Figure 1. Photo of AT202KN

FEATURES

- Isolated Power Outputs
- Small Size: 4 Channels/Inch Low
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy: ±0.01% 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

The AT202KN 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 AT202KN 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 AT202KN 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 AT202KN

The AT202KN 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.

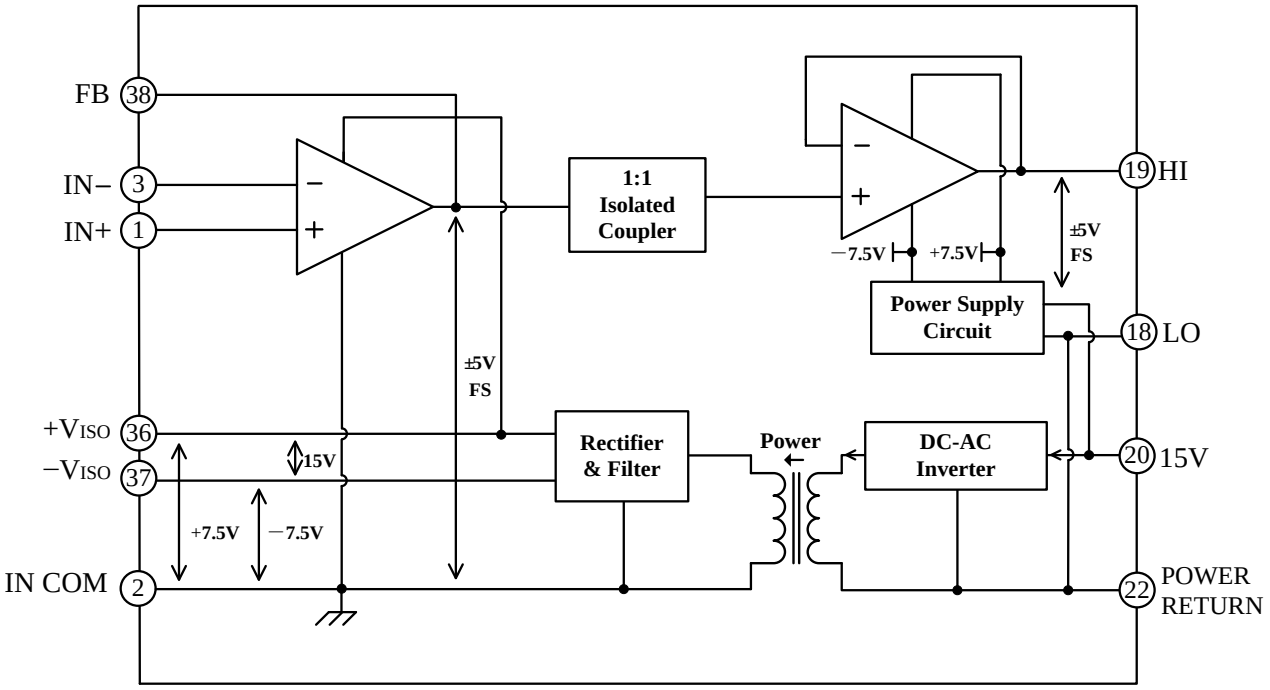

Figure 2. AT202KN Functional Block Diagram

SPECIFICATIONS

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

Model	AT202KN
GAIN	
Range	1V/V–100 V/V
Error	±0.5% typ (±4% max)
vs. Temperature	±20ppm/ ℃ typ (±45ppm/ ℃ 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 ≤ l kΩ (Input HI, LO, or Both) G = 1V/V	100dB min
G = 100V/V	110dB min
Leakage Current Input to Output @ 240Vrms, 60 Hz	2 µA rms max
INPUT IMPEDANCE	
Differential (G = 1V/V)	$10^{12}\Omega$
Common-Mode	2GΩ‖4.5pF
INPUT BIAS CURRENT	
Initial, @ 25 ℃	±30pA
vs. Temperature (0 ℃ to 70 ℃)	±10nA
INPUT DIFFERENCE CURRENT	
Initial, @ 25 ℃	±5pA
vs. Temperature (0 ℃ to 70 ℃)	±2nA
INPUT NOISE	
Voltage, 0.1Hz to 10Hz	$1.8\,\mu V_{p\text{-}p}$
f > 100Hz	$10.8nV/\sqrt{Hz}$
FREQUENCY RESPONSE	
Bandwidth ($V_O \le 10V_{p\text{-}p}$, G = 1V–50V/V)	100kHz
Settling Time, to ±10mV (10V Step)	1ms
OFFSET VOLTAGE (RTI)	
Initial, @ 25 ℃ Adjustable to Zero	(±5 ±5/G)mV max
vs. Temperature (0 ℃ to 70 ℃)	$[\pm10 \pm\frac{10}{G}]$ µV/ ℃
RATED OUTPUT	
Voltage (Out HI to Out LO)	±5V
Output Resistance	7kΩ
Output Ripple, 100kHz Bandwidth	$10mV_{p\text{-}p}$
5kHz Bandwidth	0.5mV rms
ISOLATED POWER OUTPUT	
Voltage, No Load	±7.5V
Accuracy	±10%
Current	400 µA 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)	10mA
TEMPERATURE RANGE	
Rated Performance	0 ℃ to 70 ℃
Operating	−40 ℃ to +85 ℃
Storage	−40 ℃ to +85 ℃
PACKAGE DIMENSIONS	
DlP Package (N)	2.10" ×0.700" ×0.350"

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

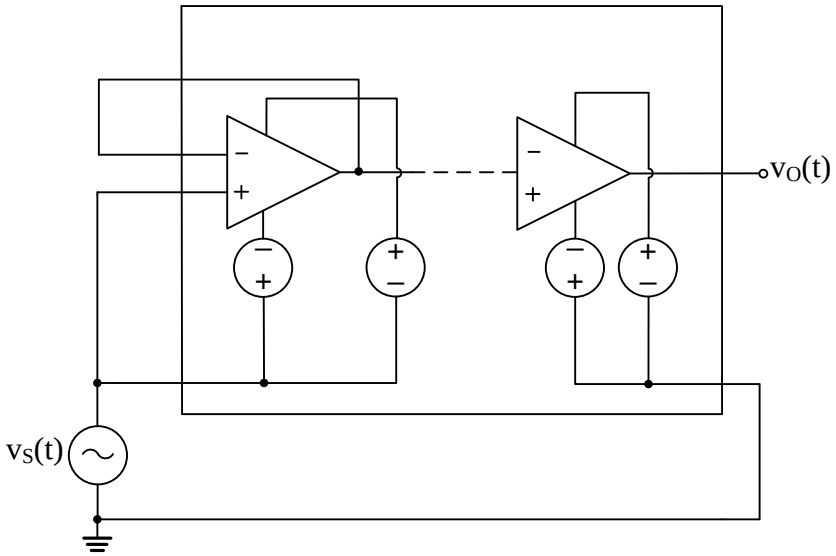

Figure 3. CMRR & CMTC Test Schematic

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, internally connected to pin 22 POWER RETURN
	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, internally connected to pin 18 GND

MECHANICAL DIMENSIONS

The dimensions of AT202KN in DIP package are shown in Figure 3.

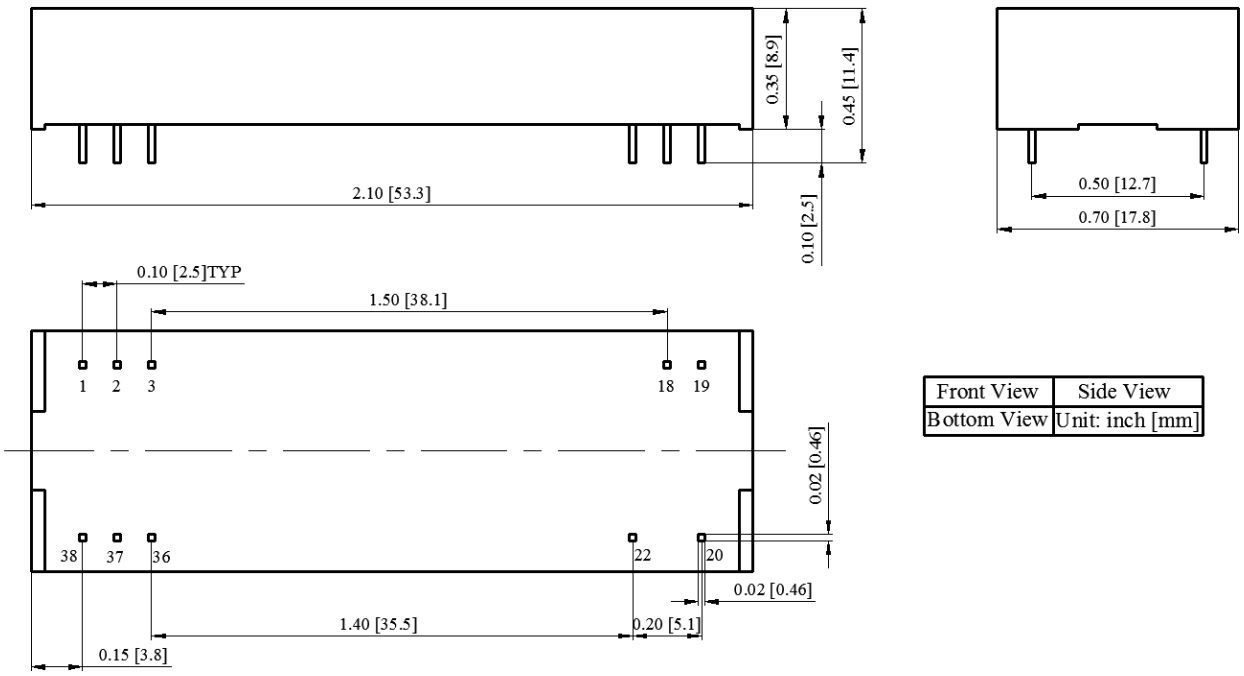

Figure 3. Dimensions of AT202KN DIP Package

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