

Low Noise, Low Power, Wide Bandwidth, 3-Axis MEMS Accelerometer

FEATURES

- ▶ Ultralow noise density:
 - ▶ 44 $\mu\text{g}/\sqrt{\text{Hz}}$ (XY), 55 $\mu\text{g}/\sqrt{\text{Hz}}$ (Z)
- ▶ Low power consumption
 - ▶ High performance: 520 μA
 - ▶ Ultra low power: 33 μA
- ▶ Wide bandwidth: 8 kHz
 - ▶ Relative flatness with equalization: <0.6 dB
- ▶ Low latency
 - ▶ Group delay: <85 μs
- ▶ Digital features
 - ▶ 16-bit ADC
 - ▶ Multiprotocol serial interfaces: SPI or I2C
 - ▶ Multiprotocol audio data output: I²S, TDM, and PDM
 - ▶ Programmable low-pass filter and high-pass filter
 - ▶ Data synchronous or asynchronous sampling
 - ▶ Output FIFO: 320 word
- ▶ Built-in features for system-level power savings
 - ▶ Single tap, double tap, and triple tap detection
 - ▶ Activity and inactivity detection
 - ▶ Configurable interrupt modes
- ▶ Integrated temperature sensor
- ▶ Voltage range options
 - ▶ V_{SUPPLY} with internal regulators: 2.25 V to 3.6 V (or $V_{1\text{P}8}$ at 1.8 V)
 - ▶ V_{DDIO} : 1.14 V to 3.6 V (1.62 V to 3.6 V for full temperature range)
- ▶ Electromechanical self test
- ▶ 20,000 g shock survival
- ▶ RoHS compliant
- ▶ Operating temperature range: -40°C to +125°C
- ▶ 14-terminal, 2.9 mm × 2.8 mm × 0.87 mm, LGA plastic package

APPLICATIONS

- ▶ Condition-based monitoring
- ▶ Structural health monitoring
- ▶ Seismic Imaging
- ▶ Wearables and low power motion detection
- ▶ Robotics

GENERAL DESCRIPTION

The ADXL382 is a low noise density, low power, 3-axis accelerometer with selectable measurement ranges. The ADXL382 supports $\pm 15\text{ g}$, $\pm 30\text{ g}$, and $\pm 60\text{ g}$ range options.

The ADXL382 offers industry leading noise, enabling precision applications with minimal calibration. The low noise and low power ADXL382 enables accurate measurements in high vibration environments.

The ADXL382 multifunction pin names can be referenced only by their relevant function for either the serial peripheral interface (SPI) or I²C interface, or these pin names can be referenced by their audio function (PDM, I²S, or TDM).

In addition to its low power consumption, the ADXL382 has many features to enable true system level performance. These features include a built-in micropower temperature sensor; single, double, and triple tap detection; and a state machine to prevent false triggering. In addition, the ADXL382 has provisions for external control of the sampling time and/or an external clock.

The ADXL382 operates on a wide, 2.25 V to 3.6 V supply range (or 1.8 V supply) and can interface, if necessary, to a host operating on a separate supply voltage. The ADXL382 is available in a 14-lead, 2.9 mm × 2.8 mm × 0.87 mm, LGA plastic package.

FUNCTIONAL BLOCK DIAGRAM

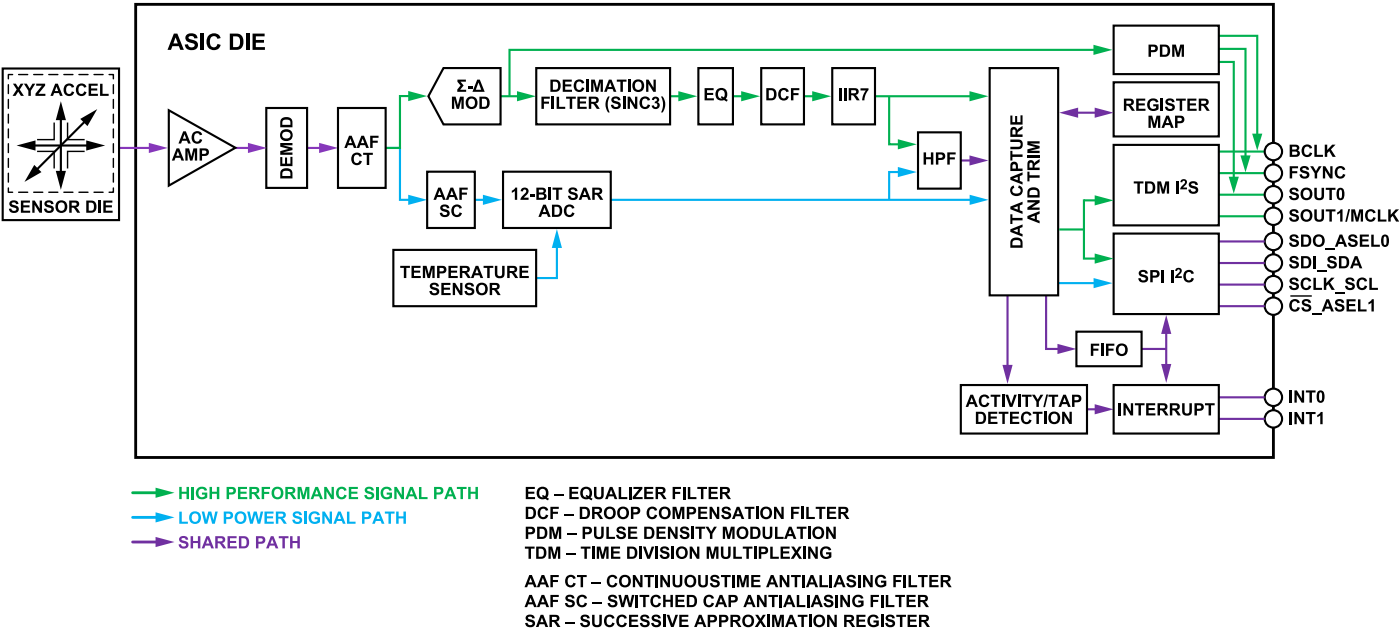


Figure 1. Functional Block Diagram

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