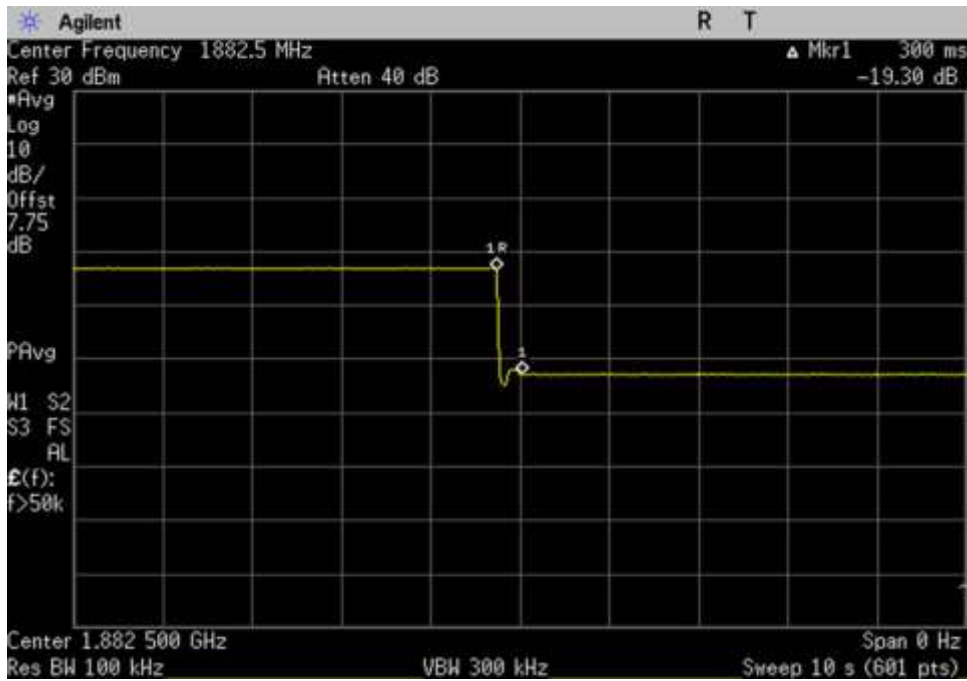


UL_1710-1755_1732.5MHz_VAR



UL_1850-1915_1882.5MHz_VAR

7.10 Occupied Band Width

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.10 Occupied Band Width / 47 CFR §2.1049 Occupied Band Width**
 Work Order #: **101748**
 Test Type: **Conducted Emissions** Date 10/08/2018
 Tested By: **Hieu Song Nguyenpham**
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test environment conditions:
 Temperature: 20.3°C
 Relative Humidity: 35%
 Pressure: 102.5kPa

 Modification #1 was in place during testing.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
P06910	Attenuator	Pasternack	PE7083	12/20/2017	12/20/2019

Summary of Results

Pass: As summarized in plots and tables below, the uniformity of the output signal relative to the input signal are practically identical. Therefore, the comparison is within limits.

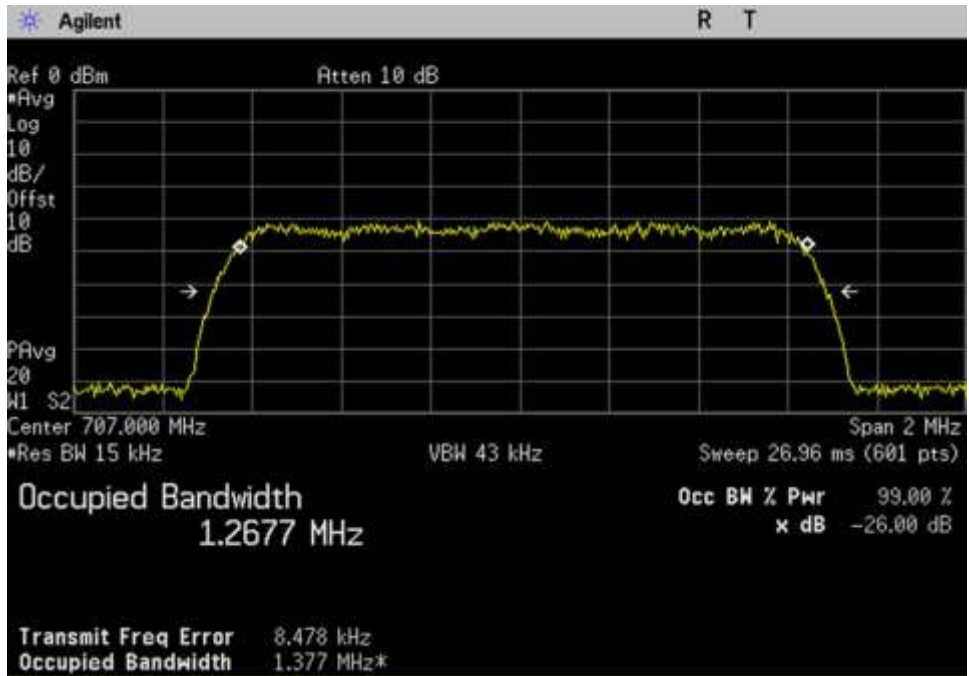
OBW-Input (Hz)				
EDGE	GSM	CDMA	WCDMA	LTE
245227	244005	1260446	4233152	4456797
245957	243754	1270863	4131642	4454730
246502	245338	1265116	4150578	4433154
243694	246893	1267675	4153047	4435235
242626	241147	1259864	4155895	4459447
244128	244476	1258128	4159127	4466699
242903	245834	1241008	4163600	4486926
243323	244750	1251492	4183786	4469413
246733	244951	1245465	4168292	4475766
242794	247060	1253951	4157432	4469614

OBW-Output (Hz)				
EDGE	GSM	CDMA	WCDMA	LTE
247533	250910	1256288	4144726	4431764
247098	248359	1259852	4148117	4459825
247924	247555	1248119	4145126	4418802
248689	247411	1249004	4160255	4460987
246947	248385	1253587	4171920	4433314
247049	246941	1250262	4147102	4452641
246283	249016	1248902	4140775	4448994
246565	246604	1250822	4123608	4453599
247249	247240	1249631	4166377	4476508
248809	245719	1259330	4152951	4445871

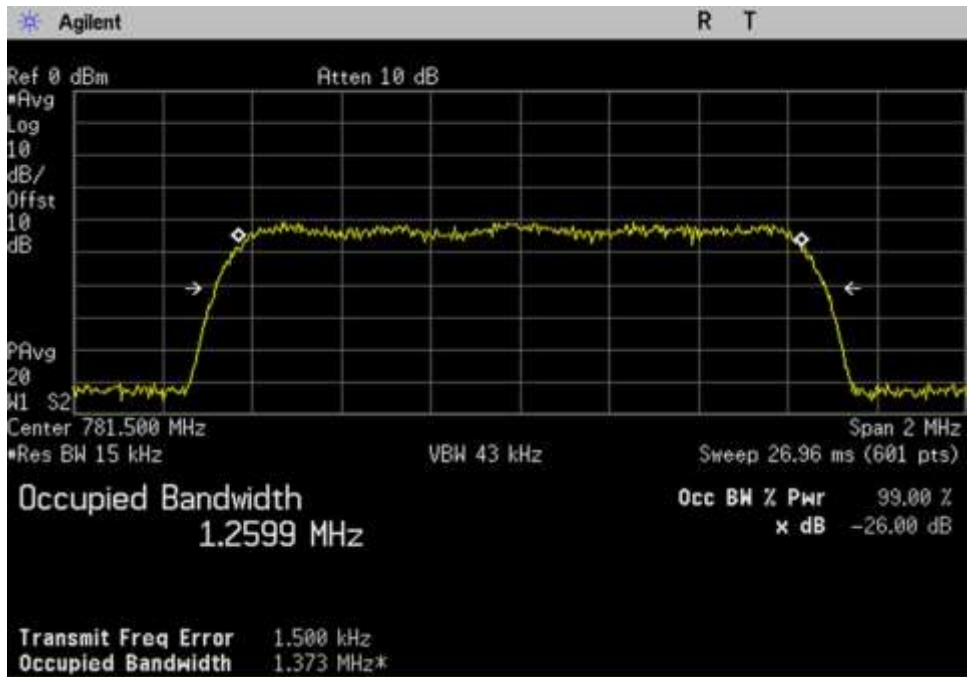
Max Difference In&Out Occ BW 99% Pwr					
Frequency Range	EDGE	GSM	CDMA	WCDMA	LTE
UL_1710-1755MHz	0.94%	2.83%	0.33%	2.09%	0.56%
UL_1850-1915MHz	0.46%	1.89%	0.87%	0.40%	0.11%
UL_824-849MHz	0.58%	0.90%	1.34%	0.13%	0.32%
UL_698-716MHz	2.05%	0.21%	1.47%	0.17%	0.58%
UL_777-787MHz	1.78%	3.00%	0.50%	0.39%	0.59%
DL_2110-2155MHz	1.20%	1.01%	0.63%	0.29%	0.31%
DL_1930-1995MHz	1.39%	1.29%	0.64%	0.55%	0.85%
DL_869-894MHz	1.33%	0.76%	0.05%	1.44%	0.35%
DL_728-746MHz	0.21%	0.93%	0.33%	0.05%	0.02%
DL_746-756MHz	2.48%	0.54%	0.43%	0.11%	0.53%

Plots

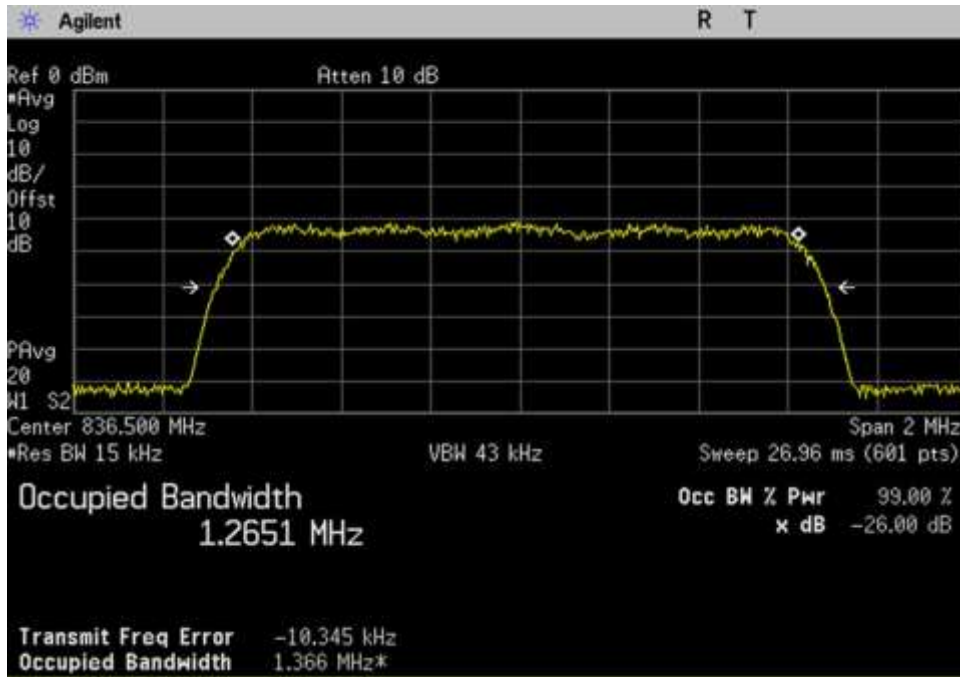
CDMA Input



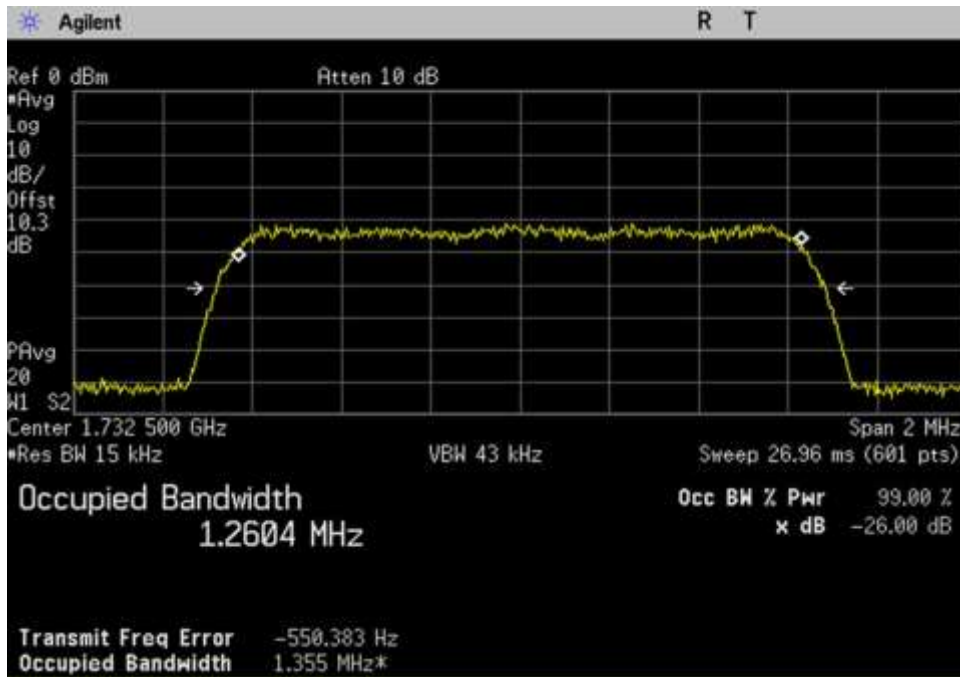
UL_698-716_CDMA_707MHz



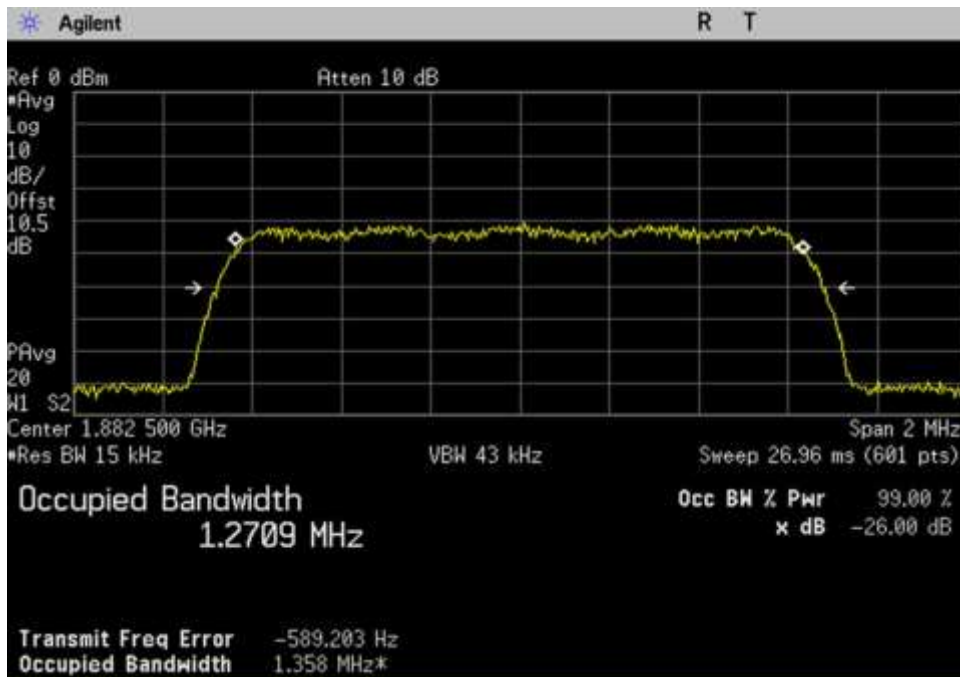
UL_776-787_CDMA_781.5MHz



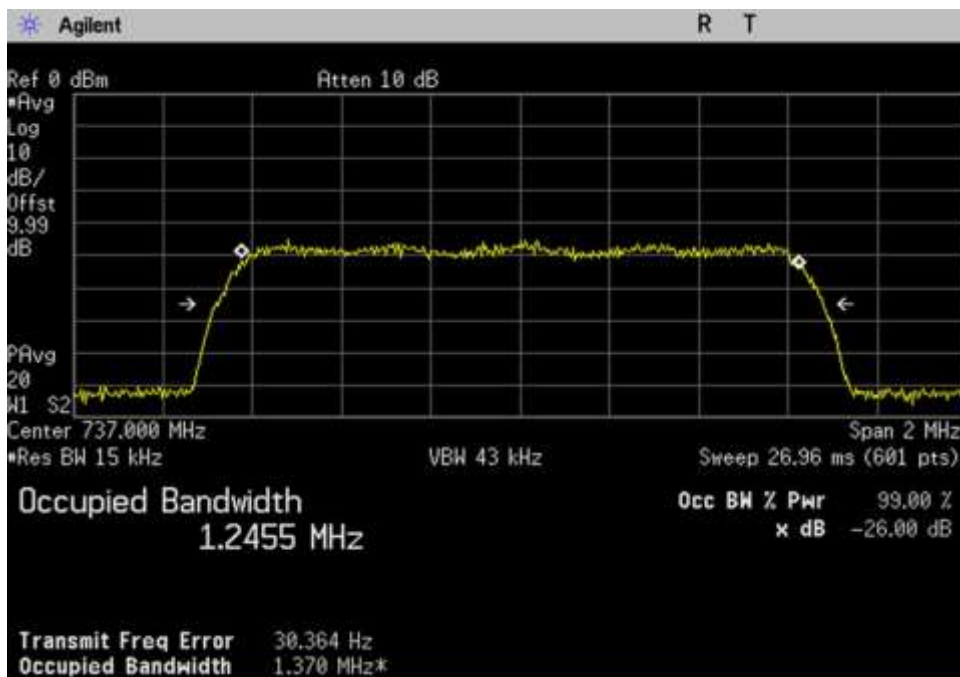
UL_824-849_CDMA_836.5MHz



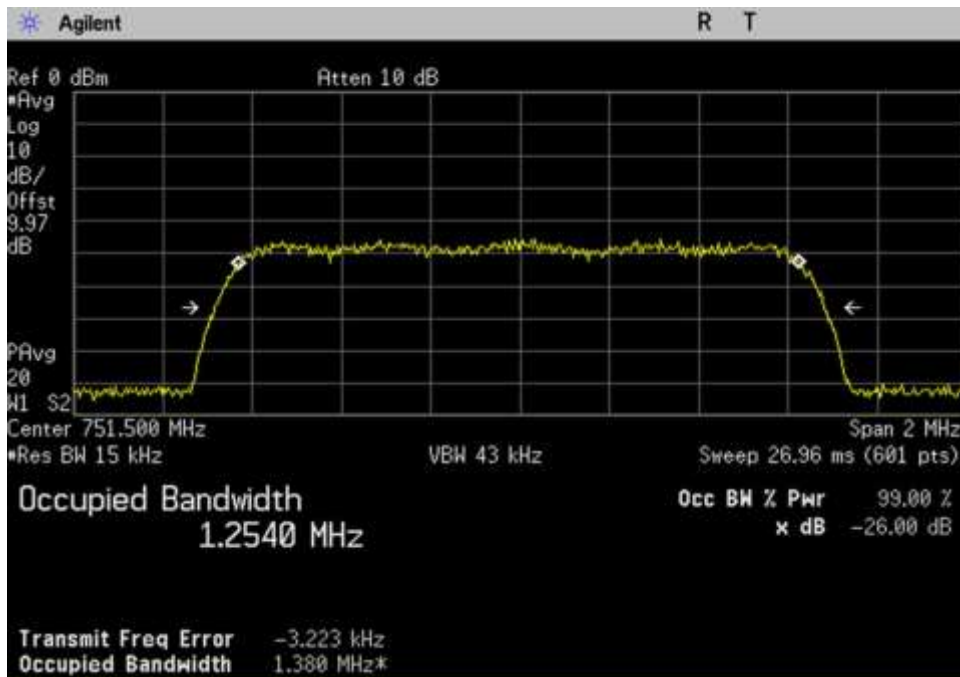
UL_1710-1755_CDMA_1732.5MHz



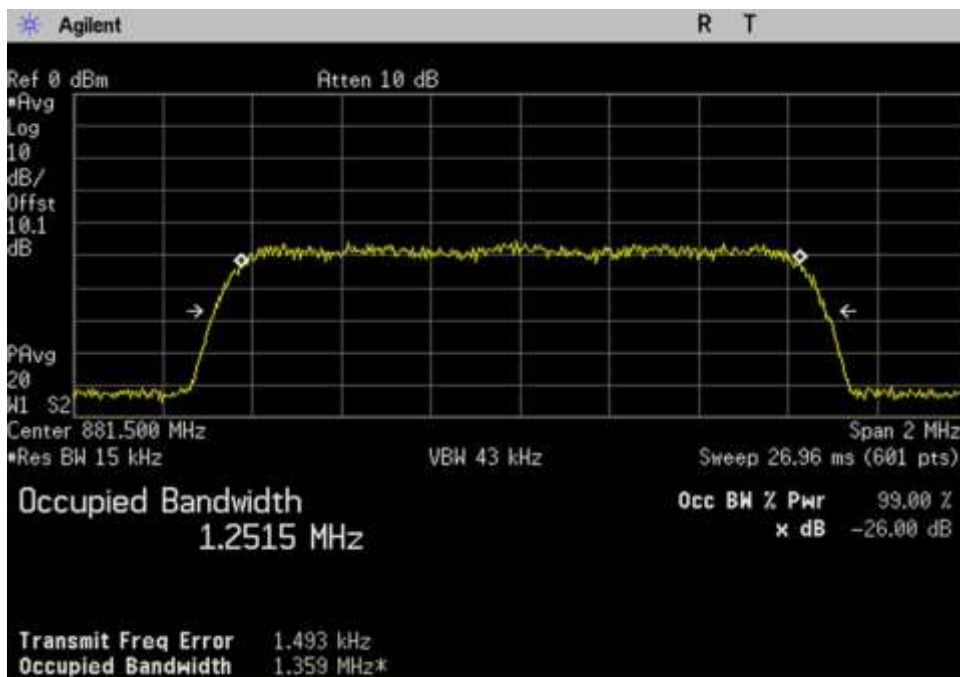
UL_1850-1915_CDMA_1882.5MHz



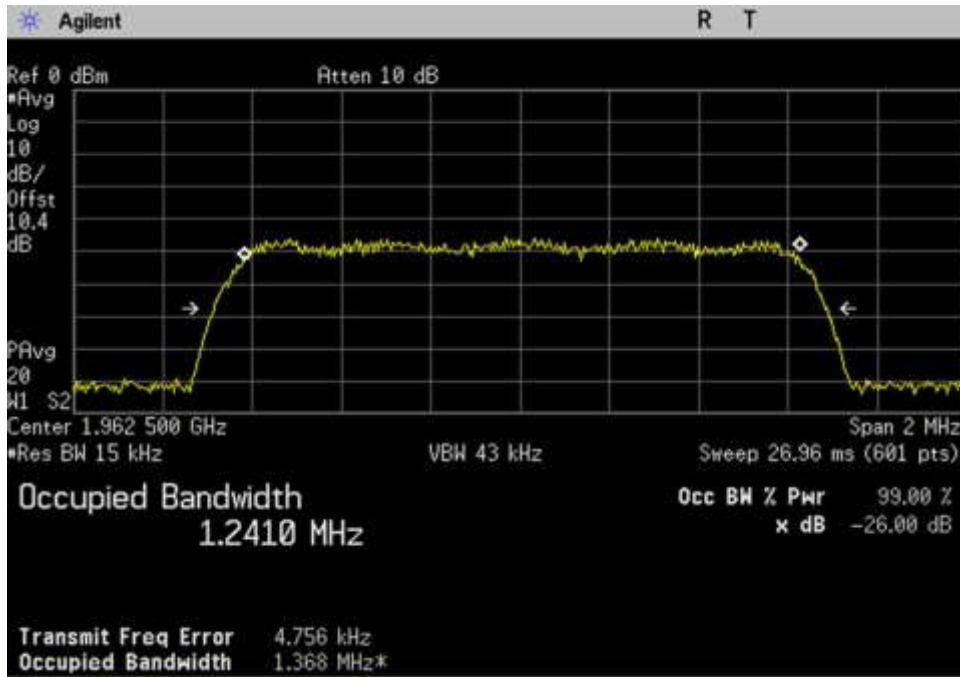
DL_728-746_CDMA_737MHz



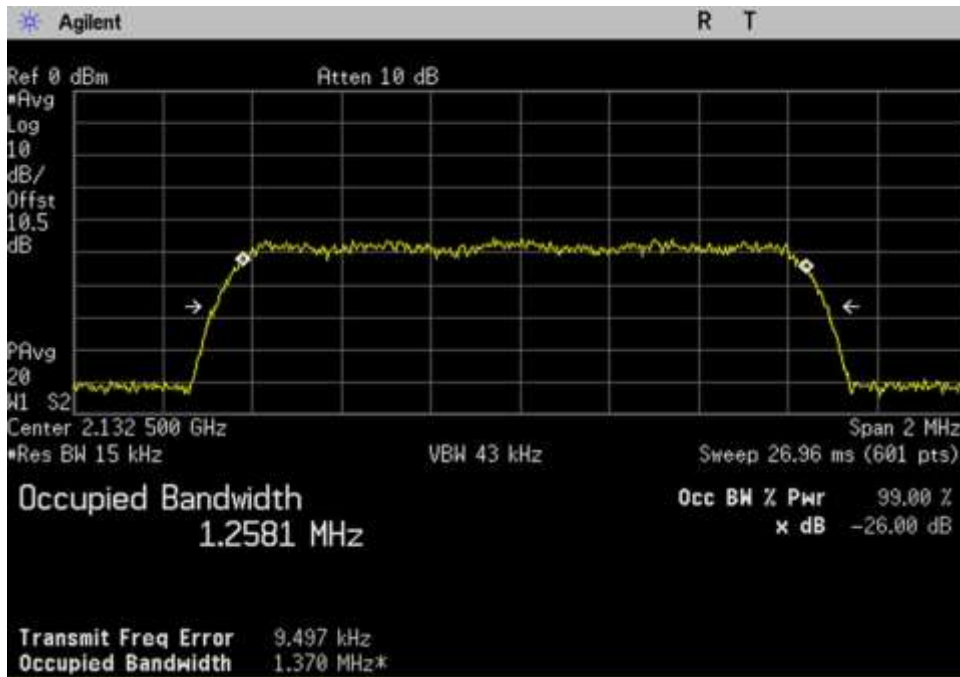
DL_746-757_CDMA_751.5MHz



DL_869-894_CDMA_881.5MHz

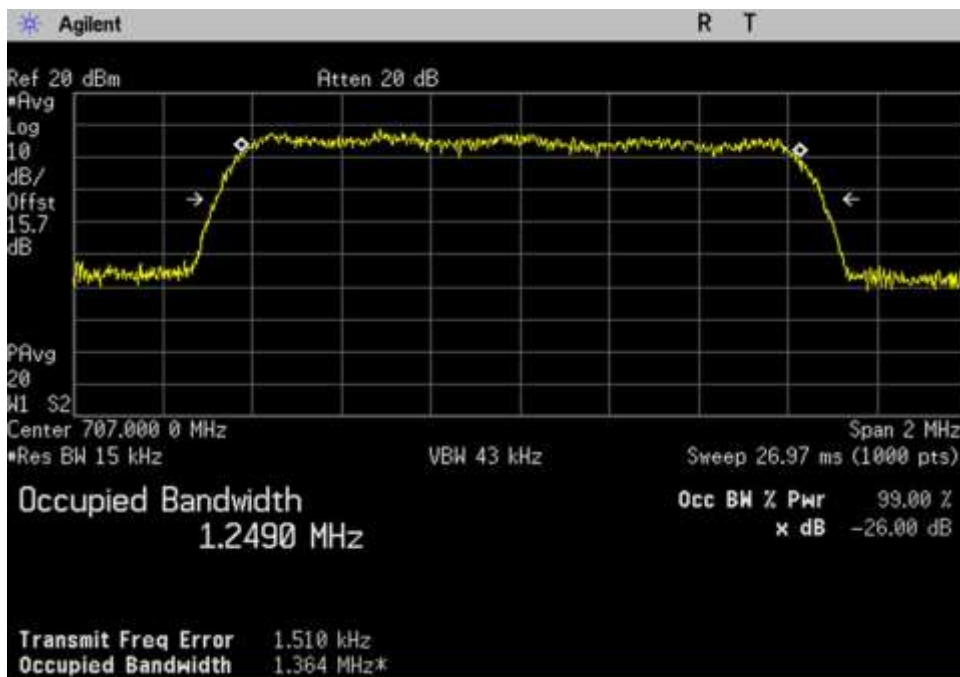


DL_1930-1995_CDMA_1962.5MHz

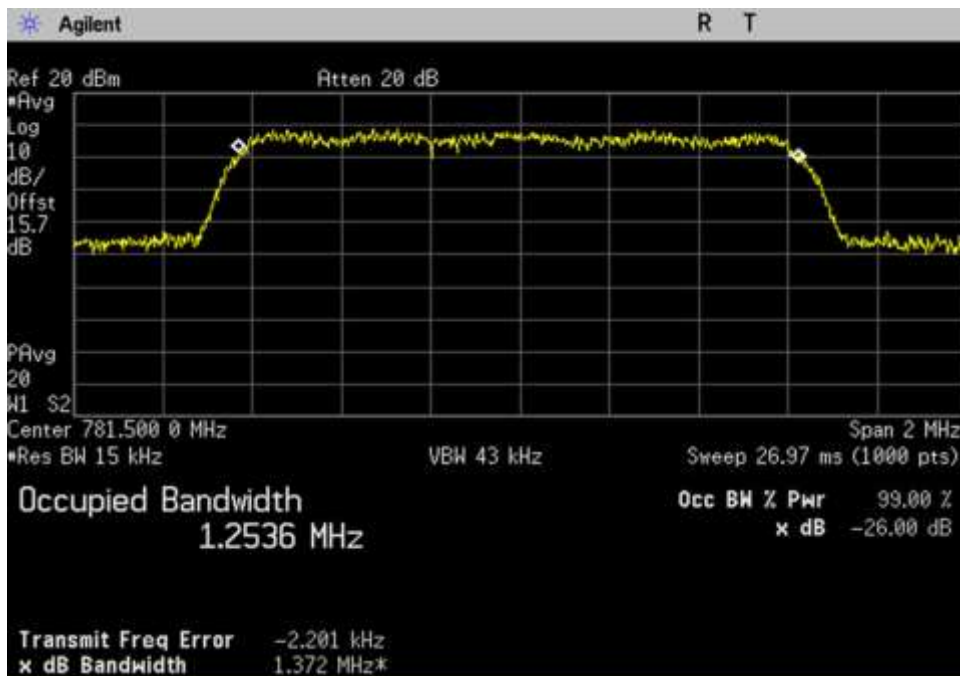


DL_2110-2155_CDMA_2132.5MHz

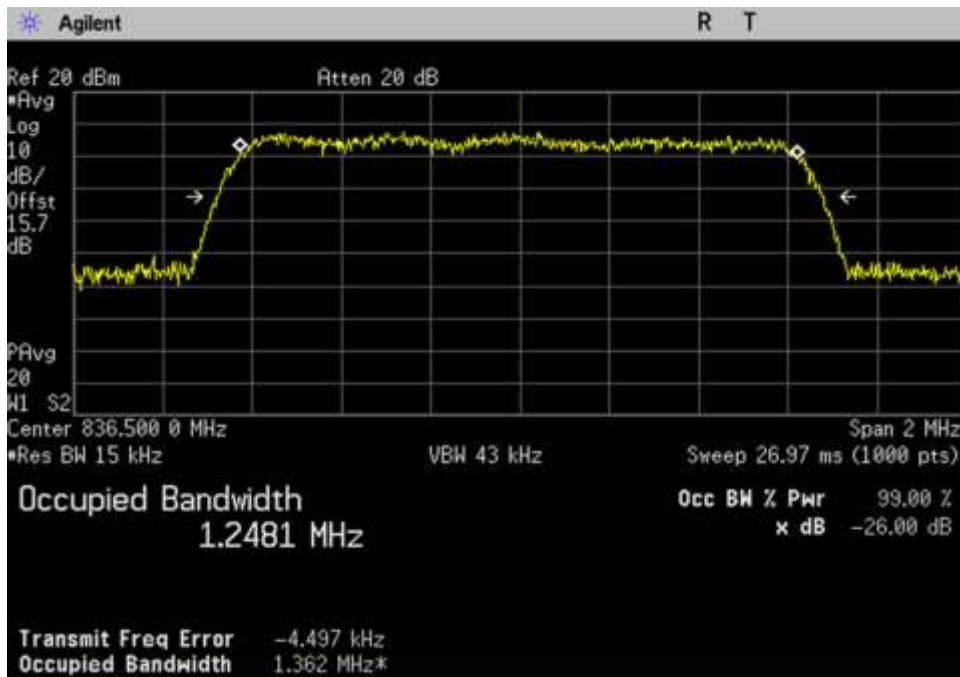
CDMA Output



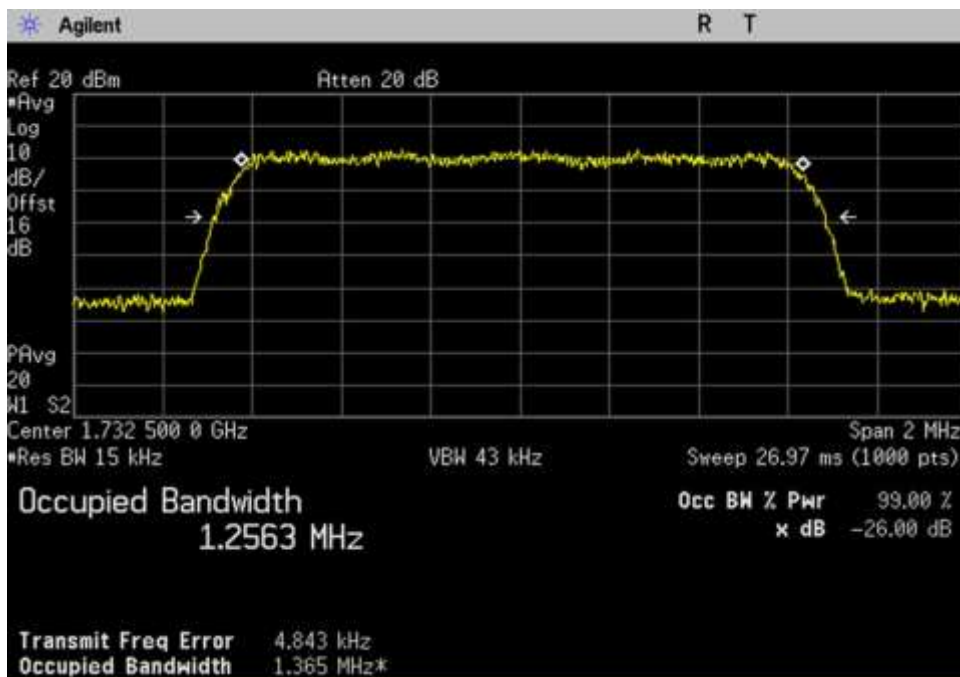
UL_698-716_CDMA_707MHz



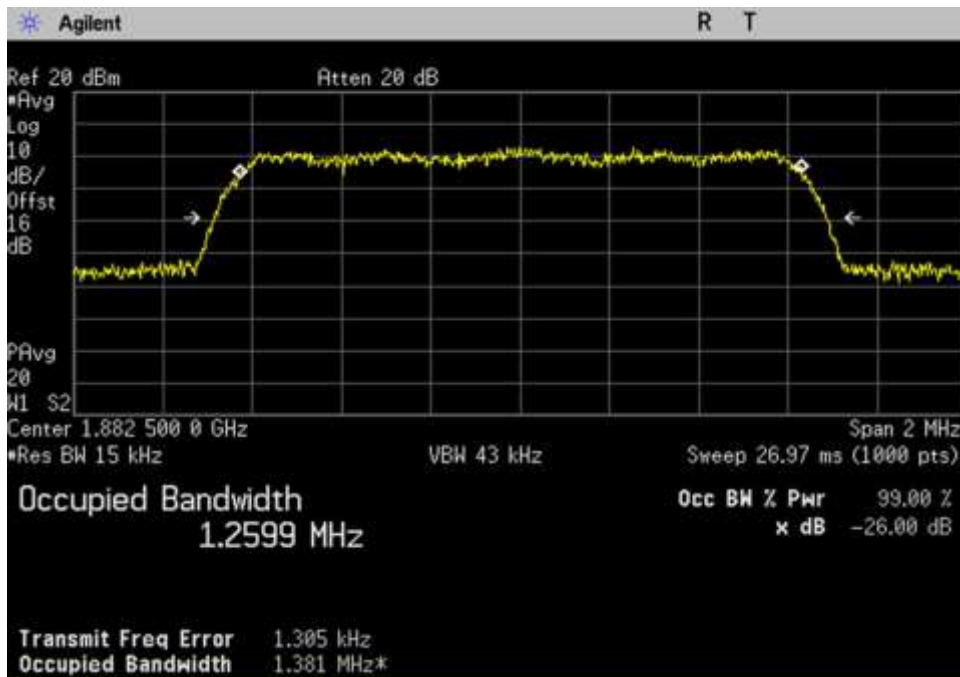
UL_776-787_CDMA_781.5MHz



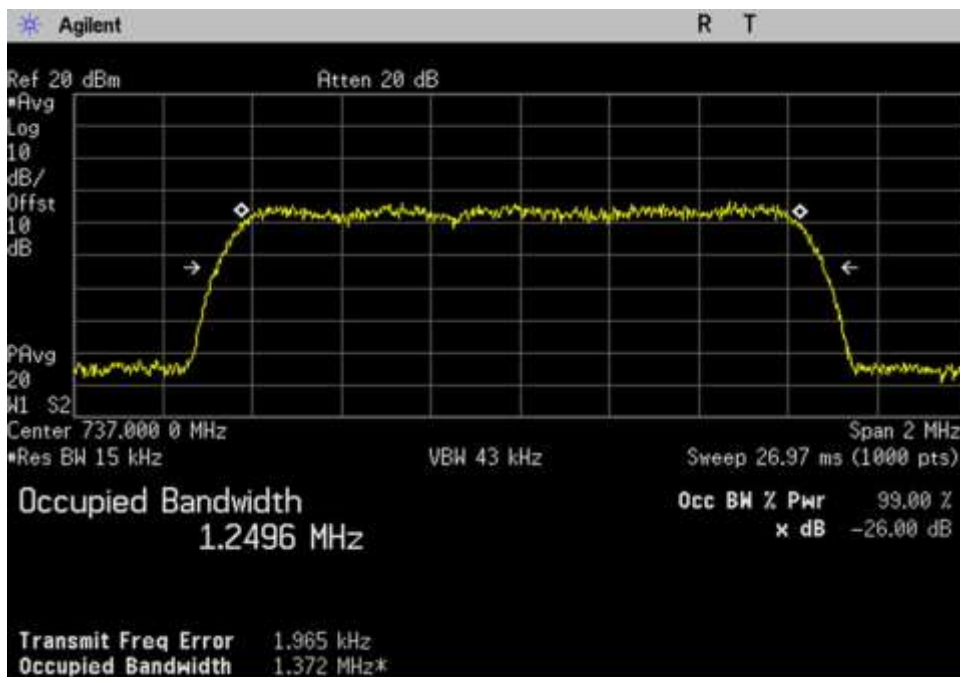
UL_824-849_CDMA_836.5MHz



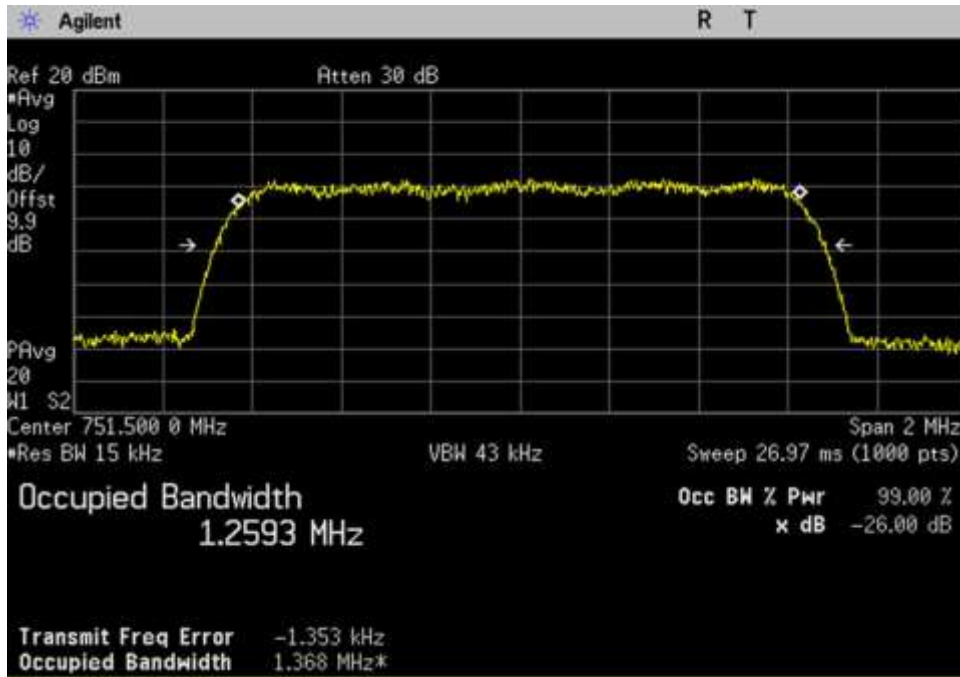
UL_1710-1755_CDMA_1732.5MHz



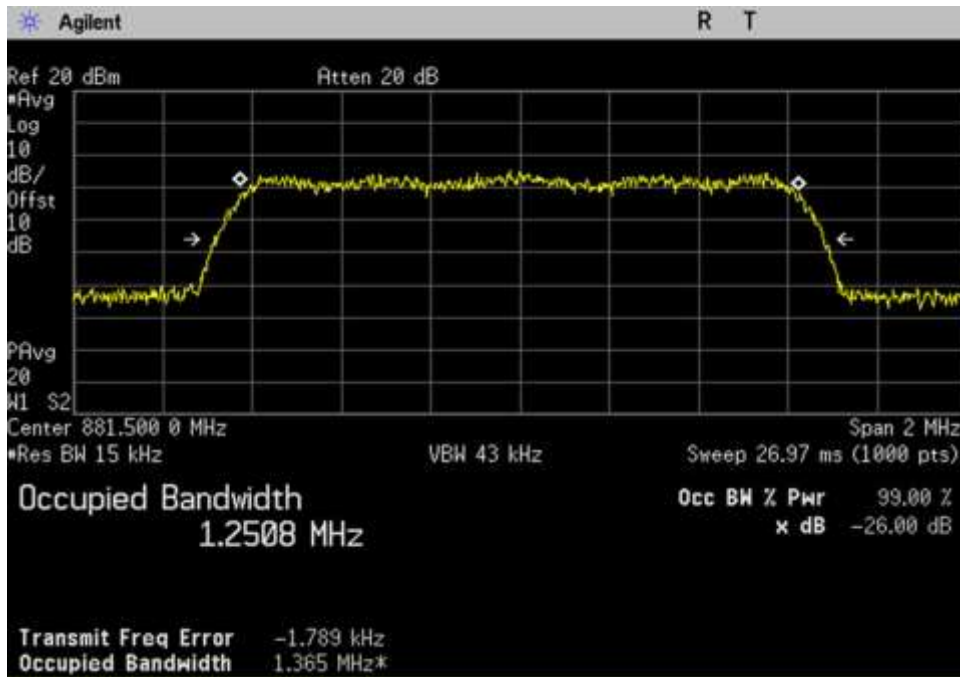
UL_1850-1915_CDMA_1882.5MHz



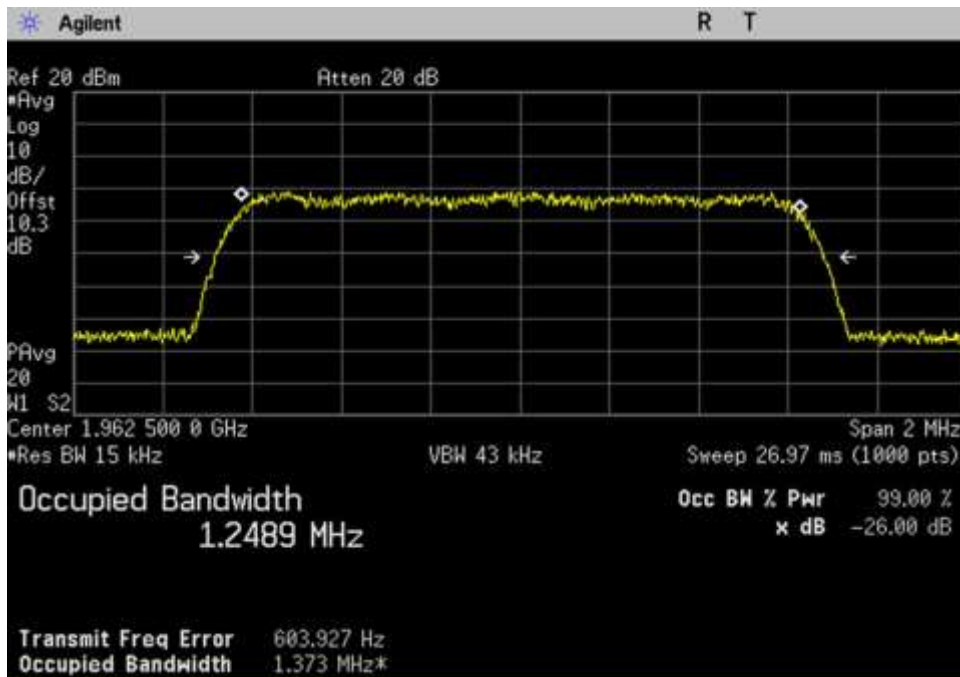
DL_728-746_CDMA_737MHz



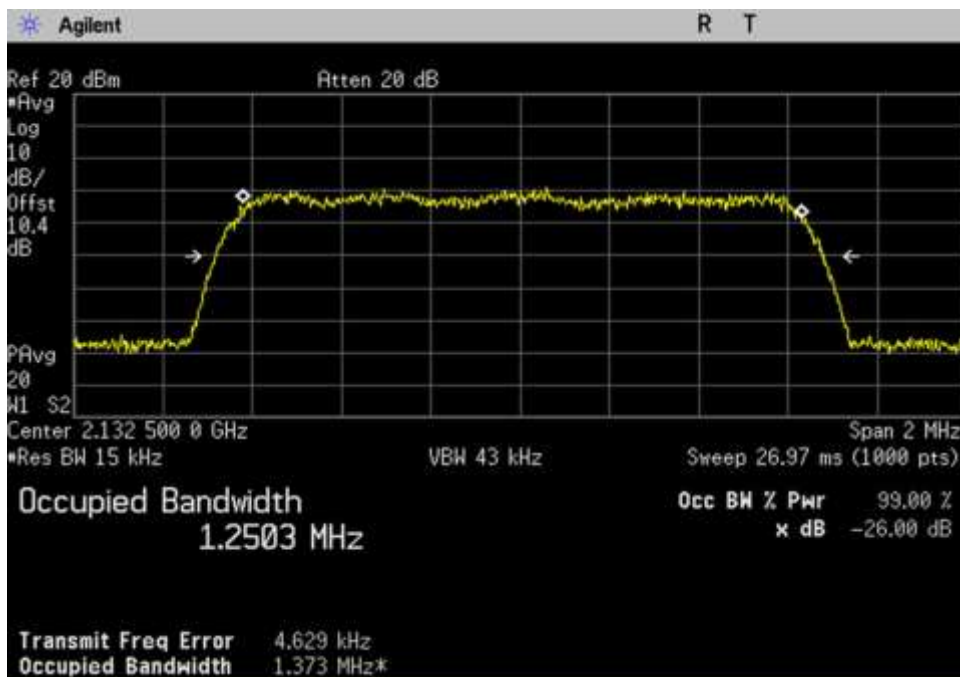
DL_746-757_CDMA_751.5MHz



DL_869-894_CDMA_881.5MHz

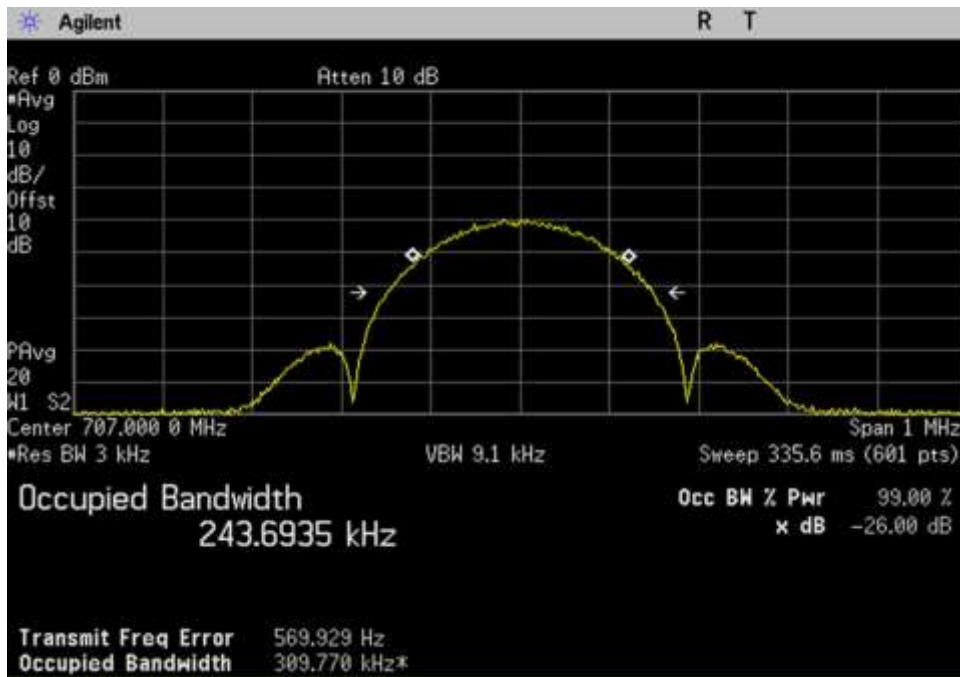


DL_1930-1995_CDMA_1962.5MHz

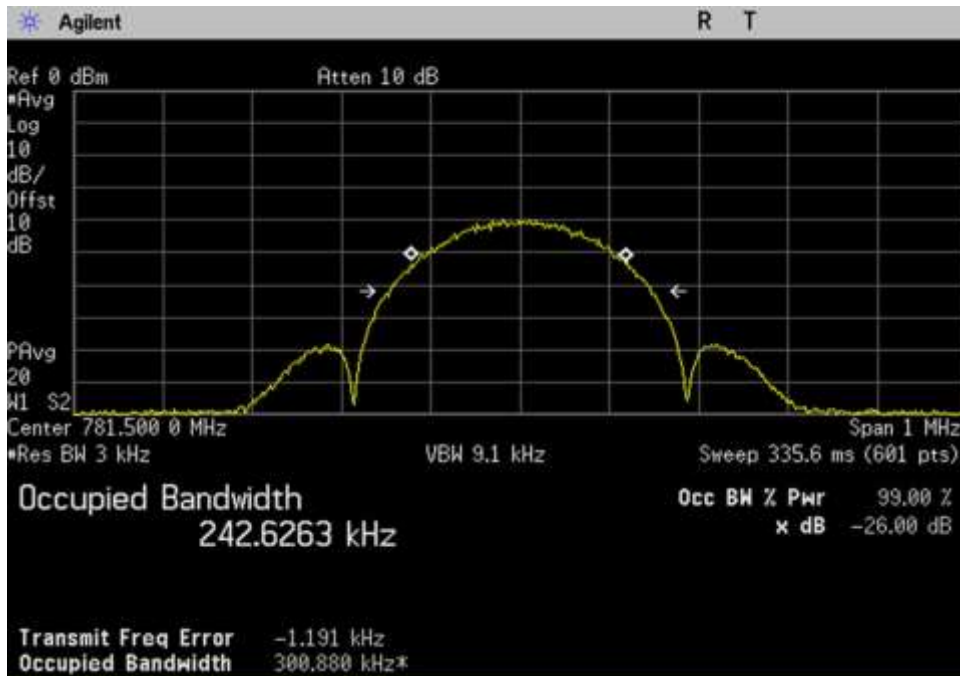


DL_2110-2155_CDMA_2132.5MHz

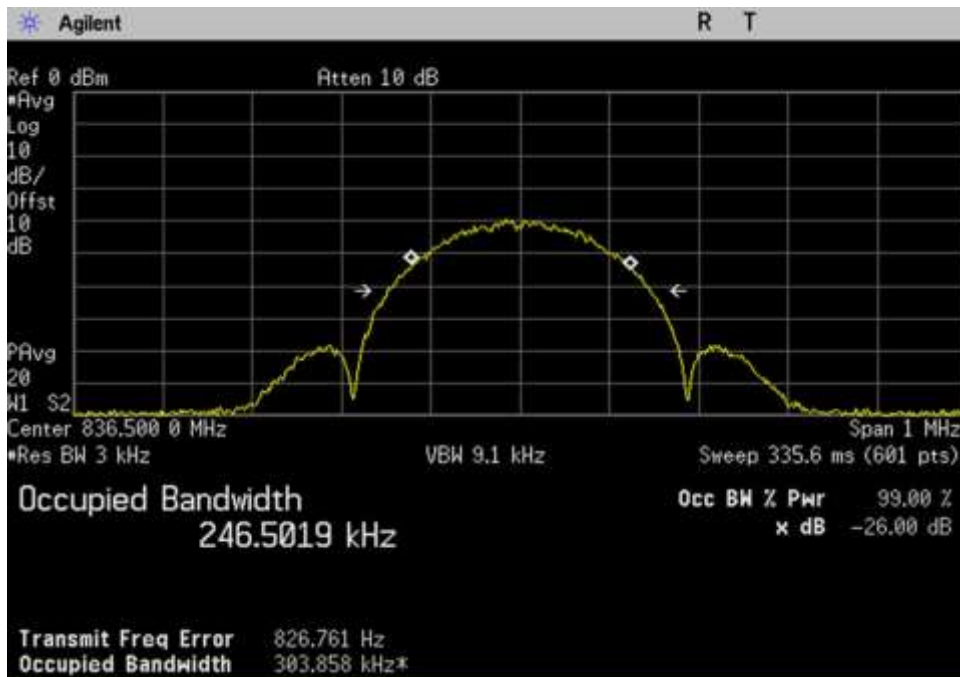
EDGE Input



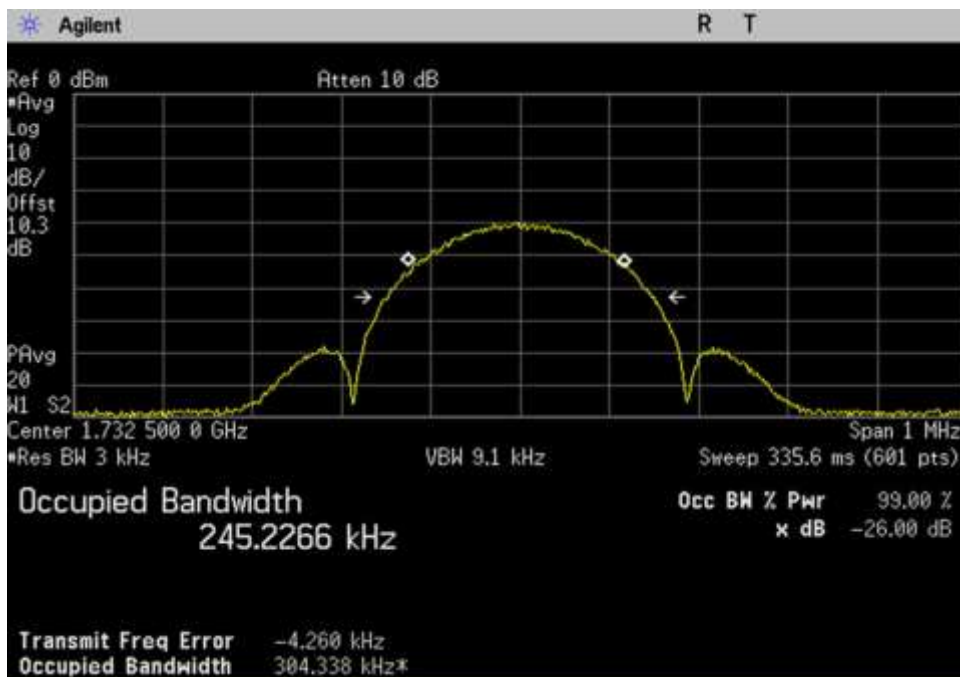
UL_698-716_EDGE_707MHz



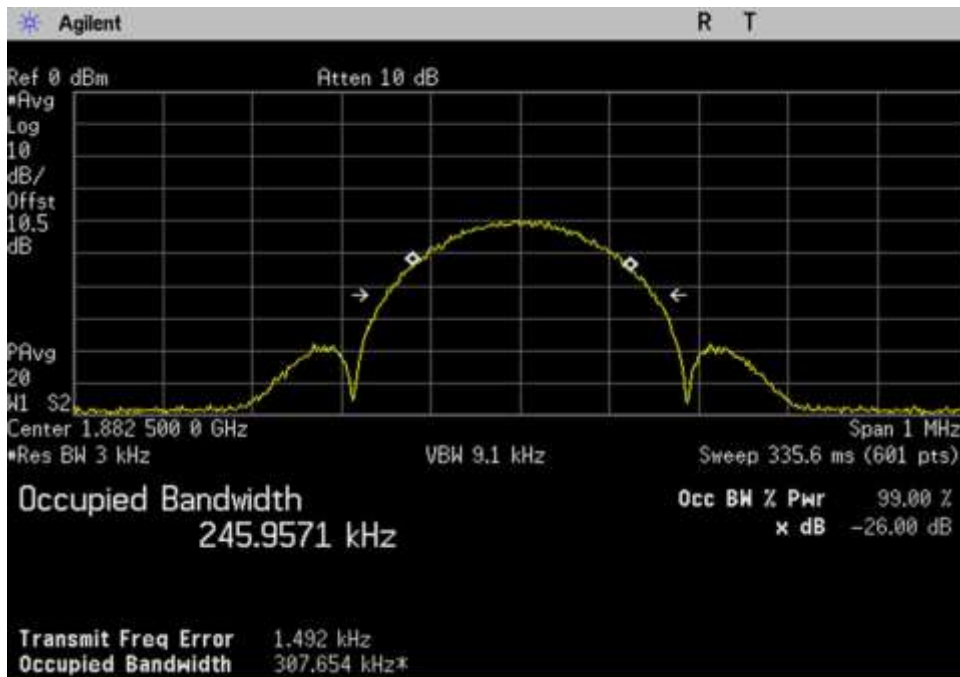
UL_776-787_EDGE_781.5MHz



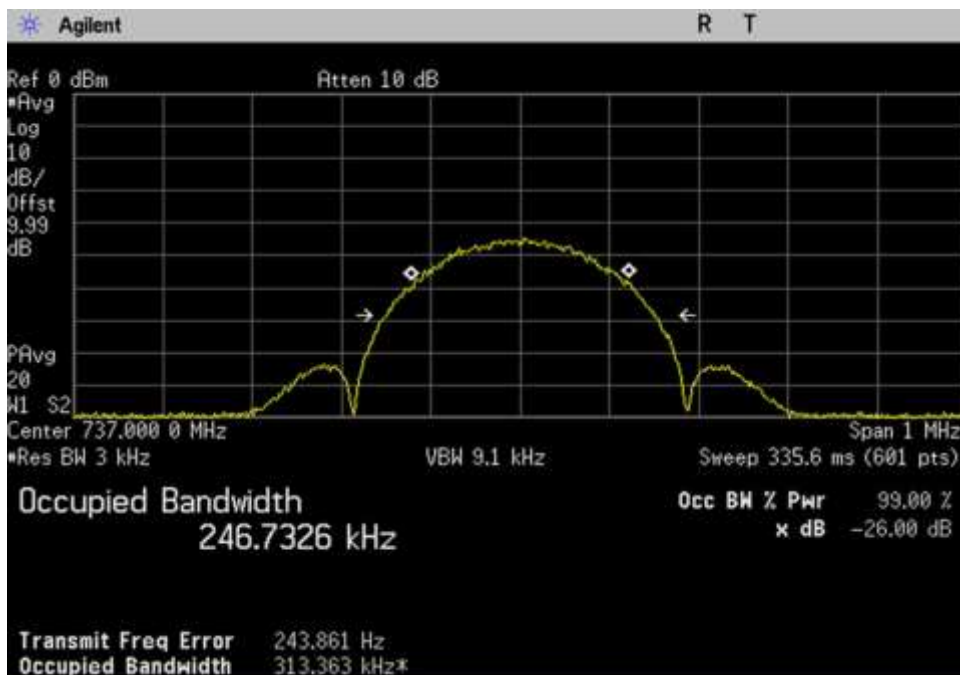
UL_824-849_EDGE_ 836.5MHz



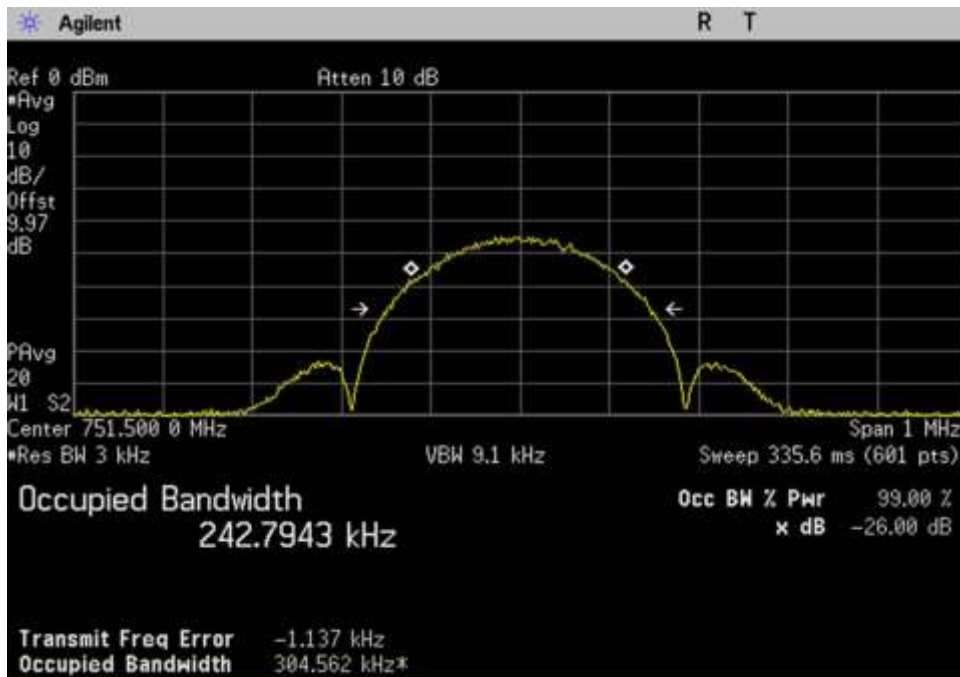
UL_1710-1755_EDGE_ 1732.5MHz



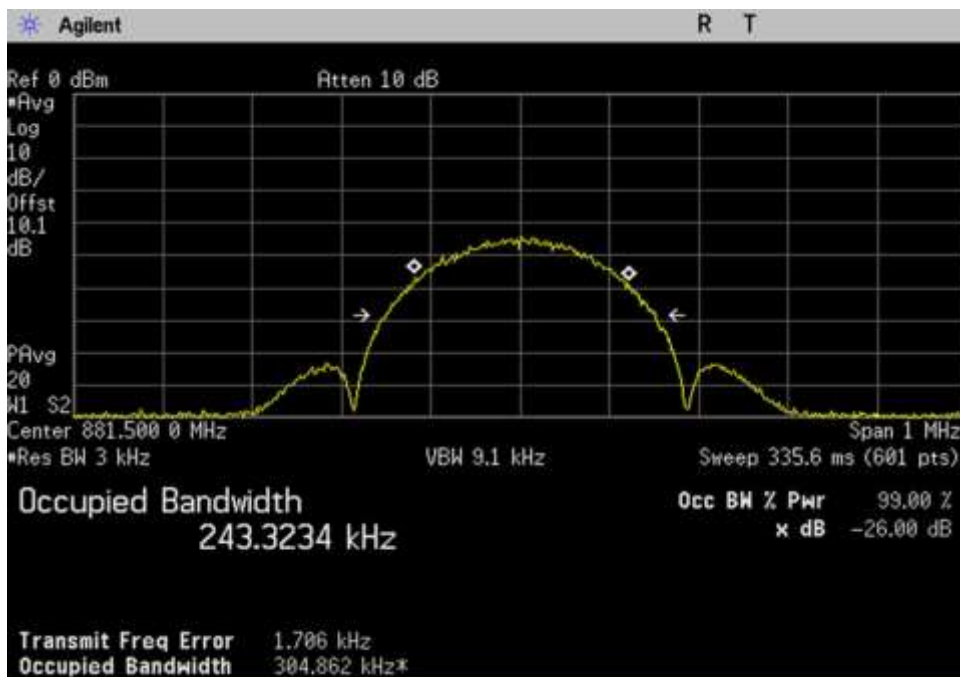
UL_1850-1915_EDGE_1882.5MHz



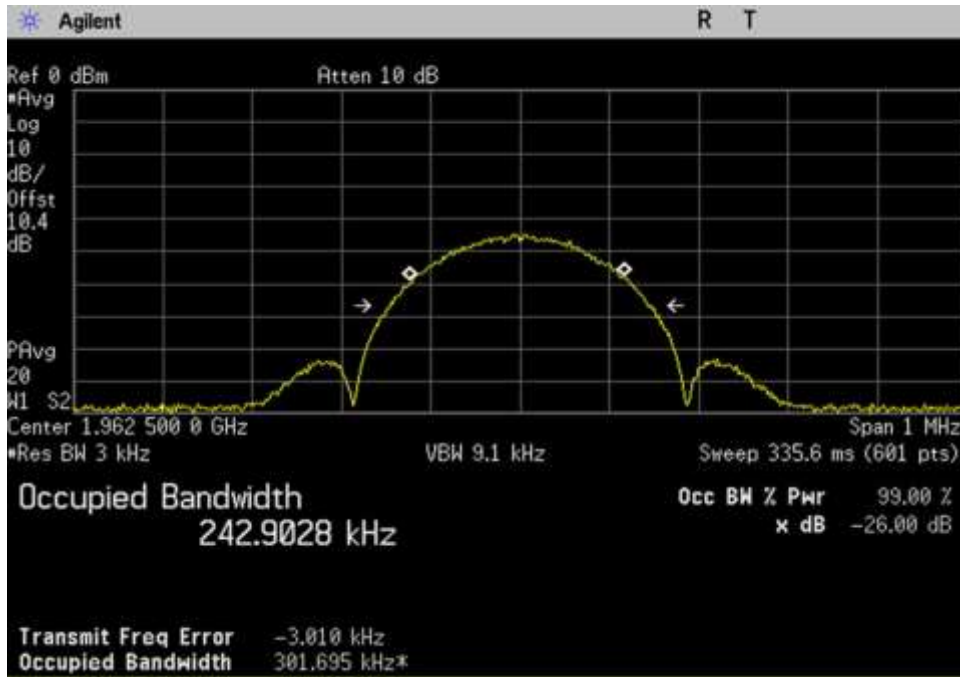
DL_728-746_EDGE_737MHz



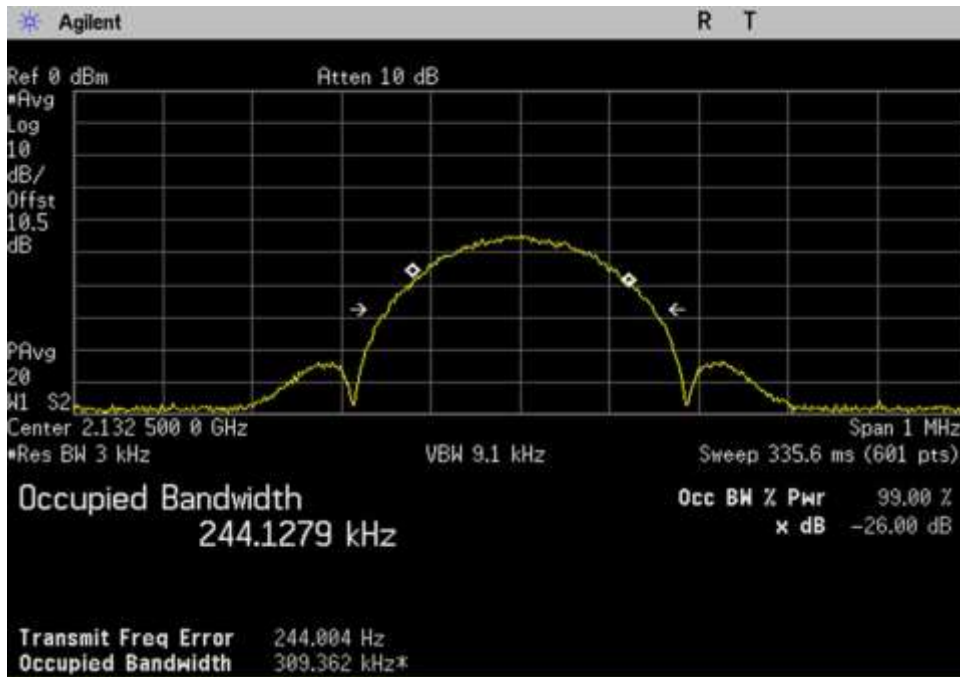
DL_746-757_EDGE_751.5MHz



DL_869-894_EDGE_881.5MHz

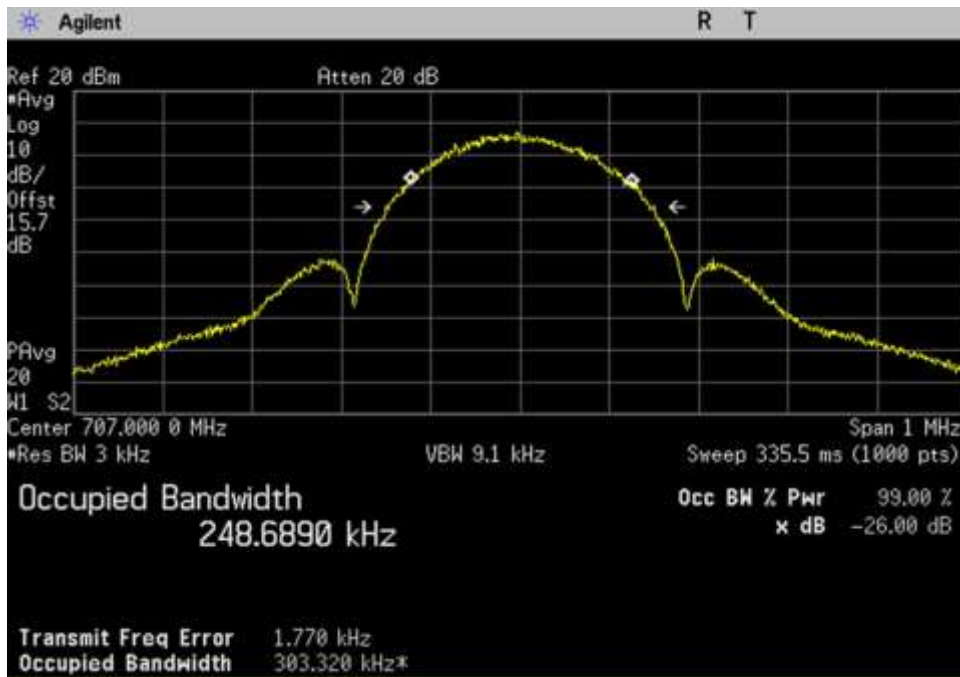


DL_1930-1995_EDGE_1962.5MHz

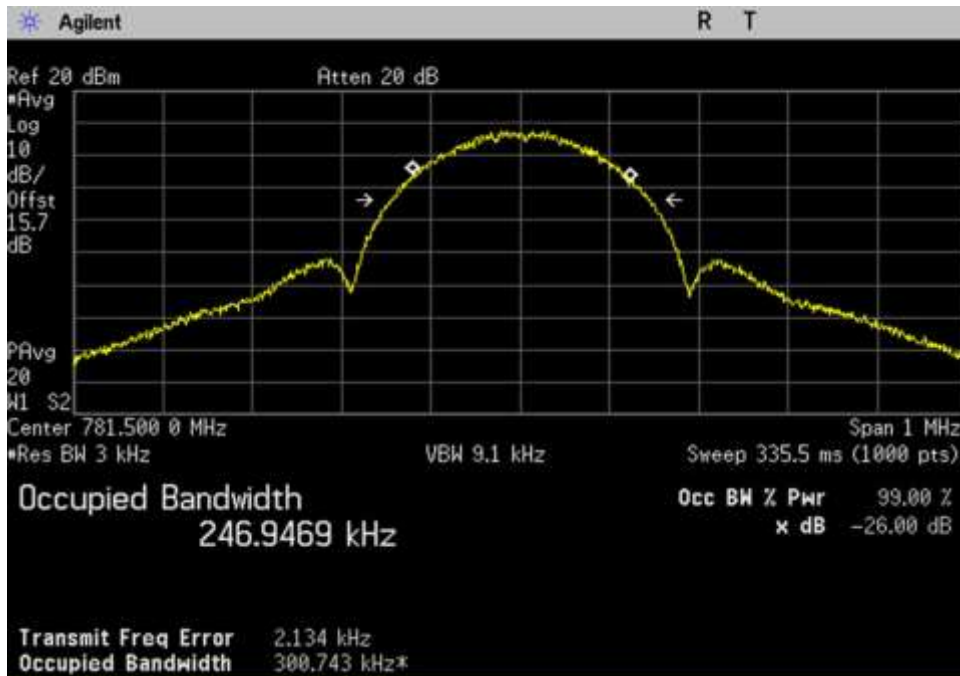


DL_2110-2155_EDGE_2132.5MHz

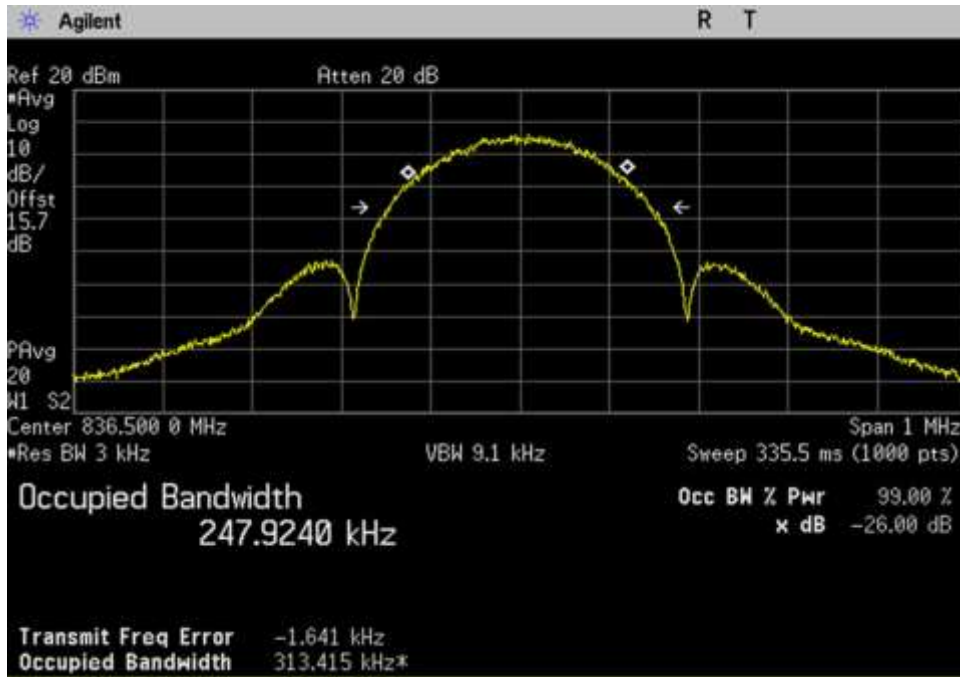
EDGE Output



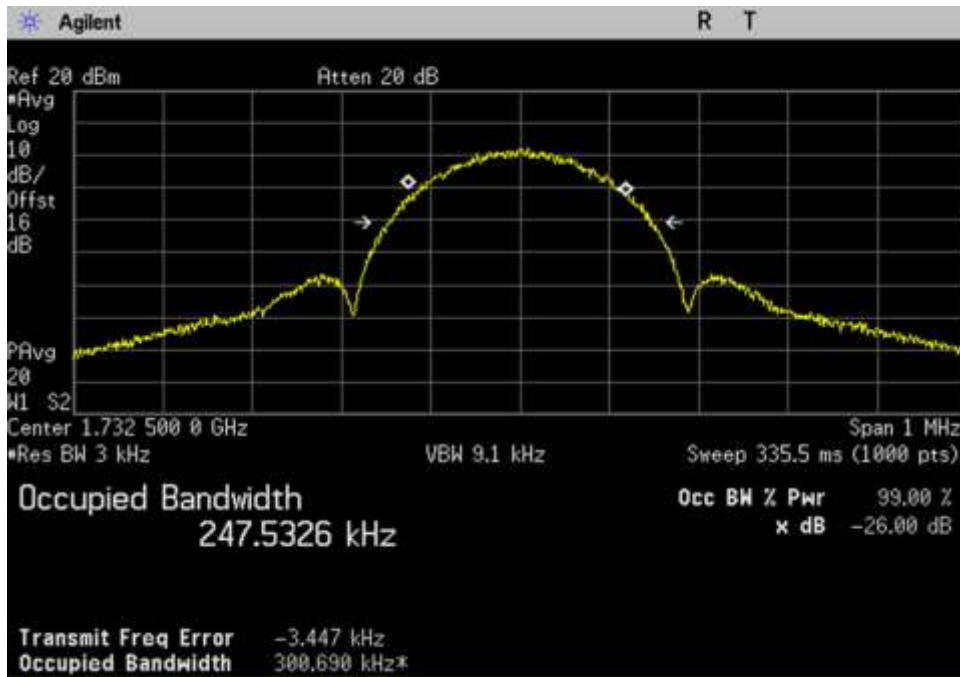
UL_698-716_EDGE_707MHz



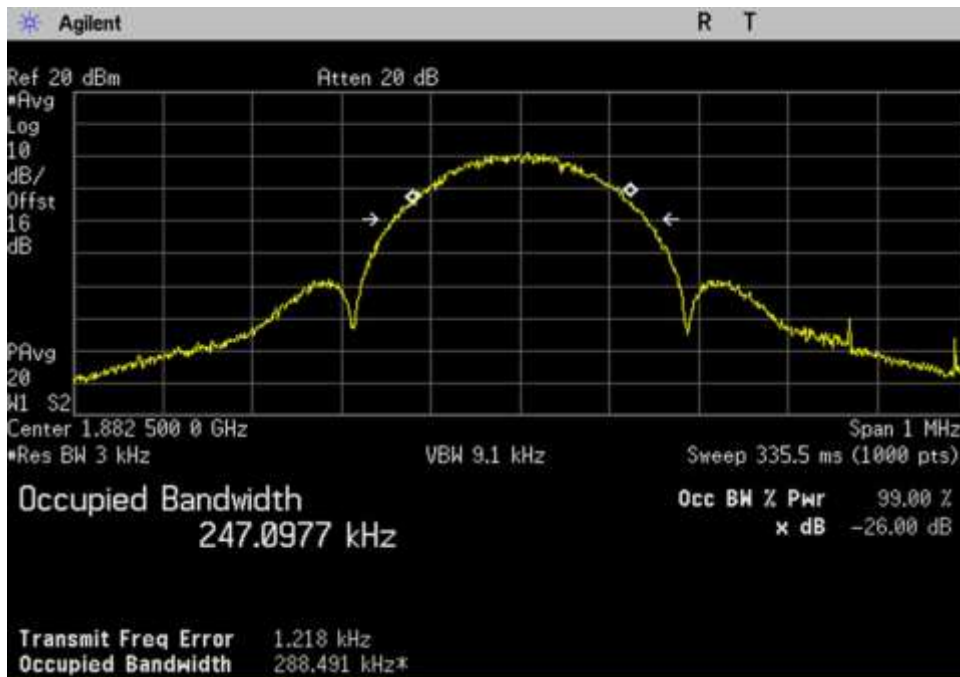
UL_776-787_EDGE_781.5MHz



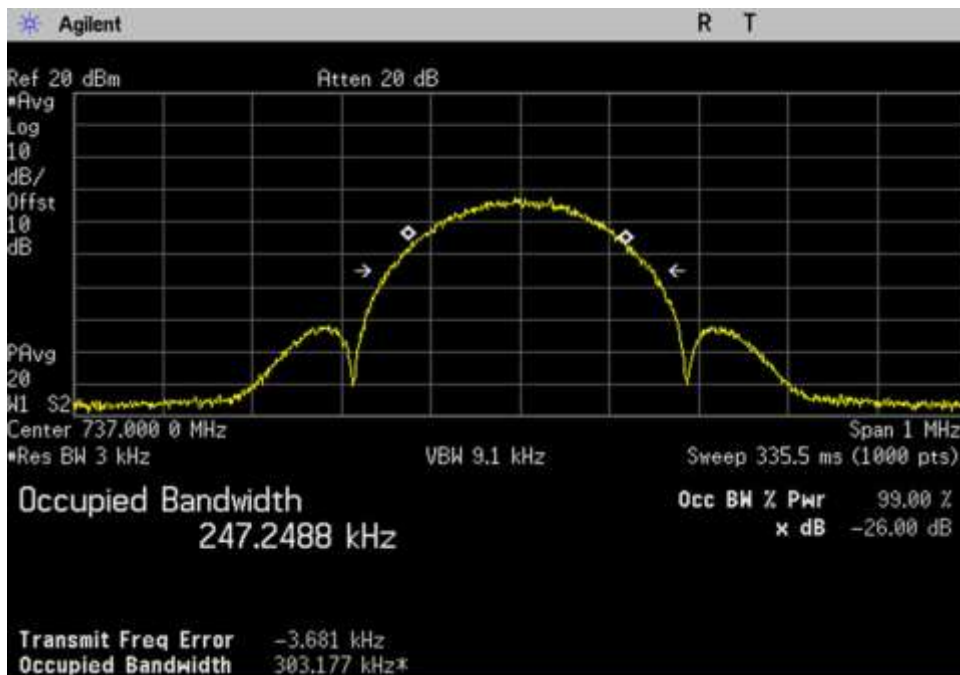
UL_824-849_EDGE_836.5MHz



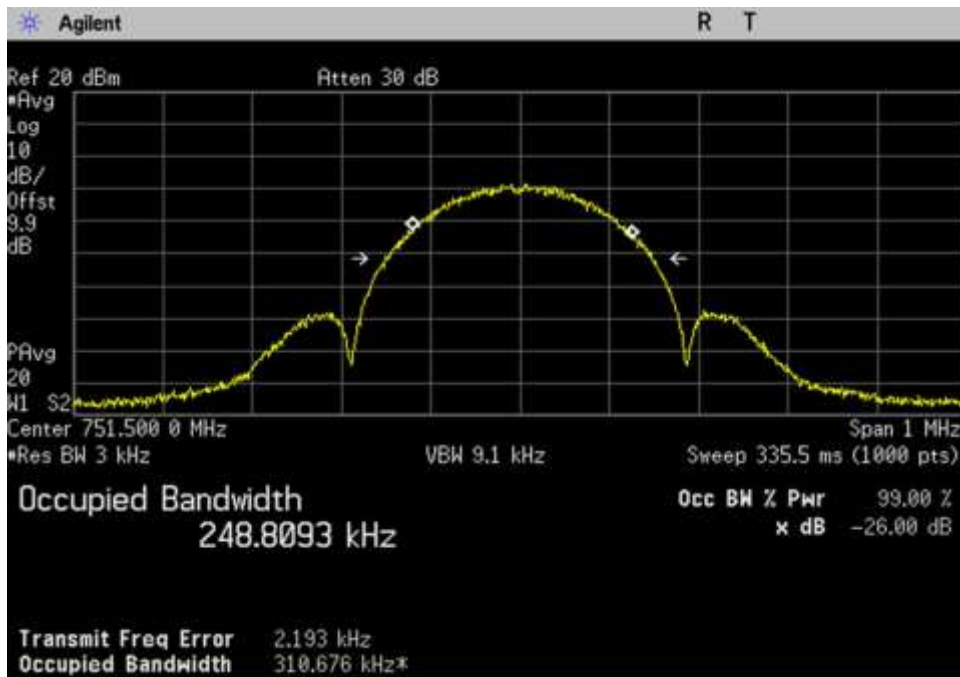
UL_1710-1755_EDGE_1732.5MHz



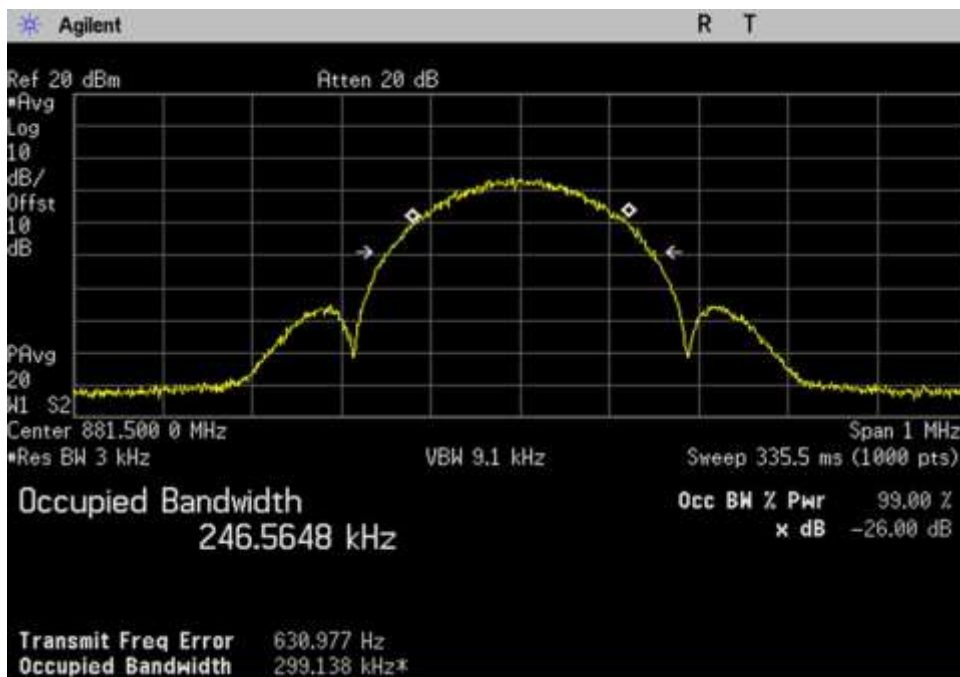
UL_1850-1915_EDGE_1882.5MHz



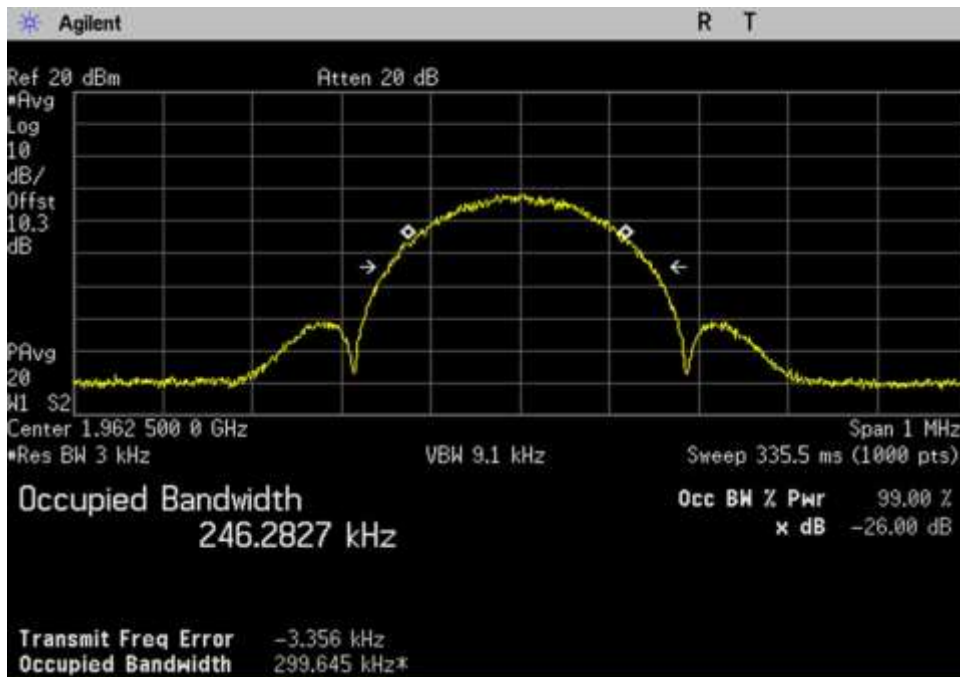
DL_728-746_EDGE_737MHz



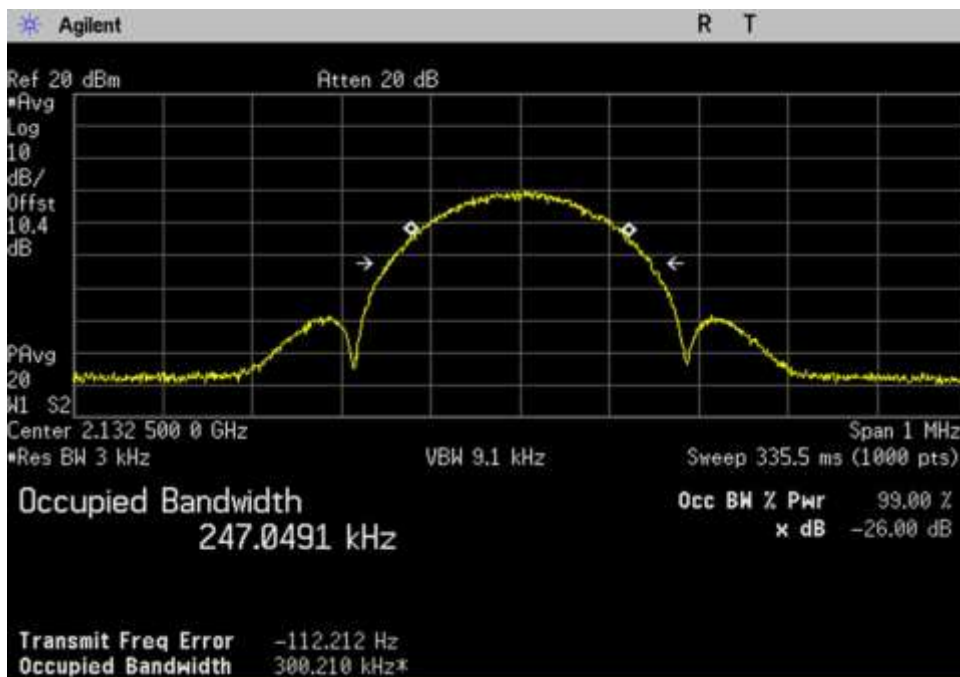
DL_746-757_EDGE_751.5MHz



DL_869-894_EDGE_881.5MHz

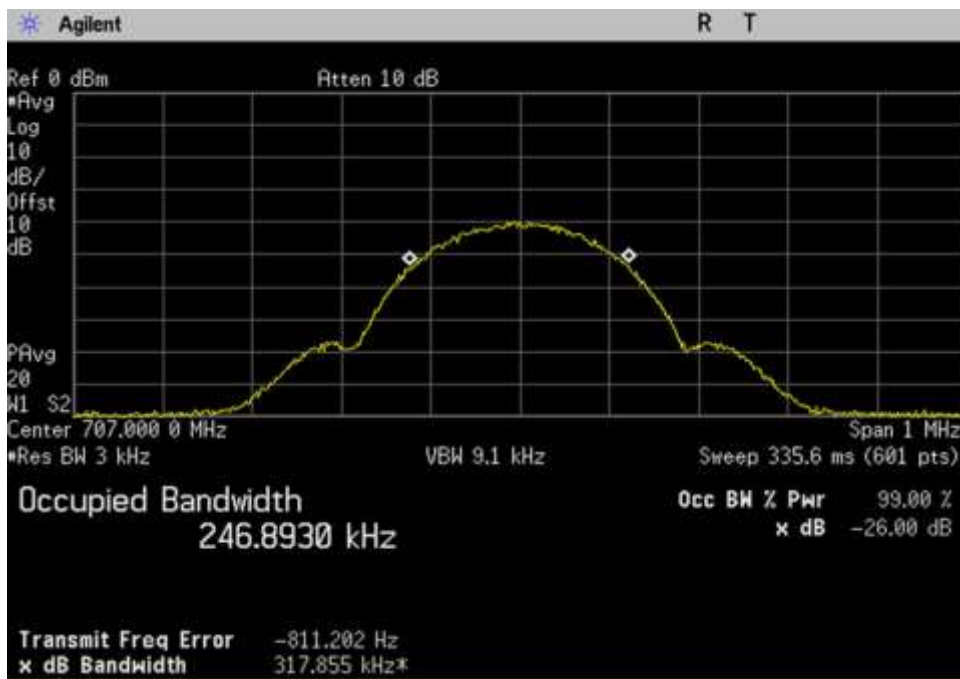


DL_1930-1995_EDGE_1962.5MHz

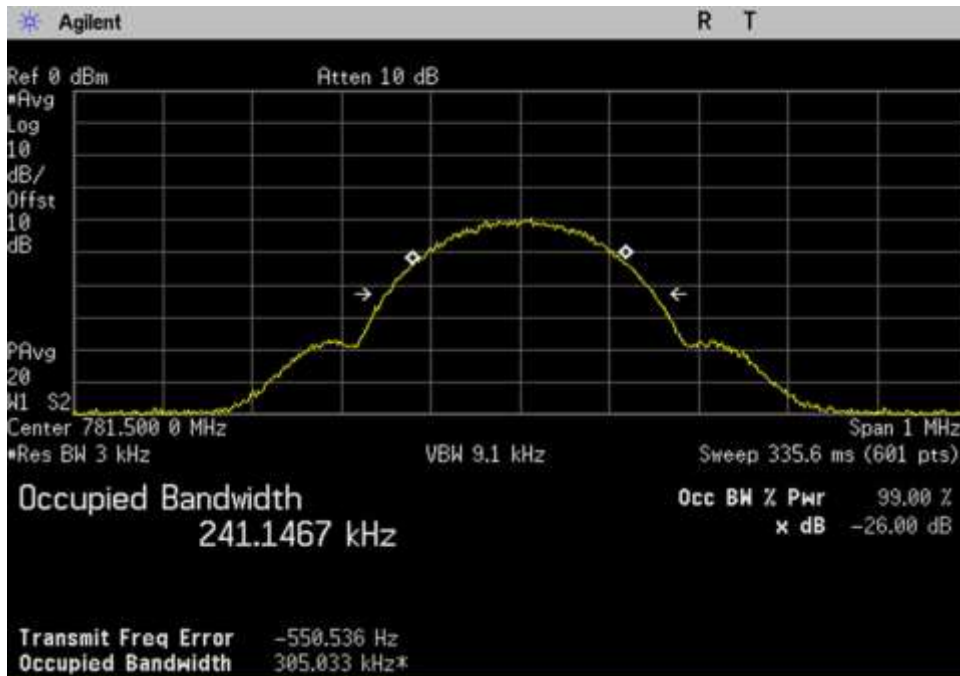


DL_2110-2155_EDGE_2132.5MHz

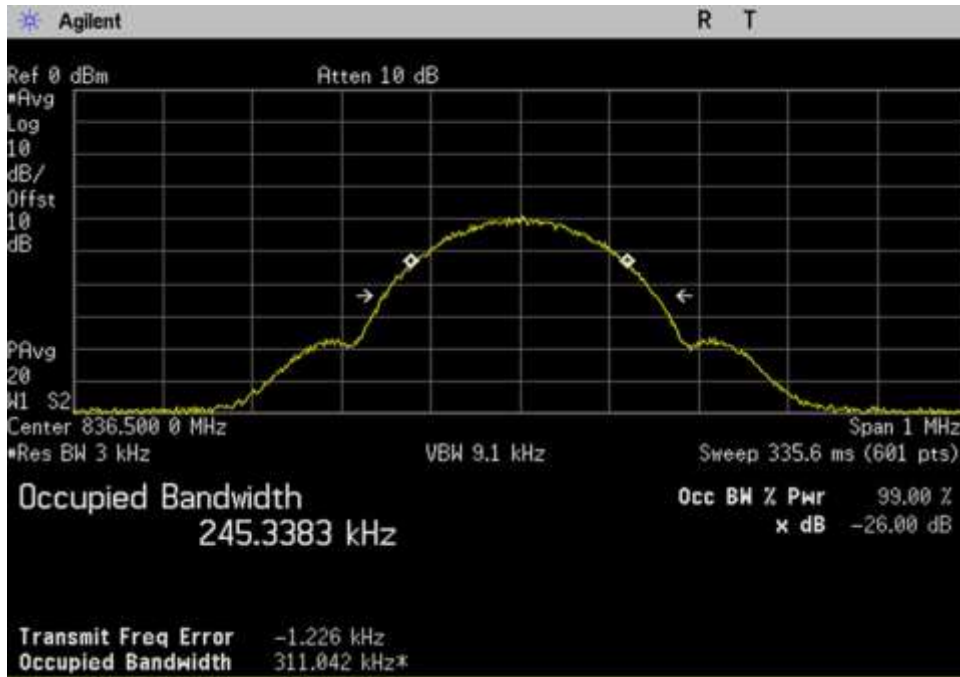
GSM Input



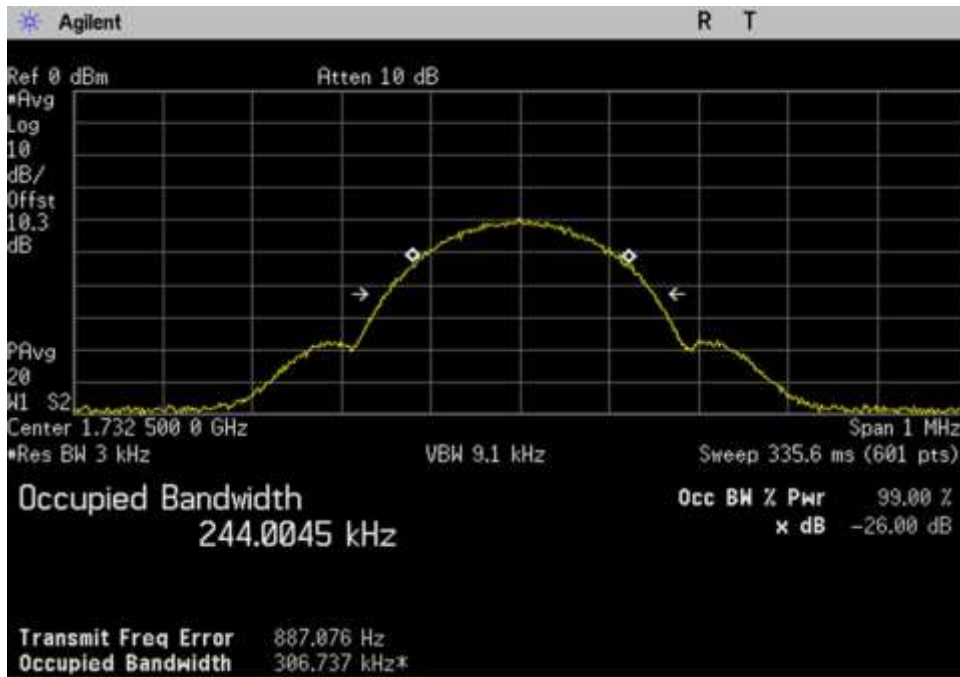
UL_698-716_GSM_707MHz



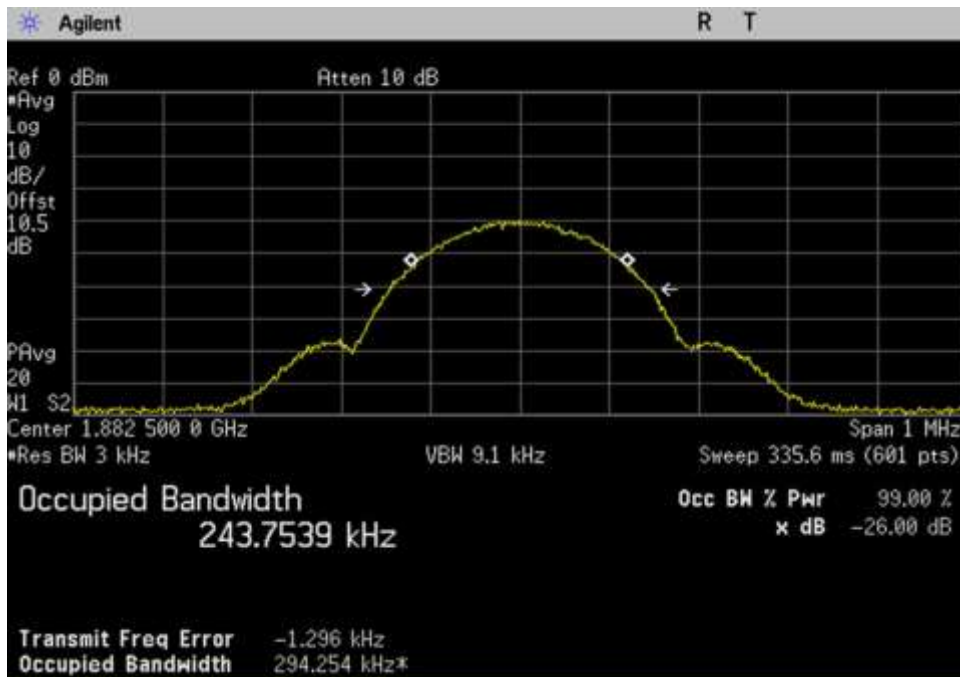
UL_776-787_GSM_781.5MHz



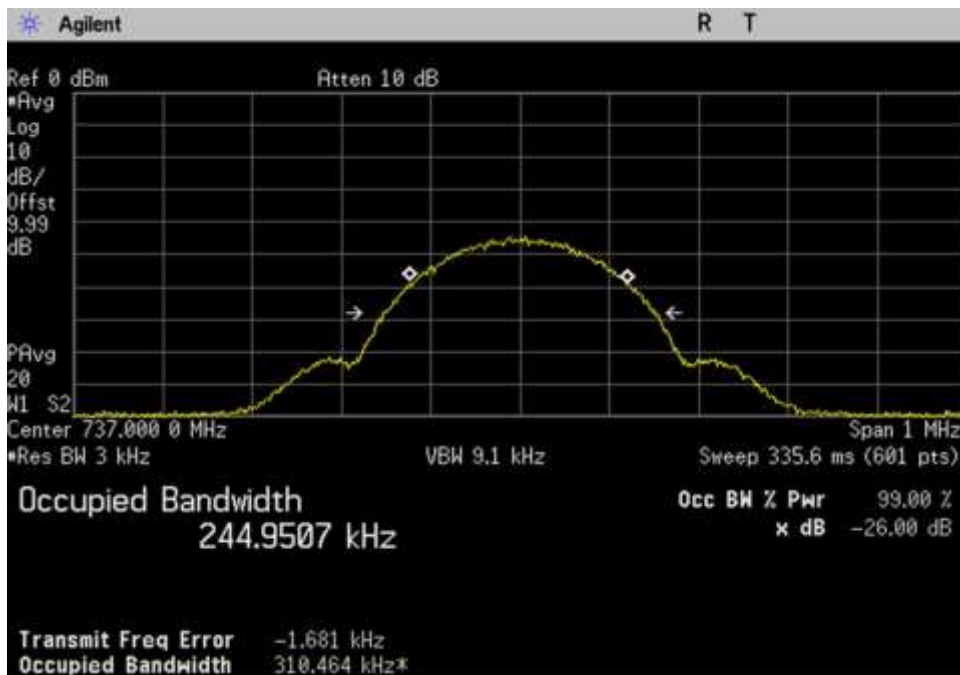
UL_824-849_GSM_836.5MHz



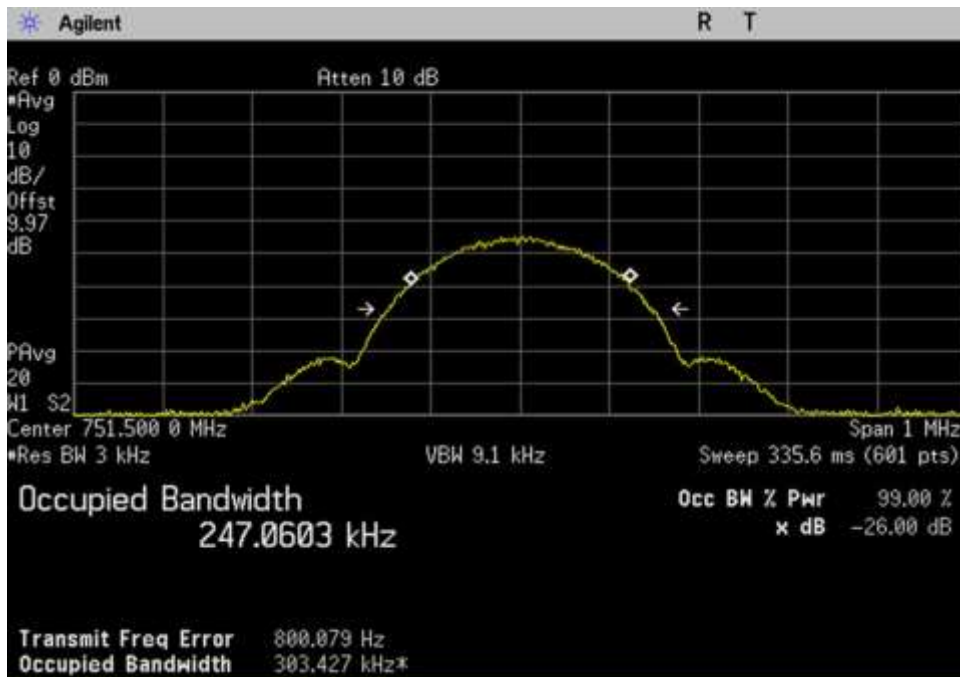
UL_1710-1755_GSM_1732.5MHz



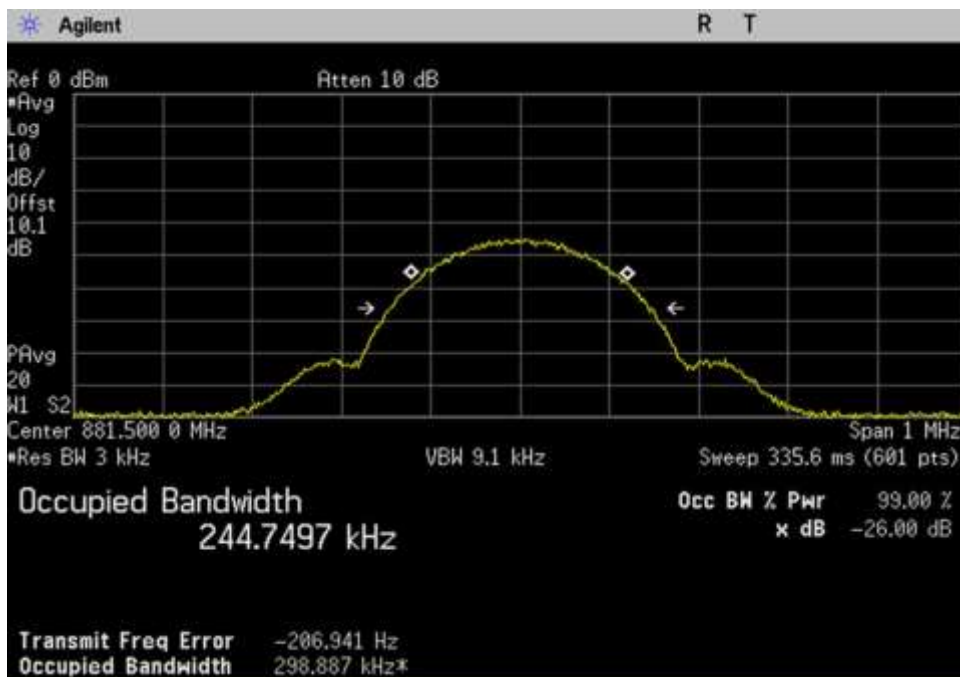
UL_1850-1915_GSM_1882.5MHz



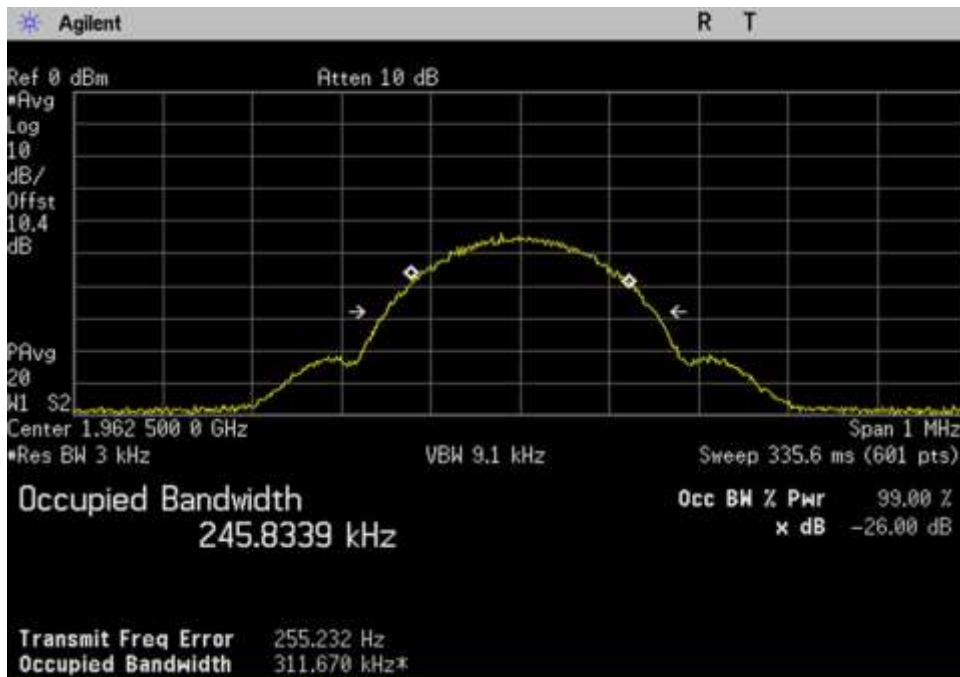
DL_728-746_GSM_737MHz



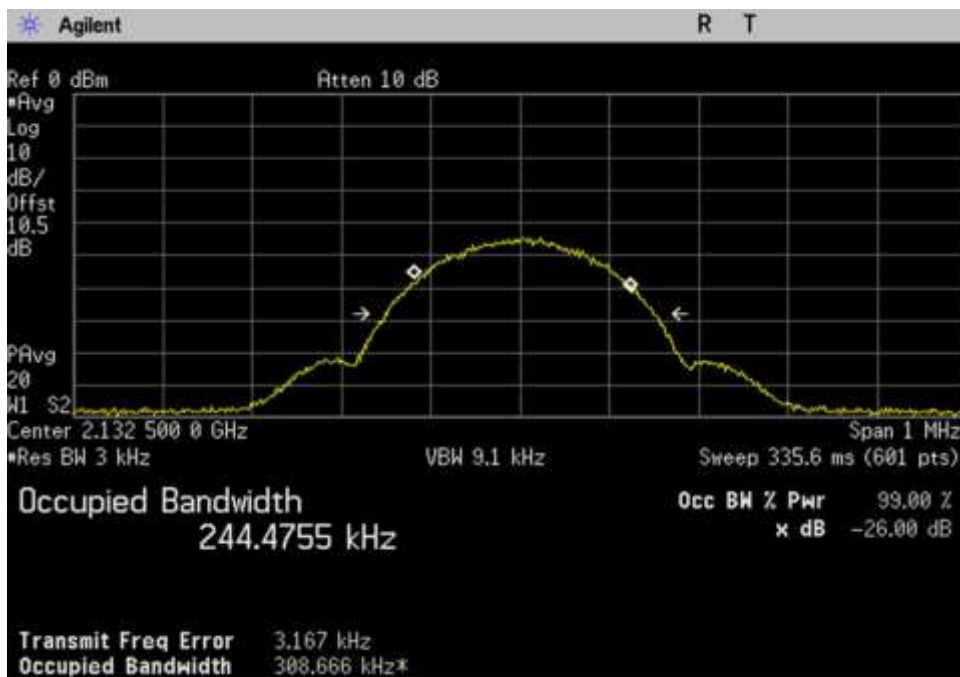
DL_746-757_GSM_751.5MHz



DL_869-894_GSM_881.5MHz

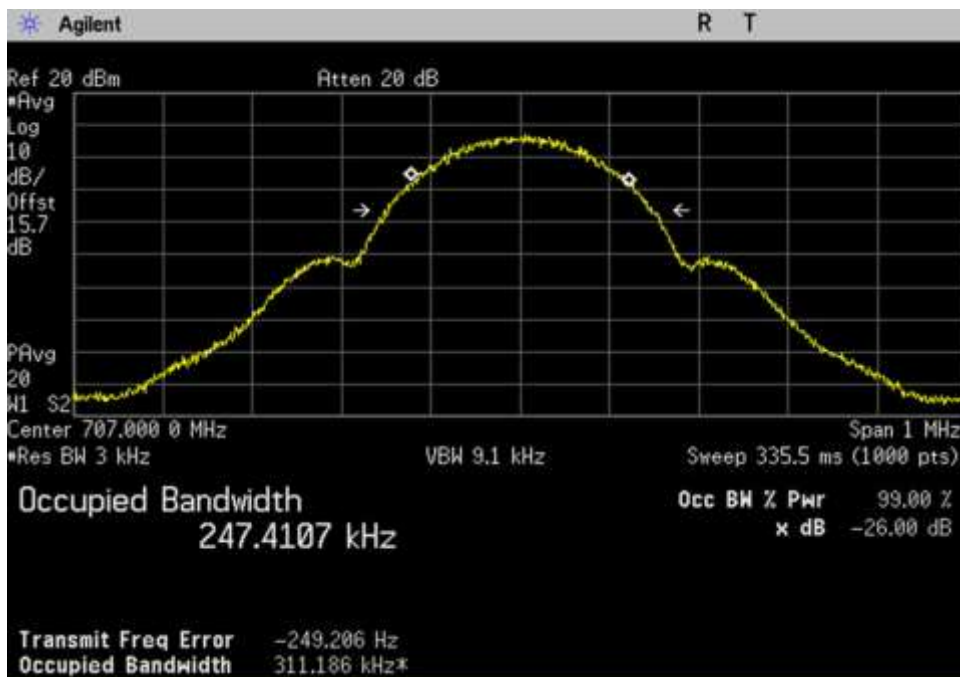


DL_1930-1995_GSM_1962.5MHz

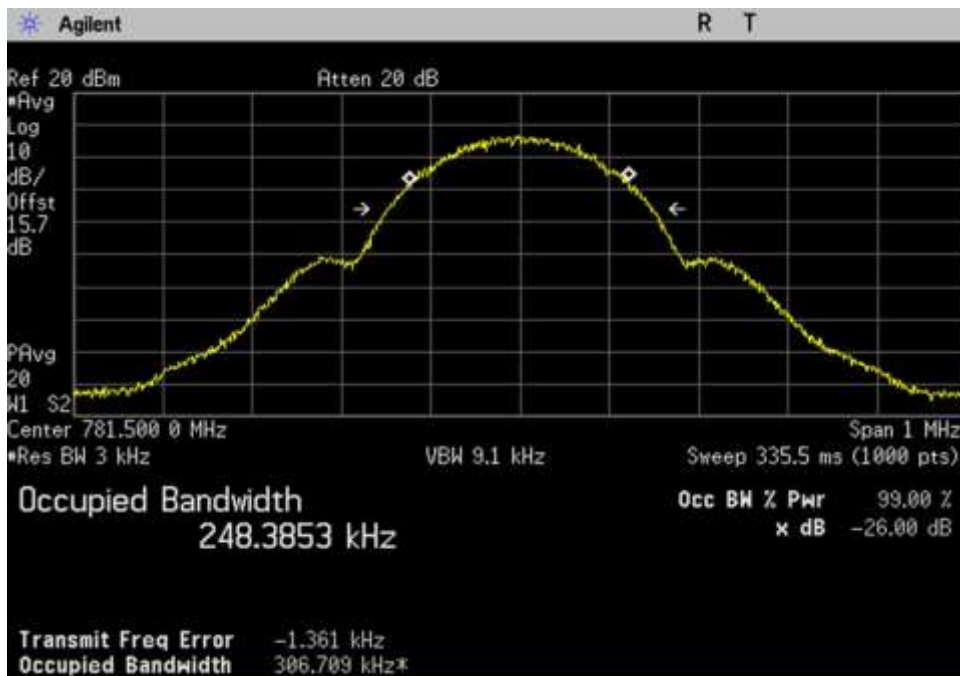


DL_2110-2155_GSM_2132.5MHz

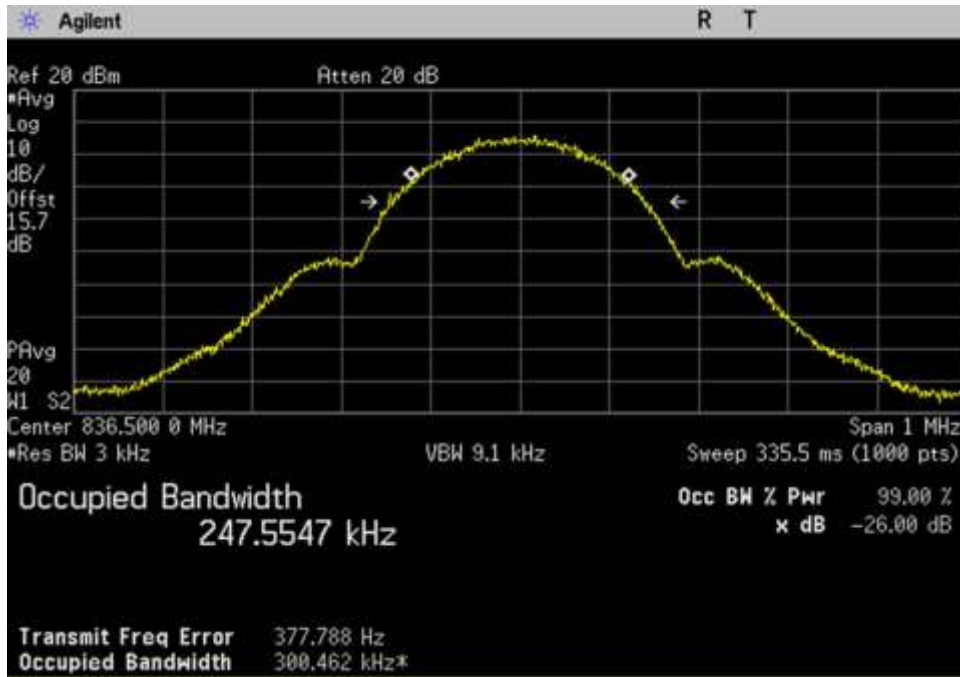
GSM Output



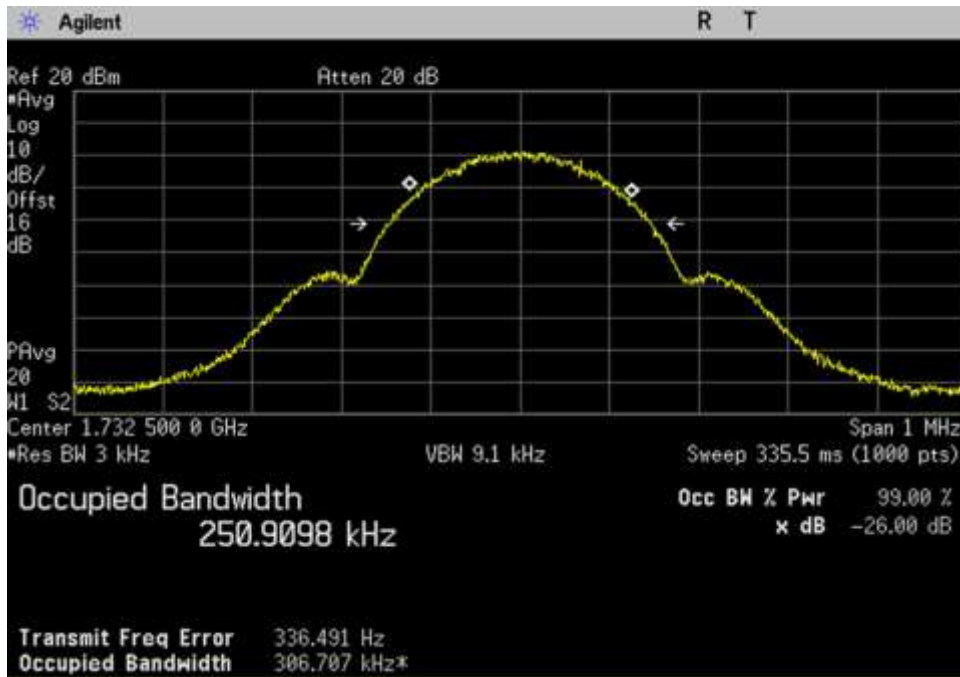
UL_698-716_GSM_707MHz



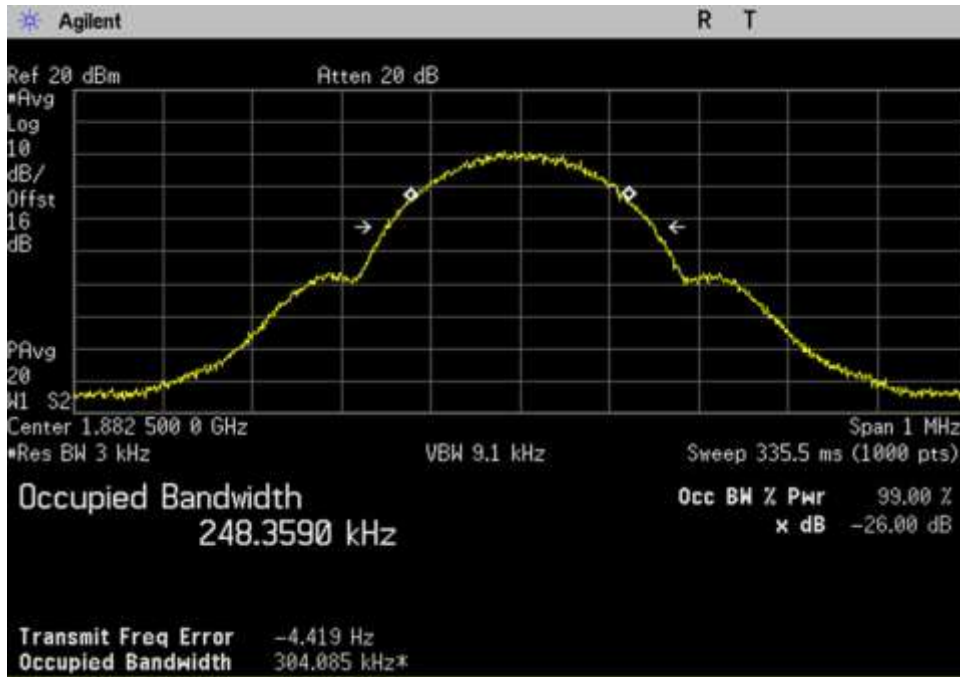
UL_776-787_GSM_781.5MHz



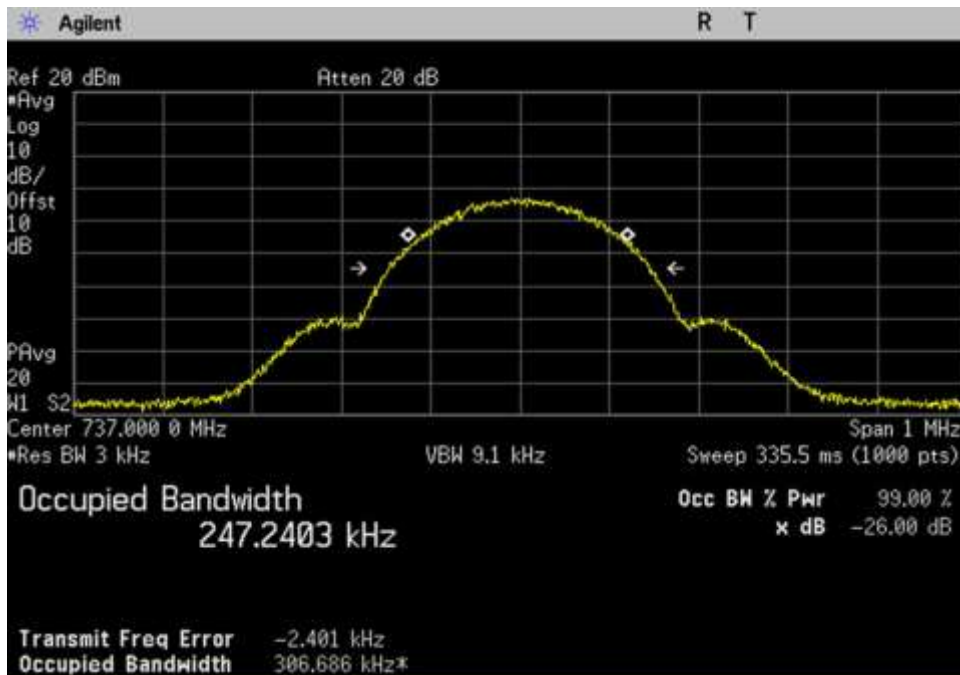
UL_824-849_GSM_836.5MHz



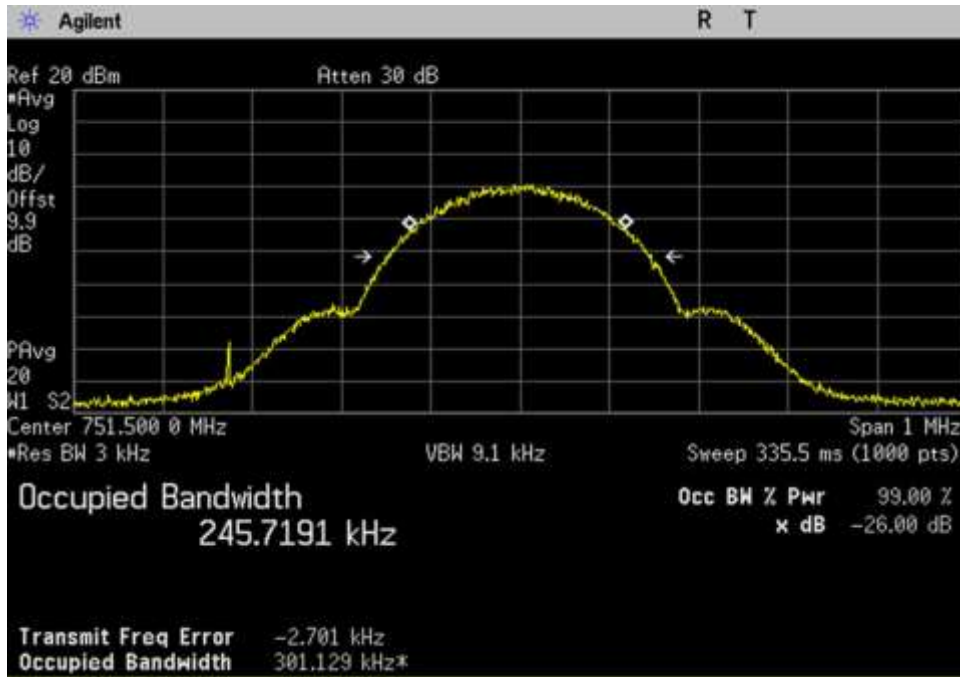
UL_1710-1755_GSM_1732.5MHz



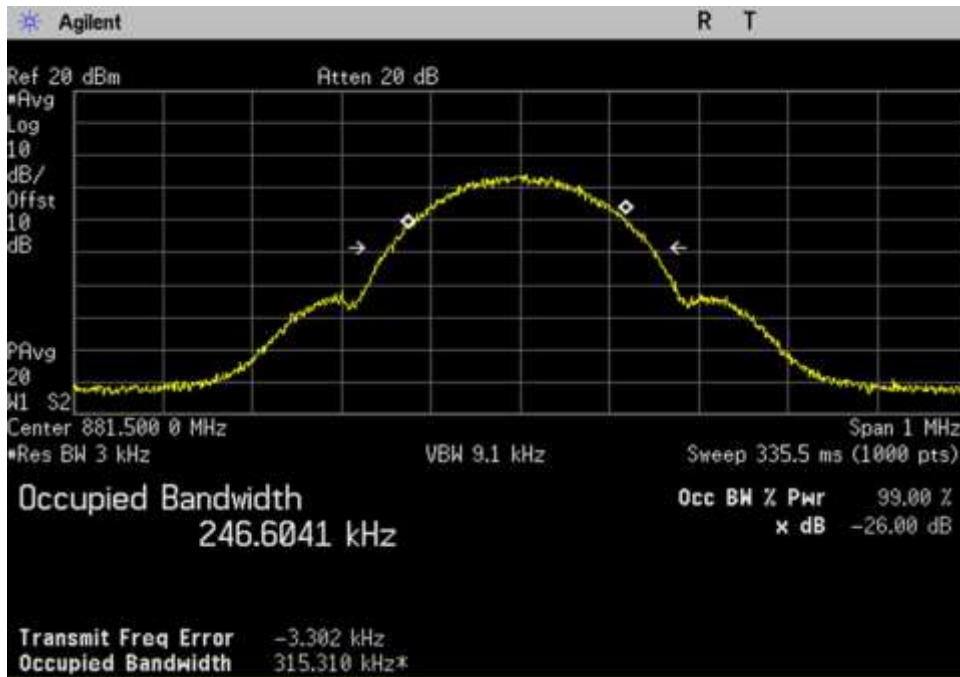
UL_1850-1915_GSM_1882.5MHz



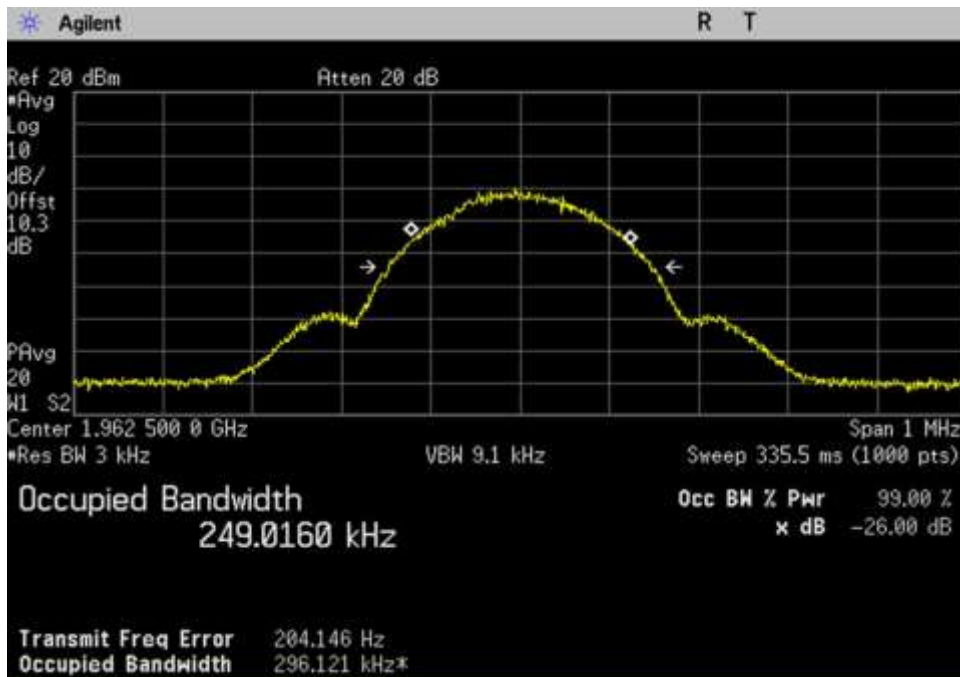
DL_728-746_GSM_737MHz



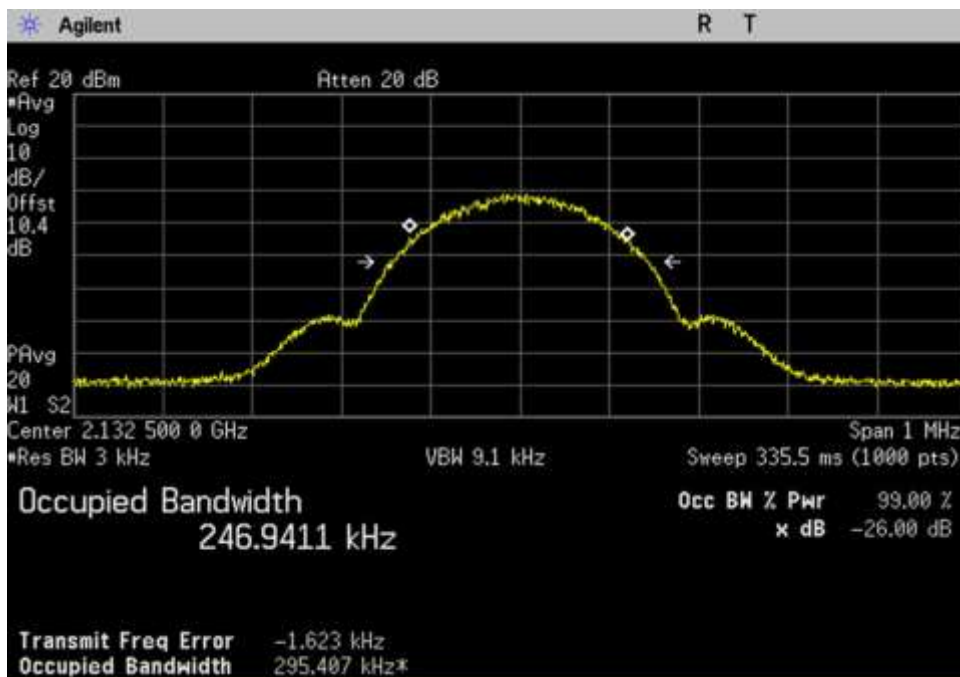
DL_746-757_GSM_751.5MHz



DL_869-894_GSM_881.5MHz

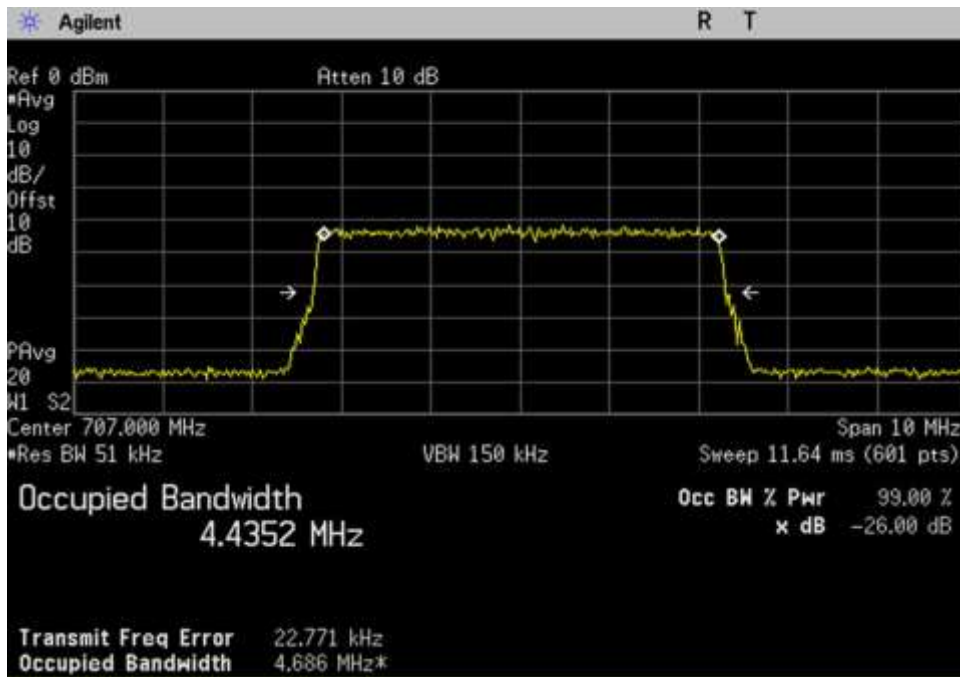


DL_1930-1995_GSM_1962.5MHz

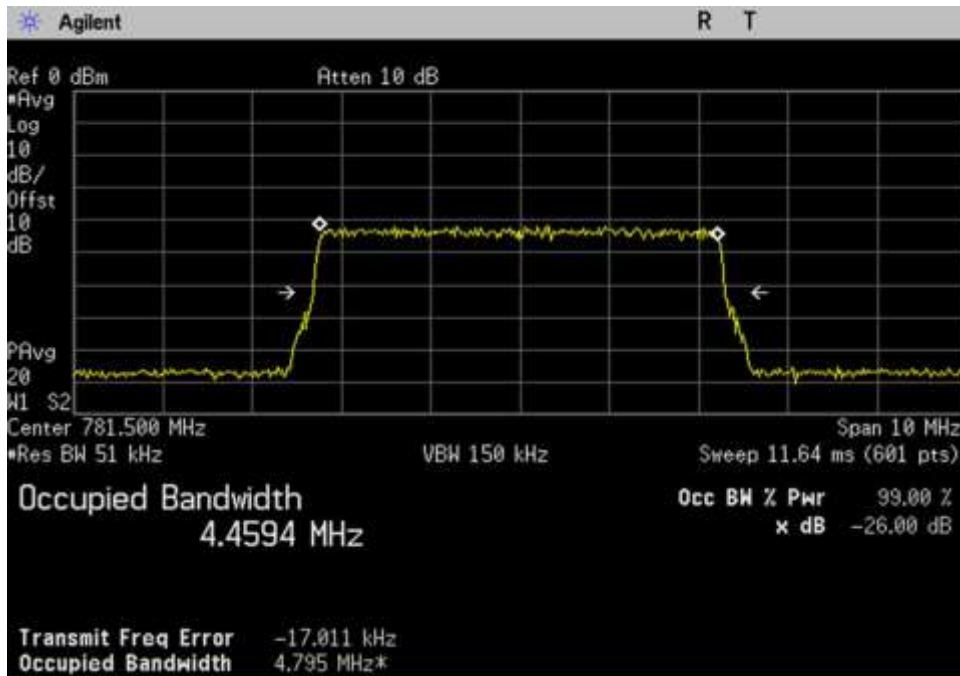


DL_2110-2155_GSM_2132.5MHz

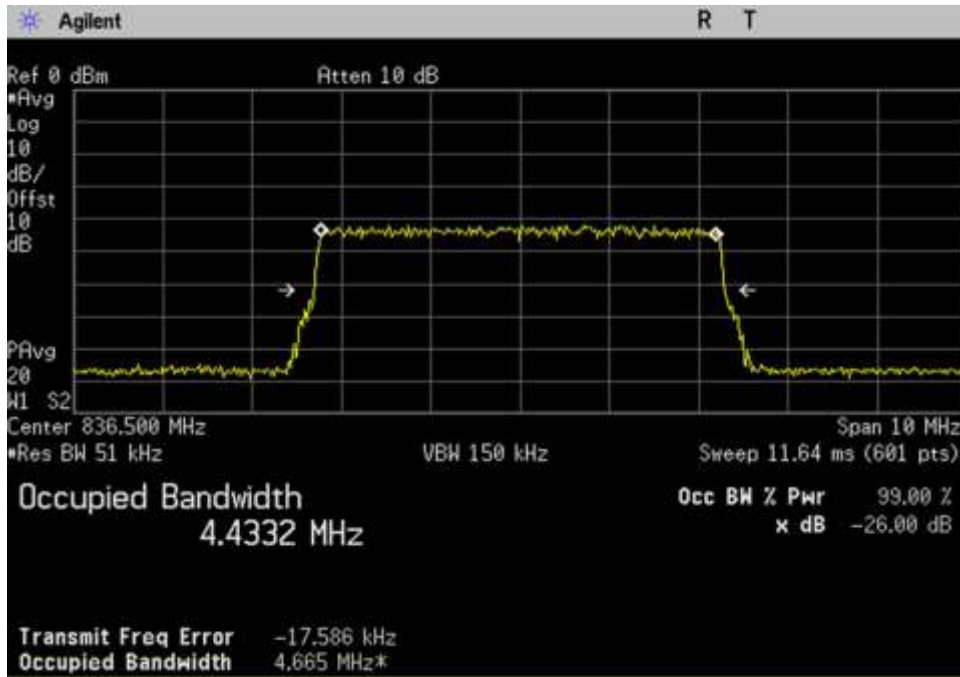
LTE Input



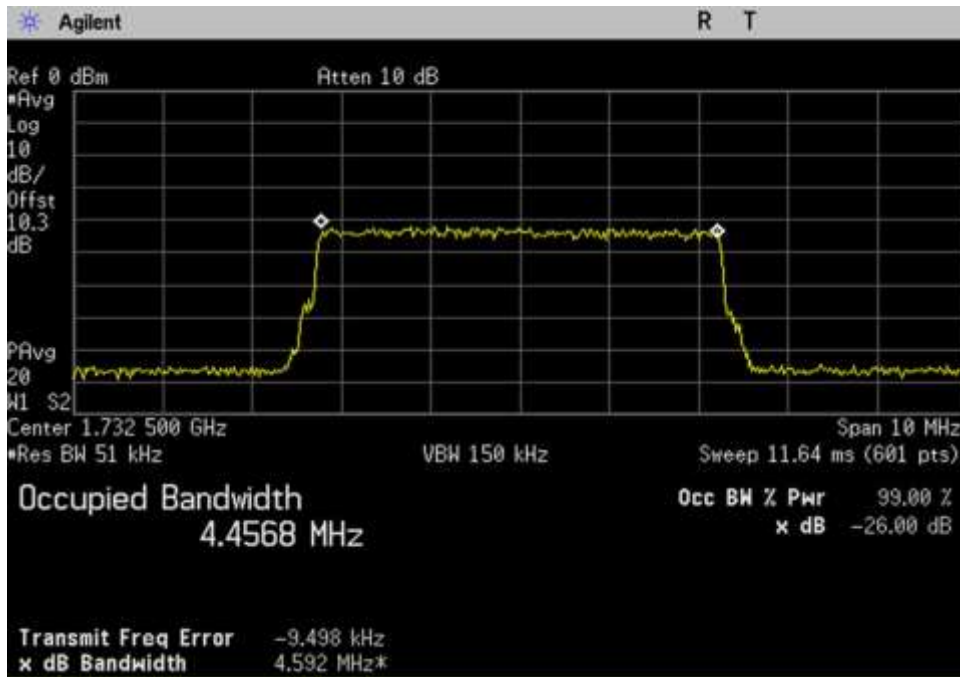
UL_698-716_LTE_707MHz



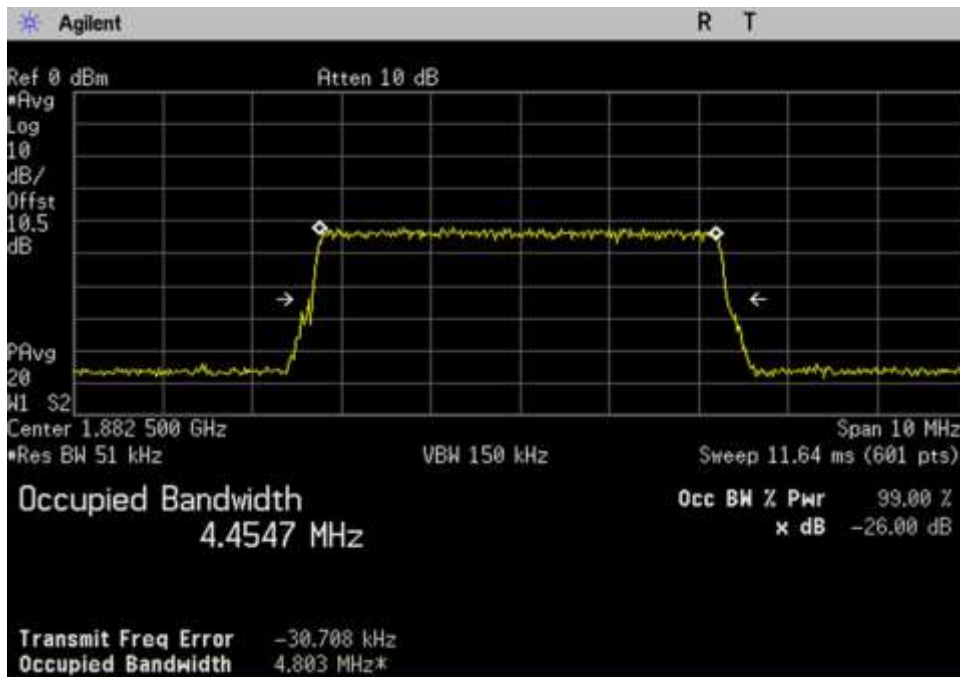
UL_776-787_LTE_781.5MHz



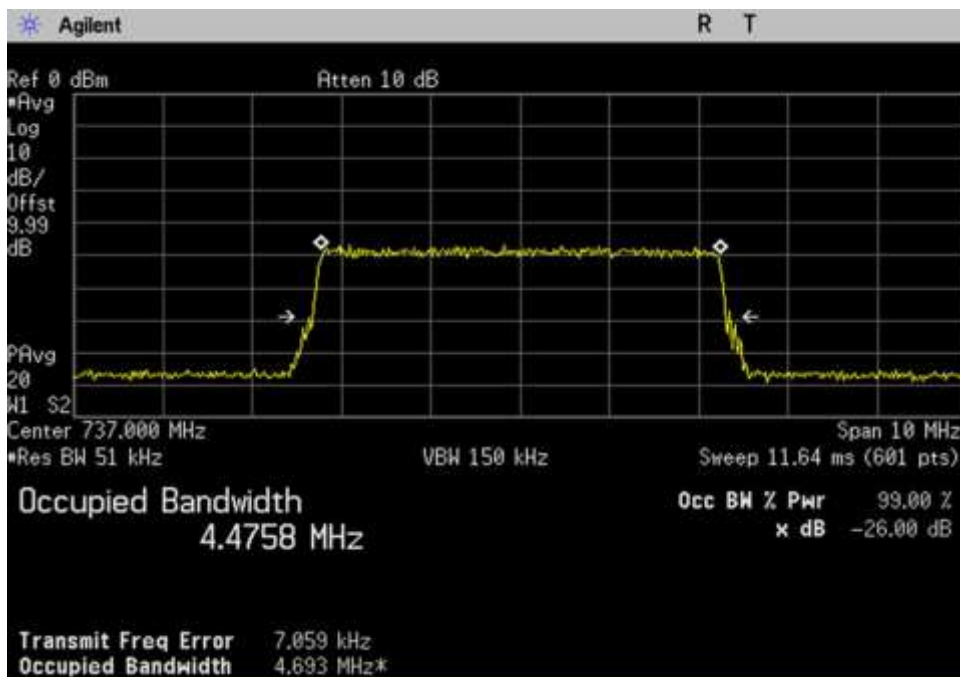
UL_824-849_LTE_836.5MHz



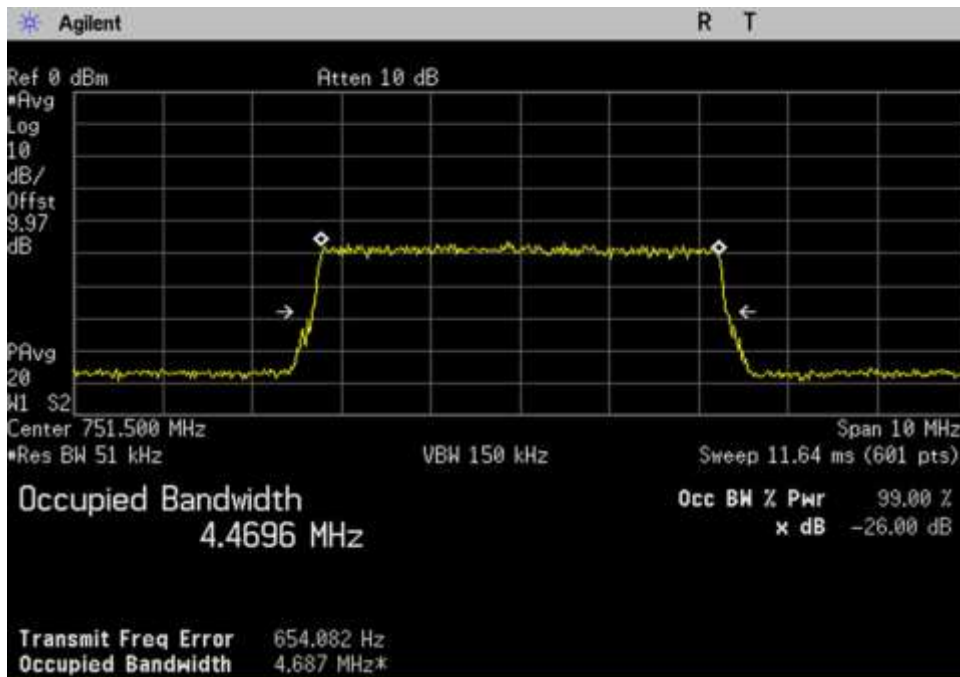
UL_1710-1755_LTE_1732.5MHz



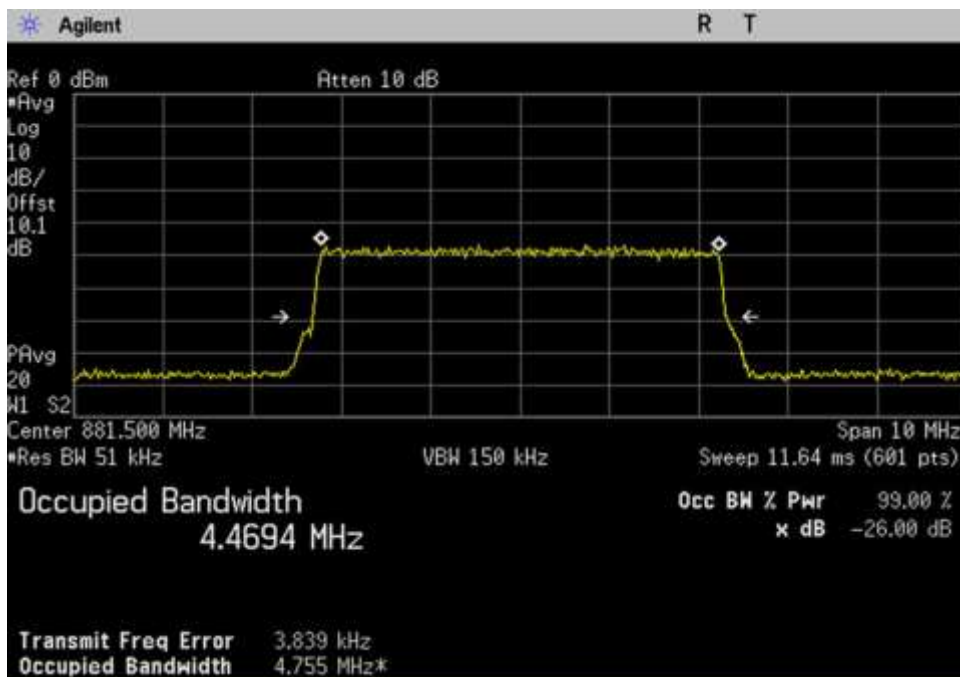
UL_1850-1915_LTE_1882.5MHz



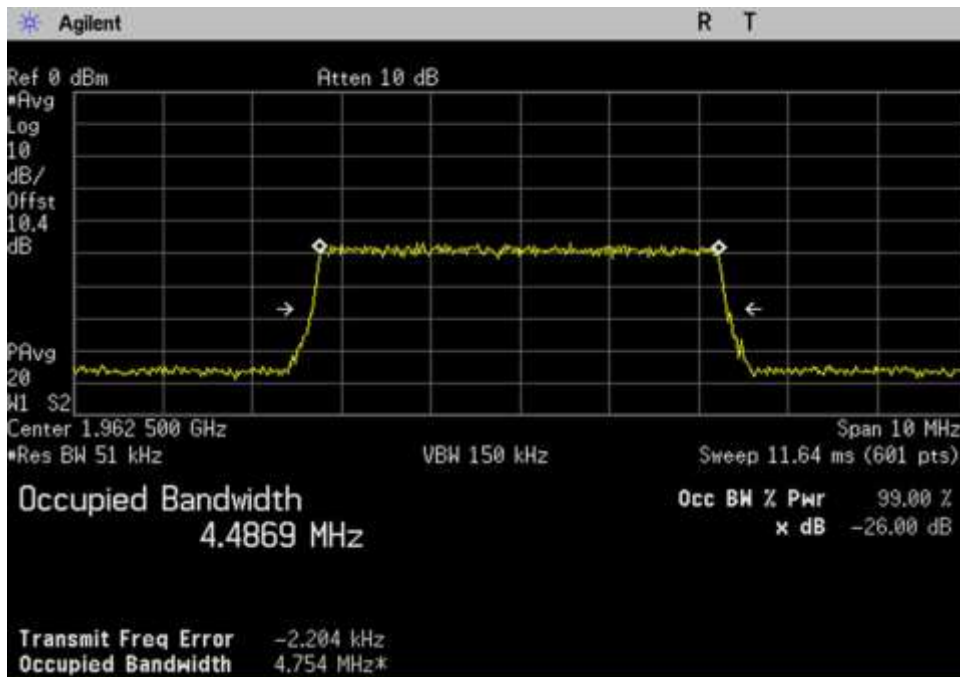
DL_728-746_LTE_737MHz



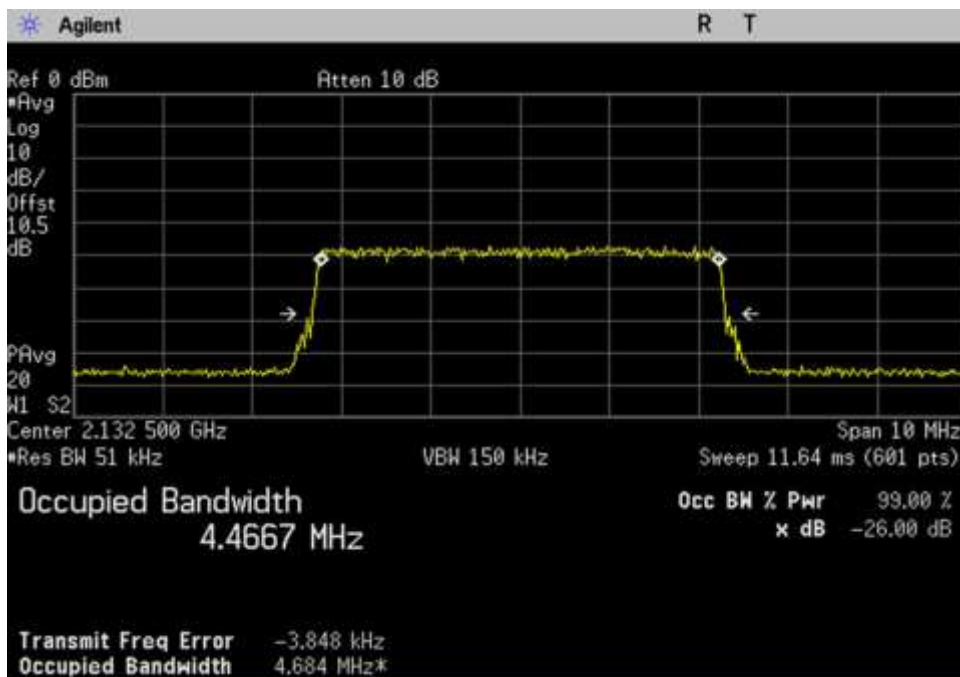
DL_746-757_LTE_751.5MHz



DL_869-894_LTE_881.5MHz

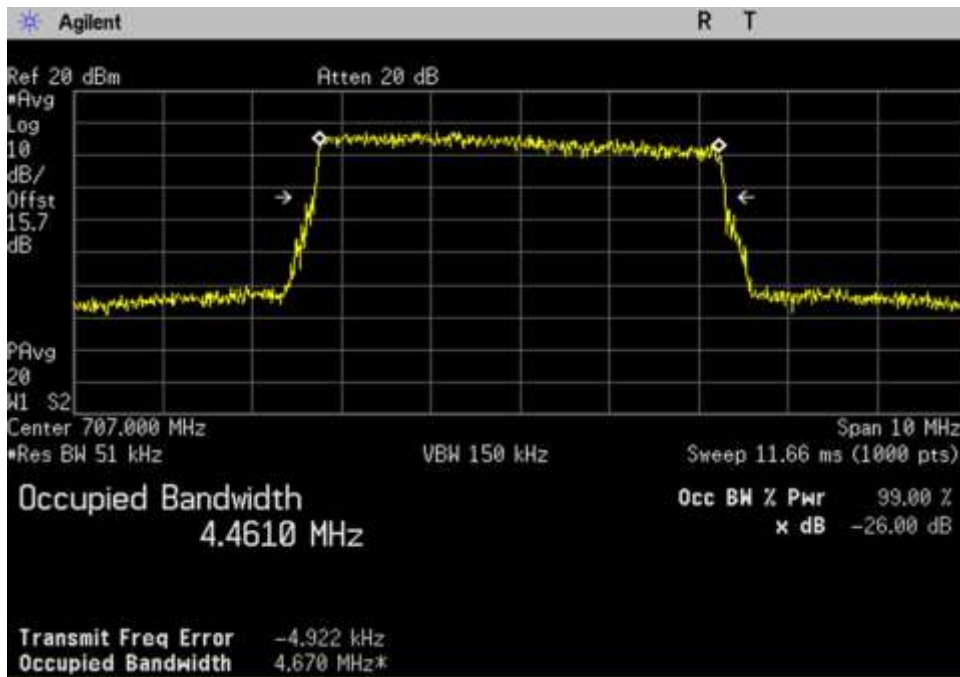


DL_1930-1995_LTE_1962.5MHz

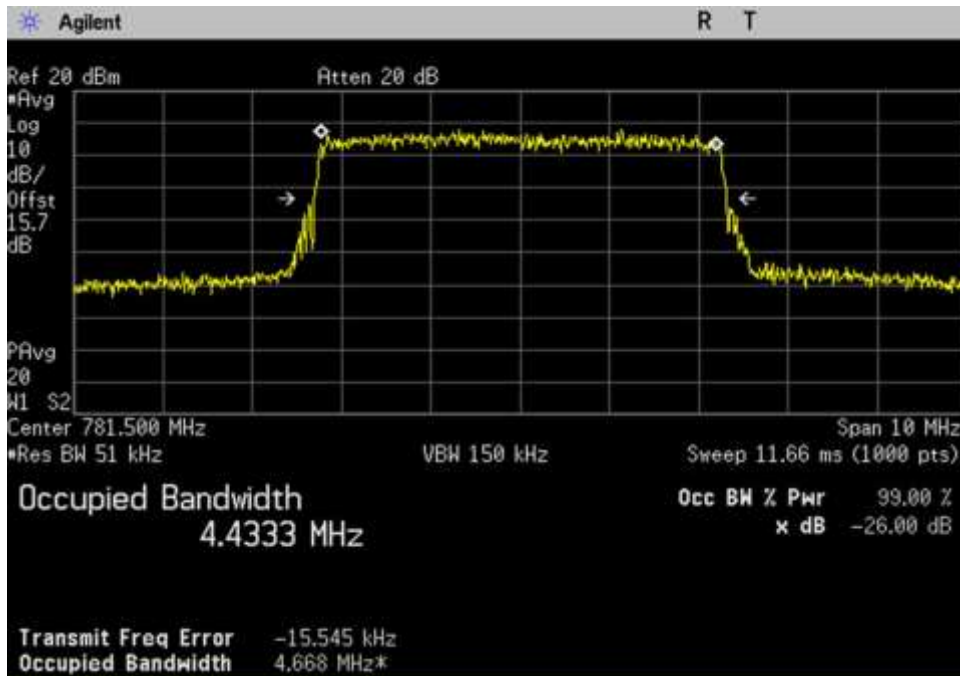


DL_2110-2155_LTE_2132.5MHz

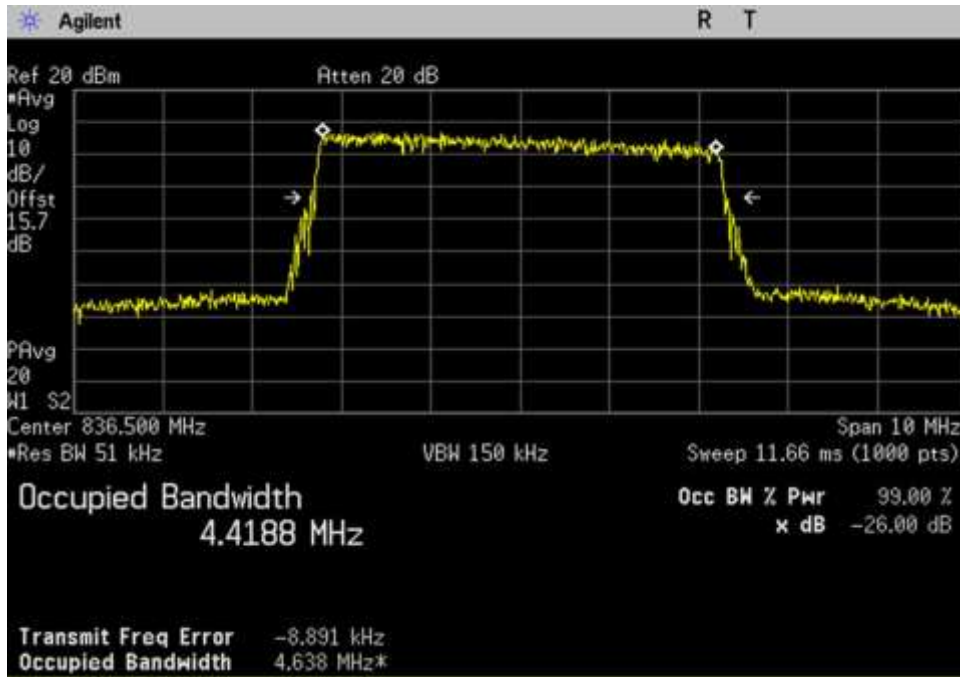
LTE Output



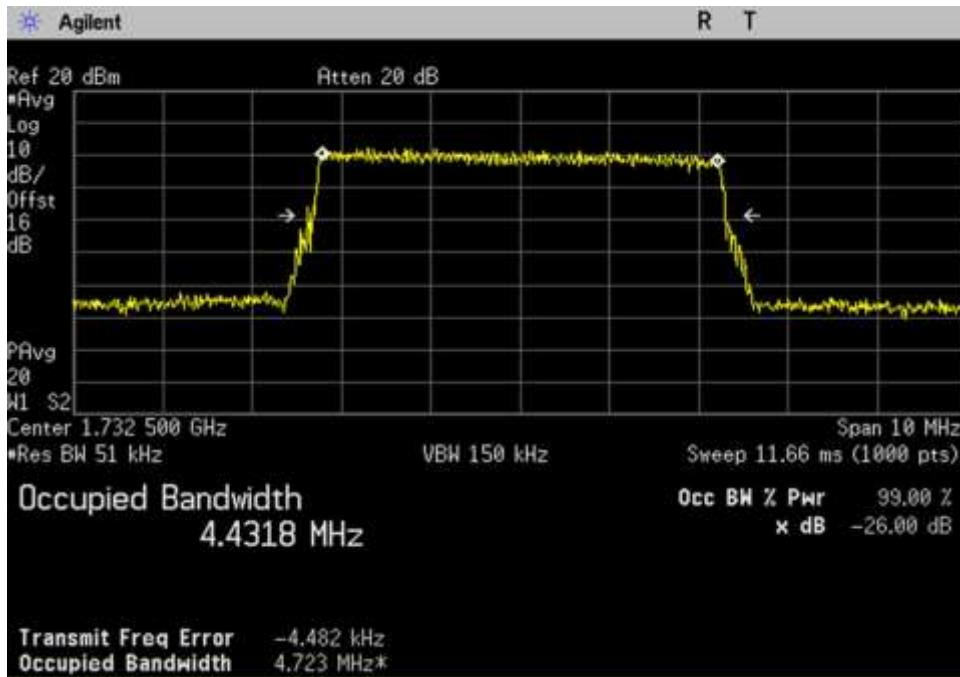
UL_698-716_LTE_707MHz



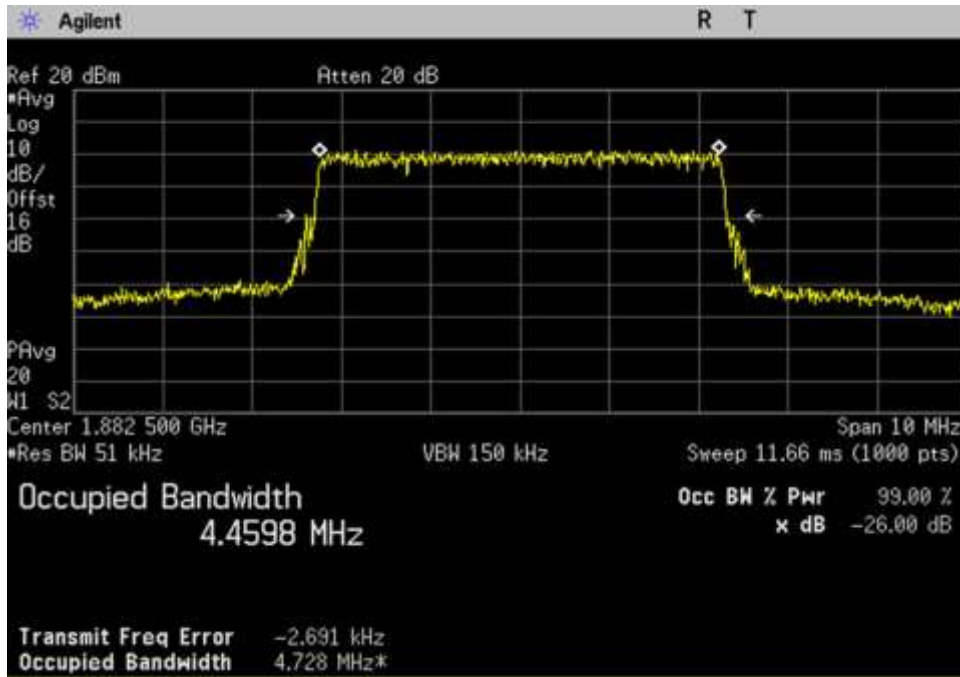
UL_776-787_LTE_781.5MHz



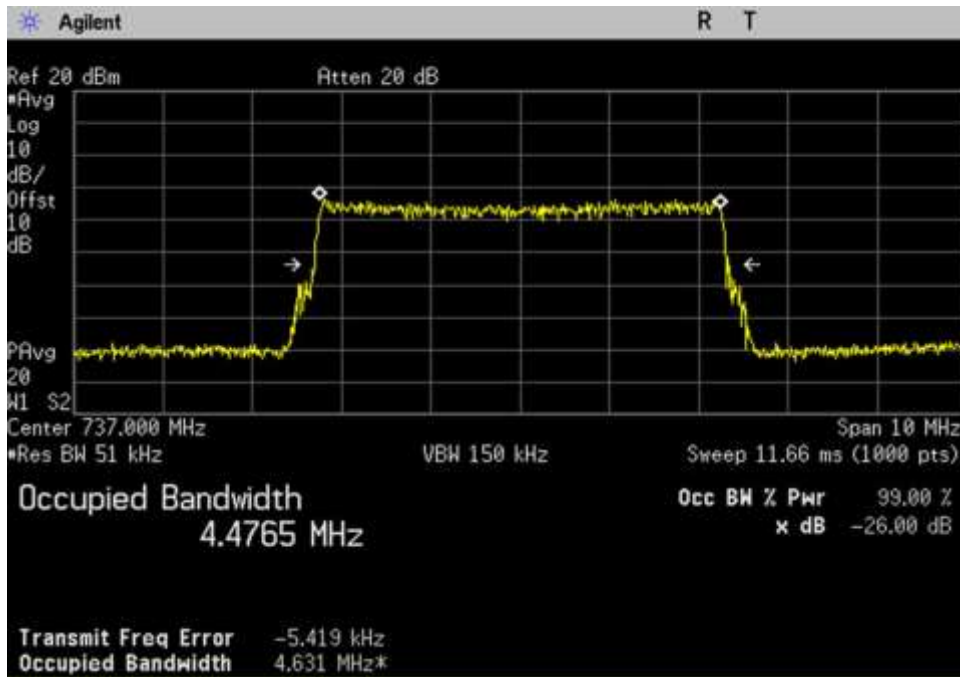
UL_824-849_LTE_836.5MHz



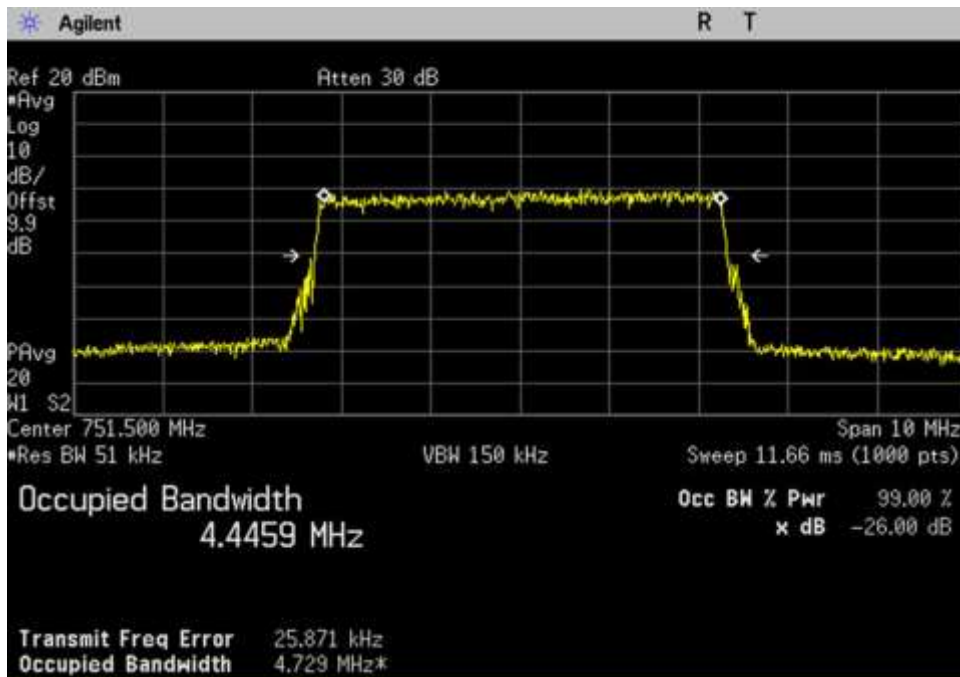
UL_1710-1755_LTE_1732.5MHz



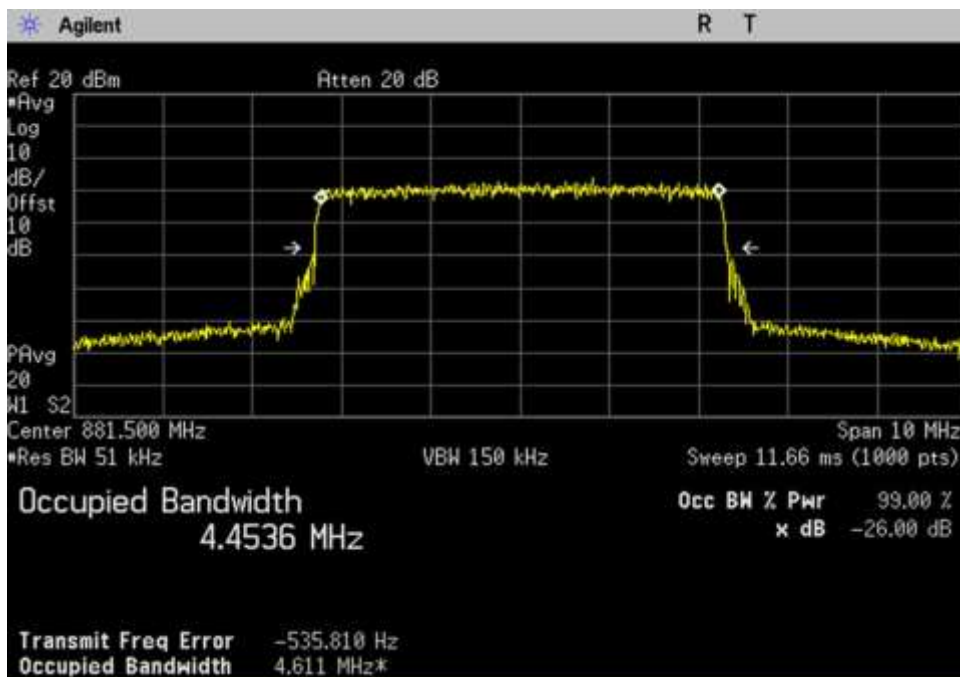
UL_1850-1915_LTE_1882.5MHz



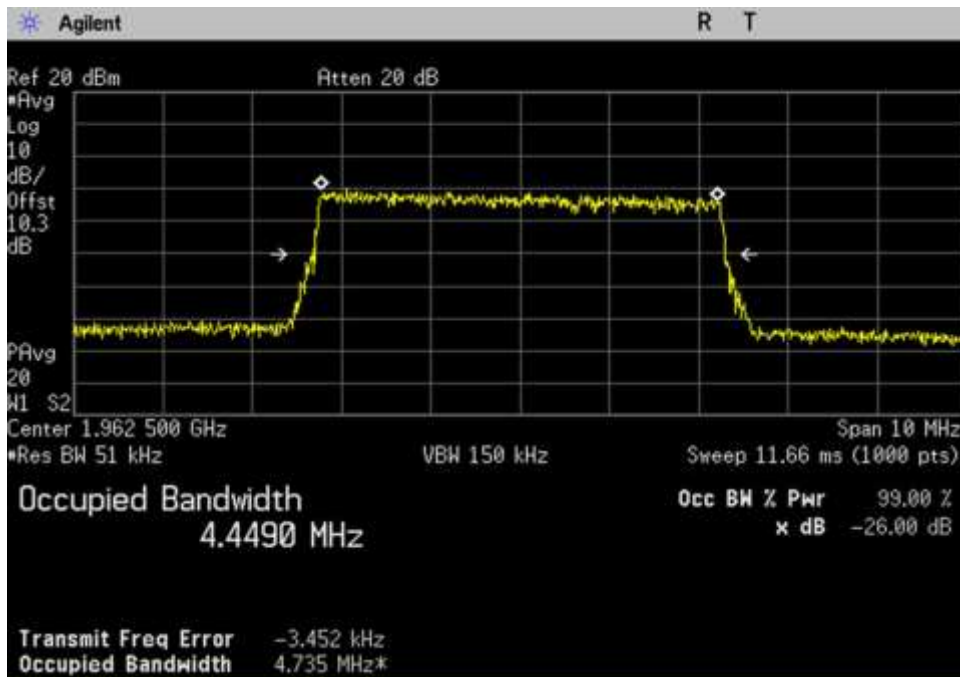
DL_728-746_LTE_737MHz



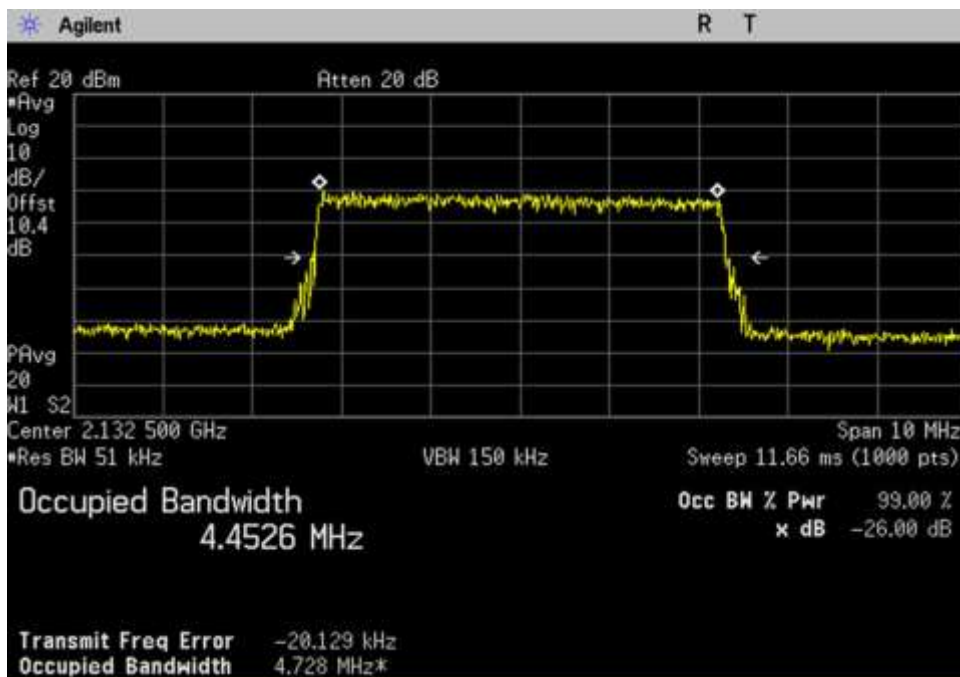
DL_746-757_LTE_751.5MHz



DL_869-894_LTE_881.5MHz

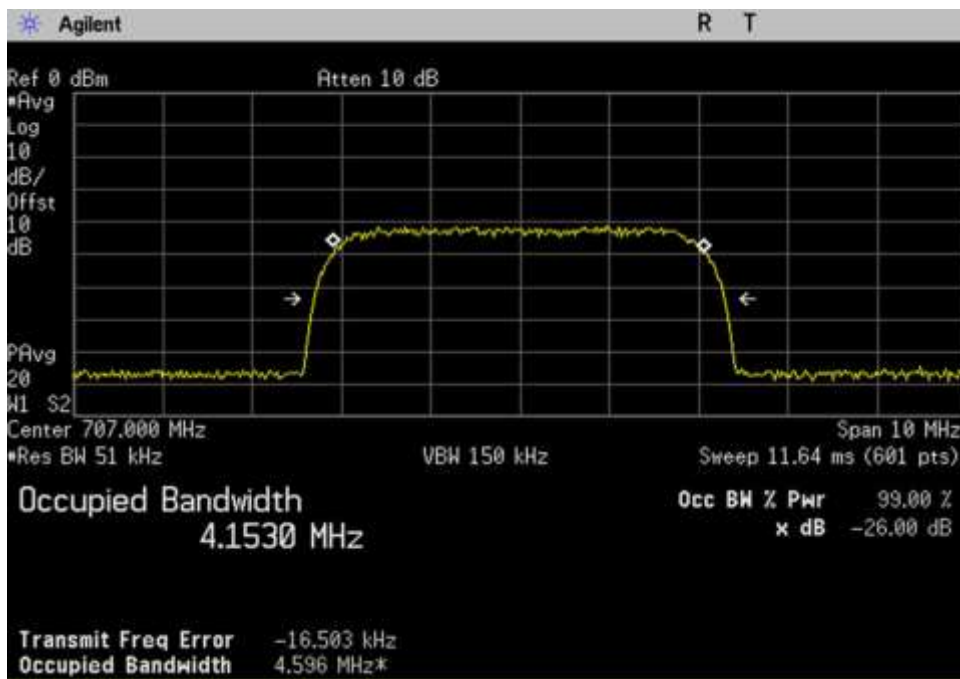


DL_1930-1995_LTE_1962.5MHz

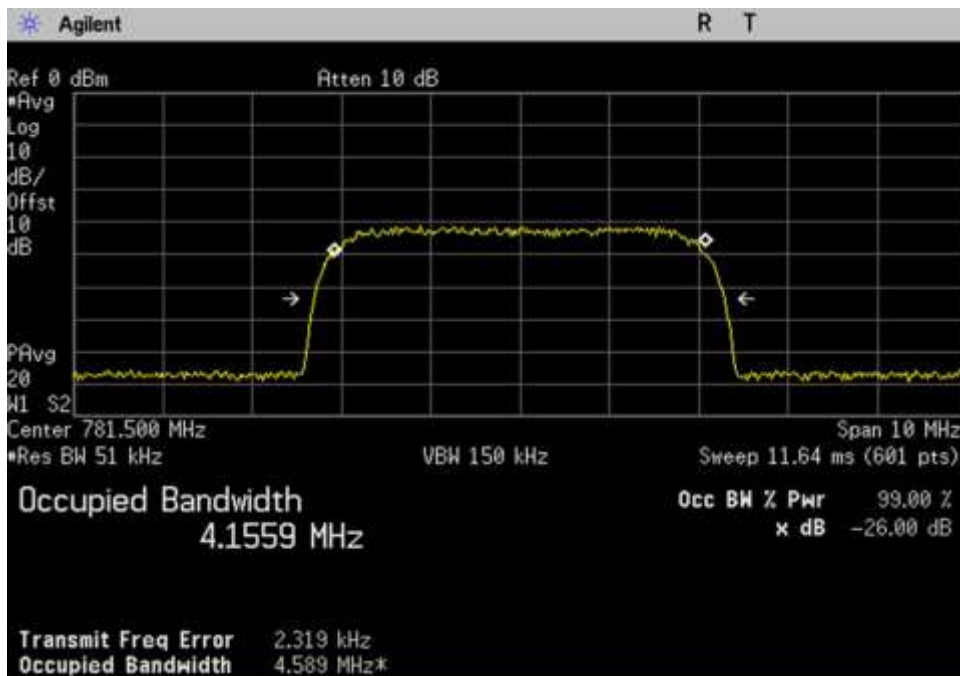


DL_2110-2155_LTE_2132.5MHz

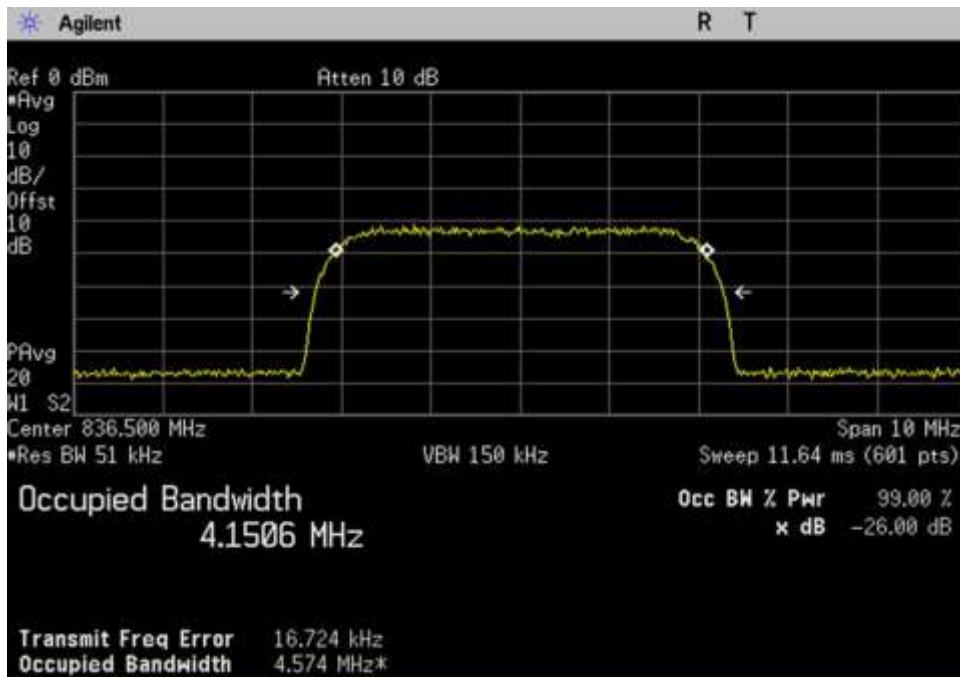
WCDMA Input



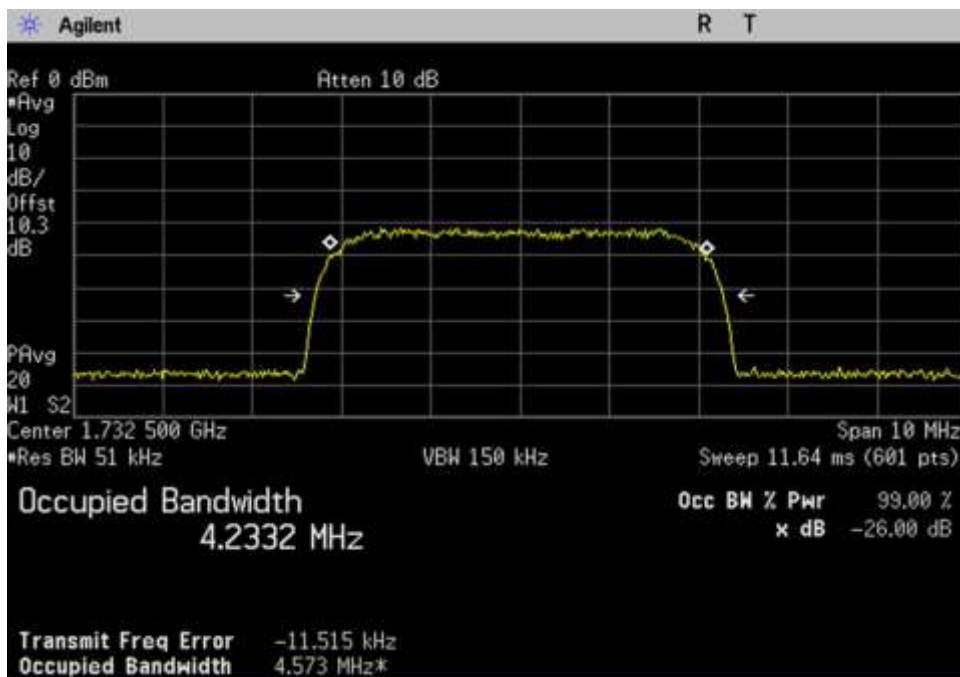
UL_698-716_WCDMA_707MHz



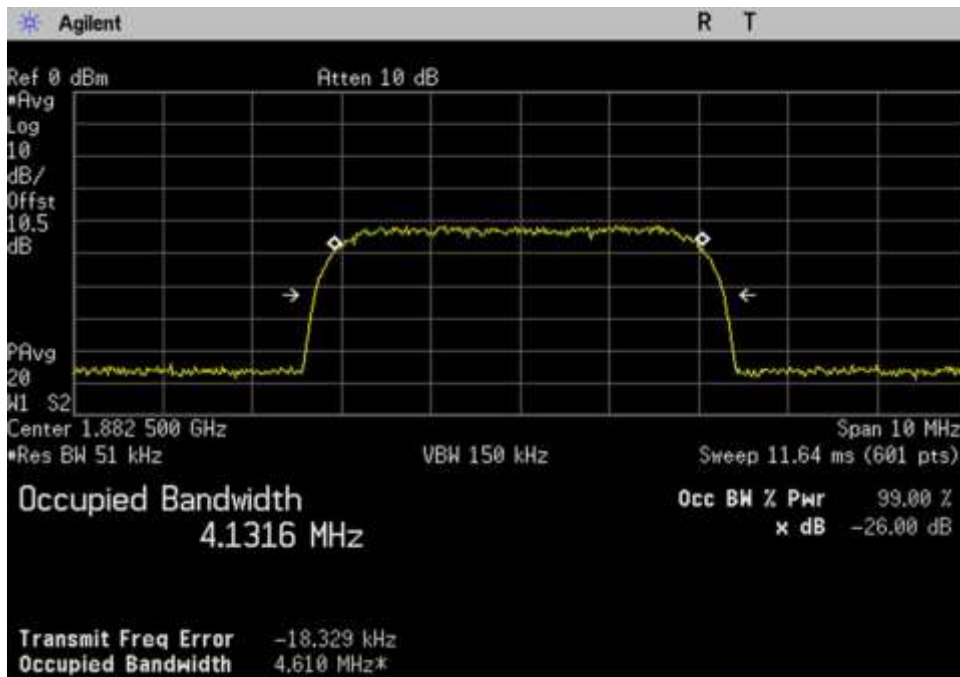
UL_776-787_WCDMA_781.5MHz



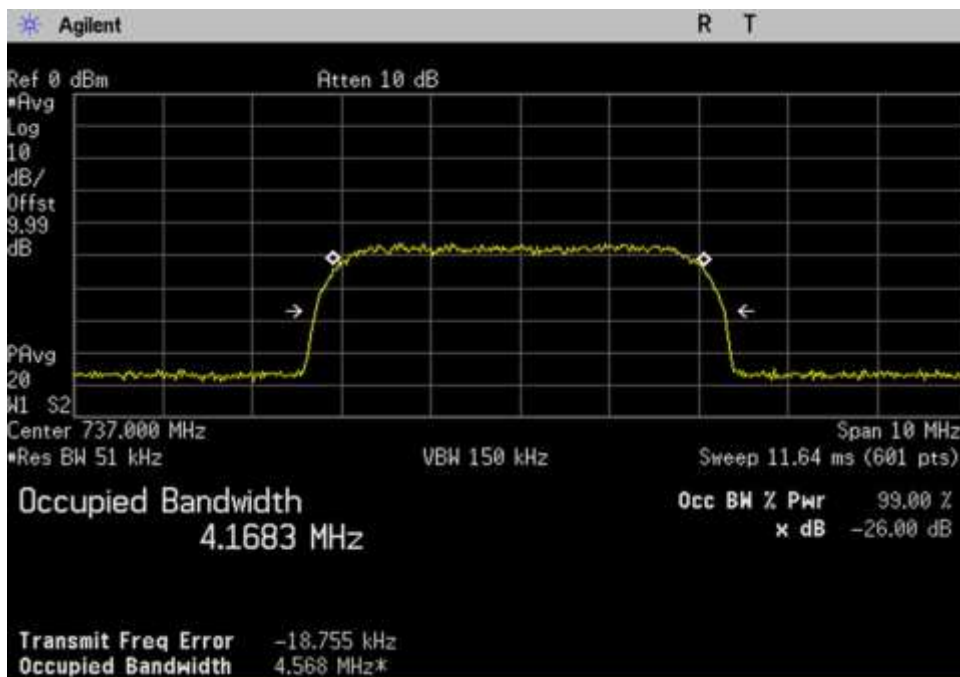
UL_824-849_WCDMA_836.5MHz



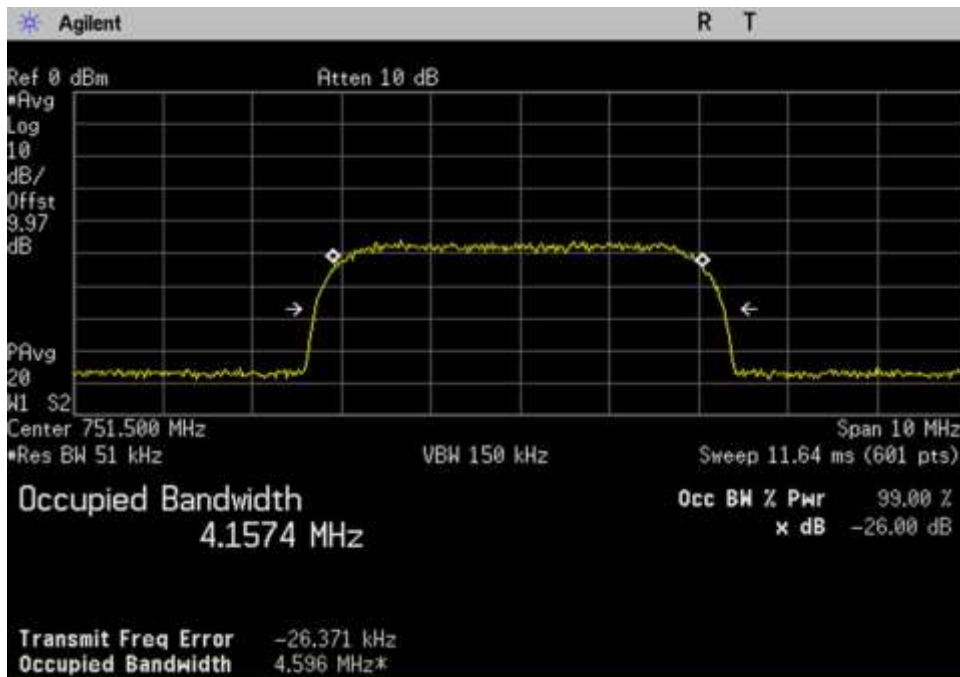
UL_1710-1755_WCDMA_1732.5MHz



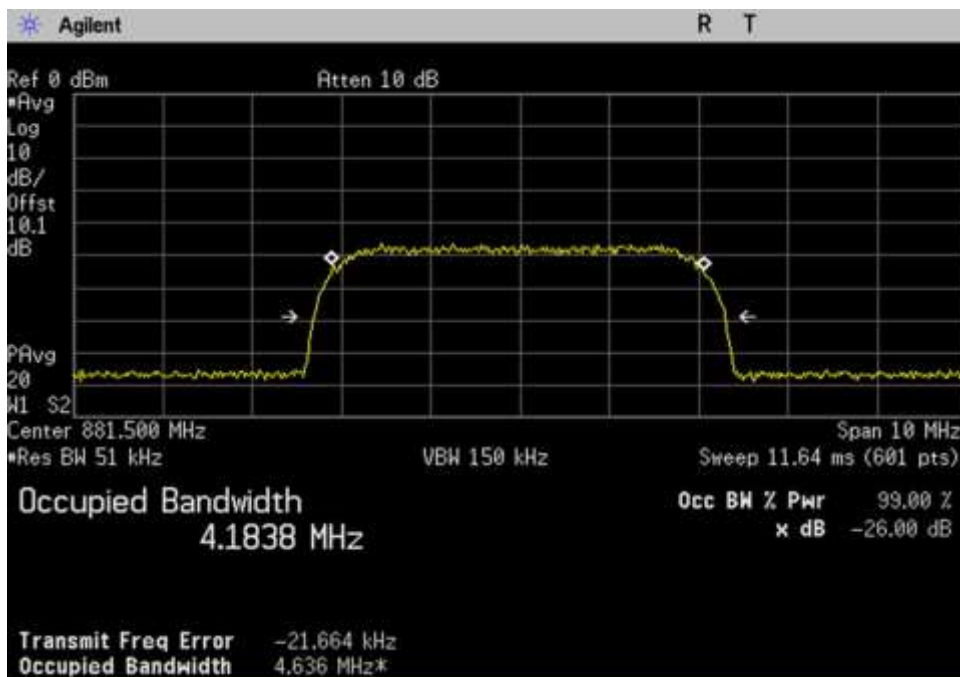
UL_1850-1915_WCDMA_1882.5MHz



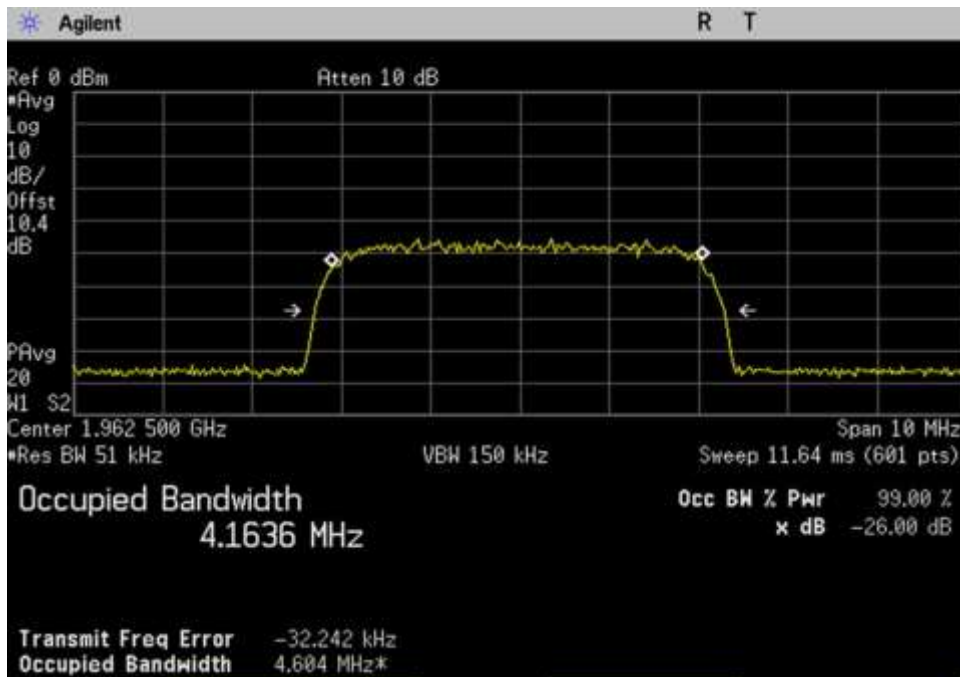
DL_728-746_WCDMA_737MHz



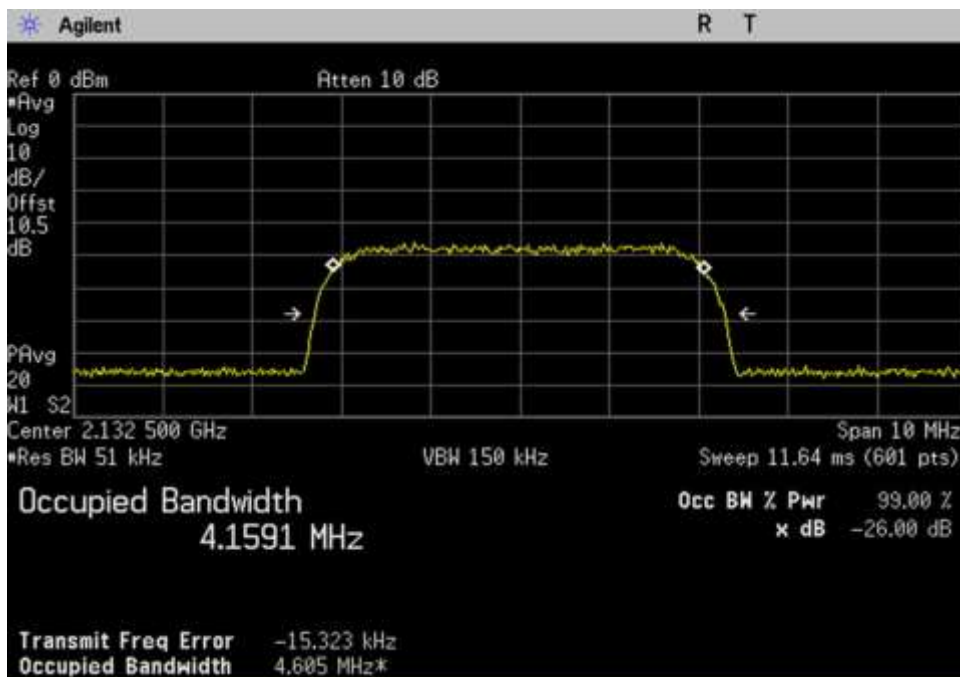
DL_746-757_WCDMA_751.5MHz



DL_869-894_WCDMA_881.5MHz

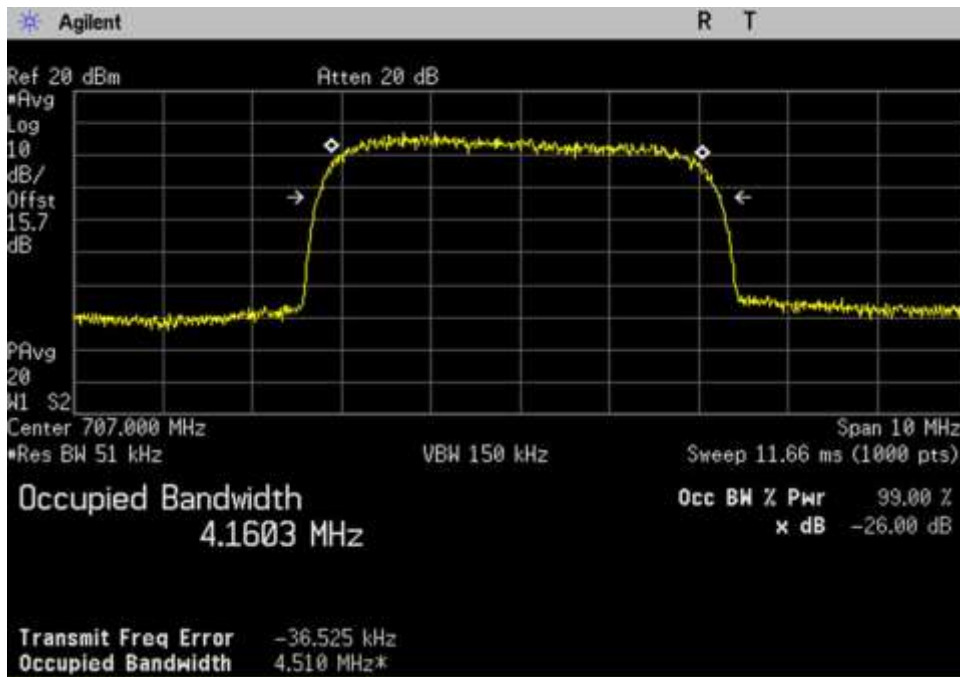


DL_1930-1995_WCDMA_1962.5MHz

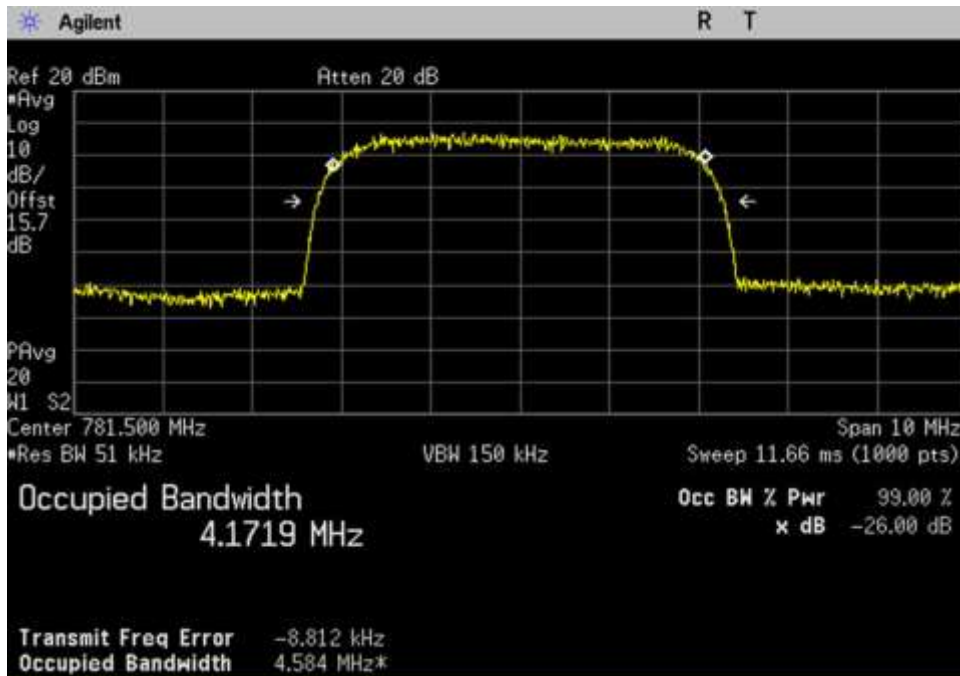


DL_2110-2155_WCDMA_2132.5MHz

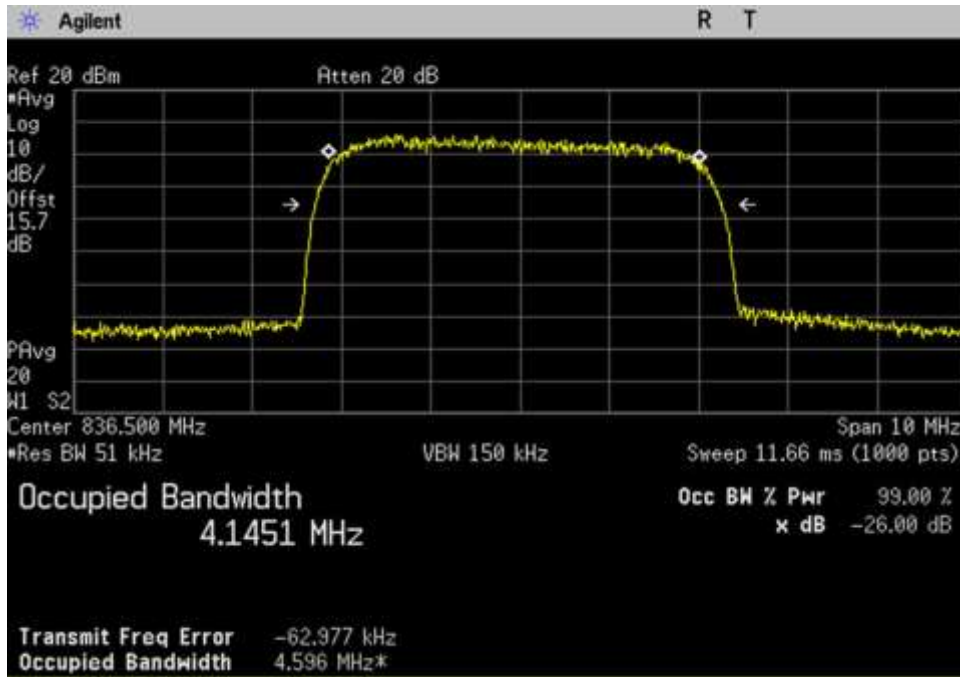
WCDMA Output



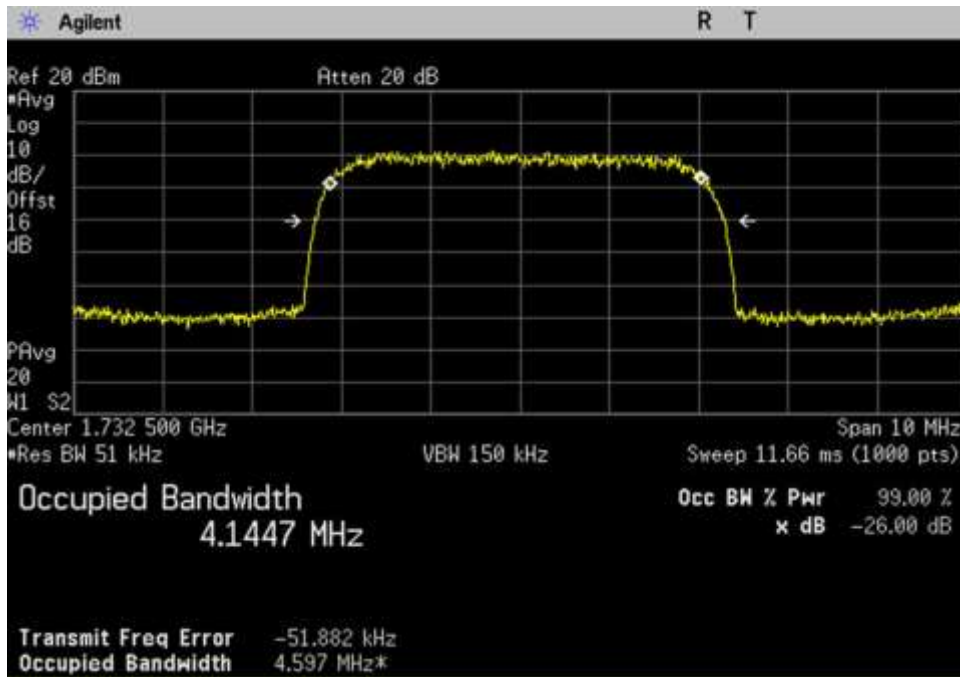
UL_698-716_WCDMA_707MHz



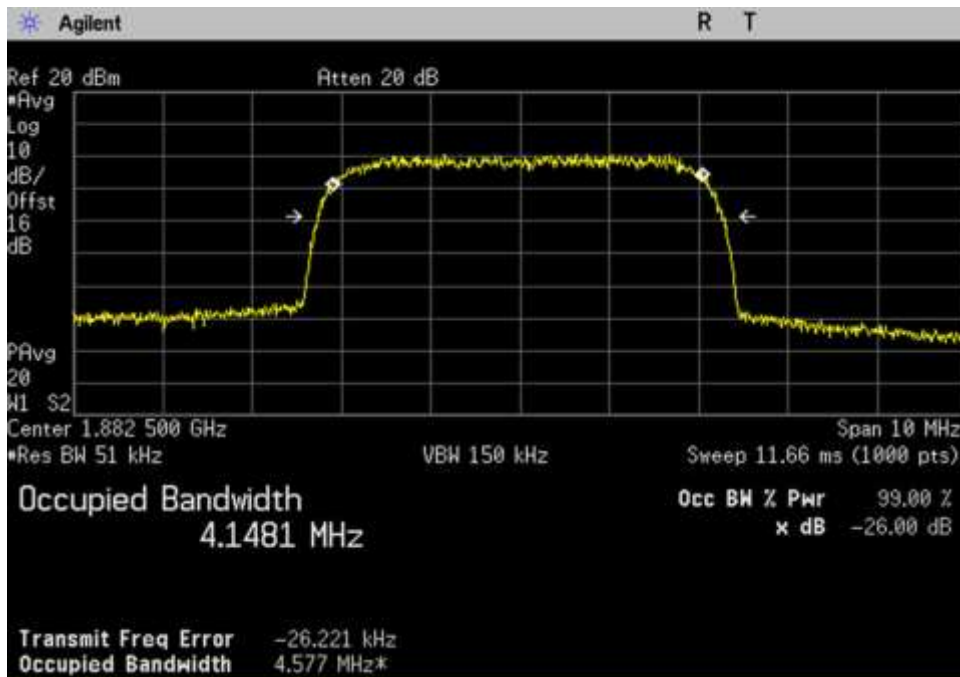
UL_776-787_WCDMA_781.5MHz



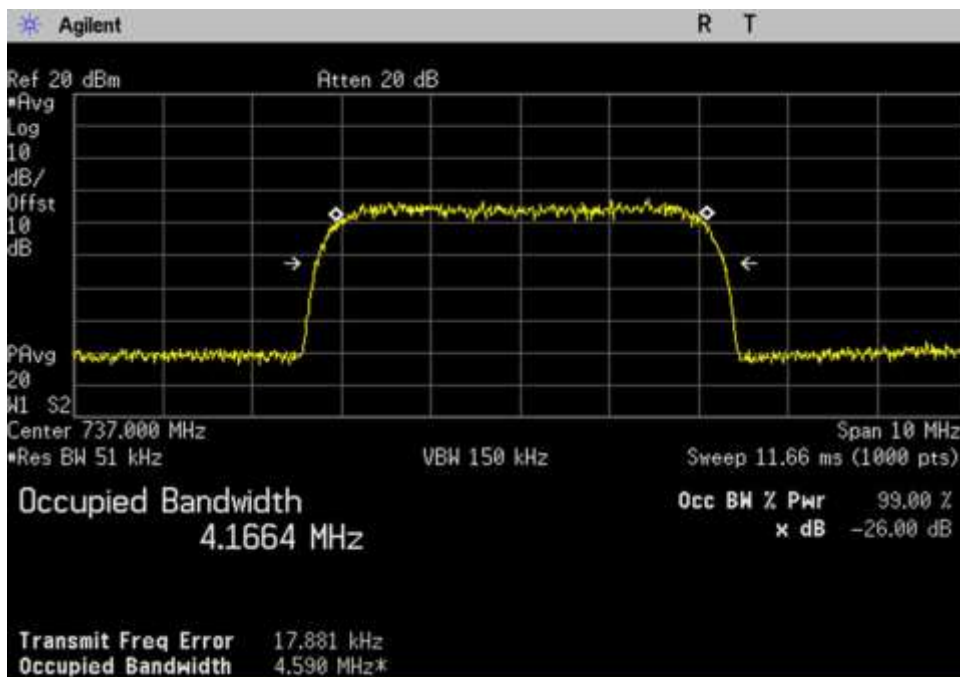
UL_824-849_WCDMA_836.5MHz



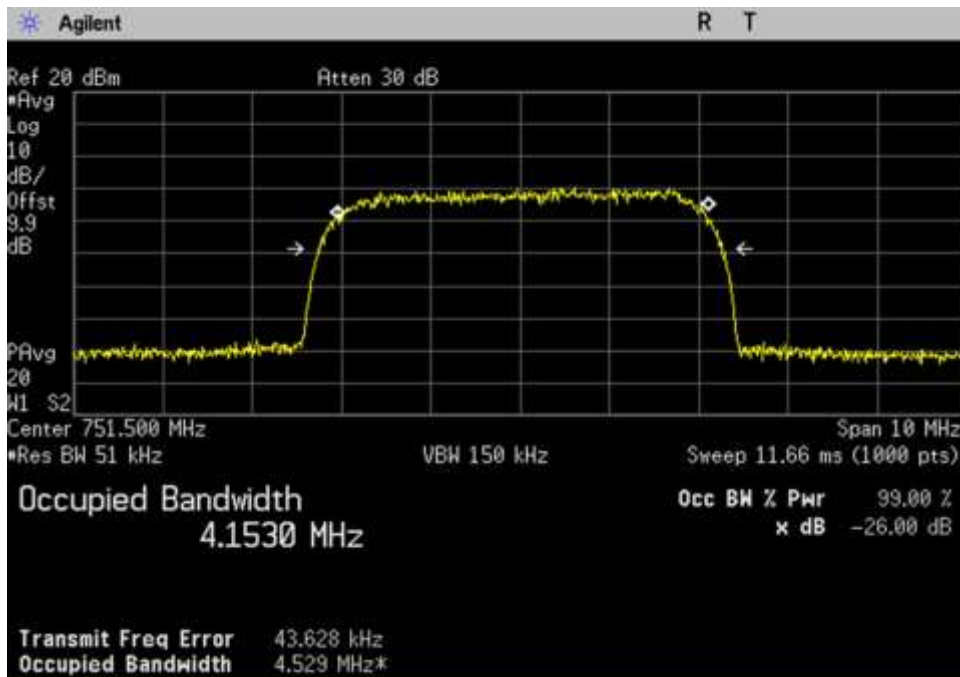
UL_1710-1755_WCDMA_1732.5MHz



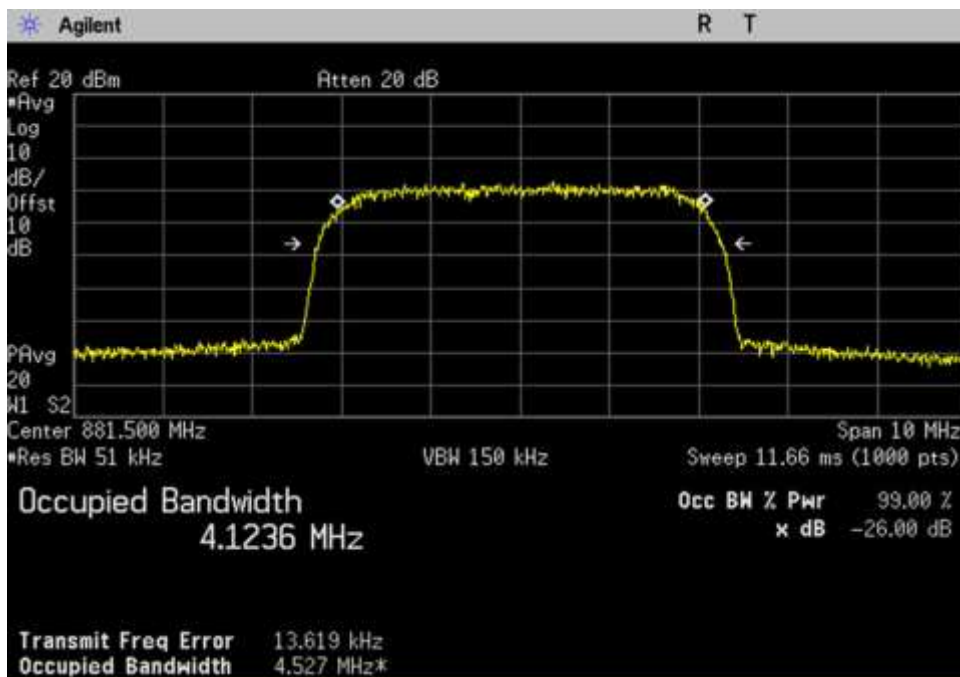
UL_1850-1915_WCDMA_1882.5MHz



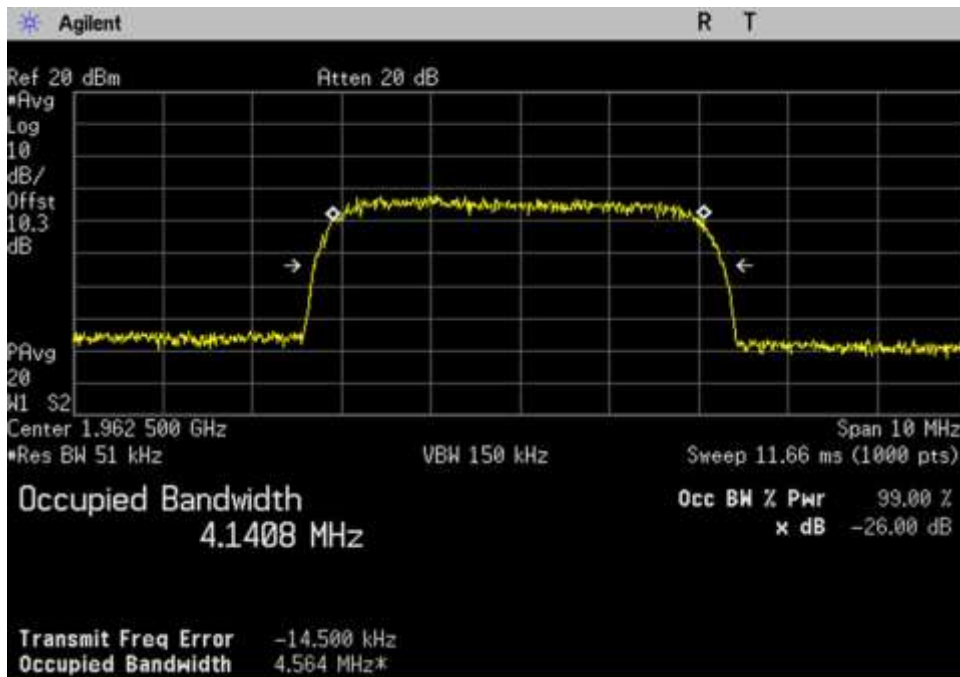
DL_728-746_WCDMA_737MHz



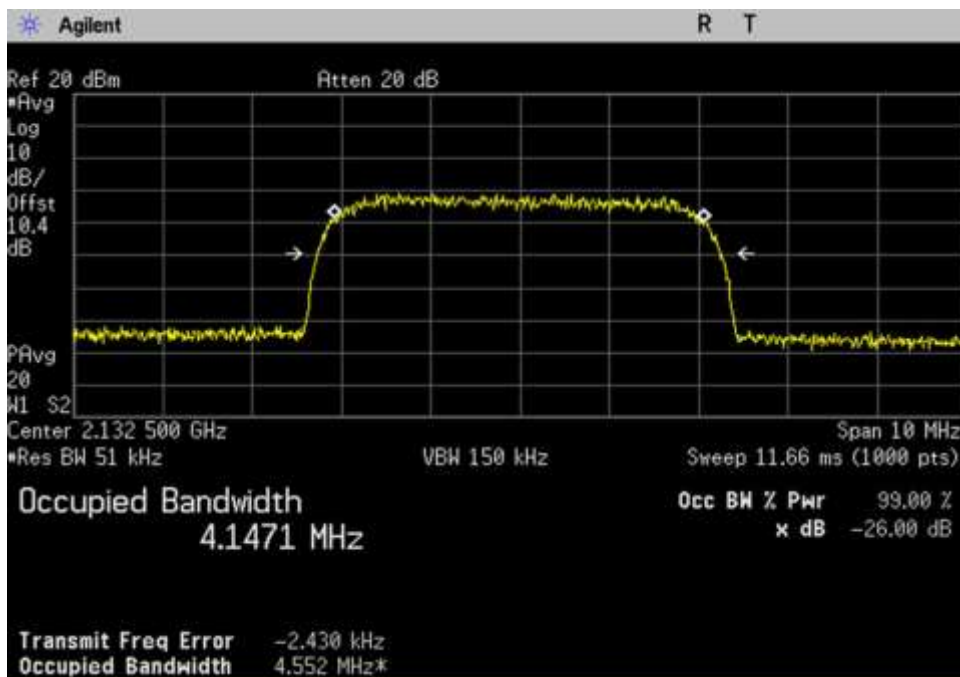
DL_746-757_WCDMA_751.5MHz



DL_869-894_WCDMA_881.5MHz



DL_1930-1995_WCDMA_1962.5MHz



DL_2110-2155_WCDMA_2132.5MHz

7.11 Oscillation Detection

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.11 Anti-Oscillation (Oscillation Restarts / Oscillation mitigation or shutdown)**
 Work Order #: **101748**
 Test Type: **Conducted Emissions** Date 10/08/2018 and 10/09/2018
 Tested By: **Hieu Song Nguyenpham**
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

10/08/2018: Test environment conditions:
 Temperature: 20.3°C
 Relative Humidity: 35%
 Pressure: 102.5kPa

10/09/2018: Test environment conditions:
 Temperature: 20.2°C
 Relative Humidity: 40%
 Pressure: 102.0kPa

Note: UL1850-1915MHz -AWGNL+5:
 - AWGNL denotes a 4.1MHz AWGN signal (99% occupied bandwidth) tuned to the frequency of 2.5 MHz above the lower edge of the operating band 1850-1915MHz
 - +5 denotes a variable attenuator adjusted such that the insertion loss for center of band under test (isolation) between the booster's donor and server ports is 5 dB greater than the maximum gain, as recorded in the maximum gain test procedure, for the band under test.

Modification #1 was in place during testing.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020
P06910	Attenuator	Pasternack	PE7083	12/20/2017	12/20/2019
P06904	Cable	Astrolab	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
P06901	Cable	Astrolab	32022-29094K-29094K-36TC	1/4/2018	1/4/2020
C00082	Directional Coupler	MECA Electronics, Inc.	722-10-1.500V	9/18/2017	9/18/2019
03412	Band Pass Filter	Pasternack	PE8705	8/16/2017	8/16/2019
03413	Band Pass Filter	Pasternack	PE8706	8/16/2017	8/16/2019
03414	Band Pass Filter	Pasternack	PE8707	8/16/2017	8/16/2019
03415	Band Pass Filter	Pasternack	PE8708	8/16/2017	8/16/2019
03447	Band Pass Filter	Pasternack	PE8710	8/16/2017	8/16/2019
03448	Band Pass Filter	Pasternack	PE8711	8/16/2017	8/16/2019
03446	Band Pass Filter	K & L	4FV50-707/H18-O/O	8/16/2017	8/16/2019
03467	High Pass Filter	K & L	4FV50-731/H30-O/O	8/16/2017	8/16/2019
03468	High Pass Filter	K & L	4CS10-781.5/E12.2-O/O	8/16/2017	8/16/2019
03469	High Pass Filter	K & L	4CS10-751.5/E12-O/O	8/16/2017	8/16/2019
02475	Attenuator	HP	8494B	6/8/2017	6/8/2019
03429	Attenuator	HP	8496B	11/8/2017	11/8/2019

Summary of Results

Pass: All oscillations detections and mitigations occur within 0.3 seconds in uplink bands, within 1 second in the downlink bands and the noise level is below the -70dBm/MHz limit.

7.11.2 Oscillation restart tests

Oscillation detection				Time Between restart		Number of restart	
Frequency MHz	Measured Sec	Limit Sec	Peak Level dBm	Measured Sec	Limit At least sec	Measured	Limit
UL 1710-1755	0.242	0.3	28.2	66	60	1	5
UL 1850-1915	0.250	0.3	25.8	68	60	1	5
UL 824-894	0.242	0.3	27.4	71	60	1	5
UL 698-716	0.250	0.3	28.3	70	60	1	5
UL 776-787	0.242	0.3	28.1	69	60	1	5
DL 2110-2155	0.267	1.0	12.3	69	60	1	5
DL 1930-1995	0.242	1.0	17.5	66	60	1	5
DL 869-894	0.250	1.0	15.2	70	60	1	5
DL:728-746	0.258	1.0	18.4	68	60	1	5
DL 746-757	0.250	1.0	17.0	69	60	1	5

The booster continues to mitigate at least 1 minute before restarting. The plots demonstrate after 1 restart (the limit is 5 restart), the booster does not resume operation until manually reset.

7.11.3 Test procedure for measuring oscillation mitigation or shutdown

	UL 1710-1755	UL1850-1915	UL 824-894	UL 698-716	UL 776-787	
Max Gain Isolation dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Limit dB
+5dB	(12.3) *	(13.5) *	(12.1) *	(13.9) *	10.8	12.0
+4dB	(13.9) *	(16.1) *	(13.9) *	(16.1) *	(12.7) *	12.0
+3dB	(16.9) *	(19.4) *	(16.1) *	(18.5) *	(14.8) *	12.0
+2dB	(19.7) *	(23.0) *	(20.8) *	(22.5) *	(17.1) *	12.0
+1dB	(23.8) *	(28.5) *	(25.8) *	(31.5) *	(21.3) *	12.0
0dB	(34.9) *	(62.7) *	(66.8) *	**	(31.2) *	12.0
-1dB	**	**	**	**	**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

	DL 2110-2155	DL 1930-1995	DL 869-894	DL 728-746	DL 746-775	
Max Gain Isolation dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Pk-Pk Difference dB	Limit dB
+5dB	10.8	11.1	(12.1) *	(14.8) *	(12.6) *	12.0
+4dB	11.2	(13.2) *	(13.6) *	(16.3) *	(15.7) *	12.0
+3dB	(14.3) *	(15.1) *	(16.0) *	(19.7) *	(20.3) *	12.0
+2dB	(17.9) *	(18.3) *	(19.9) *	(24.6) *	(27.3) *	12.0
+1dB	(22.1) *	(23.1) *	(25.9) *	(53.4) *	**	12.0
0dB	(31.1) *	(40.9) *	**	**	**	12.0
-1dB	**	**	**	**	**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

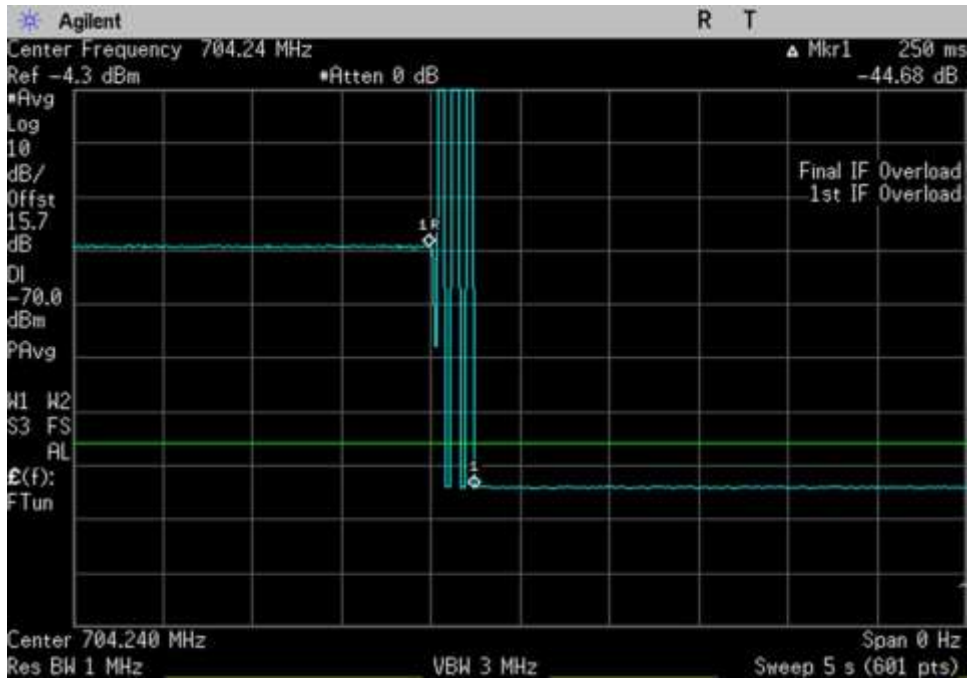
Note:

* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 97 seconds for the Uplink bands and 97 seconds for the Downlink bands.

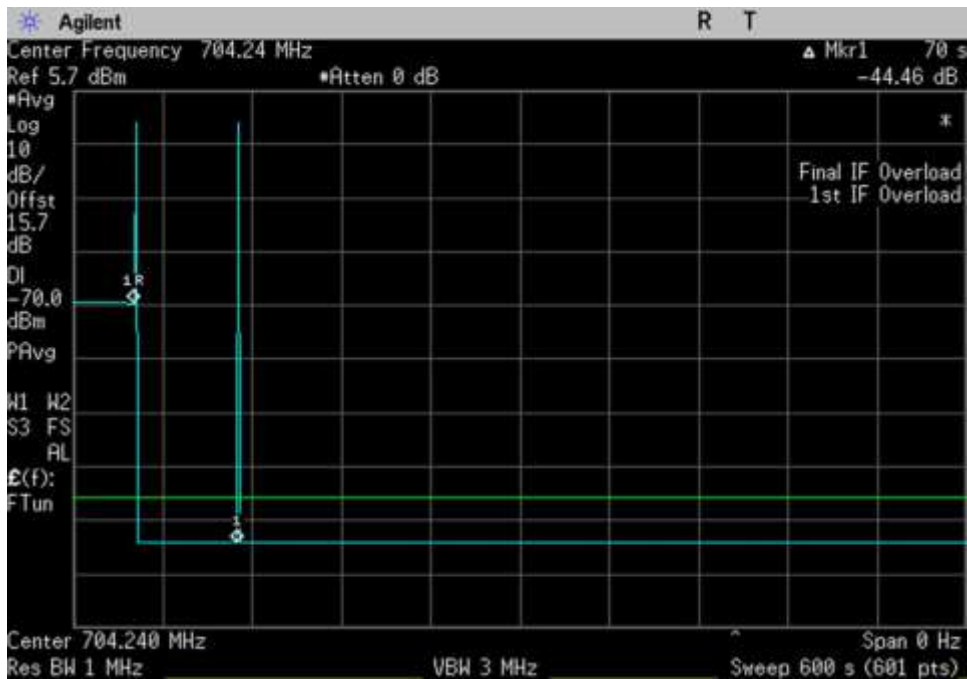
** The device shuts down immediately.

7.11.2 Oscillation Restart Tests

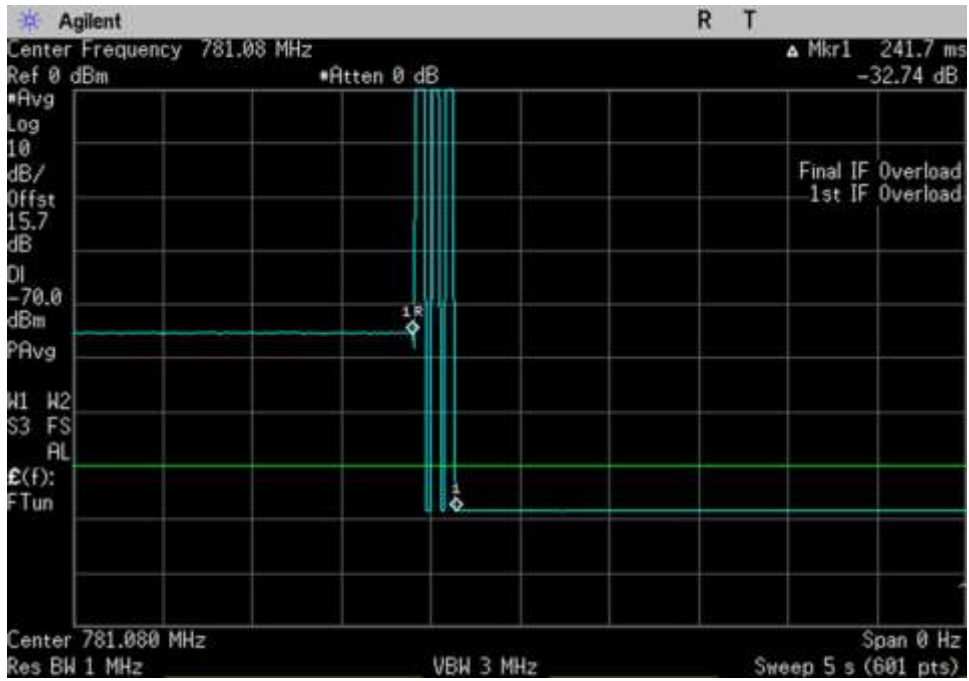
Plots



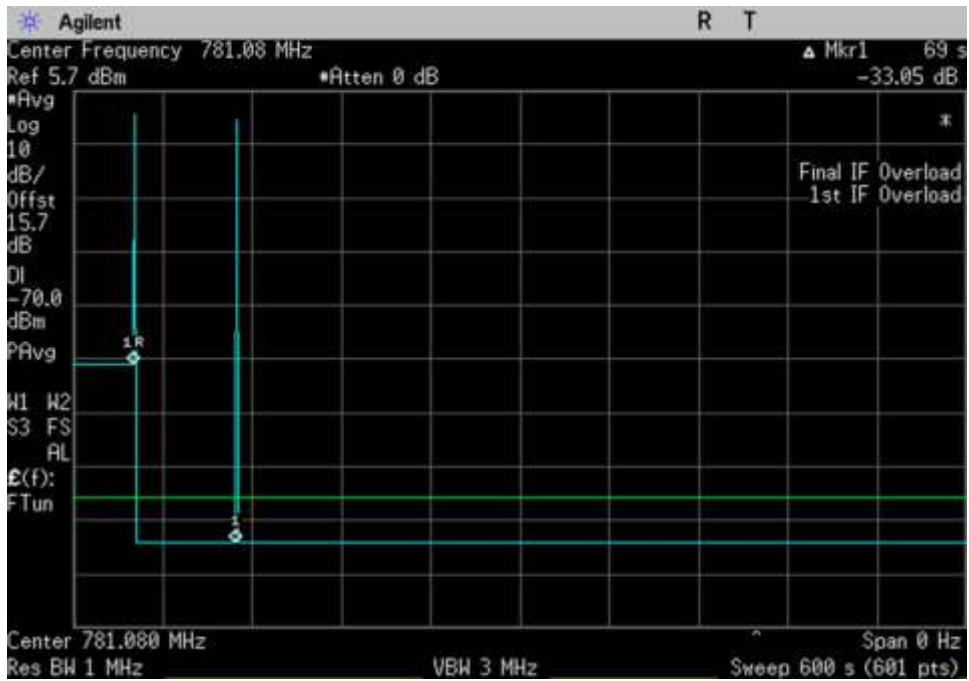
UL_698-716_704.24MHz



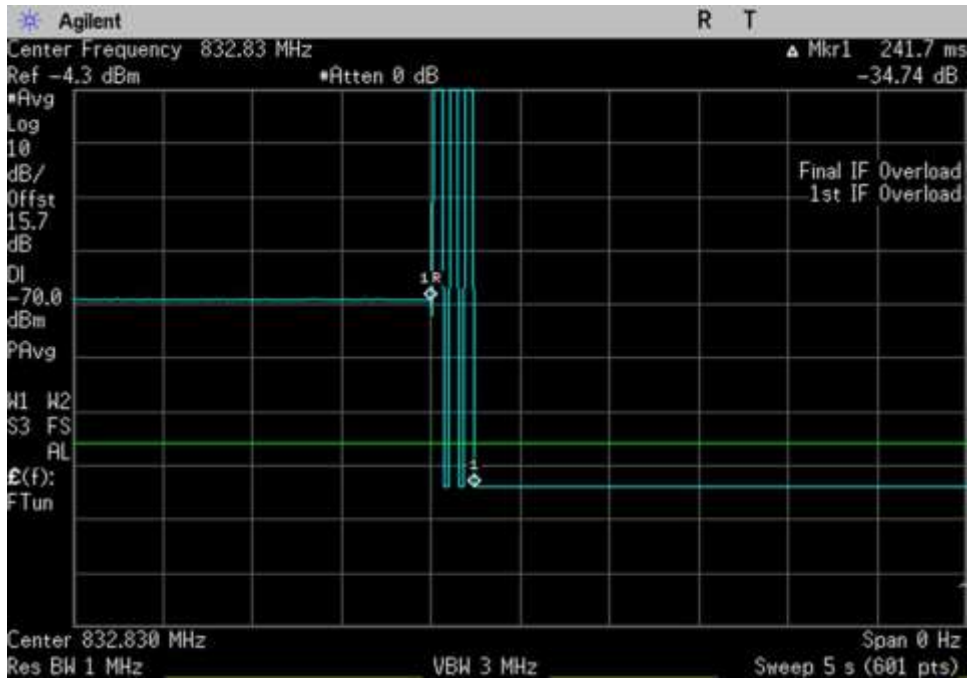
UL_698-716_600sec_704.24MHz



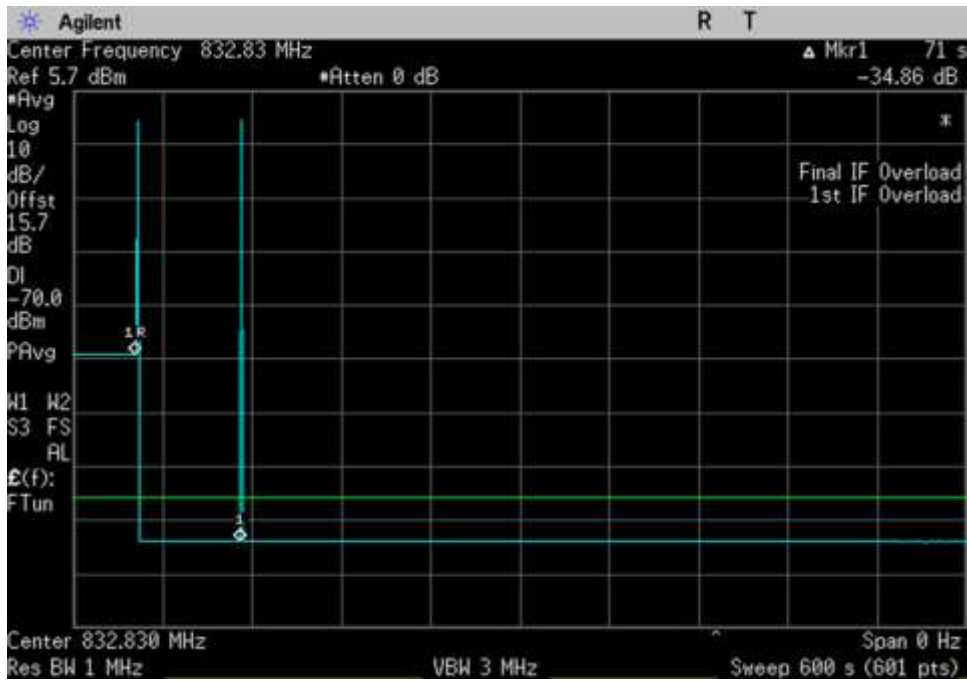
UL_776-787_781.08MHz



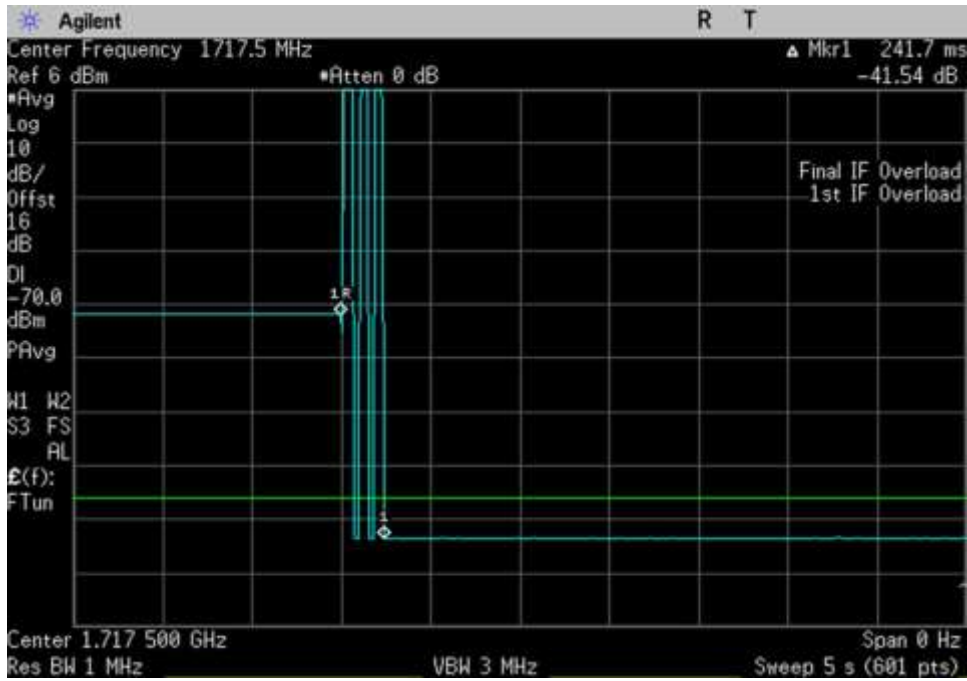
UL_776-787_600sec_781.08MHz



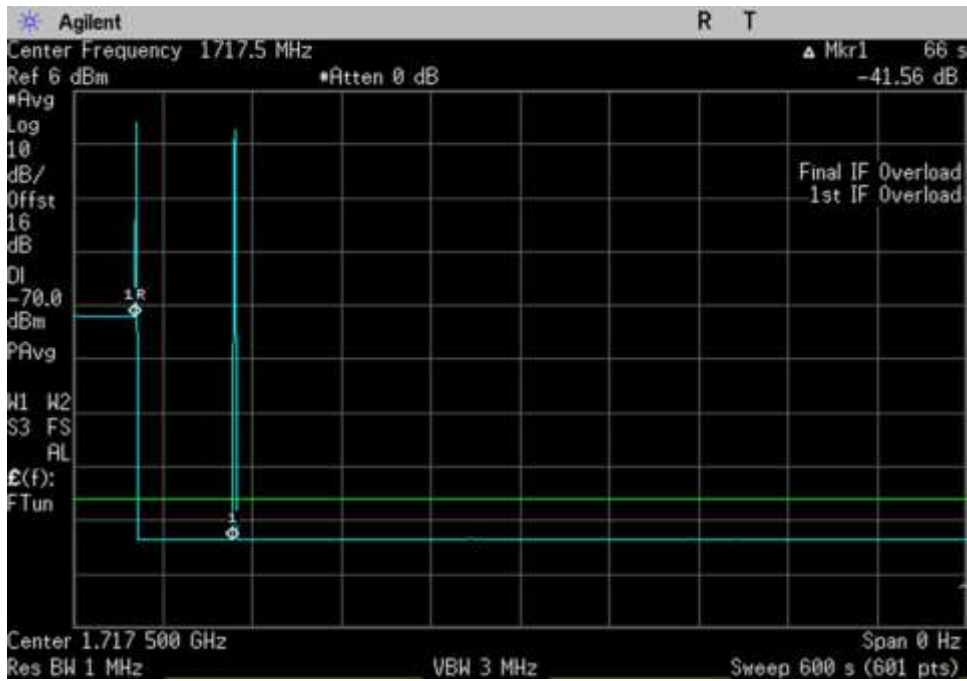
UL_824-849_832.83MHz



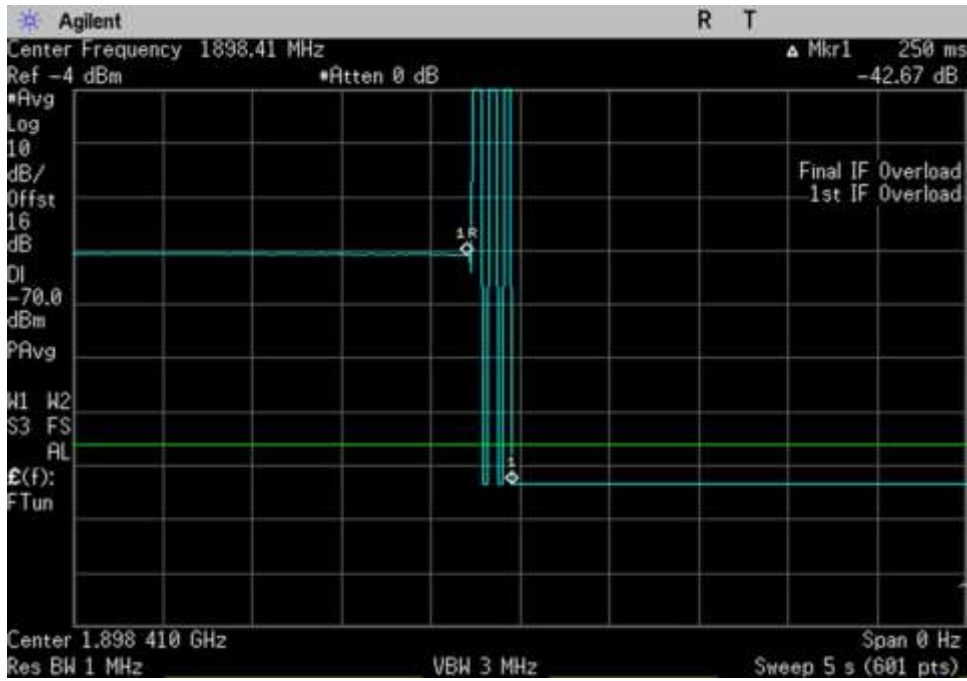
UL_824-849_600sec_832.83MHz



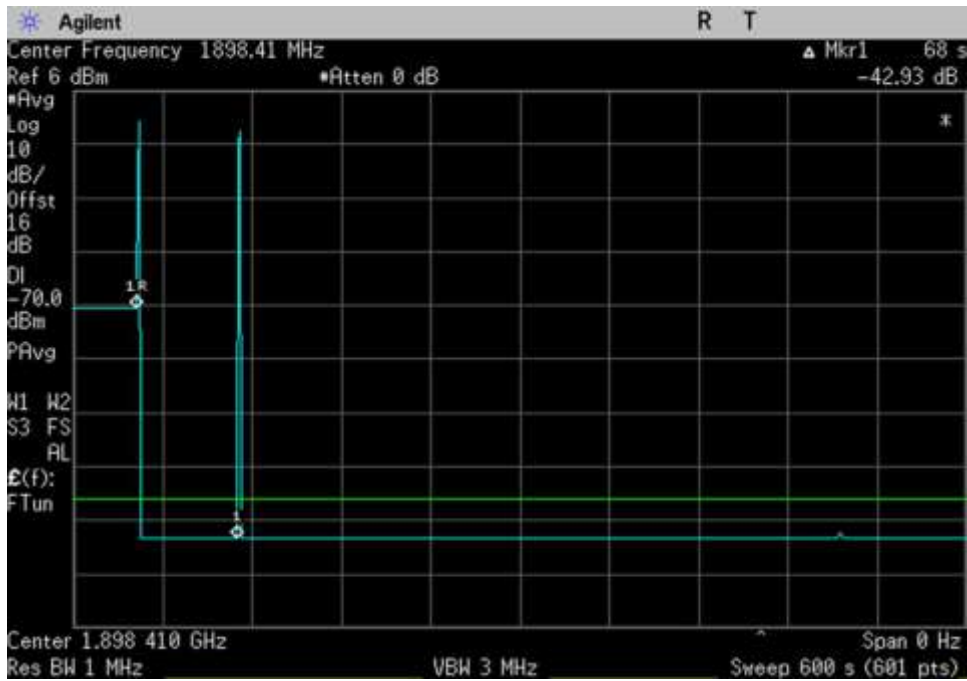
UL_1710-1755_1717.5MHz



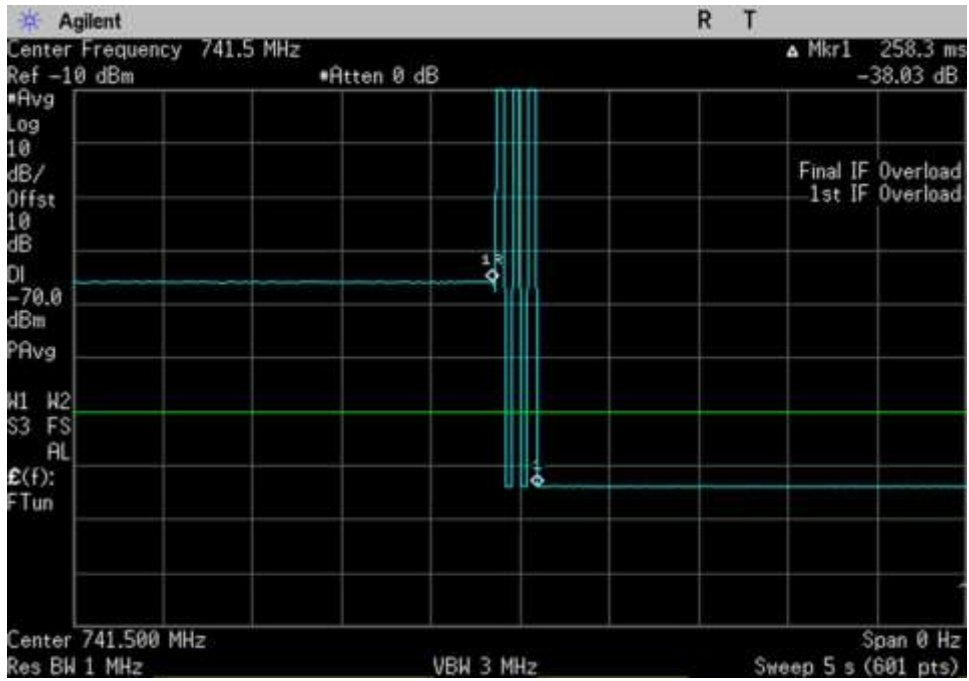
UL_1710-1755_600sec_1717.5MHz



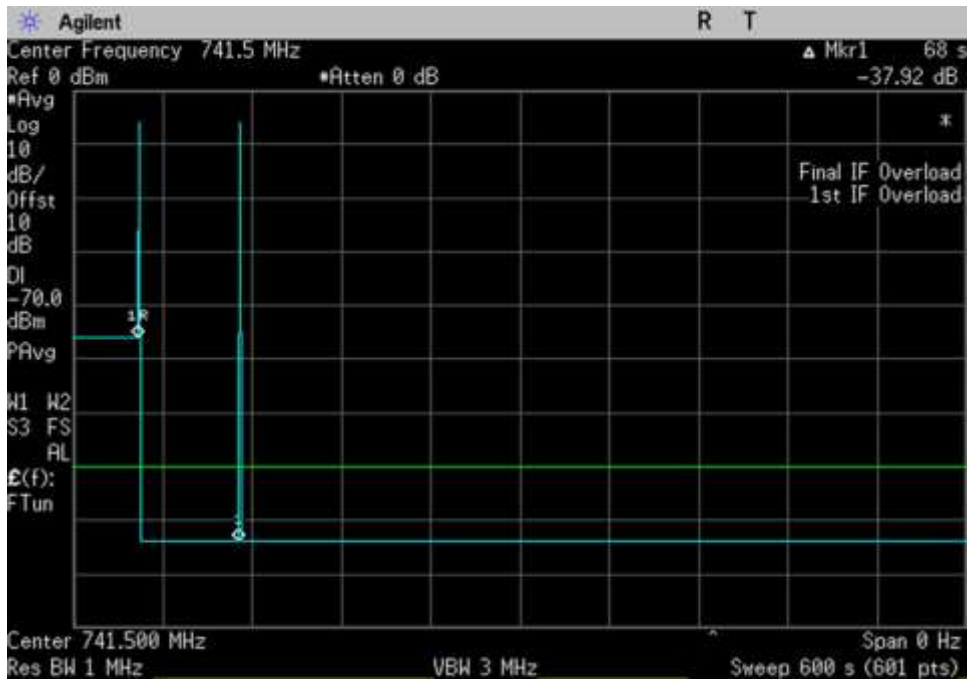
UL_1850-1915_ 1898.41MHz



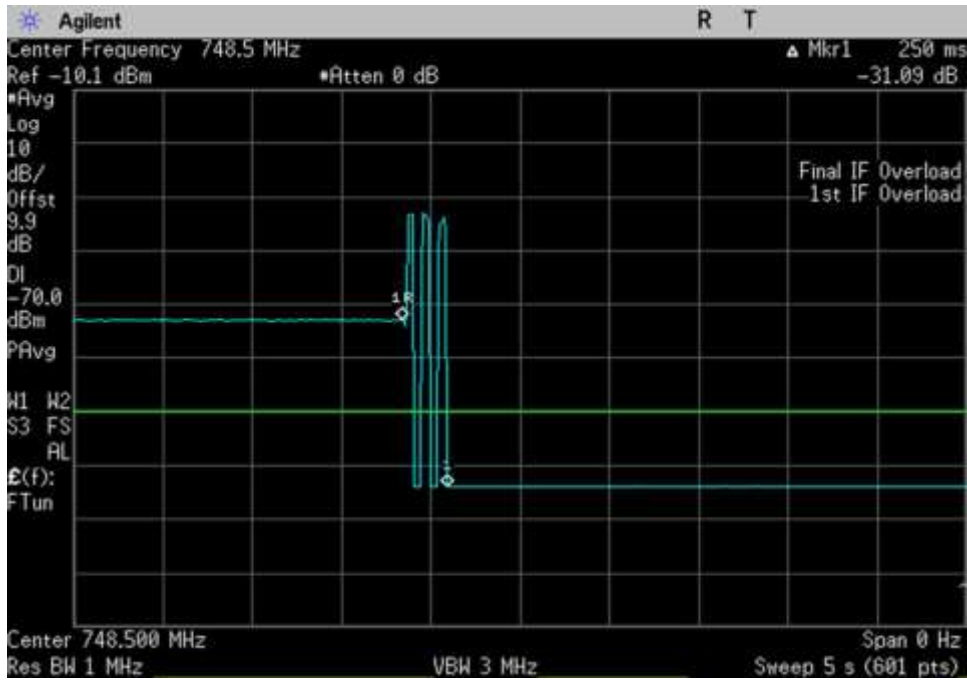
UL_1850-1915_600sec_ 1898.41MHz



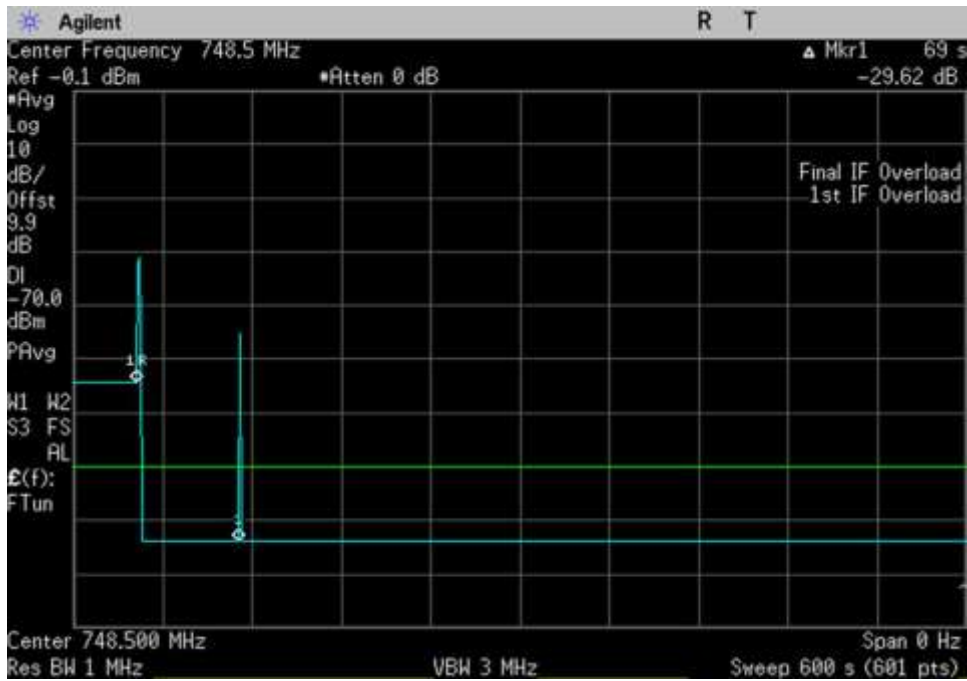
DL_728-746_741.5MHz



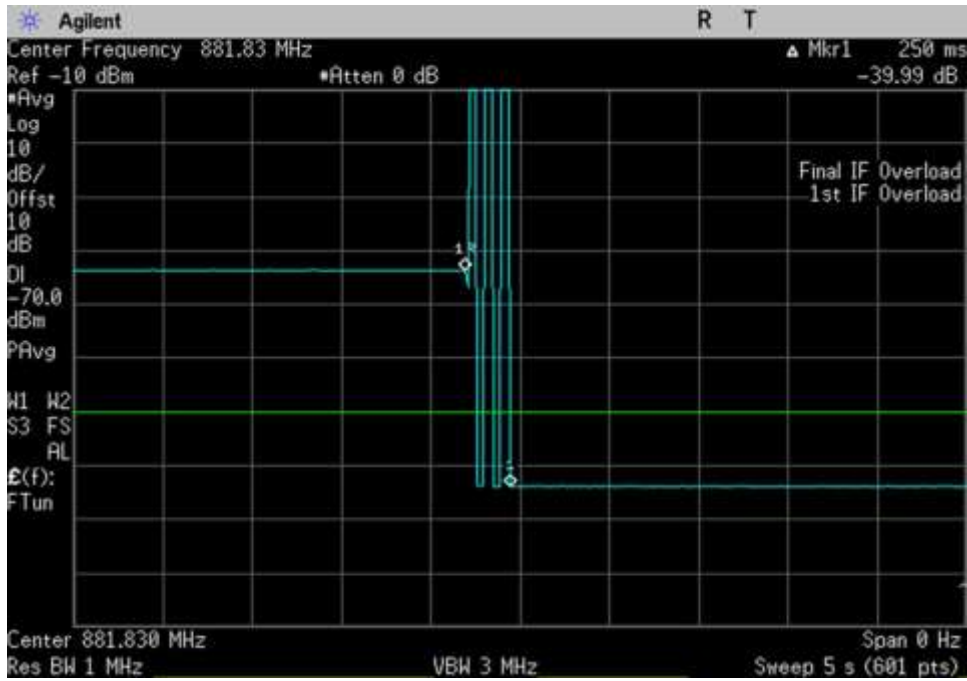
DL_728-746_600sec_741.5MHz



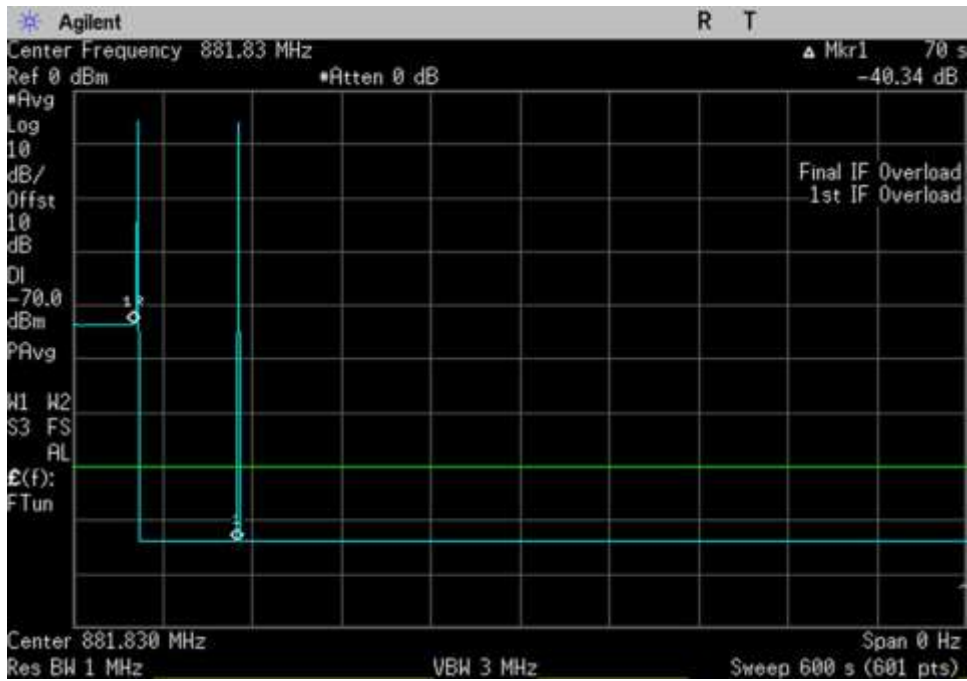
DL_746-757_748.5MHz



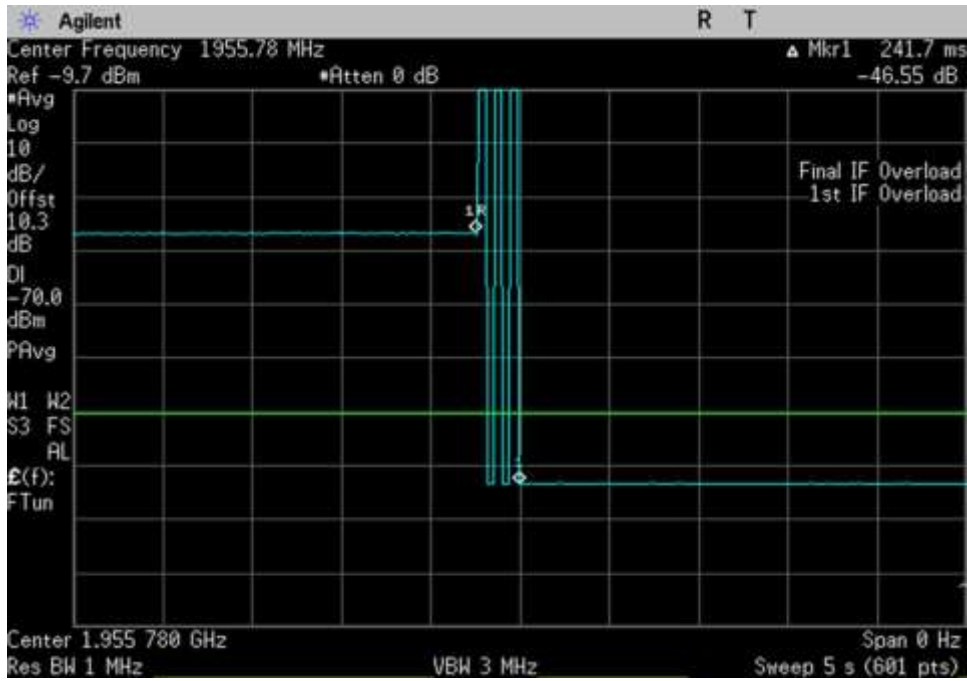
DL_746-757_600sec_748.5MHz



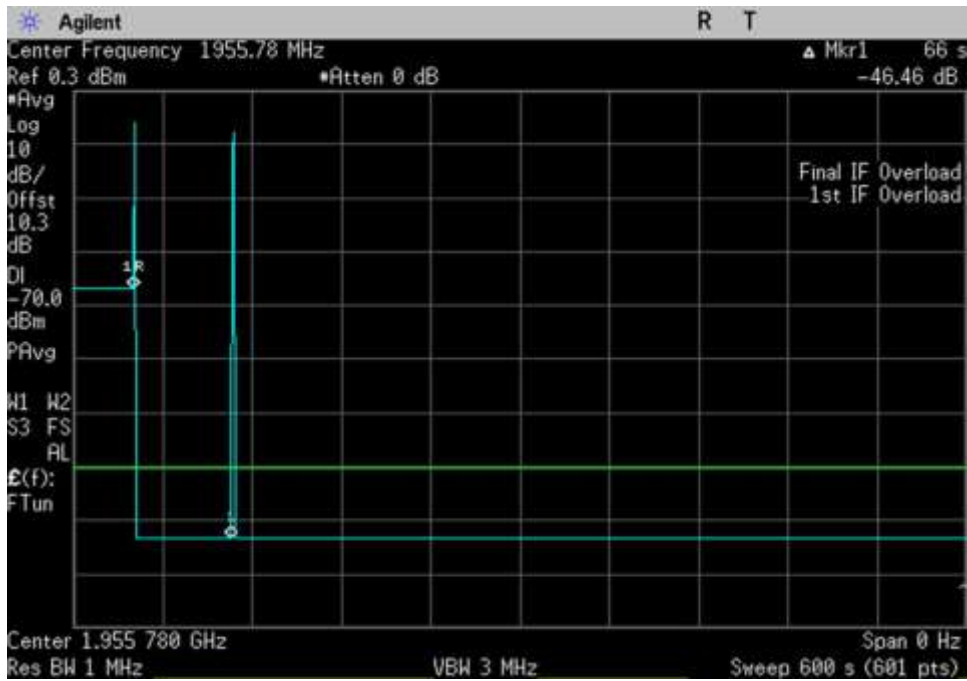
DL_869-894_881.83MHz



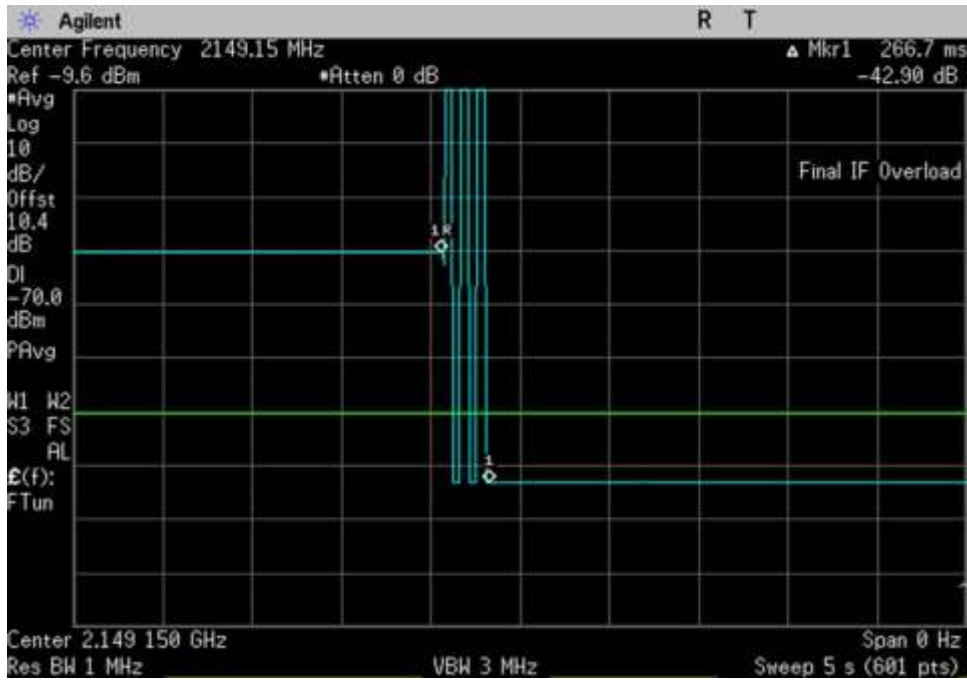
DL_869-894_600sec_881.83MHz



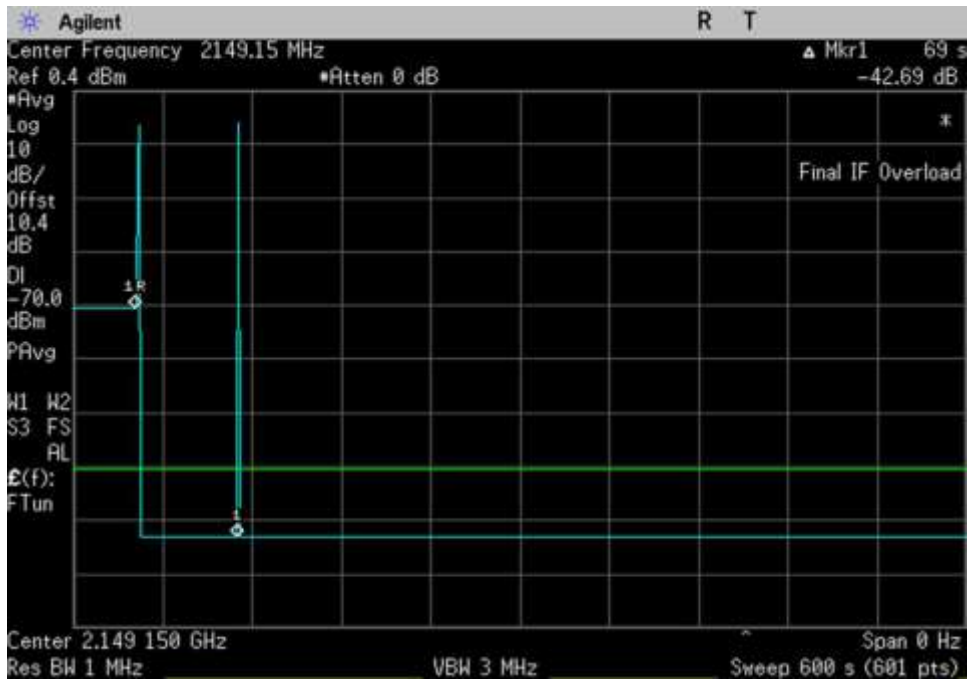
DL_1930-1995_ 1955.78MHz



DL_1930-1995_600sec_ 1955.78MHz



DL_2110-2155_ 2149.15MHz



DL_2110-2155_600sec_ 2149.15MHz

7.12 Radiated Spurious Emissions

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.12 Radiated Spurious Emissions / 2.1053 Radiated Spurious Emissions**
47 CFR §22.917(a) Radiated Spurious Emissions
47 CFR §24.238(a) Radiated Spurious Emissions
47 CFR §27.53(c), (f), (g) and (h) Spurious Emissions

Work Order #: **101748** Date: 10/10/2018
 Test Type: **Radiated Emissions**
 Tested By: **Hieu Song Nguyenpham**
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test environment conditions:
 Temperature: 20.5°C
 Relative Humidity: 43%
 Pressure: 101.9kPa

Frequency range of measurement = 9 kHz- 22 GHz.
 9 kHz - 150 kHz -> RBW=200 Hz VBW=200 Hz
 150 kHz - 30 MHz -> RBW=9 kHz VBW=9 kHz
 30 MHz - 1000MHz -> RBW=120 kHz VBW=120 kHz
 1000 MHz-22000MHz -> RBW=1 MHz VBW=1 MHz

No spurious emissions were found within 20dB of the limit line.
 Emissions in the band 1559-1610 MHz were investigated and these were not found within 20dB of the limit line.

27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

Modification #1 was in place during testing.

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03470	Spectrum Analyzer	E4440A	1/3/2018	1/3/2020
AN01996	Biconilog Antenna	CBL6111C	11/1/2016	11/1/2018
ANP06049	Attenuator	PE7002-6	5/14/2018	5/14/2020
ANP06691	Cable	PE3062-180	5/14/2018	5/14/2020
ANP00880	Cable	RG214U	5/14/2018	5/14/2020
AN00501	Preamp-TOP AMP	8447F	1/6/2017	1/6/2019
ANP01187	Cable	CNT-195	8/20/2018	8/20/2020
AN02157	Horn Antenna-ANSI C63.5	3115	2/6/2017	2/6/2019
AN03302	Cable	32026-29094K- 29094K-72TC	1/15/2018	1/15/2020
ANP01210	Cable	FSJ1P-50A-4A	1/16/2017	1/16/2019
ANP06903	Cable	32022-29094K- 29094K-36TC	1/4/2018	1/4/2020
AN02693	Active Horn Antenna- ANSI C63.5 3m	AMFW-5F- 12001800-20-10P	5/11/2017	5/11/2019
AN02694	Horn Antenna-ANSI C63.5 Calibration	AMFW-5F- 18002650-20-10P	5/11/2017	5/11/2019
AN00266	Loop Antenna	6502	6/1/2018	6/1/2020
AN03607	Preamp	AMF-7D-00101800- 30-10P	6/6/2017	6/6/2019

Summary of Results

Pass: All Radiated Spurious Emissions were found within more than 20dB margin of the limit line.

Frequency Range of measurement 9kHz -> 22GHz

LIMIT LINE FOR SPURIOUS RADIATED EMISSION

REQUIRED ATTENUATION = 43+10 LOG P (DB)

For radiated spurious emission measured at 3 meter test distance.

Required attenuation = 43+10 Log P_{t at 3 meter} dB
 Limit line (dBuV) = E_{dBuV} - Attenuation

E_{dBuV} = Measured field strength at 3 meter in dBuV/m

Power Density (Isotropic)

$$P_D = \frac{P_t}{4\pi r^2}$$

P_D = Power Density in Watts /m²

P_t = Average Transmit Power

r = Test distance

Field Intensity E (V/m)

$$E = \sqrt{P_D \times 377}$$

$$E = \frac{\sqrt{P_t \times 377}}{4\pi r^2}$$

$$E = \sqrt{\frac{P_t \times 30}{r^2}}$$

$$P_t = \left(\frac{E^2 \times r^2}{30} \right)$$

10 Log P_t = 10 Log E² (V/m) + 10 Log r² – 10 Log 30

10 Log P_t = 20 Log E (V/m) + 20 Log r – 10 Log 30

At 3 meter, r = 3 m

10 Log P_t = 20 Log E (V/m) + 20 Log 3 – 10 Log 30

10 Log P_t = 20 Log E (V/m) + 9.54 – 14.77

10 Log P_t = 20 Log E (V/m) - 5.23

Since $20 \text{ Log } E \text{ (V/m)} = 20 \text{ Log } E \text{ (uV/m)} - 120$

$$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (uV/m)} - 120 - 5.23$$

$$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (uV/m)} - 125.23$$

$$\begin{aligned} \text{Limit line (dBuV) at 3 meter} &= E_{\text{dBuV}} - \text{Attenuation} \\ &= E_{\text{dBuV}} - (43 + 10 \text{ Log } P_{t \text{ at 3 meter}}) \\ &= E_{\text{dBuV}} - 43 - 10 \text{ Log } P_{t \text{ at 3 meter}} \\ &= E_{\text{dBuV}} - 43 - (20 \text{ Log } E \text{ (uV/m)} - 125.23) \\ &= E_{\text{dBuV}} - 43 - 20 \text{ Log } E \text{ (uV/m)} + 125.23 \\ &= E_{\text{dBuV}} - 20 \text{ Log } E \text{ (uV/m)} + 82.23 \end{aligned}$$

$$\text{Since } 20 \text{ Log } E \text{ (uV/m)} = E \text{ in dBuV/m} = E_{\text{dBuV}} - E_{\text{dBuV}} + 82.23$$

$$\text{Radiated Emission limit 3 meter} = 82.23 \text{ dBuV at any power level measured in dBuV}$$

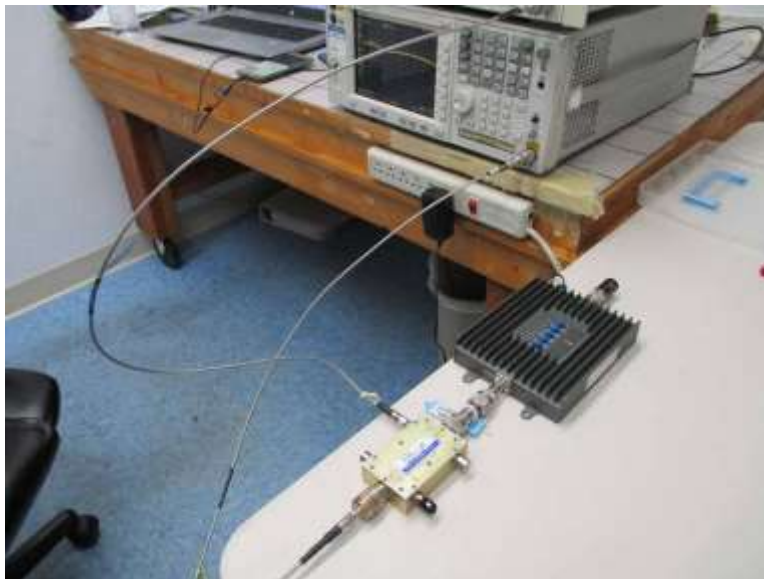
EXHIBIT A: TEST SETUP PHOTOS



Section 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, and 7.10 Test Setup



Section 7.7 Maximum Noise Test Setup



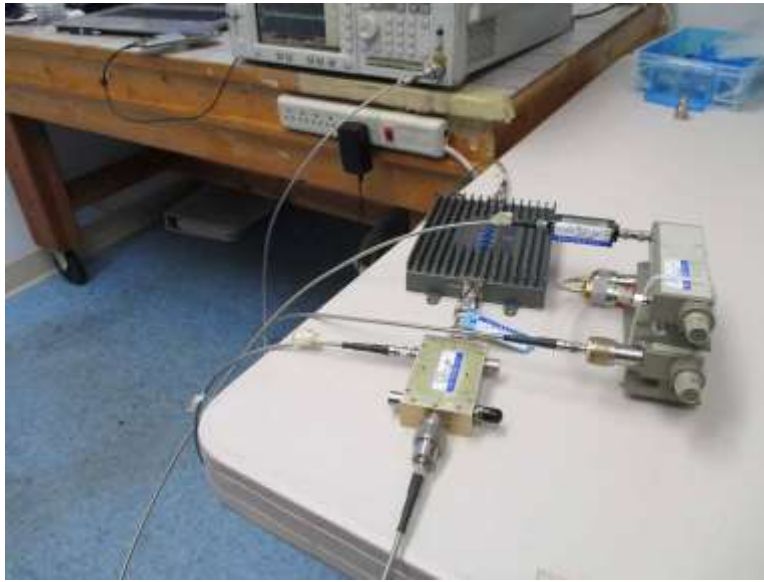
Section 7.7 Variable Timing Test Setup



Section 7.8 Test Setup



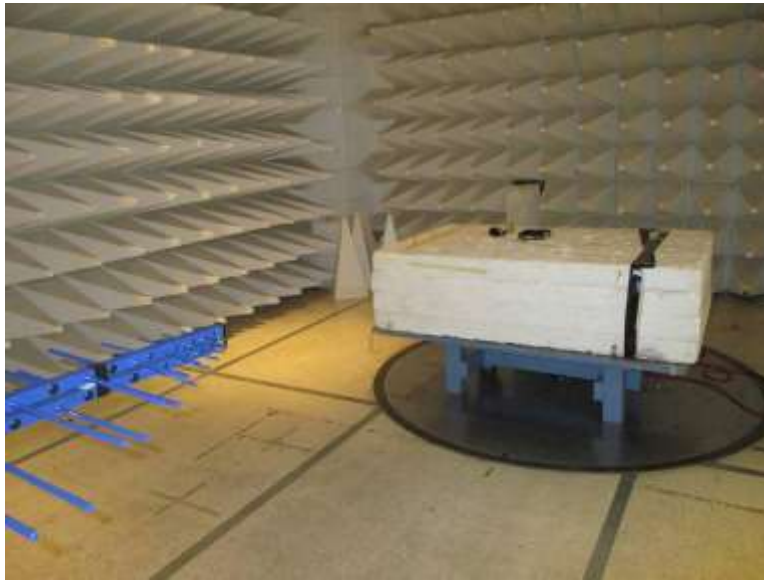
Section 7.9 Test Setup



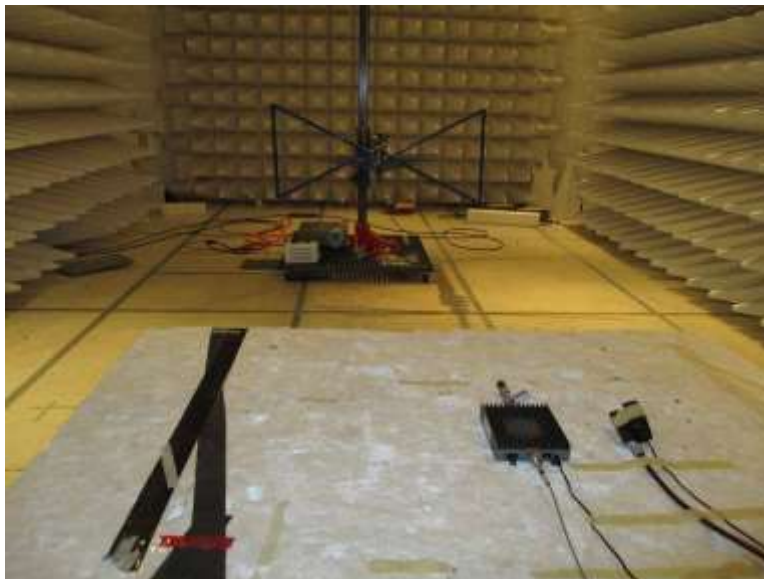
Section 7.11.2 Test Setup



7.11.3 Test Setup



Section 7.12, Below 1GHz Test Setup



Section 7.12, Below 1GHz Test Setup



Section 7.12, Above 1GHz, Cone placement Test Setup



Section 7.12, Above 1GHz, Cone placement Test Setup

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.