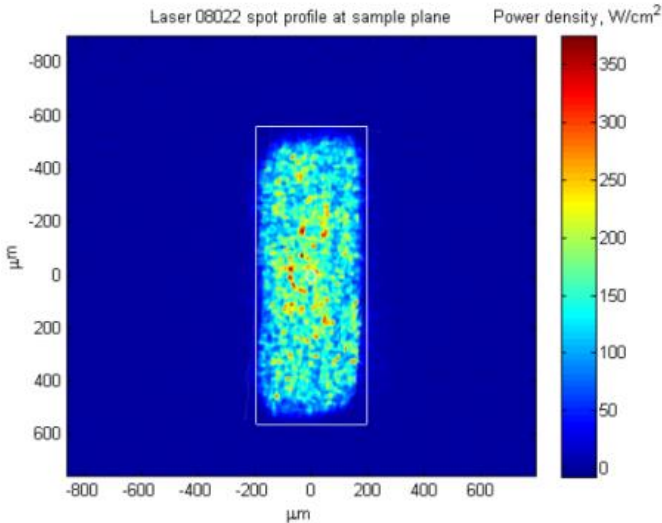


Homogenized Multi-Mode 14-Pin BF Diode



RPMC Lasers, Inc.'s proprietary multi-mode wavelength stabilized laser features high output power with narrow spectral bandwidth with a shaped and homogenized beam profile that evenly spreads out the power density and shapes the beam and to match the field of view of a camera. Designed to replace expensive DFB, DBR, fiber, and external cavity lasers, the multi-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.

Devices can be spectrally tailored to suit application needs and offer side mode suppression ratios (SMSRs) better than 40 dB (70 dB at some wavelengths available with additional optional filter), thereby providing extremely high signal to noise ratio and making these sources ideal for Raman spectroscopy. Multi-mode laser diodes are available with narrowed spectral linewidth for FWHM < 0.1 nm (0.07 nm typical) upon request. RPMC now offers a shaped and homogenized beam profile (left) for multi-mode open beam diode lasers to evenly spread out the power density and shape the beam and to match the field of view of a camera.

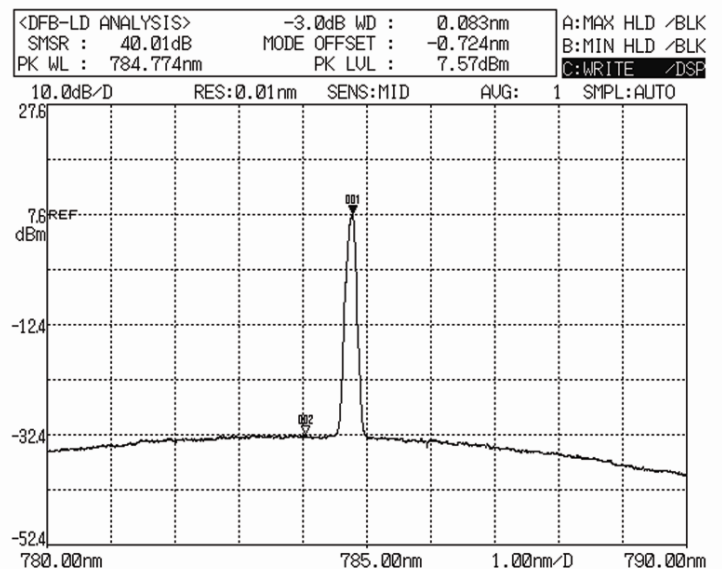
Features

- High Power Open Beam Multi-Mode Output Power
- Shaped and Homogenized Beam 2:1 or 1:2 beam aspect ratio
- Even Power Distribution
- Available standard in rectangle or square shape output beam (ask about custom shapes)
- Narrow Spectral Bandwidth (< 0.15 nm FWHM, 0.1 nm typical)
- Ultra-Narrow Spectral Bandwidth available upon request (< 0.1 nm FWHM, 0.07 nm typical). Add – NL to part number
- Stabilized Output Spectrum (< 0.007 nm/°C)
- Low Power consumption
- 40 dB SMSR Typical
- 70 dB SMSR available upon request with additional filter

Standard Wavelengths

- 638 nm
- 680 nm
- 785 nm
- 830 nm
- 1064 nm

Additional wavelengths available upon request



Typical 785 nm SS Laser Spectrum (SMSR > 40 dB)

| Wavelength (nm) | Min. Power (mW) | Part number† | Beam Aspect Ratio | Max Current, Compliance Voltage | Rectangle Direction |
|-----------------|-----------------|---------------------|-------------------|---------------------------------|---------------------|
| 638 | 300 | R0638MB0300B-75/150 | 1:2 | 1000 mA, 2.3V | Vertical |
| 680 | 300 | R0680MB0300B-75/150 | | 1350 mA, 2.3V | |
| 785 | 350 | R0785MB0350B-75/150 | | 1000 mA, 2.3V | |
| 785 | 600 | R0785MB0600B-75/150 | | 1350 mA, 2.3V | |
| 830 | 350 | R0830MB0350B-75/150 | | 1000 mA, 2.3V | |
| 830 | 600 | R0830MB0600B-75/150 | | 1350 mA, 2.3V | |
| 1064 | 600 | R1064MB600B-75/150 | | 1350 mA, 2.2V | |
| 638 | 300 | R0785MB0300B-150/75 | 2:1 | 1000 mA, 2.3V | Horizontal |
| 680 | 300 | R0785MB0300B-150/75 | | 1350 mA, 2.3V | |
| 785 | 350 | R0785MB0350B-150/75 | | 1000 mA, 2.3V | |
| 785 | 600 | R0785MB0600B-150/75 | | 1350 mA, 2.3V | |
| 830 | 350 | R0830MB0350B-150/75 | | 1000 mA, 2.3V | |
| 830 | 600 | R0830MB0600B-150/75 | | 1350 mA, 2.3V | |
| 1064 | 600 | R1064MB600B-150/75 | | 1350 mA, 2.2V | |

General Optical Specifications

| | |
|---|---|
| Wavelength Tolerance | +/- 0.5 nm |
| Spectral Linewidth ($\Delta\lambda$) | <0.15 nm, 0.1 nm typ |
| Narrowed Linewidth (-NL) Spectral Linewidth ($\Delta\lambda$) | < 0.1 nm, 0.07 nm typ |
| Wavelength Stability Range | 15 C - 45 C |
| SMSR | 35 - 45 dB |
| SMSR (with optional filter) | 60 - 70 dB |
| Output Power Stability | 1% typical, depending on timescale and operating conditions |
| Beam Exit Angle | < 3 degrees typical |
| Beam Shape Aspect Ratio | 2:1 Rectangular or 1:2 Rectangular |
| Fast Axis Beam Divergence | 10 mrad Typ, 20 mrad Max |
| Slow Axis Beam Divergence | 5 mrad Typ, 10 mrad Max |

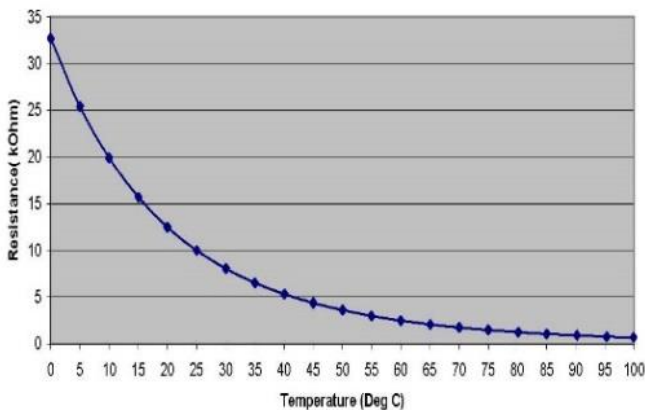
Electrical Performance Specifications

| | |
|---------------------|----------------------------|
| TEC Current Limit | 2.0 Amperes |
| TEC Voltage Limit | 4.5 V |
| Photodiode Current | 30 μ A |
| Integral Thermistor | See Thermistor information |



Thermistor

Plot of Temperature vs Resistance



Formula for calculating T based upon Resistance

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

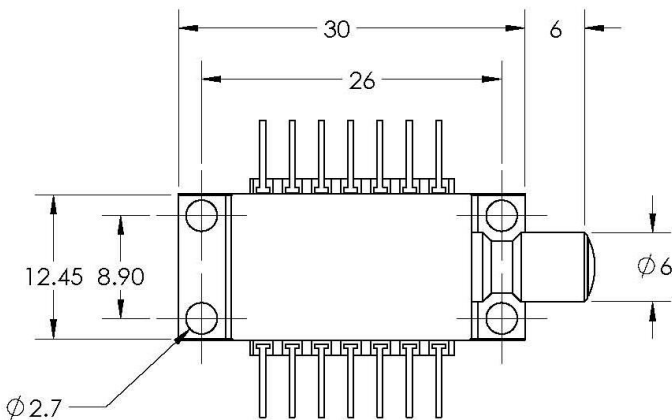
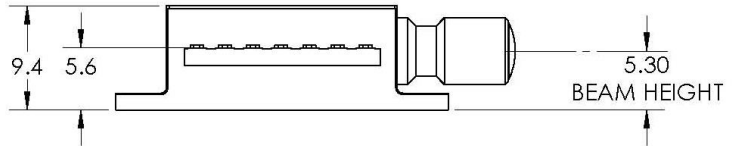
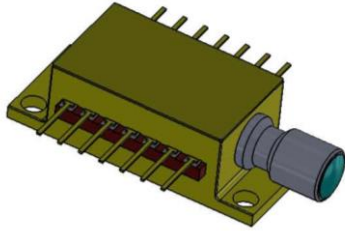
Thermistor (Betatherm 10K3CG3)

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 |

† - Part number is for our standard rectangular shaped beam. Request Part Number for other shapes

Mechanical Specifications



| 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 - |



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

- 14-pin BF should be mounted on a heat sink with a thermal compound (thermal grease).
- 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.
- Driver circuitry should be configured in a manner to prevent power surges and power spikes.
- RPMC recommends not grounding anode and cathode as this can cause ground loops.
- The beam is rectangular at the output of the lens, but at
- The spot starts out rectangular and has a lens with a focal length of 7.5 mm. RPMC recommends adding a second lens to image the rectangular beam to the spot size that you would like. The laser is focused to infinity.