

Aluminum Nitride Ceramic Thermal Pads

■ Introduction



Innovacera Ceramic Thermally Conductive Interface Pads are designed to provide a preferential heat-transfer path between heat-generating components, heat sinks, and other cooling devices.

The pads are used to fill air gaps caused by imperfectly flat or smooth surfaces which should be in thermal contact.

The pads are made by ceramic material such as alumina ceramic and aluminum nitride, which help in providing enhanced thermal conductivity and excellent insulation performance.

■ Applications

Power Devices

Integrated Circuit (IC) Chip
Packaging Heat Conduction

IGBT Transistor Heat Sink

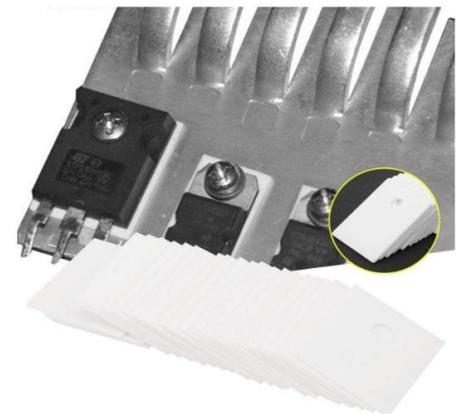
MOS Transistor

LED Board Thermal Interface
Material (TIM)

Chip ON Film (COF) Heat
Conduction

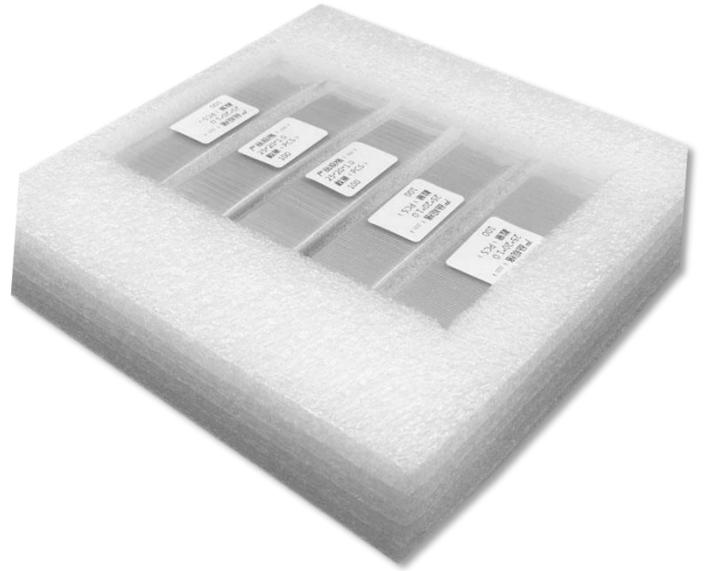
MOSFET Transistor

Heat Sink Interface



Ceramic Thermal Pads Installation Steps:

- ① Clean the target surface: Clean the dust or stains on the surface of the object to be installed, and then align the hole position of the ceramic insulating sheet;
- ② Power tube bonding: Stick the power tube on the ceramic insulating sheet;
- ③ Fixed the insulation sheet: Use screws to fix the power tube and ceramic insulating sheet on the installation object.



■ Aluminum Nitride Material Properties

Properties		Value
Bulk Density	g/cm ³	≥3.3
Water Absorption	-	0.00
Flexural Strength	MPa	>300
Vickers Hardness	GPa	11.00
Modulus of Elasticity	GPa	>200
Dielectric Constant	1MHz	8.80
Coefficient Linear Thermal Expansion	/°C, 5°C/min, 20–300°C	4.6x10 ⁻⁶
Thermal Conductivity	30 Degree Celsius	≥170
Volume Resistivity (Ω.cm)	20 Degree Celsius	>10 ¹⁴
	300 Degree Celsius	10 ⁹
	500 Degree Celsius	10 ⁷
Dielectric Strength	KV/mm	15–20

Remark: The value is just for review, different using conditions will have a little difference.

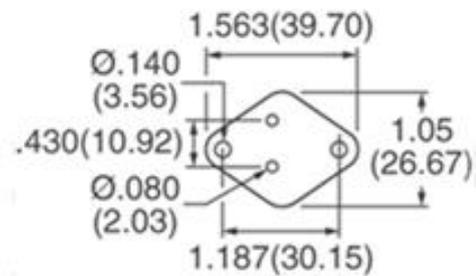
■ Regular Size & Drawing

For Package Type: TO-3P/TO-220/TO-247/TO-264/TO-3/TO-254/TO-257/TO-258, With Hole or Without Hole.

TO-3P	25x20x1mm (other thickness is available, too);
TO-220	20x14x1mm (other thickness is available, too);
TO-247	22x17x0.635mm (other thickness is available, too);
TO-264	28x22x1mm (other thickness is available, too);
TO-3	39.7x26.67x1mm (Rhombus shape);
TO-254	34x24x1mm (other thickness is available, too);
TO-257	40x28x1mm (other thickness is available, too);
TO-258	50.8x50.8x1mm (other thickness is available, too).

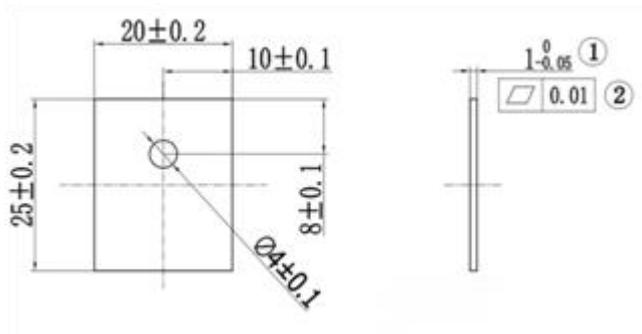
Other Standard Size:

- 25.4x25.4mm;
- 114.3x114.3mm;
- 152x152mm;
- 190.5x138mm ...

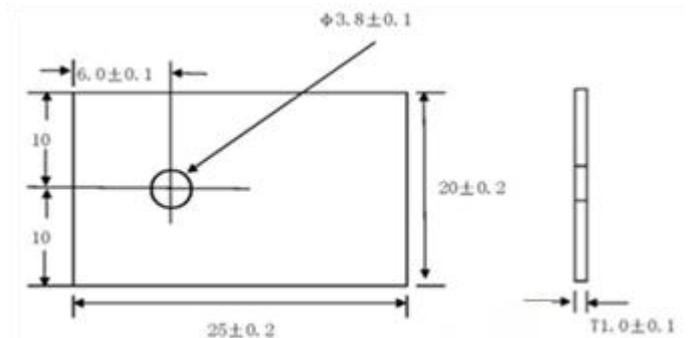


TO-3

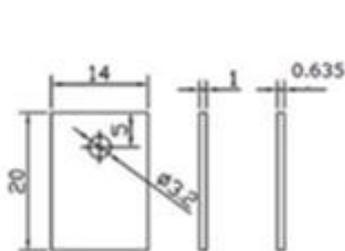
Customized sizes are available.



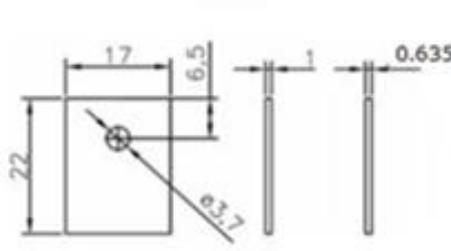
TO-3P



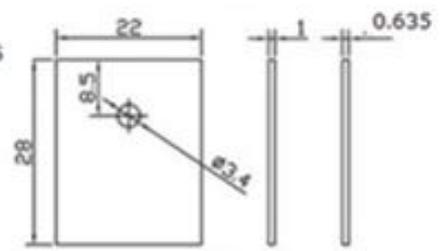
TO-3P



TO-220



TO-247



TO-264

■ Machine Detail

Technology Data	Name	Technology Requirement	Remark
1	Machine Size	Thickness	as per drawing
2	Flatness	0.01	
3	Camber	≤2‰	
4	Surface Roughness	Ra≤0.5	
5	Appearance Request	Smooth surface, no dirt, water stains, watermarks, no chip, cracks, edge breakage, scratches and other defects	
6	Clean Request	After ultrasonic cleaning, clean again with alcohol, dry and bake in time to ensure that there is no water stains and watermarks on the surface	
7	Package Request	After machining, products are placed in special pearl-cotton packaging boxes as required for turnover and transportation to avoid defects such as bruises and scratches.	

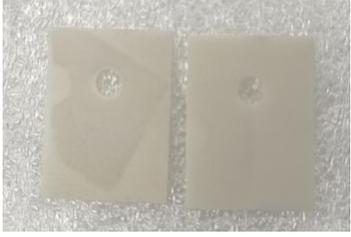
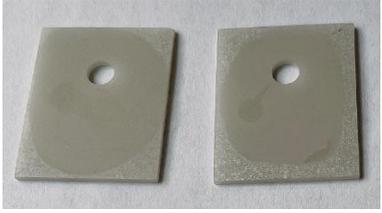
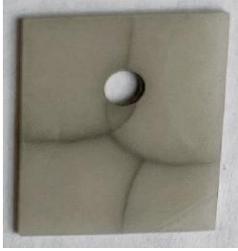
■ Product Inspection and Evaluation—size and Roughness

No.	Item	Standard Request	Inspection Way
1	Thickness	0.95–1.0 mm	Vernier calipers
2	Camber	≤2‰	Gauge of height
3	Surface roughness	Ra≤0.5	Surface roughness detector

■ Product Quality Inspection Requirement

No.	Item	Level of Sampling	AQL Value (Acceptable Level)
1	Appearance	According to AQL sampling standard	AQL=0.65
2	Thickness		
3	Camber		
4	Surface Roughness		

■ Machine Detail

No.	Defect Type	Picture	Standard Request	Inspection Way
1	Watermark		Not Allowed	Visual
2	Didn't Machine Well		Not Allowed	Visual
3	Scratch		Not Allowed	Visual
4	Coloboma		Not Allowed	Visual
5	Crack		Not Allowed	Visual
6	Dirty		Not Allowed	Visual

■ ALN Product Price List

Item	Model	Material	Product Size (mm)	Product Thickness (mm)	Product Net Weight (g)	Quantity (pcs)	EXW Price (USD)	Total Amount (USD)
1	TO-3P with holes φ3.8mm	Aluminum Nitride	25*20	1	1.65	1000	\$0.63	\$630.00
				1	1.65	10000	\$0.50	\$5,000.00
				0.635	0.99	1000	\$0.60	\$600.00
				0.635	0.99	10000	\$0.48	\$4,800.00
2	TO-220 with holes φ3.2mm	Aluminum Nitride	20*14	1	0.92	1000	\$0.48	\$480.00
				1	0.92	10000	\$0.37	\$3,700.00
				0.635	0.55	1000	\$0.45	\$450.00
				0.635	0.55	10000	\$0.35	\$3,500.00
3	TO-247 with holes φ3.7mm	Aluminum Nitride	22*17	1	1.23	1000	\$0.55	\$550.00
				1	1.23	10000	\$0.43	\$4,300.00
				0.635	0.74	1000	\$0.54	\$540.00
				0.635	0.74	10000	\$0.42	\$4,200.00
4	TO-264 with holes φ3.4mm	Aluminum Nitride	28*22	1	2.03	1000	\$0.63	\$630.00
				1	2.03	10000	\$0.50	\$5,000.00
				0.635	1.22	1000	\$0.60	\$600.00
				0.635	1.22	10000	\$0.48	\$4,800.00
5	TO-254 with holes	Aluminum Nitride	34*24	1	2.69	1000	\$1.00	\$1,000.00
				1	2.69	10000	\$0.82	\$8,200.00
				0.635	1.62	1000	\$0.98	\$980.00
				0.635	1.62	10000	\$0.80	\$8,000.00
6	TO-257 with holes	Aluminum Nitride	40*28	1	3.70	1000	\$1.50	\$1,500.00
				1	3.70	10000	\$1.26	\$12,600.00
				0.635	2.22	1000	\$1.48	\$1,480.00
				0.635	2.22	10000	\$1.24	\$12,400.00

■ ALN Product Package Requirement

- ① The product is cleaned according to the requirements, after completely dried, placed in the special pearl cotton packaging box.
- ② One group of 100 pieces of products is placed in the small cells in the packaging box. There are 5 cells in each packaging box, and 500 pieces can be placed in total (as shown in picture).
- ③ After each version of the packaging box is filled with products, it needs to wrap the film tightly, and attach the quantity label (Picture).
- ④ Put the pearl-cotton packing box into the outer carton, paste the specification and quantity label on the surface.
- ⑤ Package carton size: 21x21x12cm
- ⑥ Gross weight: 1.5kgs





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