



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

**T15D-R13-P-FCHCH**



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### **Description**

The Lasermate T15D-R13-P-FCHCH is a 1550nm MQW-DFB LD, 1310nm PIN receiver, WDM Bi-directional module designed for use in communication applications.

### **Features**

- Single Fiber with Bi-directional Transmission
- Integrated Wavelength Division Multiplexer
- 1550nm MQW-DFB LD
- 1310nm 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

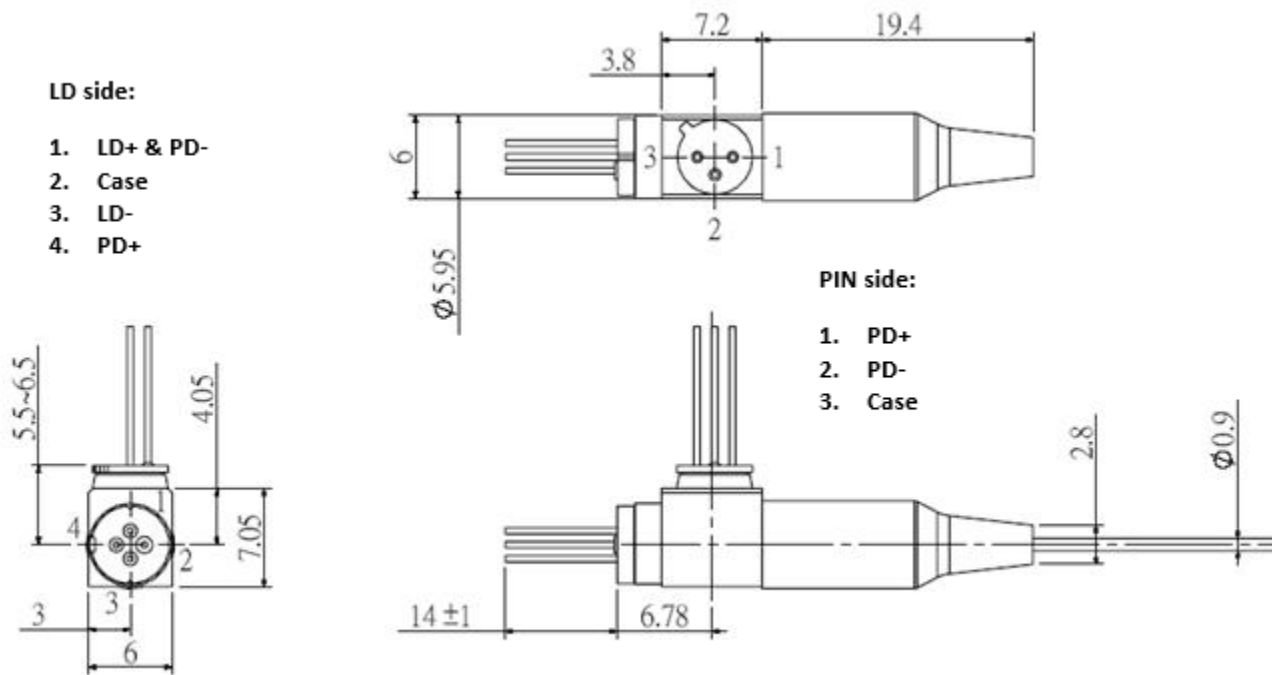
| Absolute Maximum Ratings   |                           |        |         |      |            |
|----------------------------|---------------------------|--------|---------|------|------------|
| Parameters                 |                           | Symbol | Value   | Unit | Conditions |
| Storage 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>  | 1530 | —    | 1570 | 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                | 1260 | —    | 1360 | nm   |                                            |
| Saturation Power                                                                       | P <sub>sat</sub> | 0    | —    | —    | dBm  | V <sub>r</sub> =5V, λ=1310nm               |
| 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                                 | Dcl                                                | 122  | 125  | 128  | um   |
| Mode field diameter                               | Dmf                                                | -    | 10   | -    | um   |
| Coating diameter                                  | Dbc                                                | -    | 0.9  | 1    | mm   |
| Pigtail length*                                   | L                                                  | 0.9  | 1.0  | 1.1  | m    |
| Bending radius                                    | Rb                                                 | 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)