

Test Procedure

EVAL-AD5686RARDZ

Document No. : 18-070413-01-B

Title : EVAL-AD5686RARDZ Customer Evaluation Board Test Procedure

REVISION HISTORY				
Revision	ECR #	Description of Change	Date	Author
A	ECR-114918	Initial Release	6/29/23	Denyelle Dalisay
B		Added Repacking Section	10/24/23	Denyelle Dalisay

Required Approvers	
Approver Roles	Approver Names
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Hardware List

- Computer or laptop (OS: Windows 10 64 bit)
- Mini-USB to USB Cable
- EVAL-AD5686RARDZ
- [EVAL-SDP-CK1Z](#)
- Digital Multimeter

Software List

- ACE 1.27.3250.1427_offline
- SDPEEPROMProgrammerInstall_1.0.110.0
- Board.NanoDAC.1.2023.4200-dev0061.acezip

Setup



Figure 1 Board Image

Software Download and Installation

1. Before connecting the evaluation boards, download and install the required software and files by following the proceeding instructions.
2. Access the FTP server using the provided FTP details:
 - Username: evalcd_readaccess
 - Password: !Subcon123
 - Account: evalcd_readaccess
 - FTP Server/Host: ftp.analog.com
 - Logon Type: Account
 - FTP Link or Directory: [/users/evalcd_readaccess/evalcd_read/AD5686 AD5696](#)

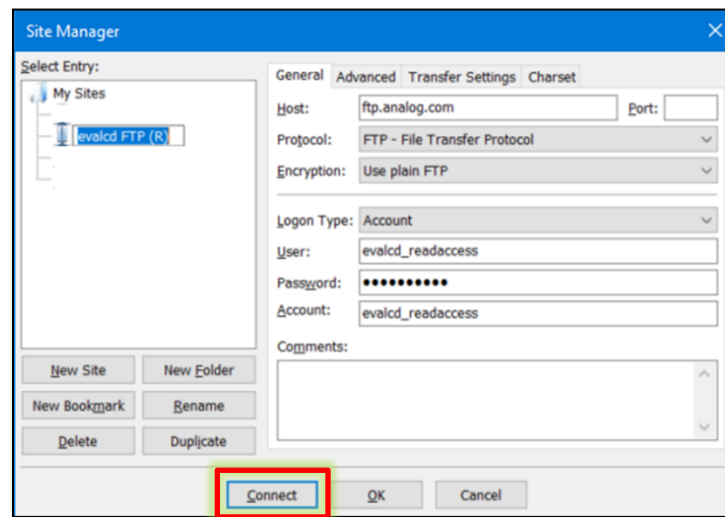


Figure 2 FTP Details

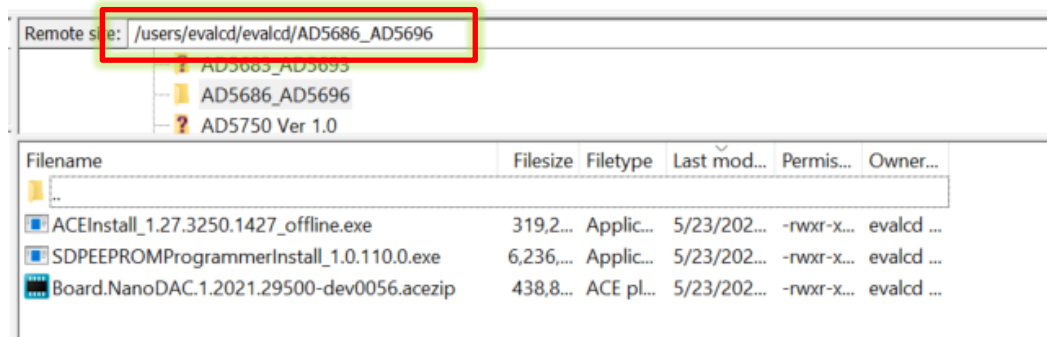


Figure 3 FTP Folder Directory / Link

1. Download or copy the software listed in the "Software List" from the FTP link provided above to your designated local folder (these are all one-time software installations).
2. Install the SDP EEPROM Programmer (SDPEEPROMProgrammerInstall_1.0.110.0).
3. Install the ACE Software (ACE 1.27.3250.1427_offline). If ACE is already installed, uninstall it, and use the provided installer.
4. Once step 3 is complete, install the Nano DAC plugin (Board.NanoDAC.1.2023.4200-dev0061) by following the procedures on the next page:

- a. Go to Start Menu  > Analog Devices> ACE

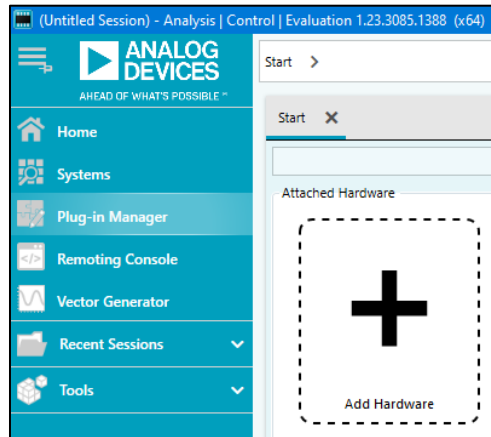


Figure 4

- b. Go to the side bar > Plug-in Manager

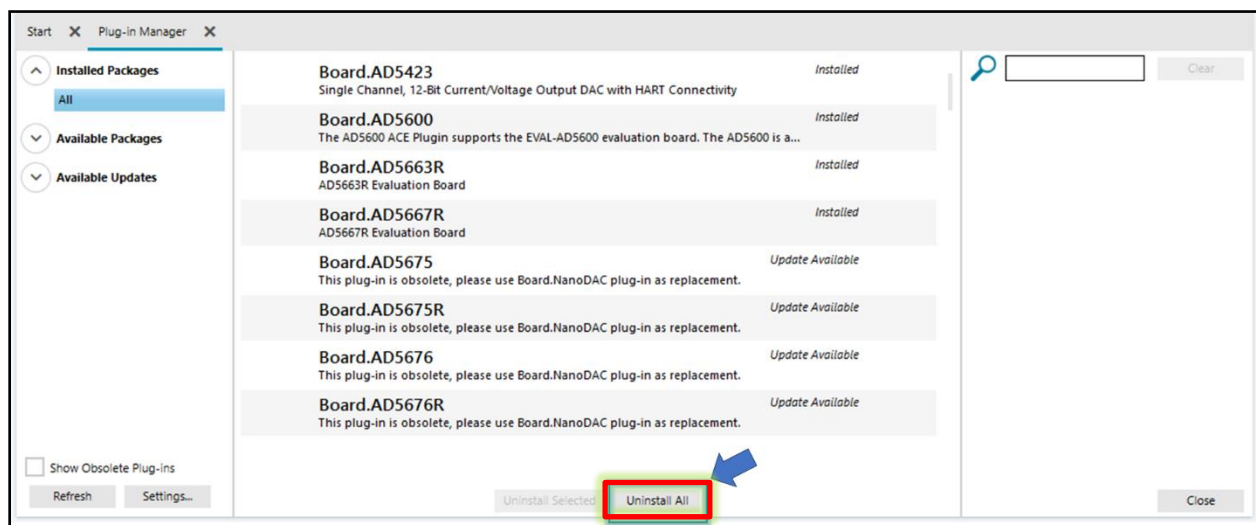


Figure 5

- c. Click “Uninstall All”.

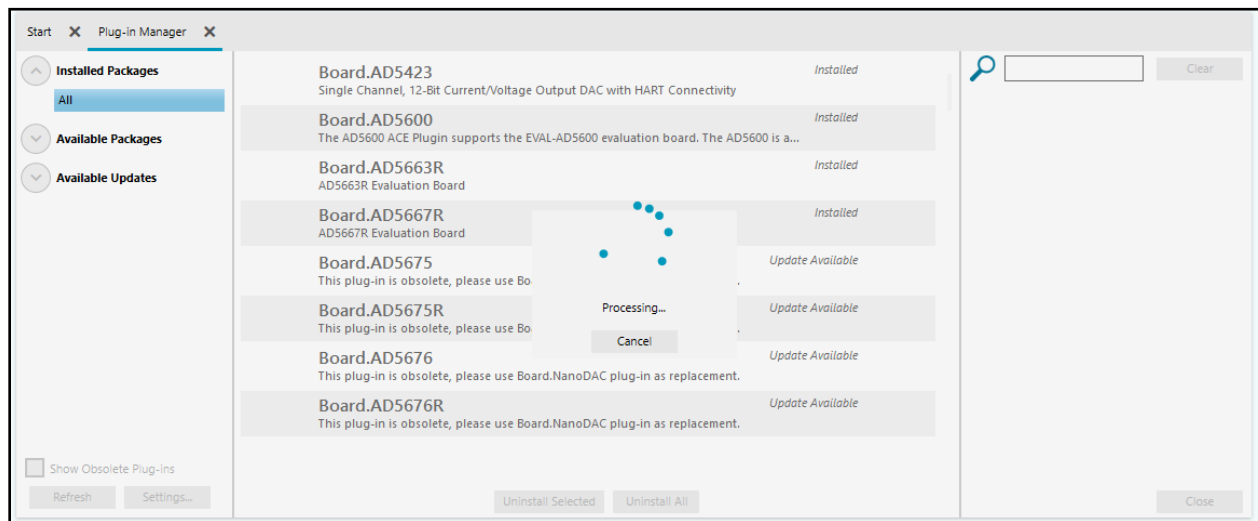


Figure 6

- d. Wait until the plug-ins are uninstalled. Then close all windows related to ACE.
- e. Run the plug-in installation of EVAL-AD5686RARDZ by double-clicking Board.NanoDAC.1.2021.29500-dev0056.acezip on your local folder.

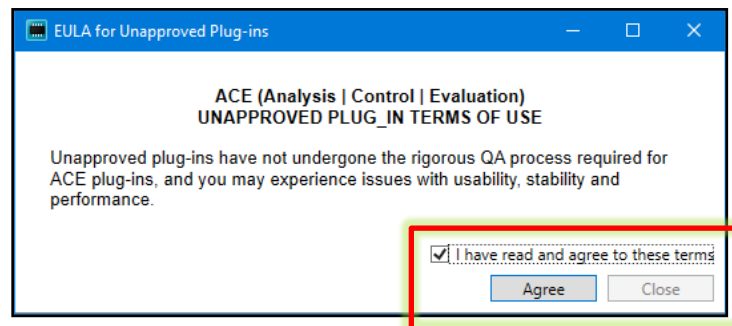


Figure 7

- f. Tick "I have read and agree to these terms" and click "Agree".

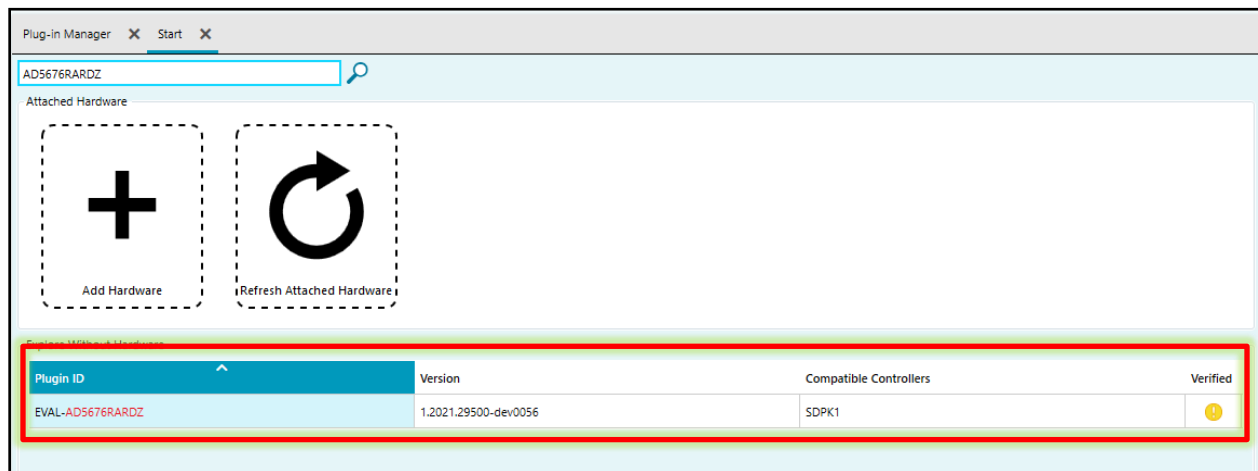


Figure 8

- g. On the Start window of ACE, search for AD5686RARDZ. Once plugin is visible, installation has been completed.

Hardware Connection

- Set the link connections as shown in Figure 9:
 - VDD_SEL: 3V3 (position B or 2-3)
 - REF_SEL: EXT (position A or 1-2)
 - RSTL: VDD (position A or 1-2)
 - VDD_VIO: DISCONNECTED

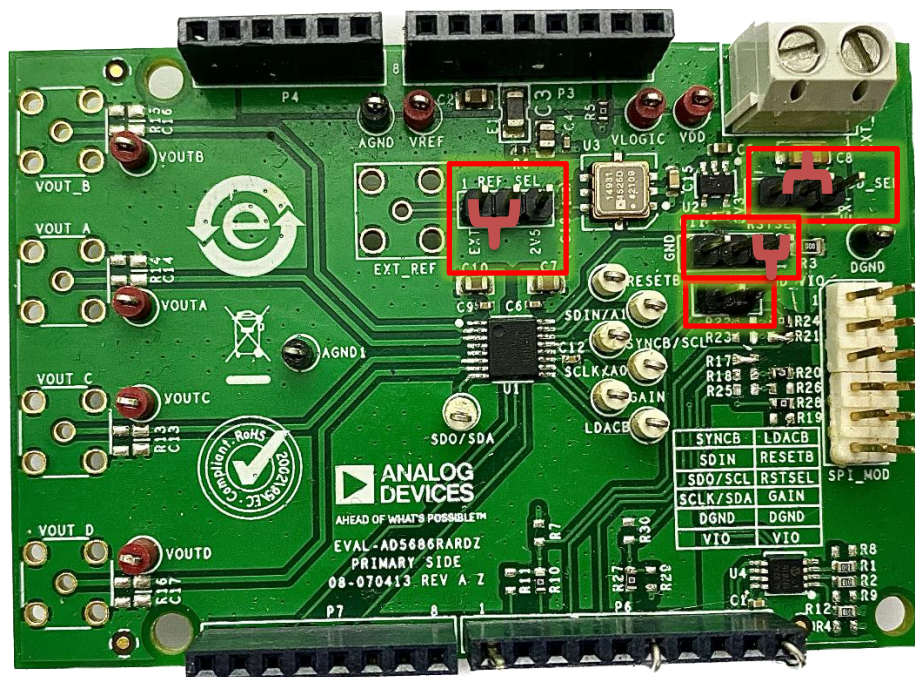


Figure 9 Link or Jumper Connections

2. Connect the EVAL-AD5686RARDZ to the Arduino connector of SDP-K1 (EVAL-SDP-CK1Z) as shown in Figure 10.
3. Attach the USB cable from the SDP-K1 to the PC.

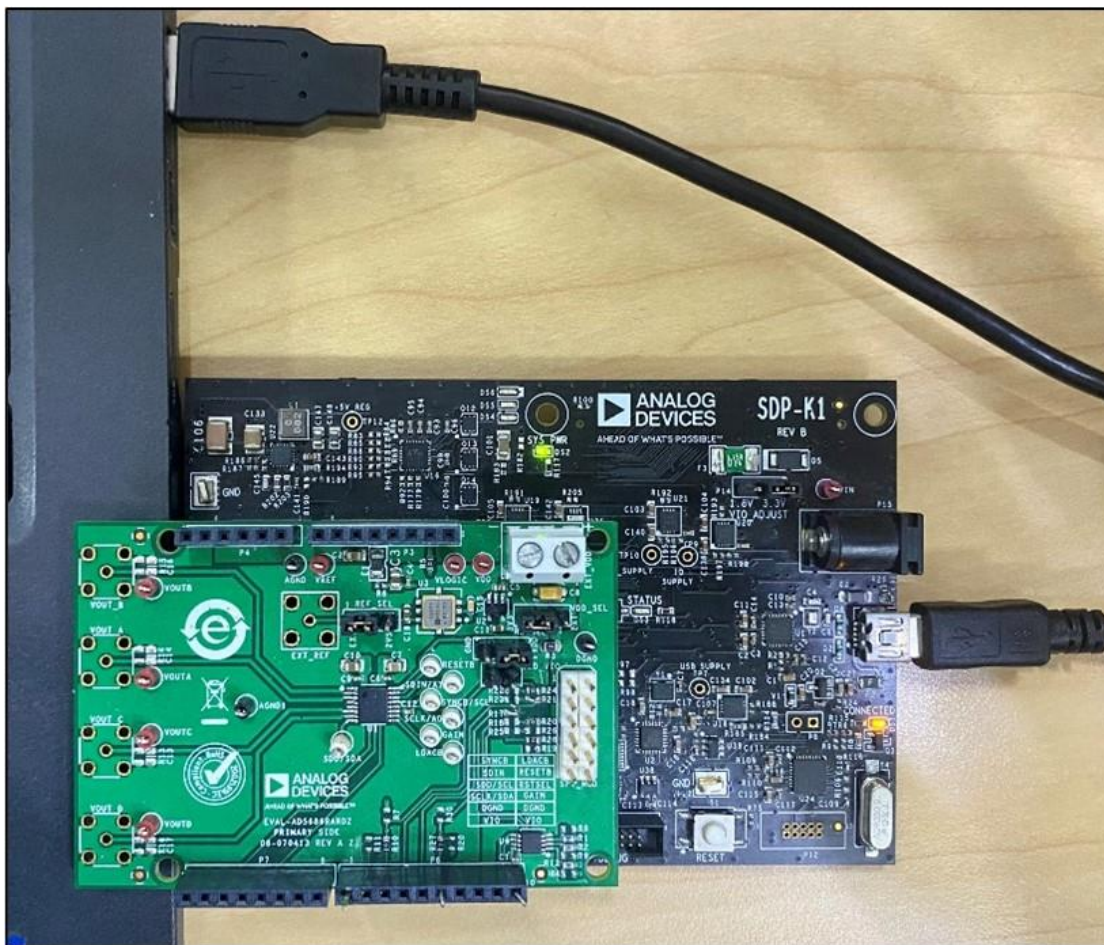


Figure 10 EVB, SDP-K1 and Laptop Connection

SDP EEPROM Programmer Procedures

1. Open the SDP EEPROM Programmer in Start Menu > SDP EEPROM Programmer (.NET). The main window shown in 11 would be launched.

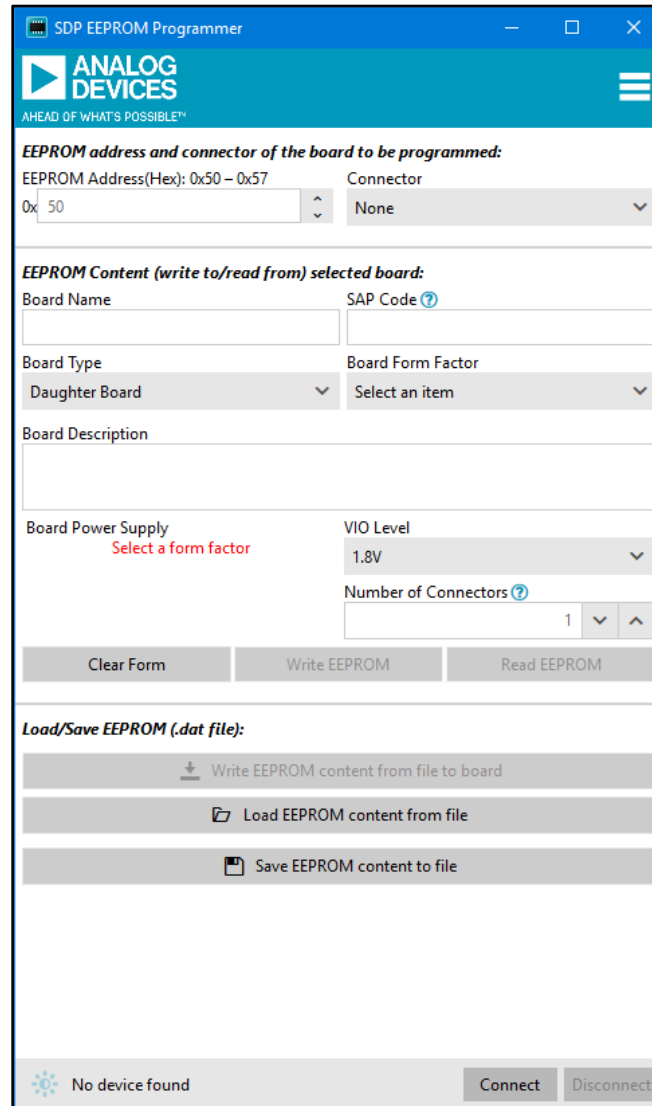
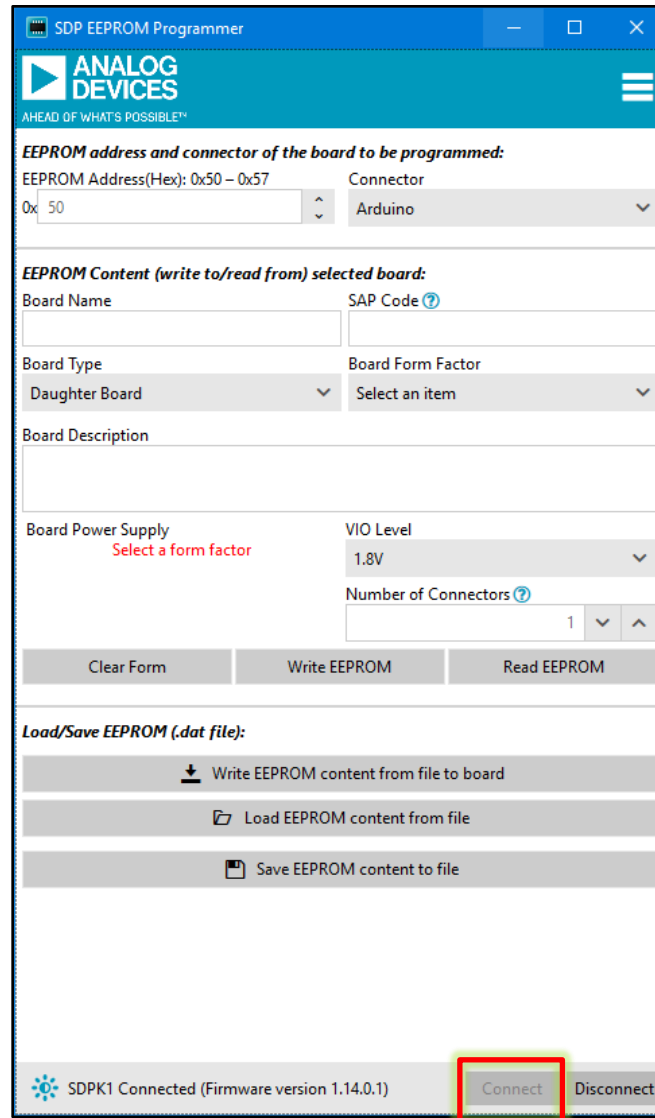


Figure 11. SDP EEPROM Programmer Window

- On the bottom right portion of the window click on Connect. The main window will change the display as shown in Figure 12.



SDP EEPROM Programmer

EEPROM address and connector of the board to be programmed:

EEPROM Address(Hex): 0x50 – 0x57
 0x 50

Connector
 Arduino

EEPROM Content (write to/read from) selected board:

Board Name
 SAP Code ?

Board Type
 Daughter Board

Board Form Factor
 Select an item

Board Description

Board Power Supply
 Select a form factor

VIO Level
 1.8V

Number of Connectors ?
 1

Clear Form Write EEPROM Read EEPROM

Load/Save EEPROM (.dat file):

Write EEPROM content from file to board

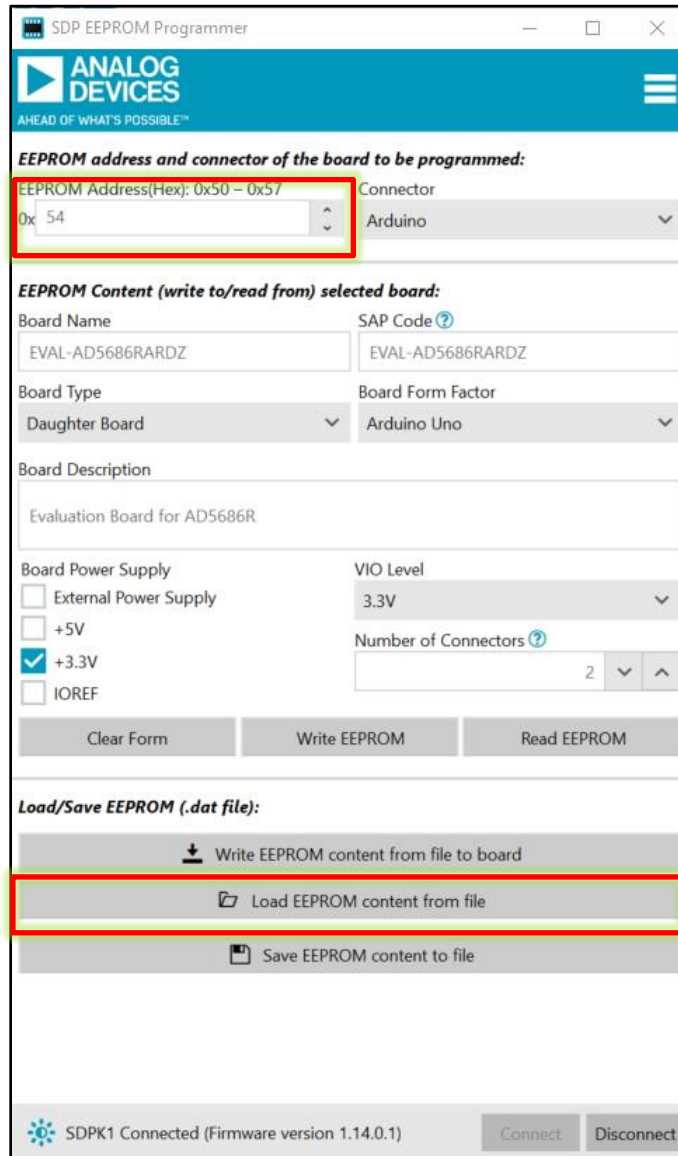
Load EEPROM content from file

Save EEPROM content to file

SDPK1 Connected (Firmware version 1.14.0.1) **Connect** Disconnect

Figure 12. SDP-K1-connected Window

3. Select the "Load EEPROM content from file" option and navigate to the local folder where the AD5686R.dat file is located and then select it. The main window will update to reflect the contents of the file. **Please verify that the "EEPROM address" and other entries on the forms match those displayed in Figure 5.**



The screenshot shows the 'SDP EEPROM Programmer' window. The 'EEPROM address and connector of the board to be programmed:' section has a red box around the 'EEPROM Address(Hex): 0x50 - 0x57' range and the '0x 54' input field. The 'EEPROM Content (write to/read from) selected board:' section contains fields for Board Name (EVAL-AD5686RARDZ), SAP Code (EVAL-AD5686RARDZ), Board Type (Daughter Board), Board Form Factor (Arduino Uno), Board Description (Evaluation Board for AD5686R), Board Power Supply (3.3V selected), VIO Level (3.3V), and Number of Connectors (2). The 'Load/Save EEPROM (.dat file):' section has three buttons: 'Write EEPROM content from file to board', 'Load EEPROM content from file' (highlighted with a red box), and 'Save EEPROM content to file'. The bottom status bar shows 'SDPK1 Connected (Firmware version 1.14.0.1)' and 'Connect/Disconnect' buttons.

Figure 13 EEPROM Content Load From File Window

4. Click on the "Write EEPROM" button located in the center of the window. Wait for the pop-up window to appear, indicating the completion of the EEPROM write process, as shown in Figure 14. Click on the "OK" button to proceed.
5. Click the "Disconnect" button situated at the bottom right corner of the window. Finally, close the SDP EEPROM Programmer window to conclude the procedure.

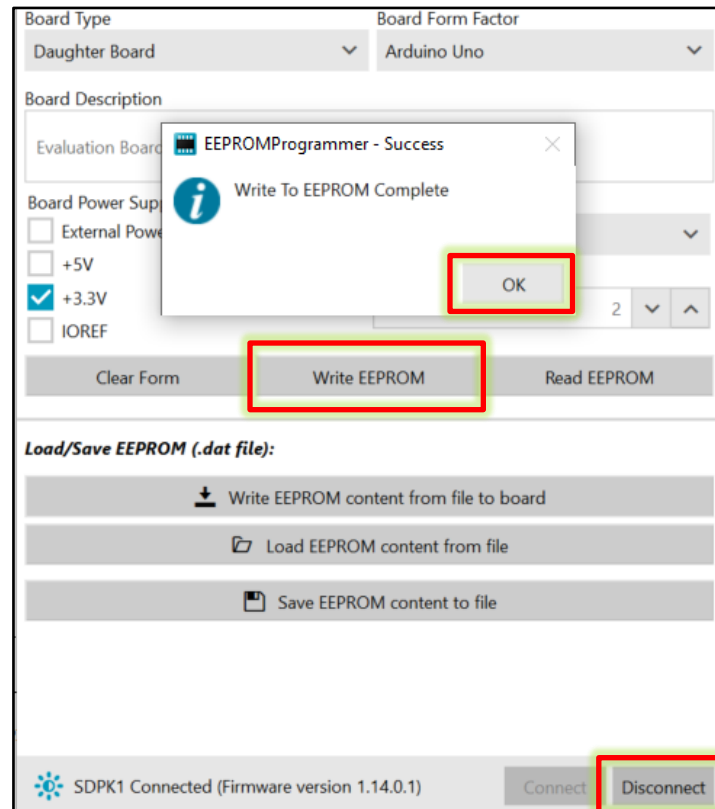


Figure 14 Write to EEPROM Complete Pop-up Window

EVAL-AD5686RARDZ ACE Plugin Test Procedure

1. With the Evaluation boards connected, measure the following test points:
 - a. Measure the VDD test pin (Analog / VDD supply checking):
 - i. VDD Test Pin = 3.3 V (Pass)
 - ii. VDD Test Pin < 3.1 V (Fail)
 - b. Measure the VLOGIC test pin (Digital / VLOGIC supply checking):
 - i. VDD Test Pin = 3.3 V (Pass)
 - ii. VDD Test Pin < 3.1 V (Fail)
 - c. Measure the VREF test pin (Internal DUT Reference checking)
 - i. VREF Test Pin = 2.5 V (Pass)
 - ii. VREF Test Pin < 2.3 V (Fail)

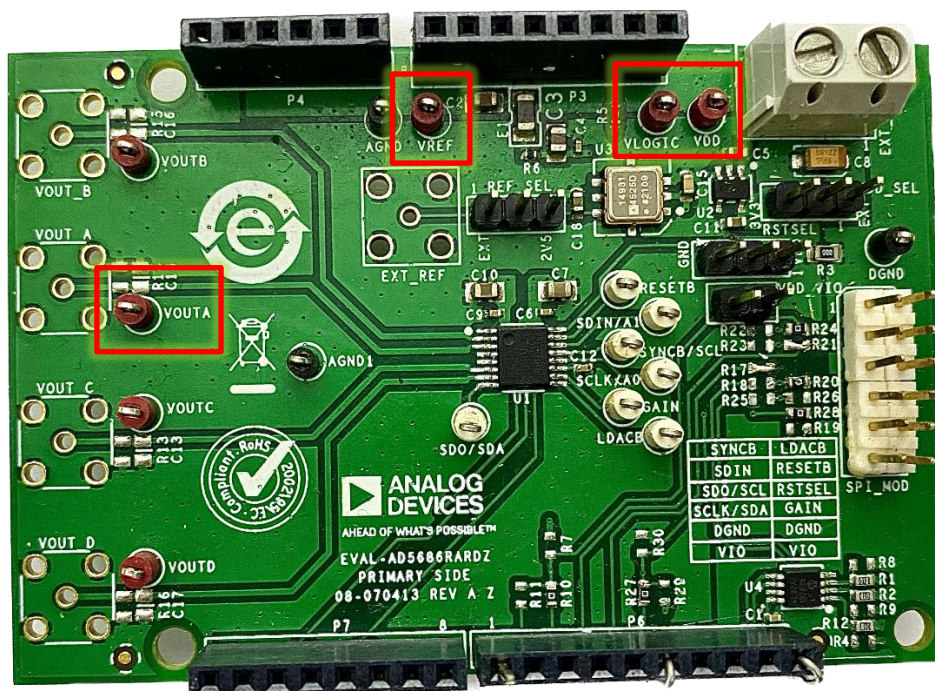


Figure 15 Test Points Location

2. Open ACE, EVAL-AD5686RARDZ will show up as an Attached Hardware, shown in Figure 16. Double-click on the EVAL-AD5686RARDZ image.
 - a. If the expected attached hardware is not shown, reconnect the USB connection from SDP-K1 Board to PC. ACE should automatically detect the attached hardware.
 - b. This version of ACE Plug in is "Unverified"

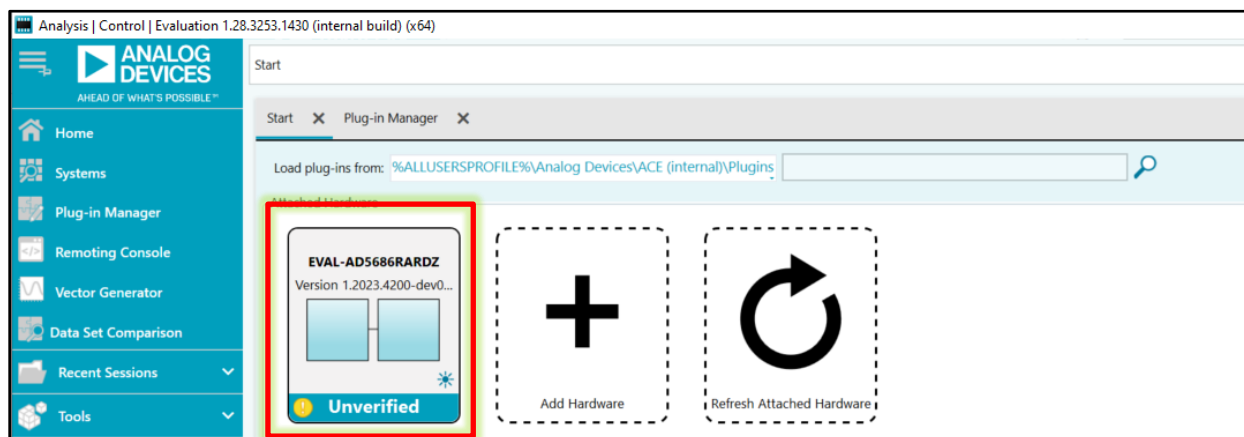


Figure 16

- Figure 17 will show up, double-click the AD5686R chip image.

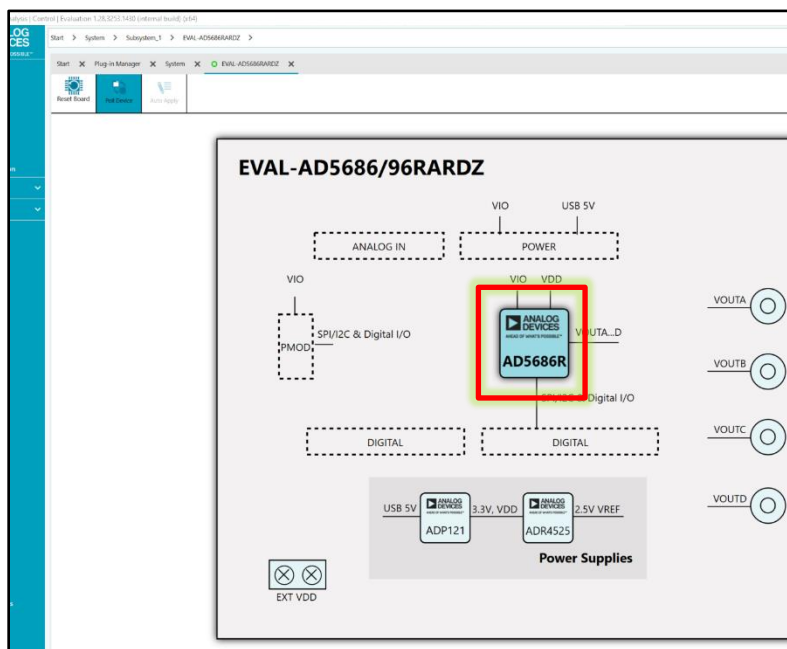


Figure 17

- The display window will transition to Figure 18. In the "Configuration" section, choose "High Gain = 2" for the "Output Gain" setting and "High: Midscale" for the "Power-on Reset" setting. Click on the "Apply" button. Once applied, the Configuration window should resemble Figure 19.

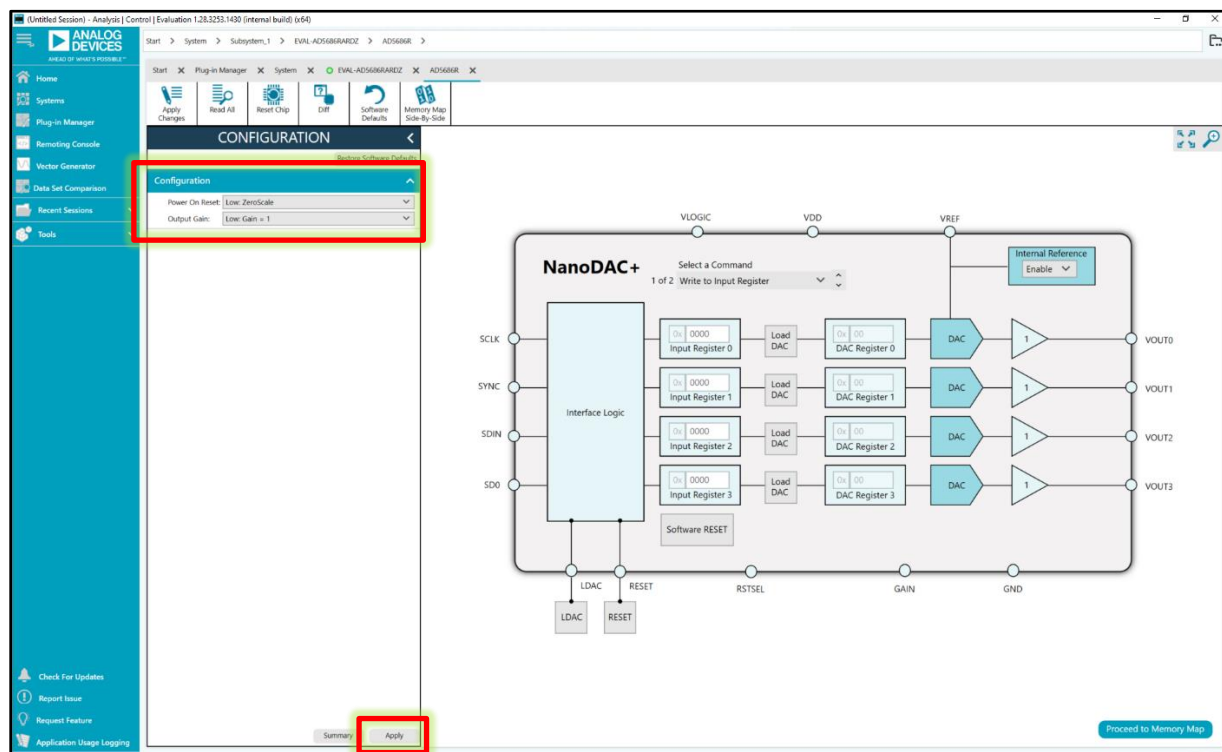


Figure 18

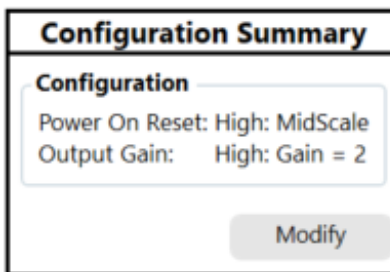


Figure 19

5. Measure the output voltage from VOUT header on the board (Gain and Power on State Checking).
 - a. $V_{OUTA} = 2.5 \text{ V}$ (Pass)
 - b. $V_{OUTA} < 2.3 \text{ V}$ (Fail)
6. Click on the dropdown box labeled "Select a Command" and choose "Write to and update DAC Register" from the options. Please refer to Figure 20 for guidance.
7. Internal Reference is Enabled by default, leave as it is.
8. Enter "999A" into the Input Register 0 field. Next, click on the "Load DAC" button. Proceed to measure VOUTA, the output voltage.
 - a. $V_{OUTA} = 3 \text{ V}$ (Pass)
 - b. $V_{OUTA} < 2.7 \text{ V}$ (Fail)

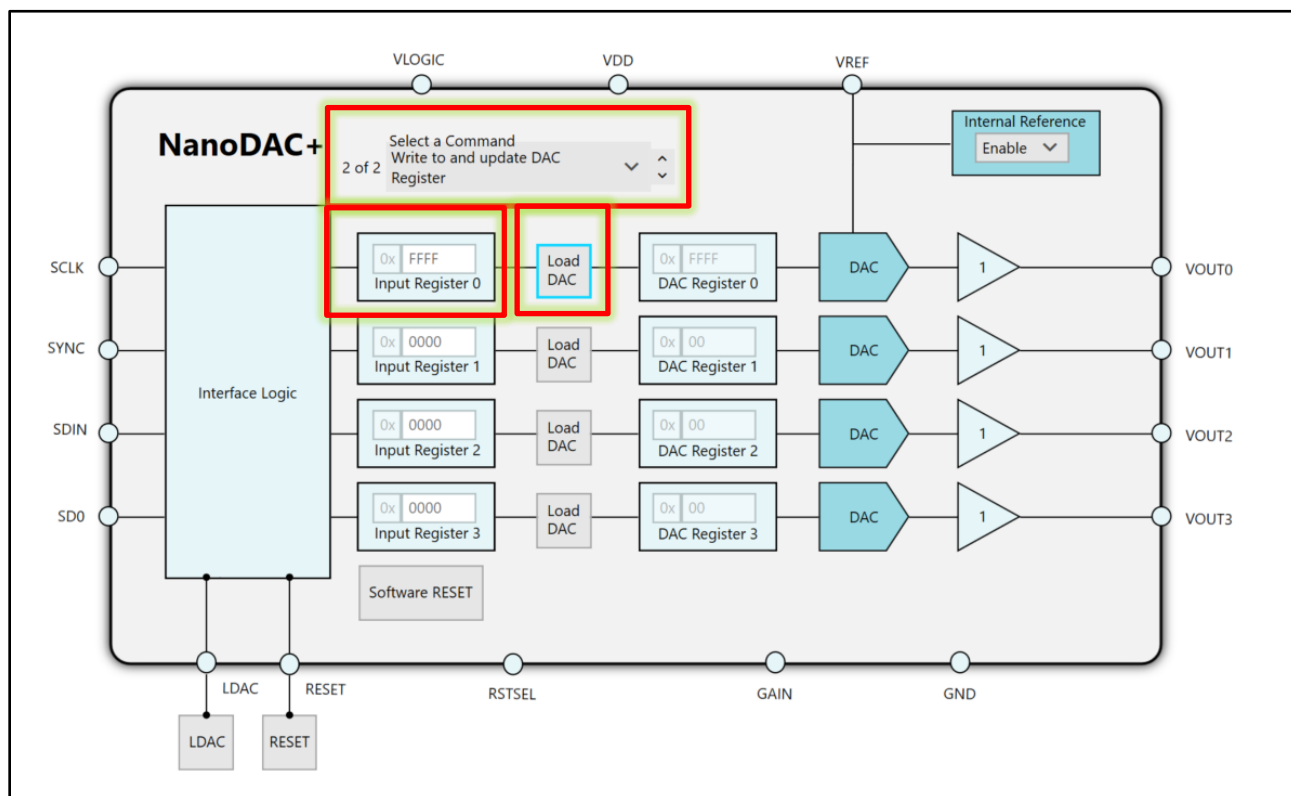


Figure 20

9. Click the “Software RESET” Button and then measure VOUTA:
 - a. VOUT = 1.25 V (Pass)
 - b. VOUT < 1.1 V (Fail)
10. Close the ACE software. Remove the USB connector.

Sticker Placement and Repacking

1. Make sure that the jumper settings are in the default positions.
2. Make sure to observe the best practices and notes in sticker placements.
 - a. Double check if the right sticker with the correct part number will be installed. Refer and cross reference with the BOM, Board Number and layout notes. For this board the name should imply “EVAL-AD5686RARDZ” as highlighted on Figure 21:

10. APPLY STICKER LABEL TO BOX ACCORDING TO BOM VARIANT DECLARATION:

* EVAL-AD5686RARDZ FOR 05-070413-01

* EVAL-AD5696RARDZ FOR 05-070413-02

Figure 21 Model Name Sticker

- a. Cut the stickers straightly so that they fit the empty box of the board without covering any labels. Avoid the mistakes shown in Figure 22, where the sticker is dirty and not

properly placed, cuts are not straight, the wrong model number is written on the sticker, and a Test Point Label is covered.

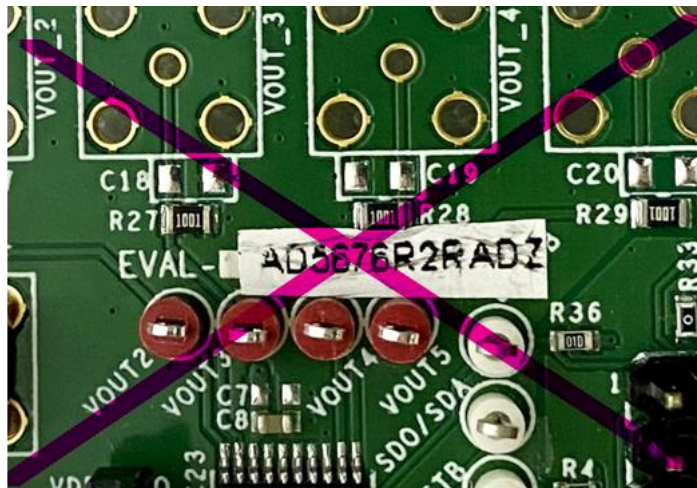


Figure 22 Sticker Mistakes to Avoid

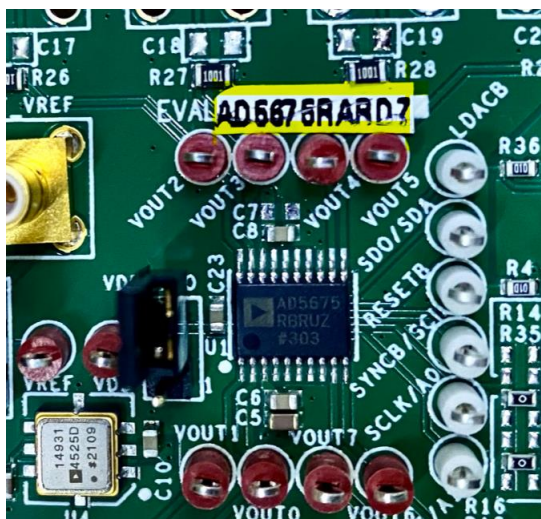


Figure 23 Sample of Sticker Placement not covering any labels

3. Repack the board that has been tested.
4. Repeat the entire process for the next board, excluding the one-time software installations. However, restart the ACE Software and disconnect then reconnect the SDP-K1 before proceeding to test the other evaluation boards.