American Standard Circuits
Creative Innovations In Flex, Digital & Microwave Circuits

Product Information Sheet

Electrasil™ -2

Product Description:

Electrasil™-2 is a silicone based conductive adhesive that provides a cost effective technique to create a thermally and electrically conductive bond between Printed Circuit Boards (PCBs) and metal carriers or heat sinks. Although the formulation of this material was specifically targeted toward meeting the critical requirements and performance goals for RF power amplifier applications, it also lends itself extremely well to other high or low frequency applications where specialized PCBs need to be mounted to a metal surface or housing. As a 0.005" thick sheet of a thermoplastic elastomer material, it provides a uniformly thick and strong bonding between the adjacent surfaces. Being an elastomer, it accommodates any TCE mismatch of the bonded layers, so there is no residual stress left in the bonded assembly. It can withstand a continuous operating temperature of 260°C (500°F) as well as multiple excursions up to 288 °C (550 °F) for subsequent operations, such as solder reflow for component installation. The ability to retain its bond strength and thermal and electrical performance after multiple high temperature excursions at these higher temperatures also lends itself very well to the use of higher temperature lead-free solders. As a silicone elastomer, its flexible nature makes it ideally suited for improved life cycle performance, without any delamination problems, when used with thermoplastic circuit materials such as PTFE where large X and Y dimensional changes may occur during the bonding process. This product is well suited for RF applications ranging from 15 GHz to 45 GHz. For Applications greater than 45 GHz please contact ASC sales for a custom solution. ASC has developed this technology and has been granted a patent by the United States Patent & Trademark Office (U.S. Patent 7,527,873)

Physical Description:

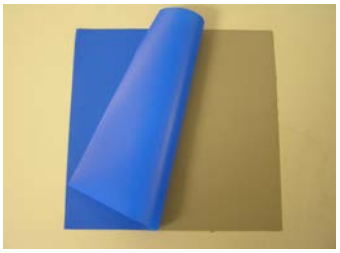
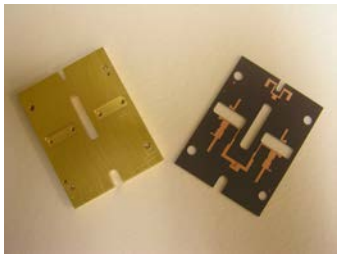
The adhesive is a silicone based thermoplastic elastomer that utilizes both mechanical and chemical bonding mechanisms to insure reliable adhesion at the bond-line interface. The high thermal and electrical conductivity is due to heavily loaded silver that ensures very low electrical and thermal resistivity. With the proven stability under adverse environmental conditions of the silicone adhesive (in space, land or water), combined with excellent physical and electrical properties of the silver fillers, Electrasil™-2 bonded PCBs would consistently deliver high performance over an extended life cycle.

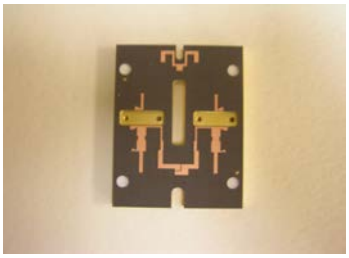
Usage:

Electrasil™-2 is used to bond PCBs to metal carriers (heat sink) prior to the assembly of components. If the customer prefers, American Standard Circuits offers the bonding service to adhere the PCB to the metal carrier. The bonding process requires a minimum pressure of 50 PSI to be applied to the bonding surface and a heat source capable of maintaining a bond line temperature of 165 °C (330 °F) for 30 minutes. Pressure is applied through use of a Fixture Clamping Device, Heated Press or an Autoclave. Heat sources include hot plate, I/R Oven, Convection Oven or an Autoclave. American Standard Circuits has application engineers on staff to help design a compatible bonding process for our customers. Once cured, Electrasil™-2 compresses about 20% of its initial thickness.

Property	Value	Method of Test
Thickness, mils	5 to 200	
Specific Gravity	3.0 to 4.0 ± 0.1	ASTM D297
Durometer, Shore A	70 to 90	ASTM D2240
Tensile (PSI)	150	ASTM D412
Elongation (%)	100 max	ASTM D412
Tear Strength (PPI)	35 to 40	ASTM D624
Bond Strength, PPI (1)	20	ASTM D429
Continuous Operating Temp	-60 C to +260 Deg C	
Thermal Conductivity	>10	ASTM F 443
Flame Retardance	Pass	UL94VO
Resistivity, at 77 F, Ohm-cm (2)	< 0.0004	ASTM D991 (modified) or Mil-G-83528

(1). All Electrasil™-2 samples maintained a cohesive bond after a convection reflow process (at 230 °C) and accelerated life testing (85 °C / 85 % RH for 1000 hours) as demonstrated by destructive peel tests. (2). Resistivity value is also dependent on the type of metal carrier finish used.



475 Industrial Dr., West Chicago, IL 60185 Ph: 630-639-5444 Fax: 630-293-1240 E-mail: technology@asc-i.com