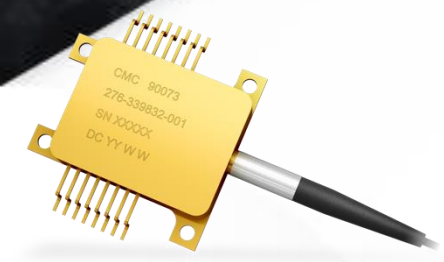
Fiber Pigtailed InGaAs Avalanche Photodiode Preamplifier Module



CMC Electronics' 276-339832 series uses an InGaAs APD with a built-in trans-impedance amplifier, enabling optimum signal to noise performance.

The APD preamplifier receiver is housed in a robust 16-pin surface mount butterfly package. The internal temperature can be monitored via an embedded thermal sensor. The module is designed for a 100-ohm output load connection (AC or DC coupled, as required by design). Default commercial off the shelf (COTS) part has a 50 µm multimode (MM) graded-index core fiber.

Customizations such as fiber diameter, fiber type, bandwidth selection, NEP screening, responsivity optimization and packaging are available

Features

- Typical 120 MHz built-in trans-impedance amplifier
- Spectral Response: 1050-1600nm
- Low Noise Equivalent Power (NEP)
- 50 µm Multimode fiber pigtail
- High dynamic range
- Hermetically Sealed 16-pin package
- ITAR free

Applications

- Range Finding
- LIDAR
- Distributed Temperature Sensing
- High resolution Laser scanning
- Free–Space Communications

Table 1. Electro-Optical Characteristics

Unless otherwise specified: T_A = 25°C, V_+ = 5.0 V, V_- = -5.0 V, V_{HV} = 40 to V_{BR}, V_{OO_ADJ} = -5 V, R_L = 100 Ω AC, λ = 1570 nm +/- 20 nm

Parameter/Condition	Min	Typ	Max	Units
V_{OP} for Responsivity, R = 580 kV/W (Note 1)	40		80	V
Bandwidth, f_{-3dB}	100	120		MHz
Noise equivalent power +25°C, R = 580 kV/W		90	120	fW/√Hz
Noise equivalent power +25°C, R = 1160 kV/W		50		
Noise equivalent power +85°C, -001, R=580 kV/W		150	200	fW/√Hz
Noise equivalent power +85°C, -001, R=1160 kV/W		100		
Noise equivalent power +85°C, -002, R=580 kV/W		200	300	
Noise equivalent power +85°C, -002, R=1160 kV/W		120		
Dark Current (I_D), R = 580 kV/W	1		15	nA
Temperature sensor (1N914 diode) with bias current = 5 mA		700		mV

Notes:
1. Each APD receivers will have its individual V_{OP} (provided on its production tests report).
2. NEP values for +85°C are by design and are for reference only. No test values provided on individual test reports. Integration of the noise calculation is based on minimum bandwidth.

Table 2. Absolute-Maximum Ratings, Limiting Values

Parameter	Min.	Max.	Units
Photodiode Total Current (All temp.)		1	mA
Peak value, 20ns pulses <100Hz		100	kW/cm^2
Preamplifier Voltage V+		6	V
Preamplifier Voltage V-		6	V
Operating Temperature	-40	85	°C
Storage Temperature	-55	125	°C

Figure 1. CMC 276-339832 Series block diagram

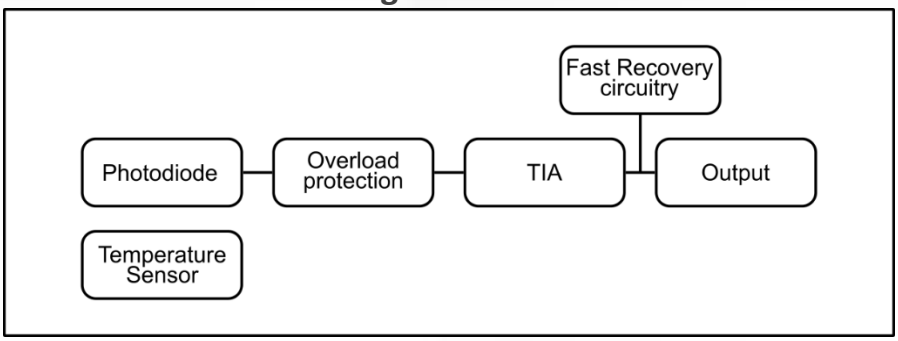
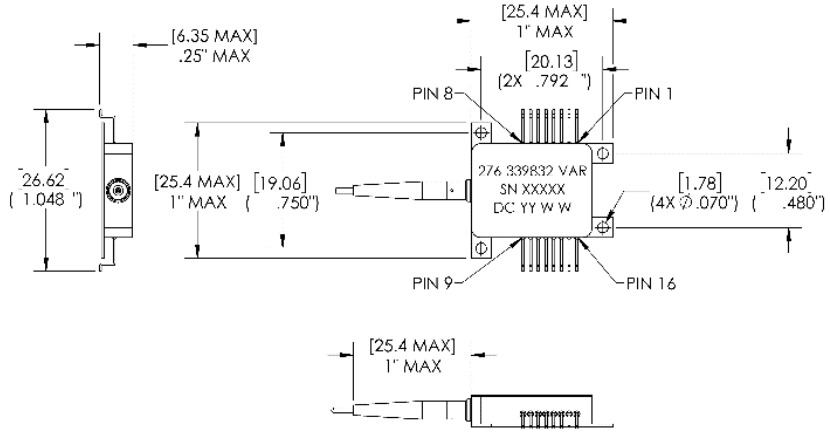


Figure 2. Package Dimension and Pinout

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



1	GND	9	V_{HV}
2	TSensor anode	10	GND
3	TSensor cathode	11	GND
4	NC	12	GND
5	V-	13	OUT
6	GND	14	GND
7	V+	15	VOO_ADJ
8	GND	16	GND

VAR Options

-001	Standard recovery
-002	Fast recovery from high power pulses

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

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