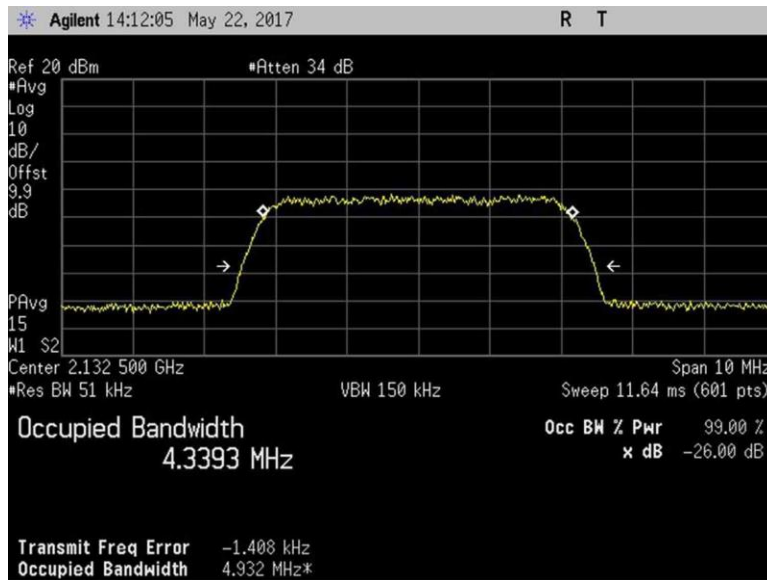
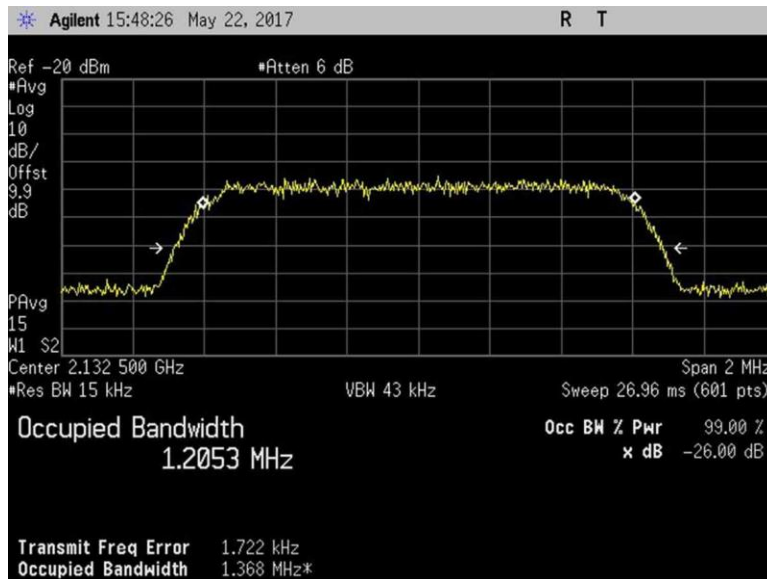


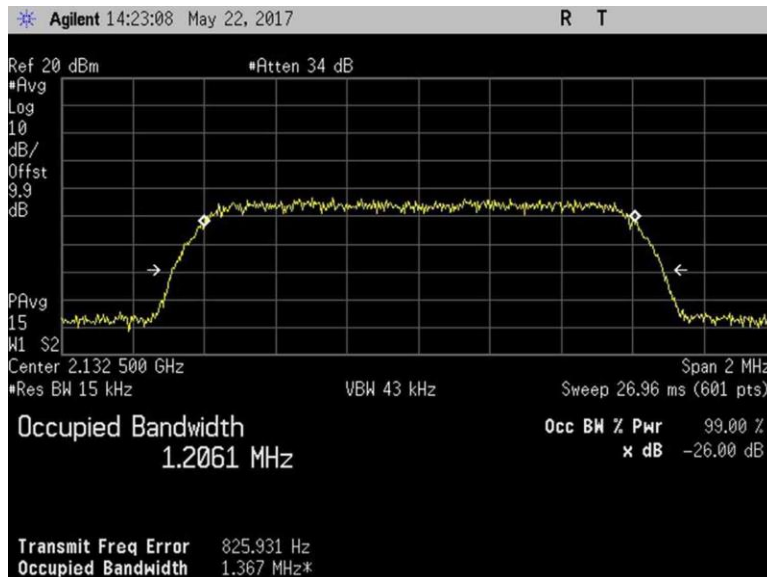
7.10_OBW_DL_2110-2155MHz_AWGN_In



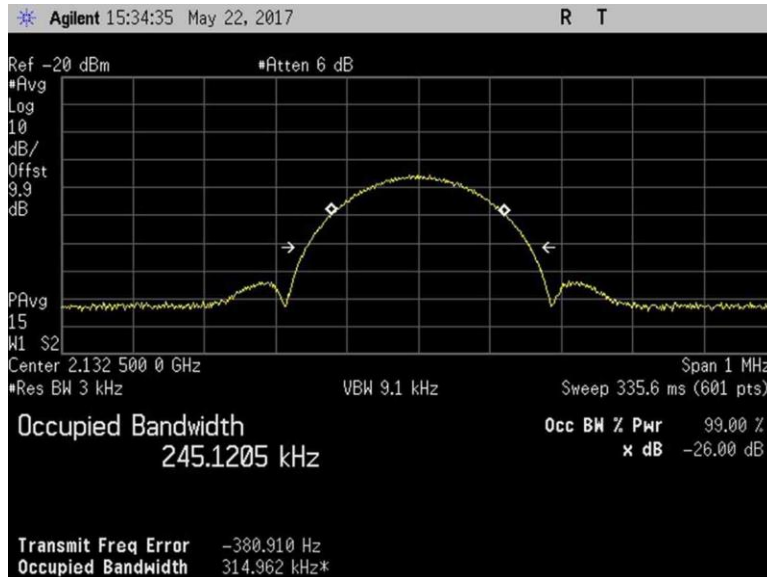
7.10_OBW_DL_2110-2155MHz_AWGN_Out



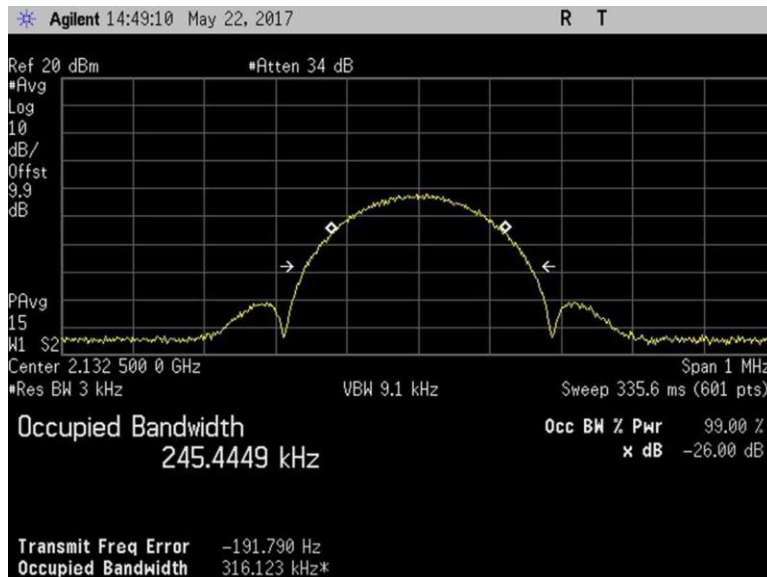
7.10_OBW_DL_2110-2155MHz_CDMA_In



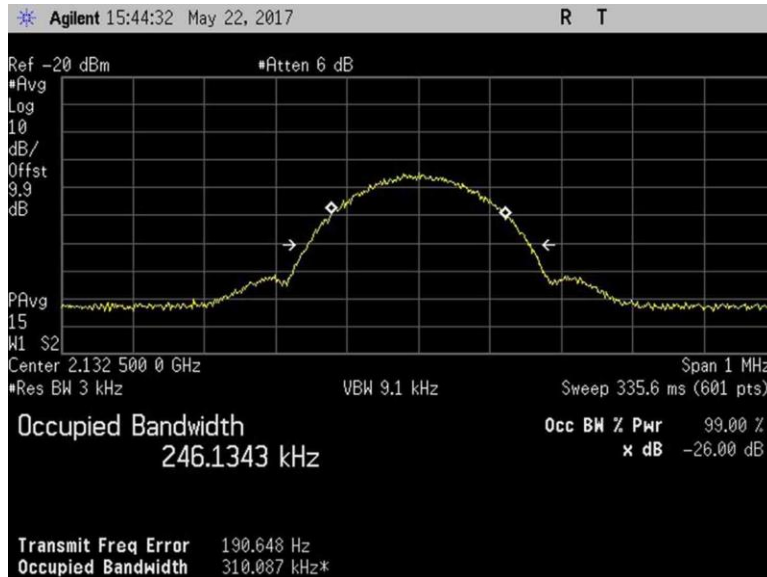
7.10_OBW_DL_2110-2155MHz_CDMA_Out



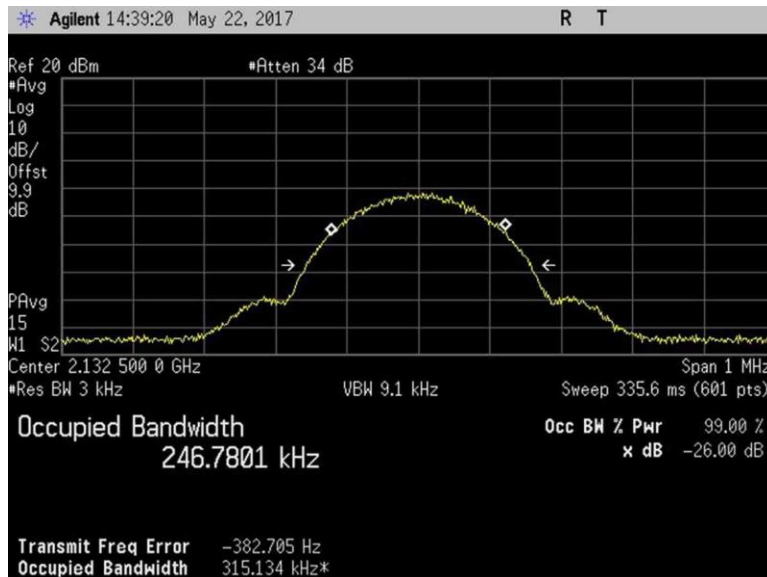
7.10_OBW_DL_2110-2155MHz_EDGE_In



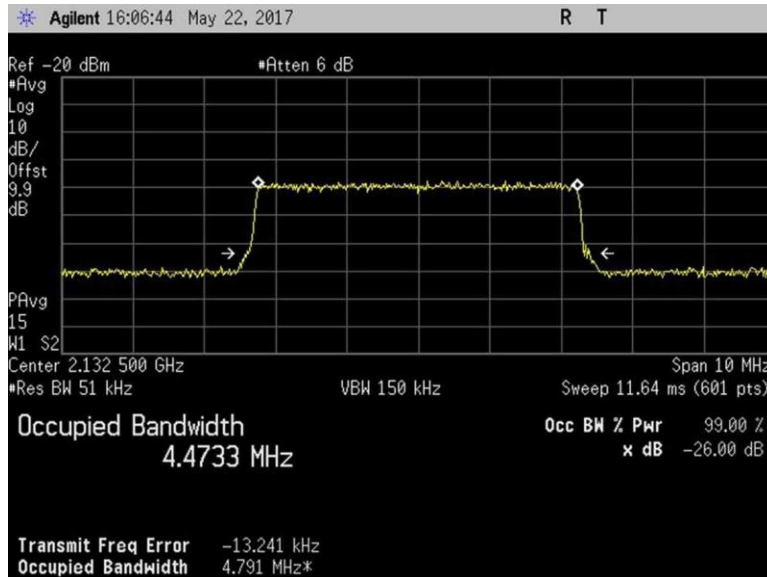
7.10_OBW_DL_2110-2155MHz_EDGE_Out



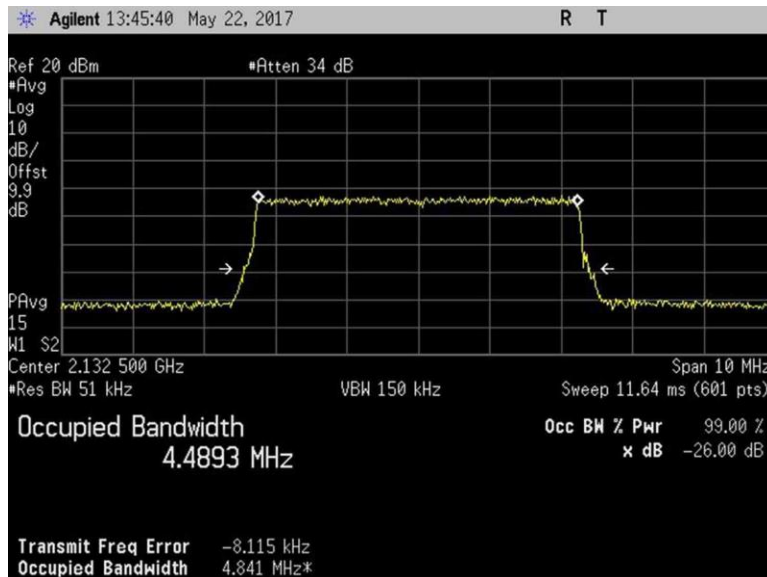
7.10_OBW_DL_2110-2155MHz_GSM_In



7.10_OBW_DL_2110-2155MHz_GSM_Out

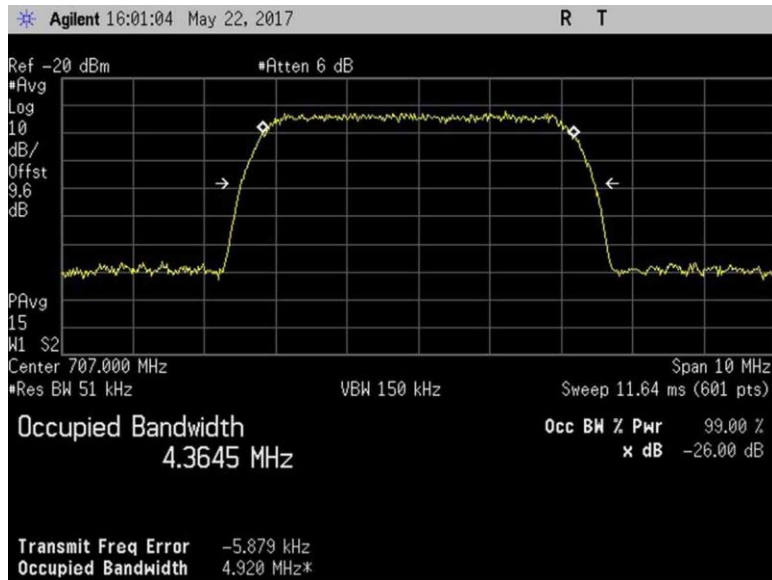


7.10_OBW_DL_2110-2155MHz_LTE_In

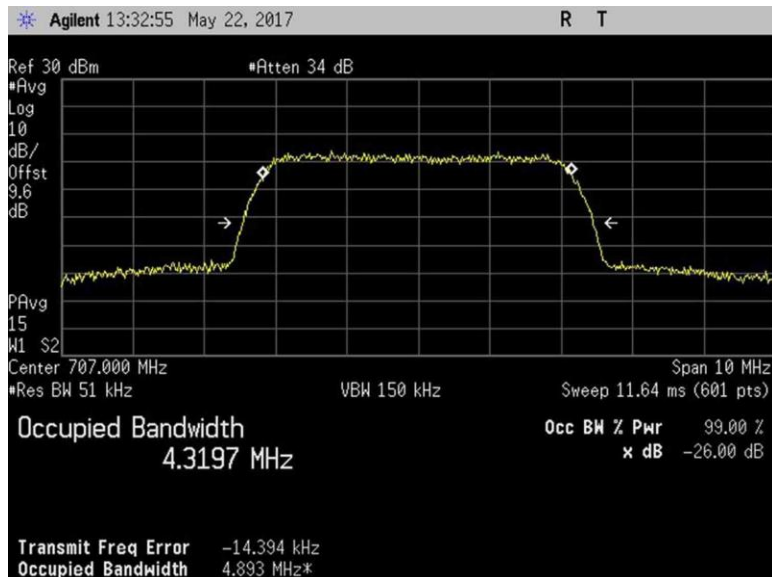


7.10_OBW_DL_2110-2155MHz_LTE_Out

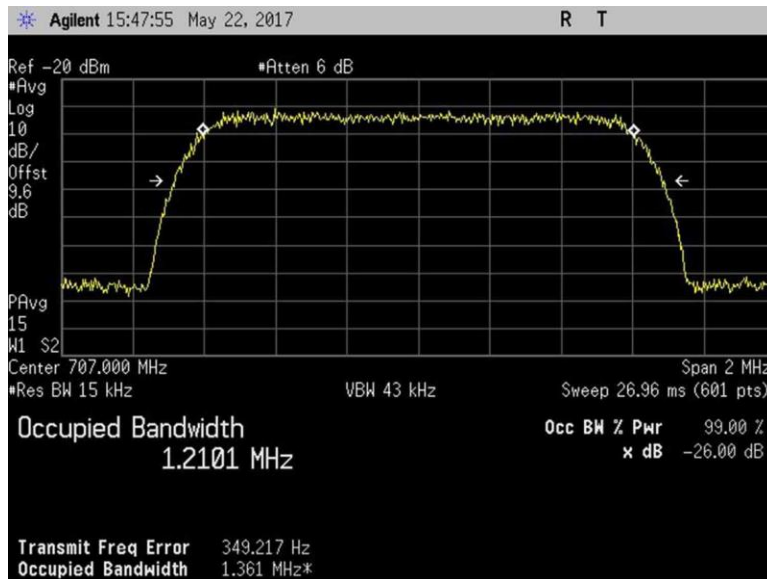
UL
AWGN, DCMA, EDGE, GSM and LTE



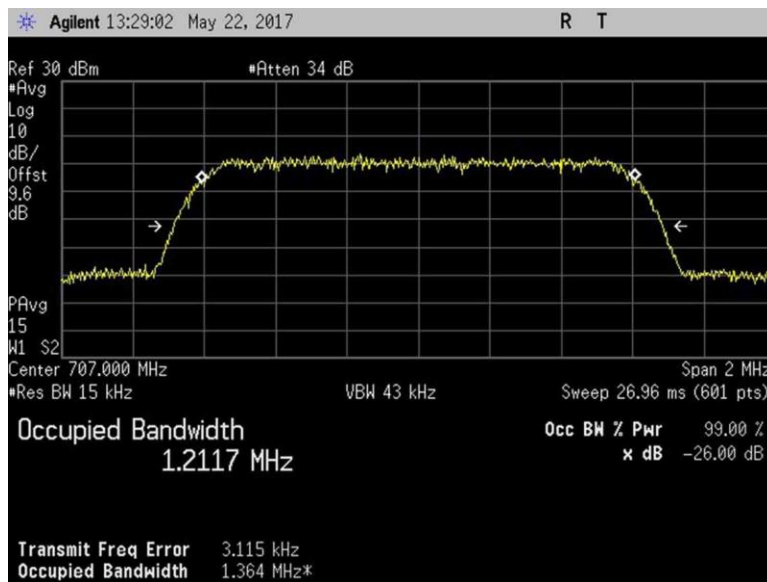
7.10_OBW_UL_698-716MHz_AWGN_In



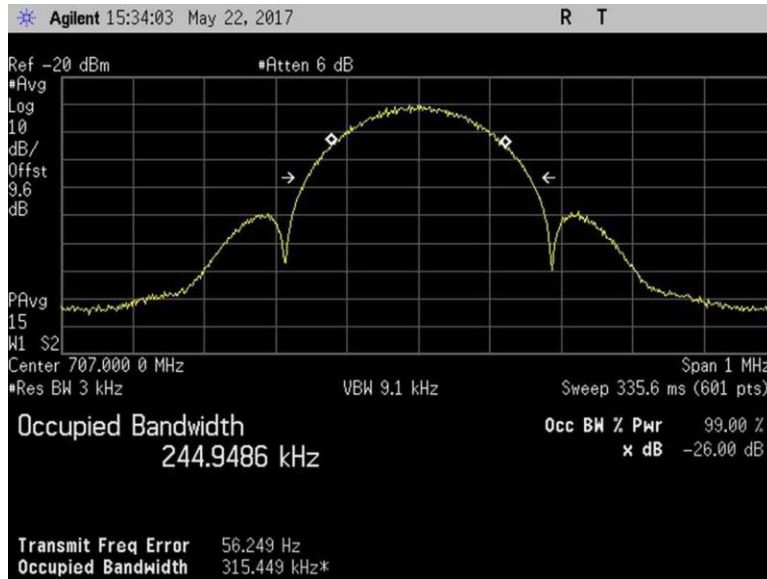
7.10_OBW_UL_698-716MHz_AWGN_Out



7.10_OBW_UL_698-716MHz_CDMA_In



7.10_OBW_UL_698-716MHz_CDMA_Out



7.10_OBW_UL_698-716MHz_EDGE_In



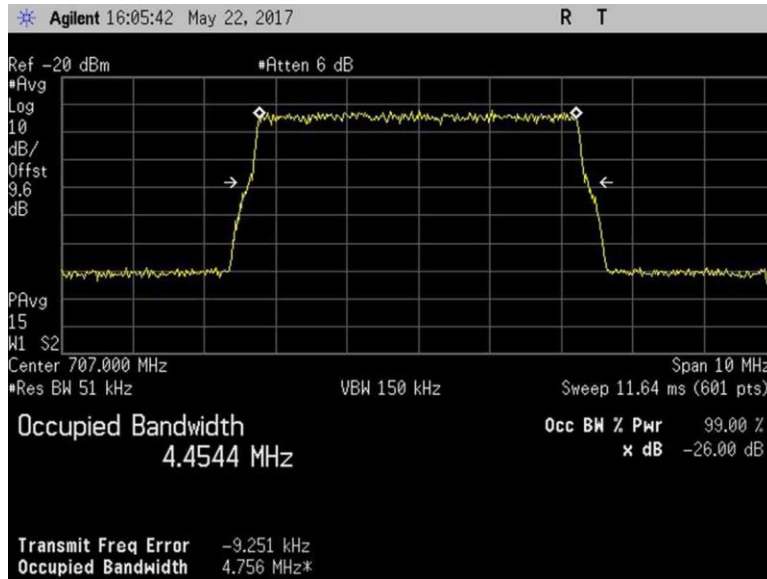
7.10_OBW_UL_698-716MHz_EDGE_Out



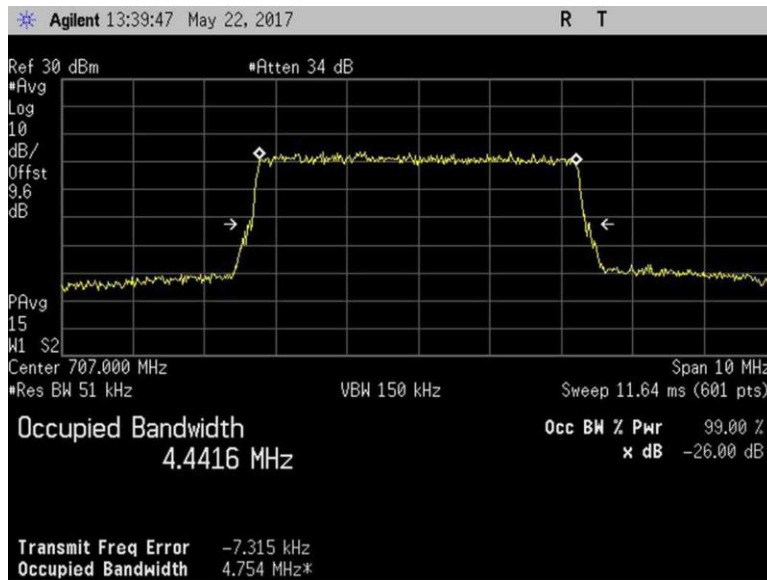
7.10_OBW_UL_698-716MHz_GSM_In



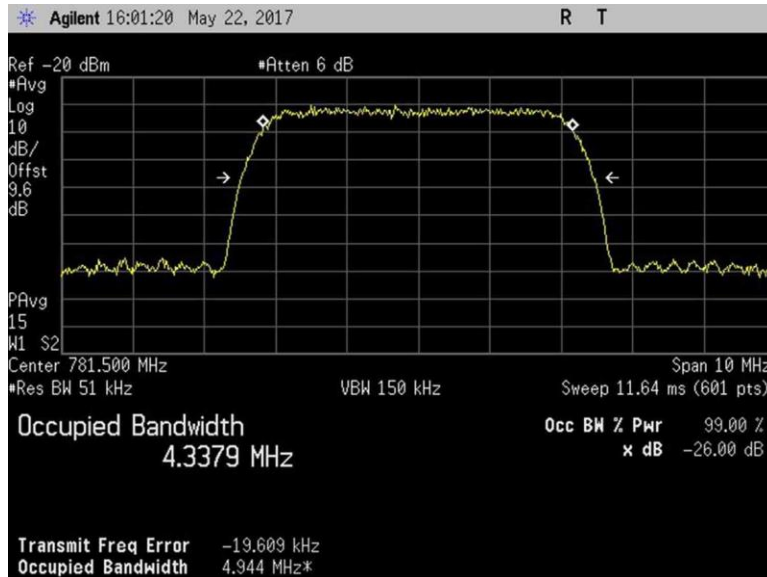
7.10_OBW_UL_698-716MHz_GSM_Out



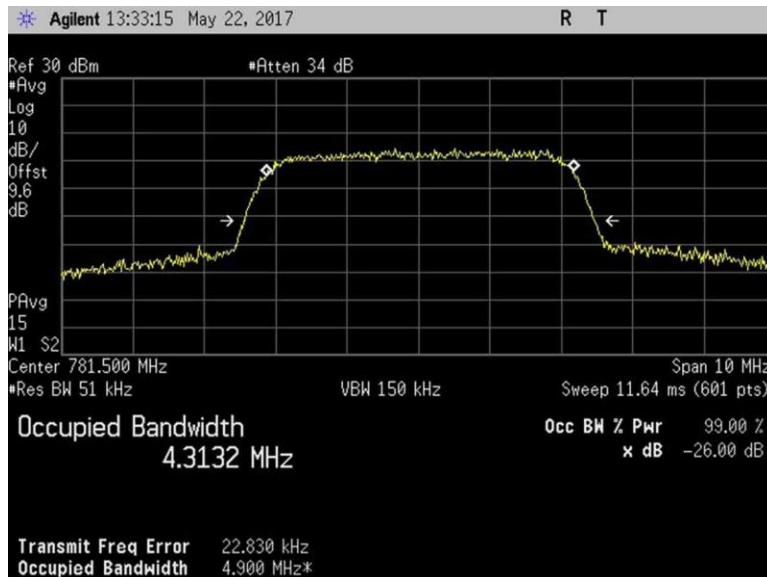
7.10_OBW_UL_698-716MHz_LTE_In



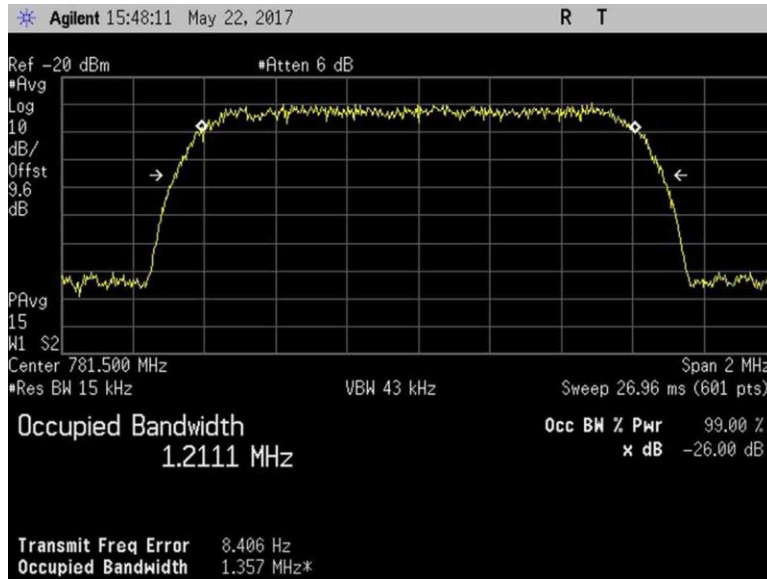
7.10_OBW_UL_698-716MHz_LTE_Out



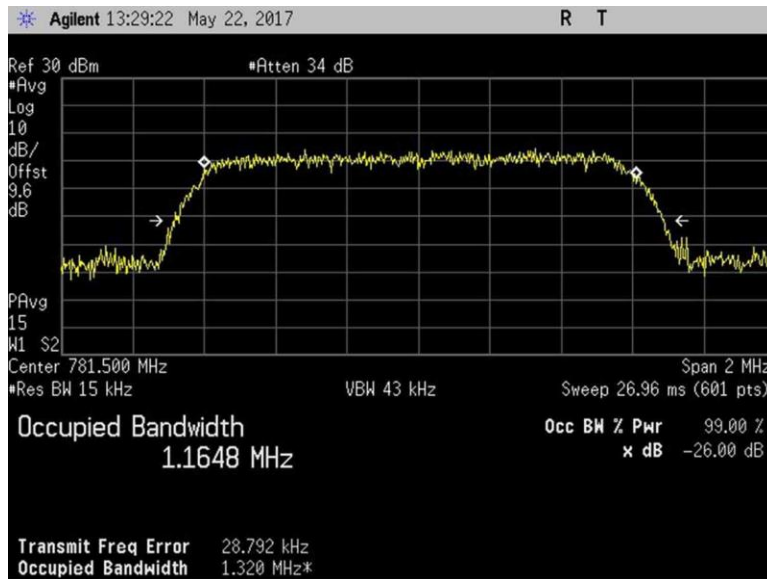
7.10_OBW_UL_776-787MHz_AWGN_In



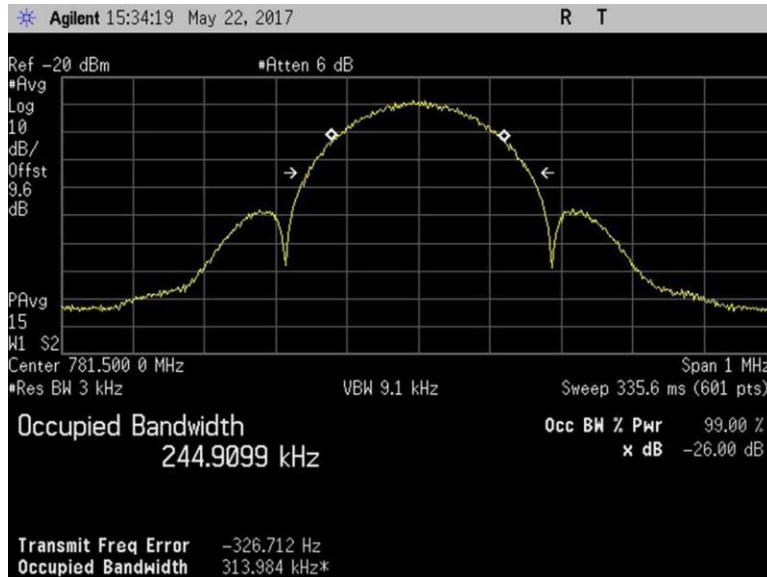
7.10_OBW_UL_776-787MHz_AWGN_Out



7.10_OBW_UL_776-787MHz_CDMA_In



7.10_OBW_UL_776-787MHz_CDMA_Out



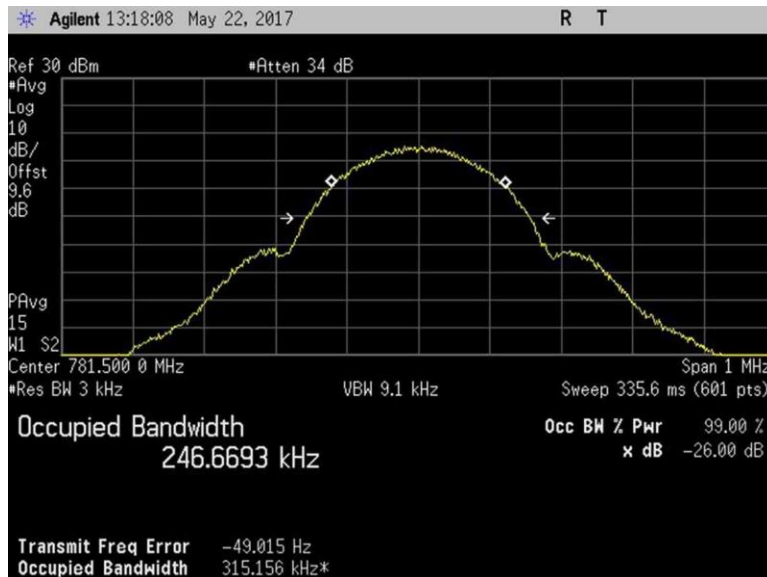
7.10_OBW_UL_776-787MHz_EDGE_In



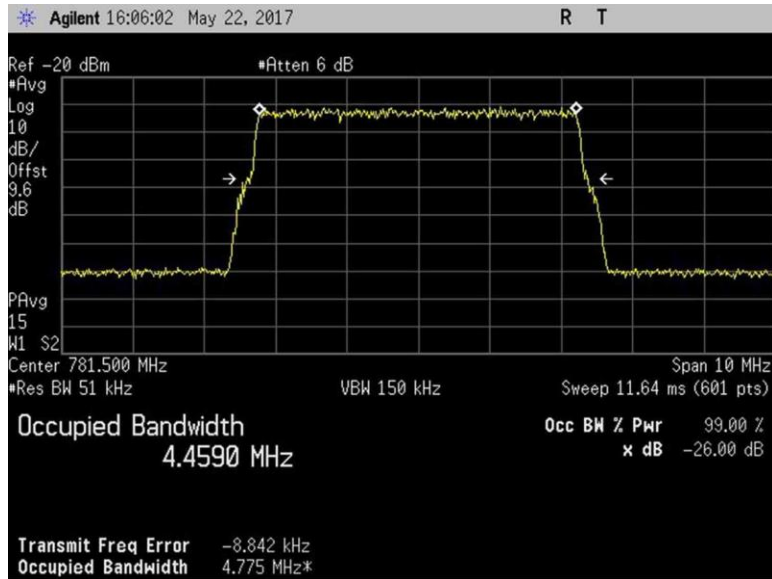
7.10_OBW_UL_776-787MHz_EDGE_Out



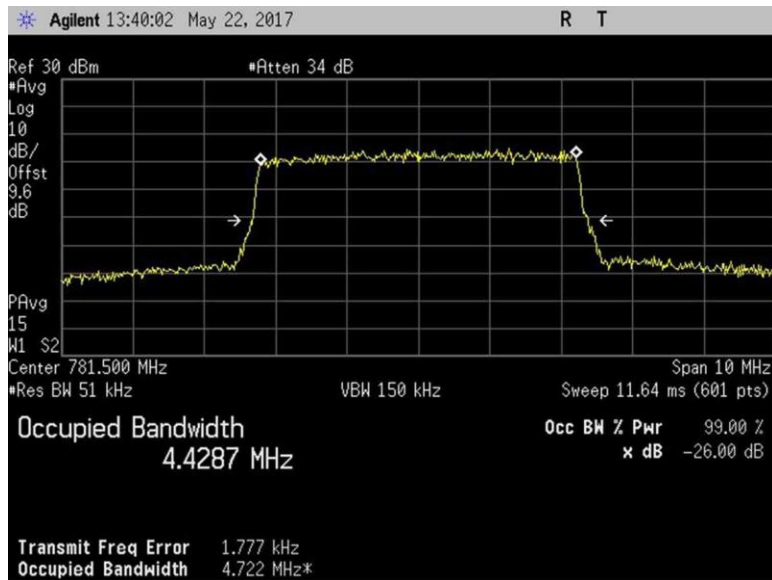
7.10_OBW_UL_776-787MHz_GSM_In



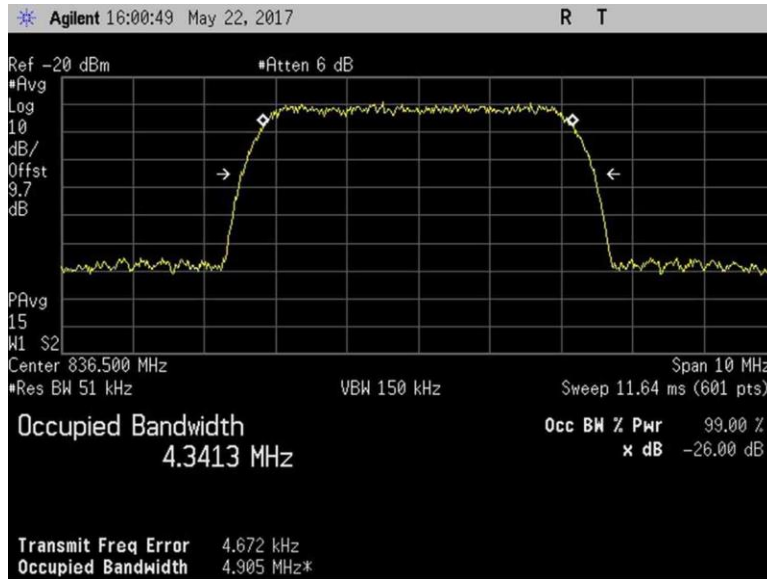
7.10_OBW_UL_776-787MHz_GSM_Out



7.10_OBW_UL_776-787MHz_LTE_In



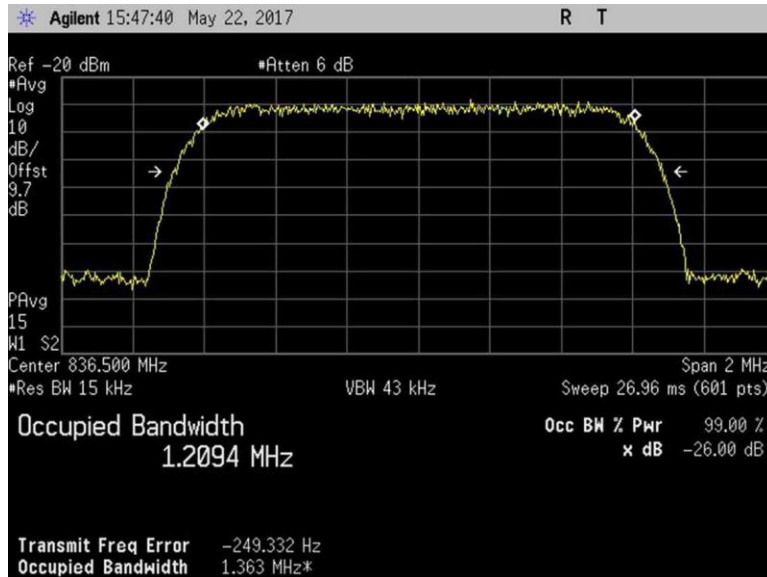
7.10_OBW_UL_776-787MHz_LTE_Out



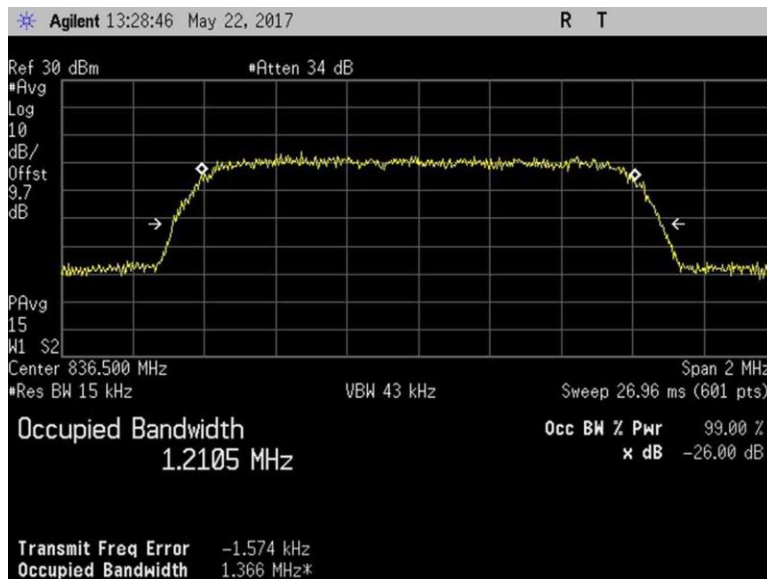
7.10_OBW_UL_824-849MHz_AWGN_In



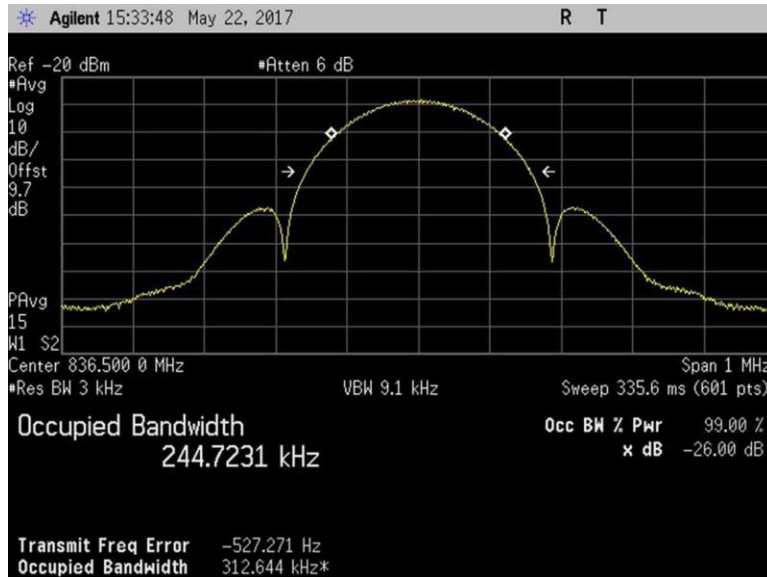
7.10_OBW_UL_824-849MHz_AWGN_Out



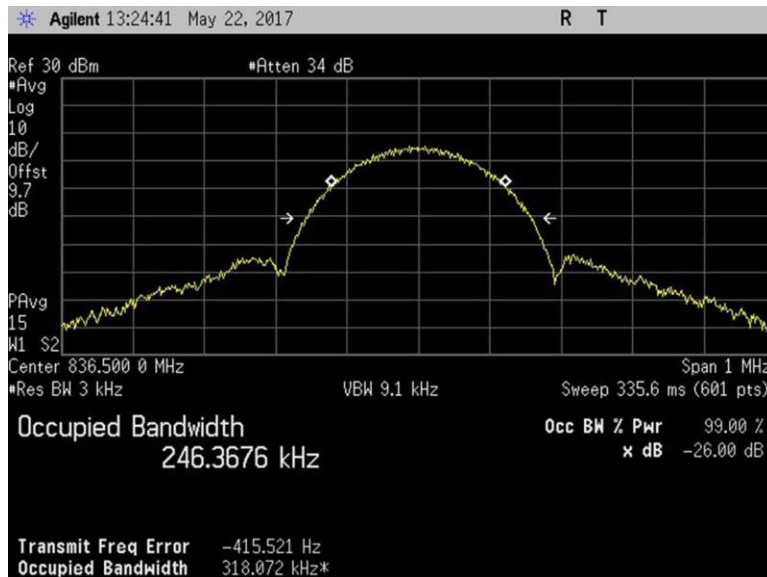
7.10_OBW_UL_824-849MHz_CDMA_In



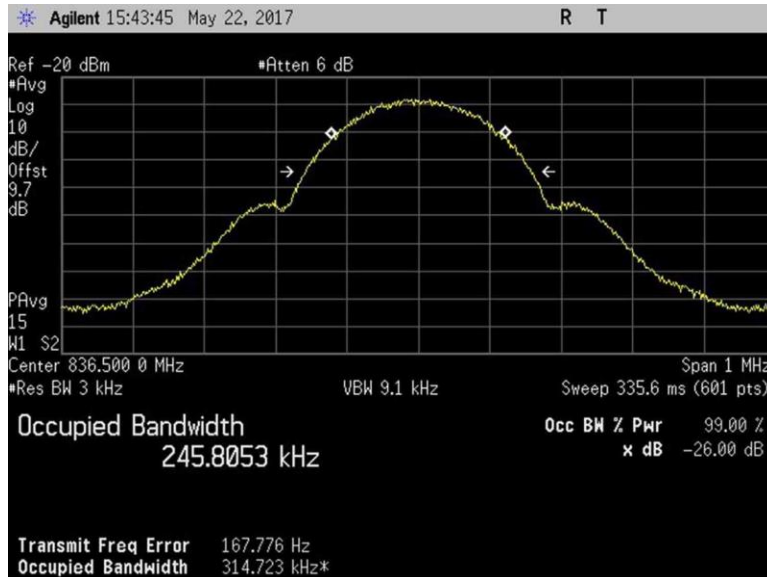
7.10_OBW_UL_824-849MHz_CDMA_Out



7.10_OBW_UL_824-849MHz_EDGE_In



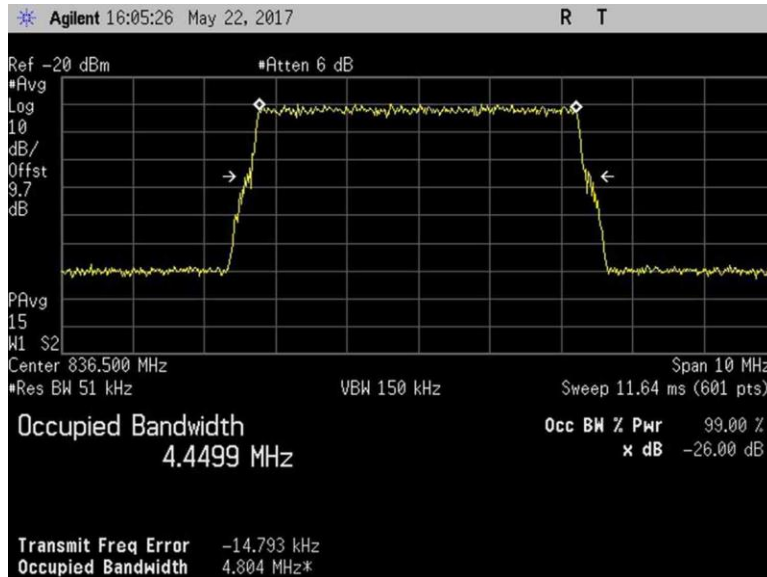
7.10_OBW_UL_824-849MHz_EDGE_Out



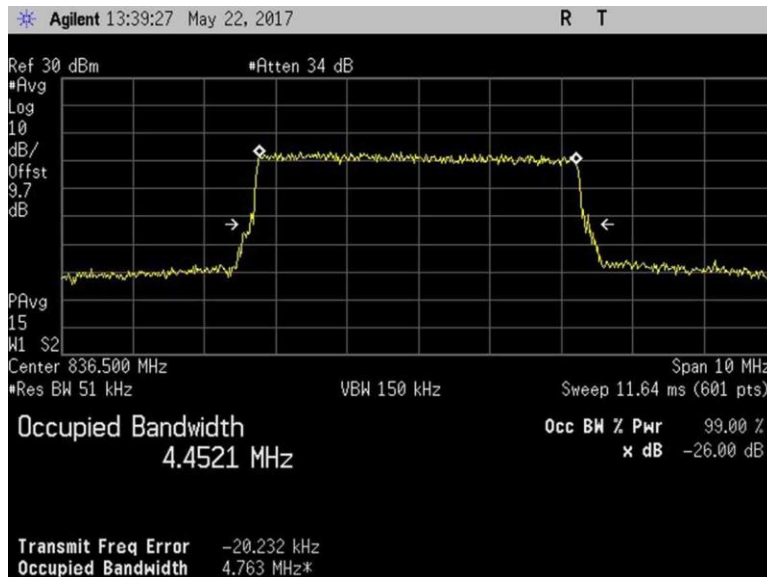
7.10_OBW_UL_824-849MHz_GSM_In



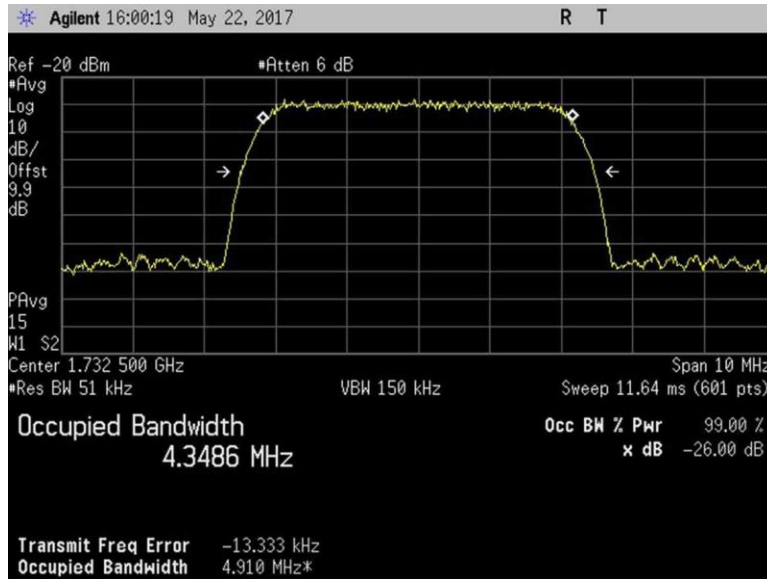
7.10_OBW_UL_824-849MHz_GSM_Out



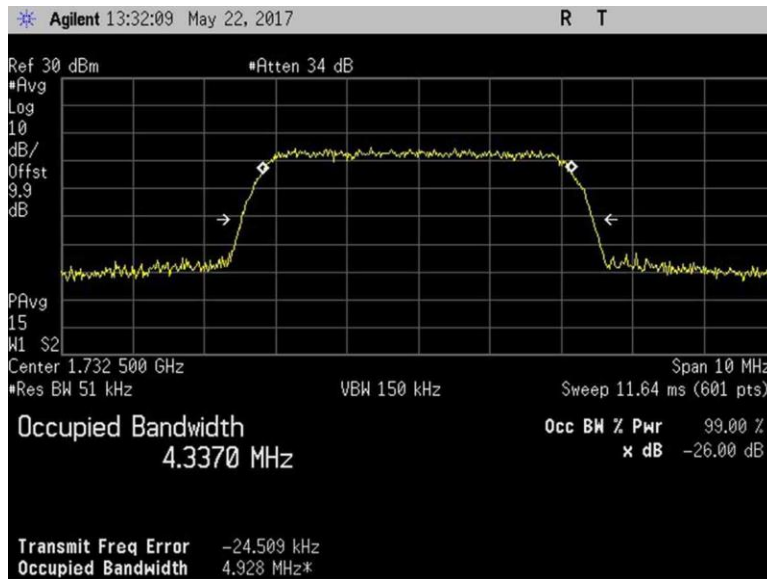
7.10_OBW_UL_824-849MHz_LTE_In



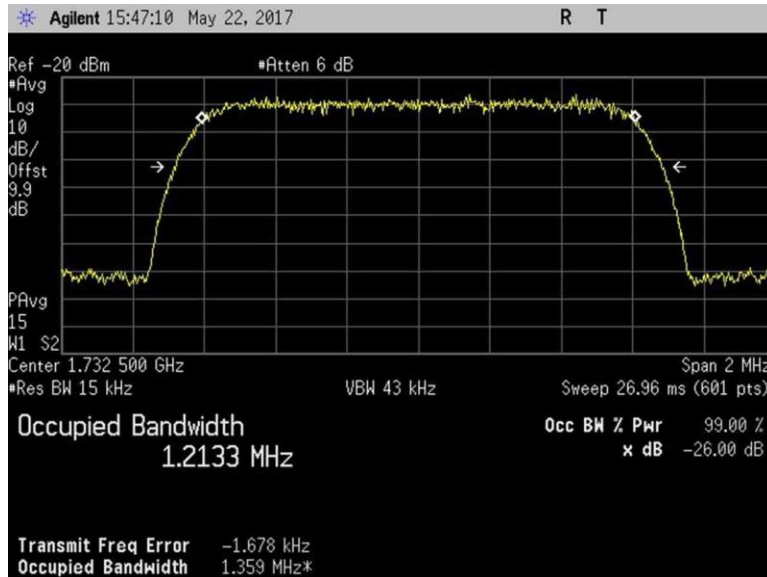
7.10_OBW_UL_824-849MHz_LTE_Out



7.10_OBW_UL_1710-1755MHz_AWGN_In



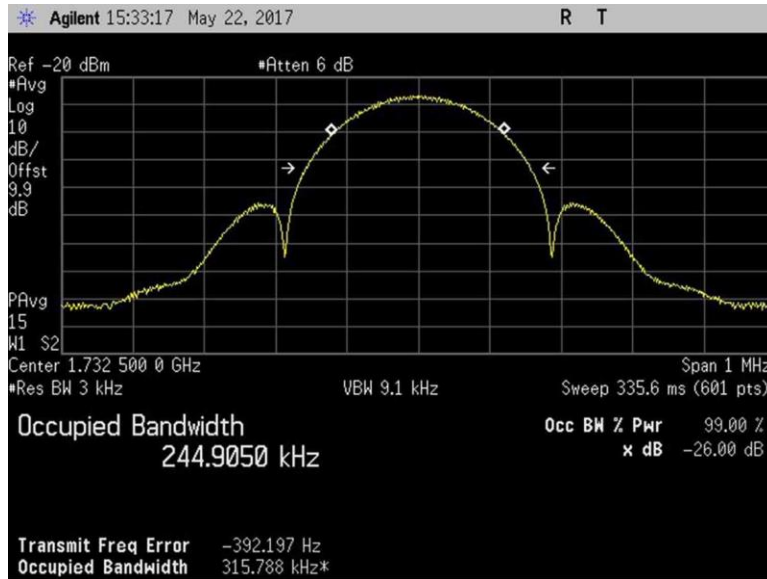
7.10_OBW_UL_1710-1755MHz_AWGN_Out



7.10_OBW_UL_1710-1755MHz_CDMA_In



7.10_OBW_UL_1710-1755MHz_CDMA_Out



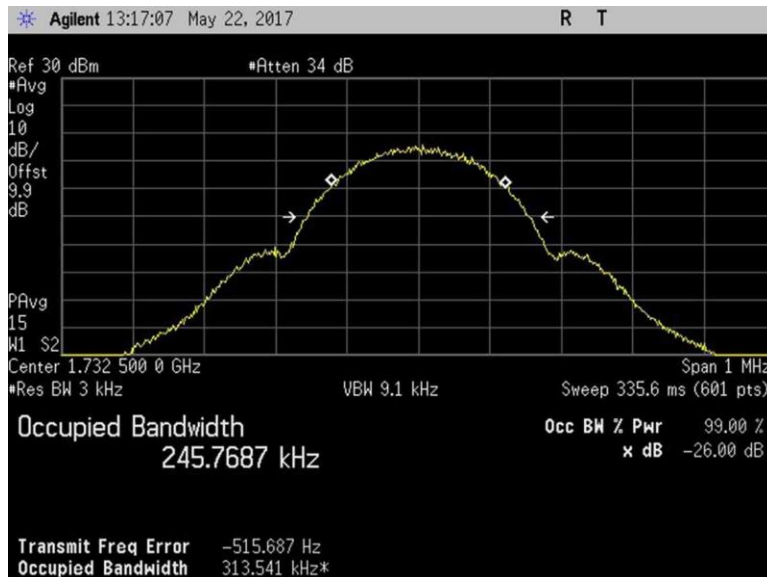
7.10_OBW_UL_1710-1755MHz_EDGE_In



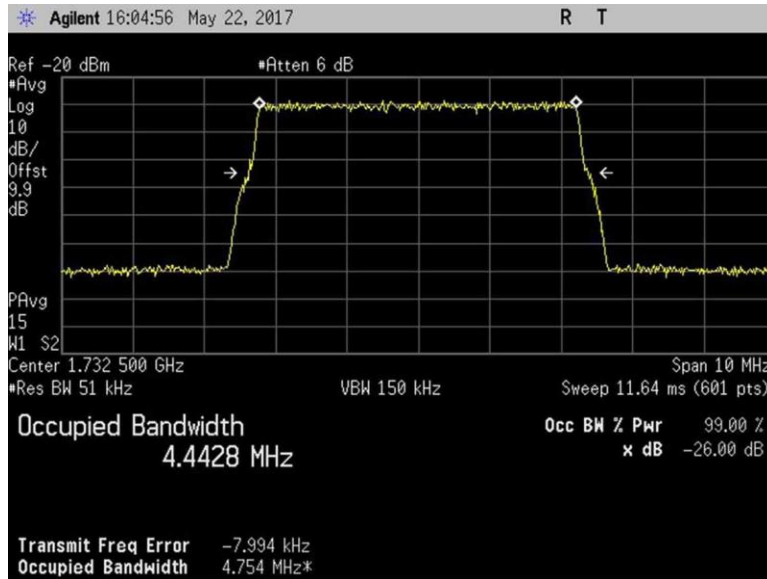
7.10_OBW_UL_1710-1755MHz_EDGE_Out



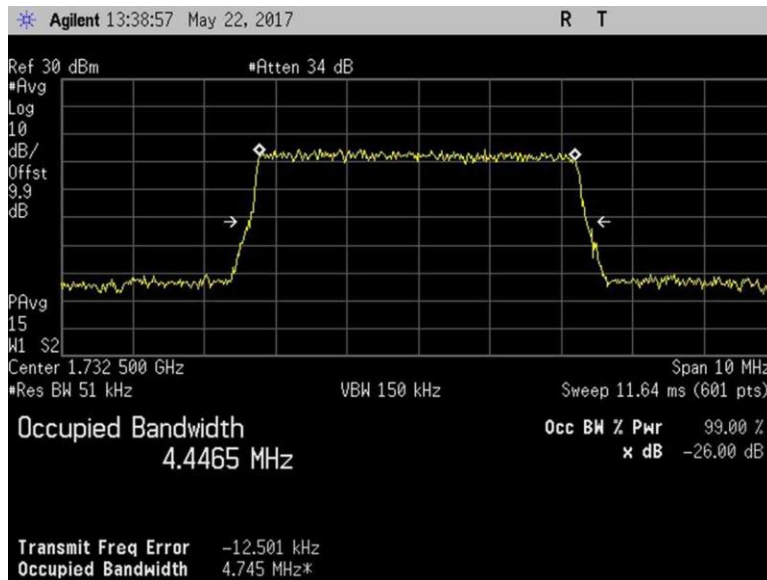
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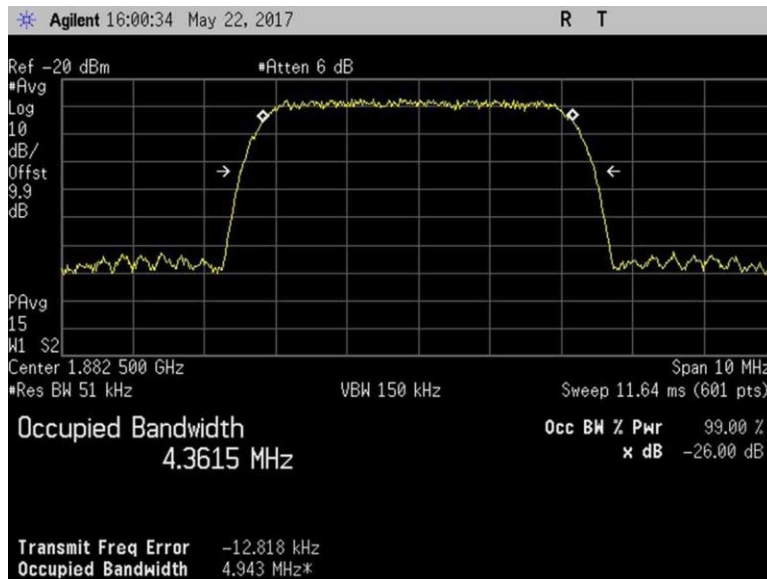
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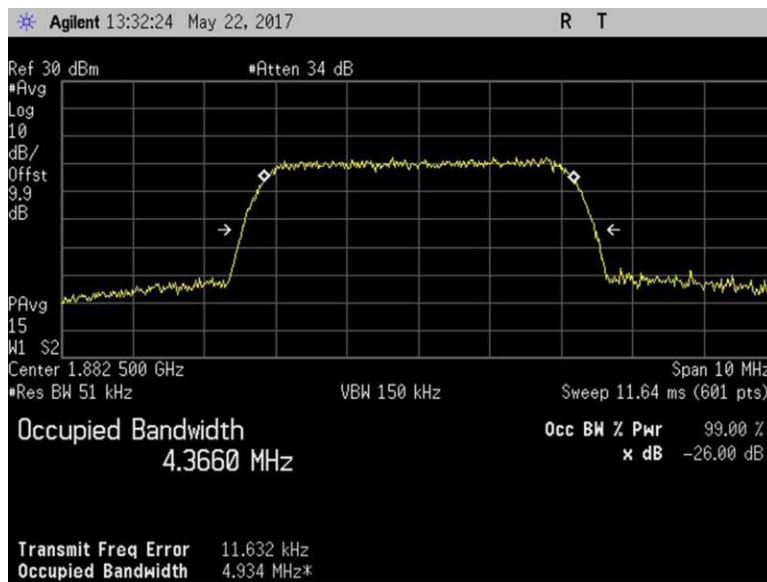
7.10_OBW_UL_1710-1755MHz_LTE_In



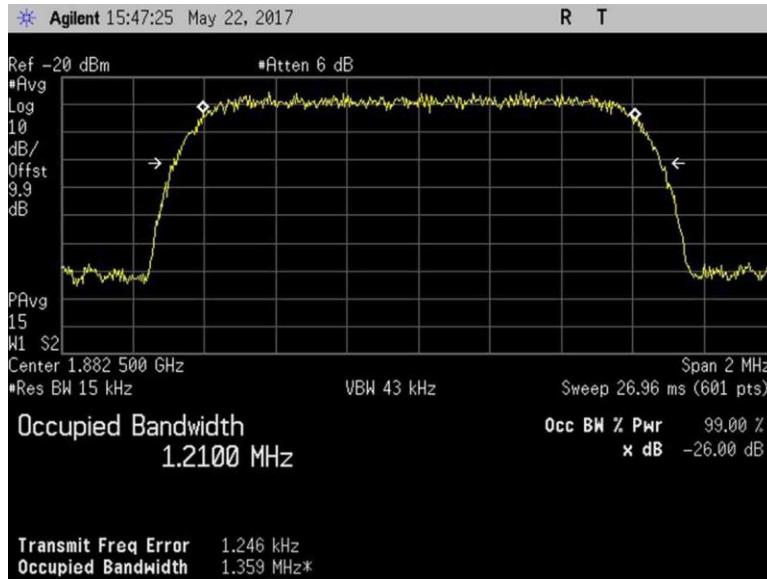
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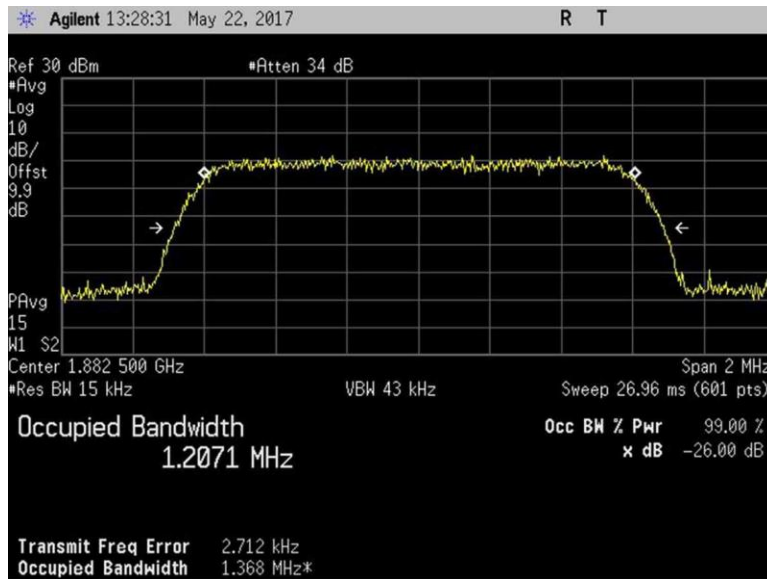
7.10_OBW_UL_1850-1915MHz_AWGN_In



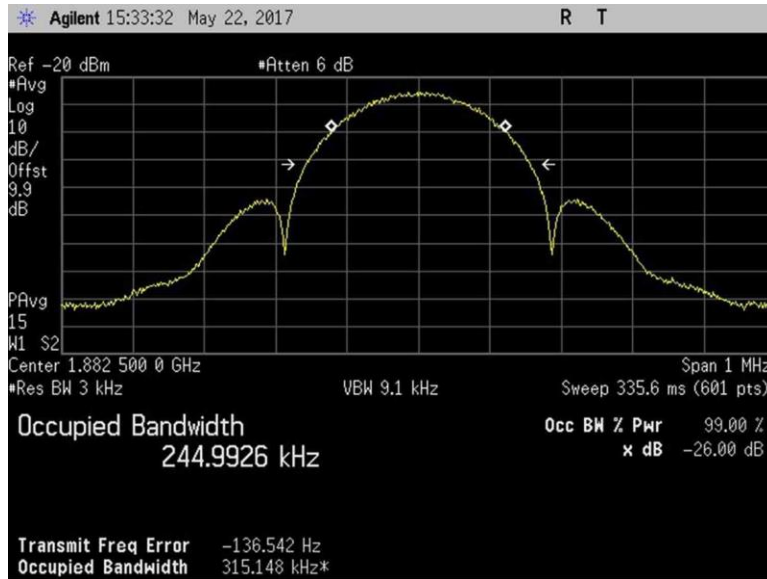
7.10_OBW_UL_1850-1915MHz_AWGN_Out



7.10_OBW_UL_1850-1915MHz_CDMA_In



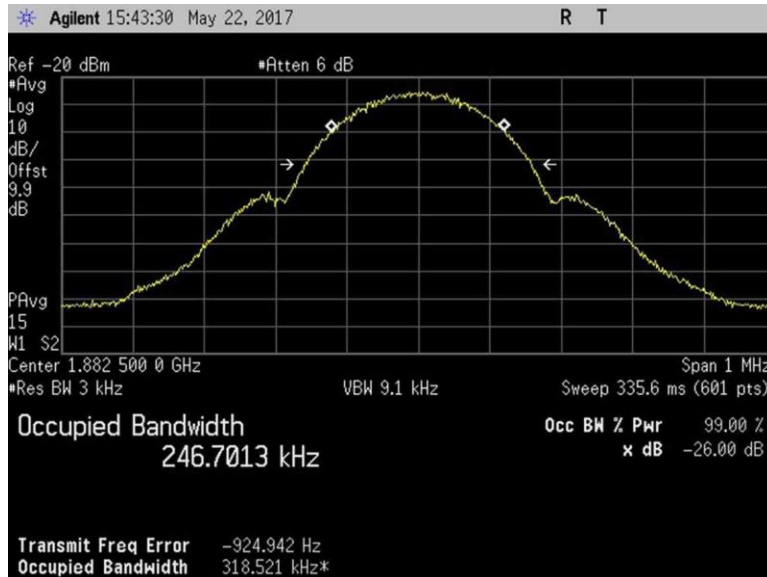
7.10_OBW_UL_1850-1915MHz_CDMA_Out



7.10_OBW_UL_1850-1915MHz_EDGE_In



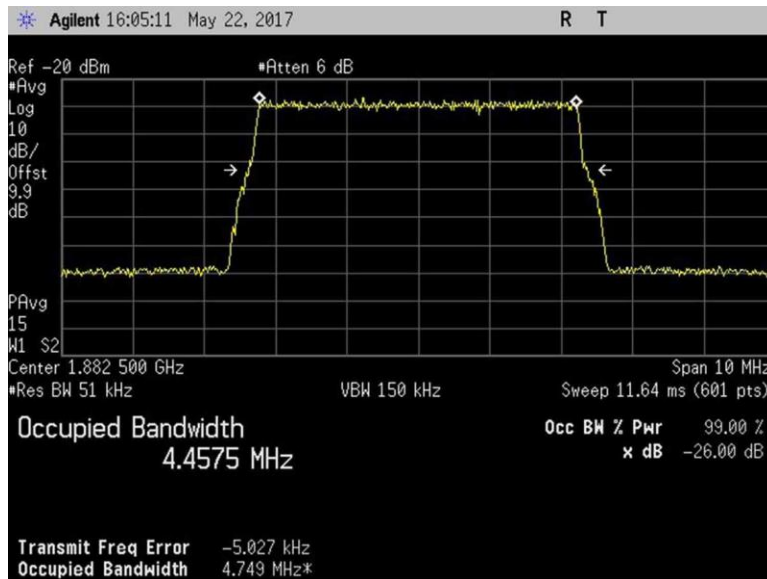
7.10_OBW_UL_1850-1915MHz_EDGE_Out



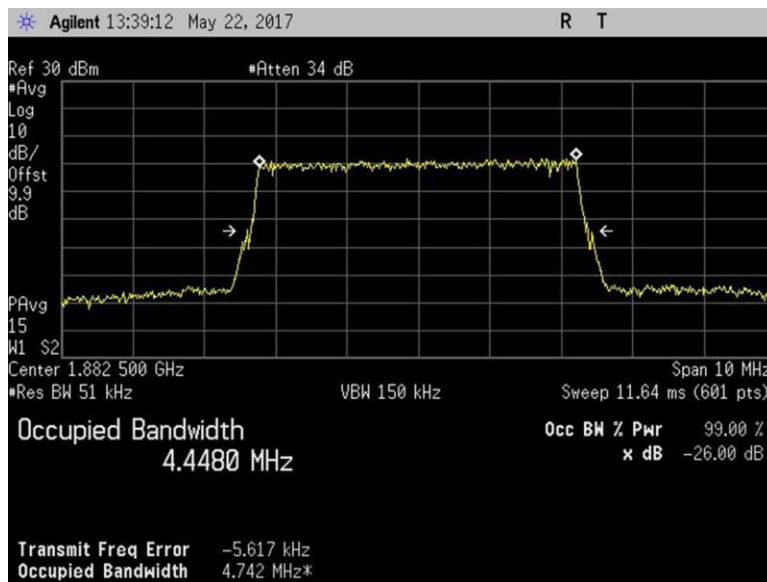
7.10_OBW_UL_1850-1915MHz_GSM_In



7.10_OBW_UL_1850-1915MHz_GSM_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 #: **99983** Date: 5/24/2017
 Test Type: **Conducted Emissions** Time: 13:23:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.02

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 v04 Dated February 12, 2016.
 Firmware: 1.7
 Test environment conditions: Test environment conditions: 22°C, 38% Relative Humidity, 101.2 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
	AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018
	AN03412	Band Pass Filter	PE8705	8/12/2015	8/12/2017
	AN03413	Band Pass Filter	PE8706	8/12/2015	8/12/2017
	AN03414	Band Pass Filter	PE8707	8/12/2015	8/12/2017
	AN03415	Band Pass Filter	PE8708	8/12/2015	8/12/2017
	AN03447	Band Pass Filter	PE8710	8/12/2015	8/12/2017
	AN03448	Band Pass Filter	PE8711	8/12/2015	8/12/2017
	AN03446	Band Pass Filter	4FV50-707/H18-O/O	1/04/2016	1/04/2018
	AN03467	Band Pass Filter	4FV50-731/H30-O/O	1/04/2016	1/04/2018
	AN03468	Band Pass Filter	4CS10-781.5/E12.2-O/O	1/04/2016	1/04/2018
	AN03469	Band Pass Filter	4CS10-751.5/E12-O/O	1/04/2016	1/04/2018
	AN02475	1 dB step Attenuator	8494B	6/29/2015	6/29/2017
	AN03429	10dB step Attenuator	8496B	8/27/2015	8/27/2017
	ANC00082	RF Coupler	722-10-1.500V	8/26/2015	8/26/2017
	ANC00087	Combiner	44000	1/07/2016	1/07/2018

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	0.26	0.30	25.2	69	60	5	5
UL1850-1915	0.25	0.30	23.5	71	60	5	5
UL824-894	0.25	0.30	29.0	70	60	5	5
UL 698-716	0.24	0.30	29.0	69	60	5	5
UL776-787	0.25	0.30	29.3	70	60	5	5
DL2110-2155	0.32	1.00	14.5	70	60	5	5
DL1930-1995	0.80	1.00	20.0	70	60	5	5
DL869-894	0.56	1.00	25.0	69	60	5	5
DL:728-746	0.56	1.00	22.6	70	60	5	5
DL 746-757	0.32	1.00	22.0	70	60	5	5

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

7.11.3 Test procedure for measuring oscillation mitigation or shutdown

	UL 1710-1755	UL1850-1915	UL 824-894	UL 698-716	UL 776-787	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	9.0	9.8	8.5	10.0	10.1	12.0
+4dB	11.1	10.8	9.7	11.0	11.7	12.0
+3dB	(12.4)*	11.9	11.2	(12.8)*	(12.8)*	12.0
+2dB	(17.8)*	(12.7)*	(13.3)*	(14)*	(14.9)*	12.0
+1dB	(20.8)*	(14.1)*	(15.7)*	(17.3)*	(17.7)*	12.0
0dB	(29.3)*	(16.7)*	(25.3)*	(21.6)*	(23.2)*	12.0
-1dB	(84.5)*	(19.1)*	(93.2)*	(33.3)*	(87.5)*	12.0
-2dB	**	(25.5)*	**	**	**	12.0
-3dB	**	(46.8)*	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

	DL 2110-2155	DL 1930-1995	DL 869-894	DL 728-746	DL 746-775	
Max Gain Isolation	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Pk-Pk Difference	Limit
dB	dB	dB	dB	dB	dB	dB
+5dB	8.8	11.9	8.7	10.3	8.9	12.0
+4dB	9.7	(15.2)*	10.5	11.4	9.2	12.0
+3dB	10.9	(18.6)*	11.7	(13.3)*	10.8	12.0
+2dB	(14.5)*	(22.5)*	(12.9)*	(15.9)*	11.4	12.0
+1dB	(15.8)*	(39.6)*	(14.3)*	(19.4)*	(15.1)*	12.0
0dB	(21.3)*	(41.5)*	(17.6)*	(20)*	(17.1)*	12.0
-1dB	(38.4)*	**	(21)*	(27.6)*	(18.2)*	12.0
-2dB	**	**	(27.2)*	**	(26.3)*	12.0
-3dB	**	**	**	**	**	12.0
-4dB	**	**	**	**	**	12.0
-5dB	**	**	**	**	**	12.0

Note:

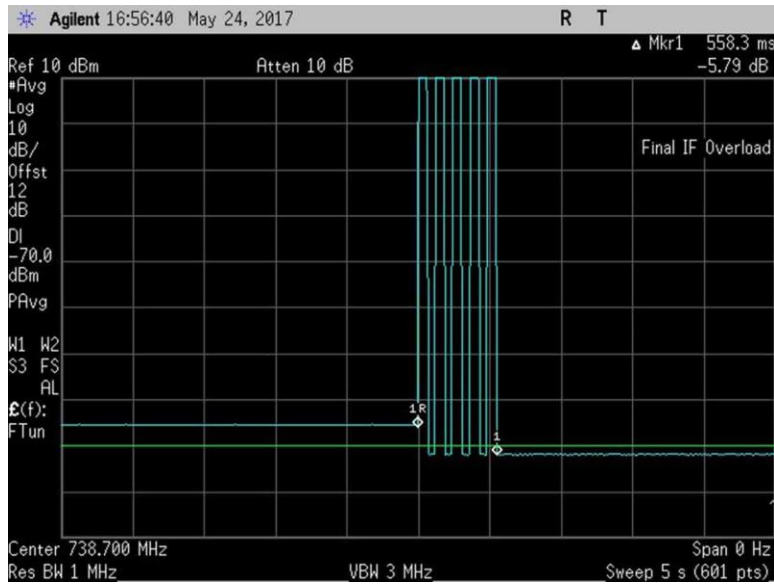
* The measured difference exceeds the limit for a period of less than 300 second before device mitigates or shuts down. The maximum recorded time prior to shutdown was 200 seconds for the Uplink bands and 220 seconds for the Downlink bands.

** The device shuts down immediately.

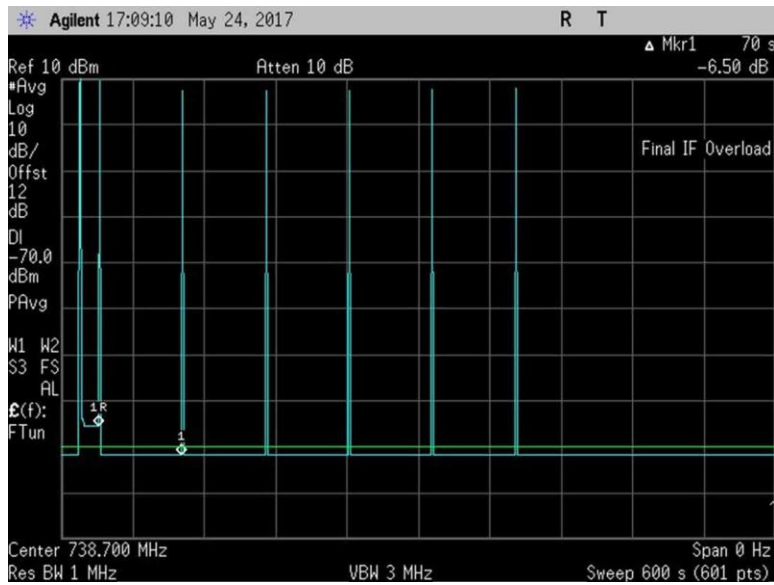
7.11.2 Oscillation Restart Tests

Plots

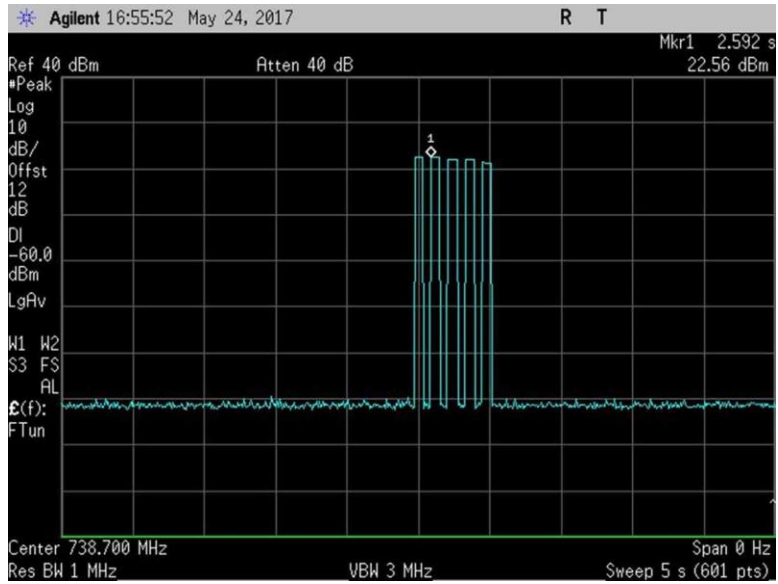
DL



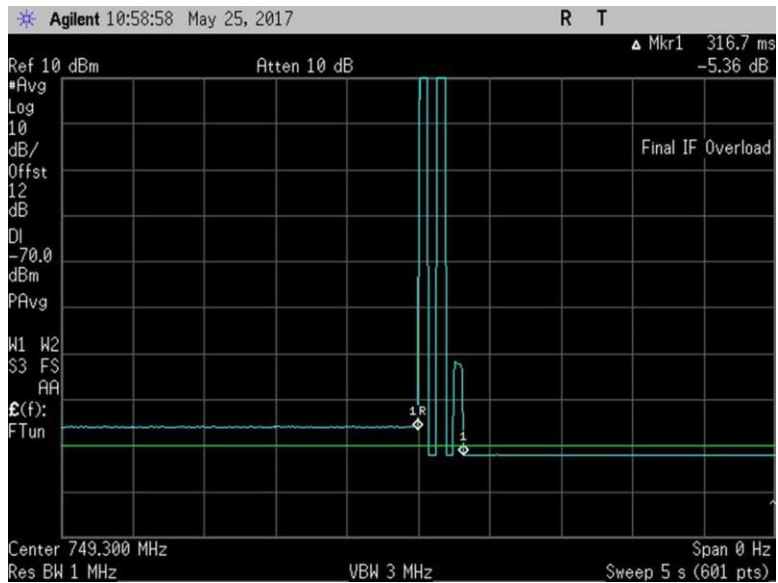
7.11.2_osc_DL_728-746MHz



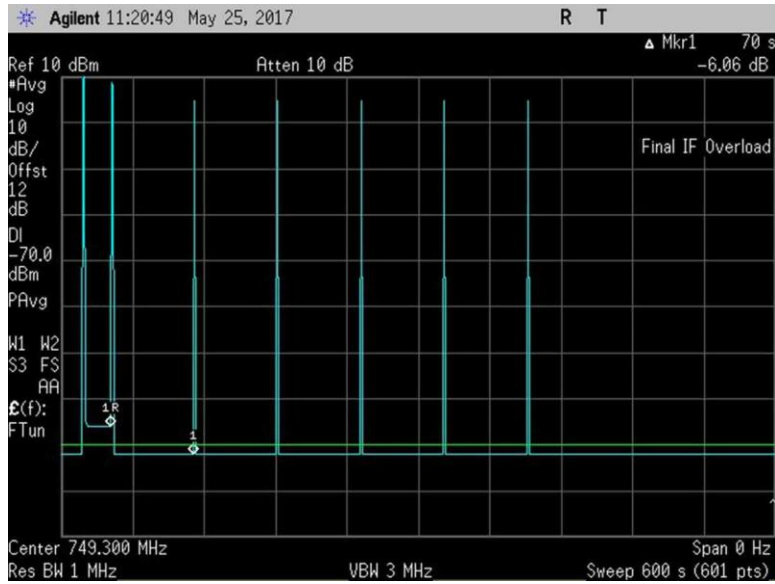
7.11.2_osc_DL_728-746MHz600sec



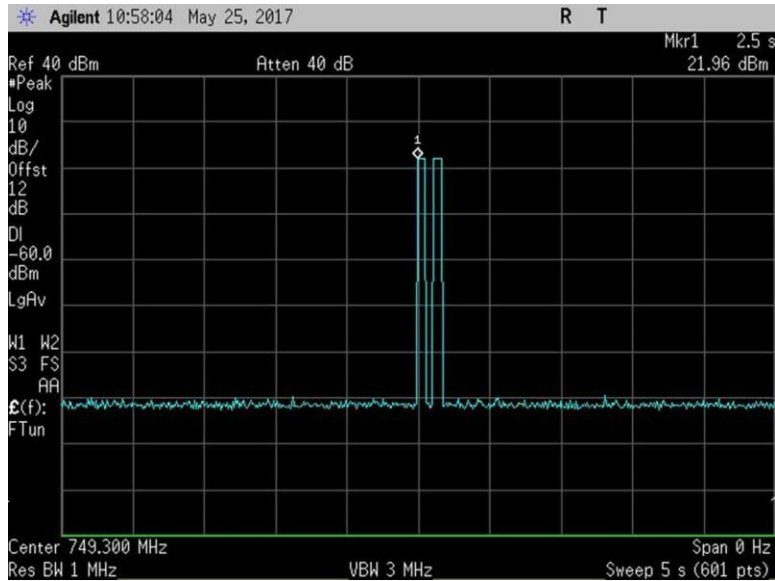
7.11.2_osc_DL_728-746MHzPk



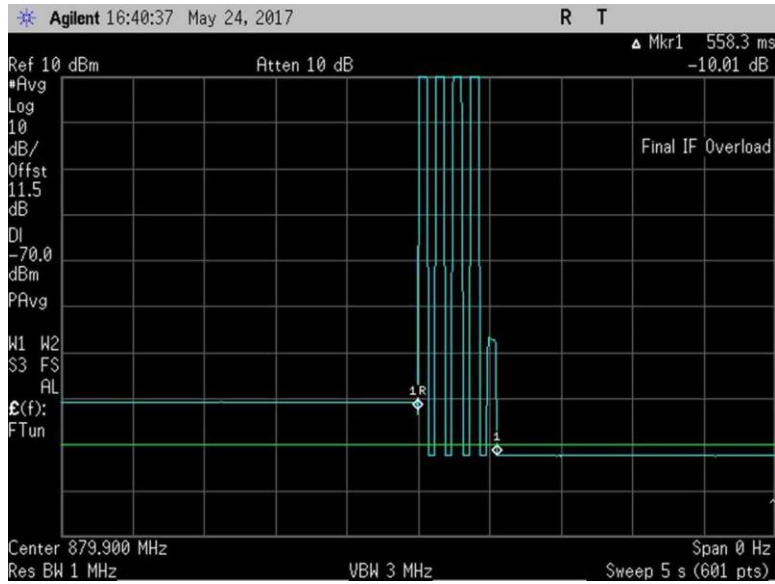
7.11.2_osc_DL_746-757MHz



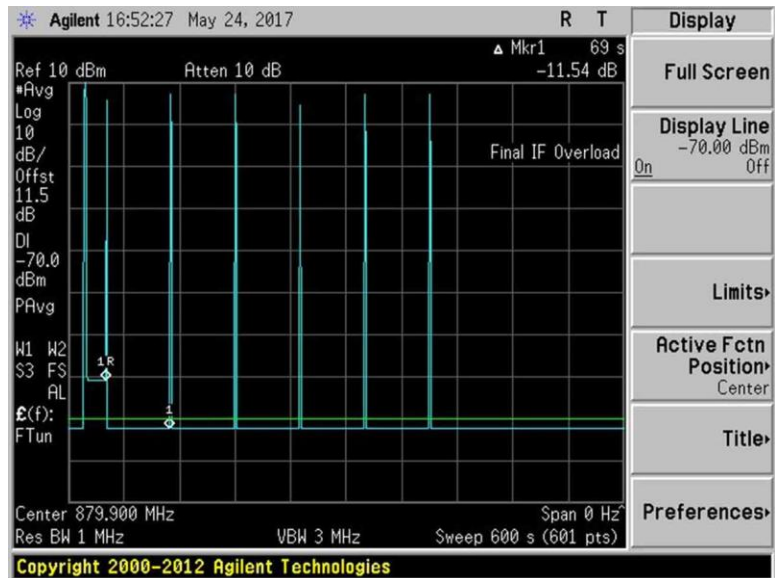
7.11.2_osc_DL_746-757MHz600sec



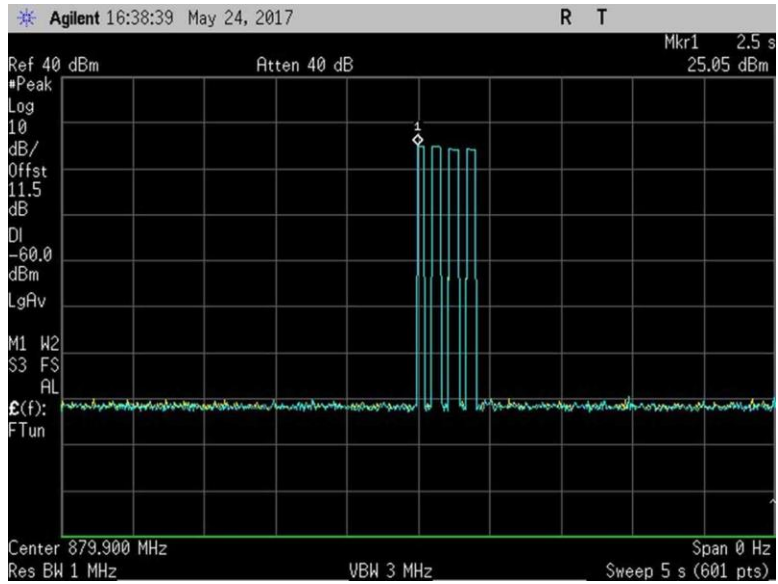
7.11.2_osc_DL_746-757MHzPk



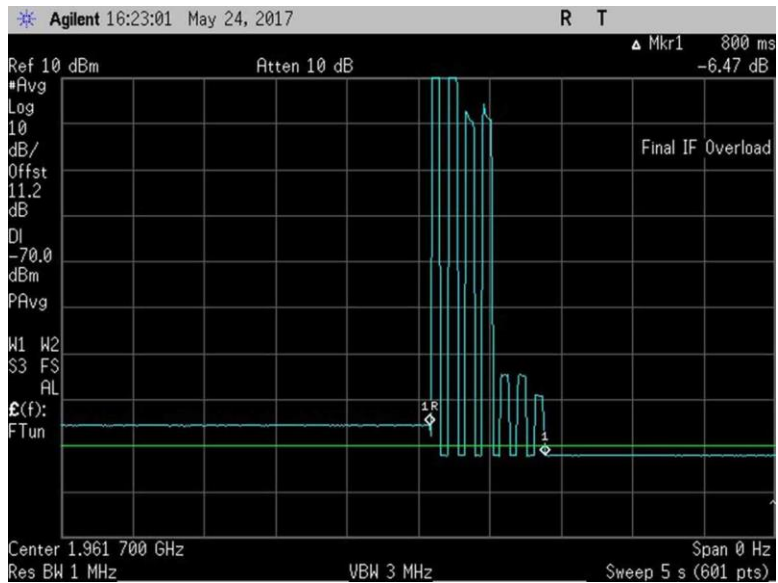
7.11.2_osc_DL_869-894MHz



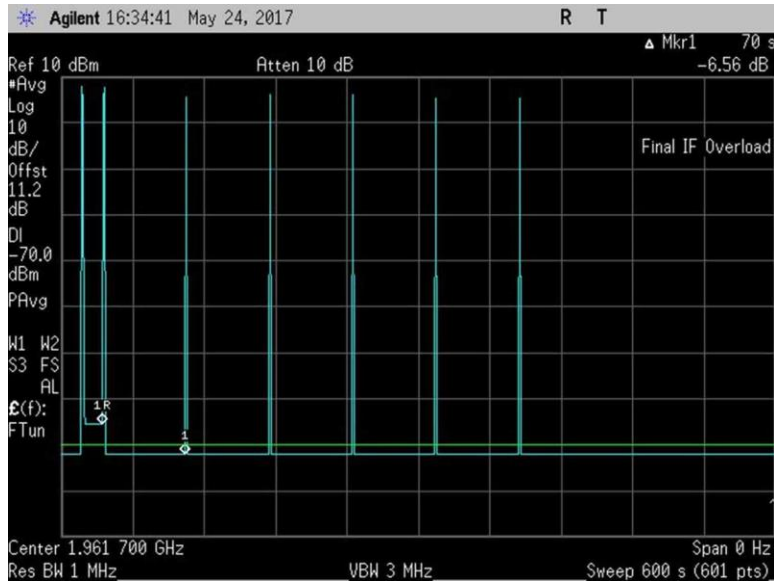
7.11.2_osc_DL_869-894MHz600sec



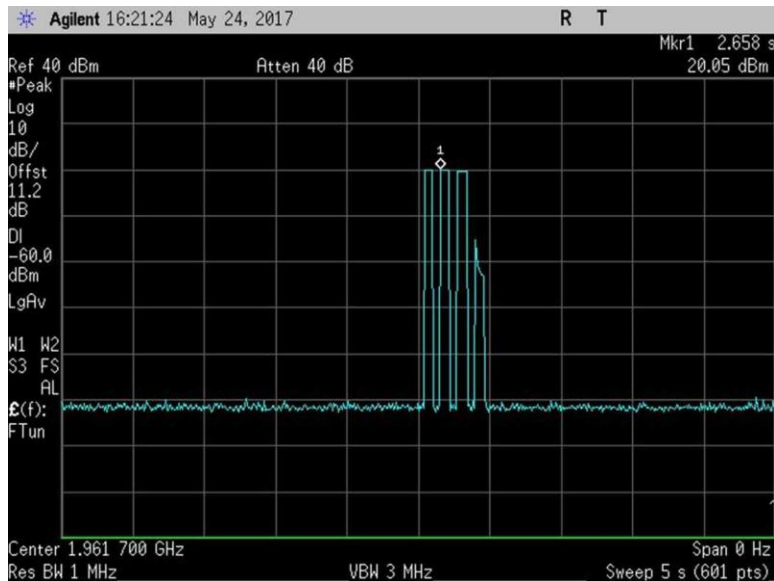
7.11.2_osc_DL_869-894MHzPk



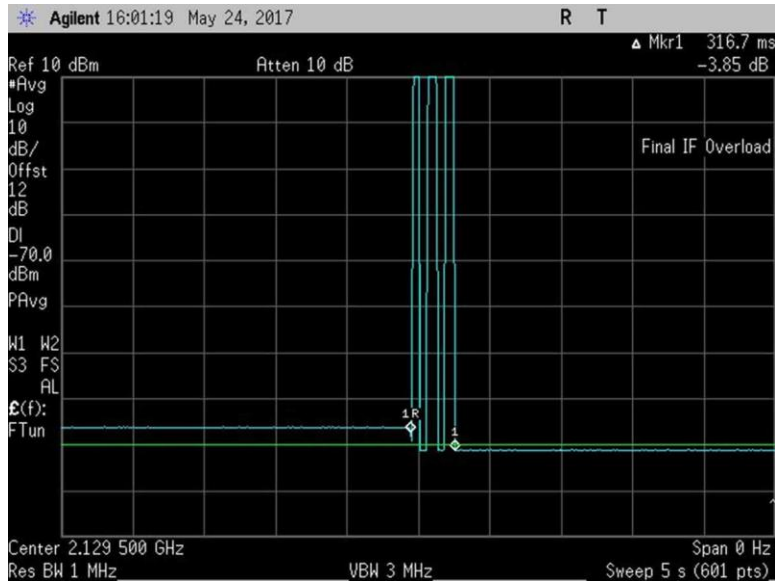
7.11.2_osc_DL_1930-1995MHz



7.11.2_osc_DL_1930-1995MHz600sec



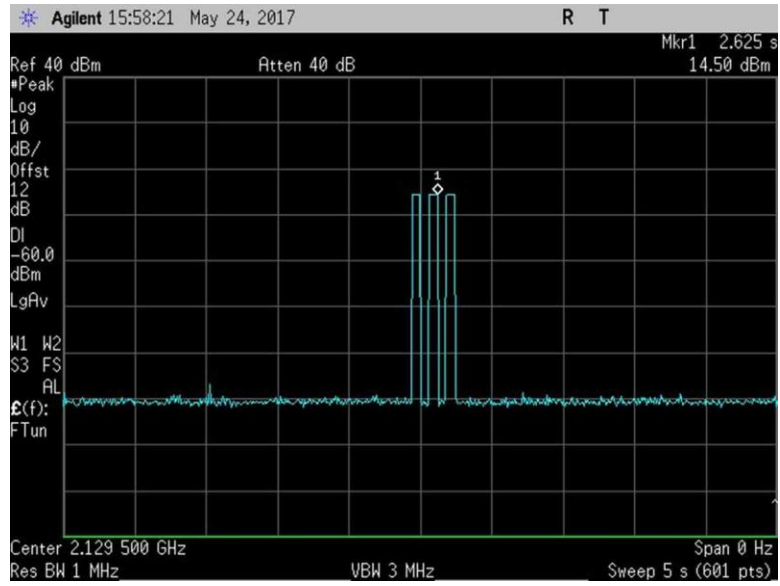
7.11.2_osc_DL_1930-1995MHzPk



7.11.2_osc_DL_2110-2155MHz

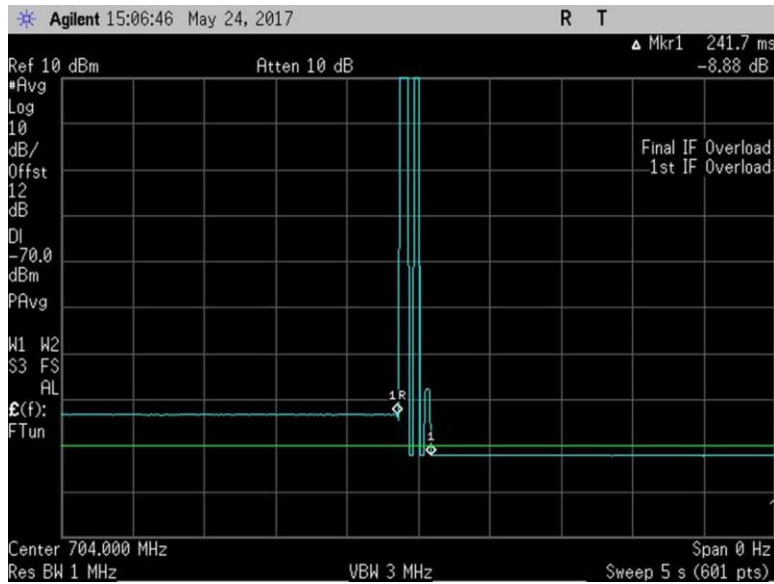


7.11.2_osc_DL_2110-2155MHz600sec

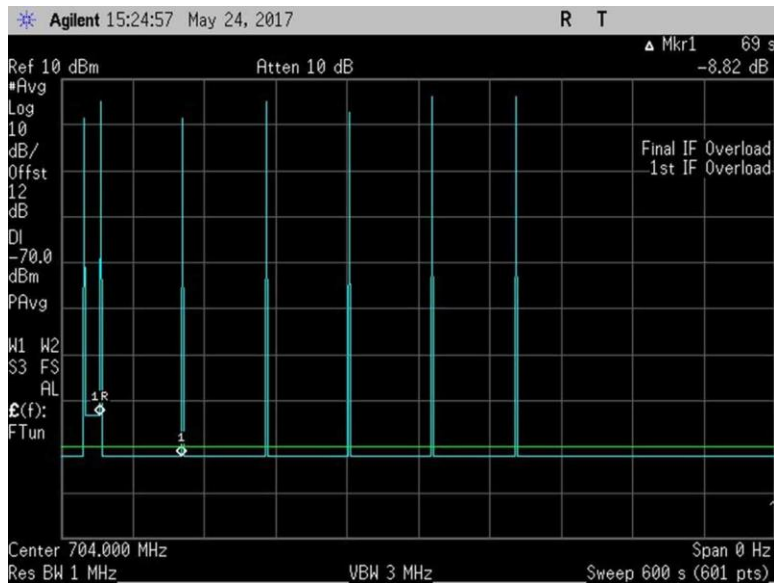


7.11.2_osc_DL_2110-2155MHzPk

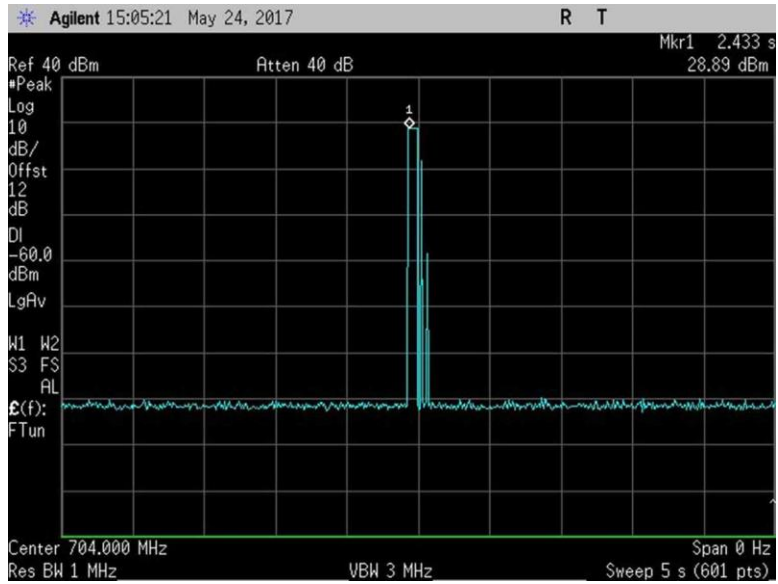
UL



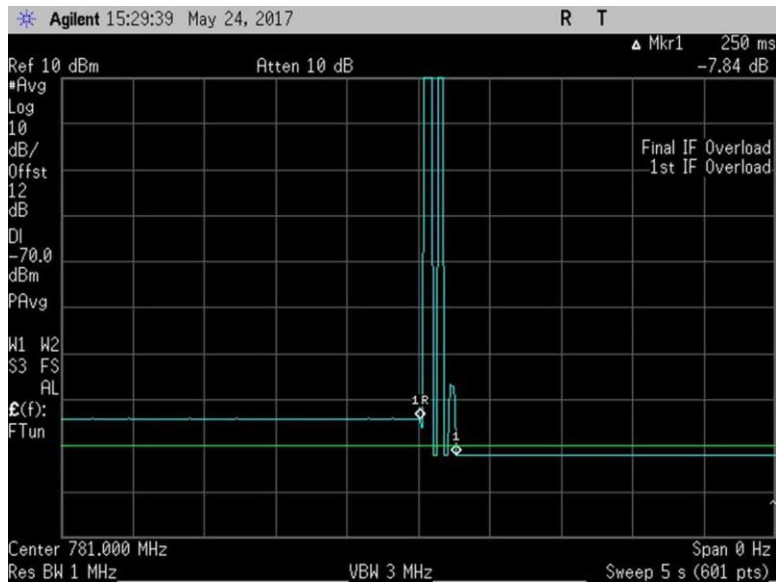
7.11.2_osc_UL_698-716MHz



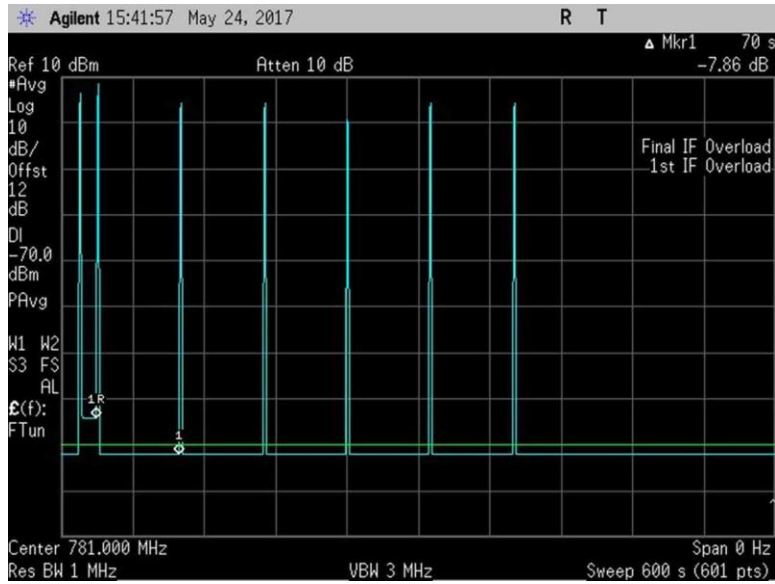
7.11.2_osc_UL_698-716MHz600sec



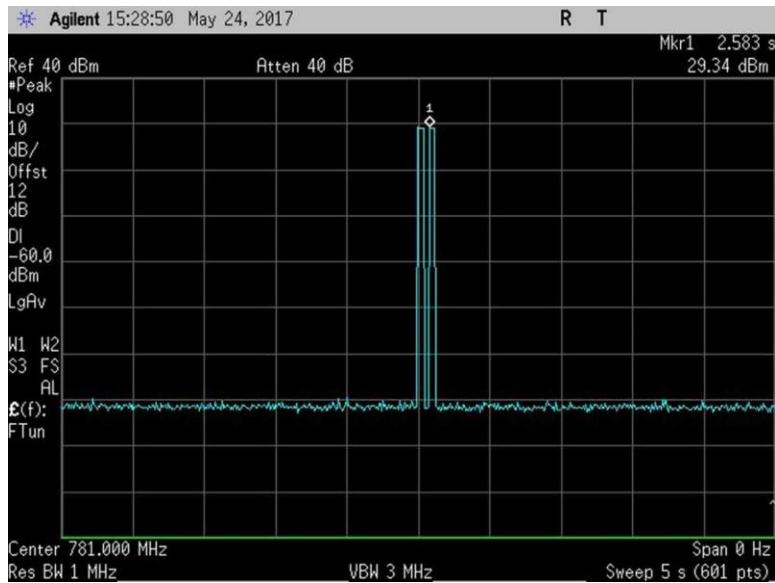
7.11.2_osc_UL_698-716MHzPk



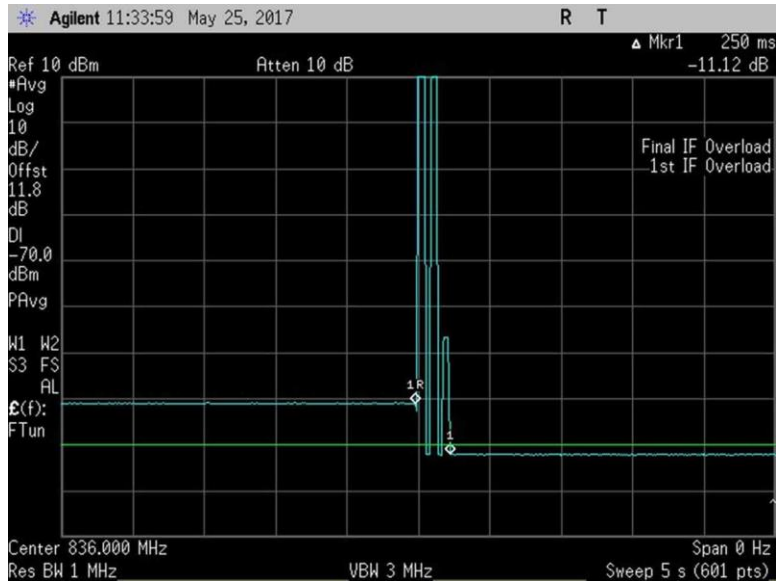
7.11.2_osc_UL_776-787MHz



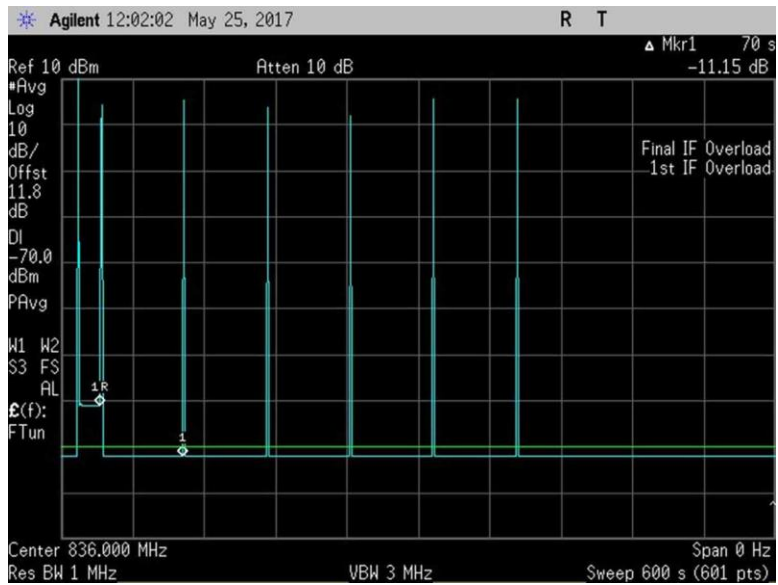
7.11.2_osc_UL_776-787MHz600sec



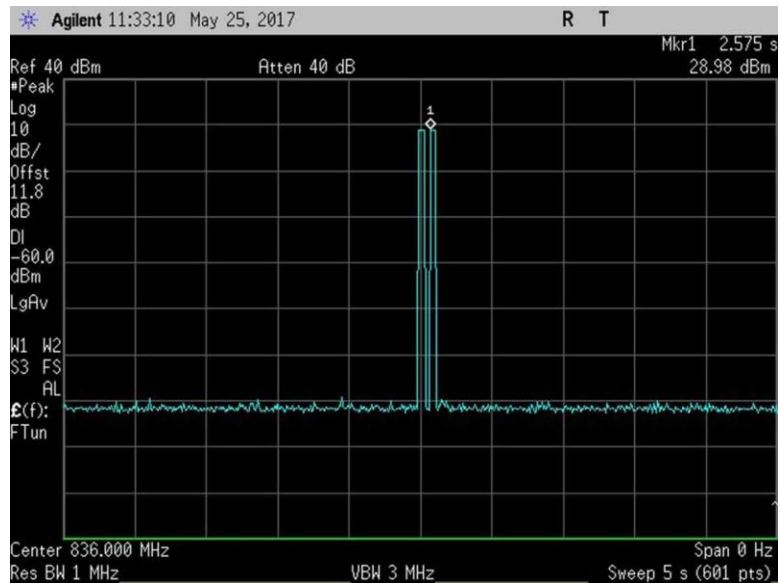
7.11.2_osc_UL_776-787MHzPk



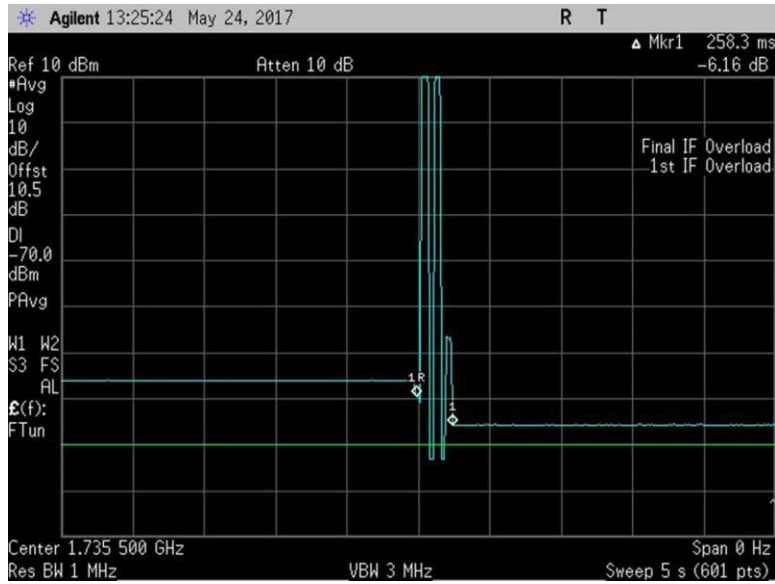
7.11.2_osc_UL_824-849MHz



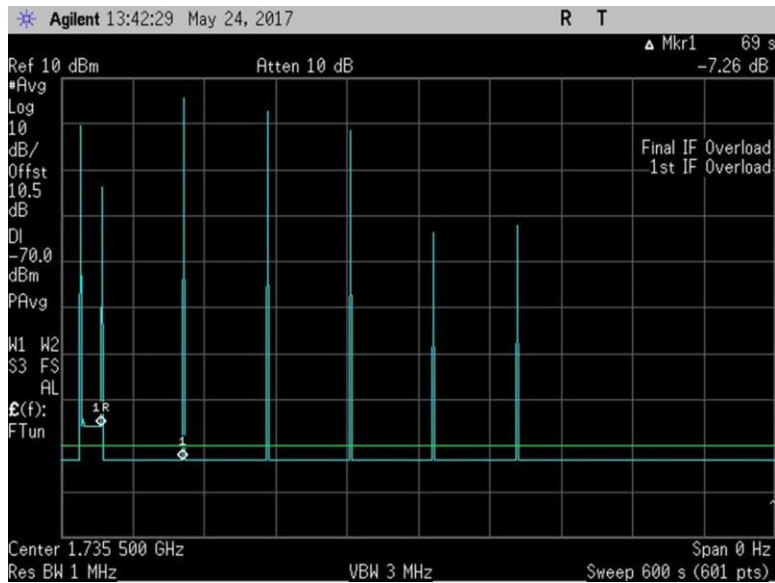
7.11.2_osc_UL_824-849MHz600sec



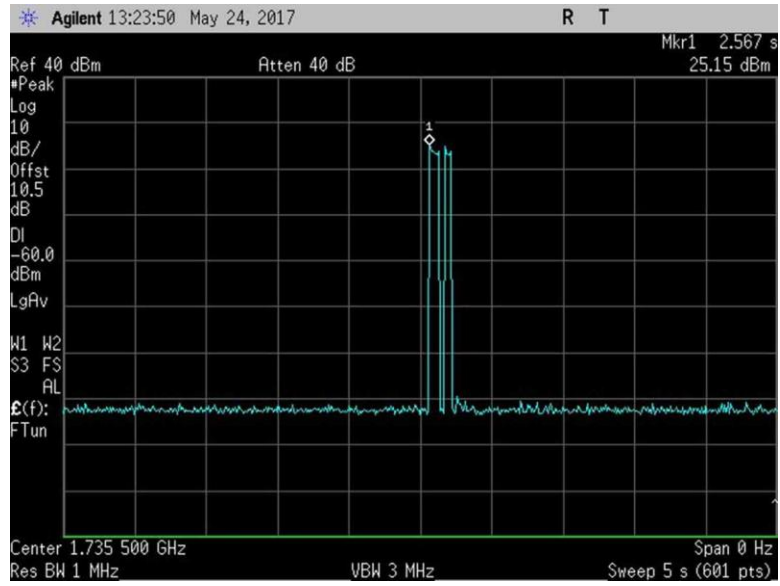
7.11.2_osc_UL_824-849MHzPk



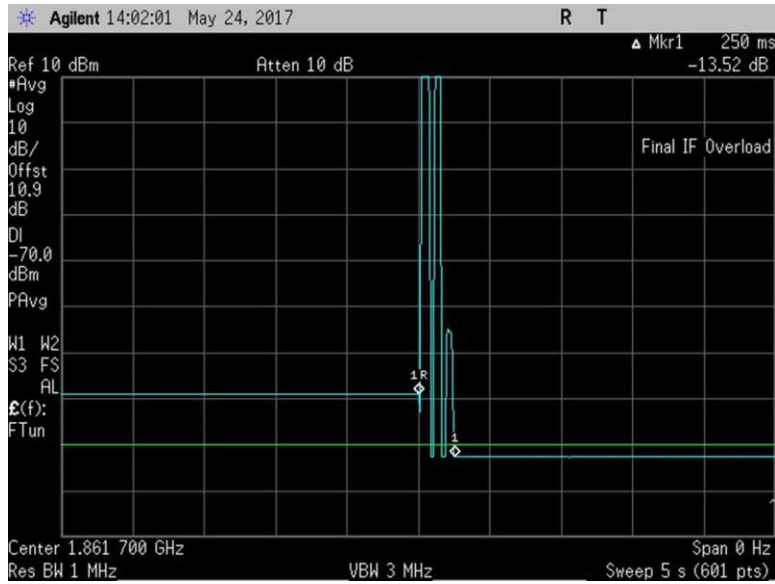
7.11.2_osc_UL_1710-1755MHz



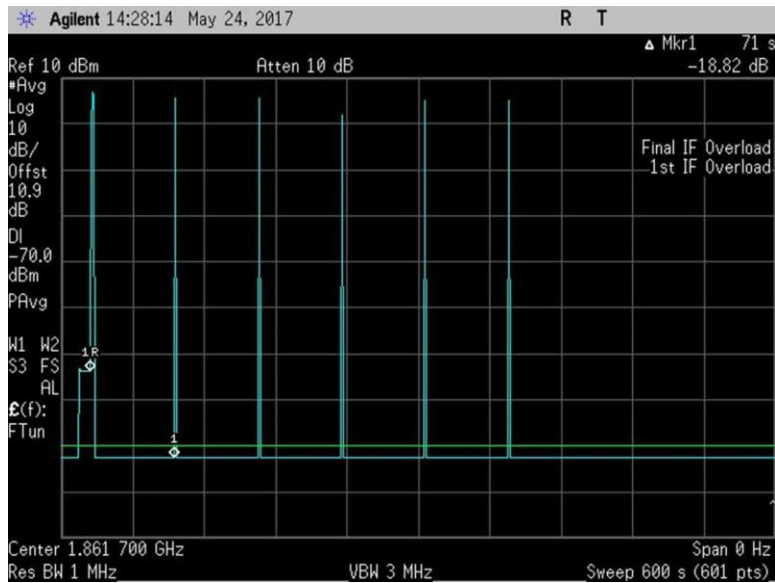
7.11.2_osc_UL_1710-1755MHz600sec



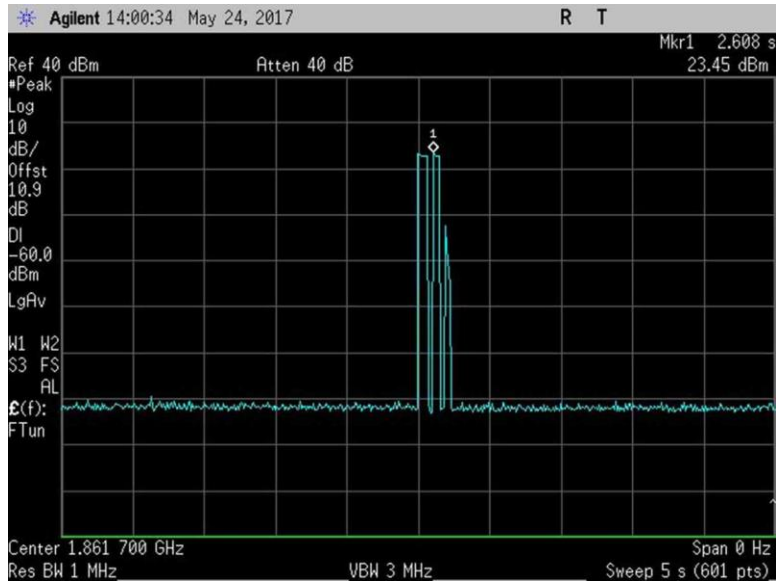
7.11.2_osc_UL_1710-1755MHzPk



7.11.2_osc_UL_1850-1915MHz



7.11.2_osc_UL_1850-1915MHz600sec

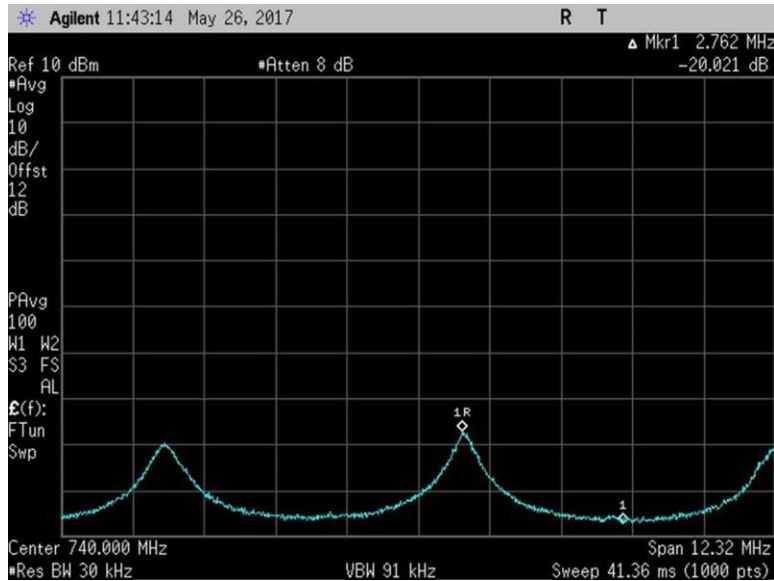


7.11.2_osc_UL_1850-1915MHzPk

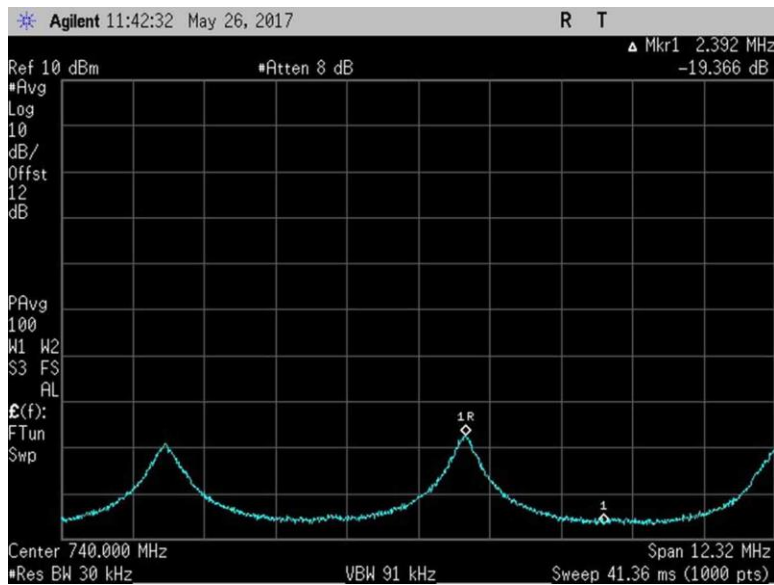
7.11.3 Measuring Oscillation Mitigation or Shutdown

Plots

DL, AWGNR / AWGNL



7.11.3_Osc_DL_728-746MHz+0_AWGNL



7.11.3_Osc_DL_728-746MHz+1_AWGNL