10G DFB 1550 nm Laser TOSA Package

Description

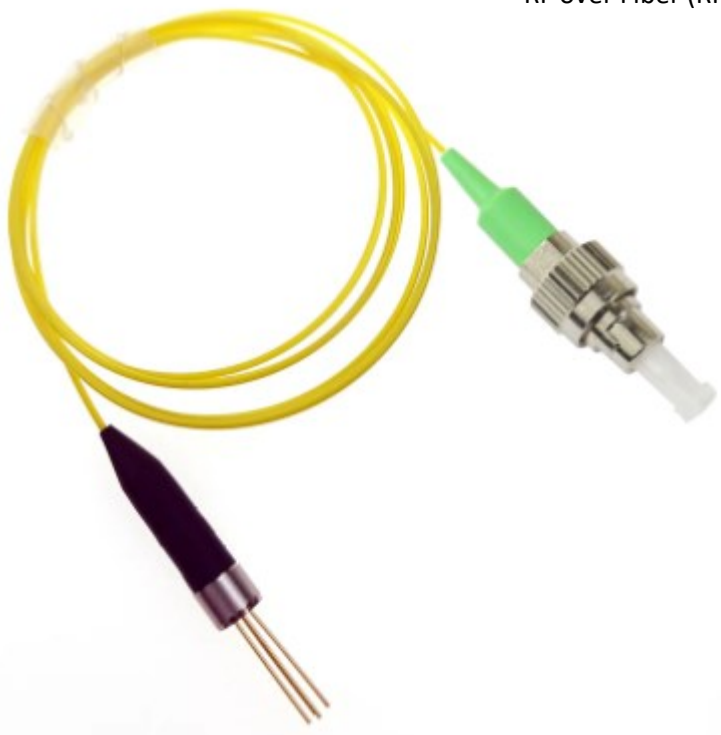
A 10 Gb/s edge emitting laser diode in a TO-can package. The Multi-quantum well distributed feedback (DFB) laser is directly modulated (DML) with a RF signal. This device comes with a built in Photodiode monitor to allow Auto-bias operation. Various build configurations allow the user to customize the optical connector as well as the mounting brackets for the device. Optics sub-assembly includes isolator.

Features

- TO-Can Package
- Single mode Pigtail cable
- 1550 nm CW
- High SFDR
- Built-in InGaAs monitor Photodiode
- Wide temperature operating range
- Built-in Optical Isolator

Applications

- Test and Measurement
- Datacenters
- RF over Fiber (RFoF)



Laser Electro-Optical Characteristics (T_{op} 23 ± 3°c, unless otherwise specified)

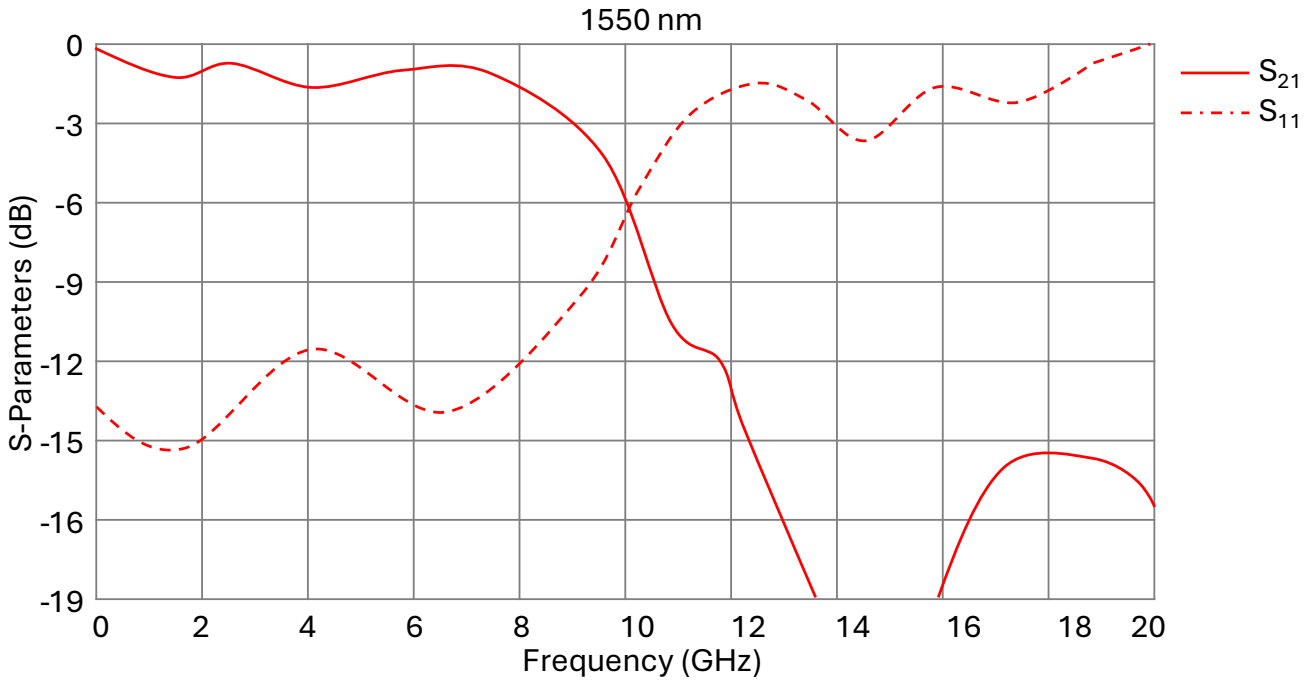
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Peak Wavelength	λ	1542	1550	1558	nm	
Threshold Current	I_{th}		5	15	mA	T=25 °C
Front Power	P_o		10		mW	$I_f = I_{th}$ + 20 mA
Slope Efficiency	η	0.15			W/A	$I_f = I_{th}$ + 20 mA
Series Resistance	R		12		Ohms	P_o = 8 mW
Forward Voltage	V_f		1.1	1.5	V	$I_f = I_{th}$ + 20 mA
Spectral Wavelength Width (RMS)	Δλ		0.5		nm	P_O = 5mW at -20 dB
Frequency Bandwidth	BW	8			GHz	Designed RF board.
Side Mode Suppression Ratio	SMSR	30			dB	
Monitor Current	Im	0.4	0.5	1.0	mA	Iop = 30 mA
Optical Return Loss	ORL			-30	dB	CW = 1310 nm
Tracking Error	Te	-1.5		1.5	dB	-40 – 80 °C
Rise/Fall Time	Tr/Tf		0.2		ns	20-80%, If = Ith
Optical Isolation	ISO	30			dB	
Relative Intensity Noise	RIN			-130	dB/Hz	

Laser Absolute Maximum Ratings

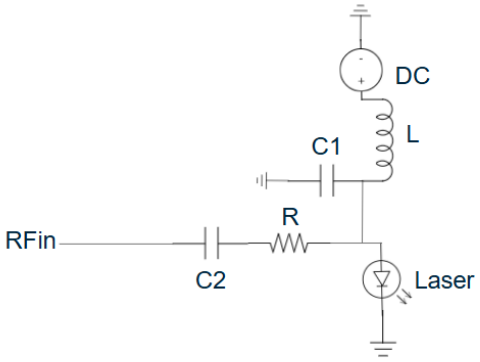
Parameter	Symbol	Condition	Min.	Max.	Unit
Voltage	V			2	V
Forward Current	I_F			100	mA
Storage Temperature	T_{stg}		-25	90	°C
Storage Humidity	H_{stg}			85	% r.H.
Operating Temperature	T_{op}		-25	85	°C
Soldering Temperature	T_{st}	60 sec		200	°C
ESD Susceptibility		HBM	100		V

Operating at maximum operating specs for prolong periods of time will damage the device.

Typical Performance Curves (Top = 25°C ± 3°C, 401 Pts, 16 Avgs, 1.5% Smoothing)



Test circuit (Dielectric material - Rogers RO3003® ξ_r – 3.00 Tan-δ - 0.001)



Test Circuit Configuration

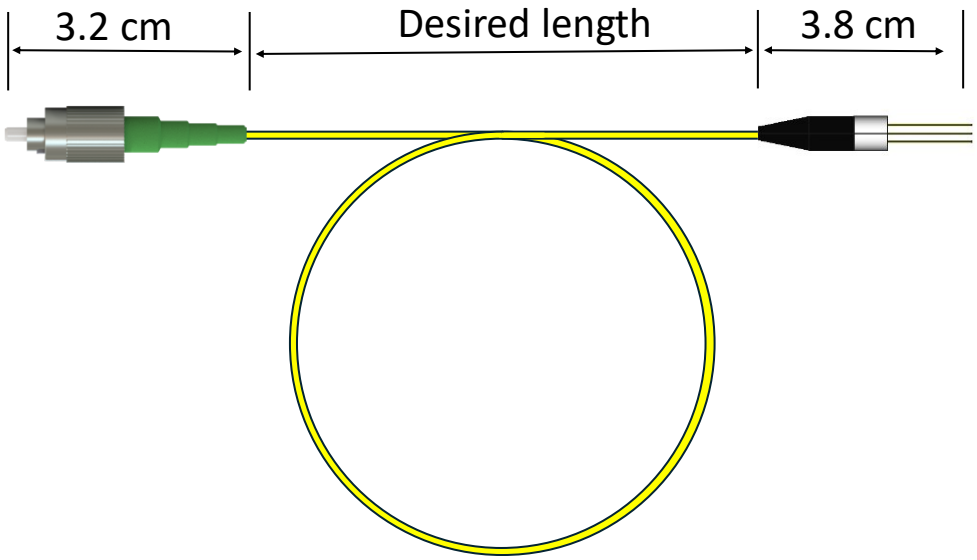
L – 1.65 µH Coil inductor (Rated 26 GHz)
C1 – 470 pF 0201 RF Capacitor
C2 – 820 pF 0201 RF Capacitor
R – 4 Ω 0402 RF Resistor

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

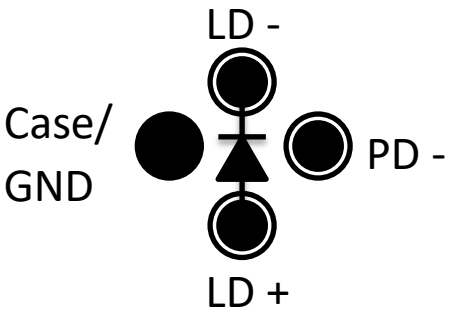
Engineering Notes:

The DFB laser diode is a 12 Ohm 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 dB 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 Dimensions



Device Pin Configuration (Bottom View)



Build A: Standard Configuration

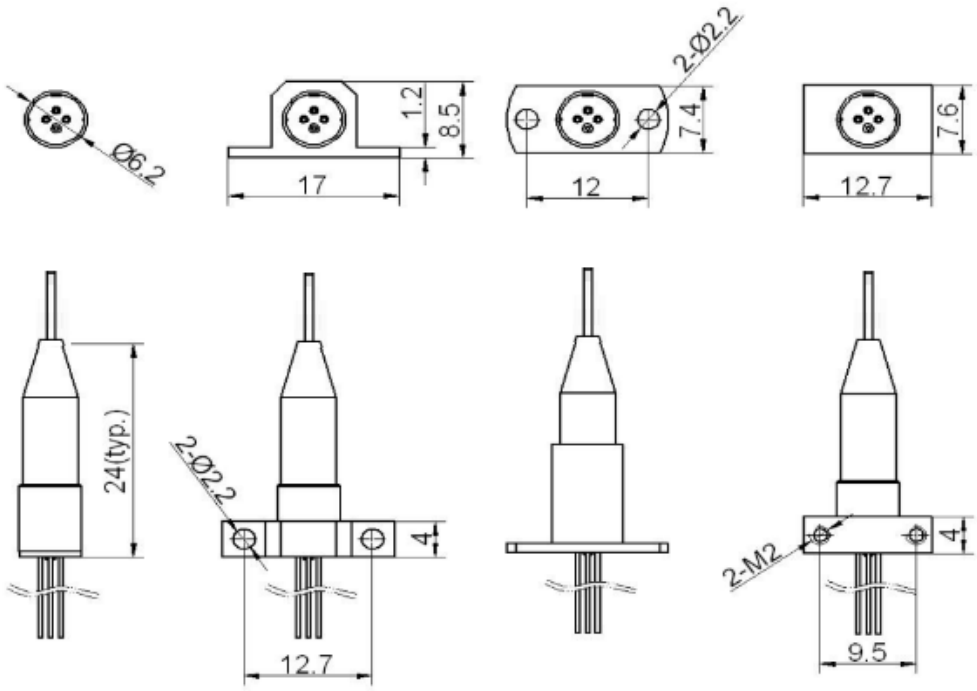
Pin Function:

1) Laser Anode
2) Photodiode Anode Tied to Case Ground
3) Laser Cathode
4) Monitor PD Cathode

Build B: Custom Pinout

Pinout can be customized

Build Configurations – Mounting Support



(a) (b) (c) (d)

Device Nomenclature

DL10-15-TO-X-XX-X

Product Line – 10G DFB Laser

Wavelength – 1550 nm

Device body style – TO-CAN

Device Mounting Support

- **(a)** No Mount
- **(b)** Horizontal Mount
- **(c)** Vertical Mount
- **(d)** Horizontal threaded

Pin Configuration

a) Standard Pinout
b) Custom Pinout

Optical Connector

(00) No Connector
(FA) FC/APC
(FP) FC/PC
(SA) SA/APC
(SP) SC/PC

Inquiry Information

Sales: For all inquiries regarding sales, please contact Sales@NuPhotonics.com

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Production Build: Customer ready devices. Small appearance changes may appear between devices.

Obsolete: Currently not supported.