

# Optical Components

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## OL3450L-2, OL3451L-2, OL3453L-2

### Series

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#### 2mWCoaxial DFB Laser Diode Modules

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### 1. DESCRIPTION

The OL3450L-2, OL3451L-2, OL3453L-2 series consist of an MQW-DFB laser diode, a monitor PD, a single-stage optical isolator, a single-mode fiber and a coaxial package.

These modules are coaxial DFB Laser Diode Modules for 2.5Gbit/s transmission with high power at high temperature.

### 2. FEATURES

- Fiber output power:  $P_f=2.0\text{mW}$
- Wide operating temperature range:  $T_c=0$  to  $+70^\circ\text{C}$
- Side mode suppression: 32dB
- Multi-quantum-well (MQW) DFB structure
- Internal monitor PD for power control
- Built-in single-stage optical isolator
- Coaxial Package
- No TEC required

### 3. APPLICATION

- OC-48, STM-16

#### 4. OPTICAL AND ELECTRICAL CHARACTERISTICS

(T<sub>c</sub> = 0 to +70°C, unless otherwise specified)

| Parameter                    | Symbol                         | Test Conditions                                   | Min. | Typ.  | Max.                     | Unit  |
|------------------------------|--------------------------------|---------------------------------------------------|------|-------|--------------------------|-------|
| Fiber Output Power           | P <sub>f</sub>                 | CW                                                | 2.0  |       |                          | mW    |
| Fiber Output Power (Average) | P <sub>AVG</sub>               | Modulated                                         | 1.0  |       |                          | mW    |
| Threshold Current            | I <sub>th</sub>                | T <sub>c</sub> =+25°C, CW, BOL                    |      | 7     | 15                       | mA    |
|                              |                                | T <sub>c</sub> =+70°C, CW, BOL                    |      | 25    | 40                       |       |
|                              |                                | T <sub>c</sub> =+70°C, CW, EOL                    |      |       | 1.5*I <sub>th</sub> -BOL |       |
| Operation Current            | I <sub>op</sub>                | P <sub>f</sub> =2.0mW, CW                         |      | 70    | 110                      | mA    |
| Slope efficiency             | η                              | P <sub>f</sub> =2.0mW, CW, T <sub>c</sub> =+25°C  | 0.05 | 0.064 |                          | W/A   |
| Modulation Current           | I <sub>mod</sub>               | P <sub>f</sub> =2.0mW, CW, T <sub>c</sub> =+25°C  |      | 30    | 40                       | mA    |
| Peak Wavelength              | λ <sub>p</sub>                 | P <sub>f</sub> = 2.0mW, CW                        | 1263 |       | 1360                     | nm    |
| Spectral Width               | Δλ                             | P <sub>f</sub> = 2.0mW, CW, -20dB                 |      | 0.2   | 0.5                      | nm    |
| Side-mode suppression ratio  | SMSR                           | P <sub>f</sub> =2.0mW, CW                         | 32   | 40    |                          | dB    |
| Rise/Fall times              | T <sub>r</sub> /T <sub>f</sub> | P <sub>AVG</sub> =1.0mW, 20-80%<br>ExR*=9dB       |      | 0.09  | 0.15                     | ns    |
| Relative Intensity Noise     | RIN                            | P <sub>f</sub> =2.0mW, CW                         |      | -140  | -130                     | dB/Hz |
| Monitor Current              | I <sub>m</sub>                 | P <sub>f</sub> = 2.0mW, CW, T <sub>c</sub> =+25°C | 50   | 400   | 2200                     | μA    |
| Tracking Error**             | TRE                            | P <sub>f</sub> =2.0mW, CW                         | -1   | ---   | +1                       | dB    |

\*ExR=Extinction ratio

\*\*TRE=10\*log{(P<sub>f</sub>@0~+70°C)/(P<sub>f</sub>@25°C)} at I<sub>m</sub> hold(@25°C)

#### 5. ABSOLUTE MAXIMUM RATING

(T<sub>c</sub> = +25°C, unless otherwise specified)

| Parameter                                    | Symbol           | Rating     | Unit |
|----------------------------------------------|------------------|------------|------|
| Fiber Output Power                           | P <sub>f</sub>   | 4          | mW   |
| LD Reverse Voltage                           | V <sub>rl</sub>  | 2          | V    |
| Monitor PD Forward Current                   | I <sub>fd</sub>  | 10         | mA   |
| Monitor PD Reverse Current                   | I <sub>rd</sub>  | 3          | mA   |
| Monitor PD Reverse Voltage                   | V <sub>rd</sub>  | 30         | V    |
| Operating Case Temperature (T <sub>c</sub> ) | T <sub>c</sub>   | 0 to +70   | °C   |
| Storage Temperature                          | T <sub>stg</sub> | -40 to +85 | °C   |
| Lead Soldering Temperature (10s)             | -                | 260        | °C   |

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## 6. CONNECTOR AND FIBER SPECIFICATIONS

| Parameter           | Specifications   | Unit |
|---------------------|------------------|------|
| Type                | SM               | ---  |
| Mode Field Diameter | 9+/-1            | μm   |
| Cladding Diameter   | 125+/-2          | μm   |
| Jacket Diameter     | 900              | μm   |
| Length              | 1(Min)           | m    |
| Connector Type      | FC/SC/LC/MU/MU-J | ---  |

## 7. ORDERING INFORMATION

OL345 0 L – 2 – AF SC

### Pin Assignment

0: C type  
1: A type  
3: B type  
(See P.4)

### Flange type

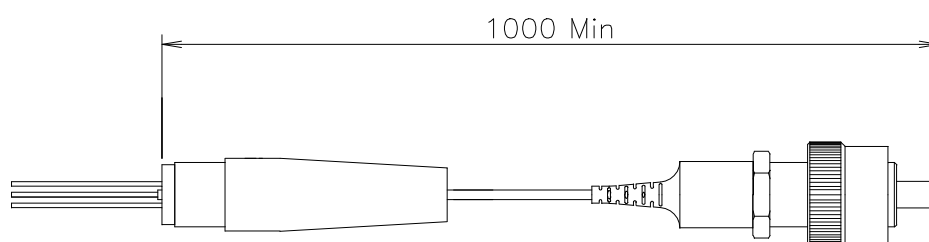
AF: Angled Flange  
SF: Straight Flange  
NF: No Flange

### Connector type

SC: SC Connector  
FC: FC Connector  
LC: LC Connector  
MU: MU Connector  
MUJ: MU-J Connector

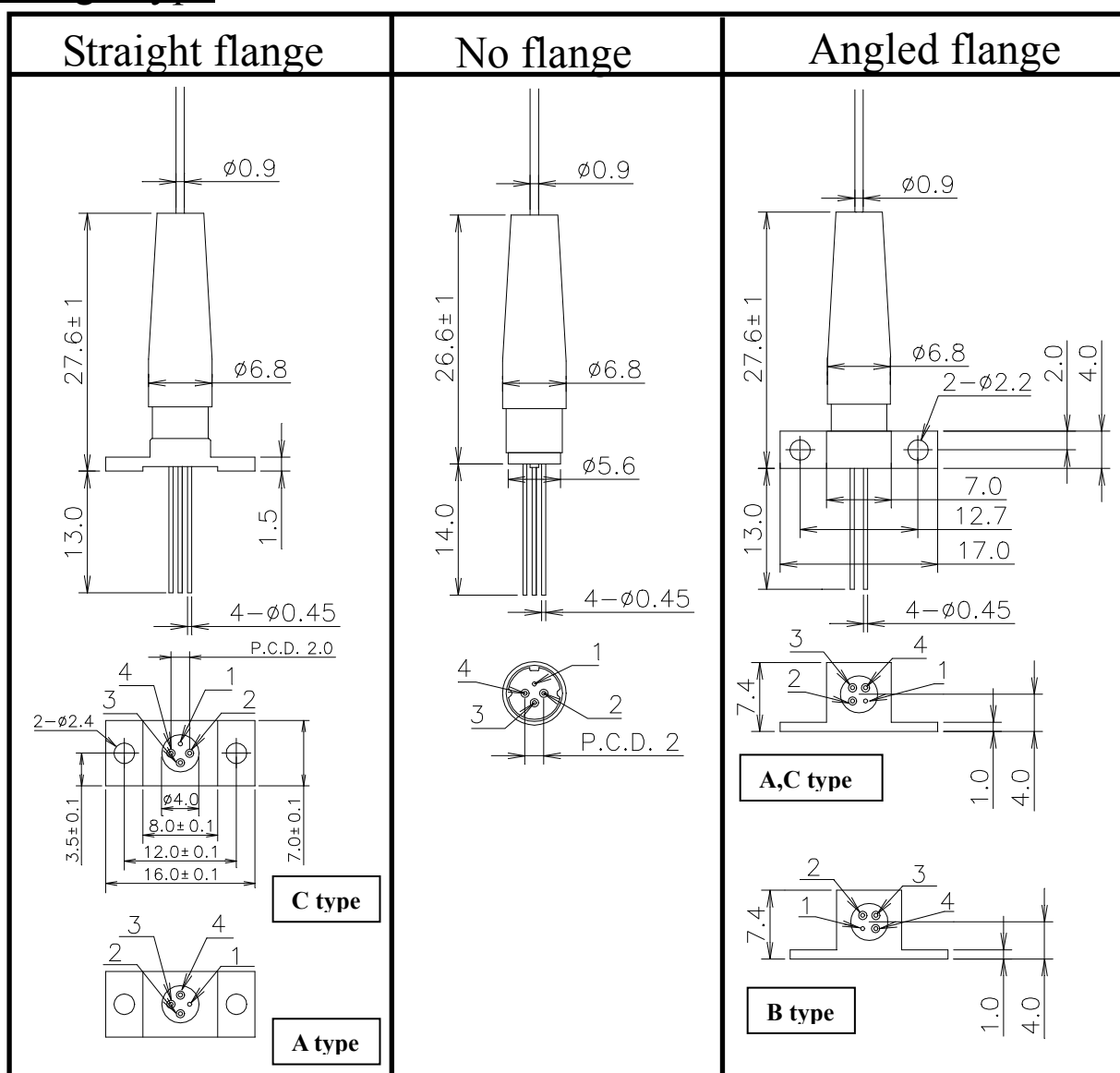
## 8. OUTLINE DRAWING

Length (mm)



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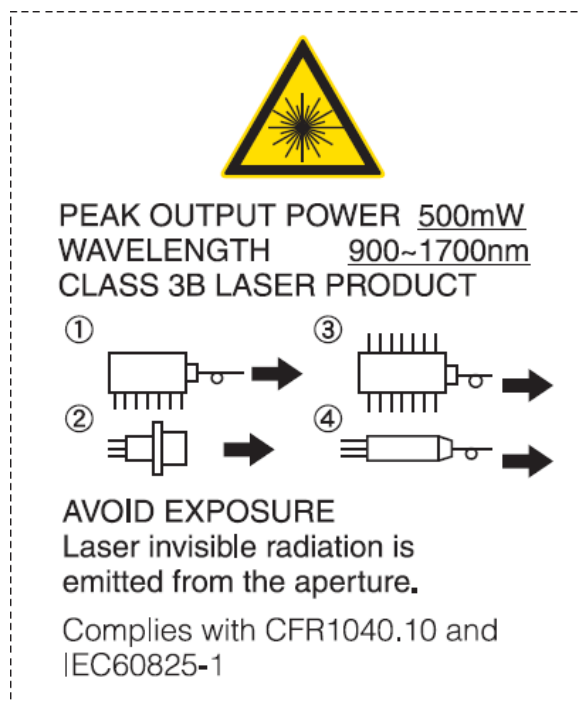
All dimensions in millimeters

Flange TypePin Assignment

| OL3450L (C type)                                                                                                                                                                                                                                                    | OL3451L (A type)       | OL3453L (B type) |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|------------|--|---|------|---|------------|---|----------|---|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|------------|--|---|-----------------|---|------------|---|------------|---|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|------------|--|---|-----------------|---|----------|---|------------|---|------------|
| <table><tr><th colspan="2">PIN configuration</th></tr><tr><th colspan="2">Assignment</th></tr><tr><td>1</td><td>CASE</td></tr><tr><td>2</td><td>LD cathode</td></tr><tr><td>3</td><td>PD anode</td></tr><tr><td>4</td><td>LD anode<br/>PD cathode</td></tr></table> | PIN configuration      |                  | Assignment |  | 1 | CASE | 2 | LD cathode | 3 | PD anode | 4 | LD anode<br>PD cathode | <table><tr><th colspan="2">PIN configuration</th></tr><tr><th colspan="2">Assignment</th></tr><tr><td>1</td><td>LD anode (CASE)</td></tr><tr><td>2</td><td>LD cathode</td></tr><tr><td>3</td><td>PD cathode</td></tr><tr><td>4</td><td>PD anode</td></tr></table> | PIN configuration |  | Assignment |  | 1 | LD anode (CASE) | 2 | LD cathode | 3 | PD cathode | 4 | PD anode | <table><tr><th colspan="2">PIN configuration</th></tr><tr><th colspan="2">Assignment</th></tr><tr><td>1</td><td>LD anode (CASE)</td></tr><tr><td>2</td><td>PD anode</td></tr><tr><td>3</td><td>PD cathode</td></tr><tr><td>4</td><td>LD cathode</td></tr></table> | PIN configuration |  | Assignment |  | 1 | LD anode (CASE) | 2 | PD anode | 3 | PD cathode | 4 | LD cathode |
| PIN configuration                                                                                                                                                                                                                                                   |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| Assignment                                                                                                                                                                                                                                                          |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 1                                                                                                                                                                                                                                                                   | CASE                   |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 2                                                                                                                                                                                                                                                                   | LD cathode             |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 3                                                                                                                                                                                                                                                                   | PD anode               |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 4                                                                                                                                                                                                                                                                   | LD anode<br>PD cathode |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| PIN configuration                                                                                                                                                                                                                                                   |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| Assignment                                                                                                                                                                                                                                                          |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 1                                                                                                                                                                                                                                                                   | LD anode (CASE)        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 2                                                                                                                                                                                                                                                                   | LD cathode             |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 3                                                                                                                                                                                                                                                                   | PD cathode             |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 4                                                                                                                                                                                                                                                                   | PD anode               |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| PIN configuration                                                                                                                                                                                                                                                   |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| Assignment                                                                                                                                                                                                                                                          |                        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 1                                                                                                                                                                                                                                                                   | LD anode (CASE)        |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 2                                                                                                                                                                                                                                                                   | PD anode               |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 3                                                                                                                                                                                                                                                                   | PD cathode             |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |
| 4                                                                                                                                                                                                                                                                   | LD cathode             |                  |            |  |   |      |   |            |   |          |   |                        |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |            |   |            |   |          |                                                                                                                                                                                                                                                                   |                   |  |            |  |   |                 |   |          |   |            |   |            |

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## 9. SAFETY INFORMATION ON THIS PRODUCT



|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Warning</b><br>Laser Beam    | A laser beam is emitted from this laser diode during operation.<br>The invisible or visible laser beam, directly or indirectly, may cause injury to the eye or loss of eyesight.<br>Do not look directly into the laser beam.<br>Avoid exposure to the laser beam, any reflected or collimated beam.                                                                                                                                          |
| <b>Caution</b><br>GaAs Product  | The product contains gallium arsenide, GaAs.<br>GaAs vapor and powder are hazardous to human health if inhaled, ingested or swallowed.<br>Do not destroy or burn the product.<br>Do not crush or chemically dissolve the product.<br>Do not put the product in the mouth.<br>Observe related laws and company regulations when discarding this product.<br>The product should be excluded from general industrial waste or household garbage. |
| <b>Caution</b><br>Optical Fiber | A glass-fiber is attached on the product. Handle with care.<br>When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.                                                                                                                                                                                                                                                                      |

All specifications described herein are subject to change without notice.

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