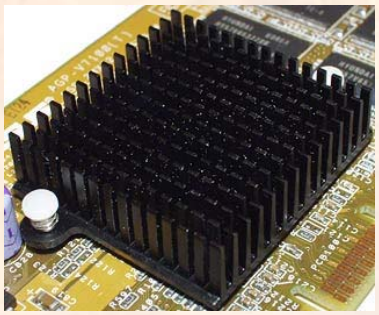
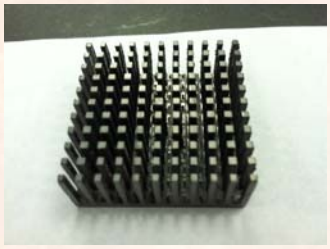
Minteq Pyrogenics Group

PYROID® HT Pyrolytic Graphite Thermal Management Material Heat Sink Application



Original Aluminum Heat Sink



Pyroid HT Replacement Heat Sink

The Challenge:

A major avionics customer with a high power load application was experiencing elevated temperatures (>150 ^{o}C) and non uniform heat distribution in the base of an existing aluminum heat sink. As a result, the power device was experiencing premature, “in the field” failures which necessitated accelerated board replacement costing the company time and money.

The current heat sink was made from aluminum (thermal conductivity of 170 W/m/K) with 196 fins of approximately 8 mm in height.

A Pyroid HT pyrolytic graphite thermal heat sink was designed for the same fin efficiency to replace the existing heat sink. Pyroid HT provides **10X** the thermal conductivity of aluminum, offering significant thermal transfer benefits along the heat sink fin length.

The Results:

Prototype test results were used to construct a CFD model to model the thermal conductivity of the two heat sink designs and optimize the design with the new material. The resultant CFD models indicated that modular Pyroid HT heat sinks with in the base holes for board attachment, would allow ease of manufacturing and installation. The high thermal conductivity of Pyroid HT allowed the customer to reduce the overall heat sink footprint by using a similar fin design but much lower number of fins.

The Pyroid HT heat spreader significantly lowered the device temperature to 70 ^{o}C and removed the temperature gradient of the base plate allowing uniform temperature dispersion.

By using the Pyroid HT heat spreader, the customer increased the reliability and longevity of the power device offering significant savings in board replacement costs

For Details or Samples

Call, FAX or Email

Toll Free: 800-962-8586 FAX: 610-250-3325

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