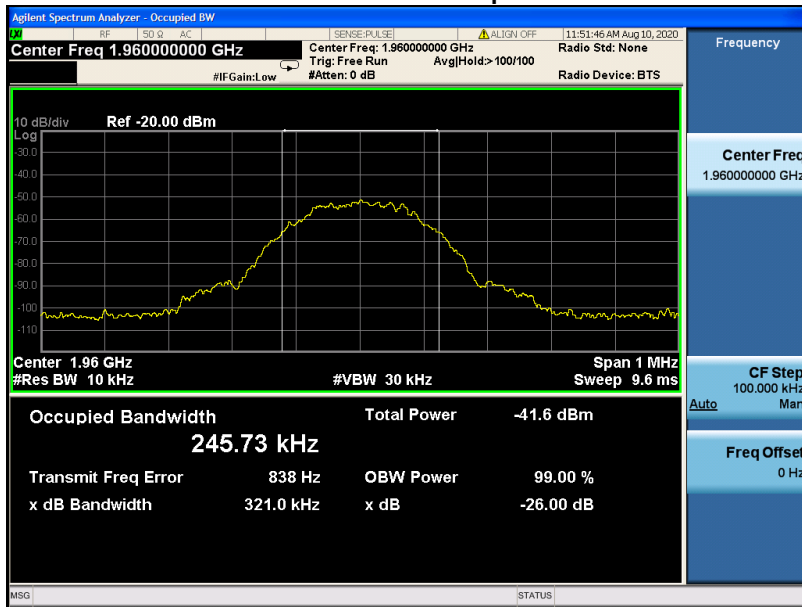
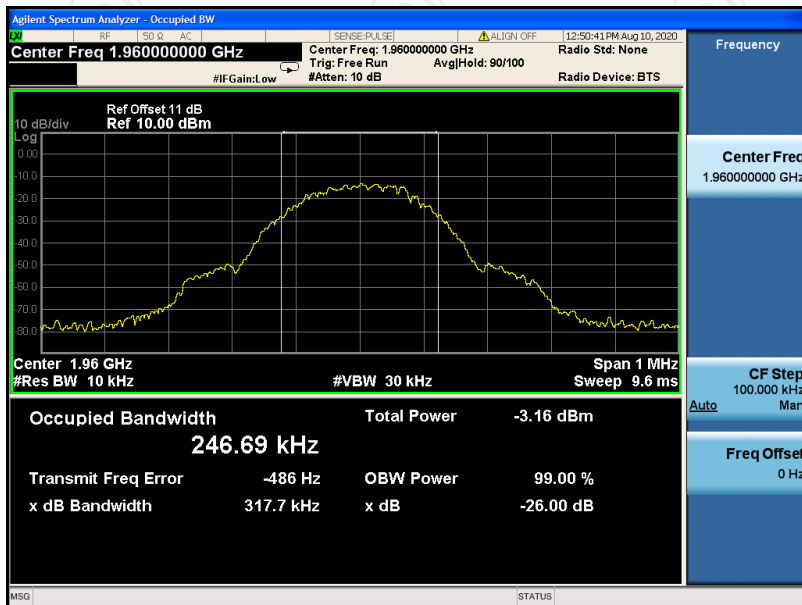


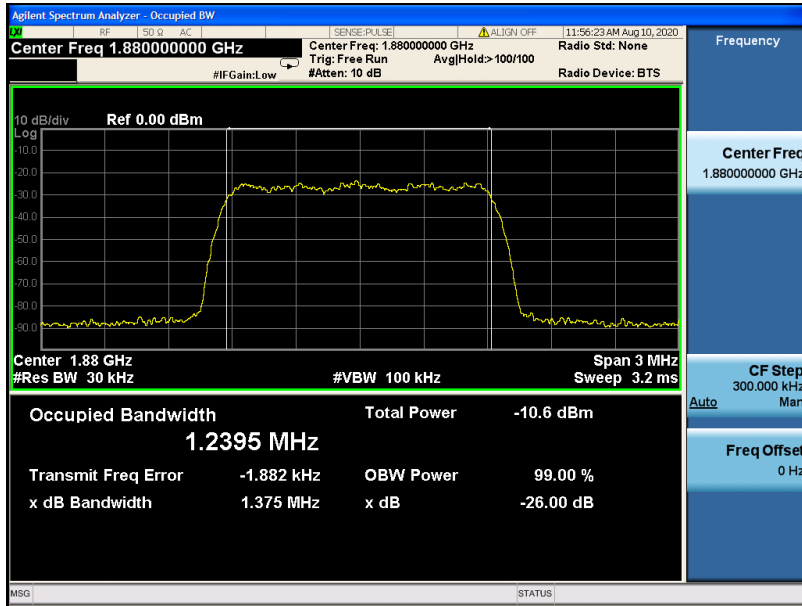
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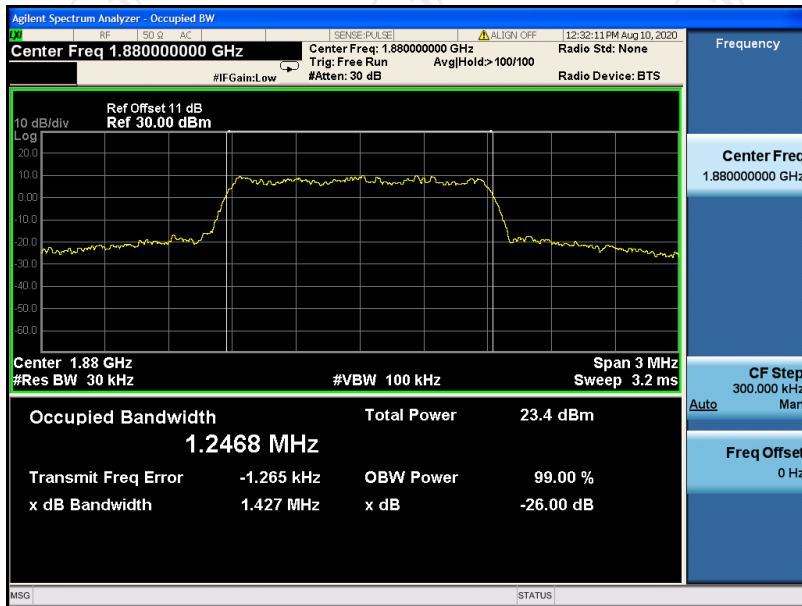
### Band2 GSM DL Output



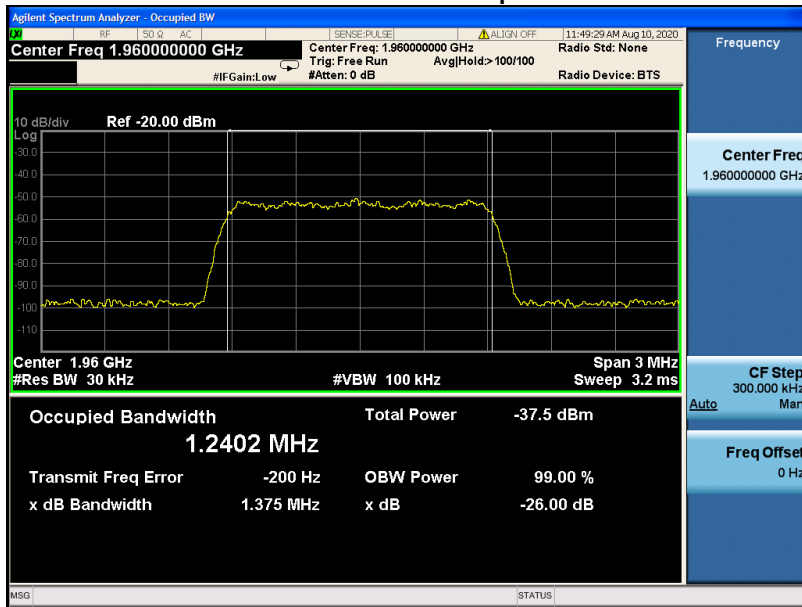
**Band2 CDMA UL Input**



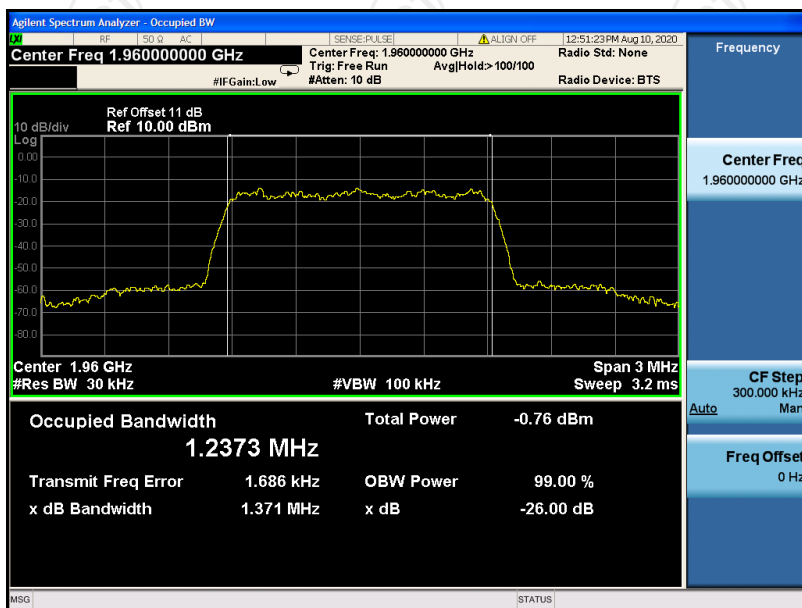
**Band2 CDMA UL output**



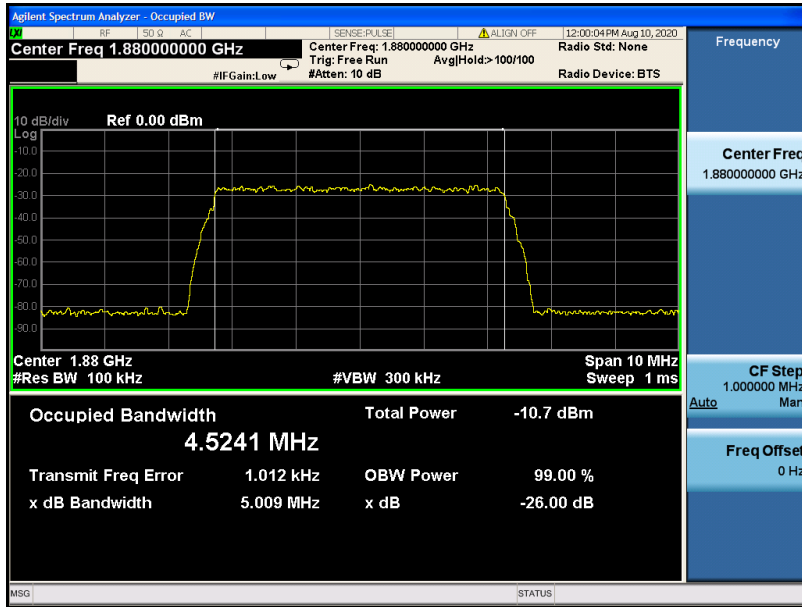
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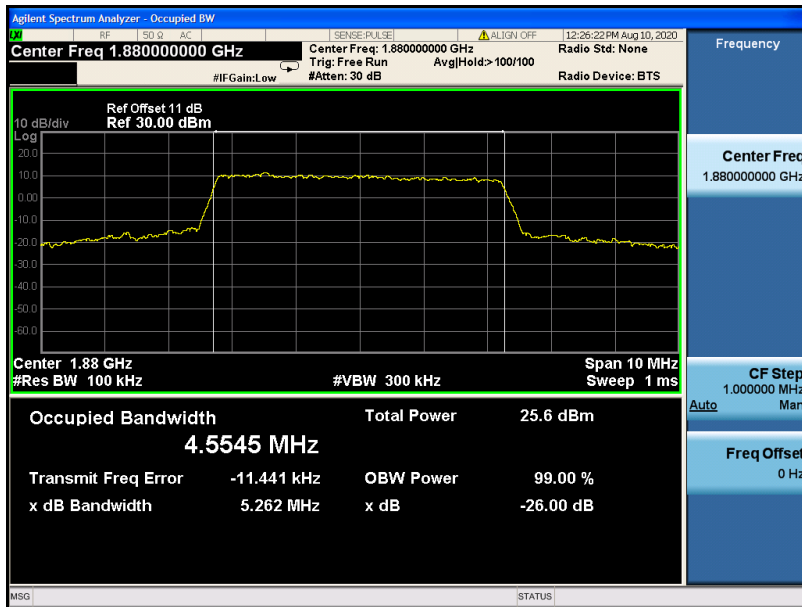
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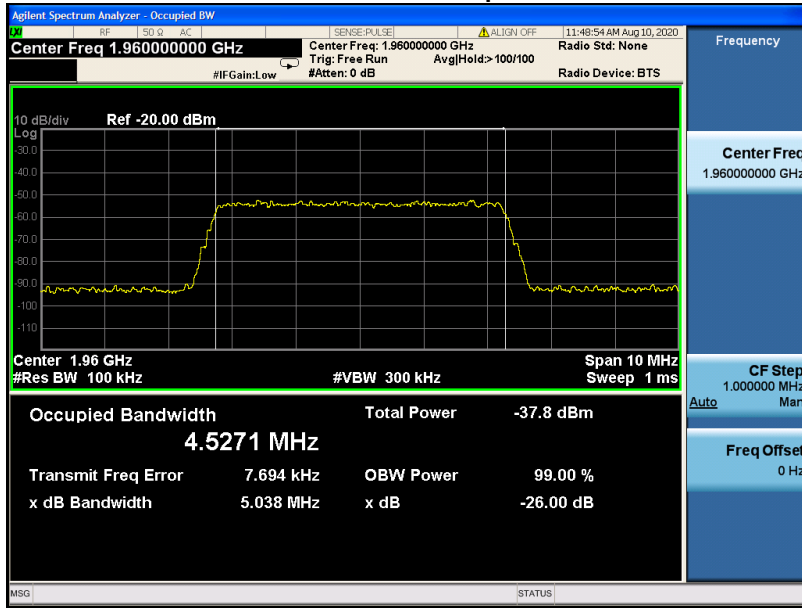
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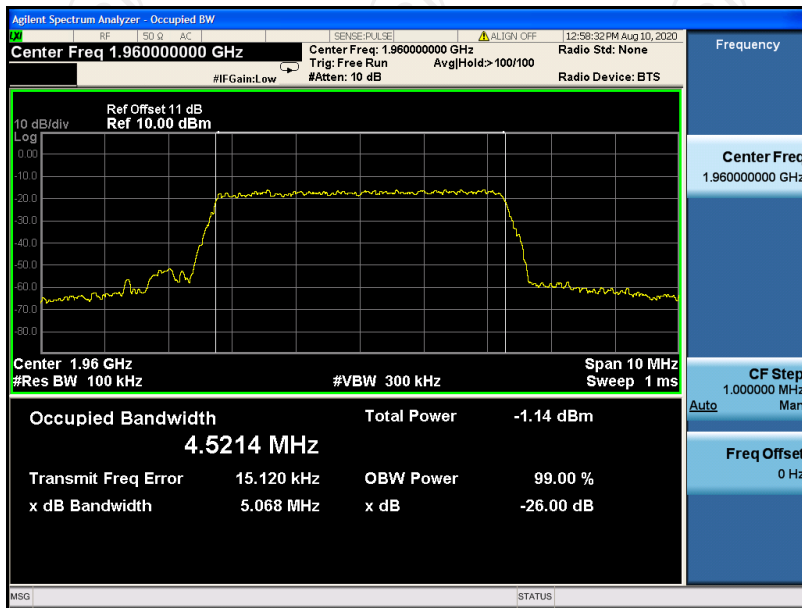
**Band2 LTE UL output**



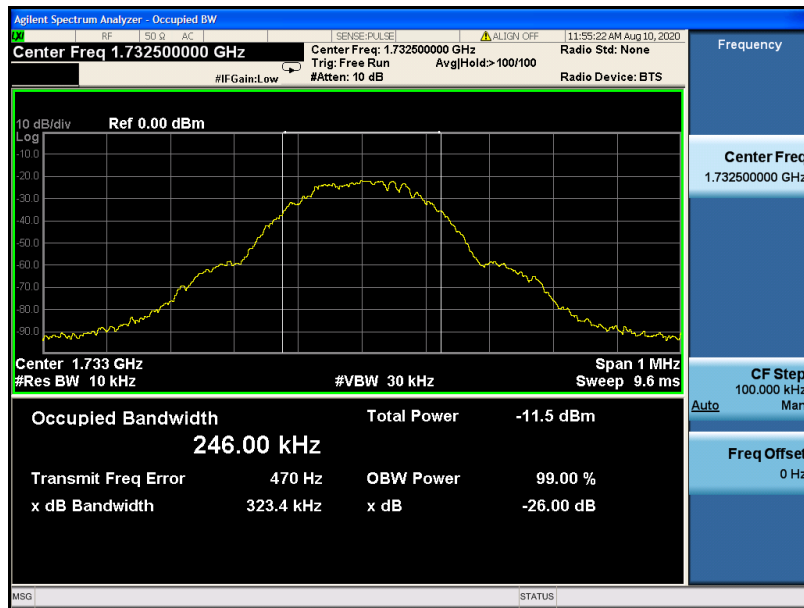
**Band2 LTE DL Input**



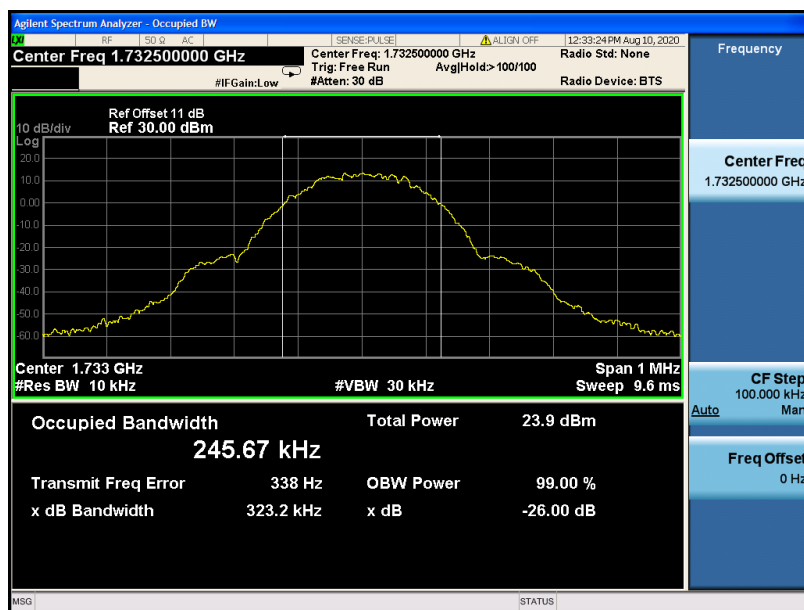
**Band2 LTE DL Output**



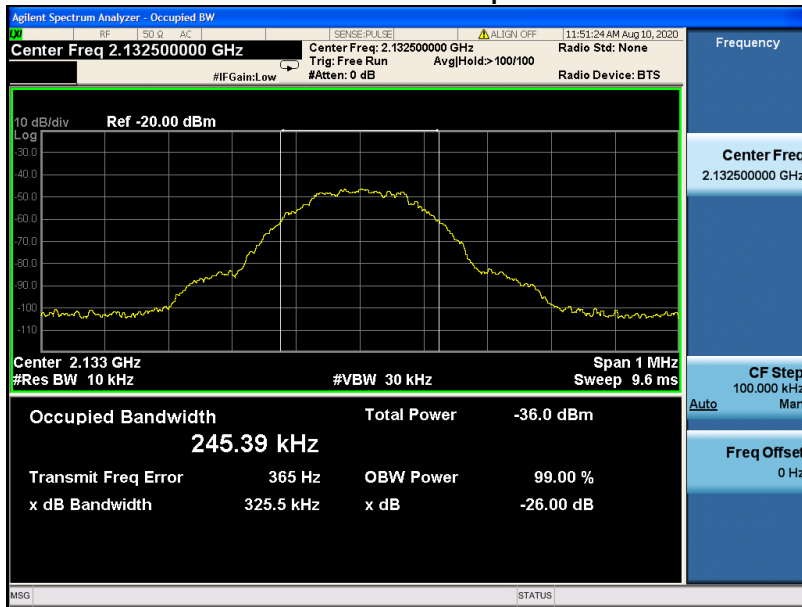
**Band4 GSM UL Input**



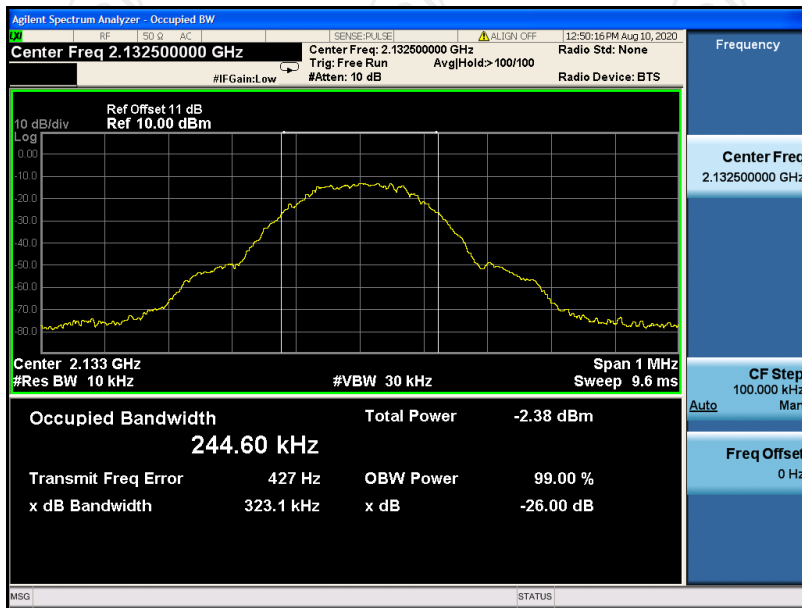
**Band4 GSM UL output**



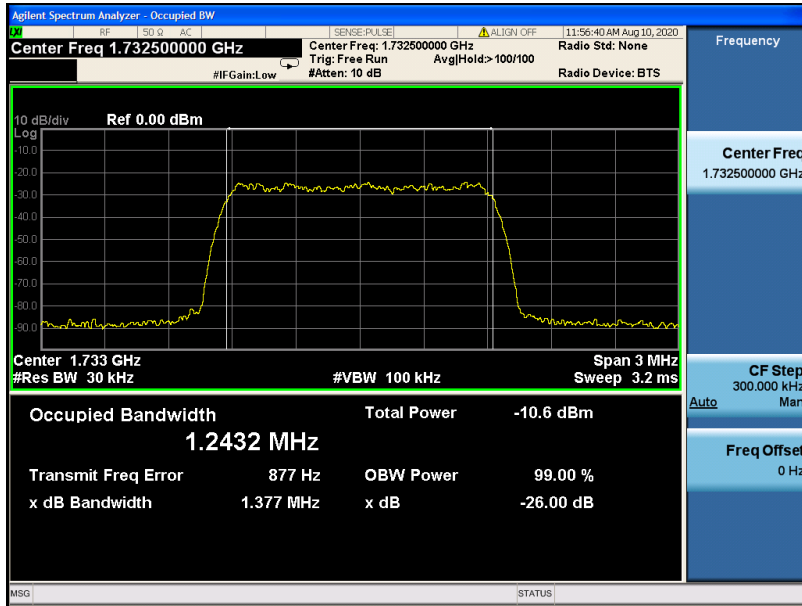
### Band4 GSM DL Input



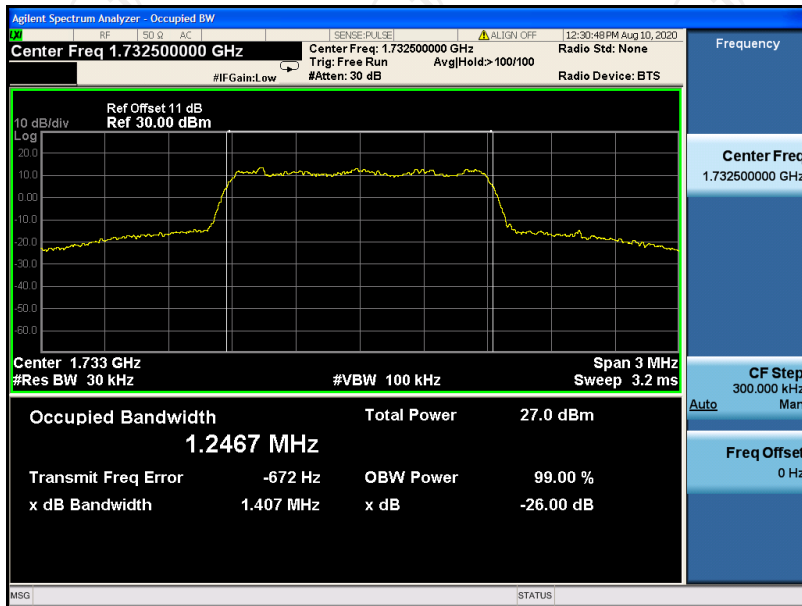
### Band4 GSM DL Output



**Band4 CDMA UL Input**

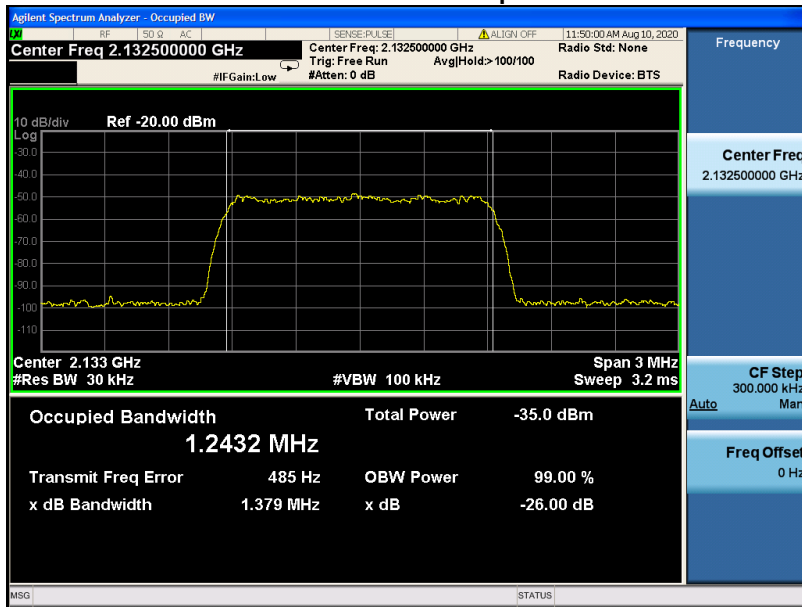


**Band4 CDMA UL output**

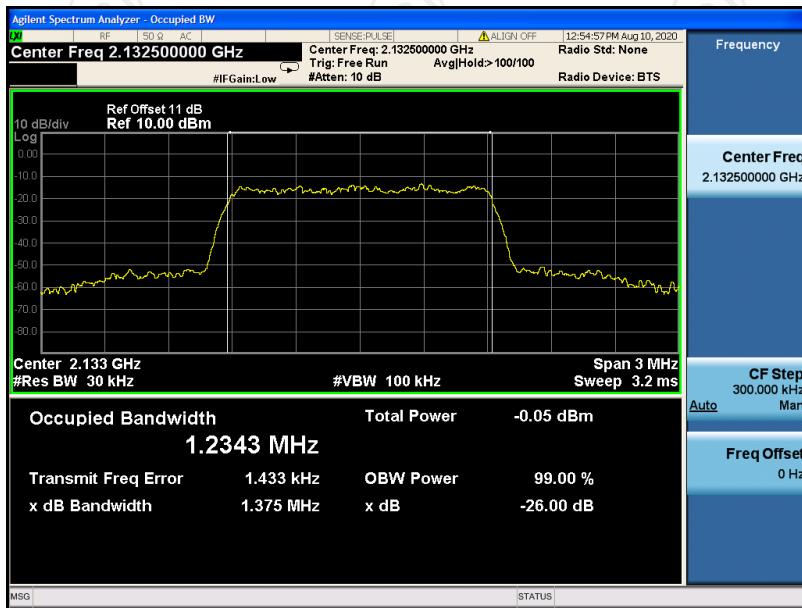




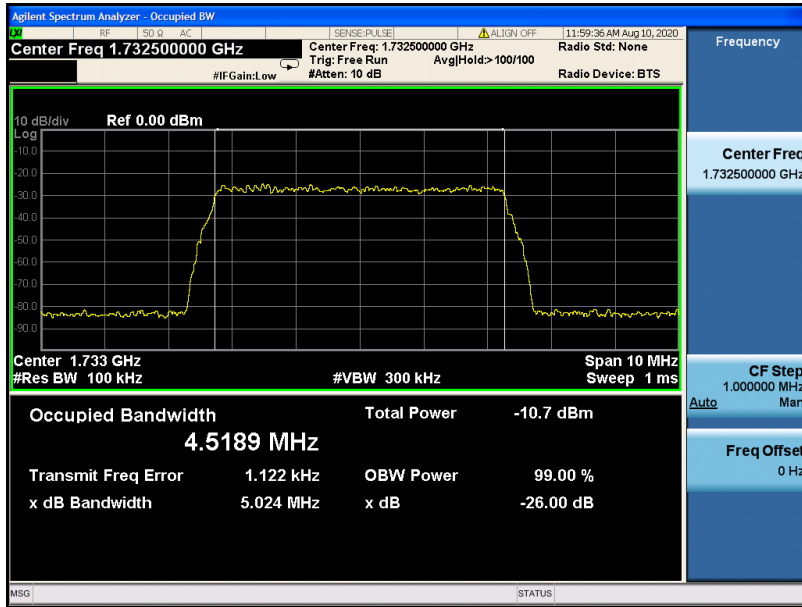
### Band4 CDMA DL Input



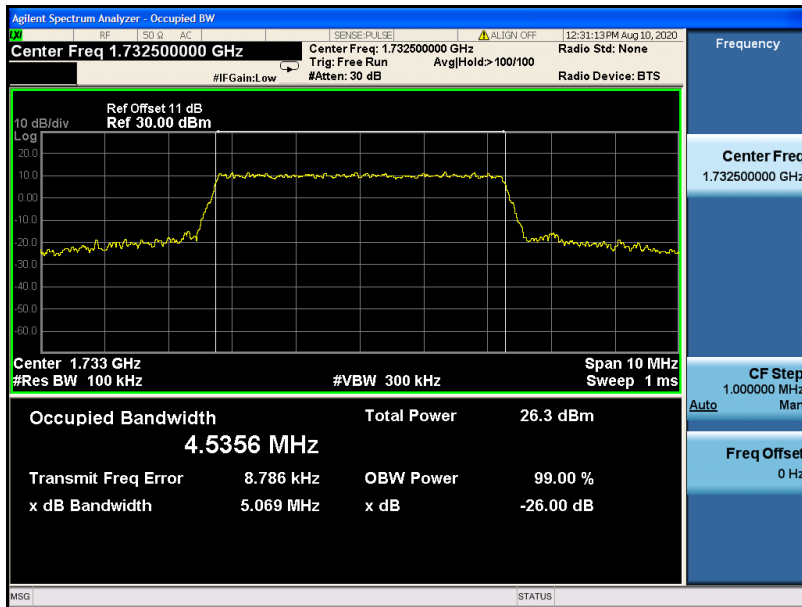
### Band4 CDMA DL Output



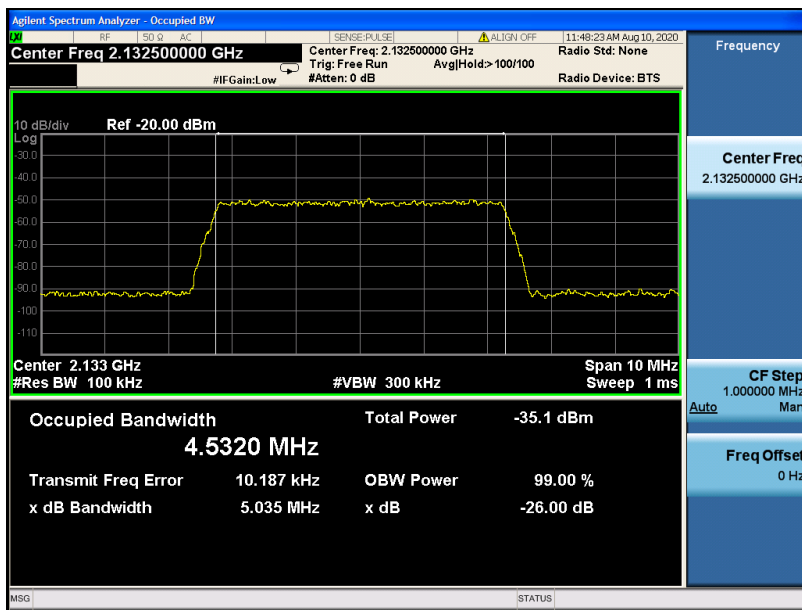
**Band4 LTE UL Input**



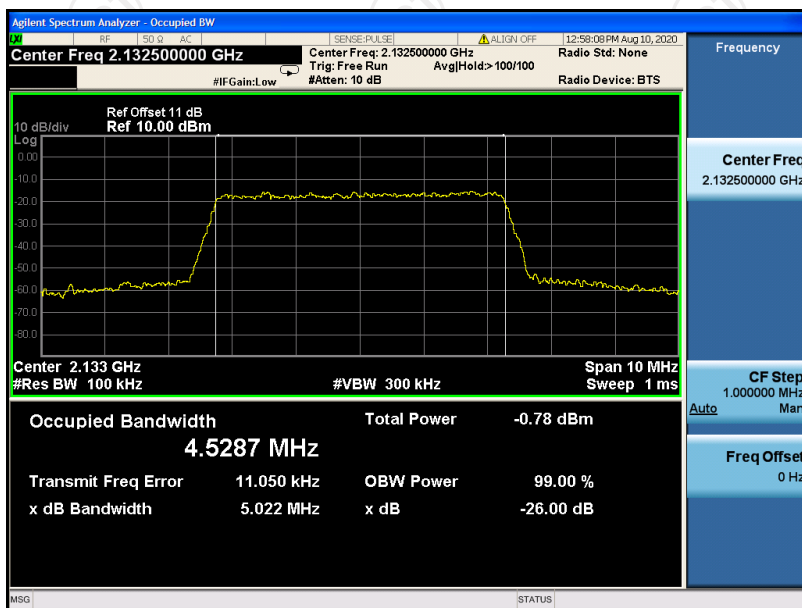
**Band4 LTE UL output**



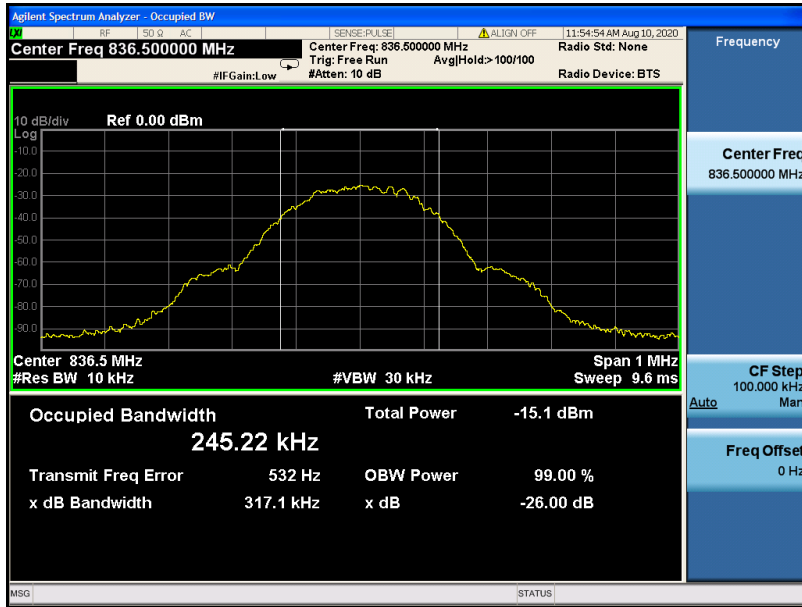
## Band4 LTE DL Input



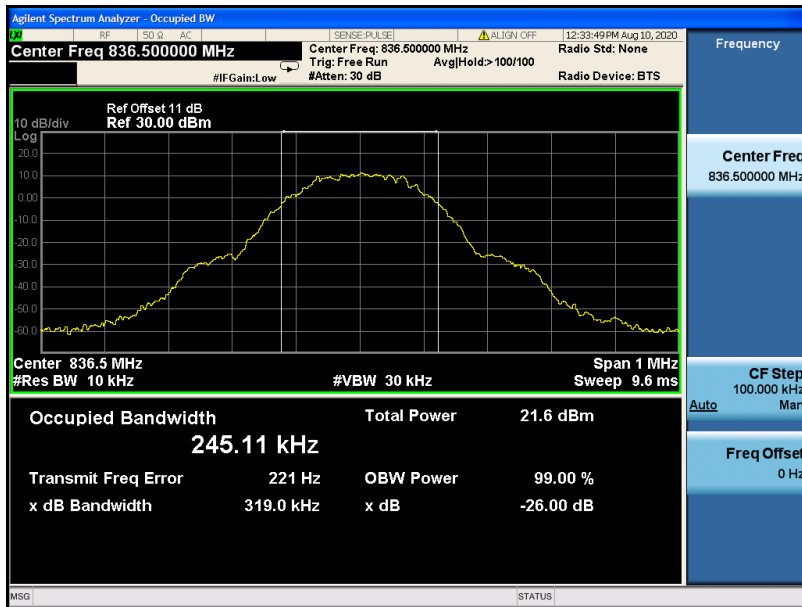
## Band4 LTE DL Output



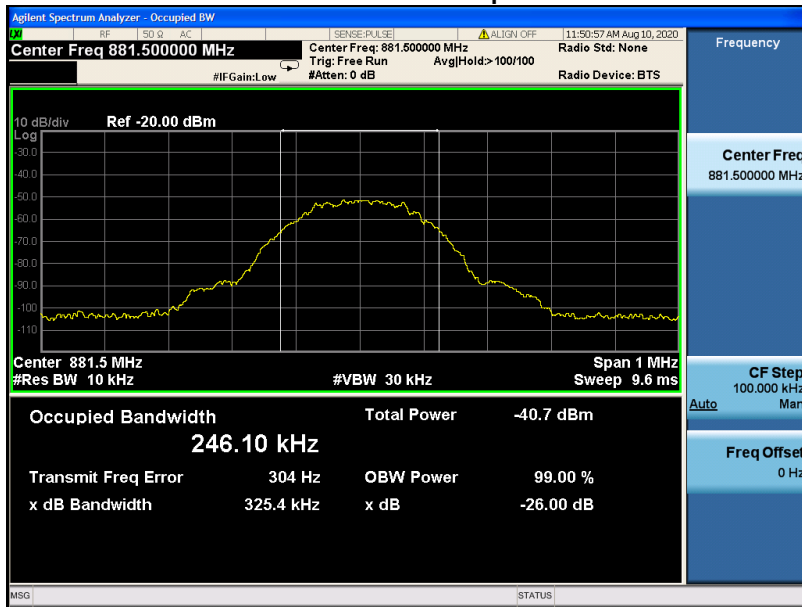
**Band5 GSM UL Input**



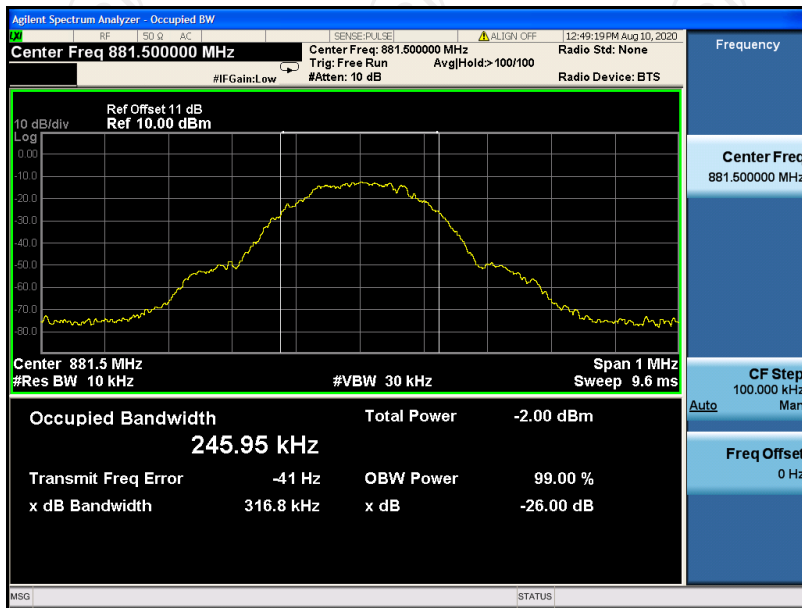
**Band5 GSM UL output**



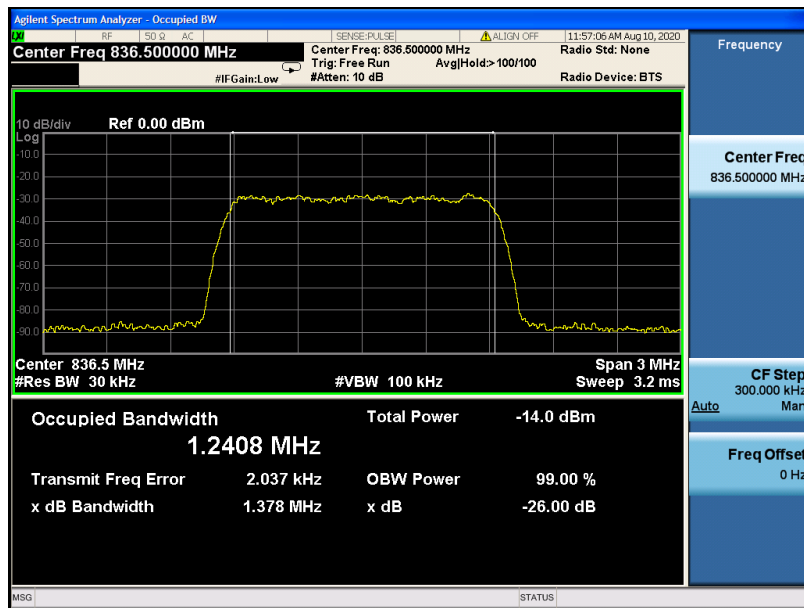
**Band5 GSM DL Input**



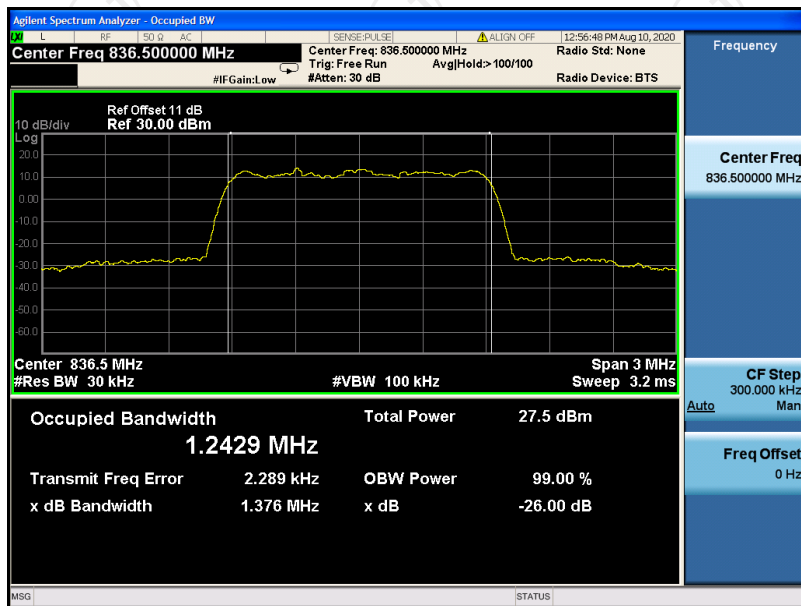
**Band5 GSM DL Output**



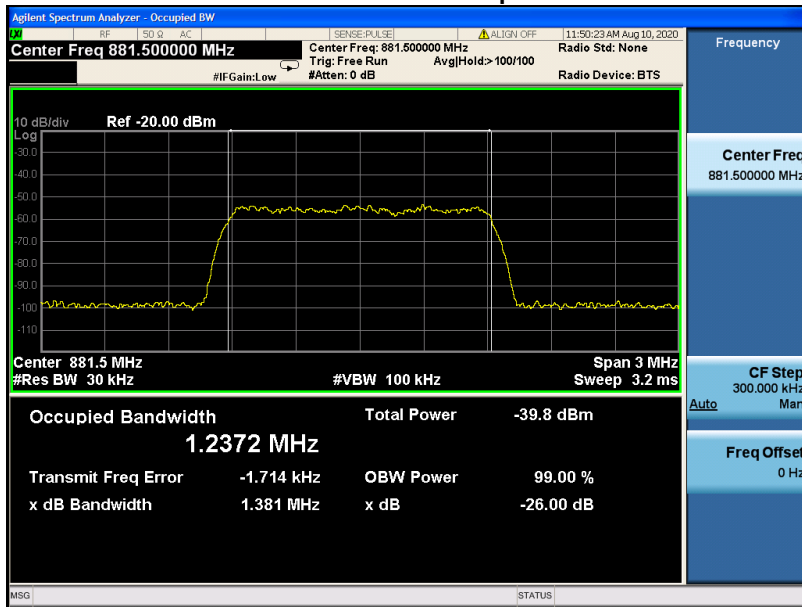
**Band5 CDMA UL Input**



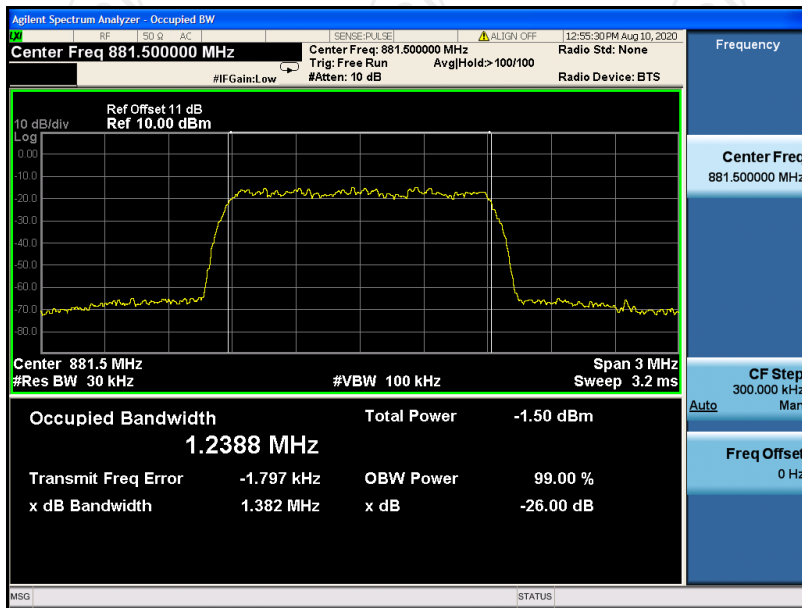
**Band5 CDMA UL output**



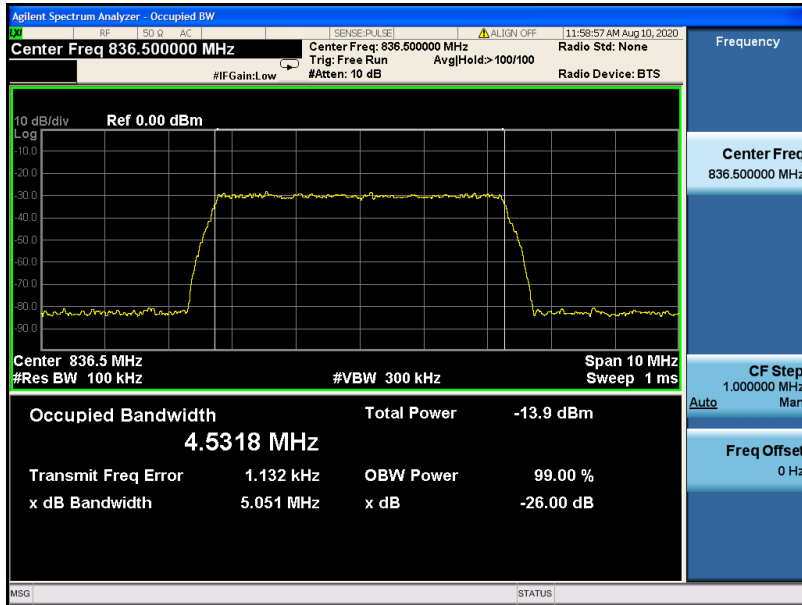
**Band5 CDMA DL Input**



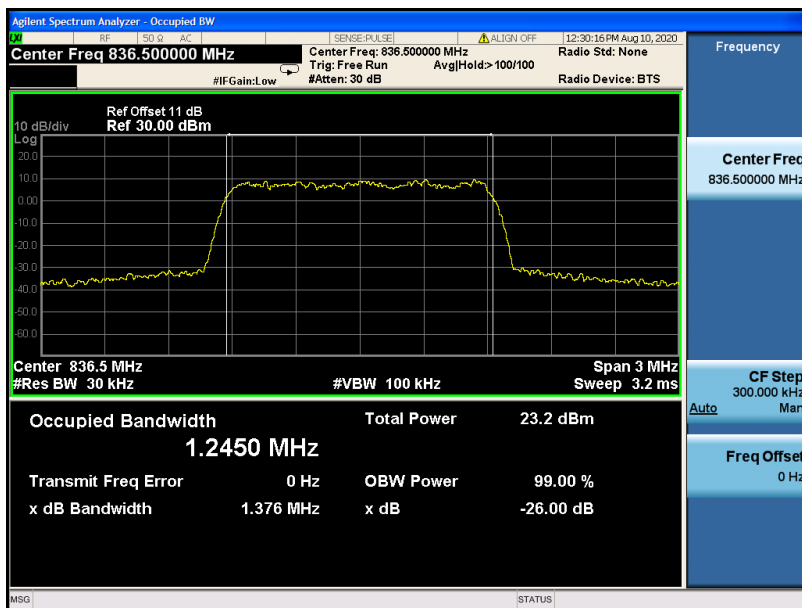
**Band5 CDMA DL Output**



**Band5 LTE UL Input**

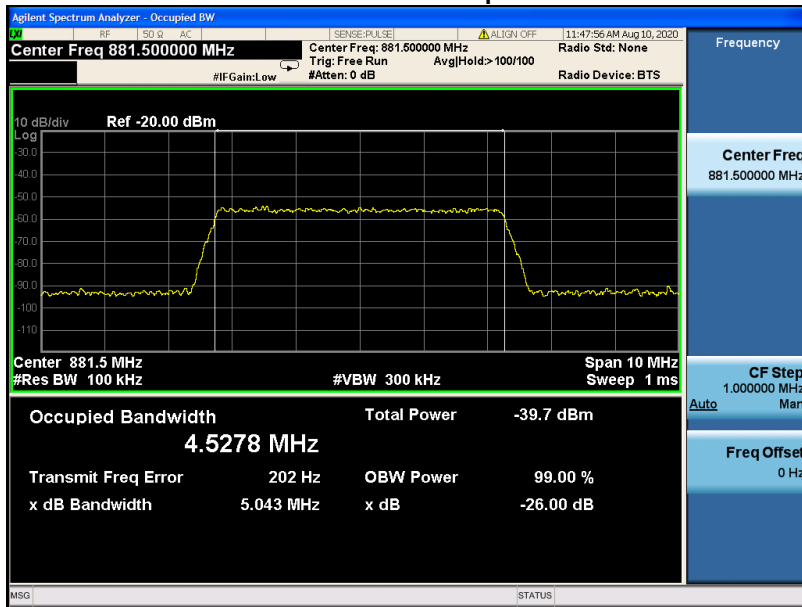


**Band5 LTE UL output**

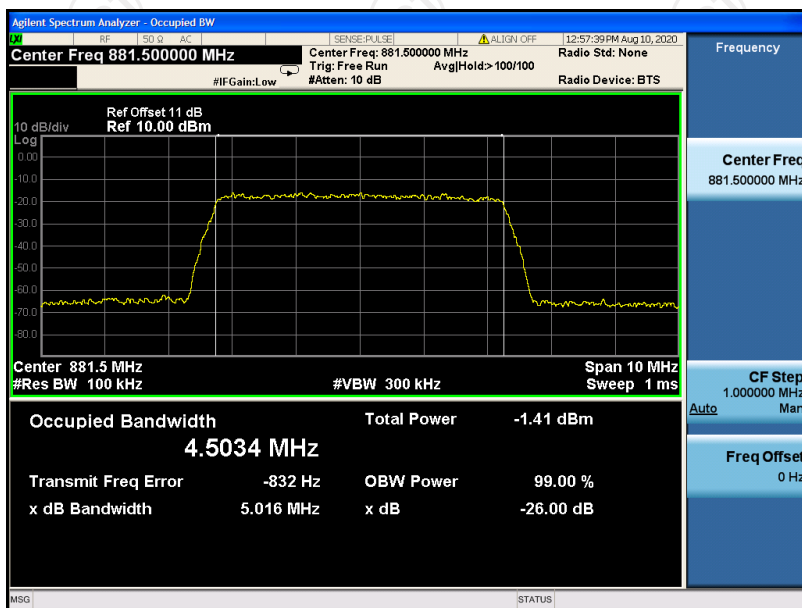




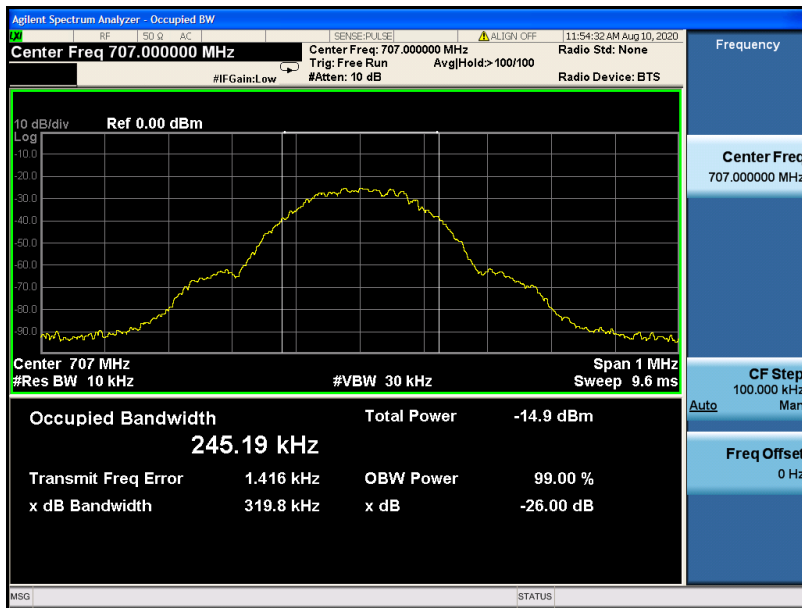
### Band5 LTE DL Input



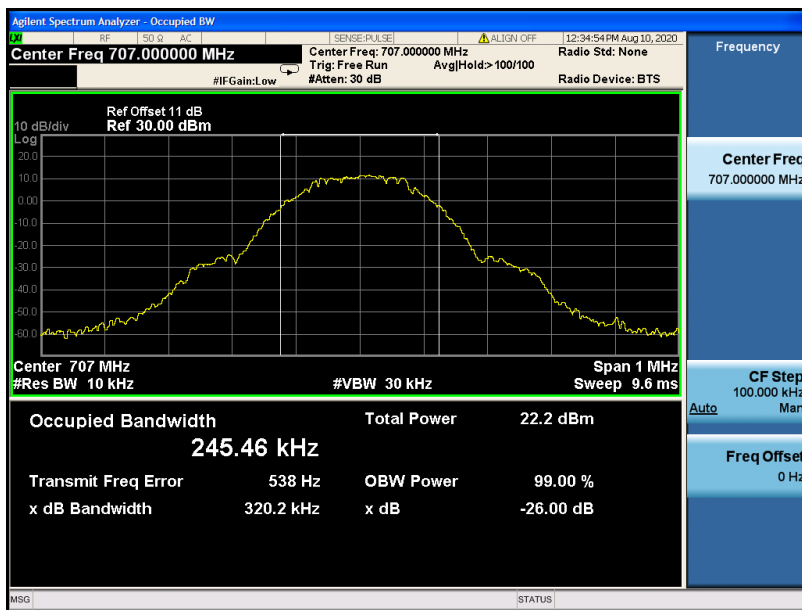
### Band5 LTE DL Output



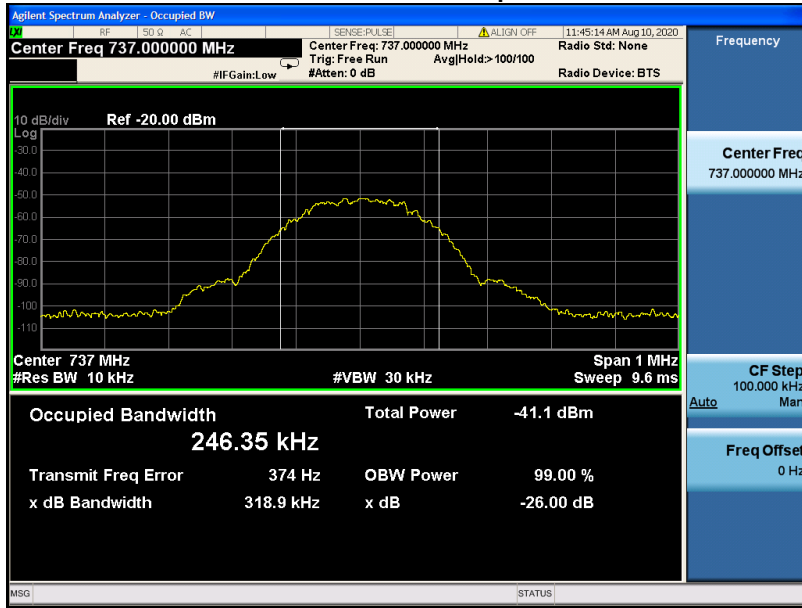
Band12 GSM UL Input



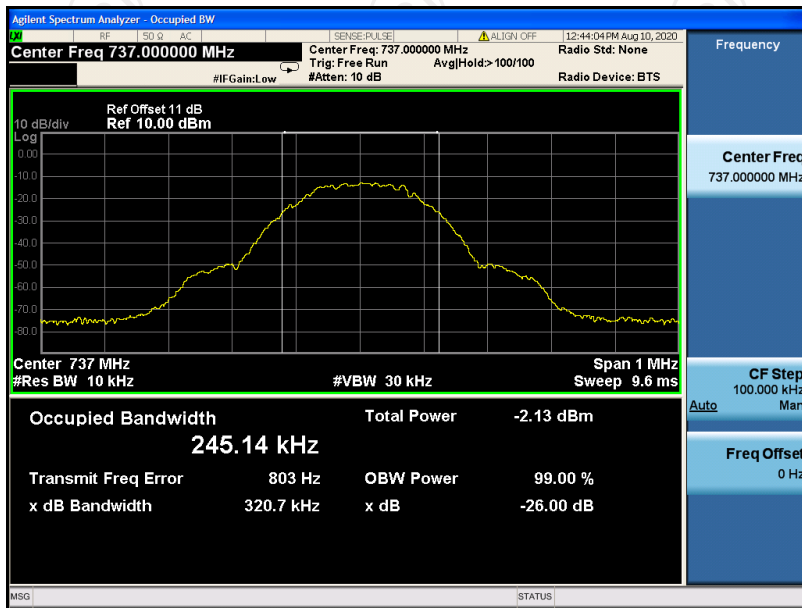
Band12 GSM UL output



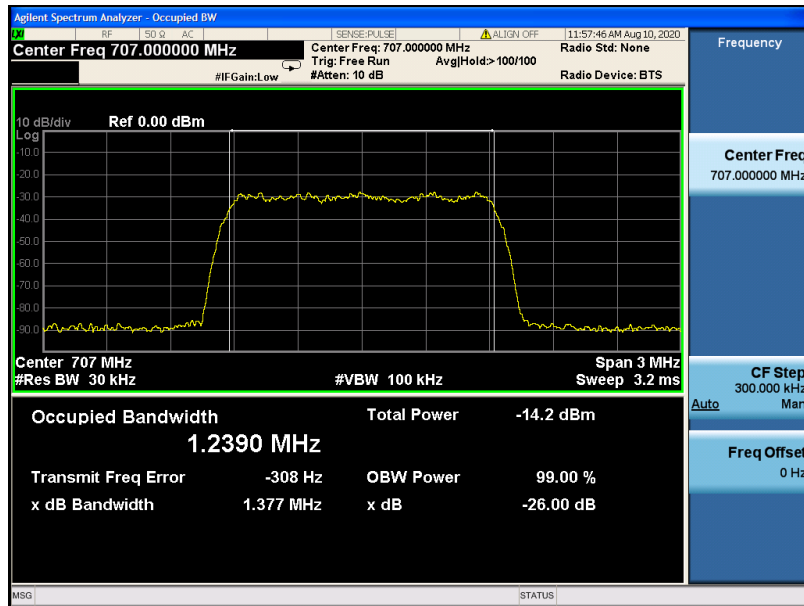
**Band12 GSM DL Input**



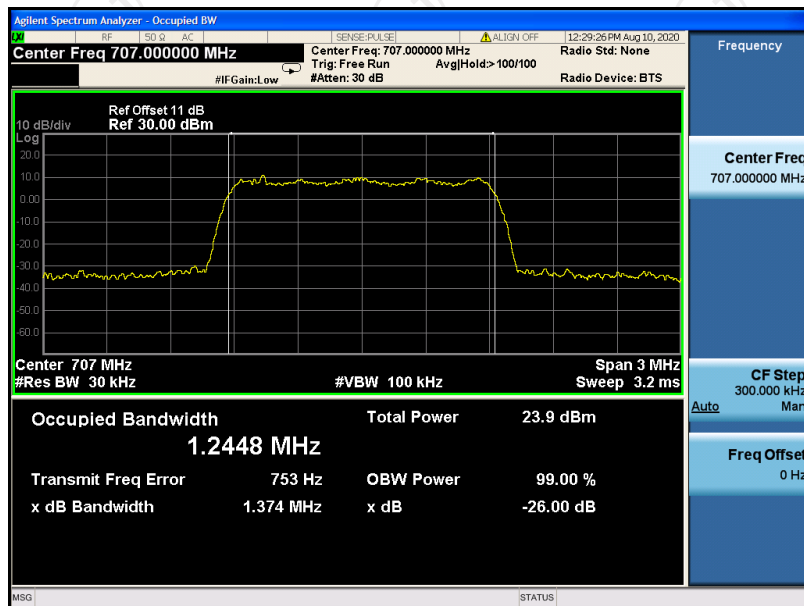
**Band12 GSM DL Output**



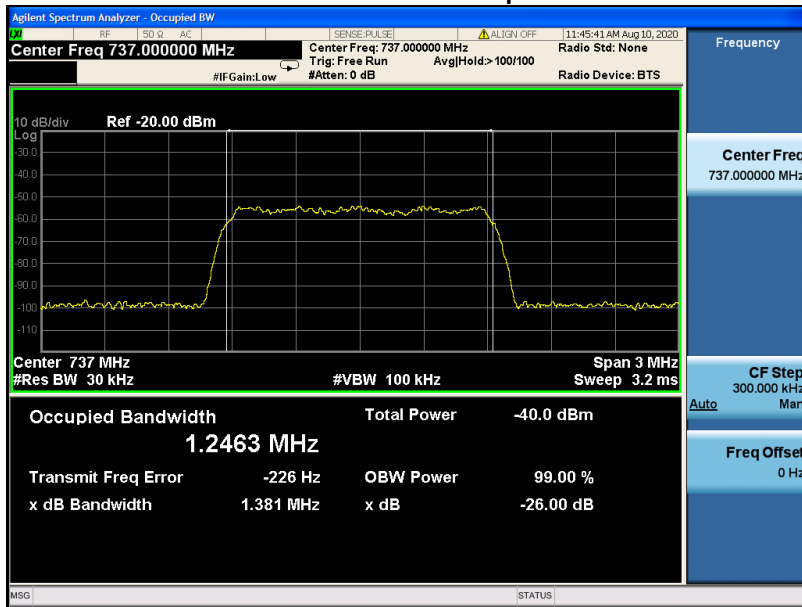
### Band12 CDMA UL Input



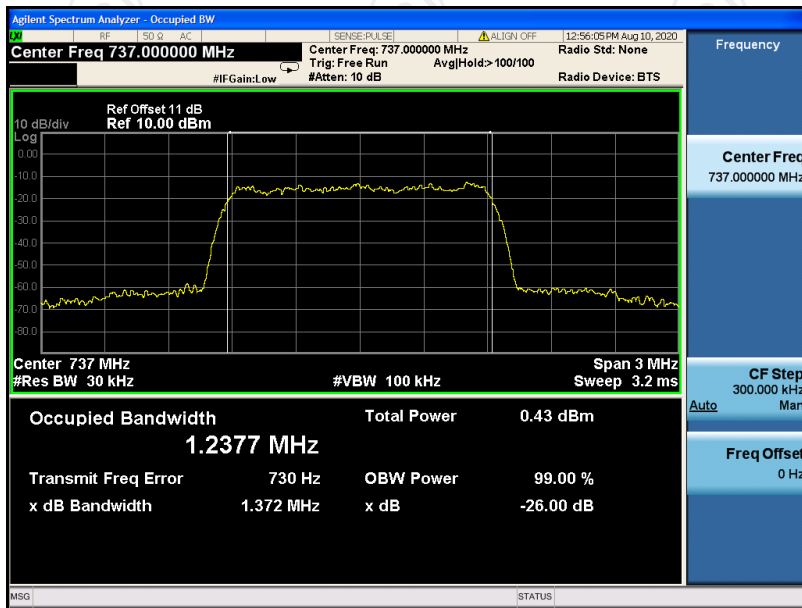
### Band12 CDMA UL output



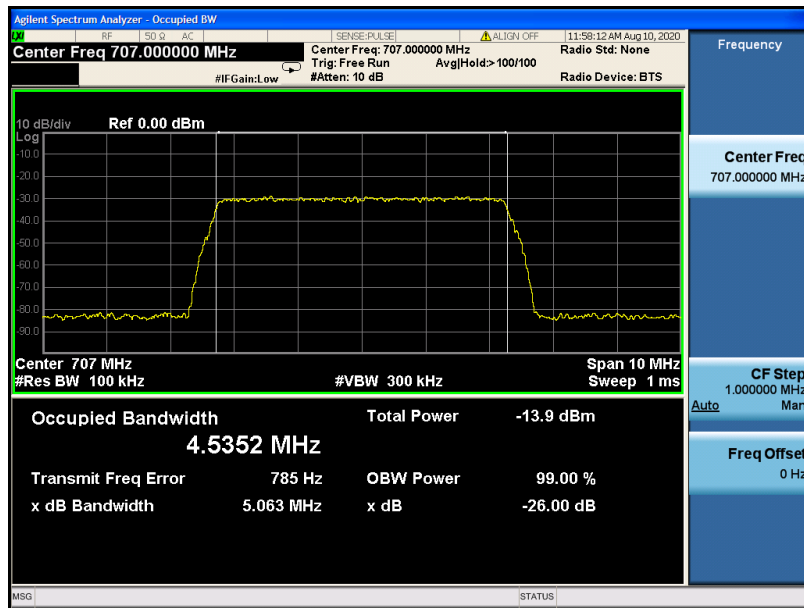
### Band12 CDMA DL Input



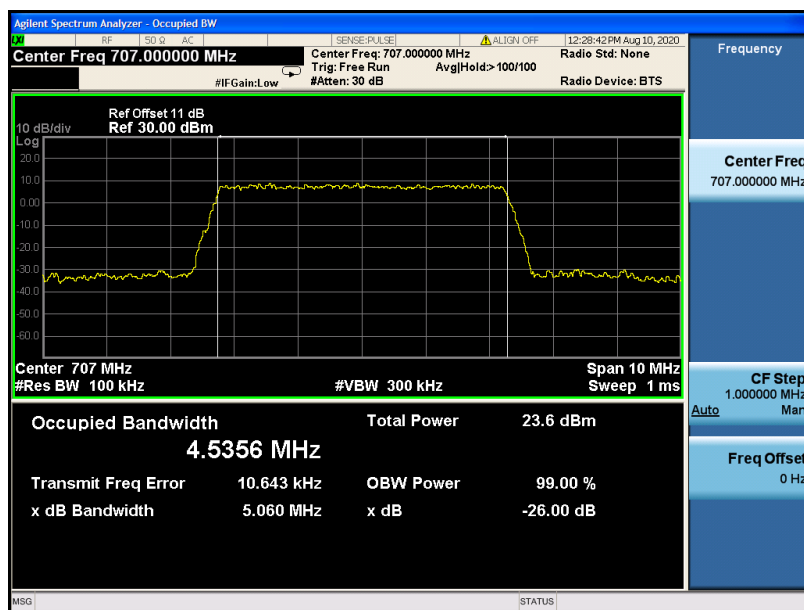
### Band12 CDMA DL Output



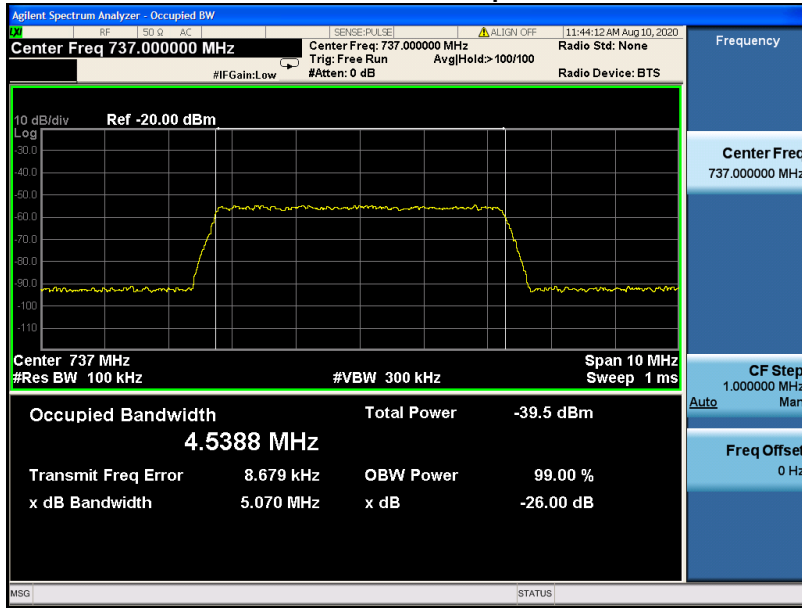
### Band12 LTE UL Input



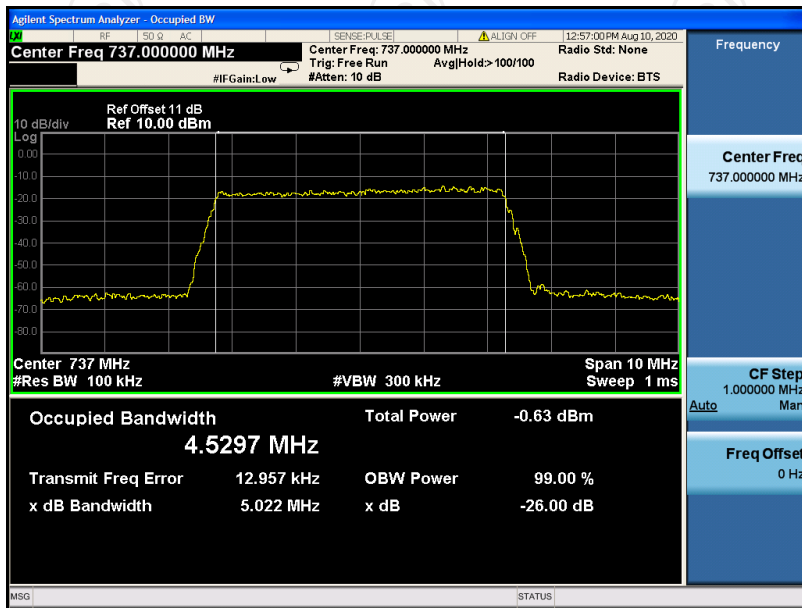
### Band12 LTE UL output



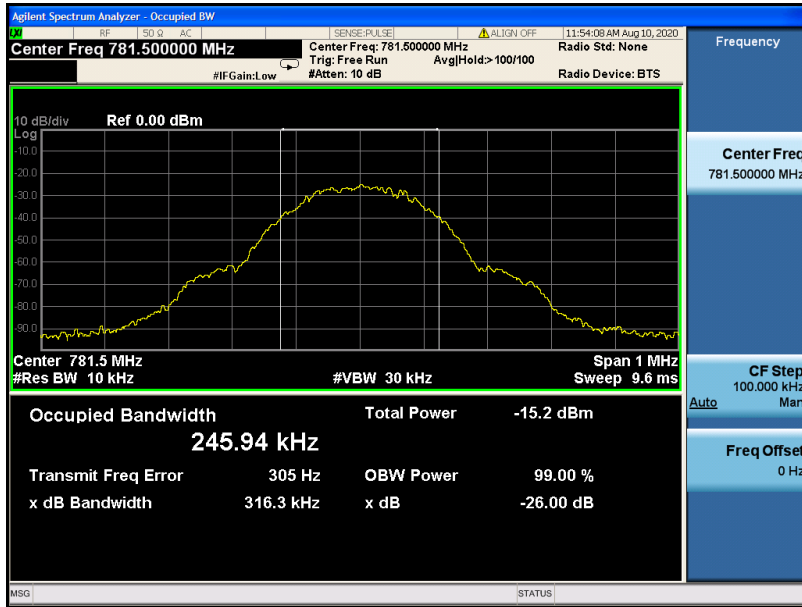
**Band12 LTE DL Input**



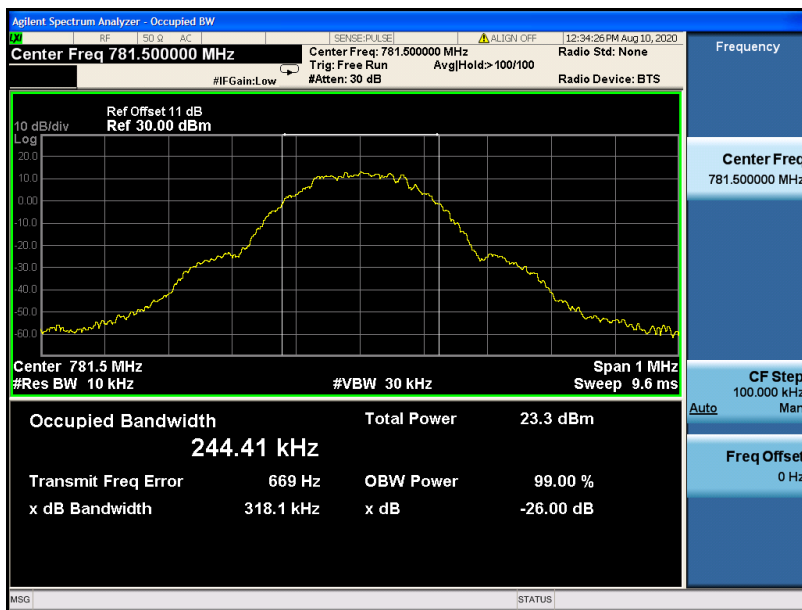
**Band12 LTE DL Output**



**Band13 GSM UL Input**

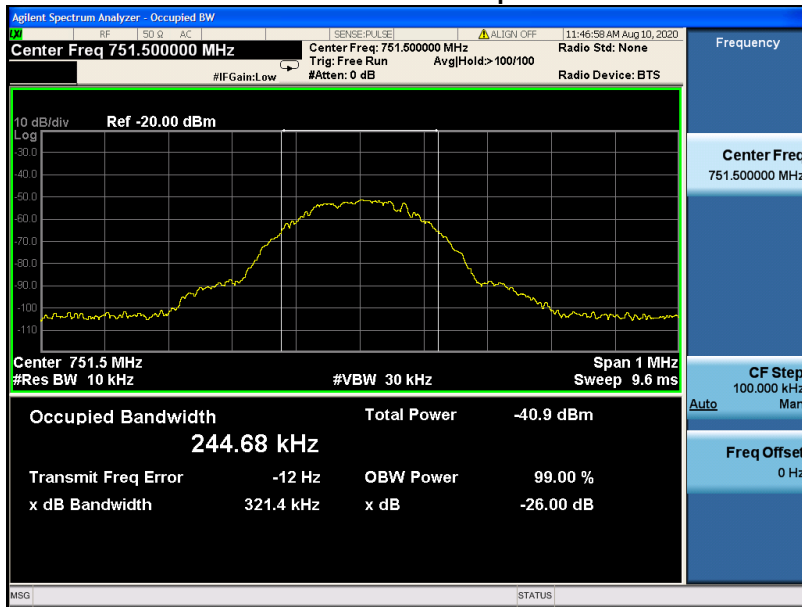


**Band13 GSM UL output**

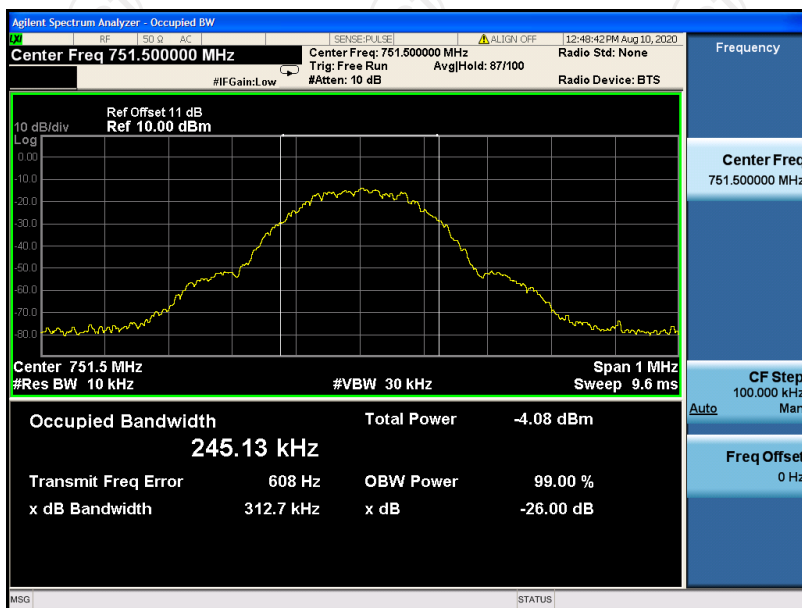




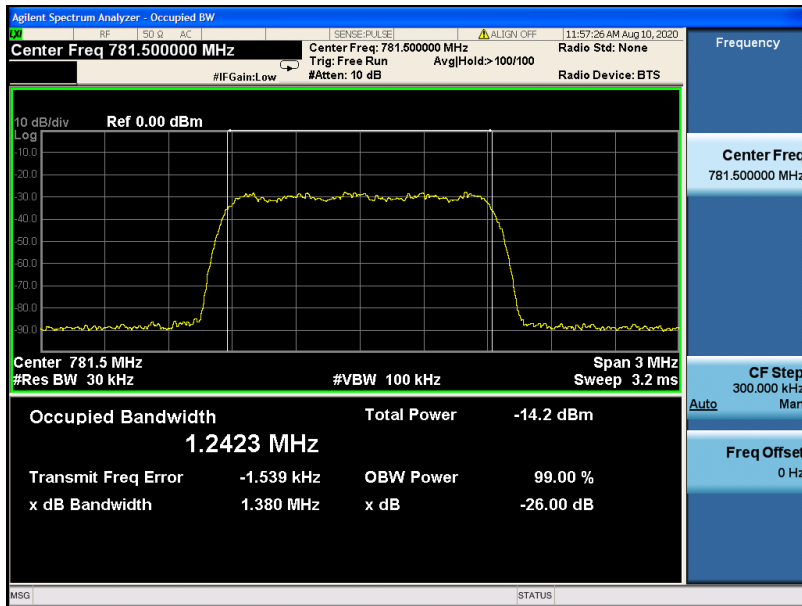
## Band13 GSM DL Input



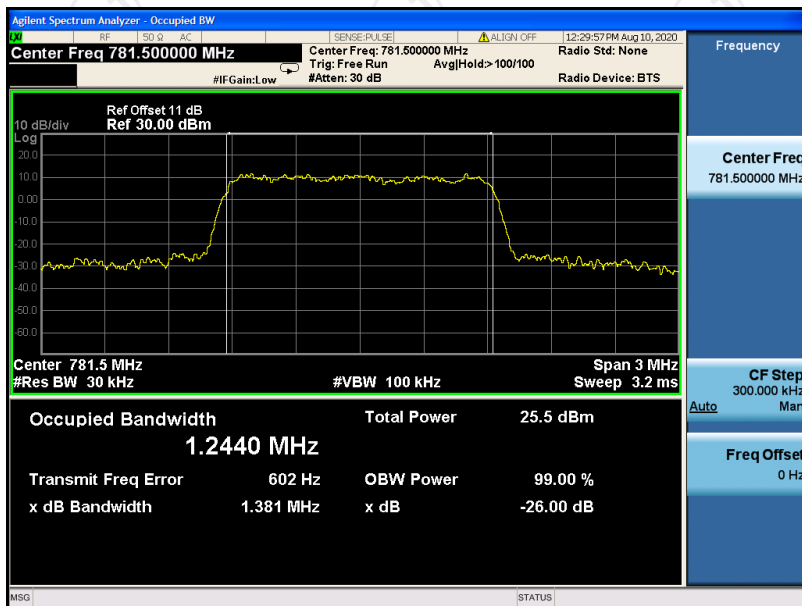
## Band13 GSM DL Output



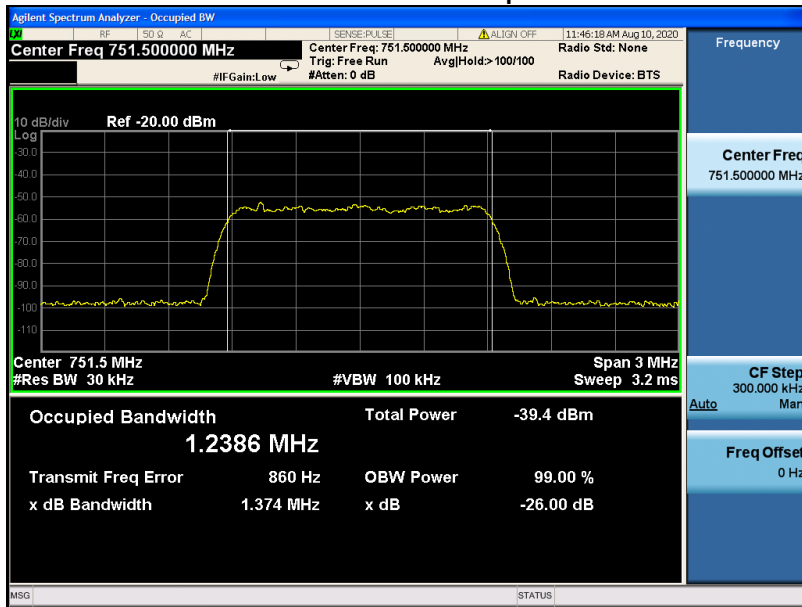
### Band13 CDMA UL Input



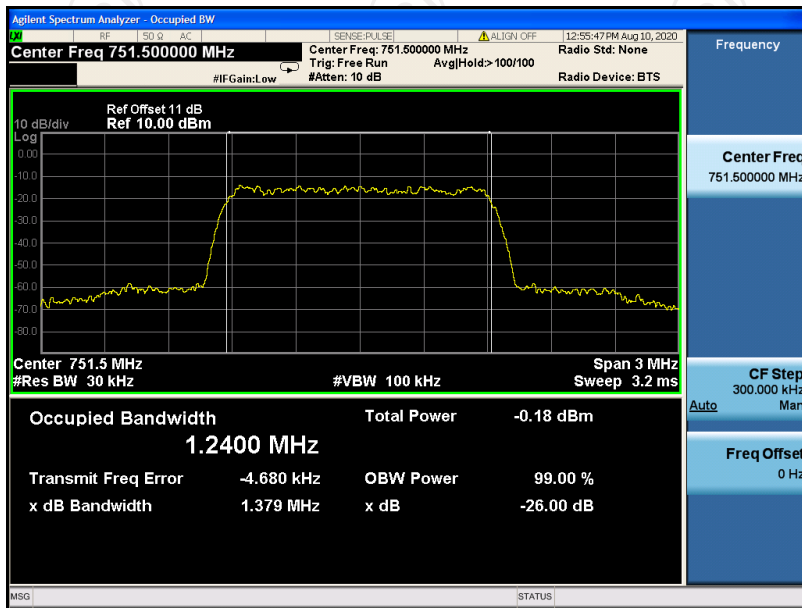
### Band13 CDMA UL output



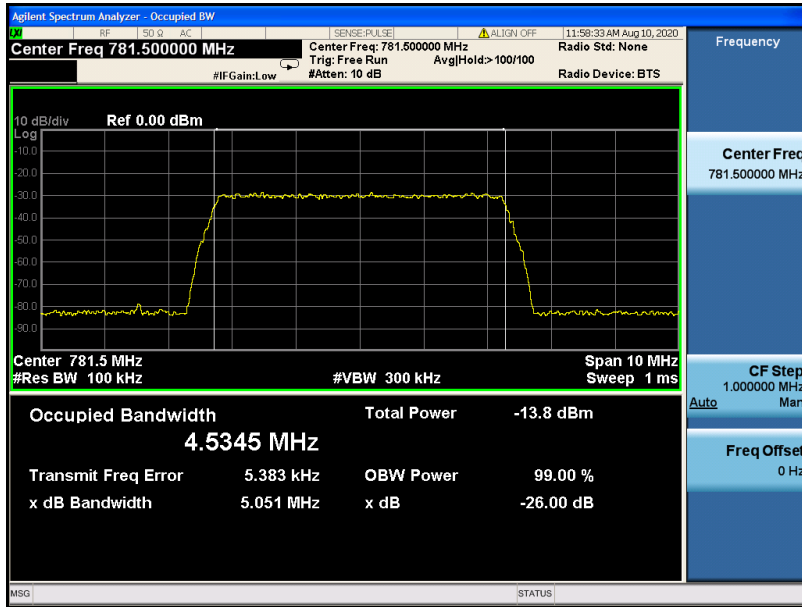
**Band13 CDMA DL Input**



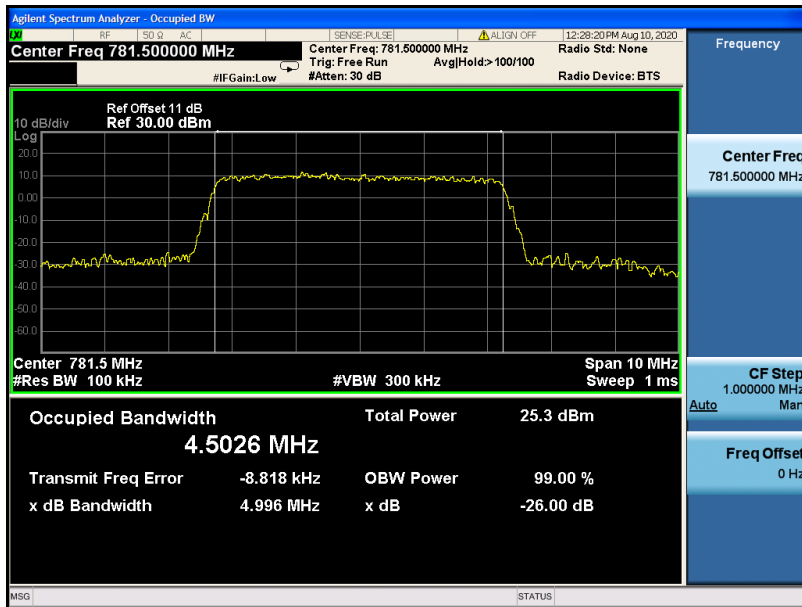
**Band13 CDMA DL Output**



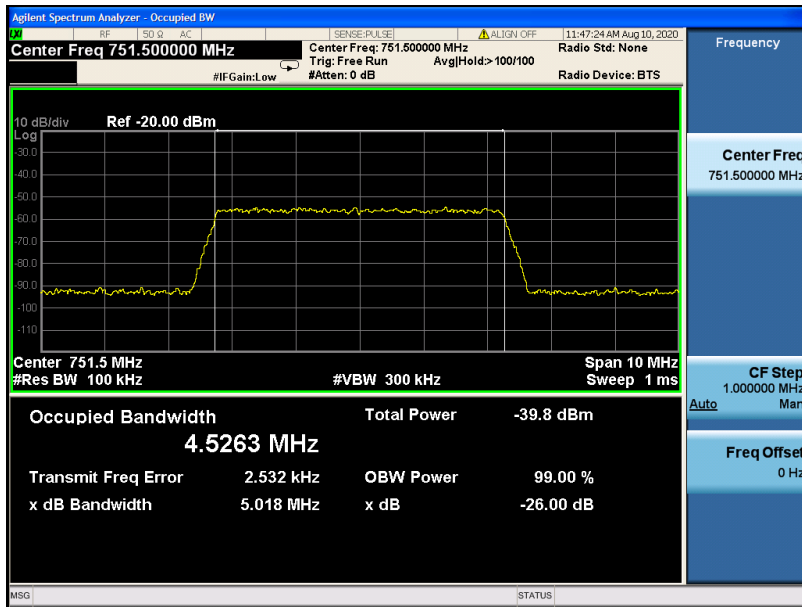
### Band13 LTE UL Input



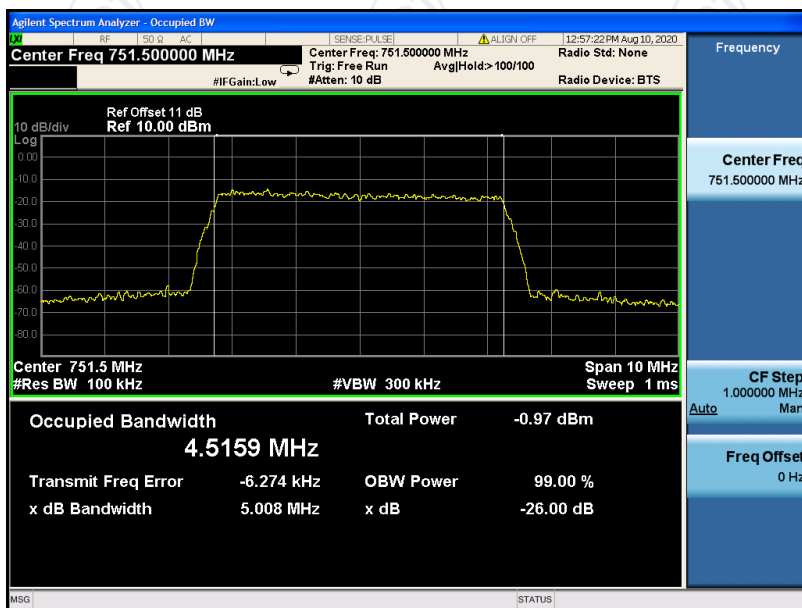
### Band13 LTE UL output



## Band13 LTE DL Input

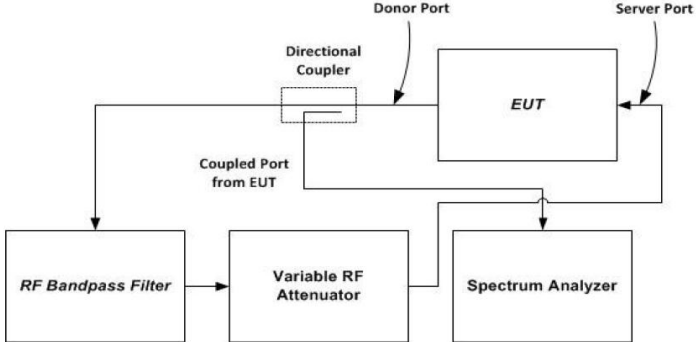
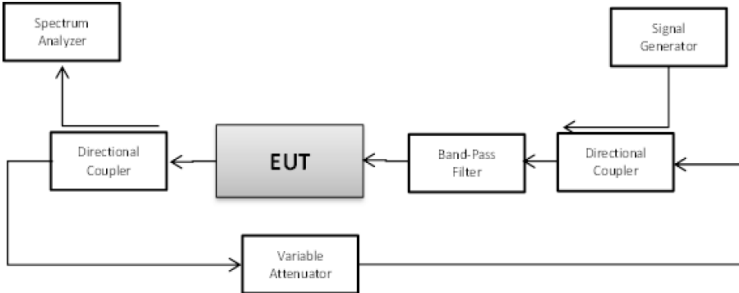


## Band13 LTE DL Output



## 6.10. Oscillation Detection and Mitigation

### 6.10.1. Test Specification

<b>Test Requirement:</b>	FCC Part20 Section 20.21(e)(8)(iii)(A)
<b>Test Method:</b>	KDB935210 D03 Signal booster Measurements v04r04
<b>Limit:</b>	Reference to test data bellow
<b>Test setup:</b>	 <p>NOTE—This figure shows the test setup for uplink bands transmission path tests; i.e., signal flow is out from the donor port into the directional coupler. For downlink bands transmission path tests, the feedback signal flow path direction and equipment connections shall be reversed, i.e., signal flow is out from the server port into the directional coupler, and signal flow is into the donor port from the variable RF attenuator.</p> <p style="text-align: center;">Figure 7 – Oscillation detection (7.11.2) test setup</p>  <p style="text-align: center;">Figure 8 – Oscillation mitigation/shutdown test setup</p>
<b>Test Procedure:</b>	<p><b>Oscillation restart tests</b></p> <ol style="list-style-type: none"> <li>Connect the normal-operating mode EUT to the test equipment as shown in Figure 7 beginning with the spectrum analyzer on the uplink output (donor) port. Confirm that the RF coupled path is connected to the spectrum analyzer. NOTE—The band-pass filter shall provide sufficient out-of-band rejection to prevent oscillations from occurring in bands not under test.</li> <li>Spectrum analyzer settings:             <ol style="list-style-type: none"> <li>Center frequency at the center of the band under test</li> <li>Span equal or slightly exceeding the width of the band under test</li> <li>Continuous sweep, max-hold</li> <li>RBW<math>\geq</math>1 MHz, VBW &gt; 3xRBW</li> </ol> </li> <li>Decrease the variable attenuator until the spectrum analyzer displays a signal within the band under test. Using a marker, identify the approximate center frequency of this signal on the max-hold display, increase the attenuation by 10 dB, then reset the EUT (e.g., cycle ac/dc power).</li> <li>Repeat 7.11.2c) twice to ensure that the center of the signal</li> </ol>

- created by the booster remains within 250 kHz of the spectrum analyzer display center frequency. If the frequency of the signal is unstable, confirm that the spectrum analyzer display is centered between the frequency extremes observed. If the signal is wider than 1 MHz, ensure that the spectrum analyzer display is centered on the signal by increasing the RBW. Reset the EUT (e.g., cycle ac/dc power) after each oscillation event, if necessary. Set the spectrum analyzer sweep trigger level to just below the peak amplitude of the displayed EUT oscillation signal.
- e) Set the spectrum analyzer to zero-span, with a sweep time of 5 seconds, and single-sweep with max-hold. The spectrum analyzer sweep trigger level in this and the subsequent steps shall be the level identified in 7.11.2d).
  - f) Decrease the variable attenuator until the spectrum analyzer sweep is triggered, increase the attenuation by 10 dB, then reset the EUT (e.g., cycle ac/dc power).
  - g) Reset the zero-span trigger of the spectrum analyzer, then repeat 7.11.2f) twice to ensure that the spectrum analyzer is reliably triggered, resetting the EUT (e.g., cycle ac/dc power) after each oscillation event if necessary.
  - h) Reset the zero-span sweep trigger of the spectrum analyzer, and reset the EUT (e.g., cycle ac/dc power).
  - i) Force the EUT into oscillation by reducing the attenuation.
  - j) Use the marker function of the spectrum analyzer to measure the time from the onset of oscillation until the EUT turns off, by setting Marker 1 on the leading edge of the oscillation signal and Marker 2 on the trailing edge. The spectrum analyzer sweep time may be adjusted to improve the time resolution of these cursors.
  - k) Capture the spectrum analyzer zero-span trace for inclusion in the test report. Report the power level associated with the oscillation separately if it can't be displayed on the trace.
  - l) Repeat 7.11.2b) to 7.11.2k) for all operational uplink and downlink bands.
  - m) Set the spectrum analyzer zero-span sweep time for longer than 60 seconds, then measure the restart time for each operational uplink and downlink band.
  - n) Replace the normal-operating mode EUT with the EUT that supports an anti-oscillation test mode.
  - o) Set the spectrum analyzer zero-span time for a minimum of 120 seconds, and a single sweep.
  - p) Manually trigger the spectrum analyzer zero-span sweep, and manually force the booster into oscillation as described in 7.11.2i).
  - q) When the sweep is complete, place cursors between the first two oscillation detections, and save the Test Plots for inclusion in the test report. The time between restarts must match the manufacturer's timing for the test mode, and there shall be no more than 5 restarts.
  - r) Repeat 7.11.2m) to 7.11.2q) for all operational uplink and downlink bands.

**Test procedure for measuring oscillation mitigation or shutdown**

- a) Connect the normal-operating mode EUT to the test equipment as shown in Figure 8.
- b) Set the spectrum analyzer center frequency to the center of band under test, and use the following settings:
  - 1) RBW=30 kHz, VBW  $\geq 3 \times$  RBW,
  - 2) power averaging (rms) detector,
  - 3) trace averages  $\geq 100$ ,
  - 4) span  $\geq 120\%$  of operational band under test

	<p>5) number of sweep points <math>\geq 2 \times \text{Span}/\text{RBW}</math>.</p> <p>c) Configure the signal generator for AWGN operation with a 99% OBW of 4.1 MHz, tuned to the frequency of 2.5 MHz above the lower edge or below the upper edge of the operating band under test. Adjust the RF output level of the signal generator such that the measured power level of the AWGN signal at the output port of the booster is 30 dB less than the maximum power of the booster for the band under test. Affirm that the input signal is not obstructing the measurement of the strongest oscillation peak in the band, and is not included within the span in the measurement.</p> <p>1) Boosters with operating spectrum passbands of 10 MHz or less may use a CW signal source at the band edge rather than AWGN.</p> <p>2) For device passbands greater than 10 MHz, standard CMRS signal sources (i.e., CDMA, W-CDMA, LTE) may be used instead of AWGN at the band edge.</p> <p>d) Set the variable attenuator to a high attenuation setting such that the booster will operate at maximum gain when powered on. Reset the the EUT (e.g., cycle ac/dc power). Allow the EUT to complete its boot-up process, to reach full operational gain, and to stabilize its operation.</p> <p>e) Set the variable attenuator such that the insertion loss for the center of the band under test (isolation) between the booster donor port and server port is 5 dB greater than the maximum gain, as recorded in the maximum gain test procedure (see 7.3), for the band under test.</p> <p>f) Verify the EUT shuts down, i.e., to mitigate the oscillations. If the booster does not shut down, measure and verify the peak oscillation level as follows.</p> <p>1) Allow the spectrum analyzer trace to stabilize.</p> <p>2) Place the marker at the highest oscillation level occurring within the span, and record its output level and frequency.</p> <p>3) Set the spectrum analyzer center frequency to the frequency with the highest oscillation signal level, and reduce the span such that the upper and lower adjacent oscillation peaks are within the span.</p> <p>4) Use the Minimum Search Marker function to find the lowest output level that is within the span, and within the operational band under test, and record its output level and frequency.</p> <p>5) Affirm that the peak oscillation level measured in 7.11.3f2), does not exceed by 12.0 dB the minimal output level measured in 7.11.3f)4). Record the measurement results of 7.11.3f2) and 7.11.3f4) in tabular format for inclusion in the test report.</p> <p>6) The procedure of 7.11.3f1) to 7.11.3f5) allows the spectrum analyzer trace to stabilize, and verification of shutdown or oscillation level measurement must occur within 300 seconds.</p> <p>14</p> <p>g) Decrease the variable attenuator in 1 dB steps, and repeat step 7.11.3f) for each 1 dB step. Continue testing to the level when the insertion loss for the center of band under test (isolation) between the booster donor port and server port is 5 dB lower than the maximum gain (see 7.3).</p> <p>h) Repeat 7.11.3a) to 7.11.3g) for all operational uplink and downlink bands.</p>
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<b>Test results:</b>	<b>PASS</b>
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**6.10.2. Test Instruments**

Equipment	Manufacturer	Model	S/N	Calibration Date	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 12, 2019	Sep. 11, 2020
Attenuation	AF115A-09-34	JFW	907763	Sep. 12, 2019	Sep. 11, 2020
RF Combiner	SUNVNDN	SUD-CS0800	16230009	Sep. 12, 2019	Sep. 11, 2020
AN03468	Band Pass Filter	4CS10-781.5/E12.2-O/O	N/A	Sep. 12, 2019	Sep. 11, 2020
AN03469	Band Pass Filter	4CS10-751.5/E12-O/O	N/A	Sep. 12, 2019	Sep. 11, 2020
AN02475	1 dB step Attenuator	8494B	N/A	Sep. 12, 2019	Sep. 11, 2020
AN03429	10dB step Attenuator	8496B	N/A	Sep. 12, 2019	Sep. 11, 2020
ANC00082	RF Coupler	722-10-1.500V	N/A	Sep. 12, 2019	Sep. 11, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

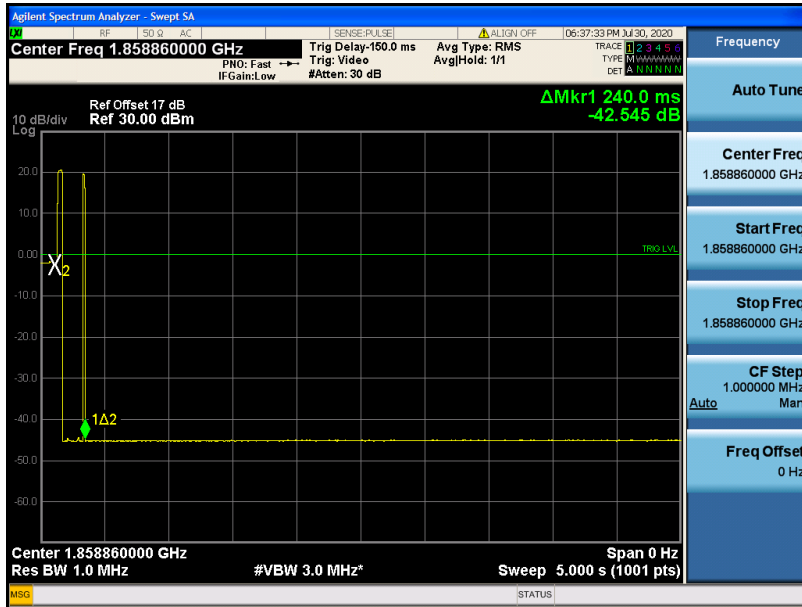
**6.10.3. Test Data**

Test results of detection time				
Operation Bands		Detection Time (s)	Limit (s)	Result
Uplink	Band2	0.240	0.300	PASS
	Band4	0.230	0.300	PASS
	Band5	0.255	0.300	PASS
	Band12	0.250	0.300	PASS
	Band13	0.255	0.300	PASS
Downlink	Band2	0.130	1.000	PASS
	Band4	0.330	1.000	PASS
	Band5	0.125	1.000	PASS
	Band12	0.100	1.000	PASS
	Band13	0.540	1.000	PASS

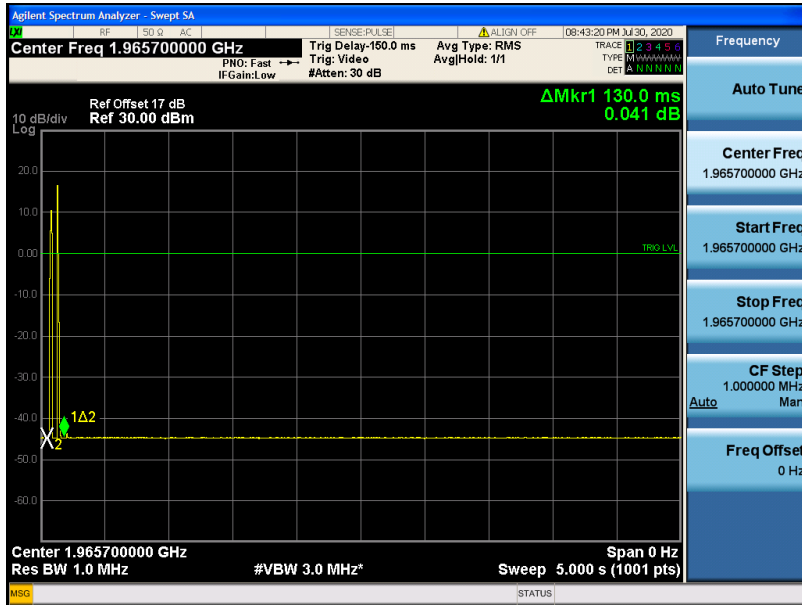
Test results of detection time						
Operation Bands		Restarting Time(s)	Limit (s)	Restarting Counts	Limit	Result
Uplink	Band2	70.62	60	2	5	PASS
	Band4	69.96	60	2	5	PASS
	Band5	69.30	60	2	5	PASS
	Band12	69.30	60	2	5	PASS
	Band13	69.30	60	3	5	PASS
Downlink	Band2	69.96	60	2	5	PASS
	Band4	69.96	60	2	5	PASS
	Band5	69.30	60	2	5	PASS
	Band12	69.30	60	3	5	PASS
	Band13	69.96	60	2	5	PASS

Test Test Plots of detection time

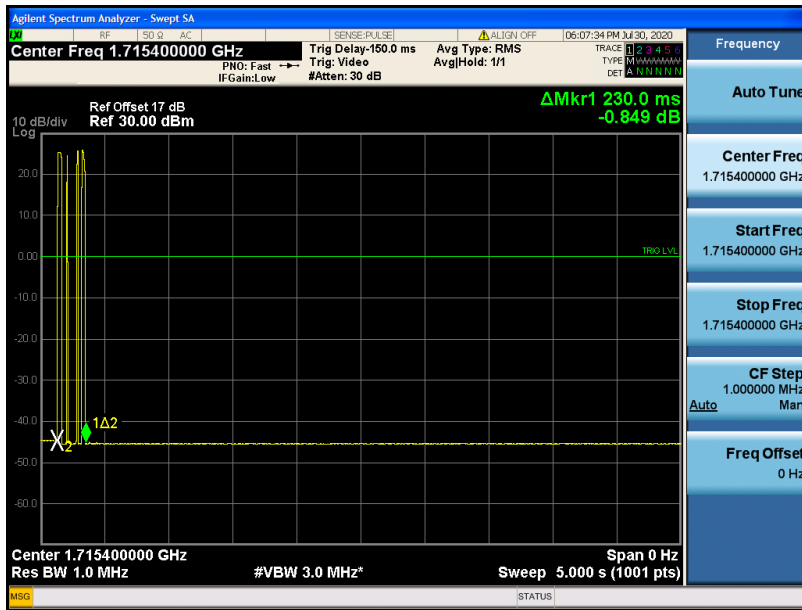
Band2 UL



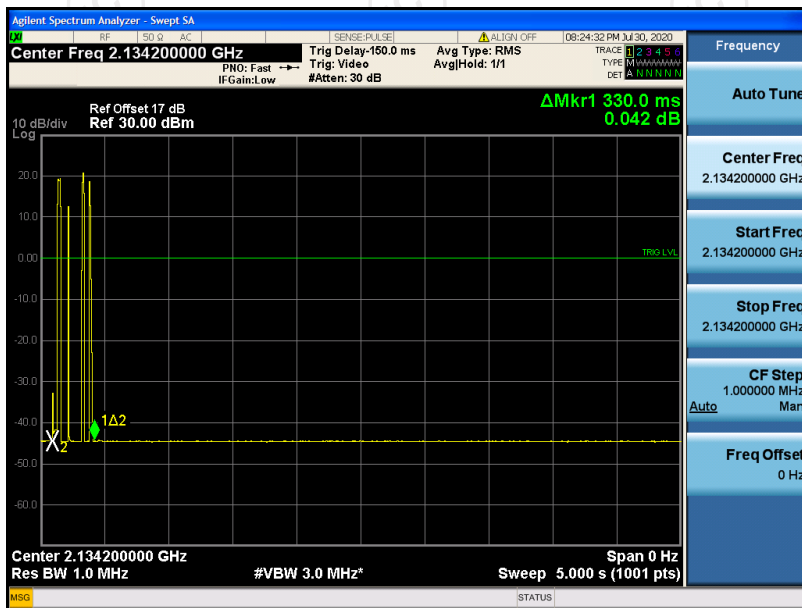
Band2 DL



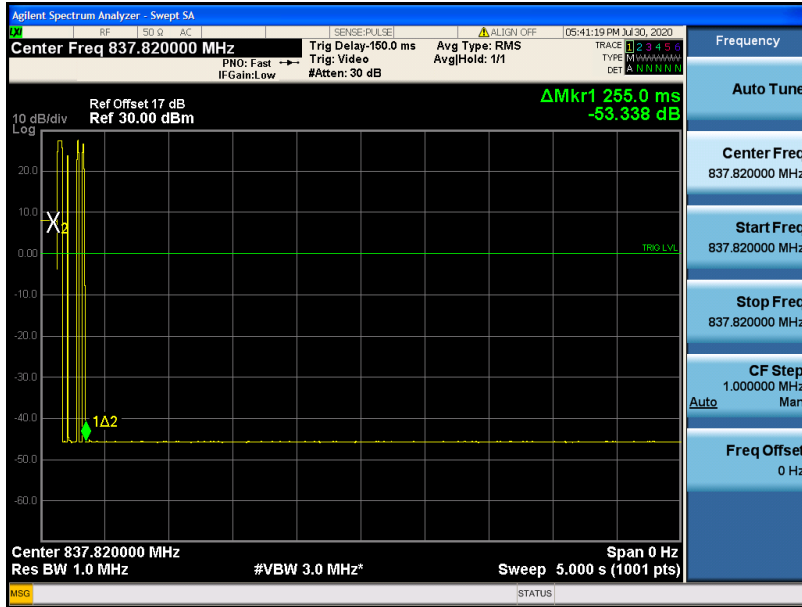
**Band4 UL**



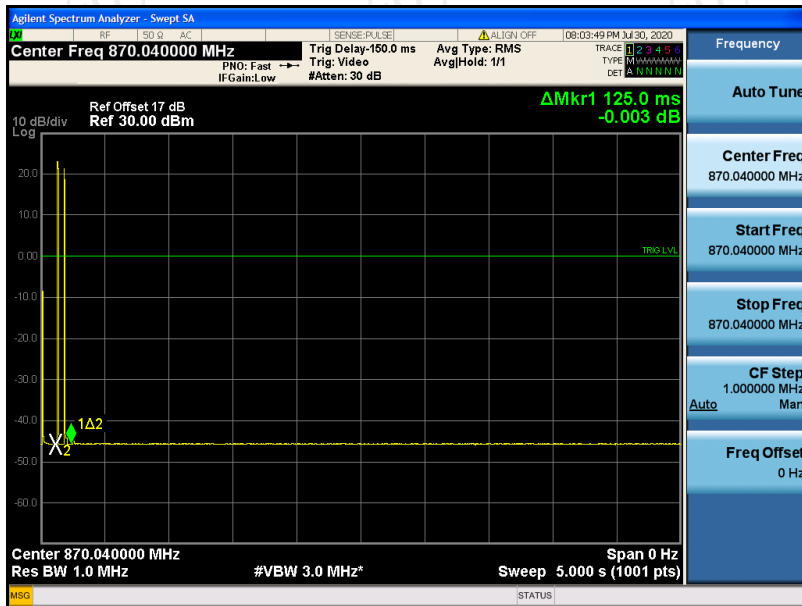
**Band4 DL**



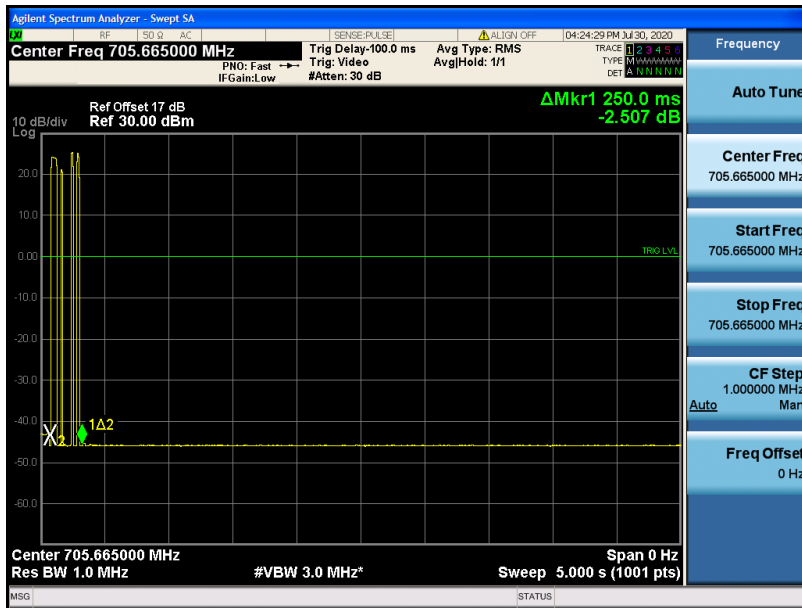
**Band5 UL**



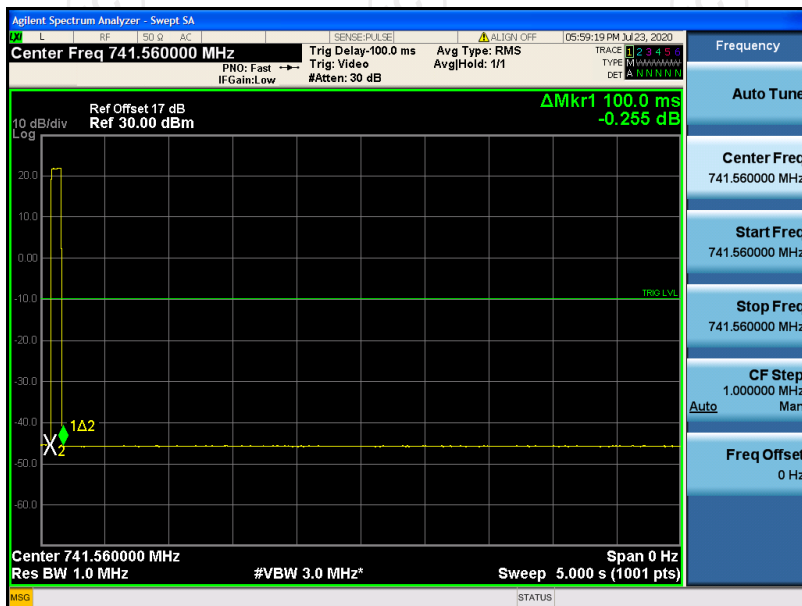
**Band5 DL**



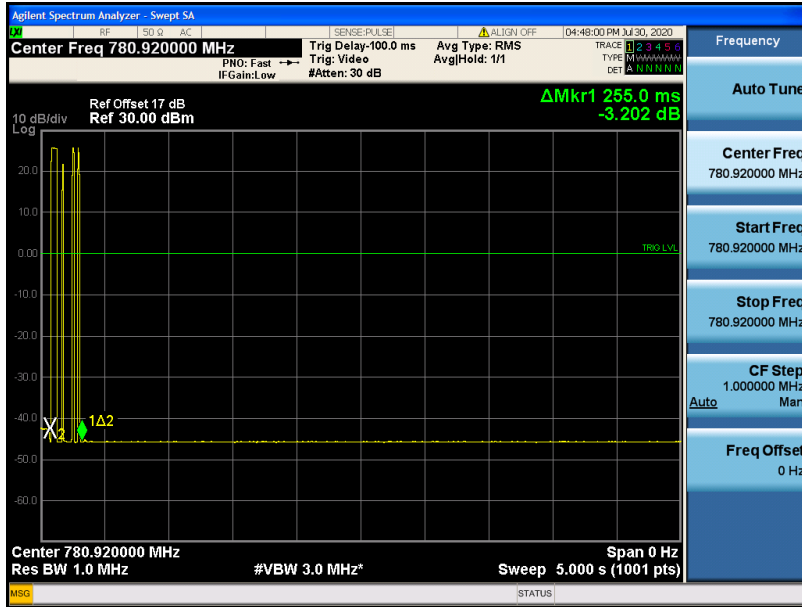
**Band12 UL**



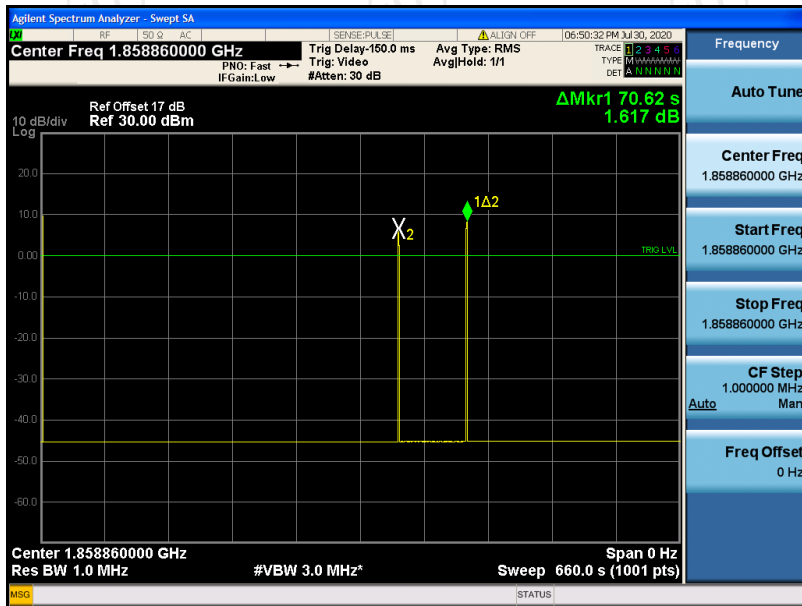
**Band12 DL**



**Band13 UL**

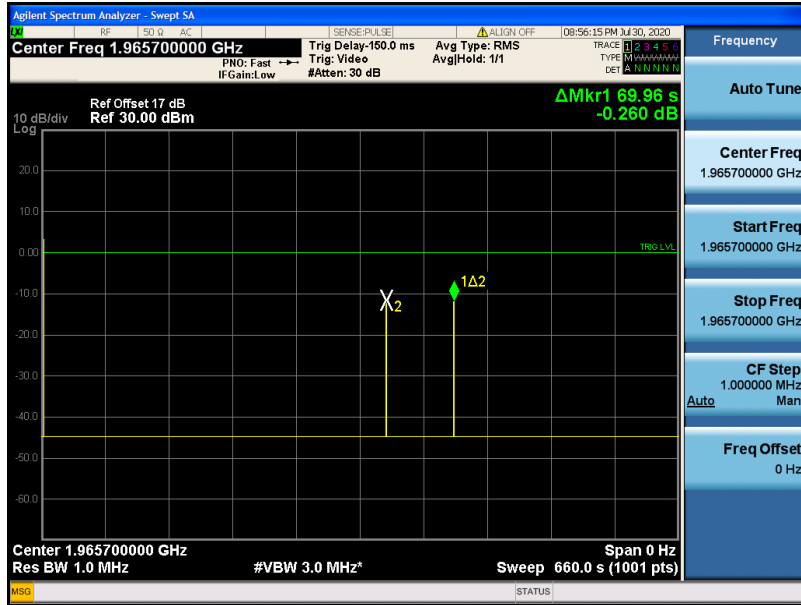


**Band13 DL**

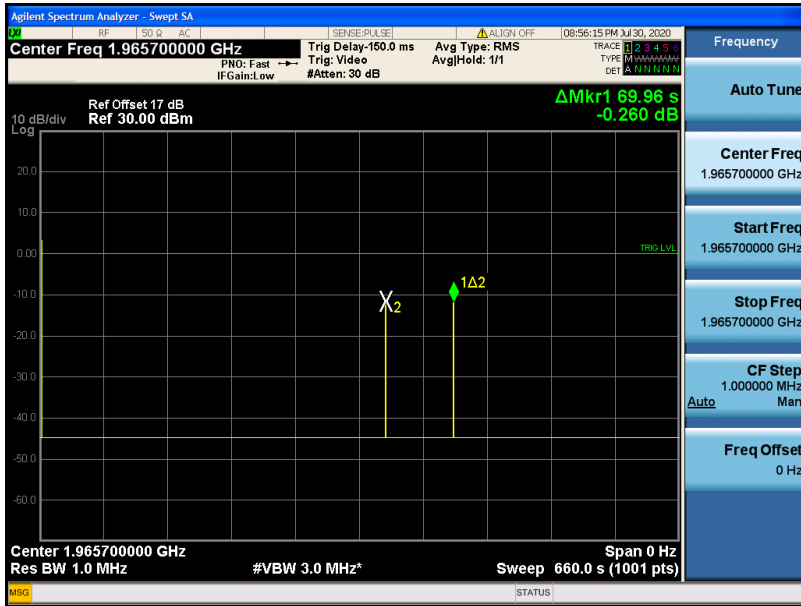


Test Test Plotts of restarting time

Band2 UL

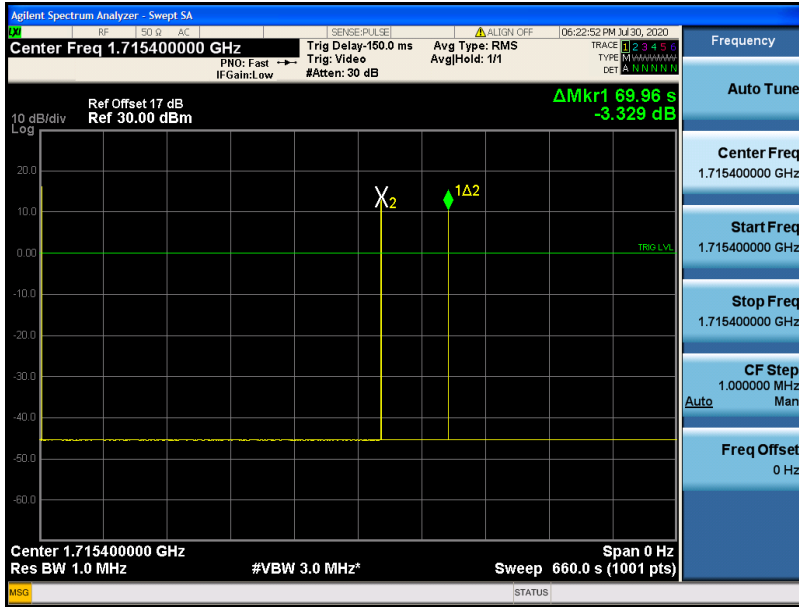


Band2 DL

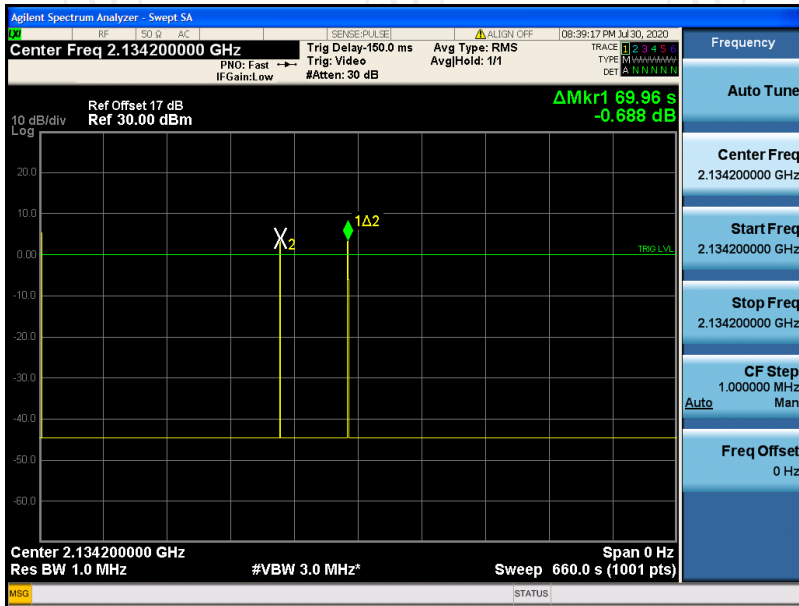




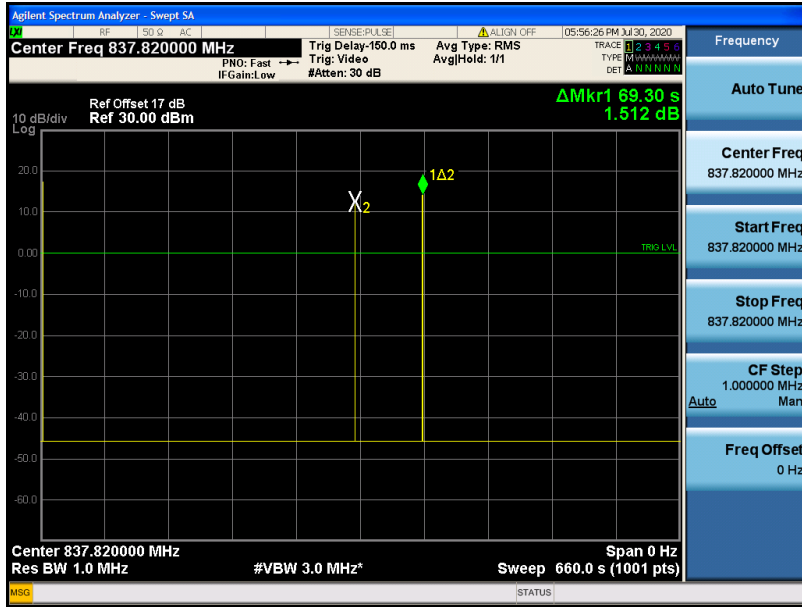
**Band4 UL**



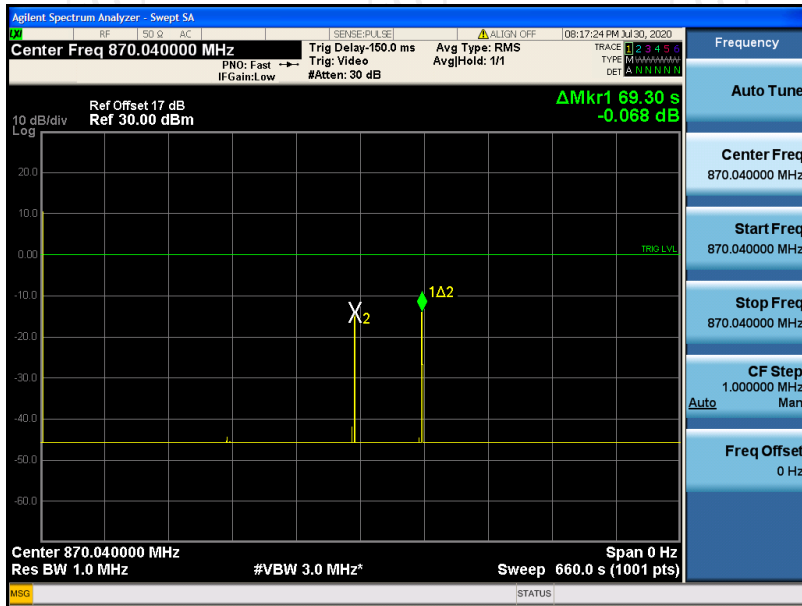
**Band4 DL**



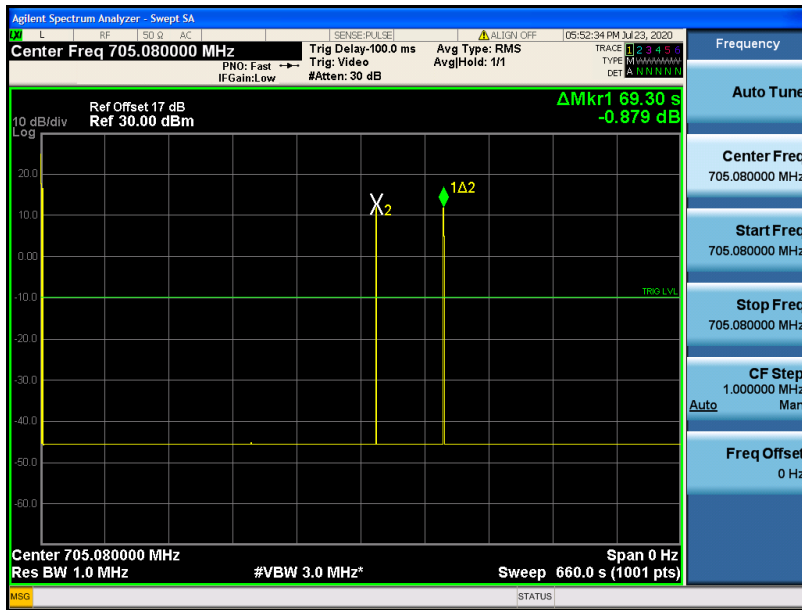
**Band5 UL**



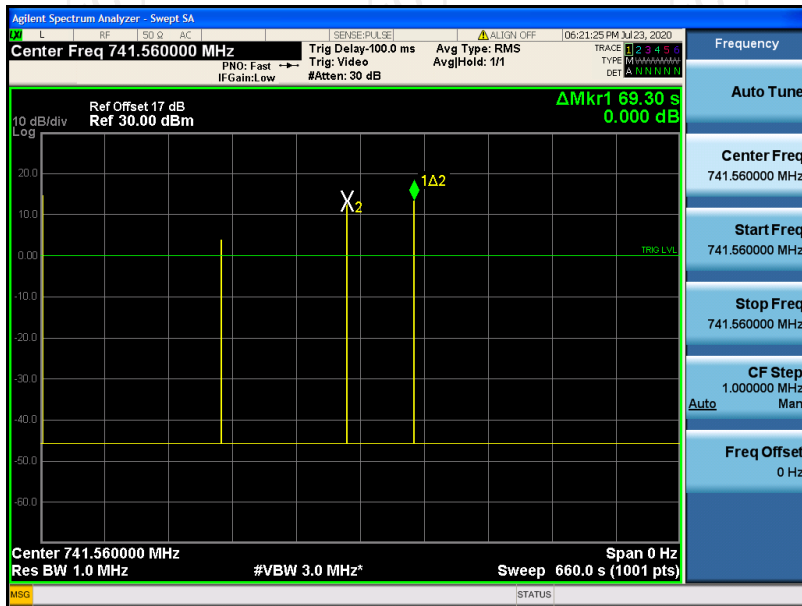
**Band5 DL**



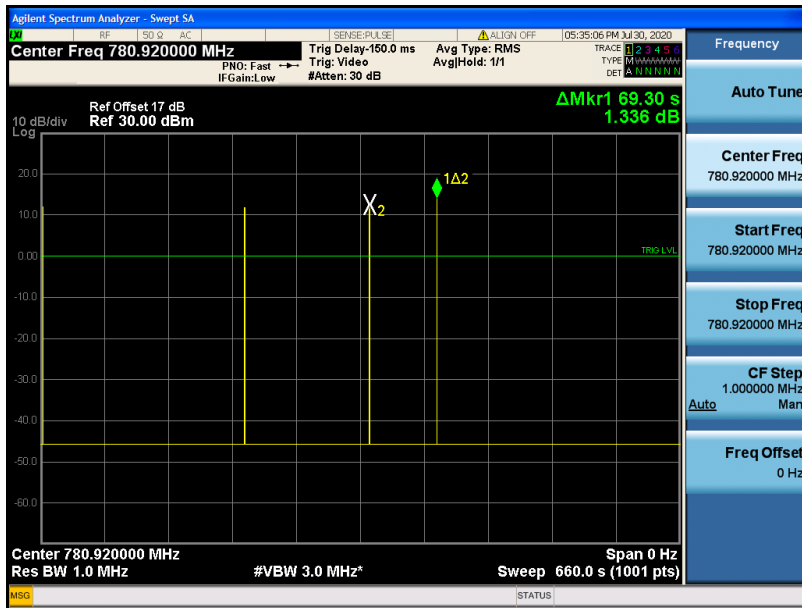
**Band12 UL**



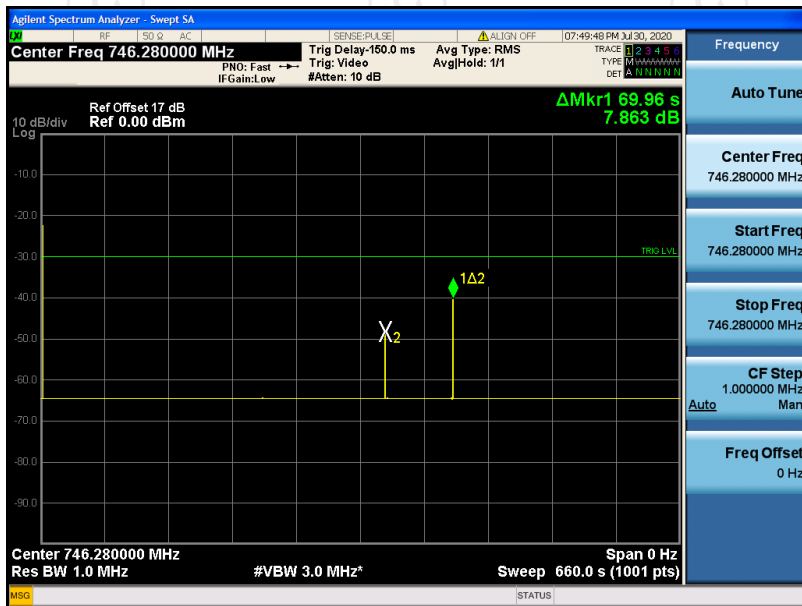
**Band12 DL**



**Band13 UL**



**Band13 DL**



Test results of Mitigation or Shutdown

Band2	Uplink(1850-1910MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1875.76	-66.82	1881.42	-78.68	11.86	<12	223	300	Pass
+4	1875.76	-63.57	1881.63	-78.18	14.61	<12	231	300	Pass
+3	1875.76	-58.43	1881.51	-78.43	20.00	<12	224	300	Pass
+2	1875.76	-40.35	1881.47	-78.82	38.47	<12	212	300	Pass
+1	EUT Shutdown								

Band2	Downlink(1930-1990MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1960.24	-74.36	1955.14	-79.43	5.07	<12	226	300	Pass
+4	1960.24	-73.14	1955.14	-79.48	6.34	<12	234	300	Pass
+3	1960.24	-72.37	1955.14	-80.04	7.67	<12	231	300	Pass
+2	1960.24	-71.54	1955.14	-79.47	7.93	<12	227	300	Pass
+1	1960.24	-67.42	1955.14	-78.29	10.87	<12	226	300	Pass
0	1960.24	-55.68	1955.14	-79.20	23.52	<12	220	300	Pass
-1	EUT Shutdown								

Band4	Uplink(1710-1755MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	1723.42	-70.03	1728.49	-79.69	9.66	<12	239	300	Pass
+4	1723.42	-67.89	1728.49	-78.82	10.93	<12	227	300	Pass
+3	1723.42	-65.72	1728.49	-78.29	12.57	<12	231	300	Pass
+2	1723.42	-61.53	1728.49	-79.72	18.19	<12	226	300	Pass
+1	1723.42	-47.14	1728.49	-80.04	32.9	<12	224	300	Pass
0	EUT Shutdown								

Band4	Downlink(2110-2155MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	2114.63	-69.54	2118.83	-77.4	7.86	<12	234	300	Pass
+4	2114.63	-67.42	2118.83	-76.84	9.42	<12	228	300	Pass
+3	2114.63	-66.54	2118.83	-77.93	11.39	<12	231	300	Pass
+2	2114.63	-63.27	2118.83	-77.85	14.58	<12	223	300	Pass
+1	EUT Shutdown								

Band5		Uplink(824-849MHz)							
Signal Type		AWGN							
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	837.56	-72.36	833.81	-79.11	6.75	<12	224	300	Pass
+4	837.56	-70.63	833.81	-79.27	8.64	<12	229	300	Pass
+3	837.56	-68.85	833.81	-79.51	10.66	<12	227	300	Pass
+2	837.56	-65.26	833.81	-79.52	14.26	<12	232	300	Pass
+1	837.56	-61.11	833.81	-79.96	18.85	<12	224	300	Pass
0	837.56	-42.17	833.81	-79.81	37.64	<12	226	300	Pass
-1	EUT Shutdown								

Band5		Downlink(869-894MHz)							
Signal Type		AWGN							
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	880.24	-74.58	876.67	-79.26	4.68	<12	233	300	Pass
+4	880.24	-73.96	876.67	-79.5	5.54	<12	240	300	Pass
+3	880.24	-72.59	876.67	-79.01	6.42	<12	235	300	Pass
+2	880.24	-70.53	876.67	-78.57	8.04	<12	228	300	Pass
+1	880.24	-68.57	876.67	-78.17	9.6	<12	230	300	Pass
0	880.24	-66.84	876.67	-79.23	12.39	<12	222	300	Pass
-1	880.24	-64.03	876.67	-79.41	15.38	<12	225	300	Pass
-2	880.24	-48.05	876.67	-79.7	31.65	<12	204	300	Pass
-3	EUT Shutdown								

Band12	Uplink(698-716MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	710.57	-73.14	712.37	-79.38	6.24	<12	227	300	Pass
+4	710.57	-72.37	712.37	-79.93	7.56	<12	229	300	Pass
+3	710.57	-70.14	712.37	-79.15	9.01	<12	231	300	Pass
+2	710.57	-67.85	712.37	-79.83	11.98	<12	224	300	Pass
+1	710.57	-65.83	712.37	-79.42	13.59	<12	226	300	Pass
0	710.57	-62.47	712.37	-79.48	17.01	<12	210	300	Pass
-1	710.57	-52.36	712.37	-78.88	26.52	<12	211	300	Pass
-2	EUT Shutdown								

Band12	Downlink(728-746MHz)								
Signal Type	AWGN								
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	741.86	-73.9	739.37	-80.35	6.45	<12	236	300	Pass
+4	741.86	-72.31	739.37	-79.95	7.64	<12	232	300	Pass
+3	741.86	-70.35	739.37	-79.81	9.46	<12	225	300	Pass
+2	741.86	-67.86	739.37	-79.6	11.74	<12	223	300	Pass
+1	741.86	-62.57	739.37	-79.72	17.15	<12	220	300	Pass
0	741.86	-43.75	739.37	-80.66	36.91	<12	201	300	Pass
-1	EUT Shutdown								

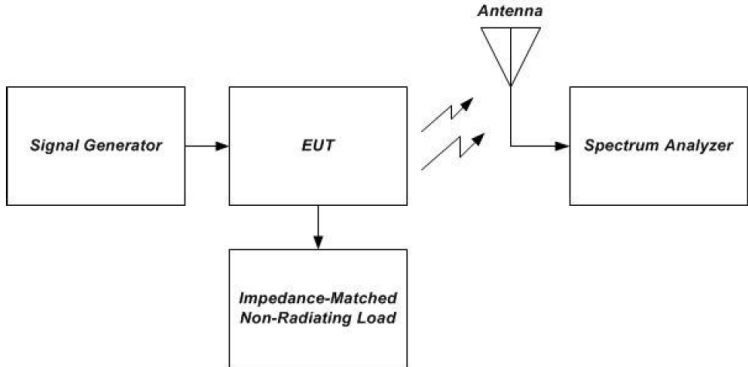


Band13		Uplink(776-787MHz)							
Signal Type		AWGN							
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	778.69	-70.41	776.34	-80.05	9.64	<12	229	300	Pass
+4	778.69	-68.58	776.34	-79.83	11.25	<12	232	300	Pass
+3	778.69	-65.24	776.34	-79.32	14.08	<12	224	300	Pass
+2	778.69	-61.21	776.34	-80.02	18.81	<12	225	300	Pass
+1	778.69	-46.71	776.34	-78.46	31.75	<12	211	300	Pass
0	EUT Shutdown								

Band13		Downlink(746-757MHz)							
Signal Type		AWGN							
Isolation	Peak Oscillations		Minimal Level		Delta Value	Limit	Time to Mitigate Oscillation	Mitigation Time Limit	Result
	Freq.	Level	Freq.	Level					
dB	MHz	dBm	MHz	dBm	dB	dB	sec	sec	
+5	747.34	-72.49	749.21	-79.75	7.26	<12	234	300	Pass
+4	747.34	-69.68	749.21	-79.39	9.71	<12	226	300	Pass
+3	747.34	-66.52	749.21	-79.61	13.09	<12	223	300	Pass
+2	747.34	-60.47	749.21	-79.12	18.65	<12	220	300	Pass
+1	747.34	-48.14	749.21	-79.61	31.47	<12	218	300	Pass
0	EUT Shutdown								

## 7. Radiation Spurious Emission

### 7.1.1. Test Specification

<b>Test Requirement:</b>	FCC Part2 Section 2.1053
<b>Test Method:</b>	KDB935210 D03 Signal booster Measurements v04r04
<b>Limit:</b>	-13dBm
<b>Test setup:</b>	 <p style="text-align: center;">Figure 10 – Radiated spurious emissions test and instrumentation setup</p>
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>a) Place the EUT on an OATS or semi-anechoic chamber turntable 3 m from the receiving antenna.15</li> <li>b) Connect the EUT to the test equipment as shown in Figure 10 beginning with the uplink output (donor) port.</li> <li>c) Set the signal generator to produce a CW signal with the frequency set to the center of the operational band under test, and the power level set at PIN as determined from measurement results per 7.2.</li> <li>d) Measure the radiated spurious emissions from the EUT from the lowest to the highest frequencies as specified in § 2.1057. Maximize the radiated emissions by using the procedures described in ANSI C63.4.</li> <li>e) Capture the peak emissions Test Plotss using a peak detector with Max-Hold for inclusion in the test report. Tabular data is acceptable in lieu of spectrum analyzer Test Plotss.</li> <li>f) Repeat 7.12c) through 7.12e) for all uplink and downlink operational bands.</li> </ol>
<b>Test results:</b>	PASS

**7.1.2. Test Instruments**

Radiated Emission				
Name	Model No.	Manufacturer	Date of Cal.	Due Date
EMI Test Receiver	ESIB7	R&S	Jul. 28, 2020	Jul. 27, 2021
Spectrum Analyzer	FSQ40	R&S	Sep. 12, 2019	Sep. 11, 2020
Amplifier	8447D	HP	Sep. 09, 2019	Sep. 08, 2020
Amplifier	EM30265	EM Electronics Corporation CO.,LTD	Sep. 09, 2019	Sep. 08, 2020
Broadband Antenna	VULB9163	Schwarzbeck	Sep. 07, 2019	Sep. 06, 2020
Horn Antenna	BBHA 9120D	Schwarzbeck	Sep. 07, 2019	Sep. 06, 2020
Coax cable (9KHz-40GHz)	RE-high-02	TCT	Sep. 09, 2019	Sep. 08, 2020
Coax cable (9KHz-40GHz)	RE-high-04	TCT	Sep. 09, 2019	Sep. 08, 2020
Loop antenna	ZN30900A	ZHINAN	Sep. 12, 2019	Sep. 11, 2020
Signal Generator	N5182A	Agilent	Sep. 12, 2019	Sep. 11, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

7.1.3. Test data

Frequency [MHz]	Antenna polarity [H/V]	Reading Level	Substitution factor	Measurement Level [dBm]	Limit [dBm]	Margin [dB]
<b>Band2 Uplink</b>						
165.17	H	-40.76	-8.48	-49.24	-13.00	-36.24
553.46	V	-54.39	5.83	-48.56		-35.56
5580.00	H	-48.36	12.39	-35.97		-22.97
5580.00	V	-46.31	13.68	-32.63		-19.63
<b>Band2 Downlink</b>						
175.14	H	-40.74	-6.95	-47.69	-13.00	-34.69
552.45	V	-54.52	5.87	-48.65		-35.65
2632.00	H	-46.67	4.60	-42.07		-29.07
5046.00	V	-51.81	12.76	-39.05		-26.05

Frequency [MHz]	Antenna polarity [H/V]	Reading Level	Substitution factor	Measurement Level [dBm]	Limit [dBm]	Margin [dB]
<b>Band4 Uplink</b>						
166.07	H	-40.87	-8.58	-49.45	-13.00	-36.45
550.95	V	-54.63	5.71	-48.92		-35.92
5179.50	H	-47.05	11.92	-35.13		-22.13
5179.50	V	-50.35	13.24	-37.11		-24.11
<b>Band4 Downlink</b>						
175.04	H	-40.66	-7.00	-47.66	-13.00	-34.66
556.77	V	-54.36	5.92	-48.44		-35.44
5182.00	H	-50.27	12.00	-38.27		-25.27
7953.00	V	-50.72	16.95	-33.76		-20.76

Frequency [MHz]	Antenna polarity [H/V]	Reading Level	Substitution factor	Measurement Level [dBm]	Limit [dBm]	Margin [dB]
<b>Band5 Uplink</b>						
167.82	H	-40.82	-8.27	-49.09	-13.00	-36.09
558.73	V	-56.71	5.99	-50.72		-37.72
2509.50	H	-47.65	4.38	-43.27		-30.27
2509.50	V	-45.71	4.51	-41.2		-28.20
<b>Band5 Downlink</b>						
175.65	H	-42.28	-6.89	-49.17	-13.00	-36.17
550.95	V	-55.08	5.71	-49.37		-36.37
5184.00	H	-50.75	12.01	-38.74		-25.74
2616.00	V	-44.66	5.56	-39.10		-26.10

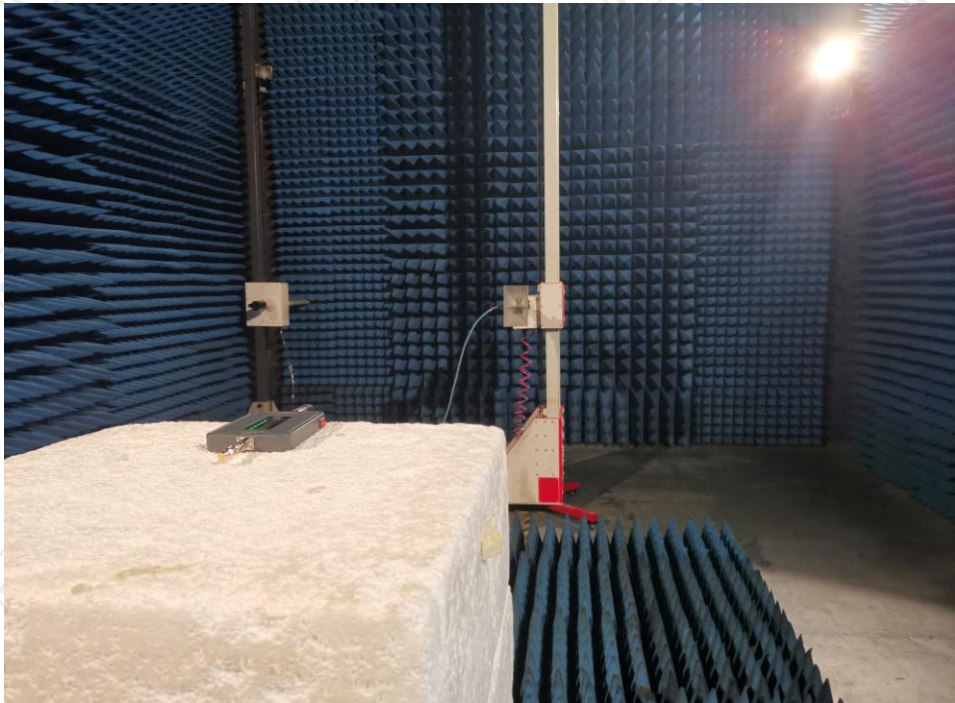
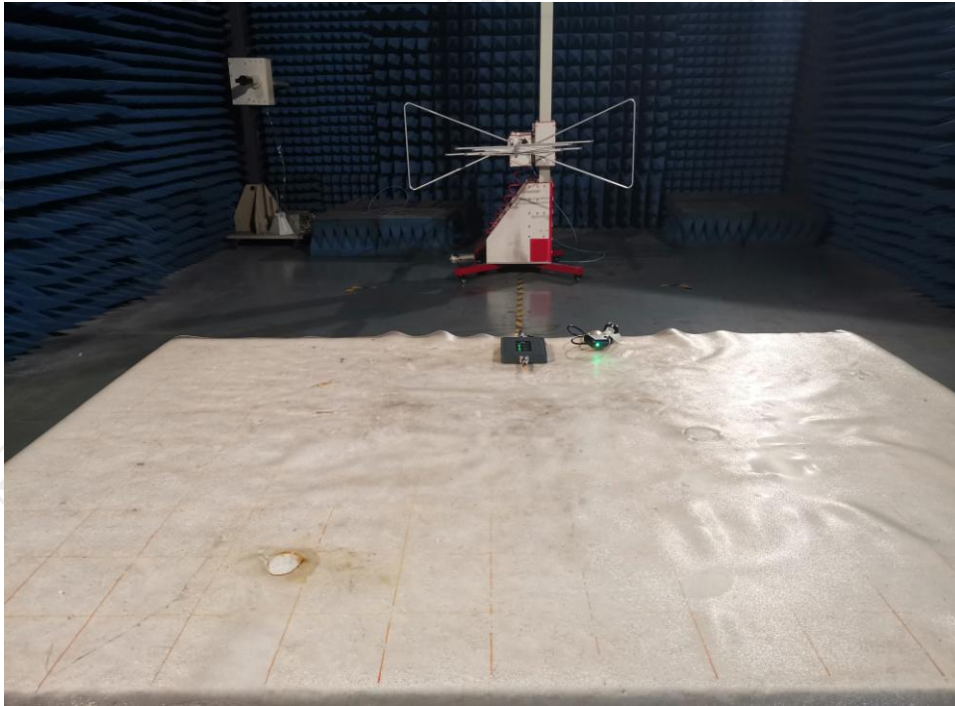
Frequency [MHz]	Antenna polarity [H/V]	Reading Level	Substitution factor	Measurement Level [dBm]	Limit [dBm]	Margin [dB]
<b>Band12 Uplink</b>						
167.88	H	-40.88	-8.22	-49.10	-13.00	-36.10
557.63	V	-56.62	5.92	-50.70		-37.70
2121.00	H	-48.36	1.89	-46.47		-33.47
2121.00	V	-45.69	2.76	-42.93		-29.93
<b>Band12 Downlink</b>						
175.75	H	-42.42	-6.78	-49.2	-13.00	-36.20
551.20	V	-55.15	5.76	-49.39		-36.39
3920.00	H	-49.50	8.07	-41.43		-28.43
4136.00	V	-49.17	9.44	-39.73		-26.73

Frequency [MHz]	Antenna polarity [H/V]	Reading Level	Substitution factor	Measurement Level [dBm]	Limit [dBm]	Margin [dB]
<b>Band13 Uplink</b>						
167.79	H	-40.77	-8.34	-49.11	-13.00	-36.11
558.18	V	-56.64	5.96	-50.68		-37.68
2344.50	H	-48.36	2.69	-45.67		-32.67
2344.50	V	-46.41	3.82	-42.59		-29.59
<b>Band13 Downlink</b>						
175.71	H	-42.35	-6.80	-49.15	-13.00	-36.15
551.36	V	-55.02	5.78	-49.24		-36.24
3654.00	H	-50.66	7.53	-43.13		-30.13
4154.35	V	-50.47	10.21	-40.26		-27.26

### Appendix A: Photographs of Test Setup

Product: Cell Phone Signal Booster

Model: AN-CPAL45 Plus

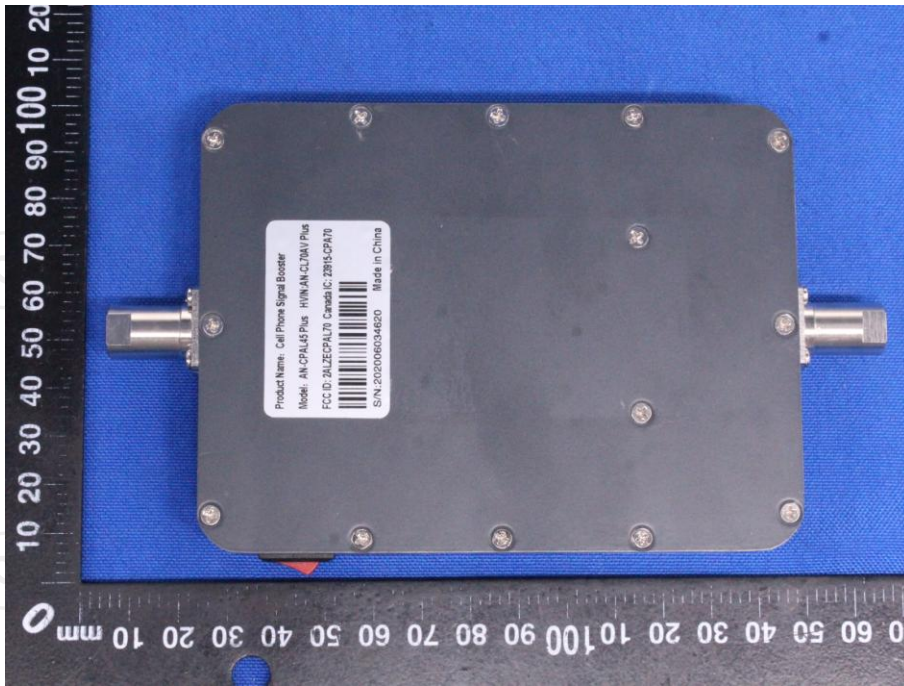




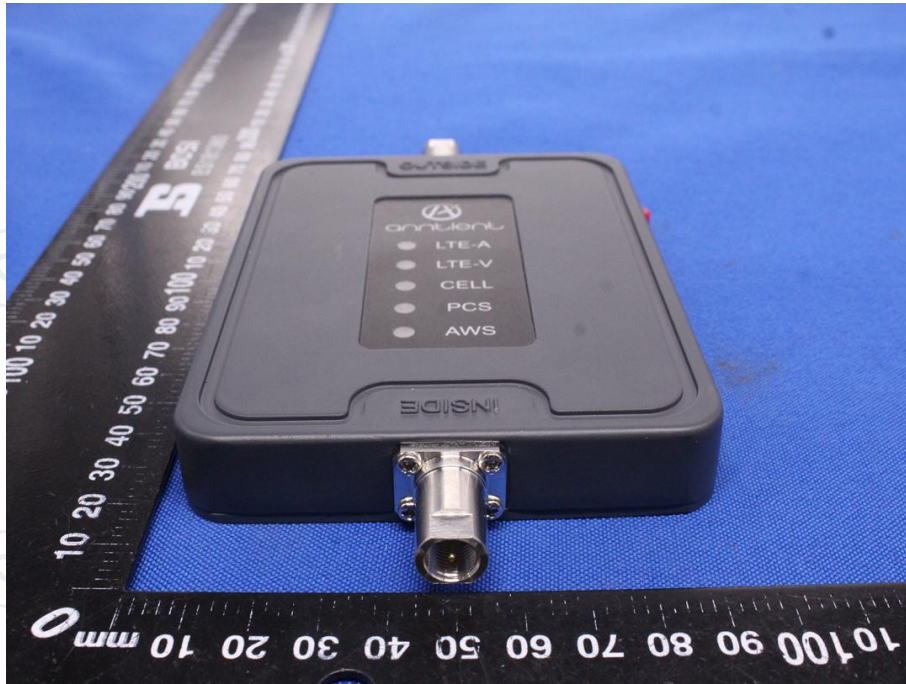


**Appendix B: Photographs of EUT**  
**Product: Cell Phone Signal Booster**  
**Model: AN-CPAL45 Plus**  
**External Photos**

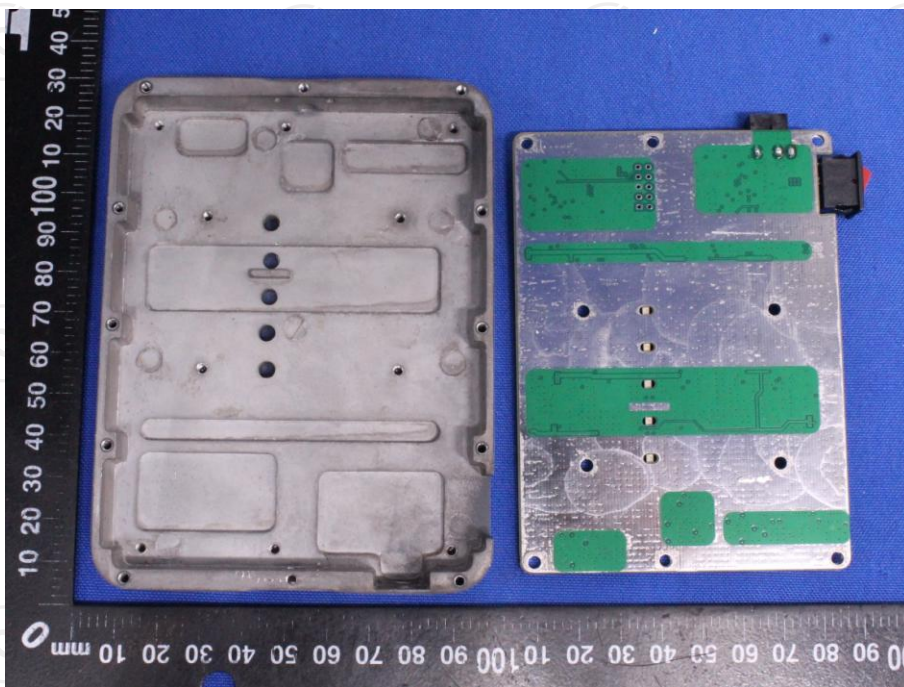
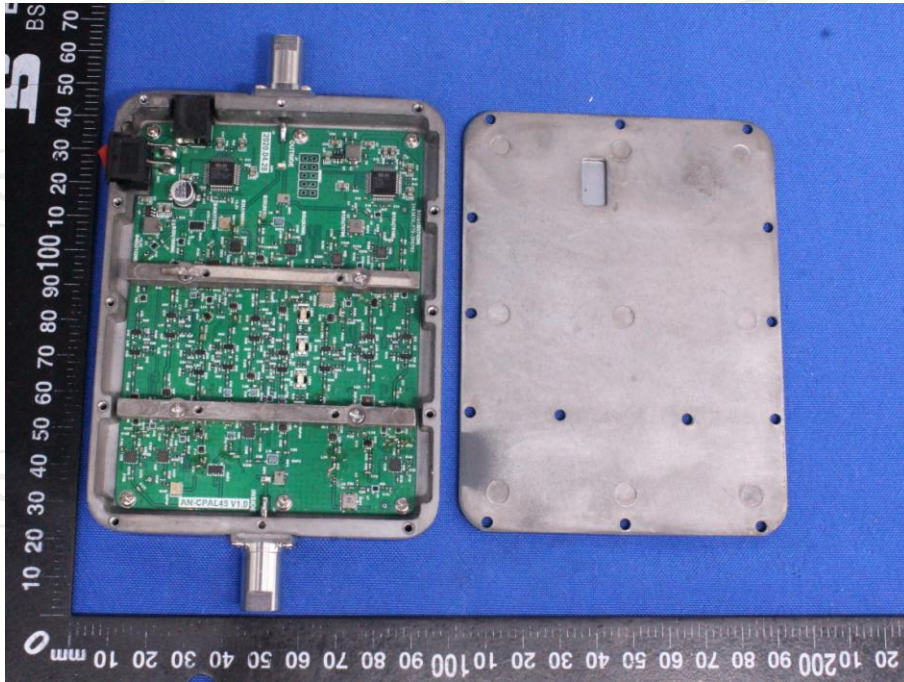


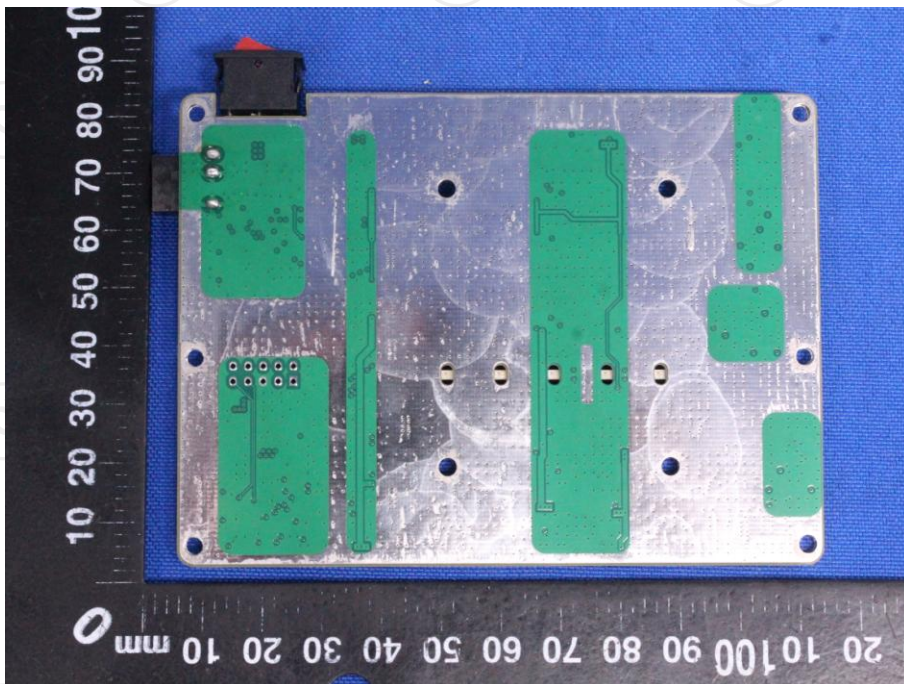
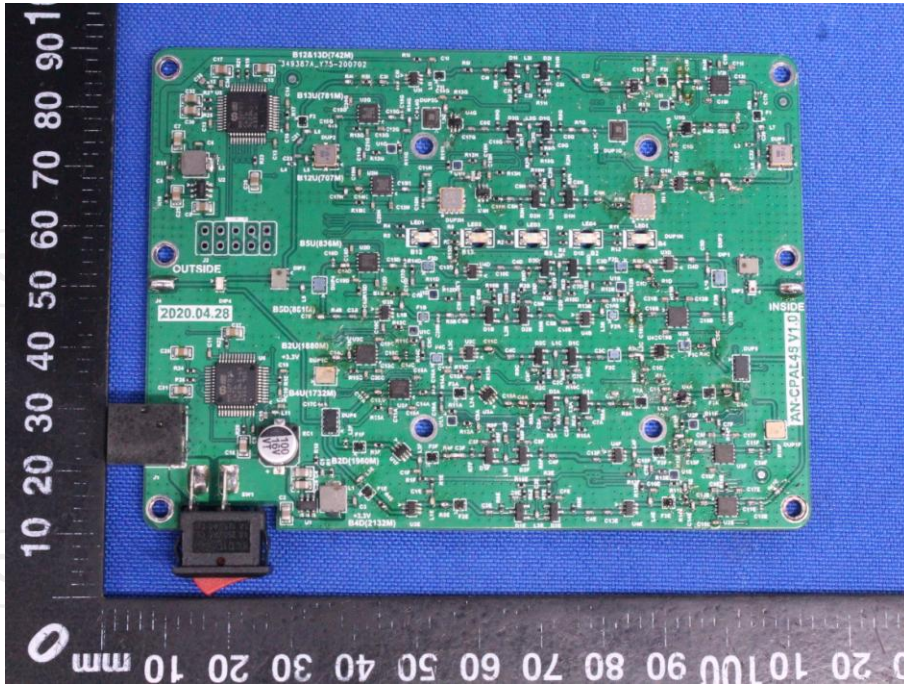


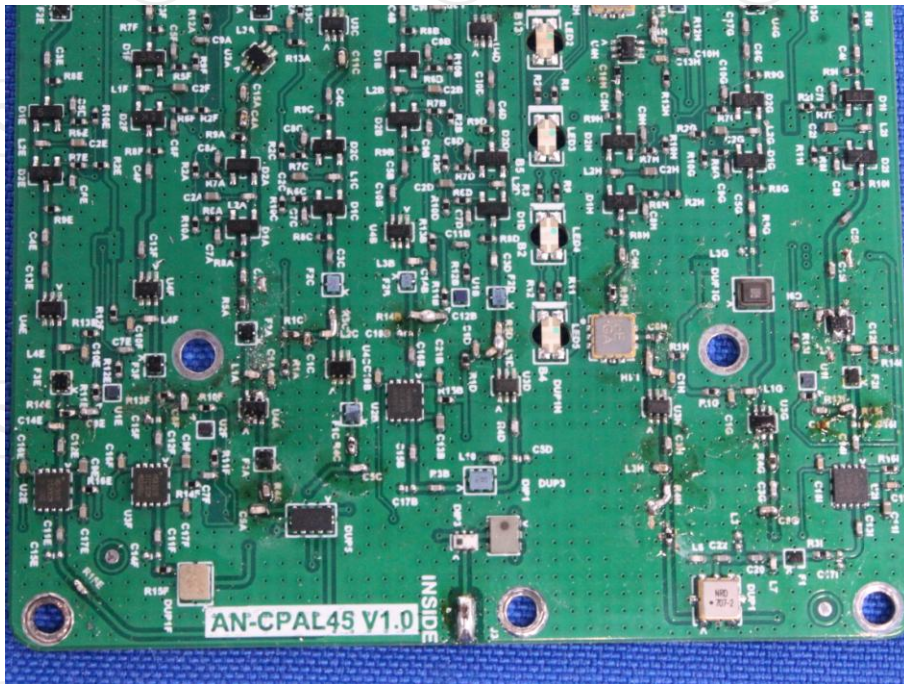
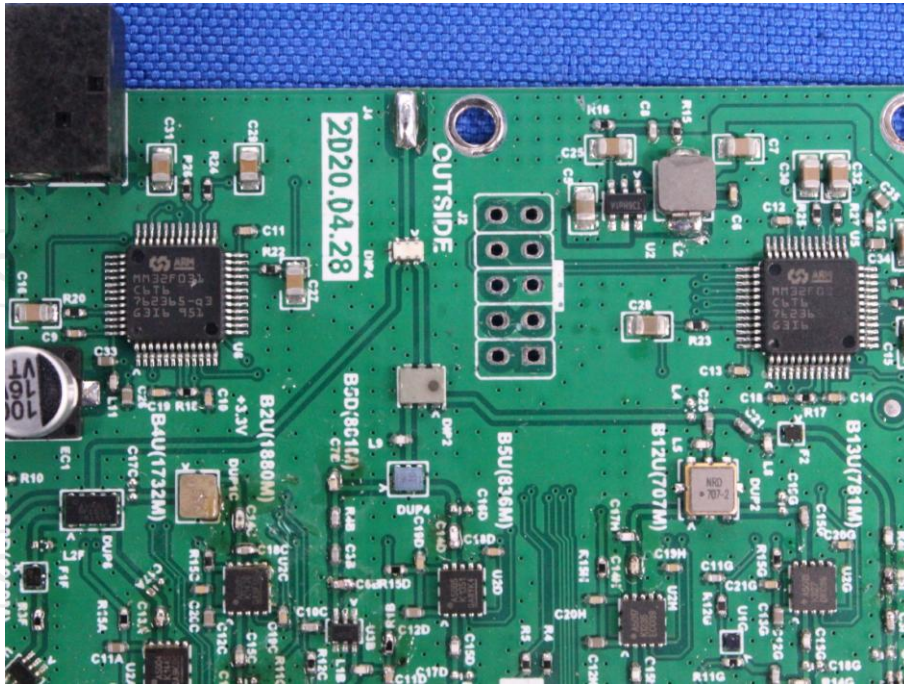




**Product: Cell Phone Signal Booster**  
**Model: AN-CPAL45 Plus**  
**Internal Photos**







**\*\*\*\*\*END OF REPORT\*\*\*\*\***