ANALOG DEVICES

ADV3226-EVALZ/ADV3227-EVALZ User Guide

UG-767

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Evaluation Board for the ADV3226/ADV3227 Analog Crosspoint Switches

FEATURES

Full-featured evaluation board for the ADV3226/ADV3227
On-board USB port for inputs and outputs control
±5 V operation

EVALUATION KIT CONTENTS

ADV3226-EVALZ/ADV3227-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

ADV3226/ADV3227 control software for 16 × 16 switch array

GENERAL DESCRIPTION

The ADV3226/ADV3227 are high speed, 16 × 16 analog crosspoint switch matrices. They offer a −3 dB signal bandwidth of greater than 750 MHz and channel switch times of less than 20 ns with 1% settling.

The ADV3226/ADV3227 include 16 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 ADV3226 has a gain of +1 and the ADV3227 has a gain of +2. They both operate on voltage supplies of ±5 V while consuming only 118 mA (ADV3226) or 133 mA (ADV3227) of idle current. Channel switching is performed via a serial digital control that can accommodate the daisy chaining of several devices or via a parallel control to allow updating of an individual output without reprogramming the entire array.

The ADV3226/ADV3227 are available in 100-lead LFCSP packages over the extended industrial temperature range of −40°C to +85°C. Some 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 ADV3226/ADV3227. Full specifications on the ADV3226/ADV3227 are available in the product data sheet, which should be consulted in conjunction with this user guide when working with the evaluation board.

TABLE OF CONTENTS

REVISION HISTORY

1/15—Revision 0: Initial Version

EVALUATION BOARD PHOTOGRAPH AND BLOCK DIAGRAM

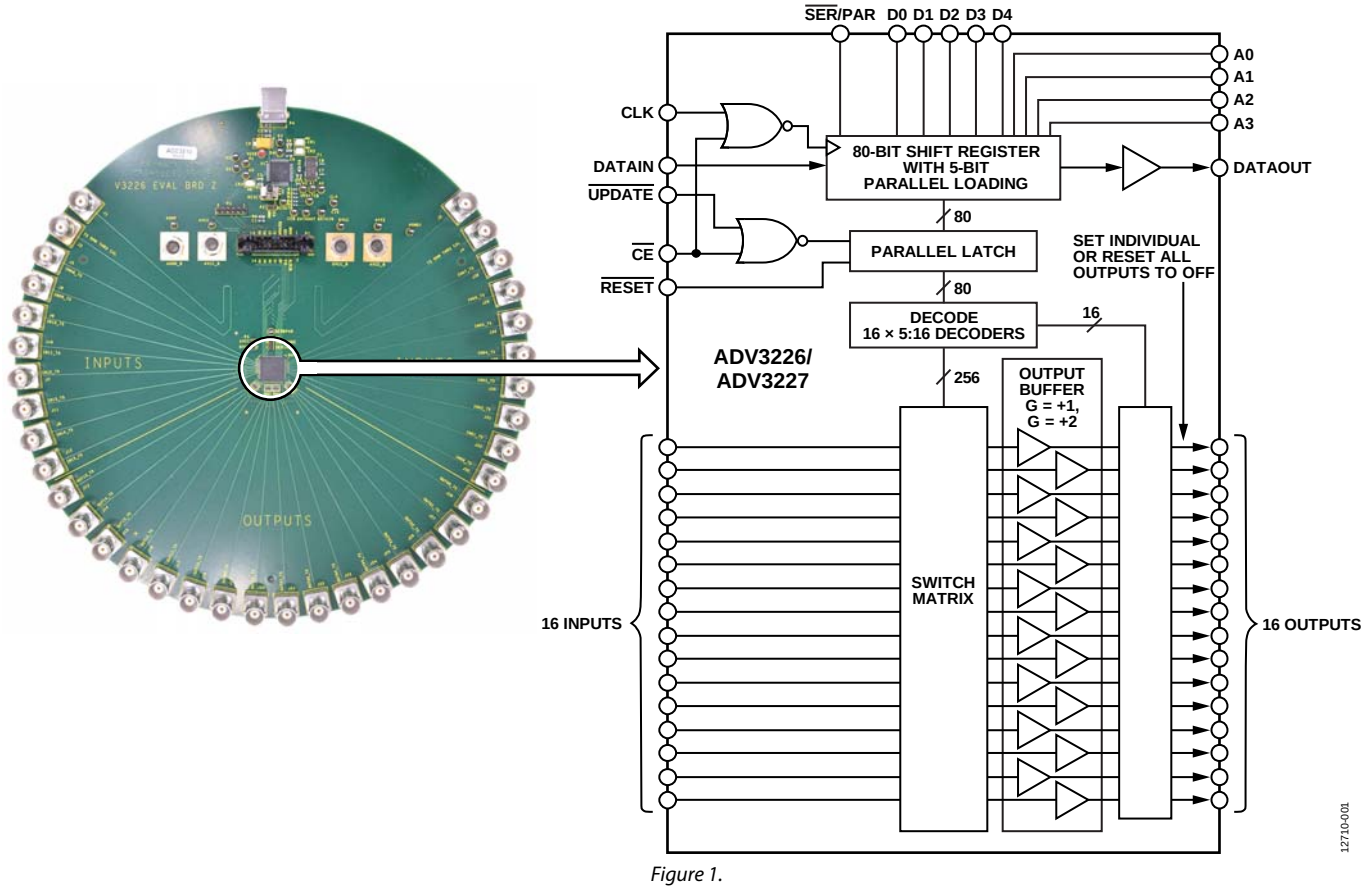

Figure 1.

EVALUATION BOARD HARDWARE

INTRODUCTION

The ADV3226-EVALZ/ADV3227-EVALZ evaluation board allows the user to easily evaluate the ADV3226/ADV3227 in their various modes and configurations. Figure 2 shows the typical bench setup used to evaluate the two analog crosspoint switches.

POWER SUPPLY

This evaluation board requires 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 IN15, with a waveform generator, a video pattern generator, or any signal source that can provide an input voltage between ±3 V for the ADV3226 and ±1.5 V for the ADV3227. Half of the inputs are 50 Ω terminated, and the other half are 75 Ω.

ANALOG OUTPUTS

The 16 outputs, terminated with 75 Ω, of this evaluation board 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 errors in the system such as crosstalk, impedance mismatch, and reflection. To remove these errors, a response calibration method that uses a thru is used in this evaluation board. This thru cal is used primarily in network analyzers to compare the trace between J2 and J4 and the trace between J1 and J3 (which are the references, shown in the yellow boxes in Figure 2) to the PCB traces from and to the DUT. If there are errors or mismatch measured, they are corrected by the network analyzer.

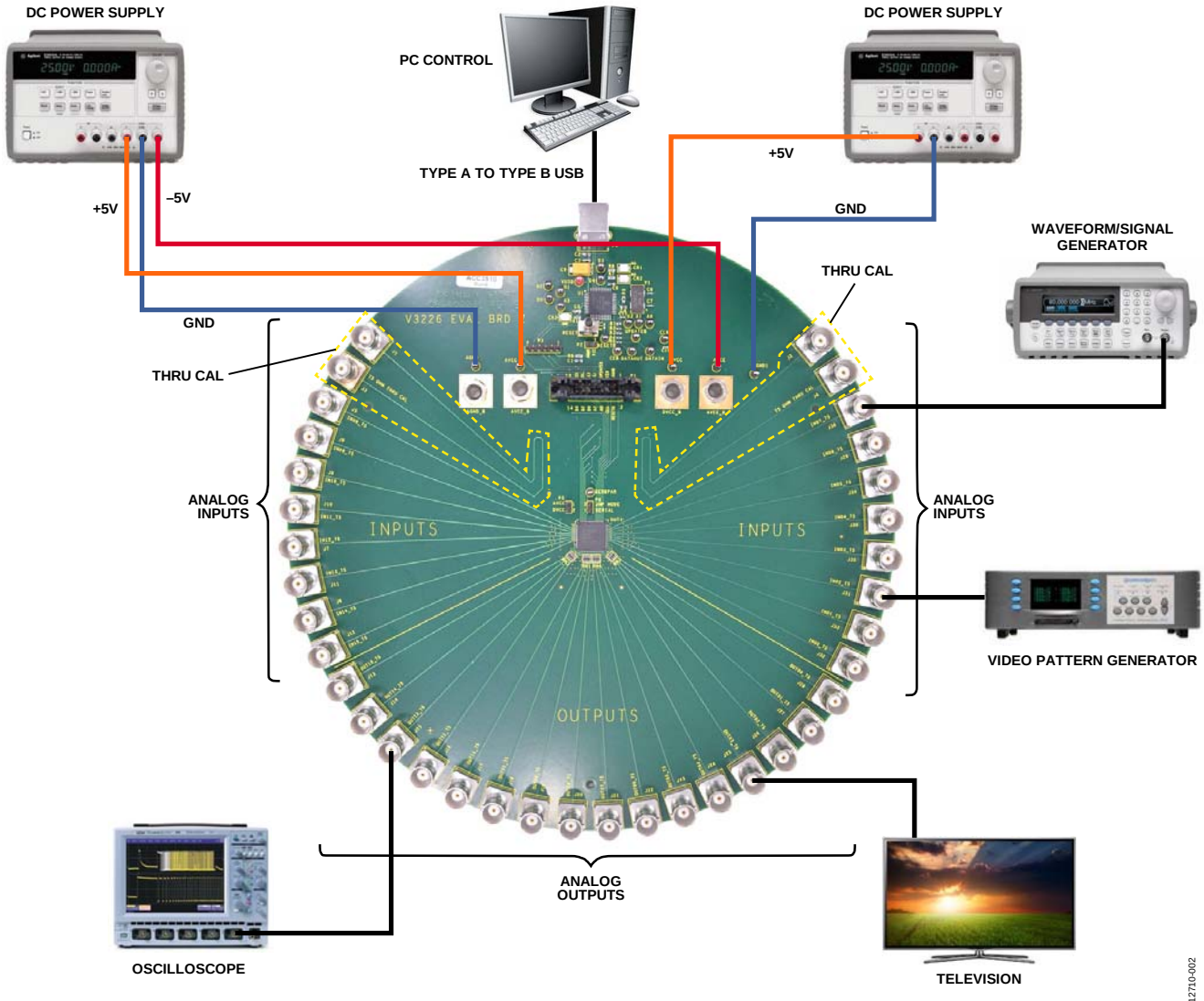

Figure 2. Typical Evaluation Setup

EVALUATION BOARD CONTROL SOFTWARE

This evaluation board is configured with a USB friendly interface to allow programmability of the ADV3226/ADV3227 registers.

Parallel and serial programming using the P1 and P3 connectors on the evaluation board is also possible. For more information on these two programming modes, see the ADV3226/ADV3227 data sheet.

INSTALLING THE EVALUATION SOFTWARE

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

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.

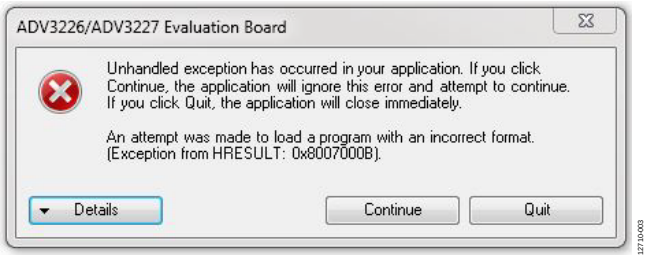

Figure 3. Dialog Box Displaying an Error Message

To install the software, take the following steps:

1. Download the control software for the ADV3226/ADV3227 at ez.analog.com/docs/DOC-11380.
2. Extract the .zip file and open or run the .exe file. The graphic user interface (GUI) for the ADV3226/ADV3227 appears as shown in Figure 4. By default, all inputs and outputs are disabled even though an input signal is present at the input port of the evaluation board.

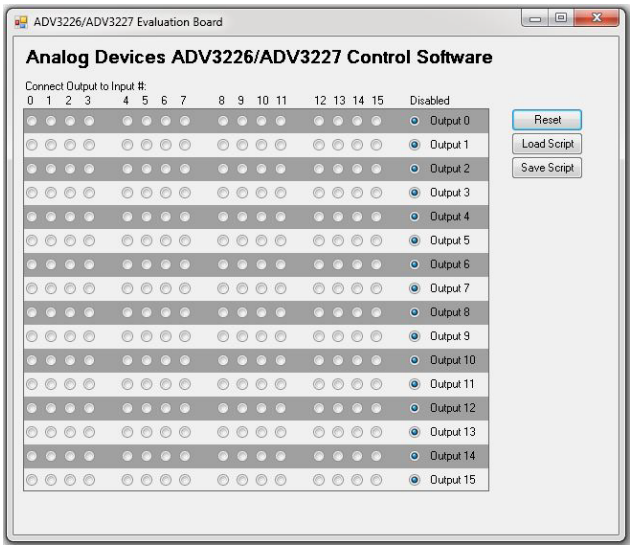

Figure 4. GUI Window for ADV3226/ADV3227

EVALUATION BOARD SCHEMATICS AND ARTWORK

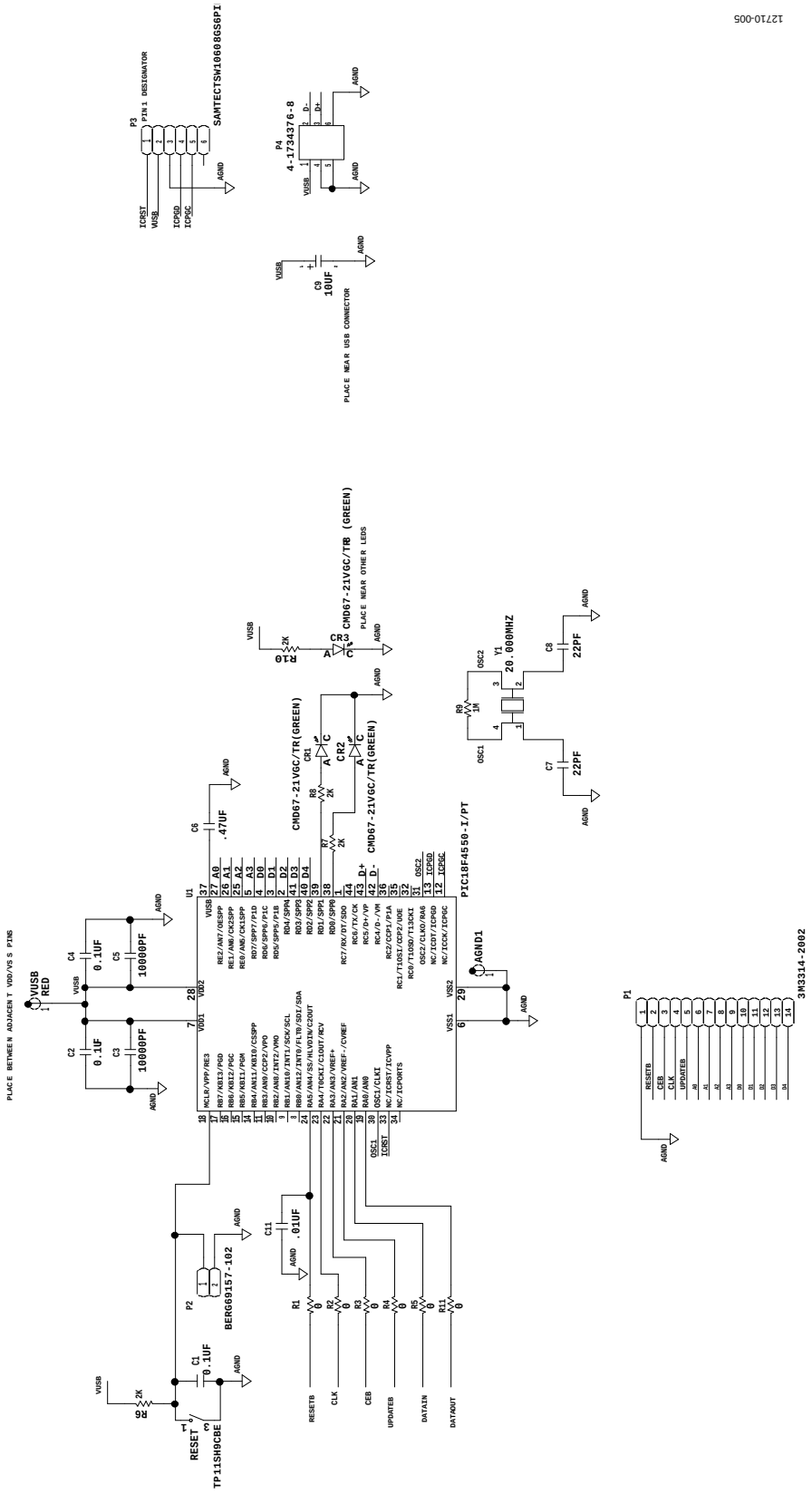

Figure 5. Serial, Parallel, and USB Interface Circuitry on the Evaluation Board

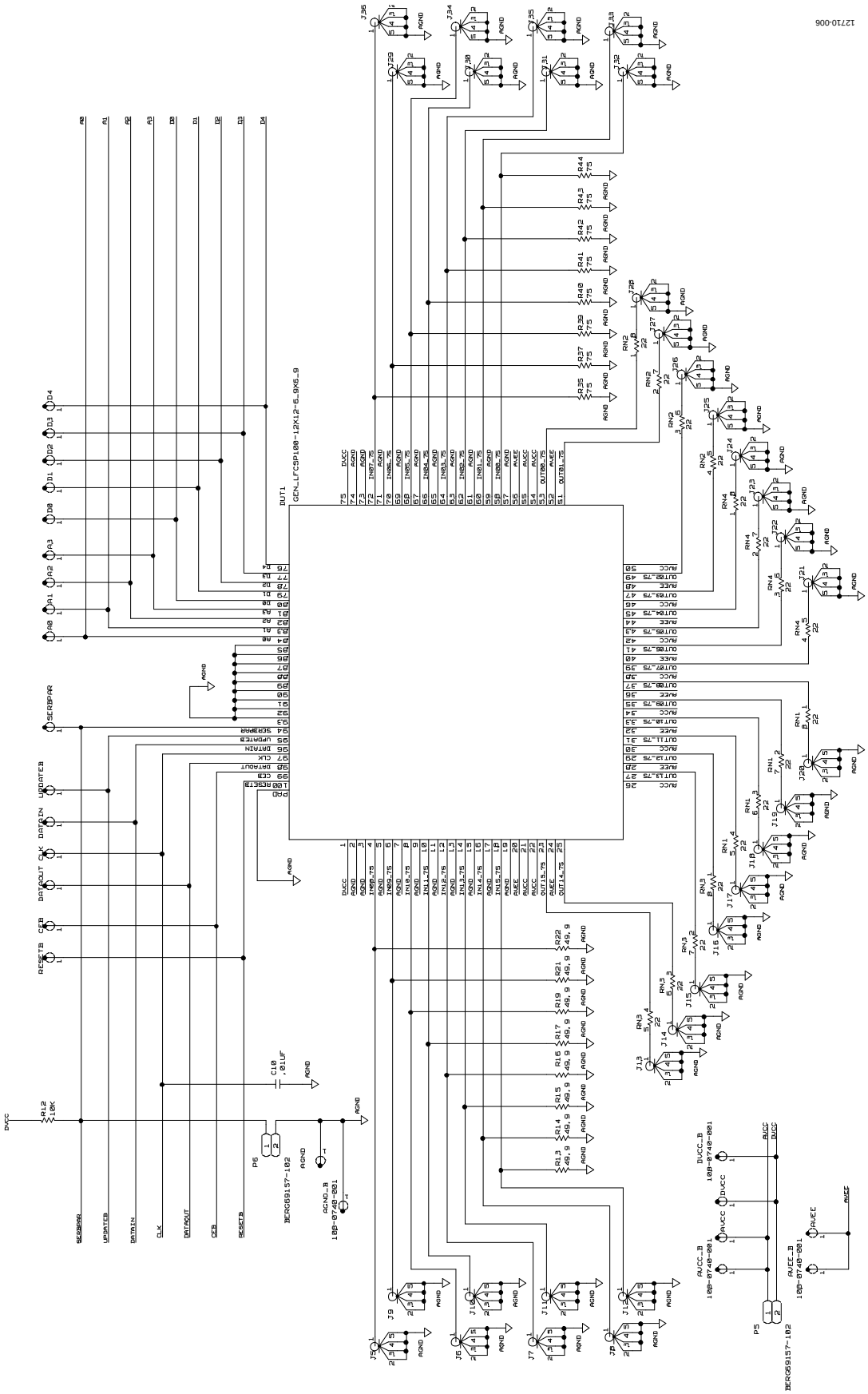

Figure 6. Device Under Test (DUT) Schematic on the Evaluation Board

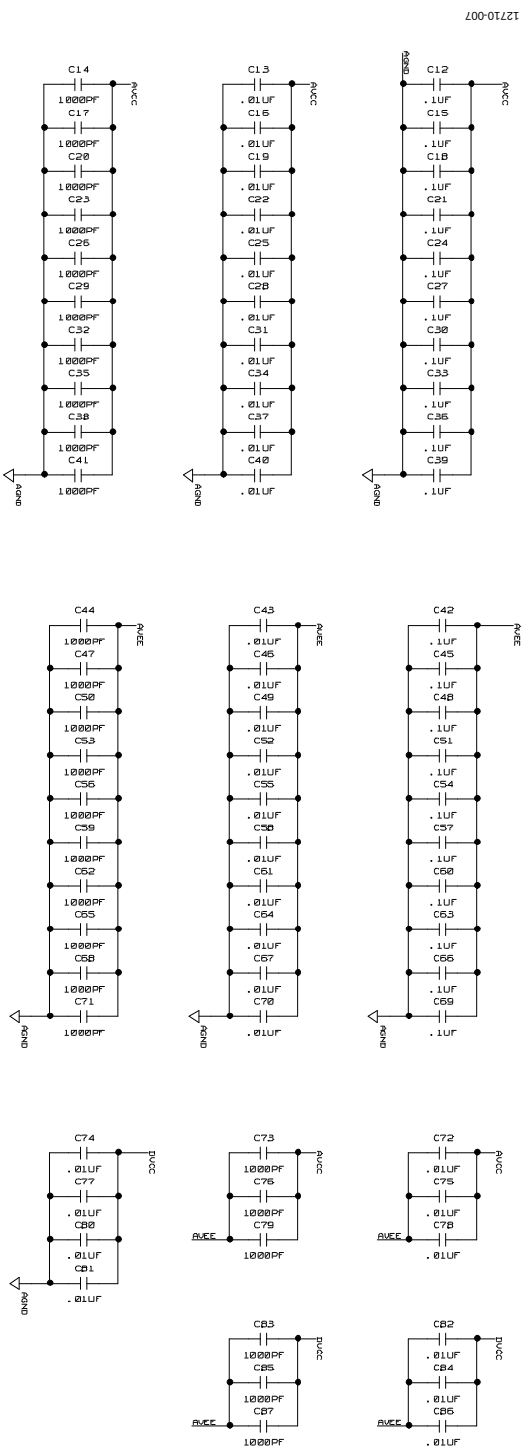

Figure 7. Decoupling Network on the Evaluation Board

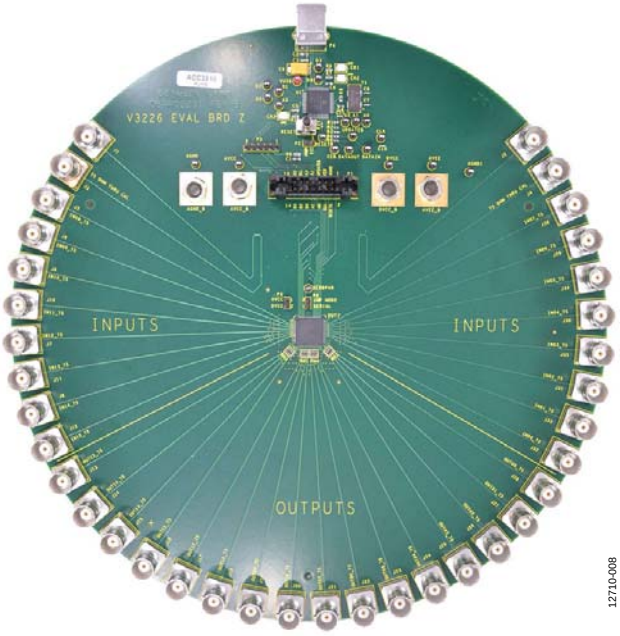

Figure 8. ADV3226-EVALZ/ADV3227-EVALZ Evaluation Board, Top View

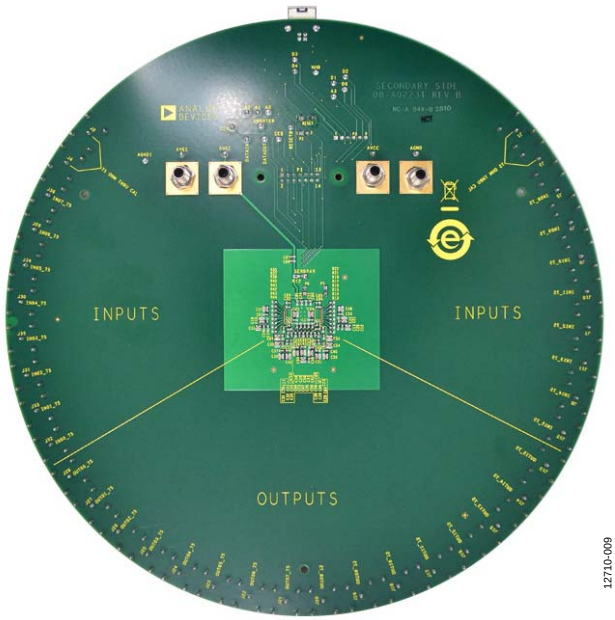

Figure 9. ADV3226-EVALZ/ADV3227-EVALZ Evaluation Board, Bottom View

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Qty	Location	Description	Value	Manufacturer	Part Number
21	A0 to A3, D0 to D4, CEB, CLK, AGND, AVCC, AVEE, DVCC, AGND1, DATAIN, RESETB, DATAOUT, SERBPAR, UPDATEB	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
3	C1, C2, C4	Capacitor, ceramic, Y5V	0.1 µF	Panasonic	ECJ-1VF1H104Z
32	C10, 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	0.01 µF	Panasonic	ECU-E1C103KBQ
20	C12, C15, C18, C21, C24, C27, C30, C33, C36, C39, C42, C45, C48, C51, C54, C57, C60, C63, C66, C69	Capacitor, ceramic, X7R	0.1 µF	Panasonic	ECY-29RE104KV
26	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	1000 pF	Panasonic	ECU-E1E102KBQ
2	C3, C5	Capacitor, ceramic, X7R	10000 pF	Panasonic	ECU-V1H103KBV
1	C6	Capacitor, ceramic, NP0	0.47 µF	Panasonic	ECJ-1VF1C474R
2	C7, C8	Capacitor, ceramic	22 pF	Phycomp (Yageo)	0402CG220J9B200
1	C9	Capacitor, tantalum, chip	10 µF	Avx	TPSD106K035R0125
3	CR1 to CR3	Diode, SMD, LED	CMD67-21VGC/TR8 (green)	Chicago Mini Lamp	CMD67-21VGC/TR8
1	DUT1	Generic, LFCSP100_12X12-6_ 9X6_9 footprint chip	GEN_LFCSP100_ 12X12-6_9X6_9	Not applicable	GEN_LFCSP100_ 12X12-6_9X6_9
36	J1 to J36	Connector, PCB, coaxial, BNC, straight	STETCOJ01001A1944	Stetco	J01001A1944
1	P1	Connector, PCB, header, SHRD, straight, 14P, male	3M3314-2002	3M	3314-2002
3	P2, P5, P6	Connector, PCB, Berg, jumper, straight, male, 2P	BERG69157-102	Berg	69157-102
1	P3	Connector, PCB, Berg header, straight, male, 6P	SAMTECTSW10608GS6PIN	Samtec	TSW-106-08-G-S
1	P4	Connector, PCB, USB, Type B, R/A, thru hole	4-1734376-8	AMP Brand	4-1734376-8
6	R1 to R5, R11	Resistor, film, SMD, 0402	0 Ω	Panasonic	ERJ-2GE0R00X
4	R6 to R8, R10	Resistor, film, SMD, 0603	2 kΩ	Yageo (Phycomp)	9C06031A2001FKHFT
1	R12	Resistor, precision, thick film chip, R0402	10 kΩ	Panasonic	ERJ-2RKF1002X
8	R13 to R17, R19, R21, R22	Resistor, precision, thick film chip, R0402	49.9 Ω	Panasonic	ERJ-2RKF49R9X
8	R35, R37, R39 to R44	Resistor, precision, thick film chip, R0402	75 Ω	Panasonic	ERJ-2RKF75R0X

Qty	Location	Description	Value	Manufacturer	Part Number
1	R9	Resistor, precision, thick film chip, R0402	1 MΩ	Panasonic	ERJ-3EKF1004V
1	RESET	Switch, SPST, ST, pushbutton	TP11SH9CBE	C&K Components	TP11SH9CBE
2	RN1 to RN4	Resistor, network, 8-pin/4-resistor, surface mount	22 Ω	CTS	742C083220JCT
1	U1	IC, other, high performance USB microcontrollers	PIC18F4550-I/PT	Microchip Technology	PIC18F4550-I/PT
1	VUSB	Connector, PCB, test point, red	Red	Components Corporation	TP-104-01-02
1	Y1	IC, crystal oscillator	20.000 MHz	ECS	ECS-200-20-18