

3750 nm DFB Interband Cascade Laser, 5 mW

ID3750HHLH



Description

The ID3750HHLH is a single spatial mode, single longitudinal mode, distributed feedback interband cascade laser contained in a high heat load (HHL) package, designed and manufactured by Thorlabs. This laser operates in continuous wave (CW) mode at room temperature.

The ID3750HHLH has a collimated output and offers a standard HHL pinout for electrical and temperature control. Its package is sealed, although the seal is not hermetic. There is no monitor photodiode.

Specifications

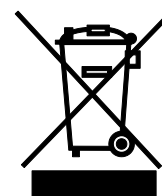
Absolute Maximum Ratings (T _{chip} = 20 °C, CW Operation)	
Absolute Max Operating Current	Varies Between Devices ^a
Absolute Max Output Power	50 mW
LD Reverse Voltage (Max)	1 V
PD Reverse Voltage (Max)	N/A
TEC Current (Max)	4.5 A
TEC Voltage (Max)	6.5 V
Operating Temperature	15 to 35 °C ^b
Storage Temperature	0 to 85 °C ^b

- The absolute maximum current is determined on a device-by-device basis and is listed on the device's data sheet.
- Non-condensing environment. Single mode performance is tested and guaranteed at 20 °C.

Thermistor Characteristics (T _{case} = 25 °C)				
	Symbol	Min	Typical	Max
Thermistor Resistance ^c	R _{th}	-	10 kΩ	-
Steinhart-Hart Coefficients (T _{case} = 25 °C)	A	-	1.129 × 10 ⁻³ K ⁻¹	-
	B	-	2.341 × 10 ⁻⁴ K ⁻¹	-
	C	-	0.878 × 10 ⁻⁷ K ⁻¹	-

- Thermistor resistance follows the Steinhart-Hart equation:

$$\frac{1}{T} = A + B(\ln R_{th}) + C(\ln R_{th})^3$$



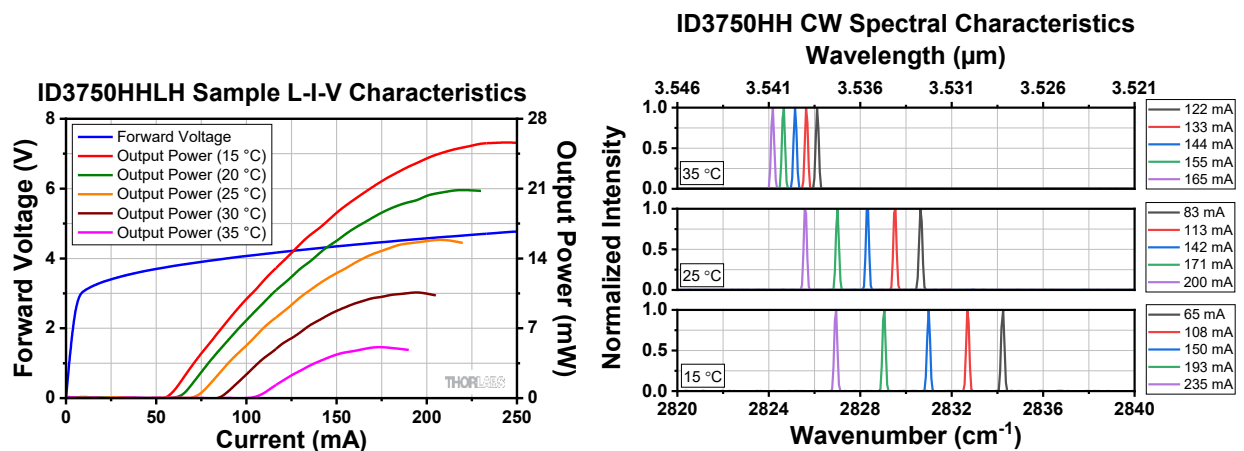
Specifications (Cont.)

Optical Electrical Characteristics ($T_{\text{chip}} = 20\text{ }^{\circ}\text{C}$, CW Operation)				
	Symbol	Min	Typical	Max
Center Wavelength	λ	3.50 μm	-	4.00 μm
Tuning Range	$\Delta\bar{\nu}$	-	2 cm^{-1}	-
Temperature Tuning	$\Delta\bar{\nu}/\Delta T$	-	-0.3 $\text{cm}^{-1}/^{\circ}\text{C}$	-
Side Mode Suppression	SMSR	20 dB	-	-
Optical Output Power	P_{out}	2 mW	5 mW	-
Operating Current	I_{op}	-	150	300 mA
Threshold Current	I_{th}	-	60 mA	-
Forward Voltage	V_F	-	5 V	8 V
Beam Pointing	Parallel ^d	-	-0.75 $^{\circ}$	+0.75 $^{\circ}$
	Perpendicular ^d	-	-2.75 $^{\circ}$	-1.25 $^{\circ}$
Beam Divergence Angle (FWHM)	Parallel ^d	$\theta_{\parallel}$	3 mrad	6 mrad
	Perpendicular ^d	$\theta_{\perp}$	3 mrad	6 mrad
M^2	Parallel ^d	$M^2_{\parallel}$	1.0	1.1
	Perpendicular ^d	$M^2_{\perp}$	1.0	1.1
Minimum Beam Diameter (D4 σ Method) ^e	D	0.5 mm	1 mm	2 mm

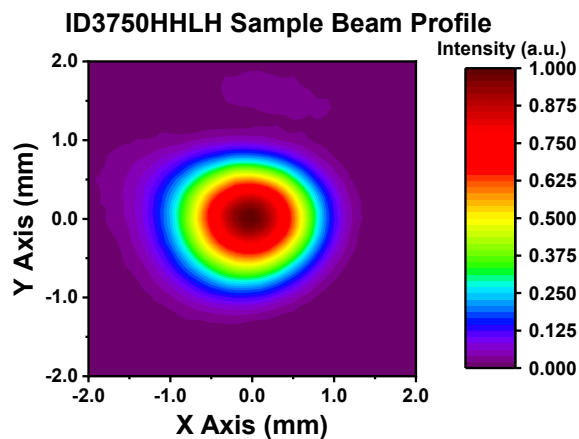
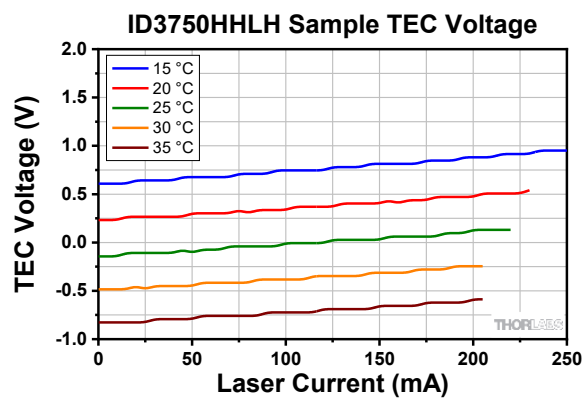
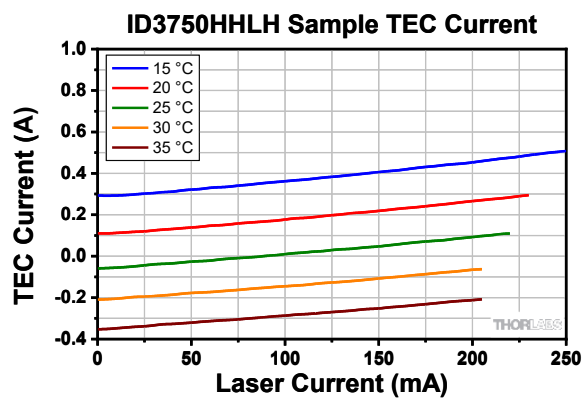
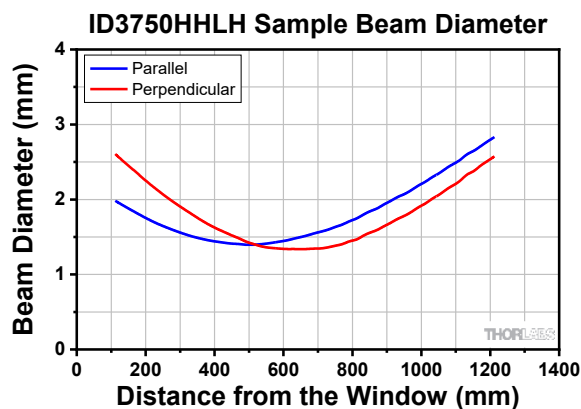
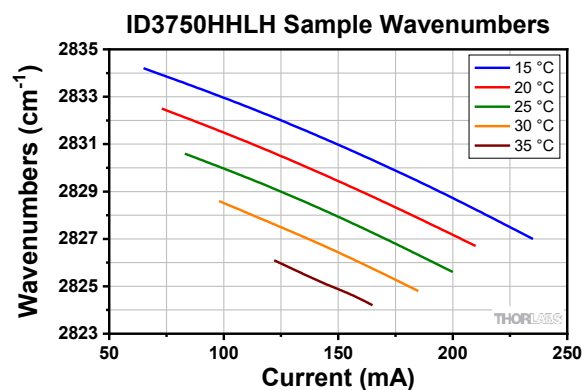
d. For this laser, these terms are defined with respect to the plane of the base plate.

e. Obtained Using a Mid-IR Beam Profiling Camera

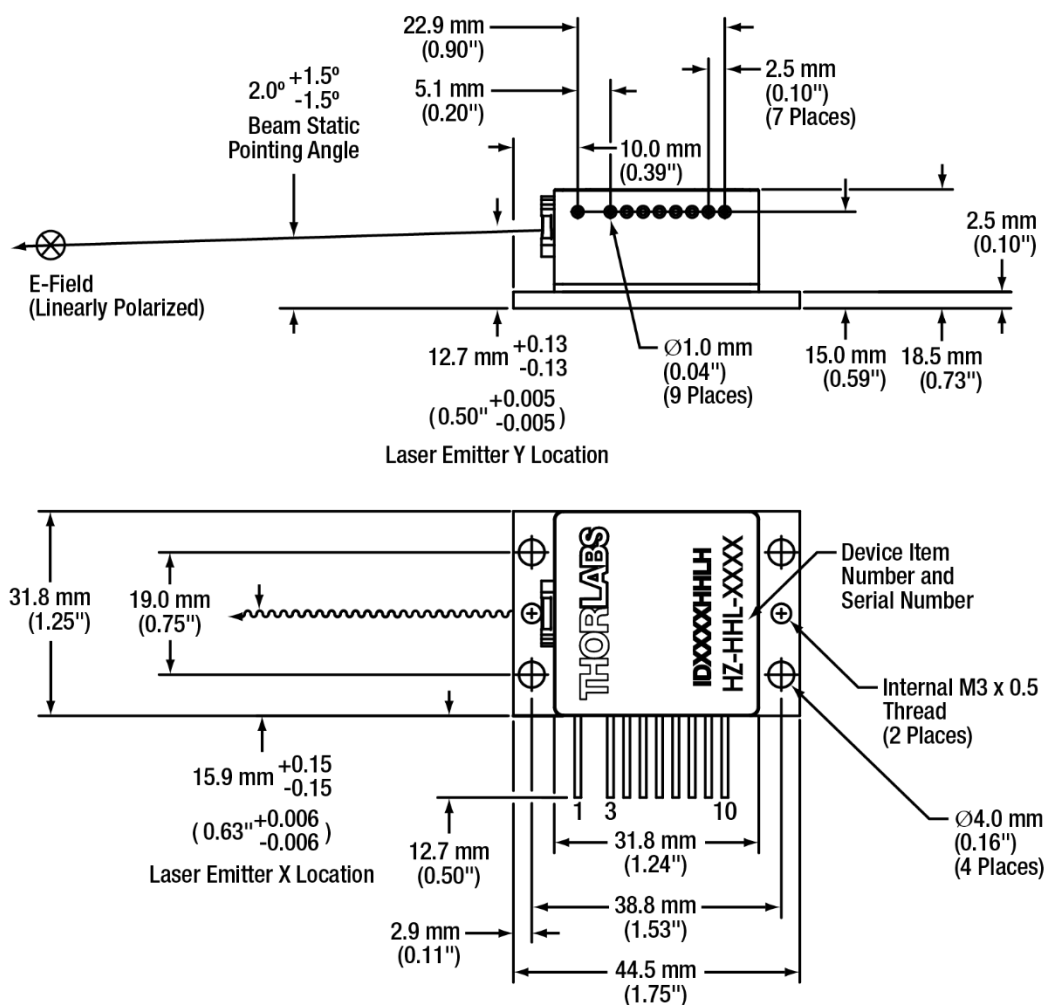
Sample Performance Plots



Sample Performance Plots (Cont.)



Drawing for ID3750HHLH



Pin	Description
1	TEC (-)
2	Not Present
3	No Connection
4	Laser Anode
5	TEC Control Thermistor, 10 k Ω
6	TEC Control Thermistor, 10 k Ω
7	Laser Cathode
8	No Connection
9	No Connection
10	TEC (+)