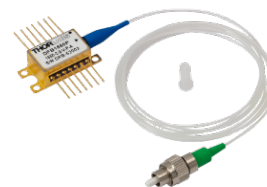


DFB1550P



Description

Thorlabs' DFB1550P 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 DFB1550P 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 PM1550 polarization-maintaining optical fiber and an FC/APC connector with the connector key aligned to the slow axis of the fiber.

Specifications

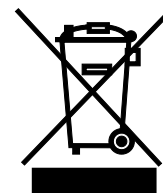
DFB1550P ^a				
	Symbol	Min	Typical	Max
Center Wavelength	λ_c	1545 nm	1555 nm	1565 nm
Laser Linewidth	$\Delta\nu$	-	150 KHz	-
Output Power CW @ I_{OP}	P_{OP}	100 mW	-	-
Operating Current	I_{OP}	-	-	1000 mA
Mode-Hop-Free Operating Current ^b	$I_{Mode-Hop-Free}$	350 mA	-	1000 mA
SMSR in Mode-Hop-Free Range ^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 $\mu A / mW$	-
Polarization Extinction Ratio ^d	r_{ex}	-	23 dB	-
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 k Ω	-

a. $T_{CASE} = 25^\circ C$; $T_{CHIP} = 15 - 35^\circ C$

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.

d. Ratio of transmitted light polarized along the fiber's slow axis to transmitted light polarized along the fast axis.



Absolute Max Ratings

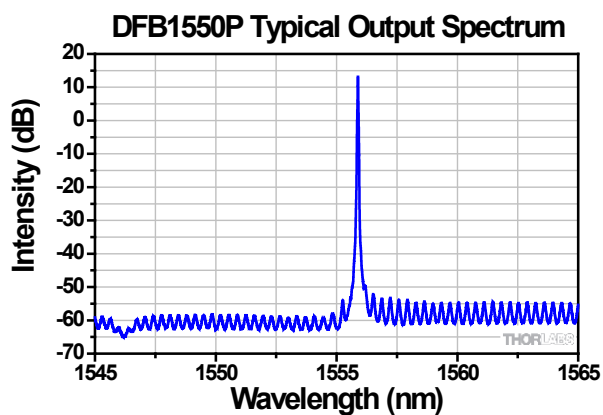
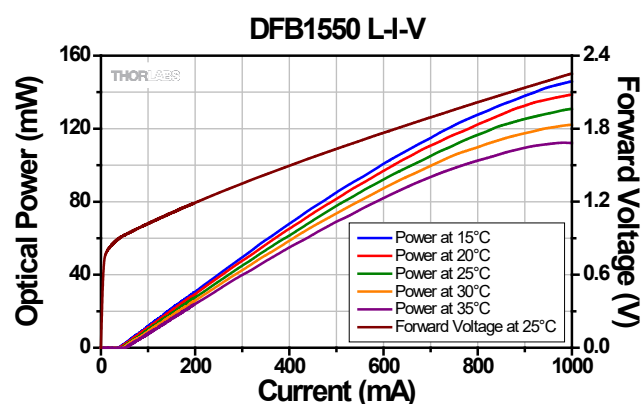
LD Reverse Voltage	2 V
Laser Current ^a	See Serialized Datasheet
Laser Power ^a	See Serialized Datasheet
TEC Current	3.0 A ($T_{CASE} = 20\text{ }^{\circ}\text{C}$); 2.9 A ($T_{CASE} = 70\text{ }^{\circ}\text{C}$)
TEC Voltage	3.6 V ($T_{CASE} = 20\text{ }^{\circ}\text{C}$); 4.4 V ($T_{CASE} = 70\text{ }^{\circ}\text{C}$)
PD Reverse Voltage	15 V
Operating Case Temperature	0 to 50 $^{\circ}\text{C}$
Operating Chip Temperature	5 to 65 $^{\circ}\text{C}$
Storage Temperature	-10 to 65 $^{\circ}\text{C}$

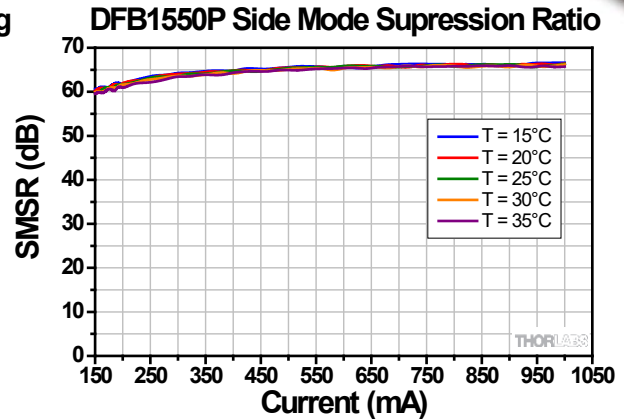
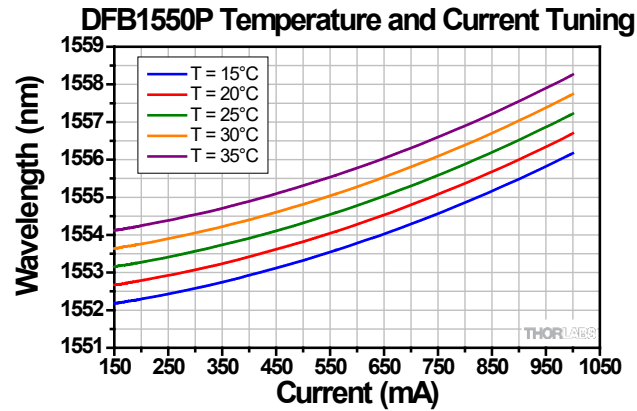
- a. Some devices will produce the max laser power before exceeding the typical operating current. Do not drive the laser diode beyond the absolute max laser current or power. Operating in this regime can cause damage to the device.

Fiber Specifications

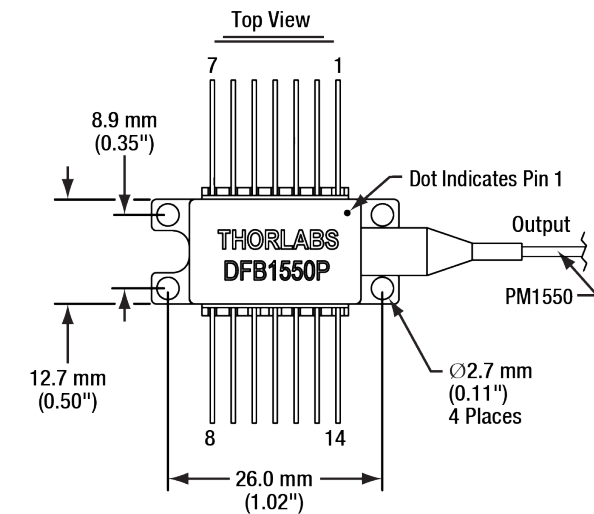
Fiber Type	PM1550
Numerical Aperture	0.125
Core Diameter	8.5 μm
Mode Field Diameter	10.5 \pm 0.5 μm at 1550 nm
Fiber Length	1.5 m
Connector	FC/APC, 2.0 mm Narrow Key
Connector Key Alignment	Slow Axis
Jacket	\varnothing 900 μm , Loose Tube

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

