

CAD2451-XX-XX 18 Gbps 1310 nm Directly Modulated DFB Laser

Overview

The CAD2451-XX-XX directly-modulated laser (DML) is a cost-effective solution for 18 Gb/s digital transmission of up to 60 km using traditional intra-city SMF-28 single-mode fiber links. The 1310 nm wavelength eliminates the concern about dispersion control over most installed intra-city fiber plants. The package contains a high-speed DFB laser chip, thermoelectric cooler, thermistor, optical isolator, and a rear-facet monitor photodiode for external optical power control. 1270/1290/1310/1330/1350/1370 nm center wavelength available



Applications

- VSR, SR, IR and LR applications
- CATV
- SONET and 18 Gb/s Ethernet transponders and line cards

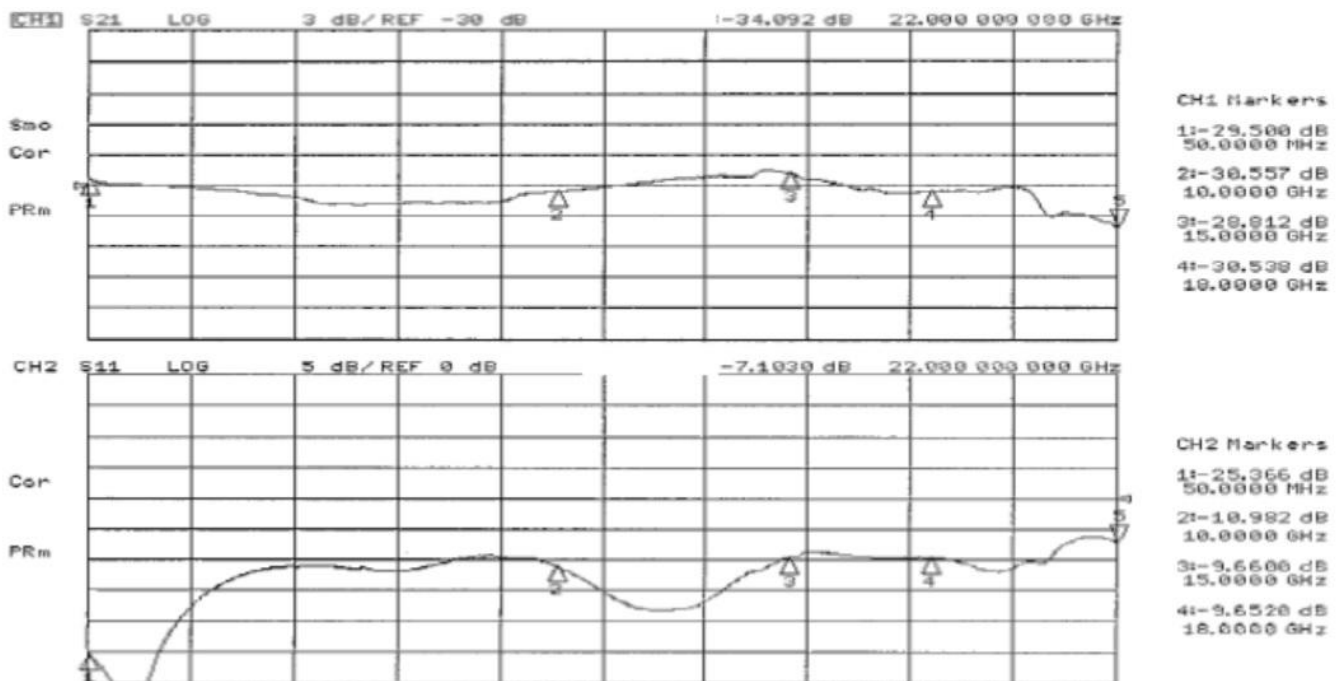
Features

- Internal TEC for stable performance over wide case range of –5 to 80 C
- High relaxation frequency at low bias
- Hermetically sealed optics, isolator on TEC
- Lower cost than EML
- Wide range of powers and distances

Optical Specification

Parameter	Min	Typ	Max	Unit
Available Center Wavelengths	1270	1310	1370	nm
Optical Output Power	-	9	-	dBm
Temperature Range	-40	-	+65	°C
Frequency Range	10		18000	MHz

Typical Optical Data



RF Specification

Parameter	Specifications	Unit
Maximum Frequency	18	GHz
Minimum Frequency	0.01	GHz
Amplitude Flatness	5	dB p-p
Input Return Loss (50Ω)	4	dB
Input 1 dB Compression	+20	dBm
Input Third Order Intercept ₃		
0.01 GHz - 7.0 GHz	+30	
7.0 GHz - 22.0 GHz	+25	
Noise Figure (dB) ₄		
0.01 GHz - 3.0 GHz	44	
3.0 GHz - 7.0 GHz	50	
7.0 GHz - 13.0 GHz	54	
13.0 GHz - 18.0 GHz	59	

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min	Max	Unit
Operating Temperature Range of Baseplate	T_{OP}	Continuous	-40	+65	°C
Storage Temperature	T_{STG}	-	-40	+85	°C
RF Input Power	P_{IN}	60 Seconds	-	+20	dBm
Laser Forward dc Current	-	-	25	120	mA
Photodiode Reverse Voltage	V_{RPD}	-	200	10	V
Laser Reverse Voltage	-	-	-	1	V
ESD	-	HMB: R = 1500 Ohm, C = 100 pF	-500	500	V
TEC Current	I_{TEC}	Continuous	-1.9	1.9	A

Electrical/Optical Characteristics

Parameter	Specifications	Unit
Wavelength	1310 to ± 30	nm
Spectral Width, FWHM ² , Typ., Max	10	MHz
Optical Power, Typical @ ITH +55 mA	8 (min)	dBm
Optical Power Stability vs. Temperature	± 15	%
DC Modulations Gain, Typical	0.24	-

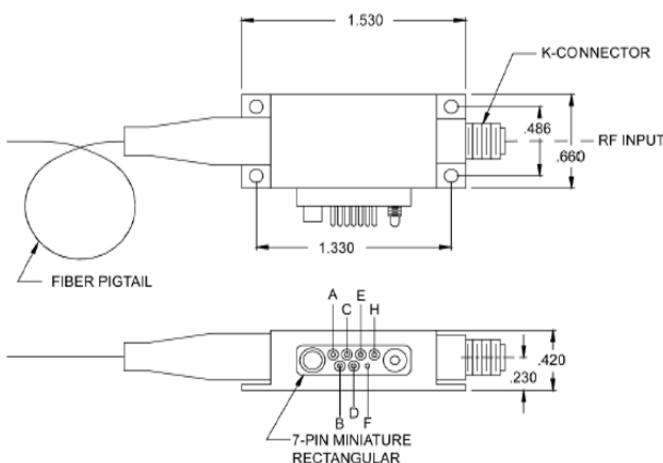
- Specifications guaranteed when unit is connected to an optical path with return loss >35 dB.
- No RF Input.

DC Parameters

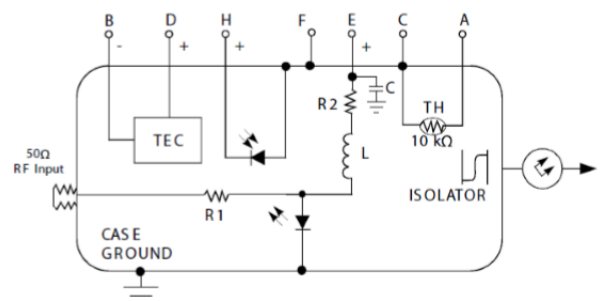
Parameter	Symbol	Condition	Min	Max	Units
Laser Bias	I_{OP}	25°C	-	65	mA
Threshold Current	I_{TH}	25°C	-	26	mA
Forward Voltage	V_F	$I_{OP} = I_{TH} + 50 \text{ mA}$	-	6	V
Thermo Electric Cooler	I_{TEC}	-	-1.1	-	A
Thermistor	R_{TH}	25°C	9.5	10	k Ω
Thermistor Temperature Coefficient	TE_{TH}	25°C	-	4.4	% / °C

Outline Drawing

Mechanical Drawing (dimensions are in inches)



Electrical Schematic



Pin Assignments

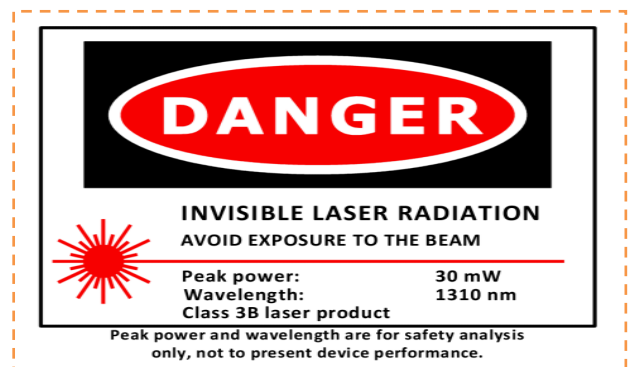
Seven-Pin Miniature Rectangular Connector

Pin	Description
A	Thermistor
B	TEC (-)
C	Thermistor
D	TEC (+)
E	Laser Bias
F	Ground
G	Monitor Photodiode

Safety Information

- The laser light emitted from this laser diode is invisible and potentially harmful to the human eye. Avoid eye and skin exposure to the beam, both direct and reflected.
- Products are subject to the risks normally associated with sensitive electronic devices including static discharge, transients, and overload. Please ensure ESD protection prior to handling the products.
- These CA OPTRONICS products are not intended for use in systems where product malfunction can reasonably be expected to result in personal injury.

Package Dimensions (Unit: mm)



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