

### 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  $\pm 2 g$  or  $\pm 4 g$  accelerometer; the [EVAL-ADXL354CZ](#) is an analog output supporting a  $\pm 2 g$  or  $\pm 8 g$  accelerometer; and the [EVAL-ADXL355Z](#) is a digital output supporting  $\pm 2 g$ ,  $\pm 4 g$ , or  $\pm 8 g$ . 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

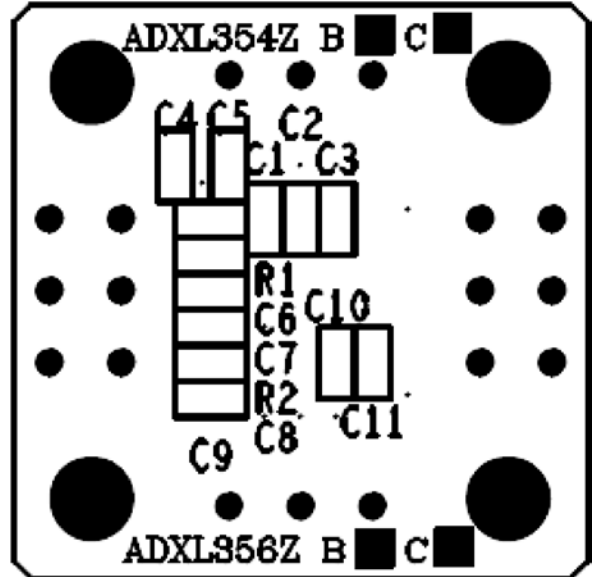


Figure 1. [EVAL-ADXL354BZ](#) and [EVAL-ADXL354CZ](#) Evaluation Boards

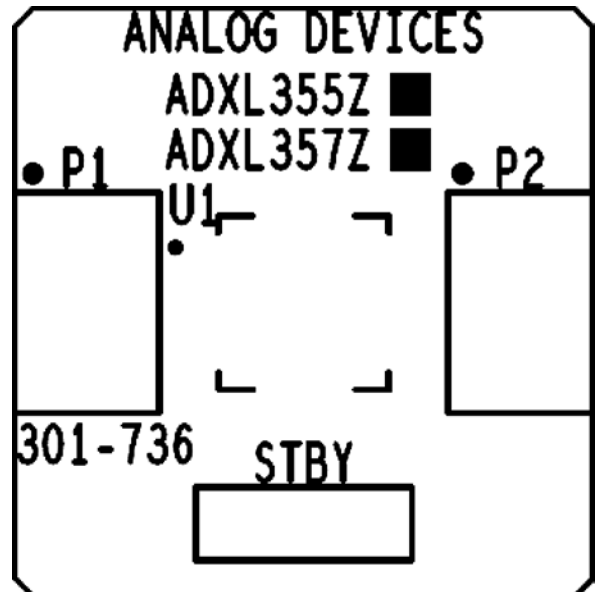


Figure 2. [EVAL-ADXL355Z](#) Evaluation Board

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**REVISION HISTORY**

**6/2018—Rev. 0 to Rev. A**

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**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  $V_{IP8ANA}$  and  $V_{IP8DIG}$  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  $\mu\text{F}$  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 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  $V_{IP8ANA}$ ,  $V_{IP8DIG}$ , TEMP, ST1, ST2, and  $V_{SS}$  (supplies the ground connection), shown in Figure 4.

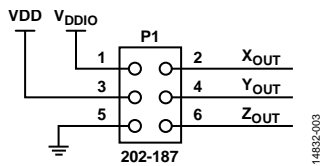


Figure 3. [EVAL-ADXL354BZ](#) and [EVAL-ADXL354CZ](#) Function Block Diagram for Header P1

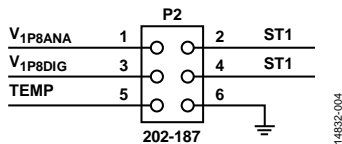


Figure 4. [EVAL-ADXL354BZ](#) and [EVAL-ADXL354CZ](#) Function Block Diagram for Header P2

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  $V_{IP8ANA}$ ,  $V_{IP8DIG}$ , MISO/ASEL,  $\overline{\text{CS}}/\text{SCL}$ , SCLK/ $V_{SSIO}$ , and MOSI/SDA (see Figure 6).

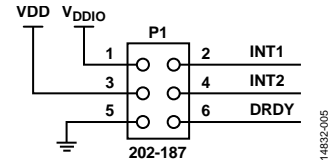


Figure 5. [EVAL-ADXL355Z](#) Function Block Diagram for Header P1

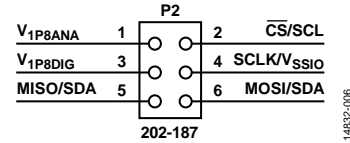


Figure 6. [EVAL-ADXL355Z](#) Function Block Diagram for Header P2

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  $\times$  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 modes 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

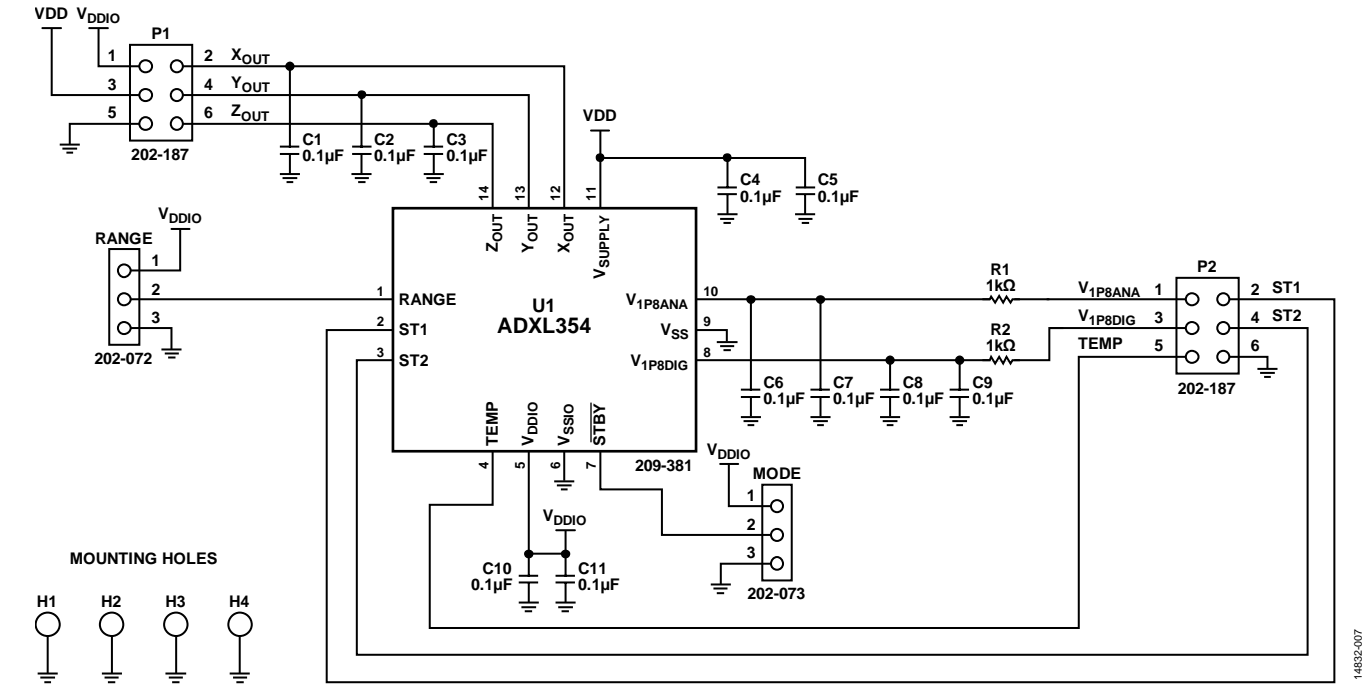


Figure 7. EVAL-ADXL354BZ and EVAL-ADXL354CZ Schematic

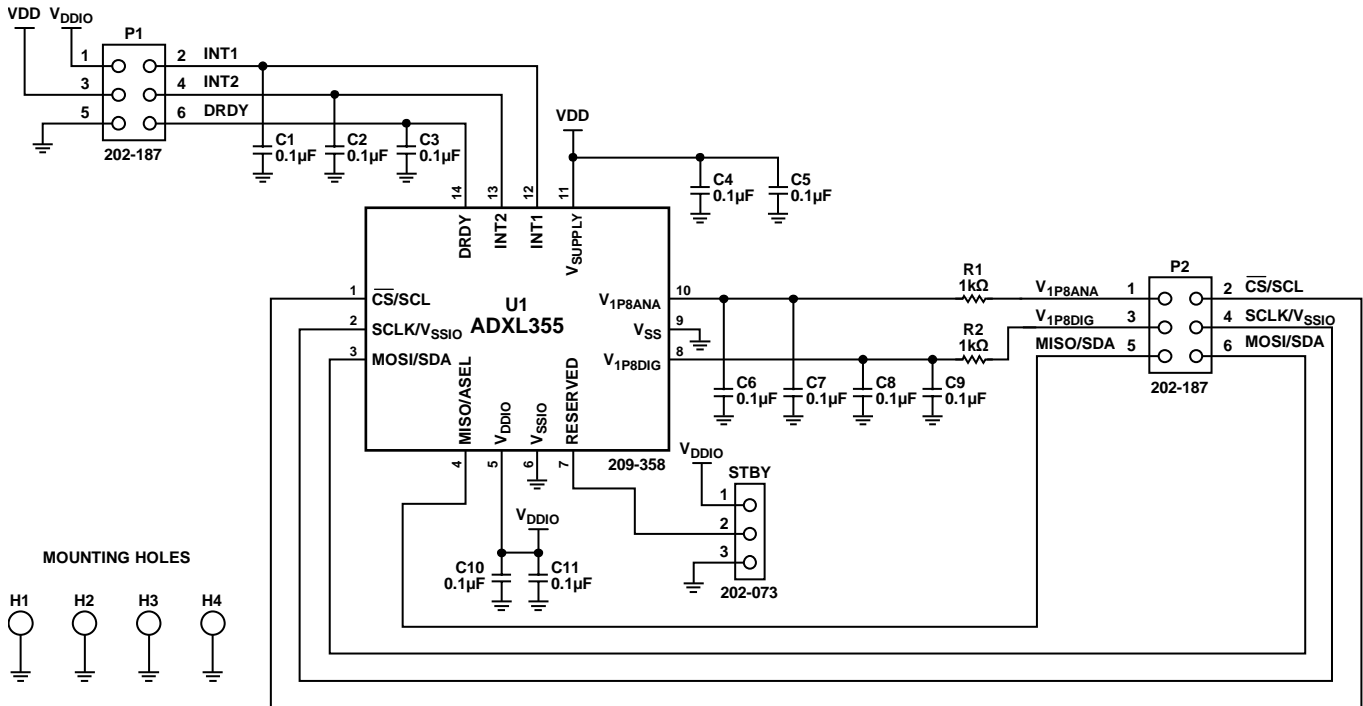


Figure 8. EVAL-ADXL355Z Schematic

# 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.	<a href="#">ADXL354</a>
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	<a href="#">ADXL354</a> bare board	Analog Devices, Inc.	<a href="#">EVAL-ADXL354BZ</a> or <a href="#">EVAL-ADXL354CZ</a>

**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.	<a href="#">ADXL355</a>
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	<a href="#">ADXL355</a> bare board	Analog Devices, Inc.	<a href="#">EVAL-ADXL355Z</a>

## RELATED LINKS

Resource	Description
<a href="#">ADXL354/ADXL355</a>	<a href="#">ADXL354/ADXL355</a> 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.

**Legal Terms and Conditions**

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