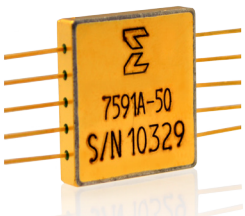
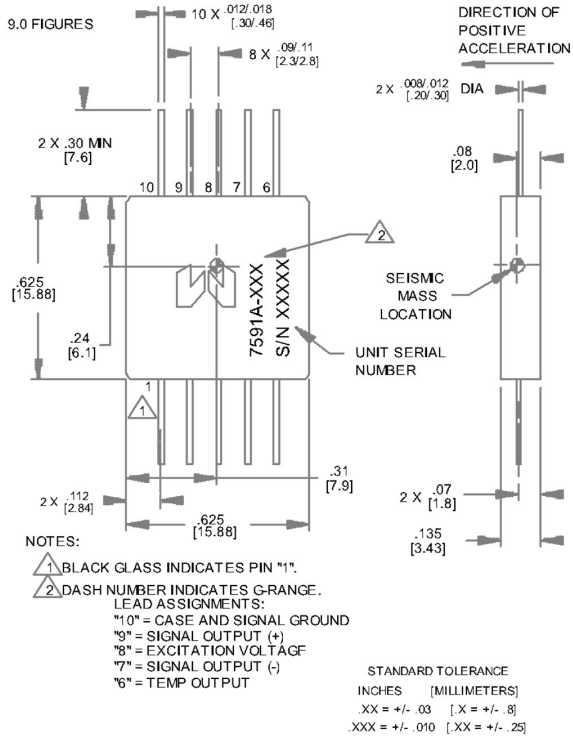
Endevco®

Variable capacitance accelerometer

Model 7591A





Key features

- DC response
- 2, 5, 10, 30, 50 and 100 g ranges
- Hermetic flatpack
- Temperature output
- Motion, low frequency, tilt

Endevco model 7591A utilizes a unique variable capacitance sensor. The accelerometer is designed for measurement of relatively low-level accelerations in aerospace and automobile environments. Typical applications require measurement of whole body motion immediately after the accelerometer is subjected to a shock motion and in the presence of severe vibrational inputs.

Gas damping and internal overrange stops enable the anisotropically etched MEMS sensor to withstand high shock and acceleration loads.

Included in the accelerometer is a signal conditioner so that the device can operate from 8.5 V to 30.0 V excitation and provide a high level, low impedance output. The ±2 volt differential output is dc coupled at a dc bias of approximately 3.6V. A temperature output voltage is provided to allow the user the capability of extracting accurate, temperature corrected, inertially sensed acceleration data.

The Model 7591A is circuit board mountable and is hermetically packaged in a leaded Kovar flat pack.

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Specifications

All specifications are referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics	Units	-2	-5	-10	-30	-50	-100
Range	g	±2	±5	±10	±30	±50	±100
Sensitivity	mV/g	1000±100	400±40	200±20	66±8	40±2	20±2
Zero measurand output	mV	±50	±50	±50	±50	±50	±50
Frequency response (±5%)	Hz	0-15	0-30	0-500	0-800	0-1000	0-2000
(ref 5 Hz for the -2and -5)							
Thermal zero shift (max)							
0°C to 50°C, (32°F to 122°F)	%FSO	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
Thermal sens shift (max)							
0°C to 50°C (+32°F to 122°F)	%	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
Transverse sensitivity	% (max)	2.0	2.0	2.0	2.0	2.0	2.0
Non-linearity and hysteresis	%FSO typ (max)	±0.2 (±0.5)	±0.2 (±0.5)	±0.2 (±0.5)	±0.2 (±0.5)	±1 (±2)	±1 (±2)
Natural frequency	Hz	1300	1600	3000	5500	6000	6000
Damping ratio		3.0	2.5	0.7	0.7	0.6	0.6
Damping ratio change with temp							
-55°C TO 121°C (-65°F TO 250°F)	%/°C	+.08	+.08	+.08	+.08	+.08	+.08
Overrange							
Electrical clipping	g	-3.5/+3.8	-9/+9.5	-18/+19	-53/+57	-175/+190	-175/+190
Mechanical stops, typical	g	±4	±12	±30	±90	±200	±200
Recovery Time	µs	‹10	‹10	‹10	‹10	‹10	‹10
Resolution [1]	equiv. g's	.0002	.0005	.0010	.0030	.0050	.0100
Magnetic Susceptibility		< 0.1 equiv. g's at 100 gauss, 60 Hz					
Temperature sensor output	mV	630					
Temperature sensor sensitivity	mV/ ºC	2.1					

Electrical		
Excitation voltage	Vdc	8.5 to 30.0
Current drain	ma	4.5 typ, 8 maximum
Output impedance	ohms	50 maximum
Load	K ohms	10 resistance minimum
	µF	0.1 capacitance maximum
Residual noise		100 µVrms typ, 0.5 to 100 Hz
		500 µVrms typ, 0.5 to 10 kHz

Physical		
Weight	grams	7 typical
Case material		Gold-plated Kovar

Environmental		
Acceleration limits (in any direction)		
Static		20,000 g
Vibration		100 g sinusoidal 20-2000 Hz; 40 g rms randon 20-2000 Hz
Shock		5,000g (150 µS haversine pulse) for -2, -5 and -10
		10,000g (80 µS haversine pulse) for -30, -50 and -100
Zero Shift		0.1% FSO typical @ 5000g
Temperature		
Operating Range	ºF (ºC)	-65 to +250 (-54 to +121)
Storage Range	ºF (ºC)	-100 to +300 (-73 to +150)
Humidity and Altitude		Not affected. Unit is hermetic.
ESD sensitivity		Class 1 (MIL-STD-883 - human body model)

Calibration data	
Sensitivity	Derived from 2g turnover results. @ 15 Vdc excitation

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Notes

1. Resolution = [2x residual noise; 0.5 to 100Hz] / sensitivity
2. Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.
3. Model number definition:

```
7591A - XXX
  |     |
  |     |____  Denotes typical range in g's
  |            -2   = 2g's
  |            -5   = 5g's
  |            -10  = 10g's
  |            -30  = 30g's
  |            -50  = 50g's
  |            -100 = 100g's
  |
  |__________  Basic Model Number
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Contact

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