

ADA4961 Eval Board Test Procedure

The ADA4961 is a differential in, differential out DVGA, intended for driving 50Ω loads, with bandwidth greater than 2GHz. This document describes, in detail, the standard test procedure for verifying the operation of the ADA4961.

Test Equipment

The test equipment required consists of the following;

1. +5V power supply, capable of 200mA
2. Two CW generators, capable of 0dBm output at >100MHz.
3. One spectrum analyzer
4. One Mini-Circuits ZFSC-2-2500-S+ RF Splitter.
5. One Windows 7 PC with ADA4961 software loaded, USB 2.0 or later interface required.

For reference, a photo of the complete set-up is shown in Figure 1.

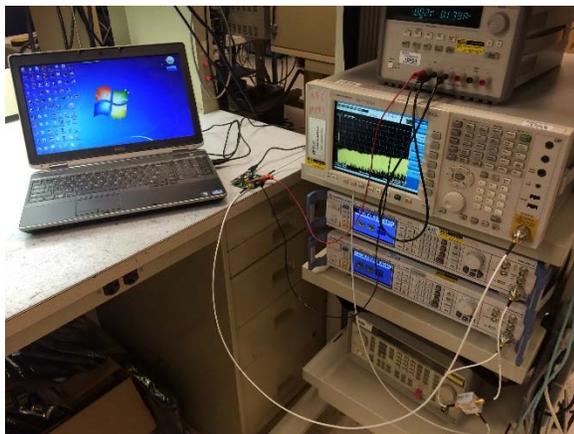


Figure 1. ADA4961 Test Procedure Set-Up

Initial Equipment Set-Up

1. Set the power supply to +5V, power supply turned off for now.
2. Set CW gen 1 to 99MHz @ -20dBm, RF output off for now.
3. Set CW gen 2 to 101MHz @ -20dBm, RF output off for now.

4. Set Spectrum Analyzer to a center frequency of 100MHz, with a 10MHz span, RBW = 30kHz and input attenuation of 10dB. The peak detector mode on the spectrum analyzer should be used for this test.
5. Connect the two generator outputs to the input terminals of the Mini-Circuits combiner. The output of the combiner should go to the input SMA connector, J1 on the ADA4961 eval board. The output SMA connector . J2 of the eval board connects to the spectrum analyzer. The details of this, as well as the SDP-S daughter card connection and the USB cable to the PC are shown in Figure 2.
6. If the spectrum analyzer allows, place markers at 97MHz, 99MHz, 101MHz and 103MHz.

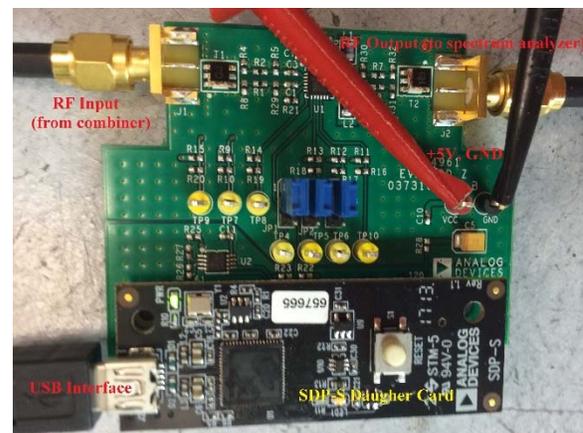


Figure 2. Detail of Connections from Test Equipment and PC to ADA4961 Eval Board

Software Installation

The Customer software for the ADA4961 eval board is built around the Analog Devices SDP-S USB hardware and software. All software described below is available in the ADA4961 software archive. To install the software for this environment, perform the following steps;

1. To install the SDP-S drivers, run the executable 'SDPDriversNET_2013.exe'.
2. The EEPROM programmer must be installed on the PC. In the 'SDPEEPROMProgrammer_2013' folder in the ADA4961 software archive, there is a setup.exe file. Run this set up, at the conclusion the EEPROM Programmer should be visible from the Windows 7 Start menu.
3. Extract the file 'ADA4961_0p0p0.zip'
4. From the ADA4961 unzipped archive, run the 'ADA4961_0p0p0_installer.exe' executable.
5. An ADA4961 icon should now appear on the PC desktop, but will not be ready to use until the DUT EEPROM is initialized in the next step.

DUT EEPROM Initialization

To perform this initialization, the user must have the executable 'EEPROMProgrammer.exe' and the file 'ADA4961_eval_board.sdpeeprom' stored on their PC.

The ADA4961 interfaces with the PC through the SDP-S daughter card interface as described above in Figure 2.

There is an EEPROM installed on the ADA4961 eval board. This EEPROM must be programmed initially in order for the USB interface to recognize the board. To program the EEPROM, take the following steps;

1. Without applying power to the ADA4961 eval board, connect the eval board and the SDP-S daughter card, as shown in Figure 2. Connect the SDP-S USB cable to the PC.
2. Run the EEPROMProgrammer. The GUI should appear as in Figure 3.

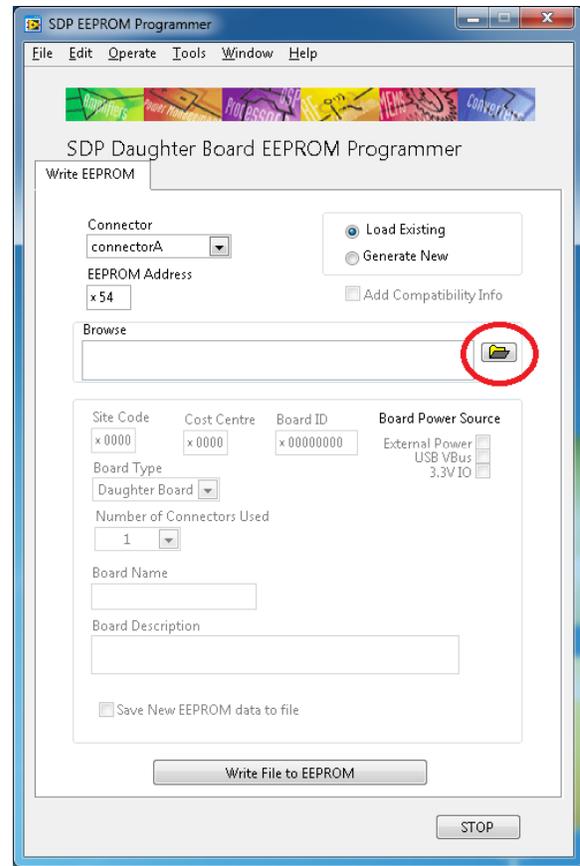


Figure 3. EEPROMProgrammer.exe GUI

3. Enter 0x54 for the EEPROM address, select 'Load Existing', click on the 'select folder' button (circled in red) and a selection window should appear as shown in Figure 4. You may need to navigate to the directory where this file is stored. Select this option, then OK.
4. This will place you back in the GUI as shown in Figure 3. Click on 'Write File to EEPROM' and a window should appear as shown in Figure 5, indicating that the EEPROM has been programmed successfully.

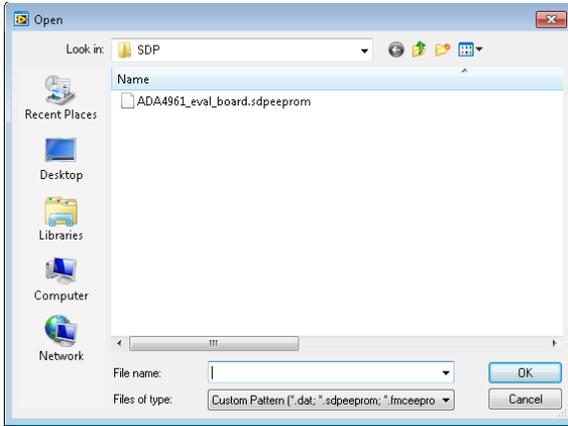


Figure 4. Selection Window for EEPROM Config File

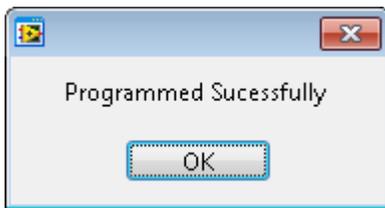


Figure 5. EEPROM Programmed Successfully

Running the Software GUI

Now that the DUT EEPROM is initialized, the ADA4961 customer software will be able to detect the eval board. To run the software, double click the ADA4961 icon that should be present on the desk top. The software GUI should appear as shown in Figure 6. When the software GUI is started, move the gain control slider to the bottom of its range (slider all the way to the bottom on the GUI).

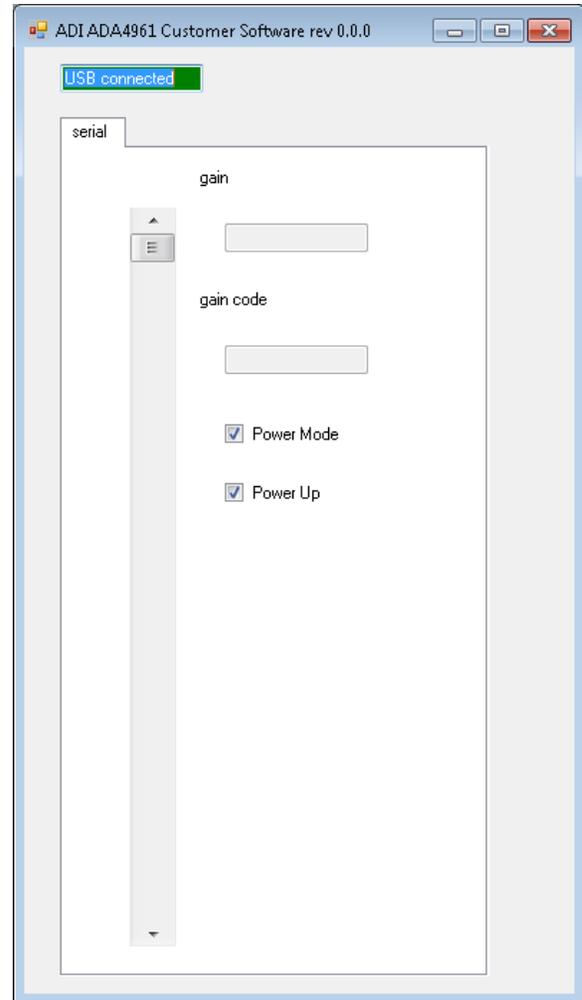


Figure 6. ADA4961_0p0p0 Customer Software GUI

Applying Power and Measurement Initialization.

Turn on the +5V power supply. The measured current should be between 130ma and 145ma. Turn on the RF outputs on both CW signal generators. Markers should have been enabled in a previous step in the procedure, so the screen on the spectrum analyzer should look similar to Figure 7.

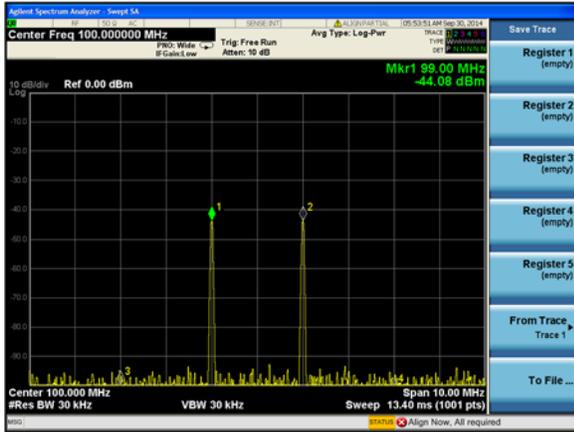


Figure 7. Initial View of Spectrum Analyzer

Adjust the level of each CW generator so that markers 1 and 2 are at -40dBm, as shown in Figure 8. Note that this step only needs to be done on the first ADA4961 DUT tested. For remaining tests on this DUT, leave the CW output power levels as they are currently set. The power/tone during this measurement should be between -39dBm and -41dBm.

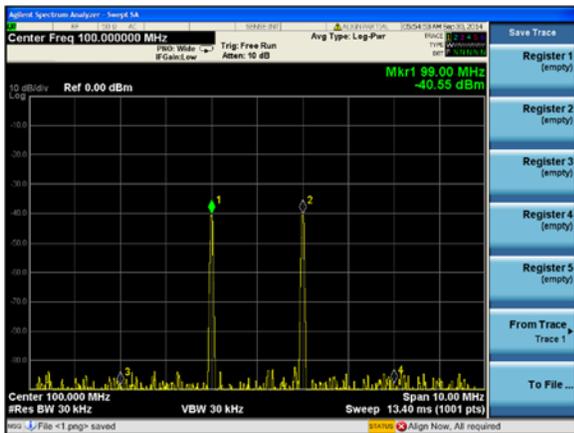


Figure 8. Spectrum Analyzer Screen, CW Generators set for -40dBm/Tone on ADA4961 Output

Move the gain control slider in the customer software GUI to the top of its range. The power/tone should increase to be between -20dBm and -18dBm as shown in Figure 9. Note during this step that the current should increase to between 155ma and 170ma. The current should stay at this level for the remainder of the

test. This increase is a result of the software enabling the ADA4961 high performance mode.

Spur Measurement, Completion of Test Marker 3 and marker 4 indicate the 3rd order harmonic performance of the ADA4961 amplifier and measurements system. On top end Spectrum Analyzers such as the Agilent PXA or Rohde and Schwarz, these markers may be in the noise floor. If lesser performing spectrum analyzers are used, spur height for marker 3 and marker 4 may be as high as -90dBm. If this requirement is met, the DUT has passed test and this procedure is complete.

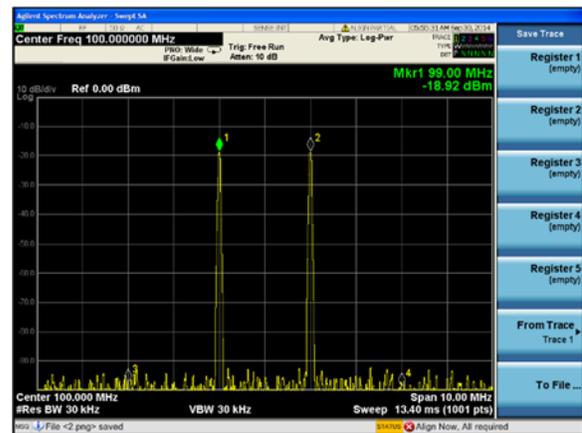


Figure 9. Spectrum Analyzer Display with ADA4961 Set to Max Gain