

## 1. Introduction

OCP-050A is a high performance cooling module designed for OEM applications for laser products, medical equipments and semiconductor processing. It is also designed for general cooling of standard butterfly laser diodes for obtaining lower temperature.

The functional hole patterns are shown in the figure below. It has two locations for butterfly laser mounts BA-01.

Custom mounting holes patterns is available upon request.

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

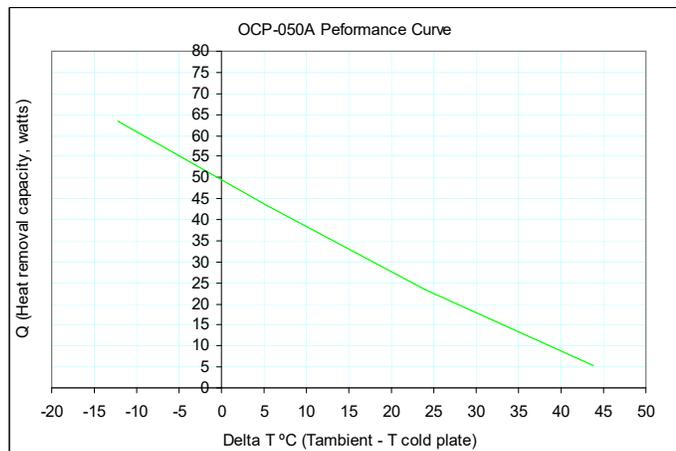
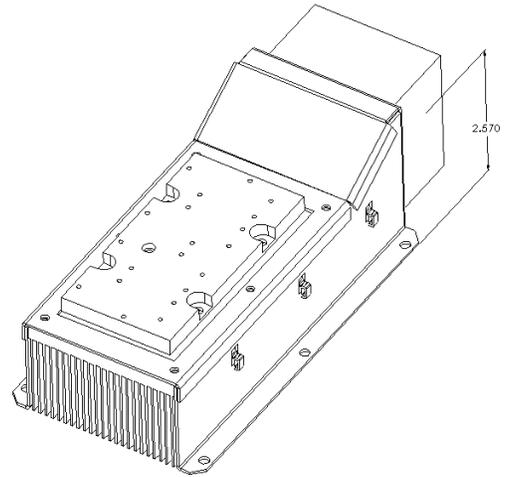
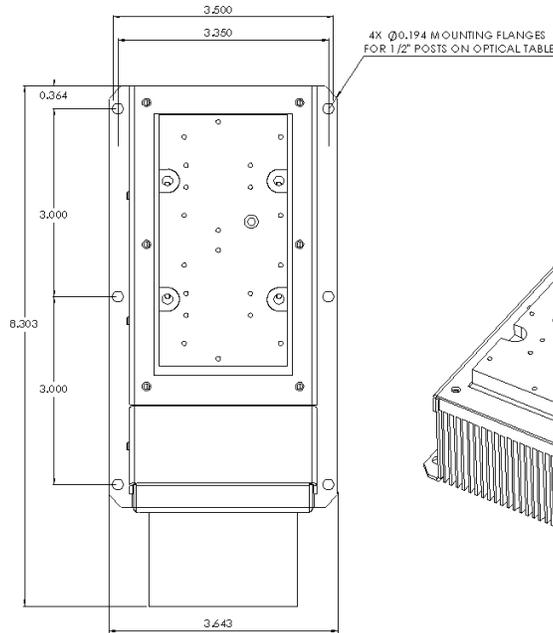
## 2. Performance curve

The curve illustrates the performance of OCP-050A. The Y-axis is the heat load to the cold plate, the X-axis is the delta between the lowest temperature on cold plate and ambient at the given heat load. Please notice that the cold plate temperature is an average figure, the temperature directly underneath the diode source will be higher and the edge of the cold plate will be lower. This curve is obtained with 3.6Amps current to each TEC with the cold side set at 25°C. The performance will improve in hotter set points and decrease if the set point is lower.

## 3. Cooling Approach

The fan pulls air away from front of heatsink in our standard configuration of the cooling module. It makes it easy to use on optical table with CS diode mounted on it since the air is pulling away from the optics. For applications where pushing air out from the front is not a concern, users can easily take the fan off and change the direction of the airflow; and the performance will be slight better.

## 4. Cooling Fan Specifications



| Parameters              | Standard     |
|-------------------------|--------------|
| Rated voltage           | 12VDC        |
| Operating voltage range | 5.5~13.8 VDC |
| Input power             | 9.9w         |
| Rated current           | .83A         |
| Noise                   | 47dBA        |

This fan is selected for maximum performance. For less demanding cooling situations, users can lower the driving voltage to the fan to reduce noise.

### 5. TEC specifications

The maximum operating current for the TEC is 4.2 A, and maximum voltage is 24VDC at room temperature. Maximum operating current and voltage increases with ambient. Exceeding the specified maximum current will reduce the performance and degrade the reliability of TECs.

The typical optimum current for each TEC is about 3~4 Amps 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 set current limit accordingly so that the TEC will not runaway.

All TECs are environmentally sealed for operating below dew points.

### 6. Diode Cooling Interface Guidelines

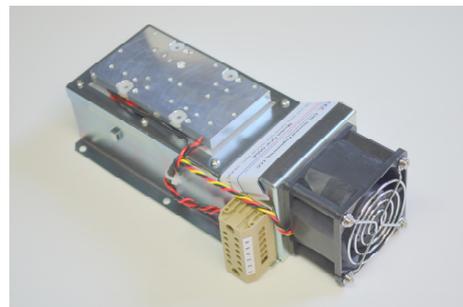
The actual performance of the cooling module is extremely sensitive to the quality of the thermal interface between the cold plate and the diode. For high power laser modules with large footprints, it is very difficult to maintain uniform high quality interface. Our cold plate is made of copper with very low spreading resistance so that the user can focus the attention primarily to the area directly underneath the laser diodes.

If diode set temperature is significantly below ambient, we highly recommend using thermal insulation materials such as silicone foam or ceramic-based insulation to insulate laser from ambient.

### 7. OCP-050A-C for interfacing with MC-1000-050

OCP-050A-C for interfacing with MC-1000-050 has a terminal block to which the TEC and fan wires are terminated. As an option, the digital thermistor can be preinstalled on the cold plate upon request, and the wires from the thermistor will also be terminated to the terminal block. The table below lists the pinouts of the terminal block:

| Pin # | Pin designation           |
|-------|---------------------------|
| 1     | TEC +                     |
| 2     | TEC -                     |
| 3     | Fan +                     |
| 4     | Fan -                     |
| 5     | Thermistor sensor VDD+GND |
| 6     | Thermistor sensor DQ      |



### 8. Pricing and Contacts

The price for OCP-050A is \$352.65 for low quantities. For volume discount or if you need further information or clarification, please contact ETE in any of the following options:

#### Elite Thermal Engineering

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