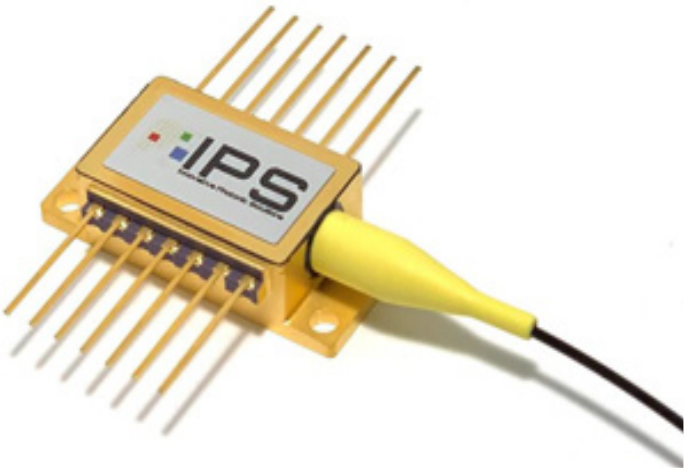
Single-Mode Fiber Coupled Butterfly Package with Optical Isolator



Innovative Photonic Solutions' proprietary single-mode wavelength-stabilized laser diode 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, and vibration, and is manufactured to meet the most demanding wavelength requirements. The single-mode 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 laser 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-Spatial-Mode, Single-Frequency Output
- Ultra-Narrow Spectral Linewidth (< 100 kHz)
- Stabilized Output Spectrum (< 0.007 nm/°C)
- Integral ESD Protection & Thermistor
- Integral Laser Line Filter
- SMSR 70 dB w/ laser line filter (40 dB without)
- Integral single stage optical isolator
- Dual stage optical isolators available > 1,000 nm
- "Ultratrack" Linear Tracking Photodiode

Standard Wavelengths

All specified wavelengths are measured "in-vacuum"

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

Specifications

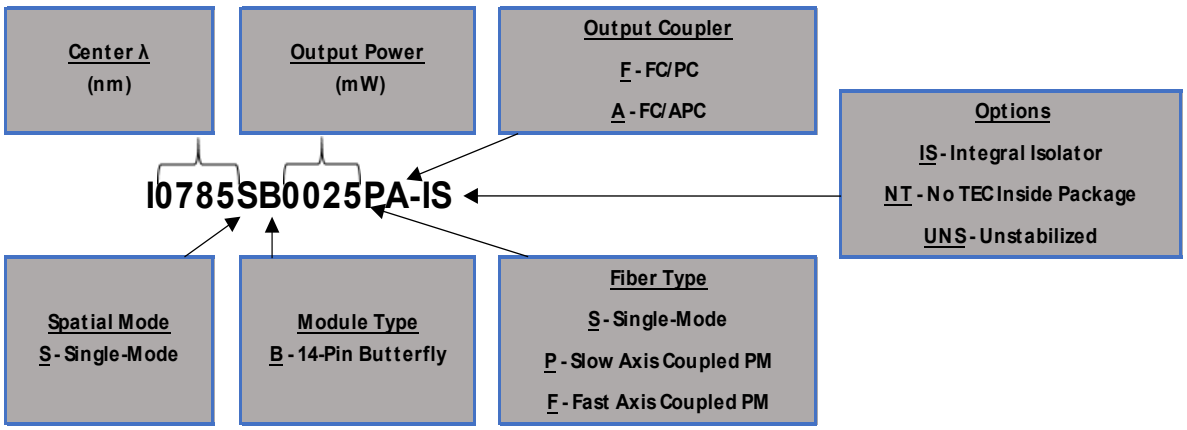
Wavelength Tolerance	+/- 0.5 nm
Spectral Linewidth (Dl)	~ 100 kHz* Typical
Wavelength Stability Range	15 C - 45 °C
SMSR	70 dB w/ laser line filter (40 dB without)
Fiber Options	Single-Mode
	Polarization Maintaining, Panda Type
Polarization Extinction (PER)	>17dB, 20dB Typical
Polarization Orientation	Standard is PM Slow Axis
Output Power Stability	1% Typical

*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

λ (nm)	Output Power (mW)	Base Part Number	Max Current, Voltage
780	25	I0780SB0025P-IS	250 mA, 2.3V
783	25	I0783SB0025P-IS	250 mA, 2.3V
785	25	I0785SB0025P-IS	250 mA, 2.3V
808	25	I0808SB0025P-IS	400 mA, 2.3V
852	20	I0852SB0020P-IS	400 mA, 2.3V
1030	50	I1030SB0050P-IS	500 mA, 2.2V
1053	50	I1053SB0050P-IS	350 mA, 2.2V
1064.X	50	I1064.XSB0050P-IS	350 mA, 2.2V

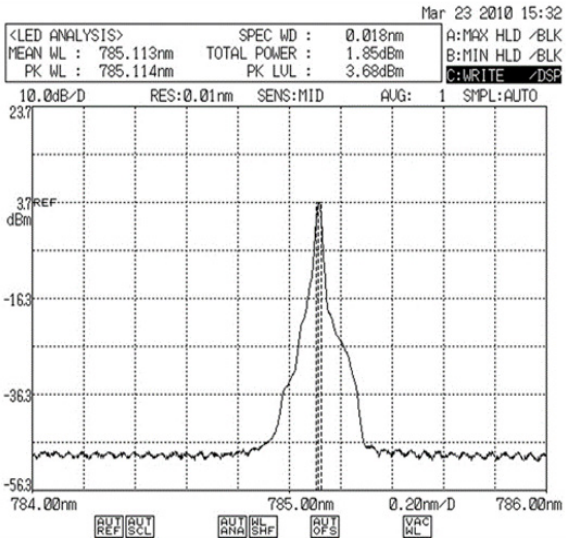
*Add A after P in part number for FC/APC Connector.
*Substitute "X" for 0, 1, 3, 4, wavelength measured in vacuum)
*Butterfly packages with internal isolators utilize an exteneded tube design

Part Schema



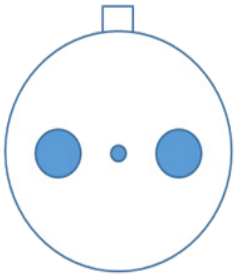
Selected Data

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



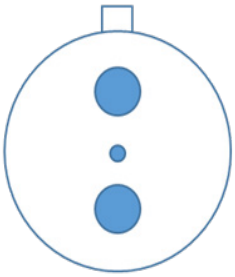
Typical 785nm SS Laser Spectrum

Fiber Alignment Key



"F" – PM Fast Axis Coupled

Fiber Alignment Key



"P" – PM Slow Axis Coupled

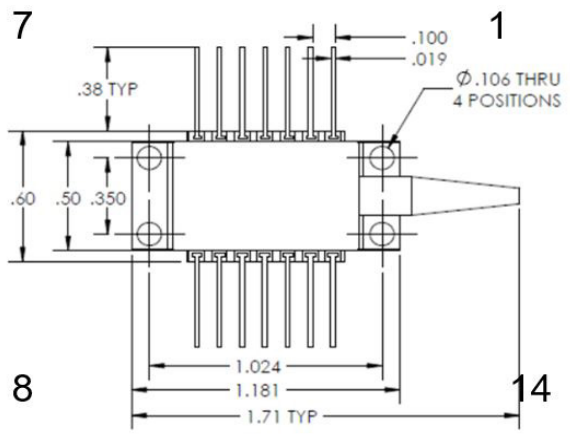
Custom Capability

- Custom wavelengths available upon request
- FC/PC, FC/APC, or unterminated output coupler
- Single-mode or Polarization-maintaining fiber available with orientation in either fast or slow axis
- External TEC (e.g. No TEC inside of package optional)

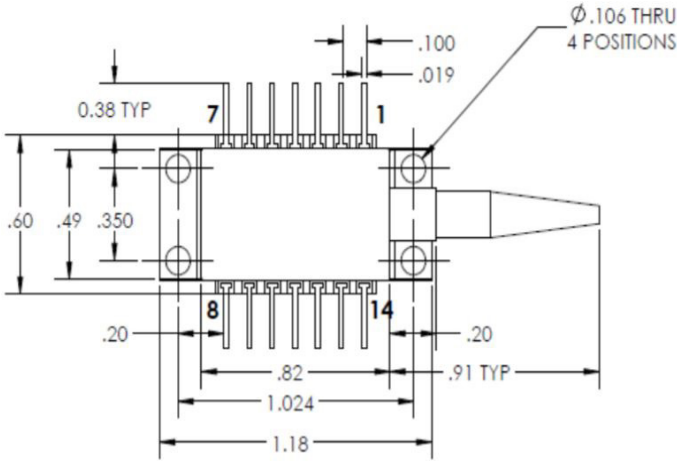
Electrical Specs

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 -

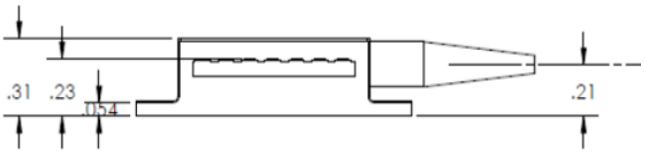
Mechanical Drawings

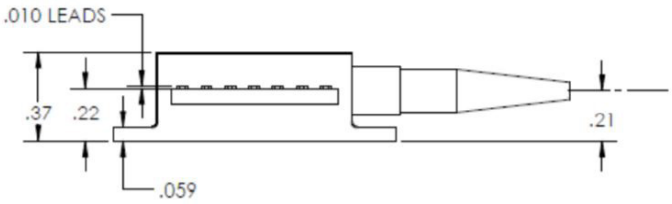


Standard Package



Extended Tube Package





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 10 and 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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