Minutes 20220427	

#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.