

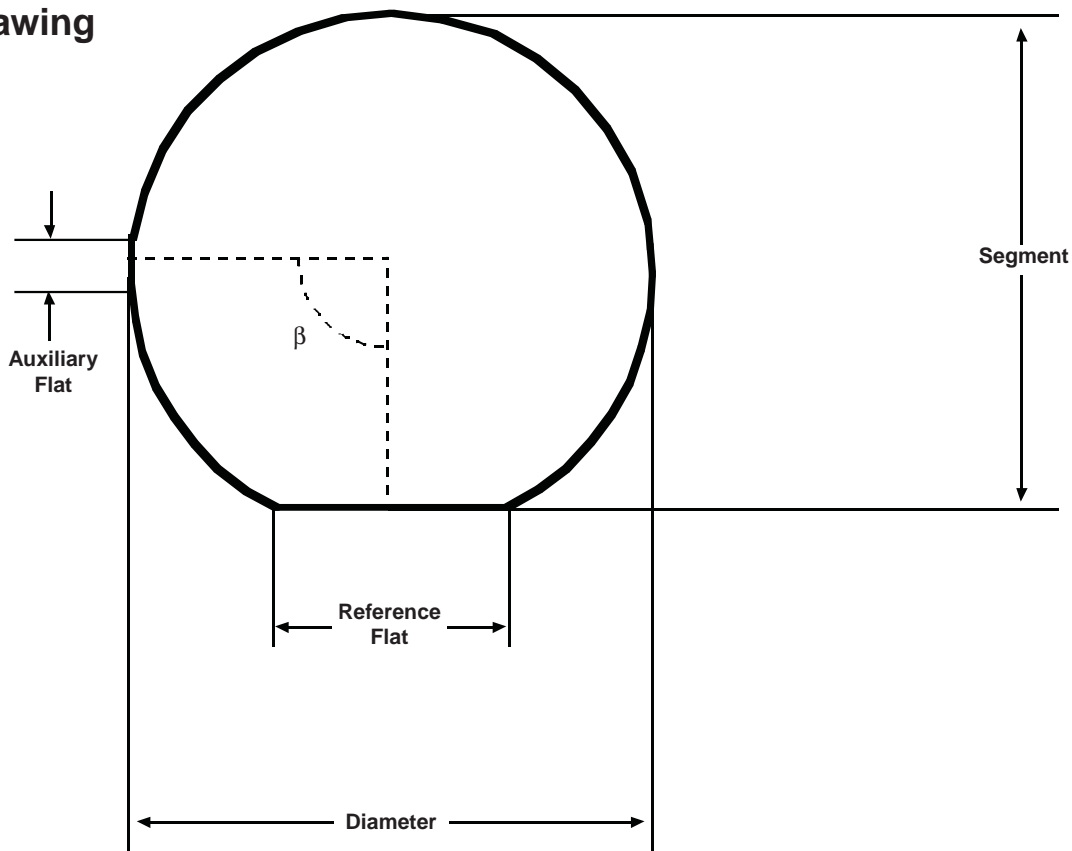
DATA SHEET

SURFACE ACOUSTIC WAVE SUBSTRATES LITHIUM TANTALATE (LiTaO_3)

General

This document describes single crystal lithium tantalate substrates suitable for use in surface acoustic wave applications. Such wafers are most commonly specified as 3" or 100 mm with a reference flat. The wafers are typically Y-cut with rotations specified between about 36° and 42° around the X-axis. A high quality, low damage surface is prepared on one major (propagating) surface by polishing. The back side is usually lapped to a rough finish to attenuate unwanted vibration modes.

Outline Drawing



References

International Electrotechnical Commission Standard, CEI/IEC 758, Second edition, 1993-04.

Institute of Electrical and Electronic Engineers Standard on Piezoelectricity ANSI/IEEE Std. 176-1987.

Physical Dimensions

	Units	Tolerance	3" / 100mm
Diameter	mm	± 0.1	76.2 / 100.0
Thickness	mm	± 0.01	0.35 - 0.50
Total thickness variation	µm	maximum	6.0
Local thickness variation (5 mm square site)	µm	maximum	2.0
Orientation of propagating surface			
around Z-axis	arc minute	± 6	Customer specified
around Y'-axis	arc minute	± 15	0.00
Reference flat width	mm	± 3	22 / 32
Reference flat orientation (perpendicular to Y'-axis)	arc minute	± 6	0
Auxiliary flat width	mm	± 1	10 / 12
Auxiliary flat location (angle β)	degrees	nominal	Customer specified
Segment	mm	nominal	74.7 / 98.5

Surface Characteristics

Roughness			
Propagating surface (R_{rms})	nm	maximum	0.6
Back side (R_a)	nm	± 25	200 - 400, based on customer specification
Bow	µm	maximum	30
Scratch length	µm	maximum	10
Dig diameter	µm	maximum	2
Observable flaws	count	maximum	2
Dimensions of chips within 1.5mm of edge			
on the circular segment	mm	maximum	0.5
on the reference flat	mm	maximum	0.2
Wafer edge treatment		semiconductor standard radius profile	

Material Properties

Curie temperature	°C	± 2	604
Composition			congruent