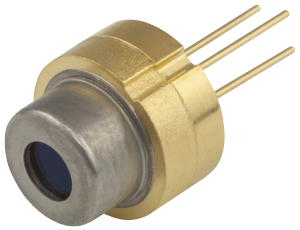
# 852 nm Grating Stabilized TO Can Laser Diode, 600 mW



**LD852-SEV600**

## Description

The LD852-SEV600 852 nm, Single-Frequency TO-Can Laser Diode is based on quantum well epitaxial layer growth and a highly reliable ridge waveguide structure with external volume holographic grating (VHG) feedback. This single-transverse mode laser diode features high optical output power and produces a wavelength stabilized spectrum with a single frequency narrow linewidth over the operating power range of approximately 500 to 600 mW. Contained in a Ø9 mm package, the LD852-SEV600 laser is ideal for illumination, printing, 3D sensing, instrumentation, defense and medical applications. This diode can be custom ordered for a wider wavelength-stabilized temperature range.

## Specifications

| LD852-SEV600 Absolute Maximum Ratings | |
|---|---|
| LD Reverse Voltage (Max) | 2 V |
| Absolute Max Current | 1050 mA |
| Absolute Max Power | 610 mW |
| Operating Temperature | 0 to 50 °C[a] |
| Storage Temperature | -10 to 65 °C |
| Pin Code | E |

| LD852-SEV600[b] | | | | |
|---|---|---|---|---|
| | Symbol | Min | Typical | Max |
| Center Wavelength | $\lambda_C$ | 850 nm | 852 nm | 854nm |
| Single Frequency Output Power[c] (CW @ $I_{CW}$ and $T_{CS}$) | $P_{CW\text{-}SF}$ | 550 mW | 600 mW | - |
| Single Frequency Power Range | $\Delta P_{SF}$ | 100 mW[d] | - | - |
| Operating Current (CW) | $I_{CW}$ | - | - | 1050 mA |
| Center Temperature for $\Delta T_{stabilized}$ | $T_{CS}$ | 15 °C | - | 30 °C |
| Wavelength Stabilized Temperature Range | $\Delta T_{stabilized}$ | 5 °C | - | - |
| Threshold Current | $I_{TH}$ | - | 250 mA | 350 mA |
| Side Mode Suppression Ratio (SMSR) | SMSR | 25 dB | 40 dB | - |
| Forward Voltage | $V_F$ | - | 2.2 V | 2.8 V |
| Slope Efficiency at 25 °C | $\Delta P/\Delta I$ | - | 0.8 W/A | - |
| Laser Linewidth | $\Delta\nu$ | - | 20 MHz | - |
| Transverse Beam Divergence Angle (FWHM) | $\theta_T$ | - | 13° | 16° |
| Lateral Beam Divergence Angle (FWHM) | $\theta_L$ | - | 8° | 10° |

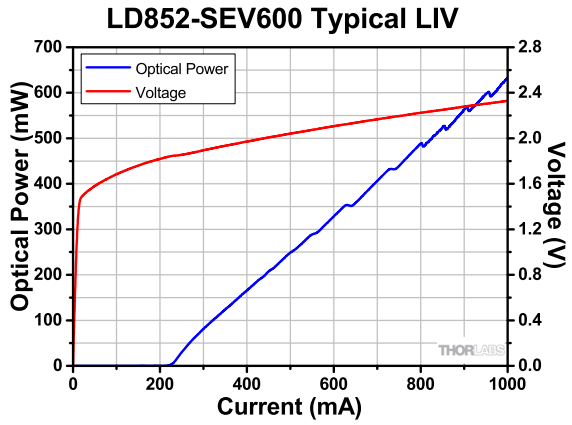
a. The wavelength-stabilized temperature range typically spans a minimum of 5 °C centered on a temperature between 15 °C and 30 °C. This specification is given for each device on the unit-specific data sheet. When operated outside of the operating temperature range the laser diode will no longer be wavelength stabilized.

b. In order to achieve the specified performance, we recommend using the TCLDM9 Laser Diode Mount and, when collimated, an NIR optical Isolator; single frequency performance when collimated is only guaranteed with >30 dB isolation of back reflections.

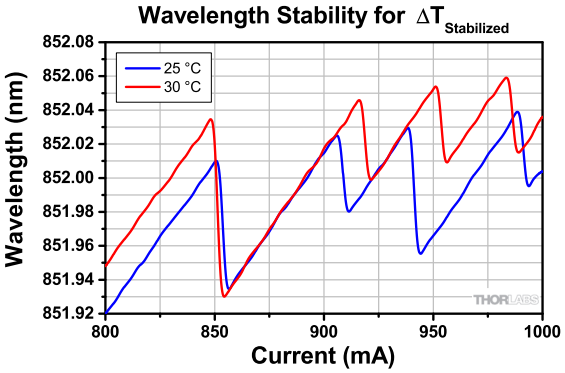
c. This value is the upper limit of the range where the diode can produce single frequency output and varies from laser to laser. The performance of each individual laser can be found on the unit-specific data sheet.

d. This value is specified for temperatures in the range given by $T_{CS} \pm ½/T_{stabilized}$. The 100 mW minimum single frequency power range corresponds to output powers between the typical $P_{CW\text{-}SF}-\Delta P_{SF}$ and $P_{CW\text{-}SF}$, i.e., between 500 mW and 600 mW.

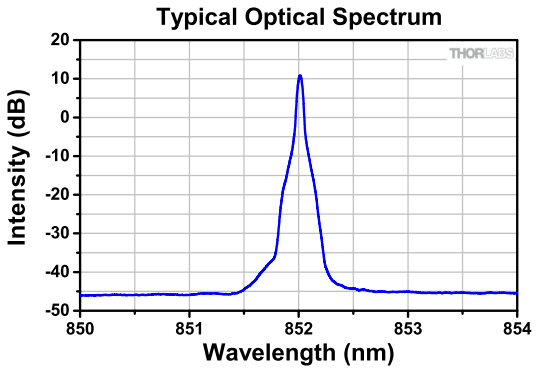
# Typical Performance Plots



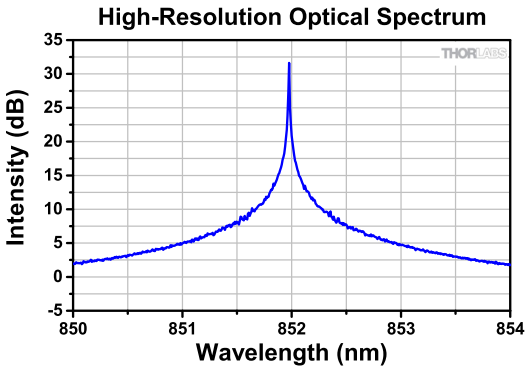

The typical output power vs. current is shown for four temperatures within the wavelength stabilized temperature range ($\Delta T_{Stabilized}$)* of a LD852-SEV600 laser diode.



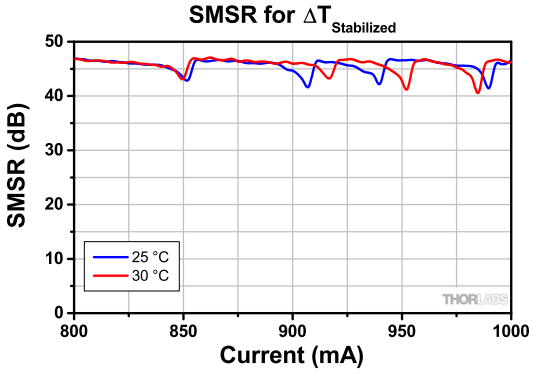

When used within the wavelength stabilized temperature range ($\Delta T_{Stabilized}$)*, the LD852-SEV600 shows excellent wavelength stability over a range of drive currents.




The typical optical spectrum is shown above. The data was obtained with a 1000 mA drive current and the device held at 25 °C.



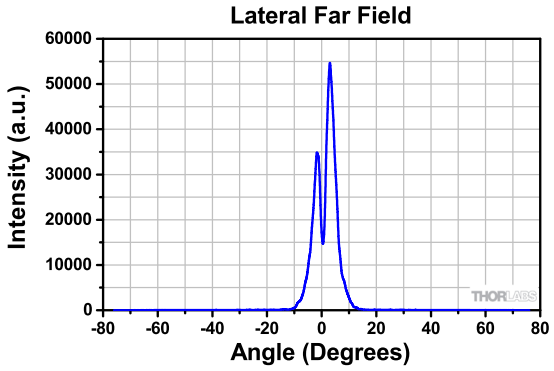

This high-resolution optical spectrum is obtained using one of Thorlabs' Optical Spectrum Analyzers (OSA201), which provides 8 pm resolution at 852 nm.

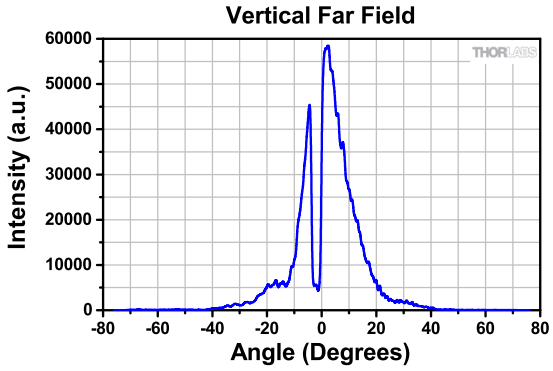



The typical side mode suppression ratio (SMSR) is shown for three temperatures within the wavelength stabilized temperature range ($\Delta T_{Stabilized}$)*.

* For each LD852-SEV600 laser, graphs of output power vs. current, wavelength stability and SMSR for $T_{Stabilized}$ will be provided on the item-specific data sheet.

## Typical Performance Plots Cont.




The diverging beam from the laser chip freely propagates through the external volume holographic grating (VHG), while the light in the center of the beam is reflected back into the chip. This results in a stabilized wavelength emitting from the laser and also creates a dark spot in the far field, as shown in the graphs above. These were measured with a current of 1000 mA.

## Drawing