Thermal Conductive Pad

ATCR1R5

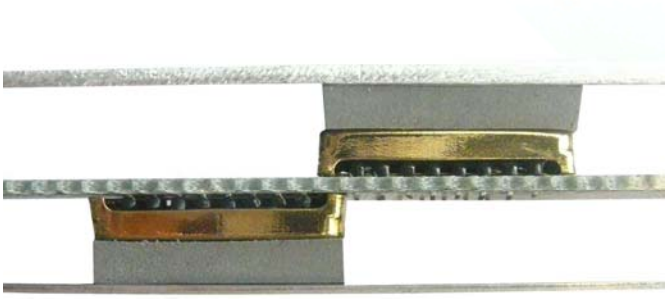

Figure 1. The photo of ATCR1R5

GENERAL INFORMATION

As more and more electronics integrate more powerful features into smaller components, the temperature increase will lead to some problems such as low operating speed, faults in the components, space limit and problems in performance, etc. Therefore, temperature control has been one of the challenges in electronic design, i.e. how to effectively dissipate more heat generated by larger unit power in more and more limited space.

According to the engineering, soft thermal conductive pad is designed to make irregular surfaces match each other. Adopting high performance thermal conductive material to eliminate the air gap, the pad has higher thermal conversion capability which allows the components to work at a lower temperature.

The thermal conductive pad is flexible and has good insulation, compressibility, and natural tack. It is designed for transferring heat by gaps. Filling the gap, the pad is able to pass the heat from the heated part to the heat sink. At the same time, the pads have other functions such as insulation, shock absorption and sealing. Widely applied in electronic products, thermal conductive pad is an excellent thermal conductive filling material with proper thickness, suitable for smaller and thinner devices.

FEATURES

- Thermal conductivity: 1.5W/m.k
- Low pressure applications
- Natural tack
- Electrical insulating
- High temperature resistance
- 100 % Lead (Pb)-free and RoHS Compliant

DESCRIPTION

ATCR1R5 series thermal pad is a special compound formed by mixing the silicon gel flour and the ceramic flour. This pad has natural weak adhesion on both sides and presents good thermal conductivity and electrical insulation under low pressure. ATCR1R5 series can work stably at -40～150ºC. The flame rating is UL94 V0.

With good thermal conductivity, wide temperature range and low price, this pad could be a cost-effective one.

APPLICATIONS

- Computer cooling modules
- Cooling devices
- High speed and large storage driver
- The automobile engine control unit
- Flat-panel displays
- Power conversion devices
- LED lighting devices
- PDP display screens
- LCD backlights

SOLUTIONS

Heat management problem usually happens to 3C electronic products, which can be solved by dissipating more heat. However, it is difficult to effectively dissipate heat only by using metal heat sink, so when there is a limited space in the product, a thermal conductive pad is needed to attain a better cooling effect. With good thermal conductivity and low thermal resistance, thermal conductive pads provide excellent cooling effect for heated electronic assemblies by filling the gap between the electronic components and the heat sink, thus enhancing heat conduction.

PRINCIPLES

Figure 2 shows the air path between the two surfaces when there is no thermal pad between the heated chip and the heat sink.

Figure 3 shows the air path when there is a thermal pad in-between.

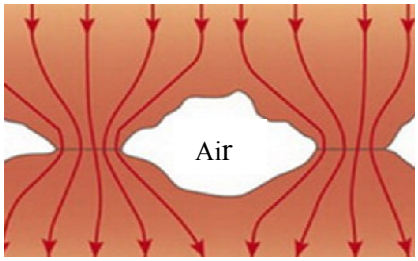

Figure 2. Without a thermal pad in-between

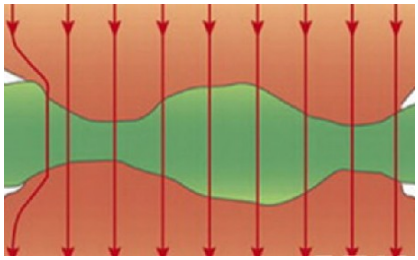

Figure 3. With a thermal pad in-between

SPECIFICATIONS

Table 1. Characteristics

	ATCR1R5-0.5	ATCR1R5-1.0	ATCR1R5-2.0	ATCR1R5-3.0	ATCR1R5-4.0	ATCR1R5-5.0	Test method	Unit
Size	200×200×0.5	200×200×1.0	200×200×2.0	200×200×3.0	200×200×4.0	200×200×5.0	ASTM D374	mm
Color	Dark gray						Visual	
Material	Silicon gel & ceramic							
Elongation	132	135	134	143	146	153	ASTM D412	%
Density	2.5						ASTM D792	g/cc (gram/cubic centimetre)
Hardness	30±5	18±5	18±5	18±5	18±5	18±5	ASTM D2240	Shore C
Tear Strength	0.80	0.80	0.80	0.70	0.70	0.65	ASTM D412	KN/m (kilo-newton/ meter)
Volume Resistivity	$8.0*10^{15}$						ASTM D257	Ω.cm
Dielectric Coefficient	5.75						ASTM D150	@1MHZ
Flame Rating	V-0						UL 94	
Insulation Strength	6.5	8	＞10	＞10	＞10	＞10	ASTM D419	Kv/mm (kilovolt/ millimeter)
Weight Loss	＜0.3						@200 ℃ 240H	%
Working Temperature	–40 ～ 150						EN344	℃
Thermal Conductivity	1.5						ASTM E1461	W/m.k (watt/ millikelvin)

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