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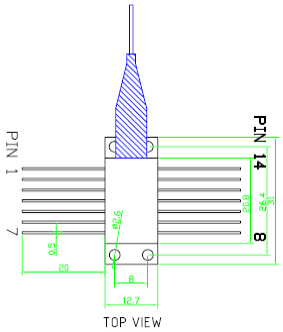
Application Notes: MM 14-pin BTF Packaged Laser Diodes

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 14-pin BTF 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 BTF package is a sealed fiber coupled laser diode device with internal thermo-electric cooler, thermistor, and photodiode.**
- **Axcel laser diode chips are coupled into a multi mode fiber, fiber diameter can vary.**



PIN OUT

1 TEC(+)	14 TEC(-)
2 Thermistor	13 Case Ground
3 PD Anode	12 NC
4 PD Cathode	11 Laser Cathode(-)
5 Thermistor	10 Laser Anode(+)
6 NC	9 NC
7 NC	8 NC

Handling and Installation

1. **All Axcel lasers are packaged in an ESD safe environment, please wear proper ESD protection before opening any Axcel packages.**
2. **Great care should be taken with the multi mode fiber. Fiber is most often up-jacketed to 900-micron in diameter. The fiber is still very fragile. PLEASE NOTE: DO NOT pull on fiber with a force greater than 1 lb (~4.45 N), doing so can damage the fiber and/or cause a misalignment in the fiber pigtail.**
3. **User needs to provide a proper heat sink for mounting the BTF package. The heat sink should be capable of dissipating four times (4X) the output power of the laser diode with a maximum temperature not to exceed Axcel's maximum temperature specification. Proper BTF-package mounts and heatsinks are available through a variety of manufacturers and distributors of electro-optical equipment. Water cooled or air cooled Cu or Al plates are also suitable choices as heat sinks for this package.**
4. **Ensure that the BTF package can be attached to the heatsink through the use of screws through the mounting holes in the base of the BTF package.**
5. **Surface of heatsink should be cleaned and prepared for BTF package mounting.**

6. **To ensure optimal thermal conductance from the BTF-package to the heatsink, it is encouraged that the BTF-package is soldered to the heatsink. The use of a thermal pad, thermal epoxy, or thermal compound is also acceptable.**

   *** Axcel recommends not using flux during pin soldering. Pin soldering condition is 5 sec and 250℃.**

7. **Tighten screws to affirm package to the mount or heatsink. Start by finger tightening all four screws, and then apply additional torque to the screws one by one in a U-pattern, starting with the front left or front right screw. DO NOT OVER-TIGHTEN mount screws. Applied torque should not exceed 16 in-oz (~ 1.7 N-cm).**

Laser Diode Turn-On Procedure

1. **Connect BTF-package pins to the corresponding wire/connection on the mount. Start with pin 1 for the TEC Anode and work up to pin 14 in numerical order following the pin-out diagram included with the product shipment. Please note that pins 6-9 and 12 have no internal connection within the package, and pin 13 is the case ground. Always double-check your connections before operation.**
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. **Monitor PD and thermistor readings to control laser diode output power and temperature. A typical 10k Ohm thermistor is used for the Axcel BTF-Package.**
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 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 pin connections 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.**