

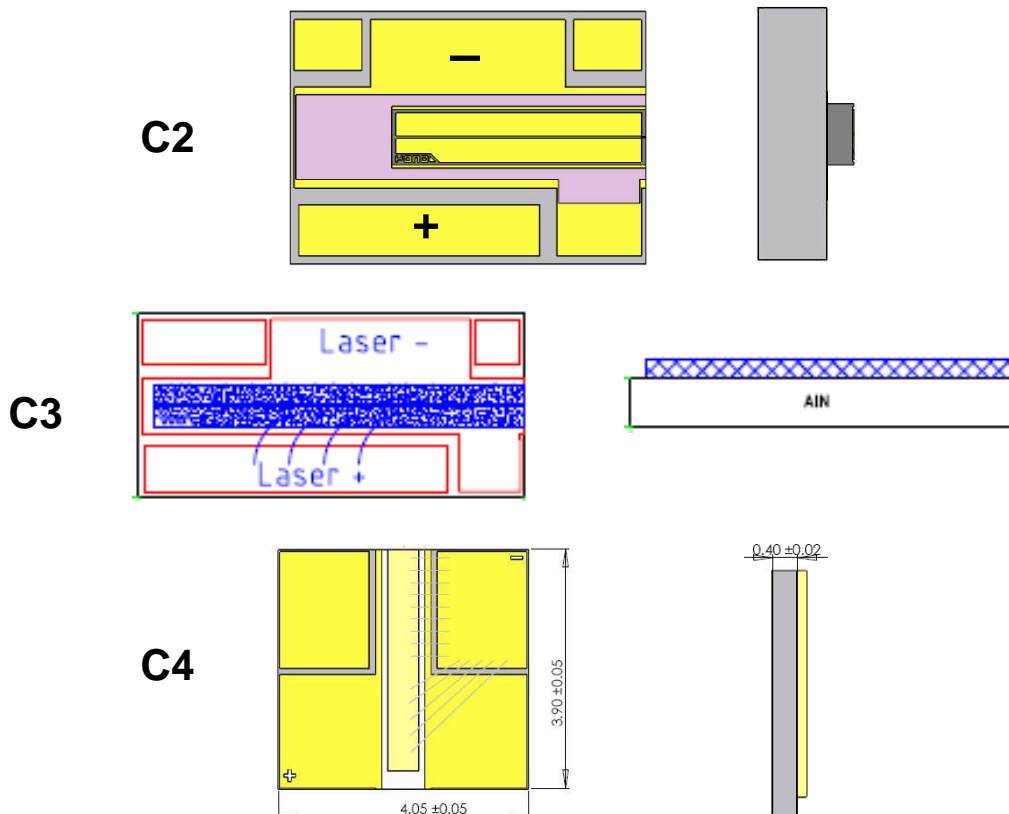
Application Notes: AlN Submounted Laser Diodes

Warning

- Handle all packages at static-safe workstations only. The use of static safe wraps and finger cots are highly recommended. Axcel laser diodes are susceptible to damage from electro-static discharge.
- All Axcel Photonics laser diodes are Class IIIB or IV laser products. High power laser light (> 50 mW) is emitted from the front facet of all laser diodes, with any exceptions specifically noted. Please do not operate laser diodes without the proper safety equipment or in the vicinity of combustible materials. Proper eye protection is required during the operation of Axcel laser diodes.
- All C2, C3, and C4-mounted laser diodes require proper heatsinking before operation and failure to do so will result in the eminent failure of the device and void all product warranties.

Package Description and Characteristics

- Axcel AlN submount is a Au-plated AlN heatsink.
- Chips are bonded to using AuSn solder, unless otherwise specified.
- C2-mount can accommodate up to a 2.0 mm cavity length laser diode chip with maximum power output of 400 mW. C3-mount can accommodate up to a 3.0 mm cavity length laser diode chip with maximum power output of 500 mW. C4-mount can accommodate up to a 3.6 mm cavity length laser diode chip with maximum power output of 8 W.



Handling and Installation

1. All Axcel laser are packaged in an ESD safe environment, please wear proper ESD protection before opening any Axcel packages.
2. User needs to provide a proper heat sink for mounting the AlN submount. The heat sink should be capable of dissipating twice the output power of the laser diode with a maximum temperature not to exceed Axcel's maximum temperature specification. Water cooled or air cooled Cu or Al plates are suitable choices as heat sinks for this package.
3. Surface of heatsink should be cleaned and prepared for mounting.
4. To ensure optimal thermal conductance from the submount to the heatsink, it is encouraged that the submount is soldered to the heatsink. The use of a thermal pad, thermal epoxy, or thermal compound is also acceptable. Thermal junction between submount and heatsink must be void free.
 - * When soldering or applying compounds or epoxies, ensure a clean solder and be sure that these material DO NOT reach above the submount base. Doing so can lead to damage of the laser chip.
 - ** Heatsink should also not exceed the submount base. Laser light reflection from the heatsink back to the rear facet of the laser chip can cause laser damage.
 - *** Axcel recommends not using flux during soldering. Soldering condition is $< 240^{\circ}\text{C}$. AuSn soldering of laser chip to submount occurs at 260°C , the temperature near the chip approaching this value will re-flow the AuSn solder.

Laser Diode Turn-On Procedure

1. Connect power leads to laser diode by soldering and wire bonding (—) wire from power supply to (—) section of submount gold plating, as illustrated under Package Description and Characteristics. Then solder and wire bond (+) wire from power supply to (+) section of submount gold plating following the same procedure.
2. Turn on current controlled power supply and set maximum current limit setting to 110% typical laser operating current. Increase current slowly to begin lasing. Increase/decrease current to adjust laser diode power output according to the LIV information provided with the diode.
3. DO NOT EXCEED THE MAXIMUM POWER AND DRIVE CURRENT INDICATED IN THE PRODUCT SPECIFICATIONS. Doing so can lead to damage of the laser and will void Axcel's warranty. Adjust output power using current control mode, do not adjust power while using voltage control mode.

Laser Diode Turn-Off Procedure

1. Decrease drive current to 0 mA.
2. Turn off laser diode power supply.
3. Disconnect wire leads.