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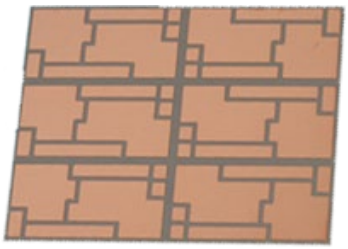
SIN Insulating Circuit Substrates



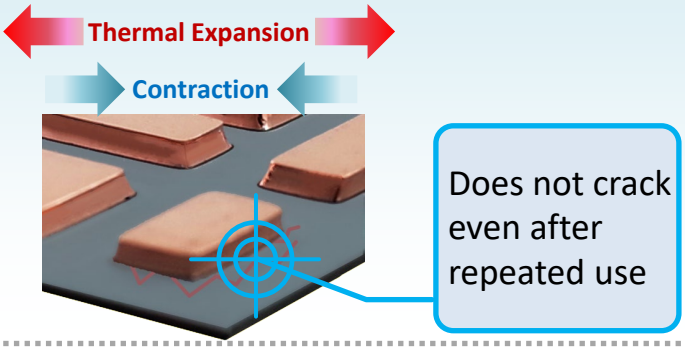
Industry highest standard heat dissipation and strength

This product is an insulation and heat dissipation substrate with copper circuit, for mounting semiconductor chips in the power module. It is a high reliability substrate that has excellent heat cycle resistance and difficult to crack even after repeated use.

Point 1

High Reliability (High Heat Cycle Resistance)

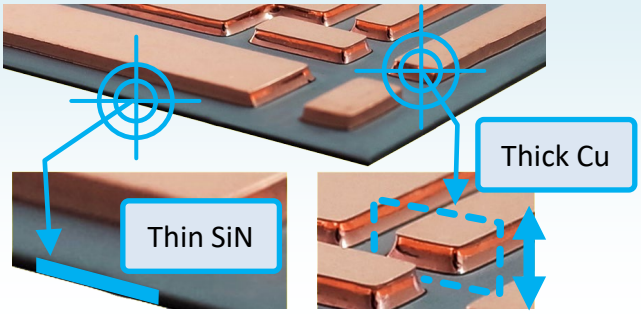
Silicon nitride ceramics have excellent heat cycle resistance.
It is difficult to crack even if exposed to thermal expansion and contraction under repeated use.



Point 2

High Heat Dissipation for Thick Copper and Thin SIN

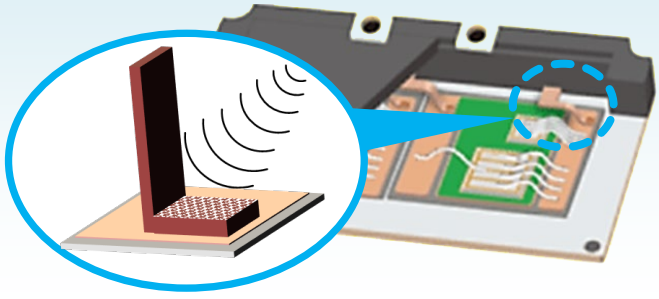
Making use of excellent mechanical properties of silicon nitride ceramics, bonding of thick copper and thinning of SIN are possible. It contributes to reduction in thermal resistance and inductance.



Point 3

Possible to Apply US(ultra sonic) Welding

This product is possible to withstand the pressure and vibration of US bonding, which has been widely used in recent years. It eliminates the need for solder directly under the Cu electrode, thus improving productivity and the reliability of bonding to the pattern-side Cu plate.



Toshiba Materials Co., Ltd.

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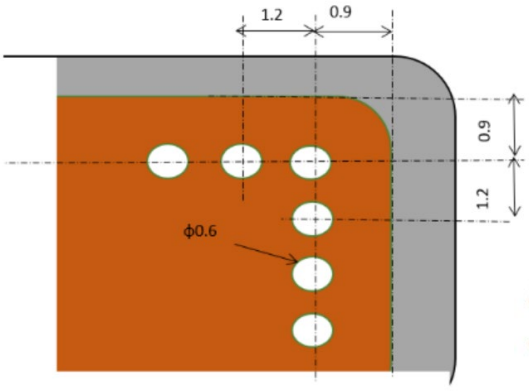
Electrode material	Cu									
[D]Cu thickness(mm)	0.10	0.15	0.20	0.25	0.30	0.40	0.50	0.60	0.70	0.80
[E]Insulation distance(mm)	min.0.5						min.0.7		min.1.0	
[F]Pattern dimention(mm) ※The bonding surface on the ceramic side is used as the reference. ※Please contact us if you have any specifications for the top side dimensions of the copper pattern.	min.0.4		min.0.5				min.0.7		min.1.0	
[G]Insulation distance(mm) ※The insulation distance between patterns[G'] must satisfy the minimum dimensional distance.	min.0.4				min.0.5	min.0.6	min.1.0		min.1.2	
Pattern Tolerance(mm)	±0.2		±0.3				±0.4		±0.5	
[H]Taper dimention(mm)	≦0.5D（less than 1/2 of the Cu）									
Warp(mm)	0.2/50 Under）									
Surface roughness(JIS B 0601:2001)	Rz≦15,(Ra≦6)									
Peel Strength(JIS C 6481:1996)	≧9.8kN/m									
Plating	Electroless plating　Ni / NiAu									
Plating thickness (any measurement point)	Ni:2～6μm / Ni:2～6μm,Au:0.05～0.1μm									
Solder Resist ※Please contact us if you have a specific solder resist.	UV curing type / Thermosetting type									
Solder Resist Thickness	5～45μm									

*The value of a table is not a guaranteed performance.

*Please contact us for possibility of correponding to designs not covered in above chart.

Dimple Dimensions

When Cu thickness is 0.3 mm or less。Tolerance ±0.3㎜。



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▸Joining method of copper circuit

In our AMC (active metal brazed copper) substrates, the copper circuit is joined to the ceramic material with a brazing material in between.
This makes it easy to create fine patterns, and produces power module substrates with outstanding heat resistance and cost effectiveness.