Single-Mode Digital Tethered Module

Innovative Photonic Solutions' Tethered Head H-type module is a fully turn-key, UL/CE and IEC certified laser module perfect for lab use. It comes with an internal wavelength stabilized laser module, a laser enable switch for safety, an LED readout, an output power control dial, a safety key lockout, a remote interlock, and an emergency shut-off switch (EMO). The digital 'Tethered Head' module offers USB connectivity, ease of use and flexibility for different setups; and allows the user to bring the open beam laser output to the sample. IPS's proprietary Wavelength Stabilized Laser features high output power with narrow spectral bandwidth. The laser's stabilized peak wavelength remains "locked" regardless of case temp (10 to +45 °C). Devices can be spectrally tailored to suit application needs and offer side mode suppression ratio (SMSR) better than 45 dB

Applications

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

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

Key Features

- Wavelength Stabilized Spectrum
- Narrow Spectral Linewidth (<100MHz FWHM)
- High Power Single-mode Open Beam Output
- TEM00, Single-Spatial and Single-Longitudinal Mode (SLM)
- Circularized & Collimated Output Beam
- Integral Laser Line Filters at 633nm, 638nm, 785nm, 808nm, and 830nm
- >50 dB SMSR Typical
- USB Interconnectivity
- UL/CE and IEC Certified & Fully turnkey

Standard Wavelengths

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

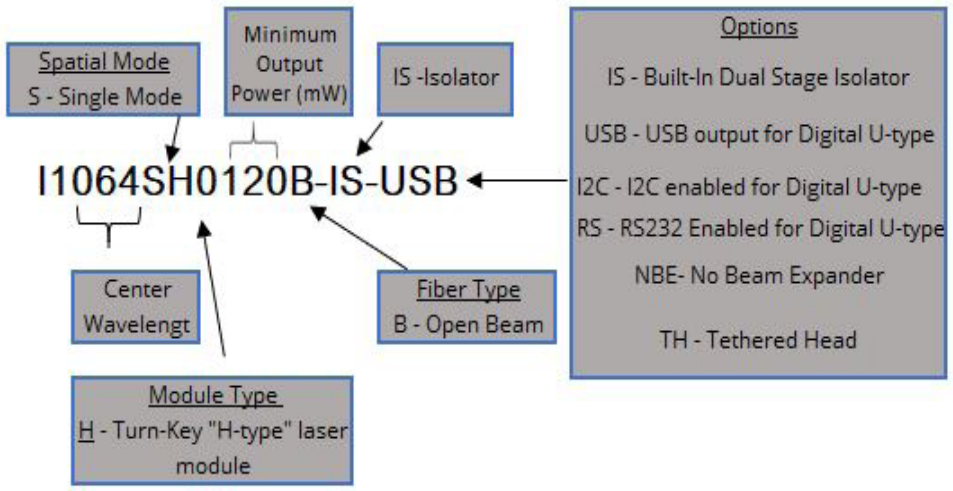
Specifications

Wavelegnth Tolerance	+/- 0.5nm
Spectral Linewidth (Δλ)	<100 MHz
Operating Temperature Range	10 - 45 °C
SMSR (no laser line filter)	45 - 50 dB typical
SMSR (w/laser line filter)	>70 dB typical
Polarization Orientation	Perpendicular to the plane of the base mounting plate of optical head
Polarization Extinction Ratio (PER)	>17 dB (typical)
Beam Quality (M^2, $1/e^2$)	<1.5 (1.3 Typical)
Spot Size[2]	~1.5mm with beam expander
Divergence[3]	< 1 mrad typ. with beam expander
Output Power Stability	<0.5% RMS
Modulation Rate	CW to kHz at 50% duty cycle or CW to 1kHz at 10-100% duty cycle
Warm-Up Time	10 sec from cold start to <1 wavenumber
	1.5 sec from warm start to <1 wavenumber
	3 sec from warm start to <0.1 wavenumber

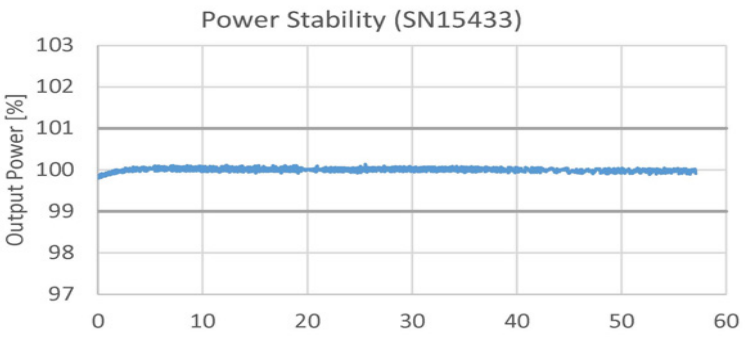
λ (nm)	Output Power (mW)	Base Part Number
633	50	I0633SHD0050B-TH-L-USB
	40	I0633SH0040B-TH-L-USB
638	60	I0638SH0060B-TH-L-USB
	50	I0638SH0050B-TH-L-USB
660	60	I0660SH0060B-TH-L-USB
685	40	I0685SH0040B-TH-L-USB
780	100	I0780SH0100B-TH-L-USB
	100	I0780SH0100B-IS-TH-L-USB
783	100	I0783SH0100B-TH-L-USB
	100	I0783SH0100B-IS-TH-L-USB
785	100	I0785SH0100B-TH-L-USB
	100	I0785SH0100B-IS-TH-L-USB
	150	I0785SH0150B-TH-L-USB
	150	I0785SH0150B-IS-TH-I-USB
808	175	I0808SH0175B-TH-L-USB
852	175	I0852SH0175B-TH-L-USB
976	175	I0976SH0175B-TH-L-USB
1053	175	I1053SH0175B-TH-L-USB
1064	175	I1064SH0175B-TH-L-USB

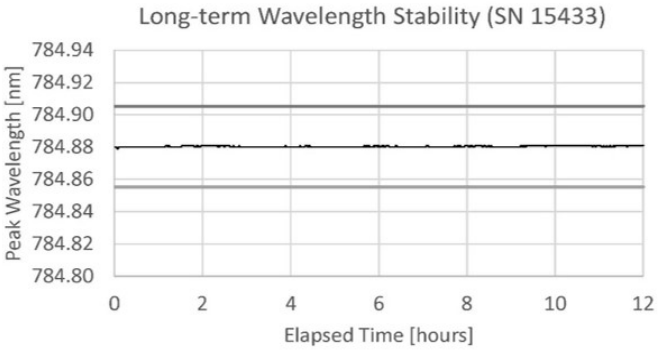
2. H-type optical head comes standard with beam expander, add - NBE to part number for no beam expander. Spot size measured at 500 mm.
3. For 785nm, beam divergence is ~ 3 - 4 mrad without beam expander

Part Schema

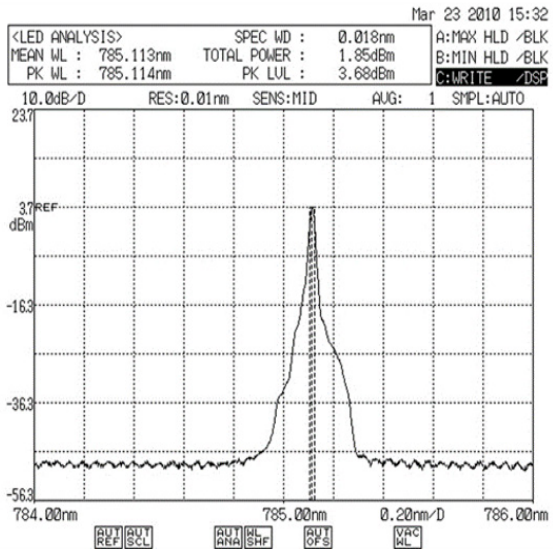


Selected Data





Module Dimensions	9.48" x 6.94" x 4.14" 48oz
H-Type Head Dimen-sions	3.82" x 1.2" x 1" 10oz
Case Material	Anodized Aluminmum
Operating Temperature	10 to 45 °C
Enviroment	0-80% Humidity, Non-Condensing
Storage Temperature	-10 to +55 °C



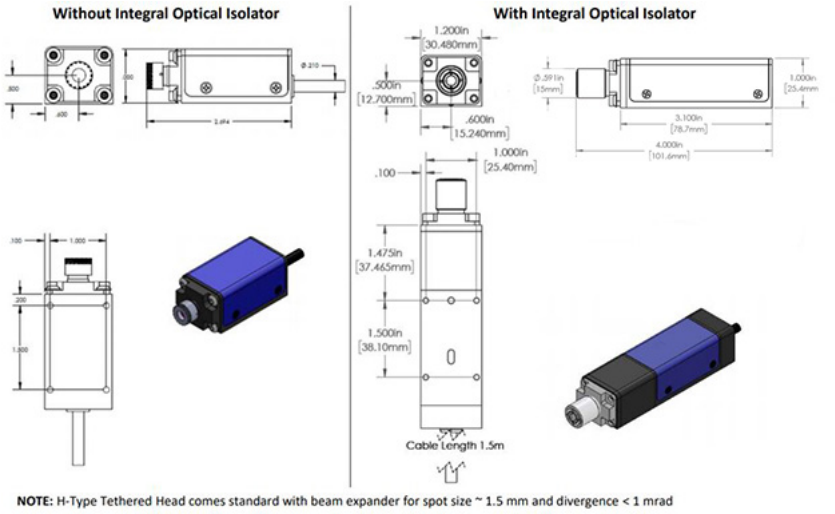
Custom Capability

- 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

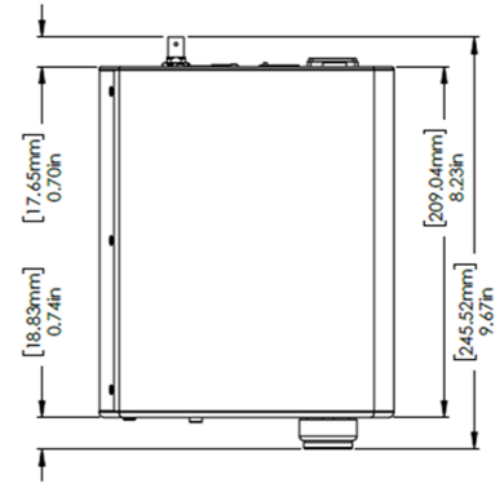
Electrical Specs

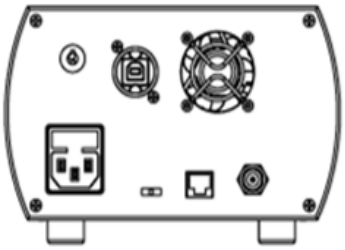
Input Power	100 - 240 VAC 50 - 60Hz, 0.4A
Fuse Rating	250V, 1A, FastBlow
	5mm x 20mm, 2 each

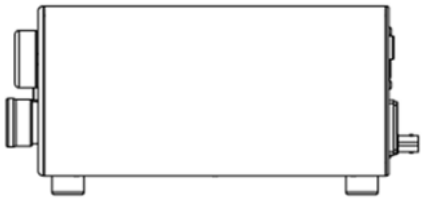
Mechanical Drawings

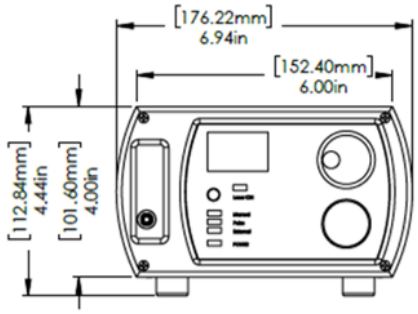


NOTE: H-Type Tethered Head comes standard with beam expander for spot size ~ 1.5 mm and divergence < 1 mrad









Operational Notes

1. Do not retro-reflect beam (unless you have selected a version with integral optical isolator)! This can cause Catastrophic Optical Damage (COD) and is not covered under warranty.
2. Digital Tethered Head modules offer the ability to adjust laser output power by connecting to a computer and adjusting the laser's operational duty cycle. Alternately, users can connect to the BNC port on the back panel and inserting their own Pulse Width Modulated (PWM) duty cycle. By using PWM, user can adjust average power from 10% to 100%. 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. The sample will experience a lower average power (equal to % duty cycle). Rise/fall time is approximately 5 microseconds.
3. See Operation Manual for full operating and safety instructions. This document is meant to offer a product overview.

Innovative Photonic Solutions, Inc.
313 Enterprise Drive
Plainsboro, NJ 08536
-
Phone: (732) 355-9300
-
sales@ipslasers.com
www.ipslasers.com

RoHS COMPLIANT

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