25G InGaAs Avalanche Photodiode TIA ROSA-LC Package

Description

A 25 Gb/s InGaAs Avalanche photodiode packaged with a transimpedance amplifier (TIA). This device is packaged in a TO-Can with LC receptable. It comes configured with a Flex PCB. The device features an optional LC-Flange receptacle for easy LC fiber optic cable insertion. Offering flat response and a broad temperature operating range.

Features

- TO-Can Package
- LC- Receptacle
- 25 Gbps
- Wide Temperature operating range
- TIA Built-in
- -24 dBm Typical sensitivity
- 1K Ohm Transimpedance Gain

Applications

- Telecommunications
- RF over Fiber (RFoF)

Electro-Optical Characteristics (T = 25°C**)**

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	1260	-	1600	nm	V_{cc} = 3.3 V
Bandwidth	BW	-	21	-	GHz	-3 dB bandwidth
Overload	OL	2.2	-	-	dBm	V_{cc} = 3.3 V
Sensitivity	Sen	-	-	-22	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, Pin -20 dBm
Dark Current	Id	-	100	-	nA	VBr
Output Impedance	Z_o	-	100	-		Differential
Maximum Output Voltage	Vo	-	300	-	mV_{p-p}	Differential
Low Frequency Cutoff	F_{low}	25	100	-	KHz	
APD Supply Voltage	V_{apd}	20	-	27	V	

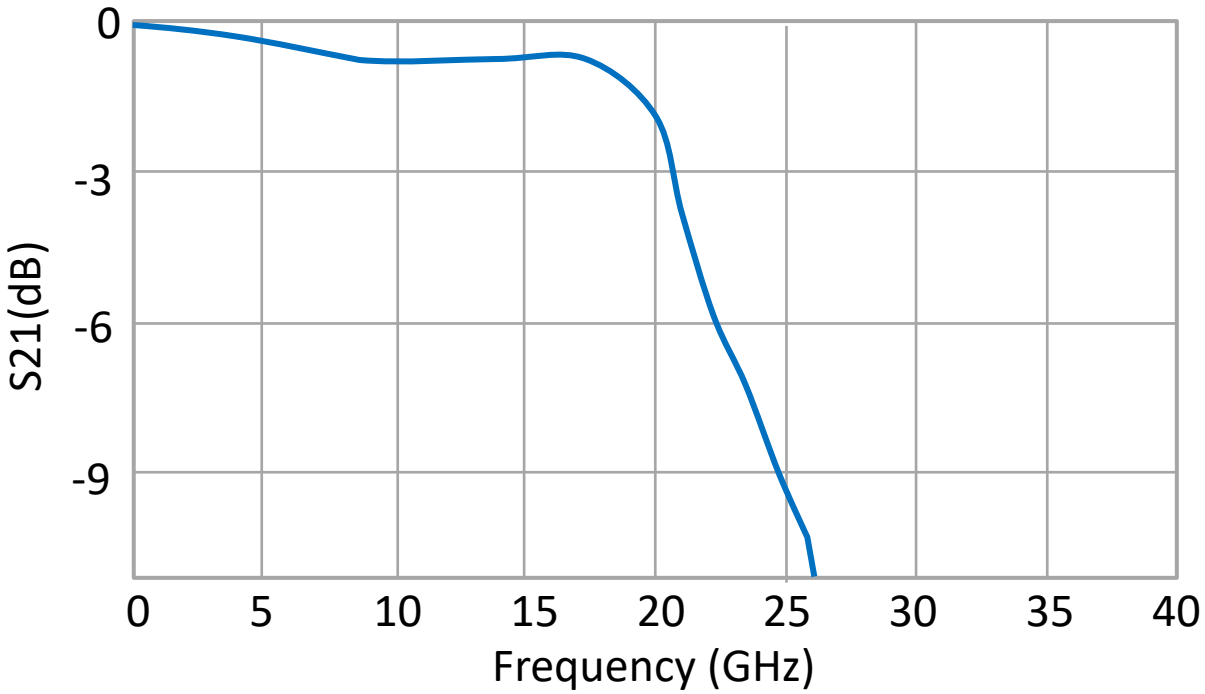
Absolute Maximum Rating (T = 25°C**)**

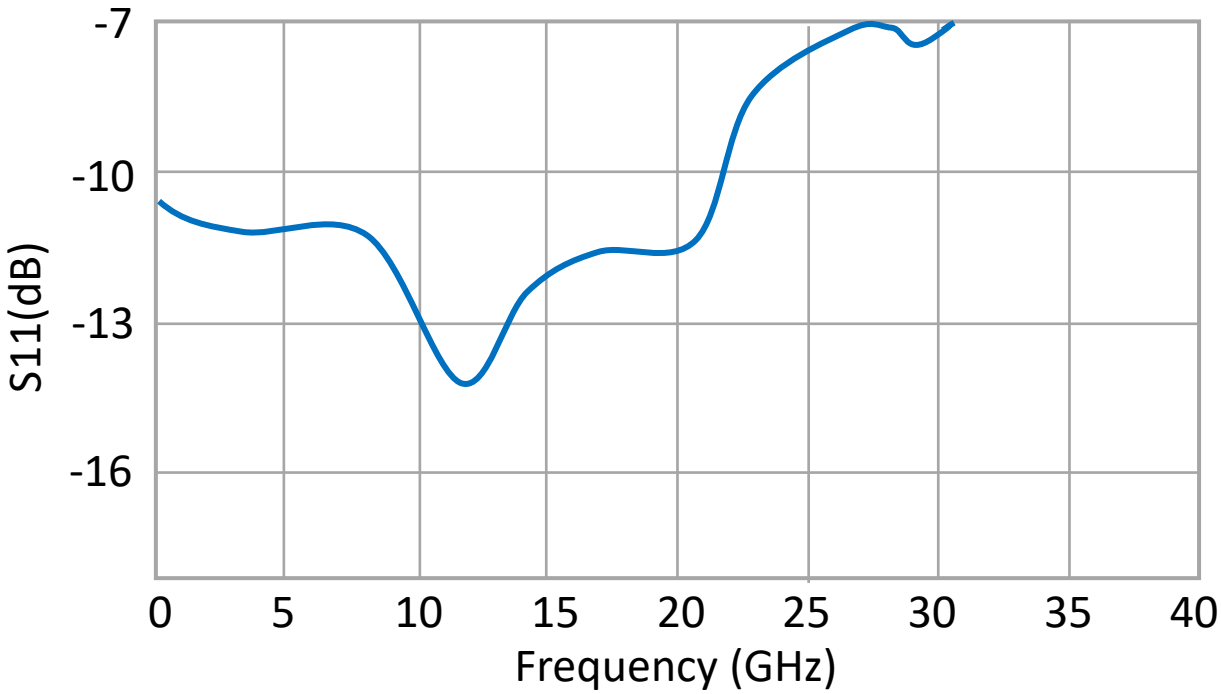
Parameter	Symbol	Condition	Min.	Max.	Unit
TIA Voltage	V_{tia}	-	-	3.6	V
Input Optical Power	P_{in}	-	-	5	dBm
APD Supply Voltage	V_{apd}	-	-	33	V
Storage Temperature	T_{stg}	-	-40	90	°C
Storage Humidity	H_{stg}	-	-	85	% r.H.
Operating Temperature	T_{op}	-	-40	85	°C
Soldering Temperature	T_{st}	10 sec	-	260	°C
ESD Susceptibility		HBM	100	-	V

Operating at maximum operating specs for prolong periods of time will damage the device.

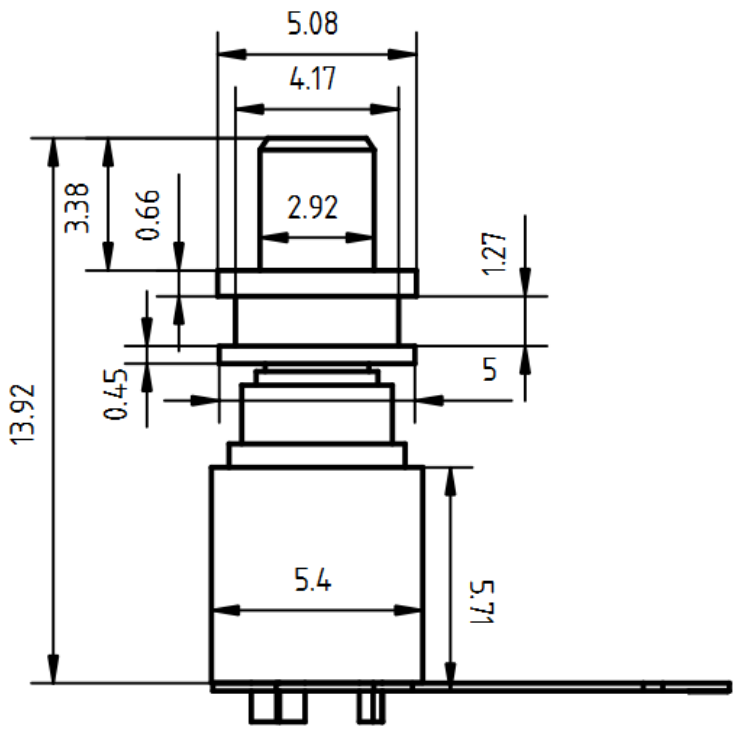
Typical Performance Curves (Top 23°C, 801 PTs, 16 AVGs, 1.5% smoothing)

RF performance dependent on PCB design and optimization. Data shown for Rogers ® RO3003 with Ground-backed Co-planner waveguide (GB-CPW). The GB-CPW was de-embedded. Single ended measurement, port two is terminated with 50 Ohm load.

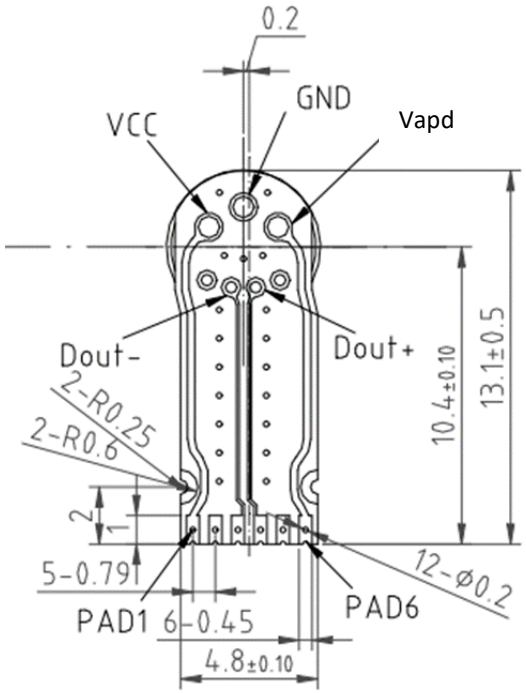




Device Dimensions (all units in mm)



Flexible PCB Pinout



Pad	Function
1	Vcc
2,5	GND
3	Dout (-)
4	Dout (+)
6	Vapd

Device Nomenclature

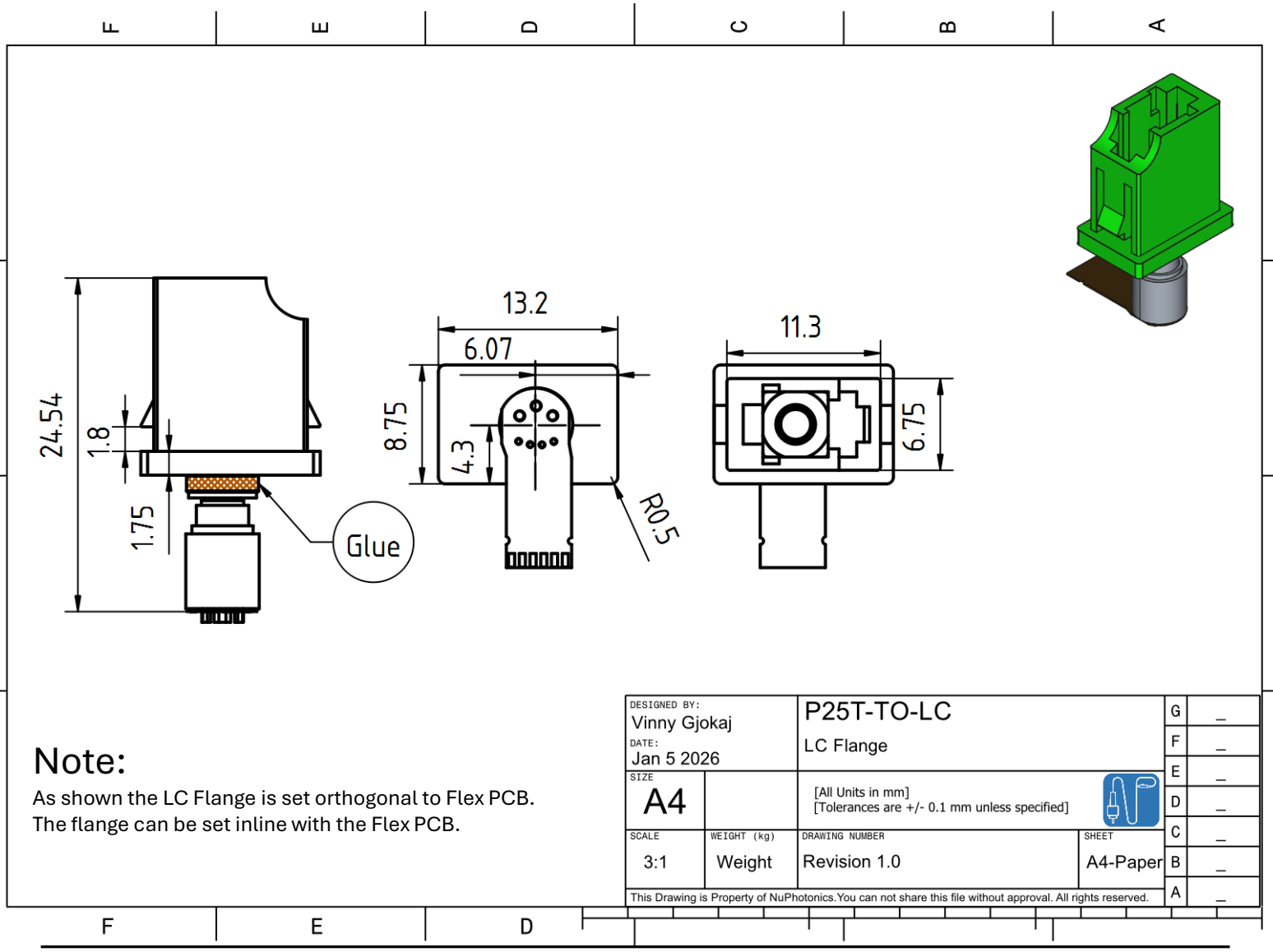
AP25T-TO-LC-X

- **Product Line –25G PIN photodiode W/ TIA**
- **Device body style – TO-CAN**
- **Flange**
  - A – Without Flange
  - B – With Flange
- **Receptacle**
  - (LC – Receptacle) Standard

Example – AP25T-TO-LC-B

25G Avalanche Photodiode LC Receptacle with Flange

Mechanical Drawing



Note:

As shown the LC Flange is set orthogonal to Flex PCB.
The flange can be set inline with the Flex PCB.

IMPORTANT NOTICES AND DISCLAIMERS

Warranty: NUPHOTONICS PROVIDES ALL OF THE INFORMATION ON TECHNICAL AND RELIABILITY DATA. THIS INCLUDES INFORMATION PRESENTED IN DATA SHEETS, DESIGN FILES, APPLICATIONS, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

The information and resources are presented and intended for developers that are skilled and adequately qualified to work with this technology. You, the customer, are solely responsible for and accept full responsibility for selecting the appropriate NuPhotonics devices for your application. You accept the sole responsibility of designing, validating, and testing your application. You bear all responsibility for your application meeting standards, safety, security, and other regulatory requirements.

NuPhotonics retains the right to change these resources without notice. All rights are reserved for NuPhotonics. NuPhotonics grants you permission to use the information in these resources to design with NuPhotonics devices. Reproduction and display of these resources is prohibited. No Third-party licenses are offered. You will fully indemnify NuPhotonics against any claims, damages, costs, losses, and liabilities that arise from you using these resources. NuPhotonics does not accept and objects to any terms you have proposed.

For terms and conditions for all NuPhotonics products please refer to www.nuphotonics.com Legal section.

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.

Revision History

1.5 – January 2026 – Included LC Flange drawing. Updated device Body drawing.

1.4 – March 2024 – Updated Mechanical drawing, Included low frequency data.

1.3 - March 2024 - Corrected pinout for APD pinout.

1.0 – December 2023 – Initial Release.