

3-mm InGaAs Quadrant PIN Receiver with 4 TIAs

Features

- 3-mm InGaAs Quad PIN
- 30 MHz Bandwidth
- Spectral Response: 1050-1600nm (typical use: 1550-1570nm eye safe range)
- Low Noise Equivalent Power (NEP)
- Ambient Light Rejection
- Optional Automatic Gain Control (AGC)
- Optional Fast Overload Recovery
- Hermetically-Sealed Package

Description

CMC Electronics' 264-339826-VAR series is an InGaAs quadrant PIN receiver with 4 built-in trans-impedance amplifiers.

The 264-339826-001 is based on a 3-mm diameter quadrant InGaAs PIN with individual GaAsFET input TIAs for each quadrant, in a 46-lead square hermetic package. Each amplifier has an overload input protection circuit from high optical power exposure. A fast recovery time option is available for handling the overload. The receiver module has standard ambient light rejection circuit, eliminating unwanted background light signals. The optional externally controlled single or multi-stage AGC provides high dynamic range. Elective supply input filtering is available for supporting improved channel-channel isolation performance. The outputs can be AC or DC coupled to a 100 ohms' load, easing the next level design as required by end user.

Customization such as detector size, bandwidth, AGC levels, packaging is available, to fit your system design needs.

Applications

- Range Finding
- Spot Tracking
- Laser Alignment
- Guidance
- Position Sensor
- Free Space Optical Communication

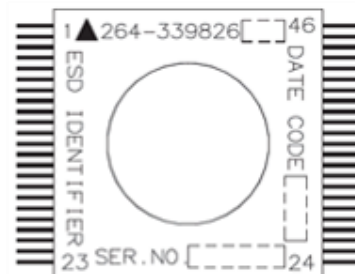


Figure 1: CMC 264-339826 SERIES ILLUSTRATION

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Block Diagram

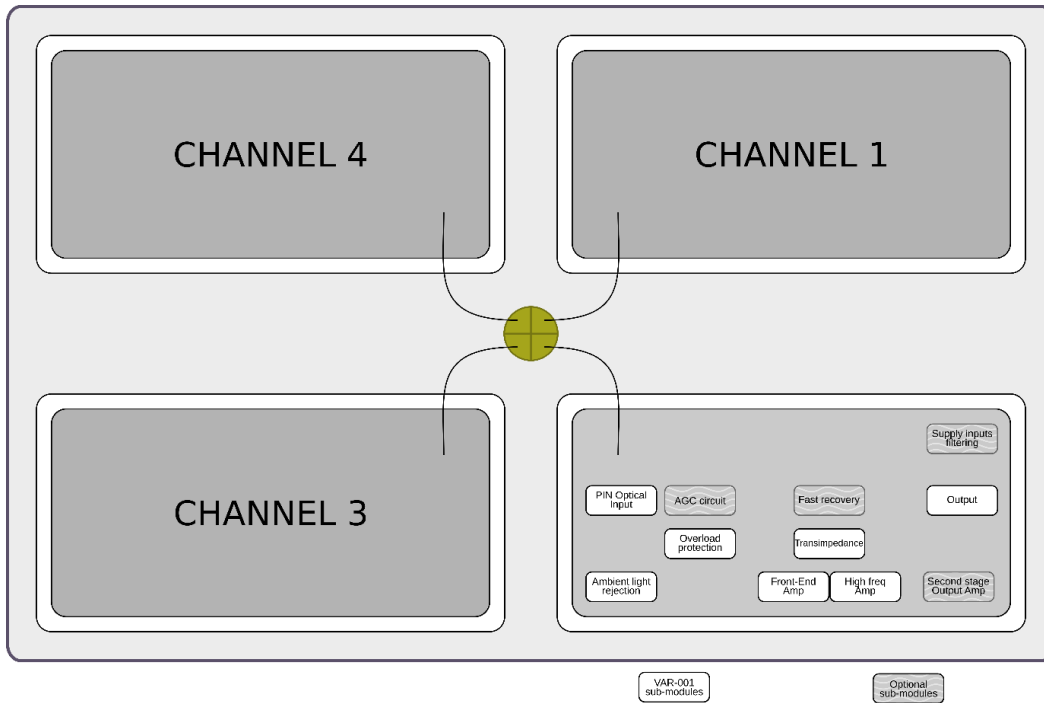


Figure 2: CMC 264-339826 SERIES BLOCK DIAGRAM (HYBRID LEVEL)

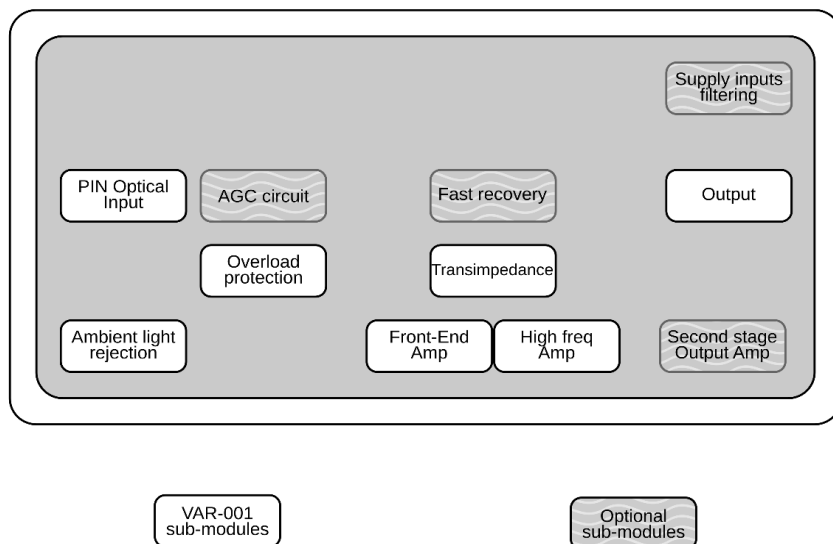


Figure 3: CMC 264-339826 SERIES BLOCK DIAGRAM (CHANNEL LEVEL)

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Electro-Optical Characteristics at TA=25oC

Unless otherwise specified: V+=5V, V=-5V, Vpin=5V, RL=100Ω AC, λ = 1570 nm +/- 10 nm; values presented for VAR-001, without options (Externally AC coupled through 4.7uF)

Parameter/Condition	Min.	Typ.	Max.	Unit.
Responsivity (R) @ 1570 nm	40	60		kV/W
Noise Equivalent Power (NEP = E _n /R) 1570 nm	–	8	12	pW/√Hz
Output Impedance	–	10	–	Ω
Bandwidth, f _{-3dB}	25	30	–	MHz
Rise Time (10-90%)	–	12	15	ns
Fall Time (90-10%)	–	12	15	ns
Linear Output Voltage Swing (Pulse) ¹	1.5	2.5	4.0	V
Output Offset Voltage	-0.6	-0.25	0.1	V
Fast recovery for optical power input signal of 1mW, 15ns pulse width ⁽¹⁾ :				
V _{out} – V _{out_PrePulse} → 200 ns after pulse start	–	–	250	mV
V _{out} – V _{out_PrePulse} → 1.0 μs after pulse start	–	–	50	mV
Ambient light rejection	25	50	–	KHz
AGC ^(1, 2)				
Attenuation		-25		dB
Channel-to-channel				
Channel isolation	–	-30	–	dB
Channel isolation with supply input filtering	–	-40	–	dB
Response linearity (Quad-PIN)	–	–	10	%
Hybrid Supply current (all channels) ^(1, 3) :				
V+	70	170	250	mA
V-	40	120	170	mA

Note (1) Fast recovery, AGC and supply input filtering are optional features. Specifications are for reference only.

Note (2) AGC (active gain control) can be single or multi-stage. Discuss with CMC for the options that are most suitable to your needs.

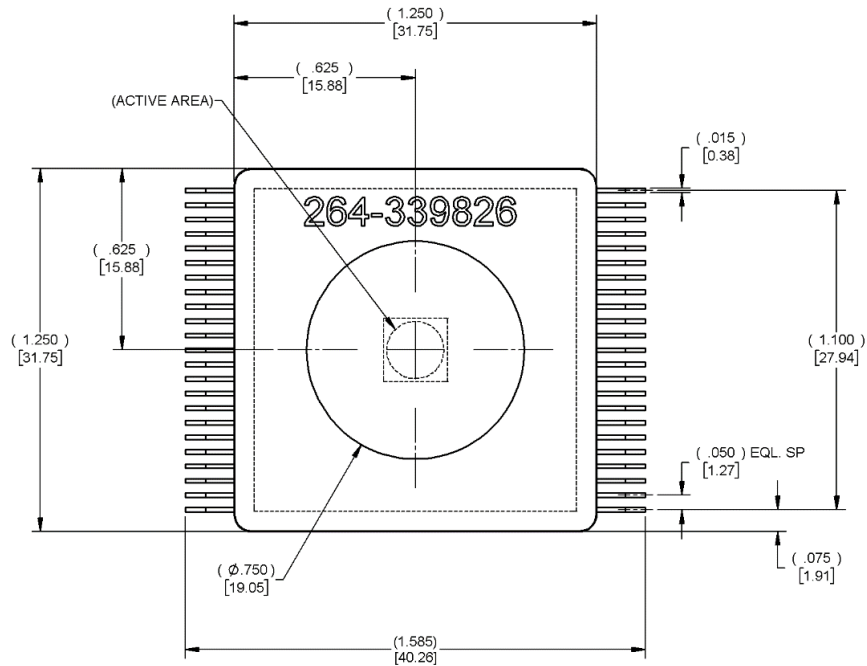
Note (3) Supply input filtering improves cross-talk performance.

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Absolute-Maximum Ratings, Limiting Values

<p>Photodiode (Optical Input)</p> <p>Incident Radiant Flux, Φ_M Max. Optical Power, CW 15 mW/cm²</p> <p>Maximum Light Density Peak value, 20ns pulses < 100Hz 100 kW/cm²</p> <p>Detector Cathode Voltage Input</p> <p>V_PIN (pin 23) PIN breakdown, Maximum voltage 20 volts Recommended operation voltage 5.0±0.1 volts Recommended overcurrent limit 500 µA</p>	<p>Hybrid Voltages</p> <p>V_POS (pin 28,17,7,40) Minimum 4.8 Volts Maximum 6.0 Volts</p> <p>V_NEG (pin 30,18,5,42) Minimum -6.0 Volts Maximum -4.8 Volts</p>
<p>Ambient Temperature:</p> <p>Storage Range: T_{stg} -55 to +125 °C Operating Range: T_A -40 to +85 °C</p>	

Package Dimension (inches) [mm]



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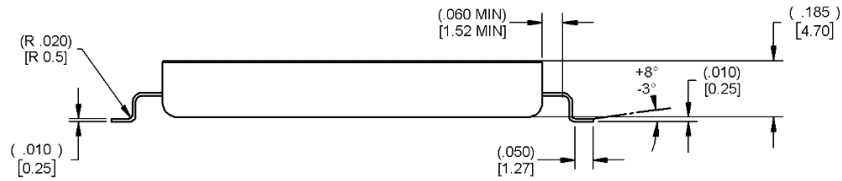


Figure 4- PACKAGE DIMENSIONS (inches) [mm]

Pinout

Common pins

Pkg Pin No.	Signal name
1,2,12,21,22,24,25,35,45,46	GND
23	V_PIN

Channel 1 pins

Pkg Pin No.	Signal name
31	Not connected
33	Not connected
32	CH1_AGC_IN
27	OUT_1
30	V_POS_1
28	V_NEG_1

Channel 2 pins

Pkg Pin No.	Signal name
16	Not connected
14	Not connected
15	CH2_AGC_IN
20	OUT_2
17	V_POS_2
18	V_NEG_2

Channel 3 pins

Pkg Pin No.	Signal name
8	Not connected
10	Not connected
9	CH3_AGC_IN
4	OUT_3
7	V_POS_3
5	V_NEG_3

Channel 4 pins

Pkg Pin No.	Signal name
39	Not connected
37	Not connected
38	CH4_AGC_IN
43	OUT_4
40	V_POS_4
42	V_NEG_4

Figure 4: PINOUT

VAR Options:

-001

3-mm diameter active area, TIA



For more information, visit www.cmcelectronics.ca 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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