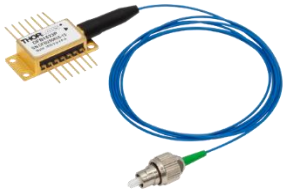
1532.7 nm, 10 mW (Min.) DFB Butterfly Laser with Isolator, PM Fiber

DFB1533P



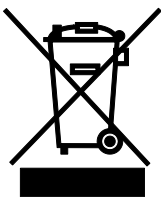
Description

Thorlabs' DFB1533P 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), specifically acetylene sensing. The DFB1533P laser includes an integrated 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

DFB1533P[a]				
	Symbol	**Min**	**Typical**	**Max**
Center Wavelength	λ_C	1531.7 nm	1532.7 nm	1533.7 nm
Laser Linewidth	$\Delta\nu$	-	2 MHz	-
Output Power CW @ I_{OP}	P_{OP}	10 mW	-	-
Forward Voltage	V_F	-	-	3.0 V
Operating Current	I_{OP}	-	-	100 mA
Mode-Hop-Free Operating Current[b]	$\Delta I_{Mode\text{-}Hop\text{-}Free}$	20 mA	-	-
SMSR in Mode-Hop-Free Range[c]	SMSR	30 dB	50 dB	-
Threshold Current	I_{TH}	-	5 mA	-
Slope Efficiency	$\Delta P/\Delta I$	-	0.26 W/A	-
Current Tuning	$\Delta\lambda/\Delta I$	-	0.01 nm/mA	-
Temperature Tuning	$\Delta\lambda/\Delta T$	-	0.1 nm/°C	-
Monitor Diode Responsivity	I_{MON}/P	-	2.8 µA/mW	-
Polarization Extinction Ratio[d]	r_{ex}	-	24 dB	-
Internal Isolation	ISO	40 dB	-	-
TEC Operation (Typical / Max @ T_{CASE} = 25 °C / 75 °C)				
TEC Current	I_{TEC}	-	0.06 A	2.0 A
TEC Voltage	V_{TEC}	-	0.20 V	4.0 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.
d. Ratio of transmitted light polarized along the fiber's slow axis to transmitted light polarized along the fast axis.

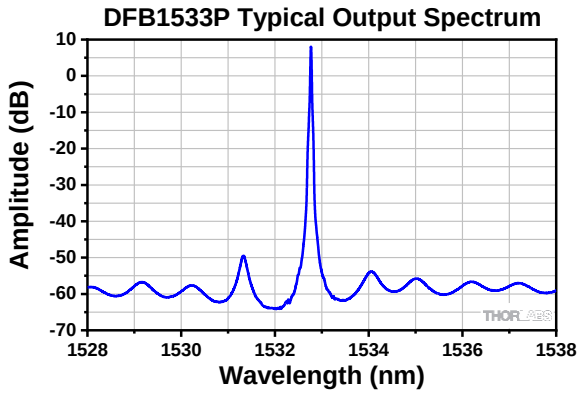


Absolute Maximum Ratings	
Laser Current[a]	See Serialized Datasheet
Laser Power[a]	See Serialized Datasheet
LD Reverse Voltage	2 V
TEC Current	2.6 A
TEC Voltage	4.7 V
PD Reverse Voltage	5 V
Operating Case Temperature	-5 to 75 °C
Operating Chip Temperature	15 to 35 °C
Storage Temperature	-40 to 85 °C

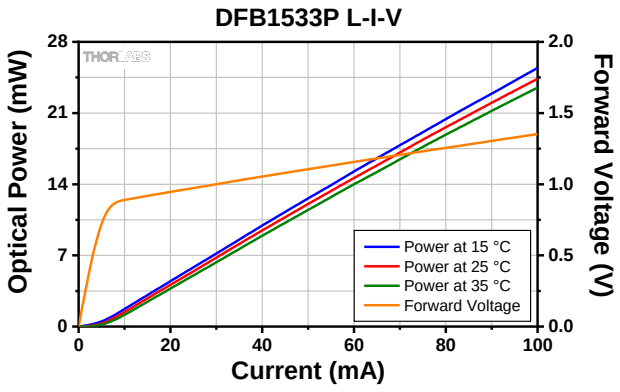
a. Some devices will produce the max laser power before reaching the max operating current. Do not drive the laser diode beyond the absolute max laser current or power. Operating in this regime can cause damage to the device.

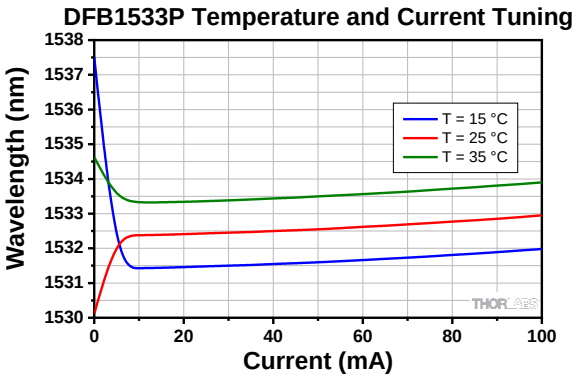
Fiber Specifications	
Fiber Type	PM1550
Numerical Aperture	0.13
Core Diameter	9 µm
Mode Field Diameter	10.5 ± 0.5 µm at 1550 nm
Fiber Length	1.0 m ± 0.1 m
Connector	FC/APC, 2.0 mm Narrow Key
Jacket	Ø900 µm, Loose Tube

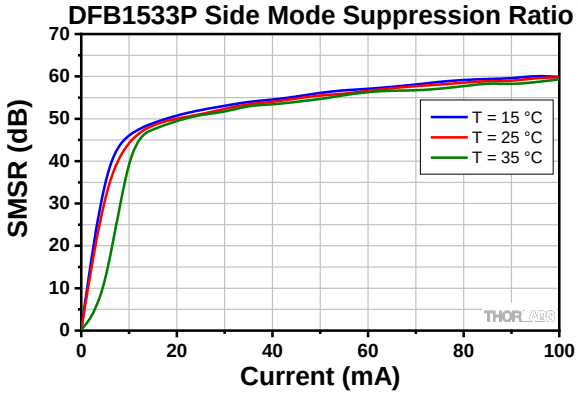
Typical Performance Plots



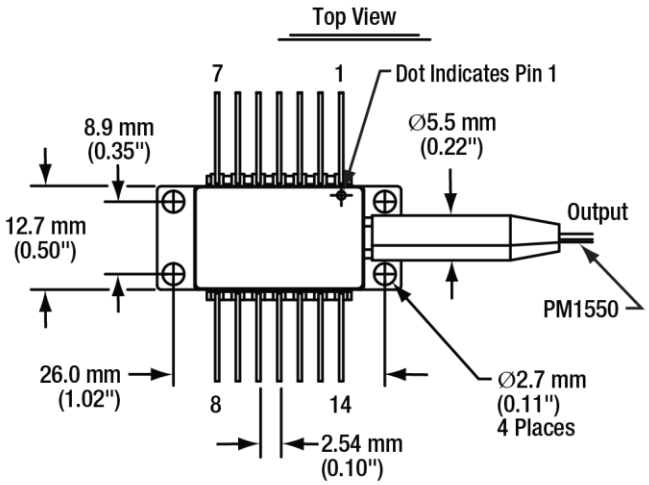
The spectrum was measured using an optical spectrum analyzer with a spectral resolution of 0.02 nm.







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