



## STANDARDS NEW ACTIVITY REPORT FORM (SNARF)

Date Prepared: 2024.12.5 Revised (if Applicable): \_\_\_\_\_

SNARF for: Specification of Multiple Materials Substrate for GaN Epitaxial Growth aiming at HB-LED

Originating Global Technical Committee: Compound Semiconductor Materials Technical Committee

Originating TC Chapter: China

Task Force (TF) in which work is to be carried out: GaN Task Force

Submitted by: Neng Zhang Company: Sinopatt Technology Co., Ltd.

Email: neng.zhang@sinopatt.com

Phone: +86-189-2250-9956

Refer to *Procedure Manual* § 2.2.4 for more information on properly filling out the SNARF.

### 1. Rationale:

#### a: Describe the need or problem addressed by this activity.

(Indicate the customer, what benefits they will receive, and if possible, quantify the impact on the return on investment [ROI] if the Document is implemented.)

1. Benefitting from advantages of wide bandgap, high electron mobility and high saturation velocity, gallium nitride (GaN) is identified as an excellent semiconductor for LED/high power/high frequency devices.
2. Due to the challenges of manufacturing large size bulk GaN substrates, the epitaxial growth on hetero-substrates, e.g. silicon, silicon carbide, as well as sapphire, is widely demanded despite the nonnegligible mismatches. Therefore, the specific substrates for GaN epitaxy directly determines the adoption of GaN in electronic and optoelectronic applications.
3. As a foundational material for manufacturing GaN electronic and optoelectronic devices, heterogeneous substrates are crucial in the entire industry chain, e. g. sapphire serves as the substrate for LEDs, silicon is used for power devices, and silicon carbide plays a crucial role in radio frequency devices.
4. In recent years, composite material substrates have gradually been a trend. They are rapidly developing in the field of high-directionality LED applications, and exhibit plenty of potentials in power electronic devices.
5. However, there is currently no existing standard for composite material substrates. Therefore, we aim to establish a standard to provide a basis for substrate material manufacturing and procurement for upstream and downstream companies in the industry chain, and finally to promote the healthy and orderly development of the industry.

#### b: Estimate effect on industry. Check one of the following:

##### ■ 1: Major effect on entire industry or on multiple important industry sectors

- identify the relevant sectors: Light-emitting diodes, Power Device, Radio frequency devices

##### ☐ 2: Major effect on an industry sector

- identify the relevant sector: \_\_\_\_\_

##### ☐ 3: Major effect on a few companies

- identify the relevant companies: \_\_\_\_\_

##### ☐ 4: Slight effect or effect not determinable



**c: Estimate technical difficulty of the activity. Check one of the following:**

- ☐ I: No Difficulty – Proven concepts and techniques exist or quick agreement is anticipated
- ☐ II: Some Difficulty – Disagreements on known requirements exist, but developing consensus is possible
- ☒ III: Difficult – Limited expertise and resources exist and/or achieving consensus is difficult
- ☐ IV: Extremely Difficult – Expertise and resources are scarce and/or achieving consensus is very difficult

---

## 2. Scope:

**a: Describe the technical areas to be covered or addressed by this Document development activity.**

*(For Subordinate Standards, list common concepts or criteria that the Subordinate Standard inherits from the Primary Standard, as well as differences from the Primary Standard.)*

1. Scope
2. Normative references
3. Terms and definitions
4. Technical requirements (technical parameters and indexes of Multiple Materials Substrate )
5. Inspection methods (measurement methods for each technical parameters of Multiple Materials Substrate )
6. Inspection regulations
7. Marking, packaging, transportation and storage

---

## b: Expected result of activity

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> New Standard or Safety Guideline (including replacement of an existing Standard or Safety Guideline)                               | <input type="checkbox"/> Line-item revision to two or more existing Standards or Safety Guidelines                |
| <input type="checkbox"/> New Subordinate Standard to an existing Standard or to a new Primary Standard to be developed concurrently with this new Subordinate Standard | <input type="checkbox"/> Reapproval of a Standard or Safety Guideline   |
| <input type="checkbox"/> New Preliminary Standard  | <input type="checkbox"/> Removal of a Standard or Safety Guideline  |
| <input type="checkbox"/> Major revision to an existing Standard or Safety Guideline  | <input type="checkbox"/> Withdrawal of a Standard or Safety Guideline   |
| <input type="checkbox"/> Line-item revision to an existing Standard or Safety Guideline  | <input type="checkbox"/> Reinstatement of a Standard or Safety Guideline  |
|  | <input type="checkbox"/> Publication of an existing Standard or Safety Guideline as an American National Standard |
|  | <input type="checkbox"/> New Auxiliary Information  |
|  | <input type="checkbox"/> Modification of existing Auxiliary Information   |

**For a new Subordinate Standard, identify the Primary Standard here:** \_\_\_\_\_

For revision of existing Standard(s) or Safety Guideline(s), identify the Standard(s) or Safety Guideline(s) that are to be revised here: \_\_\_\_\_, and identify which parts of the Standard(s) or Safety Guideline(s) that are to be revised. *(Check all that apply.)*

- ☐ **Modification of an existing part of Standard(s) or Safety Guideline(s) including Appendices, Complementary Files, and Supplementary Materials**
- ☐ **Addition of one or more Appendices or Complementary Files to an existing Standard or Safety Guideline**



- ☐ Addition of one or more Related Information sections or Various Materials to an existing Standard or Safety Guideline
- ☐ Revision or addition of one or more Subordinate Standards to an existing Primary Standard

**For Standards, identify the Standard Subtype below:**

- |  |   |
|--|---|
| <input type="checkbox"/> Classification                  | <input type="checkbox"/> Guide                    |
| <input type="checkbox"/> Practice                        | <input checked="" type="checkbox"/> Specification |
| <input type="checkbox"/> Test Method                     | <input type="checkbox"/> Terminology              |
| <input type="checkbox"/> Miscellaneous (describe:) _____ |   |

---

**3. Projected Timetable for Completion:**

**a: General Milestones**

- |  |  |
|--|--|
| a. Activity Start: <u>Nov-2024</u>           | b. 1 <sup>st</sup> Draft by: <u>Oct-2025</u> |
| c. (Optional) Informational Ballot by: _____ | d. Letter Ballot by: <u>Jun-2026</u>         |
| e. TC Chapter Approval By: <u>Dec-2026</u>   |  |

---

**4. Liaisons:**

**a: List SEMI Global Technical Committees, TC Chapters, Subcommittees, or Task Forces in your or other Regions/Locales that should be kept informed regarding the progress of this activity.**

*(Refer to SEMI Standards organization charts and global technical committee charters and scopes as needed.)*

**b: List any planned Type I Liaisons with external nonprofit organizations (e.g., SDO) that should receive Draft Documents from Standards staff for feedback during this activity and be notified when the Letter Ballot is issued (refer to Procedure Manual § 7).**

**c: Intercommittee Ballots (check one):**

- ☐ will be issued – identify the recipient global technical committee(s): \_\_\_\_\_
- ☒ will not be issued

---

**5. Safety Considerations:**

**The resulting Document is expected (Check one):**

- ☐ to be a Safety Guideline
- ☒ NOT to be a Safety Guideline

**NOTE FOR 'to be a Safety Guideline':** When all safety-related information is removed from the Document, the Document is NOT technically sound and complete – Refer to § 15.1 of the *Regulations* for special procedures to be followed.

**NOTE FOR 'NOT to be a Safety Guideline':** When all safety-related information is removed from the Document, the Document is still technically sound and complete.

---

**6. Intellectual Property Considerations:**



a: For a new Standard or Safety Guideline and for any part to be modified or added in a Revision of published Standards and Safety Guidelines (Check one):

- ☒ the use of patented technology is NOT required.  
☐ patented technology is intended to be included in the proposed Standard(s) or Safety Guideline(s).

(If the second box is checked, check one):

- ☐ Letter of Intent received  
☐ Letter of Intent not received

b: For Revision, Reapproval, Reinstatement, or Withdrawal of existing Standard(s) and Safety Guideline(s) (Check one):

- ☐ there is no known material patented technology necessary to use or implement the Standard(s) and Safety Guideline(s)  
☐ there is previously known material patented technology necessary to use or implement the Standard(s) and Safety Guideline(s)

c: The body of the Document and any Appendices, Complementary Files, Related Information sections, or Various Materials that may or may not be a part of the Document by reference (Check one):

- ☐ will incorporate Copyrighted Item  
☒ the incorporation of Copyrighted Item will NOT be required

**NOTE FOR** 'the use of patented technology or the incorporation of Copyrighted Item(s) is NOT required': If in the course of developing the Document, it is determined that the use of patented technology or Copyrighted Item(s) is necessary for the Document, the provisions of *Regulations* § 16 must be followed.

**NOTE FOR** 'will incorporate Copyrighted Item': A copyright release letter must be obtained from the copyright owner prior to publication.

---

## 7. Comments, Special Circumstances:

### 8. TC Member Review (Check one):

- ☐ took place between (put dates here: MM/DD/YYYY and MM/DD/YYYY ) before approval at the TC Chapter Meeting, or  
☒ took place between (put dates here: 11/25/2024 and 12/08/2024 ) before approval by the GCS, or  
☐ is not required for this SNARF.

**NOTE FOR** 'TC Member Review': A TC Member Review is required by the *Regulations* for a period of at least two weeks before approval of a new, or a major revision of an existing, Standard or Safety Guideline. (Refer to *Regulations* ¶ 8.2.1)

---

### 9. Approval Dates:

TC Chapter or GCS: \_\_\_\_\_

Recorded in TC Chapter Minutes: \_\_\_\_\_

---