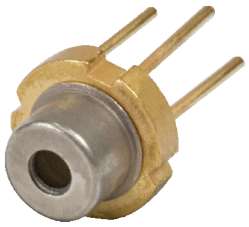
# 488 nm Laser Diode, 60 mW



**L488P60**

## Description

This 488 nm, 60 mW laser diode is a compact light source suited for a variety of applications including fluorescence and spectroscopic measurements, imaging, flow cytometry and microscopy. It comes in a ∅5.6 mm TO package with a B pin configuration; this package includes an ESD protection diode and monitor photodiode. It is recommended to have the base of the laser diode in good thermal contact with a heat sink. This laser is fully compatible with our line of Laser Diode and TEC Controllers as well as our selection of Laser Diode Mounts and Collimation Solutions.

## Specifications

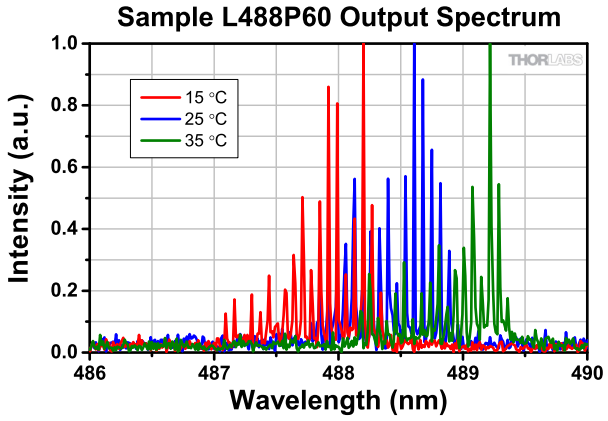
| Absolute Maximum Ratings* | |
|---|---|
| **Specification** | **Maximum** |
| **Forward Current** | 150 mA |
| **LD Reverse Current** | 20 mA |
| **Operating Case Temperature** | -20 to +60 °C |
| **Storage Temperature** | -40 to +85 °C |
| **Soldering Temperature, <10 seconds** | 260 °C |
| **Junction Temperature** | 150 °C |

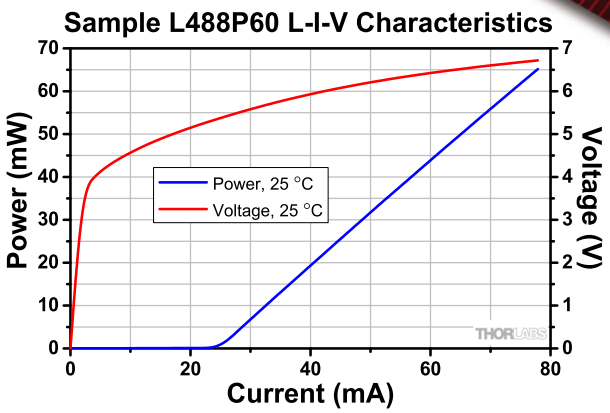
*Absolute Maximum Rating specifications should never be exceeded.
Operating at or beyond these conditions can permanently damage the laser.

| L488P60 Specifications | | | | | |
|---|---|---|---|---|---|
| | | **Symbol** | **Min** | **Typical** | **Max** |
| **Center Wavelength @ $P_{op}$** | | $\lambda_o$ | 486 nm | 488 nm | 490 nm |
| **Output Power, CW** | | $P_{op}$ | - | 60 mW | - |
| **Threshold Current** | | $I_{TH}$ | - | 30 mA | 40 mA |
| **Operating Current CW @ $P_{op}$** | | $I_{op}$ | - | 75 mA | 110 mA |
| **Operating Voltage @ $P_{op}$** | | $V_{op}$ | - | 6.8 V | 8.0 V |
| **Slope Efficiency** | | $\eta$ | - | 1.2 W/A | - |
| **Polarization Extinction Ratio (TE/TM)** | | PER | - | 20 dB | - |
| **Beam Divergence (FWHM)** | **Parallel @ $P_{op}$** | $\theta_{//}$ | 4° | 7° | 10° |
| | **Perpendicular @ $P_{op}$** | $\theta_{\perp}$ | 16° | 23° | 26° |
| **Monitor Current @ $P_{op}$ ($V_{BIAS}$ = 5 V)** | | $I_{PD}$ | - | 60 µA | - |
| **Thermal Resistance, Junction to Case** | | $R_{th}$ | - | 34 K/W | - |
| **Modulation Frequency** | | $f$ | - | >100 MHz | - |

$T_{CASE}$ = 25 °C

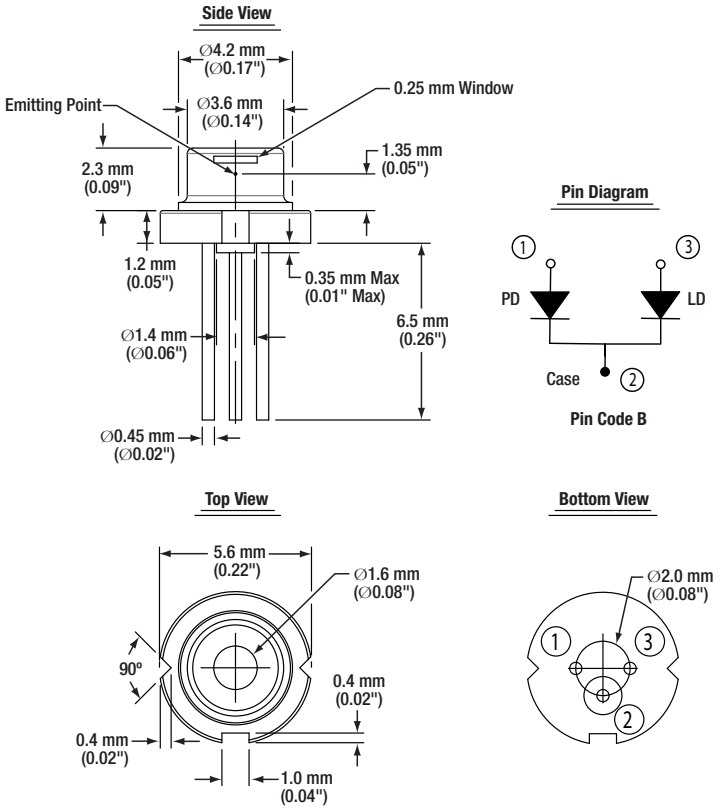
## Performance Plots




The data presented here is for one particular laser diode. Slight variations in performance data will occur from device to device. The sample spectrum of the L488P60 laser diode was measured at 15 °C, 25 °C, and 35 °C using a Thorlabs OSA201 Spectrum Analyzer with resolution of 7.5 GHz. The L-I-V characteristics data was taken at 25 °C. Please visit our website for raw spectral data and L-I-V characteristics.

## Drawings




| Pin | Description |
|---|---|
| 1 | Photodiode Anode |
| 2 | Case |
| 3 | Laser Diode Anode |

## Operation Notes and Warnings

1. The Absolute Maximum values specified above should not ever be exceeded, even instantaneously. Operating at or near one or more of these values can significantly reduce the lifetime of or destroy the device.
2. Take all necessary Electrostatic Discharge (ESD) precautions. The user should be appropriately grounded, such as through the use of an ESD wrist strap with 1 MΩ resistance, as should all surfaces that come in contact with the leads. Neither the laser diode nor its mount should be disconnected while in operation. Handling in a low humidity environment tends to increase the chance of ESD damage. Other causes of electrical transients from the environment should be avoided.
3. Applying a reverse electric potential or current exceeding the specified value across the laser diode/LED can cause damage to the device.
4. It is necessary to determine a suitable drive (injection) current for each device by empirically measuring its LI relationship ("LI curve"). To do so, it is recommend to gradually increase the current from zero while monitoring the optical power until the specified power is reached. This should be performed at the same operating temperature that will be used in the application. From this measurement, a current limit appropriate to the specific device should be set on the controller. Merely operating at the specified Typical or Maximum Operating Current can damage the laser diode since the corresponding power may exceed its operating specification.
    a. Note that the Maximum Current value given above is the maximum current required for the diode to lase at the specified typical optical power. In practice, operating at the Maximum Current spec will likely result in an output power that approaches or exceeds the Absolute Maximum value.
5. The laser diode's specifications are valid at the specified operating case temperature. Operating at other temperatures will accelerate aging and results in a reduced lifetime. The TO header needs to be in good thermal contact with a suitable heat sink. For high heat load and/or narrow operating temperature range diodes, using a low thermal impedance temperature controlled mount is absolutely necessary; and the base of the TO header should be in good thermal contact with the heat sink.
6. If it is desirable to operate the laser diode in "constant power" mode, an appropriate value for the monitor current $I_{PD}$ should be determined by measuring at $P_{OP}$ in "constant current" mode. An appropriate drive current limit should also be set when operating in the constant power mode.
7. The laser diode should be operated with an appropriate current source. The current source should be free of transients. In particular, it should not spike or overshoot when powered on or off. Many standard laboratory benchtop or board level power supplies will not be free of transient. The current reading should be accurate.
8. It is necessary to avoid direct reflections to the laser diode. This can cause sudden failure, in addition to destabilizing the performance. It is recommended to use an optical isolator if reflections may be present.
9. This device emits coherent light and is classified as Class 3B when electrically powered. To ensure safe operation, use only with a suitable power source that complies with the requirements for laser systems, as specified in IEC-60825-1 "Safety of Laser Products."