AMC-ADA4945-1EBZ Evaluation Board User Guide
UG-1514

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AMC-ADA4945-1EBZ Amplifier Mezzanine Card

FEATURES

Amplifier mezzanine card for ADC evaluation boards
Compatible with 10-lead, PulSAR® evaluation boards and select Σ-Δ ADCs
Enables change of ADC driver circuits
User defined circuit configuration

GENERAL DESCRIPTION

The Analog Devices, Inc., AMC-ADA4945-1EBZ evaluation board allows the user to evaluate the ADA4945-1 fully differential amplifier as an analog-to-digital converter (ADC) driver for specified ADCs. The AMC-ADA4945-1EBZ evaluation board mounts onto compatible ADC evaluation boards via the 7-pin J1 and J2 headers, enables quick evaluation of multiple amplifier and ADC combinations, and can be configured to accept either a single-ended or differential input signal.

The evaluation board uses several 2-pin and 3-pin headers to control various features of the ADA4945-1. Apply the proper jumpers to set the ADA4945-1 high and low output clamp levels, set the ADA4945-1 output common-mode voltage, choose the high or low power mode for the ADA4945-1, and set the ADA4945-1 digital ground level.

Optimized power and ground planes ensure low noise and high speed operation. Component placement and power supply bypassing provide maximum circuit flexibility and performance. The AMC-ADA4945-1EBZ evaluation board accepts 0402 surface mount technology (SMT) components, 0805 bypass capacitors, and 2.54 mm headers.

Full specifications on the ADA4945-1 are available in the ADA4945-1 data sheet. Consult the data sheet in conjunction with this user guide when working with the AMC-ADA4945-1EBZ evaluation board.

EVALUATION BOARD PHOTOGRAPH

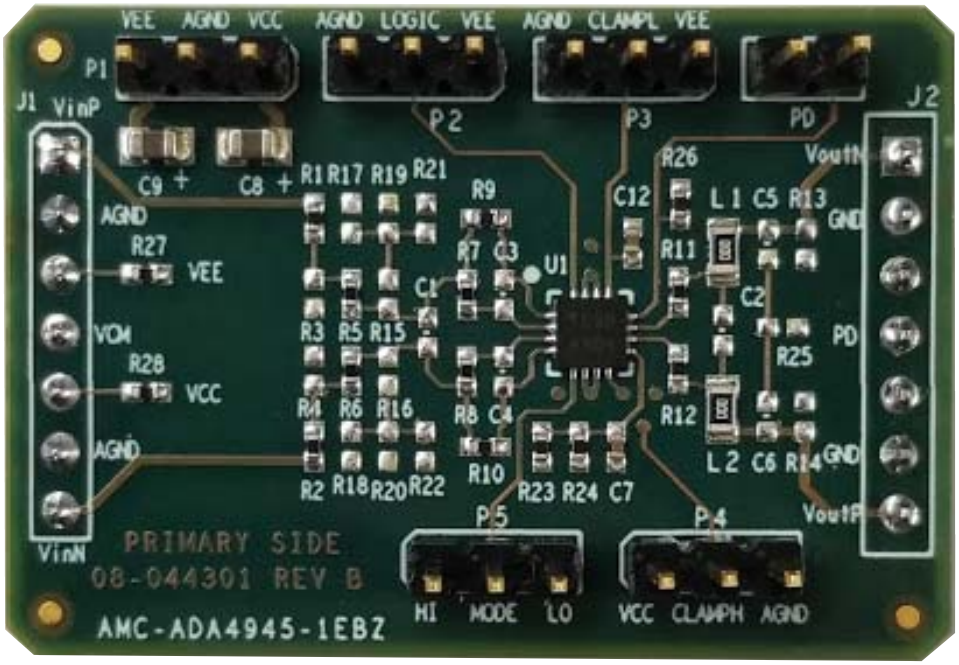

Figure 1.

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REVISION HISTORY

8/2020—Rev. 0 to Rev. A

Changes to Figure 2 4

3/2019—Revision 0: Initial Version

FUNCTIONALITY AND CONTROL

OUTPUT CLAMPS

Use the 3-pin P3 and P4 headers to set the ADA4945-1 output clamp voltage levels at the $+V_{CLAMP}$ pin and the $-V_{CLAMP}$ pin (see Figure 2 and Figure 3). To set the $+V_{CLAMP}$ voltage level to the positive supply (VCC), place a jumper across Pin 1 and Pin 2 of the P4 header. To set the $+V_{CLAMP}$ voltage level to any user defined level, apply an external voltage at Pin 2 of the P4 header. Pin 3 is connected to analog ground (AGND). Use the P3 header to set the $-V_{CLAMP}$ voltage level to the negative supply (VEE) or a user defined level.

SETTING THE DIGITAL GROUND (DGND) LEVEL

Use the 3-pin P2 header to set the logic reference level (DGND) to VEE, AGND, or a user defined level (see Figure 2 and Figure 3). To set the DGND level to VEE, place a jumper across Pin 1 and Pin 2 of the P2 header. To set the DGND level to AGND, place a jumper across Pin 2 and Pin 3 of the P2 header. If a different logic reference level is required, apply the desired voltage directly to Pin 2.

SUPPLIES, POWER MODES, AND DISABLE

The VCC and VEE power supplies are connected at the 3-pin P1 header.

Use the 3-pin P5 header to select full power operating mode or low power operating mode (see Figure 2 and Figure 3). Short Pin 1 and Pin 2 to place the ADA4945-1 in full power operating mode. Short Pin 2 and Pin 3 to place the ADA4945-1 in low power operation mode.

Short across the 2-pin PD header to place the ADA4945-1 in disable mode.

OUTPUT COMMON-MODE VOLTAGE

The AMC-ADA4945-1EBZ evaluation board receives a reference voltage from the ADC evaluation board through Pin 4 of the J1 connector (see Figure 2 and Figure 3). This reference voltage is divided in half via the R23 and R24 resistor divider, and applied to the V_{OCM} pin of the ADA4945-1. Certain ADC evaluation boards provide a reference voltage that is already divided down. If the common-mode voltage is already divided down, change R23 to 0 Ω and remove R24. When R23 and R24 are removed, V_{OCM} defaults to an internally generated level midway between $+V_{CLAMP}$ and $-V_{CLAMP}$.

EVALUATION BOARD SCHEMATIC AND ARTWORK

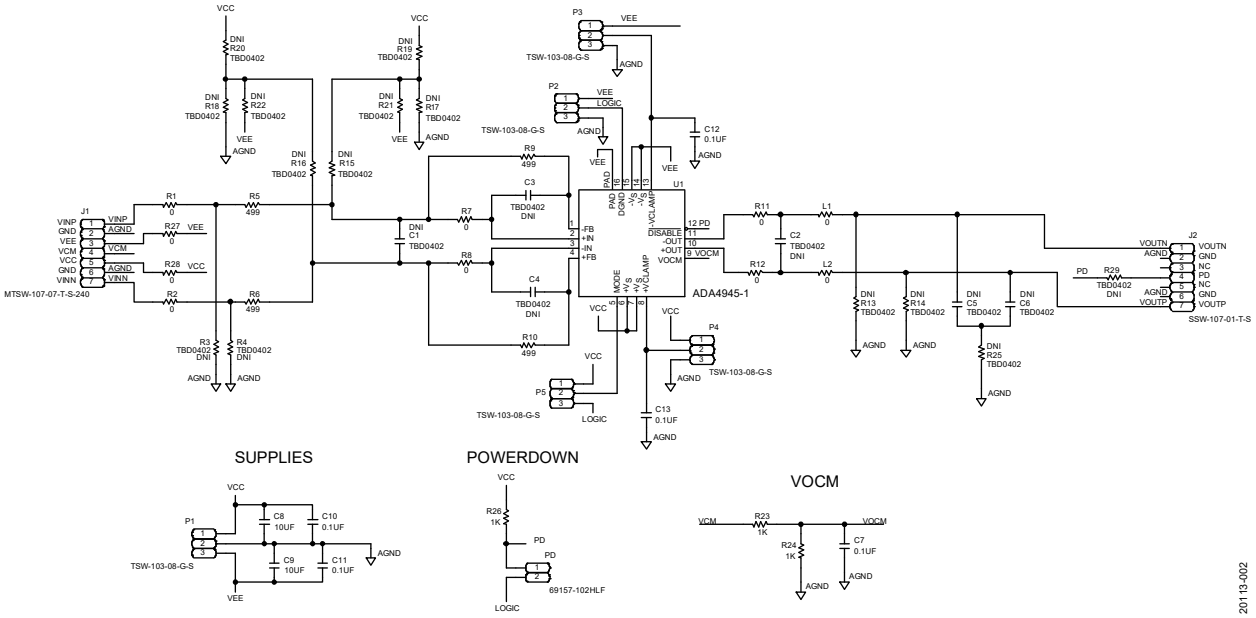

Figure 2. AMC-ADA4945-1EBZ Evaluation Board Schematic

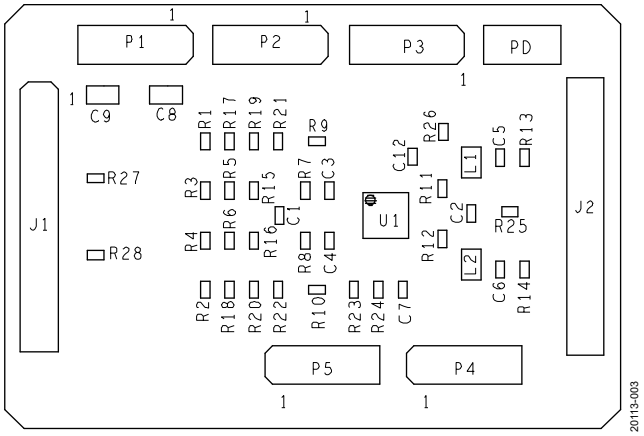

Figure 3. AMC-ADA4945-1EBZ Evaluation Board Assembly Drawing, Primary Side

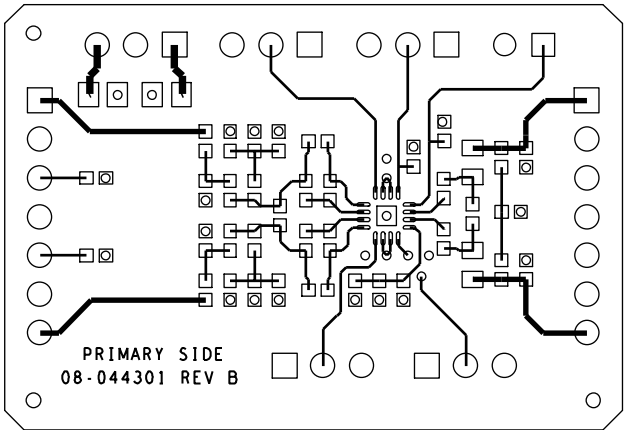

Figure 4. AMC-ADA4945-1EBZ Evaluation Board Layout Pattern, Primary Side

ORDERING INFORMATION

BILL OF MATERIALS

Table 1. AMC-ADA4945-1EBZ Bill of Materials

Quantity	Description	Reference Designation	Manufacturer	Part Number
1	High speed, ±0.1 µV/°C offset drift, fully differential ADC driver	U1	Analog Devices	ADA4945-1
5	0.1 µF ceramic capacitors, 0402	C7, C10 to C13	TDK	CGA2B1X7R1C104K050BC
2	10 µF tantalum capacitors, 0805	C8, C9	Taiyo Yuden	JMK212BJ106MG-T
8	0 Ω chip resistors, 0402	R1, R2, R7, R8, R11, R12, R27, R28	Panasonic	ERJ-2GE0R00X
4	499 Ω chip resistors, 0402	R5, R6, R9, R10	Panasonic	ERJ-2RKF4990X
3	1 kΩ chip resistors, 0402	R23, R24, R26	Panasonic	ERJ-2RKF1001X
2	0 Ω chip resistors, 0805	L1, L2	Panasonic	ERJ-6GEY0R00V
1	Berg 2-pin header	PD	Amphenol	69157-102HLF
5	Berg 3-pin headers	P1 to P5	Samtec	TSW-103-08-G-S
1	7-pin connector, male	J1	Samtec	MTSW-107-07-T-S-240
1	7-pin connector, female	J2	Samtec	SSW-107-01-T-S
16	Chip resistors, 0402, do not install (DNI)	R3, R4, R13 to R25, R29	Not applicable	Not applicable
6	Ceramic capacitors, 0402, DNI	C1 to C6	Not applicable	Not applicable