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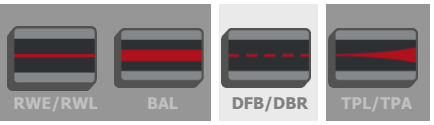
We focus on power.

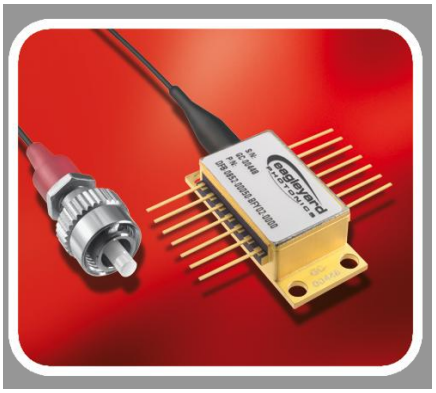
DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode
with integrated grating structure



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	Cs Spectroscopy (Variant ...-0005)
High-reliable fully Space-qualified Package	



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	Measurement Conditions / Comments
Operational Temperature at Case	T_C	°C	-20		65	
Operational Temperature at Laser Chip	T_{LD}	°C	15		45	measured by integrated Thermistor
Forward Current	I_F	mA			180	
Output Power	P_{opt}	mW	10		50	ex fiber

Characteristics at Begin Of Life

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	851	852	853	see images on page 4
Spectral Width (FWHM)	$\Delta\nu$	MHz		2		P_{opt} = 50 mW
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 = 180 mA	P_{opt}	mW	50			T_{LD} = 25° C

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Characteristics at Begin Of Life cont'd

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Slope Efficiency	S	W / A	0.2	0.5	0.7	T_{LD} = 25° C
Threshold Current	I_{th}	mA			70	T_{LD} = 25° C
Sidemode Supression Ratio	SMSR	dB	30	45		see below
Mode-hop free Operating Range (SMSR > 30 dB)						see order code scheme on p. 4
▸ Variant 0	T_{LD}	° C	24	25	26	
	P_{opt}	mW	45		50	
▸ Variant 1	T_{LD}	° C	24	25	26	
	P_{opt}	mW	10		50	
▸ Variant 2	T_{LD}	° C	15		45	
	P_{opt}	mW	10		50	
▸ Variant 5	λ_C	nm		852,35		wavelength reached within T_{LD} = 15 ° and 45° C
	P_{opt}	mW	45		50	
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, $\Delta T = \lvert T_{case} - T_{LD} \rvert$

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Resistance	R	kOhm		10		
Beta Coefficient	β			3892		

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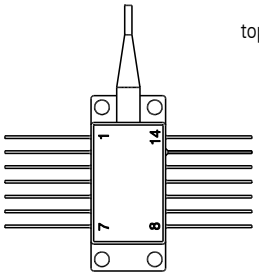
Fiber and Connector Type

		Measurement Conditions / Comments
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	see order code scheme

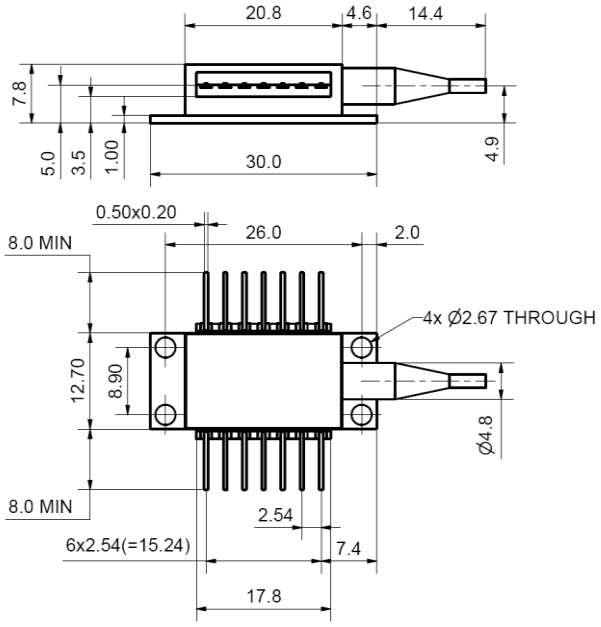
Package Pinout

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



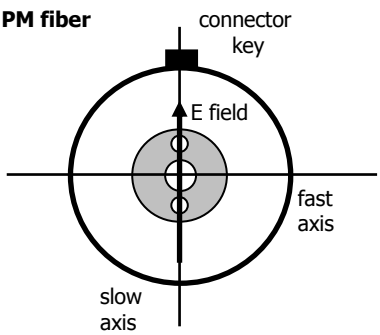
Package Drawings



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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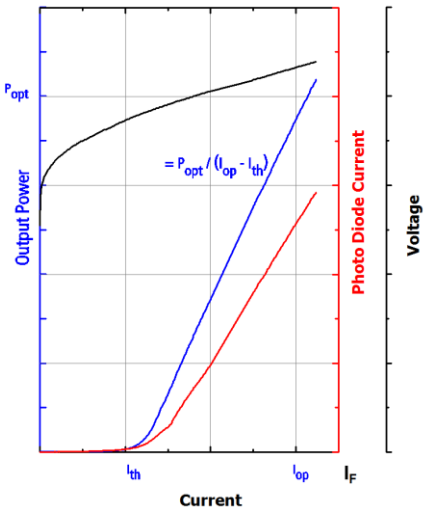
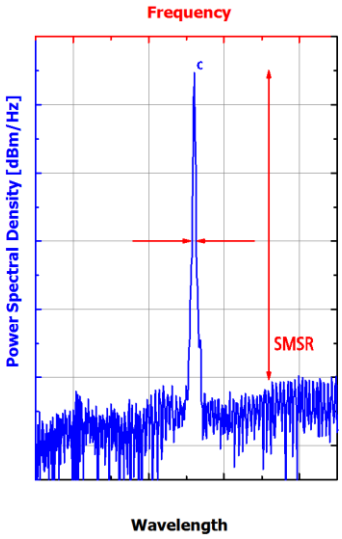
Typical Measurement Results

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

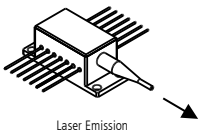
EYP-DFB-0852-00050-1500-BFY02- 0 x 0 x

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

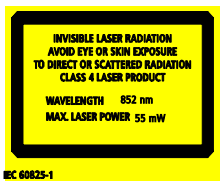
Mode-hop free Operating Range (Minimum Side Mode Suppression Ratio > 30 dB)			
P_{opt} = 45 … 50 mW;	T_{LD} = 25°	(Variant 0)	0
P_{opt} = 10 … 50 mW;	T_{LD} = 25°	(Variant 1)	1
P_{opt} = 10 … 50 mW;	T_{LD} = 15° … 45° C	(Variant 2)	2
P_{opt} = 45 … 50 mW;	λ_c = 852.35 nm	(Variant 5)	5

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.

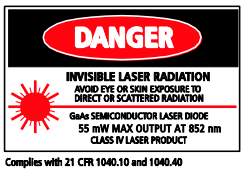


The DFB diode type is known to be sensitive against optical feedback, so an optical isolator may be required in some cases. Operating at moderate temperatures on a proper metal heat sinks willl contribute to stable operation and a long lifetime of the diode.



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.



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