

Product Specification

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10 GHz High Power Photodiode

80 mW Maximum Optical Power

Part #ARx10-80-N-C-FL-FC

PRODUCT FEATURES

- Ultra-high optical power handling—80 mW with high linearity and responsivity
- Very low phase noise
- Laser welded assembly
- Hermetically sealed
- Ruggedized for operation in harsh environments
- K-connector for RF interface (compatible with 2.92 mm and 3.5 mm SMA) (F is standard)


APPLICATIONS

- RF over fiber interconnects requiring high gain, high dynamic range, and low noise figure
- RFoF links in harsh environments
- Microwave photonics

DESCRIPTION

This product is a packaged, InGaAs photodiode (PD) that is optimized for high optical input power and output current linearity. This PD is designed for RF over fiber links and other applications that require high dynamic range, low noise figure, and high RF gain. The internal components are soldered and laser welded for long-term reliability and performance stability under harsh temperature, vibration, and other environmental conditions. This photodiode is packaged without internal 50 Ω termination and with a DC coupled output for maximum RF gain. It operates with a negative bias applied through an external bias T connected to the RF output port.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Minimum	Maximum	Units	Condition/Comments
Photodiode Reverse Voltage	V_{pd}	0	5	V	No illumination
Maximum optical input power	P_{max}		80	mW	At -3 V bias
Fiber bend radius		10		mm	Minimum bend radius

ELECTRO-OPTICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition/Comments
Wavelength range	λ	1,530		1,620	nm	
Responsivity	R	0.5	0.7		A/W	For 10 GHz standard PD
Polarization Dependent Sensitivity (PDS)	PDL		0.2	0.3	dB	Variation in detected signal over all polarization states
RF Bandwidth	$F_{3\text{ dB}}$	10.5	13		GHz	Measured at 3 dB point
PD Bias	V_{PD}	3	4	5	V	Do not exceed -5 V
Optical Saturation Power	P_{sat}	19			dBm	1 dB compression point at -3 V bias
Optical Return Loss	ORL	-27	-30		dB	
Output Reflection Coefficient	S_{22}		NA		dB	Depends on external bias T
RF Output Termination	R_{term}		NA		Ω	Not internally terminated. External bias T sets RF termination impedance.

MECHANICAL SPECIFICATIONS

Parameter	Symbol	Minimum	Maximum	Units	Condition/Comments
Height	H		9.2	mm	
Area (Length x Width)	A		19 x 15	mm ²	Mounting tabs, RF connector, and fiber snout excluded
RF Connector					K-connector (2.92mm) F (standard)
Packaging					Hermetically sealed by laser welding
Package Heat Flow					Heat sink on bottom surface
Fiber Pigtail Length		0.95	1	m	SMF28 Fiber; Custom lengths by special order
Pigtail Termination					FC/APC; others by special order

ENVIRONMENTAL SPECIFICATIONS (Preliminary, Qualification in Progress)

Parameter	Minimum	Maximum	Units	Condition/Comments
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Operating Temperature	-40	+85	°C	Case temperature
Storage Temperature	-55	+95	°C	Non-operating
Operating Humidity	0	90	% RH	
Shock	50 g amplitude and 11 ms duration, three shocks each axis, each direction			MIL-STD-810G Method 516.6, Procedure I, Operational.
Operational Vibration	3.56 Grms one hour each axis			MIL-STD-810G Method 514.6, Category 12.
Endurance Vibration	8.25 Grms one hour each axis			MIL-STD-810G Method 514.6, Category 12.
Reliability Performance	40,000		hours	

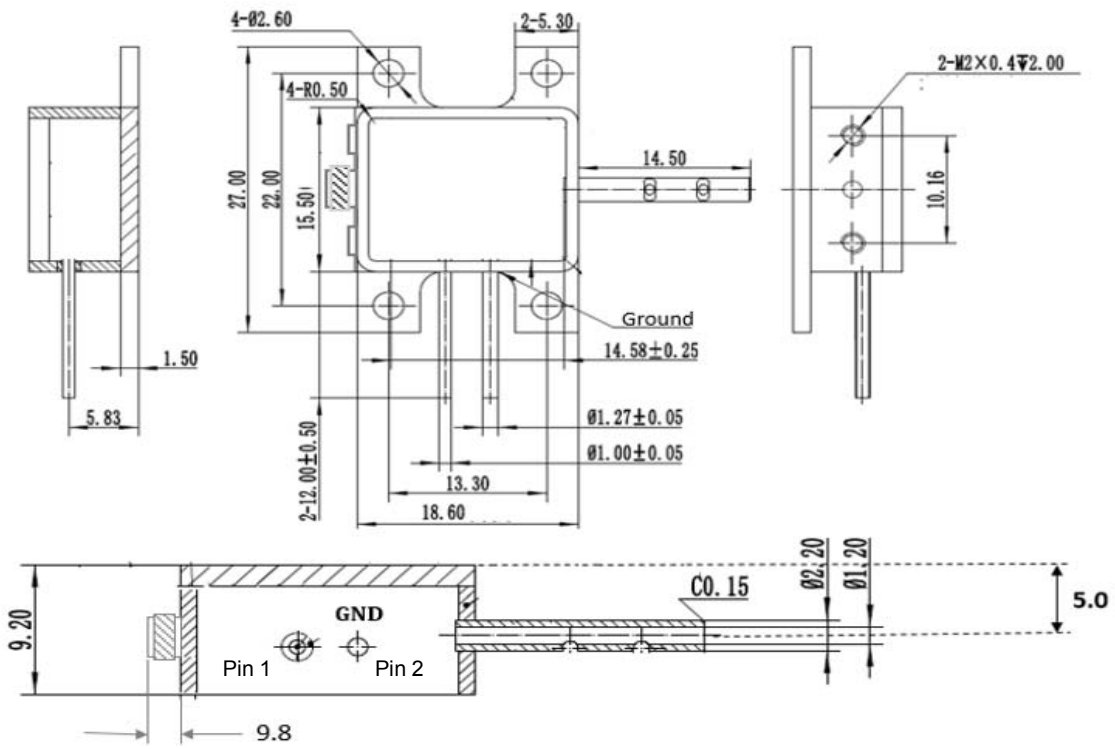
ELECTROMAGNETIC SPECIFICATIONS (Preliminary, Qualification in Progress)

Parameter	Minimum	Maximum	Units	Condition/Comments
Radiated Emission	0.002	18	GHz	Meets MIL-STD-461F, RE102, Helicopters case (<70 dBμV/m)

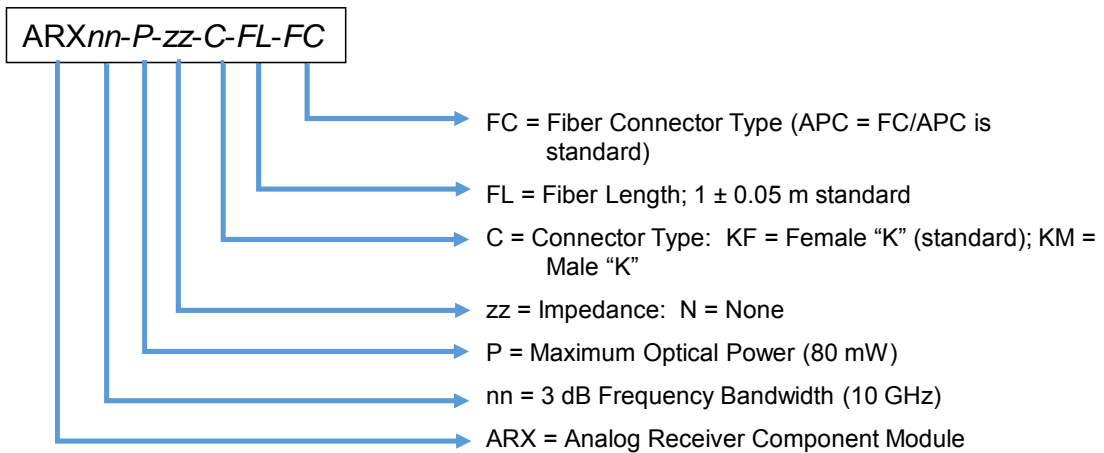
PIN CONNECTIONS

Pin #	Description
1,2	Not connected
RF	RF signal output and bias (via bias T)

MECHANICAL DRAWING



ORDERING INFORMATION



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