EYP-DFB-0852-00050-1500-BFY02-0x0x

Revision   1.08

eagleyard *photonics*

SINGLE FREQUENCY LASER DIODES

Distributed Feedback Laser

General Product Information

Product	Application
852 nm DFB Laser with hermetic Butterfly Housing	Spectroscopy
Monitor Diode, Thermoelectric Cooler and Thermistor	Metrology
PM Fiber with angle-polished Connector	
based on highly reliable space-qualified design	

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_{LD}	°C	10		50
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			55
TEC Current	I_{TEC}	A			1.8
TEC Voltage	V_{TEC}	V			3.2
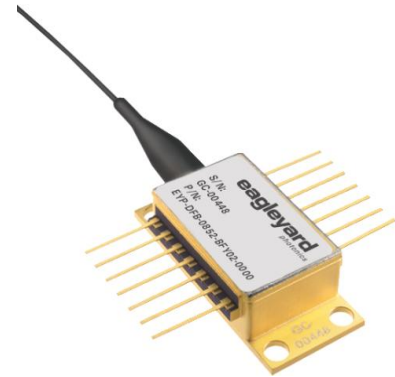
Stress in excess of the Absolute Maximum Ratings can cause permanent damage to the device.

Recommended Operational Conditions

	Symbol	Unit	min	typ	max
Operational Temperature at Case	T_C	°C	-20		65
Forward Current	I_F	mA			180
Variant 0 (EYP-DFB-…-0000)					
Operational Temperature at Laser Chip	T_{LD}	° C		25	
Output Power	P_{opt}	mW		50	
Variant 2 (EYP-DFB-…-0002)					
Operational Temperature at Laser Chip	T_{LD}	° C	15		45
Output Power	P_{opt}	mW	10		50

Measurement Conditions / Comments

Variant 2 allows wavelength tuning by temperature or current variation; in case of external backreflections small mode-hops of 100 MHz or less may appear; the use of a BFW01 or TOC03 package variants and effective optical isolation is recommended for spectroscopic application requiring absolutely mode-hop-free tuning

Characteristics at $T_{LD} = 25°$ C at Begin Of Life

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ_C	nm	851	852	853
Spectral Width (FWHM)	$\Delta\nu$	MHz		2	

Measurement Conditions / Comments

see images on page 4

$P_{opt} = 50$ mW

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Characteristics at T_{LD} = 25° C at Begin Of Life   cont'd

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Temperature Coefficient of Wavelength	$d\lambda / dT$	nm / K		0.06		
Tuning Range by Temperature for Variant 2	$\Delta\lambda_T$	nm		1.5		see comment on p. 1
Current Coefficient of Wavelength	$d\lambda / dI$	nm / mA		0.003		
Output Power @ I_F = 180 mA	P_{opt}	mW	50			
Slope Efficiency	S	W / A	0.2	0.5	0.7	
Threshold Current	I_{th}	mA			70	
Sidemode Supression Ratio	SMSR	dB	30	45		
Polarization Extinction Ratio	PER	dB		20		P_{opt} = 50 mW; T_{LD} = 25° C

Monitor Diode

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Monitor Detector Responsivity	I_{mon} / P_{opt}	µA / mW	1		20	U_R = 5 V, target values
Reverse Voltage Monitor Diode	$U_{R\ MD}$	V	3		5	

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Current	I_{TEC}	A		0.4		P_{opt} = 50 mW, ΔT = 20 K
Voltage	U_{TEC}	V		0.8		P_{opt} = 50 mW, ΔT = 20 K
Power Dissipation (total loss at case)	P_{loss}	W		0.5		P_{opt} = 50 mW, ΔT = 20 K
Temperature Difference	ΔT	K			50	P_{opt} = 50 mW, ΔT = I T_{case} - T_{LD} I

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Resistance	R	kΩ		10		
Beta Coefficient	β			3892		at T = 0° … 50° C

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Fiber and Connector Type

PM Fiber	900 / 125 / 5.5 µm, UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	different variants available
	▸ FC/APC (narrow key / 2mm)
	▸ SC/APC
	▸ other types on request

Measurement Conditions / Comments

see order code scheme

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

top view
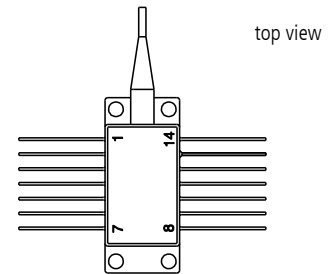
Package Drawings
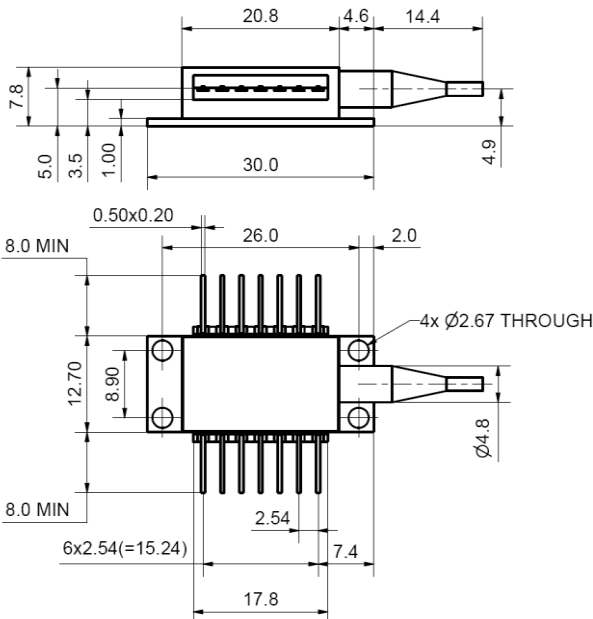
recommended
min. bending radius: 30 mm

Z11-SPEC-BFY02-DFB-0000
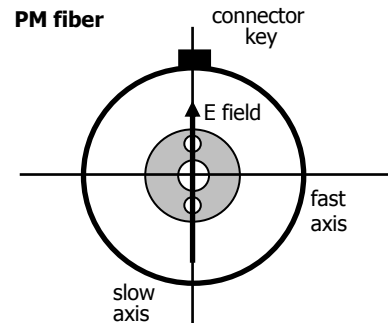
PM fiber

slow axis of the PM fiber aligned to connector key

hermetically sealed Package:
Leak Rate $< 5 \cdot 10^{-8}$ atm.cc./s
acc. MIL-STD-883E

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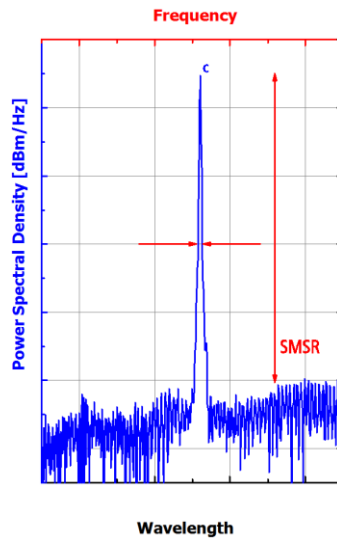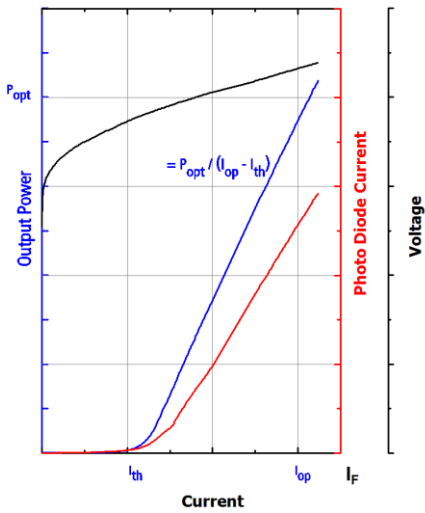
Typical Measurement Results

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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Order Code Scheme

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Connector		
FC/APC (narrow key / 2mm)		0
SC/APC		1
other connector or fiber types upon request		

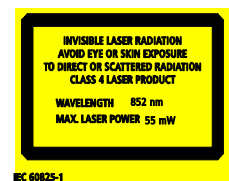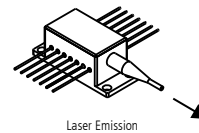| Operating Range				
$P_{opt} =$ 50 mW;	$T_{LD} = 25°$	(Variant 0)		0
$P_{opt} =$ 10 … 50 mW;	$T_{LD} = 15°$ … 45° C	(Variant 2)		2

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 sinks willl 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.

Laser Emission

INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE
TO DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT
WAVELENGTH   852 nm
MAX. LASER POWER 55 mW
IEC 60825-1

DANGER
INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
GaAs SEMICONDUCTOR LASER DIODE
55 mW MAX OUTPUT AT 852 nm
CLASS IV LASER PRODUCT
Complies with 21 CFR 1040.10 and 1040.40

Ordering Information:

XSoptix

800 Village Walk #316
Guilford, CT 06437
Ph: 203-401-8093

Email orders to: sales@xsoptix.com
Fax orders to: 800-878-7282

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