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# 780 nm Laser Diode | PH780DBR Series

## PH780DBR Series High-Power Single-Frequency Laser Diode

### 780 nm Laser Diode

#### Technology

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

#### Features

- 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

## Description

The PH780DBR Series of high-power edge-emitting lasers are based on Photodigm'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.

### Absolute Maximum Rating

Parameter	Symbol	Unit	Min	Max
Storage Temperature	$T_{STG}$	°C	0	80
Operating Temperature	$T_{OP}$	°C	5.0	70
CW Laser Forward Current, $T=T_{op}$	$I_F$	mA	-	150**
Pulsed Laser Forward Current, $T=25^{\circ}\text{C}$ ,	$I_F$	A	-	0.3
PW=300 ns, DC=10%				

Laser Reverse Voltage	$V_R$	V	-	0.0
Photodiode Forward Current <u>1/2/</u>	$I_P$	mA	-	5.0
Photodiode Reverse Voltage <u>1/2/</u>	$V_R$	V	-	20.0
Photodiode Dark Current, $V_R=10V$ , LD $I_F=0$ , <u>1/2/</u>	$I_D$	nA	-	50
TEC Current <u>1/2/</u>	$I_{TEC}$	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 $T_C = 25^\circ\text{C}$ 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	See Power Options Call-out		
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 $I_F=0$ , 1/2/	$I_D$	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	$\theta_{\parallel}$ X $\theta_{\perp}$	°	-	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.

## How To Order

Part number example: PH780DBR080CM. Assign optical power from those available shown below.

Use a three-digit format for all power entries. Call factory for special performance selection and certification to certain atomic absorption lines. Butterfly package is offered only at 50% of output powers shown, and is not recommended for spectroscopy applications. See Photodigm's application note titled Optical Feedback

## Package Type

**(CS) Chip on Submount**

**(CM) 'C' Mount**

**(T8) TO-8**

**(BF) Butterfly**

### Minimum Power (mW)

**040 120**

**080 180**



Chip on Submount  
(CS)



C-Mount



TO-8



BF



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