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NEWS

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NMIC Ships 10,000th Aluminum Diamond Heat Spreader for GaN Devices

Orders accelerate as customers validate product's ability to reduce device junction temperature by 25% and meet cost objectives while decreasing system weight.

TUCSON, AZ (February 6, 2013) — Nano Materials International Corp. (NMIC) today announced that it has shipped its 10,000th aluminum diamond metal matrix composite (MMC) heat spreader for use in gallium nitride (GaN) RF power transistors and Monolithic Microwave Integrated Circuits. The achievement is a significant milestone for acceptance of NMIC's aluminum diamond MMCs and for manufacturers of defense and commercial RF power amplifiers who must dissipate the heat generated by high-power-density GaN devices. Orders for NMIC's aluminum diamond MMCs have continuously increased as tests by GaN device, power amplifier, and system manufacturers have validated the benefits of the technology and as NMIC has optimized its processes so that it adds minimally to the cost of each device.

NMIC's MMCs are the result of more than a decade of research and development dedicated to producing a material that helps GaN device manufacturers dissipate the heat from their products. Rapidly removing heat is essential for GaN devices to deliver their rated RF output power, as the inability to do so requires them to be "backed-off" to lower power levels.

NMIC's MMCs have demonstrated their ability to reduce device junction temperature by about 25% beyond what can be realized using conventional heat spreader materials or material combinations. They exploit the inherent thermal conductivity of polycrystalline industrial-grade diamond, which at greater than 1200 W/mK is higher than any substance on Earth. NMIC's patented process combines diamond and aluminum particles to form an MMC with thermal conductivity greater than 500 W/mK, more than twice that of its nearest competitor. The MMCs are also up to 10 times lighter than conventional heat spreader materials such as copper-tungsten and copper-molybdenum.

This attribute is especially appealing in applications such as Active Electronically-Steered Array (ASEA) radars, in which hundreds or thousands of GaN MMICs are used, as pounds can be shaved from the overall system. In addition, the MMICs are extremely strong, stable during temperature cycling, and have a coefficient of expansion that matches silicon carbide (SiC), the most common transistor substrate compound used by GaN device manufacturers.