



## EYP-ECL-0671-00040-1000-BFW01-0005 Revision 0.7

# SINGLE FREQUENCY LASER External Cavity Diode Laser



#### General Product Information

Product	Application
671 nm mini-ECL Laser	Quantum Technology
with hermetic 14-Pin Butterfly Housing (RoHS compliant)	
including Monitor Diode, Thermoelectric Cooler and Thermistor	
with integrated Beam Collimation	



#### Absolute Maximum Ratings

Parameter	Symbol	Unit	min	typ	max
Storage Temperature	Τ <sub>s</sub>	°C	-40		85
Operational Temperature at Case	Tc	°C	-40		85
Operational Temperature at Chip	$T_{chip}$	°C	-5		35
Forward Current	١ <sub>F</sub>	mA			160
Reverse Voltage	V <sub>R</sub>	V			2
Output Power	P <sub>opt</sub>	mW			50
TEC Current	I <sub>TEC</sub>	А			1.1
TEC Voltage	V <sub>TEC</sub>	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
Operational Temperature at Case	T <sub>case</sub>	°C	-20		65
Operational Temperature at Chip	$T_{chip}$	°C	0		30
Forward Current	١ <sub>F</sub>	mA			150
Output Power	P <sub>opt</sub>	mW	10		40

#### Characteristics

= 15 °	°C at BOL	
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Parameter	Symbol	Unit	min	typ	max
Center Wavelength	λ <sub>c</sub>	nm	670	671	672
Target Wavelength	$\lambda_{T}$	nm		670.98	
Linewidth	Δλ	MHz		0.3	
Mode-hop free Tuning Range	$\Delta\lambda_{tune}$	pm		15	
Sidemode Suppression Ratio	SMSR	dB	30	40	
Temp. Coefficient of Wavelength	dλ / dT	nm/K		0.008	
Current Coefficient of Wavelength	dλ / dl	nm/mA		0.001	

Measurement Conditions / Comments measured by integrated Thermistor

#### Measurement Conditions / Comments

0°C 30°C at 40 mW	
FWHM; Popt = 40 mW	
at target wavelength	
Popt = 40 mW	

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Characteristics	= 15 °C at BOL				
Parameter	Symbol	Unit	min	typ	max
Laser Current	I <sub>LD</sub>	mA			150
Slope Efficiency	η	mW/mA		0.8	
Threshold Current	l <sub>th</sub>	mA			90
Divergence parallel	$\Theta_{  }$	mrad		2	
Divergence perpendicular	$\Theta_{\perp}$	mrad		2	
Beam Diameter horizontal	d	mm		1	
Beam Diameter vertical	$d_{\!\perp}$	mm		0.8	

DOP

%

90



#### Measurement Conditions / Comments

Threshold current may drift/no violation of the max Value 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) Popt = 40 mW; E field perpendicular to the base plate

#### Monitor Diode

Degree of Polarization

Parameter	Symbol Unit	min	typ	max
Monitor Detector Responsivity	I <sub>mon</sub> / Ρ <sub>or</sub> μΑ/mW	/	5	

#### Measurement Conditions / Comments 5 V

#### Thermoelectric Cooler

Parameter	Symbol	Unit	min	typ	max
Current	I <sub>TEC</sub>	А		0.4	
Voltage	$U_{TEC}$	V		1.3	
Power Dissipation (total loss at case)	P <sub>loss</sub>	W		0.5	
Temperature Difference	$\Delta T$	К			50

#### Thermistor (Standard NTC Type)

Parameter	Symbol	Unit	min	typ	max
Resistance	R	kΩ		10	
Beta Coefficient	β			3892	
Steinhart & Hart Coefficient A	А		1.	.1293 x 10⁻	3
Steinhart & Hart Coefficient B	В		2.	.3410 x 10 <sup>-</sup>	-4
Steinhart & Hart Coefficient C	С		8	.7755 x 10 <sup>-</sup>	-8

Measurement Conditions / Comments	
Popt = 40 mW, ΔT = 20 K	
Popt = 40 mW, ΔT = 20 K	
Popt = 40 mW, ΔT = 20 K	
Popt = 40 mW, ΔT =  Tcase - TLD	

Measurement Conditions / Comments
Tchip = 25°C
$R_1/R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at Tchip = 0°C 50°C

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# This data sheet is subject to change without notice.

14x 0.5 x 0.2

# SINGLE FREQUENCY LASER **External Cavity Diode Laser**

#### Pin Assignment

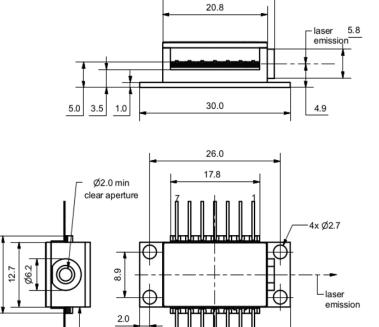
1 Thermoelectric Cooler (+)	14 Thermoelectric Cooler (-)
2 Thermistor	13 Case
3 Photo Diode Anode	12 not connected
4 Photo Diode Cathode	11 Laser Diode Cathode
5 Thermistor	10 Laser Diode Anode
6 not connected	9 not connected
7 not connected	8 not connected

22.2

#### Package Drawings

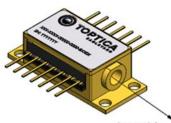
15.2

2x 8.0min



6x 2.54 (=15.24)

7.4

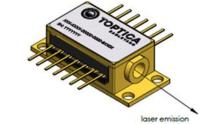


AIZ-20-1029-0928





Top View



1

7

14

8

**Typical Measurement Results** 

Current I [mW]

Unpacking, Installation and Laser Safety

device installation, ESD protection has to be maintained.

671.02 671.01

E 671.00 670.99 wavelength 670.9 670.9 670.9 670.95

T = 15°C

Optical power P [mW]

document.

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500

분 300

Linewidth 500

- T<sub>LD</sub> = 15°C

110 120

Current I [mA]

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2,0

1,5 ∑

1,0 1,0 0.5

 $T_{LD} = 13.0$  °C  $T_{LD} = 14.0$  °C  $T_{LD} = 14.0$  °C  $T_{LD} = 15.0$  °C

Li D1-Transitio Li D2-Transitio

100

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

Avoid direct and/or indirect exposure to the free running beam. Collimating and focussing the free running

Performance figures, data and any illustrative material provided in this specification are typical and must

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

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

current I [mA]

120

130

80



specifications may change without notice.

GaAs SEMICONDUCTOR LASER DIODE 00 mW MAX OUTPUT AT 670 nm CLASS IV LASER PRODUCT

AVOID EYE OR SKIN EXPOSUR TO DIRECT OR SCATTERED RADIATION

CLASS 4 LASER PRODUCT WAVELENGTH 670 nm OUTPUT POWER 100

DANGER

AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

s with 21 CFR 1040.10 and 1040.40







2023-10-25

