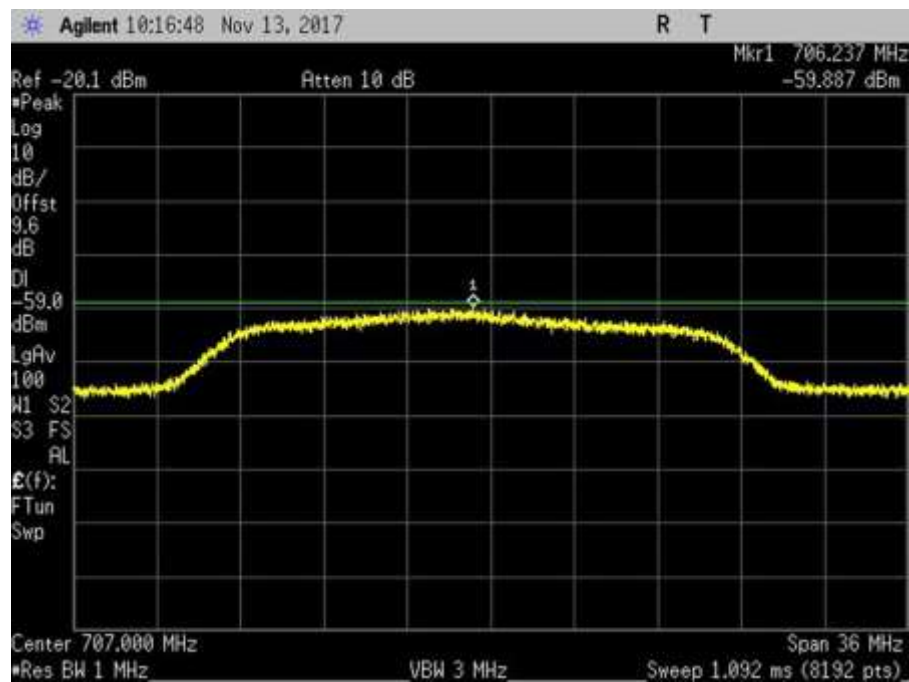
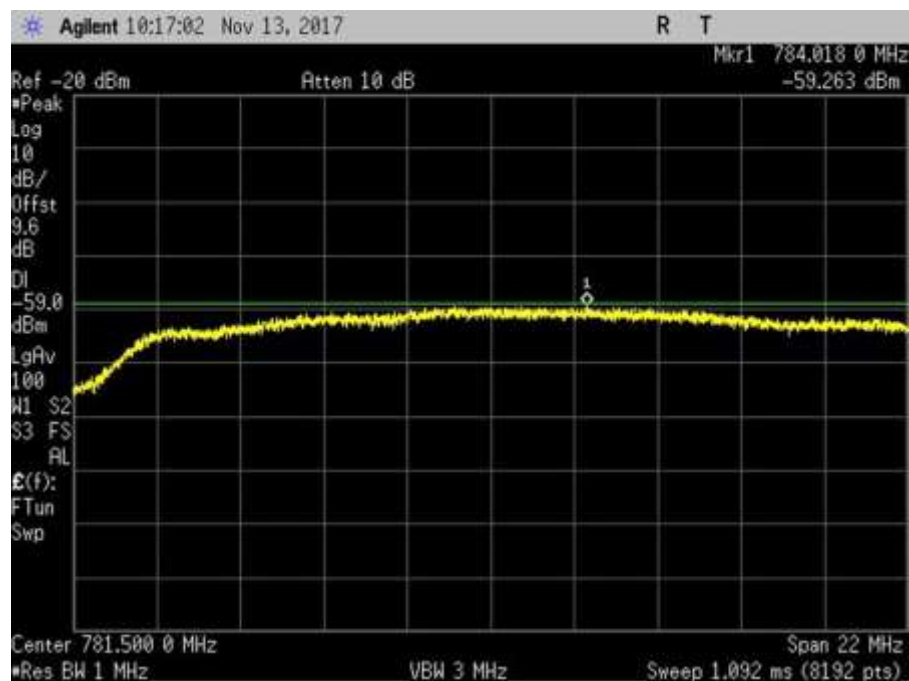


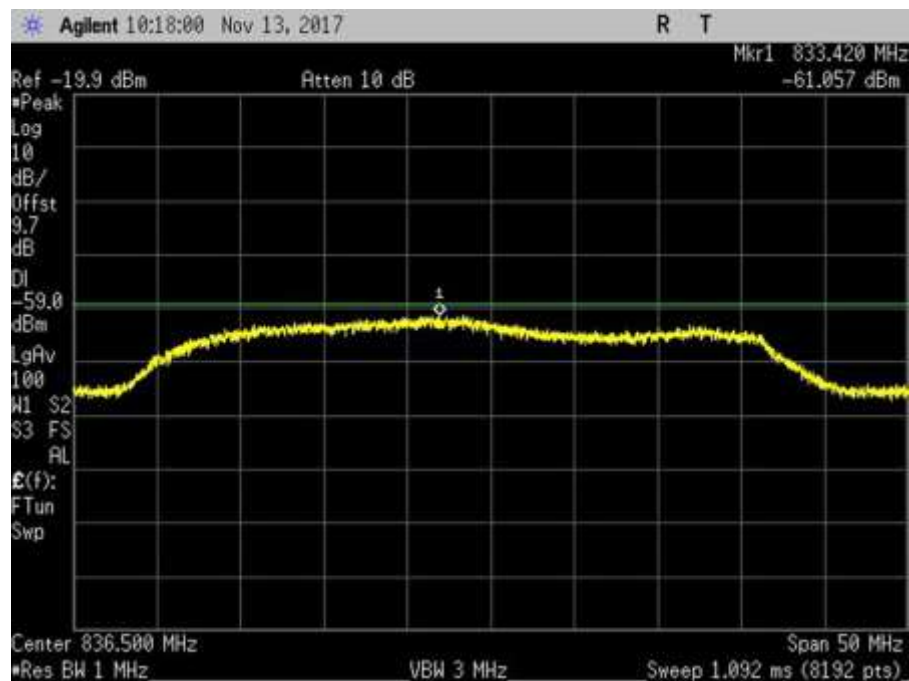
UL



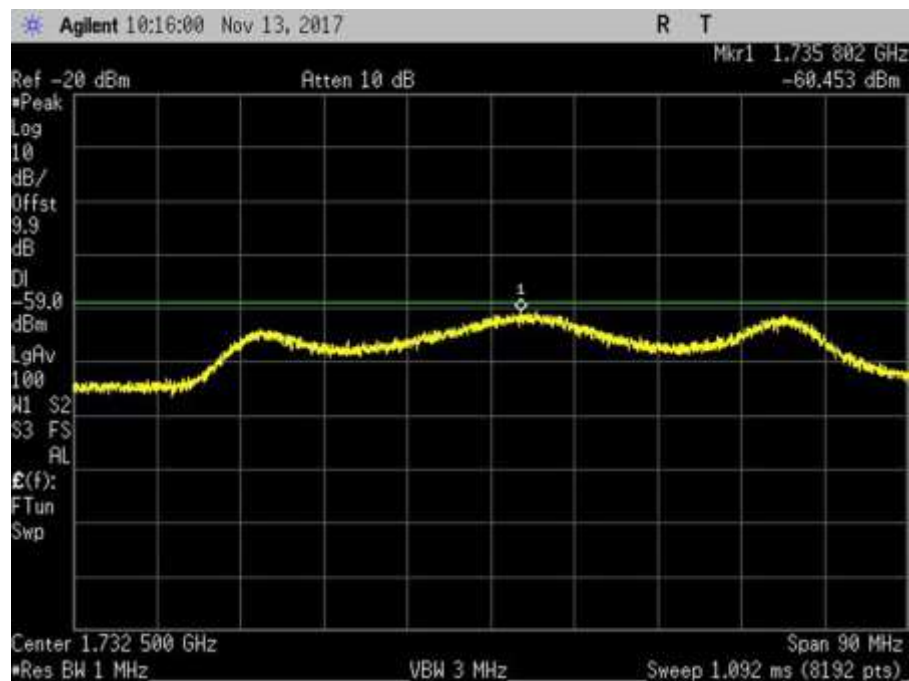
7.7.1_Noise_UL_698-716MHz



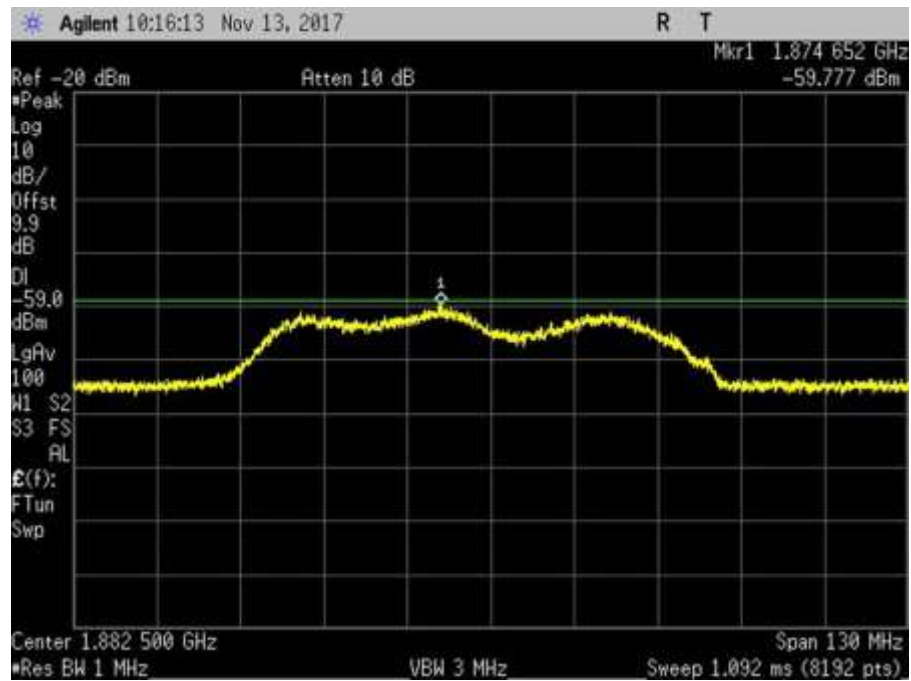
7.7.1_Noise_UL_776-787MHz



7.7.1_Noise_UL_824-849MHz



7.7.1_Noise_UL_1710-1755MHz

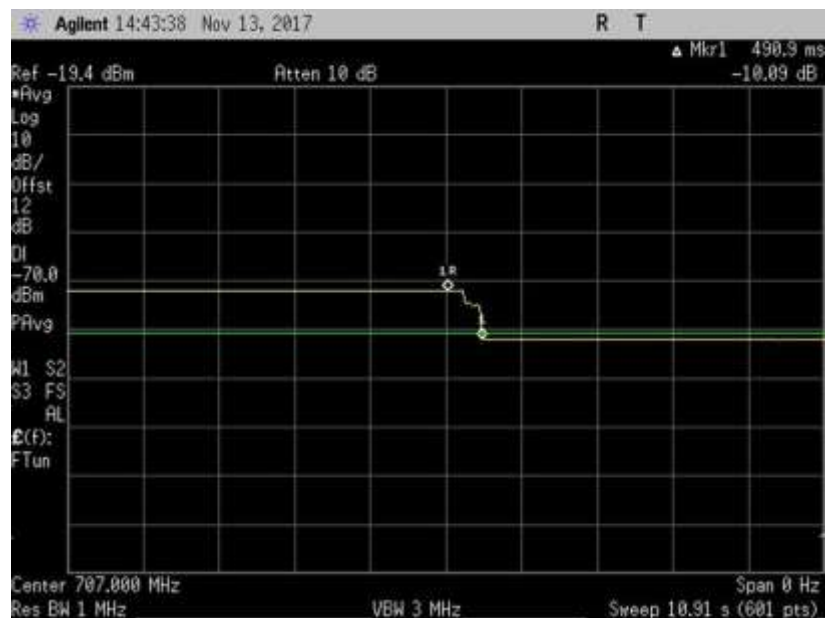


7.7.1_Noise_UL_1850-1915MHz

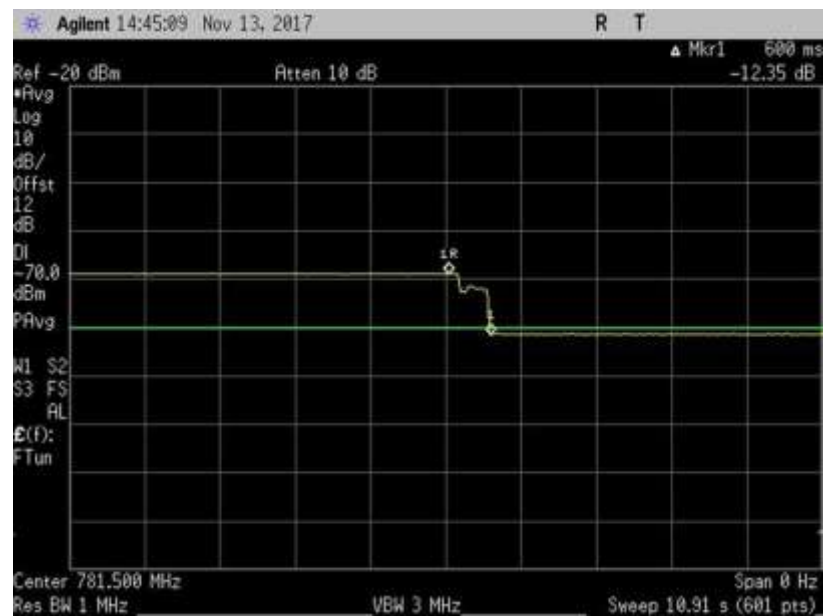
7.7.2 Variable UL Noise Timing

Plots

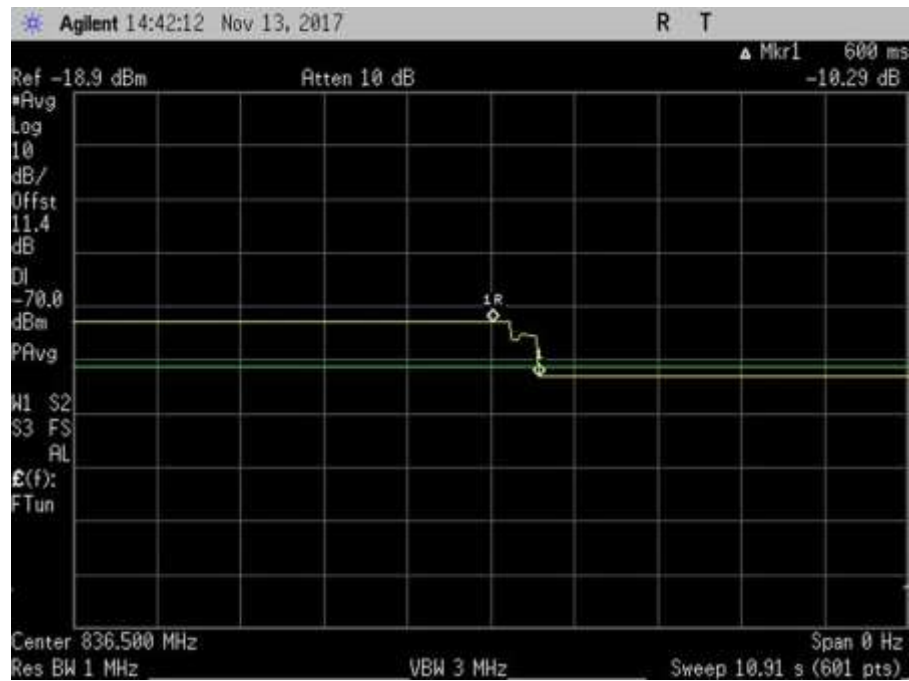
UL



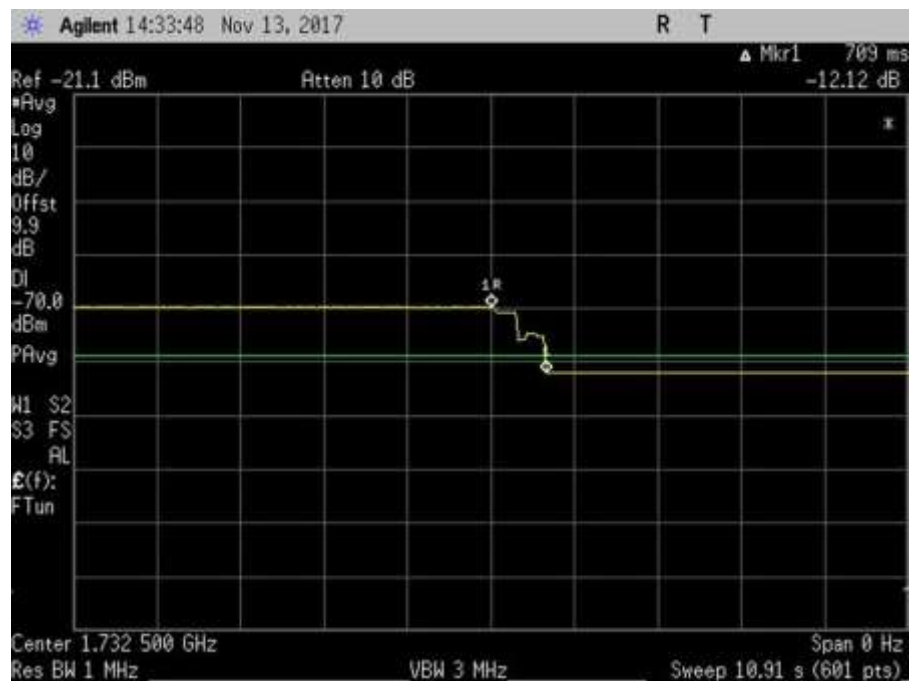
7.7.2_VarNoise_UL_698-716MHz



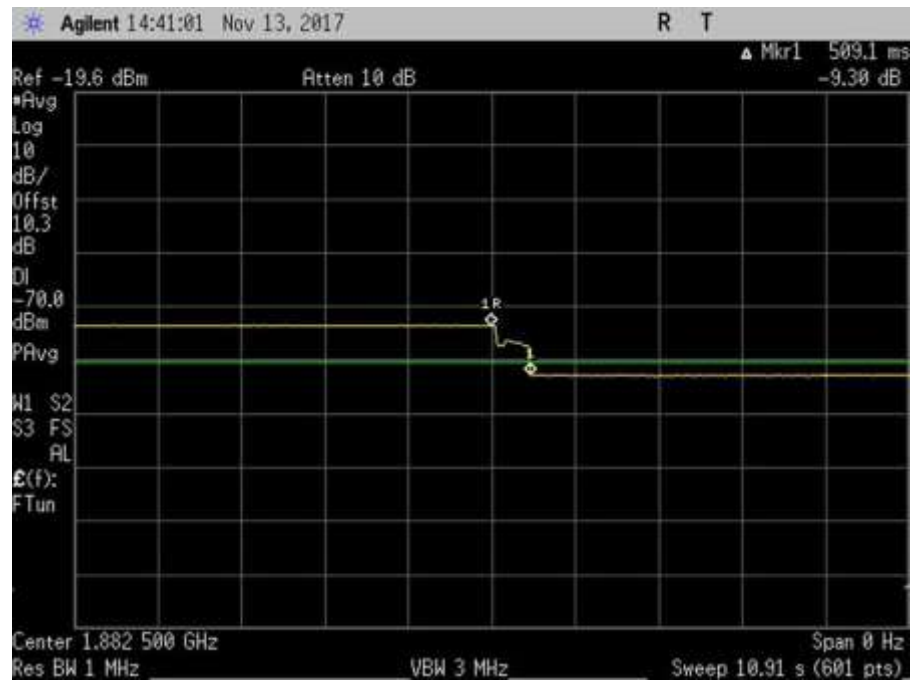
7.7.2_VarNoise_UL_776-787MHz



7.7.2_VarNoise_UL_824-849MHz



7.7.2_VarNoise_UL_1710-1755MHz



7.7.2_VarNoise_UL_1850-1915MHz

7.8 Uplink Inactivity

Test Conditions / Setup

Test Location: CKC Laboratories, Inc • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc
 Specification: **7.8 Uplink Inactivity**
 Work Order #: **100637** Date: 11/13/2017
 Test Type: **Conducted Emissions** Time: 3:18:00 PM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.
 The EUT Server port is a type FME connector and 50-ohm impedance.
 The EUT Donor port is type FME connector and 50-ohm impedance.

Part 22

UL: 824-849MHz

DL: 869-894MHz

Part 24

UL: 1850-1915MHz

DL: 1930-1995MHz

Part 27

UL: 1710-1755MHz, 698-716MHz, 776-787MHz

DL: 2110-2155MHz, 728-746MHz, 746-757MHz

Test procedure:

The test was performed in accordance with section 7.8 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017

Firmware: V 3.0

Test environment conditions: 22°C, 40% Relative Humidity, 102 kPa

Test Equipment:

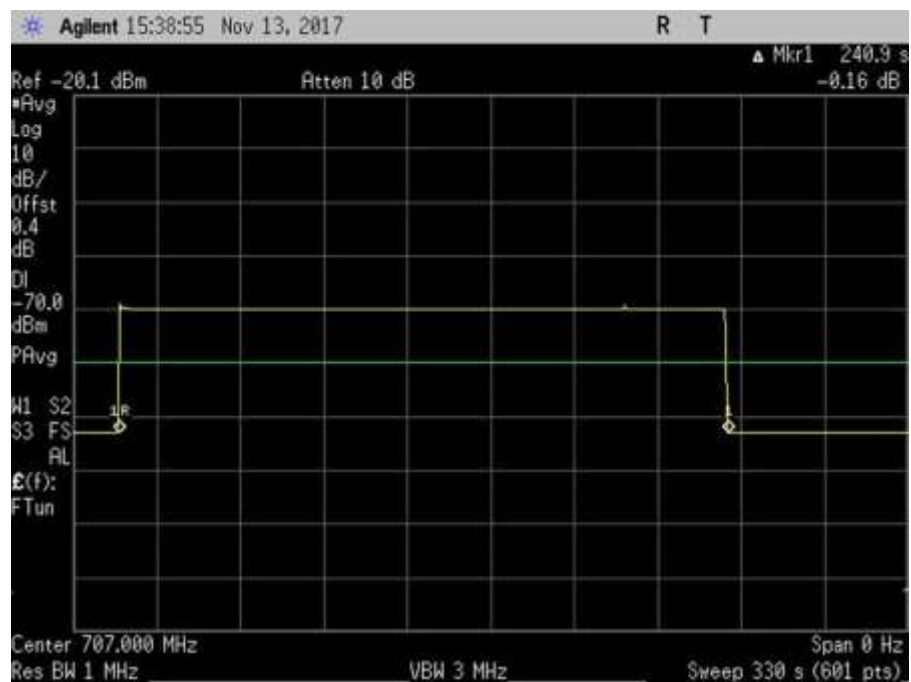
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03418	Signal Generator	E4438C	6/19/2017	6/19/2019
	ANP06239	Attenuator	54A-10	8/8/2016	8/8/2018
	ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
	AN03471	Spectrum Analyzer	E4440A	12/9/2015	12/9/2017

Summary of Results

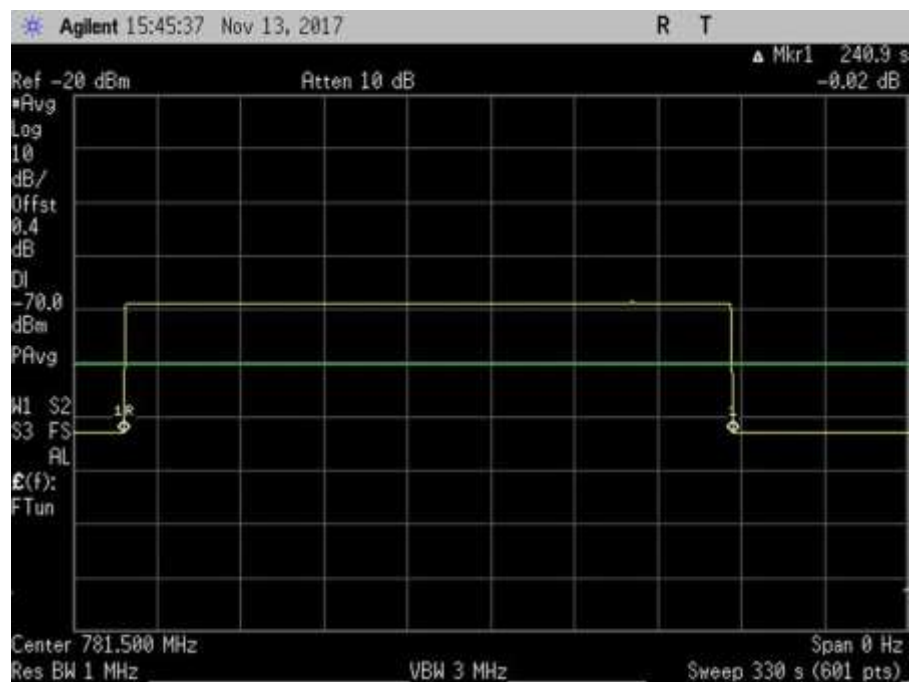
Pass: As demonstrated, when the booster is not serving an active device connection after 5 minutes the uplink noise power does not exceed -70dBm/MHz

Uplink Inactivity		
Freq	Measured	Limit
MHz	Min	Min
UL1710-1755	4.0	5.0
UL1850-1915	4.0	5.0
UL824-849	4.0	5.0
UL 698-716	4.0	5.0
UL776-787	4.0	5.0

Plots



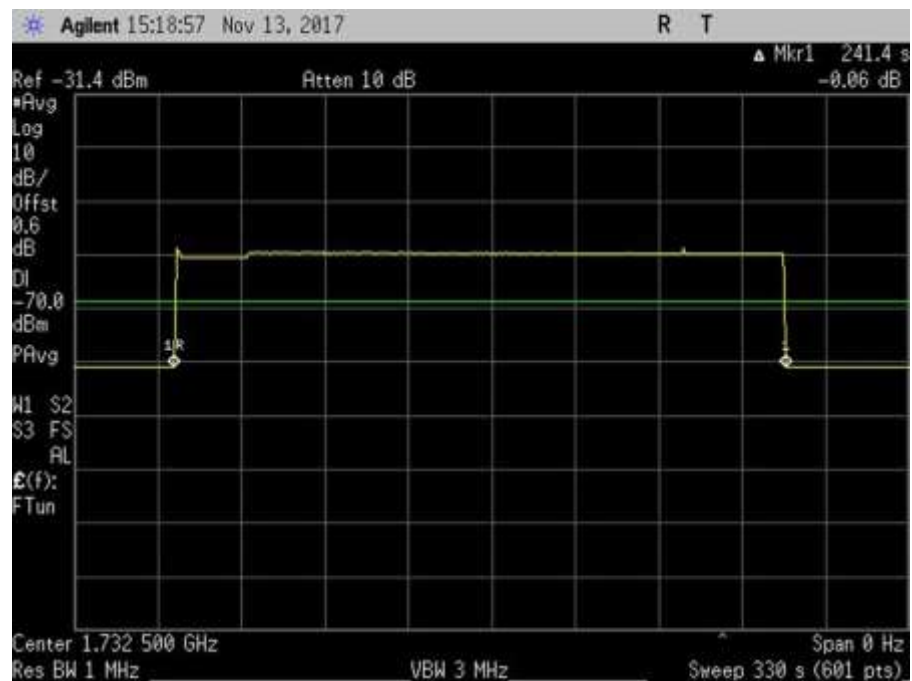
7.8_Inactivity_UL_698-716MHz



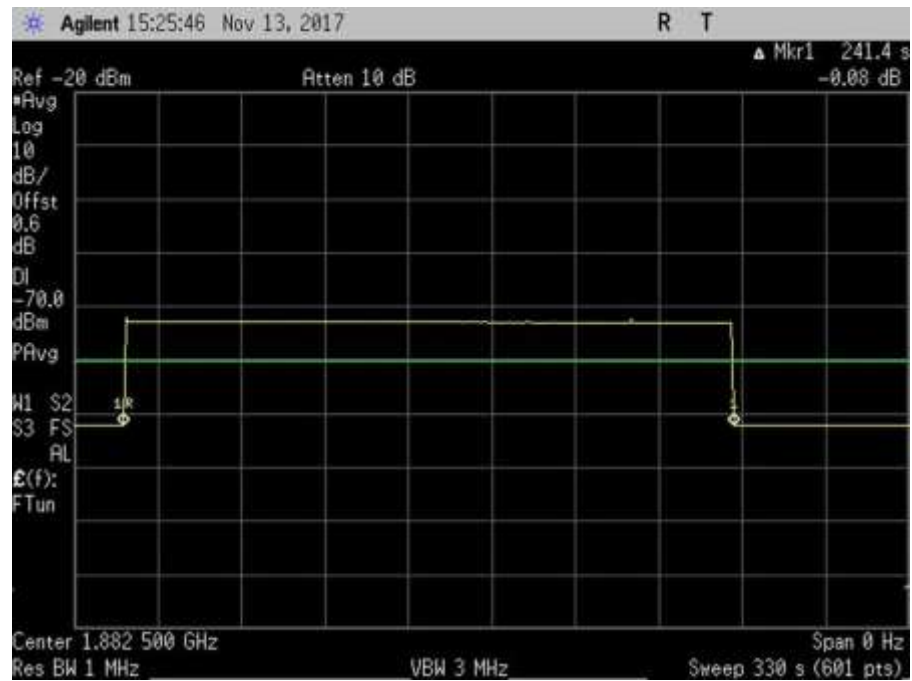
7.8_Inactivity_UL_776-787MHz



7.8_Inactivity_UL_824-849MHz



7.8_Inactivity_UL_1710-1755MHz



7.8_Inactivity_UL_1850-1915MHz

7.9 Booster Gain Limit

Test Conditions / Setup

Test Location: CKC Laboratories, Inc • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc
 Specification: **7.9 Variable Booster gain(Max Gain / Variable Uplink Gain Timing)**
 Work Order #: **100637** Date: 11/15/2017
 Test Type: **Conducted Emissions** Time: 3:32:00 PM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.
 The EUT Server port is a type FME connector and 50-ohm impedance.
 The EUT Donor port is type FME connector and 50-ohm impedance.

Part 22

UL: 824-849MHz

DL: 869-894MHz

Part 24

UL: 1850-1915MHz

DL: 1930-1995MHz

Part 27

UL: 1710-1755MHz, 698-716MHz, 776-787MHz

DL: 2110-2155MHz, 728-746MHz, 746-757MHz

Test procedure:

The test was performed in accordance with section 7.9 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017.

Firmware: V 3.0

Test environment conditions: 22°C, 40% Relative Humidity, 101.5 kPa

Note:

Used MSCL provided by the manufacturer's antenna kitting.

Mobile station coupling loss (MSCL): the minimum coupling loss (in dB) between the wireless device and the input (server) port of the consumer booster. MSCL must be calculated or measured for each band of operation and provided in compliance test reports. MSCL includes the path loss from the wireless device, and the booster's server antenna gain and cable loss. The wireless device is assumed to be an isotropic (0 dBi) antenna reference. Minimum standoff distances from inside wireless devices to the booster's server antenna must be reasonable and specified by the manufacturer in customer provided installation manuals.

$$L P = 20 \log f + 20 \log d - 27.5$$

Where:

L P = basic free space path loss,
f = Center frequency,
d = 0.6, 1.0 and 1.5 meters

Frequency (MHz)	MSCL (dB)
PCS (1850-1915)	37.8
Cellular(824-849)	32.5
LTE(698-716)	30.6
LTE(776-787)	31.5
AWS(1710-1755)	37

Note:

PCS(1850-1915) 37.8 is from Desk top RV-1 Kit d=1m
Cellular(824-849) 32.5 is from Vehicle Kit2 d=0.6m
LTE(698-716) 30.6 from Vehicle Kit2 d=0.6m
LTE(776-787) 31.5 from Vehicle Kit2 d=0.6m
AWS(1710-1755) 37 is from Marine-1 Kit d=1.5m

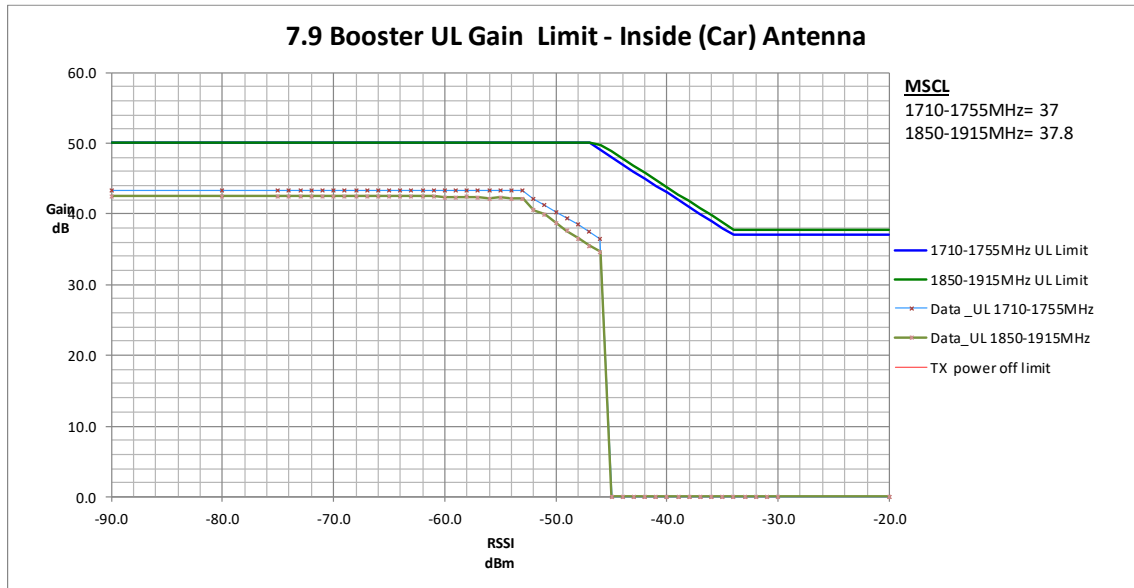
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03418	Signal Generator	E4438C	6/19/2017	6/19/2019
	ANP06239	Attenuator	54A-10	8/8/2016	8/8/2018
	ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
	AN03471	Spectrum Analyzer	E4440A	12/9/2015	12/9/2017

Summary of Results

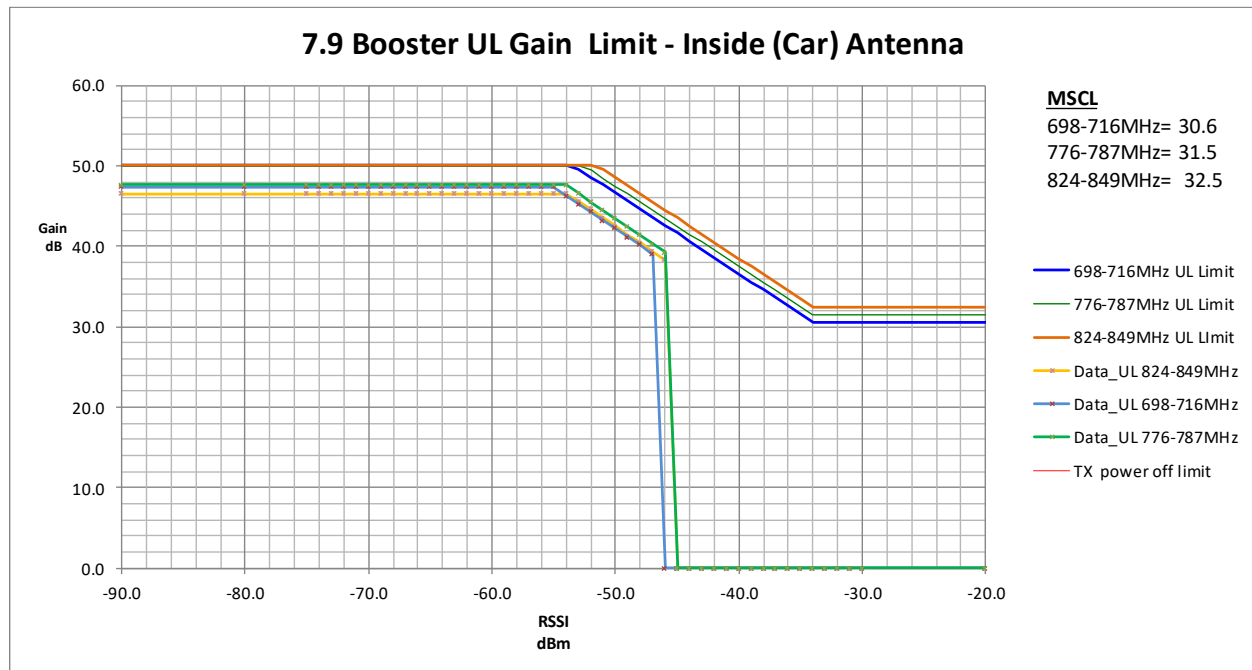
Pass: As demonstrated, computed gains are within the gain limit. All maximum variable uplink gain timings are within 1 second limit.

7.9.1 Maximum gain



1710.0 1755.0 MHz							
				Limit		Margin	
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Mobile Booster Limit	TX off	
-67.0	-25.1	18.2	43.3		50.0		-6.7
-55.0	-25.1	18.2	43.3		50.0		-6.7
-46.0	-25.1	11.4	36.5	49.0			-12.5
-37.0	-25.1	-57.4	0.0	40.0			-40.0
-36.0	-25.1	-57.4	0.0	39.0			-39.0
-35.0	-25.1	-57.4	0.0	38.0			-38.0

1850.0				1915.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Mobile Booster Limit	TX off	
-75.0	-25.5	17.0	42.5		50.0		-7.5
-55.0	-25.5	16.8	42.3		50.0		-7.7
-46.0	-25.5	9.1	34.6	49.8			-15.2
-37.0	-25.5	-60.6	0.0	40.8			-40.8
-36.0	-25.5	-60.6	0.0	39.8			-39.8
-35.0	-25.5	-60.6	0.0	38.8			-38.8



824.0				849.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Mobile Booster Limit	TX off	
-72.0	-27.1	19.4	46.5		50.0		-3.5
-58.0	-27.1	19.4	46.5		50.0		-3.5
-51.0	-27.1	16.4	43.5	49.5			-6.0
-50.0	-27.1	15.4	42.5	48.5			-6.0
-49.0	-27.1	14.2	41.3	47.5			-6.2
-48.0	-27.1	13.3	40.4	46.5			-6.1

698.0				716.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Mobile Booster Limit	TX off	
-80.0	-27.9	19.5	47.4		50.0		-2.6
-60.0	-27.9	19.5	47.4		50.0		-2.6
-53.0	-27.9	17.3	45.2	49.6			-4.4
-52.0	-27.9	16.4	44.3	48.6			-4.3
-51.0	-27.9	15.3	43.2	47.6			-4.4
-50.0	-27.9	14.3	42.2	46.6			-4.4

776.0				787.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Mobile Booster Limit	TX off	
-73.0	-27.9	19.7	47.6		50.0		-2.4
-58.0	-27.9	19.7	47.6		50.0		-2.4
-52.0	-27.9	17.6	45.5	49.5			-4.0
-51.0	-27.9	16.6	44.5	48.5			-4.0
-50.0	-27.9	15.5	43.4	47.5			-4.1
-49.0	-27.9	14.5	42.4	46.5			-4.1

7.9.2 Variable uplink gain timing

Uplink Gain Timing		
Frequency (MHz)	Measured (Sec)	Limit (Sec)
UL 1710-1755	0.70	1
UL 1850-1915	0.70	1
UL 824-849	0.63	1
UL 698-716	0.55	1
UL 776-787	0.57	1

7.9.1 Maximum Gain

For this subsection, see summary of results of 7.9

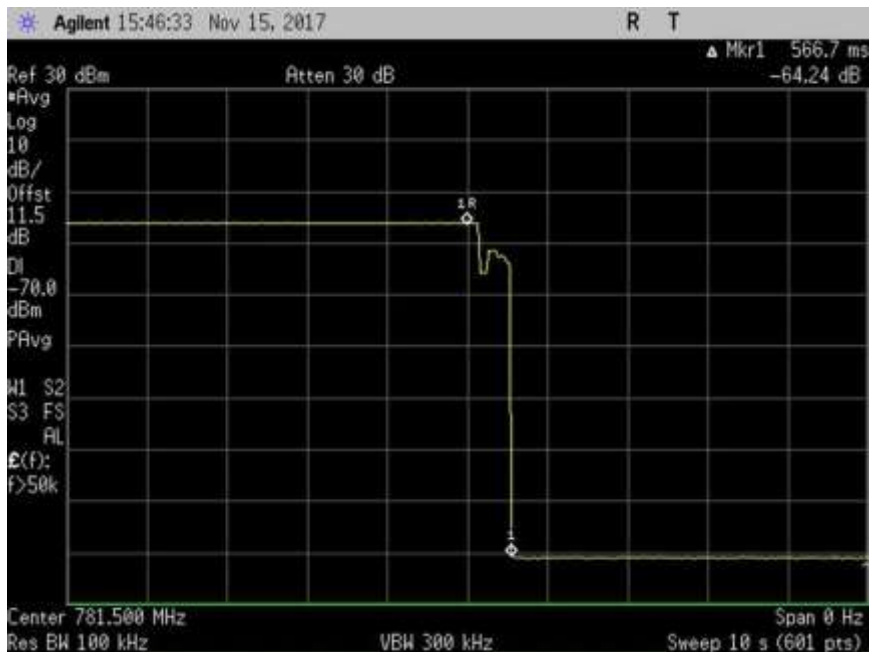
7.9.1 Maximum gain

7.9.2 Variable uplink Gain Timing

Plots



7.9.2_VarULGainTiming_UL_698-716MHz



7.9.2_VarULGainTiming_UL_776-787MHz



7.9.2_VarULGainTiming_UL_824-849MHz



7.9.2_VarULGainTiming_UL_1710-1755MHz



7.9.2_VarULGainTiming_UL_1850-1915MHz

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 #: **100637** Date: 11/13/2017
 Test Type: **Conducted Emissions** Time: 11:12:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.
 The EUT Server port is a type FME connector and 50-ohm impedance.
 The EUT Donor port is type FME connector and 50-ohm impedance.

Part 22

UL: 824-849MHz

DL: 869-894MHz

Part 24

UL: 1850-1915MHz

DL: 1930-1995MHz

Part 27

UL: 1710-1755MHz, 698-716MHz, 776-787MHz

DL: 2110-2155MHz, 728-746MHz, 746-757MHz

Test procedure:

The test was performed in accordance with section 7.10 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017.

Firmware: V 3.0

Test environment conditions: 22°C, 40% Relative Humidity, 102 kPa

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	AN03418	Signal Generator	E4438C	6/19/2017	6/19/2019
	ANP06239	Attenuator	54A-10	8/8/2016	8/8/2018
	ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
	AN03471	Spectrum Analyzer	E4440A	12/9/2015	12/9/2017

Summary of Results

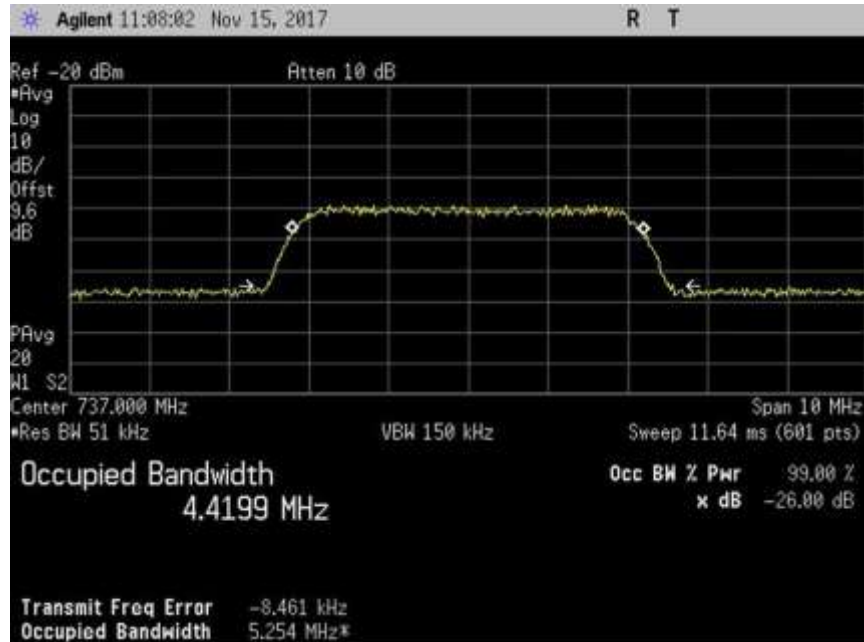
Pass: As summarized in plots and tables below, the uniformity of the output signal relative to the input signal are practically identical. Therefore, the comparison is within limits.

OBW-Input (Hz)					OBW-Output (Hz)				
EDGE	GSM	CDMA	WCDMA	LTE	EDGE	GSM	CDMA	WCDMA	LTE
244655	245180	1213862	4346087	4461993	246124	245982	1216799	4351620	4453649
244788	244592	1208479	4354318	4454206	245514	245897	1210237	4371112	4457154
244960	246511	1208113	4337957	4451246	243747	245211	1214282	4360490	4442727
244827	245609	1213216	4358675	4455535	243509	246514	1209799	4358746	4456366
245006	246593	1210949	4360001	4459303	243544	245517	1208145	4348904	4453717
246079	249014	1206826	4448446	4470159	244948	245496	1206850	4331799	4466085
246307	248086	1214503	4421260	4483061	244757	246504	1212193	4340462	4462137
247021	248207	1208743	4430952	4474680	245256	245077	1208535	4328437	4464499
246757	248817	1215548	4419857	4476132	244724	245355	1209735	4329867	4467423
247116	248698	1212425	4422816	4480149	244816	246211	1211139	4326310	4460842

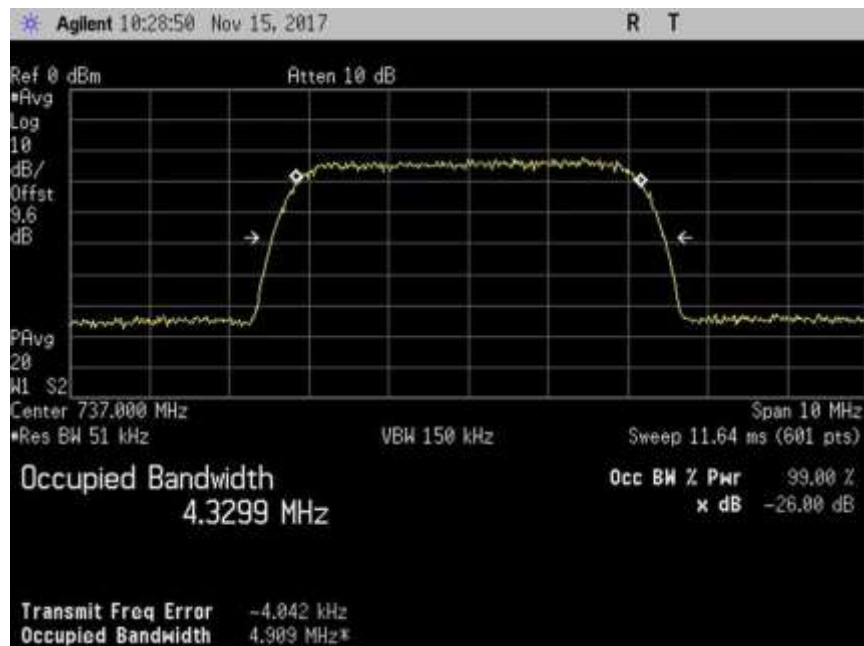
Max Difference In&Out Occ BW 99% Pwr					
Frequency Range	EDGE	GSM	CDMA	WCDMA	LTE
UL_1710-1755MHz	0.60%	0.33%	0.24%	0.13%	0.19%
UL_1850-1915MHz	0.30%	0.53%	0.15%	0.39%	0.07%
UL_824-849MHz	0.50%	0.53%	0.51%	0.52%	0.19%
UL_698-716MHz	0.54%	0.37%	0.28%	0.00%	0.02%
UL_777-787MHz	0.60%	0.44%	0.23%	0.25%	0.13%
DL_2110-2155MHz	0.46%	1.41%	0.00%	2.62%	0.09%
DL_1930-1995MHz	0.63%	0.64%	0.19%	1.83%	0.47%
DL_869-894MHz	0.71%	1.26%	0.02%	2.31%	0.23%
DL_728-746MHz	0.82%	1.39%	0.48%	2.04%	0.19%
DL_746-756MHz	0.93%	1.00%	0.11%	2.18%	0.43%

Plots

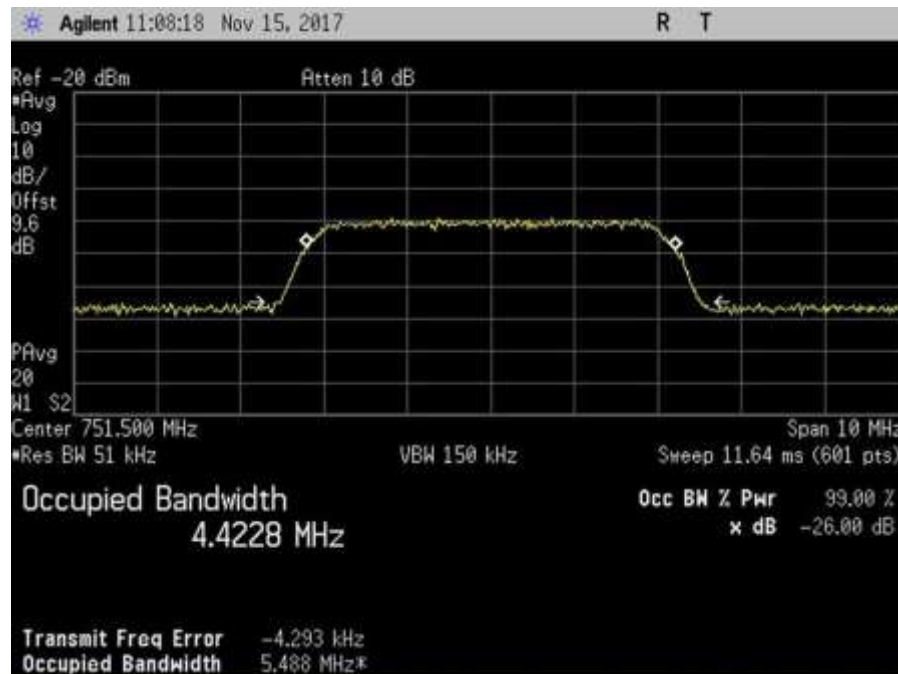
AWGN, DL



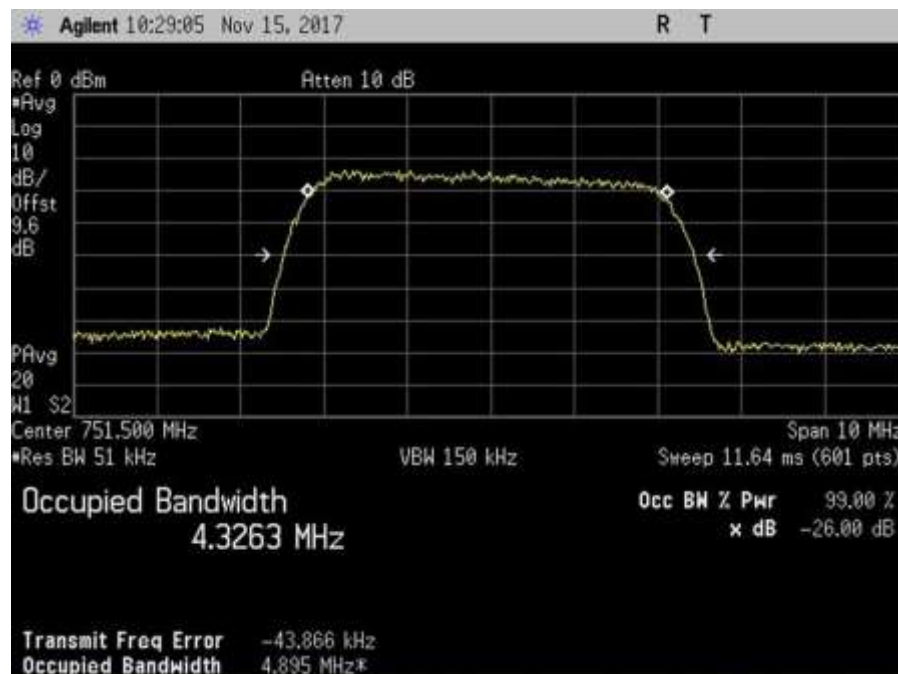
7.10_OBW_DL_728-746MHz_AWGN_In



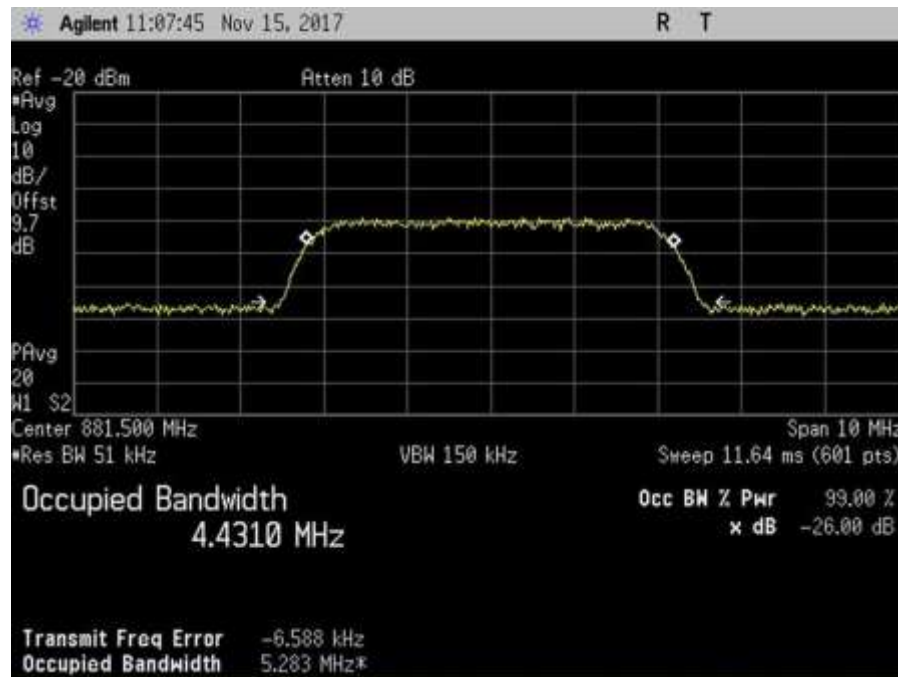
7.10_OBW_DL_728-746MHz_AWGN_Out



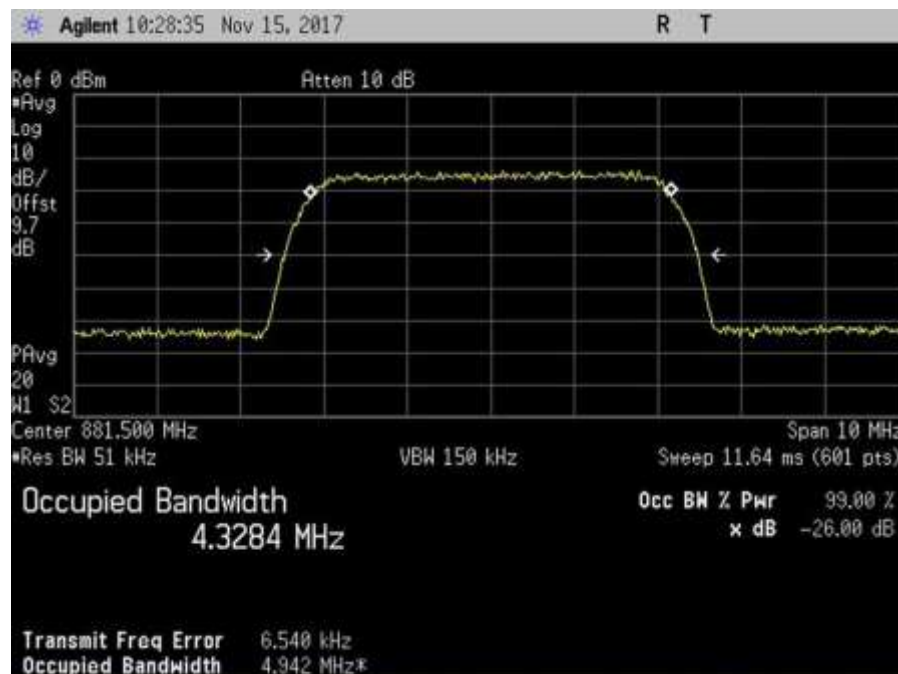
7.10_OBW_DL_746-757MHz_AWGN_In



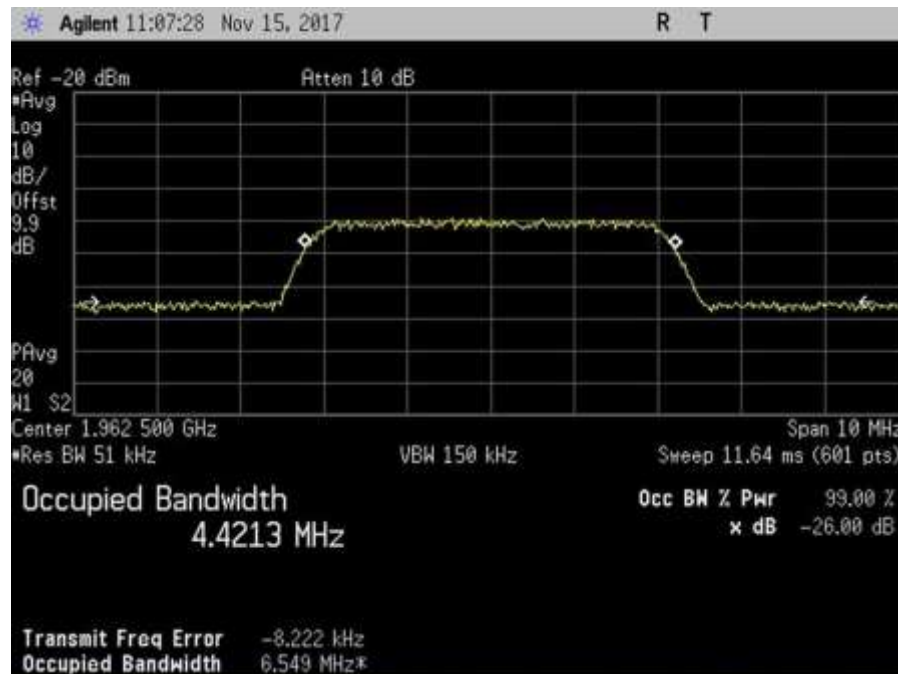
7.10_OBW_DL_746-757MHz_AWGN_Out



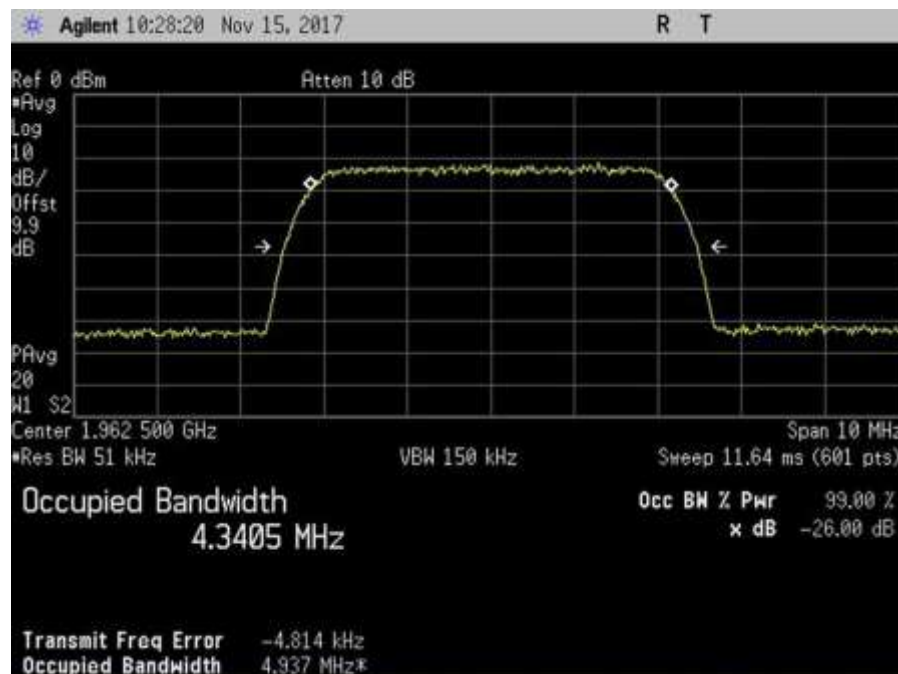
7.10_OBW_DL_869-894MHz_AWGN_In



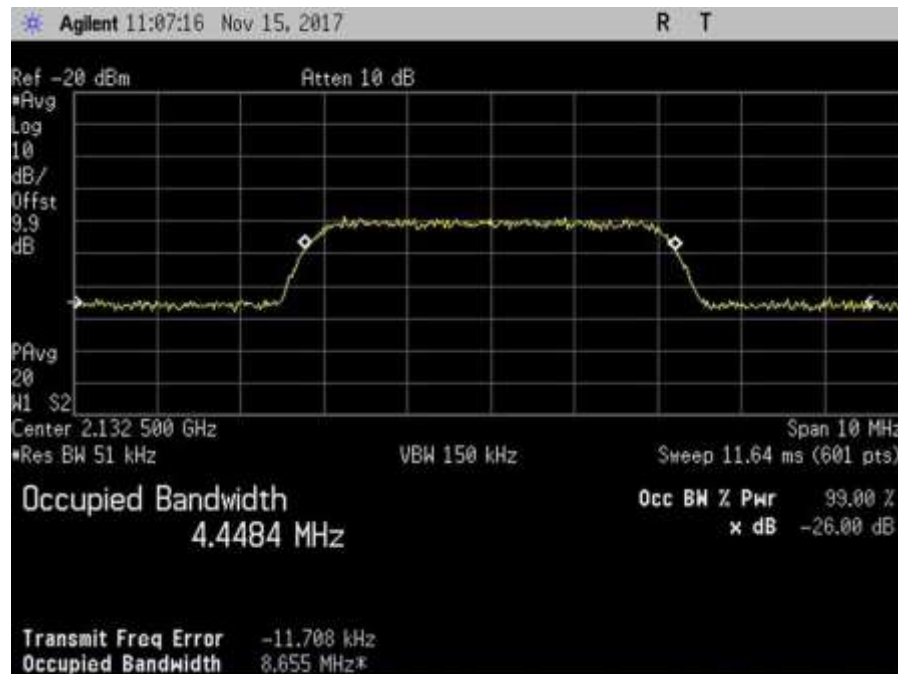
7.10_OBW_DL_869-894MHz_AWGN_Out



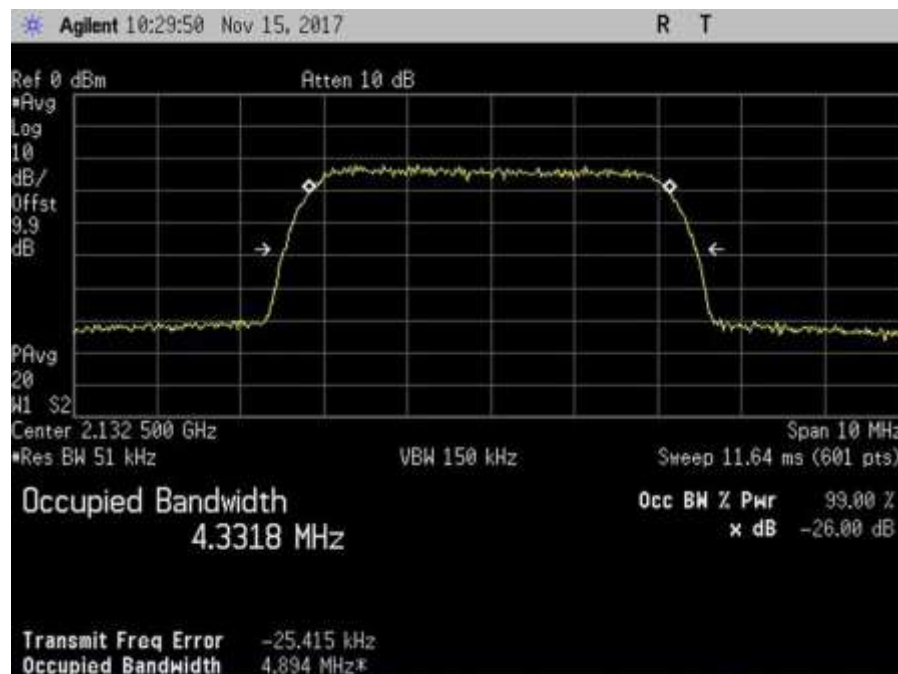
7.10_OBW_DL_1930-1995MHz_AWGN_In



7.10_OBW_DL_1930-1995MHz_AWGN_Out

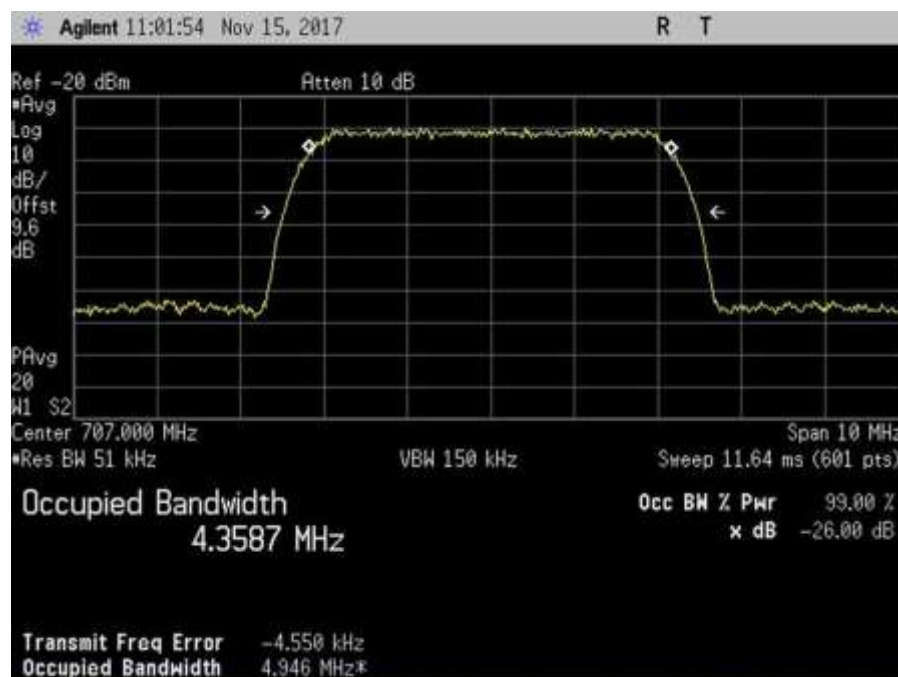


7.10_OBW_DL_2110-2155MHz_AWGN_In

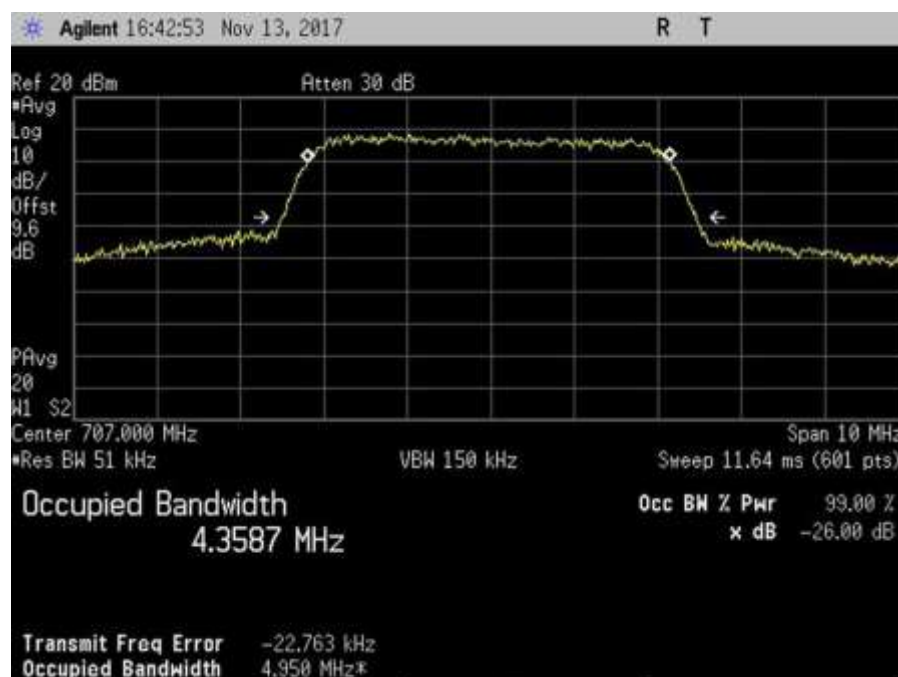


7.10_OBW_DL_2110-2155MHz_AWGN_Out

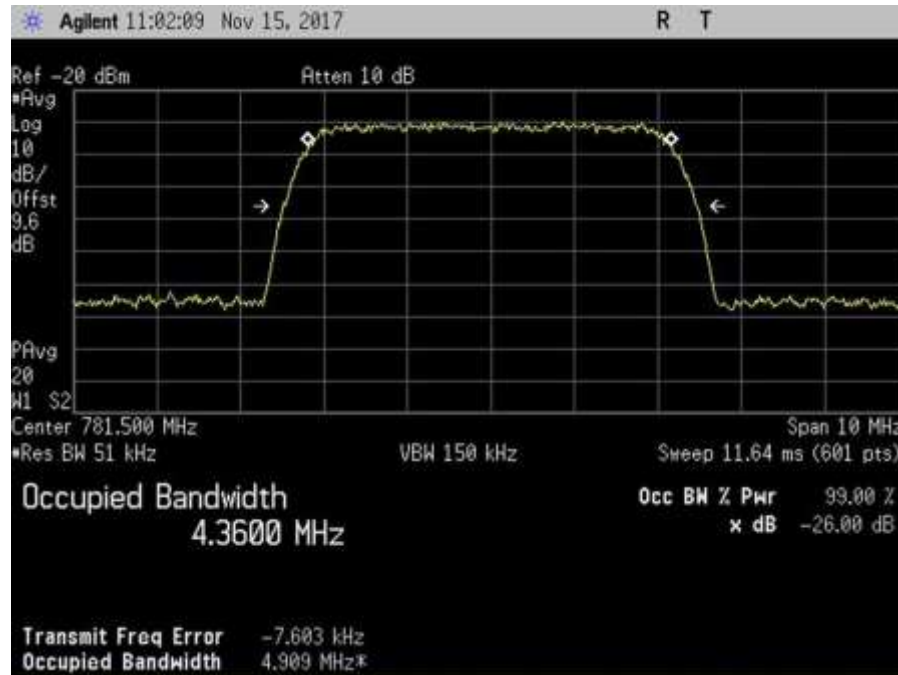
AWGN, UL



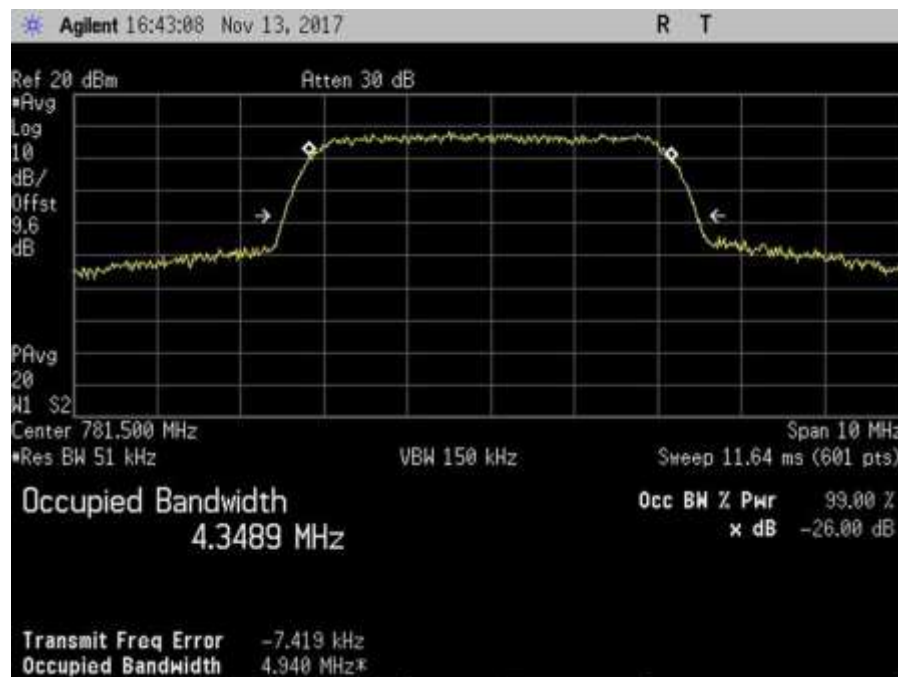
7.10_OBW_UL_698-716MHz_AWGN_In



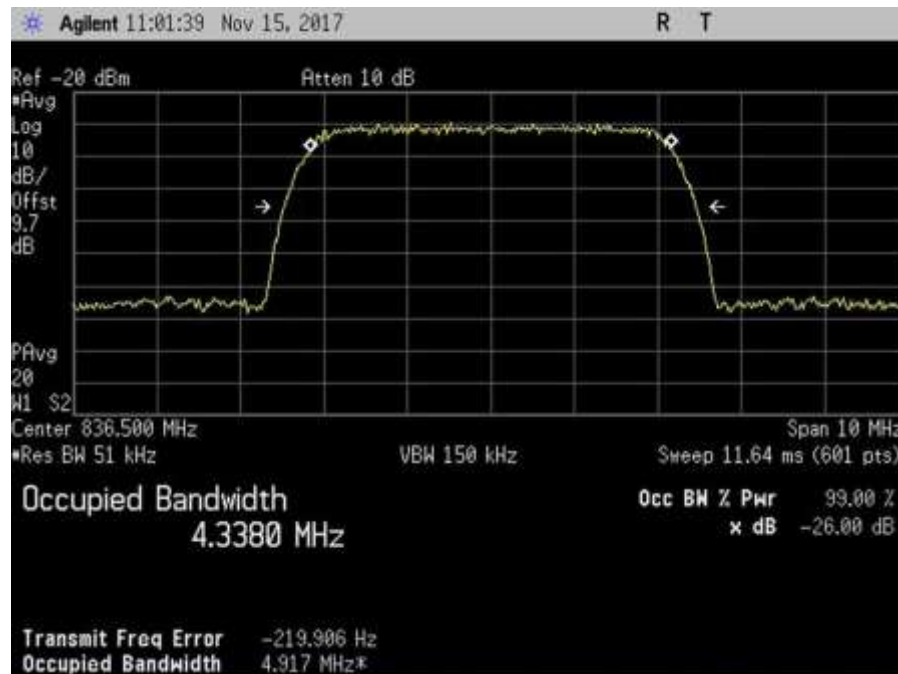
7.10_OBW_UL_698-716MHz_AWGN_Out



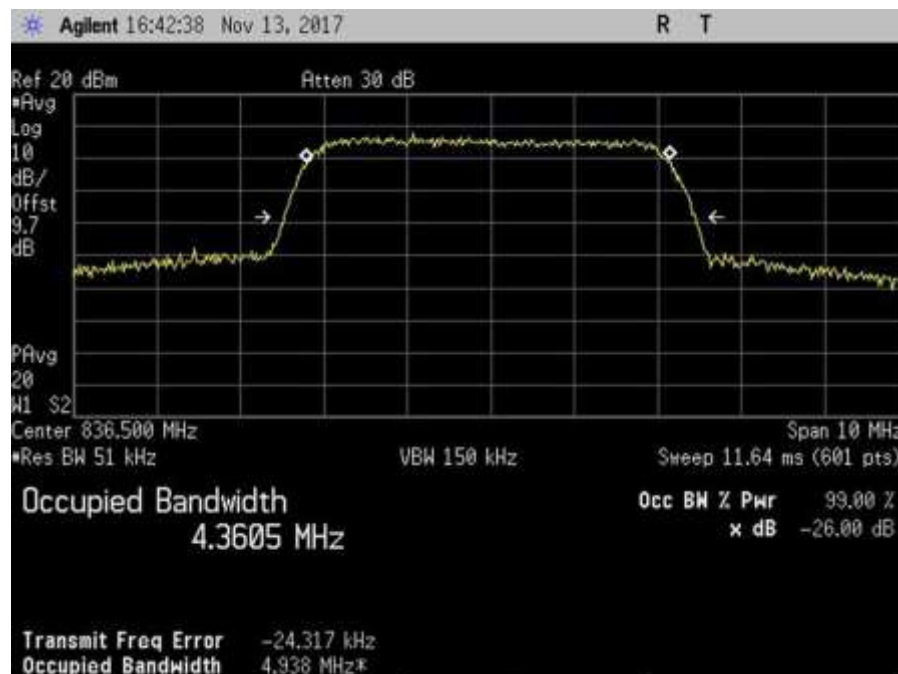
7.10_OBW_UL_776-787MHz_AWGN_In



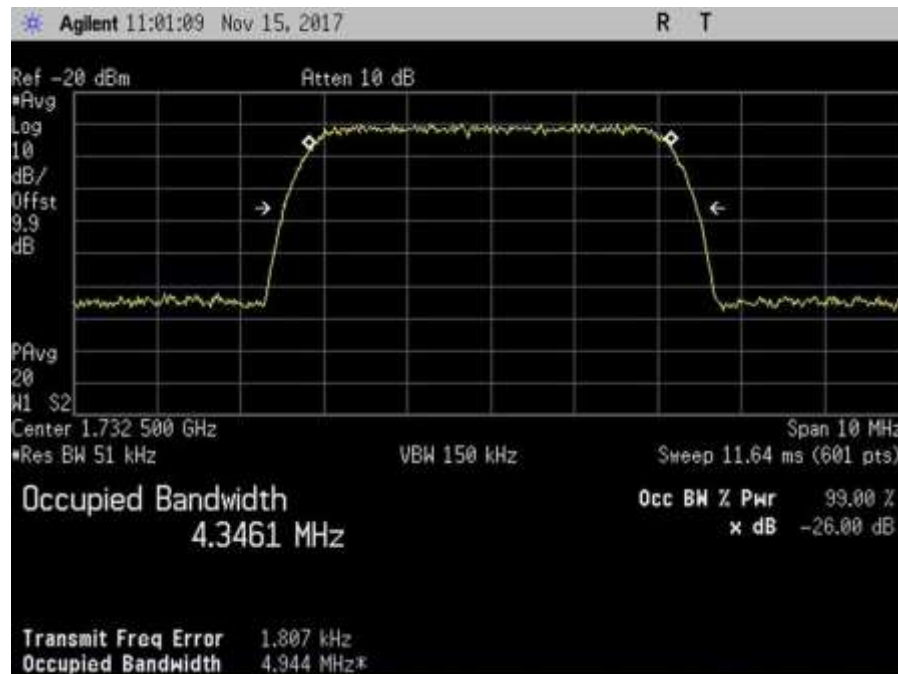
7.10_OBW_UL_776-787MHz_AWGN_Out



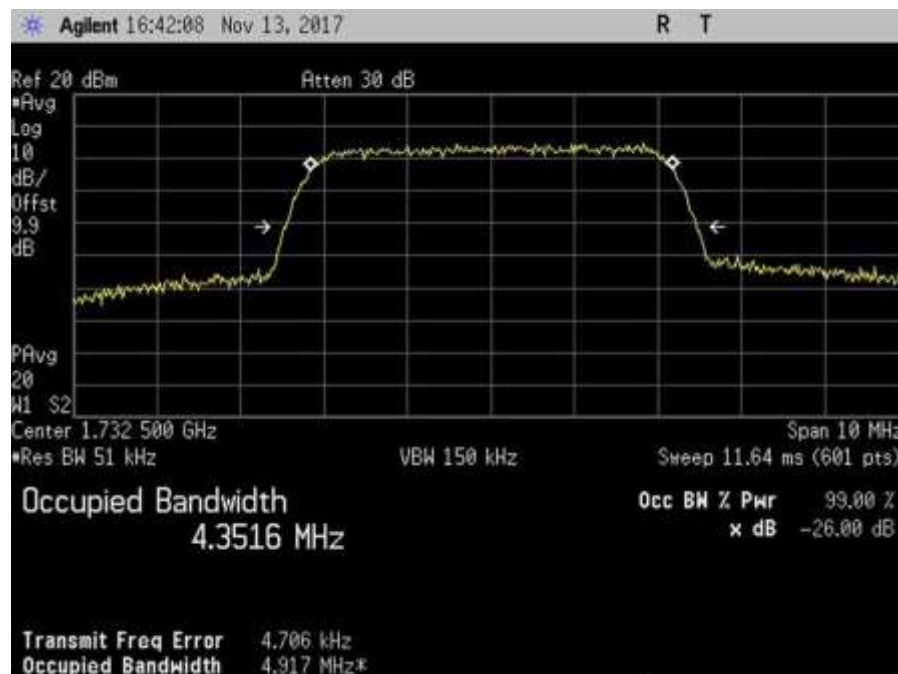
7.10_OBW_UL_824-849MHz_AWGN_In



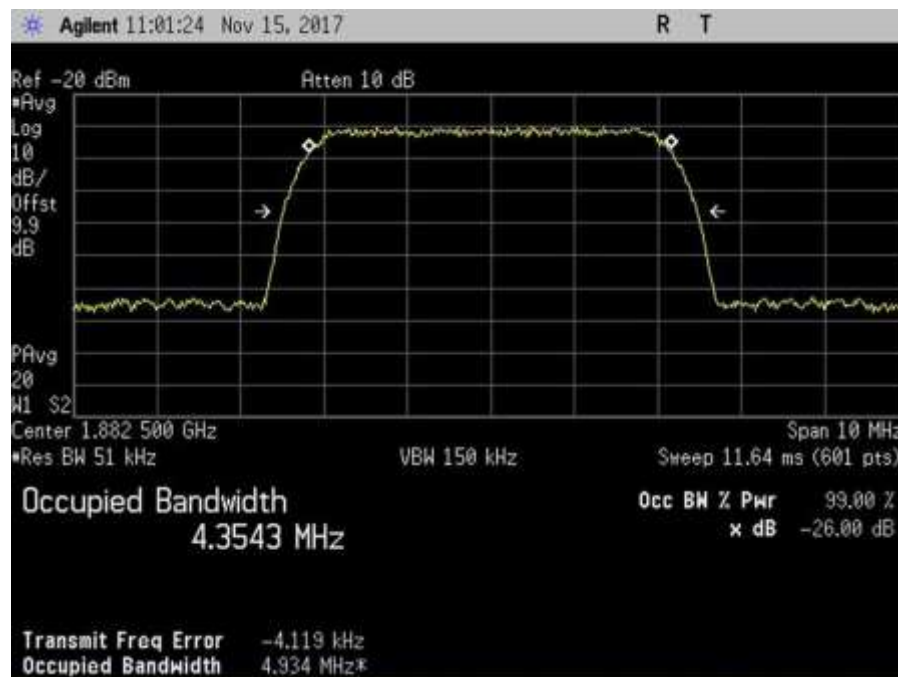
7.10_OBW_UL_824-849MHz_AWGN_Out



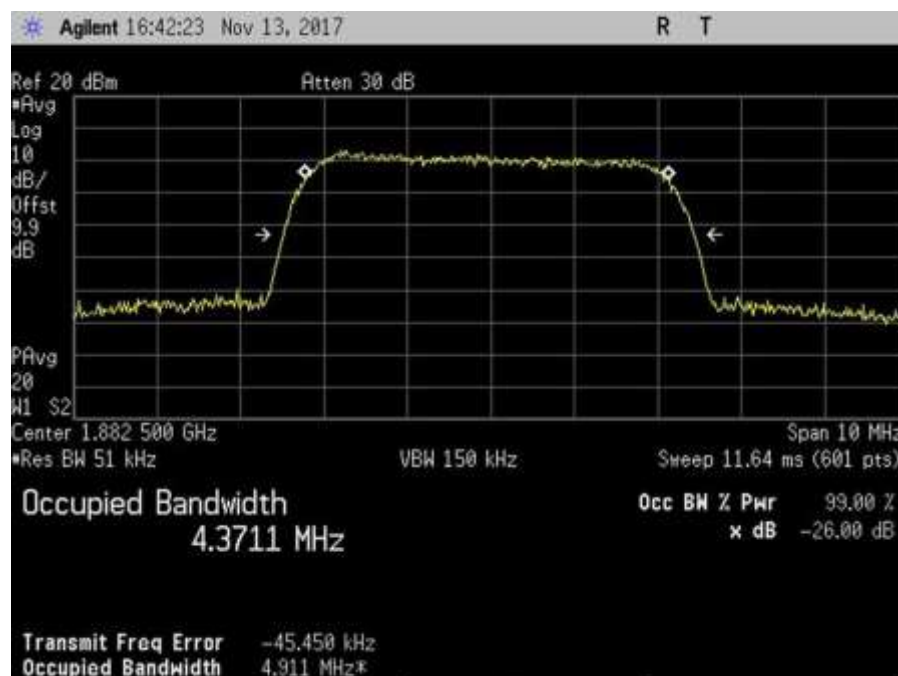
7.10_OBW_UL_1710-1755MHz_AWGN_In



7.10_OBW_UL_1710-1755MHz_AWGN_Out

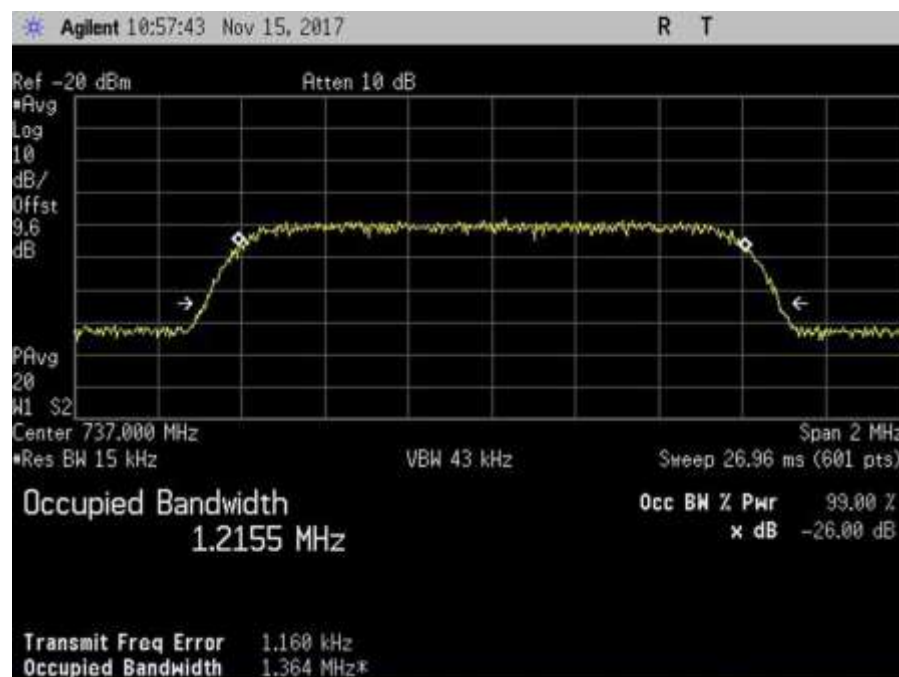


7.10_OBW_UL_1850-1915MHz_AWGN_In

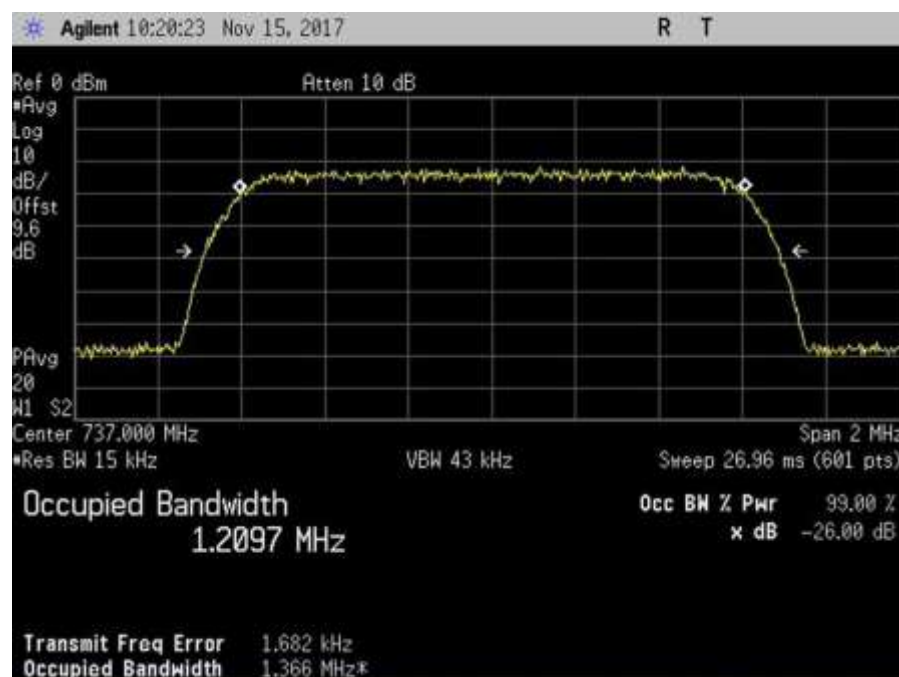


7.10_OBW_UL_1850-1915MHz_AWGN_Out

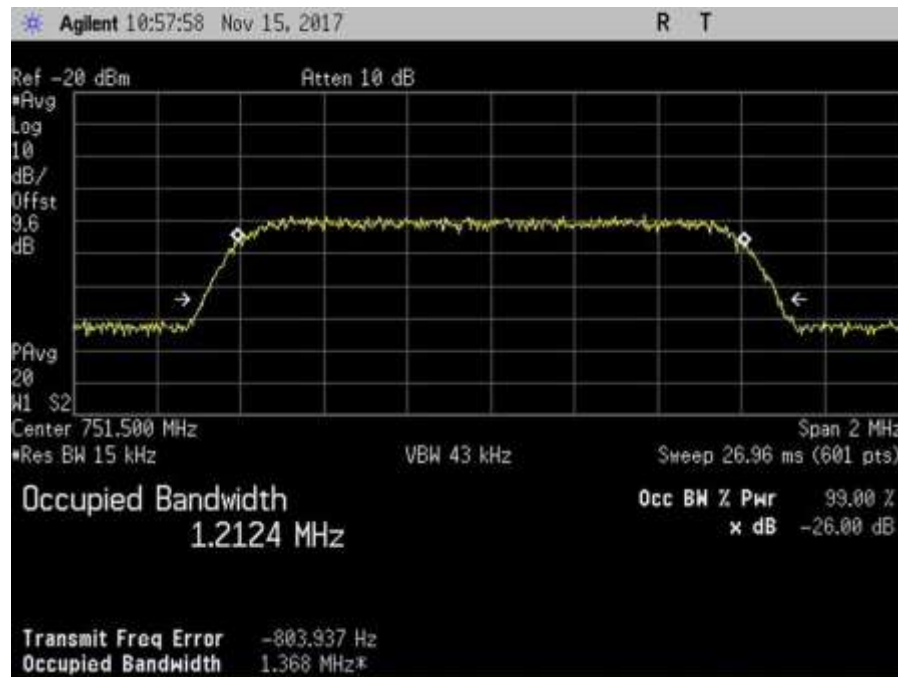
CDMA, DL



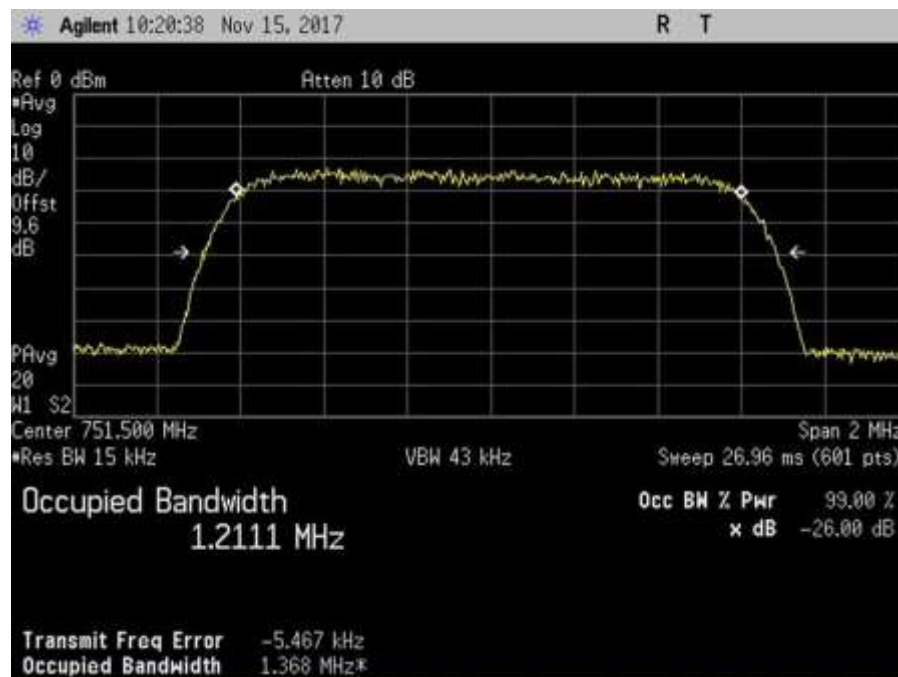
7.10_OBW_DL_728-746MHz_CDMA_In



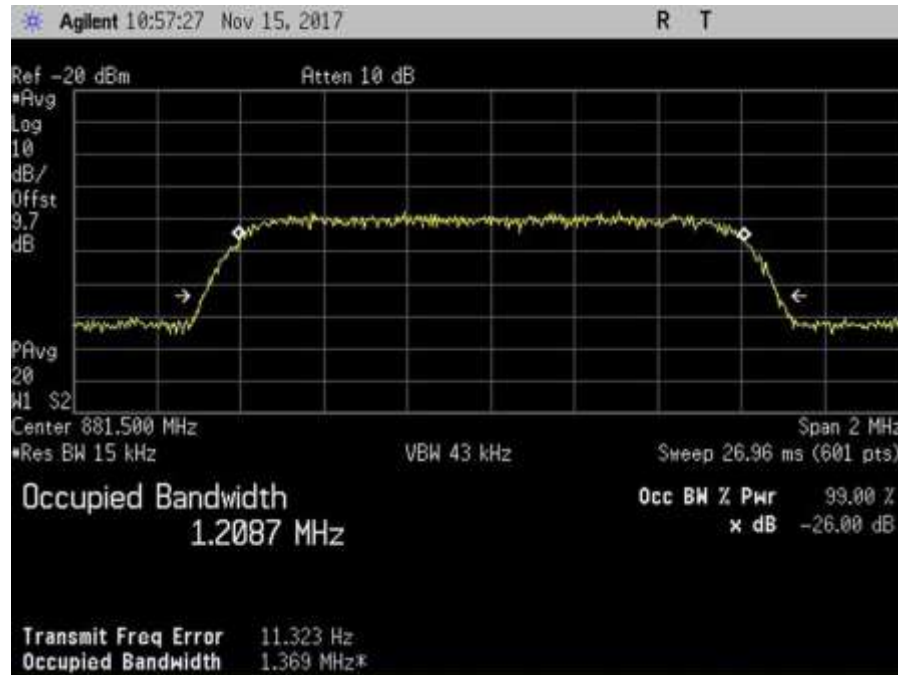
7.10_OBW_DL_728-746MHz_CDMA_Out



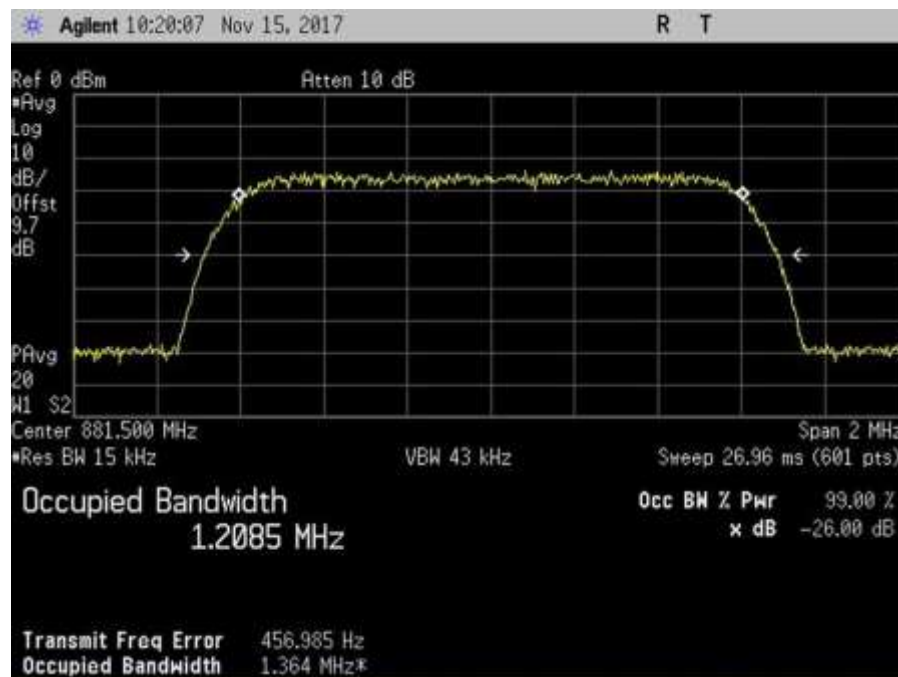
7.10_OBW_DL_746-757MHz_CDMA_In



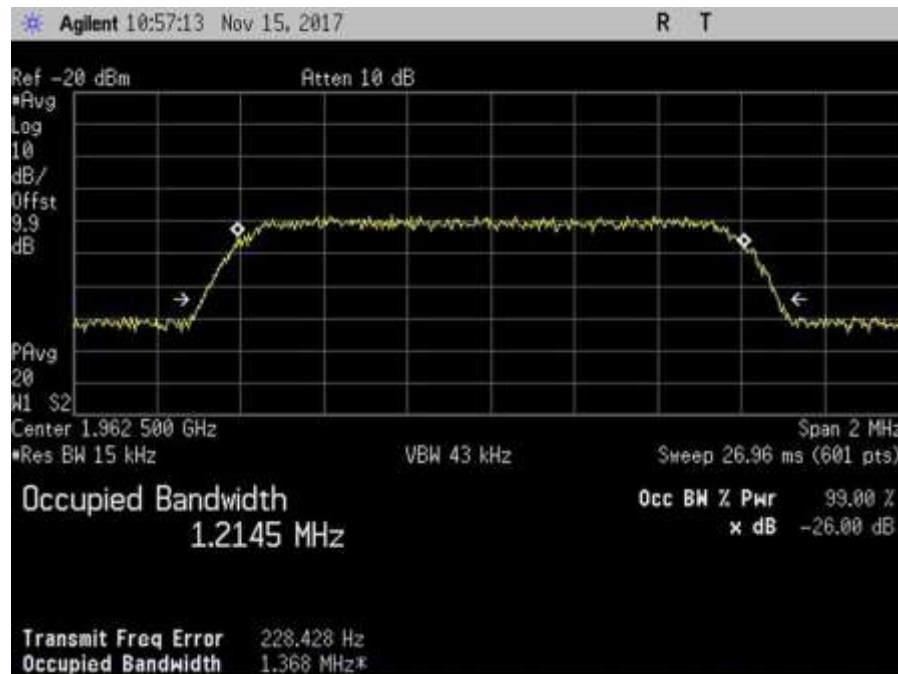
7.10_OBW_DL_746-757MHz_CDMA_Out



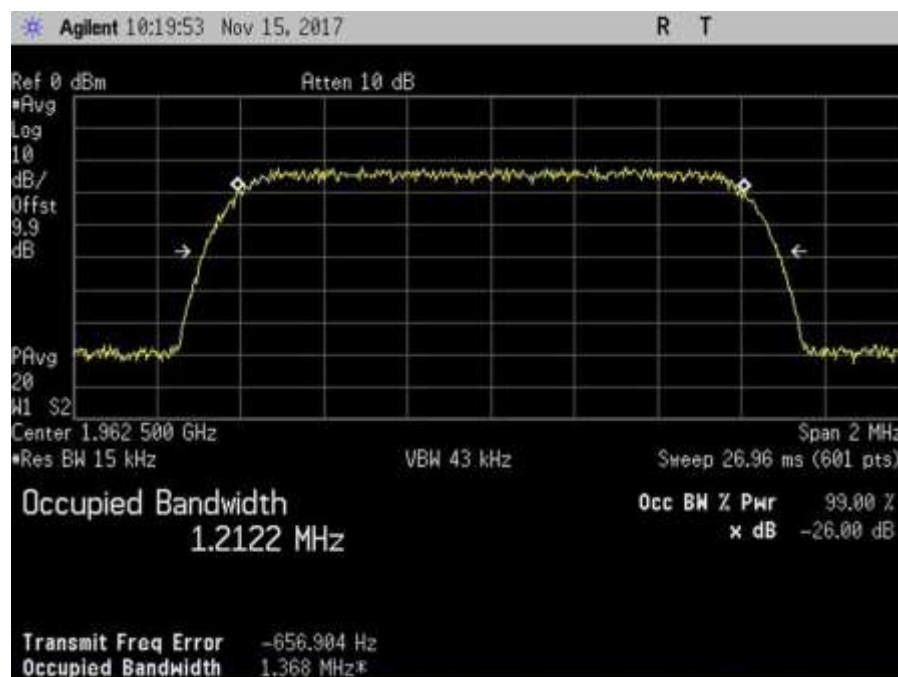
7.10_OBW_DL_869-894MHz_CDMA_In



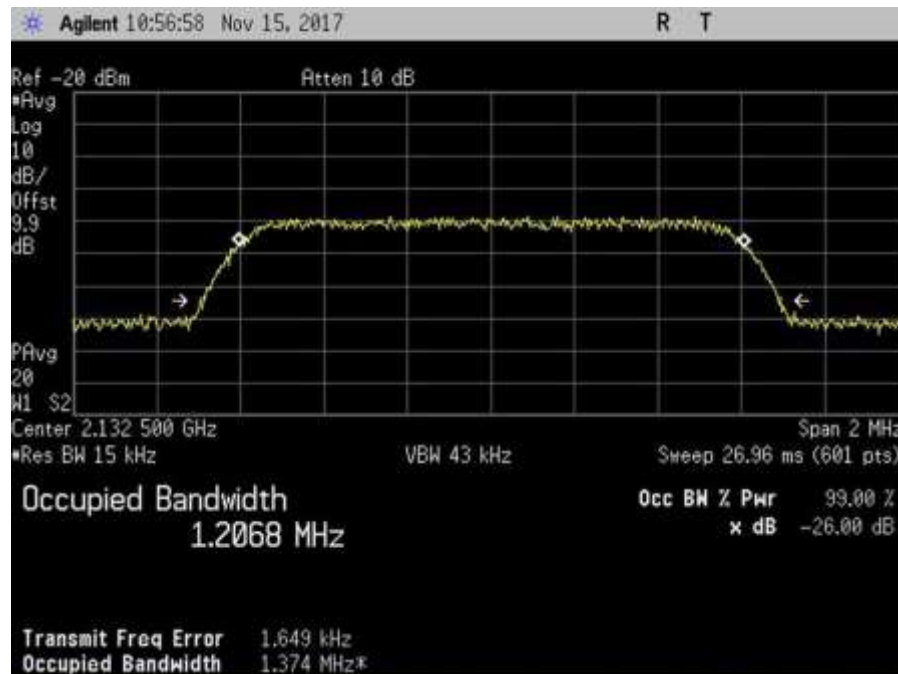
7.10_OBW_DL_869-894MHz_CDMA_Out



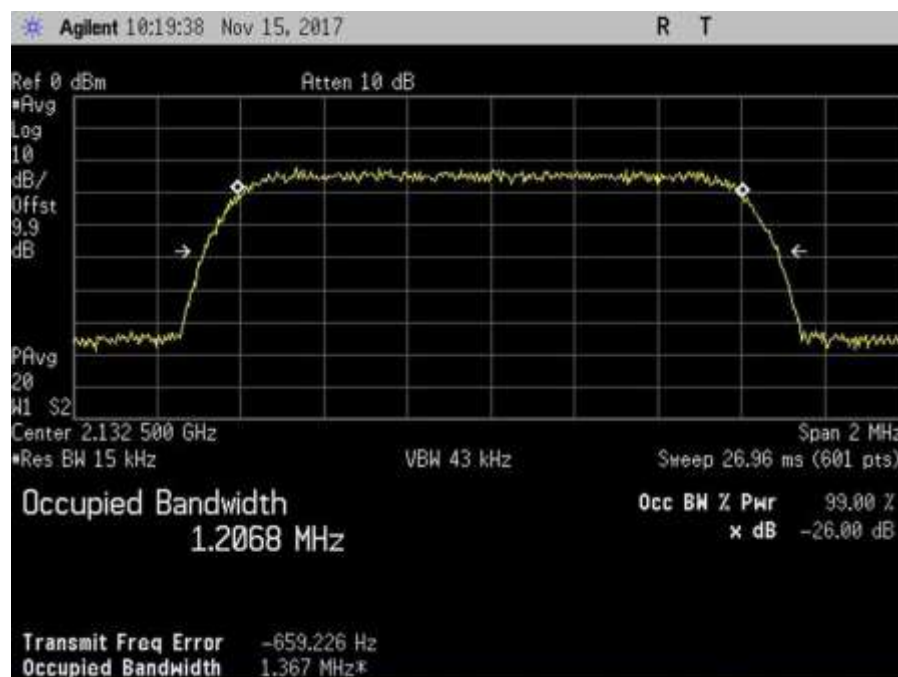
7.10_OBW_DL_1930-1995MHz_CDMA_In



7.10_OBW_DL_1930-1995MHz_CDMA_Out

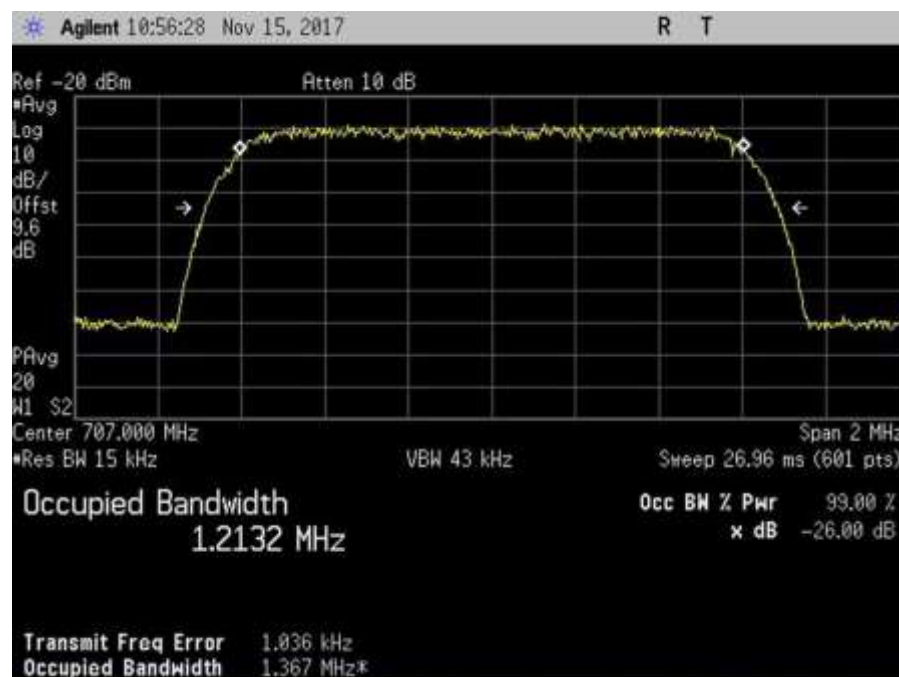


7.10_OBW_DL_2110-2155MHz_CDMA_In

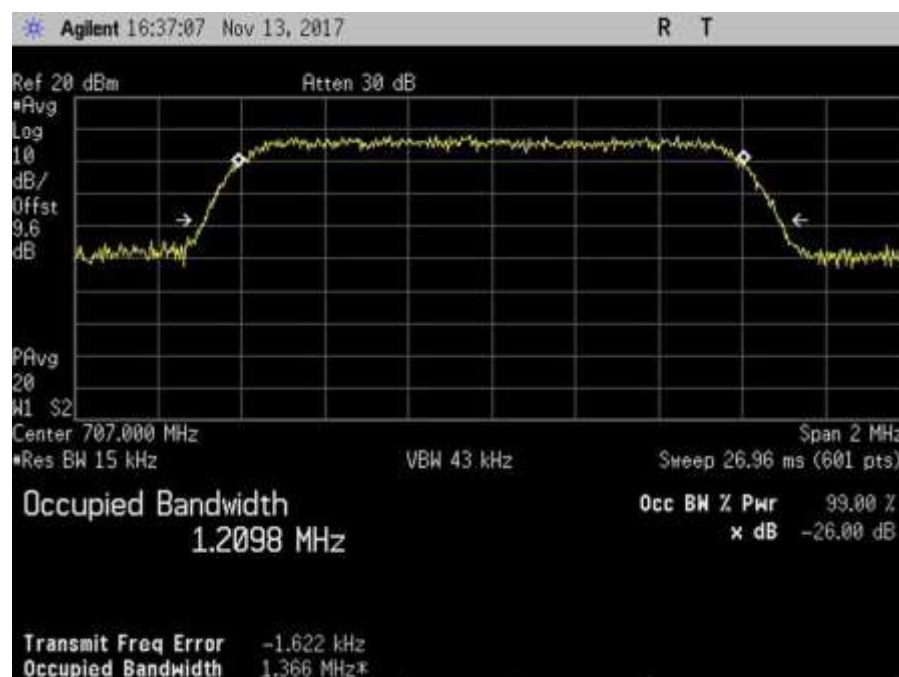


7.10_OBW_DL_2110-2155MHz_CDMA_Out

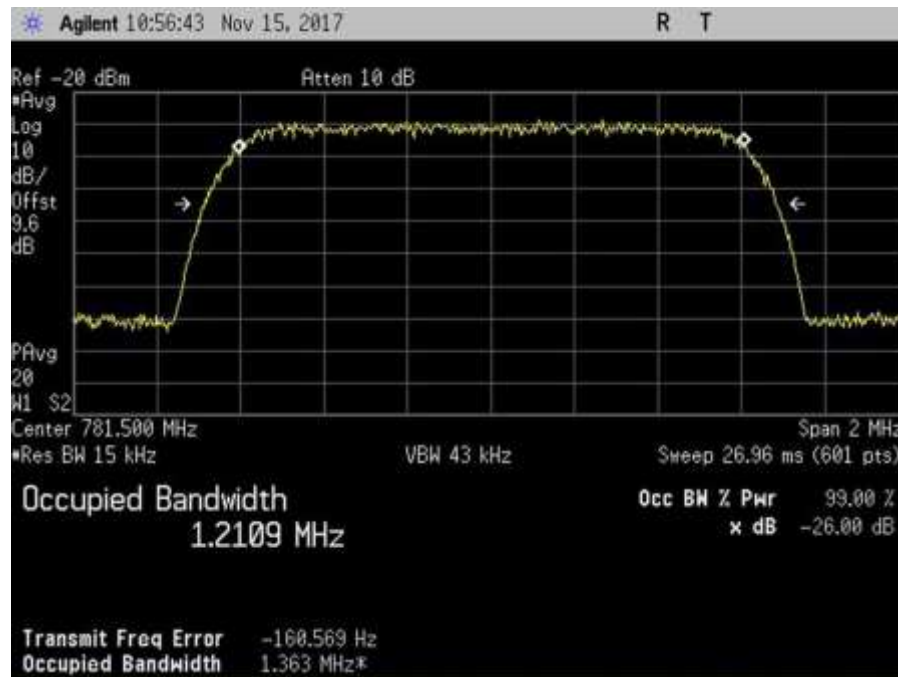
CDMA, UL



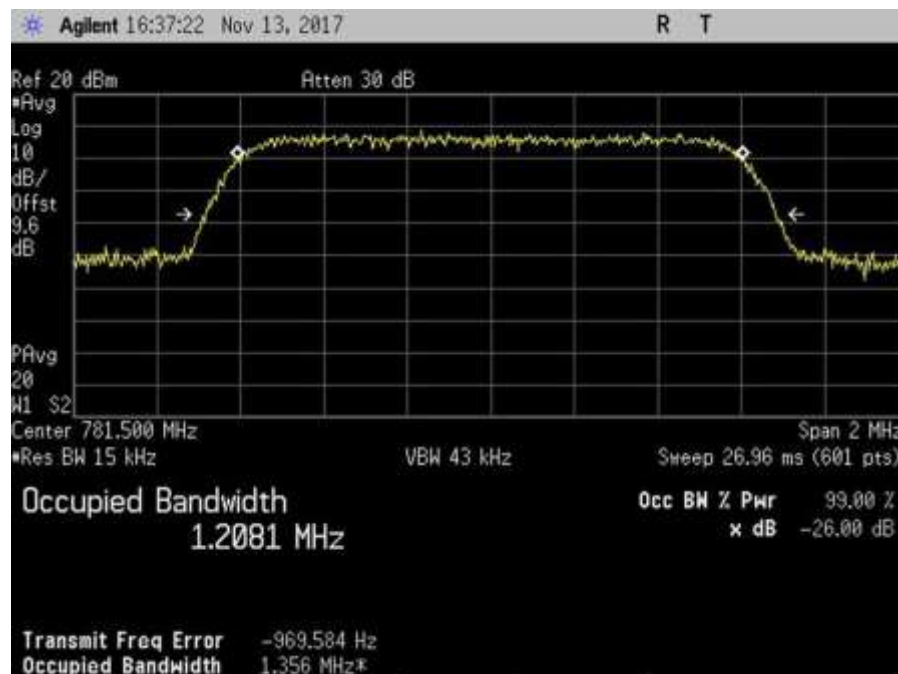
7.10_OBW_UL_698-716MHz_CDMA_In



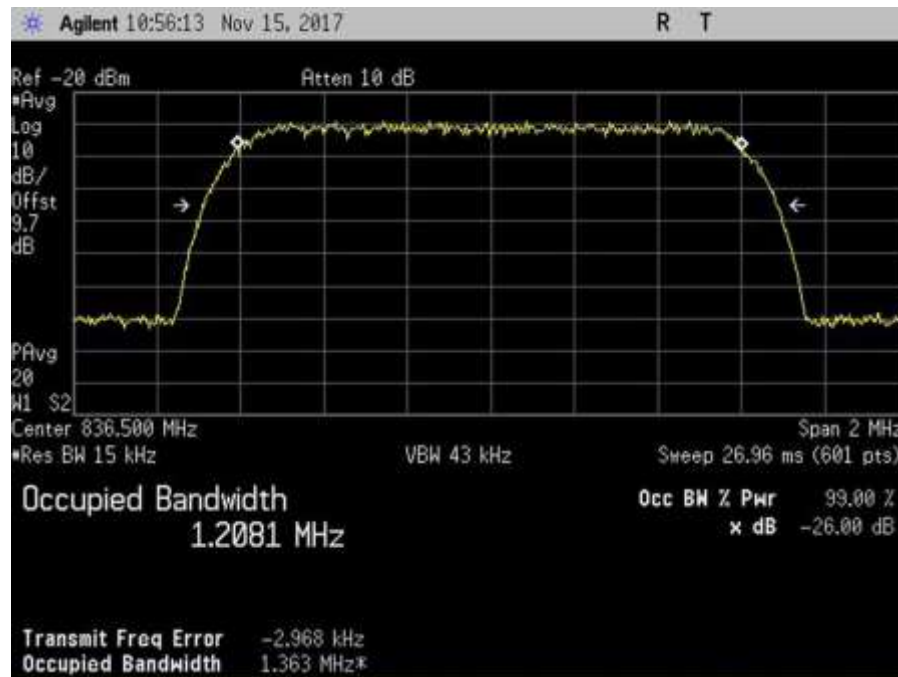
7.10_OBW_UL_698-716MHz_CDMA_Out



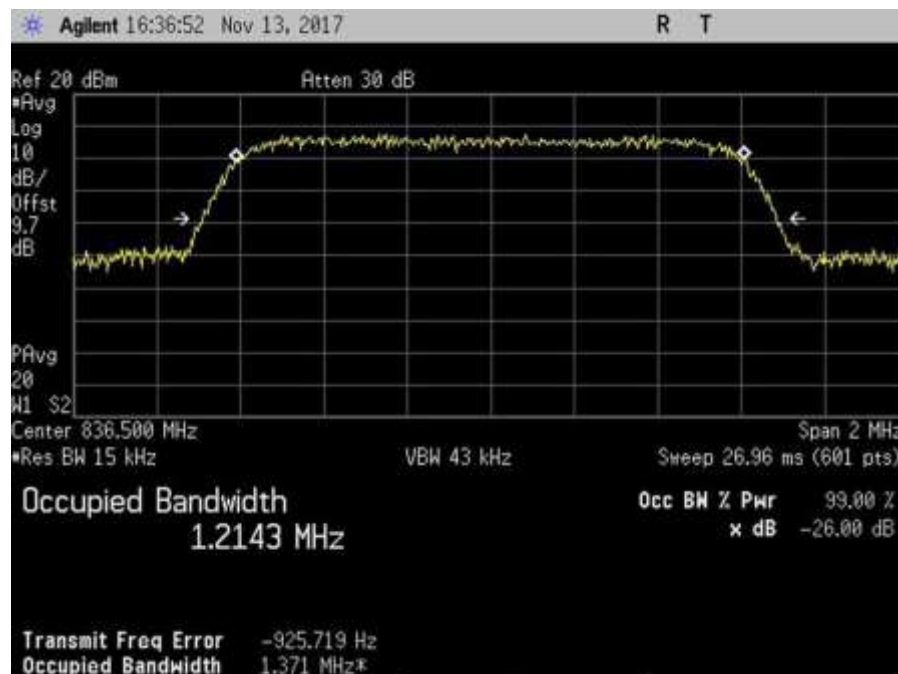
7.10_OBW_UL_776-787MHz_CDMA_In



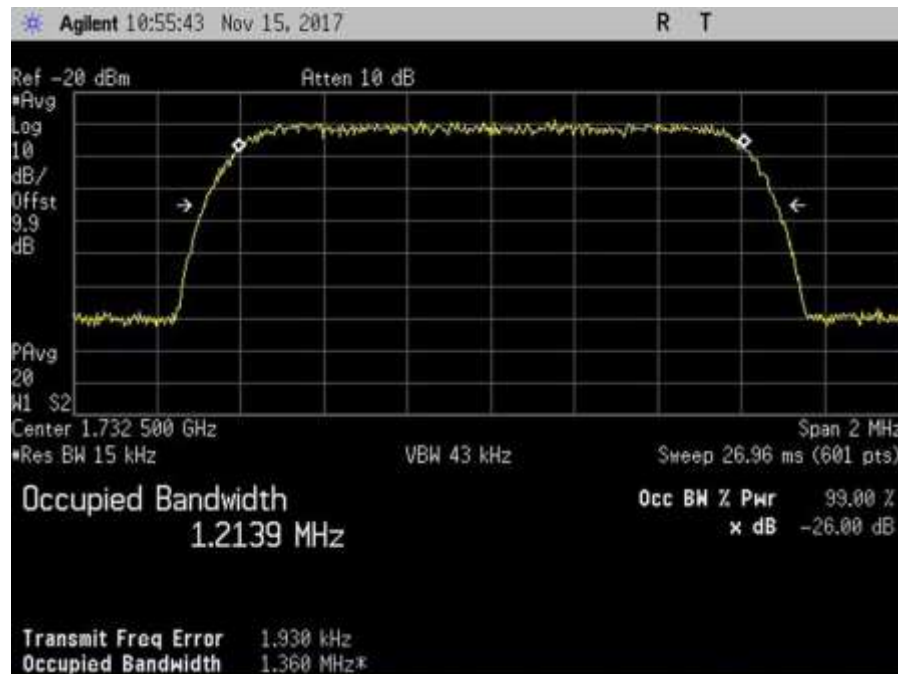
7.10_OBW_UL_776-787MHz_CDMA_Out



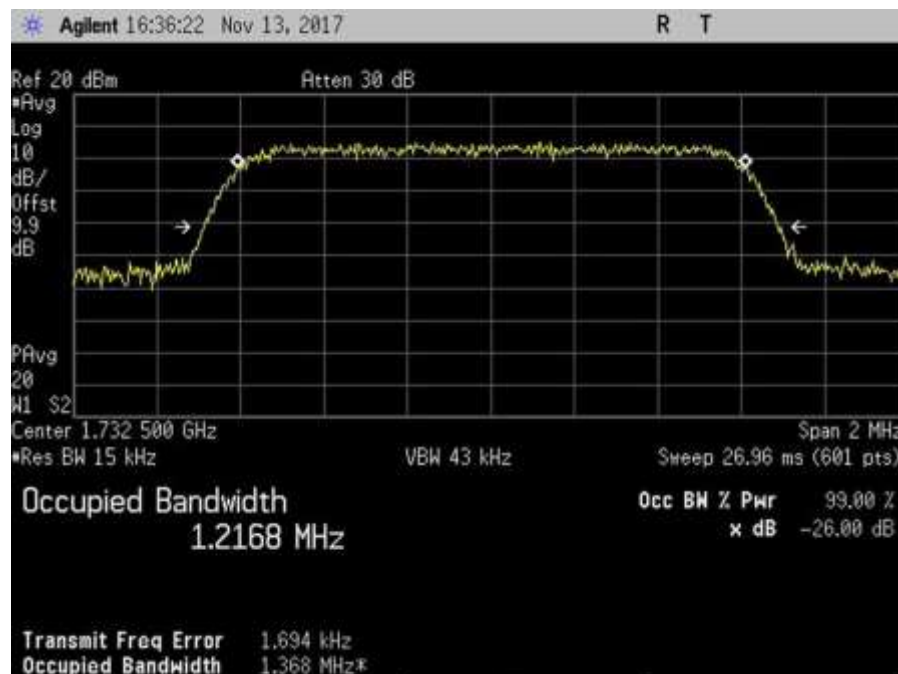
7.10_OBW_UL_824-849MHz_CDMA_In



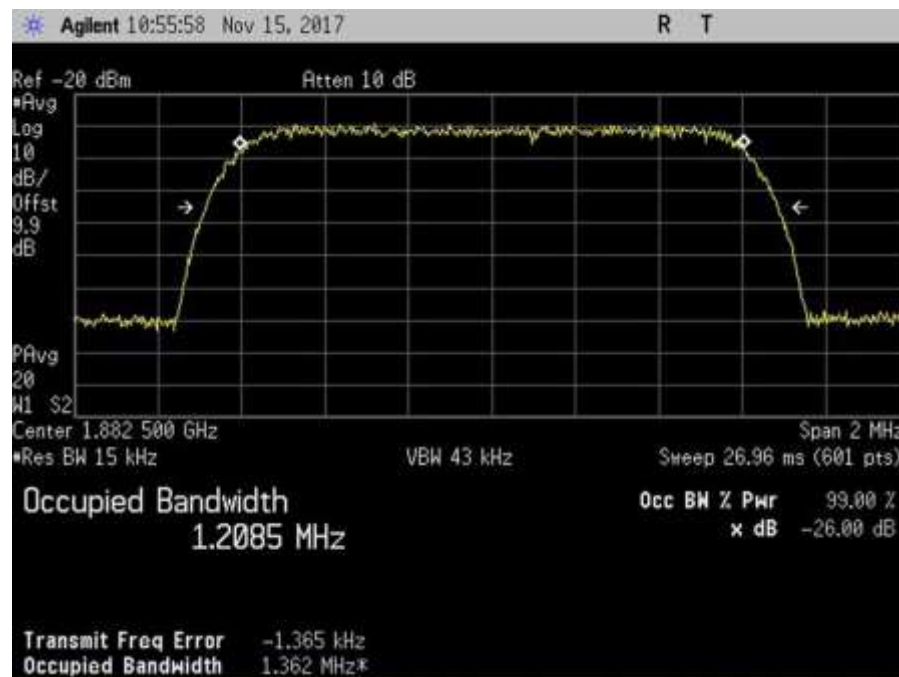
7.10_OBW_UL_824-849MHz_CDMA_Out



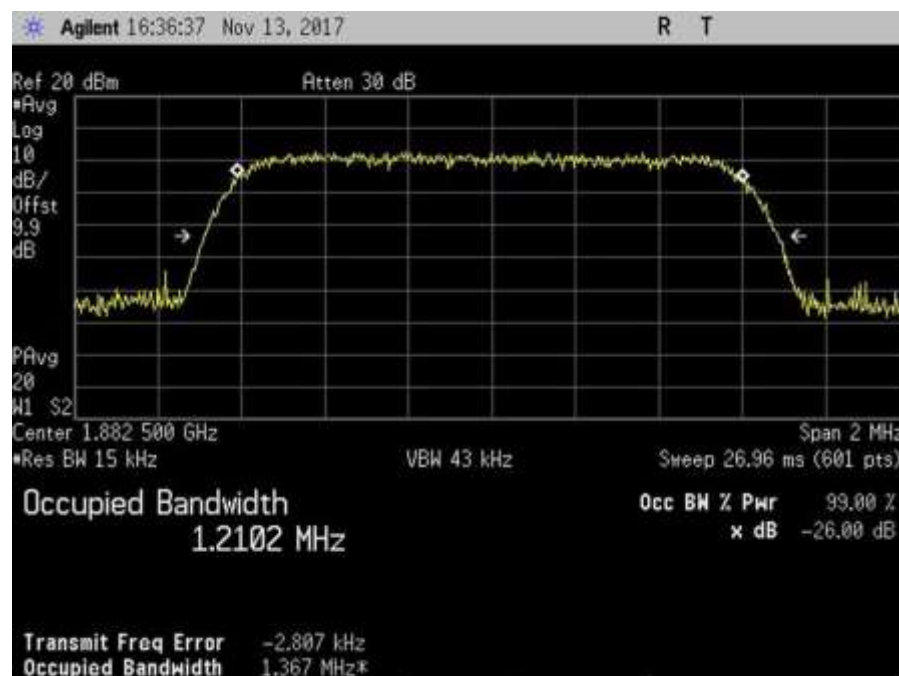
7.10_OBW_UL_1710-1755MHz_CDMA_In



7.10_OBW_UL_1710-1755MHz_CDMA_Out

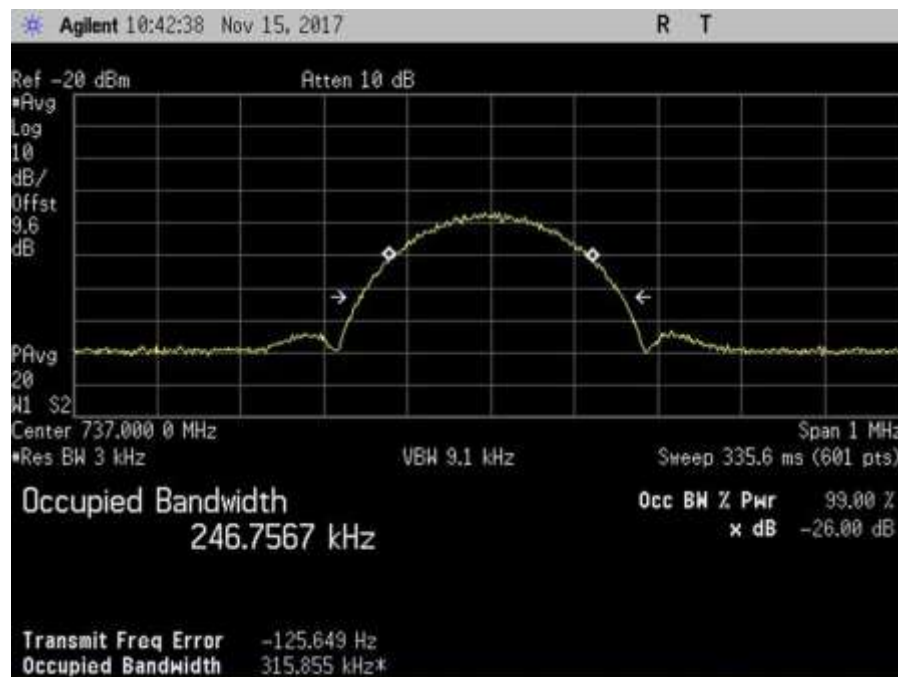


7.10_OBW_UL_1850-1915MHz_CDMA_In

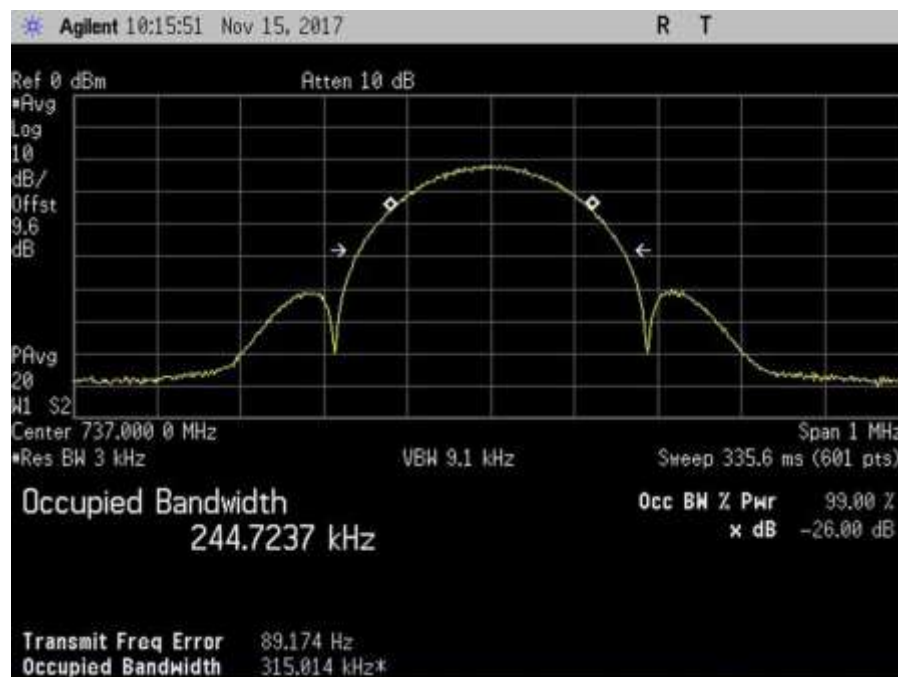


7.10_OBW_UL_1850-1915MHz_CDMA_Out

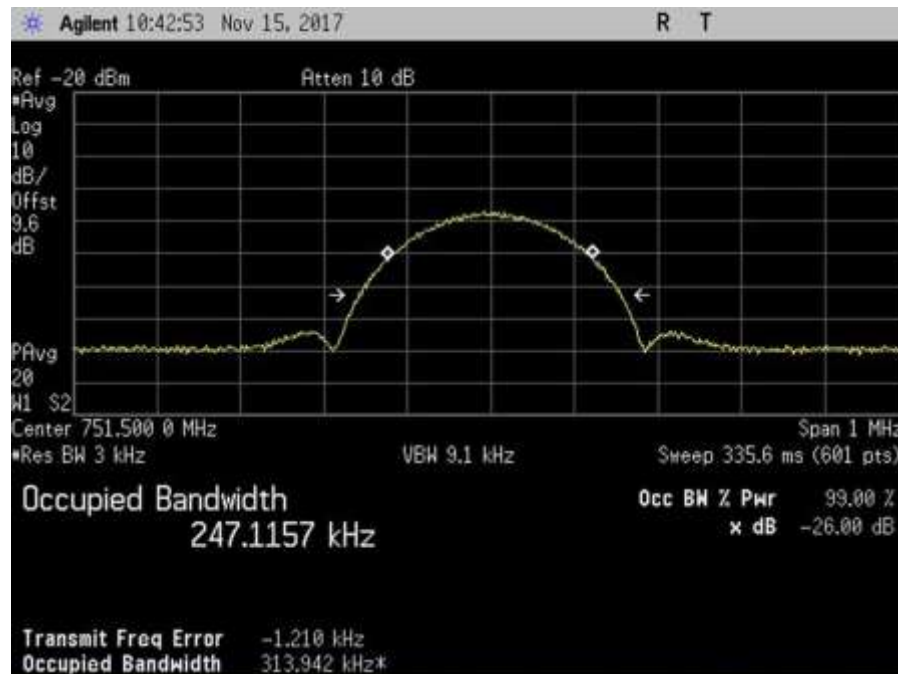
EDGE, DL



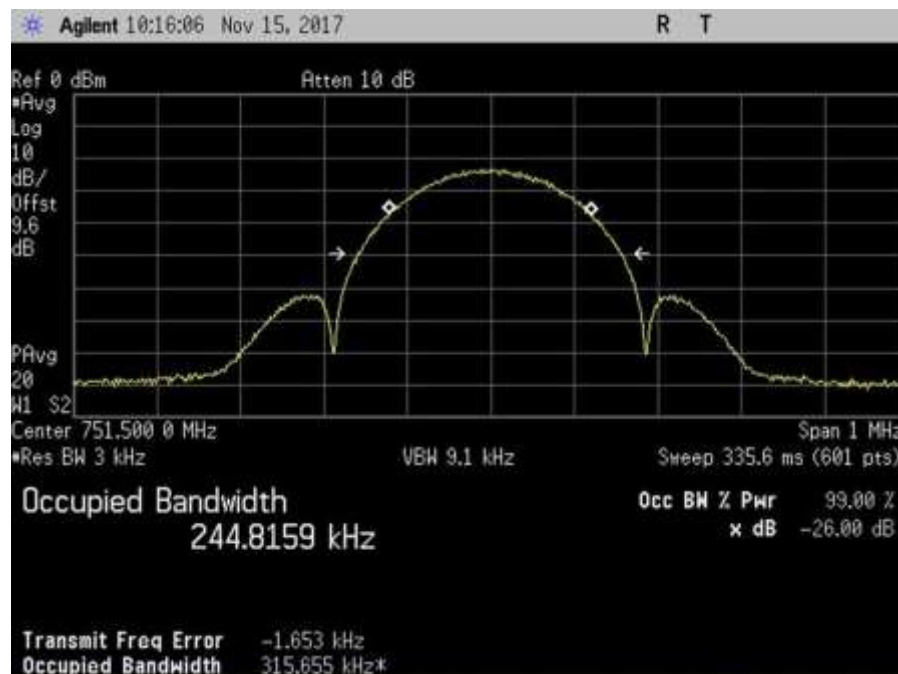
7.10_OBW_DL_728-746MHz_EDGE_In



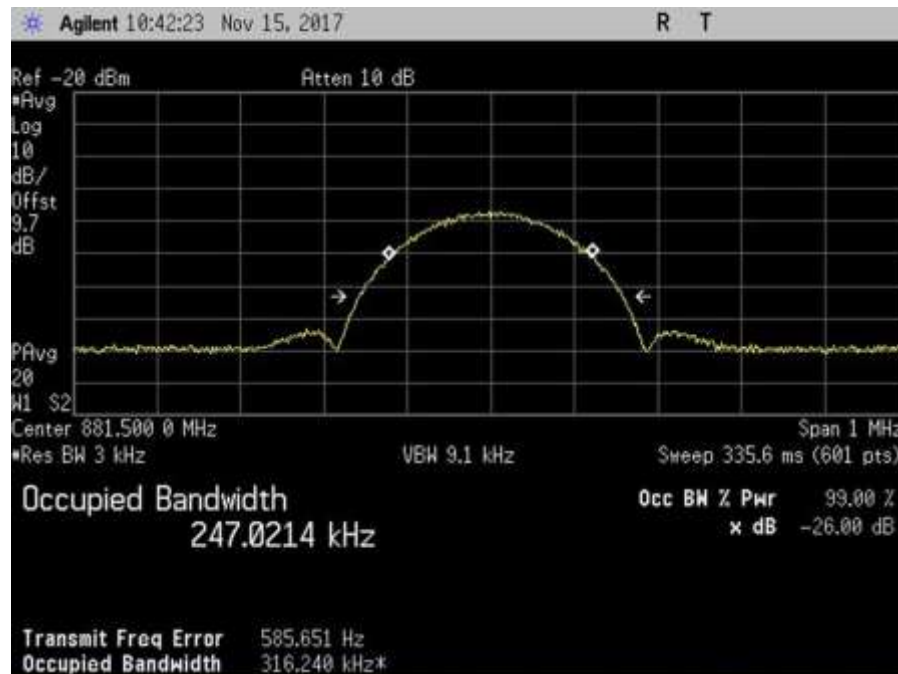
7.10_OBW_DL_728-746MHz_EDGE_Out



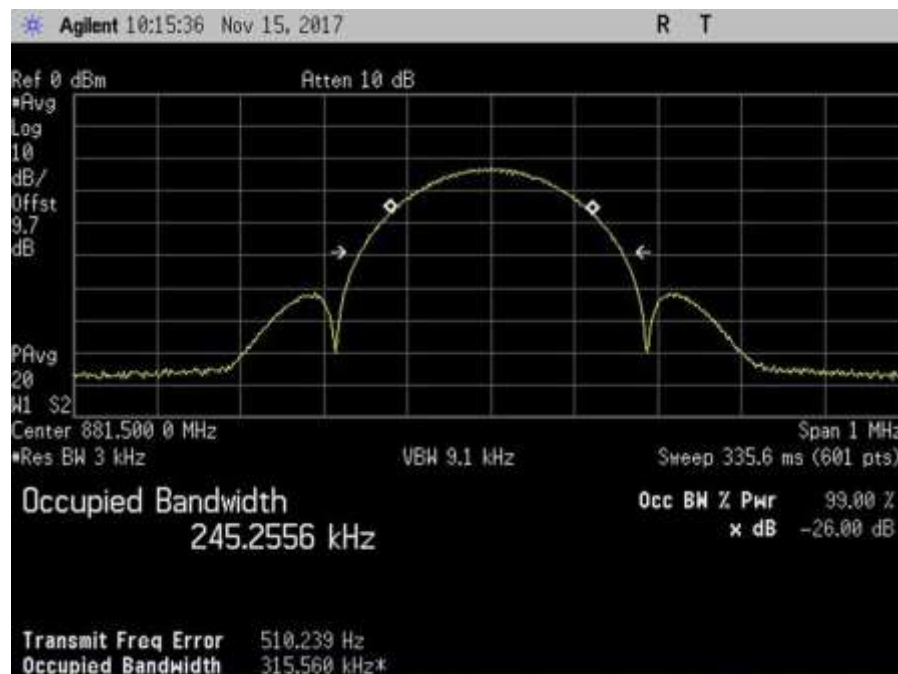
7.10_OBW_DL_746-757MHz_EDGE_In



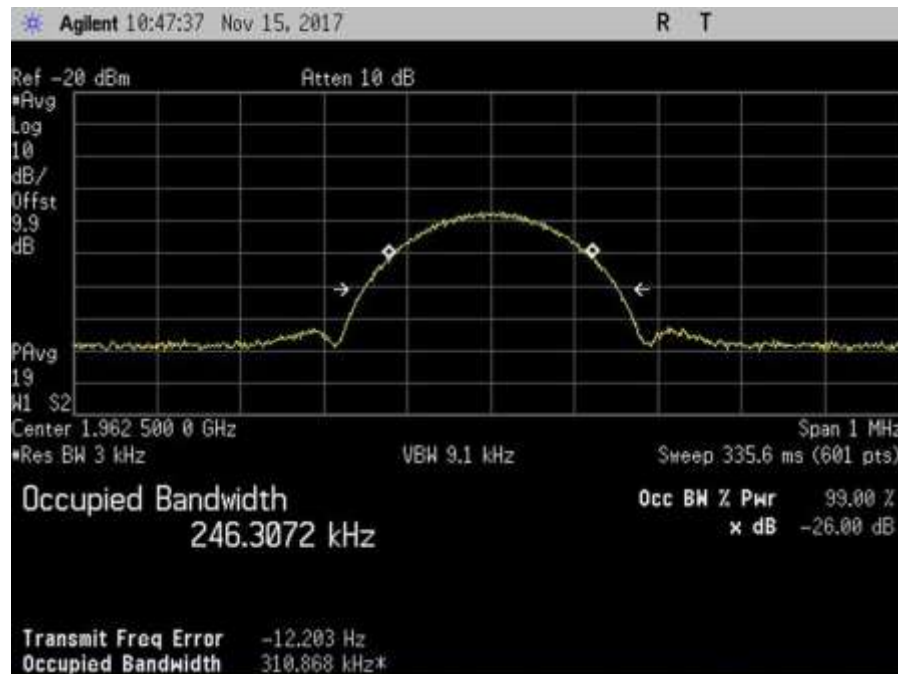
7.10_OBW_DL_746-757MHz_EDGE_Out



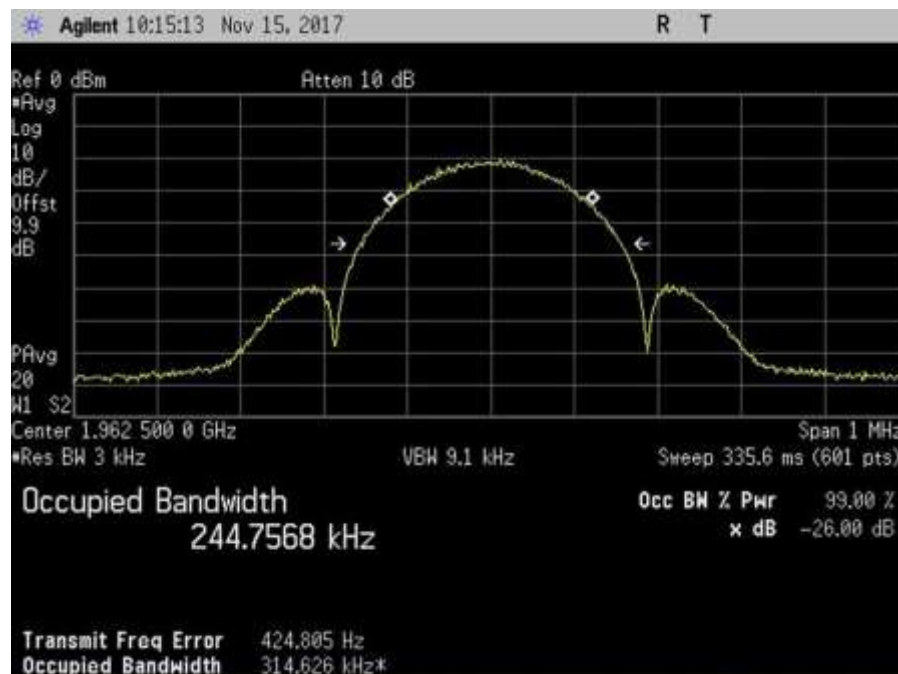
7.10_OBW_DL_869-894MHz_EDGE_In



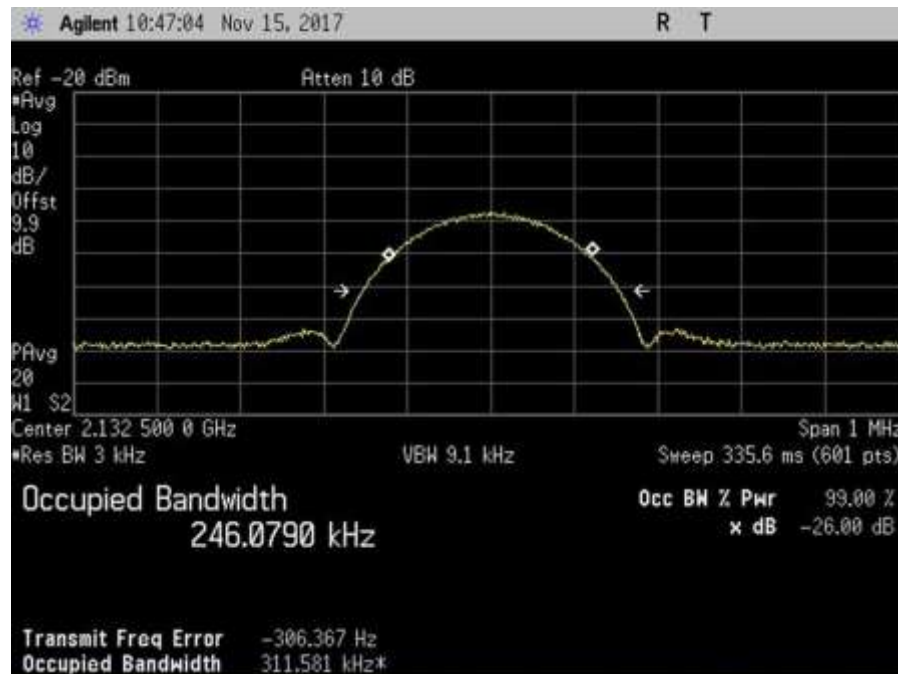
7.10_OBW_DL_869-894MHz_EDGE_Out



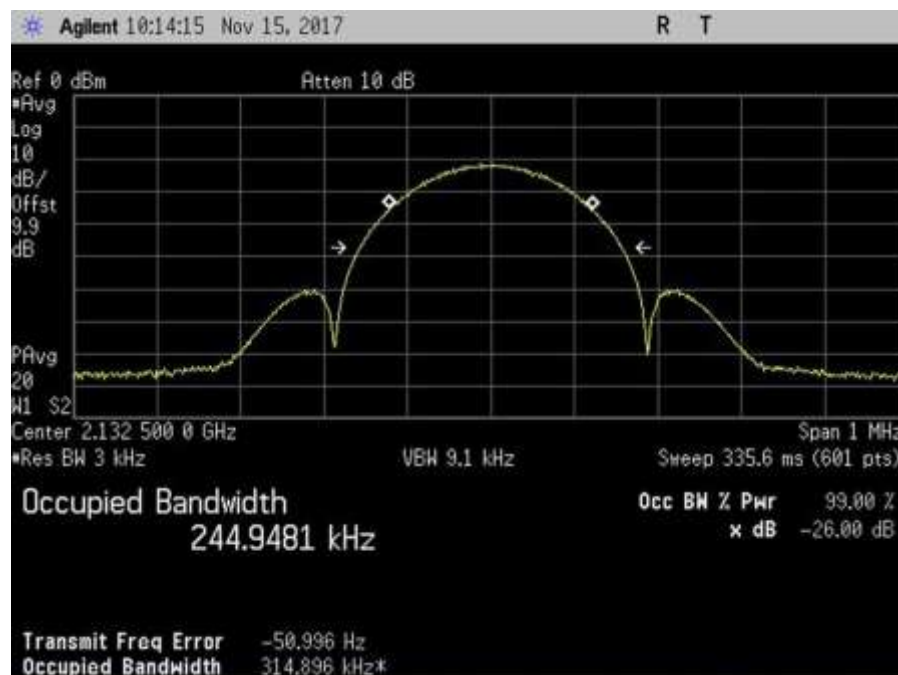
7.10_OBW_DL_1930-1995MHz_EDGE_In



7.10_OBW_DL_1930-1995MHz_EDGE_Out



7.10_OBW_DL_2110-2155MHz_EDGE_In

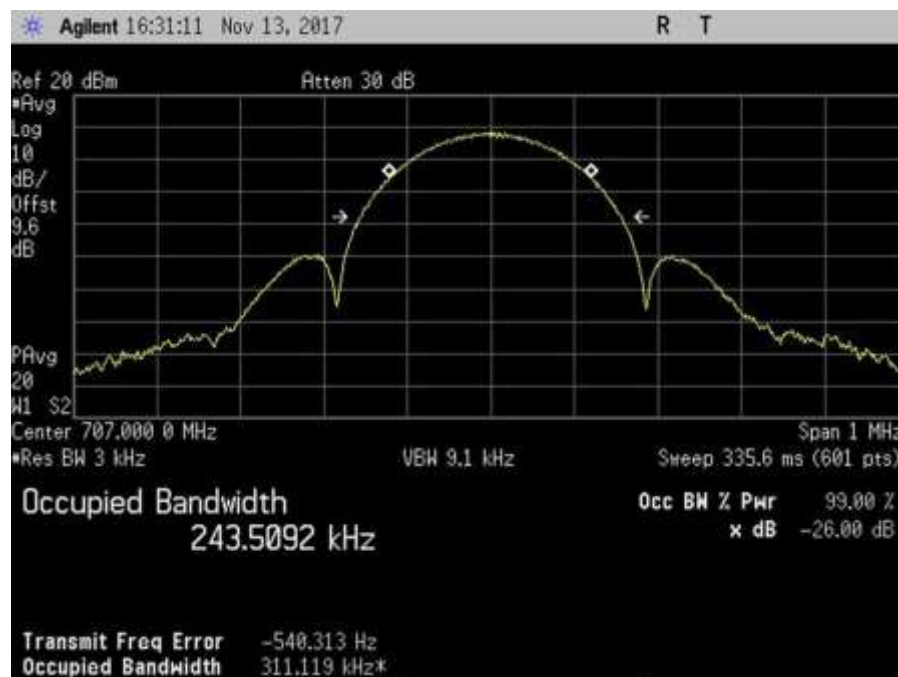


7.10_OBW_DL_2110-2155MHz_EDGE_Out

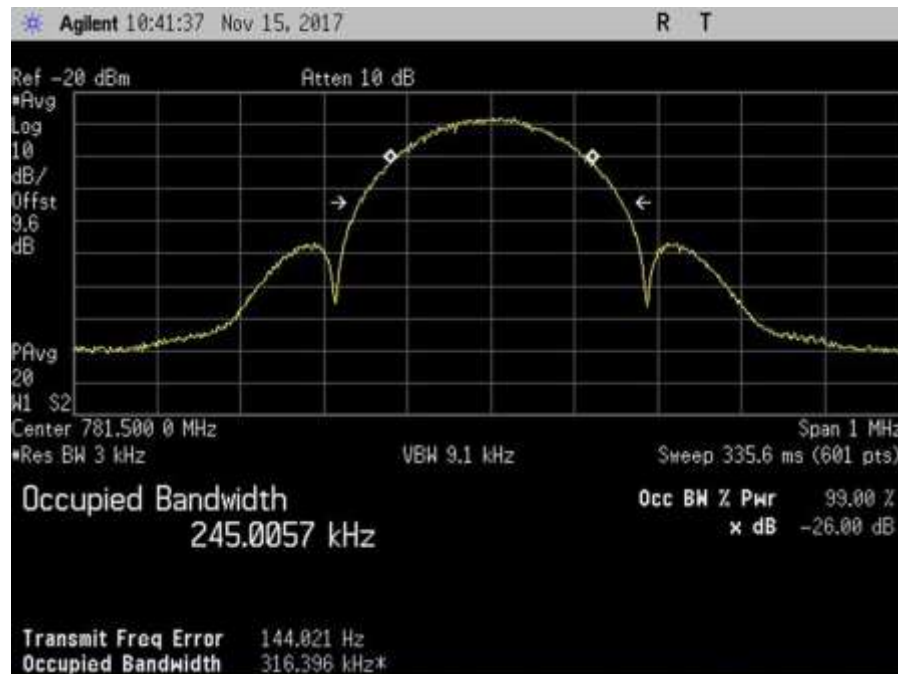
EDGE, UL



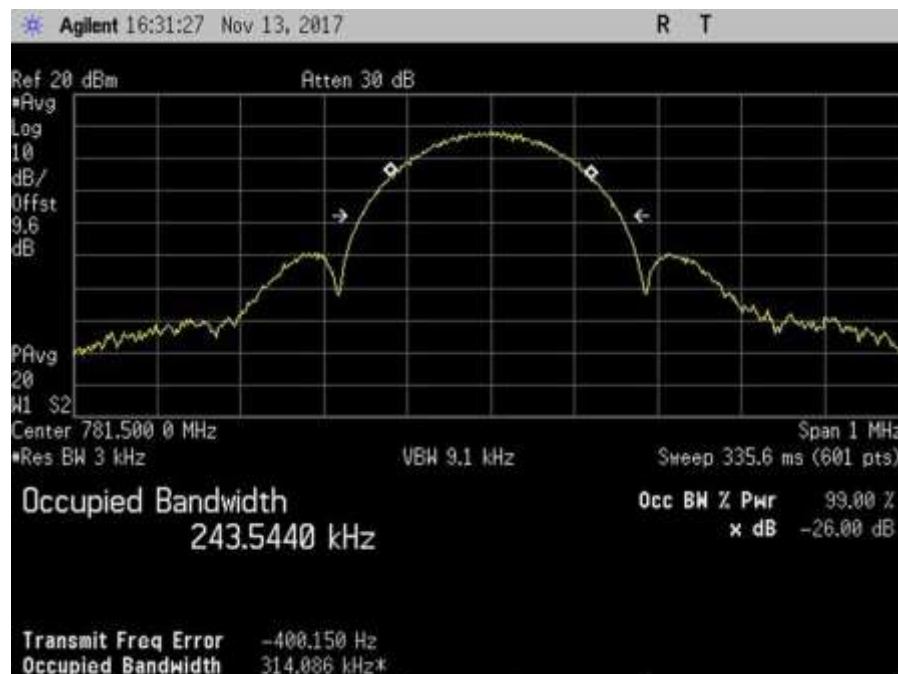
7.10_OBW_UL_698-716MHz_EDGE_In



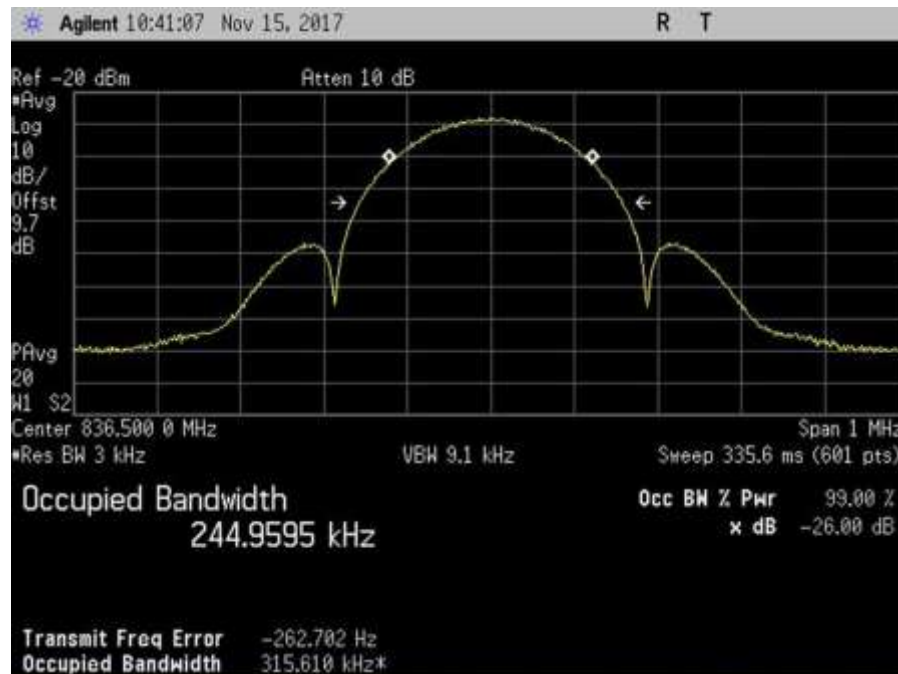
7.10_OBW_UL_698-716MHz_EDGE_Out



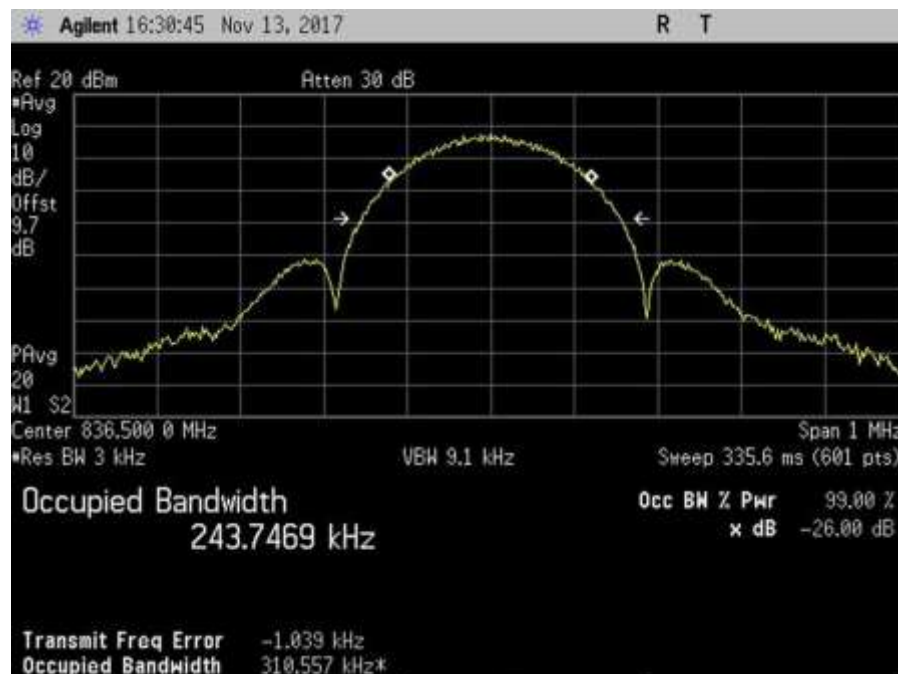
7.10_OBW_UL_776-787MHz_EDGE_In



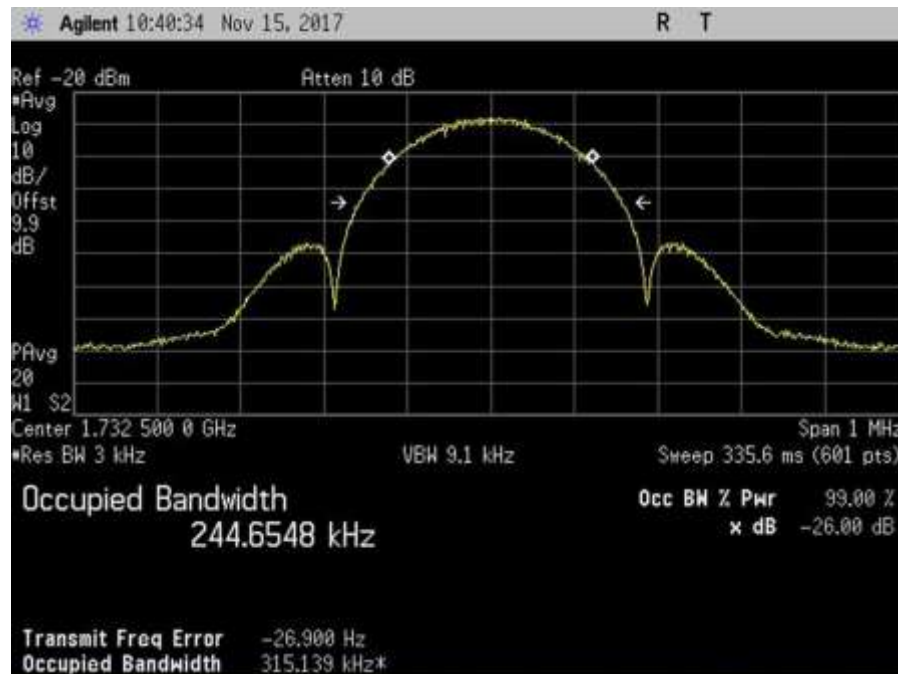
7.10_OBW_UL_776-787MHz_EDGE_Out



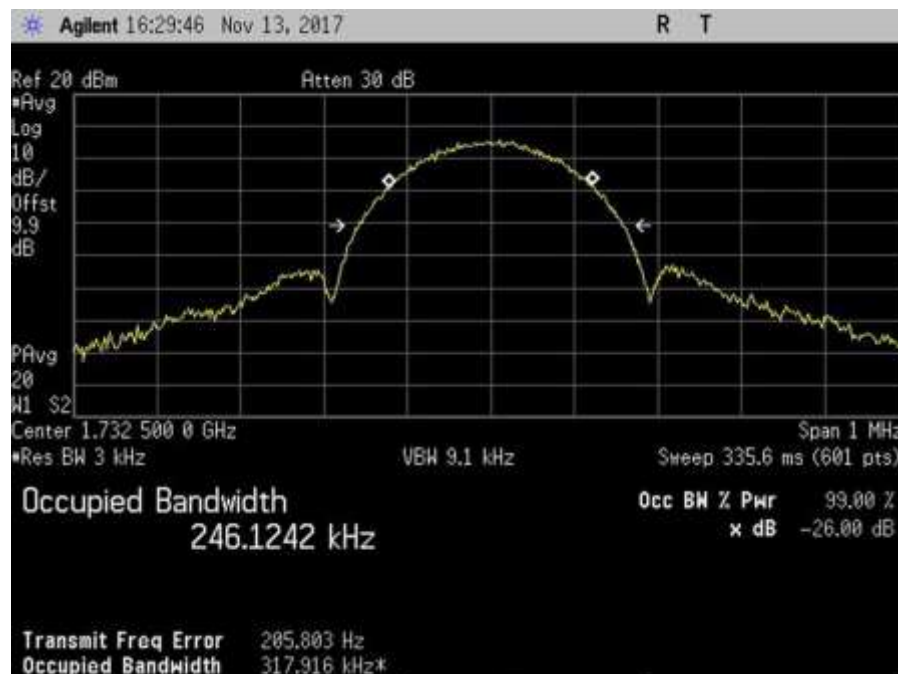
7.10_OBW_UL_824-849MHz_EDGE_In



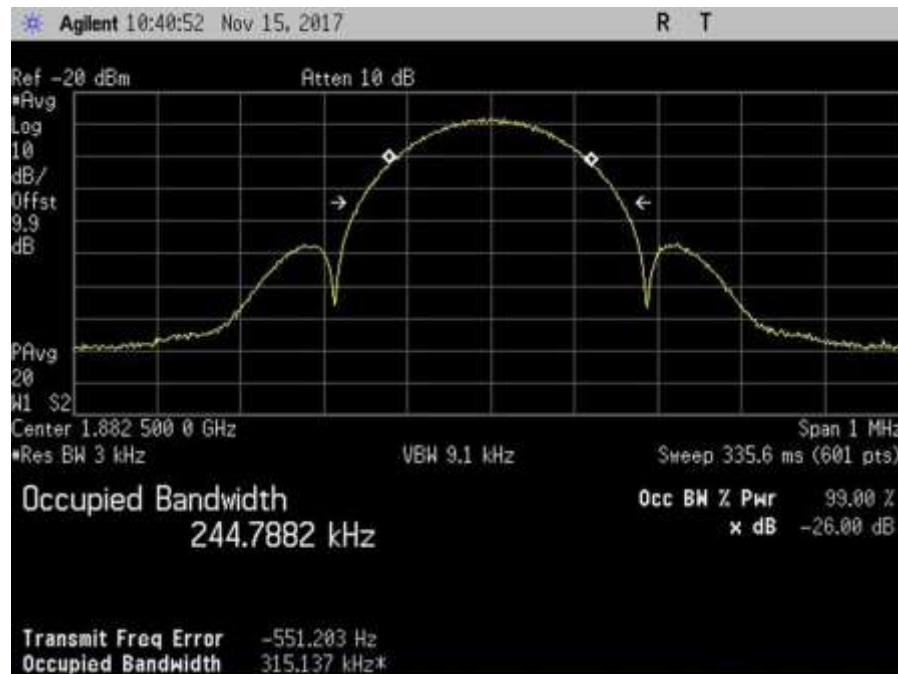
7.10_OBW_UL_824-849MHz_EDGE_Out



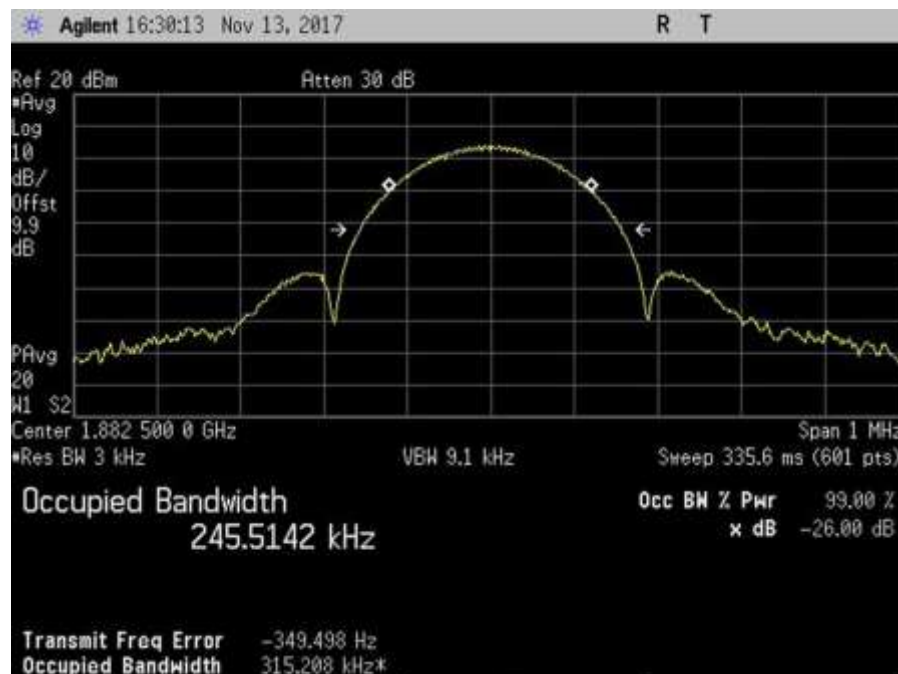
7.10_OBW_UL_1710-1755MHz_EDGE_In



7.10_OBW_UL_1710-1755MHz_EDGE_Out



7.10_OBW_UL_1850-1915MHz_EDGE_In



7.10_OBW_UL_1850-1915MHz_EDGE_Out

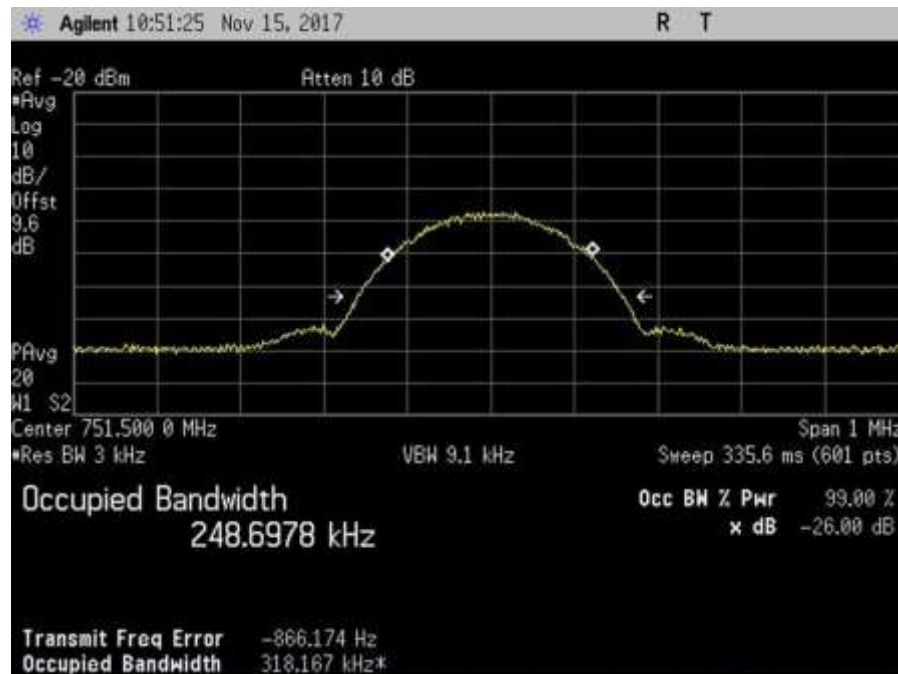
GSM, DL



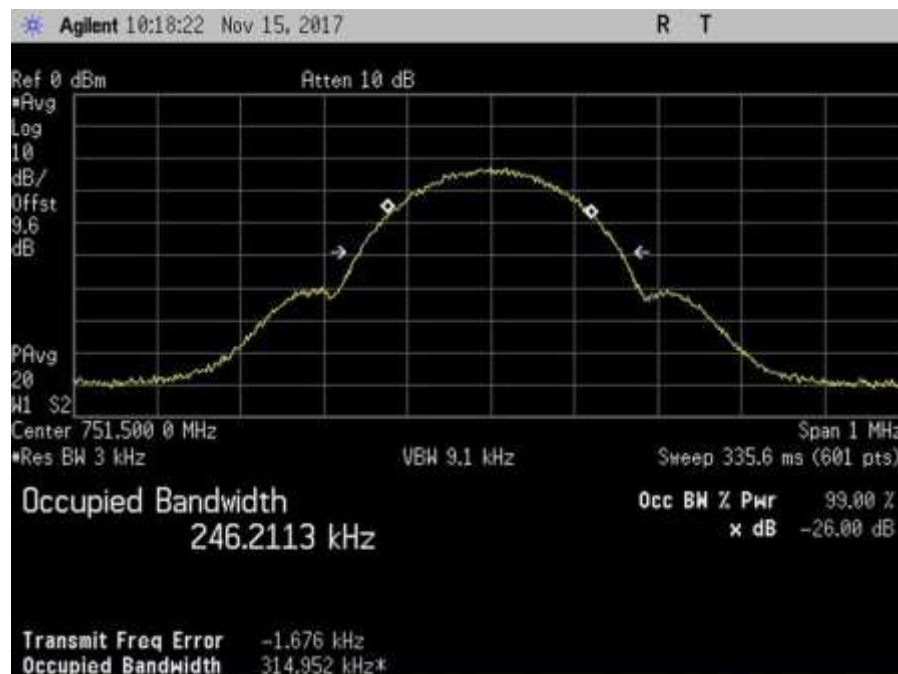
7.10_OBW_DL_728-746MHz_GSM_In



7.10_OBW_DL_728-746MHz_GSM_Out



7.10_OBW_DL_746-757MHz_GSM_In



7.10_OBW_DL_746-757MHz_GSM_Out



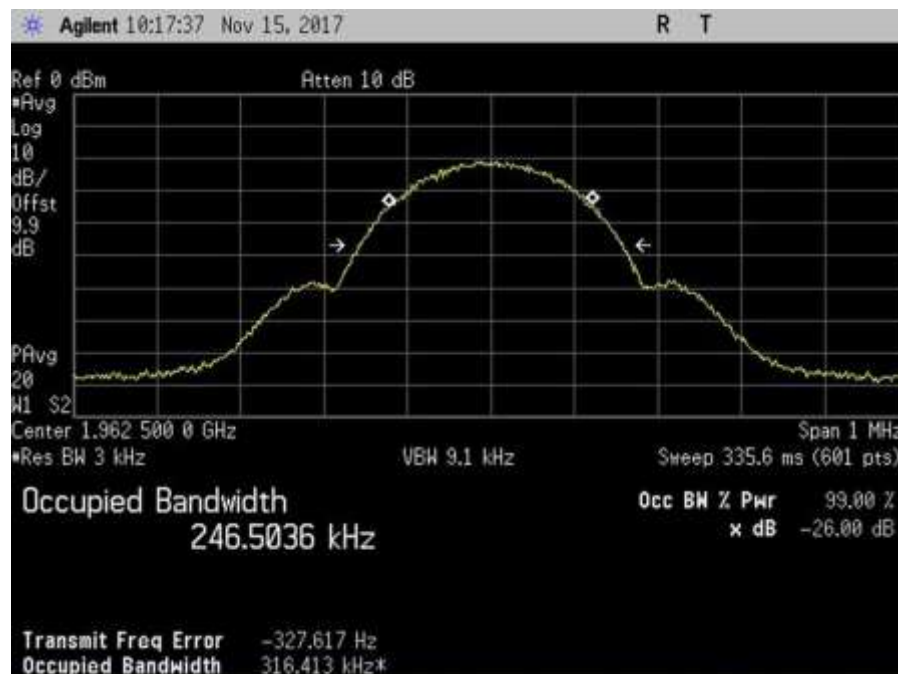
7.10_OBW_DL_869-894MHz_GSM_In



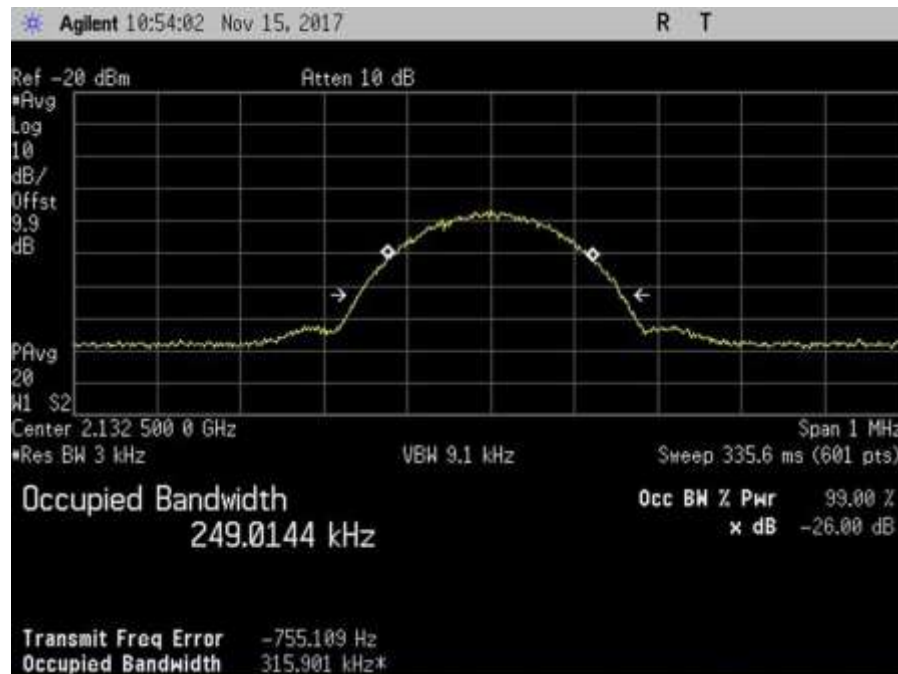
7.10_OBW_DL_869-894MHz_GSM_Out



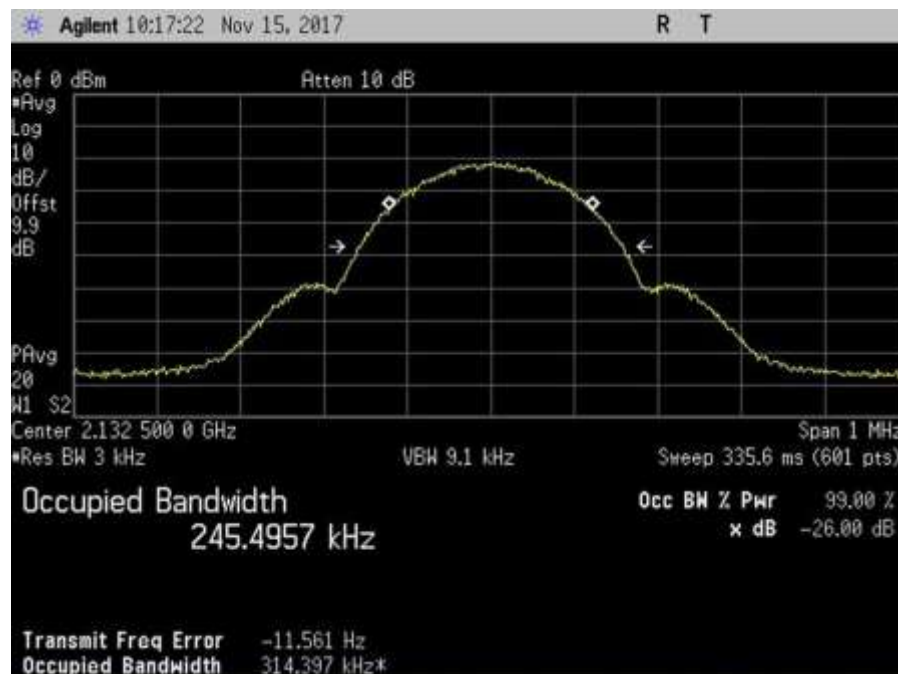
7.10_OBW_DL_1930-1995MHz_GSM_In



7.10_OBW_DL_1930-1995MHz_GSM_Out



7.10_OBW_DL_2110-2155MHz_GSM_In



7.10_OBW_DL_2110-2155MHz_GSM_Out

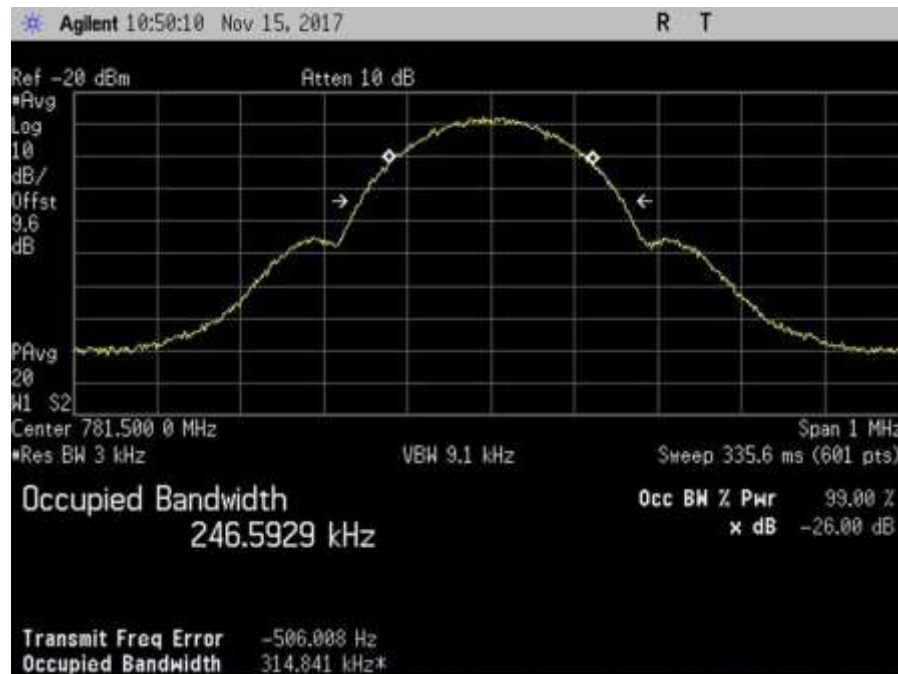
GSM, UL



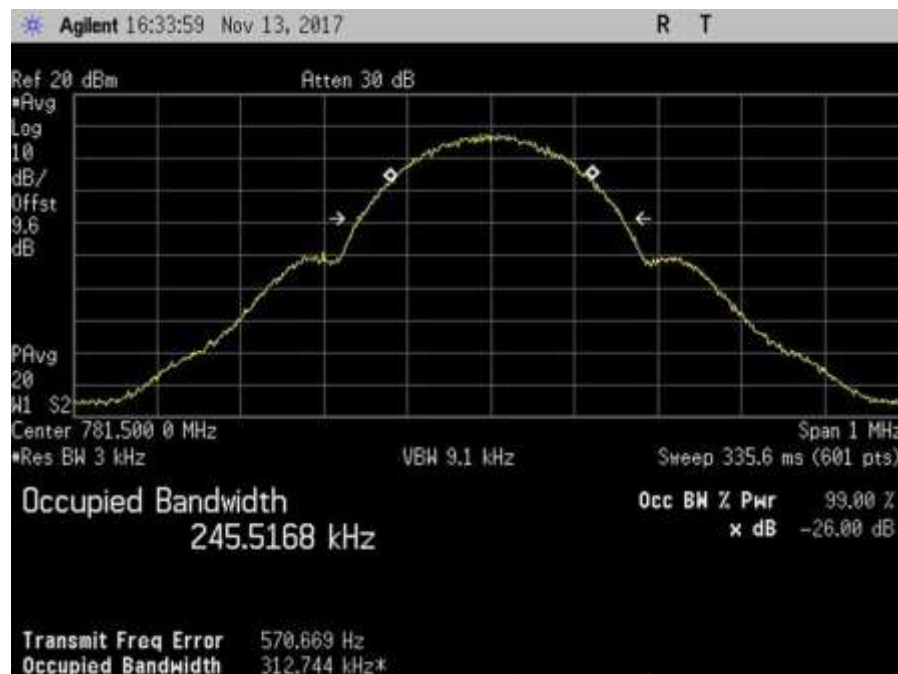
7.10_OBW_UL_698-716MHz_GSM_In



7.10_OBW_UL_698-716MHz_GSM_Out



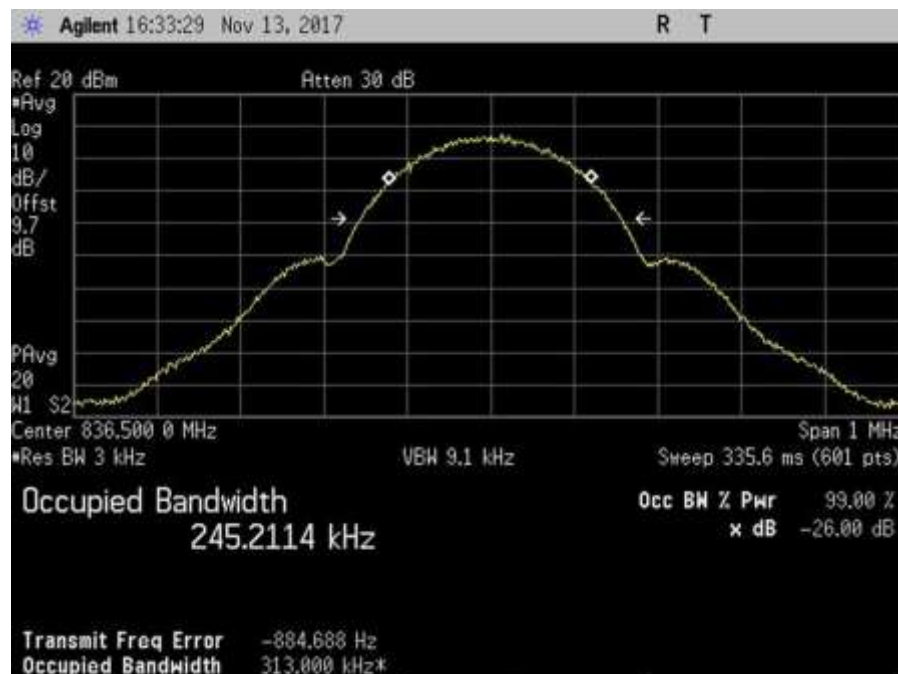
7.10_OBW_UL_776-787MHz_GSM_In



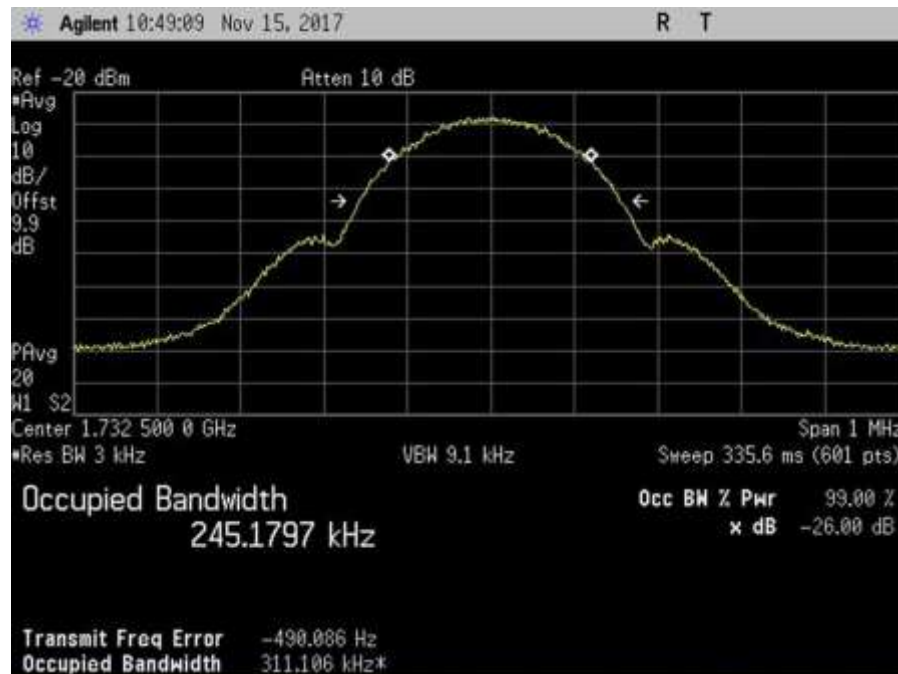
7.10_OBW_UL_776-787MHz_GSM_Out



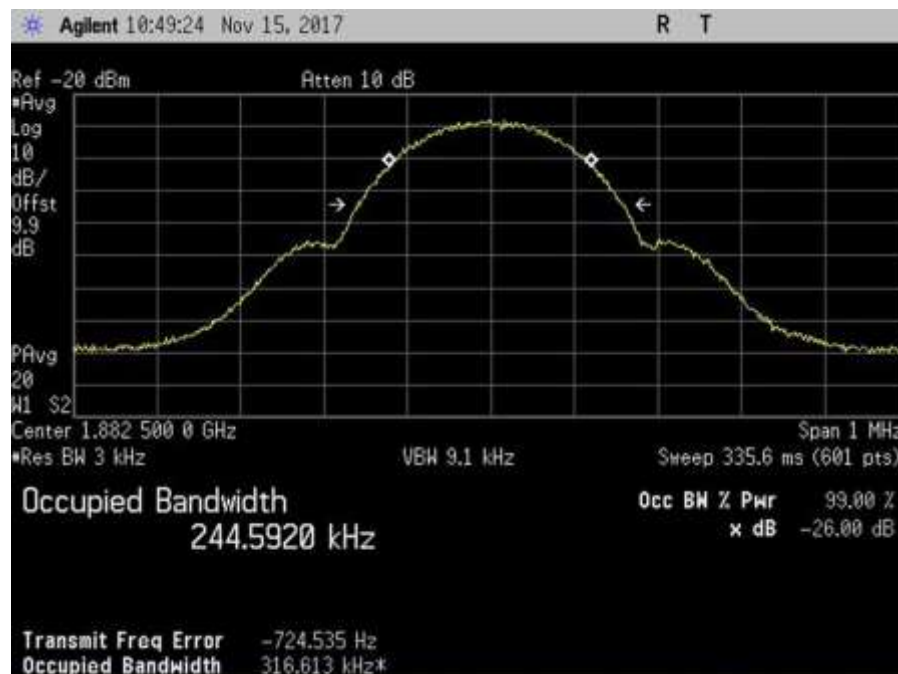
7.10_OBW_UL_824-849MHz_GSM_In



7.10_OBW_UL_824-849MHz_GSM_Out



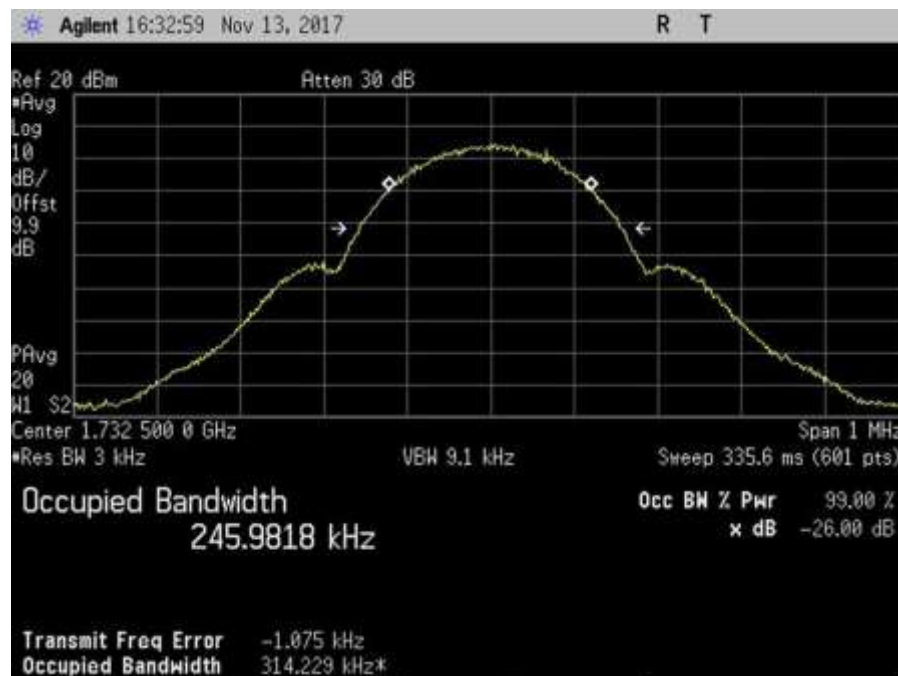
7.10_OBW_UL_1710-1755MHz_GSM_In



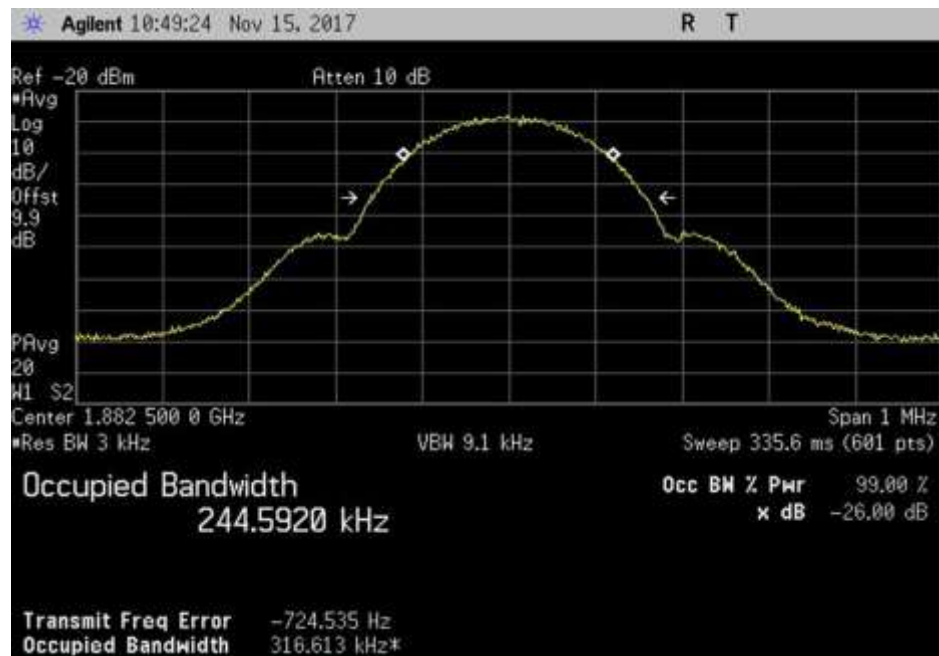
7.10_OBW_UL_1850-1915MHz_GSM_In



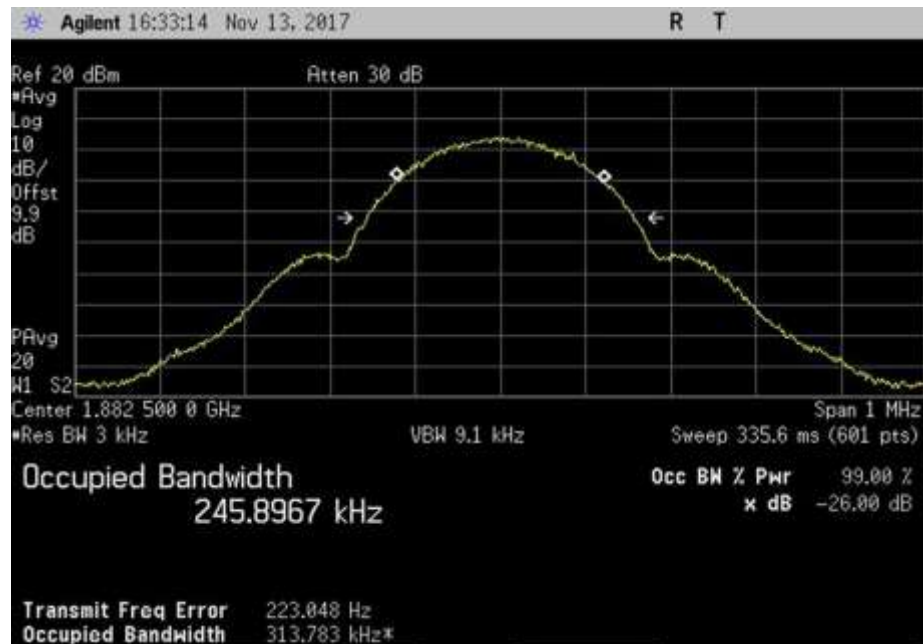
7.10_OBW_UL_1850-1915MHz_GSM_Out



7.10_OBW_UL_1710-1755MHz_GSM_Out

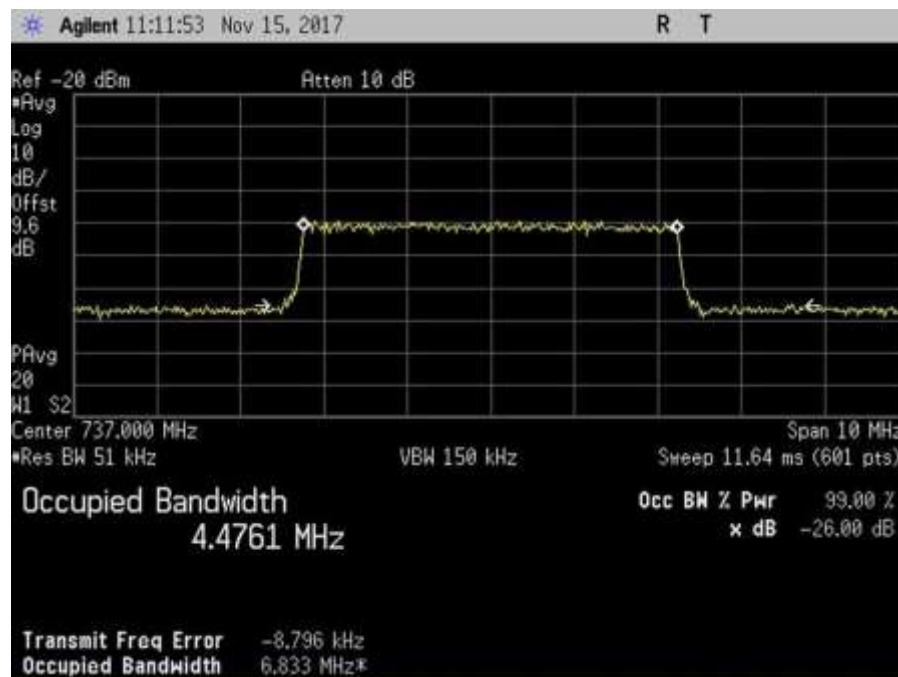


7.10_OBW_UL_1850-1915MHz_GSM_In

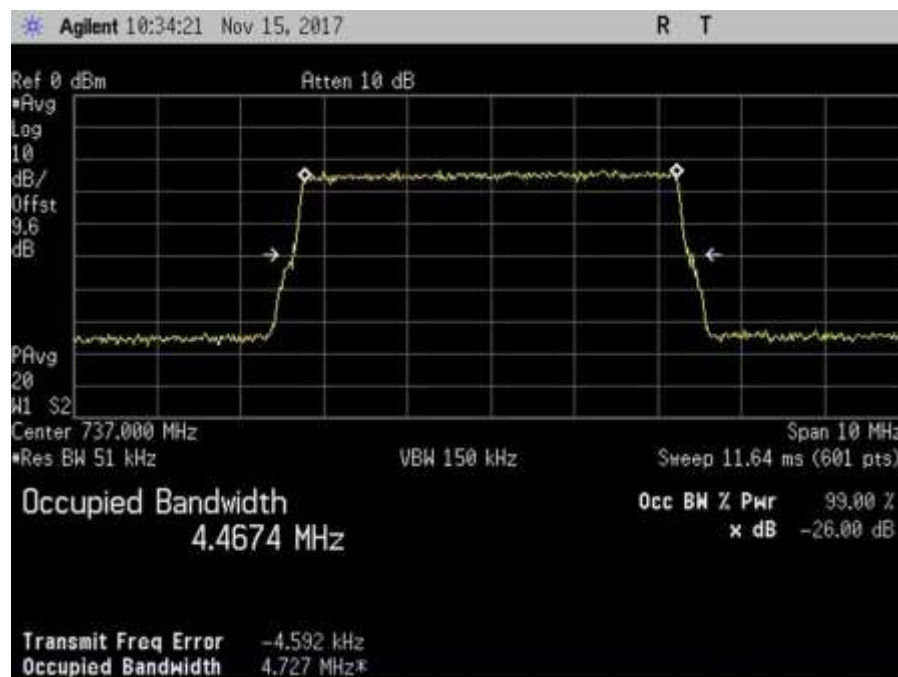


7.10_OBW_UL_1850-1915MHz_GSM_Out

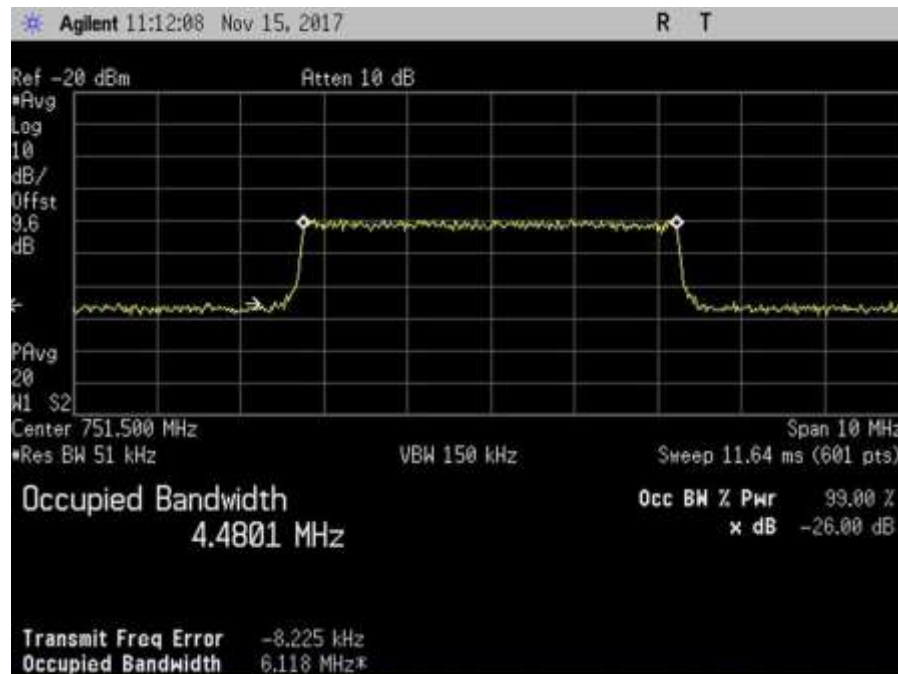
LTE, DL



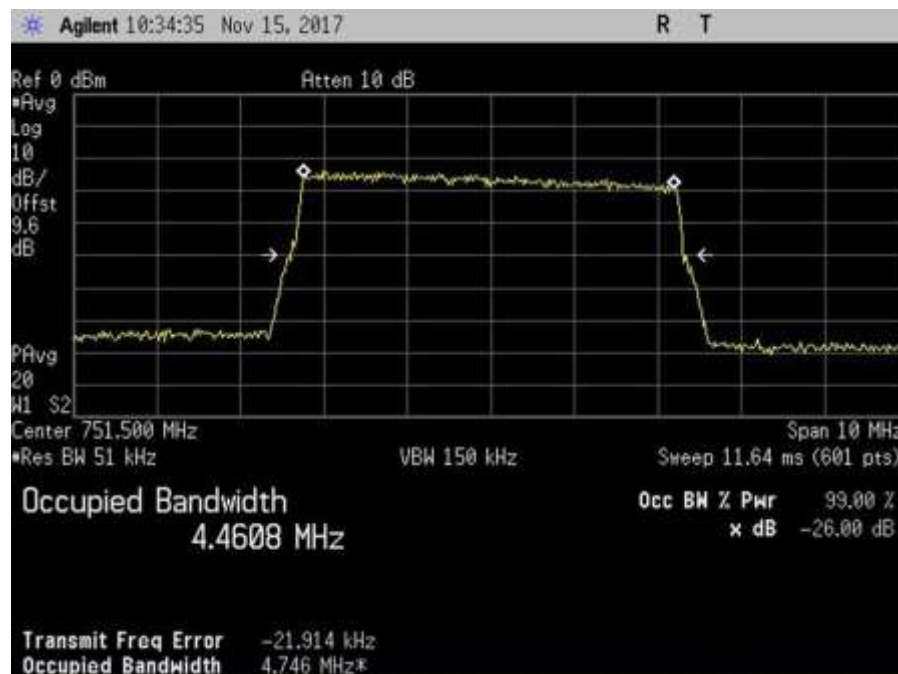
7.10_OBW_DL_728-746MHz_LTE_In



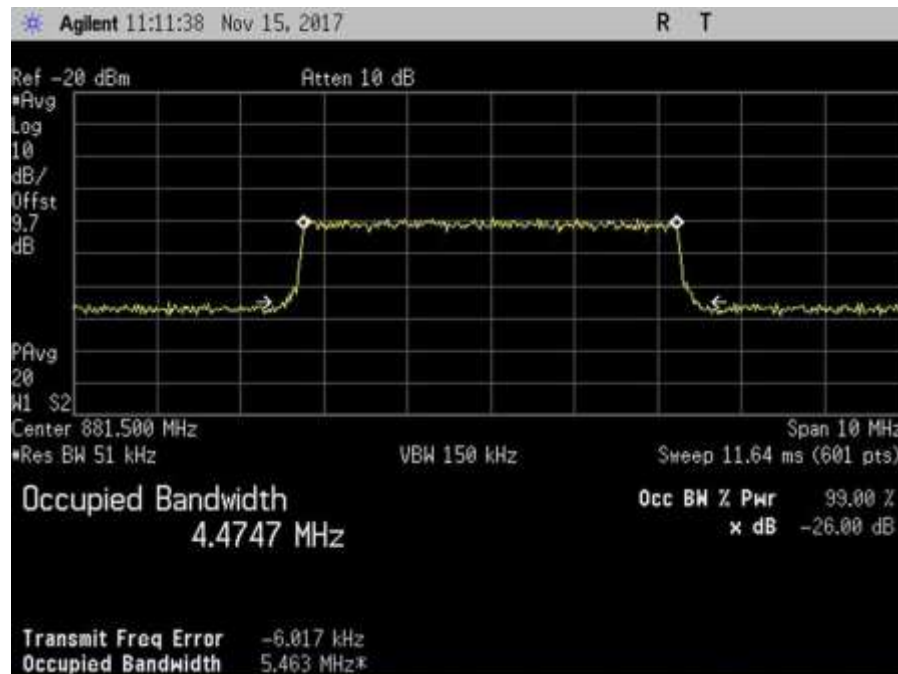
7.10_OBW_DL_728-746MHz_LTE_Out



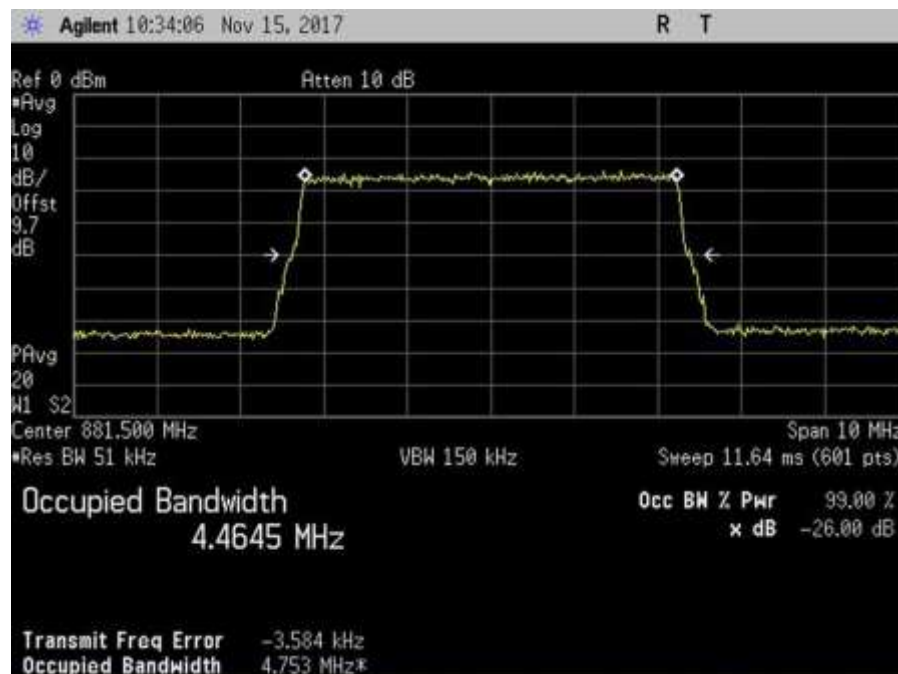
7.10_OBW_DL_746-757MHz_LTE_In



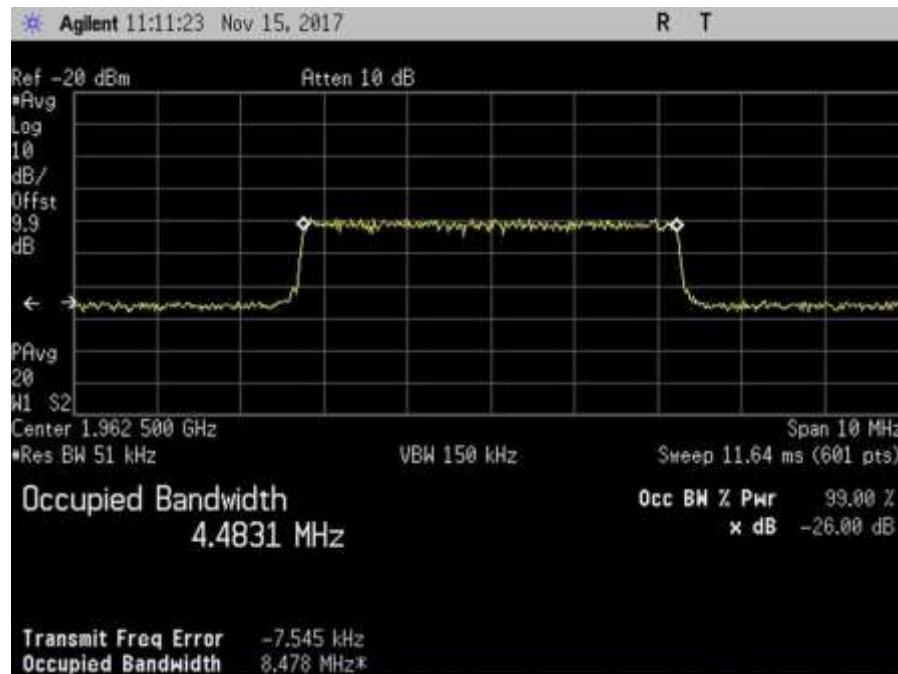
7.10_OBW_DL_746-757MHz_LTE_Out



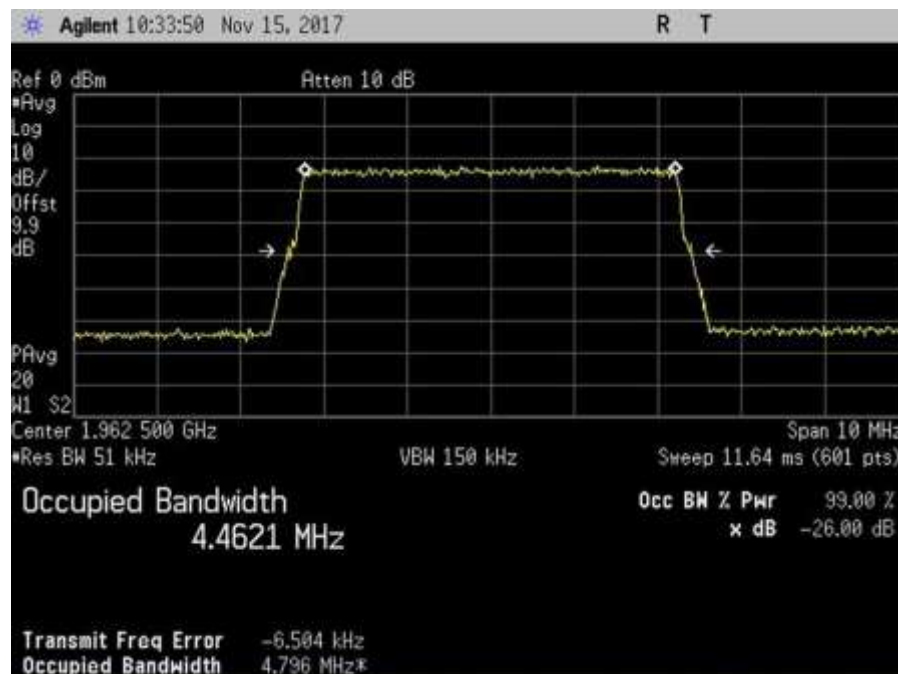
7.10_OBW_DL_869-894MHz_LTE_In



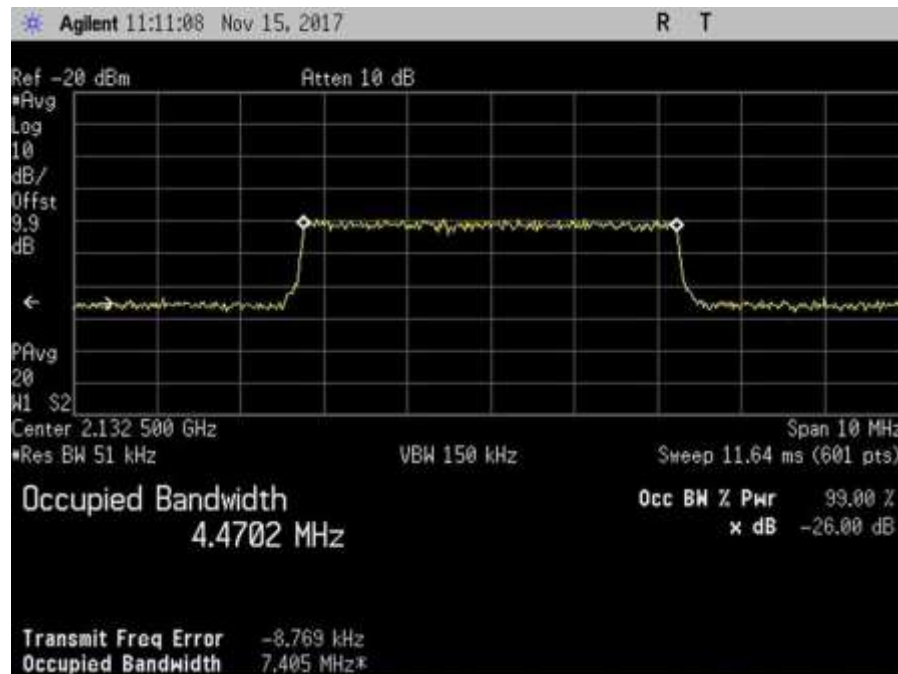
7.10_OBW_DL_869-894MHz_LTE_Out



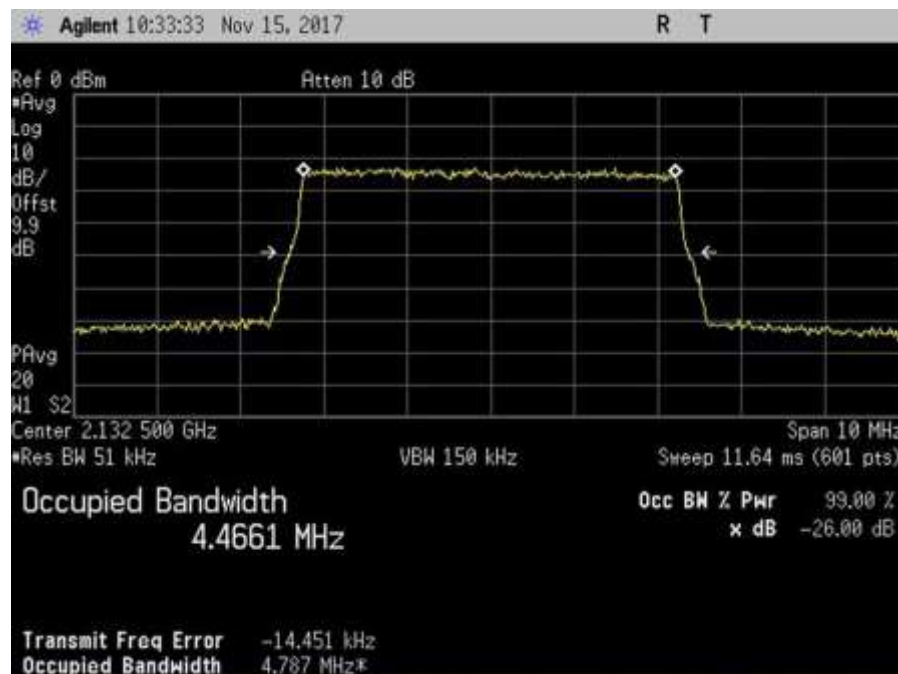
7.10_OBW_DL_1930-1995MHz_LTE_In



7.10_OBW_DL_1930-1995MHz_LTE_Out

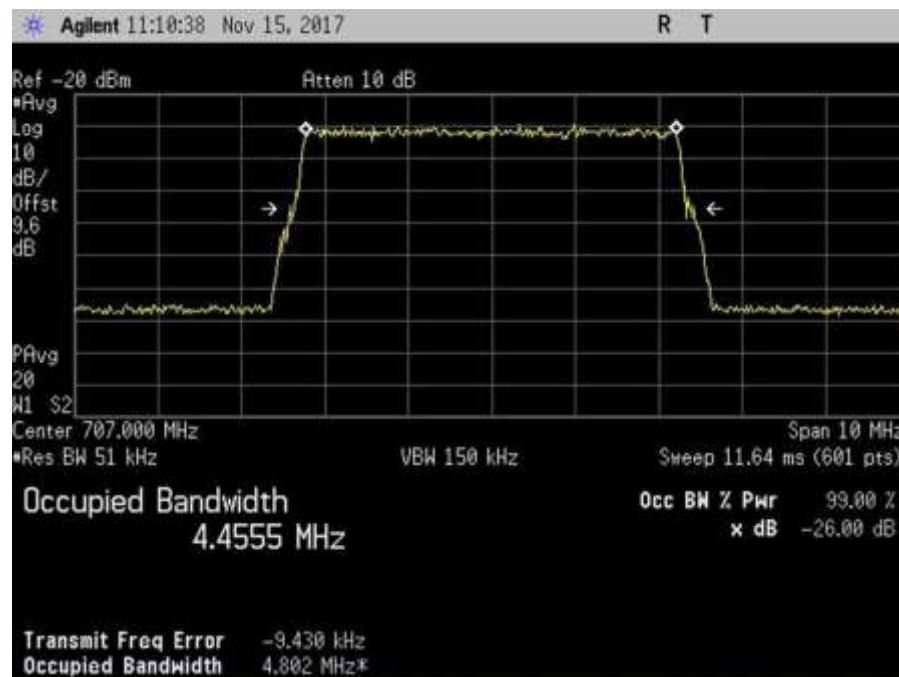


7.10_OBW_DL_2110-2155MHz_LTE_In

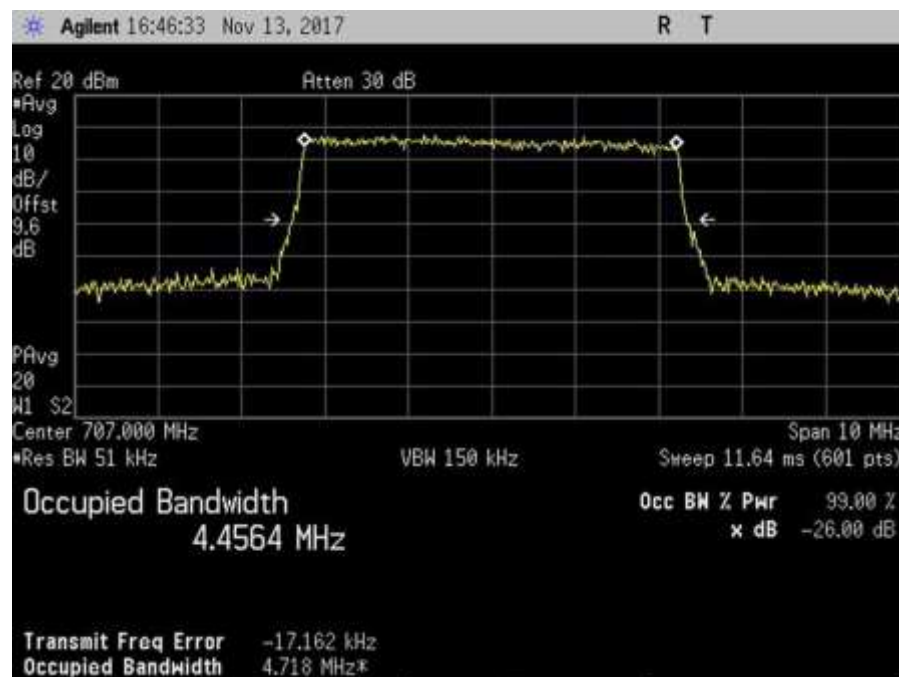


7.10_OBW_DL_2110-2155MHz_LTE_Out

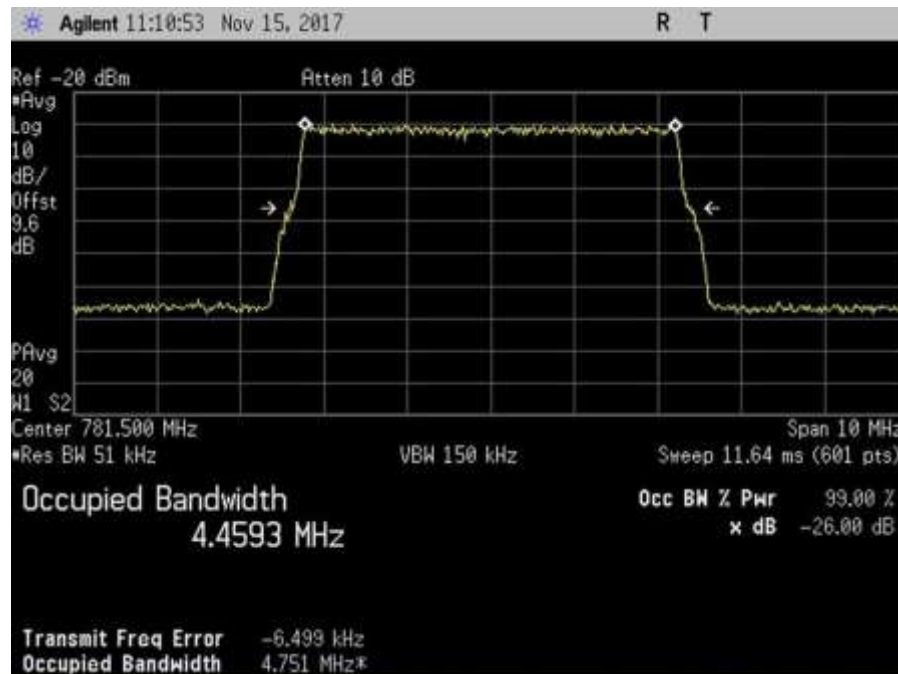
LTE, UL



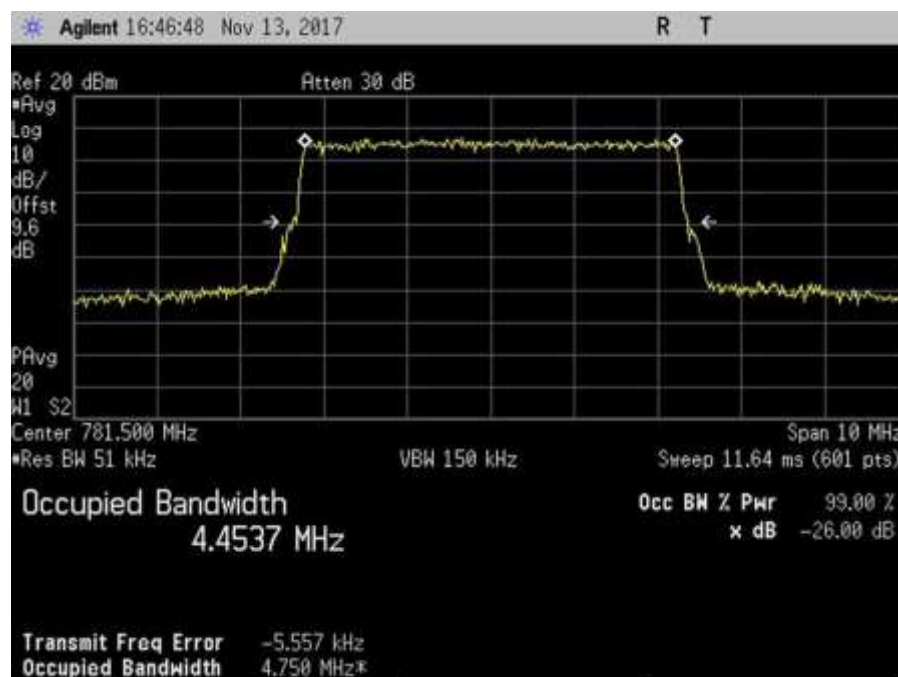
7.10_OBW_UL_698-716MHz_LTE_In



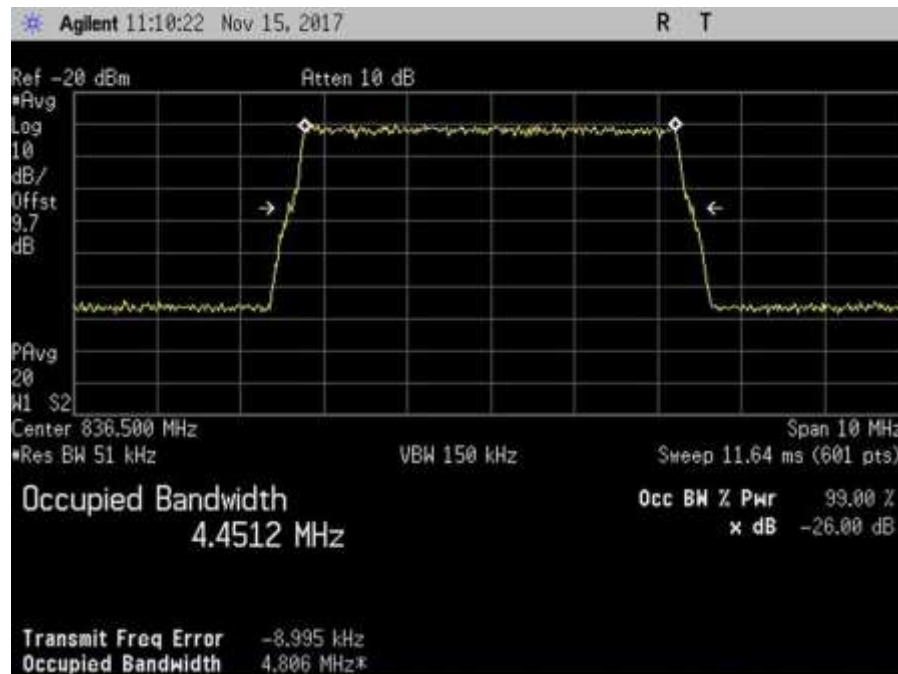
7.10_OBW_UL_698-716MHz_LTE_Out



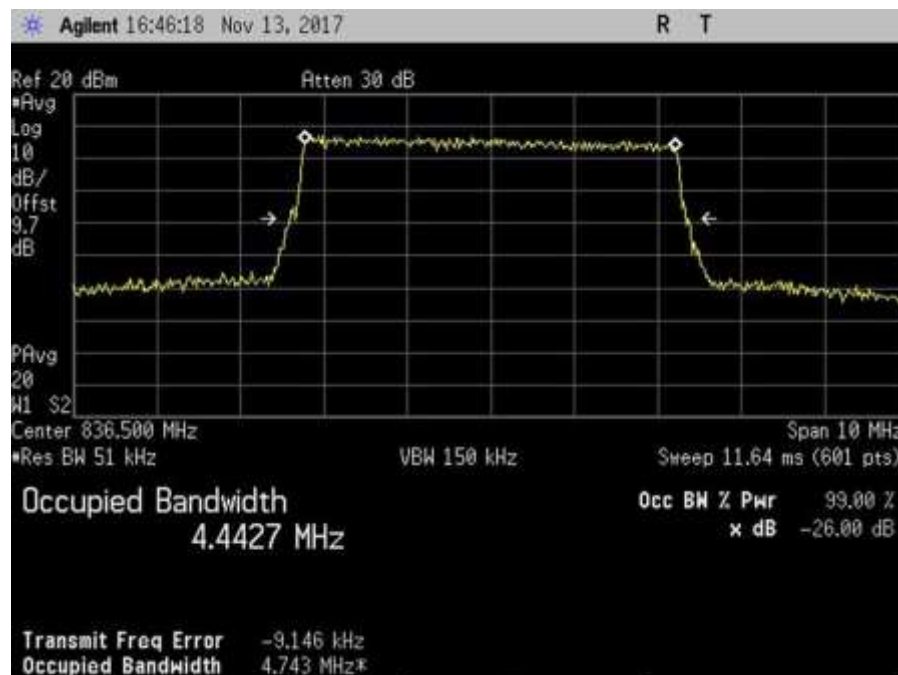
7.10_OBW_UL_776-787MHz_LTE_In



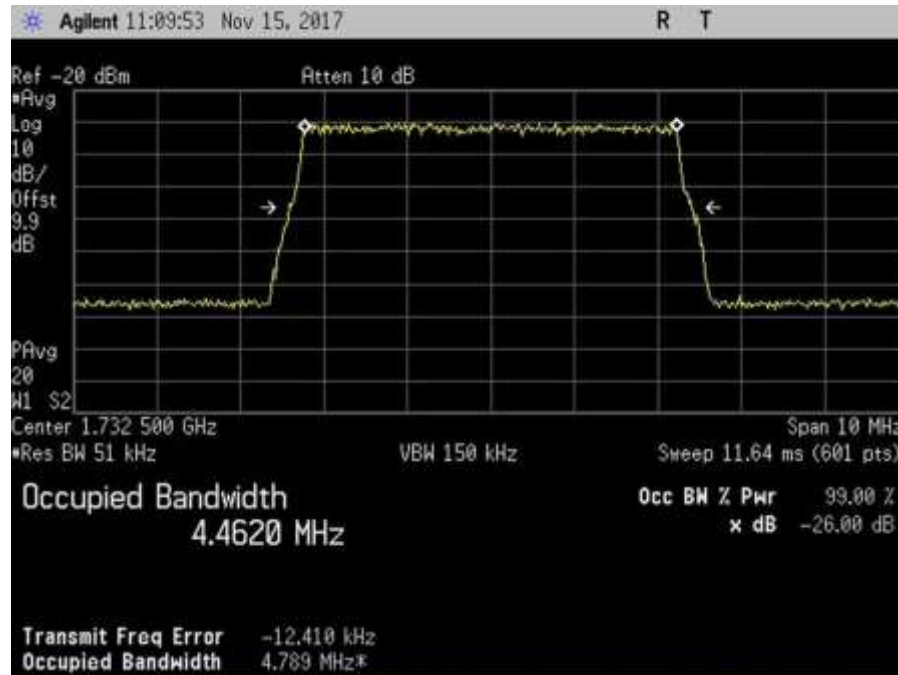
7.10_OBW_UL_776-787MHz_LTE_Out



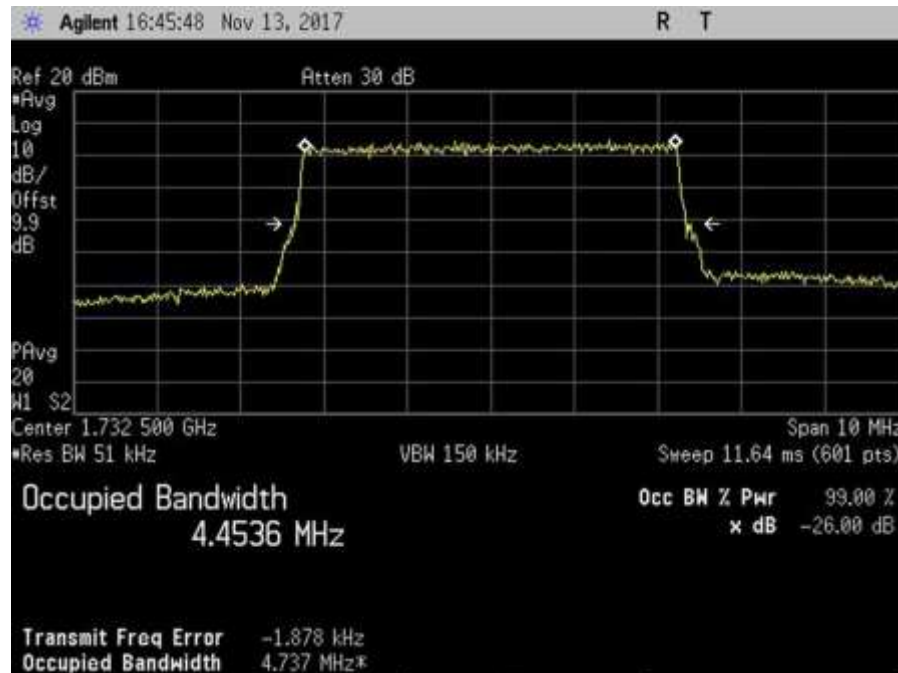
7.10_OBW_UL_824-849MHz_LTE_In



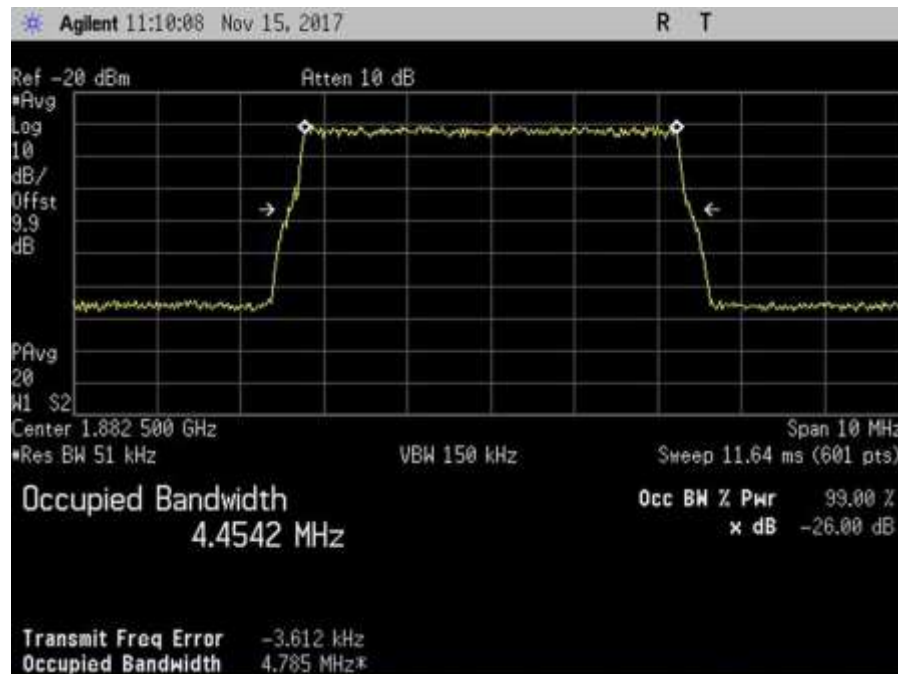
7.10_OBW_UL_824-849MHz_LTE_Out



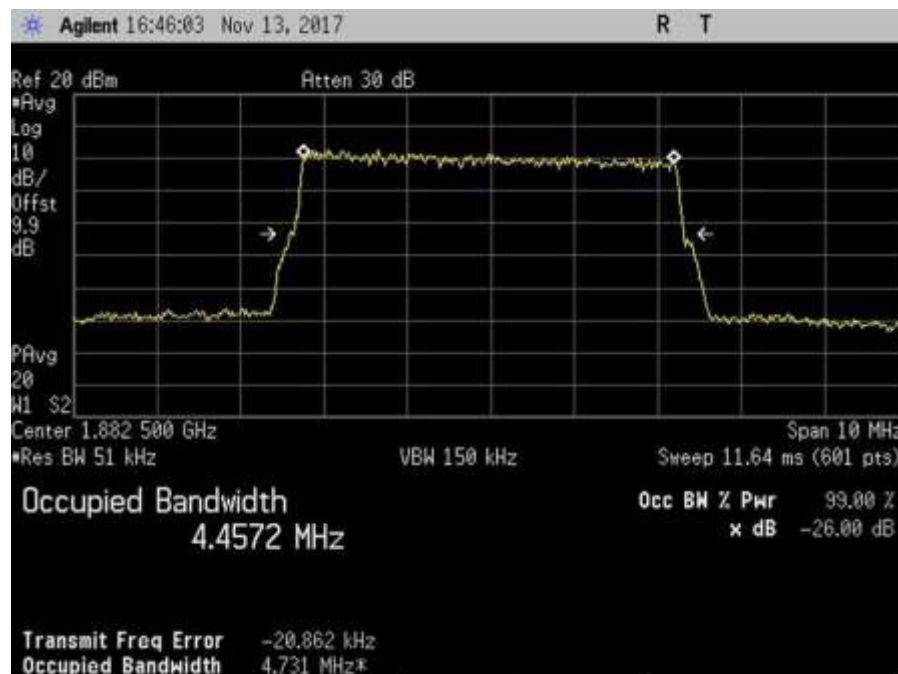
7.10_OBW_UL_1710-1755MHz_LTE_In



7.10_OBW_UL_1710-1755MHz_LTE_Out



7.10_OBW_UL_1850-1915MHz_LTE_In



7.10_OBW_UL_1850-1915MHz_LTE_Out

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 #: **100637** Date: 11/16/2017
 Test Type: **Conducted Emissions** Time: 10:02:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.
 The EUT Server port is a type FME connector and 50-ohm impedance.
 The EUT Donor port is type FME connector and 50-ohm impedance.

Part 22

UL: 824-849MHz

DL: 869-894MHz

Part 24

UL: 1850-1915MHz

DL: 1930-1995MHz

Part 27

UL: 1710-1755MHz, 698-716MHz, 776-787MHz

DL: 2110-2155MHz, 728-746MHz, 746-757MHz

Test procedure:

The test was performed in accordance with section 7.11 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017

Firmware: V 3.2

Test environment conditions: 21.3°C, 48% Relative Humidity, 101.3 kPa

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:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
	AN03470	Spectrum Analyzer	E4440A	12/9/2015	12/9/2017
	AN03412	Band Pass Filter	PE8705	8/16/2017	8/16/2019
	AN03413	Band Pass Filter	PE8706	8/16/2017	8/16/2019
	AN03414	Band Pass Filter	PE8707	8/16/2017	8/16/2019
	AN03415	Band Pass Filter	PE8708	8/16/2017	8/16/2019
	AN03447	Band Pass Filter	PE8710	8/16/2017	8/16/2019
	AN03448	Band Pass Filter	PE8711	8/16/2017	8/16/2019
	AN03446	Band Pass Filter	4FV50-707/H18-O/O	8/16/2017	8/16/2019
	AN03467	Band Pass Filter	4FV50-731/H30-O/O	8/16/2017	8/16/2019
	AN03468	Band Pass Filter	4CS10-781.5/E12.2-O/O	8/16/2017	8/16/2019
	AN03469	Band Pass Filter	4CS10-751.5/E12-O/O	8/16/2017	8/16/2019
	AN02475	1 dB step Attenuator	8494B	6/8/2017	6/8/2019
	AN03429	10dB step Attenuator	8496B	11/8/2017	11/8/2019
	ANC00082	RF Coupler	722-10-1.500V	9/18/2017	9/18/2019
	ANC00087	Combiner	44000	1/7/2016	1/7/2018

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	
Freq	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.27	0.30	26.8	70	60	1	5
UL1850-1915	0.15	0.30	29.4	70	60	1	5
UL824-894	0.25	0.30	30.8	71	60	1	5
UL 698-716	0.14	0.30	31.5	70	60	1	5
UL776-787	0.23	0.30	32.0	-	60	0	5
DL2110-2155	0.32	1.00	21.0	69	60	1	5
DL1930-1995	0.57	1.00	16.9	69	60	1	5
DL869-894	0.32	1.00	18.9	70	60	1	5
DL:728-746	0.31	1.00	19.5	69	60	1	5
DL 746-757	0.57	1.00	17.9	70	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

Max Gain Isolation dB	UL 1710-1755 Pk-Pk Difference dB	UL1850-1915 Pk-Pk Difference dB	UL 824-894 Pk-Pk Difference dB	UL 698-716 Pk-Pk Difference dB	UL 776-787 Pk-Pk Difference dB	Limit dB
+5dB	11.5	11.9	10.1	11.7	(12)*	12.0
+4dB	(12)*	(12.8)*	11.4	(13.3)*	(15.4)*	12.0
+3dB	(15)*	(14)*	(13.1)*	(15.7)*	(17.7)*	12.0
+2dB	(15.6)*	(15.8)*	(14.4)*	(17.2)*	(19.8)*	12.0
+1dB	(17.9)*	(18.2)*	(17.2)*	(21.5)*	(25.4)*	12.0
0dB	(20.3)*	(26.9)*	(20.5)*	(28.4)*	(36.4)*	12.0
-1dB	(24.2)*	(80.8)*	(27.7)*	**	**	12.0
-2dB	(31.2)*	**	**	**	**	12.0
-3dB	(89.5)*	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

Max Gain Isolation dB	DL 2110-2155 Pk-Pk Difference dB	DL 1930-1995 Pk-Pk Difference dB	DL 869-894 Pk-Pk Difference dB	DL 728-746 Pk-Pk Difference dB	DL 746-775 Pk-Pk Difference dB	Limit dB
+5dB	10.3	8.3	10.5	9.6	10.4	12.0
+4dB	11.1	9.0	11.4	11.4	11.5	12.0
+3dB	(12.5)*	10.0	(12.7)*	(12.6)*	(13.1)*	12.0
+2dB	(14)*	10.3	(14.5)*	(14.5)*	(14.4)*	12.0
+1dB	(15.4)*	11.7	(15.2)*	(16.2)*	(16.3)*	12.0
0dB	(17.9)*	(12.6)*	(20.2)*	(18.6)*	(20.6)*	12.0
-1dB	(22.4)*	(15.4)*	(24.6)*	(24)*	(21.7)*	12.0
-2dB	(30)*	(19.3)*	**	(40.6)*	**	12.0
-3dB	**	(25.8)*	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

Note:

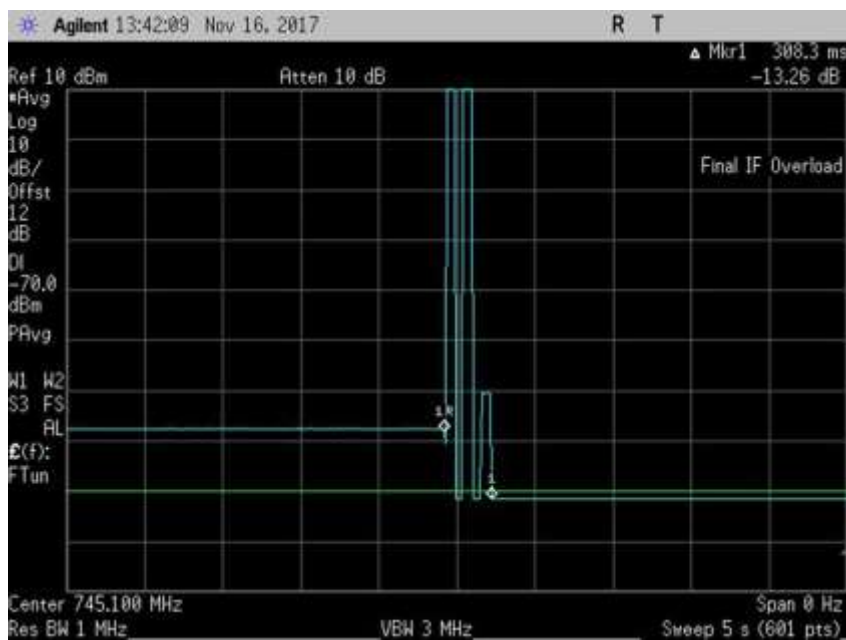
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 196 seconds for the Uplink bands and 200 seconds for the Downlink bands.

** The device shuts down immediately.

7.11.2 Oscillation Restart Tests

Plots

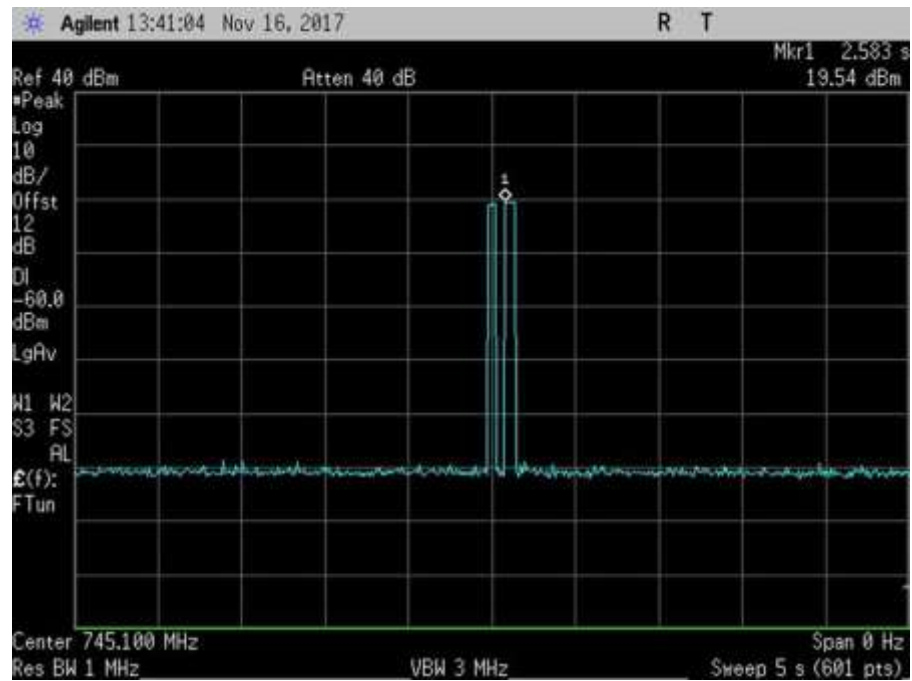
DL



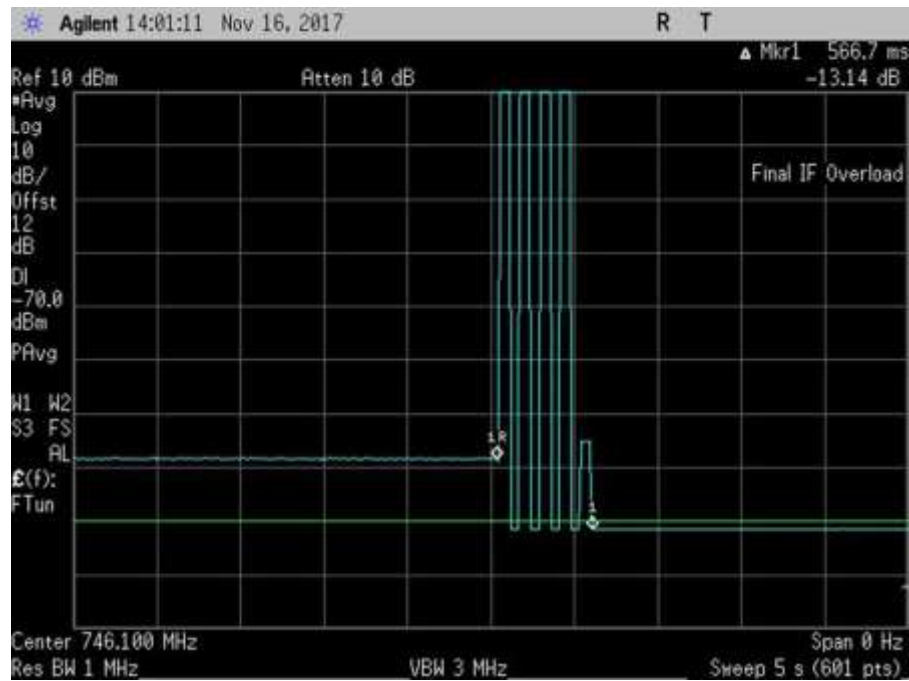
7.11.2_osc_DL_728-746MHz



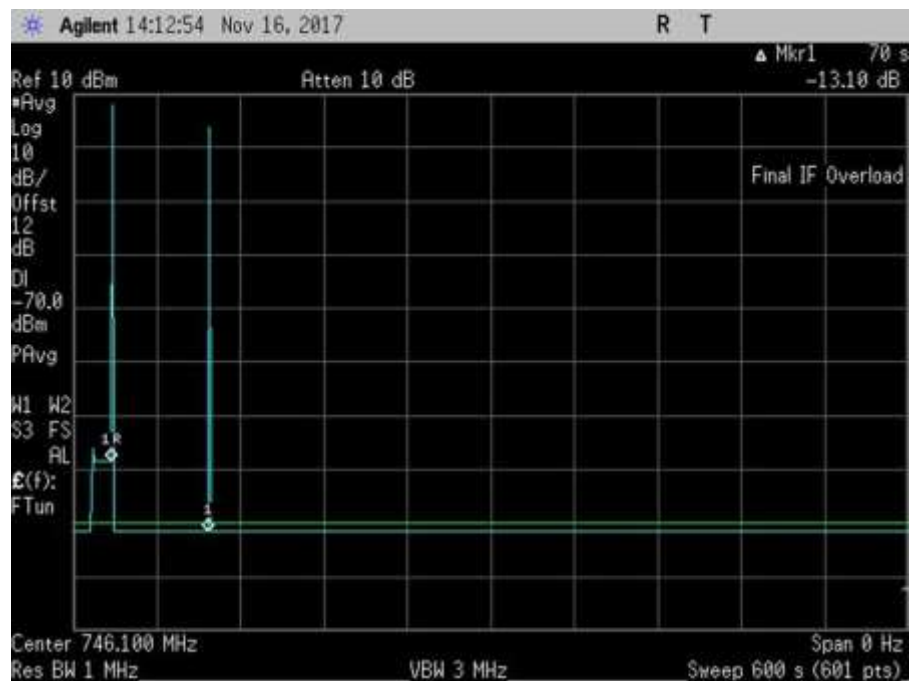
7.11.2_osc_DL_728-746MHz_600sec



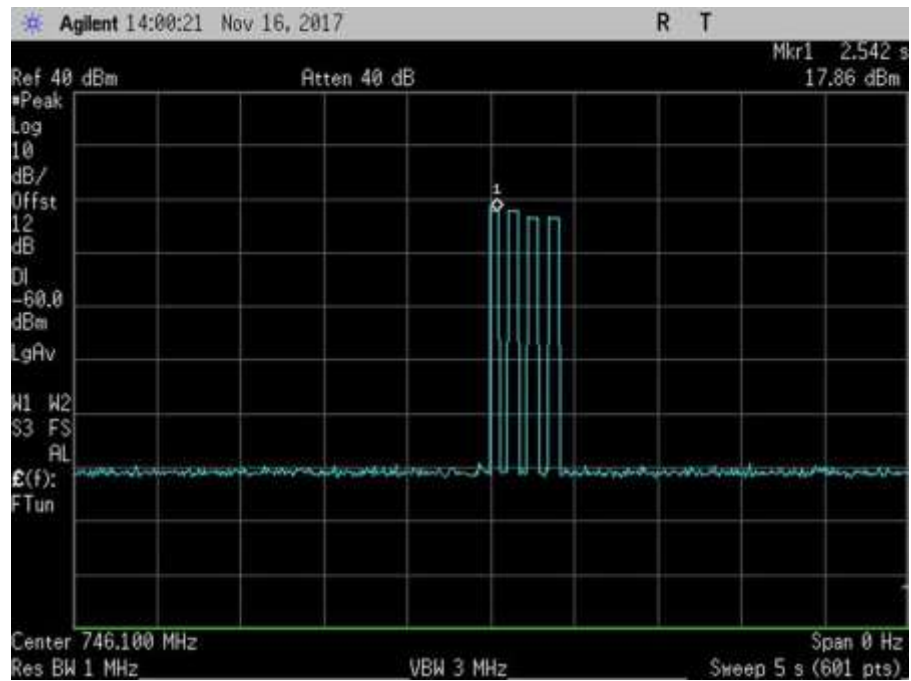
7.11.2_osc_DL_728-746MHz_Pk



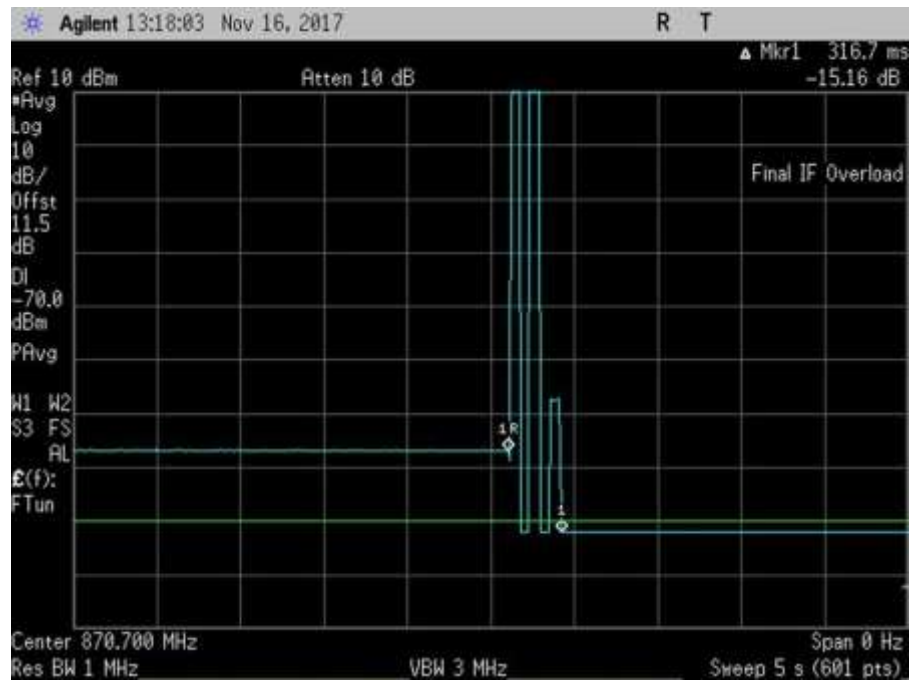
7.11.2_osc_DL_746-757MHz



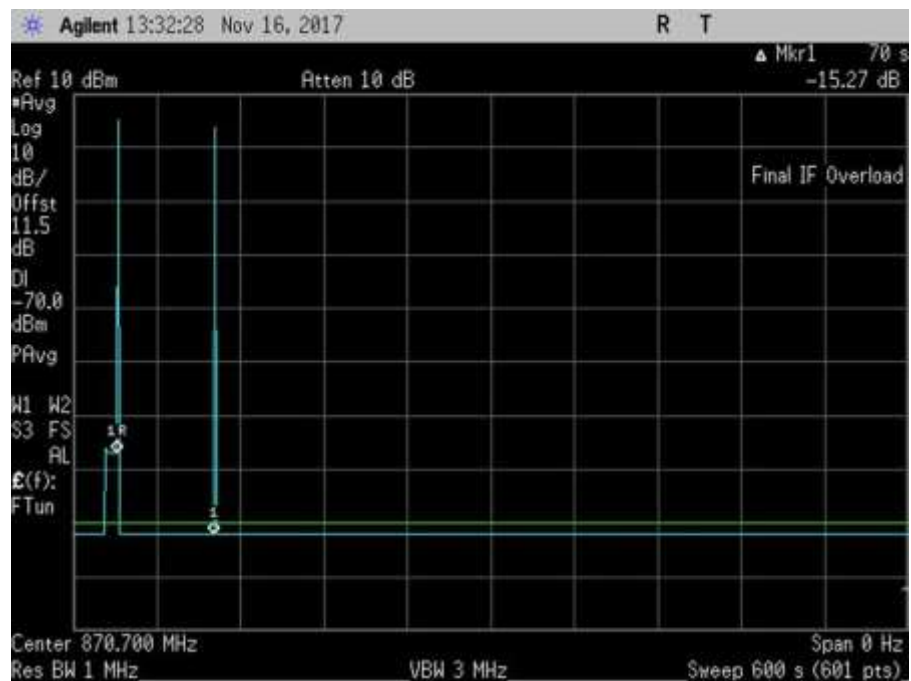
7.11.2_osc_DL_746-757MHz_600sec



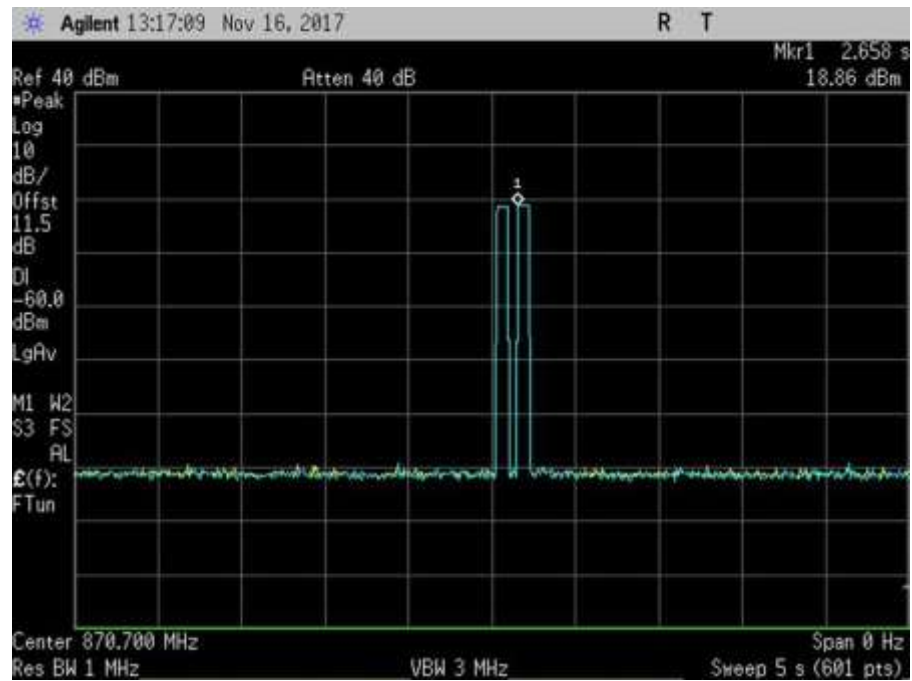
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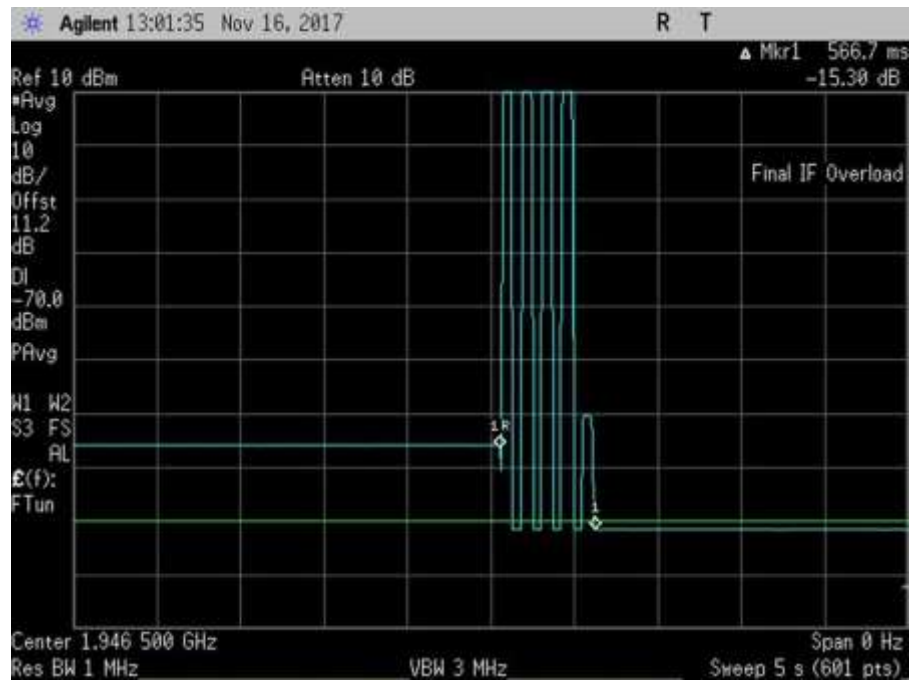
7.11.2_osc_DL_869-894MHz



7.11.2_osc_DL_869-894MHz_600sec



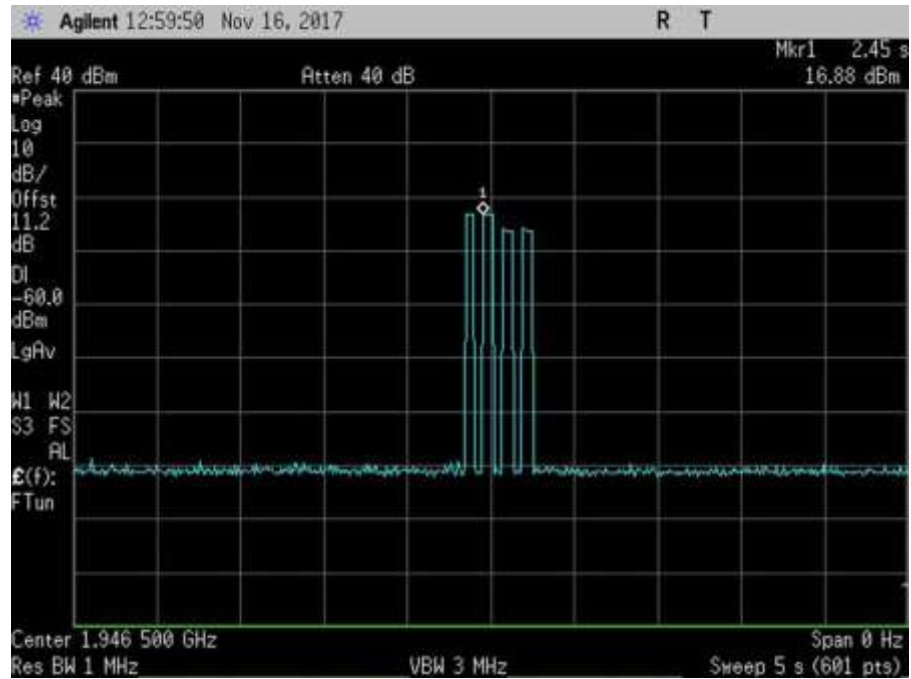
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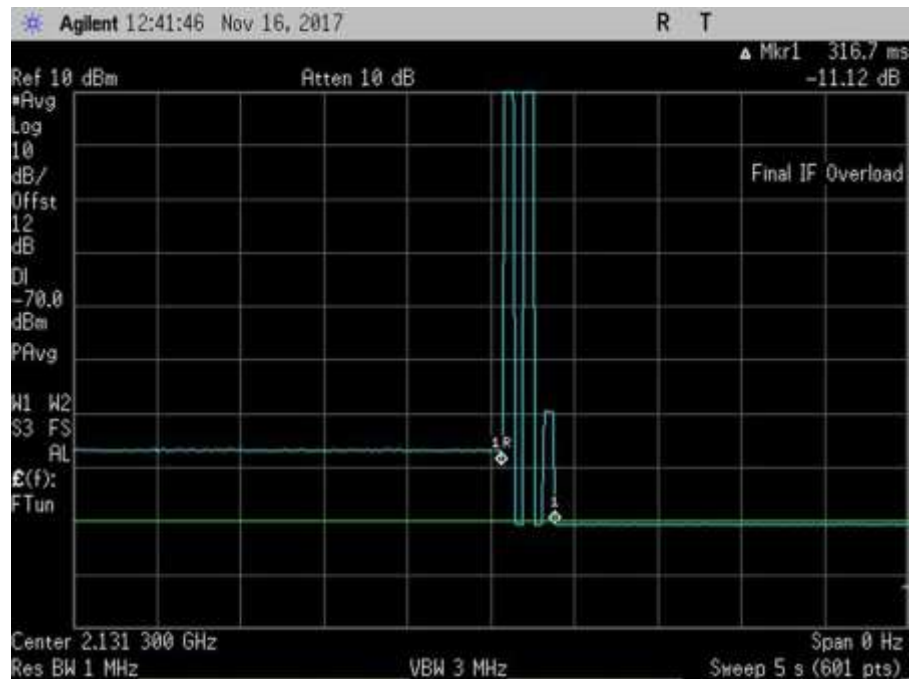
7.11.2_osc_DL_1930-1995MHz



7.11.2_osc_DL_1930-1995MHz_600sec



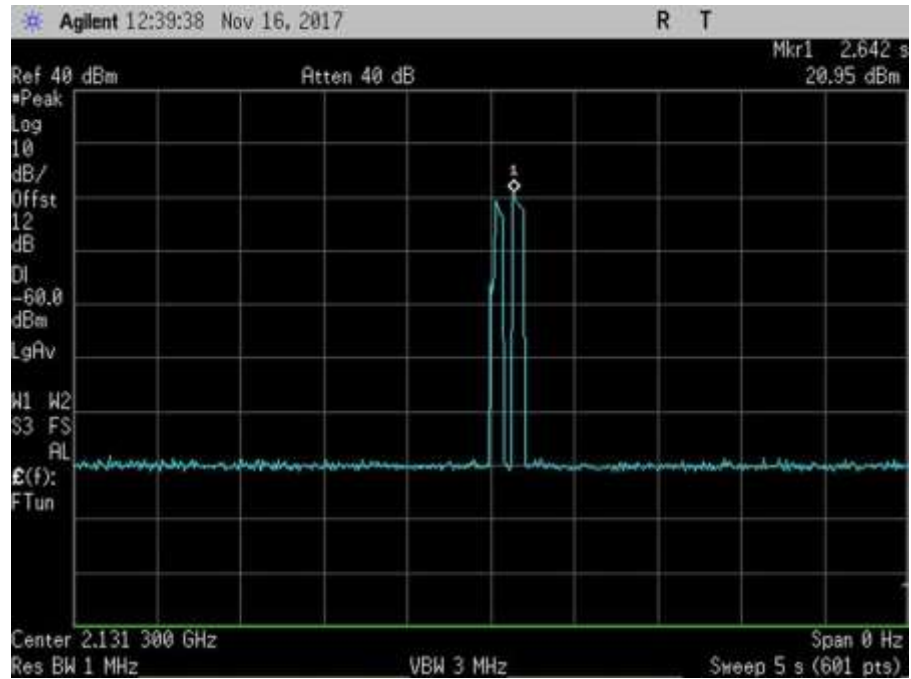
7.11.2_osc_DL_1930-1995MHz_Pk



7.11.2_osc_DL_2110-2155MHz

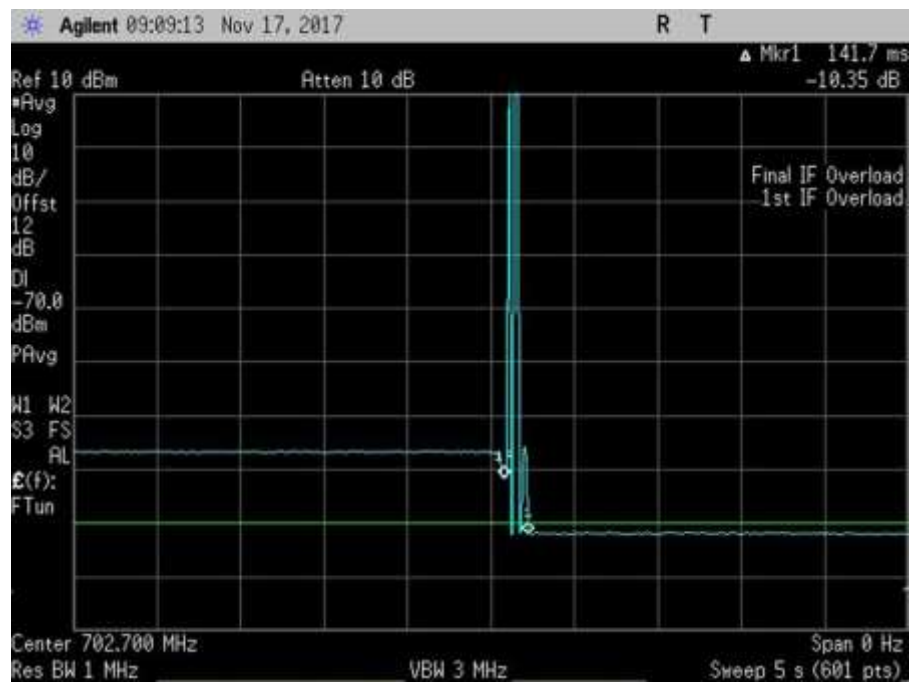


7.11.2_osc_DL_2110-2155MHz_600sec



7.11.2_osc_DL_2110-2155MHz_Pk

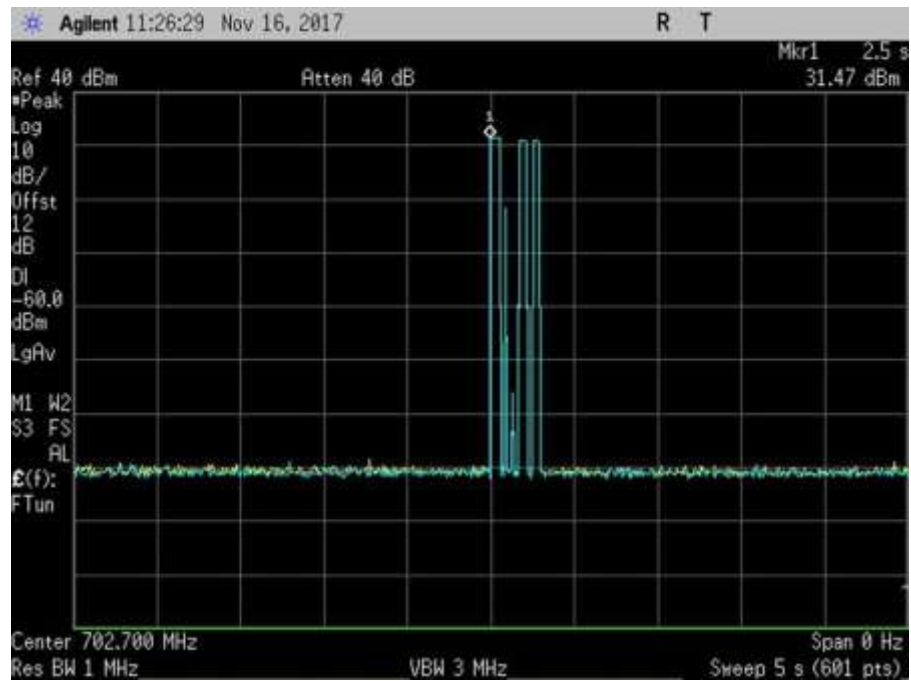
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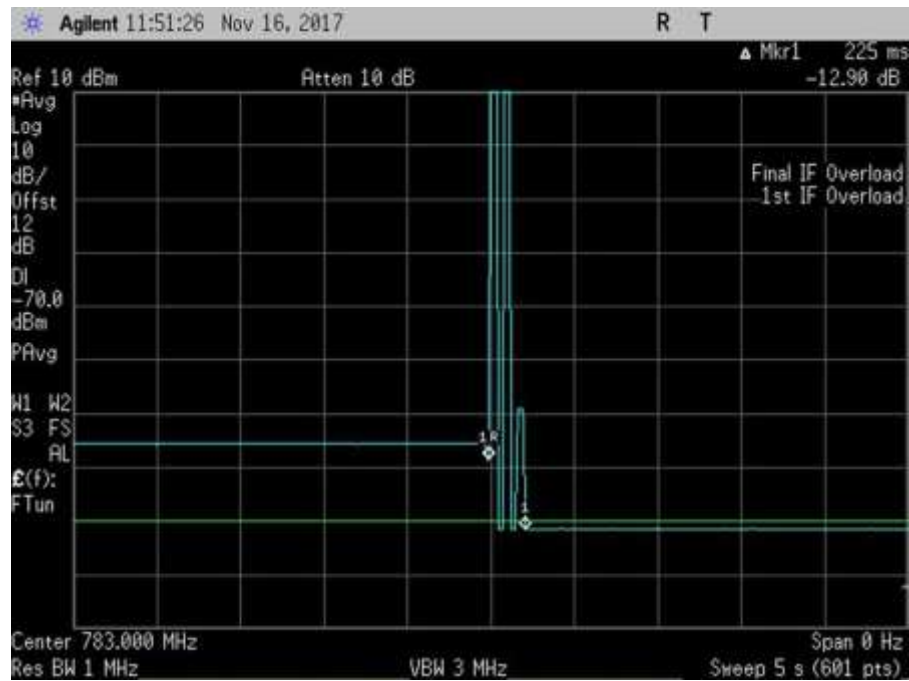
7.11.2_osc_UL_698-716MHz



7.11.2_osc_UL_698-716MHz_600sec



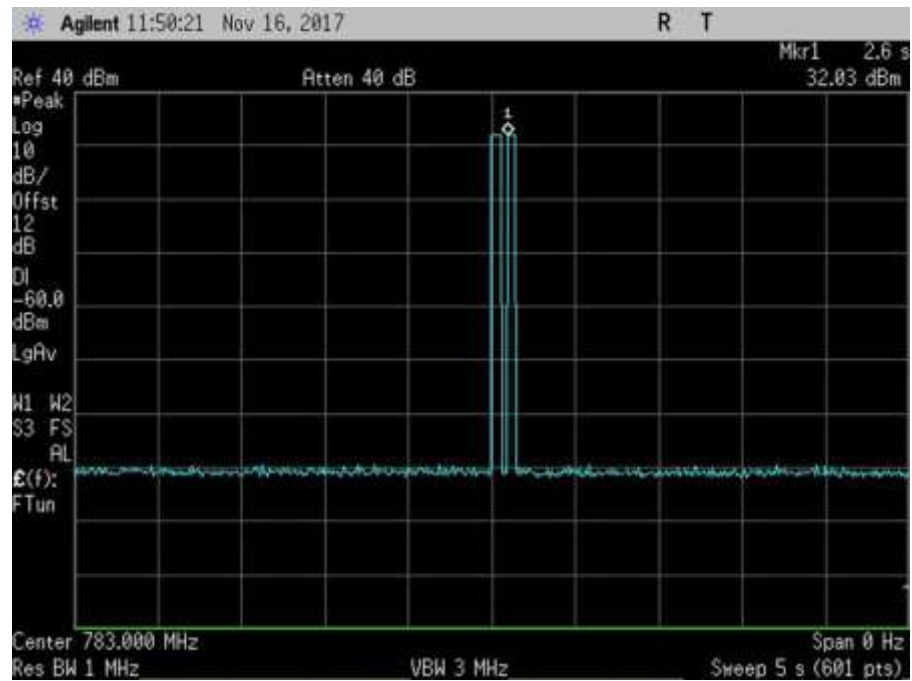
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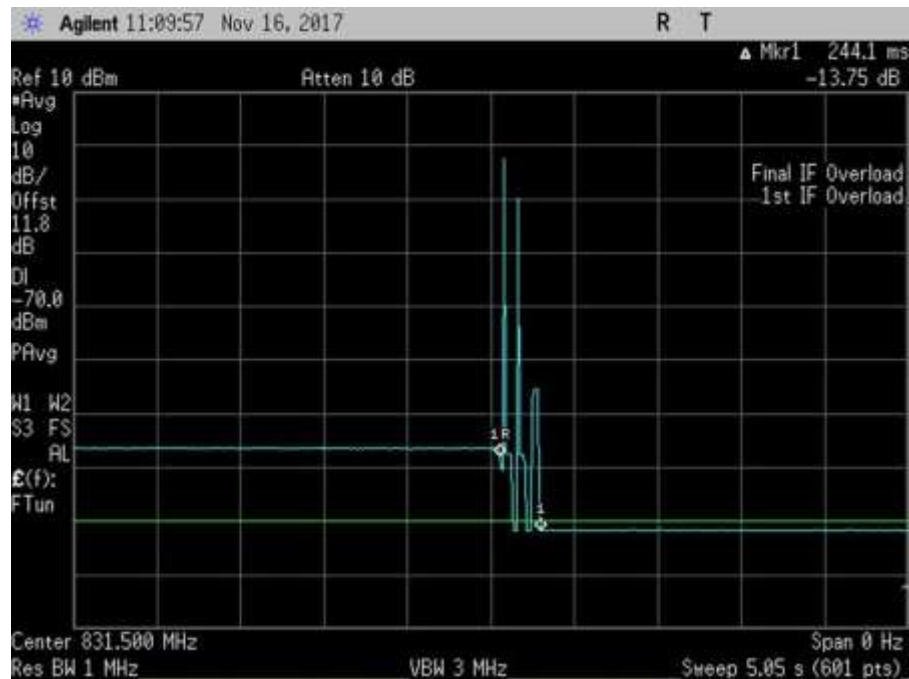
7.11.2_osc_UL_776-787MHz



7.11.2_osc_UL_776-787MHz_600sec



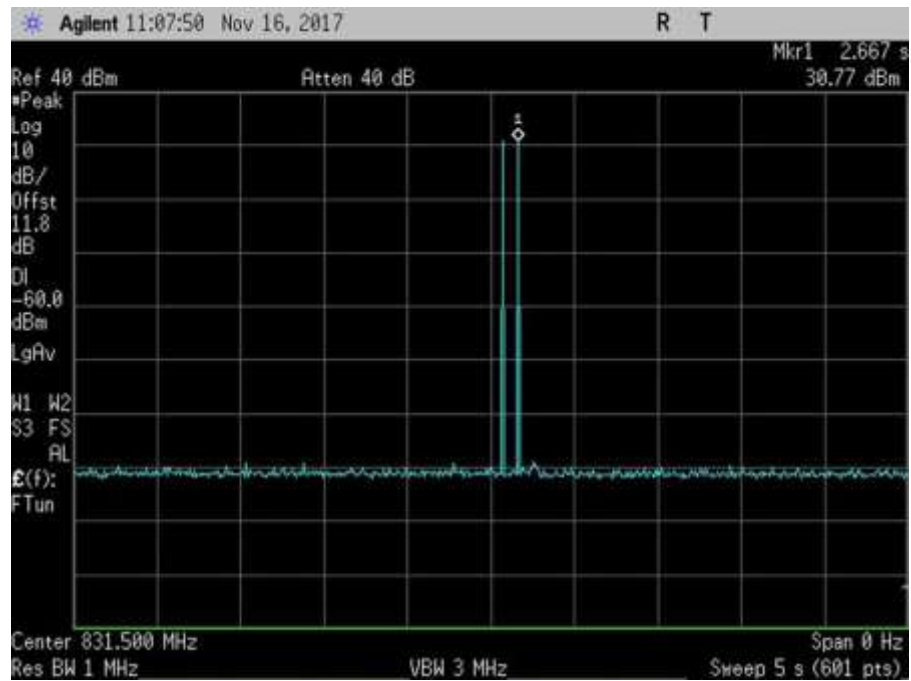
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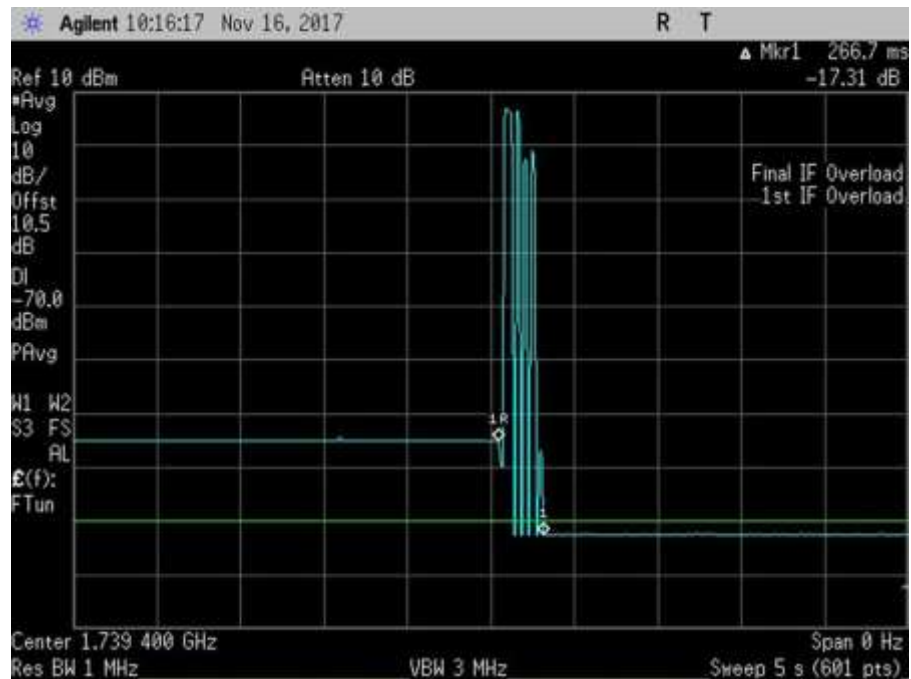
7.11.2_osc_UL_824-849MHz



7.11.2_osc_UL_824-849MHz_600sec



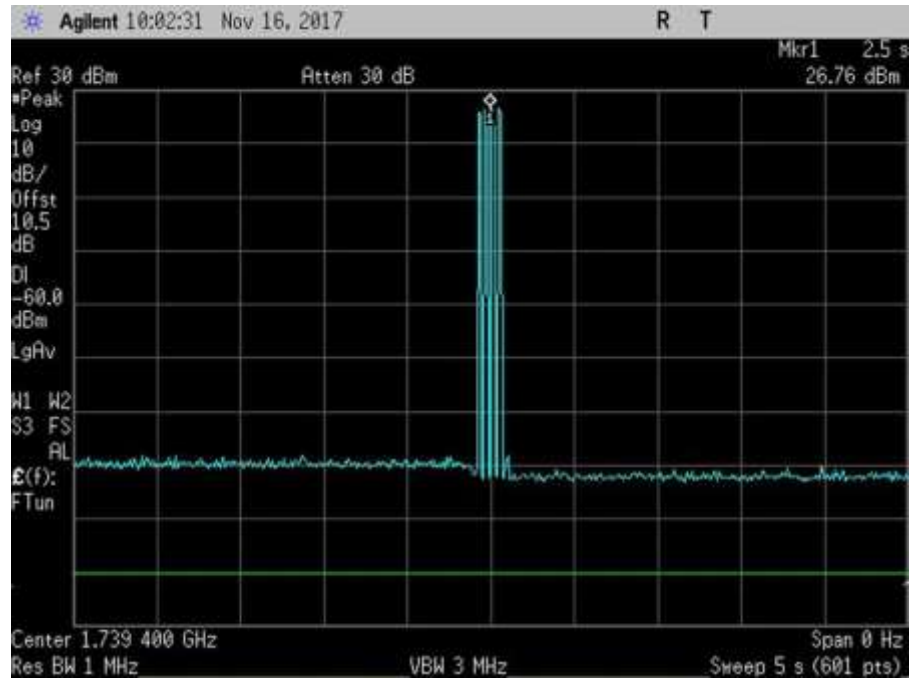
7.11.2_osc_UL_824-849MHz_Pk



7.11.2_osc_UL_1710-1755MHz



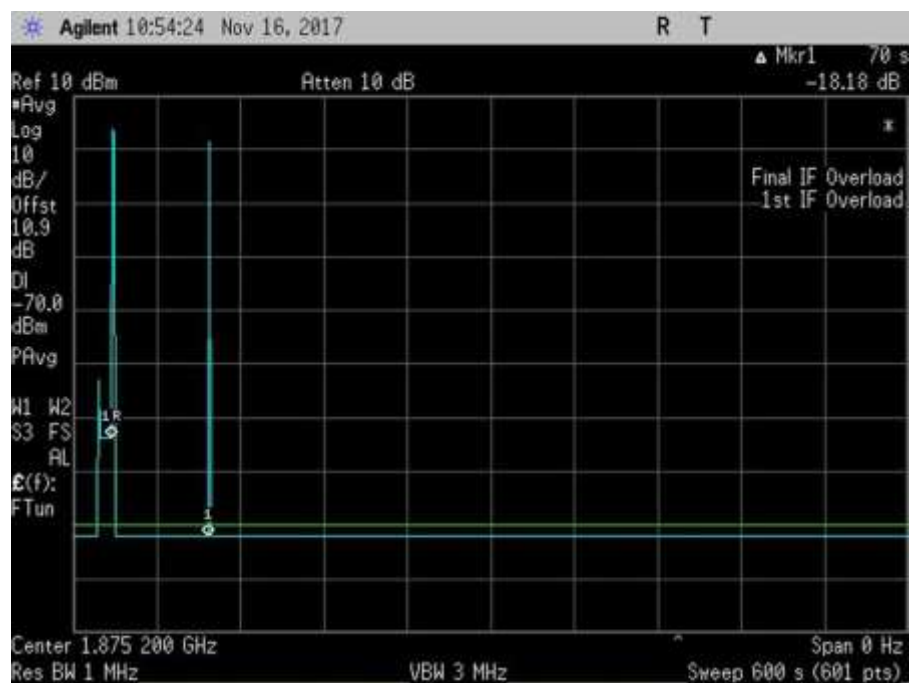
7.11.2_osc_UL_1710-1755MHz_600sec



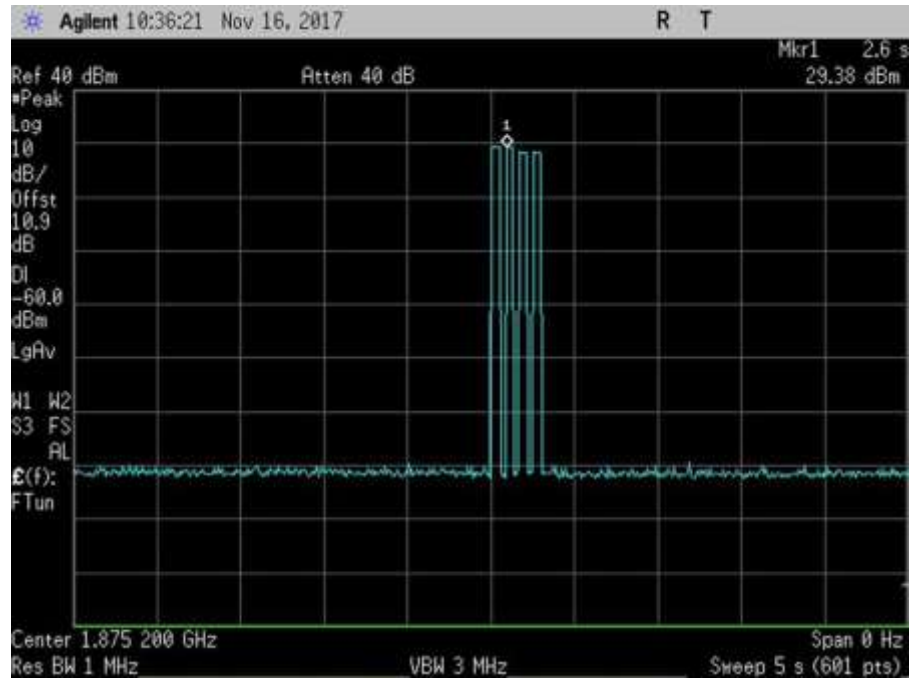
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7.11.2_osc_UL_1850-1915MHz



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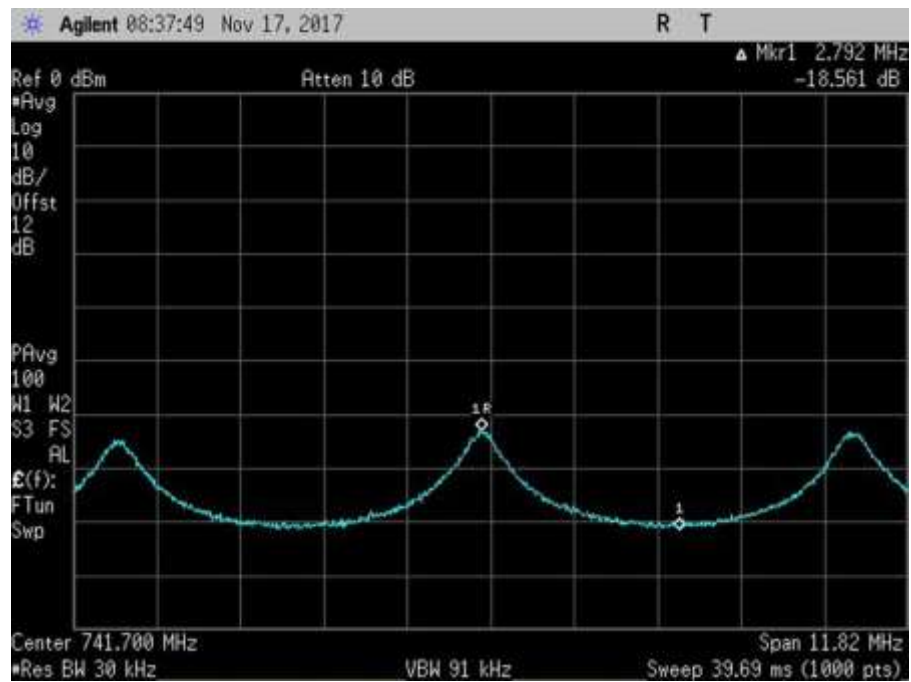


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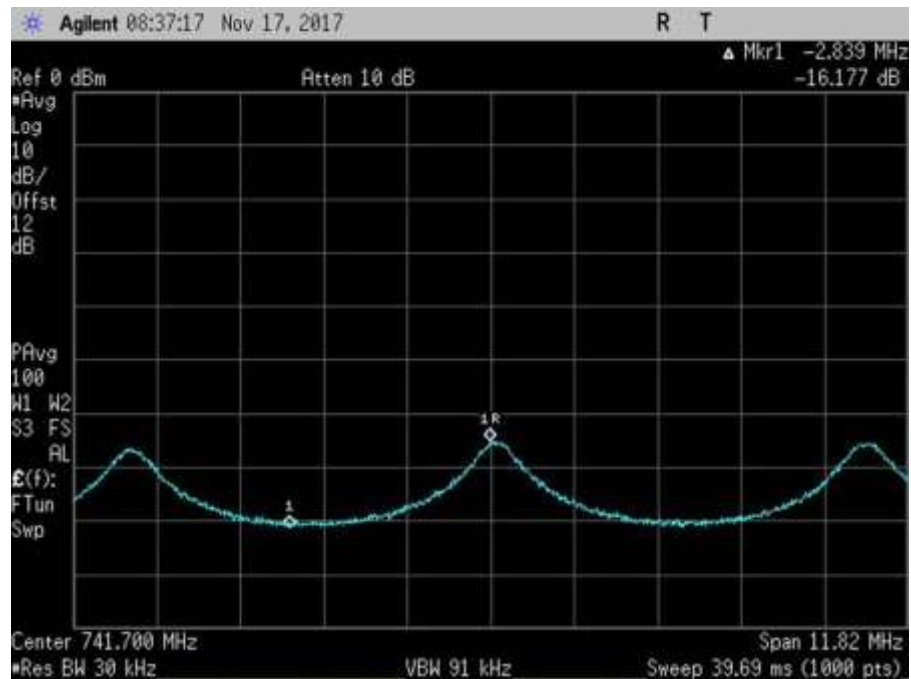
7.11.3 Measuring Oscillation Mitigation or Shutdown

Plots

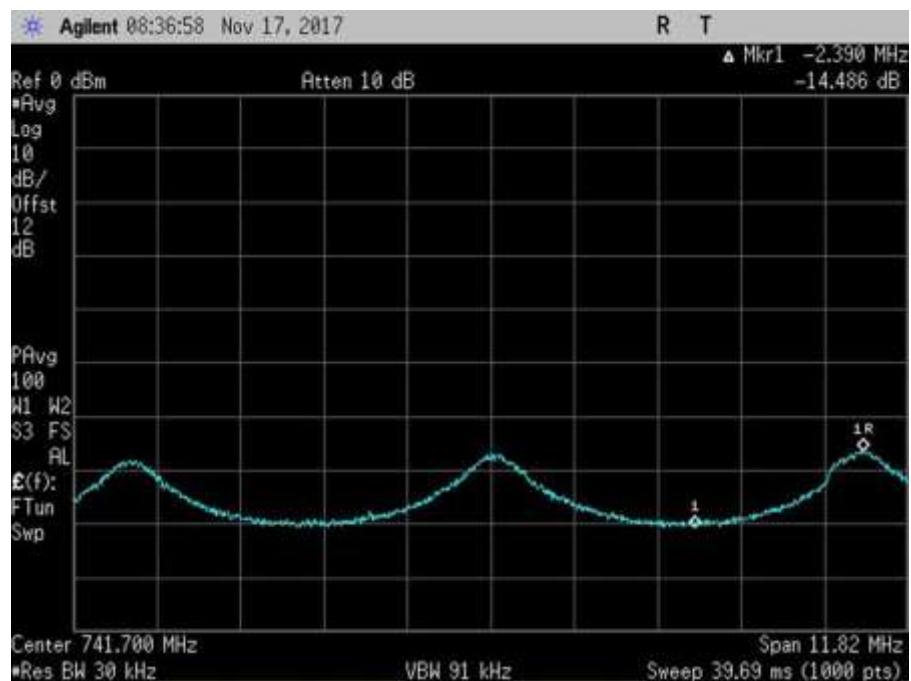
DL



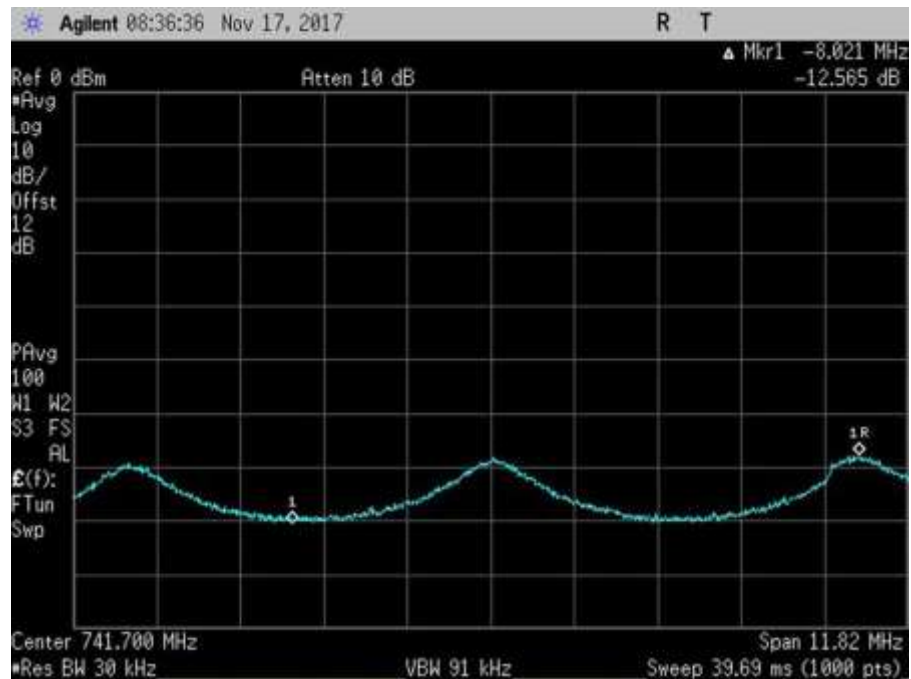
7.11.3_Osc_DL_728-746MHz+0_AWGNL



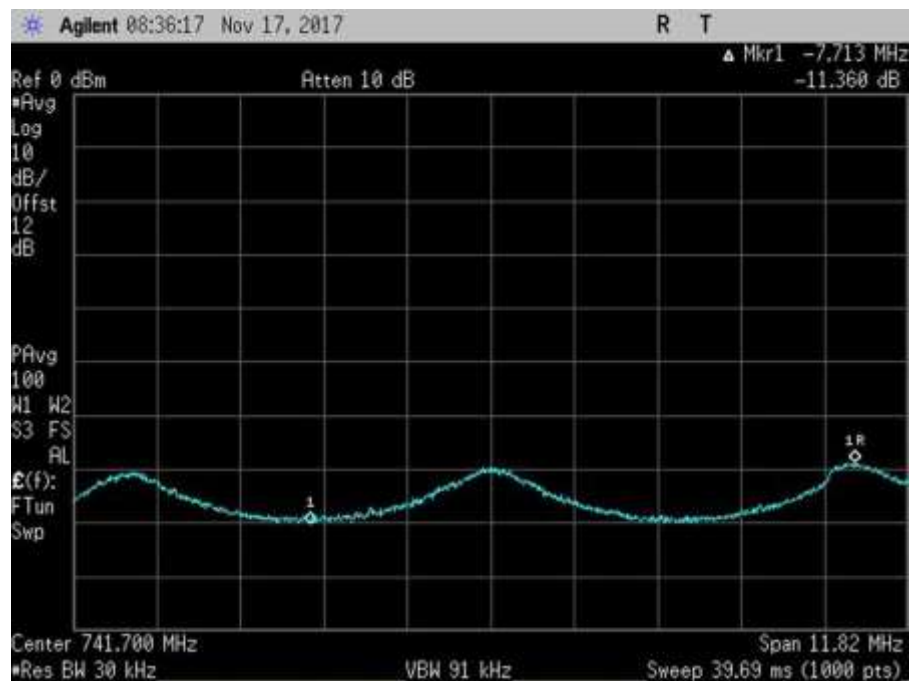
7.11.3_Osc_DL_728-746MHz+1_AWGNL



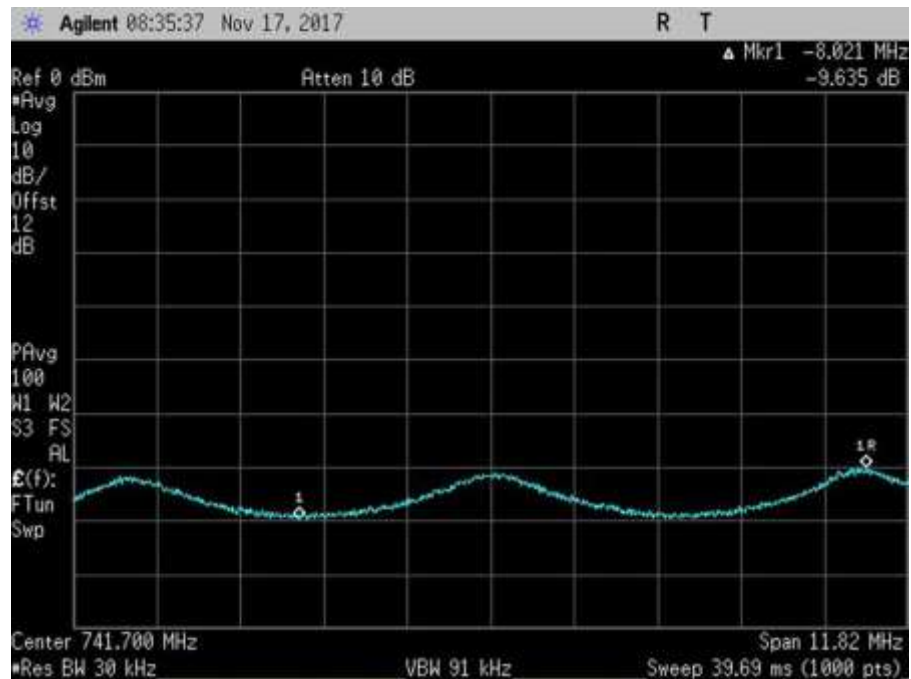
7.11.3_Osc_DL_728-746MHz+2_AWGNL



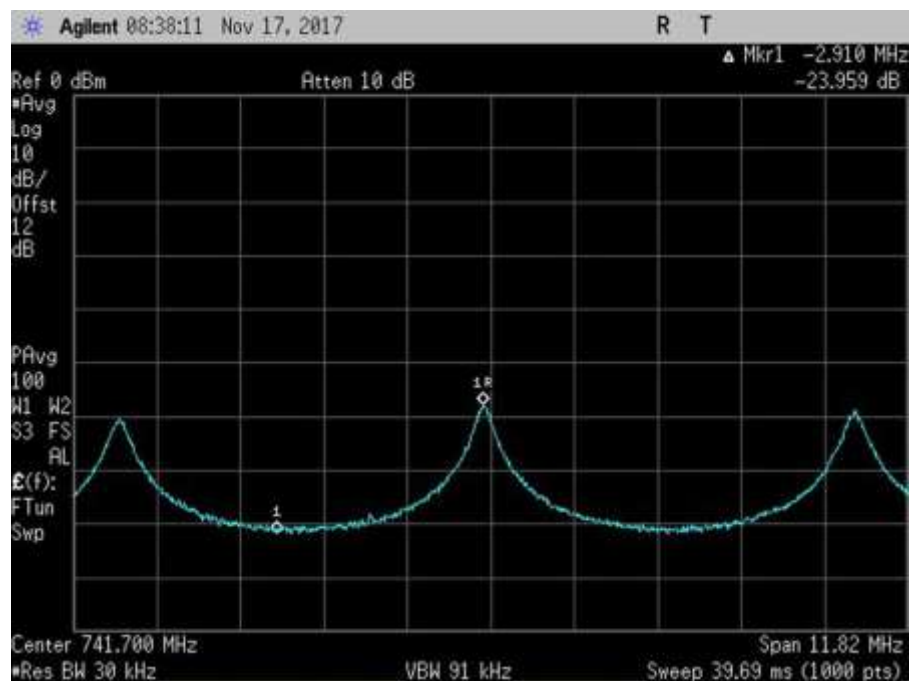
7.11.3_Osc_DL_728-746MHz+3_AWGNL



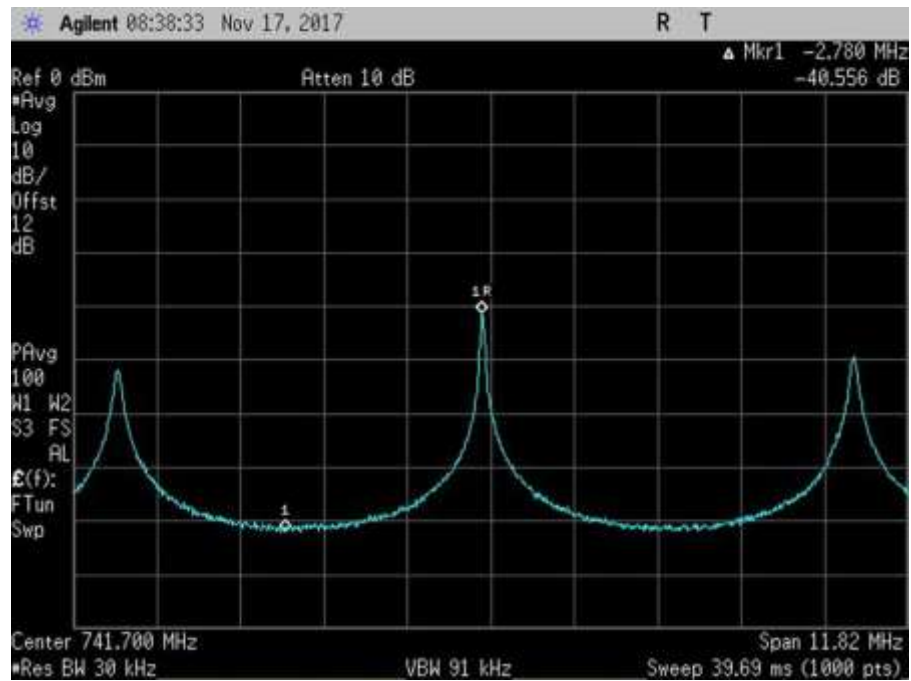
7.11.3_Osc_DL_728-746MHz+4_AWGNL



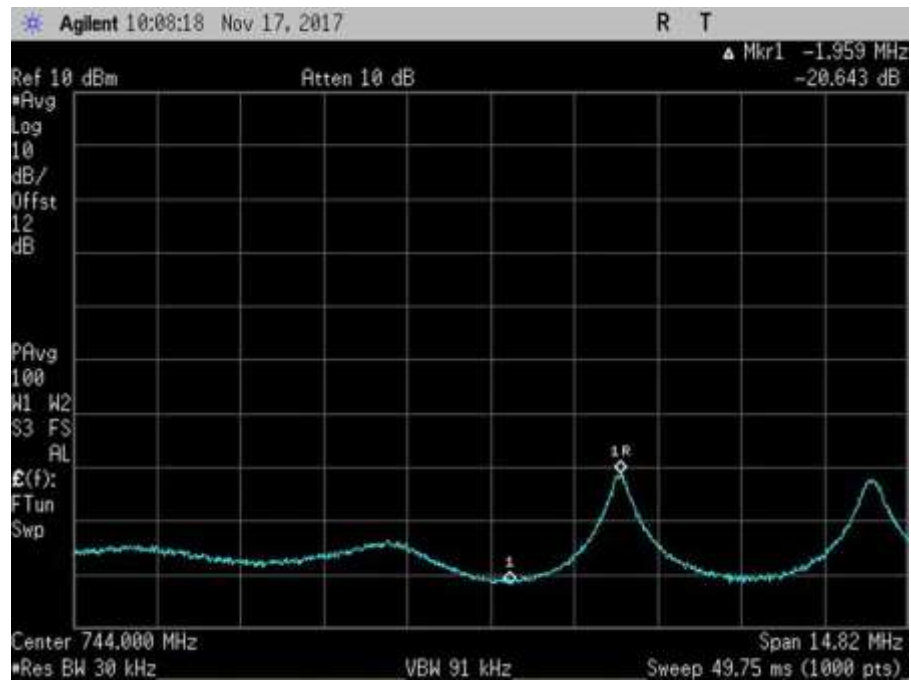
7.11.3_Osc_DL_728-746MHz+5_AWGNL



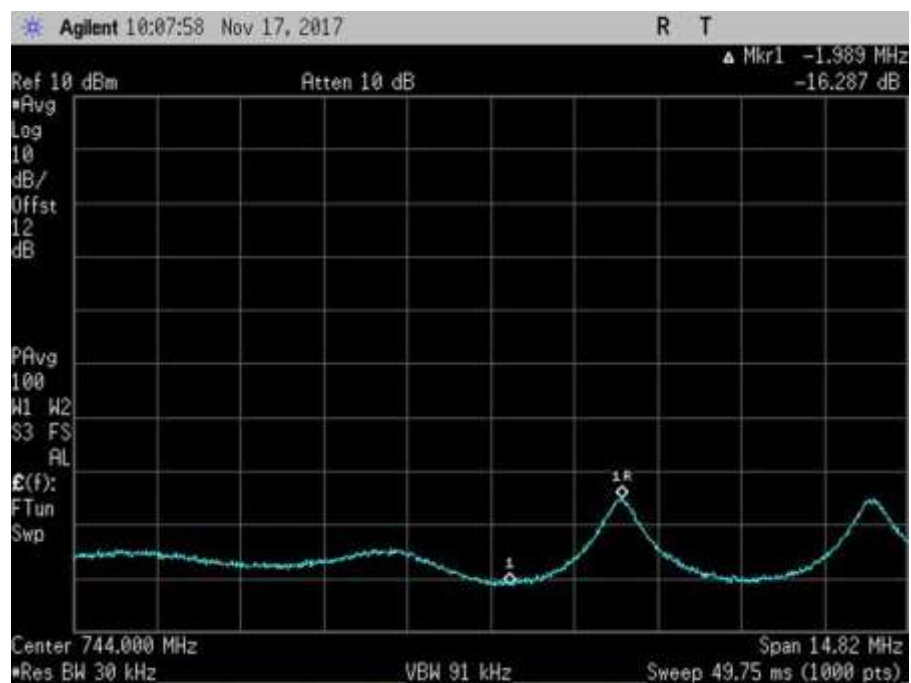
7.11.3_Osc_DL_728-746MHz-1_AWGNL



7.11.3_Osc_DL_728-746MHz-2_AWGNL



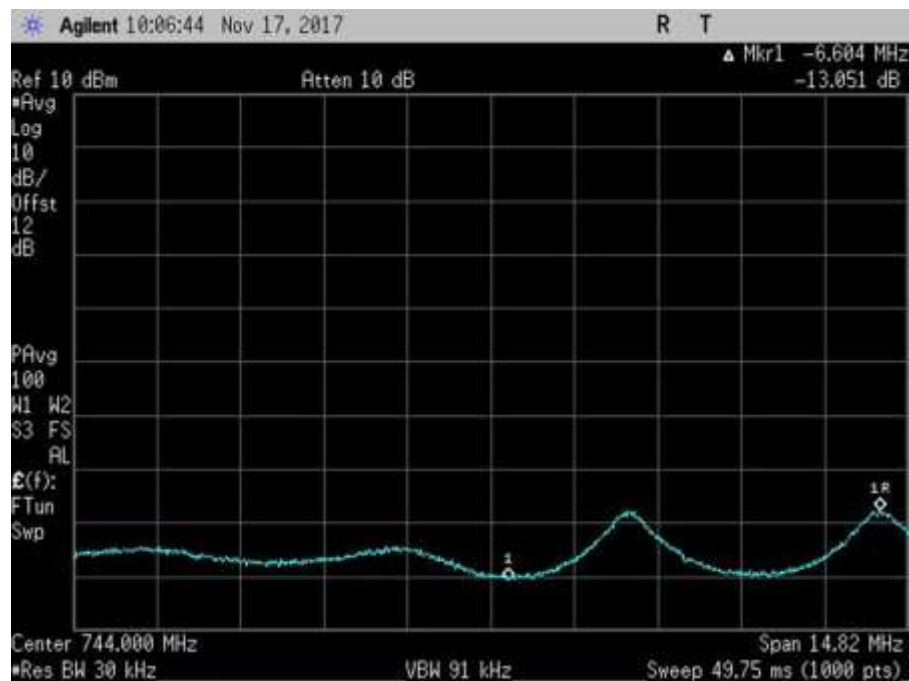
7.11.3_Osc_DL_746-757MHz+0_AWGNR



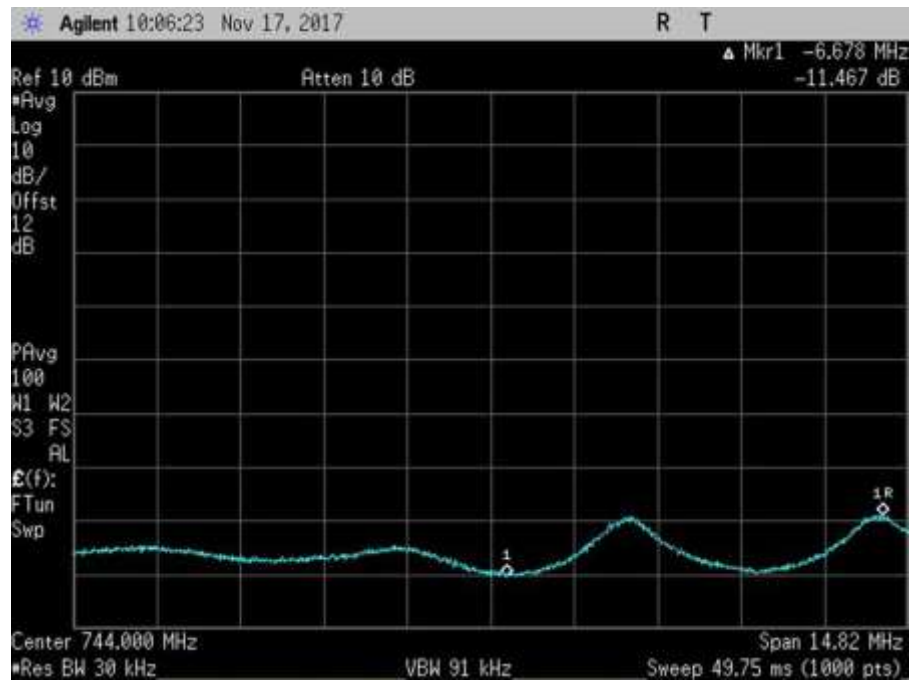
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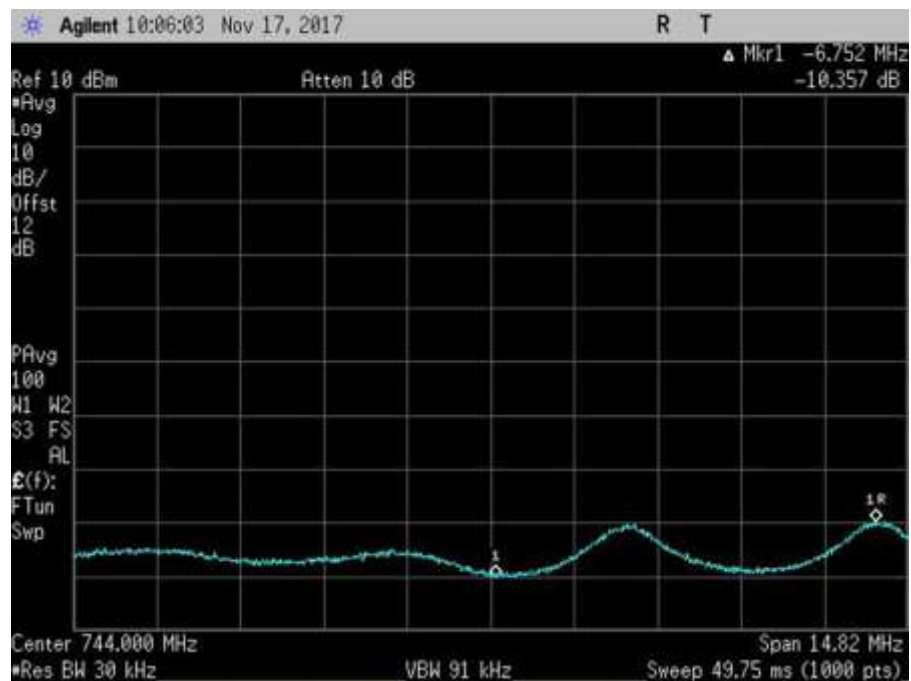
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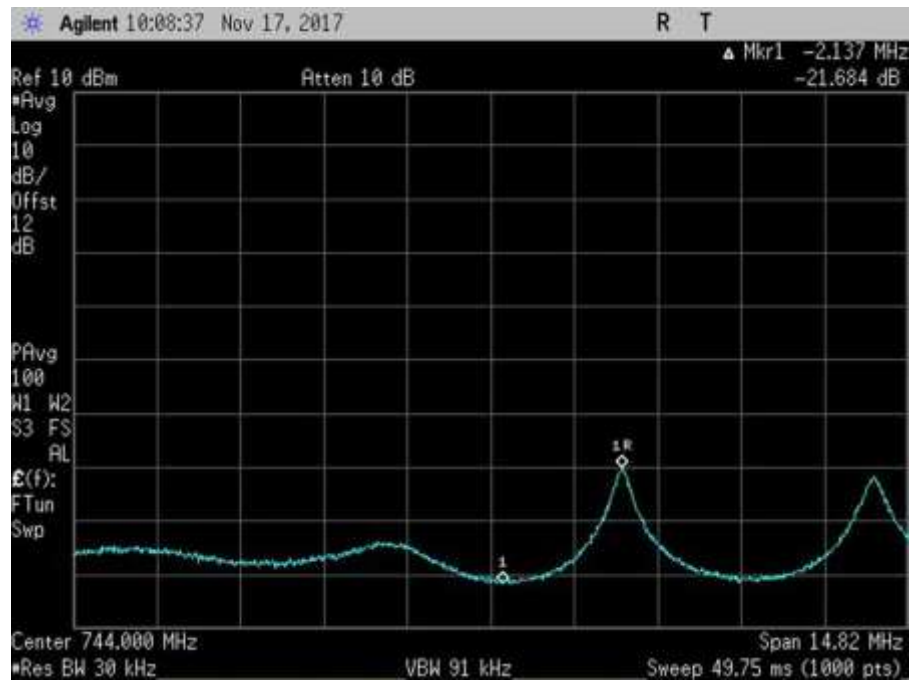
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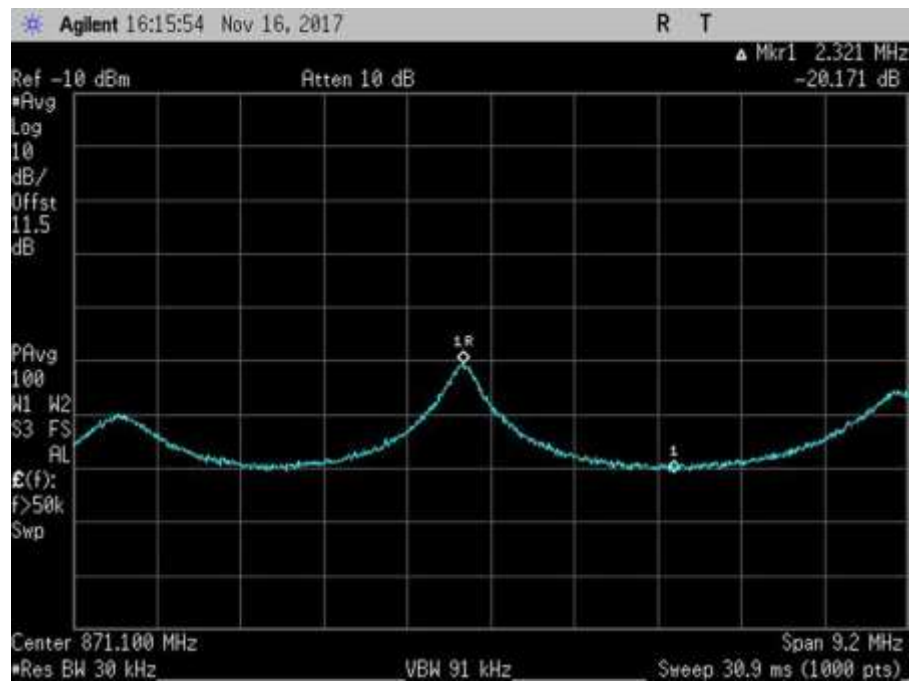
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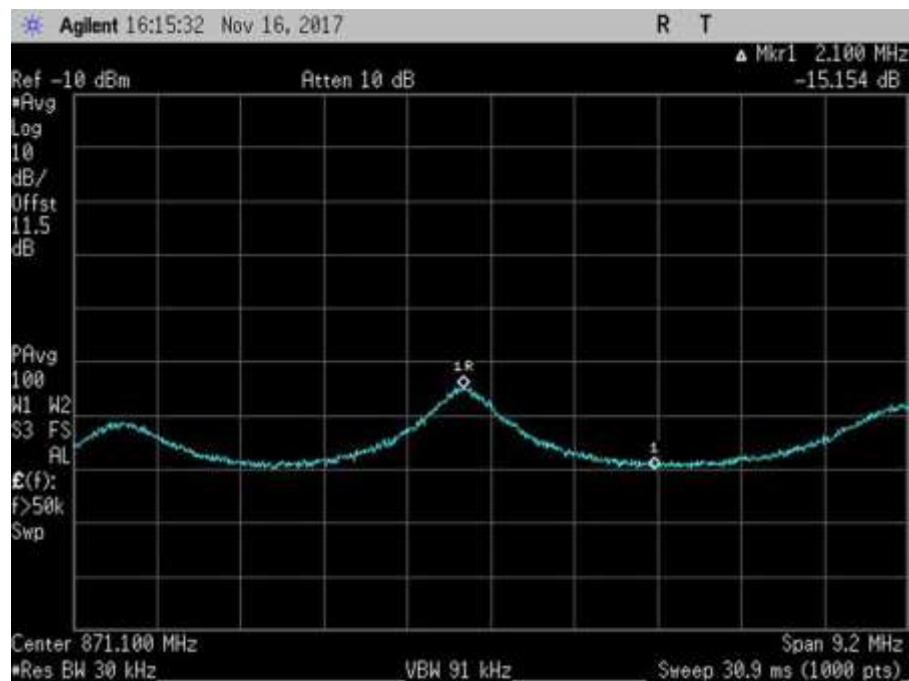
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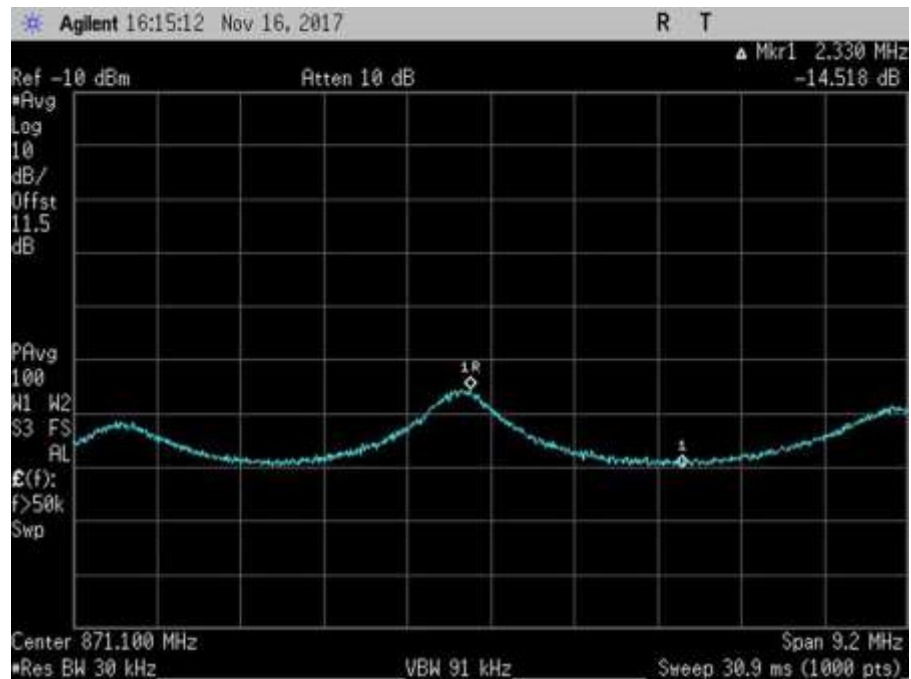
7.11.3_Osc_DL_746-757MHz-1_AWG NR



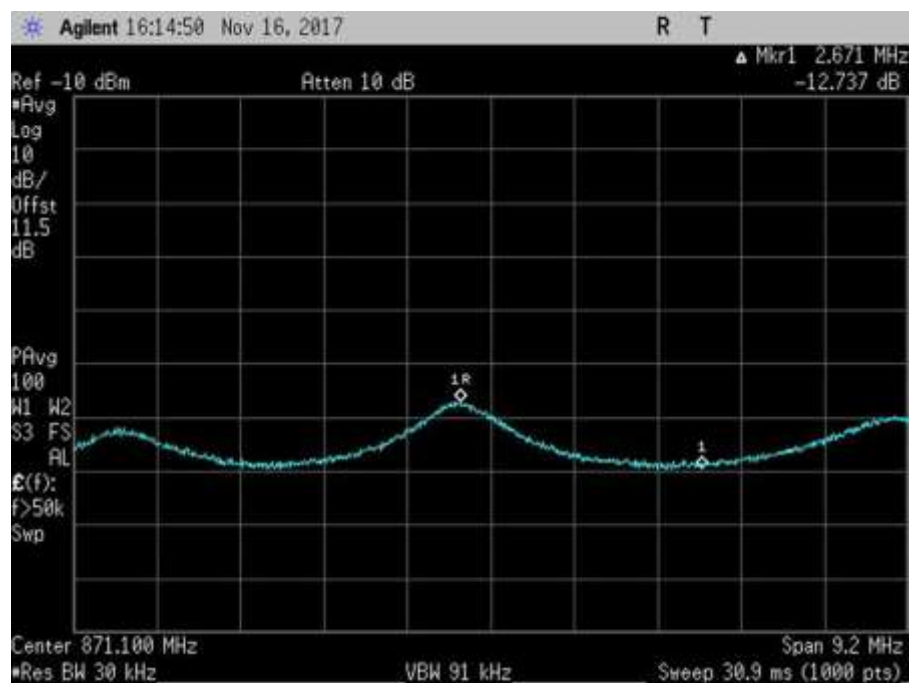
7.11.3_Osc_DL_869-894MHz+0_AWGNR



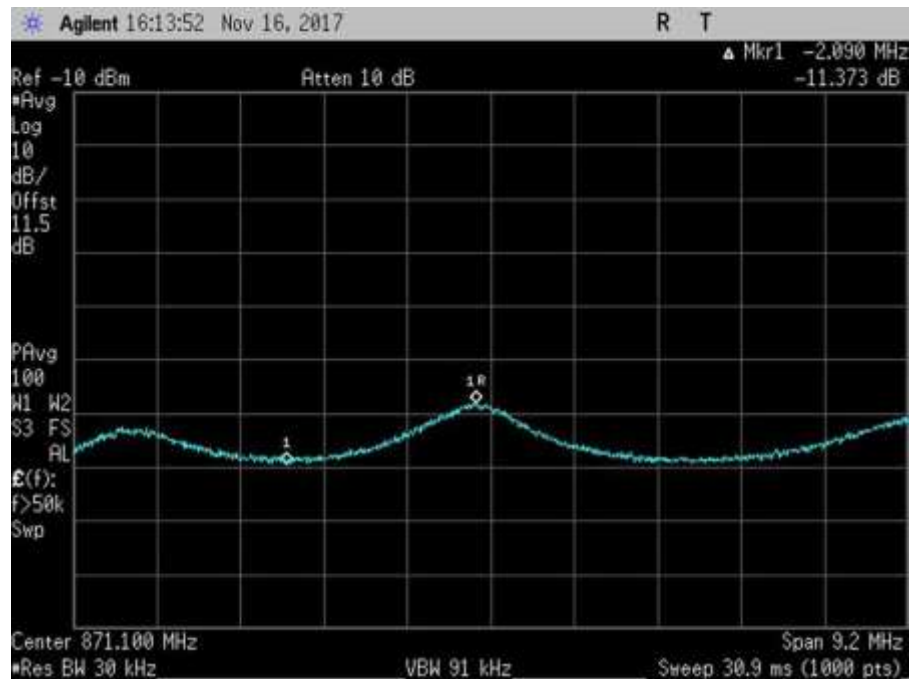
7.11.3_Osc_DL_869-894MHz+1_AWGNR



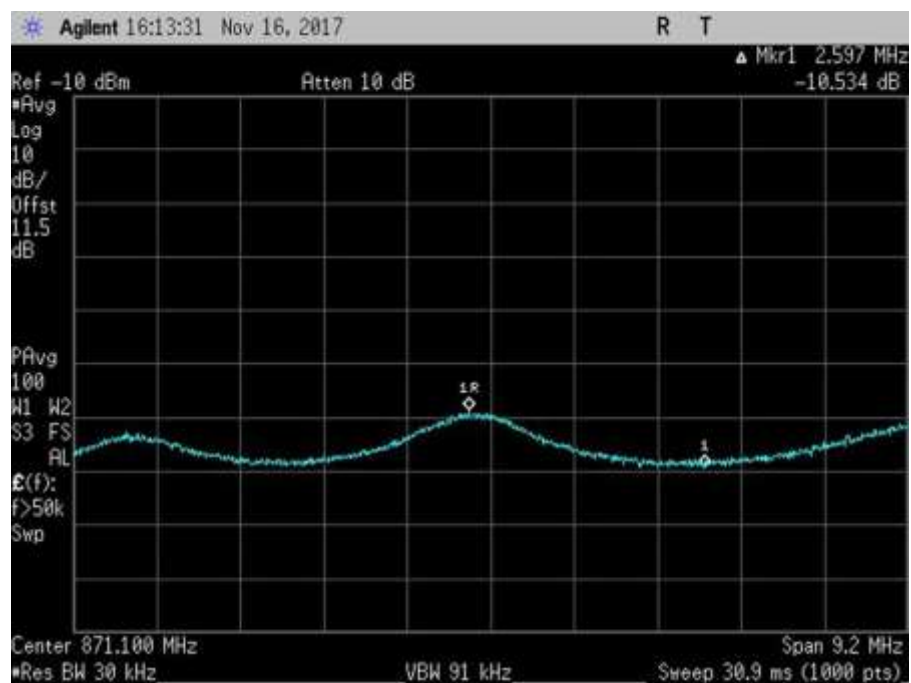
7.11.3_Osc_DL_869-894MHz+2_AWGNR



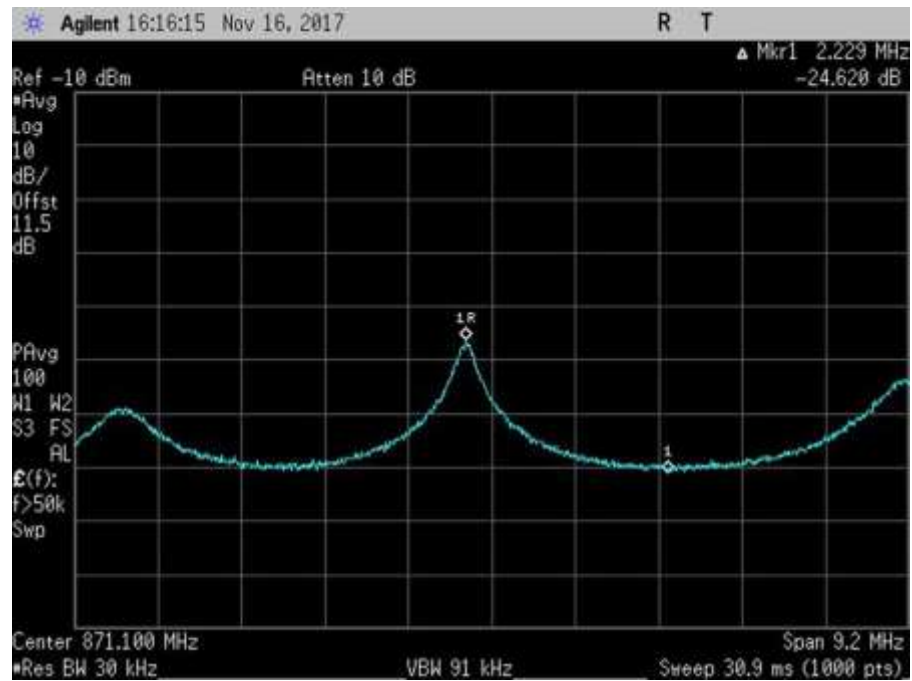
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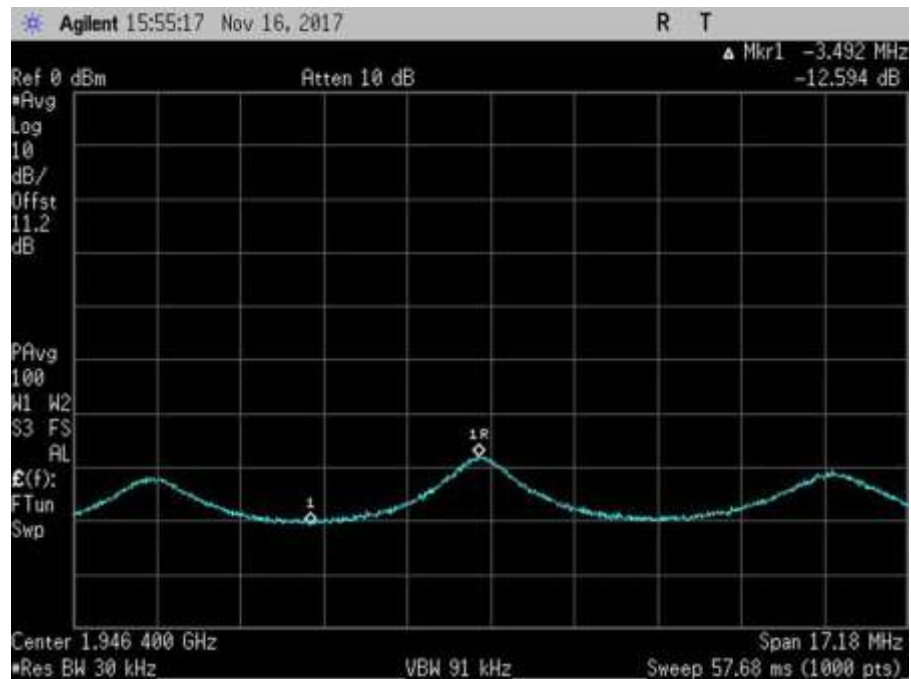
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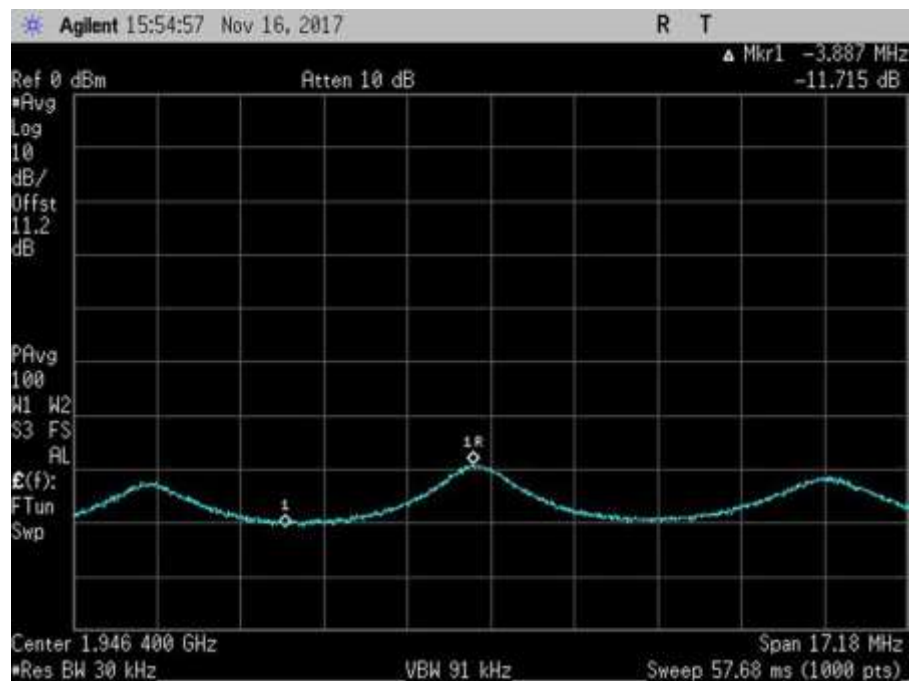
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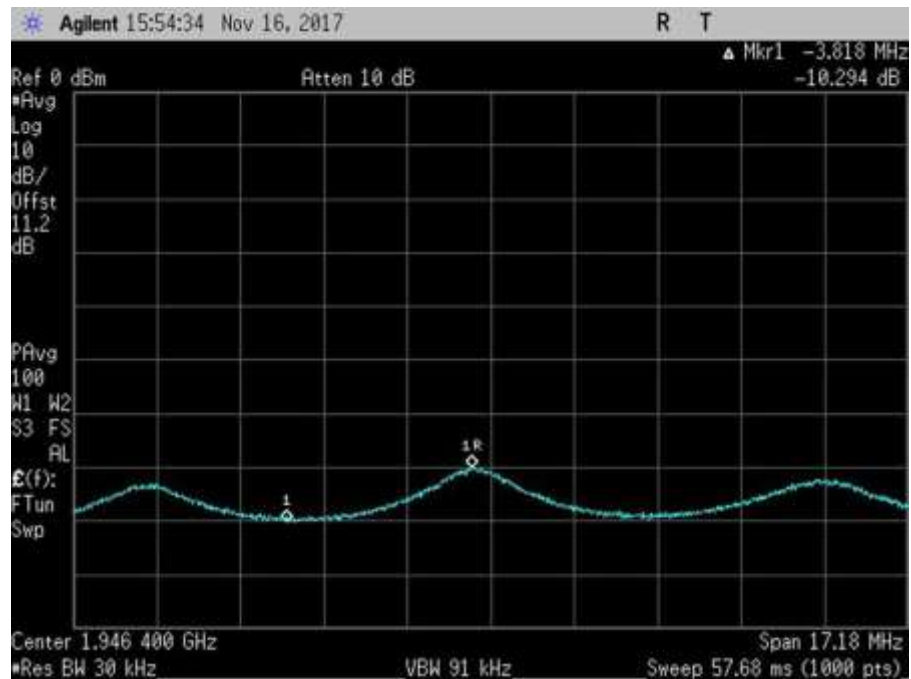
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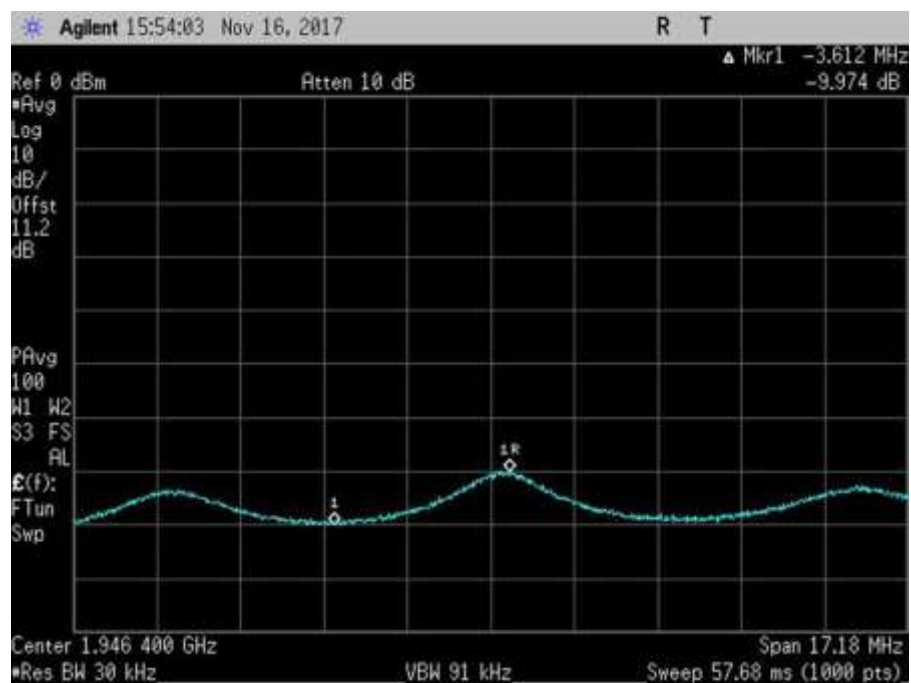
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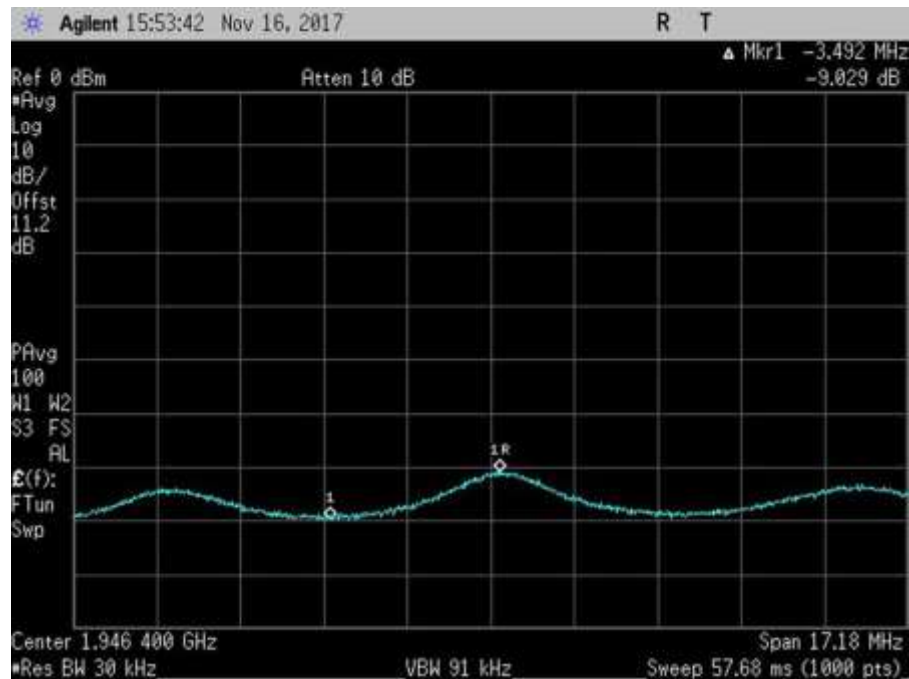
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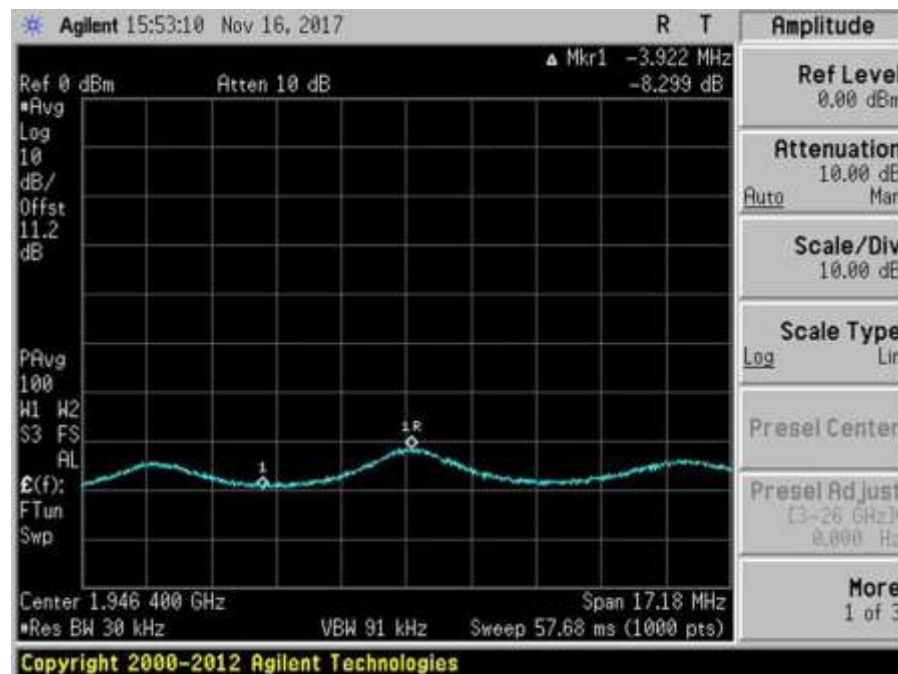
7.11.3_Osc_DL_1930-1995MHz+2_AWGNR



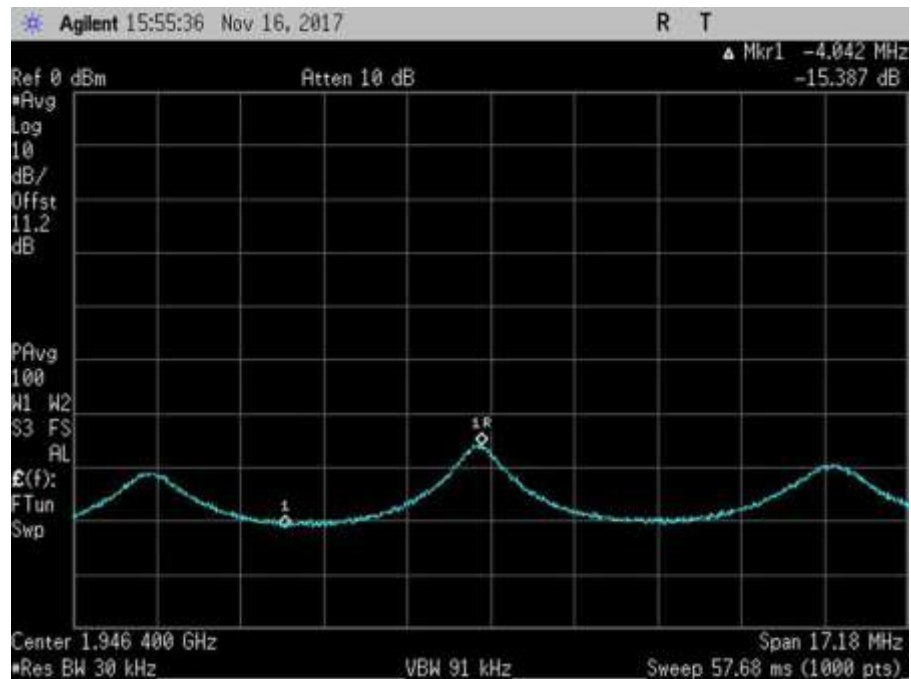
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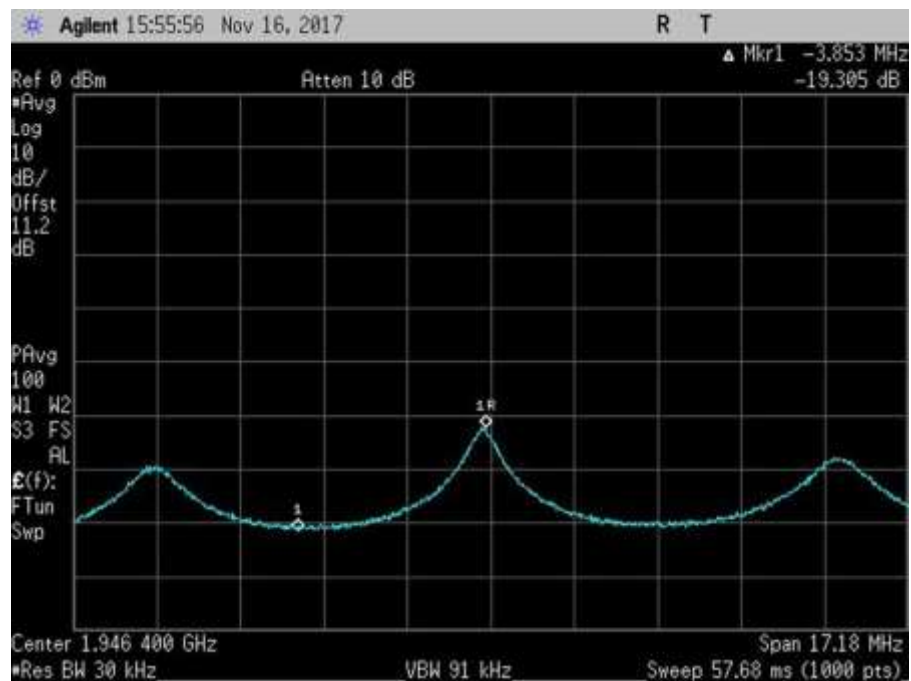
7.11.3_Osc_DL_1930-1995MHz+4_AWGNR



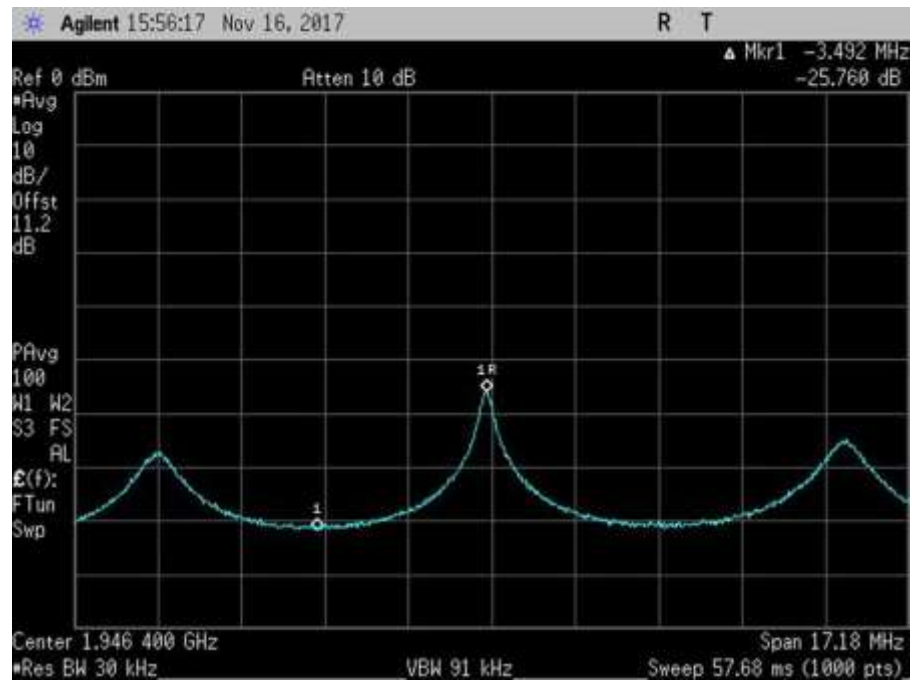
7.11.3_Osc_DL_1930-1995MHz+5_AWGNR



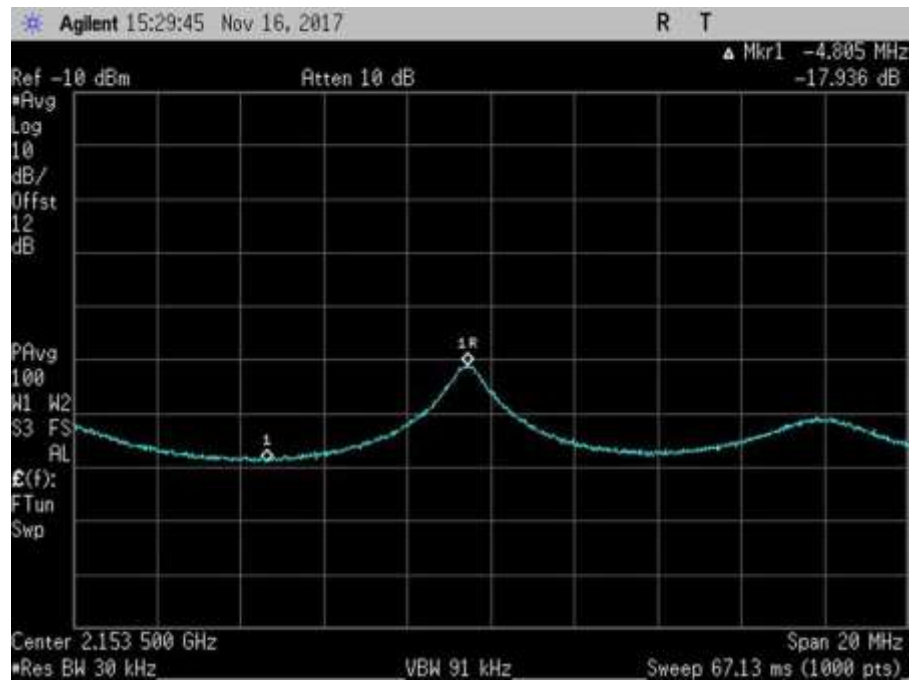
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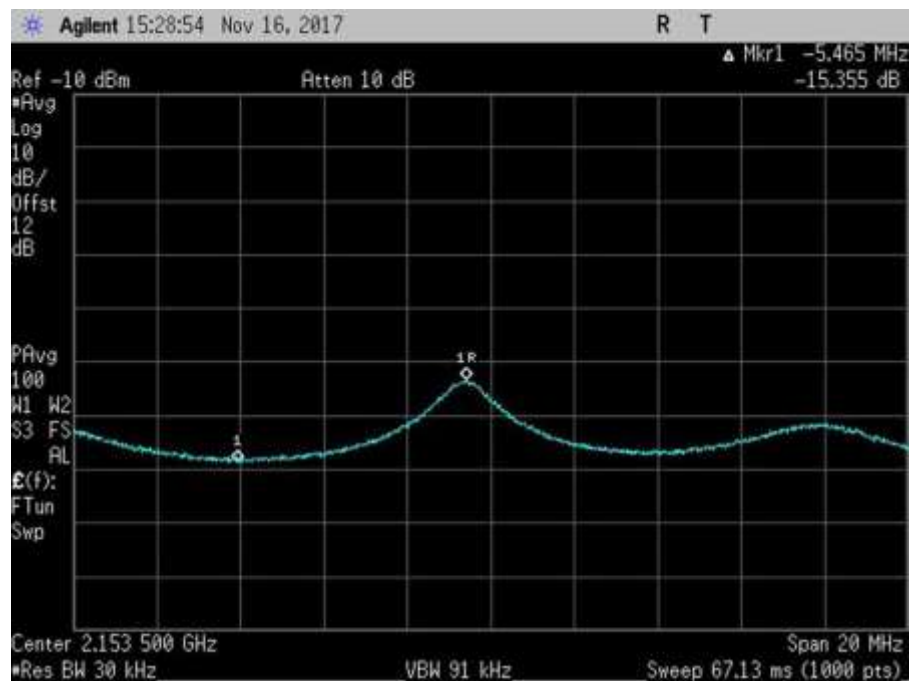
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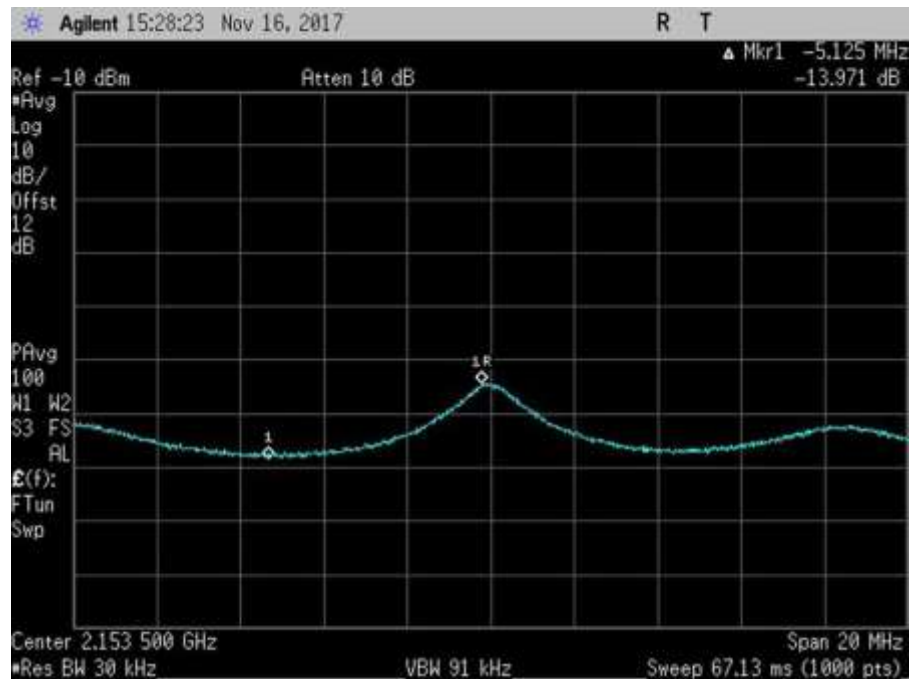
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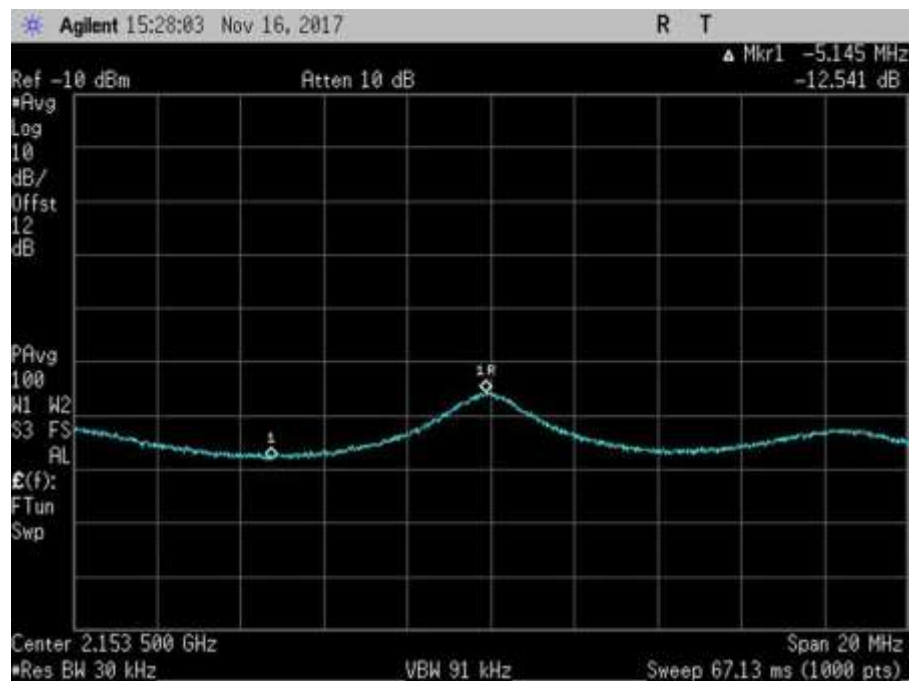
7.11.3_Osc_DL_2110-2155MHz+0_AWGNL



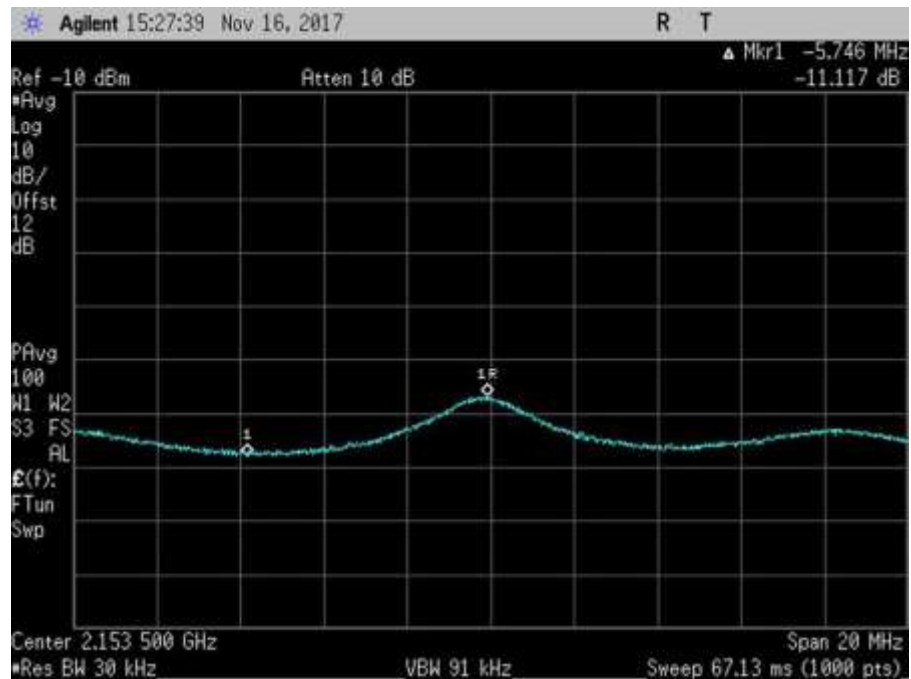
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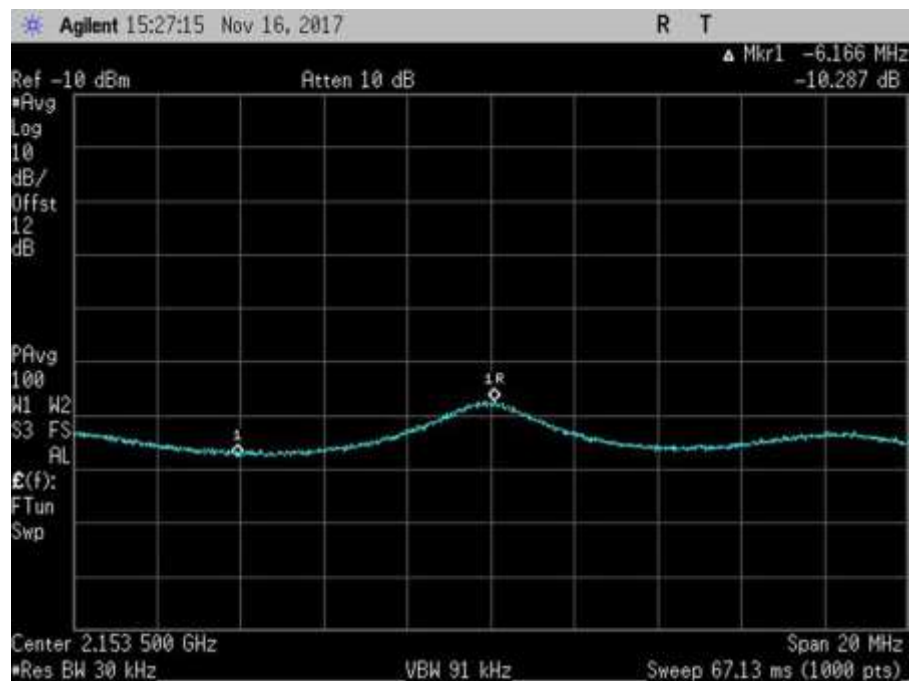
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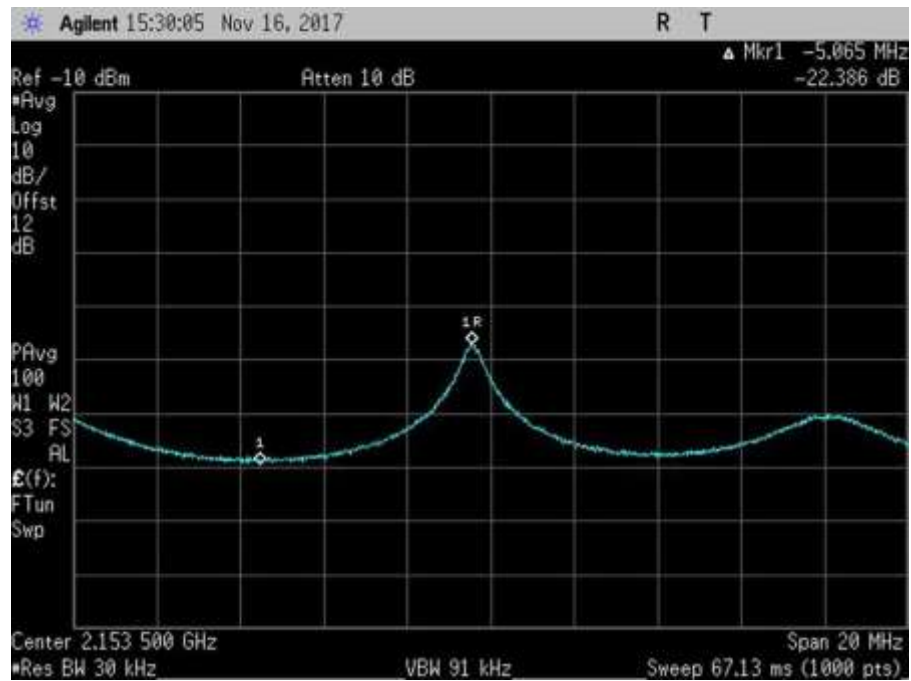
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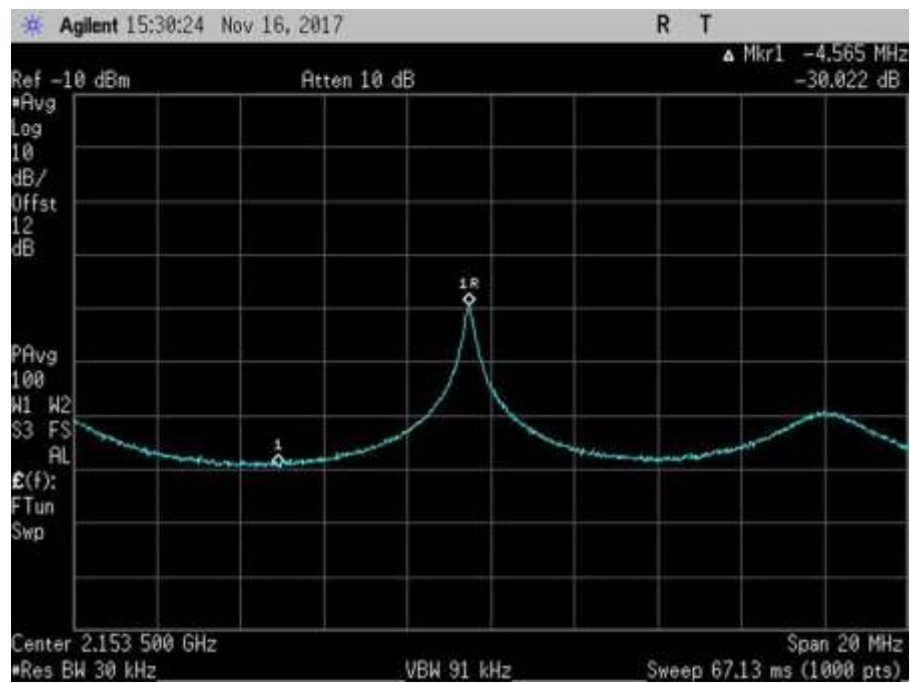
7.11.3_Osc_DL_2110-2155MHz+4_AWGNL



7.11.3_Osc_DL_2110-2155MHz+5_AWGNL

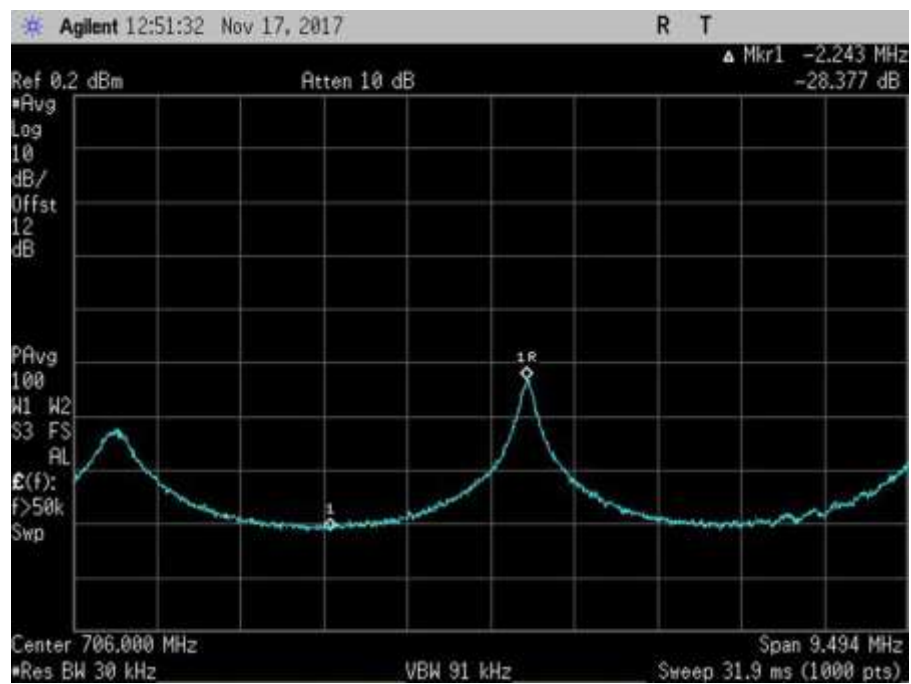


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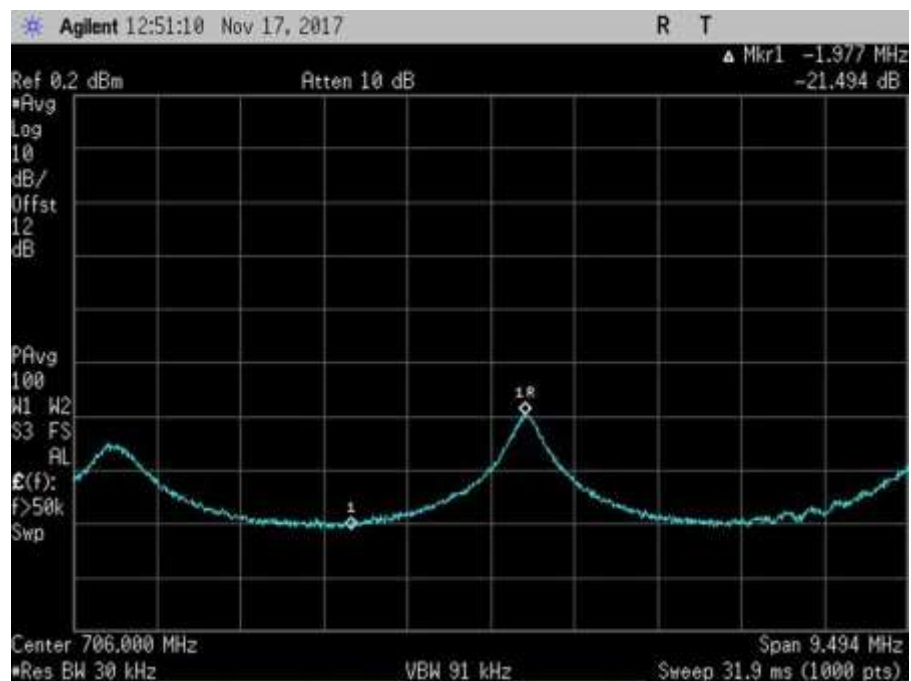


7.11.3_Osc_DL_2110-2155MHz-2_AWGNL

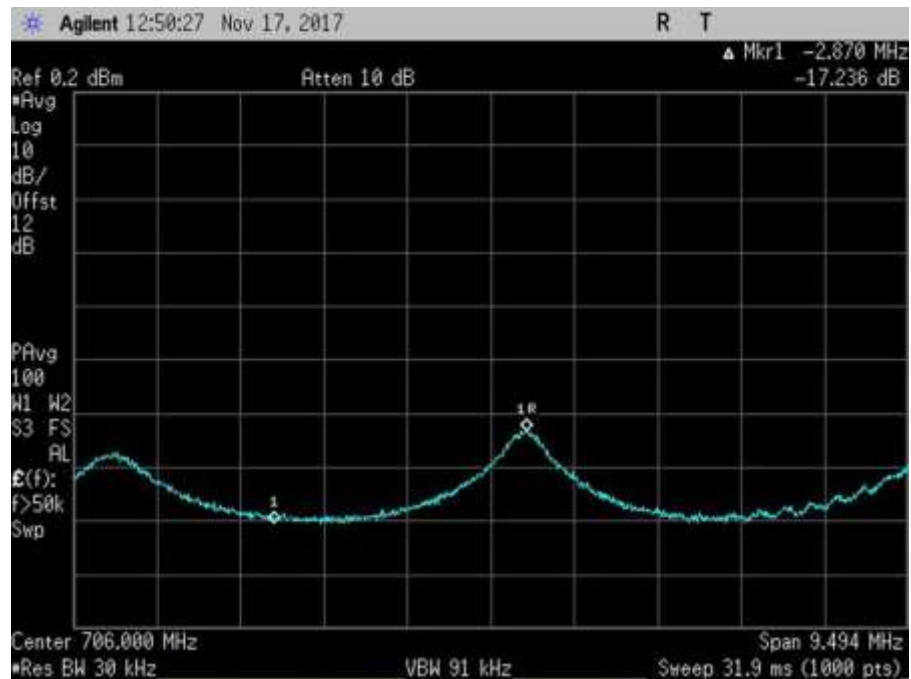
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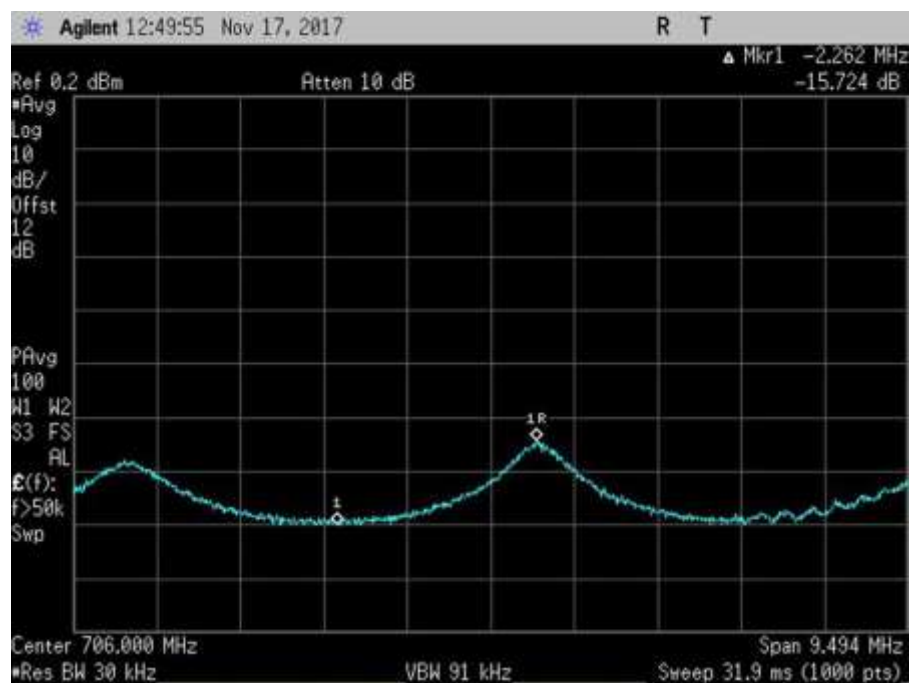
7.11.3_Osc_UL_698-716MHz+0_AWGNR



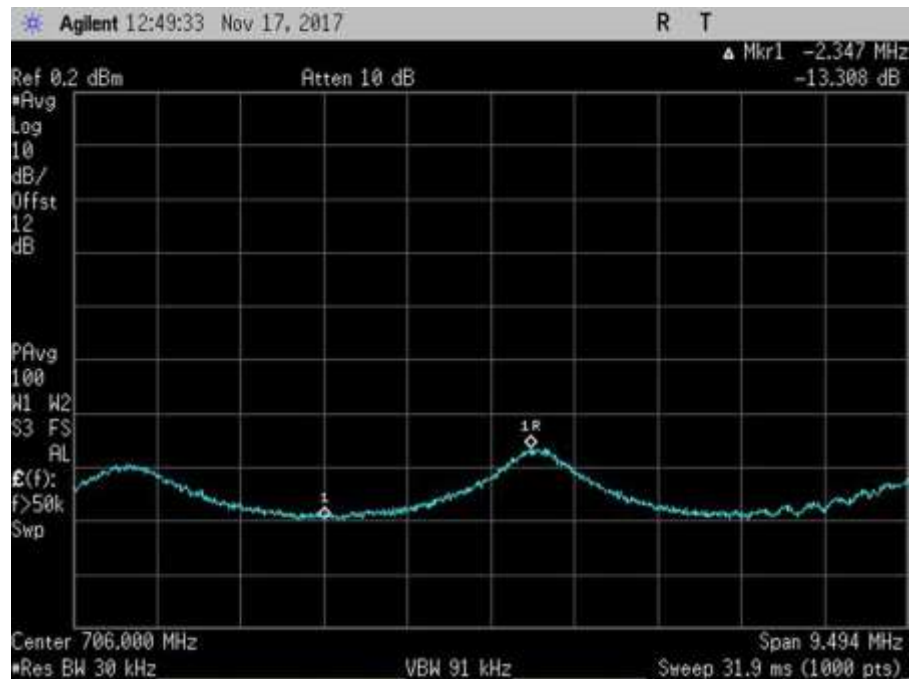
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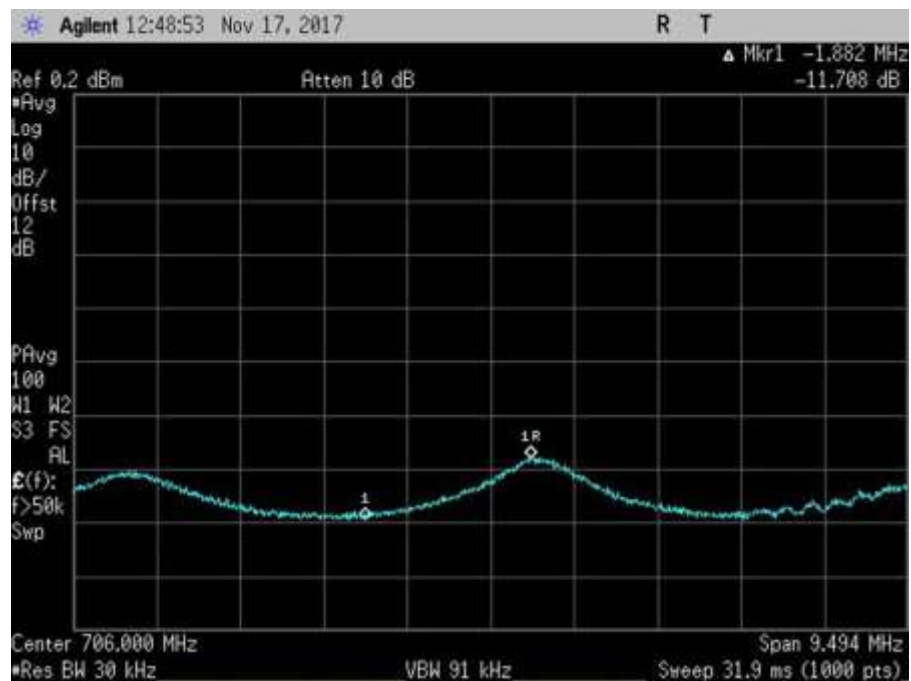
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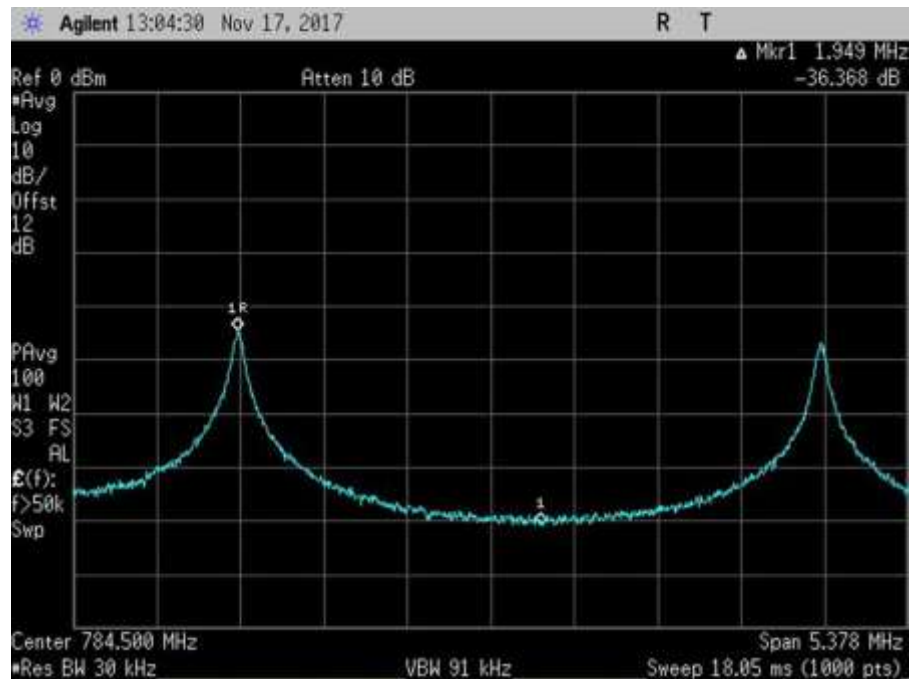
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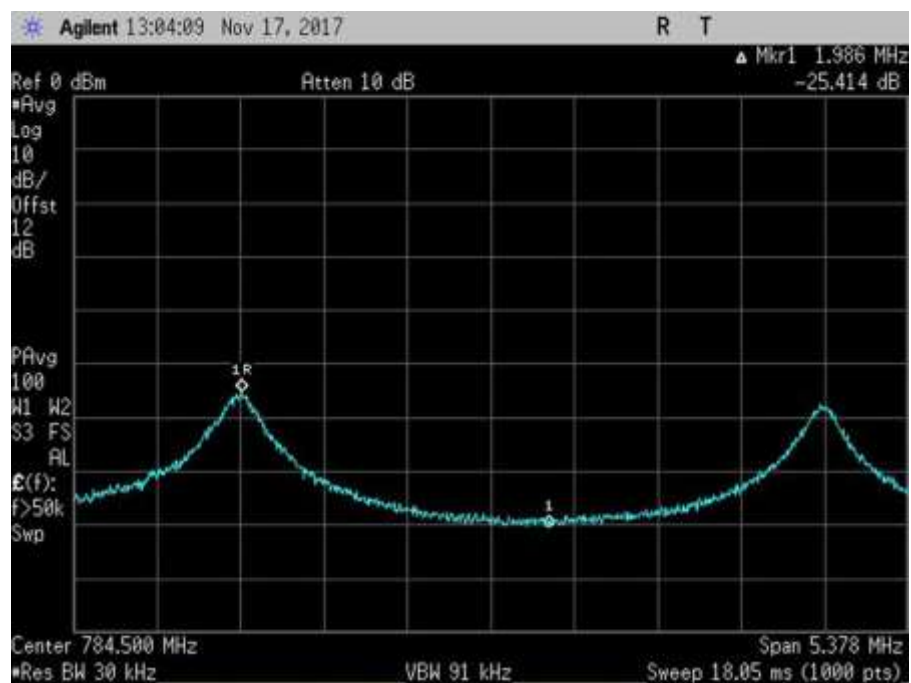
7.11.3_Osc_UL_698-716MHz+4_AWGNR



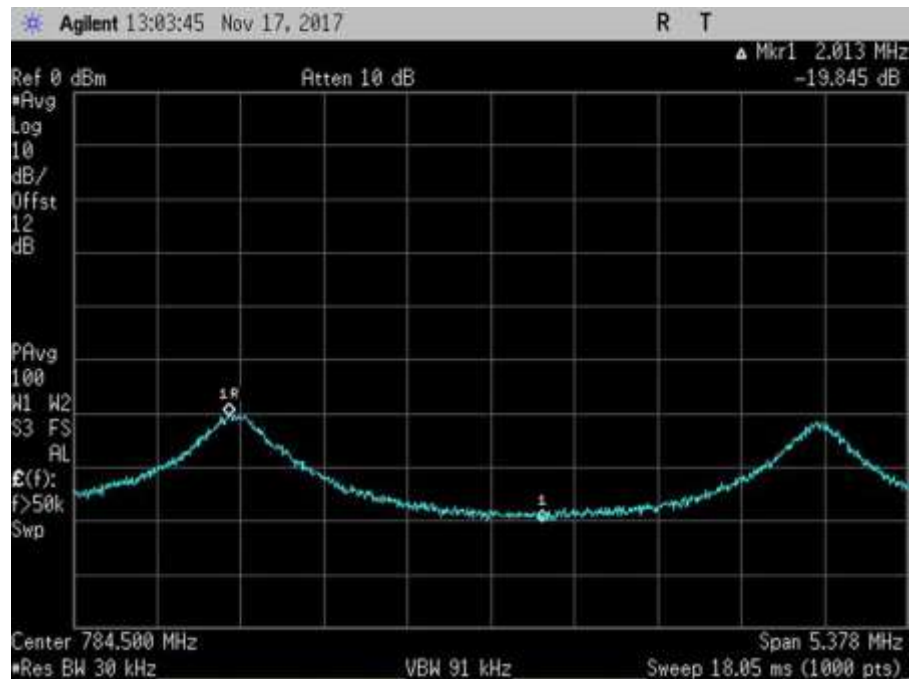
7.11.3_Osc_UL_698-716MHz+5_AWGNR



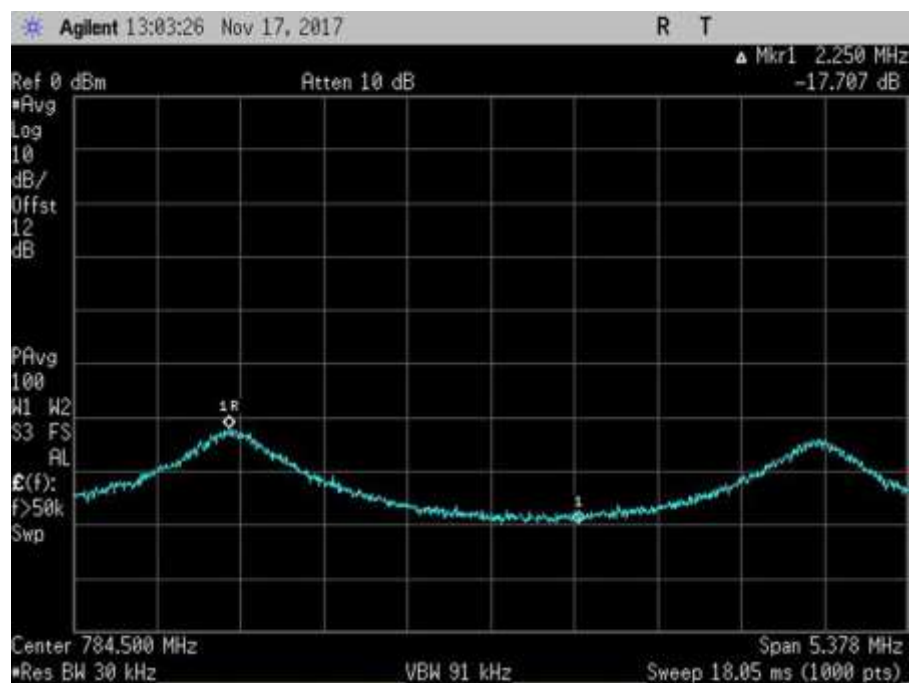
7.11.3_Osc_UL_776-787MHz+0_AWGNL



7.11.3_Osc_UL_776-787MHz+1_AWGNL



7.11.3_Osc_UL_776-787MHz+2_AWGNL



7.11.3_Osc_UL_776-787MHz+3_AWGNL