

SEMI M55.1-0304

SPECIFICATION FOR 50.8 mm ROUND POLISHED MONOCRYSTALLINE 4H AND 6H SILICON CARBIDE WAFERS

This specification was technically approved by the Global Compound Semiconductor Committee and is the direct responsibility of the European Compound Semiconductor Materials Committee. Current edition approved by the European Regional Standards Committee on October 29, 2003. Initially available at www.semi.org January 2004; to be published March 2004.

NOTE 1: This specification is intended to be a sub-document to SEMI M55, Specification For Polished Monocrystalline Silicon Carbide Wafers.

1 Purpose

1.1 This subordinate standard details the dimensional values and other information required for 50.8 mm polished monocrystalline silicon carbide wafers.

2 Scope

2.1 The complete specification for this product includes all general requirements of SEMI M55, Specification For Polished Monocrystalline Silicon Carbide Wafers.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 The backside finish properties, dopant, and resistivity are not addressed, as currently these properties depend strongly on the quick evolving technology and suitable limits for a standard do not exist.

4 Requirements

Table 1 Dimension and Tolerance Requirements

<i>Property</i>	<i>Dimension</i>	<i>Tolerance</i>	<i>Units</i>
DIAMETER	50.8	± 0.25	mm
PRIMARY FLAT LENGTH	15.8	± 1.6	mm
SECONDARY FLAT LENGTH	8.0	± 1.6	mm
BOW	0	± 25	μm
WARP	0	< 25	μm
TOTAL THICKNESS VARIATION	0	< 25	μm
TOTAL INDICATOR READING	0	< 25	μm

Table 2 Thickness Requirements (Center Point)

	<i>Dimension</i>	<i>Tolerance</i>	<i>Units</i>
Option 1:	250	± 25	μm
Option 2:	330	± 25	μm

NOTE 1: As the industrial requirements for a unique thickness specification are not established at the time of creation of this standard, two values are defined. This is to be regarded as a preliminary in that way, that in a future revision of this standard these options can be expected to be replaced by a unique definition.

Table 3 Orientation and Flat Location Requirements

<i>Property</i>	<i>Dimension</i>
SURFACE ORIENTATION (see Note 1)	<i>Tilt angle</i> (see Figure 2 in SEMI M55)
Option 1: "on axis"	$0 \pm 0.25^\circ$
Option 2: "off axis ($11\bar{2}0$)"	$3.5^\circ \pm 0.5^\circ$ parallel to edge of primary flat away from secondary flat (see Note 1)
Option 3: "off axis ($11\bar{2}0$)"	$8.0^\circ \pm 0.5^\circ$ parallel to edge of primary flat away from secondary flat (see Note 1)
Option 4: "off axis ($1\bar{1}00$)"	$3.5^\circ \pm 0.5^\circ$ parallel to edge of secondary flat away from primary flat (see Note 1)
Option 5: "off axis ($1\bar{1}00$)"	$8.0^\circ \pm 0.5^\circ$ parallel to edge of secondary flat away from primary flat (see Note 1)
ORTHOGONAL MISORIENTATION	$\pm 5^\circ$ (See Figure 2 in SEMI M55)
TOLERANCE OF PRIMARY FLAT ORIENTATION	$\pm 1^\circ$
TOLERANCE OF SECONDARY FLAT ORIENTATION (see Note 4)	$\pm 5^\circ$ relative to primary flat

NOTE 1: The frame of reference is the (0001)-plane of the crystal. It is the wafer normal on the silicon-face that is tilted towards the given crystallographic direction. That means that the crystallographic c-axis lies between the secondary/primary flat (for the ($11\bar{2}0$)/($1\bar{1}00$) option) and the silicon-face surface normal vector (See Figure 1 and 2).

NOTE 2: The angle between primary and secondary flat is defined in Figure 5 in SEMI M55.

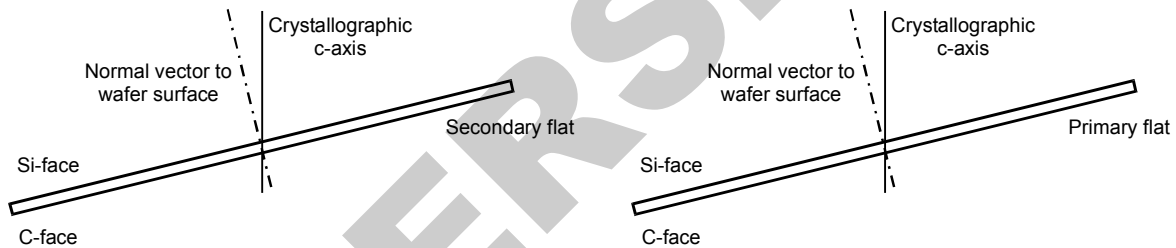


Figure 1
Definition of the Sign of the Tilt Angle (left: off axis ($11\bar{2}0$) -option, right off axis ($1\bar{1}00$) Option)