

3596 nm DFB Interband Cascade Laser, 2 mW

ID3596HH



Description

The ID3596HH 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, and the lasing wavelength can be tuned across the wavelength of 3596 nm.

The ID3596HH 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 ($T_{\text{chip}} = 20^{\circ}\text{C}$, 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 $^{\circ}\text{C}^{\text{b}}$
Storage Temperature	0 to 85 $^{\circ}\text{C}^{\text{b}}$

a. The absolute maximum current is determined on a device-by-device basis and is listed on the device's data sheet.

b. Non-condensing environment.

Thermistor Characteristics ($T_{\text{case}} = 25^{\circ}\text{C}$)				
	Symbol	Min	Typical	Max
Thermistor Resistance ^a	R_{th}	-	10 k Ω	-
Steinhart-Hart Coefficients ($T_{\text{case}} = 25^{\circ}\text{C}$)	A	-	$1.129 \times 10^{-3} \text{ K}^{-1}$	-
	B	-	$2.341 \times 10^{-4} \text{ K}^{-1}$	-
	C	-	$0.878 \times 10^{-7} \text{ K}^{-1}$	-

a. Thermistor resistance follows the Steinhart-Hart equation:

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

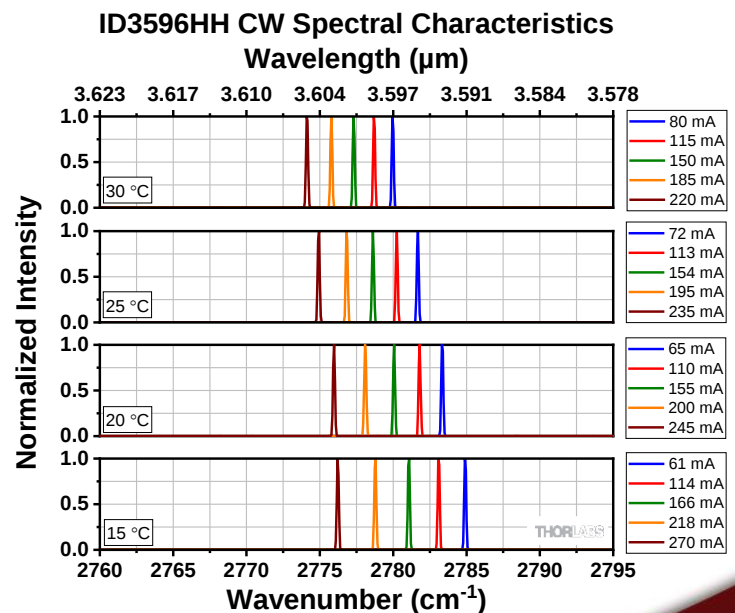
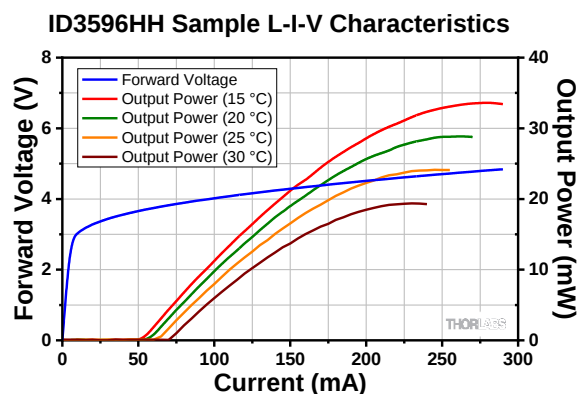


Specifications (Cont.)

Optical Electrical Characteristics (CW Operation)					
	Symbol	Min	Typical	Max	
Center Wavelength	λ	-	3.596 μm	-	
Operating Temperature	T_{op}	15 °C	-	35 °C	
Tuning Range	$\Delta\bar{\nu}$	-	3 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 mA	300 mA	
Threshold Current	I_{th}	-	60 mA	-	
Forward Voltage	V_F	-	5 V	-	
Beam Pointing	Parallel ^a	-	-0.75°	0°	+0.75°
	Perpendicular ^a	-	-2.75°	-2.0°	-1.25°
Beam Divergence Angle (FWHM)	Parallel ^a	$\theta_{\parallel}$	2 mrad	5 mrad	10 mrad
	Perpendicular ^a	$\theta_{\perp}$	2 mrad	5 mrad	10 mrad
M^2	Parallel ^a	$M^2_{\parallel}$	1.0	1.1	1.3
	Perpendicular ^a	$M^2_{\perp}$	1.0	1.1	1.3
Minimum Beam Diameter (D4 σ Method) ^b	D	0.5 mm	1.5 mm	2.5 mm	

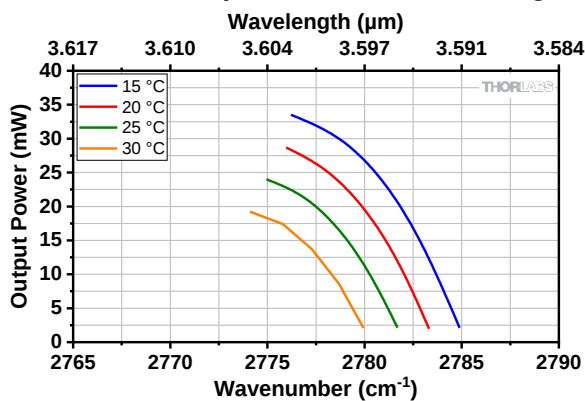
- a. For this laser, these terms are defined with respect to the plane of the base plate.
b. Obtained by scanning a razor across the beam and measuring the points where 10% of the total beam intensity and 90% of the total beam intensity are observed.

Sample Performance Plots

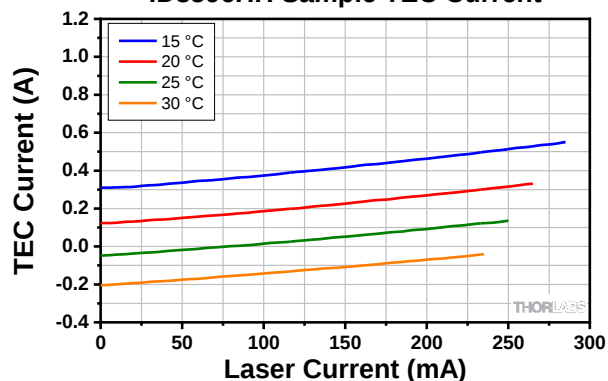


Sample Performance Plots (Cont.)

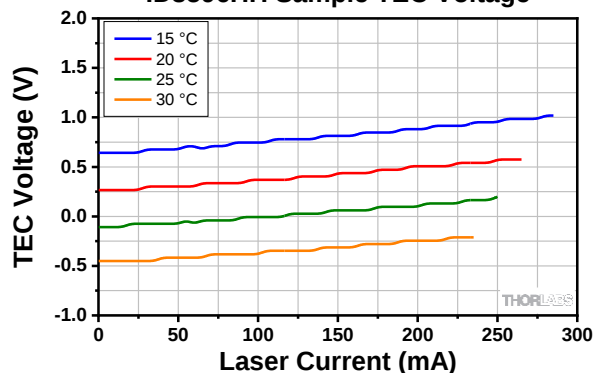
ID3596HH Output Power vs. Wavelength



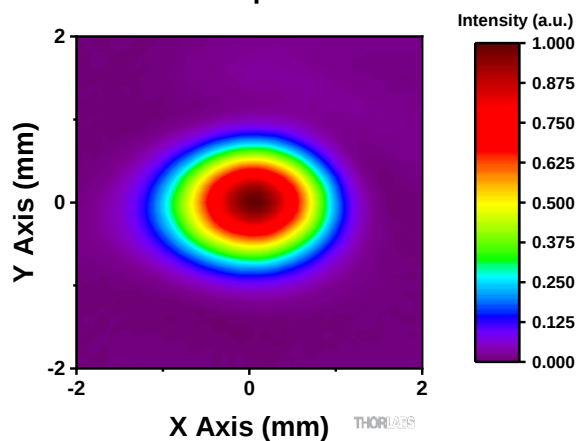
ID3596HH Sample TEC Current



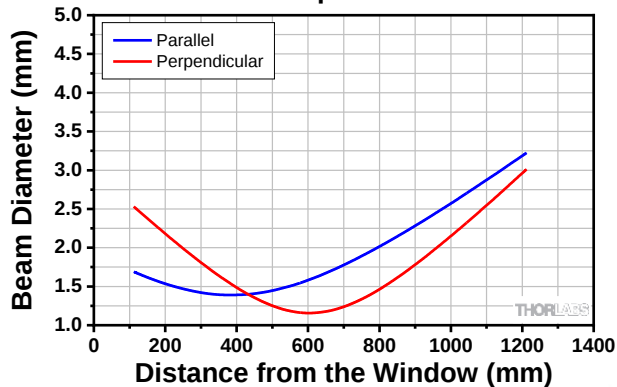
ID3596HH Sample TEC Voltage



ID3596HH Sample Beam Profile



ID3596HH Sample Beam Diameter



The beam profile above was measured at a distance of approximately 800 mm from the laser window with a pyroelectric camera that had 100 μm square pixels.

