MAS1012

High Performance Single Axis MEMS Accelerometer Sensor

Main Features

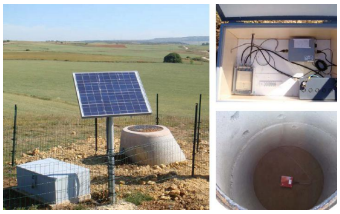
- Closed Loop Structure MEMS Capacitive Accelerometer
- Range:±2g, Excellent Bias Stability
- Dynamic Range: ≥110dB
- Bandwidth: ≥1KHz (Typical Value, -3dB)
- Low Noise: ≤1.0μgrms/√Hz
- Non-linearity: 0.1%FS (Full Range)
- Extremely Reliable in Harsh Environment
- Wide Operating Temperature Range: -40~+85ºC

MS1012 single axis MEMS accelerometer sensor is one type of high performance vibration monitoring sensor base on MEMS technogies. It adopts 7~40V or 5V±3% power supply, and has self test function, it adopts high performance accelerometer, the dynamic range can reach 110dB.

MS1012 accelerometer sensor has passed the strictest tests, it enjoys excellent performance in noise, dynamic range, non-linearity, repeatability, temperature drift, shock proof, etc. this product is an ideal option for seismic monitor, vibration monitoring, high speed train/metro train, test platform of vibration and shocking, structure health monitoring, etc.

- ✓ **12-Step Quality Control, Super Reliability, More Functions**
- ✓ **Adopting Original Big Brand Component, High-class Material, Competitive Price**
- ✓ **Real Actual Precise after Calibration, Perfect Performance**
- ✓ **Successful Applications in Tens of Fields, More than 1000 Customers are Using**

Typical Applications



Seismic Monitor

Railway Technology

Monitoring & Control

Structure Health Monitor

Super Reliability & Performance

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Skype: skymems

Focus on MEMS Measurement & Control Technologies, Products include:

MEMS Acc | MEMS Gyro | IMU | Vertical Gyro | AHRS
INS | GNSS/INS | E-compass | Inclinometer | FOG

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Technical Specifications

Technical Specs		
Type	**MS1012**	**Remarks**
Axis Number	1	
Range	±2g	
Zero Bias	±20mV	
Scale Factor Sensitivity (Differential Output)	1800±20mV/g	
Bandwidth (-3dB)	≥1000Hz	
Output Noise	1.0μg/√Hz	
Non-linearity	0.1%F.R	
Cross-axes Influence	3%	
Bias Temperature Coefficient	±0.2mg/°C	
Scale Factor Temperature Coefficient	120ppm/°C	
Output Voltage (Differential Output)	0~ ±3.6V OutP :0.5~4.5V OutN: 0.5~4.5V	OutP, OutN full range output
Self test function		
Frequency	19Hz	Square wave output
Duty Ratio	50%	
Amplitude	0.8g	Peak value
Trixial Self Test Threshold Voltage	4Vmin 5Vmax	High level is valid
Electrical Specs		
Working Voltage	7~40V or 5V±3%	
Working Current	≤25mA	Three axes
Startup Time	20ms	
Environment Performance		
Operating Temperature	-40~+85°C	
Storage Temperature	-55~+125°C	
Shock Resistance	6000g	
Physical Specs		
Dimensions (mm)	37×30×25mm	
Casing	aluminum alloy	
Weight	30grams (without lines)	76 grams (with lines)

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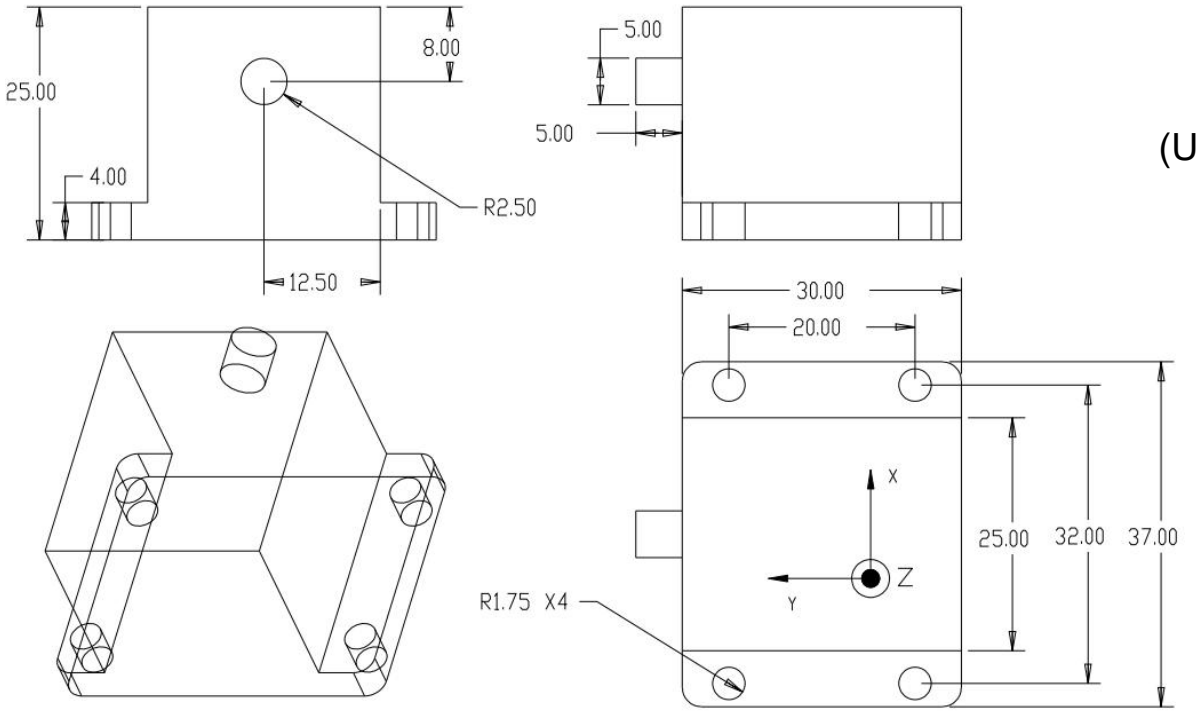
Pins Definition

Pins Definition of Differential Output Interface			
No.	**Line color**	**Definition**	**Function**
1	Red	VCC	Power Input (7~40V or 5V±3%)
2	Black	GND	GND
3	Yellow	Z_OUTP	Z axis output
4	Brown	Z_OUTN	
5	White	ST	self test input (high level power is valid, input 5V)

Dimensions



(Unit: mm)

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Principle of Self Test

MS1012 has self test function, it can measure the working status of accelerometer in three axes, when bulit-in self test mode, the square wave signal output will be generated, which can be used to malfunction test.

When it is activated, coil will generate alternating static power mechanical sensing element and it will simulate a frequency that define an input acceleration. static power is used to the sensor's self test except the inertial acceleration, so it is recommended to do the self test function in static conditions.

Cautions

Use Restrictions	
Maximum working voltage	40V or 5.15V
Proximity effect	The accelerometer is very sensitive to the surrounding capacitance, if the object is very close (mm level) to the accelerometer, this may influence the accelerometer's performance. In order to get good performance, the distance between the accelerometer and other objects should be more than 1cm, or the surface that close to the accelerometer is GND.
ESD caution 	**ESD (electrostatic discharge) sensitive device**. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Absolute Max. Ratings

Absolute Maximum Ratings	
Parameter	**Rating Value**
Vcc	-0.2V~+40V or +5.15V
ST	5V
Working Temperature	-40~+85°C
Storage Temperature	-55~+125°C

Remarks: the accelerometer that works long time in absolute maximum ratings may influence the reliability.

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Order Information

Product Model: MS1012

XX: Measurement Range:
02 = ± 2g

X: Axis Numbr
S= 1 axis

X: power supply
H=7~40V
L=5v±3%

X: Output mode
D=differenctial output

X: line lengh, X means length, normally 1 meter

XXXX: bandwidth
NC: default bandwidth
0200= 200Hz

For example, MS1012-02-T-L-D-015-1000 means that ± 2g range, 1 axis, 5V±3% power supply, 0.15meter length line, 1000Hz bandwidth accelerometer sensor