3-mm InGaAs Quadrant PIN Receiver with 4 TIAs

CMC Electronics' 264-339826-VAR series is an InGaAs quadrant PIN receiver with four (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 a standard ambient light rejection circuit, eliminating unwanted background light signals. The optional externally controlled single or multi-stage Automatic Gain Control (AGC) provides a high dynamic range. Elective supply input filtering is available for supporting improved channel-to-channel isolation performance. The outputs can be AC or DC coupled to a 100 Ω load, easing the next level design as required by the end-user.

Customizations such as detector size, bandwidth, AGC levels, packaging variations are available upon request.

Features

- 3 mm InGaAs Quad PIN
- 30 MHz Bandwidth
- Spectral Response: 1050 – 1600nm
- 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°C, V_POS = 5.0 V, V_NEG = -5.0 V, R_L = 100 Ω, λ = 1570 nm +/- 10 nm, (Externally AC coupled through 4.7uF)

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): $V_{out} - V_{out\_PrePulse}$ → 200 ns after pulse start			250	mV
$V_{out} - V_{out\_PrePulse}$ → 1 µs 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, 20 ns pulses <100 Hz		100	kW/cm^2
Operating Temperature	-40	85	°C
Storage Temperature	-55	125	°C

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

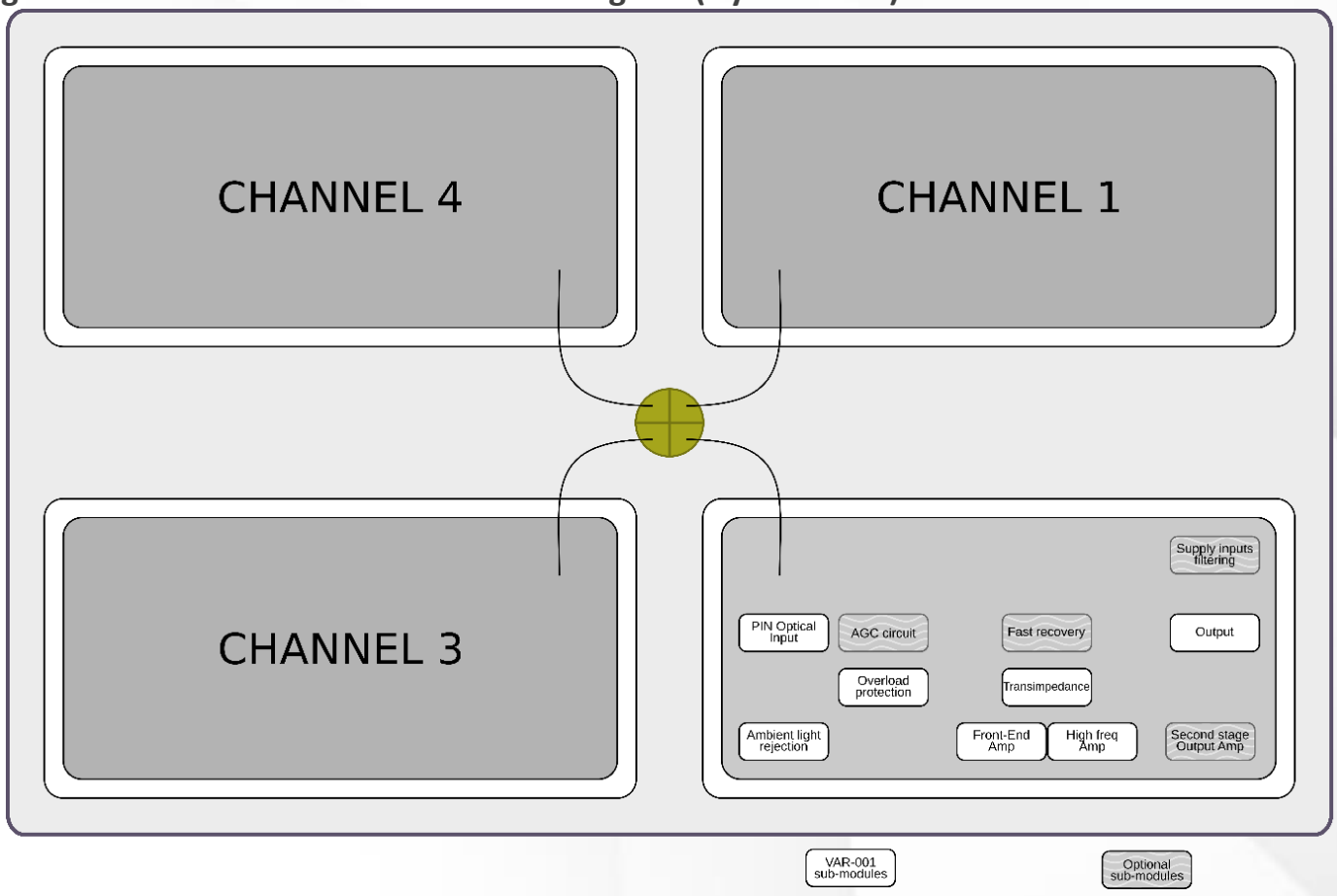


Figure 2. CMC 264-339826 Series block diagram (Channel-level)

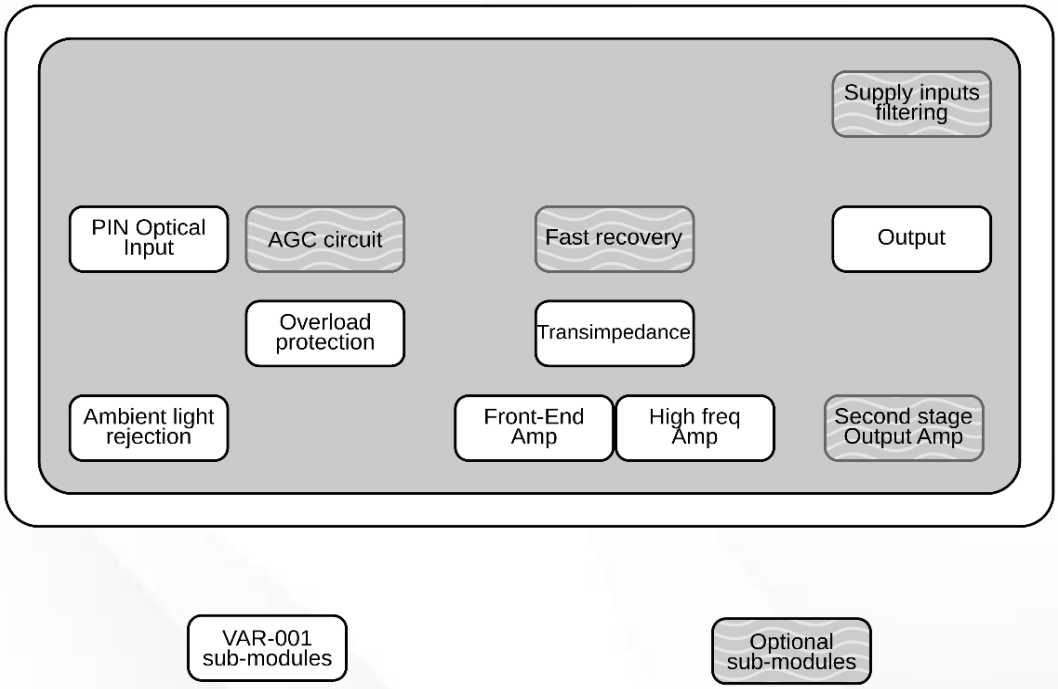
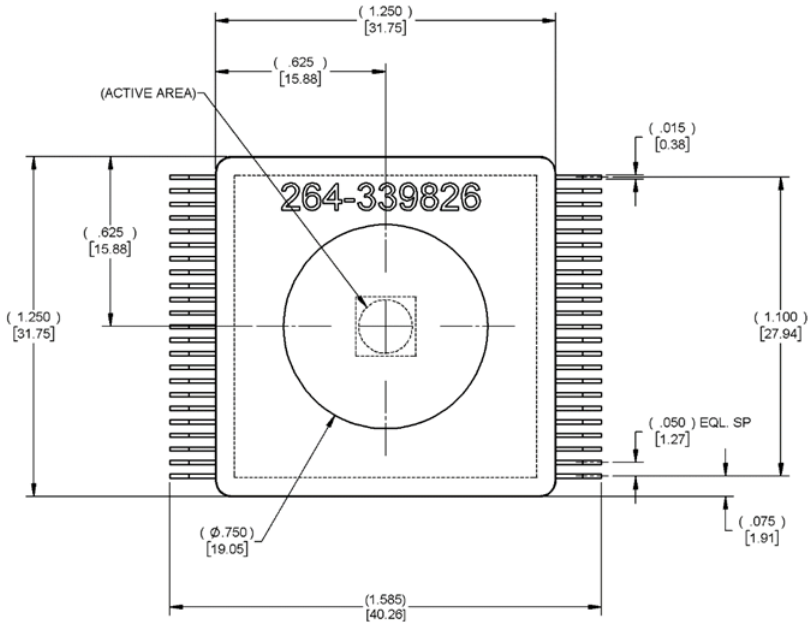
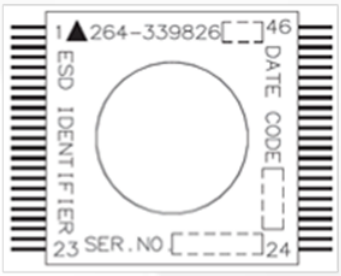


Figure 3. Package Dimension and Pinout

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





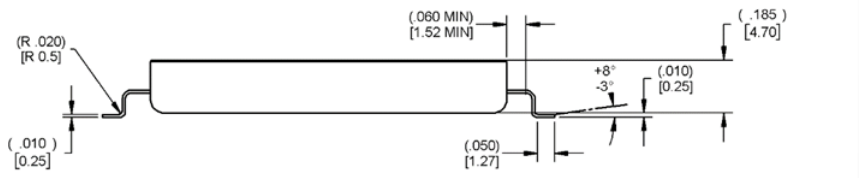


Table 3. Pinout assignation

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/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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