Evaluation Board for 5V Single Supply, 285kSPS 8-Channel, 14-Bit Sampling ADC

EVAL-AD7856CB

FEATURES

Full-Featured Evaluation Board for the AD7856
EVAL-CONTROL BOARD Compatible
Stand Alone Capability
On-Board Analog Buffering
Various Linking Options
PC Software for Control and Data Analysis when used with EVAL-CONTROL BOARD

INTRODUCTION

This Technical Note describes the evaluation board for the AD7856 high speed, low power, 14-bit ADC that operates from a single 5 V power supply. The ADC powers up with a set of default conditions at which time it can be operated as a read only ADC. The ADC contains self-calibration and system calibration options to ensure accurate operation over time and temperature and it has a number of power-down options for low power applications. The AD7856 is capable of 285 kHz throughput rate. The input track-and-hold acquires a signal in 500 ns and features a pseudo-differential sampling scheme. The AD7856 voltage range is 0 to VREF with straight binary output coding. Input signal range is to the supply and the part is capable of converting full power signals to 10 MHz. Full data on the AD7856 is available in the AD7856 data sheet available from Analog Devices and should be consulted in conjunction with this Technical Note when using the Evaluation Board.

On-board components include two OP467 quad op-amps, two AD712 dual op-amps, a 74HC04 inverter and a 74HC08 AND gate. There are various link options which are explained in detail on page 2.

Interfacing to this board is through a 96-way connector. This 96-way connector is compatible with the EVAL-CONTROL BOARD which is also available from Analog Devices. External sockets are provided for the $\overline{\text{CONVST}}$ input, CLKIN input and the AIN1-AIN8 inputs.

OPERATING THE AD7856 EVALUATION BOARD

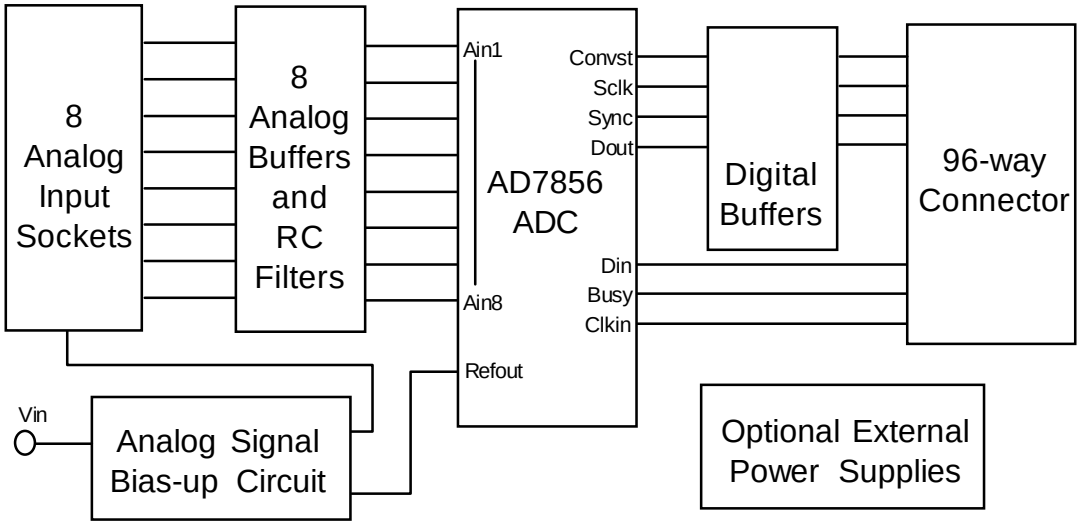
Power Supplies

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

When using the board as a stand alone unit external supplies must be provided. This evaluation board has five power supply inputs: AV_{DD}, A_{GND}, +12V, -12V, and A_{GND}. +5V must be connected to the AV_{DD} input to supply the AD7856 and the inverter and AND gates. +12V and -12V are used to supply the OP467 and AD712 op-amps. 0V is connected to one or both of the A_{GND} inputs. All supplies are decoupled to the relevant ground plane with 10µF or 47µF tantalum and 0.1µF multilayer ceramic capacitors at the point where they enter the board. The supply pins of the op-amps are also decoupled to A_{GND} with 10µF tantalum and a 0.1µF ceramic capacitors. The AD7856 supply pins are decoupled to A_{GND} with 22uF tantalum and 0.1µF 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, A_{GND} and D_{GND}. These are connected at one location close to the AD7856.

Fig. 1: FUNCTIONAL BLOCK DIAGRAM



REV. 0

One Technology Way, P.O. Box 9106, Norwood. MA 02062-9106, U.S.A. Tel: 617/329-4700 Fax: 617/326-8703

LINK AND SWITCH OPTIONS

There are 25 link options which must be set for the required operating setup before using the evaluation board. The functions of these options are outlined below.

Link No. Function.

LK1 - LK8 These links are used to connect input to the op-amps to the relevant AIN socket or to A_{gnd}.
When a link is in position "A" the associated AIN socket is connected to the input buffer.
When a link is in position "B" the input to the analog buffer is connected to A_{gnd}.

LK12 This link option selects the source of the CLKIN input. This link should be removed if the AD7856's internal clock is selected (see LK8).
When this link is "IN" the CLKIN input is provided by the EVAL-CONTROL BOARD.
When this link is "OUT" the external CLKIN input must be provided via the external socket, J4.

LK13 This link option selects the source of the $\overline{\text{CONVST}}$ input.
When this link is "IN" the $\overline{\text{CONVST}}$ input is provided by the EVAL-CONTROL BOARD.
When this link is "OUT" the $\overline{\text{CONVST}}$ input must be provided via the external socket, J5.

LK15 This link option connects the BUSY output to the EVAL-CONTROL BOARD where it is used as an interrupt request. This link is always "IN" when using the EVAL-CONTROL BOARD.

LK16 This link option is used to put the AD7856 in SLEEP mode or in NORMAL mode.
When a link is in position "A" the AD7856 is put into NORMAL mode.
When a link is in position "B" the AD7856 is put into SLEEP mode.

LK17 This link selects the source of the AV_{dd}/DV_{dd} +5V supply.
When this link is in position "A" the +5V must be supplied from an external source via power connector J2.
When this link is in position "A" the +5V is supplied from the EVAL-CONTROL BOARD.

LK18 This link option adds a 50Ω termination to Dgnd on the CLKIN line.
This link should "OUT" when using the CLKIN from the EVAL-CONTROL BOARD.
If a 50Ω termination is required when using an external CLKIN siganl this link should be "IN".

LK19 This link option adds a 50Ω termination to Dgnd on the $\overline{\text{CONVST}}$ line.
This link should "OUT" when using the $\overline{\text{CONVST}}$ from the EVAL-CONTROL BOARD.
If a 50Ω termination is required when using an external $\overline{\text{CONVST}}$ siganl this link should be "IN".

LK20 This link option is used to select the source of the +12V supply
In position A, the +12V is supplied from the EVAL-CONTROL BOARD through the 96 way connector.
In position B, the +12V is supplied from an external source through the power connector, J3.

LK21 This link option is used to select the source of the -12V supply.
In position A, the -12V is supplied from the EVAL-CONTROL BOARD through the 96 way connector.
In position B, the -12V is supplied from an external source through the power connector, J3.

LK23 This link option is used to connect the CREF1 pin to +5V.
If AVdd is used as the reference voltage at the REFIN/OUT pin or an external reference approaching AVdd is used this link must be "IN" to connect the CREF pin to AVdd.
This link must be "OUT" if using the AD7856 internal reference voltage.

LK24 This link option adds a 50Ω termination to Agnd on the Vin line.
If a 50Ω termination is required at the Analog input socket, J7, this link should be "IN".

LK25 This link is used to select the reference voltage for the AD7856.
In position "A", the AD7856 internal 4.096V reference is used.
In position "B", an external reference voltage may be applied via the VREF socket, J6.
In position "C", AVDD is used as the reference voltage.

SET-UP CONDITIONS

Care should be taken before applying power and signals to the evaluation board to ensure that all link positions are as per the required operating mode. Table I shows the position in which all the links are set when the evaluation board is sent out.

Table I. Initial Link and Switch Positions

Link No.	Position	Function.
LK1	A	Ain1 input socket is connected to its buffer op-amp.
LK2-LK8	B	The inputs to the buffer op-amps on the AIN2-AIN8 lines are connected to AGnd.
LK9	IN	The output of the AIN1 buffer op-amp is connected to the AD7856 AIN1 pin.
LK10	OUT	The AD7856 Ain1 and Ain2 pins are not connected together.
LK11	A	The AD7856 AIN2 pin is connected to the output of the AIN2 buffer op-amp.
LK12	IN	CLKIN is supplied from the EVAL-CONTROL BOARD via J1.
LK13	IN	$\overline{\text{CONVST}}$ is supplied from the EVAL-CONTROL BOARD via J1.
LK14	A	DIN is supplied from the EVAL-CONTROL BOARD via J1.
LK15	IN	BUSY is connected to the EVAL-CONTROL BOARD via J1.
LK16	A	The AD7856 SLEEP pin is connected to logic high, placing the part in NORMAL mode.
LK17	B	AV_{dd}/DV_{dd} (+5V) supplied by the EVAL-CONTROL BOARD via J1.
LK18	OUT	50Ω termination not selected on the CLKIN line.
LK19	OUT	50Ω termination not selected on the $\overline{\text{CONVST}}$ line.
LK20	A	+12V supplied from EVAL-CONTROL BOARD via J1.
LK21	A	-12V supplied from EVAL-CONTROL BOARD via J1.
LK23	OUT	CREF1 pin not connected to +5V.
LK24	OUT	50Ω termination not selected at the Analog input (Vin) socket, J7.
LK25	A	AD7856 uses it's own internal 4.096V reference.

EVALUATION BOARD INTERFACING

Interfacing to the evaluation board is via a 96-way connector, J1. J1 is used to connect the evaluation board to the EVAL-CONTROL BOARD or other system. The pinout for the J1 connector is shown in Figure 2 and its pin designations are given in Table II.

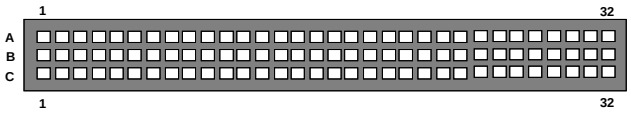


Figure 2. Pin Configuration for the 96-Way Connector, J1

96-Way Connector Pin Description

SCLK1 Serial Clock One. This continuous clock is connected to the CLKIN pin of the AD7856 via LK12. This is the master clock for the AD7856. It sets the conversion and calibration times.

DT0 Data Transmit Zero. This serial data output is connected to the DIN pin of the AD7856 via LK14.

DR0 Data Recieve Zero. This serial data input is connected to the DOUT pin ofthe AD7856 via two 74hc004 logic inverter gates.

TFS0 Transmit FrameSync. Zero. This synchronises the serial data that is transmitted to the AD7856 It is connected to the AD7856 SYNC pin via a 74HC08 AND gate buffer.

RFS0 Receive Frame Sync. Zero. This is used to frame the data that is received from the AD7856.

SCLK0 Serial Clock Zero. This serial clock is connected to the SCLK pin of the AD7856 via a 74HC04 inverter gate.

FL0 Flag zero. This logic output is connected to the $\overline{\text{CONVST}}$ input of the AD7856 via LK13 and a 74HC08 AND gate buffer. A low to high transition on this input puts the track/hold into its hold mode and starts conversion.

$\overline{\text{IRQ2}}$ Interrupt Request 2. This is a logic input and is connected to the BUSY logic output on the AD7856 via LK15. This output will go high on the falling edge of $\overline{\text{CONVST}}$ or the rising edge of $\overline{\text{CAL}}$, and remains high until conversion is completed. It is also used to indicate when the AD7856 is completed its on-chip calibration sequence.

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.

AV_{DD} Analog +5V Supply. These lines are connected to the AV_{DD} and DV_{DD} supply line on the board via LK17.

+12V +12V Supply. This line is connected to the +12V supply line on the board via LK16.

-12V -12V Supply. This line is connected to the -12V supply line on the board via LK17.

Table II. 96-Way Connector Pin Functions.

	Row A	RowB	RowC
1			
2			
3	SCLK1		SCLK1
4	DGND	DGND	DGND
5	DT0		DR0
6	TFS0		RFS0
7			SCLK0
8			
9			
10			
11			
12	DGND	DGND	DGND
13			
14			
15			
16	DGND	DGND	DGND
17	FL0		$\overline{\text{IRQ2}}$
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	-12V	AGND	+12V
31			
32	AVDD	AVDD	AVDD

Note : The unused pins of the 96-way connector are not shown.

SOCKETS

There are thirteen input sockets relevant to the operation of the AD7856 on this evaluation board. The function of these sockets is outlined in Table III.

Table III. Socket Functions

Socket	Function
AIN1-8	Sub-Miniature BNC Socket for Ain1-Ain8 analog inputs.
J4	Sub-Miniature BNC Socket for external CLKIN input.
J5	Sub-Miniature BNC Socket for external $\overline{\text{CONVST}}$ input.
J6	Sub-Miniature BNC Socket for external VREF input.
J7	Sub-Miniature BNC Socket for analog input to on-board bias circuit.
J8	Sub-Miniature BNC Socket for analog output from on-board bias circuit.

CONNECTORS

There are three connectors on the AD7856 evaluation board as outlined in Table IV.

Table IV. Connector Functions

Connector	Function
J1	96-Way Connector for interface connections to EVAL-CONTROL BOARD.
J2	External AVDD & AGND power connector.
J3	External +12V, -12V & AGND power connector.

SWITCHES

There is one switch on the AD7856 evaluation board as outlined in Table V.

Table V. Connector Functions

Connector	Function
SW1	6mm sealed push button switch to activate calibration function on the AD7856.

OPERATING WITH THE EVAL-CONTROL BOARD

The evaluation board can be operated in a stand-alone mode or operated in conjunction with the EVAL-CONTROL BOARD. This EVAL-CONTROL BOARD is available from Analog Devices under the order entry "EVAL-CONTROL BOARD". When operated with this control board, all supplies and control signals to operate the AD7856 are provided by the EVAL-CONTROL BOARD when it is run under control of the AD7856 software which is provided with the AD7856 evaluation board package. This EVAL-CONTROL BOARD will also operate with all Analog Devices evaluation boards which end with the letters CB in their title. The 96-way connector on the EVAL-AD7856CB plugs directly into the 96-way connector on the EVAL-CONTROL BOARD. No power supplies are required in the system. The EVAL-CONTROL BOARD generates all the required supplies for itself and the EVAL-AD7856CB. The EVAL-CONTROL BOARD is powered from a 12V ac transformer. This is a standard 12V ac transformer capable of supplying 1A 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 Digikey (U.S.) and Campbell Collins (U.K.).
Connection between the EVAL-CONTROL BOARD and the serial port of a PC is via a standard RS-232 cable which is provided as part the EVAL-CONTROL BOARD package. Please refer to the manual which accompanies the EVAL-CONTROL BOARD for more details on the EVAL-CONTROL BOARD package.

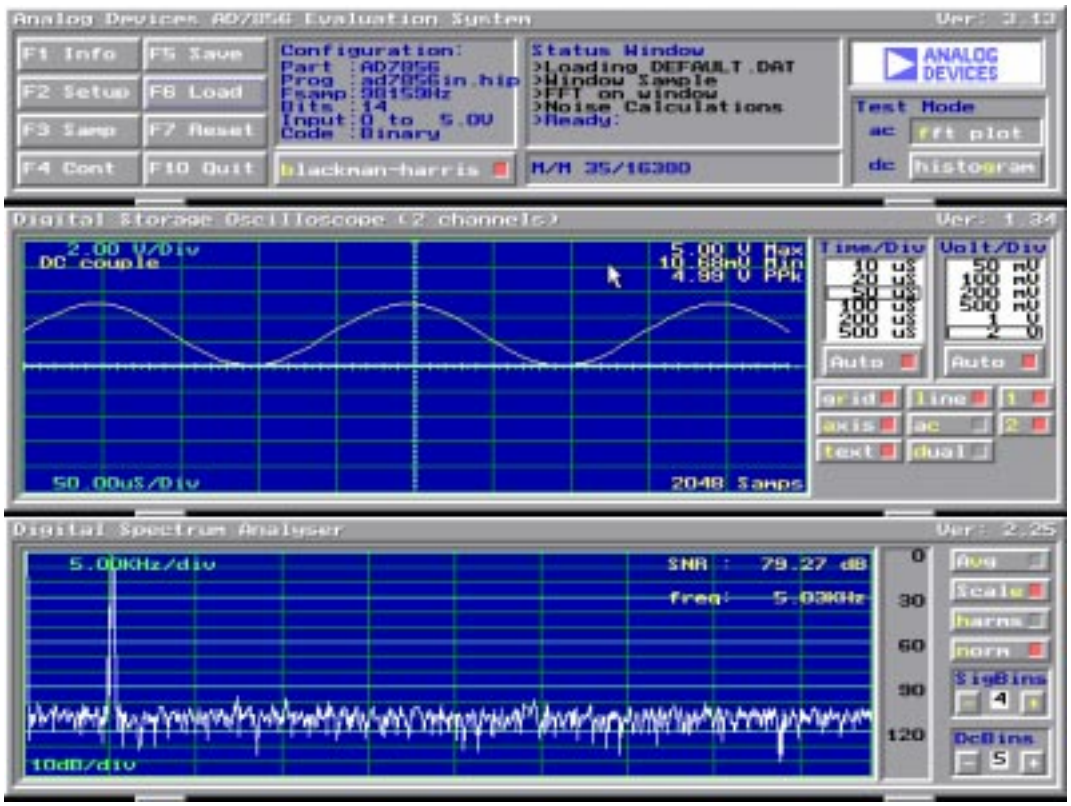


Figure 3. Main Screen

SOFTWARE DESCRIPTION

Included in the EVAL-AD7856CB evaluation board package is a PC-compatible disk which contains software for controlling and evaluating the performance of the AD7856 when it is operated with the EVAL-CONTROL BOARD. The EVAL-AD7856CB Demonstration/Evaluation Software runs under DOS 4.0 or later and requires a minimum of a 386-based machine with 400kB of base RAM and 500kB of free hard disk space. The user interface on the PC is a dedicated program written especially for the AD7856.

The disk which accompanies the EVAL-AD7856CB contains several files. The user should create a new directory on the main PC drive and label this "AD7856". Then, all files on the EVAL-AD7856CB disk should be copied into this directory. The Mouse Driver on the PC should be enabled before running the software. If this has not been loaded, the program will not run.

To run the software, simply make the AD7856 directory the current directory and type "go". When the evaluation program starts, the user sees the screen shown on Figure 3 (without any FFT or scope waveforms). This is the main screen and it is divided into three parts. The top part provides the main control interface for the AD7856 evaluation software. The middle part of the main screen functions as a Digital Storage Oscilloscope and the bottom part of the main screen operates as either a Digital Spectrum Analyzer or a Histogram analyzer.

Each part of the screen has several buttons that can be pressed by using the mouse or the keyboard. To press a button using the mouse, simply use it to move the on-screen pointer to the button to be activated and click. To use the keyboard, simply press the appropriate key as highlighted on the button. Lower case letters must be used. When a button is pressed, it is highlighted on the screen. The next button can be highlighted by using the Tab key or the previous button by holding down the shift key and the Tab key together. The highlighted button can also be pressed by pressing the space bar. Pressing the ESC key halts any operation currently in progress. In this document, if a button can be activated from the keyboard then the key used is shown in bold in the button name. For example, "no **p**rog" has the "p" highlighted in bold, indicating that the button can be activated by pressing the *p* key.

Some buttons have a red indicator. A red indicator on the button means that the function associated with that button is on. Absence of the red indicator light means that the function associated with the button is off. The on/off status of these buttons is changed simply by selecting the button.

Setting up the EVAL-CONTROL BOARD

When the software is run, the **"F2** Setup" button in the top left of the screen should be selected to pop up the setup menu (see fig. 4). This menu sets up the EVAL-CONTROL BOARD for use with the EVAL-AD7856CB.

Firstly, a configuration file must be chosen. The configuration file contains the default configuration information for the EVAL-CONTROL BOARD, the Digital Spectrum Analyzer and the Digital Storage Oscilloscope. It also tells the AD7856.EXE software which .HIP file to download to the ADSP-2111. The .HIP file contains the DSP code which is executed by the ADSP-2111. Normally, the "no **p**rog" button is off, so when the configuration file is loaded, the .HIP file is automatically downloaded to the ADSP-2111. However, if the "no **p**rog" button is on, then the .HIP file is not downloaded to the ADSP-2111.

To load the configuration file use the mouse or the keyboard to highlight the "AD7856IN" file and the **"l**oad" button is pressed.

After the configuration file is loaded, the sample rate and number of samples can be changed. The $\overline{\text{CONVST}}$ frequencies are limited to frequencies of the form 16 MHz/N, where N is an integer in the range 1 to 65536 with a maximum conversion time for the AD7856 being 5.25uS. If a frequency other than one of these frequencies is chosen, then the EVAL-CONTROL BOARD generates the next lowest available frequency.

The "Channel" section allows the user to select between single or differential input channels and also allows the user to selecthe required input channel. Use the "+" and "-" buttons to pick the channel and the "select" button to select it.

The "Analog in" section shows the analog input range and DC offset voltage.

The "Register" section gives access to the calibration options and to the Powerdown section.

Figure 4. Setup Menu Screen

The "Voltage" and "Coding" sections are set by default and should not be changed by the user.

MAIN SCREEN

The top left part of the main screen contains eight buttons which are selected using the mouse or by using the function keys from the keyboard. These buttons and the actions they perform are:

F1: Info. This button shows information on the software.

F2: Setup. This button activates the setup menu.

F3: Samp. When this key is pressed, the software causes the AD7856 to perform a number of conversions as determined by the setup menu (see above). The data from these conversions is then analyzed by the AD7856 evaluation software. Another set of samples may be taken by pressing the **F3** key again.

F4: Cont. Pressing this button causes the software to repeatedly perform conversions and analyze them. Once the conversions and analysis has been done for one set of samples, the software automatically repeats the process. It continues to do this until the ESC key is pressed.

F5: Save. This saves a set of samples to a file for use either at a later date or with other software. The samples can be saved either as "volts", "ints" or "binary". The format of all these files is ASCII text. Note that the AD7856 software can only load files saved in the "ints" format. Files saved in the "volts" and "ints" formats can be used with packages such as Mathcad. Files saved in the "binary" format are for viewing purposes only.

F6: Load. This allows the user to load data from a file with a .DAT extension. Only data that was saved as ints can be loaded and analyzed. A configuration file must be loaded via the **"F2** Setup" menu before the data file can be analyzed. If there is no EVAL-CONTROL BOARD connected to the PC, then the "no **p**rog" button in the **"F2** Setup" menu must be on. Once a configuration file has been loaded, the data loaded from the .DAT file is analyzed according to the settings in the **"F2** Setup" menu.

F7: Reset. Choosing this option resets the EVAL-CONTROL BOARD.

F10: Quit. This quits the AD7856 evaluation software and returns control to the operating system.

Information Windows

There are three information windows at the top of the main screen. The left-hand window is the configuration window and gives details about part being evaluated. It shows the name of the program that has been downloaded to the EVAL-CONTROL BOARD, the sampling frequency, the number of bits, the analog input range of the part and the output code format of the part. The right-hand large window is the Status window. This window provides feedback to the user as to what operations are currently being performed by the software and also displays error messages. Directly underneath the status window is a small window that shows the selected conversion sequence and the maximum and minimum values of the most recently captured samples for all channels in the conversion sequence.

Test Mode

At the top right of the main screen are the Test Mode buttons. These buttons determine what sort of testing is done on the samples captured by the software. Both an ac analysis and dc analysis can be performed. The function of these buttons are:

fft plot — Choosing this button causes the Digital Spectrum Analyzer to appear at the bottom of the screen.

Histo**g**ram: — Choosing this button causes the Histogram Analyzer to be displayed at the bottom of the screen.

There is one other button near the top of the screen, beside the **"F10** Quit" button. This is:

blackman-harris: When performing a Fourier transform of the sampled data, this button determines whether or not the data is windowed by a blackman-harris window before the transform. When this button is on, the data is windowed. When this button is off, the data isn't windowed. See the Digital Spectrum Analyzer section for more details.

DIGITAL STORAGE OSCILLOSCOPE.

When samples of data are captured, they are displayed on the Digital Storage Oscilloscope. If the **b**lackman-harris button is turned on then the windowed data is also displayed on the oscilloscope. The 'scope has been designed to act in a similar way as a conventional oscilloscope. To the right of the oscilloscope are several buttons that control the manner in which data is displayed on the 'scope. The timebase for the oscilloscope is automatically chosen by the software if the Time/Div "Auto" button is on. The user can also select the timebase by clicking in the Time/Div window and scrolling up and down through the possible timebases. Similarly, the vertical scale of the oscilloscope is chosen automatically if the Volt/Div "Auto" button is on. The user also has the option of selecting the desired vertical scale in a similar manner to selecting the timebase.

The other buttons associated with the oscilloscope are:

g**r**id — This button toggles the grid display of the oscilloscope on and off.

axis — This button toggles the axis display of the oscilloscope on and off

text — This button toggles the text displayed on the oscilloscope screen on and off.

line — When the line button is on, the displayed samples are joined together by lines. When this button is off, the samples are displayed as points.

a**c** — When this button is on, the dc component of the sampled signal is removed and the signal is displayed. This has the effect of centering the signal vertically on the oscilloscope screen. When this button is off, the dc component is not removed and the signal is displayed with its horizontal axis corresponding to a code of 0. The a**c** display option is useful for zooming in on a low-level signal that has a large dc offset.

dual — When the **"d**ual" button is on, the oscilloscope screen is divided into two parts with the sampled data display centered on one horizontal axis and the windowed data display centered on another. When the **"d**ual" button is off, both traces are centered on the same horizontal axis.

1 — This button toggles the sampled data trace on and off.

2 — This button toggles the windowed data trace on and off.

HISTOGRAM ANALYZER

The histogram analyzer counts the number of occurrences of each code in the captured samples and displays a histogram of these counts. The most frequently occurring code is displayed in the center of the histogram. The analyzer is normally used with a dc input signal and calculates the mean and the standard deviation of the sampled data. The mean and standard deviation are displayed in both volts and in units of the lsb size of the converter. The histogram gives a good indication of the dc noise performance of the ADC. The standard deviation shows directly the noise introduced in the conversion process. Each channel is the sequence can be viewed in turn using the 4 channel select buttons on the right of the histogram screen

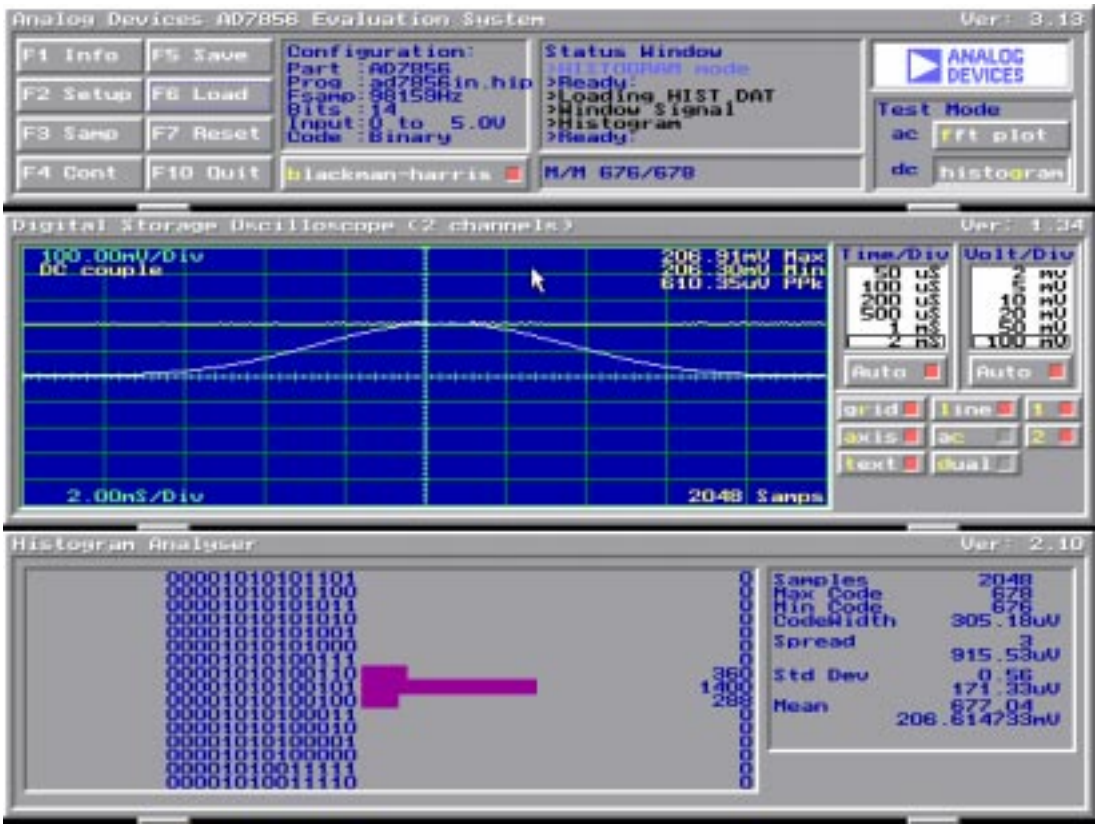


Figure 5 Histogram Screen

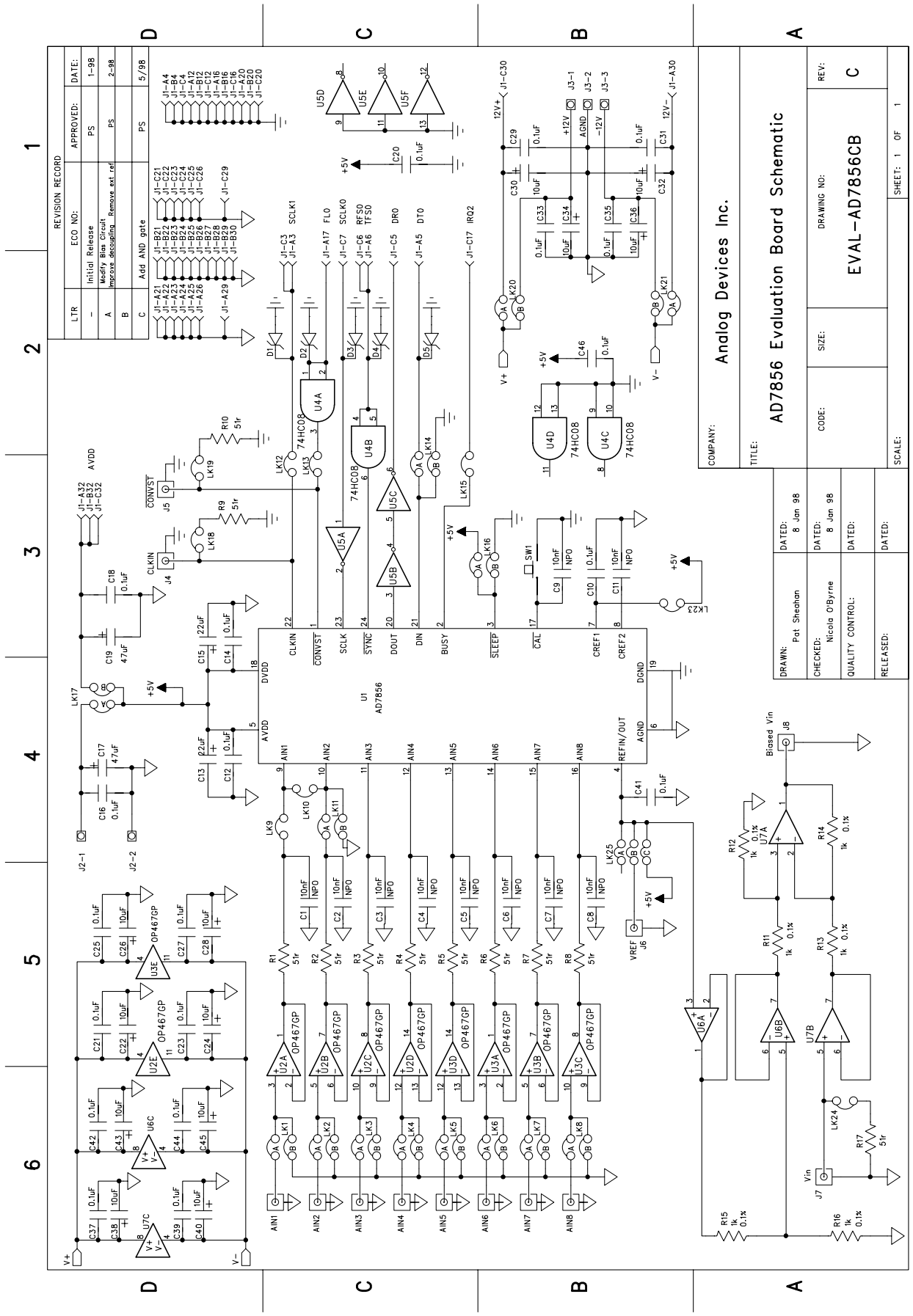


Figure 6. AD7856 Evaluation Board Circuit Diagram

Table Vi. AD7856 Evaluation Board Bill Of Materials

Qty	Reference Designator	Description/Value	Manuf. No.	Supplier No.
1	U1	AD7856	Analog Devices AD7856AN	
2	U2-3	OP467GP	Analog Devices OP467GP	
1	U4	MC74HC08AN	MOTOROLA MC74HC08AN	
1	U5	MC74HC04AN	MOTOROLA MC74HC04AN	
2	U6 U7	AD712JN	Analog Devices AD712JN	
5	D1-5	6.2V Zener Diode	Philips BZX79C6C2	FEC 369-421
8	C1-8	10nF NPO 1206 case style	AVX CM316CG103J25AT	FEC 578-320
2	C9 C11	10nF 0805 case style	AVX 08055C103KAT00J	FEC 499-225
2	C13 C15	22uF 20V TAJ-D case style	AVX TAJD226K020R	FEC 498-804
2	C17 C19	47uF 16V TAJ-D case style	AVX TAJD476K016R	FEC 498-762
20	C10 C12 C14 C16 C18 C20 C21 C23 C25 C27 C29 C31 C33 C35 C37 C39 C41 C42 C44 C46	0.1uF 0805 case style	AVX CM21X7R104K25VAT	FEC 499-687
12	C22 C24 C26 C28 C30 C32 C34 C36 C38 C40 C43 C45	10uF 16V tant. TAJ-B case style	AVX TAJB106K016R	FEC 498-737
11	R1-10 R17	51Ω 1% 0.25W	Multicomp	FEC 543-070
6	R11 - R16	1kΩ 0.1% 0.25W (RC55 Series)	Welwyn	FEC 339-179
1	J1	96 way 90° DIN41612 connector	Harting 0903-196-7921	FEC 104-986
1	J2	2 Pin Power Connector	Lumberg KRM2	FEC 151-785
1	J3	3 Pin Power Connector	Lumberg KRM3	FEC 151-786
13	J4-8 AIN1-8	50Ω SMB PCB Jack	Pasternask Enterprise. PE4147	FEC 310-682
14	LK1-8 LK11 LK14 LK16-17 LK20-21	2 Way Link Option	Harwin M20-9980406	FEC 511-791
9	LK9 LK10 LK12 LK13 LK15 LK18 LK19 LK23 LK24	1 Way Link Option	Harwin M20-9990206	FEC 511-705
1	LK25	3 Way Link Option	Harwin M20-9980606	FEC 511-780
24	LK1-21 LK23 LK24	Shorting links	Harwin M7567-05	FEC 150-410
1	SW1	6x6mm sealed pushbutton switch	Omron B3W1000	FEC 176-986
96	U1-7	Ultra low profile socket	Harwin H3153F01	FEC 519-935
4	each corner	Rubber Stick-on-feet	3M SJ5076	FEC 148-922

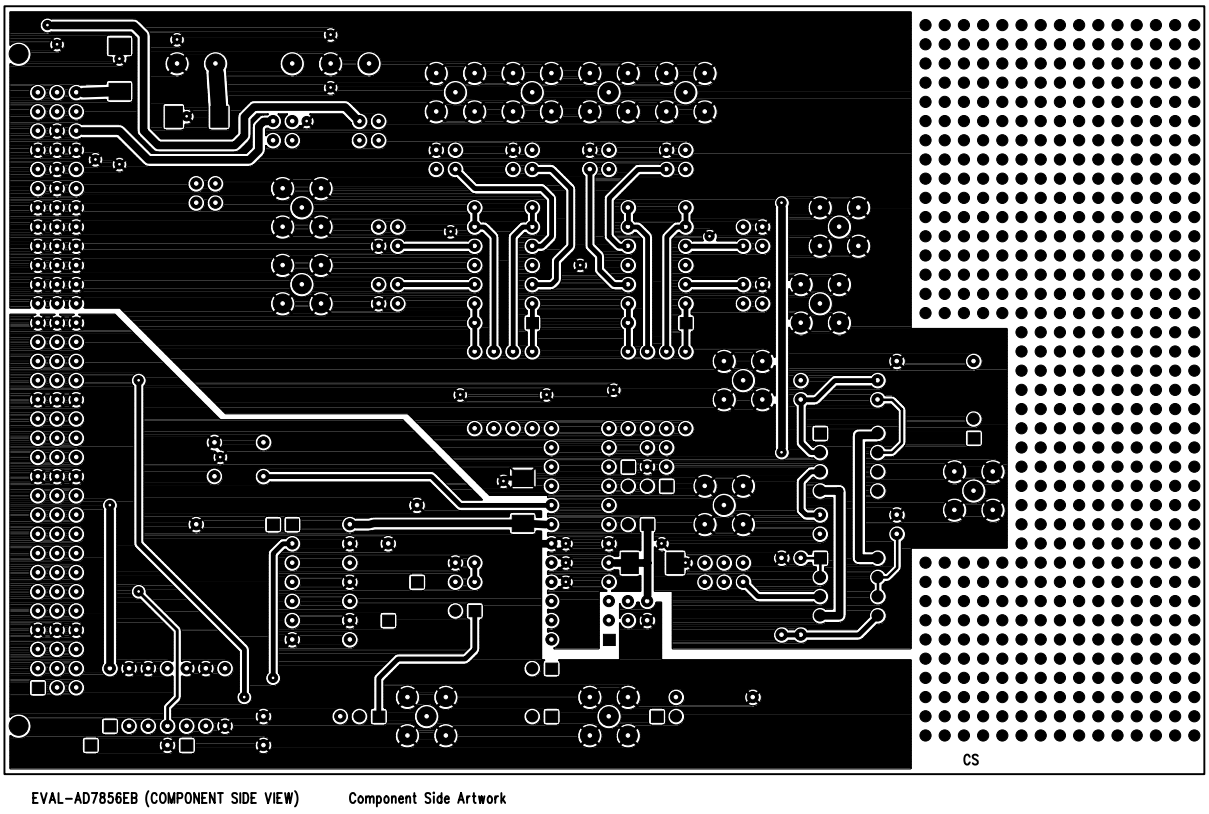


Figure 7. Component Side Artwork

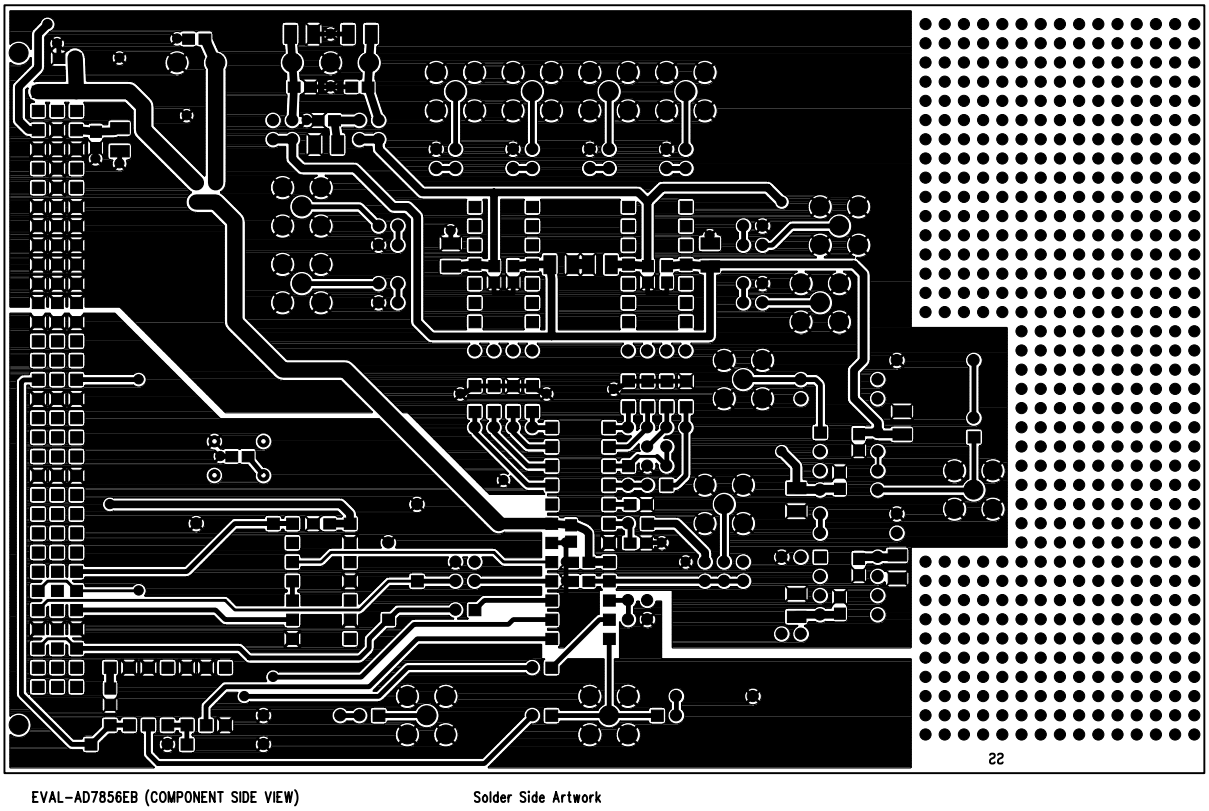


Figure 8. Solder Side Artwork

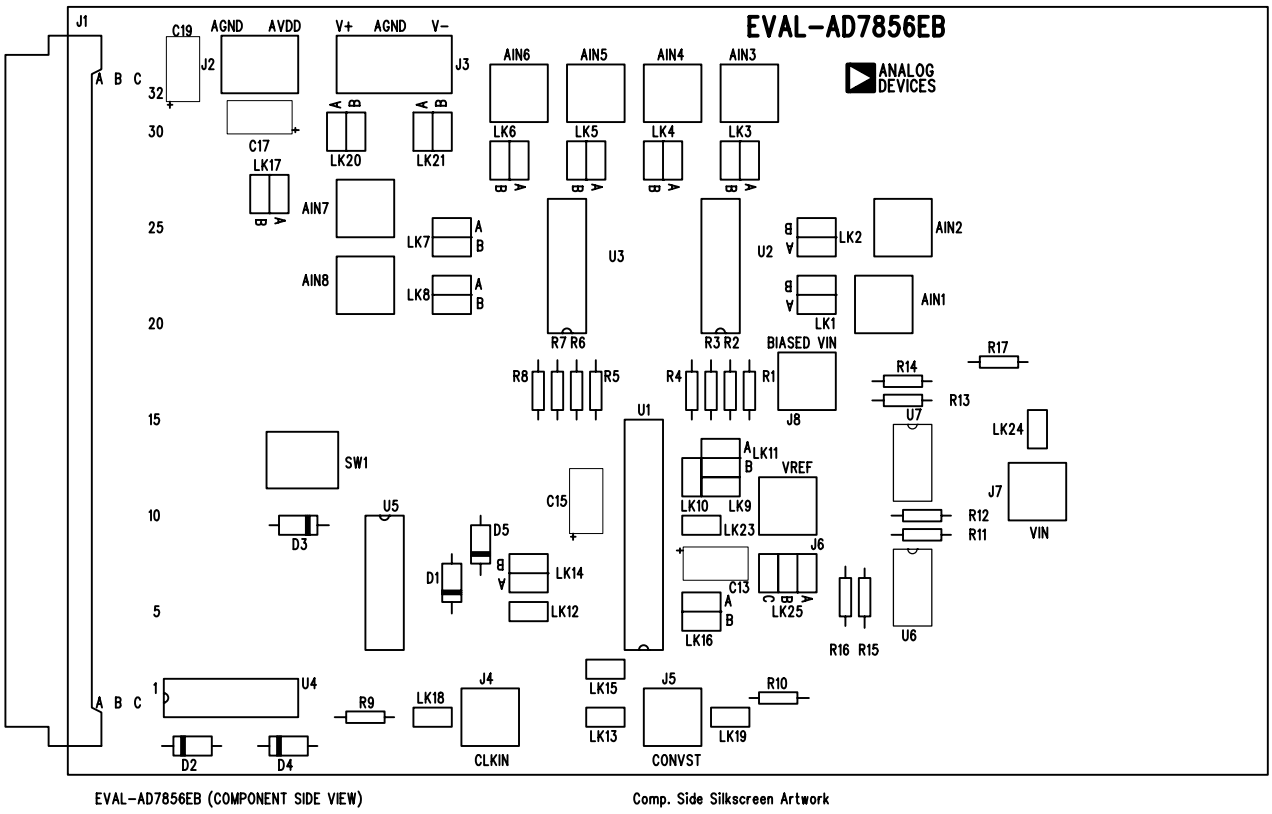


Figure 9. AD7856 Evaluation Board Component Placement Drawing (Component Side).

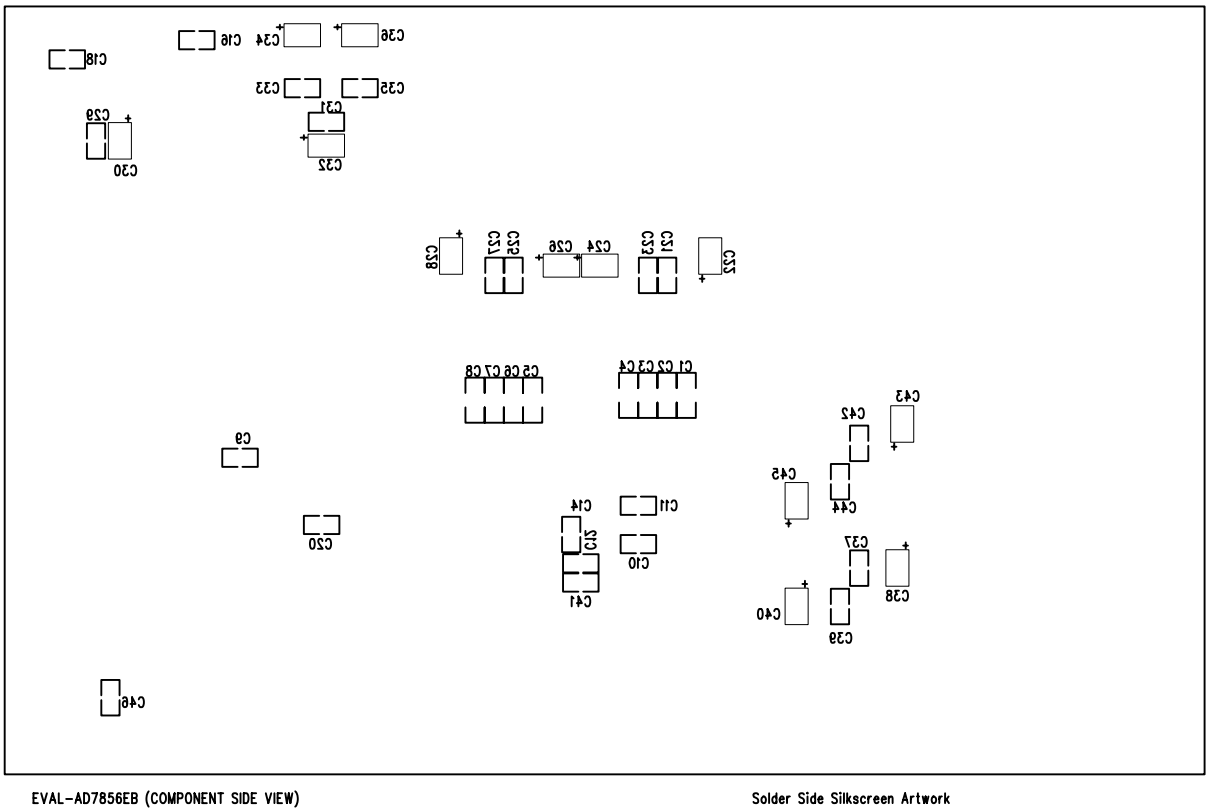


Figure 10. AD7856 Evaluation Board Component Placement Drawing (Solder Side).