Evaluation Board User Guide
UG-132

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Differential Amplifier Evaluation Board for Single 16-lead 3 mm × 3 mm LFCSP Packages

FEATURES

Flexible board layout
Accommodates the ADA492x-1 and ADA493x-1 family of differential amplifiers
Allows for various circuit configurations
Enables quick breadboarding/prototyping
Edge-mounted circuit configuration
Easy connection to test equipment and other circuits
RoHS compliant

GENERAL DESCRIPTION

The Analog Devices, Inc., differential driver evaluation board makes it easy for designers to obtain quick performance results for their particular differential driver application circuits. The board layout is very flexible and allows for many circuit configurations, including traditional four-resistor circuits, circuits with two different feedback loops, circuits with input and output transformers, filters, and many others. Most resistors and capacitors use 0603 and 0508 packages.

The evaluation board part number labeling does not contain any specific differential amplifier part number information because this is a universal evaluation board and can be used with any Analog Devices differential amplifier in a 16-lead, 3 mm × 3 mm LFCSP with a dedicated feedback pin.

The board accommodates the ADA492x-1 and ADA493x-1 family of differential amplifiers. The data sheets for these devices should be consulted in conjunction with this evaluation board user guide.

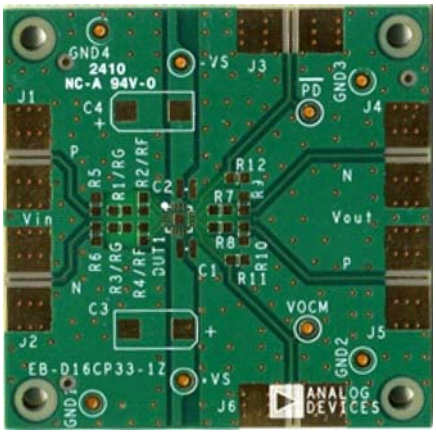

Figure 1. Component Side (LFCSP)

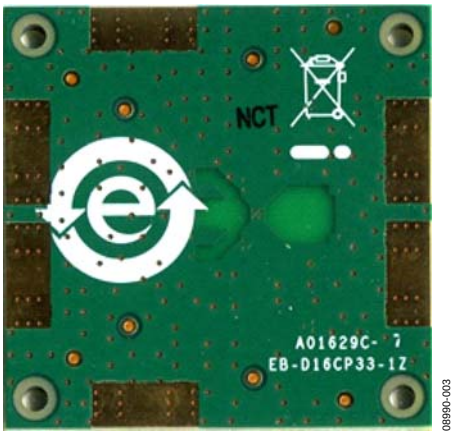

Figure 2. Circuit Side (LFCSP)

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REVISION HISTORY

10/10—Revision 0: Initial Version

DIFFERENTIAL DRIVER EVALUATION BOARD SCHEMATIC

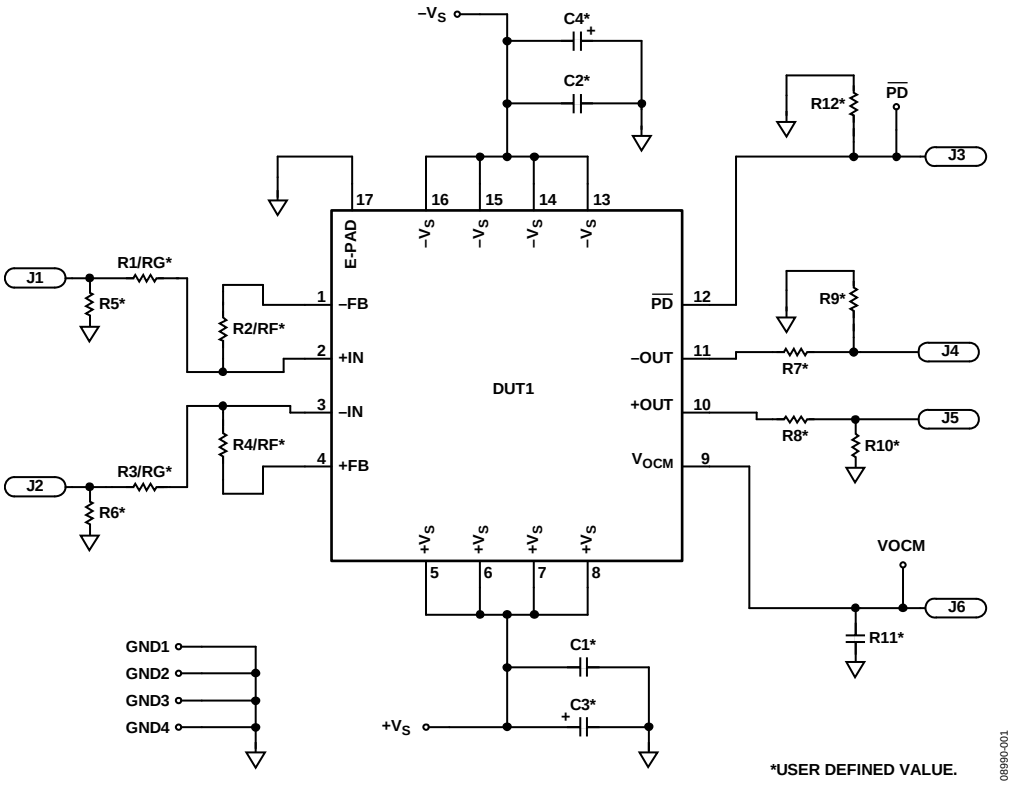

Figure 3. Differential Driver Evaluation Board Schematic

EVALUATION BOARD HARDWARE

POWER SUPPLIES

Power is applied to the board through test pins $+V_S$ and $-V_S$ (see Figure 3). The board accommodates single or dual supplies. For single-supply operation, connect the negative supply to the ground plane.

It is very important that the power supply pins of the device under test (DUT) have broadband decoupling circuitry. The board layout facilitates this with footprints for a 0508 ceramic capacitor C1 and C2) on each supply. Bulk decoupling is provided by C3 and C4; 10 μF tantalum capacitors are recommended.

FEEDBACK NETWORKS AND INPUT/OUTPUT TERMINATIONS

R1/RG and R2/RF comprise the upper resistive feedback loop (see Figure 3), and R3/RG and R4/RF compose the lower feedback loop. To minimize summing node capacitances, the ground plane under and around Pin 1 and Pin 8 of the DUT (see Figure 3) and the copper that connects to them have been removed.

R5 and R6 are included as input termination resistors for applications that have single-ended inputs.

V_{OCM} INPUT

An external voltage can be applied to V_{OCM} via J6 (referenced to the ground plane of the board). In ADC driving applications, it is convenient to apply the ADC dc reference voltage output directly to J6. The R11 component position can be used for both resistors and capacitors. A 0.1 μF capacitor is used in normal applications to provide bypassing for the dc voltage applied to the V_{OCM} pin.

It is also possible to drive the V_{OCM} input from an external ac source. In this case, omit R11 or reduce it to a value that allows the desired signal to be passed.

COMMON-MODE VOLTAGE

The internal common-mode feedback loop used in the differential drivers forces the output common-mode voltage to be equal to 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 convenient connection to coaxial cables. The recommended connector type is Johnson Components™, Part Number 142-0701-801 or equivalent.

EVALUATION BOARD LAYOUT

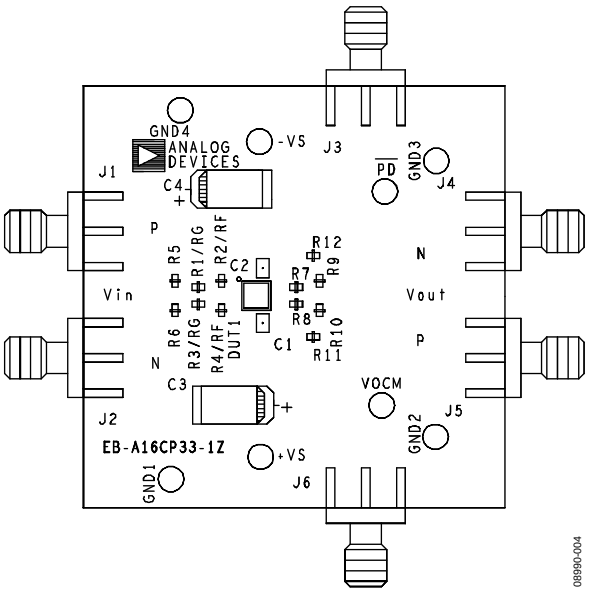

Figure 4. Assembly Drawing Component Side

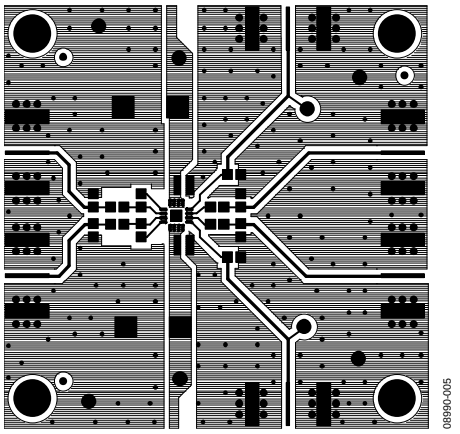

Figure 5. Component Side Metallization (LFCSP)

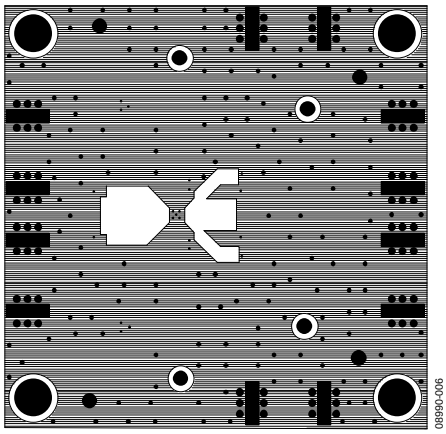

Figure 6. Circuit Side Metallization (LFCSP)

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Reference Designator	Package	Description
2	C3, C4	C7343	10 µF capacitor
2	C1, C2	C0508	Capacitor, 0.1uF
6	J1 to J6	SMASMT	SMA connector
12	R1/RG, R2/RF, R3/RG, R4/RF, R5 to R12	R0603	Resistor, user defined value
8	$+V_S$, $-V_S$, PD/DIS, V_{OCM}, GND1 to GND4	TP1	Test point
1	DUT1	16-lead LFCSP	Device under test
1			PC board

RELATED LINKS

Table 2.

Resource	Description
ADA4927-1	Product page, ultralow distortion current feedback differential ADC driver
ADA4930-1	Product page, ultralow noise driver for low voltage ADCs
ADA4932-1	Product page, low power differential ADC driver
ADA4937-1	Product page, single supply ultralow distortion differential ADC driver
ADA4938-1	Product page, ultralow distortion differential ADC driver
ADA4939-1	Product page, G > 2 ultralow distortion differential ADC driver

NOTES

NOTES

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.

ANALOG DEVICES

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