

# EYP-DFB-0852-00100-1500-BFW01-000x

Revision 0.52

18.06.2015

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## 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
Collimated beam	THz Generation
ROHS compliant	Cs Spectroscopy (Variant ...-0005)



### 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			110
TEC Current	$I_{TEC}$	A			1.1
TEC Voltage	$V_{TEC}$	V			2.8

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		40
Forward Current	$I_F$	mA			180
Output Power	$P_{opt}$	mW	20		100

#### Measurement Conditions / Comments

measured by integrated Thermistor

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

Parameter	Symbol	Unit	min	typ	max
Center Wavelength	$\lambda_C$	nm	851	852	853
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 @ $I_F = 180\text{ mA}$	$P_{opt}$	mW	100		

#### Measurement Conditions / Comments

see images on page 4

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

Parameter	Symbol	Unit	min	typ	max
Slope Efficiency	$\eta$	W / A	0.6	0.8	1.0
Threshold Current	$I_{th}$	mA			70
Divergence parallel ( $1/e^2$ )	$\Theta_{  }$	°		0.1	
Divergence perpendicular ( $1/e^2$ )	$\Theta_{\perp}$	°		0.1	
Beam Diameter ( $1/e^2$ )	$d_{  }$	mm		1.0	1.2
Beam Diameter ( $1/e^2$ )	$d_{\perp}$	mm		0.8	1.2
Degree of Polarization	DOP	%		90	
Sidemode Supression Ratio	SMSR	dB	30	50	
Mode-hop free Operating Range (SMSR > 30 dB)					
▶ Variant 2	$T_{LD}$	° C	15		40
	$P_{opt}$	mW	20		100
▶ Variant 5	$\lambda_c$	nm		852.347	
	$P_{opt}$	mW		100	

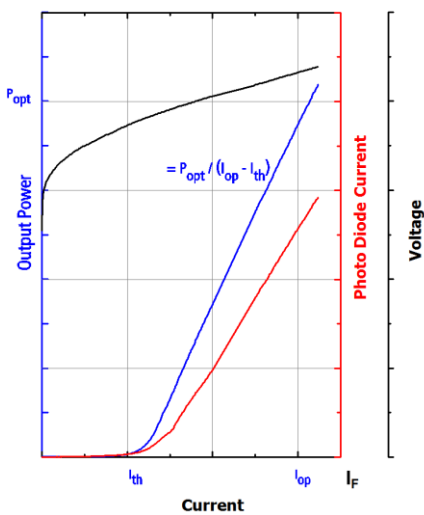
### Measurement Conditions / Comments

parallel to the base plate of the housing (see p. 3)  
 perpendicular to base plate of the housing (see p. 3)  
 parallel to the base plate of the housing (see p. 3)  
 perpendicular to base plate of the housing (see p. 3)  
 $P_{opt} = 100\text{ mW}$ ; E field parallel to the base plate  
 $P_{opt} = 100\text{ mW}$   
 see order code scheme on p. 5

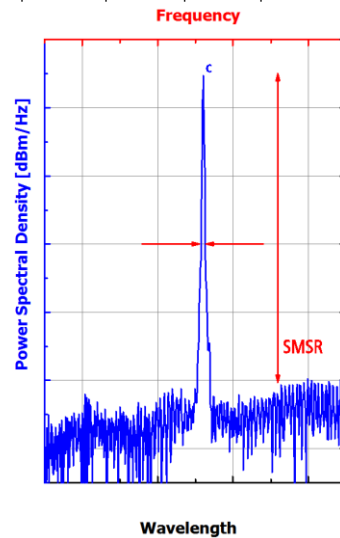
wavelength reached within  $T_{LD} = 15\text{ °}$  and  $45\text{ ° C}$

### Typical Measurement Results

Output Power vs. Current



Spectra at Specified Optical Output Power



Pictures and the illustrative graphs (on the left hand side) 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.

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### Monitor Diode

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

#### Measurement Conditions / Comments

Reverse Voltage  $U_{\text{R MD}} = 5 \text{ V}$

### Thermoelectric Cooler

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

#### Measurement Conditions / Comments

$P_{\text{opt}} = 100 \text{ mW}$ ,  $\Delta T = 20 \text{ K}$

$P_{\text{opt}} = 100 \text{ mW}$ ,  $\Delta T = 20 \text{ K}$

$P_{\text{opt}} = 100 \text{ mW}$ ,  $\Delta T = 20 \text{ K}$

$P_{\text{opt}} = 100 \text{ mW}$ ,  $\Delta T = |T_{\text{case}} - T_{\text{LD}}|$

### Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kOhm		10	
Beta Coefficient	$\beta$			3976	

#### Measurement Conditions / Comments

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## DISTRIBUTED FEEDBACK LASER

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### Package Dimensions

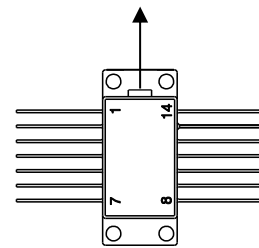
Parameter	Symbol	Unit	min	typ	max
Emission Plane	$h_{EP}$	mm		4.9	

Measurement Conditions / Comments

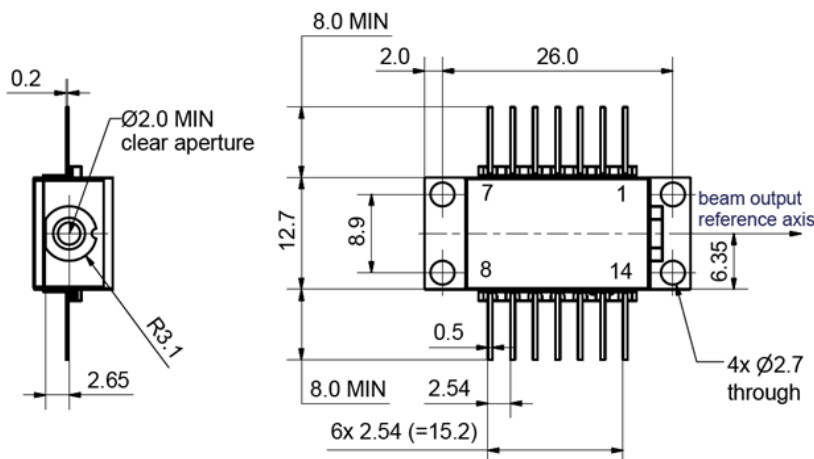
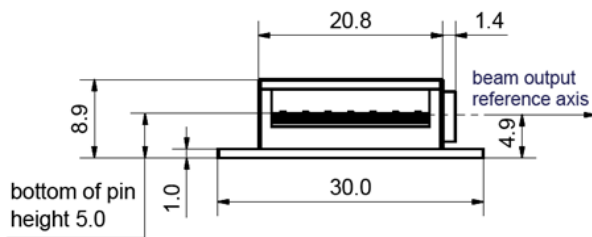
### Package Pinout

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



**Polarization:**

E field parallel to base plate

Z13-0000-BFY32-DBR-0000 Vers. 0.92

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### Order Code Scheme

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

$P_{opt} = 20 \dots 100 \text{ mW}$ ;  $T_{LD} = 15 \dots 40 \text{ }^\circ\text{C}$  (Variant 2)

$P_{opt} = 100 \text{ mW}$ ;  $\lambda_c = 852.347 \text{ nm}$  (Variant 5)

EYP-DFB-0852-00100-1500-BFW01- 0 0 0 x  
2  
5

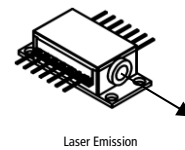
### Unpacking, Installation and Laser Safety

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.

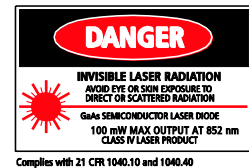
Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.

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



#### Ordering Information:



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

Email orders to: [sales@xsoptix.com](mailto:sales@xsoptix.com)  
Fax orders to: 800-878-7282