

Lanthanum Aluminate (LaAlO₃)

Lanthanum aluminate (LaAlO₃) single crystal is currently the most important industrialized, large-size single crystal material for high-temperature superconducting thin film substrates. It is grown by the Czochralski method, and single crystals and substrates with a diameter of 2 inches and larger can be obtained. It matches well with high-temperature superconducting materials and lattices such as YBaCuO, has low dielectric constant and low microwave loss, so it is suitable for making high-temperature superconducting microwave electronic devices (such as high-temperature superconducting microwave filters in telecommunication). There are huge reality and potential application prospects..



PARAMETERS

Crystal Structure	M6 (normal temperature)	M3 (>435℃)
Lattice Constant	M6 a=5.357A c=13.22 A	M3 a=3.821 A
Melting Point	2080℃	
Density	6.52 (g/cm ³)	
Mohs Hardness	6-6.5 (mohs)	
Thermal Expansion	9.4x10 ⁻⁶ /K	
Dielectric Constants	ε=21	
Secant Loss (10GHz)	~3×10 ⁻⁴ @300k, ~0.6×10 ⁻⁴ @77k	
Color and Appearance	To anneal and conditions differ from brown to brownish The polished substrate has natural twin domains.	
Chemical Stability	Room temperature is not dissoluble in minerals, the temperature is greater than 150 °C in soluble h ₃ po ₄	
Characteristics	For microwave electron device	
Growth Method	Czochralski	
Dimension	10x3mm, 10x5mm, 10x10mm, 15x15mm, 20x15mm, 20x20mm Φ15,Φ20, Φ1", Φ2",Φ2.6"	
Thickness	0.5mm, 1.0mm	
Polishing	One side or two sides	
Orientation	<100> <110> <111>	
Crystal Plane Orientation Accuracy	±0.5°	
Edge Orientation Accuracy	2° (Special requirements can reach within 1°)	

PRODUCT DATA SHEET

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Bevel Wafer	According to specific requirements, wafers with edge-oriented crystal planes inclined at a specific angle (inclination angle 1°-45°) can be processed.
Surface Roughness	$Ra \leq 5\text{\AA}$ (5×5μm)
Package	Class 100 clean bag, Class 1000 super clean room