PRECISION and LOW COST ISO-RMS-P-0 ISOLATION AMPLIFIER

FEATURES:

- Wide Signal input 0-1KHz
- 200mV AC or DC Small Signal Conversion.
- High Linearity (Non-linearity<0.2%)
- 3-Port Mutual Isolation 1.5KVAC among Input, Output and Auxiliary Power Supply
- Auxiliary Power Supply: 12VDC, 24VDC
- Accuracy: 0.1, 0.2
- International Standard UL94-V0 Package
- Flaming Retardant
- 24 PIN DIP Package or DIN Rail
- Temperature Range: -45°C to +85°C

APPLICATIONS:

- Analog Signal or Data Acquisition and Isolation
- Measurements of AC or DC Signal RMS
- Ground Loop Elimination
- Measurements & Instrumentations
- Transducer Signal Transmitting and Receiving
- Long Distance Signal Transmitting
- Signal Converter in Industrial Application

GENERAL DESCRIPTION

In general, the voltage-meter is used to test DC voltage signal, while by adding an AC/DC conversion circuit for AC signal testing. Currently, the AC voltage-meters prefer to use a simple average value response AC/DC Converter to decrease the cost and predigest the circuit. The common used average value response AC/DC Converter is of that a semi-wave or full wave line commutate type composed by operational amplifier and diode. This design features high accuracy and linearity as well as its low cost and simplized circuit design. But the disadvantage is that only can be applied to the application of testing standard sine wave voltage under no distortion, and error will occur if test the distortion sine wave. Furthermore, it is also not applicable to test square, rectangle, triangle, saw-tooth, and trapezium and ladder wave on account of the testing results is not in accordance with the fact.

The RMS Isolation Amplifier is designed to meet the requirements of electronic testing at the application where need high accuracy testing of various wave as above mentioned. The core component of RMS Isolation Amplifier is the highly integrated module, and it is configured and designed upon high accuracy amplifier and latest D/S calculation techniques. It can be used to test any type voltage or current wave without considering waveform or distortion. Above all, the RMS Isolation Amplifier features high accuracy, high linearity, wide dynamic current range, quick frequency response, and comprehensive testing applications. In addition, the product is easy to be used with only a few external components linked.

INPUT SPECIFICATIONS:

Isolated Voltage	1500VAC
Auxiliary Power Supply Range:	+/- 10%Vin
Soldering Temperature (10s)	+300°C
Minimum Load Output	2 KΩ

Note: Any input specifications from users hand exceed the above specified range will probably cause a permanent damage to the module

PRODUCT NOMENCLATURE

ISO-RMS-P-O
ISO: Product Series
RMS Input Range: 200mV Max
P: Auxiliary Power Supply
P1: 24VDC;
P2: 12VDC;
P3: 5VDC
P4: 15VDC;
P5: Users Defined
O: Output
O8: 0-2VDC;
O7: Users Defined

Input: 0-200mV AC or DC
Output:0-2V
Aux. Power Supply: 12VDC
Part Number:
ISO-200RMS-P2-O8

PARAMETERS:

Items		Test Condition	Min.	Typ.	Max.	Unit
Isolated Voltage		AC / 50Hz / 1min	1500			V (rms)
Signal Input				0.2	1	V
Min RMS Input					5	mV
CMRRI				7	100	μV /V
Gain		50 KΩ Gain Adj.		10		V/V
Gain Temperature Drift				100		ppm/°C
Non-linearity				0.2	0.5	%FSR
Maladjusted Input Voltage				0.2	1	mV
Input Impedance (Differential Mode)				8		MΩ
Input Impedance (Common Mode)				100		MΩ
Signal Output				2	10	V
Frequency Response		Vin<1V		1		KHz
Loading Capability		Vout=10V	2			KΩ
Output Ripple		No Filtering			10	mV
Voltage Temperature Drift				25		μV/°C
Auxiliary Power Supply	Voltage	Users Defined	3.3	12	24	VDC
	Current	VD=12V(RL=2K)		15		mA
Ambient Temperature			-45		+85	°C
Storage Temperature			-55		+125	°C

TYPICAL CONNECTION: (See Figure 1)

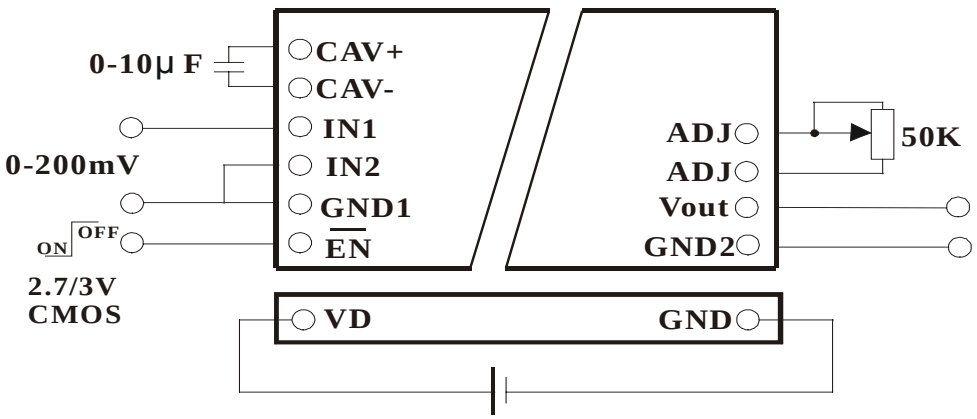


Figure 1: Typical Connection

Note:

1. CAV is an average value capacitor, and is used to calculate the average value to low frequency signal.
2. If wave peak KP≤2, no CAV connected and just applies to test the sine or triangle wave.
3. If wave peak 2<KP≤4, the CAV capacitor is needed and its capacitance is of that between 1-10uF, and the membrane capacitor is recommended.
4. IN1 & IN2: are the differential input, DC coupling and independent of signal polarity.
5. OUT: The Voltage Output (Vout)
6. EN: Input. If EN connected with VDD or No Connection, TRMS will be off function as can not obtain offset voltage. While at nominal working condition, it should be connected with GND or VSS.

TYPICAL APPLICATION:

1: AC Signal RMS Testing (See Figure 2)

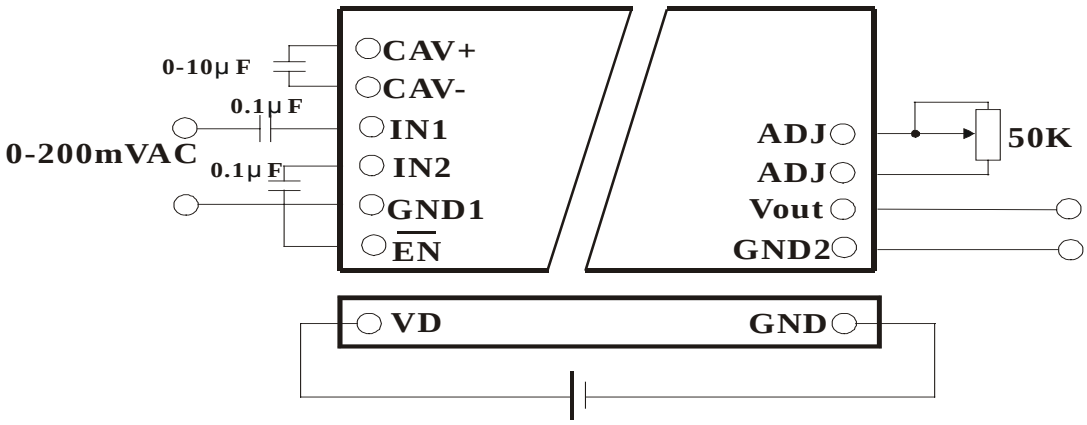


Figure 2: AC Signal RMS Testing

2: Large AC Signal RMS Testing (See Figure 3)

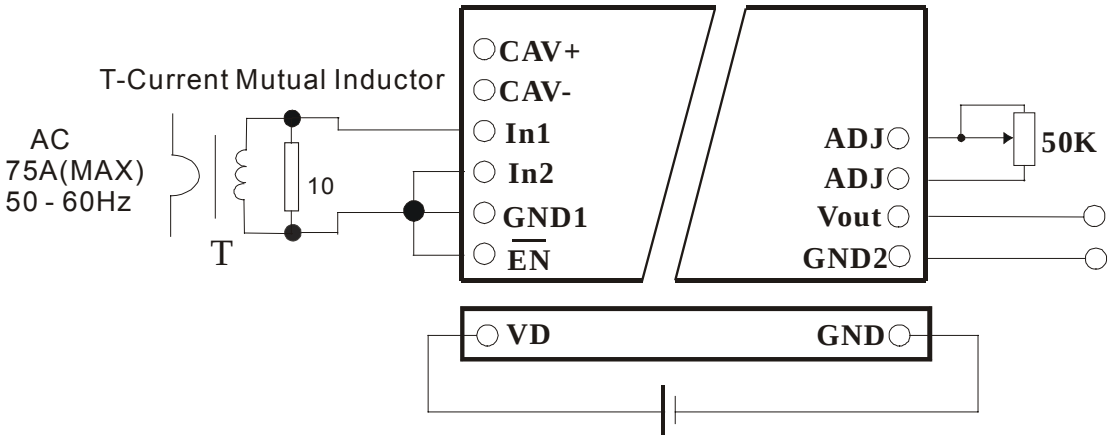


Figure 3: Large AC Signal RMS Testing

ERROR COMPARISION

Signal Testing (Wave Form)		Wave Peak Factor Kp	Wave Form Factor Kf	RMS Up/Kp =Urms	Average (Absolute Value) Urms/Kf = U	Average Comparative Error(γ)
No Distortion Sine Wave		1.414	1.111	0.707Up	0.637Up	0
Semi-wave Commutation		2	1.571	0.5Up	0.318Up	-29.40%
Square Wave	D=50%	1	1	Up	Up	11.10%
Rectangle Wave	D=25%	2	2	0.5Up	0.25Up	-44.60%
	D=1%	10	10	0.577Up	0.01Up	-99%
Triangle Wave		1.732	1.155	0.577Up	0.5Up	-3.80%
Saw-tooth Wave		1.732	1.155	0.577Up	0.5Up	-3.80%
SCR Wave	θ =110°	2.5	0.8	0.4Up	0.5Up	-39%
	θ =148°	4	0.69	0.25Up	0.36Up	-59%

Wave Peak Factor Kp = Up / Urms

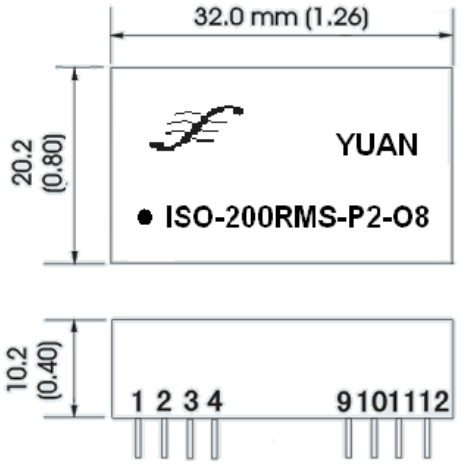
Wave Form Factor Kf = Urms / U

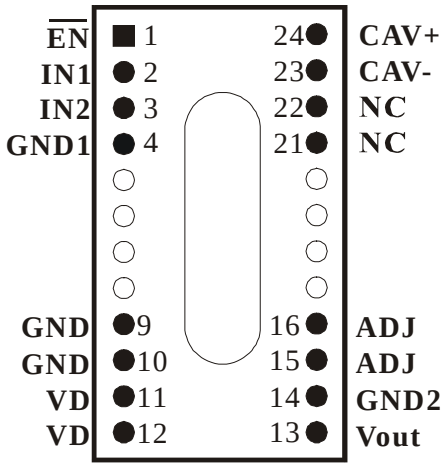
For Sine Wave: Kp = 1.414; Kf = 1.111 So, Urms = 1.111U

Set Practical Value = 1.111U; True Value = Urms

γ = (Practical Value - True Value) / True Value X 100%

OUTLINE DIMENSION AND PIN DESCRIPTION:





INPUT	D.M INPUT	D.M INPUT	Input Power Supply Negative	Aux. Power Supply Negative	Aux. Power Supply Positive	Isolated Signal Output Positive	Isolated Signal Output Negative	Gain Adjustment	NO Connection	Capacitance Negative	Capacitance Positive
EN	IN1	IN2	GND1	GND	VD	VOUT	GND2	ADJ	NC	CAV-	CAV+
1	**2**	**3**	**4**	**9,10**	**11,12**	**13**	**14**	**15,16**	**21,22**	**23**	**24**