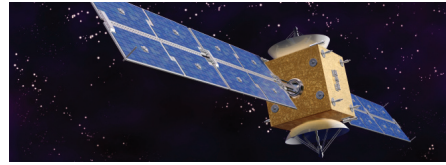


High Conductivity TC1050* Heat Spreader

For Telecommunication, Avionics and Aerospace



Description

TC1050 heat spreader consists of a TPG* core encapsulated within a structural shell. The TPG provides a highly conductive path while the encapsulation material provides the structure (strength, stiffness, and coefficient of thermal expansion). Common Encapsulation Materials include:

- Aluminum (TC1050.AL)
- Copper (TC1050.CU)
- Other available encapsulations and systems include Kovar, WCu, MoCu, AISiC, stainless steel, Ni, carbon fiber, etc.

Key Features

- Thermal conductivity 5x of aluminum and 3x of copper
- Low thermal interface resistance
- Lighter than aluminum
- Adjustable coefficient of thermal expansion
- Wide operating temperature range
- Mechanical load bearing
- Hermeticity higher than 10⁻⁸ atm.cc/s
- Vibration and shock resistance
- Machinable
- Platable
- Size up to 4 ft² (0.37 m²)

Potential Applications

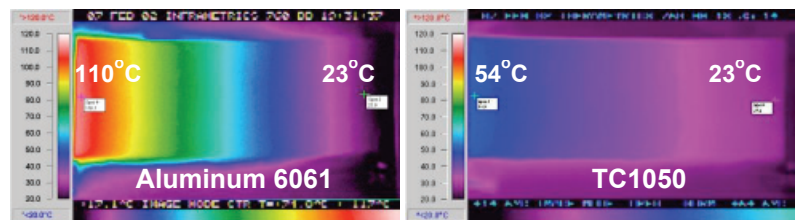
- Heat spreader in electronic packaging
- Thermal cores for PWB's
- Finned heat sinks
- Avionic thermal cores
- Satellite traveling wave tube (TWT) mounts
- Electronic chassis
- Cold plates in radar systems

Typical Property Comparison of Heat Spreader Materials

Material	In-Plane TC (W/m-K)	Thru-Plane TC (W/m-K)	In-Plane CTE (ppm/°C)	Specific Gravity	Specific In-Plane TC ⁽¹⁾
Aluminum	218	218	23	2.7	81
Copper	400	400	17	8.9	45
AISiC-12	180	180	11	2.9	62
CuW	185	185	8.3	15.2	12
CVD Diamond	1100-1800	1100-1800	1-2	3.5	310-510
TPG Graphite	1500+	10	-1	2.3	650

Typical properties are average data and are not to be used as or to develop specifications.
 (1) In-plane thermal conductivity divided by specific gravity.

Comparison of Heat Spreader Performance



IR image with 45 Watt heat loading and 20 degrees Celsius cooling

Note: Test data. Actual results may vary.

Examples of TC1050 Heat Spreaders and Cross-Section View

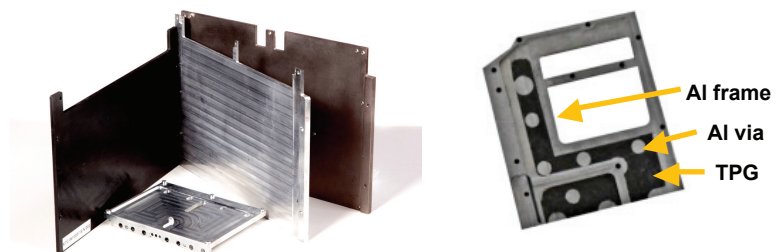
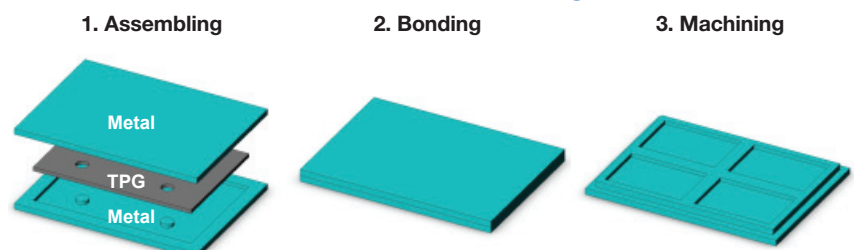


Illustration of TC1050 Manufacturing Process



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