

Evaluating the ADXL357B Low Noise, Low Drift, Low Power 3-Axis MEMS Accelerometer

FEATURES

- ▶ 2 sets of spaced vias for population of 5-pin headers
- ▶ Easily attached to a prototyping board or PCB
- ▶ Small size and board stiffness minimize the impact on the system and acceleration measurement

EVALUATION KIT CONTENTS

- ▶ EVAL-ADXL357B evaluation board
- ▶ 10-pin Harwin connector, M80-8541042

ONLINE RESOURCES

- ▶ [ADXL357B](#) data sheet

GENERAL DESCRIPTION

The EVAL-ADXL357B is a simple evaluation board that allows quick evaluation of the performance of the ADXL357B, low noise, low power accelerometer. The EVAL-ADXL357B is ideal for evaluating the ADXL357B in an existing system because the stiffness and the small size of the EVAL-ADXL357B minimize the effect of the board on both the system and acceleration measurements.

The ADXL357B is a low noise density, low 0 g offset drift, low power, 3-axis microelectromechanical system (MEMS) accelerometer with selection measurement ranges (± 10 g, ± 20 g, and ± 40 g). The ADXL357B offers industrial leading noise, minimal offset drift over temperature, and long-term stability, enabling precision applications with minimal calibration.

The low drift, low noise, and low power ADXL357B enables accurate tilt measurement in an environment with high vibration, such as airborne inertial measurement units (IMUs). The low noise over higher frequencies is ideal for wireless condition monitoring.

The ADXL357B multifunction pin names are referenced only by their relevant function for either the serial peripheral interface (SPI) or limited I²C interface.

For full details on the ADXL357B, see the ADXL357B data sheet, which can be consulted in conjunction with this user guide when using the EVAL-ADXL357B evaluation board.

EVALUATION BOARD PHOTOGRAPHS

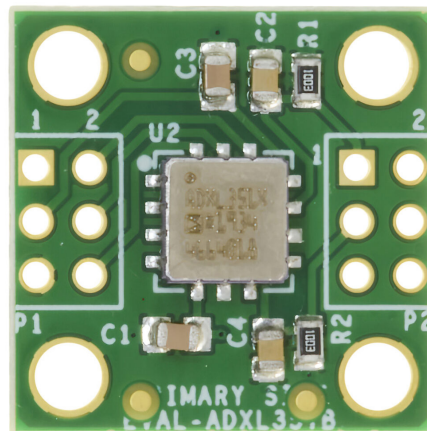


Figure 1. EVAL-ADXL357B Evaluation Board Photograph (Top)

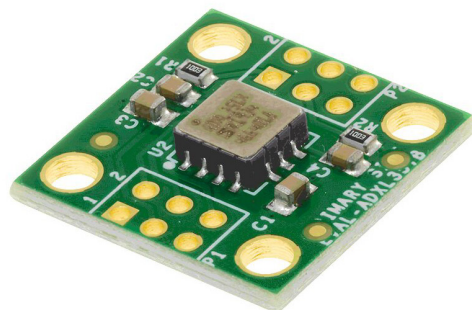


Figure 2. EVAL-ADXL357B Evaluation Board Photograph (Angle)

TABLE OF CONTENTS

Features.....	1	Evaluation Board Circuitry.....	3
Evaluation Kit Contents.....	1	Handling Considerations.....	3
Online Resources.....	1	Evaluation Board Schematic.....	4
General Description.....	1	Ordering Information.....	5
Evaluation Board Photographs.....	1	Bill of Materials.....	5
Evaluation Board Hardware.....	3		

REVISION HISTORY

3/2024—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

The EVAL-ADXL357B allows users to access the individual connections of the [ADXL357B](#) and includes decoupling capacitors for the supplies, a few discrete resistors that provide isolation on the V_{1P8ANA} and V_{1P8DIG} pins, and two 6-pin headers. Refer to the ADXL357B data sheet for more details on the specific pin definitions. The power supplies for the ADXL357B are decoupled using 1 μ F ceramic capacitors.

The EVAL-ADXL357B uses two 6-pin headers to provide access to all pins. The P1 header provides access to VDDIO, VDD (which connects to the ADXL357B V_{SUPPLY} pin), V_{SS}/V_{SSIO} (supply common connection), INT1, INT2, and DRDY, as shown in [Figure 3](#).

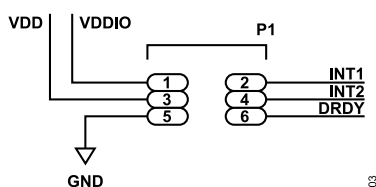


Figure 3. P1 Header Connections

The P2 header provides access to V_{1P8ANA} , CS_N/DCL , V_{1P8DIG} , SCLK/ V_{SSIO} , MOSI/SDA, and MISO/ASEL, as shown in [Figure 4](#).

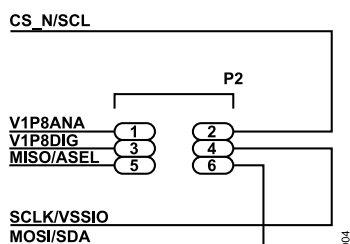


Figure 4. P2 Header Connections

The vias or headers allow the EVAL-ADXL357B to attach to either a prototyping breadboard or a printed circuit board (PCB) in an existing user system. Four holes are provided in the corners of the EVAL-ADXL357B for mechanical attachment of the EVAL-ADXL357B in many applications. An external host processor is required for communication with the ADXL357B.

The dimensions of the EVAL-ADXL357B are 0.8 in \times 0.8 in.

EVALUATION BOARD CIRCUITRY

The ADXL357B has two power modes. The device can be powered either by integrated, low dropout (LDO) regulators or by external user supplied 1.8 V regulated supplies. Refer to the ADXL357B data sheet for more information.

HANDLING CONSIDERATIONS

The EVAL-ADXL357B is not reverse polarity protected. Reversing of any of the supply connections, including the V_{SS} and V_{SSIO} pins, can cause damage to the ADXL357B.

Dropping the EVAL-ADXL357B on a hard surface can generate several thousand g of acceleration, which can exceed the ADXL357B data sheet absolute maximum limits.

EVALUATION BOARD SCHEMATIC

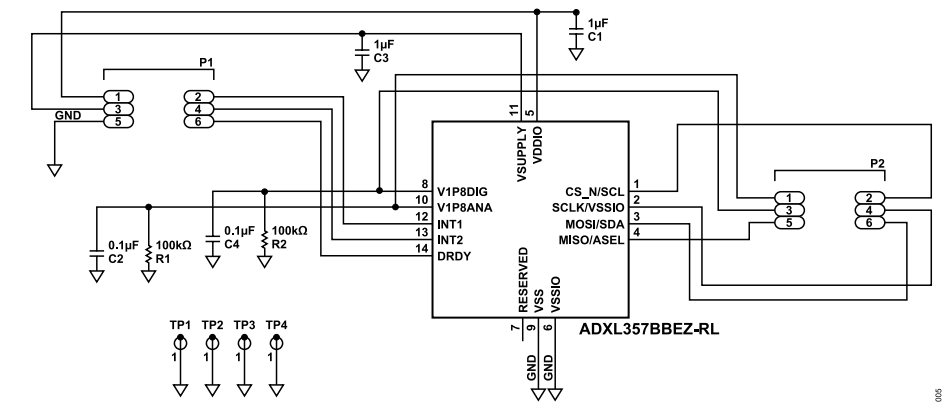


Figure 5. EVAL-ADXL357B Evaluation Board Schematic


ORDERING INFORMATION

BILL OF MATERIALS

Table 1. Bill of Materials

Quantity	Reference Designator	Description	Manufacturer	Part Number
1	U2	IC-ADI low noise, high g, low power, low drift 3-axis accelerometer prelim	Analog Devices, Inc.	ADXL357BBEZ-RL
2	C1, C3	Ceramic capacitor, 1 µF, 16 V, 10%, X8R 0805	TDK	C2012X8R1C105K125AB
2	C2, C4	Ceramic capacitor, 0.1 µF, 16 V, 10%, X7R 0805	Yageo	CC0805KRX7R7BB104
2	P1, P2	Connector-PCB, 6 POS unshrouded header, header 2.54 mm, solder straight through hole	Adam Tech	PH2-06-UA
2	R1, R2	Resistor surface-mount device (SMD), 100 KΩ, 1%, 1/8 W, 0805, AEC-Q200	Panasonic	ERJ-6ENF1003V

I²C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).



ESD Caution
ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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