

MODEL 3058 Accelerometer

Piezoresistive MEMS, DC Response

Millivolt Output

Integral Temperature Compensation

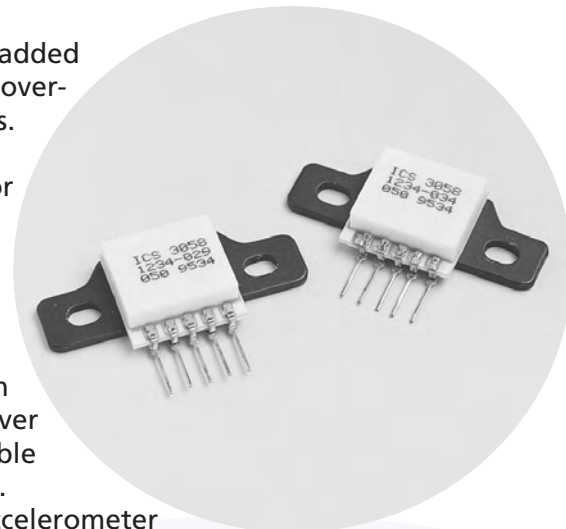
DESCRIPTION

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	•

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performance specifications

Supply Voltage: 5.0 VDC

Ambient Temperature: 25°C (Unless otherwise specified)

MSI Sensors 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

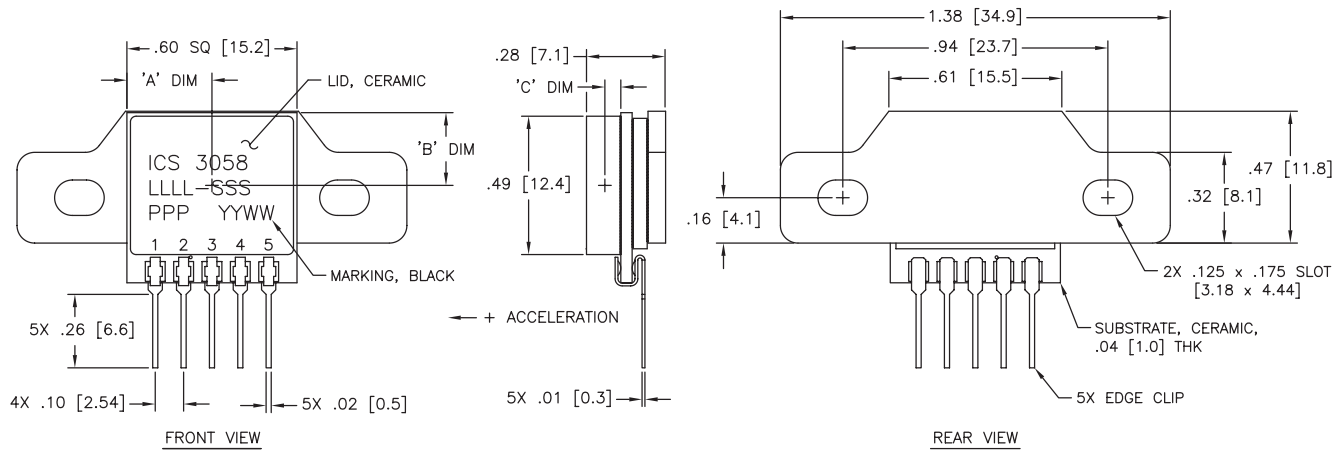
PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Zero Acceleration Output		1	2	±mV	1
Damping Ratio	0.4	0.7	0.9		
Non-linearity		0.5	1	±% Span	5
Transverse Sensitivity		1	3	±% Span	
Output Resistance	2.5	3.5	6.5	kΩ	
Temperature Error - Sensitivity (0°C to +50°C)		1.0	3.0	±% Span	1
Temperature Error - Zero (0°C to +50°C)		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	ICS USE ONLY
3	SUPPLY
4	+OUTPUT
5	-OUTPUT

LTR	2 - 20 g	50 - 100 g
"A" DIM	0.300 ± 0.005 [7.62 ± 0.13]	0.265 ± 0.005 [6.73 ± 0.13]
"B" DIM	0.250 ± 0.005 [6.35 ± 0.13]	0.240 ± 0.005 [6.10 ± 0.13]
"C" DIM	0.032 ± 0.004 [0.81 ± 0.10]	0.032 ± 0.004 [0.81 ± 0.10]

ordering information

3058 - 005 - P

