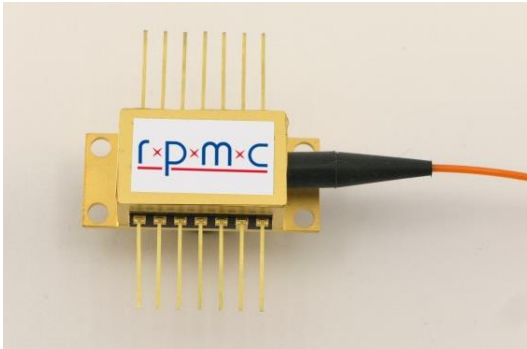
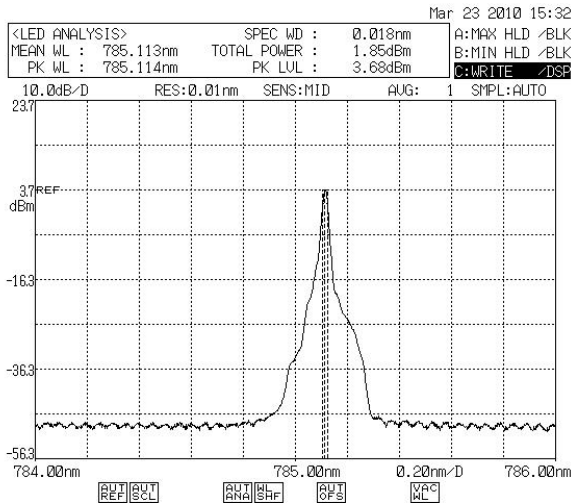


# Single-Frequency Fiber Coupled 14-Pin BF



RPMC Lasers Inc.'s 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 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. 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.



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/°C)
- Excellent Beam Quality (M<sup>2</sup> < 1.1)

## Standard Wavelengths

- 633 nm
- 638 nm
- 780 nm
- 785 nm
- 808 nm
- 830 nm
- 976 nm
- 1030 nm
- 1053 nm
- 1064 nm
- 1064.0 nm
- 1064.1 nm
- 1064.3 nm
- 1064.4 nm
- 1064.5 nm

Additional wavelengths available upon request

## General Optical Specifications

Wavelength Tolerance	+/- 0.5 nm <sup>1</sup>
Spectral Linewidth ( $\Delta\lambda$ )	< 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

**RoHS**  
COMPLIANT

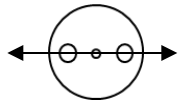
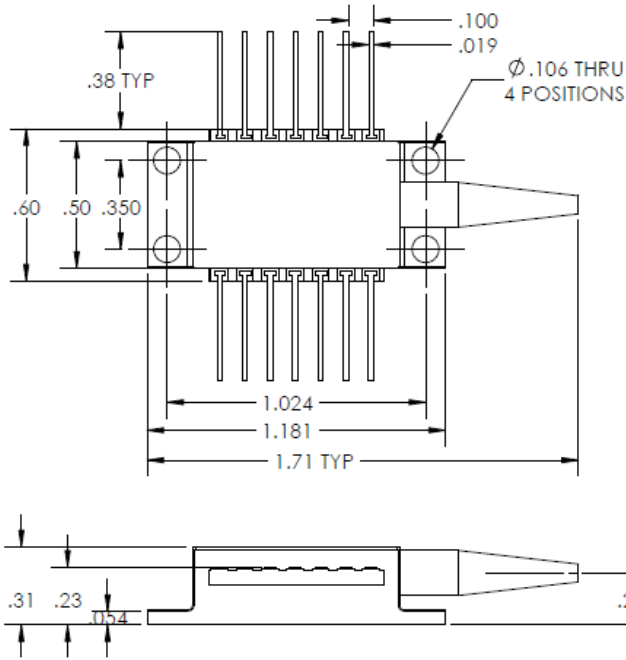
1 - If 1064.0 nm, 1064.1 nm, 1064.3 nm or 1064.4 nm is ordered, wavelength tolerance is +/- 0.1 nm. Wavelength is measured in vacuum for 1064.X



## Polarization Maintaining Products

Wavelength (nm)	Min. Power (mW)	Part number	Max Current/ Compliance Voltage	Connector	Package Type
633	20	R0633SB0020P	150 mA, 3.3V	unterminated	Standard
		R0633SB0020PA		FC/APC	
638	25	R0638SB0025P	170 mA, 3.3V	unterminated	Standard
		R0638SB0025PA		FC/APC	
660	20	R0660SB0020P	200 mA, 3.3V	unterminated	Standard
		R0660SB0020PA		FC/APC	
780	50	R0780SB0050P	180 mA, 2.3V	unterminated	Standard
		R0780SB0050PA		FC/APC	
785	50	R0785SB0050P	220 mA, 2.3V	unterminated	Standard
		R0785SB0050PA		FC/APC	
808	50	R0808SB0050P	200 mA, 2.3V	unterminated	Standard
		R0808SB0050PA		FC/APC	
830	50	R0830SB0050P	200 mA, 2.3V	unterminated	Standard
		R0830SB0050PA		FC/APC	
976	220	R0976SB0220P	600 mA, 2.2V	unterminated	Standard
		R0976SB0220PA		FC/APC	
976	500	R0976SB0500P	1000 mA, 2.2V	unterminated	Standard
		R0976SB0500PA		FC/APC	
1030	50 (integral single-stage isolator)	R1030SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		R1030SB0050PA-IS		FC/APC	
	100	R1030SB0100P	400 mA, 2.2V	unterminated	Standard
		R1030SB0100PA		FC/APC	
	280	R1030SB0280P	1000 mA, 2.2V	unterminated	Extended
		R1030SB0280PA		FC/APC	
1053	50 (integral single-stage isolator)	R1053SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		R1053SB0050PA-IS		FC/APC	
	120	R1053SB0120P	400 mA, 2.2V	unterminated	Standard
		R1053SB0120PA		FC/APC	
	300	R1053SB0300P	1000 mA, 2.2V	unterminated	Extended
		R1053SB0300PA		FC/APC	
1064	50 (integral single-stage isolator)	R1064SB0050P-IS	350 mA, 2.2V	unterminated	Extended
		R1064SB0050PA-IS		FC/APC	
	120	R1064SB0120P	400 mA, 2.2V	unterminated	Standard
		R1064SB0120PA		FC/APC	
	300	R1064SB0300P	1000 mA, 2.2V	unterminated	Extended
		R1064SB0300PA		FC/APC	
1064.X (substitute 0, 1, 3, 4 for "X", wavelength measured in vacuum)	50 (integral single-stage isolator)	R1064.XSB0050P-IS	350 mA, 2.2V	unterminated	Extended
		R1064.XSB0050PA-IS		FC/APC	
	120	R1064.XSB0120P	400 mA, 2.2V	unterminated	Standard
		R1064.XSB0120PA		FC/APC	
	300	R1064.XSB0300P	1000 mA, 2.2V	unterminated	Extended
		R1064.XSB0300PA		FC/APC	

## Standard 14-Pin BF Package



**PM Slow** – RPMC Slow Axis Standard Polarization Orientation

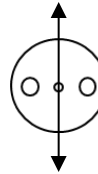
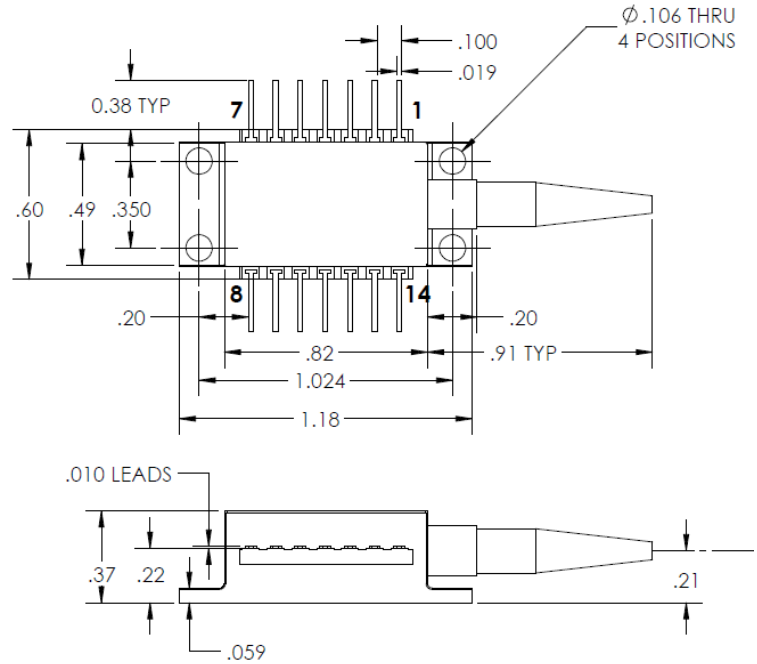
**RoHS**  
COMPLIANT

**WARNING**  
 VISIBLE LASER RADIATION  
 AVOID EXPOSURE TO BEAM  
 CLASS 3B LASER PRODUCT  
 633 nm, 638 nm,  
 660 nm, 50 mW CW  
 EN/IEC 60825-1:2014-5

**WARNING**  
 INVISIBLE LASER RADIATION  
 AVOID EXPOSURE TO BEAM  
 CLASS 3B LASER PRODUCT  
 780 nm, 785 nm, 808 nm,  
 976 nm, 830 nm, 1053 nm,  
 1030 nm, 1064 nm, 499 mW CW  
 EN/IEC 60825-1:2014-5

**WARNING**  
 INVISIBLE LASER RADIATION  
 AVOID EYE OR SKIN EXPOSURE TO  
 DIRECT OR SCATTERED RADIATION  
 CLASS IV LASER PRODUCT  
 976 nm, 800 mW CW  
 EN/IEC 60825-1:2014-5

## Extended 14-Pin BF Package



**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

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 -

**Thermistor**

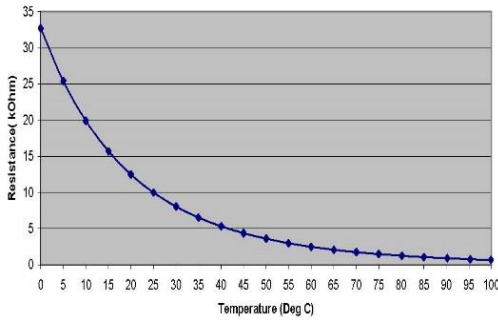
**Formula for calculating T based upon Resistance**

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

**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

**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 unless the unit has an integral optical isolator (e.g. R1064SB0050P-IS).
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 (RPMC 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. RPMC recommends not grounding anode and cathode as this can cause ground loops.

**Part Numbering Schema**

