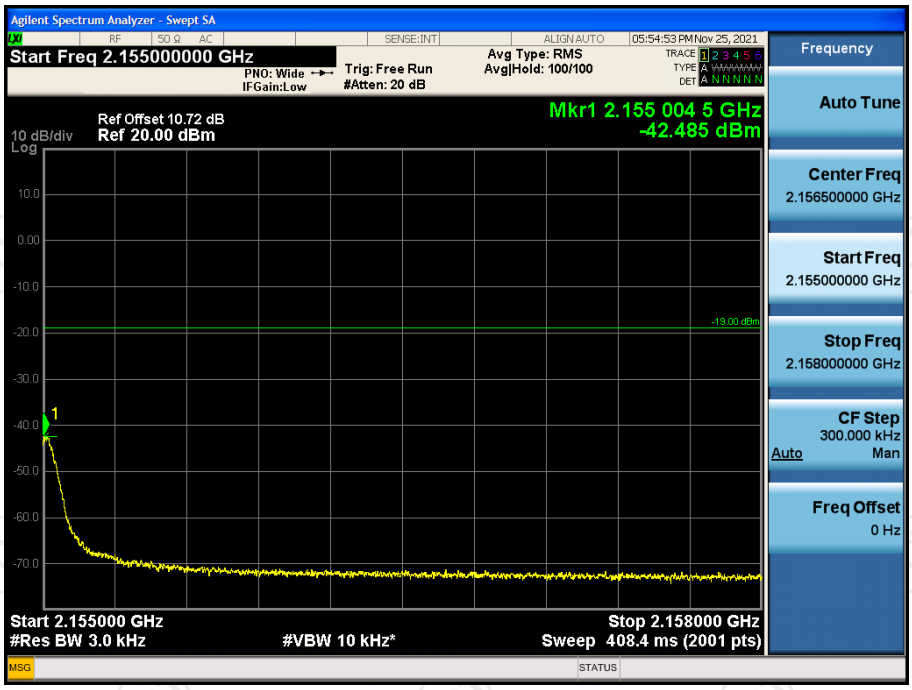
AWS-1 GSM DL Right Side Pre AGC



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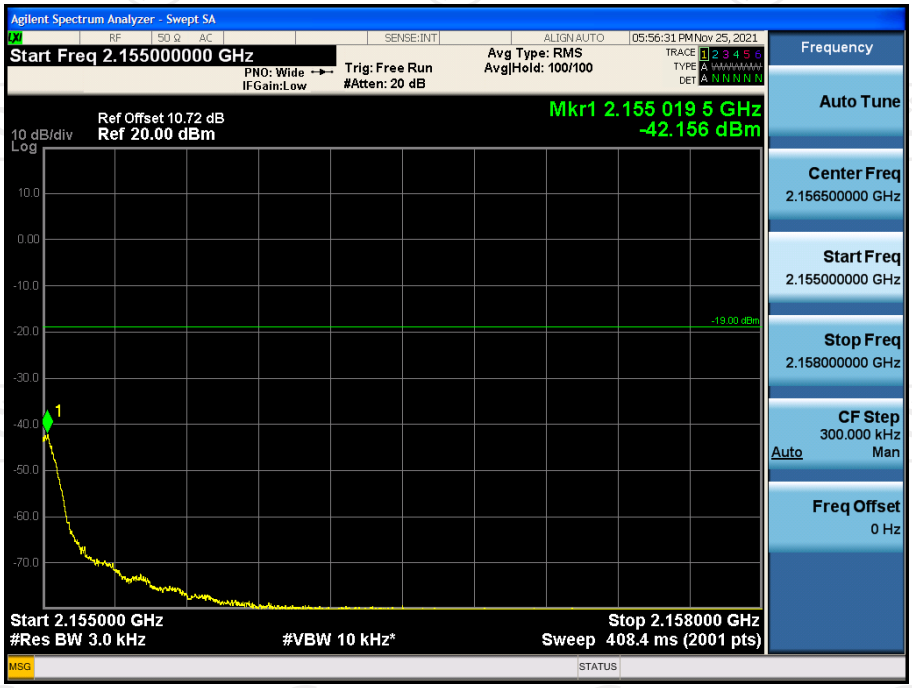
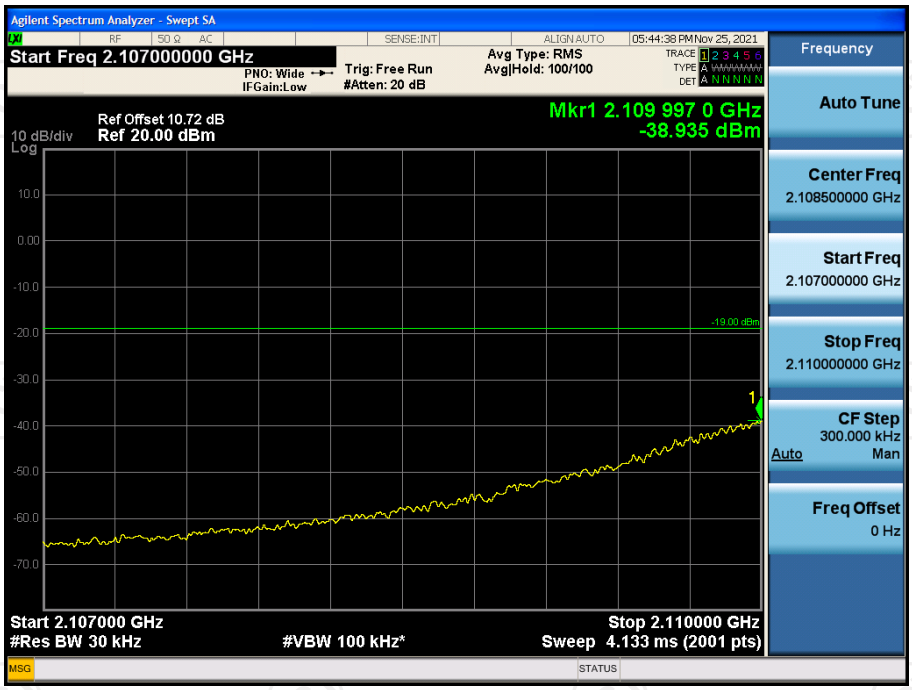


AWS-1 CDMA DL Left Side Pre AGC

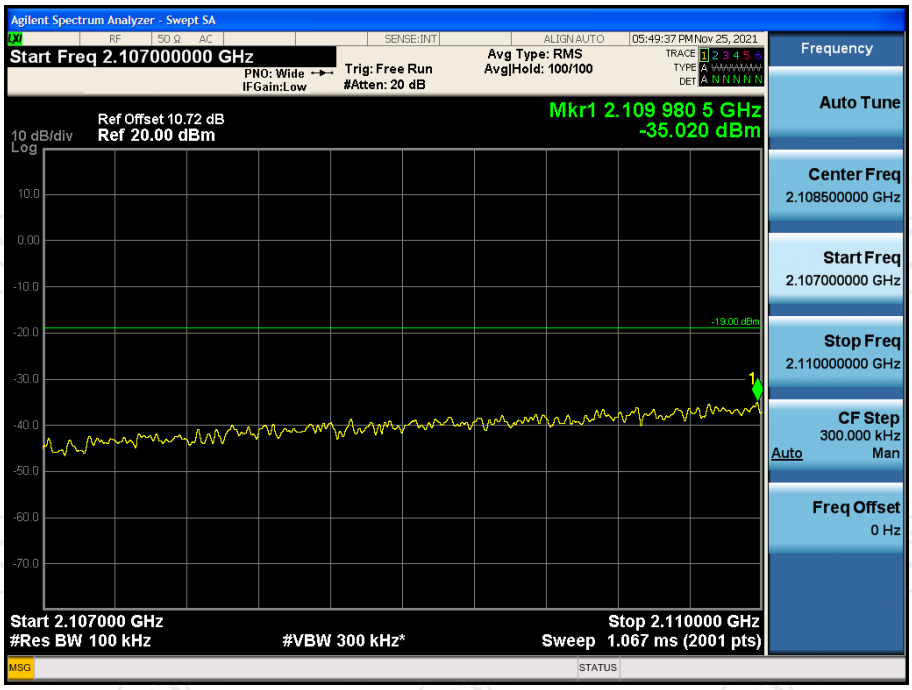
AWS-1 CDMA DL Left Side Pre AGC+10dB



AWS-1 CDMA DL Right Side Pre AGC

AWS-1 CDMA DL Right Side Pre AGC+10dB

AWS-1 LTE DL Left Side Pre AGC



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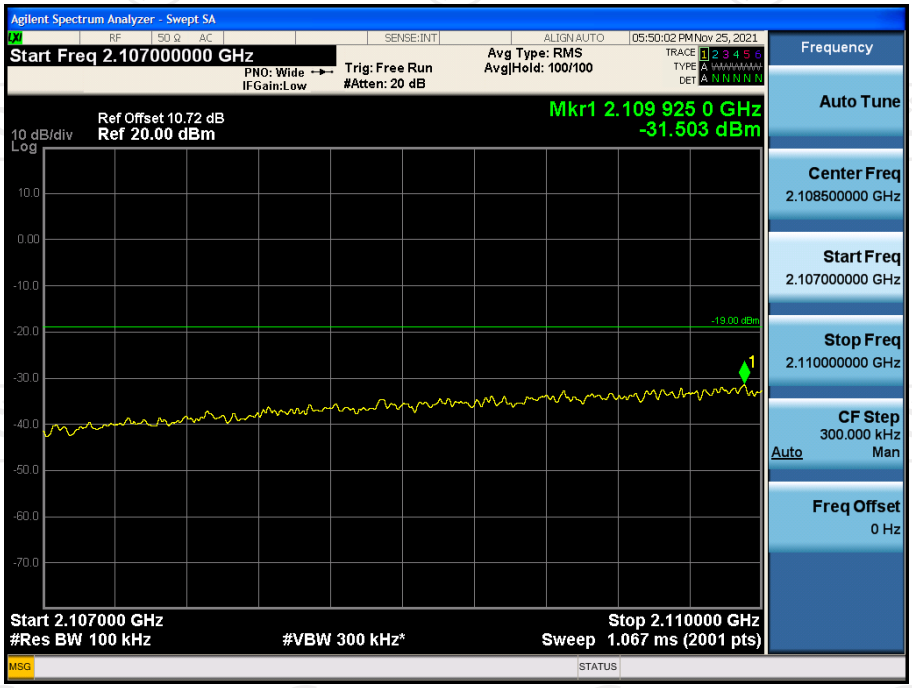

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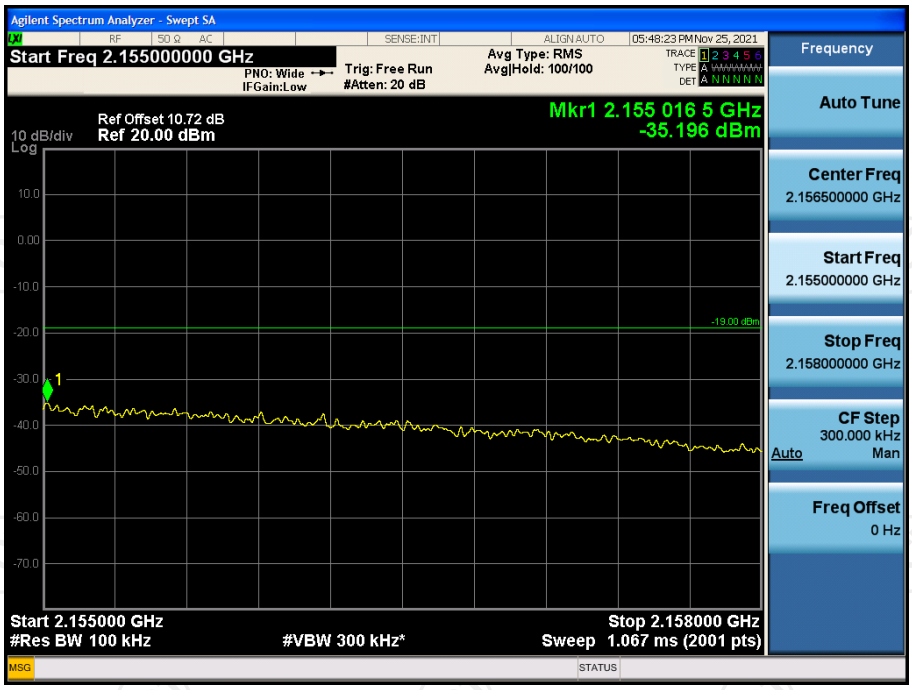

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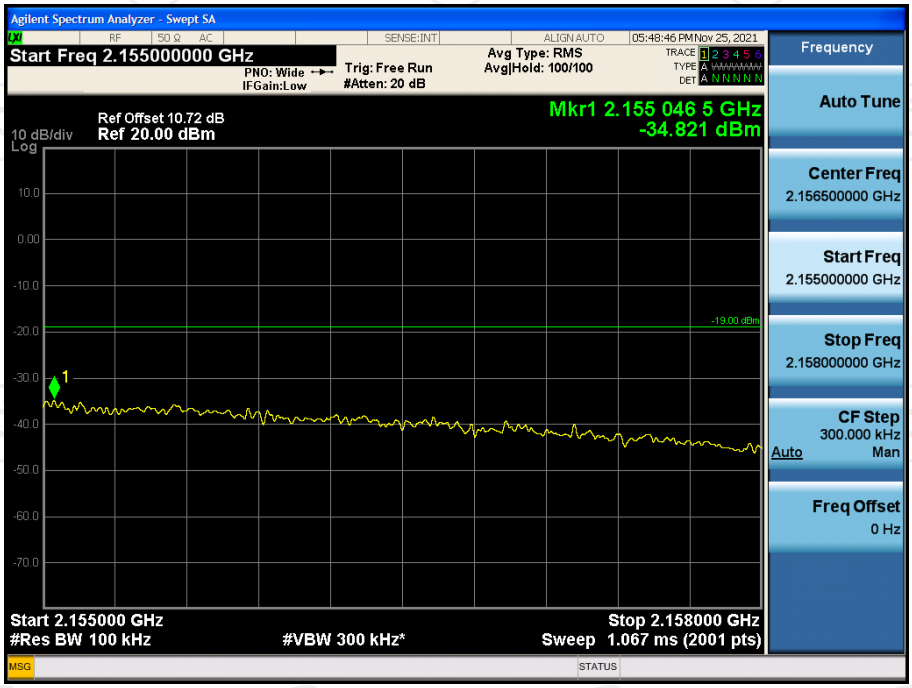
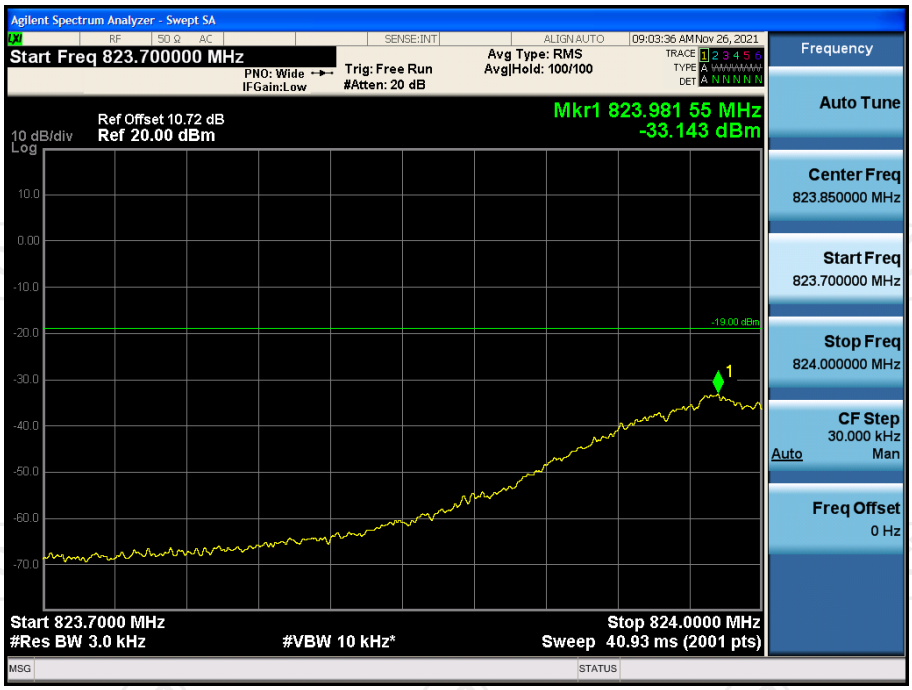
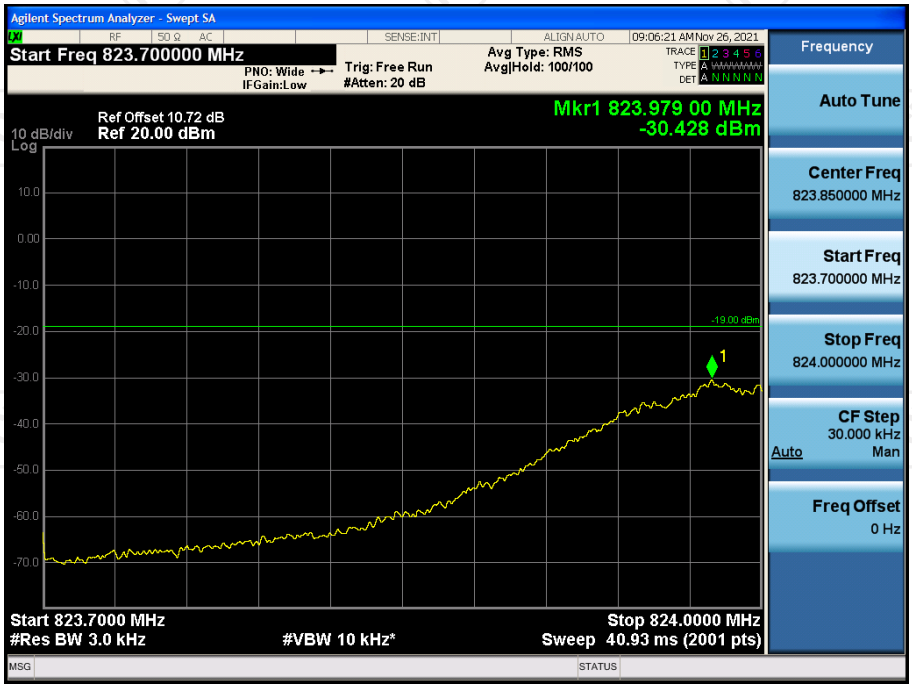


Cellular GSM UL Left Side Pre AGC



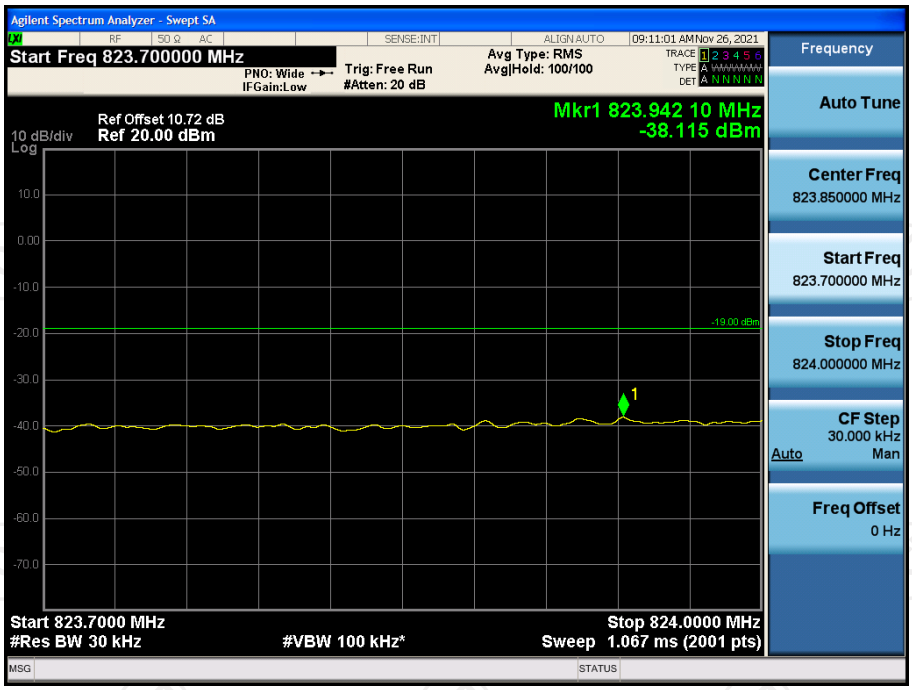
Cellular GSM UL Left Side Pre AGC+10dB



Cellular GSM UL Right Side Pre AGC

Cellular GSM UL Right Side Pre AGC+10dB

Cellular CDMA UL Left Side Pre AGC



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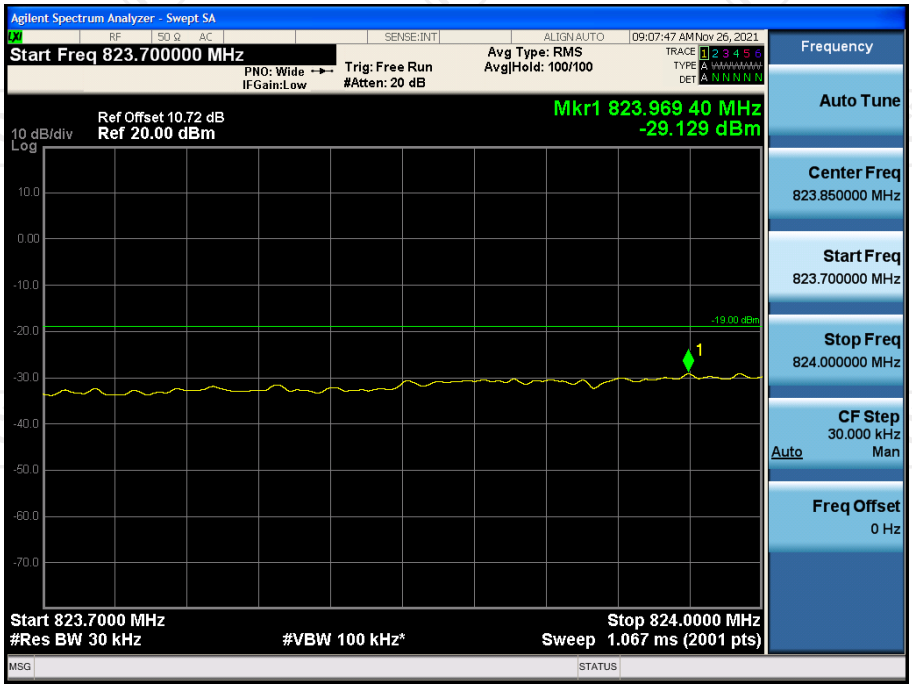
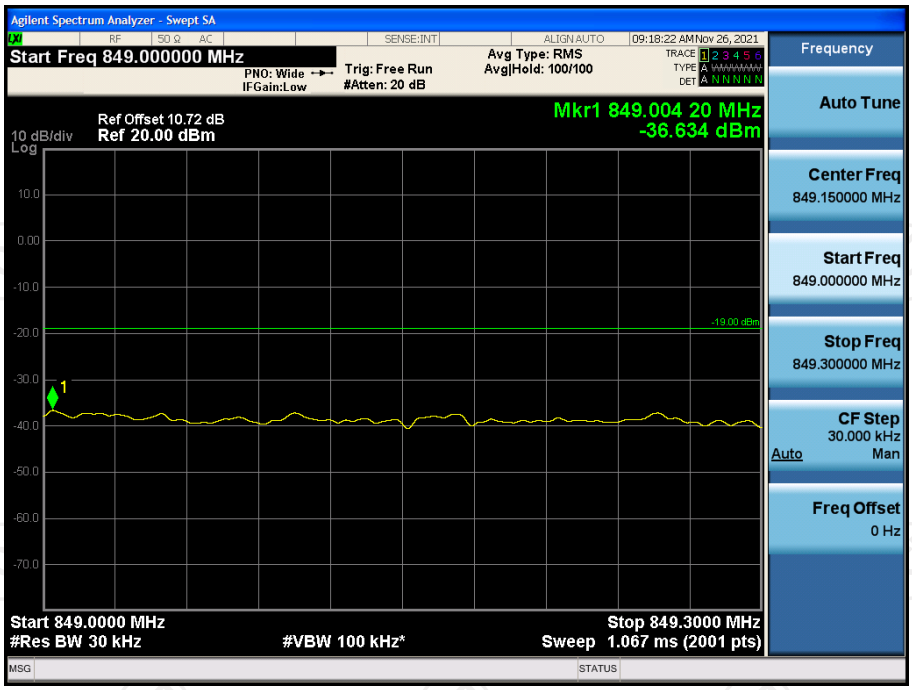
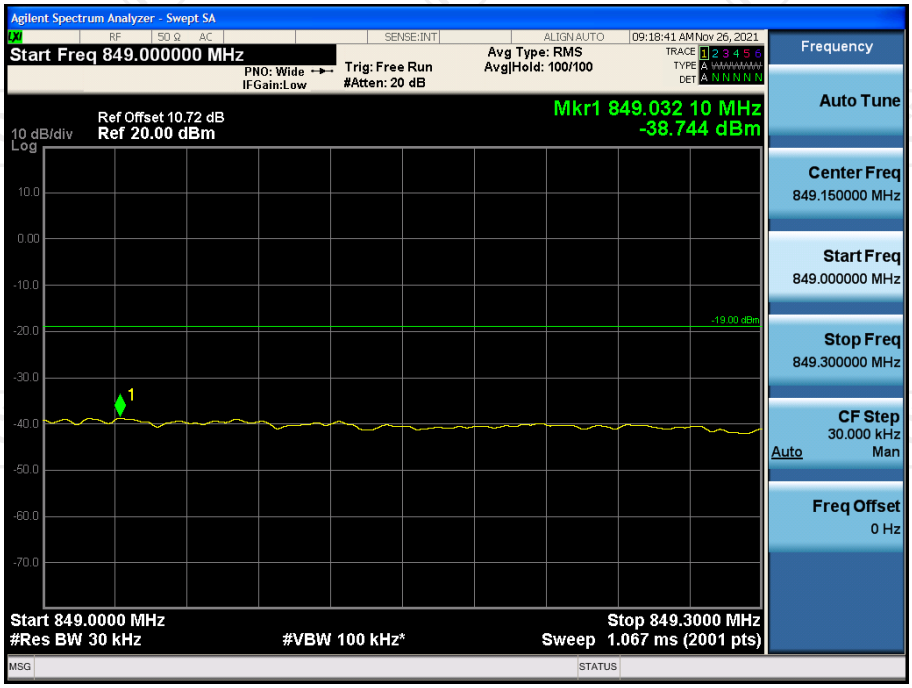


Cellular CDMA UL Right Side Pre AGC

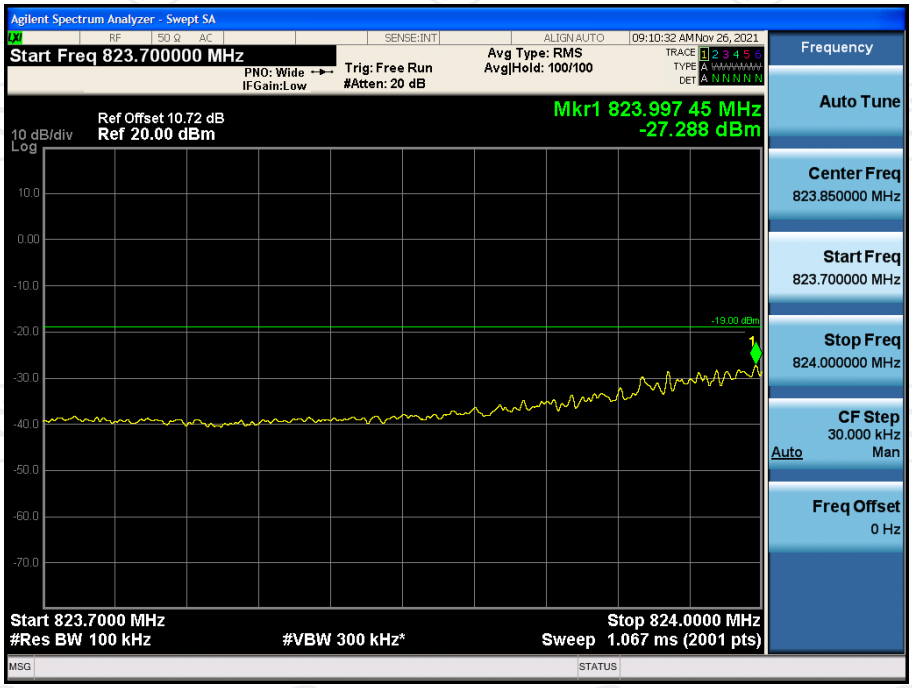


Cellular CDMA UL Right Side Pre AGC+10dB



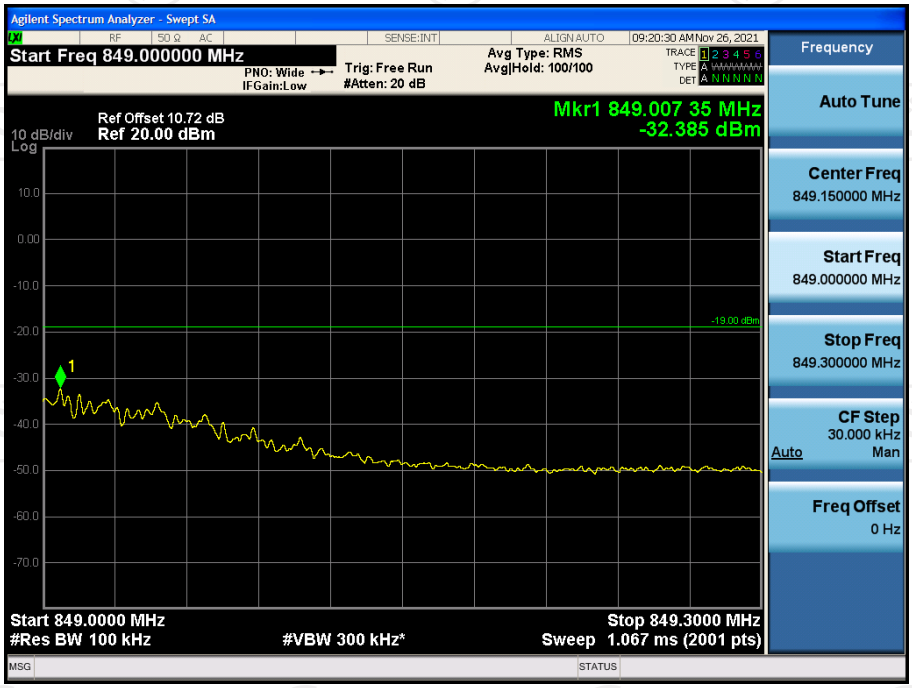
Cellular LTE UL Left Side Pre AGC

Cellular LTE UL Left Side Pre AGC+10dB



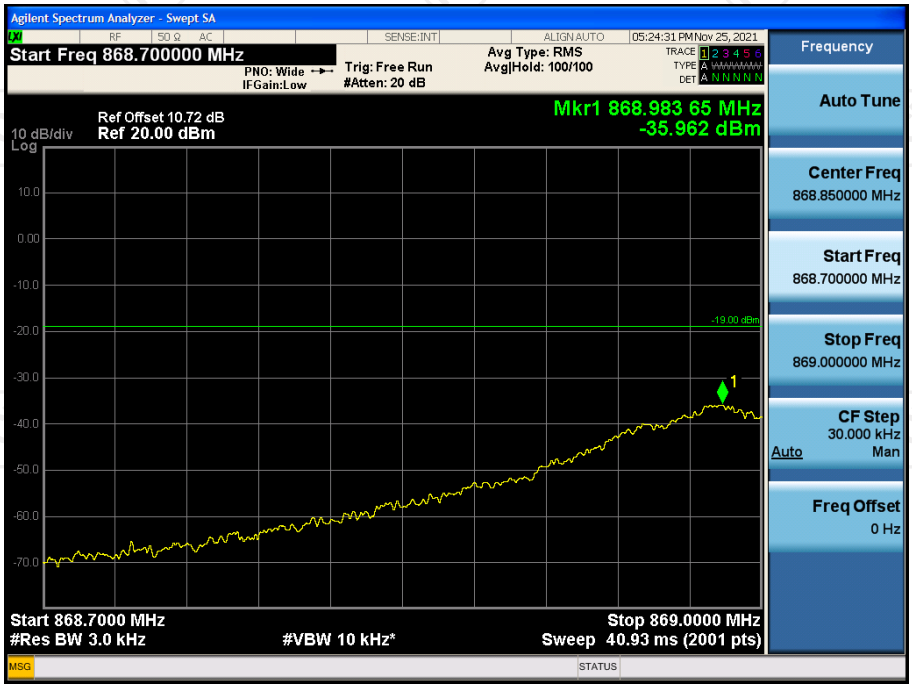
Cellular LTE UL Right Side Pre AGC

Cellular LTE UL Right Side Pre AGC+10dB



Cellular GSM DL Left Side Pre AGC

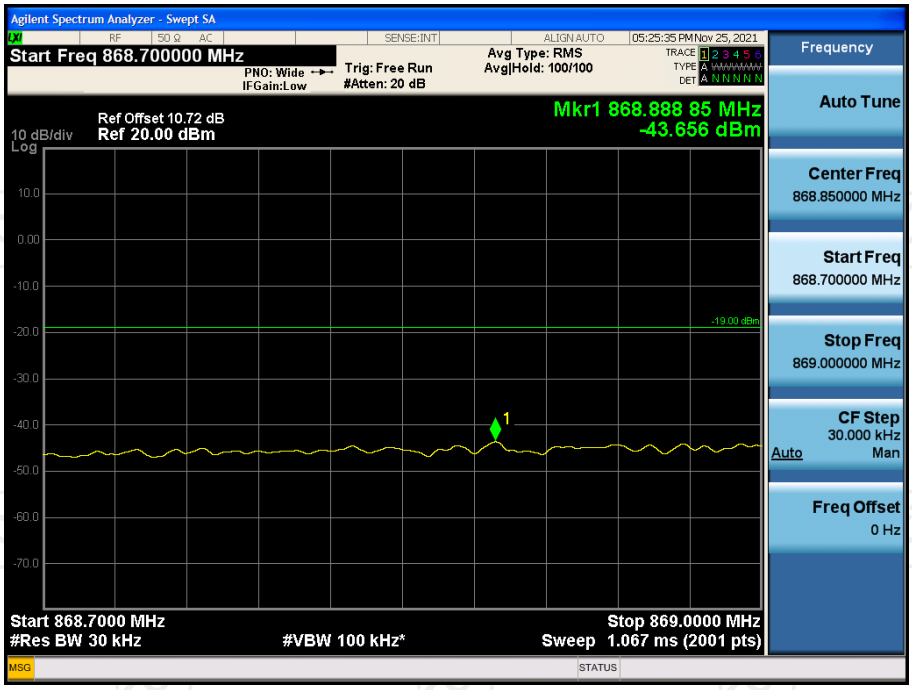
Cellular GSM DL Left Side Pre AGC+10dB



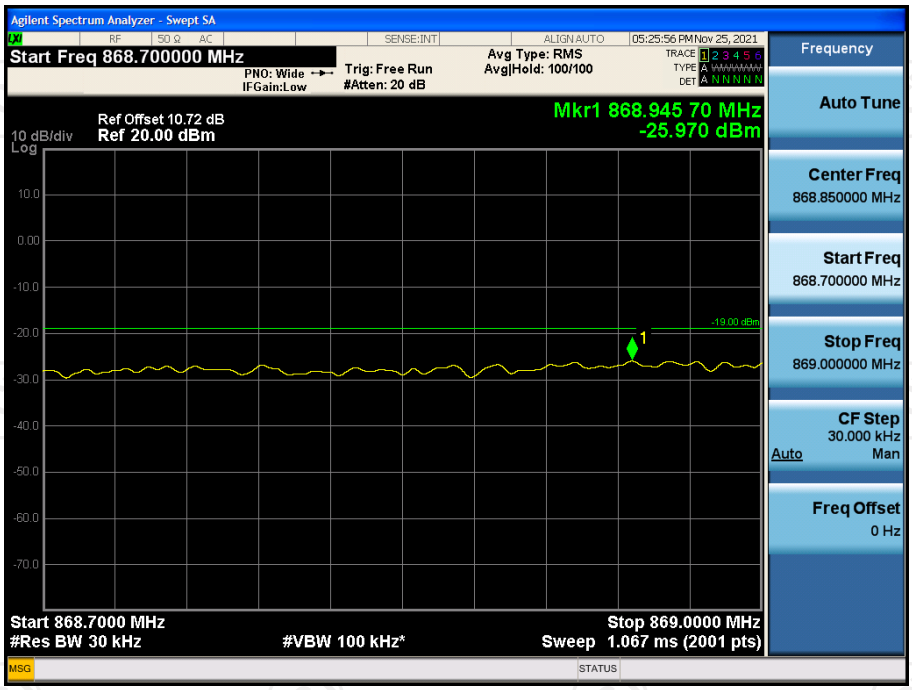
Cellular GSM DL Right Side Pre AGC

Cellular GSM DL Right Side Pre AGC+10dB

Cellular CDMA DL Left Side Pre AGC



Cellular CDMA DL Left Side Pre AGC+10dB



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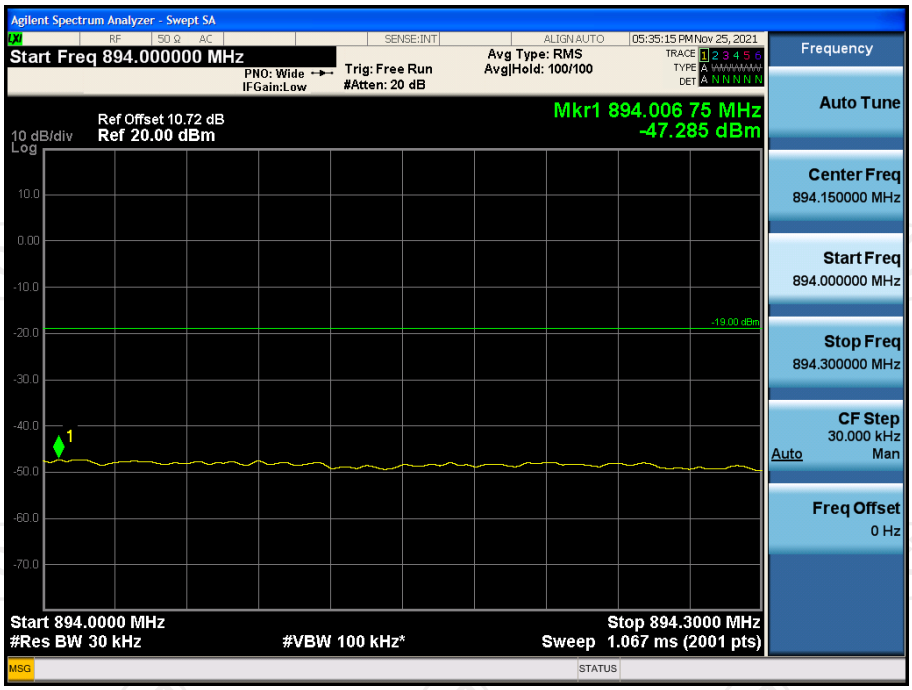
Cellular CDMA DL Right Side Pre AGC



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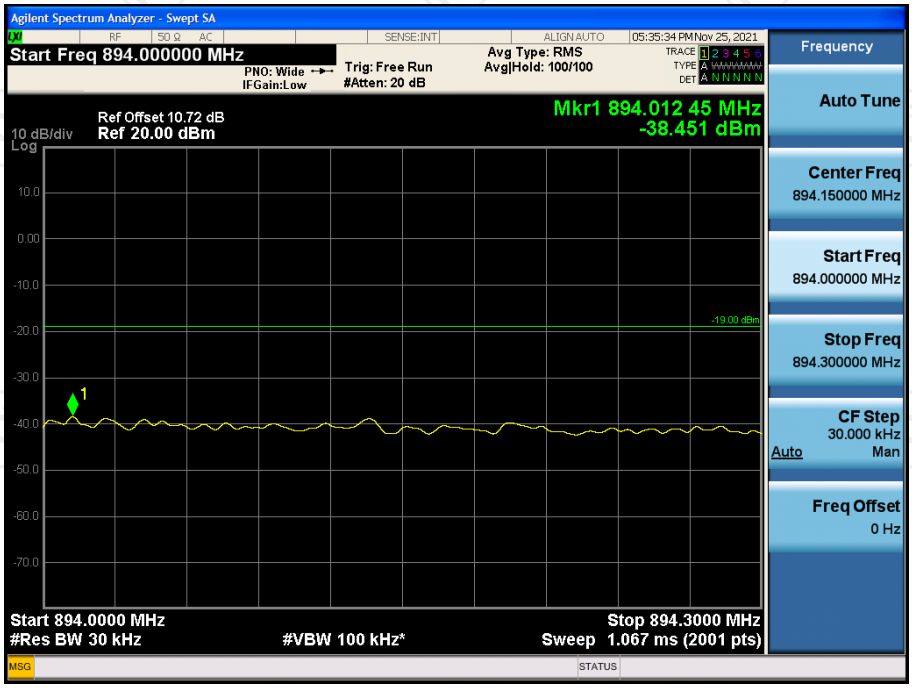
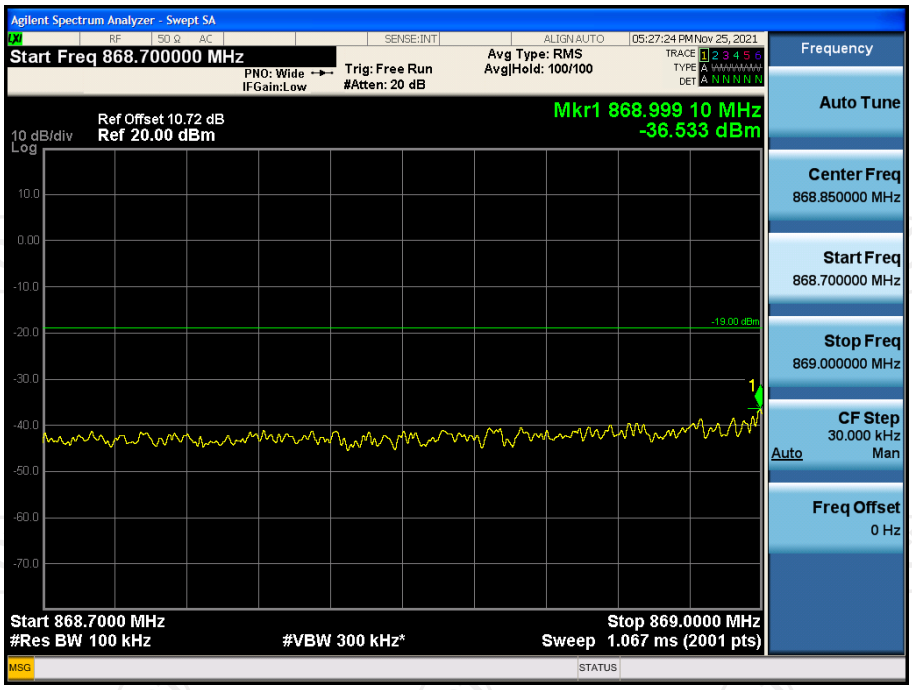
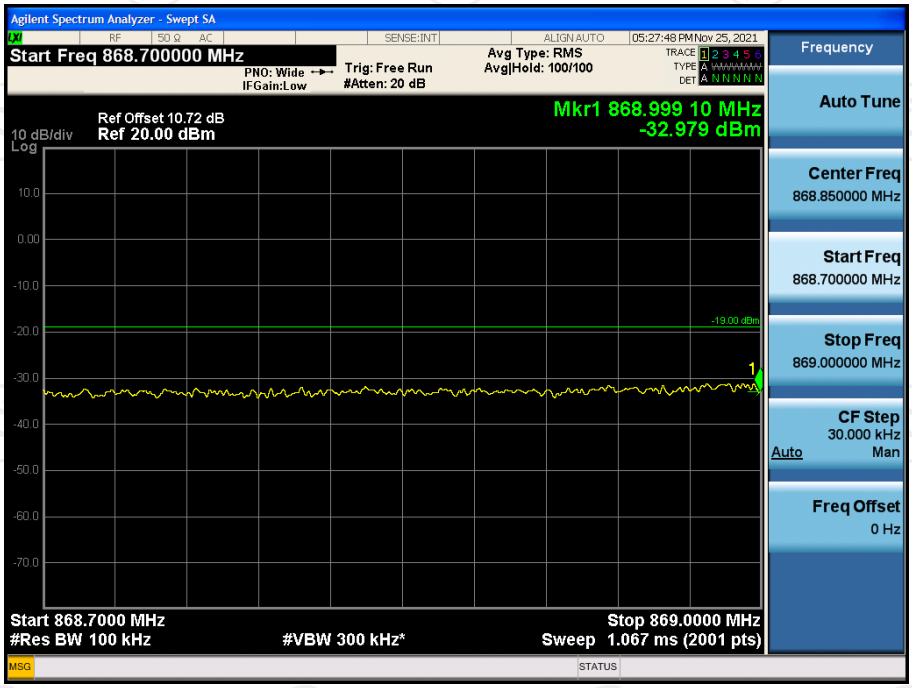


Cellular LTE DL Left Side Pre AGC



Cellular LTE DL Left Side Pre AGC+10dB



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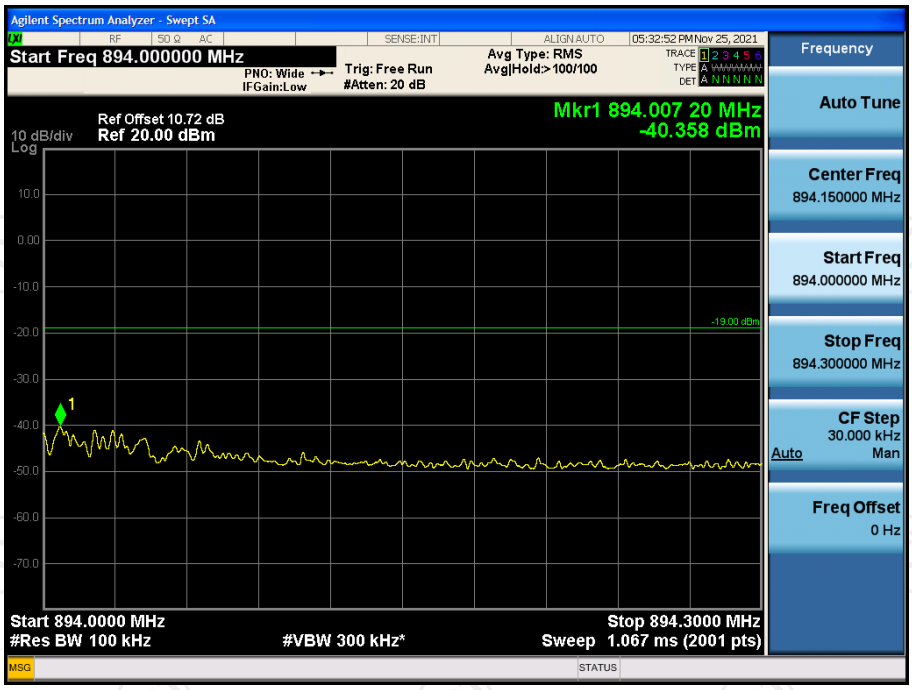
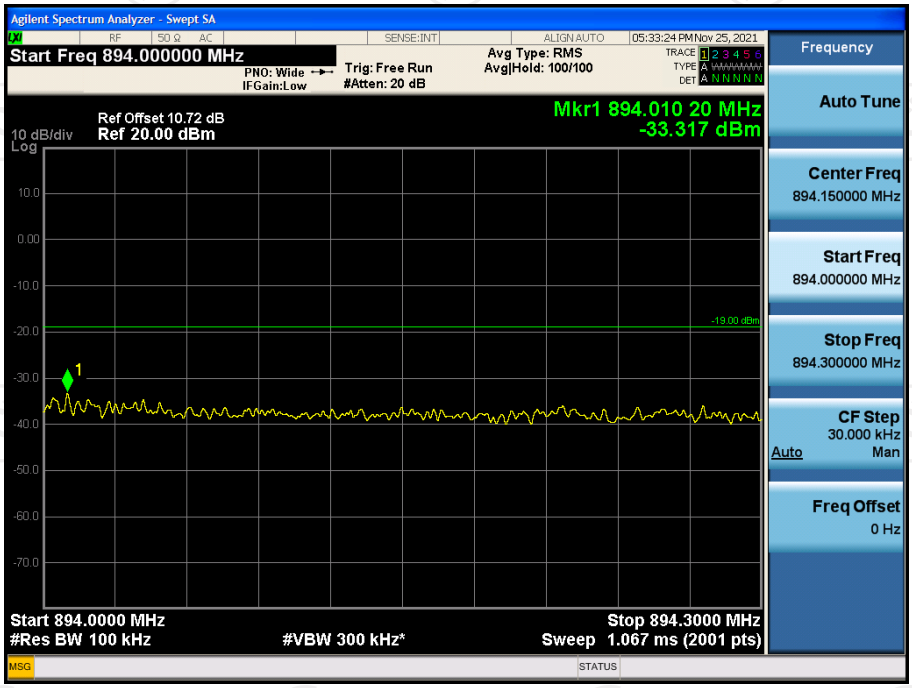
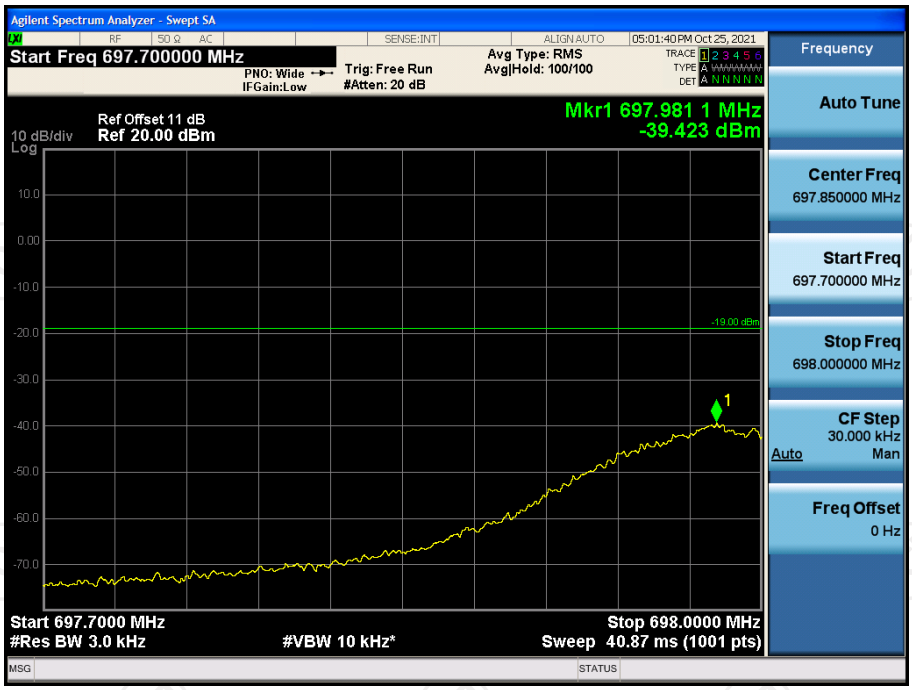


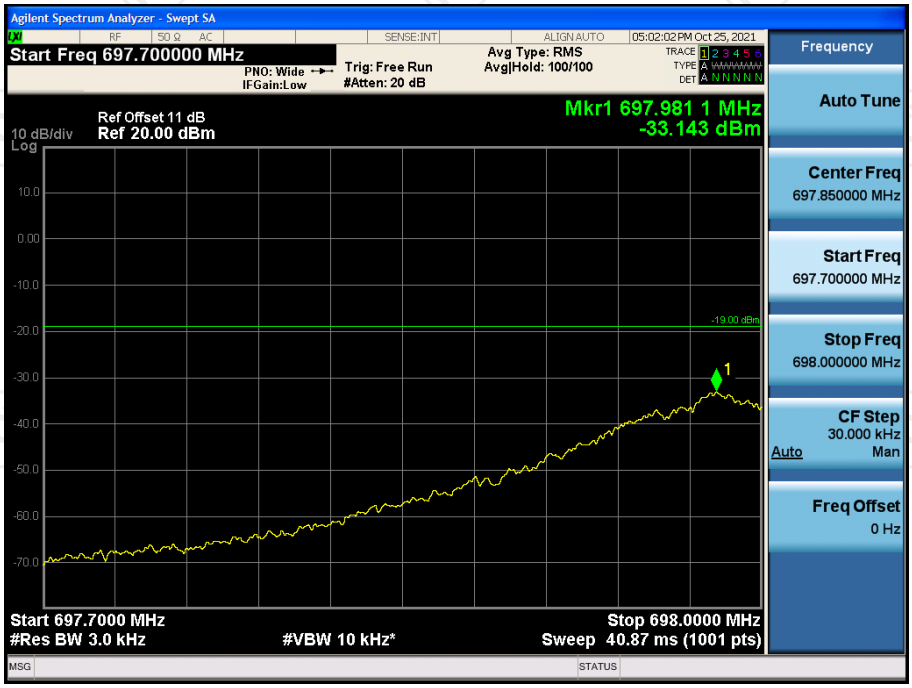
Cellular LTE DL Right Side Pre AGC+10dB



Lower700MHz GSM UL Left Side Pre AGC



Lower700MHz GSM UL Left Side Pre AGC+10dB



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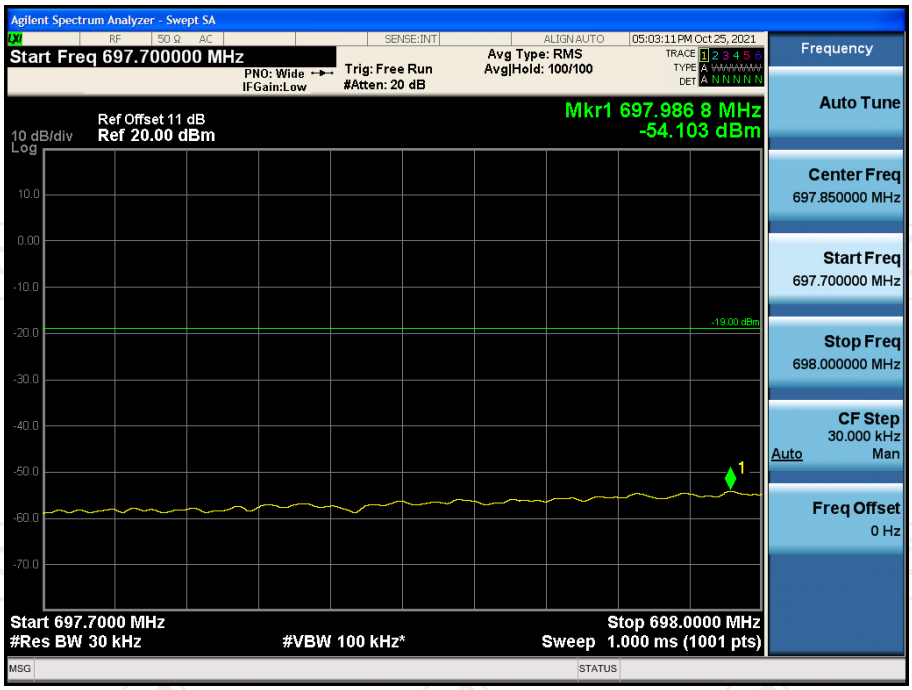
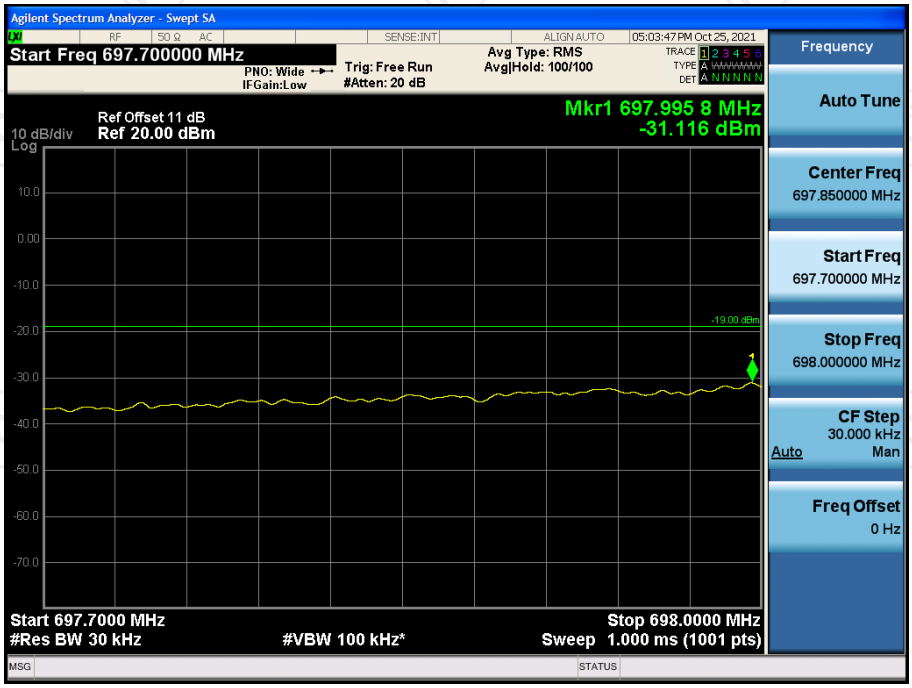
Lower700MHz GSM UL Right Side Pre AGC

Lower700MHz GSM UL Right Side Pre AGC+10dB

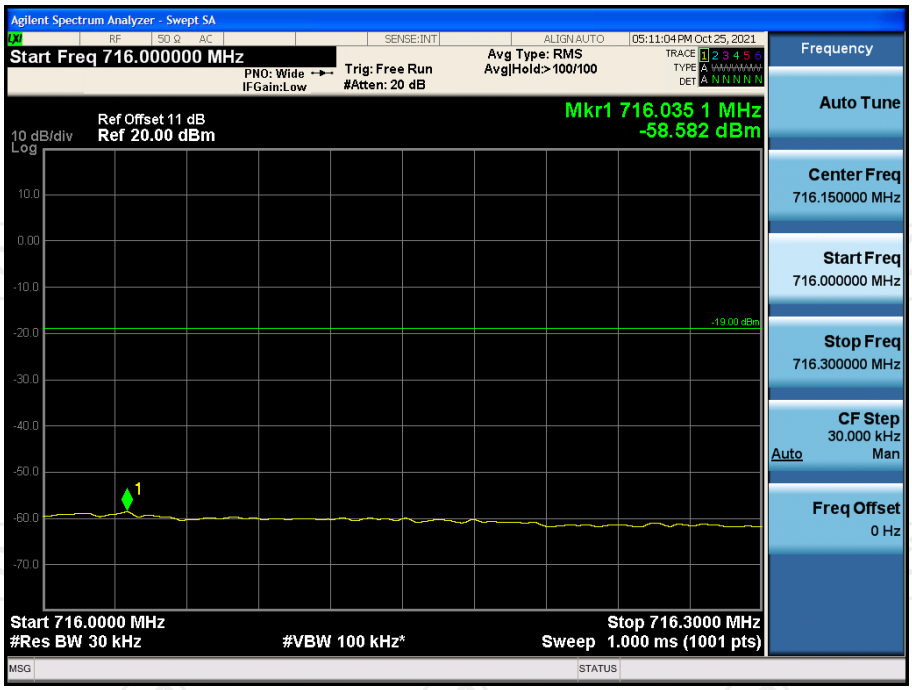
Lower700MHz CDMA UL Left Side Pre AGC



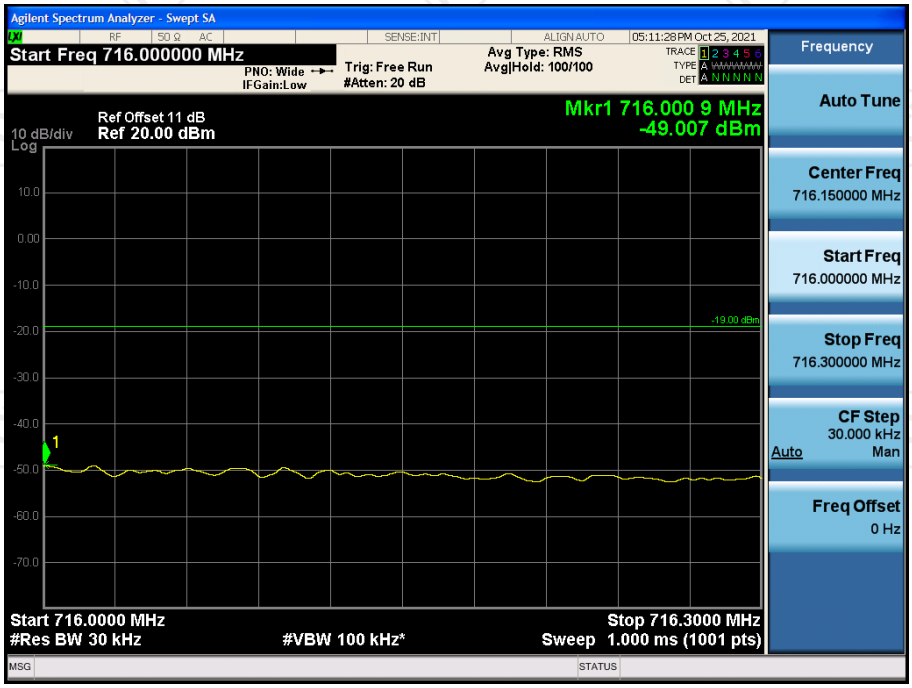
Lower700MHz CDMA UL Left Side Pre AGC+10dB



Lower700MHz CDMA UL Right Side Pre AGC

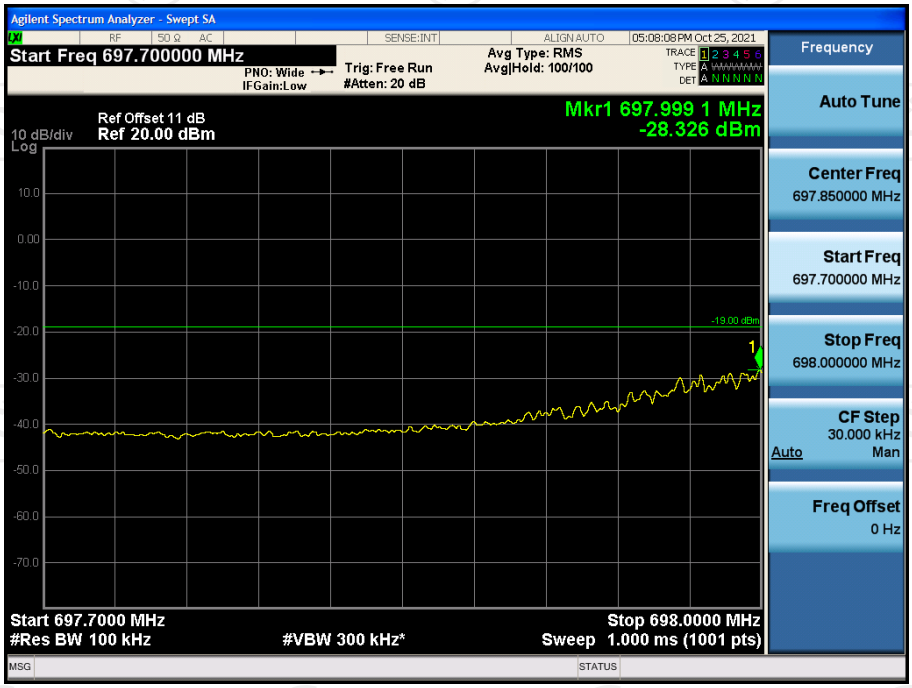


Lower700MHz CDMA UL Right Side Pre AGC+10dB



Lower700MHz LTE UL Left Side Pre AGC

Lower700MHz LTE UL Left Side Pre AGC+10dB



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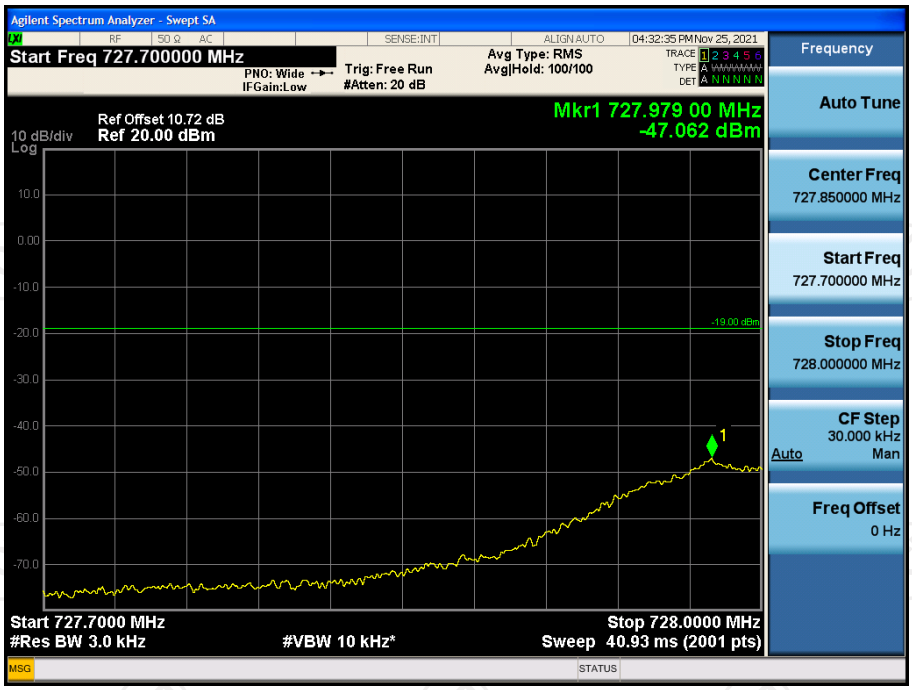
Lower700MHz LTE UL Right Side Pre AGC

Lower700MHz LTE UL Right Side Pre AGC+10dB

Lower700MHz GSM DL Left Side Pre AGC



Lower700MHz GSM DL Left Side Pre AGC+10dB

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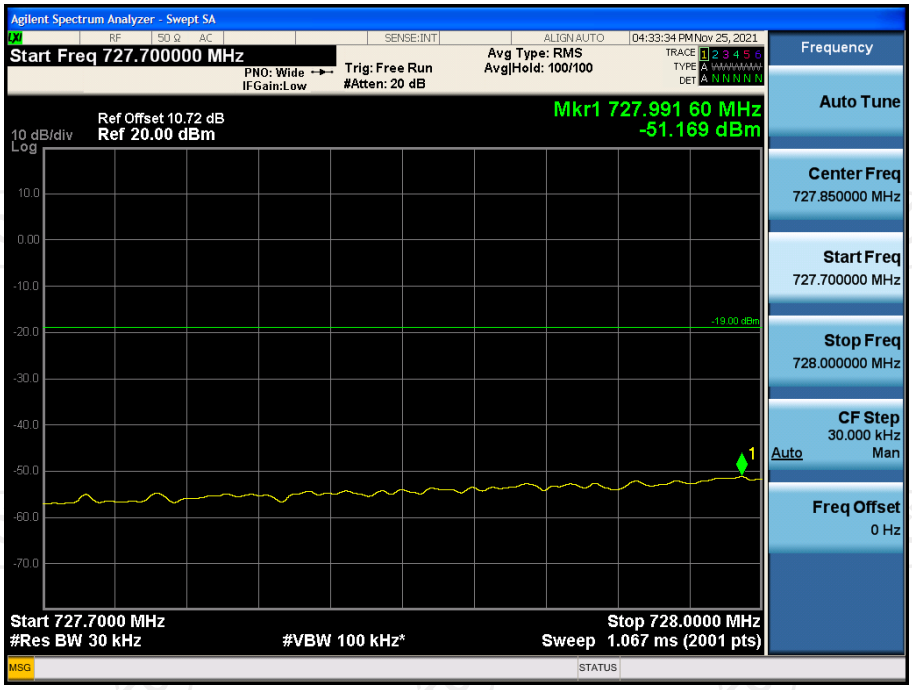
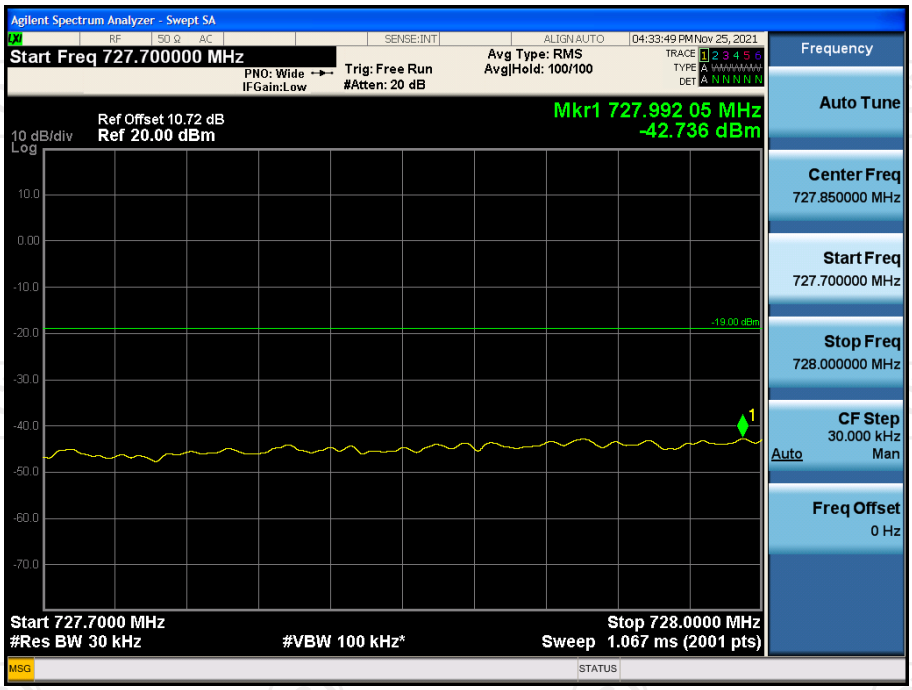
Lower700MHz GSM DL Right Side Pre AGC

Lower700MHz GSM DL Right Side Pre AGC+10dB

Lower700MHz CDMA DL Left Side Pre AGC



Lower700MHz CDMA DL Left Side Pre AGC+10dB



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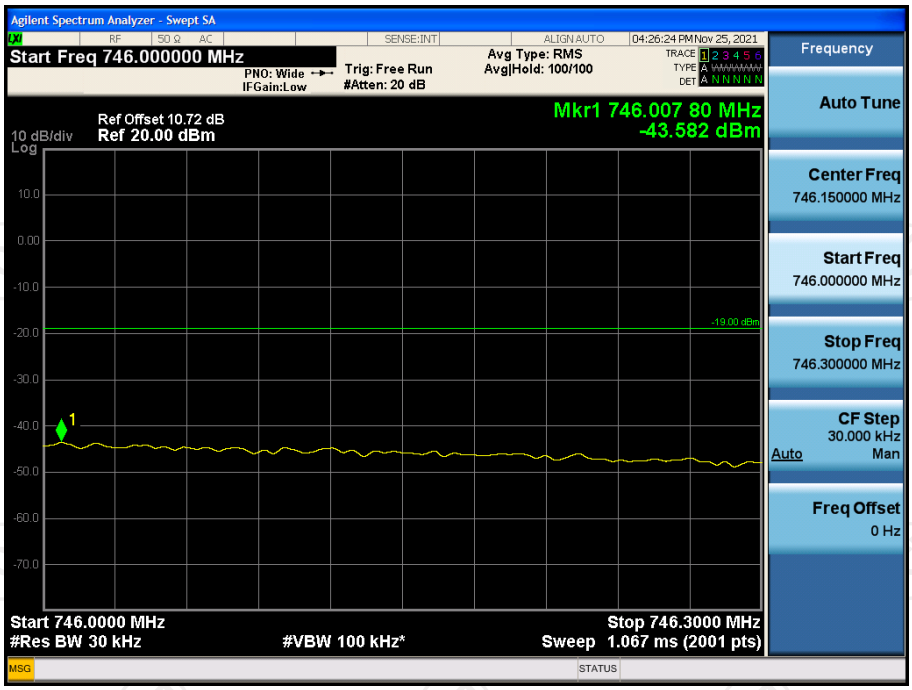
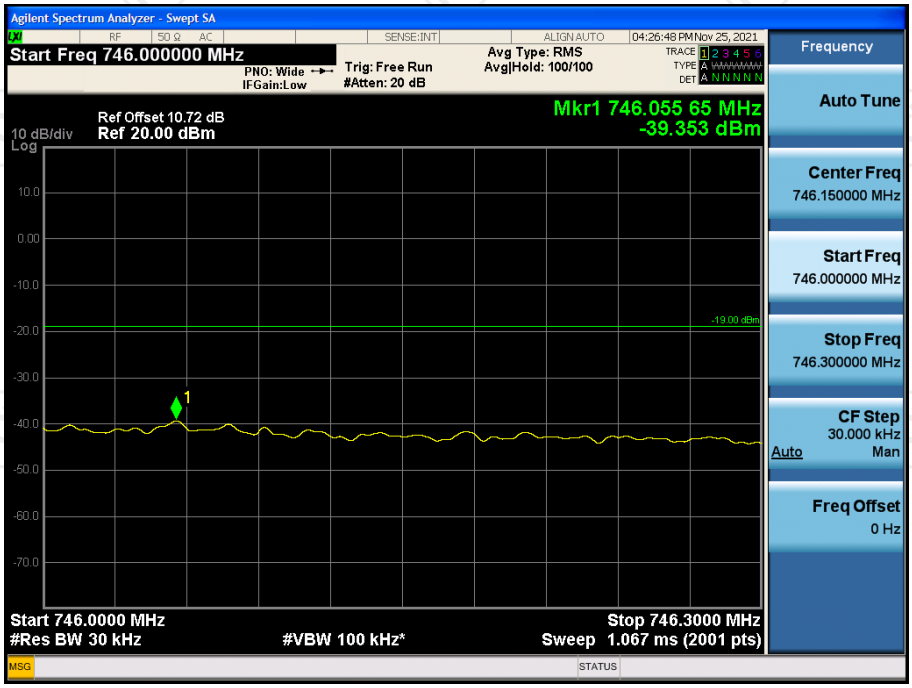
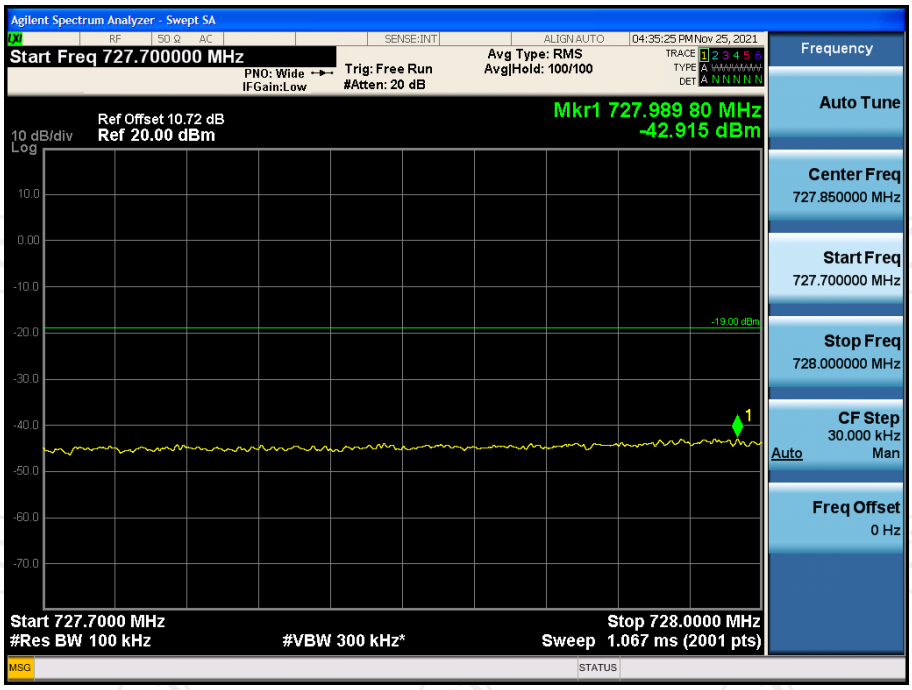
Lower700MHz CDMA DL Right Side Pre AGC



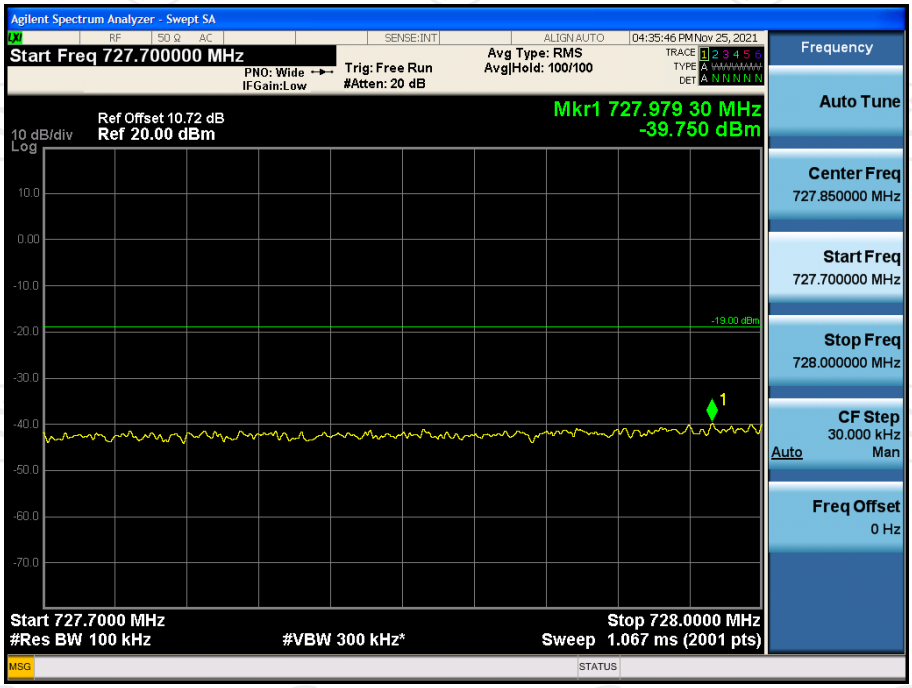
Lower700MHz CDMA DL Right Side Pre AGC+10dB



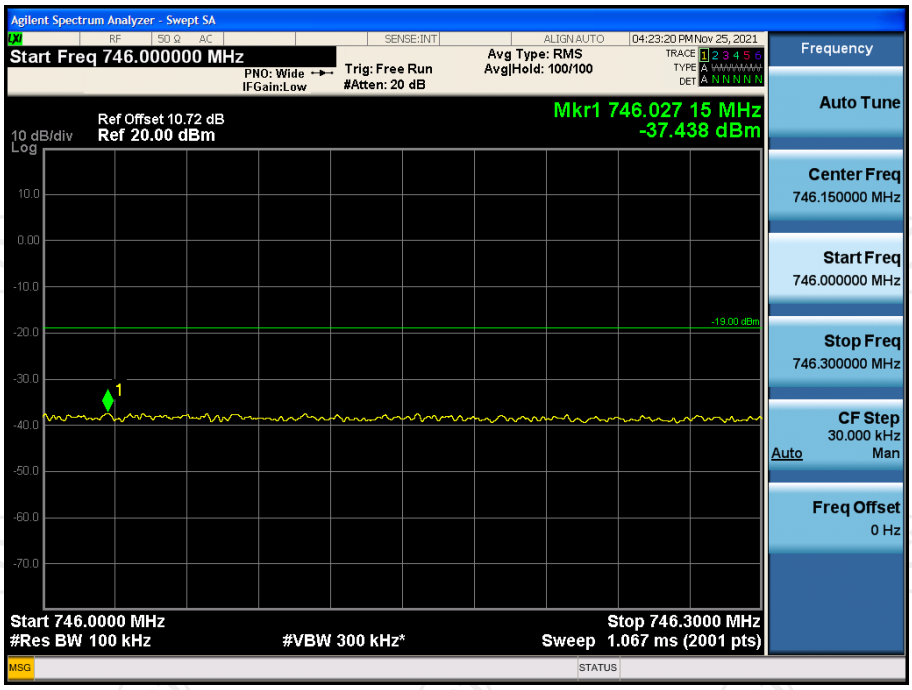
Lower700MHz LTE DL Left Side Pre AGC



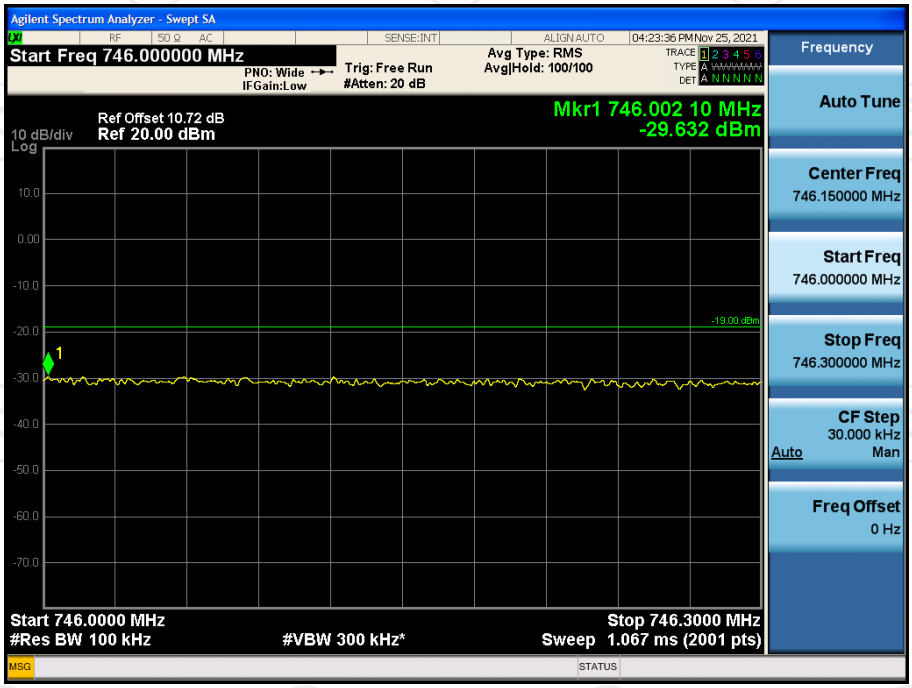
Lower700MHz LTE DL Left Side Pre AGC+10dB



Lower700MHz LTE DL Right Side Pre AGC



Lower700MHz LTE DL Right Side Pre AGC+10dB



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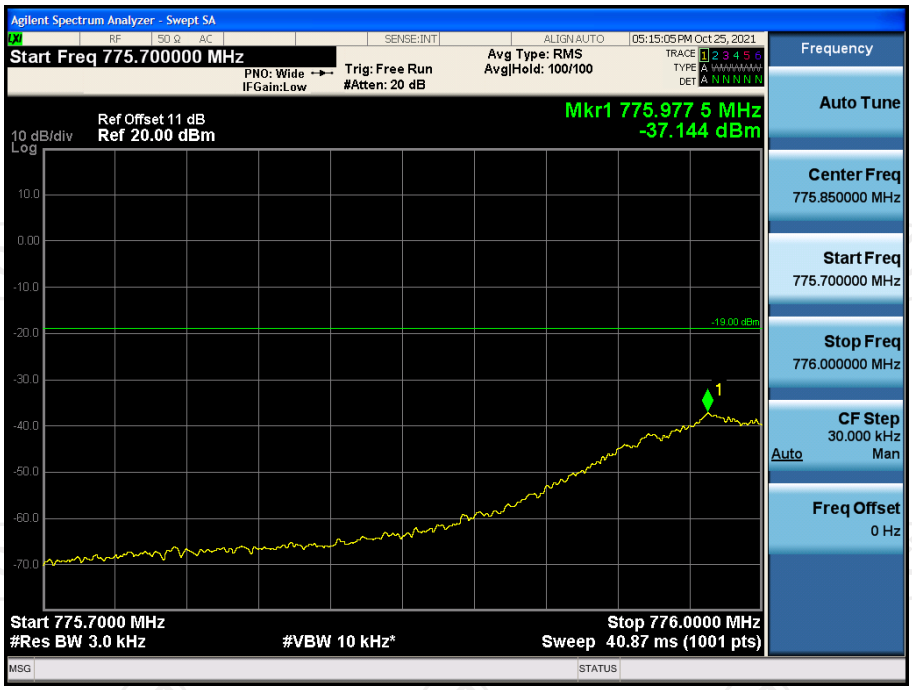
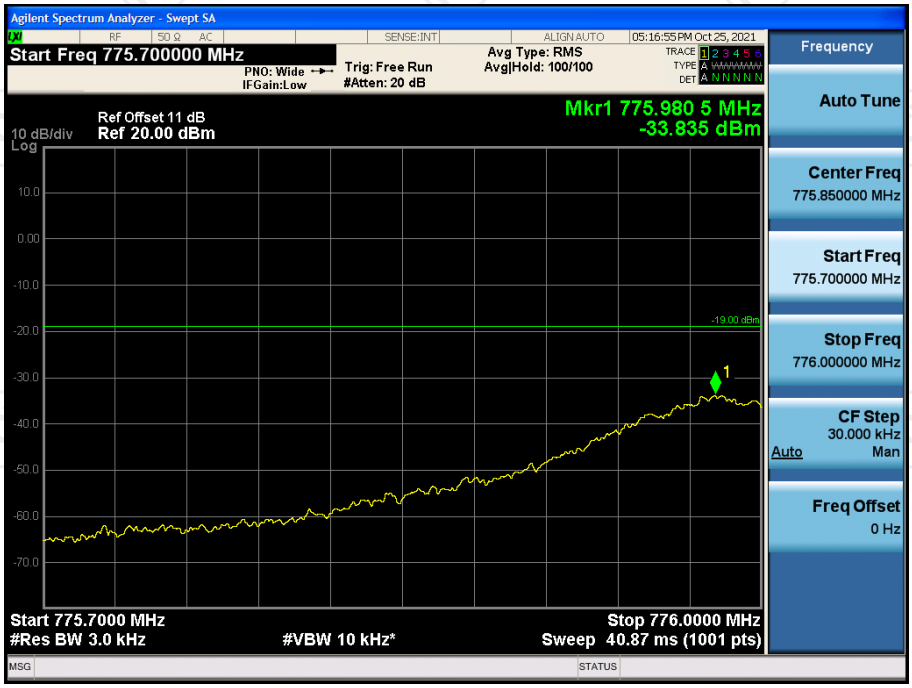
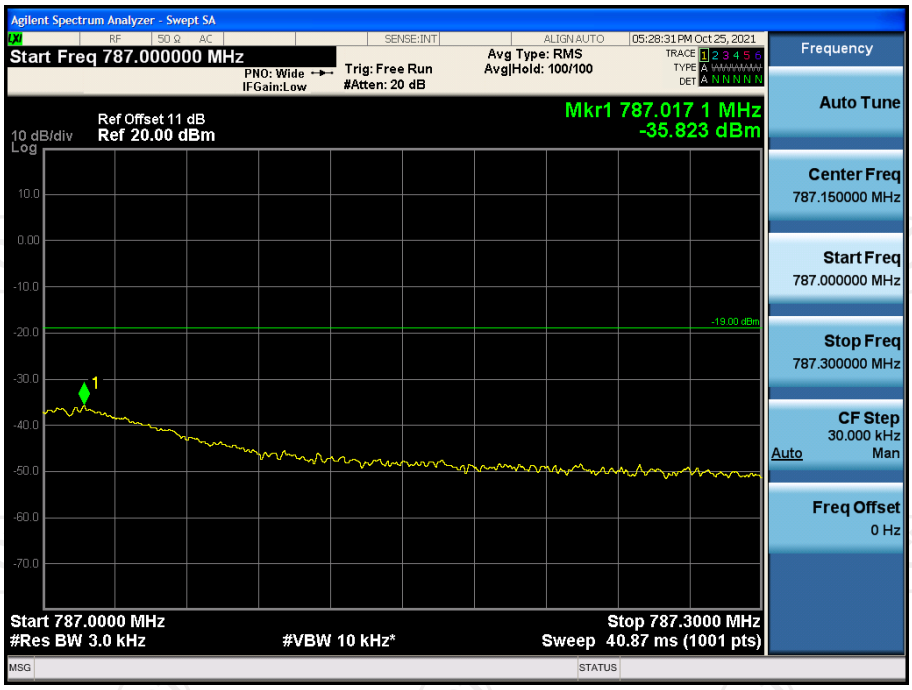
Upper700MHz GSM UL Left Side Pre AGC



Upper700MHz GSM UL Left Side Pre AGC+10dB

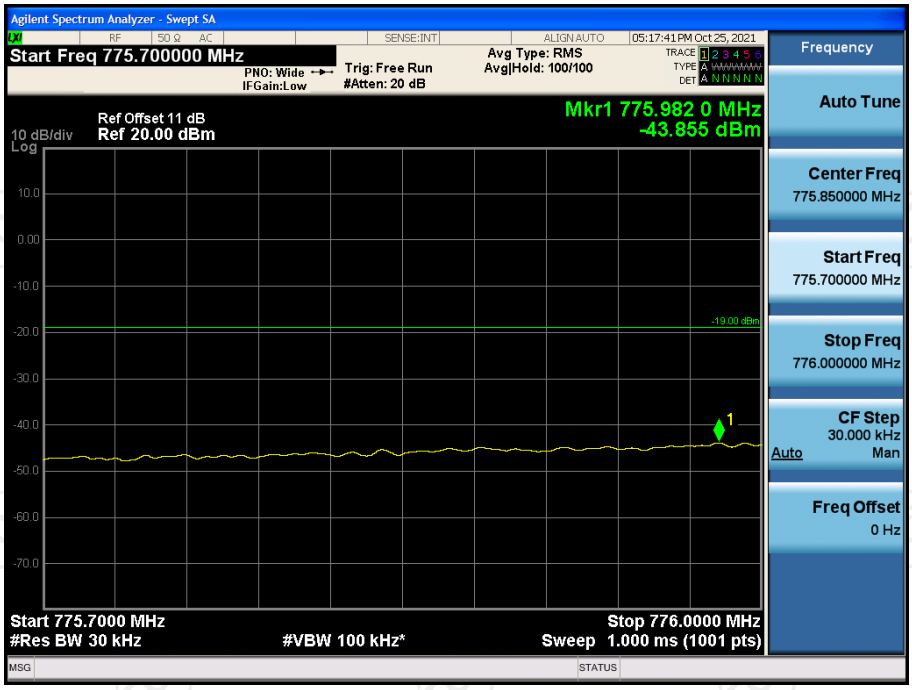


Upper700MHz GSM UL Right Side Pre AGC

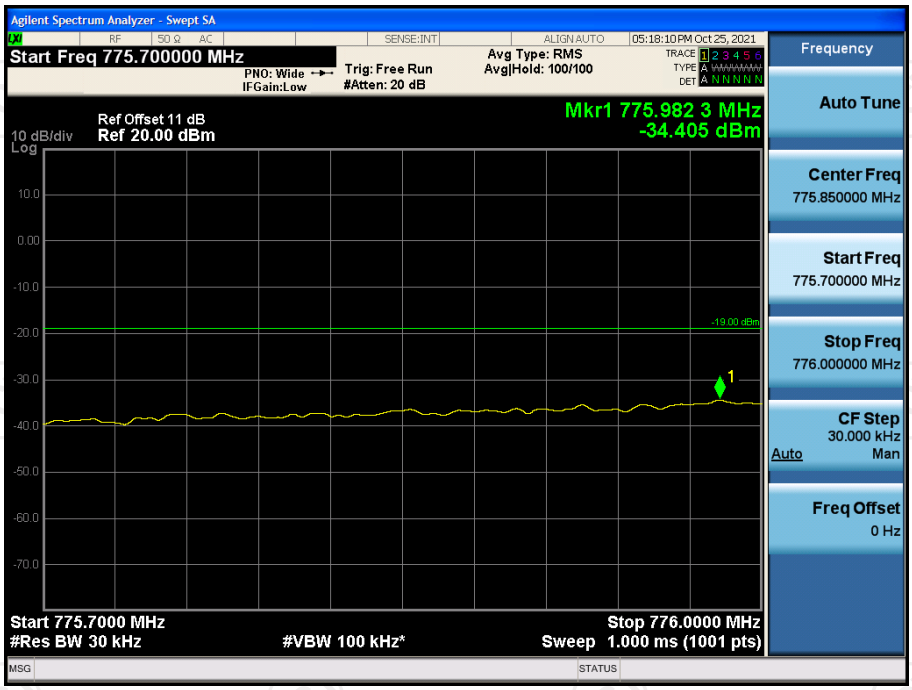


Upper700MHz GSM UL Right Side Pre AGC+10dB

Upper700MHz CDMA UL Left Side Pre AGC



Upper700MHz CDMA UL Left Side Pre AGC+10dB



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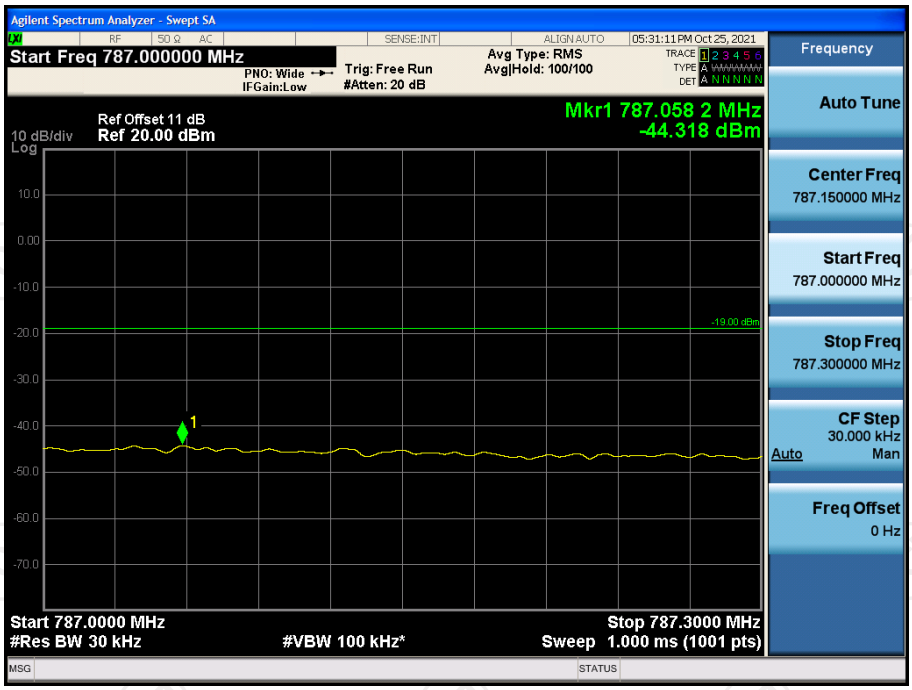
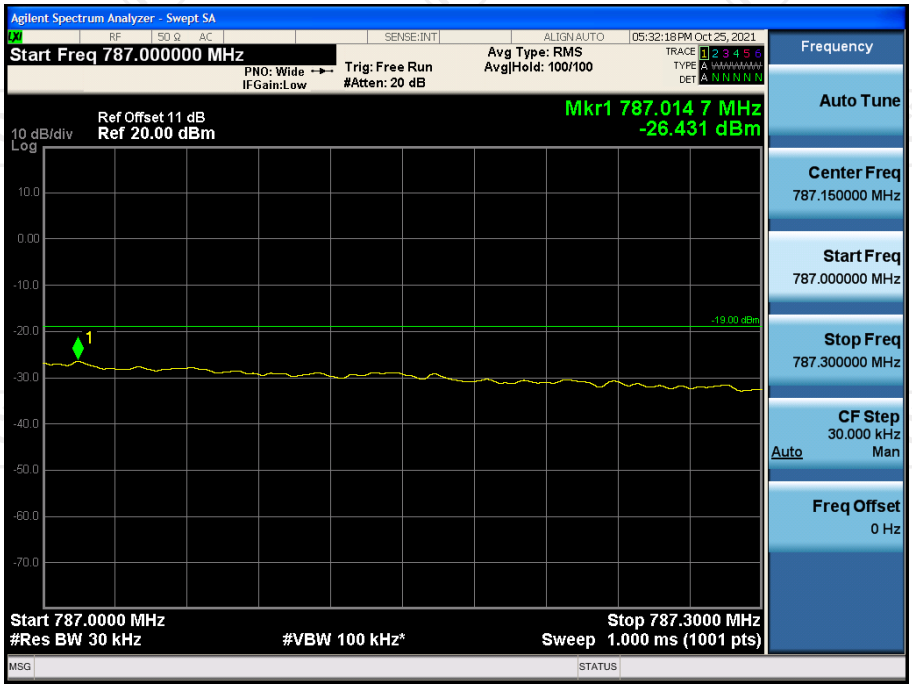
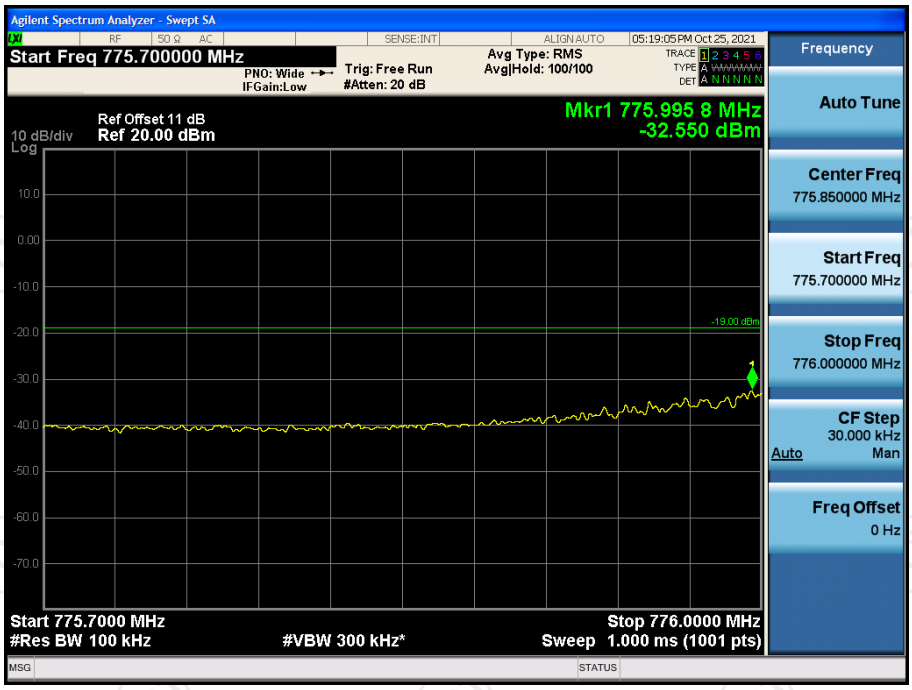
Upper700MHz CDMA UL Right Side Pre AGC



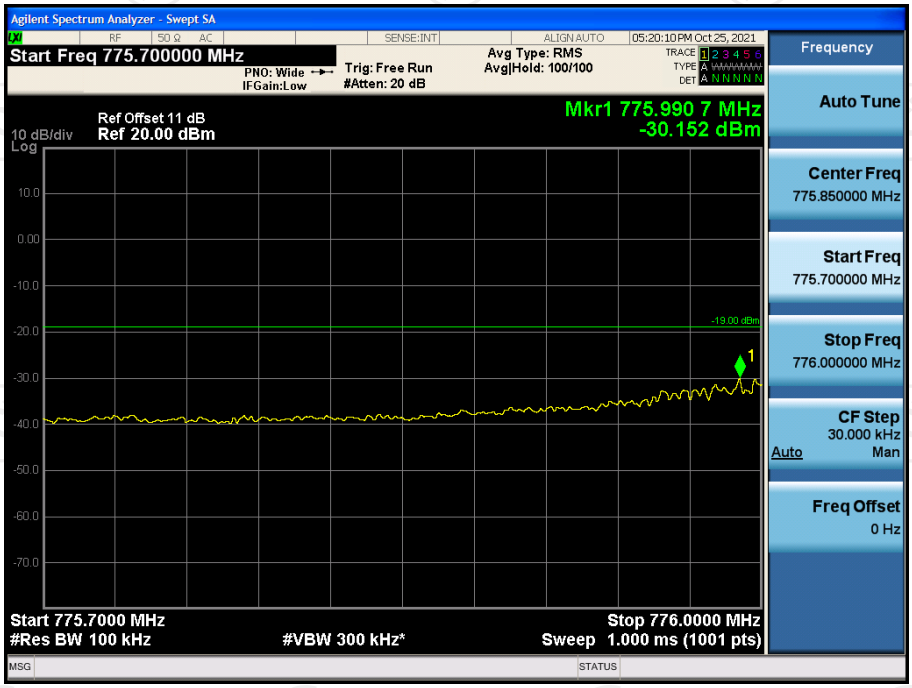
Upper700MHz CDMA UL Right Side Pre AGC+10dB



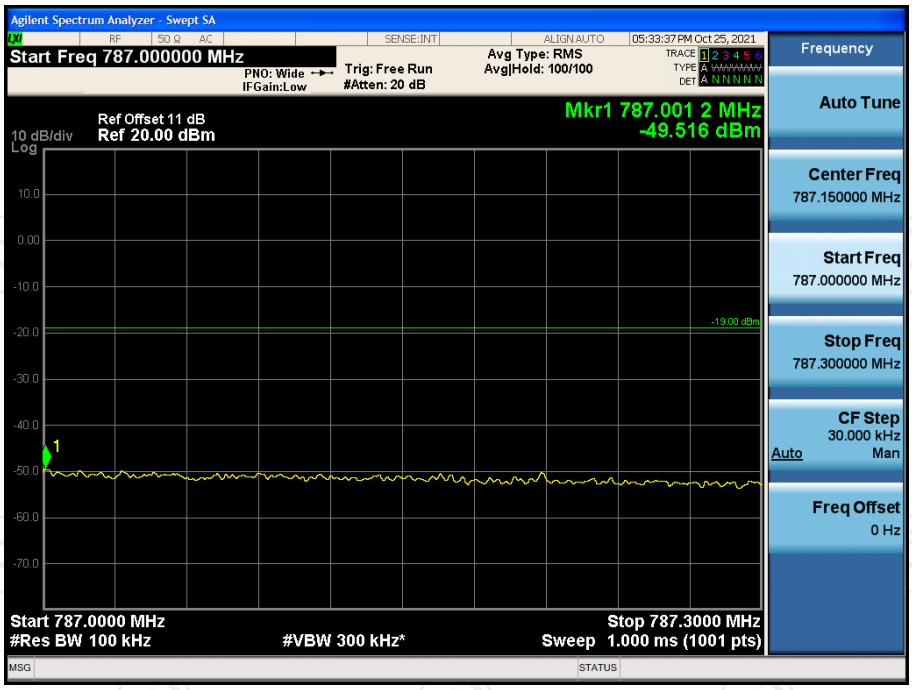
Upper700MHz LTE UL Left Side Pre AGC



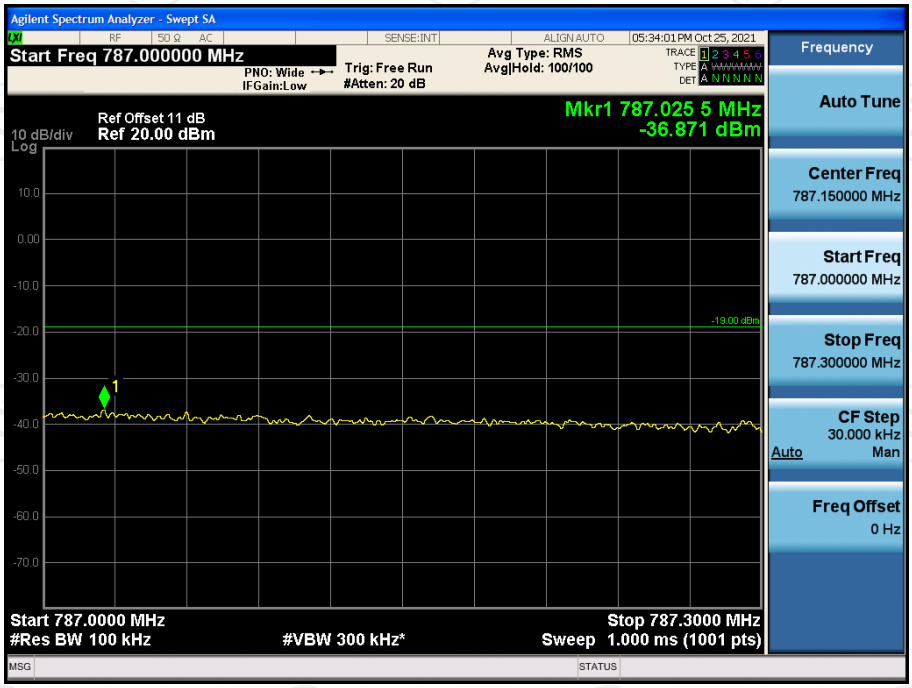
Upper700MHz LTE UL Left Side Pre AGC+10dB



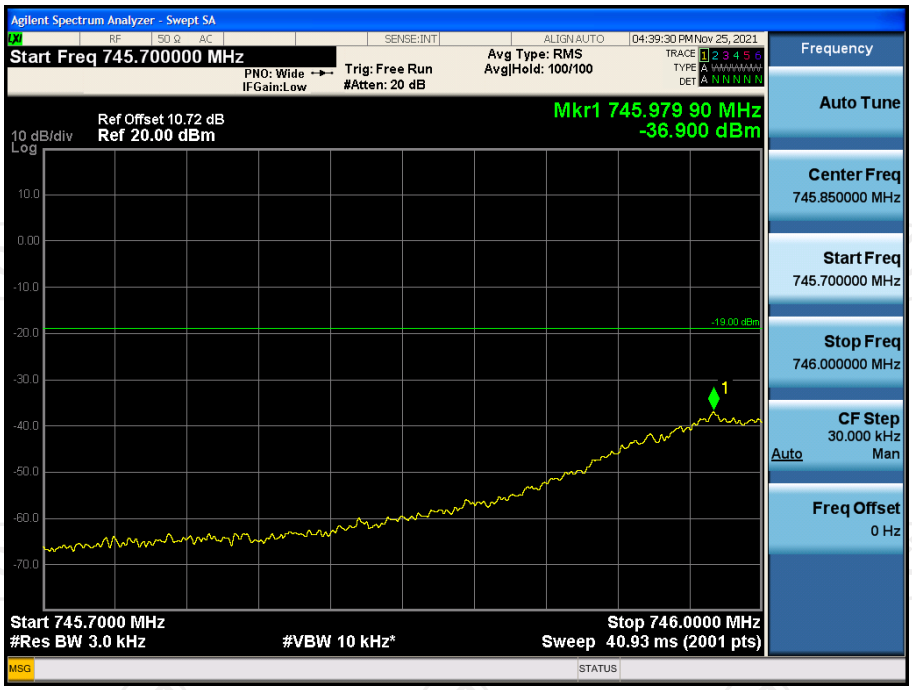
Upper700MHz LTE UL Right Side Pre AGC



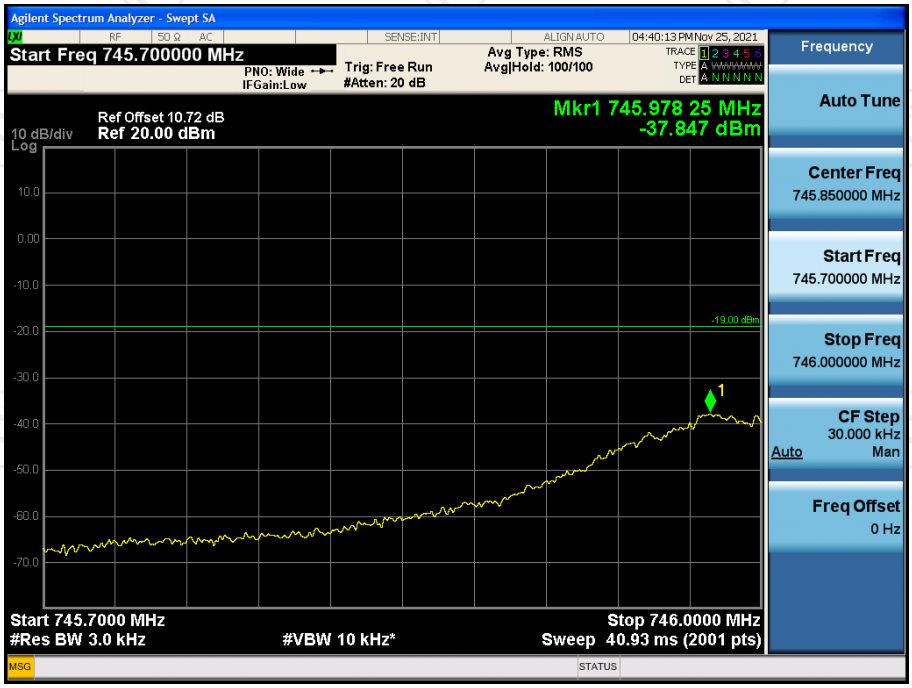
Upper700MHz LTE UL Right Side Pre AGC+10dB



Upper700MHz GSM DL Left Side Pre AGC



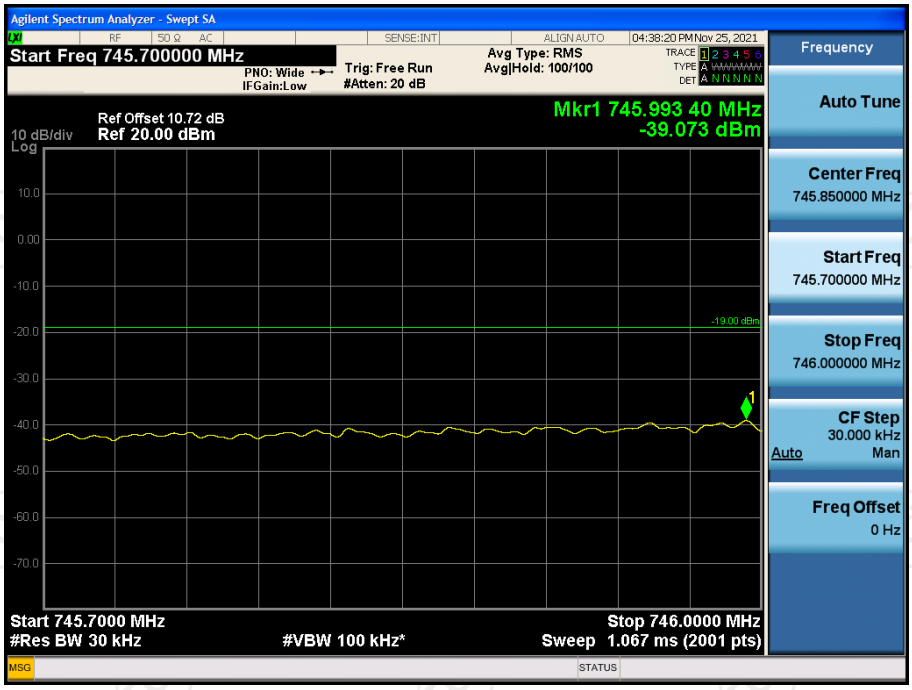
Upper700MHz GSM DL Left Side Pre AGC+10dB



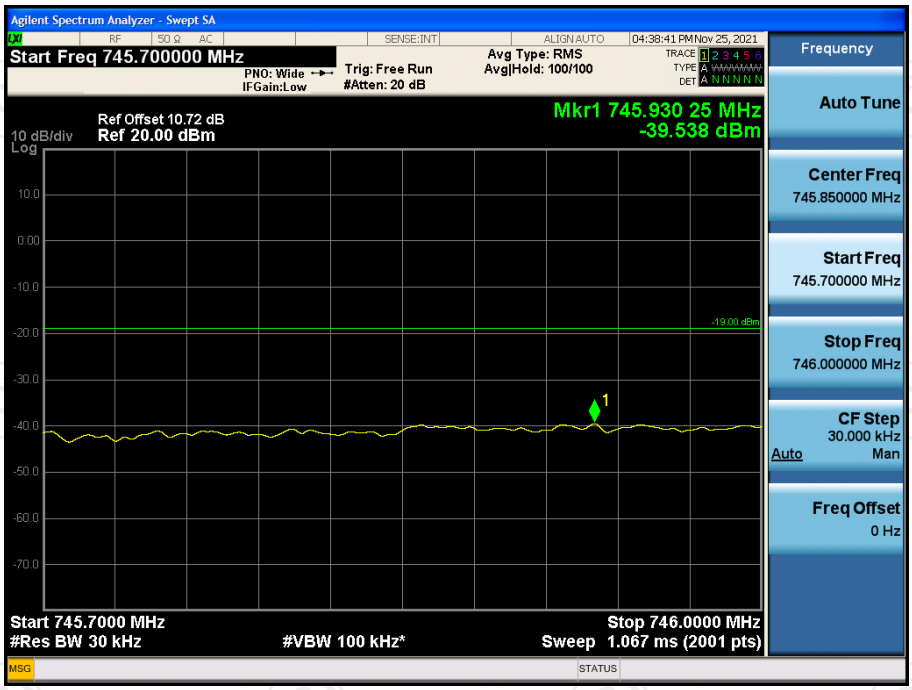
Upper700MHz GSM DL Right Side Pre AGC

Upper700MHz GSM DL Right Side Pre AGC+10dB

Upper700MHz CDMA DL Left Side Pre AGC



Upper700MHz CDMA DL Left Side Pre AGC+10dB



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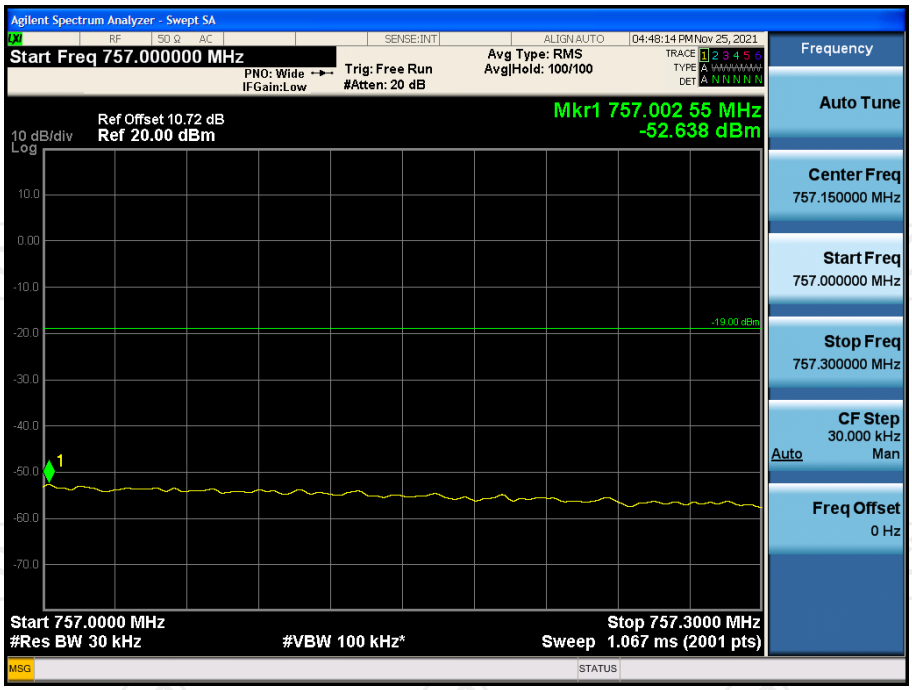
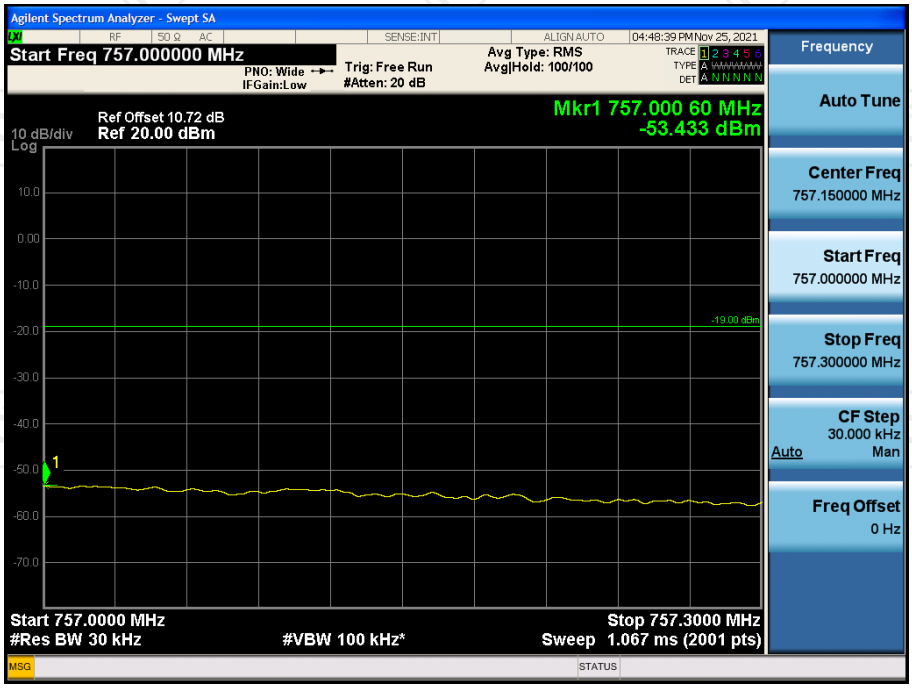
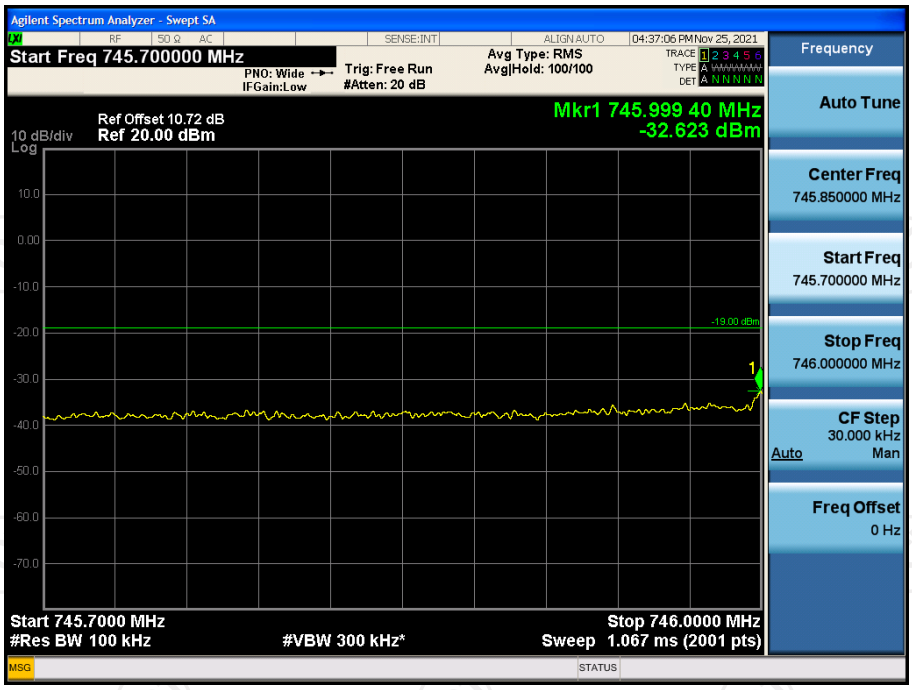
Upper700MHz CDMA DL Right Side Pre AGC



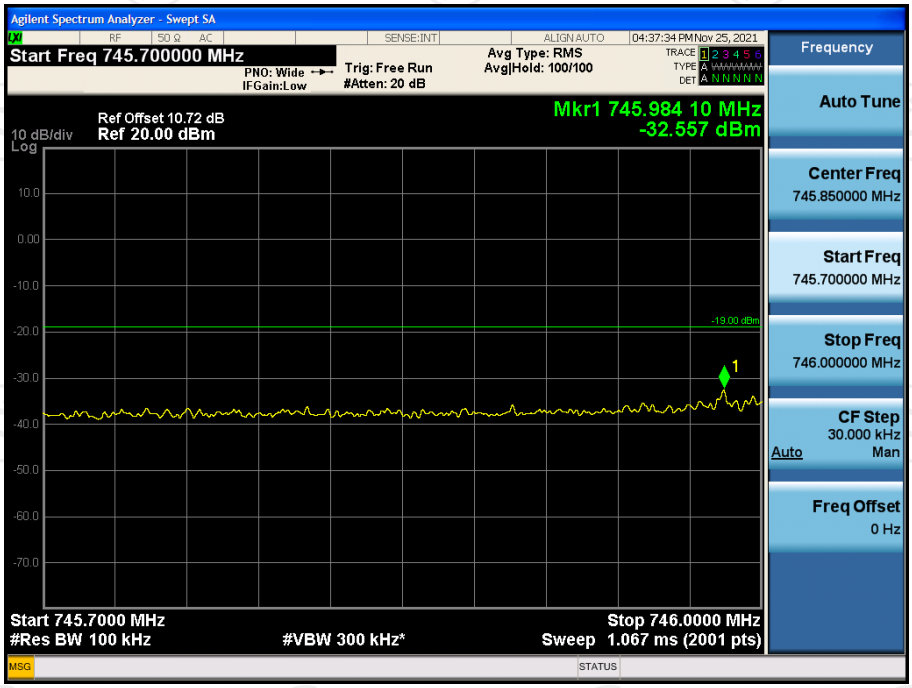
Upper700MHz CDMA DL Right Side Pre AGC+10dB



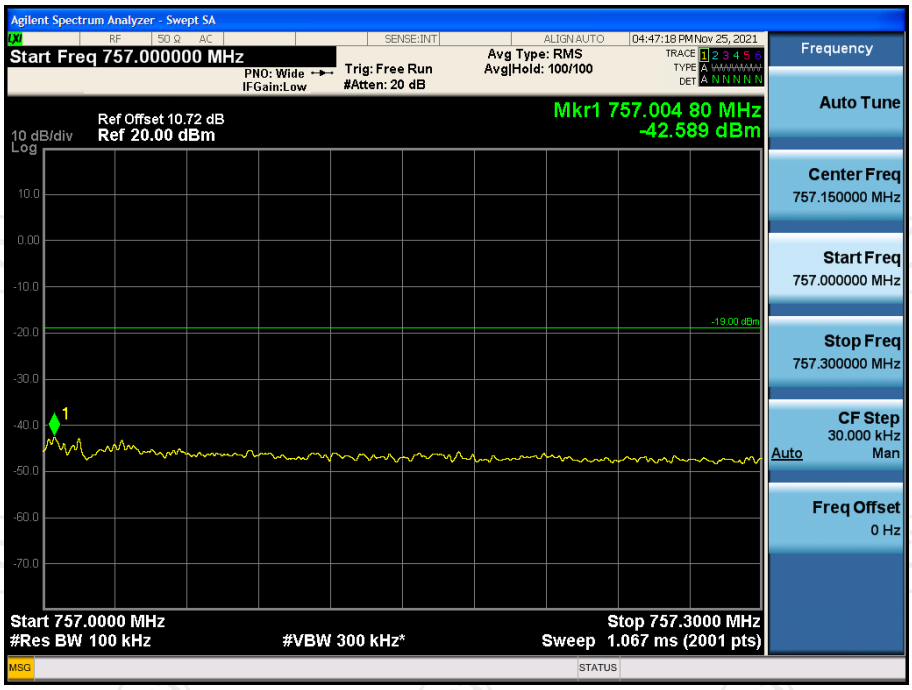
Upper700MHz LTE DL Left Side Pre AGC



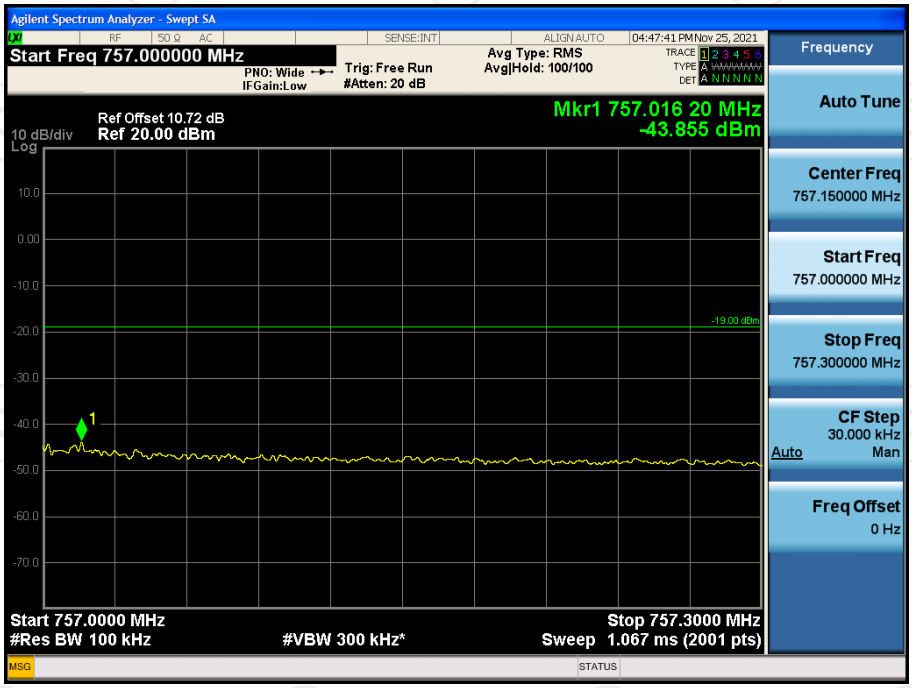
Upper700MHz LTE DL Left Side Pre AGC+10dB



Upper700MHz LTE DL Right Side Pre AGC



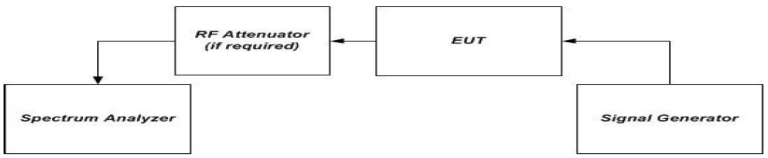
Upper700MHz LTE DL Right Side Pre AGC+10dB



Note: *Three cable lengths: shortest (50 foot), medium (100 foot), and longest (150 foot) cable lengths that are have been used in the test, only the worst case in shortest (50 foot) cable length reported.*

5.5. Conducted Spurious Emission

5.5.1. Test Specification

Test Requirement:	FCC Part2 Section 1051; FCC Rules Part 27 Subpart C, Section 27.53
Test Method:	KDB 935210 D03 Signal Booster Measurements v04r04
Limit:	-13 dBm
Test Setup:	
Test Procedure:	a) Connect the EUT to the test equipment as shown in Set-Up. Begin with the uplink output connected to the spectrum analyzer. b) Configure the signal generator for AWGN with a 99% occupied bandwidth of 4.1 MHz operation with a center frequency corresponding to the center of the CMRS band under test. c) Set the signal generator amplitude to the level determined in the power measurement procedure in Maximum power. d) Turn on the signal generator RF output and measure the spurious emission power levels with an appropriate measurement instrument as follows. e) Set RBW = measurement bandwidth specified in the applicable rule section for the operational frequency band under consideration (see Annex A for relevant cross-references). Note that many of the individual rule sections permit the use of a narrower RBW (typically ≥ 1% of the emission bandwidth) to enhance measurement accuracy, but the result must then be integrated over the specified measurement bandwidth. f) Set VBW = 3 X RBW. g) Select the power averaging (RMS) detector. (See above note regarding the use of a peak detector for preliminary measurements.) h) Sweep time = auto-couple. i) Set the analyzer start frequency to the lowest radio frequency signal generated in the equipment, without going below 9 kHz, and the stop frequency to the lower band/block edge frequency minus 100 kHz or 1 MHz, as specified in the applicable rule part. Note that the number of measurement points in each sweep must be ≥ (2 X span/RBW) which may require that the measurement range defined by the start and stop frequencies above be subdivided, depending on the available number of measurement points provided by the spectrum analyzer. Trace average at least 10 traces in power averaging (i.e., RMS) mode. j) Use the peak marker function to identify the highest amplitude level over each measured frequency range Record the frequency and amplitude and capture a Test Plots for inclusion in the test report. k) Reset the analyzer start frequency to the upper band/block edge frequency plus 100 kHz or 1 MHz, as specified in the applicable rule part, and the analyzer stop frequency to 10 times the highest frequency of the fundamental emission. Note that the number of measurement points in each sweep must be ≥ (2 X span/RBW) which may require that the measurement range defined by the start and stop frequencies above be subdivided, depending on the available number of measurement points provided by the

	spectrum analyzer. l) Use the peak marker function to identify the highest amplitude level over each of the measured frequency ranges. Record the frequency and amplitude and capture a Test Plots for inclusion in the test report. m) Repeat steps b) through l) for each supported frequency band of operation.
Test Result:	PASS

5.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182A	MY47070282	Jul. 19, 2021	Jul. 18, 2022
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 19, 2021	Jul. 18, 2022
Attenuator	50FP-006-H3	JFW	907763	N/A	N/A

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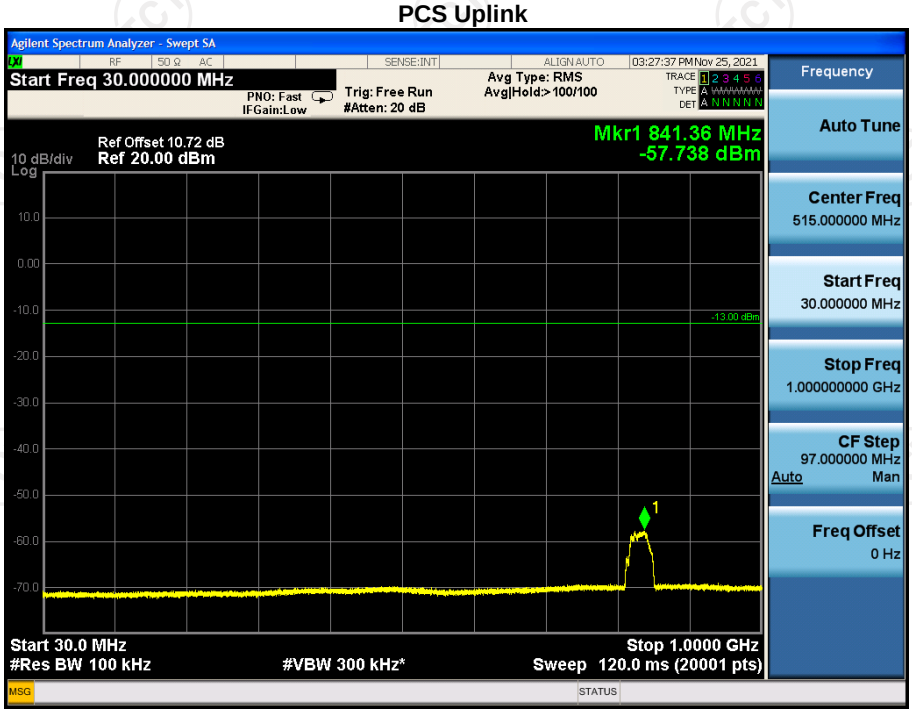
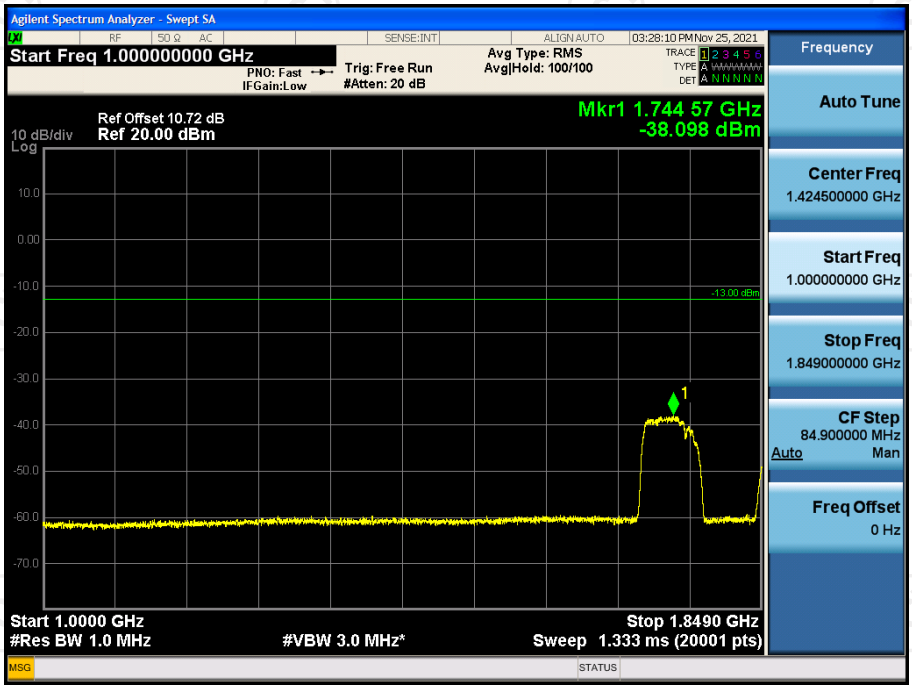
5.5.3. Test data

Test Plots

PCS Uplink





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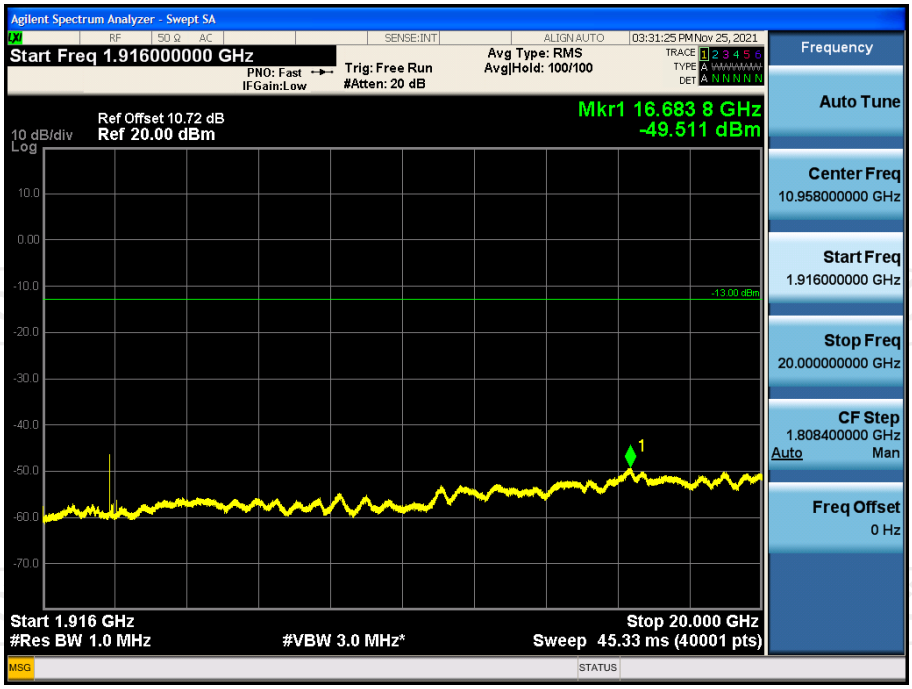
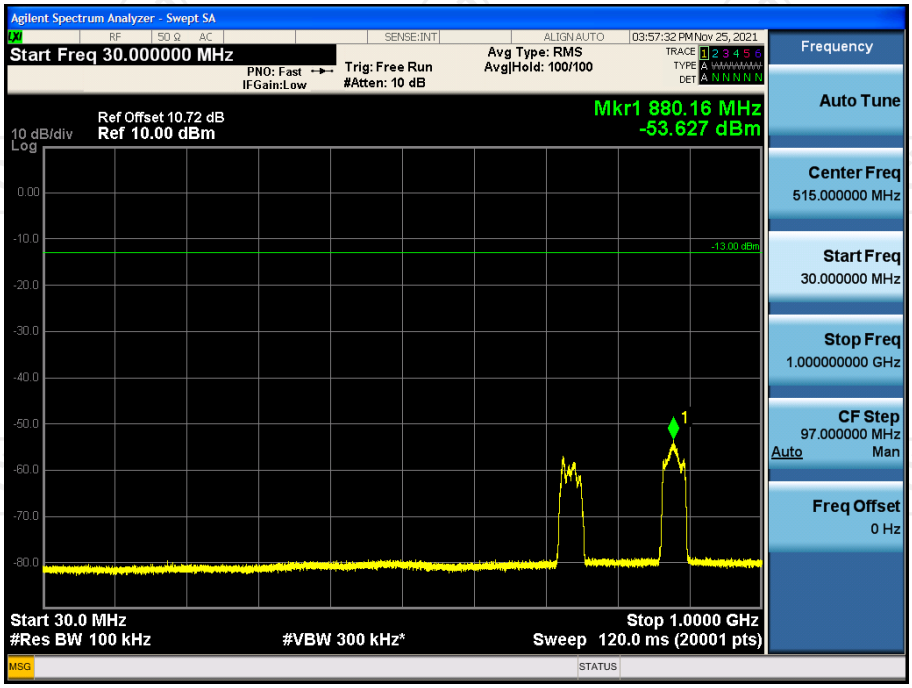
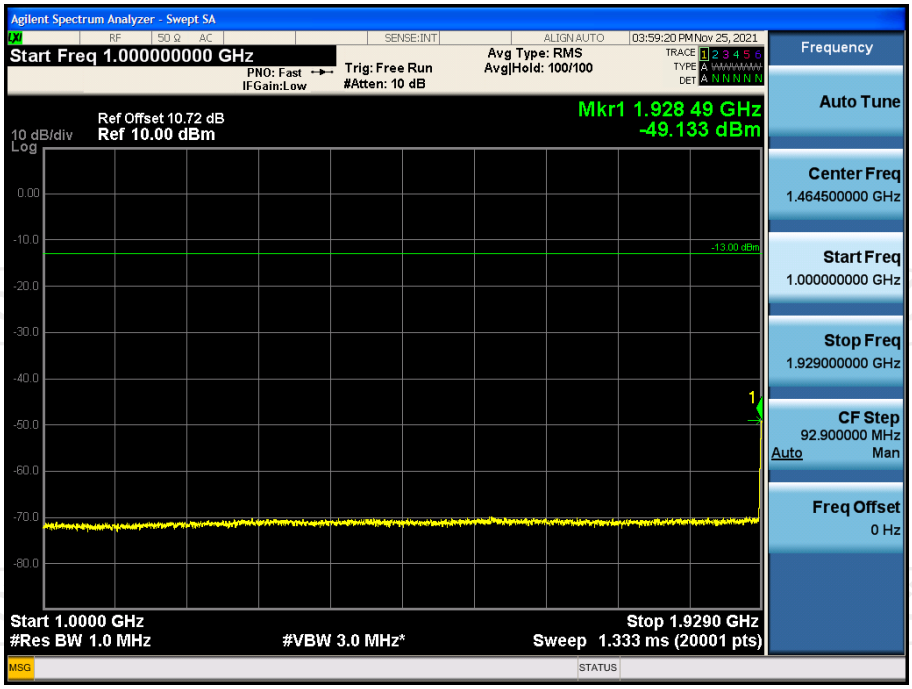
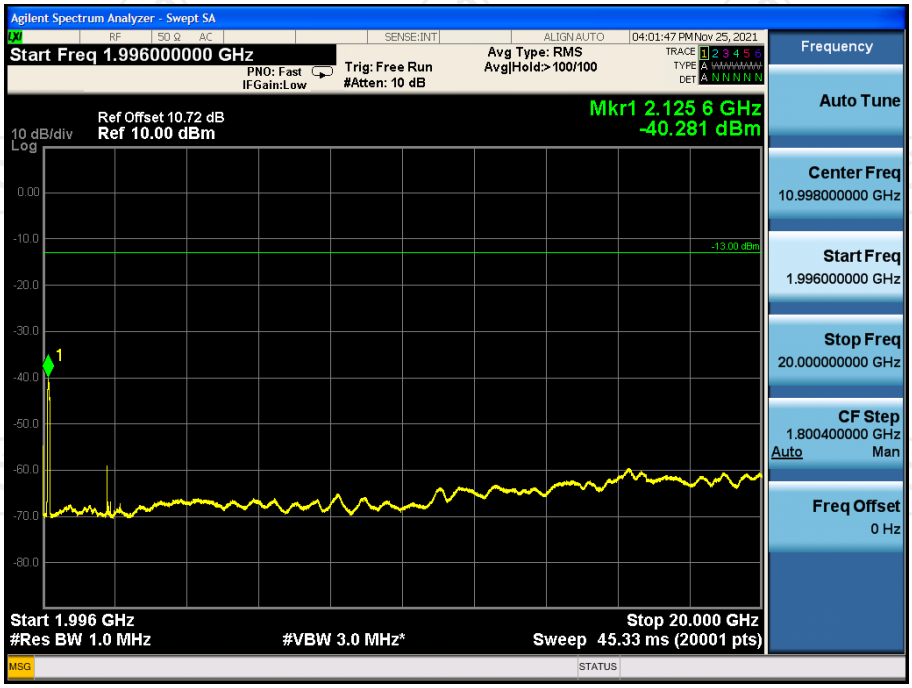


PCS Downlink

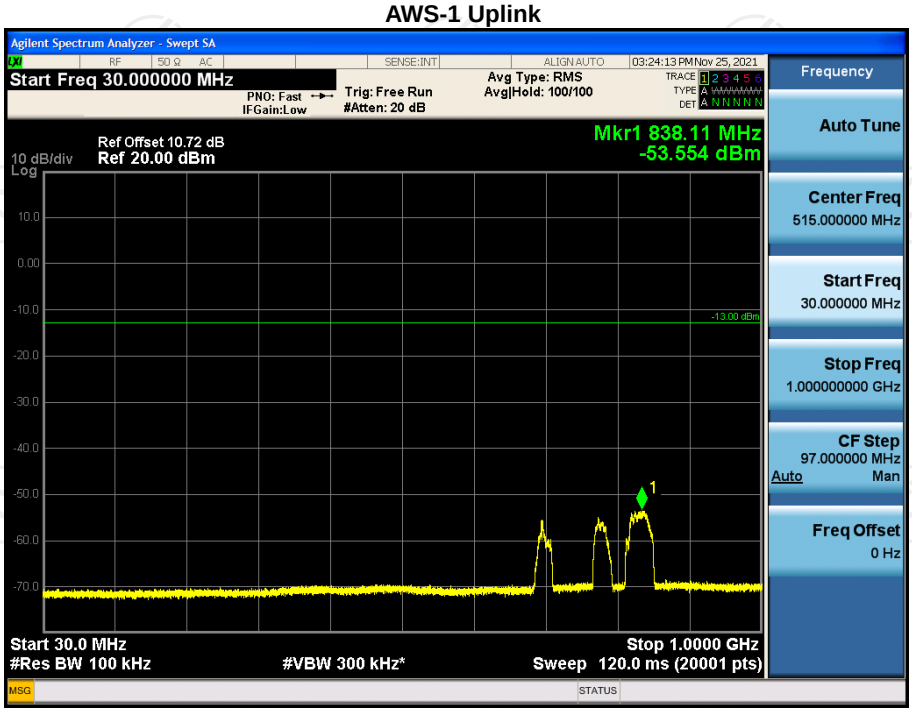


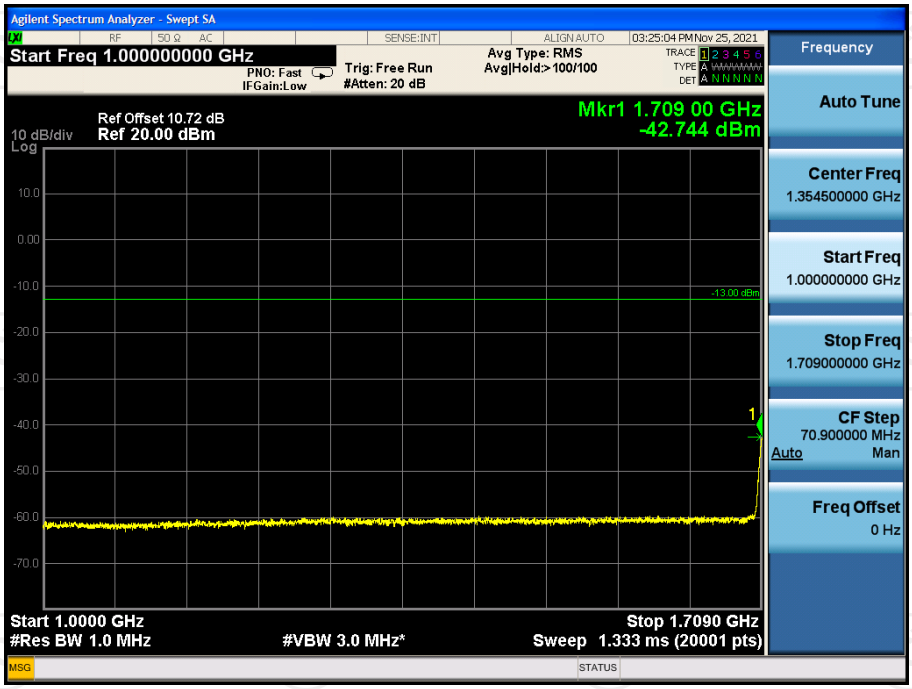

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:59:20 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 1.928 49 GHz
-49.133 dBm
-13.00 dBm
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 1.9290 GHz
Sweep 1.333 ms (20001 pts)
Frequency
Auto Tune
Center Freq
1.464500000 GHz
Start Freq
1.000000000 GHz
Stop Freq
1.929000000 GHz
CF Step
92.900000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.996000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold:>100/100
04:01:47 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.125 6 GHz
-40.281 dBm
-13.00 dBm
Start 1.996 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 20.000 GHz
Sweep 45.33 ms (20001 pts)
Frequency
Auto Tune
Center Freq
10.998000000 GHz
Start Freq
1.996000000 GHz
Stop Freq
20.000000000 GHz
CF Step
1.800400000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Plots

AWS-1 Uplink





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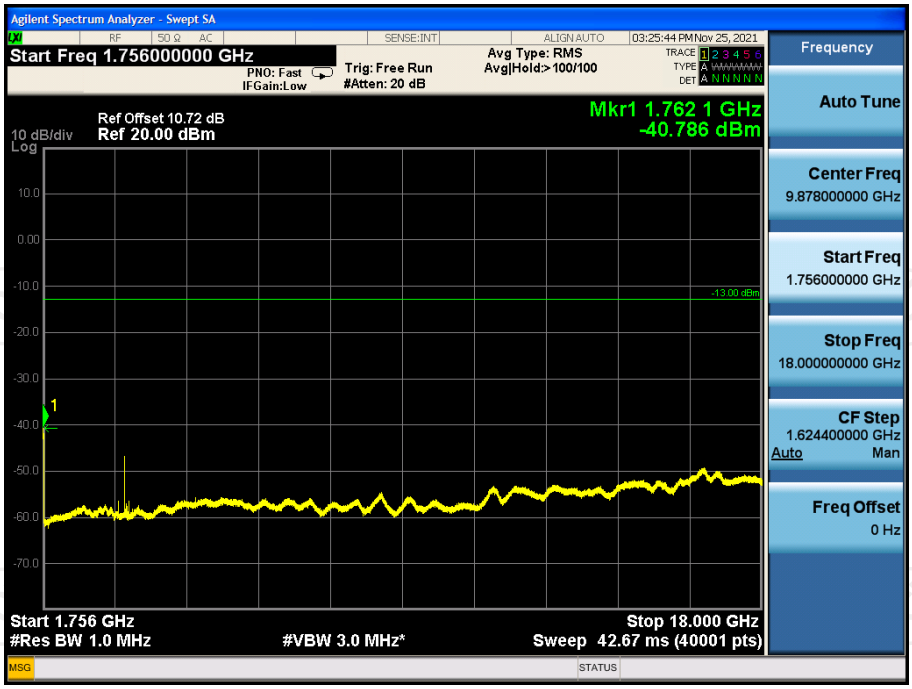
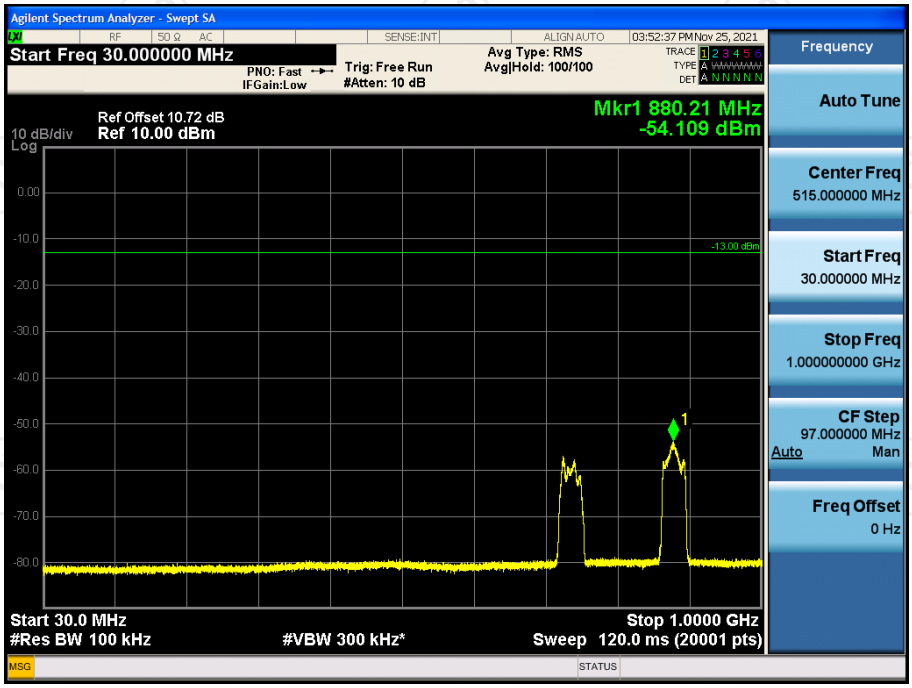


AWS-1 Downlink



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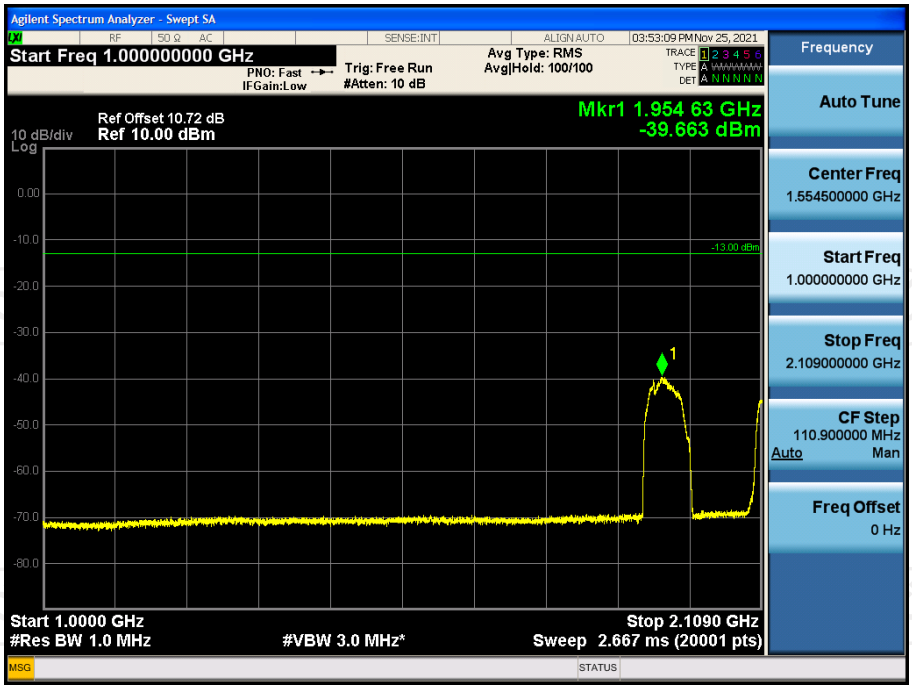
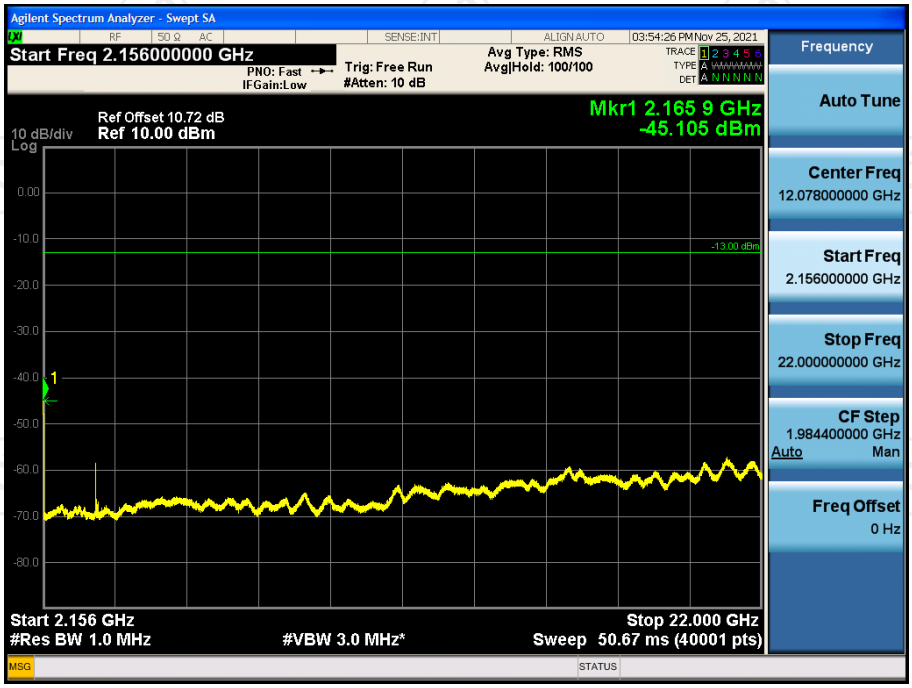
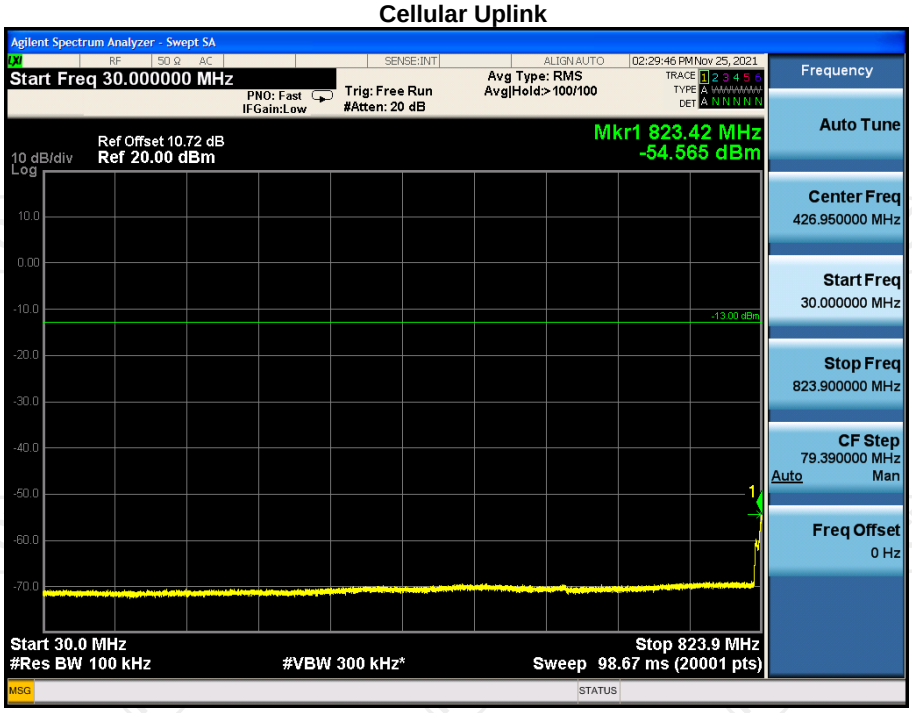
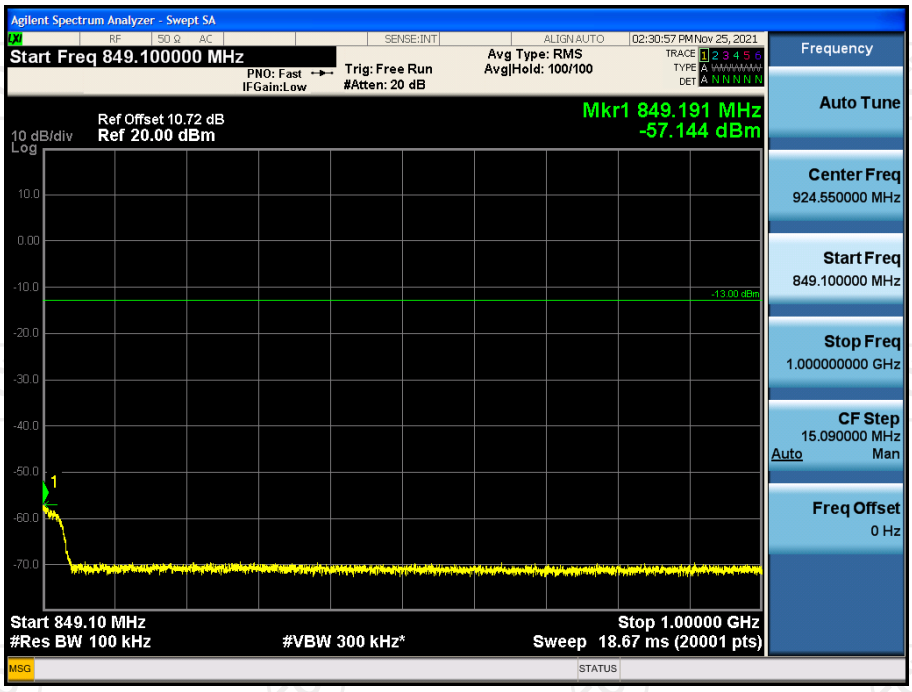

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:53:09 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 1.954 63 GHz
-39.663 dBm
-13.00 dBm
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 2.1090 GHz
Sweep 2.667 ms (20001 pts)
Frequency
Auto Tune
Center Freq
1.554500000 GHz
Start Freq
1.000000000 GHz
Stop Freq
2.109000000 GHz
CF Step
110.900000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

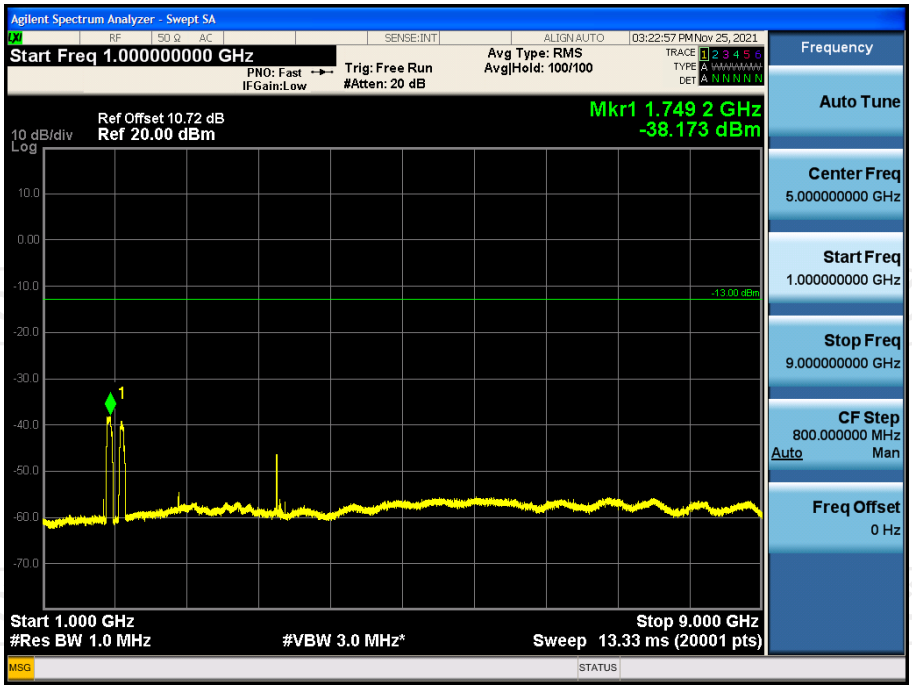

Agilent Spectrum Analyzer - Swept SA
Start Freq 2.156000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:54:26 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.165 9 GHz
-45.105 dBm
-13.00 dBm
Start 2.156 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 22.000 GHz
Sweep 50.67 ms (40001 pts)
Frequency
Auto Tune
Center Freq
12.078000000 GHz
Start Freq
2.156000000 GHz
Stop Freq
22.000000000 GHz
CF Step
1.984400000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Plots

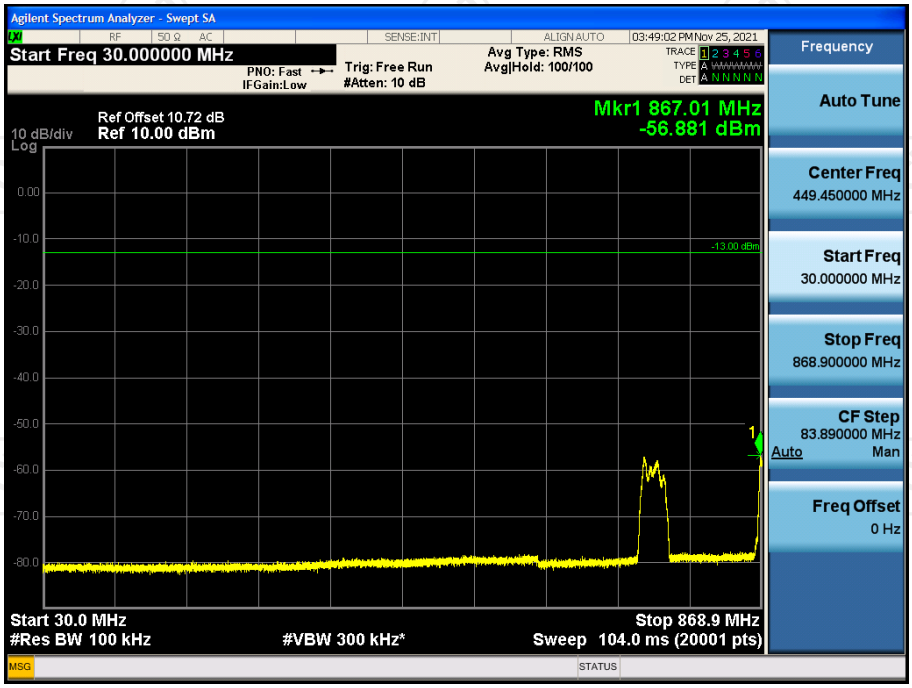
Cellular Uplink

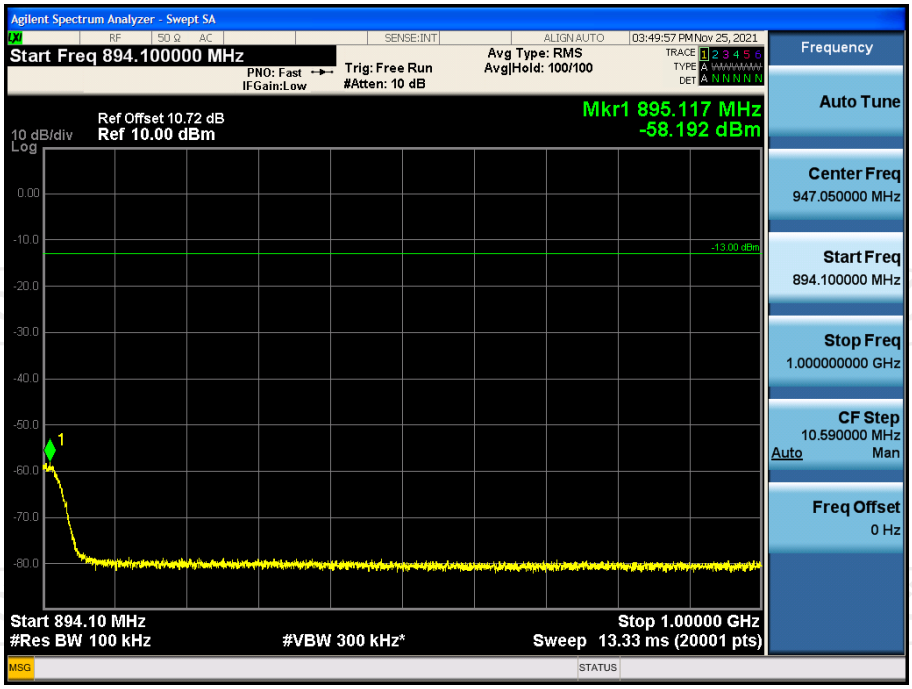


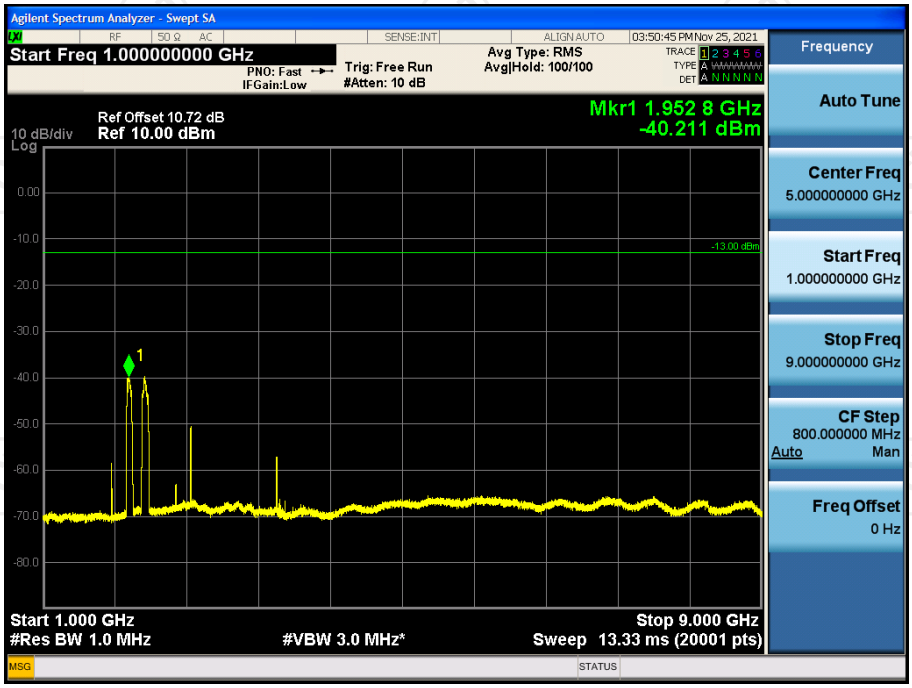




Cellular Downlink

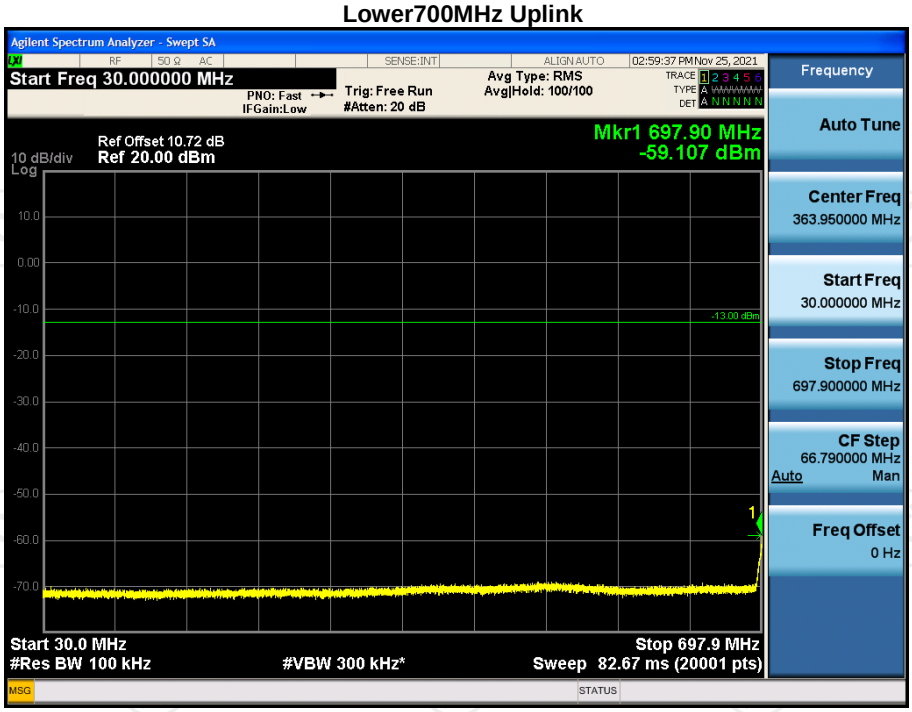


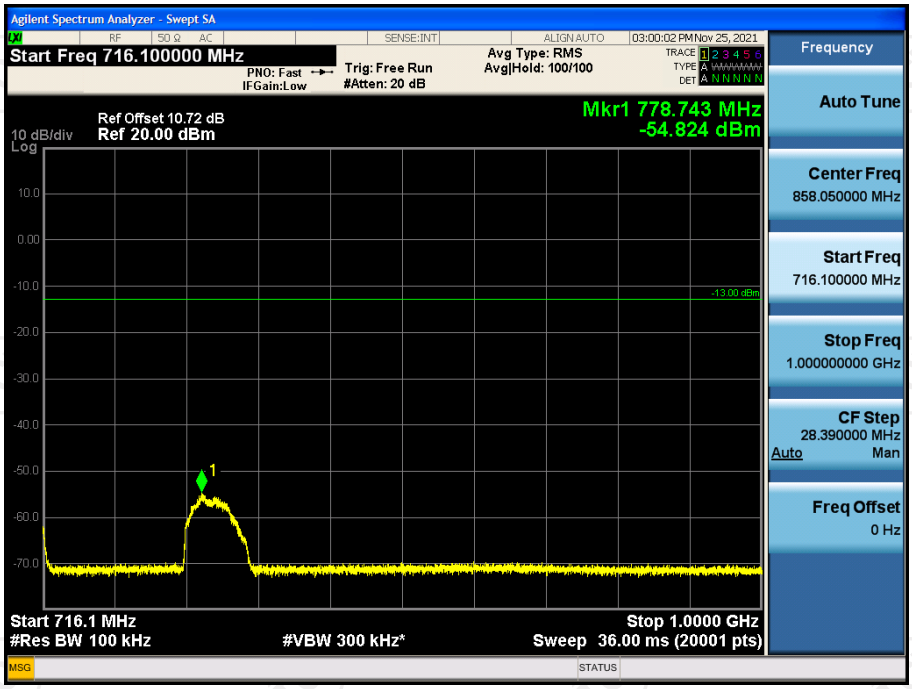

Agilent Spectrum Analyzer - Swept SA
Start Freq 894.100000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:49:57 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 895.117 MHz
-58.192 dBm
-13.00 dBm
Start 894.10 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 1.00000 GHz
Sweep 13.33 ms (20001 pts)
Frequency
Auto Tune
Center Freq
947.050000 MHz
Start Freq
894.100000 MHz
Stop Freq
1.000000000 GHz
CF Step
10.590000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:50:45 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 1.952 8 GHz
-40.211 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 9.000 GHz
Sweep 13.33 ms (20001 pts)
Frequency
Auto Tune
Center Freq
5.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
9.000000000 GHz
CF Step
800.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Plots

Lower700MHz Uplink





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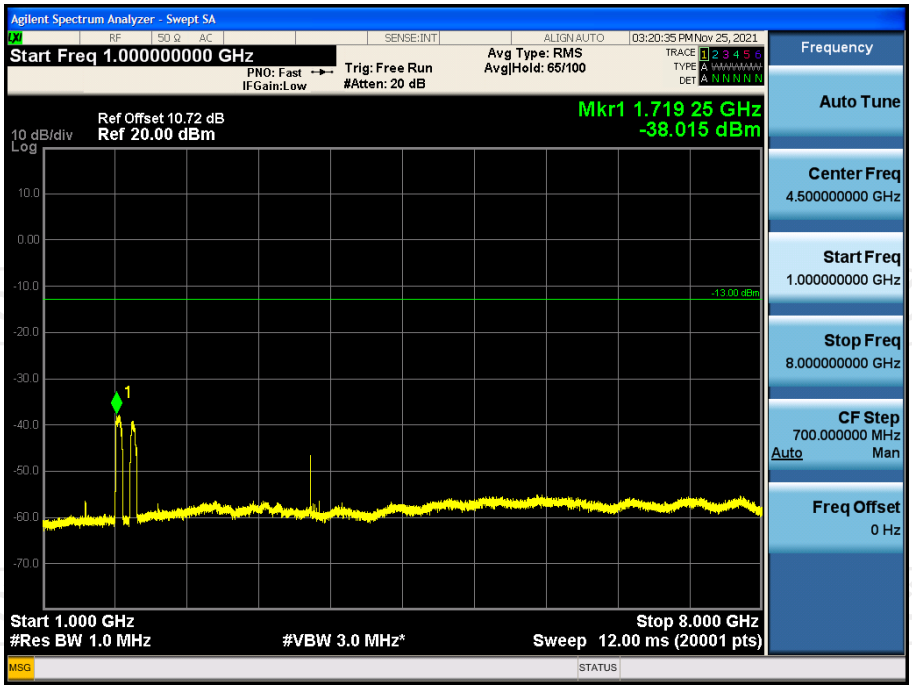
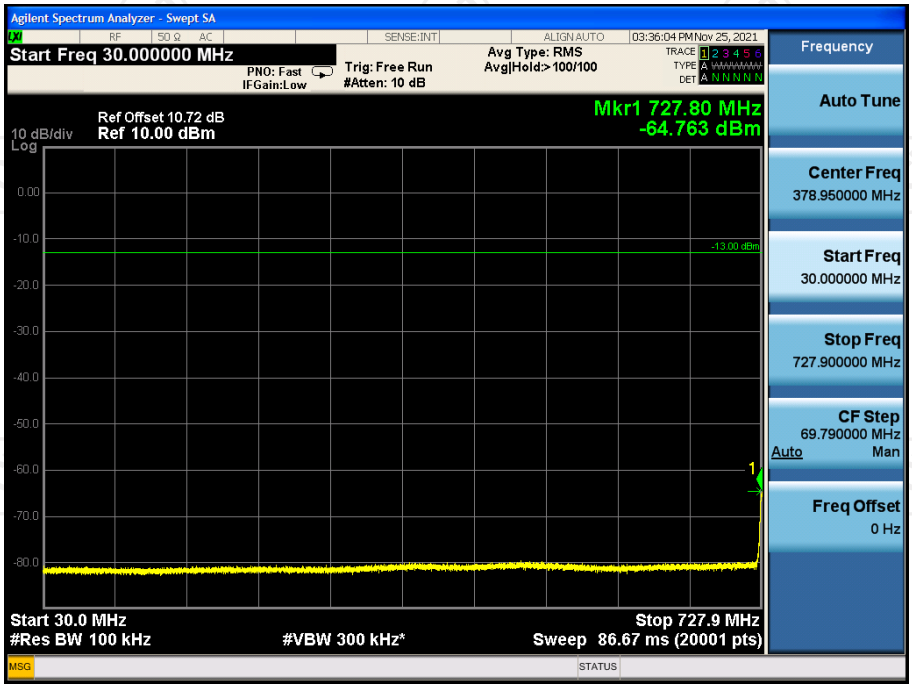


Lower700MHz Downlink



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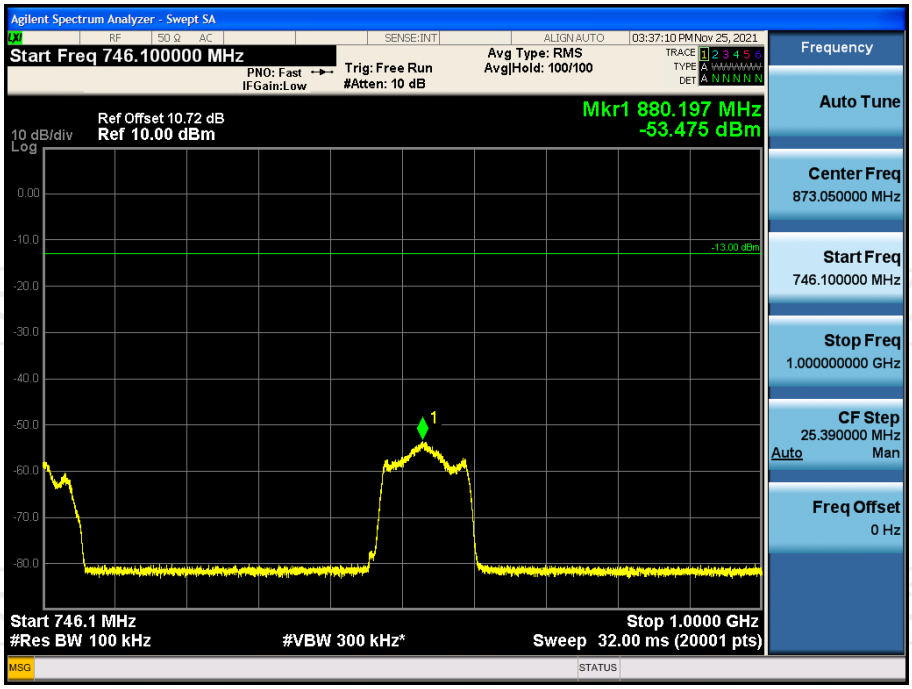
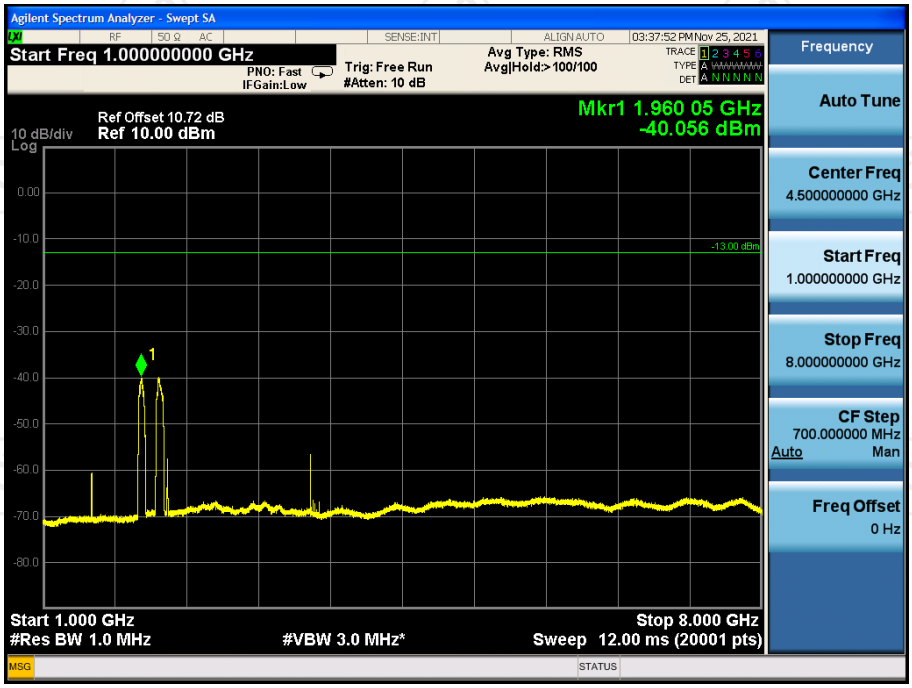
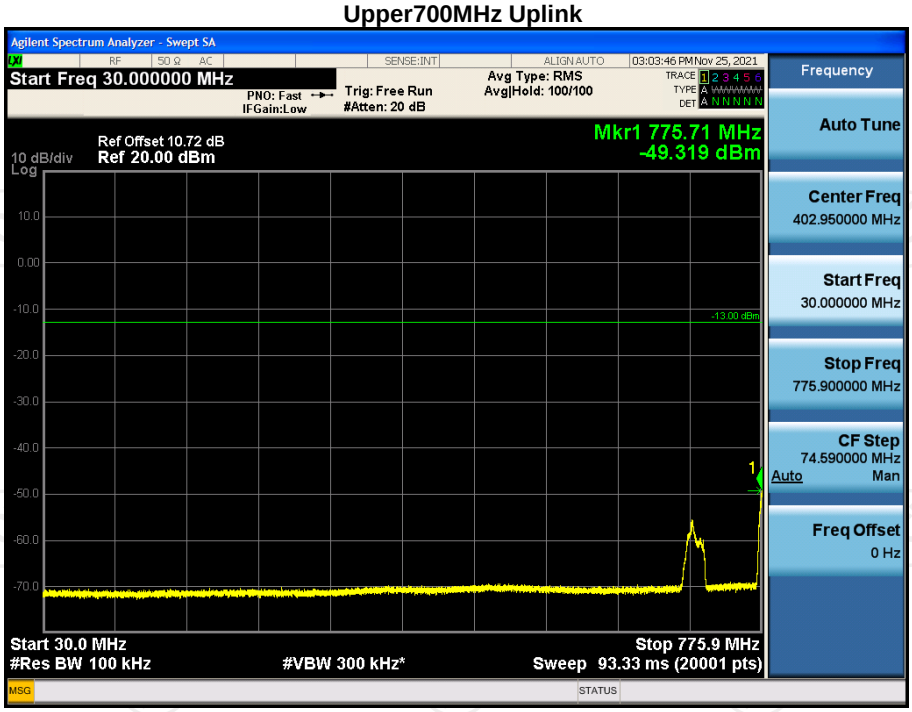
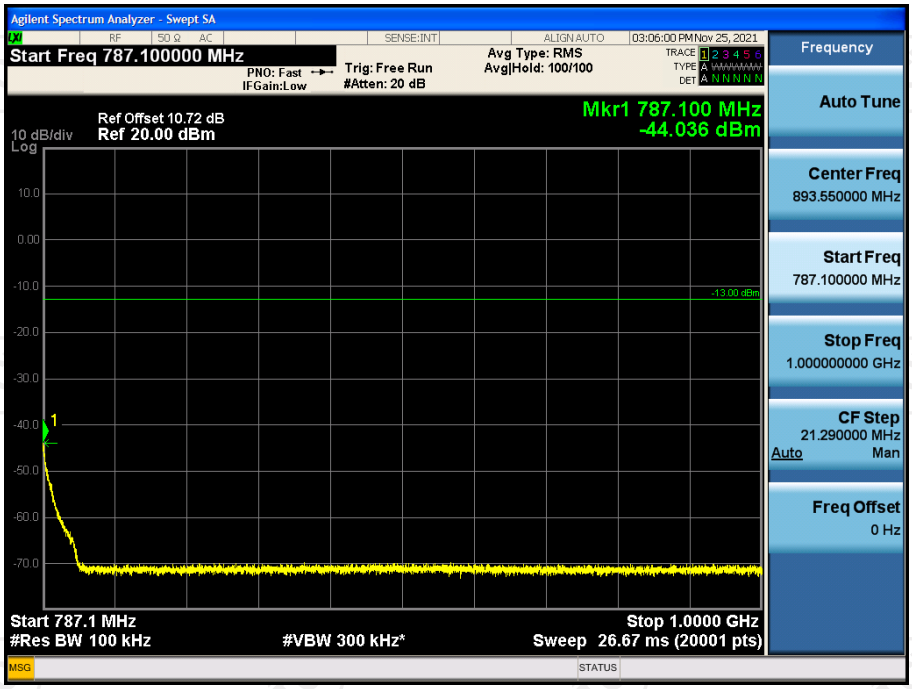

Agilent Spectrum Analyzer - Swept SA
Start Freq 746.100000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:37:10 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 880.197 MHz
-53.475 dBm
-13.00 dBm
Start 746.1 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 1.0000 GHz
Sweep 32.00 ms (20001 pts)
Frequency
Auto Tune
Center Freq
873.050000 MHz
Start Freq
746.100000 MHz
Stop Freq
1.000000000 GHz
CF Step
25.390000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

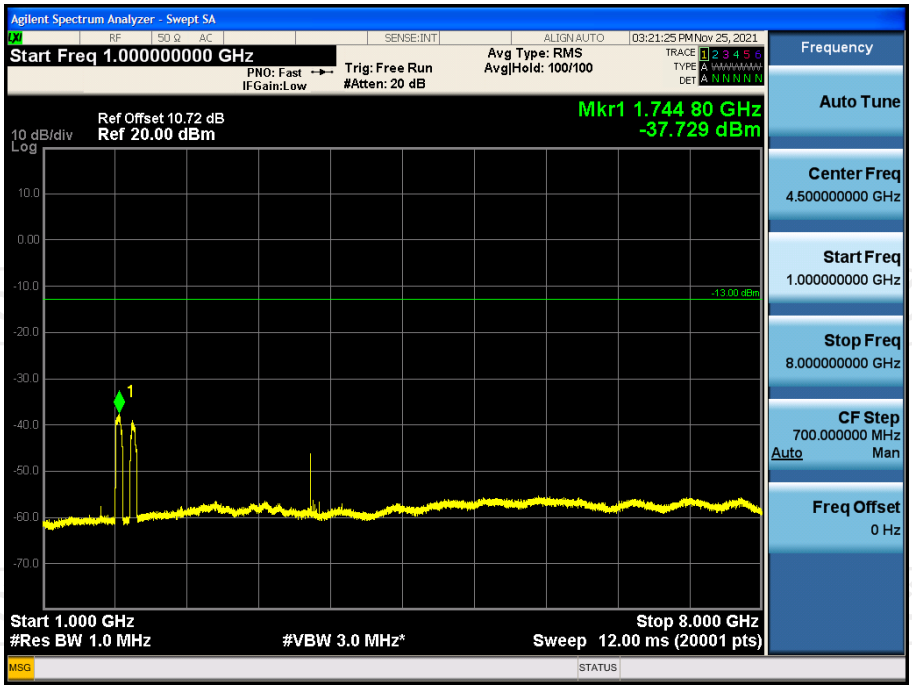

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold:>100/100
03:37:52 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 1.960 05 GHz
-40.056 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 8.000 GHz
Sweep 12.00 ms (20001 pts)
Frequency
Auto Tune
Center Freq
4.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
8.000000000 GHz
CF Step
700.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Test Plots

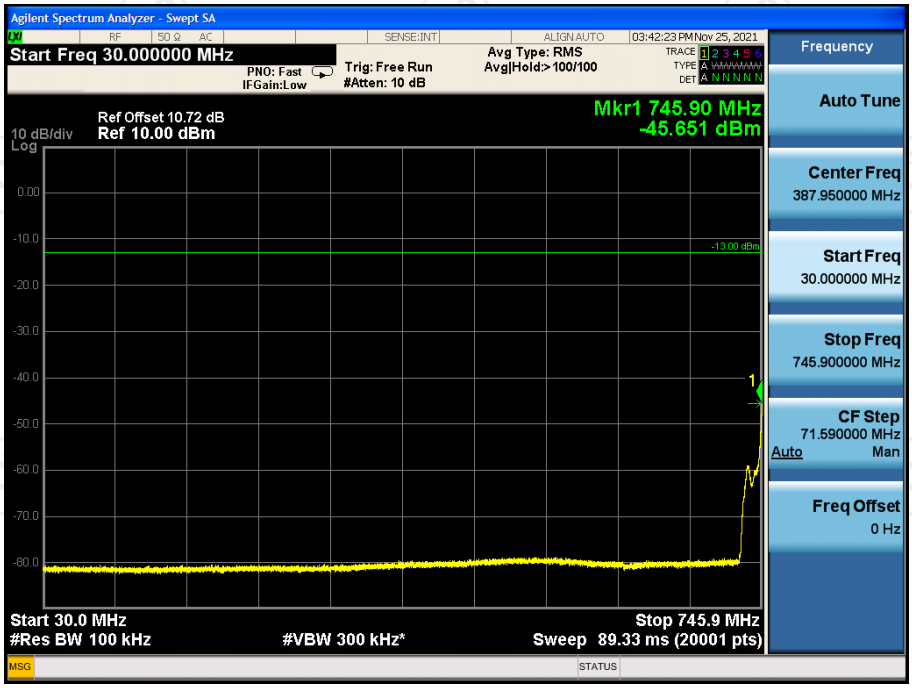
Upper700MHz Uplink



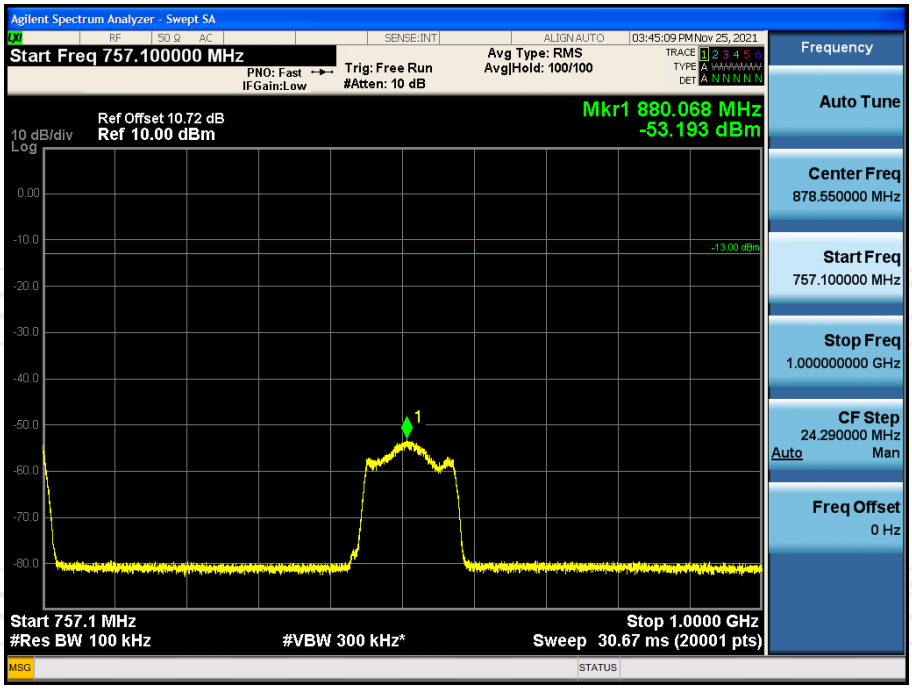


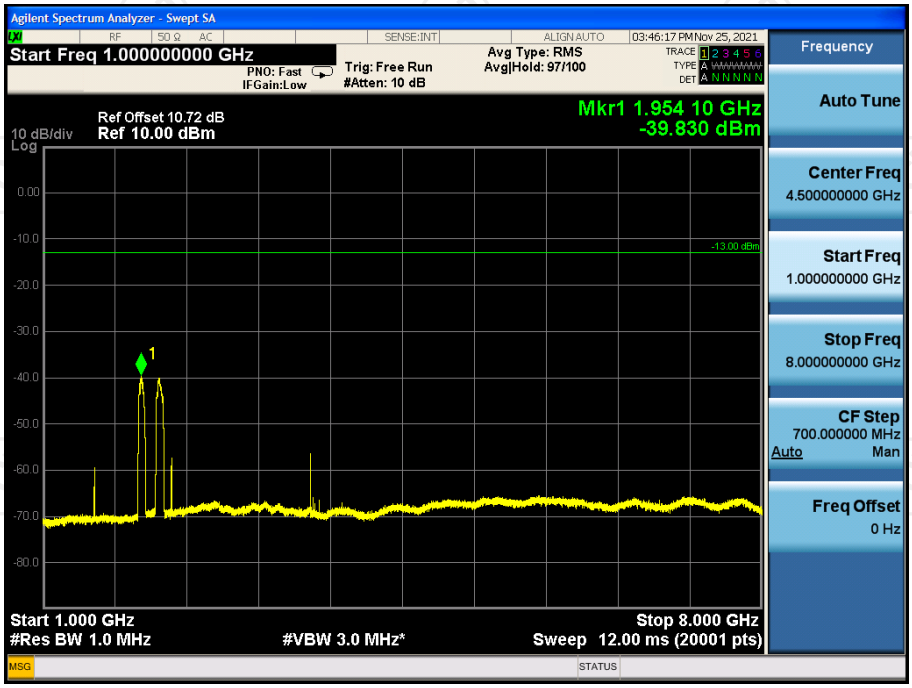


Upper700MHz Downlink



Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com


Agilent Spectrum Analyzer - Swept SA
Start Freq 757.100000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 100/100
03:45:09 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 880.068 MHz
-53.193 dBm
-13.00 dBm
Start 757.1 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 1.0000 GHz
Sweep 30.67 ms (20001 pts)
Frequency
Auto Tune
Center Freq
878.550000 MHz
Start Freq
757.100000 MHz
Stop Freq
1.000000000 GHz
CF Step
24.290000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
Avg|Hold: 97/100
03:46:17 PM Nov 25, 2021
Ref Offset 10.72 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 1.954 10 GHz
-39.830 dBm
-13.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 8.000 GHz
Sweep 12.00 ms (20001 pts)
Frequency
Auto Tune
Center Freq
4.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
8.000000000 GHz
CF Step
700.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS