# ±2g Three-Axis Accelerometer

ADVANCED SENSOR INTEGRATIONS

## *Target Technical Specification*

### FEATURES

**3-axis motion/acceleration measurements**

**±2*g* motion/acceleration measurement range**

**Very Low Operating Current Consumption: 20μA**

**Sleep Mode: 0.1μA**

**Low Voltage Operation: 2.2V-3.6V**

**High Sensitivity: 500mV/g**

**Fast Turn On Time**

**Integrated Signal Conditioning with Low Pass Filter**

**Robert Design, High Shock Survivability**

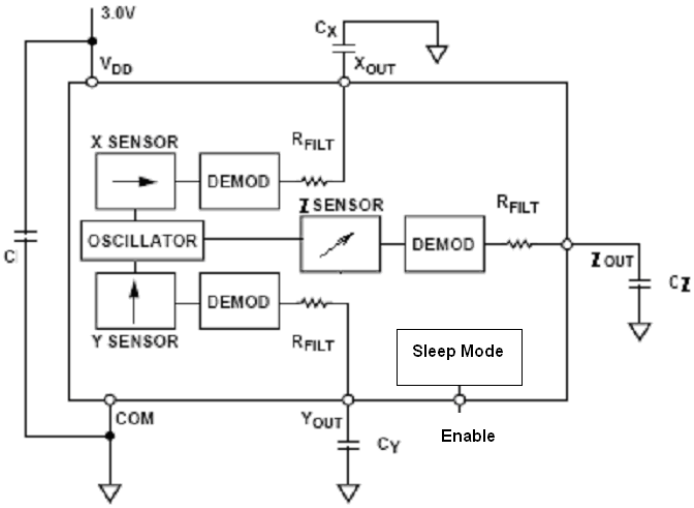


**Figure 1. Functional Block Diagram**

### APPLICATIONS

**Pedometer for portable players, watches**

**Hard disk drive impact detection/protection**

**Motion user interface for mobile phones**

**Tilt angle user interface for PDA**

**Platform stabilization and leveling**

**Tilt angle sensing and Inclinometer**

**Motion and acceleration detection**

**Environment detection, temperature, movement**

**Gaming interface**

**Health monitoring systems**

**Intelligence sports shoes pedometer and activity logging**

### GENERAL DESCRIPTION

This is a very low power consumption 3-axis motion and acceleration sensor. It is available in a single compact package by advance mixed-signal designs and MEMS sensor integration. Each axis provides an independent analog voltage output.

This sensor also offers additional features which can be used to further reduce the hardware complexity of system designs. It has signal conditioning low-pass filters and internal temperature compensation circuits. Zero-g offsets and full-scale spans are factory calibrated with no external devices. It offers a sleep mode that makes it ideal for portable battery-powered or medical devices.

# MOTION / ACCELERATION SENSOR SPECIFICATIONS

**Table 1**

| Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| OPERATING RANGE | | | | | |
| Supply Voltage, VDD | | 2.2 | 3.3 | 3.6 | V |
| Supply Current, IDD | | | 20 | | μA |
| Supply Current at Sleep Mode, IDDs | | | 0.1 | | μA |
| Operating Temperature Range | | 0 | 25 | 60 | °C |
| MOTION / ACCELERATION | | | | | |
| Input Range | | | ±2 | | g |
| Zero-g Output | 25°C | | VDD/2 | | V |
| Zero-g Temperature Drift | | | ±1 | | %FS/°C |
| Sensitivity | 25°C | 400 | 500 | 600 | mV/g |
| Sensitivity Temperature Drift | | | ±0.3 | | %FS/°C |
| Non-linearity | % of full scale | | ±5 | | % |
| Alignment Error | X to Y, X to Z, Y to Z sensor | | ±5 | | degree |
| Cross Axis Sensitivity | | | ±5 | | % |
| CONTROL TIMING | | | | | |
| Power-Up Response Time | | | 50 | | ms |
| NOISE PERFORMANCE | | | | | |
| Output Noise | @25°C, no averaging | | 20 | | mVrms |
| MOTION / ACCELERATION FREQUENCY RESPONSE | | | | | |
| Overall Sensor Bandwidth X-axis | | | 0 – 50 | | Hz |
| Overall Sensor Bandwidth Y-axis | | | 0 – 50 | | Hz |
| Overall Sensor Bandwidth Z-axis | | | 0 – 50 | | Hz |

**Table 2. Pin Descriptions**

| Pin Name | Description |
|---|---|
| VDD | Power supply input |
| VSS | Power supply ground |
| XOUT | Output voltage of the accelerometer. X-direction |
| YOUT | Output voltage of the accelerometer. Y-direction |
| ZOUT | Output voltage of the accelerometer. Z-direction |
| SLP | Sleep enable input |

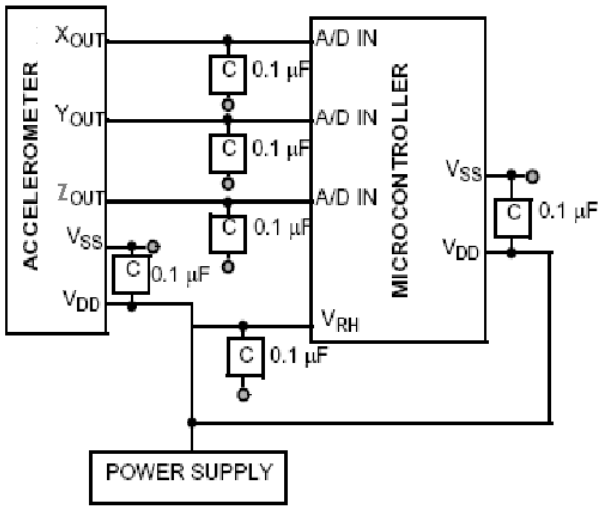


**Figure 3. Recommended connections when interfacing with Microcontroller**

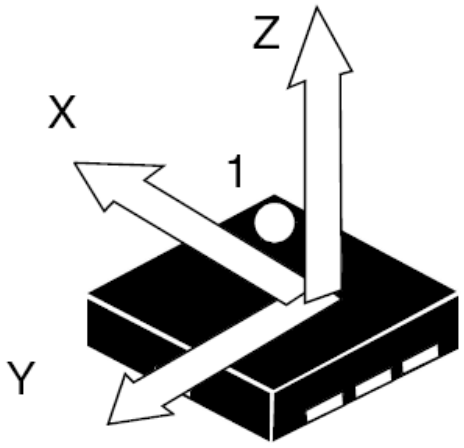


**Figure 2. Direction of the detectable accelerations**