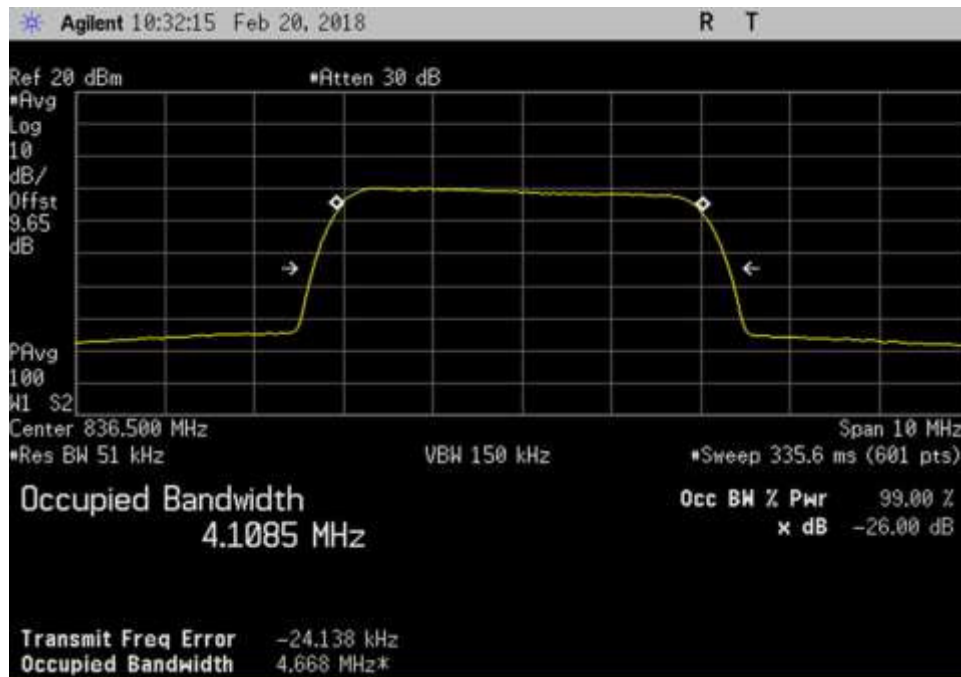
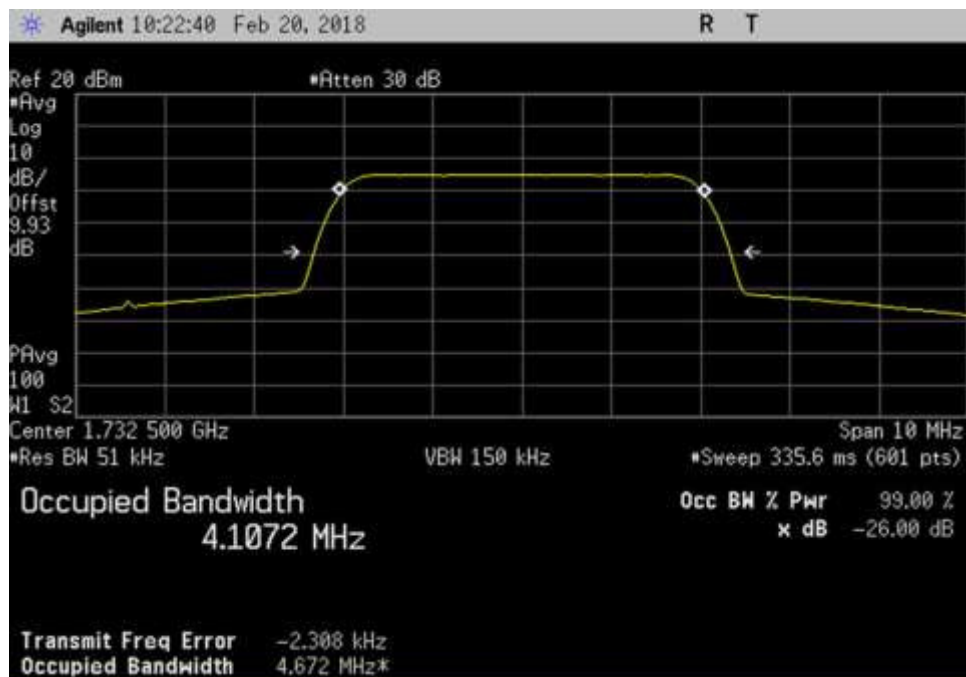
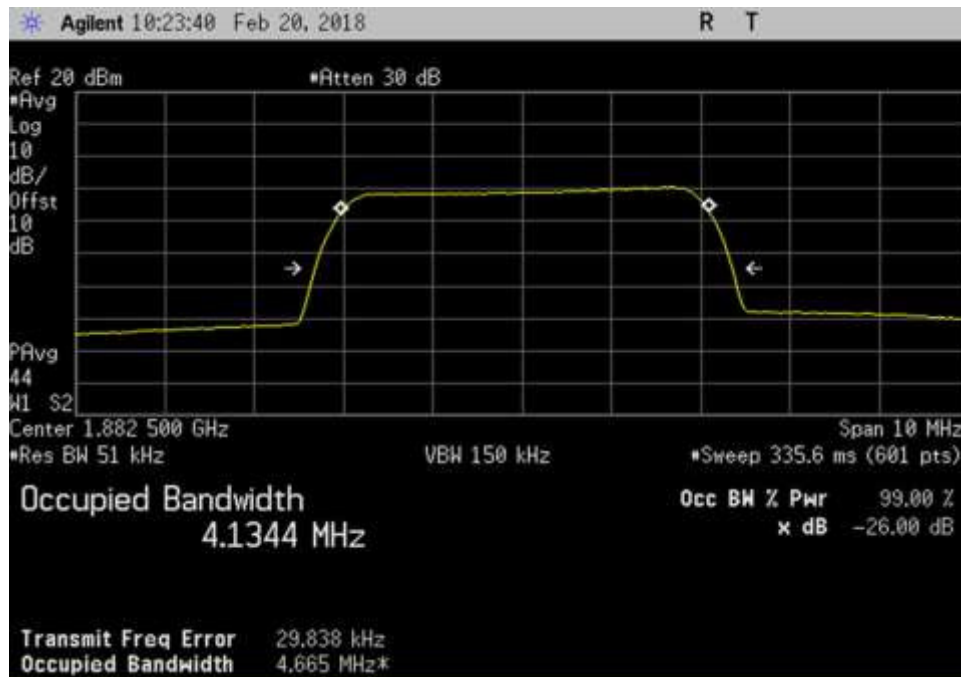




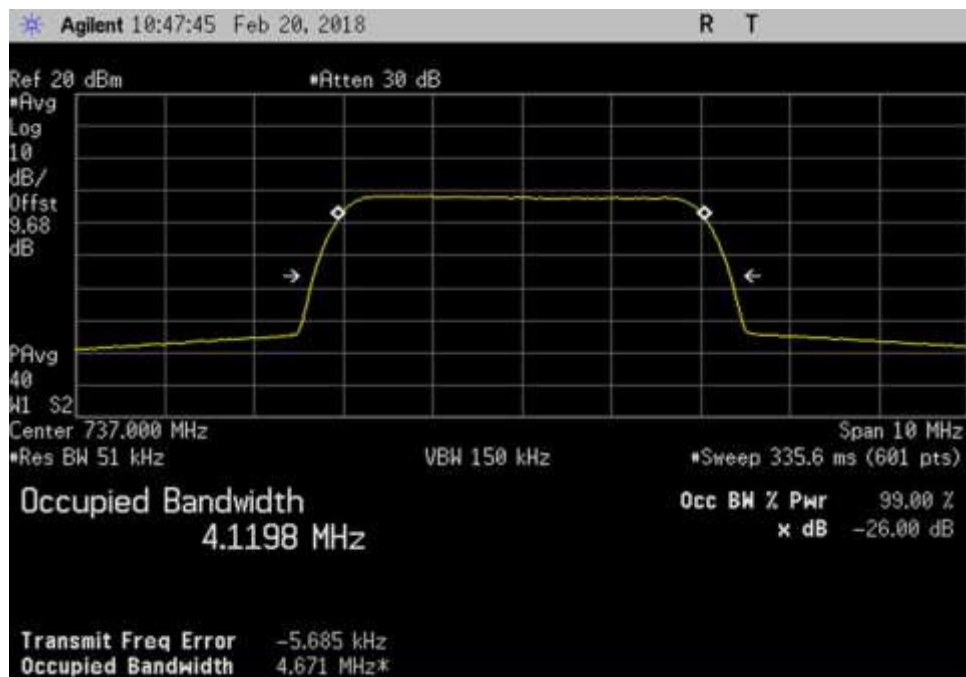
UL_824-849_AWGN_ 836.5MHz



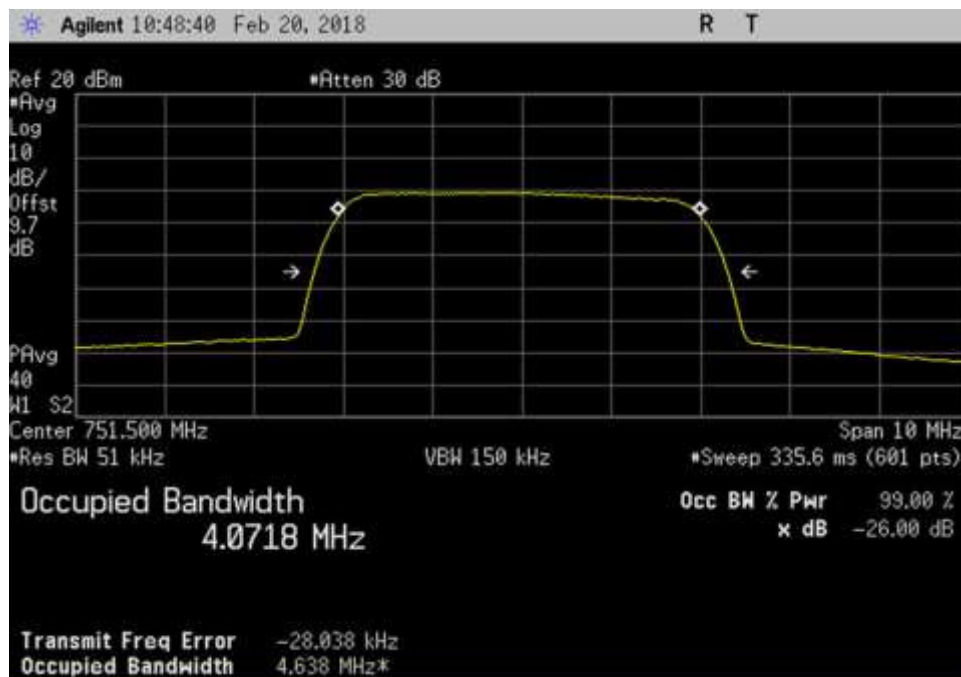
UL_1710-1755_AWGN_ 1732.5MHz



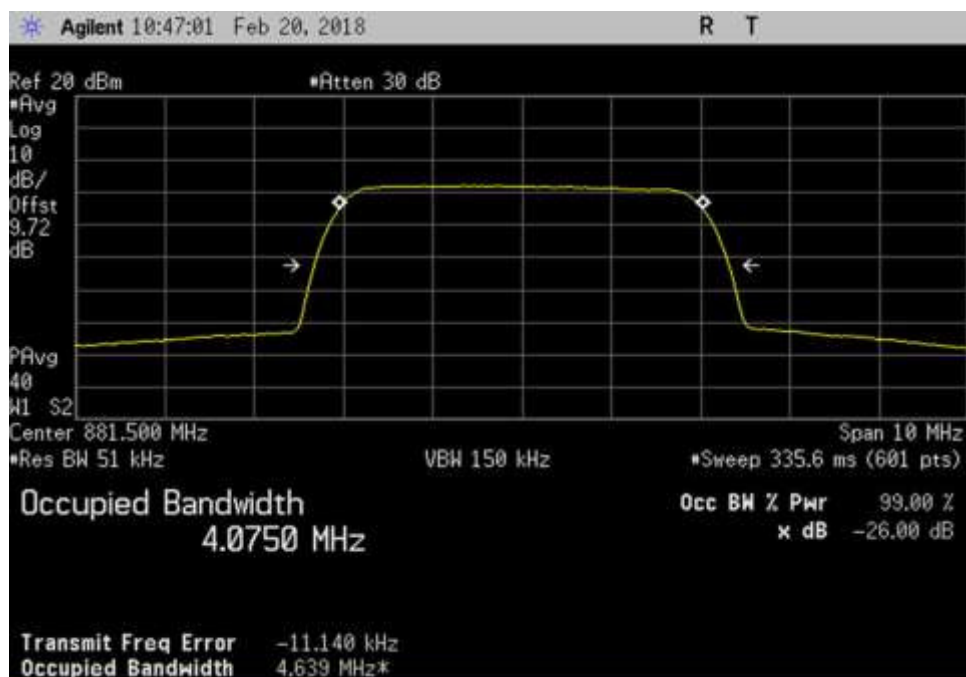
UL_1850-1915_AWGN_1882.5MHz



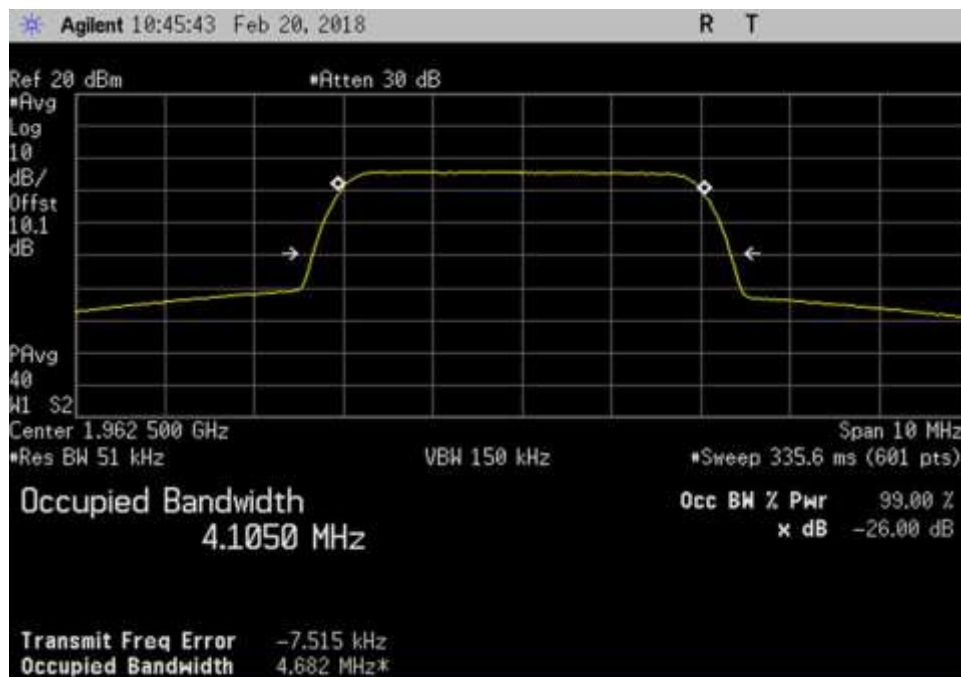
DL_728-746_AWGN_737MHz



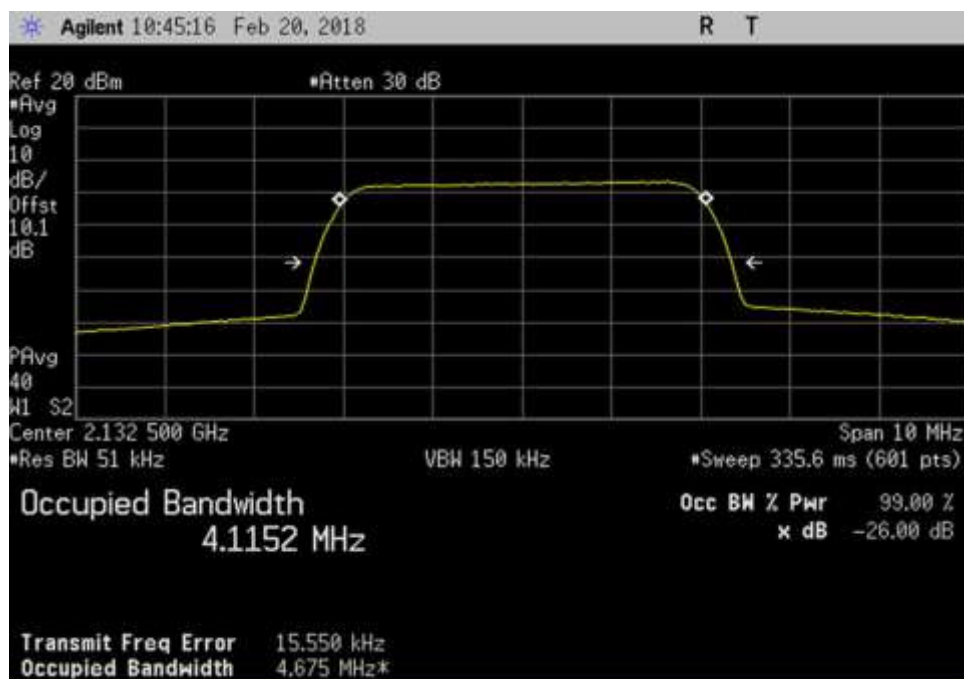
DL_746-757_AWGN_751.5MHz



DL_869-894_AWGN_881.5MHz

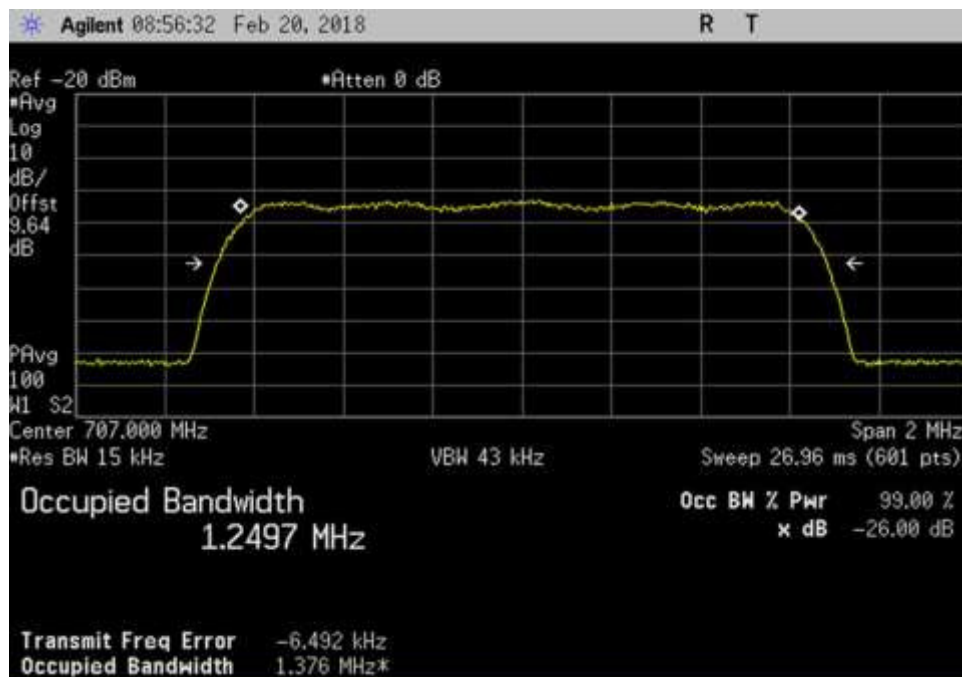


DL_1930-1995_AWGN_ 1962.5MHz

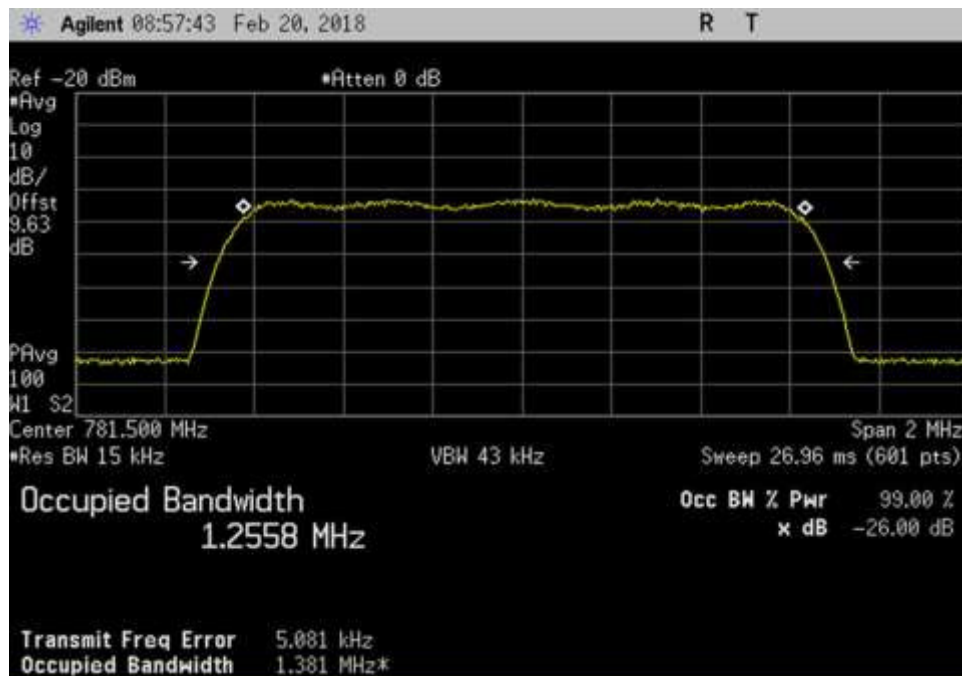


DL_2110-2155_AWGN_ 2132.5MHz

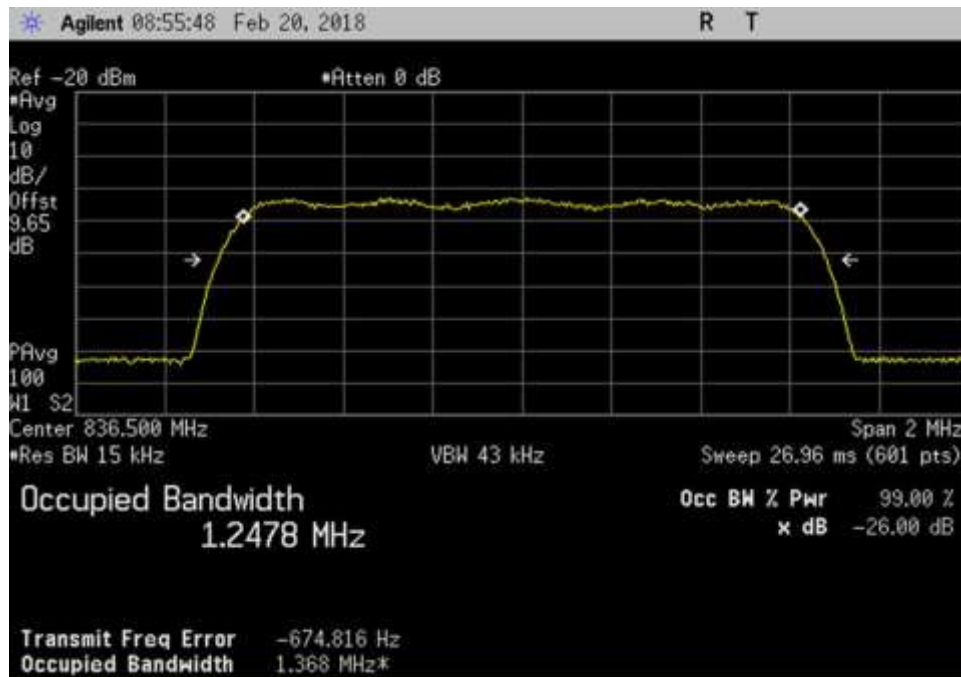
CDMA Input



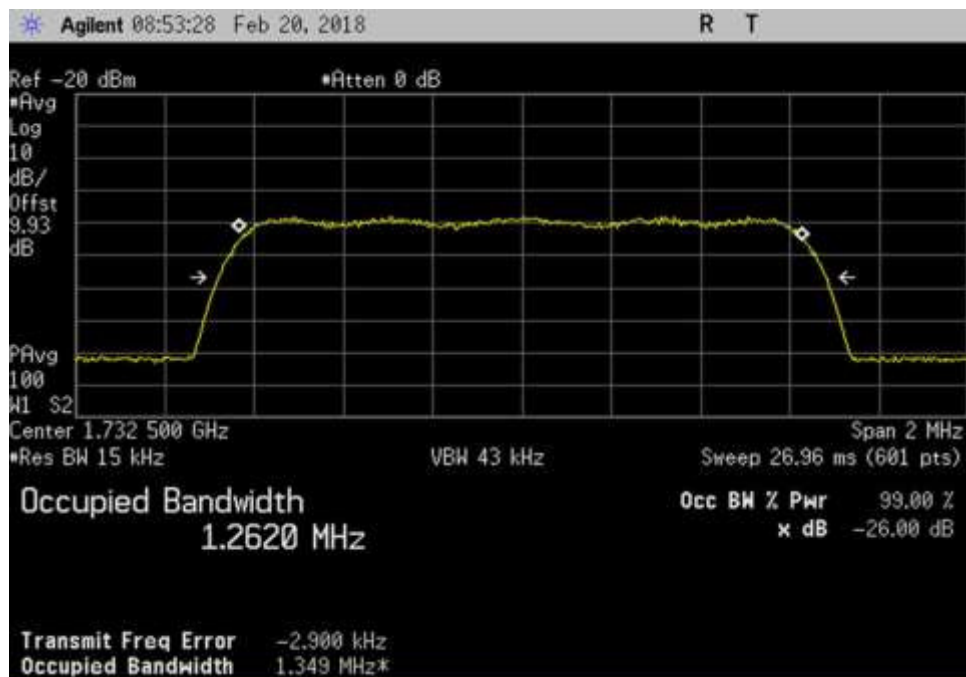
UL_698-716_CDMA_707MHz



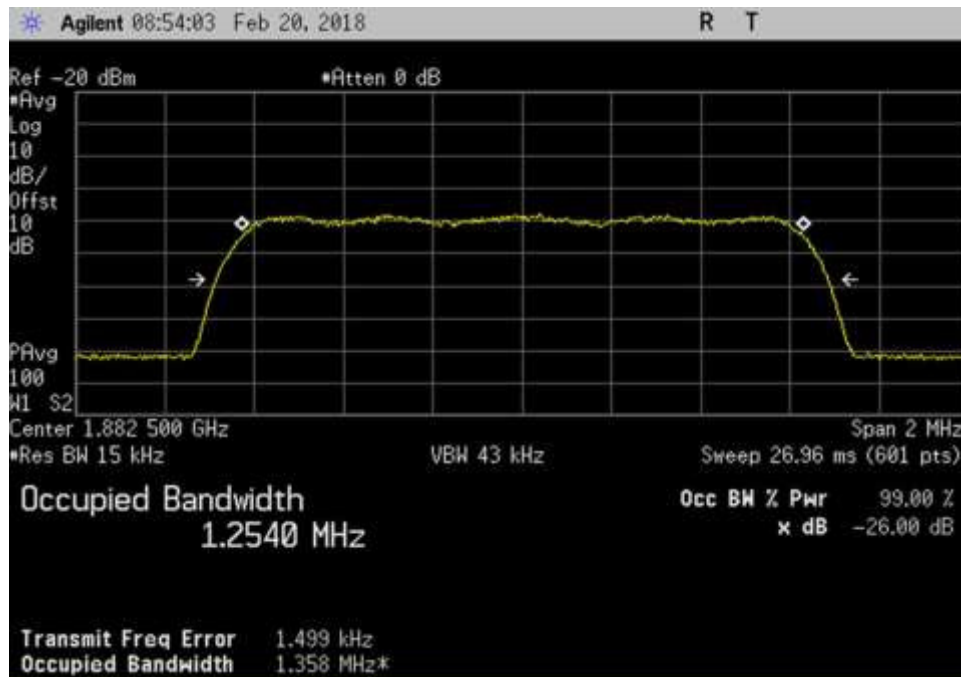
UL_776-787_CDMA_781.5MHz



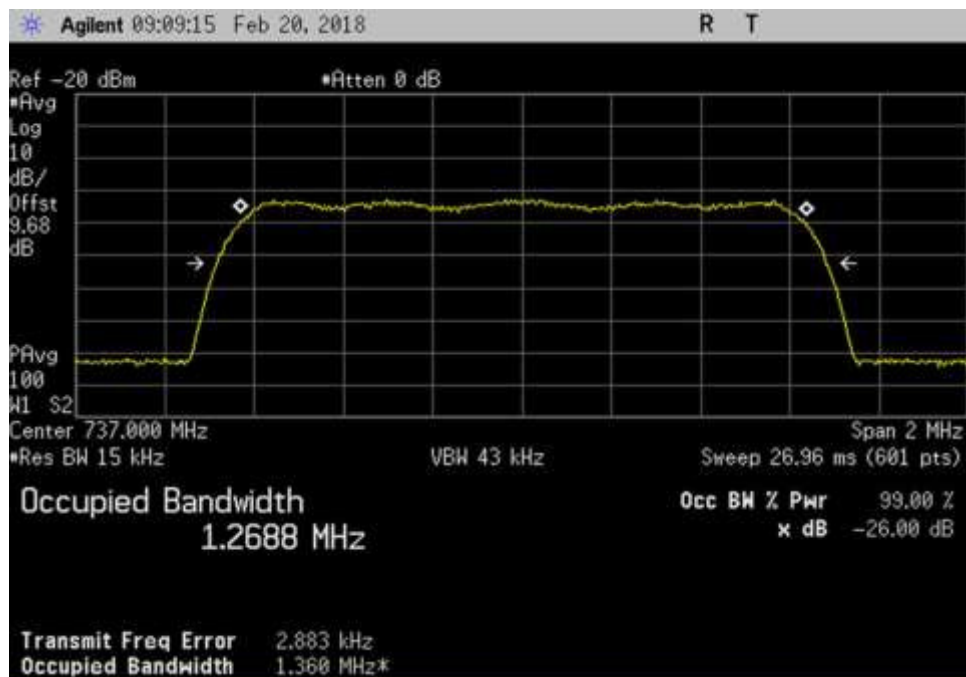
UL_824-849_CDMA_ 836.5MHz



UL_1710-1755_CDMA_ 1732.5MHz



UL_1850-1915_CDMA_1882.5MHz



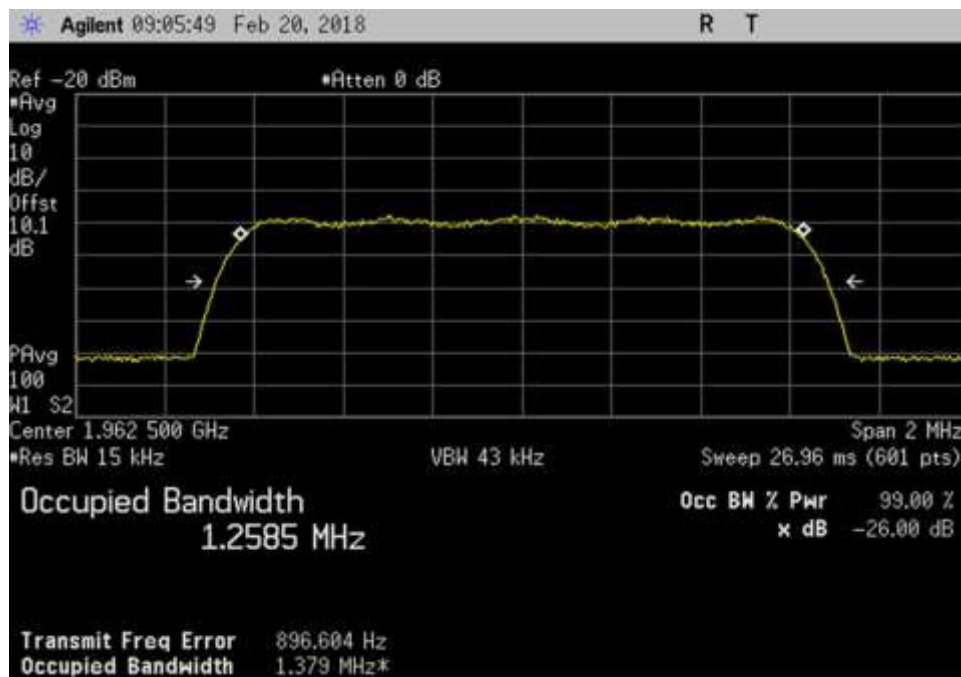
DL_728-746_CDMA_737MHz



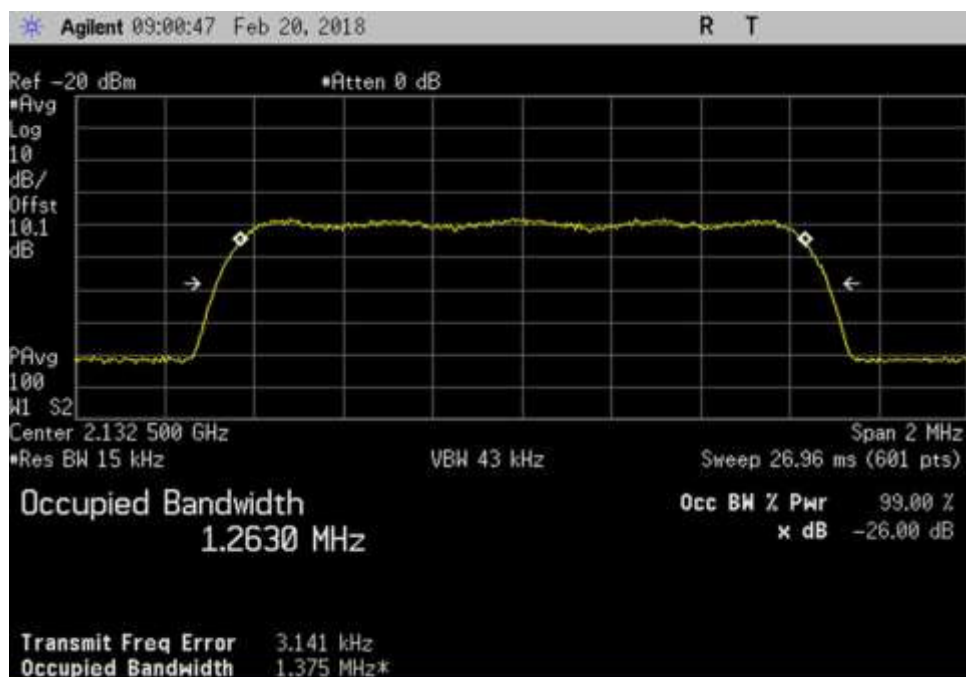
DL_746-757_CDMA_751.5MHz



DL_869-894_CDMA_881.5MHz



DL_1930-1995_CDMA_ 1962.5MHz

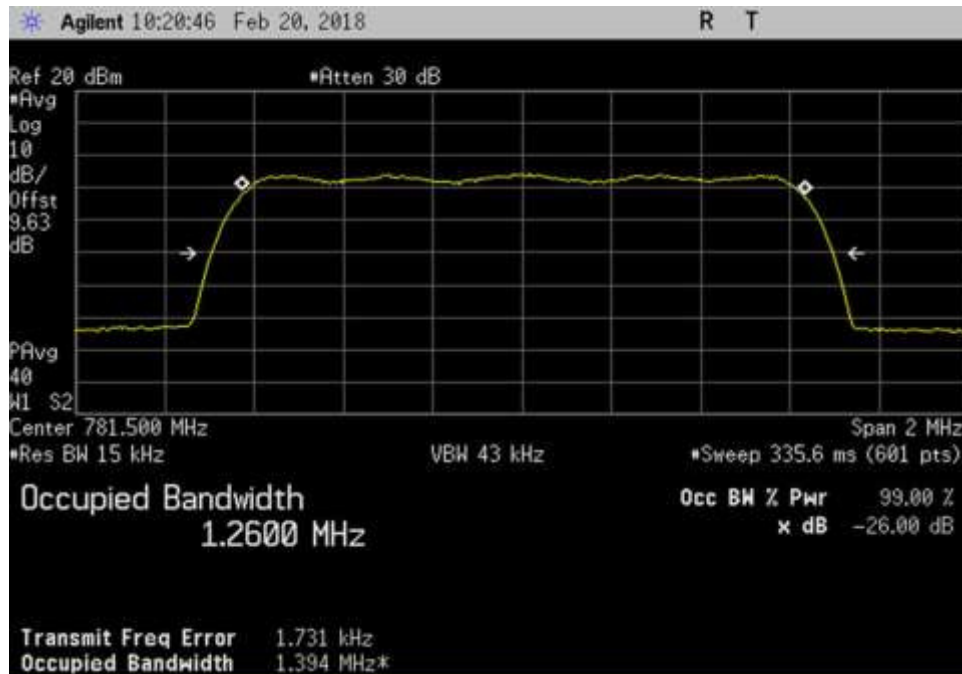


DL_2110-2155_CDMA_ 2132.5MHz

CDMA Output



UL_698-716_CDMA_707MHz



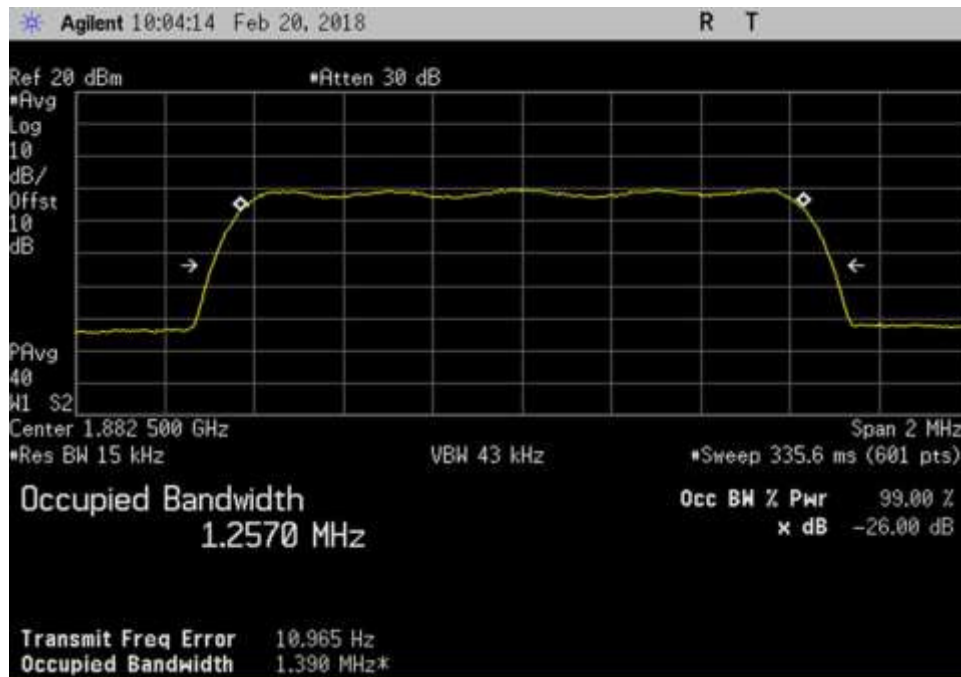
UL_776-787_CDMA_781.5MHz



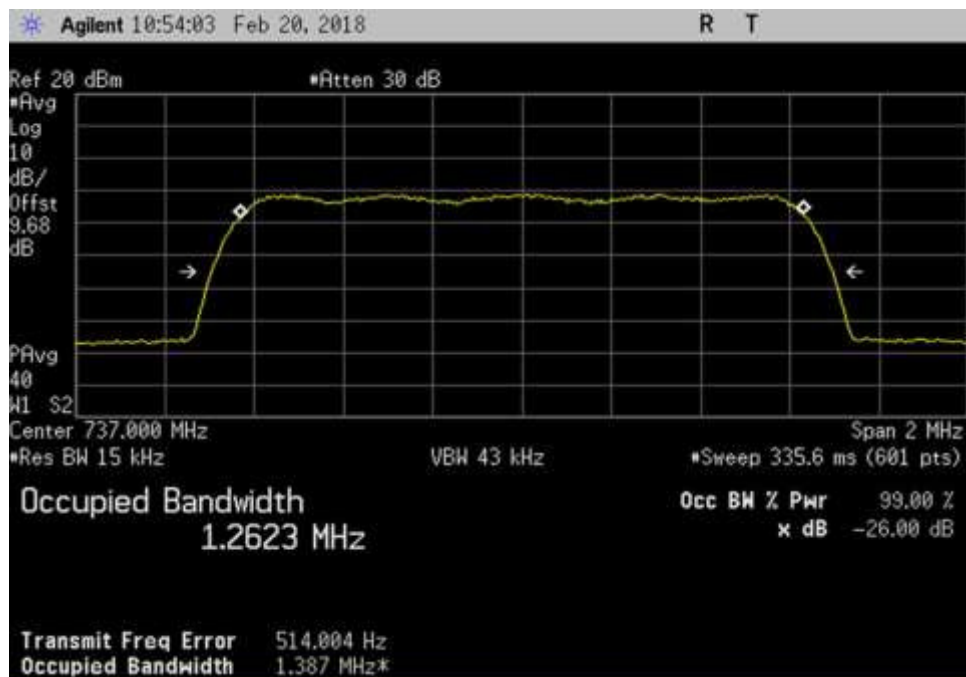
UL_824-849_CDMA_ 836.5MHz



UL_1710-1755_CDMA_ 1732.5MHz



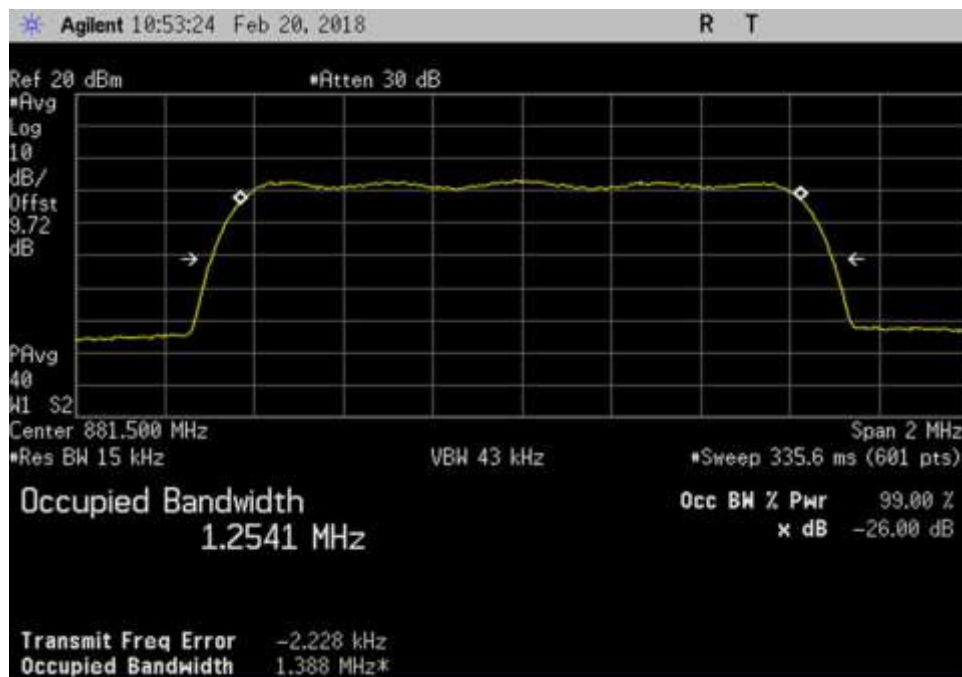
UL_1850-1915_CDMA_1882.5MHz



DL_728-746_CDMA_737MHz



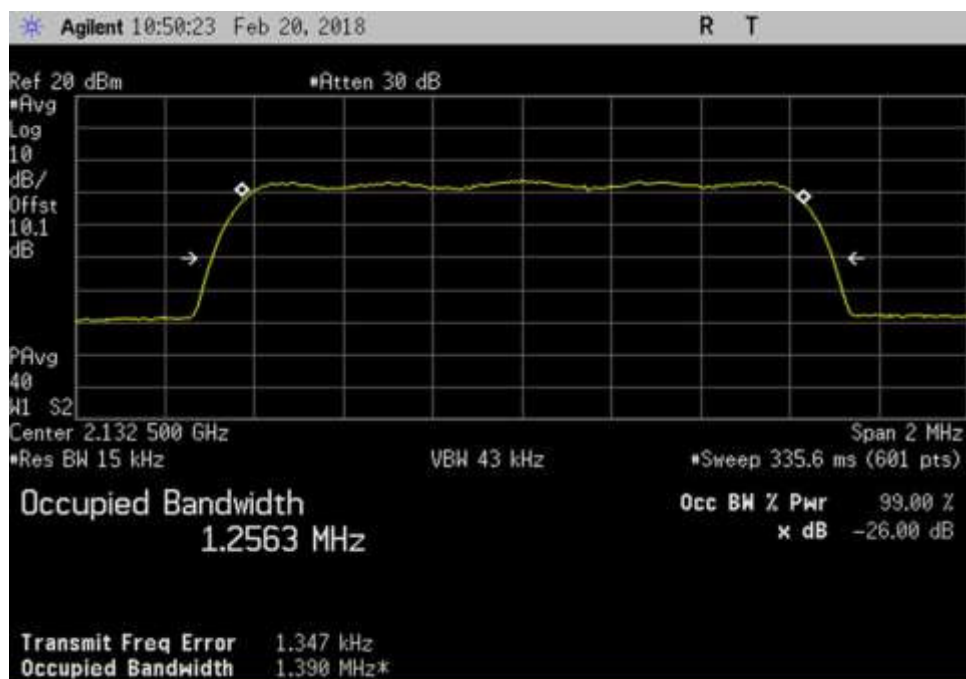
DL_746-757_CDMA_751.5MHz



DL_869-894_CDMA_881.5MHz

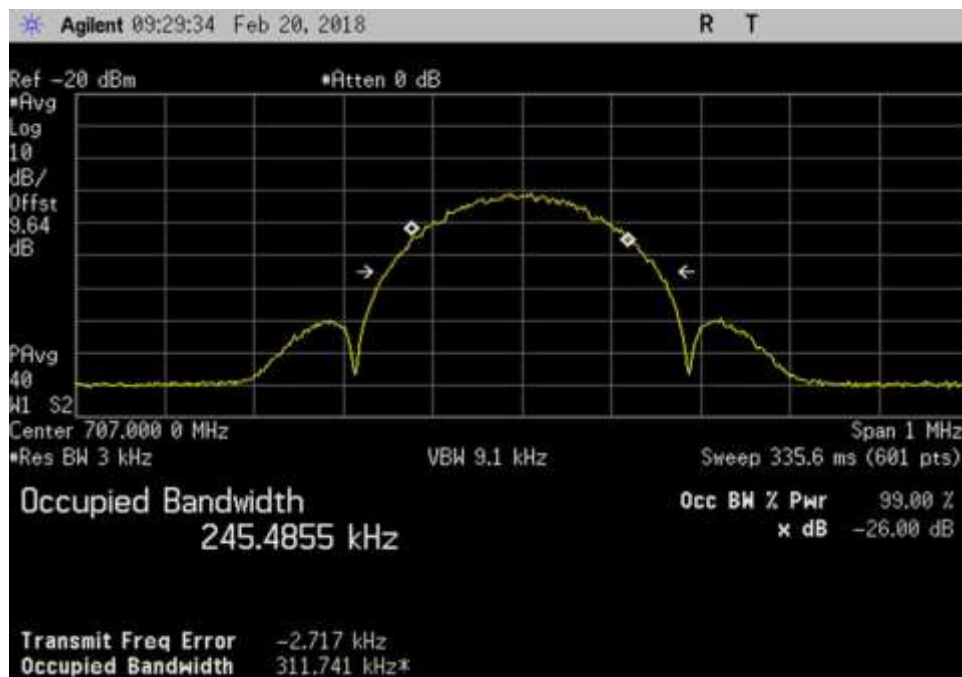


DL_1930-1995_CDMA_ 1962.5MHz

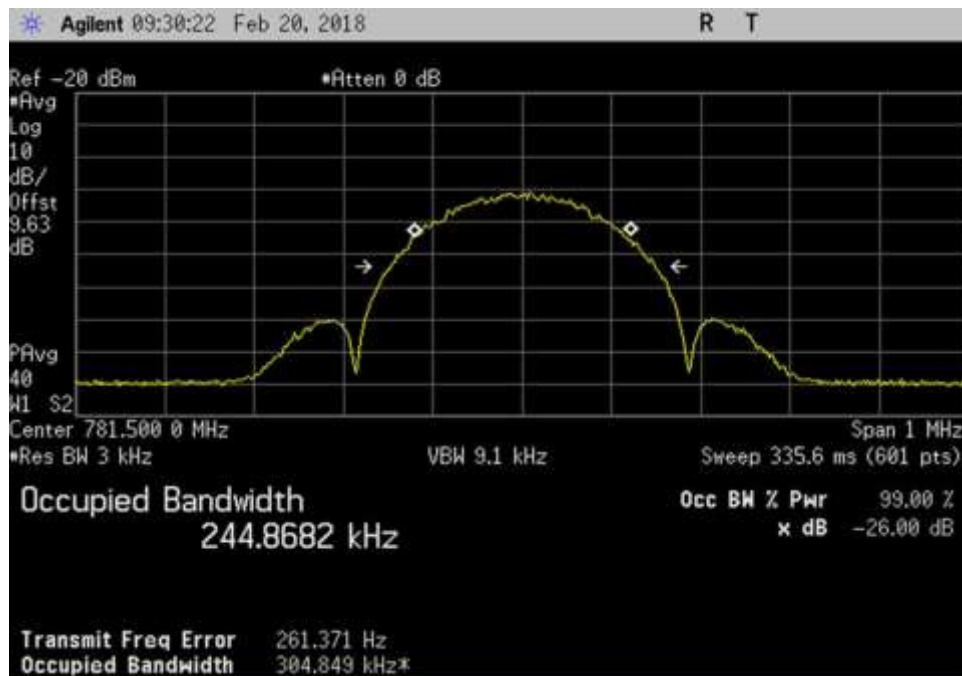


DL_2110-2155_CDMA_ 2132.5MHz

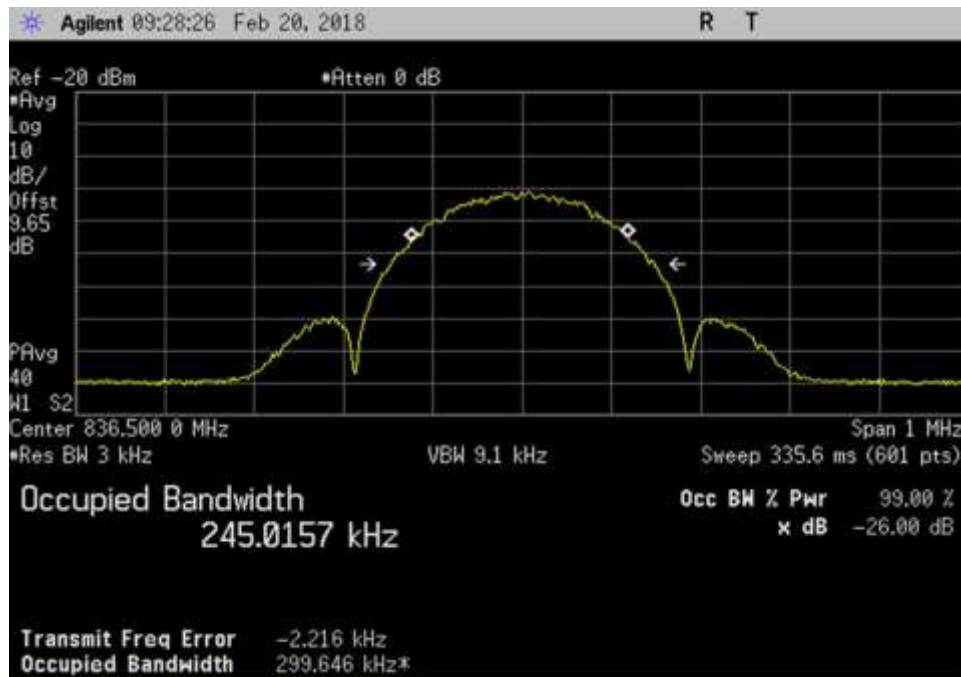
EDGE Input



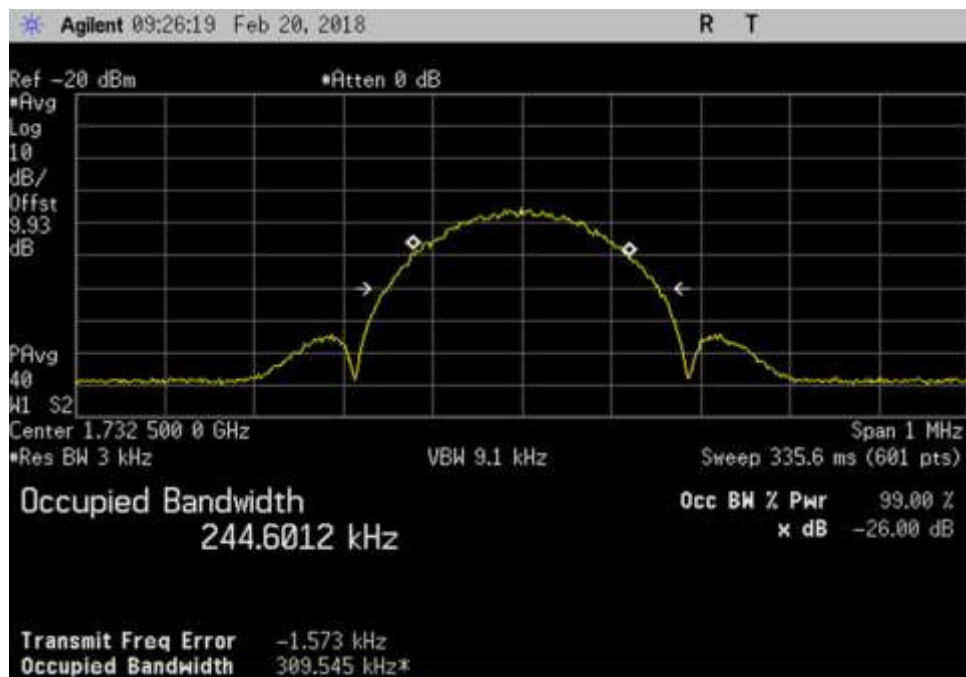
UL_698-716_EDGE_707MHz



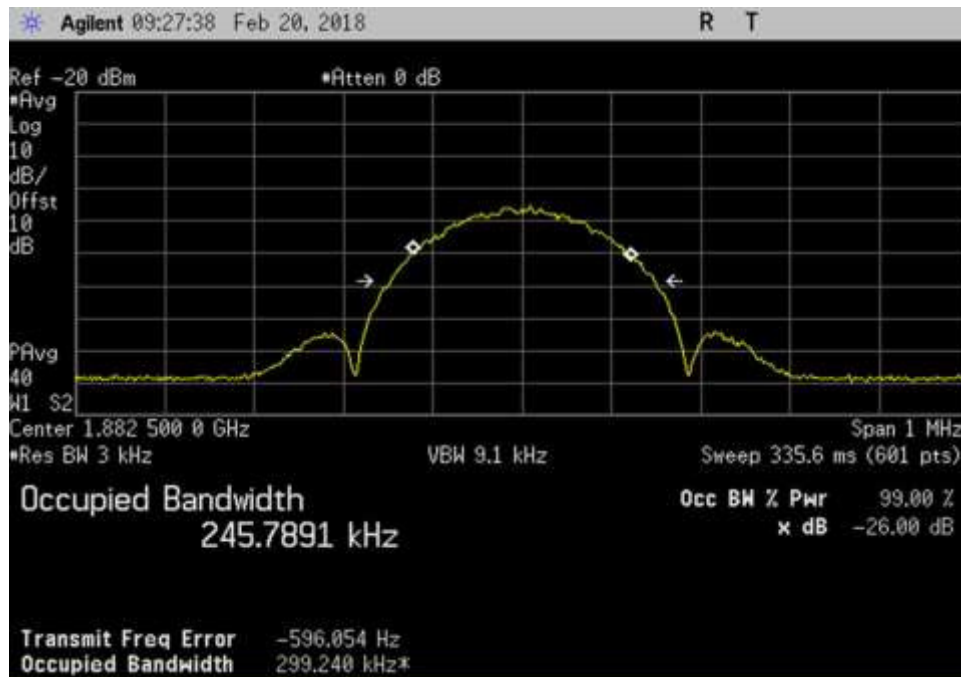
UL_776-787_EDGE_781.5MHz



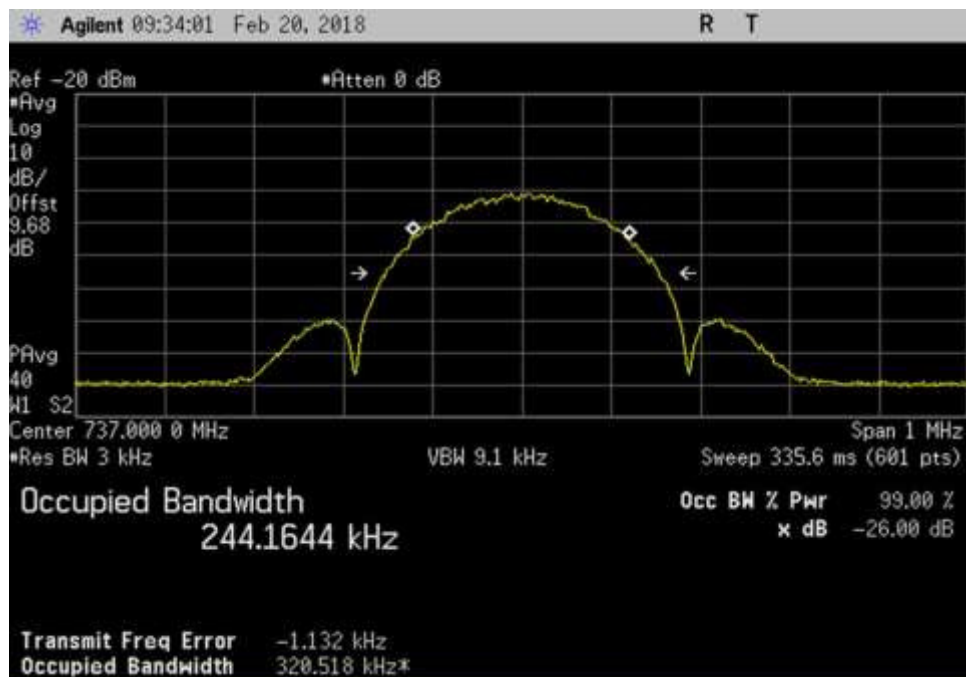
UL_824-849_EDGE_ 836.5MHz



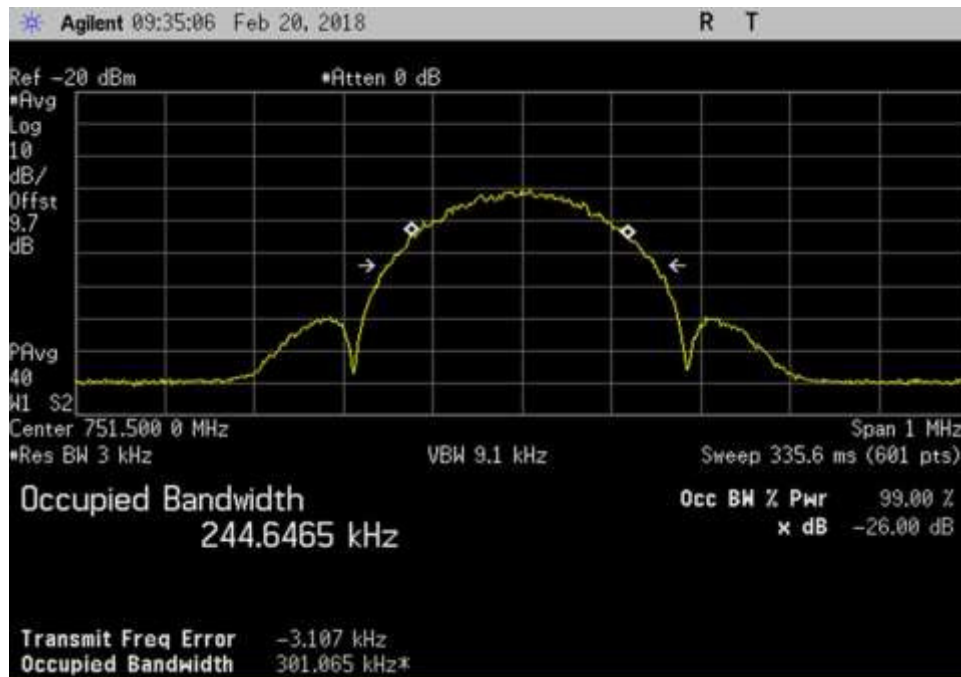
UL_1710-1755_EDGE_ 1732.5MHz



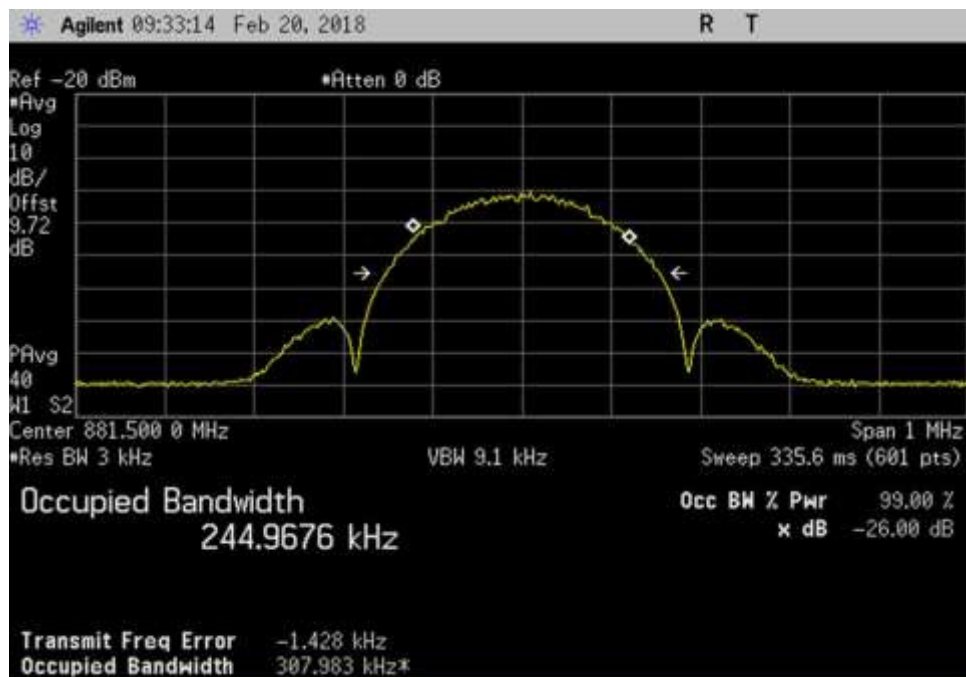
UL_1850-1915_EDGE_1882.5MHz



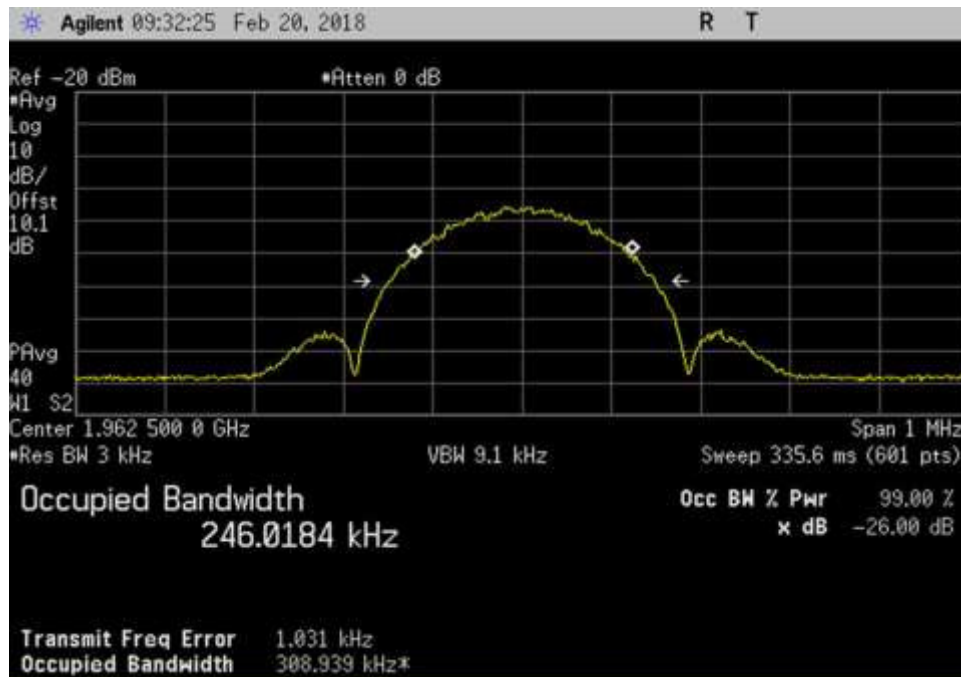
DL_728-746_EDGE_737MHz



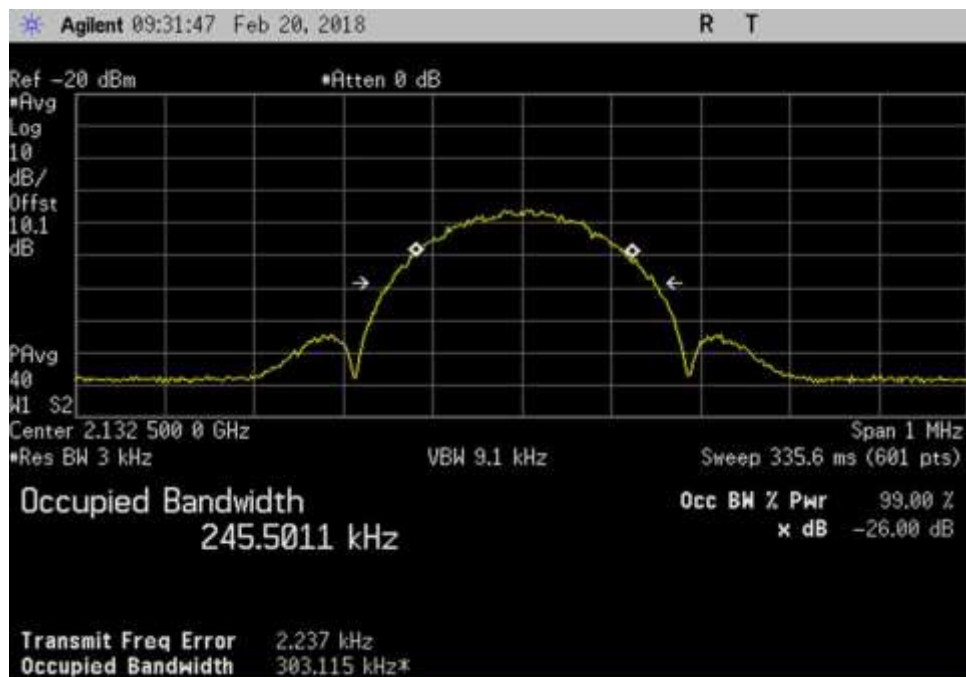
DL_746-757_EDGE_ 751.5MHz



DL_869-894_EDGE_ 881.5MHz

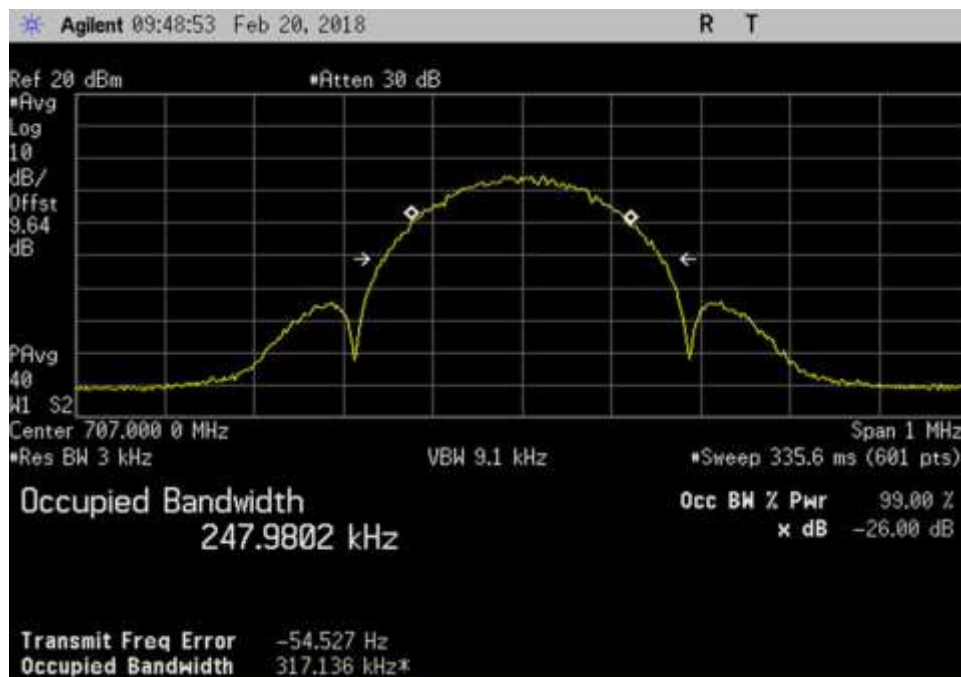


DL_1930-1995_EDGE_1962.5MHz

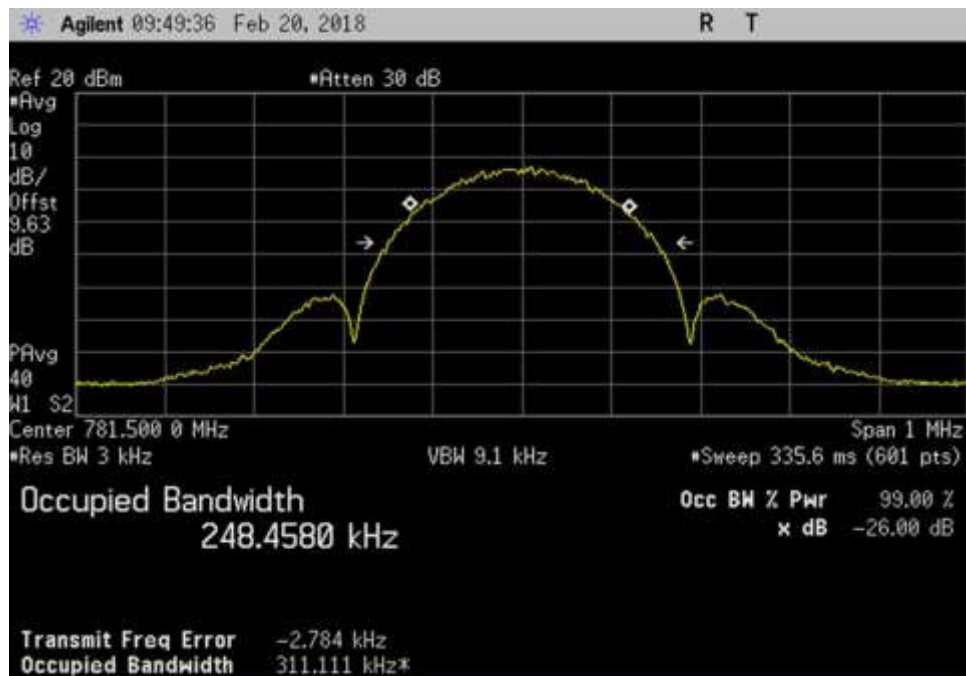


DL_2110-2155_EDGE_2132.5MHz

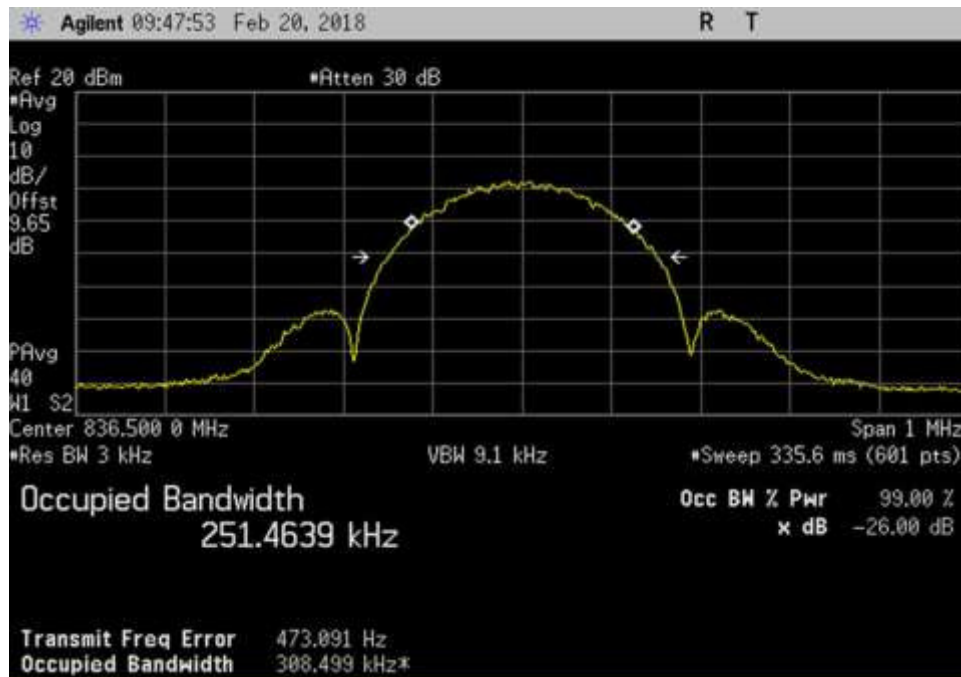
EDGE Output



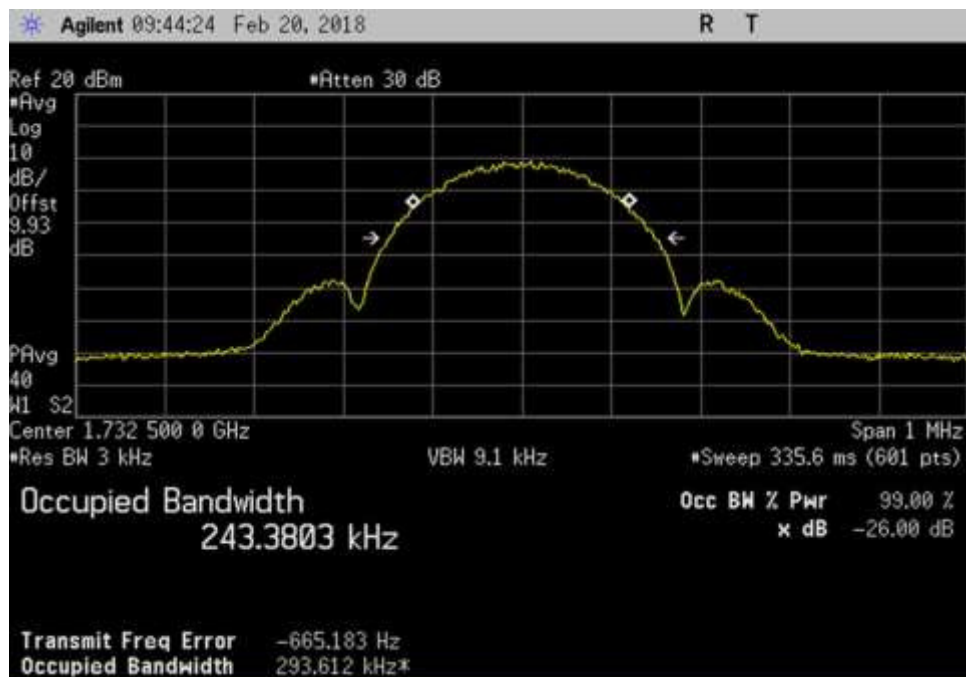
UL_698-716_EDGE_707MHz



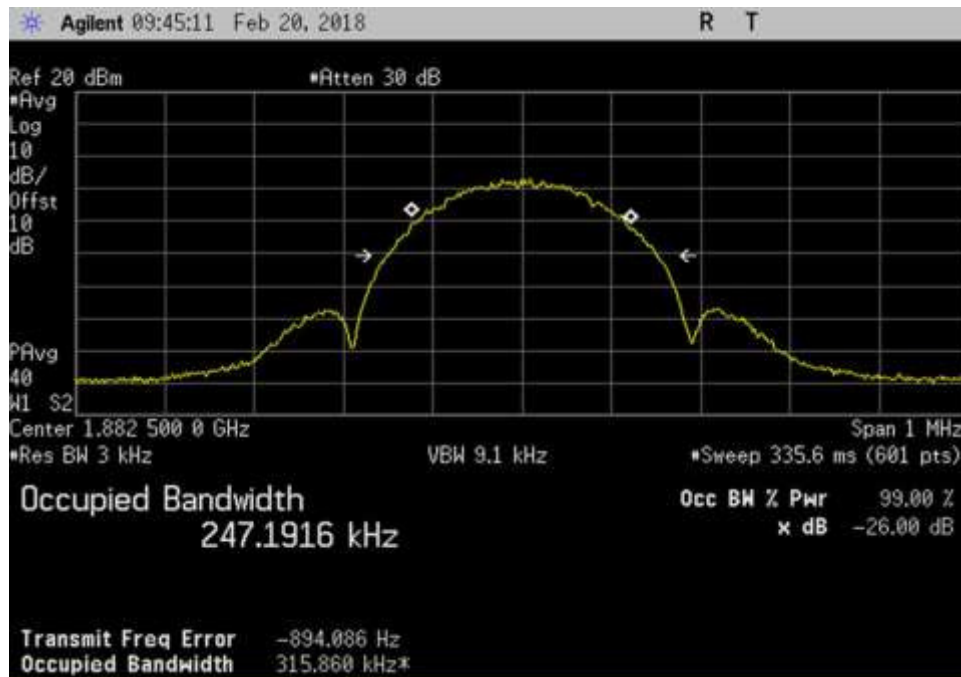
UL_776-787_EDGE_781.5MHz



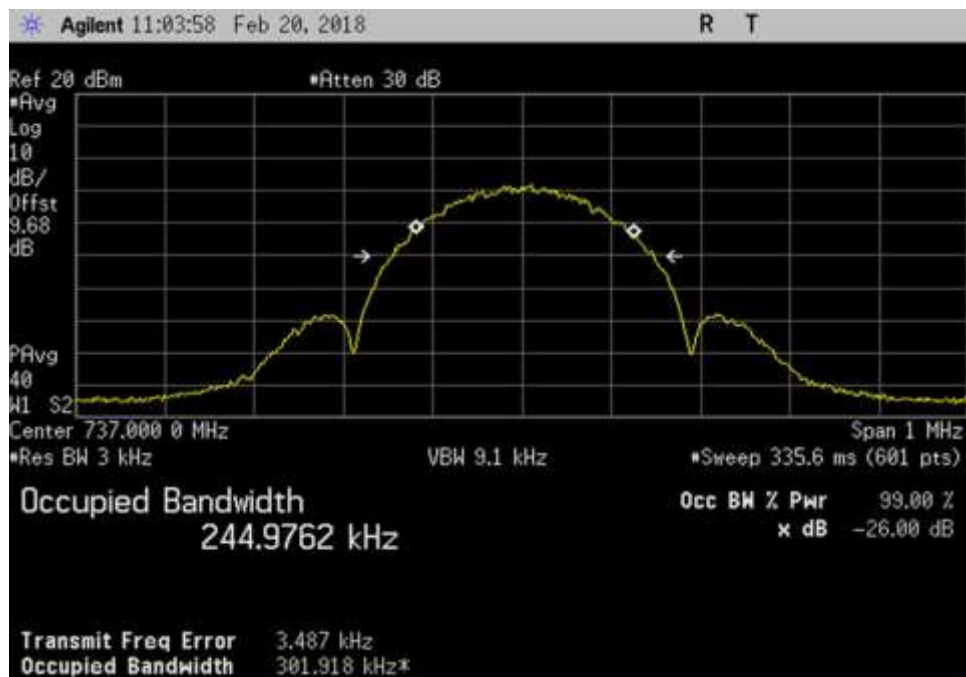
UL_824-849_EDGE_ 836.5MHz



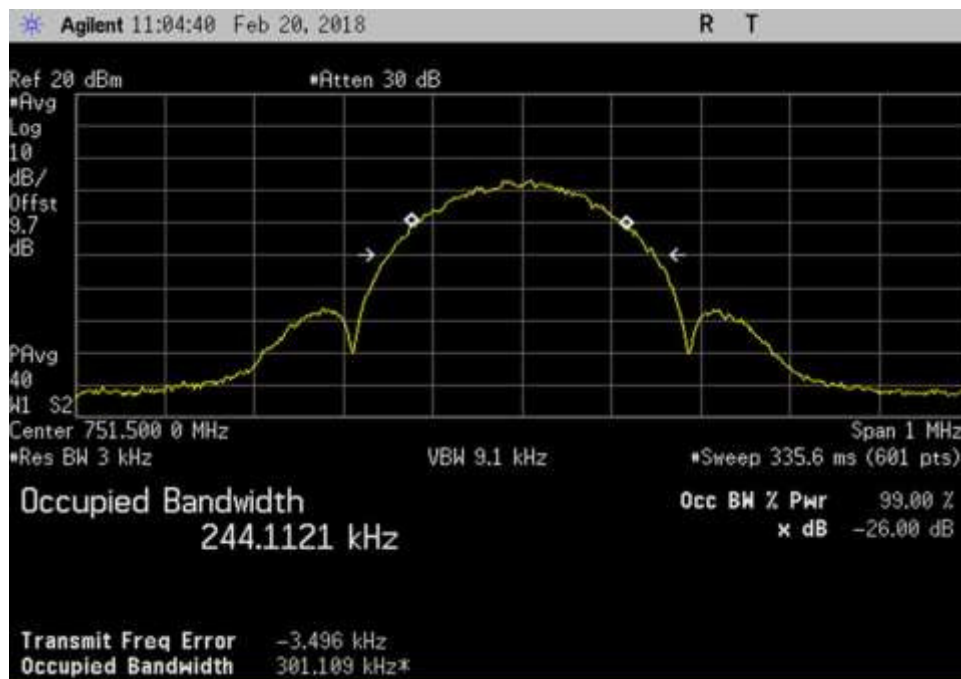
UL_1710-1755_EDGE_ 1732.5MHz



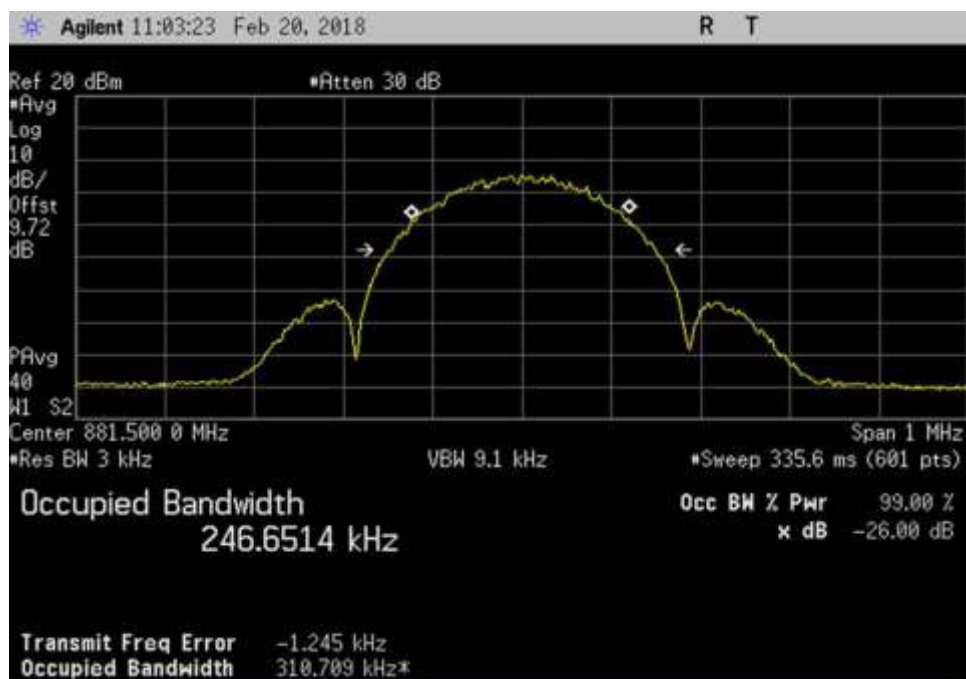
UL_1850-1915_EDGE_1882.5MHz



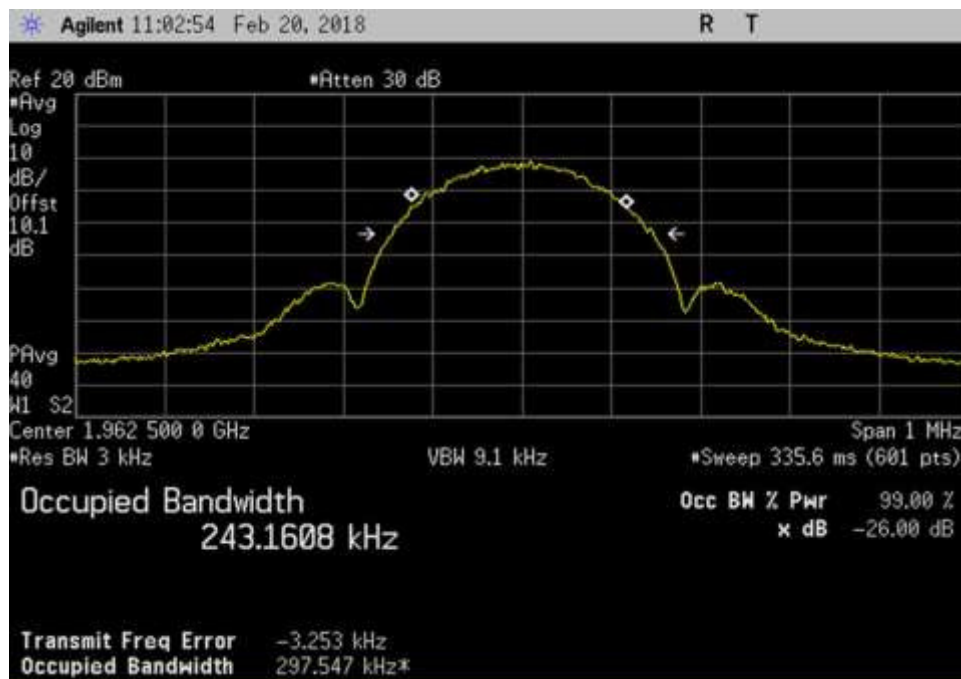
DL_728-746_EDGE_737MHz



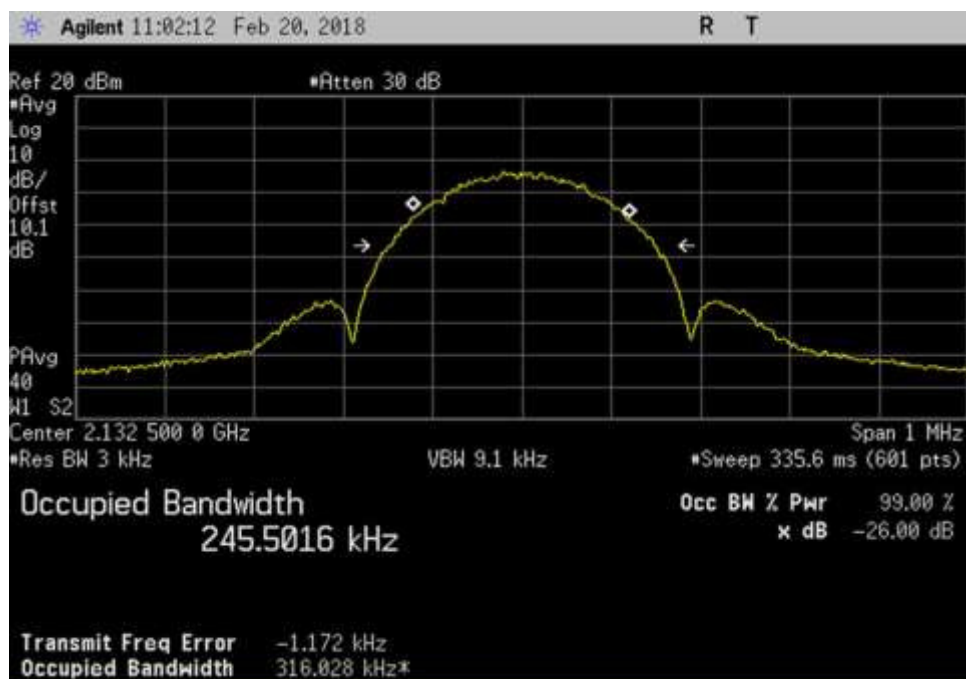
DL_746-757_EDGE_ 751.5MHz



DL_869-894_EDGE_ 881.5MHz

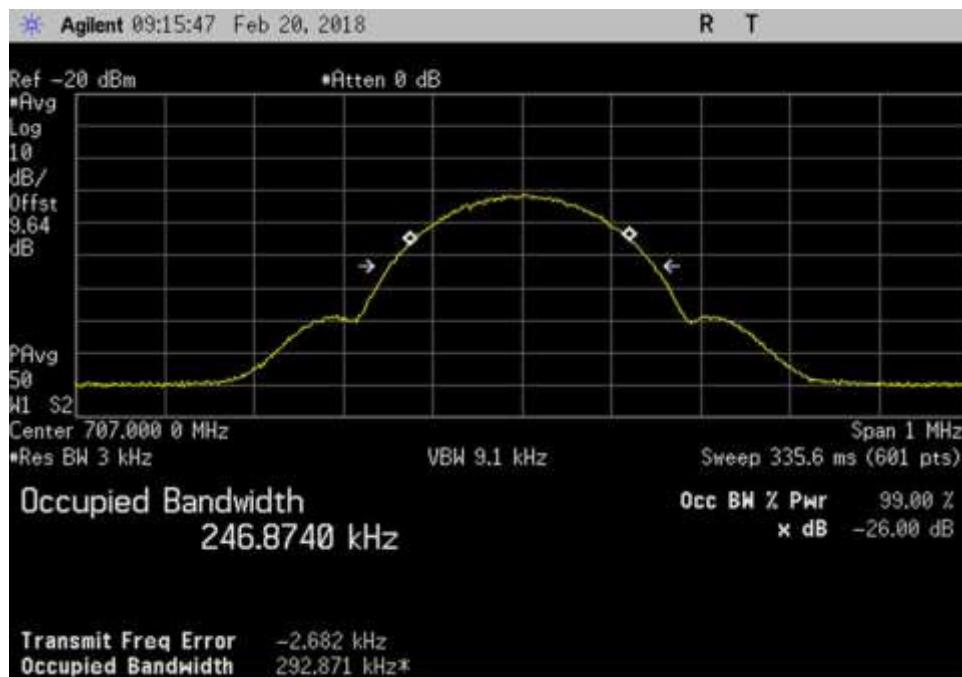


DL_1930-1995_EDGE_1962.5MHz

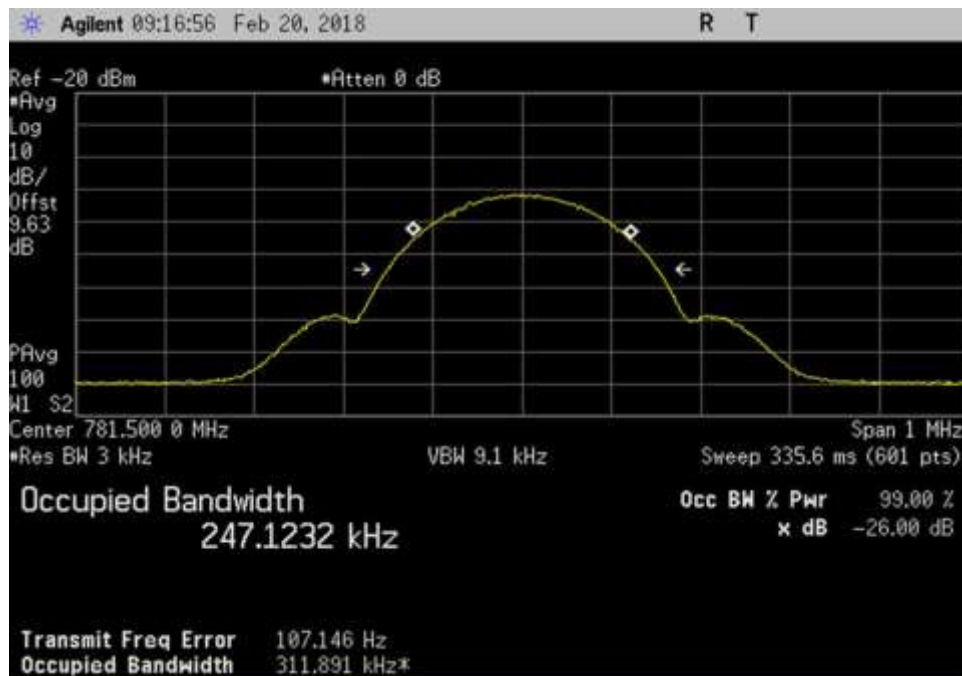


DL_2110-2155_EDGE_2132.5MHz

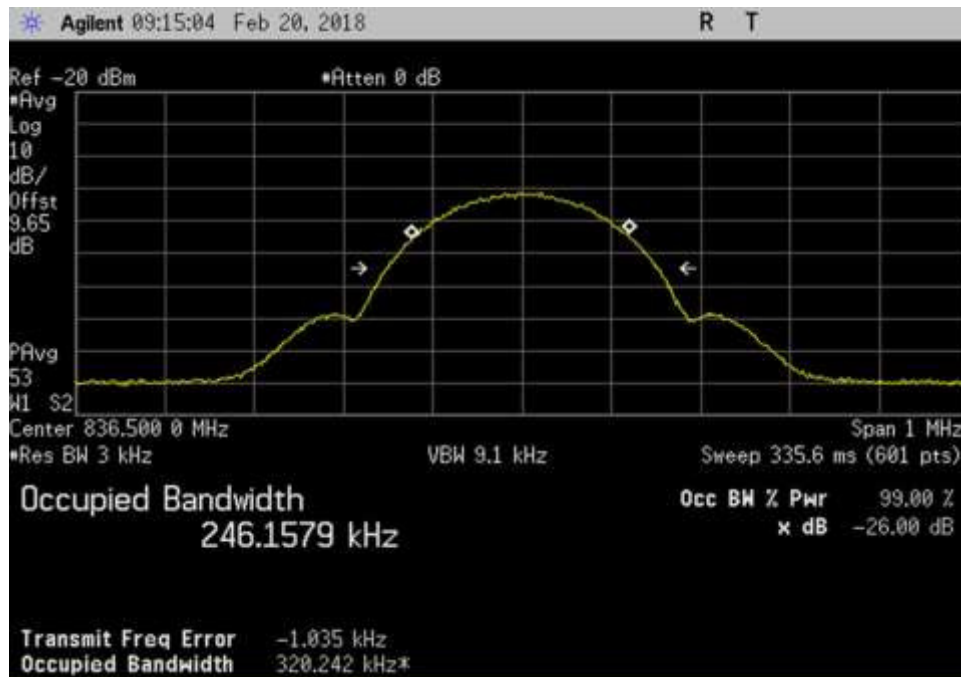
GSM Input



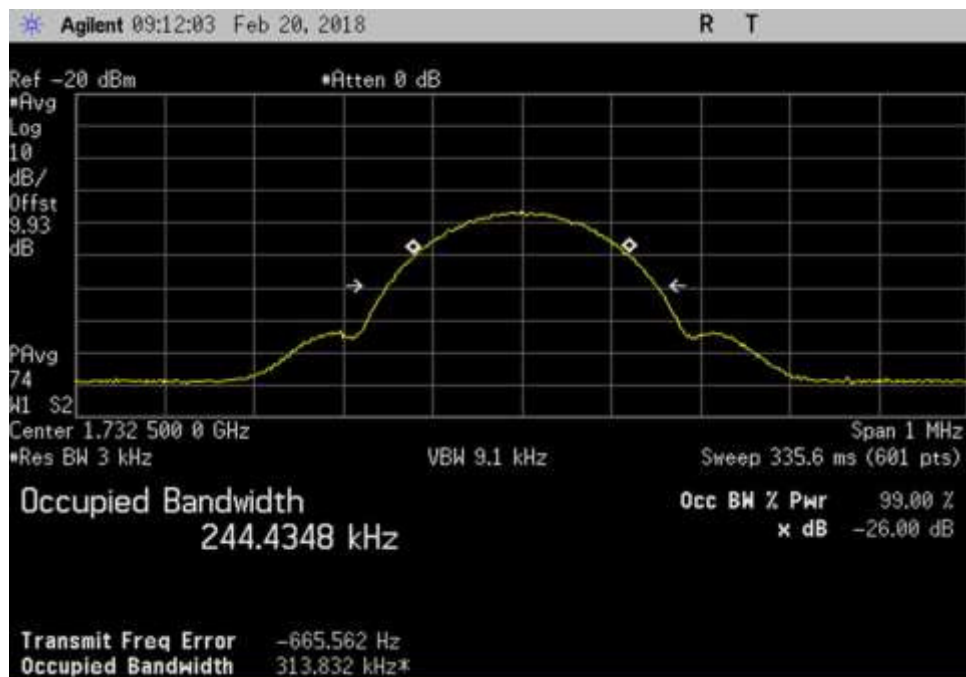
UL_698-716_GSM_ 707MHz



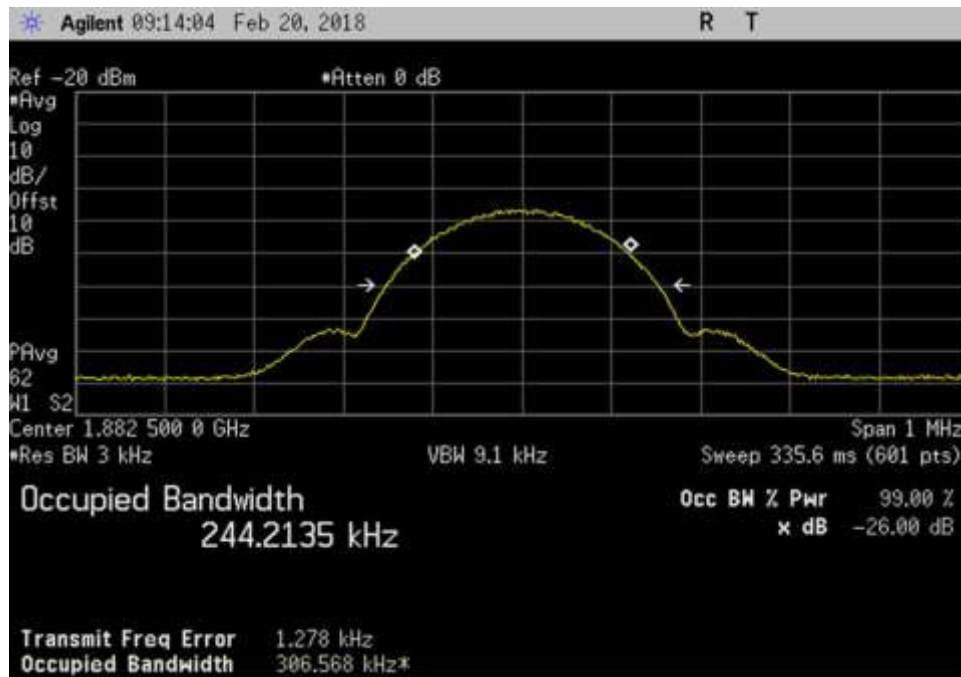
UL_776-787_GSM_ 781.5MHz



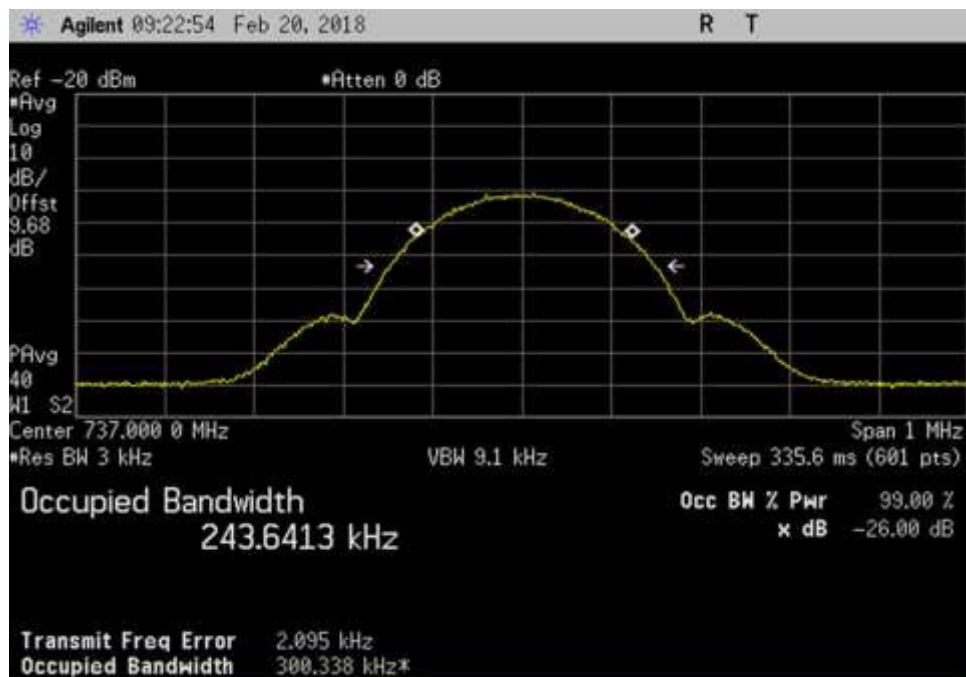
UL_824-849_GSM_ 836.5MHz



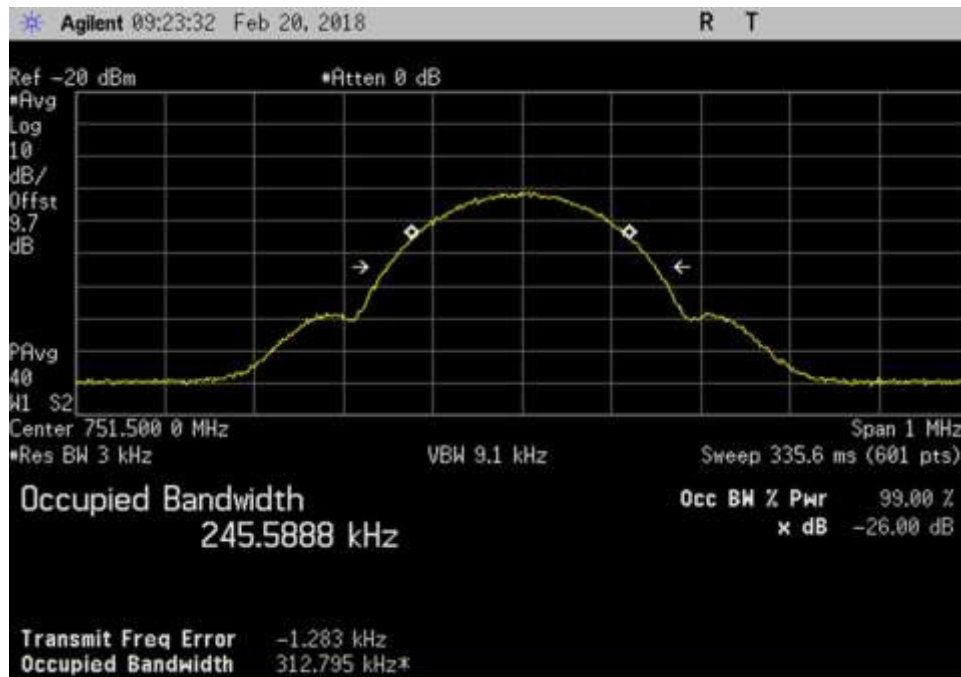
UL_1710-1755_GSM_ 1732.5MHz



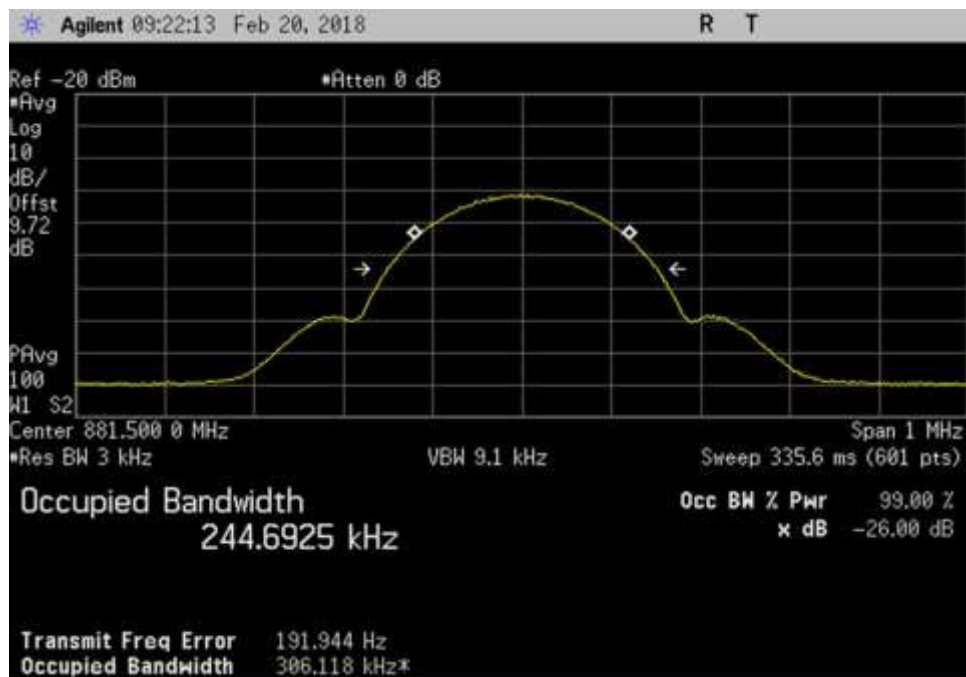
UL_1850-1915_GSM_1882.5MHz



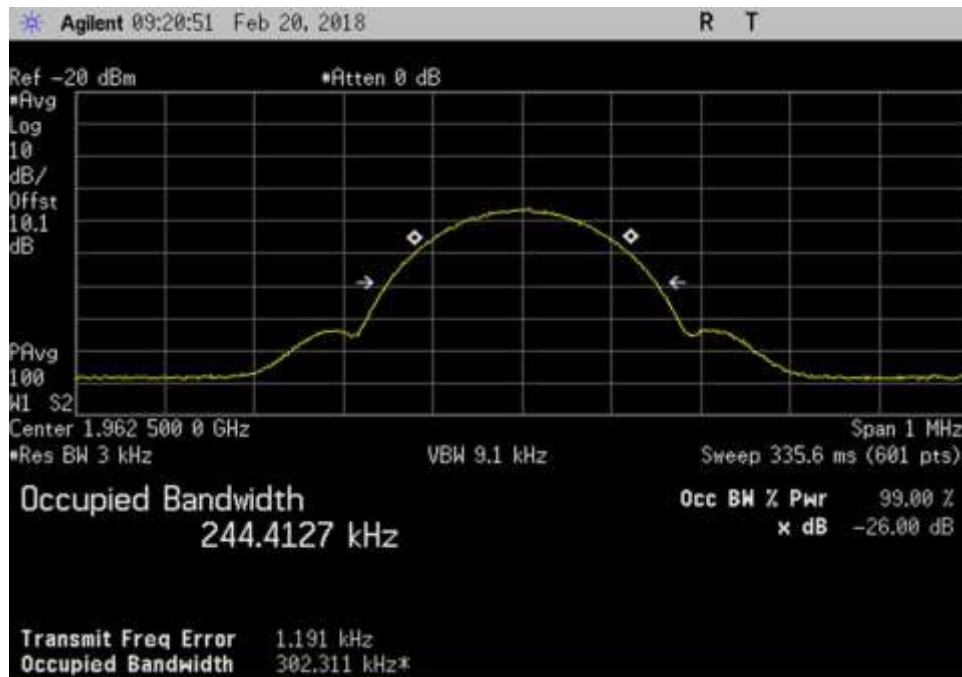
DL_728-746_GSM_737MHz



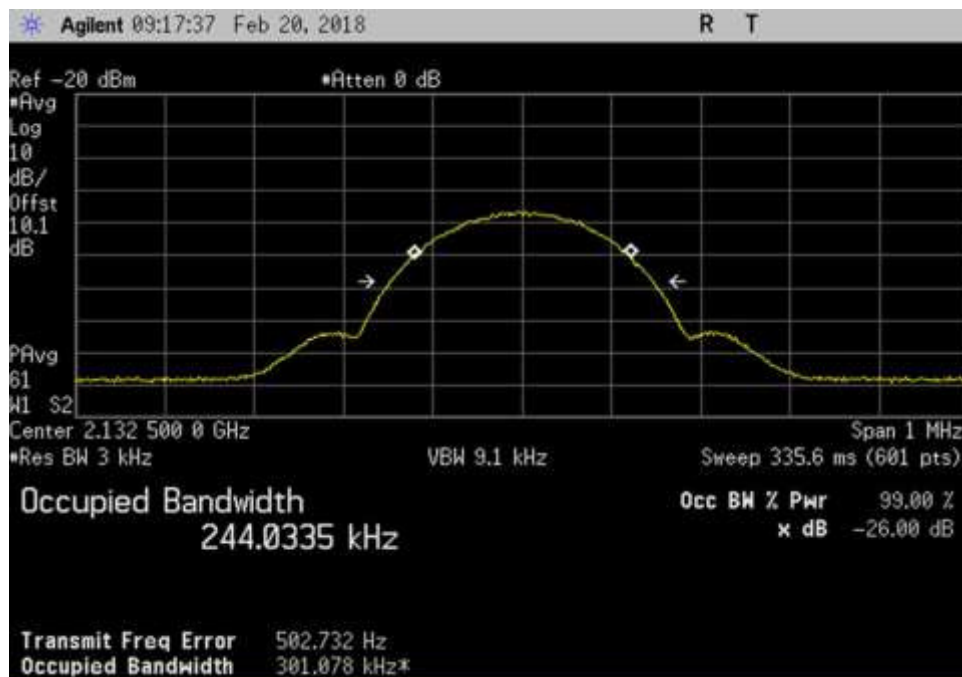
DL_746-757_GSM_ 751.5MHz



DL_869-894_GSM_ 881.5MHz

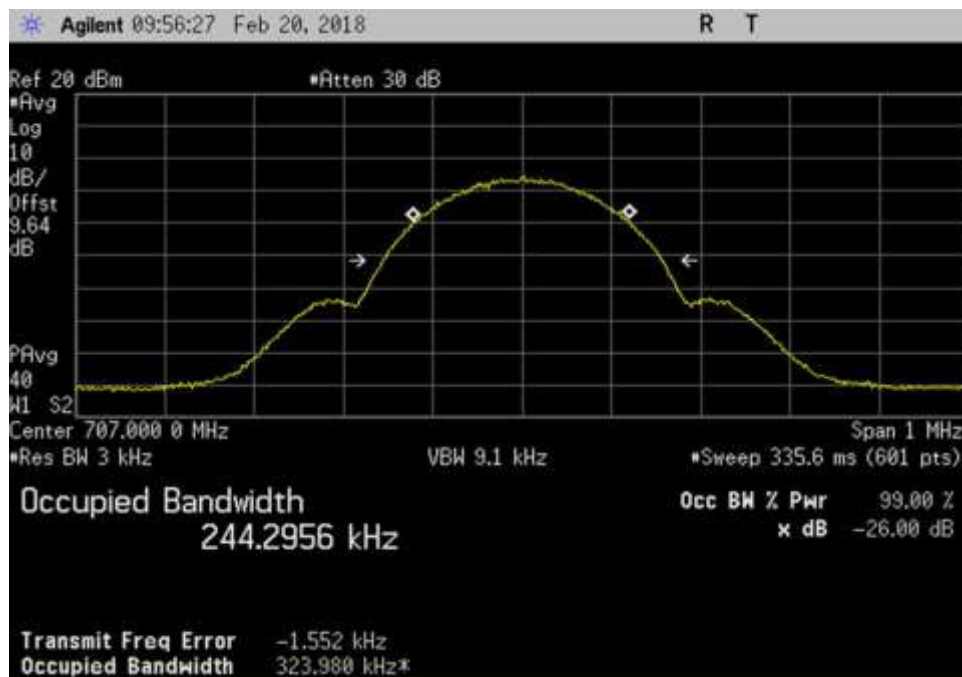


DL_1930-1995_GSM_1962.5MHz

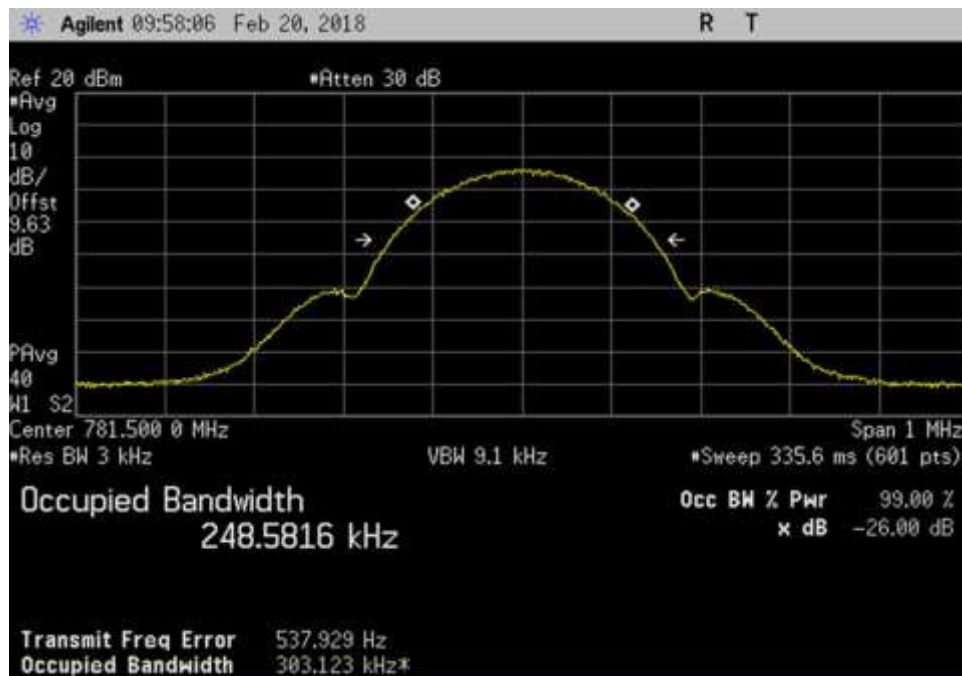


DL_2110-2155_GSM_2132.5MHz

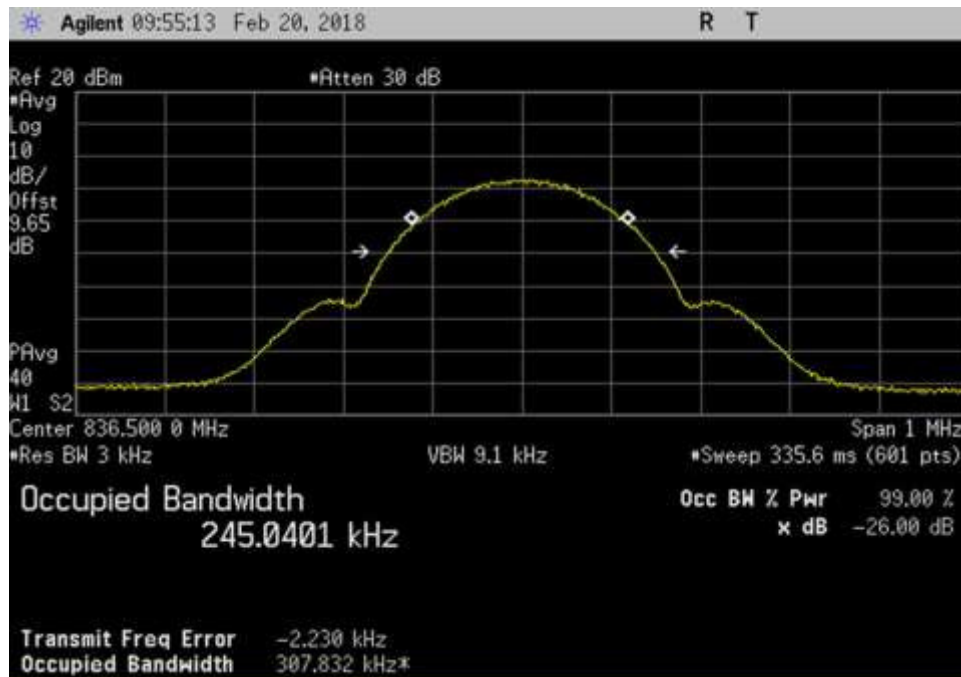
GSM Output



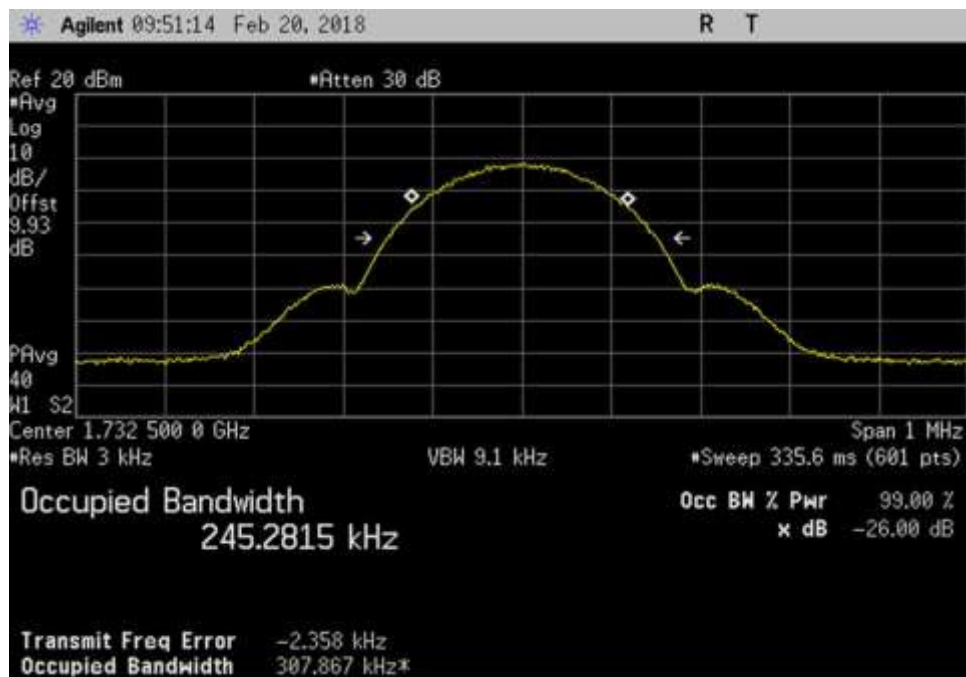
UL_698-716_GSM_ 707MHz



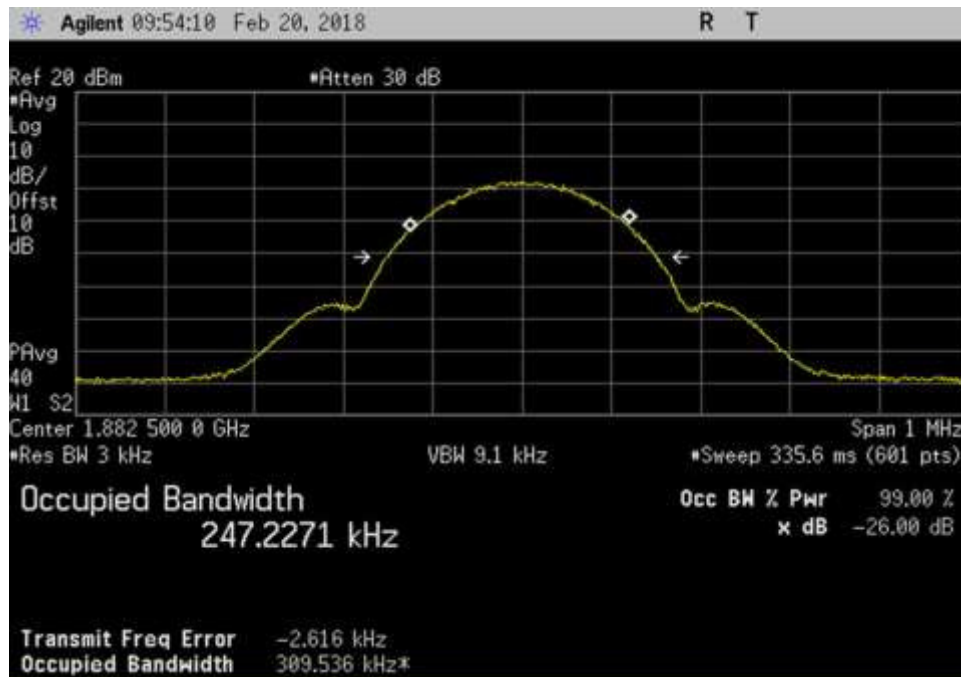
UL_776-787_GSM_ 781.5MHz



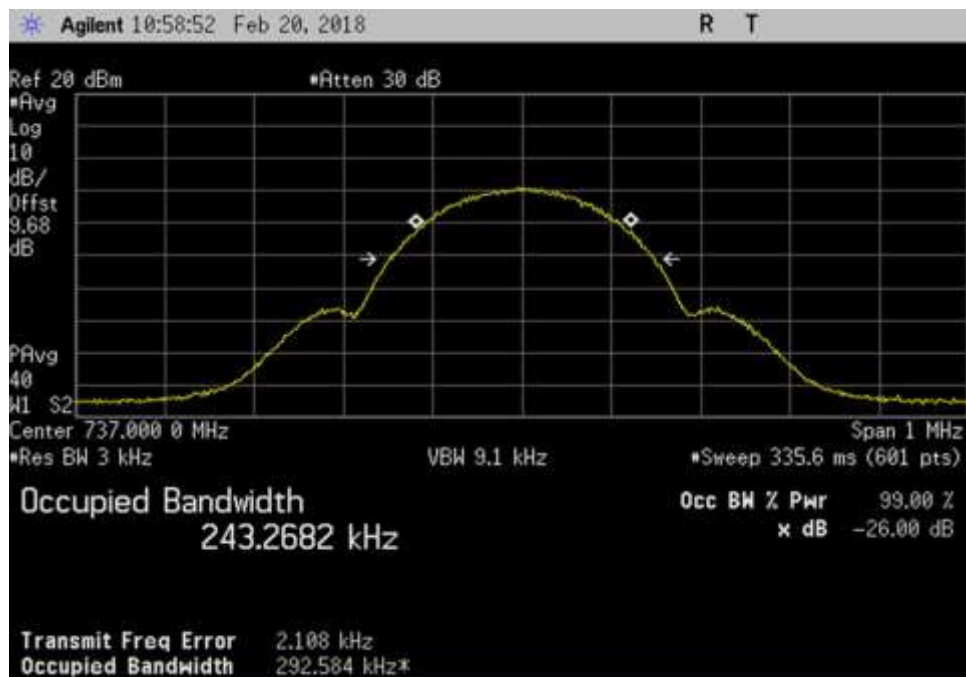
UL_824-849_GSM_836.5MHz



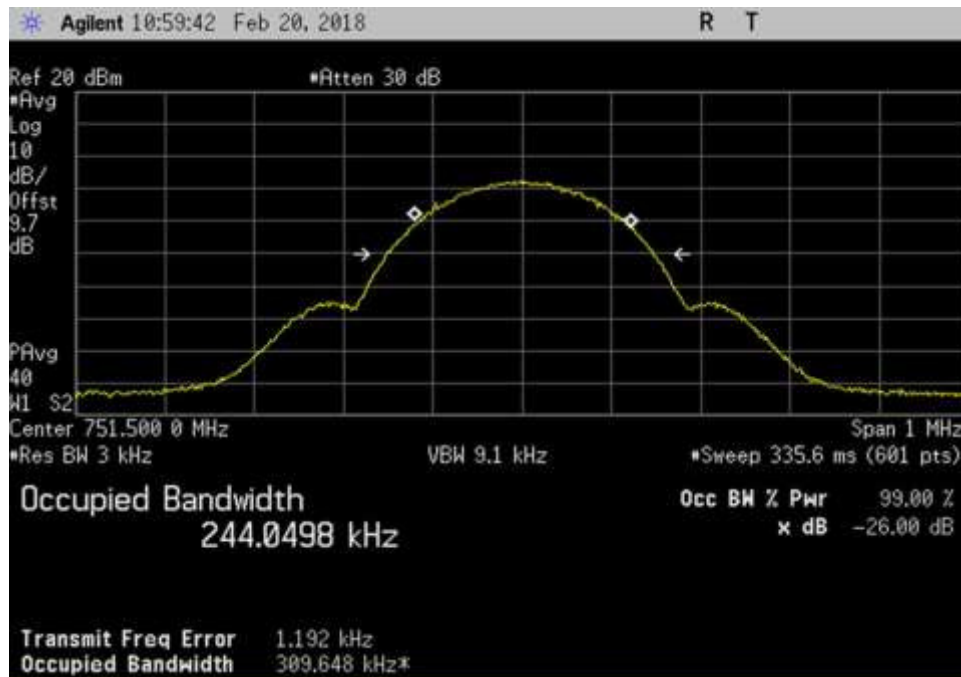
UL_1710-1755_GSM_1732.5MHz



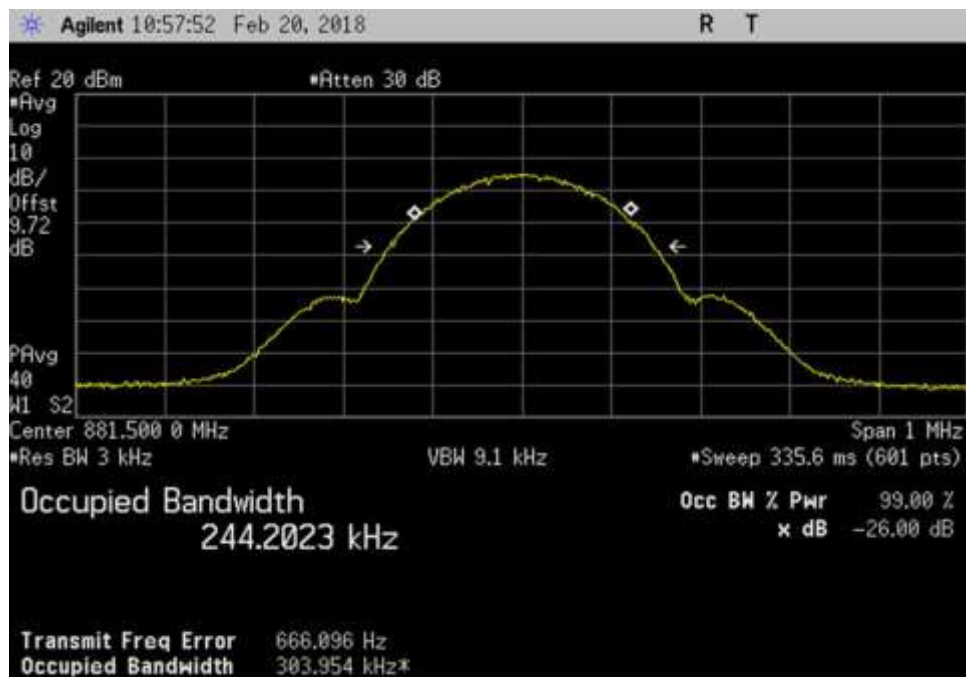
UL_1850-1915_GSM_1882.5MHz



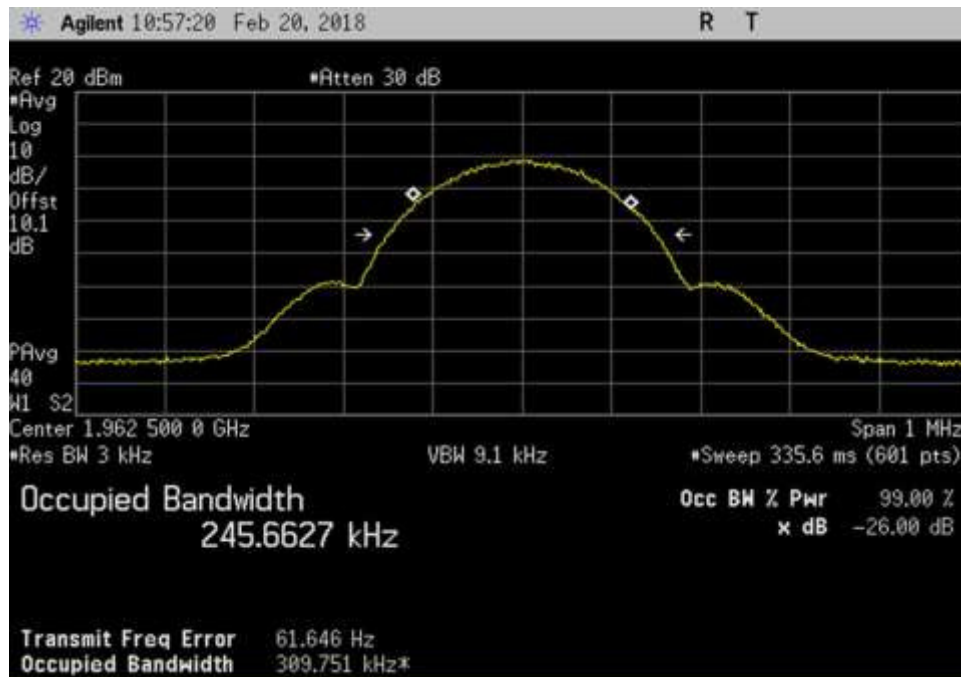
DL_728-746_GSM_737MHz



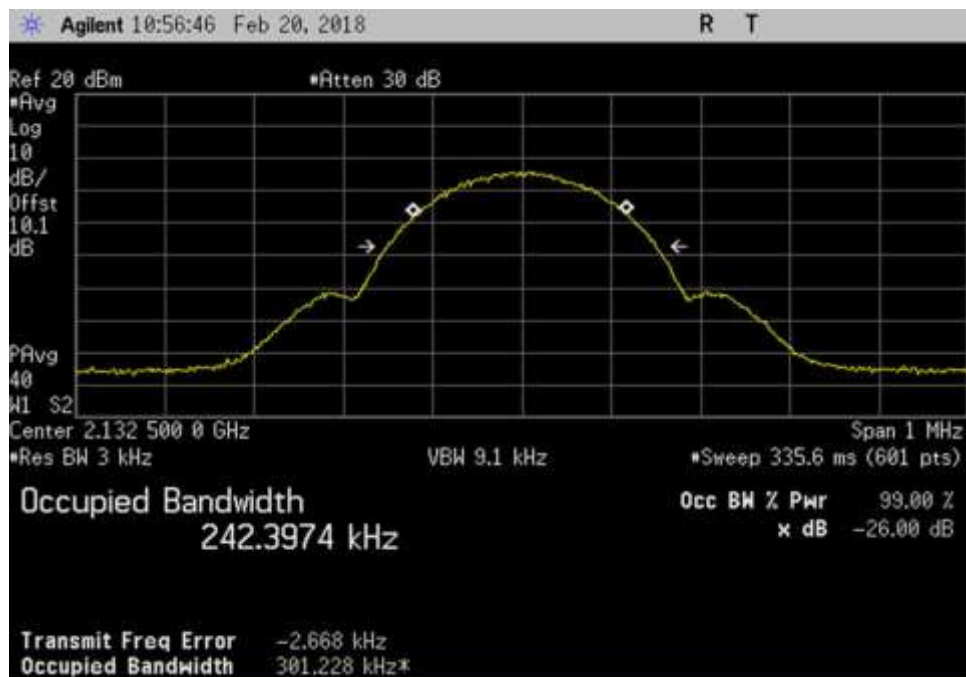
DL_746-757_GSM_ 751.5MHz



DL_869-894_GSM_ 881.5MHz

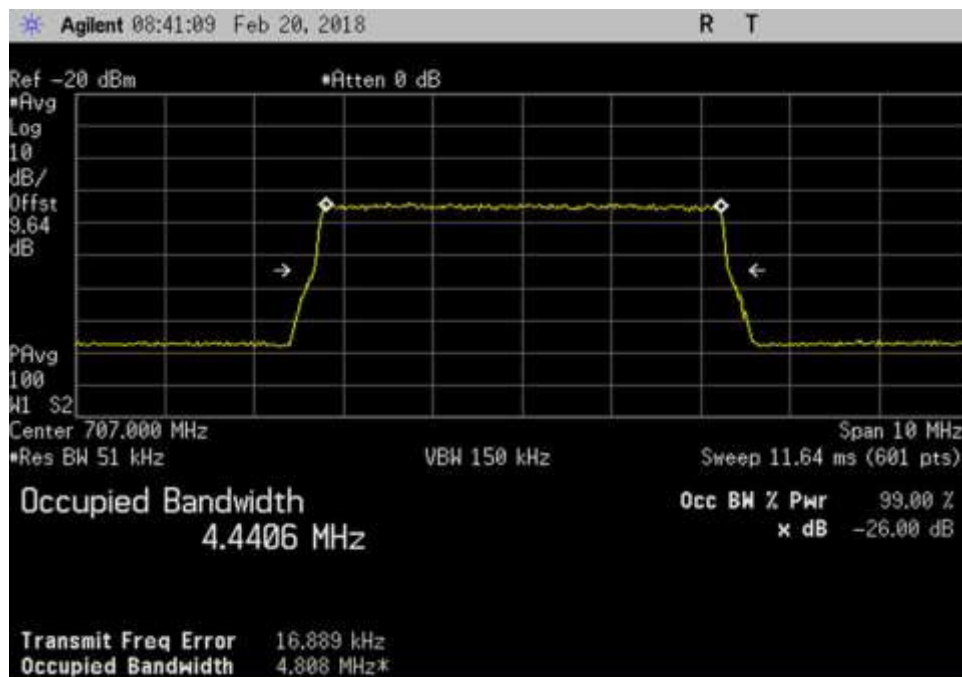


DL_1930-1995_GSM_1962.5MHz

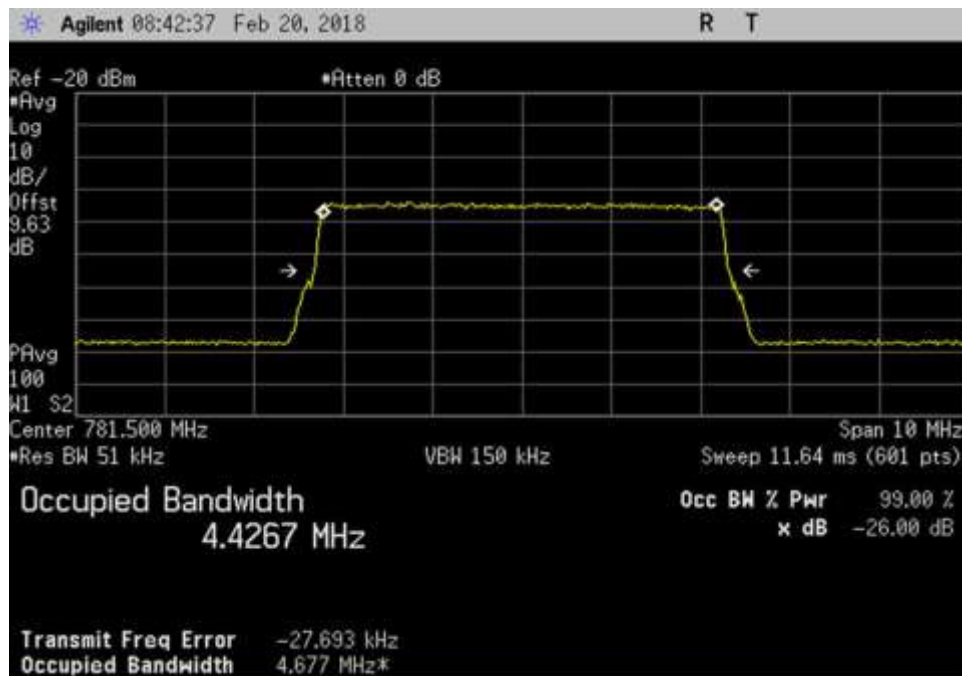


DL_2110-2155_GSM_2132.5MHz

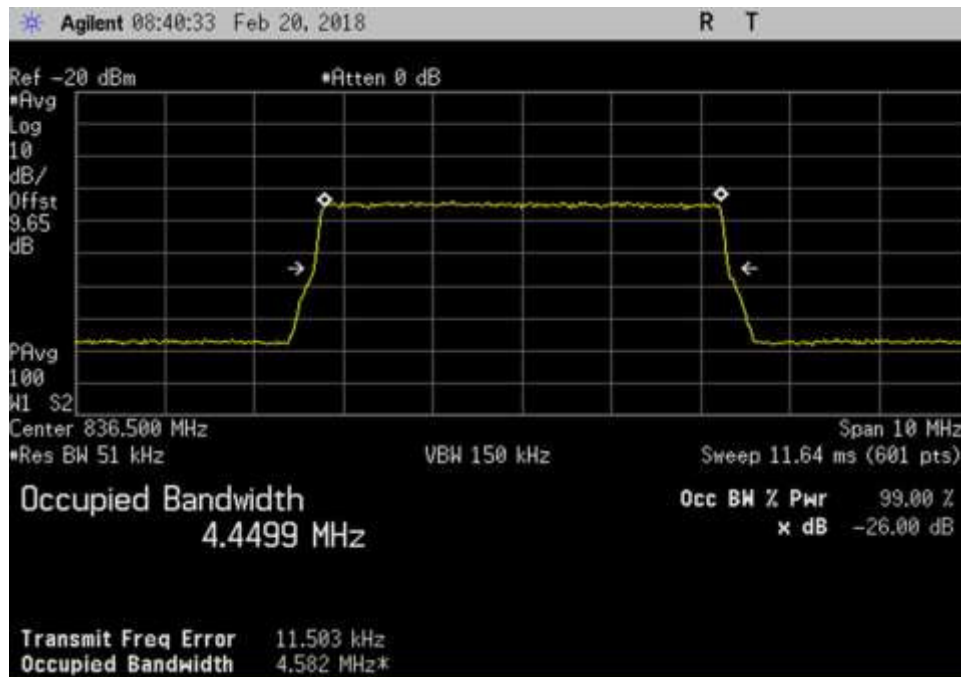
LTE Input



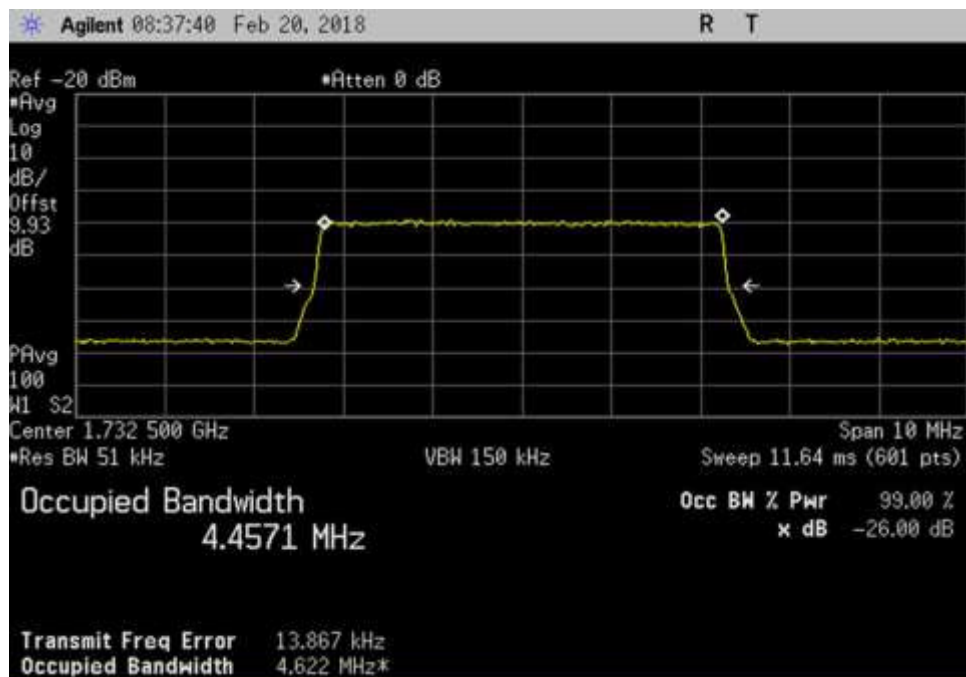
UL_698-716_LTE_ 707MHz



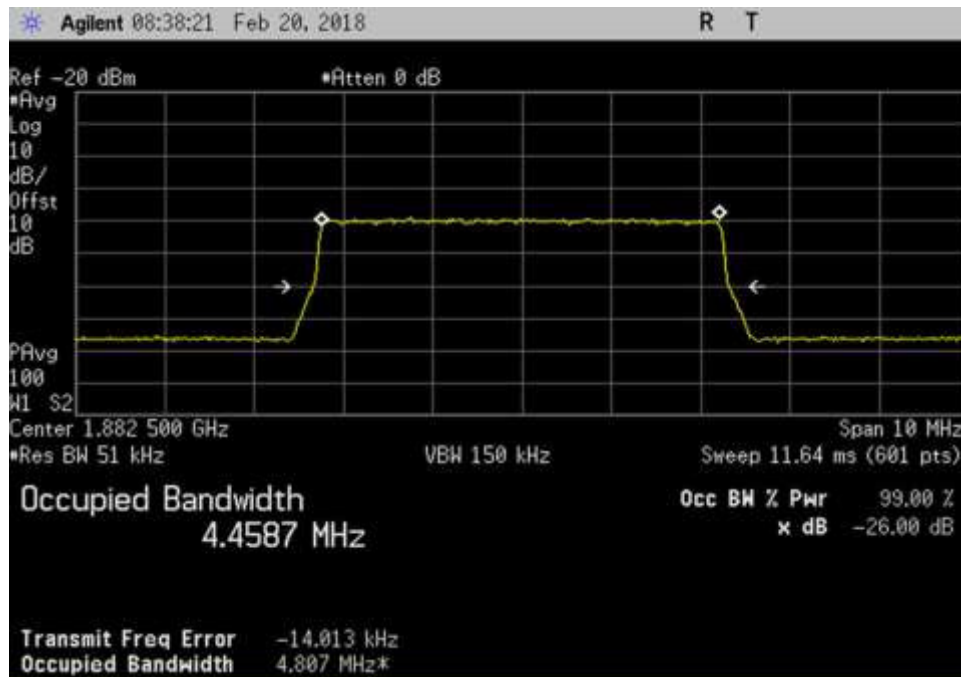
UL_776-787_LTE_ 781.5MHz



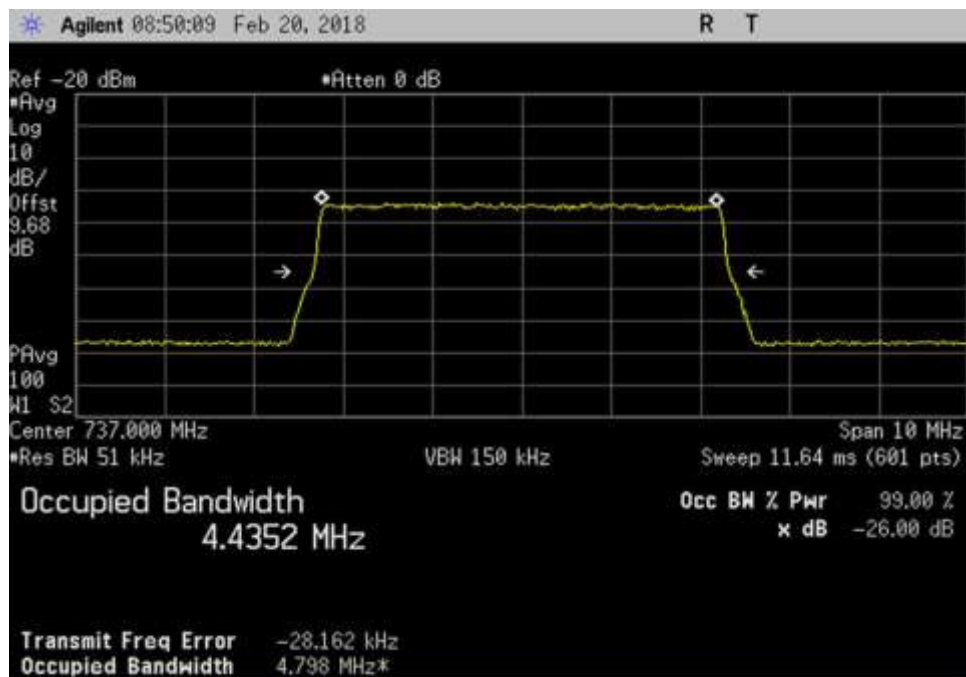
UL_824-849_LTE_ 836.5MHz



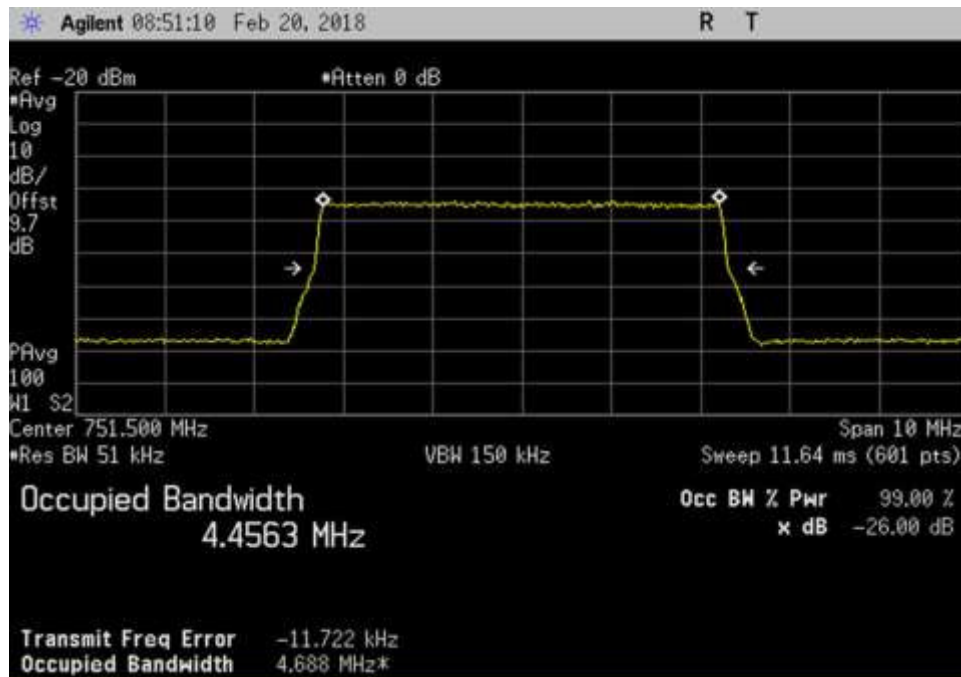
UL_1710-1755_LTE_ 1732.5MHz



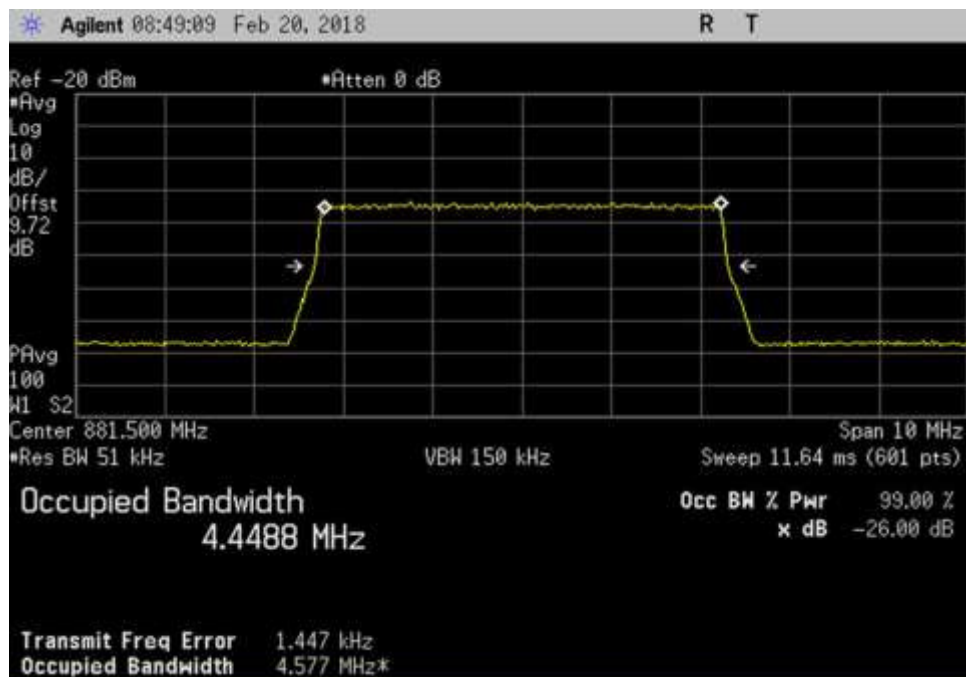
UL_1850-1915_LTE_1882.5MHz



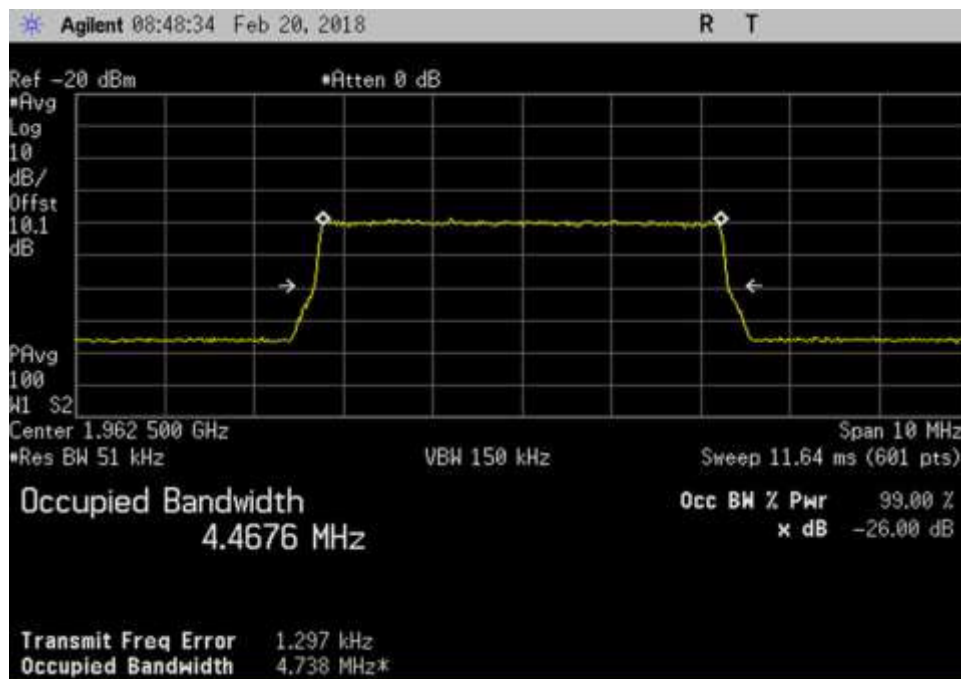
DL_728-746_LTE_737MHz



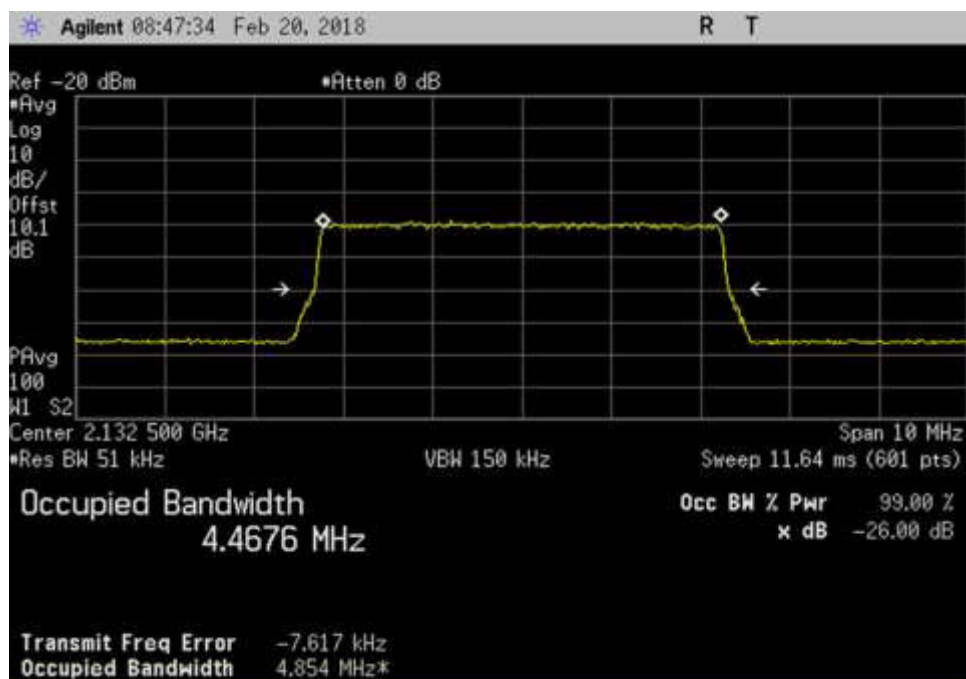
DL_746-757_LTE_751.5MHz



DL_869-894_LTE_881.5MHz

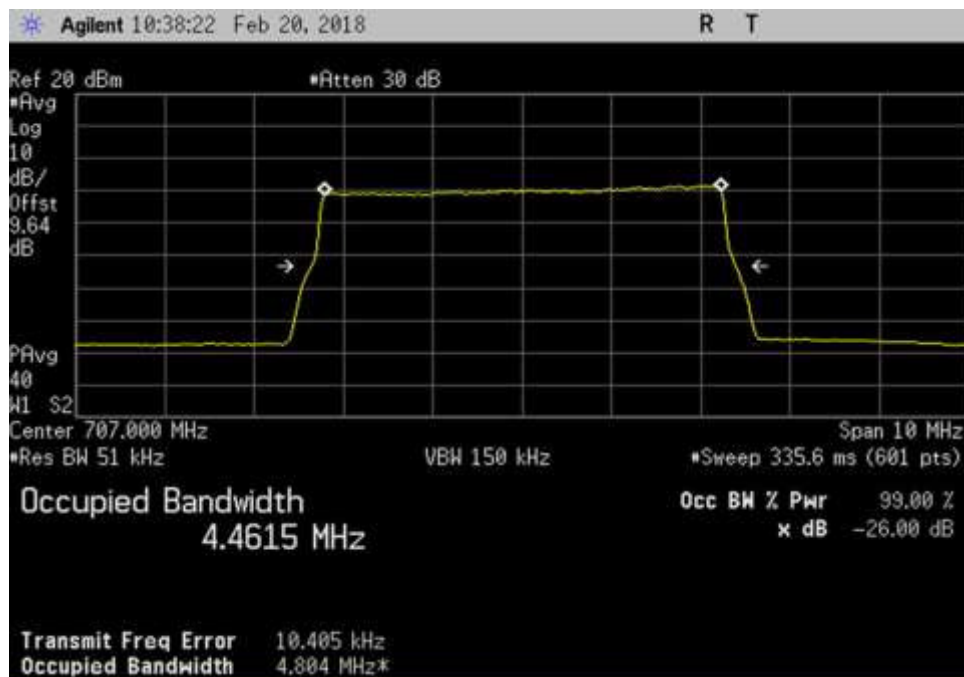


DL_1930-1995_LTE_ 1962.5MHz

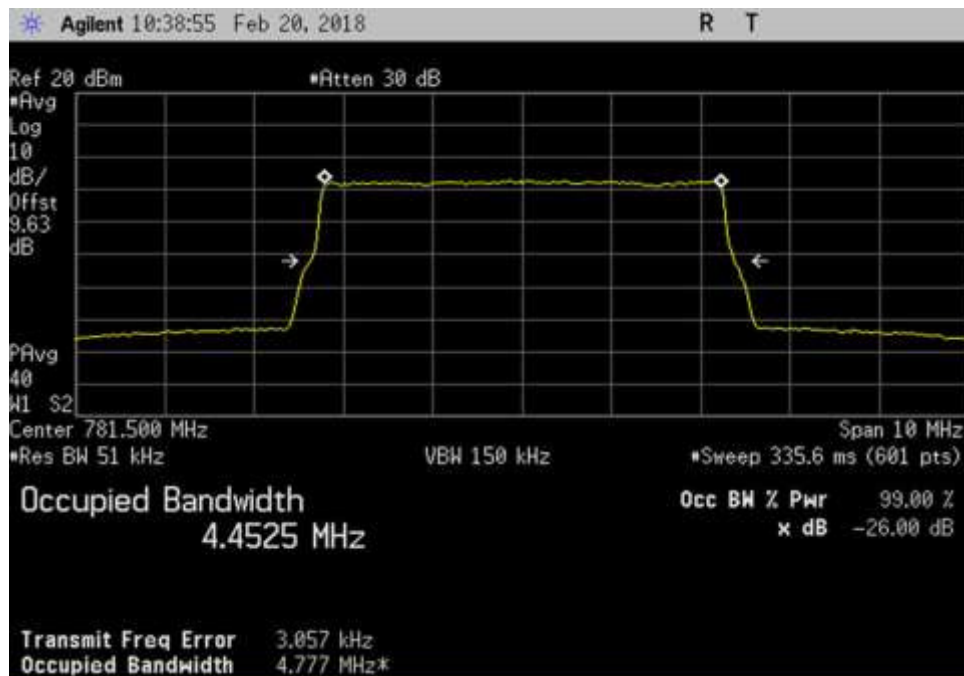


DL_2110-2155_LTE_ 2132.5MHz

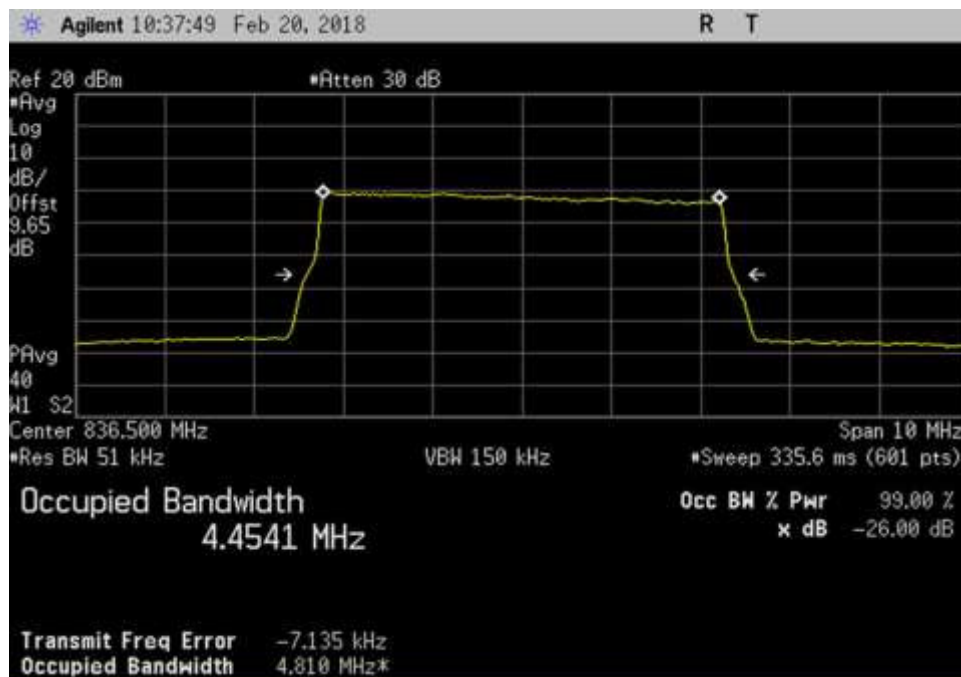
LTE Output



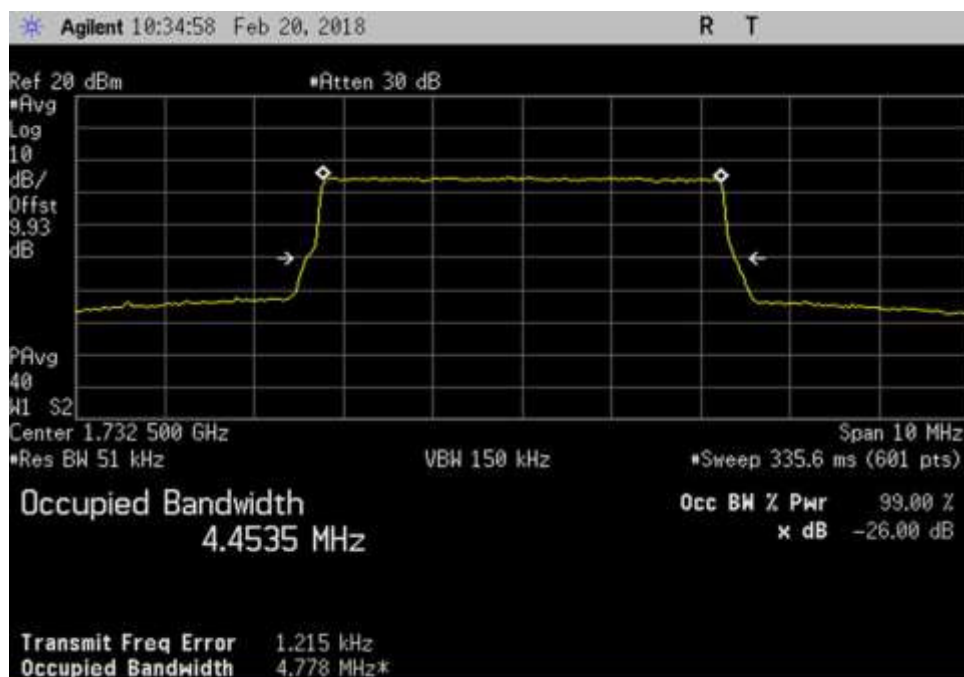
UL_698-716_LTE_ 707MHz



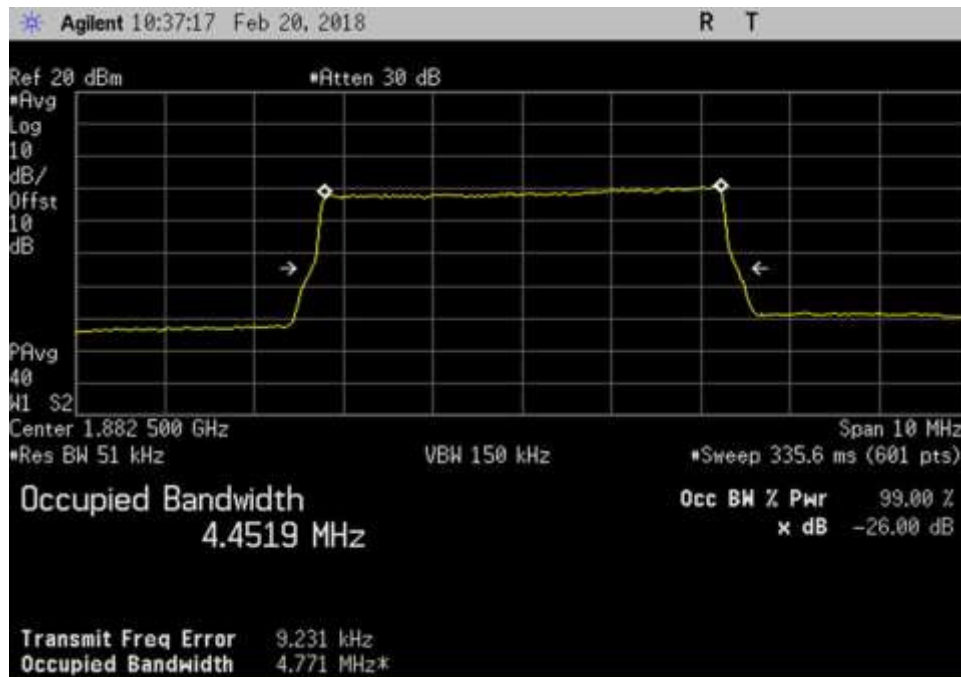
UL_776-787_LTE_ 781.5MHz



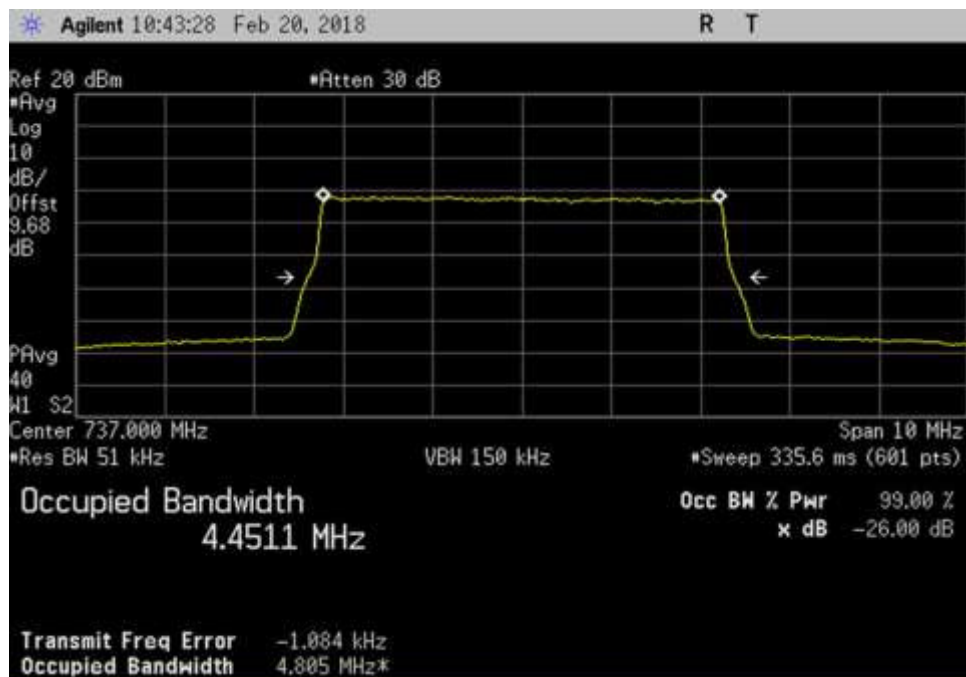
UL_824-849_LTE_ 836.5MHz



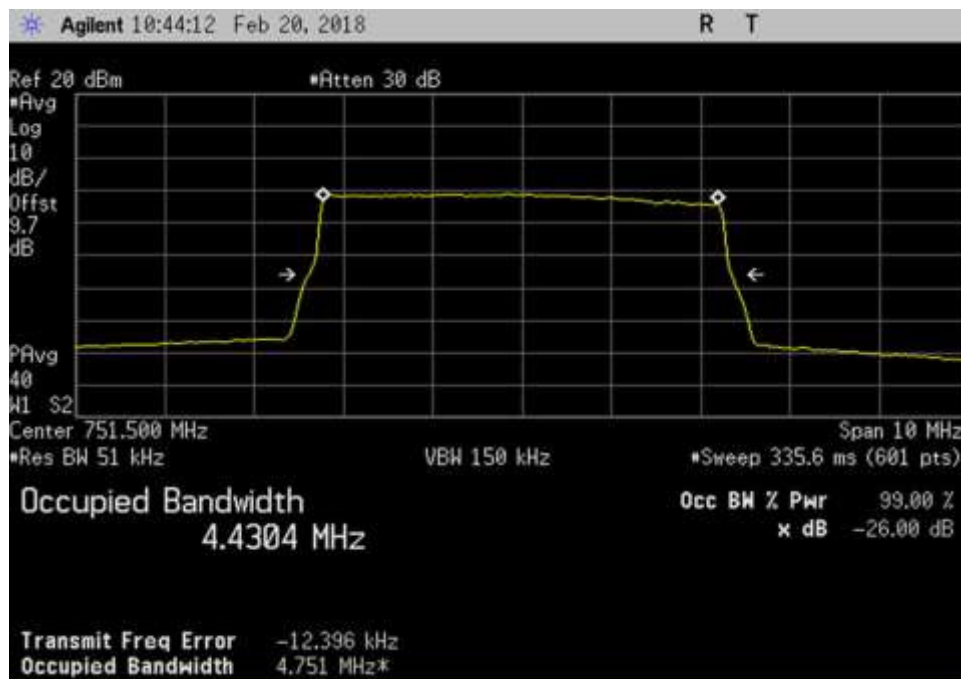
UL_1710-1755_LTE_ 1732.5MHz



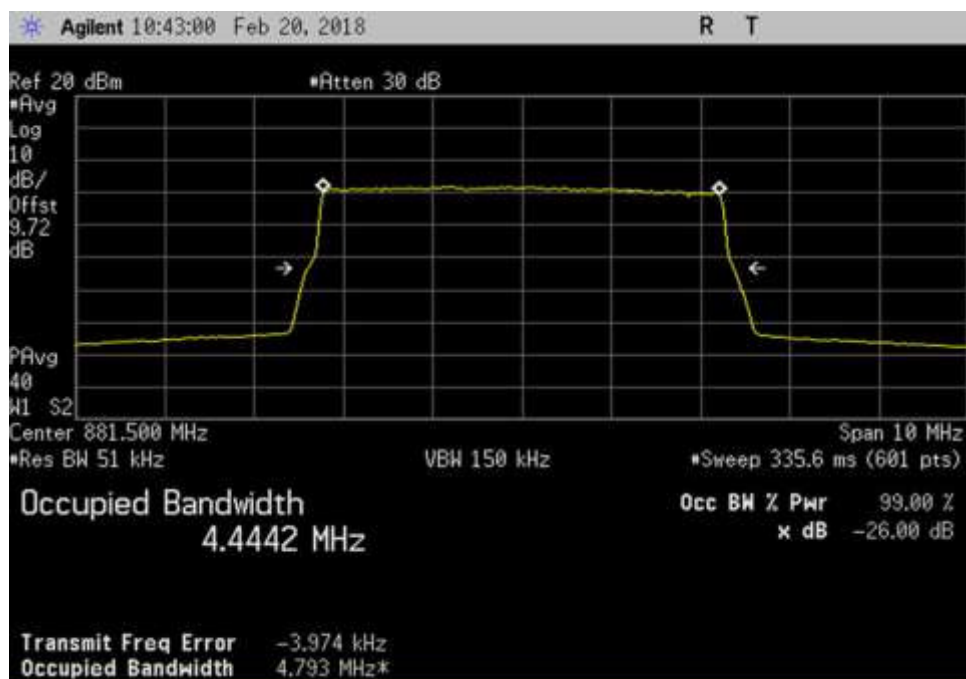
UL_1850-1915_LTE_ 1882.5MHz



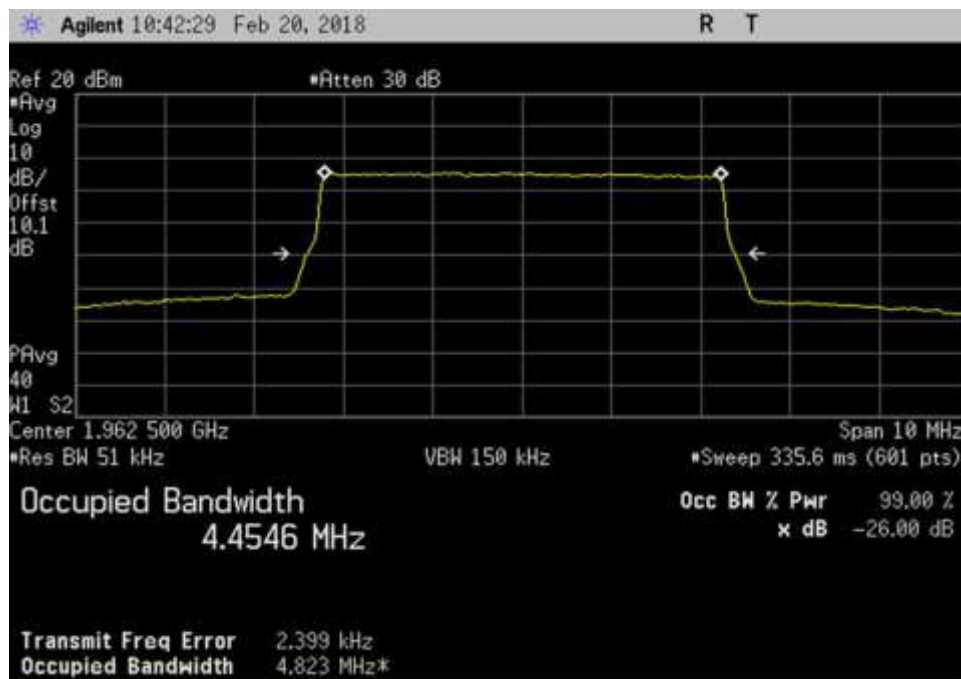
DL_728-746_LTE_ 737MHz



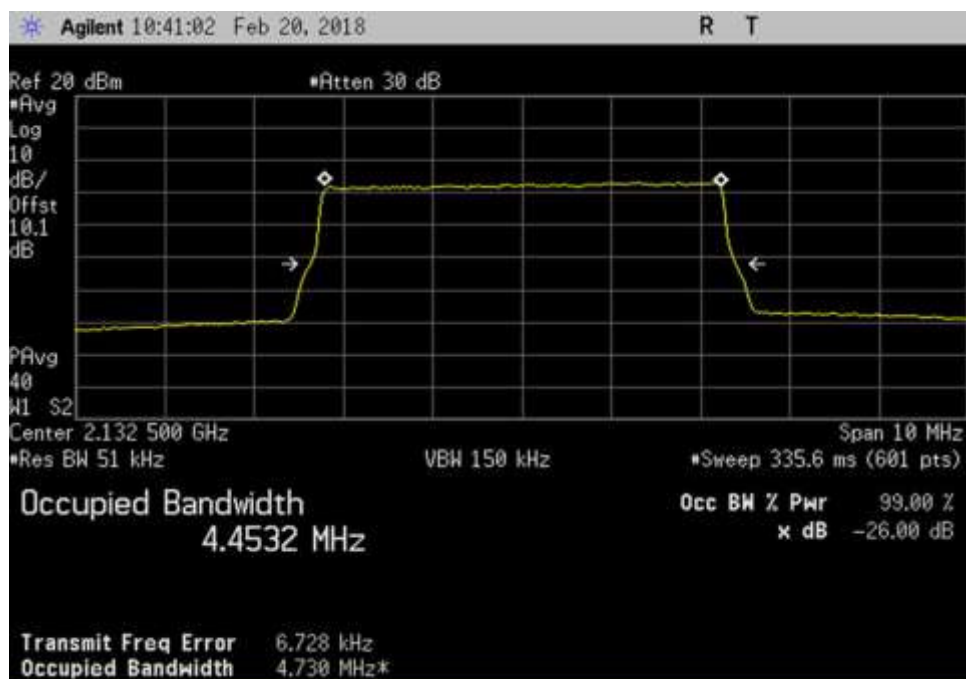
DL_746-757_LTE_751.5MHz



DL_869-894_LTE_881.5MHz



DL_1930-1995_LTE_ 1962.5MHz



DL_2110-2155_LTE_ 2132.5MHz

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 #: **100827**
 Test Type: **Conducted Emissions** Date 02/20/18
 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: 20.1°C
 Relative Humidity: 47%
 Pressure: 102.5kPa

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.

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
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020
P06909	Attenuator	Pasternack	PE7083	12/20/2017	12/20/2019
P06904	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	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.117	0.3	27.3	66	60	2	5
UL1850-1915	0.108	0.3	26.2	69	60	2	5
UL824-894	0.100	0.3	28.0	68	60	2	5
UL 698-716	0.125	0.3	31.5	66	60	2	5
UL776-787	0.192	0.3	31.6	64	60	2	5
DL2110-2155	0.267	1.0	22.7	68	60	2	5
DL1930-1995	0.225	1.0	28.4	68	60	2	5
DL869-894	0.242	1.0	20.8	69	60	2	5
DL:728-746	0.417	1.0	25.6	66	60	2	5
DL 746-757	0.225	1.0	25.6	65	60	2	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	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	10.5	(17.2) *	10.6	9.1	9.3	12.0
+4dB	(14.0) *	(21.6) *	(12.4) *	11.1	11.7	12.0
+3dB	(17.3) *	(25.3) *	(14.5) *	(12.2) *	(13.8) *	12.0
+2dB	(21.1) *	(41.0) *	(18.2) *	(14.8) *	(18.3) *	12.0
+1dB	(29.6) *	**	(28.5) *	**	(23.9) *	12.0
0dB	**	**	**	**	**	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	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	(17.1) *	(17.3) *	(15.2) *	11.8	8.6	12.0
+4dB	(20.6) *	(21.3) *	(17.5) *	(14.7) *	9.9	12.0
+3dB	(29.7) *	(27.8) *	(23.4) *	(20.2) *	11.9	12.0
+2dB	(65.9) *	**	(32.5) *	(36.5) *	(14.7) *	12.0
+1dB	**	**	**	**	(56.8) *	12.0
0dB	**	**	**	**	**	12.0
-1dB	**	**	**	**	**	12.0
-2dB	**	**	**	**	**	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

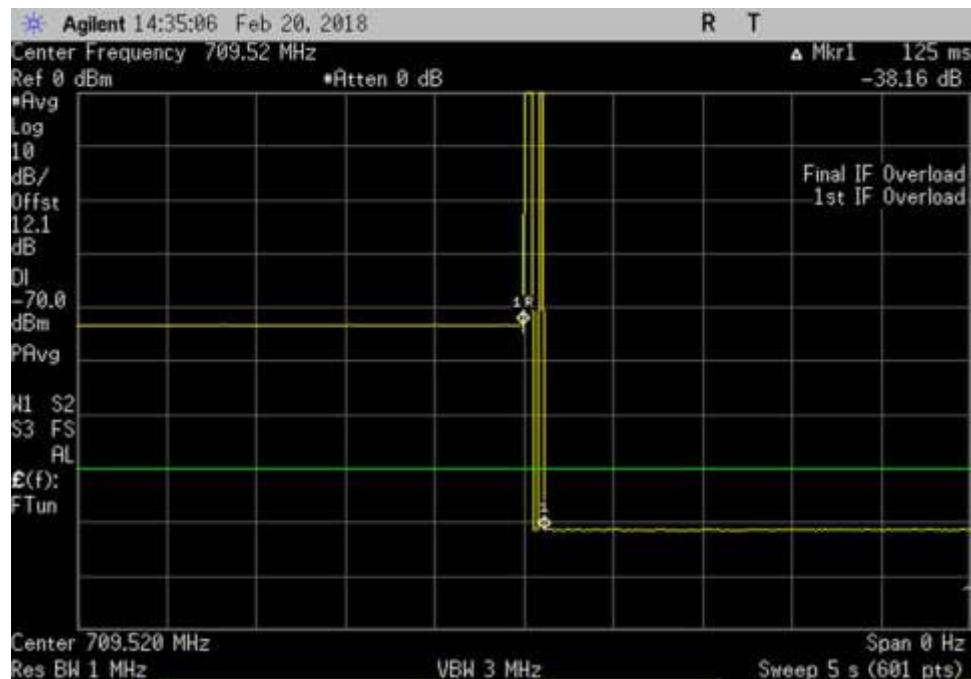
Note:

* 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 187 seconds for the Uplink bands and 191 seconds for the Downlink bands.

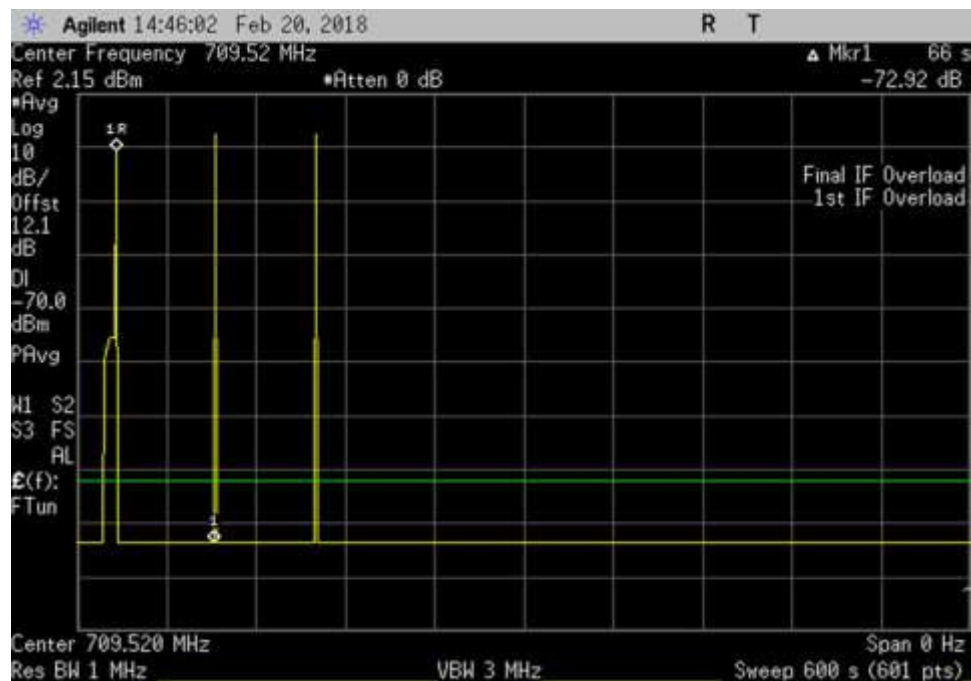
** The device shuts down immediately.

7.11.2 Oscillation Restart Tests

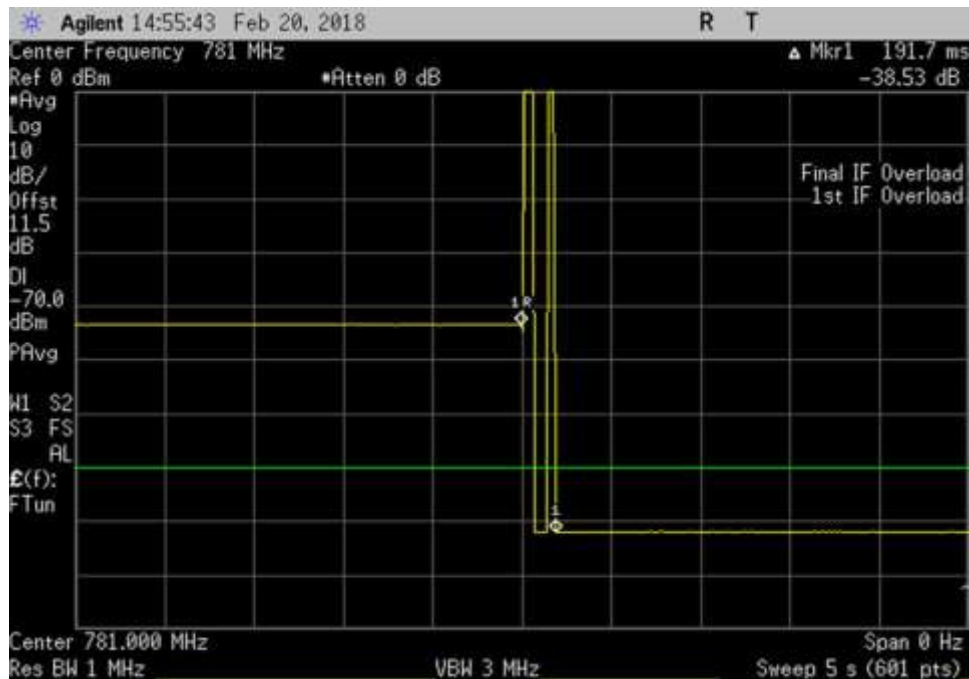
Plots



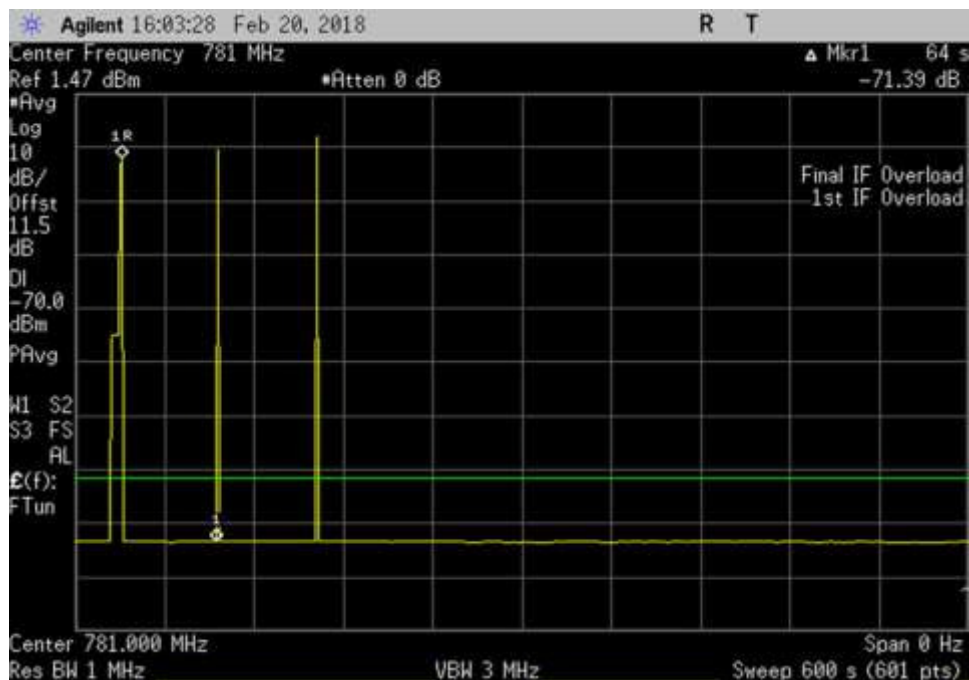
UL_698-716_ 709.52MHz_Time



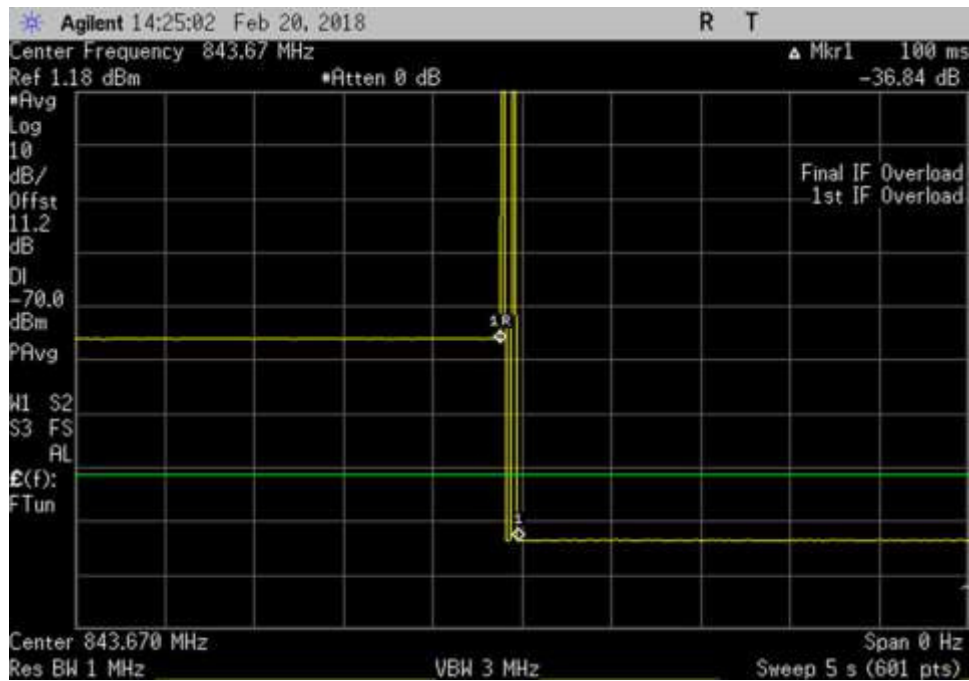
UL_698-716_600sec_ 709.52MHz



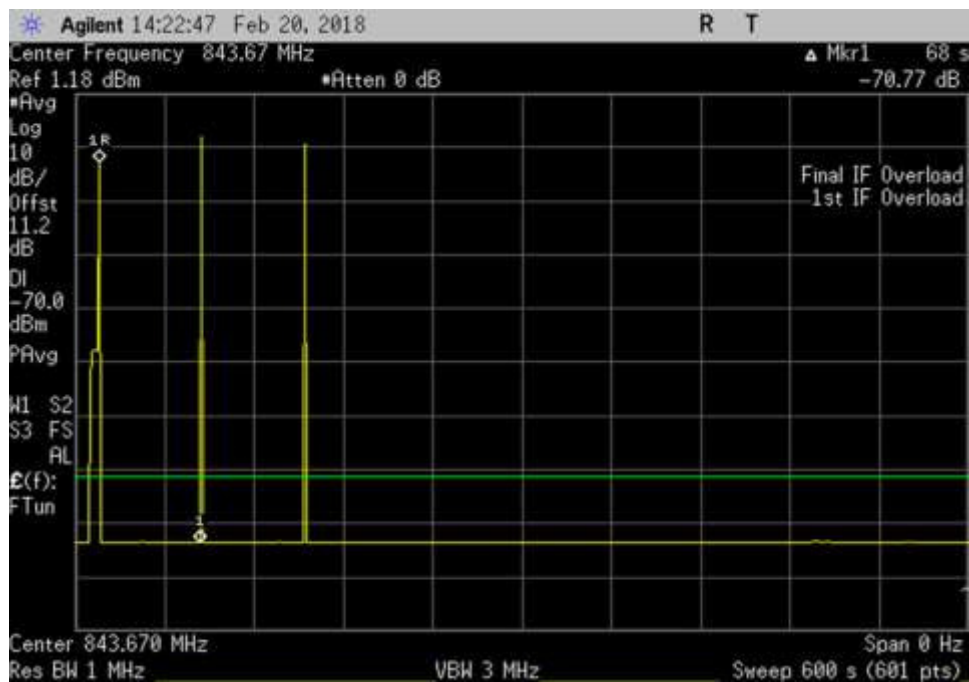
UL_776-787_781MHz_Time



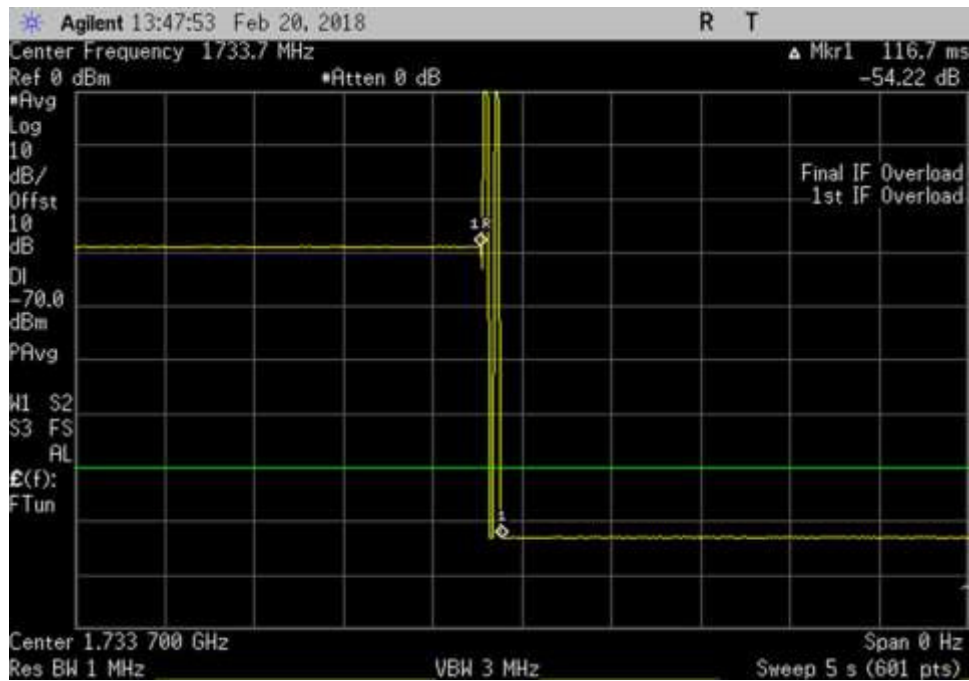
UL_776-787_600sec_781MHz



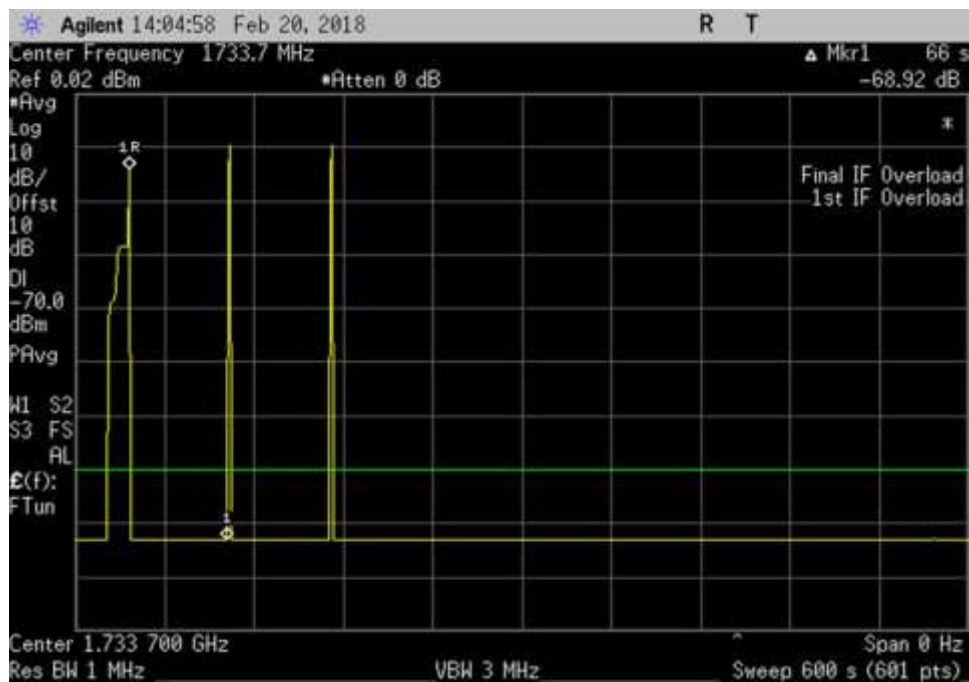
UL_824-849_ 843.67MHz_Time



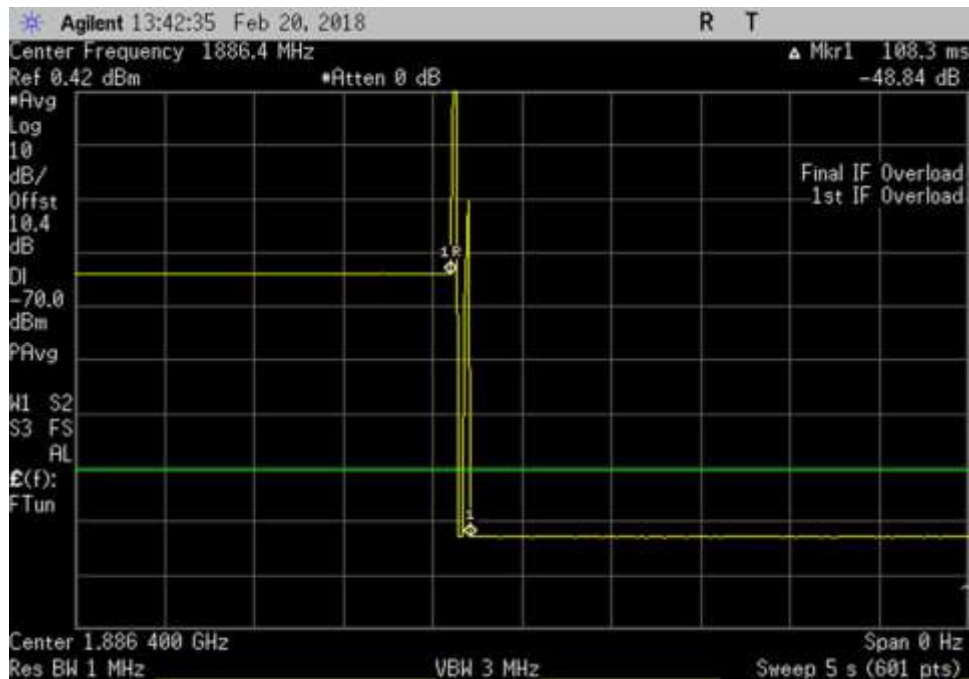
UL_824-849_600sec_ 843.67MHz



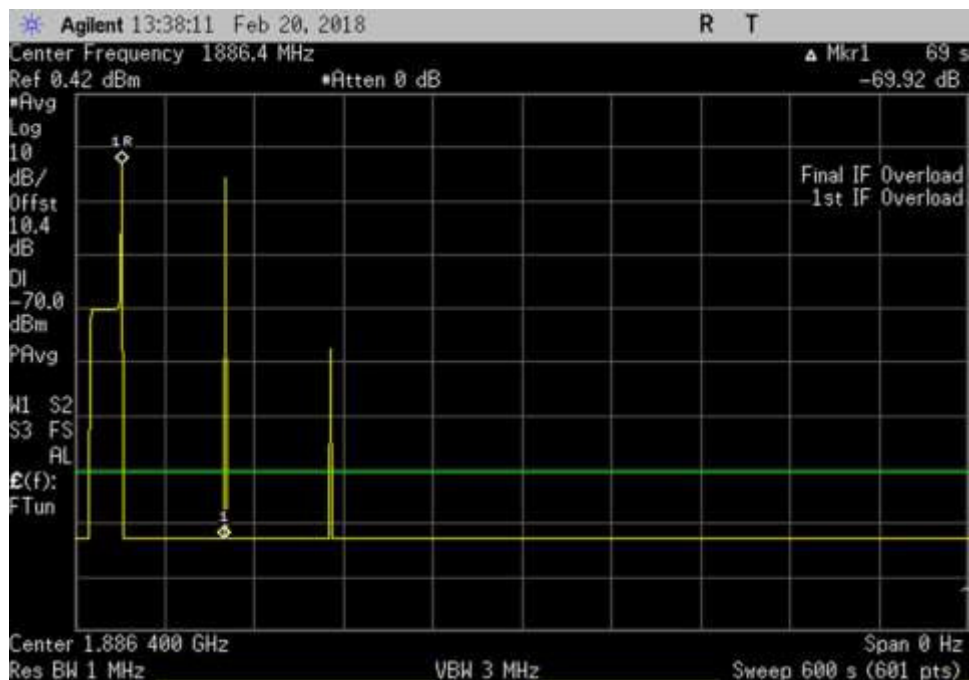
UL_1710-1755_ 1733.7MHz_Time



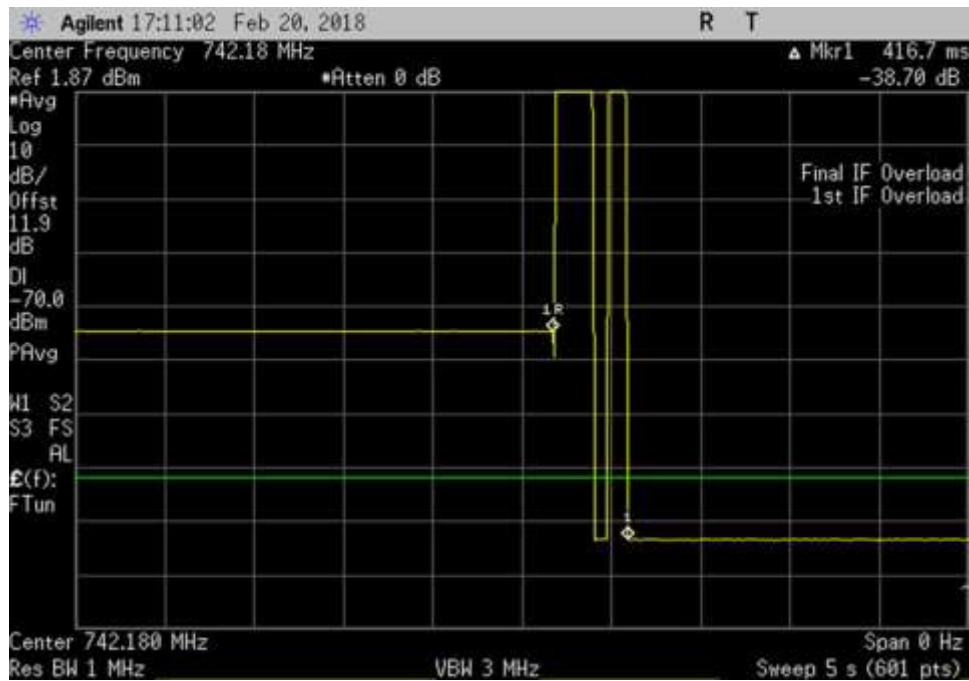
UL_1710-1755_600sec_ 1733.7MHz



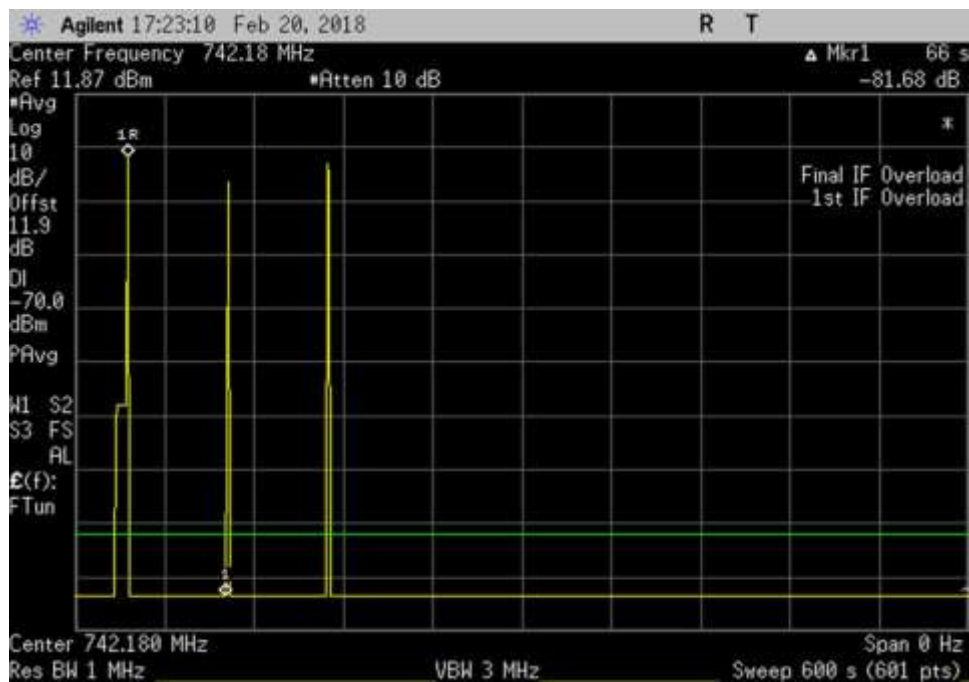
UL_1850-1915_ 1886.4MHz_Time



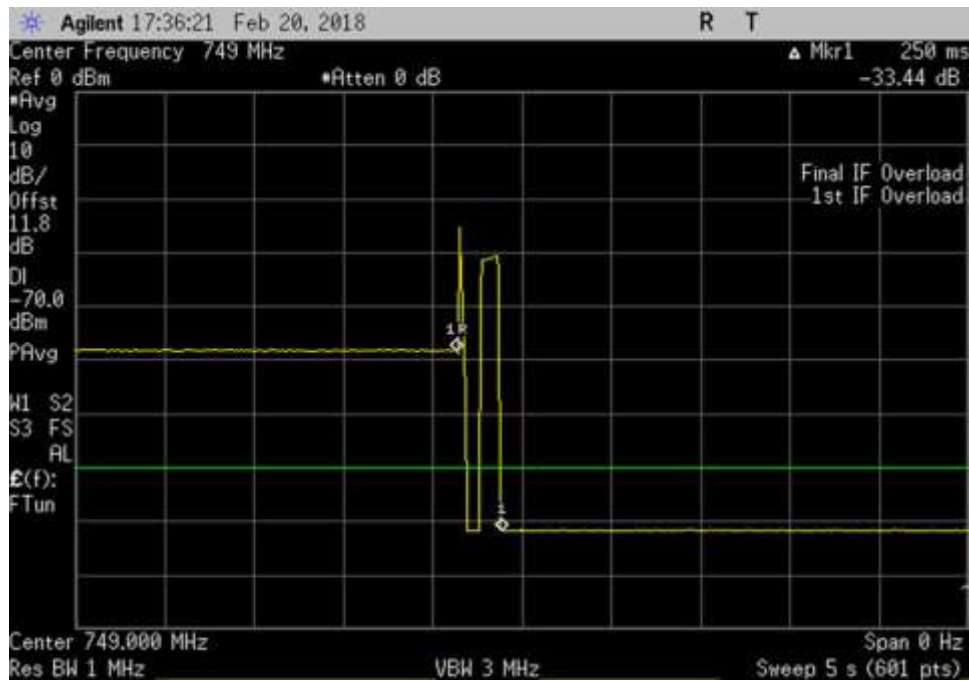
UL_1850-1915_600sec_ 1886.4MHz



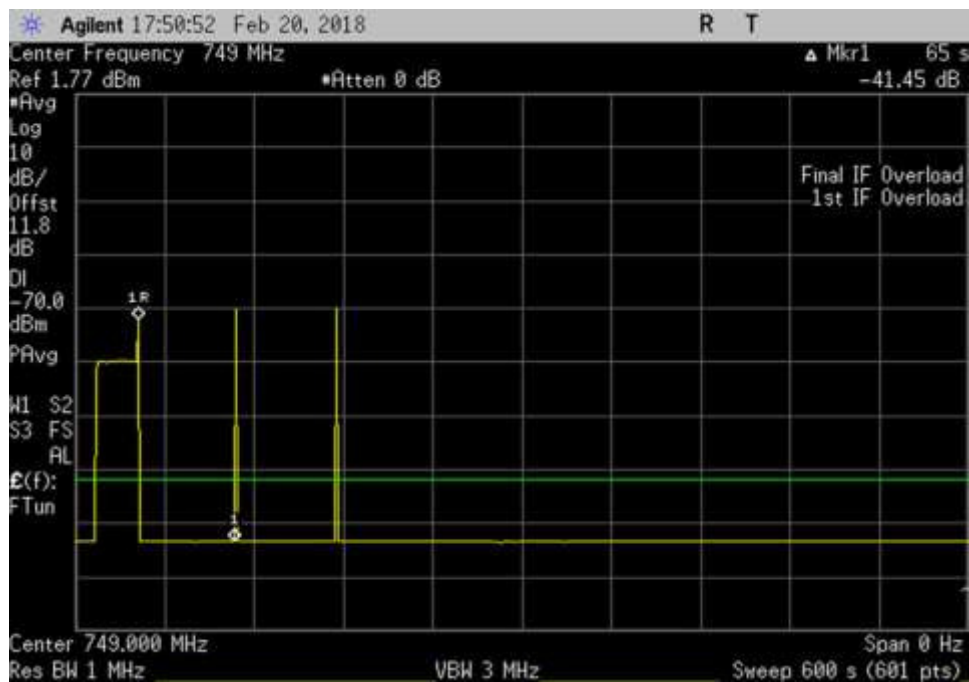
DL_728-746_742.18MHz_Time



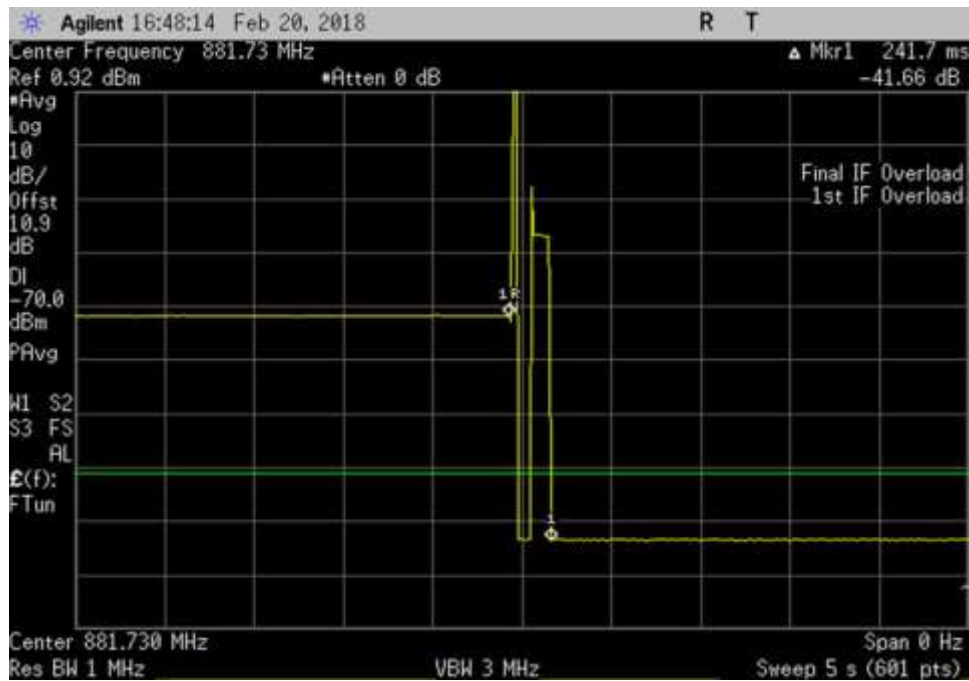
DL_728-746_600sec_742.18MHz



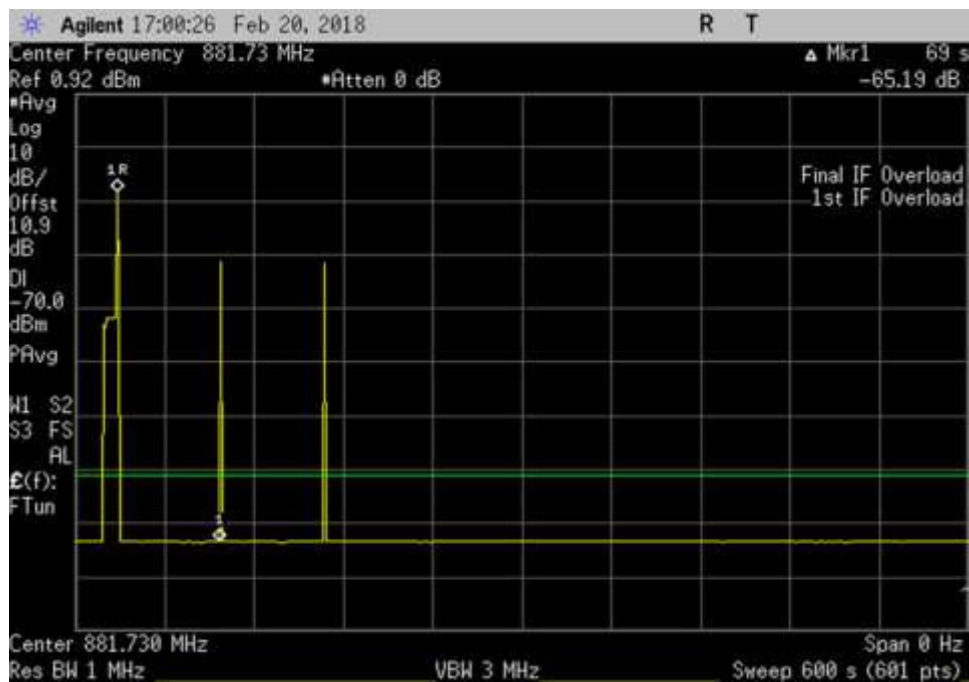
DL_746-757_749MHz_Time



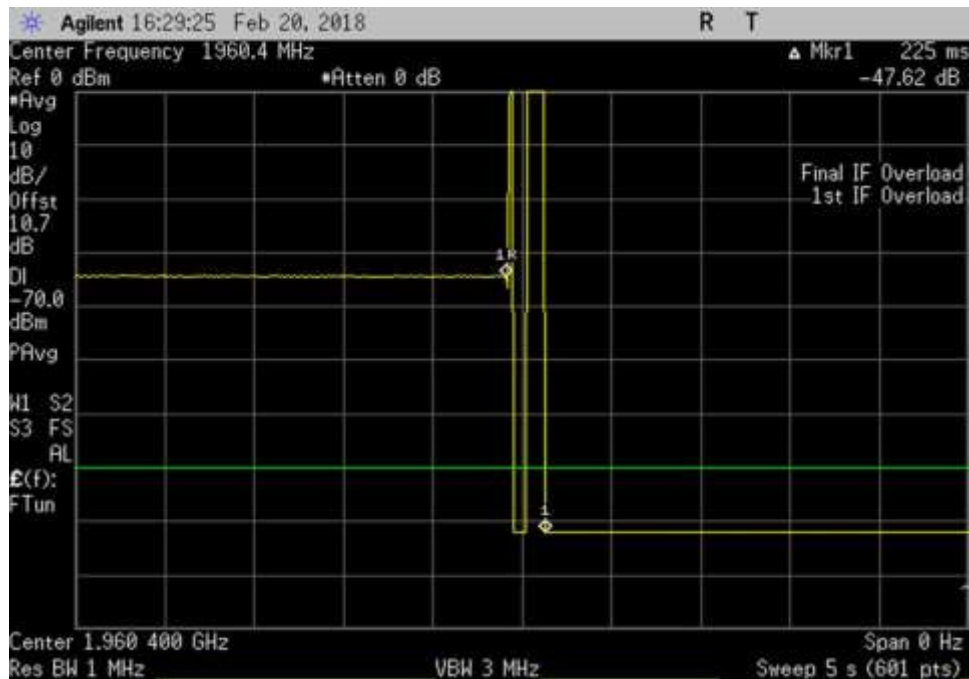
DL_746-757_600sec_749MHz



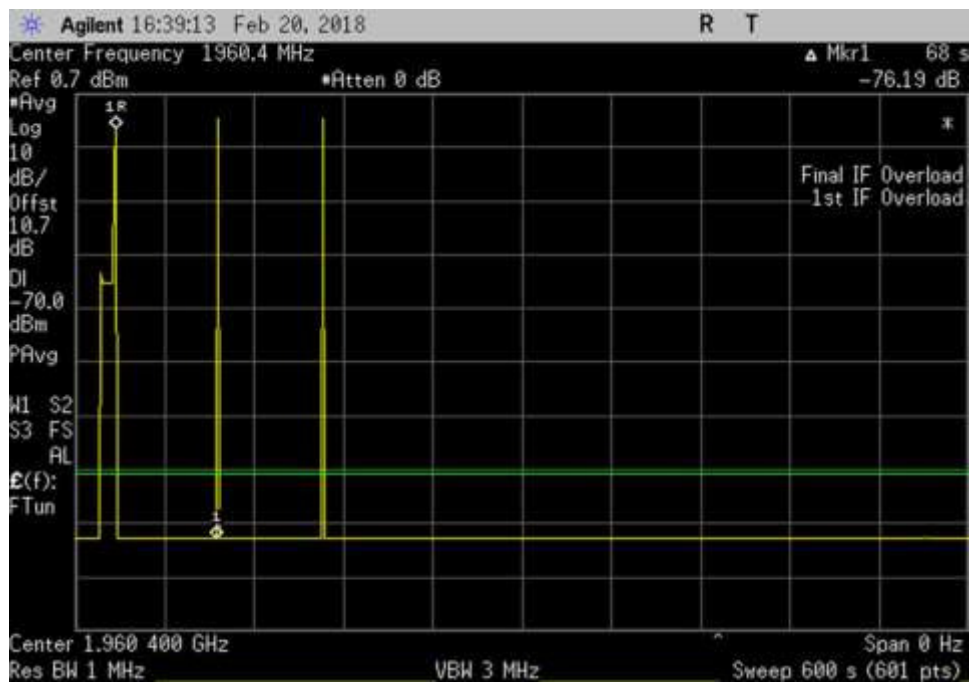
DL_869-894_ 881.73MHz_Tlme



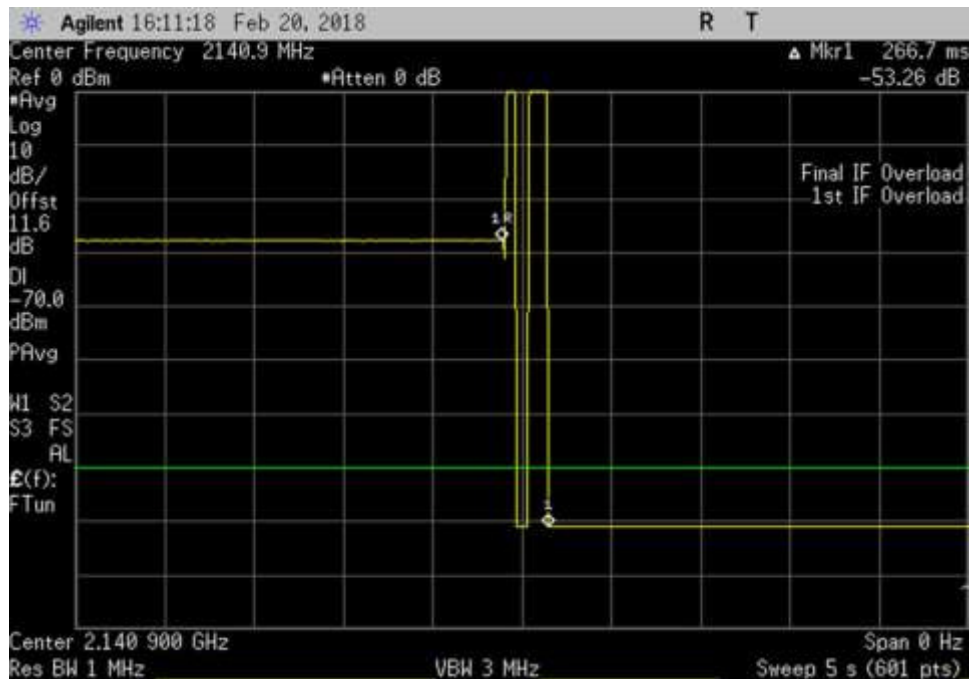
DL_869-894_600sec_ 881.73MHz



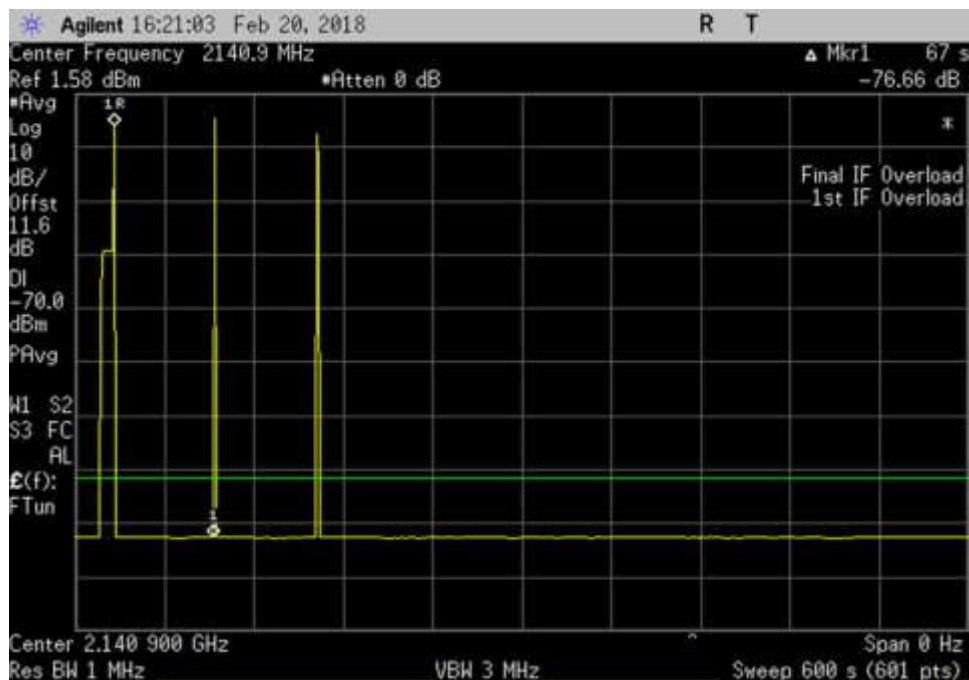
DL_1930-1995_1960.4MHz_Time



DL_1930-1995_600sec_1960.4MHz



DL_2110-2155_ 2140.9MHz_Time



DL_2110-2155_600sec_ 2140.9MHz

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 #: **100827** Date: 02/26/18
 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: 19.8°C

Relative Humidity: 46%

Pressure: 101.9kPa

Test procedure:

The test was performed in accordance with section 7.12 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017.

TX Freq = > Center frequency of above listed bands.

Modulation=> CW

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

Note:

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.

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
P06909	Attenuator	Pasternack	PE7083	12/20/2017	12/20/2019

Test Equipment:

Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
01996	Biconilog Antenna	Chase	CBL6111C	11/1/2016	11/1/2018
P06049	Attenuator	Pasternack	PE7002-6	5/9/2016	5/9/2018
P00880	Cable	Pasternack	RG214U	5/10/2016	5/10/2018
P01187	Cable	Andrews	CNT-195	8/8/2016	8/8/2018
00971A	Preamp	HP	8447D	1/8/2018	1/8/2020
02870	Spectrum Analyzer	Agilent	E4440A	3/31/2016	3/31/2018
02113	Horn Antenna	EMC Test Systems	3115	2/6/2017	2/6/2019
03607	Preamp	Miteq	AMF-7D-00101800-30-10P	6/6/2017	6/6/2019
P01210	Cable	Andrews	FSJ1P-50A-4A	1/16/2017	1/16/2019
03362	Cable	Astrolab	32022-2-29094-48TC	1/10/2017	1/10/2019
03302	Cable	Astrolab	32026-29094K-29094K-72TC	1/15/2018	1/15/2020
P06138	Cable	Astrolab	32022-29094K-29094K-72TC	3/27/2017	3/27/2019
P00928	Cable	various	various	1/15/2018	1/15/2020
P06126	Cable	Astrolab	32022-29094K-29094K-168TC	3/27/2017	3/27/2019
02693	Active Horn Antenna	Miteq	AMFW-5F-12001800-20-10P	5/11/2017	5/11/2019
02694	Horn Antenna	Miteq	AMFW-5F-18002650-20-10P	5/11/2017	5/11/2019
02695	Active Horn Antenna	Miteq	AMFW-5F-260400-33-8P	5/11/2017	5/11/2019
P00929	Cable	various	various	1/15/2018	1/15/2020
00432	Loop Antenna	EMCO	6502	5/30/2017	5/30/2019

Summary of Results

Pass: All Radiated Spurious Emissions were found with 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 $P_{t \text{ at 3 meter}}$ dB

Limit line (dBuV) = $E_{dBuV} - \text{Attenuation}$

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)

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

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

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

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

$$10 \log P_t = 10 \log E^2 (\text{V/m}) + 10 \log r^2 - 10 \log 30$$

$$10 \log P_t = 20 \log E (\text{V/m}) + 20 \log r - 10 \log 30$$

At 3 meter, $r = 3 \text{ m}$

$$10 \log P_t = 20 \log E (\text{V/m}) + 20 \log 3 - 10 \log 30$$

$$10 \log P_t = 20 \log E (\text{V/m}) + 9.54 - 14.77$$

$$10 \log P_t = 20 \log E (\text{V/m}) - 5.23$$

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

$$10 \log P_t = 20 \log E (\mu\text{V/m}) - 120 - 5.23$$

$$10 \log P_t = 20 \log E (\mu\text{V/m}) - 125.23$$

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

Since $20 \log E (\mu\text{V/m}) = E \text{ in dBuV/m} - 20 \log E_{\text{dBuV}}$

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

EXHIBIT A: TEST SETUP PHOTOS



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



Section 7.7 Max Noise and 7.8 Test Setup



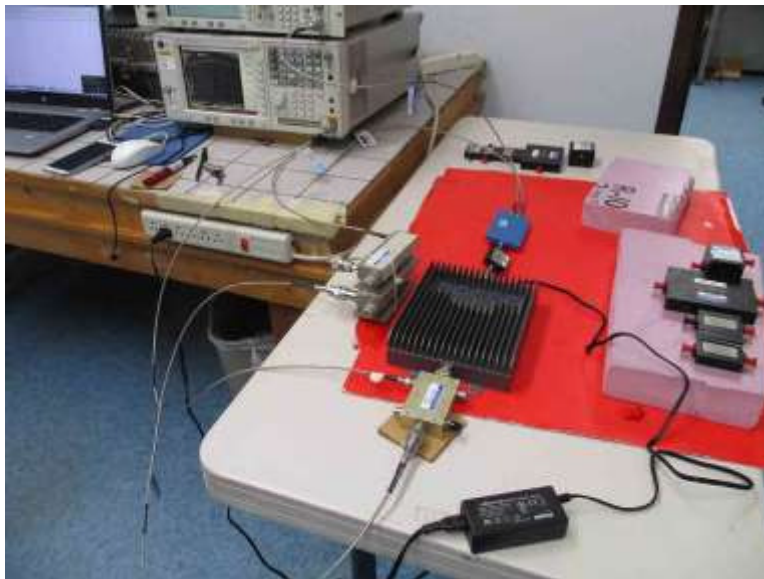
Section 7.7 Variable Noise for UL Test Setup



Section 7.9 Test Setup



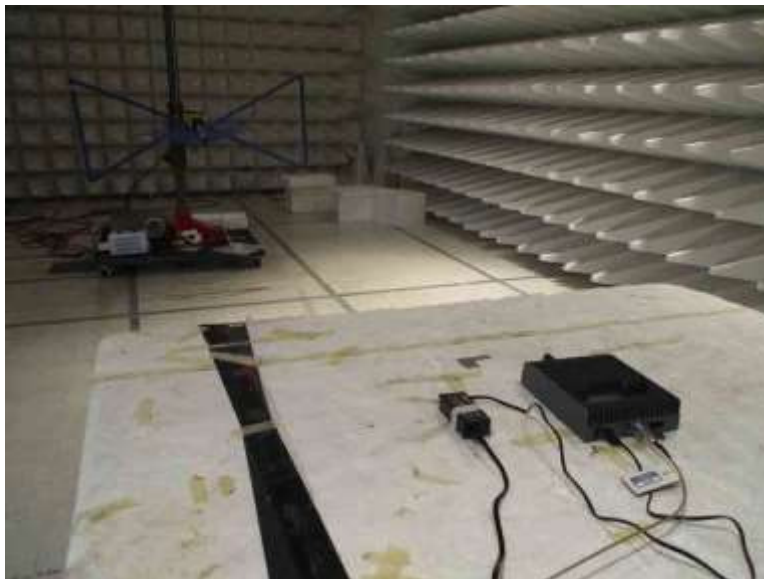
Section 7.11.2 Test Setup



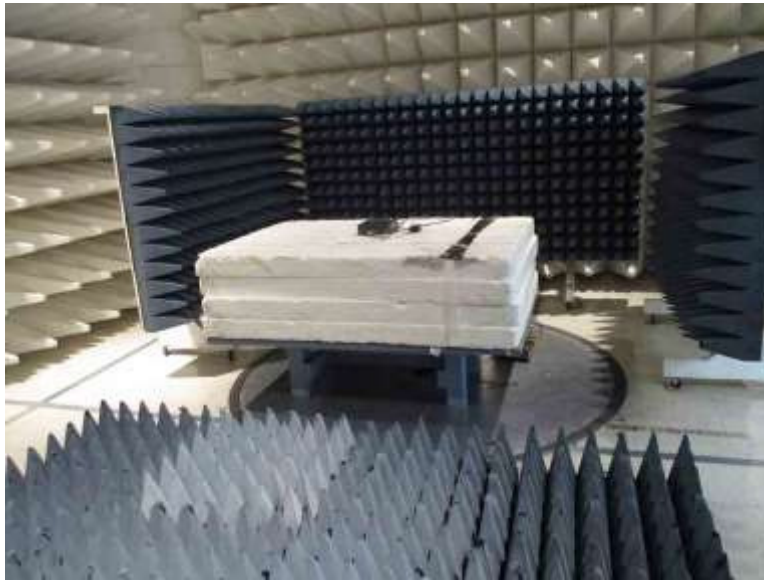
Section 7.11.3 Test Setup



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.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	($\text{dB}\mu\text{V}$)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	($\text{dB}\mu\text{V}/\text{m}$)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.