

Evaluating the Low Noise, High Frequency MEMS [ADXL1001](#)/[ADXL1002](#) Accelerometers

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 digitizer and host processor

DOCUMENTS NEEDED

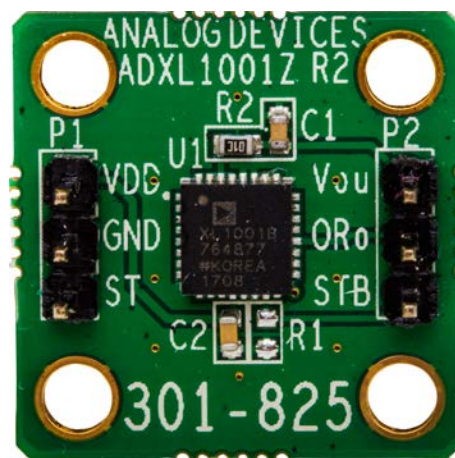
[ADXL1001/ADXL1002](#) data sheet

GENERAL DESCRIPTION

The [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) are simple evaluation boards that allow users to quickly evaluate the performance of the [ADXL1001](#) and [ADXL1002](#) vibration sensors. The [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) are specifically designed to mount onto a mechanical shaker and are constructed of an extra thick printed circuit board (PCB), measuring 0.8 inches square. Screw holes are supplied for rigid mounting to the shaker block. This design allows users to evaluate the full performance range of the [ADXL1001](#) or [ADXL1002](#) vibration sensor without having to solder the device to a separate test board. A simple RC low-pass filter is provided at the output with a -3 dB bandwidth of about 20 kHz. Components can be replaced to allow users to implement their own application specific low-pass filter on the output of the device.

Full details on the microelectromechanical systems (MEMS) [ADXL1001/ADXL1002](#) accelerometers are provided in the [ADXL1001/ADXL1002](#) data sheet, available from Analog Devices, Inc., which must be consulted in conjunction with this evaluation board user guide.

EVALUATION BOARD PHOTOGRAPHS



15710-009

Figure 1. [EVAL-ADXL1001Z](#)



15710-010

Figure 2. [EVAL-ADXL1002Z](#)

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REVISION HISTORY

3/2017—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

CIRCUIT DESCRIPTION

The schematics for the [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) are shown in Figure 3 and Figure 4. This circuit was designed to allow a user configurable low-pass filter on the device output. When no low-pass filter is needed, users must short the R1 solder pads together, and it is recommended that a bypass capacitor (22 nF) be placed on C2 for improved electromagnetic interference (EMI) rejection.

The board layouts of the [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) are shown in Figure 1 and Figure 2, and the bill of materials list for the [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) is

shown in Table 1. As delivered, the bandwidth limit of the evaluation boards is set by the external RC filter at about 20 kHz. It is recommended that additional filtering, such as a <75 kHz low-pass filter, be added to mitigate high frequency noise outside of the vibration band of interest.

SPECIAL NOTES ON HANDLING

The [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#) are not reverse polarity protected. Reversing the power supply or applying inappropriate voltages to any pin may damage the [EVAL-ADXL1001Z](#) and [EVAL-ADXL1002Z](#).

EVALUATION BOARD SCHEMATICS AND ARTWORK

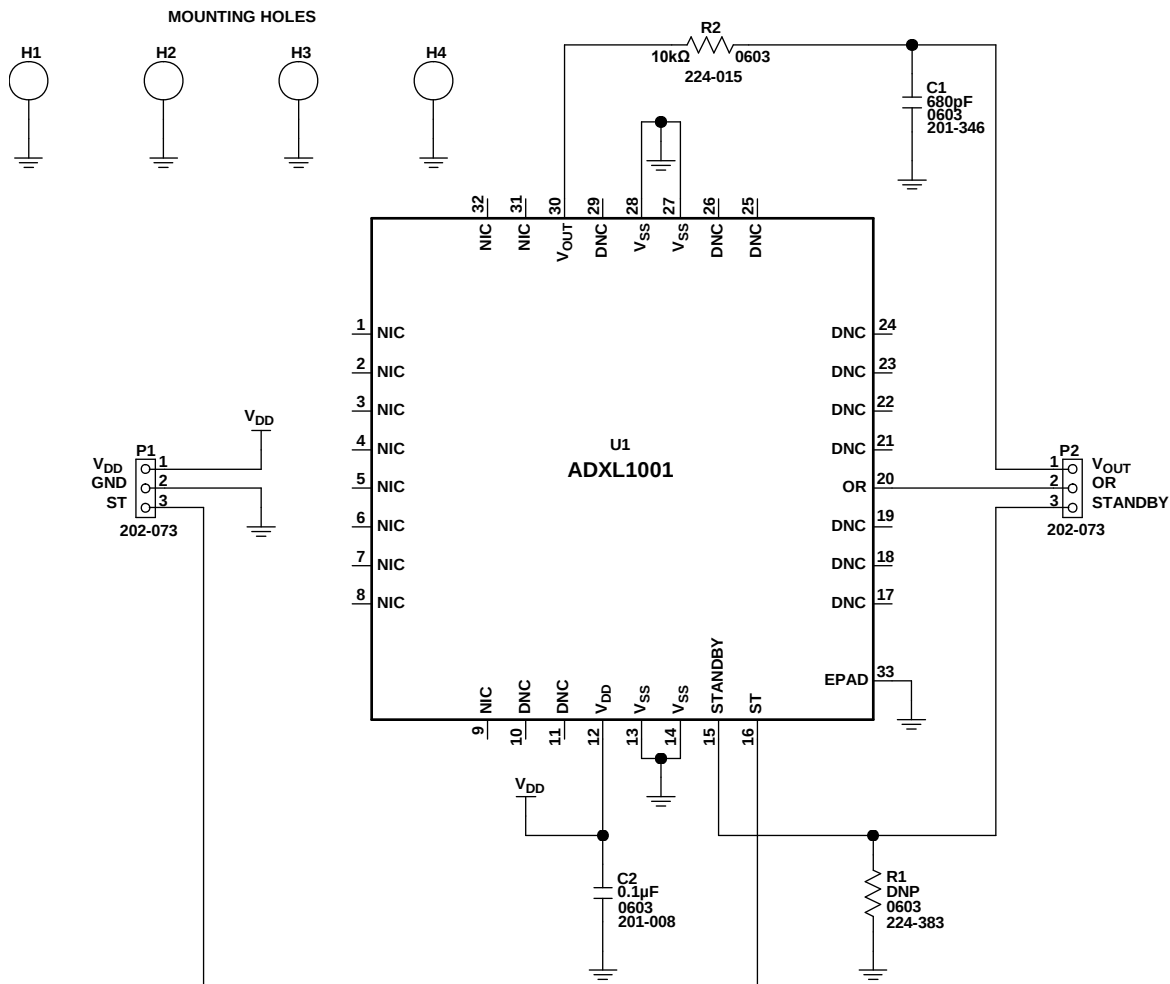


Figure 3. EVAL-ADXL1001Z Schematic

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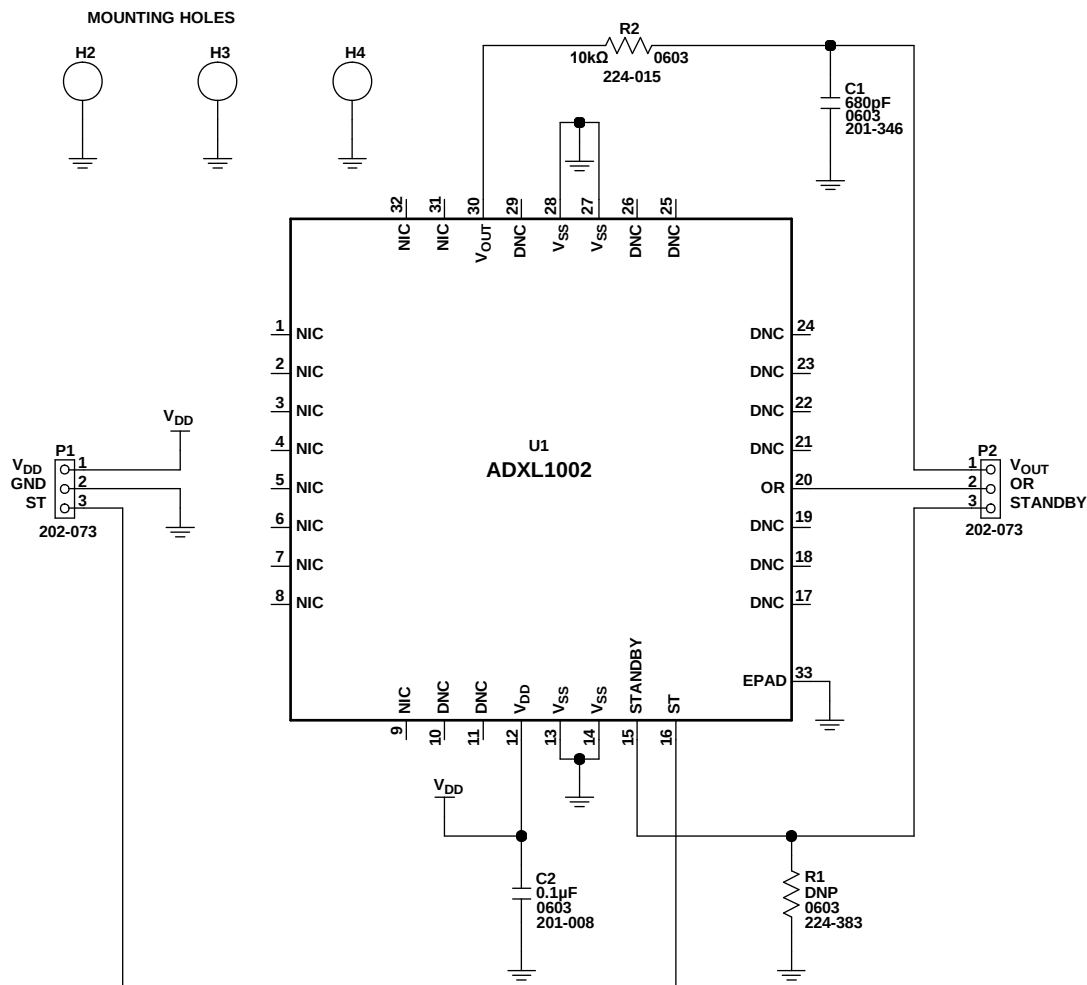
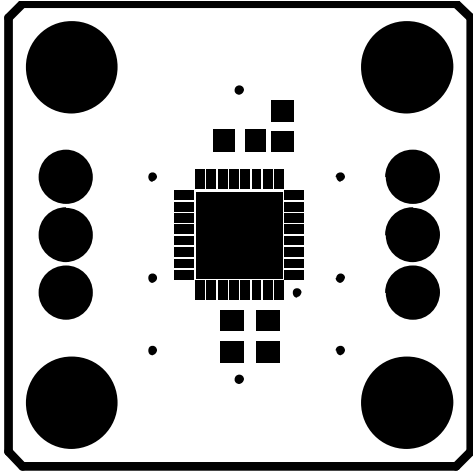


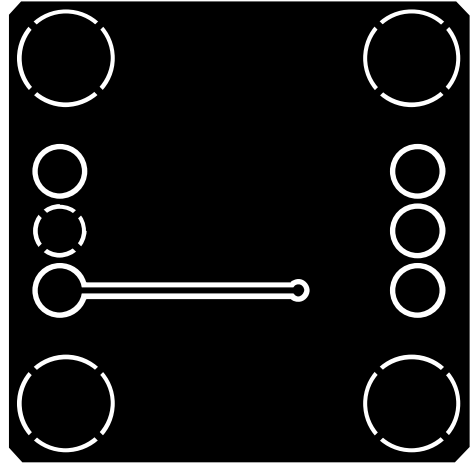
Figure 4. EVAL-ADXL100Z Schematic

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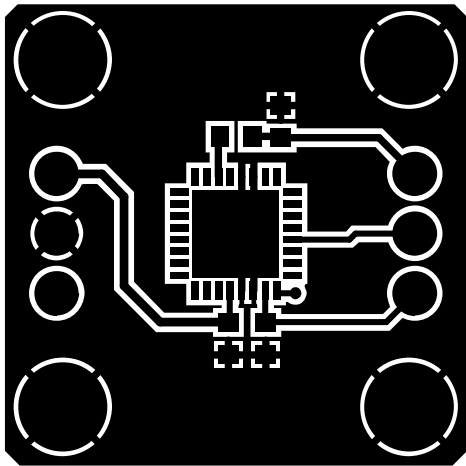
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Figure 5. Top Soldermask



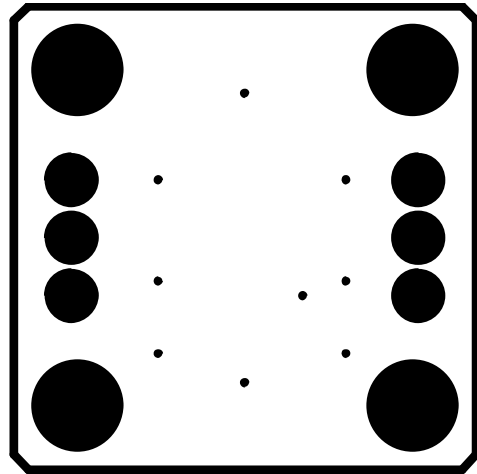
15710-007

Figure 7. Bottom Copper Layer



15710-006

Figure 6. Top Copper Layer



15710-008

Figure 8. Secondary Bottom Soldermask

ORDERING INFORMATION

BILL OF MATERIALS

Table 1. [EVAL-ADXL1001Z/EVAL-ADXL1002Z](#) Bill of Materials

Qty	Reference Designator	Description
1	C1	680 pF capacitor, 0603 size
1	C2	0.1 μ F capacitor, 0603 size
1	R1	Not included
1	R2	10 k Ω resistor, 0603 size



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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