LED SUBSTRATES AND SUBMOUNTS

Remtec's LED Substrates and Submounts Meet the Growing Challenges for Cost Effective Packaging in Demanding Applications

Remtec designs and manufactures high performance metallized LED substrates and submounts utilizing a variety of technologies each suitable for a specific customer requirement be it performance characteristics, power level or assembly methods.

Metallized substrates and submounts are produced on alumina, AlN and BeO ceramics using **PCTF®** (Plated Copper on Thick / Thin Film) metallization, **AgENIG®** (Electroless Nickel and Immersion Gold over Silver) and **DBC** (Direct Bond Copper). Manufacturing technology and processes enable Remtec to offer economically priced LED substrates without any compromise in quality or performance.

Remtec's high performance ceramics offer 25-125μm thick copper metallization. Tin, nickel and gold finish over bare copper allows utilization of various interconnect techniques: RoHS soldering, gold and aluminum wire bond, epoxy and high-temperature die attach as well as flip chip bonding.

In addition, lower cost **gold-tin** plating can be selectively applied over basic metallization with a protective cap layer that prevents oxidation and ensures void-free solder joints. That, combined with a fine-line capability and gaps as narrow as 50μm, makes Remtec's submounts an ideal candidate for mounting flip-chip and "bond pad down" GaN, GaAs and other LED devices.

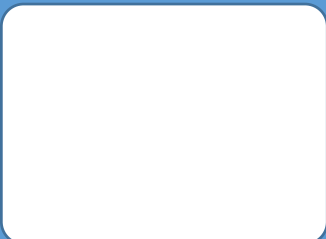
Usage of high thermal conductivity ceramic materials (up to 280 W/Mx°C) and thick copper tracks with resistivity less than 1 mΩ/square results in excellent thermal management. Parts can be supplied to a customer in a large multiple-image format for automatic assembly, which reduces the product cost. Otherwise, parts can be supplied individually in waffle packs.

As a result, Remtec is now able to offer LED assembly manufacturers a reliable solution for competitively priced submounts. Low upfront tooling costs and fast turnaround time permit designers to bring their products into market faster and with lower engineering costs.

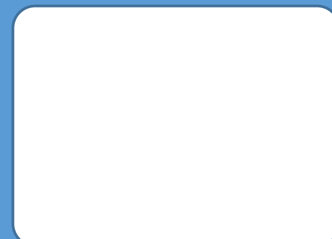
Remtec, a RoHS compliant, ISO 9001:2008 registered and ITAR compliant company, provides ceramic packaging solutions for optoelectronics, microwave/RF components and modules and DC power electronics. Applications include high performance laser, photo diode and LED submounts, optoelectronic circuits, spacers, power modules as well as RF power amplifiers and TC modules.

AlN ceramic carrier with copper metallization and Ni-Au finish for an LED with pad down design (50μm gap) for a high volume application.

AlN ceramic mount with thick film silver metallization and Ni-Au finish for a high intensity LED (400nm) for polymerizing light cured dental materials.

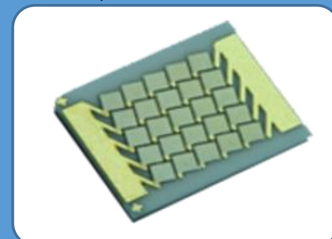


Carrier mount for LED luminaires on AlN with 40μm copper and ENEPIG surface finish.



250μm thick DBC substrate for LED UV curing applications with brilliant white dielectric for enhanced optical reflectivity.

LED sensor: Leadless SMT package for direct PCB mount with 25μm Cu on BeO, metal plugged via holes, castellations and multilayer dielectric.



Multiple LED ceramic array built on alumina submount with AgENIG metallization and AuSn selective plating.

Table Typical Features Summary
Line width / spacing typical 75-125μm
Anode/Cathode gap (spacing) 50μm
Suitable for flip chip and "bond pad down" devices
Metallization thickness 25-125μm
Track resistivity less than 1mΩ/square
Metallization finish: Ni-Au, wire bondable with Au or Al, solderable and brazeable
AuSn and Sn selective plating 3-20μm

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