

SiN Insulating Heat Dissipation Substrates



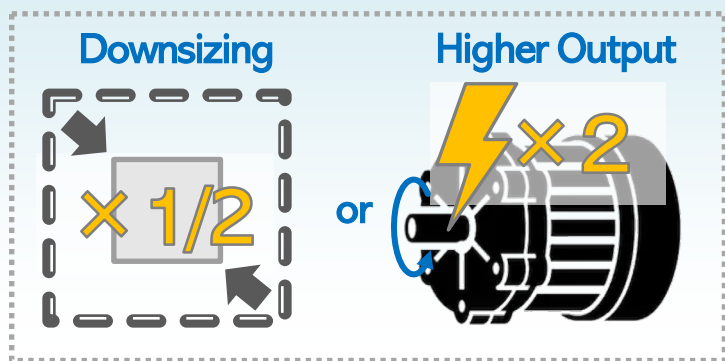
Industry highest standard heat dissipation and strength

This product is an insulation and heat dissipation substrate for semiconductor products. It boasts reliable insulation properties even with thin thickness. It has excellent strength and heat dissipation characteristics, making it ideal for high loads and high power applications.

Point 1

Downsizing · Higher Output Can be Achieved

For example, if resin is replaced by silicon nitride of the existing design, heat dissipation effect can be doubled. Also, downsizing and higher output of the product can be achieved.



Point 2

Design with High Load is Possible

Silicon nitride ceramics have an excellent mechanical properties. It makes it possible to achieve items such as following which was difficult in the conventional material.

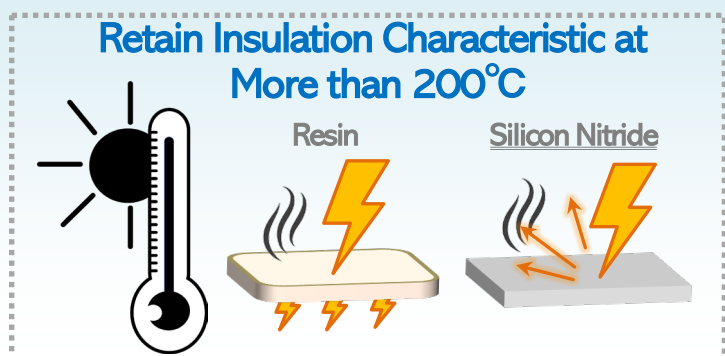
- Stack with high load
- Use under high vibration
- Screwing with holes etc ...



Point 3

Stable Insulation Properties Even at High Temperature

Fluctuation of characteristic value under high temperatures is small for Silicon nitride. Insulation is retained even at high temperature of more than 200°C, so it is possible to adapt to increased junction temperature of semiconductor.



Typical values for properties of fine ceramics for electronics

Item	Measuring method	Unit		Silicon nitrides (Si ₃ N ₄)	
				TSN-90	
Density	JIS Z8807	RT	Mg/m ³	3.35	
Thermal properties	Specific heat	JIS C2141		J/kg·K	650
	Thermal conductivity	JIS R1611		W/m·K	90
	Coefficient of thermal expansion	JIS C2141	RT-500°C	x10 ⁻⁶ /K	3.4
	Dielectric strength	JIS C2110-1	50Hz	kV/mm	25.0
Electrical properties	Volume resistivity	JIS C2141	RT	Ω·m	1x10 ¹⁵
	Dielectric constant	JIS C2141	1MHz		8.0
	Dielectric factor	JIS C2141	1MHz	tanδx10 ⁻⁴	8.0
	3-point bending strength	JIS C2141	RT	MPa	680
Mechanical properties	Fracture toughness	JIS R1607	RT	MPa·m ^{1/2}	6.5
	Young's modulus	JIS R1602	RT	GPa	300
	Poisson's ratio	JIS R1602			0.27
	Features				High thermal conductivity High strength
Main applications				Substrates for semiconductor assembly Radiator plates (for compression force) Heatsinks	

The values in the table are reference values, not guaranteed values.

Standard design

Item	Unit	Silicon nitride (Si ₃ N ₄)	
		TSN-90	
Outer dimensions	mm	MAX 170 x 130	
	Tolerance	±0.15 (Laser cut)	
Thickness	mm	0.32	
	Tolerance	±0.05mm	
Warp	mm/mm	0.4% Under (≤50mm)	
Surface area	—	Blast processing (Honing)	

Values on the chart are standard design rule and not guaranteed value.
Please contact us for possibility of corresponding to designs not covered in above chart.