Aluminum Diamond Composites
for Microelectronics and Optoelectronics

Aluminum Diamond for Heat Spreaders, Flanges, Pills, Laser Mounts, Submounts
Superb thermal dissipation and matched thermal expansion to semiconductor dies make Aluminum Diamond the material of choice for packaging highly thermal demanding microelectronic and optoelectronic applications.
NMIC Aluminum Diamond heat spreaders provide attractive solutions to your most demanding packaging needs with thermal performance reaching 550 W/mK and a thermal expansion of 6.1 ppm/K (40 - 100°C).
NMIC Aluminum Diamond heat spreaders are expansion matched for active semiconductor materials such as Si, GaN, GaAs, SiC.

BENEFITS
• Thermal conductivity reaching 550 W/mk
• CTE matched to various semiconductor materials
• Heat spreaders provided with Ni/Au electrolytic or electroless plating
• Exceptional tolerance, surface roughness, and flatness
• In-house production capability guarantees rapid prototyping and sample turnaround
• Engineering staff available to help custom design components for your application
• Flat, irregular, and multi-step geometries possible

APPLICATIONS
• Power Packages
• RF, Microwave, Millimeter Wave Packages
  – LDMOS FET  – HBT  – MESFET
  – Bipolar  – HEMT  – MMIC
• Laser Diodes
  – Pulse  – CW  – Single Emitters Bars

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**NMIC Aluminum Diamond AS-D60 Material Properties***

Thermal Conductivity ....... 500 W/mK (thickness dependent)
Thermal Expansion (CTE)
   - 40–100°C .......... 6.1 ppm/K
   - 40–200°C .......... 7.1 ppm/K
   - 40–300°C .......... 7.9 ppm/K
Density ................. 3.10 - 3.26 g/cc
Flexural Strength .......... 300 MPa
Modulus ............... 340 GPa
Specific Heat ........... 0.62 J/gK
Electrical Resistivity ........ <=3.7 x 10^-7 ohm-m

**NMIC Aluminum Diamond AS-D60 Dimensional Properties***

Dimension Range
   - Max ................... 45 mm x 45 mm
   - Min ................... 3 mm x 3 mm
Thickne Range ........... 0.5 mm ≤ t ≤ 2.0 mm
Tolerances
   - Dimension ........... ± 0.05 mm
   - Thickness ............. ± 0.05 mm
Flatness and Parallelism
   - Flatness .............. 100 μm
   - Parallelism ........... 200 μm
Surface Roughness (Ra)
   - After Plating ........ ≤ 0.84 μm

**NMIC Aluminum Diamond AS-D60 Plating Properties***

Base Plating
   - Ni ..................... 4.0 μm
Final Plating
   - Au ..................... 2.0 μm

*Above properties are representative. Actual values are based on material thickness and customer configuration.