

## Pigtailed PD for analog application TAP4NN3 series



- Long wavelength InGaAs PIN-PD
- Detection wavelength range of 1.1 $\mu$ m to 1.6 $\mu$ m
- SMF or MMF Pigtailed
- SC, FC, ST, or LC Connector

### Family Model

TAP4NN3

TZP4NN3

TBP4NN3

### Features

- InGaAs long wavelength PIN photodiode
- Operation at 1310nm & 1550nm
- High responsivity, low dark current and low capacitance
- Operating temperature ; -40 $^{\circ}$ C to +85 $^{\circ}$ C
- Single-mode fiber or multimode fiber pigtailed with SC or FC connector

### Description

The TxP4NN3 series is a reliable InGaAs PIN photodiode module pigtailed with SMF or MMF.

The parts of pigtailed PD module – single-mode fiber, lens and photodiode - are actively aligned by high power YAG laser welding method. This packaging guarantees high detector responsivity and low deviation 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.651 and 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.

- Analog application(for CATV Return Path-TAP4NN3, for CATV Forward Path-TZP4NN3, for Wireless fiber optic Repeater-TBP4NN3)
- SCM(Sub-Carrier Multiplexing) Transmission
- Subscriber loops
- Private optical networks

## Absolute Maximum Ratings

| Parameters                    | Symbol    | Unit                          | Min. | Max.   | Remarks     |
|-------------------------------|-----------|-------------------------------|------|--------|-------------|
| Ambient Operating Temperature | $T_{op}$  | $^{\circ}\text{C}$            | -40  | 85     | Outdoor use |
| Storage Temperature           | $T_{stg}$ | $^{\circ}\text{C}$            | -40  | 85     |             |
| Reverse Voltage               | $V_{RP}$  | V                             | -    | 15/20/ |             |
| Reverse Current               | $I_{RP}$  | mA                            | -    | 3/1 /  |             |
| Forward Current               | $I_{FL}$  | mA                            | -    | 50/2/  |             |
| Lead Soldering Temp./Time     |           | $^{\circ}\text{C}/\text{sec}$ |      | 260/10 |             |

## Electrical & Optical Characteristics

(T<sub>op</sub> = 25 $^{\circ}\text{C}$ )

| Parameters                | Symbol        | Condition                                                                                | Unit          | Min.         | Typ.         | Max. | Remark                                                                  |
|---------------------------|---------------|------------------------------------------------------------------------------------------|---------------|--------------|--------------|------|-------------------------------------------------------------------------|
| Detection range           | $\lambda$     | $V_R=5\text{V}$ , $R>0.75$<br>$R > 0.65$                                                 | $\mu\text{m}$ | 1.1          |              | 1.6  |                                                                         |
| Responsivity              | R             | $V_R=5\text{V}$ , $\lambda=1.3\mu\text{m}$<br>$V_R=5\text{V}$ , $\lambda=1.5\mu\text{m}$ | A/W           | 0.80<br>0.85 | 0.85<br>0.90 |      |                                                                         |
| Dark Current              | $I_D$         | $V_R=5\text{V}$                                                                          | nA            |              |              | 1.0  |                                                                         |
| Cut-off Frequency         | $f_c$         | -3dB, $V_R=5\text{V}$                                                                    | GHz           | 2/3          |              |      | $R_L=50\Omega$                                                          |
| Reverse Breakdown Voltage | $V_{BD}$      | $V_R=5\text{V}$ , $I_{RD}=1\mu\text{A}$                                                  | V             | 25/0         |              |      |                                                                         |
| Capacitance               | C             | $V_R=5\text{V}$ , $f=1\text{MHz}$                                                        | pF            |              |              | 0.6  |                                                                         |
| Second-Order Distortion   | IMD2          | $V_R=12\text{V}$ ,<br>$P_{AVG}=0\text{dBm}$ ,<br>OMI=0.4, Note1                          | dBc           |              |              | -70  | TAP4NN3 <sup>1)</sup><br>TZP4NN3 <sup>2)</sup><br>TBP4NN3 <sup>3)</sup> |
| Third-Order Distortion    | IMD3          | Note 1                                                                                   | dBc           |              |              | -75  | TZP4NN3 <sup>2)</sup><br>TBP4NN3 <sup>3)</sup>                          |
| Back Reflection           | IL            |                                                                                          | dB            |              |              | -45  |                                                                         |
| Active Area Diameter      | $\varnothing$ |                                                                                          | $\mu\text{m}$ |              | 75/70<br>45  |      | for 2GHz<br>for 5GHz                                                    |

Note1-1) TAP4NN3 : Two-tone test condition :  $f_1=13\text{MHz}$ ,  $f_2=19\text{MHz}$ ,  $f_1\pm f_2$ Note1-2) TZP4NN3 : Two-tone test condition :  $f_1=320\text{MHz}$ ,  $f_2=450\text{MHz}$ ,  $f_1\pm f_2$ ,  $\lambda=1550\text{nm}$  per channel

Note1-3) TBP4NN3 : same as the Note1-2

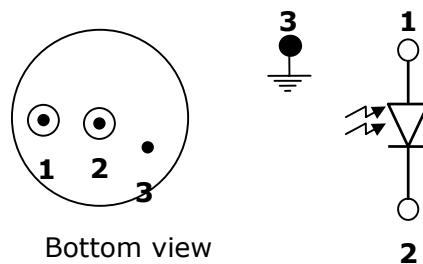
## ! Handling Caution

The Photo-diode 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

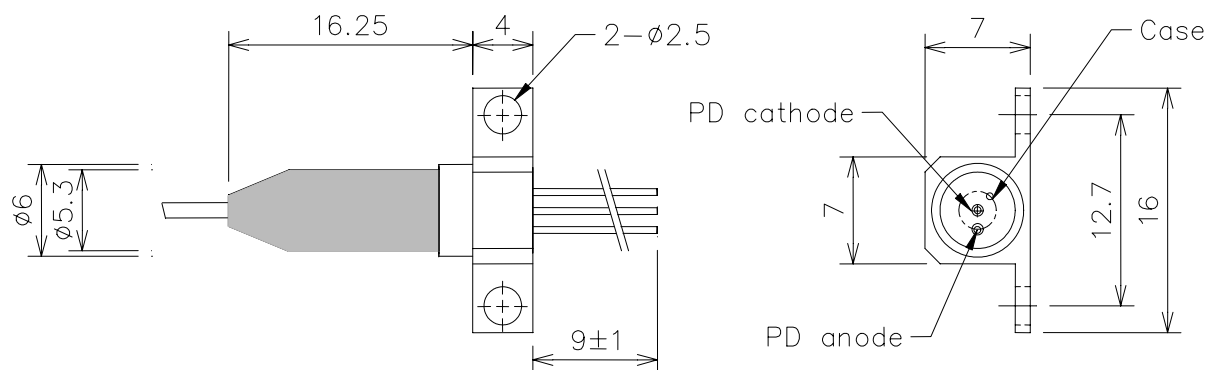
## Pin Description

| Pin No. | Symbol   | Description |
|---------|----------|-------------|
| 1       | $A_{PD}$ | PD anode    |
| 2       | $K_{PD}$ | PD cathode  |
| 3       | GND      | Case ground |

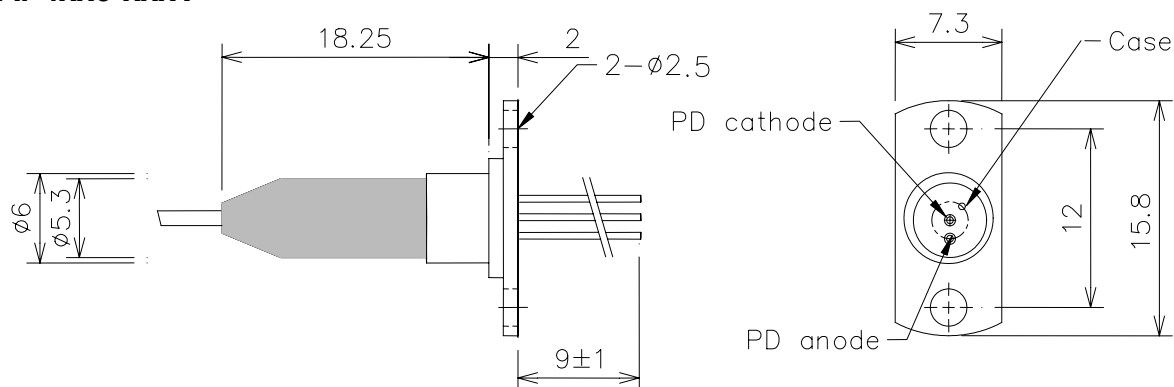


## Outline Diagram

### – TAP4xx3-xxxH



### – TAP4xx3-xxxV



## – TAP4xx3-xxxN

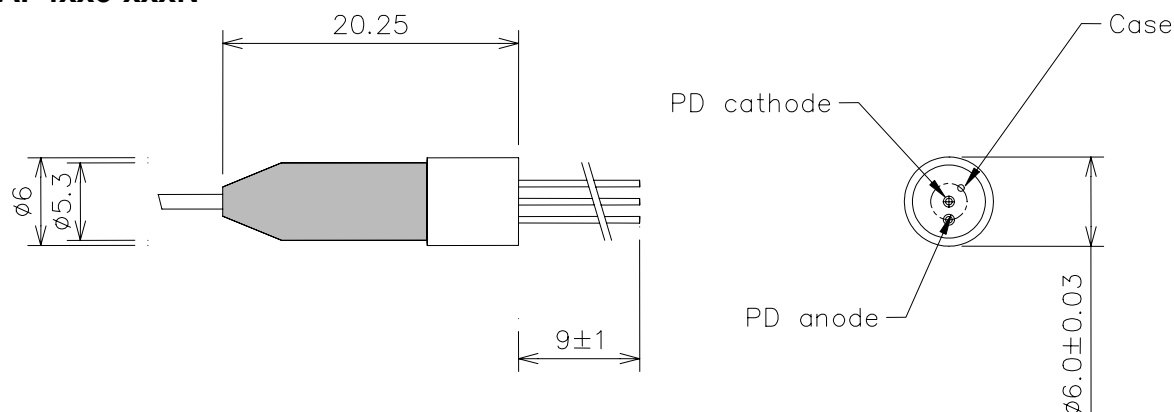


Fig.4 Pigtailed PD Package Dimensions [unit: mm]

## Ordering Information

| Com<br>pany  | Device Type                                                                                                                                 |                                                            | Wave-<br>length                              | Data rate<br>(PIN-TIA)                                                                                                        | Volt.<br>(TIA)                                         | Pin                                                                                                                  |   | Temp.<br>Range                                                                | Fiber                            | Conne<br>ctor                                                                       | Flang<br>e                                                                    |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>T</b>     | <b>A</b>                                                                                                                                    | <b>P</b>                                                   | <b>4</b>                                     | <b>N</b>                                                                                                                      | <b>N</b>                                               | <b>3</b>                                                                                                             | - | <b>I</b>                                                                      | <b>S</b>                         | <b>N</b>                                                                            | <b>H</b>                                                                      |
| Tera<br>dian | <b>A</b> ; PD<br>for CATV<br>Return<br>path<br><b>Z</b> ; PD<br>for CATV<br>Forward<br>Path<br><b>B</b> ; PD<br>for<br>wireless<br>repeater | <b>P</b> ; PIN<br><b>T</b> ; PIN-<br>TIA<br><b>A</b> ; APD | <b>4</b> ;<br>1.3/1.5<br><b>8</b> ;<br>850nm | <b>N</b> ; None<br><b>0</b> ; 51Mbps<br><b>1</b> ; 155Mbps<br><b>4</b> ; 622Mbps<br><b>8</b> ; 1.25Gbps<br><b>G</b> ; 2.5Gbps | <b>N</b> ;<br>None<br><b>3</b> ; 3.3V<br><b>5</b> ; 5V | <b>3</b> ; 3pin<br><b>4</b> ; 4pin<br>(diffe-<br>rential)<br><b>5</b> ; 5pin<br><b>6</b> ; 4pin<br>(single<br>ended) |   | <b>I</b> ; Indoor<br>Use<br>(0~70℃)<br><b>O</b> ; Outdoor<br>Use<br>(-40~85℃) | <b>S</b> ; SMF<br><b>M</b> ; MMF | <b>N</b> ; None<br><b>S</b> ; SC<br><b>F</b> ; FC<br><b>T</b> ; ST<br><b>L</b> ; LC | <b>N</b> ;<br>None<br><b>V</b> ;<br>Vertical<br><b>H</b> ;<br>Hori-<br>zontal |

\*Note 1 ;

- 220m with 62.5/125μm MMF @1.25Gbps
- 500m with 50/125μm MMF @1.25Gbps
- 200m with 62.5/125μm MMF @2.125Gbps

\*Note 2 ; additional order information

- Connector type default is SC/PC and the default length of fiber is 1m

## More Information

## Teradian Inc.

Address 946, Dunsan-dong, Seo-gu, Daejeon, 302-120, Korea  
 Tel +82-42-476-4800, 4803(Oversea Sales Team)  
 Fax +82-42-476-4805  
 Homepage <http://www.teradian.com>  
 e-mail [sales@teradian.com](mailto:sales@teradian.com)