

**PC Board Mountable Accelerometer**  
**Millivolt Output**  
**Small Size**  
**Low Cost**

- ▶ Vibration/Shock Monitoring
- ▶ Consumer Electronics
- ▶ Patient Monitoring
- ▶ Crash Recorder



## DESCRIPTION

The Model 3031 is a piezoresistive silicon accelerometer in a surface mount package. It is intended for high volume applications where small size, light weight, and low cost are required.

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.

For non-surface mount accelerometers please see the Models 3022, 3028, 3052 or 3058.

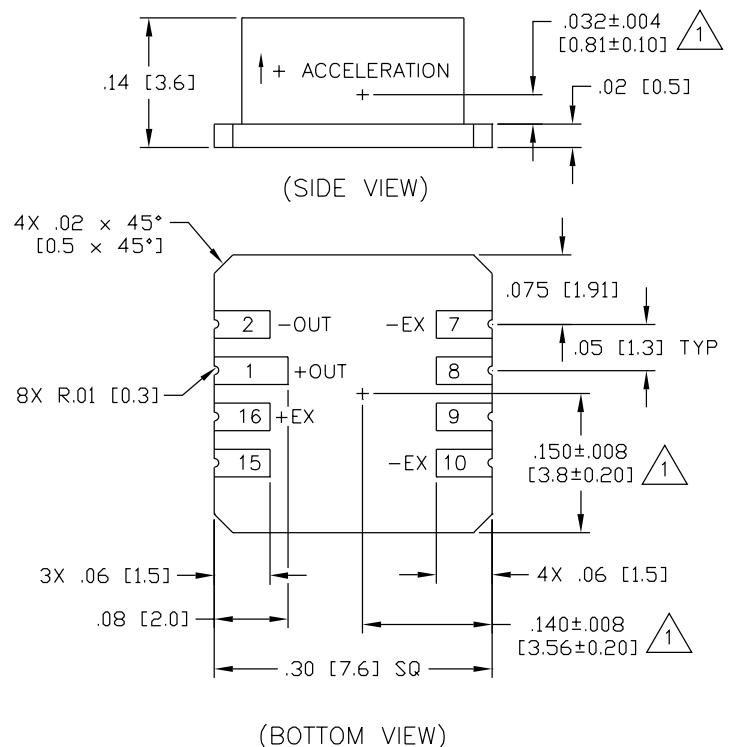
## FEATURES

- ▶ Surface Mount Package
- ▶  $\pm 0.5\%$  Non-linearity (typical)
- ▶  $\pm 1.0\%$  Temperature Performance (with comp resistors—typical)
- ▶ DC Response
- ▶ Built-in Damping
- ▶ Built-in Overrange Stops
- ▶ Low Power

## STANDARD RANGES

| Range     | g |
|-----------|---|
| $\pm 50$  | ● |
| $\pm 100$ | ● |
| $\pm 200$ | ● |
| $\pm 500$ | ● |

## DIMENSIONS



(1) NOTED DIMENSIONS INDICATE CENTER OF GRAVITY POSITIONS.

**PERFORMANCE SPECIFICATIONS**

Supply Voltage: 5.0 VDC  
 Ambient Temperature: 25°C (Unless otherwise specified)

| PARAMETERS                       | RANGE   |         |          |           | UNITS | NOTES |
|----------------------------------|---------|---------|----------|-----------|-------|-------|
|                                  | ±50G    | ±100G   | ±200G    | ±500G     |       |       |
| Frequency Response [MIN]         | 0-1000  | 0-1500  | 0-2000   | 0-2400    | Hz    | 1     |
| Mounted Resonant Frequency [MIN] | 2000    | 3000    | 4000     | 5000      | Hz    |       |
| Sensitivity (MIN/MAX)            | 0.6/1.5 | 0.3/0.6 | 0.15/0.3 | 0.06/0.15 | mV/g  | 2     |

| PARAMETERS                          | MIN             | TYP | MAX  | UNITS   | NOTES |
|-------------------------------------|-----------------|-----|------|---------|-------|
| Zero Acceleration Output            |                 | 5   | 25   | ±mV     |       |
| Damping Ratio                       | 0.4             | 0.7 | 0.9  |         |       |
| Non-linearity                       |                 | 0.5 | 1    | ±% Span | 3     |
| Transverse Sensitivity              |                 | 1   | 3    | ±% Span |       |
| Input & Output Resistance           | 2.5             | 3.5 | 6.5  | kΩ      |       |
| Temperature Error - Span            |                 | 1.0 | 2.0  | ±% Span | 4, 5  |
| Temperature Error - Zero            |                 | 1.0 | 2.0  | ±% Span | 4, 5  |
| Supply Voltage                      |                 | 5.0 | 10.0 | VDC     |       |
| Output Noise                        |                 | 1.0 |      | μV p-p  | 6     |
| Output Load Resistance              | 5               |     |      | MΩ      |       |
| Acceleration Limits (Any Direction) |                 | 20X |      | Rated   | 7     |
| Operating Temperature               | -40°C to +125°C |     |      |         |       |
| Storage Temperature                 | -55°C to +150°C |     |      |         |       |
| Weight                              | 0.3 Grams       |     |      |         |       |

- Notes**
1. The frequency response is defined as the range of frequencies over which the device sensitivity is within ±5% of the DC value.
  2. Output voltage increases for positive acceleration; output voltage decreases for negative acceleration.
  3. Best Fit Straight Line.
  4. Percentage values are with external compensation.
  5. Compensated temperature range: 0-50°C in reference to 25°C.
  6. 10 Hz to 1 kHz.
  7. 20X or 2000g, whichever is less.
  8. Solder on pads is 62% Tin, 36% Lead, 2% Silver. Maximum allowable temperature during mounting is 220°C for 1 minute. Contact factory if a higher mounting temperature will be used.

**ORDERING INFORMATION**



**CONNECTIONS**

