



# ADX105/ADX150/ADX190 Evaluation Modules

## ADX105EM-1, ADXL105EM-3, ADXL150EM-1, ADXL150EM-3, ADXL190EM-1

### FEATURES

- High Performance Prepackaged Accelerometers
- Complete Acceleration Measurement System
- Small, Low Cost, Ready-to-Use
- $\pm 4 \text{ g}$ ,  $\pm 10 \text{ g}$ , 100 Hz Single and Multiaxis Versions
- Wide Dynamic Range:  $\pm 100 \text{ g}$  Single Axis
- Low Power Supply Current
- +5 V Single Supply Operation
- Easy Screw-Down/Bolt-Down Mounting

### APPLICATIONS

- Vibration Analysis, Seismic and Earthquake Monitoring, Crash Sensing, Robotic Applications, Shipping and Transportation Shock Monitoring, Active Suspension Applications, Medical Analysis, Active Sound Cancellation, and Much More

### GENERAL DESCRIPTION

The ADXL105EM, ADXL150EM, and ADXL190EM evaluation modules provide a complete acceleration measurement system in a low cost package. These modules simplify the evaluation and testing of our ADXL105/ADXL150/ADXL190/ADXL250 monolithic accelerometer ICs.

The ADXL105, ADXL150, ADXL190 (single) and ADXL250 (dual axis) accelerometers offer low noise and high signal-to-noise ratios. In addition, the scale factor and 0 g output level are both riometric to the power supply so the accelerometer and any following circuitry (such as an ADC, etc.) will track each other if the supply voltage varies.

Each module contains one or more ADXL105, ADXL150, or ADXL190 series accelerometers precalibrated to a convenient output scale factor with onboard low-pass filtering.

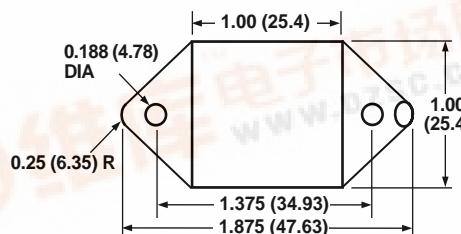
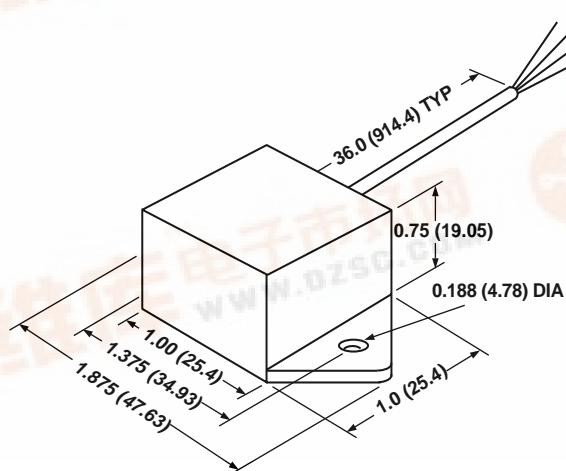


All that is required to use these modules is a +5 volt power supply. The module should be attached (i.e., screwed or glued down) securely to the object being measured, taking care that the axis of sensitivity, indicated by the large arrow on the top of the module, is aligned with the expected acceleration.

Modules are available in other package styles (such as ruggedized metallic box) and in other g ranges from our third party partners. See our web site at: [www.analog.com/imems/](http://www.analog.com/imems/) for more information.

### OUTLINE DIMENSIONS

Dimensions shown in inches and (mm).



### CABLE SIGNAL COLOR CODE

FUNCTION	COLOR	PIN #
+5VDC	RED	1
COM RTN	BLACK	2
A1 (X) OUT	WHITE	3
A2 (Y) OUT	YELLOW	4
A3 (Z) OUT	GREEN	5

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# ADXL105EM-1/ADXL105EM-3/ADXL150EM-1/ADXL150EM-3/ ADXL190EM-1-SPECIFICATIONS

## ACCELEROMETER EVALUATION MODULES

Model	ADXL105 EM-1 Single Axis	ADXL105 EM-3 Tri-Axial	ADXL150 EM-1 Single Axis	ADXL150 EM-3 Tri-Axial	ADXL190 EM-1 Single Axis	Units	Remarks
Span	$\pm 4$	$\pm 4$	$\pm 10$	$\pm 10$	$\pm 100$	$g$	$\pm 5\%$
Sensitivity <sup>1</sup>	500	500	200	200	20	$mV/g$	$\pm 5\%$ , @ +5.00 V
Bandwidth	DC-100	DC-100	DC-100	DC-100	DC-400	Hz	$\pm 5\%$
Noise	4	4	10	10	40	$mg\ rms$	typ
Orientation	Horizontal	Tri-Axial	Horizontal	Tri-Axial	Vertical		
Zero $g$ Output <sup>2</sup>	$+2.5 \pm 0.1$	$+2.5 \pm 0.1$	$+2.5 \pm 0.1$	$+2.5 \pm 0.1$	$+2.5 \pm 0.1$	Volts	@ +25°C, @ +5.00 V
Zero $g$ Drift <sup>3</sup>	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$g$	0°C to +70°C typ
Span Output	$\pm 2.0 \pm 0.2$	$\pm 2.0 \pm 0.2$	$\pm 2.0 \pm 0.1$	$\pm 2.0 \pm 0.1$	$\pm 2.0 \pm 0.2$	Volts	@ +25°C, @ +5.00 V
Nonlinearity <sup>4</sup>	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	% FS	typ
Alignment	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	Degrees	typ
Transverse Sensitivity <sup>5</sup>	$\pm 3.5$	$\pm 3.5$	$\pm 3.5$	$\pm 3.5$	$\pm 3.5$	% FS	typ
Temperature Range	0 to +70	0 to +70	0 to +70	0 to +70	0 to +70	°C	
Shock	500	500	500	500	1000	$g$	Powered
	2000	2000	2000	2000	2000	$g$	Unpowered
Output Loading	$>2\ k\Omega$ , $<1\ nF$	$>2\ k\Omega$ , $<1\ nF$	$>2\ k\Omega$ , $<1\ nF$	$>2\ k\Omega$ , $<1\ nF$	$>2\ k\Omega$ , $<1\ nF$		max
Supply Voltage							
Specified Performance	$+5 \pm 0.25$	$+5 \pm 0.25$	$+5 \pm 0.25$	$+5 \pm 0.25$	$+5 \pm 0.25$	Volts	max
Functional Range	$+5 \pm 1$	$+5 \pm 1$	$+5 \pm 1$	$+5 \pm 1$	$+5 \pm 1$	Volts	typ
Supply Current	3.5	10	3.5	10	3.5	mA	typ

### NOTES

<sup>1</sup>Ratiometric to Supply:  $V_{OUT} = (V_S/2) - (\text{sensitivity} \times (V_S/5\ V) \times \text{accel})$ .

<sup>2</sup>Ratiometric to supply, proportional to  $V_S/2$ .

<sup>3</sup>Zero  $g$  Drift is specified as the typical change in 0  $g$  level from its initial value at +25°C to its worst case value at  $T_{MIN}$  or  $T_{MAX}$ .

<sup>4</sup>Nonlinearity is the deviation from a best fit straight line at full scale.

<sup>5</sup>Transverse sensitivity is error measured in the primary axis output created by forces induced in the orthogonal axis. Transverse sensitivity error is primarily due to the effects of misalignment (i.e., much of it can be tuned out by adjusting the package orientation).

<sup>6</sup>All frequency break points are -3 dB, single pole, -6 dB per octave roll-off.

Specifications subject to change without notice.