SEMI M23.2-0211 (Reapproved 0218)
SPECIFICATION FOR ROUND 76.2 mm (3 inch) DIAMETER POLISHED MONOCRYSTALLINE INDIUM PHOSPHIDE WAFERS

This Standard was technically approved by the Compound Semiconductor Materials Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on June 28, 2017. Available at www.semiviews.org and www.semi.org in February 2018; originally published in 1993; previously published February 2011.

1 Purpose

1.1 This Specification defines properties of round 76.2 mm monocrystalline indium phosphide wafers, in agreement with presently established industry practice. It uniquely defines those mechanical parameters that do not need, for technical reasons, a choice of different values.

2 Scope

2.1 The parameters defined include the values and tolerances of wafer diameter, thickness and surface orientation.

2.2 The complete specification for this product includes all requirements of SEMI M23, excluding those that are not relevant to this Specification.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 *SEMI Standards and Safety Guidelines*

SEMI M23 — Specification for Polished Monocrystalline Indium Phosphide Wafers

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

Table 1 Dimension and Tolerance Requirements

Property	*Dimension*	*Tolerance*	*Units*[#1]
Diameter	76.2	±0.5	mm
Thickness, Center Point	600	±25	µm
Primary Flat Length	22	±2	mm
Secondary Flat Length	11	±2	mm
Bow	To be specified.		
Total Thickness Variation	To be specified.		

#1 For reference purposes, the metric (SI) units apply.

Table 2 Orientation and Flat Location Requirements

Property	*Requirement*	
Option	*Dove-Tail*	*V-Groove*
Primary Flat Orientation	$(01\bar{1})$ ± 0.5°,[#1] under an indium facet. The primary flat shall be perpendicular to the 'Dove-tail' etch figure.[#2]	$(01\bar{1})$ ± 0.5°,[#1] under a phosphorus facet. The primary flat shall be perpendicular to the 'V-Groove' etch figure.[#2]
Secondary Flat Orientation	90 ± 5° clockwise from the primary flat.	90 ± 5° counterclockwise from the primary flat.
Surface Orientation[#3]		

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Property	*Requirement*	
Option	*Dove-Tail*	*V-Groove*
A	{100} ± 0.5° (see SEMI M23, Figure 1)	{100} ± 0.5° (see SEMI M23, Figure 2,)
B	{100} off 2° ± 0.5° toward any {110} plane (see SEMI M23, Figure 3)	{100} off 2° ± 0.5° toward the {110} plane which is between the primary and secondary flats (see SEMI M23, Figure 4)
Orthogonal Misorientation	±5° (see SEMI M23, Figure 5)	±5° (see SEMI M23, Figure 5)

#1 See Table 1 in SEMI M23.

#2 See Figures 1 and 2 in SEMI M23, which show the orientation of the Dovetail and V-groove figures relative to crystallographically anisotropic pits (see #4).

#3 The frame of reference is the (100) plane of the crystal. It is the wafer normal that is tilted towards the (110) plane of the crystal.

#4 Relating to the etchant used for identifying V-groove and/or dovetail direction, see ¶ 13.1 of SEMI M23: "HBr-$K_2Cr_2O_7$-H_2O etching system for indium phosphide."

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