



**Compound Semiconductor Materials Committee China TC Chapter
HB-LED Committee China TC Chapter
Joint Meeting Summary and Minutes**

China Fall Standards Meeting 2021

September 22nd, 2021, 13:30-17:00

HUALUXE, NO.34 South Changjiang Road, Wuhu, Anhui, China

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)

SEMI Staff: Daniel Qi – SEMI China, Isadora Jin – SEMI China, Ein Wu (SEMI China), Cassie Li (SEMI China)

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
HC SEMITEK	Wang	Jiangbo	SEMILAB	Jiang	Xiaochen
CRRC TIMES	Liu	Guoyou	SXSK	Wang	Lizhong
Monocrystal	Niu	Chongshi	Enkris	Zhu	Dandan
HORIBA	Xiong	Hongwu	Epiworld	Feng	Gan
HORIBA	Sun	Xiaofei	TDG	Wei	Mingde
EcoSys	Xing	Xianqiang	Silicology	Miao	Zhi
CGB	Geng	Biao	Dongrong-China	Yuan	feng
NAURA	Wang	Xiangang	CETC13	Sun	Niefeng
BST	Liu	Jianzhe	TRUSTEC	Kan	Zhanbo
GusuLab	Li	Shunfeng	TRUSTEC	Pan	Lei
DAS	Wu	Bin	KingPop	Zhou	Yang
Sinopatt	Zhang	Neng	Enkris	Chen	Yuchao
Wylton	Xue	Biao	Dynax	Qian	Hongtu
PALMLAND	Wang	Qiming	Enkris	Chen	Yuchao
GenePowers	Huang	Hongjia	Weixing	Ma	Chen
McLantics	Xue	Rong	Winifred	Li	Xu
CS Microelectronics	Su	Xiaoping	CWT	Zheng	Songsen
MigeLab	Lu	Min	Institute of semiconductors, CAS	Zheng	Hongjun
IB	Li	Hailong	AMEC	Liu	Yingbin
Yixinhe	Chen	Shiyou	GHTOT	Ji	Yong



Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leader</i>
<i>Compound Semiconductor Materials</i>		
SiC Epitaxial Wafer Task Force	Gan FENG — Epiworld	Gan FENG — Epiworld Guosheng SUN — Institute of Semiconductors, CAS
SiC Substrate Task Force	Min LU — MigeLab	Min LU — MigeLab Hongjun ZHENG — Institute of Semiconductors, CAS Fangliang YAN — MigeLab
<i>HB-LED</i>		
None		

Table 3 Committee Structure Changes

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

Table 4 Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
<i>Compound Semiconductor Materials</i>		
None		
<i>HB-LED</i>		
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

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
<i>Compound Semiconductor Materials</i>			
None			
<i>HB-LED</i>			
None			

Table 6 Authorized Activities

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

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
<i>Compound Semiconductor Materials</i>			
None			
<i>HB-LED</i>			



Table 6 Authorized Activities

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

#	Type	SC/TF/WG	Details
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
<i>Compound Semiconductor Materials</i>			
6693	Cycle 1-22	SiC Epitaxial Wafer TF	New Standard: Specification for 4H-SiC Homo-Epitaxial Wafer
6767	Cycle 9-21 Cycle 1-22	SiC Substrate TF	Test Method for Flatness of Silicon Carbide Wafers by Optical Interference
6768	Cycle 9-21 Cycle 1-22	SiC Substrate TF	Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection
6769	Cycle 9-21 Cycle 1-22	SiC Substrate TF	Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic
<i>HB-LED</i>			
None			

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

#	TF	Title	Expiration Date
<i>Compound Semiconductor Materials</i>			
None			
<i>HB-LED</i>			
None			

Table 9 SNARF(s) Abolished

#	TF	Title
<i>Compound Semiconductor Materials</i>		
None		
<i>HB-LED</i>		
None		

Table 10 Standard(s) to receive Inactive Status

Standard Designation	Title
<i>Compound Semiconductor Materials</i>	
None	
<i>HB-LED</i>	
None	



Table 11 New Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
<i>Compound Semiconductor Materials</i>		
None		
<i>HB-LED</i>		
None		

Table 12 Previous Meeting Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
<i>Compound Semiconductor Materials</i>		
None		
<i>HB-LED</i>		
None		

1 Welcome, Reminders, and Introductions

Committee co-chair Jiangbo Wang chaired the meeting and welcomed all attendees. All the attendees introduced themselves. SEMI Staff called the meeting to order at 13:30 p.m.. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed.

Agenda was reviewed.

Attachment: 1 Chinese SEMI Standard Meeting Reminders

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: Yuchao Chen (Enkris) / Xiaoping Sun (CS MICROELECTRONICS)

Discussion: None

Vote: 20Y - 0 N, (Total 20 companies.) Motion Passed.

Attachment: 3 China CSM&HB-LED TC Joint Spring Meeting Minutes 20210316

3 Liaison Reports

3.1 Compound Semiconductor Materials North America TC Chapter

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

Action Item: Next meeting –Nov 2021

- The Co-chair of North America Compound Semiconductor Materials TC is Russ Kremer (Consultant) and Jim Oliver (Northrop Grumman).
- Ballot Results
 - Doc. 6735, Withdrawal of SEMI M42 - Specification for Compound Semiconductor Epitaxial Wafers
Passed as balloted
 - Doc. 6736, Reapproval of SEMI M86 - Specification for Polished Monocrystalline c-Plane Gallium Nitride Wafers

Failed

- Authorized Ballots
 - Cycle 5-2021
 - Doc. 6805, Revision of SEMI M9.5 with title change from “Specification for Round 100mm Polished Monocrystalline Gallium Arsenide Wafers for Electronic Device Applications” to “Specification for Round 100mm Polished Monocrystalline Gallium Arsenide Wafers
 - Doc. 6818, Withdrawal of SEMI M9.1-0813 — Specification For Round 50.8 mm Polished Monocrystalline Gallium Arsenide Wafers For Electronic Device Applications
 - Doc. 6819, Withdrawal of SEMI M9.6-0813 — Specification For Round 125 mm Diameter Polished Monocrystalline Gallium Arsenide Wafers
- Task Force Updates
 - M86 (GaN) Revision TF
 - Drafting Doc. 6806, Revision of M86, Specification for Polished Monocrystalline c-Plane Gallium Nitride Wafers (Subject: To revise 1-4 inches diameter)
 - Coordinating with Gallium Nitride manufacturers and end users
- 5 year review
 - SEMI M65-0816, Specification for Sapphire Substrates to use for Compound Semiconductor Epitaxial Wafers
 - Checking with sapphire substrate manufacturers for input.

Attachment: 5 CSM NA Liaison Report June 2021

3.2 Compound Semiconductor Materials Europe TC Chapter

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

Action Item: Next meeting –Nov 2021

- The Co-chair of Europe Compound Semiconductor Materials TC is Arnd Weber (SiCrystal).
- Ballot Results
 - Doc.6779, Reapproval of SEMI M64-0915 Test Method For The E12 Deep Donor Concentration In Semi-Insulating (Si) Gallium Arsenide Single Crystals By Infrared Absorption Spectroscopy
Passed as balloted
 - Doc.6780, Line Item Revision of SEMI M87-0116 Test Method For Contactless Resistivity Measurement Of Semi-Insulating Semiconductors
Passed as balloted
- Authorized Ballot
 - Doc. 6717, New Standard: Test Method For Determination Of Threading Screw Dislocation Density In 4H-SiC By X-Ray Topography
 - Full-Wafer TSD Density Mapping of 4H-SiC Task Force
- 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
- Publication is pending
- Full-Wafer TSD Density Mapping of 4H-SiC TF
 - Leader
 - Christian Kranert (Fraunhofer)
 - Issued doc. 6716, New Standard: Test Method for Quantifying Threading Screw Dislocations (TSDs) in 4H-SiC Crystals for cycle 6-2021
- 5 Year Review TF
 - Leaders
 - Hans Christian – Munich University of Applied Sciences
 - Arnd Weber (SiCrystal)
 - Reviewing Standards due for 5 year review
 - SEMI M46 - Test Method for Measuring Carrier Concentrations in Epitaxial Layer Structures by ECV Profiling
 - Needs more time
 - SEMI M63 - Test Method for Measuring the Al Fraction in AlGaAs on GaAs Substrates by High Resolution X-Ray Diffraction
 - Requesting other TC Chapter from other regions to take a look
 - SEMI M75 - Specification for Polished Monocrystalline Gallium Antimonide Wafers
 - Needs experts for review

Attachment: 6 Eu CSM Liaison Report August 2021 v1

3.3 *Compound Semiconductor Materials Japan TC Chapter*

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

Action Item: Next meeting –Jan. 19, 2022 at Japan Winter 2022 Meetings

- Web Conference
- The Co-chair of Japan Compound Semiconductor Materials TC is Masayoshi Obara (Shin-Etsu Handotai Co., Ltd.).
- Committee Structure Changes
 - Silicon Carbide Substrate liaison Task Force (New TF)
- New TFOF
 - Charter: Discussions will be held in Japan to support and complement Silicon Carbide materials revision and new standards development activities in other regions.
 - Scope: To cover the scope of the Silicon Carbide Substrate 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 discharged four Inactive TFs in the last Japan TC Chapter Meetings.
 - The Japan TC Chapter approved a New TFOF ‘ Silicon Carbide Substrate Liaison TF’. Please refer the New TFOF page.
- 5-Year Review
 - None

Attachment: 7 Japan CSM Liaison Report Jun2021 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
- 2021 Critical Dates for SEMI Standards Ballots
- NARSC Members
- Organization chart
- Major Activity

Attachment: 4 SEMI Staff Report 20210922-169-v2

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.
- Documents in work:
 - Doc. 6693, New Standard:Specification for 4H-SiC Homo-Epitaxial Wafer
 - Timetable for Document Completion
 - Progress of Documents Work

Attachment: 8 Report of 4H-SiC Epitaxial Wafer Specification Task Force_20210921(2)

5.2 Silicon Carbide Substrate Task Force

Min Lu (MigeLab) 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

Attachment: 9 SEMI 碳化硅衬底工作组工作介绍 20210922

6 Old Business

6.1 Refer to Table 12 Previous Meeting Action Items

7 New Business

7.1 Requests for ballots in Cycle 9-21 or Cycle 1-22

7.1.1 Document 6693, New Standard:Specification for 4H-SiC Homo-Epitaxial Wafer

Motion: Gan Feng (Epiworld) moved that the committee approve Document 6693 for Letter Ballot in Cycle 1-22.

By / 2nd: Gan Feng (Epiworld)/Guoyou Liu (CRRC TIMES)

Discussion: Xiaoping Su(CS MICROELECTRONICS): Have you considered the surface graininess?

Gan Feng (Epiworld): There is no need to consider about the surface graininess in epitaxial gaps.

Shunfeng Li(GusuLab): Is it a common way to test the doping concentration?

Gan Feng (Epiworld): This MCV has not been popularized yet.

Vote: 19 in favor and 0 opposed. (Total 20 companies.) Motion Passed as balloted.

Attachment:

7.1.2 Document 6767, Test Method for Flatness of Silicon Carbide Wafers by Optical Interference

Motion: Min Lu (MigeLab) moved that the committee approve Document 6767 for Letter Ballot in Cycle 9-21 or Cycle 1-22.

By / 2nd: Min Lu (MigeLab) / Niefeng Sun (CETC13)

Discussion: Shunfeng Li(Gusu Lab): What is the difference in measurement?

Min Lu (MigeLab): It used red laser.

Chongshi Niu (Monocrystal): How to get 3.1% in the report?

Min Lu (MigeLab): Maximum standard deviation equals to standard deviation divided by the average value.

Vote: 16 in favor and 0 opposed. (Total 20 companies.) Motion passed.

Attachment:

7.1.3 Document 6768, Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection

Motion: Min Lu (MigeLab) moved that the committee approve Document 6768 for Letter Ballot in Cycle 9-21 or Cycle 1-22.

By / 2nd: Min Lu (MigeLab) / Niefeng Sun (CETC13)

Discussion: Niefeng Sun (CETC13): The test scope should be added.



Niefeng Sun (CETC 13): This test method has been successfully used.

Vote: 19 in favor and 0 opposed. (Total 20 companies.) Motion passed.

Attachment:

7.1.4 Document 6769, Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic

Motion: Min Lu (MigeLab) moved that the committee approve Document 6769 for Letter Ballot in Cycle 9-21 or Cycle 1-22.

By / 2nd: Min Lu (MigeLab) / Niefeng Sun (CETC13)

Discussion: Min Lu (MigeLab): We use bending to test stress.

Vote: 15 in favor and 0 opposed. (Total 20 companies.) Motion passed.

Attachment:

7.2 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, 2022 in China.

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

Adjournment: 16:30.

Respectfully submitted by:

Cassie Li

Standards, Specialist

SEMI China

Phone: 86-21-60277645

Email: cassie.li@semichina.org

Minutes tentatively approved by:

Jiangbo Wang (HC SEMITEK), Compound Semiconductor Materials Committee and HB-LED Committee China TC Chapter Co-chair	<2021/> 2021.10.04
Guoyou Liu (CRRC TIMES), Compound Semiconductor Materials Committee and HB-LED Committee China TC Chapter Co-chair	<2021/> 2021.10.09

Table 13 Index of Available Attachments^{#1}

<i>Title</i>	<i>Title</i>
1 Chinese SEMI Standard Meeting Reminders	2 Compound&HB-LED TC Fall Meeting 2021 Agenda



Table 13 Index of Available Attachments^{#1}

3 China CSM&HB-LED TC Joint Spring Meeting Minutes 20210316	4 SEMI Staff Report 20210922-169-v2
5 CSM NA Liaison Report June 2021	6 Eu CSM Liaison Report August 2021 v1
7 Japan CSM Liaison Report Jun2021 v1	8 Report of 4H-SiC Epitaxial Wafer Specification Task Force_20210921(2)
9 SEMI 碳化硅衬底工作组工作介绍 20210922	

#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.