

## Evaluating the ADXL358 Low Noise, Low Drift, Low Power, 3-Axis MEMS Accelerometer

### FEATURES

- ▶ 2 sets of spaced vias for populating 6-pin headers
- ▶ Easily attaches to prototyping board or PCB
- ▶ Small size and board stiffness minimizes impact on the user system and acceleration measurements

### EQUIPMENT NEEDED

- ▶ External host processor

### DOCUMENTS NEEDED

- ▶ [ADXL358](#) data sheet

### GENERAL DESCRIPTION

The EVAL-ADXL358BZ and EVAL-ADXL358CZ are evaluation boards that allow quick evaluation of the performance of the ADXL358 low noise, low power, 3-axis, MEMS accelerometer. The EVAL-ADXL358BZ is an analog output accelerometer that supports  $\pm 10\text{ g}$  and  $\pm 20\text{ g}$  ranges whereas the EVAL-ADXL358CZ supports the  $\pm 10\text{ g}$  and  $\pm 40\text{ g}$  ranges.

These evaluation boards are ideal for evaluating the ADXL358 in an existing system because the stiffness and the small size of these evaluation boards minimize the effect of the boards on both the system and acceleration measurements.

Full details on the ADXL358 are available in the ADXL358 data sheet, which should be consulted in conjunction with this user guide when using these evaluation boards.

Note that the layout for the EVAL-ADXL358BZ and EVAL-ADXL358CZ applies to the EVAL-ADXL358Z.

### EVALUATION BOARD PHOTOGRAPHS

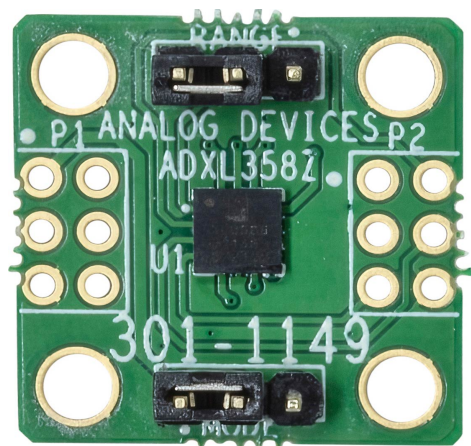


Figure 1. EVAL-ADXL358Z Top

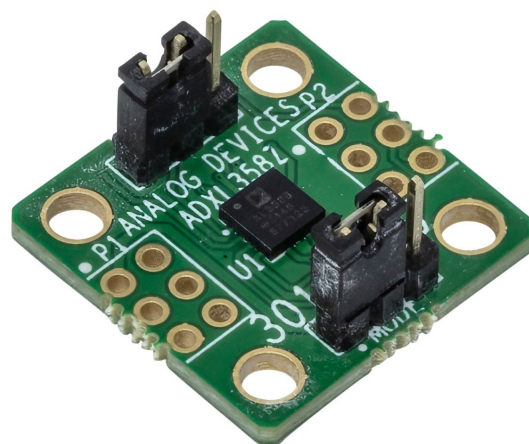


Figure 2. EVAL-ADXL358Z Angle

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REVISION HISTORY

5/2023—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

The EVAL-ADXL358BZ and EVAL-ADXL358CZ allow users to access the individual connections of the ADXL358. Each of the evaluation boards includes decoupling capacitors for the supplies, a few discrete resistors that provide isolation on the V<sub>1P8ANA</sub> and V<sub>1P8DIG</sub> pins, and two 6-pin headers. Refer to the ADXL358 data sheet for more details on the specific pin definitions. The power supplies for the ADXL358 are decoupled using multiple 0.1 μF and 1 μF ceramic (0603) capacitors.

The EVAL-ADXL358BZ and EVAL-ADXL358CZ have 0.1 μF capacitors on each axis output to set the output low-pass filter with a cutoff frequency of 50 Hz and two 3-position jumpers to configure RANGE and MODE (tied to the ADXL358  $\overline{\text{STBY}}$  pin). The two 6-pin headers provide access to all other pins.

Header P1 provides access to V<sub>DDIO</sub> (used to set the RANGE pin and the  $\overline{\text{STBY}}$  levels on the ADXL358), V<sub>DD</sub> (which supplies the ADXL358 V<sub>SUPPLY</sub> pin), V<sub>SS</sub>/V<sub>SSIO</sub> (supply common connection), and X<sub>OUT</sub>, Y<sub>OUT</sub>, and Z<sub>OUT</sub>, as shown in Figure 3.

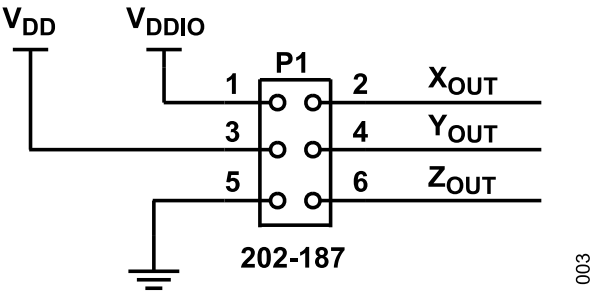


Figure 3. EVAL-ADXL358Z Functional Block Diagram for Header P1

Header P2 provides access to V<sub>1P8ANA</sub>, V<sub>1P8DIG</sub>, TEMP, ST1, ST2, and V<sub>SS</sub> (supply common connection), as shown in Figure 4.

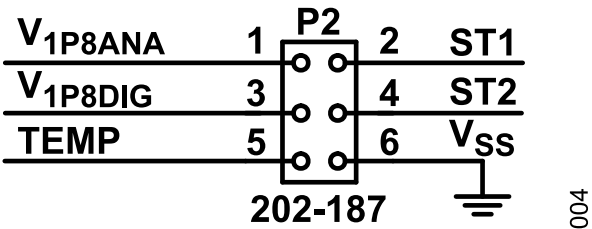


Figure 4. EVAL-ADXL358Z Functional Block Diagram for Header P2

The vias or headers allow the evaluation boards 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 evaluation boards for mechanical attachment of the evaluation boards in many applications. The analog output of the ADXL358 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 evaluation board schematic of the EVAL-ADXL358BZ and EVAL-ADXL358CZ is shown in Figure 5. The ADXL358 has two power modes. These modes can be powered either by integrated, low dropout (LDO) regulators or by external user-supplied 1.8 V regulated supplies. Refer to the ADXL358 data sheet for more information.

HANDLING CONSIDERATIONS

The EVAL-ADXL358BZ and EVAL-ADXL358CZ are not reverse polarity protected. Reversing any of the supply connections, including the V<sub>SS</sub> and the V<sub>SSIO</sub> pins, can cause damage to the ADXL358.

Dropping the evaluation boards on a hard surface can generate several thousand g of acceleration, which can exceed the ADXL358 data sheet absolute maximum limits.

## EVALUATION BOARD HARDWARE

## EVALUATION BOARD SCHEMATIC

Note that the layout for the EVAL-ADXL358BZ and EVAL-ADXL358CZ applies to the EVAL-ADXL358Z.

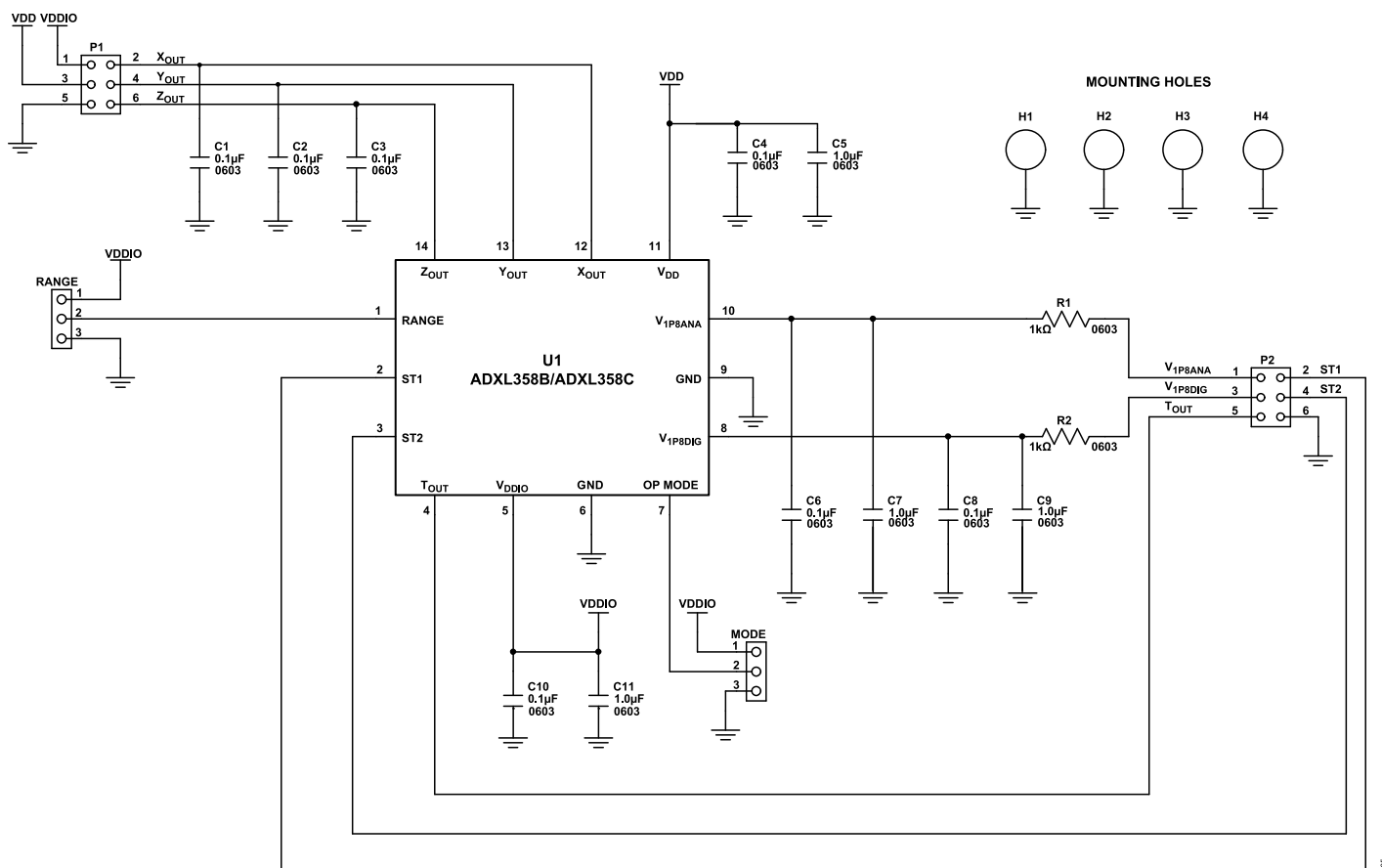


Figure 5. EVAL-ADXL358BZ/EVAL-ADXL358CZ Schematic

## ORDERING INFORMATION

## BILL OF MATERIALS

Table 1. Bill of Materials for the EVAL-ADXL358Z

Qty	Reference Designator	Description	Manufacturer	Part Number
1	U1	Low noise, low drift, low power, 3-axis MEMS accelerometer	Analog Devices, Inc.	<a href="#">ADXL358B/ADXL358C</a>
7	C1 to C4, C6, C8, C10	Capacitors, ceramic, 0.1 $\mu$ F, 50 V, 10%, X7R, 0603	Cal-Chip	GMC10X7R104K50NT
4	C5, C7, C9, C11	Capacitors, ceramic, 1.0 $\mu$ F, 10 V, 10%, X7R, 0603	Cal-Chip	GMC10X7R105K10NT
2	R1, R2	Resistors, 1 k $\Omega$ , 0.1 W, 1%, 0603	Chip Technologies	CR0603F1001T1LF
2	MODE, RANGE	Jumpers, 3-position, through hole	HSM	C2100-03ASGAS0R
2	P1, P2	Headers, male, nonshrouded, 2 $\times$ 3, 0.1 in. spacing, through hole, do not insert	FCI	67996-206HLF
1	PCB	EVAL-ADXL358BZ/EVAL-ADXL358CZ	Intempco	301-1149

**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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