



ADV3224-EVALZ/ADV3225-EVALZ/ADV3228-EVALZ/ADV3229-EVALZ User Guide UG-766

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Evaluation Board for the [ADV3224/ADV3225/ADV3228/ADV3229](#) Analog Crosspoint Switch

FEATURES

Full featured evaluation board for the [ADV3224/ADV3225/ADV3228/ADV3229](#)

On-board USB port for inputs and outputs control
 ± 5 V operation

EVALUATION KIT CONTENTS

[ADV3224-EVALZ/ADV3225-EVALZ/ADV3228-EVALZ/ADV3229-EVALZ](#) evaluation board

Instruction guide for software download

EQUIPMENT NEEDED

Signal source or video pattern generator and signal analyzer

Power supplies (5 V/1 A and ± 5 V/1 A)

PC running Windows XP only

Type A to Type B USB 2.0 connector (recommended)

BNC-to-BNC connector for inputs and outputs

SOFTWARE NEEDED

[ADV3224/ADV3225 Control Software](#) for 16×8 switch array

[ADV3228/ADV3229 Control Software](#) for 8×8 switch array

GENERAL DESCRIPTION

The [ADV3224/ADV3225](#) are high speed, 16×8 analog crosspoint switch matrices, and the [ADV3228/ADV3229](#) are 8×8 , analog crosspoint switch matrices. These devices offer a -3 dB signal bandwidth of greater than 750 MHz and a high slew rate of greater than 2500 V/ μ s.

The [ADV3224/ADV3225/ADV3228/ADV3229](#) include eight independent output buffers that can be placed into a high impedance state for paralleling crosspoint outputs to prevent off channels from loading the output bus. The [ADV3224](#) and [ADV3228](#) have a gain of 1, and the [ADV3225](#) and [ADV3229](#) have a gain of 2, and all of the devices operate on voltage supplies of ± 5 V. Channel switching is performed via a serial digital control that accommodates the daisy chaining of several devices, or via a parallel control to allow updating of an individual output without reprogramming the entire array.

The [ADV3224/ADV3225/ADV3228/ADV3229](#) are available in a 72-lead LFCSP package over the extended industrial temperature range of -40°C to $+85^{\circ}\text{C}$. Applications of these analog crosspoint switches include routing high speed video signals (NTSC, PAL, SECAM, YUV, RGB, MPEG, and wavelet), data communications, and telecommunications.

This user guide provides all of the supporting documents and software for the evaluation of the [ADV3224/ADV3225/ADV3228/ADV3229](#). Full specifications on these products are available in the [ADV3224/ADV3225](#) and [ADV3228/ADV3229](#) data sheets, which should be consulted in conjunction with this user guide when working with the evaluation board.

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REVISION HISTORY

11/14—Revision 0: Initial Version

EVALUATION BOARD PHOTOGRAPH AND FUNCTIONAL BLOCK DIAGRAM

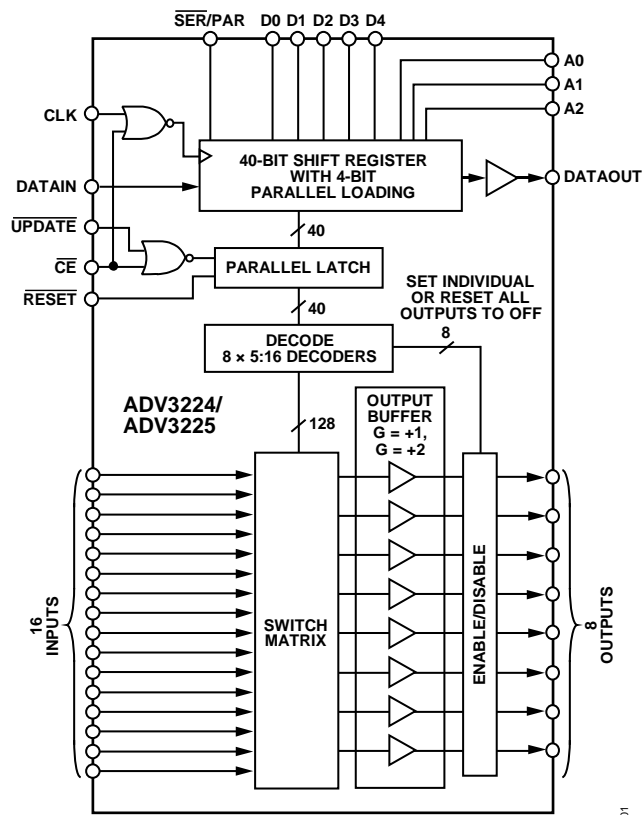
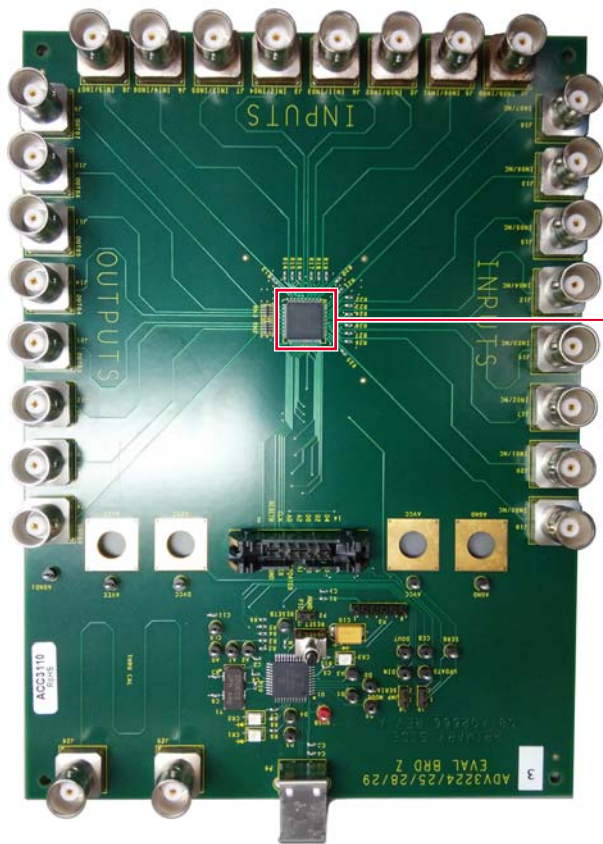


Figure 1.

12707-001

EVALUATION BOARD HARDWARE

The [ADV3224-EVALZ/ADV3225-EVALZ/ADV3228-EVALZ/ADV3229-EVALZ](#) evaluation boards allow the user to easily evaluate the [ADV3224/ADV3225/ADV3228/ADV3229](#) in their various modes and configurations. Figure 2 shows the typical bench setup used to evaluate the four analog crosspoint switches.

POWER SUPPLY

These evaluation boards require a typical ± 5 V power supply for the analog circuitry and a 5 V single supply for the digital circuitry. Connect the supplies as shown in Figure 2.

ANALOG INPUTS

Drive any or all of the inputs, IN00 to IN07, with a waveform generator, video pattern generator, or any signal source that can provide an input voltage between -3 V and $+3$ V for the [ADV3224/ADV3228](#), and between -1.5 V and $+1.5$ V for the [ADV3225/ADV3229](#). All the inputs are terminated with 75Ω .

ANALOG OUTPUTS

The eight outputs of each evaluation board are terminated with 75Ω . All eight outputs can be disabled simultaneously using the RESET button. The waveform signal from each or from all of the outputs can be checked using a signal analyzer such as an oscilloscope or television.

THRU CAL

Printed circuit board (PCB) traces contribute certain errors in the system such as crosstalk, impedance mismatch, and reflection. To remove these errors, these evaluation boards use a response calibration method that uses a thru. This thru cal method is used primarily in network analyzers to compare the trace between J25 and J26, which is the reference and is shown in Figure 2, to the PCB traces from and to the device under test (DUT). If errors or mismatch are measured, they are corrected by the network analyzer.

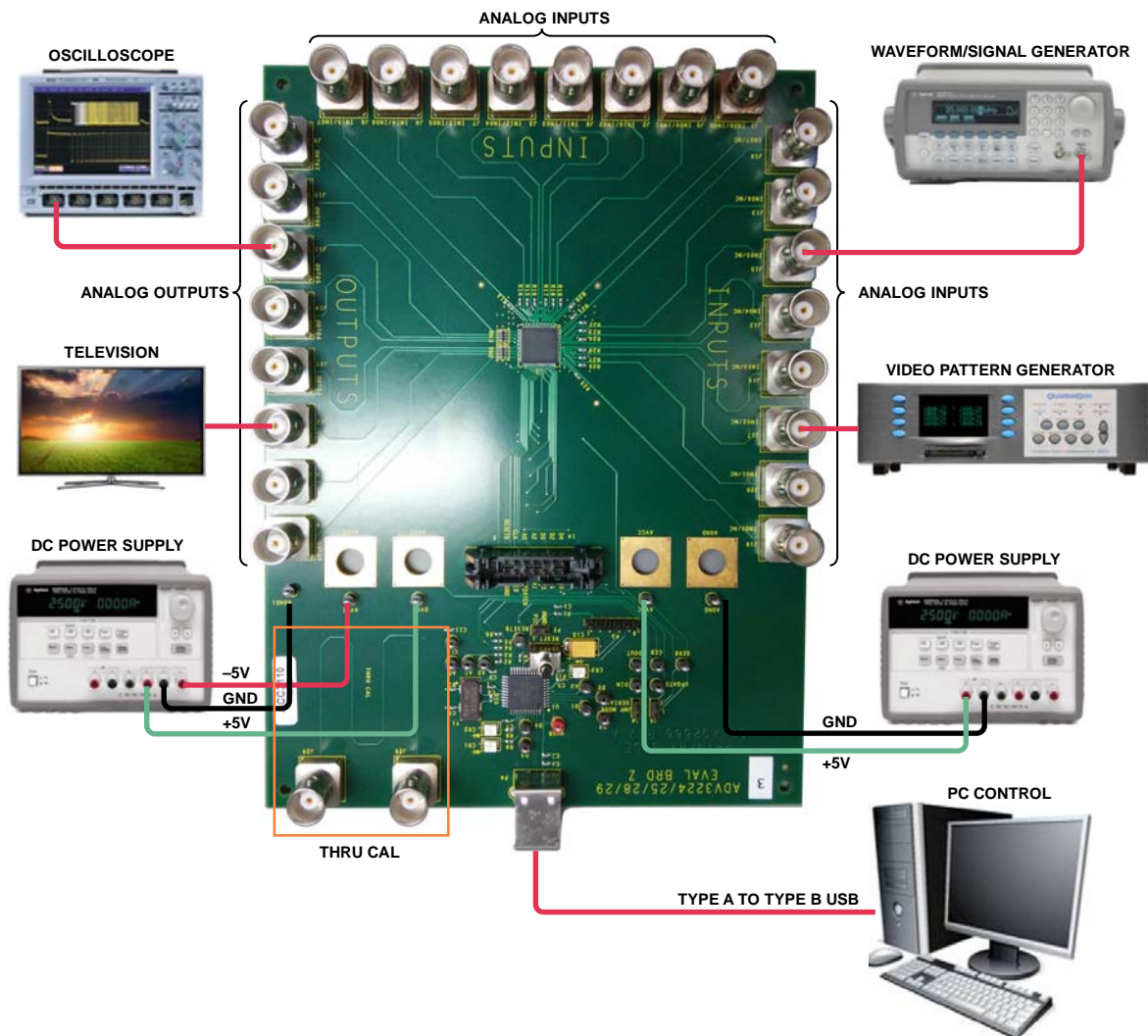


Figure 2. Typical Evaluation Setup

EVALUATION BOARD CONTROL SOFTWARE

These evaluation boards are configured with a USB friendly interface to allow programmability of the [ADV3224/ADV3225/ADV3228/ADV3229](#) registers.

Parallel and serial programming, using the P1 and P3 connectors on the evaluation board, can also be achieved. For information on these two programming modes, refer to the [ADV3224/ADV3225](#) and [ADV3228/ADV3229](#) data sheets.

INSTALLING THE EVALUATION SOFTWARE

The following instructions describe the procedure to install evaluation the software onto a PC running the Windows® XP operating system only.

1. Download the appropriate control software, the [ADV3224/ADV3225 Control Software](#) or the [ADV3228/ADV3229 Control Software](#).
2. Extract the .zip file and open or run the .exe file. The graphic user interface (GUI) for the [ADV3224/ADV3225](#) and [ADV3228/ADV3229](#) appear as shown in Figure 4. By default, all inputs and outputs are disabled, although an input signal is present in the input port of the evaluation board.

Note that the software can be installed in other operating systems, such as Windows 7 or Windows 8; however, any commands by the user in the GUI are not read and a dialog box appears as shown in Figure 3. The same dialog box appears when the software is activated but the USB connector is not connected to the evaluation board.

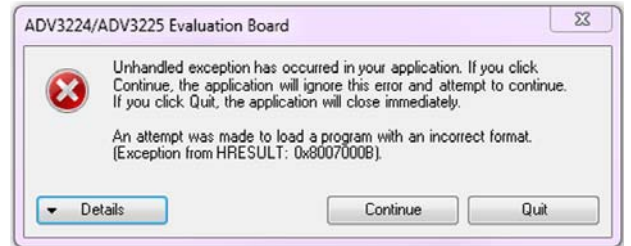


Figure 3. Error Message

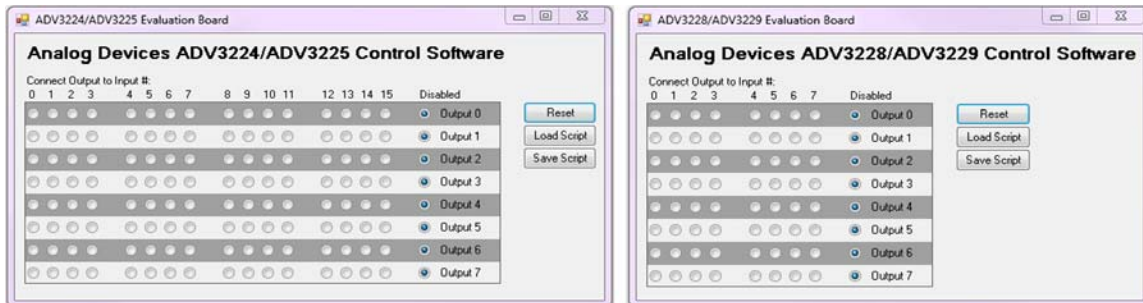


Figure 4. GUI Window for [ADV3224/ADV3225](#) (Left) and GUI Window for [ADV3228/ADV3229](#) (Right)

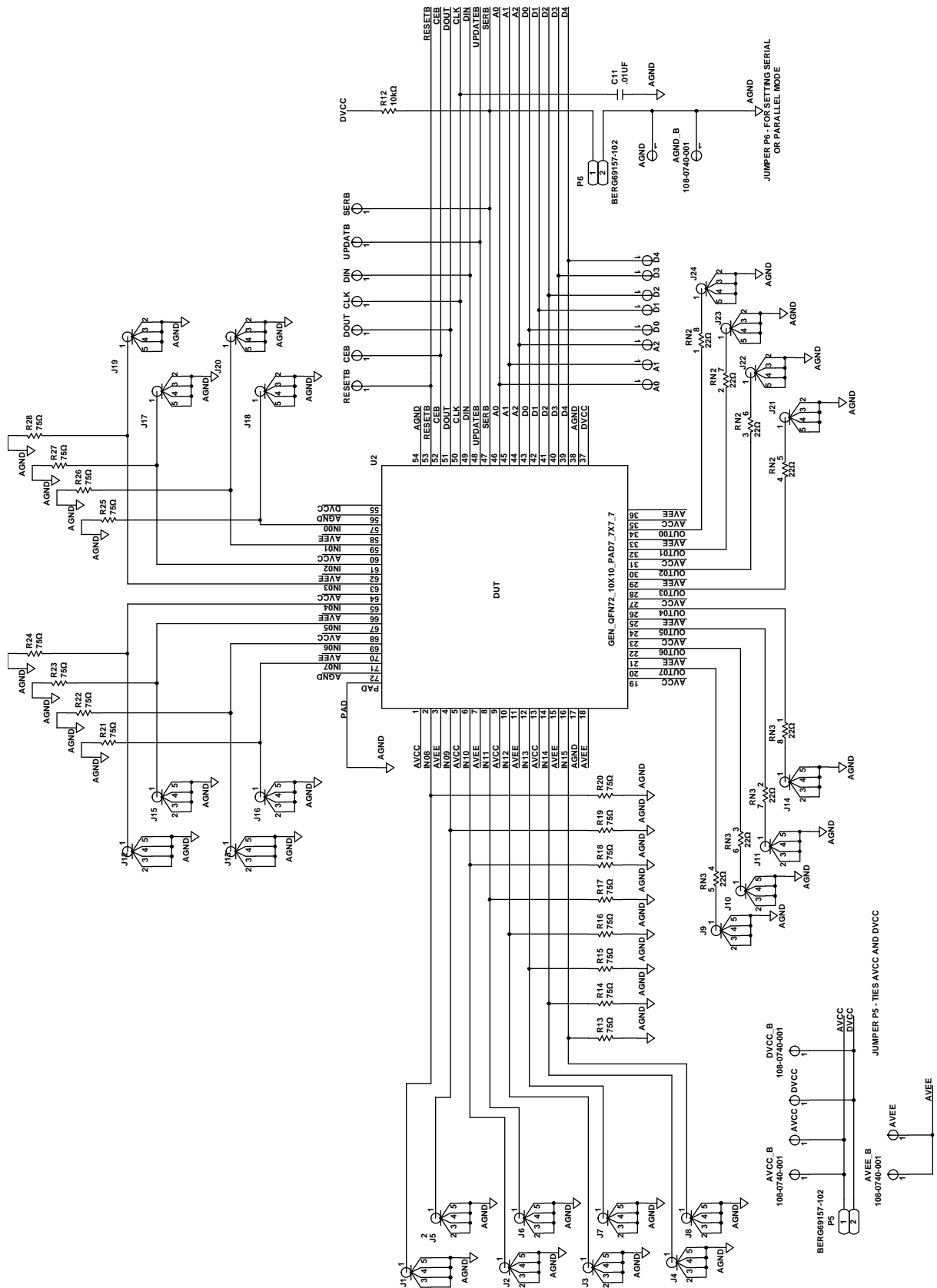


Figure 6. DUT Schematic on the Evaluation Board

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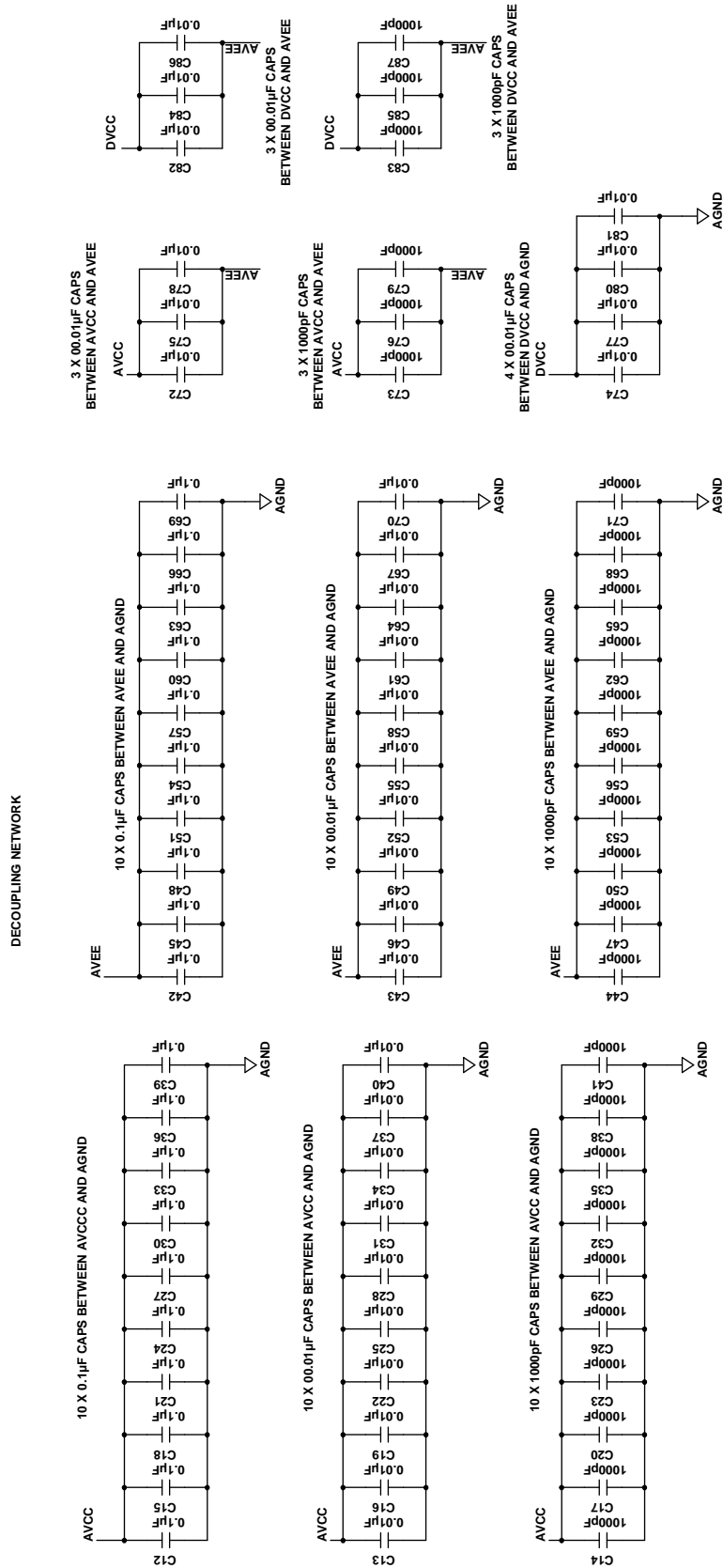


Figure 7. Decoupling Network on the Evaluation Board

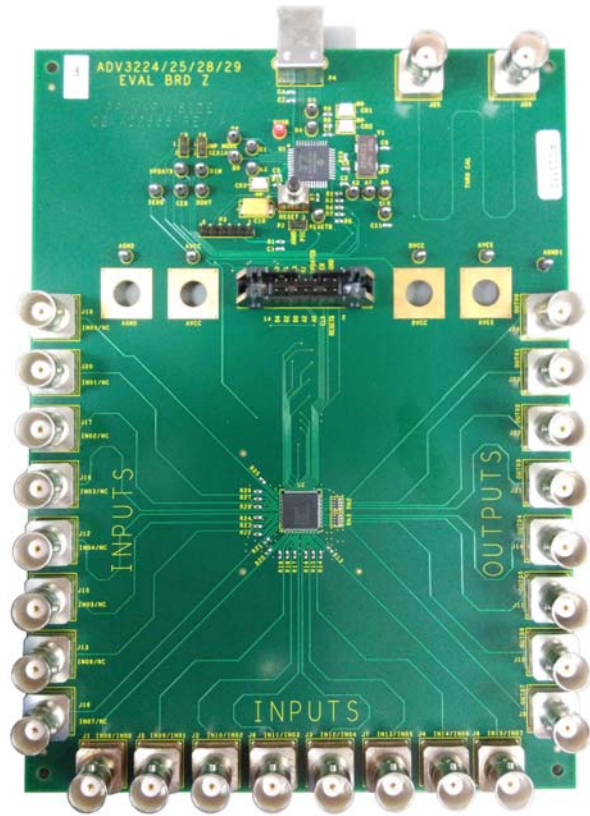


Figure 8. Evaluation Board Top View

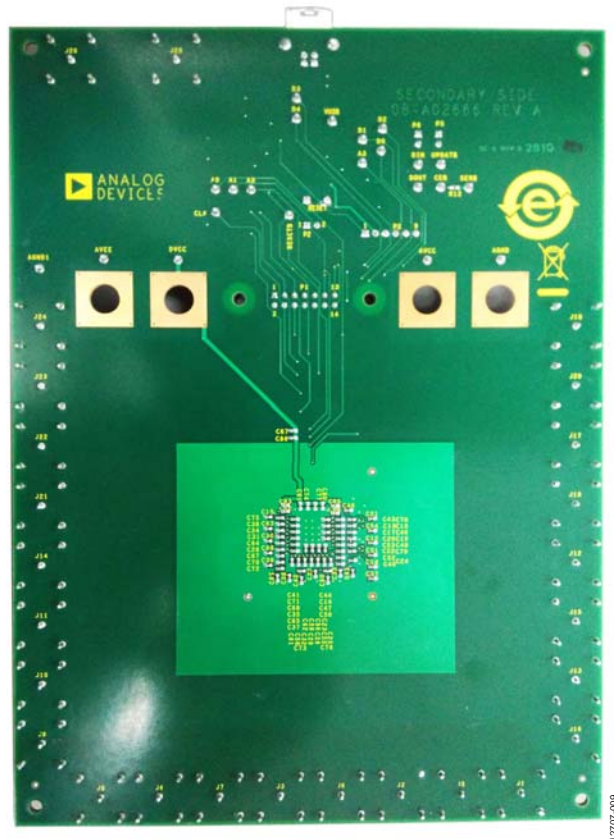


Figure 9. Evaluation Board Bottom View

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Location	Description	Value	Manufacturer	Part Number
21	A0 to A3, D0 to D4, CEB, CLK, DIN, AGND, AVCC, AVEE, DOUT, DVCC, SERB, AGND1, RESETB, UPDATB	Connector, PCB, pin, Vector	K24A W. EYELET T15.23	Vector	K24A W. EYELET T15.23
4	AGND_B, AVCC_B, AVEE_B, DVCC_B	Connector, PCB, banana jack, uninsulated, STD (version 2 footprint)	108-0740-001	Johnson	108-0740-001
23	C1, C3, C5, C12, C15, C18, C21, C24, C27, C30, C33, C36, C39, C42, C45, C48, C51, C54, C57, C60, C63, C66, C69	Capacitor, ceramic, X7R, 0402	0.1 μ F	Murata	GRM155R71C104KA88D
1	C10	Capacitor, tantalum, chip	10 μ F	AVX	TPSD106K035R0125
32	C2, C11, C13, C16, C19, C22, C25, C28, C31, C34, C37, C40, C43, C46, C49, C52, C55, C58, C61, C64, C67, C70, C72, C74, C75, C77, C78, C80 to C82, C84, C86	Capacitor, ceramic, X7R, 0402	0.01 μ F	Panasonic	ECU-E1C103KBQ
28	C4, C6, C14, C17, C20, C23, C26, C29, C32, C35, C38, C41, C44, C47, C50, C53, C56, C59, C62, C65, C68, C71, C73, C76, C79, C83, C85, C87	Capacitor, ceramic, SMD, 0402	1000 pF	Panasonic	ECU-E1E102KBQ
1	C7	Capacitor, ceramic, X5R, 0402	0.47 μ F	Taiyo	LMK105BJ474KV-F
2	C8, C9	Capacitor, ceramic	22 pF	Phycomp (Yageo)	0402CG220J9B200
3	CR1 to CR3	Diode, SMD, LED	CMD67-21VGC/TR8 (green)	Chicago Miniature Lamp	CMD67-21VGC/TR8
26	J1 to J26	Connector, PCB, coaxial, BNC, ST	STETCOJ01001A1944	STETCO	J01001A1944
1	P1	Connector, PCB, header, shrouded, ST, 14P, male	3M3314-2002	3M	3314-2002
3	P2, P5, P6	Connector, PCB, Berg, jumper, ST, male, 2P	BERG69157-102	Berg	69157-102
1	P3	Connector, PCB, Berg, header, ST, male, 6P	SAMTECTSW10608GS6PIN	Samtec	TSW-106-08-G-5
1	P4	Connector, PCB, USB Type B, R/A, thru hole	4-1734376-8	AMP	4-1734376-8
4	R1, R8, R9, R11	Resistor, precision, thick film chip, R0402	2 k Ω	Panasonic	ERJ-2RKF2001X
1	R10	Resistor, precision, thick film chip, R0402	1 M Ω	Panasonic	ERJ-2RKF1004X
1	R12	Resistor, precision, thick film chip, R0402	10 k Ω	Panasonic	ERJ-2RKF1002X
16	R13 to R28	Resistor, precision, thick film chip, R0402	75 Ω	Panasonic	ERJ-2RKF75R0X
6	R2 to R7	Resistor, film, SMD, 0402	0 Ω	Panasonic	ERJ-2GE0R00X
1	RESET	Switch, SPST, ST, push button	TP11SH9CBE	C & K	TP11SH9CBE
2	RN2, RN3	Resistor, network, 8-pin, 4 resistors, surface mount	22 Ω	CTS	742C083220JCT
1	U1	IC, other, high performance USB microcontrollers	PIC18F4550-I/PT	Microchip Technology	PIC18F4550-I/PT
1	U2	Generic QFN72_10X10_PAD7_7X7_7 footprint chip	GEN_QFN72_10X10_PAD7_7X7_7	Not applicable	GEN_QFN72_10X10_PAD7_7X7_7
1	VUSB	Connector, PCB, test point, red	Red	Components Corp	TP-104-01-02
1	Y1	IC, crystal oscillator	20.000 MHz	ECS	ECS-200-20-18

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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