

Automotive Grade Multifunctional high-precision isolation amplifier

General anti-interference Analog signal isolator: ISO EM210 Series

Product features:

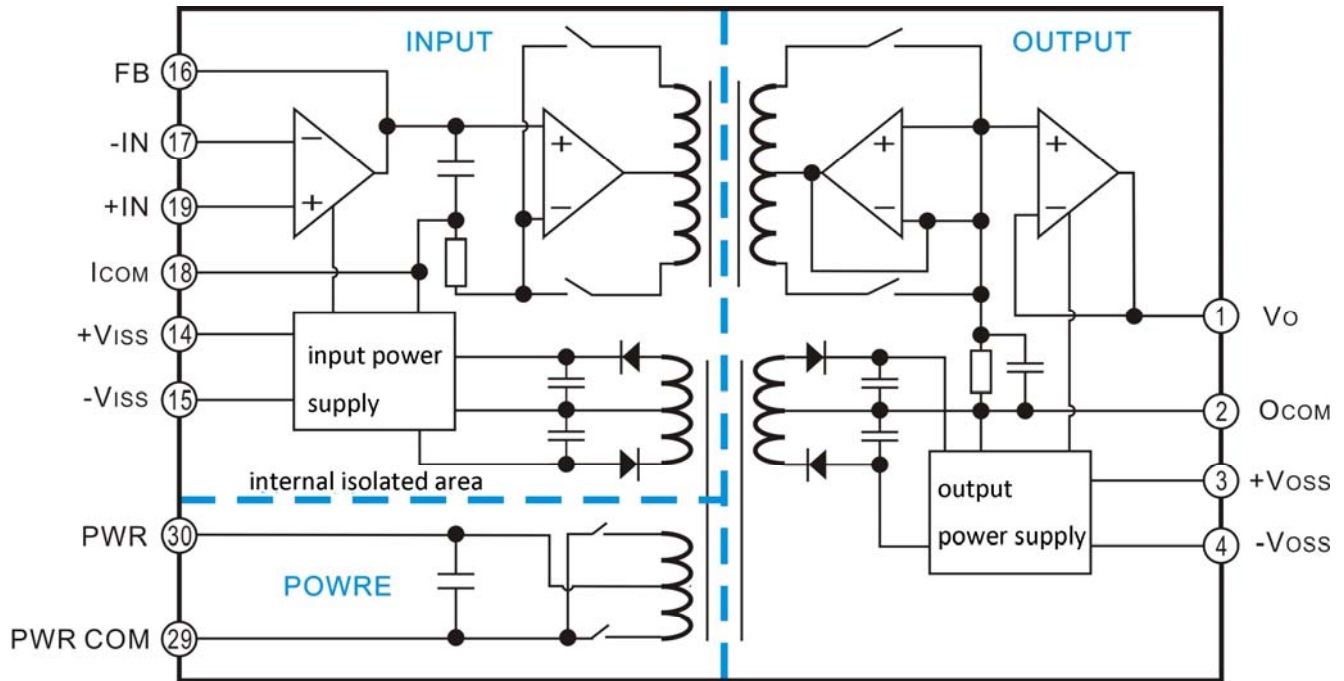
- high bandwidth: 20KHz (-3dB), It is Pin-Pin compatible with the AD210 module
- Low cost, small-volume, DIP standard 38Pin Metal case with Shielded Packages
- Precision grade : 0.1 grade, 0.2 grade, nonlinear degree <0.2% in the full range
- Auxiliary power, signal input and output: 3000VDC three isolation
- Auxiliary power supply: 5V, 12V, 15V, 24VDC and other single power supply modes for optional
- Power distribution can be expanded in the input end and output end: $\pm 15V @ \pm 10mA$
- variable gain input amplifier ($G=1\sim 100V/V$)
- Small size: 50.8 X 25.4 X 10.2 mm (Length X width X height)
- Automotive grade Operating environment wide temperature range: $-40 \sim +125\text{ }^{\circ}\text{C}$

Typical application:

- isolate power distribution and signal acquisition and transmission for Passive transducers
- Pre-amplifier, bridge and other circuits are configured with power supply to facilitate signal collection
- PLC/FCS/DCS control system analog signal isolation, acquisition
- Isolated amplification conversion of high precision DC millivolt micro signal
- Analog Signal Ground Wire Interference And Its Suppression and loop isolation, acquisition
- Analog signal isolation amplification conversion and long - line transmission in industrial field
- Instruments and sensors, PLC analog transceiver
- Power monitoring, medical equipment high voltage isolation safety grid
- The input loop of multi-channel data acquisition is isolated and anti-interference

Features:

SunYuan The ISO EM210 series analog signal isolation amplifier is a hybrid integrated circuit with magneto-electric coupling. The product is packaged in a low cost, small size DIP standard 38Pin metal case, which effectively shields field EMC space interference and is Pin-Pin compatible with the AD210 module. Multiple groups of isolated DC/DC conversion circuit and magneto-electric coupling signal isolation circuit are integrated inside the module, so that external only need to select a DC 5V/12V/15V/24V single power supply to complete the analog signal input/output/auxiliary power three-terminal isolation amplification and conversion technology, and support single-ended and positive and negative two-way DC signal input and output. ISO EM210 have comprehensive function design, it uses a non-fixed gain mode. The input signal is amplified by the preamplifier (gain 1-100) at the input end and then entered the internal modulator for modulation. The non-fixed gain input amplifier is convenient for users to flexibly configure and use according to the field working condition. Users can realize variable gain application through peripheral feedback gain resistance, etc. The modulated signal is transmitted to the output side through transformer coupling. The output is amplified after demodulation circuit demodulation. The three-isolation design structure of the module enables the device to satisfy the complete isolation of signal input, signal output and auxiliary power supply. By interrupting the grounding loop and leakage path measures, and suppressing common mode voltage and noise, the measurement accuracy is prevented and the accuracy and integrity of the measurement signal are improved, which is very suitable for single channel or multi-channel signal isolation applications. ISO EM210 adopts the low cost scheme of magneto-electric coupling, mainly used for EMC (electromagnetic interference) without special requirements, the internal DC-DC isolation power supply in addition to supply power to the internal amplifier circuit, also can provide a group of $\pm 15V / \pm 10mA$ stable voltage isolation power supply to the input and output terminals. Used for two-wire sensor distribution or input preamplification, signal bias, differential circuit, bridge circuit reference power supply. The product can meet the requirements of wet, vibration and wide temperature range $-40 \sim +125\text{ }^{\circ}\text{C}$.



Picture1 ISOEM210 Schematic diagram

The maximum rating of product: (The life of the product will affect the long-term operation in the maximum rated environment. Once the maximum value is exceeded, irreparable damage occurs.)

Continuous Isolation Voltage (Maximum continuous isolation voltage between input and output)	3KVDC/rms
PWR (Maxi input range of auxiliary power supply voltage)	±25%Vdd
Junction Temperature (Maxi operating temperature range)	- 40°C ~ + 125°C
Lead Temperature (maxi welding temperature of pin and duration<10S)	+300°C
Output Voltage Load Min (Minimum load when output voltage signal)	2KΩ

Product technical parameters:

Parameter name	Test condition	Mini	Typical value	Max	unit
Isolation voltage	AC,50Hz,1min		3000		VDC
Gain		1		100	V/V
Gain error			2		mV/V
Gain temperature drift			25		ppm/°C
Non-linearity			0.1	0.2	%FSR
Signal input	voltage	-10		10	V
Input offset voltage			2	5	mV
Input impedance			10 ¹²		Ω
Distribution power output	voltage		± 15		V
	current		± 10		mA
	ripple		50		mV

	accuracy			2	5	%
Signal input	voltage	-10			10	V
Load capacity	Vout=±10V	1	2			kΩ
Frequency response	-3dB				20	KHz
CMRR					105	dB
Signal output ripple	Filterless		10	20		mVRMS
Signal voltage temperature drift			0.1	0.5		mV/°C
Auxiliary power supply	voltage	user-defined	5	12	24	VDC
	Power consumption	Full load		0.8	1	W
Operating ambient temperature		-40			125	°C
Storage temperature		-55			85	°C

Product model and selection definition:

ISOEM210-P□

Power Supply

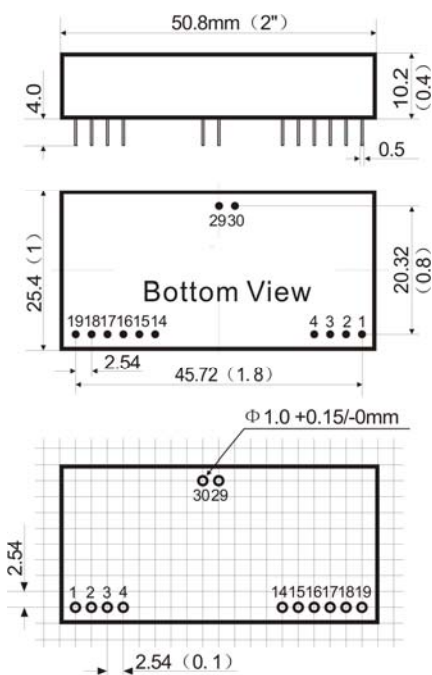
- P1: 24VDC
- P2: 12VDC
- P3: 5VDC
- P4: 15VDC
- P8: customize

Model Selection for example:

For example 1: Auxiliary power supply: 24VDC; Model number: ISOEM210 - P1

For example 2: Auxiliary power supply: 15VDC; Model number: ISOEM210 - P4

Product shape and size picture of PCB layout for refe (Standard DIP38 pin)



(50.8 x 25.4 x 10.2 mm) PCB Layout refe.



Typical application diagram:

FIG. 2 shows the application of the most basic gain configuration. Set the gain of the input amplifier to $G=1$, that is, when the input signal is $\pm 10V$, the output is also $\pm 10V$. If the input signal is small and we need to amplify the input signal ($G>1$), we can configure the peripheral gain feedback resistor as shown in Figure 3 to amplify the input signal. In order to ensure the accuracy, it is best to choose a metal film resistance with a temperature coefficient of 25PPM. The value can be calculated according to the actual output voltage to amplify, according to the amplification factor to match the resistance, to meet the V_{out} calculation formula.

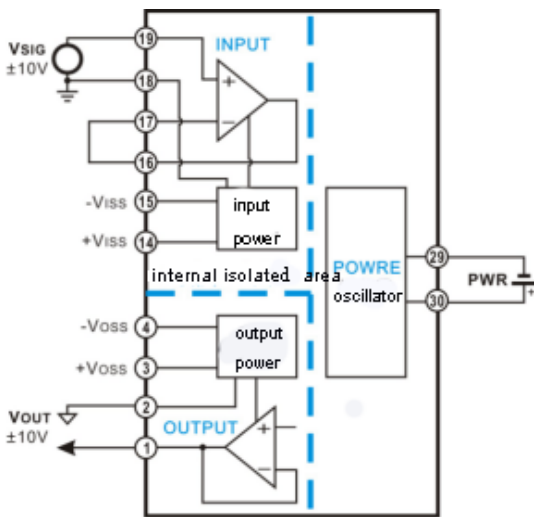


FIG. 2 Typical applications with a gain of 1 ($G=1$)

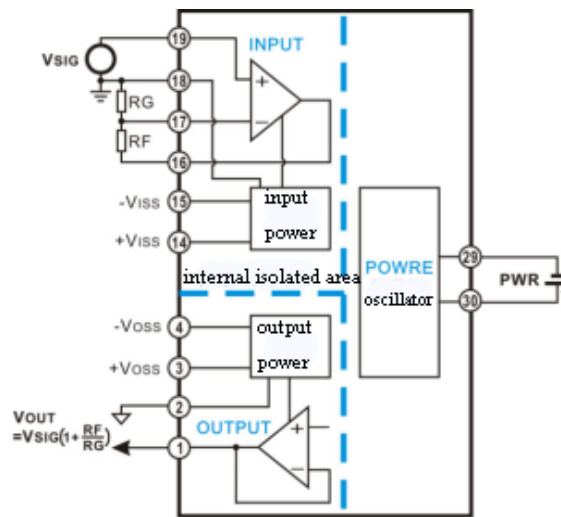


FIG. 3 Typical applications with gain greater than 1 ($G > 1$)

As shown in Figure 4, it is necessary to add a current sampling resistance at the input end to convert the current signal into a voltage signal input. In the figure, the gain of the input amplifier is configured as $G=1$, that is, the sampled voltage. After isolation of the module, the output voltage is basically consistent with the input voltage. If the sampled resistance is selected relatively small, the sampled voltage is obtained relatively small. When the sampled voltage needs to be amplified and then output, the peripheral gain feedback resistor can be configured as shown in Figure 3 for signal amplification. The value of the resistance can be calculated according to the actual voltage to be output, and the resistance can be matched according to the amplification ratio. In order to ensure accuracy, it is best to choose metal film resistance with temperature coefficient of 25PPM, which can meet the calculation formula of V_{out} . FIG. 5 The input is connected to the inverting amplifier application, the input signal can be inverting amplifying output, gain can be set by adjusting R_F and R_S , if you choose the potentiometer adjustment, please choose the high-precision metal film multi-turn potentiometer.

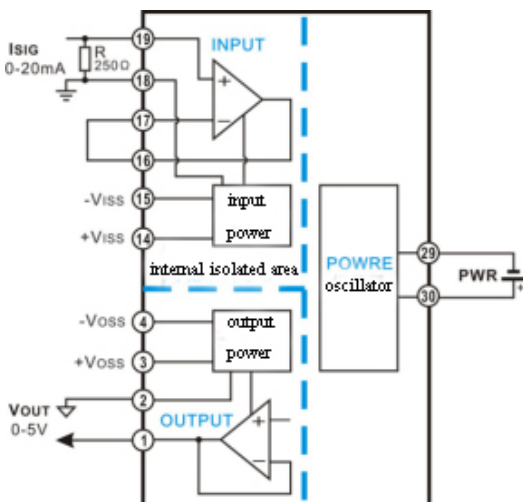


FIG. 4 Typical application of current input and voltage output

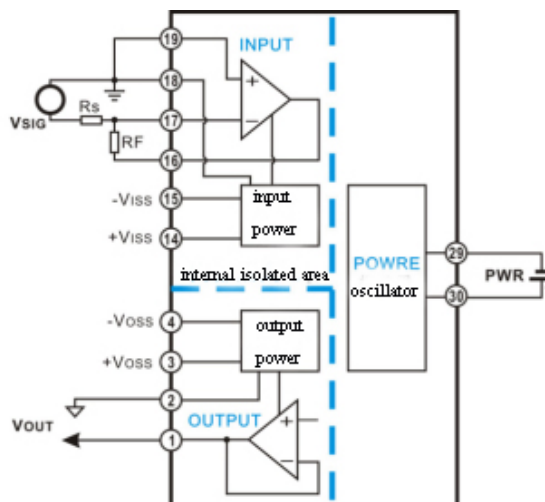


FIG. 5 Typical application of signal reverse mode

Pin function description:

Pin	Pin function	
1	Output+	Signal output positive end
2	Ocom-	Signal output common ground terminal
3	+Voss	The output terminal isolates the positive output terminal of the distribution
4	-Voss	The output terminal isolates the negative output terminal of the distribution
14	+Viss	The input side isolates the positive output side of the distribution
15	-Viss	The input terminal isolates the negative output terminal of the distribution
16	FB	Signal feedback terminal
17	-IN	Input negative terminal
18	Icom-	Input common ground terminal
19	+IN	Positive input terminal
29	PWR COM	power input ground terminal
30	PWR	Power input positive end

