Dual-Axis, 60 g to 480 g Sensor with SPI and PSI5

FEATURES

- User selectable sensor *g* ranges: ±60 *g*, ±120 *g*, ±240 *g*, ±480 *g*
- Dual x-axis and z-axis sensor
- Compliant to PSI5 Version 2.1 airbag substandard
- Synchronous operation
- PSI5-P10P-500/3L and others
- Daisy-chain operation with bidirectional communication
- Application level serial peripheral interface (SPI) communication
- Selectable 16-bit or 10-bit sensor data
- Independently programmable *g* range and time slot for each axis
- Independent fault discrimination for each axis
- Fully differential analog signal chain
- 0.25 µs data interpolation routine
- User selectable, continuous auto-zero operation
- High resistance to electromagnetic interference (EMI) and radio frequency interference (RFI)
- SPI mode supply voltage: 3.3 V and 5 V, +5%
- PSI5 mode supply voltage range: 4.5 V to 11.0 V
- Qualified for automotive applications

APPLICATIONS

- Front impact crash sensing
- Side impact crash sensing

GENERAL DESCRIPTION

The ADXL256 is a dual-axis, integrated satellite sensor with user-selectable *g* ranges, compliant to the PSI5 Version 2.1 airbag substandard and backwards compliant to the PSI5 Version 1.3. The ADXL256 (x-axis and z-axis) enables low-cost solutions for front impact and side impact airbags, as well as satellite sensor and electronic control unit (ECU) main sensor applications. Acceleration data is sent to the control module via a digital, 2-wire current loop PSI5 bus. Communication via the SPI bus is also available for ECU applications.

The device uses an error-correction code (ECC)-protected, one time programmable (OTP) memory. The sensor *g* range is configurable to provide full-scale measurement of ±60 *g*, ±120 *g*, ±240 *g*, or ±480 *g* acceleration. The user can program each axis independently with multiple *g* ranges in different time slots. In PSI5 mode, there are four programmable time slots available. The device transmits 16-bit or 10-bit acceleration data to the control module, and can be configured to include either a 1-bit parity check, or a 3-bit cyclic redundancy check (CRC).

The ADXL256 is available in a 4 mm × 4 mm LFCSP and is specified to operate over the full automotive temperature range, −40°C to +125°C.

Analog Devices is in the process of updating documentation to provide terminology and language that is culturally appropriate, which is a process with a wide scope and will be phased in as quickly as possible. Thank you for your patience.

FUNCTIONAL BLOCK DIAGRAM

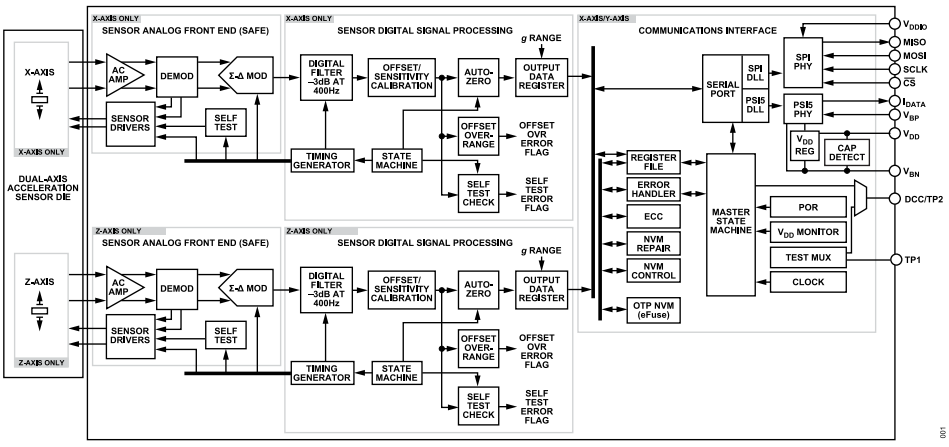


Figure 1. Functional Block Diagram

For more information about the ADXL256, contact the Analog Devices, Inc., Customer Interaction Center to connect with a technical support specialist.

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NOTES

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