

InGaAs Avalanche Photodiode in Hermetic Package



CMC Electronics' 264-339767-VAR series is an InGaAs APD with low k-factor and high responsivity, in a TO-hermetic package.

Based on an industry-proven design and optimized for fast overload recovery, the 264-339767 InGaAs APDs have a high Quantum Efficiency (QE) over the wavelength range of 1000 to 1600 nm.

With low leakage current, high dynamic range is maintained even at high operating temperatures, reducing the need for cooling.

Customizations such as detector size, noise or responsivity screening are available upon request.



Features

- Active area from 20 – 200 μm
- Low k-factor InGaAs APD
- Low Noise Equivalent Power (NEP)
- High dynamic range
- Wide Operating Temp Range
- 264-339767 Series: Hermetic TO-46 Case
- 276-339767 Series: Fiber Pigtailed (Typical coupling efficiency: > 90 %)



Applications

- Range Finding
- Optical time-domain reflectometer (OTDR)
- LiDAR
- Industrial, Analytical

Table 1. Electro-Optical CharacteristicsConditions: $T_A = 25^\circ\text{C}$, $M = 10$ unless otherwise specified

Parameter	Symbol	200 μm DIA VAR -001			80 μm DIA VAR -002			50 μm DIA VAR -003			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Operating Voltage, V_{OP}	V_{OP}	25		80	25		80	25		80	V
Operating point from Breakdown Voltage ($V_{BR} - V_{OP}$)	ΔV	5	8		5	8		5	8		V
Temperature Coefficient of V_{OP}	$\Delta V/\Delta T$		0.07			0.07			0.07		V/ $^\circ\text{C}$
Dark current	I_d		15	50		10	30		5	25	nA
Quantum Efficiency 1064-1550 nm	QE	75	83		75	83		75	83		%
Responsivity at 1550 nm	R		9.4			9.4			9.4		A/W
Capacitance	C_d		2.0	2.4		0.65	0.70		0.55	0.6	pF
Spectral Noise Current	i_n		0.3	0.9		0.1	0.4			0.3	pA/ $\sqrt{\text{Hz}}$
Excess Noise Factor	F		3.2			3.2			3.2		
Bandwidth	f_{-3dB}		1.0			2.0			2.5		GHz
Recommended Operating Gain (Note 1)	M	10	20		10	20		10	20		
Operating Temperature	T_A	-45		+85	-45		+85	-45		+85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55		+125	-55		+125	-55		+125	$^\circ\text{C}$
Parameter	Symbol	30 μm DIA VAR -004			20 μm DIA VAR -005						Units
		Min	Typ	Max	Min	Typ	Max				
Operating Voltage, V_{OP}	V_{OP}	25		80	25		80				V
Operating point from Breakdown Voltage ($V_{BR} - V_{OP}$)	ΔV	5	8		5	8					V
Temperature Coefficient of V_{OP}	$\Delta V/\Delta T$		0.07			0.07					V/ $^\circ\text{C}$
Dark current	I_d		1	10		0.5	5				nA
Quantum Efficiency 1064-1550 nm	QE	75	83		75	83					%
Responsivity at 1550 nm	R		9.4			9.4					A/W
Capacitance	C_d		0.45			0.40					pF
Spectral Noise Current	i_n										pA/ $\sqrt{\text{Hz}}$
Excess Noise Factor	F		3.2			3.2					
Bandwidth	f_{-3dB}		4			4.5					GHz
Recommended Operating Gain (Note 1)	M	10	20		10	20					
Operating Temperature	T_A	-45		+85	-45		+85				$^\circ\text{C}$
Storage Temperature	T_{stg}	-55		+125	-55		+125				$^\circ\text{C}$

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

Table 2. Absolute-Maximum Ratings, Limiting Values

Parameter	Symbol	Max.	Units
Forward Current	I_F	5	mA
Total Power Dissipation	P_{TOT}	20	mW
Soldering Temperature (5 seconds, leads only)		260	$^\circ\text{C}$

Figure 1. Typical Quantum Efficiency

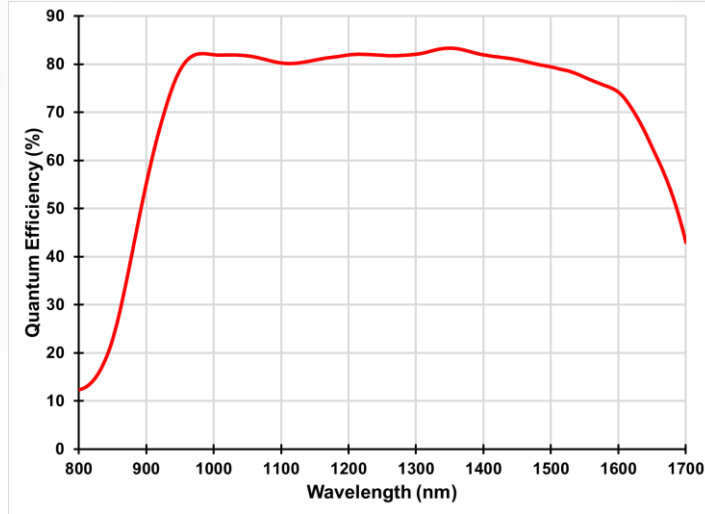


Figure 2. Typical Normalized Responsivity

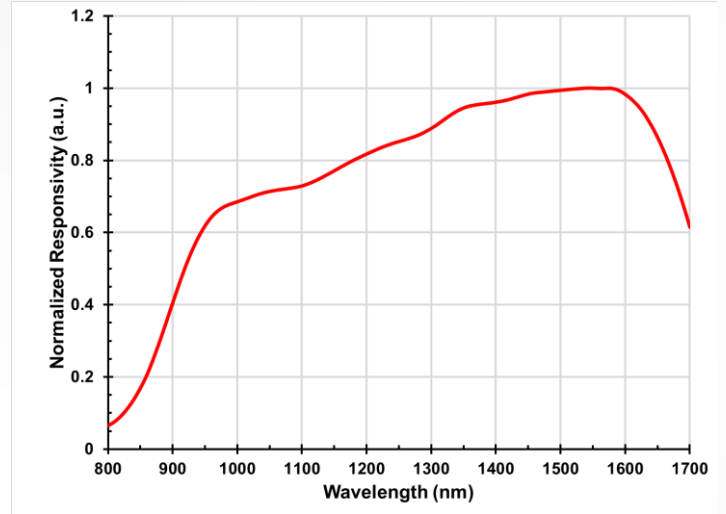


Figure 3. Typical APD Gain and Dark Current

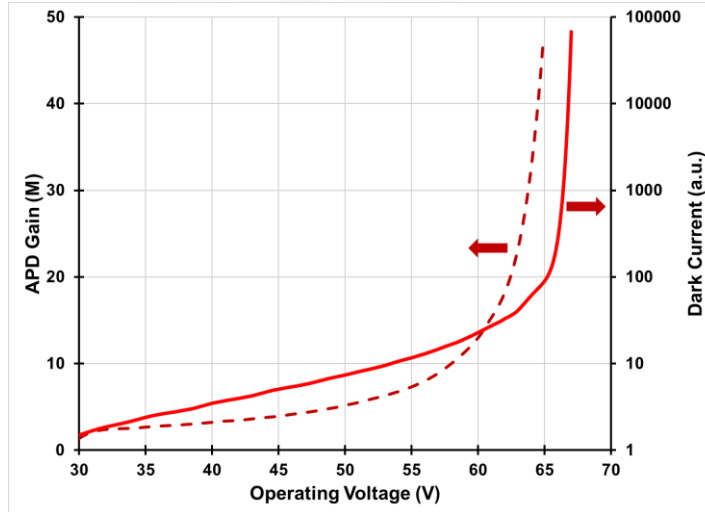


Figure 4. Typical Capacitance

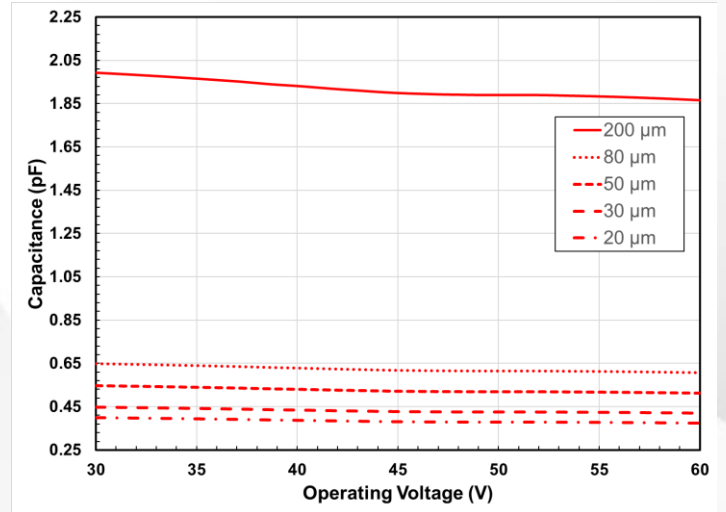


Figure 5. 276-339767 Package Dimension and Pinout

Unless otherwise specified, dimensions are in mm and are for reference only. Standard fiber length = 1 meter. Connector options available

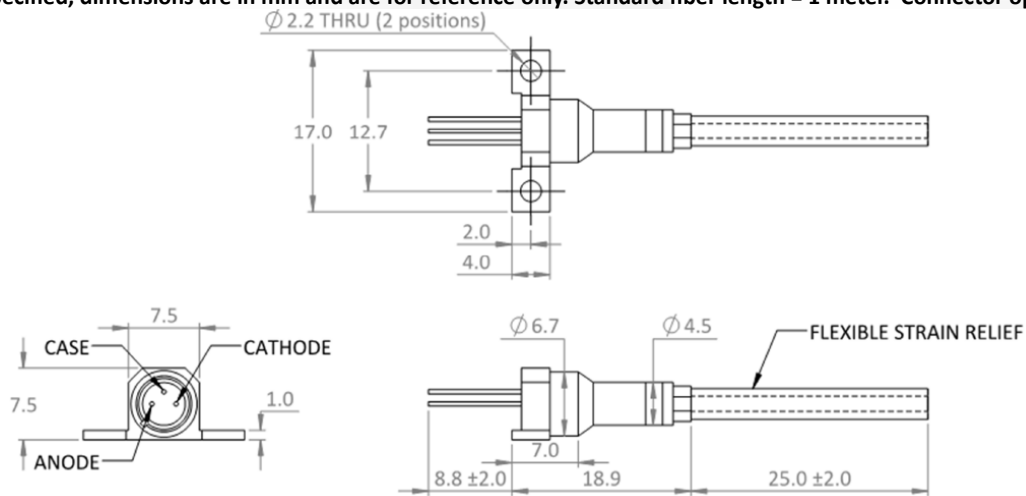
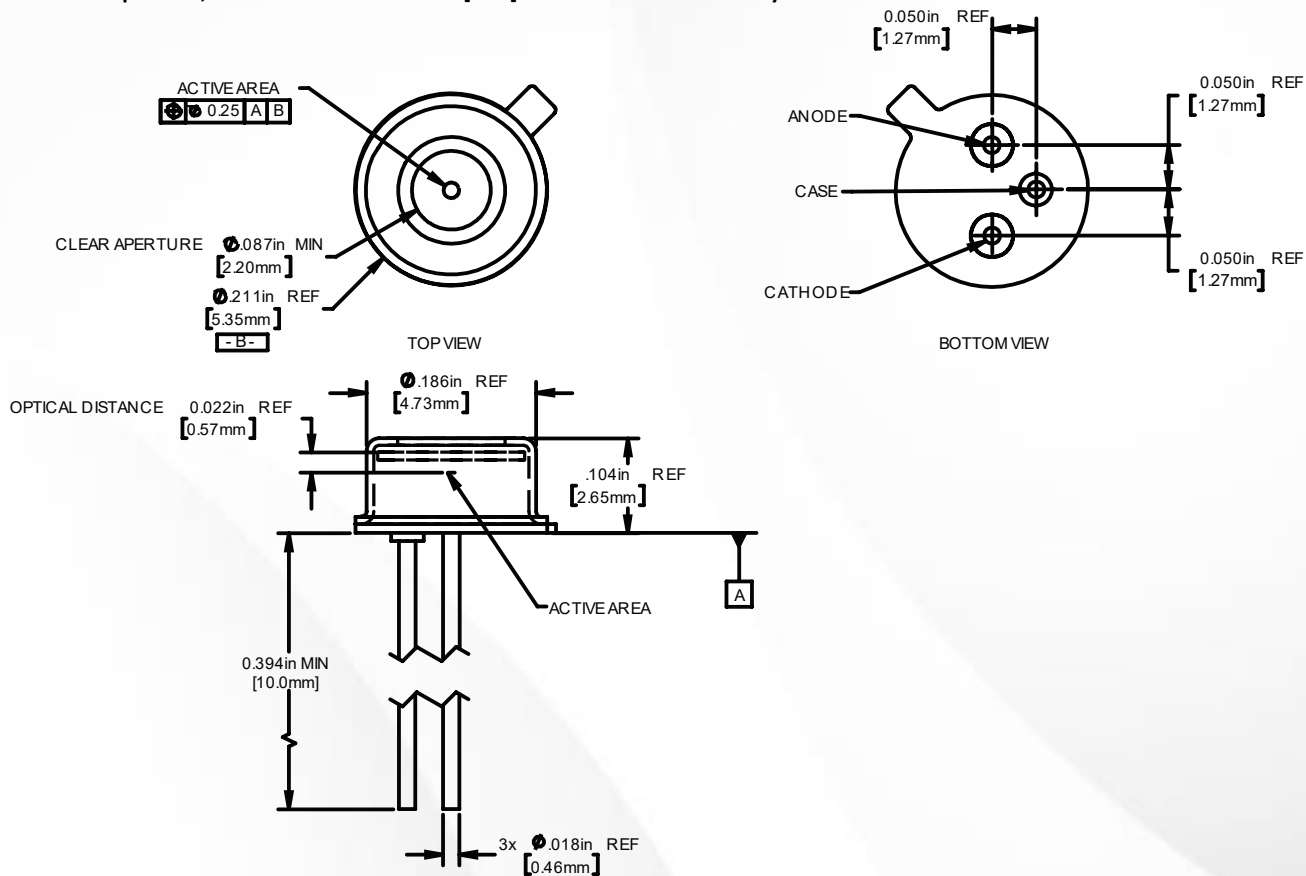


Figure 6. 264-339767 Package Dimension and Pinout

Unless otherwise specified, dimensions are in inches [mm] and are for reference only.



VAR Options

VARinte	APD Diameter	264-339767-VAR	276-339767-VAR
-001	200 μm	TO-46	Fiber Pigtail 62.5 μm MMF
-002	80 μm	TO-46	Fiber Pigtail 62.5 μm MMF
-003	50 μm	TO-46	Fiber Pigtail 9 μm SMF
-004	30 μm	TO-46	Fiber Pigtail 9 μm SMF
-005	20 μm	TO-46	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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