

# EYP-DFB-1064-00500-1500-BFY02-0010



We focus on power.

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## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode with integrated grating structure

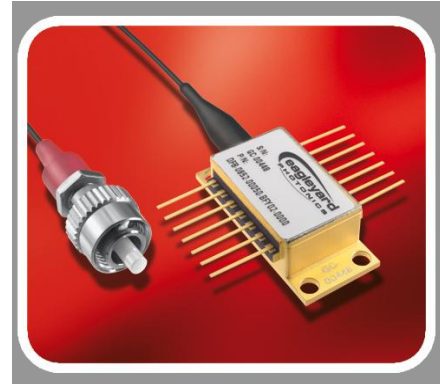


### General Product Information

Product	Application
1064 nm DFB Laser with hermetic Butterfly Housing	Spectroscopy
Monitor Diode, Thermoelectric Cooler and Thermistor	Metrology
PM Fiber with angle-polished Connector	Seed Laser
Optimized for Pulse Operation	

### Absolute Maximum Ratings

	Symbol	Unit	min	typ	max
Storage Temperature	$T_S$	°C	-40		85
Operational Temperature at Case	$T_C$	°C	-40		85
Operational Temperature at Laser Chip	$T_{TEC}$	°C	5		50
Forward Current (pulse mode)	$I_{F Peak}$	mA			1600
Forward Current (cw)	$I_F$	mA			190
Reverse Voltage	$V_R$	V			2
Output Power (pulse mode)	$P_{opt Peak}$	mW			1000
Output Power (cw)	$P_{opt}$	mW			50
TEC Current	$I_{TEC}$	A			1.8
TEC Voltage	$V_{TEC}$	V			3.2



Stress in excess of the Absolute Maximum Ratings can cause permanent damage to the device.

### Recommended Operational Conditions

	Symbol	Unit	min	typ	max
Operational Temperature at Case	$T_C$	°C	-20		65
Operational Temperature at Laser Chip	$T_{TEC}$	°C	10		40
Forward Current (pulse mode)	$I_{F Peak}$	mA			1500
Forward Current (cw)	$I_F$	mA			170
Average Output Power (pulsed)	$P_{opt avg}$	mW		1.2	

#### Measurement Conditions / Comments

measured by integrated Thermistor  
under Pulse Mode Conditions  
under cw conditions  
ex fiber, under Pulse Mode Conditions

### Pulse Mode Conditions

Parameter	Symbol	Unit	min	typ	max
Pulse Width	$t_p$	ns		10	
Pulse Repetition Rate	RR	kHz		200	
Duty Cycle	D.C.	%		0,2	

#### Measurement Conditions / Comments

longer pulses, higher rep rates or duty cycles may damage the laser - other pulse conditions may be applicable but have not been specifically tested

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### Characteristics under Pulse Mode Cond. (BOL)

Parameter	Symbol	Unit	min	typ	max
Center Wavelength (vac.)	$\lambda_{C \text{ Target}}$	nm		1064	
Output Power @ $I_F = 1500 \text{ mA}$	$P_{\text{opt Peak}}$	mW		600	
Sidemode Supression Ratio	SMSR	dB	25		
Wavelength Chirp	$\Delta\lambda_{\text{Chirp}}$	pm			200
Pulse-to-Pulse Stability	$\Delta P_{\text{peak}}$	%		3	

#### Measurement Conditions / Comments

Integration >1,000 pulses (infinite persistence)

### Characteristics under cw Conditions (BOL)

Parameter	Symbol	Unit	min	typ	max
Application Target Center Wavelength (vac.)	$\lambda_{C \text{ Target}}$	nm	1063	1064	1065
Spectral Width (FWHM)	$\Delta\nu$	MHz		2	
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06	
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003	
Output Power @ $I_F = 170 \text{ mA}$	$P_{\text{opt}}$	mW	40		
Slope Efficiency	$S$	W / A	0.2	0.4	0.7
Threshold Current	$I_{\text{th}}$	mA			70
Sidemode Supression Ratio	SMSR	dB	30	45	

#### Measurement Conditions / Comments

$P_{\text{opt}} = 40 \text{ mW}$

$T_{\text{TEC}} = 25^\circ \text{ C}$

$T_{\text{TEC}} = 25^\circ \text{ C}$

### Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	$I_{\text{mon}} / P_{\text{opt}}$	$\mu\text{A} / \text{mW}$	1		20
Reverse Voltage Monitor Diode	$U_{R \text{ MD}}$	V	3		5

#### Measurement Conditions / Comments

$U_R = 5 \text{ V}$ , target values

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**Thermoelectric Cooler**

Parameter	Symbol	Unit	min	typ	max
Current	$I_{TEC}$	A		0.4	
Voltage	$U_{TEC}$	V		0.8	
Power Dissipation (total loss at case)	$P_{loss}$	W		0.5	
Temperature Difference	$\Delta T$	K			50

Measurement Conditions / Comments

$P_{opt} = 40 \text{ mW}, \Delta T = 20 \text{ K}$   
 $P_{opt} = 40 \text{ mW}, \Delta T = 20 \text{ K}$   
 $P_{opt} = 40 \text{ mW}, \Delta T = 20 \text{ K}$   
 $P_{opt} = 40 \text{ mW}, \Delta T = |T_{case} - T_{LD}|$

**Thermistor (Standard NTC Type)**

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kOhm		10	
Beta Coefficient	$\beta$			3892	

Measurement Conditions / Comments

**Fiber and Connector Type**

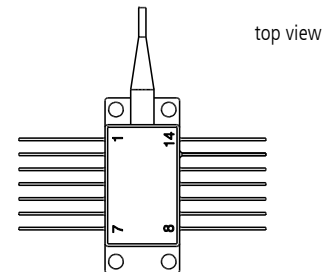
PM Fiber	900 / 125 / 5.5 $\mu\text{m}$ , UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	FC/APC (narrow key / 2mm)

Measurement Conditions / Comments

other connector types on request

**Package Pinout**

1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected

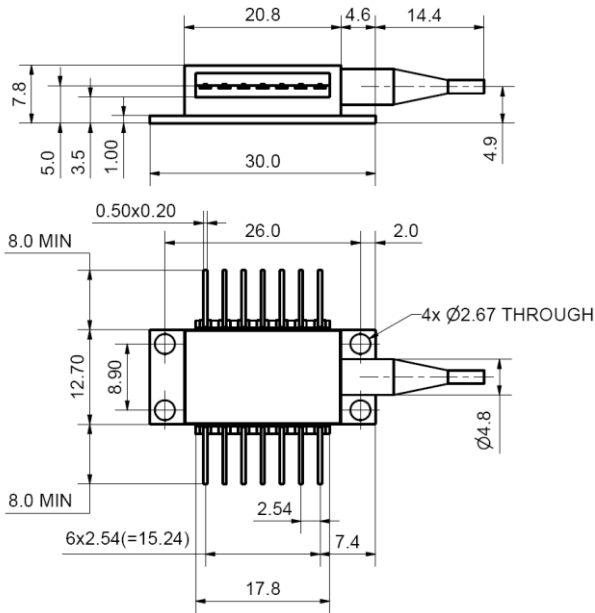


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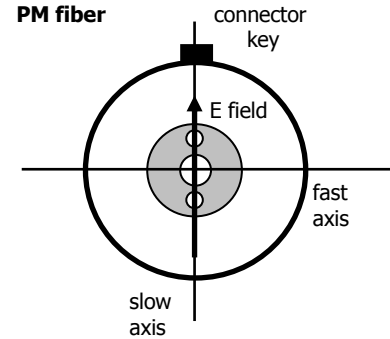
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### Package Drawings



recommended  
min. bending radius: 30 mm



slow axis of the PM fiber aligned to connector key

### hermetically sealed Package:

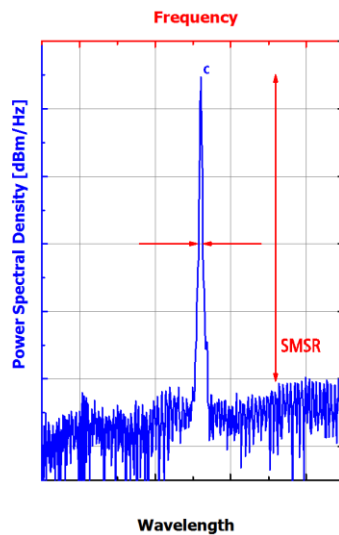
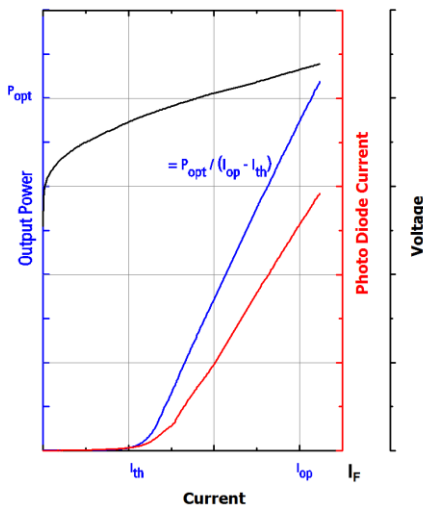
Leak Rate <math>< 5 \cdot 10^{-8}</math> atm.cc./s  
acc. MIL-STD-883E

Z11-SPEC-BFY02-DFB-0000

### Typical Measurement Results

Output Power vs. Current

Spectra at Specified Optical Output Power



Performance figures, data and any illustrative material provided in this specification are typical and must be specifically confirmed in writing by eagleyard Photonics before they become applicable to any particular order or contract. In accordance with the eagleyard Photonics policy of continuous improvement specifications may change without notice.

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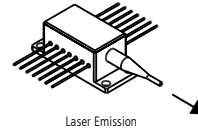
**Unpacking, Installation and Laser Safety**

Unpacking the laser diodes should only be done at electrostatic safe workstations (EPA). Though protection against electro static discharge (ESD) is implemented in the laser package, charges may occur at surfaces. Please store this product in its original package at a dry, clean place until final use. During device installation, ESD protection has to be maintained.

The DFB diode type is known to be sensitive against optical feedback, so an optical isolator may be required in some cases. Operating at moderate temperatures on a proper metal heat sink will contribute to stable operation and a long lifetime of the diode.

The laser emission from this diode is close to the invisible infrared region of the electromagnetic spectrum. Avoid direct and/or indirect exposure to the free running beam. Collimating the free running beam with optics as common in optical instruments will increase threat to the human eye.

Each laser diode will come with an individual test protocol verifying the parameters given in this document.



IEC 60825-1



Complies with 21 CFR 1040.10 and 1040.40