Datasheet revision 1.9

Deep-Space Liquid Metal™
Heat Sink Thermal Compound
79 W/mK** 10g/3cc Syringe

Product Highlights

- **Lead-Free / RoHS 3 Compliant / REACH Compliant**
- **Deep-Space Liquid Metal™**, non-curing, flowable, thermally conductive heat sink compound
- Pure Liquid Metal
- Provides extremely high thermal conductivity of 79 W/m·K**, low bleed and high temperature stability
- Electrically Conducting
- **Alloy contains Gallium and is not compatible with Aluminum Heat Sinks**

Specifications

Alloy:	100% **Deep-Space Liquid Metal™** Pure Metal Proprietary Formula
Heat Sink Material Compatibility:	Nickel-Plated Copper, Nickel, Copper*
Heat Sink Material Incompatibility:	**Aluminum (Do Not Use with Aluminum Heat Sinks)***. Our TC4 alloy contains gallium, which is corrosive to aluminum, it makes it brittle and corrodes the surface, restricting heat flow.
Density:	6.8 g/cc
Melting Range:	10-11°C. From -40°C to 10-11°C, TC4 is a solid malleable thermal interface material (TIM). Above 10-11°C to 150°C, it is a liquid TIM.
Viscosity:	2 mPa·s (Malcom @ 10 RPM/20°C)
Thermal Conductivity:	79 W/m·K**
Thermal Resistance:	0.003 °C*cm^2/W
Electrical Conductivity:	6.10 x 10^6 S/m (at 20°C)
Electrical Resistance:	1.64 x 10^{-7} Ω·m (at 20°C)
Coefficient of Thermal Expansion (CTE):	19 x 10^{-6} / C (at 20°C)
Operating Temperature (Continuous):	-40 to 150°C (-40 to 302°F)
Operating Temperature (Peak):	200°C (392°F)
Operating Life:	>8 years *dependent on several factors, test in application to ensure suitability
Size:	10g/3cc Manual Syringe w/ 2x 25-gauge tips, squeegee

***Gallium is known to alloy with various other metals. TC4 should be tested in your individual application to ensure long term reliability.

** Calculated based on industry data and measurements from testing in the Chip Quik laboratory, using proprietary modified hot plate test method, using 12.7mm (0.5") diameter copper substrates, with TC4 liquid metal thermal interface material (TIM) applied between substrates in a fine layer.

Academic research into Gallium based liquid metal alloys, using laser flash test method, has shown thermal conductivities of up to 350 W/mK can be achieved in ideal laboratory conditions when a small enough quantity, less than 0.01g, of liquid metal is applied to fill all microscopic air gaps between copper substrates. This is very close to the thermal conductivity of the pure copper substrates of 385 W/mK.

Thermal conductivity of liquid metal is highly dependent on application, quantity used, pressure, substrate material and any coatings applied. Testing in end use application is required to determine actual thermal conductivity achieved in application, as it may be higher or lower than 79 W/mK, dependent on a large number of application specific factors.

Application Instructions

Apply sparingly with provided tips. Thinly spread using provided squeegee. Deep-Space Liquid Metal™ is highly conductive and is designed to fill all small cracks and crevices in surfaces to achieve extremely high thermal conductivity. Deep-Space Liquid Metal™ is thermally and electrically conductive, avoid getting it on electrical pins/pads/traces/BGA balls.

Storage and Handling

Store at room temperature 20-25°C (68-77°F).

Shelf Life

>60 months

Transportation

This product has no shipping restrictions. Shipping below 0°C (32°F) or above 25°C (77°F) for normal transit times by ground or air will not impact this product's stated shelf life.

Chip Quik® Thermal Paste Orderable Part Numbers

Thermal Conductivity (W/m·K)	Thermal Resistance (°C*cm^2/W)	Density (g/cc)	Color	Package	Size (g)	Orderable Part Number
0.67	0.16	2.1	White	Syringe	10	TC1-10G
				Syringe	20	TC1-20G
				Jar	200	TC1-200G
4.3	0.06	2.5	Grey	Syringe	10	TC2-10G
				Syringe	20	TC2-20G
				Jar	50	TC2-50G
8.5	0.03	2.5	Grey	Syringe	1	TC3-1G
				Syringe	3.5	TC3-3.5G
				Syringe	10	TC3-10G
79	0.003	6.8	Silver	Syringe	1	TC4-1G
				Syringe	2	TC4-2G
				Syringe	5	TC4-5G
				Syringe	10	TC4-10G
				Syringe	20	TC4-20G
				Syringe	972	TC4-972G
				Syringe	6800	TC4-6800G