

# Al<sub>2</sub>O<sub>3</sub> Single Crystal

## Sapphire boule and polished wafer

Sapphire (single crystal of Al<sub>2</sub>O<sub>3</sub>) is being used extensively as a substrate for HV nitrides and for many other epitaxial films. MTI has been supplying sapphire substrates since 1991 for research and industry. In order to meet the increasing demand for blue LED and LD devices, MTI has built up a venture in China to mass produce high quality sapphire crystal and epi polished wafer at the most competitive price. Our excellent specialists, advanced growth technology and state of art polishing facilities allow us to become one of the largest suppliers for sapphire crystal and wafer in the world.

<b>Physical Properties of Sapphire</b>	
Crystal Structure	Hexagonal. a =4.758 Å c= 12.992 Å
Crystallographic D spacing	(1120) - a plane: 2.379 Å      (1102) - r plane: 1.740 Å (1010) - m plane: 1.375 Å      (1123) - r plane: 1.147 Å <sup>-</sup> (0001) - c plane: 2.165 Å      (1011) - s plane: 1.961 Å
Crystal Purity	> 99.99%
Melt Point	2040 °C
Density	3.98 g/cm <sup>3</sup>
Hardness	9 ( mohs)
Thermal Expansion	7.5 (x10 <sup>-6</sup> / °C)
Specific Heat	0.1 cal / (g*K)
Thermal Conductivity,	46.06 @ 0 °C    25.12 @ 100 °C,    12.56 @ 400 °C    ( W/(m.K) )
Dielectric Constant	~ 9.4 @300K at A axis    ~ 11.58@ 300K at C axis
Loss Tangent at 10 GHz	< 2x10 <sup>-5</sup> at A axis ,    <5 x10 <sup>-5</sup> at C axis
<b>Standard Products</b>	
As - grown boules <0001> ori.± 0.5°	3" dia x 50 ~ 70 mm length 2" dia x 50 ~ 70 mm length 30 mm dia x 150 mm length
As-cut blanks <0001> ori.± 0.5°	2" dia x 0.7 mm thickness 1" dia x 0.7 mm thickness
Epi -polished substrates C, R, A plane: ori.± 0.5° 1 or 2 sides polished Ra< 10 Å	3" dia. x 0.5 mm 2" dia. x 0.33 mm,    2"dia x 0.5 mm 1" dia x 0.5 mm 0.5" x 0.5" x 0.5 mm 10x10x0.5 mm

*Special size and orientation are available upon request*



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