



# Evaluation Board for 10-/12-Bit High Speed, Low Power ADCs

## EVAL-AD7470/AD7472

### FEATURES

Full-featured evaluation board for the AD7470/AD7472

Compatible with the EVAL-CONTROL BRD2

Standalone capability

On-board analog buffering and reference

Optional on-board analog bias-up circuit

Optional on-board burst clock generator circuit

Various linking options

PC software for control and data analysis when used with the EVAL-CONTROL BRD2

### GENERAL DESCRIPTION

This data sheet describes the evaluation board for the AD7470/AD7472. The AD7470/AD7472 are, respectively, 10-/12-bit, high speed, low power, successive approximation ADCs that

operate from a single 2.7 V to 5.25 V supply. Full data on the AD7470/AD7472 is available in the AD7470/AD7472 data sheet available from Analog Devices, Inc. and should be consulted in conjunction with this data sheet when using the evaluation board.

On-board components include an AD780 (a pin programmable +2.5 V or +3 V ultra high precision band gap reference), an AD797 and an AD711 (op amps used to buffer the bipolar and unipolar analog input respectively), and an OP07 (op amp used to buffer the DC bias voltage applied to the optional analog input bias-up circuit). There are various link options, which are explained in detail in the Link and Switch Options section.

Interface to this board is via a 96-way connector. This 96-way connector is compatible with the EVAL-CONTROL BRD2 (also available from Analog Devices). External sockets are provided for the CNVST input, CLKIN input, and the VIN inputs.

### FUNCTIONAL BLOCK DIAGRAM

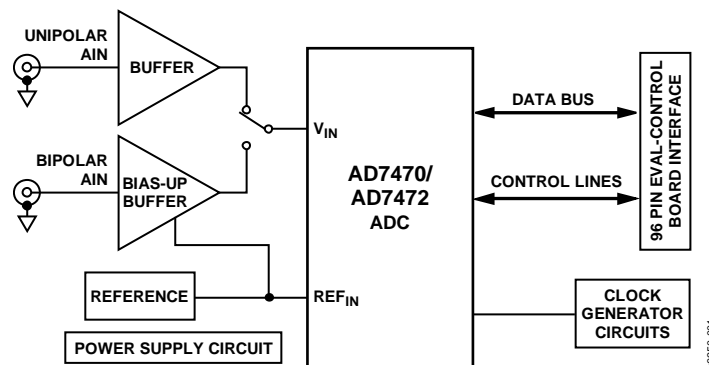


Figure 1.

### Rev. C

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# EVAL-AD7470/AD7472

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## REVISION HISTORY

### 10/07—Rev. B to Rev. C

Updated Format .....	Universal
Changes to Analog Input Section .....	3
Changes to Table 1 .....	3
Changes to Figure 6 .....	11
Changes to Figure 7 .....	12
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## EVALUATION BOARD HARDWARE

### POWER SUPPLIES

When using this evaluation board with the EVAL-CONTROL BRD2 all supplies are provided from the EVAL-CONTROL BRD2 through the 96-way connector.

When using the board as a standalone unit, external supplies must be provided. This evaluation board has five power supply inputs: VDD, AGND, VSS, VDRIVE, and DGND. Connect +5 V to the VDD input to supply the AV<sub>DD</sub> and DV<sub>DD</sub> pins on the AD7470/AD7472, the AD780 voltage reference, the positive supply pin of all three op amps, and the digital control logic. Connect 0 V to the AGND input. Connect -5 V to the VSS input to supply the negative supply pins on all three op amps. The VDRIVE input can be used to provide an external voltage for the output drivers on the AD7470/AD7472. If an external VDRIVE is supplied, it is referenced to the DGND input, which should be tied to 0 V. The supplies are decoupled to the relevant ground plane with 47  $\mu$ F tantalum and 0.1  $\mu$ F multilayer ceramic capacitors at the point where they enter the board. The supply pins of the op amps and reference are also decoupled to AGND with a 10  $\mu$ F tantalum and a 0.1  $\mu$ F ceramic capacitor. The AV<sub>DD</sub> supply pin is decoupled to AGND with 10  $\mu$ F tantalum and 0.1  $\mu$ F multilayer ceramic capacitors. The AD7470/AD7472 DV<sub>DD</sub> and V<sub>DRIVE</sub> pins are decoupled to AGND with 10  $\mu$ F tantalum capacitors and to DGND with 0.1  $\mu$ F multilayer ceramic capacitors.

Extensive ground planes are used on this board to minimize the effect of high frequency noise interference. There are two ground planes, AGND and DGND, that are connected at one location close to the AD7470/AD7472.

### ANALOG INPUT

The analog input portion of this evaluation board accommodates unipolar and bipolar signals. Unipolar signals within the AD7470/AD7472 analog input signal range from 0 V to 2.5 V and are connected via SK5. They are then buffered by the on-board buffer before being applied to the V<sub>IN</sub> pin of the AD7470/AD7472. Bipolar signals are connected via SK3 and are biased up by the on-board bias-up buffer circuit before being applied to the V<sub>IN</sub> pin of the AD7470/AD7472. The input impedance of the bias-up circuit is 50  $\Omega$ , which is determined by the value of R7. The input impedance may be modified by removing/changing the value of R7. To obtain optimum performance from this evaluation board, the use of an impedance matched, passive filter is recommended before the analog signal is applied to the evaluation board. For example, when using a 100 kHz input tone, a 100 kHz 50  $\Omega$  filter from TTE (part number KC5-100K-15K-50-720B) is suitable.

### R8 POTENTIOMETER (50 k $\Omega$ )

This variable resistor is used to trim the dc bias voltage applied to the optional analog input bias-up circuit. This bias voltage is factory preset to 1.25 V, which biases a bipolar signal to swing around the midpoint of the analog input range (0 V to 2.5 V). If any adjustment is required, the user can use the histogram window in the evaluation board software to analyze the dc voltage variation while adjusting the trimmer potentiometer. To view this properly, an analog input signal should not be applied to the board. Under normal operation, this potentiometer should not be adjusted as it is preset for optimum performance.

### LINK AND SWITCH OPTIONS

There are 11 link options, which must be set for the required operating setup before using the evaluation board. The functions of these options are outlined in Table 1.

Table 1.

Link No.	Function
LK1	This link is used to select the dc bias voltage to be applied to the optional V <sub>IN</sub> bias-up circuit. If the user is using the bias-up circuit, this link must be inserted which applies the 2.5 V reference voltage to the bias-up circuit. This causes a bipolar signal (applied to the bipolar V <sub>IN</sub> input socket) to be biased up around +1.25 V before it is applied to the AD7470/AD7472 V <sub>IN</sub> pin (see also LK10). If the bias up circuit is not being used, this link should be removed.
LK2	This link must be in Position A if external power supplies are being used. In this position, the control logic is being powered by the voltage applied to the VDD input. When power is being supplied from the EVAL-CONTROL BRD2, this link can be moved to Position B if the user wants to drive the control logic from a separate +5 V, which is generated, on the EVAL-CONTROL BRD2.
LK3	This link option selects the source of the CLKIN input. In Position A, the CLKIN input is provided by the EVAL-CONTROL BRD2. In Position B, the CLKIN input is provided via the on-board 25 MHz oscillator. In Position C, an external CLKIN signal must be provided via the external socket, SK1. When using the on-board generated burst clock, this link must be in Position D.

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Link No.	Function
LK4	This link option selects the source of the CONVST input. In Position A, the CONVST input is provided by the EVAL-CONTROL BOARD2. In Position B, the CONVST input is provided via the external socket, SK2.
LK5	This link option selects the source of the $\overline{RD}$ input. In Position A, the $\overline{RD}$ input is provided by the EVAL-CONTROL BRD2. In Position B, the $\overline{RD}$ input is tied to GND.
LK6	This link option selects the source of the $\overline{CS}$ input. In Position A, the $\overline{CS}$ input is provided by the EVAL-CONTROL BRD2. In Position B, the $\overline{CS}$ input is tied to GND.
LK7	This link option sets the voltage applied to the $V_{DRIVE}$ pin on the AD7470/AD7472. In Position A, $V_{DRIVE}$ is connected directly to the $DV_{DD}$ pin. In Position B, an external voltage must be applied to the $V_{DRIVE}$ pin via J3.
LK8	This link selects the source of the VDD supply. In Position A, VDD must be supplied from an external source via J2. In Position B, VDD is supplied from the EVAL-CONTROL BRD2.
LK9	This link selects the source of the $V_{SS}$ supply. In Position A, $V_{SS}$ must be supplied from an external source via J2. In Position B, $V_{SS}$ is supplied from the EVAL-CONTROL BRD2.
LK10	This link must be in Position A, if a bipolar AIN signal is being applied to the bipolar VIN socket, SK3. This link must be in Position B, if a unipolar AIN signal is being applied to the unipolar VIN socket, SK5.
LK11	This link is used to provide a clock signal path to the burst mode circuit generator either from the on-board clock oscillator or from an external clock source via SK1. In Position A, the master clock signal is provided from the on-board crystal oscillator. In Position B, the master clock signal must be provided from an external source via SK1.

### SET-UP CONDITIONS

Before applying power and signals to the evaluation board, take care to ensure that all link positions are as per the required operating mode. Table 2 shows the default positions of the links. All links are set for use with the EVAL-CONTROL BRD2.

**Table 2. Initial Link and Switch Positions**

Link No.	Position	Function
LK1	Inserted	Provides dc bias voltage to the analog bias-up circuit.
LK2	A	The digital logic circuitry is powered from the same voltage as the AD7470/AD7472.
LK3	A	The CLKIN signal is provided by the EVAL-CONTROL BRD2 via J1.
LK4	A	The CONVST signal is provided by the EVAL-CONTROL BRD2 via J1.
LK5	A	The $\overline{RD}$ signal is provided by the EVAL-CONTROL BRD2 via J1.
LK6	A	The $\overline{CS}$ signal is provided by the EVAL-CONTROL BRD2 via J1.
LK7	A	The AD7470/AD7472 $V_{DRIVE}$ pin is connected to the AD7470/AD7472 $DV_{DD}$ pin.
LK8	B	$V_{DD}$ is supplied by the EVAL-CONTROL BRD2 via J1.
LK9	B	$V_{SS}$ is supplied by the EVAL-CONTROL BRD2 via J1.
LK10	A	The AD7470/AD7472 $V_{IN}$ pin is connected to the output of the bias-up circuit.
LK11	A	Master clock for burst clock generator is provided from the on-board clock oscillator.

## EVAL-CONTROL BRD2 INTERFACING

Interface to the EVAL-CONTROL BRD2 via a 96-way connector, J1. The pinout for the J1 connector is shown in Figure 2 and its pin designations are given in Table 4.

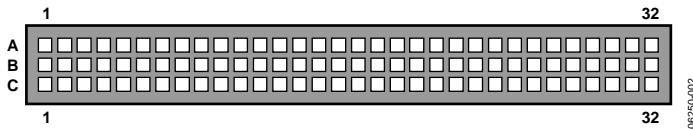


Figure 2. Pin Configuration for the 96-Way Connector, J1

Table 3. 96-Way Connector Pin Description

Signal	Description
D0 to D11	Data Bit 0 to Data Bit 11. Three-state TTL outputs. D11 is the MSB.
SCLK0	Serial Clock Zero. This continuous clock can be connected to the CLKIN pin of the AD7470/AD7472 via LK3.
+5VD	Digital +5 V supply. This can be used to provide a separate +5 V supply for the digital logic if required via LK2.
$\overline{\text{RD}}$	Read. This is an active low logic input connected to the $\overline{\text{RD}}$ pin of the AD7470/AD7472 via LK5.
$\overline{\text{CS}}$	Chip Select. This is an active low logic input connected to the $\overline{\text{CS}}$ pin of the AD7470/AD7472 via LK6.
FL0	Flag Zero. This logic input is connected to the $\overline{\text{CONVST}}$ input of the AD7470/AD7472 via LK4.
$\overline{\text{IRQ2}}$	Interrupt Request 2. This is a logic output and is connected to the BUSY logic output on the AD7470/AD7472.
DGND	Digital Ground. These lines are connected to the digital ground plane on the evaluation board. It allows the user to provide the digital supply via the connector along with the other digital signals.
AGND	Analog Ground. These lines are connected to the analog ground plane on the evaluation board.
AVSS	Negative Supply Voltage. This provides a negative supply to the on-board op amps via LK9.
AVDD	Positive Supply Voltage. This provides a positive supply to the op amps, the reference, the AD7470/AD7472, and the digital logic.

Table 4. 96-Way Connector Pin Functions<sup>1</sup>

Pin	Row A	Row B	Row C
1			
2		D0	
3		D1	
4	DGND	DGND	DGND
5		D2	
6		D3	
7	SCLK0	D4	SCLK0
8	+5VD	+5VD	+5VD
9	$\overline{\text{RD}}$	D5	
10		D6	$\overline{\text{CS}}$
11		D7	
12	DGND	DGND	DGND
13		D8	
14		D9	
15		D10	
16	DGND	DGND	DGND
17	FL0	D11	$\overline{\text{IRQ2}}$
18			
19			
20	DGND	DGND	DGND
21	AGND	AGND	AGND
22	AGND	AGND	AGND
23	AGND	AGND	AGND
24	AGND	AGND	AGND
25	AGND	AGND	AGND
26	AGND	AGND	AGND
27		AGND	
28		AGND	
29	AGND	AGND	AGND
30		AGND	
31	AVSS	AVSS	AVSS
32	AVDD	AVDD	AVDD

<sup>1</sup>The unused pins of the 96-way connector are not shown.

While the [AD7470/AD7472](#) data sheet specifies a maximum clock frequency of 30 MHz and 26 MHz for the parts, the DSP and the on-board crystal oscillator output a 20 MHz and 25 MHz clock, respectively. Therefore, the maximum sampling frequency is less than specified on the data sheet. An external clock frequency (up to the maximum specified on the data sheet) can be applied via the external socket, SK1.

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In addition, when interfacing directly to the EVAL-CONTROL BRD2, all power supplies and control signals can be generated by the EVAL-CONTROL BRD2. However, due to the nature of the DSP interface on the EVAL-CONTROL BRD2, the maximum [AD7470/AD7472](#) sampling rates supported when interfacing the EVAL-AD7470/AD7472 directly to the EVAL-CONTROL BRD2 are shown in Table 5.

**Table 5. Maximum Sampling Rates**

CLK Source	AD7470		AD7472	
	5 V	3 V	5 V	3 V
DSP	950 kSPS	900 kSPS	850 kSPS	800 kSPS
On-Board CLK	1.1 MSPS	1.1 MSPS	950 kSPS	950 kSPS

If the EVAL-AD7470/7472CB is run at 3 V, the [AD797](#) and [AD711](#) input buffers should be changed for a different ones specified for  $\pm 3$  V power supply, otherwise the input signal is clipped.

## SOCKETS

There are four input sockets relevant to the operation of the AD7470/AD7472 on this evaluation board. The function of these sockets is outlined in Table 6.

**Table 6. Socket Functions**

Socket	Function
SK1	Subminiature BNC socket for external clock input.
SK2	Subminiature BNC socket for external $\overline{\text{CONVST}}$ input.
SK3	Subminiature BNC socket for bipolar analog input. The AD7470/AD7472 can only accept analog inputs in the range 0 V to REFIN. Bipolar analog inputs in the range $-1.25$ V to $+1.25$ V applied to this socket are biased up to the acceptable AD7470/AD7472 input range by the on-board bias-up circuit before being applied to the AD7470/AD7472 $V_{\text{IN}}$ pin.
SK5	Subminiature BNC socket for unipolar analog input. Analog inputs in the acceptable AD7470/AD7472 analog input range (0 V to REFIN) are applied to this socket. The signal is then buffered before it is applied to the AD7470/AD7472 $V_{\text{IN}}$ pin.

## CONNECTORS

The basic connectors on the AD7470/AD7472 evaluation board are outlined in Table 7.

**Table 7. Connector Functions**

Connector	Function
J1	96-way connector for EVAL-CONTROL BRD2 interface connections.
J2	External VDD, VSS, and AGND power connector.
J3	External VDRIVE and DGND power connector.

## OPERATING WITH THE EVAL-CONTROL BRD2

The evaluation board can be operated in a standalone mode or operated in conjunction with the EVAL-CONTROL BRD2. This EVAL-CONTROL BRD2 is available from Analog Devices under the order entry EVAL-CONTROL BRD2. When interfacing directly to this control board, all supplies and control signals to operate the AD7470/AD7472 are provided by the EVAL-CONTROL BRD2 when it is run under the control of the AD7470/AD7472 software, which is provided with the AD7470/AD7472 evaluation board package. This EVAL-CONTROL BRD2 also operates with all Analog Devices evaluation boards, which end with the letters CB in their part number.

The 96-way connector on the EVAL-AD7470/AD7472 plugs directly into the 96-way connector on the EVAL-CONTROL BRD2. No power supplies are required in the system. The EVAL-CONTROL BRD2 generates all the required supplies for itself and the EVAL-AD7470/AD7472. The EVAL-CONTROL BRD2 is powered from a 12 V ac transformer. This is a standard 12 V ac transformer capable of supplying 1 A current and is available as an accessory from Analog Devices under the following part numbers:

- EVAL-110VAC-US: For use in the U.S. or Japan
- EVAL-220VAC-UK: For use in the U.K.
- EVAL-220VAC-EU: For use in Europe

These transformers are also available for other suppliers including Digi-Key (U.S.) and Campbell Collins (U.K.). A connection between the EVAL-CONTROL BRD2 and the serial port of a PC is via a standard printer port cable, which is provided as part the EVAL-CONTROL BRD2 package. Refer to the data sheet that accompanies the EVAL-CONTROL BRD2 for more details on the EVAL-CONTROL BRD2 package.

## EVALUATION BOARD SOFTWARE

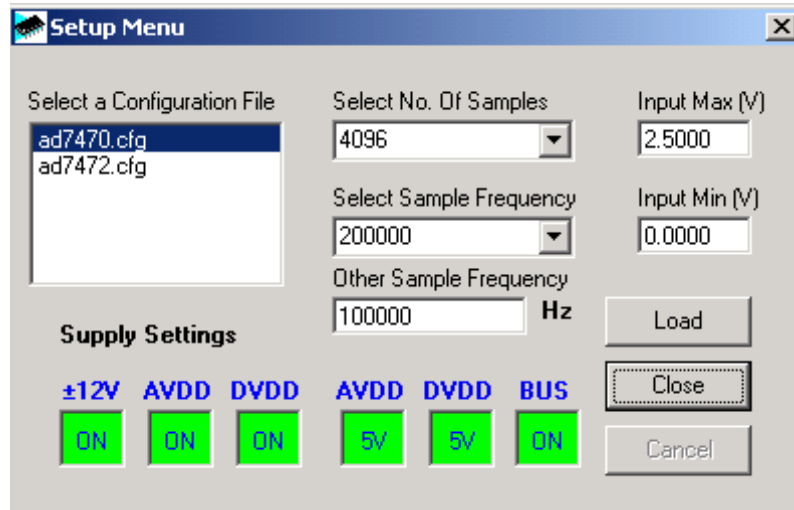


Figure 3. The Setup Dialog Box

### SETUP SCREEN

Figure 3 shows the setup dialog box. The setup dialog box allows you to load the required configuration file for the evaluation board. The configuration file gives the software detailed information about the AD7470/AD7472 evaluation board and part connected to the EVAL-CONTROL BRD2 such as number of bits, maximum sampling rate, output coding, maximum analog input, and power supply requirements. The configuration file also tells the software the name of the DSP program file, which should be downloaded to the EVAL-CONTROL BRD2. These files are supplied by Analog Devices with the evaluation board.

### SETTING UP THE EVAL-CONTROL BRD2

Connect the EVAL-CONTROL BRD2 and evaluation board via the 96-way connector. Then apply power to the EVAL-CONTROL BRD2. At this stage, the red LED light should be flashing to indicate that the EVAL-CONTROL BRD2 is functional and ready to receive instructions. Load the software (previously installed) before the printer port cable is connected between the EVAL-CONTROL BRD2 and the PC. This ensures that the printer port has been initialized properly. The printer port cable can then be connected between the PC and the EVAL-CONTROL BRD2.

### RUNNING THE SOFTWARE

With the hardware set up, you are now in a position to use the software to control the EVAL-CONTROL BRD2 and the evaluation board. In the main dialog box, select the **File** menu and click **Setup**. This displays the setup form (see Figure 3). A window on the left of the setup form lists all the available configuration files. The configuration files are text based files, which contain information about the particular evaluation board to be tested. The information covers such things as the part name, number of samples to be taken, default and maximum sampling frequency, and power supply settings. The configuration file also contains the name of the DSP program file to be downloaded to the EVAL-CONTROL BRD2. Select the relevant configuration file and click **Load**. The EVAL-CONTROL BRD2 is reset and the DSP program downloaded. When the download is complete, the power supply settings indicated in the configuration file are set and you may hear some of the relays clicking. The pull-down menu items such as number of samples and sampling frequency have been set to the default values specified by the configuration file. The user is free to change these at will. Once all the settings have been decided, click **Close** to return to the main dialog box.

# EVAL-AD7470/AD7472

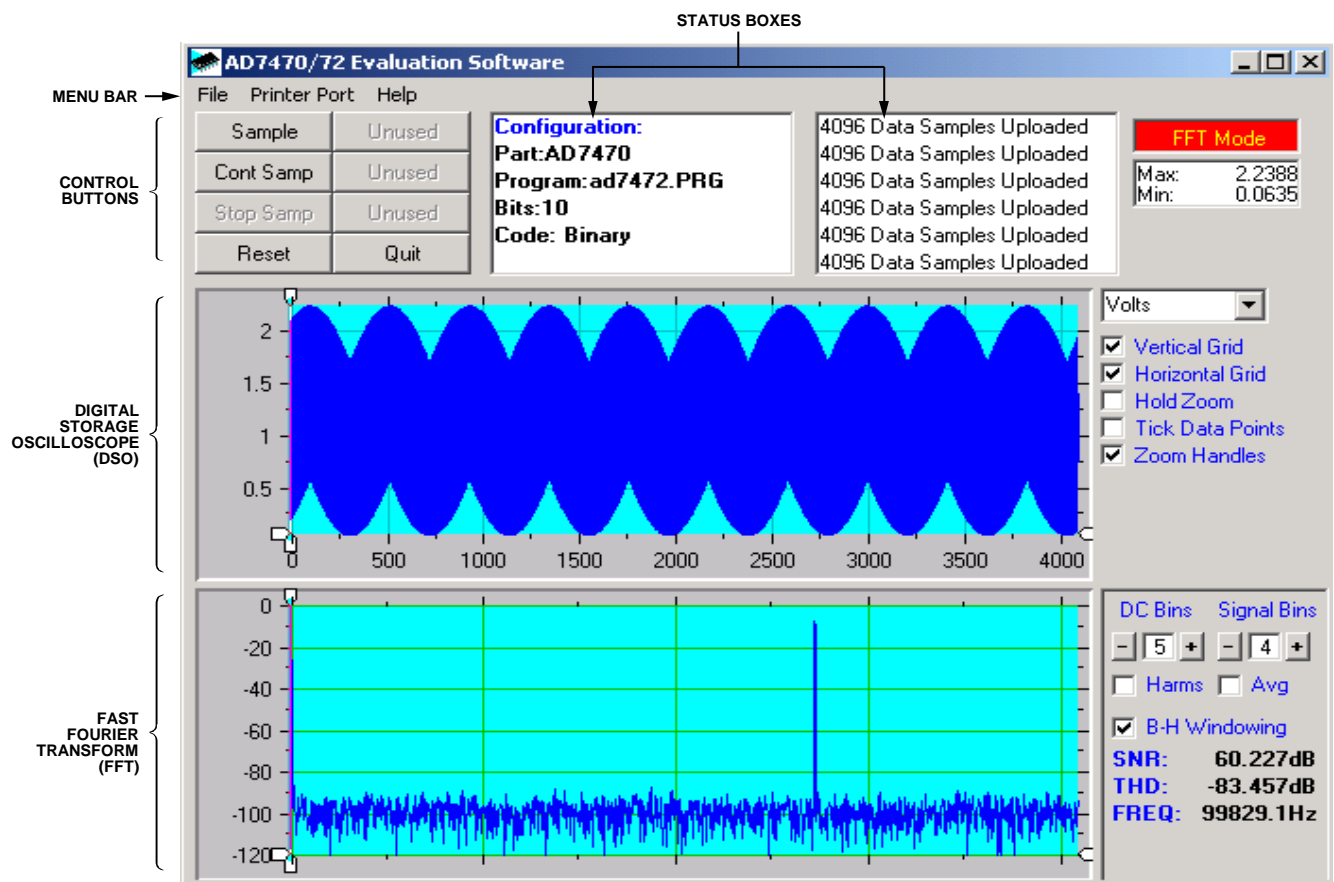


Figure 4. Main Dialog Box

## SOFTWARE CONFIGURATION FILES

Software configuration files give the EVAL-CONTROL BRD2 software information on how the software and hardware should perform. They contain information such as the name of the DSP program to download, the default and maximum sample frequencies, the number of samples to take and the power supply settings to use. A typical software configuration file (\*.cfg) is shown in Listing 1.

### Listing 1

```
[EVAL-CONTROL BOARD]
partname:AD7472
programname:ad7472.PRG
samplefrequency:100000
maxsamplefrequency:950000
samples:2048
```

```
+/-15V:on
dvdd:5:on
avdd:5:on
bus:on
;options 2scomp, binary
dataformat:binary
numberofbits:12
inputVmax:2.5
inputVmin:0
```

## SOFTWARE DESCRIPTION

Included in the EVAL-AD7470/AD7472 evaluation board package is a CD that contains software for controlling and evaluating the performance of the AD7470/AD7472 when it is operated with the EVAL-CONTROL BRD2. When the CD is inserted into the PC, an installation program automatically begins. This program installs the evaluation software onto the machine and installs the data sheet for the AD7470/AD7472 evaluation board as well as the data sheet for the AD7470/AD7472. All literature on the CD is in Adobe Systems Inc's portable documentation format (PDF) and requires Acrobat Reader™ to be viewed or printed. The user interface on the PC is a dedicated program written especially for the AD7470/AD7472.

The software which controls the EVAL-CONTROL BRD2 and thus the AD7470/AD7472 evaluation board has three main screens. The dialog box in Figure 4 shows what appears when the software is running. The main function of the screen is to allow the user to read a predetermined number of samples from the evaluation board and display them in both the time and frequency domain.



The upper third of the dialog box contains the control buttons, the menu bar, and the status windows. The control buttons allow the user to take samples, reset the part, and quit the program. The menu bar allows the user to enter the setup menu, select which printer port is to be used to control the EVAL-CONTROL BRD2, load and save data, and get information about the software. The status window indicates the setup of the evaluation board/device, the number of samples taken, and any information or error messages are generated.

The middle third of the AD7470/AD7472 main dialog box is a digital storage oscilloscope (DSO). When samples are uploaded from the EVAL-CONTROL BRD2, they are displayed here. The samples can be displayed either as integer values or as voltages. Once the samples are displayed, clicking any point on the graph displays the sample number and the value of the point directly beneath the cursor. Along the axis of the graph are the zoom handles; these allow you to zoom in and out to get a closer look at a particular sample if required. When another set of samples is taken the graph attempts to display all values collected unless the **Hold Zoom** check box is ticked. If the **Hold Zoom** box is ticked, the graph keeps the same axis settings as for the previous set of data samples. There are additional check boxes in this section to give you control over the vertical grids, horizontal grids, and data points.

The lower third of the dialog box shows either a fast Fourier transform (FFT) of the data, or a histogram, which shows the number of occurrences of each particular code read back. The FFT (the default option) is typically used when you are examining an ADC's performance in the frequency domain, while the histogram gives an indication of the ADC's performance to DC signals. The option displayed can be changed by clicking the **FFT Mode/Histogram Mode** button in the top right of the dialog box. Figure 5 shows the main dialog box when histogram mode is selected.

### **Taking Samples**

Clicking **Sample** instructs the EVAL-CONTROL BRD2 to take the required number of samples at the required frequency from the evaluation board. These samples are then uploaded and displayed. An FFT and histogram are also calculated and displayed. If you click **Cont Samp**, the software repeats the process indefinitely until the user clicks the button **Stop Samp**. While the software is continuously sampling data the other control buttons are disabled.

### **Reset Button**

The **Reset** button causes the EVAL-CONTROL BRD2 to perform a reset function. When this happens, the power supplies are turned off and the program in DSP memory is lost. Repeat the setup instructions to download another program if required.

### **Quit Button**

The **Quit** button exits the software. The program running on the EVAL-CONTROL BRD2 is not terminated.

## **MENU BAR**

The main dialog box of the EVAL-CONTROL BRD2 contains a number of options available as pull-down menu items.

### **File Menu**

**Setup Menu:** Displays the setup dialog box as shown in Figure 3.

**Load Raw Data:** Allows the user to load data, which had been saved by the software during a previous session.

**Save Raw Data:** Allows the user to save the current set of sample data points. The data can be reloaded to the EVAL-CONTROL BRD2 software at a later date or can be used by other programs for further analysis.

**Save Binary Data:** Allows the user to save the current set of sample data points. The data is saved in binary format as a text file. This method can be useful for examining code flicker, and looking for stuck bits.

**Save FFT Data:** Allows the user to save the current set of FFT data points. FFT data cannot be reloaded into the EVAL-CONTROL BRD2 software, but can be loaded into other software packages for further analysis.

**Exit:** Quits the program.

### **Printer Port**

This menu item allows you to select which printer port to use for communicating with the EVAL-CONTROL BRD2.

**LPT1:** This option selects 0x378 as the printer port address. This is the default option.

**LPT2:** This option selects 0x278 as the printer port address.

**PRN:** This option selects 0x3BC as the printer port address.

### **Help**

This menu item gives information about the current revision of software for the particular evaluation board being used.

# EVAL-AD7470/AD7472

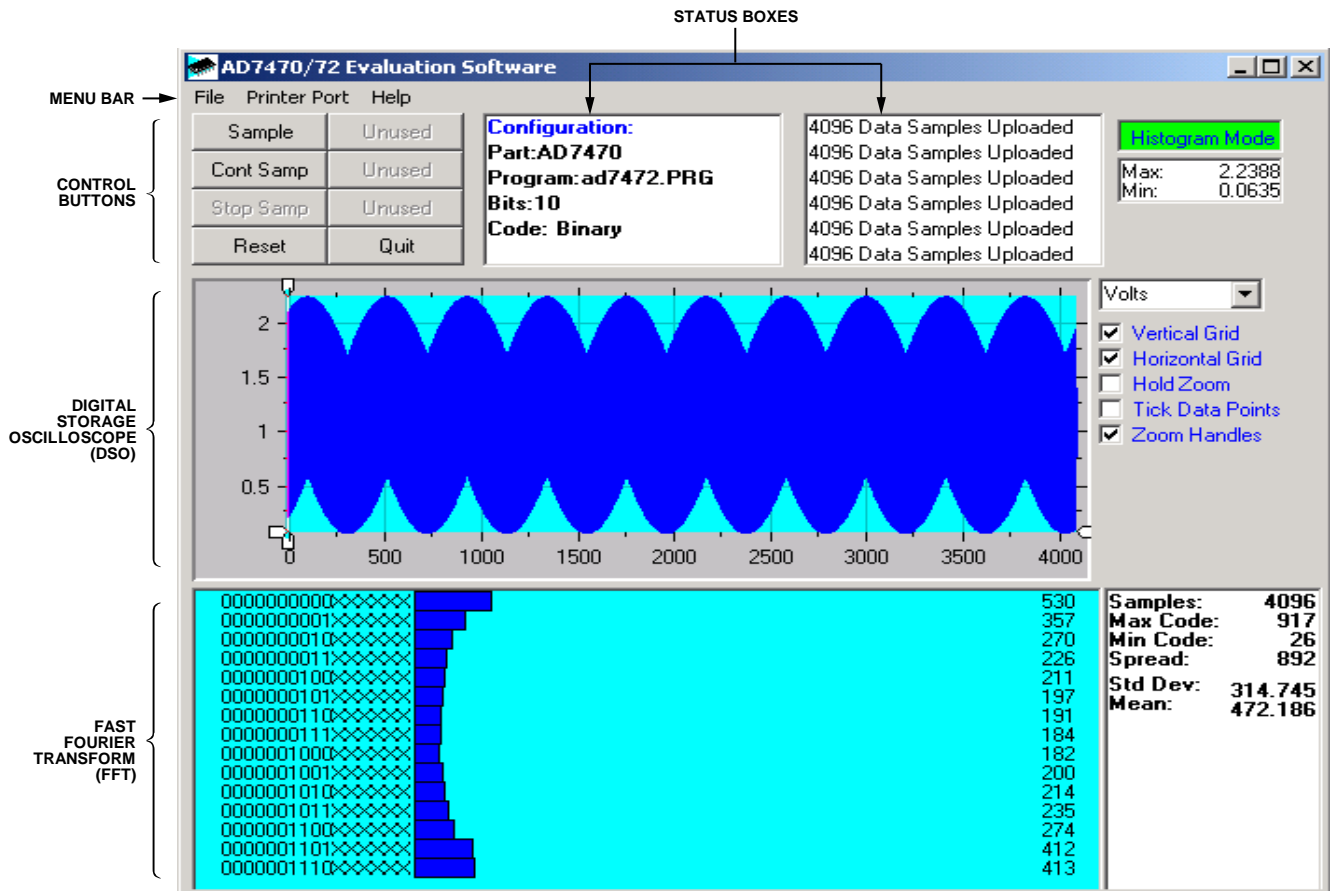


Figure 5. Main Dialog Box—Histogram Mode

EVALUATION BOARD SCHEMATICS AND ARTWORK

900-05290

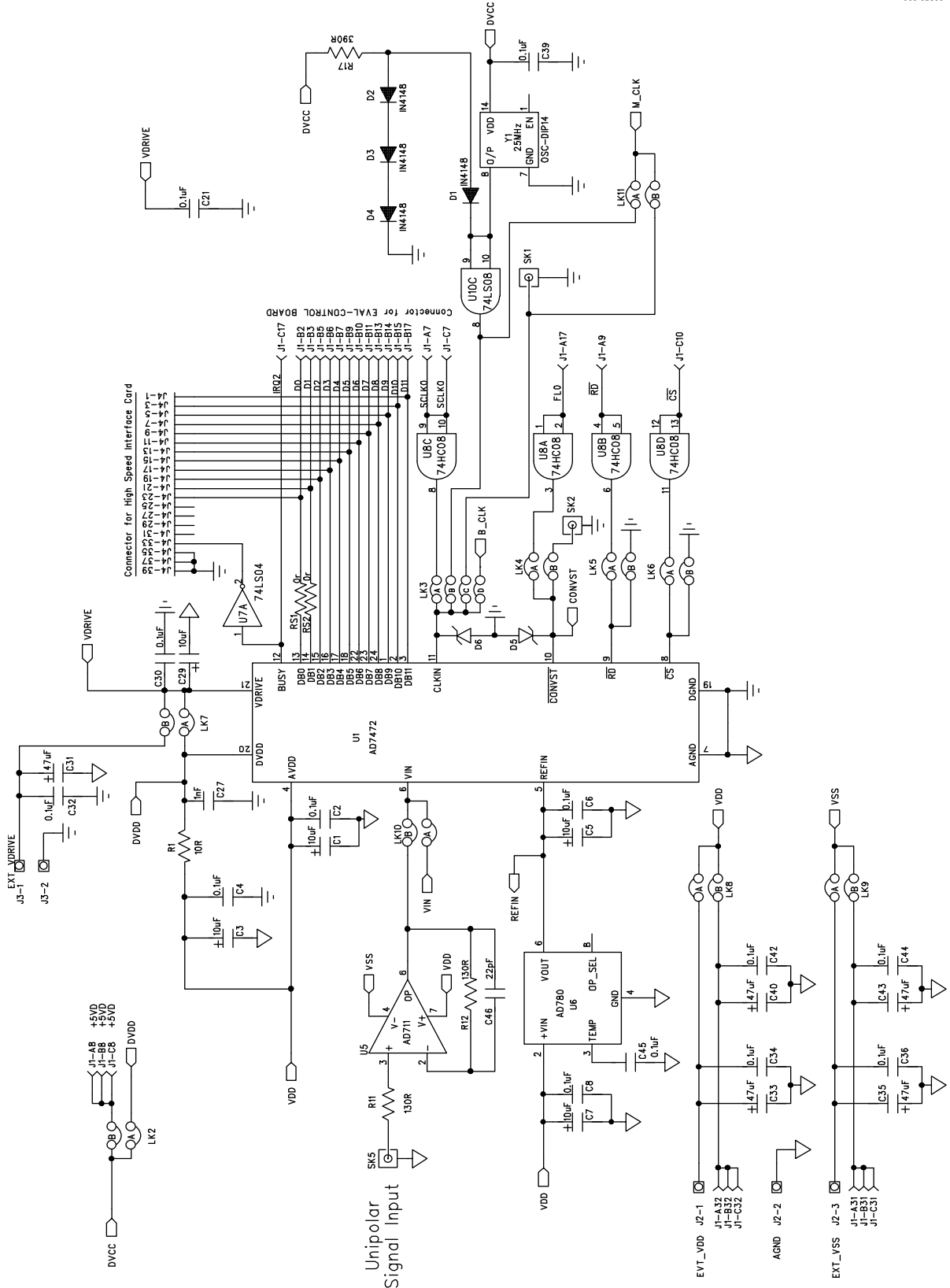


Figure 6. AD7470/AD7472 Evaluation Board Circuit Diagram (ADC Section)

# EVAL-AD7470/AD7472

100-05290

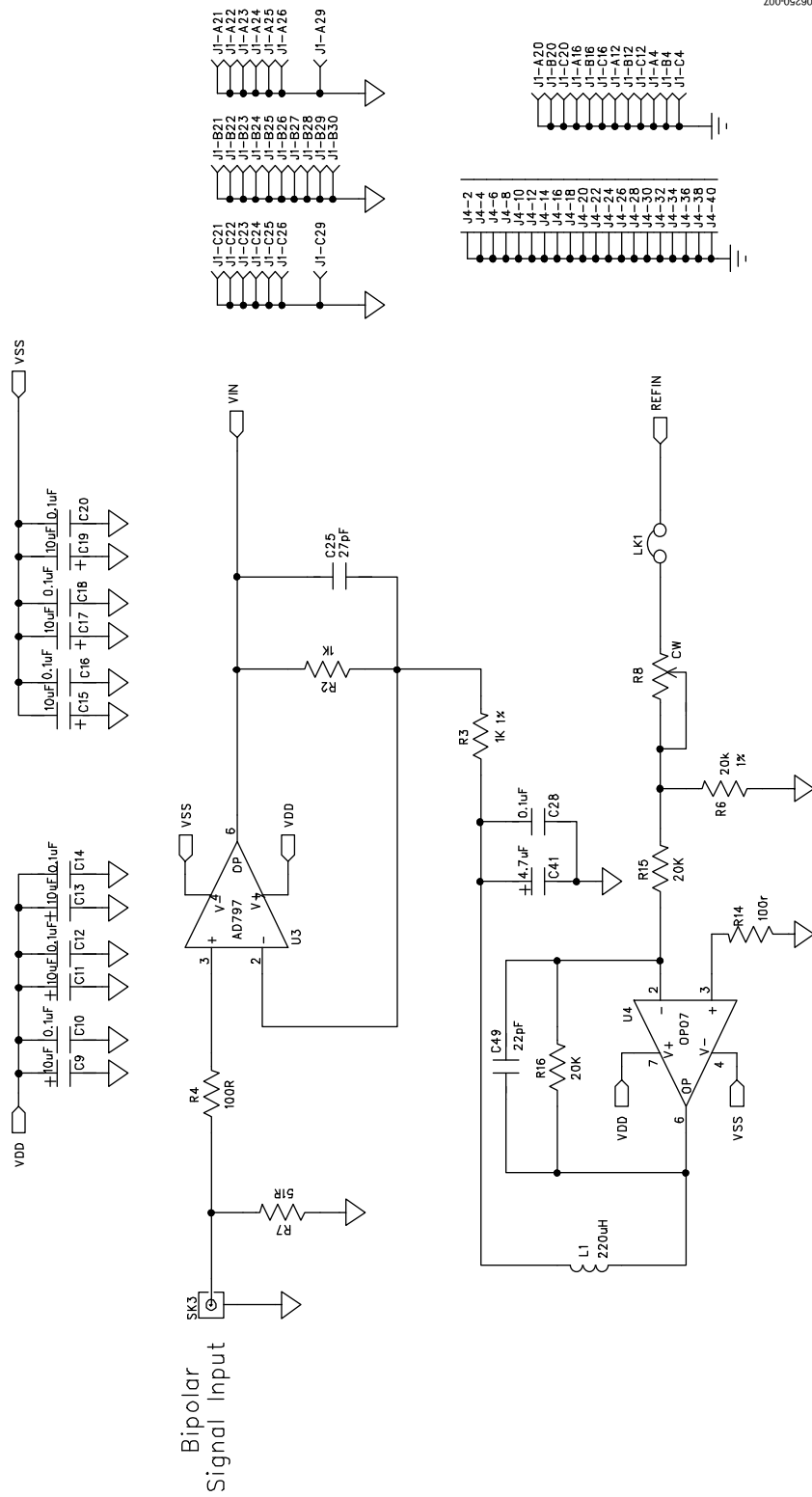


Figure 7. AD7470/AD7472 Evaluation Board Circuit Diagram (Analog Input Bias-Up Section)

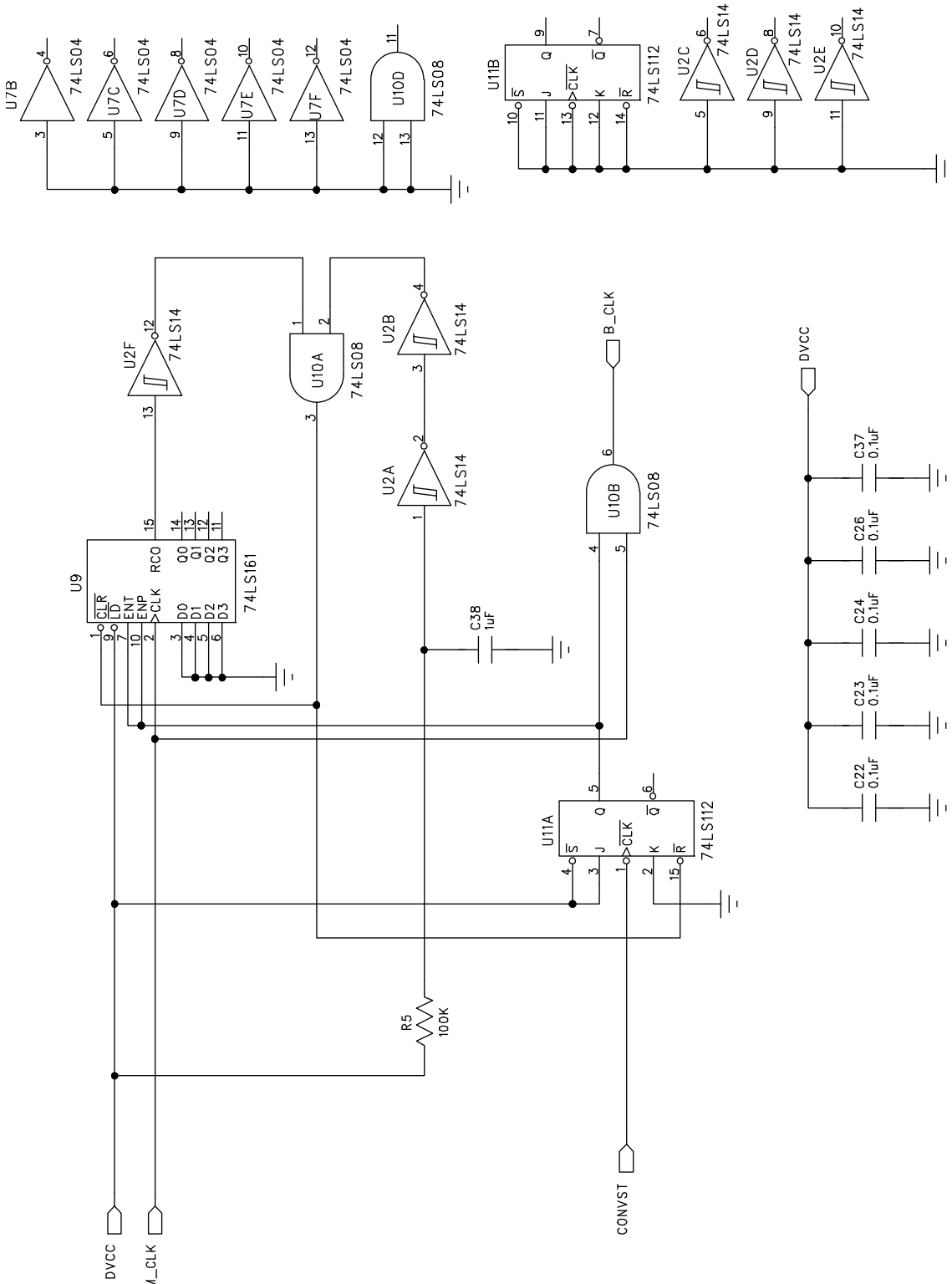
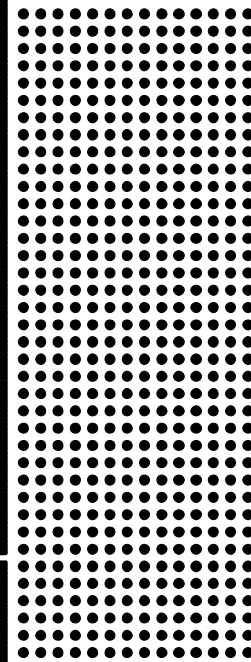
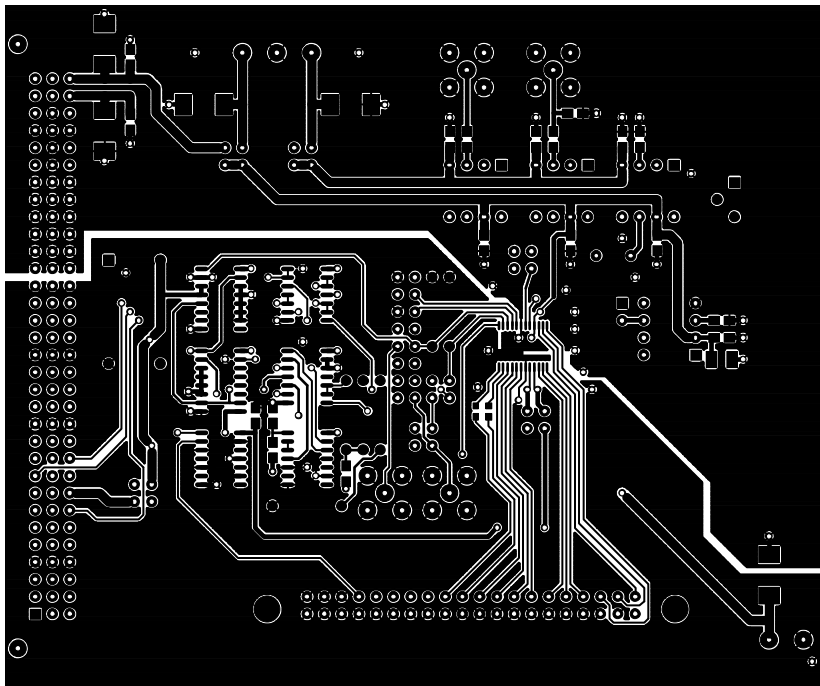


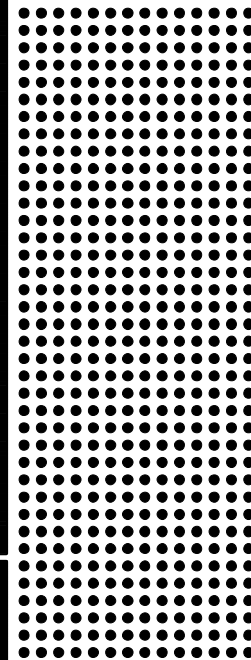
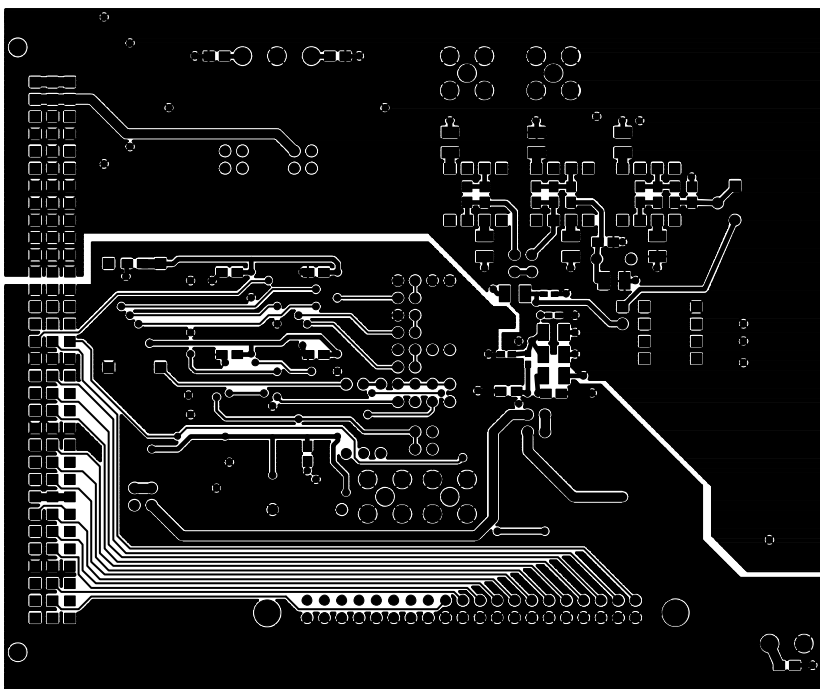
Figure 8. AD7470/AD7472 Evaluation Board Circuit Diagram (Burst Clock Generator Section 16)

# EVAL-AD7470/AD7472



06250-009

Figure 9. Component Side Artwork



06250-010

Figure 10. Solder Side Artwork

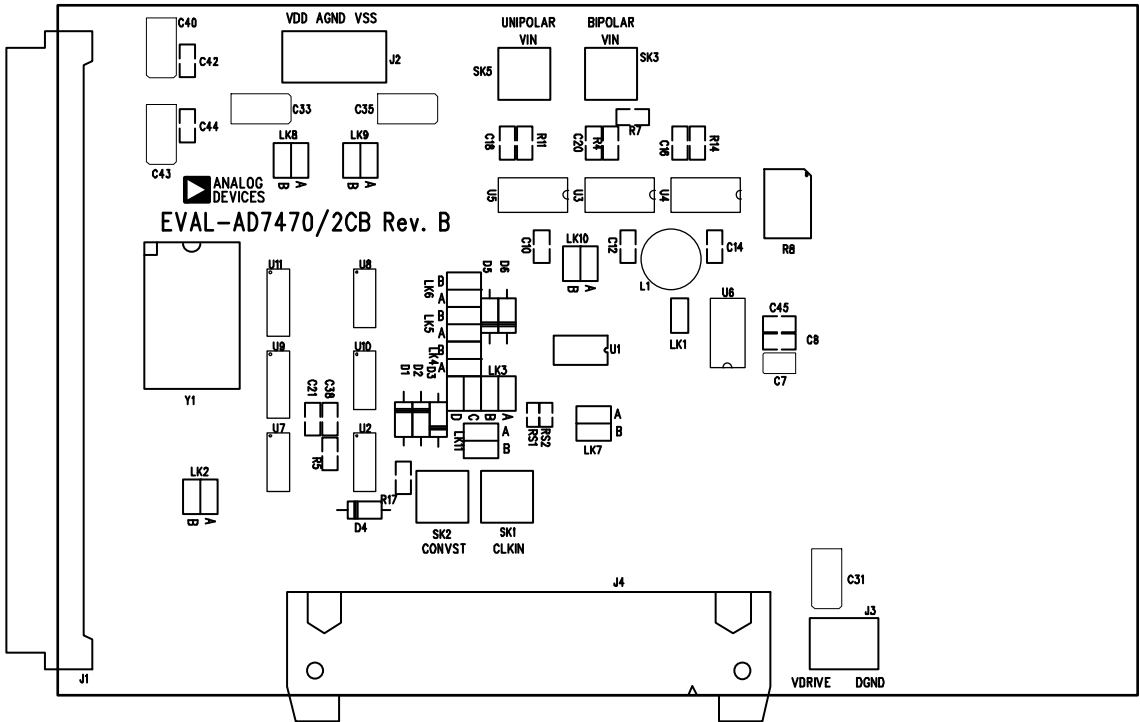


Figure 11. AD7470/AD7472 Evaluation Board Component Placement Drawing (Component Side)

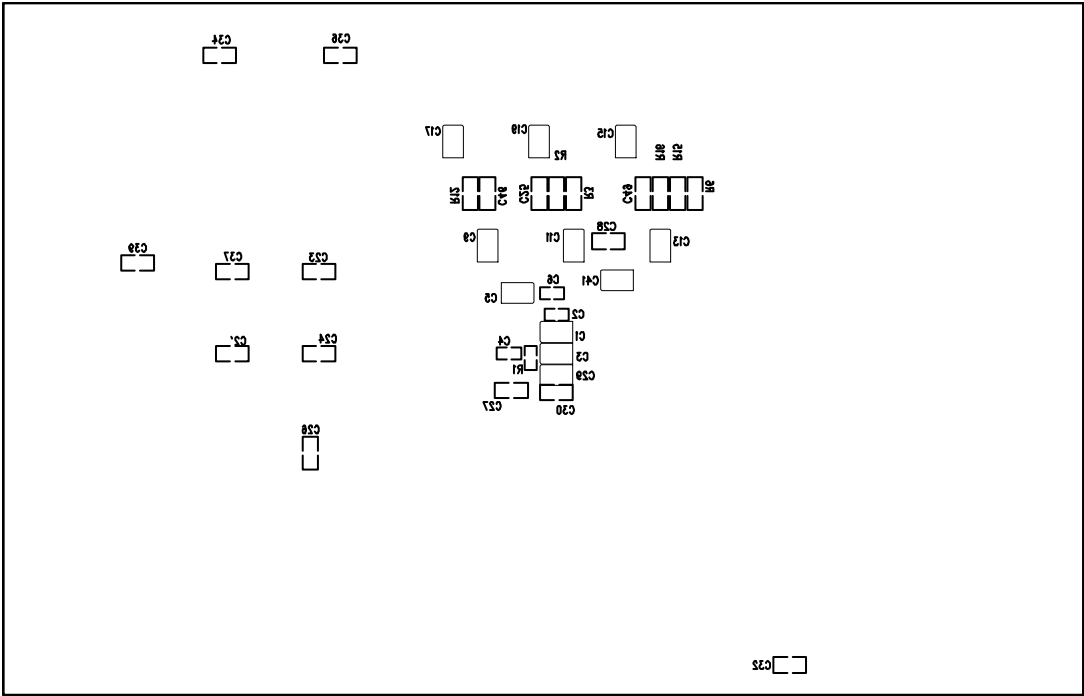


Figure 12. AD7470/AD7472 Evaluation Board Component Placement Drawing (Solder Side)

# EVAL-AD7470/AD7472

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 8.

Qty	Reference Designator	Description	Order Number
11	C1, C3, C5, C7, C9, C11, C13, C15, C17, C19, C29	10 $\mu$ F 10 V (TAJ-B series)	FEC 498-660
3	C2, C4, C6	0.1 $\mu$ F 16 V X7R (0603 size)	FEC 499-675
22	C8, C10, C12, C14, C16, C18, C20, C21, C22, C23, C24, C26, C28, C30, C32, C34, C36, C37, C39, C42, C44, C45	0.1 $\mu$ F 50 V X7R (0805 size)	FEC 499-687
1	C25	27 pF 50V NPO (0805 size)	FEC 1414683
1	C27	1000 pF 50 V NPO (0805 size)	FEC 317-457
5	C31, C33, C35, C40, C43	47 $\mu$ F 16 V (TAJ-D series)	FEC 498-762
1	C38	1 $\mu$ F 25 V Y5V (0805 size)	FEC 317-640
2	C46, C49	22 pF 100 V NPO (0805 size)	FEC 317-500
1	C41	4.7 $\mu$ F 16 V (TAJ-B series)	FEC 498-725
1	R1	10 $\Omega$ $\pm$ 1 % (0603 size)	FEC 910-995
2	R2, R3	1 k $\Omega$ $\pm$ 1 % (0603 size)	FEC 911-239
2	R4, R14	100 $\Omega$ $\pm$ 1 % (0805 size)	FEC 911-732
1	R5	100 k $\Omega$ $\pm$ 1 % (0603 size)	FEC 911-471
3	R6, R15, R16	20 k $\Omega$ $\pm$ 1 % (0805 size)	FEC 771-491
1	R7	51 $\Omega$ $\pm$ 1 % (0805 size)	FEC1152422
2	R11, R12	130 $\Omega$ $\pm$ 1 % (0805 size)	FEC 771-235
1	R17	390 $\Omega$ $\pm$ 1 % (0603 size)	FEC 911-185
1	R8	0 k $\Omega$ Multiturn trimmer potentiometer 5	FEC 9353640
1	L1	220 $\mu$ H inductor (8RHB series)	FEC 598-215
1	U1	AD7472ARU/AD7470ARU	AD7472ARU
1	U2	NTE74LS14M	FEC349850
1	U3	AD797BN	AD797BN
1	U4	OP07DP	OP07DP
1	U5	AD711KN	AD711KN
1	U6	AD780AN	AD780AN
1	U7	DM74LS04M	Digi-Key DM74LS04M-ND
1	U8	74HC08M	FEC1201314
1	U9	SN74LS161AD	Digi-Key SN74LS161AD-ND
1	U10	DM74LS08M	Digi-Key DM74LS08M-ND
1	U11	SN74LS112AD	Digi-Key SN74LS112AD-ND
1	Y1	25 MHz TTL output crystal	FEC 9712585
4	D1, D2, D3, D4	1N4148 signal diode	FEC 368-118
2	D5, D6	SD103C Schottky diode	Digi-Key SD103CTPMSTR-ND
1	LK1	2 pin header	FEC 511-705
9	LK2, LK4, LK5, LK6, LK7, LK8, LK9, LK10, LK11	4- pin (2 + 2) header	FEC 511-791
1	LK3	8-pin (4 + 4) header	FEC 511-780
11	LK1 to LK11	Shorting link	FEC 1097975
36	U3, U4, U5, U6, Y1	Ultra low profile sockets	FEC 519-959
1	J1	96-pin 90° DIN41612 plug	FEC 1096905
1	J2	3-pin terminal block	FEC 151-786
1	J3	2-pin terminal block	FEC 151-785
4	SK1, SK2, SK3, SK5	Gold 50 W SMB jack	FEC 1206013
1	EVAL-AD7470/AD7472CB	PCB	N/A



**ORDERING GUIDE**

<b>Model</b>	<b>Description</b>
EVAL-AD7470CB	AD7470 Evaluation Board
EVAL-AD7472CB	AD7472 Evaluation Board

**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.

**EVAL-AD7470/AD7472**

**NOTES**

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**EVAL-AD7470/AD7472**

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