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 single mode fiber and optical connector.
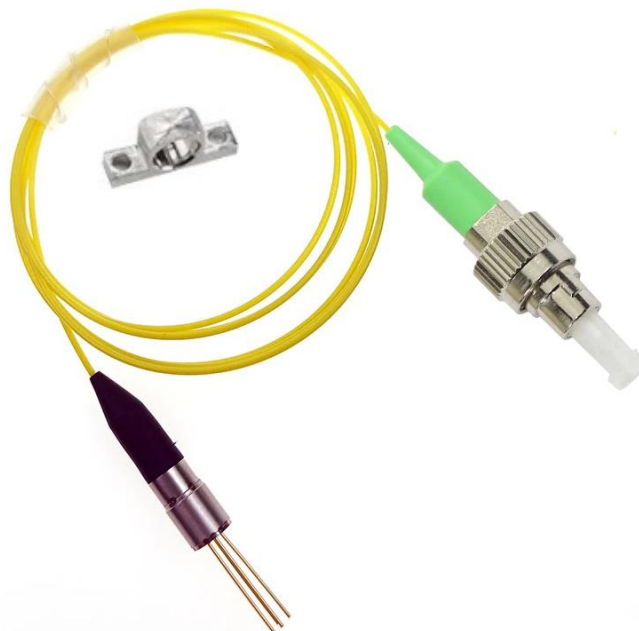
Features

- Dark Current ~ 2 nA
- Spectral Noise Density ~ $1 \frac{pA}{\sqrt{Hz}}$
- Terminal Capacitance 0.35 pF at $VBR_{90\%}$
- High Quantum efficiency
  - η = 90% at λ = 1310 nm, M=1
  - η = 77% at λ = 1550 nm, M=1
- 2.5 GHz Cutoff Frequency
- Ability to choose desired optical connector.
- Ability to choose desired fiber type.

Applications

- Optical time-domain reflectometer (OTDR)

Electro-Optical Characteristics (T$_{op}$ 23 ± 3ºc, 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	δ		0.2		%/°C	
Dark Current	ID	1	2	25	nA	Taken at 90% VBR
Multiplied Dark Current	IDM		1	3	nA	M = 2 to 10
Terminal Capacitance	Ct		0.35		Pf	Taken at 90% VBR at f = 1 MHz
Cut-Off Frequency	fC		2.5		GHz	M = 10
Quantum Efficiency	η	76	90		%	λ = 1310 nm , M = 1
		65	77			λ = 1550 nm , M = 1
Responsivity	S	0.85	0.9		A/W	λ = 1310 nm , M = 1
		0.9	0.95			λ = 1550 nm , M = 1
Multiplication factor	M	30	40			λ = 1310 nm, IPO = 1.0 µw, VR = V (at ID = 1 µA)
Excess Noise Factor	X		0.7			λ = 1310 nm, IPO = 1.0 µw, M = 10, f = 35 MHz
	F		5			λ = 1310 nm, IPO = 1.0 µw, M = 10, f = 35 MHz
Optical Return Loss	ORL	30			dB	SMF
Spectral Noise Density	SN	0.2	0.5	1.5	$\frac{pA}{\sqrt{Hz}}$	Taken at M = 40, 50, and 60 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$_{in}$			10	mW
Storage Temperature	T$_{stg}$		-25	90	ºC
Storage Humidity	H$_{stg}$			85	% r.H.
Operating Temperature	T$_{op}$		-10	80	ºC
Soldering Temperature	T$_{st}$	60 sec		200	ºC
ESD Susceptibility		HBM	100		V

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

NuPhotonics

Typical Performance Curves (T$_{op}$ = 23°C ± 3)

Dark Current Vs. Gain

—— 25°C	– – – – 45°C	– · – 65°C

8 nA limit at M =65, T= 45°C

2.5 nA limit at M = 65, T = 25°C

Gain Vs. Reverse Bias Voltage

Plateau around M= 1

NuPhotonics
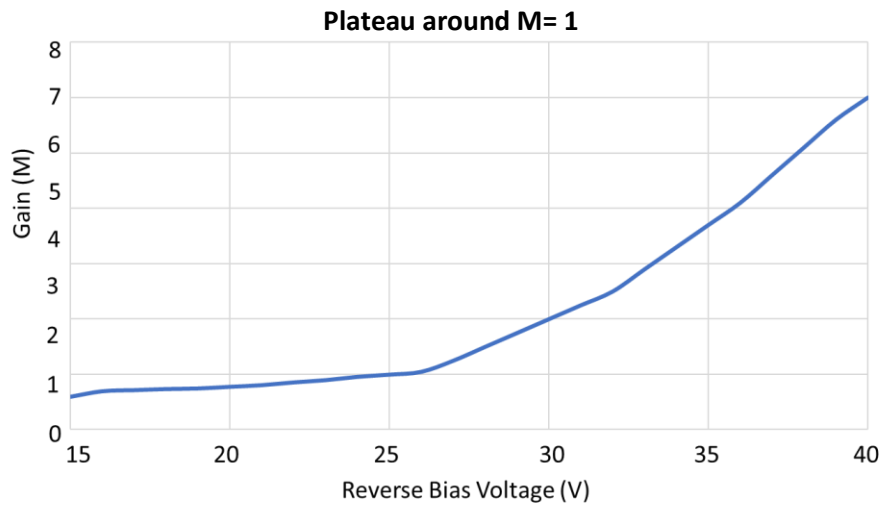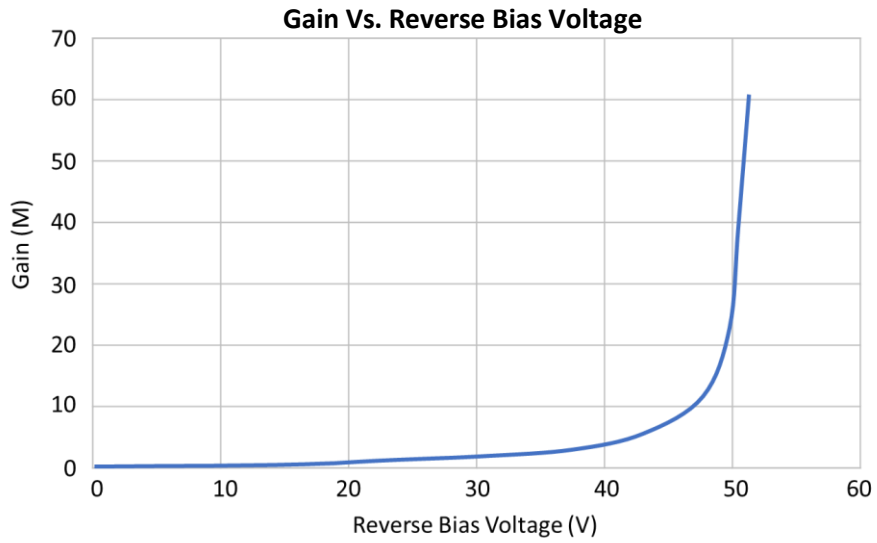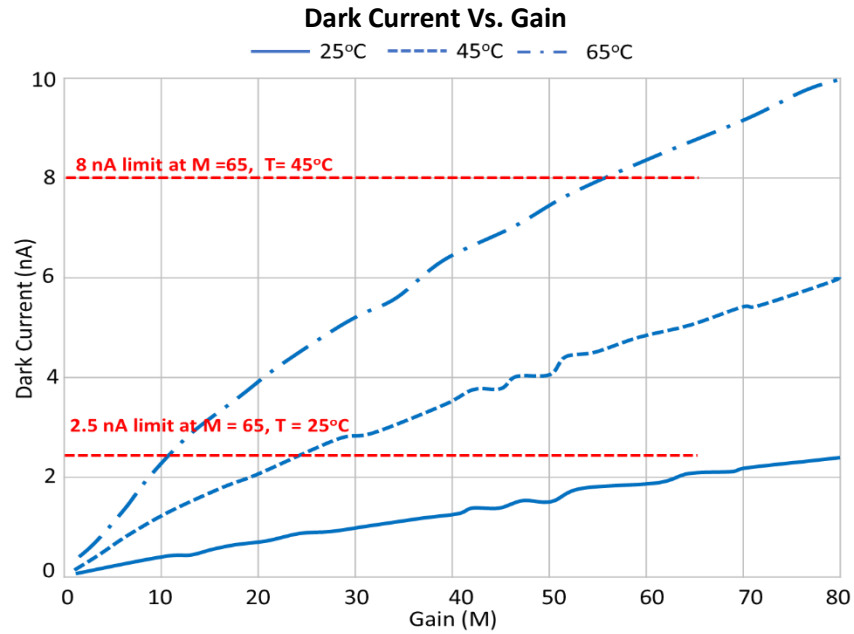
Pin Configuration
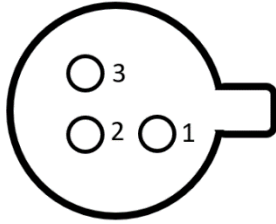
Fig 1A: Bottom View
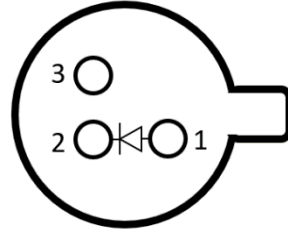
Fig 1B: Functional Diagram

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

Table 1: Device Pin out

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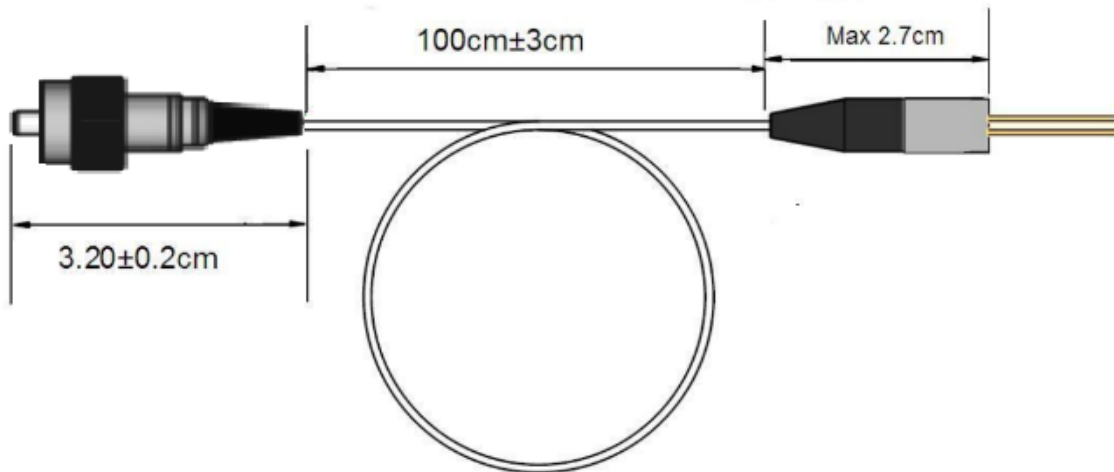
Fig 2: Device mechanical drawing. (All units in mm). Fiber and connector size differs based on build configuration.

NuPhotonics

Build Configurations – Mounting Support

(a)   (b)   (c)   (d)
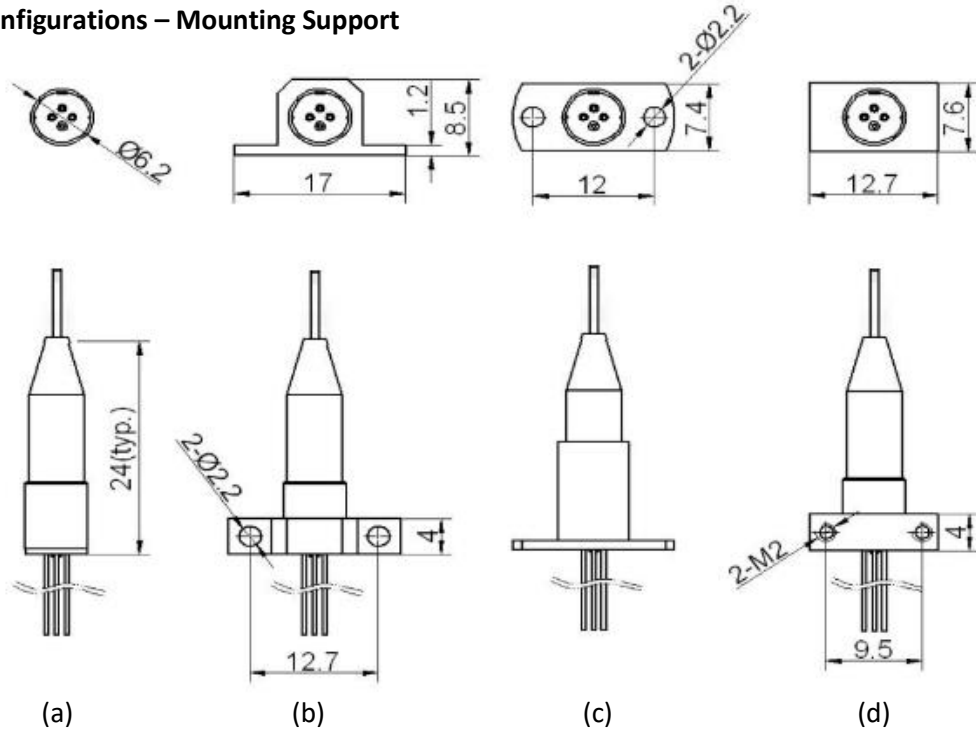
Device Nomenclature

A25-TO-X-XX

Product Line – 2.5G Avalanche Photodiode —

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

NuPhotonics

Inquiry Information

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

General: If you are interested in a custom solution, general information, or engineering related information please contact Inquiry@NuPhotonics.com

IMPORTANT NOTICES AND DISCLAIMERS

Definitions: Product State

Alpha Build: Devices in Alpha build are in internal engineering build and testing stages. Major changes may happen for production build.

Beta Build: Devices in Beta build are for external customer and engineering sample testing stages. Minor changes may happen for production build.

Production Build: Customer ready devices. Small appearance changes may occur between devices.

Obsolete: Currently not supported.