

FEATURES

Low power: 2.3 mA maximum quiescent current

Low noise

3.2 nV/ $\sqrt{\text{Hz}}$ maximum input voltage noise at 1 kHz

200 fA/ $\sqrt{\text{Hz}}$ typical current noise spectral density at 1 kHz

Excellent ac specifications

10 MHz typical small signal bandwidth (gain = 1 and gain = 10)

2 MHz typical small signal bandwidth (gain = 100)

0.6 μs typical settling time to 0.001% (gain = 10)

80 dB minimum CMRR at 20 kHz (gain = 1)

35 V/ μs typical slew rate

High precision dc performance

84 dB minimum CMRR DC to 60 Hz with 1 k Ω source imbalance (gain = 1)

0.9 $\mu\text{V}/^\circ\text{C}$ maximum input offset voltage, average temperature coefficient

5 ppm/ $^\circ\text{C}$ maximum gain vs. temperature (gain = 1)

2 nA maximum input bias current

Inputs protected to 40 V from opposite supply

$\pm 2.5\text{ V}$ to $\pm 18\text{ V}$ dual supply (+5 V to +36 V single supply)

Gain set with a single resistor (gain = 1 to 10,000)

Known Good Die (KGD): these die are fully guaranteed to data sheet specification.

APPLICATIONS

Medical instrumentation

Precision data acquisition

Microphone preamplification

Vibration analysis

Multiplexed input applications

ADC driver

GENERAL DESCRIPTION

The AD8421-KGD is a low cost, low power, low noise, ultralow bias current, high speed instrumentation amplifier that is ideally suited for a broad spectrum of signal conditioning and data acquisition applications. This device features high CMRR, allowing the device to extract low level signals in the presence of high frequency common-mode noise over a wide temperature range.

FUNCTIONAL BLOCK DIAGRAM

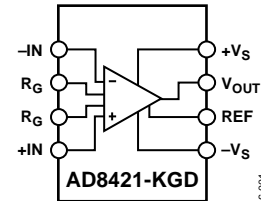


Figure 1.

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The 10 MHz small signal bandwidth, 35 V/ μs slew rate, and 0.6 μs settling time to 0.001% (gain = 10) allow the AD8421-KGD to amplify high speed signals and excel in applications that require high channel count, multiplexed systems. Even at higher gains, the current feedback architecture maintains high performance. For example, at gain = 100, the bandwidth is 2 MHz and the settling time is 0.8 μs .

The AD8421-KGD has excellent distortion performance, making this device suitable for use in demanding applications such as vibration analysis.

The AD8421-KGD delivers 3 nV/ $\sqrt{\text{Hz}}$ input voltage noise and 200 fA/ $\sqrt{\text{Hz}}$ current noise spectral density with only 2 mA quiescent current, making the device an ideal choice for measuring low level signals. For applications with high source impedance, the AD8421-KGD employs innovative process technology and design techniques to provide noise performance that is limited only by the sensor.

The AD8421-KGD uses unique protection methods to ensure robust inputs while still maintaining low noise. This protection allows input voltages up to 40 V from the opposite supply rail without damage to the device.

A single resistor sets the gain from 1 to 10,000. The reference pin can be used to apply a precise offset to the output voltage.

The AD8421-KGD is specified from -40°C to $+85^\circ\text{C}$ and operational to 125°C .

Additional application and technical information can be found in the [AD8421](#) data sheet.