

MAX11216

24-Bit, 10mW, 140dB SNR, 64ksps Delta-Sigma ADC with Integrated PGA

Low-Power, Low-Noise ADC Ideal for Seismic Data Acquisition



NDA Required. Request Full Data Sheet

Overview

Description

The MAX11216 is a 24-bit delta-sigma ADC that achieves excellent 140dB SNR while dissipating low 10mW. Sample rates up to 64ksps allow both precision DC and AC measurements. Integral nonlinearity is guaranteed to 4ppm maximum. The THD is -122dB. The MAX11216 communicates via an SPI-compatible serial interface and is available in a small 24-pin TSSOP package.

The MAX11216 offers a $6.5\text{nV}/\sqrt{\text{Hz}}$ noise programmable gain amplifier with gain settings between 1x to 128x. Optional buffers are also included to provide isolation of the signal inputs from the switched capacitor sampling network. This allows the MAX11216 to be used with high-impedance sources without compromising available dynamic range.

The MAX11216 operates from a single 2.7V to 3.6V analog supply, or split $\pm 1.8\text{V}$ analog supplies, allowing the analog input to be sampled below ground. The digital supply range is 2.0V to 3.6V, allowing communication with 2.5V, 3V, or 3.3V logic.

Key Features

- High Resolution for Instrumentation Applications that Require a Wide Dynamic Range
 - 138dB SNR at 15.6sps
 - 127dB SNR at 500sps
 - 21-Bit Noise-Free Resolution at 50sps
 - 19-Bit Noise-Free Resolution at 1ksps
- Longer Battery Life for Portable Applications

- 2.4mA Operating Mode Current from AVDD
- 4.4mA PGA Low-Noise Mode Current from AVDD
- 1µA Sleep Current
- High Accuracy for DC Measurements
 - 1ppm INL (typ), 4ppm (max)
- Single or Split Analog Supplies Provide Input Voltage Range Flexibility
 - 2.7V to 3.6V (Single Supply) or ±1.8V (Split Supplies)
- Flexible High-Performance Filter Architecture Simplifies Design
 - Programmable SINC + FIR + IIR
 - Linear or Minimum Phase Response
 - Programmable Highpass Filter
 - Selectable FIR Data Rates: 125sps to 16ksps
- Enables System Integration
 - Low-Noise PGA with Gains of 1, 2, 4, 8, 16, 32, 64, 128
 - Signal Buffer Optional
 - 3 General-Purpose I/Os
- Enables Integrated Part and System Calibration Capability for Gain and Offset
- Robust 24-Pin TSSOP Packaging

Applications/Uses

- ATE
- High-Precision Portable Sensors
- Medical Equipment
- Scientific Instrumentation
- Seismic Data Acquisition