

MODEL 3058 Accelerometer



Piezoresistive MEMS, DC Response

Millivolt Output

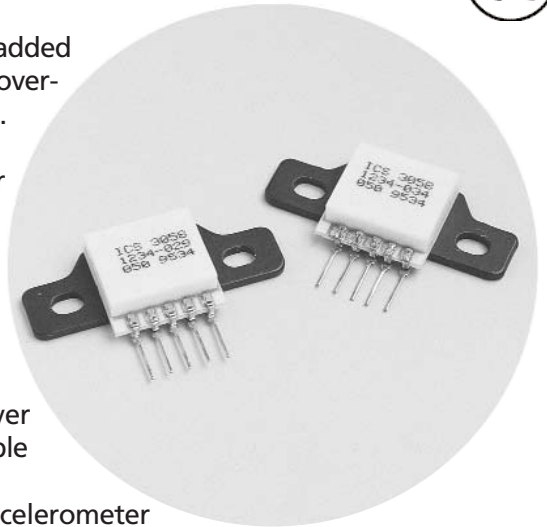
Integral Temperature Compensation

DESCRIPTION

The Model 3058 is a piezoresistive silicon accelerometer with integral temperature compensation. It is packaged on a ceramic substrate with a metal bracket which can be used to bolt the sensor to the mounting location.

The 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 an accelerometer designed for adhesive mounting, see the Model 3052. For uncompensated accelerometers, please refer to the Models 3022 and 3028.

FEATURES

- ◆ Bolt Mount
- ◆ $\pm 0.5\%$ Non-linearity (typical)
- ◆ $\pm 1.0\%$ Temperature Performance (Typical)
- ◆ DC Response
- ◆ Gas Damping
- ◆ Built-in Overrange Stops

◆ Low Power

APPLICATIONS

- ◆ Vibration/Shock Monitoring
- ◆ Inertial Guidance
- ◆ Motion Control
- ◆ Impact Testing
- ◆ Transportation

standard ranges

| Range | g | Range | g |
|----------|---|-----------|---|
| ± 2 | • | ± 20 | • |
| ± 5 | • | ± 50 | • |
| ± 10 | • | ± 100 | • |

Vibration Sensors Technical Support:
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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 |
|----------------------------------|---------|---------|---------|-------|-------|
| | ±2g | ±5g | ±10g | | |
| Frequency Response [MIN] | 0-250 | 0-300 | 0-400 | Hz | |
| Mounted Resonant Frequency [MIN] | 700 | 800 | 1000 | Hz | |
| Sensitivity (MIN/MAX) | 6.0/9.0 | 2.4/3.6 | 1.2/1.8 | mV/g | 1, 3 |

| PARAMETERS | RANGE | | | UNITS | NOTES |
|----------------------------------|---------|-----------|-----------|-------|-------|
| | ±20G | ±50G | ±100G | | |
| Frequency Response [MIN] | 0-600 | 0-1000 | 0-1500 | Hz | 2 |
| Mounted Resonant Frequency [MIN] | 1500 | 2000 | 3000 | Hz | |
| Sensitivity (MIN/MAX) | 0.6/0.9 | 0.24/0.36 | 0.12/0.18 | mV/g | 1, 3 |

| PARAMETERS | MIN | TYP | MAX | UNITS | NOTES |
|------------------------------------------------|----------------------------------------------|-----|------|---------|-------|
| Zero Acceleration Output | | 1 | 2 | ±mV | 1 |
| Damping Ratio | 0.4 | 0.7 | 0.9 | | |
| Non-linearity | | 0.5 | 1 | ±% Span | 5 |
| Transverse Sensitivity | | 1 | 3 | ±% Span | |
| Output Resistance | 2.5 | 3.5 | 6.5 | kΩ | |
| Temperature Error - Sensitivity (0°C to +50°C) | | 1.0 | 3.0 | ±% Span | 1 |
| Temperature Error - Zero (0°C to +50°C) | | 1.0 | 3.0 | ±% Span | 1 |
| Supply Voltage | 2.0 | 5.0 | 10.0 | VDC | |
| Current | | 1.5 | | mA | |
| Output Noise | | 1.0 | | µV p-p | |
| Output Load Resistance | 5 | | | MΩ | 4 |
| Shock Limits | 5000g for <20g range; 10,000g for >50g range | | | | |
| Operating Temperature | -40°C to +125°C | | | | |
| Compensated Temperature Range | 0°C to +50°C | | | | |
| Storage Temperature | -40°C to +125°C | | | | |
| Weight (with pins) | 4.5 Grams | | | | |

Notes

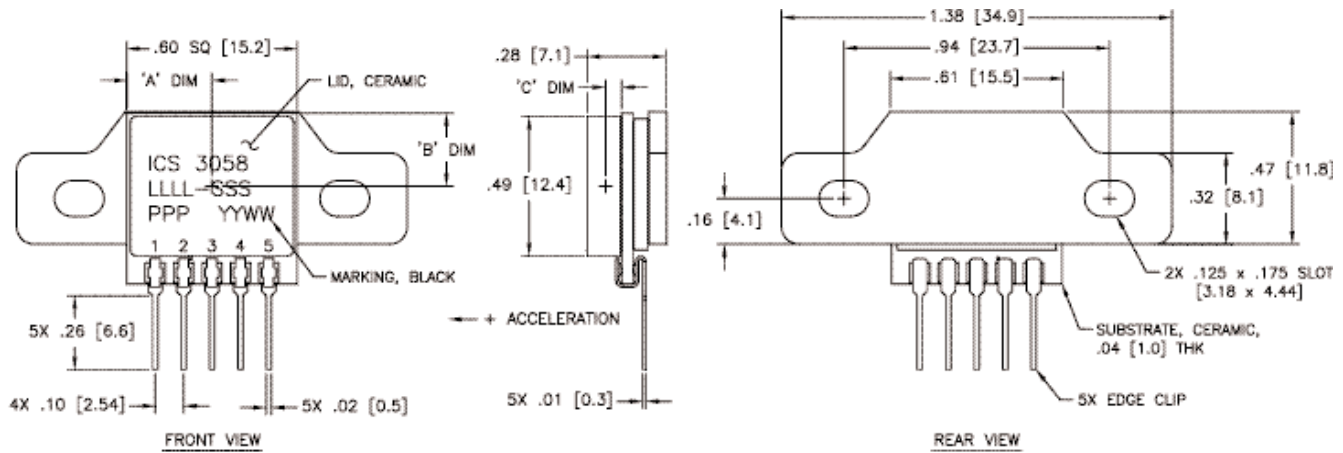
- Actual test data for this parameter is included on the calibration sheet included with each sensor.
- The useful frequency range is defined as the range of frequencies over which the device sensitivity is within ±5% of the DC value.
- Positive voltage change for positive acceleration; negative voltage change for negative acceleration.
- Prevents increase of TC-Span and sensitivity decrease due to output loading
- Best Fit Straight Line. For full scale ranges of 10g or less, the maximum non-linearity is ±2%.

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dimensions

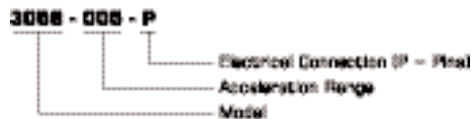


ALL DIMENSIONS ARE IN INCHES [mm]

electrical schematic

| PIN NUMBER | FUNCTION |
|------------|---------------|
| 1 | GROUND |
| 2 | MEAS USE ONLY |
| 3 | SUPPLY |
| 4 | +OUTPUT |
| 5 | -OUTPUT |

ordering information



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