B&B Sachsenelektronik GmbH
Leipziger Str. 40
09648 Mittweida
Germany

Phone +49 3727 6297 0
Fax +49 3727 6297 24
info@sensolute.com
www.sensolute.com

DATASHEET

Micro Vibration Sensor

MVS0608.02L

Revision 1.2

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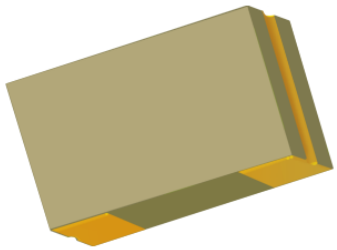

MVS0608.02L

FEATURES

- Omnidirectional vibration sensor
- Wide supply voltage range: 1.80 V to 15 V
- Low operating current
  (e.g. Icc max. 0.2µA at Vcc 2V and R 10Meg)
  (e.g. Icc max. 2.0µA at Vcc 2V and R 1Meg)
- Noiseless
- R_{On} < 100 Ω
- Protected against environmental stress
- Automated SMT-mounting
- RoHS compliant, lead free
- Specified from -20 °C to +70 °C
- Size 2.85 mm x 2.45 mm x 1.7 mm
- Reacting point: approx. 50 mg

APPLICATIONS

- Motion detection
- System wake up – low power

MATERIAL

Package:	PCB laminate material
Inner contact material:	Gold plated
Micro Ball:	Gold plated

DESCRIPTION

The micro vibration sensor is used for the detection of slight movements and vibrations by means of a mobile micro sphere. The ball bridges two contacts reducing the resistance between the two external connection pads from several mega ohms (> 30 MOhm) to below 100 Ohms. The sensor is fully passive, requires no signal conditioning, and operates with currents as low as 0.2 µA.

With the aid of tool-specific evaluation electronics, the micro vibration sensor controls the operation of movement-sensitive devices. The micro vibration sensor is utilised for converting many systems to environmentally friendly devices by implementing wake-up and power-down logic to conserve battery power and bringing energy consumption to a minimum, pushing the availability of green technology and green electronics into new areas of design and application.

The sensor is typically used for applications such as bike computers, remote controls, electronic lock systems, RFiD transponders, GPS tracking systems, wireless sensor networks, illuminated dog`s collars, access control systems, data loggers, bicycle lights, that are only switched on when in motion.

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1. Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply voltage	V_{CC}	+1.80	+15	Vdc
Current	I_{CC}		2	mA
R Open	R_O	-	> 30	MOhm
R Closed	R_C	< 100	-	Ohm
Operating ambient temperature	T_{amb}	-20	+70	°C

* Current consumption is determined by the resistance of the application circuit and the supply voltage. The sensor is fully passive, requires no signal conditioning, and operates with currents a low as 0.2 µA.
(e.g. max. Icc 0.2µA at Vcc 2V and R 10Meg)
(e.g. max. Icc 2.0µA at Vcc 2V and R 1Meg)

2. Soldering Process

Reflow Soldering Process 260°C, 10 sec

3. Functionality

A mobile, gilded micro sphere is located inside the hollow space of the sensor. When moving, the micro sphere bridges two gilded contacts by switching over from a high resistive to a low resistive state. When the Sensor is at rest, it is **not necessarily closed**. Only in 70% - 99% of time the sensor will be closed when at rest.

The figure shows the typical characteristics of the sensor in excitation and rest.

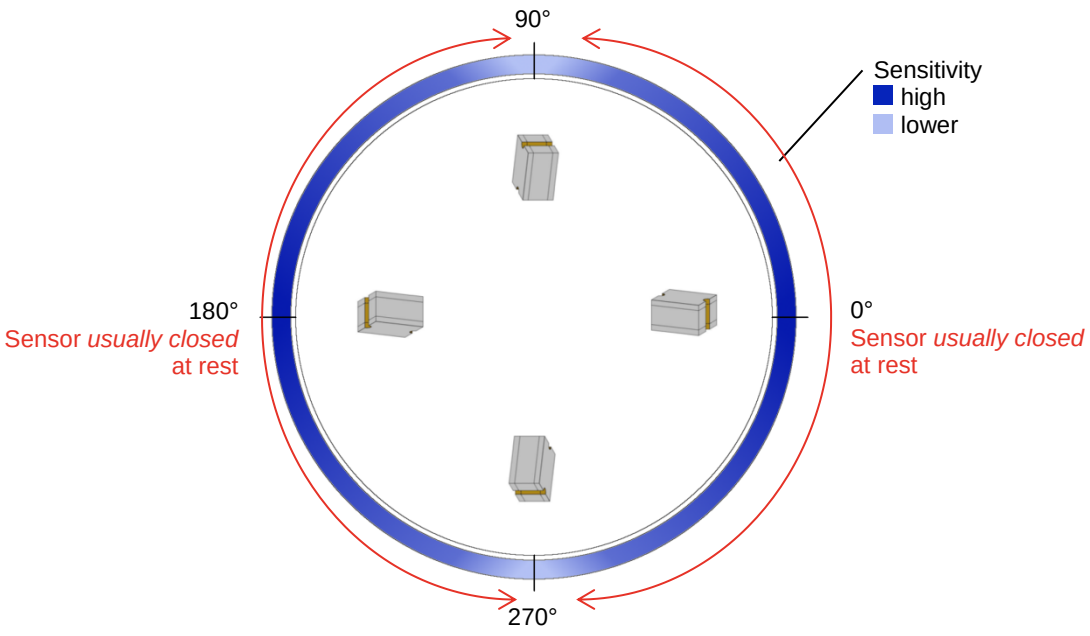

Figure 1: Characteristic of the sensor MVS0608.02L

4. Qualification

High temperature and high humidity storage

Test time:	48h
Test temperature:	50°C
Humidity:	90%
	without condensation
	no evidence of internal corrosion after the test.

High humidity storage

Test time:	96 h
Test temperature:	40°C
Test humidity:	95%
	no evidence of internal corrosion after the test.
	no shape distortion

Temperature cycle storage

Test cycle:	8 cycles, T1 = 65°C for 6h, T2 = -20°C for 6h,
	temperature change rate = 3K/min
	no evidence of internal corrosion after the test.
	no shape distortion

Non Operation Half Sine Shock

Test cycle:	Acceleration 25g at 6msec pulse width
	1000 cycles pos. 1000cycles neg.; 1Shock/s; 3 axis: X, Y, Z

Non Operational Vibration Test

Test cycle:	Sinus 10 ... 300Hz; Elongation 0.25mm / 0.25g; 5 cycles; 1 axis
Frequency area A:	10 – 22.28Hz, amplitude in A:0.25 mm
Frequency area B:	22.28 - 300Hz, acceleration in B: 0.25g
Sweep speed:	1 Octave/min, Cycles: 10
Time per Sweep:	4.9 min

Non Operational Vibration Test

Test cycle:	Sinus 10 ... 500Hz; Elongation 3.0mm / 1.5g; 5 cycles; 1 axis
Frequency area A:	10 – 15.76Hz, Amplitude in A: 3.0mm
Frequency area B:	15.76 - 500Hz, Acceleration in B: 1.5 g
Sweep speed:	1 Octave/min, Number of sweeps: 10
Time per Sweep:	5.62 min

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5. Package mechanical data

5.1 Package outline

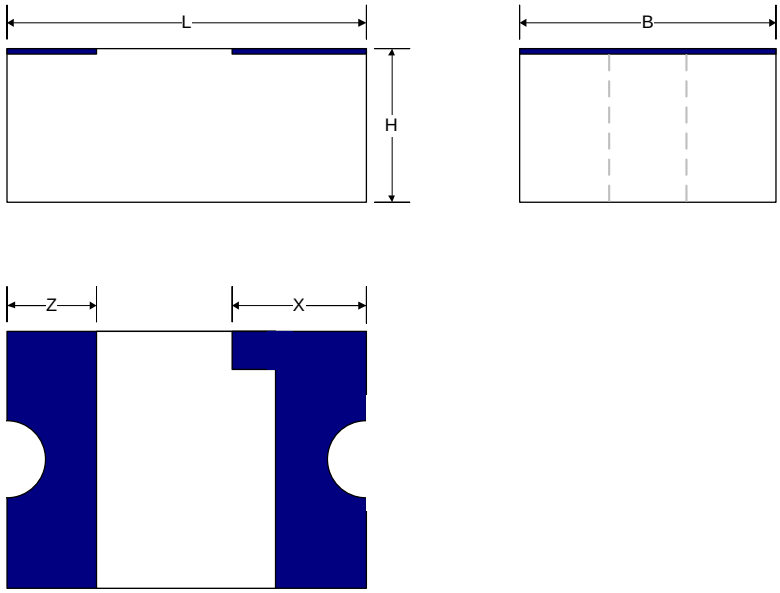

Figure 2: Package outline (drawing not to scale)

DIMENSIONS (mm)

Symbol	Value (mm)	Tolerance
L	2.850	±0.125
H	1.700	±0.125
B	2.450	±0.125
Z	0.675	±0.125
X*	1.055	±0.125

*Depending on the sensor orientation in the SMD belt, the flag can be on the right or left side.

5.2 Footprint

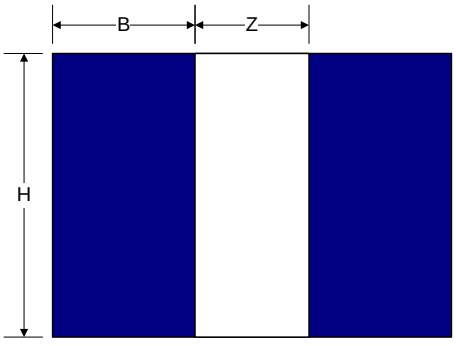

Figure 3: Recommended footprint (drawing not to scale)

DIMENSIONS (mm)

Symbol	Value (mm)
H	2.80
B	1.40
Z	1.00

6. Ordering information

6.1 Reel (standard-packing)

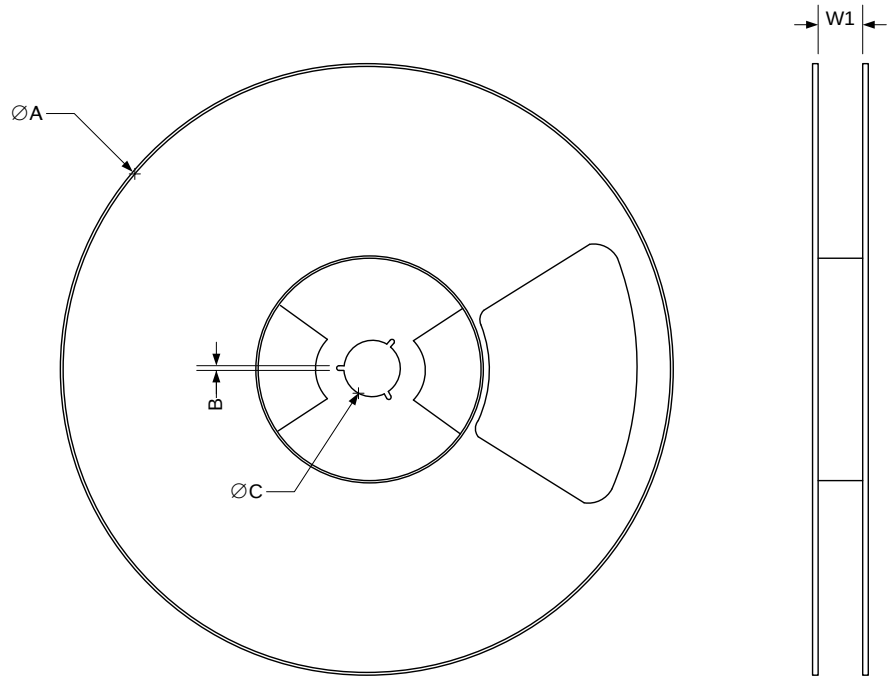

Figure 4: Reel information (drawing not to scale)

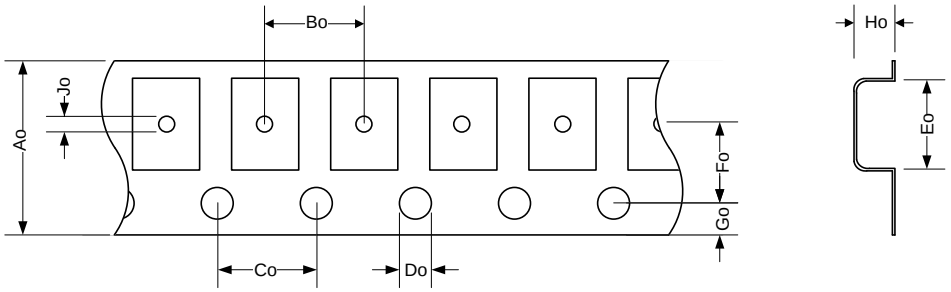

Figure 5: Tape information (drawing not to scale)

DIMENSIONS (mm)

Symbol	Min	Max
∅A	179.50	180.50
B	2.00	2.50
∅C	8.40	9.90
W1	8.40	9.90
Ao	7.70	8.30
Bo	3.90	4.10
Co	3.90	4.10
Do	1.40	1.60
Jo	0.80	1.20
Go	1.74	1.76
Fo	3.45	3.55
Eo	3.50	3.70
Ho	1.90	2.10

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Mailing Address:
B&B Sachsenelektronik GmbH
Leipziger Str. 40
09648 Mittweida
Germany