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Single-Mode Wavelength Stabilized Open Beam 14-pin BF

Innovative Photonic Solutions' 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/^{0}C), and vibration, and is manufactured to meet the most demanding wavelength requirements.

The Single-Mode Spectrum Stabilized laser is available (both fiber coupled and open beam) at wavelengths ranging from 405 – 2400 nm, in a 14-Pin Butterfly package, in an integrated OEM module, or in a fully integrated module with user configurable temperature and power control electronics. Lasing wavelength can be accurately specified and repeatedly manufactured to within 0.1 nm. The laser is ideal for high resolution Raman spectroscopy, confocal microscopy, direct-diode frequency doubling, laser seeding, gas sensing, metrology and remote sensing applications.

Wavelength (nm)	Min. Power (mW)	Part number	Max Current, Compliance Voltage
633	15	R0633SB0015B	100 mA, 3.3V
633	35	R0633SB0035B	150 mA, 3.3V
633	50	R0633SB0050B	175 mA, 3.3V
638	35	R0638SB0035B	170 mA, 3.3V
638	60	R0638SB0060B	170 mA, 3.3V
660	50	R0660SB0050B	200 mA, 3.3V
780	100	R0780SB0100B	180 mA, 2.3V
785	100	R0785SB0100B	250 mA, 2.5V
808	100	R0808SB0100B	200 mA, 2.3V
830	100	R0830SB0100B	200 mA, 2.3V
976	500	R0976SB0500B	400 mA, 2.2V
1030	450	R1030SB0450B	750 mA, 2.2V
1053	500	R1053SB0500B	750 mA, 2.2V
1064	250	R1064SB0250B	400 mA, 2.2V
1064	500	R1064SB0500B	750 mA, 2.2V

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

Features

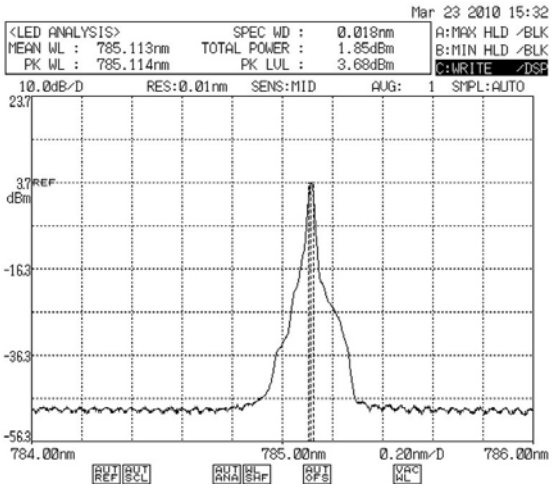
- High Power Single Frequency Output (SLM)
- Narrow Spectral Linewidth (<100 kHz)
- Stabilized Output Spectrum (< 0.007 nm/^{0}C)
- Gaussian TEM_{00} Spatial Mode
- Circularized & Collimated Output Beam
- Integral ESD Protection & Thermistor
- Integral Laser Line Filter[1]
- SMSR 70 dB w/ laser line filter (40 dB without)
- "Ultra-Track" Linear Tracking Photodiode

Standard Wavelengths

• 633 nm	• 780 nm	• 976 nm
• 638 nm	• 785 nm	• 1030 nm
• 660 nm	• 808 nm	• 1053 nm
	• 830 nm	• 1064 nm

Custom wavelengths available

Typical Spectral Plot



Typical 785 nm SS Laser Spectrum

RoHS COMPLIANT

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www.rpmclasers.com

General Optical Specifications

Wavelenth 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)
SMSR	35 -45 dB typical
SMSR w/integral laser line filter	70 dB typical
Power Stability	1% typical
Polarization Extinction (PER)	>17 dB, 20 dB typical
Polarization Orientation	Parallel to mounting surface[2]
Spatial Profile	TEM00
Beam Exit Angle	< 3 degrees
Beam Quality (M-Squared)	< 1.5
Beam Ellipticity	1.5:1
Beam Divergence[3]	~ 2 mrad[3]

Electrical Performance Specifications

TEC Current Limit	3.2 A
TEC Voltage Limit	5.8 V
Photodiode Current	30 uA
Integral Thermistor	See Thermistor Section

Electrical Pinout

1	TEC +
2	THERMISTOR (10K Ohm @ 25C)
3	PD ANODE
4	PD CATHODE
5	THERMISTOR
6	NC
7	NC
8	NC
9	LASER CATHODE (-)
10	LASER ANODE (+)
11	LASER CATHODE (-)
12	NC
13	CASE GROUND
14	TEC -

2 – Parallel to mounting surface for most wavelengths, but it could vary depending on wavelength. Please ask about your specific wavelength.
3 – Divergence for 785 nm TO-56 is ~3-4 mrad

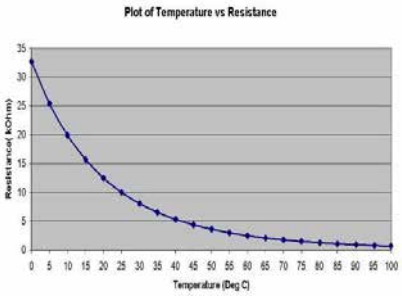
Thermistor

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

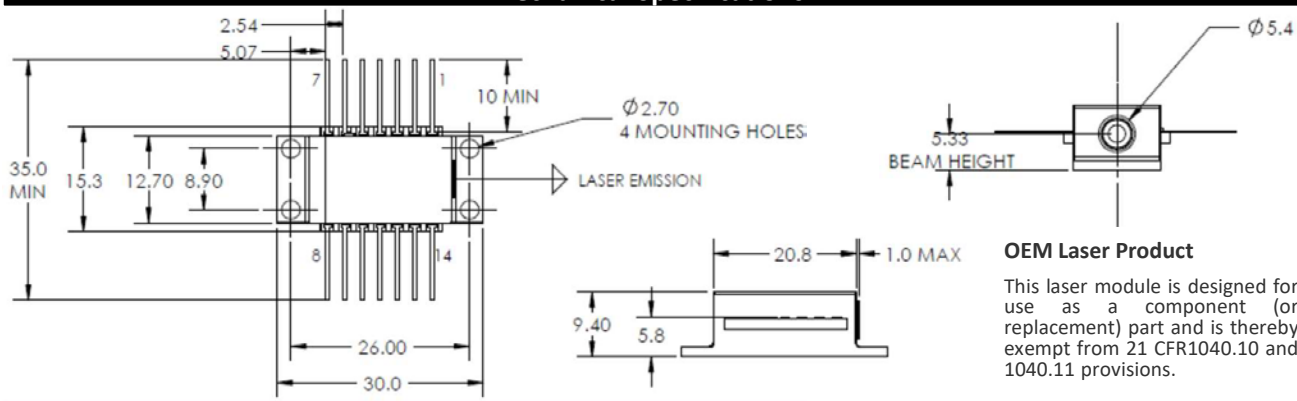


Temperature [C]	Resistance [kOhm]
100	0.68
95	0.78
90	0.91
85	1.07
80	1.25
75	1.48
70	1.75
65	2.08
60	2.49
55	2.99
50	3.6
45	4.37
40	5.32
35	6.54
30	8.05
25	10
20	12.5
15	15.7
10	19.9
5	25.4
0	32.7

Operational Notes

1. 14-pin BF should be mounted on a heat sink with a thermal compound (thermal grease).
2. Do not retro-reflect beam! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty.
3. 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).
4. 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).
5. Take care not to over-tighten screws when mounting. This can bend the BF package causing damage and hindering performance, and is not covered under warranty.
6. Driver circuitry should be configured in a manner to prevent power surges and power spikes.
7. IPS recommends not grounding anode and cathode as this can cause ground loops.

Mechanical Specifications



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.

4.20.20 SR