

# MODEL 3022 Accelerometer

**Piezoresistive MEMS**

**PC Board Mountable Accelerometer**

**Millivolt Output**

**Low Cost**

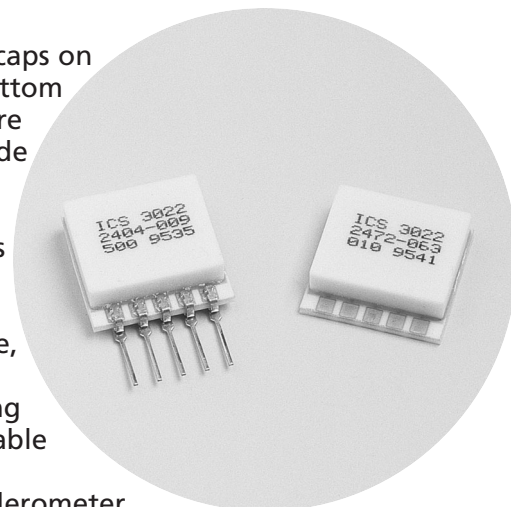
## DESCRIPTION

**The Model 3022** is a piezoresistive silicon accelerometer packaged in a ceramic substrate with a sealed ceramic cover. The ceramic provides an excellent bonding surface for the customer's application specific adhesive.

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 with a mounting bracket designed to bolt the sensor to a mounting location, see the Model 3028. Please refer to the Models 3052 and 3058 for accelerometers with integral temperature compensation.



## FEATURES

- ◆ Designed for PCB or Adhesive Mounting
- ◆  $\pm 0.5\%$  Non-linearity (typical)
- ◆ DC Response
- ◆ Gas Damping
- ◆ Built-in Over-range Stops
- ◆ Low Power

## APPLICATIONS

- ◆ Vibration/Shock Monitoring
- ◆ Modal Analysis
- ◆ Motion Control
- ◆ Impact Testing
- ◆ Transportation

## Standard Ranges

Range	g	Range	g
$\pm 2$	•	$\pm 50$	•
$\pm 5$	•	$\pm 100$	•
$\pm 10$	•	$\pm 200$	•
$\pm 20$	•		

# Model 3022 Accelerometer

## performance specifications

Supply Voltage: 5.0 VDC

Ambient Temperature: 25°C (Unless otherwise specified)

### RANGE

PARAMETERS	±2G	±5G	±10G	±20G	UNITS	NOTES
Frequency Response [MIN]	0-250	0-300	0-400	0-600	Hz	1
Mounted Resonant Frequency [MIN]	700	800	1000	1500	Hz	
Sensitivity (MIN/MAX)	8.0/20.0	6.0/15.0	3.0/6.0	1.5/3.0	mV/g	2, 3

### RANGE

PARAMETERS	±50G	±100G	±200G	UNITS	NOTES
Frequency Response [MIN]	0-1000	0-1500	0-2000	Hz	1
Mounted Resonant Frequency [MIN]	2000	3000	4000	Hz	
Sensitivity (MIN/MAX)	0.6/1.5	0.3/0.6	0.15/0.3	mV/g	2, 3

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Zero Acceleration Output		5.0	25.0	±mV	3
Damping Ratio	0.4	0.7	0.9		
Non-linearity		0.5	1.0	±% Span	4
Transverse Sensitivity		1.0	3.0	±% Span	
Input & Output Resistance	2.5	3.5	6.5	kΩ	3
Temperature Error - Span (0°C to +50°C)	-0.3	-0.15	0	%/°C	
Temperature Error - Zero (0°C to +50°C)	-0.1	-0.05	+0.1	mV/°C	
Supply Voltage	2.0	5.0	10.0	VDC	
Output Noise		1.0		μV p-p	5
Output Load Resistance	5			MΩ	
Shock Limits	5000g for ≤ 20g range; 10,000g for ≥ 50g range				
Operating Temperature	-40°C to +125°C				
Storage Temperature	-40°C to +125°C				
Weight (with pins)	3.1 Grams				
Materials	Alumina ceramic substrate with alumina ceramic cap				

### Notes

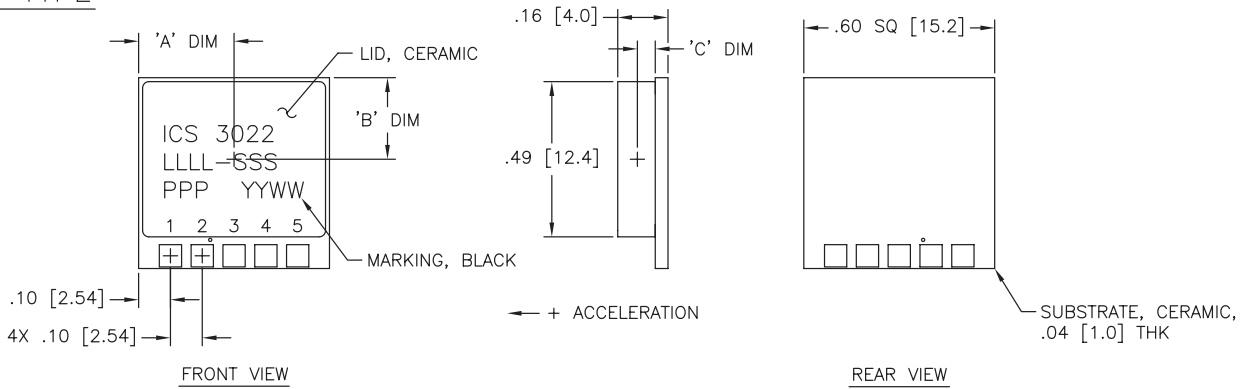
1. The frequency response is defined as the range of frequencies over which the device sensitivity is within ±5% of the DC value.
2. Output voltage increases for positive acceleration; output voltage decreases for negative acceleration.
3. Actual test data for this parameter is included on the calibration sheet

4. Best Fit Straight Line. For full scale ranges of 10g or less, the maximum non-linearity is ±2%.
5. 10 Hz to 1 kHz.

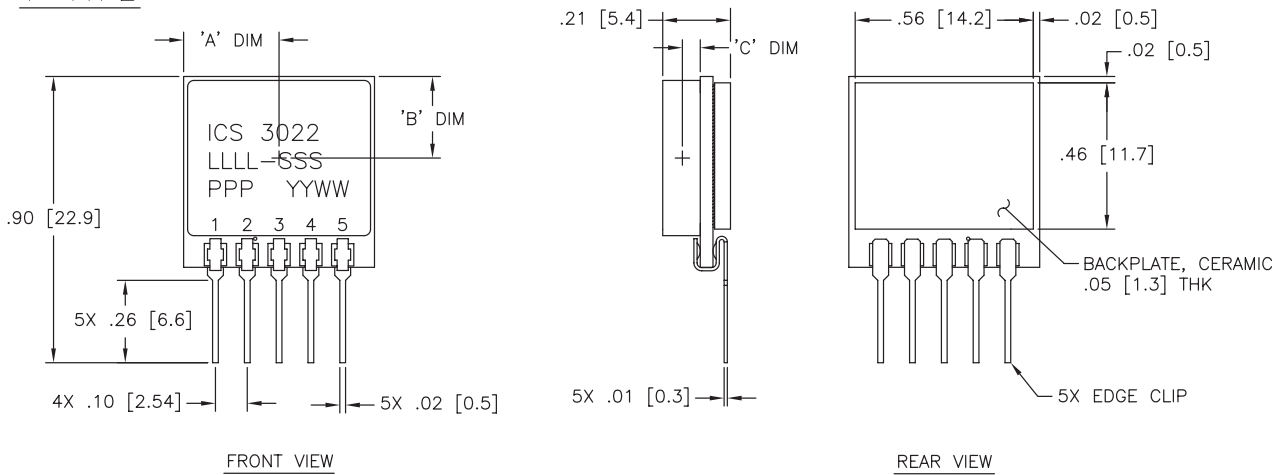
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## dimensions

### N TYPE



### P TYPE



ALL DIMENSIONS ARE IN INCHES [mm]

LTR	2 - 20 g	50 - 200 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



## electrical schematic

