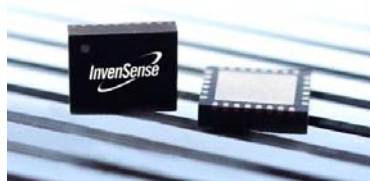


IXZ-500TM

Integrated X/Z MEMS Gyroscope



GENERAL DESCRIPTION



The IXZTM family of dual-axis MEMS gyroscopes feature the world's first roll/yaw (X and Z-axis) MEMS gyros that meet the in-plane mounting requirements of remote controls and interactive game controllers for digital TVs, IPTVs, set top boxes, media

centers and PCs. Traditionally, designers of remote controls have had to use two single Z-axis or one dual-axis X/Y gyroscope, which because of their axes of sensitivity, required a daughter card for mounting the angular rate sensors perpendicular to the rest of the system electronics. The in-plane mounting of the IXZ family overcomes this limitation, enabling compelling form-factor designs.

The IXZ-500 is uniquely suited for motion-controlled menu-navigation applications. The device features a primary output with a $\pm 500^\circ/\text{sec}$ full scale range, for measuring higher speed motions, and has a secondary output with a $\pm 110^\circ/\text{sec}$ full-scale range, for sensing more precise movements. These dual outputs allow the system designer to use an analog-to-digital-converter (ADC) with two fewer bits, saving overall system cost.

The IXZ-500 leverages InvenSense's patented and volume-proven Nasiri-Fabrication platform, which integrates MEMS wafers with companion CMOS electronics through wafer-level bonding to produce a functionally complete, low-cost motion sensor. All required conditioning electronics are integrated into a single chip measuring 4x5x1.2mm. It incorporates X- and Z-axis low-pass filters and an EEPROM for on-chip factory calibration of the sensor. Factory trimmed scale factors eliminate the need for external active components and end-user calibration. A built-in Proportional-To-Absolute-Temperature (PTAT) sensor provides temperature compensation information. The product is RoHS and Green Compliant.

APPLICATIONS

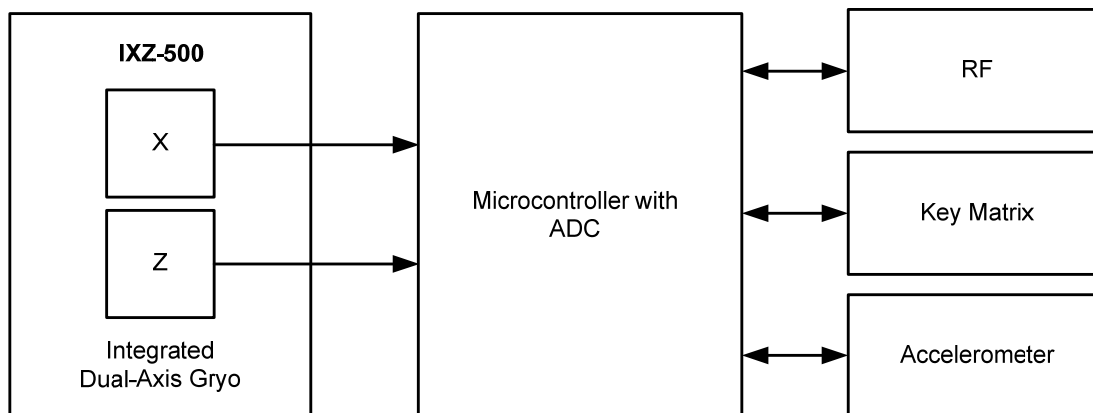
- 3D Remote Controls
- 3D Mice

SPECIFICATIONS

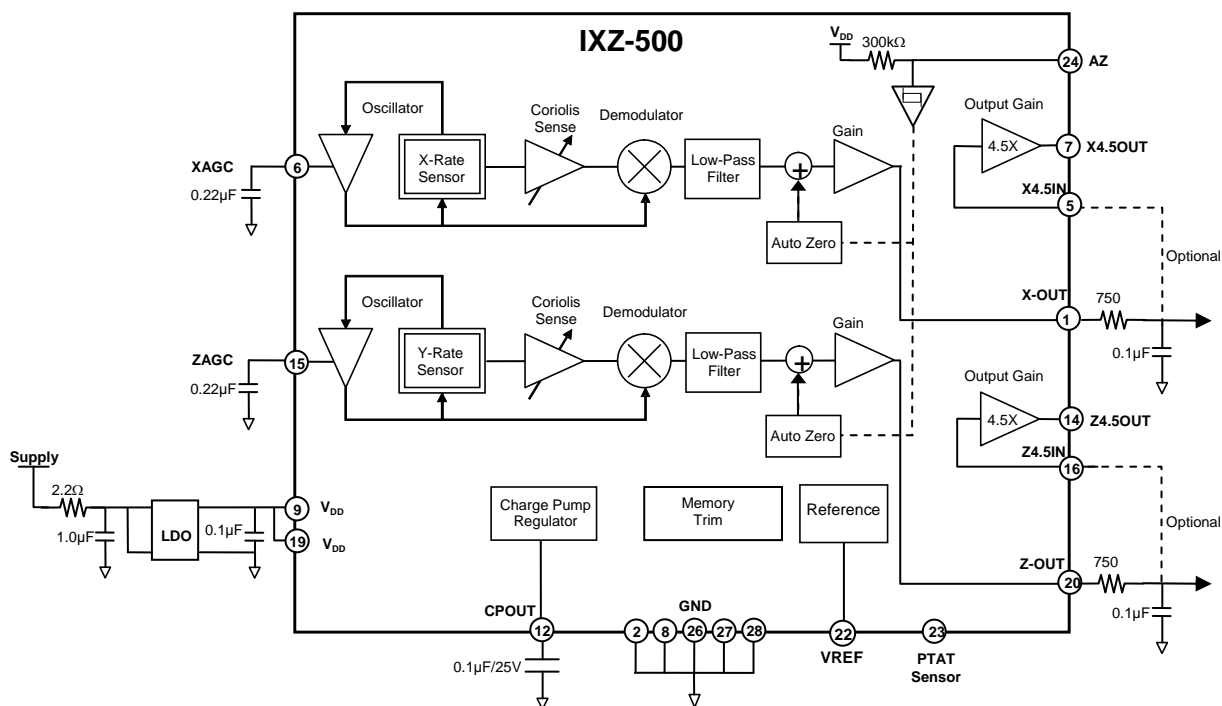
| Parameter | | Specifications | Unit |
|------------------------|-------------|----------------|-------------------------------|
| Full-Scale Range | Out Pins | ± 500 | $^\circ/\text{sec}$ |
| | 4.5Out Pins | ± 110 | |
| Sensitivity | Out Pins | 2.0 | $\text{mV}/^\circ/\text{sec}$ |
| | 4.5Out Pins | 9.1 | |
| Cross Axis Sensitivity | | ± 1 | % |
| Non-linearity | | < 1 | % of FSR |
| Supply Voltage | | 3.0 ± 0.3 | V |
| Supply Current | | 7 | mA |
| Operating Temperature | | -20 to +85 | $^\circ\text{C}$ |
| On time | | 50 | ms |
| Shock Tolerance | | 10,000 | g |

FEATURES

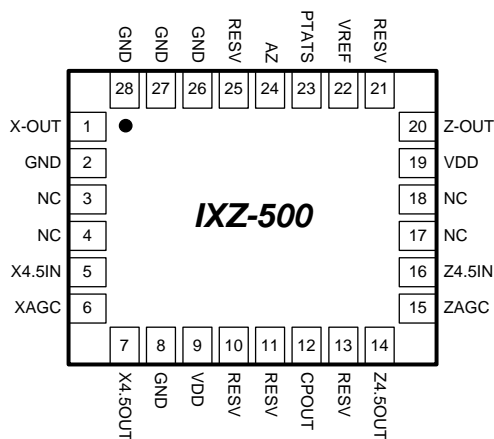
- Integrated X- and Z-axis gyros on a single chip with in-plane mounting
- Two separate outputs per axis for higher speed motions and lower-speed precise movements:
 - $500^\circ/\text{s}$ full scale range (higher speed)
 - $110^\circ/\text{s}$ full scale range (high precision)
- Integrated amplifiers and low-pass filters
- Auto Zero function for bias calibration
- On-chip temperature sensor
- High vibration rejection over a wide frequency range
- High cross-axis isolation by proprietary MEMS design
- 3V single supply operation
- Hermetically sealed for temp and humidity resistance
- 10,000 g shock tolerant
- Smallest dual axis gyro package at 4 x 5 x 1.2mm
- RoHS and Green Compliant



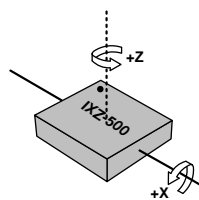
Remote Control and 3D Mice System Block Diagram



IXZ-500 Block Diagram



**28-pin, 4mm x 5mm x 1.2mm
QFN Package**



**Orientation of Axes of
Sensitivity and Polarity
of Rotation**

Related Products

| Sense Axes | Product | Full-Scale Range (°/sec) |
|------------|---------|--------------------------|
| X,Z | IXZ-500 | ±500, ±110 |
| | IXZ-650 | ±2000, ±440 |
| X,Y | IDG-500 | ±500, ±110 |
| | IDG-650 | ±2000, ±440 |

ABOUT INVENSENSE

InvenSense is the leading provider of motion processing products for mobile consumer applications, with proven technology and products shipped in millions of units monthly to companies worldwide. The company's patented motion processing technology and Nasiri-Fabrication platform addresses the emerging needs of many mass-market consumer applications such as gaming, image stabilization, remote controls, and handsets that require improved performance, enhanced features, and new and more intuitive motion and gesture-based user-interface solutions. InvenSense is a privately held company with headquarters located in Sunnyvale, California. More information can be found at <http://www.invensense.com>.

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