

AD8273-EVALZ/AD8277-EVALZ/AD8279-EVALZ User Guide UG-744

One Technology Way • P.O. Box 9106 • Norwood, MA 02062-9106, U.S.A. • Tel: 781.329.4700 • Fax: 781.461.3113 • www.analog.com

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

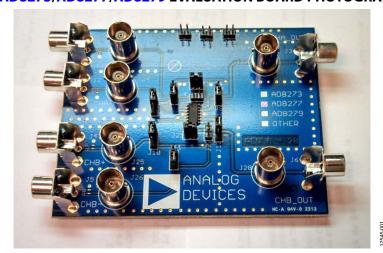


Figure 1. AD8273/AD8277/AD8279 Evaluation Board

UG-744

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

TABLE OF CONTENTS

reatures	1
Evaluation Kit Contents	1
Additional Equipment Needed	1
Online Resources	1
General Description	1
AD8273/AD8277/AD8279 Evaluation Board Photograph	1
Revision History	2
Quick Start	3
Overview	3
Required Equipment	3

Initial Configuration	3
Power Up	4
Link Configuration Options	5
Jumper Configurations	5
Factory Default Condition	5
Configurations for Channel 1	5
Configurations for Channel 2	5
Evaluation Board Schematic	6
Ordering Information	7
D:11 - CM - (: 1 -	7

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

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

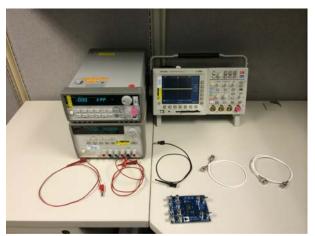


Figure 2. An Example of the Minimal Requirements for Quick Start Operation

INITIAL CONFIGURATION

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

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

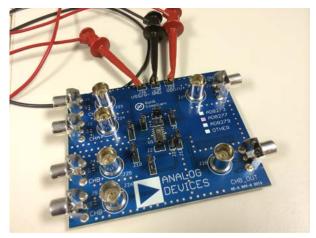


Figure 3. The AD8273/AD8277/AD8279 Evaluation Board with the Basic **Power Connections**

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.

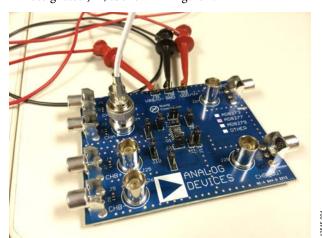


Figure 4. The AD8273/AD8277/AD8279 Evaluation Board with the Source Signal Connected

 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).

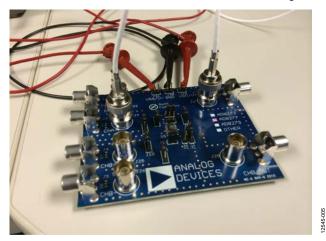


Figure 5. Completed Connections for Quick Start Usage

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 $\pm 5.0~V$ 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.)

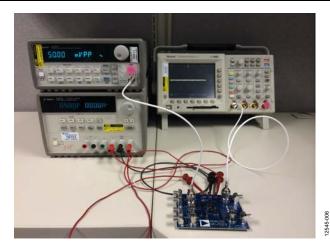
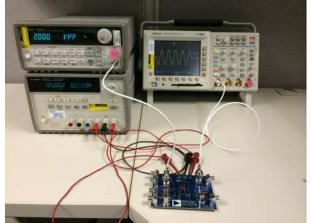


Figure 6. The Completed Setup

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.



12545-0

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.

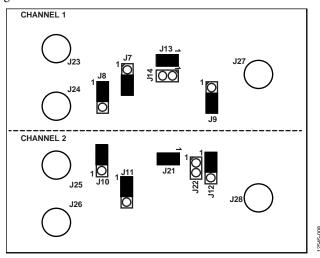


Figure 8. Factory Default Jumper Configuration

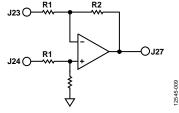


Figure 9. Factory Configuration for Channel 1 (Difference Amplifier)

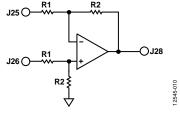


Figure 10. Factory Configuration for Channel 2 (Difference Amplifier)

CONFIGURATIONS FOR CHANNEL 1

Gain of 2, Difference Amplifier for AD8273 or AD8279

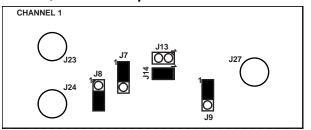


Figure 11. Schematic for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

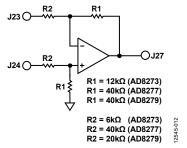


Figure 12. Jumper Configuration for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

CONFIGURATIONS FOR CHANNEL 2

Gain of 2, Difference Amplifier for AD8273 and AD8279

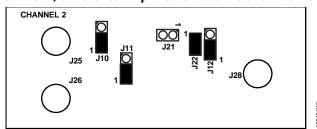


Figure 13. Schematic for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

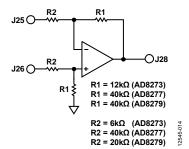


Figure 14. Jumper Configuration for Gain of 2, Difference Amplifier Setting (Note That for the AD8277, the Gain is Still 1)

EVALUATION BOARD SCHEMATIC

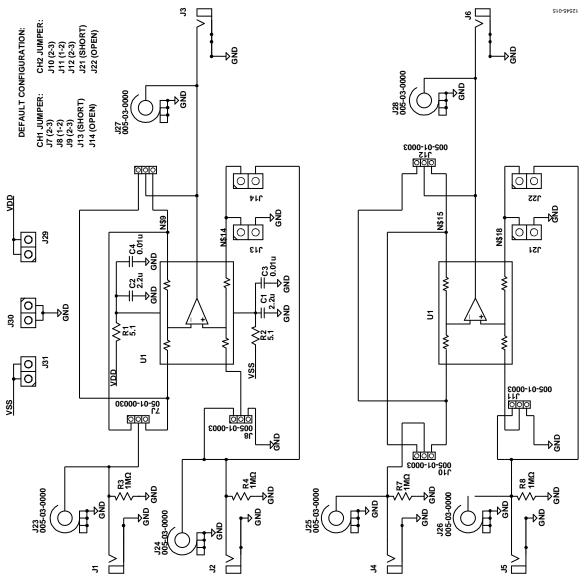


Figure 15. AD8273/AD8277/AD8279 Evaluation Board Schematic

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Quantity	Value	Designator	Manufacturer Part Number	Manufacturer
2	2.2 μF	C1, C2	UMK316BJ225KD-T	Taiyo
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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at One Technology Way, Norwood, MA 02062, USA. Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY. Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer, all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI. CONFIDENTIALITY. This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. ADDITIONAL RESTRICTIONS. Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. TERMINATION. ADI may terminate this Agreement at any time upon giving written notice to Customer, Customer agrees to return to ADI the Evaluation Board at that time, LIMITATION OF LIABILITY, THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00). EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.

©2014–2015 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners. UG12545-0-8/15(A)



www.analog.com