

## Proper Handling and Operating Requirements Photodigm Laser Diodes

### Safety

Laser diodes produce by Photodigm are all high power emitting greater than 50mW of optical energy. Read and understand the laser product classifications. Always use the proper equipment and be familiar with its use. Safety is the responsibility of the user.

### ESD Caution

Handle laser diodes and modules at static safe workstations only. During device set-up or when introducing to a higher assembly, anti-static procedures must be followed. When not in use, shorten the leads of laser diodes to protect against ESD. Although not classified as ESD, protect the laser diode from momentary transients that can be present in inferior equipment.

### Storage

Store device in a clean dry environment in original container. Protect from ESD sources and in the case of an exposed **facet**, away from airborne contaminate that might deposit on the **facet** surface. The **facet** coating must remain unspoiled otherwise COD failure will occur. Never make contact to the front **facet**. The **facet** cannot be cleaned or repaired.

### Package Descriptions

Photodigm supplies its laser diodes in a variety of package configurations. Refer to package outlines on web site. The standard offering is:

**14-pin Butterfly:** Laser mounted in hermetic package coupled to PM fiber. Internal TEC. Kovar base

**Chip on Submount:** Laser mounted to AINI submount with AuSn solder. Exposed bond wires and facet.

**'C' Mount Block** and: Laser mounted to copper block with AuSn solder. Exposed bond wires and facet.

**12-pin TO-8:** Laser mounted in windowed package. Internal TEC. Kovar base

All Photodigm laser require active cooling to make the best use its spectral purity. The butterfly and TO-8 have an internal cooler (TEC) and thermistor. The chip on submount and 'C' Mount require external temperature control components. Do not attempt to operate laser without proper thermal management.

### Mounting

Proper mounting means proper cooling. The laser device can be clamped, soldered, or screwed to a flat surface that can be kept at a constant temperature while being exposed to the lasers thermal load. Thermal compounds are not recommend due to possible contamination of the facet or fiber end. Verify mounting surfaces are flat and free of voids. Torque screws for even and consistent attachment. When making solder electrical connections, shield laser facet or exposed optical surfaces from the flux fumes. Always follow standard ESD procedures when making electrical connections.

## Operation

Verify all equipment is more than adequate for the laser diode under operation without exceeding the laser's ratings. All equipment should be off before connecting laser. Diode lasers should only be operated in a dust free environment. High electrical fields near the active region attract particles.

### **Check all connections against the circuit diagram** then...

- Power on the TEC controller and set for 25C. Set temperature and current limits to those specified in applicable laser product bulletin. Verify correct operation of cooling system by varying temperature +/-3C while monitoring TEC current. If working correctly, the current should increase sharply and decrease as it reaches the new temperature set point. If current continues to increase, the set-up is incorrect. Recheck the mounting and do not continue until problem is corrected.
- Power on the laser driver. Set current limit to laser's maximum rating and slowly increase the drive current to 50% of rated current. TEC controller should reach the set temperature without exceeding the set current limit. The temperature should be maintained with a TEC current less than 1.2 Amps. If not, a problem exists and it must be corrected.
- Increase/decrease laser current to achieve the desired laser power output as shown on the LIV plot provide with each Photodigm laser. The laser may now be temperature tuned for the wavelength of interest. Cooling below the dew point can condense impurities on the facet surface. Do not exceed the maximum ratings of the laser diode.

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