Evaluating the **AD8251** 10 MHz, 20 V/μs, G = 1, 2, 4, 8 iCMOS Programmable Gain Instrumentation Amplifier

**FEATURES**
- Does not require software to operate
- Runs from dual supply (±7 to ±15 V)
- Gain selection through DIP switches
- Numerous test points for external stimulus
- Signal paths use SMA connectors

**EQUIPMENT NEEDED**
- Dual-output, programmable power supply (±15 V at +50 mA)
- Dual-output function generator
- Oscilloscope
- Banana to grabber test leads
- BNC to SMA coaxial cables
- A small, flat head screw driver or similar device to set DIP switches

**DOCUMENTS NEEDED**
- AD8251 data sheet

**GENERAL DESCRIPTION**

The AD8251-EVALZ user guide details how the AD8251-EVALZ evaluation board evaluates the AD8251. The user guide outlines the basic connections required to evaluate the AD8251 and describes the switch settings available to obtain desired outputs.

Many configuration options are available on the AD8251-EVALZ evaluation board that allow additional input filtering and output filtering if there is a noisy environment (see Figure 6). The logic control is covered with an on-board 5.0 V regulator and a dual in-line package (DIP) switch. However, these logic signals can be overridden and clipped on by way of the on-board test points if the DIP switch has each position set to open.

1 If the purchased AD8251-EVALZ evaluation board is a version released prior to 2015 (printed on the board), refer to the AD8251-EVALZ (Rev. 0) user guide at https://wiki.analog.com/resources/eval/ad8250-evaluation-guide.
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REVISION HISTORY
This user guide is for the redesigned AD8251-EVALZ evaluation board released in 2015 (printed on the board). If using the version released prior to 2015, refer to the AD8251-EVALZ (Rev. 0) user guide located at https://wiki.analog.com/resources/eval/ad8250-evaluation-guide.

7/2016—Rev. 0 to Rev. A
Updated Content, Figures, and Specifications to Correspond with the Updated AD8251-EVALZ Evaluation Board Released in 2015 ................................................................. Universal

6/2007—Revision 0: Initial Version
EVALUATION BOARD SOFTWARE QUICK START PROCEDURES

REQUIRED EQUIPMENT
To perform the start-up operations outlined in this guide, use the following items:

- A dual-output, programmable power supply, such as the Keithley 2230-30-1 supply.
- A dual-channel function generator, such as the LeCroy WaveStation 2012.
- An oscilloscope, such as the LeCroy WaveSurfer 3034.
- A small slotted screw driver, or similar device, to adjust the three DIP switches within the SW3 DIP switch (see Figure 7).
- Two black banana to grabber test leads, such as the Pomona 3782-36-0.
- Two red banana to grabber test leads, such as the Pomona 3782-36-2.
- Three BNC (male) to SMA (male) coaxial cables.

INITIAL CONFIGURATION PROCEDURE
1. Before any connections are made, verify the initial DIP switch configuration. Set all switches to the off position, as indicated by the silkscreen (see Figure 7).
2. Set the power supply to ±15 V with a current limit of 25 mA each channel.
3. Set the function generator to produce a complementary (in-phase and out-of-phase), 1 kHz sine wave, at a 50 mV differential amplitude signal. Select the high impedance setting on both outputs of the generator. For a 50 Ω signal source, use 25 mV.
4. Ensure the signal generator outputs are off.
5. Connect the power supply leads from the power supply source: +15 V to VIN+, −15 V to VIN−, and Common/Ground to GND.
6. Connect the J3 output signal to any channel on the oscilloscope and set the vertical setting to 100 mV/division.

POWERING UP THE AD8251-EVALZ EVALUATION BOARD
1. Enable the power supply output. Observe the indicated current consumption on the supply. The correct operation does not exceed 15 mA.
2. Turn on the two channels of the function generator.
3. Observe the output of the AD8251 evaluation board on the oscilloscope. The output must look similar to Figure 2, showing a signal of 400 mV in amplitude.
4. Set Switch 3 on the SW3 DIP switch to set the gain to Gain (G) = 2. The result must resemble Figure 3.
5. If the output signal is at 100 mV amplitude, set Switch 3 on the SW3 DIP switch to off and set Switch 2 to the on position (G = 4). The result must resemble Figure 4.
6. Finally, change the signal generator amplitude to a 10 mV differential signal and set Switch 3 on the SW3 DIP switch to the on position to set $G = 8$. The result must resemble Figure 5.

7. If Switch 1 is set to on, the AD8251 does not update any changes to the gain. Checking the gains validates the basic operation of the AD8251-EVALZ.

Figure 5. Output of the AD8251-EVALZ when $G = 8$
EVALUATION BOARD SCHEMATIC AND ARTWORK

Figure 6. AD8251-EVALZ Evaluation Board Schematic

Figure 7. AD8251-EVALZ Silkscreen
### ORDERING INFORMATION

#### BILL OF MATERIALS

<table>
<thead>
<tr>
<th>Qty</th>
<th>Reference Designator</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Part Number</th>
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<td>1</td>
<td>J5</td>
<td>Standard 2.54 mm spacing, 2-pin header</td>
<td>TE Connectivity</td>
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<td>Vishay</td>
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<td>Analog Devices, Inc.</td>
<td>AD8251ARMZ</td>
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**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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