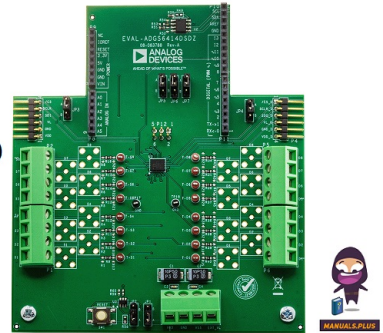




**EVAL-
ADGS6414D
Evaluation
Board**



ANALOG DEVICES EVAL-ADGS6414D Evaluation Board Owner's Manual

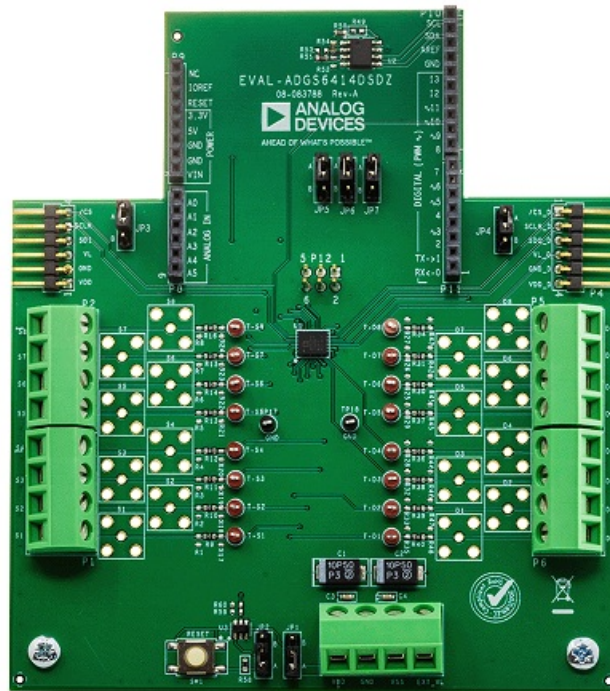
[Home](#) » [Analog Devices](#) » ANALOG DEVICES EVAL-ADGS6414D Evaluation Board Owner's Manual 

Contents

- 1 ANALOG DEVICES EVAL-ADGS6414D Evaluation Board
- 2 Product Usage Instructions
- 3 FAQ
- 4 FEATURES
- 5 GENERAL DESCRIPTION
- 6 EVALUATION BOARD PHOTOGRAPH
- 7 EVALUATION BOARD HARDWARE
- 8 EVALUATION BOARD SOFTWARE
- 9 BLOCK DIAGRAM AND DESCRIPTION
- 10 EVALUATION BOARD SCHEMATICS AND ARTWORK
- 11 ORDERING INFORMATION
- 12 Documents / Resources
 - 12.1 References



ANALOG DEVICES EVAL-ADGS6414D Evaluation Board



Specifications:

- **Product:** EVAL-ADGS6414DARDZ
- **On Resistance:** 0.56 Ohms
- **Switch Type:** High Density Octal SPST
- **Interface:** SPI with error detection
- **Control:** PC control with EVAL-SDP-K1 system demonstration platform

Product Usage Instructions

Equipment and Software Required:

- EVAL-ADGS6414DARDZ evaluation board
- EVAL-SDP-CK1Z (SDP-K1) controller board
- DC voltage source
- ACE software with EVAL-ADGS6414DARDZ plugin

General Description:

The EVAL-ADGS6414DARDZ is the evaluation board for the ADGS6414D, an octal SPST switch controlled by SPI. The SPI features robust error detection capabilities such as CRC, invalid read and write address detection, and SCLK count error detection. The board also supports burst mode to reduce command execution time.

Instructions

Power Supplies:

Connect P1, P2, P5, and P6 screw connectors to the source and drain pins of the ADGS6414D. Additional SMB connector pads are available for extra connections.

Input Signals:

Each trace on the source and drain sides includes 0603 pads for load placement on the signal path to ground. A 0

resistor in the signal path can be replaced with a user-defined value, creating an RC filter.

Link Options:

Ensure proper link settings on the EVAL-ADGS6414DARDZ for desired operating conditions. Refer to Table 1 for SDP-K1 controller board control and Table 2 for Arduino controller control details.

FAQ

Q: What documents are needed for using the EVAL-ADGS6414DARDZ?

A: You will need the ADGS6414D data sheet.

Q: What software is required for operating the EVAL-ADGS6414DARDZ?

A: ACE software with EVAL-ADGS6414DARDZ plugin is needed.

FEATURES

- SPI with error detection
- Includes CRC, invalid read and write addresses, and SCLK count error detection
- Analog supply voltages
- Dual supply: $\pm 4.5\text{V}$ to $\pm 22\text{V}$
- Single supply: 5V to 40V
- PC control in conjunction with the evaluation software
- EVAL-SDP-K1 (SDP-K1) system demonstration platform

EVALUATION BOARD KIT CONTENTS

- EVAL-ADGS6414DARDZ evaluation board

DOCUMENTS NEEDED

- ADGS6414D data sheet

EQUIPMENT NEEDED

- EVAL-SDP-CK1Z (SDP-K1) controller board
- DC voltage source
- $\pm 20\text{V}$ (dual supply)
- 36V (single supply)
- Optional 3.3V digital logic supply
- Analog signal source
- Method to measure voltage, such as a digital multimeter (DMM)

SOFTWARE NEEDED

- ACE software with EVAL-ADGS6414DARDZ plugin

GENERAL DESCRIPTION

The EVAL-ADGS6414DARDZ is the evaluation board for the ADGS6414D. The ADGS6414D is an octal SPST switch controlled by a serial peripheral interface (SPI). The SPI has robust error detection features, including cyclic redundancy check (CRC) error detection, invalid read and write address detection, and SCLK count error detection. The ADGS6414D also supports burst mode, which decreases the time between SPI commands. Figure 1 shows the EVAL-ADGS6414DARDZ in a typical evaluation setup. The EVAL-ADGS6414DARDZ is controlled by the system demonstration platform (SDP) EVAL-SDP-CK1Z (SDP-K1) that connects to a PC via a USB port. The ADGS6414D is in the center of the evaluation board, and wire screw terminals are provided to connect to each of the source and drain pins. Three screw terminals power the device, and a fourth terminal provides users with a defined digital logic-supply voltage, if required. Alternatively, the digital logic-supply voltage can be supplied from the SDP-K1.

The EVAL-SDP-CK1Z (SDP-K1) controller board is available to order on the Analog Devices, Inc., website.

For full details on the ADGS6414D, refer to the ADGS6414D data sheet, which should be consulted in conjunction with this user guide when using the EVAL-ADGS6414DARDZ.

EVALUATION BOARD PHOTOGRAPH

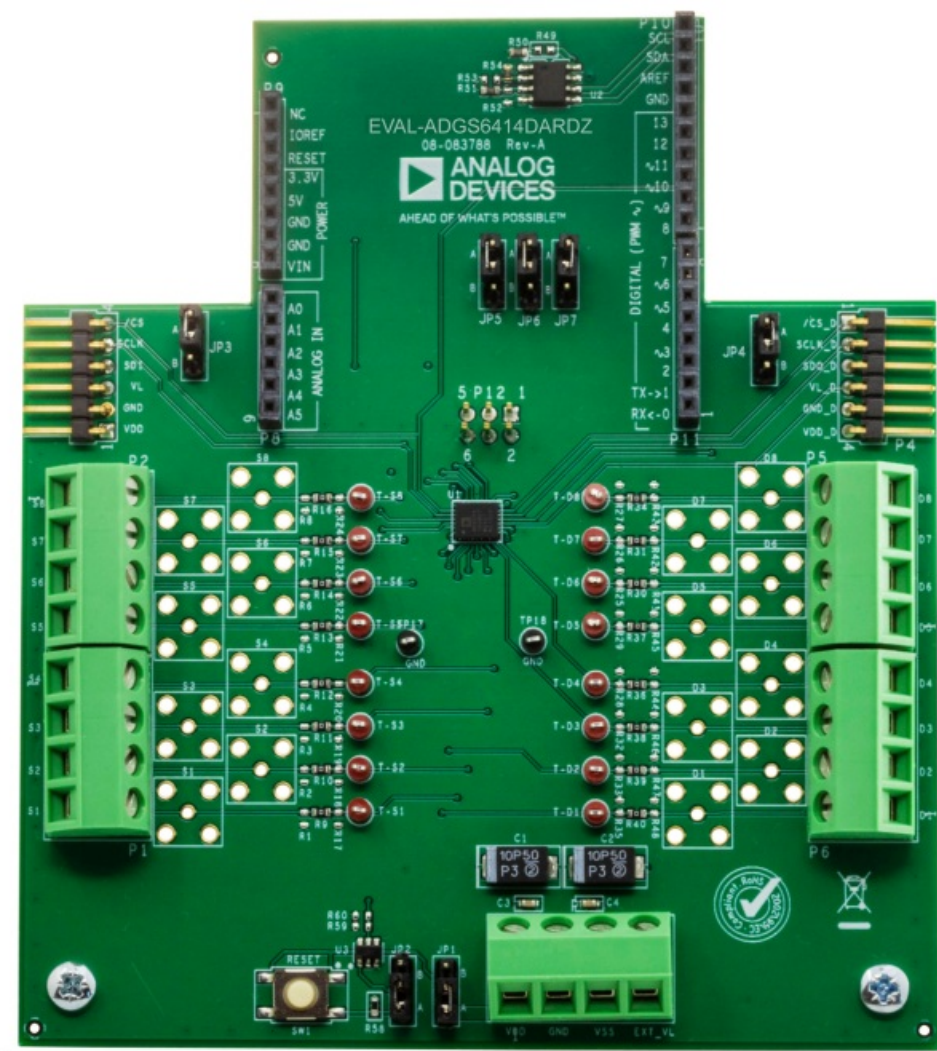


Figure 1. EVAL-ADGS6414DARDZ Evaluation Board Photograph

EVALUATION BOARD HARDWARE

POWER SUPPLIES

The P7 connector provides access to the supply pins of the ADGS6414D. VDD, GND, and VSS on P7 link to the appropriate pins on the ADGS6414D. For dual-supply voltages, the EVALADGS6414DARDZ can be powered from $\pm 18\text{V}$ to $\pm 22\text{V}$. For single-supply voltages, the GND and VSS terminals must be connected together and can power the EVAL-ADGS6414DARDZ with 18V to 39.6V. Additionally, 3.3V is supplied to the RESET/VL pins of the ADGS6414D by the SDP-K1 controller board when the JP1 link is in Position B. When controlling the ADGS6414D by a method other than the SDP-K1 controller board, supply between 2.7V and 5.5V to the RESET/VL pins of the ADGS6414D via the EXT_VL screw terminal input on P7. Ensure JP1 is in Position A.

INPUT SIGNALS

The P1, P2, P5, and P6 screw connectors connect to both the source and drain pins of the ADGS6414D. Additional Subminiature Version B (SMB) connector pads are available if extra connections are required. Each trace on the source and drain sides of the EVALADGS6414DARDZ includes two sets of 0603 pads that can place a load on the signal path to the ground. A 0Ω resistor is placed in the signal path and can be replaced with a user-defined value. The resistor and the 0603 pads create a simple RC filter.

LINK OPTIONS

Ensure that the link options provided on the EVALADGS6414DARDZ are set for the required operating conditions before using the evaluation board. Table 1 details the positions of the links to control the evaluation board via the SDP-K1 controller board using a PC and external power supplies. The functions of these link options are detailed in Table 3.

Table 2 details the positions of the links to control the evaluation board via an Arduino controller using a PC and external power supplies. JP5, JP6, and JP7 should remain in Position A when the EVAL-ADGS6414DARDZ is being controlled using the SDP-K1 and when being controlled by Arduinos that do not require the alternative SPI connections.

When using the SDP-K1 controller board in conjunction with the EVAL-ADGS6414DARDZ, place JP1 in Position B to avoid damage to the SDP-K1.

Table 1. Link Options for SDP-K1 Control (Default)

Link Number	Option
JP1	B
JP2	B

Table 2. Link Options for Arduino Control (Default)

Link Number	Option
JP5	A
JP6	A
JP7	A

ROUTE THROUGH PINS FOR DAISY CHAINS

The P3 and P4 headers allow access to the route through pins of the ADGS6414D. Use the P3 and P4 headers to daisy-chain multiple EVAL-ADGS6414DARDZ devices together. To daisy-chain the EVAL-ADGS6414DARDZ devices, connect CS_D, SCLK_D, and SDO_D on P4 of one EVAL-ADGS6414DARDZ to CS, SCLK, and SDI on P3 of the next EVAL-ADGS6414DARDZ. VL, GND, and VDD can also be shared between these evaluation boards via the P3 and P4 headers. However, because VSS is only accessible from P7, connect VSS to each daisy-chained EVAL-ADGS6414DARDZ.

It is also possible to daisy-chain multiple EVAL-ADGS6414DARDZ devices together through stacking EVAL-ADGS6414DARDZ devices on top of each other using the P8, P9, P10, and P11 connectors. Using this method allows for great space saving on the work bench. To daisy-chain the EVAL-ADGS6414DARDZ devices, place JP3 of the first device to Position A to allow for the SDI signal to be received through the SPI source and JP4 to

Position B to allow the SDO to be daisy-chained the next device through P4. For any subsequent EVAL-ADGS6414DARDZ devices in the daisy-chain, place JP3 to Position B to read from the previous device through P3, and JP4 will remain at Position B until the last device in the chain, which will be in Position A, allowing the signal to be read from P10. The CS, SCLK, VL, and GND pins will all be shared through the P9 and P10 connectors. VDD can be shared through P3, P4, or P7, whereas VSS is only accessible from P7.

Table 3. Link Functions

Link Number	Function
JP1	The JP1 link selects the source of the V_L voltage supplied to the ADGS6414D. Position A selects EXT_VL from P7. Position B selects 3.3V from the SDP-K1 controller board.
JP2	The JP2 link selects how a hardware reset is performed. Position A indicates the SW1 push-button performs a hardware reset. Position B indicates the SDP-K1 controller board performs a hardware reset.
JP3	The JP3 link selects the source of the SDI. Position A provides the SDI from the SDP-K1 controller board. Position B provides the SDI from the SDI_D spin used when connected to another board in the daisy-chain.
JP4	The JP4 link selects the source of the SDO. Position A sends the SDO to the SDP-K1 controller board. Position B sends the SDO to the SDO_D spin used when connected to another board in the daisy-chain.

EVALUATION BOARD SOFTWARE

INSTALLING THE SOFTWARE

The EVAL-ADGS6414DARDZ uses the Analog Devices [Analysis, Control, Evaluation \(ACE\)](#) software. ACE is a desktop software application that allows users to evaluate and control multiple evaluation systems. The ACE installer installs the necessary SDP drivers and .NET Framework 4 by default. Install ACE before connecting to the [SDP-K1](#) controller board. The full instructions on how to install and use the ACE software can be found on the Analog Devices website at www.analog.com/ace.

After ACE is installed, the EVAL-ADGS6414DARDZ plugin appears when opening the application.

INITIAL SET UP

To set up the EVAL-ADGS6414DARDZ, complete the following steps:

1. Connect the EVAL-ADGS6414DARDZ to the SDP-K1 controller board via the Arduino-compatible connector.
2. Connect the SDP-K1 controller board to the computer using the USB cable provided with the SDP-K1.
3. Power the EVAL-ADGS6414DARDZ as described in the Power Supplies section.
4. Run the ACE application. The EVAL-ADGS6414DARDZ plugin appears in the Attached Hardware section of the Start tab.
5. Double click the ADGS6414D Board evaluation board plugin to open the ADGS6414D chip view, as shown in

Figure 2.

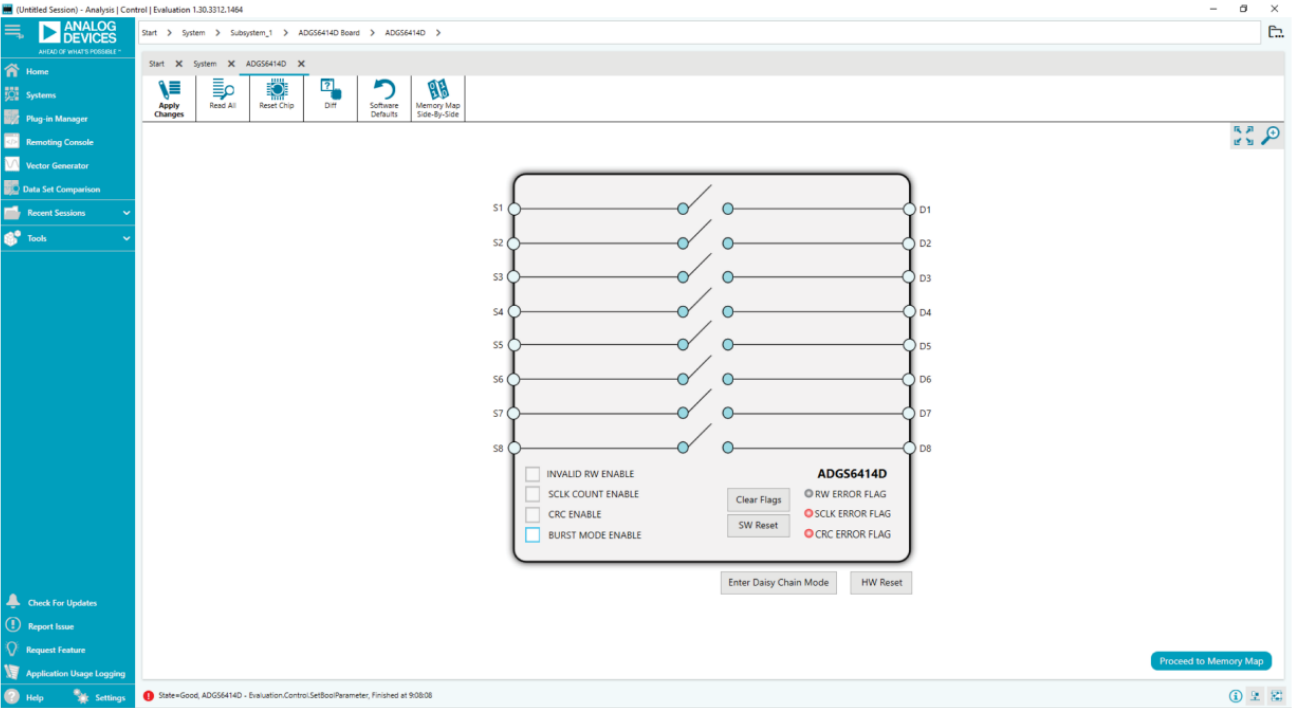


Figure 2. Chip View for the ADG56414D

BLOCK DIAGRAM AND DESCRIPTION

The ADG56414D chip view is similar to the functional block diagram shown in the ADG56414D data sheet. Therefore, it is simple to correlate the functions on the EVAL-ADG56414DARDZ with the descriptions in the data sheet. Refer to the ADG56414D data sheet for a full description of each block, register, and setting.

Some of the blocks and their functions are described in this section as they pertain to the EVAL-ADG56414DARDZ. Figure 3 shows the full screen block diagram (with labels), and Table 4 describes the functionality of each labeled block.

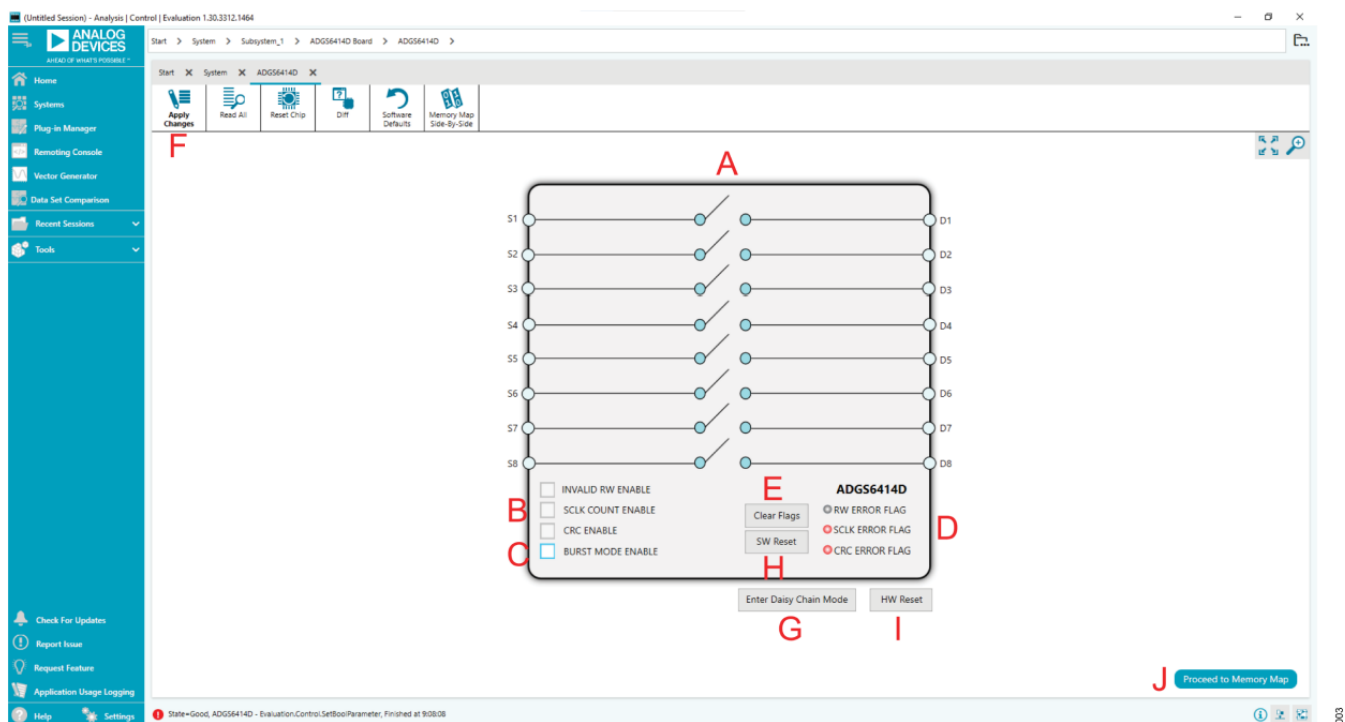


Figure 3. Chip View for the ADGS6414D with Labeled Block Diagram

Table 4. Block Diagram Functions

Label	Function
A	The eight switches configure SW1 to SW8 as open or closed. Click the switch to configure it.
B	INVALID RW ENABLE, SCLK COUNT ENABLE, and CRC ENABLE. Select or clear these check boxes to enable or disable the error detection features on the SPI.
C	BURST MODE ENABLE. Select or clear this check box to enable or disable burst mode.
D	RW ERROR FLAG, SCLK ERROR FLAG, and CRC ERROR FLAG. These indicators illuminate red if flags assert in the error flags register.
E	Clear Flags. Click this button to clear the error flags register.
F	Apply Changes. Click this button to apply all modified values to the devices.
G	Enter Daisy Chain Mode. Click this button to put all evaluation boards that are connected in a daisy-chain configuration into daisy-chain mode.
H	SW Reset. Click this button to perform a software reset on the ADGS6414D.
I	HW Reset. Click this button to perform a hardware reset on the ADGS6414D. JP2 must be set to Position B.
J	Proceed to Memory Map. Click this button to access the ADGS6414D Memory Map view.

DAISY-CHAIN MODE

It is possible to daisy-chain multiple ADGS6414D devices together. Daisy-chain mode enables the configuration of multiple devices with a minimal amount of digital lines. The route of digital signals and supplies through the ADGS6414D allows an increase in channel density when using the device in daisy-chain mode. Integrated passive components eliminate the need for external passive components.

Click Enter Daisy Chain Mode to open the Daisy Chain Mode view, as shown in Figure 4. Select the number of boards that are connected in the daisy chain from the Number of Devices in Daisy Chain dropdown box. Select the checkboxes of the switches that are to be turned on. Click Apply Changes to write these values to the devices in the daisy chain. To exit daisy-chain mode, perform a hardware reset. To perform a hardware reset, click the HW Reset button in the Daisy Chain Mode view (JP2 must be set to Position B) or press the physical hardware reset button on the EVAL-ADGS6414DARDZ.

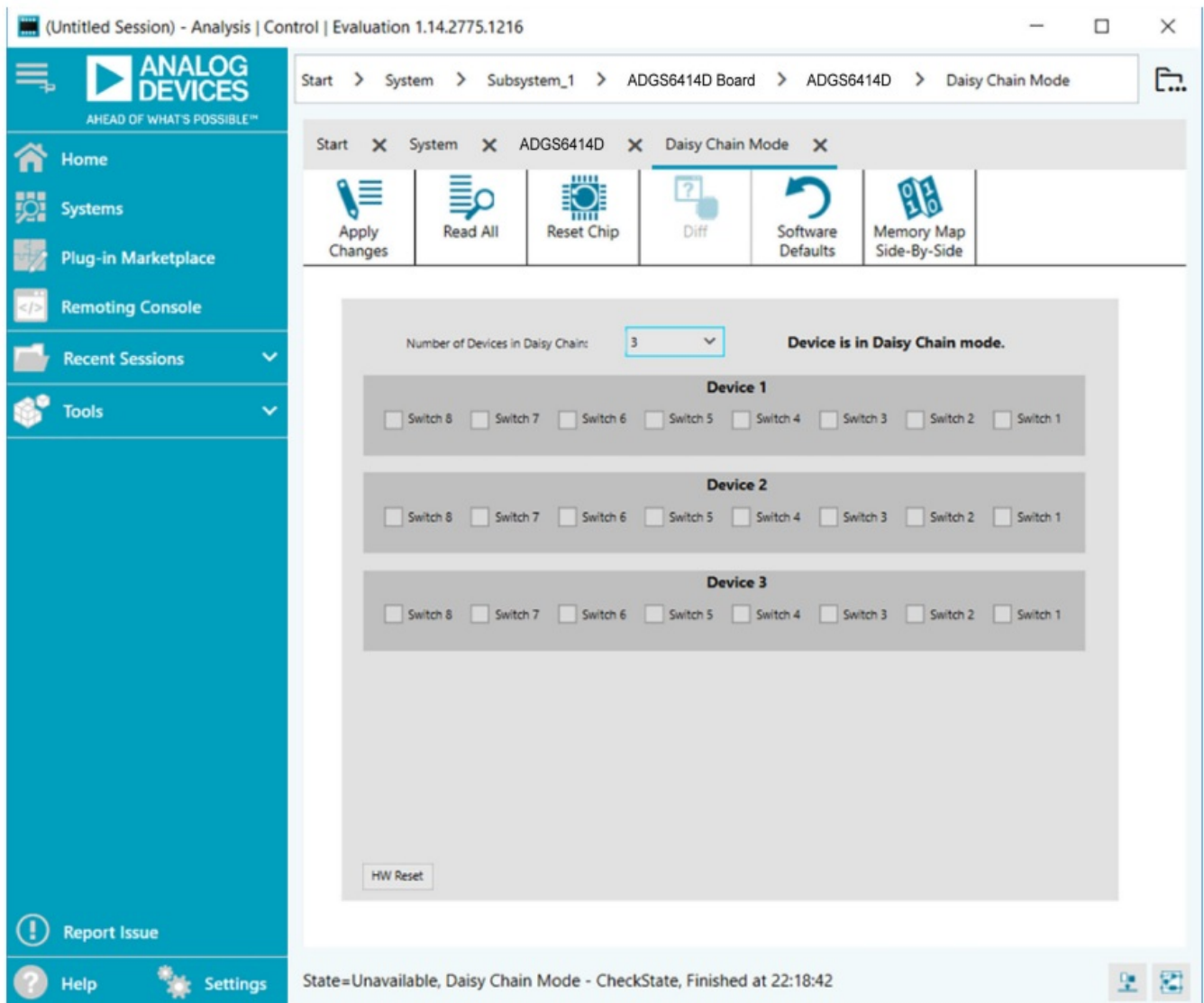


Figure 4. Daisy Chain Mode View

MEMORY MAP

All registers are fully accessible from the ADGS6414D Memory Map view. To access the ADGS6414D Memory Map view, click Proceed to Memory Map. The ADGS6414D Memory Map view allows registers to be edited at a bit level (see Figure 5 and Figure 6). The shaded bits are read-only bits and cannot be accessed in ACE. All other bits are toggled. The bold bits or registers are modified values that have not been transferred to the evaluation board. Click Apply Changes to transfer the data to the EVAL-ADGS6414DARDZ.

All changes made in the ADGS6414D Memory Map view correspond to the block diagram. For example, if the internal register bit is enabled, the bit displays as enabled on the block diagram.

Registers				
+ / -	Address (Hex)	Name	Data (Hex)	Data (Binary)
+	0001	* SW_DATA	00	0 0 0 0 0 0 0 0 0 0
+	0002	ERR_CONFIG	06	0 0 0 0 0 0 1 1 0
+	0003	* ERR_FLAGS	00	0 0 0 0 0 0 0 0 0 0
+	0005	BURST_EN	00	0 0 0 0 0 0 0 0 0 0

Figure 5. ADGS6414D Memory Map View

Registers				
+ / -	Address (Hex)	Name	Data (Hex)	Data (Binary)
+	0001	* SW_DATA	01	0 0 0 0 0 0 0 0 0 1
+	0002	ERR_CONFIG	06	0 0 0 0 0 0 1 1 0
+	0003	* ERR_FLAGS	00	0 0 0 0 0 0 0 0 0 0
+	0005	BURST_EN	00	0 0 0 0 0 0 0 0 0 0

Figure 6. ADGS6414D Memory Map View with Unapplied Changes in the SW_DATA Register

EVALUATION BOARD SCHEMATICS AND ARTWORK

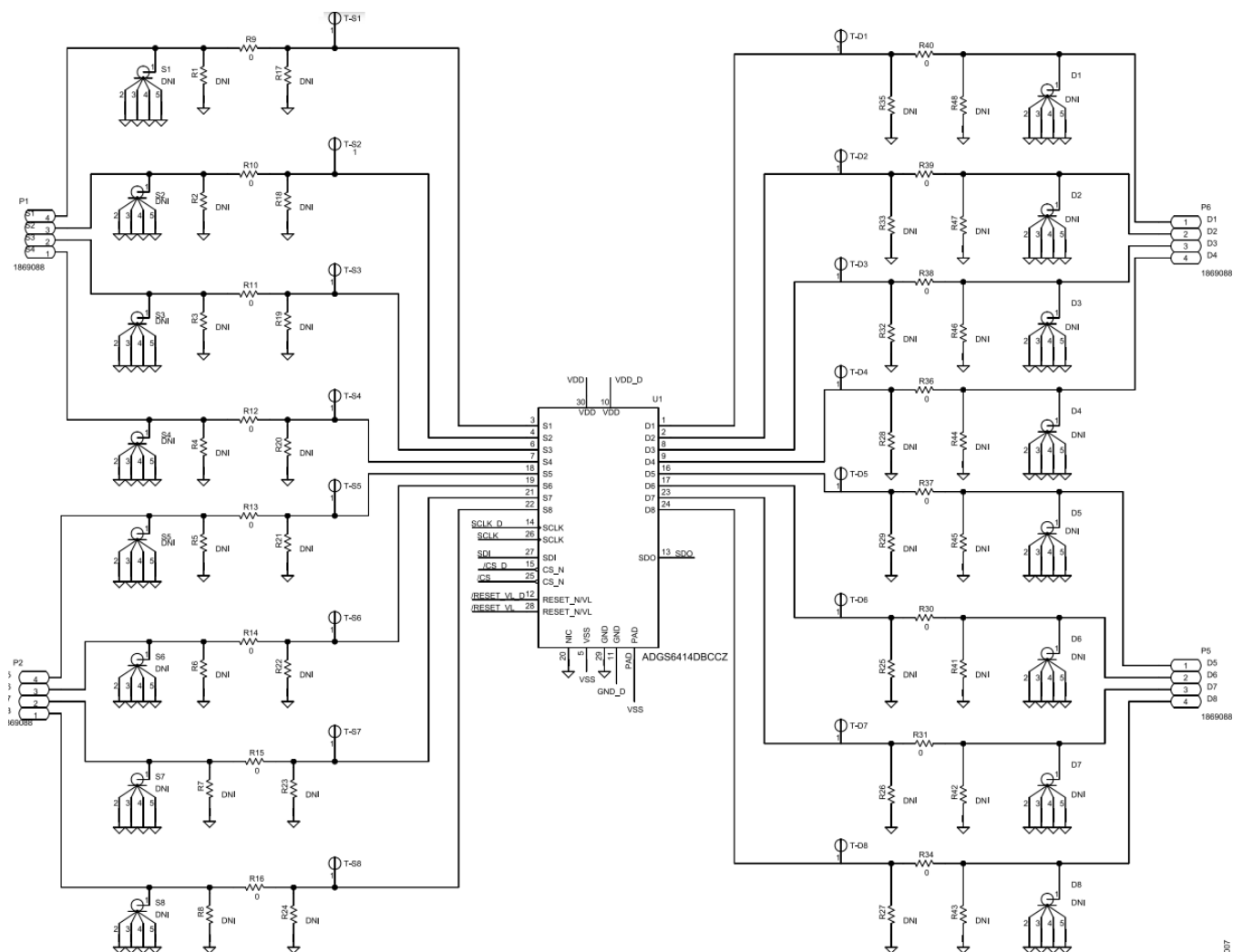


Figure 7. EVAL-ADGS6414DARDZ Schematic 1

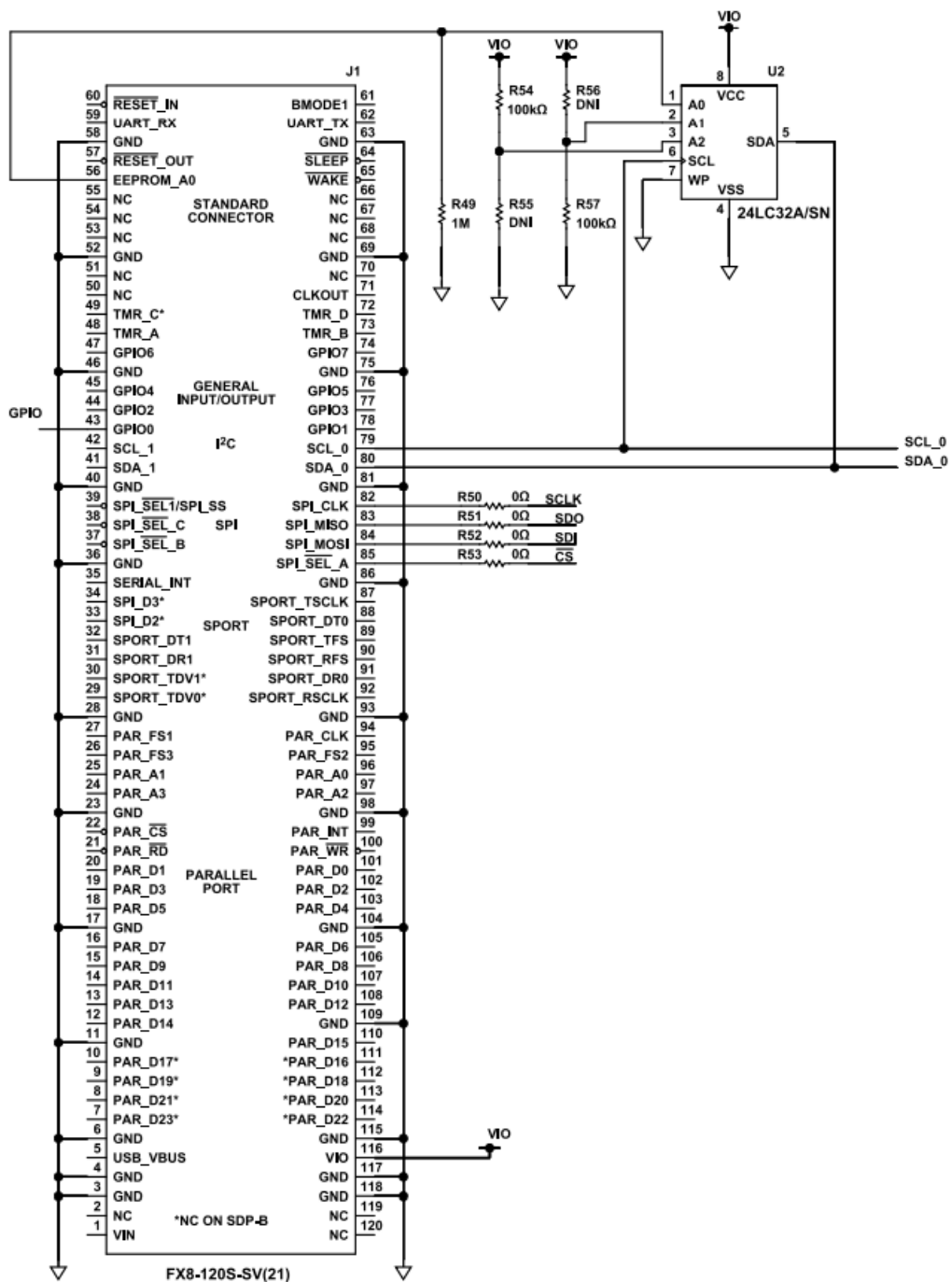


Figure 8. EVAL-ADGS6414DARDZ Schematic 2

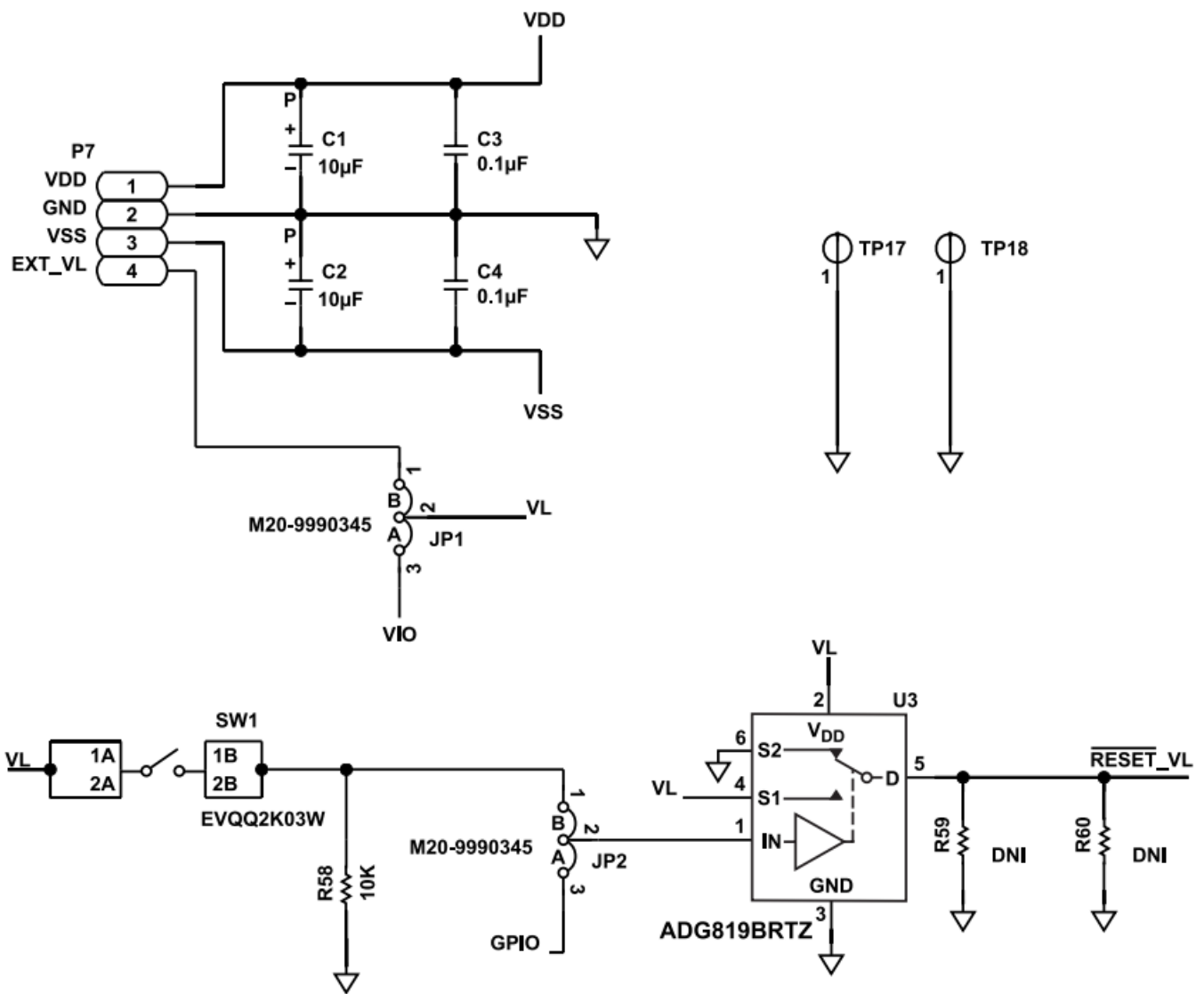


Figure 9. EVAL-ADGS6414DARDZ Schematic 3

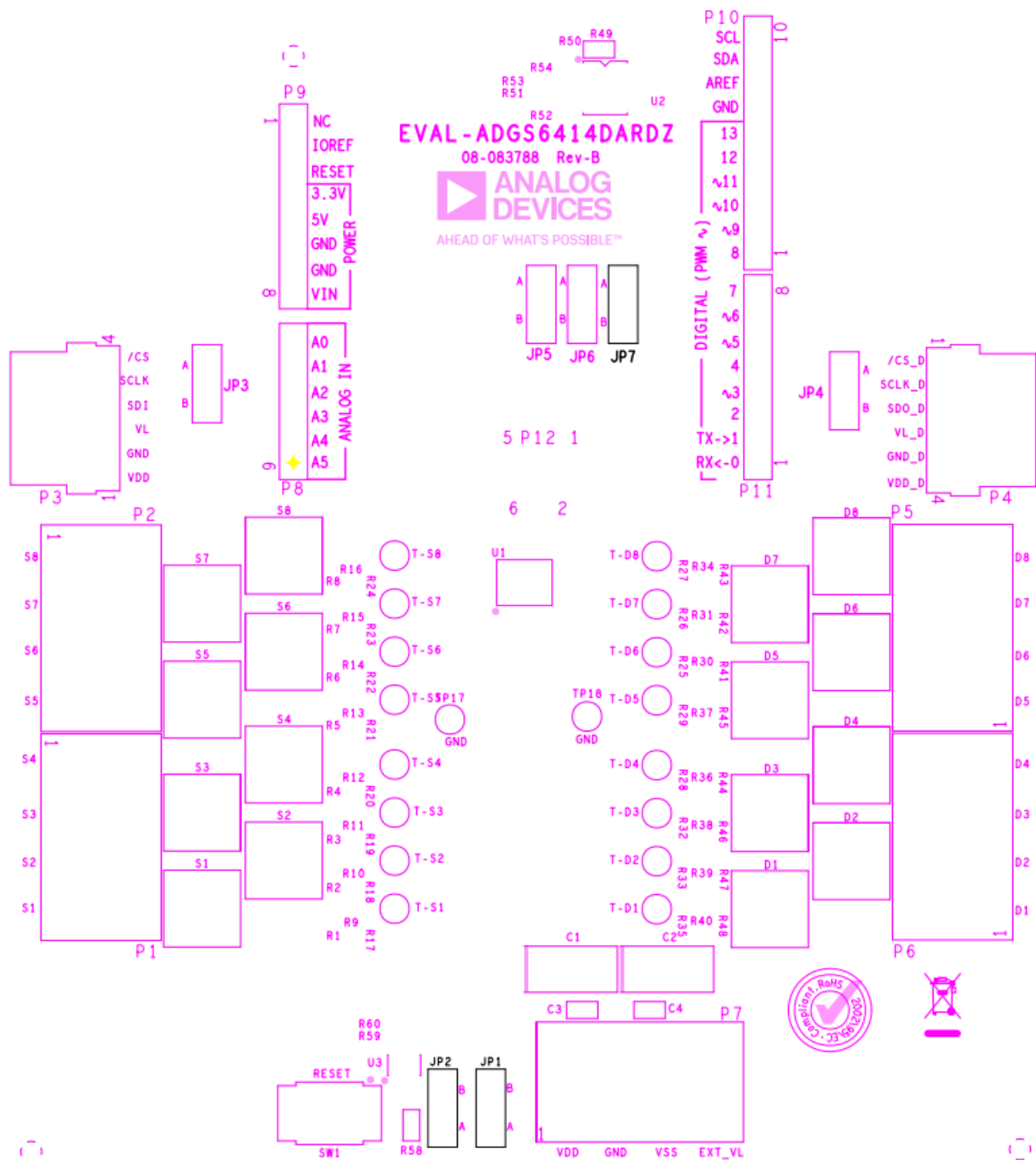


Figure 10. EVAL-ADGS6414DARDZ Silkscreen

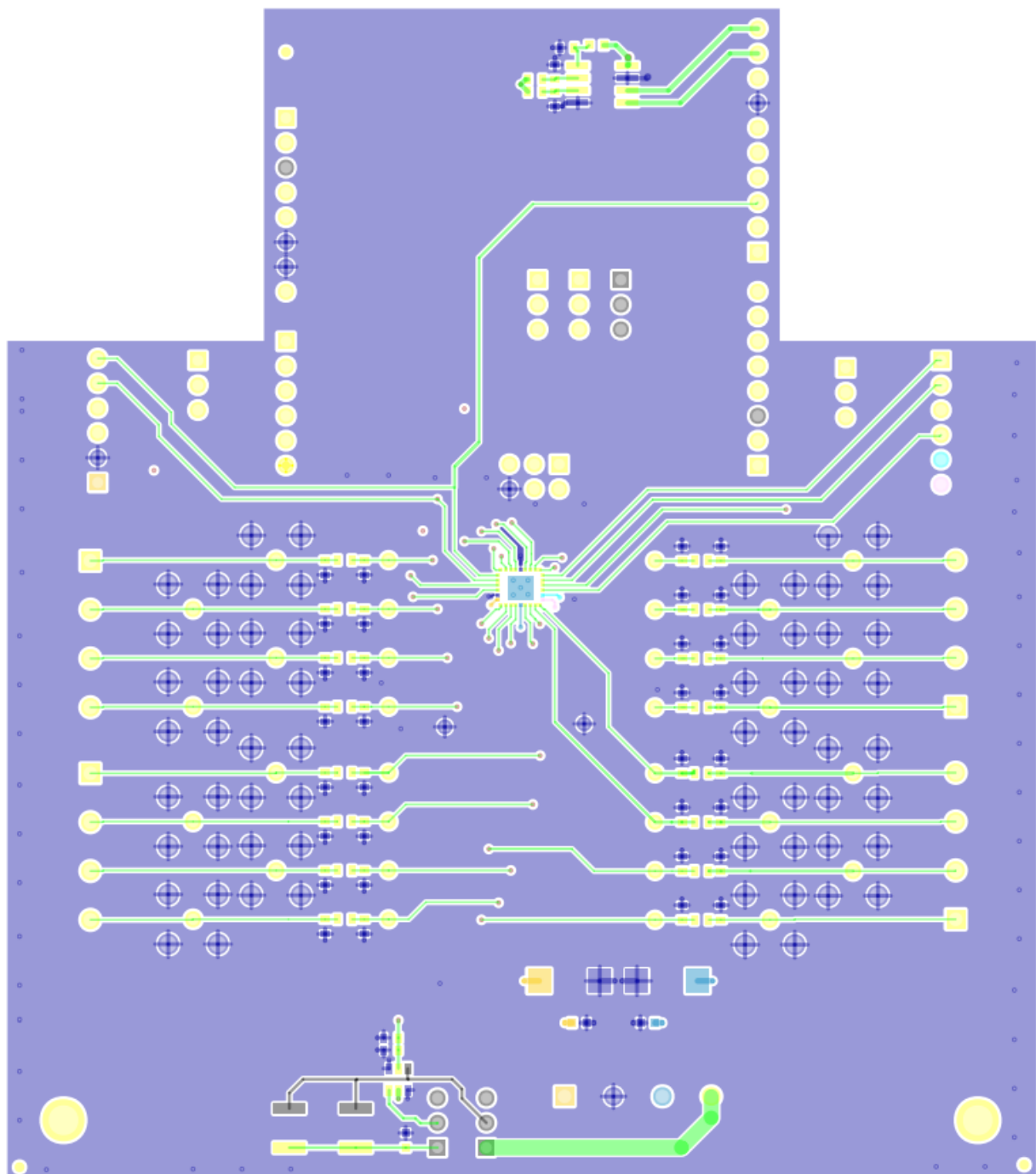
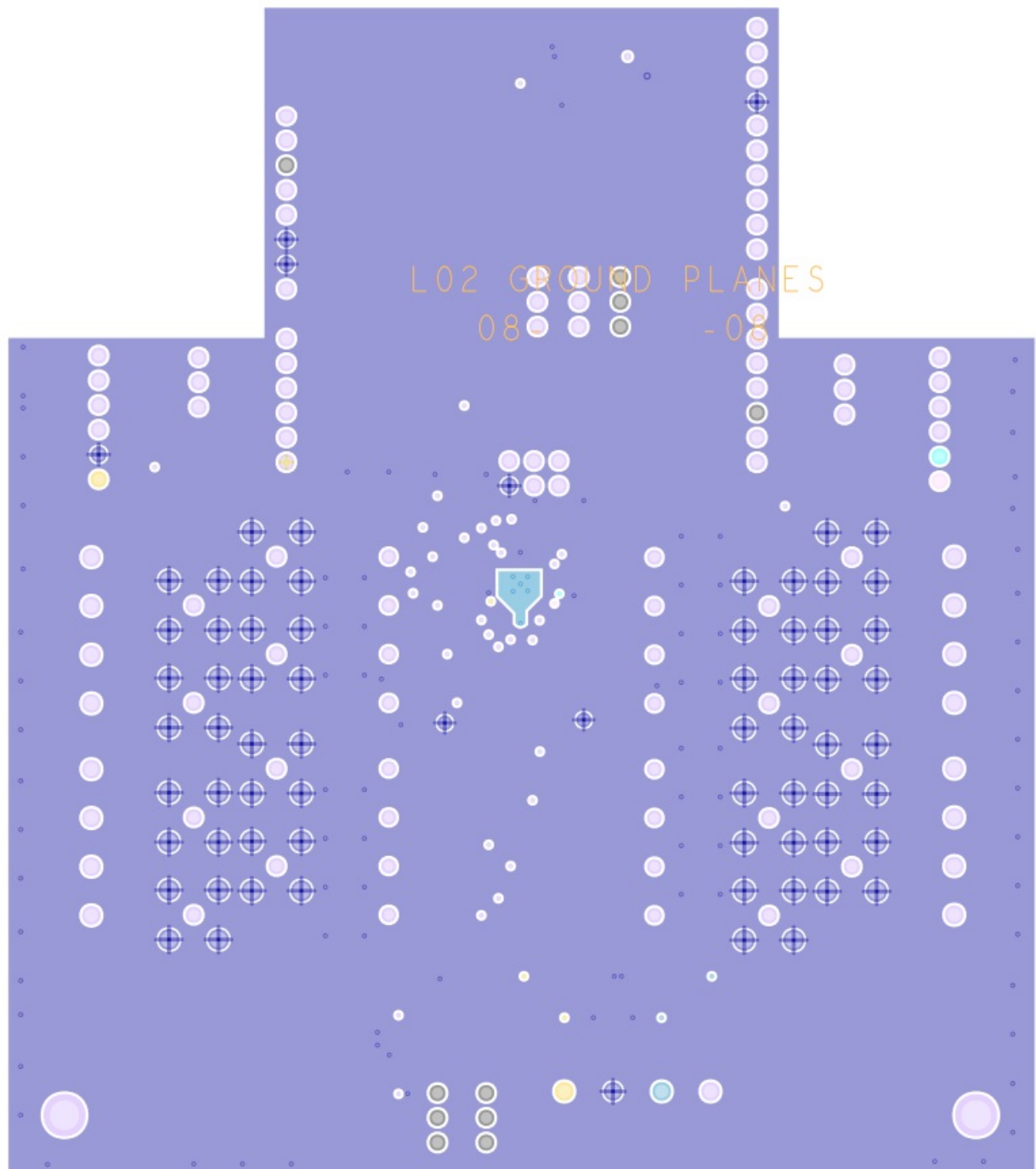


Figure 11. EVAL-ADGS6414DARDZ Top Layer



012

Figure 12. EVAL-ADGS6414DARDZ Layer 2

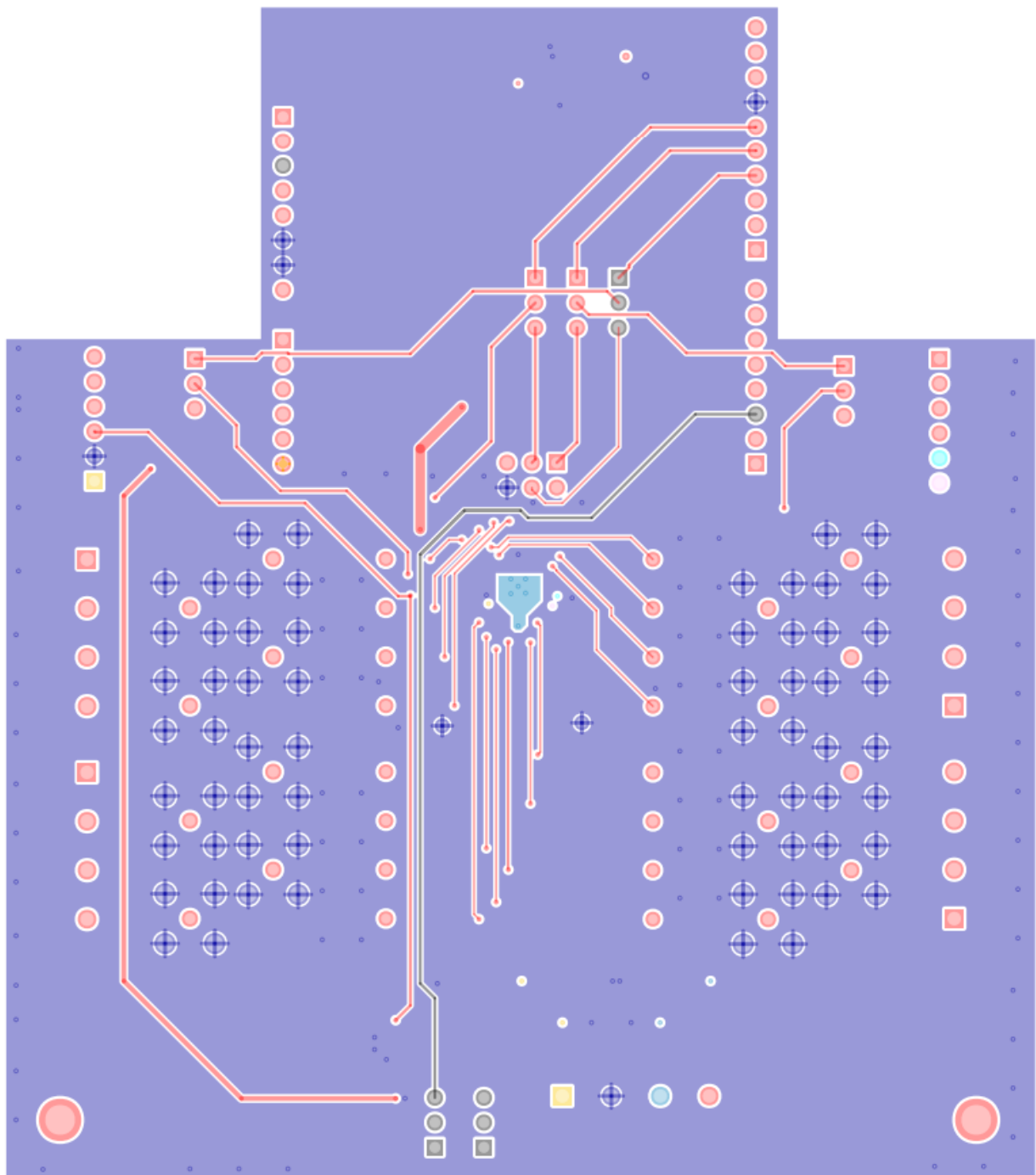


Figure 13. EVAL-ADGS6414DARDZ Layer 3

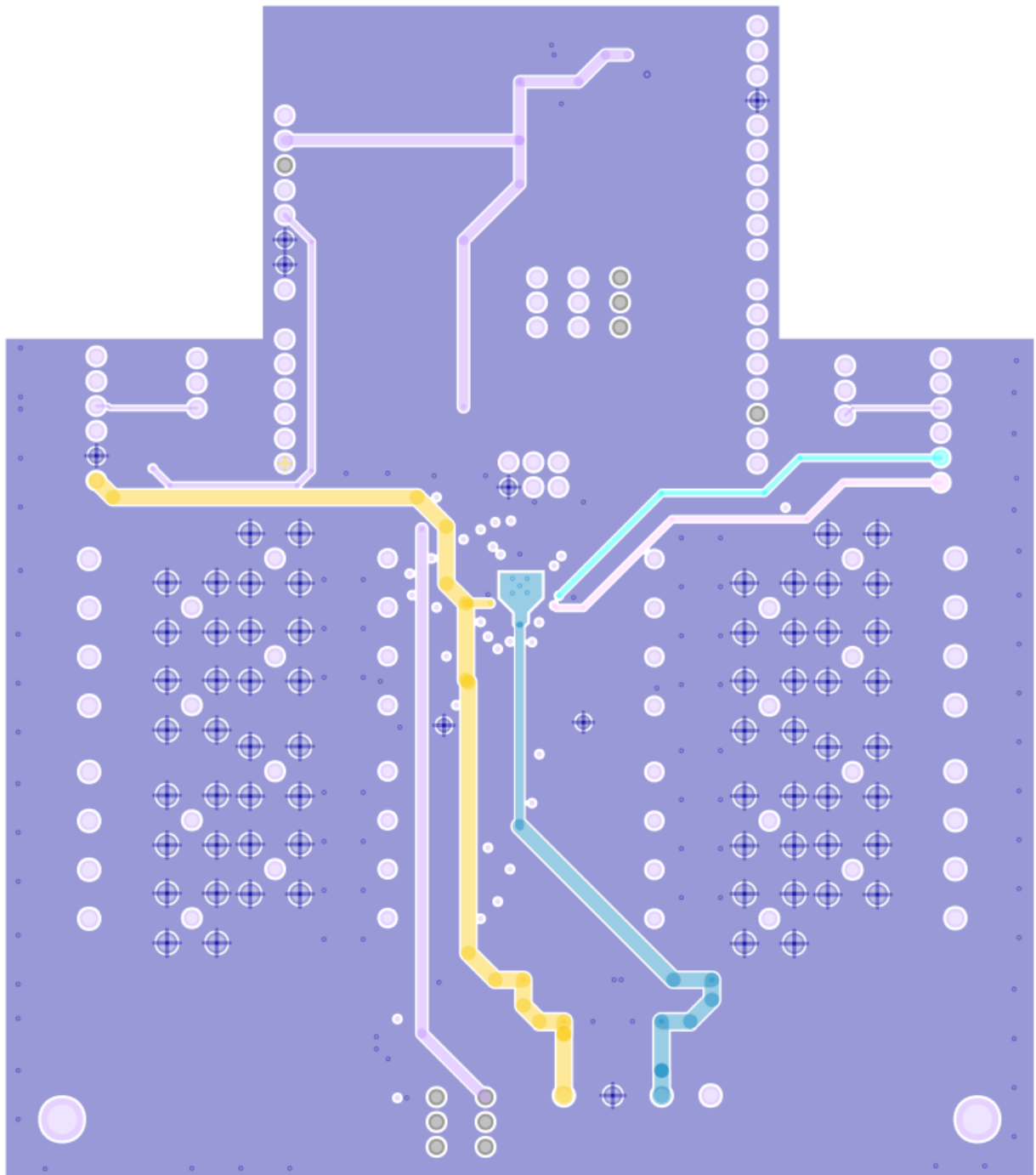


Figure 14. EVAL-ADGS6414DARDZ Bottom Layer

ORDERING INFORMATION

BILL OF MATERIALS

Table 5. Bill of Materials for EVAL-ADGS6414DARDZ

ANALOG-DEVICES-EVAL-ADGS6414D-Evaluation-Board-FIG- (18)

I2C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).

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.

Legal Terms and Conditions

By using the evaluation board discussed herein (together with any tools, components documentation or support materials, the "Evaluation Board"), you are agreeing to be bound by the terms and conditions set forth below ("Agreement") unless you have purchased the Evaluation Board, in which case the Analog Devices Standard Terms and Conditions of Sale shall govern. Do not use the Evaluation Board until you have read and agreed to the Agreement. Your use of the Evaluation Board shall signify your acceptance of the Agreement. This Agreement is made by and between you ("Customer") and Analog Devices, Inc. ("ADI"), with its principal place of business at Subject to the terms and conditions of the Agreement, ADI hereby grants to Customer a free, limited, personal, temporary, non-exclusive, non-sublicensable, non-transferable license to use the Evaluation Board FOR EVALUATION PURPOSES ONLY.

Customer understands and agrees that the Evaluation Board is provided for the sole and exclusive purpose referenced above, and agrees not to use the Evaluation Board for any other purpose. Furthermore, the license granted is expressly made subject to the following additional limitations: Customer shall not (i) rent, lease, display, sell, transfer, assign, sublicense, or distribute the Evaluation Board; and (ii) permit any Third Party to access the Evaluation Board. As used herein, the term "Third Party" includes any entity other than ADI, Customer, their employees, affiliates and in-house consultants. The Evaluation Board is NOT sold to Customer; all rights not expressly granted herein, including ownership of the Evaluation Board, are reserved by ADI.


CONFIDENTIALITY.

This Agreement and the Evaluation Board shall all be considered the confidential and proprietary information of ADI. Customer may not disclose or transfer any portion of the Evaluation Board to any other party for any reason. Upon discontinuation of use of the Evaluation Board or termination of this Agreement, Customer agrees to promptly return the Evaluation Board to ADI. **ADDITIONAL RESTRICTIONS.** Customer may not disassemble, decompile or reverse engineer chips on the Evaluation Board. Customer shall inform ADI of any occurred damages or any modifications or alterations it makes to the Evaluation Board, including but not limited to soldering or any other activity that affects the material content of the Evaluation Board. Modifications to the Evaluation Board must comply with applicable law, including but not limited to the RoHS Directive. **TERMINATION.** ADI may terminate this Agreement at any time upon giving written notice to Customer. Customer agrees to return to ADI the Evaluation Board at that time.

LIMITATION OF LIABILITY. THE EVALUATION BOARD PROVIDED HEREUNDER IS PROVIDED "AS IS" AND ADI MAKES NO WARRANTIES OR REPRESENTATIONS OF ANY KIND WITH RESPECT TO IT. ADI SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, ENDORSEMENTS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, RELATED TO THE EVALUATION BOARD INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT WILL ADI AND ITS LICENSORS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES RESULTING FROM CUSTOMER'S POSSESSION OR USE OF THE EVALUATION BOARD, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DELAY COSTS, LABOR COSTS OR LOSS OF GOODWILL. ADI'S TOTAL LIABILITY FROM ANY AND ALL CAUSES SHALL BE LIMITED TO THE AMOUNT OF ONE HUNDRED US DOLLARS (\$100.00).

EXPORT. Customer agrees that it will not directly or indirectly export the Evaluation Board to another country, and that it will comply with all applicable United States federal laws and regulations relating to exports. **GOVERNING LAW.** This Agreement shall be governed by and construed in accordance with the substantive laws of the Commonwealth of Massachusetts (excluding conflict of law rules). Any legal action regarding this Agreement will be heard in the state or federal courts having jurisdiction in Suffolk County, Massachusetts, and Customer hereby submits to the personal jurisdiction and venue of such courts. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement and is expressly disclaimed.

Documents / Resources

	ANALOG DEVICES EVAL-ADGS6414D Evaluation Board [pdf] Owner's Manual ADGS6414D, EVAL-ADGS6414D Evaluation Board, EVAL-ADGS6414D, Evaluation Board, Board
---	--

References

- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.