**Document No. : 18-046215-01 Rev A**

**Title : AD9162-FMCB-EBZ Customer Evaluation Board Test Procedure**

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| REVISION HISTORY | | | | |
| **Revision** | **ECR #** | **Description of Change** | **Date** | **Author** |
| A | ECR-075261 | Initial Release | 1/31/18 | Saber Bahranifard |
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| **Required Approvers** | |
| **Approver Roles** | **Approver Names** |
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**AD916X-FMC/FMCB-EBZ Test Procedure – Carl Scire - 06/03/2016**

**Software Setup**

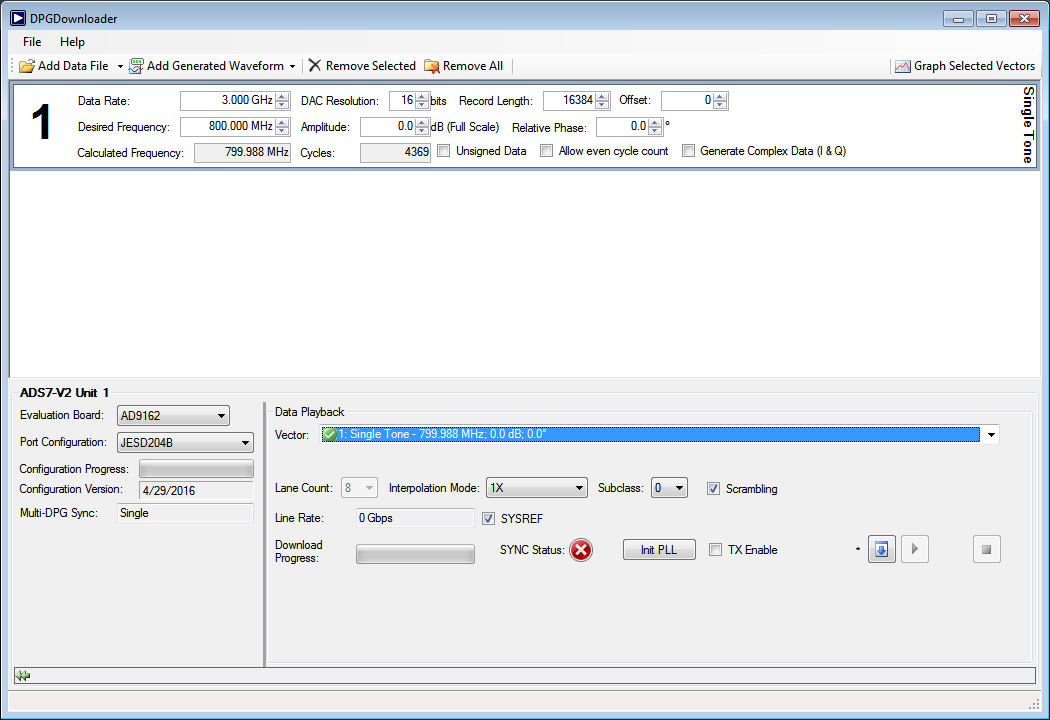
1. Install the latest DPG Downlaoder from DAC Software Suite DVD.
2. Install ADI FMC EEPROM Generator, <https://code.analog.com/gf/project/fmc_eeprom/frs/> or from DAC Software Suite DVD, if available.

**Hardware Setup**

1. Set SMA Signal Generator to 3 GHz 3dBm amplitude and connect it to J31.
2. Connect Melabs U2 Programmer to XP1 and Mini USB to XP2.
3. Connect the signal analyzer to the SMA connector, J32. The spectrum analyzer can be configured with Start Frequency = 50 MHz, Stop Frequency 5 GHz, and Resolution Bandwidth of 300 kHz. Use an Average/RMS detector setting, and choose Input Attenuation to be 6 dB.

**Program**

1. Open DPG Downloader (Start > Programs > Analog Devices > DPG > DPGDownloader). Wait a few seconds until the power LED on the evaluation board is lit.
2. Connect AD9161 (/2/3/4)-FMC (B/C)-EBZ Board to ADS7-**V2 using FMC P1 connector,** Apply power to ADS7-V2.
3. Start->Analog Devices ->ADI FMC EEPROM Generator, click Open File and select the correct EEPROM file for the board you are testing
4. Click Read/Write EEPROM and Click write. When finished, press OK.
5. Power down ADS7-V2. Wait until DPG Downloader shows “No devices found”.
6. Power on ADS7-V2.
7. Open Melabs U2 Programmer and select File – Open, opening the correct .hex SPI Firmware for the board you are testing.
8. Press program button. When finished, press OK.
9. Click on “Add Generated Waveform”, and then “Single Tone”. A single tone panel will be added to the vector list. Enter the sample rate, or DAC clock frequency in this case, 3 GHz. (Select 5 GHz sample rate if you are skipping the External Clock Hardware Setup and go to step 22) Default “Resolution” should be 16 bits. Set Desired Frequency to 800 MHz. Keep “Amplitude” as 0dB. Uncheck the “Unsigned Data” check box. In the lower portion of the screen, select 1: Single Tone - 799.950 MHz; 0.0 dB; 0.0o as the Data Vector. See below.



**Operation**

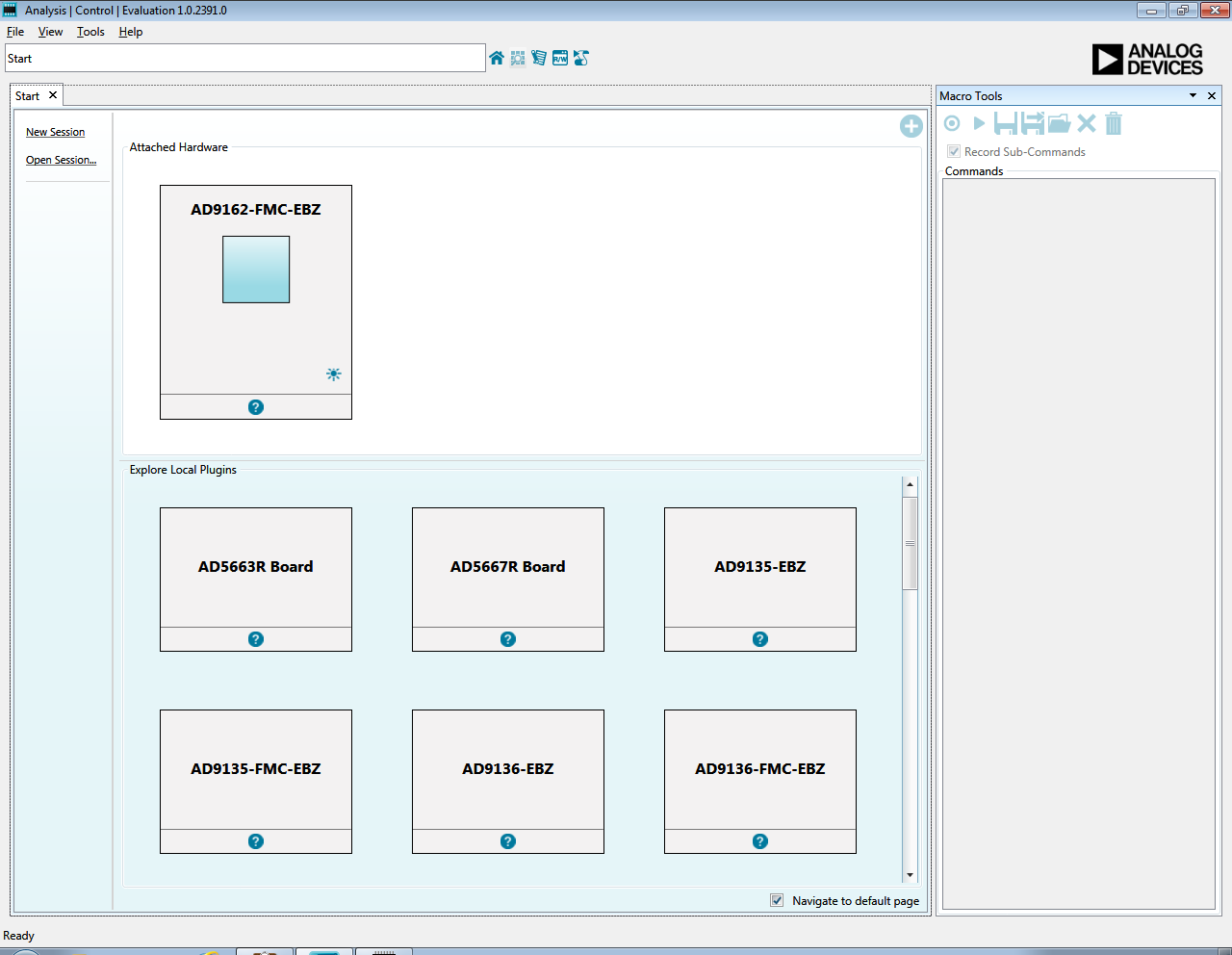
1. Open the ACE software, which is located in Start->Programs->Analog Devices->ACE->ACE.
2. Run ACE Software and click on AD916X-FMC-EBZ for testing with **AD916X Startup Wizard.**

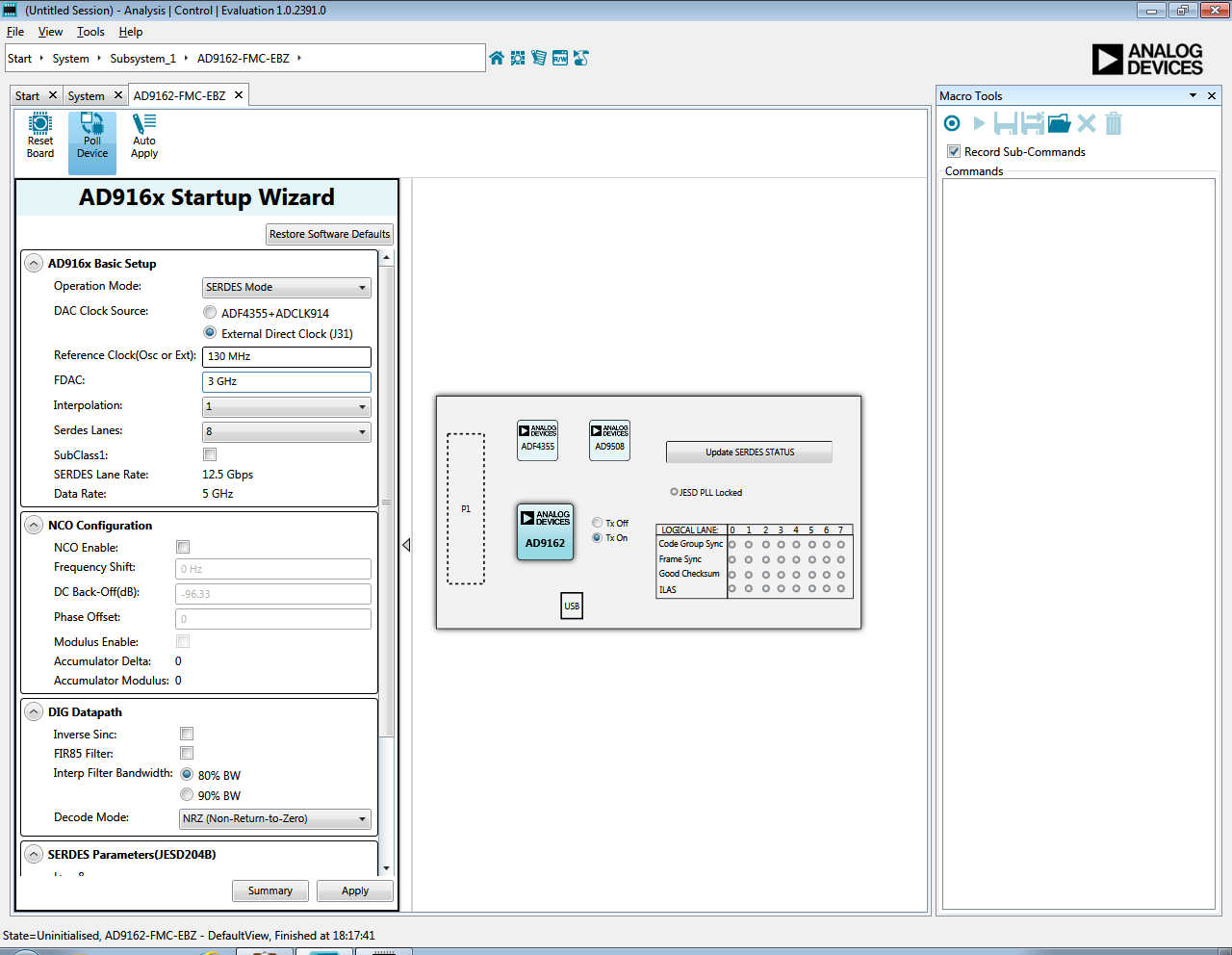
**External Clock Hardware Setup**

1. Set front output of SMA 100A Signal Generator to 3 GHz with 3dBm amplitude and connect it to J31.
2. Set separate Signal Generator or rear output of SMA 100A Signal Generator to 130 MHZ, 6dBm amplitude and connect it to J61.
3. Remove jumper shunt from JP1.
4. In **AD916X Startup Wizard** **Summary** - SelectExternal Direct Clock (J31), set Reference Clock (Osc or Ext): 130MHz, FDAC: 3GHZ. See below.

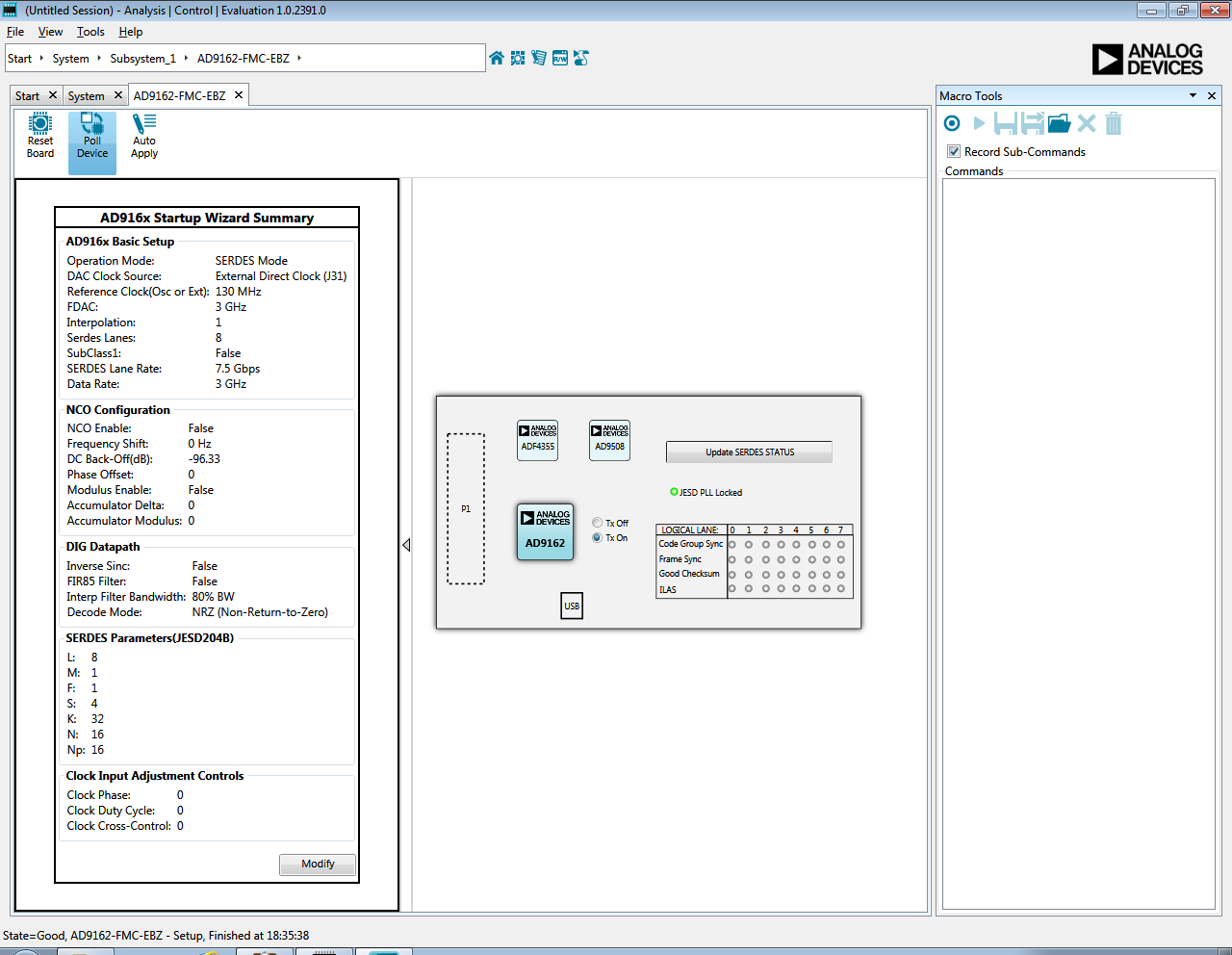
### External Clock Hardware Setup with only 1 Signal Source

1. Set front output of Signal Generator to 3 GHz with 3dBm amplitude and connect it to J31.
2. Use 10 MHz reference output from the rear of Signal Generator and connect it to J61.
3. Remove jumper shunt from JP1.
4. In ACE **AD916X Startup Wizard** **Summary**- SelectExternal Direct Clock (J31), set Reference Clock (Osc or Ext): 10MHz, FDAC: 3GHZ.

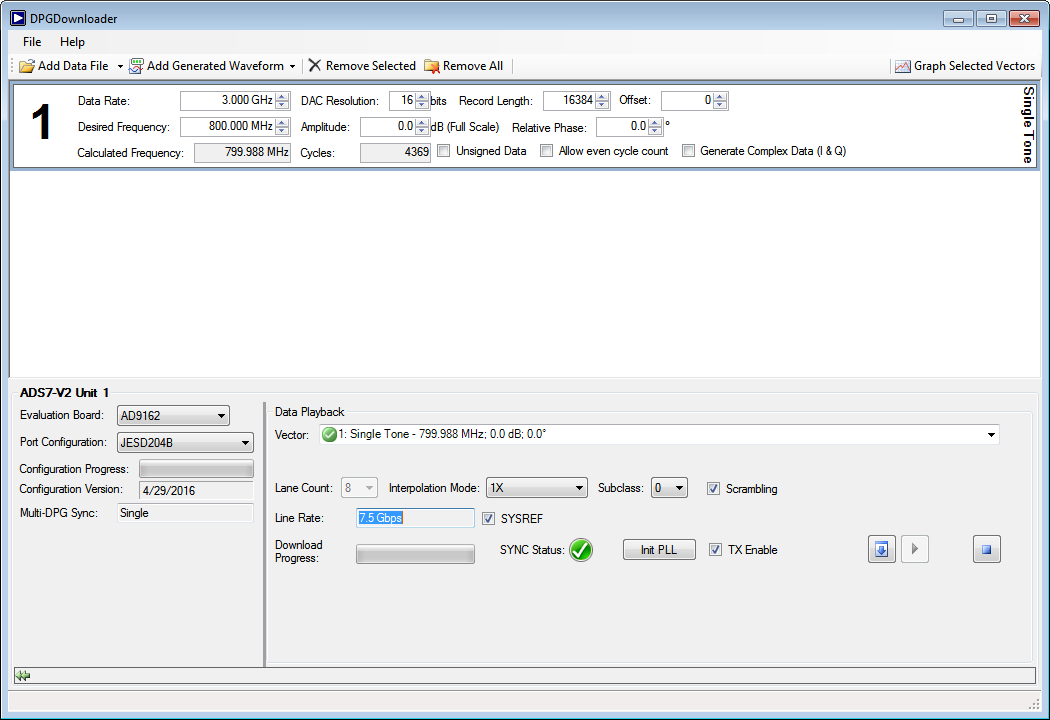




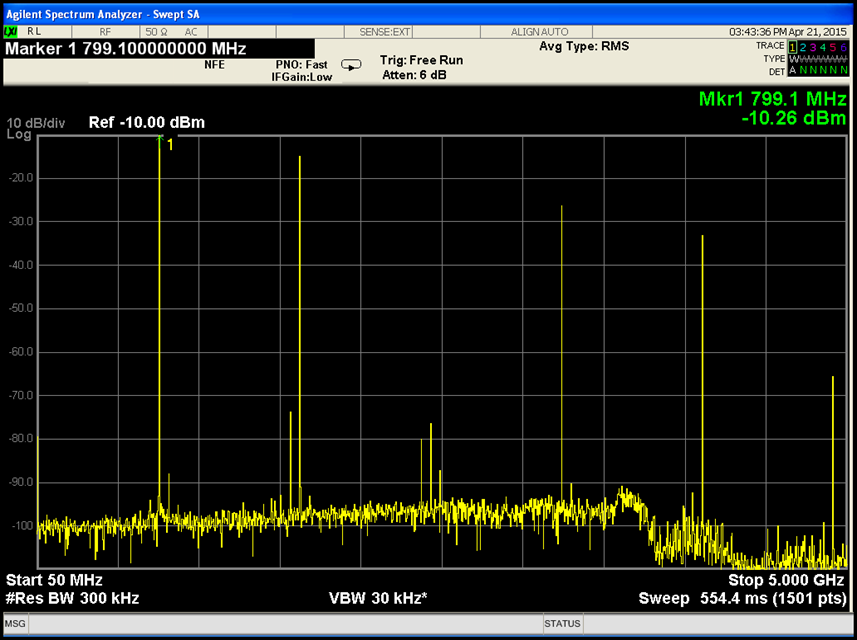
1. Click “Apply”.



1. Go directly to DPG Downloader
2. Run Vector 1: Single Tone – 799.950 MHz; 0.0 dB; 0.0o” as the Data Vector.
3. Click the  button to download the pattern from the computer to the ADS7 unit, wait for the Play () button to become active, and then click the Play ( ) button to begin vector playback to the AD9162. The “SYNC Status” should show as the green check mark. See below.



Depending on the settings, an 800 MHz single tone output should now also appear on the signal analyzer as seen on the screen shot below.



1. Shut down ADS7-V2, remove cables from J31 and J61 and install jumper shunt at JP1.
2. In DPG Downloader set Data Rate to 5 GHz. Default “Resolution” should be 16 bits. Set Desired Frequency to 800 MHz. Keep “Amplitude” as 0dB. “Unsigned Data” box should be unchecked. In the lower portion of the screen, select 1: Single Tone - 799.950 MHz; 0.0 dB; 0.0o as the Data Vector.
3. Run ACE or clear ACE from last session by going to File - Close Session.
4. Jumper shunt should be installed at JP1.
5. Restart ADS7-V2.
6. Click on AD9162-FMC-EBZ for testing with Internal ADF4355 Clock + ADCLK914.
7. Use defaults and hit “Apply”.

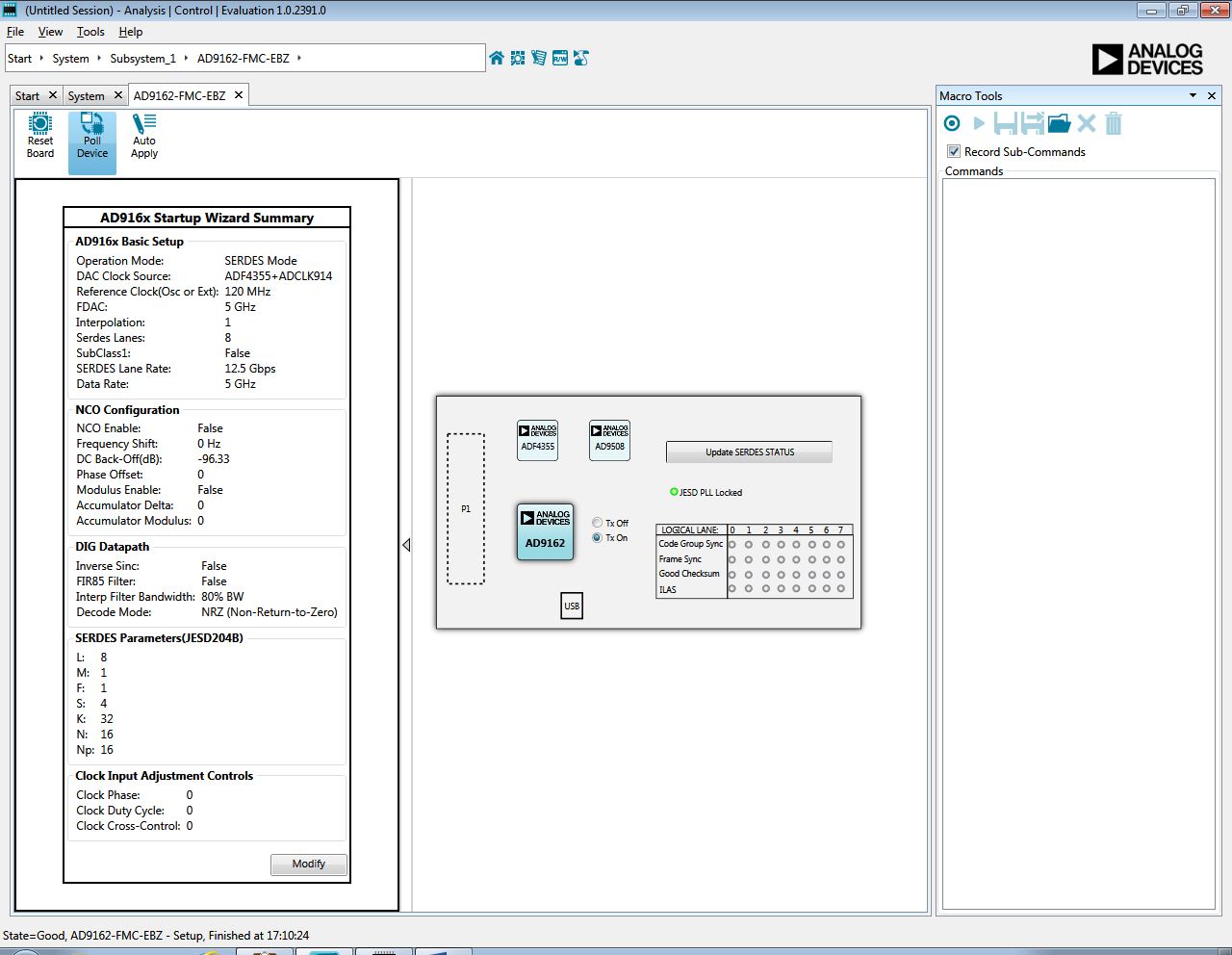
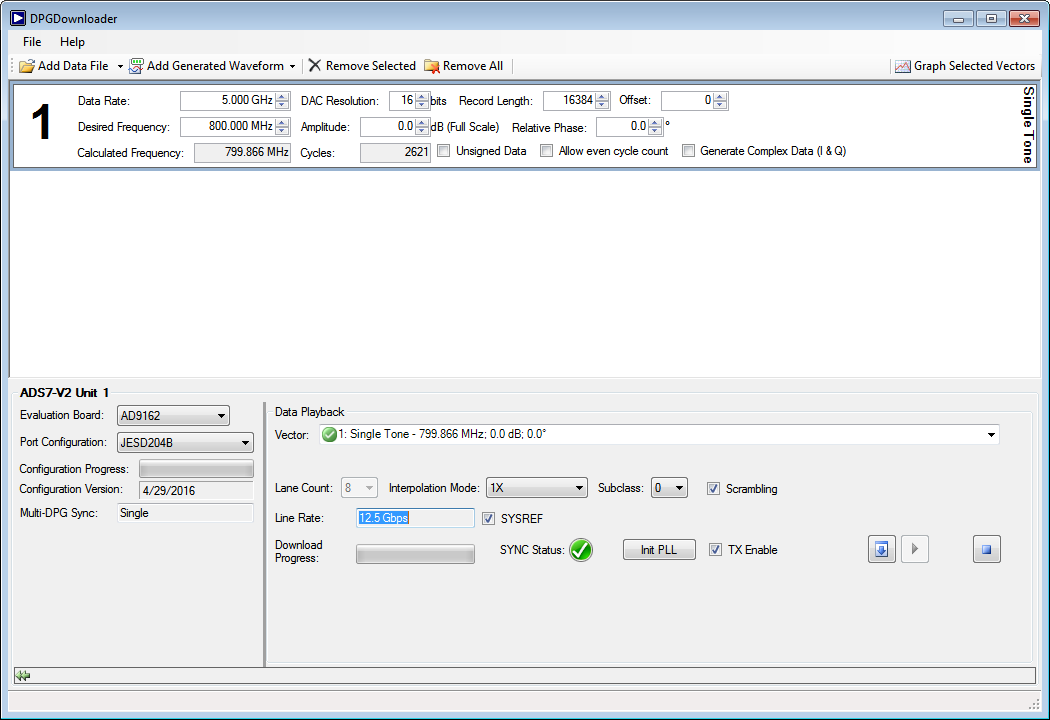


Figure 5. Download single tone vector and play it. Same as steps 19 and 20.

An 800 MHz single tone should now appear on the signal analyzer as shown Figure 6.

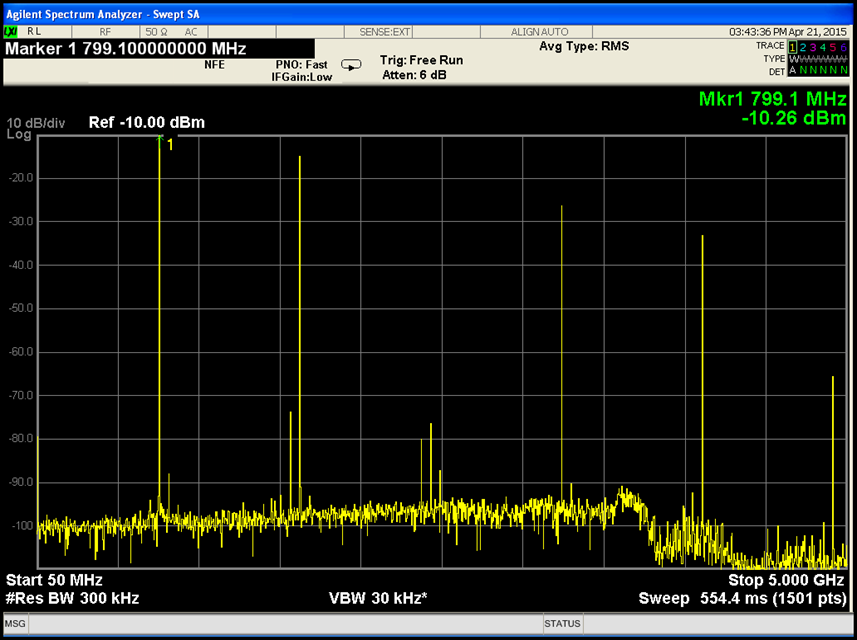


Figure 6. Spectrum Analyzer plot of DAC output in JESD 8-lane, 1x mode, showing single tone at 800 MHz