



# 2.5Gbps TX:1310nm DFB LD / RX:1550nm PD WDM Bi-Directional Module Pigtail T13DD-R15A-P-FCHCH

Data Sheet

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## Description

The Lasermate T13DD-R15A-P-FCHCH is a 1310nm MQW-DFB LD, 1550nm analog PD receiver, WDM Bi-directional module designed for use in communication applications.

## Features

- Single Fiber with Bi-directional Transmission
- Integrated Wavelength Division Multiplexer
- 1310nm MQW-DFB LD
- 1550nm Analog PD Receiver
- Uncooled
- Low threshold current
- Hermetically sealed
- Operating temperature -20 to +85°C

## Packaging

- Package in pigtailed module with FC/PC

## Applications

- Optical Communication System
- Gigabit Ethernet links

## Specifications

Absolute Maximum Ratings					
Parameters		Symbol	Value	Unit	Conditions
Storage temperature		Tstg	-40~+85	°C	
Operating case temperature		Top	-20~+85	°C	
Relative humidity		RH	0~85	%	
TX	Forward current (LD)	I <sub>FLD</sub>	120	mA	
	Reverse voltage (LD)	V <sub>RLD</sub>	2	V	
	Reverse current (PD)	I <sub>RPD</sub>	2	mA	
	Reverse voltage (PD)	V <sub>RPD</sub>	15	V	
RX	Forward current	I <sub>FPD</sub>	10	mA	
	Reverse voltage	V <sub>r</sub>	20	V	
	Saturation power	P <sub>SAT</sub>	0	dBm	
Soldering temperature		Stemp	260	°C	10 seconds

TX Electro-Optical Characteristics (CW @ T <sub>c</sub> = 25°C unless otherwise noted)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold current	I <sub>th</sub>	—	6	14	mA	CW
		—	—	40		CW, T <sub>c</sub> = -20~85 °C
Operating voltage	V <sub>op</sub>	—	1.1	1.6	V	CW, Pop, T <sub>c</sub> = -20~85°C
Operating power	Pop	1.0	—	—	mW	Pop = I <sub>th</sub> +20mA
Peak wavelength	λ <sub>p</sub>	1290	—	1330	nm	CW, Pop
Side-mode suppression rate	SMSR	30	40	—	dB	CW, Pop
Spectral Width (RMS)	Δλ	—	—	1.0	nm	CW, Pop
Rise time	T <sub>r</sub>	—	—	0.1	ns	I <sub>b</sub> =I <sub>th</sub> , 20%~80%
Fall time	T <sub>f</sub>	—	—	0.15	ns	I <sub>b</sub> =I <sub>th</sub> , 20%~80%
Monitor current	I <sub>m</sub>	0.05	—	1.0	mA	Pop, V <sub>rp</sub> = 5V
Monitor dark current	I <sub>d</sub>	—	—	100	nA	V <sub>rp</sub> = 5V
Monitor capacitance	C	—	—	10	pF	V <sub>rp</sub> = 5V, f=1MHz
Tracking error	TE	—	±0.7	±1.5	dB	APC, -20~85°C

RX Electro-Optical Characteristics (CW @ T <sub>c</sub> = 25°C unless otherwise noted)						
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Detection Range	λ	1480	1550	1580	nm	
Data Rate	B	2.5	—	—	GHz	
Responsivity	R	0.7	—	—	A/W	V <sub>r</sub> =5V, λ=1310nm
Dark Current	I <sub>d</sub>	—	—	1.0	nA	V <sub>r</sub> =5V
Capacitance	C	—	0.56	0.7	pF	V <sub>r</sub> =5V, f=1MHz
Second Order Inter-Modulation Distortion	IMD2	—	—	-70	dBc	λ=1310nm (Note 1)
Third Order Inter-Modulation Distortion	IMD3	—	—	-80	dBc	λ=1310nm (Note 1)

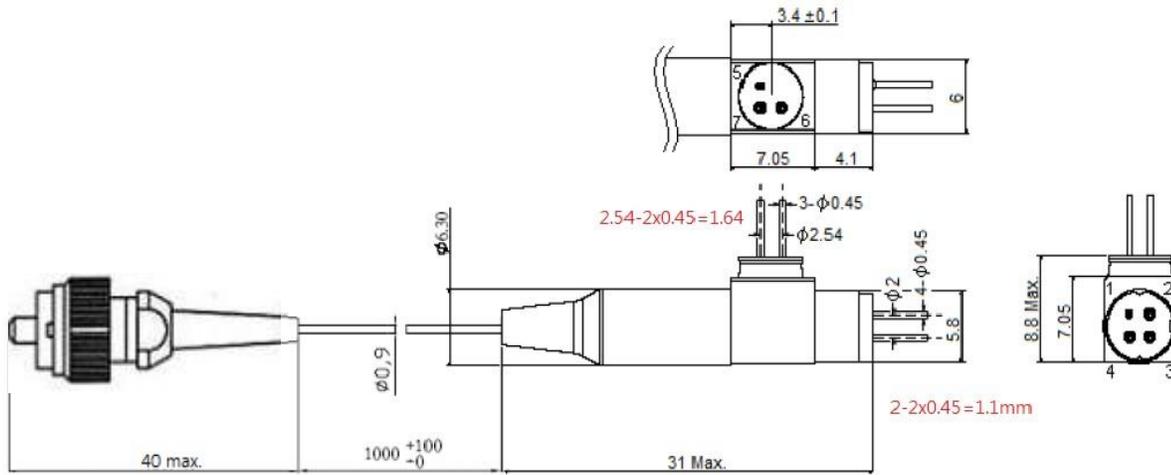
Notes:

1. IMD2 measured at V<sub>r</sub>=12V, P<sub>avg</sub>=0dBm, OMI=0.7, RLOAD=50Ω, f<sub>1</sub>+f<sub>2</sub>=850 MHz, f<sub>1</sub>-f<sub>2</sub>=50 MHz.

Fiber Pigtail Specifications						
Parameters	Symbol	Min.	Typ.	Max.	Unit	
Fiber type	Single Mode Fiber (Flame Retardant Hytrel Coating)					
Cladding diameter	D <sub>cl</sub>	122	125	128	um	
Mode field diameter	D <sub>mf</sub>	-	10	-	um	
Coating diameter	D <sub>bc</sub>	-	0.9	1	mm	
Pigtail length*	L	0.9	1.0	1.1	m	
Bending radius	R <sub>b</sub>	30	-	-	mm	
Connector	FC/PC					

\*From the ferrule-end to the bottom of TO-header.

Outline Dimensions (unit: mm)



PIN ASSIGNMENT			
	Laser Diode		Photodiode
Pin #	Type	Pin #	Type
1	Case Gnd/ LD Anode	5	Case Gnd
2	LD Cathode	6	Anode
3	Monitor Diode Cathode	7	Cathode
4	Monitor Diode Anode		

Additional Notes

- Avoid eye or skin exposure to laser radiations.
- The device is sensitive to electro-static discharge (ESD). The device should be handled with ESD proof tools. To assemble the device on PCB, proper grounding is required to prevent ESD.
- Specifications are subject to change without notice.