

# EYP-DFB-0760-00010-1500-BFY02-0x0x

Revision 1.01

13.01.2014

page 1 from 5

## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode with integrated grating structure

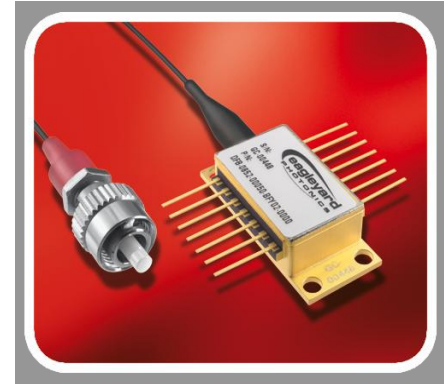


### General Product Information

Product	Application
760 nm DFB Laser with hermetic Butterfly Housing	Spectroscopy
Monitor Diode, Thermoelectric Cooler and Thermistor	O <sub>2</sub> 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 <sub>S</sub>	°C	-40		85
Operational Temperature at Case	T <sub>C</sub>	°C	-40		85
Operational Temperature at Laser Chip	T <sub>LD</sub>	°C	10		50
Forward Current	I <sub>F</sub>	mA			130
Reverse Voltage	V <sub>R</sub>	V			2
Output Power	P <sub>opt</sub>	mW			12
TEC Current	I <sub>TEC</sub>	A			1.8
TEC Voltage	V <sub>TEC</sub>	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 <sub>C</sub>	°C	-20		65
Operational Temperature at Laser Chip	T <sub>LD</sub>	°C	15		35
Forward Current	I <sub>F</sub>	mA			120
Output Power	P <sub>opt</sub>	mW	2		10

#### Measurement Conditions / Comments

measured by integrated Thermistor

ex fiber

### Characteristics at T<sub>LD</sub> = 25 °C at Begin Of Life

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ <sub>C</sub>	nm	759	760	761
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 <sub>F</sub> = 120 mA	P <sub>opt</sub>	mW	10		

#### Measurement Conditions / Comments

see images on page 4

ex fiber

# EYP-DFB-0760-00010-1500-BFY02-0x0x

Revision 1.01

13.01.2014

page 2 from 5

## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode  
with integrated grating structure



### 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	$I_{mon} / P_{opt}$	$\mu\text{A/mW}$	6		120

#### 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	$\Delta T$	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	$\beta$			3976	

#### Measurement Conditions / Comments

# EYP-DFB-0760-00010-1500-BFY02-0x0x

Revision 1.01

13.01.2014

page 3 from 5

## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode with integrated grating structure



### Fiber and Connector Type

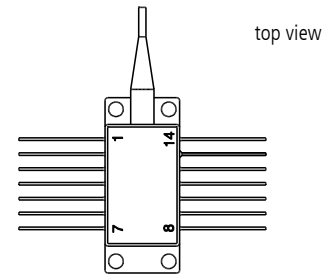
PM Fiber	900 / 125 / 5.5 $\mu\text{m}$ , UV/Polyester-elastomer Coating (l = 1 +/-0.1 m)
Connector	different variants available <ul style="list-style-type: none"> <li>▶ FC/APC (narrow key / 2mm)</li> <li>▶ SC/APC</li> <li>▶ other types on request</li> </ul>

### Measurement Conditions / Comments

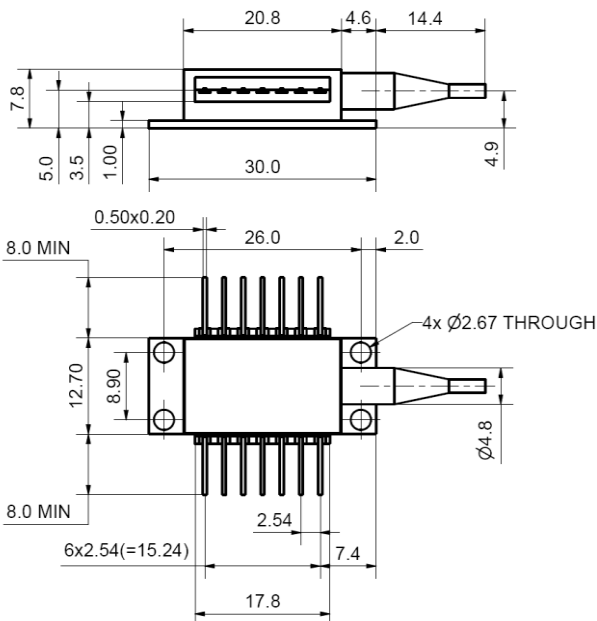
see order code scheme

### Package Pinout

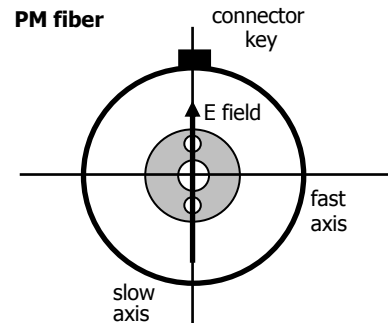
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected



### 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

Z11-SPEC-BFY02-DFB-0000

# EYP-DFB-0760-00010-1500-BFY02-0x0x

Revision 1.01

13.01.2014

page 4 from 5

## DISTRIBUTED FEEDBACK LASER

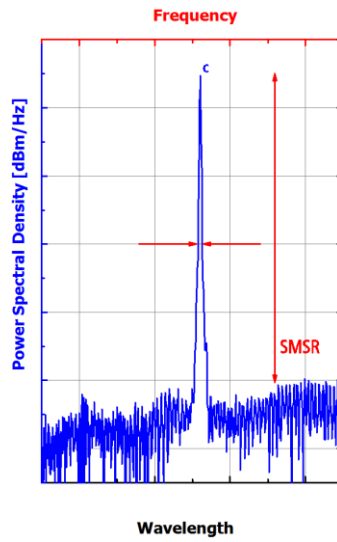
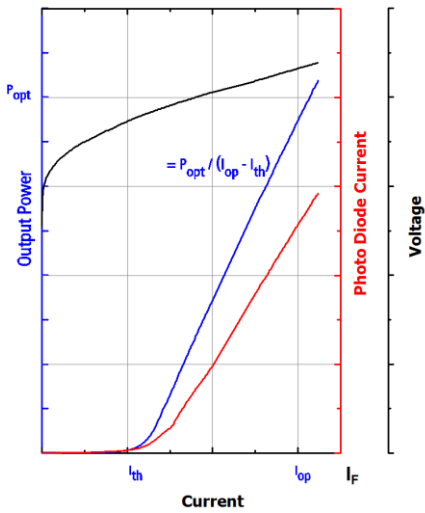
GaAs Semiconductor Laser Diode with integrated grating structure



### 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.

# EYP-DFB-0760-00010-1500-BFY02-0x0x

Revision 1.01

13.01.2014

page 5 from 5

## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode with integrated grating structure



### 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)

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

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

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

EYP-DFB-0760-00010-1500-BFY02- 0 x 0 x

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.

