

## MATERIAL DATA SHEET

Material type: Sapphire

### SA100

#### Properties of Microstructure

Alumina Content		%	99.9
Density	JIS R 1634	g/cm <sup>3</sup>	3.97
Water Absorption		%	0
Mean Grain Size		µm	-

#### Mechanical Properties

Hardness (HV 9.807N)	JIS R 1610	GPa	Surface a: 22.5
Compressive strength	JIS R 1608	MPa	2940
Flexural strength	JIS R 1601	MPa	Surface a, axis c: 690
Modulus of Elasticity	JIS R 1602	GPa	470
Poisson's ratio	JIS R 1602		-
Fracture toughness	JIS R 1607	MPa*m <sup>1/2</sup>	-

#### Thermal Properties

Specific Heat 20°C	JIS R 1611	J/gK	0.75
Thermal Conductivity	JIS R 1611	W/mK	41
Expansion coefficient 40-400°C	JIS R 1618	10 <sup>-6</sup> /K	Parallel to axis c: 7.7
Expansion coefficient 40-800°C	JIS R 1618	10 <sup>-6</sup> /K	Vertical to axis c: 7.0
Thermal Shock Temperature Difference (in water)	JIS R 1648	°C	-

#### Electrical Properties

Dielectric strength	JIS C 2141	kV/mm	48
Specific Resistance 20°C	JIS C 2141	Ω•cm	>10 <sup>14</sup>
Specific Resistance 300°C	JIS C 2141	Ω•cm	-
Specific Resistance 500°C	JIS C 2141	Ω•cm	10 <sup>11</sup>
Dielectric constant (1 MHz)	JIS C 2141		parallel to axis c: 11.5 vertical to axis c: 9.3
Dielectric Loss Angle (1 MHz)	JIS C 2141	10 <sup>-4</sup>	<1
Typical Colour			transparent

The values are typical material properties and may vary according to products configuration and manufacturing process.