# 10G InGaAs Pin Photodiode W/ TIA

## Description

The A10-TO is a high sensitivity 10G Pin-TIA receiver in a pigtail fiber coupled TO package. It includes a 10G pin photodiode with a high gain TIA in a hermetically sealed package.

## Features

- Dark Current ~ 25 nA (typical)
- High Sensitivity ~16 dBm
- Terminal Capacitance 1 pF at $VBR_{90\%}$
- 8 GHz Cutoff Frequency
- 4K Ohm Transimpedance Gain
- Ability to choose desired optical connector.
- Ability to choose desired fiber length.

## Applications

- 10G RFoF
- 10G Base-L Ethernet
- Fiber Optic Sensors

**Electro-Optical Characteristics ($T_{op}$ 23 ± 3°c, unless otherwise specified)**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_{cc}$ | | 3.3 | 3.6 | V | |
| Supply Current | $I_{cc}$ | | 26 | 35 | mA | $V_{cc}$ = 3.3 V |
| Response Spectrum | λ | 1100 | | 1650 | nm | $V_{cc}$ = 3.3 V |
| Bandwidth | BW | | 8 | | GHz | -3 dB bandwidth |
| Overload | OL | 2.2 | | | dBm | $V_{cc}$ = 3.3 V |
| Sensitivity | Sen | | | -15.5 | dBm | 25.78 Gbps, 1310 nm, ER = 4 dB, BER = $10^{-5}$ |
| Optical Return Loss | ORL | | | -27 | dB | CW = 1310 nm |
| RSSI Offset Current | $I_{RSS}$ | | | 100 | nA | $V_{cc}$ = 3.3 V |
| Responsivity | R | 0.7 | 0.8 | | A/W | 1310 nm, 50 % VBR, M=2, Pin -20 dBm |
| Dark Current | Id | | 25 | 100 | nA | VBr |
| Operation Current | $I_{op}$ | | 6 | | uA | |
| Output Impedance | $Z^{-}_{o}$ | | 100 | | | Differential |
| Maximum Output Voltage | Vo | | 300 | | $mV_{p-p}$ | Differential |
| Low Frequency Cutoff | $F_{low}$ | 25 | 100 | | KHz | |

**Absolute Maximum Ratings**

| Parameter | Symbol | Condition | Min. | Max. | Unit |
|---|---|---|---|---|---|
| Reverse Voltage | $V_r$ | | | 5 | V |
| Forward Current | $I_F$ | | | 8 | mA |
| Reverse Current | $I_R$ | | | 0.5 | mA |
| Optical Input power | $P_{in}$ | | | 10 | mW |
| Storage Temperature | $T_{stg}$ | | -25 | 90 | °C |
| Storage Humidity | $H_{stg}$ | | | 85 | % r.H. |
| Operating Temperature | $T_{op}$ | | -10 | 80 | °C |
| Soldering Temperature | $T_{st}$ | 60 sec | | 200 | °C |
| ESD Susceptibility | | HBM | 100 | | V |

**Operating at maximum ratings for a prolonged period will cause damage to the device.**

## Pin Configuration

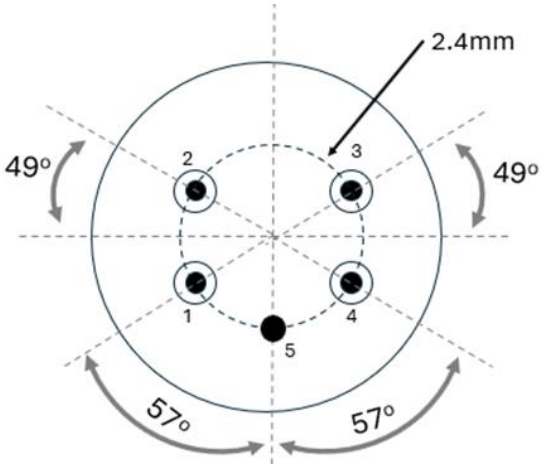



Fig 1A: Bottom View

| Pin Number | Function |
|---|---|
| 1 | Dout (+) |
| 2 | VCC |
| 3 | Imon |
| 4 | Dout (-) |
| 5 | GND |

Table 1: Device Pin out

## Device Dimensions

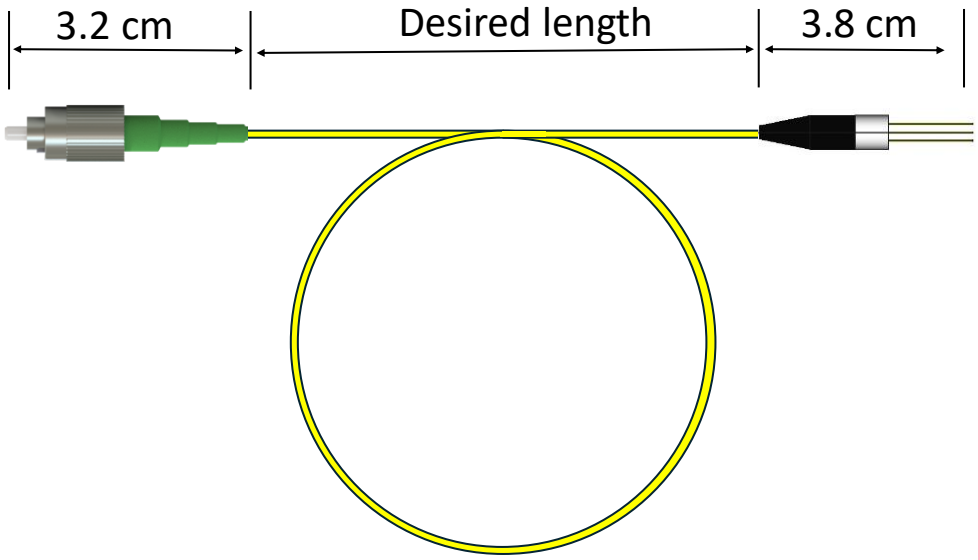
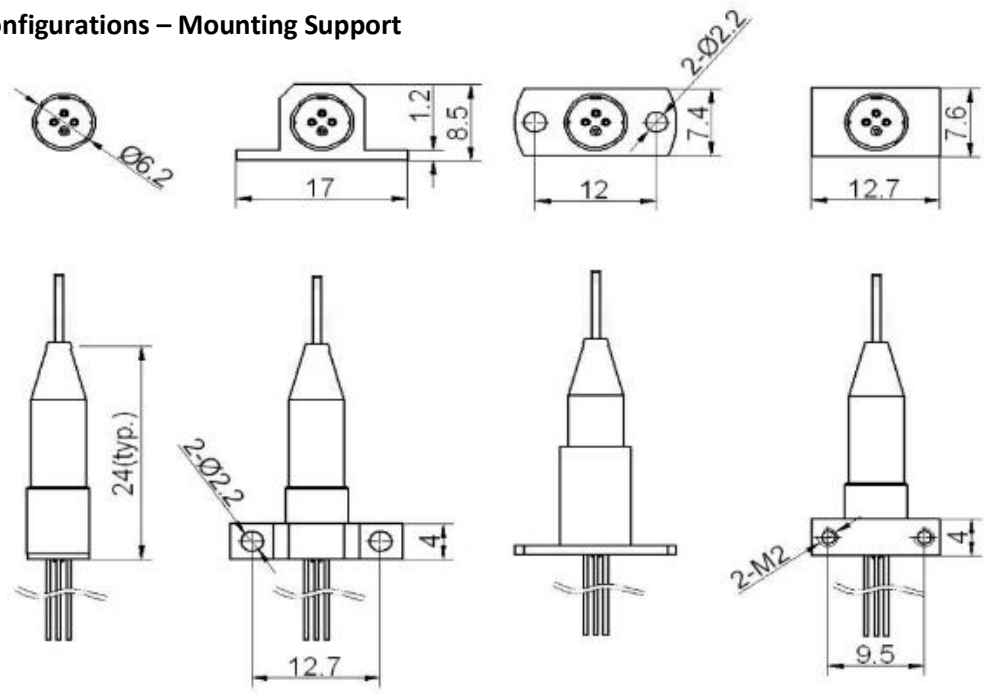



Fig 2: Device mechanical drawing. (All units in mm). Fiber and connector size differs based on build configuration.

**Build Configurations – Mounting Support**




(a) (b) (c) (d)

**Device Nomenclature**

**P10A-TO-X-XX**

**Product Line – 10G Pin Photodiode with TIA**

**Device body style – TO-CAN**

**Device Mounting Support**

- **(a)** No Mount
- **(b)** Horizontal Mount
- **(c)** Vertical Mount
- **(d)** Horizontal threaded

**Optical Connector**

(00) No Connector
(FA) FC/APC
(FP) FC/PC
(CA) LC/APC
(CP) LC/PC

**Inquiry Information**

**Sales:** All inquiries regarding sales please contact Sales@NuPhotonics.com

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