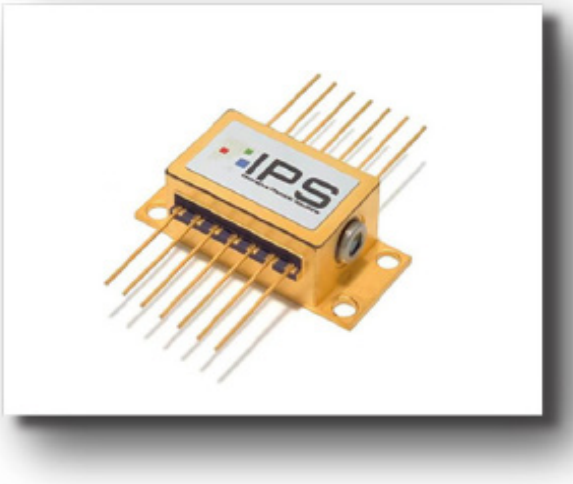
Single-Mode Open Beam Butterfly Package with Optical Isolator



Innovative Photonic Solutions' proprietary Single-Mode Wavelength-Stabilized laser diode with an optical isolator features high output power with narrow spectral bandwidth and a diffraction limited free space output beam. Designed to replace expensive DFB, DBR, fiber, and external cavity lasers, the single-mode spectrum stabilized laser featuring an optical isolator offers superior wavelength stability over time, temperature, and vibration, and is manufactured to meet the most demanding wavelength requirements. The single-mode packaged product line comes standard with a circularized output beam, internal photodiode, thermistor and ESD protection. Lasing wavelength can be accurately specified and repeatedly manufactured to within +/-0.1 nm upon request.

Applications

This 14-pin open beam butterfly package is designed for OEM integration and is ideal for:

- High Resolution Raman Spectroscopy
  - Confocal Microscopy
  - Raman Imaging
  - Portable Raman
  - Process Raman
- Direct-Diode Frequency Doubling
- Fiber Laser Seeding
- Metrology & Interferometry
- Remote Sensing

Key Features

- High-Power Single Frequency Output (SLM)
- Narrow Spectral Linewidth
- Stabilized Output Spectrum (< 0.007 nm/°C)
- Excellent Beam Quality (M^2, $1/e^2$) < 1.2
- Beam exit angle <1°

Standard Wavelengths

All specified wavelengths are measured "in-vacuum".

780nm	808nm	976nm
783nm	830nm	1030nm
785nm	852nm	1053nm
		1064nm

Custom wavelengths available upon request.

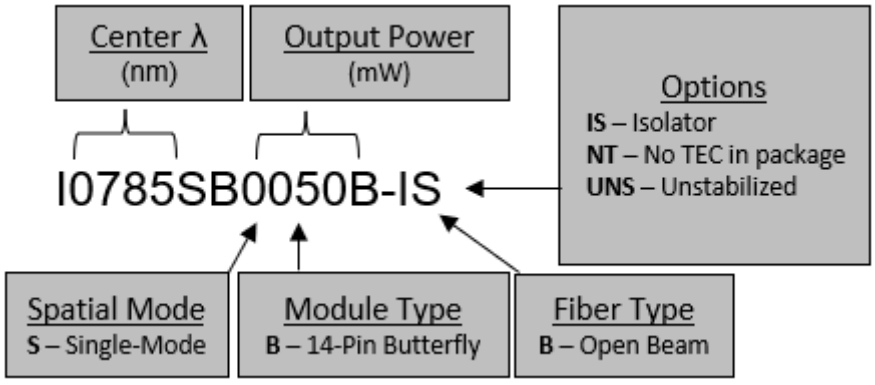
Specifications

Wavelength Tolerance	+/- 0.5 nm
Spectral Linewidth	~ 100 kHz* instantaneous
Wavelength Stability Range	15°C-45°C
SMSR	35-45 dB
Power Stability	1% typical
Polarization Extinction (PER)	>17dB, 20dB Typical
Spatial Profile	TEM00
Beam Exit Angle	<1°
Beam Quality (M^2, $1/e^2$)	<1.2
Beam Ellipticity	< 1.5:1
Beam Divergence	~2 mrad

λ (nm)	Output Power (mW)	Base Part Number	Max Current, Voltage
780	50	I0780SB0050B-IS	200mA, 2.5V
783	50	I0783SB0050B-IS	200mA, 2.5V
785	50	I0785SB0050B-IS	200mA, 2.5V
808	50	I0808SB0050B-IS	400mA, 2.3V
852	40	I0852SB0040B-IS	500mA, 2.3V
1030	100	I1030SB0100B	750mA, 2.2V
1053	100	I1053SB0100B	750mA, 2.2V
1064	100	I1064.XSB0100B	750mA, 2.2V

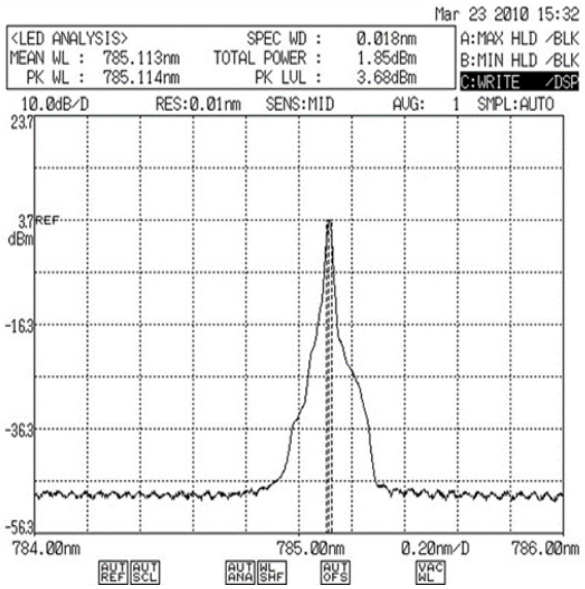
*Requires driver electronics with very low noise analog laser driver along with a design for dual TECs for improved temperature control. Refer to the Linewidth White Paper on our website for further details.

Part Schema

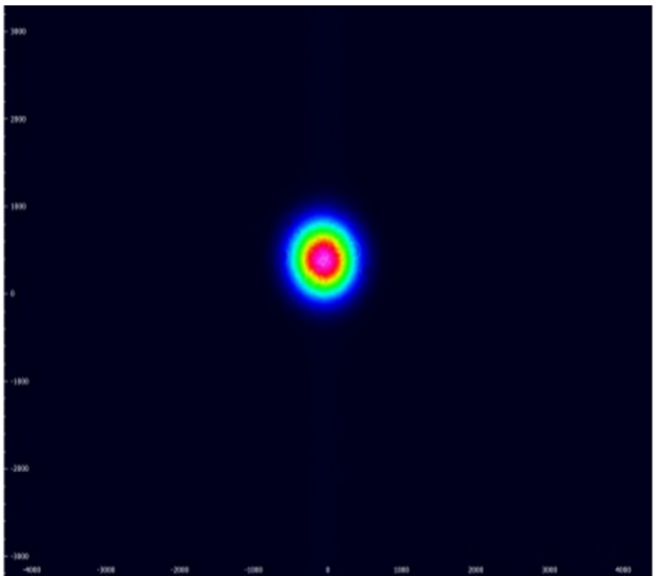


Selected Data

TEC Current Limit	3.2 A
TEC Voltage Limit	5.8 V
Photodiode Current	30μA
Integral Thermistor	Betatherm 10K3CG3



Typical 785nm SS Laser Spectrum



Typical 785nm Beam Quality

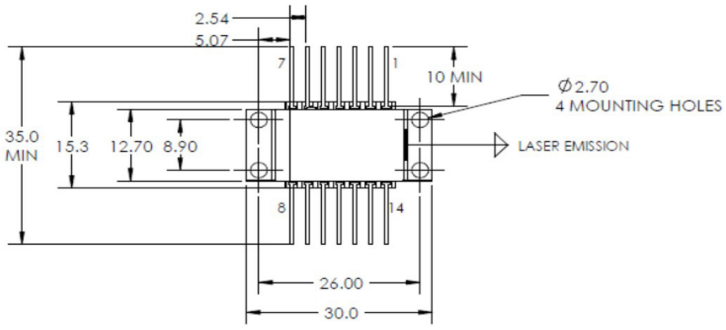
Custom Capability

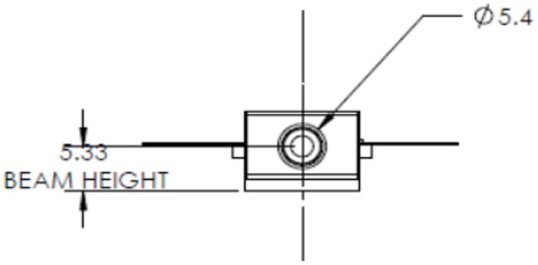
- Custom wavelengths available upon request.
- External TEC (e.g. No TEC inside of package optional).

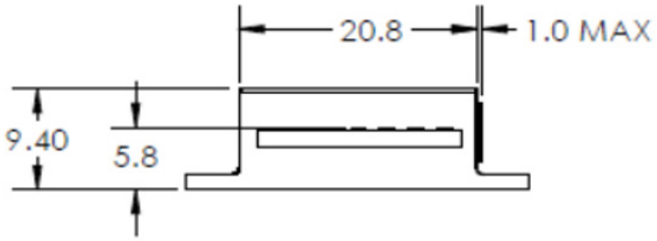
Electrical Specs

Pin 1	TEC+
Pin 2	Thermistor 10kOhm @25°C
Pin 3	PD Anode
Pin 4	PD Cathode
Pin 5	Thermistor
Pin 6-8	NC
Pin 9	Laser Cathode (-)
Pin 10	Laser Anode (+)
Pin 11	Laser Cathode (-)
Pin 12	NC
Pin 13	Case Ground
Pin 14	TEC -

Mechanical Drawings







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

1. 14-pin BF should be mounted on a heat sink with a thermal compound (thermal grease).
2. 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.
3. Laser and TEC driver circuitry should be configured in a manner to prevent power /current / voltage surges and spikes.
4. IPS recommends not grounding anode and cathode as this can cause ground loops.
5. Laser and TEC driver circuitry should be configured in a manner to prevent power /current / voltage surges and spikes.
6. Do not retro-reflect beam! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty.
7. Laser will operate in single frequency mode at set-points between 15 to 45˚C, however, optimal operating set point must be determined for each laser diode to avoid mode-hopping (see note 8).
8. To determine optimal operating point, plot wavelength vs temperature and wavelength vs. current to determine where mode-hop locations are. Set operating temperature and current halfway between mode-hops. This will ensure the most stable operation (See Mode Hop Whitepaper for more details).

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