

# 780 nm Laser Diode

## Description

The IDP780DBR Series of high-power edge-emitting lasers are based on Idealphotonics's advanced single-frequency laser technology. It provides a diffraction limited, single lateral and longitudinal mode beam. Facets are passivated for high-power reliability. Single frequency 780 nm laser diodes are used in atomic spectroscopy for rubidium-based applications.

## Feature

- W Available in several package styles
- Pulsed operation for spectral stability at short pulse lengths
- High power for CW applications
- High Slope Efficiency
- Spectroscopy Series 780 nm laser diode certified for D2 line of Rb

## Technology

- DBR Single-Frequency Laser Chip
- AlGaAs QW Active Layer
- Epi designed for high reliability

## Specification

Absolute Maximum Rating

Parameter	Symbol	Unit	Min	Max
Storage Temperature	T <sub>STG</sub>	°C	0	80
Operating Temperature	T <sub>OP</sub>	°C	5.0	70
CW Laser Forward Current, T=T <sub>op</sub>	I <sub>F</sub>	mA	-	150**
Pulsed Laser Forward Current, T=25°C, PW=300 ns, DC=10%	I <sub>F</sub>	A	-	0.3
Laser Reverse Voltage	V <sub>R</sub>	V	-	0.0
Photodiode Forward Current <u>1/2/</u>	I <sub>P</sub>	mA	-	5.0
Photodiode Reverse Voltage <u>1/2/</u>	V <sub>R</sub>	V	-	20.0
Photodiode Dark Current, V <sub>R</sub> =10V, LD I <sub>F</sub> =0, <u>1/2/</u>	I <sub>D</sub>	nA	-	50
TEC Current <u>1/2/</u>	I <sub>TEC</sub>	A	-2.0	2.0

TEC Voltage <u>1/2/</u>	$V_{TEC}$	V	-6.0	6.0
Thermistor Current <u>1/2/</u>	$I_{THRM}$	mA	-	1.0
Thermistor Voltage <u>1/2/</u>	$V_{THRM}$	V	-	10
External Back Reflection	-	dB	-	-14
Lead Soldering Temperature, 10 sec. Max. <u>1/2/</u>	-	°C	-	260
Fiber Pull Force <u>1/</u>	-	N	-	5.0
Fiber Bend Radius <u>1/</u>	-	mm	-	35

1/ Butterfly package 2/ TO8 package\*\*Do not exceed drive current or operating power of supplied LIV

CW Characteristics at TC = 25°C unless otherwise specified



Parameter	Symbol	Unit	Min	Typ	Max
Center Wavelength	$\lambda_c$	nm	778	780	782
Optical Output Power @ LIV current	$P_o$	mW	40-180		
Slope Efficiency, <u>1/</u>	$\eta_d$	W/A	0.25	0.36	
Slope Efficiency	$\eta_d$	W/A	0.60	0.75	-
Threshold Current	$I_{th}$	mA	-	50	70
Laser Series Resistance	$R_s$	$\Omega$	-	2.0	2.5
Laser Forward Voltage	$V_f$	V	-	2.0	2.5
Thermistor Resistance @ 25°C, <u>1/2/</u>	$R_T$	K $\Omega$	-	10	-
Photodiode Dark Current, $V_R=10V$ , LD $I_F=0$ , <u>1/2/</u>	$I_D$	nA	-	-	50
Laser Line Width	$\Delta\nu$	MHz	-	0.7	1.0
Polarization Extinction Ratio, <u>1/</u>	PER	dB	-16	-19	-
Beam Divergence @ FWHM	$\theta \times \theta_{\perp}$	°	-	6 X 26	8 X 28
Side Mode Suppression Ratio	SMSR	dB	-30	-	-
Laser Polarization				TE	
Mode Structure			Fundamental Mode		

1/ Butterfly package 2/ TO-8 package

## Handling Precautions

These devices are sensitive to ESD. When handling the module, grounded work area and wrist strap must be used. Always store in an antistatic container with all leads shorted together.

## Package

T08	Butterfly
 A cylindrical, gold-colored T08 package with a central lens and four pins extending from the bottom. The background is blue with light rays emanating from the package.	 A yellow butterfly package with a central lens and four pins extending from the bottom. It is connected to a fiber optic cable with a red connector. The background is blue with light rays emanating from the package.