

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 μ m/1.55 μ 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 our 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_{op} = 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 _f | mA | | | 40 42 | TLF3xxx TLF5xxx |
| Forward Voltage | V_f | CW, @P _f | 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 | η | @P _f | mW/ mA | 0.02 0.04 0.08 0.12 | 0.025 0.05 0.10 0.15 | | TLFx05x TLFx10x TLFx20x TLFx30x |
| Central Wavelength | λ_c | CW, @P _f | nm | 1280 1520 | 1310 1550 | 1340 1580 | TLF3xxx TLF5xxx |
| Spectral Linewidth | $\Delta\lambda$ | CW, @P _f ,RMS | nm | | 2 | 3 | |
| Rise/Fall Time | t_{Rf}, t_F | $I_b = I_{th}, 10-90\%$ | ns | | 0.3 | 0.7 | |
| Tracking Error | γ | APC, T _C =0~+70°C or -40~+85°C | dB | -1.0 | | 1.0 | I _m =const. |
| Optical Isolation ¹ | 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

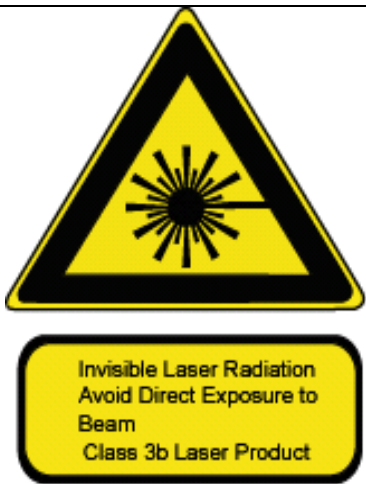
These LD modules have laser semiconductor product and are classified as AEL Class IIIb per U.S. FDA/CDRH 21CFR 1040 and class 3a per EN60825-1. These products comply with 21CFR, Chapter 1, Subchapter J(21CFR 1040.10 and 1040.11 laser safety requirements).

Laser Data

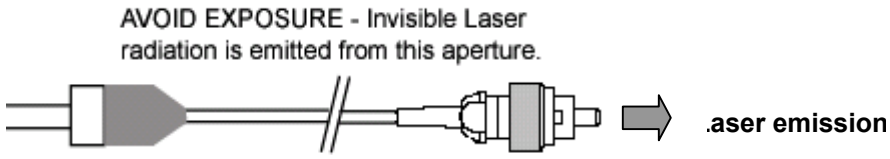
Wavelength : nm(Model :) / nm(Model :)
 Measured Output power : mW(1310nm) / mW(1550nm)
 Limited Power : mW(1310nm) / nW(1550nm)

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

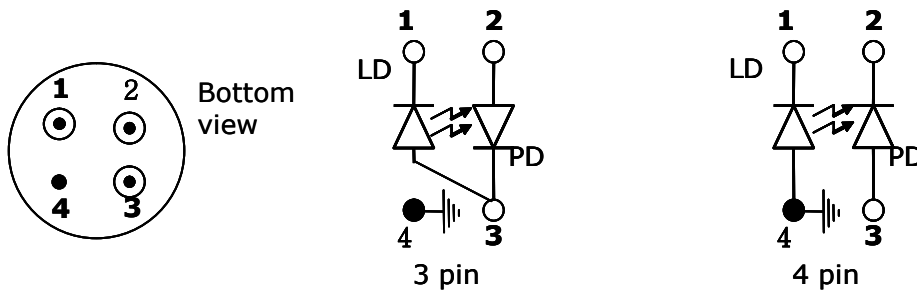


Ref : IEC60825



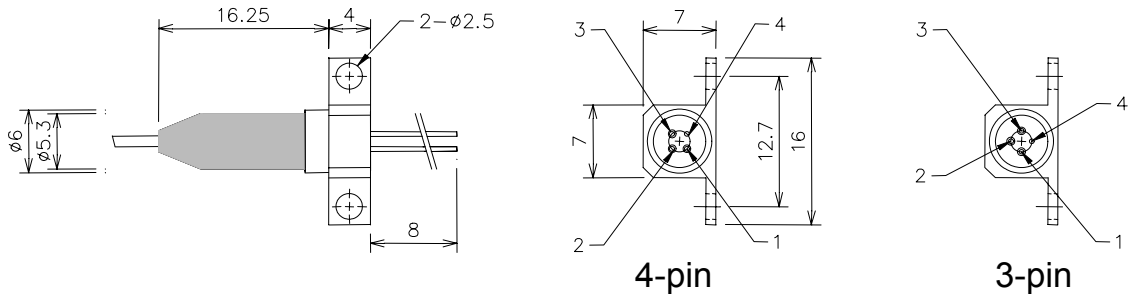
Pin Descriptions

| 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 |

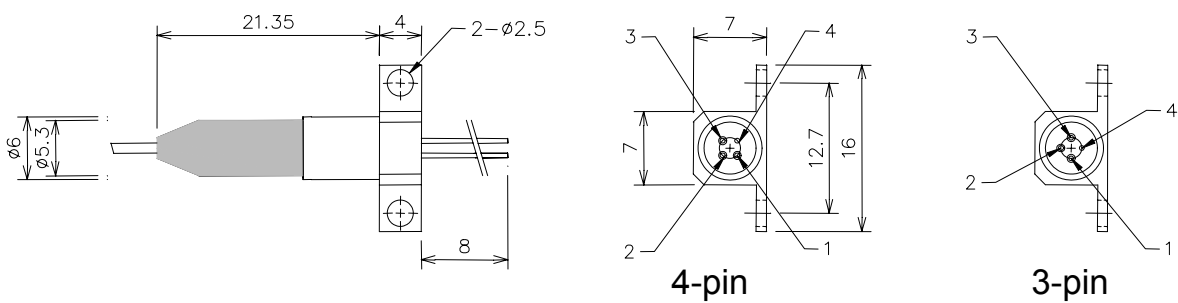


Outline Diagram

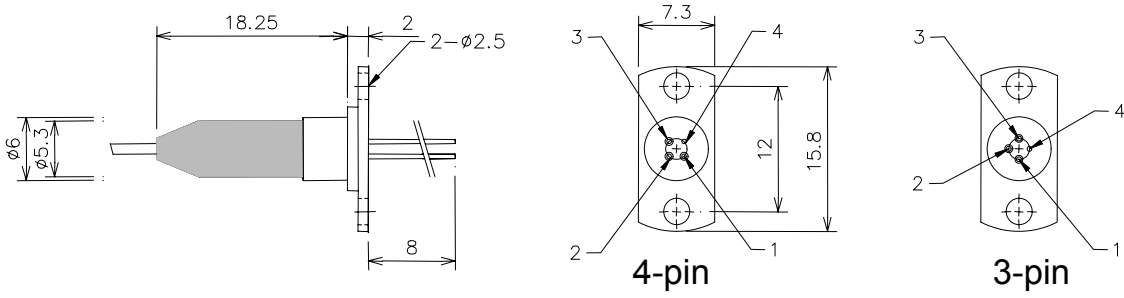
- TLFx05x-xxxH, TLF310x-xxxH



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



- TLFx05x-xxxV, TLF310x-xxxV



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

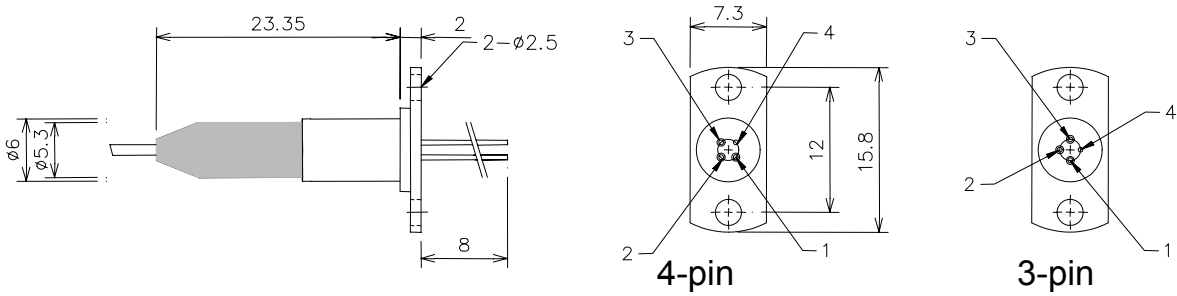
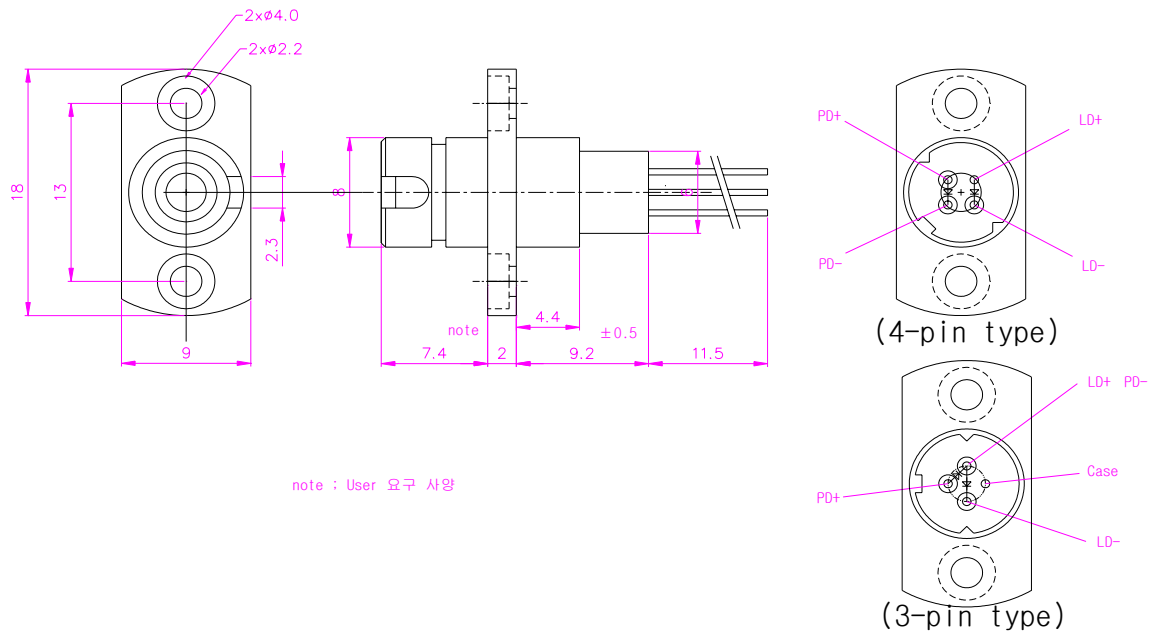


Fig.3 TLF series Dimensions [unit: mm]

- TRFx05x-xxFV, TRF310x-xxFV



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

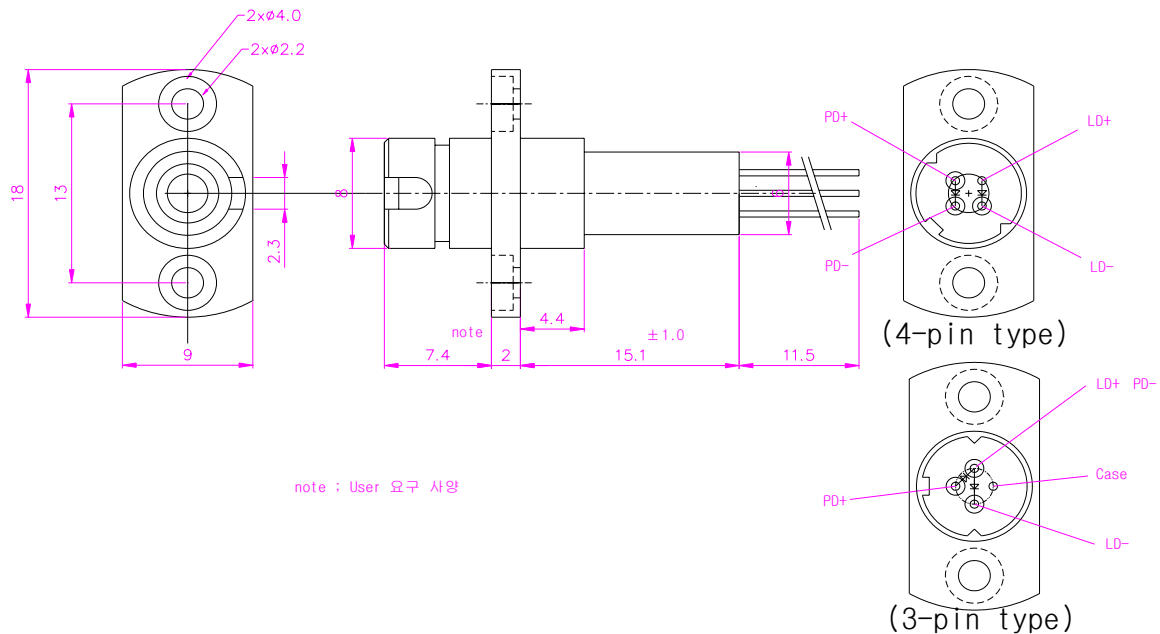


Fig.3 TRF series Dimensions [unit: mm]

Ordering Information

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

*Note 1 ; additional order information
 - Connector type default is SC/PC and the default length of fiber is 1m

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