Silicon nitride AMB copper-clad substrates arranged in a rack

Silicon Nitride AMB Copper-Clad Substrates

Product ID / SKU: FWM/CS-AMB-004

Material: Ceramic / Copper AMB System

Product type: Ceramic Substrate

Si3N4 AMB copper-clad substrates positioned for high-reliability power modules and repeated thermal cycling.

Si_3N_4 Substrate (Sinalit) Properties

Property	Sinalit - bare Si_3N_4 substrate	Conditions / ±10% measurement tolerance (except ref.)
Density (g/cm³)	≥3.22	DIN EN 993-1
Bending strength (MPa)	≥700	-
Fracture toughness (MPa·m½)	≥6.5	Indentation-fracture method
Thermal conductivity (W/(m·K))	90	Room temperature; DIN EN 821-2
Coefficient of thermal expansion (10^{-6}/K)	3.3 (ref.)	100-800°C; DIN 51045-1
Dielectric strength (kV/mm)	≥25	20°C; AC / DC; DIN EN 60243-1
Volume resistivity (Ω·cm)	≥10^{14}	Room temperature; IEC 62631-3
Young’s modulus (GPa)	≥280	ASTM C1259-15
Specific heat capacity (J/(g·K))	≥0.68	25°C; DIN EN 821-3 Method B
Relative permittivity	7.8 (ref.)	Room temperature; 1 MHz; Ra ≤0.4 µm; ASTM D150
Dielectric loss tangent	≤0.003	Room temperature; 1 MHz; Ra ≤0.4 µm; ASTM D150

Typical Construction Parameters

Construction item	Typical configuration	Applicable condition
Ceramic base	Silicon nitride (Si3N4)	Grade and route dependent
Si3N4 thickness	0.25 / 0.32 mm	Si_3N_4 ceramic layer
Copper thickness	0.30 / 0.40 / 0.50 / 0.80 mm	Selected AMB layer combinations

Construction item	Typical configuration	Applicable condition
Pattern	Custom power circuit	Drawing review required
Surface finish	Bare Cu and selected plated finishes	Assembly-process dependent