DATA SHEET

eagleyard photonics

EYP-DBR-0633-00005-2000-BFW01-0005

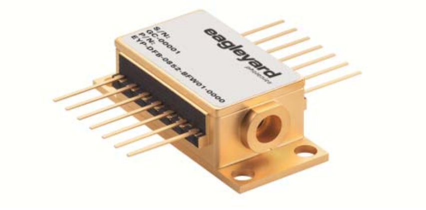
Revision 0.74

2017-03-02

SINGLE FREQUENCY LASER DIODES
Distributed Bragg Reflector Laser

General Product Information

Product	Application
633 nm DBR Laser	HeNe Laser Replacement
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	(meets exactly 632.991 nm)
including Monitor Diode, Thermoelectric Cooler and Thermistor	Please note: The use of the laser in
Collimated beam	3D trackers is protected by patents



Absolute Maximum Ratings

Parameter	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	0		25
Forward Current	I_F	mA			200
Reverse Voltage	V_R	V			2
Output Power	P_{opt}	mW			6
TEC Current	I_{TEC}	A			1.1
TEC Voltage	V_{TEC}	V			2.8

Measurement Conditions / Comments

Stress in excess of one of the Absolute Maximum Ratings may damage the laser. Please note that a damaging optical power level may occur although the maximum current is not reached. These are stress ratings only, and functional operation at these or any other conditions beyond those indicated under Recommended Operational Conditions is not implied.

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_{case}	°C	0		50	
Operational Temperature at Laser Chip	T_{LD}	°C	10		15	measured by integrated Thermistor
Forward Current	I_F	mA		80	140	
Output Power	P_{opt}	mW			5	

Characteristics at T_{LD} = 15° at BOL

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	632	633	634	
Target Wavelength	λ_T	nm		632.991		reached within T_{LD} = 0 ° ... 20° C at 5 mW
Linewidth (FWHM)	$\Delta\lambda$	MHz		1		
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm				
Sidemode Supression Ratio	SMSR	dB	30			P_{opt} = 5 mW
Temperature Coefficient of Wavelength	$d\lambda$ / dT	nm / K		0.045		
Current Coefficient of Wavelength	$d\lambda$ / dI	nm / mA		0.001		

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Characteristics at T_{LD} = 15° at BOL cont'd

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Laser Current @ P_{opt} = 5 mW	I_{LD}	mA			180	
Slope Efficiency	η	W / A	0.15	0.4		
Threshold Current	I_{th}	mA		80	120	Ith drift may occur, no violation of the max. value
Divergence parallel (FWHM)	$\Theta_{\|\|}$	°		0.1		parallel to the base plate of the housing (see p. 3)
Divergence perpendicular (FWHM)	$\Theta_{\perp}$	°		0.1		perpendicular to base plate of the housing (see p. 3)
Beam Diameter horizontal	$d_{\|\|}$	mm		0.7	1.0	parallel to the base plate of the housing (see p. 3)
Beam Diameter vertical	$d_{\perp}$	mm		0.6	1.0	perpendicular to base plate of the housing (see p. 3)
Degree of Polarization	DOP	%		90		P_{opt} = 5 mW; E field perpendicular to base plate

Monitor Diode

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Monitor Detector Responsivity	I_{mon} / P_{opt}	µA/mW	10		400	U_R = 5 V

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Current	I_{TEC}	A		0.7	1.1	P_{opt} = 5 mW, ΔT = 40 K
Voltage	U_{TEC}	V		1.7	2.8	P_{opt} = 5 mW, ΔT = 40 K
Power Dissipation (total loss at case)	P_{loss}	W		0.4	0.5	P_{opt} = 5 mW, ΔT = 40 K
Temperature Difference	ΔT	K			60	P_{opt} = 5 mW, ΔT = |Tcase - TLD|

Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Resistance	R	kΩ		10		T_{LD} = 25° C
Beta Coefficient	β			3892		$R_1 / R_2 = e^{\beta (1/T_1 - 1/T_2)}$ at T_{LD} = 0° … 50° C
Steinhart & Hart Coefficient A	A			1.1293×10^{-3}		$1/T = A + B(\ln R) + C(\ln R)^3$
Steinhart & Hart Coefficient B	B			2.3410×10^{-4}		T: temperature in Kelvin
Steinhart & Hart Coefficient C	C			8.7755×10^{-8}		R: resistance at T in Ohm

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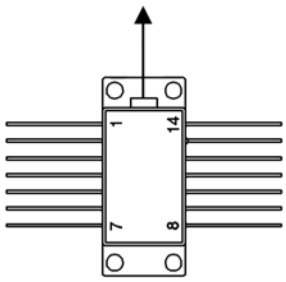
Pin Assignment

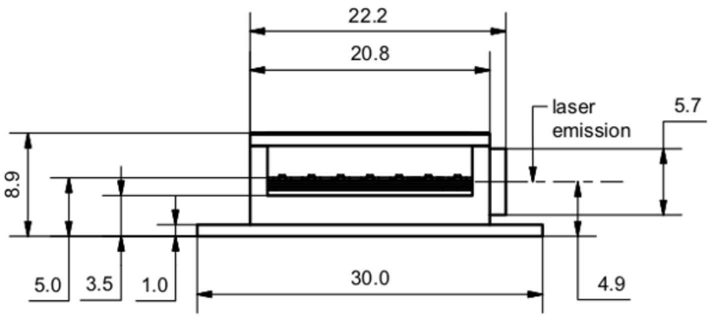
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photodiode (Anode)	12	not connected
4	Photodiode (Cathode)	11	Laser Diode (Cathode)
5	Thermistor	10	Laser Diode (Anode)
6	not connected	9	not connected
7	not connected	8	not connected

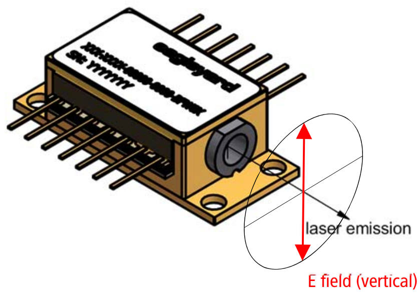
All 14 pins are isolated from case.

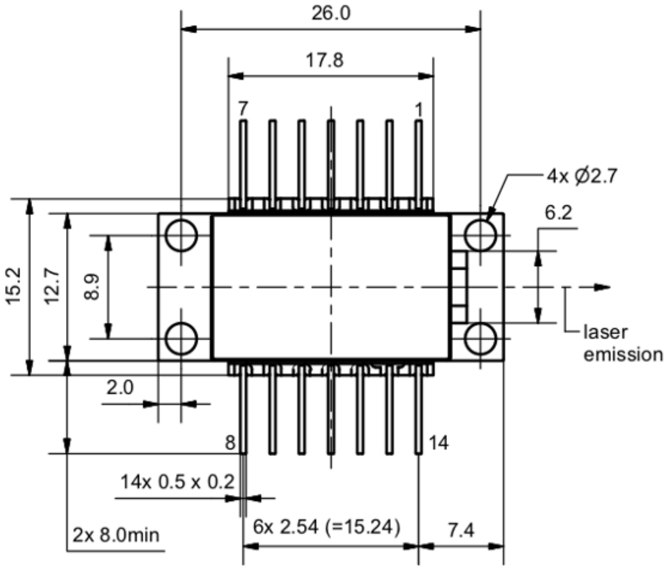


top view

Package Drawings







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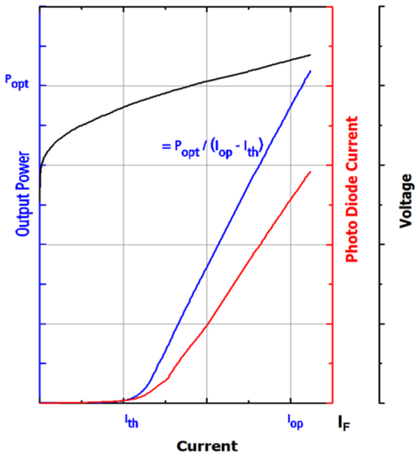
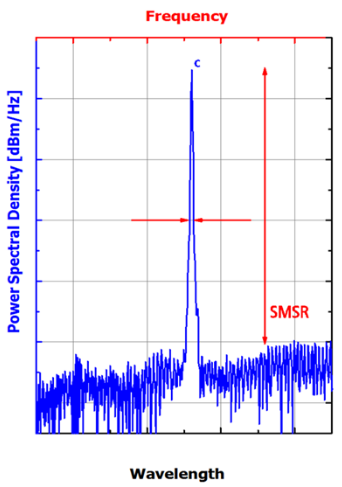
Typical Measurement Results

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.

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 DBR laser is sensitive against optical feedback, so an optical isolator may be required in order to avoid any disturbance of the emission spectrum. Operating at moderate temperatures on proper heat sinks will contribute to a long lifetime of the diode.

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running beam with optics as common in optical instruments will increase threat to the human eye.

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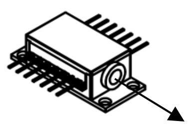
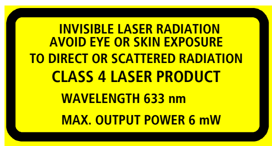


Laser Emission



IEC-60825-0

Complies with 21 CFR 1040.10 and 1040.40

Ordering Information:

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Email orders to: sales@xsoptix.com
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