Combined Gyroscope and 3-Axis Accelerometer

Data Sheet

ADXC1501

FEATURES

Combined gyroscope and 3-axis, low *g* accelerometer
Temperature compensated, high precision bias, and sensitivity performance
±30 m*g* accelerometer bias stability over temperature
±2°/sec gyroscope null stability over temperature
2.5 m*g* rms typical accelerometer noise at 35.6 Hz
0.1°/sec rms typical gyroscope noise at 35.6 Hz
Gyroscope: linear acceleration rejection of 0.03°/sec/*g*
Acceleration: ±32 *g* overload performance
SPI digital output with a 16-bit data-word and a 4-bit CRC
Comprehensive electromechanical fail-safe features
6 kHz data update rate
Programmable filter response
<16 mA quiescent current draw
3.3 V or 5 V operation
−40°C to +105°C temperature range
16-lead SOIC package for robust EMI performance
Qualified for automotive applications

APPLICATIONS

Electronic stability control
Chassis control

GENERAL DESCRIPTION

The ADXC1501 is a yaw rate gyroscope and 3-axis accelerometer combined in a single package. It is designed for electronic stability control and other high performance applications that require yaw rate and acceleration signals simultaneously. An internal temperature sensor compensates offset and sensitivity performance, providing excellent stability over the −40°C to +105°C temperature range.

A digital serial port interface (SPI) transmits the yaw rate and acceleration data to a host microcontroller. A 4-bit cyclical redundancy check (CRC) provides fault coverage for the transmitted SPI data, and internal fault detection routines ensure the integrity of all reported yaw rates and acceleration data. A fully integrated electromechanical continuous self test (CST) routine provides run-time diagnostic capability for assessing the health of each MEMS element.

An advanced gyroscope sensor design rejects the linear acceleration effects of shock and vibration, enabling the ADXC1501 to operate in harsh environments. The accelerometer signal chain is designed to prevent overload conditions from occurring in these same harsh environments.

The ADXC1501 is designed to operate at either 3.3 V or 5 V. At less than 16 mA current consumption, the ADXC1501 can be used in energy sensitive applications.

FUNCTIONAL BLOCK DIAGRAM

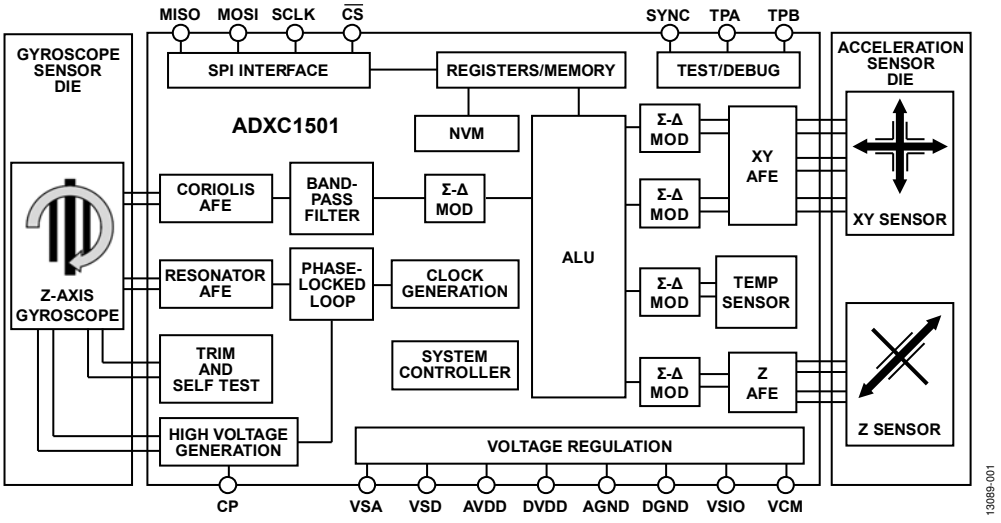

Figure 1.

For more information about the ADXC1501, contact the Analog Devices, Inc., Customer Interaction Center at http://www.analog.com/technical_support to connect with a technical support specialist.

Rev. Sp0 **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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