

**FEATURES**

**On-board USB/VGA/S-Video connectors**  
**Direct hook-up to USB port of PC**  
**PC software for control of switches**

**KIT CONTENTS**

**Fully fitted printed circuit board (PCB)**  
**Evaluation software CD**  
**USB cable**  
**Documentation**

**GENERAL DESCRIPTION**

The ADG790 evaluation board is designed to allow the user to evaluate the performance of the ADG790 switch with minimum effort. The board is fitted with connectors (J1 to J13), allowing

the user to connect various signal sources (USB/VGA/S-Video) to the switch. All signals applied to the switch can be monitored using the test points (T1 to T32) on the board. See the ADG790 Switch Pins, Test Points, and Connectors section for a detailed description of connectors and test pins.

The evaluation software allows the user to easily program the ADG790 and control its operation by connecting the board to a USB port of a PC running Windows® 2000 or XP. The USB port also provides the power for the board; therefore, no additional external supply is required.

Consult the ADG790 data sheet (available at the Analog Devices, Inc. website), in conjunction with this technical note, when using the ADG790 evaluation board.

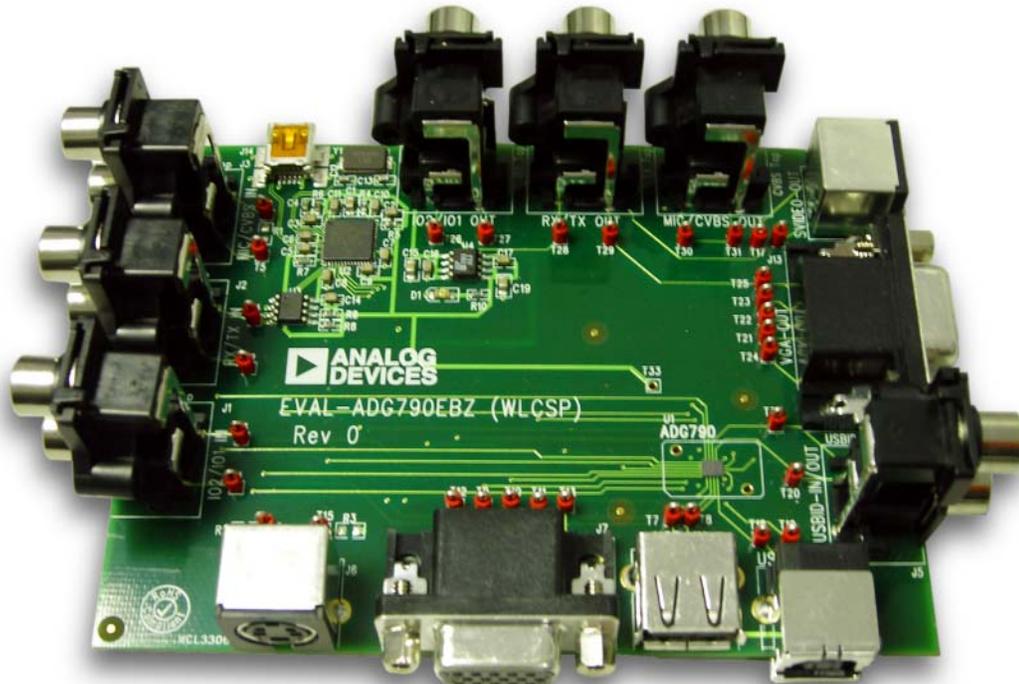
**EVALUATION BOARD**

Figure 1.

**Rev. 0**

Evaluation boards are only intended for device evaluation and not for production purposes. Evaluation boards as supplied "as is" and without warranties of any kind, express, implied, or statutory including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. No license is granted by implication or otherwise under any patents or other intellectual property by application or use of evaluation boards. Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Analog Devices reserves the right to change devices or specifications at any time without notice. Trademarks and registered trademarks are the property of their respective owners. Evaluation boards are not authorized to be used in life support devices or systems.

## TABLE OF CONTENTS

Features .....	1	Evaluation Board Schematics and Artwork.....	5
Kit Contents .....	1	Evaluation Board Hardware.....	10
General Description .....	1	ADG790 Switch Pins, Test Points, and Connectors .....	10
Evaluation Board .....	1	Ordering Information .....	11
Revision History .....	2	Ordering Guide .....	11
Evaluation Board Software .....	3	ESD Caution.....	11
Software Installation .....	3		
Software Operation .....	3		

## REVISION HISTORY

1/07—Revision 0: Initial Version

# EVALUATION BOARD SOFTWARE

## SOFTWARE INSTALLATION

The ADG790 evaluation board includes self-installing software on CD-ROM. The software is compatible with Windows® 2000/XP. If the setup file does not run automatically after inserting the disc, run setup.exe manually from the CD-ROM.

The evaluation software must be installed before connecting the evaluation board to the USB port of the PC, to ensure that it is correctly recognized by Windows when connected.

1. After the installation has completed, connect the ADG790 evaluation board to the PC USB port using the cable supplied.
2. When the evaluation board is detected, proceed through any dialog boxes that appear to finalize the installation.

## SOFTWARE OPERATION

To launch the software, click on the **ADG790** submenu under the **Analog Devices** menu. Click on **ADG790 Evaluation Software**. Figure 2 displays the main window that is opened.

If you receive an error message in the **Firmware Download Status** section, check the connection between the board and the USB port of the PC and restart the application.

The software provides two operating modes, selected by clicking on the **Function Select** and **Input Pins** buttons in the **Control Mode** section.

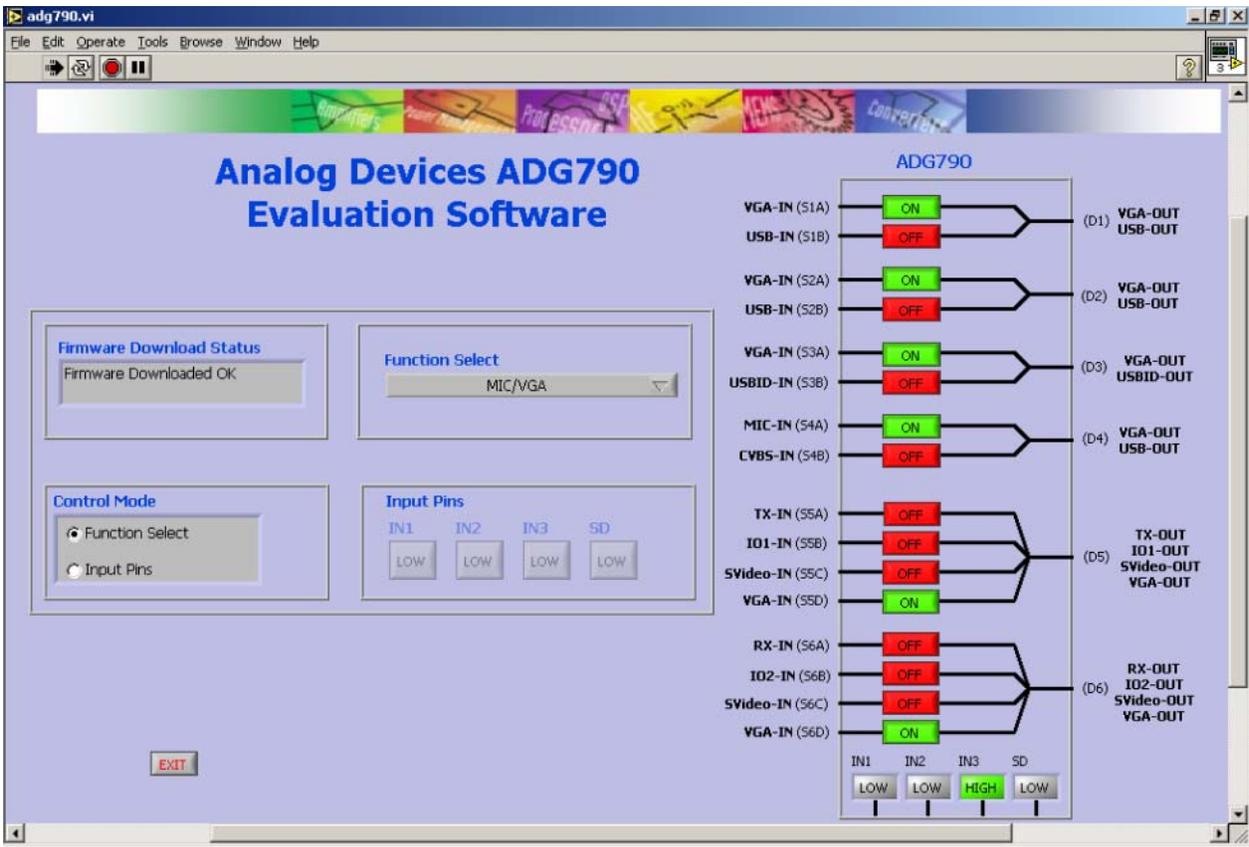


Figure 2. Main Window

# EVAL-ADG790

## Input Pins Mode

In this mode, the user manually controls the logic value on each of the ADG790 control pins using the buttons labeled **IN1**, **IN2**, **IN3**, and **SD**. Table 1 indicates the correspondence between the logic state of the ADG790 control pins and the signals allowed to pass through the device.

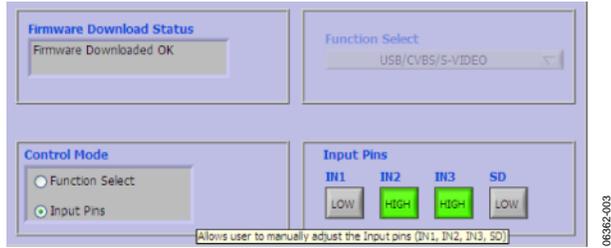


Figure 3. Input Pins Section

Table 1. Input Pin Table

IN1	IN2	IN3	S/D	Connection <sup>1</sup>
X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	High	IO1/IO2
Low	Low	Low	Low	USB/CVBS/S-VIDEO
Low	Low	High	Low	MIC/VGA
Low	High	Low	Low	USB/IO1/IO2/MIC
Low	High	High	Low	USB/MIC/S-VIDEO
High	Low	Low	Low	USB/TX/RX/MIC
High	Low	High	Low	CVBS/VGA
High	High	Low	Low	USB/TX/RX/CVBS
High	High	High	Low	USB/IO1/IO2/CVBS

<sup>1</sup> Designates the established connection listed in the column between the IN and OUT connectors, respectively.

<sup>2</sup> X = don't care.

## Function Select Mode

In function select mode, instead of setting the logic state for each individual control pin of the ADG790, the user can choose the signals allowed to pass through the switch by simply selecting an item from the **Function Select** drop down list, as shown in Figure 4. Once a selection is made, the software automatically sets the logic value for the ADG790 control pins (IN1, IN2, IN3, and S/D) to execute the desired command.

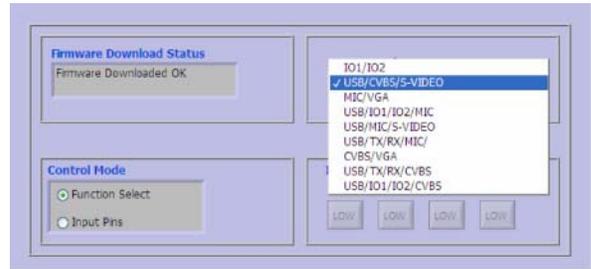


Figure 4. Function Select Drop-Down List

## ADG790 Control Pins/Switch Status

When a selection is made in either the **Function Select** section or the **Input Pins** section, the **ADG790** illustration on the right side of the window indicates the operation of the ADG790 switches and control pins during evaluation. The text in bold beside each pin represents the connector connection, and the text in parentheses represents the ADG790 pin name.



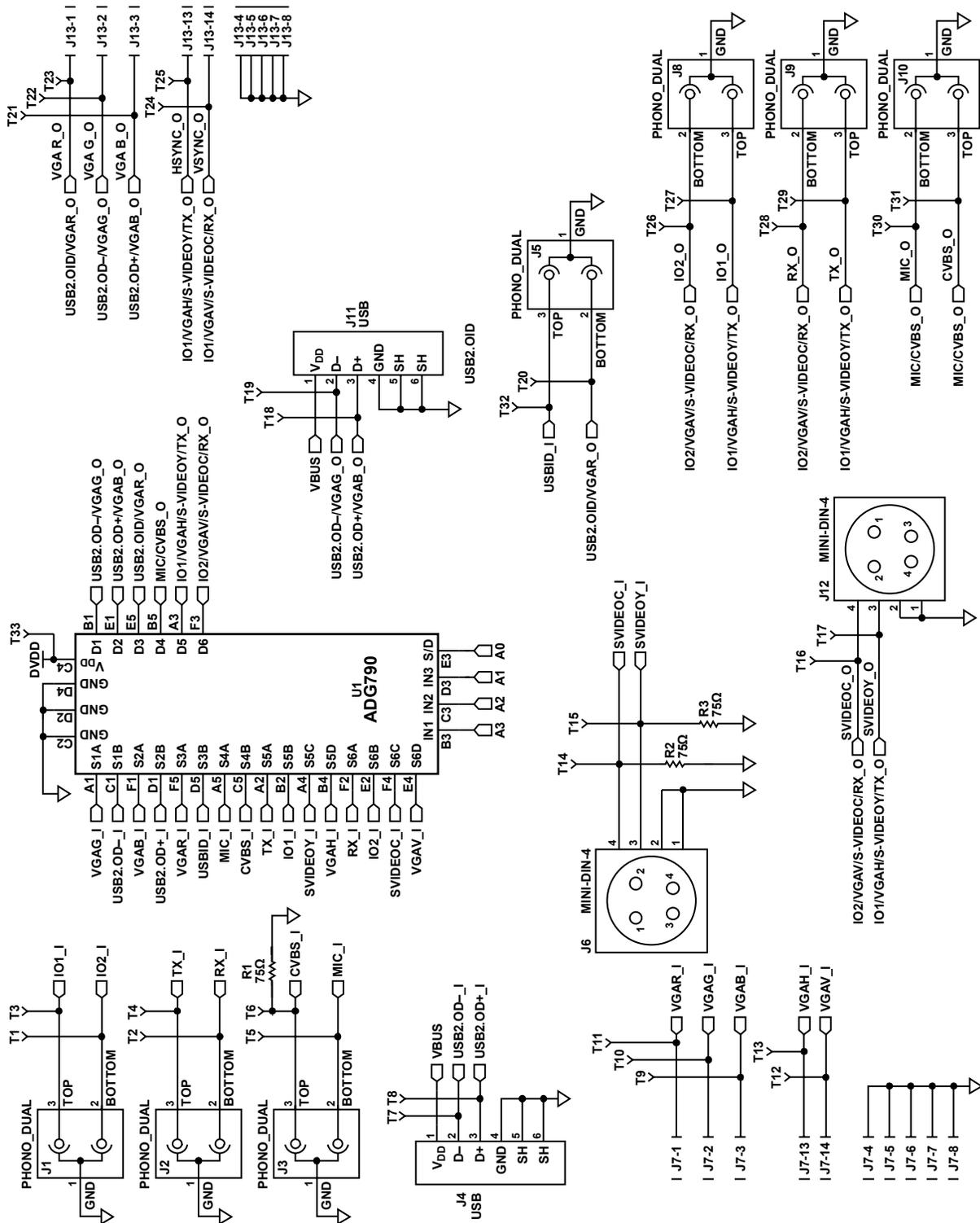


Figure 6. EVAL-ADG790 Schematic (Switch Circuitry)

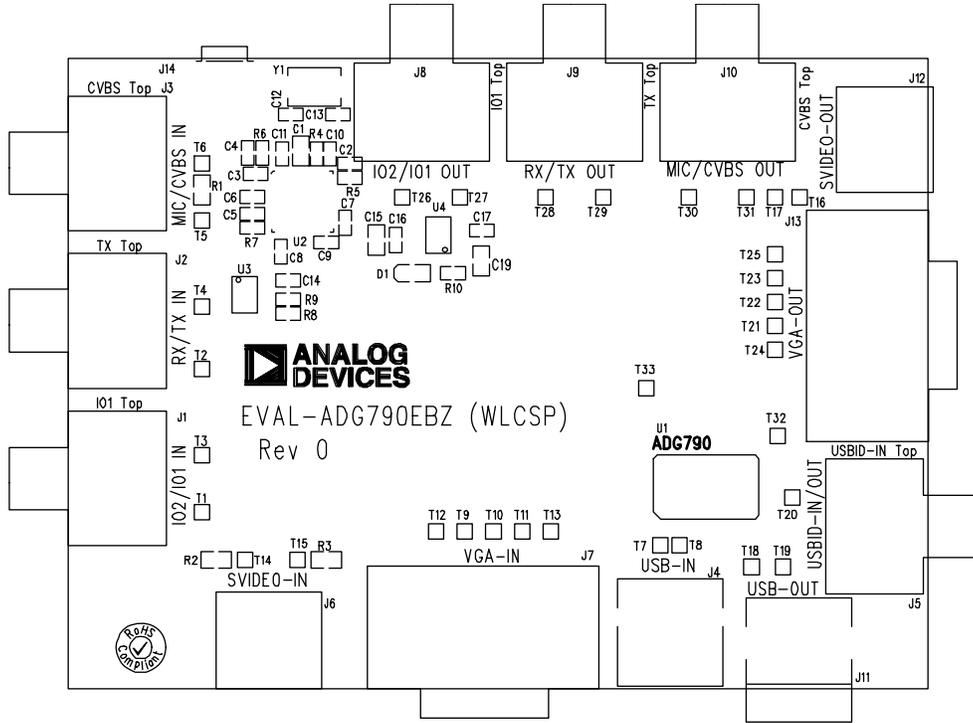


Figure 7. Silkscreen Image of the ADG790 Evaluation Board

06362-007

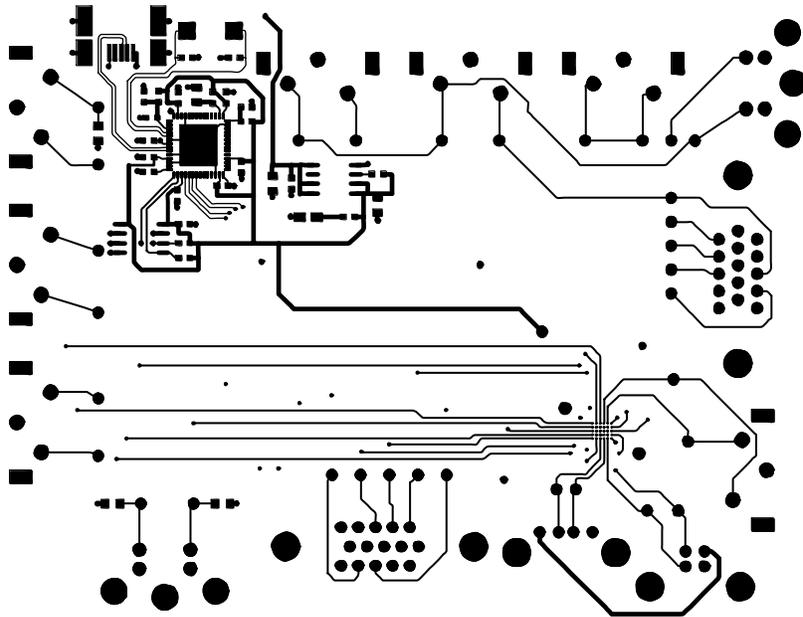
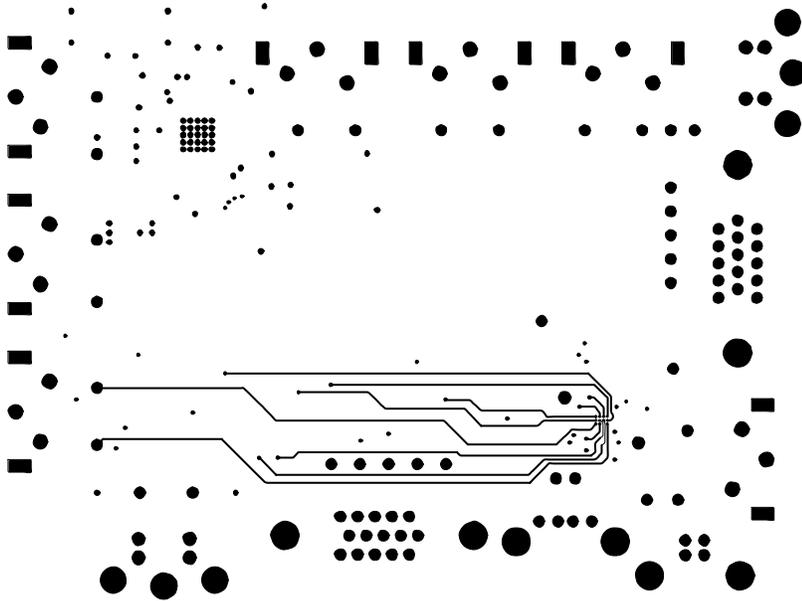


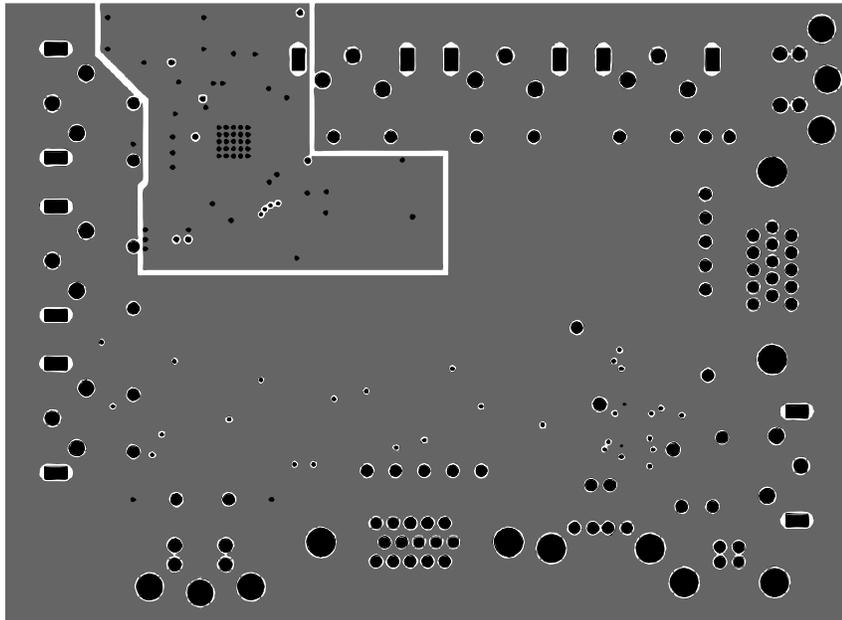
Figure 8. PCB Drawing, Layer 1 (Top Layer)

06362-008



06362-009

Figure 9. PCB Drawing, Layer 2



06362-010

Figure 10. PCB Drawing, Layer 3

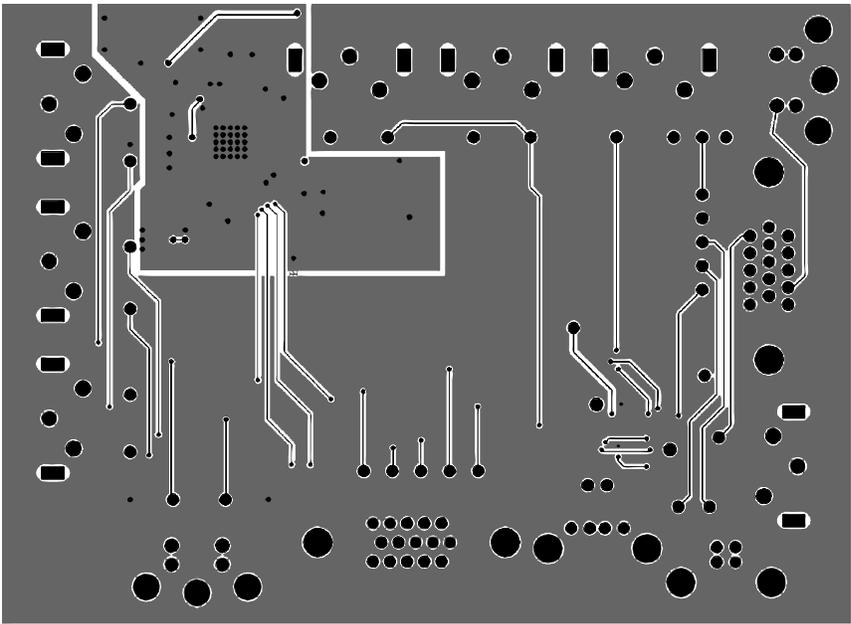


Figure 11. PCB Drawing, Layer 4 (Bottom Layer)

06362-011

# EVAL-ADG790

## EVALUATION BOARD HARDWARE

### ADG790 SWITCH PINS, TEST POINTS, AND CONNECTORS

Table 2.

Connector Name	Signal Name	Pin Number/Position	ADG790 Pin Name	Test Point
J1	IO2 IN	BOTTOM	S6B	T1
	IO1 IN	TOP	S5B	T3
J2	RX IN	BOTTOM	S6A	T2
	TX IN	TOP	S5A	T4
J3	MIC IN	BOTTOM	S4A	T5
	CVBS IN	TOP	S4B	T6
J4	USB 2.0 D+ IN	3	S2B	T8
	USB 2.0 D- IN	2	S1B	T7
J5	USB 2.0 ID OUT	BOTTOM	D3	T20
	USBID IN	TOP	S3B	T32
J6	S-VIDEO C IN	4	S6C	T14
	S-VIDEO Y IN	3	S5C	T15
J7	VGA R IN	1	S3A	T11
	VGA G IN	2	S1A	T10
	VGA B IN	3	S2A	T9
	VGA HSYNC IN	13	S5D	T13
	VGA VSYNC IN	14	S6D	T12
J8	IO2 OUT	BOTTOM	D6	T26
	IO1 OUT	TOP	D5	T27
J9	RX OUT	BOTTOM	D6	T28
	TX OUT	TOP	D5	T29
J10	MIC OUT	BOTTOM	D4	T30
	CVBS OUT	TOP	D4	T31
J11	USB 2.0 D+ OUT	3	D2	T18
	USB 2.0 D- OUT	2	D1	T19
J12	S-VIDEO C OUT	4	D6	T16
	S-VIDEO Y OUT	3	D5	T17
J13	VGA R OUT	1	D3	T23
	VGA G OUT	2	D1	T22
	VGA B OUT	3	D2	T21
	VGA HSYNC OUT	13	D5	T25
	VGA VSYNC OUT	14	D6	T24

## ORDERING INFORMATION

Table 3. Components Listing

Qty	Reference Designator	Description	Supplier/Number
12	C2, C3, C5:C11, C14, C16, C17	16 V X7R SMD ceramic capacitor, 0603, 0.1 $\mu$ F	FEC432-210
3	C1, C15, C19	6.3 V X5R ceramic capacitor, 0805, 10 $\mu$ F	FEC940-2136
2	C12, C13	50 V NPO SMD ceramic capacitor, 0603, 12 pF	FEC 721-979
1	C4	SMD X5R ceramic capacitor, 0603, 2.2 $\mu$ F	FEC 940-2101
1	D1	Light-emitting diode, green	FEC 852-9892
7	J1, J2, J3, J5, J8, J9, J10	RCA dual phono jack, R/A, red/white	Digi-Key CP-1435-ND
1	J4	Right-angle USB receptacle, type A	FEC 107-6663
2	J6, J12	4-pin mini DIN connector	FEC 152-211
2	J7, J13	15-pin high density D-type connector, 90 degrees, female	FEC 107-5303
1	J11	Right-angle USB receptacle, type B	FEC 107-6665
1	J14	USB mini-B connector, USB-OTG	FEC 978-6490
3	R1, R2, R3	SMD resistor, 0805, 75 $\Omega$ termination resistor (not populated)	
2	R4, R5	SMD resistor, 0603, 100 k $\Omega$	FEC 933-0402
2	R8, R9	SMD resistor, 0603, 2.2 k $\Omega$	FEC 933-0810
1	R6	SMD resistor, 0603, 0 $\Omega$	FEC 933-1662
1	R7	SMD resistor, 0603, 10 k $\Omega$	FEC 933-0399
1	R10	SMD resistor, 0603, 1 k $\Omega$	FEC 933-0380
32	T1:T32	Test point	FEC 873-1144
1	T33	Test point (not populated)	
1	U1	ADG790	ADG790BCBZ <sup>1</sup>
1	U2	USB microcontroller	Cypress CY7C68013-56LFC
1	U3	24LC64, 64 k I <sup>2</sup> C <sup>®</sup> serial EEPROM	FEC 9758070
1	U4	Precision, low dropout voltage regulator	ADP3303ARZ-3.3 <sup>1</sup>
1	Y1	XTAL-CSM-8A, SMD crystal	Digi-Key XC1009CT-ND

<sup>1</sup> Z = Pb-free part.

### ORDERING GUIDE

Model	Description
EVAL-ADG790EBZ <sup>1</sup>	Evaluation Board

<sup>1</sup> Z = Pb-free part.

### 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.

**NOTES**

Purchase of licensed I<sup>2</sup>C components of Analog Devices or one of its sublicensed Associated Companies conveys a license for the purchaser under the Philips I<sup>2</sup>C Patent Rights to use these components in an I<sup>2</sup>C system, provided that the system conforms to the I<sup>2</sup>C Standard Specification as defined by Philips.