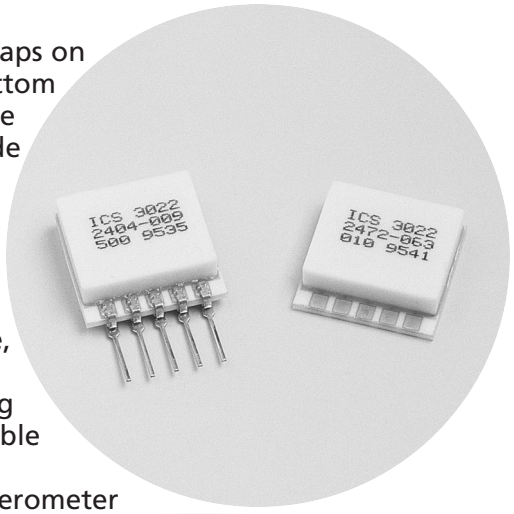
MODEL 3022 Accelerometer

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 customers 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
- ±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
±2	•	±50	•
±5	•	±100	•
±10	•	±200	•
±20	•		

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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 provided with each sensor.
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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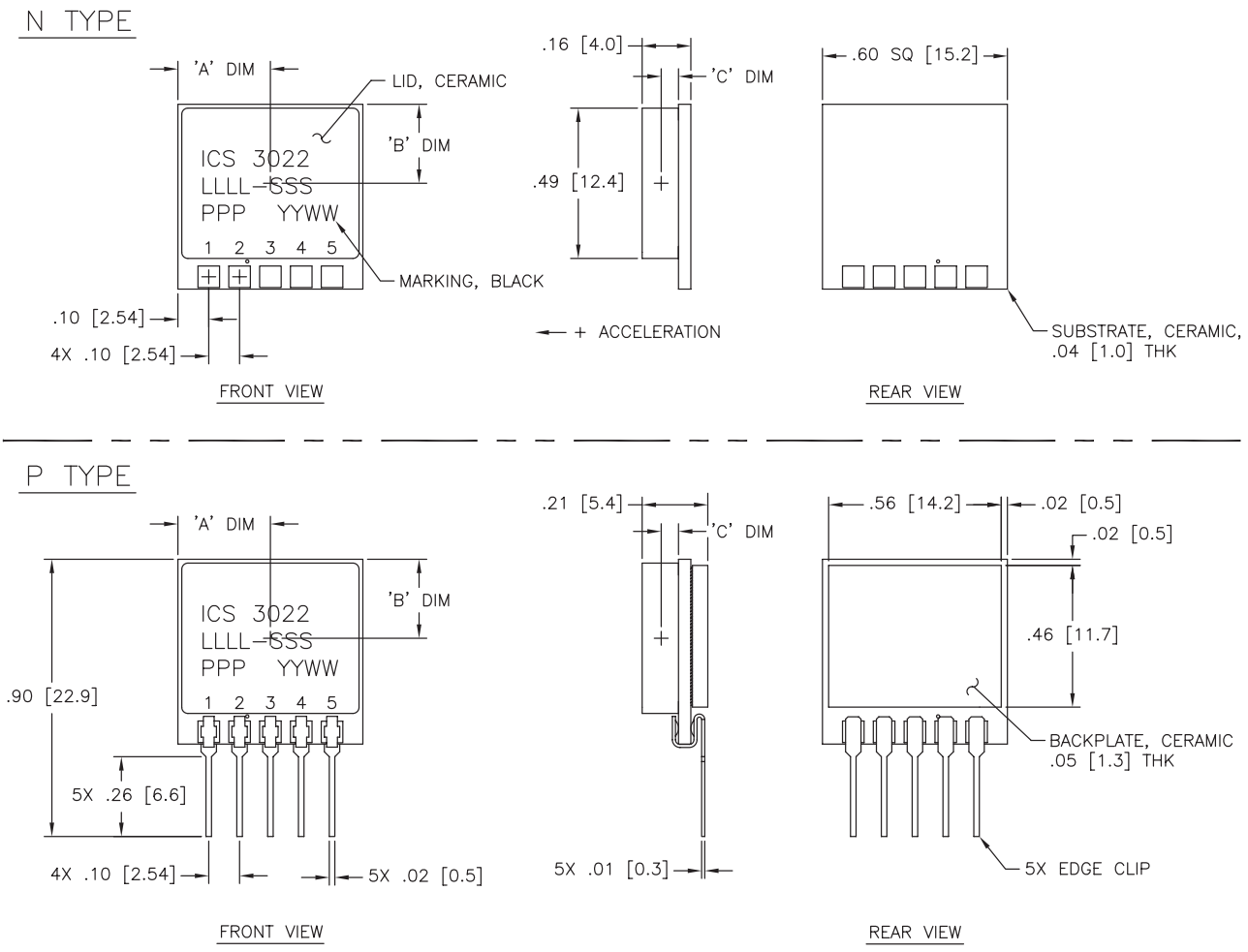
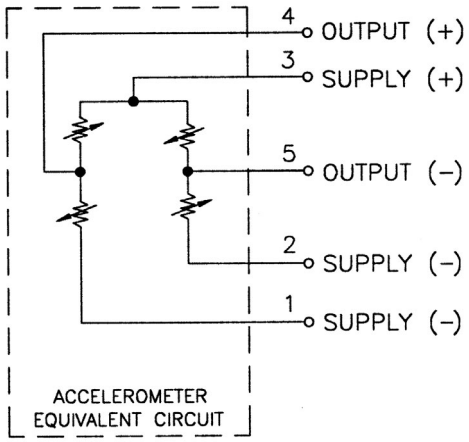
dimensions



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]

electrical schematic



ordering information

3022 - 005 - P

- P — Electrical Connection (P = Pins, N = None)
- 005 — Acceleration Range
- 3022 — Model