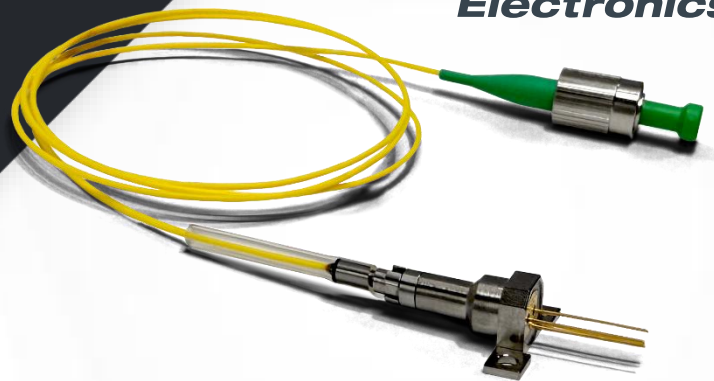


Pigtailed High-Gain Low-Noise InGaAs APD



CMC Electronics' 276-339767-VAR is a pigtailed InGaAs APD Series available in 30 μm (single mode fiber, SMF) and 80 μm (multimode fiber, MMF) active area variants, both with very high operating gain above $M = 100$, very low k-factor (k), and Excess Noise Figure (F).

Based on an industry-proven design, the 276-339767 Series InGaAs APDs have a high Quantum Efficiency (QE) over the wavelength range of 950 to 1600 nm.

A high dynamic range is maintained even at high operating temperatures, reducing the need for cooling.

Customizations such as optical return loss tuning or responsivity screening are available upon request.

Features

- Active area from 30 – 80 μm
- Low k-factor InGaAs APD
- Low Excess Noise Factor (F)
- Low Noise Equivalent Power (NEP)
- High dynamic range
 - $\Delta V \approx 8 \text{ V}$ ($M = 10$)
 - $\Delta V \approx 4 \text{ V}$ ($M = 45$)
 - $\Delta V \approx 1 \text{ V}$ ($M = 100$)
- Wide Operating Temp Range
- Typical coupling efficiency: $> 90 \%$
- Low Optical Return Loss (ORL)
- FC/APC and other connectors available upon request

Applications

- Optical Time-Domain Reflectometry (OTDR)
- LiDAR and Laser Range Finding (LRF)
- Distributed Fiber Optic Sensing (DFOS)
- Distributed Temperature Sensing (DTS)
- Distributed Acoustic Sensing (DAS)
- Structural Health Monitoring (SHM)

Table 1. Electro-Optical Common Characteristics

Conditions: $T_{\text{case}} = 25^{\circ}\text{C}$, $M = 10$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Units
Breakdown Voltage	V_{BR}	45	60	80	V
Operating point from Breakdown Voltage ($V_{\text{BR}} - V_{\text{OP}}$)	ΔV	7	8	9	V
Temperature Coefficient of V_{OP}	$\Delta V/\Delta T$		0.06		V/ $^{\circ}\text{C}$
Quantum Efficiency (1064-1550 nm)	QE	75	83		%
Responsivity at 1550 nm	R	8.5	9.0		A/W
Excess Noise Factor	F		3.2		
Recommended Operating Gain (Note 1)	M	10	65	100	
Operating Temperature	T_{A}	-45		+85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55		+85	$^{\circ}\text{C}$

Note: 1. Noise increases with gain and depends on bulk and surface currents.

Table 2. Electro-Optical Specific Characteristics

Conditions: $T_{\text{case}} = 25^{\circ}\text{C}$, $M = 10$ unless otherwise specified

Parameter	Symbol	80 μm		30 μm		Units
		Typ.	Max.	Typ.	Max.	
Dark current	I_{d}	2	10	0.25	0.5	nA
Capacitance	C_{d}	0.55	0.6	0.45		pF
Spectral Noise Current	i_{n}	0.18		0.045		$\text{pA}/\sqrt{\text{Hz}}$
Bandwidth	$f_{-3\text{dB}}$	5.8		6.5		GHz
Optical Return Loss	ORL	-25		-35		dB

Figure 1. Typical Quantum Efficiency

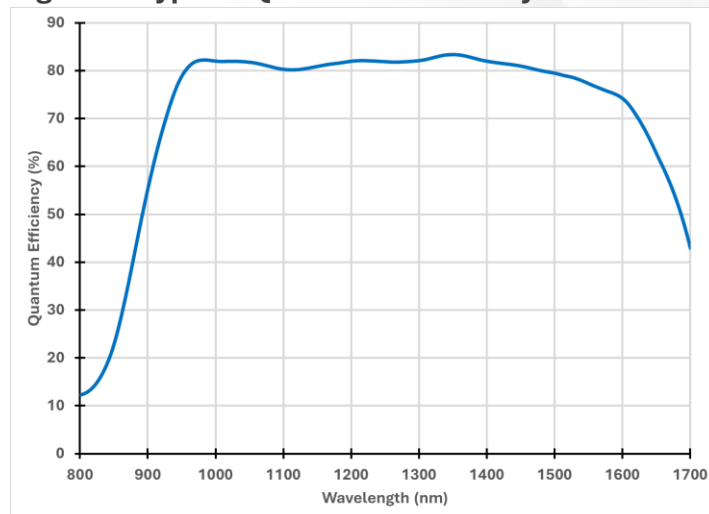
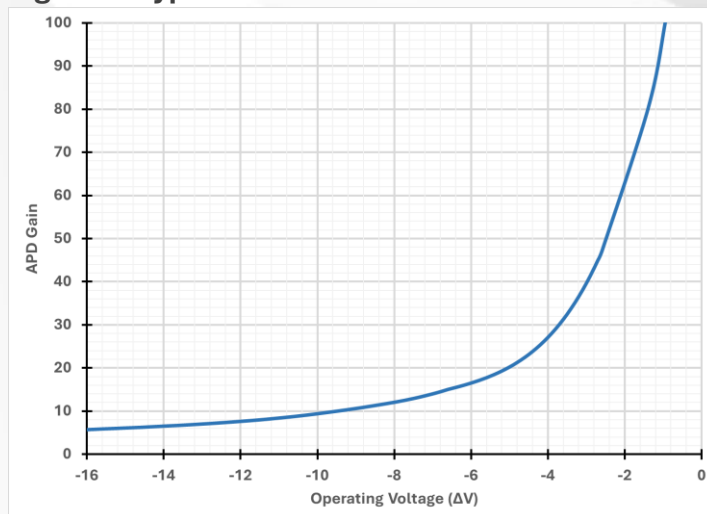


Figure 2. Typical APD Gain



276-339767 Series
Pigtailed InGaAs Avalanche Photodiodes

Figure 3. 276-339767 Package Dimension and Pinout
Unless otherwise specified, dimensions are in mm and are for reference only. Connector options available upon request

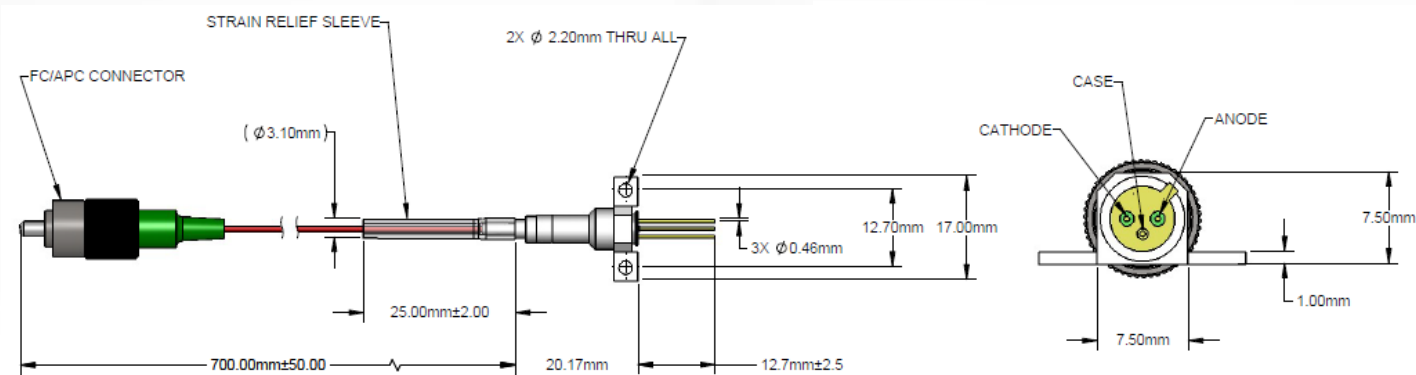


Table 4. Ordering Guide

VAR	Typical Bandwidth	Active Diameter	Comments
276-339767-002	5.8 GHz	80 µm	Fiber Pigtail 62.5 MMF
276-339767-004	6.5 GHz	30 µm	Fiber Pigtail 9 µm SMF



For more information, visit www.cmcelectronics.ca/optoelectronics or email us at opto@cmcelectronics.ca

For information purposes only. To accommodate product improvements, specifications are subject to change without notice.

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