CECL Laser Module (Discontinued)

D2-100-CECL CECL Laser

Model No. D2-100-CECL

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Please read Limited Warranty and General Warnings and Cautions prior to operating the D2-100-CECL.

Description

The CECL laser modules is comprised of a fabry-perot (FP) laser diode and grating in a precision temperature-controller housing. The grating is placed close (<1 cm) to the FP laser diode, resulting in a short cavity capable of GHz mode-hop free injection current tuning. The grating is at a fixed position, resulting in stiff design that is highly immune to mechanical vibration. Large frequency tuning is achieved via temperature. The result is a robust laser capable of very fast servo control for easy locking to spectroscopic transitions. The module contains no moving parts or piezo-electrics and is therefore inherently robust and rugged. The CECL laser is collimated by a 0.60 NA lens. Two mirrors control the positioning of the output laser beam.

The temperature controllers use an 8-pin circular connector on the back of the laser subassembly. The injection current connection to the laser diode is through an SMA connector also on the back of the laser subassembly.

Absolute Maximum Ratings

Note: All modules designed to be operated in laboratory environment

Parameter	Rating
Environmental Temperature	>15°C and <30°C
Environmental Humidity	<60%
Environmental Dew Points	<15°C
Stage 2 Temperature of the CECL Diode	>23°C and <29°C
CECL Laser Diode Current	See datasheet included with your laser.

Specifications

	Min.	Typical	Max.	Units
Beam diameter	0.8	1.1	1.7	mm ($1/e^2$ dia.)
Polarization	Horizontal			
Temperature range **Stage 1, housing** **Stage 2, laser**	 15 0	 20 15	 40 50 [1)]	°C
Temperature stability	See Laser Controller			
Safety Class	3B			
Beam height	1			inches
Total package Size (L x W x H)	4 x 4 x 1.75			inches

Inputs, Outputs, and Controls

Beam Conditioning

Laser diodes all have astigmatism, which means the horizontal and vertical axes have different foci. Vescent uses a powerful asphere with a short focal length and an anamorphic prism pair to create a small diameter circular beam. This reduces the costs of the isolator and other downstream modules by reducing the clear aperture requirements. While the aspheres and anamorphic prisms produce a circular beam, astigmatism dictates that a single lens will not simultaneously collimate both orthogonal axes of the beam with the result that in the far field the beam is again elliptical.

The far-field pattern is the most important for ascertaining the quality of the diode output. The near-field pattern often shows stray light from the diode waveguide and ASE that doesn't propagate as part of the primary beam. However, aberrations and beam clipping due to an insufficient lens NA will show up as fringes-on the far field pattern. Vescent has taken care in the design of the laser module to keep aberrations and clipping to a minimum, resulting in a clean beam in the far field.

Cable Connector

The connections to the TECs and thermisters are made to an 8-pin circular connector. The pin definitions are:

Pin	Signal
1	TEC1+
2	TEC1-
3	Rth-1
4	Rth1-RTN
5	TEC2+
6	TEC2-
7	Rth2
8	Rth2-RTN

Laser Current (SMA)

Current is provided to the laser diode chip through an SMA connector. The central conductor of the SMA connects to the laser anode, and the shield connects to the laser cathode. *This is a direct, unprotected connection to the laser chip, so care must be taken to avoid ESD damage.*

[1)]

Operation above 40° C can reduce the lifetime of the laser diode

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