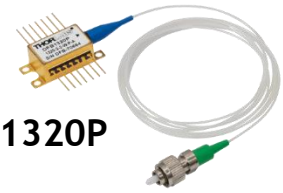
1320 nm, 250 mW (Min) DFB Butterfly Laser with Isolator, PM Fiber



DFB1320P

Description

Thorlabs' DFB1320P 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, CPO, and general sensing. The DFB1320P 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 PM1300 polarization-maintaining optical fiber and an FC/APC connector with the connector key aligned to the slow axis of the fiber.

Specifications

DFB1320P[a]				
	Symbol	**Min**	**Typical**	**Max**
Center Wavelength	λ_C	1310 nm	1320 nm	1330 nm
Laser Linewidth	Δv	-	50 kHz	-
Output Power CW @ I_{OP}	P_{OP}	250 mW	-	-
Operating Current	I_{OP}	-	-	1800 mA
Mode-Hop-Free Operating Current[b]	$\Delta I_{Mode\text{-}Hop\text{-}Free}$	350 mA	-	-
SMSR in Mode-Hop-Free Range[c]	SMSR	30 dB	50 dB	-
Threshold Current	I_{TH}	-	150 mA	-
Forward Voltage	V_F	-	-	3.0 V
Slope Efficiency	$\Delta P/\Delta I$	-	0.20 W/A	-
Current Tuning	$\Delta\lambda/\Delta I$	-	0.001 nm/mA	-
Temperature Tuning	$\Delta\lambda/\Delta T$	-	0.086 nm/°C	-
Monitor Diode Responsivity	I_{MON}/P	-	0.13 µA/mW	-
Polarization Extinction Ratio[d]	r_{ex}	-	23 dB	-
Internal Isolation	ISO	-	50 dB	-
TEC Operation (Typical / Max @ T_{CASE} = 25°C / 50°C)				
TEC Current	I_{TEC}	-	0.8 A	2.3 A
TEC Voltage	V_{TEC}	-	1.10 V	3.8 V
Thermistor Resistance @ 25 °C	R_{TH}	-	10 kΩ	-

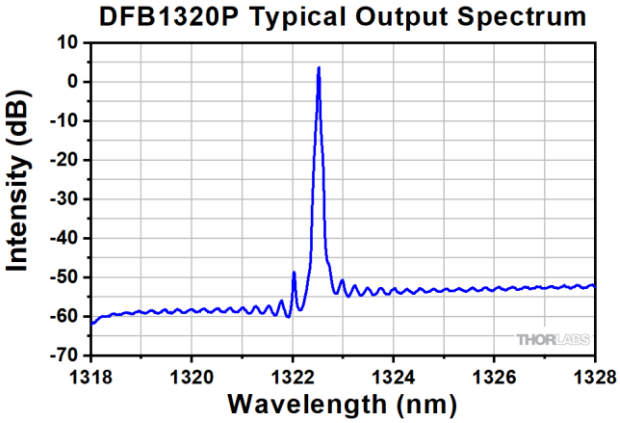
a. T_{CASE} = 25 °C; T_{CHIP} = 20 - 35 °C.
b. The current range where mode-hops are not observed, allowing for continuous tuning.
c. As measured with an optical spectrum analyzer (OSA) with spectral resolution of 0.02 nm to empirically determine single frequency range. Laser 30 dB bandwidth and SMSR 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	2.5 A
TEC Voltage	4.0 V
PD Reverse Voltage	15 V
Operating Case Temperature	0 to 50 °C
Operating Chip Temperature	20 to 35 °C
Storage Temperature	-10 to 65 °C

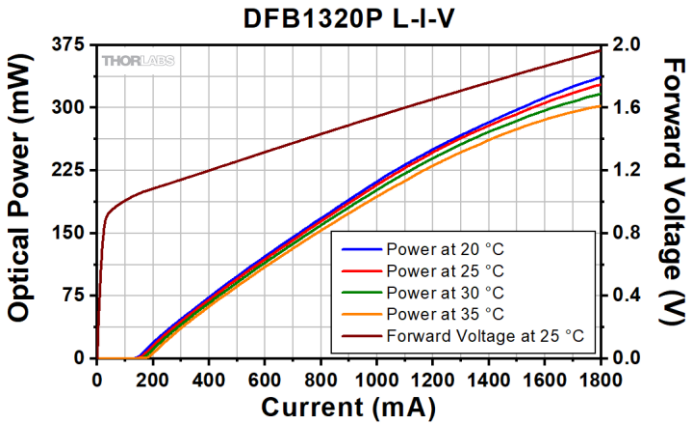
a. Some devices will produce the max laser power before exceeding the max operating current. Do not drive the laser diode beyond the absolute max laser current or power. Operating in this regime can cause damage to the device.

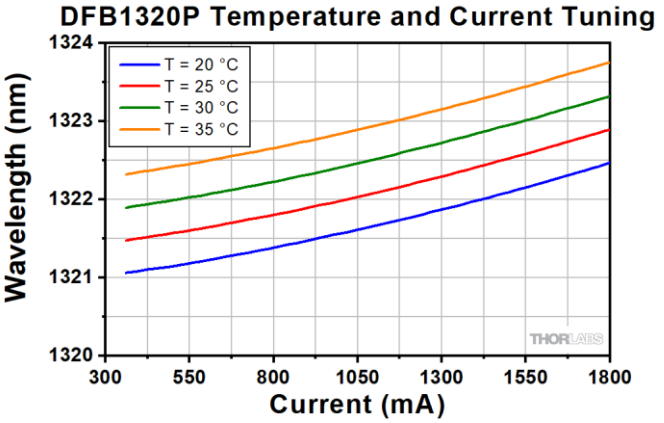
Fiber Specifications	
Fiber Type	PM1300
Numerical Aperture	0.120
Core Diameter	8.5 µm
Mode Field Diameter	9.3 ± 0.5 µm at 1300 nm
Fiber Length	1.5 m
Connector	FC/APC, 2.0 mm Narrow Key
Connector Key Alignment	Slow Axis
Jacket	Ø900 µm, Loose Tube

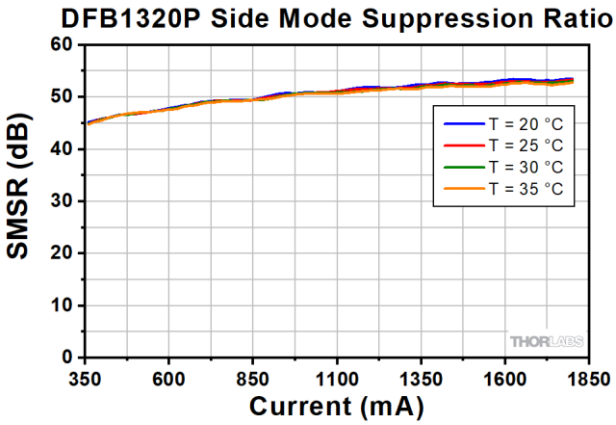
Typical Performance Plots



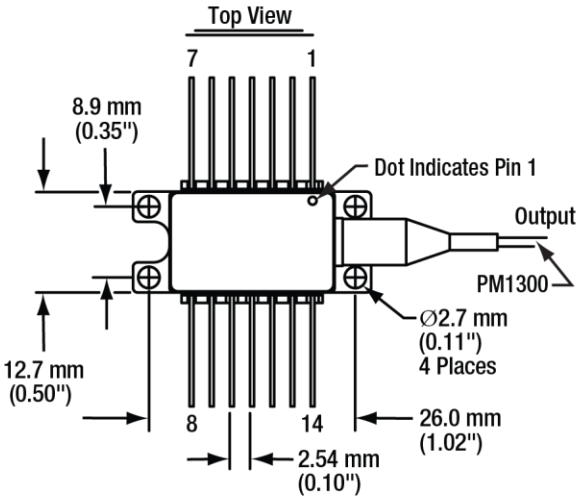
The spectrum was measured using an optical spectrum analyzer with a spectral resolution of 0.02 nm.







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