1425 nm, 500 mW Butterfly Laser, PM Fiber with FBG

BL1425-PAG500

Description

Thorlabs' BL1425-PAG500 is a 1425 nm, 500 mW FBG-stabilized laser with a PM fiber output and FC/APC connector in a 14-pin, hermetically sealed, butterfly package. It is well suited for Raman amplification as well as other applications that benefit from an FBG-stabilized or a high-power single mode laser. The FBG, which is relatively insensitive to temperature by virtue of its design, stabilizes the Fabry-Perot gain chip emission and reduces the gain chip's sensitivity to external reflection. The BL1425-PAG500 laser is Telcordia® GR-468 CORE compliant.

Specifications

Absolute Max Ratings[a,b]	
LD Reverse Voltage (Max)	2.0 V
Absolute Max Current	3000 mA
Absolute Max Power	650 mW
Operating Case Temperature	-5 to +75 °C
Storage Temperature	-40 to +85 °C
Max TEC Voltage, Cooler Mode	4.5 V
Max TEC Current, Cooler Mode	3.5 A
Max Tightening Torque	150 mN·m

a. Absolute Maximum Rating specifications should never be exceeded. Operating at or beyond these conditions can permanently damage the laser.
b. T_{chip} = 25 °C, T_{case} = -5 °C to 75 °C

Operation Specs[a]				
	Symbol	**Min**	**Typical**	**Max**
Peak Wavelength[b]	λ_p	1424 nm	1425 nm	1426 nm
Spectral Bandwidth (FWHM)	$\Delta\nu$	-	1.2 nm	2.0 nm
Output CW Operating Power	P_{OP}	500 mW	-	-
Kink-Free Power	$P_{Kink\text{-}Free}$		500 mW	
Threshold Current	I_{TH}	-	75 mA	200 mA
Forward Current (@ P_{OP})	I_{OP}	-	1600 mA	2100 mA
Slope Efficiency	$\Delta P/\Delta I$	0.20 W/A	0.28 W/A	-
Forward Voltage	V_F	-	1.7 V	2.1 V
Relative Intensity Noise (100 kHz ~ 1 GHz)	RIN	-	-	-105 dB/Hz
Temp. Coefficient of FBG (@ P_{OP})	$\Delta\lambda/\Delta T$	-	0.01 nm/°C	0.02 nm/°C
Polarization Extinction Ratio	PER	13 dB	18 dB	-

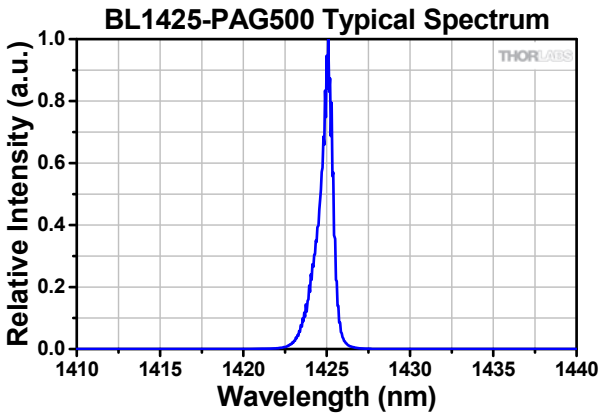
a. T_{case} = T_{FBG} = 25 °C
b. Vacuum Wavelength

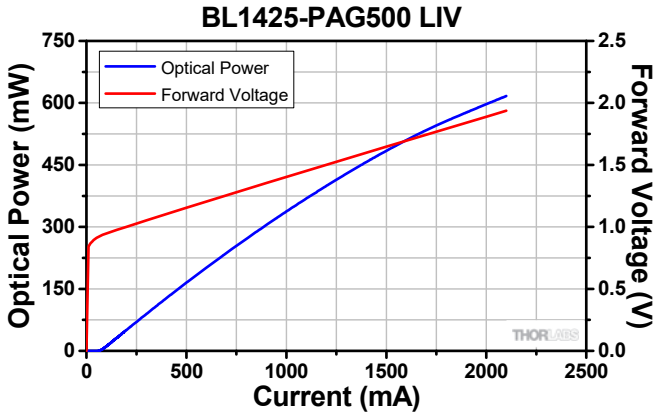
TEC Characteristics				
	Symbol	Min	Typical	Max
Cooling Capacity	ΔT_{TEC}	-	-	30 °C
Total TEC Power Consumption P_{OP} = 500 mW @ T_{case} = 70 °C	P_{TEC}	-	-	9.0 W
Thermistor ß Constant	T_C	3700 K	-	4100 K
Thermistor Resistance (@ 25 °C)	R_{TH}	9.5 kΩ	10 kΩ	10.5 kΩ

Fiber Specifications			
Fiber Type	Corning PM15-U25D or Equivalent PM Fiber		
Fiber Termination	FC/APC, 2.0 mm Narrow Key		
Key Alignment	Key Parallel to Slow Axis of Fiber		
Polarization	Aligned to Slow Axis of Fiber		
Protection Tubing Diameter	900 µm		
Parameter	**Min**	**Typical**	**Max**
Fiber Coating Diameter	230 µm	245 µm	260 µm
FBG Recoat Diameter	260 µm	295 µm	400 µm
Fiber Bend Radius	20 mm	-	-
Distance Between FBG and Module[a]	-	2.5 m	-
Distance Between FBG and Fiber End	0.5 m	-	-
Pigtail Length	-	3.4 m	-

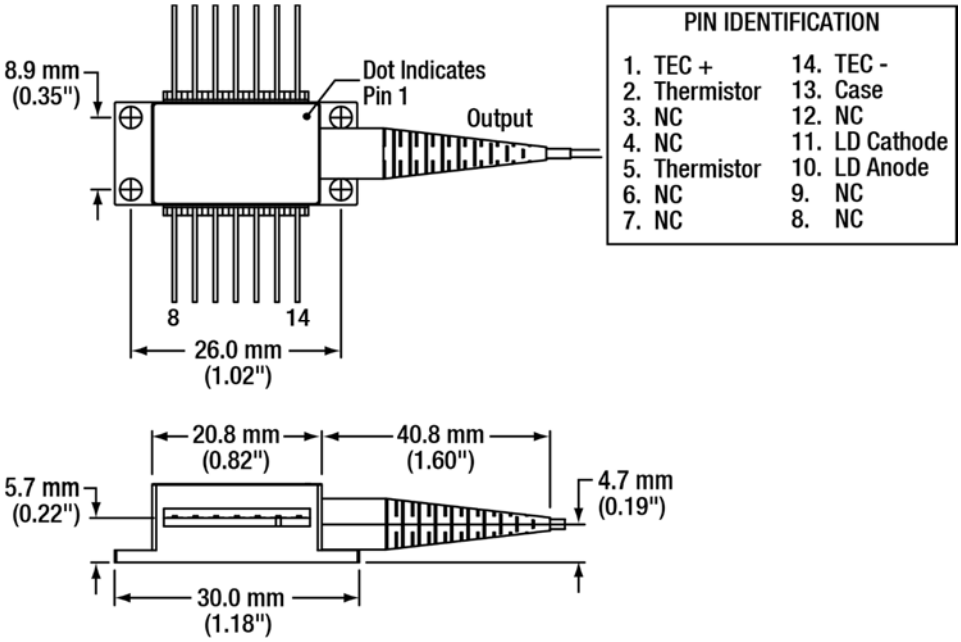
a. To the Center of the FBG, Approximate Location Marked on Outside of Tubing

Typical Performance Plots





Drawings



Operation Notes and Warnings

1) Always inspect and clean the fiber end face of the pigtail and mating fiber prior to mating. Damaged or scratched fibers will have to be polished and terminated with connectors again. The mating sleeve should also remain clean. It is recommended that mating be done only in a clean environment. Failure to properly clean this fiber can cause the fiber end face to become burned or otherwise damaged. Inspecting by eye with the device powered can cause injury and/or permanent blindness.
2) Always ensure this device is properly temperature regulated. Thorlabs' recommend mounts are CLD1015 or LM14S2. Thermal conductivity can be improved by applying thermal tape, or a small amount of thermal paste, between top of the mount and bottom of the butterfly package. Mounting screws should be used with appropriate torque (i.e, hand-tight, or <150 mN·m).
3) Short mounting screws should be used (~1/8" or ~3.5 mm thread length is recommended).
4) For monitoring absolute power, a 1% fiber tap splitter (coupler) with separate PD is recommended.
5) This product is not designed to be modulated. It is suggested to use an external switch such as a Pockels cell if a modulated output is desired.
6) If shortening the fiber length, be sure to leave the FBG, which is marked on the outside of the fiber and tubing for convenience.
7) To protect the laser diode from damage due to electrostatic discharge (ESD), please follow proper ESD handling precautions.
8) This device emits coherent light from the connector end of the fiber and is classified as Class 4 when combined with other components. To ensure safe operation, use only with a suitable power source that complies with the requirements for laser systems, as specified in IEC-60825-1 "Safety of Laser Products."
9) Handle the module only by its package. Do not hold by the fiber pigtail.