

ESD precautions
thermal management
DFB laser concept
Tunable Diode Laser Spectroscopy (TDLAS)
n+ packages

thermal management design considerations

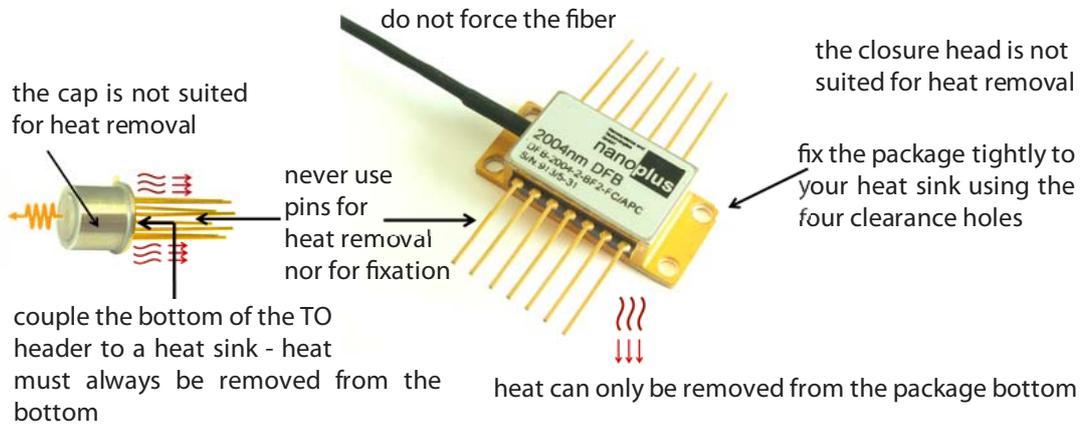


general

Using nanoplus lasers, correct handling of the temperature control and thermal management of your system are important. Many critical parameters, including wavelength tuning, lifetime, day-to-day repeatability, threshold current and efficiency, are highly dependent on the laser temperature. A temperature stability below 10 mK is desirable for most applications. In addition, DFB laser diodes tune their wavelength with temperature, so control of it is essential and using the laser in the specified temperature range is necessary.

design suggestions

The details of the mounting are determined by considerations of how to keep the temperature of the laser as stable as possible. However, because diode lasers and associated optics can be much smaller and lighter than other types of lasers, the scale of the assembly is often quite different. The figure shows our TO5 and our Butterfly laser mount.



In the shown TO5 case, the laser-chip is soldered on top of a heat spreader, which is mounted to the TEC. The bottom of the TEC is attached to the TO5 base plate of the header. Because of thermal radiation and air currents, it is advisable to enclose the laser mount in some sort of container, which is also keeping dust out of the system and insulating it from vibrations. This TO5 package will not sufficiently dissipate the heat without further measures! So the heat must be removed from the bottom of the TO5 package as shown in the picture. Use thermal grease only in thin layers and consider long term behavior.

If you use a temperature controller, be sure to set its current limit below the maximum rating of the TEC module. To avoid oscillations, set the values of your PID controller to match the thermal load. Temperatures above 130 °C may damage the laser mount! Use a socket for connecting the pins to your circuit. If you want to solder a wire to the pins, use 280 °C as temperature for the soldering-iron, and hold the iron to the pins for less than 3 sec. Poor thermal management may cause high temperatures which are damaging the bonding. Ask the manufacturer of the temperature controller for further advice if you feel unsure about the electronics. A proper heat sink is available from nanoplus as accessory.

warranty

Thermal management of the device cannot be influenced by the manufacturer. In consequence, nanoplus cannot be responsible for thermally damaged lasers and any warranty is void. All devices leave nanoplus in tested condition and in proper environment to prevent damage during transport. Before unpacking the laser, consider thermal management and only use appropriate instruments for a long lifetime of your laser.



device protected by
 US patent 6.671.306
 US patent 6.846.689
 EU patent EP0984535

nanoplus
 Nanosystems and Technologies GmbH
 Oberer Kirschberg 4
 D-97218 Gerbrunn

phone: +49 (0) 931 90827-0
 fax: +49 (0) 931 90827-19
 email: sales@nanoplus.com
 internet: www.nanoplus.com

© copyright nanoplus GmbH 2017. All rights reserved.
 nanoplus GmbH reserves the right to modify these specifications at any time without notice.

