# EYP-ECL-0795-00120-1300-BFW01-0005

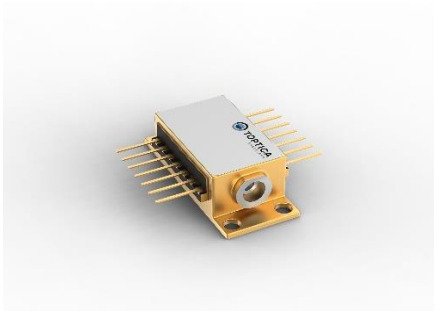
Revision 0.51

25.07.2025

## SINGLE FREQUENCY LASER
## External Cavity Diode Laser

### General Product Information

| Product | Application |
|---|---|
| 795 nm mini-ECL | Spectroscopy (Rb D1 line) |
| 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 | 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 | -5 | | 50 | |
| Forward Current | $I_F$ | mA | | | 270 | |
| Reverse Voltage | $V_R$ | V | | | 2 | |
| Output Power | $P_{opt}$ | mW | | | 120 | |
| TEC Current | $I_{TEC}$ | A | | | 1.4 | |
| TEC Voltage | $V_{TEC}$ | V | | | 4.8 | |

### 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 | 0 | | 40 | measured by integrated Thermistor |
| Forward Current | $I_F$ | mA | | | 250 | |
| Output Power | $P_{opt}$ | mW | 20 | | 100 | |



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### Characteristics Tchip = 25 °C at BOL

| Parameter | Symbol | Unit | min | typ | max | Measurement Conditions / Comments |
|---|---|---|---|---|---|---|
| Center Wavelength | $\lambda_C$ | nm | 794 | 795 | 796 | |
| Target Wavelength | $\lambda_T$ | nm | | 794.98 | | reached within Tchip = 0 °C ... 40 °C |
| Linewidth | $\Delta\lambda$ | MHz | | 0.2 | | measured in the time scale of 1 ms |
| Mode-hop free Tuning Range | $\Delta\lambda_{tune}$ | pm | | 20 | | By current tuning, at target wavelength |
| Output Power | $P_{opt}$ | mW | | | 100 | |
| Sidemode Suppression Ratio | SMSR | dB | 30 | 45 | | Popt = 100 mW |
| Temp. Coefficient of Wavelength | $d\lambda / dT$ | nm/K | | 0.008 | | |
| Current Coefficient of Wavelength | $d\lambda / dI$ | nm/mA | | 0.001 | | |
| Laser Current | $I_{LD}$ | mA | | | 250 | |
| Slope Efficiency | $\eta$ | mW/mA | | 0.8 | | |
| Threshold Current | $I_{th}$ | mA | | 60 | | |
| Divergence parallel | $\Theta_{\parallel}$ | mrad | | 2 | | parallel to the base plate of the housing (see p. 3) |
| Divergence perpendicular | $\Theta_{\perp}$ | mrad | | 2 | | perpendicular to base plate of the housing (see p. 3) |
| Beam Diameter horizontal | $d_{\parallel}$ | mm | | 1.0 | 1.2 | parallel to the base plate of the housing (see p. 3) |
| Beam Diameter vertical | $d_{\perp}$ | mm | | 0.8 | 1.2 | perpendicular to base plate of the housing (see p. 3) |
| Degree of Polarization | DOP | % | | 90 | | Popt = 100 mW; E field perpendicular to the base plate |

### Monitor Diode

| Parameter | Symbol | Unit | min | typ | max | Measurement Conditions / Comments |
|---|---|---|---|---|---|---|
| Monitor Detector Responsivity | $I_{mon} / P_{op}$ | µA/mW | | 10 | | 5 V |

### 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 | | 1.5 | | Popt = 100 mW, ΔT = 20 K |
| Power Dissipation (total loss at case) | $P_{loss}$ | W | | 0.5 | | 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 | b | | | 3892 | | $R_1/R_2 = e^{\beta(1/T_1 - 1/T_2)}$ at Tchip = 0 ... 50 °C |
| Steinhart & Hart Coefficient A | A | | | $1.1293 \times 10^{-3}$ | | $1/T = A + B(\ln R) + C(\ln R)^3$ |
| Steinhart & Hart Coefficient B | B | | | $2.3410 \times 10^{-4}$ | | T: Temperature in Kelvin |
| Steinhart & Hart Coefficient C | C | | | $8.7755 \times 10^{-8}$ | | R: resistance at T in Ω |



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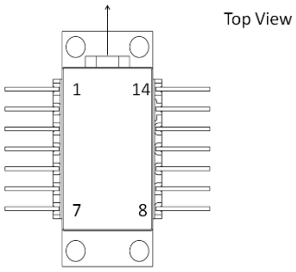
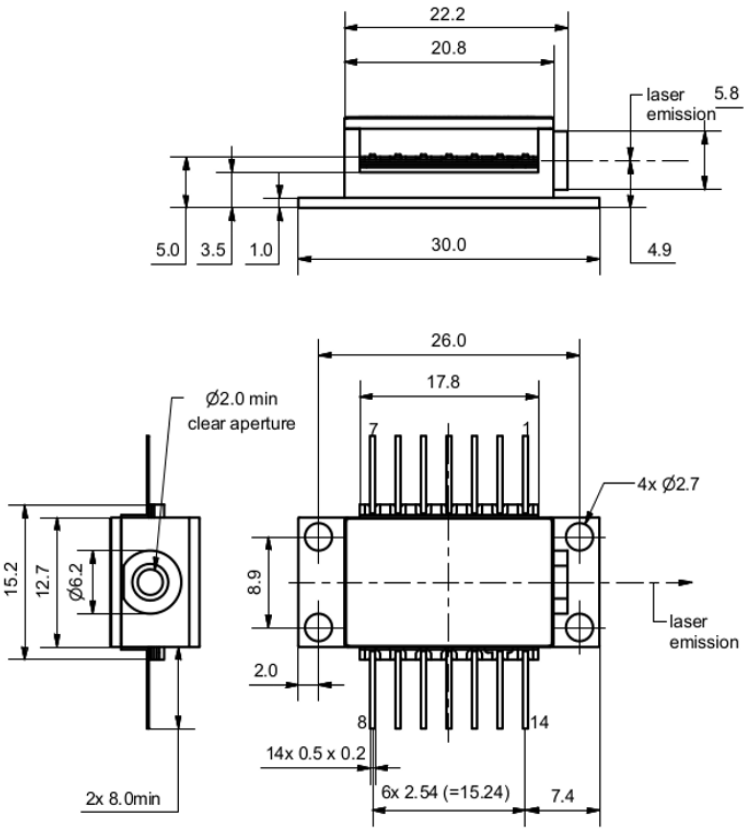
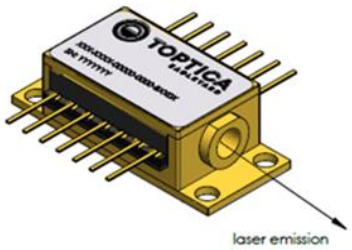
### Pin Assignment

| | | | |
|---|---|---|---|
| 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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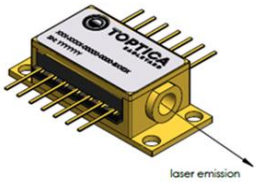
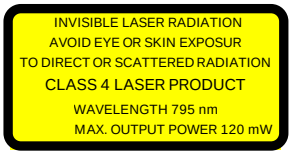
### Unpacking, Installation and Laser Safety

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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