



# 1.25Gbps TX:1310nm DFB LD / RX:1550nm PIN WDM Bi-Directional Module Pigtail

T13D-R15-P-FCHCH



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## Description

The Lasermate T13D-R15-P-FCHCH is a 1310nm MQW-DFB LD, 1550nm PIN 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 InGaAs PIN Receiver
- Uncooled
- Low threshold current
- Hermetically sealed
- Operating temperature -40 to +85°C

## Packaging

- Package in pigtailed module with FC/PC

## Applications

- Optical Communication System
- Gigabit Ethernet links
- Fiber Channel Link at 1.06Gbps

## Specifications

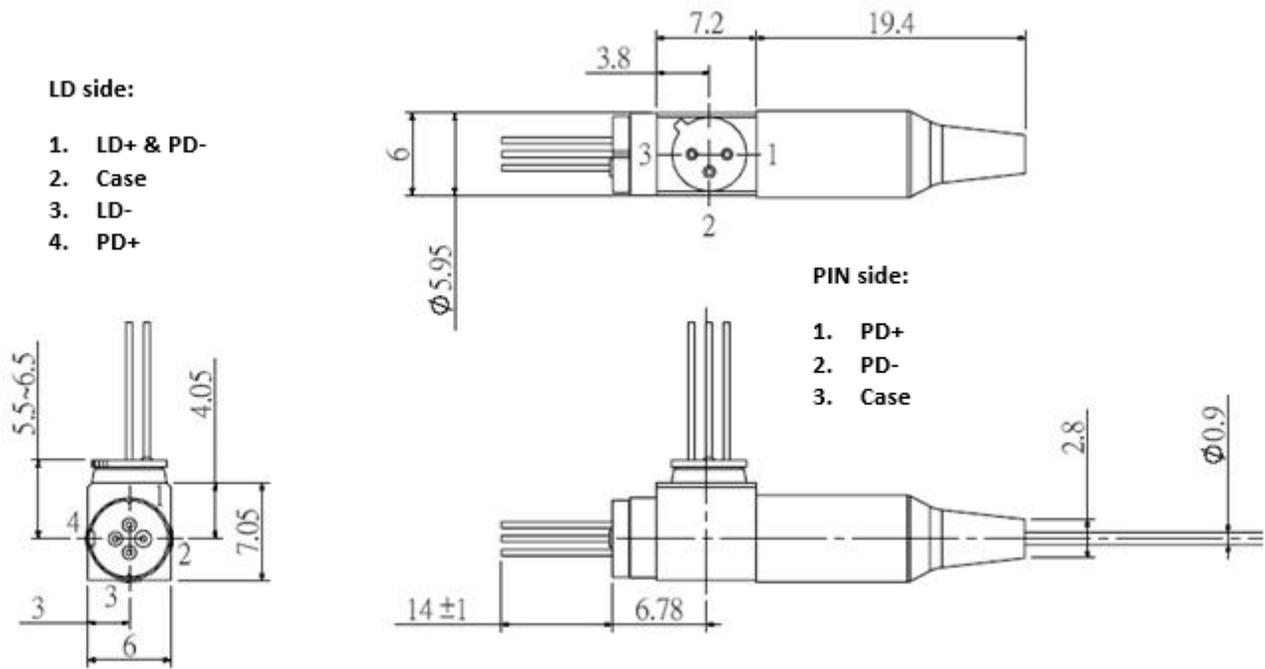
| Absolute Maximum Ratings   |                           |        |         |      |            |
|----------------------------|---------------------------|--------|---------|------|------------|
| Parameters                 |                           | Symbol | Value   | Unit | Conditions |
| Storage temperature        |                           | Tstg   | -40~+85 | °C   |            |
| Operating case temperature |                           | Top    | -40~+85 | °C   |            |
| TX                         | Peak optical output power | Po     | 8       | mW   |            |
|                            | Forward current (LD)      | IfLD   | 150     | mA   |            |
|                            | Reverse voltage (LD)      | VrLD   | 2       | V    |            |
|                            | Reverse current (PD)      | IrPD   | 2       | mA   |            |
|                            | Reverse voltage (PD)      | VrPD   | 15      | V    |            |
| RX                         | Reverse Voltage           | Vr     | 10      | V    |            |
| 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> | –    | 8    | 15   | mA   | CW  |
|  |                 | –    | –    | 50   |      | CW, T <sub>c</sub> = -40~85°C                                       |
| Operating voltage  | V <sub>op</sub> | –    | 1.2  | 1.6  | V    | CW, Pop, T <sub>c</sub> = -40~85°C                                  |
| Operating power  | Pop             | 1    | –    | –    | mW   | Pop = I <sub>th</sub> +20mA   |
| Peak wavelength  | λ <sub>p</sub>  | 1290 | –    | 1330 | nm   | CW, Pop   |
| Side-mode suppression rate   | SMSR            | 30   | –    | –    | dB   | CW, Pop   |
| Spectral Width (-20dB)   | Δλ              | –    | –    | 1    | nm   | CW, Pop   |
| Rise time  | T <sub>r</sub>  | –    | –    | 0.3  | ns   | I <sub>b</sub> =I <sub>th</sub> , 20%~80%, T <sub>c</sub> =-40~85°C |
| Fall time  | T <sub>f</sub>  | –    | –    | 0.3  | ns   | I <sub>b</sub> =I <sub>th</sub> , 20%~80%, T <sub>c</sub> =-40~85°C |
| Monitor current  | I <sub>m</sub>  | 0.1  | 0.5  | –    | 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, -40~85°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 | –    | 1580 | nm   | V <sub>r</sub> =5V                         |
| Saturation Power   | P <sub>sat</sub> | 0    | –    | –    | dBm  | V <sub>r</sub> =5V, λ=1550nm               |
| Responsivity   | R                | 0.65 | –    | –    | A/W  | V <sub>r</sub> =5V, P <sub>in</sub> =100uW |
| Dark Current   | I <sub>d</sub>   | –    | 0.1  | 2.0  | nA   | V <sub>r</sub> =5V                         |
| Capacitance  | C                | –    | 0.7  | 1.2  | pF   | V <sub>r</sub> =5V                         |
| Bandwidth  | BW               | 1.5  | –    | –    | GHz  | V <sub>r</sub> =5V                         |

| 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)



## 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.



**Lasermate Group, Inc.**  
 19608 Camino De Rosa  
 Walnut, CA 91789 USA  
 Tel: (909)718-0999  
 Fax: (909)718-0998  
[sales@lasermate.com](mailto:sales@lasermate.com)  
[www.lasermate.com](http://www.lasermate.com)