Medical & Industrial Solation Solation



IA175 ULTRA-LINEAR ISOLATION AMPLIFIER WITH EXTERNAL SYNC CAPABILITY

Fully Compatible with 12-Bit Acquisition Systems

FEATURES

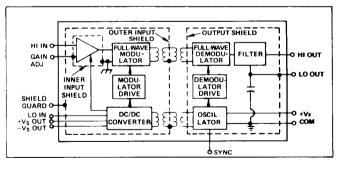
- UL Component Recognized
- Provision for External Synchronization
- High Linearity: 0.005% Peak, Typical
- High Input/Output Isolation: 5000VDC continuous,

3000VAC RMS

- 1000:1 Programmable Gain
- Low Drift: ±0.01%/°C Maximum
- 126dB Common-Mode Rejection

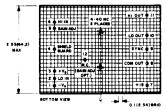
The Model IA175 Isolation Amplifier features very high linearity, input/output isolation, and common-mode rejection, very low drift, and externally programmable gain. Its 0.005% linearity assures compatibility with 12-bit data acquisition systems, and its ability to operate at common-mode input voltages up to 5000 VDC enables operation with single sources in high voltage systems and other hazardous locations. Common-mode rejection is at least 120 dB with source imbalance of up to 5000 ohms. Input voltage noise is 1µV, 10Hz to 1 kHz, and current noise is 10 pA for the same range. The gain of the amplifier is programmable from 1V/V to 1000V/V by means of an externally connected resistance value. The internal oscillator used to provide modulation and demodulation for input isolation can be synchronized with those of associated Model IA175 amplifiers by means of an external trigger, to avoid imposition of beat-frequency phenomena on the output signals. An independent ± 14 VDC, ± 15 mA supply in the input section, with the same voltage isolation as the amplifier input, is used to power an external transducer, or preamplifier.

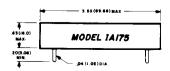
BLOCK DIAGRAM IA175



CONNECTION NOTES:

- Gain Adjustment Resistor (Rg) is connected between GAIN and LO-IN pins.
- If no output-offset adjustment is required, connect LO-OUT to COMMON pin. Otherwise, consult factory.







CHARACTERISTICS		
CHARACTERISTICS		
(Typical, @ 25°C, V _S = +15 VDC unless otherwise noted.)		
GAIN (Non-Inverting)	1 10001/7/	
Range Formula	1 to 1000V/V 1 + (30kQ/Rg)	
Deviation from Formula	± 1%	
vs. Temperature (0 to +70°C)	± 0.005%/°C	
vs. Temperature (0 to +70°C)	± 0.01%/°C max.	
Nonlinearity, ±5V Output	$\pm 0.01\%$ max.	
Nonlinearity, ± 10V Output	± 0.02% max.	
INPUT VOLTAGE RATINGS		
Linear Differential Range	± 10V min.	
Max. Safe Differential Input rms. Continuous	1257/	
Peak Pulse, 5 ms Duration, One Pulse/Sec	125V rms : ±600V	
Max. CMV, Inputs to Outputs/Power Comme		
Peak AC, 60 HZ, 1 Minute	3,000V	
Peak AC, 60 HZ, 1 Minute Peak DC Continuous	± 5,000V	
CMR, Inputs to Outputs, 60 Hz		
Balanced Source Impedance	126dB	
5kQ Source Imbalance	120dB	
CMR, Inputs to Guard, 60 Hz	6040	
5kΩ Source Imbalance	80dB	
Max. Leakage Current, Inputs to Common 115 VAC, 60Hz	8μA max.	
	opri max.	
INPUT IMPEDANCE Differential	10°Ω∥3 pF	
Overload	27kΩ	
Common Mode	10 ¹¹ Ω∥20pf	
INPUT BIAS CURRENT	11 • 1	
Initial, @ +25°C	± 2nA	
vs. Temperature (0 to +70°C)	±0.01nA/°C	
INPUT NOISE		
Voltage,		
0.01 Hz to 10Hz	3μV p-p	
10Hz to 1kHz	lμV rms	
Current	•	
0.01Hz to 10Hz	lpA p-p	
FREQUENCY RESPONSE		
Small Signal, - 3dB Gain = 100V/V	1kHz	
Full Power, 20V p-p Output	500Hz	
Slew Rate	30mV/μs	
OFFSET VOLTAGE, REFERRED TO INPUT		
Initial, @ +25°C	$\pm (1 + 5/G)mV$	
vs. Temperature (0 to $+70^{\circ}$ C)	: 35	
Gain = $1V/V (\mu V)^{\circ}C \text{ max.}$ Gain = $100V/V (\mu V)^{\circ}C \text{ max.}$	± 35 ± 15	
At other Gains ($\mu V / ^{\circ}C$ max.)	$\pm (15 + 20/G)$	
vs. Supply Voltage	$\pm (1 + 20/G)\mu V/V$	
DATED OUTDUT		
RATED OUTPUT Voltage, 50kQ Load		
Voltage, 50kQ Load	± 10V min.	
Voltage, 50kQ Load Output Ripple, 20 kHz		
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance	± 10V min. 10mV p-p 1.0kΩ	
Voltage, 50kQ Load Output Ripple, 20 kHz	± 10V min. 10mV p-p	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance	± 10V min. 10mV p-p 1.0kΩ	
Voltage, 50kΩ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5%	
Voltage, 50kΩ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load Accuracy Current	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load Accuracy Current Regulation	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min.	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2%	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load A Gain	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min.	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005%	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100µV	
Voltage, 50kΩ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, - 2% ± 0.005% ± 100µV ± 5µV	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, of or rated performance	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, of or rated performance	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5%0 ± 15 mA min. + 0, -2%0 ± 0.005%0 ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, of or rated performance	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5%0 ± 15 mA min. + 0, -2%0 ± 0.005%0 ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 · 8 kHz, 5VDC @	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. +0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100µV ± 5µV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 - 8 kHz, 5VDC @ 50% duty cycle	
Voltage, 50kΩ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE Rated Performance	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 · 8 kHz, 5VDC @ 50% duty cycle	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ±15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, - 2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 - 8 kHz, 5VDC @ 50% duty cycle 0°C to 70°C - 55°C to + 85°C	
Voltage, 50kΩ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE Rated Performance	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 · 8 kHz, 5VDC @ 50% duty cycle	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE Rated Performance Storage	± 10V min. 10mV p-p 1.0kQ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, - 2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 - 8 kHz, 5VDC @ 50% duty cycle 0°C to 70°C - 55°C to + 85°C	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE Rated Performance Storage CASE DIMENSIONS MATING SOCKET	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 · 8 kHz, 5VDC @ 50% duty cycle 0°C to 70°C - 55°C to + 85°C 3.5″ x 2.5″ x .62″ S132	
Voltage, 50kQ Load Output Ripple, 20 kHz Output Impedance Max. CMV, Output Common to Power Common Peak AC or DC Continuous ISOLATED POWER CIRCUIT Voltage, ± 15 mA Load Accuracy Current Regulation No load to full load Δ Gain Δ Output Offset Δ Input Offset POWER SUPPLY, SINGLE POLARITY Voltage, for rated performance Voltage, operating Current, quiescent Current, quiescent Current, full load External Sync. Frequency TEMPERATURE RANGE Rated Performance Storage CASE DIMENSIONS	± 10V min. 10mV p-p 1.0kΩ ± 50Vpk ± 14 VDC ± 5% ± 15 mA min. + 0, -2% ± 0.005% ± 100μV ± 5μV + 15VDC, ± 0.5V + 12 to + 18VDC 70mA 100mA 7 - 8 kHz, 5VDC @ 50% duty cycle 0°C to 70°C -55°C to + 85°C 3.5″ x 2.5″ x .62″	

IA184 LOW-COST, HIGH-LINEARITY ISOLATION AMPLIFIER WITH EXTERNAL SYNC CAPABILITY

Fully Compatible with 10-Bit Data Acquisition Systems

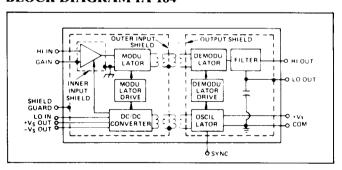


FEATURES

- UL Component Recognized (IA184)
- Provision for External Synchronization
- High Linearity: 0.025% Peak, Typical
- 2500 V Input/Output Isolation
- 126 dB Common-Mode Rejection
- 1000:1 Programmable Gain
- Small Size: only 1.5" x 1.5" x 0.63"

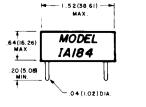
The Model IA184 Isolation Amplifier is an ultracompact module offering high linearity, 2500-Volt input/ output isolation, 126 dB common-mode rejection, externally programmable gain, a floating internal supply for powering an external transducer, and external synchronization of the internal oscillator used in obtaining the input isolation. Its 0.1% linearity assures compatibility with 10-bit data acquisition systems, and input voltage noise is held to 1µV, 10 Hz to 1 kHz, with 10 pA maximum current noise for the same range. The internal oscillator used to provide modulation and demodulation for input isolation can be synchronized with those of associated Model IA184 amplifiers by an external trigger, to prevent imposition of beat-frequency phenomena on the output signal. An independent ± 15 VDC, ± 15 mA supply in the input section, with the same voltage isolation as the input, can be used to power an external transducer or preamplifier.

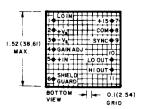
BLOCK DIAGRAM IA 184



CONNECTION NOTES:

- Gain Adjustment Resistor (Rg) is connected between GAIN and LO-IN pins.
- If no output-offset adjustment is required, connect LO-OUT to COMMON pin. Otherwise, consult factory.





CHARACTERISTICS (Typical, @ 25 °C, $V_S = +15$ VDC unless otherwise noted.)

GAIN (Non-Inverting)	A184
Range (50kQ Load) Formula	1 to 1000V/V
Formula	Gain = $(1 + 100k\Omega)$
Deviation from Formula	±3% Rg
vs. Temperature (0 to +70 °C) Nonlinearity, G = 1V/V to	±0.015%/℃
10V/V	@ ±5V. ±0.025%
	@ ± 5V, ± 0.025% @ ± 10V, ± 0.1%
	@ ± 10V, ± 0.2% max
INPUT VOLTAGE RATING Linear Differential Range, G =	
1V/V	± 10V min.
Max. Safe Differential Input	1267
Continuous Pulse, 10ms Duration, 1	125V rms
pulse/10 sec	±600Vpk max.
Max. CMV, Inputs to Outputs AC, 60 Hz, 1 Minute duration	2500V rms
Pulse, 10ms duration, 1	2500 7 11115
pulse/10 sec	$\pm 2500 \text{Vpk max}$.
With 510kQ in series with Guard	± 5000Vpk max.
Continuous, AC or DC	± 2500V pk max.
CMR, Inputs to Outputs, 60 Hz	•
Rs<5kQ Balanced Source Impedance	126dB
5KQ Source Imbalance	120dB
CMR, Inputs to Guard, 60 Hz	904b
IkQ Source Imbalance Max. Leakage Current,	80db
Inputs to Power	
Common @ 115 VAC, 60 Hz	1.2µA rms max.
INPUT IMPEDANCE Differential	1040#3 55
Overload	10⁴Ω∥3 pF 27kΩ
Common Mode	5 x 10 ¹⁰ Ω∥20 pF
INPUT BIAS CURRENT	
Initial, $@ + 25 ^{\circ}$ C vs. Temperature (0 to +70 $^{\circ}$ C)	±2nA ±0.01nA/°C
INPUT NOISE	IO.OHA/ C
Voltage	
0.05 Hz to 10Hz	3μV
10Hz to 1kHz Current	1μV rms
0.05Hz to 100Hz	5pA p-p
10Hz to 1kHz	10pA rms
FREQUENCY RESPONSE	
Small Signal, $-3dBG = 1V/V$ to $10V/V$	1kHz
Full Power, 10V p-p Output Gain = 1V/V	IKIIZ
Gain = 1V/V	500Hz
Gain = $10V/V$ Recovery Time, to $\pm 100\mu V$ after	500Hz
application of ±600Vpk	
differential input pulse	50ms
OFFSET VOLTAGE, REFERRED Initial, @ +25 °C	
vs. Temperature (0 to +70°C)	$\pm (1 + 5/G)mV$
Coin = 1V/V/(V/9C max)	± 65
Gain = $100V/V (\mu V/ \% \text{ max.})$) ± 15
At other Gains $(\mu \hat{V} / {}^{\circ}C \text{ max.})$ vs. Supply Voltage	$\pm (15 + 50/G)$ $\pm (1 + 50/G)\mu V/V$
RATED OUTPUT	= \1 · 20/0/pi//
Voltage, 50kΩ Load	± 10V min.
Output Impedance	1kQ
Max. CMV, Output Common t Peak AC or DC Continuous	to Power Common, ±50V pk
ISOLATED POWER OUTPUTS	
Voltage, ±5 mA Load	± 15 VDC
Accuracy	± 5%0
Current Regulation, NL to FL	± 15 mA min. +0, -3%
	100m V p-p
Ripple, 100kHz Bandwidth	ARITY
POWER SUPPLY, SINGLE POL	
POWER SUPPLY, SINGLE POL	$+ 15VDC, \pm .5V$
POWER SUPPLY, SINGLE POL	+ 15VDC, ± .5V + (8 to 15.5) VDC + 20mA
POWER SUPPLY, SINGLE POLA Voltage, Rated Performance Voltage, Operating Current, Ouiescent	+ 20mA 50mA
POWER SUPPLY, SINGLE POL	+ 20mA 50mA 33 to 37 kHz, 5VDC
POWER SUPPLY, SINGLE POL. Voltage, Rated Performance Voltage, Operating Current, Quiescent Current, Full Load External Sync Freq.	+ 20mA 50mA
POWER SUPPLY, SINGLE POL. Voltage, Rated Performance Voltage, Operating Current, Quiescent Current, Full Load External Sync Freq. TEMPERATURE RANGE	+ 20mA 50mA 33 to 37 kHz, 5VDC 50% duty cycle
POWER SUPPLY, SINGLE POL. Voltage, Rated Performance Voltage, Operating Current, Quiescent Current, Full Load External Sync Freq.	+ 20mA 50mA 33 to 37 kHz, 5VDC
POWER SUPPLY, SINGLE POLA Voltage, Rated Performance Voltage, Operating Current, Quiescent Current, Full Load External Sync Freq. TEMPERATURE RANGE Rated Performance Storage	+ 20mA 50mA 33 to 37 kHz, 5VDC 50% duty cycle 0 to +70°C -55°C to +85°C
POWER SUPPLY, SINGLE POL. Voltage, Rated Performance Voltage, Operating Current, Quiescent Current, Full Load External Sync Freq. TEMPERATURE RANGE Rated Performance	+ 20mA 50mA 33 to 37 kHz, 5VDC 50% duty cycle 0 to + 70°C

NOMINAL WEIGHT

MATING SOCKET

1.3 ounces

IA284 LOW COST, HIGH-LINEARITY ISOLATION AMPLIFIER

Fully Compatible with 10-Bit Data Acquisition Systems





FEATURES

• Linearity: 0.025% Peak, Typical

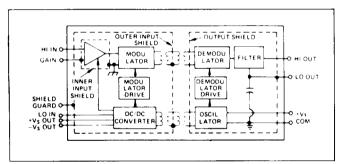
• 2500 V Input/Output Isolation

• 126 dB Common-Mode Rejection

• 10:1 Programmable Gain

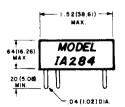
The Model IA284 Isolation Amplifier is an ultra-compact module offering high linearity, 2500-Volt input/output isolation, 126 dB common-mode rejection, programmable gain and a floating internal supply for powering an external transducer. Its .1% linearity assures compatibility with 10-bit data acquisition systems, and input voltage noise is held to 1 V, 10 Hz to 1 kHz, with 10 pA maximum current noise for the same range. An independent \pm 15 VDC, \pm 15 mA supply in the input section, with the same voltage isolation as the input, can be used to power an external transducer or preamplifier.

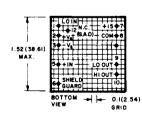
BLOCK DIAGRAM IA284



CONNECTION NOTES:

- Gain Adjustment Resistor (Rg) is connected between GAIN and LO-IN pins.
- 2. If no output-offset adjustment is required, connect LO-OUT to COMMON pin. Otherwise, consult factory.





CHARACTERISTICS (Typical, @ 25°C, V_S = +15 VDC unless otherwise noted.) IA284

CAIN (Non Investigat)	1A284
GAIN (Non-Inverting)	
Range (50kQ Load)	1 to 10 V/V
Formula	$Gain = (1 + \underbrace{100k\Omega}_{})$
Deviation from Formula	± 3 % 10.7k Ω + Rg
vs. Temperature (0 to +70°C)	±0.015%/°C
Nonlinearity, $G = 1V/V$ to	
10V/V	@ ±5V, ±0.025%
	@ ±5V, ±0.025% @ ±10V, ±0.1% @ ±10V, ±0.2% max.
INPUT VOLTAGE RATING	3 1.0., 10.0
Linear Differential Range, G =	
1V/V	± 10V min.
Max. Safe Differential Input	2401/
Continuous	240V rms
Pulse, 10ms Duration, 1 pulse/10 sec	6500V pk max.
Max. CMV, Inputs to Outputs	0300 v pk max.
AC, 60 Hz, 1 Minute duration	2500V rms
Pulse, 10ms duration,	******
1 pulse/10 sec With 510kΩ in series with	± 2500Vpk max.
Guard	± 5000V pk max.
Continuous, AC or DC	± 2500Vpk max.
CMR, Inputs to Outputs, 60 Hz,	
R _S <5kQ Balanced Source Impedance	126dB
5KQ Source Imbalance	120dB
CMR, Inputs to Guard, 60 Hz	
1kQ Source Imbalance	80db
Max. Leakage Current,	
Inputs to Power Common @ 115 VAC, 60 Hz	1.2µA rms max.
INPUT IMPEDANCE	respect title of an.
Differential	10°Ω∦30pF
Overload	390k ♀
Common Mode	5 x 10 ¹⁰ Ω∥20 pF
INPUT DIFFERENCE CURREN	
Initial, @ + 25 °C	±2nA
vs. Temperature (0 to +70°C)	±0.01nA/°C
INPUT NOISE	
Voltage 0.05 Hz to 10Hz	8 _µ v
10Hz to 1kHz	10 μV rms
Current	107
0.05Hz to 100Hz	
	5pA p-p
10Hz to 1kHz	SpA p-p 10pA rms
FREQUENCY RESPONSE	
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V	10pA rms
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, - 3dB G = 1V/V to 10V/V	
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, - 3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V	10pA rms
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, - 3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V	1kHz 500Hz 500Hz
IOHz to IkHz FREQUENCY RESPONSE Small Signal, - 3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = IV/V Recovery Time, to ± 100µV afte	1kHz 500Hz 500Hz
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk	1kHz 500Hz 500Hz
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, - 3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk differential input pulse	10pA rms 1kHz 500Hz 500Hz 50ms
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL	10pA rms 1kHz 500Hz 500Hz 500Hz 70 INPUT
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, −3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C)	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, −3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C)	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100µV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (µV/°C max.) Gain = 100V/V (µV/°C max.)	10pA rms 1kHz 500Hz 500Hz 500Hz 1TO INPUT ± (1 + 5/G)mV ± 65 ± 15
IOHz to IkHz FREQUENCY RESPONSE Small Signal, ¬3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = 100V/V (μV/°C max.) At other Gains (μV/°C max.)	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV ±65)±15 ±(15 + 50/G)
TREQUENCY RESPONSE Small Signal, ¬3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage	10pA rms 1kHz 500Hz 500Hz 500Hz 1TO INPUT ± (1 + 5/G)mV ± 65 ± 15
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ± 100μV after application of ± 600V pk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25 °C vs. Temperature (0 to +70°C) Gain = 1V/V (μV/°C max.) Gain = 100V/V (μV/°C max.) At other Gains (μV/°C max.) vs. Supply Voltage RATED OUTPUT	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 1 TO INPUT ±(1 + 5/G)mV ±65 ±15 ±(15 + 50/G) ±(1 + 50/G)μV/V
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ± 100µV after application of ± 600Vpk differential input pulse OFFSET VOLTAGE, REFERRET Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (µV/°C max.) Gain = 100V/V (µV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50k Q Load Output Impedance	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV ±65)±15 ±(15 + 50/G)
IOH2 to 1kHz FREQUENCY RESPONSE Small Signal, ¬3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Gain = 10V/V Recovery Time, to ±100µV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (µV/°C max.) Gain = 10V/V (µV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV ±65 ±15 ±(15 + 50/G) ±(1 + 50/G)μV/V ±10V min.
10Hz to 1kHz FREQUENCY RESPONSE Small Signal, −3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (μV/°C max.) Gain = 1V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC	10pA rms 1kHz 500Hz 500Hz 500Hz 700 INPUT ± (1 + 5/G)mV ± 65 ± 15 ± (15 + 50/G) ± (1 + 50/G)μV/V ± 10V min. 1kΩ
THE TO INHZ FREQUENCY RESPONSE Small Signal, -3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = I0V/V Recovery Time, to ± 100µV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRET Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = IV/V (µV/°C max.) Gain = IV/V (µV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50k Q Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV ±65 ±15 ±(15 + 50/G) ±(1 + 50/G)μV/V ±10V min.
IOH2 to 1kHz FREQUENCY RESPONSE Small Signal, ¬3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 7 TO INPUT ±(1 + 5/G)mV ±65 ±(15 + 50/G) ±(15 + 50/G)μV/V ±10V min. 1kΩ ±50V pk
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, ¬3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = I0V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous SOLATED POWER OUTPUTS Voltage, ±5 mA Load	10pA rms 1kHz 500Hz 500Hz 500Hz 7 701NPUT ±(1 + 5/G)mV ±65 ±(15 + 50/G) ±(17 + 50/G)μV/V ±10V min. 1kΩ ±50V pk ±15 VDC
THE TO INHZ FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 1 TO INPUT ±(1 + 5/G)mV ±65 ±(15 + 50/G) ±(16 + 50/G)μV/V ±10V min. 1kQ ±50V pk ±15 VDC ±5%
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, ¬3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = I0V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50k2 Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL	10pA rms 1kHz 500Hz 500Hz 50ms 7 TO INPUT ±(1 + 5/G)mV ±65) ±15 ±(15 + 50/G) ±(1 + 50/G)µV/V ±10V min. 1kQ ±50V pk ±15 VDC ±5% ±15 mA min. +0, -15%
THE TO INHZ FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy	10pA rms 1kHz 500Hz 500Hz 500ms 1TO INPUT ±(1 + 5/G)mV ±65 ±15 + 50/G) ±(1 + 50/G)μV/V ±10V min. 1kΩ ±50V pk ±15 VDC ±5% ±15 VDC ±5% ±15 mA min.
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, -3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = IV/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 1TO INPUT ±(1 + 5/G)mV ±65 ±15 + 50/G) ±(1 + 50/G)μV/V ±10V min. 1kΩ ±50V pk ±15 VDC ±5% ±15 mA min. +0, -15% 100m V p-p ARITY
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, -3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = I0V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 7 TO INPUT ± (1 + 5/G)mV ± 65) ± 15 ± (15 + 50/G) ± (1 + 50/G)µV/V ± 10V min. 1kQ ± 50V pk ± 15 VDC ± 5% ± 15 mA min. + 0, -15% 100m V p-p ARITY + 15 VDC, ± .5V
IOH2 to 1kHz FREQUENCY RESPONSE Small Signal, -3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV after application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Rated Performance Voltage, Rated Performance	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 1TO INPUT ±(1 + 5/G)mV ±655 ±(15 + 50/G) ±(17 + 50/G)μV/V ±10V min. 1kQ ±50V pk ±15 VDC ±55% ±15 mA min. +0, -15% 100m V p-p ARITY +15 VDC, ±.5V +(8 to 15.5) VDC
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, -3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERRED Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous SOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Rated Performance Voltage, Rated Performance Voltage, Operating Current, Quiescent	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 7 TO INPUT ± (1 + 5/G)mV ± 65) ± 15 ± (15 + 50/G) ± (1 + 50/G)µV/V ± 10V min. 1kQ ± 50V pk ± 15 VDC ± 5% ± 15 mA min. + 0, -15% 100m V p-p ARITY + 15 VDC, ± .5V
TREQUENCY RESPONSE Small Signal, ¬3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Rated Performance Voltage, Operating Current, Quiescent TEMPERATURE RANGE	10pA rms 1kHz 500Hz 500Hz 500Hz 7 50ms 7 TO INPUT ±(1 + 5/G)mV ±65 ±(15 + 50/G) ±(1 + 50/G)μV/V ±10V min. 1kΩ ±50V pk ±15 VDC ±5% ±15 mA min. +0, -15% 100m V p-p ARITY +15 VDC, ±.5V +(8 to 15.5) VDC +20mA
TREQUENCY RESPONSE SMAIL Signal, ¬3dB G = 1V/V to 10V/V Full Power, 10V p-p Output Gain = 1V/V Gain = 10V/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25°C vs. Temperature (0 to +70°C) Gain = 1V/V (μV/°C max.) Gain = 10V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous ISOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Operating Current, Quiescent TEMPERATURE RANGE Rated Performance	10pA rms 1kHz 500Hz 500Hz 500Hz 50ms 7 TO INPUT ±(1 + 5/G)mV ±655 ±(15 + 50/G) ±(17 + 50/G)μV/V ±10V min. 1kΩ ±15 VDC ±5% ±15 mA min. +0, −15% 100m V p-p ARITY +15 VDC, ±.5V +(8 to 15.5) VDC +20mA 0 to +70 ℃
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, ¬3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = I0V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous SOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Operating Current, Quiescent TEMPERATURE RANGE Rated Performance Storage	10pA rms 1kHz 500Hz 500Hz 500Hz 500ms 7 TO INPUT ± (1 + 5/G)mV ±65 ± 115 + 50/G) ± (1 + 50/G)μV/V ± 10V min. 1kΩ ± 50V pk ± 15 VDC ± 50% ± 15 mA min. + 0, -15% 100m V p-p ARITY + 15 VDC, ± .5V + (8 to 15.5) VDC + 20mA 0 to +70 °C - 55 °C to + 85 °C
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, -3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = IV/V Gain = IV/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREE Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = IV/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV, Output Common to Power Common, Peak AC or DC Continuous SOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Rated Performance	10pA rms 1kHz 500Hz 500Hz 500Hz 500ms 7 TO INPUT ± (1 + 5/G)mV ±65 ± 15 + 50/G) ± (15 + 50/G) ± (1 + 50/G)μV/V ± 10V min. 1kΩ ± 50V pk ± 15 VDC ± 5% 15 WDC ± 15% 100m V p-p ARITY + 15 VDC, ± .5V + (8 to 15.5) VDC + 20mA 0 to +70 °C -55 °C to +85 °C 1.5" x 1.5" x 0.62"
IOH2 to IkHz FREQUENCY RESPONSE Small Signal, ¬3dB G = IV/V to 10V/V Full Power, 10V p-p Output Gain = IV/V Gain = 10V/V Recovery Time, to ±100μV afte application of ±600Vpk differential input pulse OFFSET VOLTAGE, REFERREL Initial, @ +25 °C vs. Temperature (0 to +70 °C) Gain = IV/V (μV/°C max.) Gain = I0V/V (μV/°C max.) vs. Supply Voltage RATED OUTPUT Voltage, 50kΩ Load Output Impedance Max. CMV. Output Common to Power Common, Peak AC or DC Continuous SOLATED POWER OUTPUTS Voltage, ±5 mA Load Accuracy Current Regulation, NL to FL Ripple, 100kHz Bandwidth POWER SUPPLY, SINGLE POL Voltage, Rated Performance Voltage, Operating Current, Quiescent TEMPERATURE RANGE Rated Performance Storage	10pA rms 1kHz 500Hz 500Hz 500Hz 500ms 7 TO INPUT ± (1 + 5/G)mV ±65 ± 115 + 50/G) ± (1 + 50/G)μV/V ± 10V min. 1kΩ ± 50V pk ± 15 VDC ± 50% ± 15 mA min. + 0, -15% 100m V p-p ARITY + 15 VDC, ± .5V + (8 to 15.5) VDC + 20mA 0 to +70 °C - 55 °C to + 85 °C

IA294 MEDICAL ISOLATION AMPLIFIER LOW NOISE, WITH ACTIVE INPUT REFERENCE AND SHIELD DRIVES

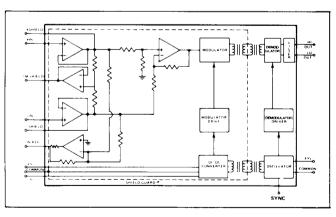


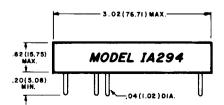
FEATURES

- UL component recognized
- True instrumentation front-end
- Active input reference
- · Active shield drives
- Low noise: 8 μν P-P, .05 to 100 Hz.
- High CMRR: 126 dB input to output, 120 dB input to guard
- guaru
- Isolated Power: ±15V @ 15 mA
- Small size: 2" x 3 "
- External Sync capability for multi-channel monitors

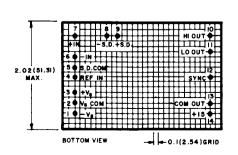
The Model IA294 Isolation Amplifier features small size, low noise, high common mode rejection, active guard and shield drives. CMRR is 126 dB input to output with balanced source impedance. CMRR from input to active input reference is 120 dB. This Isolation Amplifier contains most of the front-end circuitry that is found in monitor and diagnostic ECG's. The IA294 has a true instrumentation front-end for high CMRR, active right leg drive, sync capability for multichannel use, isolated power (\pm 15 V @ 15 mA) and separate active drives for either, individual shielded inputs or a common outer shield. This model also features 6500 V input to output protection and 6500 V differential input protection for defibrillators. Input to output leakage current is less than 10 μ A.

BLOCK DIAGRAM (IA294)





CHARACTERISTICS		
(Typical @ 25 °C, $V_S = +15$ VDC unless otherwise noted.)		
GAIN (NON-INVERTING) ACCURACY vs. Temperature Non-Linearity Differential Input Impedance Common-Mode Input Impedance	10 V/V ± 2% ± .01 %/°C ± 0.1 % 3 x 10⁴Ω∥3pF 5 x 10¹°Ω∥20pF	
INPUT VOLTAGE Max. Safe Differential Input Pulse, 10 ms Duration Max. Safe Common Mode Input (DC cont.) INPUT BIAS CURRENT vs. Temperature	± 1 V min. ± 240 V rms ± 6500 V peak ± 5000 VDC ± 2 nA ± .02 nA/°C	
SAFETY CURRENT LIMITS	10μA max.	
INPUT NOISE (5 K UNBALANCE) Voltage .05 to 100 Hz, pp Voltage 10 Hz to 1 kHz, rms Current .05 Hz to 1 kHz, rms	8μV 5μV 10 pA	
COMMON MODE REJECTION	-	
Input to Output, CMV = 115 VAC, 60 Hz Balanced Source Impedance 5kΩSource Imbalance Two Inputs to Input Reference CMV = 10V p-p, 60 Hz 5kΩSource Imbalance	126 dB 120 db	
OUTPUT		
Range (50kΩ Load) Output Impedance Max. CMV, Outputs to power common Offset voltage referred to input vs. Temperature (0° to 70°C) vs. Supply Voltage	$\pm 10 \text{ V}$ 1 k Ω $\pm 30 \text{ V}$ peak $\pm 5 \text{ mV}$ $\pm 100\mu\text{V}/^{\circ}\text{C}$ $\pm 20 \mu\text{V}/^{\circ}\text{O}$	
FREQUENCY RESPONSE		
Small Signal, -3 dB Full Power, 6 V pp Overload Recovery	1 kHz 500 Hz 20 msec	
ISOLATED POWER OUTPUT Voltage, ±10 mA load Accuracy Current, min.	± 15 VDC ± 5% ± 15 mA	
NOMINAL WEIGHT	8 ounces	
POWER SUPPLY, SINGLE POLARITY Voltage Rated Performance Current, Quiescent TEMPERATURE RANGE	± 14.5 to + 16 VDC + 40 mA	
Rated Performance	0°C to 70°C	
Storage	-25 °C to +85 °C	
SOCKET	S135	



IA296 ULTRA LOW NOISE TRUE INSTRUMENTATION MEDICAL ISOLATION AMPLIFIER

INTRONICS INTRONICS ISOLATION AMPLIFIER INTRONICS ISOLATION INTRONICS INTRONICS INTRONICS INTRONICS INTRONICS INTRONICS INTRONICS

FEATURES

- UL Component Recognized
- Ultra Low Noise
- Failure of any internal component results in < 10 μA bias current
- Excellent CMRR: 170 dB; 160 dB with 5 kΩ source imbalance
- External Sync Capability

The Model IA296 Isolation Amplifier features very high input/output isolation and very low noise. It can operate at common mode input voltages up to 5000 VDC continuous; CMRR is 170 dB with balanced source impedance, and 160 dB with 5 k Ω source imbalance. Input voltage noise is held to 0.3 μ V, 10 Hz-1 kHz rms, and current noise to 4 pA, 0.5 Hz-1 kHz rms. Input bias current is only 200 pA, and on the failure of any component is limited to 10 μ A. An independent \pm 12 VDC, 10 mA supply in the input section with the same voltage isolation as the amplifier input, is used to power optional external circuitry.

BLOCK DIAGRAM 1A296

