Changzhou Tiger Electronic Materials Technology Co., Ltd.

POWER YOUR CHIPS

Company Introduction

• Changzhou Tiger Electronic Materials Tehnology Co., Ltd. is mainly engaged in the technical development and consulting of heat dissipation components in the field of power semiconductor IGBT packaging, and provides the overall scheme, technical services, production and sales of heat dissipation materials. The company focuses on the third generation of electronic packaging materials - aluminum-based silicon carbide research and development, production and sales. A variety of AlSiC, MoCu, W-Cu, MoCuMo, Kovar and Invar and so on products have been developed to meet the needs of users, providing professional thermal management materials and technical solutions for manufacturers of microwave devices, high-power devices and microelectronic devices.

• In conjunction with many well-known universities and research institutes in China, the company independently develops the preparation, plating process and production equipment of aluminium-based silicon carbide composites, with high production efficiency and stable product performance.

• The company has advanced production equipment and various supporting production and testing equipment, has strong production and testing capabilities, and has established a relatively perfect quality management system of ISO 9001. With abundant scientific research achievements, rich practical experience and advanced production equipment, Tiger is in the leading international level in product performance and production technology.

• The company's main products: IGBT module heat dissipation baseplate, rectifier heat dissipation baseplate, solid-state relay, thyristor element heat dissipation baseplate, high-end LED display heat dissipation baseplate and other special heat dissipation baseplate. The company's products are widely used in rail transit, new energy vehicles, power systems, aerospace and national defense and other fields. They are the key materials in the field of new generation power electronic packaging.

铝碳化硅应用

Aluminum silicon carbide application

● 铝碳化硅IGBT基板

铝碳化硅复合材料是良好的电子封装材料，高热导率、低热膨胀系数、高比刚度、易成形、低成本，使其从出现伊始，就得到封装热管理行业的青睐，也是目前高功率IGBT模块封装最佳的选择。

● 铝碳化硅基板在电子封装领域的先天优势

铝碳化硅复合材料的天然优势大幅提高了其在振动、粉尘等恶劣工作环境中功率模块的工作稳定性，这使铝碳基板成为高铁、新能源汽车、风力发电、焊接应用上IGBT模块的标配。

Performance Data

SiC	55~70%
Thermal Conductivity ((W/mK)@25℃)	200~240
Specific heat ((J/gK)@25℃)	0.803
Density (g/cm^3)	2.97~3.01
CTE (ppm/℃)	(25℃-100℃)7.42
	(25℃-150℃)7.93
	(25℃-200℃)8.35
Bending Strength (MPa)	⩾300
Elongation at Rupture (%)	0.28
Fracture Toughness	12
Electrical Resistance (μOhm-cm)	20
Hermeticity ($atm-cm^3/sHe$)	$<10^{10}$

AlSiC Performance in Different Companies

Company	Model	Si/(vo l %)	TC/ (W.m^{-1}.K^{-1})	CTE/(×10^{-6}K^{-1})	Density /(g.cm^{-3})
TTC	MCX-703 MCX-724		185 165	7 7. 2	3 2.94
AMETEK	SiC/Al	55	190~200	9.77~10.56	2.96
CPS	AlSiC9 AlSiC10	63 68	180~200 210	8~8.75 8.75	3.01 3.03
DENKA	Al-SiC		180-200	7.5	2.96
Alpha Materials	SiC/Al	—	170~200	6.5~9.5	2.95~3.0
SEI	SiC/Al	70 65	140 130	8 9	2.6 2.6
Xi'an Miqan Microelectronics Materials	AlSiC	55 63 70	180	9.8 8 7	2.96 3 3.02
Hunan Harvest Technology Development	AlSiC-11 AlSiC-9 AlSiC-7		175 180 180	11.2 9.3 7.2	2.89 2.93 3.01
Beijing Baohang Advanced Materials	Al/SiC	50~70	170	8~12	—
Tiger (泰格尔)	AlSiC	55~70	200~240	7.42	2.97~3.1

Alloy Materials

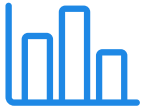
Molybdenum-copper (Mo-Cu), tungsten-copper (W-Cu), CMC and other materials combine the low expansion coefficient of molybdenum and tungsten with the high thermal conductivity of copper, which can effectively release the heat of electronic devices, and can be used in large-scale integrated circuits and high-power microwave devices. According to customer requirements, the surface can be plated with nickel, gold, silver, etc.

Moterials	(Gt%)	TC/ ($W.m^{-1}.K^{-1}$)	CTE/($\times 10^{-6}K^{-1}$)	Density /($g.cm^{-3}$)
W-Cu	W94Cu6-W50Cu50	140-340	6-12.5	17.6-12
Mo-Cu	Mo90Cu10-Mo50Cu50	150-270	5.6-10.0	10-9.54
Cu-Mo-Cu	Cu/Mo/Cu13：74：13-Cu/Mo/Cu1：1：1	200-305（X） 170-250（Y）	5.6-8.8	9.88-9.3
Cu-MoCu-Cu	-	200-300	7.3-11.5	9.5-9.1
W	-	167	4.67	19.3
Mo	-	138	4.90	10.2
Cu	W94Cu6-W50Cu50	394	17.1-19.4	8.93
Kovar（4J29）	-	17	5.8	8.2
4J36	-	11	0.4	8.04

Advantages

Stable

Good uniformity without bad stress



Better Performance

Top level heat dissipation performance with best uniformity

Advanced Creativity

Perfect realizing the design intention

Advantages

1

World-class performance

Our flat baseplates have the World-class performance and with best uniformity at every point of the plate.

2

Scientific production methods

Our scientific production process enables our production capacity to meet a large number of customer needs. We now can manufacture 2000 PCS/Day , and expecting 10000 PCS/Day until 2020.

3

Electroplating process

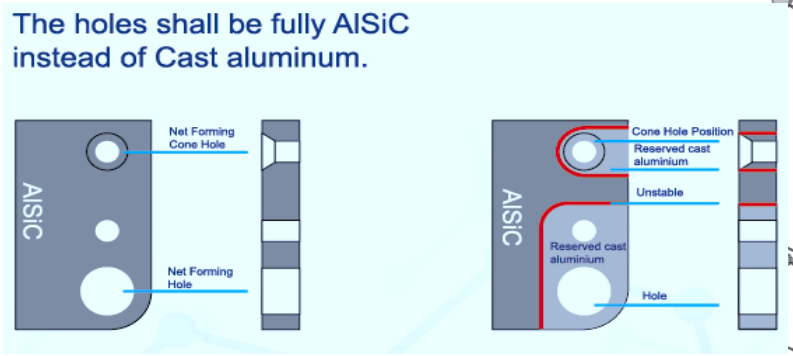
We have a powerful plating process, with a plating plant of 30,000 sqm.

Advantages

4

We are all AlSiC

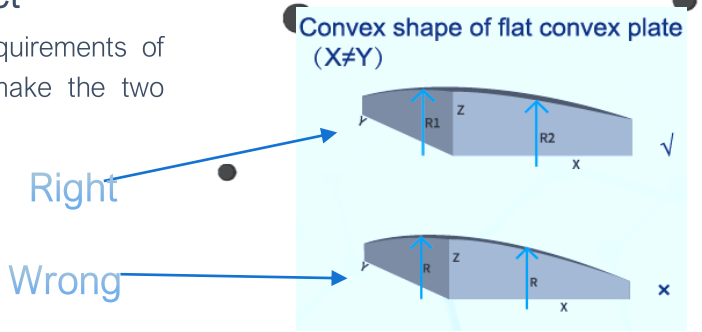
Our baseplates are Net Forming by AlSiC. There will be no fracture and shedding between aluminium and silicon carbide, because we are all AlSiC.

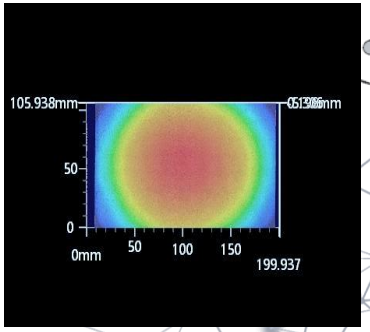


5

Double arc processing effect

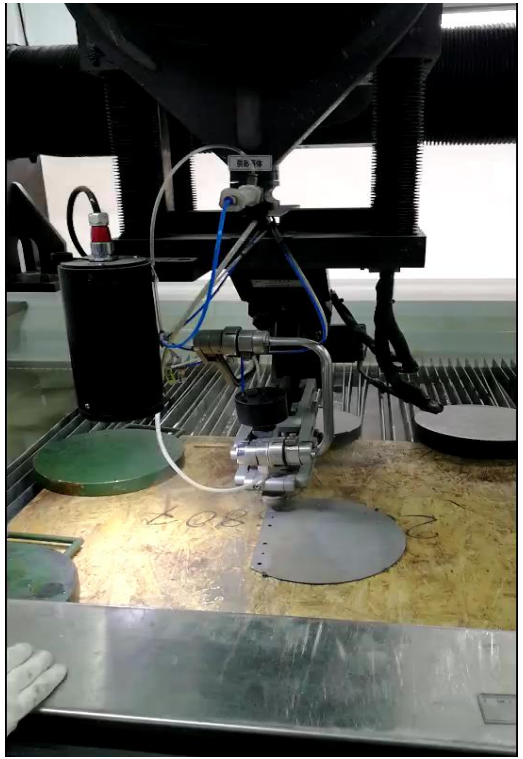
We can achieve the international requirements of double arc processing effect, and make the two radians different.





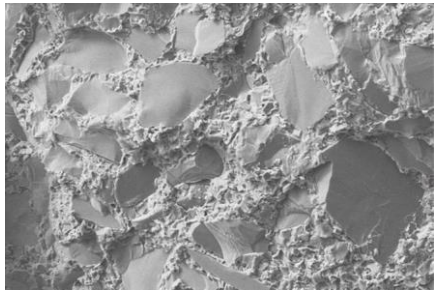
Equipment

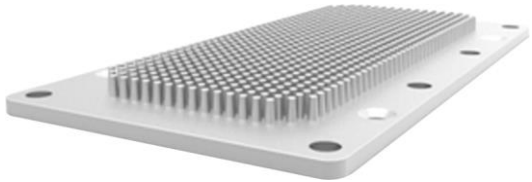
Equipment

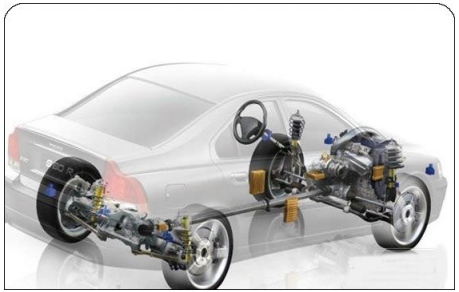


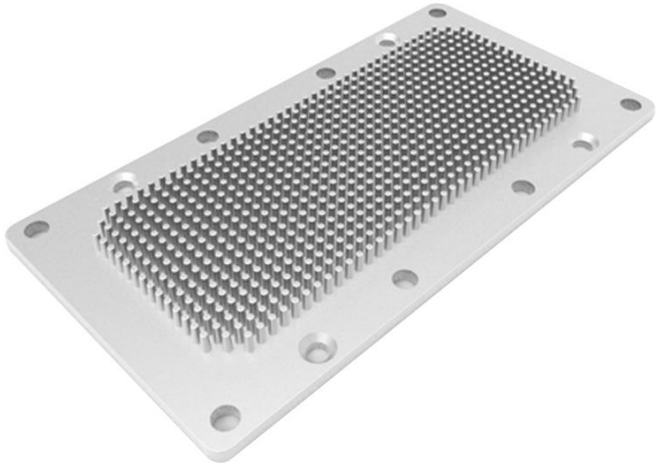
Equipment

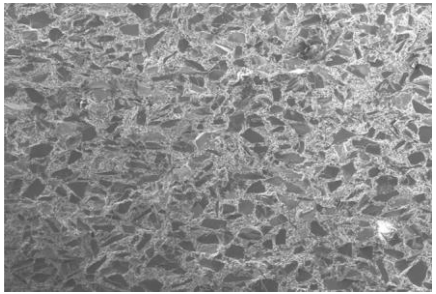
Display



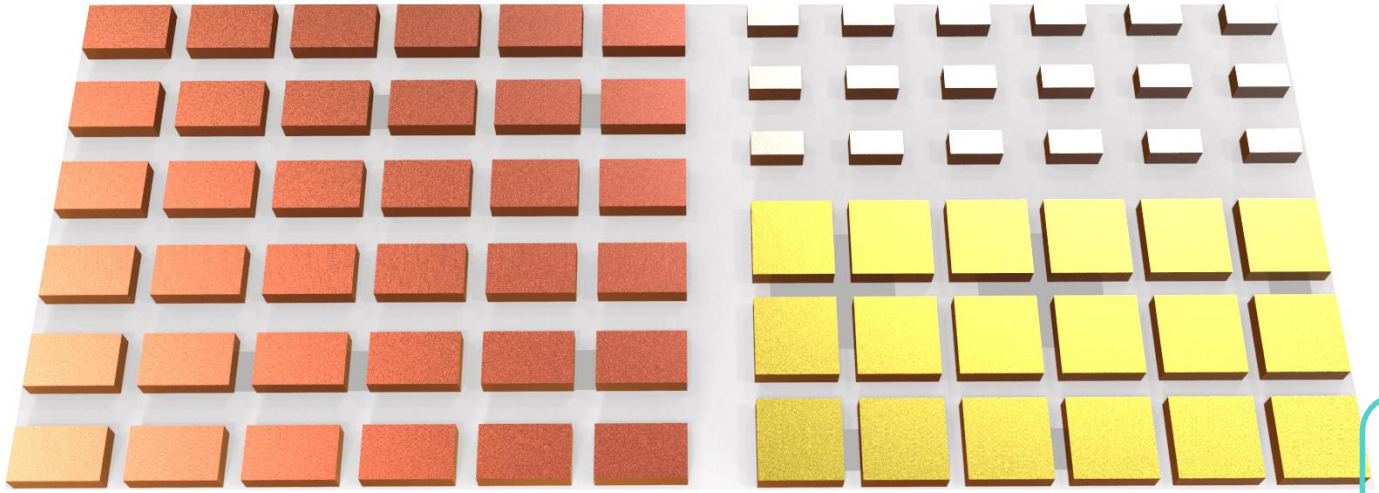








Small Sizes Display(Both Mo alloy materials and AlSiC materials)



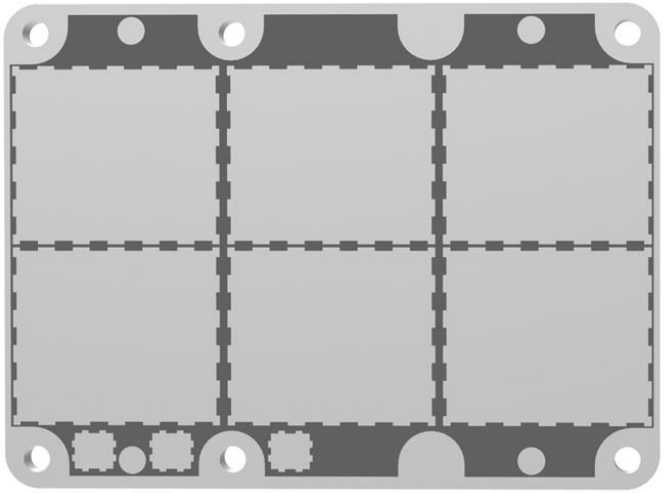
Flat Baseplates

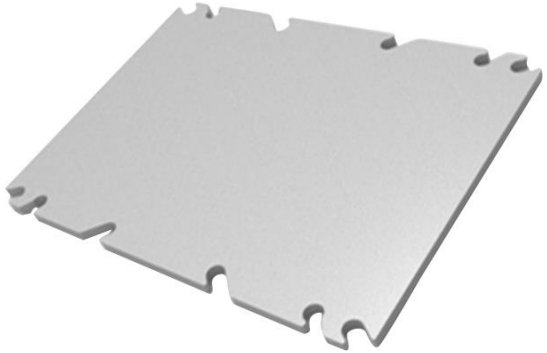
Min. Thickness 0.5mm

Min. Length&Width 2mm* 1mm

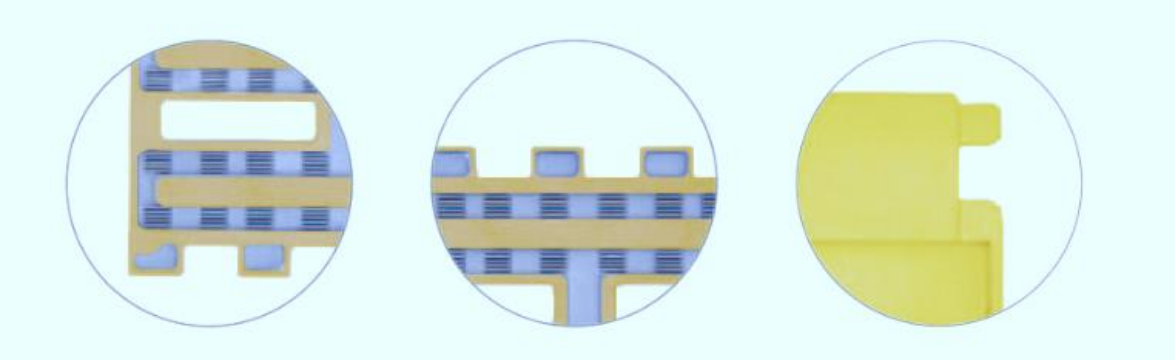
The micro-high-end heat sink has excellent performances such as high thermal conductivity, low expansion and high power. It is the best alternative to traditional heat-dissipating materials such as Cu-Mo. Our daily production capacity can reach 200,000 pieces, and the surface can be plated with nickel, gold, copper, silver, etc.

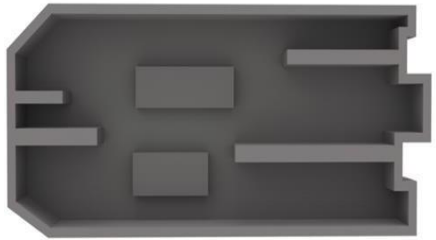
Display

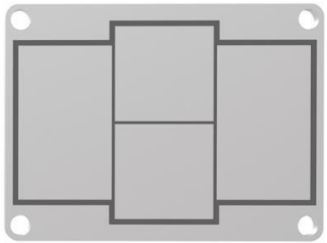


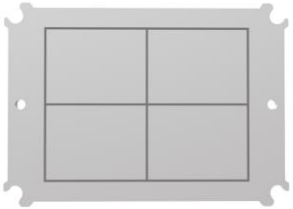


Display

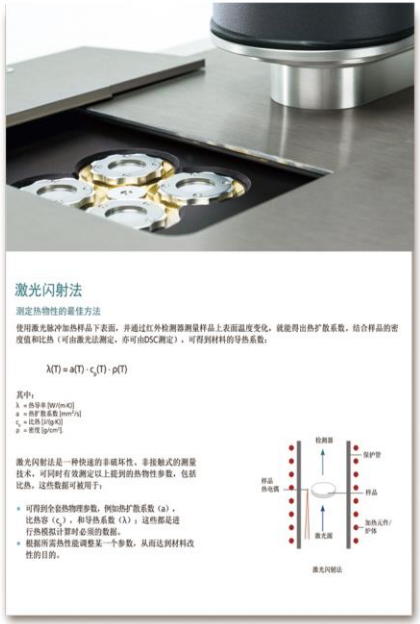








Testing Euipment



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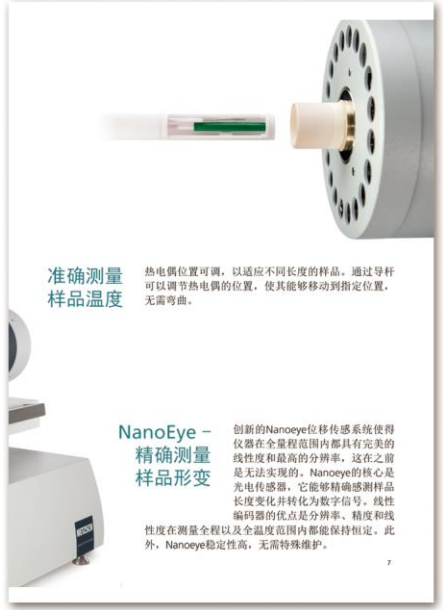

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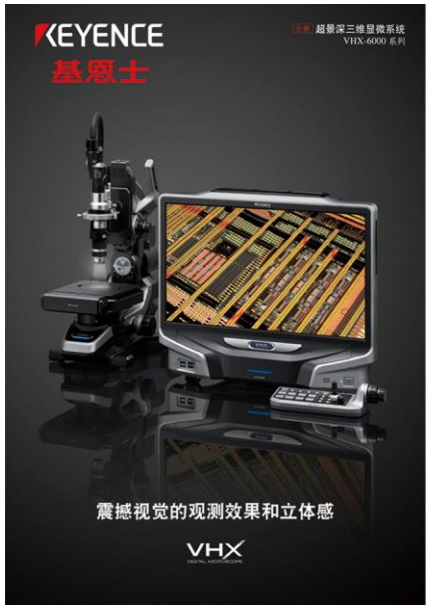

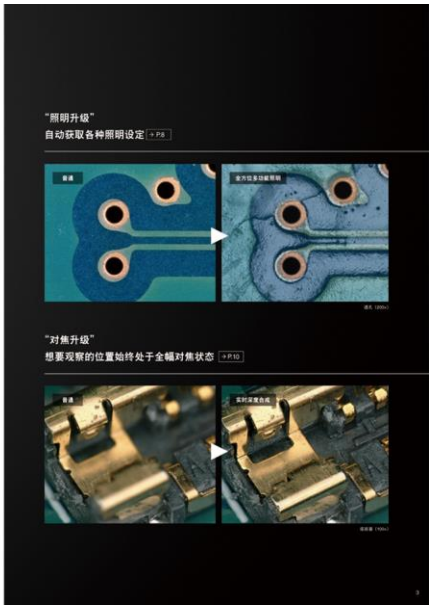

THANK YOU

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