



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:  $\pm 0.01\%$  Max Nonlinearity
- High CMV Isolation:  $\pm 2000\text{V}$  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 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 25kHz, 15V<sub>P-P</sub> square wave generated internally.

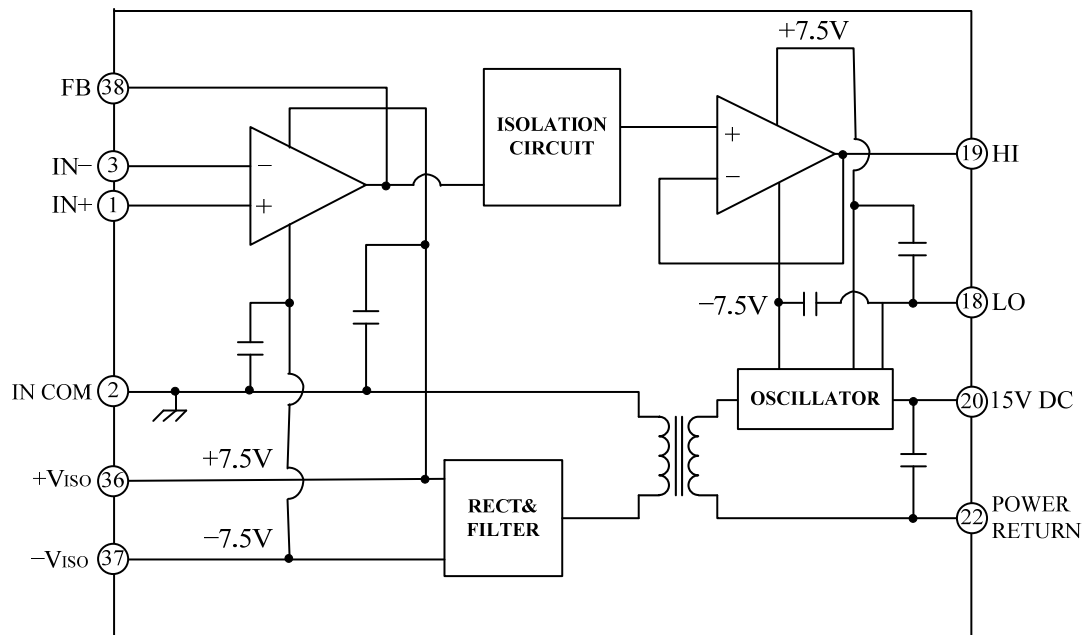


Figure 2. AT202KN Functional Block Diagram



#### SPECIFICATIONS

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

Model	AT202KN
<b>GAIN</b>	
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
<b>INPUT VOLTAGE RATINGS</b>	
Input Voltage Range	±5V
Max Isolation Voltage (Input to Output)	
AC, 60Hz, Continuous	1500Vms
Continuous (AC and DC)	±2000V Peak
Isolation-Mode Rejection Ratio (IMRR)	
@ 60 Hz	
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>FREQUENCY RESPONSE</b>	
Bandwidth ( $V_O \leq 10V_{P-P}$ , G = 1V–50V/V)	100kHz
Settling Time, to ±10mV (10V Step)	1ms
<b>OFFSET VOLTAGE (RTI)</b>	
Initial, @ 25°C Adjustable to Zero	(±5 ± 5/G)mV max
vs. Temperature (0°C to 70°C)	[±10 ± $\frac{10}{G}$ ] μV/°C
<b>RATED OUTPUT</b>	
Voltage (Out HI to Out LO)	±5V
Voltage at Out HI or Out LO	±6.5V
Output Resistance	7kΩ
Output Ripple, 100kHz Bandwidth	10mV <sub>P-P</sub>
5kHz Bandwidth	0.5mV rms
<b>ISOLATED POWER OUTPUT</b>	
Voltage, No Load	±7.5V
Accuracy	±10%
Current	400μA Total
Regulation, No Load to Full Load	5%
Ripple	100mV <sub>P-P</sub>
<b>POWER SUPPLY</b>	
Voltage, Rated Performance	15V±5%
Voltage, Operating	15V±10%
Current, No Load ( $V_S = 15V$ )	5mA
<b>TEMPERATURE RANGE</b>	
Rated Performance	0°C to 70°C
Operating	–40°C to +85°C
Storage	–40°C to +85°C
<b>PACKAGE DIMENSIONS</b>	
DIP Package (N)	2.10"×0.700"×0.350"

**PIN DESIGNATIONS**

Pin #	Function
1	+INPUT
2	INPUT/V <sub>ISO</sub> COMMON
3	-INPUT
18	OUTPUT LO
19	OUTPUT HI
20	15 V POWER IN
22	CLOCK/POWER COMMON
36	+V <sub>ISO</sub> OUTPUT
37	-V <sub>ISO</sub> OUTPUT
38	INPUT FEEDBACK

**MECHANICAL DIMENSIONS**

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

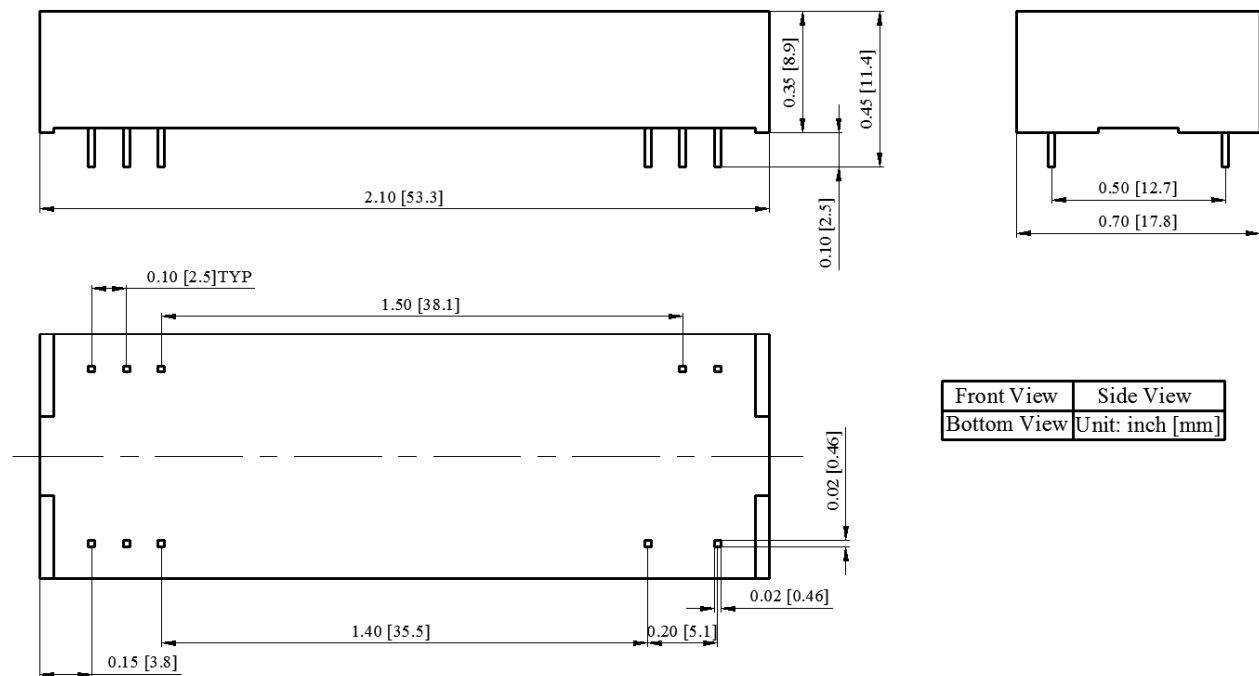


Figure 3. Dimensions of AT202KN DIP Package



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