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Evaluating the **AD8273/AD8277/AD8279** Difference Amplifiers

FEATURES

- Full featured evaluation board for the **AD8273/AD8277/AD8279**
- On-board voltage regulator
- Low cost and easy to use header for control signals
- All analog design, no software needed
- Footprints provided for alternate configurations

EVALUATION KIT CONTENTS

- AD8273-EVALZ/AD8277-EVALZ/AD8279-EVALZ** evaluation board
- AD8273-EVALZ/AD8277-EVALZ/AD8279-EVALZ** user guide (UG-744)

ADDITIONAL EQUIPMENT NEEDED

- A signal generator
- A single- or dual-output power supply
- An oscilloscope with at least 20 MHz of bandwidth
- BNC cables for signal interconnects
- Test clips for power

ONLINE RESOURCES

- AD8273** data sheet
- AD8277** data sheet
- AD8279** data sheet

GENERAL DESCRIPTION

This user guide describes the evaluation board for the **AD8273/AD8277/AD8279**. The design of this board emphasizes simplicity and ease of use. The **AD8273/AD8277/AD8279** board comes with a ready assortment of connection options (BNC and RCA connectors), and many configurations are set by jumpers.

The **AD8273**, **AD8277**, and **AD8279** data sheets cover the details of operation of the devices. Using these data sheets for reference helps designers in their end application. The data sheets are helpful for understanding the operation of the **AD8273/AD8277/AD8279**, especially during the initial configuration and when powering the board up for the first time.

AD8273/AD8277/AD8279 EVALUATION BOARD PHOTOGRAPH

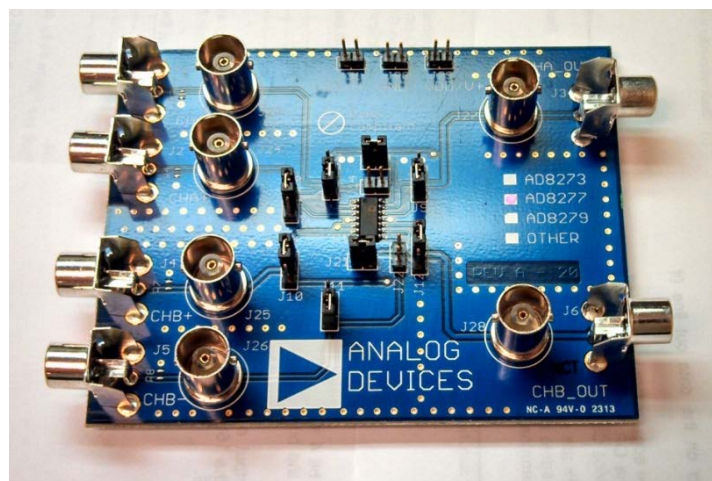


Figure 1. **AD8273/AD8277/AD8279** Evaluation Board

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REVISION HISTORY

8/15—Rev. 0 to Rev. A

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8/14—Revision 0: Initial Version

QUICK START

OVERVIEW

This section outlines the basic configuration of the [AD8273/AD8277/AD8279](#) evaluation board to test for basic functionality. It outlines the best option for the initial user experience to start up and running quickly. The expected time to be up and running is about ten minutes.

REQUIRED EQUIPMENT

Besides the [AD8273/AD8277/AD8279](#) evaluation board, a minimum of eight other items are required (see Figure 2).

- A signal source such as an arbitrary waveform generator
- A single or dual output power supply
- An oscilloscope
- Two cables, typically BNC to BNC, to connect the test equipment to the [AD8273/AD8277/AD8279](#) evaluation board
- Three clip leads to connect the power supply to the [AD8273/AD8277/AD8279](#) evaluation board

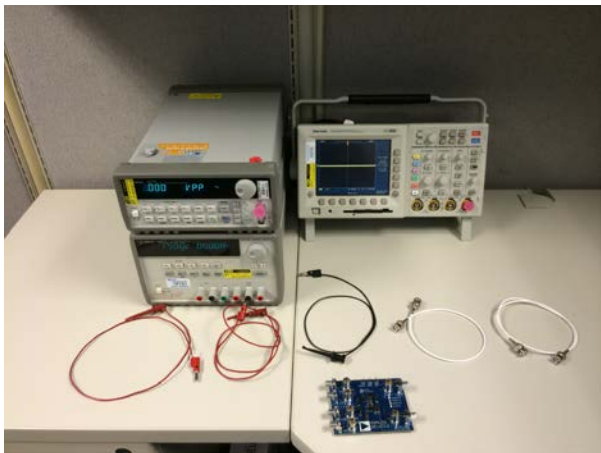


Figure 2. An Example of the Minimal Requirements for Quick Start Operation

INITIAL CONFIGURATION

To begin the initial board configuration, use the following steps:

1. With the power supply off, connect the power supply leads to the header, located at the top of the board (see Figure 3).

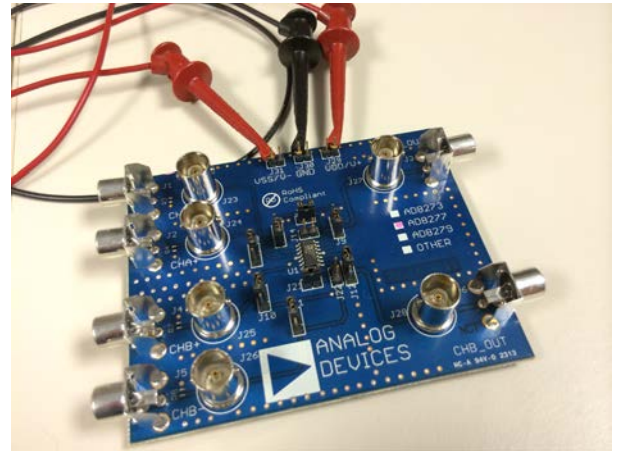


Figure 3. The [AD8273/AD8277/AD8279](#) Evaluation Board with the Basic Power Connections

2. For a single input signal source, the [AD8273/AD8277/AD8279](#) evaluation board performs best in the noninverting mode of operation. No jumper changes are required for this mode. Connect the signal source to the BNC connector designated J24, as shown in Figure 4.

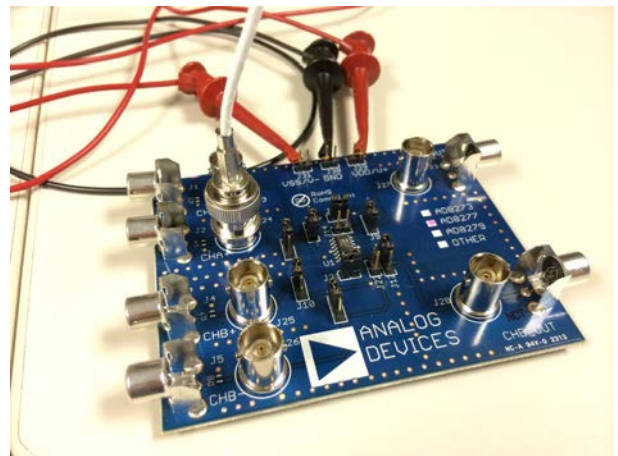


Figure 4. The [AD8273/AD8277/AD8279](#) Evaluation Board with the Source Signal Connected

3. Lastly, connect a BNC to BNC cable to the oscilloscope and Connector J27. This step completes the connections for using Channel 1 of the [AD8273/AD8277/AD8279](#) (see Figure 5).

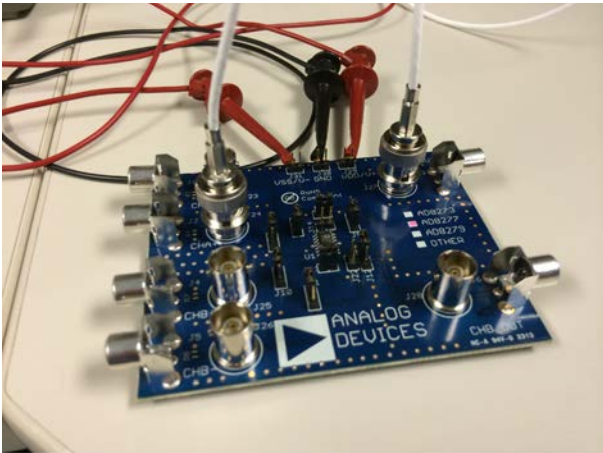


Figure 5. Completed Connections for Quick Start Usage

POWER UP

With the initial configuration complete, use the following steps to power up the [AD8273/AD8277/AD8279](#) evaluation board:

1. Set the power supply to either ± 5.0 V or +5.0 V.
2. Turn on the supply. The [AD8273/AD8277/AD8279](#) are very low in quiescent current; as a result, some power supplies may not report any current load.
3. Configure the signal source to output a 1 kHz sine wave at 2 V p-p. (Note that if the signal source is relative to a 50 Ω impedance, set the amplitude to 1 V p-p.)

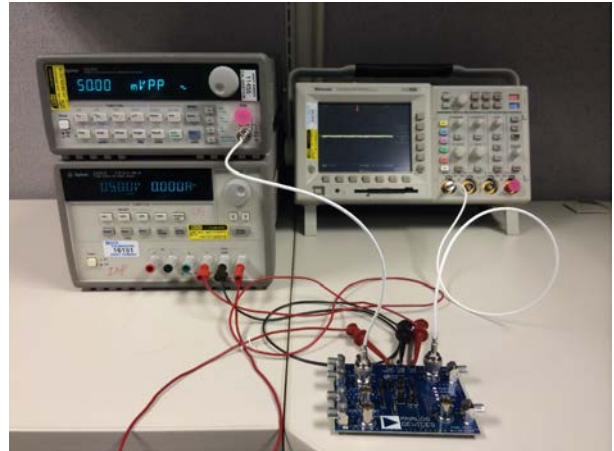


Figure 6. The Completed Setup

4. Enable the signal source. For the [AD8277](#), a 2 V p-p sine wave appears on the output of the oscilloscope. For the [AD8273](#) and [AD8279](#), a 1 V p-p sine wave appears on the output of the oscilloscope.

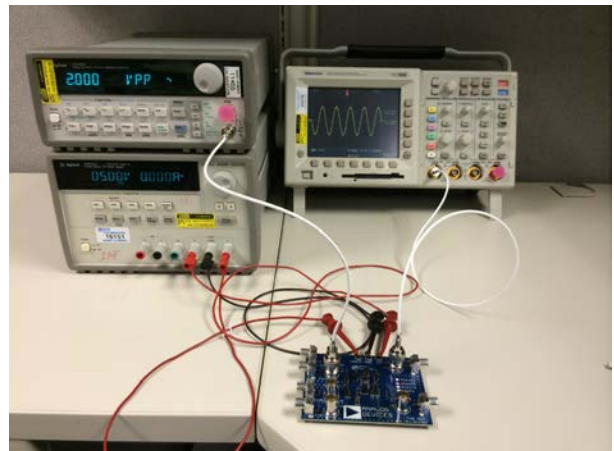


Figure 7. Final Result with 2 V p-p Signal Appearing on the Oscilloscope Using the [AD8277-EVALZ](#)

LINK CONFIGURATION OPTIONS

JUMPER CONFIGURATIONS

The AD8273/AD8277/AD8279 evaluation board offers the user many permutations of device configuration by selecting the appropriate jumpers. Each channel has an independent set of jumpers associated with its configuration and setup.

FACTORY DEFAULT CONDITION

For the AD8273 and AD8279, the factory default configuration is a difference amplifier with a gain of 0.5. For the AD8277, the factory default configuration is a difference amplifier with a gain of 1.

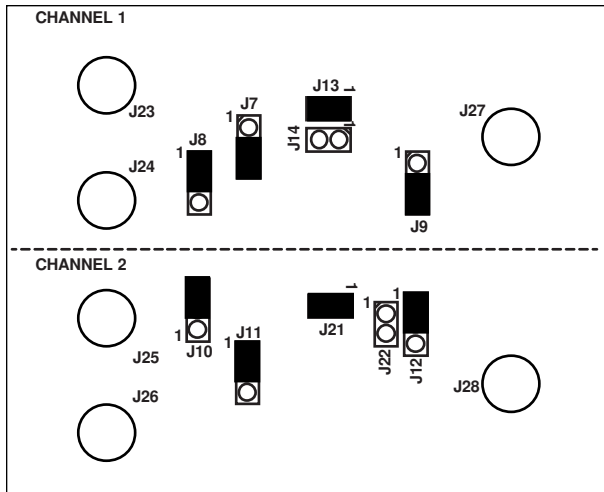


Figure 8. Factory Default Jumper Configuration

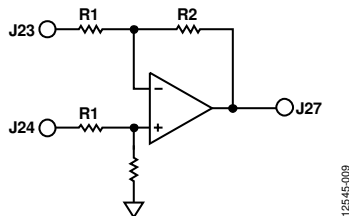


Figure 9. Factory Configuration for Channel 1 (Difference Amplifier)

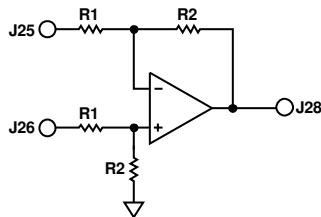


Figure 10. Factory Configuration for Channel 2 (Difference Amplifier)

CONFIGURATIONS FOR CHANNEL 1

Gain of 2, Difference Amplifier for AD8273 or AD8279

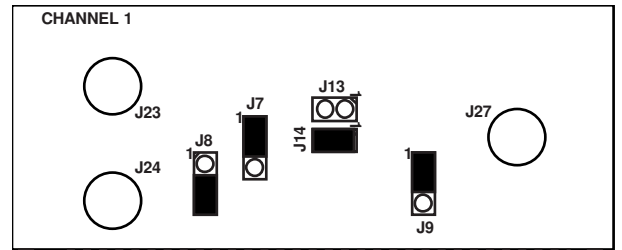


Figure 11. Schematic for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

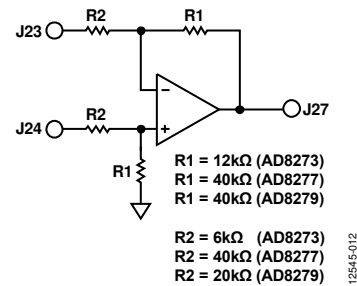


Figure 12. Jumper Configuration for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

CONFIGURATIONS FOR CHANNEL 2

Gain of 2, Difference Amplifier for AD8273 and AD8279

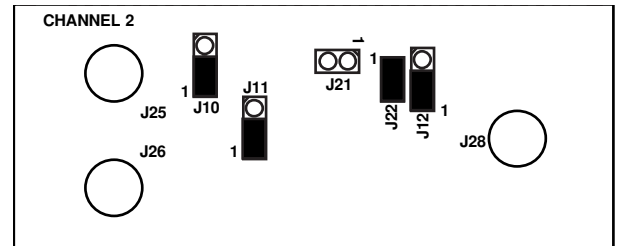


Figure 13. Schematic for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

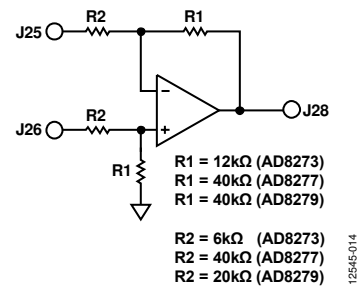


Figure 14. Jumper Configuration for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

EVALUATION BOARD SCHEMATIC

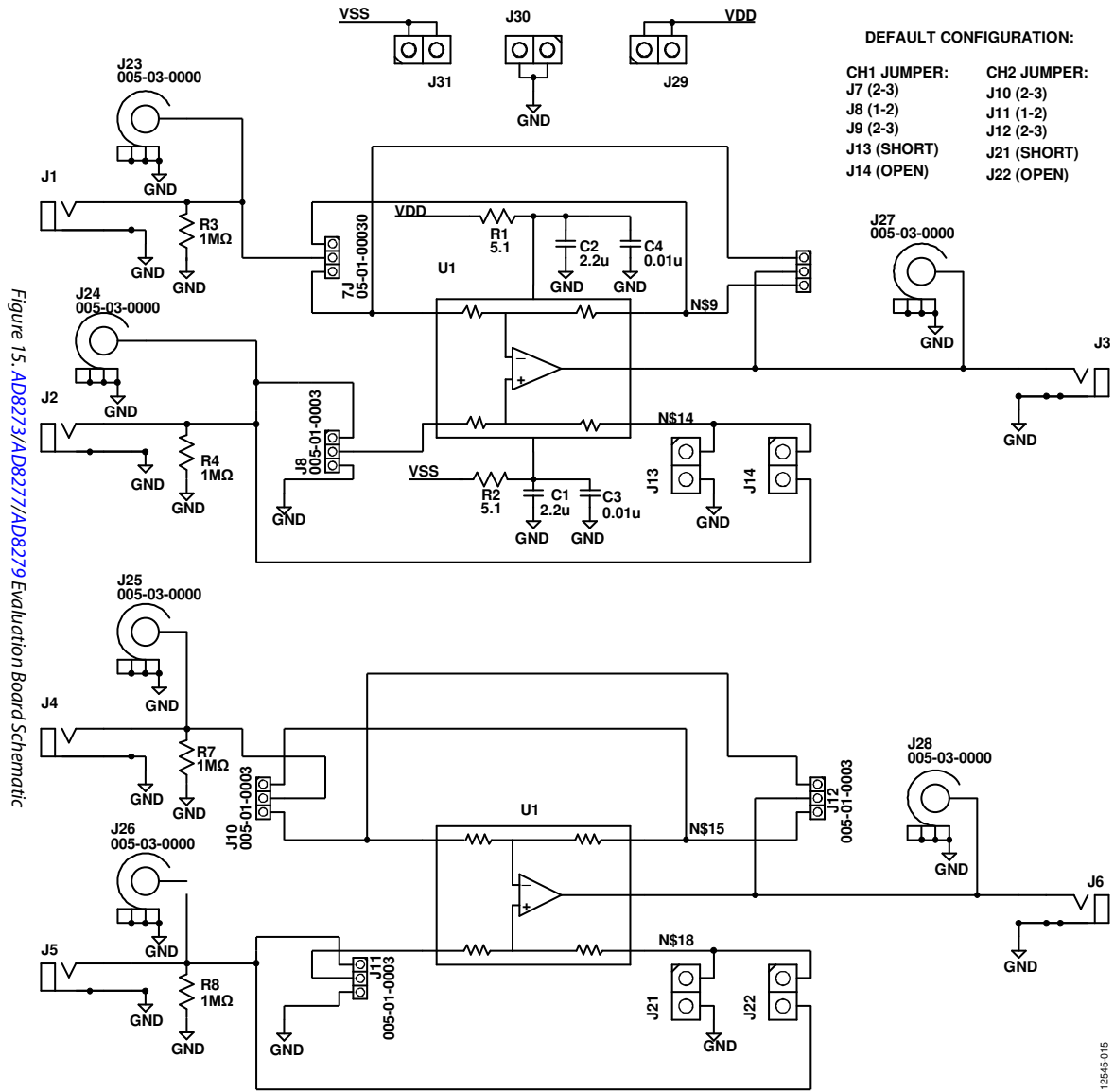


Figure 15. AD8273/AD8277/AD8279 Evaluation Board Schematic

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

| Quantity | Value | Designator | Manufacturer Part Number | Manufacturer |
|----------|--|-----------------------------------|---|----------------------|
| 2 | 2.2 μ F | C1, C2 | UMK316BJ225KD-T | Taiyo |
| 2 | 0.01 μ F | C3, C4 | C1608X7R1H103K080AA | TDK |
| 6 | RCA/RA | J1, J2, J3, J4, J5, J6 | RCJ-011 | CUI Inc |
| 6 | SIP-3 | J7, J8, J9, J10, J11, J12 | 68000-103HLF | FCI |
| 6 | BNC | J23, J24, J25, J26, J27, J28 | 5-1634503-1 | TE Connectivity |
| 7 | Not applicable | J13, J14, J21, J22, J29, J30, J31 | 5-146285-2 | TE Connectivity |
| 2 | 5.1 Ω | R1, R2 | RMCF1206JT5R10 | Stackpole |
| 1 | AD8273ARZ , AD8277ARZ , or AD8279ARZ | U1 | AD8273ARZ , AD8277ARZ , AD8279ARZ | Analog Devices, Inc. |



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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