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Evaluation Board for the ADV3221/ADV3222 800 MHz, 4:1 Analog Multiplexers

FEATURES

Full featured evaluation board for the ADV3221/ADV3222
Single board with both 50 Ω and 75 Ω termination
±5 V operation

EVALUATION KIT CONTENTS

ADV3221-EVALZ/ADV3222-EVALZ evaluation board
Instruction guide for user guide download

EQUIPMENT NEEDED

Signal source or video pattern generator and signal analyzer
Power supplies (2 V/100 mA and ±5 V/1 A)
BNC-to-SMA connector for inputs and output using the 50 Ω terminated board
BNC-to-BNC connector for inputs and output using the 75 Ω terminated board

GENERAL DESCRIPTION

The ADV3221 and ADV3222 are high speed, high slew rate, buffered, 4:1 analog multiplexers. They offer a −3 dB signal bandwidth greater than 800 MHz and channel switch times of less than 20 ns with 1% settling. With lower than −58 dB of crosstalk and −67 dB isolation (at 100 MHz), the ADV3221 and ADV3222 are useful in many high speed applications. The differential gain error of less than 0.02% and differential phase error of less than 0.02°, together with 0.1 dB gain flatness out to 100 MHz while driving a 75 Ω back terminated load, make the ADV3221 and ADV3222 ideal for all types of signal switching.

The ADV3221/ADV3222 include an output buffer that can be placed into a high impedance state, which allows multiple outputs to be connected together for cascading stages without the off channels loading the output bus. The ADV3221 has a gain of +1, and the ADV3222 has a gain of +2; both devices operate on ±5 V supplies while consuming less than 7.5 mA of idle current. The channel switching is performed via latched control lines, allowing synchronous updating in a multiple ADV3221/ADV3222 environment.

The ADV3221/ADV3222 are offered in a 16-lead SOIC package and are available over the extended industrial temperature range of −40°C to +85°C.

This user guide provides all of the supporting documentation for working with the ADV3221-EVALZ/ADV3222-EVALZ evaluation board. Additional information is available in the ADV3221/ADV3222 data sheet, which should be consulted in conjunction with this user guide when working with the evaluation board.

EVALUATION BOARD PHOTOGRAPH AND BLOCK DIAGRAM

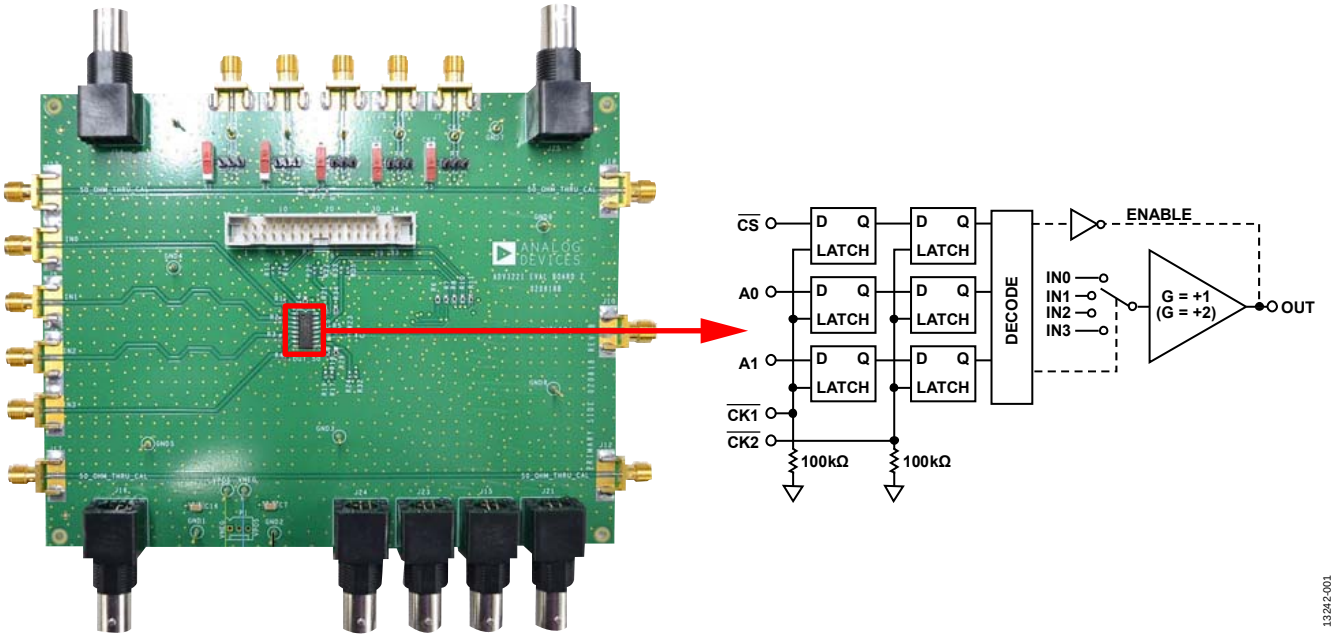

Figure 1.

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REVISION HISTORY

6/15—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

INTRODUCTION

The ADV3221-EVALZ/ADV3222-EVALZ evaluation board allows the user to easily evaluate the ADV3221/ADV3222 in both the 50 Ω and 75 Ω terminations. Figure 2 shows the typical bench setup used to evaluate the 4:1 analog multiplexers.

POWER SUPPLY

This evaluation board requires a typical ±5 V power supply for the analog circuitry and a minimum of 2 V single supply for the digital circuitry. Connect the supplies as shown in Figure 2.

ANALOG INPUTS

Drive the inputs, IN0 to IN3, with a waveform generator for the 50 Ω terminated board or with a video pattern generator for the 75 Ω terminated board, or any signal source that can provide an input voltage of ±3 V for the ADV3221 and ±1.5 V for the ADV3222.

ANALOG OUTPUT

The output, OUT, of this evaluation board produces a voltage of ±3 V only for both the ADV3221 and ADV3222. The waveform signal from this output can be checked using a signal analyzer such as an oscilloscope or a display/monitor.

DIGITAL LOGIC INPUTS

The logic levels of $\overline{CS}$, A0, A1, $\overline{CK1}$, and $\overline{CK2}$ determine which input port to produce in the OUT pin. All of these logic inputs require a minimum of 2 V to set in high mode and require a maximum of 0.8 V to set in low mode. Table 1 shows the truth table in setting the input.

QUICK START GUIDE

To get started, take the following steps:

1. Remove the ADV3221-EVALZ/ADV3222-EVALZ evaluation board from the box.
2. Connect +5 V to V_POS, connect −5 V to V_NEG, and connect GND to GND1, GND2, or any GND.
3. Connect a 2-pin jumper or shunt on Pin 1and Pin 2 of P2, P4, P5, P6, and P7.
4. Set A0, A1, $\overline{CS}$, $\overline{CK1}$, and $\overline{CK2}$ to low by switching S1, S2, S3, S4, and S5 near the S1 to S5 labels.
5. Connect an input signals that is within the input voltage range of the device through the BNC-to-SMA or BNC-to-BNC connector between the signal generator or video pattern generator and IN0, IN1, IN2, and IN3.
6. Connect an oscilloscope or display/monitor to OUT through the BNC-to-SMA or BNC-to-BNC connector. OUT produces the signal in IN0.
7. To produce other inputs in OUT, connect 2 V to the A0 and A1 test points (between the SMA and the 3-pin headers). The 2 V supply is used in setting A0 and A1 in high mode.
8. To set IN1 as the input, switch S1 near the A0 label. To set IN2 as the input, switch S1 near the S1 label and S2 near the A1 label. To set IN3 as the input, switch both S1 and S2 near the A0 and A1 labels.

Table 1. Input Setting Truth Table

$\overline{CS}$	A1	A0	$\overline{CK1}$	$\overline{CK2}$	Output
0	0	0	0	0	IN0
0	0	1	0	0	IN1
0	1	0	0	0	IN2
0	1	1	0	0	IN3
1	X[1]	X[1]	0	0	High-Z

[1] X is don't care.

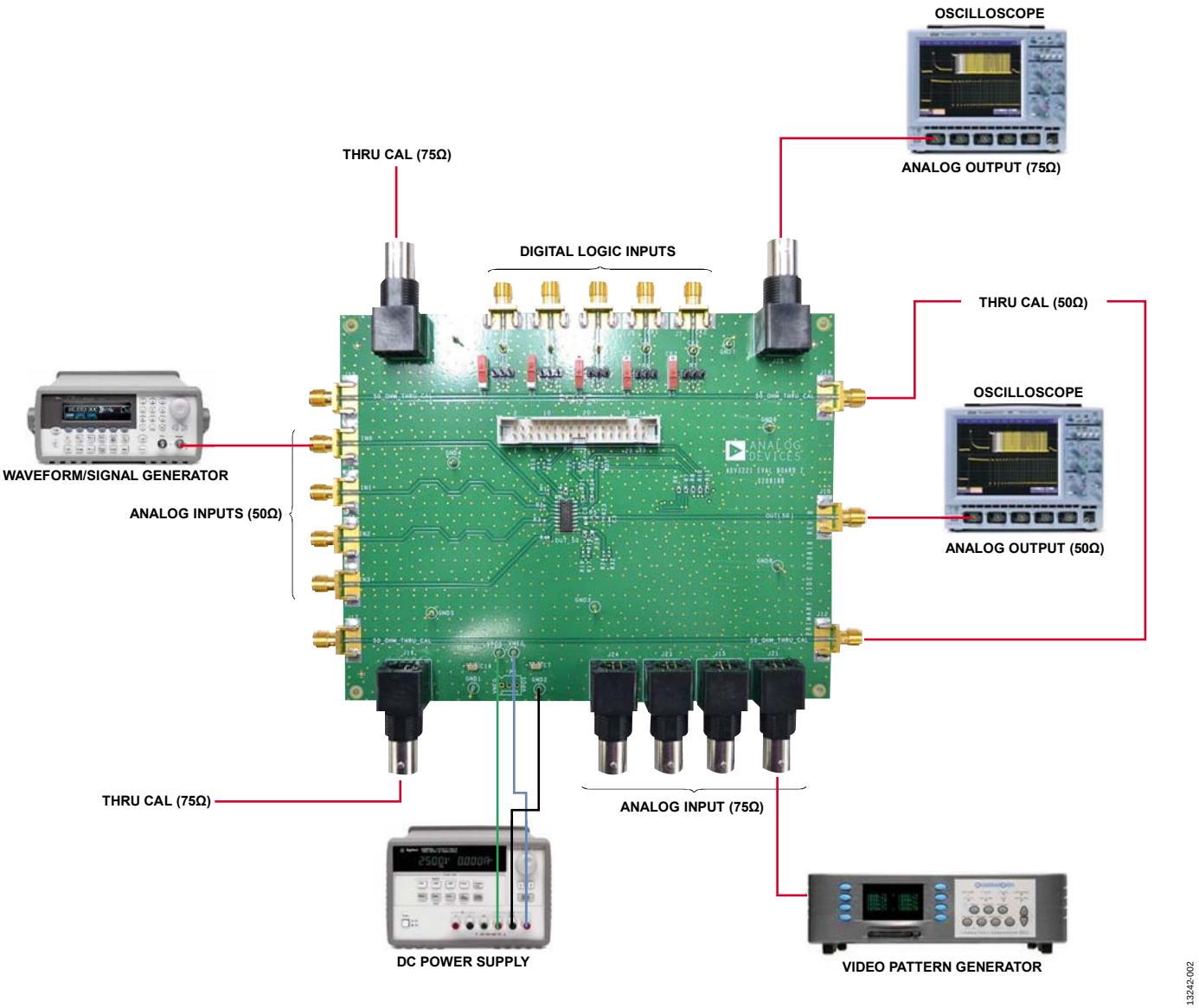

Figure 2. Typical Evaluation Setup

EVALUATION BOARD SCHEMATICS AND ARTWORK

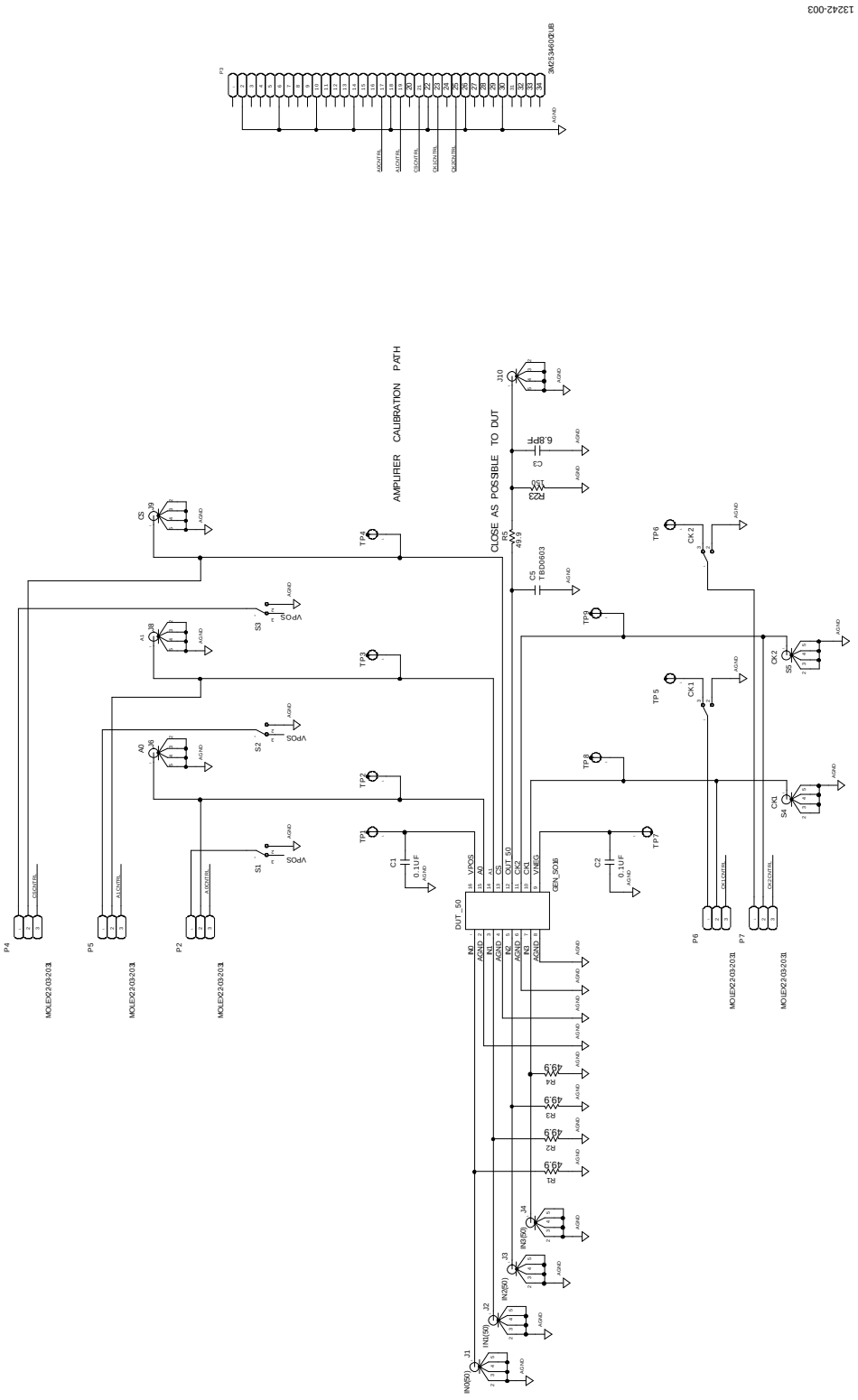

Figure 3. Evaluation Board Schematic, 50 Ω Terminated Side

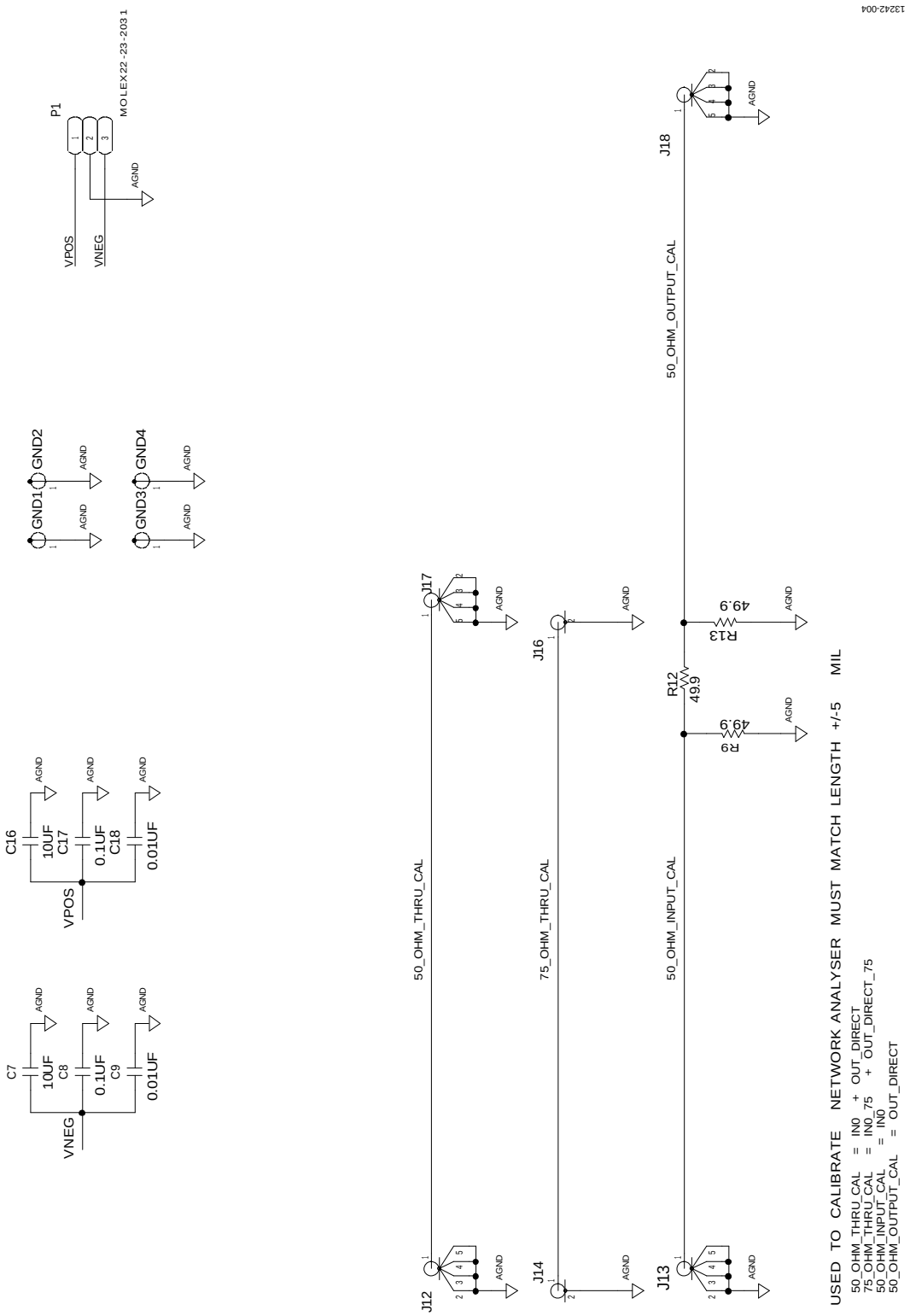

Figure 4. Evaluation Board Schematic, Supplies, and Thru Cal

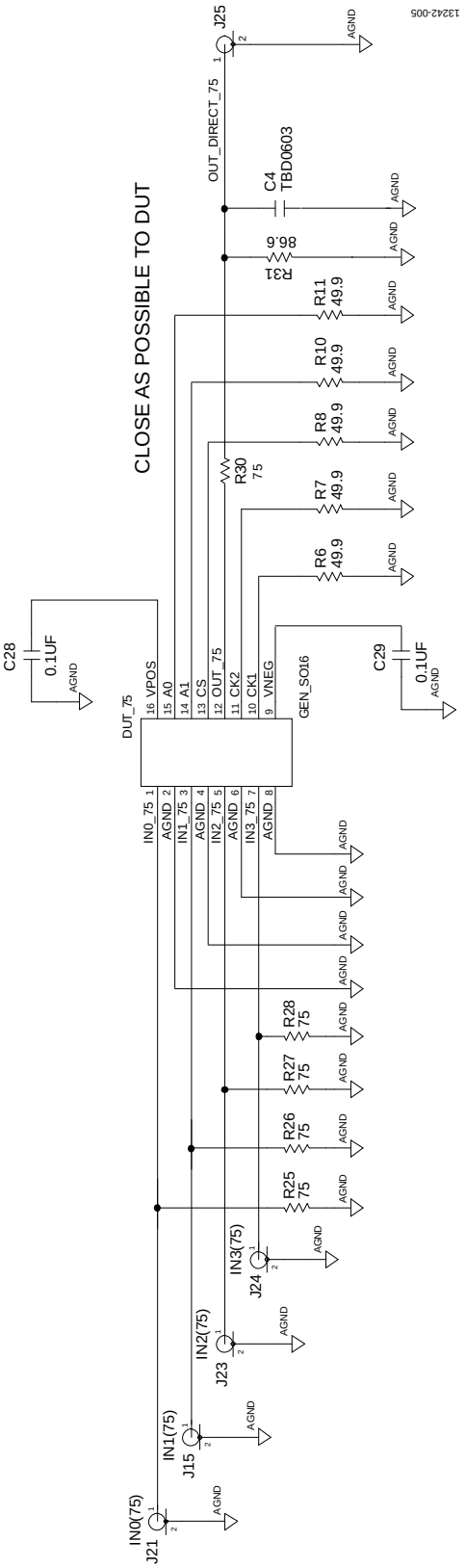

Figure 5. Evaluation Board Schematic, 75 Ω Terminated Side

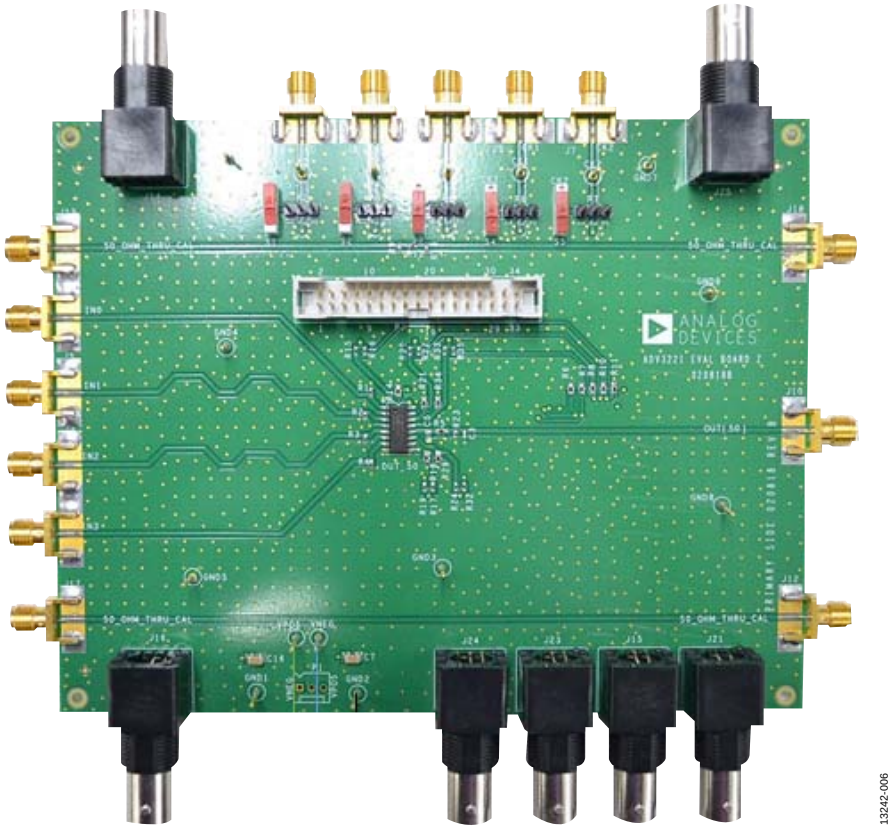

Figure 6. ADV3221-EVALZ/ADV3222-EVALZ Evaluation Board, Top View

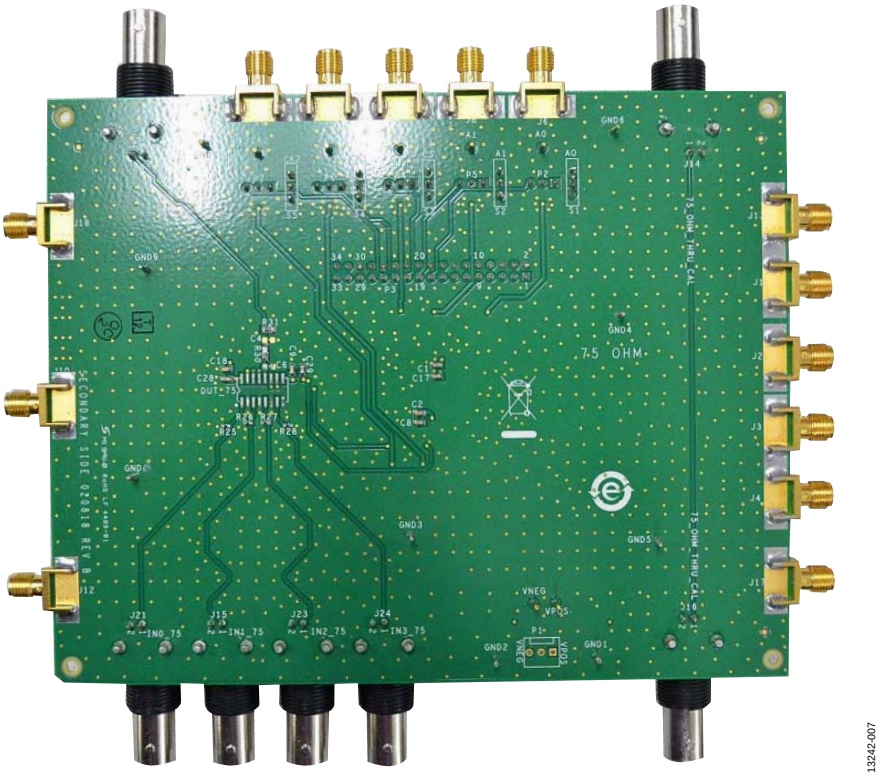

Figure 7. ADV3221-EVALZ/ADV3222-EVALZ Evaluation Board, Bottom View

ORDERING INFORMATION

BILL OF MATERIALS

Table 2.

Item	Qty	Description	Manufacturer	Manufacturer Part No.	Reference Designator
1	6	Capacitor, ceramic, chip, X8R, 0.1 µF	TDK	C1608X8R1E104K	C1, C2, C8, C17, C28, C29
2	2	Capacitor, ceramic, monolithic, X5R,10 µF	Murata	GRM31CR61E106KA12L	C7, C16
3	2	Capacitor, ceramic, X7R, 0.01 µF	Phycomp (Yageo)	2238 586 15636	C9, C18
4	1	Capacitor, ceramic, 6.8 pF	Samsung	CL05C6R8DBNC	C3
5	2	Do not install (TBD_C0603)	TBD_C0603	TBD_C0603	C4, C5
6	5	Switch, PCB mount slide	SECMA	09-03-201-02	S1 to S3, CK1, CK2
7	2	Generic SO16 footprint chip	Not Applicable	GEN_SO16	DUT_50, DUT_75
8	13	Connector, PCB pin vector	Vector	K24A	TP1 to TP9, GND1 to GND4
9	14	Connector, PCB, coaxial, SMA end launch	Johnson	142-0701-851	J1 to J4, J6, J8 to J10, S4, S5, J12, J13, J17, J18
10	7	Connector, PCB, BNC, RA, insulated, PCB socket, 75 Ω, BLK	Tyco Electronics	1-1634622-0	J14 to J16, J21, J23 to J25
11	1	Connector, PCB, header, 3 position	Molex	22-23-2031	P1
12	5	Connector, PCB, straight, header, 3 pin	Molex	22-03-2031	P2, P4-P7
13	1	Connector, PCB, shrouded, header, 34 position, straight	3M	2534-6002UB	P3
14	4	Resistor, ultra precision, ultra reliability, MF chip, 49.9 Ω	Susumu	RG1005P-49R9-B-T5	R1 to R4
15	6	Resistor, precision, thick film chip, R0603, 49.9 Ω	Panasonic	ERJ-3EKF49R9V	R5 to R8, R10, R11
16	3	Resistor, precision, thick film chip, R0402, 49.9 Ω	Panasonic	ERJ-2RKF49R9X	R9, R12, R13
17	1	Resistor, ultra precision, ultra reliability, MF chip, 150 Ω	Susumu	RG1005P-151-B-T5	R23
18	4	Resistor, precision, thick film chip, R0402, 75 Ω	Panasonic	ERJ-2RKF75R0X	R25 to R28
19	1	Resistor, film, SMD, 0603, 75 Ω	Vishay	P0603E75R0BBT	R30
20	1	Resistor, thick film chip, 0603, 86.6 Ω	Panasonic	ERJ-3EKF86R6V	R31

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.

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