LINbO3 WAFER FOR SAW DEVICE

1 This specification is used for 3” Lithium Niobate wafer (SAW grade).

2 Growth method for Lithium Niobate is to be Czochralsky pulled and it is a single crystal.

3 General LiNbO 3 Wafer Requirements

3.1 Wafer Diameter -- 76.2 ± 0.5 mm.

3.2 Thickness -- 0.50 ± 0.05 mm, or other size if specified.

3.3 Bow -- < 50 microns (see Figure #3).

3.4 Taper -- < 0.025 mm (see Figure #4).

3.5 Wafer Orientation -- To be as requested ± 0.2 degrees (± 12 minutes), unless specified .

3.6 Identification flat position and length is to be as follows:

3.6.1 Primary Flat Location -- Must be within ± 0.1 degrees (± 6 minutes), unless specified .

3.6.2 Primary Flat Length -- From 20 to 24 mm, unless specified.

3.6.3 Secondary Flat Location(s) -- Must be within ± 2.5 degrees, as illustrated in Figure #2.

3.6.4 Secondary Flat Length -- From 8 to 12 mm.

3.7 Surface Polish Quality

3.7.1 Cleanliness -- No stains or residues on either side when inspected under a collimated light

3.7.2 Front surface must be free of scratches, pits, dimples, cracks, “orange peel”, smudges, fingerprints, saw marks, and unpolished areas. Typically referred to as “mirror polish”.

3.7.3 Backside Polish -- Lapped with GC1000# (W14) diamond sand and etched.

3.7.4 Edge Chips -- Not to exceed 0.75 mm in diameter.

3.7.5 Edge Bevel -- To extend inward from the wafer edge 0.5 to 1.5 mm, with a bevel angle of 5 0 to 15 0 (see Figure #1).

- Individual Wafer Orientation “Special” Requirements

4.1 128 0 Y-cut

4.1.1 Orientation -- 127.86 0 Y ± 0.5 0

4.1.2 Primary flat direction -- X-axis.

4.1.3 Secondary flat -- None or one flat, 270 0 clockwise from the primary flat if required.

4.2 YZ-cut

4.2.1 Orientation -- Y-axis ± 0.5 0

4.2.2 Primary flat direction -- Z-axis.

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4.2.3 Secondary flat – none

4.3 64 0 Y-cut

4.3.1 Orientation -- 64 0 Y ± 0.5 0

4.3.2 Primary flat direction -- X-axis.

4.3.3 Secondary flat -- One flat, 180 0 clockwise from the primary flat.

5 Package

5.1 Wafers are packaged in plastic containers (25 wafers each) which are individually sealed in plastic bags, and are boxed in cardboard with 8 or less containers. Any empty space shall be filled with packing peanuts and at least 4 inches of foam between the inner and outer boxes.

5.2 Wafer supplier must maintain the records by lot number for material shipped to customer to this specification. The records must include all QC data for measurable parameters of the samples inspected. The records are to be available to customer for a period of one year from date of shipment of the product.

5.3 Each package of 25 wafers must be marked with information required by purchasing and receiving: Wafer's name, wafer orientation, wafer diameter, lot number, inspector's number and date. Each outer box must be marked which side is up, do not stack, fragile, and have two shock watch label attached to opposite sides, and also be labeled with the following:

5.3.1 Supplier name and address

5.3.2 Lot number

5.3.2 Customer's name and address

5.3.3 Customer's part number, if required

5.3.4 Date boxed

Figure 1#

Edge Bevel

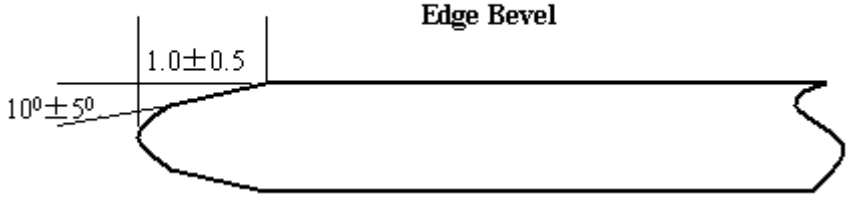

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Figure 2#

$LiNbO_3$ Wafer Secondary Flat Locations By Cut Angle

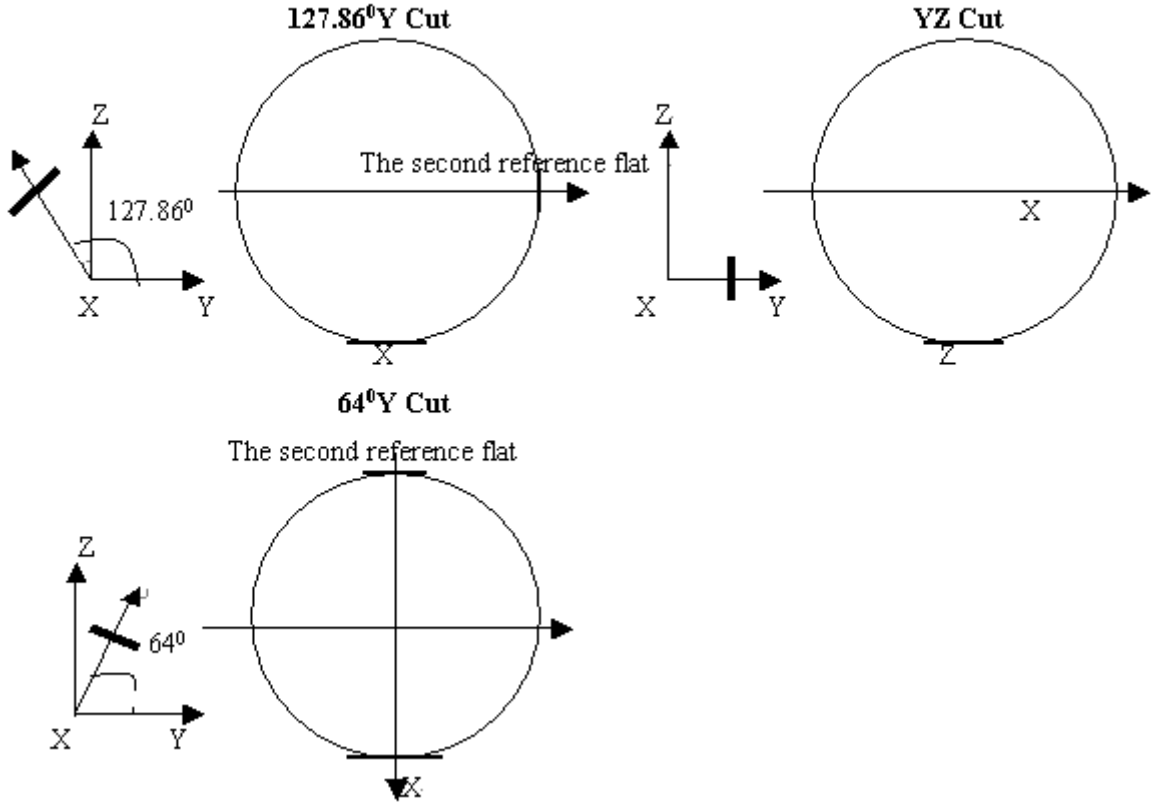

Figure 3#

Bow is the maximum height difference between any two point on the center line.

Wafer may not be in a vacuum state.

BOW = B B > C

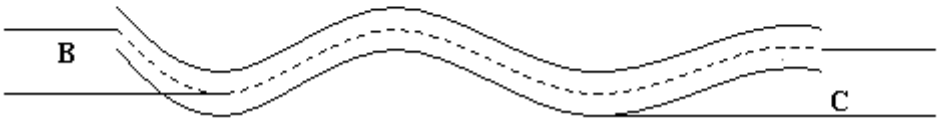

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Figure 4#

Taper is the absolute difference between maximum and minimum thickness of a test sample encountered during a thickness scan or series of point thickness measurements.

TAPER = A + B

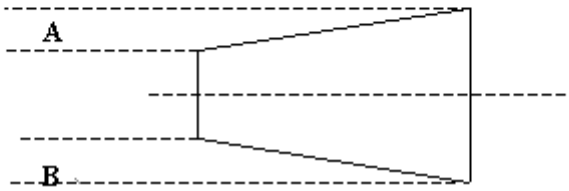
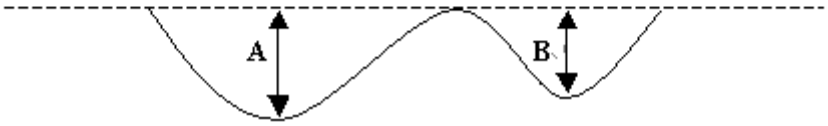


Figure 5#

Top surface flatness is the maximum height difference between any two points on the wafer surface.

The wafer may be in a vacuum state.

If A>B then surface flatness =A



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