

EYP-DFB-0764-00010-1500-BFY02-0x0x

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DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode with integrated grating structure



General Product Information

Product	Application
764 nm DFB Laser with hermetic Butterfly Housing	Spectroscopy
Monitor Diode, Thermoelectric Cooler and Thermistor	O ₂ Detection
PM Fiber with angle-polished Connector	Metrology
High-reliable Package compliant for Space Applications	

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			130
Reverse Voltage	V _R	V			2
Output Power	P _{opt}	mW			12
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 _{LD}	°C	15		35
Forward Current	I _F	mA			120
Output Power	P _{opt}	mW	2		10

Measurement Conditions / Comments

measured by integrated Thermistor

ex fiber

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

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ _C	nm	763	764	765
Spectral Width (FWHM)	Δν	MHz		2	
Temperature Coefficient of Wavelength	dλ / dT	nm / K		0.06	
Current Coefficient of Wavelength	dλ / dI	nm / mA		0.003	
Output Power @ I _F = 120 mA	P _{opt}	mW	10		

Measurement Conditions / Comments

see images on page 4

ex fiber

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

Parameter	Symbol	Unit	min	typ	max
Slope Efficiency	S	W / A	0.1	0.2	0.3
Threshold Current	I_{th}	mA			70
Polarization Extinction Ratio	PER	dB		10	
Sidemode Supression Ratio	SMSR	dB	30	45	
Mode-hop free Operating Range (SMSR > 30 dB)					
▶ Variant 0 (see order code scheme)	T_{LD}	° C		25	
	P_{opt}	mW		10	
▶ Variant 1 (see order code scheme)	T_{LD}	° C		25	
	P_{opt}	mW	2		10
▶ Variant 2 (see order code scheme)	T_{LD}	° C	15		35
	P_{opt}	mW	2		10

Measurement Conditions / Comments

$P_{opt} = 10\text{ mW}$
see below

temperature measured by integrated themistor

temperature measured by integrated themistor

temperature measured by integrated themistor

Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	I_{mon} / P_{opt}	$\mu\text{A/mW}$	5		200

Measurement Conditions / Comments

$P_{opt} = 2 \dots 10\text{ mW}$, $U_{RMD} = 5\text{ V}$

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	ΔT	K			50

Measurement Conditions / Comments

$P_{opt} = 10\text{ mW}$, $\Delta T = 20\text{ K}$

$P_{opt} = 10\text{ mW}$, $\Delta T = 20\text{ K}$

$P_{opt} = 10\text{ mW}$, $\Delta T = 20\text{ K}$

$P_{opt} = 10\text{ mW}$, $\Delta T = I T_{case} - T_{LD}$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	$k\Omega$		10	
Beta Coefficient	β			3976	

Measurement Conditions / Comments

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Fiber and Connector Type

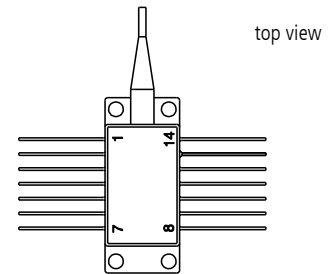
PM Fiber	900 / 125 / 5.5 μm , UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	different variants available <ul style="list-style-type: none"> ▶ FC/APC (narrow key / 2mm) ▶ SC/APC ▶ other types on request

Measurement Conditions / Comments

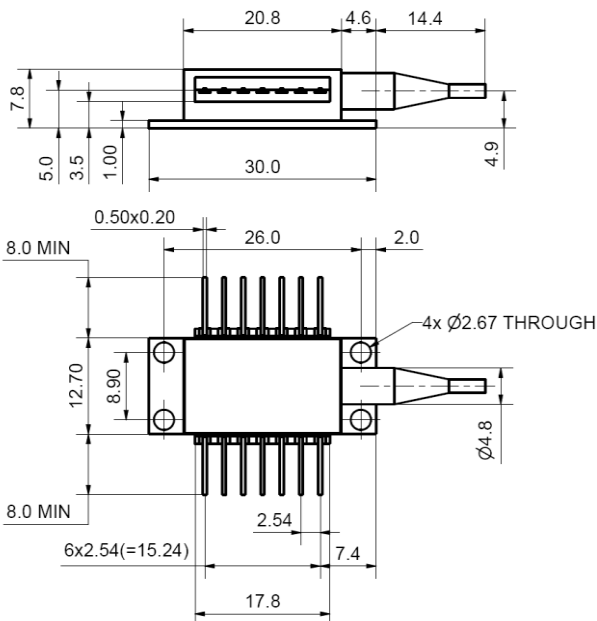
see order code scheme

Package Pinout

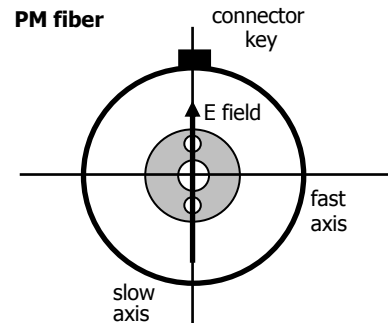
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



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

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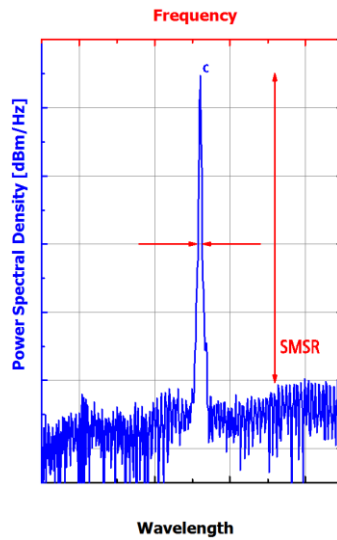
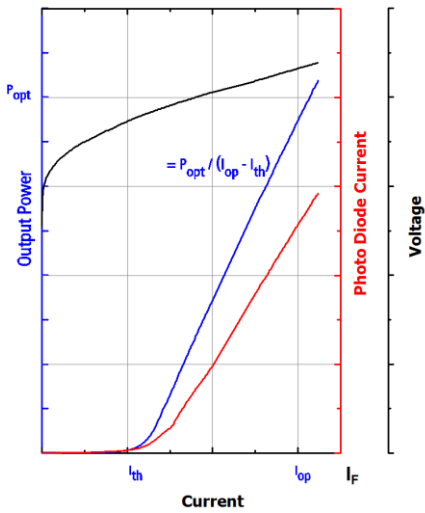
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Typical Measurement Results

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

Connector

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

Mode-hop free Tuning Range (Minimum Side Mode Suppression Ratio > 30 dB)

$P_{opt} = 10 \text{ mW};$	$T_{LD} = 25^\circ$
$P_{opt} = 2 \dots 10 \text{ mW};$	$T_{LD} = 25^\circ$
$P_{opt} = 2 \dots 10 \text{ mW};$	$T_{LD} = 15 \dots 35^\circ$

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0
1

Variant 0	0
Variant 1	1
Variant 2	2

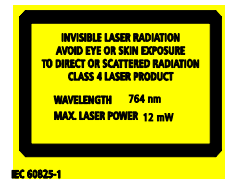
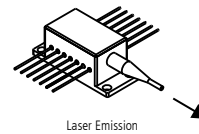
Unpacking, Installation and Laser Safety

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 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.



Ordering Information:

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

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