semi | Standards

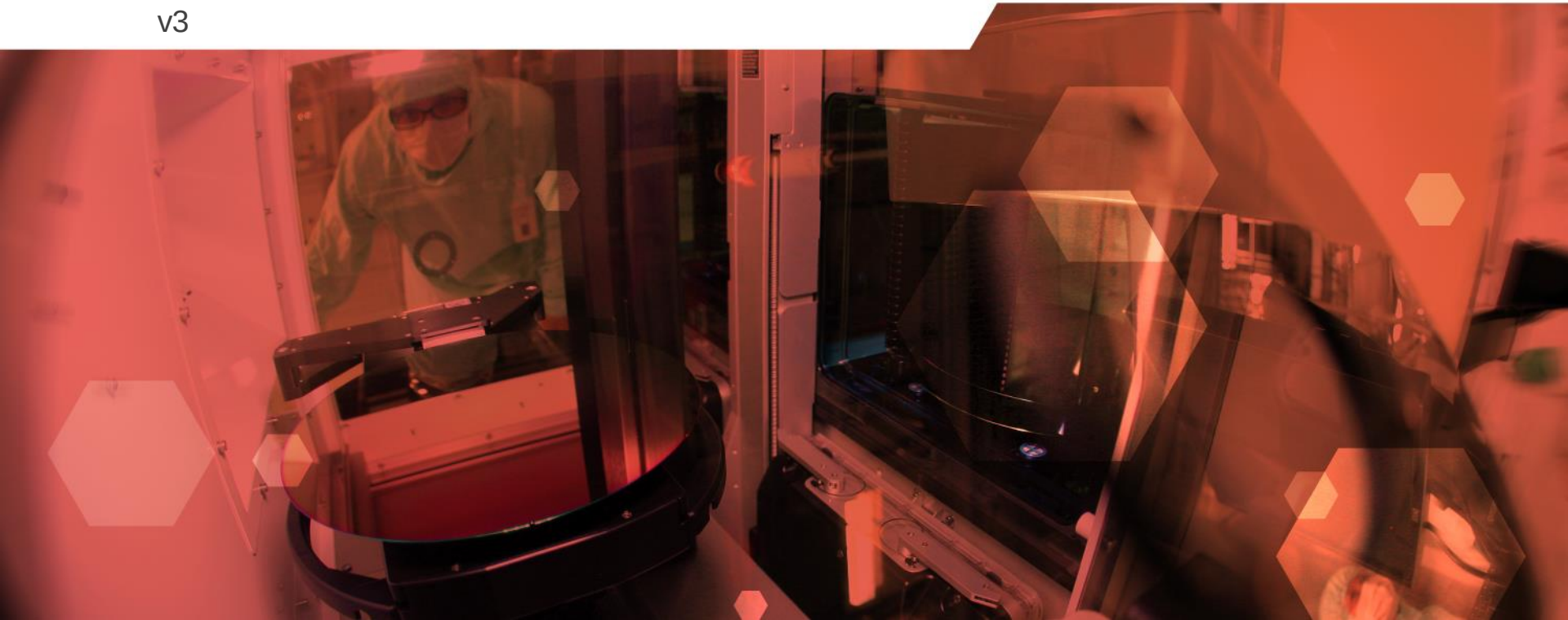
Fan-Out Panel Level Packaging (FO-PLP) Panel Task Force

April 4, 2019

Task Force Leaders: Cristina Chu (ASMPT-NEXX), Richard Allen (NIST)

SEMI Staff: Laura Nguyen

v3



Agenda

- Welcome
- Agenda Review
- SEMI Required Elements (Membership Requirements, Antitrust and Intellectual Property Reminders, and Effective Meeting Guidelines)
- Introductions
- Review Draft Document 6332A
- Action Items (if any)
- Next Meeting and Adjournment

Ballot Review: Draft Document 6332A

- Ballot Results

Microsoft Word
97 - 2003 Documen

Proposed Changes – Section 1: Purpose
Changes Highlighted

- *1.1 Panel Level Packaging (PLP) is projected to become a critical packaging process. This Specification identifies the physical properties that must be specified for the semiconductor industry to produce an equipment set for successful implementation of PLP. Many of the applications for panel packaging lines include fan out technology applications.*
- *1.2 To permit common processing equipment, standardized panel (largest external) dimensions (whether with or without process carrier) are essential. ~~As this technology has developed, numerous panel sizes are being investigated delaying the introduction of the technology and requiring customization of equipment and processes for each panel size.~~*
- 1.3 To accelerate the adoption of panel level packaging by eliminating the need to customize equipment and processes for a variety of panel sizes.

Proposed Changes – Section 6: Requirements Changes Highlighted

- 6.1 Panel material purchased or fabricated according to this specification shall ~~will~~ have the largest external dimensions of:

  - 510 ±1.0 mm × 515 ±1.0 mm;

    OR

  - • 600 ±1.0 mm × 600 ±1.0 mm;

  Both dimensions are the largest external dimensions. In some cases, the dimensions include only a panel, in remaining cases the dimensions may include a (usually smaller) panel plus the process carrier.

- 6.2 For conveyor based equipment, the shorter edge of the panel (e.g., 510 mm x 515 mm) ~~if appropriate) is~~ shall be the leading edge~~.~~ (not applicable to square 600 mm x 600 mm panel).

Proposed changes in response to UAA comment 1

(C1: the distinction between the definitions in 5.2.2 and 5.2.3 is unclear to me.)

New Standard: SPECIFICATION FOR PANEL ~~SUBSTRATE~~ CHARACTERISTICS FOR PANEL LEVEL PACKAGING (PLP) APPLICATIONS

5 Terminology

5.1 *Abbreviations and Acronyms*

~~5.1.1 *FO-PLP* — fan-out panel level packaging~~

~~5.1.2~~ 5.1.1 *PLP* — panel level packaging

5.2 *Definitions*

5.2.1 *process carrier* — a device or material, usually Si, ceramic, glass, or metal, that provides temporary mechanical support to hold one or more panels during processing.

NOTE 1: In front end applications and most SEMI Standards, the term "carrier" is understood to mean any cassette, box or pod that is used to transport and store substrates. In most back end or packaging applications, the same term "carrier" is used to describe the material that provides temporary mechanical support for the substrate during processing. To minimize confusion, the term "process carrier" is used in this Standard for the back-end application.

5.2.2 *panel* — the rectangular base material to implement panel level packaging processes.

~~5.2.3 *panel substrate* — the rectangular starting material (often epoxy or glass) that can be used to implement panel level packaging processes.~~

~~5.2.4 *PLP substrate* — an alternative definition of ¶ 5.2.3.~~

~~5.2.5 *PLP substrate carrier* — an alternative definition of ¶ 5.2.1.~~

Action Items/Next Steps

- Ratification Ballot, Cycle 4
  - Voting open from April 30 – May 30, 2019
  - Voting will be on the changes shown in previous slides (Purpose and Requirement sections) and changes in the Word document 6332A to title and terminology section in response to Comment 2 from UAA.
  - Please note, that the Regulations state:

    10.3 TC Members Eligible to Vote on a Ratification Ballot — Only TC Members of the Primary GTC or Advisory GTC who are registered on the issue date of the Letter Ballot for which the Ratification Ballot is issued are eligible to vote on the Ratification Ballot.
  - If you are not a member of the 3DP&I TC, please email Laura Nguyen/SEMI to be added to the TC Chapter prior to **April 30**!

- Discussion:
  - Future activities of the Fan-Out Panel Level Packaging TF
  - Other

Next TF Meeting

- **July 11, 2019 – During SEMICON/West (tentative)**
  - **Please watch for announcements**

Thank you!

- Any questions?
- Contact Information

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Cristina Chu (ASMPT-NEXX)	cristina.chu@asmpt.com
Richard Allen (NIST)	richard.allen@nist.gov
Laura Nguyen (SEMI Staff)	lnguyen@semi.org

Attendee List

First Name	Last Name	Company	Attended
Shoji	Komatsu	Acteon NEXT	
Haruo	Shimamoto	AIST	
Sesh	Ramaswami	Applied Materials	
Youichirou	Satou	Asahi Glass	
Marco	Gavagnin	AT&S	
Markus	Leitgeb	AT&S	
Bevan	Wu	BW Associates	X
Kenji	Yamagata	Daifuku	
Gary	Gallagher	Entegris	
Michael	Toepper	Fraunhofer	
Tanja	Braun	Fraunhofer	
Toshihisa	Nonaka	Hitachi-chem	
Pat	Tang	IMSM	
Masahiro	Tsuriya	iNEMI	
Michael	Obrien	Intel	X
Sai	Boyapati	Intel	
Stefan	Radloff	Intel	X

First Name	Last Name	Company	Attended
Arun	Karamcheti	Intevac	
Yaojian	Lin	JCET Group	
Sanjay	Bhandari	mCube	
Mei-Chien	Lu	Monte Rosa Tech	
Ting Yu	Wu	NCAP	
Yoko	Miyazaki	Nidec-Read Corp	
Richard	Allen	NIST	(phone)
Tim	Kryman	Rudolph Tech	
Denny	Fritz	SAIC	
Hiroyuki	Shida	Shinpoly	X
Vern	Solberg	Solberg Consulting	
Steve	Martell	Sonoscan	X
Marcus	Arendt	SUSS MicroTec	
Kiyoshi	Kanashiro	TDK	
Cristina	Chu	ASMPT-NEXX	X
Matt	Fuller	Entegris	
Albert	Koller	Evatec AG	

Attendee List

First Name	Last Name	Company	Attended
Michael	Yingling	UIC	
Paul	Shih	UIC	
Rameen	Hadizadeh	Wispry	
Bill	Moffat	Yield Eng. Systems	
Len	Perroots	Microsense	
Chris	Moore	Covalent Metrology	
Shavi	Spinzi	Orbotech	
Ted	Tessier	Gordian Int'l	
Anil	Vijayendran	Vecco	
Suresh	Jayaraman	Amkor	
Ilona	Schmidt	Corning	X
Supika	Mashiro	TEL	X

First Name	Last Name	Company	Attended

Next TF Meeting

- **Date TBD**
  - For Members in Europe:
    - 11:00 AM EDT
    - 8:00 AM PDT
    - 5:00 PM CEST
    - https://www.timeanddate.com/worldclock/fixedtime.html?p1=283&iso=20180807T08&ah=1&sort=0
  - For Members in Asia:
    - 7:00 PM EDT
    - 4:00 PM PDT
    - **<day ahead>**; 7:00 AM China/Taiwan, 8:00 AM Tokyo
    - https://www.timeanddate.com/worldclock/fixedtime.html?iso=20180807T16&p1=283&ah=1