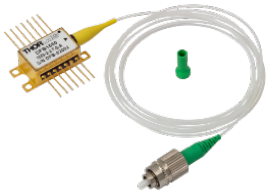
1550nm, 100mW DFB Butterfly Laser with Isolator, SM Fiber

DFB1550



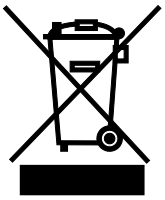
Description

Thorlabs' DFB1550 Distributed Feedback (DFB) laser is a single-frequency laser diode that is well-suited as a low-noise pump source for near infrared spectroscopy (NIRS), telecommunication, LIDAR, and general sensing. The DFB1550 laser includes an integrated dual-stage optical isolator, thermoelectric cooler (TEC), thermistor, and monitor photodiode. It is packaged in a 14-pin butterfly package with SMF-28 optical fiber and an FC/APC connector with the connector key aligned to the slow axis of the fiber.

Specifications

DFB1550[a]				
	Symbol	**Min**	**Typical**	**Max**
Center Wavelength	λ_C	1545 nm	1555 nm	1565 nm
Laser Linewidth	Δv	-	150 kHz	-
Output Power CW @ I_{OP}	P_{OP}	100 mW	-	-
Operating Current	I_{OP}	-	-	1000 mA
Mode-Hop-Free Operating Current[b]	$I_{Mode\text{-}Hop\text{-}Free}$	350 mA	-	1000 mA
SMSR in Mode-Hop-Free Range[c]	SMSR	30 dB	50 dB	-
Threshold Current	I_{TH}	-	50 mA	-
Forward Voltage	V_F	-	-	3.0 V
Slope Efficiency	$\Delta P/\Delta I$	-	0.15 W/A	-
Current Tuning	$\Delta\lambda/\Delta I$	-	0.006 nm/mA	-
Temperature Tuning	$\Delta\lambda/\Delta T$	-	0.10 nm/°C	-
Monitor Diode Responsivity	I_{MON}/P	-	5 µA/mW	-
Internal Isolation	ISO	-	50 dB	-
TEC Current	I_{TEC}	-	0.46 A	-
TEC Voltage	V_{TEC}	-	0.60 V	-
Thermistor Resistance @ 25 °C	R_{TH}	-	10 kΩ	-

a. T_{CASE} = 25 °C; T_{CHIP} = 15 - 35 °C
b. The current range where mode-hops are not observed, allowing for continuous tuning.
c. As measured with an optical spectrum analyzer (OSA) with spectral resolution of 0.02 nm to empirically determine single frequency range. Laser 30 dB bandwidth and SMSR are subject to monochromator settings and OSA internal algorithms and will differ from instrument to instrument.

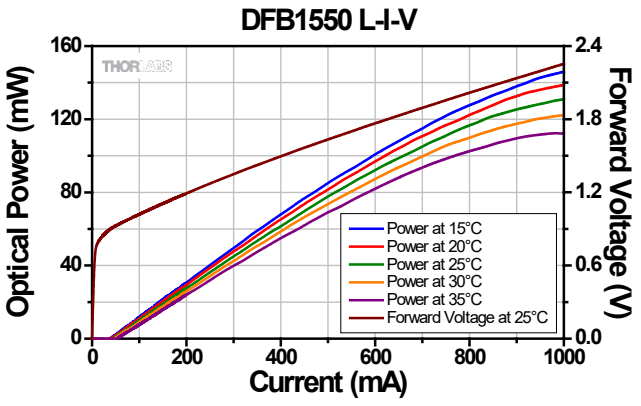


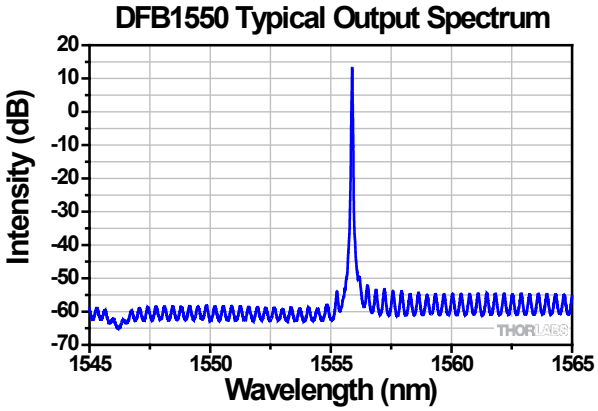
Absolute Max Ratings	
LD Reverse Voltage	2 V
Laser Current[a]	See Serialized Datasheet
Laser Power[a]	See Serialized Datasheet
TEC Current	3.0 A (T_{CASE} = 20 °C); 2.9 A (T_{CASE} = 70 °C)
TEC Voltage	3.6 V (T_{CASE} = 20 °C); 4.4 V (T_{CASE} = 70 °C)
PD Reverse Voltage	15 V
Operating Case Temperature	0 to 50 °C
Operating Chip Temperature	5 to 65 °C
Storage Temperature	-10 to 65 °C

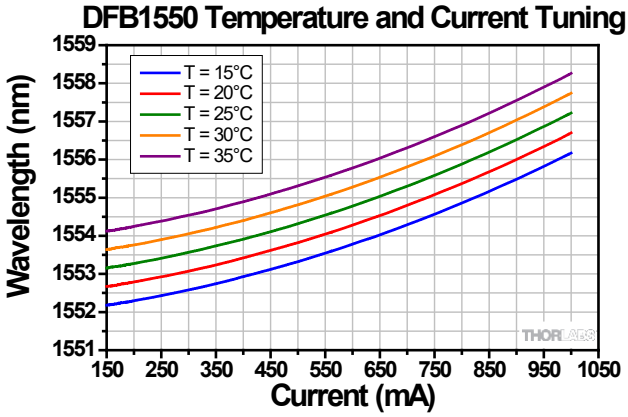
a. Some devices will produce the max laser power before exceeding the typical operating current. Do not drive the laser diode beyond the absolute max laser current or power. Operating in this regime can cause damage to the device.

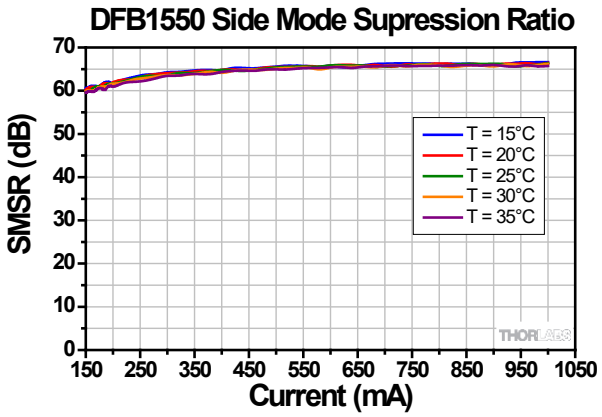
Fiber Specifications	
Fiber Type	SMF-28e
Numerical Aperture	0.14
Core Diameter	8.2 µm
Mode Field Diameter	10.4 ± 0.5 µm at 1550 nm
Fiber Length	1.5 m
Connector	FC/APC, 2.0 mm Narrow Key
Jacket	Ø900 µm, Loose Tube

Typical Performance Plots

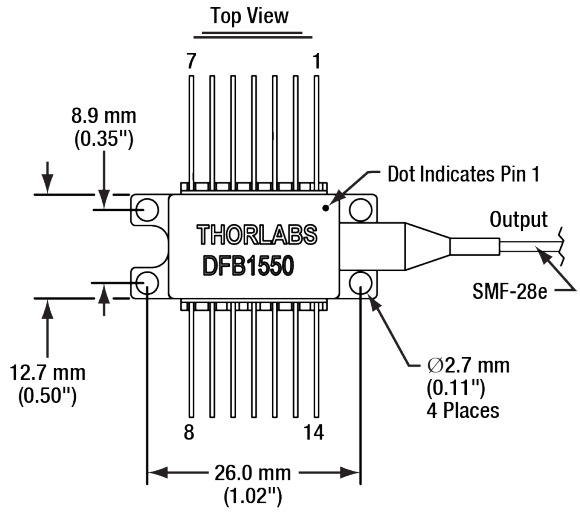








Drawings



PIN IDENTIFICATION			
1.	TEC +	14.	TEC -
2.	Thermistor	13.	Case
3.	PD Anode	12.	NC
4.	PD Cathode	11.	LD Cathode
5.	Thermistor	10.	LD Anode
6.	NC	9.	NC
7.	NC	8.	NC