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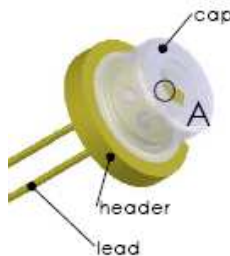
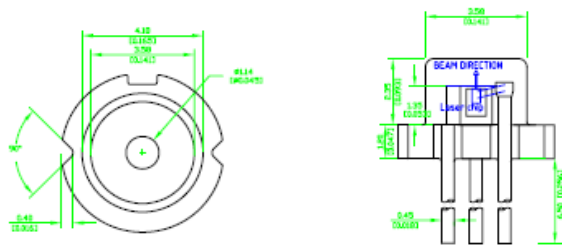
Application Notes: TO-packaged (TO-18 and TO-5) Laser Diodes

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 TO-packaged 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 TO-package is a Au-plated Cu heatsink (header) with electrical pin leads for the laser diode and for an optional photo diode. This package comes with a cap with a glass window protecting the laser diode chip.
- Chips are bonded to TO-package using Indium solder, unless otherwise specified.
- 5.6 mm TO-package (TO-18) can accommodate up to a 0.75 mm cavity length laser diode chip with maximum power output of 500 mW in multi mode and 80 mW in single mode. 9 mm TO-package (TO-5) can accommodate up to a 1.5 mm cavity length laser diode chip with maximum power output of 2 W in multi mode and 400 mW in single mode.



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 TO-package. 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. Proper TO-package mounts are available through a variety of manufacturers and distributors of electro-optical equipment.
3. Surface of heatsink/mount should be cleaned and prepared for TO mounting.
4. To ensure optimal thermal conductance from the TO-package to the heatsink, it is encouraged that the TO-package is soldered to the heatsink. The use of a thermal pad, thermal epoxy, or thermal compound is also acceptable. The use 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 the TO-package and heatsink must be void free.

*Axcel recommends not using flux during soldering. Soldering condition is < 135°C. Indium soldering of laser chip to TO-package occurs at 155°C, the temperature near the chip approaching this value will re-flow the Indium solder.

Laser Diode Turn-On Procedure

1. Connect power to laser diode by connecting LD Cathode to (—) and connecting LD Anode to (+) of current controlled power supply. If package comes with an optional photo diode, connect the PD Cathode and PD Anode to the laser's monitor circuit.
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 and unmount if necessary. If unmounting Axcel laser diodes, please use the same precautions as when mounting the device. These precautions are outlined in the "Handling and Installation" section of this Application note.