

## Evaluating the **ADA4622-2** Low Bias Current, Single-Supply, Rail-to-Rail Output, Precision Op Amp

### FEATURES

- Full featured evaluation board for dual low bias current amplifiers in narrow-body SOIC**
- Enables quick prototyping**
- User defined circuit configuration**
- Edge mounted SMA connector provisions**
- Easy connection to test equipment and other circuits**
- Available provision for photodiode for quick evaluation**
  - Connections available for photodiode bias**
  - Guard trace available to minimize leakage**

### GENERAL DESCRIPTION

This user guide describes the EVAL-ADA4622-2ARZ evaluation board, which allows users to test the [ADA4622-2](#) but can also be used for other dual, low bias current amplifiers that come in an 8-lead standard small outline package (SOIC\_N). The design of this evaluation board emphasizes simplicity and ease of use. Provisions are available on the board to interface easily to test equipment.

The EVAL-ADA4622-2ARZ uses a combination of surface-mount technology (SMT) in Case Size 0603, with the exception of bypass capacitors and termination resistors. The EVAL-ADA4622-2ARZ evaluation board also features a variety of unpopulated resistor and capacitor pads that provide the user with multiple choices and extensive flexibility for different application circuits.

The evaluation board also has a provision for photodiode sensors, allowing easy configuration of a transimpedance amplifier (TIA). The layout is optimized with provisions for guarding to ensure low leakage and low parasitic capacitance for TIA applications.

Full specifications of the [ADA4622-2](#) can be found in the [ADA4622-2](#) data sheet, available from Analog Devices, which must be consulted in conjunction with this user guide when using the EVAL-ADA4622-2ARZ.

### EVAL-ADA4622-2ARZ EVALUATION BOARD PHOTOGRAPH

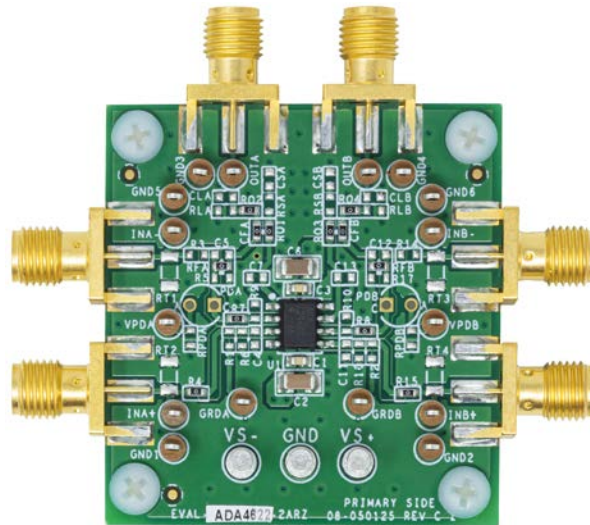


Figure 1.

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**REVISION HISTORY**

**6/2020—Revision 0: Initial Version**

## EVALUATION BOARD QUICK START OPERATION

### OVERVIEW

This section outlines the basic configuration of the EVAL-ADA4622-2ARZ board to test basic functionality of the device. Provisions are included on the board so that it is highly configurable for any application. The connectors available on the board provide an easy interface to various bench equipment.

### Power Supply

The EVAL-ADA4622-2ARZ uses turret connectors for the power supply connections. The board comes installed with  $0.1\ \mu\text{F}$  and  $10\ \mu\text{F}$  decoupling capacitors on both supplies. Apply the positive supply to the VS+ connector and the negative supply to the VS- connector.

### Amplifier Configuration

Both channels on the EVAL-ADA4622-2ARZ board are configured in a noninverting configuration with a gain of 1 by default. Preinstalled resistors accommodate this configuration. Figure 2 shows the default connections on the board.

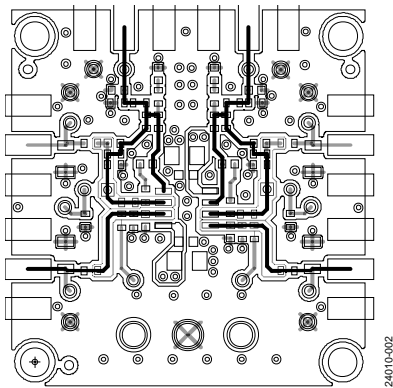


Figure 2. Default Connection

### POWER-UP PROCEDURE

To begin using the EVAL-ADA4622-2ARZ board, use the following procedure:

1. Set the power supplies to 15 V,  $-15\ \text{V}$ , and ground, and connect to the VS+, VS-, and GND turrets, respectively.
2. Connect an oscilloscope to the OUTA and OUTB Subminiature Version A (SMA) connectors.
3. Connect an input signal source to INA+ and INB+. Set the signal source to the preferred amplitude and frequency. Keep the amplitude within the input voltage range of the device to ensure proper operation.
4. Turn on the power supplies, then turn on the input signal source.

The oscilloscope now reads the same amplitude and frequency as the input signal.

### TRANSIMPEDANCE AMPLIFIER (TIA) CONFIGURATION

The low input bias current and low input capacitance of the ADA4622-2 amplifier makes this device a good choice for transimpedance configurations. The evaluation board has an on-board provision for a photodiode (radial package) on both channels of the amplifier. The evaluation board is fabricated with a guard trace around the  $-\text{IN}$  x pin to ensure minimal leakage when evaluating in a transimpedance configuration. R1 for Channel A and R2 for Channel B provide quick connections of the guard trace to the noninverting pin of the amplifier in an inverting TIA configuration.

When operating in a TIA configuration, a bias voltage can be applied to VPDA or VPDB. If no bias voltage needs to be applied, install a  $0\ \Omega$  resistor at RPDA or RPDB to connect the anode of the photodiode to ground. For this TIA configuration, install the photodiode at either PDA or PDB, along with the feedback resistor at RFA and RFB, for Channel A and Channel B, respectively. A capacitor at C5 and C12 can be added for stability of the circuit.

EVALUATION BOARD SCHEMATICS AND ARTWORK

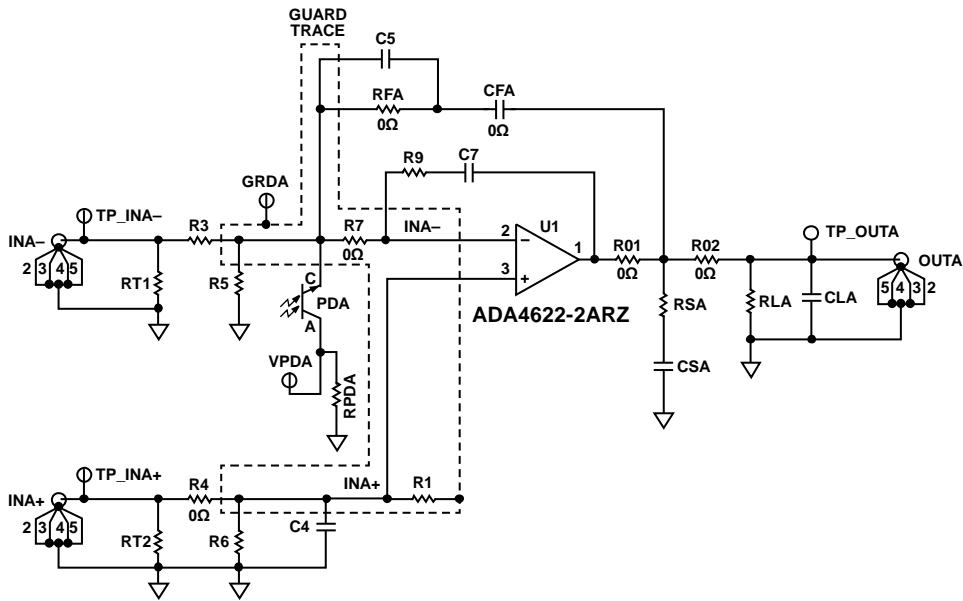


Figure 3. Channel A Circuit Connections

24010-003

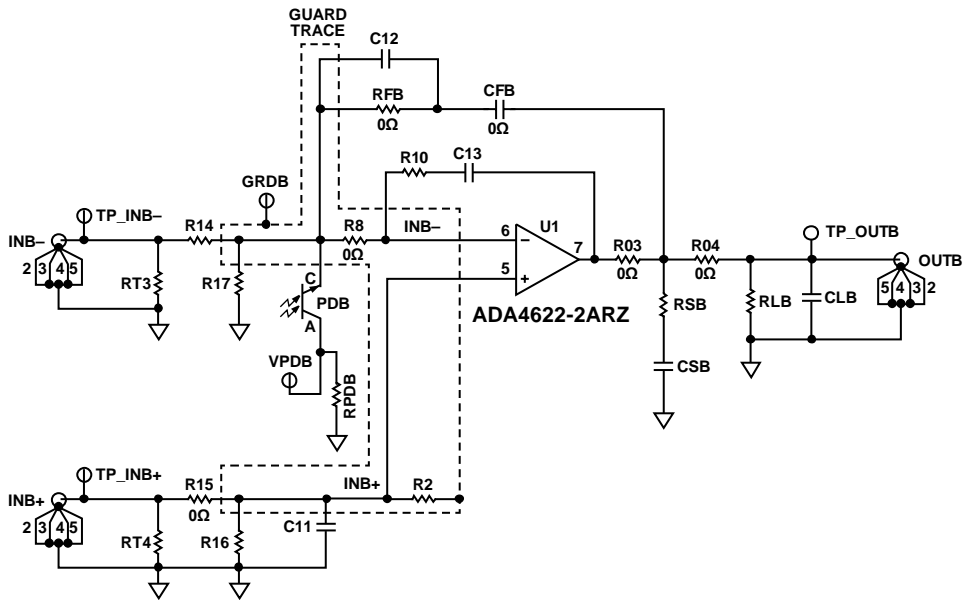


Figure 4. Channel B Circuit Connections

24010-004

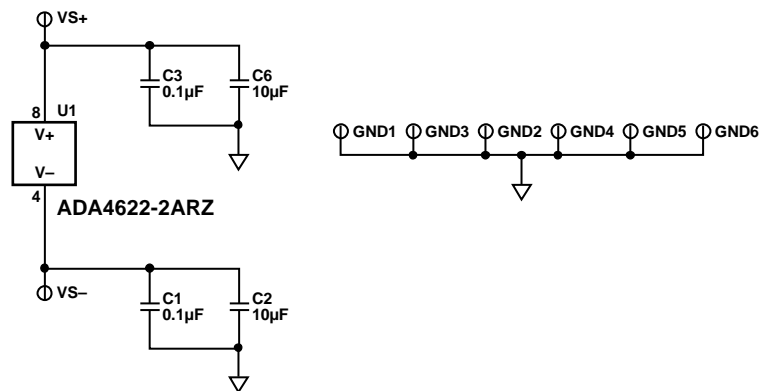


Figure 5. Power and Ground Connections

24010-005

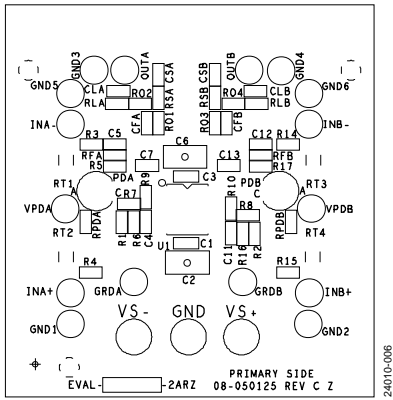


Figure 6. Assembly Drawing, Primary Side

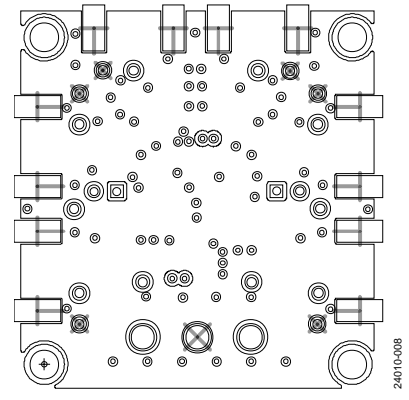


Figure 8. Layout Pattern, Secondary Side

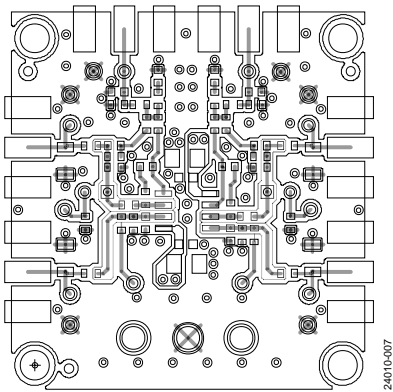


Figure 7. Layout Pattern, Primary Side

## ORDERING INFORMATION

## BILL OF MATERIALS

Table 1.

Quantity	Reference Designator	Description	Supplier	Part Number
1	U1	8-lead SOIC	Analog Devices, Inc.	ADA4622-2ARZ
2	C1, C3	Ceramic capacitors, X7R, 0603, 0.1 $\mu$ F, 50 V	Vishay	VJ0603Y104KXAAC31X
2	C2, C6	Ceramic capacitors, X5R, 0603, 10 $\mu$ F, 50 V	TDK	C3216X5R1H106K160AB
10	C4, C5, C7, C11, C12, C13, CLA, CLB, CSA, CSB	User defined capacitors, 0603	Not applicable	Not applicable
12	CFA, CFB, R4, R7, R8, R15, RFA, RFB, RO1, RO2, RO3, RO4	0 $\Omega$ resistors, 0603	Panasonic	ERJ-3GEY0R00V
16	R1, R2, RPDA, RPDB, R3, R5, R6, R9, R10, R14, R16, R17, RLA, RLB, RSA, RSB	User defined resistors, 0603	Not applicable	Not applicable
4	RT1, RT2, RT3, RT4	User defined resistors, 1206	Not applicable	Not applicable
3	GND, VS+, VS-	Connectors, solder terminal turrets	Mill-Max	2501-2-00-80-00-00-07-0
2	GND1, GND2	Test points, black	Components Corporation	TP-104-01-00
2	PDA, PDB	User defined photodiodes	Not applicable	Not applicable
6	INA+, INA-, INB+, INB-, OUTA, OUTB	Coaxial SMA end launches	Cinch Connectivity Solutions	142-0701-801
16	GND1, GND2, GND3, GND4, GND5, GND6, GRDA, GRDB, TP_INA+, TP_INA-, TP_INB+, TP_INB-, TP_OUTA, TP_OUTB, VPDA, VPDB	Connectors, PCB test points	Keystone Electronics	5115

**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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