

## Pigtailed/Receptacle FP-LD TLFxxxx/TRFxxxx Series



- 1310nm/1550nm InGaAsP LD
- Fabry-Perot Laser Diode
- SMQW(Strained Multi-Quantum Well) Structure
- SMF Pigtailed, SC or FC Connector

**Family Model** – L : pigtailed, R : Receptacle

TLFx05x TLFx10x TLFx20x TLFx30x / TLSx05x TLSx10x TLSx20x TLSx30x  
TRFx05x TRFx10x TRFx20x TRFx30x

### Features

- 1.31 $\mu$ m/1.55 $\mu$ m InGaAsP SMQW Fabry-Perot laser diode
- Low threshold, high slope efficiency LD
- High output power uncooled laser diode
- Operating temperature ; -40 $^{\circ}$ C to +85 $^{\circ}$ C
- Single-mode fiber pigtailed with SC or FC connector
- Tested by TERADIAN's Reliability and Qualification Program

### Description

The TLFxxxx/TRFxxxx series, pigtailed coaxial LD module consists of an uncooled, reliable strained MQW InGaAsP laser(FP) and a back-facet InGaAs PIN photodiode. The parts of pigtailed LD module – single-mode fiber, lens and laser diode - are actively aligned by high power YAG laser welding method. This packaging guarantees high coupling efficiency, high slope efficiency, low operating current and low tracking error over a wide temperature range (0 $^{\circ}$ C to +70 $^{\circ}$ C/-40 $^{\circ}$ C to +85 $^{\circ}$ C), and provides high optical performance for ITU-T G.652 standard optical fiber.

### Applications

Used in telecommunication and data communication systems, from medium to high speed for intra-office, short-haul inter-office and long-haul inter-office applications.

- Fiber in the loop(FTTO, FTTC, FTTH etc.)
- Intra-office and Inter-office links
- Transport links (SDH,SONET, PDH)
- Private optical networks
- Subscriber loops

## Absolute Maximum Ratings

Parameters	Symbol	Unit	Min.	Max.	Remarks
Ambient Operating Temperature	$T_{op}$	°C	0 -40	70 85	Indoor use Outdoor use
Storage Temperature	$T_{stg}$	°C	-40	85	
Forward Current(LD)	$I_{FL}$	mA	-	150	
Reverse Voltage(LD)	$V_{RL}$	V	-	2	
Reverse Current(mPD)	$I_{RP}$	mA	-	2	
Reverse Voltage(mPD)	$V_{RP}$	V	-	15	
Lead Soldering Temp./Time		°C/sec		260/10	

## Electrical & Optical Characteristics

(T<sub>op</sub> = 25 °C)

Parameters	Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Threshold Current	$I_{th}$	CW	mA		7 9	15 17	TLF3xxx TLF5xxx
Operating Current	$I_{op}$	CW, @P <sub>f</sub>	mA			40 42	TLF3xxx TLF5xxx
Forward Voltage	$V_f$	CW, @P <sub>f</sub>	V			1.6	
Optical Output Power	$P_f$	CW, $I_{op}=I_{th} + 20mA$	mW		0.5 1.0 2.0 3.0		TLFx05x TLFx10x TLFx20x TLFx30x
Slope Efficiency	$\eta$	@P <sub>f</sub>	mW/ mA	0.02 0.04 0.08 0.12	0.025 0.05 0.10 0.15		TLFx05x TLFx10x TLFx20x TLFx30x
Central Wavelength	$\lambda_c$	CW, @P <sub>f</sub>	nm	1280 1520	1310 1550	1340 1580	TLF3xxx TLF5xxx
Spectral Linewidth	$\Delta\lambda$	CW, @P <sub>f</sub> ,RMS	nm		2	3	
Rise/Fall Time	$t_{R}, t_F$	$I_b = I_{th}, 10-90\%$	ns		0.3	0.7	
Tracking Error	$\gamma$	APC, T <sub>C</sub> =0~+70°C or -40~+85°C	dB	-1.0		1.0	I <sub>m</sub> =const.
Optical Isolation <sup>1</sup>	ISO		dB	30			
Dark Current(m-PD)	$I_D$	$V_{RP}=5V$	nA			10	
Monitor Current(m-PD)	$I_m$	$V_{RP}=5V, @P_f$	mA	0.08			
Capacitance(m-PD)		$V_{RP}=5V, f=1MHz$	pF			10	

1. Optical Isolation is only applicable for the optical isolator option.

### ! Handling Caution

The LD module can be damaged by overvoltage and current surges. Precautions should be taken for transient power supply.

This device is susceptible to damage as a result of electrostatic discharge(ESD). Take proper precautions during both handling and testing

The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap off by dropping the module.

### Laser Eye Safety

These LD modules have laser semiconductor product and are classified as AEL Class IIIb per U.S. FDA/CDRH 21CFR 1040 and class 3a per EN60825-1. These products comply with 21CFR, Chapter 1, Subchapter J( 21CFR 1040.10 and 1040.11 laser safety requirements).

### Laser Data

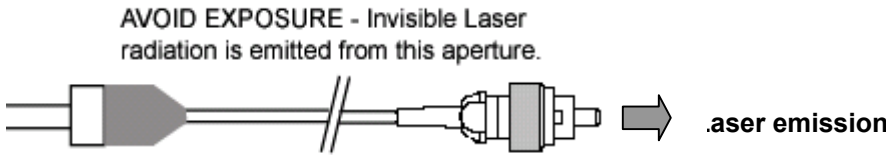
Wavelength :        nm(Model : ) /        nm(Model : )  
 Measured Output power :        mW(1310nm) /        mW(1550nm)  
 Limited Power :        mW(1310nm) /        nW(1550nm)

**Caution**

**On operation, if optical connectors are unterminated, modules can emit invisible laser radiation. Radiation emitted by laser devices can be dangerous to the eyes. Avoided eye or skin exposure to direct or scattered radiation**

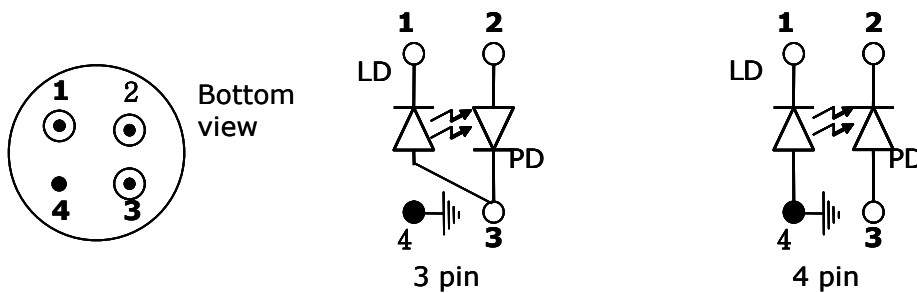


Ref : IEC60825



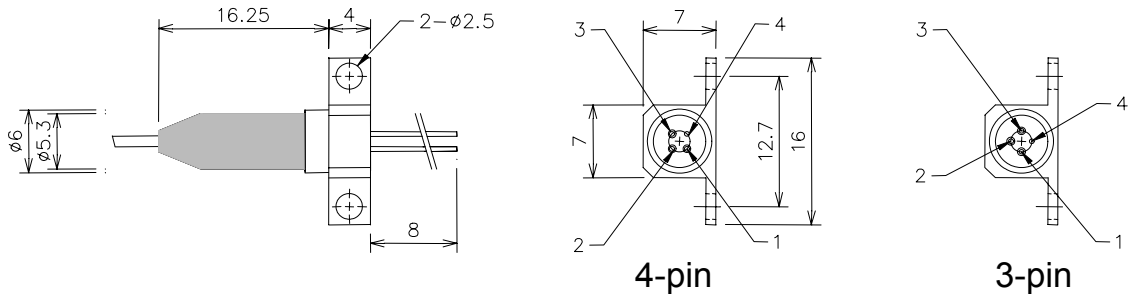
### Pin Descriptions

Pin No.	Description	
	3 pin type	4 pin type
1	LD cathode	LD cathode
2	Backfacet PD anode	Backfacet PD cathode
3	LD anode & PD cathode	Backfacet PD anode
4	Case ground	LD anode & Case ground

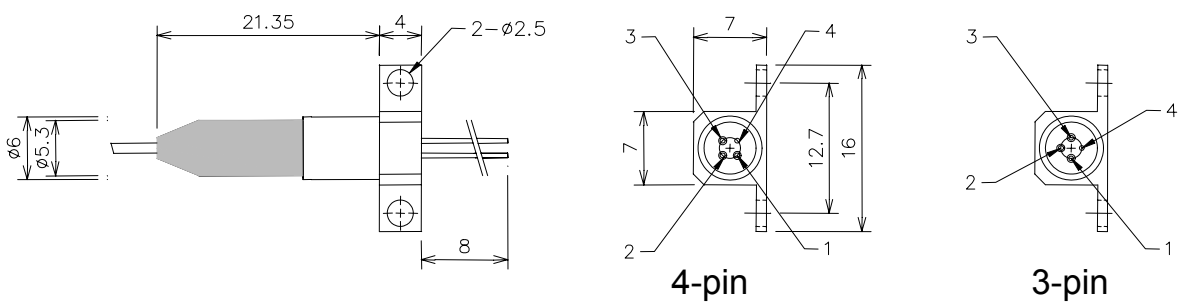


### Outline Diagram

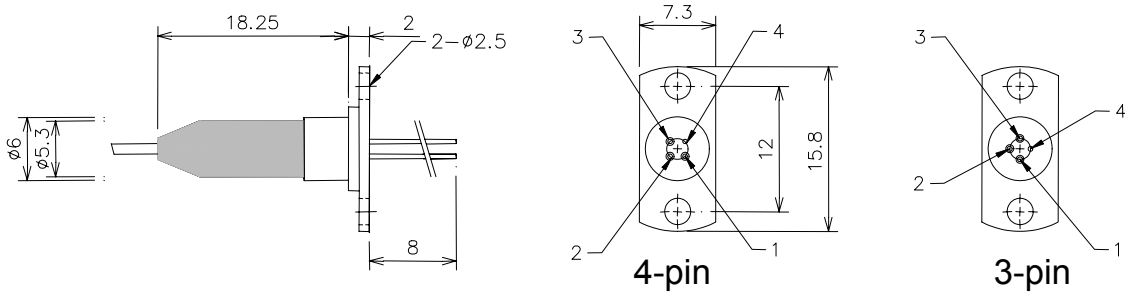
- TLFx05x-xxxH, TLF310x-xxxH



- TLF510x-xxxH, TLFx20x-xxxH, TLFx30x-xxxH



- TLFx05x-xxxV, TLF310x-xxxV



- TLF510x-xxxV, TLFx20x-xxxV, TLFx30x-xxxV

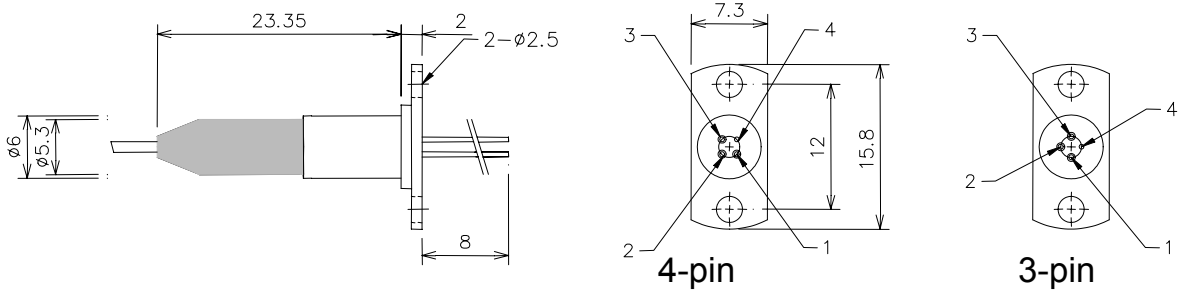
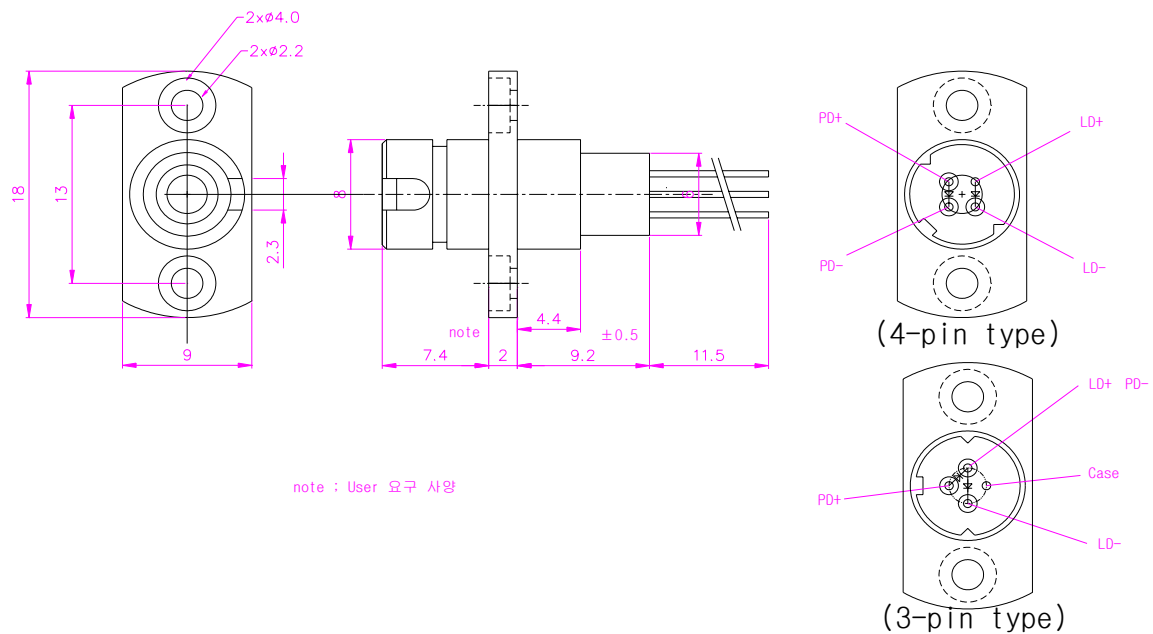


Fig.3 TLF series Dimensions [unit: mm]

- TRFx05x-xxFV, TRF310x-xxFV



- TRF510x-xxFV, TRFx20x-xxFV, TRFx30x-xxFV

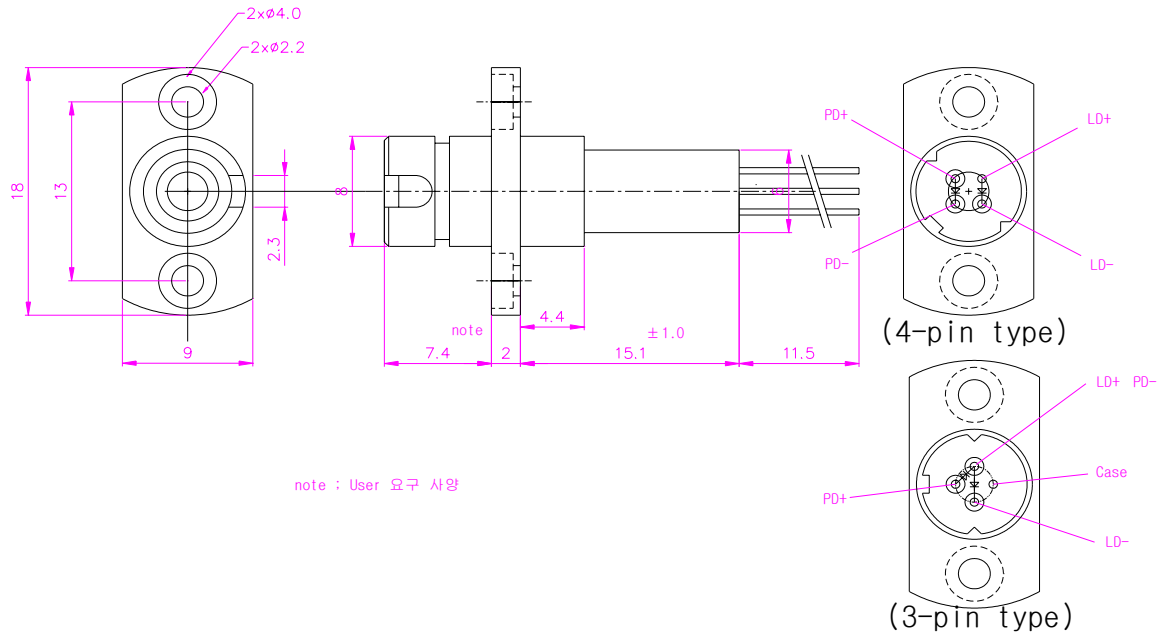


Fig.3 TRF series Dimensions [unit: mm]

Ordering Information

Com pany	Device Type		Wave- length	Output Power	Pin	Temp. Range	Fiber	Conne ctor	Flange
<b>T</b>	<b>L</b>	<b>F</b>	<b>3</b>	<b>05</b>	<b>3</b>	<b>O</b>	<b>S</b>	<b>S</b>	<b>N</b>
Tera dian	<b>L</b> ; Pigtail LD <b>R</b> ; receptacle LD	<b>F</b> ;FP (without isolator) <b>S</b> ;FP (with isolator) <b>D</b> ;DFB (with isolator) <b>E</b> ;DFB (without isolator)	<b>3</b> ;1.3μm <b>5</b> ;1.55μm	<b>05</b> ;0.5mW <b>10</b> ;1.0mW <b>20</b> ;2.0mW <b>30</b> ;3.0mW	<b>3</b> ; 3pin <b>4</b> ; 4pin	<b>I</b> ;Indoor Use (0~70℃) <b>O</b> ;Outdoor Use (-40~85℃)	<b>S</b> ;SMF <b>M</b> ;MMF	<b>N</b> ;None <b>S</b> ;SC <b>F</b> ;FC <b>T</b> ;ST <b>L</b> ;LC	<b>N</b> ;None <b>V</b> ;Vertical <b>H</b> ;Hori- zontal

\*Note 1 ; additional order information

- Connector type default is SC/PC and the default length of fiber is 1m

More Information

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