

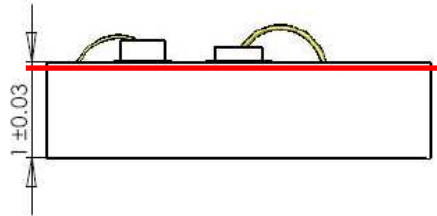
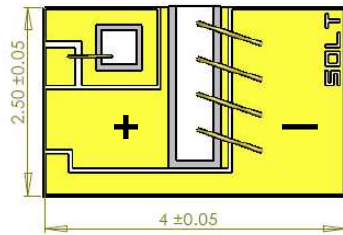
Application Notes: QA-mounted Laser Diodes

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 QA-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 QA-mount is a Au-plated AlN heatsink.
- Chips are bonded to QA-mount using AuSn solder, unless otherwise specified.
- QA-mount can accommodate up to a 2.0 mm cavity length laser diode chip with maximum power output of 3 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 QA-mount. 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 QA-mount mounting.

4. To ensure optimal thermal conductance from the QA-mount to the heatsink, it is encouraged that the QA-mount is soldered to the heatsink. The use of a thermal pad, thermal epoxy, or thermal compound is also acceptable. The use of the above thermal management items is only recommended for low power operation (< 500 mW), and required for high power operation (> 500 mW). Thermal junction between QA-mount and heatsink must be void free.

* When soldering or applying compounds or epoxies, DO NOT apply these materials to the rear of the QA-mount above the red line indicated on the diagram above. Doing so can lead to damage of the laser chip.

** Heatsink should also not exceed this line. 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 QA-mount 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 the (—) wire from power supply to (—) section of QA-mount gold plating, as illustrated under Package Description and Characteristics. Then solder and wire bond the (+) wire from power supply to (+) section of QA-mount 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 while 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.