



SELECTION GUIDE

Part #	Description	Package	Serial #	Status	Output Voltage vs. Power Supply	Bandwidth	Linearity	Max Common-Mode Voltage	Power Supply Current	Rise Time $t_r$	Pinout	Mechanical Outline	Datasheet	Buy Now	
AD202KNATI 2000V DIP	Pin out compatible with AD202KN, but output voltage is not isolated with power supply	DIP	≤25156	Stop production	Non-Isolated	20kHz	±0.02%	2000V	20mA	18μs	Fig. 1.1	Fig. 10.1		-	
	Upgraded replacement for AD202KN	DIP	>25156	In production	Isolated	800kHz	±0.02%	2000V	12mA	0.5μs					
AD202JNATI 1000V DIP	Upgraded replacement for AD202JN	DIP	-	In production	Isolated	800kHz	±0.02%	1000V	12mA	0.5μs	Fig. 1.2	Fig. 10.1			
AD202KYATI 2000V SIP	Pin out compatible with AD202KY, but output voltage is not isolated with power supply	SIP	≤25290	Stop production	Non-Isolated	20kHz	±0.02%	2000V	20mA	18μs	Fig. 1.3	Fig. 10.2		-	
	Upgraded replacement for AD202KY	SIP	>25290	In production	Isolated	800kHz	±0.02%	2000V	12mA	0.5μs					
AD202JYATI 1000V SIP	Upgraded replacement for AD202JY	SIP	-	In production	Isolated	800kHz	±0.02%	1000V	12mA	0.5μs	Fig. 1.4	Fig. 10.2			
AD202KN	Made by Analog Device	DIP	-	Stop production	Isolated	2kHz	±0.025%	2000V	5mA	180μs	-	-	-	-	
AD202JN	Made by Analog Device	DIP	-	Stop production	Isolated	2kHz	±0.05%	1000V	5mA	180μs	-	-	-	-	
AD202KY	Made by Analog Device	SIP	-	Stop production	Isolated	2kHz	±0.025%	2000V	5mA	180μs	-	-	-	-	
AD202JY	Made by Analog Device	SIP	-	Stop production	Isolated	2kHz	±0.05%	1000V	5mA	180μs	-	-	-	-	
ATIA202KN	Obsolete, identically replaced by AD202KNATI	DIP	-	Stop production	Isolated	20kHz	±0.01%	2000V	12mA	18μs	-	-		-	
ATIA202KY	Obsolete, identically replaced by AD202KYATI	SIP	-	Stop production	Isolated	20kHz	±0.01%	2000V	12mA	18μs	-	-		-	



Figure 1.1. Photo of AD202KNATI



Figure 1.3 Photo of AD202KYATI



Figure 1.2. Photo of AD202JNATI



Figure 1.4 Photo of AD202JYATI

### FEATURES

- Isolated Power Outputs
- Small Size: 4 Channels/Inch Low
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy:  $\pm 0.02\%$  Max Nonlinearity
- High CMV Isolation:  $\pm 1000\text{V}$  Continuous

### APPLICATIONS

It can be applied for multichannel data acquisition, current shunt measurements motor controls, process signal isolation, high voltage instrumentation amplifier, etc.

### DESCRIPTION

#### Upgraded Drop-in Replacement for AD202JY

**We guarantee production for  $\geq 10$  years.**

The AD202JYATI is a high voltage isolation amplifier designed for multiple applications where input signals are measured, processed, or transmitted without a galvanic

connection. These isolation amplifiers in SIP package offer a signal and power isolation function.

With internal transformer-coupling, the AD202JYATI provides total galvanic isolation between the input and output stages of the isolation amplifier. These amplifiers eliminate the need for an external DC-DC converter, which allows the designer to minimize the necessary circuit overhead, thus reducing the overall design and component costs.

The AD202JYATI is powered directly from a 15V DC power supply, featuring small size, high accuracy, low power, wide bandwidth, excellent performance, flexible input, isolated power, etc.

### INSIDE THE AD202JYATI

The AD202JYATI uses an amplitude modulation technique to permit transformer coupling of signals down to dc (Figure 2). It also contains an uncommitted input op amp and a power transformer that provides isolated power to the op amp, the modulator, and any external load. The power transformer primary is driven by a 3MHz, 15V<sub>P-P</sub> square wave generated internally.

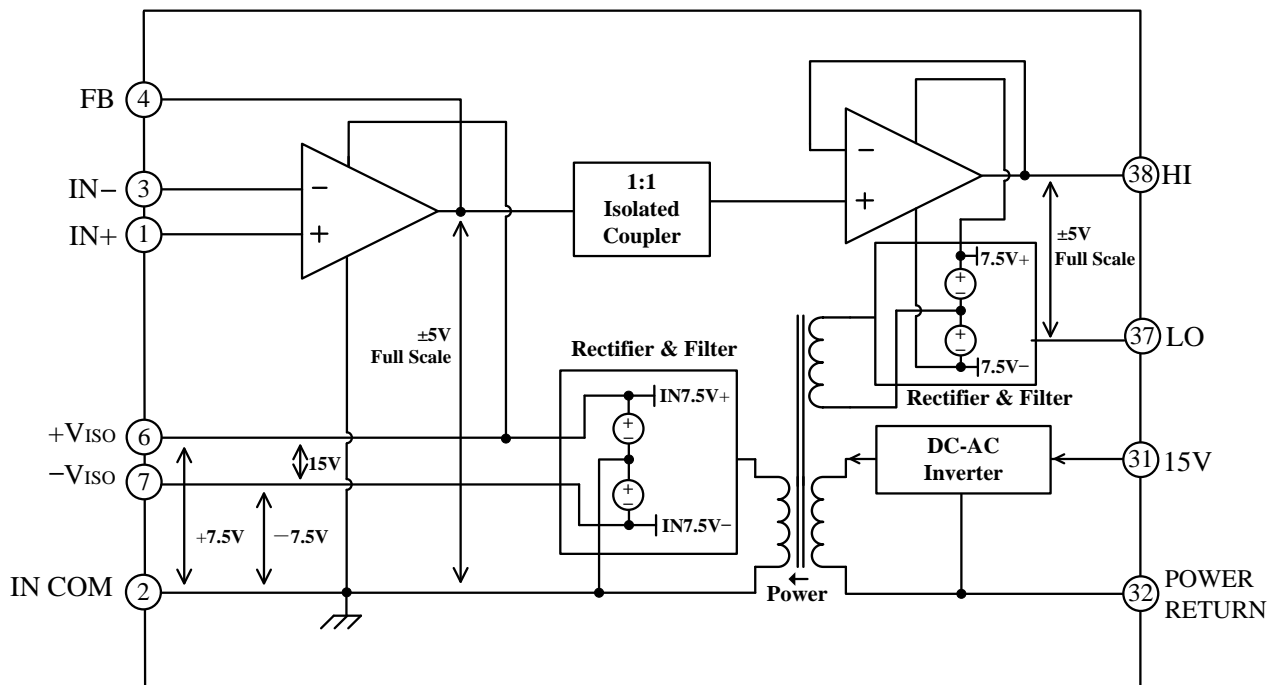


Figure 2. AD202JYATI Functional Block Diagram

**SPECIFICATIONS**

Table 1. Electrical characteristics. (Typical @ 25°C and  $V_S = 15V$  unless otherwise noted.)

Model	AT202JY
<b>GAIN</b>	
Range	1V/V–100 V/V
Error vs. Temperature	±0.5% typ (±4% max)
vs. Time	±20ppm/°C typ (±45ppm/°C max)
vs. Supply Voltage	±50 ppm/1000 Hours
Nonlinearity (G = 1V/V)	±0.01%/V
Nonlinearity vs. Isolated Supply Load	±0.0015%/mA
<b>INPUT VOLTAGE RATINGS</b>	
Input Voltage Range	±5V
Max Isolation Voltage (Input to Output)	
AC, 60Hz, Continuous	750Vrms
Continuous (AC and DC)	±1000V Peak
CMRR (Common-Mode Rejection Ratio)*	–74dB
CMTC(Common-Mode Transfer Coefficient)*	–0.2×10 <sup>3</sup>
RS ≤ 100Ω (HI and LO Inputs) G = 1V/V	105dB
G = 100V/V	130dB
RS ≤ 1 kΩ (Input HI, LO, or Both) G = 1V/V	100dB min
G = 100V/V	110dB min
Leakage Current Input to Output @ 240Vrms, 60 Hz	2μA rms max
<b>INPUT IMPEDANCE</b>	
Differential (G = 1V/V)	10 <sup>12</sup> Ω
Common-Mode	2GΩ/4.5pF
<b>INPUT BIAS CURRENT</b>	
Initial, @ 25°C	±30pA
vs. Temperature (0°C to 70°C)	±10nA
<b>INPUT DIFFERENCE CURRENT</b>	
Initial, @ 25°C	±5pA
vs. Temperature (0°C to 70°C)	±2nA
<b>INPUT NOISE</b>	
Voltage, 0.1Hz to 10Hz	1.8μV <sub>P-P</sub>
f > 100Hz	10.8nV/√Hz



<b>Model</b>	AT202JY
<b>FREQUENCY RESPONSE</b> Bandwidth ( $V_O \leq 10V_{P-P}$ , $G = 1V-50V/V$ ) Settling Time, to $\pm 10mV$ (10V Step)	800kHz 1ms
<b>OFFSET VOLTAGE (RTI)</b> Initial, @ 25°C Adjustable to Zero vs. Temperature (0°C to 70°C)	$(\pm 5 \pm 5/G)mV$ max $[\pm 10 \pm \frac{10}{G}] \mu V/^\circ C$
<b>RATED OUTPUT</b> Voltage (Out HI to Out LO) Output Resistance Output Ripple, 100kHz Bandwidth 5kHz Bandwidth	$\pm 5V$ 750 $\Omega$ 10mV <sub>P-P</sub> 0.5mV rms
<b>ISOLATED POWER OUTPUT</b> Voltage, No Load Accuracy Current Regulation, No Load to Full Load Ripple	$\pm 7.5V$ $\pm 10\%$ 400 $\mu A$ Total 5% 100mV <sub>P-P</sub>
<b>POWER SUPPLY</b> Voltage, Rated Performance Voltage, Operating Current, No Load ( $V_S = 15V$ )	15V $\pm 5\%$ 15V $\pm 10\%$ 12mA
<b>TEMPERATURE RANGE</b> Rated Performance Operating Storage	0°C to 70°C -40°C to +85°C -40°C to +85°C
<b>PACKAGE DIMENSIONS</b> SIP Package (N)	2.08"×0.26"×0.78"

\*Test Schematic Figure 3 @ 100Hz Sine Wave @ $v_S(t) = 1000V$ .

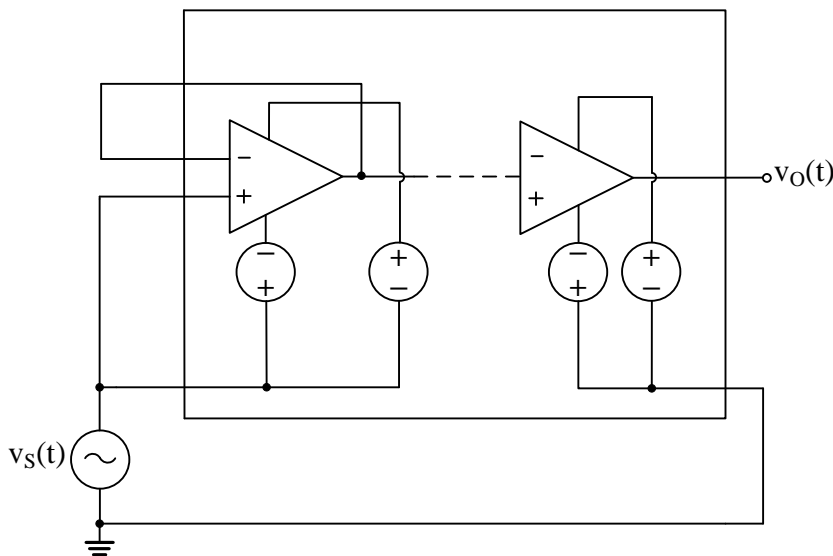


Figure 3. CMRR & CMTC Test Schematic



PIN DESIGNATIONS

Block	Pin #	Pin Name	Type	Function Description
Isolated Block	1	IN+	Isolated analog input	Isolated positive (Non-inverting) input
	2	IN COM	Isolated analog ground	Isolated ground
	3	IN-	Isolated analog input	Isolated negative (inverting) input
	6	+VISO OUT	Isolated power output	Isolated positive power supply output, +7.5V, referenced to pin 2 IN COM
	5	-VISO OUT	Isolated power output	Isolated negative power supply output, approximately -7.0V, referenced to pin 2 IN COM
	4	FB	Isolated analog output	Isolated op amp output as a feedback signal
Local Block	37	LO	Analog output	Low Voltage Output
	38	HI	Analog output	High Voltage Output
	31	15 V POWER	Analog input	Positive 15V power supply input
	32	RETURN	Analog input	Power supply return

RISE TIME

1. Connect pin FB and pin IN-. Provide a -2V ~ +2V voltage to pin IN+. The rise time = 500ns.

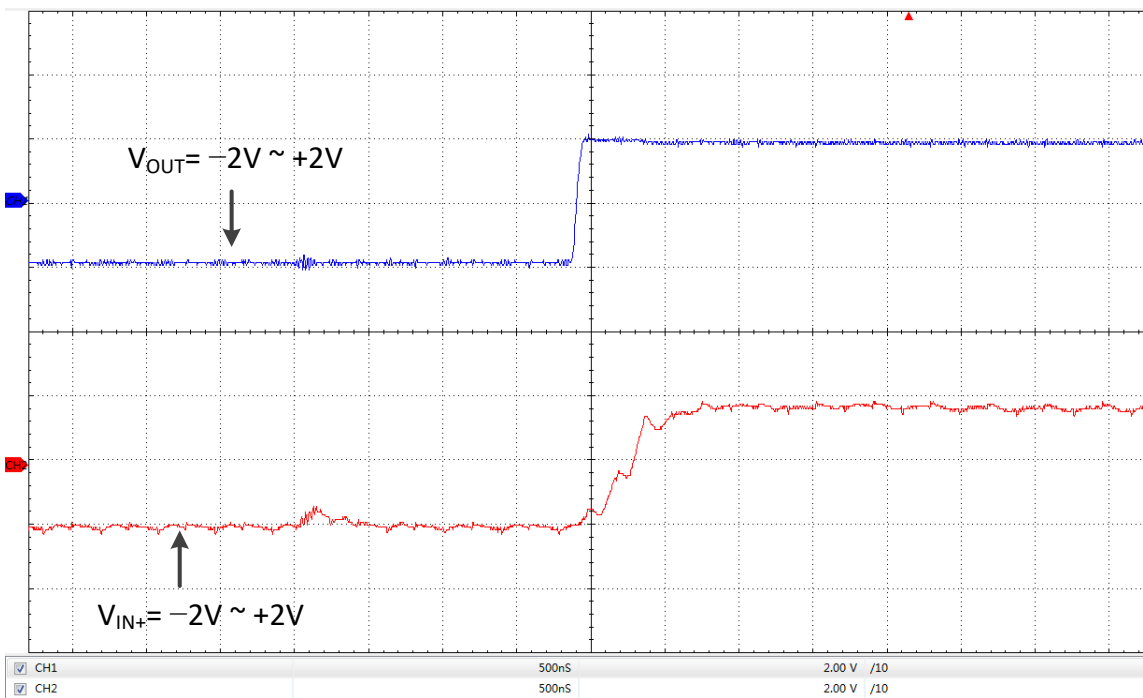


Figure 4. Rise time @ V<sub>IN+</sub> = -2V ~ +2V



2. Connect pin FB and pin IN-. Provide a -5V ~ +5V voltage to pin IN+. The rise time = 1  $\mu$ s.

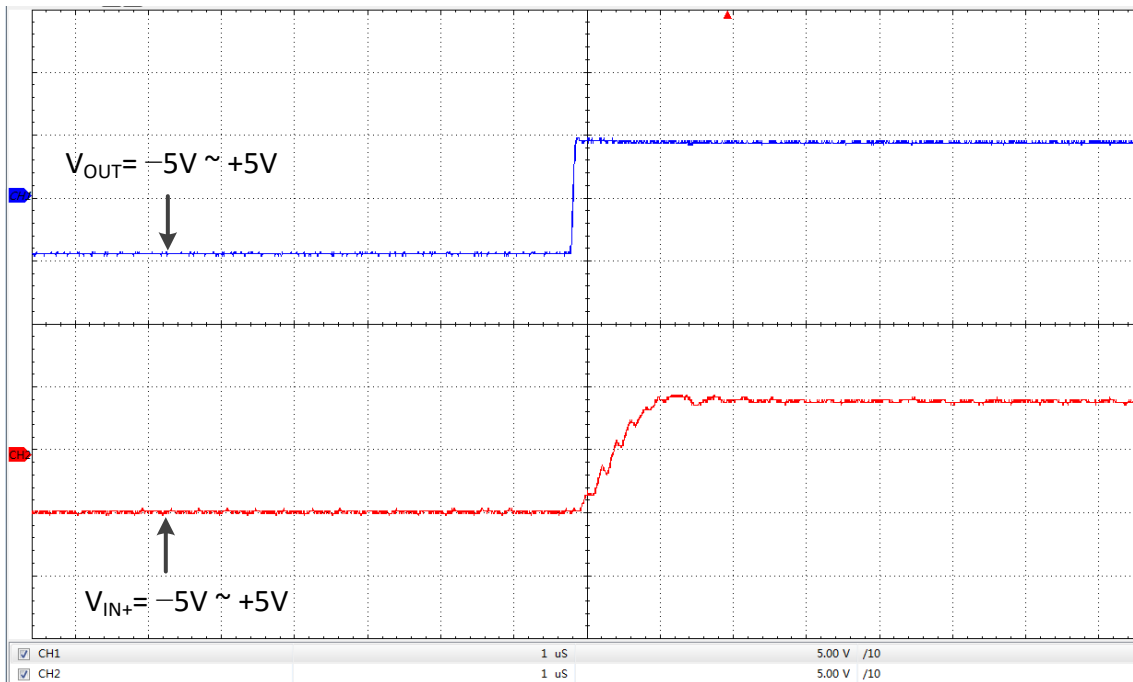


Figure 5. Rise time @  $V_{IN+} = -5V \sim +5V$

3. Connect pin FB and pin IN-. Provide a -5V ~ +5V voltage to pin IN+. The Frequency  $f = 500kHz$ .

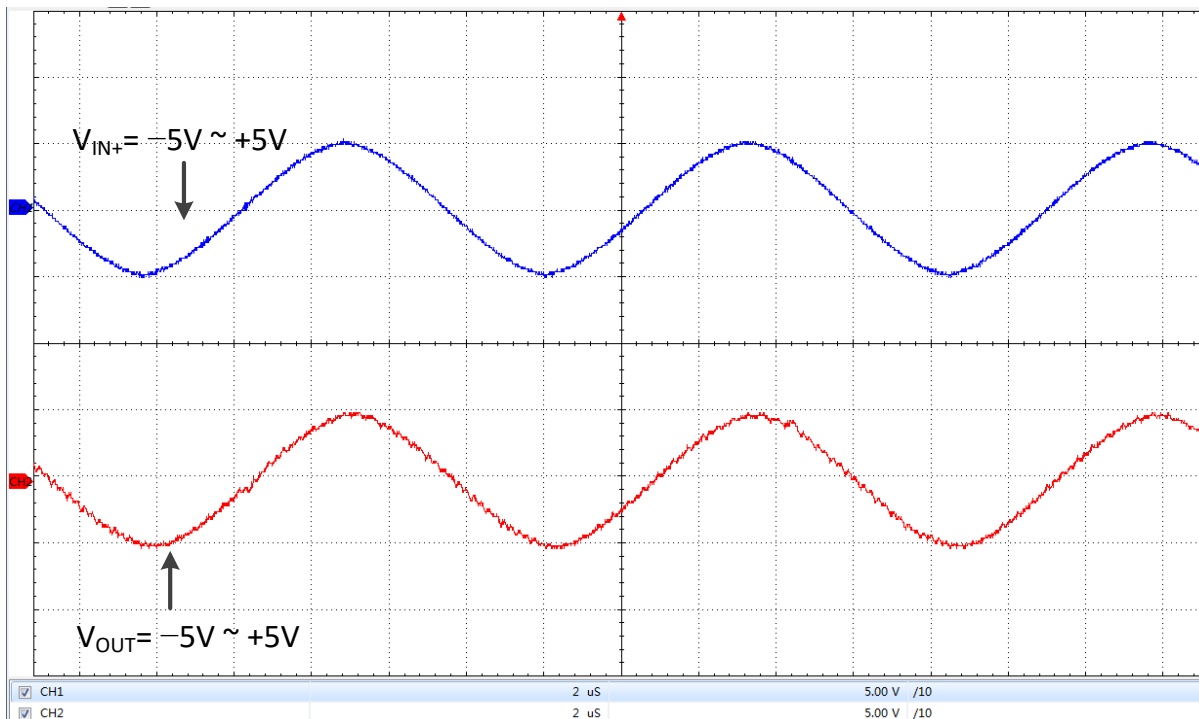


Figure 6. Frequency @  $V_{IN+} = -5V \sim +5V$



4. Connect pin FB and pin IN-. Provide a -5V ~ +5V voltage to pin IN+. The Frequency  $f = 50\text{Hz}$ .

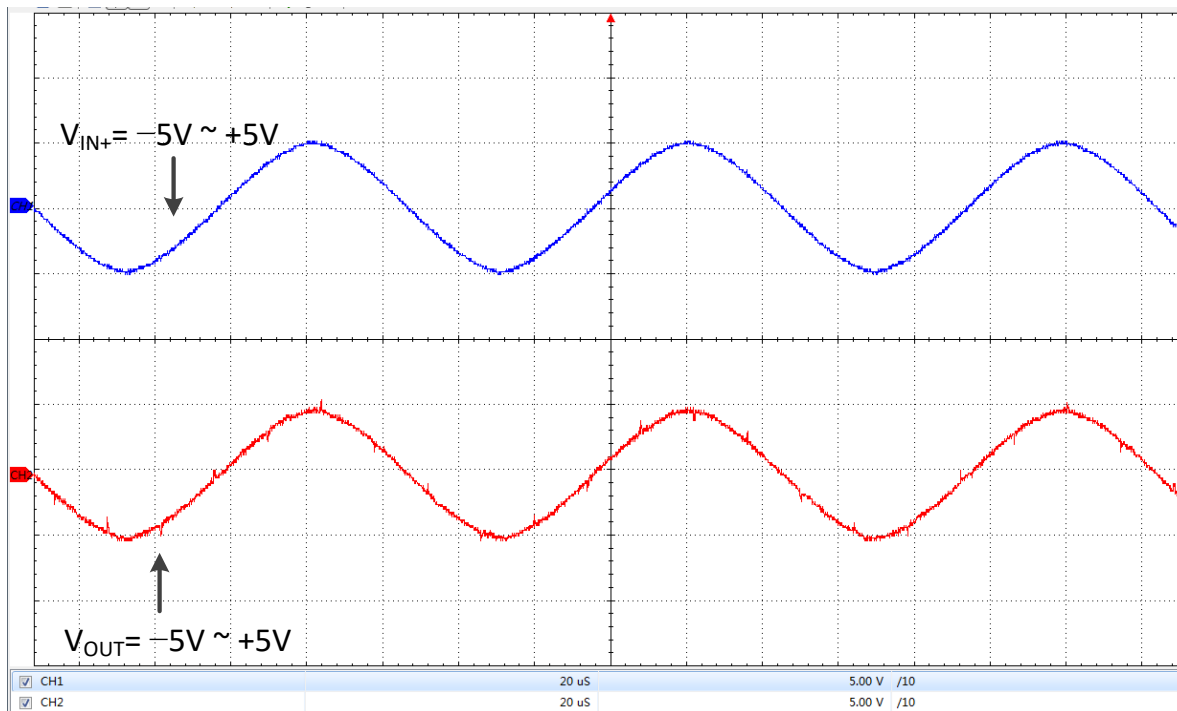


Figure 7. Frequency @  $V_{IN+} = -5V \sim +5V$

5. Connect pin FB and pin IN-. Provide a -5V ~ +5V voltage to pin IN+. The Frequency  $f = 100\text{Hz}$ .

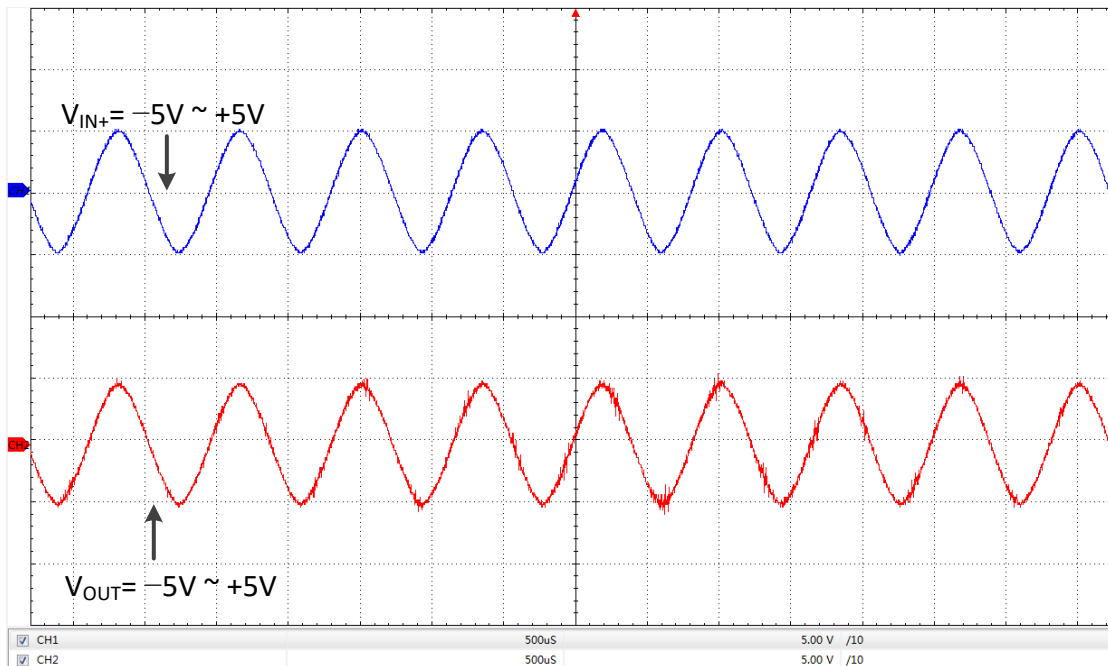


Figure 8. Frequency @  $V_{IN+} = -5V \sim +5V$



NONLINEARITY

Connect pin FB and pin IN-. Provide a -5V ~ +5V voltage to pin IN+. The output voltage is as follows.

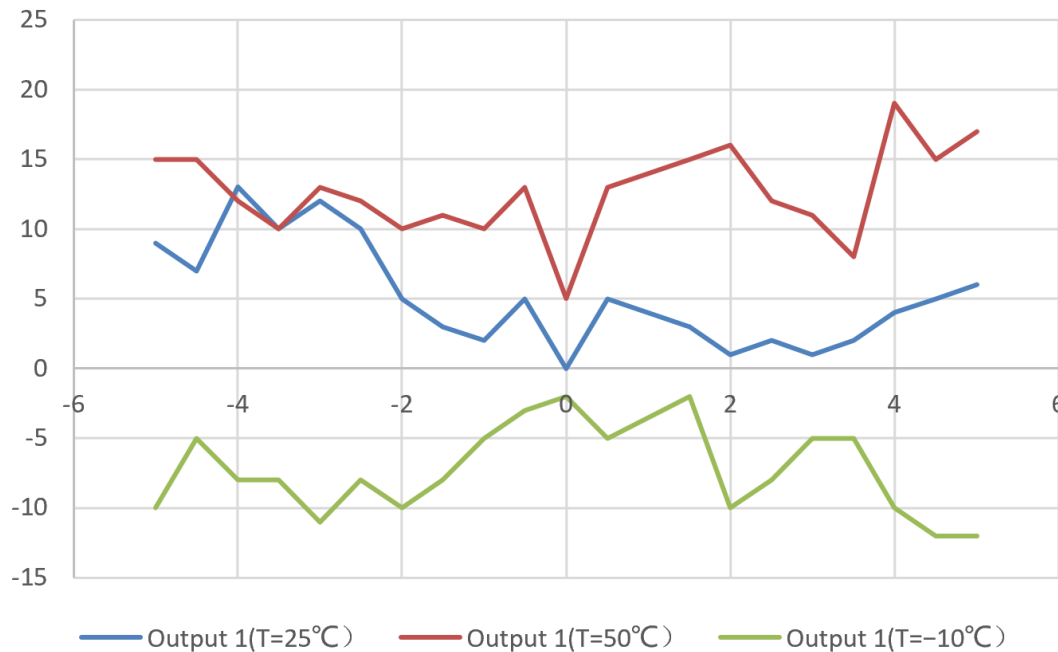


Figure 9. Nonlinearity

MECHANICAL DIMENSIONS

The dimensions of AD202JYATI in SIP package are shown in Figure 9.2.

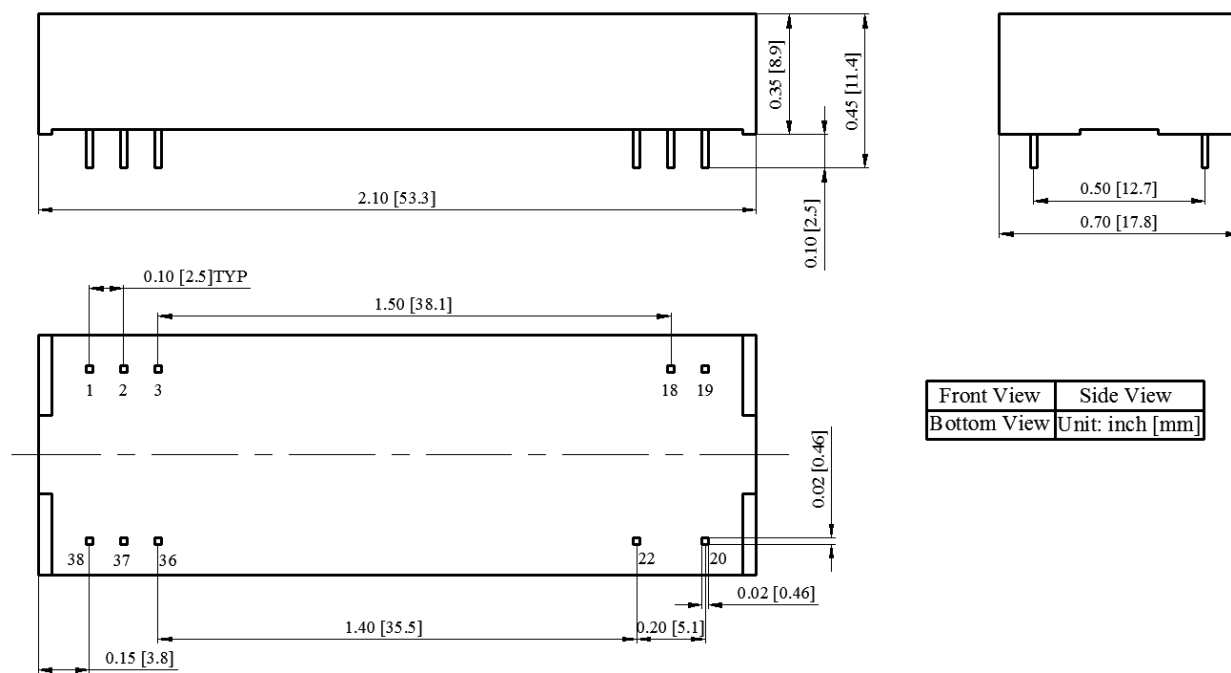


Figure 10.1. Dimensions of AD202JNATI & AD202KNATI DIP Package



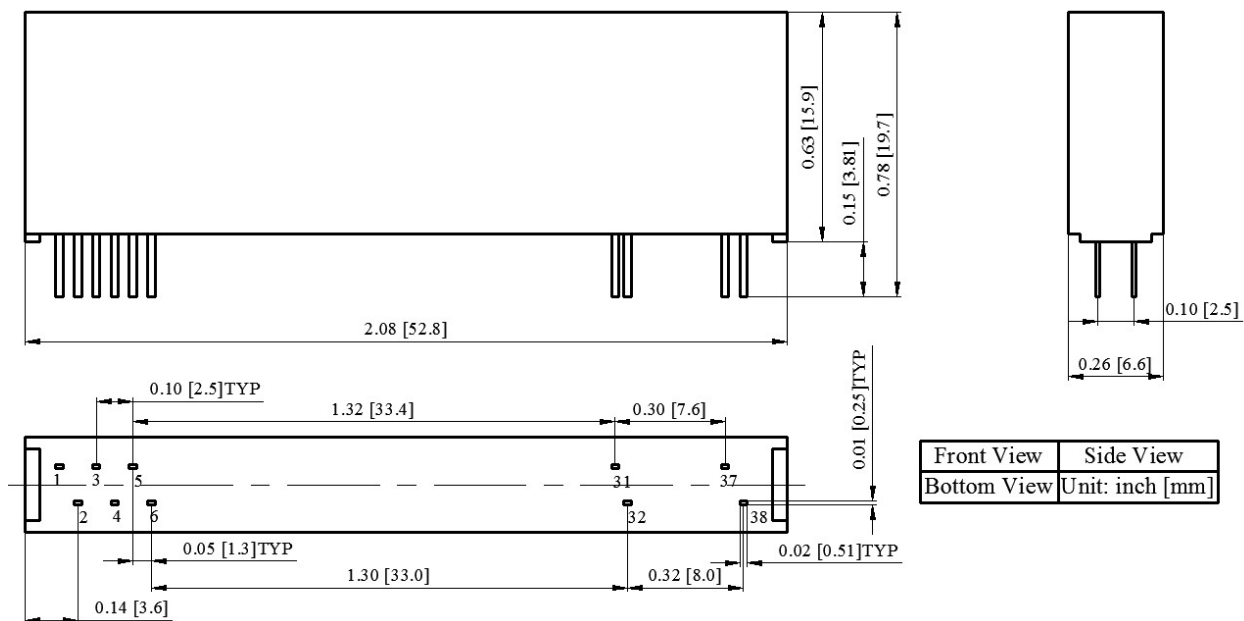


Figure 10.2. Dimensions of AD202JYATI & AD202KYATI SIP Package

**NOTICE**

- ATI warrants performance of its products for one year to the specifications applicable at the time of sale, except for those damaged by excessive abuse. Products found not meeting the specifications within one year from the date of sale can be exchanged free of charge.
- ATI reserves the right to make changes to its products or to discontinue any product or service without notice and advise customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current and complete.
- All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability. Testing and other quality control techniques are utilized to the extent ATI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.
- Customers are responsible for their applications using ATI products. In order to minimize risks associated with the customers' applications, adequate design and operating safeguards must be provided by the customers to minimize inherent or procedural hazards. ATI assumes no liability for applications assistance or customer product design.
- ATI does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of ATI covering or relating to any combination, machine, or process in which such products or services might be or are used. ATI's publication of information regarding any third party's products or services does not constitute ATI's approval, warranty or endorsement thereof.
- IP (Intellectual Property) Ownership: ATI retains the ownership of full rights for special technologies and/or techniques embedded in its products, the designs for mechanics, optics, plus all modifications, improvements, and inventions made by ATI for its products and/or projects.