

Micropower, 3-Axis, $\pm 2\text{ g}/\pm 4\text{ g}/\pm 8\text{ g}$, Digital Output MEMS Accelerometer

FEATURES

- ▶ Ultralow power
- ▶ Power can be derived from coin cell battery
- ▶ 1.8 μA at 100 Hz ODR, 2.0 V supply
- ▶ 3.0 μA at 400 Hz ODR, 2.0 V supply
- ▶ 270 nA, motion activated, wake-up mode
- ▶ 10 nA standby supply current, 2.0 V supply
- ▶ High resolution, sensitivity at X_{OUT} , Y_{OUT} , Z_{OUT} : 1 mg/LSB
- ▶ Built in features for system level power savings
- ▶ Adjustable threshold sleep/wake modes for motion activation
- ▶ Autonomous interrupt processing, without need for microcontroller intervention, to allow the rest of the system to be turned off completely
- ▶ Deep embedded FIFO minimizes host processor load
- ▶ Awake state output enables implementation of standalone, motion activated switch
- ▶ Low noise down to 175 $\mu\text{g}/\sqrt{\text{Hz}}$
- ▶ Wide operating voltage range: 1.6 V to 3.5 V
- ▶ Operates off 1.6 V to 3.3 V batteries
- ▶ Special, high reliability manufacturing flow
- ▶ Acceleration sample synchronization via external trigger
- ▶ On-chip temperature sensor
- ▶ SPI digital interface
- ▶ Measurement ranges selectable via SPI command
- ▶ Small and thin 3 mm \times 3.25 mm \times 1.06 mm package

APPLICATIONS

- ▶ Medical implantable
- ▶ Clinical and home healthcare devices
- ▶ Hearing aids
- ▶ Motion enabled power save switches and metering devices
- ▶ Wireless sensors

GENERAL DESCRIPTION

The ADXL362-MI is an ultralow power, 3-axis MEMS accelerometer that consumes less than 2 μA at a 100 Hz output data rate (ODR) and 270 nA when in motion triggered wake-up mode. Unlike accelerometers that use power duty cycling to achieve low power consumption, the ADXL362-MI does not alias input signals by undersampling; it samples the full bandwidth of the sensor at all data rates.

The ADXL362-MI always provides 12-bit output resolution; 8-bit formatted data is also provided for more efficient single-byte transfers when a lower resolution is sufficient. Measurement ranges of $\pm 2\text{ g}$, $\pm 4\text{ g}$, and $\pm 8\text{ g}$ are available, with a resolution of 1 mg/LSB on the $\pm 2\text{ g}$ range. For applications where a noise level lower than the normal 550 $\mu\text{g}/\sqrt{\text{Hz}}$ of the ADXL362-MI is desired, either of two lower noise modes (down to 175 $\mu\text{g}/\sqrt{\text{Hz}}$ typical) can be selected at minimal increase in supply current.

In addition to its ultralow power consumption, the ADXL362-MI has many features to enable true system level power reduction. It includes a deep multimode output, first in, first out (FIFO), a built in micropower temperature sensor, and several activity detection modes including adjustable threshold sleep and wake-up operation that can run as low as 270 nA at a 6 Hz (approximate) measurement rate. A pin output is provided to directly control an external switch when activity is detected, if desired. In addition, the ADXL362-MI has provisions for external control of sampling time and/or an external clock.

The ADXL362-MI operates on a wide 1.6 V to 3.5 V supply range, and can interface, if necessary, to a host operating on a separate, lower supply voltage. The ADXL362-MI is processed through a special, high reliability manufacturing flow involving additional process, test, and quality controls to meet a higher quality and reliability standard that gives more robustness to Class II medical devices and Class III medical devices. Further details are available with Analog Devices, Inc., consultation. The ADXL362-MI is available in a 3 mm \times 3.25 mm \times 1.06 mm LGA package.

FUNCTIONAL BLOCK DIAGRAM

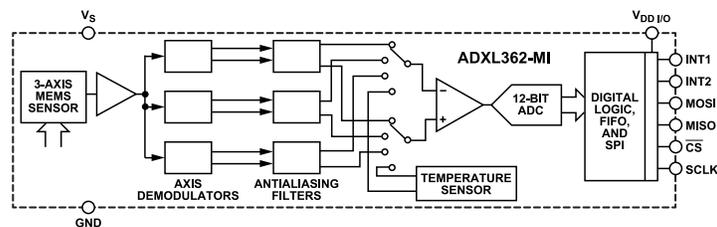


Figure 1.

For more information on the ADXL362-MI, contact Analog Devices, Inc., at healthcare-support@analog.com.

Rev. SpD

DOCUMENT FEEDBACK

TECHNICAL SUPPORT

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