

EVAL-AD7760/AD7762EDZ

FEATURES

- Full-featured evaluation board for the AD7760/AD7762 EVAL-CED1Z compatible**
- On-board 4.096 V reference**
- Crystal clock oscillator MCLK source**
- PC software for control and data analysis for use with EVAL-CED1Z**
- Filter Programmability – Load custom filter to AD7760/62**

EVALUATION BOARD DESCRIPTION

This data sheet describes the evaluation board for the AD7760/AD7762 Σ - Δ ADCs. The AD7760 is a 24-bit ADC that combines wide input bandwidth and high speed with the benefits of Σ - Δ conversion with a performance of 100 dB SNR at 2.5 MSPS, making it ideal for high-speed data acquisition.

The AD7762 derivative is a parallel version with maximum output data rate of 625 kSPS.

Complete specifications for the AD7760/AD7762 devices are available in the AD7760/AD7762 data sheets available from Analog Devices, Inc., and should be consulted in conjunction with this data sheet when using the evaluation board.

The evaluation software is available to download from the AD7760/AD7762 product pages. This includes both the Labview source code and the FPGA interfacing code, which is written for the FPGA on the acquisition board – CED1Z.

The AD7760 interfacing signals are created by the EVAL-CED1Z board which should be used in conjunction with EVAL-AD7760/2EDZ board to enable data acquisition via the provided software and USB link.

The EVAL-AD7760/2EDZ board itself includes all routing required for evaluating the AD7760/2 device.

The MCLK signal for the main device is generated from a 40 MHz crystal oscillator. The user can also choose if required, to drive the AD7760/AD7762 with an external clock source by inserting the 0 Ω link to the SMB marked “MCLK”.

The AD7760/AD7762 evaluation board comes with an on-board FPGA device that is used to interface with the EVAL-CED1Z board. The combination of the EVAL-AD7760/2EDZ board and EVAL-CED1Z board allied with the EVAL-AD7760/AD7762EDZ software allows the user to upload samples taken by the AD7760/AD7762 device onto a PC showing the waveform being sampled, as well as allowing the data to be shown in histogram or FFT format. The EVAL-AD7760/AD7762EDZ can also be used on a standalone basis (without EVAL-CED1Z); however, in this case the user must provide the required interface and acquisition requirements.

CONTENTS OF EVALUATION KIT

- AD7760/AD7762 evaluation board (EVAL-AD7760/AD7762EDZ)
- EVAL-AD7760_2EDZ evaluation software CD—software and drivers

EVALUATION BOARD BLOCK DIAGRAM

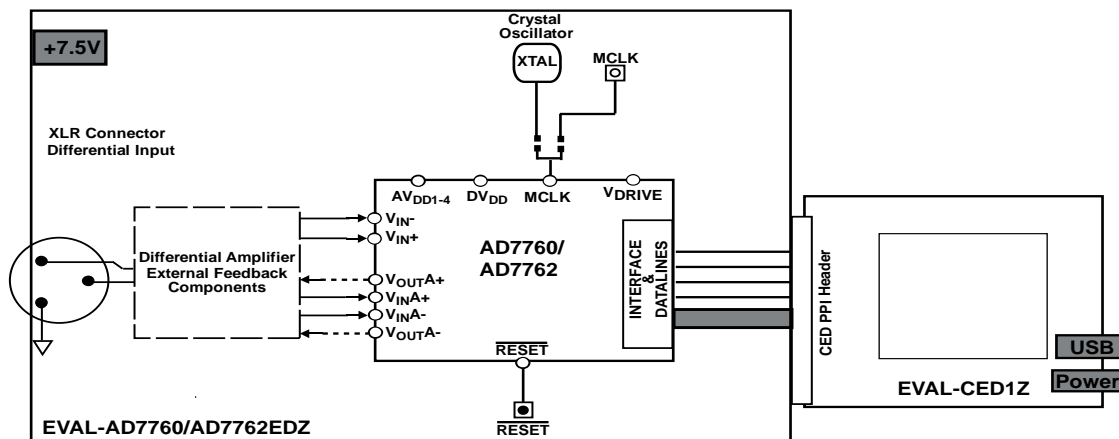


Figure 1.

Rev. PrB

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REVISION HISTORY

08/08—Rev Pr. A –Modified for use with EVAL-CED1Z

03/09 – Rev Pr. B- Modified for Rev G of AD7760_2 evaluation board.

HARDWARE DESCRIPTION

POWER SUPPLIES

The EVAL-AD776xEDZ must be powered using an external power supply that applies a 7.5 V between the V+ and GND terminals of Connector J2.

This 7.5 V supply is then regulated on board using ADP3334 devices (U9 and U6) to provide the 2.5 V and 5 V signals required by the AD7760/AD7762 device. Supplies AV_{DD2}, AV_{DD3}, and AV_{DD4} are the 5 V supplies to the AD7760/AD7762 device. A voltage of 2.5 V supplies the AD7760/AD7762 pins AVDD1, VDRIVE, and DVDD.

A separately regulated 2.5 V supply is used to power all digital functionality on the EVAL-AD7760/AD7762EDZ excluding the AD7760/AD7762 device. An individually regulated 5 V supply also supplies the crystal oscillator and clock buffer devices on the EVAL-AD7760/AD7762EDZ. Setting LK1 to A means that the MCLK buffer is powered by 5 V, enabling the AD7760/AD7762 device to be operated using an MCLK signal with amplitude of 5 V.

DIFFERENTIAL INPUT

The differential input to the AD7760/AD7762 device is applied through the connector marked J1. This is an XLR audio standard connector. The differential inputs are routed through the AD7760/AD7762 on-board differential amplifier using the external circuit components as detailed in the AD7760/AD7762 data sheets.

STANDALONE OPERATION

The EVAL-AD776xEDZ can be used in a standalone manner (that is, without using the EVAL-CED1Z). In this case, however, the user must provide all the required interface communications and be able to provide a means to acquire the output data from the board.

DECOUPLING AND LAYOUT RECOMMENDATIONS

The data sheets of the AD7760, AD7762, and AD7763 devices contain specific information about the decoupling and layout recommendations required to achieve the optimum specifications.

The EVAL-AD7760/AD7762EDZ adheres to these recommendations completely and is designed as the blueprint for users of the AD7760, AD7762 devices. The Gerber files for the EVAL-AD7760/2EDZ board are available for download from the AD7760 or AD7762 product pages at www.analog.com

The EVAL-AD7760/AD7762EDZ is 4-layer boards. One layer is a dedicated ground plane. All supplies to devices on the EVAL-AD7760/AD7762EDZ are decoupled to this ground plane. In addition to the PCB's top and bottom layers, there is also a layer for routing power signals. All layers of the board are detailed in the Evaluation Board Schematic and Artwork section.

In addition, the exposed paddle of an AD7760, AD7762 device is connected by multiple vias to this ground plane. The exposed paddle is not connected to any of the ground pins on the AD7760, AD7762 device.

EVAL-AD7760/AD7762EDZ

LINK OPTIONS

The link options on the evaluation board should be set for the required operating setup before using the board. The functions of these links are described in Table 1.

Table 1. Link Options

| Link No. | Function | Position Descriptions | Default |
|--------------|--|---|-------------|
| LK1 | Selects the V_{DD} voltage for Clock Buffers U16 and U2. | Position A selects $V_{DD} = 5\text{ V}$. Achieves maximum performance. Position B selects $V_{DD} = 2.5\text{ V}$ | Position A |
| R9, R10, R13 | A $0\ \Omega$ link must be placed in either R9 or R10 to select the MCLK source for the AD7760/AD7762 device. R13 must be in place to link the MCLK signal to the EVAL-CED1Z board to allow for data acquisition using the supplied software. | R9 routes the buffered 40 MHz on-board crystal oscillator to the MCLK pin of the AD7760/AD7762 device. R10 allows the user to input an external MCLK signal through the MCLK SMB connector (J8), which is buffered (by U2) and routed to the MCLK pin of the AD7760/AD7762 device. | R9 and R13. |

SOFTWARE INSTRUCTIONS FOR FIRST-TIME USE

INSTALLING THE SOFTWARE

The EVAL-AD7760/AD7762 evaluation board includes self-installing software on CD ROM, for controlling and evaluating the performance of the AD7760/AD7762 when it is operated with the EVAL-CED1Z board. The software is compatible with Windows® 2000/XP®. If the setup file does not run automatically, setup.exe can be run from the CD-ROM.

When the CD is inserted into the PC, an installation program automatically begins. This program installs the evaluation software. The user interface on the PC is a dedicated program written especially for the AD7760/AD7762 when operating with the EVAL-CEDZ board.

The software should be installed before the USB cable is connected between the EVAL-CEDZ and the PC. This ensures that the appropriate USB driver files have been properly installed before the EVAL-CEDZ is connected to the PC.

When the software is ran for the first time with the EVAL-CEDZ board connected to the PC, the PC will automatically find the new device and will identify it. Follow the onscreen instructions that appear automatically. This installs the drivers for the CED on the PC. If an error appears on screen when the software is first opened, then the PC is not recognizing the USB device. This error is corrected by

1. Opening the PC's Device Manager. The Device Manager is accessed by right clicking on the My Computer Icon, and selecting Properties. When the System Properties Window opens, select the Hardware tab.
2. Click on Device Manager in the Hardware Tab of the System Properties window.
3. Examine the devices listed under the Universal Serial Bus Controller heading.
4. If an unknown device is listed, right click on this option and select, Update Driver.
5. The New Hardware Wizard will run twice, and under the ADI Development Tools the following hardware is listed:

ADI Converter Evaluation and Development Board (WF)

6. Reboot the PC.

This section describes how the evaluation board, the EVAL-CEDZ and the software should be set up to begin using the complete system.

1. Insert the CD into the appropriate computer drive.
2. The dialog box shown in Figure 2 appears.

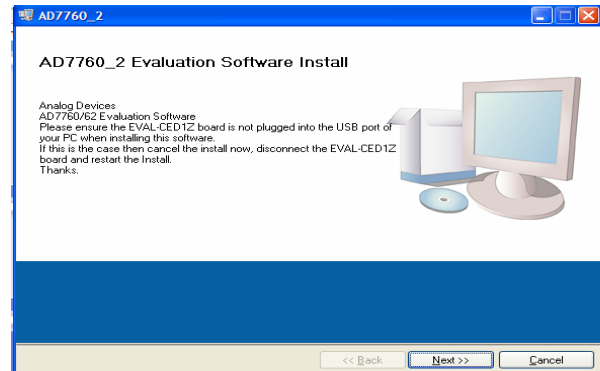


Figure 2. EVAL-AD7760_2EDZ Setup Dialog Box, Initial Software Install Screen

3. The destination directory can be chosen using the default clicking “Next” as shown in Figure 3). If a different location than the default is preferred, click **Browse** and select the desired location. When ready, click **Next**.

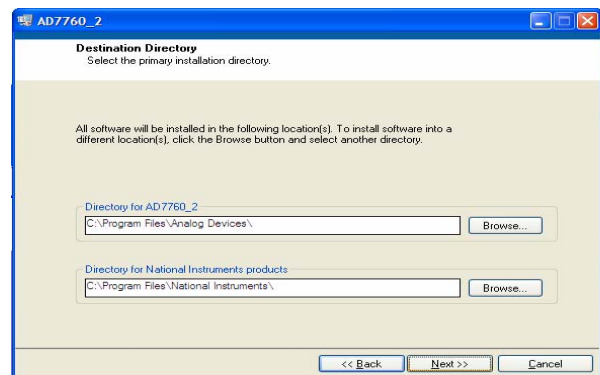


Figure 3. Choose the Destination of the AD776x Software

4. Accept the license agreement by selecting the correct option and clicking “Next” as shown in Figure 4.

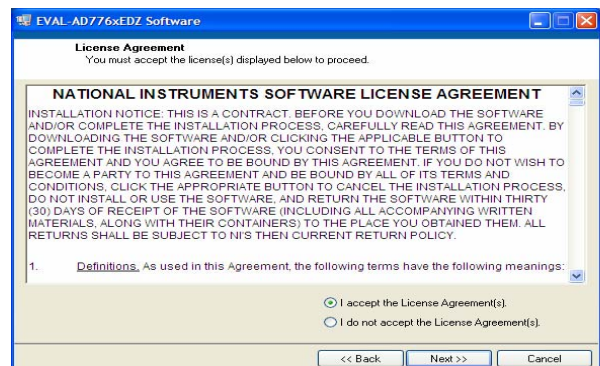


Figure 4. Accept license agreement

EVAL-AD7760/AD7762EDZ

- To start the installation, click the “Next” button as shown in Figure 5, this window details the actions of the installation.

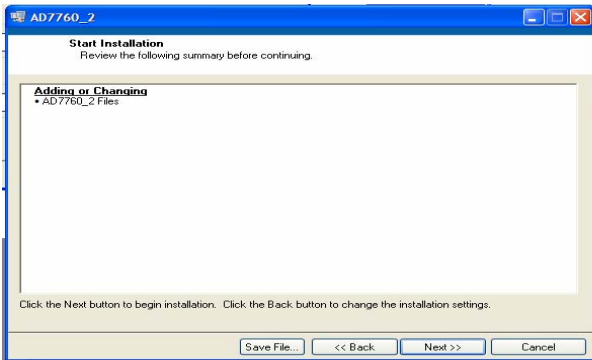


Figure 5. EVAL-AD776xEDZ Install actions

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- The software can now be located by following the path that was chosen during installation. If the default location was chosen, the location of the software in the case of the AD7760 is **Start > All Programs > Analog Devices > AD7760_2 > AD7760_2**.

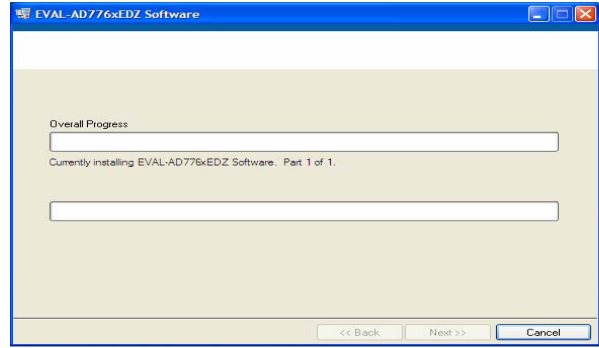


Figure 6. Default Location of AD7760/AD7762 Software

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- On completion of the installation, the window as shown in Figure 7 is displayed.

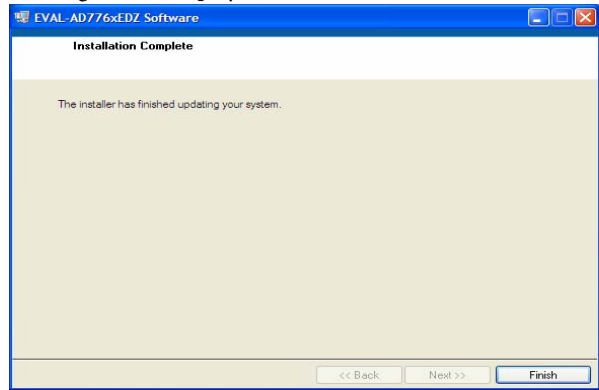


Figure 7. Install Completed

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- On completion of the installation, it is advised that the user re-start the PC in order for the software to take full effect.

USING THE EVALUATION SYSTEM

HARDWARE CONNECTIONS

1. Apply power to the EVAL-CED1Z via +7V, 15W power supply provided with the EVAL-CED1Z board. At this stage, the green LED labeled 'Power' on the EVAL-CED1Z should be lighting. This indicates that the EVAL-CED1Z is receiving power. The USB cable can then be connected between the PC and the EVAL-CED1Z.
2. Connect the USB cable between the PC and the EVAL-CED1Z. A green LED positioned beside the USB connector on the EVAL-CEDZ board will light indicating that the USB connection has been established.
3. Power up the EVAL-AD7760/AD7762EDZ evaluation board through Connector J2. Connect a wire from the V+ labeled connector to 7.5 V of an external power supply. Also ensure that there is a GND connection between the GND of J2 and the power supply GND connection.
4. Connect the female connector (J13, marked "CED1Z PPI"), which is on the under side of the EVAL-AD7760/AD7762EB evaluation board to the PPI header of

the EVAL-CED1Z board.

5. Start the EVAL-AD7760/AD7762EDZ software.

The differential input to the AD7760/AD7762 device can be connected to the black connector XLR connector (J1) marked "Differential Input." This differential input is routed to the inputs of the AD7760/AD7762's on-board differential amplifier. As the software will power up the AD7760/2 device it is advisable that users do not apply an analog input until the device is fully powered up.

With the hardware set up, you can now use the software to control the EVAL-CED1Z and the AD7760/AD7762 evaluation board. To launch the software, from the **Analog Devices** menu click on the **AD7760_2** submenu, then click on the **AD7760_2 icon**.

Note: In the case where an Error message appears, click OK and restart the application after checking the connection between the adapter board and the USB port on the PC. Also, check that the USB device is identified by the Device Manager as detailed in the first time use of EVAL-CED1Z paragraph of Installing the Software section.

SOFTWARE INSTRUCTIONS FOR NORMAL USE

Once the initial software installation has been completed, follow these instructions for the general setup of the evaluation software each subsequent time the system is used.

Note that the hardware must be powered up as per the Hardware connections section before attempting the following steps.

1. The download default location for the EVAL-AD7760/AD7762EDZ evaluation software can be found by clicking **Start > All Programs > Analog Devices > AD7760_2 > AD7760_2**. If a location other than the default was used, follow the path that was entered during setup.
2. The evaluation software GUI appears –see Figure 10 there are five main control sections as described.
3. To start select the correct AD776x device from the drop down box – selecting AD7760 or AD7762.
4. To Power up the AD7760/2device under evaluation, first click the Power Mode drop down menu, and select either ‘Low Power’ or ‘Normal Power’. This will automatically prompt the EVAL-CED1Z to write to the AD7760/AD7762 registers and power up the AD7760/2 device.

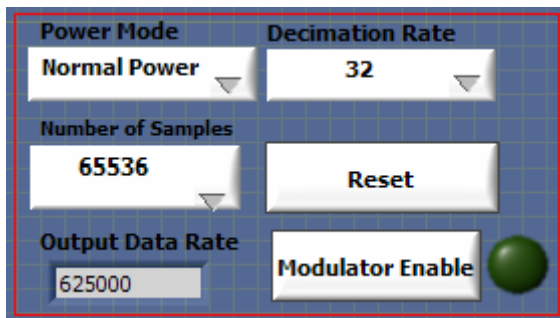


Figure 8. Power, Number of Samples, Decimation Rate and Modulator Mode Control buttons.

5. Note that the external voltage supply connected to the EVAL-AD7760/AD7762EDZ board will show approximately ~240mA in ‘Normal Power’ mode, and approx ~170mA in ‘Low Power mode. Seeing this current draw levels change, when switching between the power modes also verifies that the communications between the EVAL-AD7760/2EDZ and EVAL-CED1Z board are operational.
6. The AD7760 or AD7762 device will power up in a default decimation setting of 32. Change the Decimation Rate setting by clicking on the Decimation rate drop down control as shown in Figure 8. This allows the user to vary the over sampling rate and implement the five (for

AD7760) on-chip decimation options offering from a 78kHz to 2.5MHz output data rate from the AD7760.

7. The user can specify the power mode, decimation rate, and number of samples to be acquired (typically 65536 samples) by using the drop-down menus on the software front panel. The software allows the number of samples specified by the user samples to be viewed as a waveform, histogram, or FFT.

The choosing the different decimation rates from the front panel controls writes to the AD7760/2 control register 2 to change the amount of decimation used in the second internal FIR filter of the AD7760. This filter can be set bypassed to enable decimate x8 mode or otherwise set to decimate x2 to x32 in order to enable an overall decimation rate of 16 to 256 for the AD7760 device.

8. Note that for the AD7762 device only operates in decimation rates: Dec x32, Dec x64, Dec x128, and Dec x 256.
9. To show samples output by the EVAL-AD7760/AD7762/EBZ evaluation board Click **Sample** or **Continuous**. Clicking **Sample** gives one set of samples, the length of which is determined by the **No. Samples** selection on the software front panel. Clicking **Continuous** shows continuously updated samples of the analog input to the device.

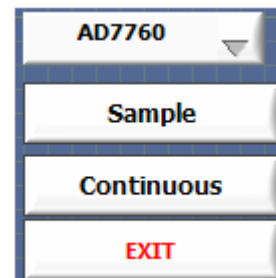


Figure 9.

10. It is important to ensure that the frequency of the $\overline{\text{DRDY}}$ pulse on an oscilloscope (test point marked DRDY) is checked so that it matches the frequency shown in the **Frequency** text box on the software front panel.
11. If at any stage these do not match, reset the AD7760/AD7762 evaluation board by pressing the $\overline{\text{RESET}}$ push button on the evaluation board. Then set the decimation rate on the software front panel to the correct default value.

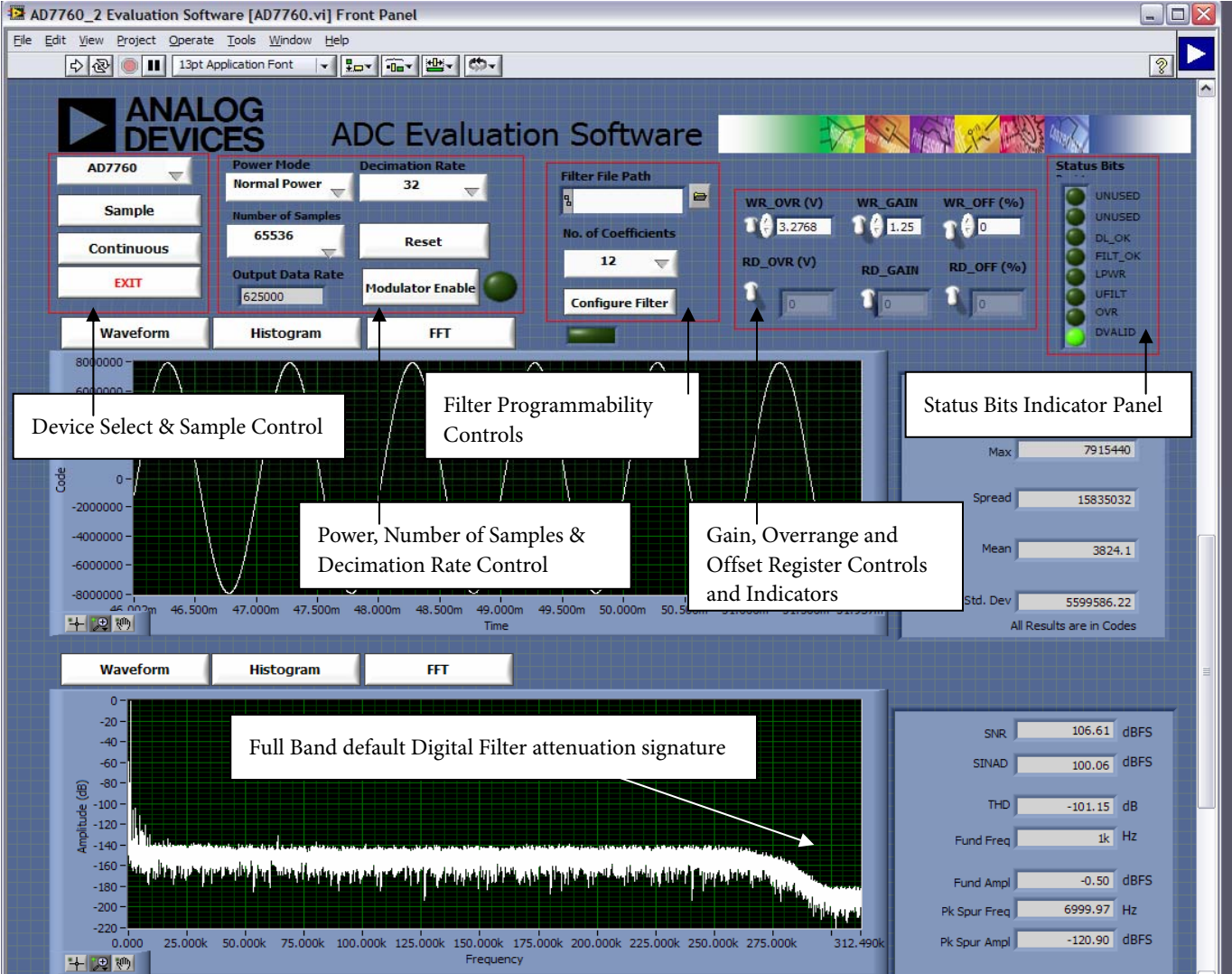


Figure 10. Front Panel GUI showing control and indicator information and the performance with a -0.5dB 1 kHz input tone in decimate by 32 mode when running with the default 40MHz MCLK.

EVAL-AD7760/AD7762EDZ

MODULATOR MODE

12. Evaluation of the AD7760 device when using this hardware and software allows the user to use look at the direct raw modulator output from the device –bypassing all the internal FIR filtering.

To enter Modulator mode click the “Modulator Enable” button as shown in Figure 8. When in Modulator Mode the green indicator light beside the control button will be asserted.

Running in modulator mode allows the user to see the noise shaping provided by the AD7760 Sigma-Delta modulator as shown in Figure 11.

13. Click the “Modulator Enable” button to get out of the modulator mode –green indicator light will go off. Reset by clicking the “RESET” button and finally set the decimation rate wanted to running with the internal default FIR filters.

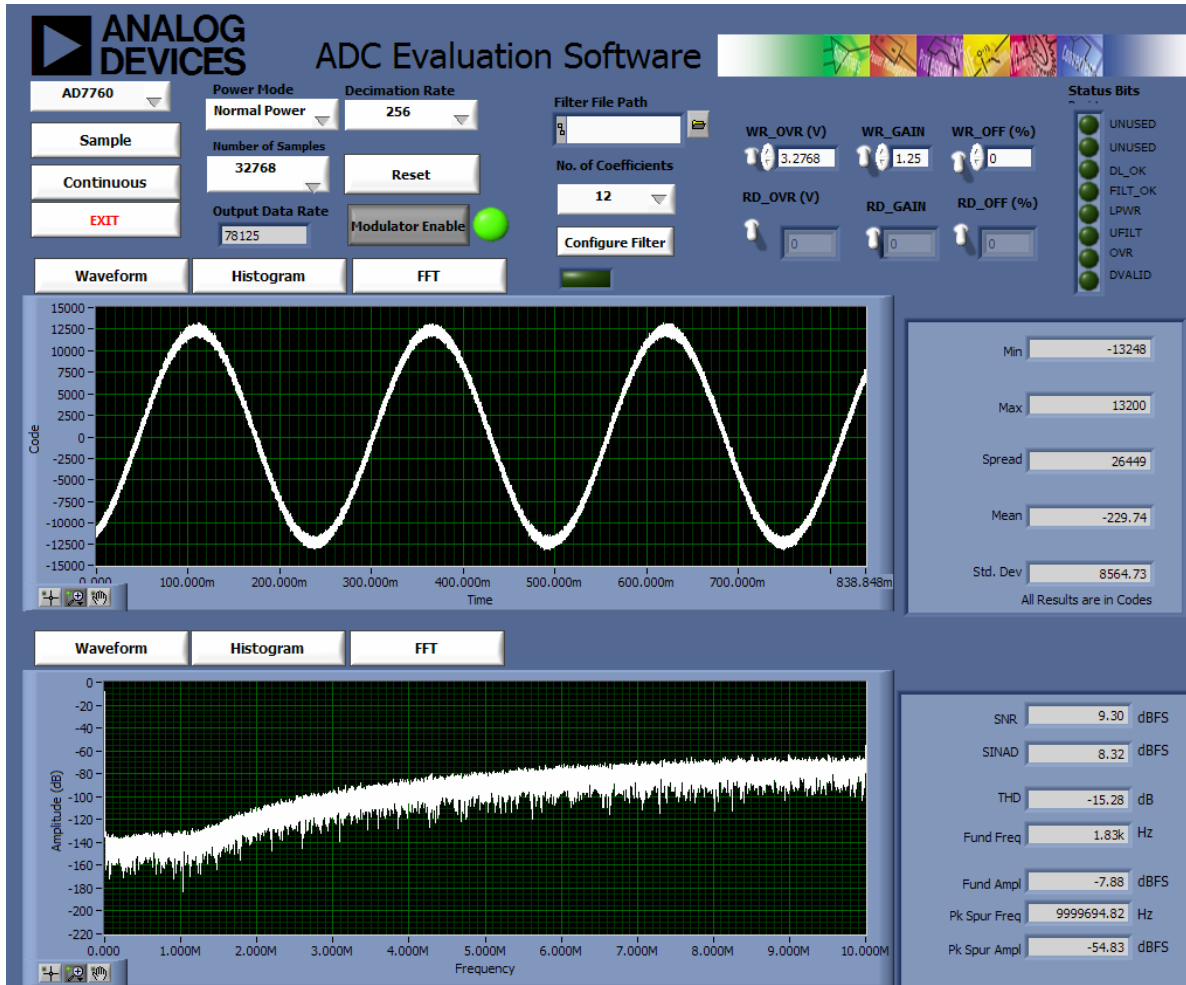


Figure 11. Modulator Mode example of noise shaping provided by the AD7760 Sigma-Delta Modulator. The high frequency content of the modulator output leads to the coarse nature of the waveform shown.

DOWNLOADING A USER-DEFINED FILTER

The final stage of the AD7760/2 FIR filter can be programmed to suit the user's specific requirements. The filter designed must correspond with the requirements listed in the datasheet – it must be a symmetrical filter with an even number of coefficients. The number of coefficients can be from 12 to 96.

- Due to the symmetry of the filter, the coefficients will repeat. Thus, only half of the coefficients are required to be sent to the AD7760/2 device.
- The AD7760/2 software reads the coefficients from a text file and writes each coefficient to the AD7760/2. The filter file should contain the correct checksum, which is also written to the ADC, and the file must be in the correct format.

- An example of this format is shown in Figure 12. This example corresponds to the example digital filter in the Downloading A User Defined Filter section in the AD7760/2 datasheet.
- Each of the 32 bit words (in this case there are 12 words for the coefficients + the checksum) are in a Hexadecimal format – there must also be no spaces between the characters and no text, spaces or notation before or after any of the hex words to be written. The software implements a text read from each line of the file and then translates this value to the correct binary 32 –bit word to be written to the AD7760/2 as per the description in the datasheet.

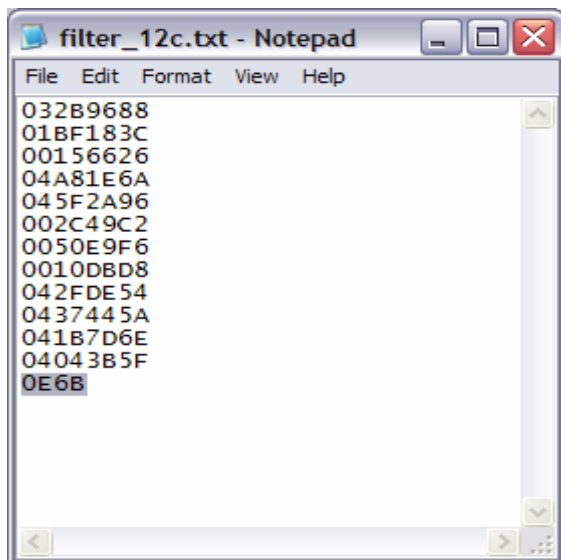


Figure 12. Example of format required for filter coefficients to be downloaded correctly.

- To download a filter,
 - Select the number of coefficients that will be downloaded – this is half the filter length – so if you have a 24 tap filter you select 12 in the drop down selection shown in Figure 13.

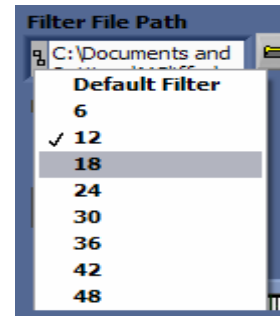


Figure 13. Number of coefficients to be sent to the AD7760/2 device.

- Now click on the folder icon and browse to the location of the filter text file. The install will have placed a copy of the datasheet example at Program files/Analog Device/ AD7760_2 this file is called “filter_12c.txt”

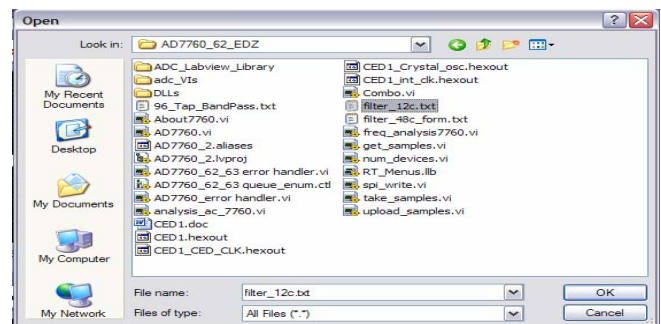


Figure 14. Browse to select the specific text file.

- Finally click the “Configure Filter” button to download the user-defined filter.
- Once this is done then, click the “Sample” button to acquire a batch of samples from the AD7760/2 device.
- The filter example used in the AD7760/2 datasheet will show a slower transition band. The FFT of this filter implementation is shown in Figure 15. As highlighted, the status bits output by the ADC will show if the filter file has been downloaded correctly. The indicators for the DL_OK, FILT_OK and UFILT are all asserted to show a successful filter download.

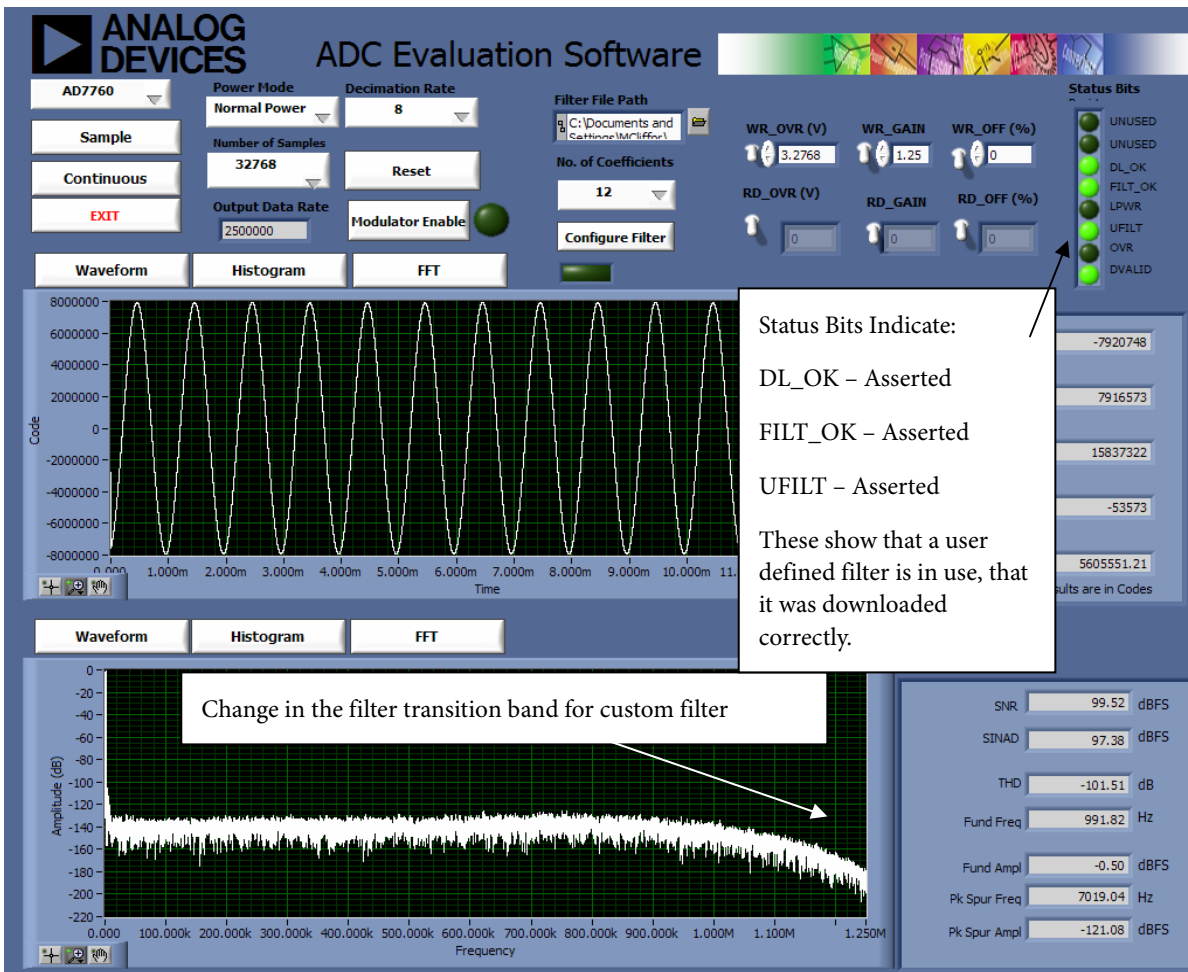


Figure 15. User-defined filter example – implemented on evaluation board. See indicators illuminated, and custom filter transition band.

WRITING TO GAIN, OFFSET & OVERRANGE REGISTERS

17. The EVAL-AD7760/2EDZ board allows the user to write to the on-board registers for control of gain correction, offset correction, and the setting of the overrange flag.
18. As an example of this, the default value of the gain correction register, 1.25 can be changed to a value of 1.00. Do this by setting the value in the WR_GAIN text box to 1.00. Click on the white WR_GAIN switch on the front panel in order to write to the gain register.
19. To check that the value has been written correctly click on the white RD_GAIN switch on the front panel and the value of the AD7760/2 gain register will be shown in the RD_GAIN indicator box.

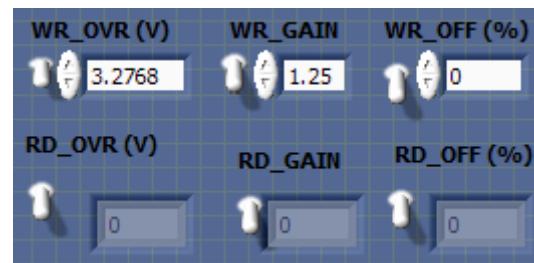


Figure 16. Overrange, Gain, Offset register Write and Read functions.

EVALUATION BOARD SCHEMATIC AND ARTWORK

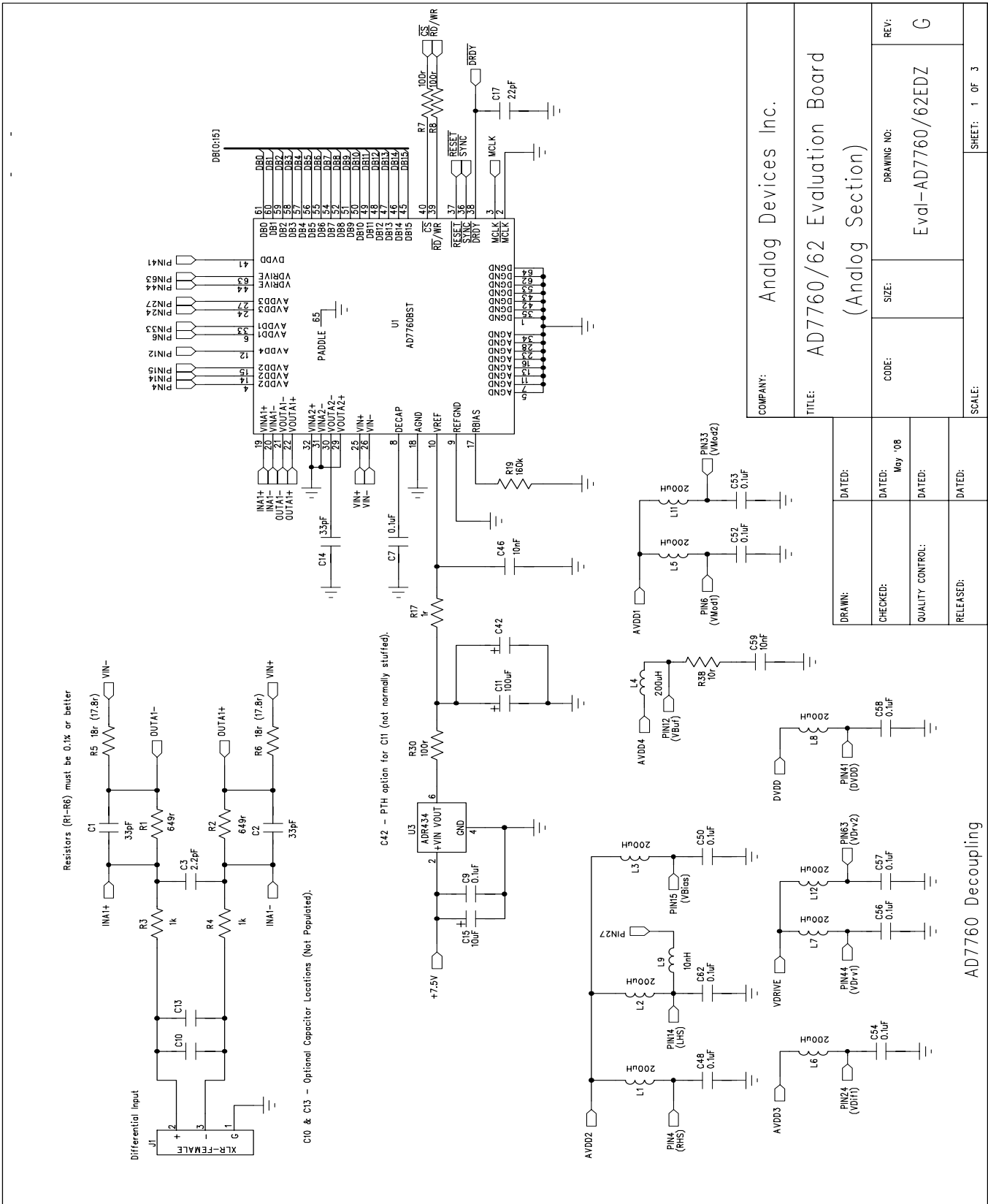


Figure 17. EVAL-AD7760/AD7762EDZ Schematic (Analog Section Rev.G) Page 1 of 4

EVAL-AD7760/AD7762EDZ

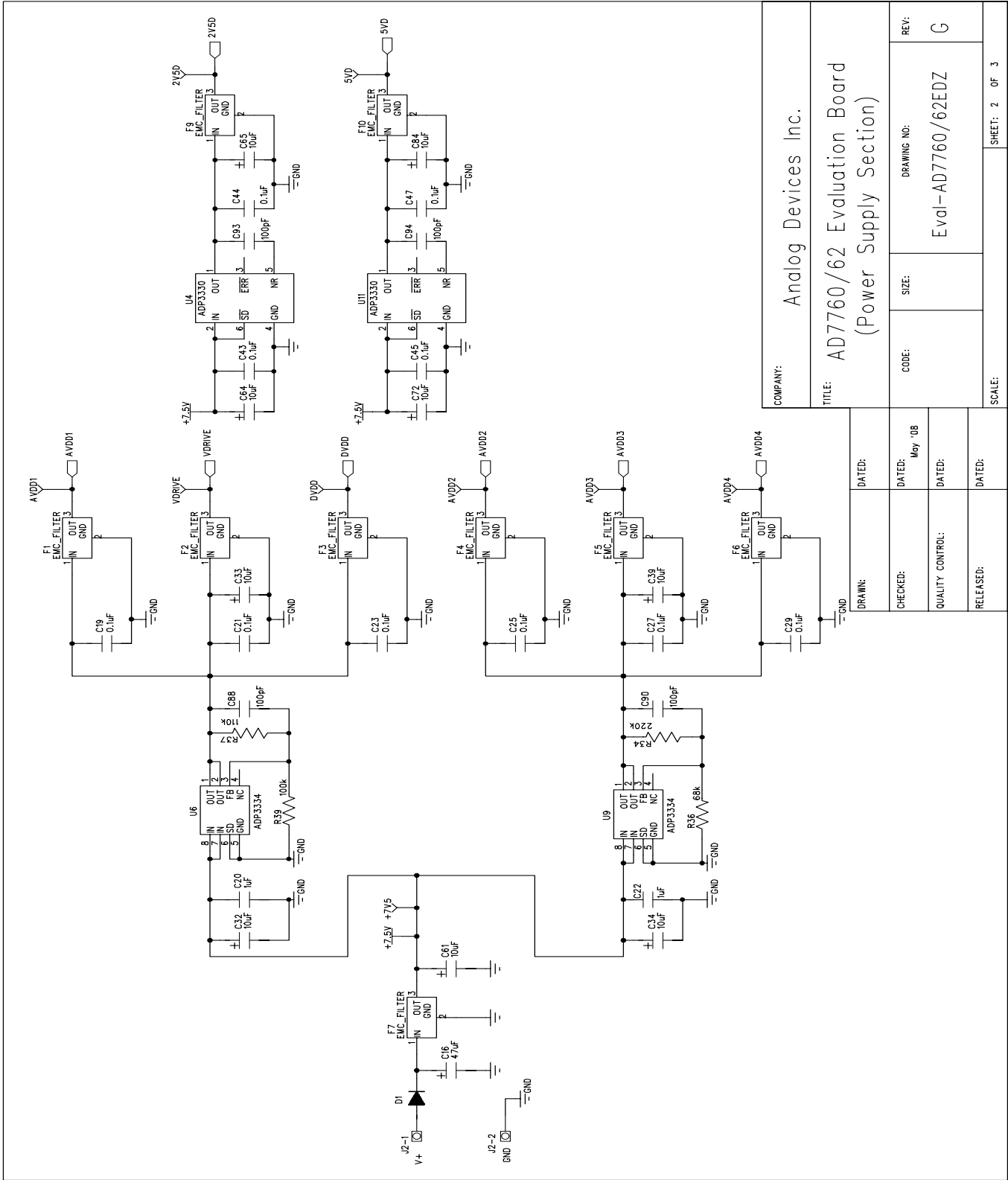


Figure 18. EVAL-AD7760/AD7762EDZ Schematic (Power Supply Section Rev G) Page 2 of 3

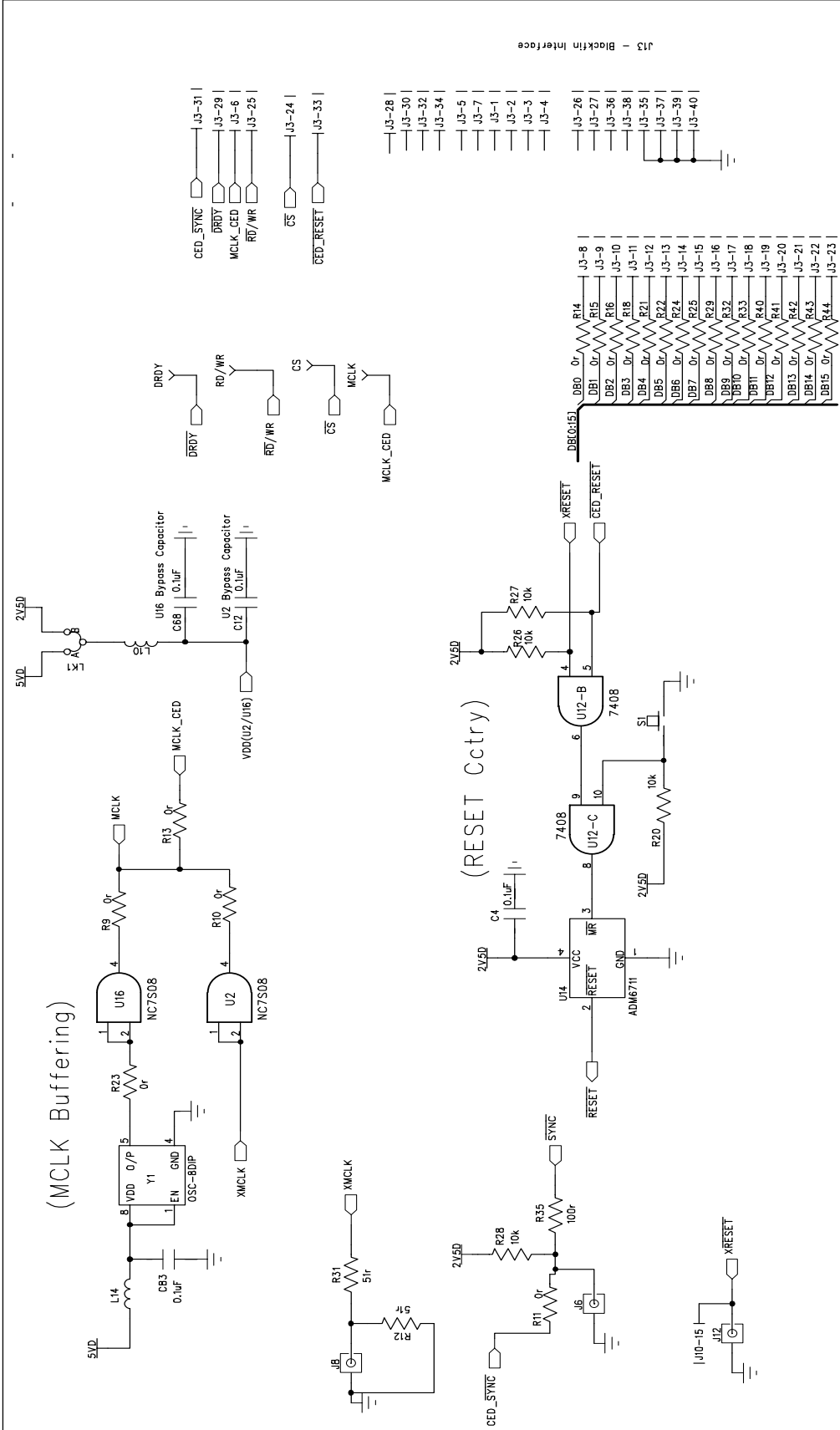
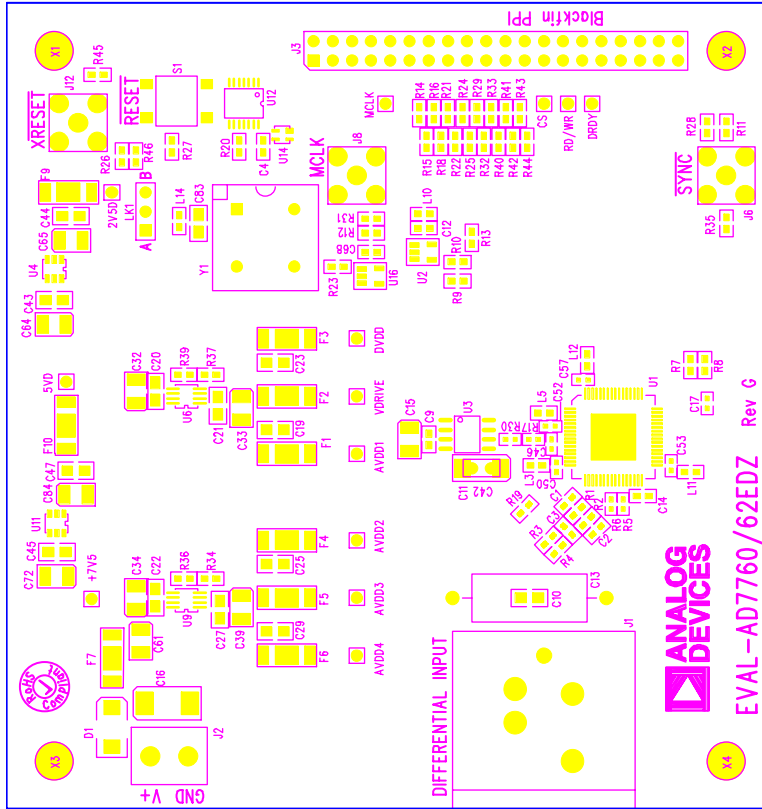


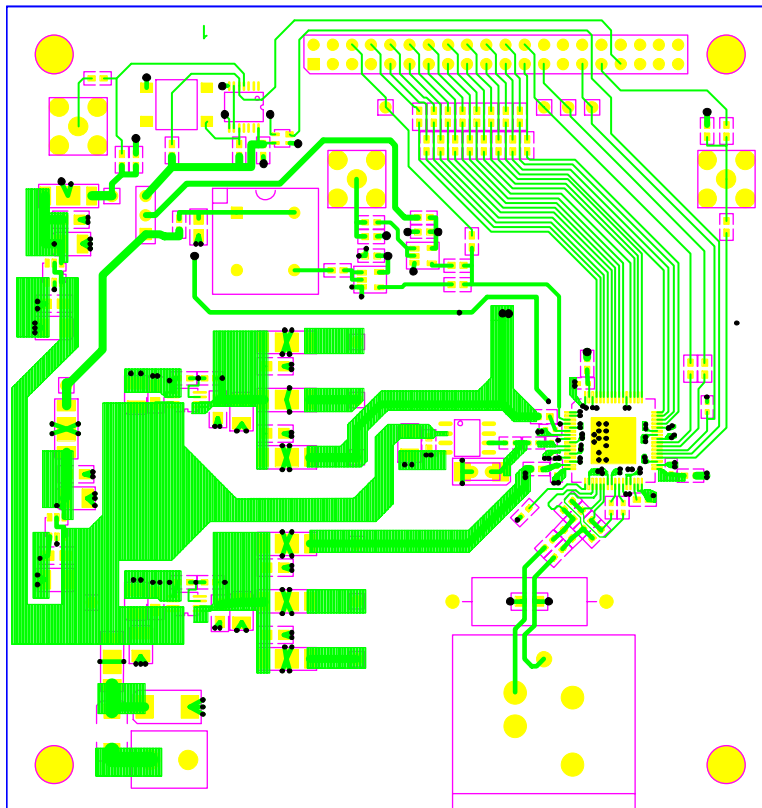
Figure 19. EVAL-AD7760/AD7762EDZ Schematic (Interface Section Rev F) Page 3 of 3

| | | | |
|--|----------------|---------------------|--------|
| COMPANY: | | Analog Devices Inc. | |
| TITLE: AD7760/AD7762 Evaluation Board (Interface Section) | | | |
| DRAWN: | DATED: | CODE: | SIZE: |
| CHECKED: | DATED: May '08 | DBE15 | DBE15 |
| QUALITY CONTROL: | DATED: | EVAL-AD7760/62EDZ | |
| RELEASED: | DATED: | DRAWING NO: | REV: G |
| SCALE: | | SHEET: 3 OF 3 | |



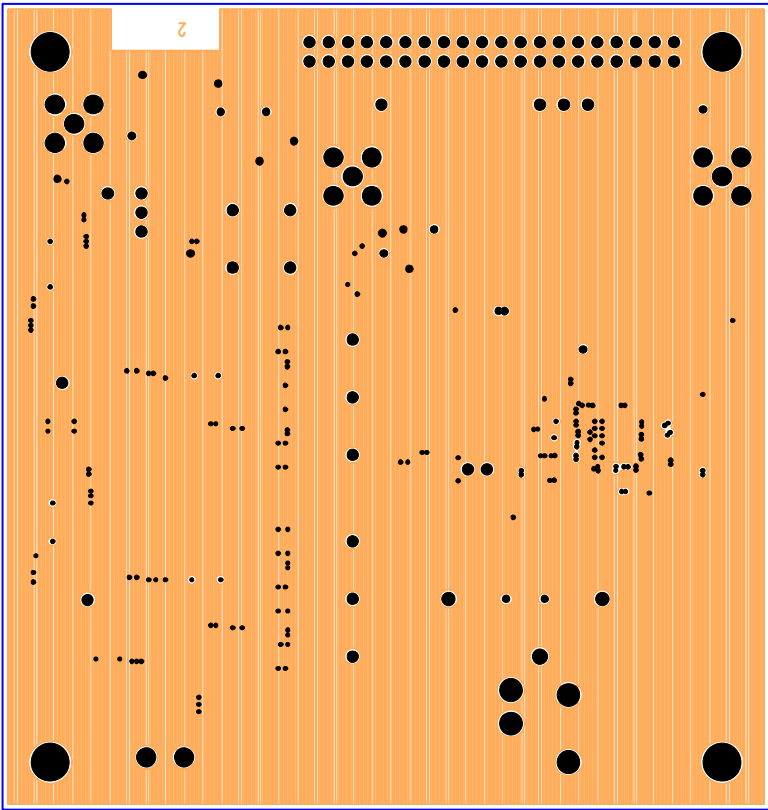
EVAL-AD7760/62EDZ (Rev. G) – Component Side View
Silkscreen Top

Figure 20. EVAL-AD7760/AD7762EDZ Component Side Top Silkscreen Artwork



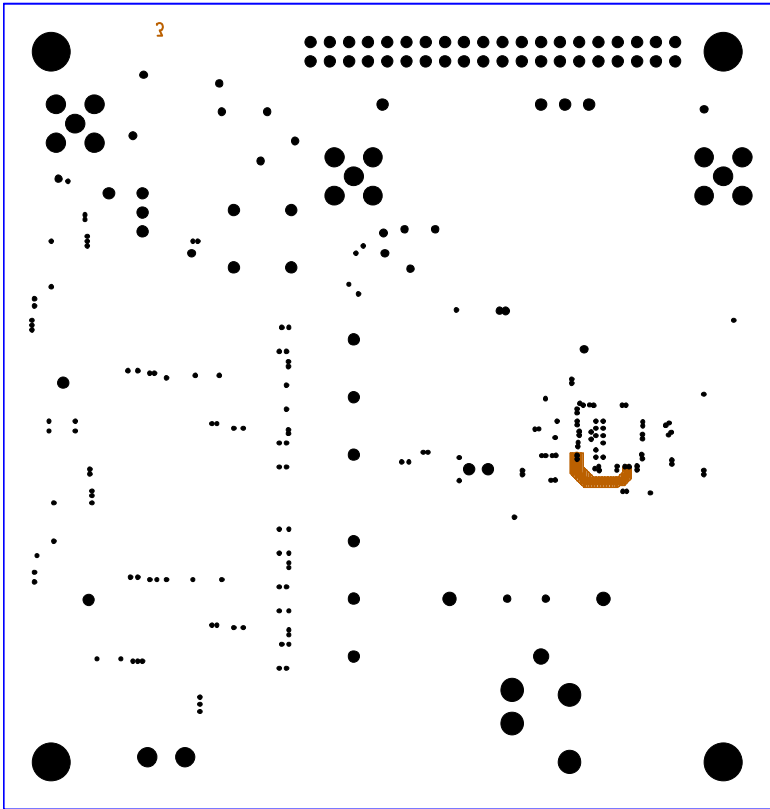
EVAL-AD7760/62EDZ (Rev. G) – Component Side View
Component Side – Layer 1

Figure 21. EVAL-AD7760/AD7762EDZ Component Side Layer 1 Artwork



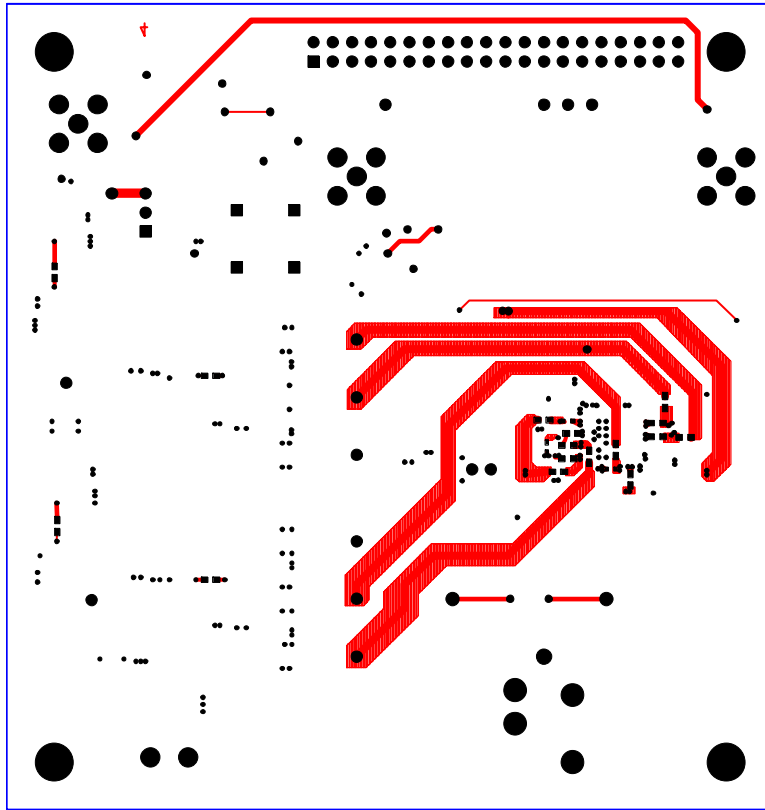
EVAL-AD7760/62EDZ (Rev. C) – Component Side View
Ground Plane – Layer 2

Figure 22. EVAL-AD7760/AD7762EDZ Ground Plane Layer 2 Artwork



EVAL-AD7760/62EDZ (Rev. C) – Component Side View
Power – Layer 3

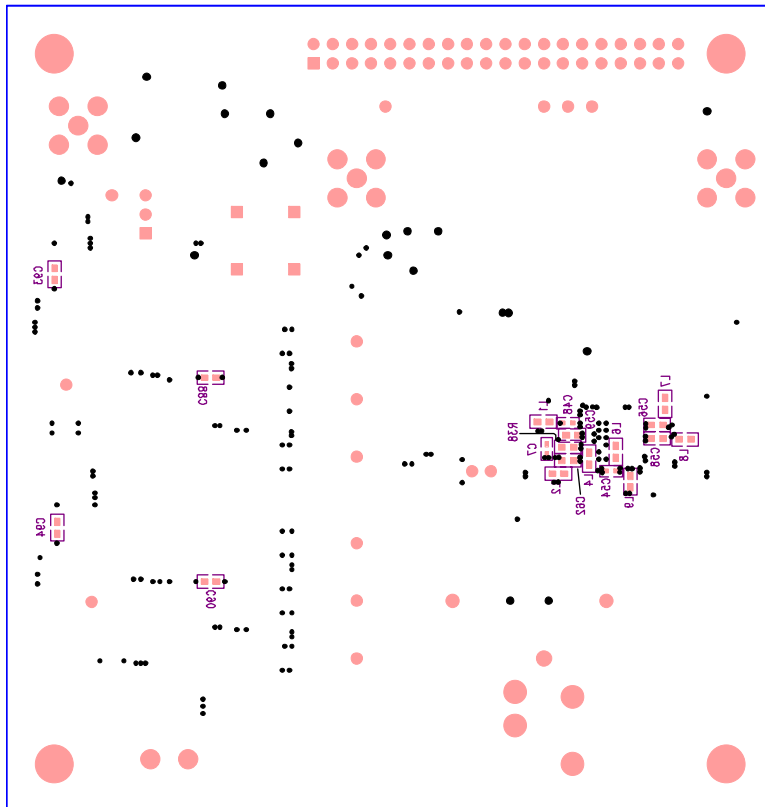
Figure 23. EVAL-AD7760/AD7762EDZ Power Plane Layer 2 Artwork



EVAL-AD7760/62EDZ (Rev. G) – Component Side View

Solder Side – Layer 4

Figure 24. EVAL-AD7760/AD7762EDZ Solder Side Layer 4 Artwork



EVAL-AD7760/62EDZ (Rev. G) – Component Side View

silkscreen Bottom

Figure 25. EVAL-AD7760/AD7762EDZ Component Side Bottom Silkscreen Artwork

ORDERING INFORMATION

BILL OF MATERIALS

Table 2.

| Name | Value | PCB Decal | PART DESC | STOCK CODE |
|------|-------|-----------|--------------------------------------|---------------|
| C1 | 33pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 498555 |
| C2 | 33pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 498555 |
| C3 | 2.2pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 721888 |
| C4 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C7 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C9 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C10 | n/a | 0805 | Optional Capacitor Footprint (0805) | Do not insert |
| C11 | 100uF | CAP\TAJ_C | 10v Tantalum Capacitor | FEC 197180 |
| C12 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C13 | n/a | R1W | Optional Capacitor Footprint (0805) | Do not insert |
| C14 | 33pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 498555 |
| C15 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C16 | 47uF | CAP\TAJ_D | 20V Tantalum Capacitor | FEC 197464 |
| C17 | 22pF | 0402 | 50V C0G Multilayer Ceramic Capacitor | FEC 8819629 |
| C19 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C20 | 1uF | 0805 | 16V X7R Multilayer Ceramic Capacitor | FEC 9527710 |
| C21 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C22 | 1uF | 0805 | 16V X7R Multilayer Ceramic Capacitor | FEC 9527710 |
| C23 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C25 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C27 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C29 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C32 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C33 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C34 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C39 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C42 | n/a | CAP\MR04 | PTH Capacitor Location | Do not insert |
| C43 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C44 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C45 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C46 | 10nF | 0402 | 16V X7R Multilayer Ceramic Capacitor | FEC 578149 |
| C47 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C48 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C50 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C52 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C53 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C54 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C56 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C57 | 0.1uF | 0402 | 16V Y5V Multilayer Ceramic Capacitor | FEC 3019482 |
| C58 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C59 | 10nF | 0603 | 25V X7R Multilayer Ceramic Capacitor | FEC 499146 |
| C61 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C62 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C64 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C65 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |

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|-----|------------------|------------|---|----------------|
| C68 | 0.1uF | 0603 | 16V X7R Multilayer Ceramic Capacitor | FEC 9406140 |
| C72 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C83 | 0.1uF | 0805 | 50V X7R Multilayer Ceramic Capacitor | FEC 9406387 |
| C84 | 10uF | CAP\TAJ_B | 20V Tantalum Capacitor | FEC 197427 |
| C88 | 100pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 9406115 |
| C90 | 100pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 9406115 |
| C93 | 100pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 9406115 |
| C94 | 100pF | 0603 | 50V NPO Multilayer Ceramic Capacitor | FEC 9406115 |
| D1 | | DO-214AA | 2A Rectifier Diode | FEC 9843876 |
| F1 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F2 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F3 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F4 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F5 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F6 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F7 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F9 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| F10 | | EMC_FILTER | 1nF 3-Terminal Capacitor | FEC 9528202 |
| J1 | | XLR-FEMALE | XLR Female Audio Connector | FEC 724518 |
| J2 | | CON\POWER2 | 2 Pin Terminal Block (5mm Pitch) | FEC 151789 |
| J3 | | HEADER40 | 40-Pin (2x20) PC104 Stackthrough Header | FEC 359907 |
| J6 | | SMB | 50 Ohm SMB Jack | FEC 4194512 |
| J8 | | SMB | 50 Ohm SMB Jack | FEC 4194512 |
| J12 | | SMB | 50 Ohm SMB Jack | FEC 4194512 |
| L1 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L2 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L3 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L4 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L5 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L6 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L7 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L8 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L9 | 10nH | 0603 | Inductor | FEC 3877024 |
| L10 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L11 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L12 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| L14 | | 0603 | Ferrite Bead (Wurth Electronik) | 74279266LF |
| LK1 | | LINK-3P | 3 Pin SIL Header (with shorting block) | FEC 1022248 |
| R1 | 649R 0.1% | 0603 | Holsworthy (Tyco) | RN73C1J649RBTG |
| R2 | 649R 0.1% | 0603 | Holsworthy (Tyco) | RN73C1J649RBTG |
| R3 | 1k 0.1% | 0603 | Holsworthy (Tyco) | RN73C1J1K0BTG |
| R4 | 1k 0.1% | 0603 | Holsworthy (Tyco) | RN73C1J1K0BTG |
| R5 | 18r (17.8r) 0.1% | 0402 | Holsworthy (Tyco) | RN73C1J17R8BTG |
| R6 | 18r (17.8r) 0.1% | 0402 | Holsworthy (Tyco) | RN73C1J17R8BTG |
| R7 | 100r | 0603 | SMD Resistor | FEC 9330364 |
| R8 | 100r | 0603 | SMD Resistor | FEC 9330364 |
| R9 | 0r | 0603 | SMD Resistor | FEC 9331662 |
| R10 | 0r | 0603 | SMD Resistor | Do not insert |
| R11 | 0r | 0603 | SMD Resistor | Do not insert |
| R12 | 51r | 0603 | SMD Resistor | FEC 9331336 |

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|-----|-----------|---------------------|---|--------------------------|
| R13 | 0r | 0603 | SMD Resistor | Do not insert |
| R14 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R15 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R16 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R17 | 1r | 0402 | SMD Resistor | FEC 9238123 |
| R18 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R19 | 160k | 0603 | SMD Resistor | FEC 9330682 |
| R20 | 10k | 0603 | SMD Resistor | FEC 9330399 |
| R21 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R22 | 0R | 0603 | SMD Resistor | FEC 1357983 |
| R23 | 0R | 0603 | SMD Resistor | FEC 9331662 |
| R24 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R25 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R26 | 10k | 0603 | SMD Resistor | FEC 9330399 |
| R27 | 10k | 0603 | SMD Resistor | FEC 9330399 |
| R28 | 10K | 0603 | SMD Resistor | FEC 9330399 |
| R29 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R30 | 100R | 0402 | SMD Resistor | FEC 9239111 |
| R31 | 51R | 0603 | SMD Resistor | FEC 9331336 |
| R32 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R33 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R34 | 220k | 0603 | SMD Resistor | FEC 9330836 |
| R35 | 100R | 0603 | SMD Resistor | FEC 9330364 |
| R36 | 68k | 0603 | SMD Resistor | FEC 9331468 |
| R37 | 110k | 0603 | SMD Resistor | FEC 9330461 |
| R38 | 10R | 0603 | SMD Resistor | FEC 9330429 |
| R39 | 100k | 0603 | SMD Resistor | FEC 9330402 |
| R40 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R41 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R42 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R43 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R44 | 0r | 0603 | SMD Resistor | FEC 1357983 |
| R45 | 100r | 0603 | SMD Resistor | Do not insert |
| R46 | 0r | 0603 | SMD Resistor | Do not insert |
| S1 | | SW_PB_SMD_6MM | SMD Push Button Switch (sealed 6mm x 6mm) | FEC 177-807 |
| U1 | AD7760BSV | LQFP64_PADDLE | ADC | AD7760BSVZ AD7762BSVZ |
| U2 | NC7S08 | SOT23-5 | Single Gate TTL | FEC 1013807 |
| U3 | ADR434 | SO8NB | Voltage Reference | ADR434ARZ |
| U4 | ADP3330 | SOT23-6 | Low Dropout Regulator | ADP3330ARTZ-2.5 |
| U6 | ADP3334 | MSO8 | Low Dropout Regulator | ADP3334ARMZ |
| U9 | ADP3334 | MSO8 | Low Dropout Regulator | ADP3334ARMZ |
| U11 | ADP3330 | SOT23-6 | Low Dropout Regulator | ADP3330ARTZ-5 |
| U12 | 7408 | TSSOP-14 | QUAD 2-INPUT POS-AND GATE | FEC 1102978 |
| U14 | ADM6711 | SC70-4(LARGE_PIN_2) | Reset Generator | ADM6711ZAKSZ |
| U16 | NC7S08 | SOT23-5 | Single Gate TTL | FEC 1013807 |
| Y1 | 40MHz | OSC_DIP8 | OSC-8DIP MX045HS40M0000 | Digikey CTX175-ND |

EVAL-AD7760/AD7762EDZ

ORDERING GUIDE

| Model | Description |
|----------------|--|
| EVAL-AD7760EDZ | Evaluation Kit |
| EVAL-AD7762EDZ | Evaluation Kit |
| EVAL-CED1Z | Converter Evaluation and Development (CED) 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.

NOTES