

# Optical Components

Rev. 3 [10. 2008]

## OF3500B

156Mbps APD-preamplifier coaxial module with a single mode fiber

### 1. DESCRIPTION

OF3500B is an optical receiver module for digital transmission systems up to 156Mbps. It uses an InGaAs avalanche photodiode with a low noise preamplifier. Package style is a hermetically sealed coaxial package with a single mode fiber pigtail.

### 2. FEATURES

Data rate up to 156Mbps  
High responsivity InGaAs-APD : 8.5A/W  
Wide dynamic range  
Typical sensitivity : -47.5dBm  
Low noise  
Small coaxial package

### 3. APPLICATION

SONET OC-3/SDH STM-1 applications  
Long-haul transmission systems up to 156Mbps



### 4. OPTICAL AND ELECTRICAL CHARACTERISTICS

(Wavelength=1550nm , Tc =25°C , Vcc=3.3V, unless otherwise specified)

| Parameter                      | Symbol    | Test Conditions                                                                           | Min. | Typ.  | Max.  | Unit |
|--------------------------------|-----------|-------------------------------------------------------------------------------------------|------|-------|-------|------|
| Wavelength                     | $\lambda$ | --                                                                                        | 1250 | --    | 1620  | nm   |
| APD Breakdown Voltage          | VBR       | ID=10 $\mu$ A                                                                             | 40   | 50    | 70    | V    |
| Temperature Coefficient of VBR | $\gamma$  | --                                                                                        | 0.05 | 0.09  | 0.12  | V/°C |
| APD Responsivity               | RAPD      | $\lambda$ =1.55 $\mu$ m, M=1                                                              | 0.80 | 0.85  | --    | A/W  |
|                                |           | $\lambda$ =1.31 $\mu$ m, M=1                                                              | 0.75 | 0.85  | --    |      |
| Responsivity                   | R         | RL>500 $\Omega$ , M=10,<br>Pin=-43dBm, Differential                                       | 160  | --    | --    | kV/W |
| Bandwidth                      | BW        | f3dB, RL>500 $\Omega$ , M=10                                                              | 120  | --    | --    | MHz  |
| Sensitivity                    | Prmin     | 155Mbps, NRZ,<br>BER=10 <sup>-10</sup> , PRBS2 <sup>23</sup> -1,<br>Rext=12.0dB*, M=Mopt. | --   | -47.5 | -46.5 | dBm  |
| Overload                       | Prmax     | 155Mbps, NRZ,<br>BER=10 <sup>-10</sup> , PRBS2 <sup>23</sup> -1,<br>M=3                   | -7   | -5    | --    | dBm  |
| Supply Current                 | ICC       | Pin = 0mW                                                                                 | --   | 21    | 26    | mA   |
| Recommended TIA Supply Voltage | VCC       | --                                                                                        | 3.1  | 3.3   | 3.5   | V    |
| Optical Return Loss            | ORL       | --                                                                                        | --   | --    | -27   | dB   |

\*) Extinction ratio of LD source.

**OF3500B**

**5. ABSOLUTE MAXIMUM RATING**

(Tc = 25 °C, unless otherwise specified)

| Parameter             | Symbol | Rating     | Unit |
|-----------------------|--------|------------|------|
| APD Bias Voltage      | VB     | 0 to VBR   | V    |
| TIA Supply Voltage    | Vcc    | 4.5        | V    |
| APD Forward Current   | IF     | 2          | mA   |
| APD Reverse Current   | IR     | 2(cw)      | mA   |
| Operating Temperature | Tc     | -40 to +85 | °C   |
| Storage Temperature   | Tstg   | -40 to +85 | °C   |

**6. CONNECTOR AND FIBER SPECIFICATIONS**

| Parameter           | Specifications | Unit |
|---------------------|----------------|------|
| Type                | SM             | --   |
| Flame Rating        | UL94 V-0       | --   |
|                     | UL1581 VW-1    | --   |
| Mode Field Diameter | 10             | μm   |
| Cladding Diameter   | 125            | μm   |
| Jacket Diameter     | 900            | μm   |
| Length              | 1 (Min.)       | m    |
| Standard Connector  | FC/PC or SC/PC | --   |

**7. ORDERING INFORMATION**

OF3500B - \_ \_ \_ \_

ex.) OF3500B-WFFC

OF3500B with a flange and FC connector.

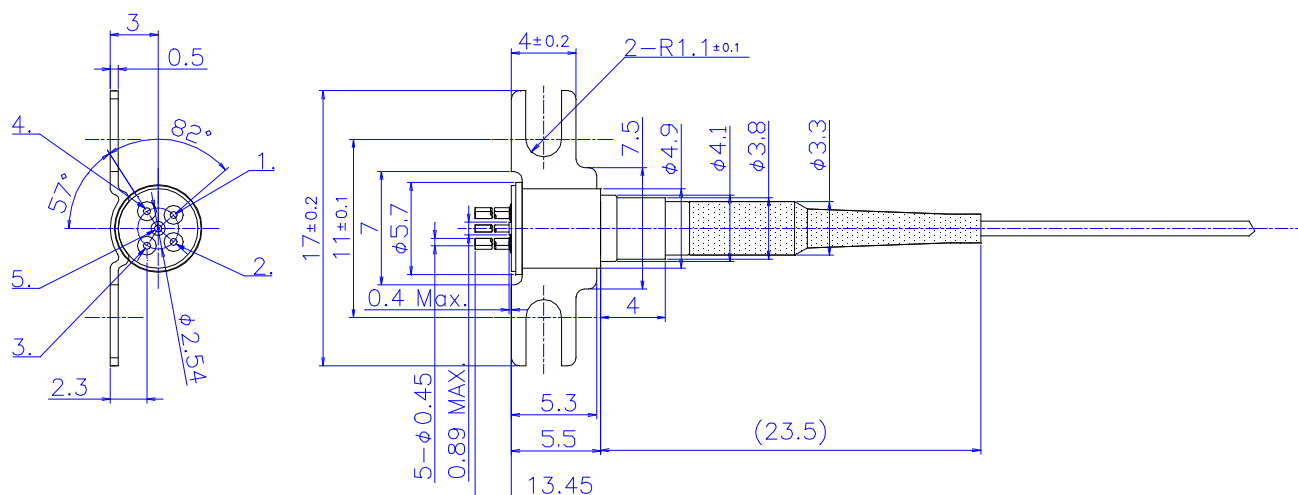
| <u>Flange</u> | <u>Connector</u> |
|---------------|------------------|
| WF            | FC               |
| NF            | SC               |
|               | LC               |
|               | MU               |

## OF3500B

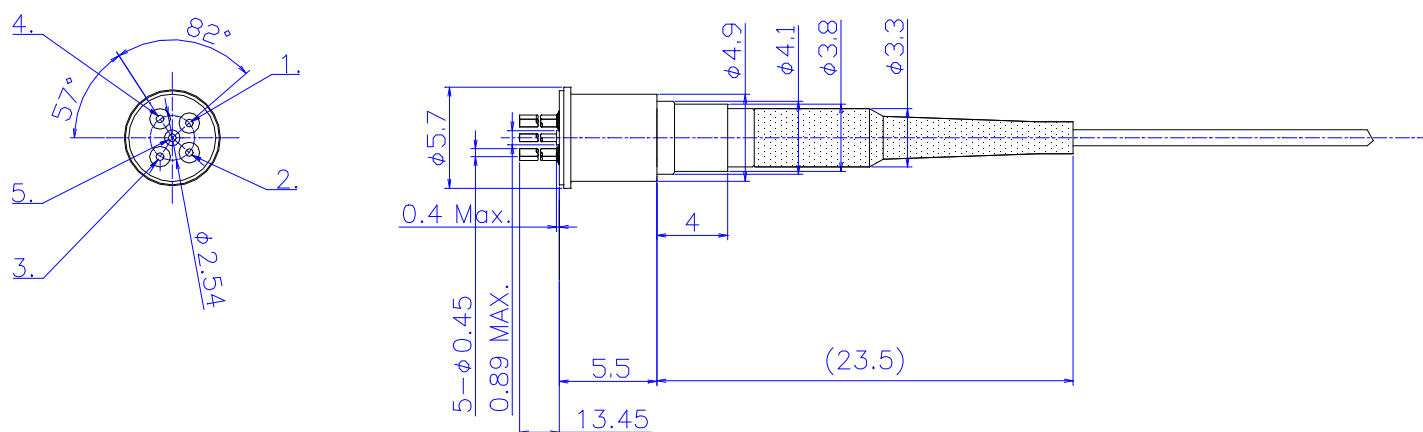
### 8. OUTLINE DRAWING

All dimensions in millimeters

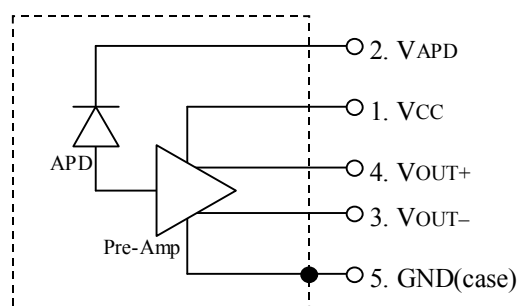
Package No. OF3500B-WF\_\_



Package No. OF3500B-NF\_\_



| Pin Connection |           |
|----------------|-----------|
| 1              | VCC       |
| 2              | VAPD      |
| 3              | VOUT-     |
| 4              | VOUT+     |
| 5              | GND(case) |



**NOTE**

Under the condition “ $V_{APD}$  set, but with  $V_{cc}$  absent”, optical inputs may result in damage to the TIA. It is necessary to set  $V_{cc}$  before optical inputs to prevent such trouble.

**SAFETY INFORMATION ON THIS PRODUCT**

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Caution</b><br><br>GaAs<br>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><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.                                                                                                                                                                                                                                                                      |

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