

In this application note, we provide the recommended fiber handling procedures for all pigtailed devices manufactured by Compound Photonics, Inc., including the 6-pin, 14-pin, and CPM packages.

Handling Precautions for ESD

Follow all of the following precautions when handling a pigtailed laser diode product, as this device may be damaged by static electrical discharge.

- Remove any lead shorting clips only when ready to use. Replace the clips for device storage or transport.
- Always store and transport in closed conductive containers.
- Remove from containers only after grounding at a static-controlled workstation.
- Personnel handling this device should wear a static dissipative outer garment and should be grounded at all times.
- Floors should have a grounded static dissipative covering or treatment.
- Tables should have a grounded static dissipative covering.
- Avoid insulating materials of any kind.
- Always use a grounded soldering iron to install.
- Test only at static-controlled workstations.

Failure to follow all of these precautions may result in reduced device lifetime.

Device Testing

This device is sensitive to optical back reflections and should not be operated in a condition where a significant amount of counter-propagating optical power is possible. Testing the device with optical back reflection present may result in invalid test results, such as broader optical spectrum or modified operating current, or result in damage to the diode chip. All devices are shipped with no connector and the fiber tip is not cleaved. Testing of this device should only be attempted after the fiber tip has an angled cleave of approximately 8 degrees. The fiber termination must be clean of any contamination or debris.

Laser Safety

Most Compound Photonics products are Class 4 laser devices generating enough infrared light power to burn skin, blind eyes or start fires in combustible objects. The primary packaging of the device contains specific laser safety instructions. It is imperative that all qualified operators read and understand these instructions before using or testing the device.



Figure 1. Sample danger safety label applied to all Compound Photonics external packaging.



Compound Photonics Technical Note TN01: General Handling Procedures for Pigtailed Devices

Fiber Handling Precautions

This device is equipped with a fiber optic pigtail, and should only be handed by qualified operators with specific training on handling fiber pigtailed devices.

Always wear eye protection when handling optical fiber. It is recommended to wear gloves when handling bare fibers.

Bend Radius

Bending an optical fiber affects both the optical performance and the mechanical reliability of the device. In terms of optical performance, 0.15NA fibers are more sensitive to bending than 0.22NA fibers. Keeping bend radii as high as possible will maximize the optical power measured at the fiber output. Coiling the fiber to a bending radius smaller than about 30 mm can entail significantly the device performance, especially if the fiber NA is 0.15.

The absolute minimum bending radius for a 100 μ m fiber is 25 mm. Any bend on a smaller radius could limit the lifetime of the device, either causing an immediate fiber break or a non-apparent damage leading to premature device failure.

Hand oil, adhesive tape, grease, glue, and other materials deposited on the fiber surface can absorb optical power. Those absorption sites can lead to failure, especially at bending locations. Keeping fibers clean and as straight as possible is of particular importance for fiber carrying high optical power, such as the output pigtails on CPM modules.

Adhesives

In general, avoid using adhesive tape or other adhesives not specifically intended for use with optical fiber. If you must tack the fiber into place, Dow Corning 3145 RTV Adhesive Sealant has been found to be acceptable and result in little or no optical loss.

Fiber Tip

Most Compound Photonics fiber pigtailed devices are delivered with a rough output cleave. The device performance will be optimized when this fiber is cleaved and spliced to a clean, high-quality, angle-polished fiber connector. An alternative is to cleave the fiber tip and to handle the bare fiber directly. An 8-degree angled cleave is recommended. A straight cleave can be acceptable for some applications, but could compromise the device performance.

Make sure the connector end or the fiber tip is free from debris and contaminants. The fiber or connector tip should be inspected periodically, especially if the device is operated elsewhere than in a clean room. Compound Photonics does not recommend cleaning a bare, cleaved fiber tip. Repeat the cleaving operation if the fiber tip is damaged or contaminated. Operation of a laser diode with a damaged or contaminated fiber tip can result in the fiber burning or “fusing.”

Splicing

If splicing the fiber, a version of splice protection is highly recommended. Compound Photonics recommends recoating the fiber if possible. If not possible, the use of heat-shrinkable reinforced sleeves to protect fiber splices is recommended, as these are inexpensive, easy to apply and provide very good splice protection.