

LASER AND PHOTO DIODE SUBMOUNTS

Remtec's Plated Copper on Thick & Thin Film Metallization (PCTF®) Meets the Challenges of High Performance Laser & Photo Diodes in Demanding Optoelectronic Applications.

Remtec manufactures high performance metallized laser and photo diode submounts, accessory circuits, and spacers to customer specification.

Remtec's submounts are produced on BeO and AlN ceramics using PCTF® (Plated Copper on Thick Film) metallization. For less thermally demanding applications, alumina based materials are available. PCTF manufacturing technology and processes enable Remtec to offer lower cost laser diode submounts without any compromise in performance or quality.

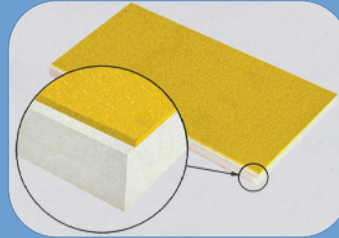
Remtec's high performance laser diode submounts offer 25-75 micron thick copper metallization with a unique **Zero Pullback™** from a burr-free ceramic edge for various demanding optoelectronic applications. A **Zero Pullback™** metallization with burr-free edge greatly enhances performance characteristics of edge emitting diodes.

In addition, lower cost **gold-tin** plating finish can be selectively applied over basic metallization. Gold-tin alloy composition may be adjusted from 72/28 to 80/20 within a thickness range of 3 to 12 microns. A barrier metal under Au-Sn prevents gold enrichment and a protective cap layer stops oxidation and ensures void-free solder joints.

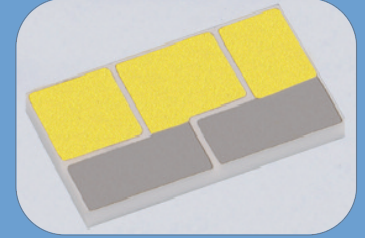
As a result Remtec is now able to offer to the high power laser diode industry a reliable single source solution for competitively priced submounts. Features comprise a **Zero Pullback™** copper metallization, an economical **gold tin** finish and all the advantages of PCTF® technology. It combines elements of thick and thin films with plated copper and nickel/gold finish.

Low upfront tooling costs and fast turnaround time permit designers to bring their systems into production faster and with lower engineering costs.

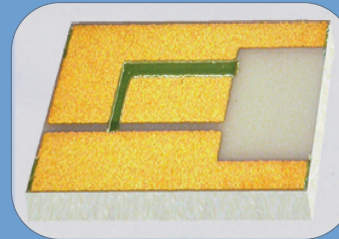
Technical data is shown on the reverse side.



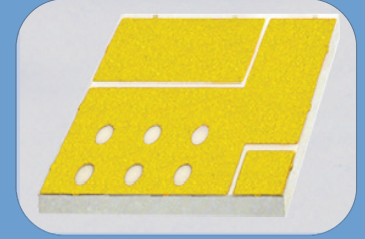
Plated copper metallization with Zero Pullback™ for elevated power levels of edge emitting diodes.



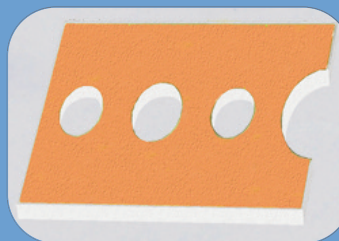
Zero Pullback™ metallization with 50 µm plated copper and plated **Gold-Tin** finish (6-8 µm) for high power Laser Diodes.



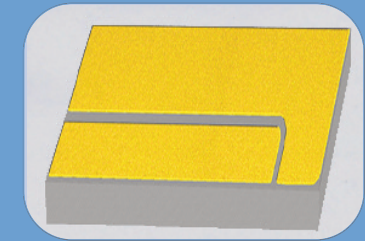
BeO Submount with plated copper and solder dams to prevent gold tin spreading. PCTF metallization exhibits consistent adhesion, and solder dams control die positioning.



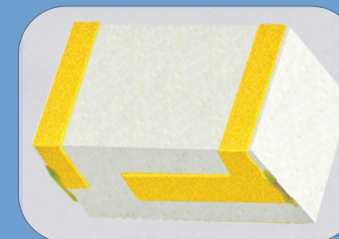
BeO Edge-emitting Diode Submount with PCTF® and Ni-Au finish provides a cost effective solution for high volume applications. The total thickness tolerance is $\pm 20 \mu\text{m}$.



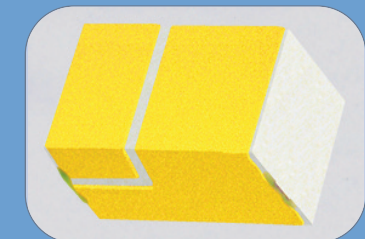
Cost effective PCTF alumina spacer with 50 µm copper metallization for low dc resistance. Ni-Au finish not shown.



Aluminum Nitride Submount for high power VCSEL lasers minimizes CTE mismatch.



Two-sided PCTF Photo Diode Submount. Selective gold plating for wire bonding and soldering ensures ease of assembly and enhanced reliability.



Three-sided PCTF ceramic submount with plated copper and nickel-gold finish. Excellent adhesion, solderability, wire bondability, zero solder leaching.

TECHNICAL DATA

Remtec's Cost Effective Ceramic Packaging Solutions Ensure Optimum Performance for Laser & Photo Diode Submounts.

PCTF® technology combines elements of thick and thin films with plated copper and nickel/gold finish with excellent and reliable adhesion. Therefore, substrates are available with multiple metallization techniques and selective plating options permitting both silver thick film and TiW thin film seed layers of various thicknesses, plated copper from 5 to 75 micron and Ni-Au finish with gold thickness from .1 to 4.0 micron. Selective gold-tin plating capability ensures excellent die attach and void free soldering.

PCTF® technology enables creating fully hermetic, metal plugged vias in a ceramic substrate with high thermal and electrical conductivity. The plated copper vias' capability allows design and manufacture of hermetic integral substrate packages with built-in laser diode submounts and low dc resistance conductor traces.

Ceramic and copper surface finish can be held to less than 1 µm. Overall submount thickness tolerances can be held to ±13 µm, flatness to 1 µm and surface roughness to less than Ra .05 µm.

Remtec and its team of technical experts are ready to assist you with your metallized ceramics requirements. We provide you a complete solution from prototype design and fabrication to high volume production.

Please send your electronic files in DXF and/or DWG formats to sales@remtec.com. Additional data is available at www.remtec.com. More detailed design guidelines are available upon request.

Remtec, a RoHS compliant and ISO 9001:2000 registered company, provides ceramic packaging solutions for optoelectronics, microwave/RF components and modules and power electronics. Applications include high performance laser and photo diodes submounts, optoelectronic circuits, spacers, power modules as well as RF power amplifiers and TC modules.

Ceramic Substrates

Material	Thermal Conductivity, W/m ⁰ C	TCE, ppm/ ⁰ c	Dielectric Constant
Beryllia	280 to 325	7.0	6.4
Aluminum Nitride	170-230	4.5	8.9
Alumina	25	7.2	9.4

Typical Mechanical Tolerances

Flatness	<1µm
Roughness	.05 Ra µm
Submount Thickness	±13µm

Typical Metallization Schemes for Submounts

- Ag(15µm)-Cu(50µm)-Ni(2.5µm)-Au(0.5µm)-AuSn(5µm)
- Ag(15µm)-Cu(50µm)-Ni(2.5µm)-Au1(0.25µm)-Au2(1.0µm)
- TiW(0.1µm)-Cu(25µm)-Ni(2.5µm)-Au(0.5µm)-AuSn(5µm)
- TiW(0.1µm)-Cu(25µm)-Ni(2.5µm)-Au1(0.25µm)-Au2(1.0µm)

Custom metallization is available upon request

Metallization Options

- Thick or Thin films with 25-75µm Plated Copper
- Selective Copper and Gold Plating Metallization
- Three-sided Metallization
- Zero Pullback™ Metallization of 25-75µm Plated Copper
- Finish: Ni/Au and/or Au/Sn Plating
- Plated Through Holes and Solid Plugged Via Fills
- Wire Bondable and Solderable