EVAL-FDA-1RMZ-8 User Guide
UG-888

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Evaluation Board for Differential Amplifiers Offered in 8-Lead MSOP Packages

FEATURES

Flexible board layout for various circuit configurations
Enables quick breadboarding/prototyping
Edge mounted SMA connector provisions
Easy connection to test equipment and other circuits
RoHS compliant

GENERAL DESCRIPTION

The Analog Devices, Inc., DIFF AMP MSOP 8 PIN EVAL BD Z (EVAL-FDA-1RMZ-8) evaluation board evaluates single, high speed, fully differential amplifiers offered in 8-lead MSOP packages. The evaluation board is a bare board that enables users to quickly prototype a variety of amplifier circuits, minimizing risk and reducing time to market. The board layout is flexible and allows many circuit configurations, including traditional four resistor circuits, circuits with two different feedback loops, and filters. Most resistors and capacitors use 1206, 0402, 0508, and 0603 packages.

Because this universal evaluation board can be used with many Analog Devices differential amplifiers in 8-lead MSOP packages, the evaluation board label does not contain specific device numbers.

The board accommodates the ADA4940-1, as well as the AD8131, AD8132, and AD8138 differential amplifiers (see the Related Links section for all devices). The data sheets for these devices should be consulted in conjunction with this evaluation board user guide.

Figure 1 shows the component side of the bare evaluation board. Figure 2 shows the circuit side of the bare evaluation board.

Figure 3 shows the evaluation board schematic. The printed circuit board (PCB) assembly drawings are shown in Figure 4 and Figure 5. The layout pattern for the PCB is shown in Figure 6 and Figure 7.

EVALUATION BOARD COMPONENT SIDE AND CIRCUIT SIDE

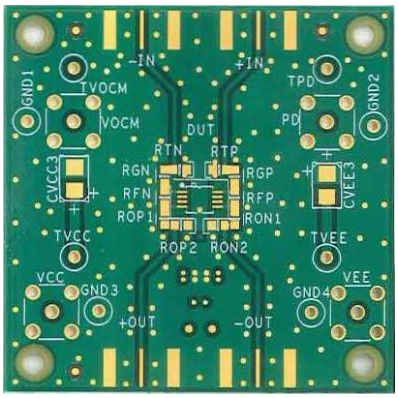

Figure 1. Evaluation Board, Component Side

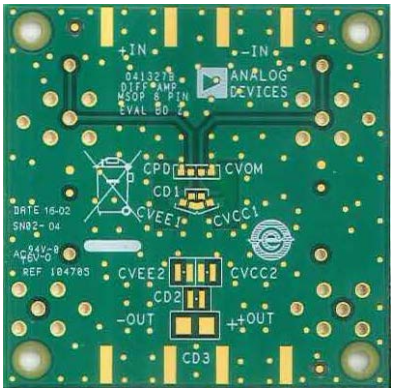

Figure 2. Evaluation Board, Circuit Side

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REVISION HISTORY

3/16—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

POWER SUPPLIES

Apply power to the evaluation board through the TVCC and TVEE test points (see Figure 3). The board accommodates single or dual supplies. For single-supply operation, connect the negative supply to the ground plane.

It is important that the power supply pins of the device under test (DUT) have broadband decoupling circuitry. The board layout facilitates the decoupling ability with footprints for 0508 ceramic capacitors (CVCC2 and CVEE2) on each supply, as well as 0402 ceramic capacitors (CVCC1 and CVEE1). Bulk decoupling is provided by CVCC3 and CVEE3; 10 µF tantalum capacitors are recommended.

FEEDBACK NETWORKS AND INPUT/OUTPUT TERMINATIONS

Resistors RGN and RFN comprise the negative resistive feedback loop and Resistors RGP and RFP comprise the positive feedback loop (see Figure 3). To minimize summing node capacitances, the ground plane under and around Pin 1 and Pin 8 of the DUT and the copper that connects to the pins are removed.

Resistors RTN and RTP are included as input termination resistors for applications that have single-ended inputs.

V_{OCM} INPUT

An external voltage can be applied to the V_{OCM} pin on the DUT via the TVOCM test point (referenced to the ground plane of the board). In analog-to-digital converter (ADC) driver applications, it is convenient to apply the ADC dc reference voltage output directly. The CVOM component position can be used for both resistors and capacitors. A 0.1 µF capacitor provides bypassing for the dc voltage applied to the V_{OCM} pin in normal applications.

It is also possible to drive the V_{OCM} input from an external ac source. In this case, omit CVOM or reduce it to a value that allows the desired signal to pass.

COMMON-MODE VOLTAGE

The internal common-mode feedback loop, used in the differential drivers, forces the output common-mode voltage to equal the voltage applied to the V_{OCM} input, thereby providing excellent output balance.

SMA INPUT/OUTPUT CONNECTORS

The inputs and outputs have edge mounted SMA connectors for a convenient connection to coaxial cables. The recommended connector is 142-0701-801 from Johnson Components, or an equivalent.

EVALUATION BOARD SCHEMATIC AND ARTWORK

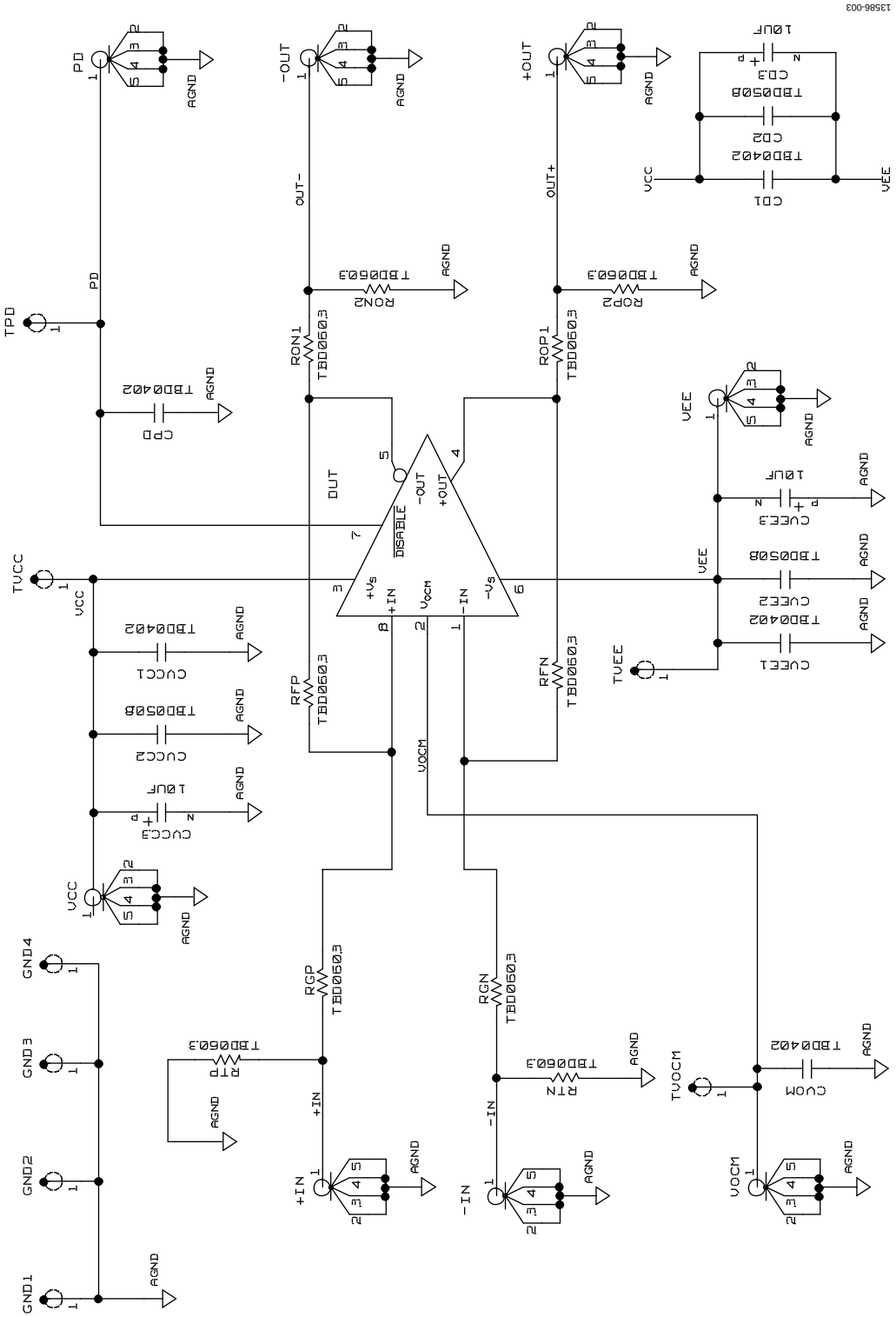

Figure 3. Differential Amplifier Evaluation Board Schematic, 8-Lead MSOP

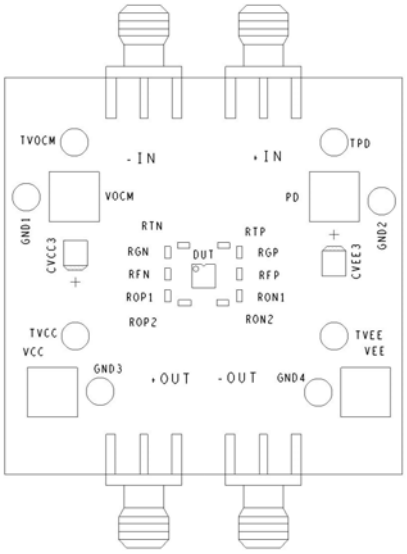

Figure 4. Top Silkscreen

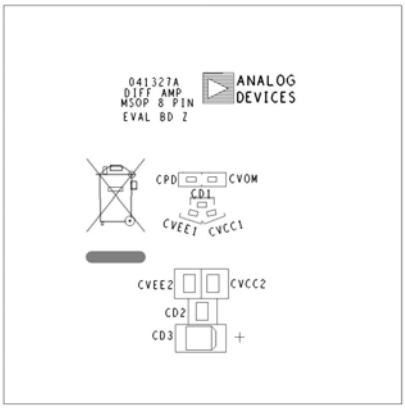

Figure 5. Bottom Silkscreen

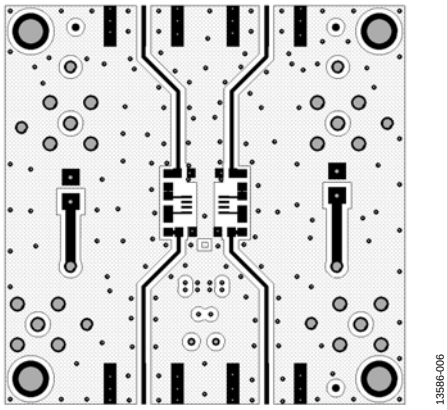

Figure 6. Assembly Drawing, Component Side

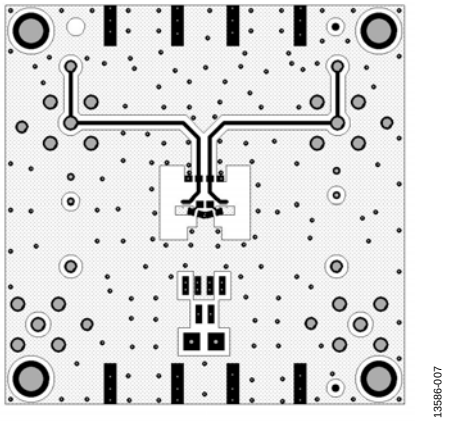

Figure 7. Assembly Drawing, Circuit Side

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Reference Designator	Description	Package
3	CVCC3, CVEE3, CD3	Capacitor, 10 µF	C1206
3	CVCC2, CVEE2, CD2	Capacitor, 0.1 µF	C0508
3	CVCC1, CVEE1, CD1	Capacitor, 0.1 µF	C0402
2	CPD, CVOM	Capacitor or resistor	C0402
4	−IN, +IN, −OUT, +OUT	Side launch SMA connector	SMA/SMT
4	VCC, VEE, VOCM, PD	Vertical launch SMA connector	SMA/SMT
10	RTN, RTP, RGP, RGN, RFP, RFN, ROP1, RON1, ROP2, RON2	Resistor, user defined value	R0603
8	TVCC, TVEE, TVOCM, TPD, GND1 to GND4	Test point	TP1
1	DUT	Device under test	8-lead SOIC
1	PCB	Printed circuit board	

RELATED LINKS

Table 2.

Resource	Description
ADA4940-1	Product page, ultralow power, low distortion differential ADC driver
AD8131	Product page, low cost, high speed differential driver with a fixed gain of 2
AD8132	Product page, low cost, high speed differential amplifier
AD8137	Product page, low cost, high speed differential ADC driver
AD8138	Product page, low distortion differential ADC driver
AD8139	Product page, ultralow noise, rail-to-rail differential ADC driver

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