Innovative Photonic Solutions

Innovative Photonic Solutions, Inc. ■ 4250 U.S. Highway 1, Suite 1
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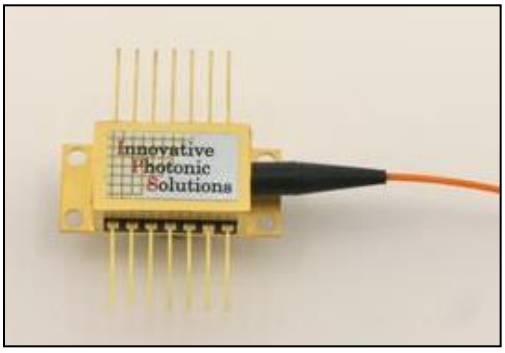
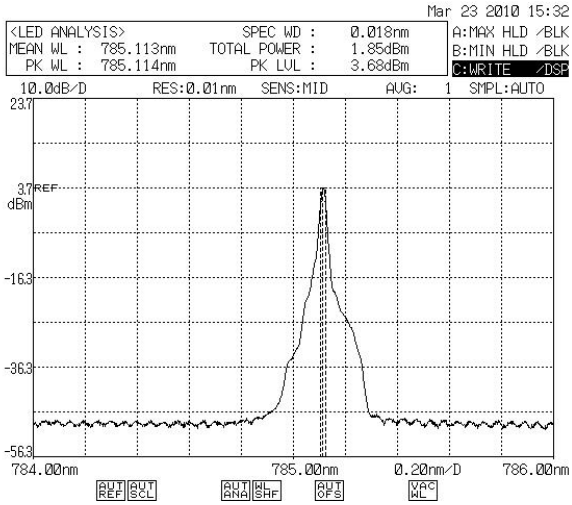
Single-Frequency Fiber Coupled 14-Pin BF



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 at wavelengths ranging from 633 nm – 2400 nm (standard wavelengths listed above), 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. Lasi ng 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.



Typical 785 nm SS Laser Spectrum

Features

- High Power Single Mode (single spatial & SLM) Output
- Ultra-Narrow Spectral Bandwidth (< 100 kHz)
- Stabilized Output Spectrum (< 0.007 nm/0C)
- Excellent Beam Quality (M^2 < 1.1)

Standard Wavelengths

• 633 nm	• 808 nm	• 1064 nm
• 638 nm	• 830 nm	• 1064.0 nm
• 780 nm	• 976 nm	• 1064.1 nm
• 783 nm	• 1030 nm	• 1064.3 nm
• 785 nm	• 1053 nm	• 1064.4 nm

Additional wavelengths available upon request

General Optical Specifications

Wavelength Tolerance	+/- 0.5 nm [1]
Spectral Linewidth (Δλ)	< 100 kHz Typical
Wavelength Stability Range	15 C - 45 C
SMSR	35 -45 dB typical
Fiber Options	Single-Mode
	Polarization Maintaining, Panda Type
Polarization Orientation	IPS standard is PM slow. The "P" in part number signifies PM slow. Substitute "F" for PM fast
Polarization Extinction Ratio (PER)	>17 dB, 20 dB typical
Output Power Stability	1% typical

General Electrical Performance Specifications

TEC Current Limit	2.0 Amperes
TEC Voltage Limit	4.5 V
Photodiode Current	30 uA
Integral Thermistor	See Thermistor Section on p.4

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1 - If 1064.0 nm, 1064.1 nm, 1064.3 nm or 1064.4 nm is ordered, wavelength tolerance is +/- 0.1 nm. Wavelength is measured in vacuum for 1064.X

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Polarization Maintaining Products

Wavelength (nm)	Min. Power (mW)	Part number	Max Current/ Compliance Voltage	Connector	Package Type
633	20	I0633SB0020P	150 mA, 3.3V	unterminated	Standard
		I0633SB0020PA		FC/APC	
638	25	I0638SB0025P	170 mA, 3.3V	unterminated	Standard
		I0638SB0025PA		FC/APC	
780	50	I0780SB0050P	220 mA, 2.3V	unterminated	Standard
		I0780SB0050PA		FC/APC	
783	50	I0783SB0050P	220 mA, 2.3V	unterminated	Standard
		I0783SB0050PA		FC/APC	
785	50	I0785SB0050P	220 mA, 2.3V	unterminated	Standard
		I0785SB0050PA		FC/APC	
808	50	I0808SB0050P	200 mA, 2.3V	unterminated	Standard
		I0808SB0050PA		FC/APC	
830	50	I0830SB0050P	200 mA, 2.3V	unterminated	Standard
		I0830SB0050PA		FC/APC	
976	220	I0976SB0220P	600 mA, 2.2V	unterminated	Standard
		I0976SB0220PA		FC/APC	
976	500	I0976SB0500P	1000 mA, 2.2V	unterminated	Standard
		I0976SB0500PA		FC/APC	
1030	50 (integral dual-stage isolator)	I1030SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		I1030SB0050PA-IS		FC/APC	
	100	I1030SB0100P	400 mA, 2.2V	unterminated	Standard
		I1030SB0100PA		FC/APC	
	280	I1030SB0280P	1000 mA, 2.2V	unterminated	Extended
		I1030SB0280PA		FC/APC	
1053	50 (integral dual-stage isolator)	I1053SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		I1053SB0050PA-IS		FC/APC	
	120	I1053SB0120P	400 mA, 2.2V	unterminated	Standard
		I1053SB0120PA		FC/APC	
	300	I1053SB0300P	1000 mA, 2.2V	unterminated	Extended
		I1053SB0300PA		FC/APC	
1064	50 (integral dual-stage isolator)	I1064SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		I1064SB0050PA-IS		FC/APC	
	120	I1064SB0120P	400 mA, 2.2V	unterminated	Standard
		I1064SB0120PA		FC/APC	
	300	I1064SB0300P	1000 mA, 2.2V	unterminated	Extended
		I1064SB0300PA		FC/APC	
1064.X (substitute 0, 1, 3, 4 for "X", wavelength measured in vacuum)	50 (integral dual-stage isolator)	I1064.XSB0050P-IS	350 mA, 2.2V	unterminated	Extended
		I1064.XSB0050PA-IS		FC/APC	
	120	I1064.XSB0120P	400 mA, 2.2V	unterminated	Standard
		I1064.XSB0120PA		FC/APC	
	300	I1064.XSB0300P	1000 mA, 2.2V	unterminated	Extended
		I1064.XSB0300PA		FC/APC	

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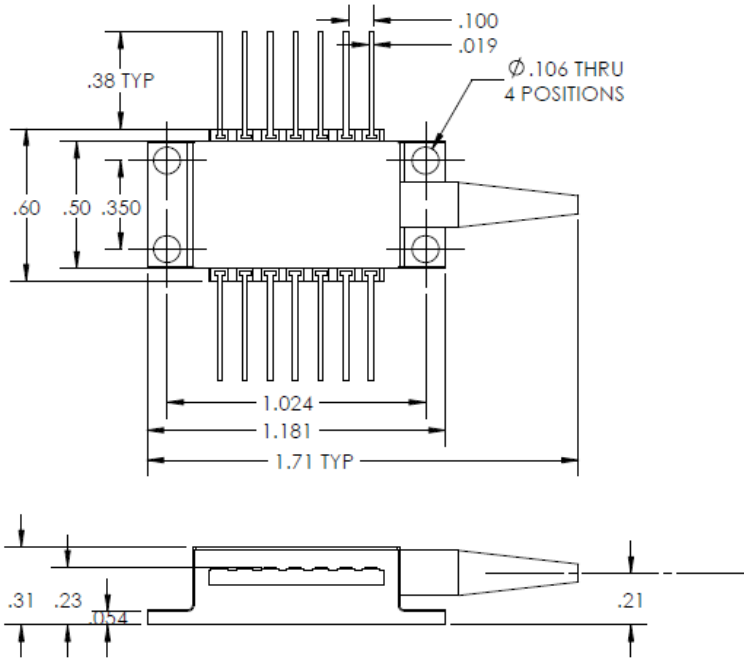
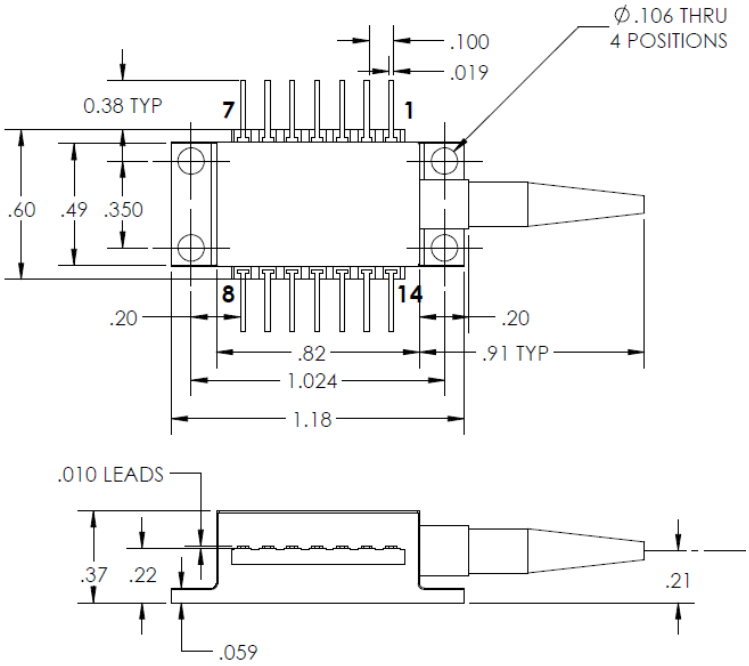
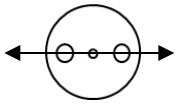
Standard 14-Pin BF Package



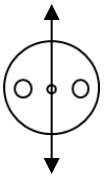
Extended 14-Pin BF Package



RoHS COMPLIANT



PM Slow – IPS Slow Axis Standard Polarization Orientation



PM Fast – If PM Fast is desired, this must be specified by replacing the "P" in the part number with "F"

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.

Electrical Pinout

Pin #	Name
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 -

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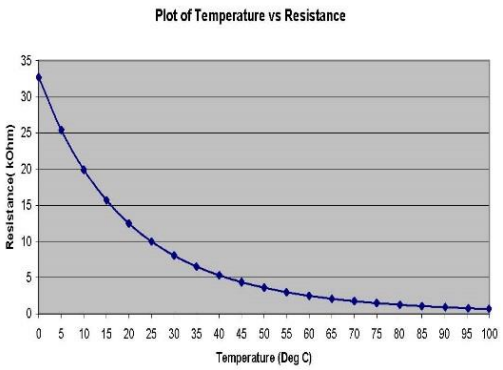
Thermistor

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. 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 3).
3. 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).
4. 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.
5. Driver circuitry should be configured in a manner to prevent power surges and power spikes.
6. IPS recommends not grounding anode and cathode as this can cause ground loops.

Part Numbering Schema