Instruction Manual for Butterfly Housing

Table 1: Revision History

Rev.	Date	Author	Description
1.0	2016-03-22	T. Büttner	Draft Issue
1.01	2016-04-08	M. Kneier	Public Release

Table 2: Applicable Products

P/N	EYP-XXX-XXXX-XXXXX-XXXX-**BFY**XX-XXXX

1 Objective

The objective of this document is to provide specific information as a recommendation for the handling and mounting of our 14-Pin Butterfly laser diode package (thereafter called 'device').

eagleyard cannot confirm or guarantee the reliability of the final attachment method that is chosen by our customer, because the detailed configuration and requirements are highly dependent upon the specific application and environmental conditions.
However, following the recommendations as given in the subsequent paragraphs a faultless operation should be enabled.

2 Precautions for handling of the device

2.1 Electrostatic discharge, ESD

For the handling of the fiber pigtailed device during unpacking and installation, e.g. mounting to a mechanical fixture for testing and measurement purposes or final mounting to a heatsink that was designed for the specific application, general precautions have to be considered. The device was shipped with appropriate shorting clips attached to the leads and we highly recommend keeping those shorting clips in place as long as possible. Please follow the common guidelines for handling of devices that are sensitive to electrostatic discharge (ESD regulations). The device shall be protected against possible damage due to electrostatic discharge during all steps of storing, handling and the attachment to a mechanical and electronical interface. The design of the circuitry used for driving the laser diode current and the thermal control loop (TEC circuit) should consider ESD aspects as well as protection from transients, reverse voltage and overcurrent.

©eagleyard Photonics GmbH
Rudower Chaussee 29 (IGZ)
12489 Berlin, Germany

www.toptica-eagleyard.com

Fon: +49. 30. 6392 4520
Fax: +49. 30. 6392 4529
e-mail: info@toptica-eagleyard.com

2.2 Mechanical stress

For the device, there are many possible ways to apply unintentionally or accidentally direct or premature damage due to mechanical stress that is induced to parts of the package, e.g. the package body, the body baseplate, the electrical leads, the fiber strain-relief boot and the fiber itself.

Mechanical stress can result from improper handling and the mechanical mounting situation, e.g. excessive bending or pulling of the pins, of the fiber and structural parts of the package body. Any bending or warping of the package baseplate has to be avoided. Otherwise a direct or premature damage of the internal structure, especially of the TEC could occur and immediately lead to a catastrophic failure or have a negative influence towards the long-term reliability of the device.

Permanent mechanical stress delivered to the parts that were described above, has to be avoided or kept within the specified range. Therefore please refer to the specific data sheet of the device or the corresponding section of this document.

3 Recommendations for mounting of the device

3.1 Mechanical and thermal interface

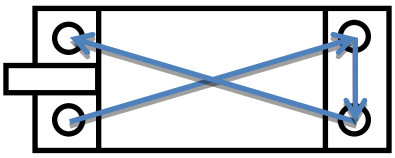
The waste heat that is generated while operating the device and that is delivered to the package baseplate has to be dissipated by a metallic heatsink, well designed for the specific application, to keep the package case temperature within the specified range under any operating condition. Please refer to the temperature rating section of the data sheet.
Common and recommended methods for attaching the device are by screwing or clamping to a flat metal surface.
Since the bottom side of the device's baseplate features a very flat and even surface with a controlled roughness, it would be best to place the package directly to a clean metal surface with the following properties:

- Please avoid mechanical pressure to other parts of the package body, such as the lid, the lead feedthrough or the fiber strain-relief boot
- The surface of the heatsink and the bottom of the device has to be free from dust, stain or oxidation, fat, liquids or any other residuals
- The surface should obtain a roughness R_a 0.8 µm or better across the entire mounting area and a flatness of at least 50 µm
- If it cannot be avoided to use thermal interface material (paste or film), it is recommended to keep the deployed layer as thin as possible, **not exceeding 0.25 mm** (0.01") for film material and 0.1 mm (0.004") for paste ('thermal grease').
- We recommend to use only **fiber glass reinforced films**, to prevent uneven compression across the mounting area, thus leading to excessive warpage of the baseplate

©eagleyard Photonics GmbH
Rudower Chaussee 29 (IGZ)
12489 Berlin, Germany
www.toptica-eagleyard.com
Fon: +49. 30. 6392 4520
Fax: +49. 30. 6392 4529
e-mail: info@toptica-eagleyard.com

- When using film-type thermal interface material (e.g. ‘gap-pads’) make sure that the size of the film matches at least the entire area and contour of the package baseplate to support the complete surrounding of all four screw holes

- It is recommended to use only cylindrical or flat-headed type of screws that should be installed and evenly bolted down in the way of a cross-pattern, first setting and fastening all screws finger-tight and finally fasten the screws with a controlled torque that **must not exceed 0.2 Nm** on each screw (e.g. using a miniature torque wrench in the applicable range)



3.2 Soldering of the leads

The electrical connection of the device usually would be done by clamping or soldering of the package leads.

When preparing the leads by means of bending and cutting please always consider the aspect of inducing stress to the package and its components. Special care should be taken not to compromise the solder joint of each lead where it is attached to the package sidewall. The lead should be supported by clamping it close to the package in a stress-free manner, e.g. using some tweezers or an appropriate fixture. The minimum bend radius of the leads should be at least twice the cross section of the lead in the desired direction.

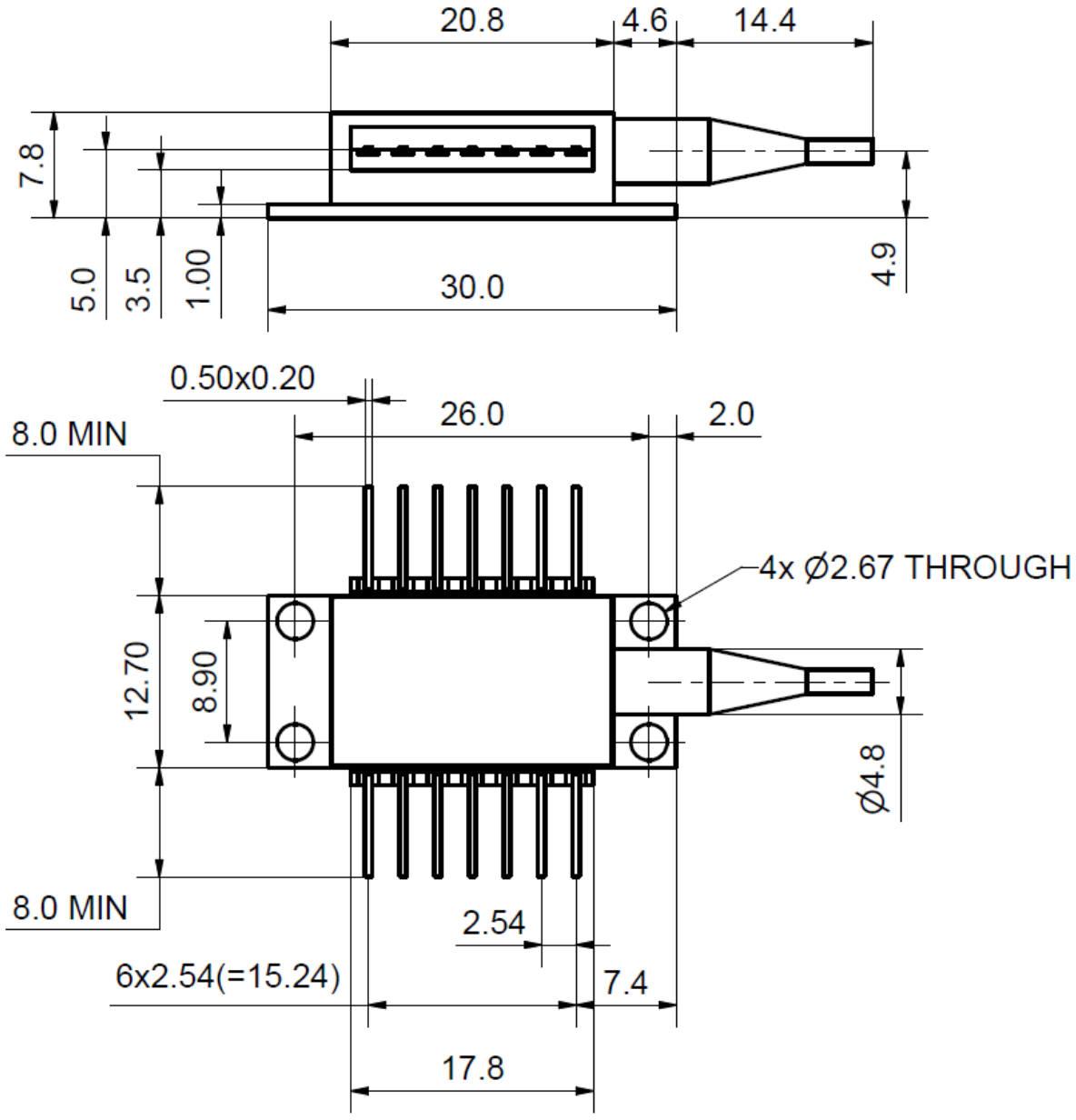
When soldering the leads to a PCB or similar, please always use a selective methodology to protect the fiber pigtail (such as hand-held iron, bar or laser spot) while preserving the following conditions:

- Prior to any soldering action, the device has to be mounted correctly as described
- During soldering operation the leads must not exceed a temperature of 260°C for more than 10 seconds to avoid damage of internal components
- Make sure not to touch the fiber or the fiber strain-relief boot with the hot soldering iron and always keep the temperature at the fiber below 85°C to prevent any damage to the coating during soldering operation

©eagleyard Photonics GmbH
Rudower Chaussee 29 (IGZ)
12489 Berlin, Germany
www.toptica-eagleyard.com
Fon: +49. 30. 6392 4520
Fax: +49. 30. 6392 4529
e-mail: info@toptica-eagleyard.com

4 Appendix

Mechanical package drawing



©eagleyard Photonics GmbH
Rudower Chaussee 29 (IGZ)
12489 Berlin, Germany

www.toptica-eagleyard.com

Fon: +49. 30. 6392 4520
Fax: +49. 30. 6392 4529
e-mail: info@toptica-eagleyard.com