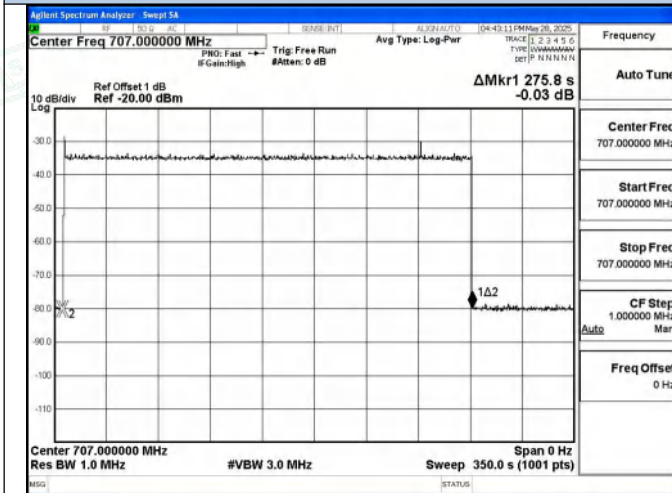
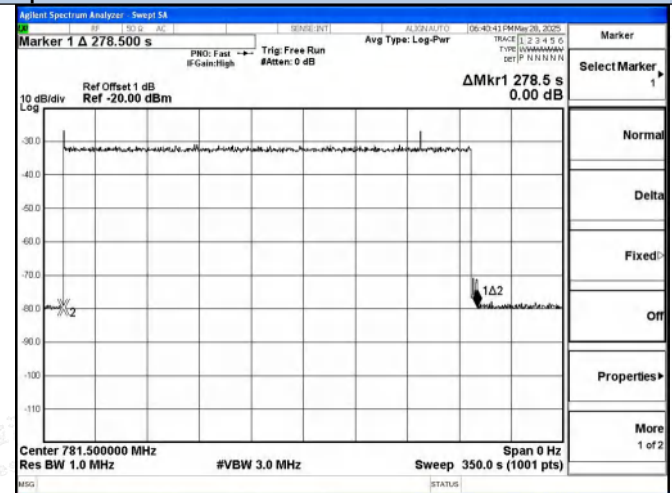




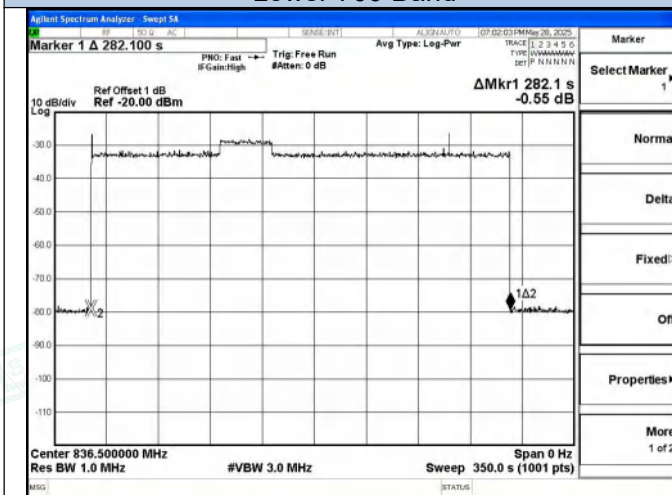
Test Graphs



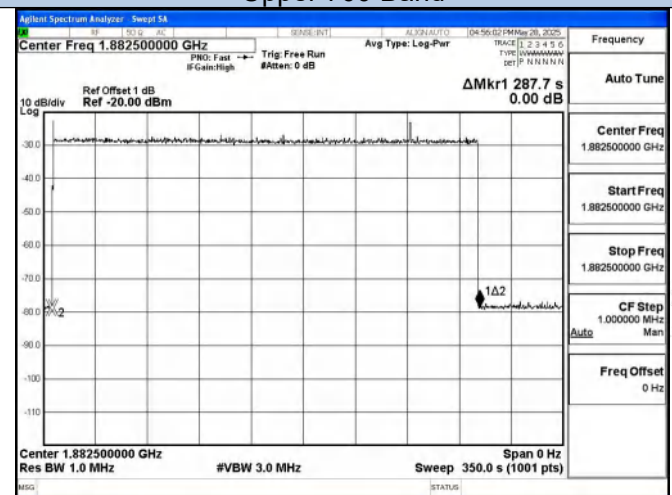
Lower 700 Band



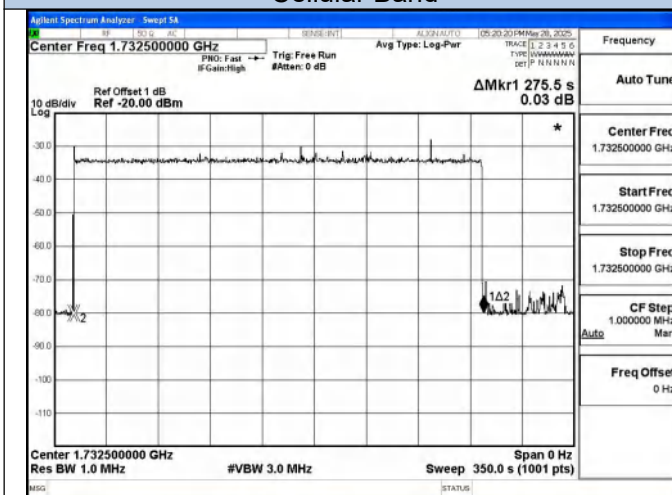
Upper 700 Band



Cellular Band



PCS Band



AWS Band



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6.10 Occupied Bandwidth

6.10.1 Applicable Standard

According to §2.1049 Measurements required: Occupied bandwidth.

This measurement is required to compare the consistency of the output signal relative to the input signal, and to satisfy the requirements of Section 2.1049.

6.10.2 Test Procedure

According to section 7.10 of KDB 935210 D03 Signal Booster Measurement v04r04:

- a) Connect the test equipment as shown in Figure 10 to firstly measure the characteristics of the test signals produced by the signal generator.
- b) Set VBW $\geq$ 3 RBW.
- c) Set the center frequency of the spectrum analyzer to the center of the operational band. The span will be adjusted for each modulation type and OBW as necessary for accurately viewing the signals.
- d) Set the signal generator for power level to match the values obtained from the tests of 7.2.
- e) Set the signal generator modulation type for GSM with a PRBS pattern and allow the trace on the signal generator to stabilize adjusting the span as necessary.
- f) Set the spectrum analyzer RBW for 1% to 5% of the EBW.
- g) Capture the spectrum analyzer trace for inclusion in the test report.
- h) Repeat 7.10c) to 7.10g) for CDMA and WCDMA modulation, adjusting the span as necessary. AWGN or LTE may be used in place of WCDMA, as an option.
- i) Repeat 7.10c) to 7.10h) for all uplink and downlink operational bands.
- j) Connect the test equipment as shown in Figure 10, with the uplink output (donor) port connected to the spectrum analyzer, and the server port connected to the signal generator.
- k) Repeat 7.10c) to 7.10i) with this EUT uplink path test setup.
- l) Connect the test equipment as shown in Figure 10, with the downlink output (server) port connected to the spectrum analyzer, and the donor port connected to the signal generator.
- m) Repeat 7.10c) to 7.10i) with this EUT downlink path test setup.

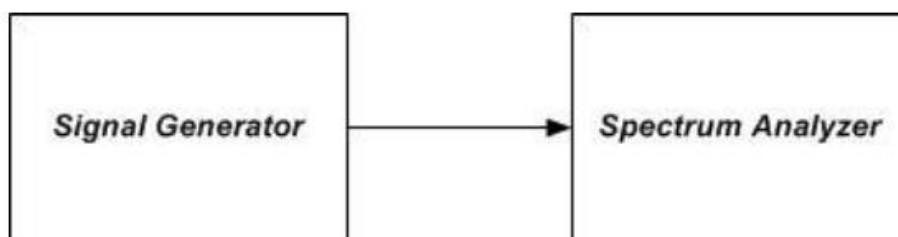


Figure 10 – Test setup for measuring characteristics of test signals used for subsequent EUT occupied bandwidth testing





6.10.3 Test data

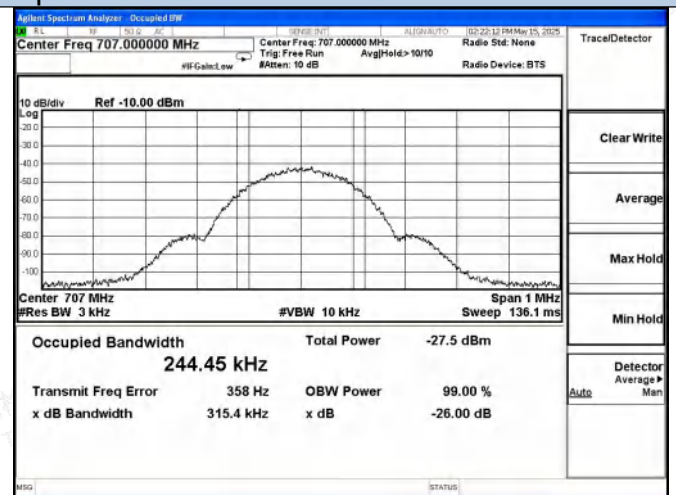
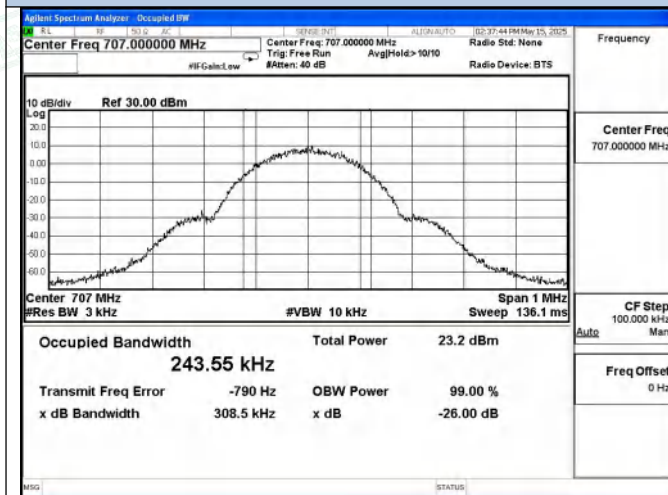
Temperature	23.2℃	Humidity	52.5%
Test Engineer	Nick Peng	Test Mode	Transmitting

Operation Band		Signal Type	Input OBW (MHz)	Output OBW (MHz)
Uplink	Lower 700 Band	GSM	243.55	244.45
		CDMA	1.2444	1.2508
		LTE	4.2655	4.2672
	Upper 700 Band	GSM	247.54	246.50
		CDMA	1.2549	1.2469
		LTE	4.2025	4.2539
	Cellular Band	GSM	246.07	245.57
		CDMA	1.2504	1.2516
		LTE	4.2349	4.2862
	PCS Band	GSM	244.74	246.42
		CDMA	1.2479	1.2524
		LTE	4.2156	4.2685
	AWS Band	GSM	243.92	247.15
		CDMA	1.2509	1.2552
		LTE	4.1973	4.2832
Downlink	Lower 700 Band	GSM	245.38	244.65
		CDMA	1.2460	1.2491
		LTE	4.1654	4.2897
	Upper 700 Band	GSM	245.76	242.55
		CDMA	1.2471	1.2505
		LTE	4.1423	4.2659
	Cellular Band	GSM	243.32	248.60
		CDMA	1.2482	1.2599
		LTE	4.2343	4.2880
	PCS Band	GSM	242.40	245.90
		CDMA	1.2524	1.2584
		LTE	4.2015	4.2942
	AWS Band	GSM	243.72	245.90
		CDMA	1.2524	1.2561
		LTE	4.2181	4.2601

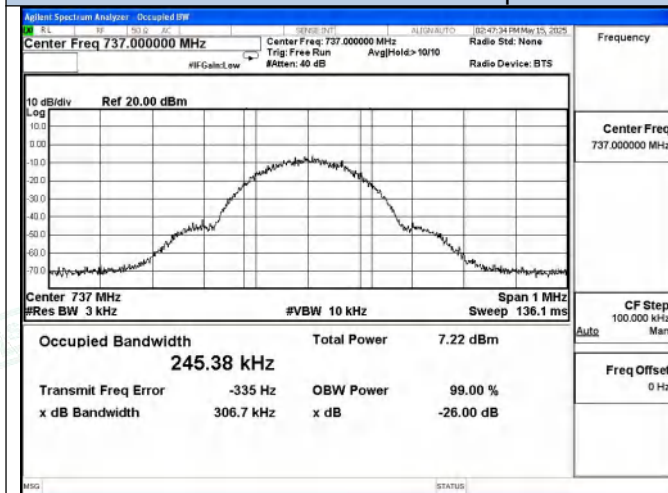




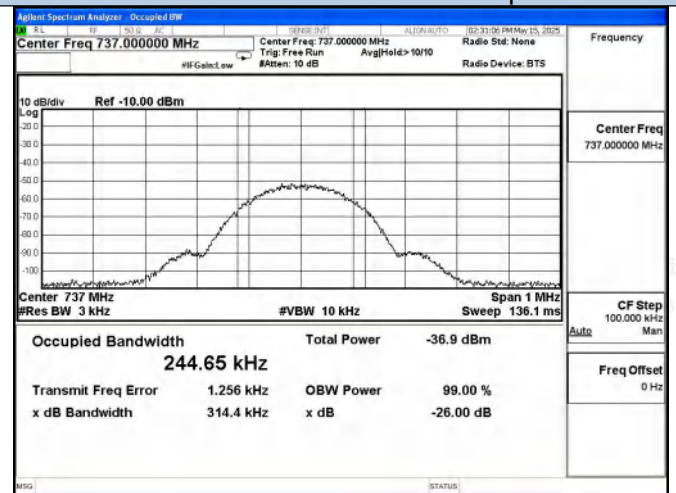
Test Graphs



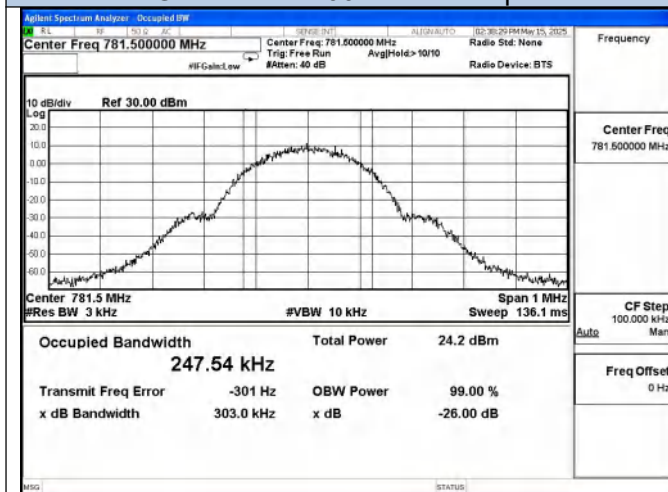
GSM-Lower 700 Band UL Input



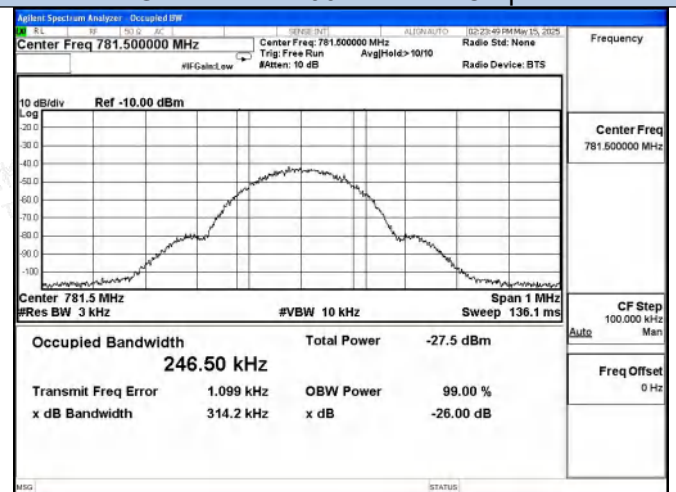
GSM-Lower 700 Band UL Output



GSM-Lower 700 Band DL Input



GSM-Lower 700 Band DL Output



GSM-Upper 700 Band UL Input

GSM-Upper 700 Band UL Output

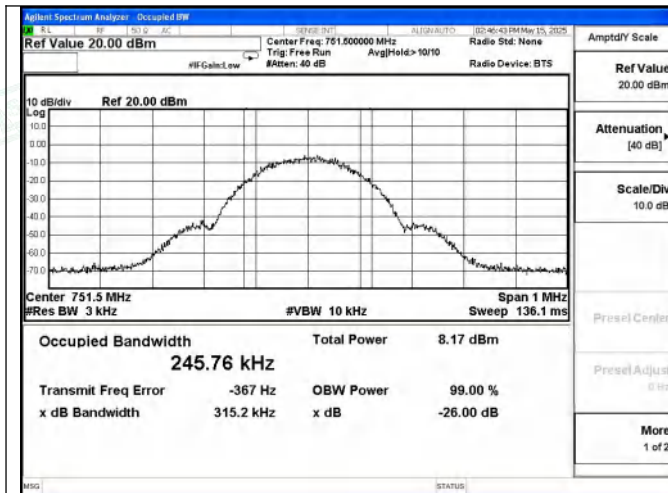


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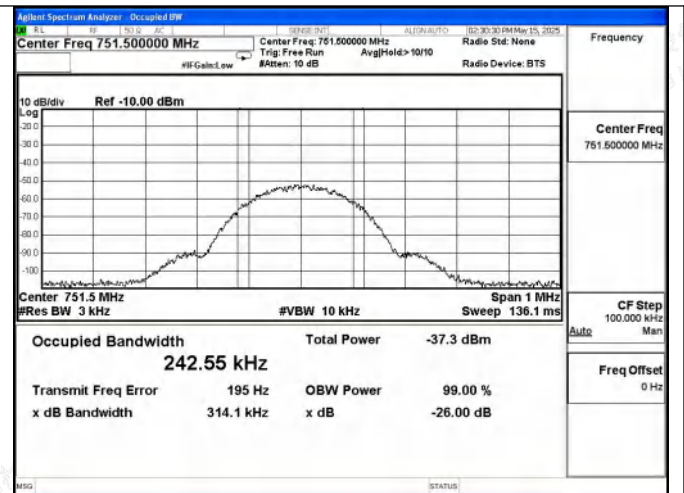
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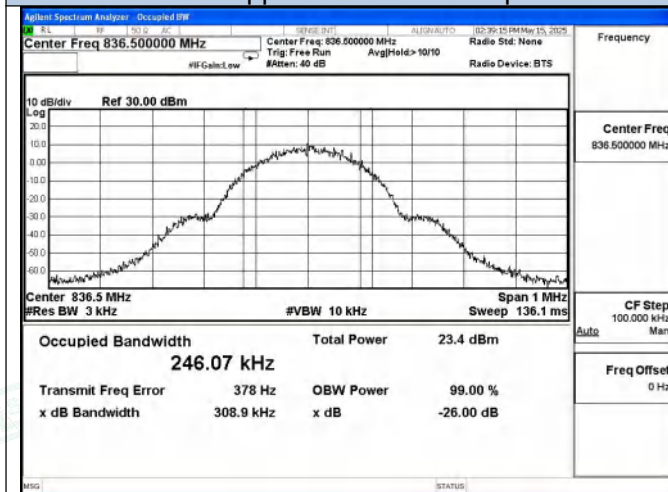
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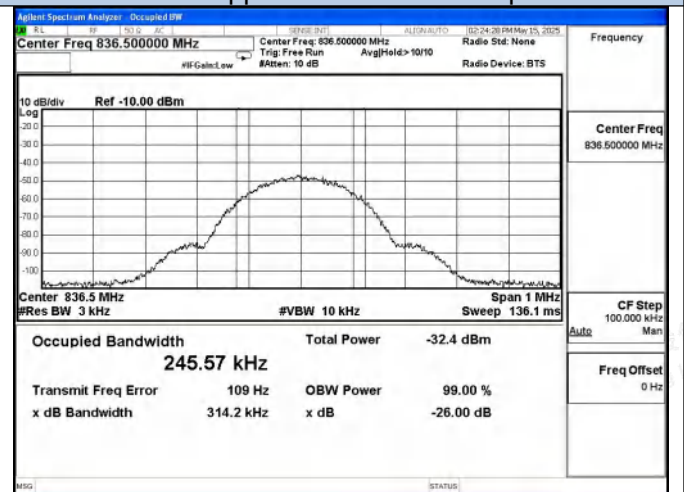
GSM-Upper 700 Band DL Input



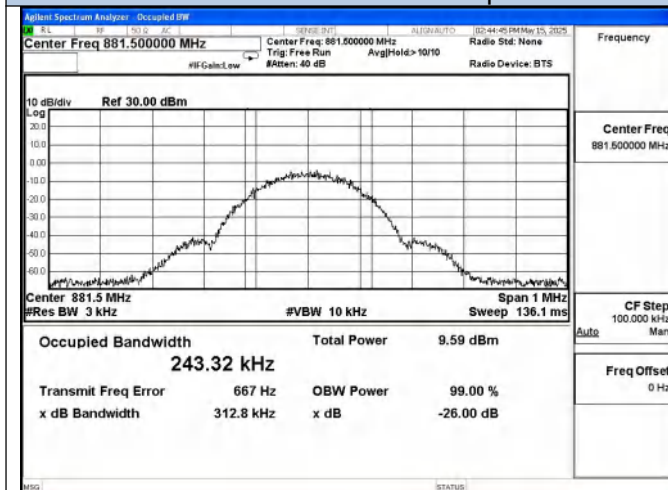
GSM-Upper 700 Band DL Output



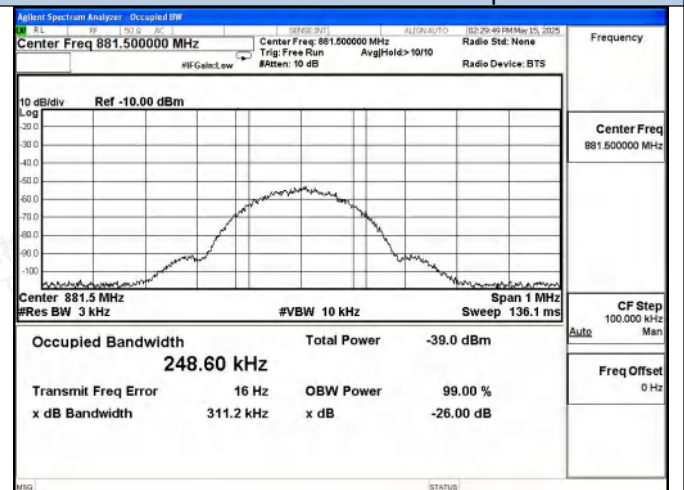
GSM-Cellular Band UL Input



GSM-Cellular Band UL Output

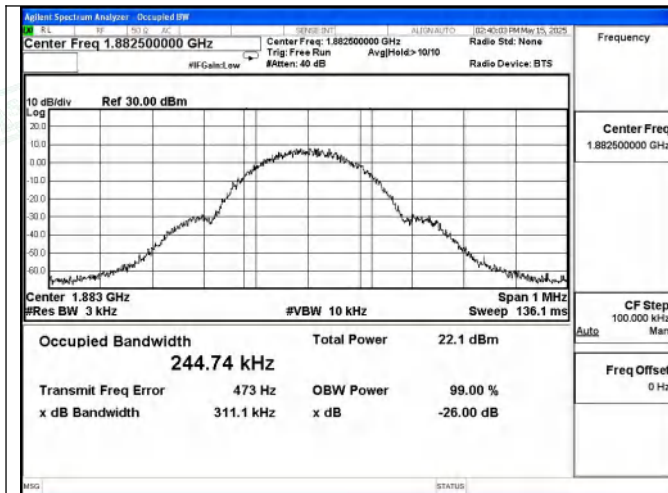


GSM-Cellular Band DL Input

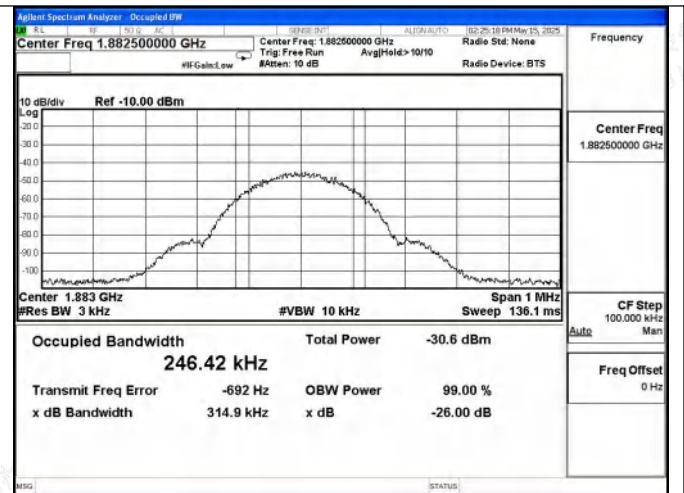


GSM-Cellular Band DL Output

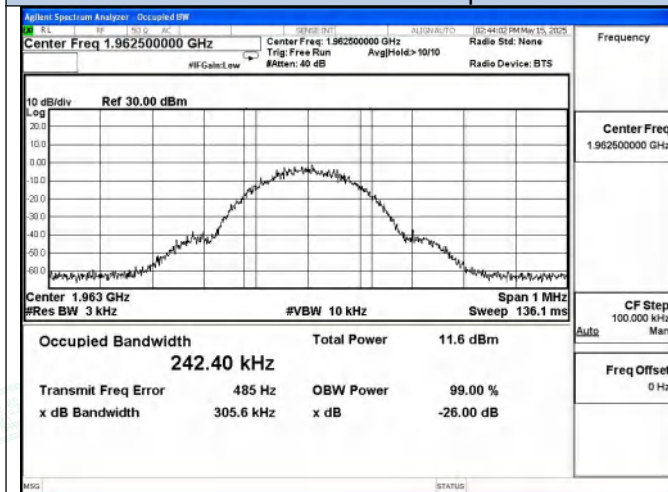




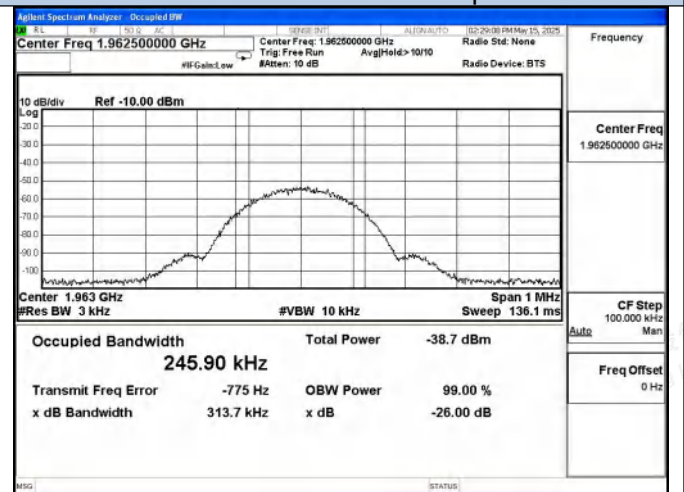
GSM-PCS Band UL Input



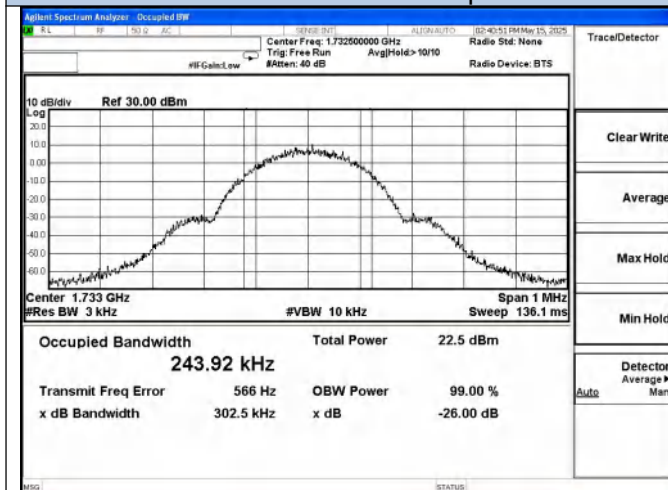
GSM-PCS Band UL Output



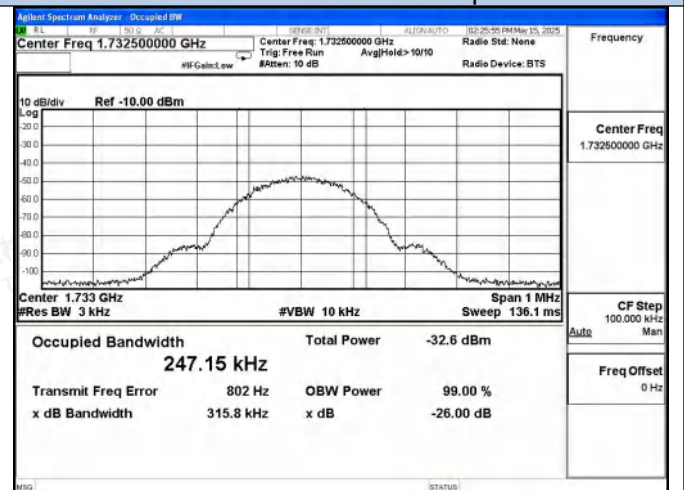
GSM-PCS Band DL Input



GSM-PCS Band DL Output



GSM-AWS Band UL Input



GSM-AWS Band UL Output

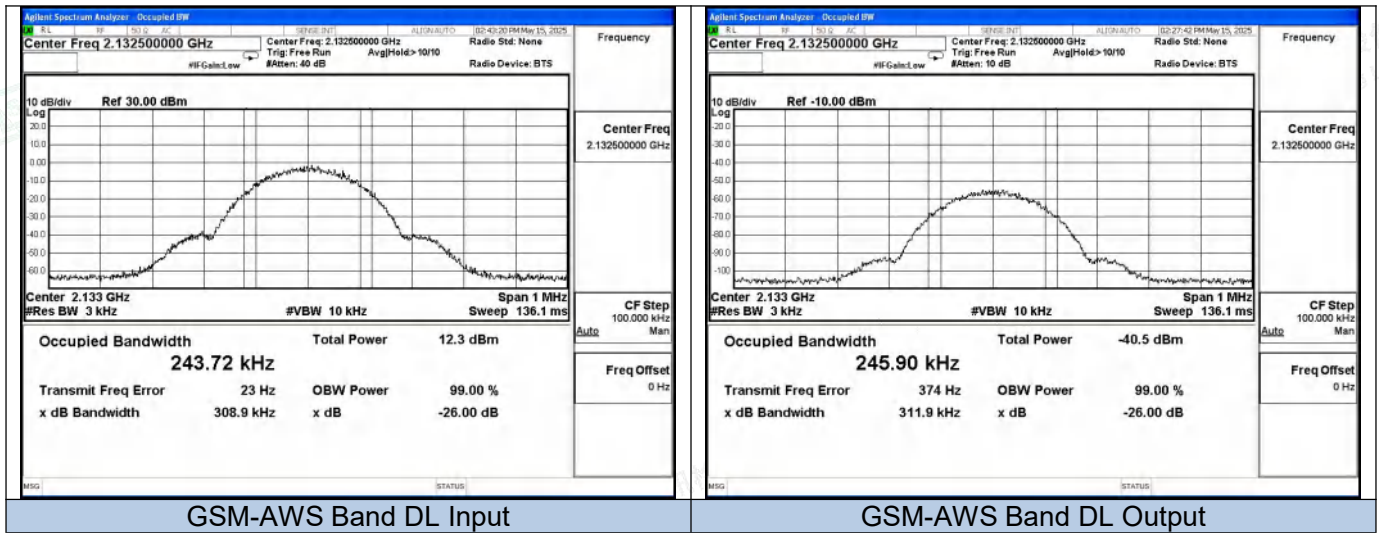


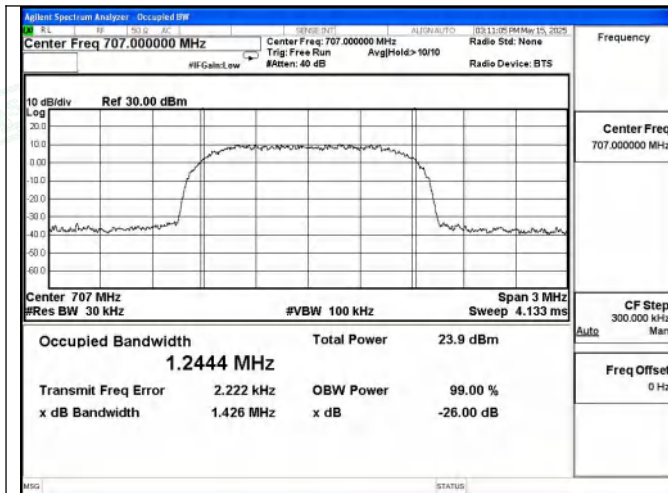
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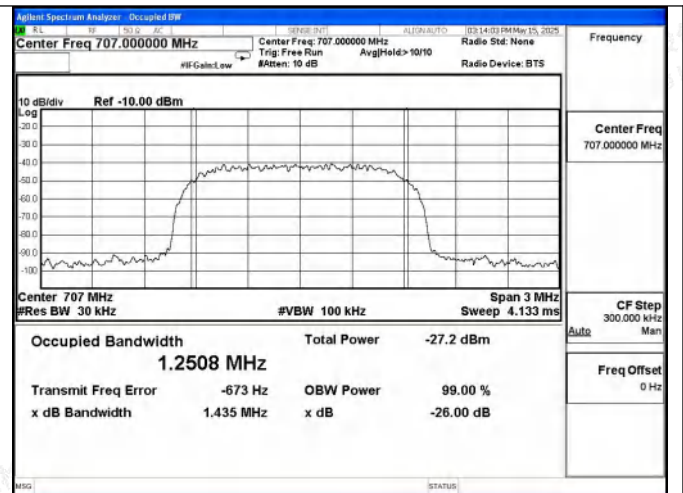
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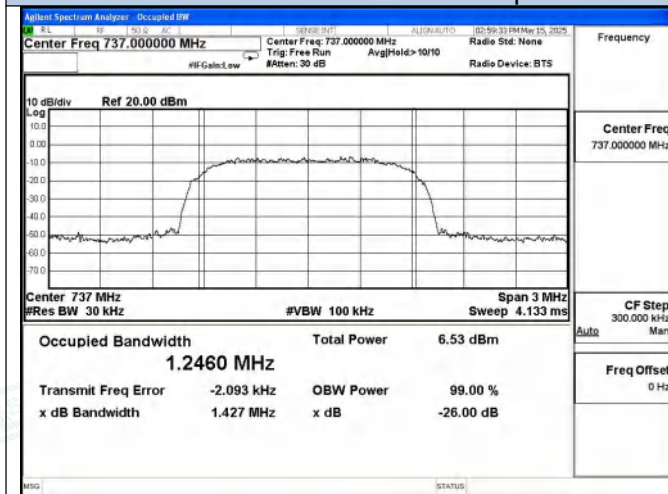




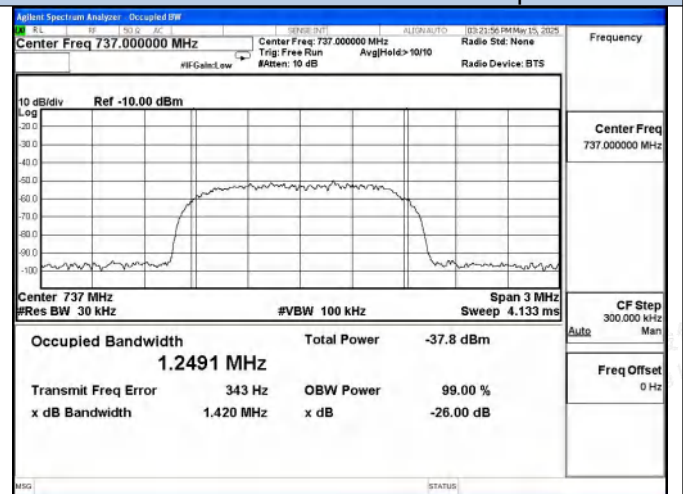
CDMA-Lower 700 Band UL Input



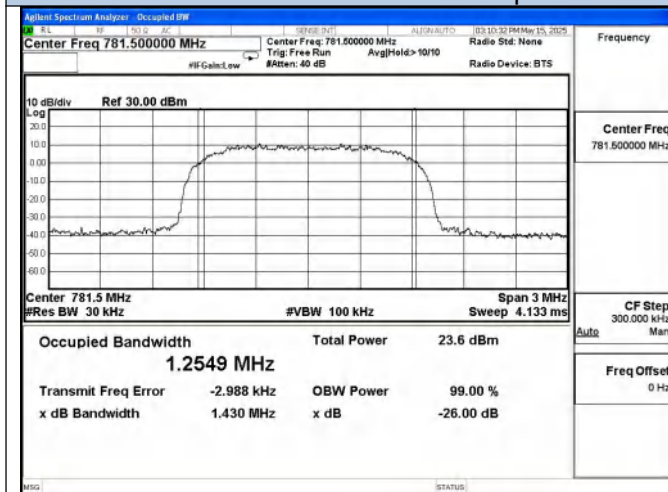
CDMA-Lower 700 Band UL Output



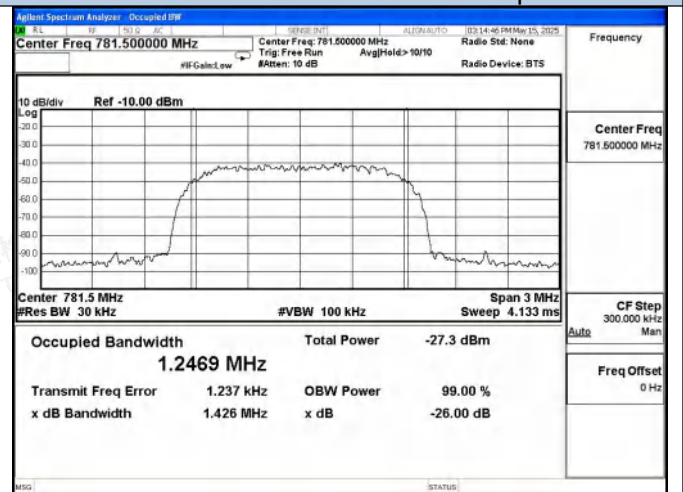
CDMA-Lower 700 Band DL Input



CDMA-Lower 700 Band DL Output



CDMA-Upper 700 Band UL Input



CDMA-Upper 700 Band UL Output

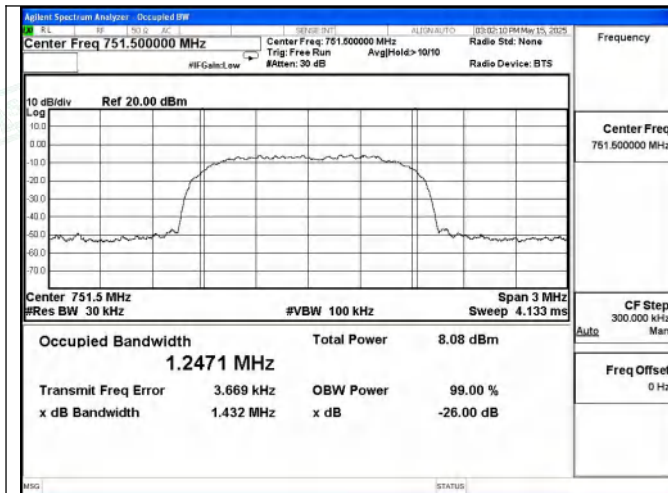


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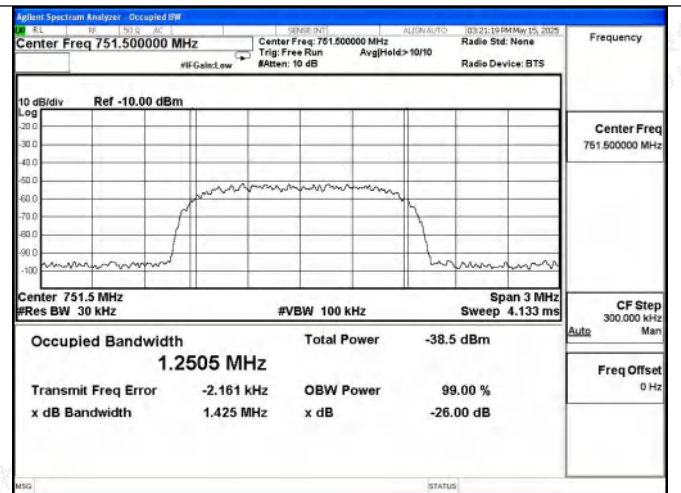
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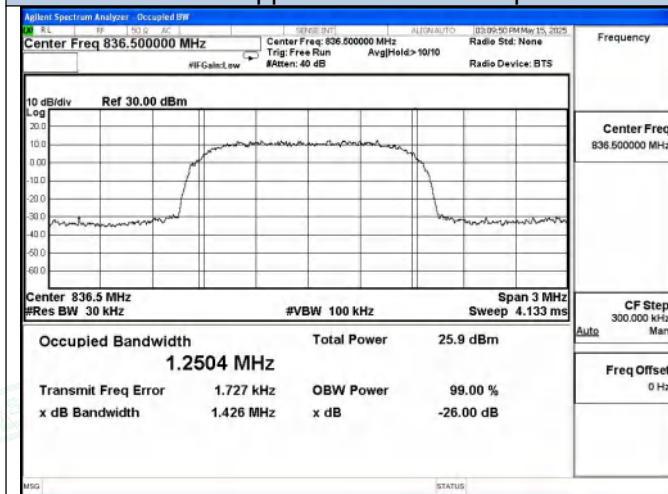
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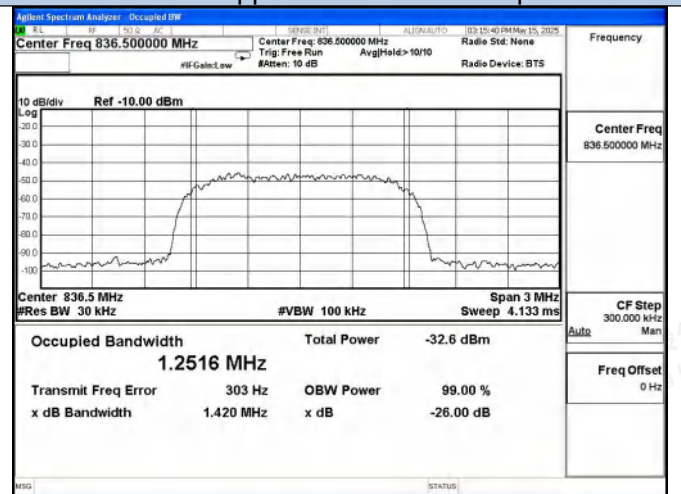
CDMA-Uppper 700 Band DL Input



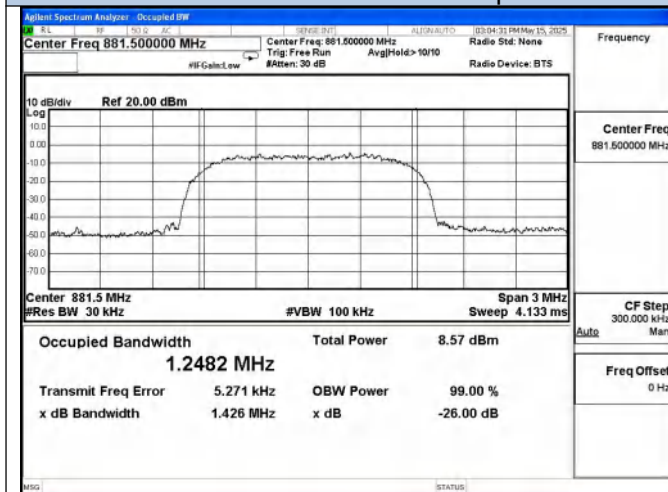
CDMA-Uppper 700 Band DL Output



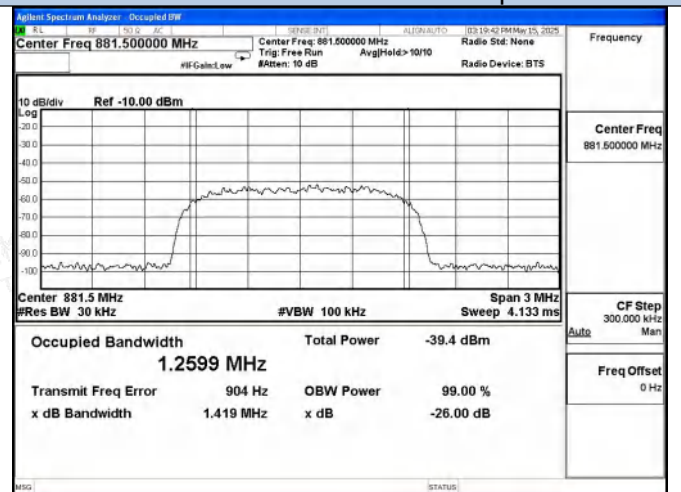
CDMA-Cellular Band UL Input



CDMA-Cellular Band UL Output



CDMA-Cellular Band DL Input



CDMA-Cellular Band DL Output

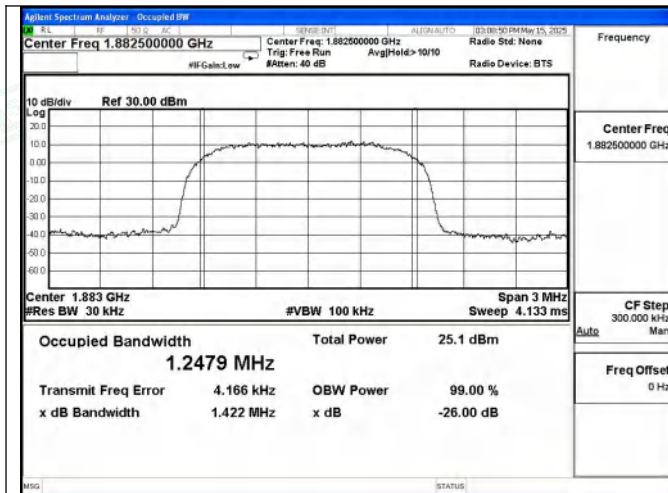


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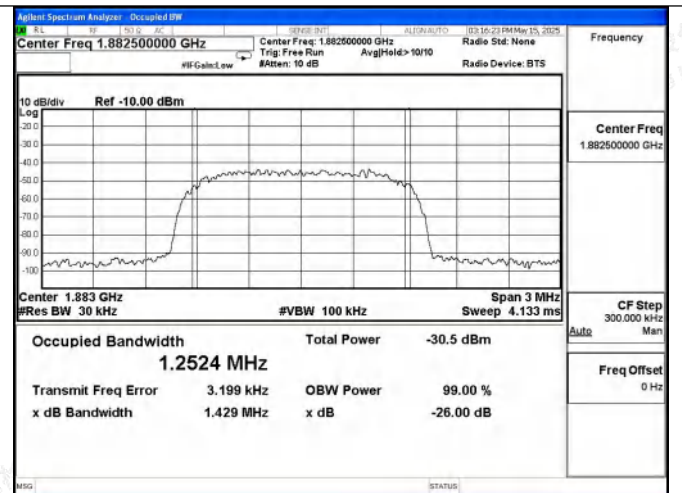
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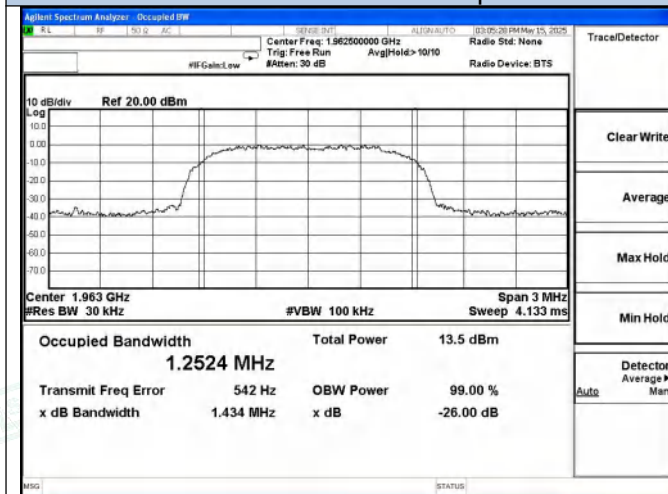
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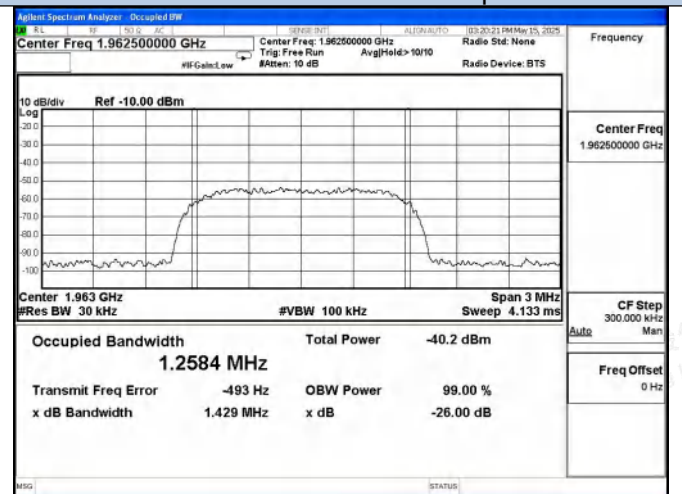
CDMA-PCS Band UL Input



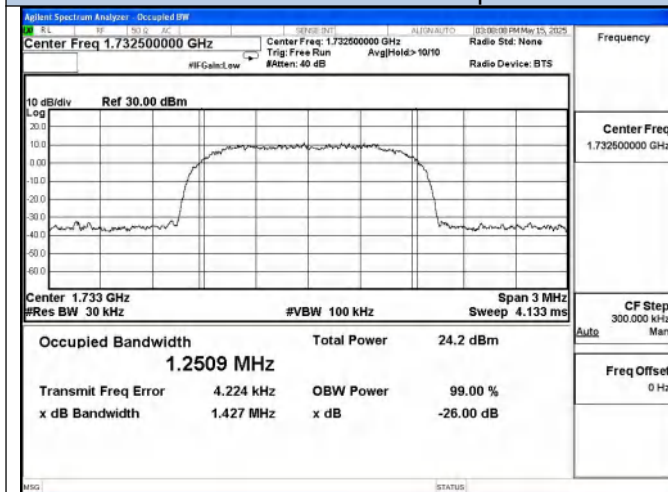
CDMA-PCS Band UL Output



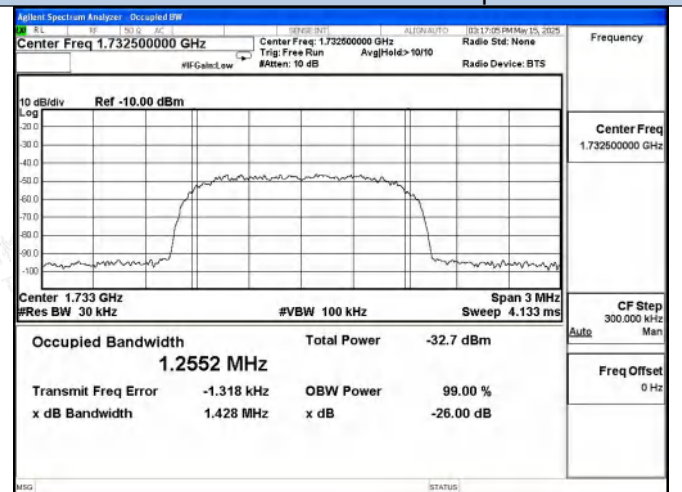
CDMA-PCS Band DL Input



CDMA-PCS Band DL Output



CDMA-AWS Band UL Input



CDMA-AWS Band UL Output

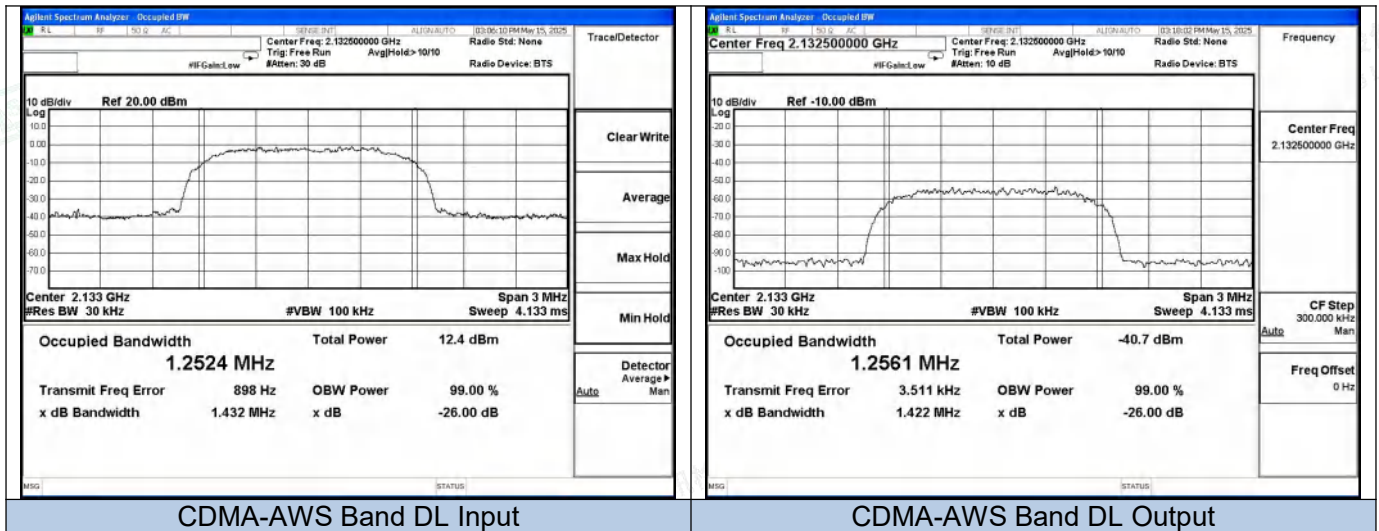


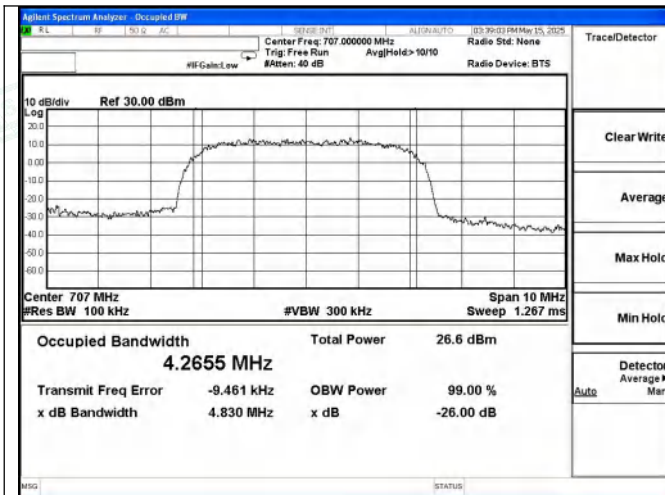
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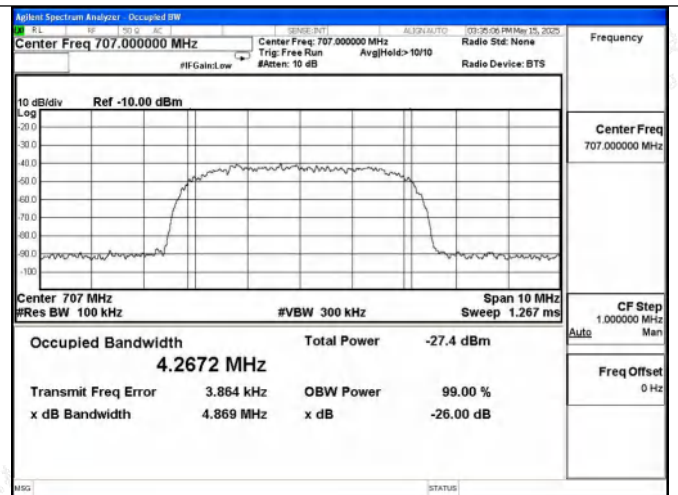
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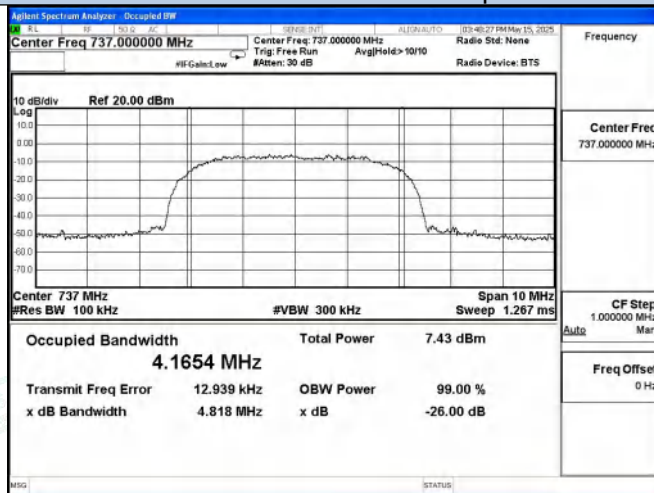




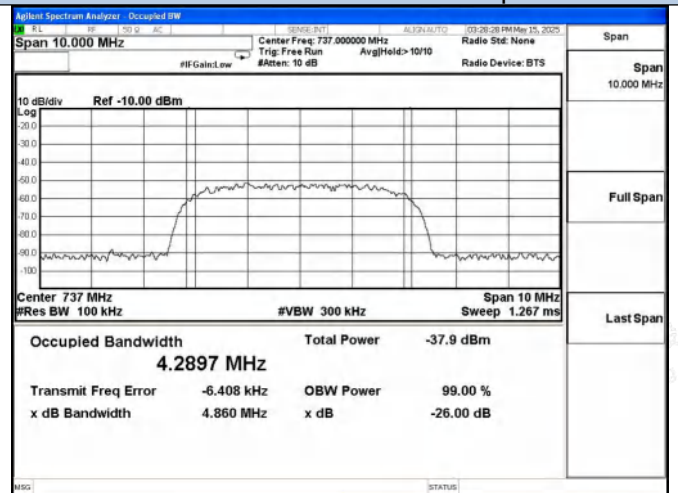
LTE-Lower 700 Band UL Input



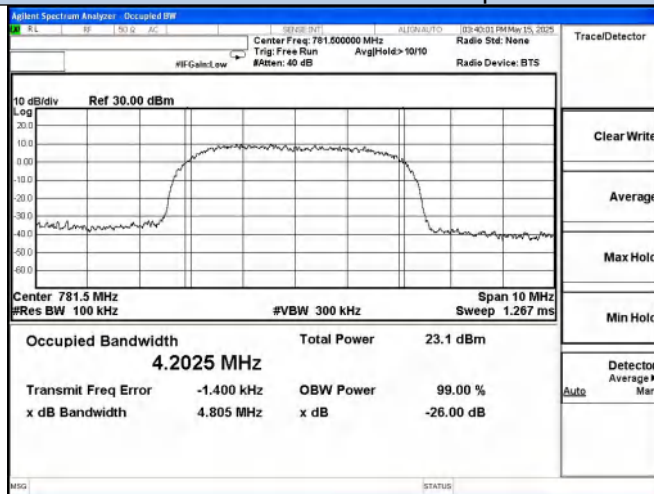
LTE-Lower 700 Band UL Output



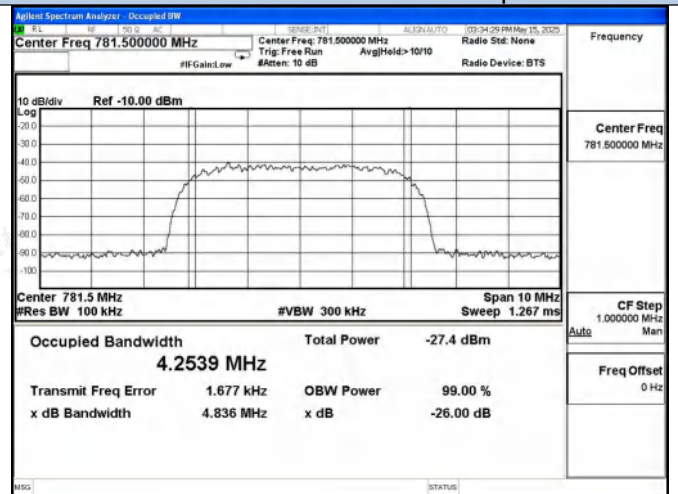
LTE-Lower 700 Band DL Input



LTE-Lower 700 Band DL Output



LTE-Upper 700 Band UL Input



LTE-Upper 700 Band UL Output

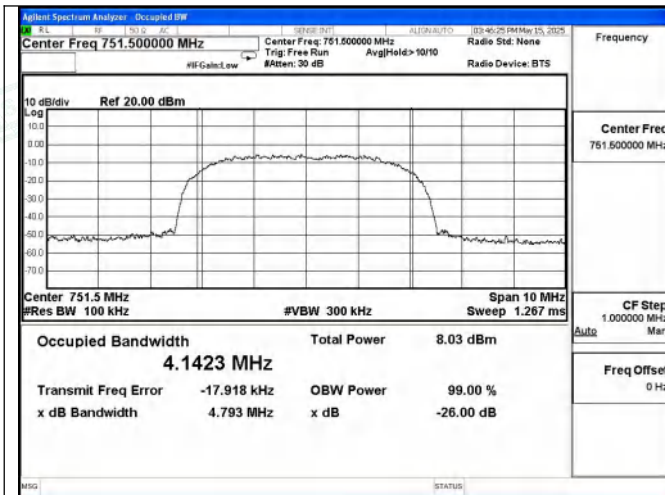


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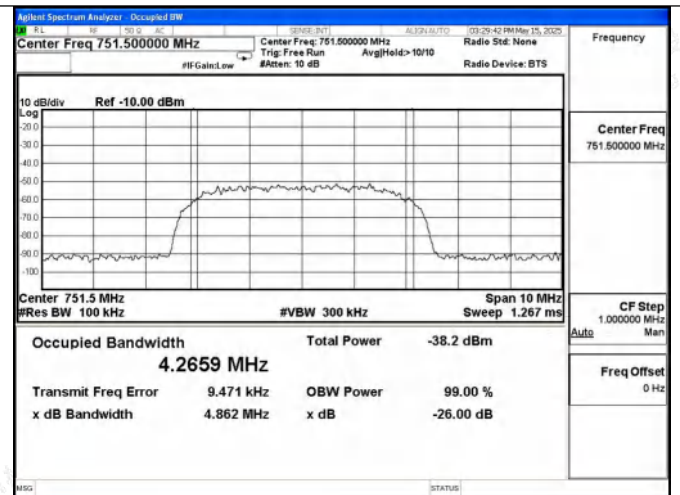
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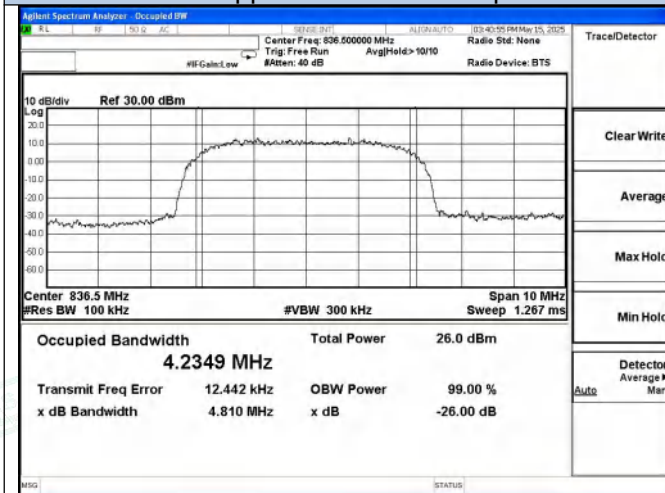
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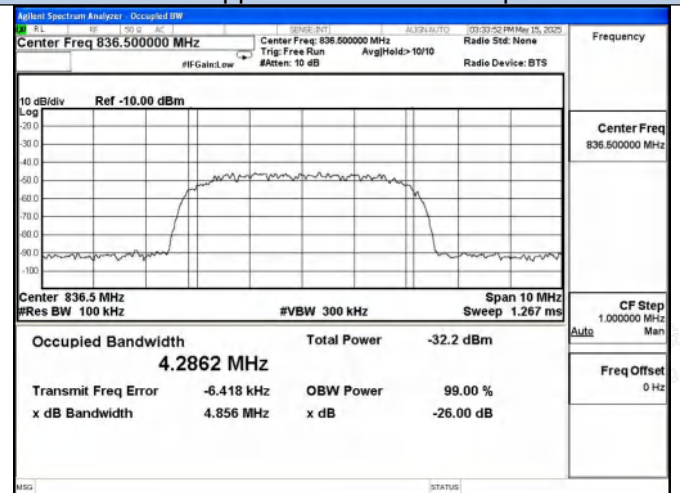
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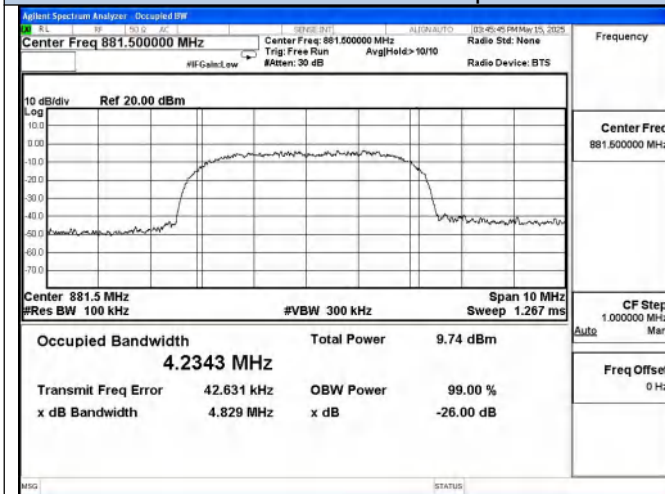
LTE-Upper 700 Band DL Output



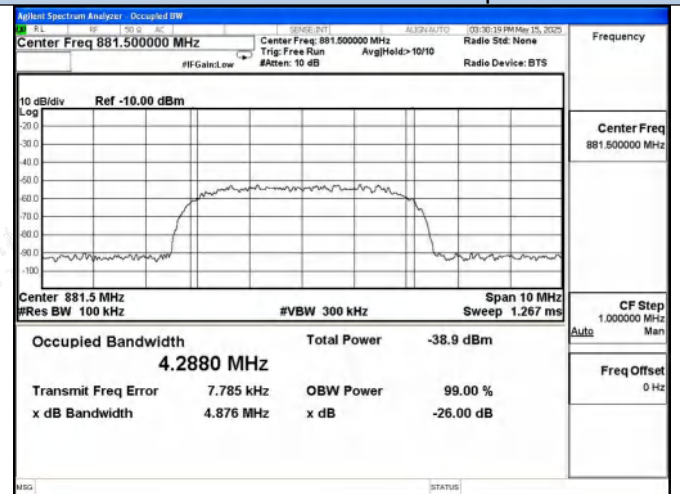
LTE-Cellular Band UL Input



LTE-Cellular Band UL Output



LTE-Cellular Band DL Input



LTE-Cellular Band DL Output

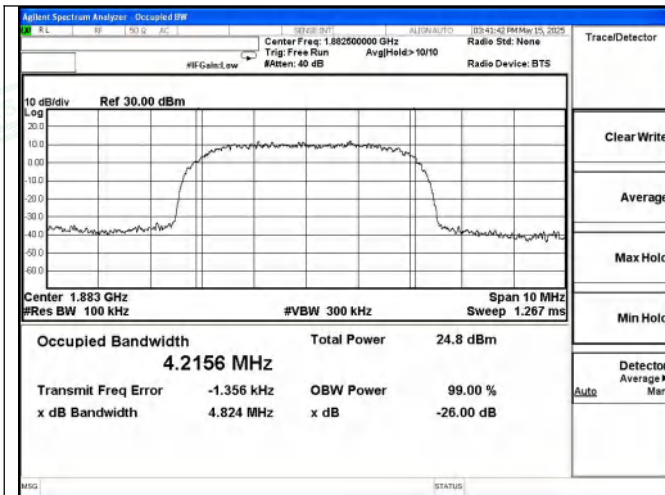


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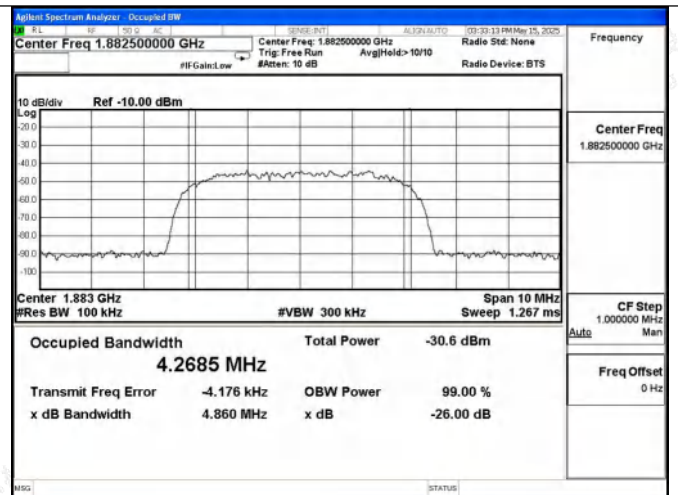
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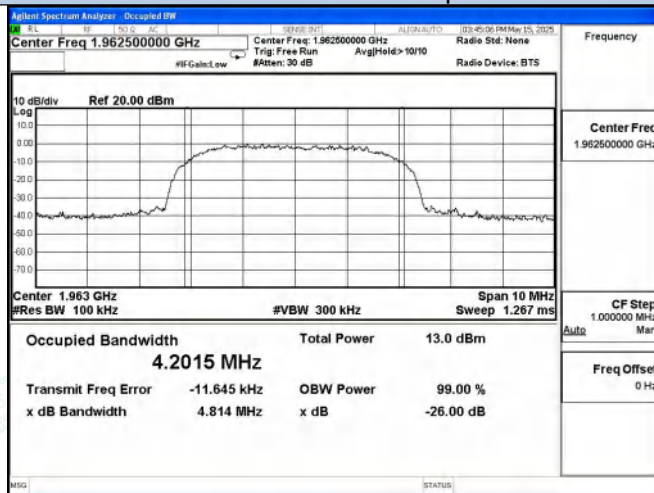
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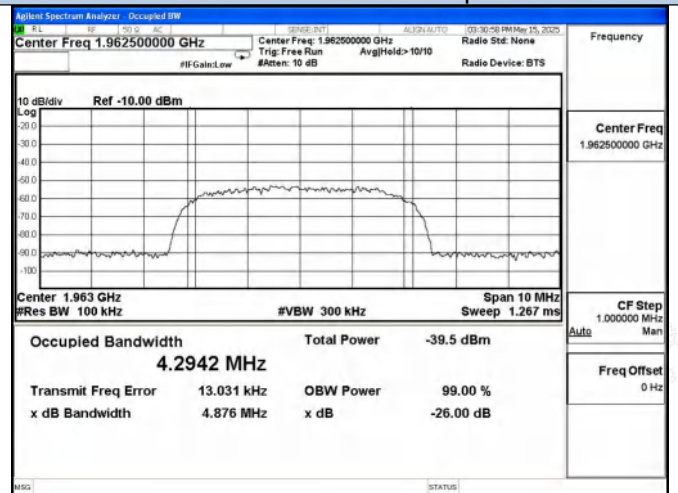
LTE-PCS Band UL Input



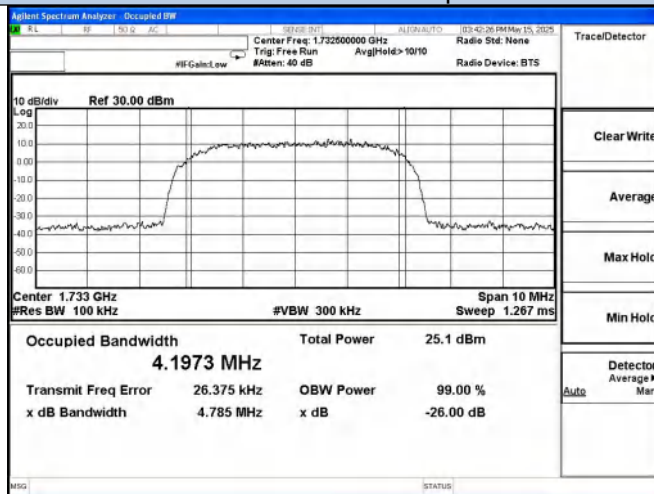
LTE-PCS Band UL Output



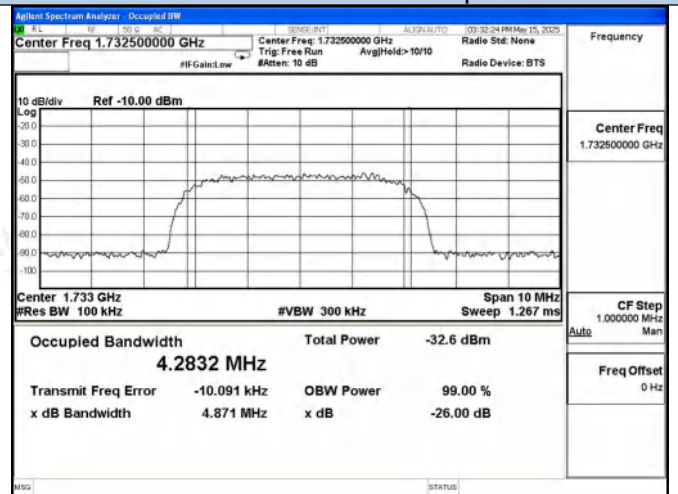
LTE-PCS Band DL Input



LTE-PCS Band DL Output



LTE-AWS Band UL Input



LTE-AWS Band UL Output

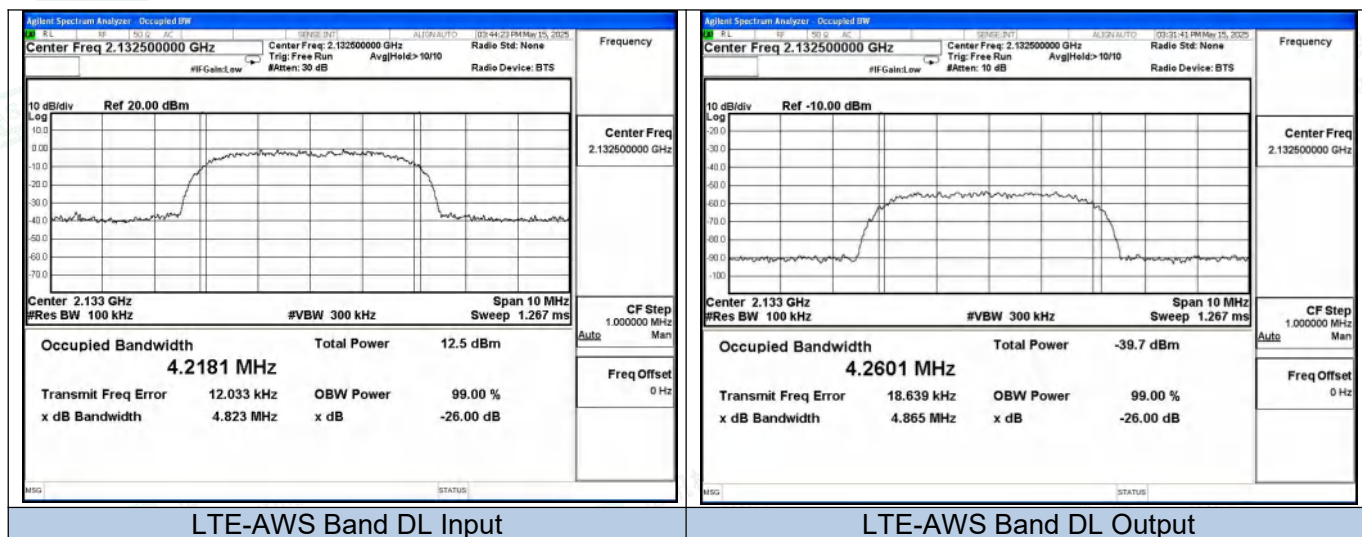


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LTE-AWS Band DL Input

LTE-AWS Band DL Output





7. RADIATION SPURIOUS EMISSION

7.1 Applicable Standard

According to §2.1053 Measurements required: Field strength of spurious radiation. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. So the Conducted emissions limit = -13 dBm

7.2 Test Procedure

- According to section 7.12 of KDB 935210 D03 Signal Booster Measurement v04r04: This procedure is intended to satisfy the requirements specified in Section 2.1053. The applicable limits are those specified for mobile station emissions in the rule part appropriate to the band of operation (see Appendix A). Separate compliance requirements are applicable for any digital device circuitry that controls additional functions or capabilities and that is not used only to enable operation of the transmitter in a booster device [i.e., Section 15.3(k) digital device definition]. Separate compliance requirements are applicable for any receiver components/functions that tune within 30 MHz to 960 MHz contained in booster devices [Section 15.101(b)].
- Place the EUT on an OATS or semi-anechoic chamber turntable 3 m from the receiving antenna.
 - Connect the EUT to the test equipment as shown in Figure 11 beginning with the uplink output (donor) port.
 - 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.
 - Measure the radiated spurious emissions from the EUT from the lowest to the highest frequencies as specified in Section 2.1057. Maximize the radiated emissions by using the procedures described in ANSI C63.26.
 - Capture the peak emissions plots using a peak detector with Max-Hold for inclusion in the test report. Tabular data is acceptable in lieu of spectrum analyzer plots.
 - Repeat 7.12c) through 7.12e) for all uplink and downlink operational bands.

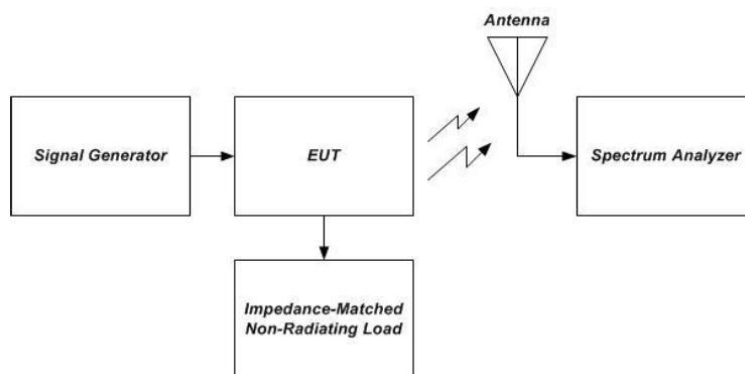


Figure 11 – Radiated spurious emissions test and instrumentation setup





7.3 Test Data

Temperature	23.2℃	Humidity	52.5%
Test Engineer	Nick Peng	Test Mode	Transmitting

Lower 700 Band Uplink								
Frequency (MHz)	P _{Mea} (dBm)	P _{Cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1414	-42.49	4.75	3.00	10.44	-36.80	-13.00	-23.80	H
2121	-55.83	5.66	3.00	12.33	-49.16	-13.00	-36.16	H
1414	-45.58	4.75	3.00	10.44	-39.89	-13.00	-26.89	V
2121	-47.24	5.66	3.00	12.33	-40.57	-13.00	-27.57	V

Upper 700 Band Uplink								
Frequency (MHz)	P _{Mea} (dBm)	P _{Cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1563	-44.37	4.99	3.00	11.12	-38.24	-13.00	-25.24	H
2344.5	-49.82	5.85	3.00	12.02	-43.65	-13.00	-30.65	H
1563	-42.28	4.99	3.00	11.12	-36.15	-13.00	-23.15	V
2344.5	-51.91	5.85	3.00	12.02	-45.74	-13.00	-32.74	V

Cellular 700 Band Uplink								
Frequency (MHz)	P _{Mea} (dBm)	P _{Cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673	-45.65	3.90	3.00	8.58	-40.97	-13.00	-27.97	H
2509.5	-50.06	4.32	3.00	6.80	-47.58	-13.00	-34.58	H
1673	-42.12	3.90	3.00	8.58	-37.44	-13.00	-24.44	V
2509.5	-46.05	4.32	3.00	6.80	-43.57	-13.00	-30.57	V





PCS Band Uplink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3765	-45.62	5.32	3.00	10.03	-40.91	-13.00	-27.91	H
5647.5	-50.61	6.19	3.00	11.41	-45.39	-13.00	-32.39	H
3765	-45.20	5.32	3.00	10.03	-40.49	-13.00	-27.49	V
5647.5	-53.87	6.19	3.00	11.41	-48.65	-13.00	-35.65	V

AWS Band Uplink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3465	-43.94	4.63	3.00	9.84	-38.73	-13.00	-25.73	H
5197.5	-50.73	5.94	3.00	10.86	-45.81	-13.00	-32.81	H
3465	-41.79	4.63	3.00	9.84	-36.58	-13.00	-23.58	V
5197.5	-52.50	5.94	3.00	10.86	-47.58	-13.00	-34.58	V

Lower 700 Band Downlink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin	Polarization
1474	-40.56	4.75	3.00	10.44	-34.87	-13.00	-21.87	H
2211	-47.17	5.66	3.00	12.33	-40.50	-13.00	-27.50	H
1474	-42.13	4.75	3.00	10.44	-36.44	-13.00	-23.44	V
2211	-50.16	5.66	3.00	12.33	-43.49	-13.00	-30.49	V

Upper 700 Band Downlink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin	Polarization
1503	-40.18	4.99	3.00	11.12	-34.05	-13.00	-21.05	H
2254.5	-48.60	5.85	3.00	12.02	-42.43	-13.00	-29.43	H
1503	-42.64	4.99	3.00	11.12	-36.51	-13.00	-23.51	V
2254.5	-52.43	5.85	3.00	12.02	-46.26	-13.00	-33.26	V

Cellular Band Downlink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	Ga Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin	Polarization
1763	-42.06	3.90	3.00	8.58	-37.38	-13.00	-24.38	H
2644.5	-54.64	4.32	3.00	6.80	-52.16	-13.00	-39.16	H
1763	-40.97	3.90	3.00	8.58	-36.29	-13.00	-23.29	V
2644.5	-51.39	4.32	3.00	6.80	-48.91	-13.00	-35.91	V



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Scan code to check authenticity



PCS Band Downlink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin	Polarization
3925	-43.37	5.32	3.00	10.03	-38.66	-13.00	-25.66	H
5887.5	-50.93	6.19	3.00	11.41	-45.71	-13.00	-32.71	H
3925	-41.07	5.32	3.00	10.03	-36.36	-13.00	-23.36	V
5887.5	-50.45	6.19	3.00	11.41	-45.23	-13.00	-32.23	V

AWS Band Downlink								
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin	Polarization
4265	-45.04	4.63	3.00	9.84	-39.83	-13.00	-26.83	H
6397.5	-49.37	5.94	3.00	10.86	-44.45	-13.00	-31.45	H
4265	-43.18	4.63	3.00	9.84	-37.97	-13.00	-24.97	V
6397.5	-49.86	5.94	3.00	10.86	-44.94	-13.00	-31.94	V

Remark:

1. We were not recorded other points as values lower than limits.
2. $\text{Peak EIRP(dBm)} = P_{\text{Mea}}(\text{dBm}) - P_{\text{cl}}(\text{dB}) + G_{\text{a}}(\text{dB})$.
3. $\text{Margin} = \text{Peak EIRP} - \text{Limit}$.





8. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

9. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

10. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF TEST REPORT-----



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