

3-mm InGaAs Quadrant PIN Receiver with 4 TIAs

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 GaAs FET 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.



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



Applications

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

Table 1. Electro-Optical Characteristics

Unless otherwise specified: $T_A = 25^\circ\text{C}$, $V_{\text{POS}} = 5.0\text{ V}$, $V_{\text{NEG}} = -5.0\text{ V}$, $R_L = 1000\ \Omega$ AC, $\lambda = 1570\text{ nm} \pm 10\text{ nm}$,
(Externally AC coupled through 4.7 μF)

Parameter	Min.	Typ.	Max.	Units
Responsivity		60		kV/W
Noise equivalent power		8	15	pW/√Hz
Output impedance		10		Ω
Bandwidth	25	30		MHz
Rise time (10-90%)		12	15	ns
Fall time (90-10%)		12	15	ns
Linear output voltage swing (Pulse)	1.5	2.5	4.0	V
Output offset voltage	-0.6	-0.25	0.1	V
Overload recovery for optical power input signal of 1 mW, 15 ns pulse width (Note 1): $V_{\text{out}} - V_{\text{out_PrePulse}} \rightarrow 200\text{ ns}$ after pulse start			250	mV
$V_{\text{out}} - V_{\text{out_PrePulse}} \rightarrow 1\ \mu\text{s}$ after pulse start			50	mV
Ambient light rejection	25	50		kHz
Active Gain Control (Notes 1 & 2) Attenuation		-25		dB
Channel-to-channel Channel isolation		-30		dB
Channel isolation with supply input filtering (Note 1)		-40		dB
Response linearity (Quad-PIN)			10	%
Hybrid Supply current (all channels) (Notes 1, 3) V+	70	170	250	mA
V-	40	120	170	mA

- Notes:**
1. Fast recovery, active gain control (AGC) and supply input filtering are optional features. For reference only.
 2. AGC can be single or multi-stage. Discuss with CMC for the options that are most suitable to your needs.
 3. Supply input filtering improves crosstalk performance.

Table 2. Absolute-Maximum Ratings, Limiting Values

Parameter	Min.	Max.	Units
PIN breakdown, Maximum voltage [V_IN (pin23)]		20	V
Recommended operation voltage		5.0 ± 0.1	V
Recommended overcurrent limit		500	µA
Input Voltage Positive Supply [V_POS (pin 30, 17, 7, 40)]	+4.8	+6.0	V
Input Voltage Negative Supply [V_NEG (pin 28, 18, 5, 42)]	-4.8	-6.0	V
Maximum Optical Power, CW		15	mW/cm ²
Peak value, 20ns pulses <100Hz		100	kW/cm ²
Operating Temperature	-40	85	°C
Storage Temperature	-55	125	°C

Note: 1. Absolute maximum over the product Temperature Operating Range (-40°C to +85°C).

Figure 1. CMC 264-339826 Series block diagram (Hybrid level)

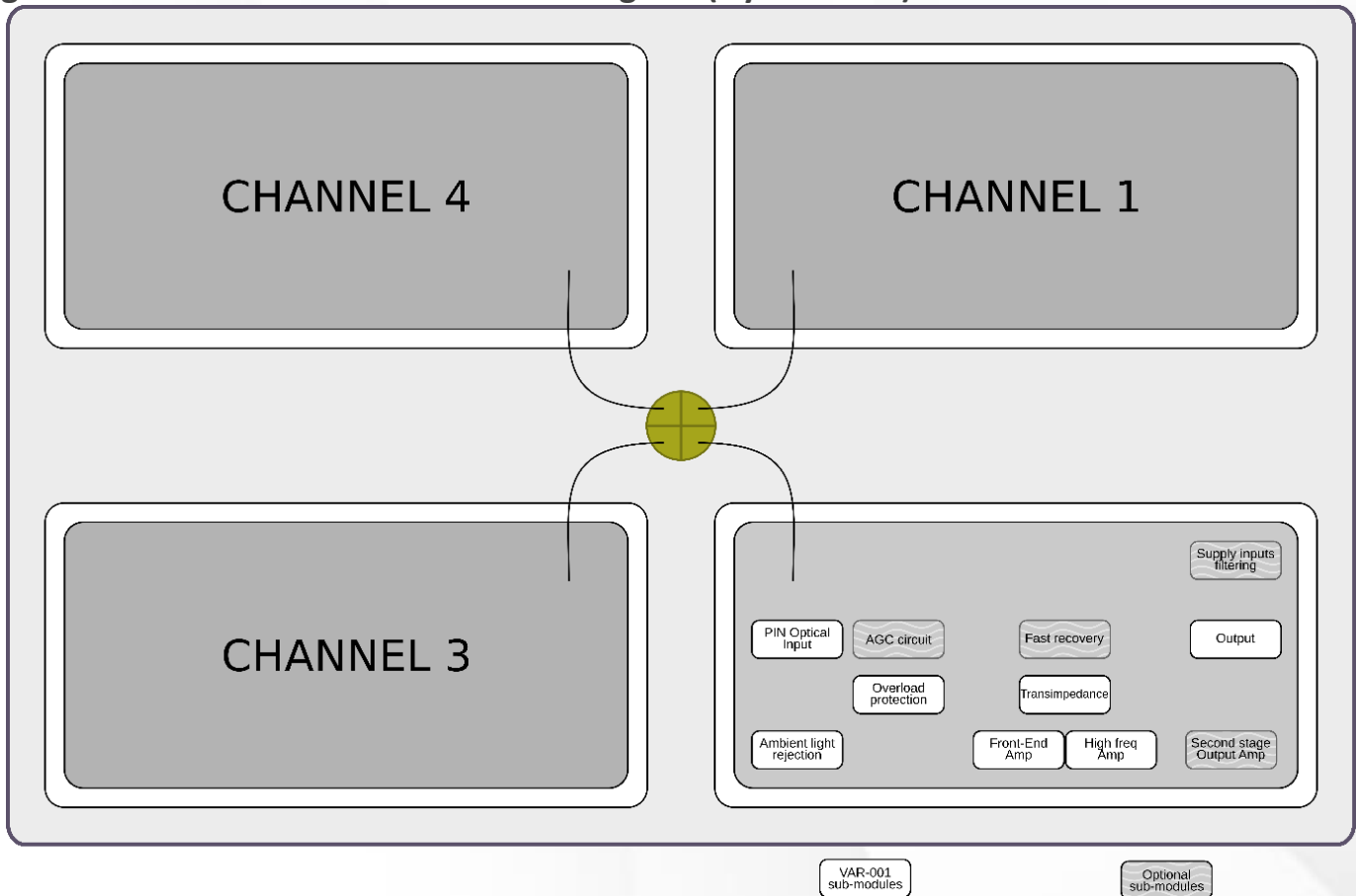


Figure 2. CMC 264-339826 Series block diagram (Channel level)

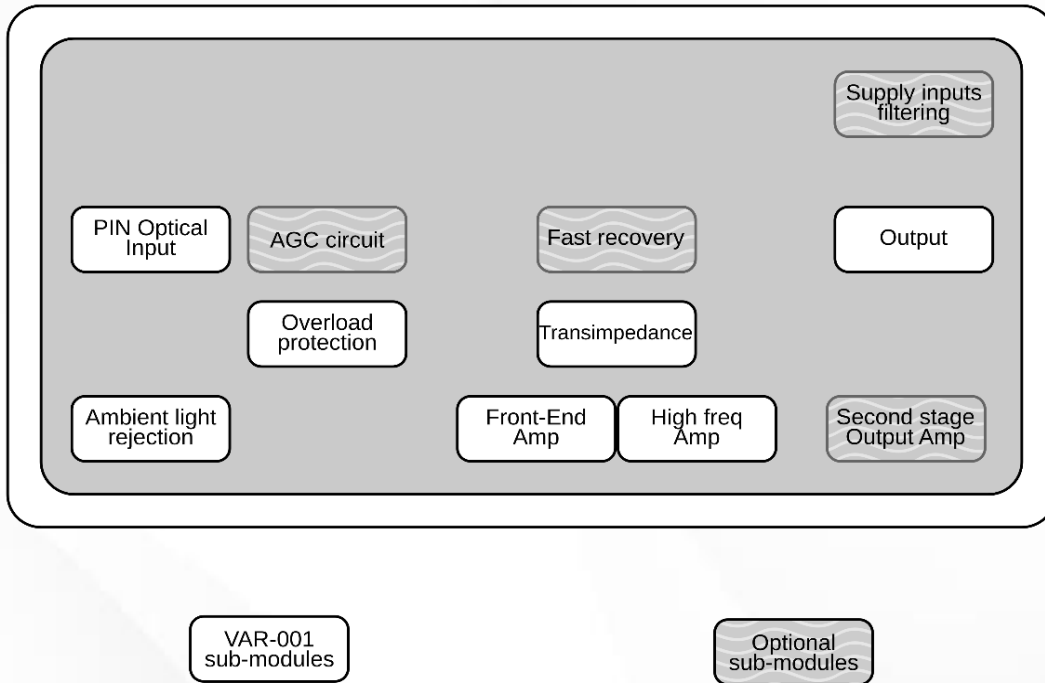


Figure 3. Package Dimension and Pinout

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

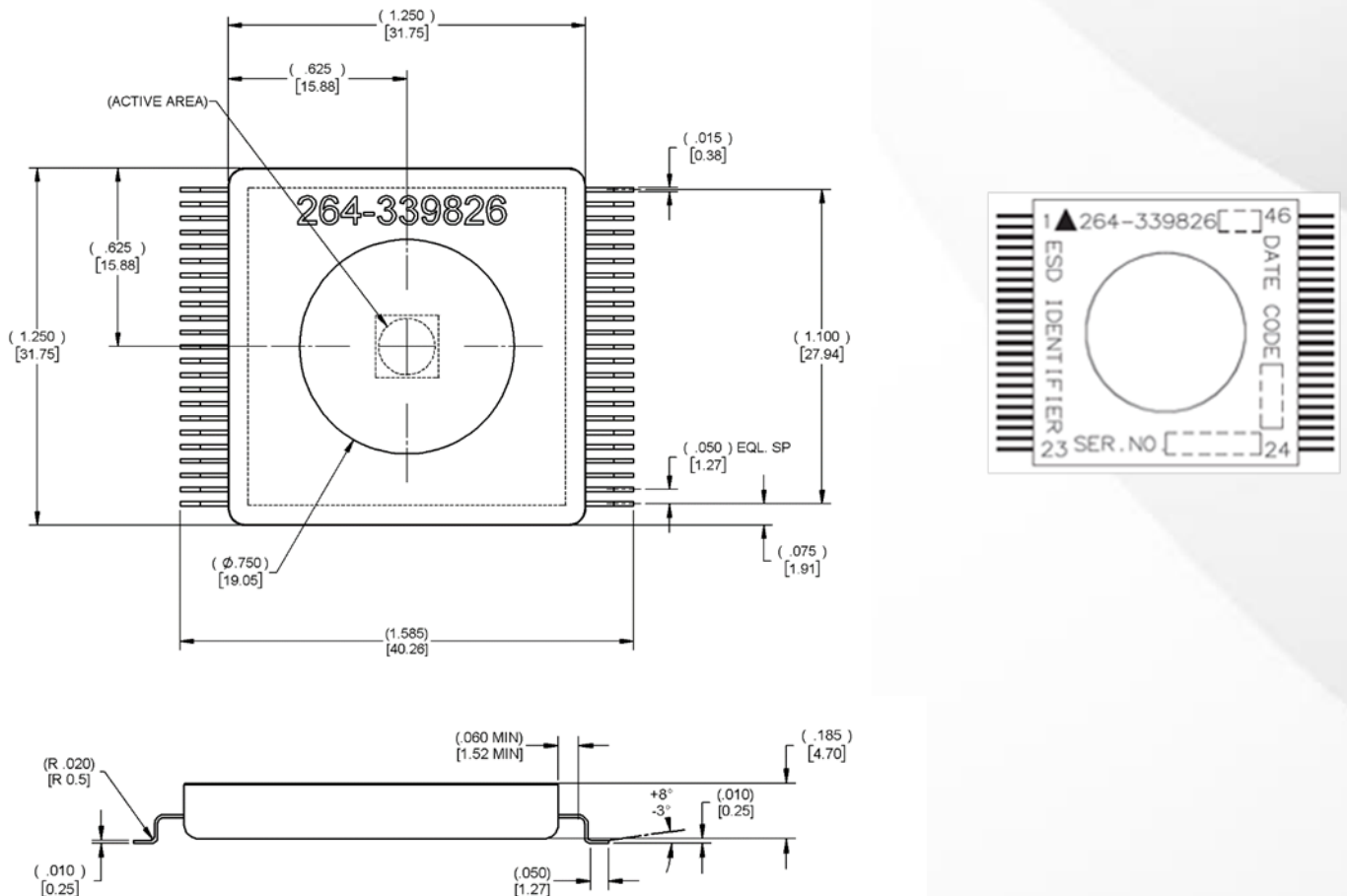


Table 3. Pinout assignment

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

Channel 1 Pins		Channel 2 Pins	
Pkg Pin No.	Signal name	Pkg Pin No.	Signal name
31	Not connected	16	Not connected
33	Not connected	14	Not connected
32	CH1_AGC_IN	15	CH2_AGC_IN
27	OUT_1	20	OUT_2
30	V_POS_1	17	V_POS_2
28	V_NEG_1	18	V_NEG_2

Channel 3 Pins		Channel 4 Pins	
Pkg Pin No.	Signal name	Pkg Pin No.	Signal name
8	Not connected	39	Not connected
10	Not connected	37	Not connected
9	CH3_AGC_IN	38	CH4_AGC_IN
4	OUT_3	43	OUT_4
7	V_POS_3	40	V_POS_4
5	V_NEG_3	42	V_NEG_4

VAR Options

-001	InGaAs PIN 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.

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED
CMC-MEG-OPTO826-VAR
August 2022