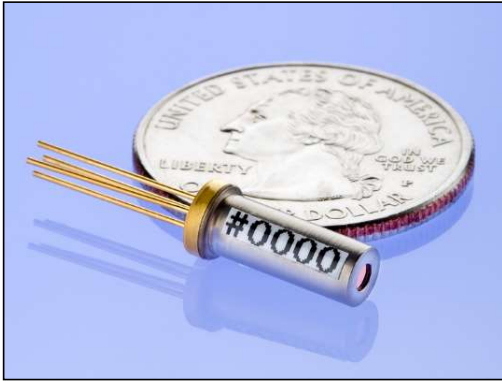


Wavelength Stabilized TO-56 Lasers



Innovative Photonic Solution's proprietary single-mode wavelength stabilized laser 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 (0.007 nm/°C), and vibration, and is manufactured to meet the most demanding wavelength requirements.

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. The laser package is designed for OEM integration and is ideal for high resolution Raman spectroscopy, confocal microscopy, metrology and interferometry applications.



1 - Integral laser line filters for 633 nm, 638 nm, 785 nm, 808 nm, 830 nm and 1064 nm

Features

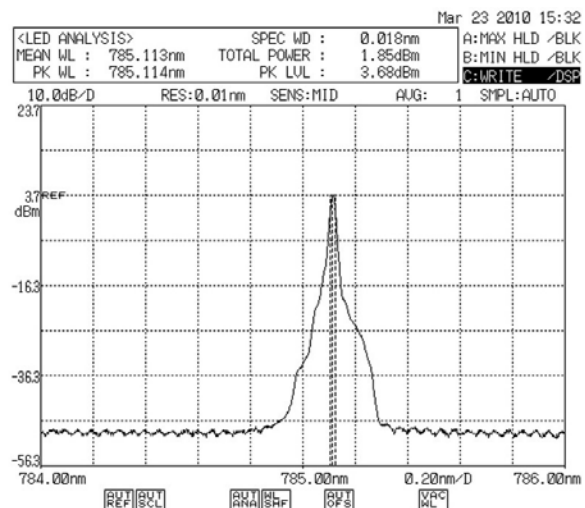
- High Power Single Frequency Output
- Narrow Spectral Linewidth (~100 kHz)
- Stabilized Output Spectrum (< 0.007 nm/°C)
- Gaussian TEM₀₀ Spatial Mode
- Circularized & Collimated Output Beam
- Integral ESD Protection & Thermistor
- Integral Laser Line Filter¹
- SMSR 70 dB w/ laser line filter (40 dB without)

Standard Wavelengths

- 633 nm
- 638 nm
- 780 nm
- 783 nm
- 785 nm
- 808 nm
- 830 nm
- 1053 nm
- 1064 nm

Custom wavelengths available

Typical Spectral Plot



Typical 785 nm SS Laser Spectrum

General Optical Specifications

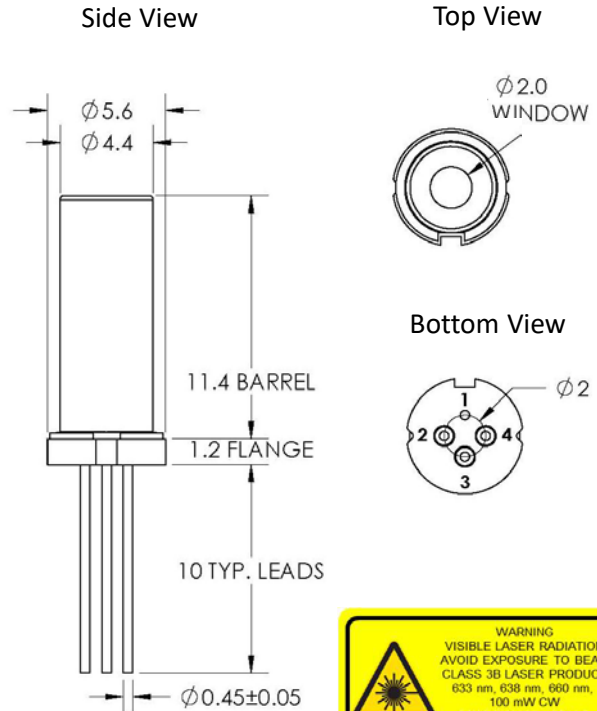
Wavelength Tolerance	+/- 0.5 nm
Spectral Linewidth ($\Delta\lambda$)	~ 100 kHz instantaneous
Wavelength Stability Range	15 C - 45 C (optimal set point must be determined for best performance - see operational notes below)
SMSR	35 -45 dB
SMSR w/integral laser line filter	70 dB
Power Stability	1% typical
Polarization Extinction (PER)	>17 dB
Polarization Orientation	Parallel to V-notches
Spatial Profile	TEM00
Beam Exit Angle	< 3 degrees
Beam Quality (M-Squared)	< 1.5
Beam Ellipticity	1.5:1
Beam Divergence (Typical)	~ 2 mrad
	~ 4 mrad for 785 nm

Wavelength (nm)	Min. Power (mW)	Part number	Max Current, Voltage
633	15	R0633S50015B	100 mA, 3.0V
633	35	R0633S50035B	175 mA, 3.0V
633	50	R0633S50050B	175 mA, 3.0V
638	35	R0638S50035B	150 mA, 3.3V
638	60	R0638S50060B	170 mA, 3.3V
780	100	R0780S50100B	250 mA, 2.2V
783	100	R0783S50100B	250 mA, 2.2V
785	100	R0785S50100B	250 mA, 2.2V
785	200	R0785S50200B	400 mA, 3.0V
808	100	R0808S50100B	300 mA, 2.2V
830	100	R0830S50100B	300 mA, 2.2V
1053	150	R1053S50150B	300 mA, 2.2V
1064	150	R1064S50150B	300 mA, 2.2V

Electrical Pinout

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

TO-56 Mechanical Specifications



OEM Laser Product

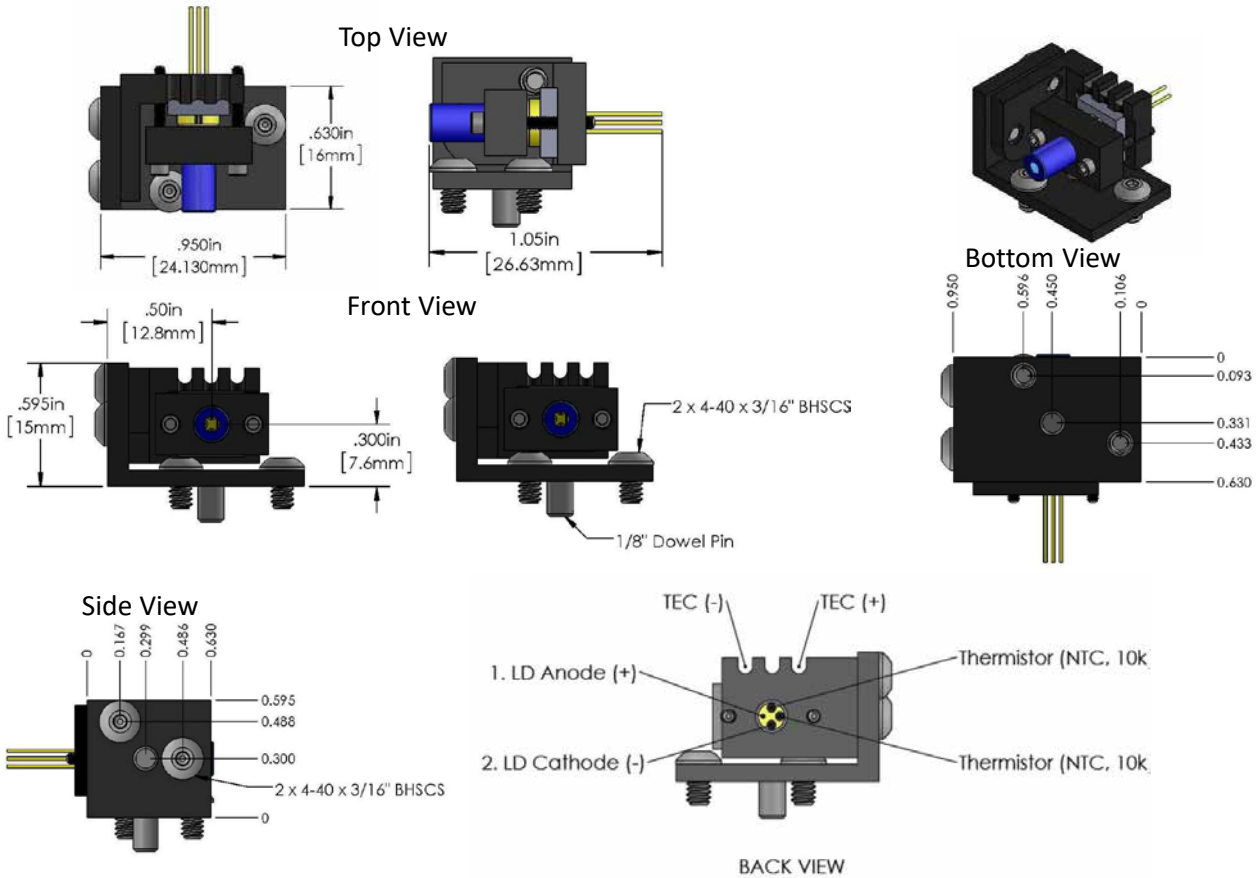
This laser module is designed for use as a component (or replacement) part and is thereby exempt from 21 CFR 1040.10 and 1040.11 provisions.



Operational Notes

- Laser must be compression mounted on a Thermo-Electric Cooler (TEC) and heat sink to guarantee wavelength stable performance
- 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)
- Do not retro-reflect beam! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty
- To determine optimal operating point, plot output power vs temperature to determine where mode-hop locations are. Set operating temperature halfway between mode-hops. This will ensure the most stable operation (IPS can offer the option of determining this optimal operating point for each diode)
- IPS can offer the TO-56 mounted with TEC and heat sink in our A-type gimbal (-GUTS option). See p.3 for drawings.

TO-56 in "GUTS" Mount Mechanical Specifications



Thermistor

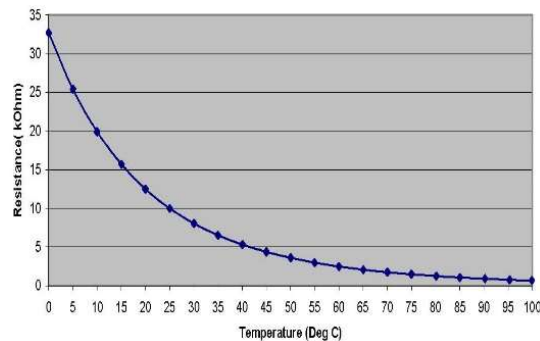
Formula for calculating T based upon Resistance

$$1/(C1+C2*LN(kOhm*1000)+C3*(LN(kOhm*1000))^3)-273.15$$

Thermistor (Betatherm 10K3CG3)

C1 0.00113
 C2 0.000234
 C3 8.78E-08

Plot of Temperature vs Resistance



Temperature [C]	Resistance [kOhm]
100	0.68
95	0.78
90	0.91
85	1.07
80	1.25
75	1.48
70	1.75
65	2.08
60	2.49
55	2.99
50	3.6
45	4.37
40	5.32
35	6.54
30	8.05
25	10
20	12.5
15	15.7
10	19.9
5	25.4
0	32.7

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