Micropower, 3-Axis, ±2 *g*/±4 *g*/±8 *g*, Digital Output MEMS Accelerometer

Data Sheet **ADXL362-MI**

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 µg/√Hz**
- **Wide operating voltage range: 1.6 V to 3.5 V**
- **Operates off 1.8 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 × 3.25 mm × 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 ±2 *g*, ±4 *g*, and ±8 *g* are available, with a resolution of 1 mg/LSB on the ±2 *g* range. For applications where a noise level lower than the normal 550 µg/√Hz of the ADXL362-MI is desired, either of two lower noise modes (down to 175 µg/√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 × 3.25 mm × 1.06 mm LGA package.

FUNCTIONAL BLOCK DIAGRAM

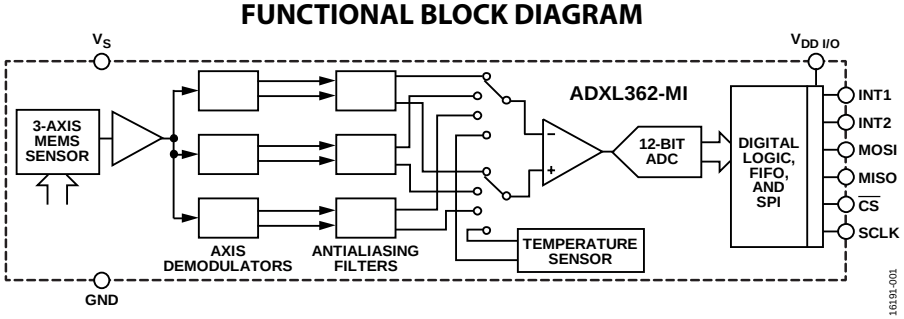

Figure 1.

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

Rev. SpB **Document Feedback**

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700
Technical Support **www.analog.com**

NOTES

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