

MODEL 3255 Accelerometer

PC Board Mountable Accelerometer

0.5 to 4.5 VDC Output

Integral Temperature Compensated

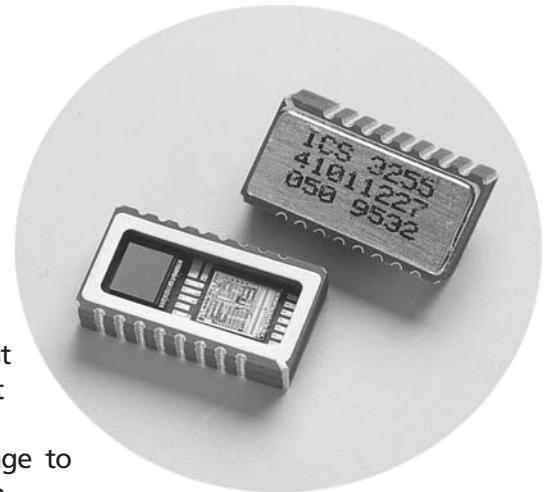
10,000g Over-Range Protection

DESCRIPTION

The Model 3255 is a two-chip accelerometer designed for surface mount applications. The package can be mounted in one of two orientations, allowing the measurement axis to be either parallel or perpendicular to the mounting surface without the use of costly brackets. This accelerometer consists of a micro machined silicon mass suspended by multiple beams from a silicon frame. Piezoresistors located in the beams change their resistance as the motion of the suspended mass changes the strain in the beams. Silicon caps on the top and bottom of the device are added to provide over-range stops. This design provides for a very low profile, high shock resistance, durability and built-in damping over a wide

usable bandwidth. A patented self-test feature is also built into the sensor.

By applying a voltage to the self-test pin, an electrostatic force is created that attracts the seismic mass towards the top cap, simulating an acceleration and allowing proper sensor function to be verified.



FEATURES

- ◆ Surface Mount Package
- ◆ Three Axis Mounting Options
- ◆ Self Test Function
- ◆ DC Response
- ◆ Gas Damping
- ◆ Built-in Overrange Stops

APPLICATIONS

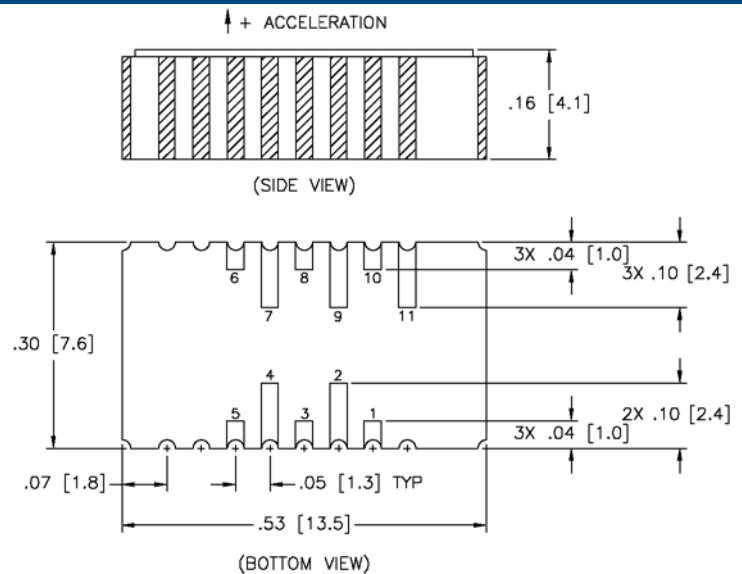
- ◆ Impact Testing
- ◆ Vibration/Shock Monitoring
- ◆ Crash Applications
- ◆ Aerospace Testing

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standard ranges

| Range | g |
|-------|---|
| ±25 | • |
| ±50 | • |
| ±100 | • |
| ±250 | • |
| ±500 | • |

dimensions



US Patents 5,103,667; 5,253,510; 5,445,006; 5,503,016; and 5,616,863 apply



Model 3255 Accelerometer

performance specifications

All values are typical at 25°C, 100Hz and 5Vdc excitation unless otherwise stated.

Measurement Specialties reserves the right to update and change these specifications without notice.

| PARAMETERS | RANGE | | | UNITS | NOTES |
|-----------------------|-----------|-----------|-----------|-------|-------|
| | ±25G | ±50G | ±100G | | |
| Bandwidth(MIN) | 0-1000 | 0-1000 | 0-1500 | Hz | 5 |
| Sensitivity (MIN/MAX) | 72.0/88.0 | 36.0/44.0 | 18.0/22.0 | mV/g | |

| PARAMETERS | RANGE | | UNITS | NOTES |
|-----------------------|---------|---------|-------|-------|
| | ±250G | ±500G | | |
| Bandwidth(MIN) | 0-2000 | 0-2000 | Hz | 5 |
| Sensitivity (MIN/MAX) | 7.2/8.8 | 3.6/4.4 | mV/g | |

| PARAMETERS | ALL RANGES | | | UNITS | NOTES |
|--|--|-------|--------|--------|-------|
| | MIN | TYP | MAX | | |
| Zero Acceleration Output | 2.4 | 2.5 | 2.6 | Volts | |
| Non-linearity | | 0.2 | 1.0 | ±%Span | 1 |
| Transverse Sensitivity | | 1 | 3 | ±%Span | |
| Supply Voltage | 4.5 | 5.0 | 7.0 | Volts | 2 |
| Supply Current | | | 10 | mA | |
| Self-Test Input Voltage | -30 | | 0 | Volts | 3, 4 |
| Self-Test Response (Vst = -5V) | -0.89 | -1.48 | -2.07 | G | 3, 4 |
| Self-Test Input Current (Vst = -5V) | | | 0.1 | mA | 3, 4 |
| Self-Test Accuracy | -5 | | 5 | % | 3, 4 |
| Output Source Current (load to ground) | 1.0 | | | mA | |
| Output Sink Current (supply to load) | 0.5 | | | mA | |
| Shock Limits | | | 10,000 | G | |
| Thermal Zero Shift (-20°C to +85°C) | -5 | | +5 | %FSO | |
| Thermal Sensitivity Shift (-20°C to +85°C) | -5 | | +5 | %FSO | |
| Compensated Temperature | -20°C to +85°C Contact factory for custom temperature compensation | | | | |
| Operating Temperature | -40°C to +125°C | | | | |
| Weight | 1.5 Grams | | | | |

Notes

1. Best Fit Straight Line.
2. Output is ratio metric with supply voltage in the range of (5.0 ± 0.5) V.
3. Applying the self-test input voltage simulates an acceleration. The sensor output is proportional to the square of the voltage difference between the self-test input and the positive supply. When not using the self-test function, the self-test input pin should be connected to the positive supply voltage. For detailed description refer to Technical Note TN010.
4. Self-test input voltage is with respect to supply voltage. For example, if supply voltage is 5 VDC then Vst = -5 V is equivalent to ground.
5. The useful frequency range is defined as the range of frequencies over which the device sensitivity is within ±5% of the DC value.
6. The alarm output is a digital output which is 0 V during normal operation and 5 V when the output voltage of the accelerometer die is outside the normal range. This is the case if there is a malfunction of the accelerometer or a broken wire bond to the sensor.
7. View Technical Note TN-010 for more information on the 3255 accelerometer.

ordering information



Vibration Sensors Technical Support:

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electrical schematic

| Pad | Function |
|-----------|--------------------------|
| 1 | Alarm Function |
| 2 | Signal Output |
| 3 | Ground |
| 4 | +5V Supply |
| 5 | Self Test |
| 6 thru 11 | No Electrical Connection |

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