Single-Mode Digital D-Type Module

Innovative Photonic Solutions' proprietary Single-Mode Spectrum Stabilized Laser features high output power with ultra-narrow spectral bandwidth and a circularized and collimated 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 Digital OEM D-type module comes standard with a circularized and collimated output beam, integral laser line filter pack, internal thermistor and TEC, linear tracking photodiode and ESD protection, and UART I/O interface.

Applications

This laser package is designed for OEM Integration and is ideal for:

- HIgh Resolution Raman Spectroscopy
  - Handheld Raman Spectroscopy
  - Confocal Microscopy
  - Raman Imaging
  - Portable Raman
  - Process Raman
- Metrology & Interferometry
- Remote Sensing

Key Features

- High Power Single Frequency Output (SLM)
- Ultra-Narrow Spectral Bandwidth
- Circularized & Collimated Output Beam
- Gaussian TEM00 Spatial Mode
- Dual Integral Laser Line Filters
- Optical Isolator
- SMSR 70 dB w/ laser line filter (40 dB without)
- Integral Thermistor & TEC
- Integral ESD Protection
- Integral Linear Tracking Photodiode
- Designed with modularity in mind. It comes standard with a 3-5 X adjustable beam expander and dual stage optical isolator.
- Digital UART I/O

Standard Wavelengths

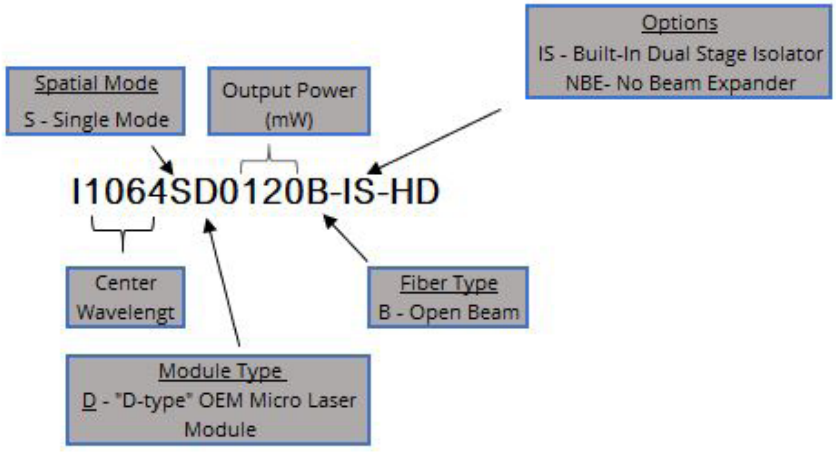
633nm	685nm	785nm	852nm
638nm	780nm	808nm	976nm
660nm	783nm	830nm	1053nm
			1064nm

Specifications

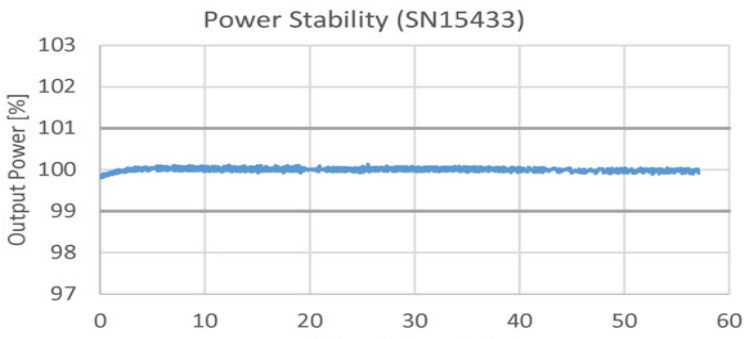
Wavelegnth Tolerance	+/- 0.5nm
Spectral Linewdith FWHM	<100MHZ
SMSR w/ integral laser line filter	70 dB
Power Stability	+/- 0.5% to 1% typical
Waveelgnth Stability Range	15 °C to 45 °C
Power Consumption	2W typical, 5W max
Linear Tracking Photodiode (Optional, Internal TIA output)	1V Max
Polarization Extinction (PER)	>17 dB (20 dB Typical)
Polarization Orientation	Perpendicular to the plane of base plate mounting plane
Spatial Profile	TEM00
Beam Quality (M^2, $1/e^2$)	<1.2
Beam Ellipticity	<1.5:1
Beam Diameter	4.0 mm (+/- 0.4mm) w/ beam expander
	~0.7mm w/o beam expander
Beam Divergence	<1 mrad w/ beam expander
	~2 mrad w/o beam expander
Cold Start to <1 wavenumber	10 Seconds
Warm Start to <1 wavenumber	1 Second
Warm Start to <0.1 wavenumber	3 seconds

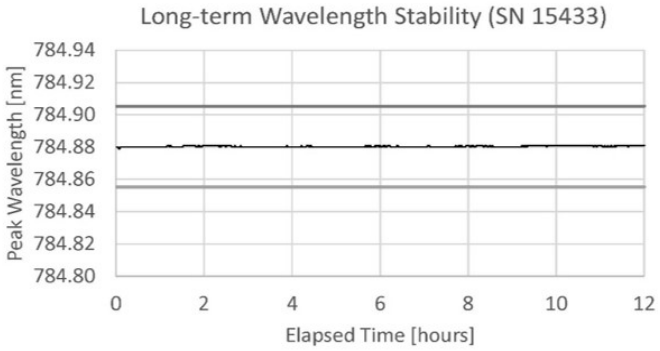
λ (nm)	Output Power (mW)	Base Part Number
633	50	I0633SD0050B-HD
	40	I0633SD0040B-IS-HD
638	60	I0638SD0060B-HD
	50	I0638SD0050B-IS-HD
660	60	I0660SD0060B-HD
685	40	I0685SD0040B-HD
780	100	I0780SD0100B-HD
	100	I0780SD0100B-IS-HD
783	100	I0783SD0100B-HD
	100	I0783SD0100B-IS-HD
785	100	I0785SD0100B-HD
	100	I0785SD0100B-IS-HD
	150	I0785SD0150B-HD
	150	I0785SD0150B-IS-HD
808	175	I0808SD0175B-HD
852	175	I0852SD0175B-HD
976	175	I0976SD0175B-HD
1053	175	I1053SD0175B-HD
1064	175	I1064SD0175B-HD

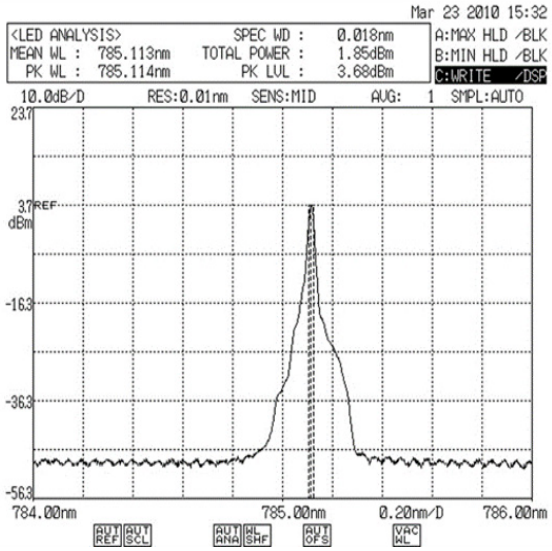
Part Schema



Selected Data







Custom Capability

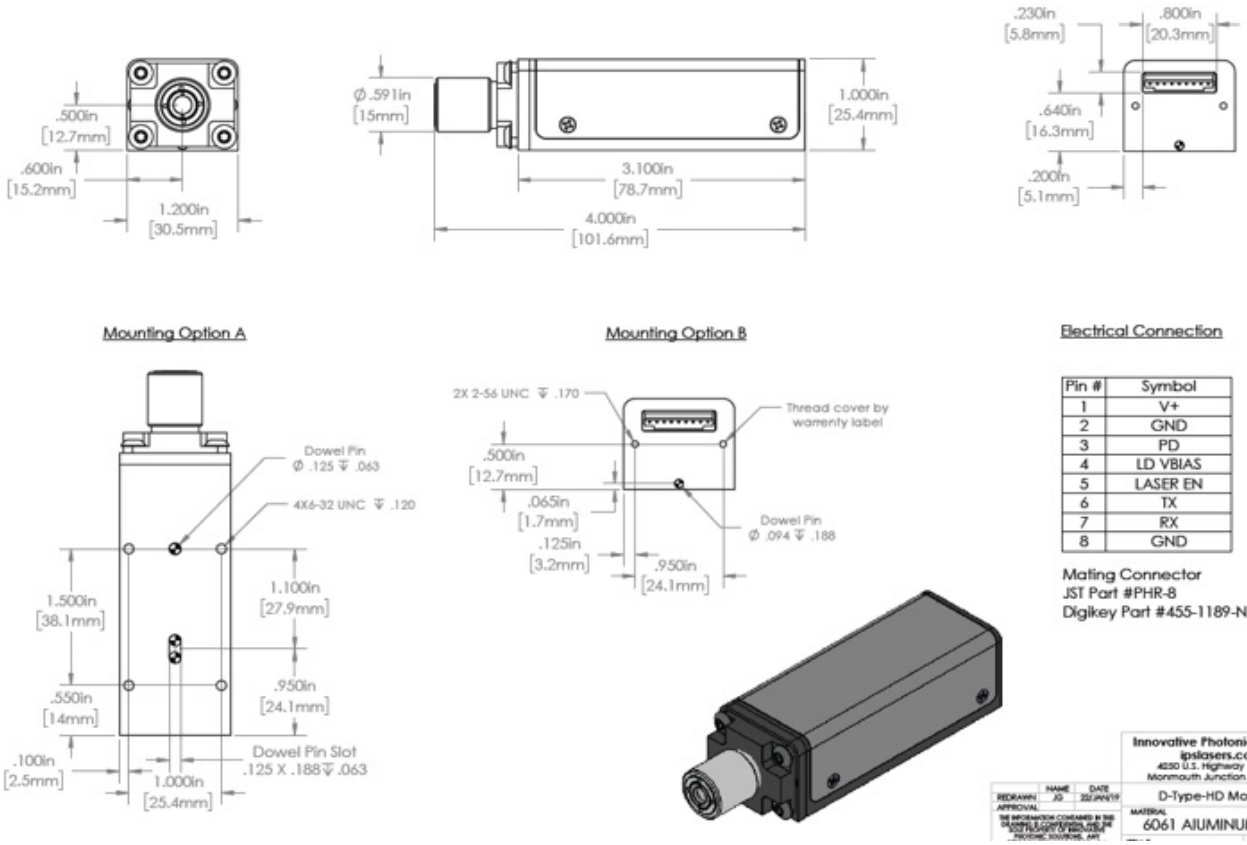
- Custom wavelengths available upon request
- Adjustable beam expander to set beam diameter at specified distances
- Multi-mode Achro-fiber port available
- Optical isolator available for 633nm, 638nm, 780nm, 785nm in standard D-Type module
- Optical isolator available for 976nm and 1064nm in larger D-Type module

NOTES: Pins 1, 2**, 5*, and 8** are required for laser operation
*Laser Enable is required unless module is set to "Always On" Laser Enable Mode (Mode 2)
**GND must be supplied to both GND pins (pin 2 and pin 8)
+ Transmit from host connects to Rx on Laser Module, receive on host connects to Tx on Laser Module

Electrical Specs

Pin	Symbol	Wire Color	Description	Notes
1	VCC	Red	Supply Voltage	5-12V DC, 1 Amp
2**	GND Retrun	Gray	Ground Return	Need to connect to signal ground
3	PD	Gray	Linear Tracking PhotoDiode	Voltage Proportional to PD Current
4	LD Set	Gray	Laser Power Control	0.0V DC - 5V DC - Disable by default
5*	LD Enable	Gray	Laser Enable	5V TTL, See Note 1 Below
6+	Tx	Gray	Transmit	Digital I/O (UART 3.3V)
7+	Rx	Gray	Receive	Digital I/O (UART 3.3V)
8**	Sig GND	Gray	Signal Ground	Tie GND Return (Pin 2)

Mechanical Drawings



Operational Notes

1. Do not retro-reflect beam! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty (unless optical isolator version is included in product).
2. Laser Enable Safety Feature: The optical output is enabled when pin (5) is changed from TTL “LO” (0 V) to TTL “HI” (5 Volt). A built-in safety circuit keeps the laser turned off after a power failure, even when pin (5) is set to 5 Volt. The laser output turns on only at the rising edge of the signal applied to pin (5).
3. To adjust power output, IPS strongly recommends using Pulse Width Modulation (PWM) to adjust average power rather than using pin 4 (LD SET).
4. By using PWM, user can adjust average power from 10% to 100% in digital increments by setting pulse width and duty cycle. For example, if a 50% duty cycle is selected, the laser will be on 50% of the time, and off 50% of the time, making the average power equal to 50% of the CW output power. and the sample will experience a lower average power. Rise/fall time is approximately 20 microseconds.
5. D-type comes with a cable with 8pin JST connector on one end (see electrical pinout on p.3). User must supply 5V power and TTL signal to operate.
6. Digital D-type is UART compatible (see digital I/O manual for command set).

Innovative Photonic Solutions, Inc.
313 Enterprise Drive
Plainsboro, NJ 08536
-
Phone: (732) 230-1601
-
sales@ipslasers.com
www.ipslasers.com

RoHS COMPLIANT