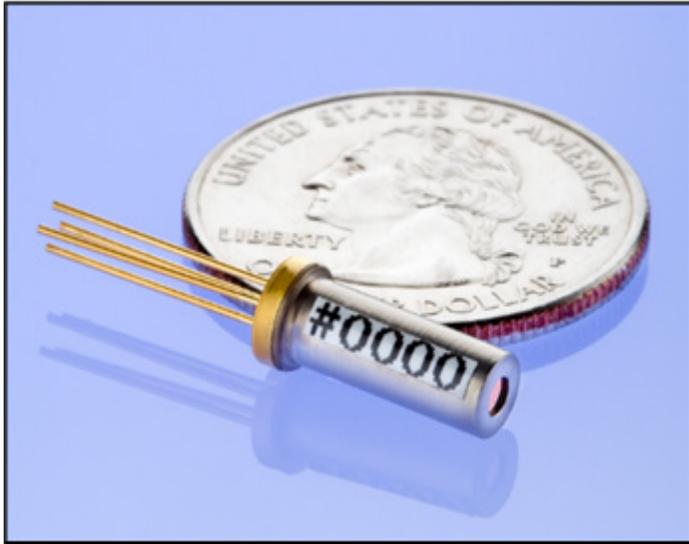


TO-56 & GUTS Package



Innovative Photonic Solutions' proprietary single-mode wavelength stabilized laser diode features high output power with ultra-narrow spectral bandwidth and a diffraction limited output beam. Designed to replace expensive DFB, DBR, fiber, and external cavity lasers, the Single-Mode Spectrum Stabilized Laser offers superior wavelength stability over time, temperature, and vibration; and is manufactured to meet the most demanding wavelength requirements.

Standard Wavelengths

| | | | |
|--------|-------|-------|--------|
| 633 nm | 685nm | 785nm | 852nm |
| 638nm | 780nm | 808nm | 976nm |
| 660nm | 783nm | 830nm | 1053nm |
| | | | 1064nm |

Custom wavelengths available upon request

All specified wavelengths are measured "in-vacuum"

Applications

This laser package is designed for OEM Integration and is ideal for:

- High-Resolution Raman Spectroscopy
 - Handheld Raman Spectroscopy
 - Confocal Microscopy
 - Raman Imaging
 - Portable Raman
 - Process Raman
- Metrology/Interferometry
- Remote Sensing
- Laser speckle contrast imaging
- Laser illumination

Key Features

The TO-56 packaged product line comes standard with a circularized and collimated output beam, internal thermistor and ESD protection. Lasing wavelength can be accurately specified and repeatedly manufactured to within +/-0.1 nm upon request.

- High-Power Single-Spatial-Mode, Single-Frequency Output
- Ultra-Narrow Spectral Linewidth (~100 kHz)
- Stabilized Output Spectrum (< 0.007 nm/°C)
- Gaussian TEM00 Spatial Mode
- Circularized and Collimated Output Beam
- Integral ESD Protection & Thermistor
- Integral Laser Line Filter
- SMSR 70 dB w/ laser line filter (40 dB without)

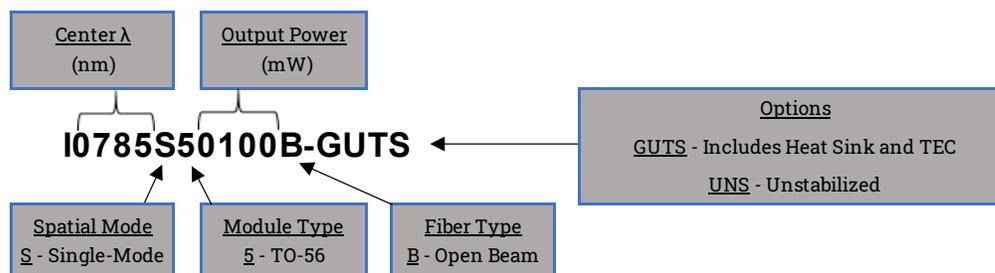
Specifications

| | |
|--|---------------------------|
| Wavelength Tolerance | +/- 0.5 nm |
| Spectral Linewidth | ~100kHz* Instantaneous |
| Wavelength Stability Range | 15° C - 45° C |
| SMSR | 35 - 45 dB |
| SMSR w/integral laser line filter | 70 dB |
| Power Stability | 1% typical |
| Beam Exit Angle | < 3° |
| Beam Quality (M ² /1/e ²) | < 1.2 |
| Beam Ellipticity | < 1:5:1 |
| Polarization Extinction Ratio (PER) | >17 db |
| Polarization Orientation | Parallel to V-notches |
| Beam Divergence (Typical) | ~ 2 mrad |
| | ~ 4 mrad for 785nm |
| Spatial Profile | TEM00 |

| λ (nm) | Output Power (mW) | Base Part Number | Max Current, Voltage |
|----------------|-------------------|------------------|----------------------|
| 633 | 50 | I0633S50050B | 175 mA, 3.0V |
| 638 | 60 | I0638S50060B | 250mA, 3.2V |
| 660 | 60 | I0660S50060B | 175mA, 3.3V |
| 685 | 40 | I0685S50040B | 60 mA, 3.0V |
| 780 | 100 | I0780S50100B | 220mA, 3.3V |
| | 100 | I0783S50100B | 200mA, 2.2V |
| 785 | 100 | I0785S50100B | 200mA, 2.2V |
| | 150 | I0785S50150B | 400mA, 3.0V |
| 808 | 150 | I0808S50150B | 400mA, 3.0V |
| 830 | 150 | I0830S50150B | 500mA, 2.2V |
| 852 | 150 | I0852S50150B | 500mA, 2.2V |
| 976 | 150 | I0976S50150B | 500mA, 2.2V |
| 1053 | 150 | I1053S50150B | 500mA, 2.2V |
| 1064 | 150 | I1064S50150B | 500mA, 2.2V |

*Requires driver electronics with very low noise analog laser driver along with a design for dual TECs for improved temperature control. Refer to the [Linewidth White Paper](#) on our website for further details

Part Schema

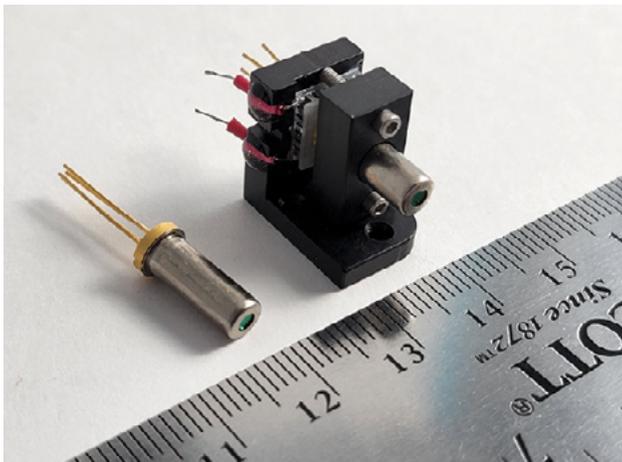


GUTS Package

A Convenient Method For Heat Sinking Your Laser

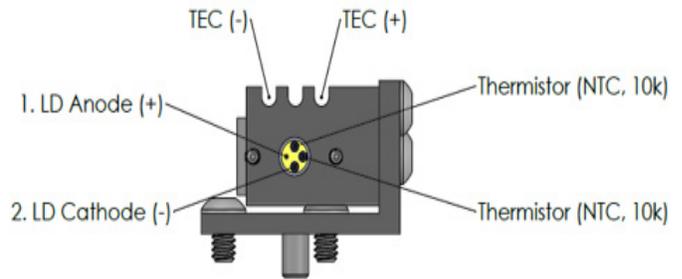
Features:

- Integrates TEC, heat sink and TO-56 laser into one component.
- Offers 2-axis alignment in both pitch and yaw.



Electrical Specs

| | |
|--------------|-----------------------------|
| Pin 1 | LD Anode (+), Case Ground |
| Pin 2 | LD Cathode (-) |
| Pin 3 | Thermistor - 10kOhm @ 25° C |
| Pin 4 | Thermistor - 10kOhm @ 25°C |

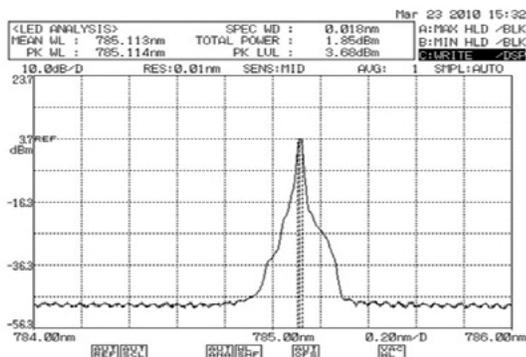


BACK VIEW

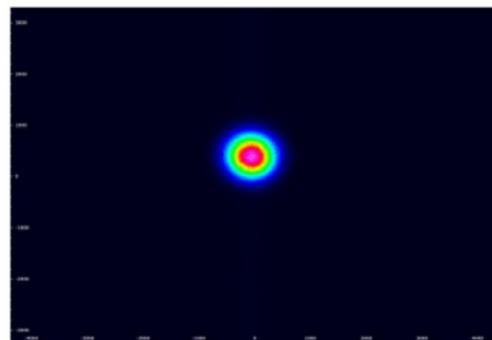
| | |
|------------------------|-------------------|
| GUTS TEC Current Limit | 1.3A |
| GUTS TEC Voltage Limit | 3.0V |
| Integral Thermistor | Betatherm 10K3CG3 |

| Recommended Electrical Connector (Not Included) | |
|---|-------------------------|
| Description | Thorlabs Part Number |
| Ø9 mm 4-Pin Laser Diode Socket | S8060-4 |

Selected Data

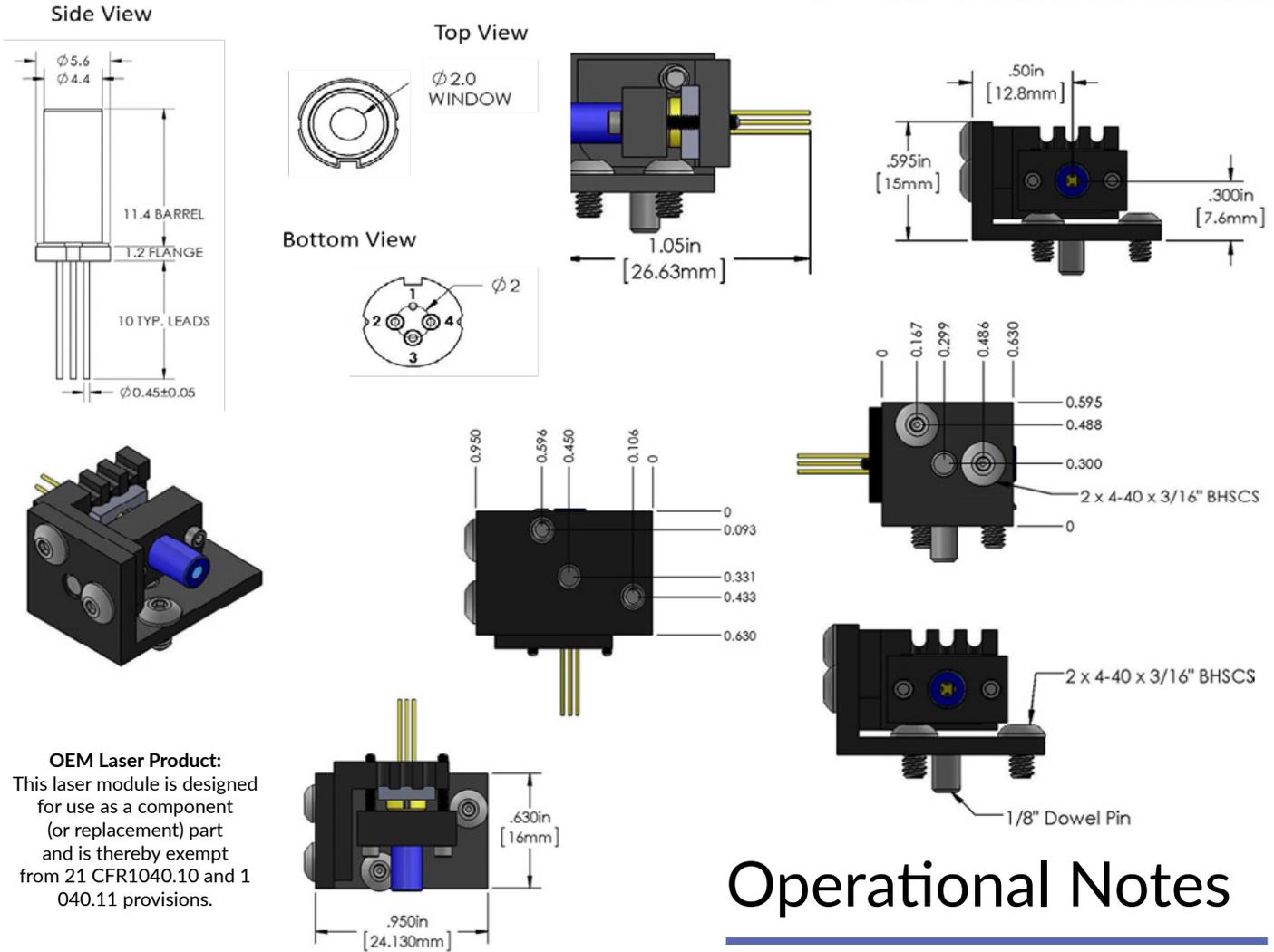


Typical 785nm SS Laser Spectrum



Typical 785nm Beam Quality

Mechanical Drawings



OEM Laser Product:
 This laser module is designed for use as a component (or replacement) part and is thereby exempt from 21 CFR1040.10 and 1040.11 provisions.

Operational Notes

1. Laser must be compression mounted on a Thermo-Electric Cooler (TEC) and heat sink to guarantee wavelength stable performance
2. Laser will operate in single frequency mode at set-points between 10 and 45 degrees, however, optimal operating set point must be determined for each laser diode to avoid mode-hopping (see note 4)
3. Do not retro-reflect beam! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty
4. To determine optimal operating point, plot wavelength vs temperature and wavelength vs. current to determine where mode-hop locations are. Set operating temperature and current halfway between mode-hops. This will ensure the most stable operation (See [Mode Hop Whitepaper](#) for more details).

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