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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

<image><image>

AD8273/AD8277/AD8279 EVALUATION BOARD PHOTOGRAPH

Figure 1. AD8273/AD8277/AD8279 Evaluation Board

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.

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REVISION HISTORY

8/15—Rev. 0 to Rev. A	
Changes to Figure 8	. 5
Changes to Table 1	. 7

8/14—Revision 0: Initial Version

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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

 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

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AD8273-EVALZ/AD8277-EVALZ/AD8279-EVALZ User Guide

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.)



2545-006

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)

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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 ۳ 12545-015 ٩ CH2 JUMPER: J10 (2-3) J11 (1-2) J12 (2-3) J21 (SHORT) J22 (OPEN) DEFAULT CONFIGURATION: ₽g ₽g J28 005-03-0000 ₽₽ CH1 JUMPER: J7 (2-3) J8 (1-2) J9 (2-3) J13 (SHORT) J14 (OPEN) ⊾₽ੂ J27 005-03-0000 002-01-0003 115 0000 b 60 155 ٨D 114 -k ₽₿ N\$15 N\$9 00 00N\$18 **N\$14** 213 121 Ş s O −þ₽ 5 Śਸ਼? ≥52.5 5 VSS g 002-01-0003 02-01-00030 ____ VSS 000 0002-01-0003 18 <u>ololo</u> ۲ R ₽ġ 002-01-0003 ∕~ 1MD > R4 1MΩ R8 1MΩ R7 1MD ₽g ₽G ₽₽ J25 005-03-0000 J23 005-03-0000 ₽₽ J26 005-03-0000 ₽Ë ₽₽ J24 n0<u>5-0</u>3-0000 ₽₽ ₽₽ ₽₿



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ORDERING INFORMATION

BILL OF MATERIALS

Tabla 1

Quantity	Value	Designator	Manufacturer Part Number	Manufacturer
2	2.2 μF	C1, C2	UMK316BJ225KD-T	Таіуо
2	0.01 μF	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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