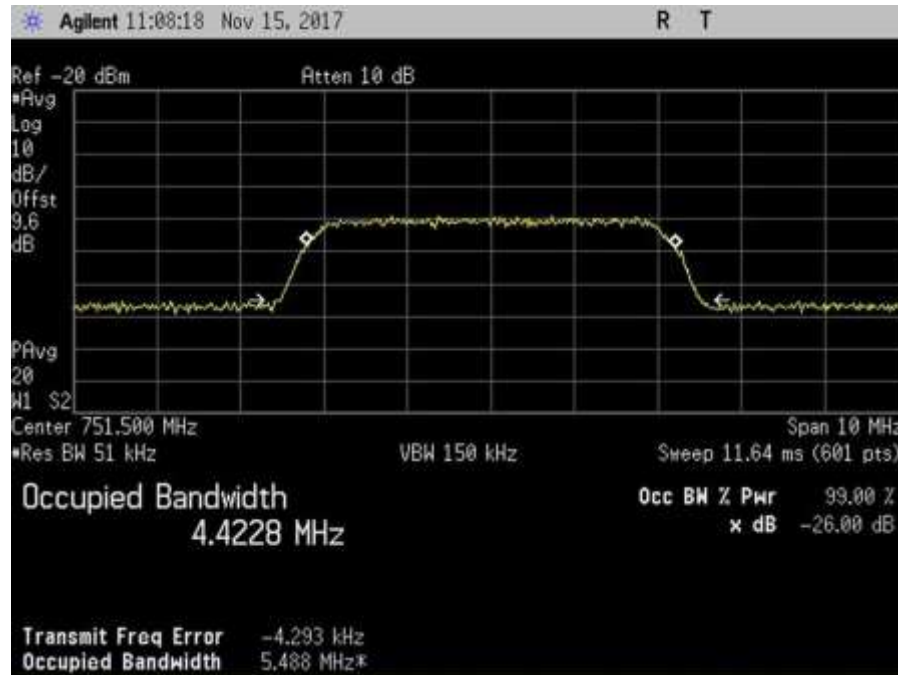
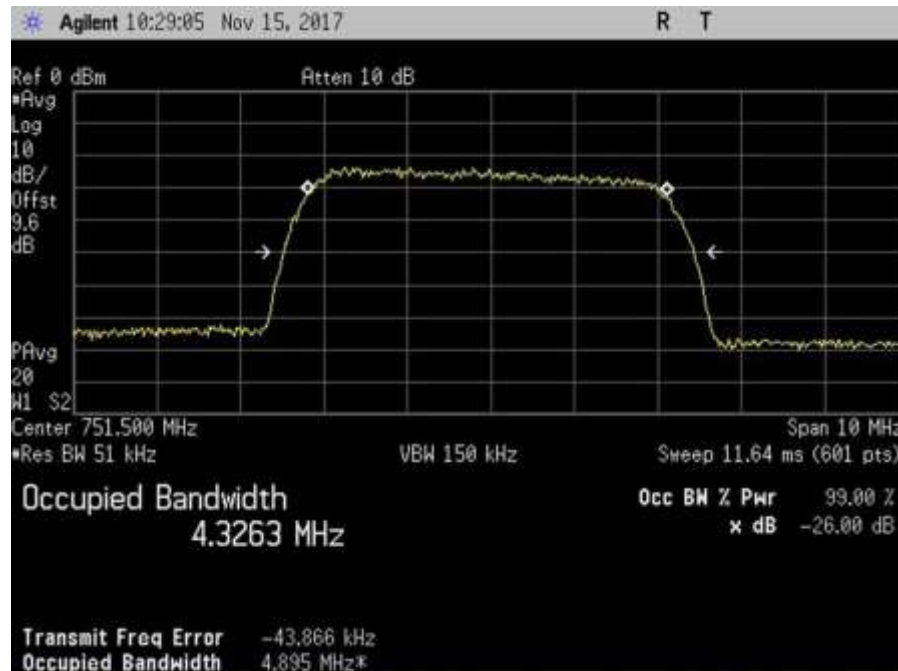
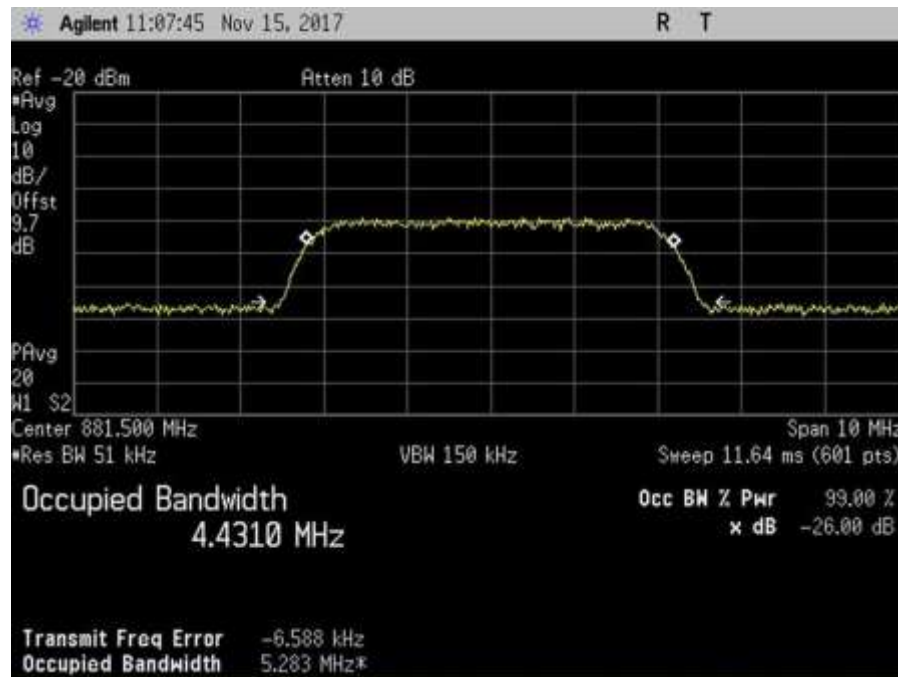




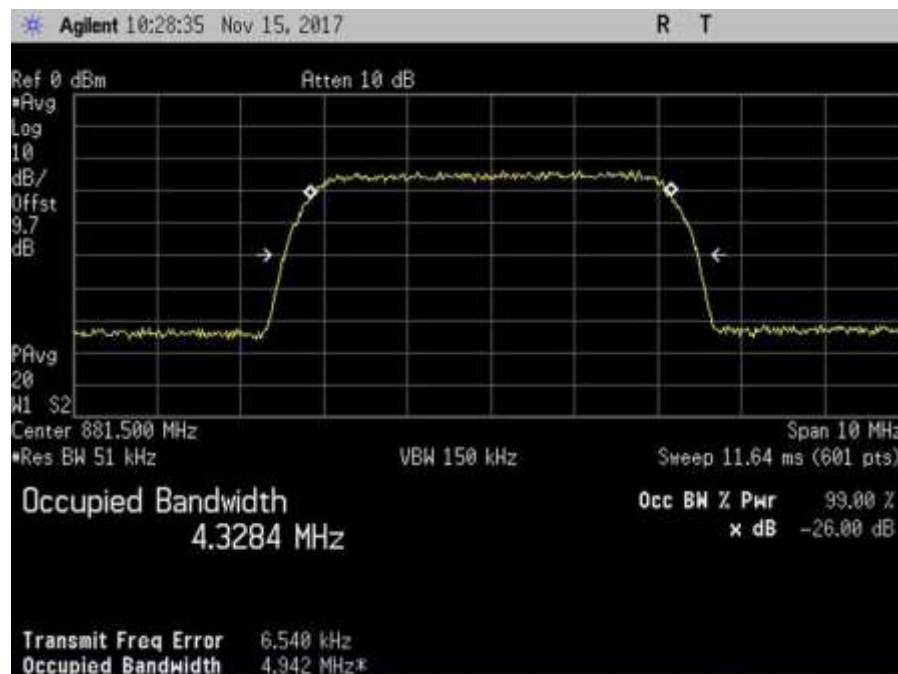
7.10_OBW_DL_746-757MHz_AWGN_In



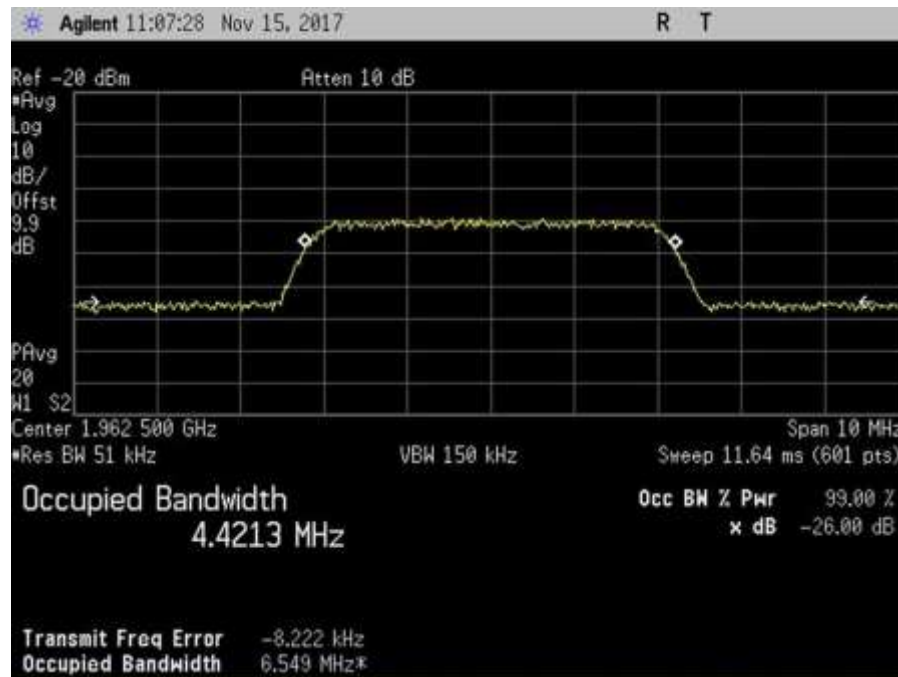
7.10_OBW_DL_746-757MHz_AWGN_Out



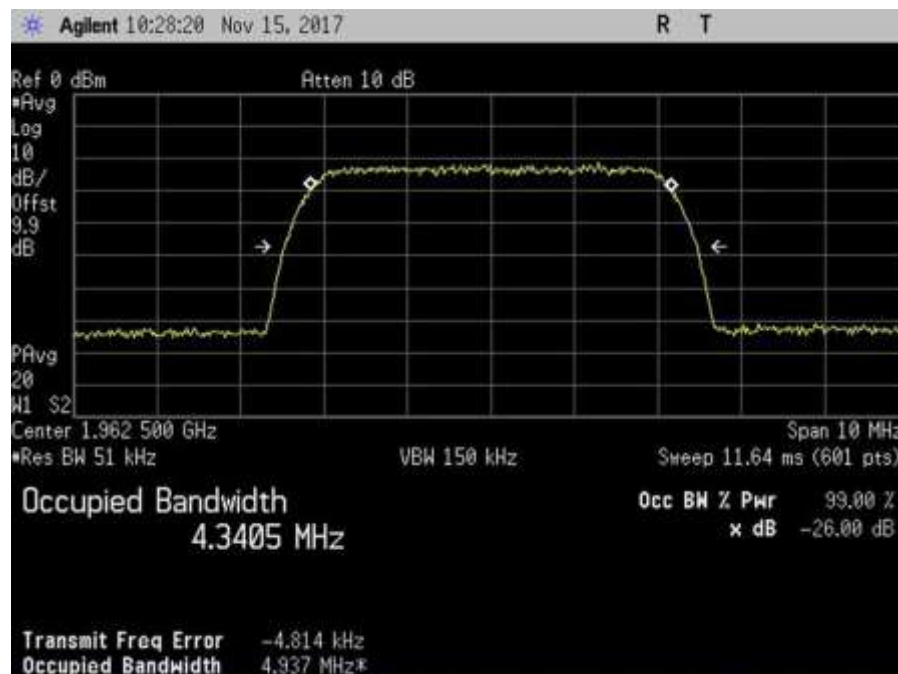
7.10_OBW_DL_869-894MHz_AWGN_In



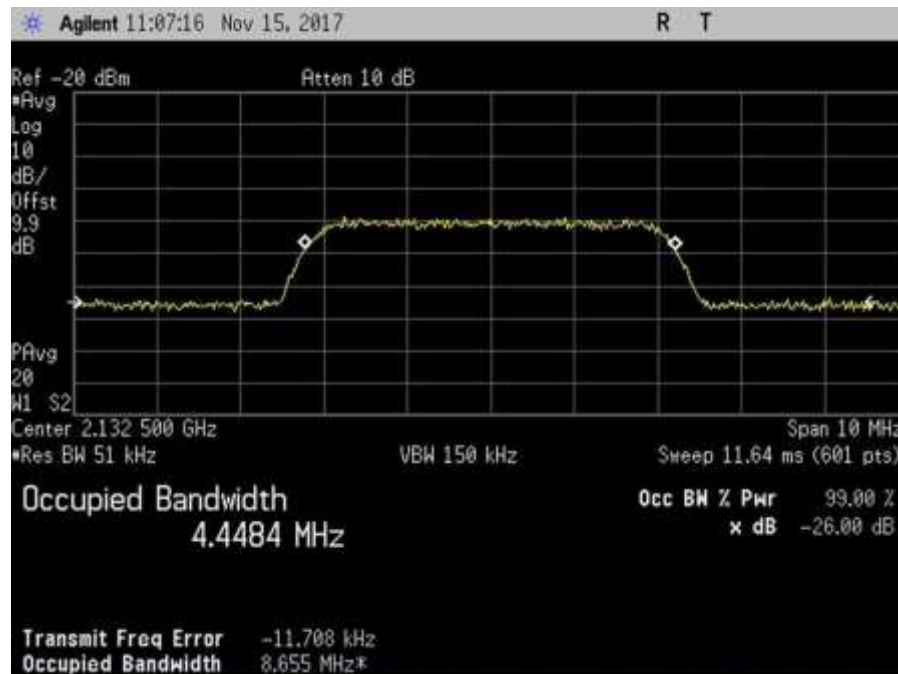
7.10_OBW_DL_869-894MHz_AWGN_Out



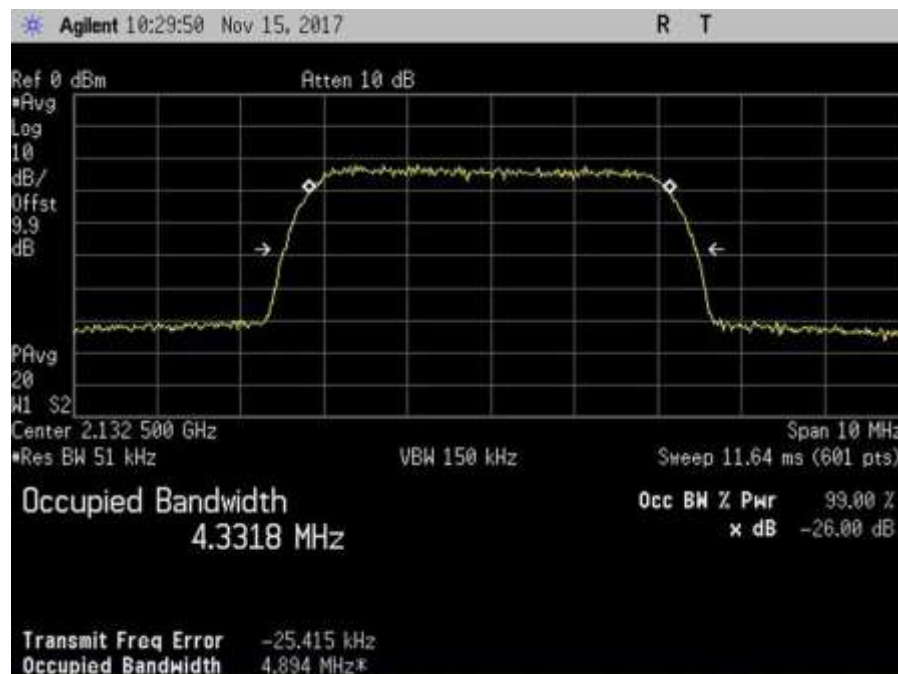
7.10_OBW_DL_1930-1995MHz_AWGN_In



7.10_OBW_DL_1930-1995MHz_AWGN_Out

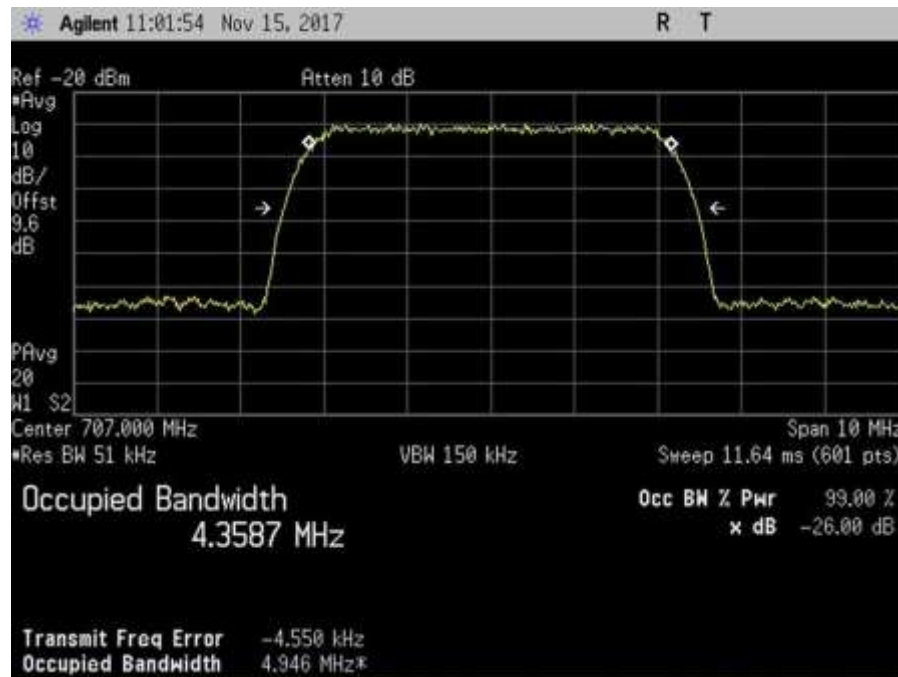


7.10_OBW_DL_2110-2155MHz_AWGN_In

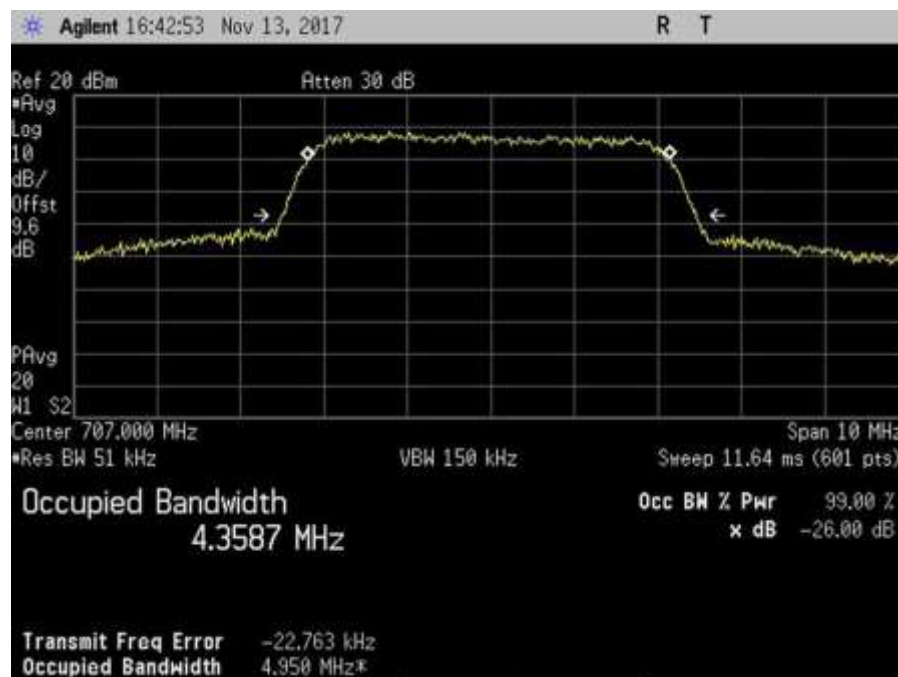


7.10_OBW_DL_2110-2155MHz_AWGN_Out

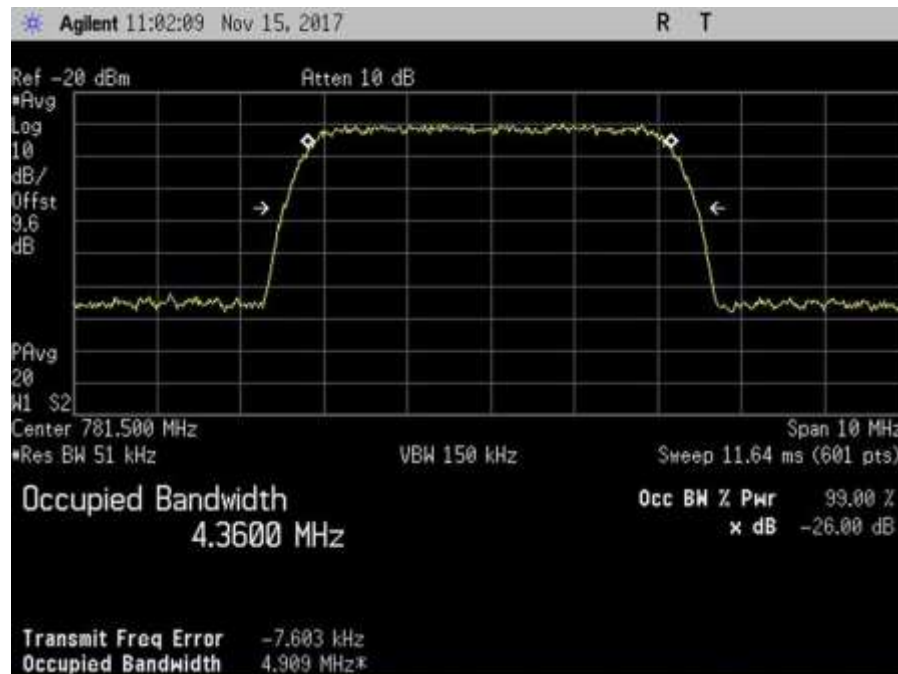
AWGN, UL



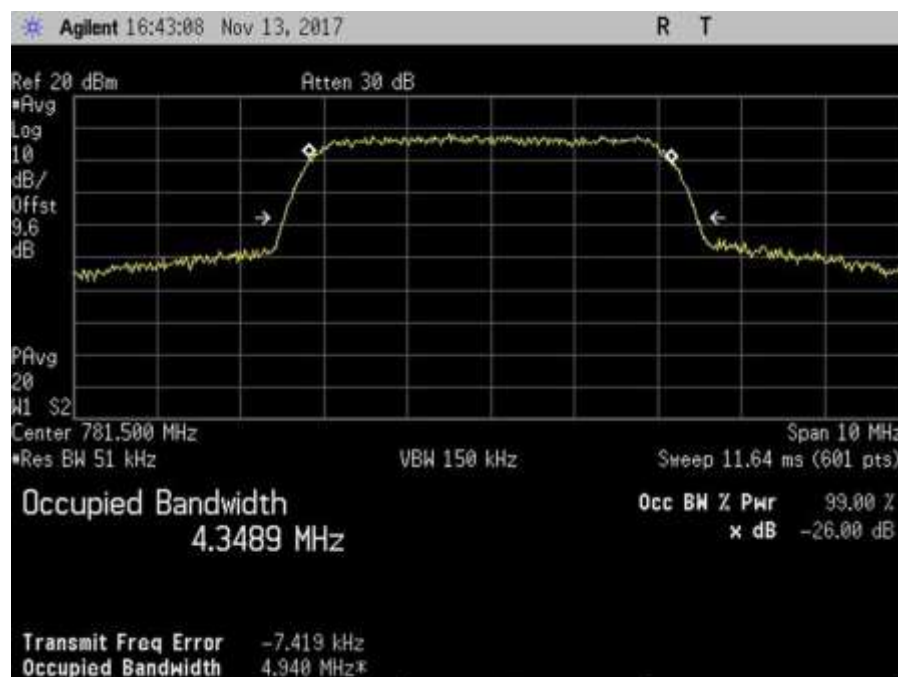
7.10_OBW_UL_698-716MHz_AWGN_In



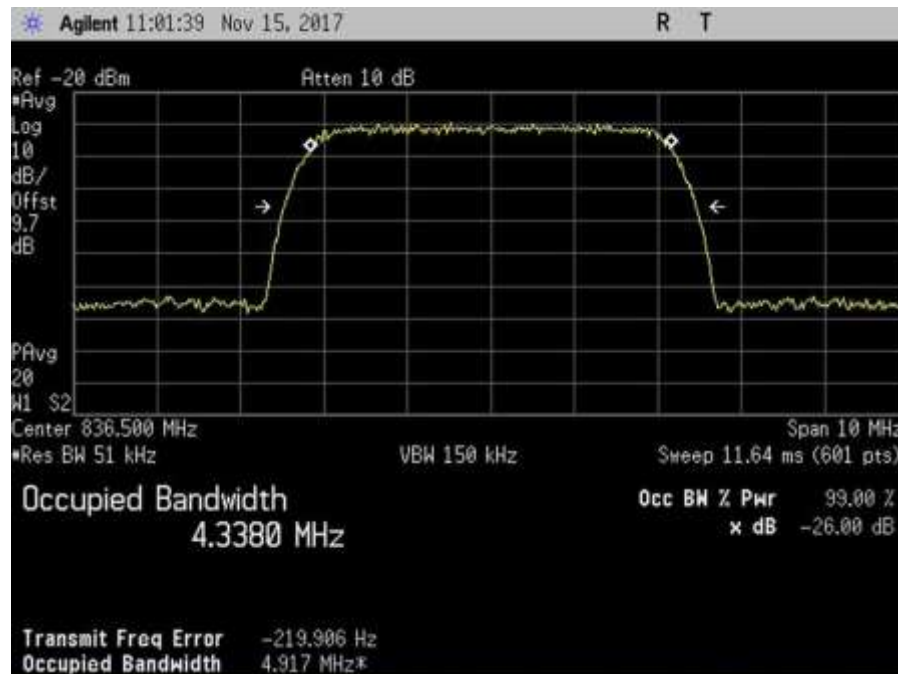
7.10_OBW_UL_698-716MHz_AWGN_Out



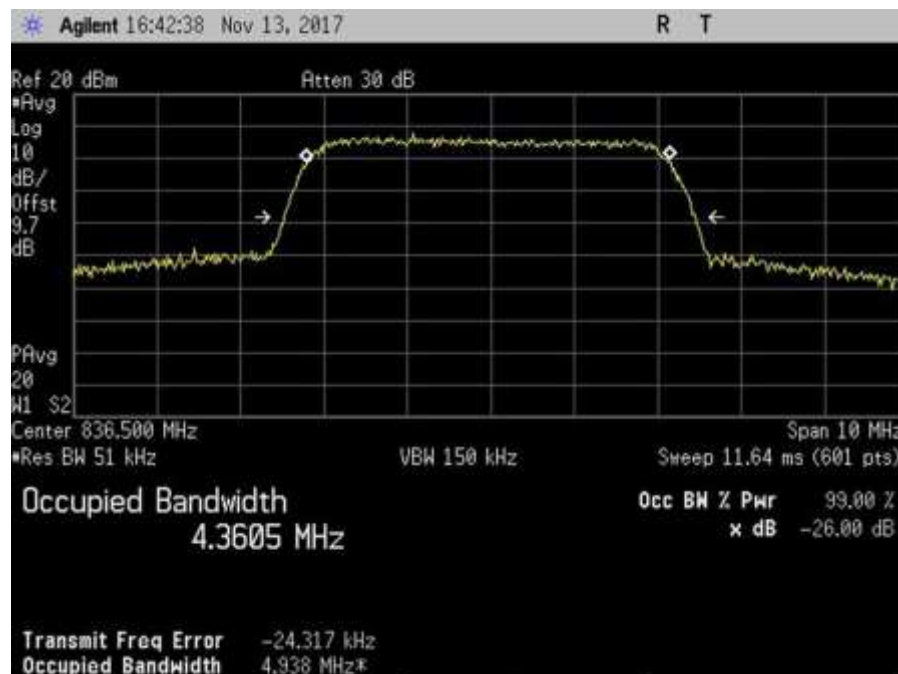
7.10_OBW_UL_776-787MHz_AWGN_In



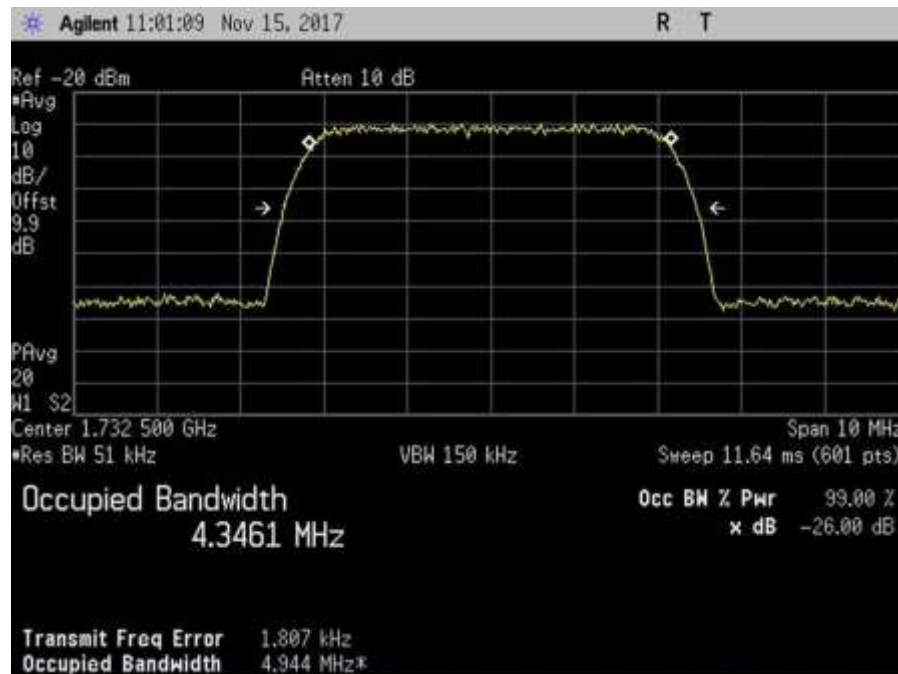
7.10_OBW_UL_776-787MHz_AWGN_Out



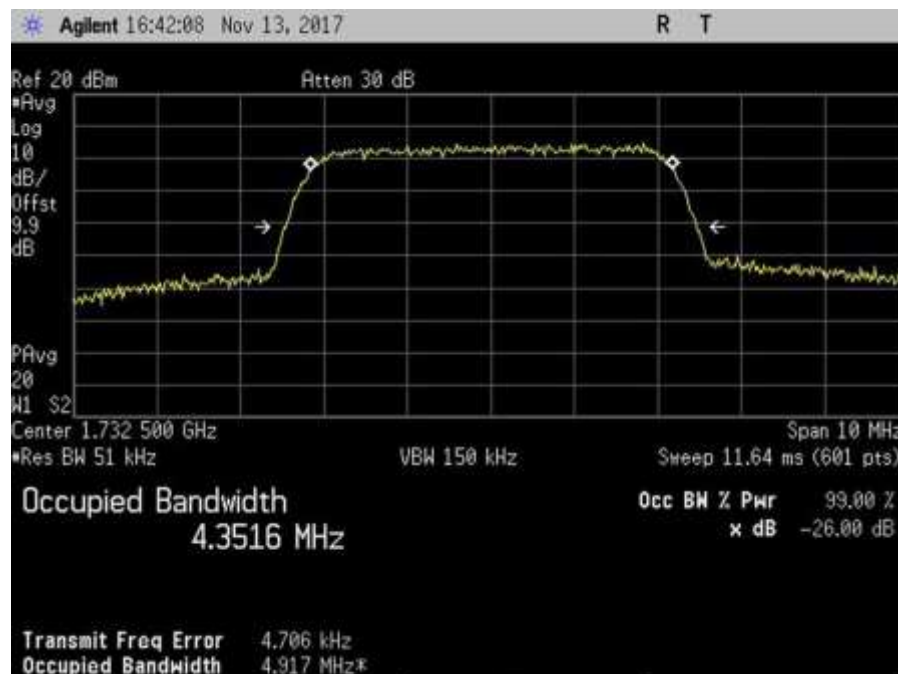
7.10_OBW_UL_824-849MHz_AWGN_In



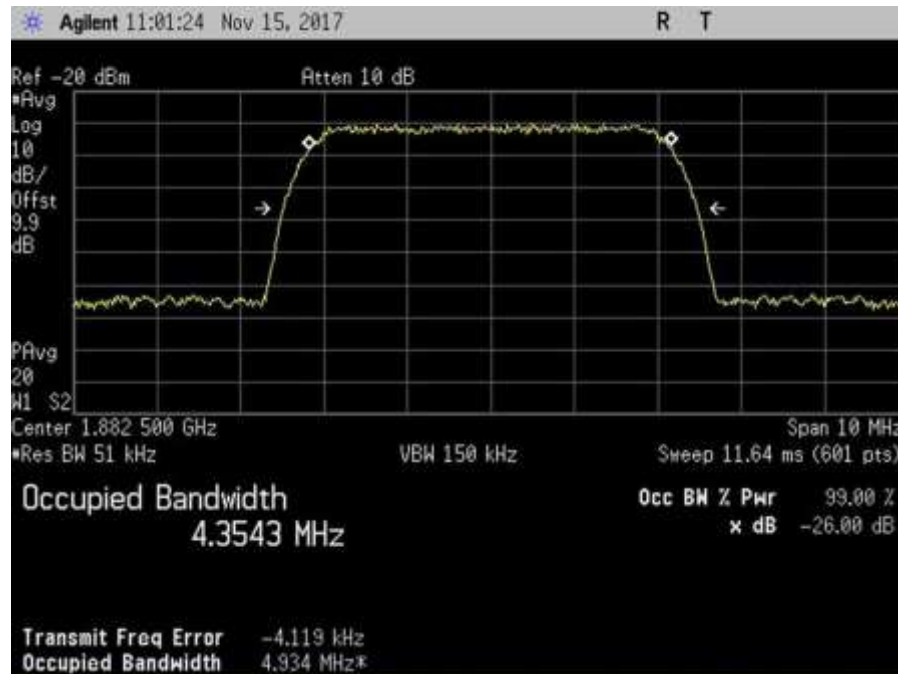
7.10_OBW_UL_824-849MHz_AWGN_Out



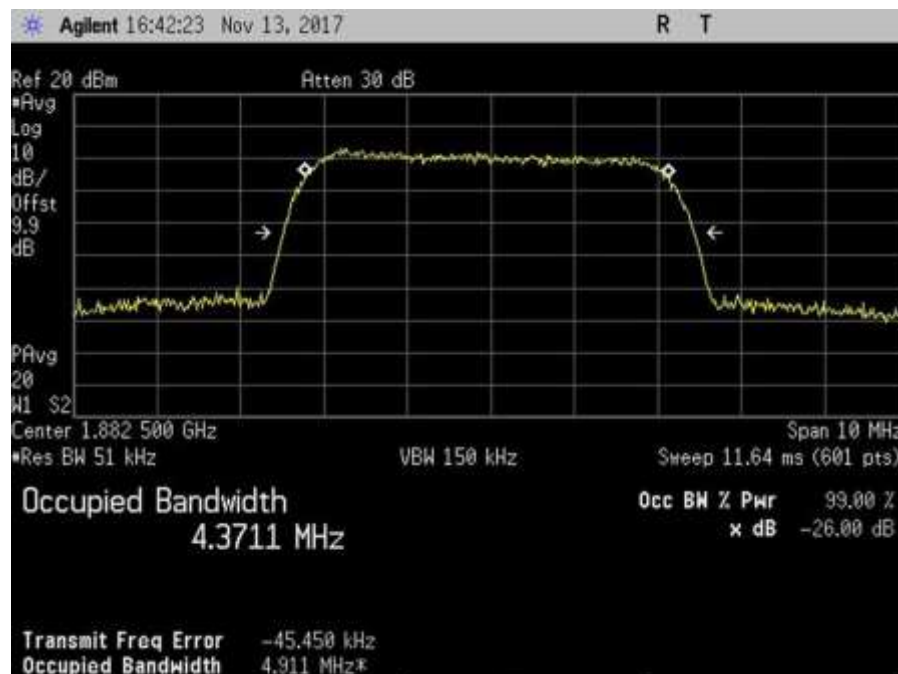
7.10_OBW_UL_1710-1755MHz_AWGN_In



7.10_OBW_UL_1710-1755MHz_AWGN_Out

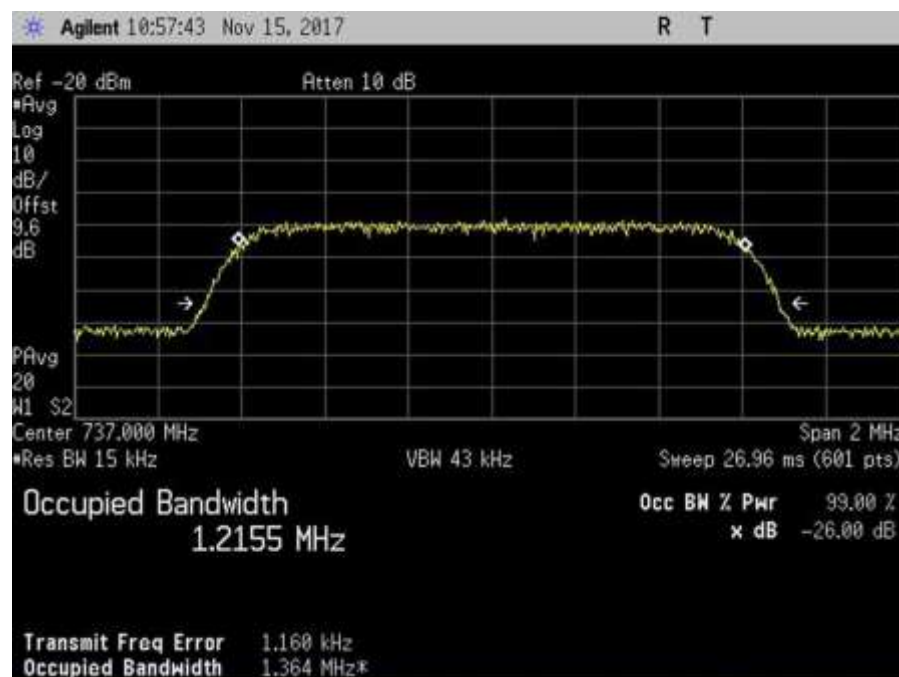


7.10_OBW_UL_1850-1915MHz_AWGN_In

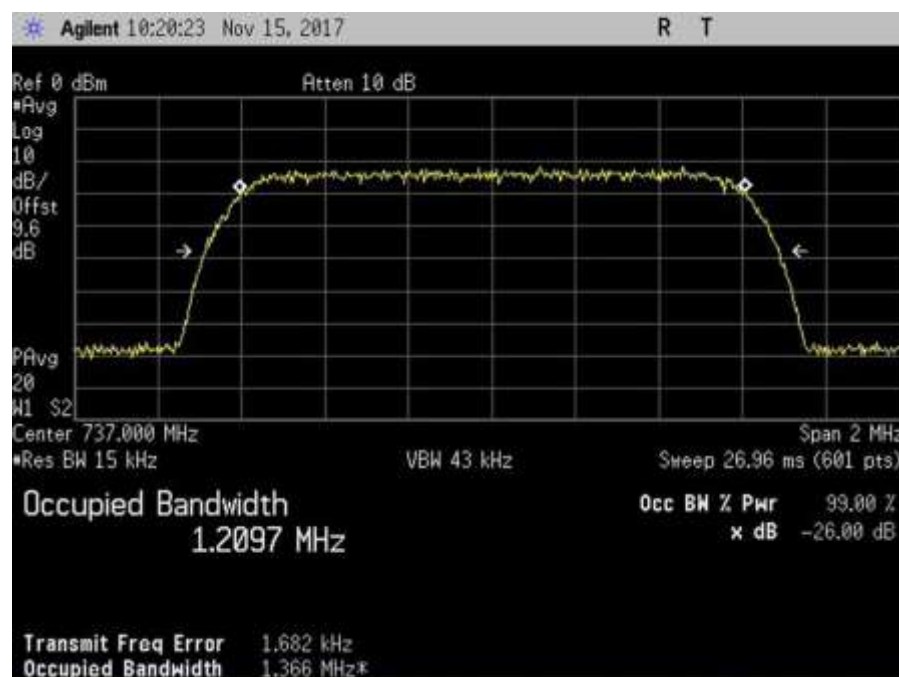


7.10_OBW_UL_1850-1915MHz_AWGN_Out

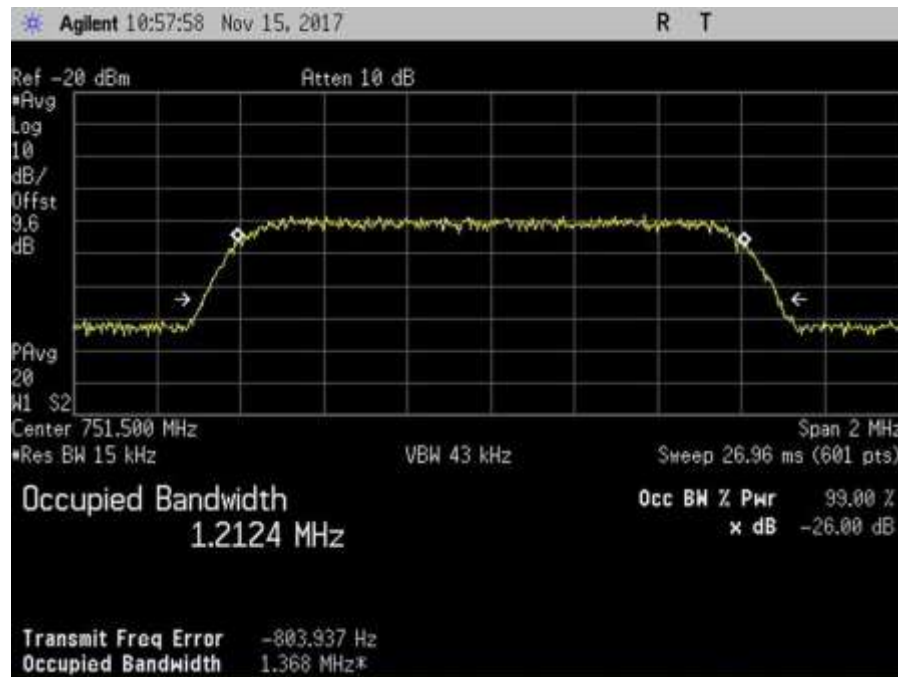
CDMA, DL



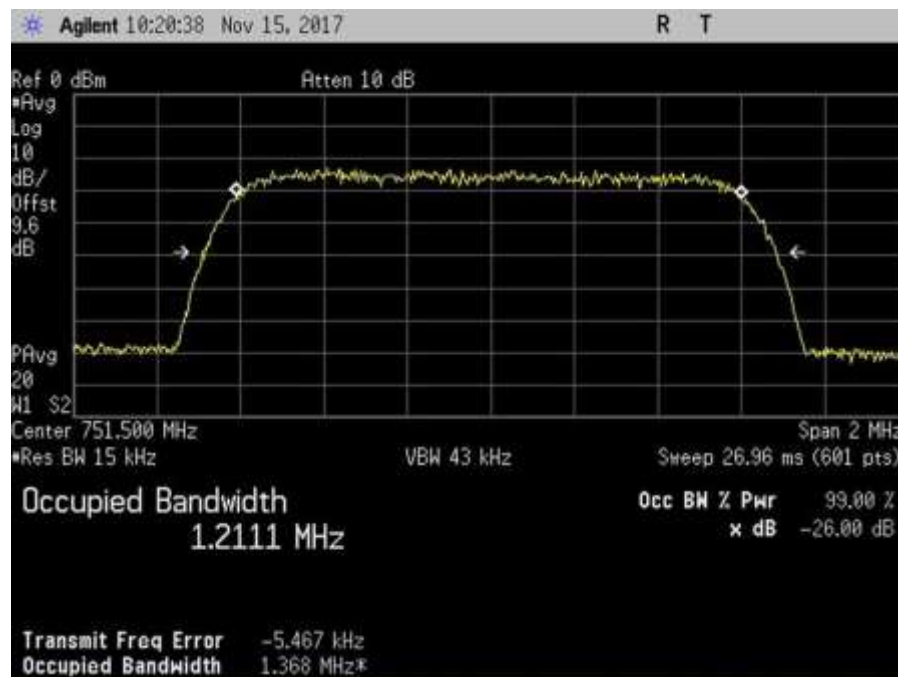
7.10_OBW_DL_728-746MHz_CDMA_In



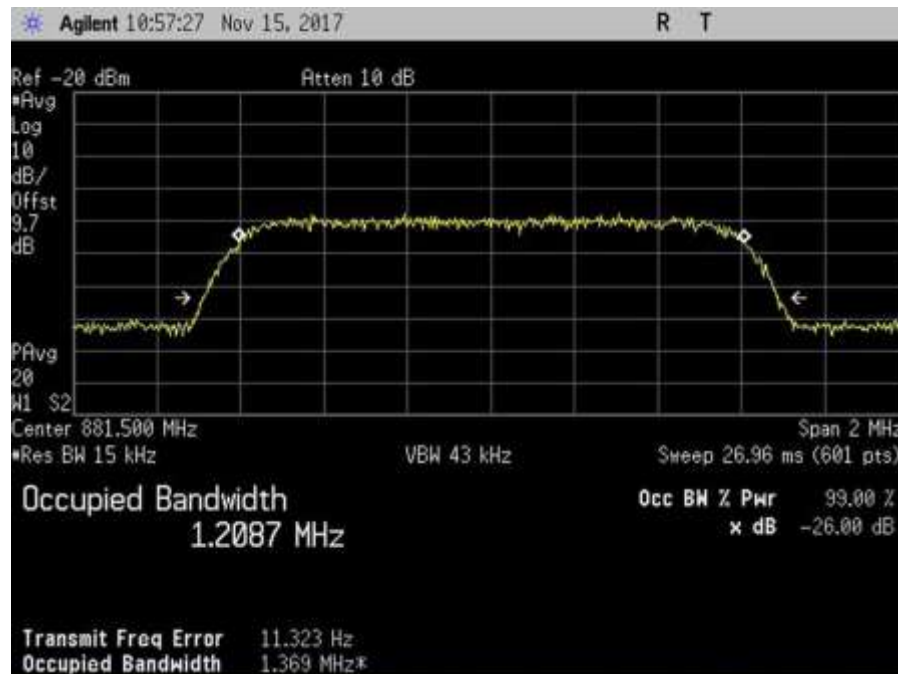
7.10_OBW_DL_728-746MHz_CDMA_Out



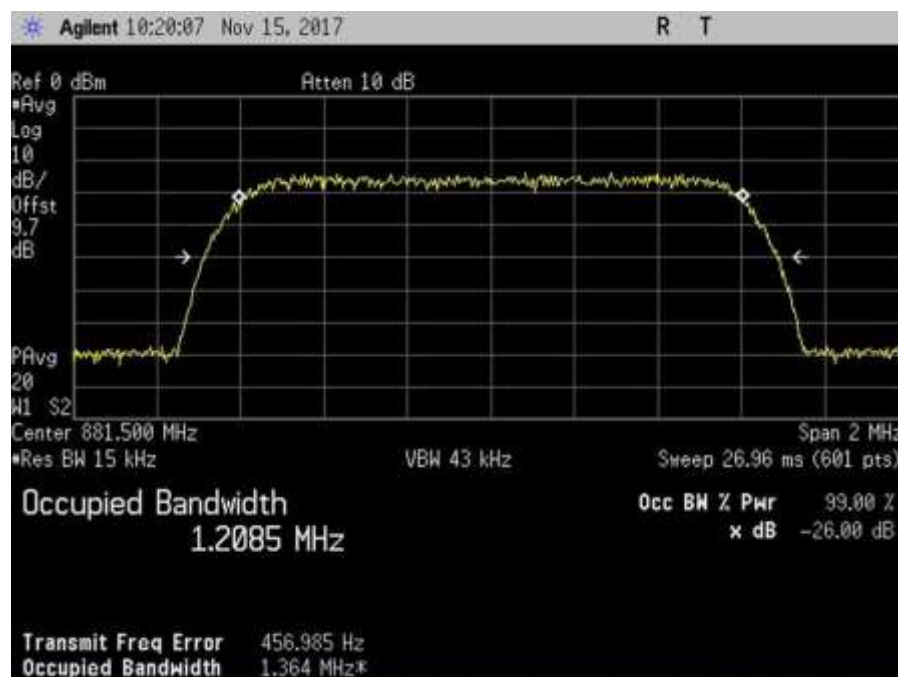
7.10_OBW_DL_746-757MHz_CDMA_In



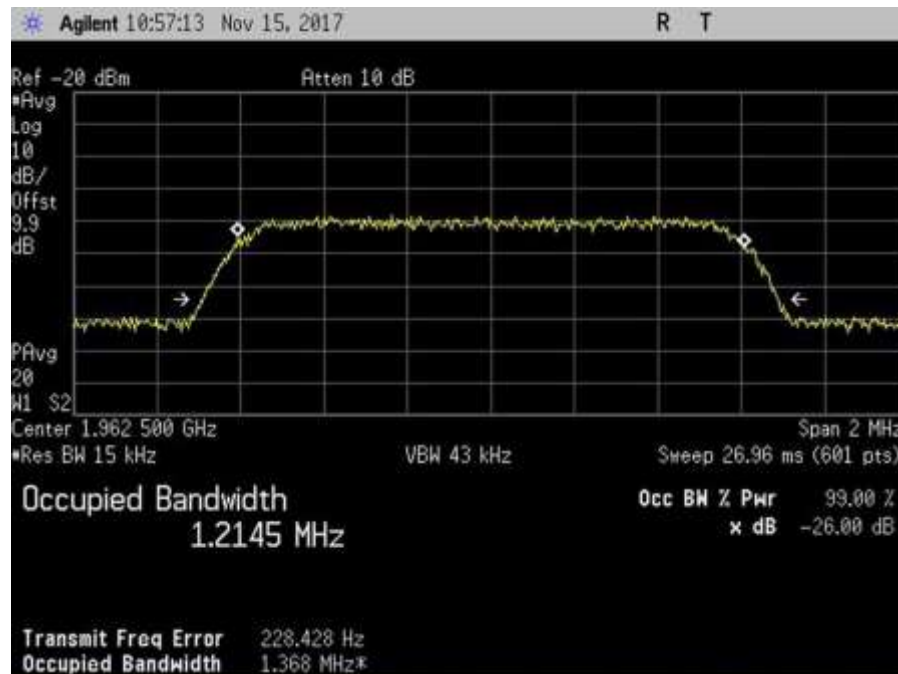
7.10_OBW_DL_746-757MHz_CDMA_Out



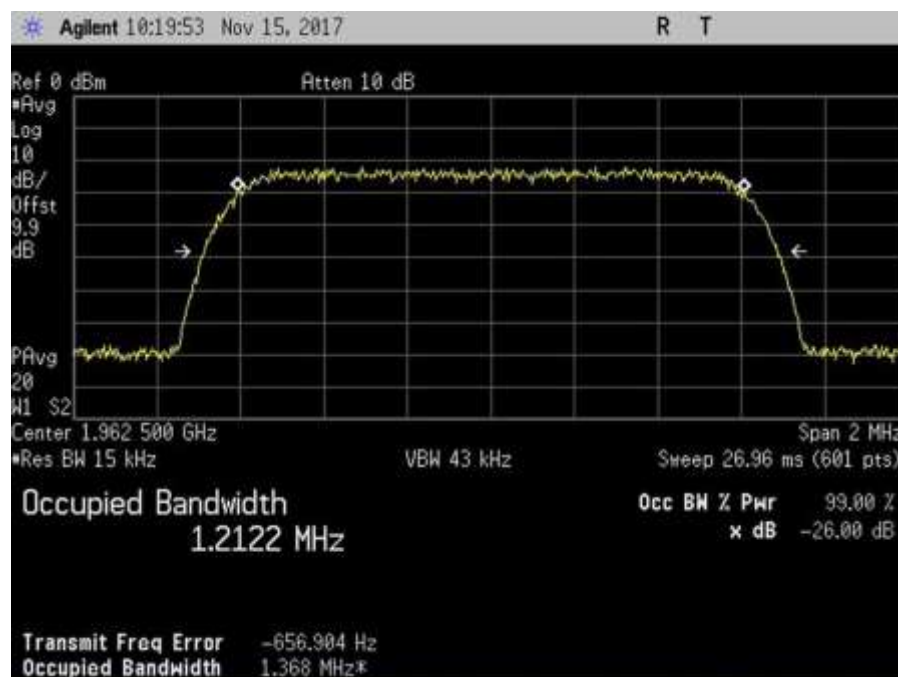
7.10_OBW_DL_869-894MHz_CDMA_In



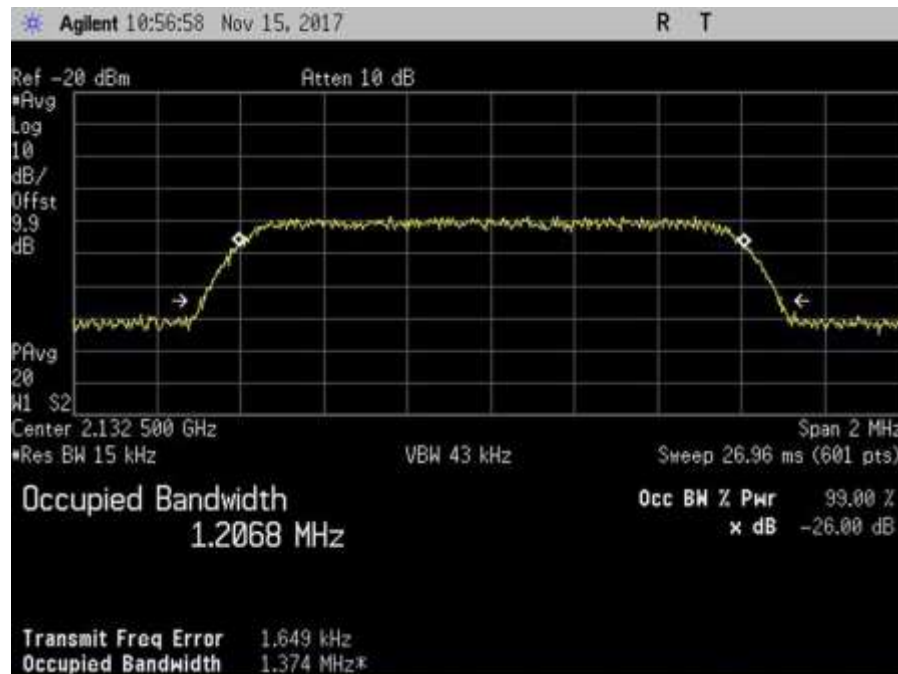
7.10_OBW_DL_869-894MHz_CDMA_Out



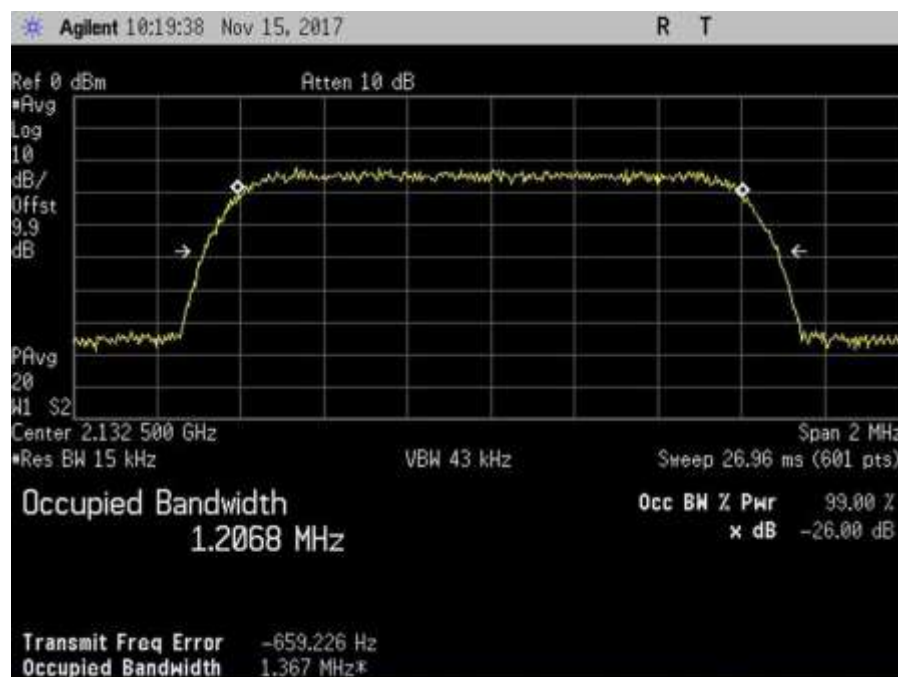
7.10_OBW_DL_1930-1995MHz_CDMA_In



7.10_OBW_DL_1930-1995MHz_CDMA_Out

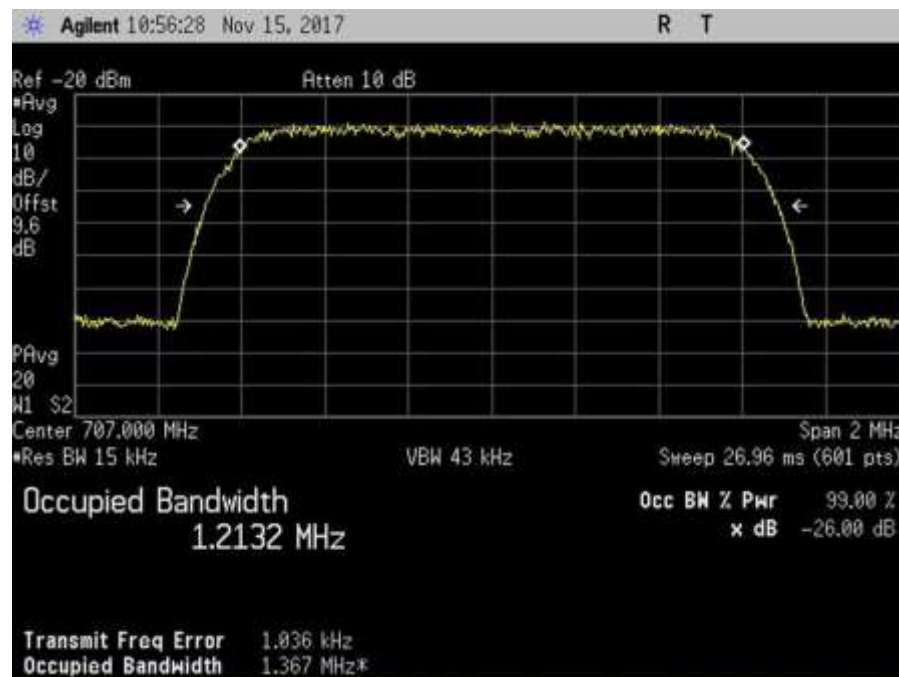


7.10_OBW_DL_2110-2155MHz_CDMA_In

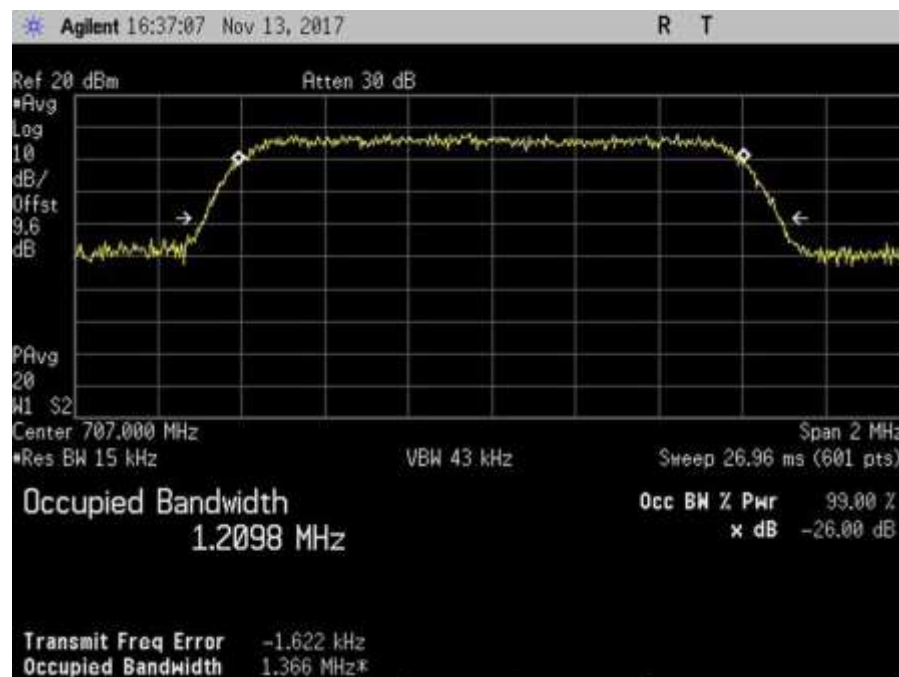


7.10_OBW_DL_2110-2155MHz_CDMA_Out

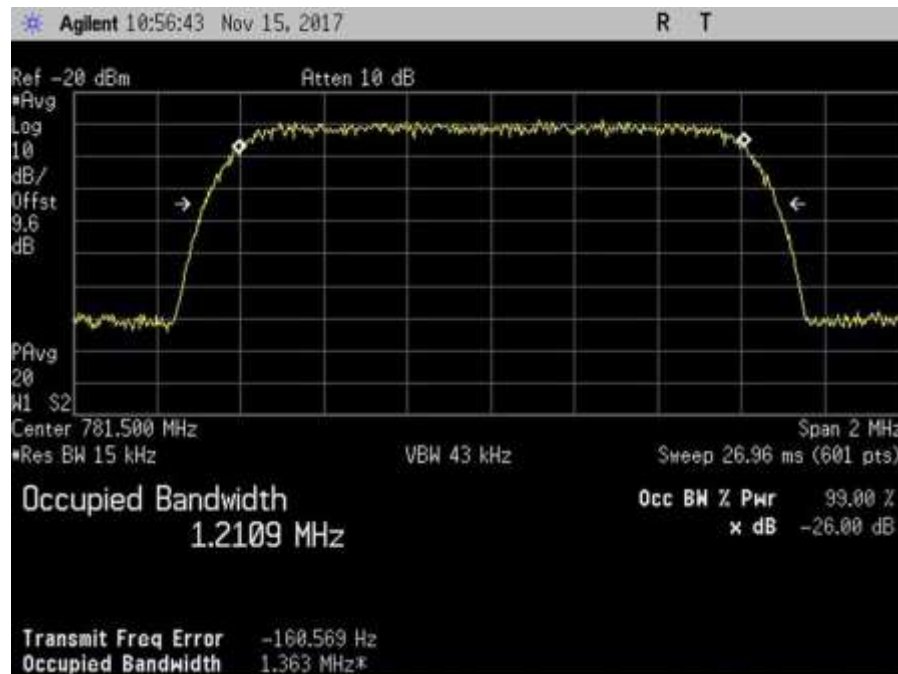
CDMA, UL



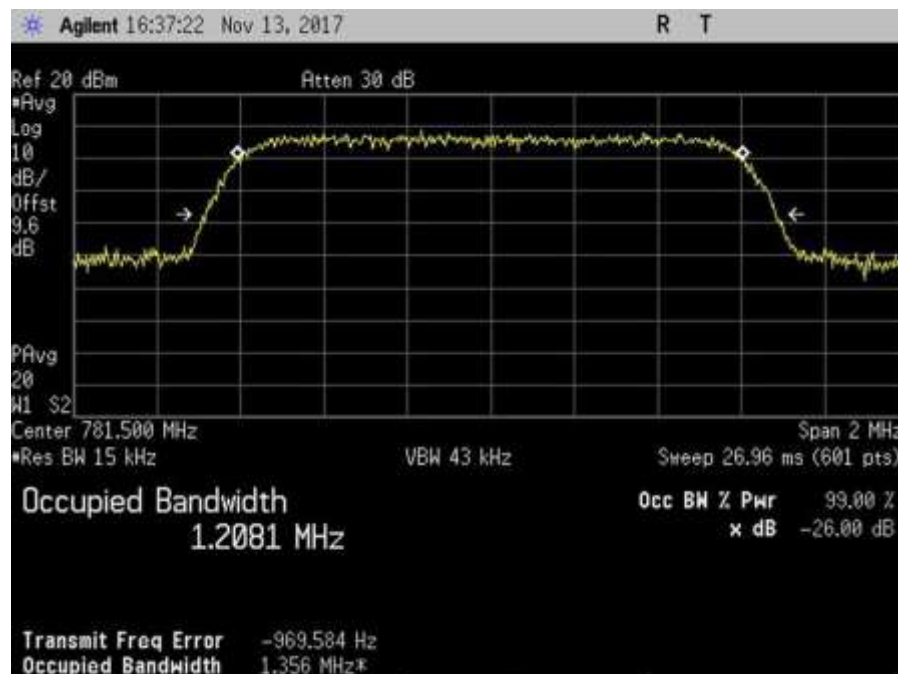
7.10_OBW_UL_698-716MHz_CDMA_In



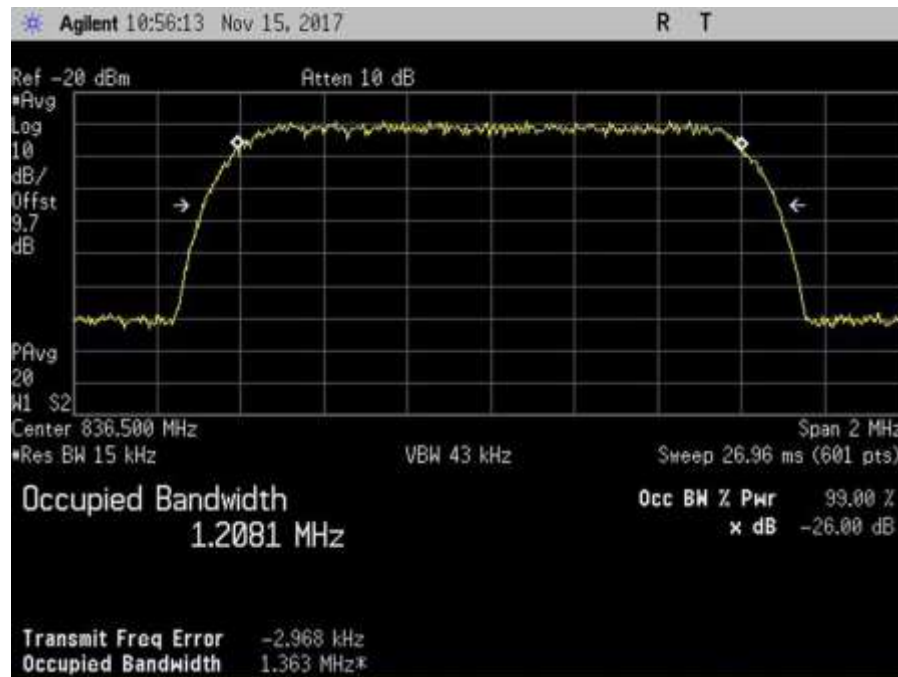
7.10_OBW_UL_698-716MHz_CDMA_Out



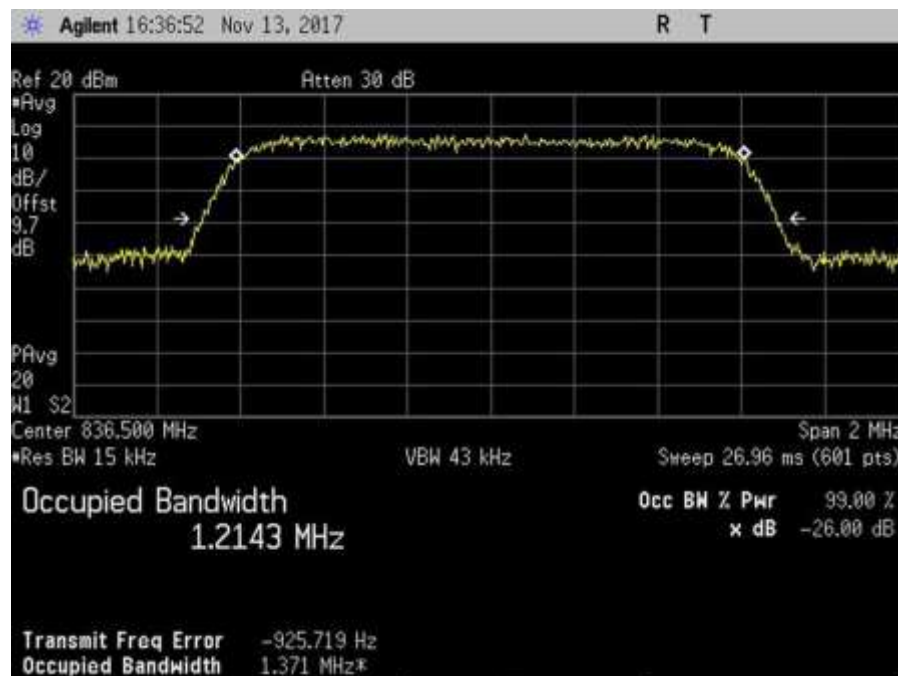
7.10_OBW_UL_776-787MHz_CDMA_In



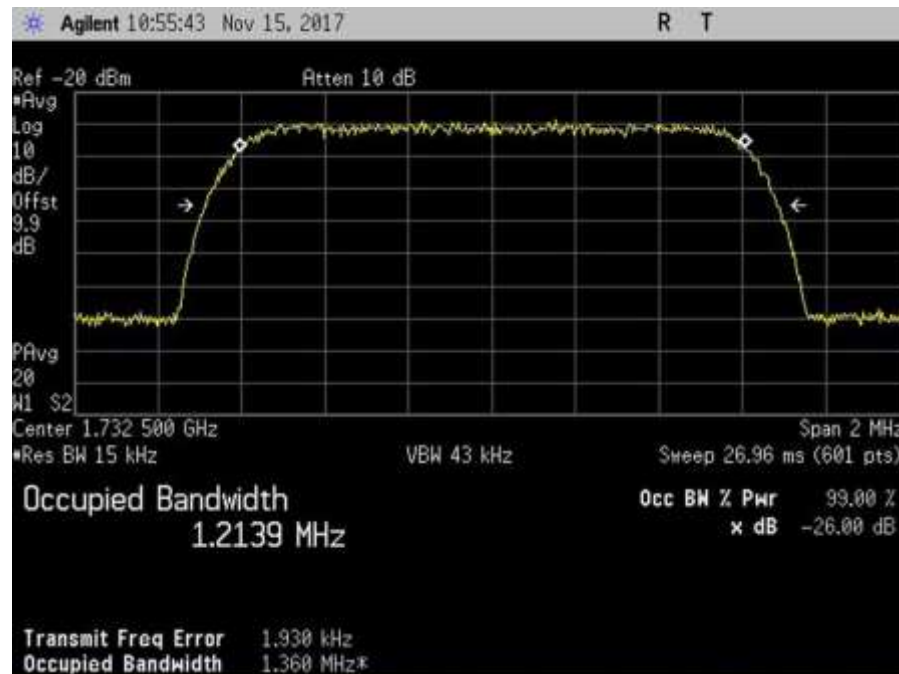
7.10_OBW_UL_776-787MHz_CDMA_Out



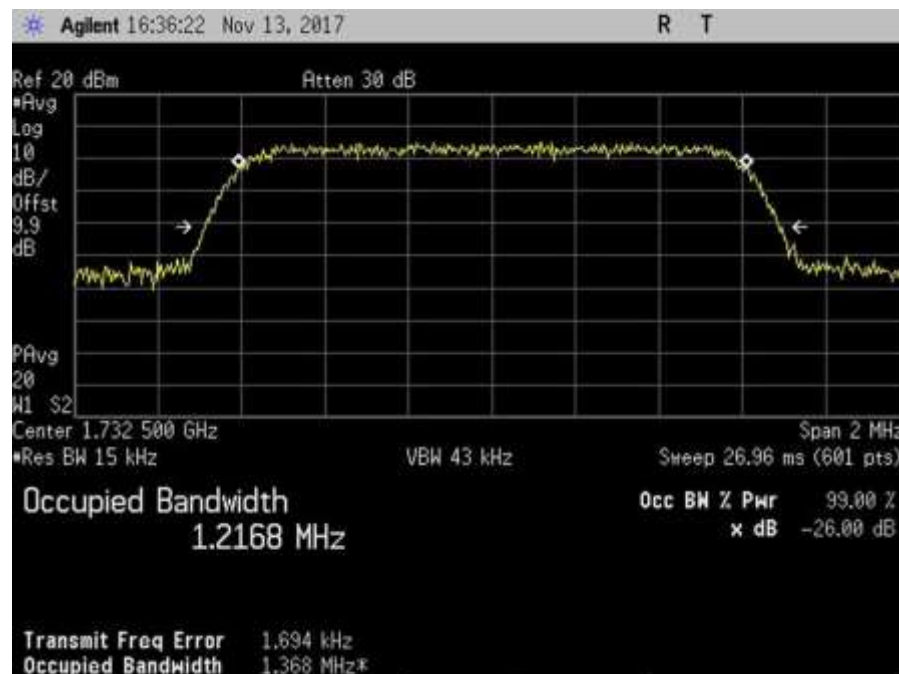
7.10_OBW_UL_824-849MHz_CDMA_In



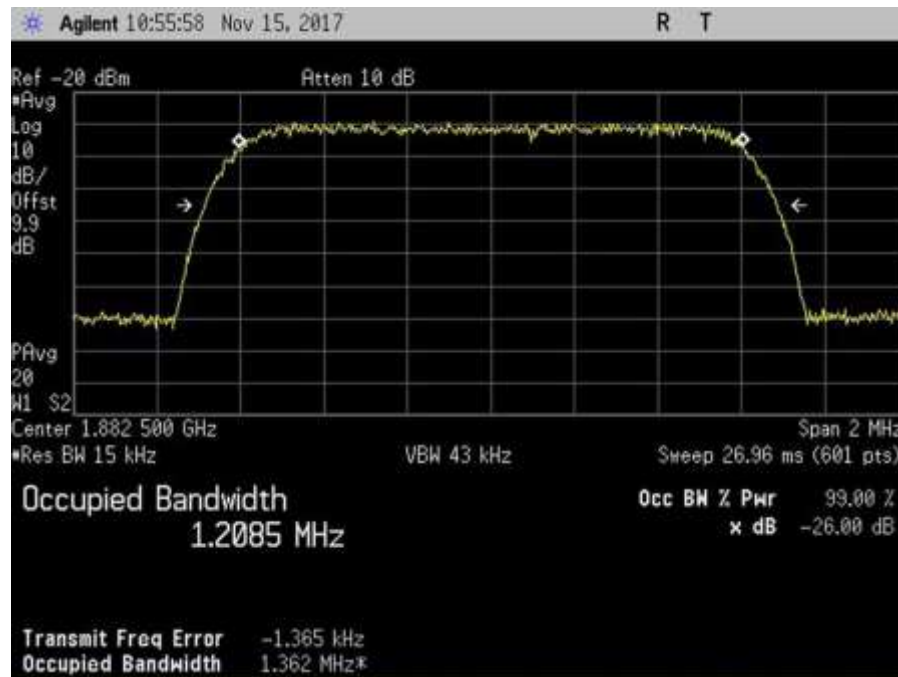
7.10_OBW_UL_824-849MHz_CDMA_Out



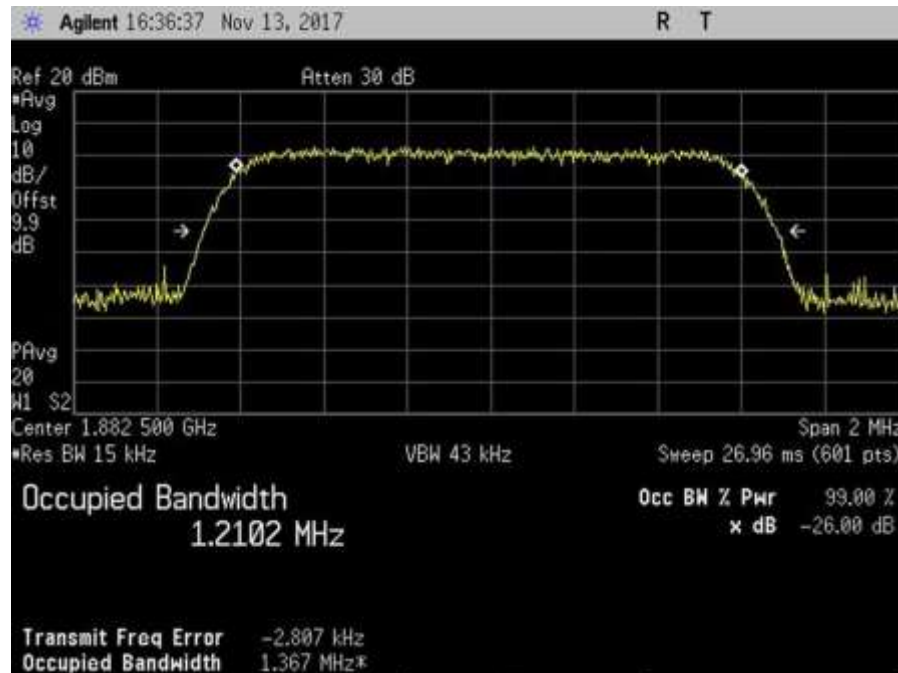
7.10_OBW_UL_1710-1755MHz_CDMA_In



7.10_OBW_UL_1710-1755MHz_CDMA_Out

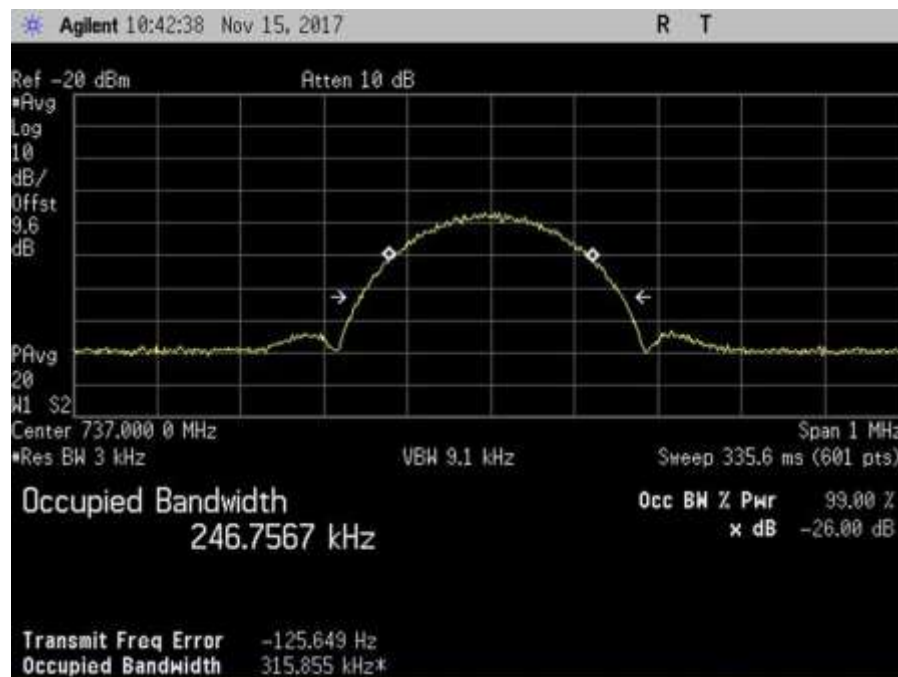


7.10_OBW_UL_1850-1915MHz_CDMA_In

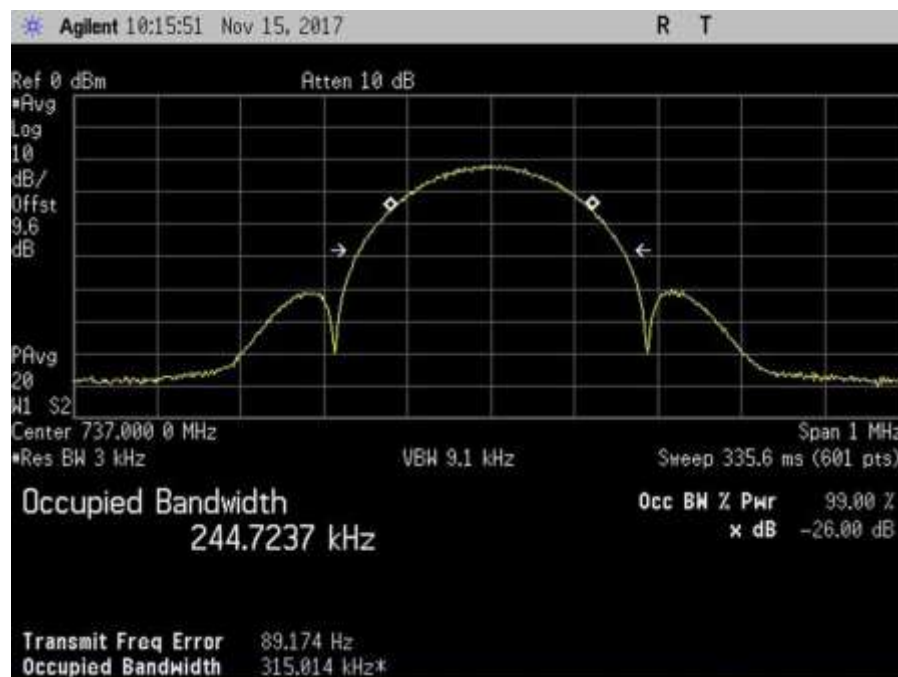


7.10_OBW_UL_1850-1915MHz_CDMA_Out

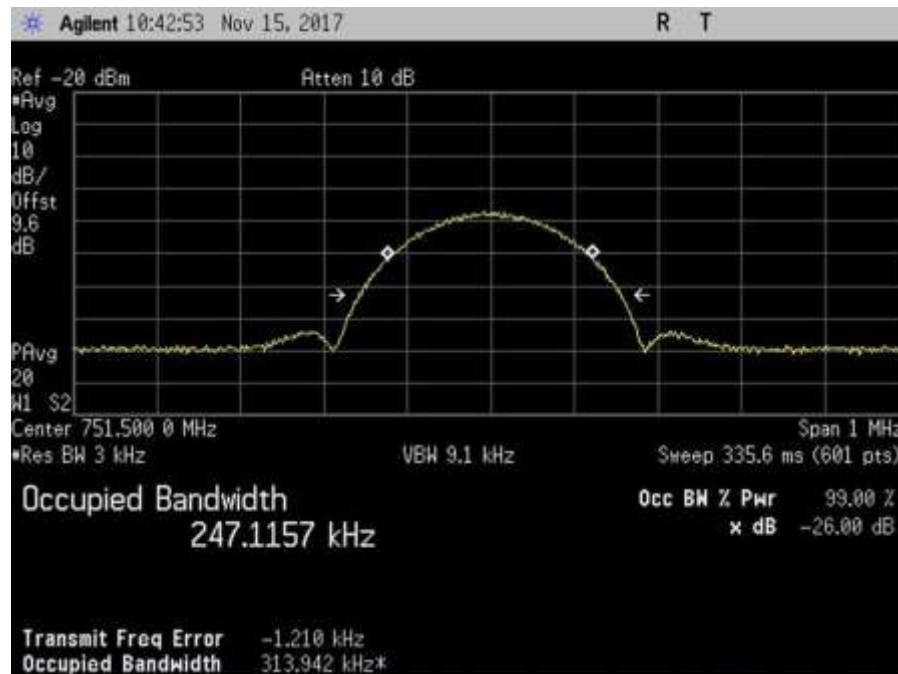
EDGE, DL



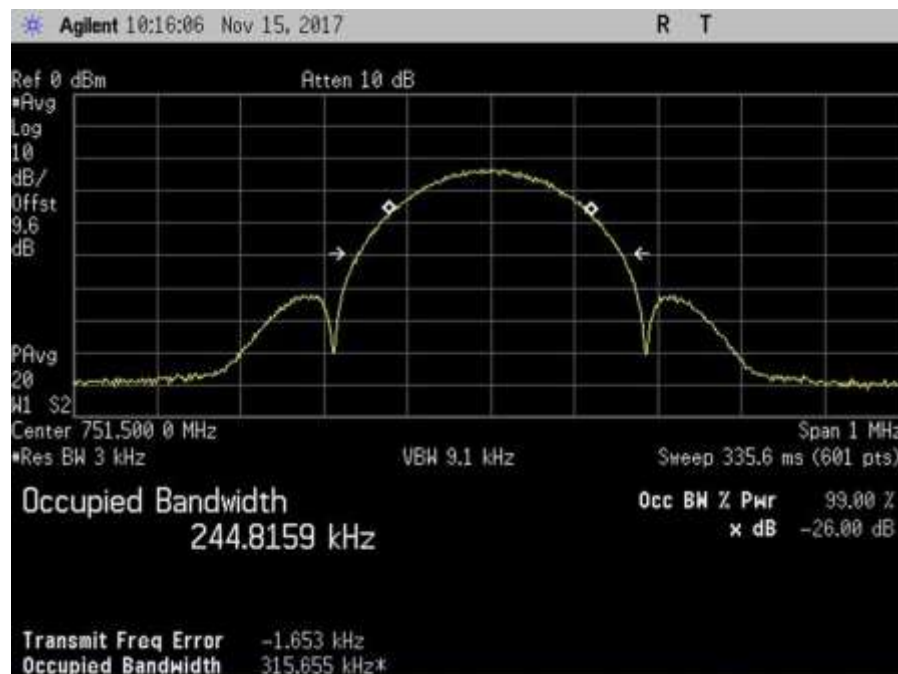
7.10_OBW_DL_728-746MHz_EDGE_In



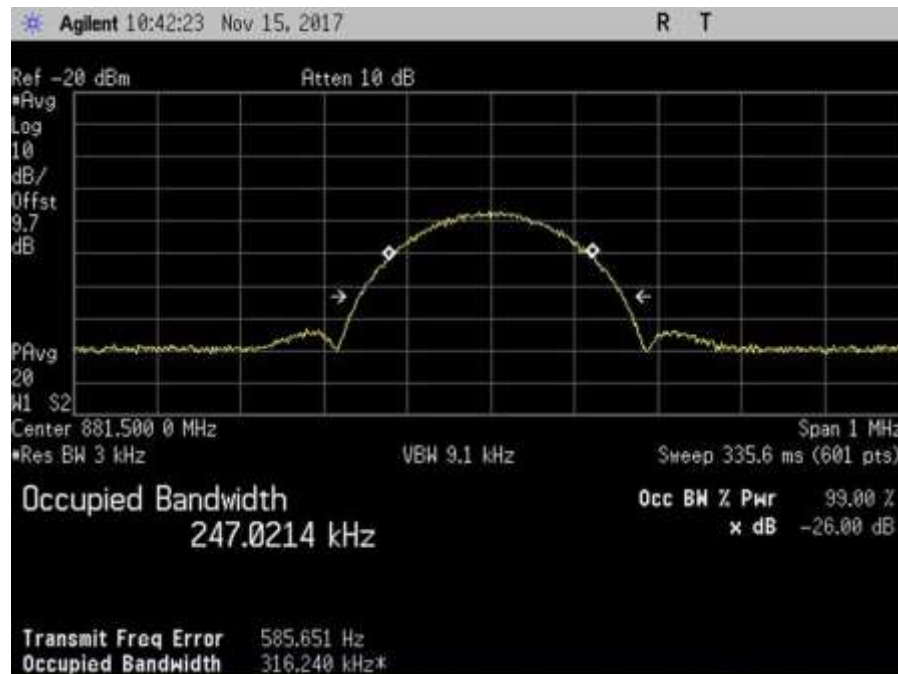
7.10_OBW_DL_728-746MHz_EDGE_Out



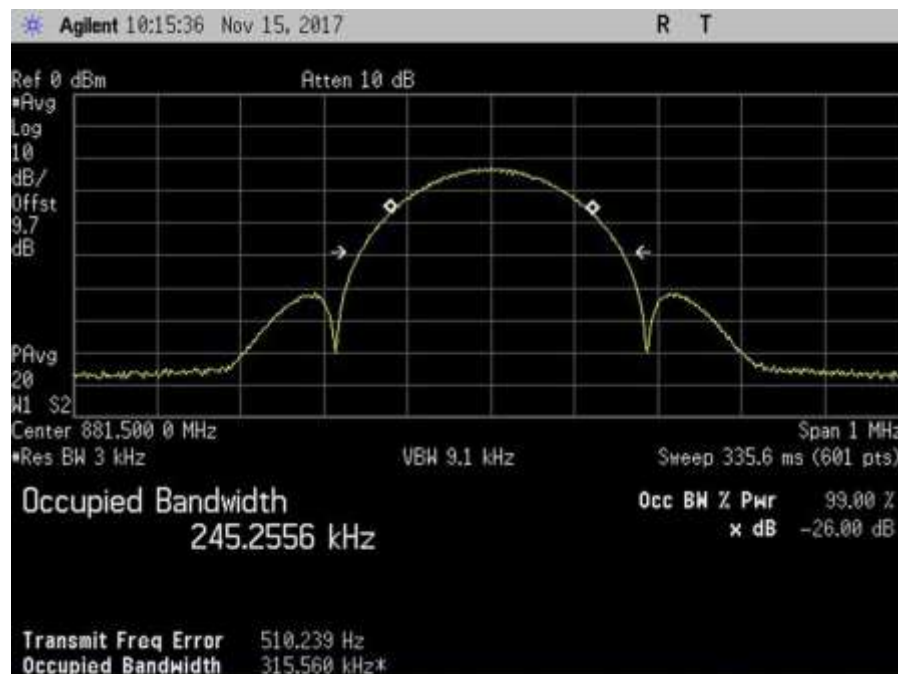
7.10_OBW_DL_746-757MHz_EDGE_In



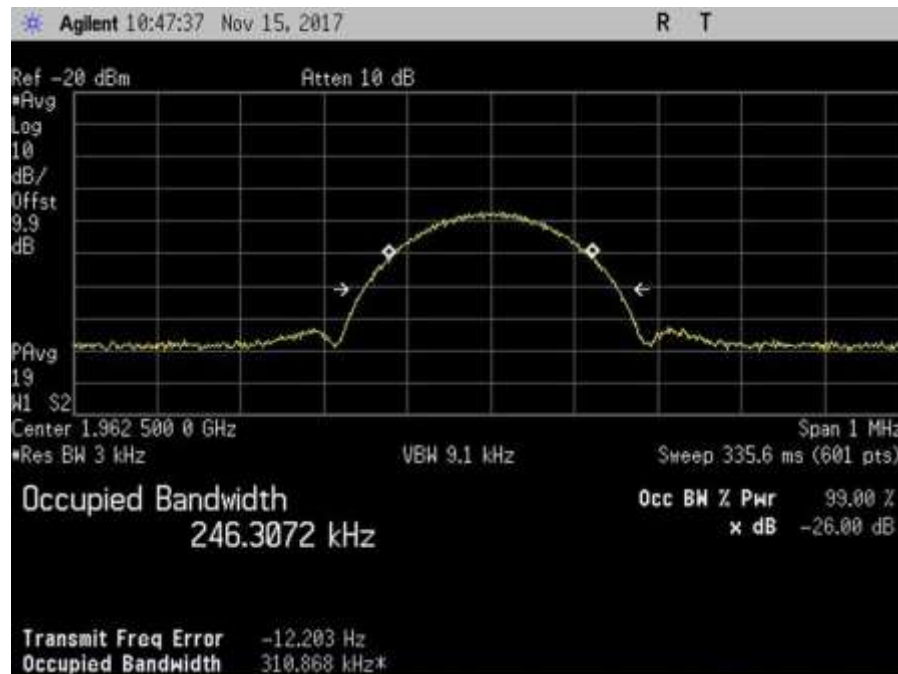
7.10_OBW_DL_746-757MHz_EDGE_Out



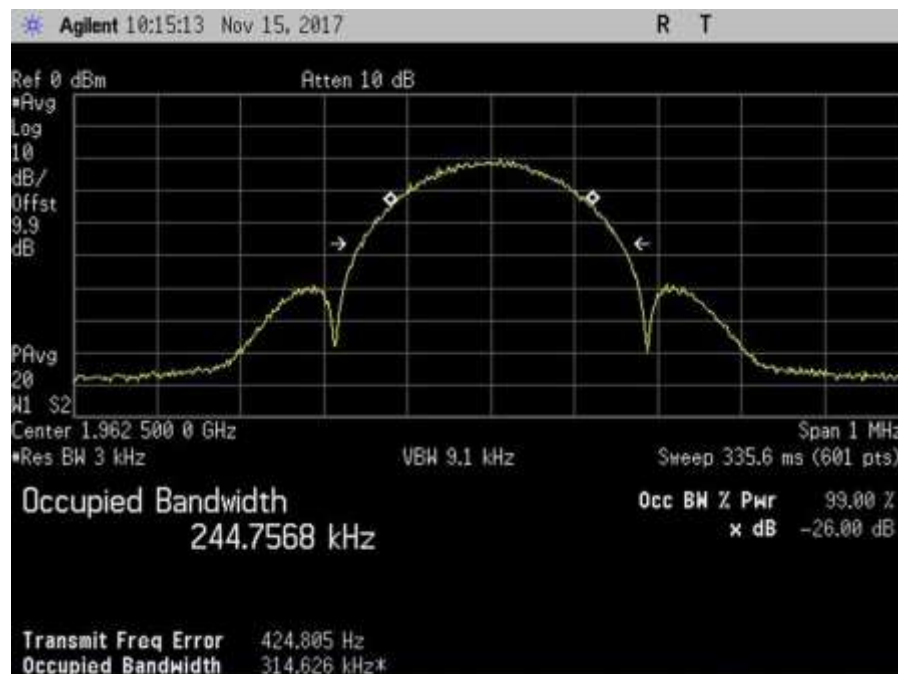
7.10_OBW_DL_869-894MHz_EDGE_In



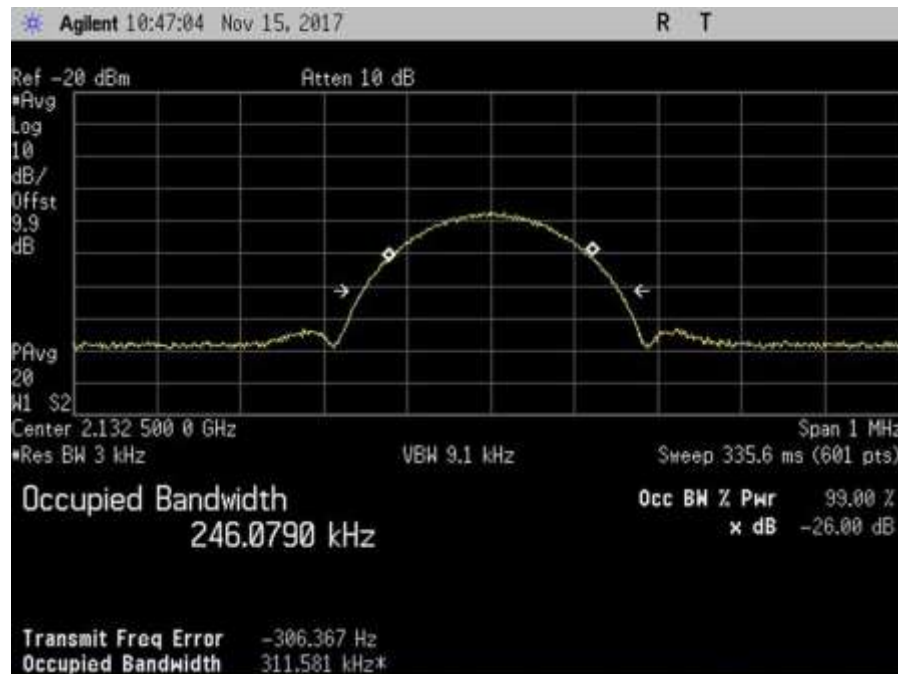
7.10_OBW_DL_869-894MHz_EDGE_Out



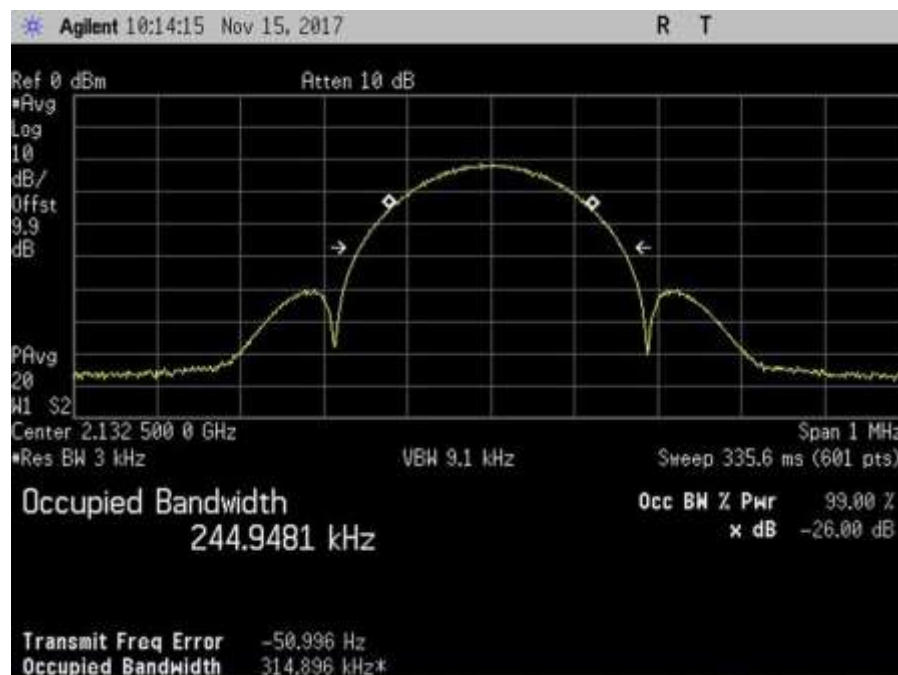
7.10_OBW_DL_1930-1995MHz_EDGE_In



7.10_OBW_DL_1930-1995MHz_EDGE_Out

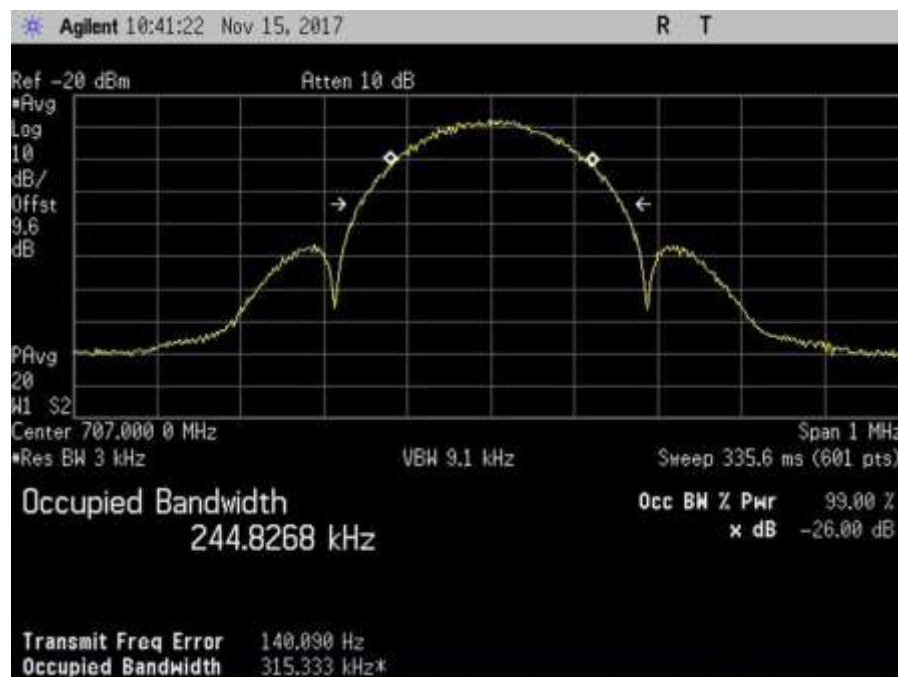


7.10_OBW_DL_2110-2155MHz_EDGE_In

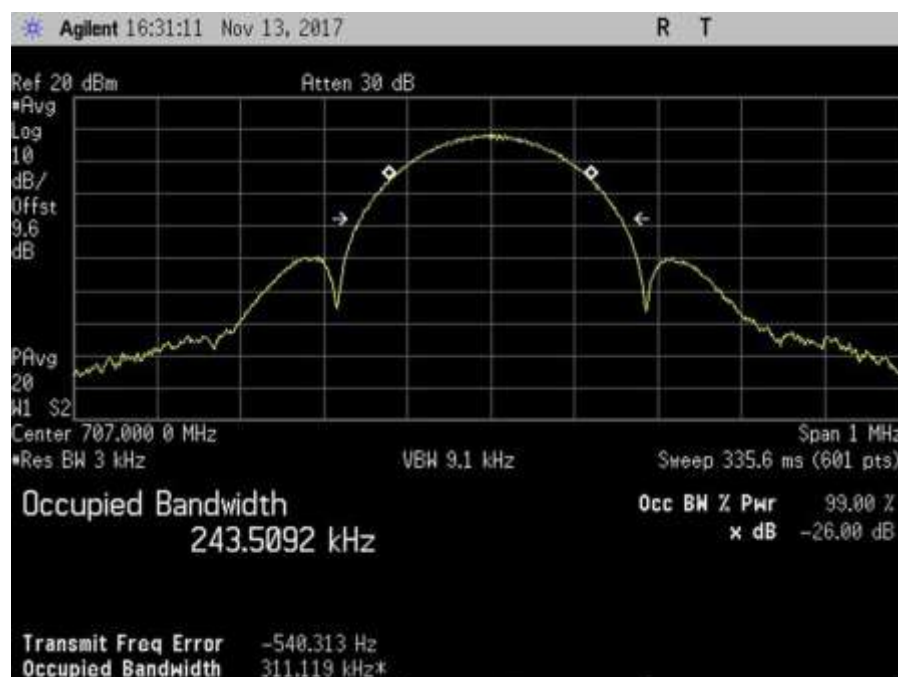


7.10_OBW_DL_2110-2155MHz_EDGE_Out

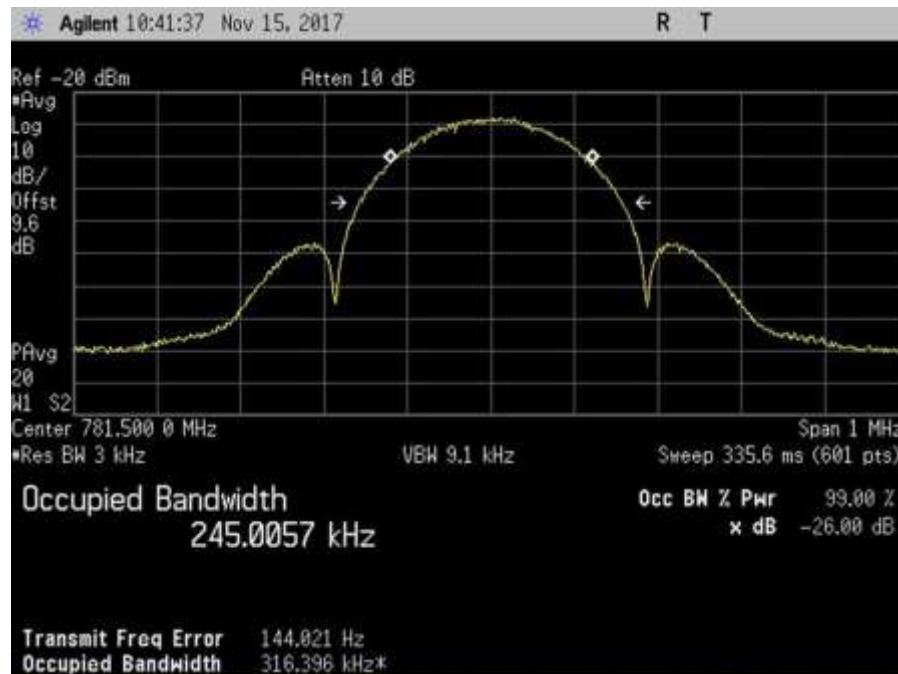
EDGE, UL



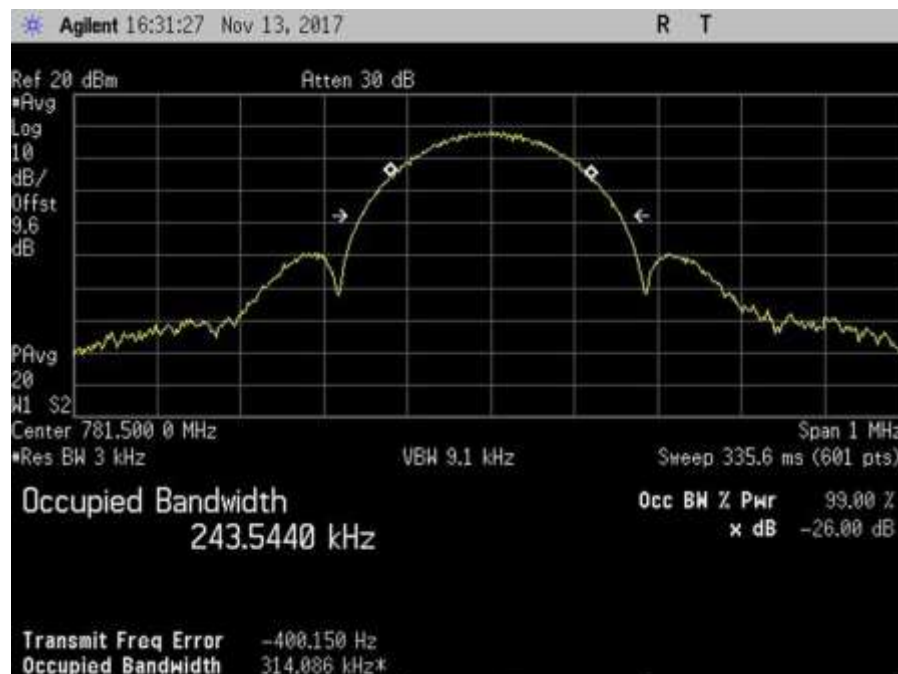
7.10_OBW_UL_698-716MHz_EDGE_In



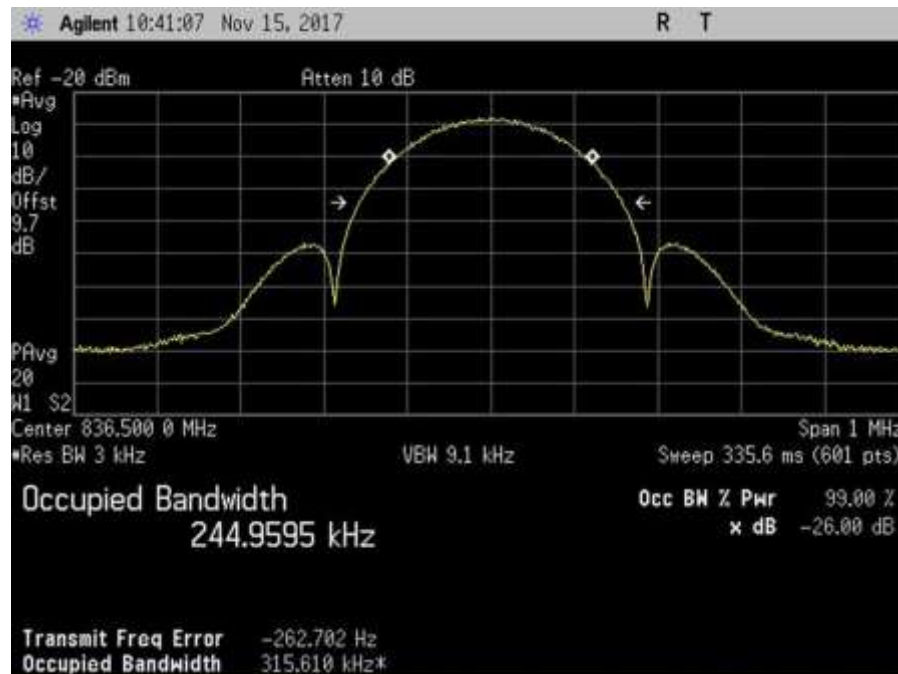
7.10_OBW_UL_698-716MHz_EDGE_Out



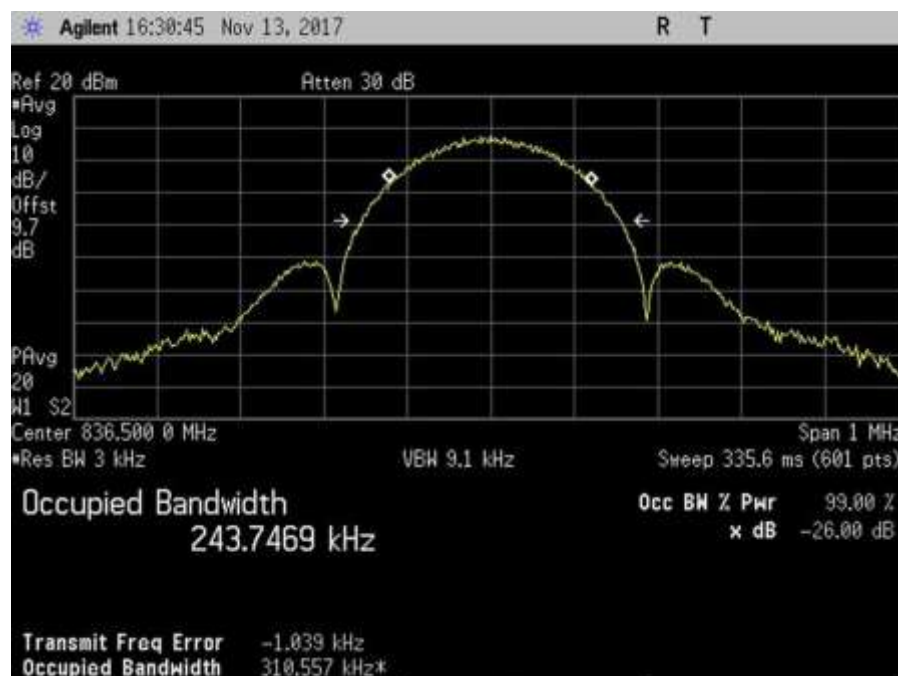
7.10_OBW_UL_776-787MHz_EDGE_In



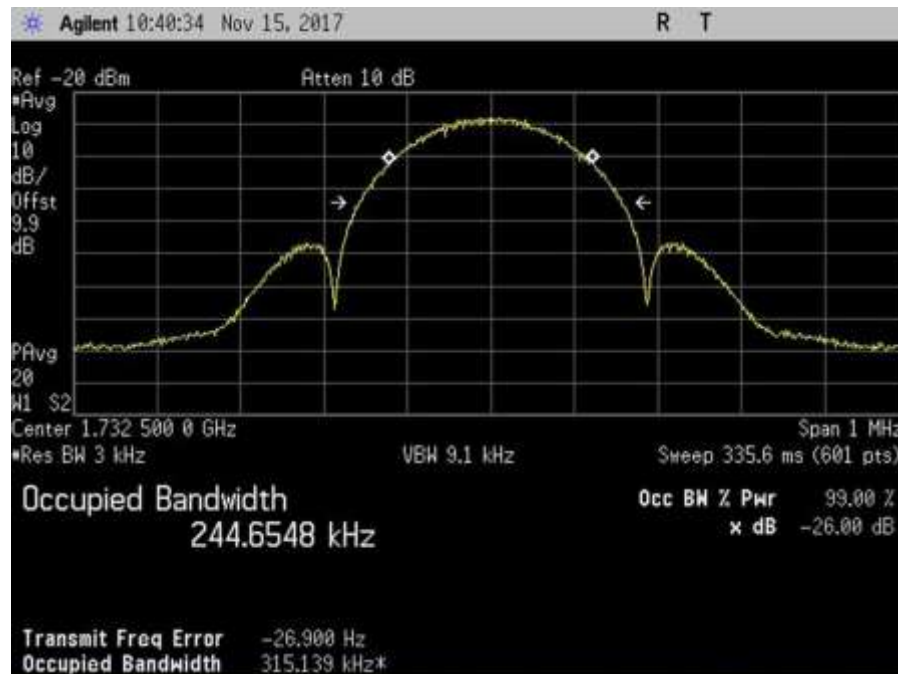
7.10_OBW_UL_776-787MHz_EDGE_Out



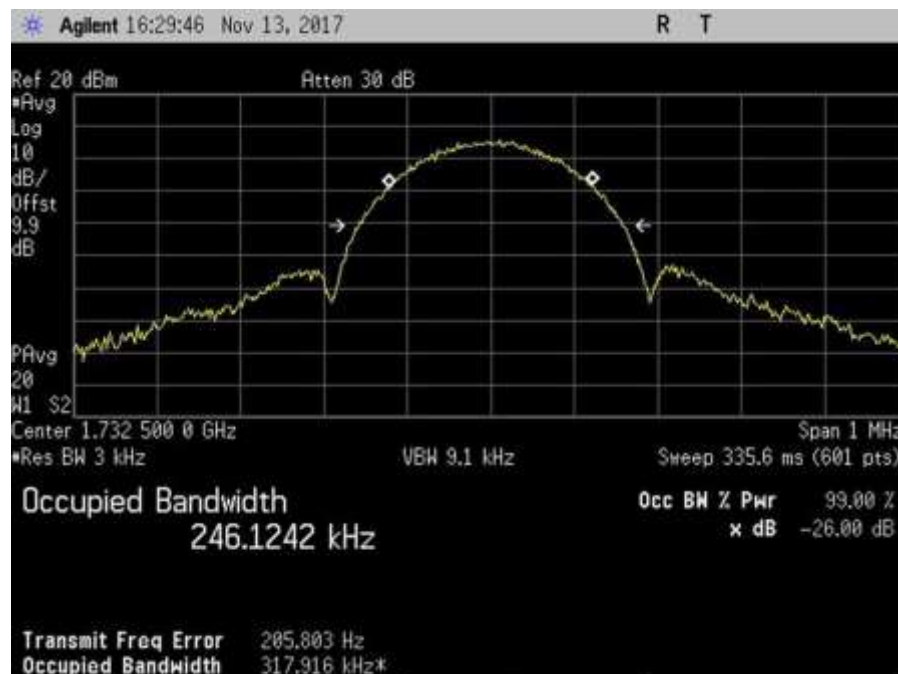
7.10_OBW_UL_824-849MHz_EDGE_In



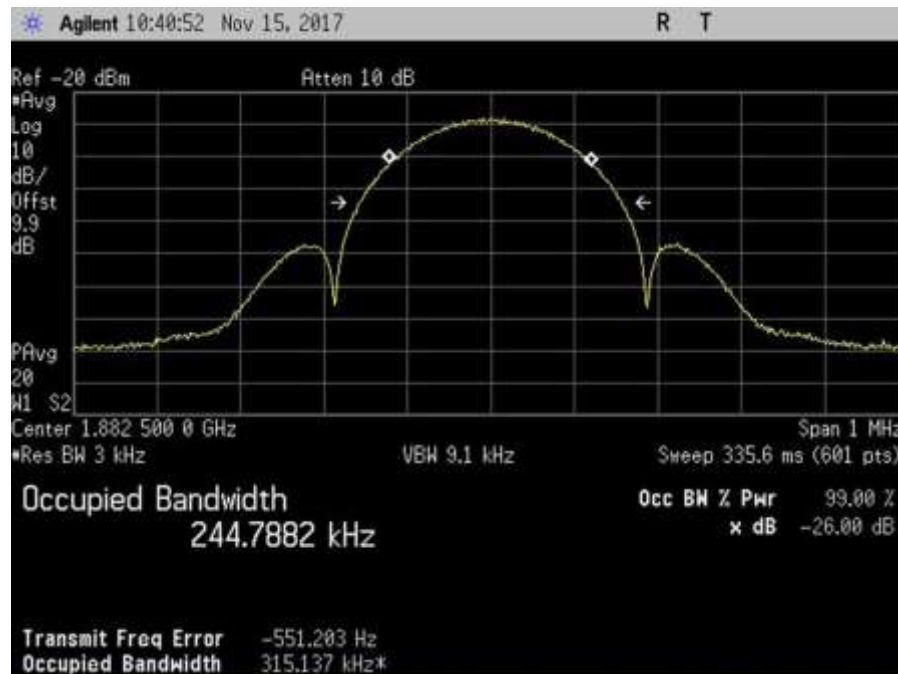
7.10_OBW_UL_824-849MHz_EDGE_Out



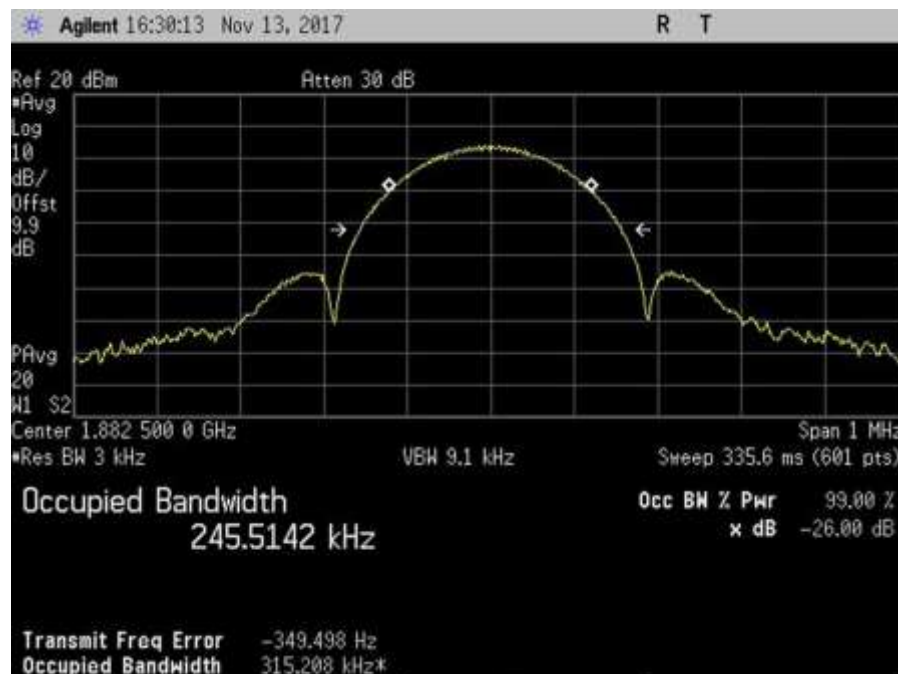
7.10_OBW_UL_1710-1755MHz_EDGE_In



7.10_OBW_UL_1710-1755MHz_EDGE_Out



7.10_OBW_UL_1850-1915MHz_EDGE_In



7.10_OBW_UL_1850-1915MHz_EDGE_Out

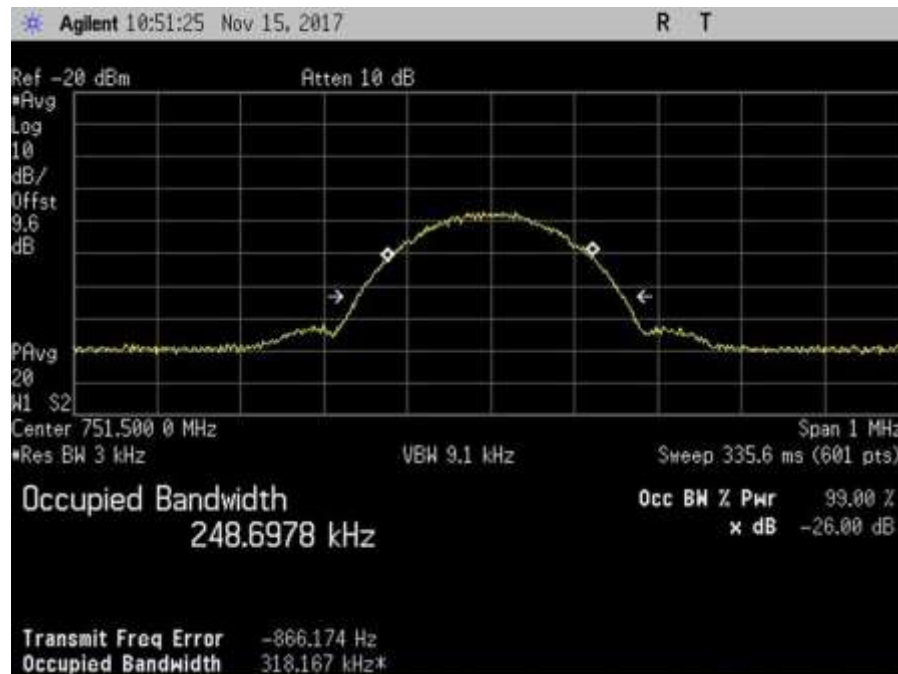
GSM, DL



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



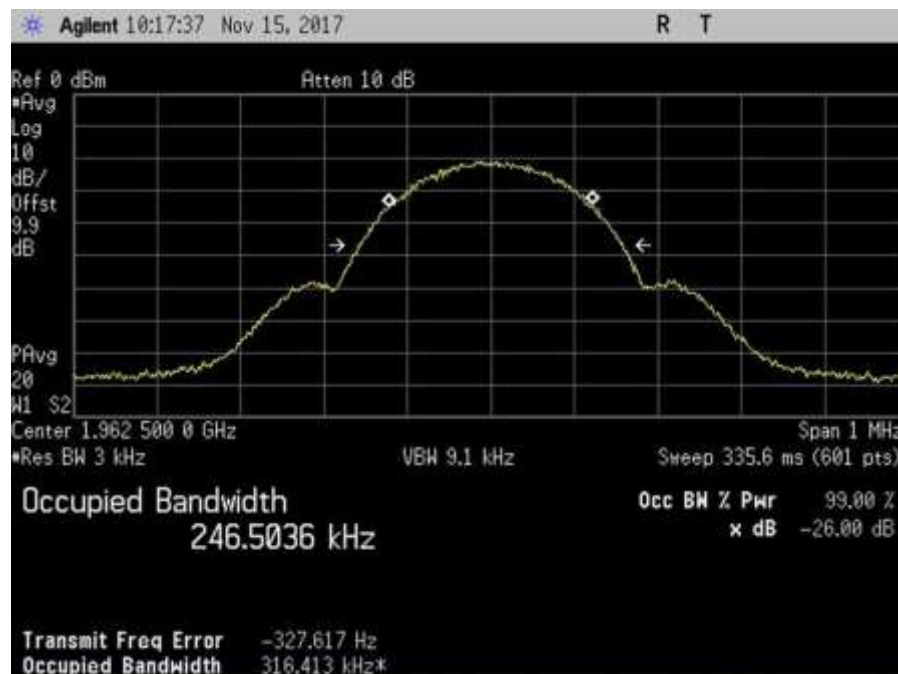
7.10_OBW_DL_869-894MHz_GSM_In



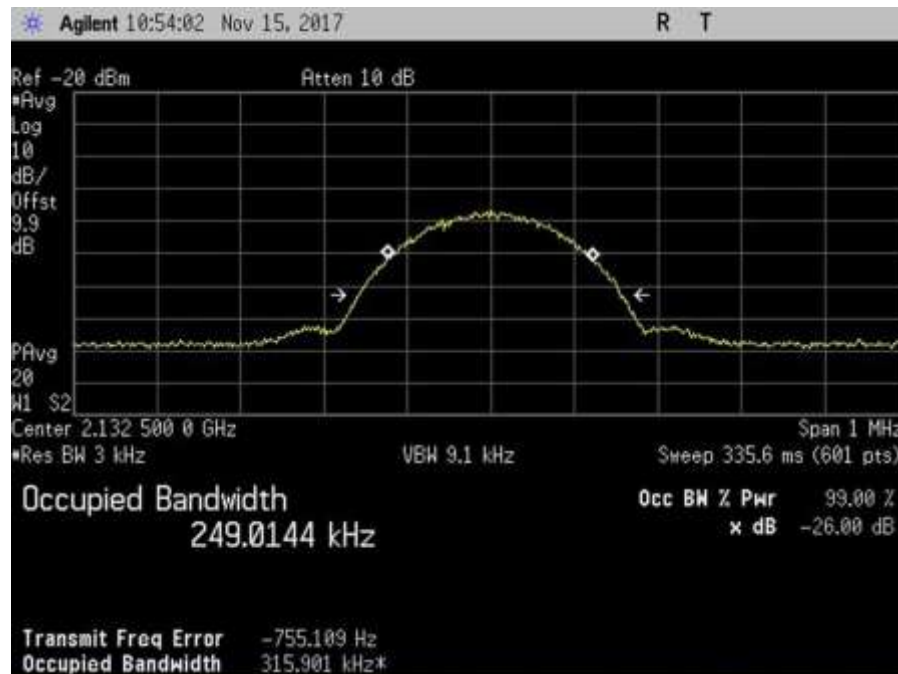
7.10_OBW_DL_869-894MHz_GSM_Out



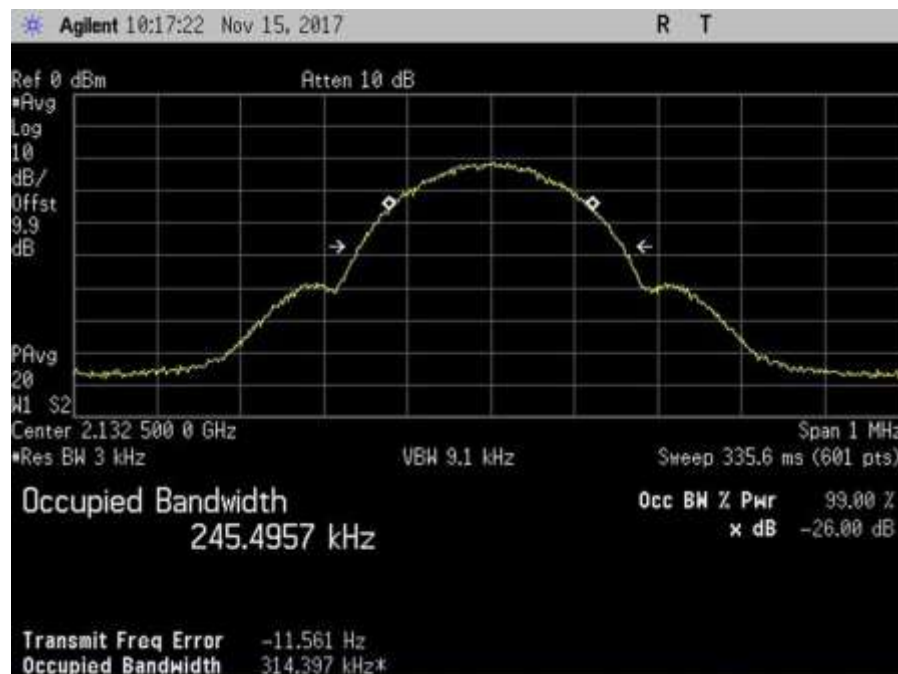
7.10_OBW_DL_1930-1995MHz_GSM_In



7.10_OBW_DL_1930-1995MHz_GSM_Out



7.10_OBW_DL_2110-2155MHz_GSM_In



7.10_OBW_DL_2110-2155MHz_GSM_Out



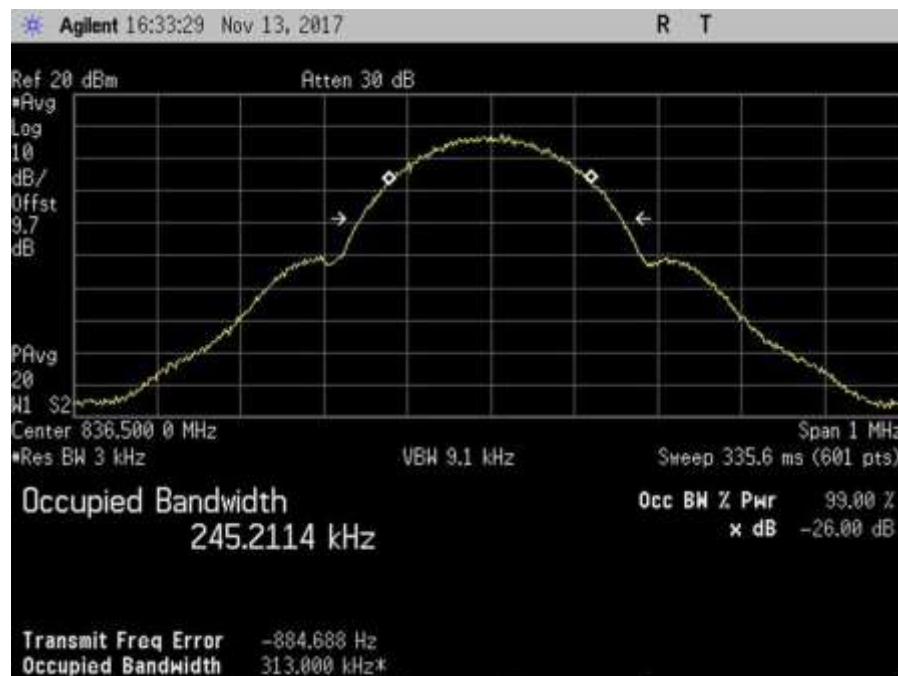
7.10_OBW_UL_776-787MHz_GSM_In



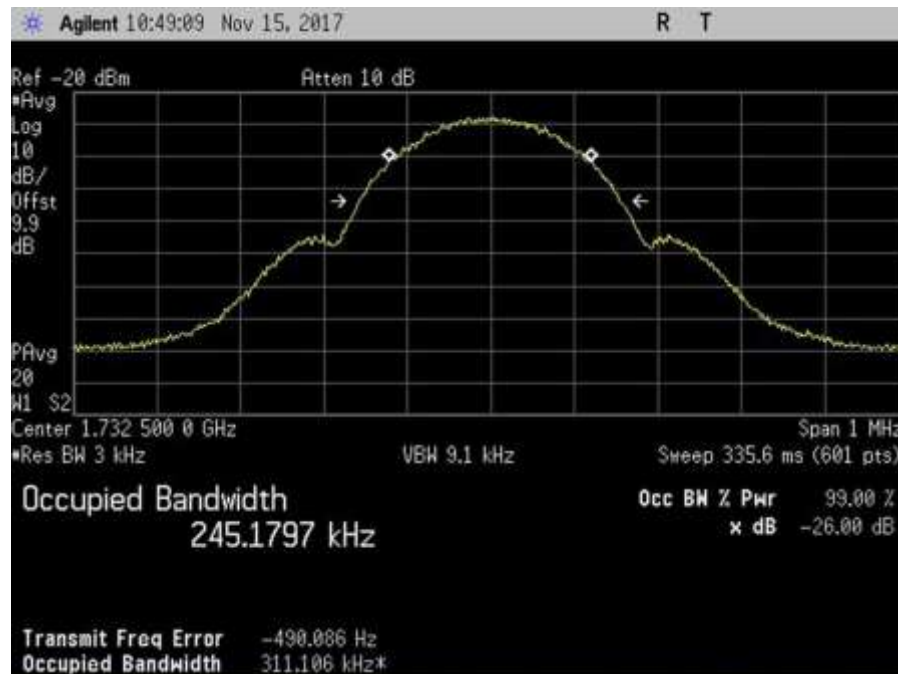
7.10_OBW_UL_776-787MHz_GSM_Out



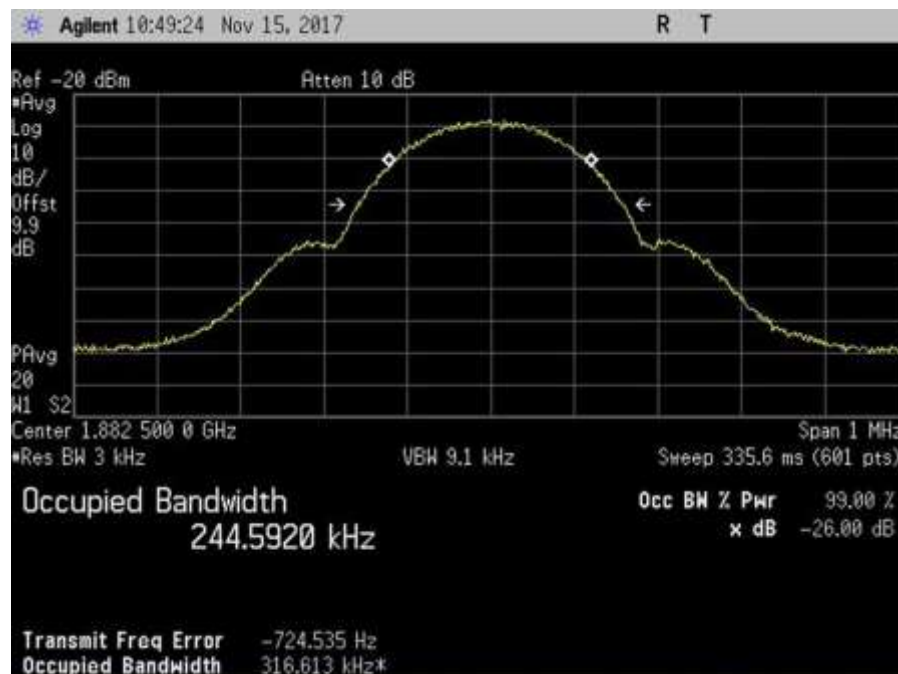
7.10_OBW_UL_824-849MHz_GSM_In



7.10_OBW_UL_824-849MHz_GSM_Out



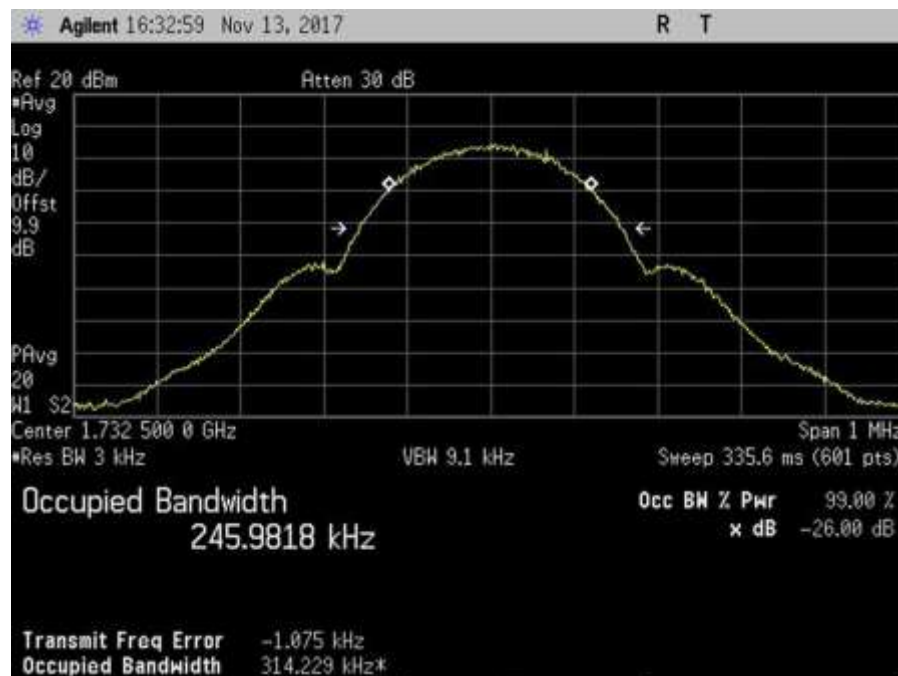
7.10_OBW_UL_1710-1755MHz_GSM_In



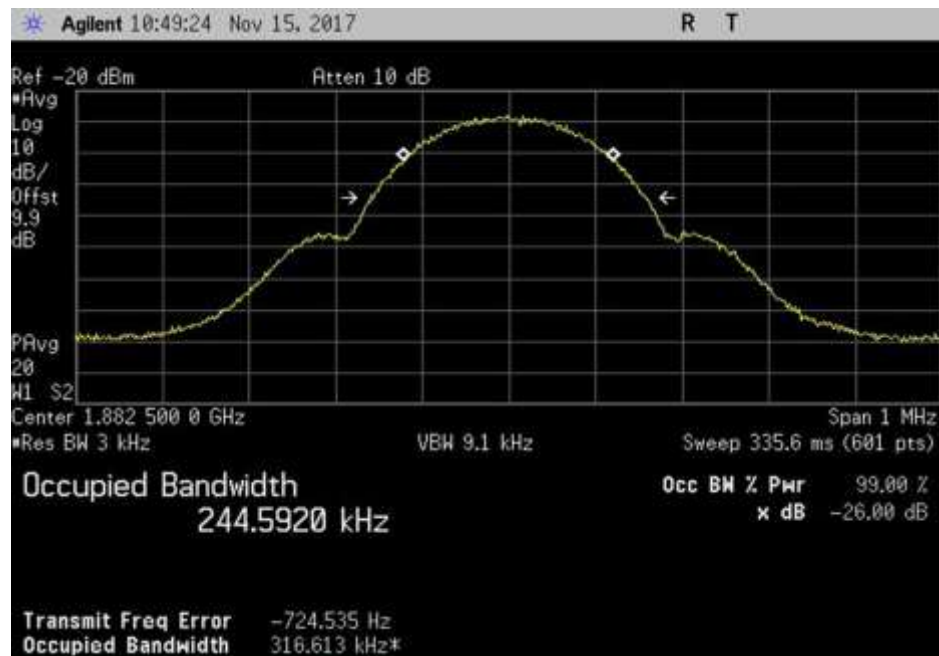
7.10_OBW_UL_1850-1915MHz_GSM_In



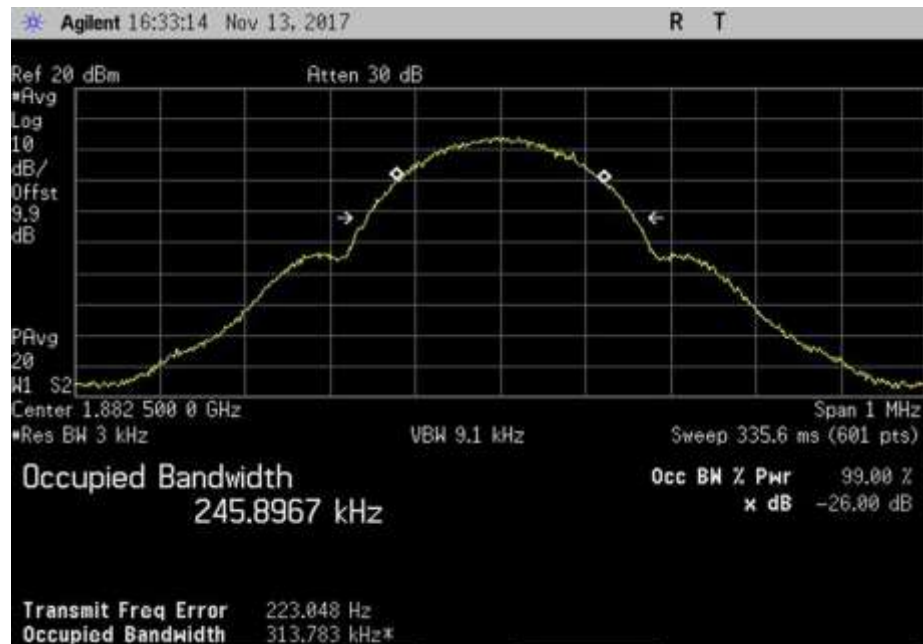
7.10_OBW_UL_1850-1915MHz_GSM_Out



7.10_OBW_UL_1710-1755MHz_GSM_Out

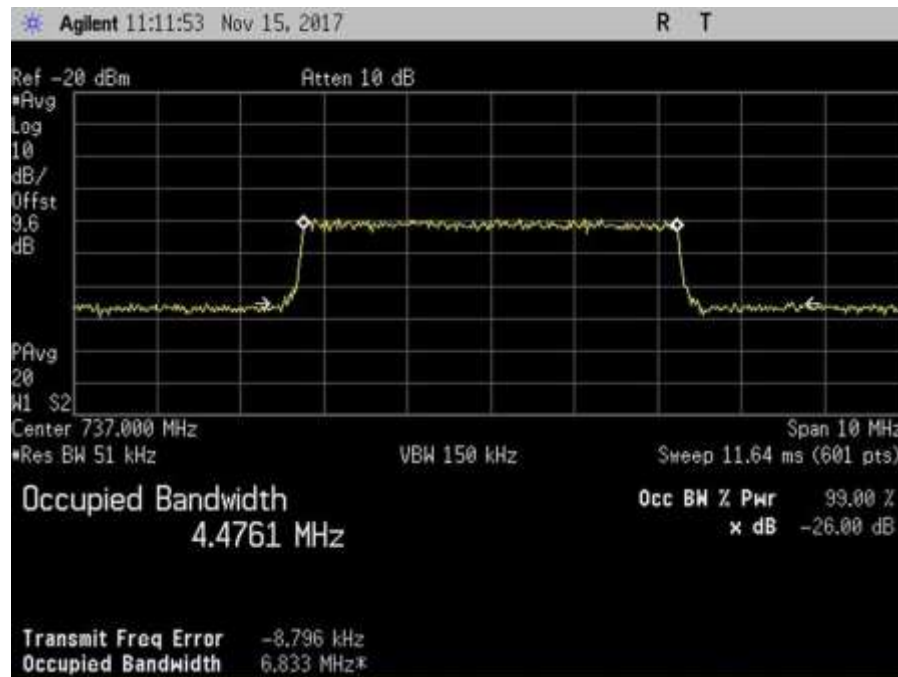


7.10_OBW_UL_1850-1915MHz_GSM_In

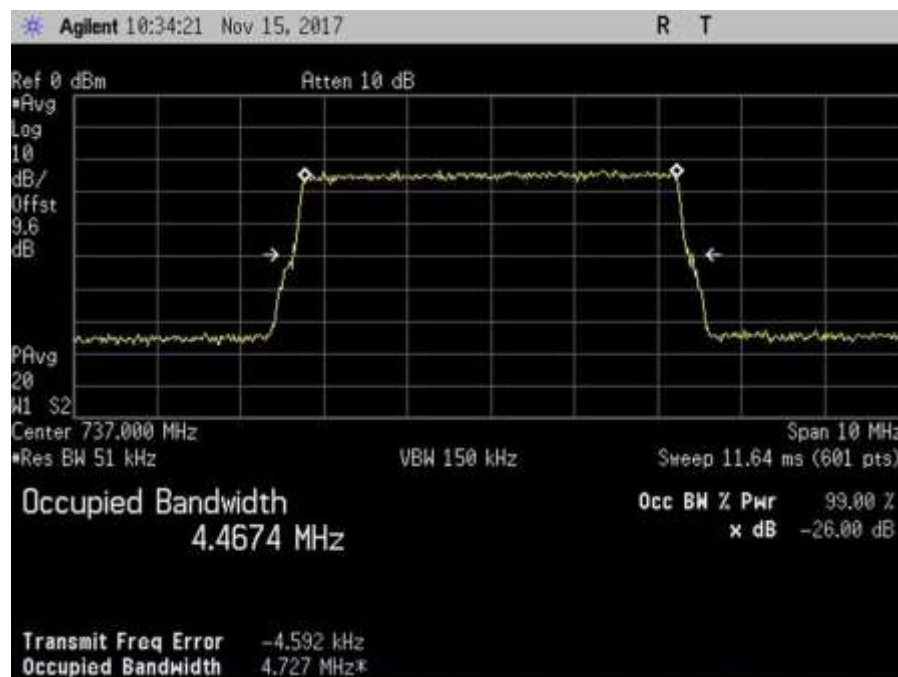


7.10_OBW_UL_1850-1915MHz_GSM_Out

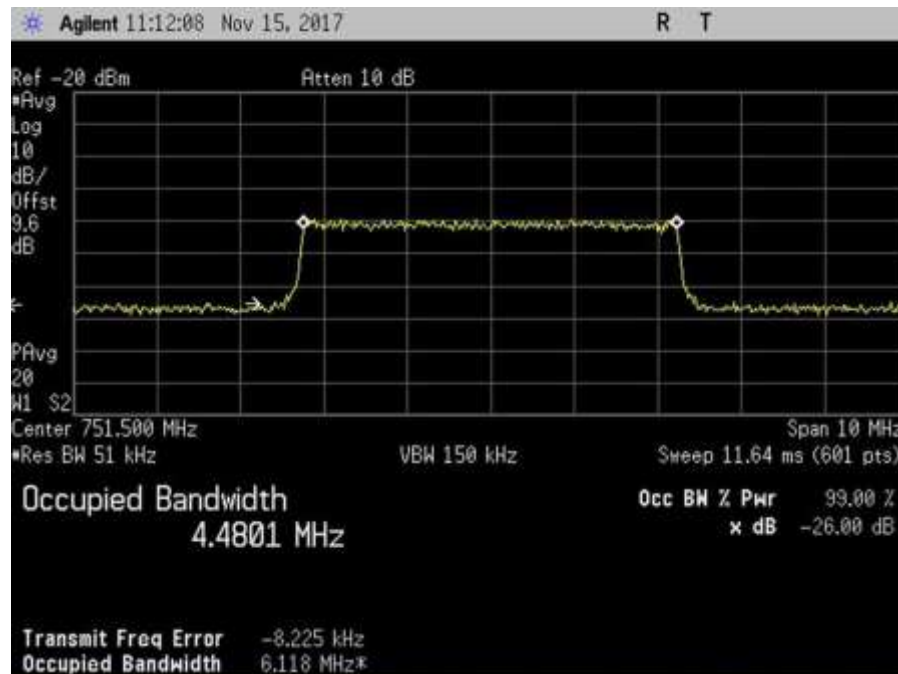
LTE, DL



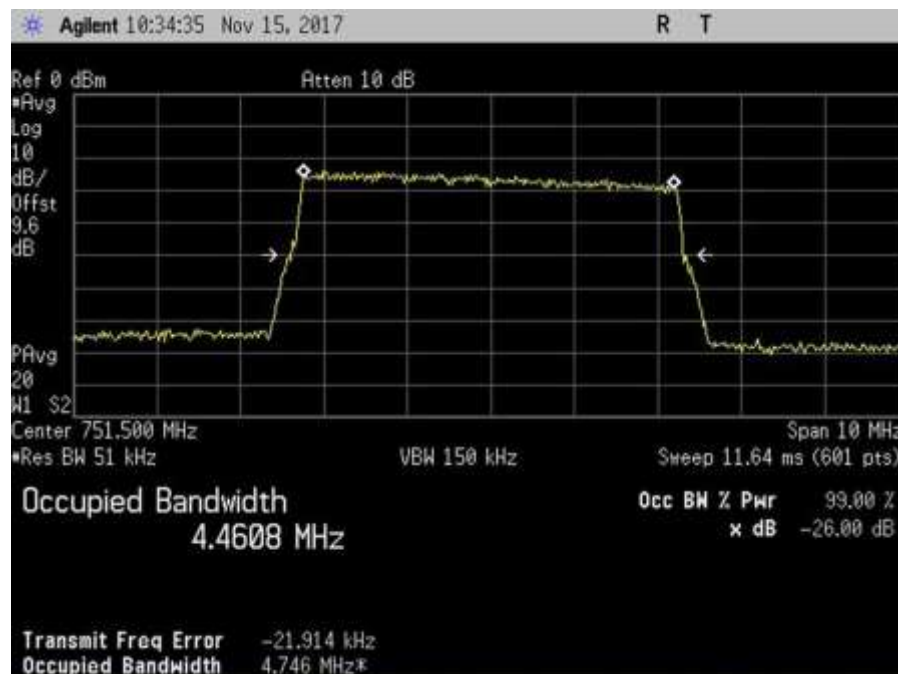
7.10_OBW_DL_728-746MHz_LTE_In



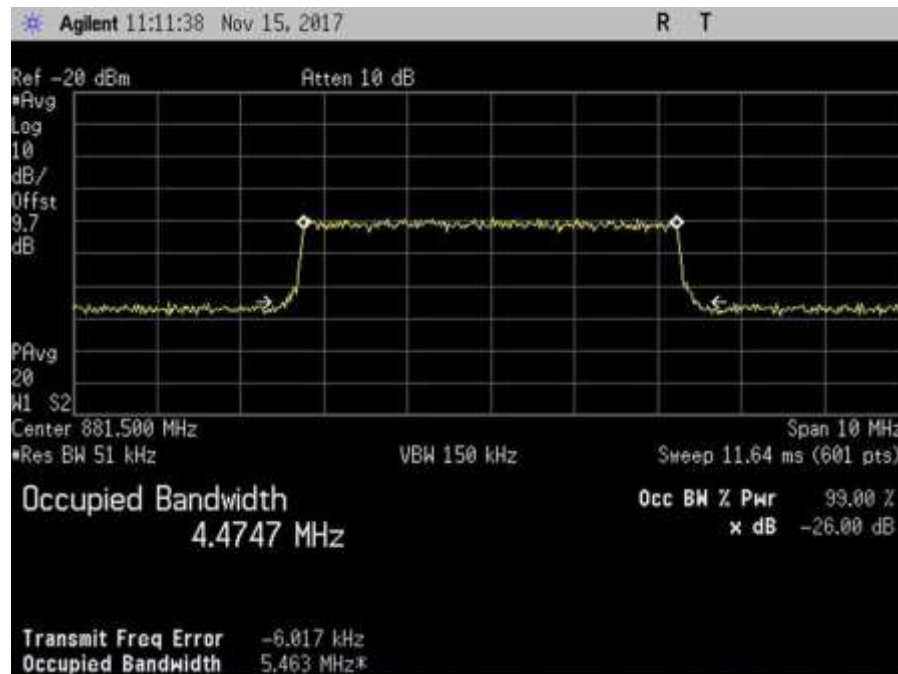
7.10_OBW_DL_728-746MHz_LTE_Out



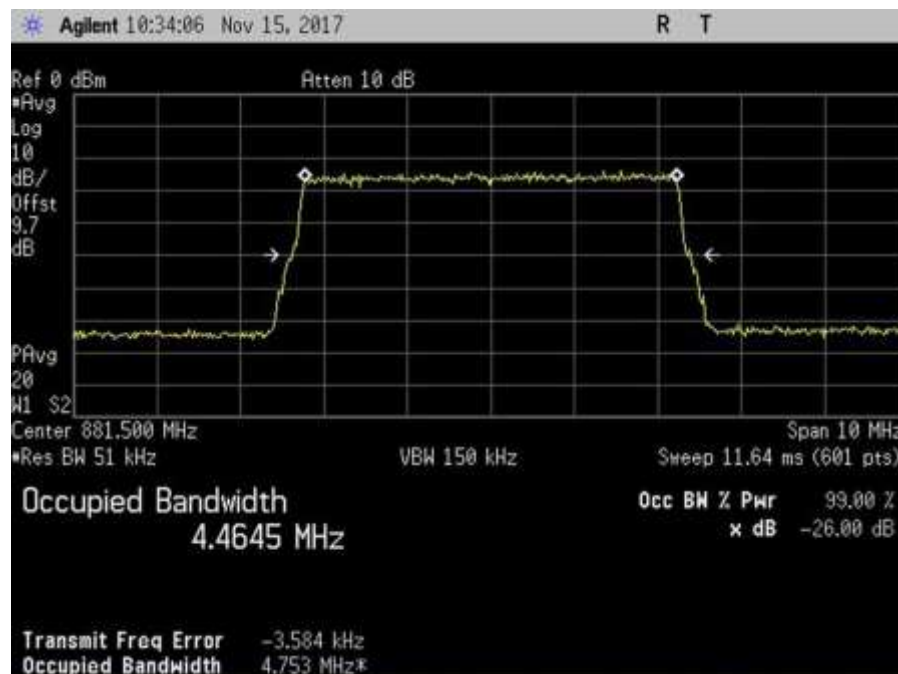
7.10_OBW_DL_746-757MHz_LTE_In



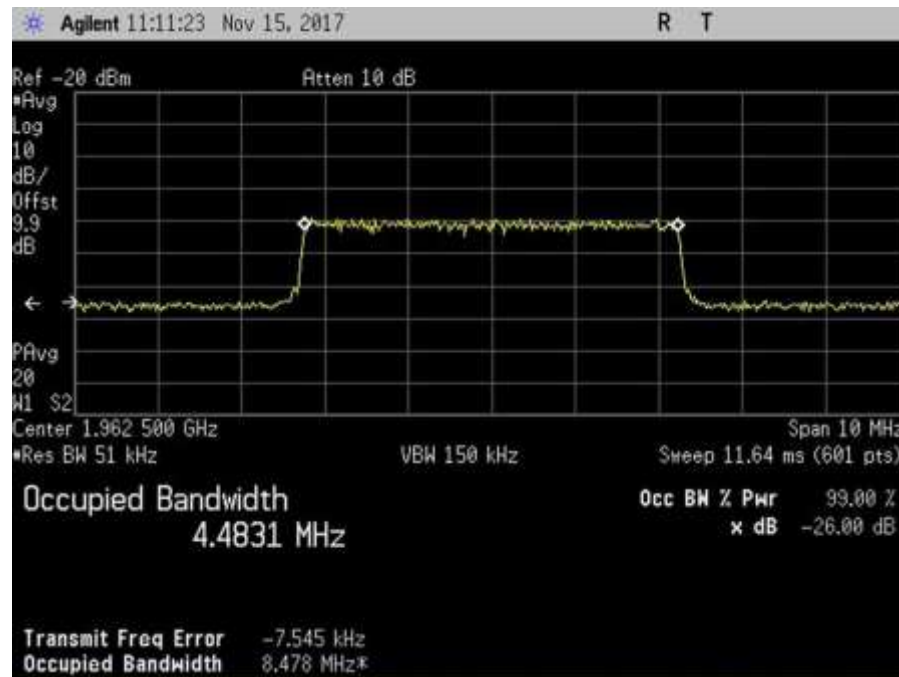
7.10_OBW_DL_746-757MHz_LTE_Out



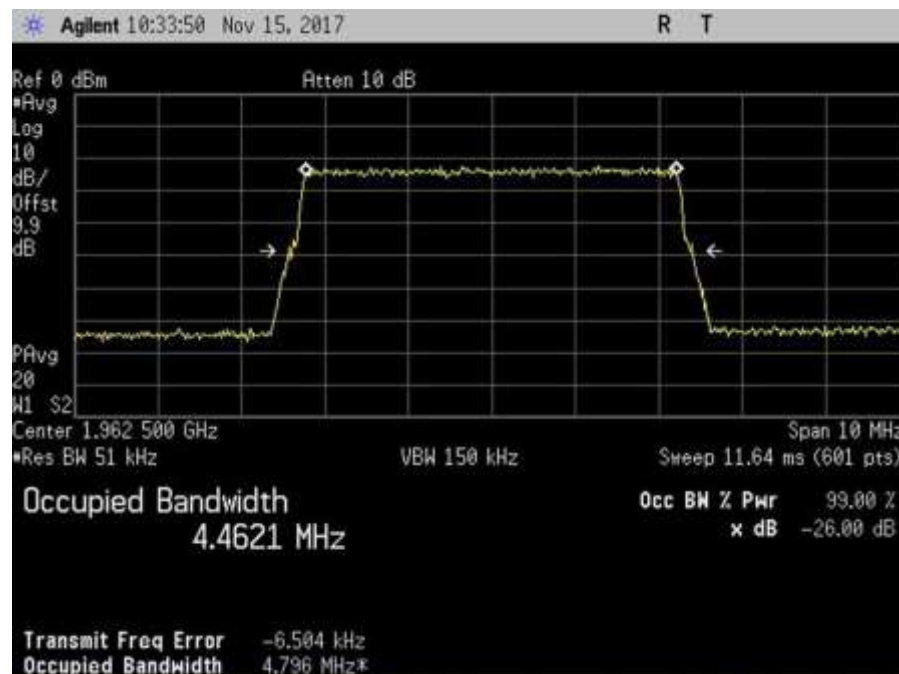
7.10_OBW_DL_869-894MHz_LTE_In



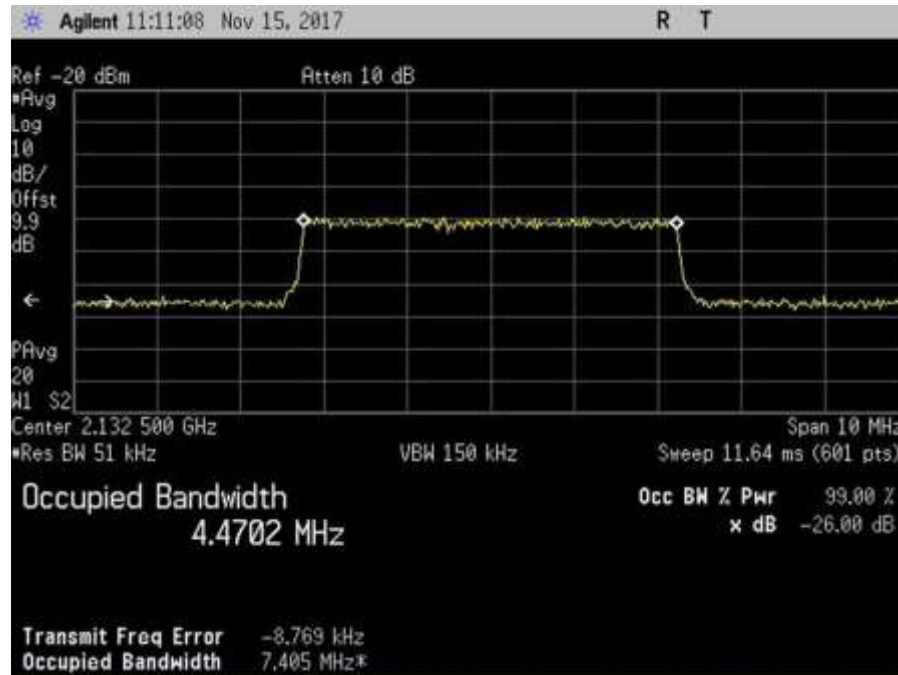
7.10_OBW_DL_869-894MHz_LTE_Out



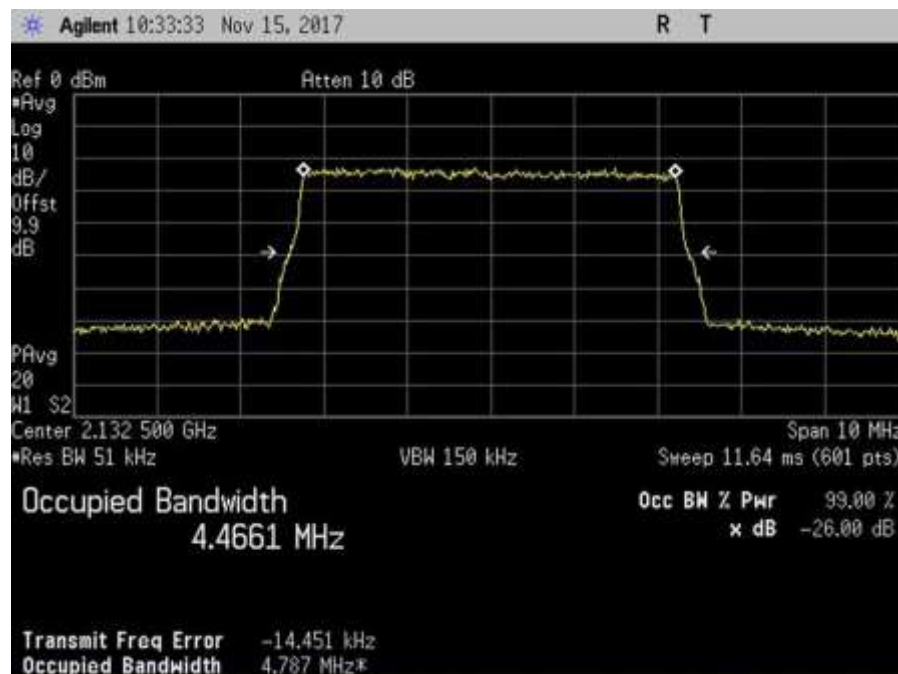
7.10_OBW_DL_1930-1995MHz_LTE_In



7.10_OBW_DL_1930-1995MHz_LTE_Out

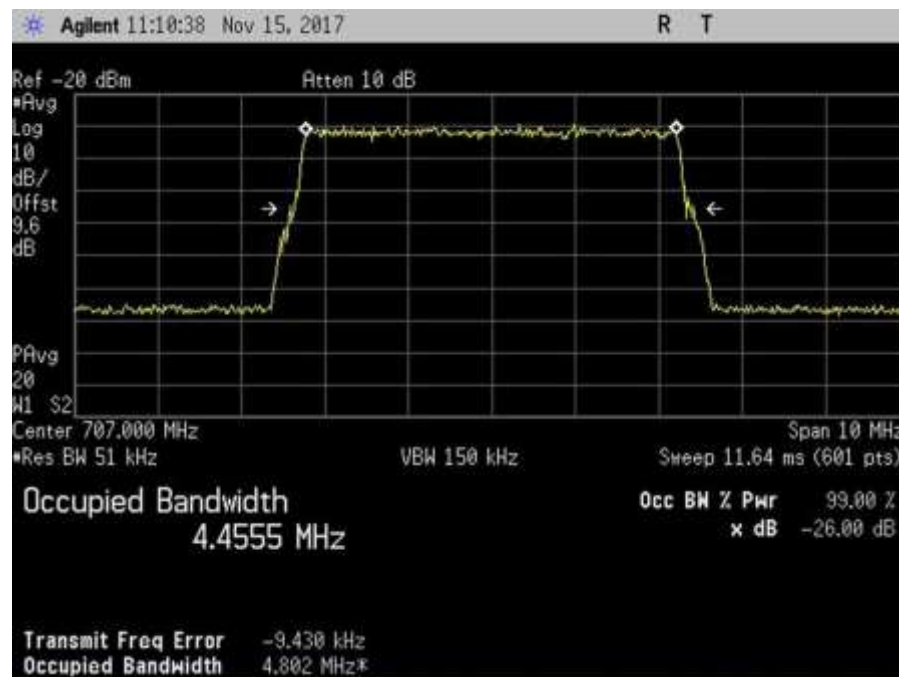


7.10_OBW_DL_2110-2155MHz_LTE_In

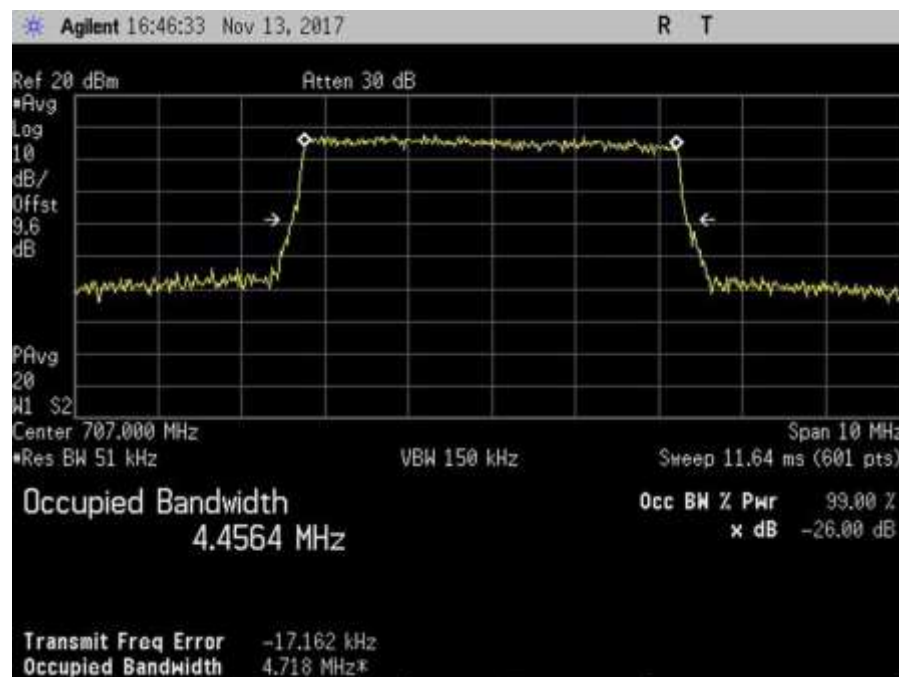


7.10_OBW_DL_2110-2155MHz_LTE_Out

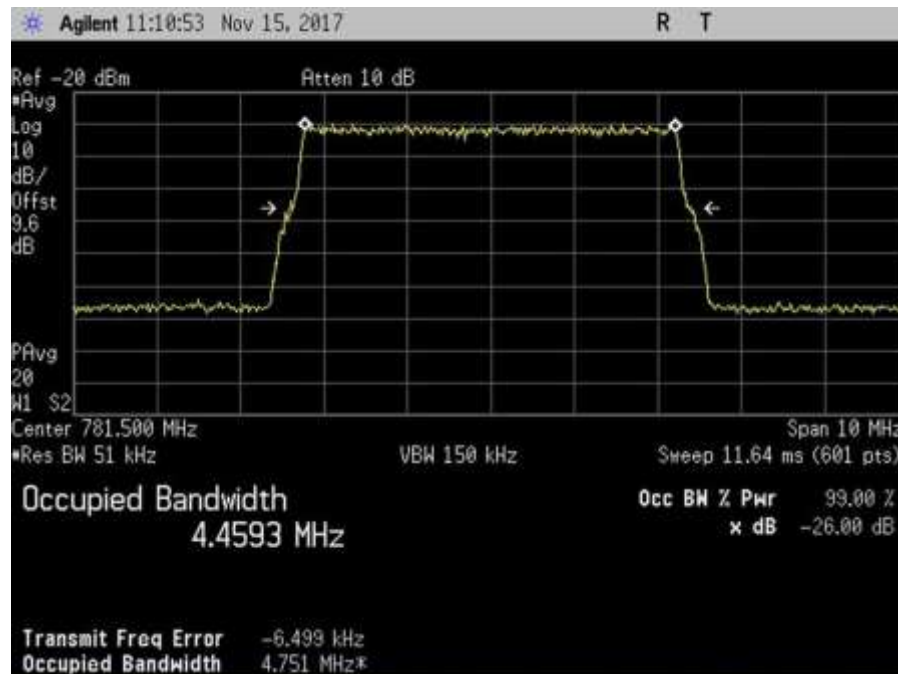
LTE, UL



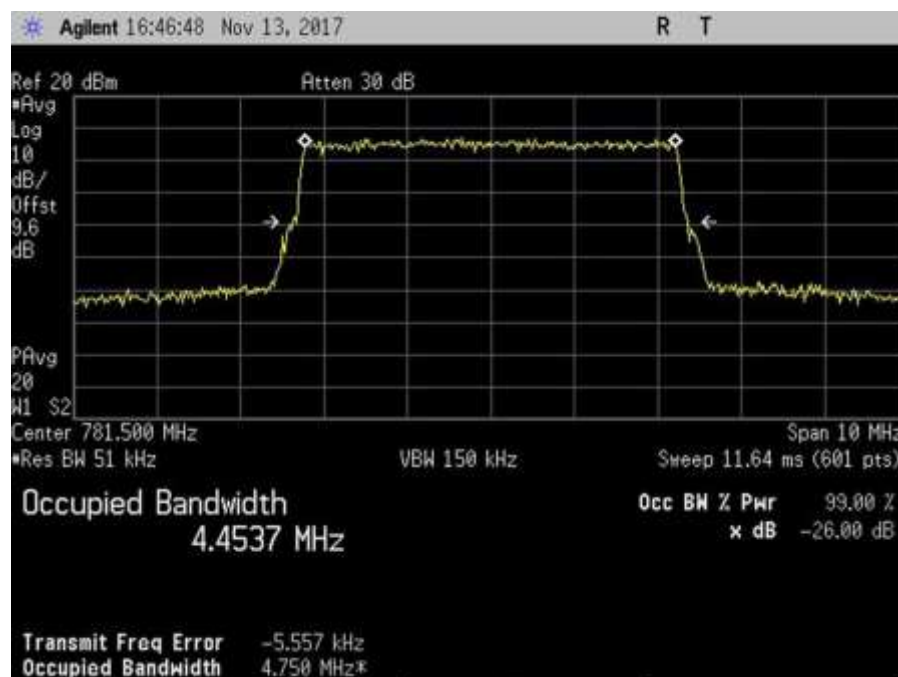
7.10_OBW_UL_698-716MHz_LTE_In



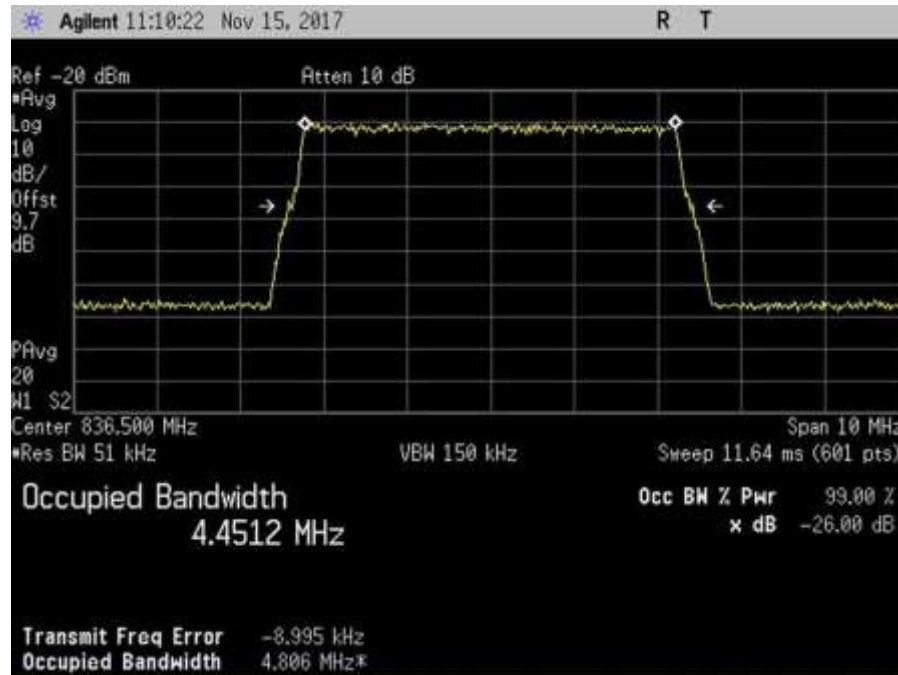
7.10_OBW_UL_698-716MHz_LTE_Out



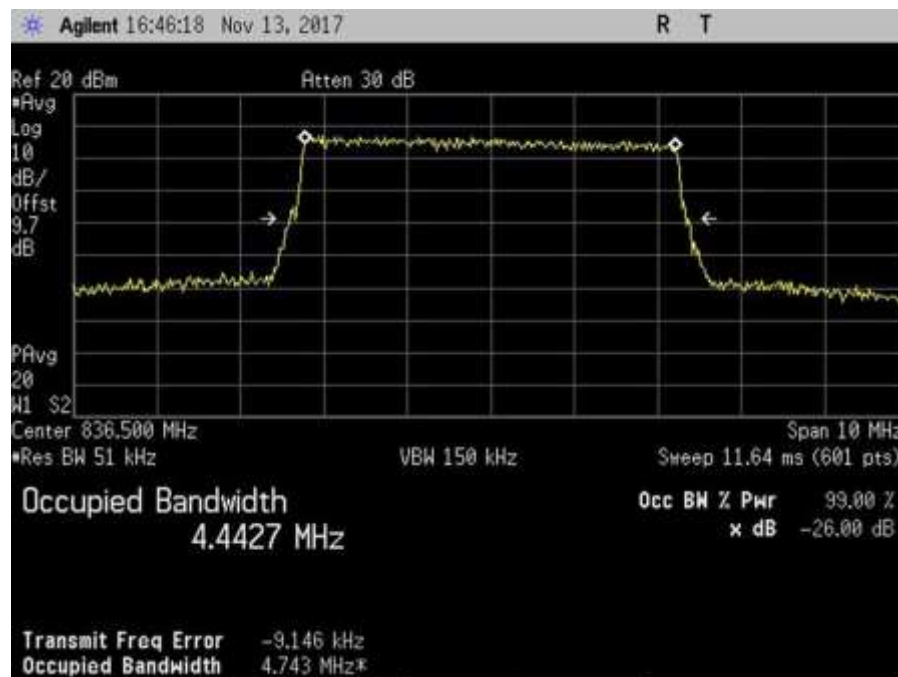
7.10_OBW_UL_776-787MHz_LTE_In



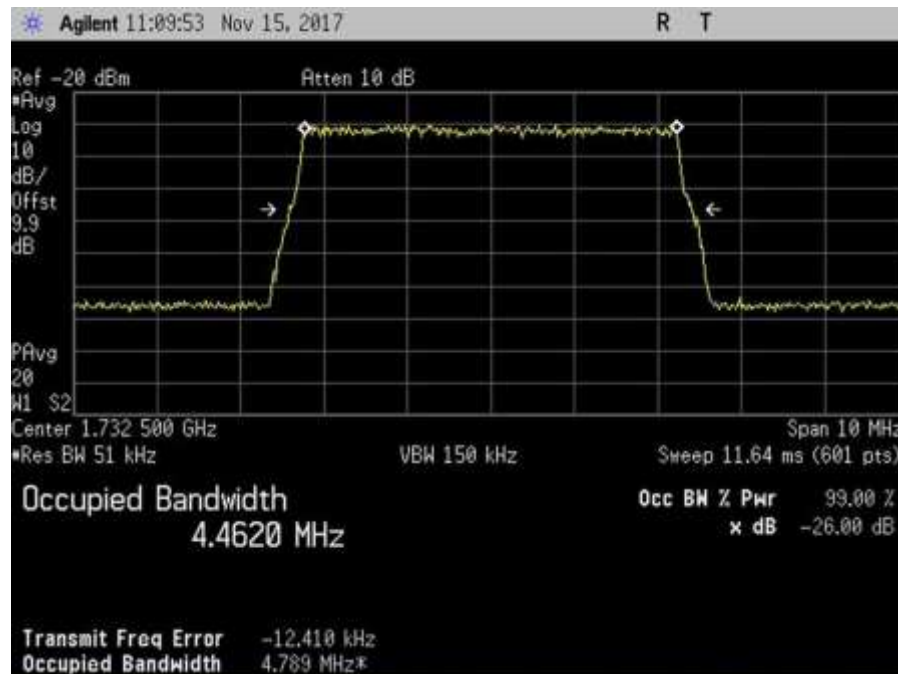
7.10_OBW_UL_776-787MHz_LTE_Out



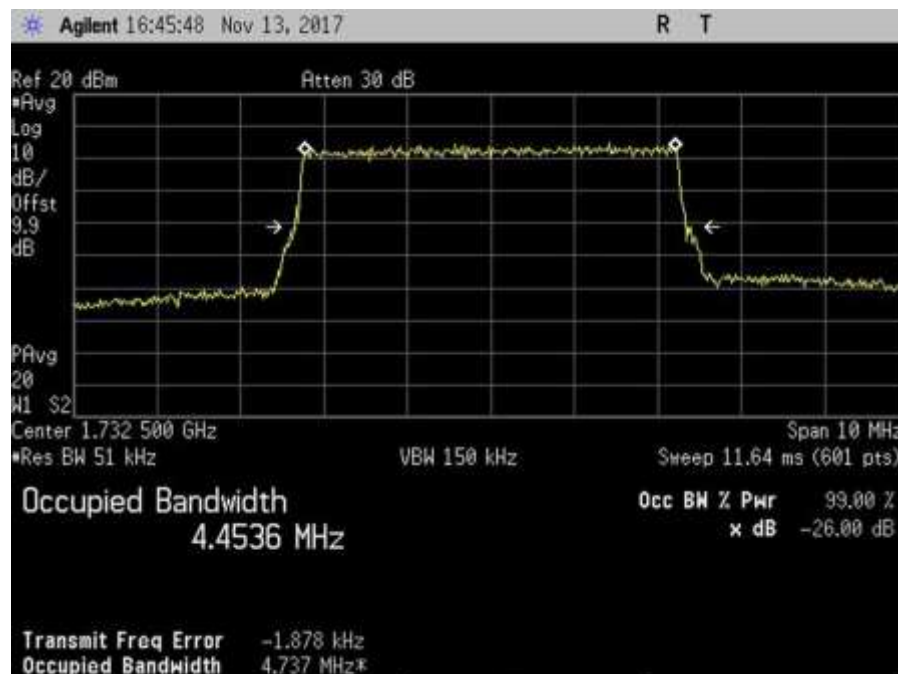
7.10_OBW_UL_824-849MHz_LTE_In



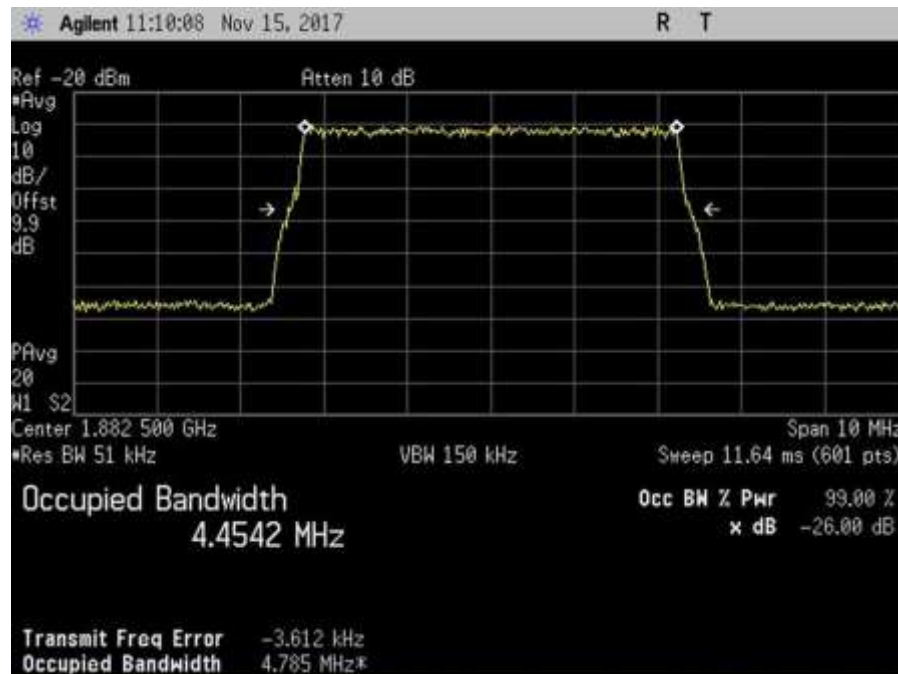
7.10_OBW_UL_824-849MHz_LTE_Out



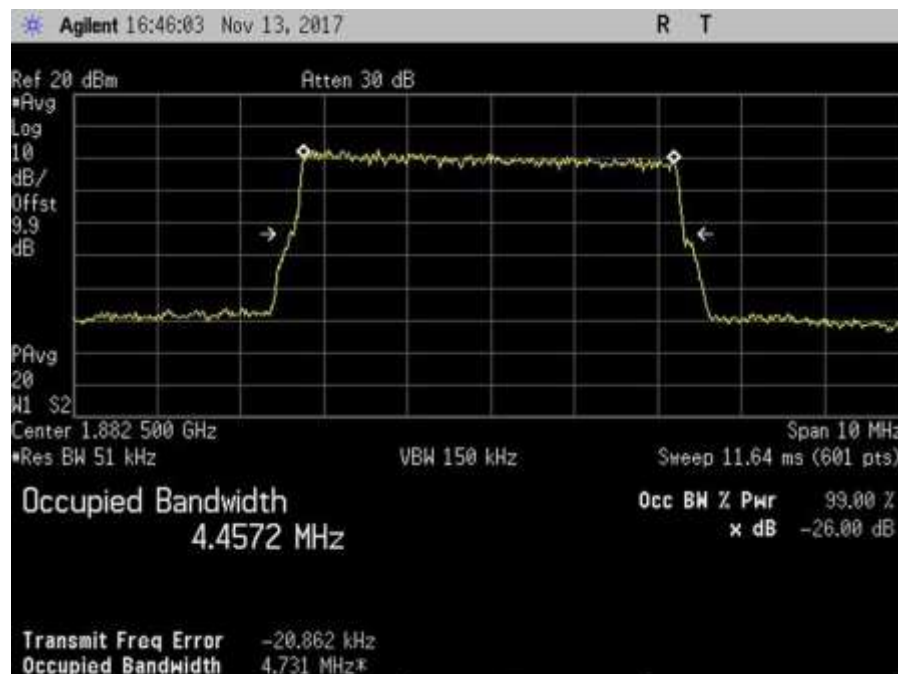
7.10_OBW_UL_1710-1755MHz_LTE_In



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:

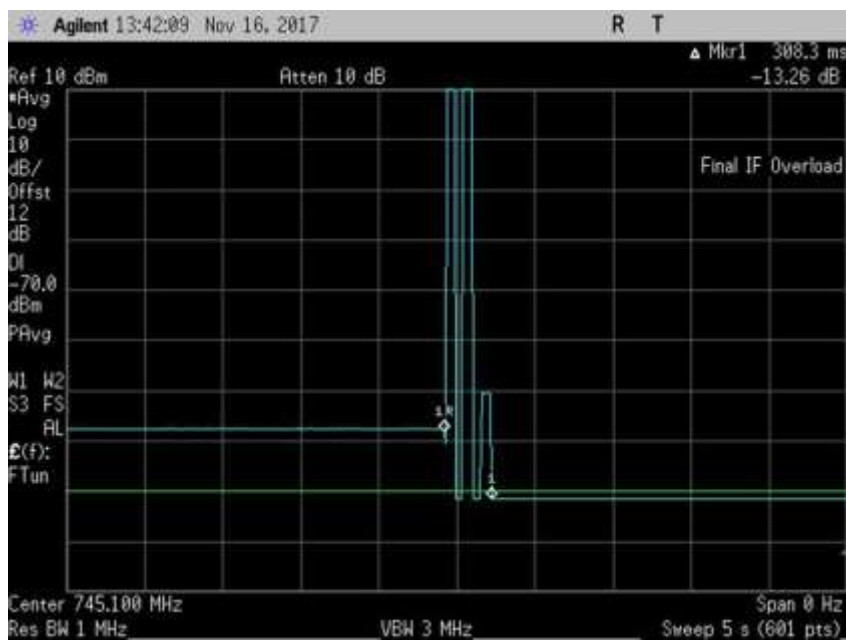
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 196 seconds for the Uplink bands and 200 seconds for the Downlink bands.

** The device shuts down immediately.

7.11.2 Oscillation Restart Tests

Plots

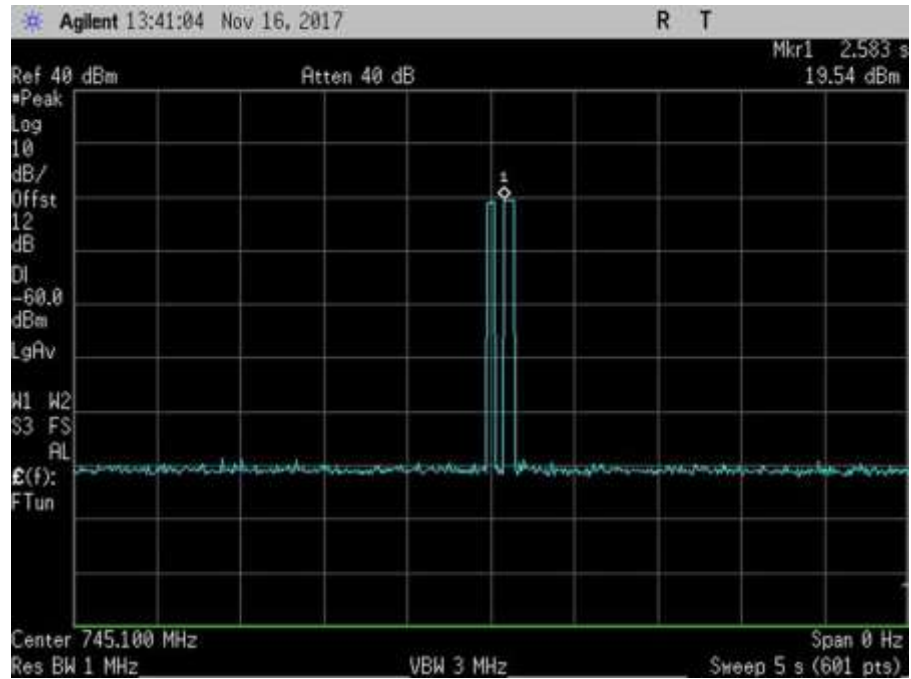
DL



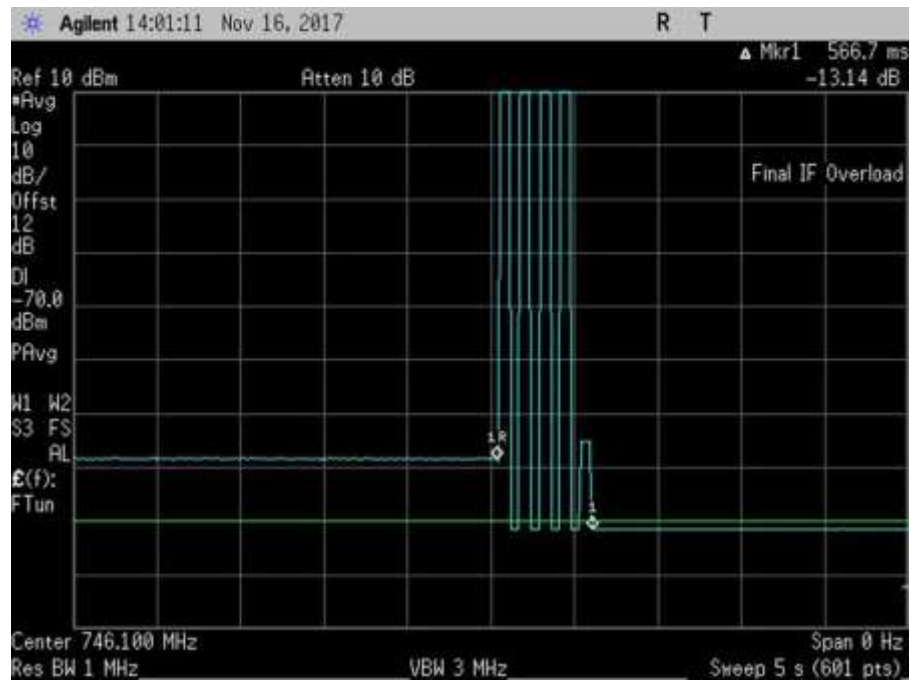
7.11.2_osc_DL_728-746MHz



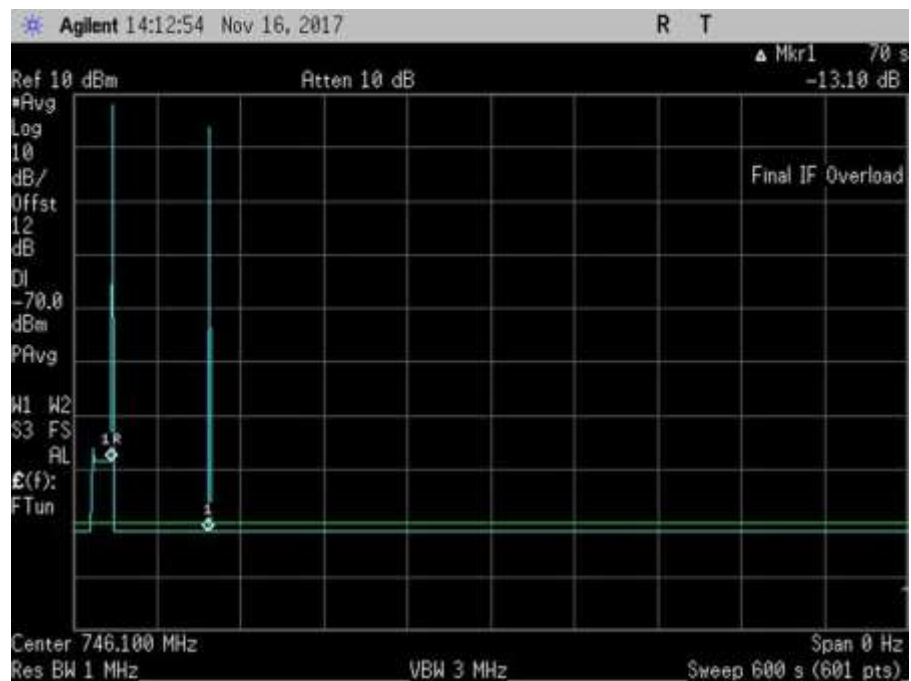
7.11.2_osc_DL_728-746MHz_600sec



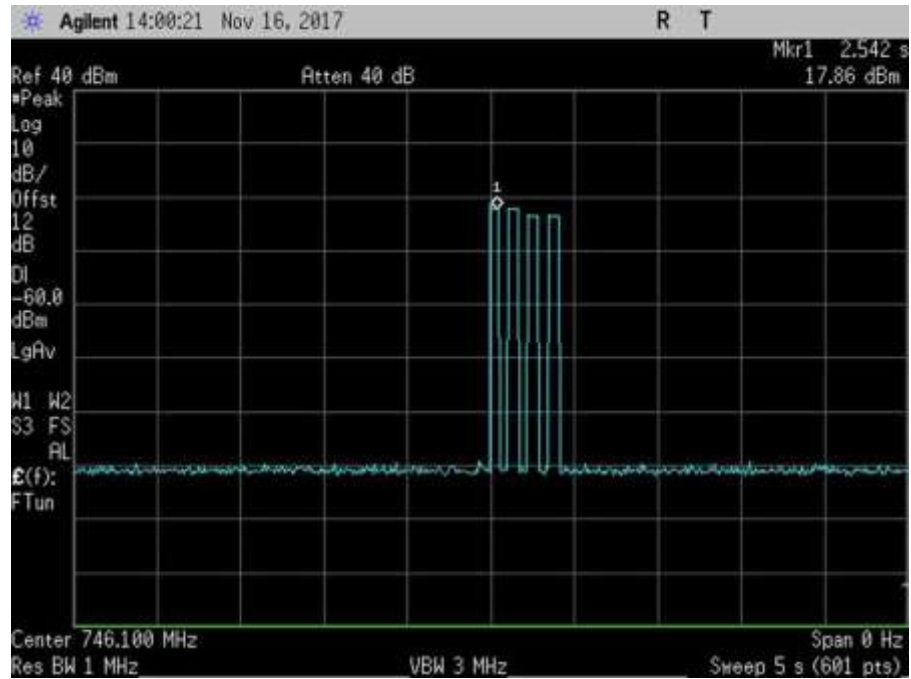
7.11.2_osc_DL_728-746MHz_Pk



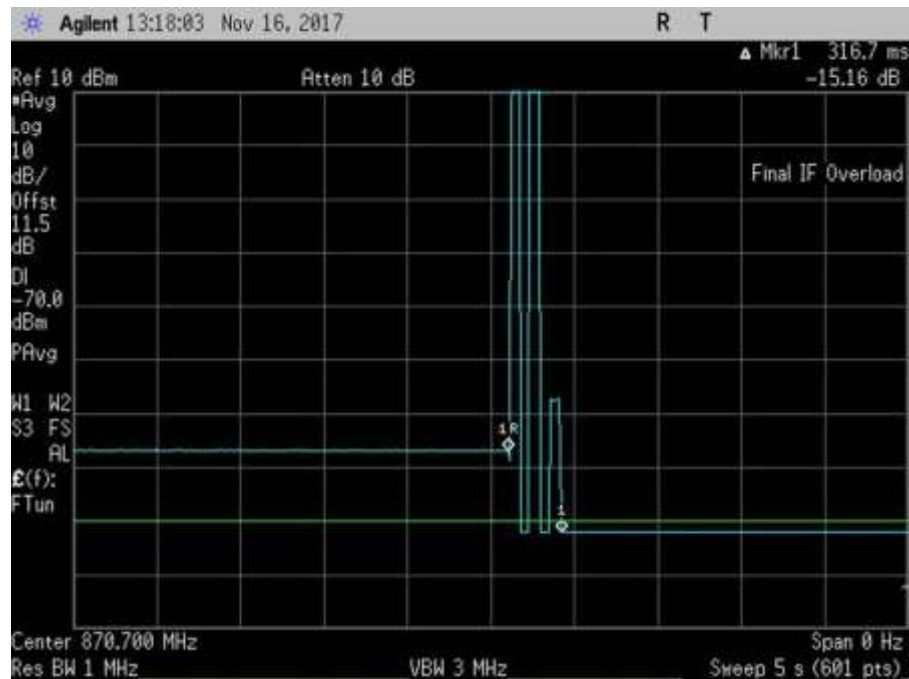
7.11.2_osc_DL_746-757MHz



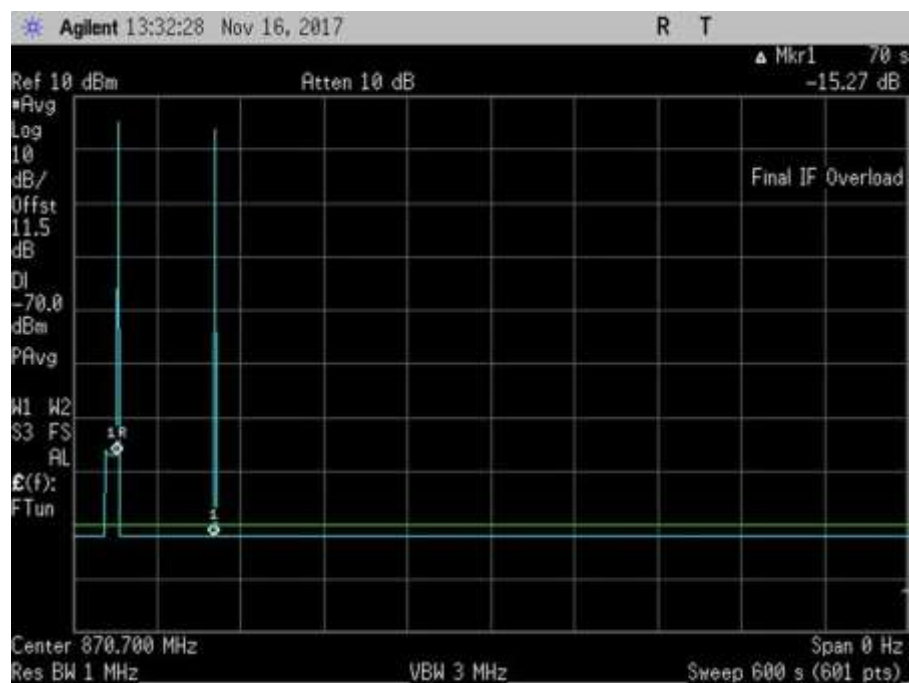
7.11.2_osc_DL_746-757MHz_600sec



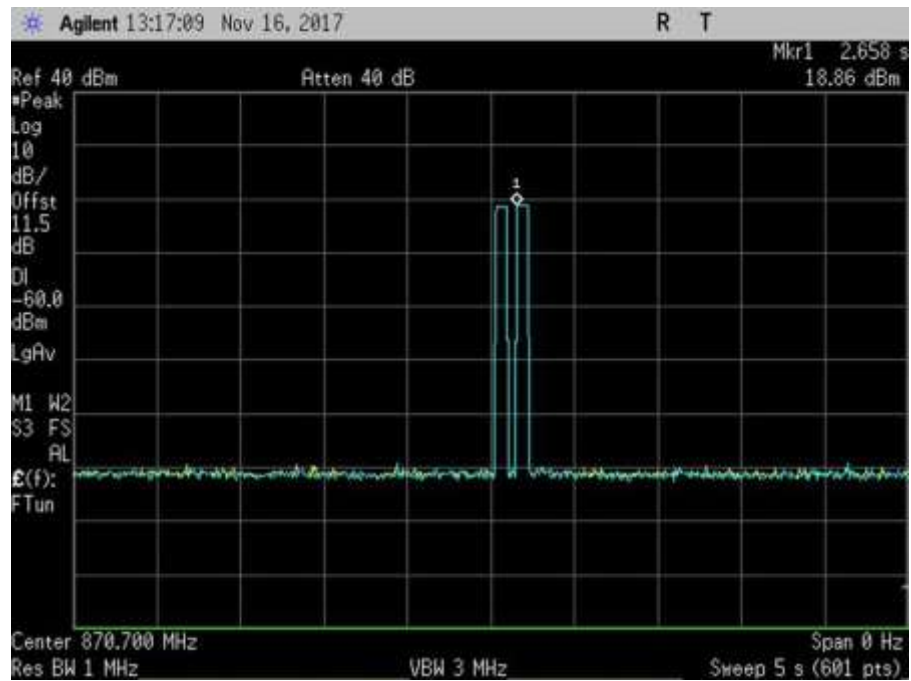
7.11.2_osc_DL_746-757MHz_Pk



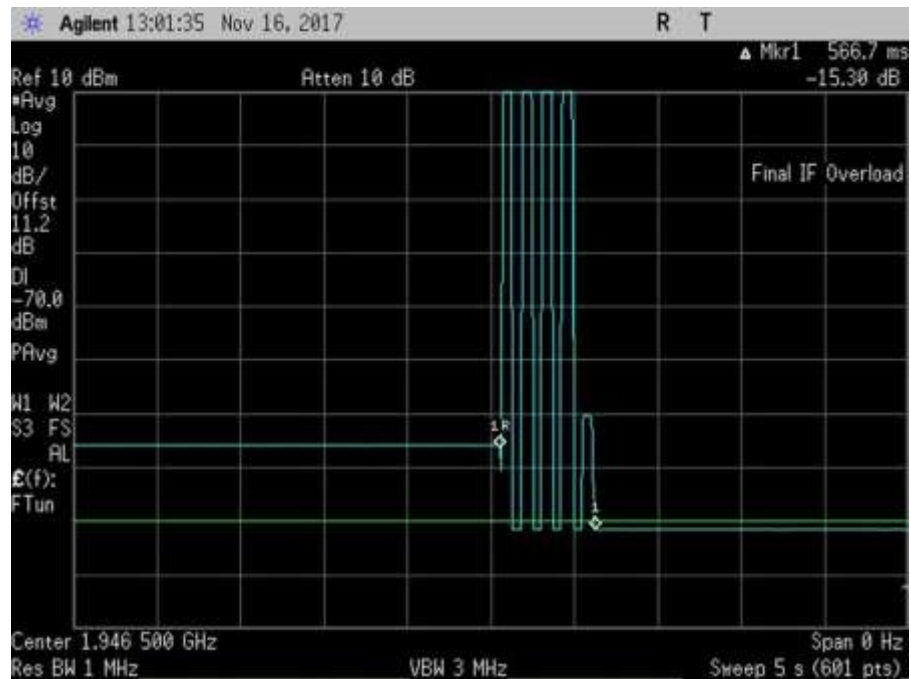
7.11.2_osc_DL_869-894MHz



7.11.2_osc_DL_869-894MHz_600sec



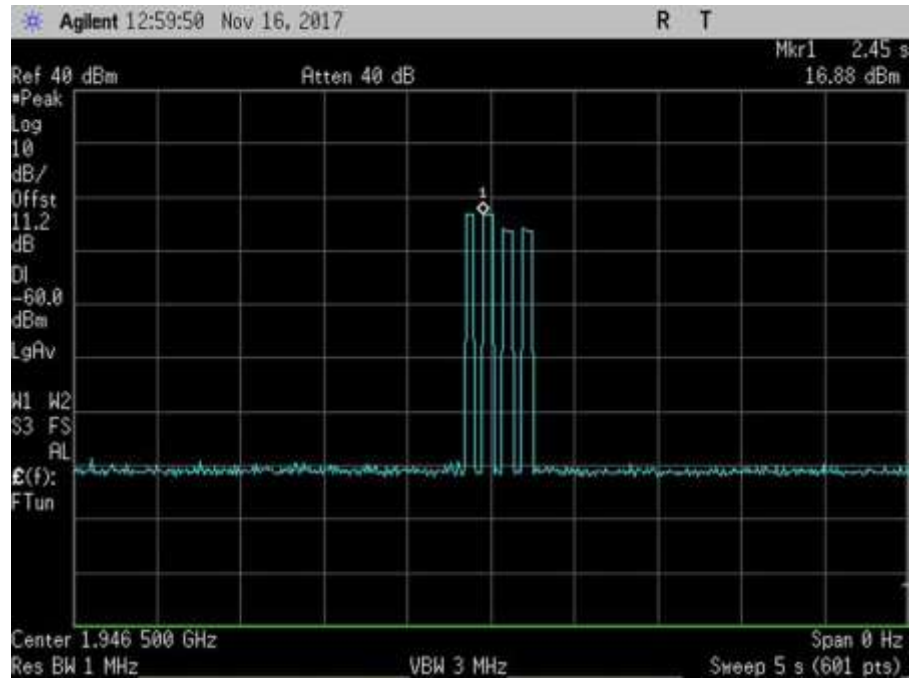
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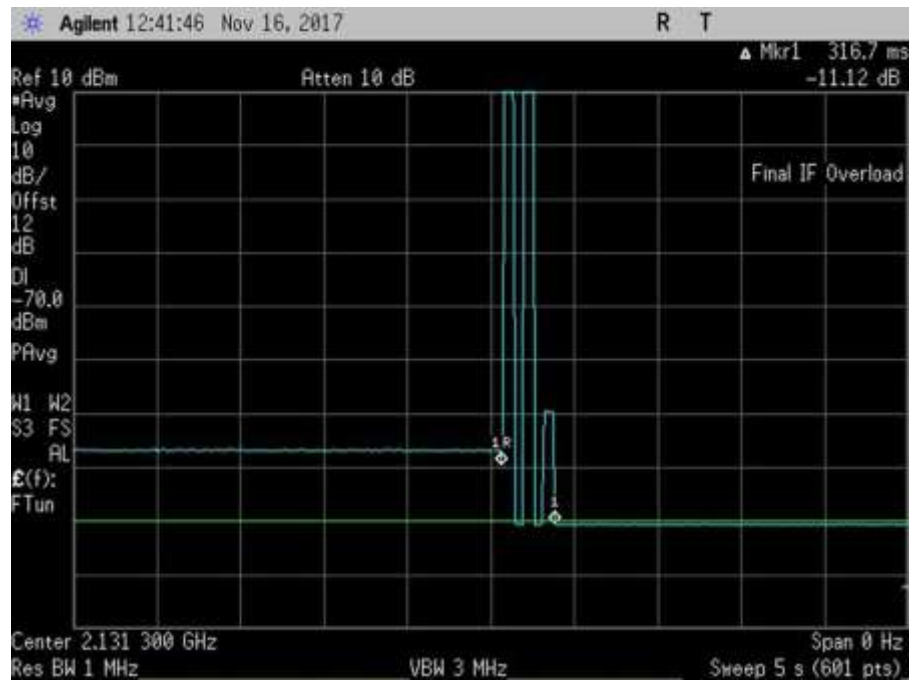
7.11.2_osc_DL_1930-1995MHz



7.11.2_osc_DL_1930-1995MHz_600sec



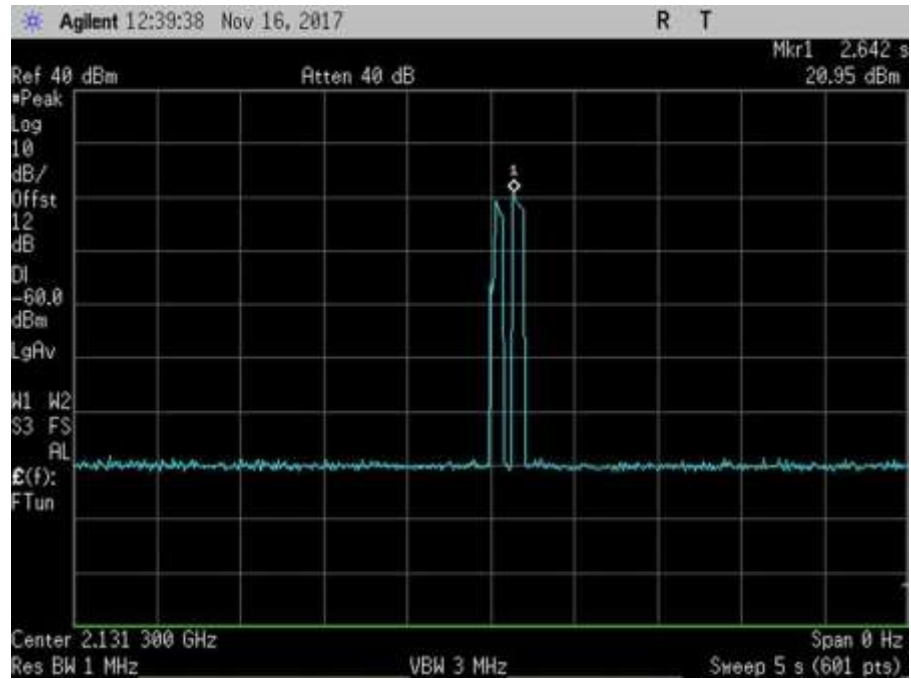
7.11.2_osc_DL_1930-1995MHz_Pk



7.11.2_osc_DL_2110-2155MHz

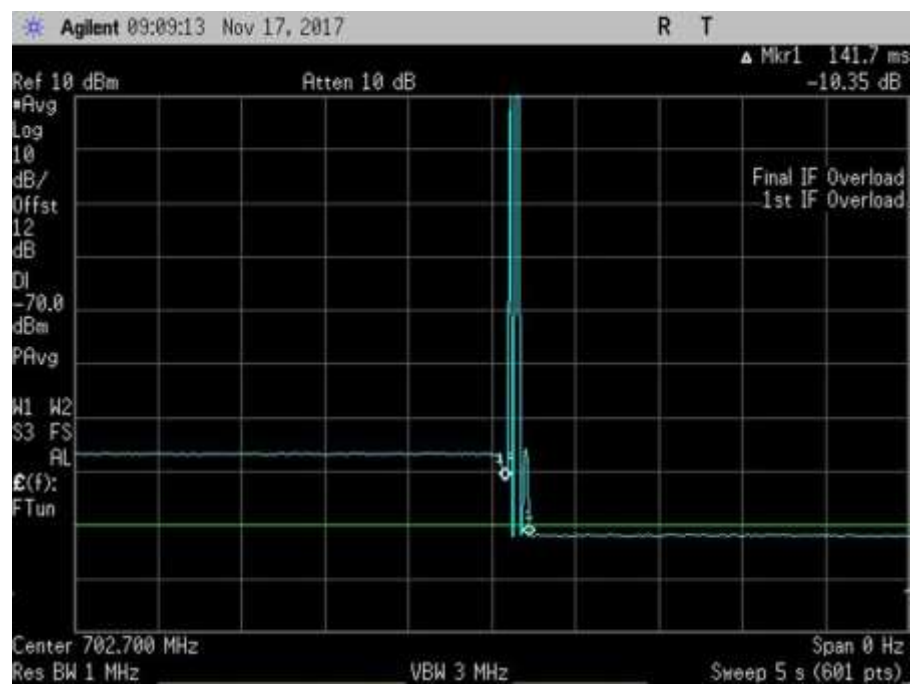


7.11.2_osc_DL_2110-2155MHz_600sec

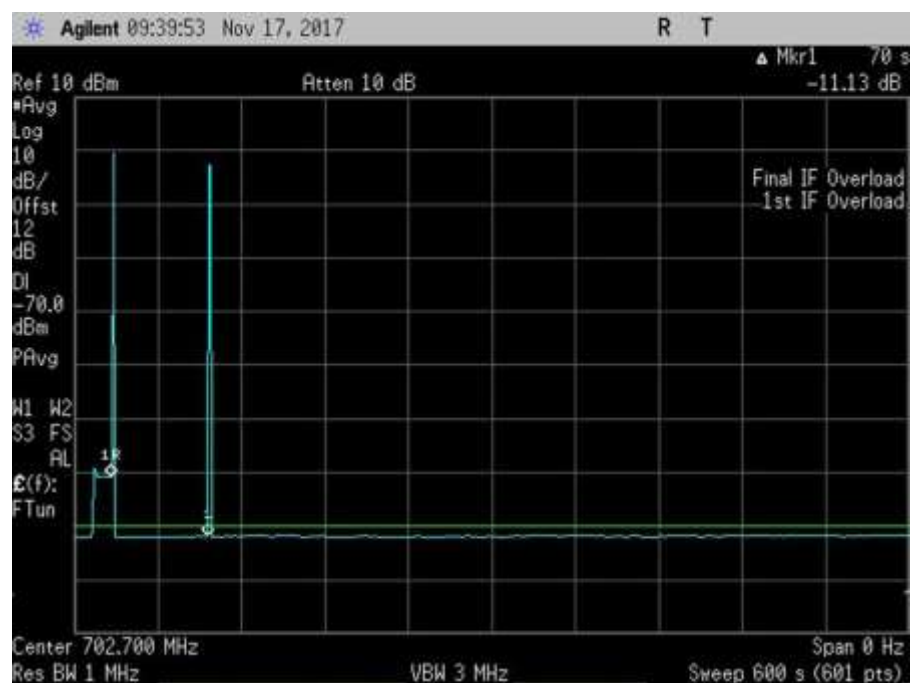


7.11.2_osc_DL_2110-2155MHz_Pk

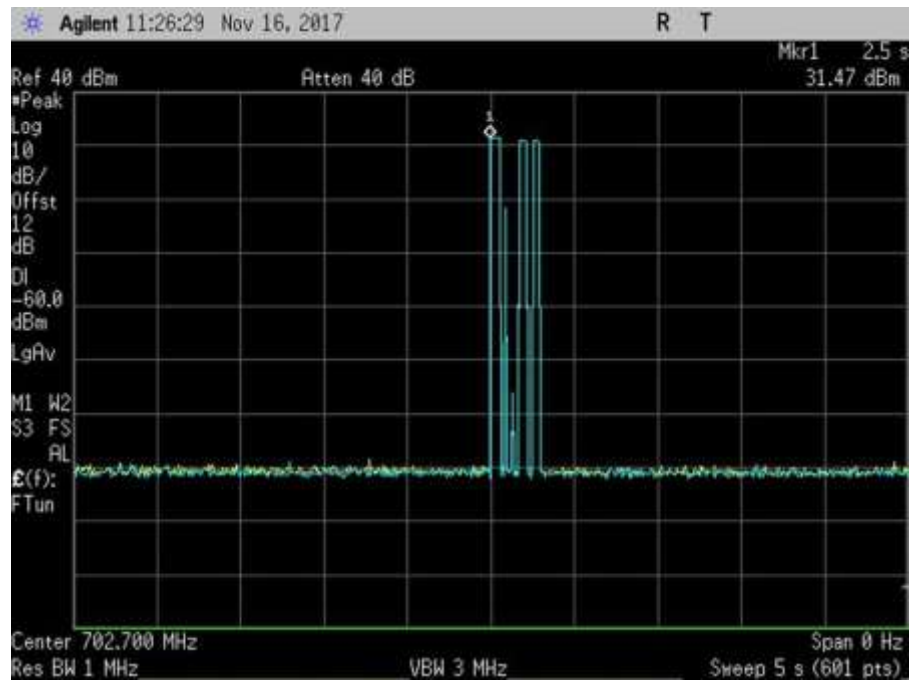
UL



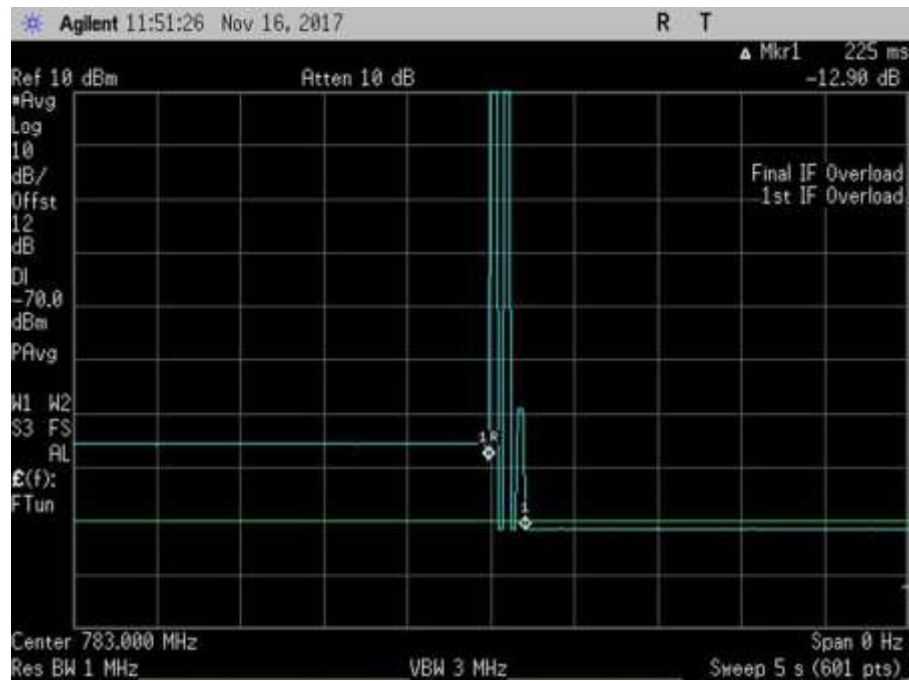
7.11.2_osc_UL_698-716MHz



7.11.2_osc_UL_698-716MHz_600sec



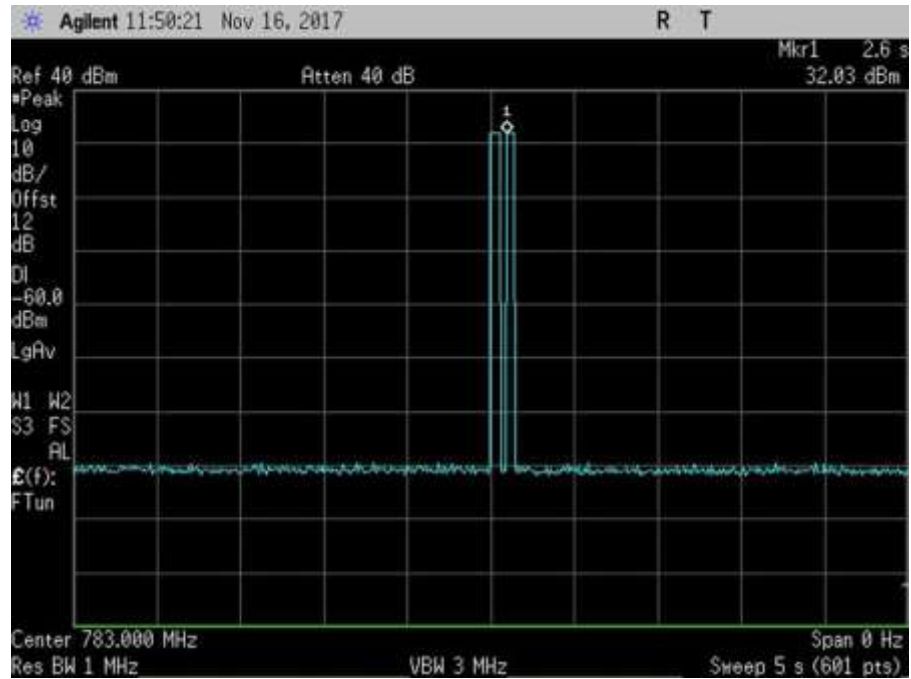
7.11.2_osc_UL_698-716MHz_Pk



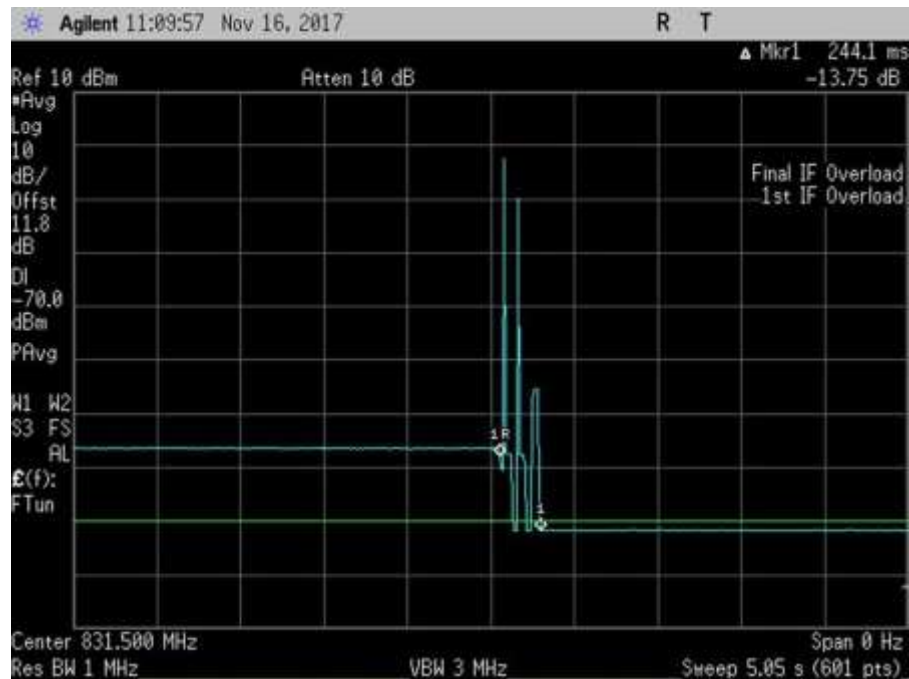
7.11.2_osc_UL_776-787MHz



7.11.2_osc_UL_776-787MHz_600sec



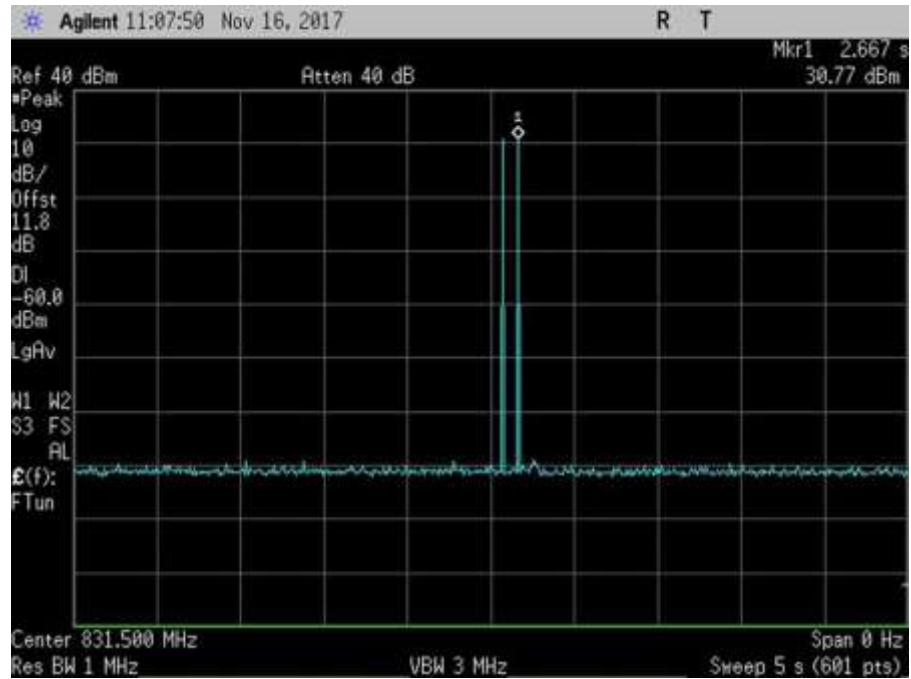
7.11.2_osc_UL_776-787MHz_Pk



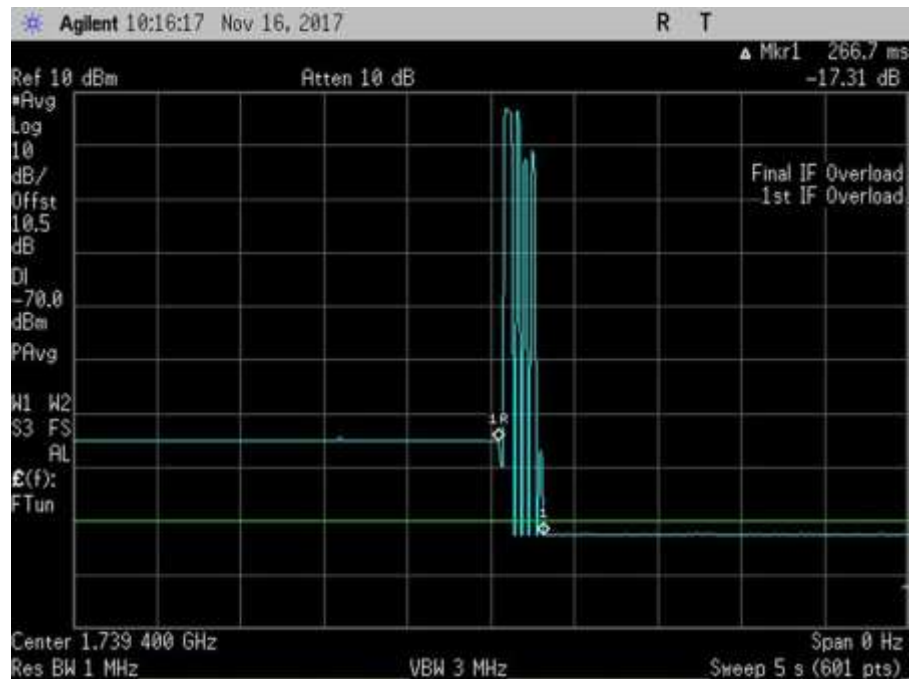
7.11.2_osc_UL_824-849MHz



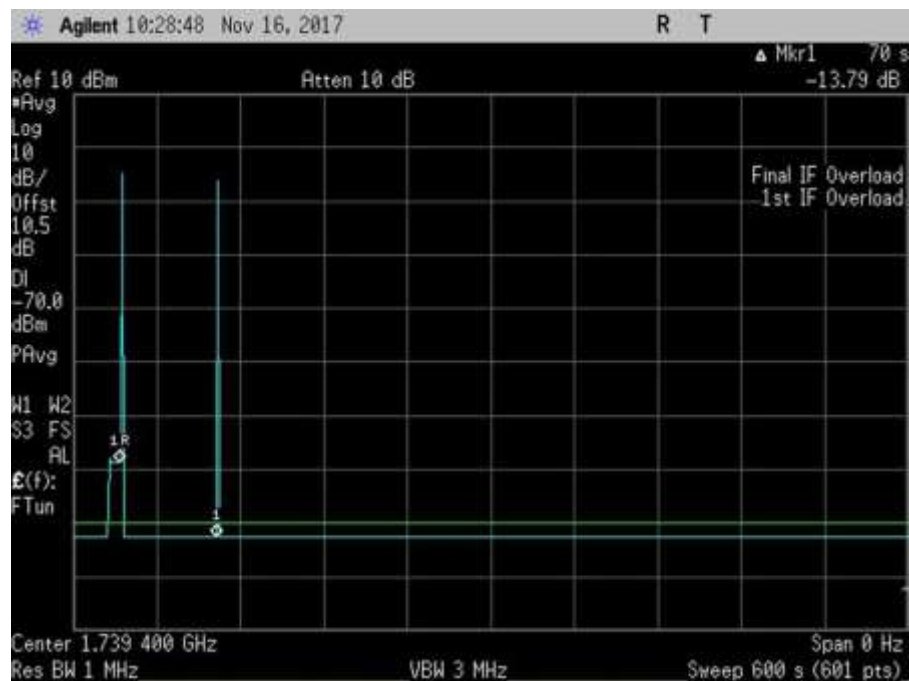
7.11.2_osc_UL_824-849MHz_600sec



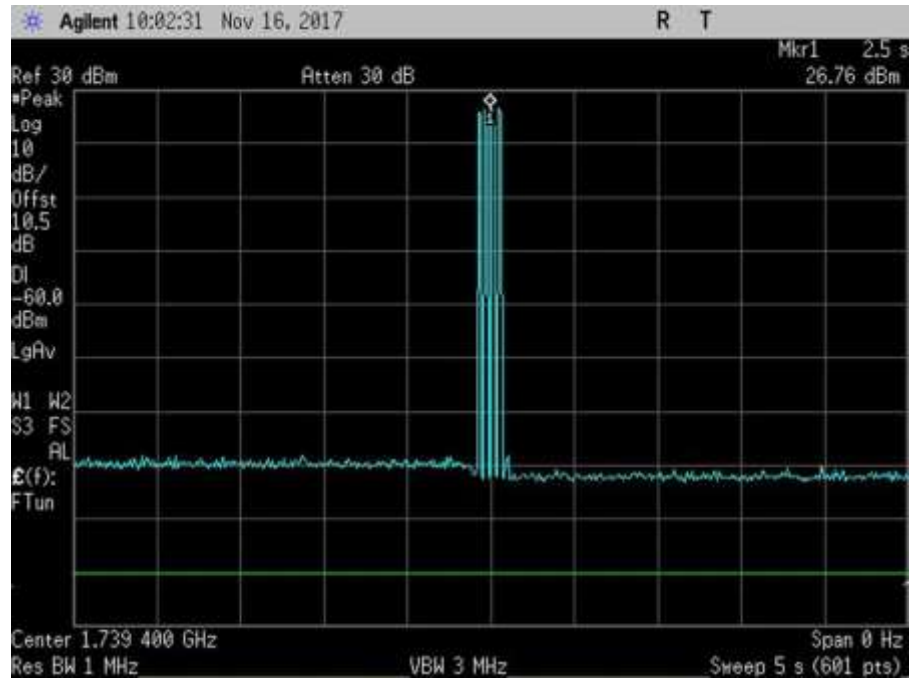
7.11.2_osc_UL_824-849MHz_Pk



7.11.2_osc_UL_1710-1755MHz



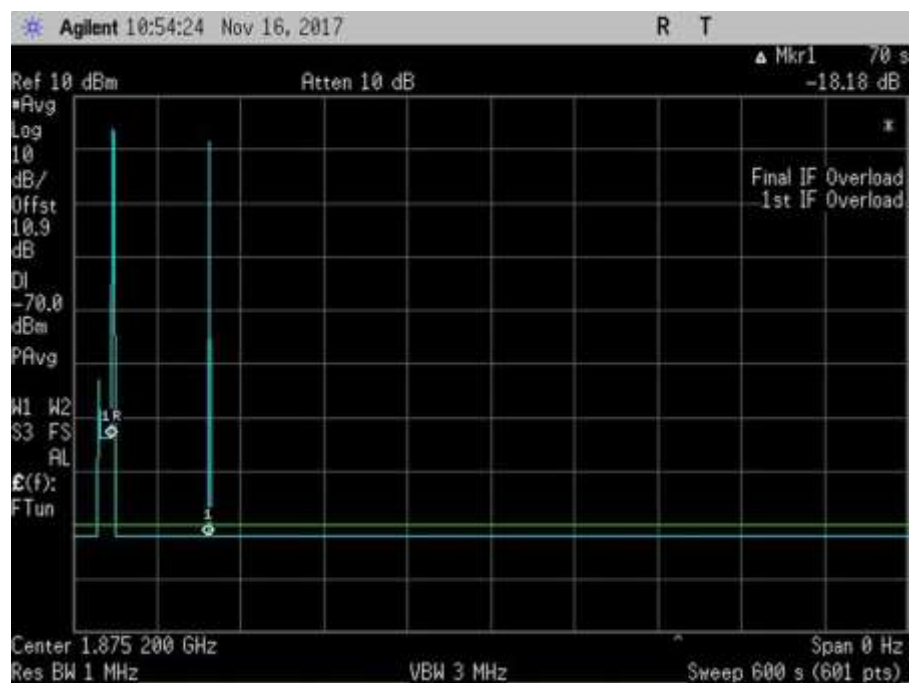
7.11.2_osc_UL_1710-1755MHz_600sec



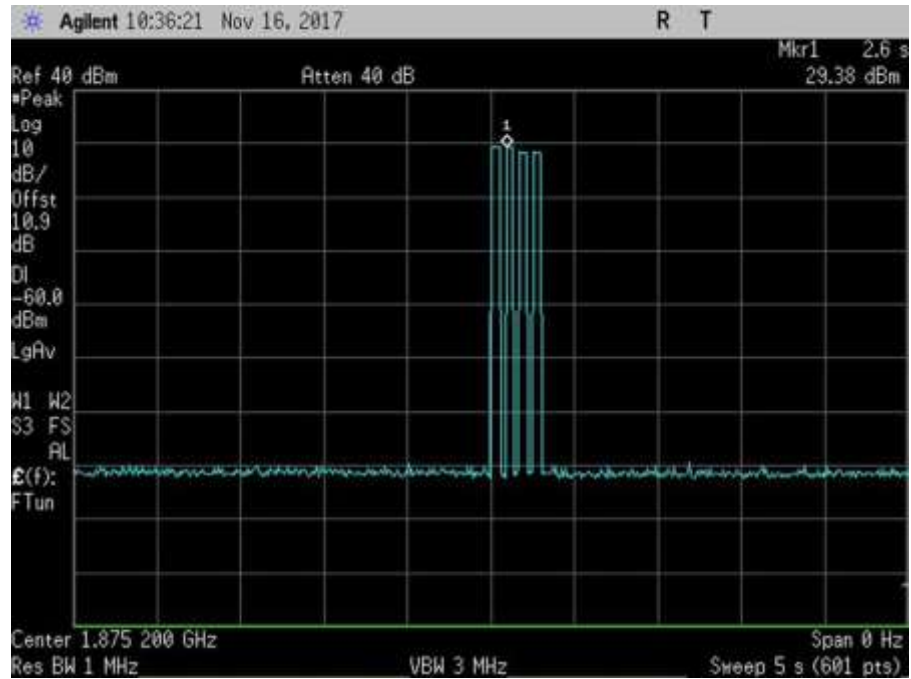
7.11.2_osc_UL_1710-1755MHz_Pk



7.11.2_osc_UL_1850-1915MHz



7.11.2_osc_UL_1850-1915MHz_600sec

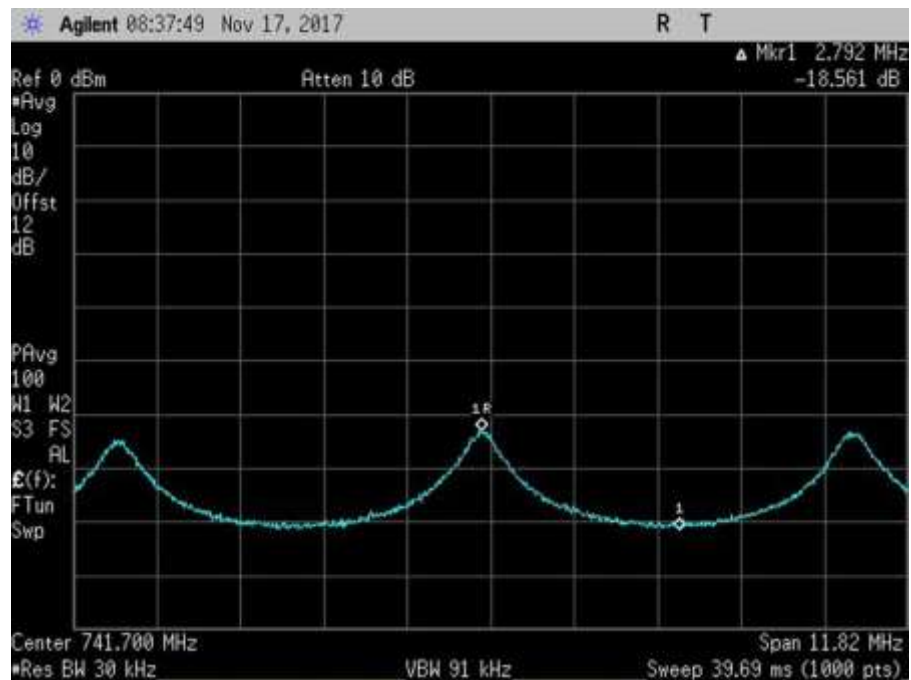


7.11.2_osc_UL_1850-1915MHz_Pk

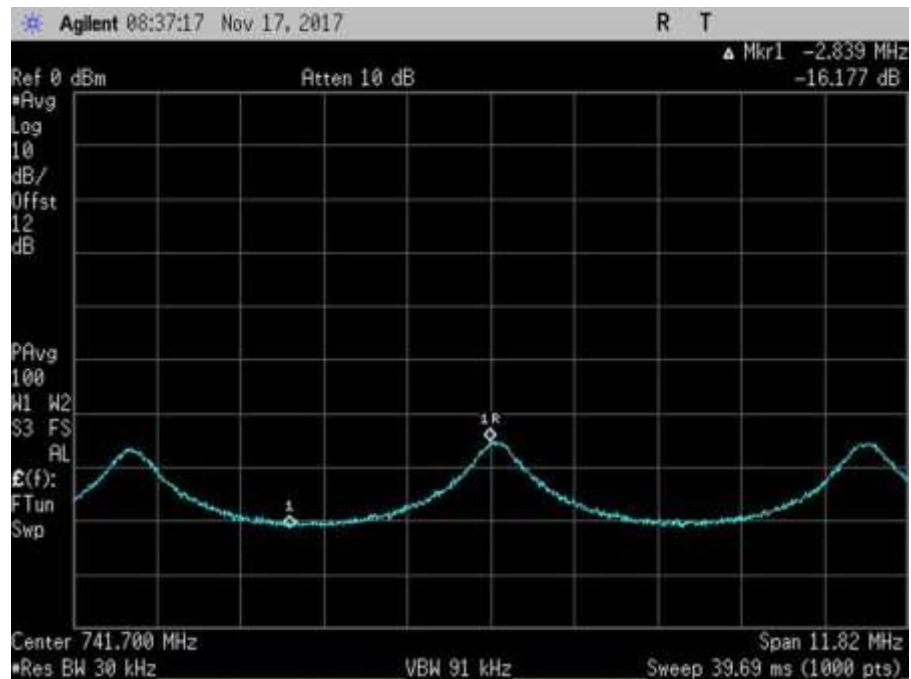
7.11.3 Measuring Oscillation Mitigation or Shutdown

Plots

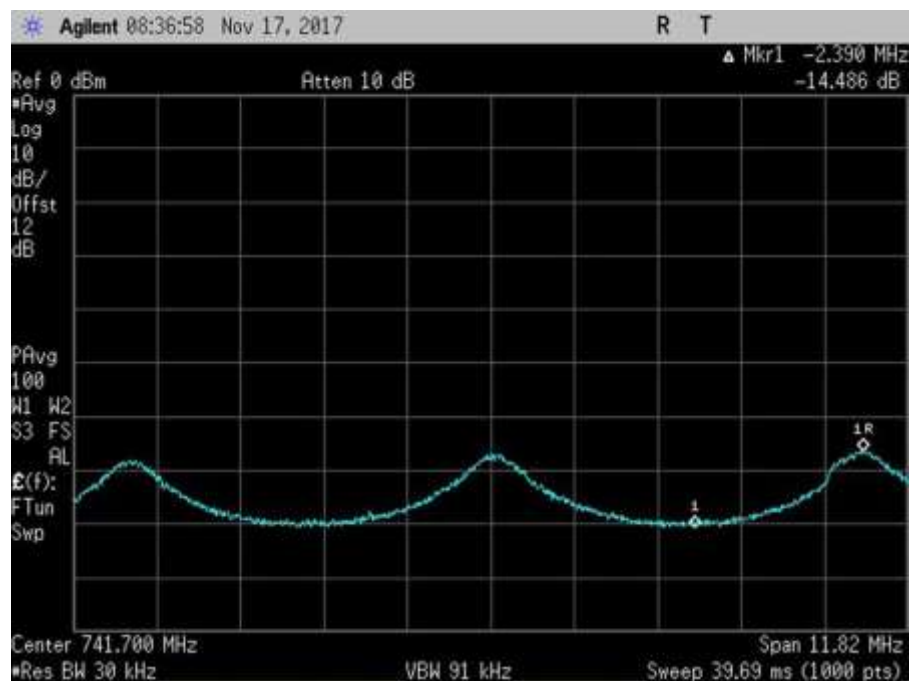
DL



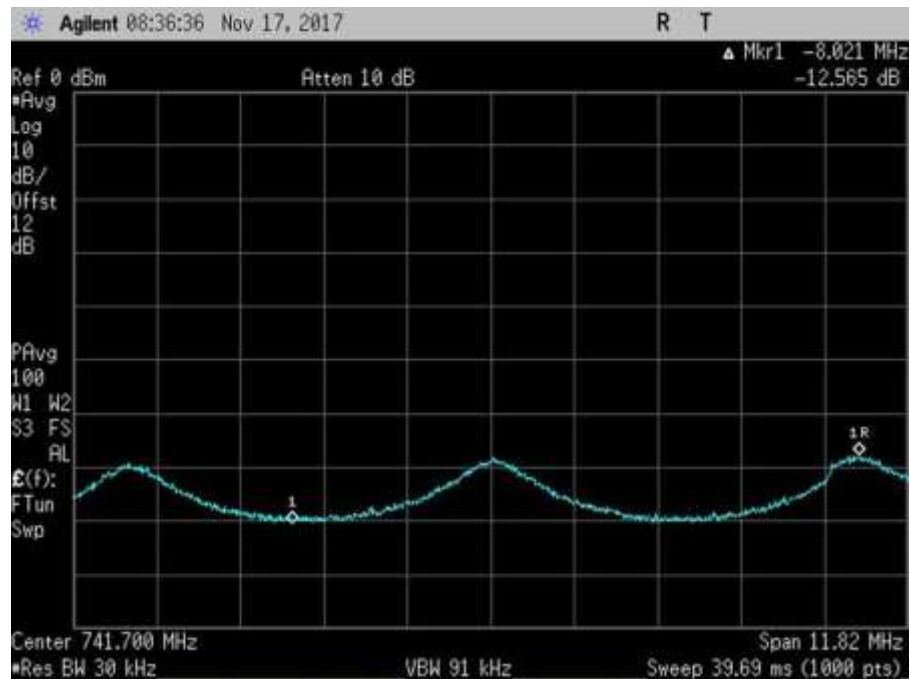
7.11.3_Osc_DL_728-746MHz+0_AWGNL



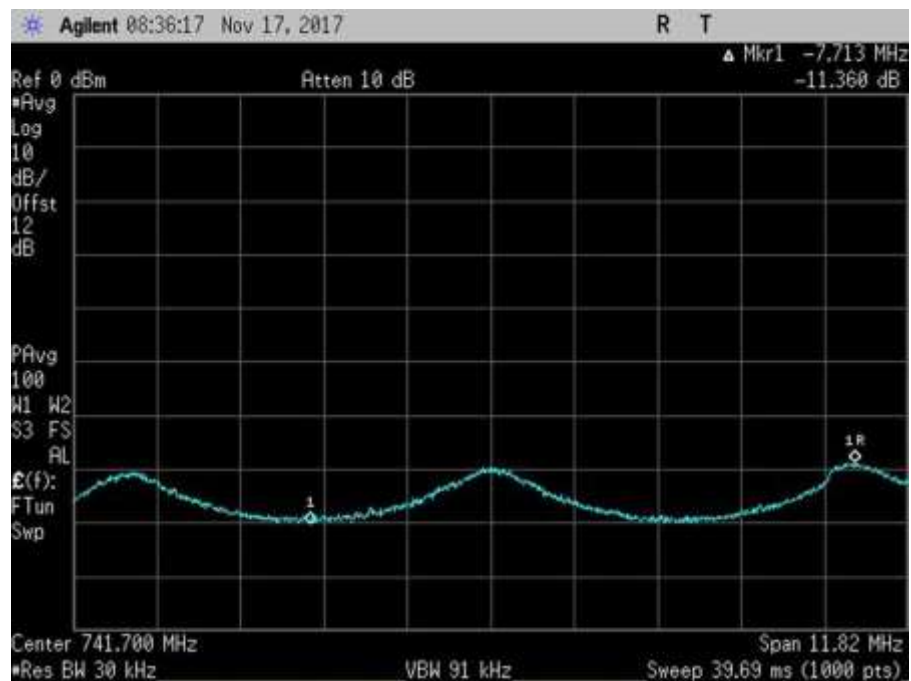
7.11.3_Osc_DL_728-746MHz+1_AWGNL



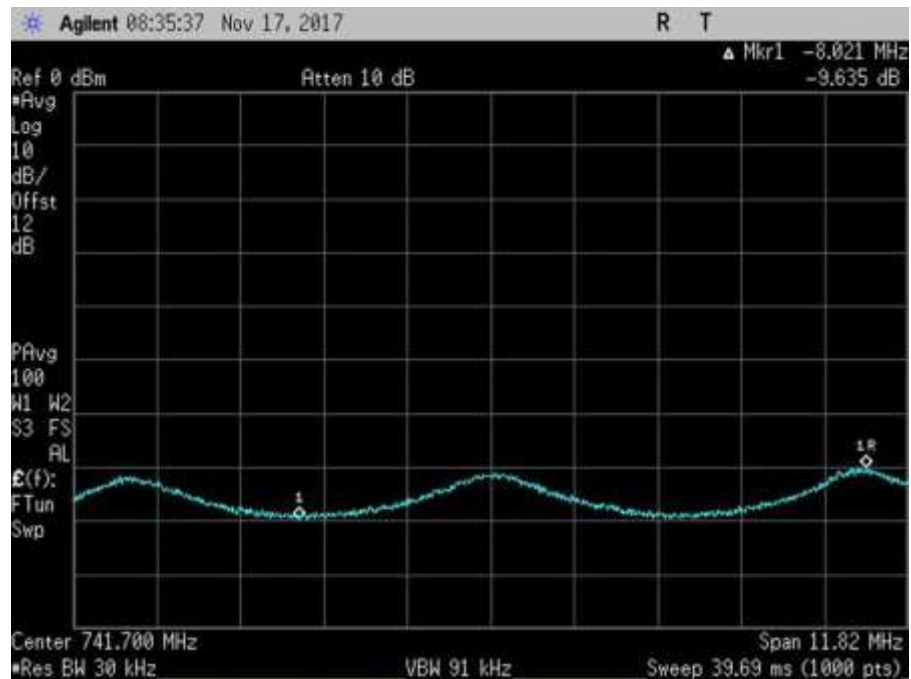
7.11.3_Osc_DL_728-746MHz+2_AWGNL



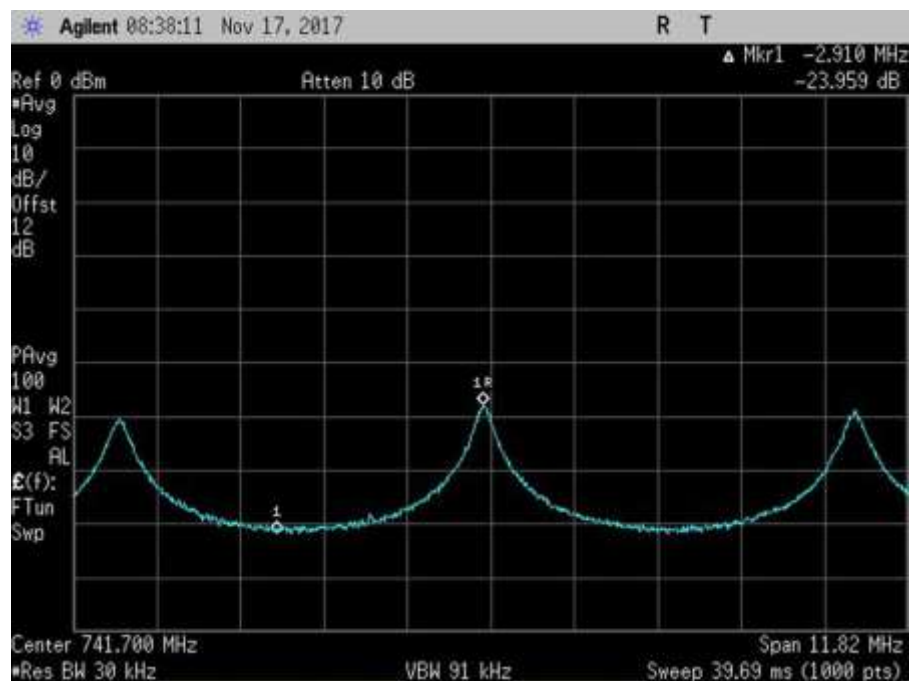
7.11.3_Osc_DL_728-746MHz+3_AWGNL



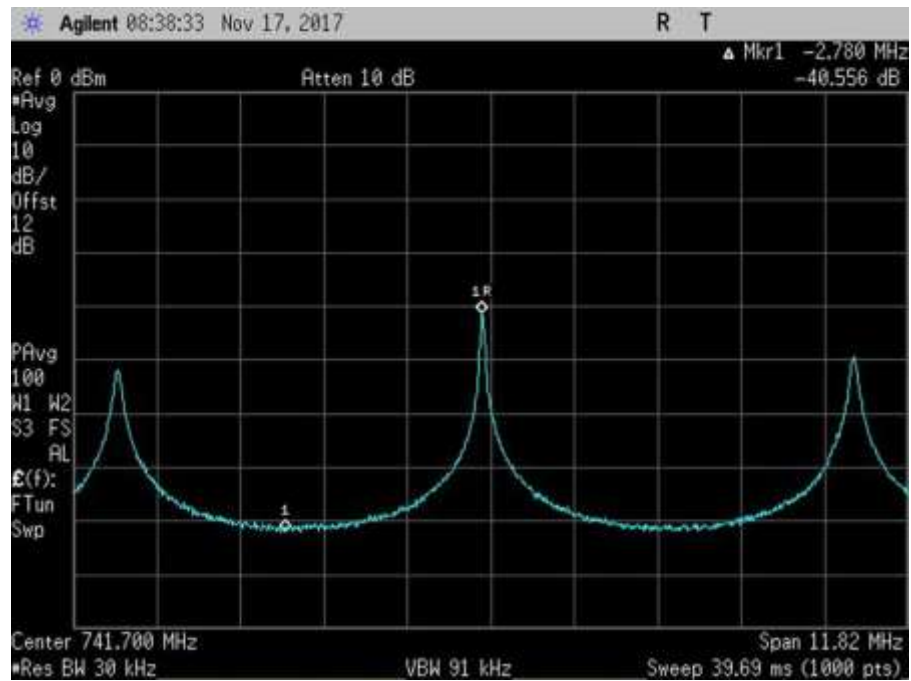
7.11.3_Osc_DL_728-746MHz+4_AWGNL



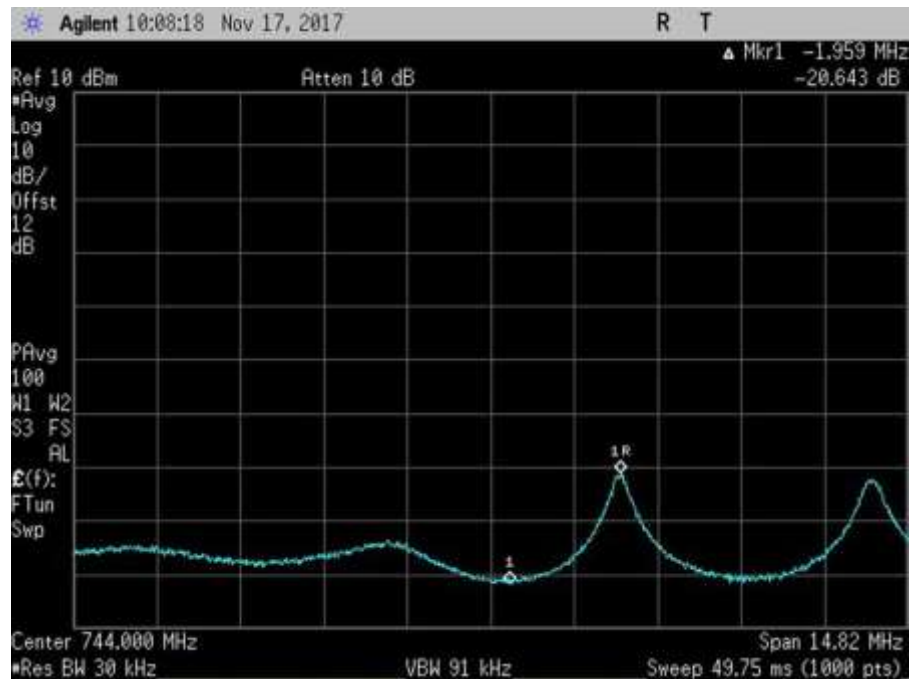
7.11.3_Osc_DL_728-746MHz+5_AWGNL



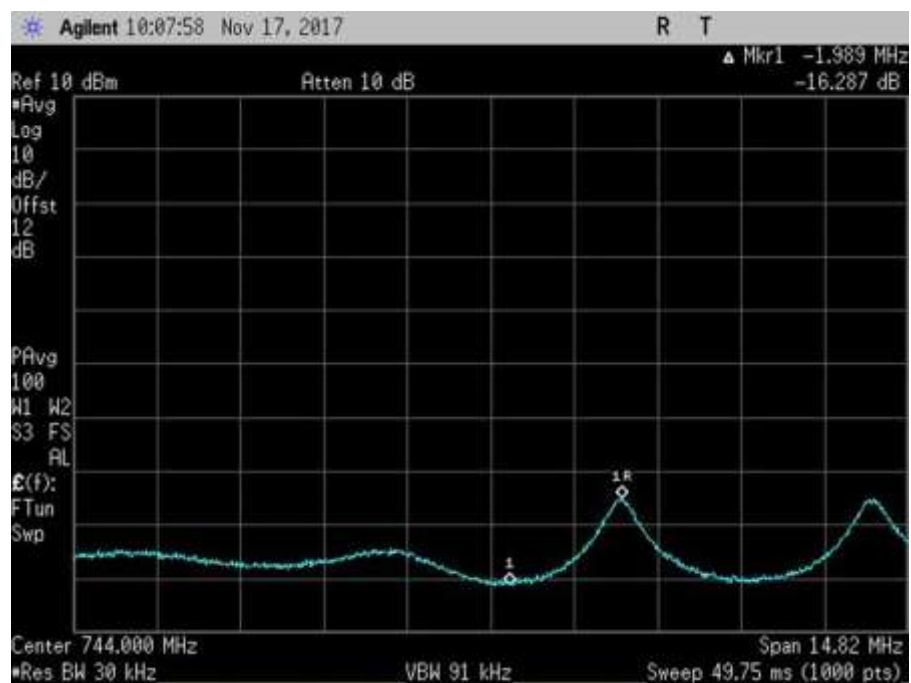
7.11.3_Osc_DL_728-746MHz-1_AWGNL



7.11.3_Osc_DL_728-746MHz-2_AWGNL



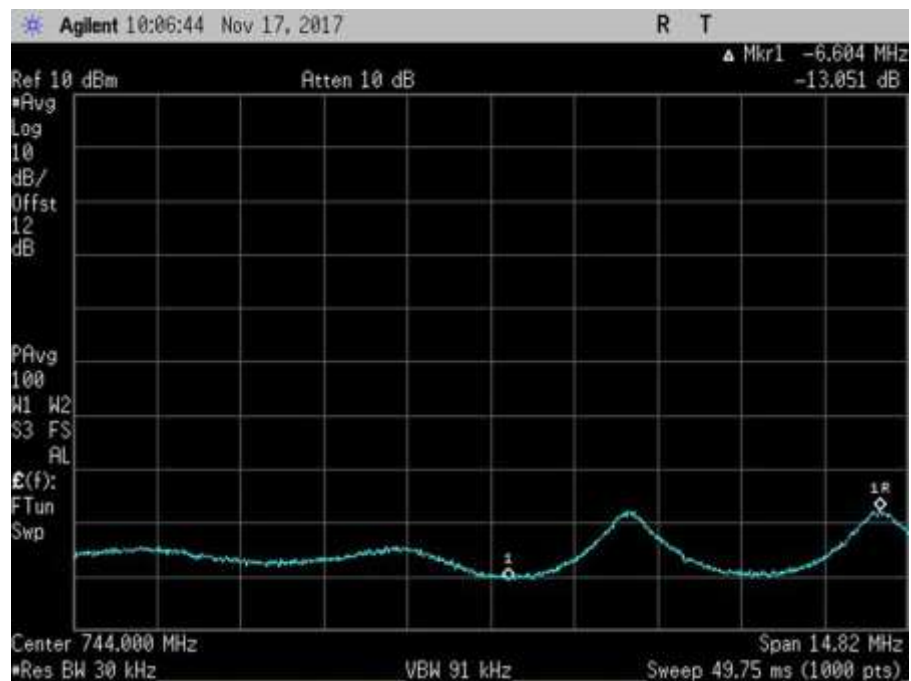
7.11.3_Osc_DL_746-757MHz+0_AWGNR



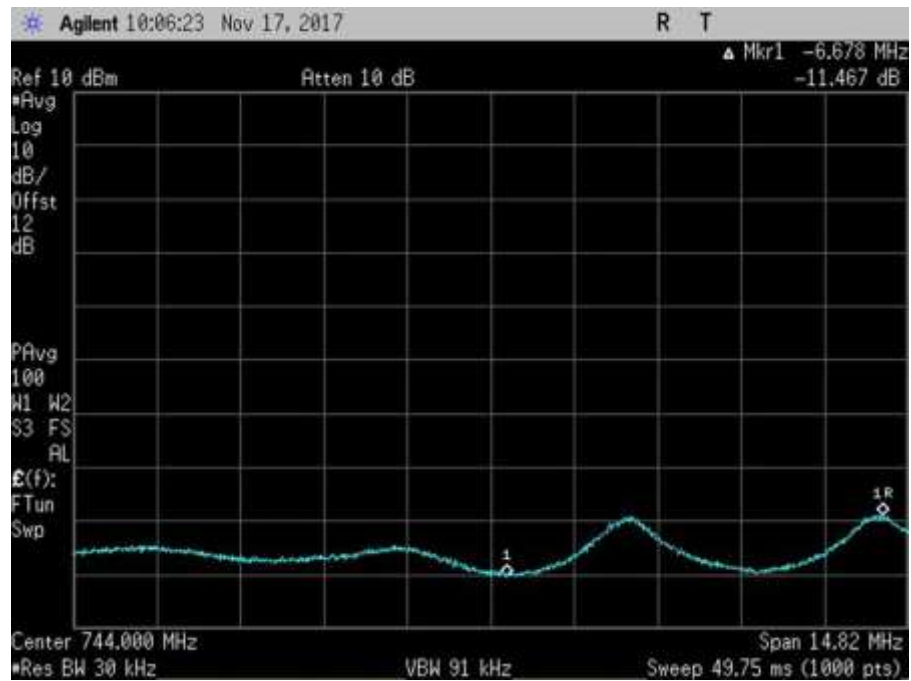
7.11.3_Osc_DL_746-757MHz+1_AWGNR



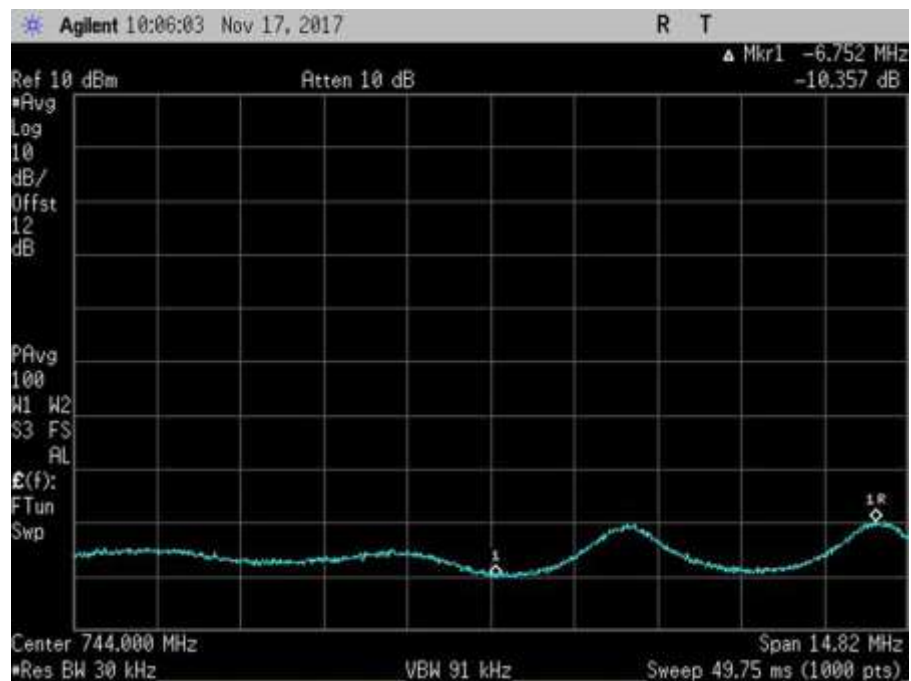
7.11.3_Osc_DL_746-757MHz+2_AWGNR



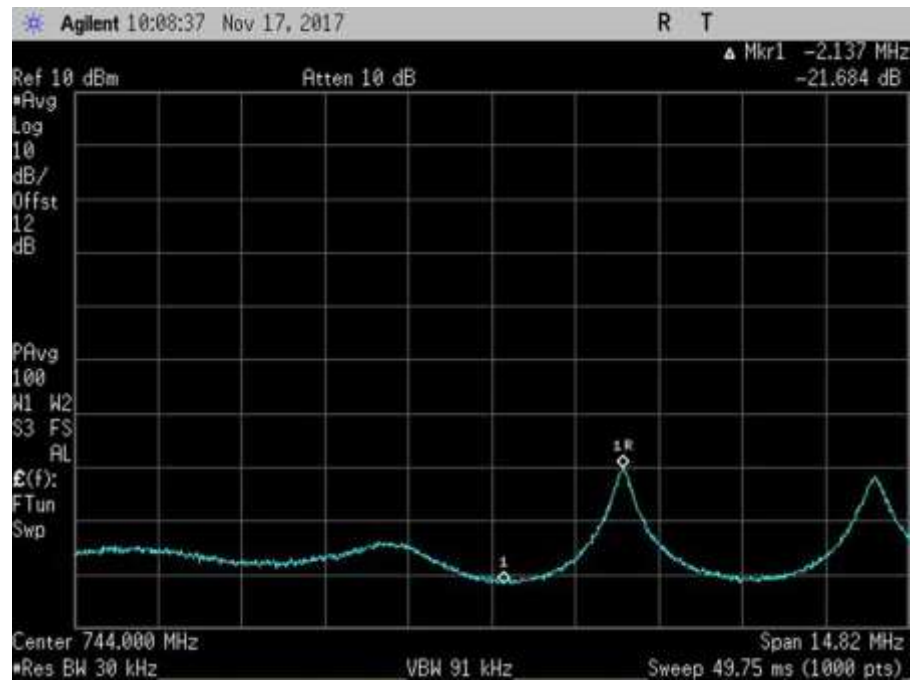
7.11.3_Osc_DL_746-757MHz+3_AWGNR



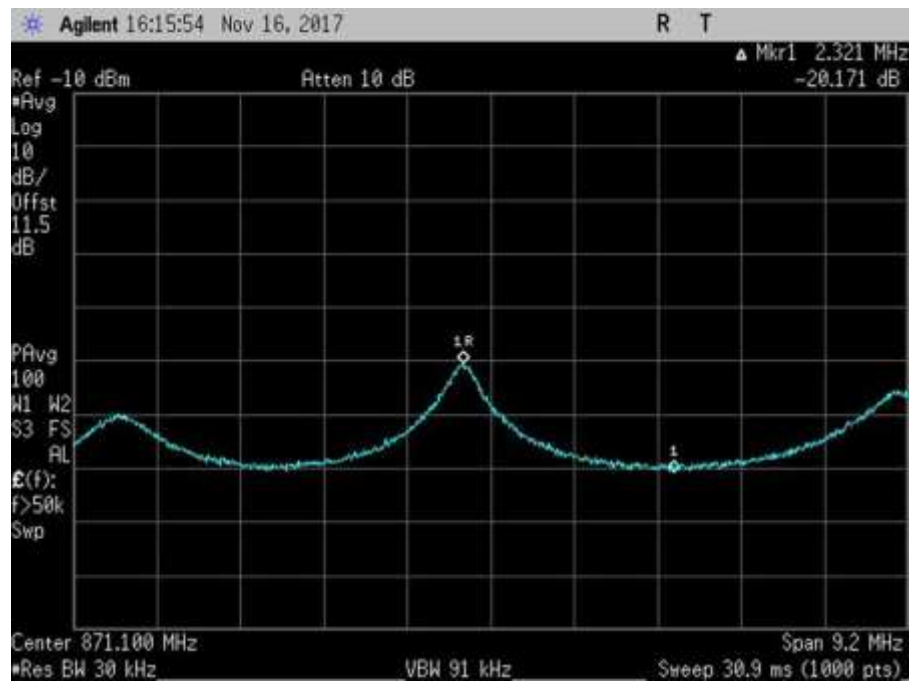
7.11.3_Osc_DL_746-757MHz+4_AWGNR



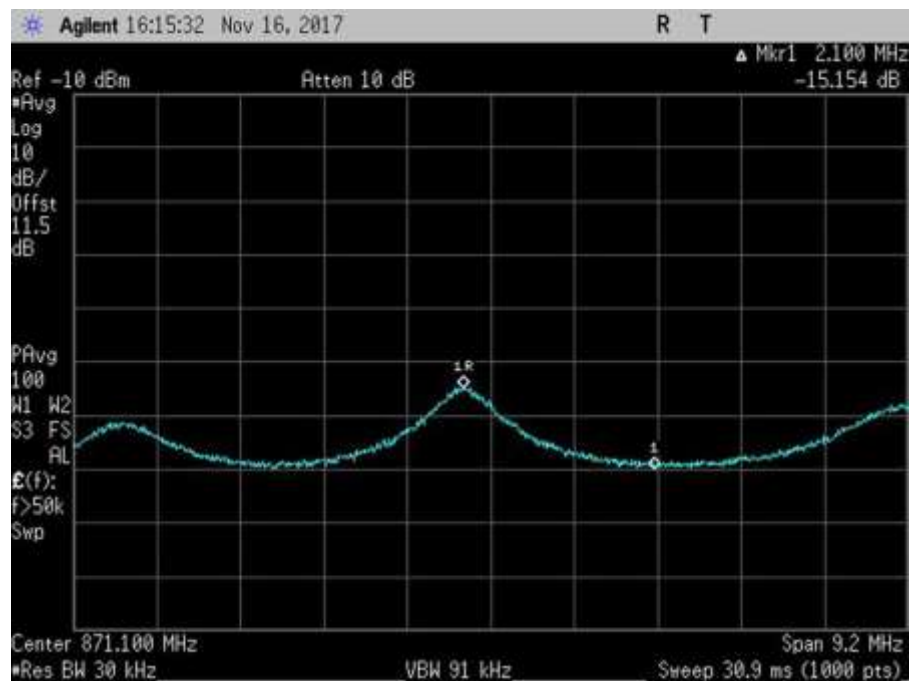
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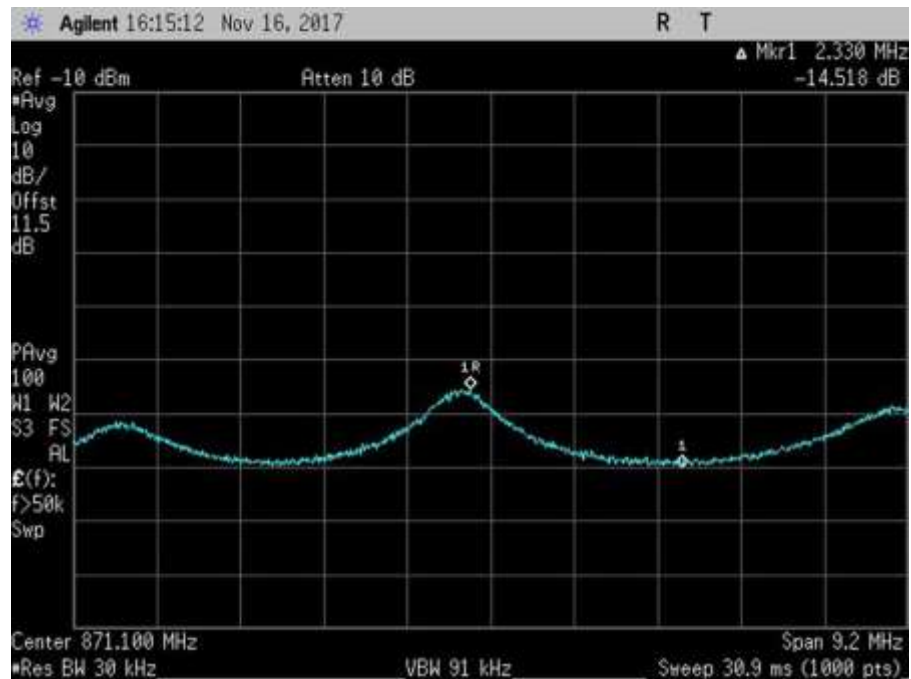
7.11.3_Osc_DL_746-757MHz-1_AWG NR



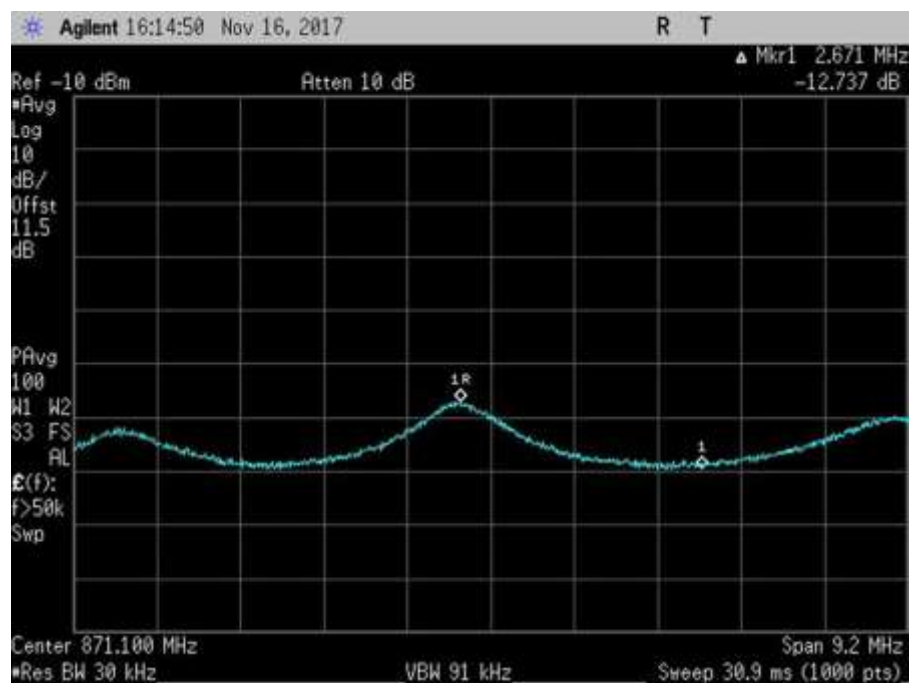
7.11.3_Osc_DL_869-894MHz+0_AWGNR



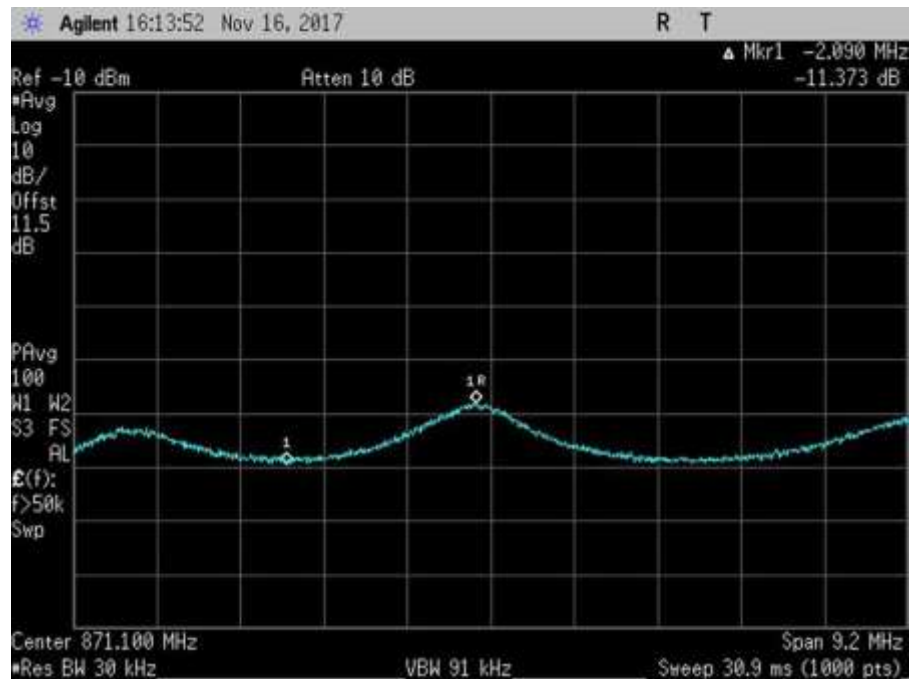
7.11.3_Osc_DL_869-894MHz+1_AWGNR



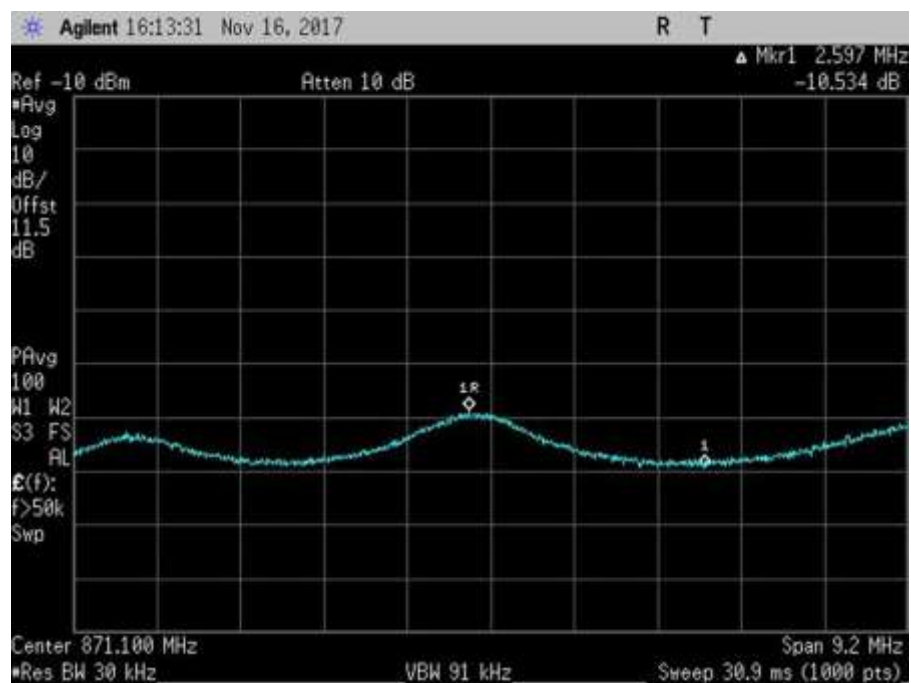
7.11.3_Osc_DL_869-894MHz+2_AWGNR



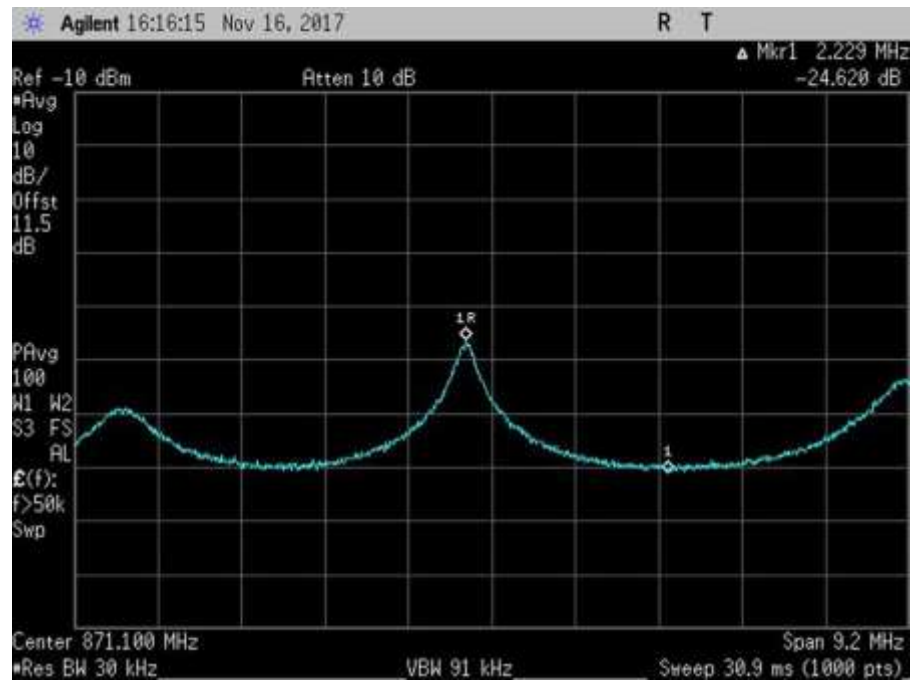
7.11.3_Osc_DL_869-894MHz+3_AWGNR



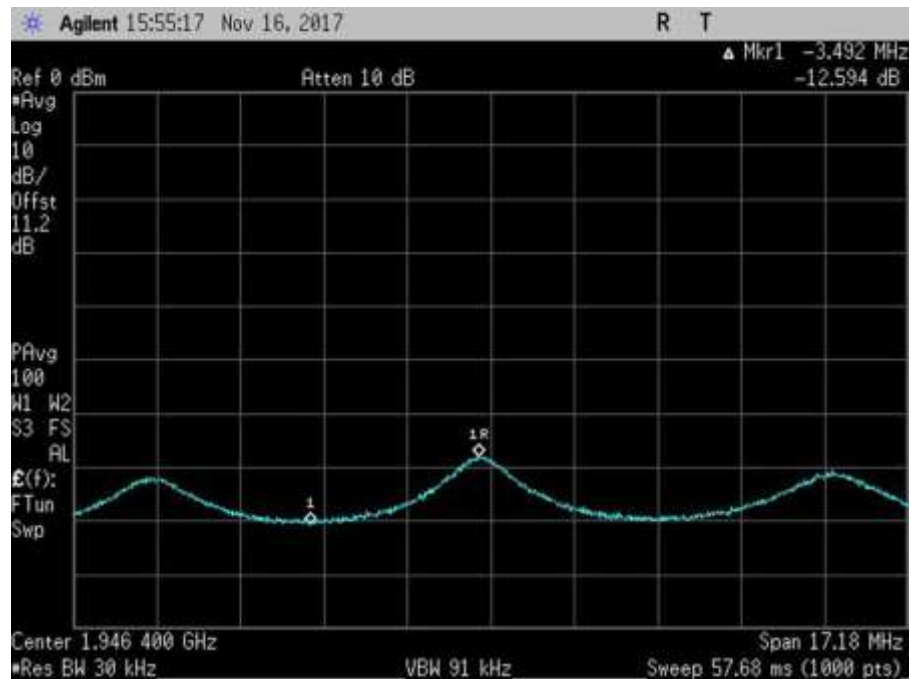
7.11.3_Osc_DL_869-894MHz+4_AWGNR



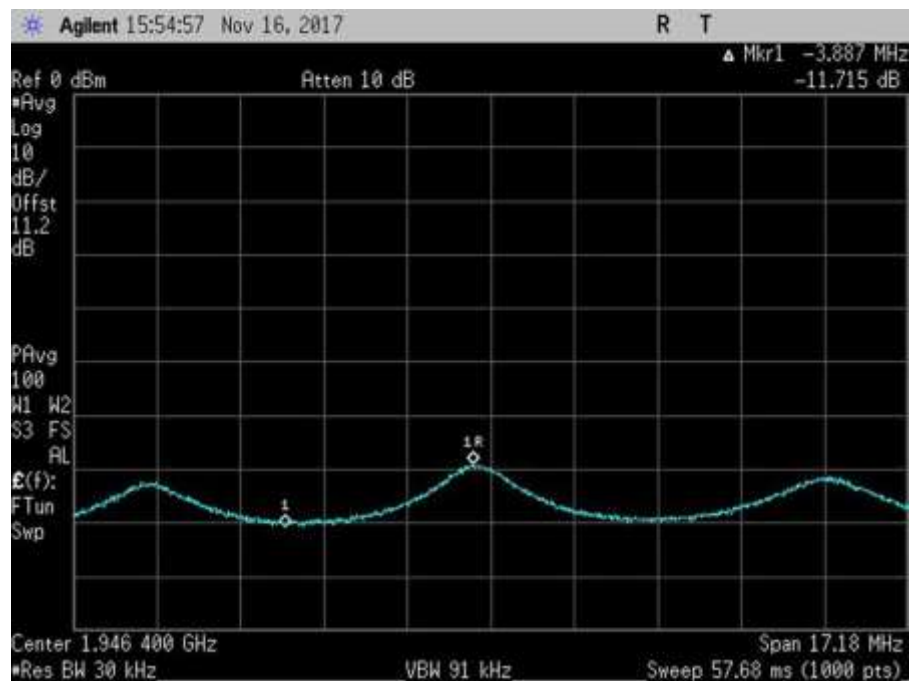
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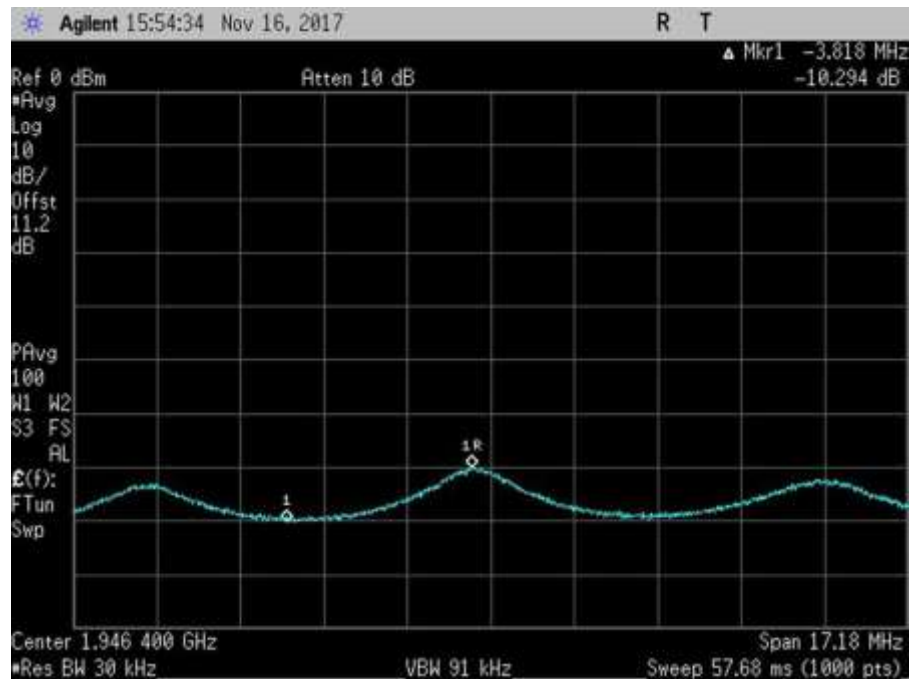
7.11.3_Osc_DL_869-894MHz-1_AWG NR



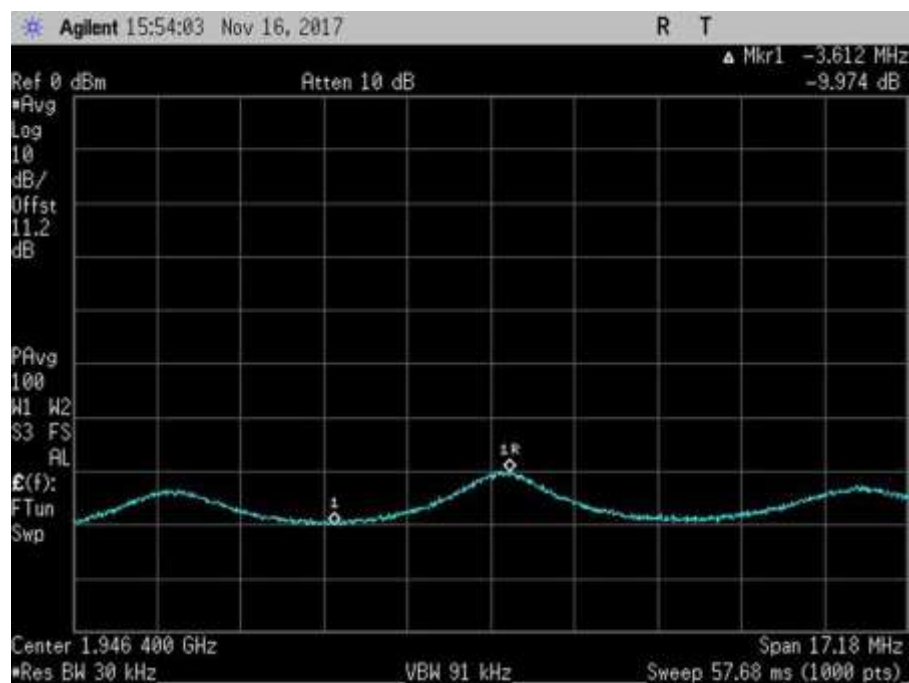
7.11.3_Osc_DL_1930-1995MHz+0_AWGNR



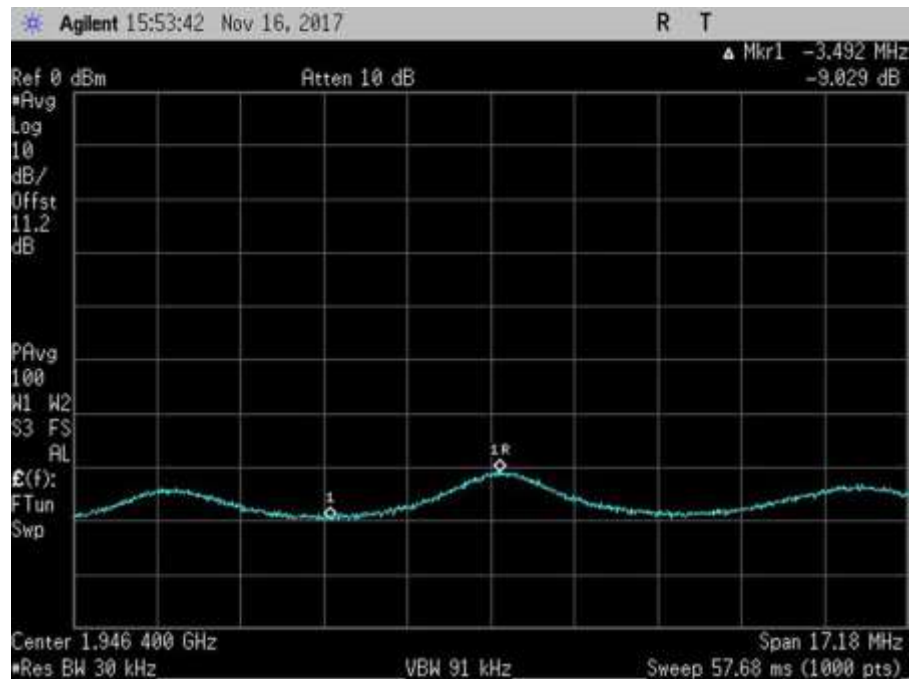
7.11.3_Osc_DL_1930-1995MHz+1_AWGNR



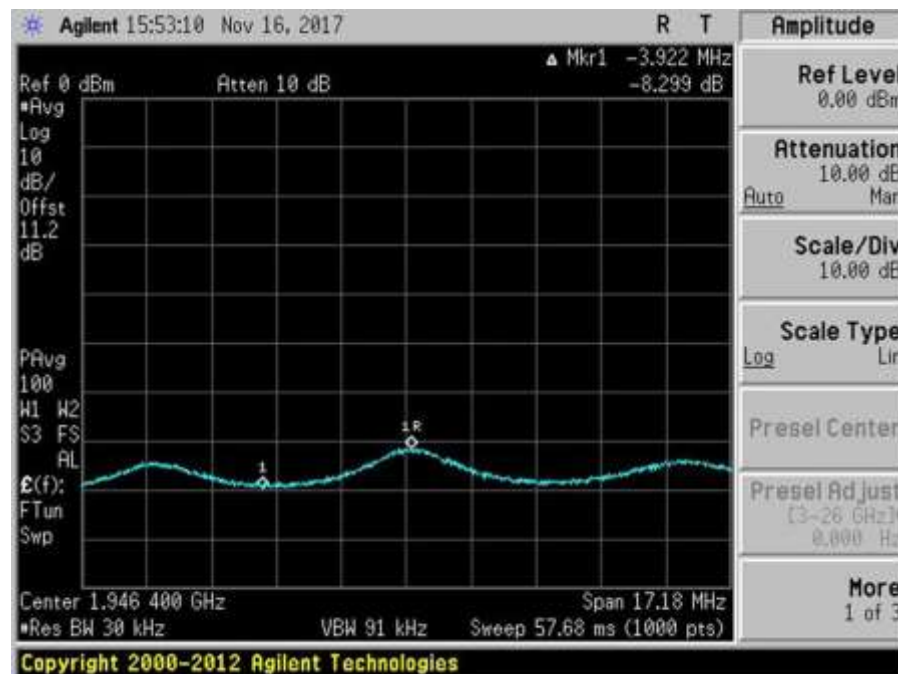
7.11.3_Osc_DL_1930-1995MHz+2_AWGNR



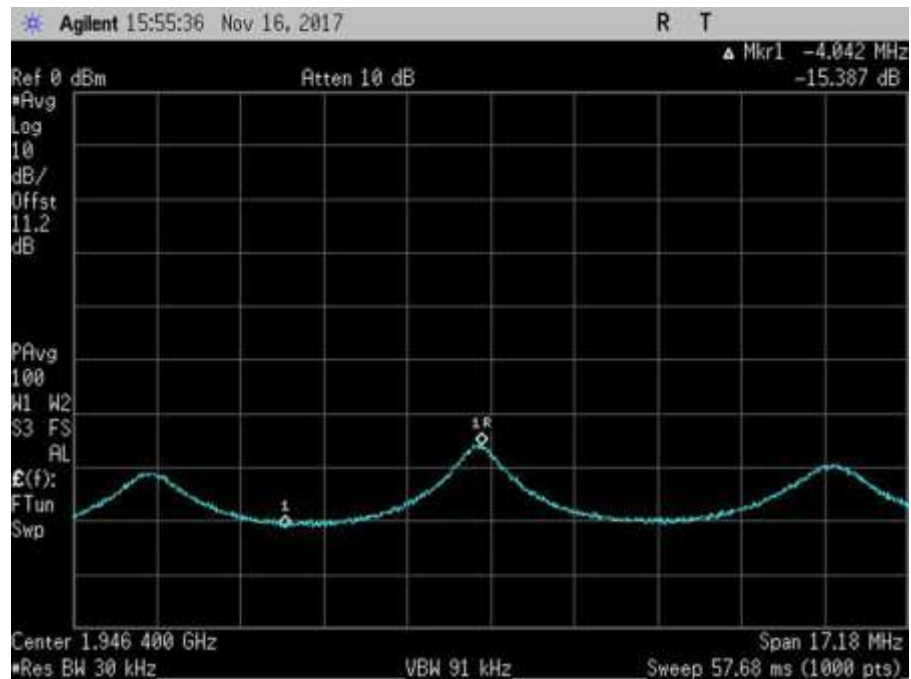
7.11.3_Osc_DL_1930-1995MHz+3_AWGNR



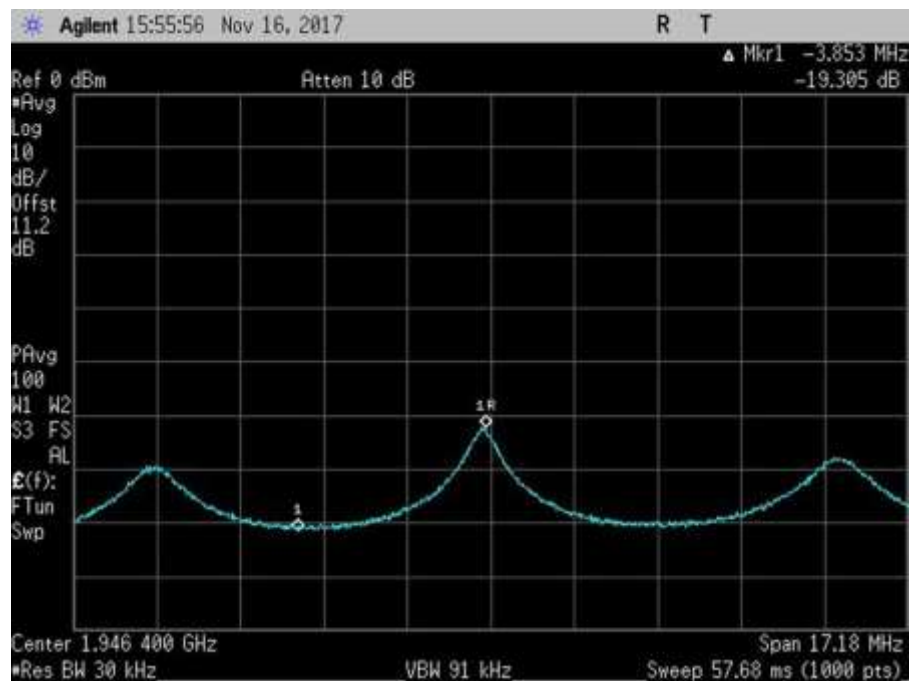
7.11.3_Osc_DL_1930-1995MHz+4_AWGNR



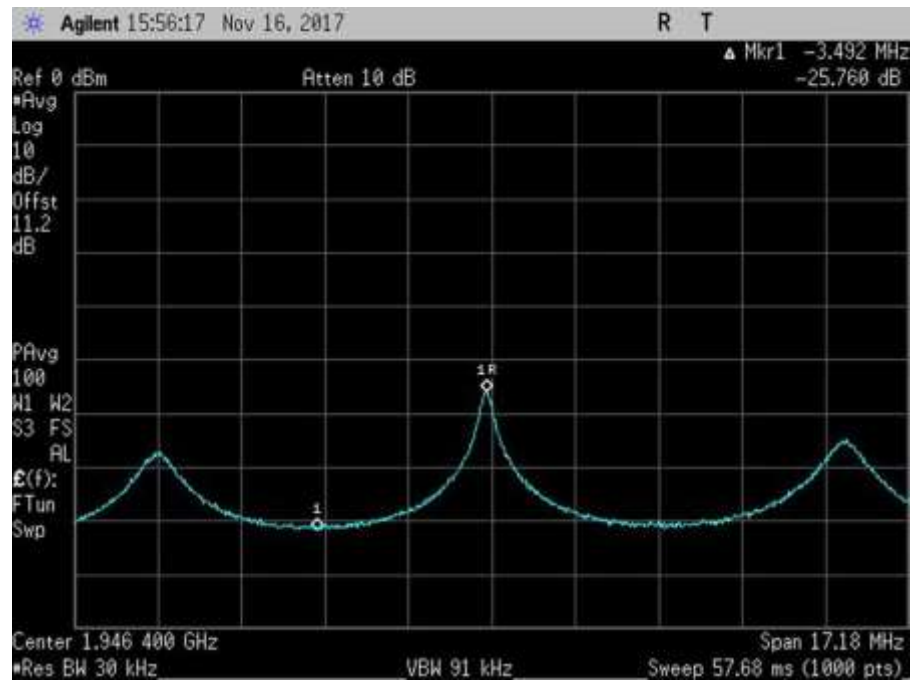
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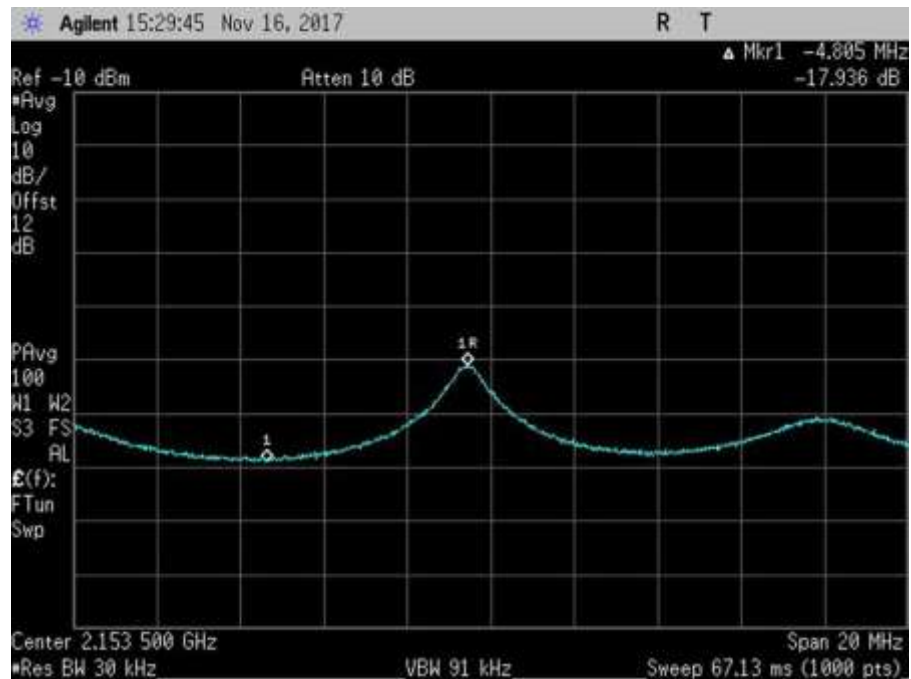
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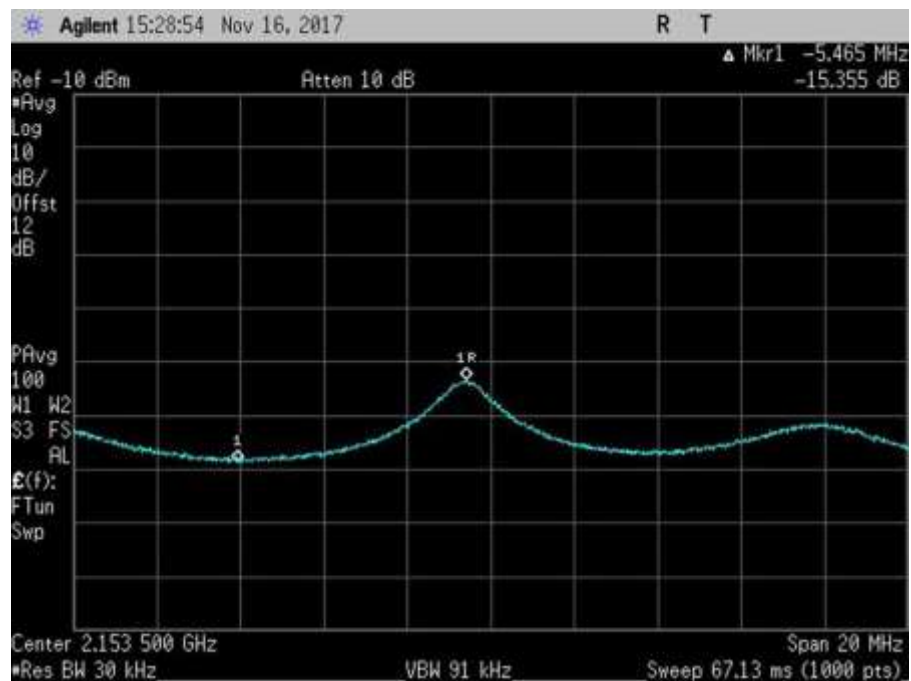
7.11.3_Osc_DL_1930-1995MHz-2_AWG NR



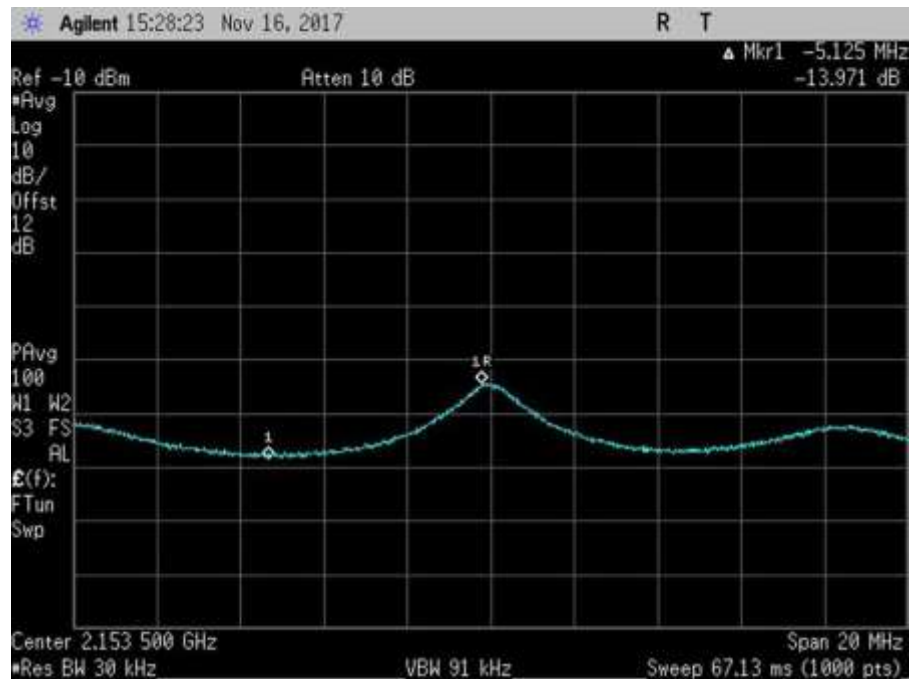
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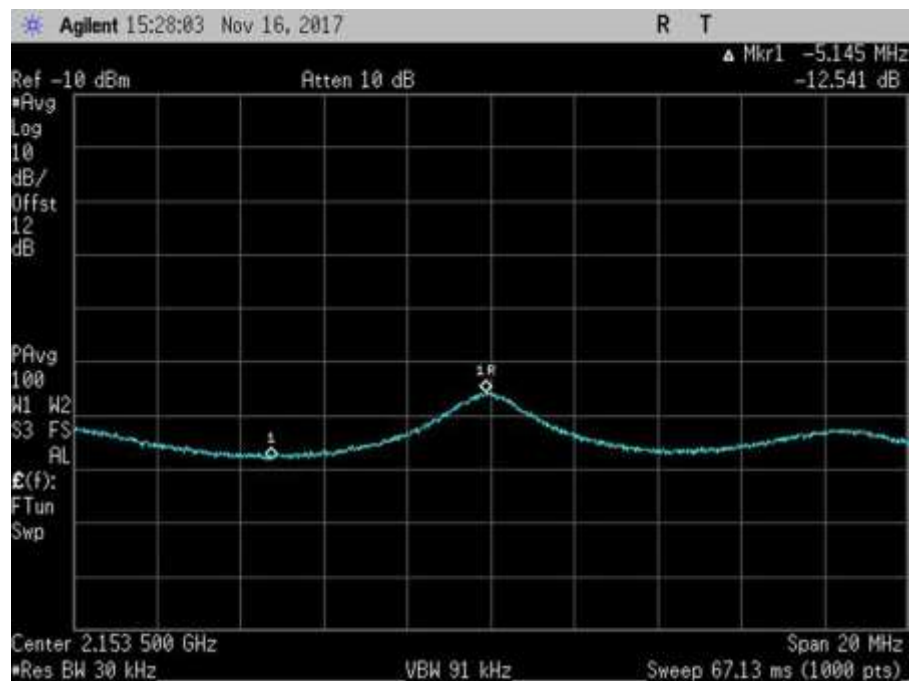
7.11.3_Osc_DL_2110-2155MHz+0_AWGNL



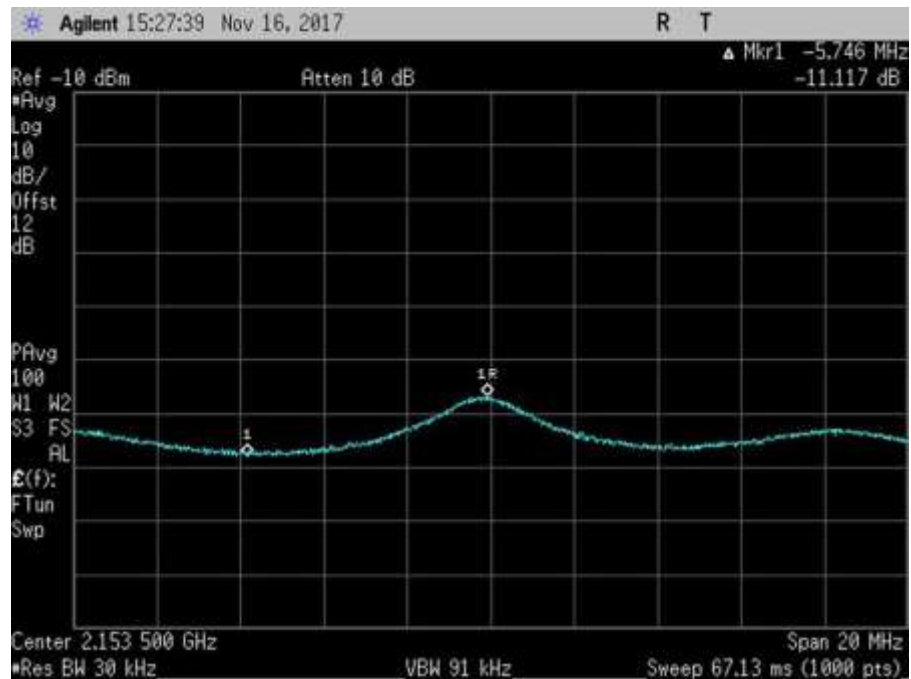
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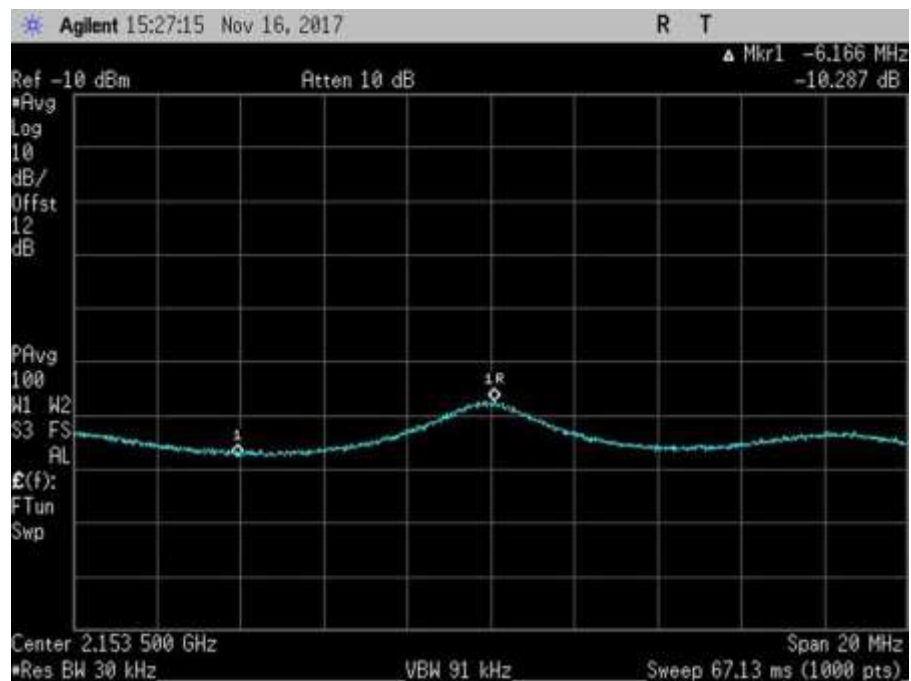
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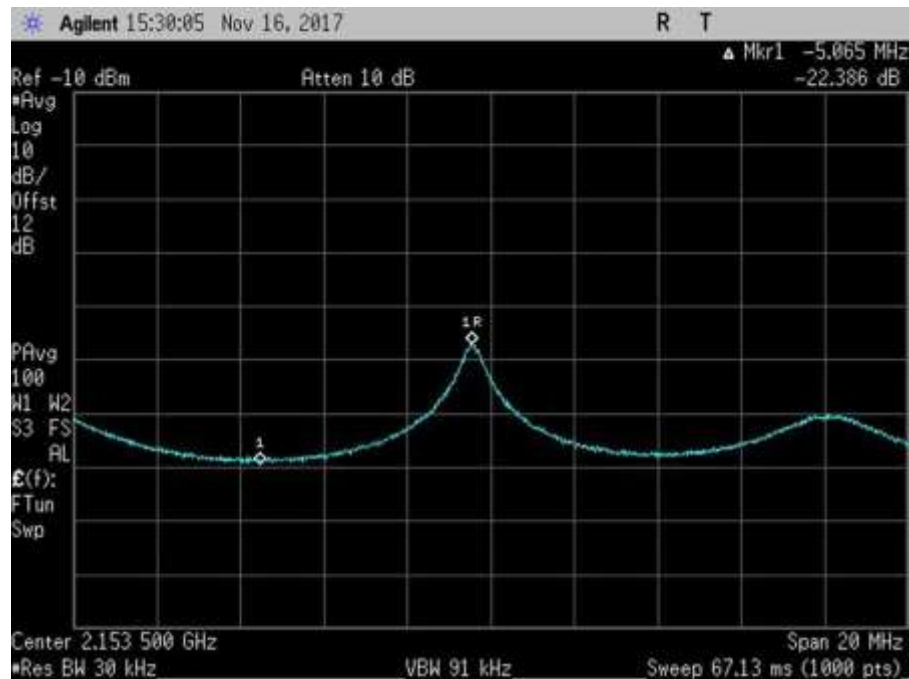
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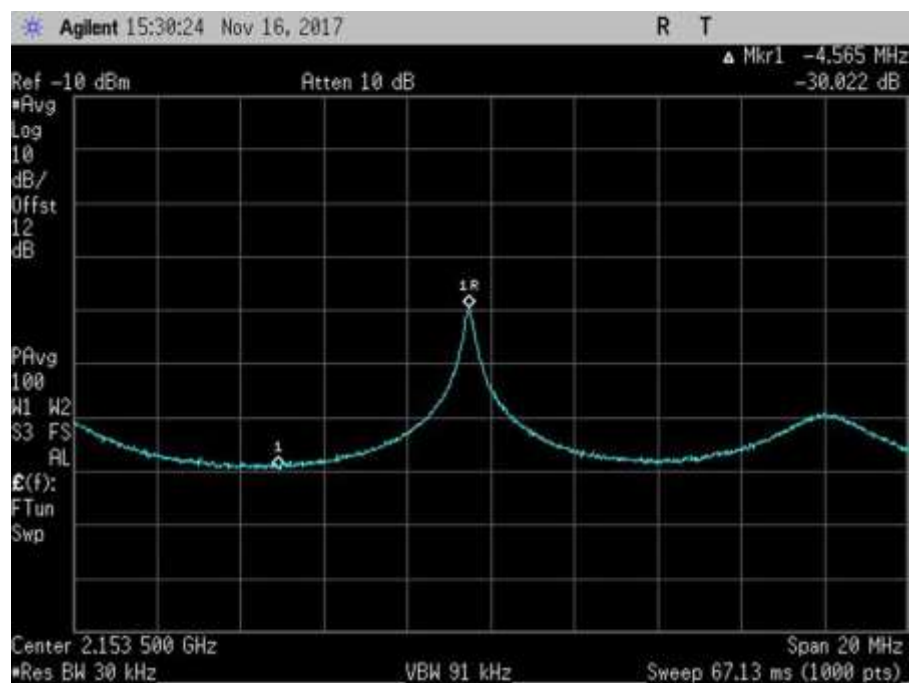
7.11.3_Osc_DL_2110-2155MHz+4_AWGNL



7.11.3_Osc_DL_2110-2155MHz+5_AWGNL

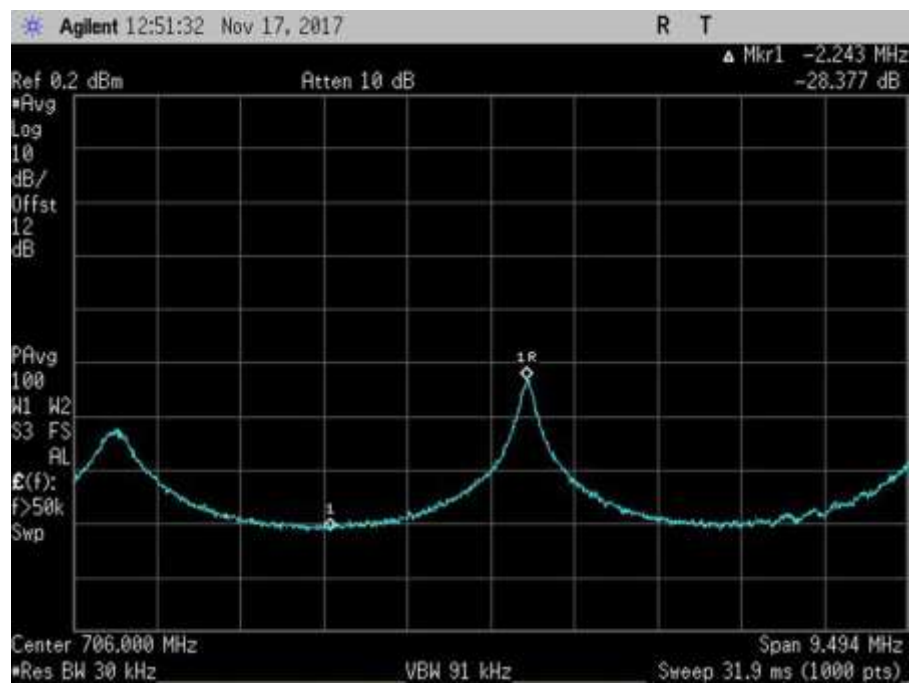


7.11.3_Osc_DL_2110-2155MHz-1_AWGNL

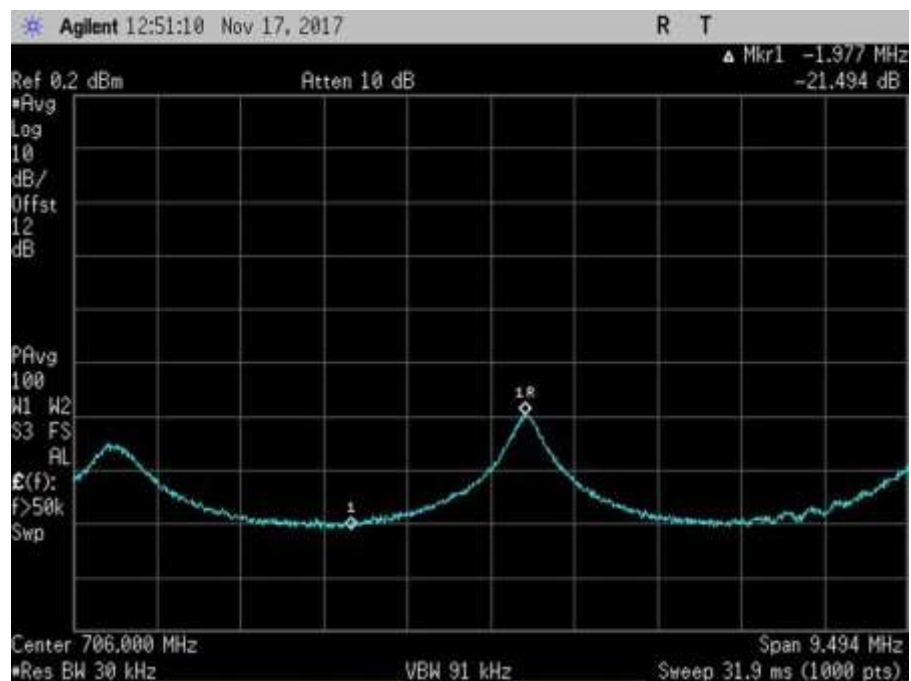


7.11.3_Osc_DL_2110-2155MHz-2_AWGNL

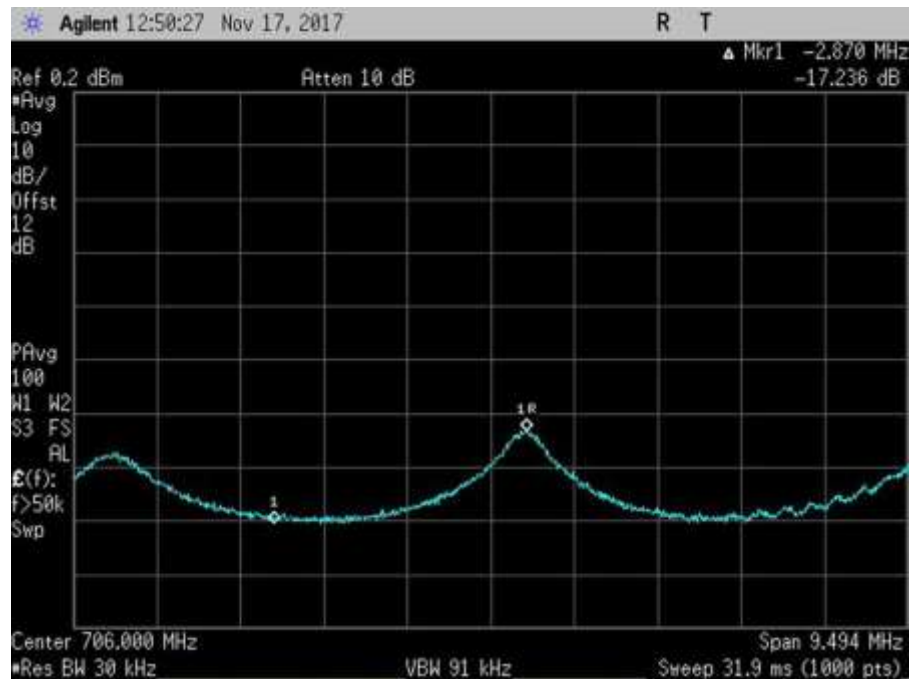
UL



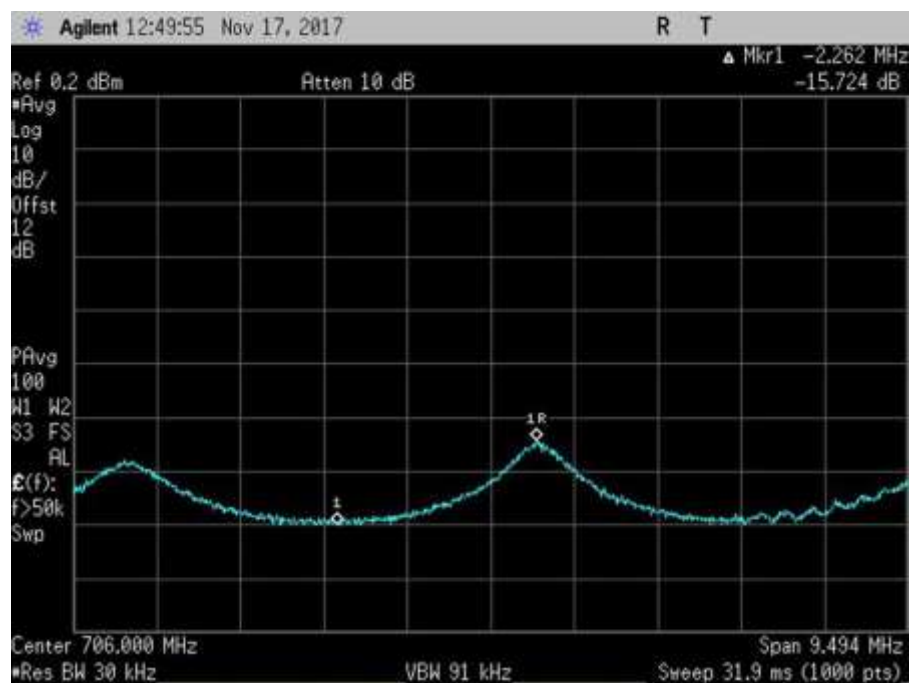
7.11.3_Osc_UL_698-716MHz+0_AWG NR



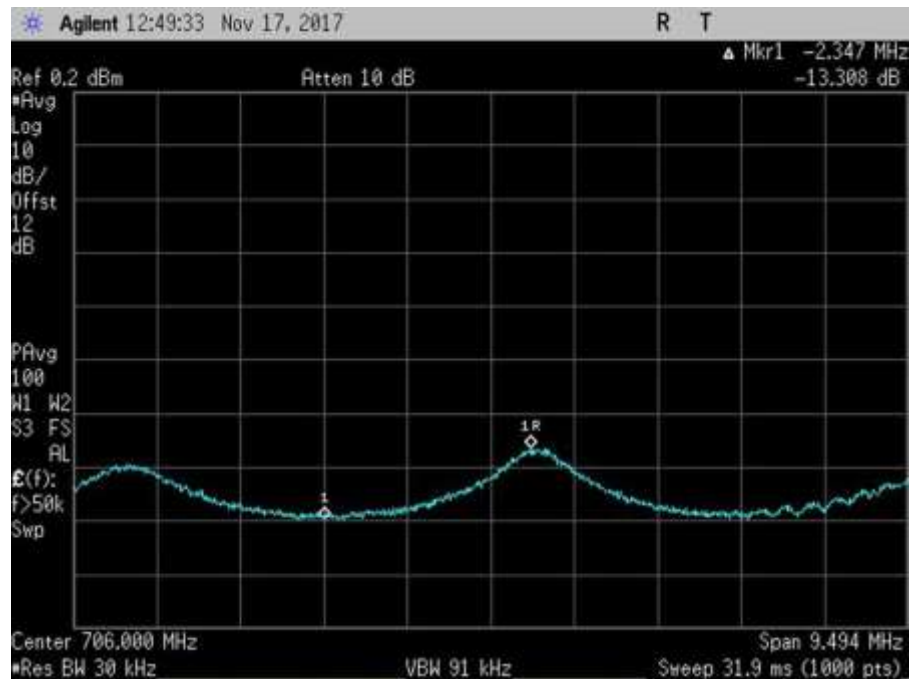
7.11.3_Osc_UL_698-716MHz+1_AWG NR



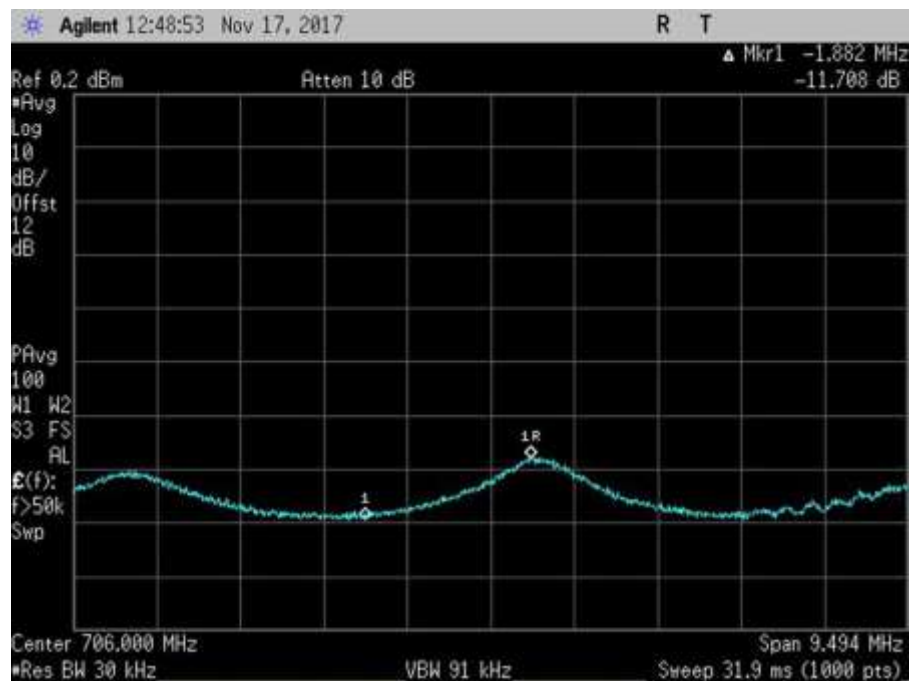
7.11.3_Osc_UL_698-716MHz+2_AWGNR



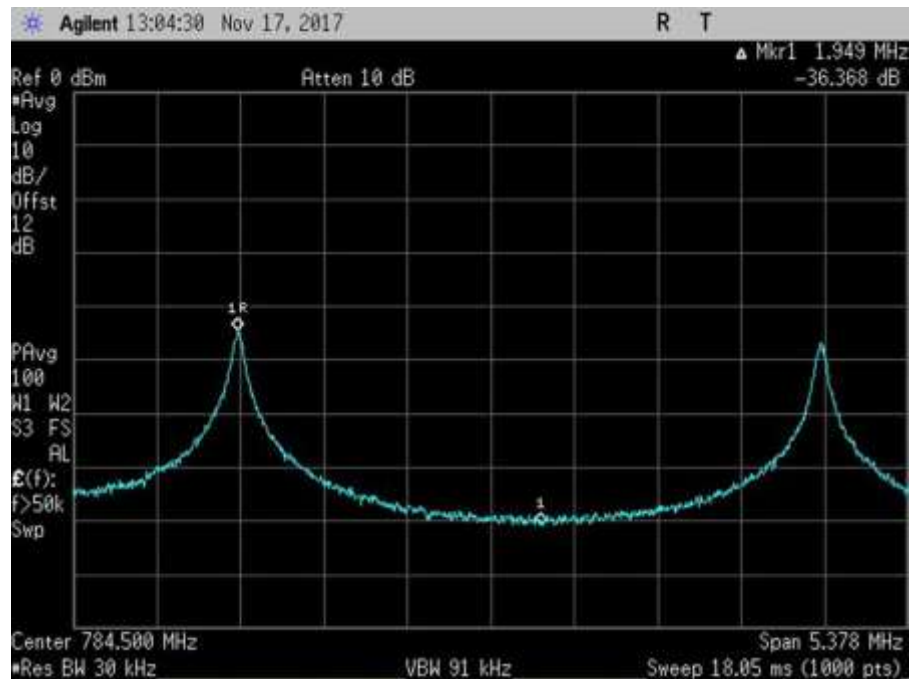
7.11.3_Osc_UL_698-716MHz+3_AWGNR



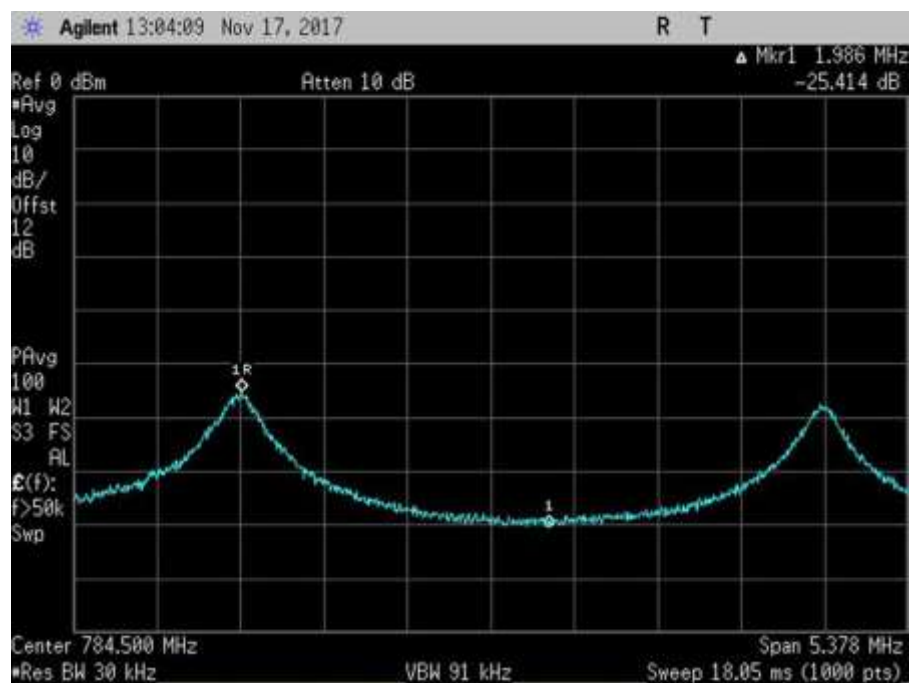
7.11.3_Osc_UL_698-716MHz+4_AWGNR



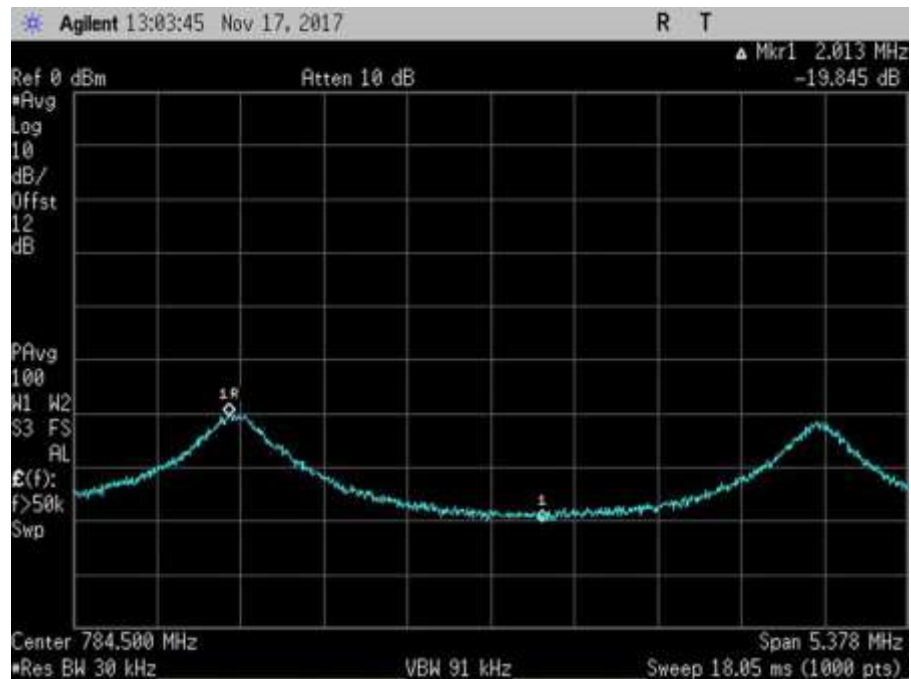
7.11.3_Osc_UL_698-716MHz+5_AWGNR



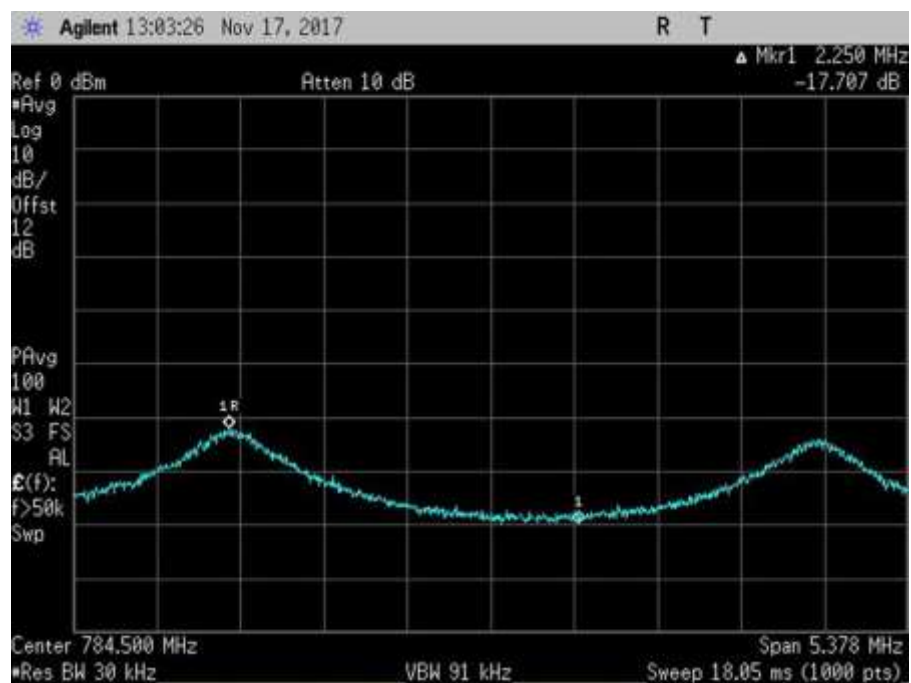
7.11.3_Osc_UL_776-787MHz+0_AWGNL



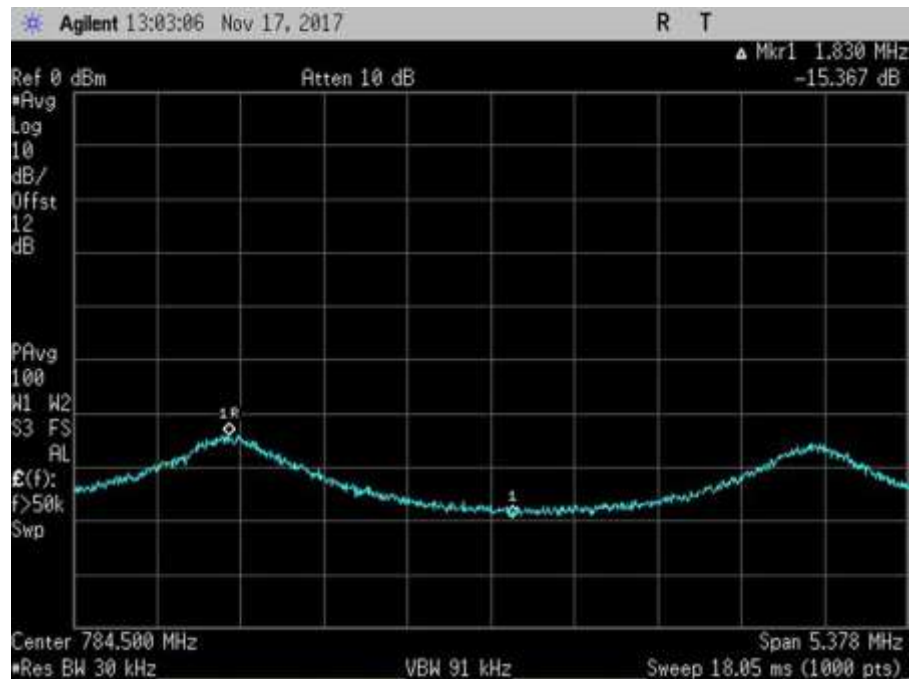
7.11.3_Osc_UL_776-787MHz+1_AWGNL



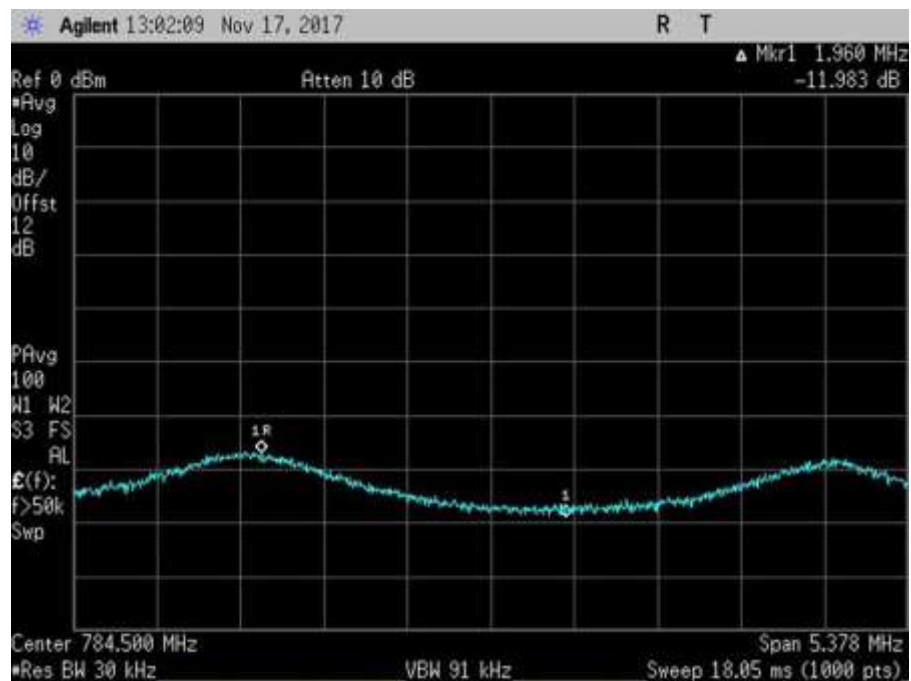
7.11.3_Osc_UL_776-787MHz+2_AWGNL



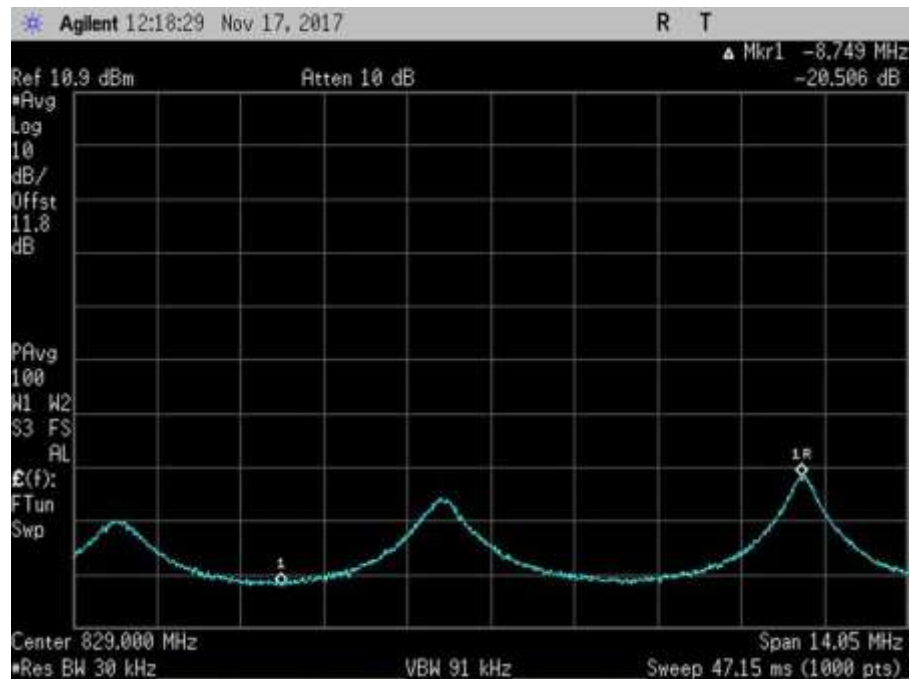
7.11.3_Osc_UL_776-787MHz+3_AWGNL



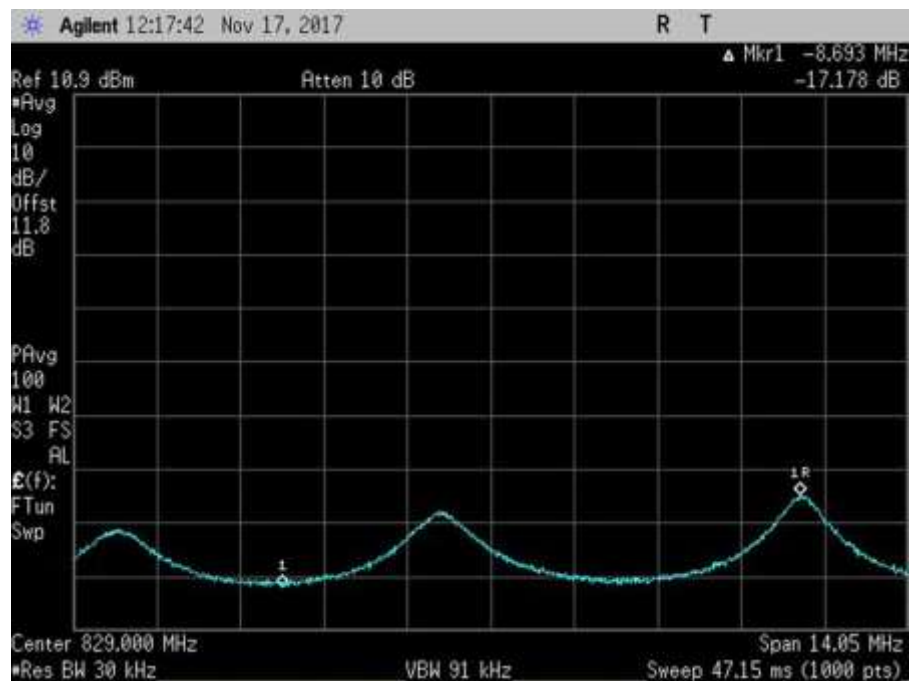
7.11.3_Osc_UL_776-787MHz+4_AWGNL



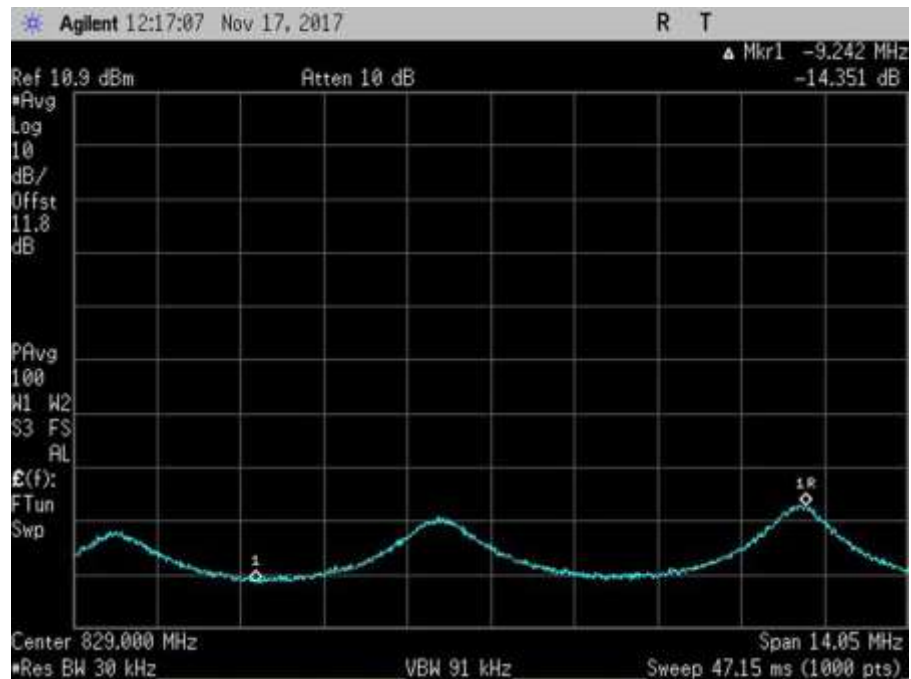
7.11.3_Osc_UL_776-787MHz+5_AWGNL



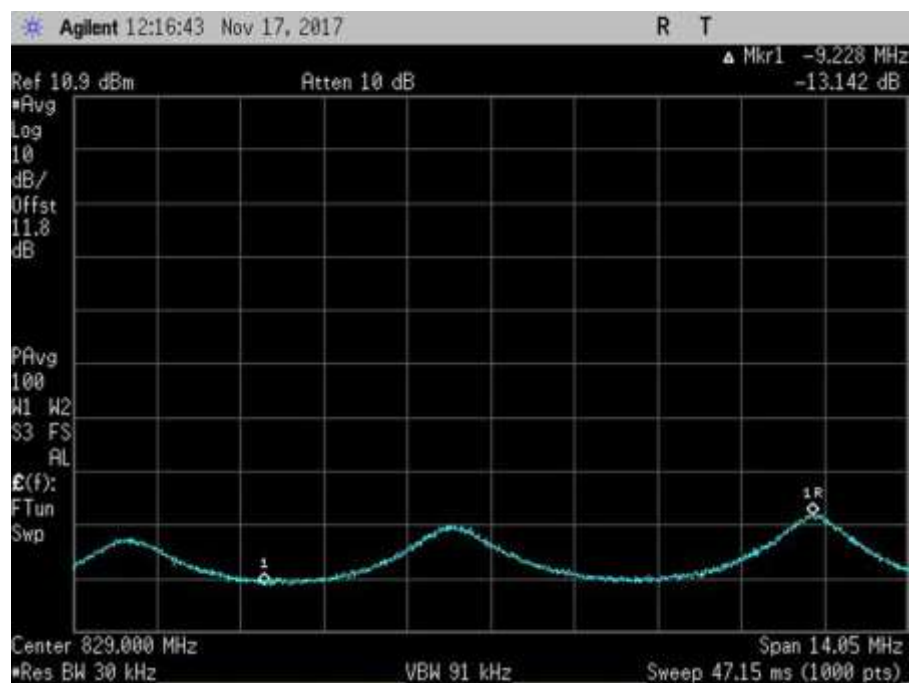
7.11.3_Osc_UL_824-849MHz+0_AWGNR



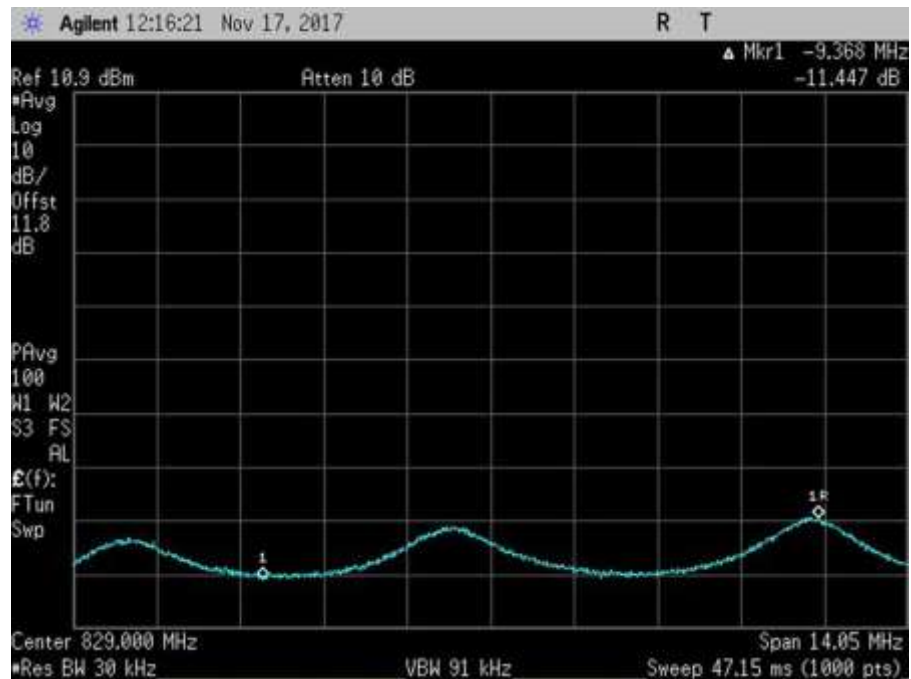
7.11.3_Osc_UL_824-849MHz+1_AWGNR



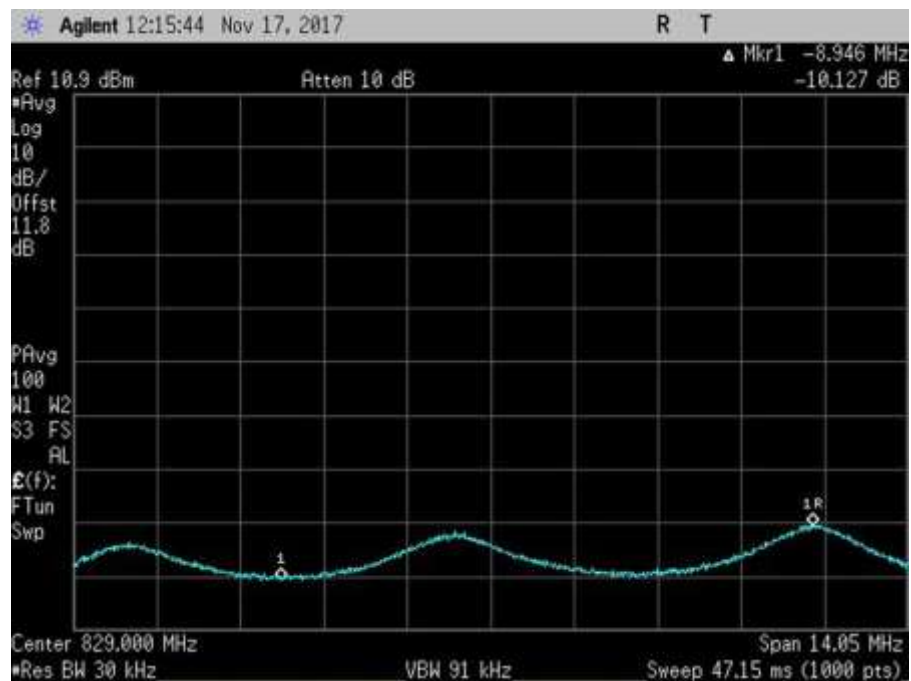
7.11.3_Osc_UL_824-849MHz+2_AWGNR



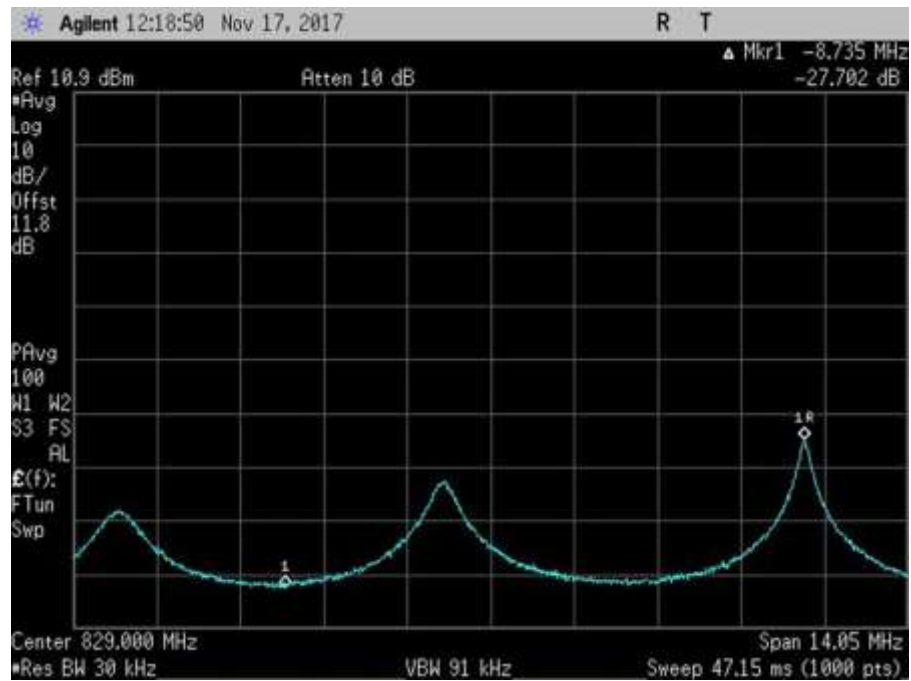
7.11.3_Osc_UL_824-849MHz+3_AWGNR



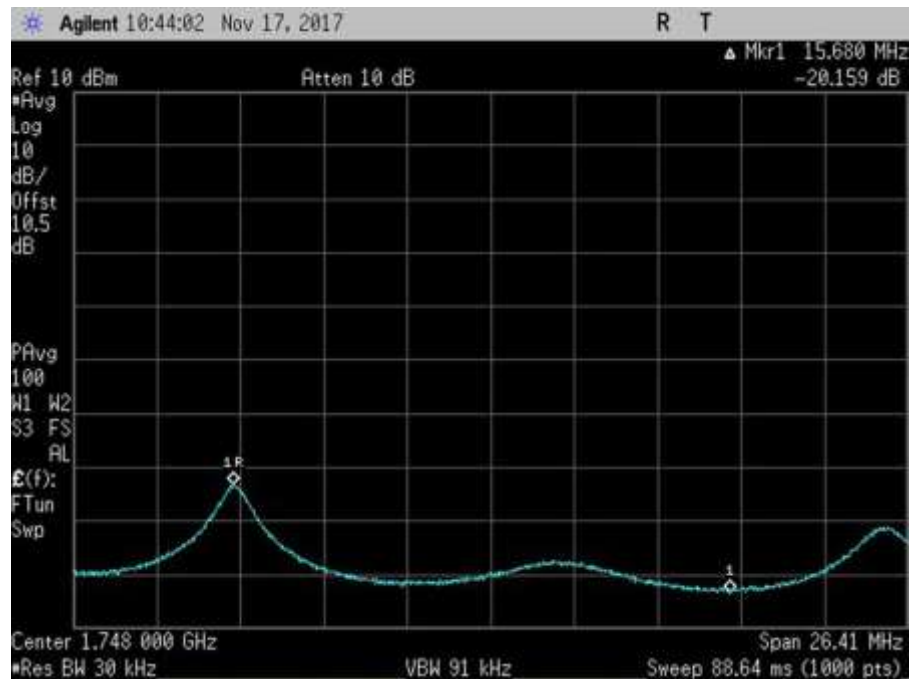
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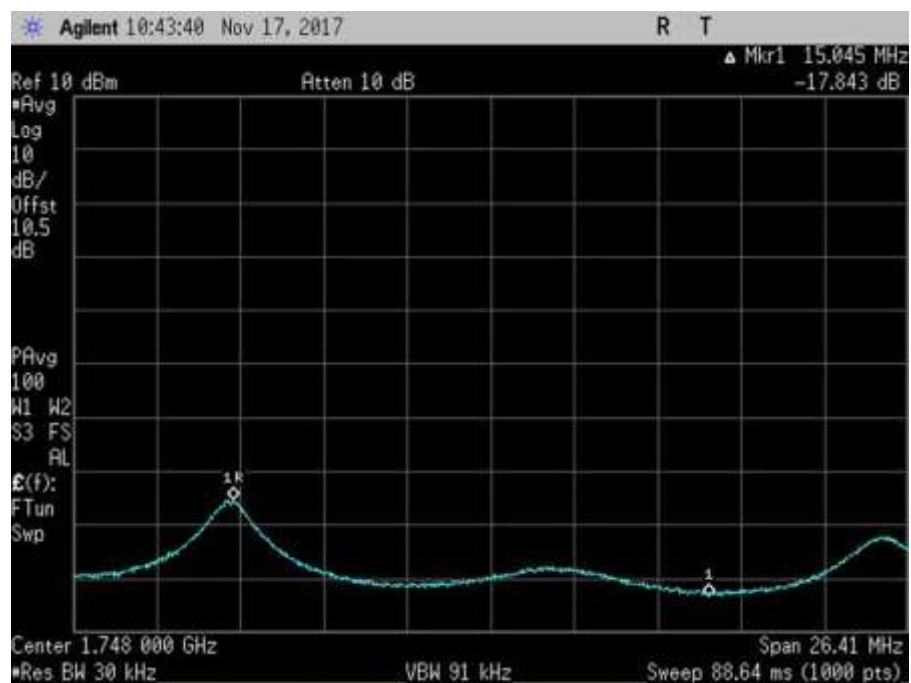
7.11.3_Osc_UL_824-849MHz+5_AWGNR



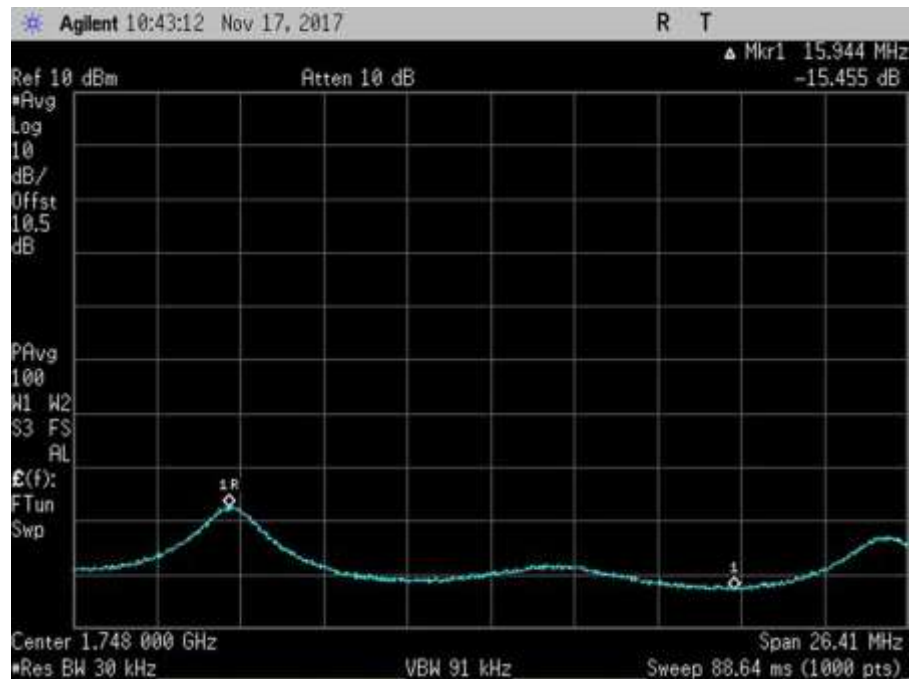
7.11.3_Osc_UL_824-849MHz-1_AWG NR



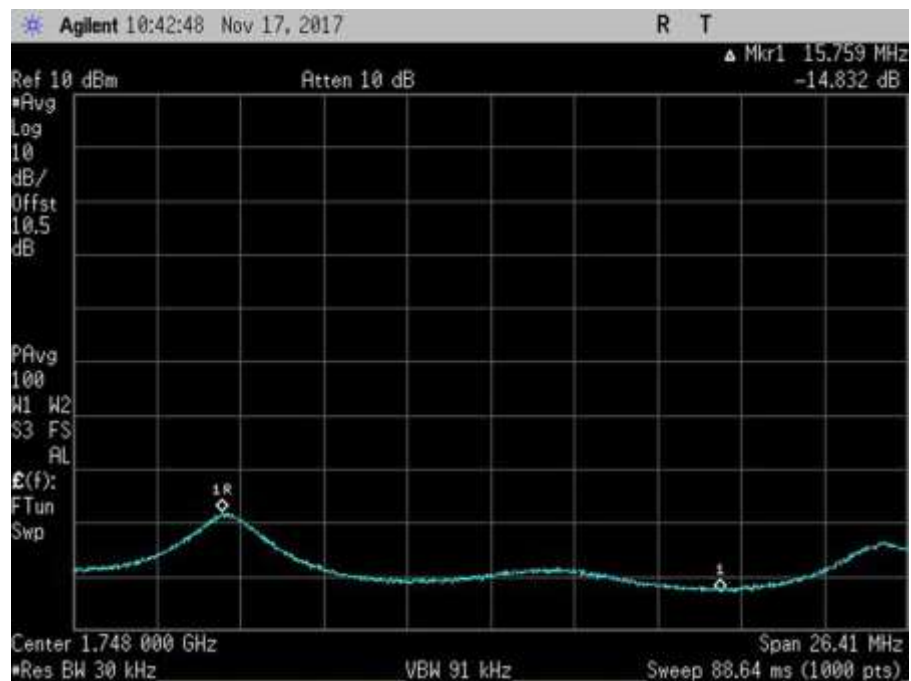
7.11.3_Osc_UL_1710-1755MHz+0_AWGNL



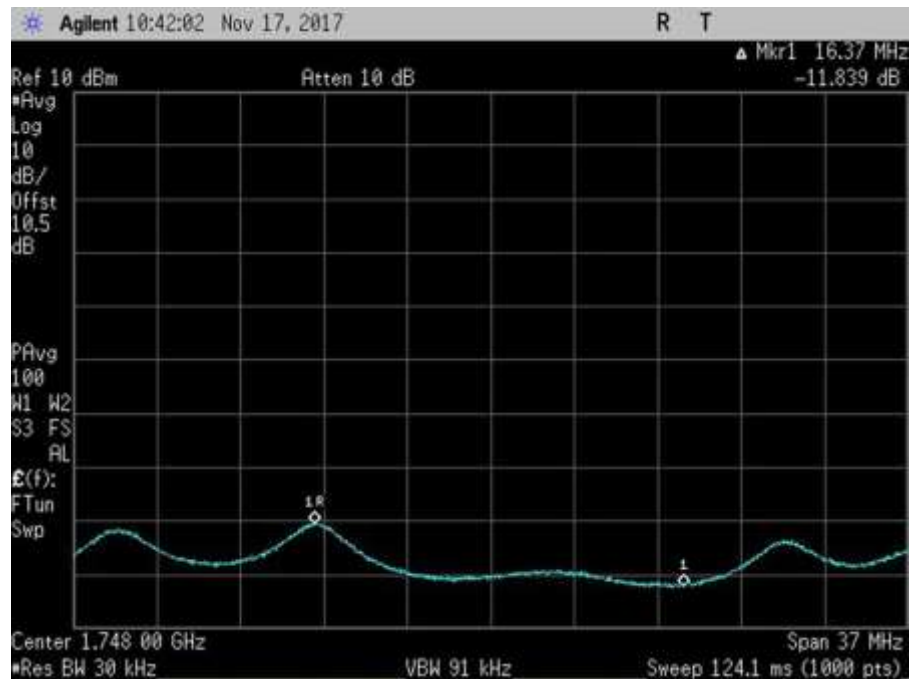
7.11.3_Osc_UL_1710-1755MHz+1_AWGNL



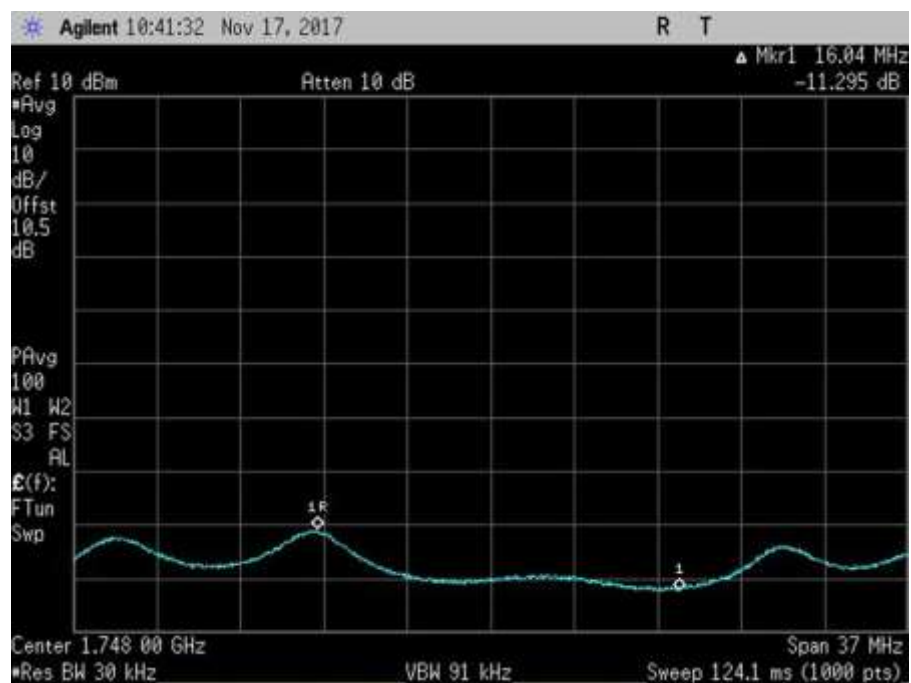
7.11.3_Osc_UL_1710-1755MHz+2_AWGNL



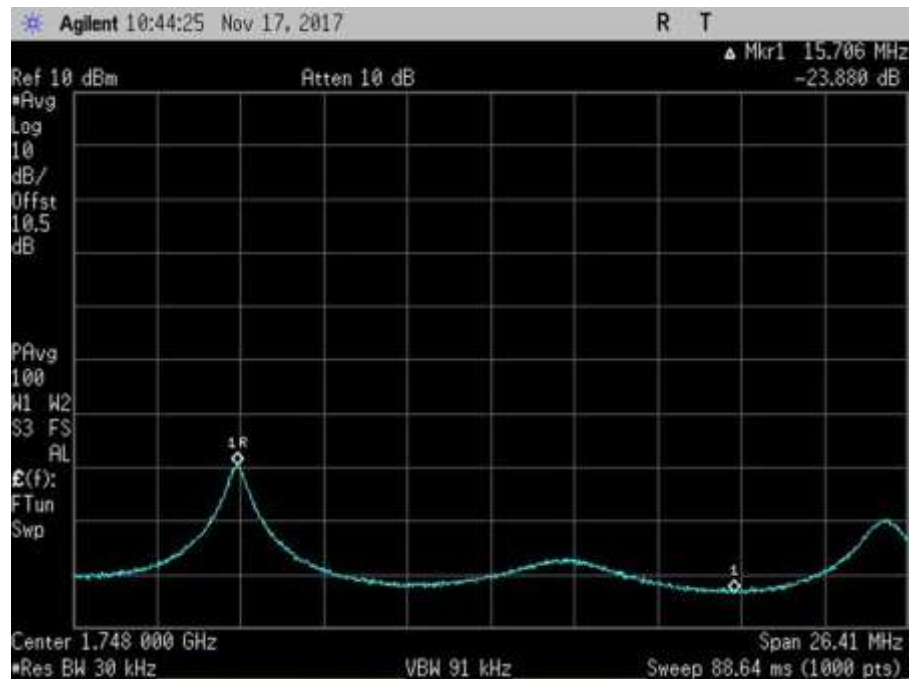
7.11.3_Osc_UL_1710-1755MHz+3_AWGNL



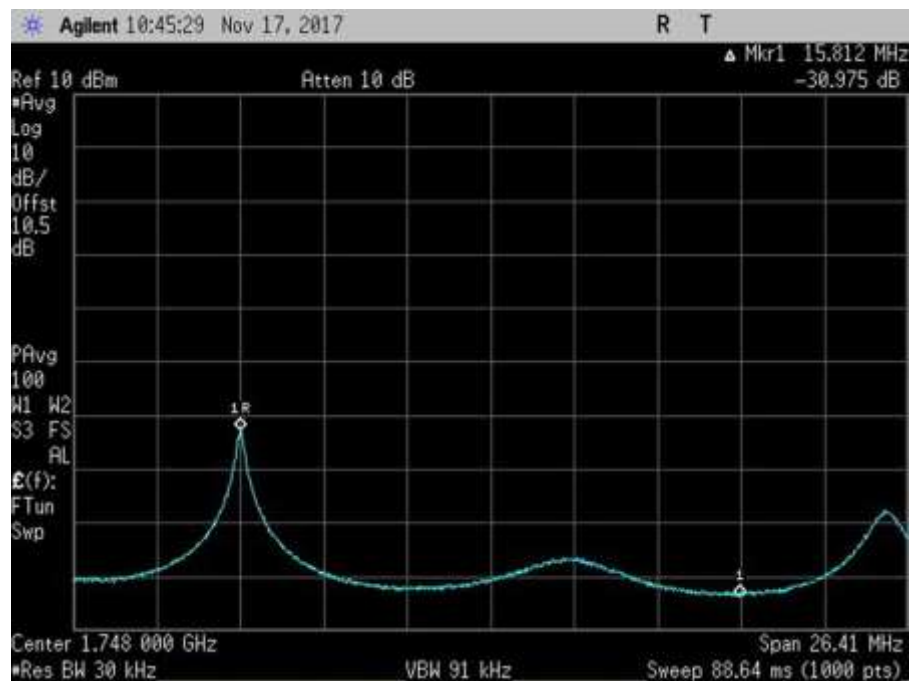
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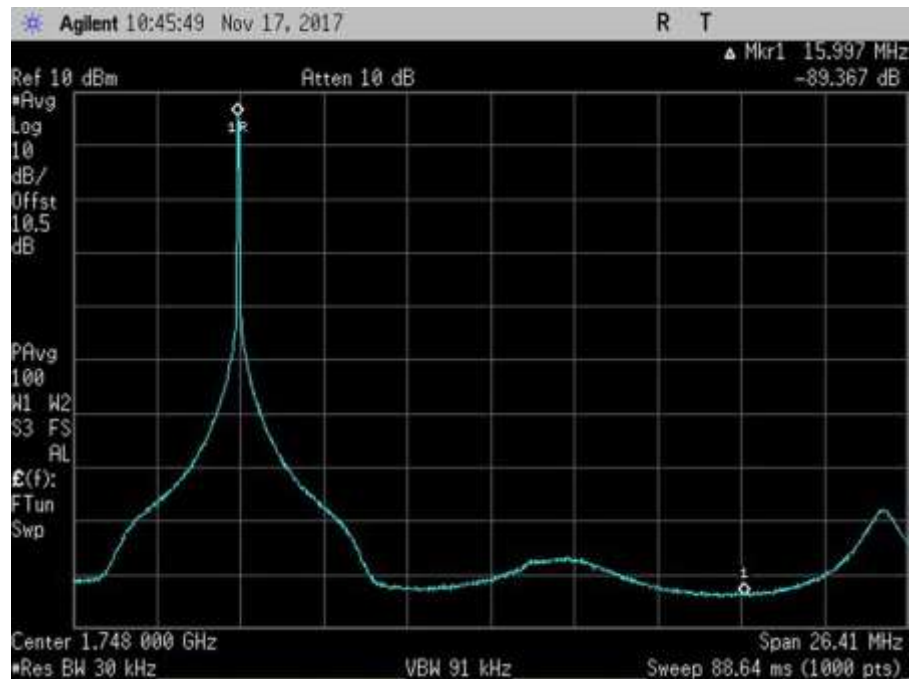
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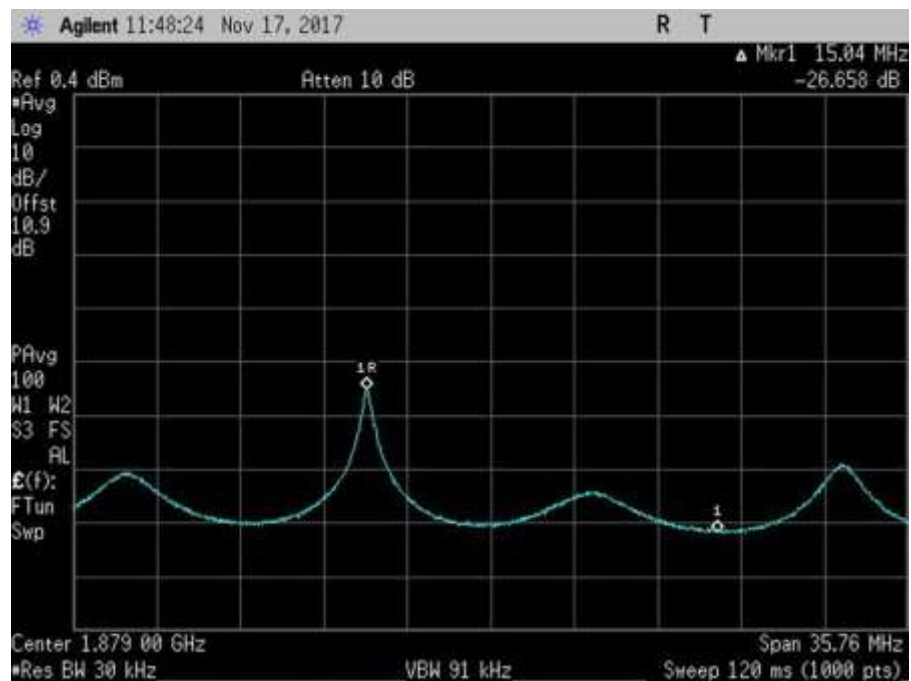
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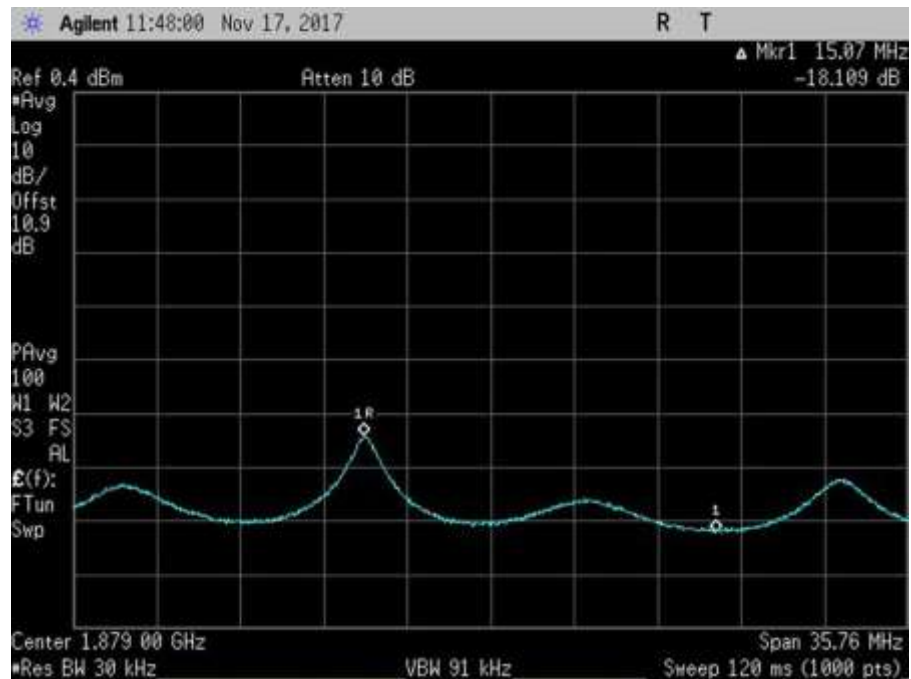
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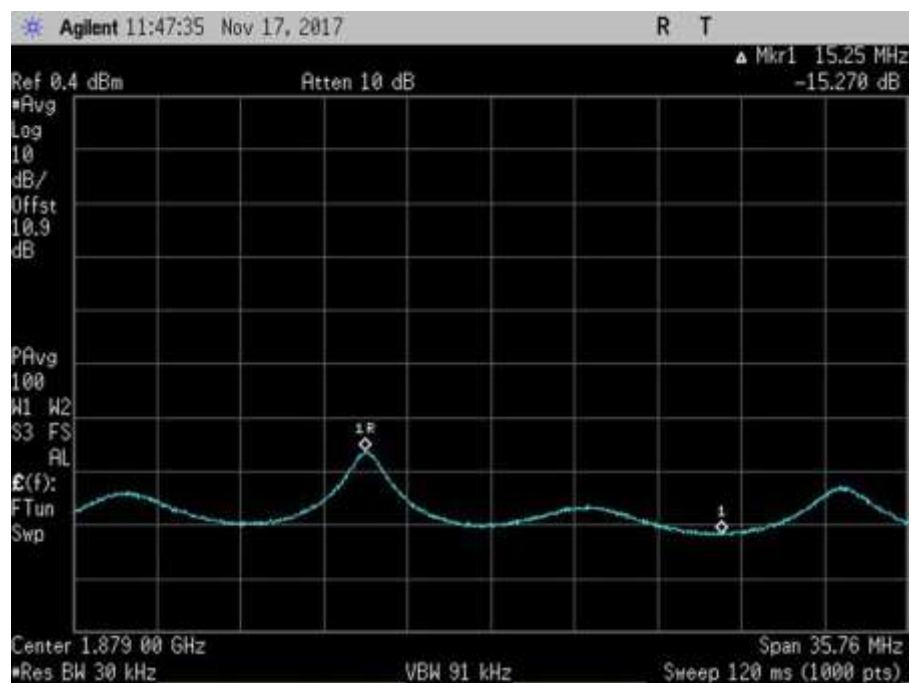
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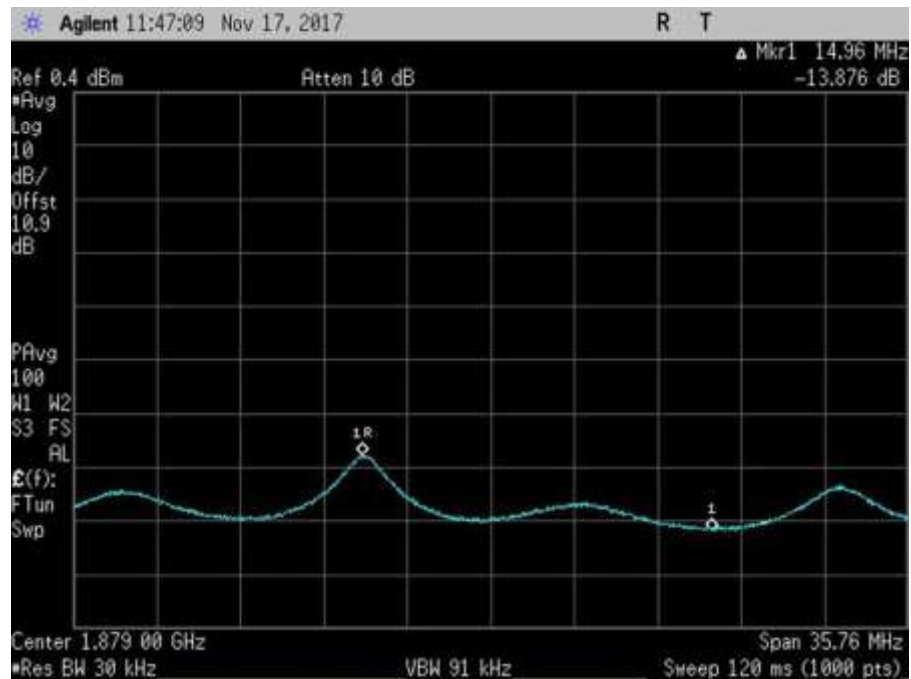
7.11.3_Osc_UL_1850-1915MHz+0_AWGNR



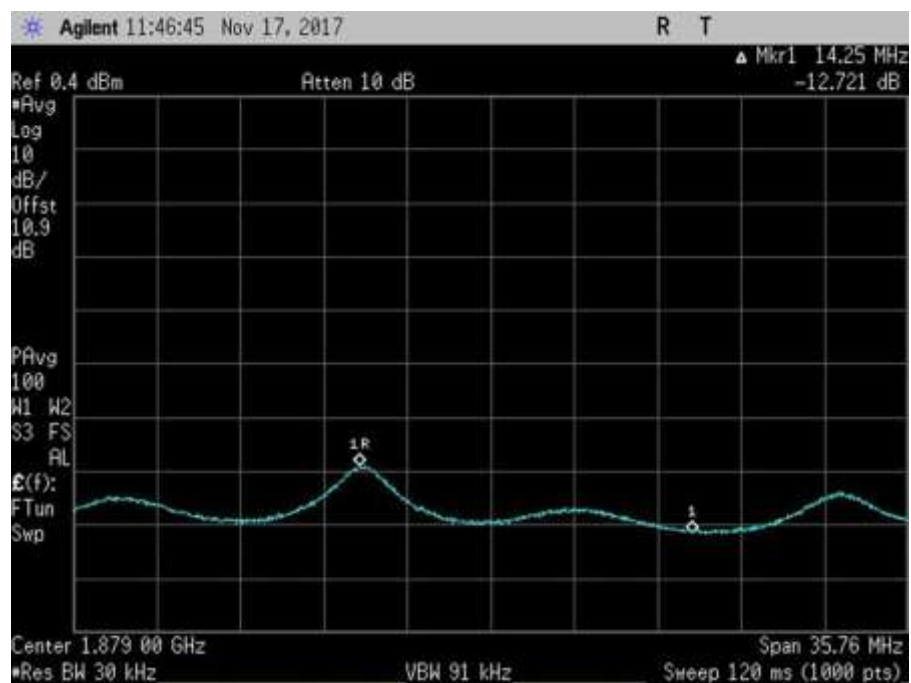
7.11.3_Osc_UL_1850-1915MHz+1_AWGNR



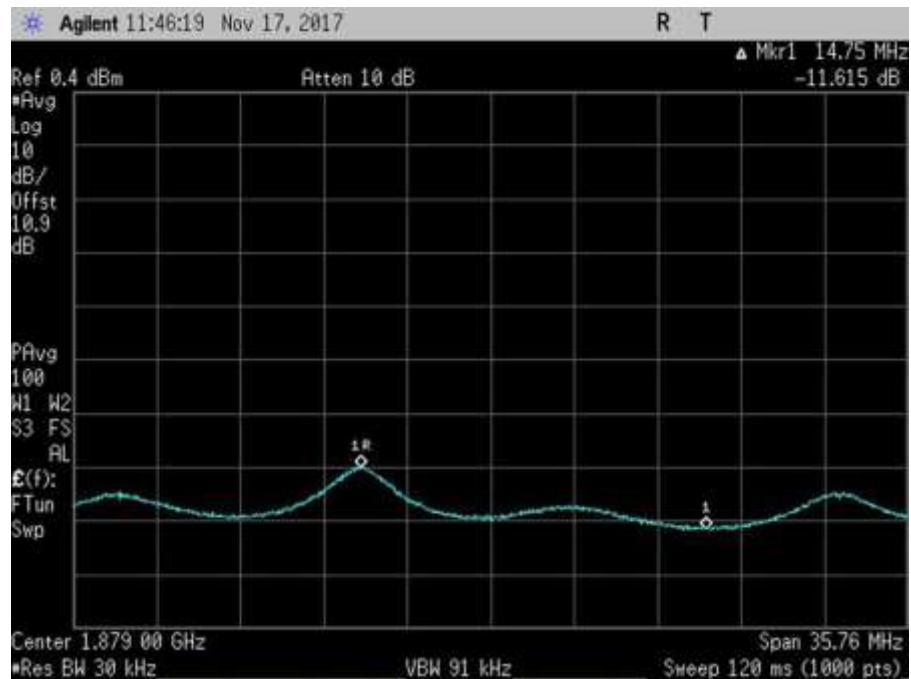
7.11.3_Osc_UL_1850-1915MHz+2_AWGNR



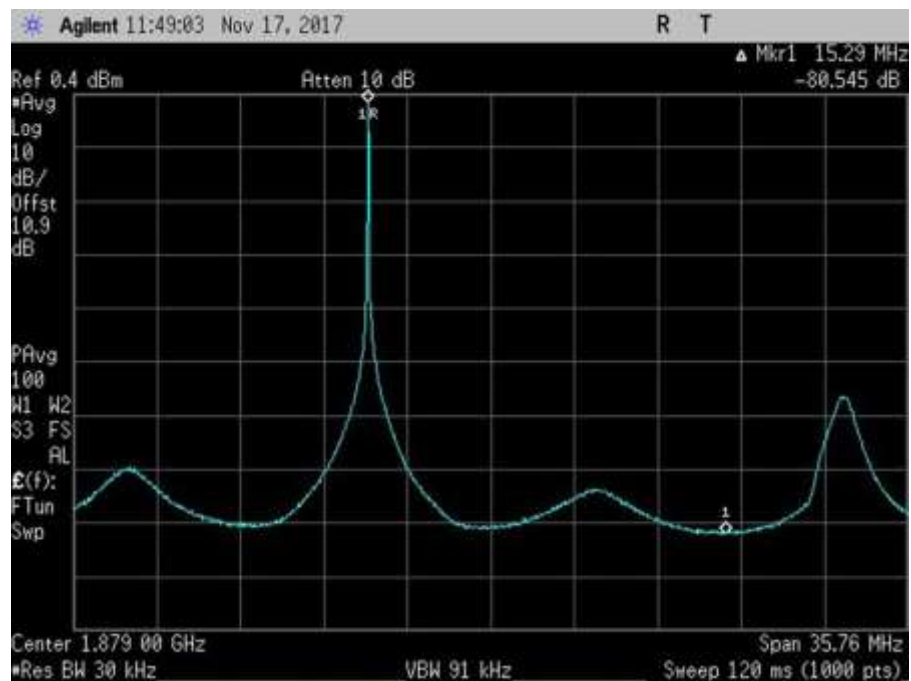
7.11.3_Osc_UL_1850-1915MHz+3_AWGNR



7.11.3_Osc_UL_1850-1915MHz+4_AWGNR



7.11.3_Osc_UL_1850-1915MHz+5_AWGNR



7.11.3_Osc_UL_1850-1915MHz-1_AWGNR

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 #: **100637** Date: 11/22/2017
 Test Type: **Radiated Emissions** Time: 8:05:00 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:

Test environment conditions: 21.5°C, 58% Relative Humidity, 101.9 kPa

The equipment under test (EUT) is a Mobile CMRS Wideband Consumer Booster. During testing, the (EUT) is placed on the Styrofoam table top. Five different CW signals (one per each band) are injected sequentially to the input port of EUT using a signal generator. The signal generator is set to produce a CW signal with the frequency set to the center of each operational band under test and the power level is set at Pin as determined from 7.2 section of the test procedure indicated further below.

Evaluation of DL path was performed with signals fed into the Outside antenna port while Inside antenna port was terminated with equivalent 50 Ohm Pasternack load (MN: PE6187 / SN: 1443).

Evaluation of UL path was performed with signal fed into the Inside antenna port while Outside antenna port was terminated with the same above 50 Ohm load.

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 7.12 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r01 Dated October 27, 2017.
 Firmware: V 3.2

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:

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
	AN01996	Biconilog Antenna	CBL6111C	11/1/2016	11/1/2018
	ANP06049	Attenuator	PE7002-6	5/9/2016	5/9/2018
	ANP00880	Cable	RG214U	5/10/2016	5/10/2018
	ANP06691	Cable	PE3062-180	6/23/2016	6/23/2018
	AN00971A	Preamp	8447D	2/5/2016	2/5/2018
	ANP01187	Cable	CNT-195	8/8/2016	8/8/2018
	AN03470	Spectrum Analyzer	E4440A	12/9/2015	12/9/2017
	AN02113	Horn Antenna-ANSI C63.5	3115	2/6/2017	2/6/2019
	ANP06900	Cable	32022-29094K-29094K-36TC	12/30/2015	12/30/2017
	AN02810	Preamp	83051A	2/26/2016	2/26/2018
	ANP01210	Cable	FSJ1P-50A-4A	1/16/2017	1/16/2019
	AN03302	Cable	32026-29094K-29094K-72TC	1/29/2016	1/29/2018
	AN03143	Cable	32022-29094K-144TC	3/27/2017	3/27/2019
	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	3/30/2017	3/30/2019
	ANP00928	Cable	various	1/25/2016	1/25/2018
	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/7/2016	10/7/2018
	ANP00929	Cable	various	1/25/2016	1/25/2018
	AN00432	Loop Antenna	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)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$= E_{\text{dBuV}} - E_{\text{dBuV}} + 82.23$$

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

7.13 Spectrum Block Filter

NA = Section 7.13 not applicable because the EUT does not utilize spectrum block filtering.

EXHIBIT A: TEST SETUP PHOTOS

Sections 7.1, 7.2, 7.3, 7.4, 7.5, 7.6 Test Setup



Section 7.8 Test Setup



Section 7.9 Test Setup



Section 7.10 Test Setup



Section 7.11 Test Setup, View 1



Section 7.12 Test Setup, View 2

