

FEATURES

- 3-axis sensing**
- Small, low profile package**
4 mm \times 4 mm \times 1.45 mm LFCSP
- Low power: 350 μ A typical**
- Single-supply operation: 1.8 V to 3.6 V**
- 10,000 g shock survival**
- Excellent temperature stability**
- Bandwidth adjustment with a single capacitor per axis**
- RoHS/WEEE lead-free compliant**

APPLICATIONS

- Cost-sensitive, low power, motion- and tilt-sensing applications**
 - Mobile devices
 - Gaming systems
 - Disk drive protection
 - Image stabilization
 - Sports and health devices

GENERAL DESCRIPTION

The ADXL325 is a small, low power, complete 3-axis accelerometer with signal conditioned voltage outputs. The product measures acceleration with a minimum full-scale range of $\pm 5 g$. It can measure the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration, resulting from motion, shock, or vibration.

The user selects the bandwidth of the accelerometer using the C_X , C_Y , and C_Z capacitors at the X_{OUT} , Y_{OUT} , and Z_{OUT} pins. Bandwidths can be selected to suit the application with a range of 0.5 Hz to 1600 Hz for X and Y axes and a range of 0.5 Hz to 550 Hz for the Z axis.

The ADXL325 is available in a small, low profile, 4 mm \times 4 mm \times 1.45 mm, 16-lead, plastic lead frame chip scale package (LFCSP_LQ).

FUNCTIONAL BLOCK DIAGRAM

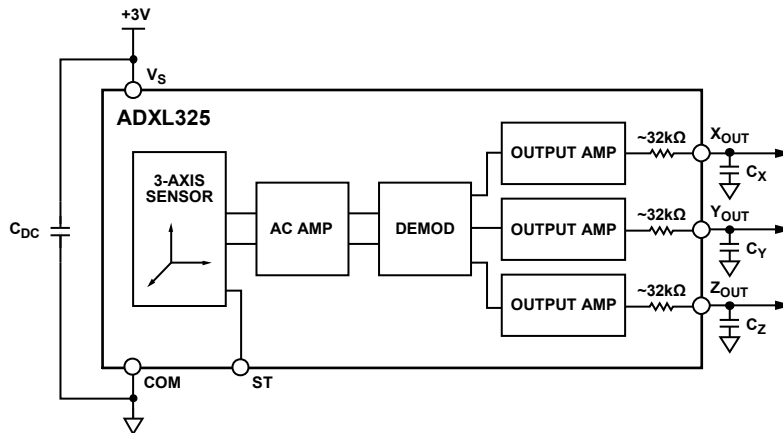


Figure 1.

Rev. 0

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TABLE OF CONTENTS

Features	1	Performance	10
Applications.....	1	Applications Information	11
General Description	1	Power Supply Decoupling	11
Functional Block Diagram	1	Setting the Bandwidth Using C_x , C_y , and C_z	11
Revision History	2	Self Test	11
Specifications.....	3	Design Trade-Offs for Selecting Filter Characteristics: The Noise/BW Trade-Off.....	11
Absolute Maximum Ratings.....	4	Use with Operating Voltages Other Than 3 V	11
ESD Caution.....	4	Axes of Acceleration Sensitivity	12
Pin Configuration and Function Descriptions.....	5	Layout and Design Recommendations	13
Typical Performance Characteristics	6	Outline Dimensions	14
Theory of Operation	10	Ordering Guide	14
Mechanical Sensor.....	10		

REVISION HISTORY

8/09—Revision 0: Initial Version

SPECIFICATIONS

$T_A = 25^\circ\text{C}$, $V_S = 3\text{ V}$, $C_X = C_Y = C_Z = 0.1\ \mu\text{F}$, acceleration = 0 g, unless otherwise noted. All minimum and maximum specifications are guaranteed. Typical specifications are not guaranteed.

Table 1.

Parameter	Conditions	Min	Typ	Max	Unit
SENSOR INPUT	Each axis				
Measurement Range		± 5	± 6		g
Nonlinearity	Percent of full scale		± 0.2		%
Package Alignment Error			± 1		Degrees
Interaxis Alignment Error			± 0.1		Degrees
Cross-Axis Sensitivity ¹			± 1		%
SENSITIVITY (RATIOMETRIC) ²	Each axis				
Sensitivity at X_{OUT} , Y_{OUT} , Z_{OUT}	$V_S = 3\text{ V}$	156	174	192	mV/g
Sensitivity Change Due to Temperature ³	$V_S = 3\text{ V}$		± 0.01		%/ $^\circ\text{C}$
ZERO g BIAS LEVEL (RATIOMETRIC)					
0 g Voltage at X_{OUT} , Y_{OUT} , Z_{OUT}	$V_S = 3\text{ V}$	1.3	1.5	1.7	V
0 g Offset vs. Temperature			± 1		mg/ $^\circ\text{C}$
NOISE PERFORMANCE					
Noise Density X_{OUT} , Y_{OUT} , Z_{OUT}			250		$\mu\text{g}/\sqrt{\text{Hz}}$ rms
FREQUENCY RESPONSE ⁴					
Bandwidth X_{OUT} , Y_{OUT} ⁵	No external filter		1600		Hz
Bandwidth Z_{OUT} ⁵	No external filter		550		Hz
R_{FILT} Tolerance			$32 \pm 15\%$		k Ω
Sensor Resonant Frequency			5.5		kHz
SELF TEST ⁶					
Logic Input Low			+0.6		V
Logic Input High			+2.4		V
ST Actuation Current			+60		μA
Output Change at X_{OUT}	Self test 0 to 1	-90	-190	-350	mV
Output Change at Y_{OUT}	Self test 0 to 1	+90	+190	+350	mV
Output Change at Z_{OUT}	Self test 0 to 1	+90	+320	+580	mV
OUTPUT AMPLIFIER					
Output Swing Low	No load		0.1		V
Output Swing High	No load		2.8		V
POWER SUPPLY					
Operating Voltage Range		1.8		3.6	V
Supply Current	$V_S = 3\text{ V}$		350		μA
Turn-On Time ⁷	No external filter		1		ms
TEMPERATURE					
Operating Temperature Range		-40		+85	$^\circ\text{C}$

¹ Defined as coupling between any two axes.

² Sensitivity is essentially ratiometric to V_S .

³ Defined as the output change from ambient-to-maximum temperature or ambient-to-minimum temperature.

⁴ Actual frequency response controlled by user-supplied external filter capacitors (C_X , C_Y , C_Z).