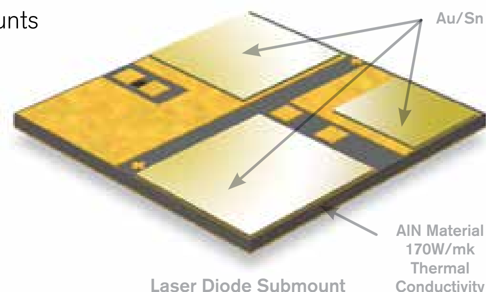
Laser Diode Submounts (Au/Sn)



Laser Diode Submount

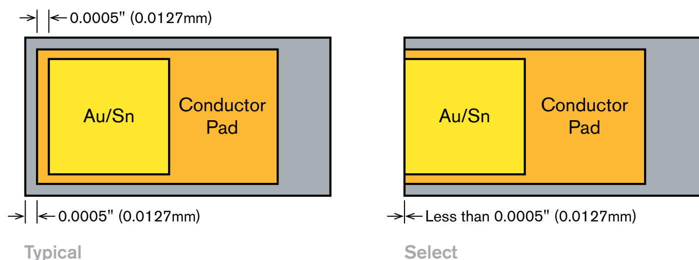
Applied Thin-Film Products (ATP) is one of the industry leaders for Laser Diode Submounts with pre-deposited Au/Sn. ATP custom fabricates thin-film submounts with tightly controlled substrate and metal thicknesses for your alignment needs. Hi-thermal conductivity materials include Aluminum Nitride (AlN) and Beryllium Oxide (BeO).

These submounts can have pre-deposited and patterned Gold Tin (Au/Sn) to accommodate lower manufacturing cost, higher volume, and automated assembly of laser diode modules. The use of pre-deposited and patterned Au/Sn replaces the more traditional approach of using thick Au/Sn preforms. ATP's standard alloy composition is 80% Au and 20% Sn which typically reflows at 278°C under a high purity gas blanket consisting either of forming gas or Nitrogen.

ATP has an enhanced integrated Au/Sn process that will extend the freeze time of the Au/Sn up to 60sec depending on the actual reflow temperature being used. Please contact our Sales department for more info. ATP offers both plated and sputtered Au/Sn. Our Sales department can make recommendations which process to be used, based on your specific applications. Samples are available. Please ask for ATP1014S for sputtered, ATP1014P for plated and ATP1014PX for advanced plated Au/Sn. Au/Sn performance may varies based on the actual reflow temperature and time.

Die Shear test will be performed on the test die to meet and/or exceed MIL-STD-883. Contact our Sales Department for our test profile. Custom test profile and the detailed test procedure are available upon request.

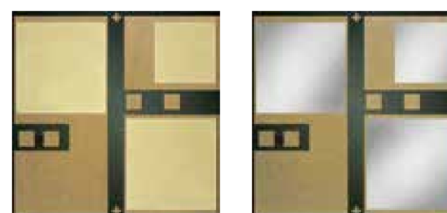
- Replaces Traditional Au/Sn Preforms
- Accurately Controlled Thickness
- Lot to Lot Consistency
- Reduce Au/Sn Thickness
- Complex Solder Pad Geometries
- Accurate Laser Alignment

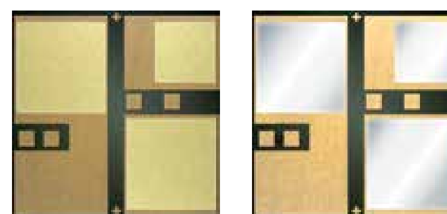


Typical Select

Pre-Deposited and Patterned Au/Sn Guidelines

- Minimum pullback from circuit edge:
  Typical: 0.001"
  Select: <0.0005"
  Consult our Sales Department.
- Smallest Feature Size:
  Typical: 0.003" x 0.003" (0.076mm x 0.076 mm
  Select: 0.0015" x 0.0015" (0.038mm x 0.038 mm)
- Minimum Pitch (minimum space between Au/Sn Pads): 0.003" (0.076mm)
- Typical Au/Sn Thickness: 160–240μ" (4–6 microns)
  t(Thickness outside of the typical range might restrict the process used.)
- AuSn thickness with 3–6μm for sputtered and 4–7μm for plated
- Tolerance on Thickness of Plated Au/Sn: ±80μ" (±2 microns)
- Placement Accuracy of Au/Sn: ±0.0005" (±0.0127mm)
- Dimensional Tolerance on Au/Sn Pad: ±0.0002" (±0.005mm)
- Minimum Pull Back From Laser Cut Edge: 0.0015" (0.0381mm)
- Minimum Pull Back From Conductive Plated Thru Via Holes: 0.0025" (0.0635mm)


ATP1014P: Plated before reflow
ATP1014P: Plated after reflow


ATP1014S: Sputtered before reflow
ATP1014S: Sputtered after reflow

ATP circuits with Au/Sn are best assembled when received. Little information is available about long-term storage of thin Au/Sn layers under ambient conditions. Gold Tin intermetallic compounds (IMCs) are known to form at room temperature when excess Au or Sn is present, so compositional changes might occur during long-term storage. To our knowledge, oxidation of Au/Sn IMCs has not been studied but likely is accelerated by high humidity and high storage temperature. Storing the circuits with Au/Sn in a nitrogen purged dessicator may minimize the oxidation effect.