EN: This Datasheet/Document is presented by the manufacturer.

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EVAL-ADXL354/EVAL-ADXL355 User Guide

UG-1030

One Technology Way • P.O. Box 9106 • Norwood, MA 02062-9106, U.S.A. • Tel: 781.329.4700 • Fax: 781.461.3113 • www.analog.com

Evaluating the ADXL354/ADXL355 Low Noise, Low Drift, Low Power, 3-Axis MEMS Accelerometers

FEATURES

2 sets of spaced vias for populating 6-pin headers
Easily attachable to prototyping board or PCB
Small size and board stiffness minimize impact on the system being monitored and acceleration measurements

EQUIPMENT NEEDED

External host processor

DOCUMENTS NEEDED

ADXL354/ADXL355 data sheet

GENERAL DESCRIPTION

The EVAL-ADXL354BZ, EVAL-ADXL354CZ, and EVAL-ADXL355Z are simple evaluation boards that allow quick evaluation of the performance of the ADXL354 and the ADXL355 low noise, low power, 3-axis, MEMS accelerometer. The EVAL-ADXL354BZ is an analog output supporting a ±2 *g* or ±4 *g* accelerometer; the EVAL-ADXL354CZ is an analog output supporting a ±2 *g* or ±8 *g* accelerometer; and the EVAL-ADXL355Z is a digital output supporting ±2 *g*, ±4 *g*, or ±8 *g*. These evaluation boards are ideal for evaluating the ADXL354 and ADXL355 in an existing system because the stiffness and small size of the evaluation board minimizes the effect of the evaluation board on both the system and acceleration measurements.

Full details about the ADXL354/ADXL355 are available in the ADXL354/ADXL355 data sheet, which is available from Analog Devices, Inc., and should be consulted in conjunction with this user guide when using this evaluation board.

PRINTED CIRCUIT BOARD LAYOUT

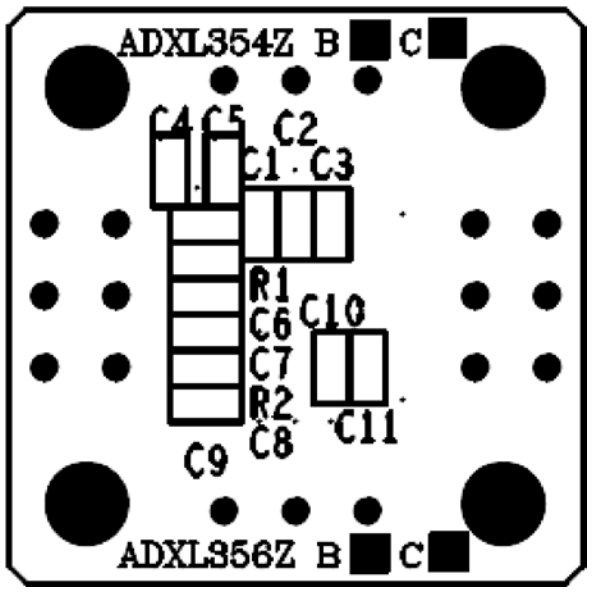


Figure 1. EVAL-ADXL354BZ and EVAL-ADXL354CZ Evaluation Boards

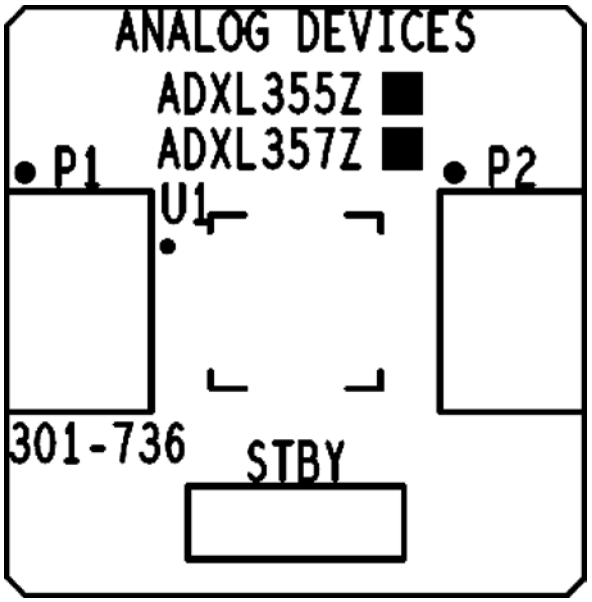


Figure 2. EVAL-ADXL355Z Evaluation Board

PLEASE SEE THE LAST PAGE FOR AN IMPORTANT WARNING AND LEGAL TERMS AND CONDITIONS.

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REVISION HISTORY

6/2018—Rev. 0 to Rev. A

Changes to Figure 7 and Figure 8 4

9/2016—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

The EVAL-ADXL354BZ, EVAL-ADXL354CZ, and EVAL-ADXL355Z evaluation boards allow users to access the individual connections of the ADXL354 and ADXL355. Each of the evaluation boards include decoupling capacitors for supplies, a few discrete resistors to provide isolation on the V_{1P8ANA} and V_{1P8DIG} pins, and two 6-pin headers. Refer to the ADXL354/ADXL355 data sheet for more detail on specific pin definitions. The power supplies for the ADXL354/ADXL355 is decoupled using multiple 0.1 µF ceramic (0603) capacitors.

The EVAL-ADXL354BZ and EVAL-ADXL354CZ evaluation boards have capacitors on each axis output to set the output low-pass filter and two 3-position jumpers to configure Range and Mode. The two 6-pin headers provide access to all other pins. Header P1 provides access to V_{DDIO} (sets the RANGE pin and the $\overline{STBY}$ pin levels on the EVAL-ADXL354BZ and EVAL-ADXL354CZ evaluation boards), VDD (supplies the ADXL354 V_{SUPPLY} pin), V_{SS}/V_{SSIO} (supplies the ground connection), X_{OUT}, Y_{OUT}, and Z_{OUT}, shown in Figure 3. Header P2 provides access to V_{1P8ANA}, V_{1P8DIG}, TEMP, ST1, ST2, and V_{SS} (supplies the ground connection), shown in Figure 4.

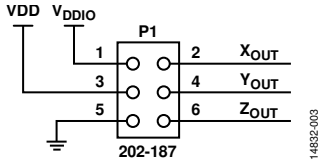


Figure 3. EVAL-ADXL354BZ and EVAL-ADXL354CZ Function Block Diagram for Header P1

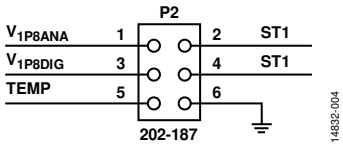


Figure 4. EVAL-ADXL354BZ and EVAL-ADXL354CZ Function Block Diagram for Header P2

The EVAL-ADXL355Z uses two 6-pin headers to provide access to all pins. Header P1 provides access to V_{DDIO}, VDD (which is connected to the ADXL355 V_{SUPPLY} pin), V_{SS}/V_{SSIO} (supply ground connection), INT1, INT2, and DRDY, shown in Figure 5. Header P2 provides access to V_{1P8ANA}, V_{1P8DIG}, MISO/ASEL, $\overline{CS}$/SCL, SCLK/V_{SSIO}, and MOSI/SDA (see Figure 6).

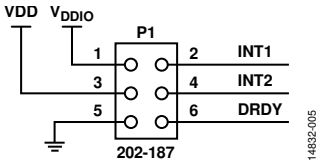


Figure 5. EVAL-ADXL355Z Function Block Diagram for Header P1

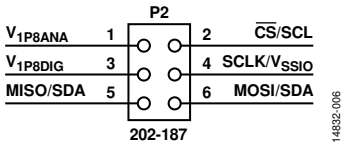


Figure 6. EVAL-ADXL355Z Function Block Diagram for Header P2

The vias or headers allow the evaluation boards to attach to either a prototyping breadboard or to a printed circuit board (PCB) in an existing user system. Four holes are provided in the corners of the evaluation board for mechanical attachment of the evaluation boards in many applications. An external host processor is required for communication to the ADXL355, while the analog output of the ADXL354 must be connected to a band limited analog-to-digital converter (ADC).

The dimensions of the evaluation boards are 0.8 in × 0.8 in.

CIRCUIT DESCRIPTION

The PCB layout of the EVAL-ADXL354BZ, EVAL-ADXL354CZ, and EVAL-ADXL355Z evaluation boards are shown in Figure 2. The ADXL354 and ADXL355 each have two moded by which they can be powered: by integrated low dropout regulators (LDOs) or external, user supplied 1.8 V regulated supplies. Refer to the ADXL354/ADXL355 data sheet for more information.

HANDLING CONSIDERATIONS

The EVAL-ADXL354BZ, EVAL-ADXL354CZ, and EVAL-ADXL355Z evaluation boards are not reverse polarity protected. Reversing any of the supply connections, including the V_{SS} and V_{SSIO} pins, can cause damage to the ADXL354/ADXL355.

Dropping the evaluation boards on a hard surface can generate several thousand *g* of acceleration, which can exceed the ADXL354/ADXL355 data sheet absolute maximum limits.

EVALUATION BOARD SCHEMATICS AND ARTWORK

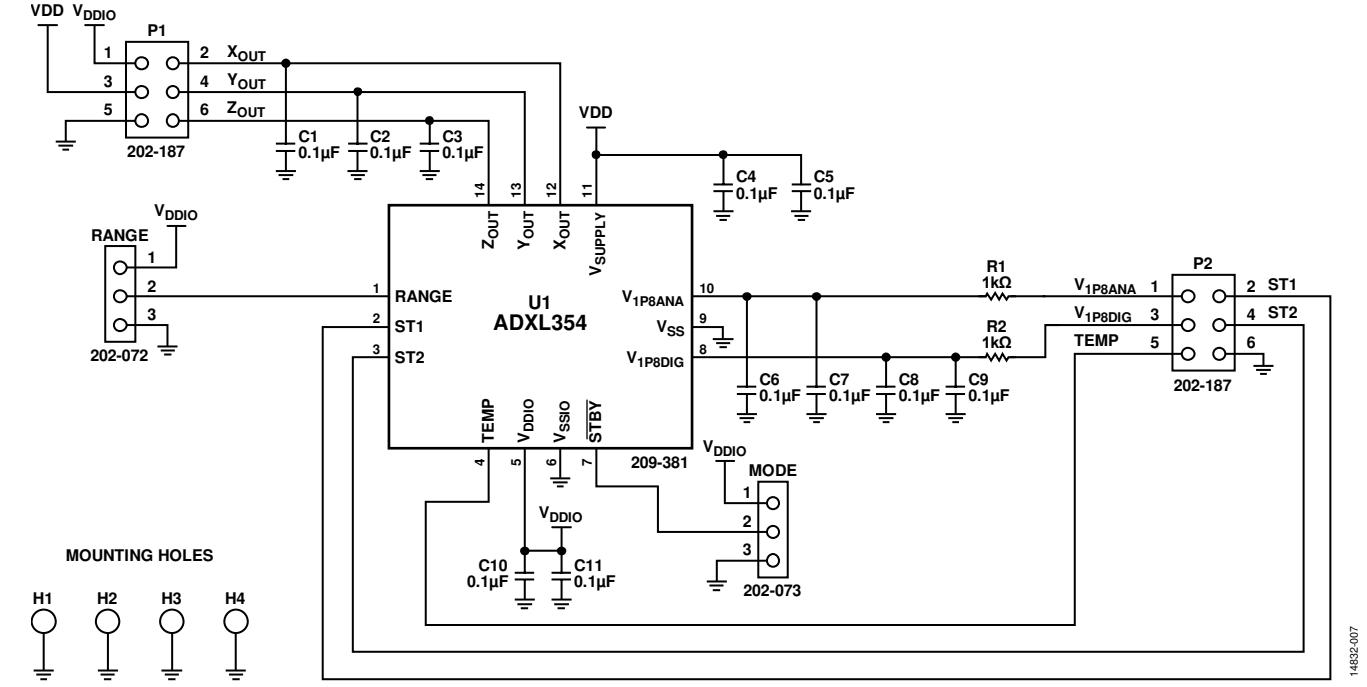


Figure 7. EVAL-ADXL354BZ and EVAL-ADXL354CZ Schematic

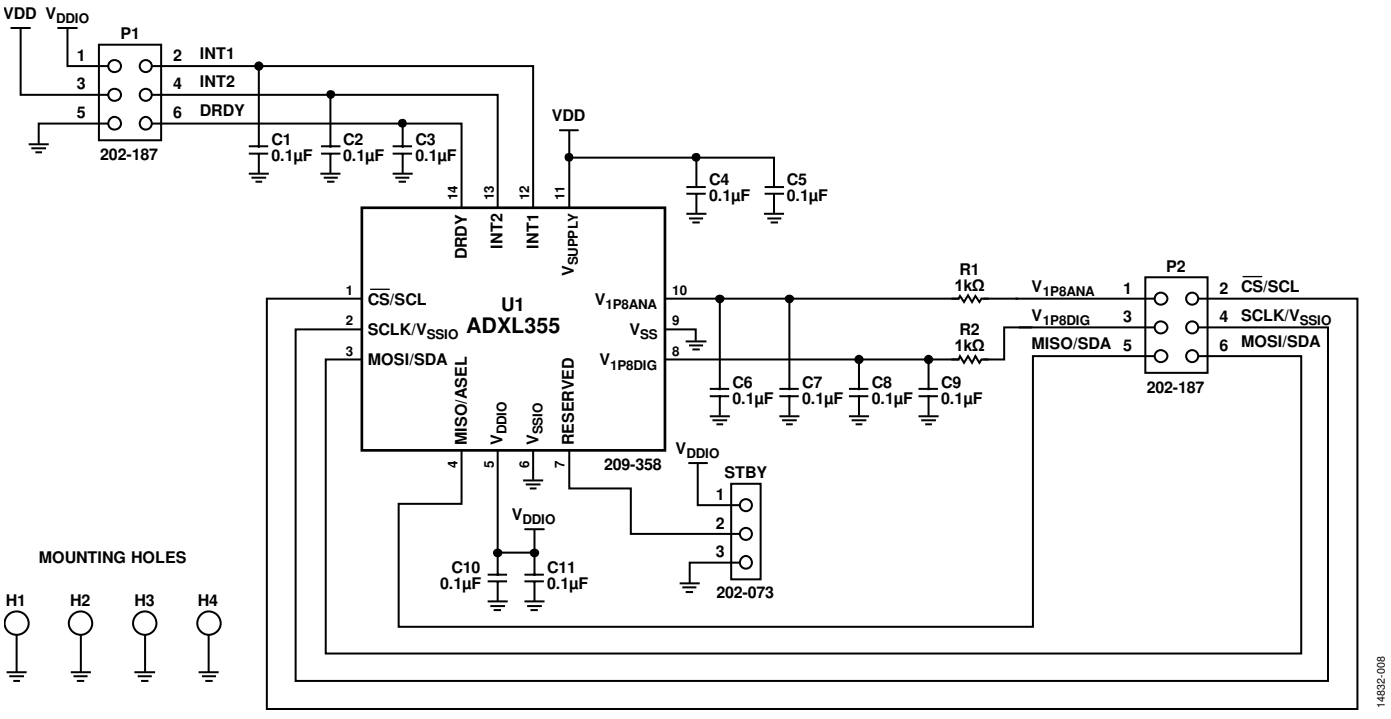


Figure 8. EVAL-ADXL355Z Schematic

ORDERING INFORMATION

BILL OF MATERIALS

Table 1. EVAL-ADXL354BZ and EVAL-ADXL354CZ Evaluation Boards

Qty	Reference Designator	Description	Manufacturer	Part Number
1	U1	High performance, 3-axis MEMS accelerometer, LC-14	Analog Devices, Inc.	ADXL354
11	C1 to C11	Capacitors, ceramic, 0.1 µF, 50 V, 10%, X7R, 0603	Cal-Chip	GMC10X7R104K50NTLF
2	R1, R2	Resistors, 100 kΩ, 1/10W, 1%, 0603	Cal-Chip	CR0603F1001T1LF
2	MODE, RANGE	Jumpers, 3-position, through hole	Prolex	2556P03UA00
2	P1, P2	Headers, male, nonshrouded, 2 × 3, 0.1" spacing, through hole, do not insert	FCI	67996-206HLF
1	PCB	ADXL354 bare board	Analog Devices, Inc.	EVAL-ADXL354BZ or EVAL-ADXL354CZ

Table 2. EVAL-ADXL355Z Evaluation Board

Qty	Reference Designator	Description	Manufacturer	Part Number
1	U1	High performance, 3-axis MEMS accelerometer, LC-14	Analog Devices, Inc.	ADXL355
8	C4 to C11	Capacitors, ceramic, 0.1 µF, 50 V, 10%, X7R, 0603	Cal-Chip	GMC10X7R104K50NTLF
2	R1, R2	Resistors, 100 kΩ, 1/10W, 1%, 0603	Cal-Chip	CR0603F1001T1LF
1	STBY	Jumpers, 3-position, through hole	Prolex	2556P03UA00
2	P1, P2	Headers, male, nonshrouded, 2 × 3, 0.1" spacing, through hole, do not insert	FCI	67996-206HLF
1	PCB	ADXL355 bare board	Analog Devices, Inc.	EVAL-ADXL355Z

RELATED LINKS

Resource	Description
ADXL354/ADXL355	ADXL354/ADXL355 product page



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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