EYP-DFB-0852-00100-1500-BFW01-0005

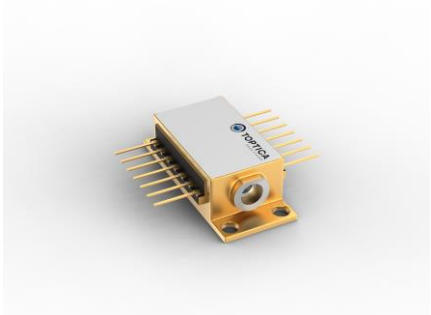
Revision 0.93

2024-04-11

SINGLE FREQUENCY LASER
DFB Laser

General Product Information

Product	Application
852 nm DFB Laser	Spectroscopy (Cs D2 line)
with hermetic 14 Pin-Butterfly Housing (RoHS compliant)	Metrology
including Monitor Diode, Thermoelectric Cooler and Thermistor	Atomic Clock
with integrated Beam Collimation	



Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Storage Temperature	T_S	° C	-40		85	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.
Operational Temperature at Case	T_C	° C	-40		85	
Operational Temperature at Chip	T_{chip}	° 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			1,4	
TEC Voltage	V_{TEC}	V			3,2	

Recommended Operational Conditions

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Operational Temperature at Case	T_{case}	° C	-20		65	
Operational Temperature at Chip	T_{chip}	° C	15		45	measured by integrated Thermistor
Forward Current	I_F				180	
Output Power	P_{opt}	mW	20		100	0

Characteristics Tchip = 25° at BOL

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Center Wavelength	λ_C	nm	851	852	853	
Target Wavelength	λ_T	nm		852.347		reached within Tchip =15 ° ... 45° C at 100 mW
Linewidth	$\Delta\lambda$	MHz		0,6	1	Popt = 100 mW
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm	25			> 10 GHz, at target wavelength
Sidemode Suppression Ratio	SMSR	dB	30	50		Popt = 100 mW
Temp. Coefficient of Wavelength	$d\lambda / dT$	nm/K		0,06		
Current Coefficient of Wavelength	$d\lambda / dI$	nm/mA		0,003		

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Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Laser Current	I_{LD}	mA			180	
Slope Efficiency	η	mW/mA		0,8		
Threshold Current	I_{th}	mA			70	
Divergence parallel	$\Theta_{\parallel}$	°		0,1		parallel to the base plate of the housing
Divergence perpendicular	$\Theta_{\perp}$	°		0,1		perpendicular to base plate of the housing
Beam Diameter horizontal	$d_{\parallel}$	mm		1	1,2	parallel to the base plate of the housing
Beam Diameter vertical	$d_{\perp}$	mm		0,8	1,2	perpendicular to base plate of the housing
Degree of Polarization	DOP	%		90		Popt = 100 mW; E field parallel to the base plate

Monitor Diode

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Monitor Detector Responsivity	I_{mon} / P_{opt}	µA/mW	0,5		10	5 V reverse voltage

Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max	Measurement Conditions / Comments
Current	I_{TEC}	A		0,4		Popt = 100 mW, ΔT = 20 K
Voltage	U_{TEC}	V		1,3		Popt = 100 mW, ΔT = 20 K
Power Dissipation (total loss at case)	P_{loss}	W		0,4		Popt = 100 mW, ΔT = 20 K
Temperature Difference	ΔT	K			50	Popt = 100 mW, ΔT = |Tcase - Tchip|

Thermistor (Standard NTC Type)

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

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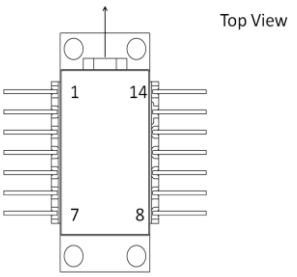
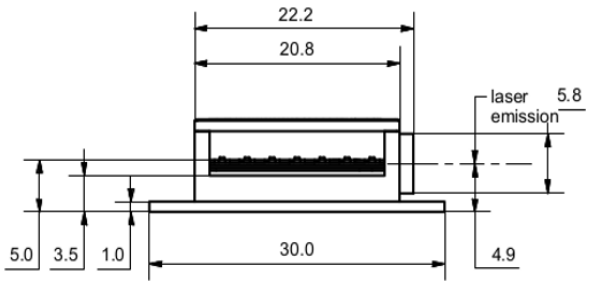
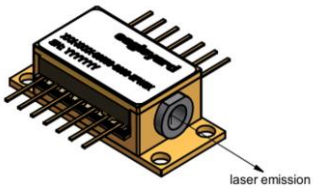
Pin Assignment

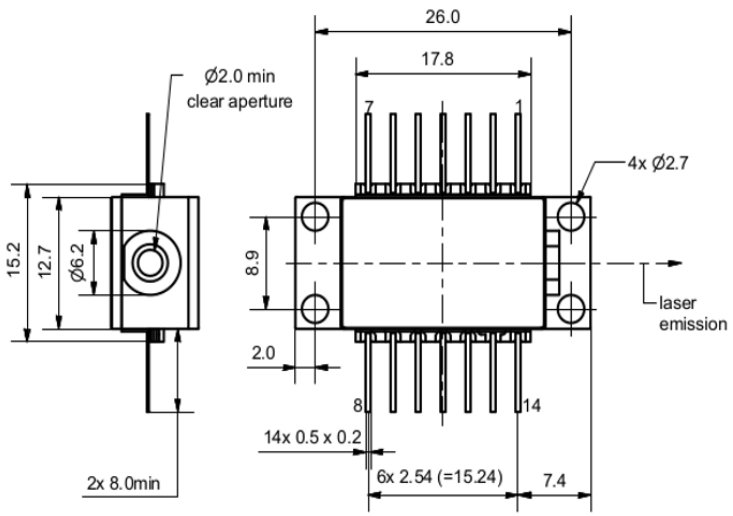
1	Thermoelectric Cooler (+)	14	Thermoelectric Cooler (-)
2	Thermistor	13	Case
3	Photo Diode Anode	12	not connected
4	Photo Diode Cathode	11	Laser Diode Cathode
5	Thermistor	10	Laser Diode Anode
6	not connected	9	not connected
7	not connected	8	not connected



Package Drawings







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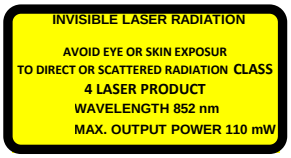
Unpacking, Installation and Laser Safety

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.



IEC-60825-1

A laser diode 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.

Complies with 21 CFR 1040.10 and 1040.40

Each laser diode will come with an individual test protocol verifying the parameters given in this document.

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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