

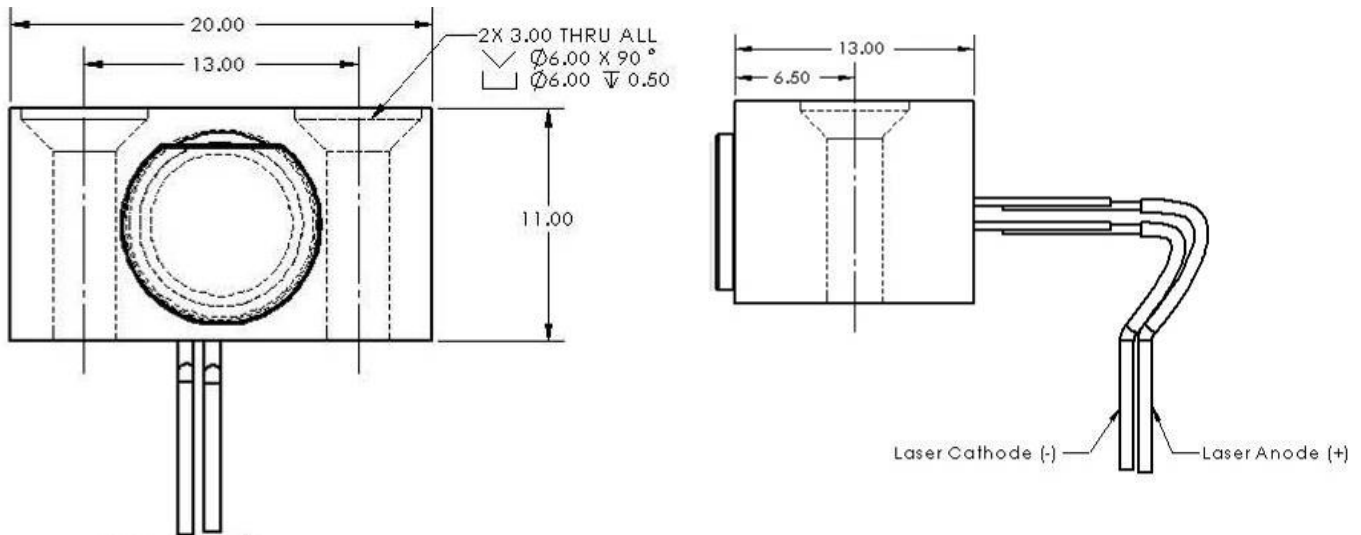


## Application note for the P-Type Laser Engine

The laser engine P-type package is designed to offer a low cost, thermally conductive package at infrared wavelengths where convective cooling may not be possible by the attached device.



The laser engine P-type package is shipped as an optical laser package integrated with a thermally conductive body and custom designed optical element. The outline of the package appears in Figure 1.



**Figure 1.** Dimensioned package outline for the SemiNex Laser Engine Package type P. Note: Due to customization, the optical element in the figure may not be representative of delivered product.

The package is designed with two through holes which are to be used with two 3mm flat head screws. The anode wire is red and the cathode wire is black. Care should be taken when mounting the body to a surface since the body of the laser engine may also be connected to the anode. The top of the laser engine is the face with the two recessed holes.

## **Laser Engine Attachment**

For optimal operation, the laser engine should be attached to a temperature controlled mounting plate, such as a cold plate or TEC. Attaching the laser engine package type P requires 2, M3 flat head screws. The mounting plate should be tapped with hole patterns to match those in Figure 1. For long term use and highly efficient thermal transfer between the laser engine and cooling plate or TEC, a layer of thermal grease or indium foil should be used. Recommended thermal greases are ShinEtsu Micro Si Product X23-7762, ShinEtsu Micro Si Product G751 or Artic Silver 5. Indium foil can be obtained from Indium Corp, part number ribbonin-10101. For short term operation, the use of thermal grease can be avoided, but the temperature rise will be larger than with the grease, which will result in a decrease in optical power.

### *Attachment without thermal grease*

Wipe the bottom of the laser engine and top of the mounting plate with a clean cloth to remove any particles. Place the laser engine on the mounting plate, align the holes and insert the screws into the package. Tighten the screws by securing one until a resistance is observed and repeat the process with the other screw. Return to the first screw and tighten with a torque wrench. Use caution to prevent over tightening. Do not exceed 5 in-pounds. Repeat with the second screw.

### *Attachment with Thermal Grease*

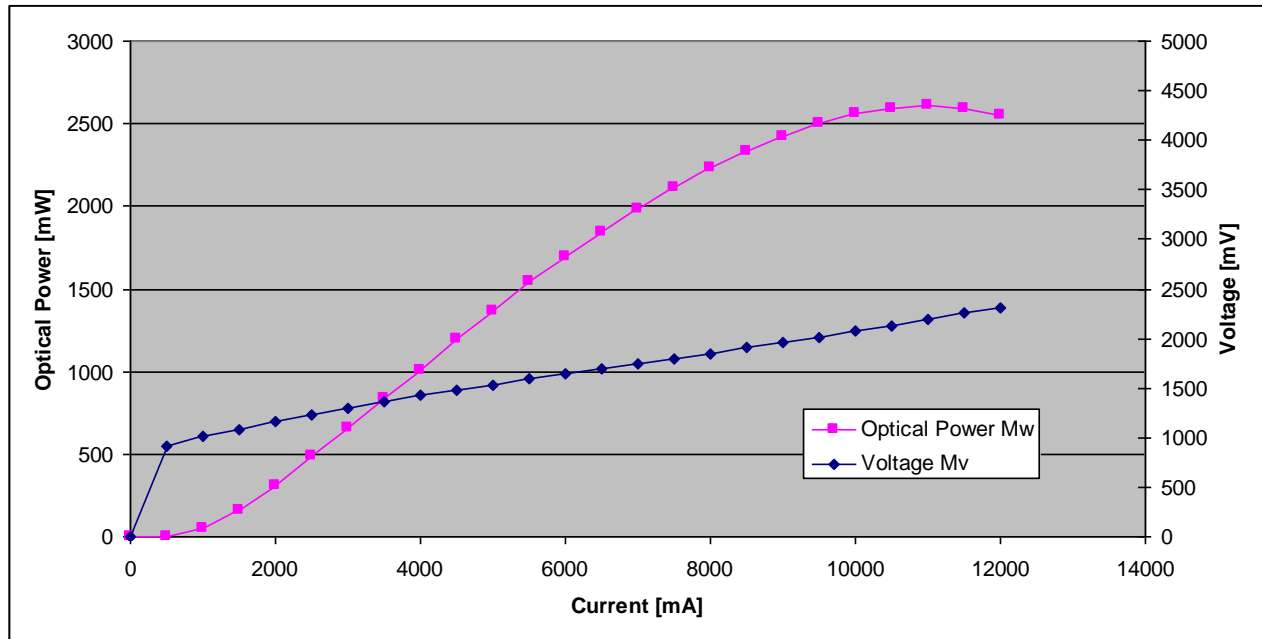
Wipe the bottom of the laser engine and top of the mounting plate with a clean cloth to remove any particles. Apply a small amount of grease to the bottom of the laser engine. Spread the grease as evenly as possible using a roller or squeegee. Align the bolt holes of the laser engine to the bolt holes in the mounting plate and secure with M3 screws. Tighten the screws as described above. Use caution to prevent over tightening. Do not exceed 5 in-pounds. Remove any excess grease using a towel. Use caution to ensure grease does not fall on the lens.

### *Attachment with Indium Foil*

Wipe the bottom of the laser engine and top of the mounting plate with a clean cloth to remove any particles. Cut a small piece of foil approximately 20mm x 13mm and lay it on the mounting plate in the attachment location. Cut holes in the foil at the locations of the screws using a tool such as scissors or an X-Acto knife. Align the bolt holes of the laser engine to the bolt holes in the mounting plate and secure with M3 screws. Tighten the screws as described above. Use caution to prevent over tightening. Do not exceed 5 in-pounds. Use caution to ensure debris does not fall on the lens during mounting.

## Laser Engine Operation

The laser engine has been tested prior to shipment while attached to a 20C cold plate using indium foil. A typical LIV appears in Figure 2. Due to lens customization and choice of wavelength, optical power and/or voltages may be different. A recommended safe operating current range is between 500mA and 90% of peak power. Peak power and slope will change with mounting plate and ambient temperature.



**Figure 2.** Typical LIV of laser engine package P. Performance will vary with choice of wavelength, lens customization, and temperature.