

### FEATURES

Full-featured evaluation boards for the ADG79XX family of switches:

- ADG791A/ADG791G (Quad 2:1 multiplexer)
- ADG792A/ADG792G (Triple 4:1 multiplexer)
- ADG793A/ADG793G (Triple 3:1 multiplexer)
- ADG795A/ADG795G (Five 2:1 multiplexer)
- ADG796A (Hex 2:1 multiplexer)
- ADG799A/ADG799G (Triple 2 x 2 crosspoint switch)

Various link options

Direct hook-up to the USB port of a PC

PC software for control of switches

Functions with or without a PC

### GENERAL DESCRIPTION

This data sheet describes the evaluation boards for the ADG79XX family of switches. The evaluation boards are designed to accommodate all devices from the ADG79XX family and allow the user to evaluate their performance. All of the evaluation boards (except for the ADG796A board) are populated with the ADG79XG version of each generic and cover the functionality of the ADG79XA generics.

Each EVAL-ADG79XXEB model has an on-board, USB-to-I<sup>2</sup>C<sup>®</sup> controller. This allows users to control the operation of the switch through the USB port of a PC by using the software provided with the board.

Full data on the ADG79XX family of switches can be found on the data sheets available from Analog Devices, Inc., ([www.analog.com](http://www.analog.com)) and should be consulted in conjunction with this data sheet when using each evaluation board.

### EVALUATION BOARD DIGITAL PICTURE

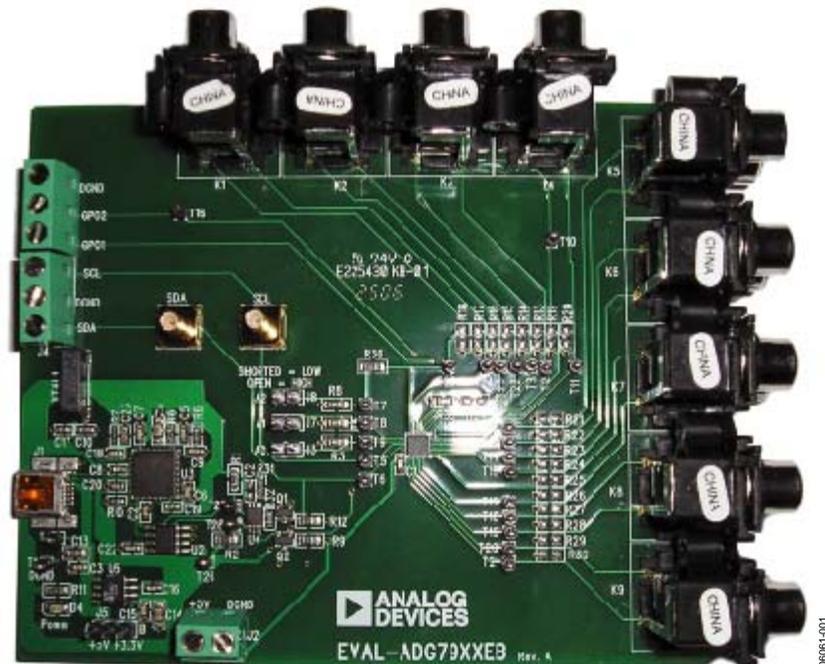


Figure 1.

### Rev. 0

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## REVISION HISTORY

7/06—Revision 0: Initial Version

## HARDWARE DESCRIPTION

### POWER SUPPLY

The ADG79XX evaluation boards can be operated from 3.3 V or 5 V supply voltages, selectable using J5. When connected to a PC, the USB port provides the 5 V, while the 3.3 V is generated using an on-board regulator. If a PC is not used, the 5 V supply must be applied to the J2 connector.

### CONNECTING SIGNALS TO THE BOARD

The board is fitted with connectors (K1 to K9) that allow the user to connect various signal sources to the switch. Each connector has an option to place termination resistors, if required (R13 to R31). All signals applied to the switch can be monitored using the test points provided (T1 to T28).

The I<sup>2</sup>C signals SDA and SCL are available at the SMB connectors labeled SDA and SCL, as well as at J4. They can be used to connect the ADG79XX switch to an external I<sup>2</sup>C bus.

The logic levels provided by the GPO pins are available at connector J6.

### LINK OPTIONS

The configuration of the board is set using the J3, J5, J7, and J8 links. J3, J7, and J8 set the least significant bits of the I<sup>2</sup>C address (A0, A1, and A2) for the ADG79XX device used on the board. Table 1 shows the logic values for A0, A1, and A2 for various configurations of the J3, J7, and J8 links. When the ADG796A is used, its I<sup>2</sup>C address is set using only J3 and J7; J8 has no effect.

Table 1. J3 Link Options

Link	I <sup>2</sup> C Address Bit	Shorted	Open
J3	A0	0 (Low)	1 (High)
J7	A1	0 (Low)	1 (High)
J8	A2	0 (Low)	1 (High)

J5 sets the power supply applied to the switch as shown in Table 2.

Table 2. J5 Link Options

Position	A	B
Supply Voltage	5 V	3.3 V

Note that all the information required to set up the board is available on the board's silkscreen.

### SWITCH PIN CONNECTIONS TO K1 THROUGH K9

Table 3.

Connectors	Test Point	Part Number					
		ADG791A, ADG791G	ADG792A, ADG792G	ADG793A, ADG793G	ADG795A, ADG795G	ADG796A	ADG799A, ADG799G
K1 Top	T24	–	S3C	S3C	–	S6B	S3A
K1 Bottom	T25	–	–	–	–	S6A	–
K2 Top	T22	–	D3	D3	D5	D5	D3A
K2 Bottom	T23	–	S3D	–	–	D6	D3B
K3 Top	T2	–	S3A	S3A	S5A	S5A	–
K3 Bottom	T3	–	S3B	S3B	S5B	S5B	S3B
K4 Top	T11	S4B	S2C	S2C	S4B	S4B	S2B
K4 Bottom	T10	S4A	–	–	S4A	S4A	–
K5 Top	T13	D3	D2	D2	D3	D3	D2A
K5 Bottom	T12	D4	S2D	–	D4	D4	D2B
K6 Top	T15	S3A	S2A	S2A	S3A	S3A	–
K6 Bottom	T14	S3B	S2B	S2B	S3B	S3B	S2A
K7 Top	T17	S2B	S1C	S1C	S2B	S2B	S1B
K7 Bottom	T16	S2A	–	–	S2A	S2A	–
K8 Top	T19	D1	D1	D1	D1	D1	D1A
K8 Bottom	T18	D2	S1D	–	D2	D2	D1B
K9 Top	T21	S1A	S1A	S1A	S1A	S1A	–
K9 Bottom	T20	S1B	S1B	S1B	S1B	S1B	S1A

## EVALUATION BOARD SOFTWARE

### SOFTWARE INSTALLATION

The ADG79XX evaluation kit includes self-installing software on CD-ROM. The software is compatible with Microsoft® Windows® 2000 and Windows® XP with a minimum display resolution of 1024 × 768 pixels.

The evaluation software should be installed before connecting the evaluation board to the PC's USB port. This ensures that the board is correctly recognized when connected to the PC.

Follow these steps to install the evaluation software:

1. Start the Windows operating system and insert the CD-ROM.
2. If the setup file does not run automatically, **setup.exe** can be run directly from the CD-ROM.
3. After installing the software from the CD-ROM, connect the ADG79XX evaluation board to the PC's USB port using the cable supplied.
4. When the evaluation board is detected, proceed through any dialog boxes that appear. This completes the installation of the drivers for the board.

### SOFTWARE OPERATION

1. To launch the software, click **Analog Devices > ADG79XX > ADG79XX Evaluation Software**.
2. Next, the main screen is opened (see Figure 2).



Figure 2. Main Screen

3. If you receive an error message in the **USB Link Status** box, make sure that the board is recognized by Windows. Then, click the arrow button displayed on the top left corner of the window to restart the application.

4. Use the **Device Selection List** menu, shown in Figure 3, to choose the software for ADG79XX device that is fitted onto the evaluation board. If the exact part number is not known, check the label on the evaluation board.

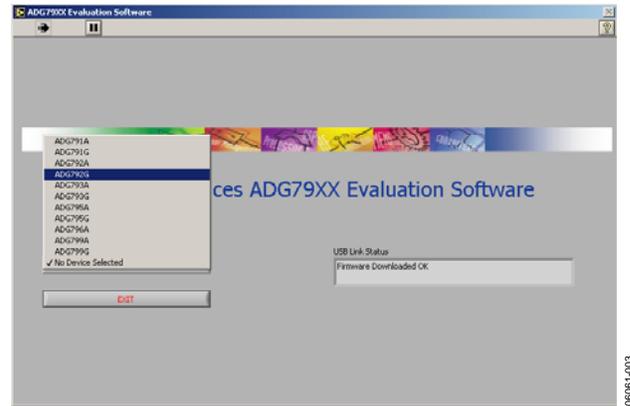


Figure 3. Device Selection List Menu

5. After the desired device is selected, a new window opens as shown in Figure 4.

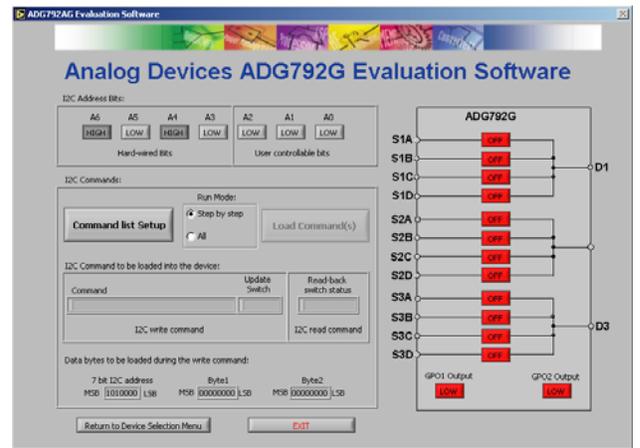


Figure 4. Main Window for ADG792G Evaluation Software

6. Figure 4 represents the main window for ADG792G but it is similar to the main windows for all ADG79XX devices. Each main window has the control elements highlighted in Figure 5.

## MAIN WINDOW SETUP

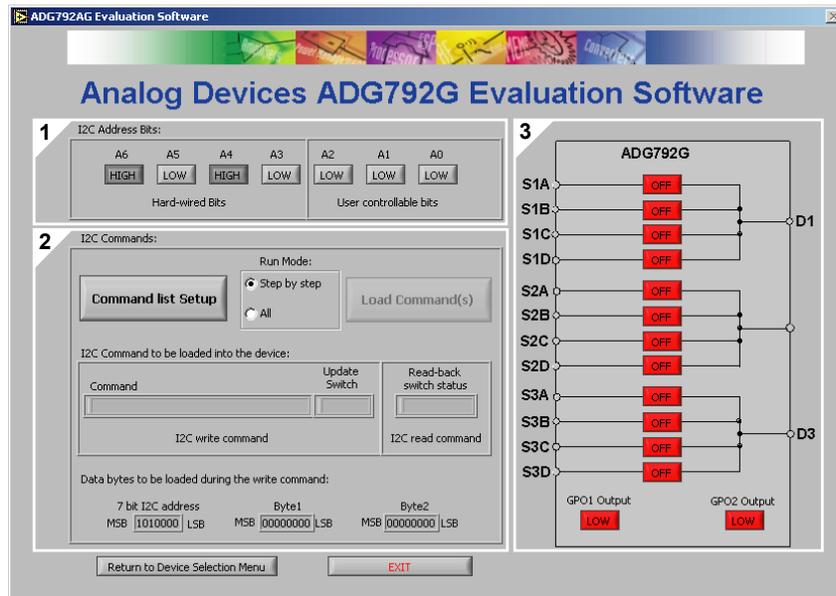


Figure 5. Main Window Setup

### The I2C Address Bits

This section (Section 1 in Figure 5) lets you set the I<sup>2</sup>C address to be sent to the evaluation board. These user-controllable bits must be set to match the configuration of J3, J7, and J8 from the evaluation board.

### The I2C Commands

This section (Section 2 in Figure 5) lets you establish a list of commands to be sent to the board. The commands can be sent in step-by-step mode or all at once. After loading a command, the software gives you the option of updating the switch and/or reading back the switch status. The evaluation software is designed to update the switch configuration only if the **Update Switch** option is set to **Yes**. This option sets the LDSW bit accordingly (see data sheets) and allows you to execute a set of commands in a single step. See the Command List Setup section for more information.

### The Block Diagram of the Part

This section (Section 3 in Figure 5) shows the current status of the switches and GPO pins (if available). If the **Read-back switch status** (see Section 2 in Figure 5) option is set to **Yes**, the software reads the status of the switch and updates the diagram.

## Command List Setup

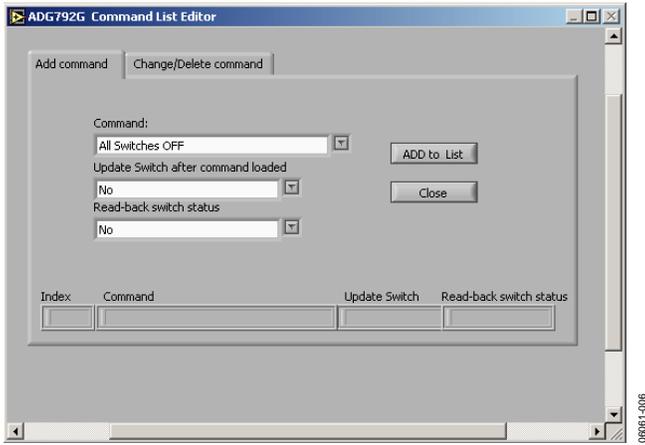


Figure 6. Setup Command List Window

1. Click the **Command List Setup** button from the **I2C Commands** section (Section 2 in Figure 5). The window in Figure 6 is displayed.
2. Use the drop-down list to select the desired command. The list of commands is specific to each device. For more details on the set of commands available for each device, consult the part's data sheet.
3. You can also select whether to the **Update Switch after command loaded** or to **Read-back switch status** with the associated drop down lists. Once the desired options have been chosen, click the **ADD to List** button to insert the selection to the command list displayed at the bottom of the window.

4. When the list is complete, close this window to return to the main window (Figure 5).
5. If edits are required to the command list, click the **Change/Delete command** tab. The window in Figure 7 then appears.

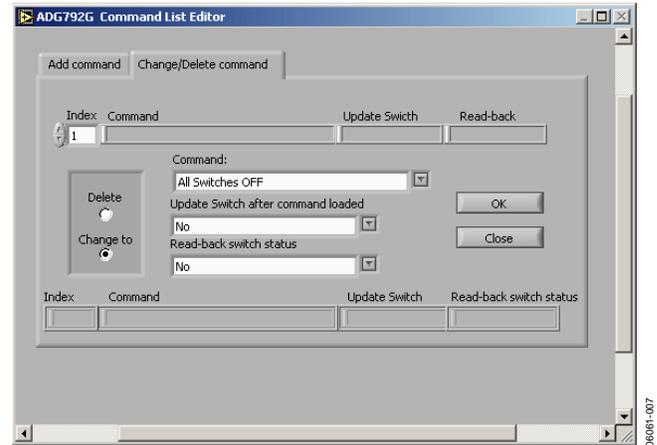


Figure 7. Change/Delete Command Window

6. To edit/delete an item from the list at the bottom of the window, select it and click the **Index** button until the desired item is displayed. If the **Change to** option button is selected, three drop-down lists allow you to change the selected item. Any edit/delete command is completed by clicking the **OK** button. The updated item then appears in the list at the bottom of the window. When the editing is complete, click **Close** to return to the main window (Figure 5).

EVALUATION BOARD SCHEMATICS AND ARTWORK

800-19090

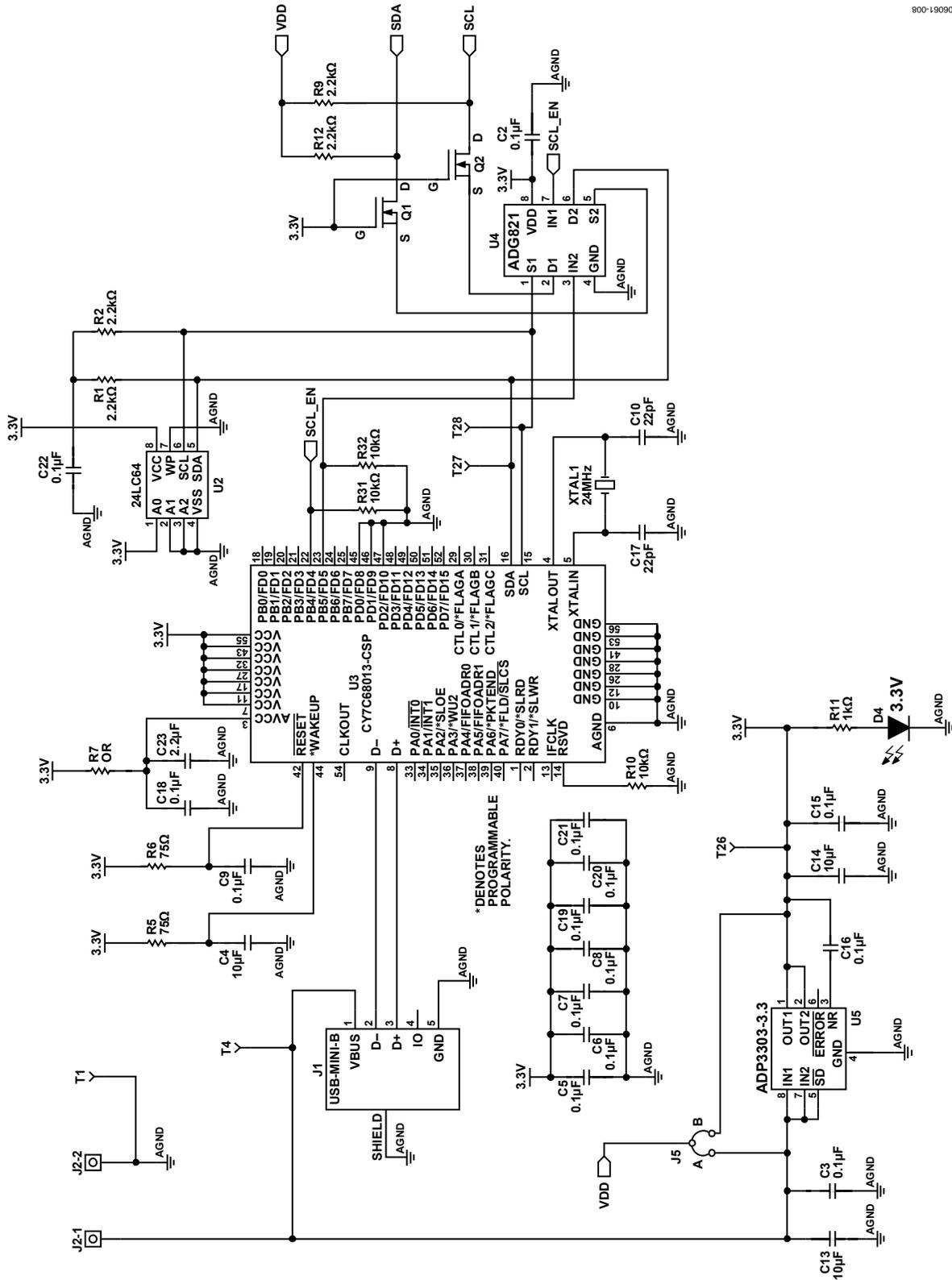


Figure 8. EVAL-ADG79XXEB Schematic—USB Controller Section

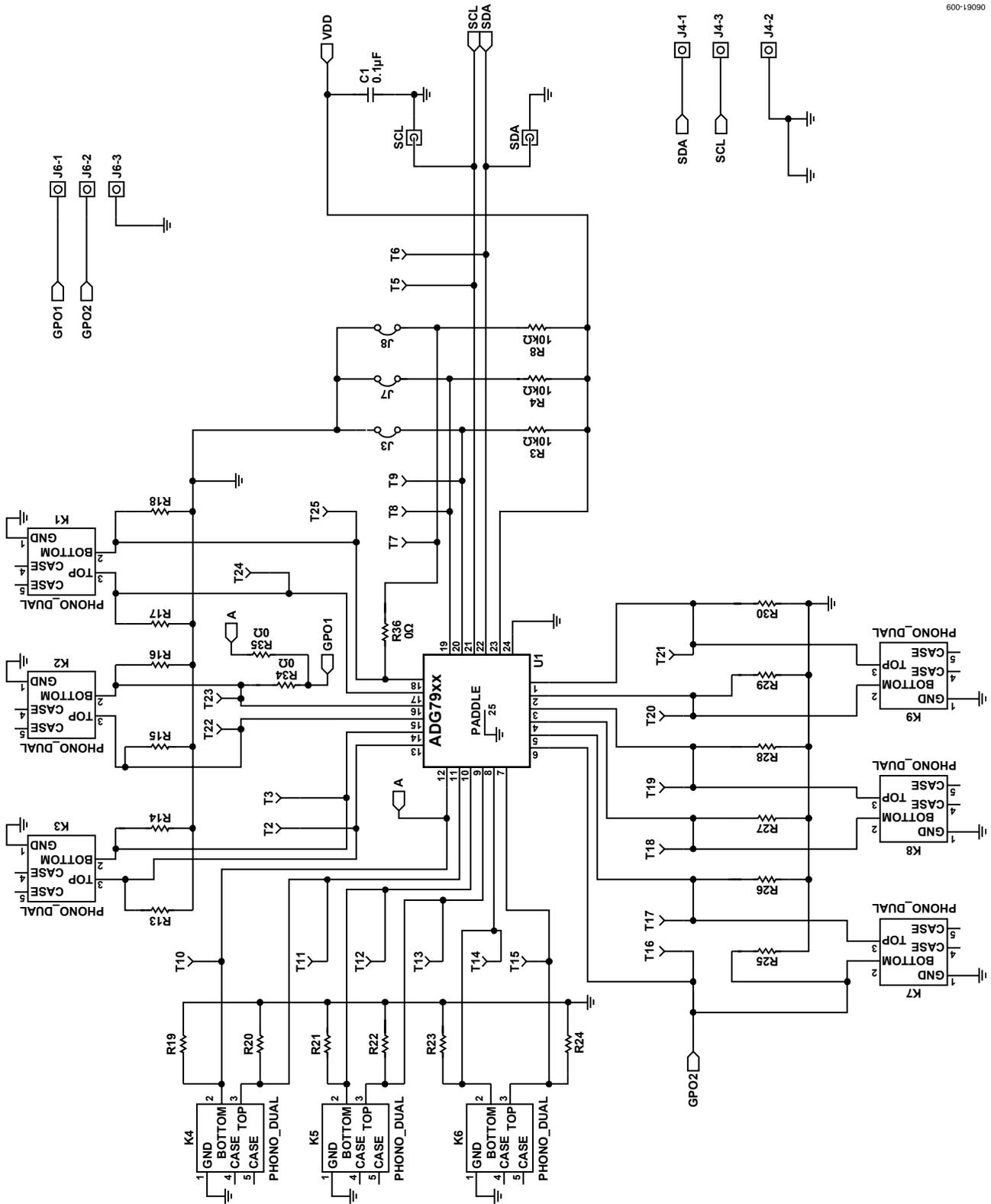


Figure 9. EVAL-ADG79XXEB Schematic—Switch Section

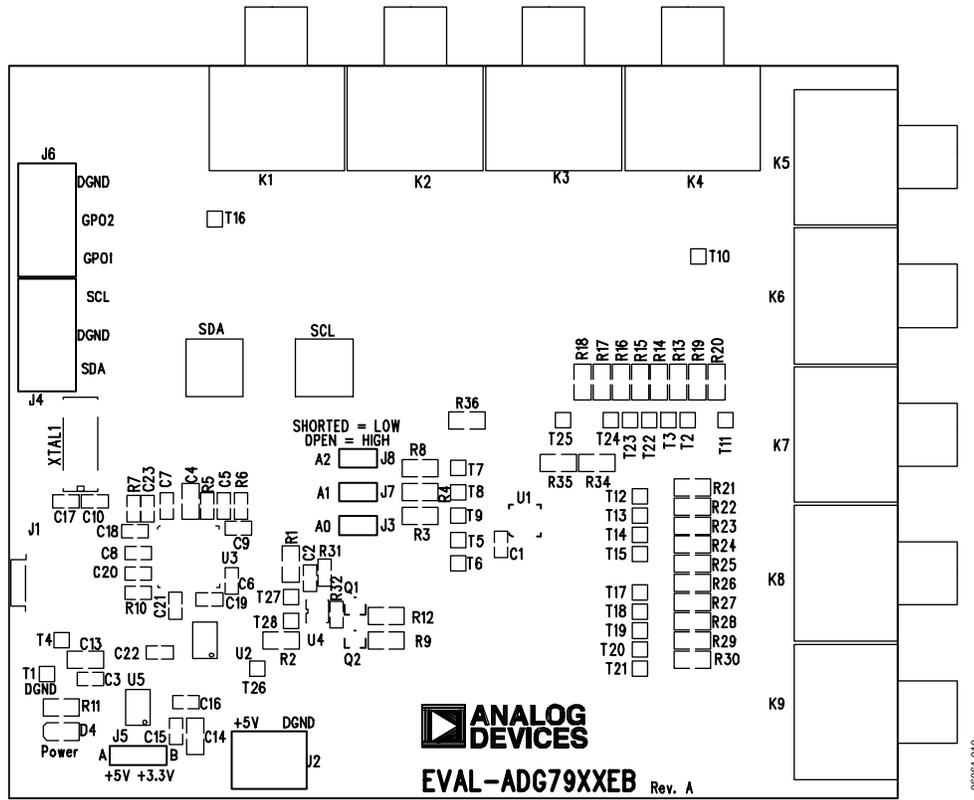


Figure 10. EVAL-ADG79XXEB Silkscreen Image

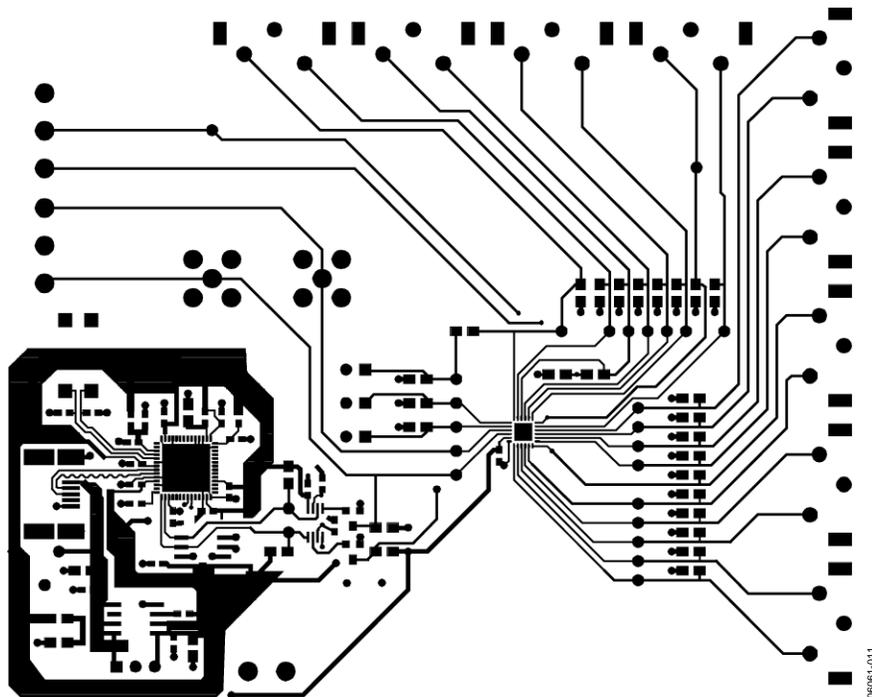


Figure 11. EVAL-ADG79XXEB Component Side



## ORDERING INFORMATION

### BILL OF MATERIALS

Table 4.

Qty	Reference Designator	Description	Supplier/Number
14	C1, C3, C5 to C9, C15, C16, C18 to C22,	0.1 $\mu$ F (0603 package) 50 V X7R SMD ceramic capacitor	FEC 499-675
3	C4, C13, C14	10 $\mu$ F (0805 package) X5R ceramic capacitor	Digikey 490-1709-1-ND
1	C2	Not populated	
2	C10, C17	22 pF (0603 package) 50 V X7R SMD ceramic capacitor	FEC 722-005
1	C23	2.2 $\mu$ F (0603 package) 6.3 V X5R SMD ceramic capacitor	Digikey 490-1552-1-ND
1	D4	LED (0805 package)	FEC 359-9681
1	J1	USB Mini-B connector	Digikey WM2499TR-ND
1	J2	2-pin terminal block	FEC 151-785
3	J3, J7, J8	2-pin jumper	FEC 511-705, FEC 528-456
1	J5	3-pin jumper	FEC 148-535, FEC 150-411 (36-pin strip)
2	J4, J6	3-pin terminal block	FEC 963-2980
9	K1 to K9	Socket, phono PCB gold 1 pair	FEC 382-4834
2	Q1, Q2	FDV301N SMD MOSFET transistor	FEC 984-5011
2	SCL, SDA	50 $\Omega$ straight SMB jack	FEC 419-4512
4	R1, R2, R9, R12	2.2 k $\Omega$ SMD resistor	FEC 196-319
2	R5, R6	75 $\Omega$ SMD resistor	FEC-933-1549
6	R3, R4, R8, R10, R31, R32	10 k $\Omega$ SMD resistor	FEC 923-4136
1	R7	0 $\Omega$ SMD resistor	FEC 933-1662
1	R34	0 $\Omega$ SMD resistor. Not populated except for ADG791A/ADG791G/ADG795A/ADG795G	FEC 923-3750
1	R35	0 $\Omega$ SMD resistor. Populated except for ADG791A/ADG791G/ADG795A/ADG795G	FEC 923-3750
1	R36	0 $\Omega$ SMD resistor. Populated except for ADG796A	FEC 923-3750
1	R11	1 k $\Omega$ SMD resistor	FEC 933-2383
27	R13 to R30	Not populated	
28	T1 to T28	Testpoint	FEC 240-333
1	U1	ADG792GBCPZ for EVAL-ADG792GEB ADG793GBCPZ for EVAL-ADG793GEB ADG791GBCPZ for EVAL-ADG791GEB ADG795GBCPZ for EVAL-ADG795GEB ADG796ABCPZ for EVAL-ADG796AEB ADG799GBCPZ for EVAL-ADG799GEB	Analog Devices
1	U2	24LC64 EEPROM	Digikey 24LC64-I/SN-ND
1	U3	USB microcontroller	Cyprus CY7C68013-56LFC
1	U4	Dual SPST switch	Analog Devices ADG821BRMZ
1	U5	3.3 V regulator	Analog Devices ADP3303AR-3.3
1	XTAL1	24 MHz CM309S SMD crystal	FEC 950-9658

# EVAL-ADG79XXEB

## ORDERING GUIDE

Model	Description
EVAL-ADG791GEB <sup>1</sup>	ADG791G Evaluation Board
EVAL-ADG792GEB <sup>1</sup>	ADG792G Evaluation Board
EVAL-ADG793GEB <sup>1</sup>	ADG793G Evaluation Board
EVAL-ADG795GEB <sup>1</sup>	ADG795G Evaluation Board
EVAL-ADG796AEB <sup>1</sup>	ADG796A Evaluation Board
EVAL-ADG799GEB <sup>1</sup>	ADG799G Evaluation Board

<sup>1</sup> Evaluation boards are RoHS compliant.

## ESD CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although this product features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



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