10G DFB 1550 nm 10 mW Pigtail TO-CAN - TEC

Description

A 10G 1550 nm DFB laser packaged with a power monitoring InGaAs photodiode and a Peltier thermoelectric cooler (TEC). The device comes in an 8-pin pigtailed TO-can with customizable SMF-28 fiber and optical connector. The device features a built-in optical isolator.

Features

- High output power 10 mW
- Built-in monitor Photodiode
- Available wavelengths
  - 1310 nm
  - 1550 nm
- 6GHz Cutoff Frequency
- High power efficiency 90%
- Selectable optical connector options.
- Built-in Isolator

Applications

- Optical time-domain reflectometer (OTDR)
- Telecommunications
- RF over Fiber (RFoF)

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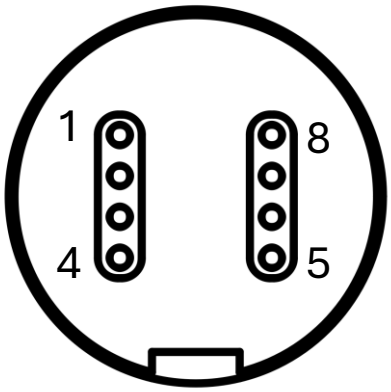
Electro-Optical Characteristics (T = 25°C)

Parameter	Symbol	Condition	Min.	Typical	Max.	Unit
Forward Voltage	V_f	Laser	-	1.2	1.6	V
Threshold Current	I_{th}	Laser	3	-	15	mA
Pulsed Optical Power	P_{pulse}	Laser	20	-	-	mW
Constant Optical Power	P_{cw}	Laser	-	10	-	mW
Center Wavelength	λ_c	T = 25°C	1549	-	1551	nm
Bandwidth	BW	-	-	5	-	GHz
Optical Isolation	Iso	-	30	-	-	dB
Thermistor	R_{th}	25°C	-	10	-	kΩ
Relative Intensity Noise	RIN	25°C	-	-	-130	dB/Hz
TEC	Qmax	-	-	-	0.6	W
	Imax	-	-	-	0.9	A
	Vmax	-	-	-	1.2	V
	ΔT	-	-	40	-	K
Laser Series Resistance	R	25°C	-	10	-	Ω

Absolute Maximum Rating (T = 25°C)

Parameter	Symbol	Condition	Min.	Max.	Unit
Reverse Voltage	V_r	Laser Photodiode	-	2 10	V
Forward Current	I_F	-	-	300	mA
Reverse Current	I_R	Photodiode	-	2	mA
Fiber Bend Radius	R	SMF28	30	-	mm
Storage Temperature	T_{stg}	-	-25	90	°C
Storage Humidity	H_{stg}	-	-	85	% r.H.
Operating Temperature	T_{op}	-	-25	80	°C
Soldering Temperature	T_{st}	60 sec	-	200	°C
ESD Susceptibility		HBM	100	-	V

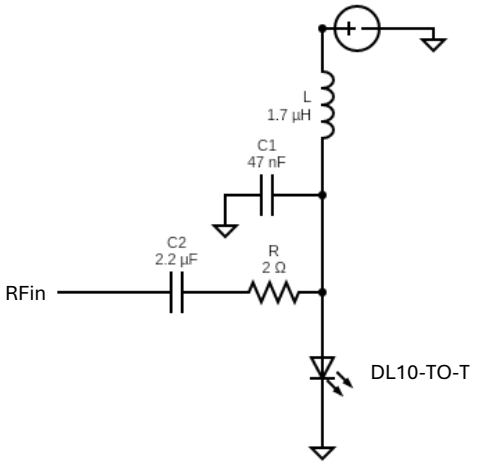
Device Pin Configuration



Bottom view

Pin #	Description:
1	Photodiode Anode (+)
2	Photodiode Cathode (-)
3	Thermistor
4	TEC (+)
5	TEC (-)
6	Thermistor
7	Laser Anode (+)
8	Laser Cathode (-)

Recommended RF Circuit (Dielectric material - Rogers RO3003® ξ_r – 3.00 Tan-δ - 0.001)



Test Circuit Configuration

L – 1.7 µH Coil inductor (Rated 26 GHz)

C1 – 47 nF 0201 RF Capacitor

C2 – 2.2 µF 0402 RF Capacitor

R – 2 Ω 0402 RF Resistor

Microstrip traces - 50 Ω ground backed coplanar waveguide (GB-CPW)

Engineering Notes:

The DFB laser diode is a 10 Ω series device. Impedance matching the device can be difficult for large bandwidths. To improve S11 impedance matching, a series SMD resistor **R** can be placed which will help lower the S11 < -10 dB. Limiting **R** < 5 Ω will help minimize S21 additional losses. If a flatter S21 is more desirable, **C1** can be added to the impedance matching structure. Balancing **R** and **C1** will yield a flatter S21 response with better S11 matching.

Device Nomenclature

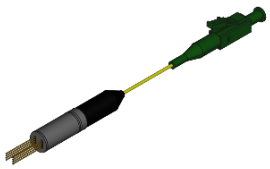
DL10-TO-T-X-XX-XX

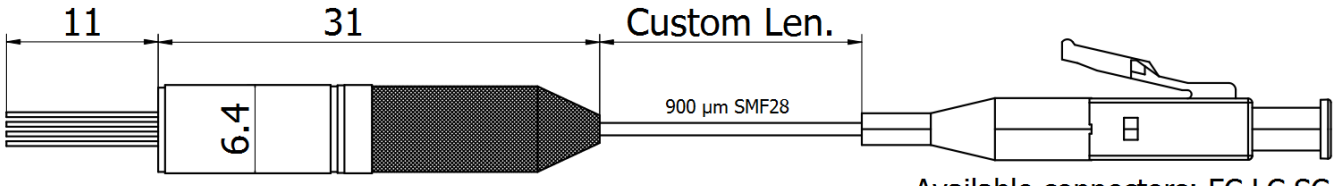
- **Product Line – DFB Laser**
- **Device body style – TO-CAN**
- **TEC**
- **Optical Connector**
  - 00 - No Connector
  - FA - FC/APC
  - FP - FC/PC
  - LA - LC/APC
  - LP - LC/PC
- **Wavelength**
  - 15 – 1550 nm
- **Pin Configuration**
  - (A) Standard

Example – DL10-TO-T-A-15-FA

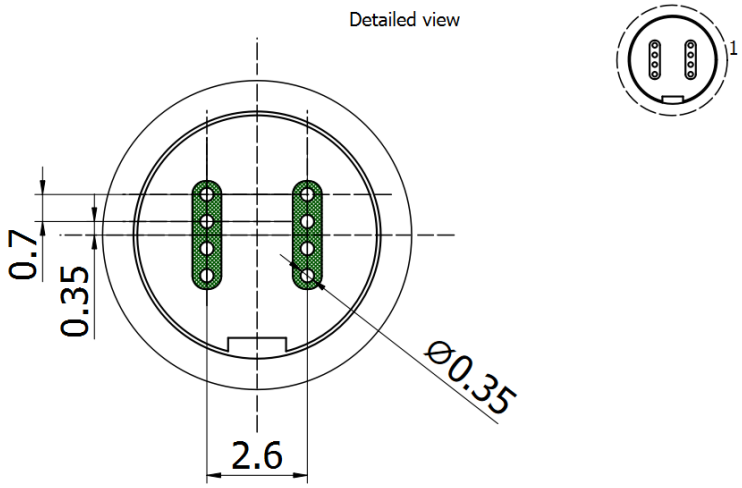
10G DFB Laser TO-can TEC Standard pinout 1550 nm FC/APC

Mechanical Drawing





Available connectors: FC,LC,SC



Created by: Vinny Gjokaj	Title: 10G DFB TO-CAN W/ TEC Drawing LC/APC		
Supplementary information:	Size: A2	Sheet: X / Y	Scale: 5:1
	Part number: DL10-TO-T-15-A-LA		
	Drawing number: DN: 1.0.0.0		
[All units in mm] [Tolerances are +/- 0.1 unless specified]	Date: 24/04/2025		Revision: REV A

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Revision History

1.1 – March 2026 – Grammatical and spelling error correction. Updated Disclaimer section

1.0 – April 2025 – Initial Release