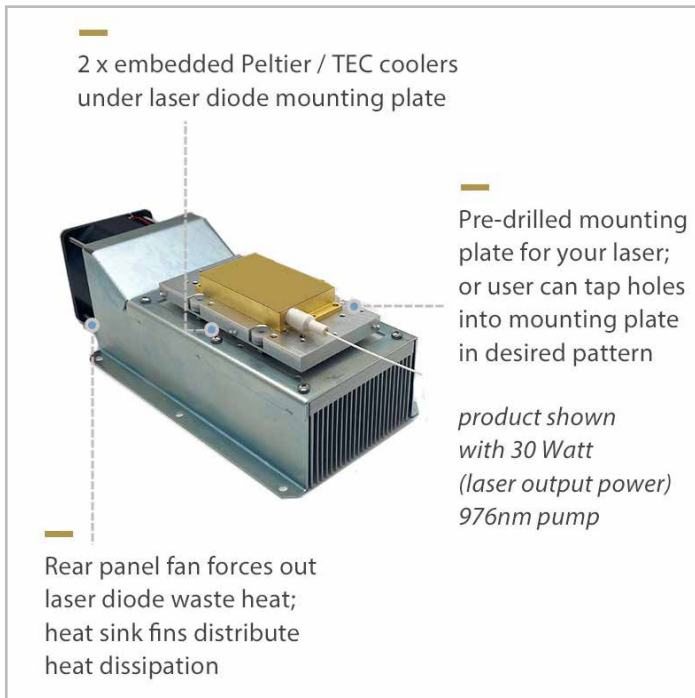


50 Watt Laser Diode Mount and Heatsink Assembly TEC-Based Heat Removal and Temperature Management

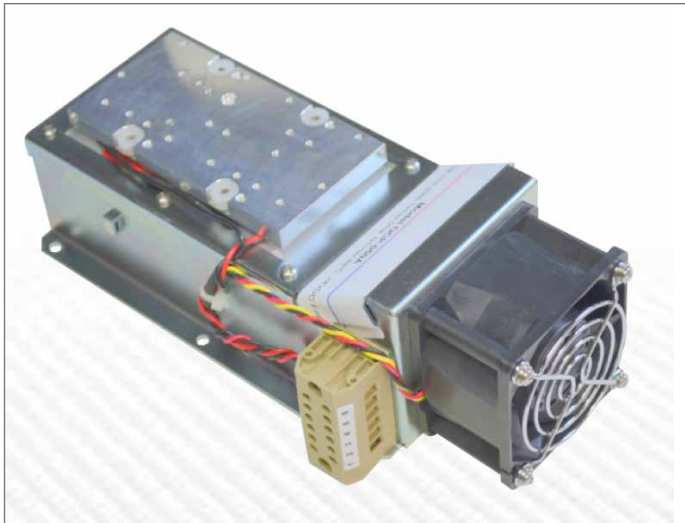


OCP-050A Heatsink

- o Up to 50 Watts of Waste Heat Removal Capacity
- o TEC Heat-Pumps for Temperature Control and Stabilization
- o Integrates with the BA-01 and BA-02 Butterfly Laser Diode Mounting
- o Pre-Drilled Mounting Plate for Butterfly Lasers
- o Custom Mounting Plates Available

VERSATILE AND HIGH EFFICIENCY HEAT SINK

The OCP-050A is a high performance TEC- and fan-based cooling module designed for high power laser diodes. It is an affordable, high performance solution for cooling and temperature control of fiber coupled laser diodes in laboratory environments.



The functional hole patterns are shown in the dimensions figure below. It has two locations for butterfly laser mounts BA-01. Custom mounting holes patterns are available upon request.

The cold plate is electrically isolated from the heatsink and the fan duct: it is safe to mount the diode directly on the cold plate using indium foil.

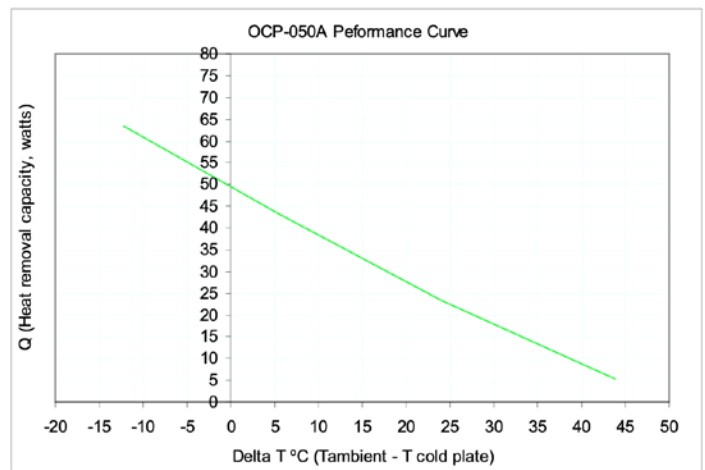
PRINCIPLE OF OPERATION

In the standard configuration the fan pulls air through the heatsink fins. The OCP-050A can be used on an optical table in this configuration because the air is directed away from the optics. The fan can be removed and turned around to reverse the airflow through the heatsink; in this configuration heat removal capacity is slightly improved.

HIGH PERFORMANCE HEAT CONTROL

The chart below illustrates the heat removal capacity of the OCP-050A. The Y-axis is the heat load to the cold plate; the X-axis is the delta between the lowest temperature on the cold plate and ambient at the given heat load. The cold plate temperature is an average figure, and the temperature directly underneath the laser diode module will be higher, while the temperature at the edge of the cold plate will be lower.

This curve is obtained with 3.6 Amps current to each TEC with the cold side set point at 25°C.



Due to the physics of TEC operation, heat removal capacity performance improves with hotter set points and decrease if the set point is lower.

TEC SPECIFICATIONS

The maximum operating current for the TEC is 4.2 A, and maximum voltage is 12 VDC at room temperature. Maximum operating current and voltage increases with ambient. Exceeding the specified maximum current will reduce the performance and reduce the long-term reliability of the TECs.

The typical optimum current for each TEC is 3 - 4 Amps, and depends on the set temperature, heat load, interface quality between the diode and cold plate, and ambient temperature. Users are advised to manually ramp the TEC driving current after assembling the diode on the cold plate to identify the optimum current, and then set the current limit accordingly so that the TEC current will not run away.

All TECs are environmentally sealed for operating below dew point.

DIODE COOLING INTERFACE GUIDELINES

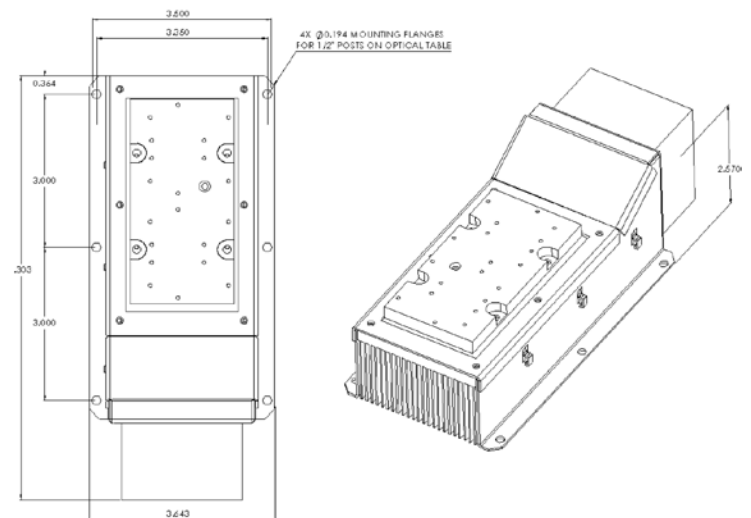
The heat removal performance of the heat sink is sensitive to the quality of the thermal interface between the cold plate and the laser diode module.

For high power laser modules with a large footprint, it is difficult to maintain a uniform high quality interface.

The cold plate is made of copper with very low spreading resistance, and using dry interface materials will help considerably to form a uniform heat conduction interface.

If the laser diode set temperature is significantly below ambient, we recommend insulating the module on the top of the cold plate. Thermal insulation materials such as silicone foam or ceramic-based insulation work well to insulate laser from ambient.

HEATSINK DIMENSIONS



OCP-050A SPECIFICATIONS

HEAT SINK ASSEMBLY OVERVIEW	Anodized Aluminum Mounting Plate; Temperature Stabilization by Peltier / TE Cooler Custom Mounting Plates Available on Request Thermal Resistance: TEC to Ambient 0.22°C/W Typical Temperature Uniformity: <0.5°C Across Laser Diode Mounting Plate Embedded TEC Max Ratings: 150°C Heat Load (Qmax) Maximum: 50 Watts Cooling Plate Material: Anodized Aluminum
CONNECTIONS	Connections: TEC x 2, Fan x 1
INTEGRATED FAN AND TEC RATINGS	2 x Integrated TEC Ratings (max): 4.2 Amps, 12 Volts Per TEC Fan Rated Voltage: 12 VDC Fan Operating Voltage Range: 5.5 - 13.8 VDC Fan Rated Current: 1.6 Amps Fan Input Power: 9.9 Watts

PRODUCT SALES AND SERVICE

Unlimited phone and email support is provided for products purchased through Laser Lab Source. Orders for this product are fulfilled by Laser Lab Source in North America and select international regions.

PRODUCT WARRANTY

This product is sold with a full one-year warranty. It is warranted to be free from defects in material and/or workmanship for a period of one year from the date of shipment. The warranty does not cover damage to the to the product due to mishandling or use of the product outside of its specified maximum ratings.



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