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/lnch Low
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy: ±0.2% Max Nonlinearity
- High CMV Isolation: ±2000V 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 AD202KN

We guarantee production for ≥10 years.

The AD202KNATI 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 DIP package offer a signal and power isolation function.

With internal transformer-coupling, the AD202KNATI 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 AD202KNATI 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 AD202KNATI

The AD202KNATI 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 20kHz, $15V_{P-P}$ square wave generated internally.

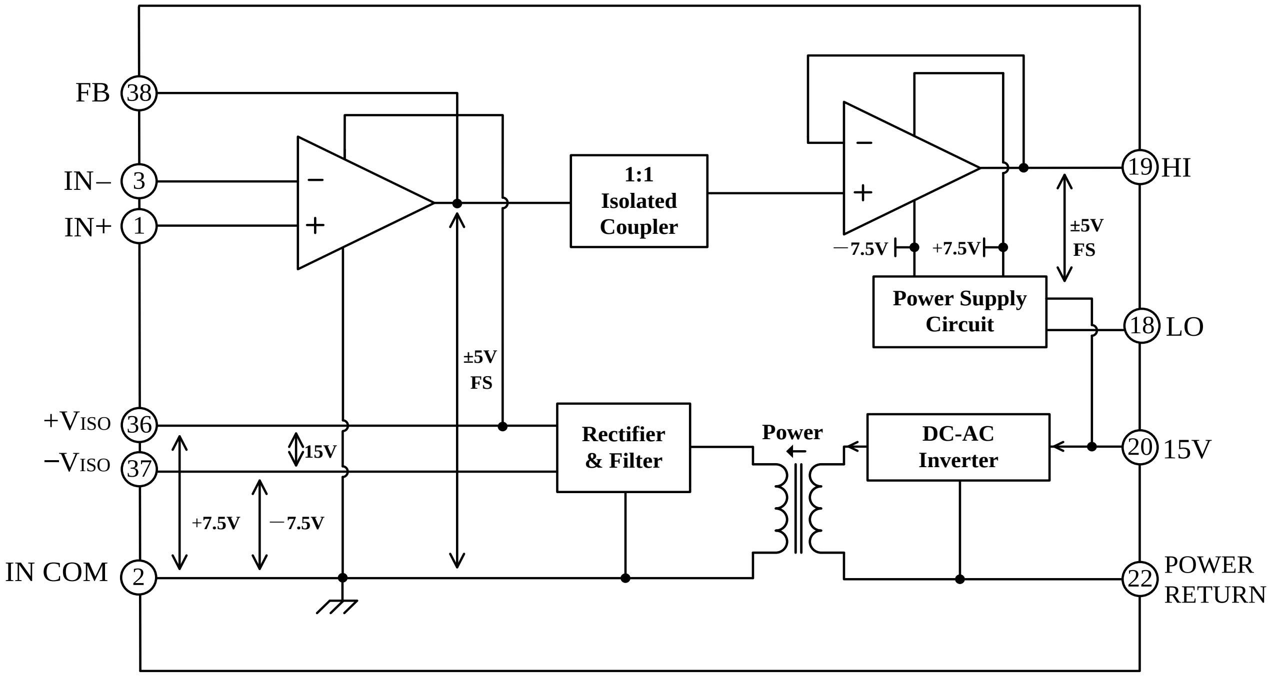

Figure 2. AD202KNATI Functional Block Diagram

SPECIFICATIONS

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

Model	**AD202KNATI**
GAIN	
Range	1V/V–100 V/V
Error	±0.5% typ (±4% max)
vs. Temperature	±20ppm/°C typ (±45ppm/°C max)
vs. Time	±50 ppm/1000 Hours
vs. Supply Voltage	±0.01%/V
Nonlinearity (G = 1V/V)	±0.01 max
Nonlinearity vs. Isolated Supply Load	±0.0015%/mA
INPUT VOLTAGE RATINGS	
Input Voltage Range	±5V
Max Isolation Voltage (Input to Output)	
AC, 60Hz, Continuous	1500Vms
Continuous (AC and DC)	±2000V Peak
CMRR (Common-Mode Rejection Ratio)*	−74dB
CMTC(Common-Mode Transfer Coefficient)*	-0.2×10^{3}
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
INPUT IMPEDANCE	
Differential (G = 1V/V)	10^{12}Ω
Common-Mode	2GΩ‖4.5pF
INPUT BIAS CURRENT	
Initial, @ 25°C	±30pA
vs. Temperature (0°C to 70°C)	±10nA
INPUT DIFFERENCE CURRENT	
Initial, @ 25°C	±5pA
vs. Temperature (0°C to 70°C)	±2nA
INPUT NOISE	
Voltage, 0.1Hz to 10Hz	1.8μV_{P-P}
f > 100Hz	10.8nV/$\sqrt{Hz}$

Model	AD202KNATI
FREQUENCY RESPONSE	
Bandwidth ($V_O \leq 10V_{P-P}$, G = 1V–50V/V)	800kHz
Settling Time, to ±10mV (10V Step)	1ms
OFFSET VOLTAGE (RTI)	
Initial, @ 25°C Adjustable to Zero	(±5 ± 5/G)mV max
vs. Temperature (0°C to 70°C)	$[\pm 10 \pm \frac{10}{G}]$ µV/°C
RATED OUTPUT	
Voltage (Out HI to Out LO)	±5V
Output Resistance	7kΩ
Output Ripple, 100kHz Bandwidth	$10mV_{P-P}$
5kHz Bandwidth	0.5mV rms
ISOLATED POWER OUTPUT	
Voltage, No Load	±7.5V
Accuracy	±10%
Current	400µA Total
Regulation, No Load to Full Load	5%
Ripple	$100mV_{P-P}$
POWER SUPPLY	
Voltage, Rated Performance	15V±5%
Voltage, Operating	15V±10%
Current, No Load (V_S = 15V)	10mA
TEMPERATURE RANGE	
Rated Performance	0°C to 70°C
Operating	−40°C to +85°C
Storage	−40°C to +85°C
PACKAGE DIMENSIONS	
DIP Package (N)	2.10"×0.700"×0.350"

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

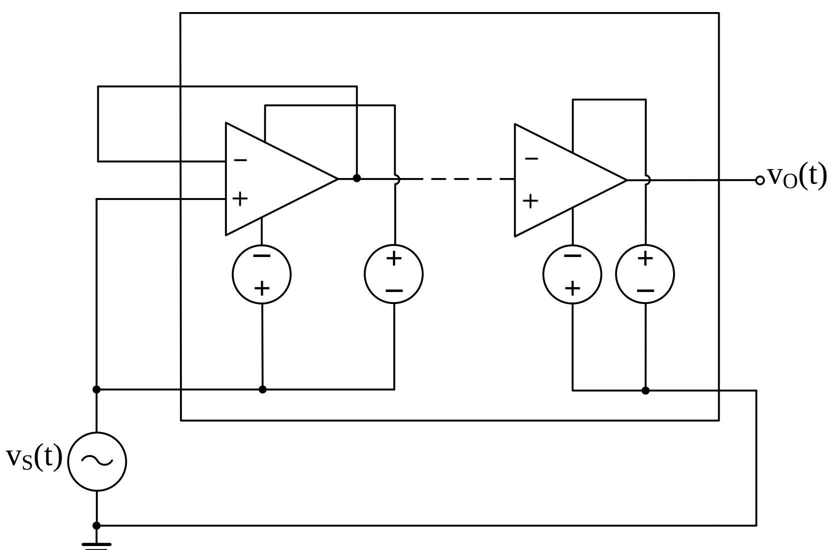

Figure 3. CMRR & CMTC Test Schematic

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
	36	+VISO OUT	Isolated power output	Isolated positive power supply output, +7.5V, referenced to pin 2 IN COM
	37	−VISO OUT	Isolated power output	Isolated negative power supply output, approximately −7.0V, referenced to pin 2 IN COM
	38	FB	Isolated analog output	Isolated op amp output as a feedback signal
Local Block	18	LO	Analog ground	Output voltage ground reference
	19	HI	Analog output	Op amp output, equals to the voltage difference between FB and IN COM
	20	15 V	Analog input	Positive 15V power supply input
	22	POWER 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.

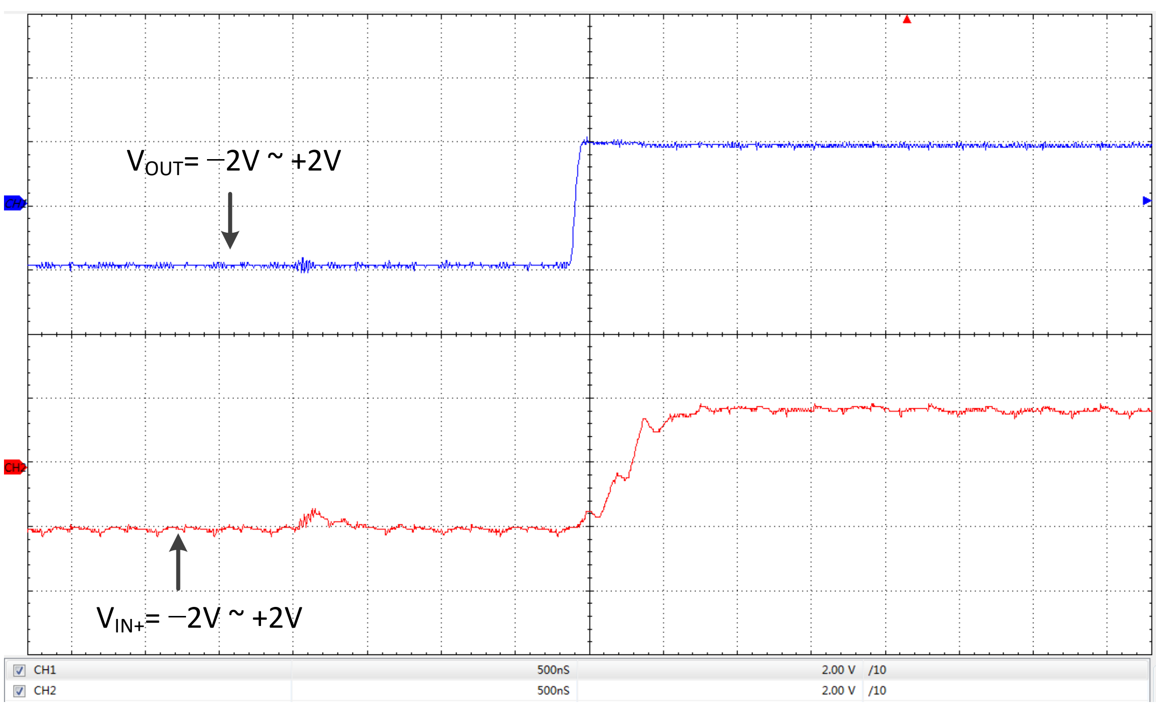

Figure 4. Rise time @ V_{IN+} = −2V ~ +2V

2. Connect pin FB and pin IN−. Provide a −5V ~ +5V voltage to pin IN+. The rise time = 1μs.

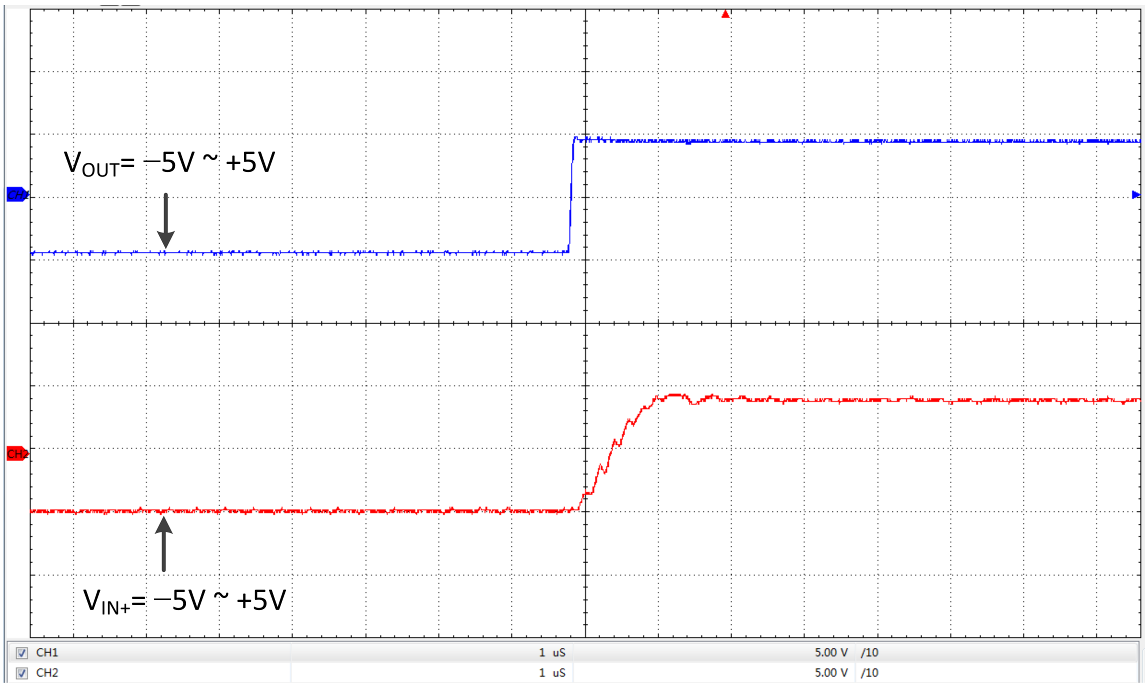

Figure 5. Rise time @ V_{IN+} = −5V ~ +5V

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

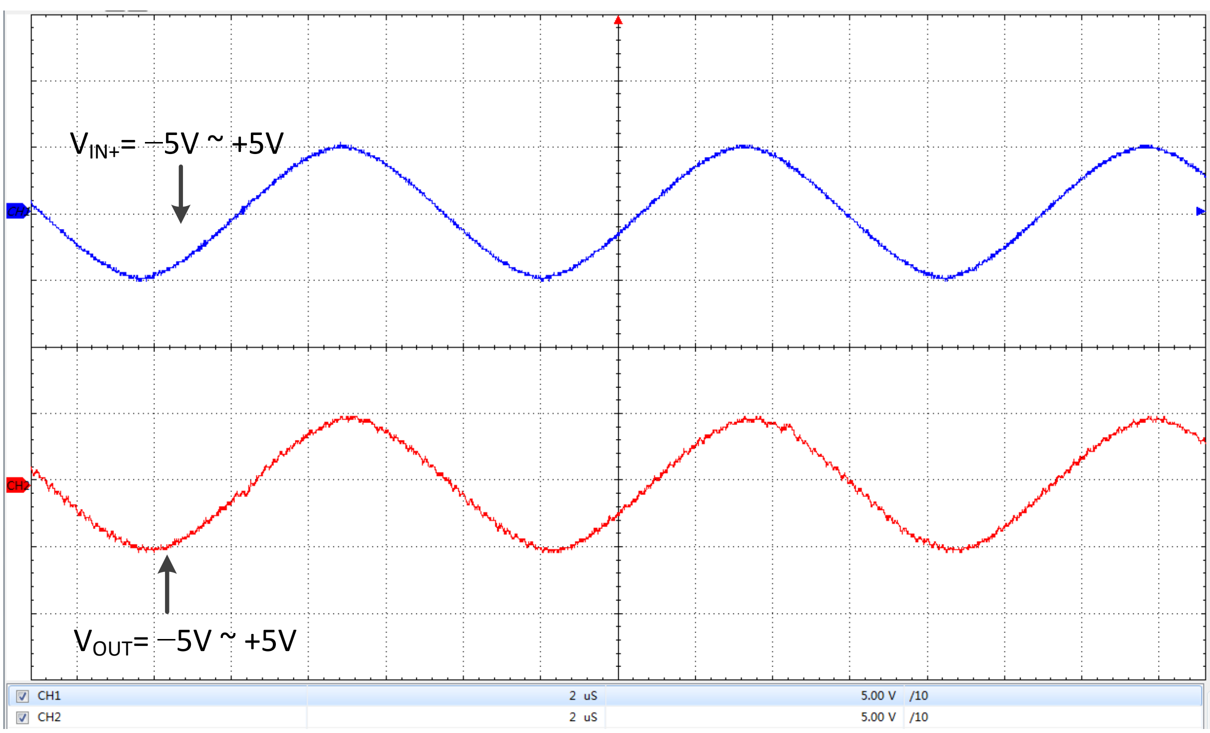

Figure 6. Frequency @ V_{IN+} = −5V ~ +5V

4. Connect pin FB and pin IN−. Provide a −5V ~ +5V voltage to pin IN+. The Frequency f = 50Hz.

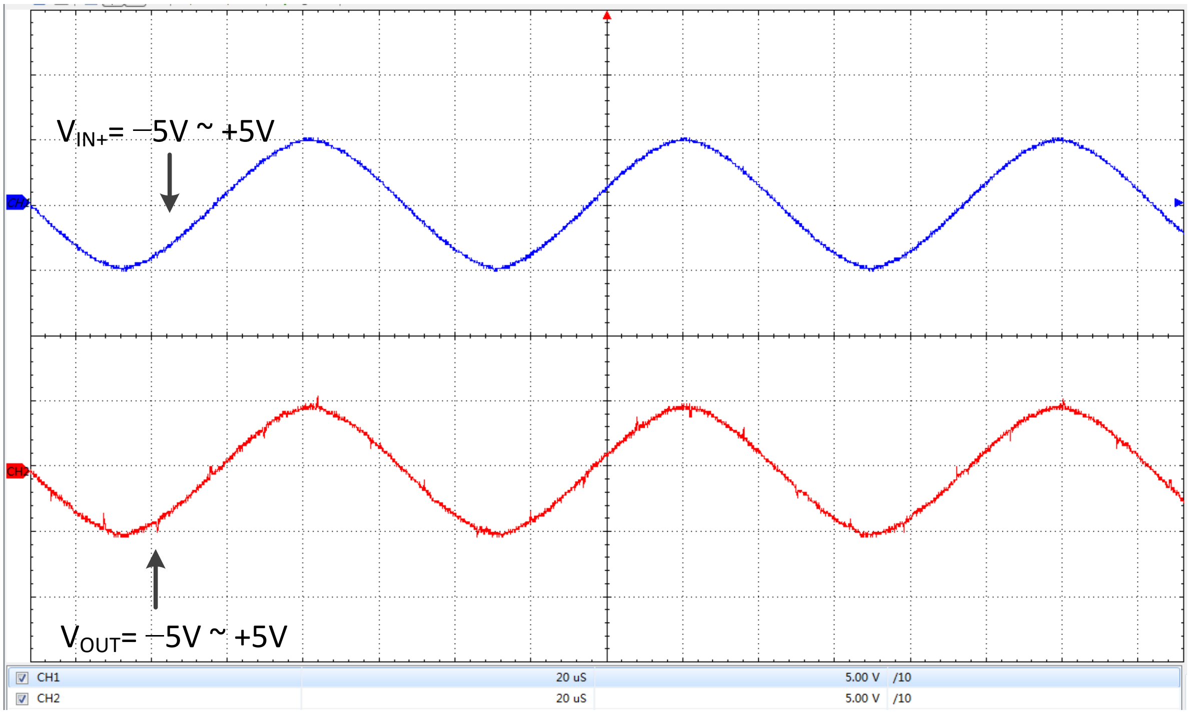

Figure 7. Frequency @ V_{IN+} = −5V ~ +5V

5. Connect pin FB and pin IN−. Provide a −5V ~ +5V voltage to pin IN+. The Frequency f = 100Hz.

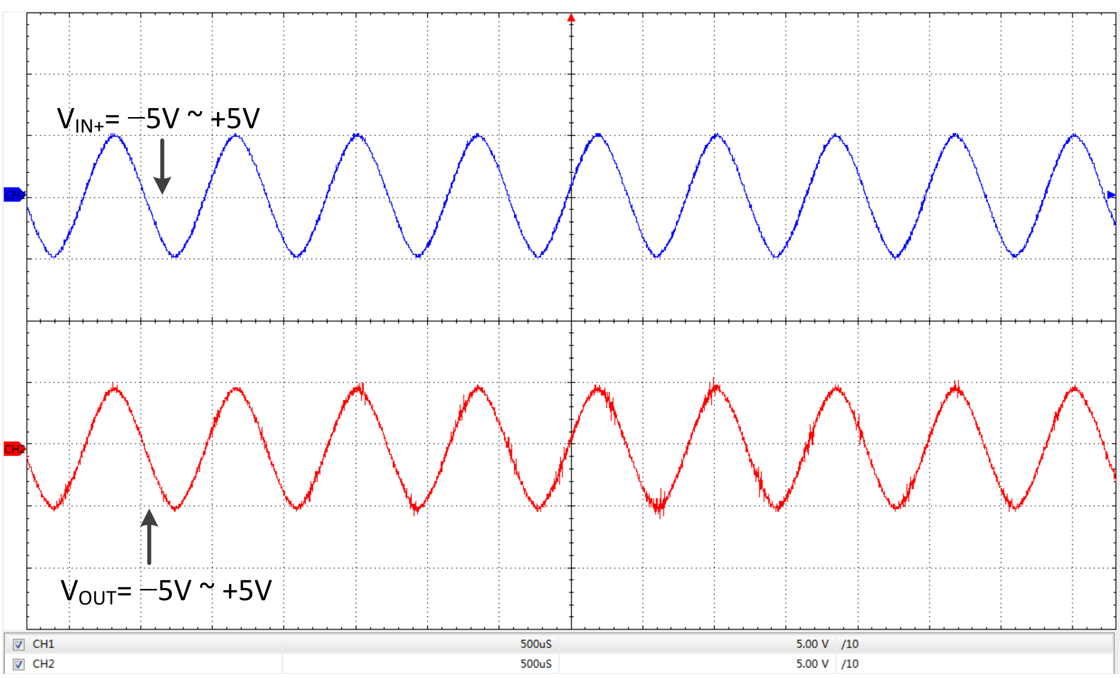

Figure 8. Frequency @ V_{IN+} = −5V ~ +5V

NONLINEARITY

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

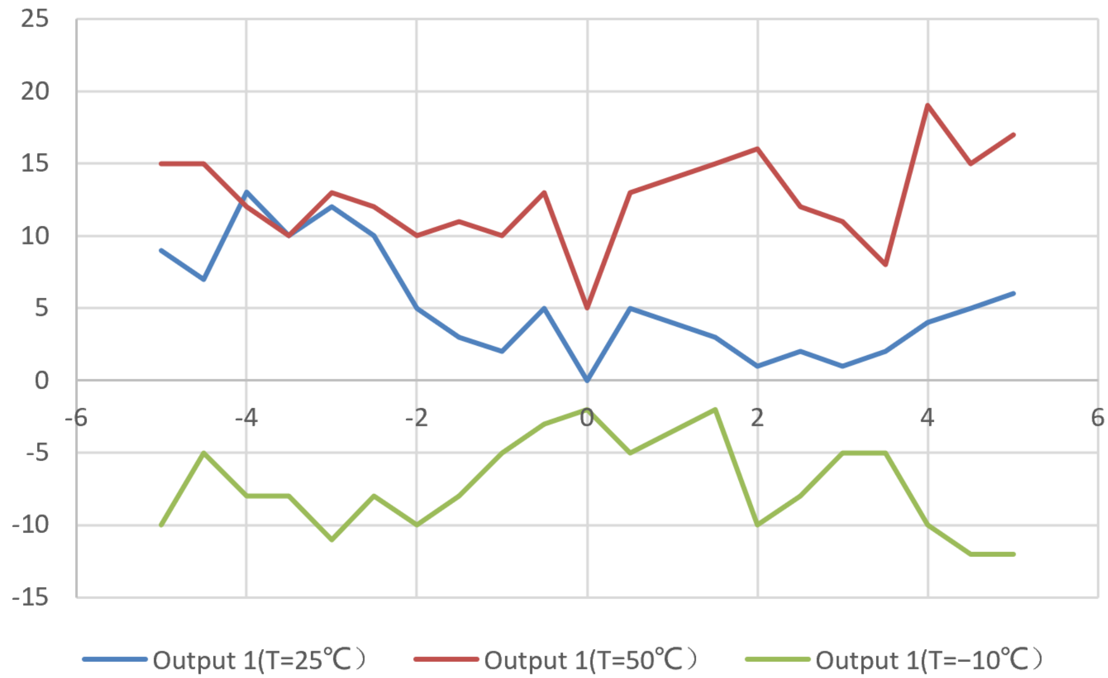

Figure 9. Nonlinearity

MECHANICAL DIMENSIONS

The dimensions of AD202KNATI in DIP package are shown in Figure 10.1.

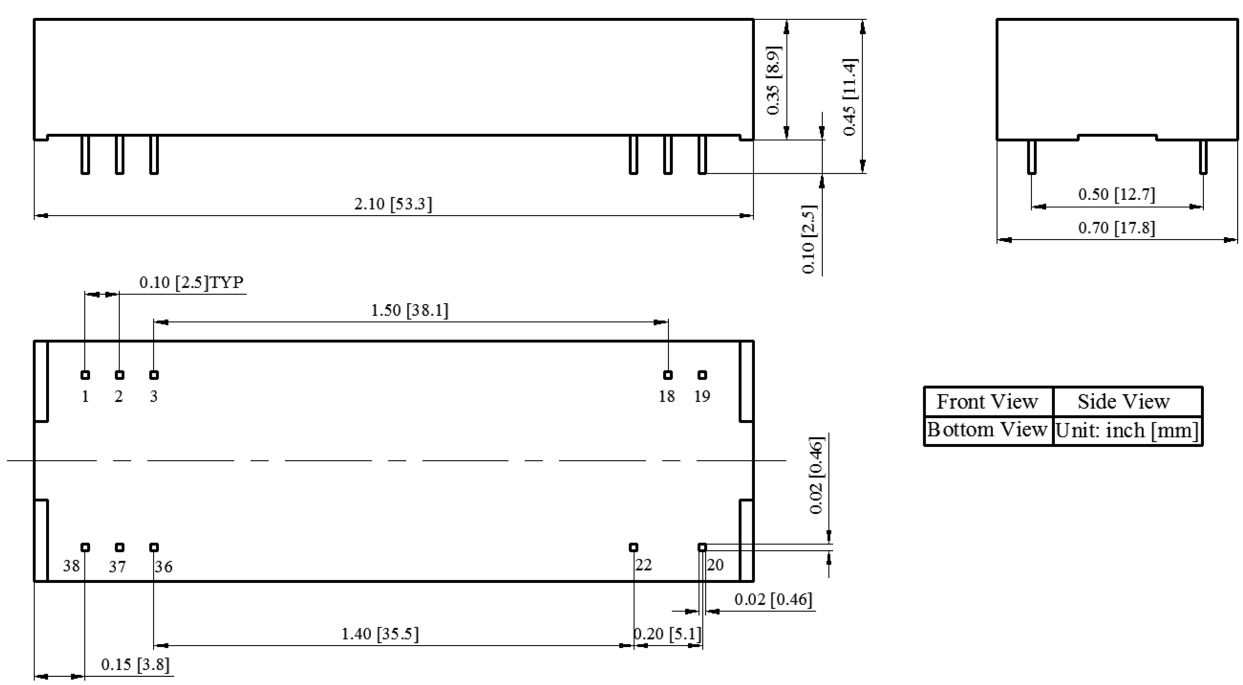

Figure 10.1. Dimensions of AD202JNATI & AD202KNATI DIP Package

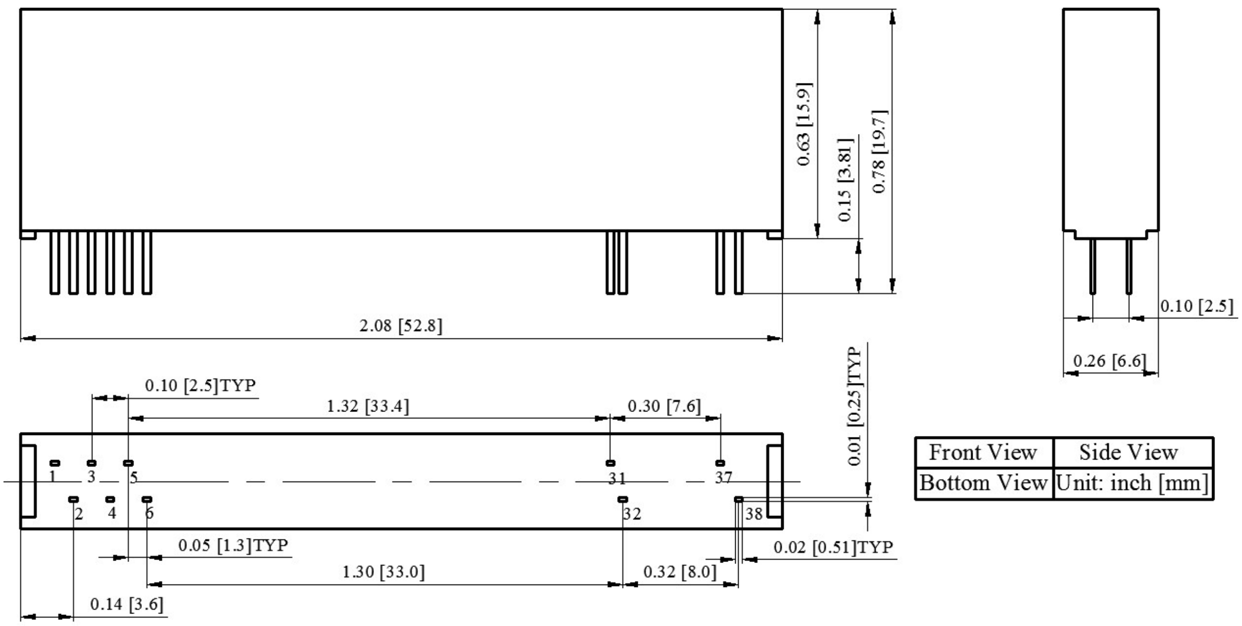

Figure 10.2. Dimensions of AD202JYATI & AD202KYATI SIP Package

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