High Performance Accelerometer with Dual Spectrum Signal Processing

Data Sheet

ADXL195/ADXL295

FEATURES

- Single-axis (ADXL195) and dual-axis (ADXL295) configurations
- ±120 *g* baseband acceleration channel
  - 12-bit resolution at 62.5 m*g*/LSB
  - 512 kHz data interpolation rate
- 40 g_{AVG} high frequency signal processing channel
  - 10-bit resolution at 83.3 m*g* avg/LSB
  - 128 kHz data interpolation rate
- Sensor frequency response down to dc
- On-demand electromechanical self-test
- On-demand HF signal injection self-test
- Fully differential circuitry for high resistance to EMI/RFI
- Independent x- and y-axis sense structures for robust FMEA performance
- Independent x- and y-axis arming thresholds
- Low noise
  - 1 LSB rms (12-bit baseband acceleration channel)
  - 2 LSB rms (10-bit high frequency acceleration channel)
- Qualified for automotive applications
- Temperature range: −40°C to +105°C
- 3.3 V and 5 V operation

APPLICATIONS

- Enhanced crash sensing
- Shock detection

GENERAL DESCRIPTION

The ADXL195/ADXL295 are dual spectrum accelerometers that measure baseband acceleration in up to two axes (XL-X and XL-Y), as well as high frequency (HF) acceleration energy. Identical, independent X and Y sense structures are implemented to achieve the best possible fail-safe performance.

The XL-X and XL-Y channels output baseband acceleration information with a nominal full-scale range of ±120 *g* and a bandwidth of 408 Hz. The acceleration data is provided as a 12-bit, twos complement word with a resolution of 62.5 m*g*/LSB.

HF acceleration within the frequency band of 15.5 kHz to 23 kHz is rectified and filtered to generate an average *g* (g_{AVG}) energy measurement. The HF channel has a nominal full-scale range of 40 g_{AVG} and a bandwidth of 393 Hz. When combined with the XL-X and XL-Y information, HF acceleration information allows for enhanced vehicle impact detection and discrimination.

The ADXL195/ADXL295 are available in a 16-lead, narrow-body SOIC package with an exposed pad. The ADXL195/ADXL295 can operate at 3.3 V and 5 V and are specified for operation from −40°C to +105°C.

FUNCTIONAL BLOCK DIAGRAM

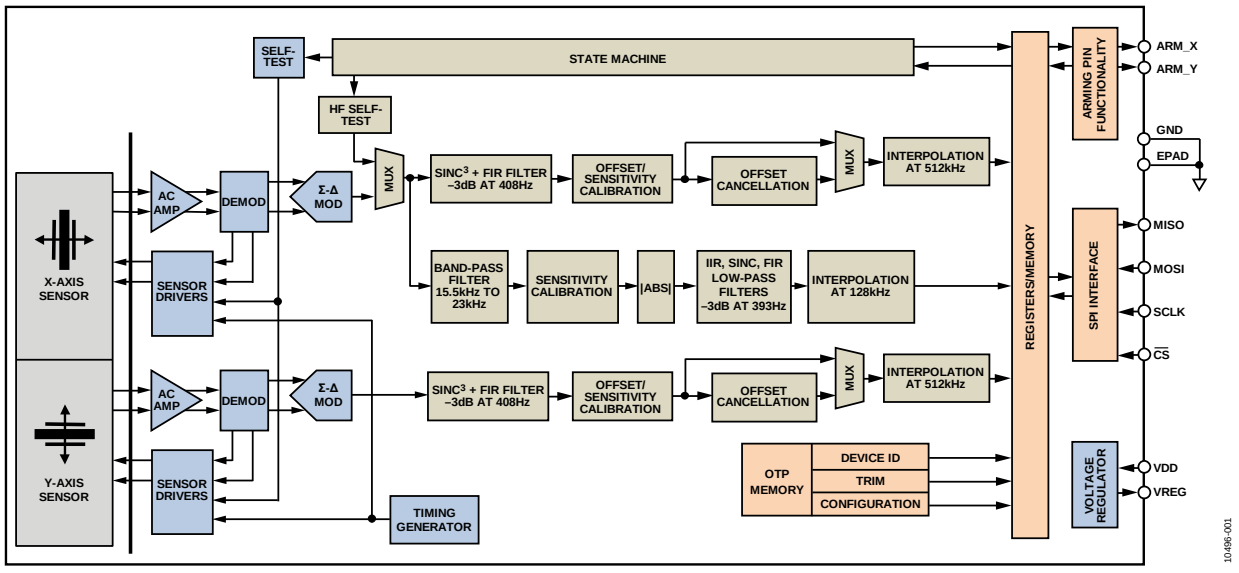

Figure 1.

For more information about the ADXL195/ADXL295, please contact the Analog Devices, Inc., Customer Interaction Center at http://www.analog.com/en/content/technical_support_page/fca.html to connect with a technical support specialist.

Rev. SpA Document Feedback

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NOTES

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