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Evaluation Board User Guide for the ADA4625-1 Low Noise, Fast Settling, Single Supply, RRO, JFET Op Amp

FEATURES

Full featured evaluation board for the ADA4625-1
Enables quick prototyping
User defined circuit configuration
Edge mounted SMA connector provisions
Easy connection to test equipment and other circuits

EVALUATION KIT CONTENTS

EVAL-ADA4625-1ARDZ evaluation board

DOCUMENTS NEEDED

ADA4625-1 data sheet

GENERAL DESCRIPTION

This user guide describes the evaluation board for the ADA4625-1 low noise, fast settling, single supply, rail-to-rail output (RRO), junction field effect transistor (JFET) op amp in an 8-lead small outline integrated circuit (SOIC) package with an exposed pad. The design of this evaluation board emphasizes simplicity and ease of use. This evaluation board is a 2-layer board that accommodates edge mounted SubMiniature version A (SMA) connectors on the inputs and outputs. The SMA connectors allow efficient connection to test equipment or other circuitry.

The evaluation board ground plane, components placement, and power supply bypassing are optimized for maximum circuit flexibility and performance. The exposed pad of the ADA4625-1 is connected to the ground plane on the evaluation board to enhance thermal and noise performance. The evaluation board uses a combination of surface mount technology (SMT) component case sizes 0603 and 0805, with the exception of the bypass capacitors, Capacitor C3 and Capacitor C5, which have a maximum standard size of 1206. The evaluation board also features a variety of unpopulated resistor and capacitor pads, which provide the user with multiple choices and extensive flexibility for different application circuits and configurations, such as active loop filters, transimpedance amplifiers (TIAs), and charge amplifiers.

The ADA4625-1 data sheet covers the specifications and details of the device operation and application circuit configurations and guidance. Consult the data sheet in conjunction with this user guide for a better understanding of the device operation, especially when powering up the evaluation board for the first time.

Figure 1 shows the top view of the evaluation board, and Figure 2 shows the bottom view.

EVAL-ADA4625-1ARDZ PHOTOGRAPHS

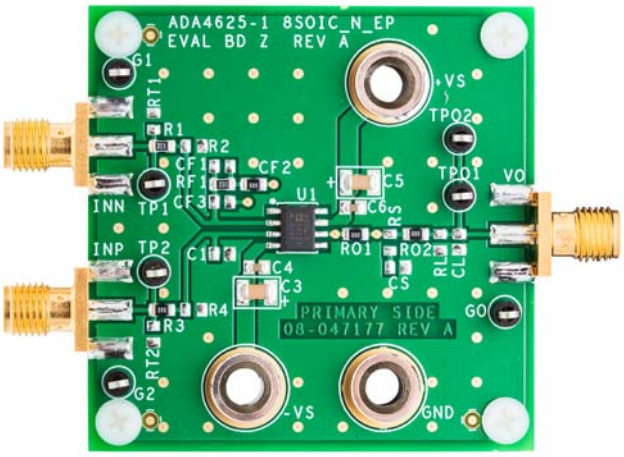

Figure 1. Top View

Figure 2. Bottom View

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REVISION HISTORY

10/2017—Revision 0: Initial Version

QUICK START OPERATION

OVERVIEW

This section outlines the basic configuration of the ADA4625-1 evaluation board to test basic functionality of the device. For first time users, quick start operation is the best option to begin using the evaluation board immediately.

The input signal is applied to the edge mounted SMA type radio frequency (RF) connectors (INN and INP). The output signal is accessible via the edge mounted SMA connector (VO).

ADDITIONAL EQUIPMENT NEEDED

- A signal generator
- A dual output dc power supply
- An oscilloscope with a bandwidth of at least 20 MHz
- Two SMA male to Bayonet Neill-Concelman (BNC) male cables
- Three banana plug to banana plug cables
- Optional 3 inch test hook jumper and SMA short

POWER SUPPLY CONFIGURATION

The banana jacks, designated by +VS, −VS, and GND, power the evaluation board. Connect the dc power with correct polarity and voltage. Reverse polarity or overvoltage can permanently damage the evaluation board. Permissible supply voltages range from 5 V to 36 V. Higher voltages may damage the amplifier. Decoupling capacitors of 10 µF and 0.1 µF come preinstalled on the board for ready operation.

INITIAL CONFIGURATION

To start the initial evaluation board configuration, use the following procedure:

1. Ensure that the power supply is off. Using the banana to banana cables, connect the positive supply, negative supply, and ground to the banana jacks +VS, −VS, and GND, respectively.
2. Connect the signal source to INP or Test Point TP2 and connect INN to ground.
3. Connect the output SMA connector (VO) to the oscilloscope using an SMA to BNC cable. Set the oscilloscope to 1 MΩ input impedance.

POWER-UP PROCEDURE

After completing the initial configuration, use the following procedure to power up the board:

1. Set the V+ supply to 15 V and V− supply to −15 V.
2. Turn on the power supply. The typical supply current of the ADA4625-1 is 4.0 mA. Current drawn from the power supply must not exceed 5 mA.
3. Configure the signal source to output a 1 kHz sine wave of 1 V p-p.
4. Enable the signal source. The oscilloscope must be able to measure a 10 V p-p sine wave at the output of the ADA4625-1.

EVALUATION BOARD SCHEMATIC AND ARTWORK

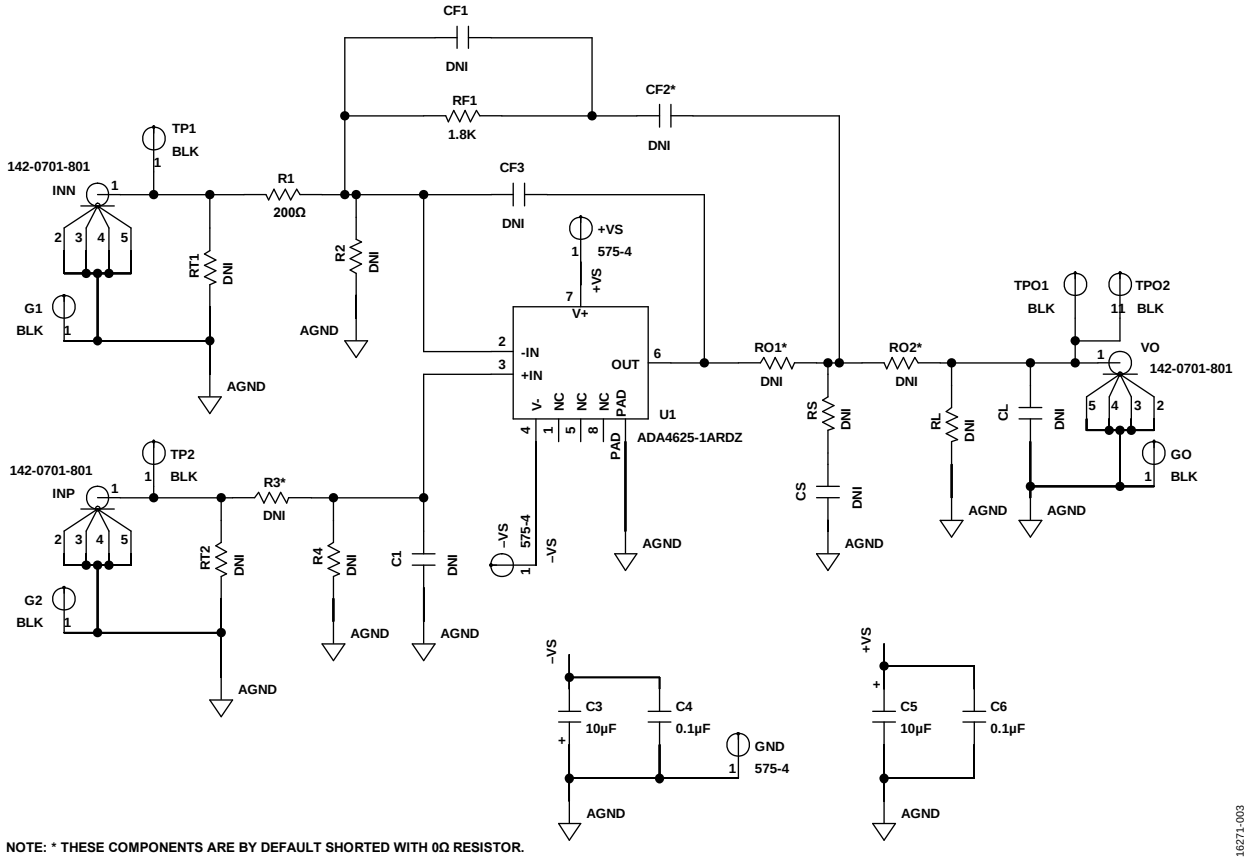

Figure 3. Evaluation Board Schematic

EVALUATION BOARD LAYOUT

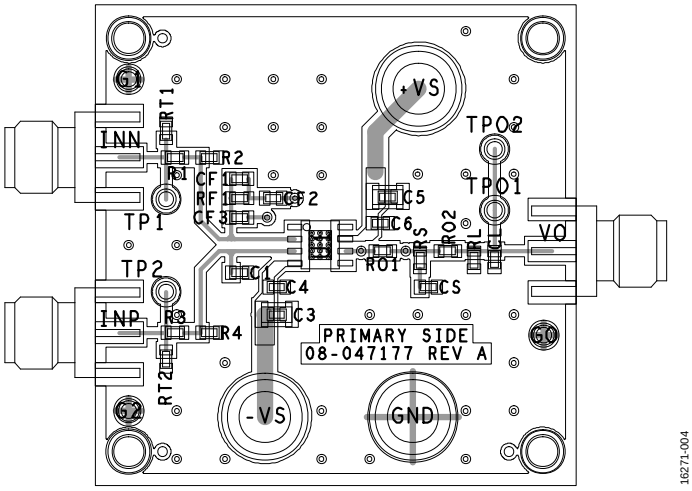

Figure 4. Component Side Layout

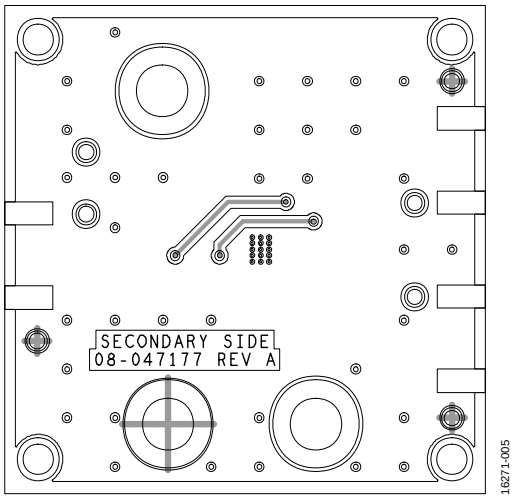

Figure 5. Circuit Side Layout

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Reference Designator	Description	Supplier	Part Number
1	U1	8-lead SOIC_N_EP	Analog Devices, Inc.	ADA4625-1ARDZ
2	C3, C5	Ceramic capacitors, X7R, 0603, 0.1 µF, 100 V	Murata Manufacturing Co.	GRM188R72A104
2	C4, C6	Ceramic capacitors, X5R, 1206, 10 µF, 50 V	Murata Manufacturing Co	GRM31CR61H106
1	R1	200 Ω resistor	Panasonic	ERA-6AEB201V
1	RF	1.82 kΩ resistor	Panasonic	ERA-6YEB182V
6	C1, CF1, CF2, CF3, CS, CL	User defined capacitors; CF2 is shorted with a 0 Ω resistor		
9	RT1, RT2, R2, R3, R4, RO1, RO2, RS, RL	User defined resistors; R3, RO1, and RO2 are shorted with 0 Ω resistors		
3	INN, INP, VO	Coax SMA end launch	Cinch Connectivity Solutions	142-0701-801
7	G1, G2, GO, TP1, TP2, TPO1, TPO2	Conn-PCB, test points	Components Corporation	TP-104-01-00
3	+VS, −VS, GND	Connectors, banana jack	Keystone Electronics	575-4

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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