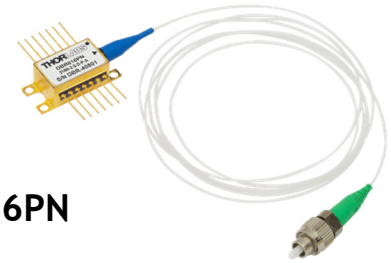
816 nm, 45 mW DBR Butterfly Laser with Isolator, PM Fiber



DBR816PN

Description

Thorlabs' DBR816PN Distributed Bragg Reflector (DBR) laser is a single-frequency laser diode that is well-suited as a low-noise pump source for near infrared spectroscopy (NIRS). This wavelength is specifically useful for water vapor differential absorption lidar (DIAL) systems. The DBR816PN laser includes an integrated optical isolator, thermoelectric cooler (TEC), thermistor, and monitor photodiode. It is packaged in a 14-pin butterfly package with PM780-HP polarization-maintaining optical fiber and an FC/APC connector with the connector key aligned to the slow axis of the fiber.

Specifications

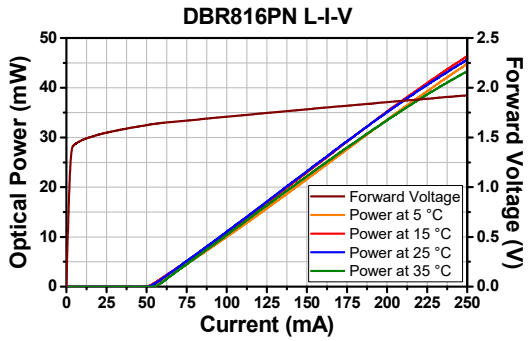
DBR816PN[a]				
	Symbol	**Min**	**Typical**	**Max**
Center Wavelength	λ_C	814 nm	816 nm	818 nm
Laser Linewidth	$\Delta\nu$	-	1 MHz	-
Output Power CW @ I_{OP}	P_{OP}	35 mW	45 mW	-
Operating Current	I_{OP}	-	250 mA	
Mode-Hop-Free Range[b]	$\Delta I_{Mode\text{-}Hop\text{-}Free}$	20 mA	-	-
SMSR in Mode-Hop-Free Range[c]	SMSR	30 dB	50 dB	-
30 dB BW in Mode-Hop-Free Range[c]	30 dB BW	-	-	0.3 nm
Threshold Current	I_{TH}	-	54 mA	-
Forward Voltage	V_F	-	1.95 V	2.5 V
Slope Efficiency	$\Delta P/\Delta I$	-	0.23 W/A	-
Current Tuning	$\Delta\lambda/\Delta I$	-	0.002 nm/mA	-
Temperature Tuning	$\Delta\lambda/\Delta T$	-	0.06 nm/°C	-
Monitor Diode Responsivity	I_{MON}/P	-	11 µA/mW	-
Polarization Extinction Ratio[d]	r_{ex}	-	16 dB	-
Internal Isolation	ISO	-	>30 dB	-
TEC Current	I_{TEC}	-	0.13 A	-
TEC Voltage	V_{TEC}	-	0.16 V	-
Thermistor Resistance @ 25 °C	R_{TH}	-	10 kΩ	-

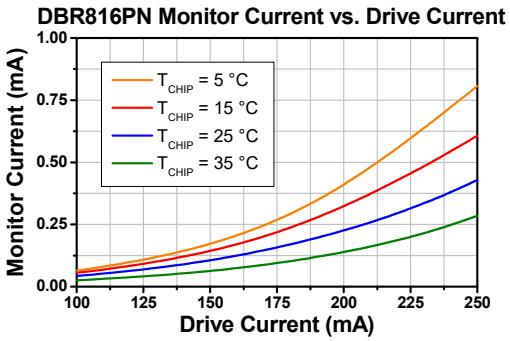
a. T_{CASE} = 25 °C; T_{CHIP} = 25 °C.
b. Continuous tuning range between mode hops.
c. As measured with an optical spectrum analyzer (OSA) with spectral resolution of 0.02 nm to empirically determine single frequency range. Laser 30 dB bandwidth and SMSR are subject to monochromator settings and OSA 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.

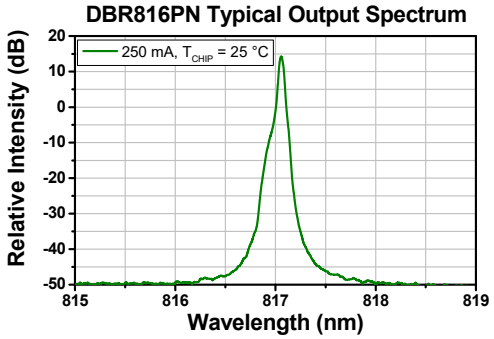
Absolute Max Ratings	
LD Reverse Voltage (Max)	2 V
Laser Current (Max)[a]	See Serialized Datasheet
Laser Power (Max)[a]	See Serialized Datasheet
TEC Current (Max)	3.0 A (T_{CASE} = 20 °C); 2.9 A (T_{CASE} = 70 °C)
TEC Voltage (Max)	3.6 V (T_{CASE} = 20 °C); 4.4 V (T_{CASE} = 70 °C)
PD Reverse Voltage (Max)	15 V
Operating Case Temperature	0 to 50 °C
Operating Chip Temperature	5 to 45 °C
Storage Temperature	-10 to 65 °C

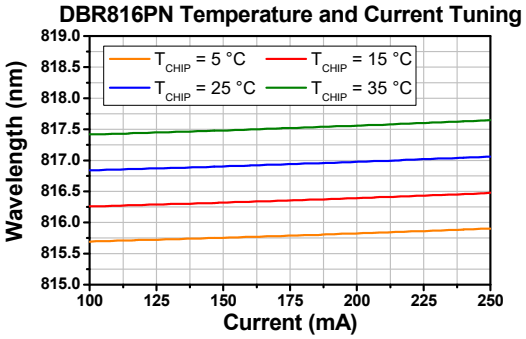
a. Some devices will produce the max laser power before exceeding the typical operating current. Do not drive the laser diode beyond the absolute max laser current or power. Operating in this regime can cause damage to the device.

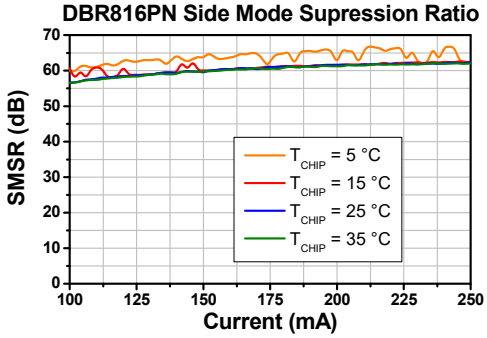
Typical Performance Plots

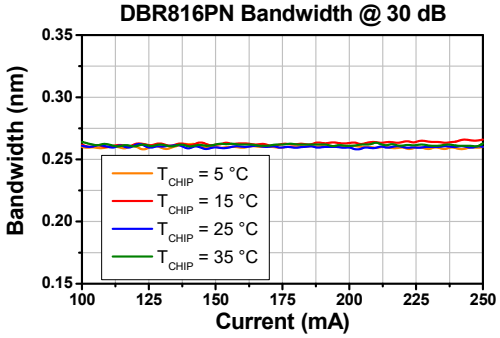




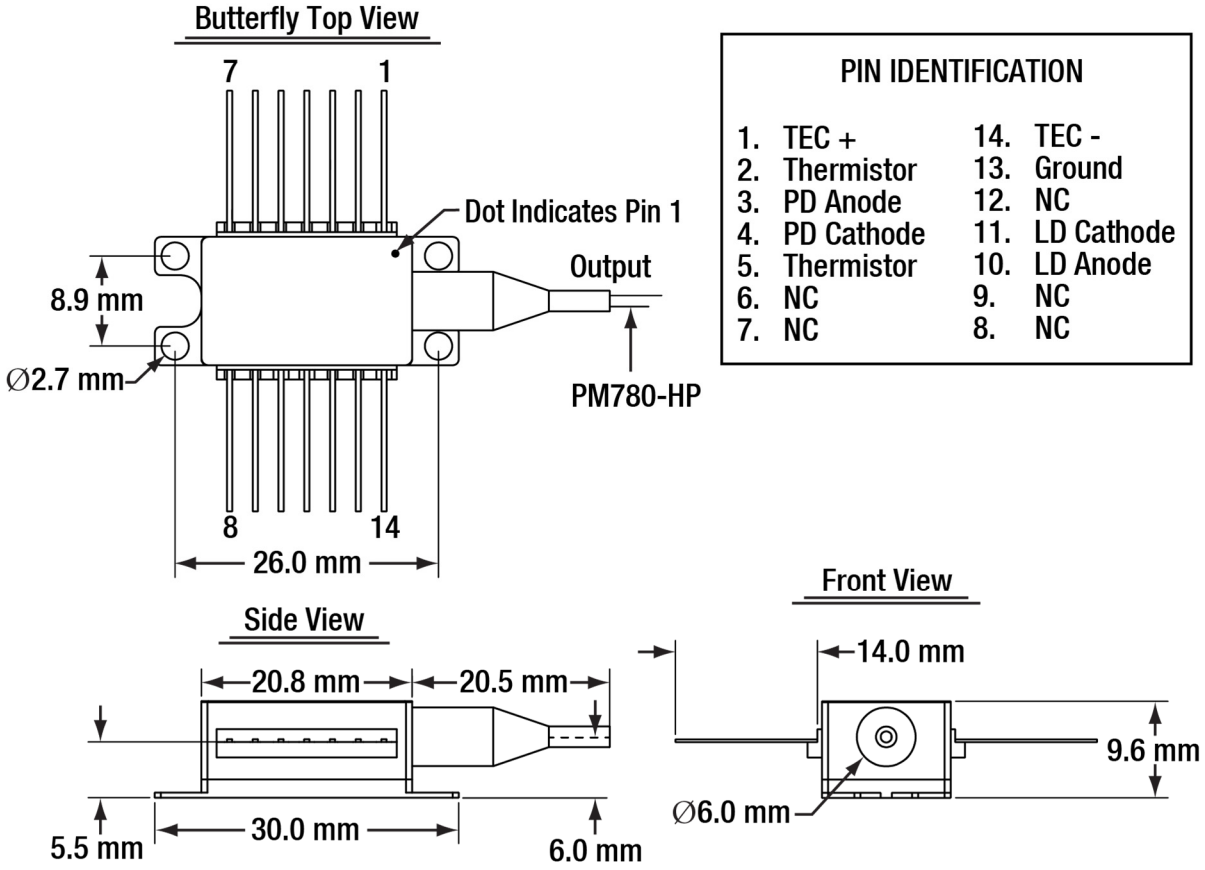








Drawings



PIN IDENTIFICATION

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