Figure 1. Photo of AD202JYATI

FEATURES

- Isolated Power Outputs
- Small Size: 4 Channels/lnch Low
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy: ±0.02% 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 AD202JY

We guarantee production for ≥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, $15V_{P\text{-}P}$ square wave generated internally.

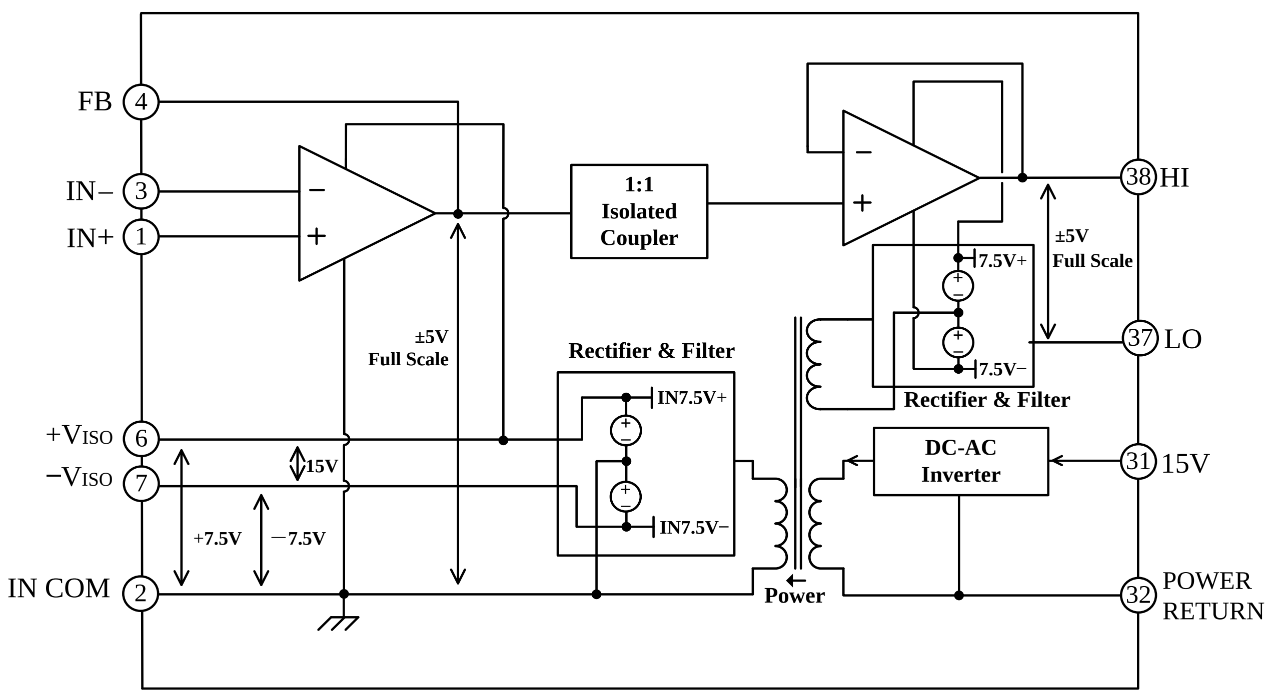

Figure 2. AD202JYATI Functional Block Diagram

SPECIFICATIONS

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

Model	AT202JY
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	1500Vrms
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)	$10^{12}\Omega$
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	$1.8\mu V_{P\text{-}P}$
f > 100Hz	$10.8nV/\sqrt{Hz}$
FREQUENCY RESPONSE	
Bandwidth ($V_O \leq 10V_{P\text{-}P}$, 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	750Ω
Output Ripple, 100kHz Bandwidth	$10mV_{P\text{-}P}$
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	$100mV_{P\text{-}P}$
POWER SUPPLY	
Voltage, Rated Performance	15V±5%
Voltage, Operating	15V±10%
Current, No Load (V_S = 15V)	12mA
TEMPERATURE RANGE	
Rated Performance	0°C to 70°C
Operating	−40°C to +85°C
Storage	−40°C to +85°C
PACKAGE DIMENSIONS	
SIP Package (N)	2.08"×0.26"×0.78"

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

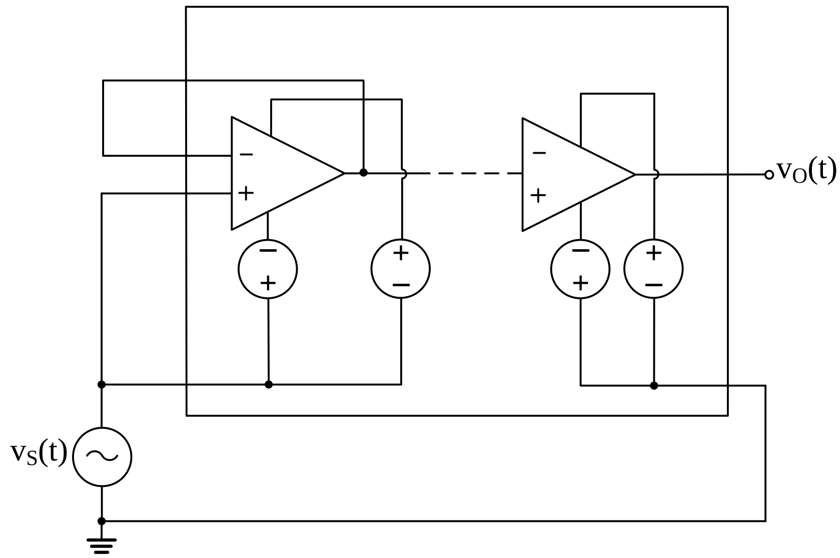

Figure 3. CMRR & CMTC Test Schematic

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	Analog input	Positive 15V power supply input
	32	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.

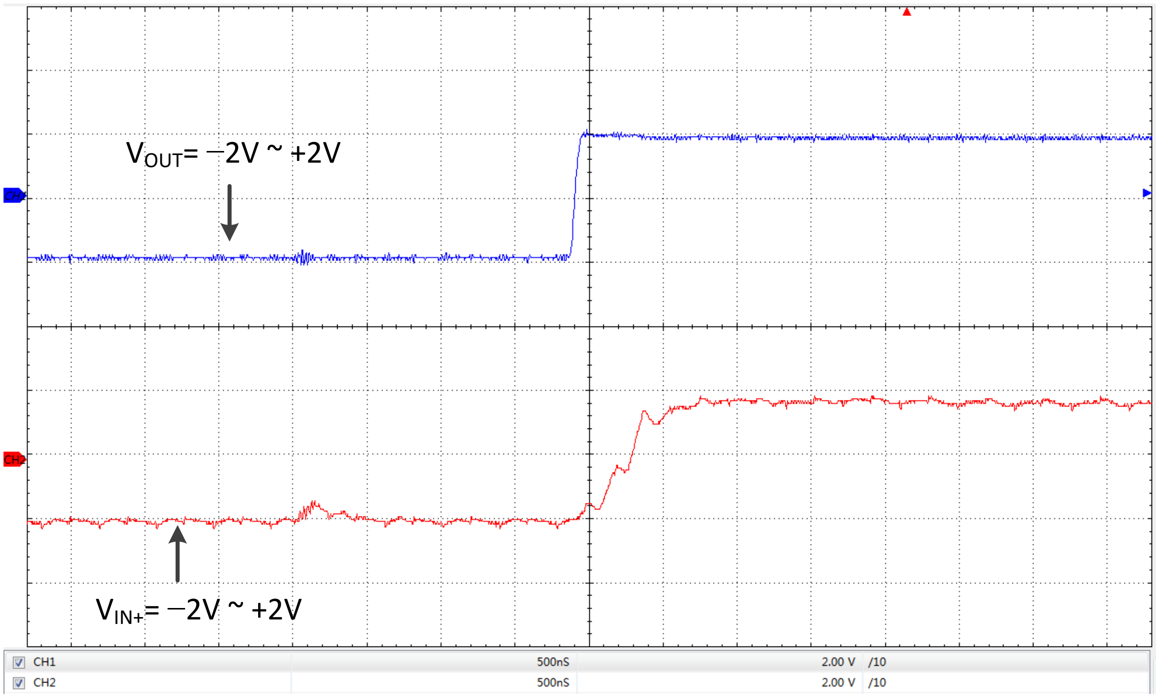

Figure 4. Rise time @ V_{IN+} = −2V ~ +2V

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

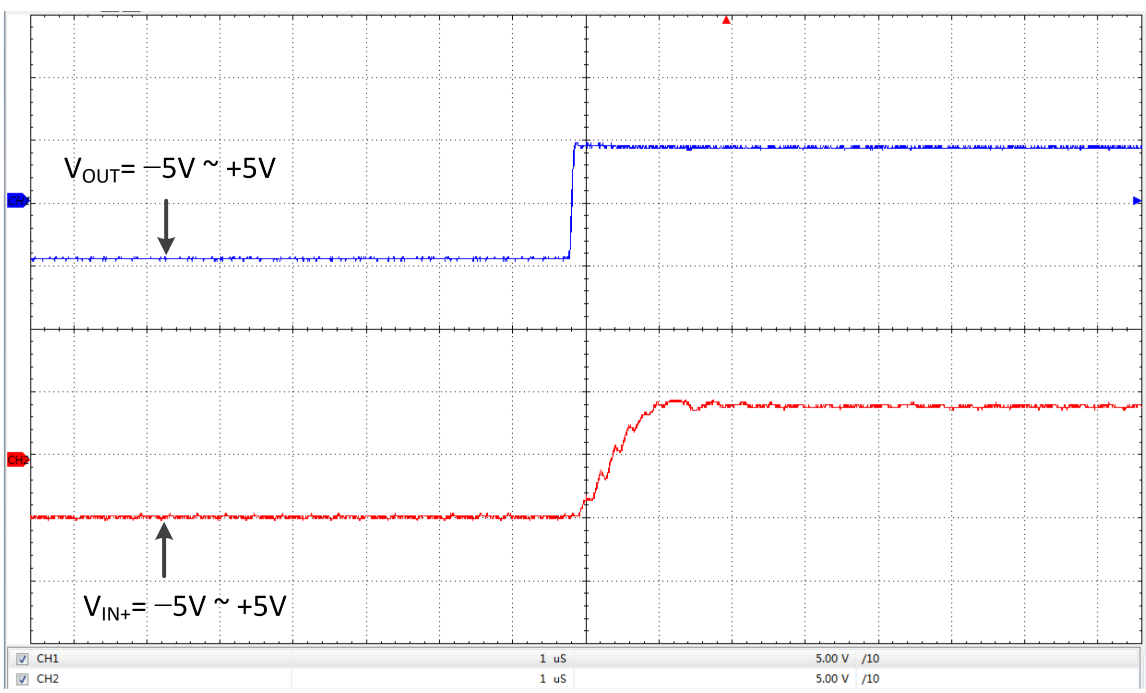

Figure 5. Rise time @ V_{IN+} = −5V ~ +5V

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

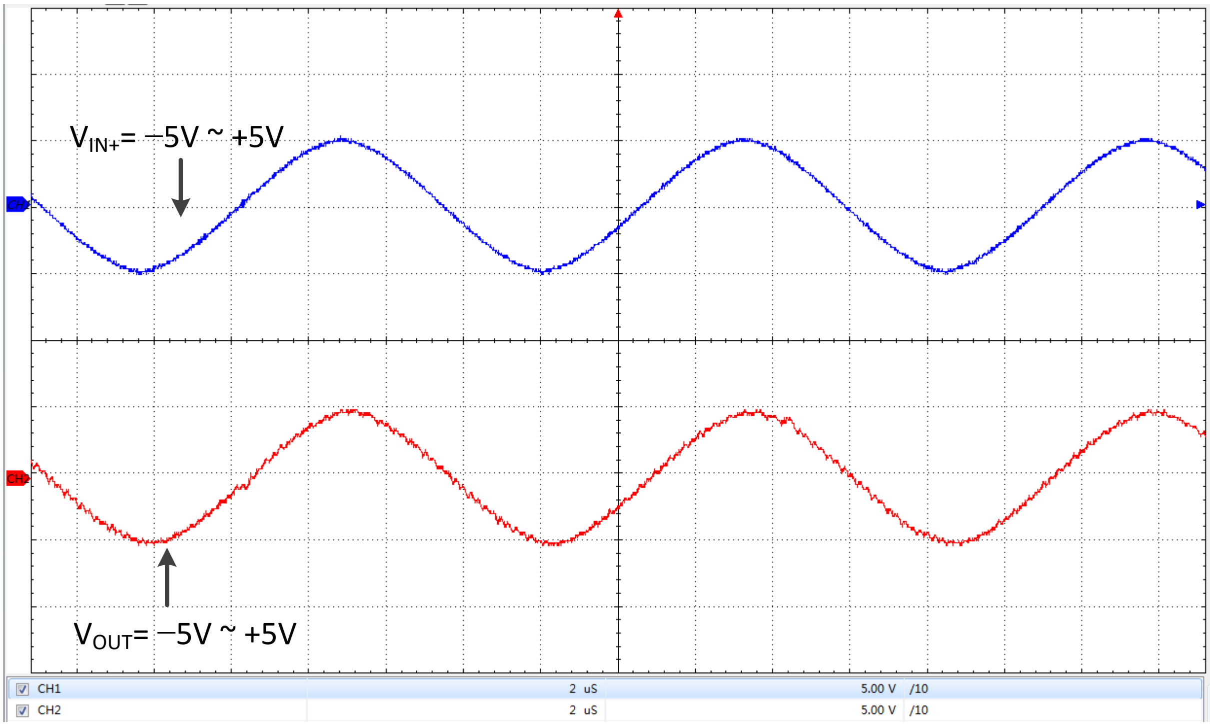

Figure 6. Frequency @ V_{IN+} = −5V ~ +5V

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

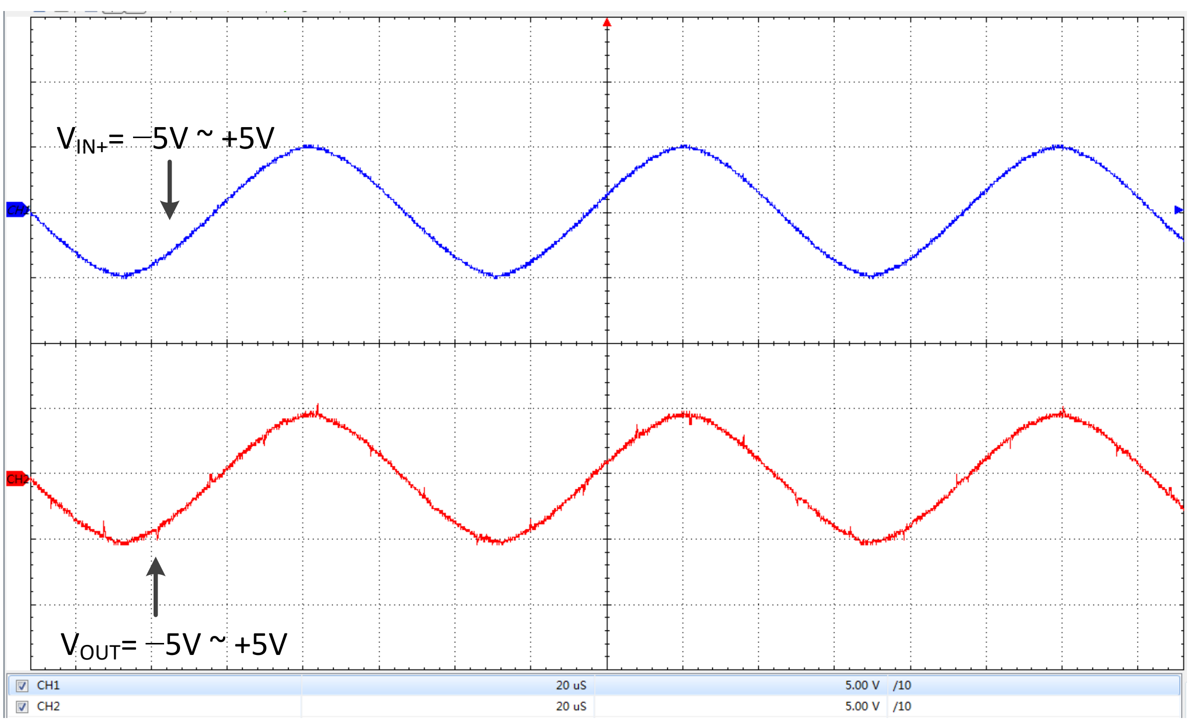

Figure 7. Frequency @ V_{IN+} = −5V ~ +5V

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

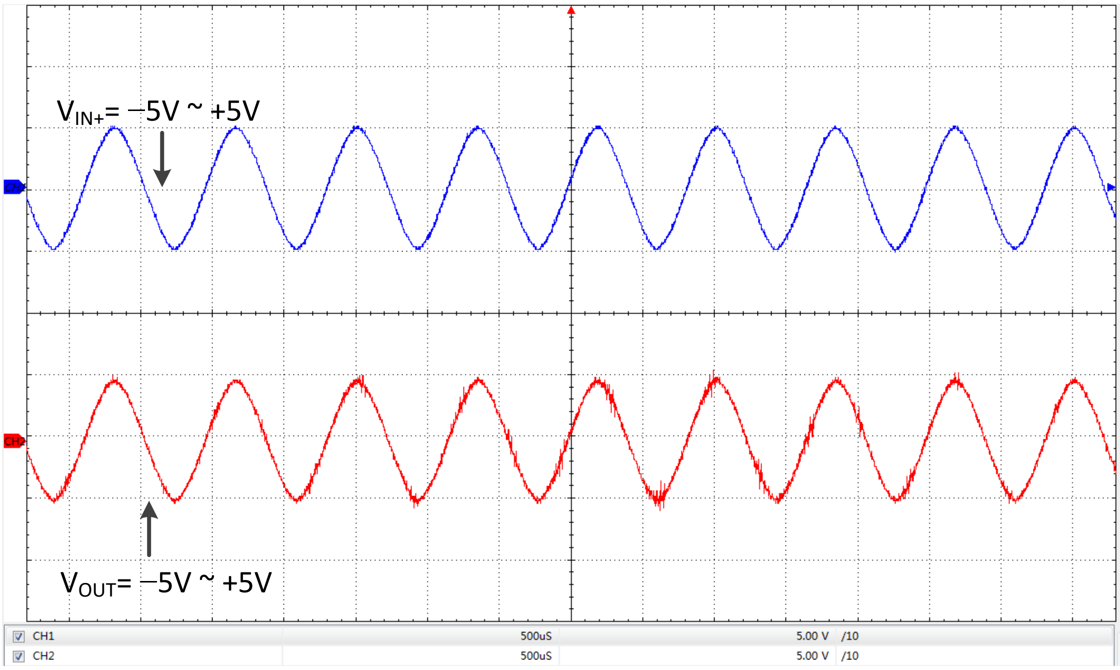

Figure 8. Frequency @ V_{IN+} = −5V ~ +5V

MECHANICAL DIMENSIONS

The dimensions of AD202JYATI in SIP package are shown in Figure 4.

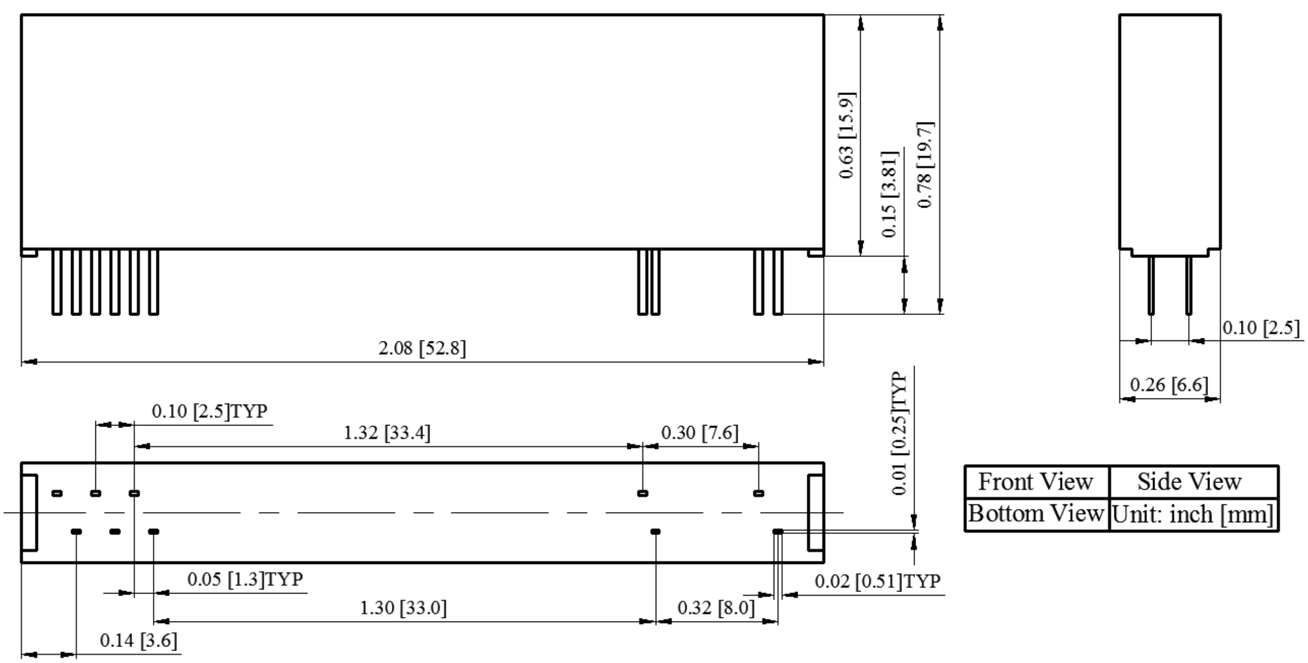

Figure 9. Dimensions of AD202JYATI SIP Package

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