

# EYP-DFB-1064-00080-1500-TOC03-000x

Version 0.90

2009-05-20

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## DISTRIBUTED FEEDBACK LASER

GaAs Semiconductor Laser Diode  
with integrated grating structure



### General Product Information

Product	Application
1064 nm DFB Laser with hermetic TO Housing	Spectroscopy
Monitor Diode, Thermoelectric Cooler and Thermistor	Metrology
	Nd:YAG Replacement



### Absolute Maximum Ratings

	Symbol	Unit	min	typ	max
Storage Temperature	$T_S$	°C	-40		85
Operational Temperature at Case	$T_C$	°C	-20		75
Operational Temperature at Laser Chip	$T_{LD}$	°C	10		50
Forward Current	$I_F$	mA			190
Reverse Voltage	$V_R$	V			0
Output Power	$P_{opt}$	mW			90
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		40
Forward Current	$I_F$	mA			170
Output Power	$P_{opt}$	mW	20		80

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	1063	1064	1065
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 @ $I_F = 170\text{ mA}$	$P_{opt}$	mW	80		
Slope Efficiency	$S$	W / A	0.6	0.8	1.0

Measurement Conditions / Comments
see images on page 4

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RWE/RWL



BAL



DFB/DBR



TPL/TPA

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

Parameter	Symbol	Unit	min	typ	max
Threshold Current	$I_{th}$	mA			70
Divergence parallel	$\Theta_{  }$	°		8	
Divergence perpendicular	$\Theta_{\perp}$	°		21	
Sidemode Suppression Ratio	SMSR	dB	30	45	
Mode-hop free Temperature Range (SMSR > 30 dB)					
▶ Variant 0	$T_{LD}$	°C		25	
▶ Variant 1	$T_{LD}$	°C		25	
▶ Variant 2	$T_{LD}$	°C	15		40
Mode-hop free Power Range (SMSR > 30 dB)					
▶ Variant 0	$P_{opt}$	mW		80	
▶ Variant 1	$P_{opt}$	mW	20		80
▶ Variant 2	$P_{opt}$	mW	20		80
Polarization Extinction Ratio	PER	dB		20	
Spatial Mode (transversal)				TEM <sub>00</sub>	

#### Measurement Conditions / Comments

parallel to short axis of the housing (see p. 3)

parallel to long axis of the housing (see p. 3)

see below

Temperature at Laser Chip

see order code scheme on p. 5

SMSR &gt; 30 dB

see order code scheme on p. 5

 $P_{opt} = 80$  mW; E field parallel to short axis of housing

fundamental mode

### Monitor Diode

Parameter	Symbol	Unit	min	typ	max
Monitor Detector Responsivity	$I_{mon} / P_{opt}$	μA / mW	0.5		10
Reverse Voltage Monitor Diode	$U_{RMD}$	V	3		5

#### Measurement Conditions / Comments

 $U_R = 5$  V, target values

### 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

 $P_{opt} = 80$  mW,  $\Delta T = 20$  K $P_{opt} = 80$  mW,  $\Delta T = 20$  K $P_{opt} = 80$  mW,  $\Delta T = 20$  K $P_{opt} = 80$  mW,  $\Delta T = |T_{case} - T_{LD}|$ 

### Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kOhm		10	
Beta Coefficient	$\beta$			3892	

#### Measurement Conditions / Comments

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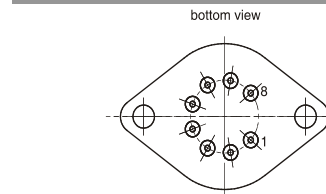
### Package Dimensions

Parameter	Symbol	Unit	min	typ	max
Height of Laser Output above Header	$H_L$	mm		5.1	
Housing Dimension	$l \times w \times h$	mm <sup>3</sup>		38.9 x 25.4 x 9.3	
Pin Length	L	mm	10.8		

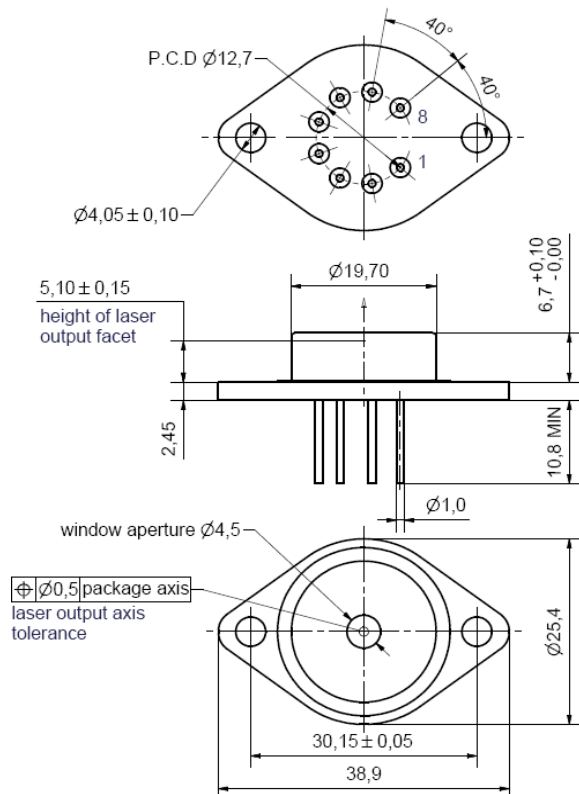
### Measurement Conditions / Comments


### Package Pinout

1	Thermoelectric Cooler (+)	5	Laser Diode (Anode)
2	Thermistor	6	Photo Diode (Anode)
3	Thermistor	7	Photo Diode (Cathode)
4	Laser Diode (Cathode)	8	Thermoelectric Cooler (-)

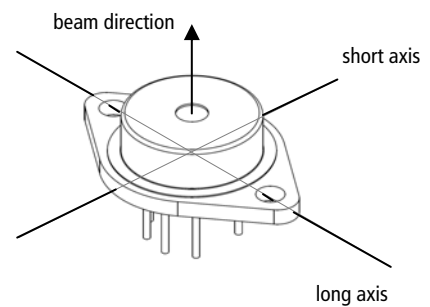


### Package Drawings



### Polarization:

E field parallel to short axis of housing



### hermetically sealed Package:

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

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RWE/RWL



BAL



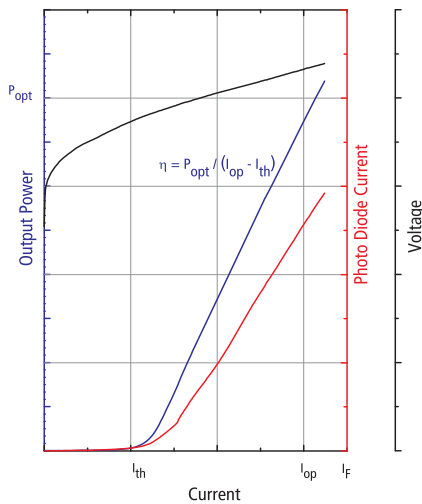
DFB/DBR



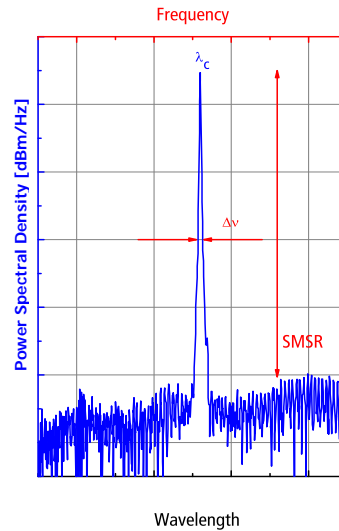
TPL/TPA

### 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.

Ordering Information:



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Ph: 203-401-8093

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



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### Order Code Scheme

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

$P_{opt} = 80 \text{ mW};$	$T_{LD} = 25^\circ$	(Variant 0)
$P_{opt} = 20 \dots 80 \text{ mW};$	$T_{LD} = 25^\circ$	(Variant 1)
$P_{opt} = 20 \dots 80 \text{ mW};$	$T_{LD} = 15^\circ \dots 40^\circ \text{ C}$	(Variant 2)

EYP-DFB-1064-00080-1500-TOC03-	0	0	0	x
	0			
	1			
	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 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.

