

FEATURES

- Isolated Power Outputs
- Small Size
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy: $\pm 0.05\%$ Max Nonlinearity
- High CMV Isolation: $\pm 50,000\text{V}$ pk Continuous

APPLICATIONS

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

DESCRIPTION

The AT5005 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 or DIP package offer a signal and power isolation function.

With internal transformer-coupling, the AT5005 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 AT5005 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 AT5005

The AT5005 uses an amplitude modulation technique to permit transformer coupling of signals down to dc (Figure 1). 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_{p-p} square wave generated internally.

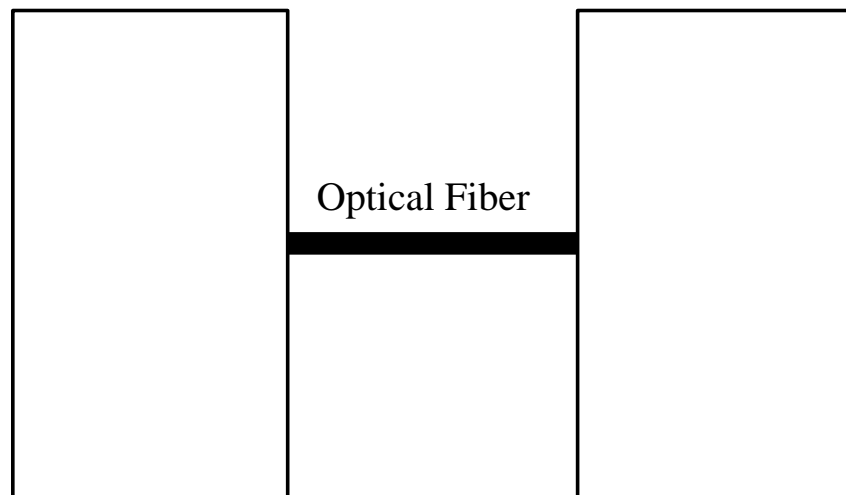


Figure 1. AT5005 Functional Block Diagram



SPECIFICATIONS

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

| Model | AT5005 |
|--|----------------------------------|
| 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) | ±0.05 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 | 30,000Vms |
| Continuous (AC and DC) | ±50,000V 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 |
| 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 100 Hz | 4µA _{P-P} |
| f > 200Hz | 50nV/√Hz |
| FREQUENCY RESPONSE | |
| Bandwidth ($V_O \leq 10V_{P-P}$, G = 1V–50V/V) | 2kHz |
| 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) | [±10 ± $\frac{10}{G}$] µV/ °C |
| RATED OUTPUT | |
| Voltage (Out HI to Out LO) | ±5V |
| Voltage at Out HI or Out LO (Ref. Pin 32) | ±6.5V |
| 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 (AT202 Only) | |
| Voltage, Rated Performance | 15V ±5% |
| Voltage, Operating | 15V ±10% |
| Current, No Load ($V_S = 15V$) | 5mA |
| 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 (Y) | 2.08" ×0.250" ×0.625" |
| DIP Package (N) | 2.10" ×0.700" ×0.350" |



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