



## 2.5G Avalanche Photodiode OTDR

### Description

The A25-OTDR is an avalanche photodiode specifically designed for OTDR applications. This device was optimized to deliver low dark current and low spectral noise density. This makes the device ideal for OTDR applications. This device offers a direct drop in TO-Can package with customizable Multimode fiber and optical connector. The device features a 50 micron active area.

### Features

- Dark Current  $\sim 0.8$  nA
- Spectral Noise Density  $\sim 0.5 \frac{pA}{\sqrt{Hz}}$
- Terminal Capacitance 0.7 pF at VBR<sub>90%</sub>
- High Quantum efficiency
  - $\eta = 90\%$  at  $\lambda = 1310$  nm, M=1
  - $\eta = 77\%$  at  $\lambda = 1550$  nm, M=1
- 2.5 GHz Cutoff Frequency
- Ability to choose desired optical connector.
- Ability to choose desired fiber type.
- 50 Micron Active Area



### Applications

- Optical time-domain reflectometer (OTDR)



**Electro-Optical Characteristics ( $T_{op} 23 \pm 3^{\circ}C$ , unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Reverse Breakdown Voltage	VBR	40	45	55	V	ID = 100
Temperature Coefficient reverse breakdown voltage	$\delta$		0.1		%/°C	
Dark Current	ID		5		nA	Taken at 90% VBR
Multiplied Dark Current	IDM		0.8		nA	M = 10
Terminal Capacitance	Ct		0.7		Pf	Taken at 90% VBR at f = 1 MHz
Cut-Off Frequency	fC		2.5		GHz	M = 10
Quantum Efficiency	$\eta$	76	90		%	$\lambda = 1310 \text{ nm}$ , M = 1
		65	77			$\lambda = 1550 \text{ nm}$ , M = 1
Responsivity	S		0.9		A/W	$\lambda = 1310 \text{ nm}$ , M = 1, Pin = 1 $\mu$ W
			0.7			$\lambda = 1550 \text{ nm}$ , M = 1, Pin = 1 $\mu$ W
Multiplication factor	M		30			$\lambda = 1550 \text{ nm}$ , IPO = 1.0 $\mu$ w, VBR-1.2V
Excess Noise Factor	X		0.7			$\lambda = 1310 \text{ nm}$ , IPO = 1.0 $\mu$ w, M = 10, f = 35 MHz
	F		5			$\lambda = 1310 \text{ nm}$ , IPO = 1.0 $\mu$ w, M = 10, f = 35 MHz
Optical Return Loss	ORL	30			dB	SMF
Spectral Noise Density	SN	0	0.5		$\frac{pA}{\sqrt{Hz}}$	Taken at M = 30, with DC source

**Absolute Maximum Ratings**

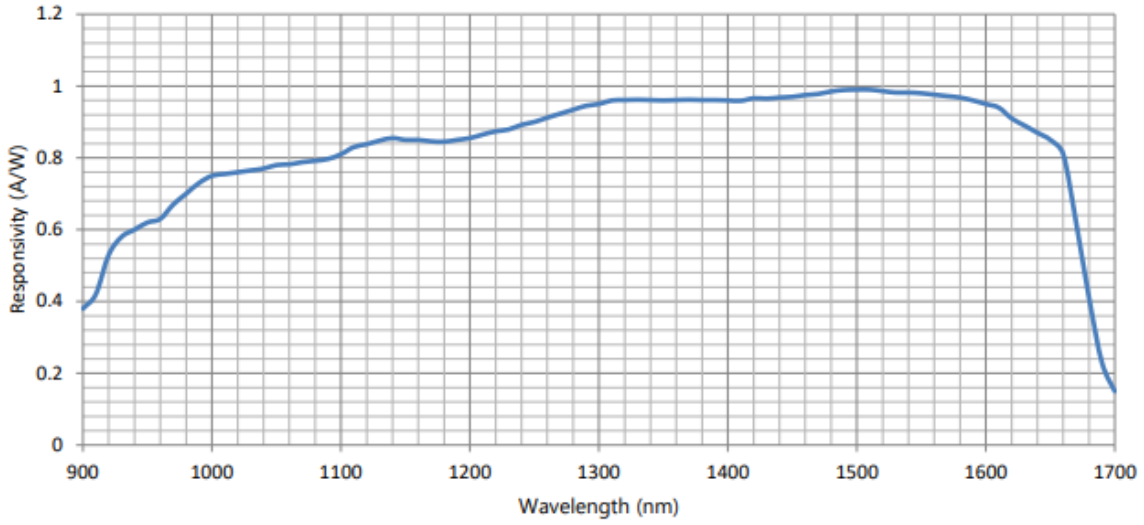
Parameter	Symbol	Condition	Min.	Max.	Unit
Reverse Voltage	$V_r$			55	V
Forward Current	$I_F$			8	mA
Reverse Current	$I_R$			0.5	mA
Optical Input power	$P_{in}$			0.3	mW
Storage Temperature	$T_{stg}$		-25	90	°C
Storage Humidity	$H_{stg}$			85	% r.H.
Operating Temperature	$T_{op}$		-10	80	°C
Soldering 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.  
**Typical Performance Curves ( $T_{op} = 25^{\circ}C \pm 5$ )**

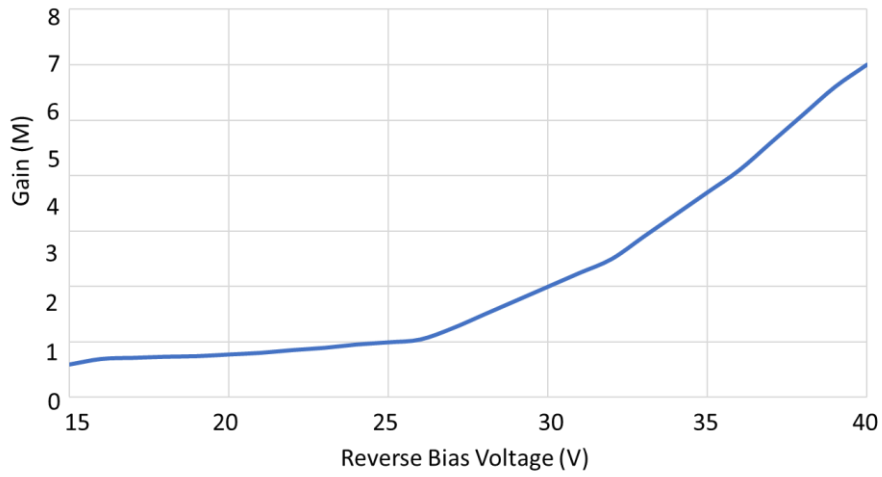
**Dark Current Vs. Gain**



**Responsivity VS Wavelength (M=1)**



**Plateau around M = 1**



## Pin Configuration

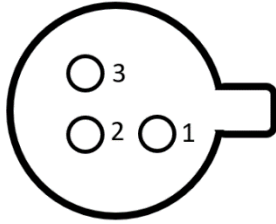


Fig 1A: Bottom View

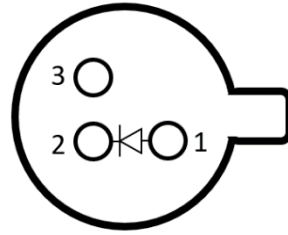


Fig 1B: Functional Diagram

Pin Number	Function
1	PD Anode (+)
2	PD Cathode (-)
3	Case Ground

Table 1: Device Pin out

## Device Dimensions

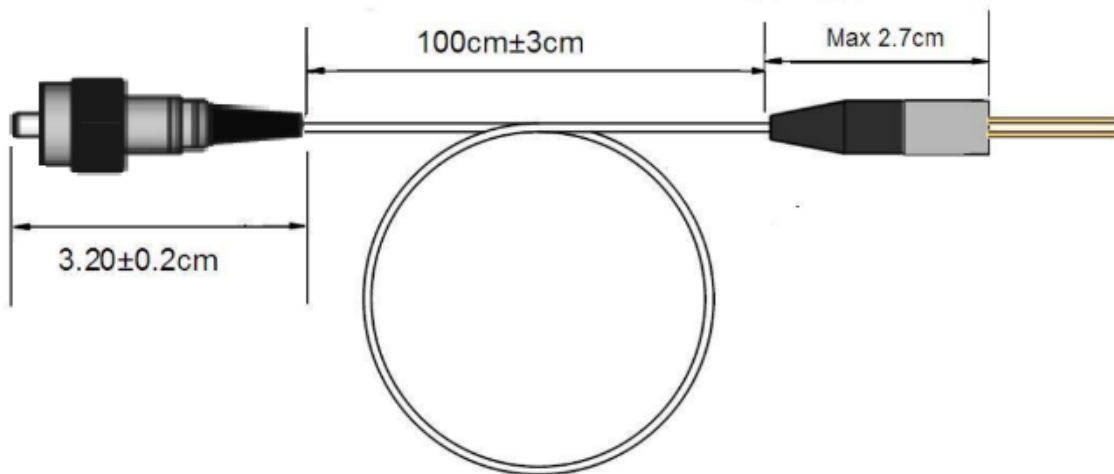
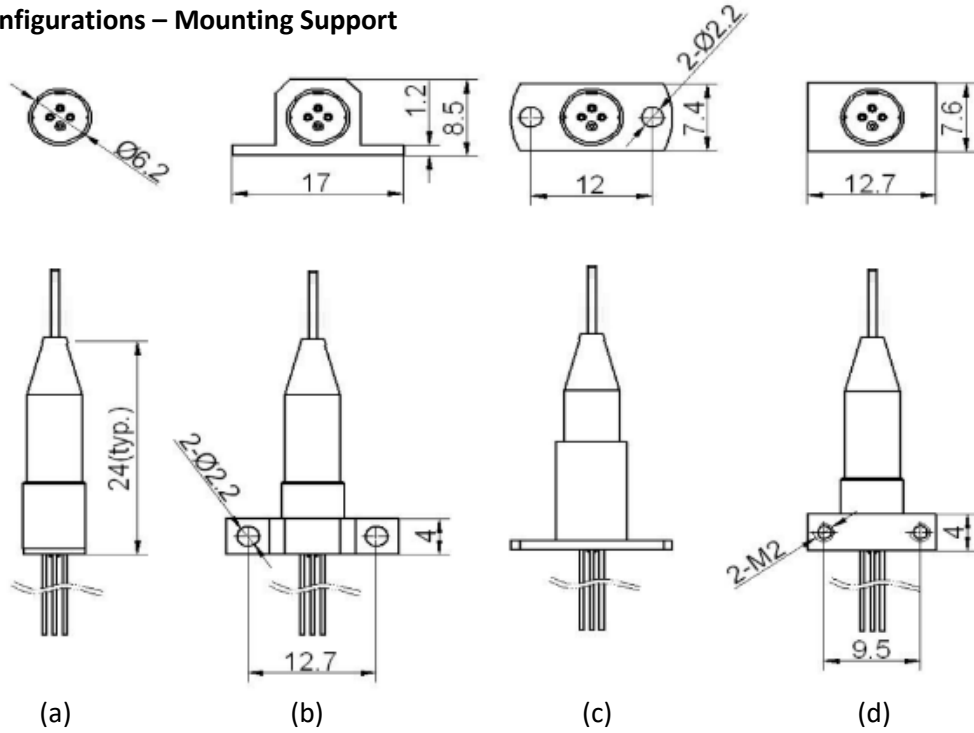


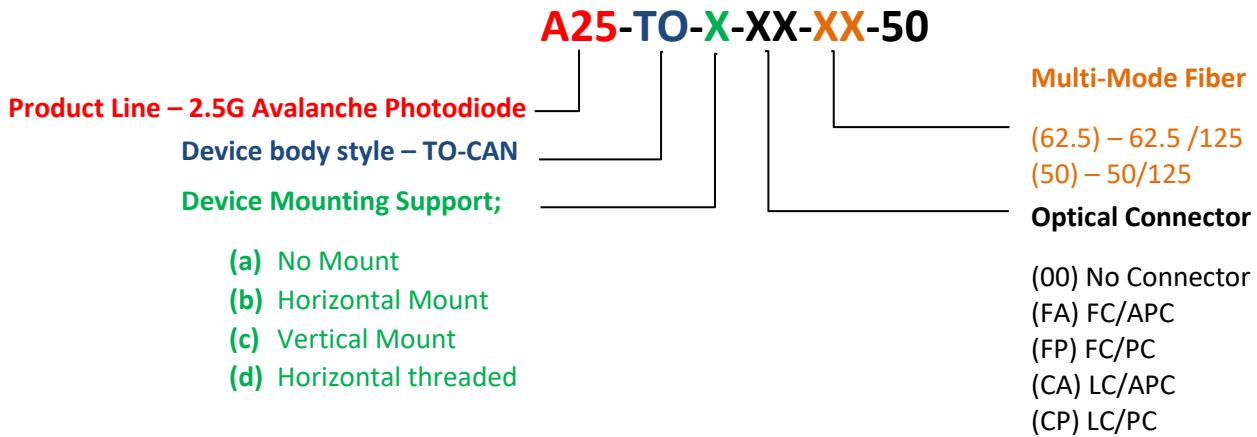
Fig 2: Device mechanical drawing. (All units in mm). Fiber and connector size differs based on build configuration.



## Build Configurations – Mounting Support



## Device Nomenclature



## **Inquiry Information**

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