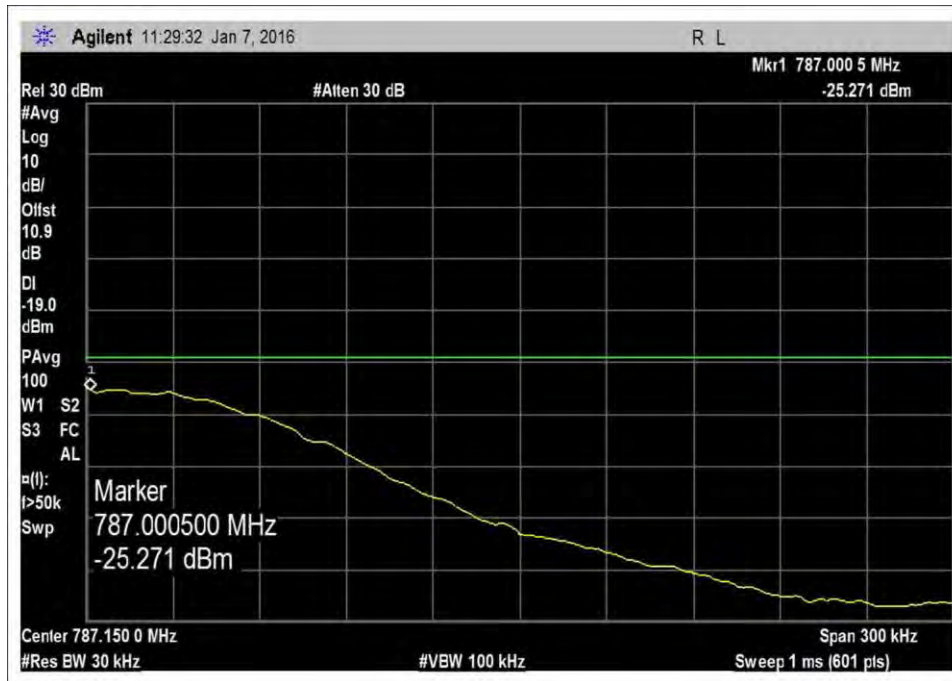
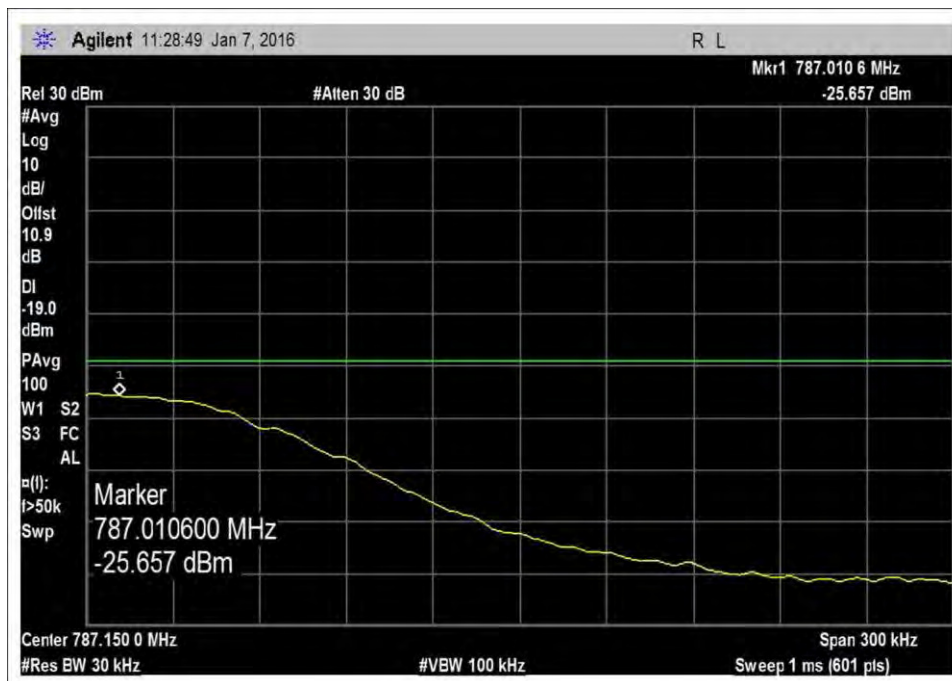
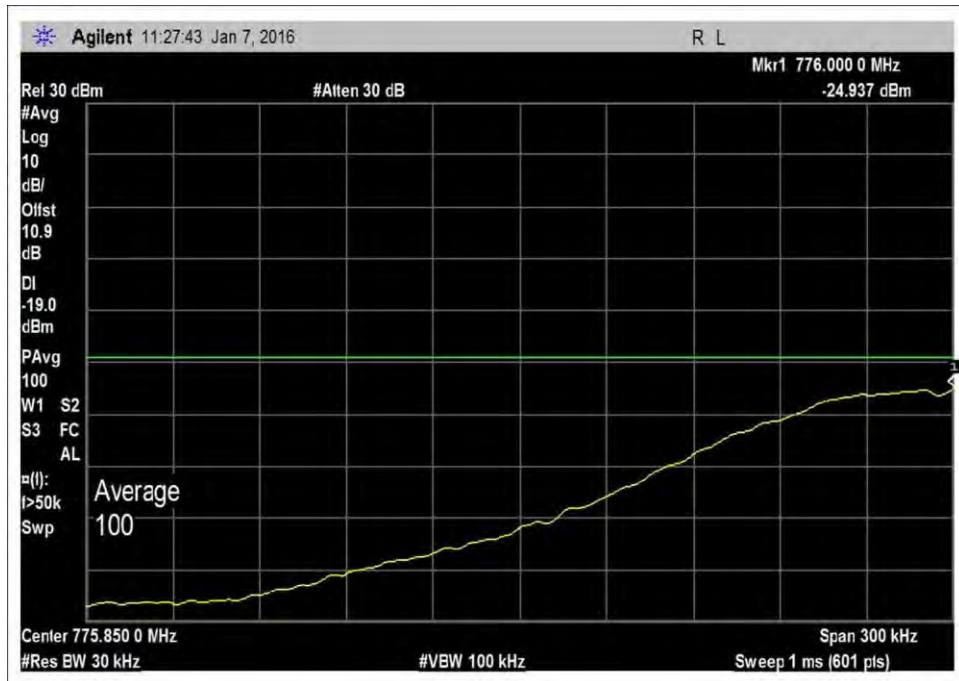




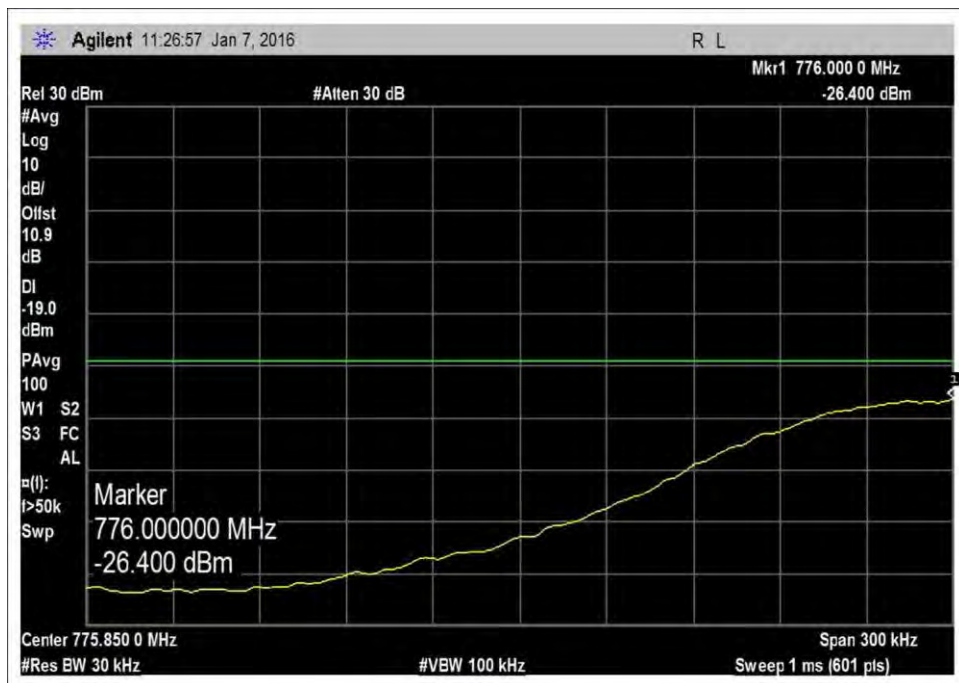
7.5_OBE_UL_776-787MHz_H_Max



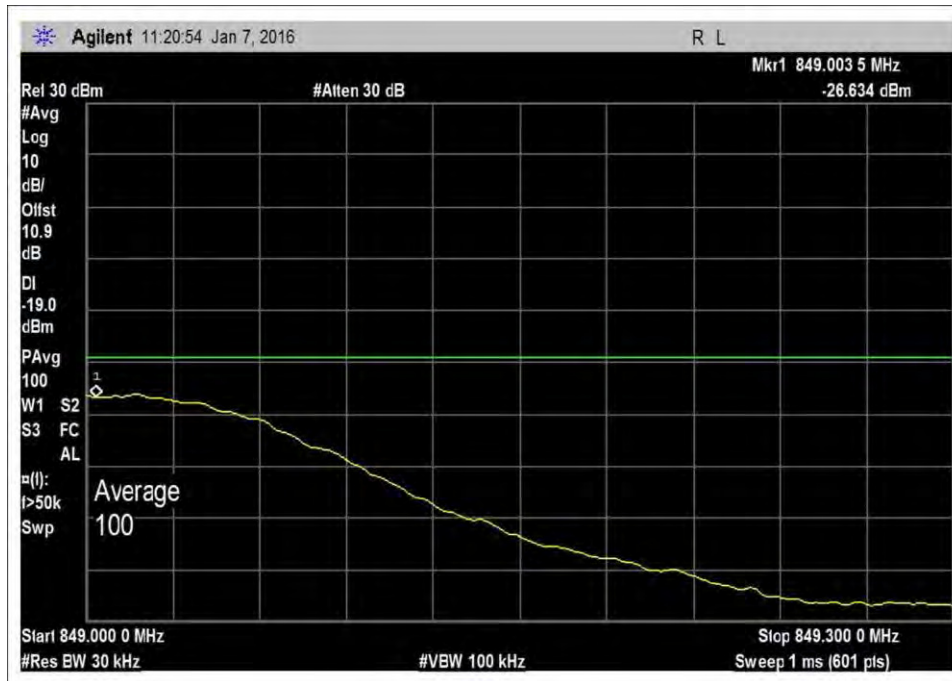
7.5_OBE_UL_776-787MHz_H_PreAGC



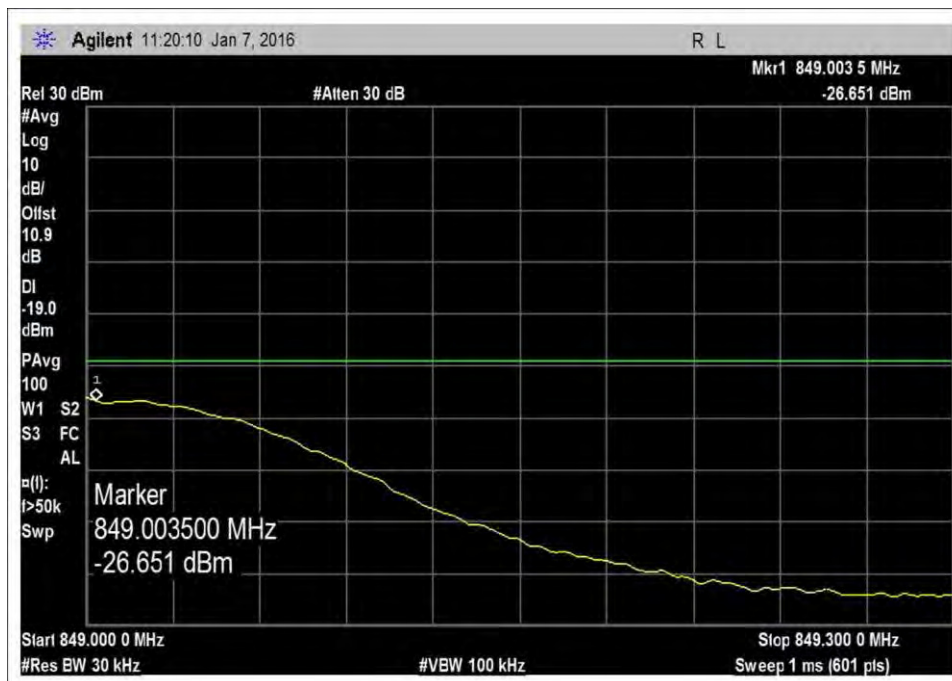
7.5_OBE_UL_776-787MHz_L_Max



7.5_OBE_UL_776-787MHz_L_PreAGC



7.5_OBE_UL_824-849MHz_H_Max



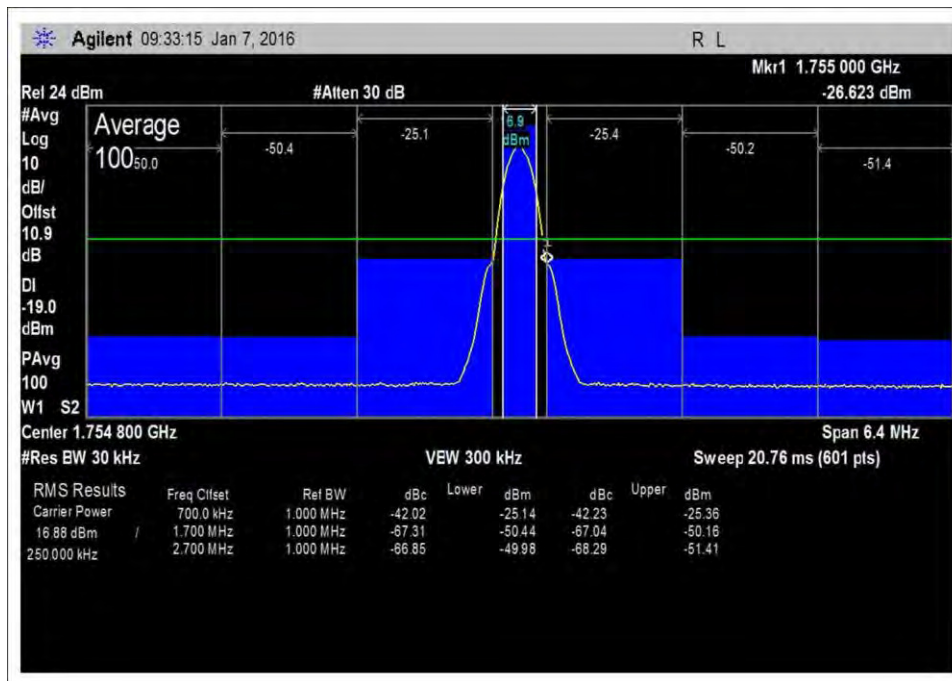
7.5_OBE_UL_824-849MHz_H_PreAGC



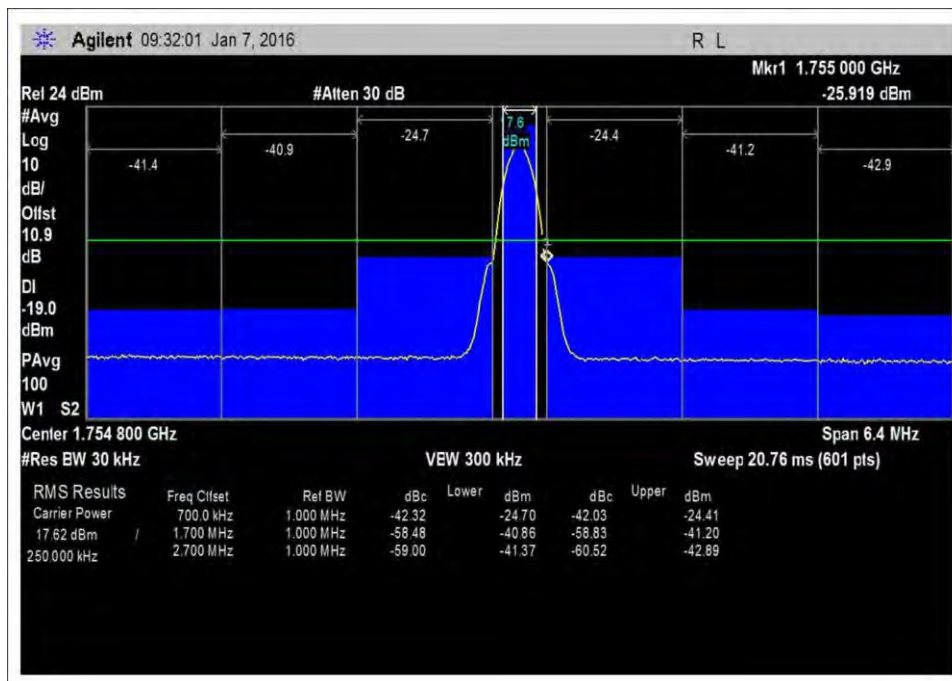
7.5_OBE_UL_824-849MHz_L_Max



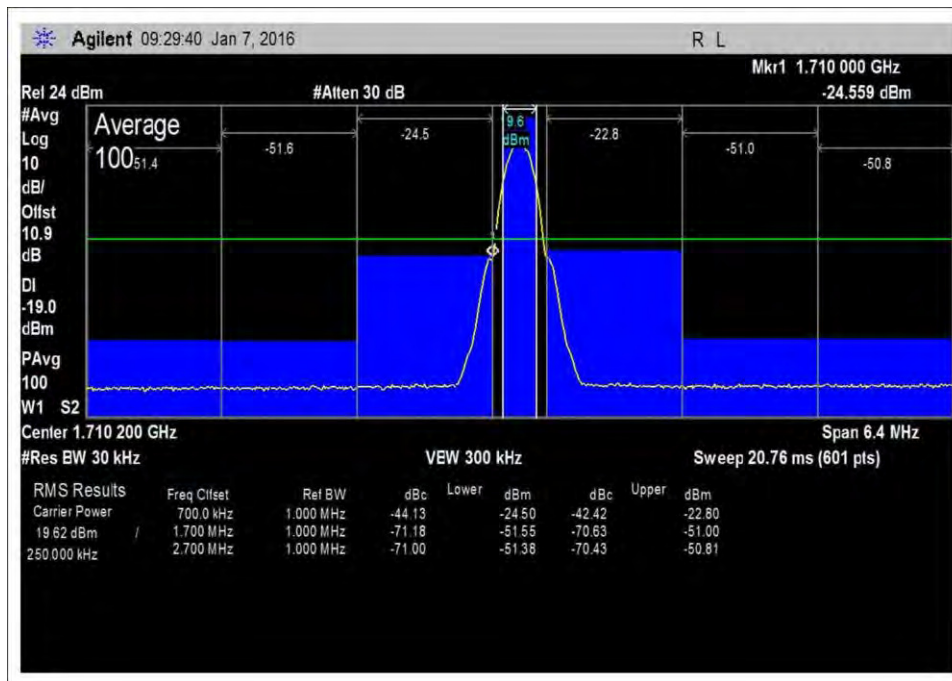
7.5_OBE_UL_824-849MHz_L_PreAGC



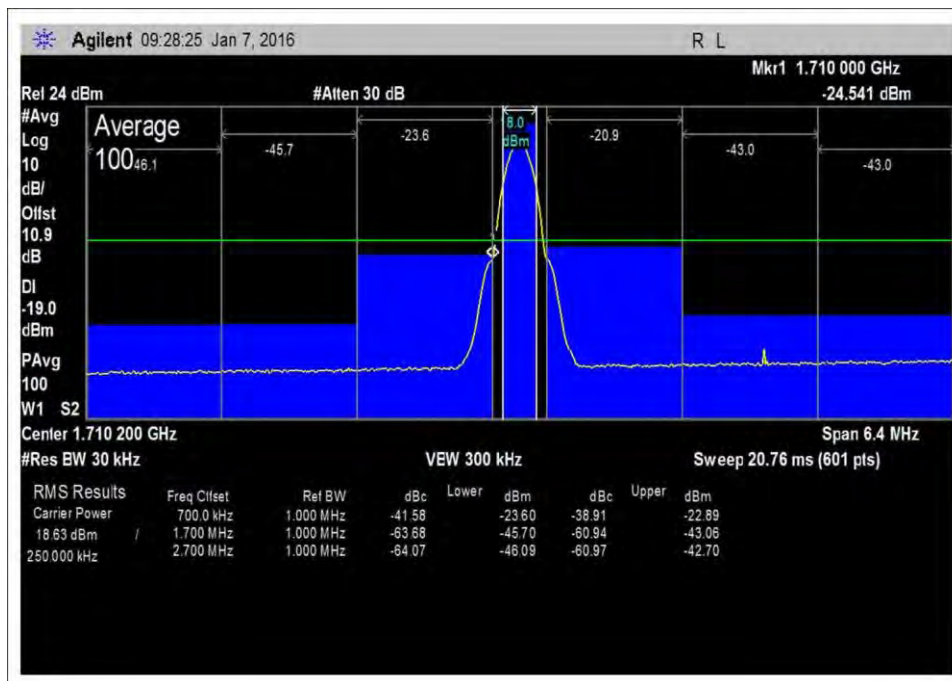
7.5_OBE_UL_1710-1755MHz_H_Max



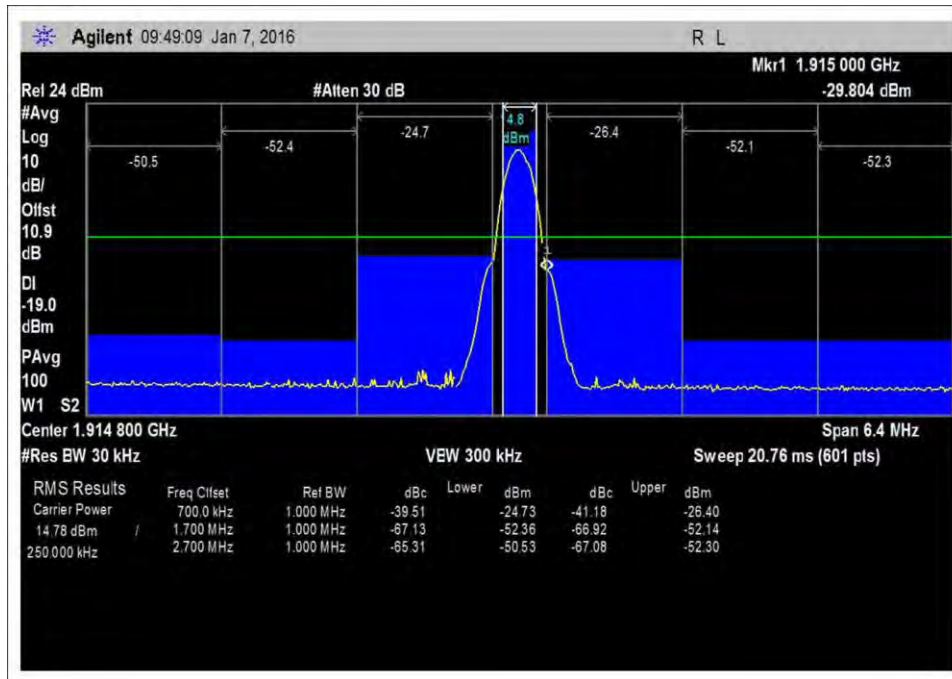
7.5_OBE_UL_1710-1755MHz_H_PreAGC



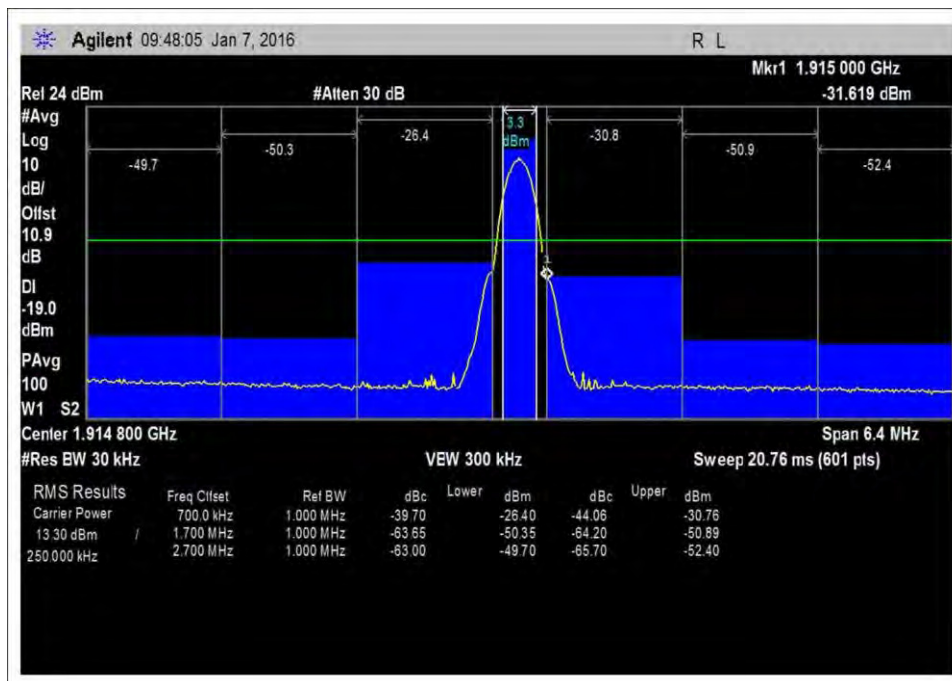
7.5_OBE_UL_1710-1755MHz_L_Max



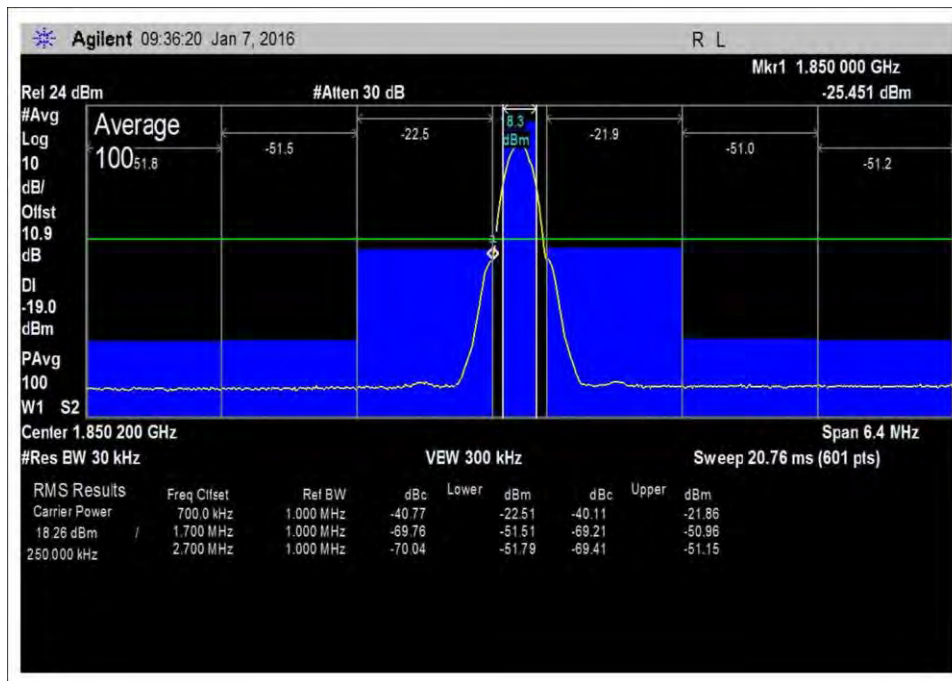
7.5_OBE_UL_1710-1755MHz_L_PreAGC



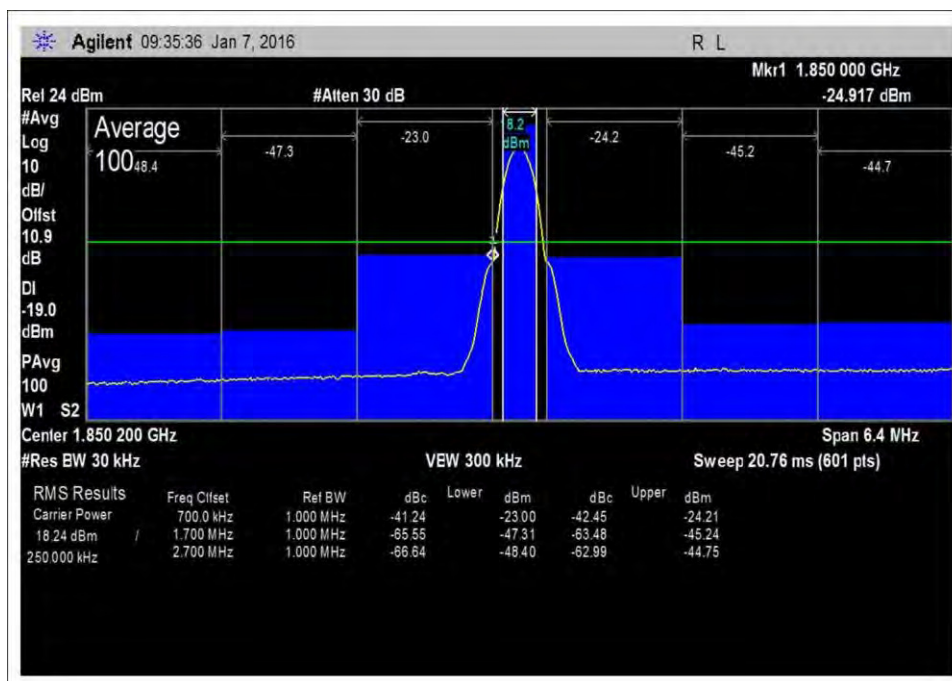
7.5_OBE_UL_1850-1915MHz_H_Max



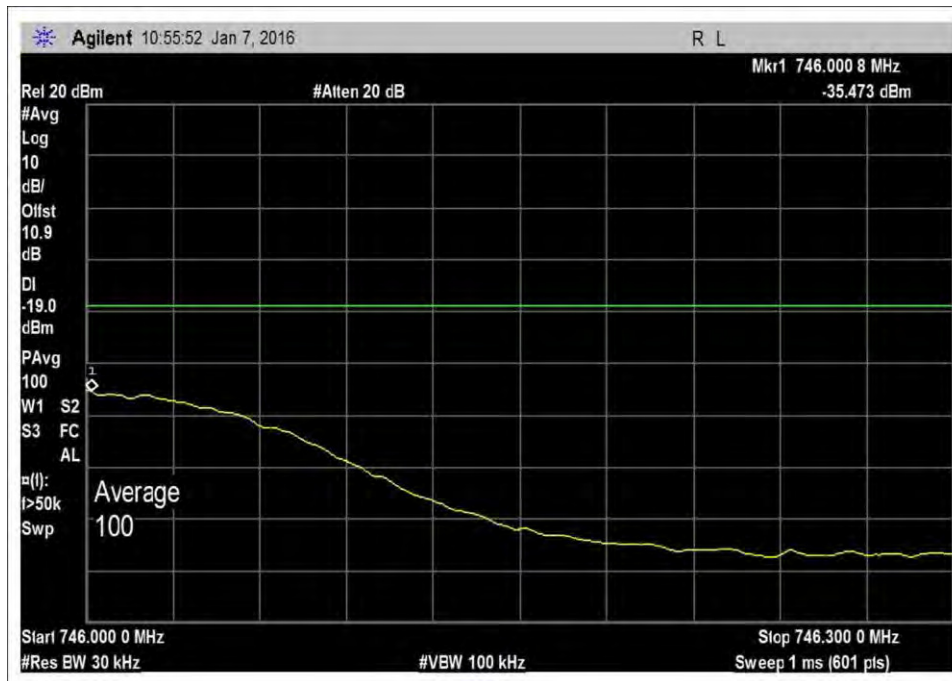
7.5_OBE_UL_1850-1915MHz_H_PreAGC



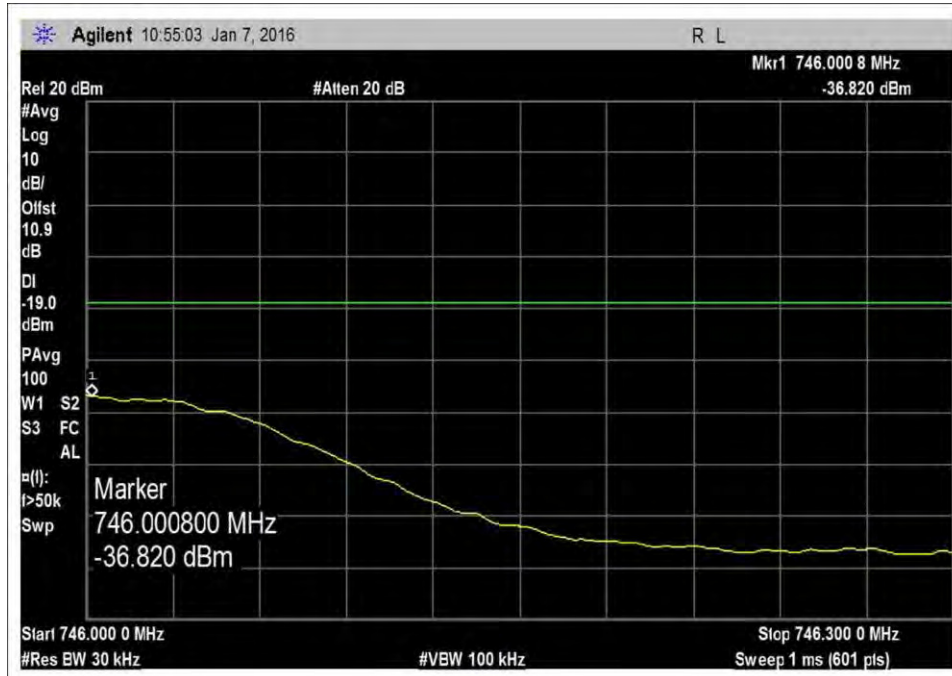
7.5_OBE_UL_1850-1915MHz_L_Max



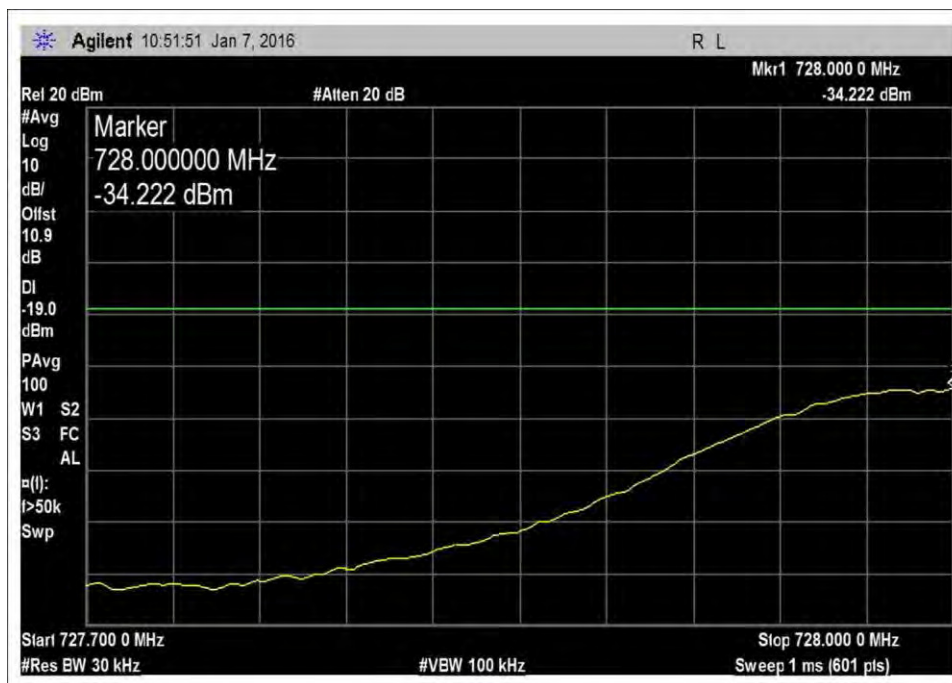
7.5_OBE_UL_1850-1915MHz_L_PreAGC



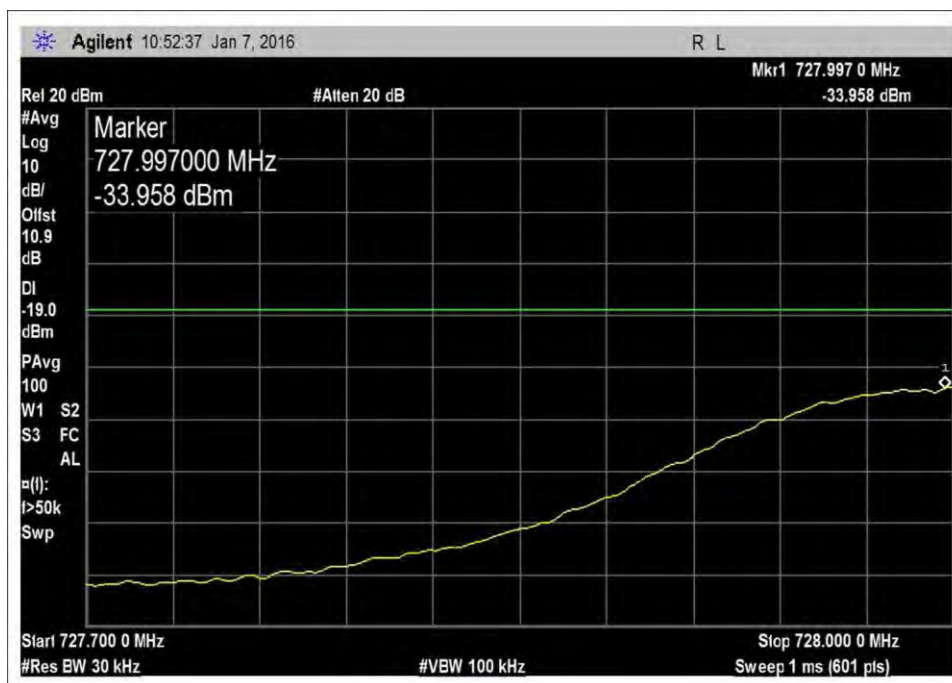
7.5_OBE_DL_728-746MHz_H_Max



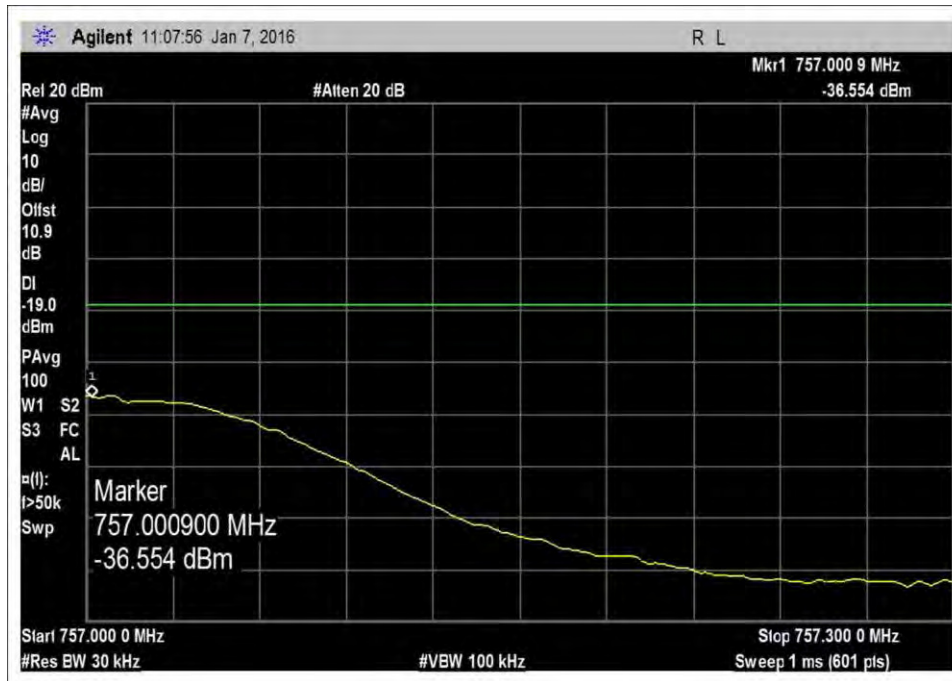
7.5_OBE_DL_728-746MHz_H_PreAGC



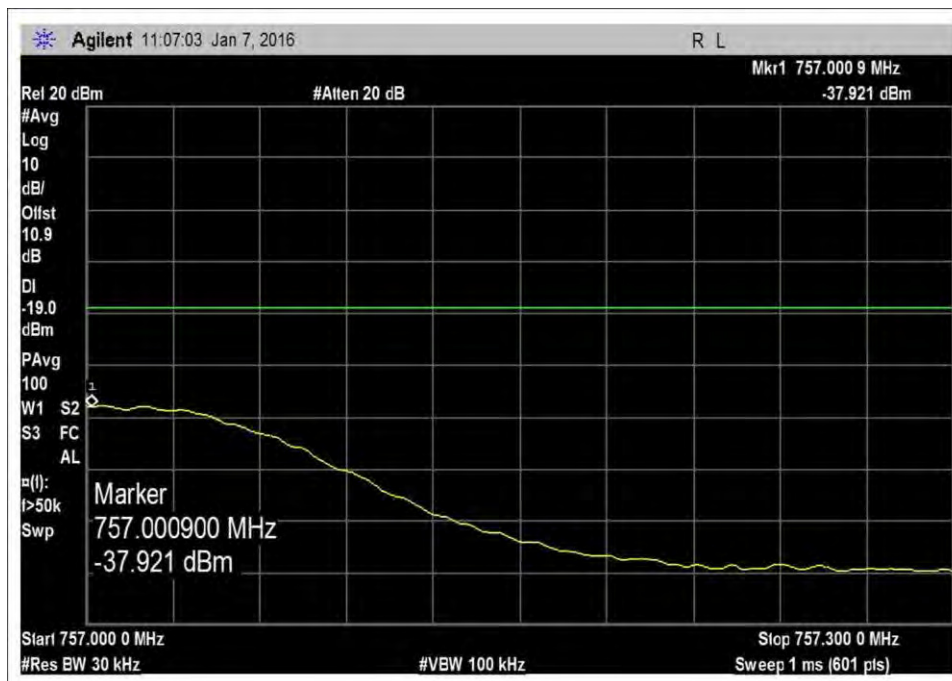
7.5_OBE_DL_728-746MHz_L_Max



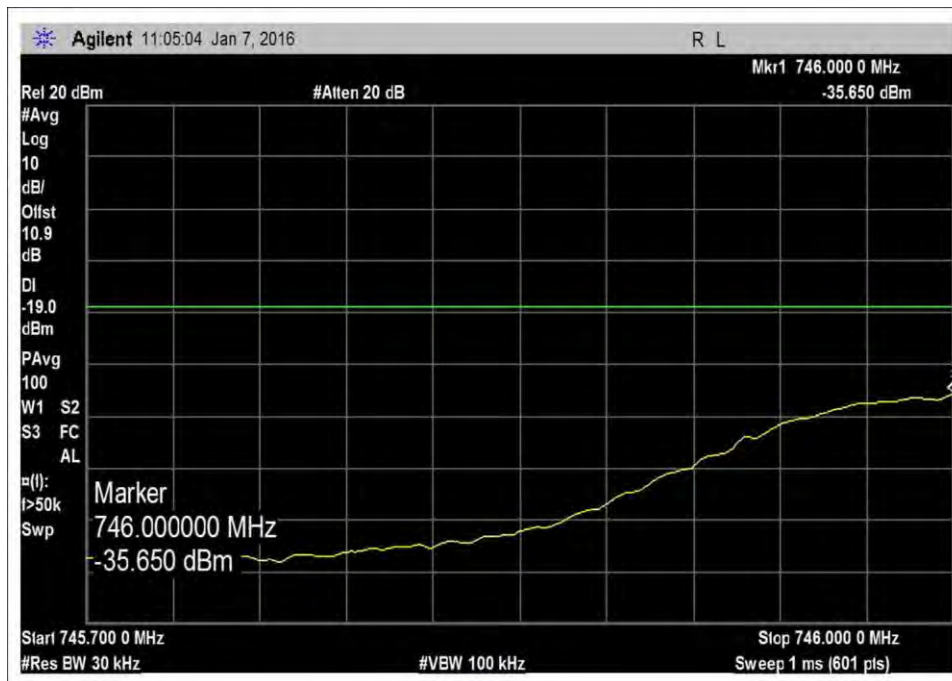
7.5_OBE_DL_728-746MHz_L_PreAGC



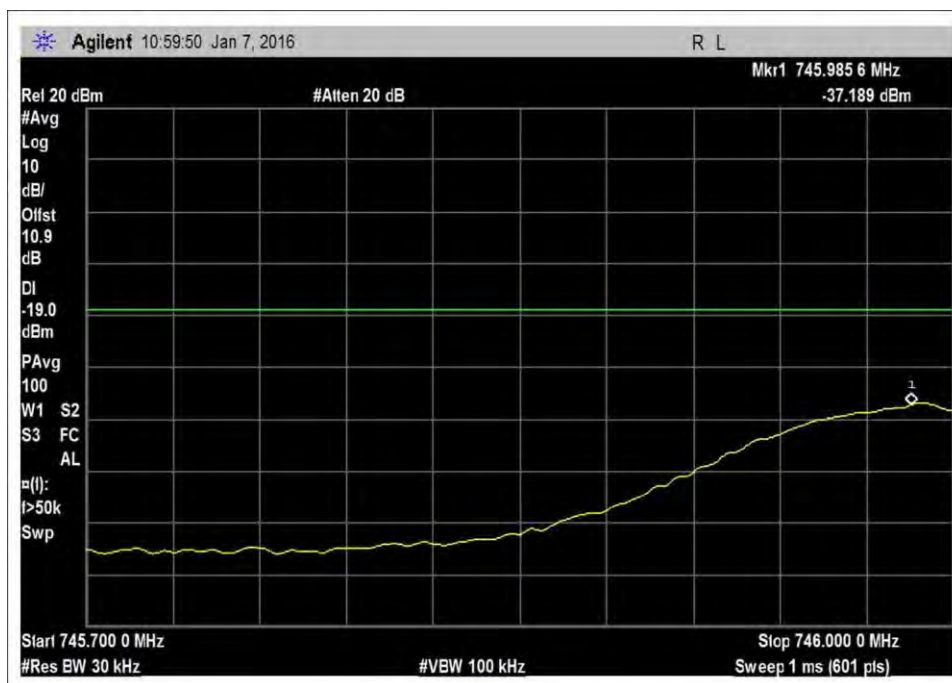
7.5_OBE_DL_746-757MHz_H_Max



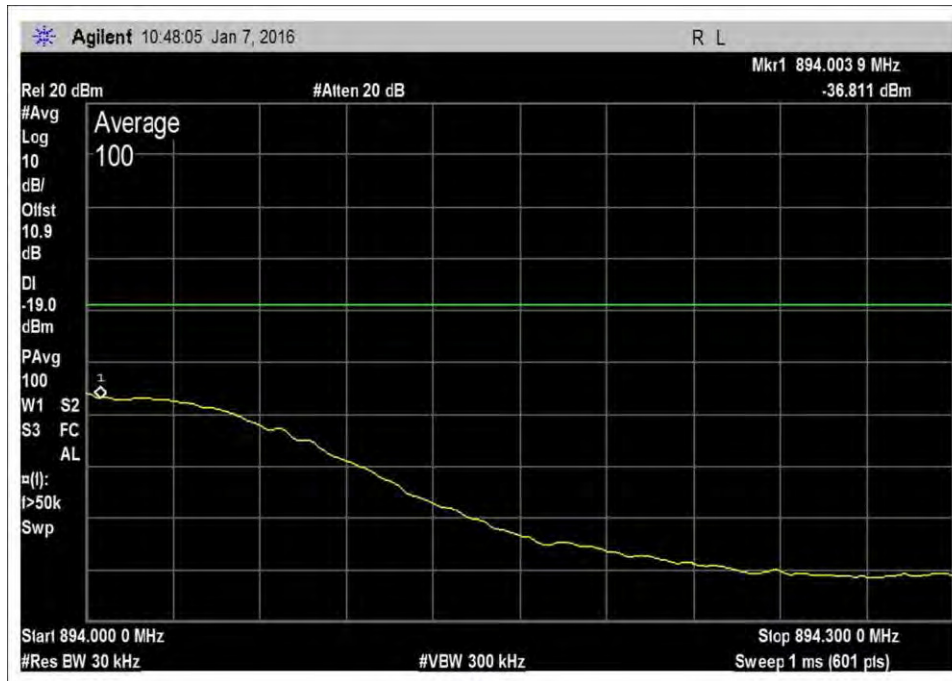
7.5_OBE_DL_746-757MHz_H_PreAGC



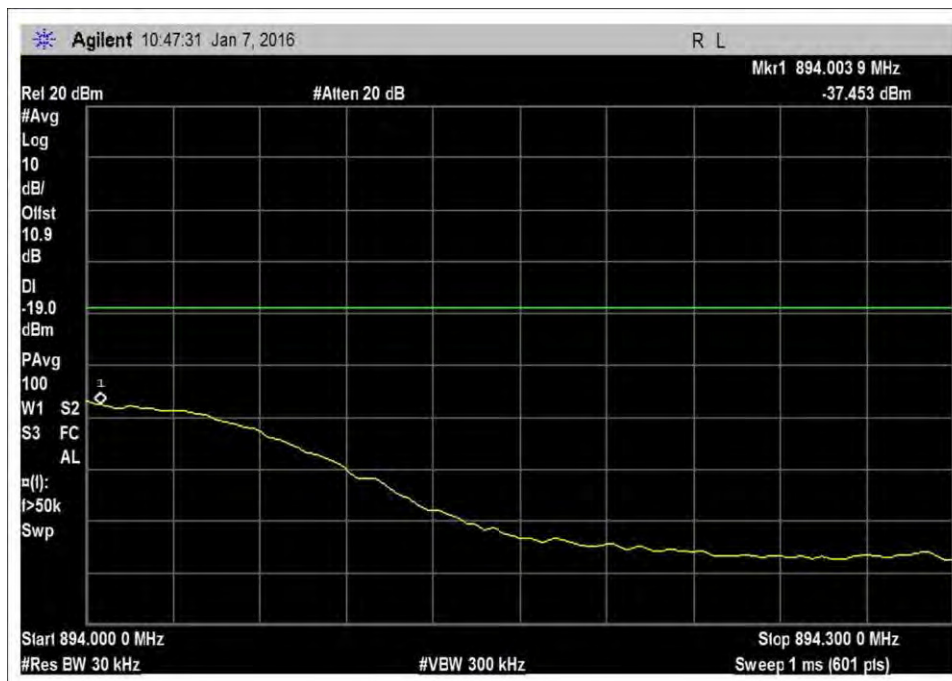
7.5_OBE_DL_746-757MHz_L_Max



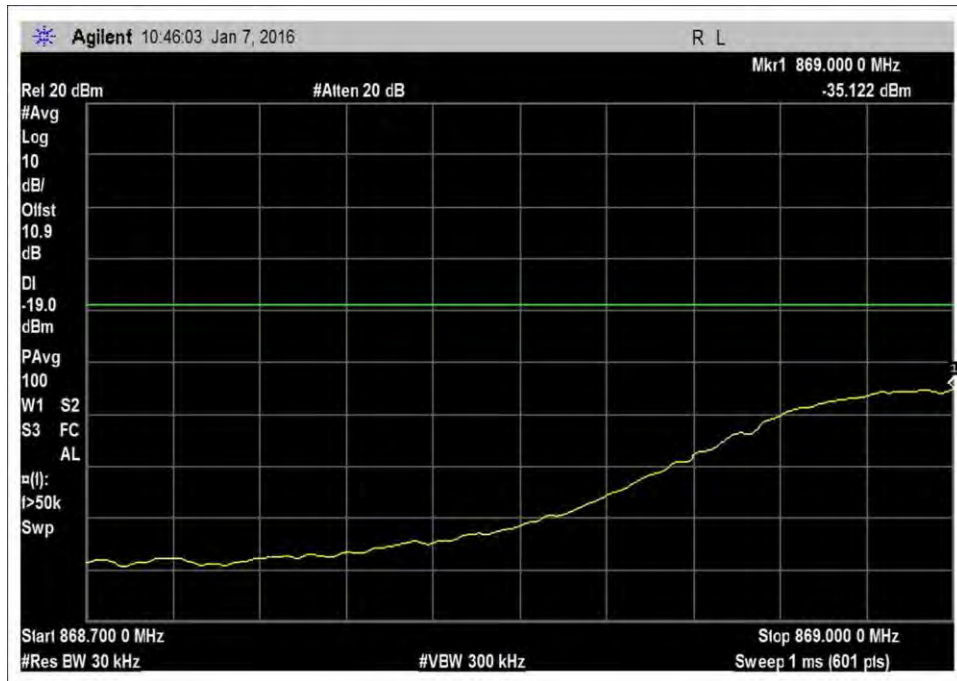
7.5_OBE_DL_746-757MHz_L_PreAGC



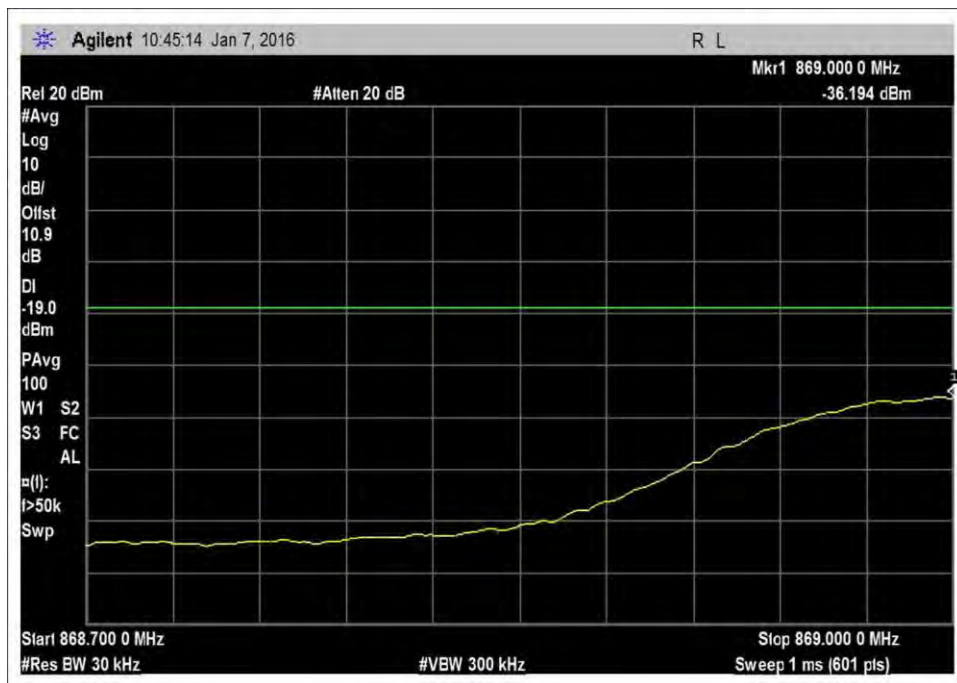
7.5_OBE_DL_869-894MHz_H_Max



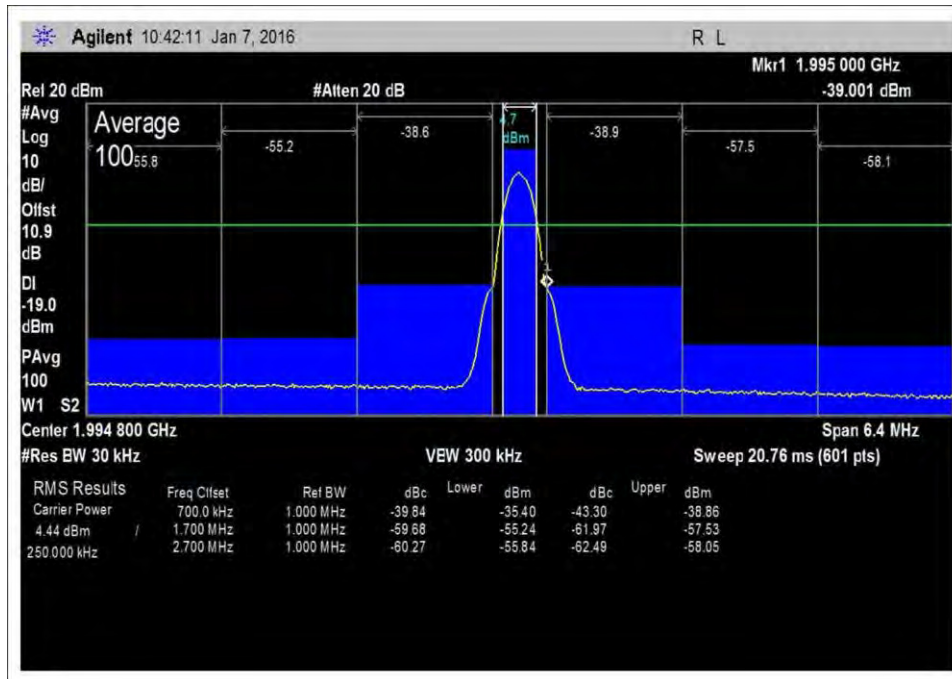
7.5_OBE_DL_869-894MHz_H_PreAGC



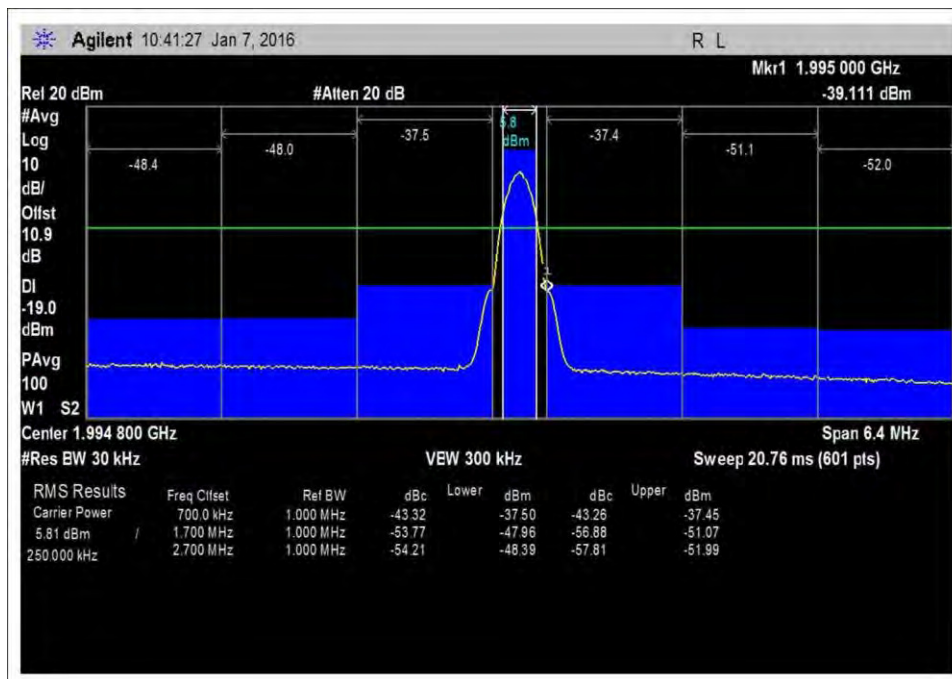
7.5_OBE_DL_869-894MHz_L_Max



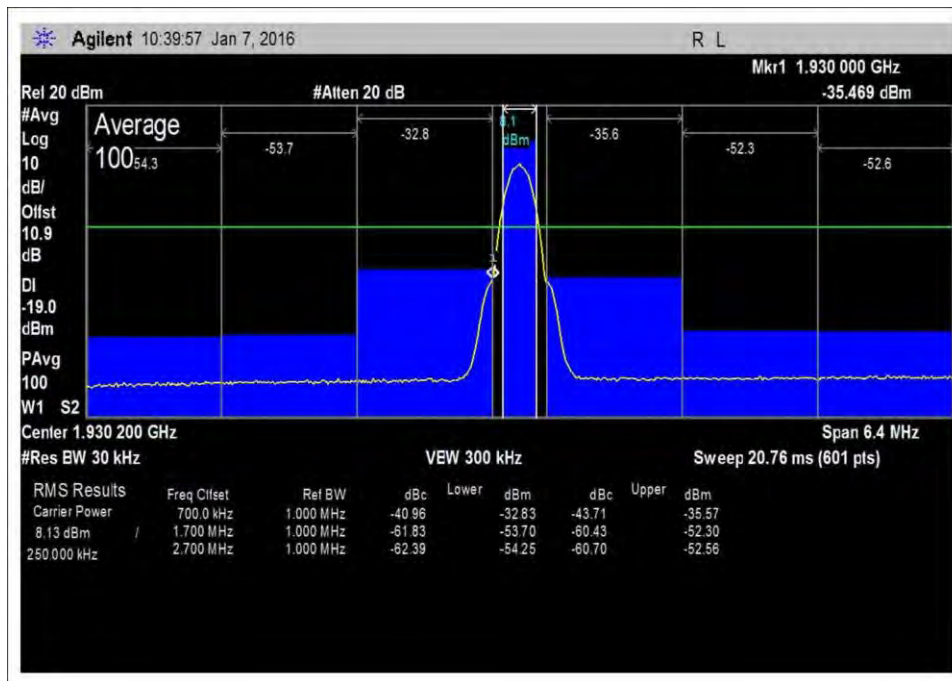
7.5_OBE_DL_869-894MHz_L_PreAGC



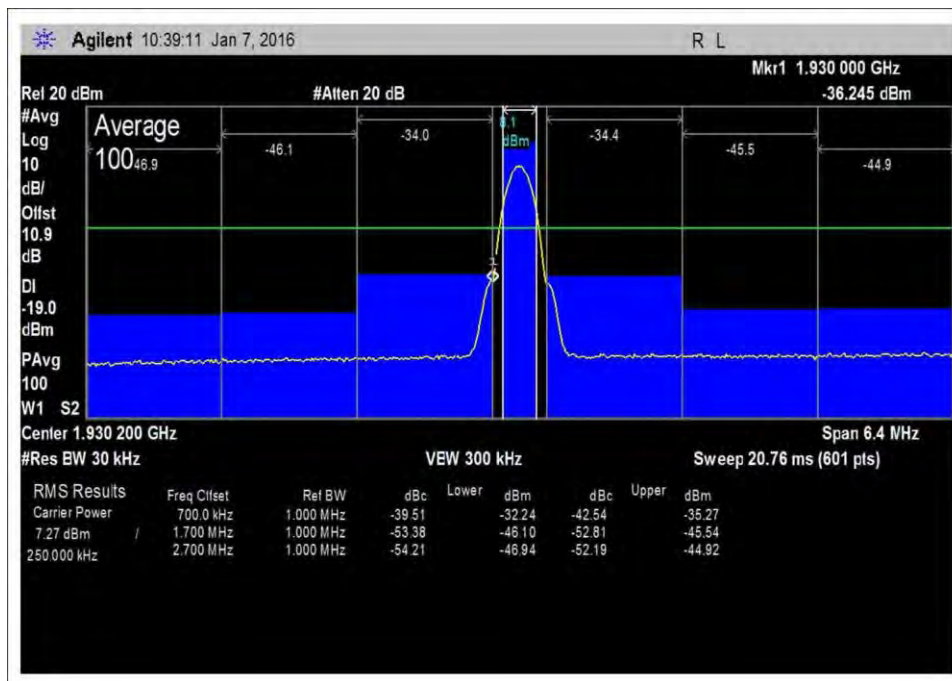
7.5_OBE_DL_1930-1995MHz_H_Max



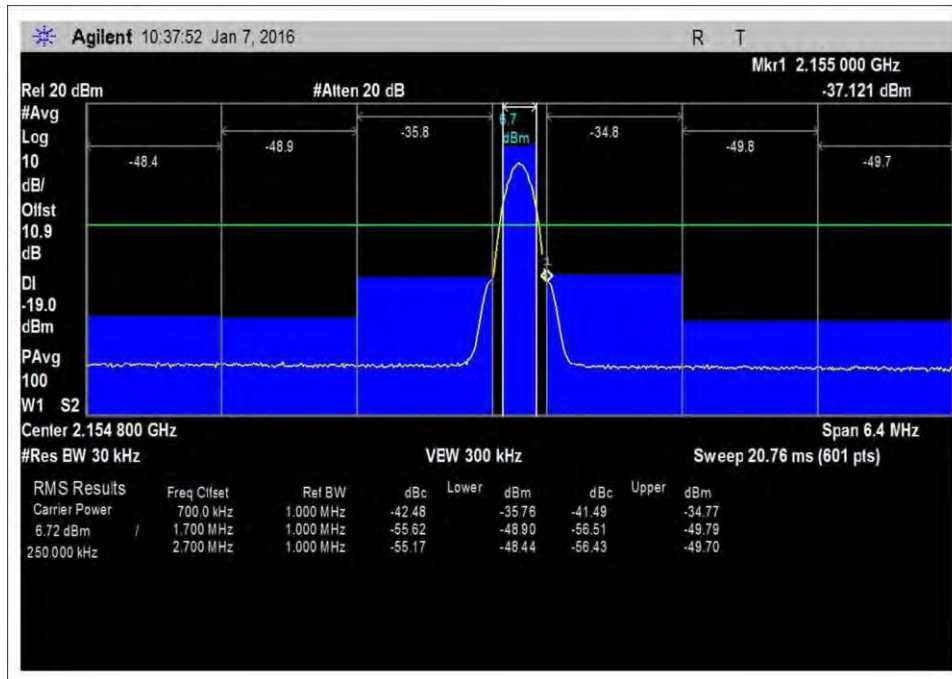
7.5_OBE_DL_1930-1995MHz_H_PreAGC



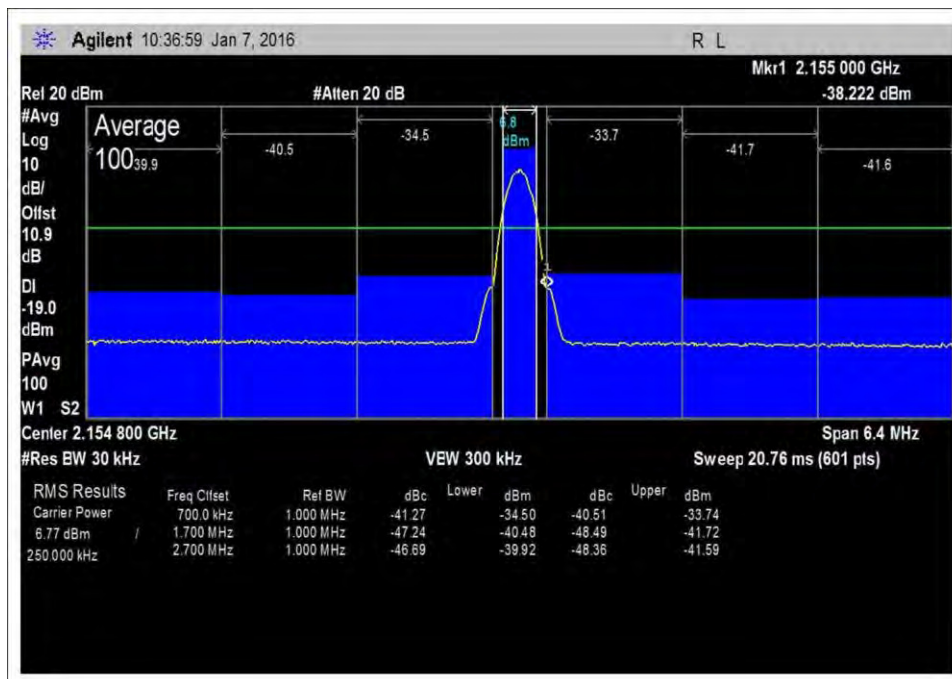
7.5_OBE_DL_1930-1995MHz_L_Max



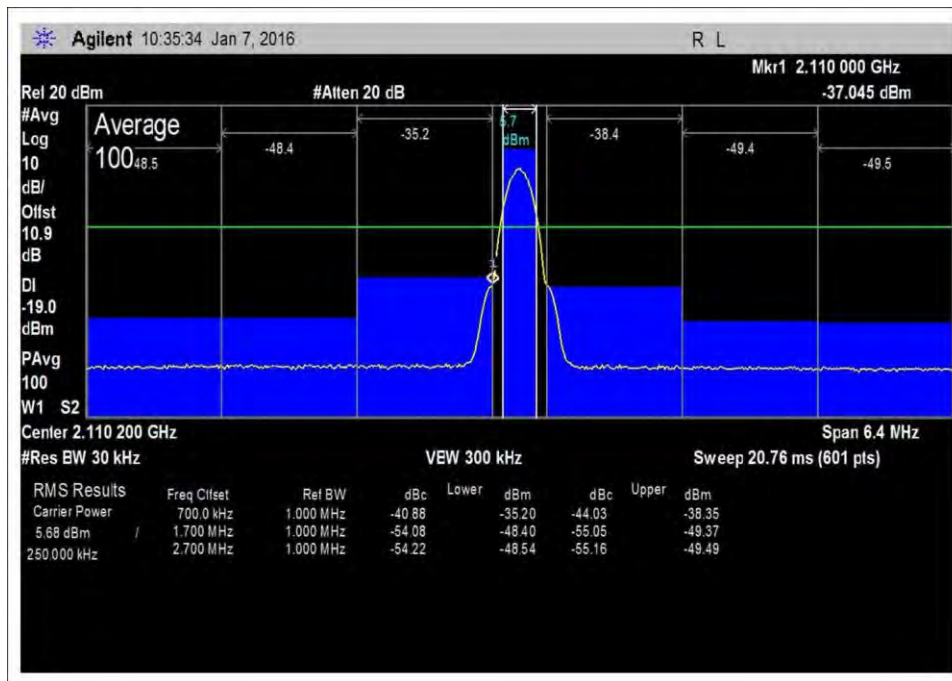
7.5_OBE_DL_1930-1995MHz_L_PreAGC



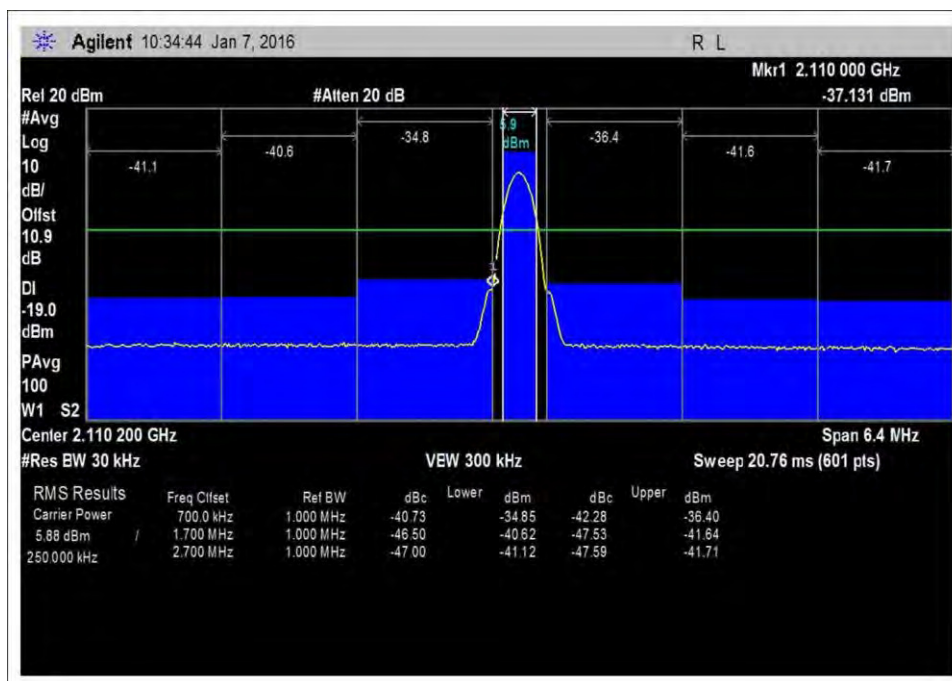
7.5_OBE_DL_2110-2155MHz_H_Max



7.5_OBE_DL_2110-2155MHz_H_PreAGC

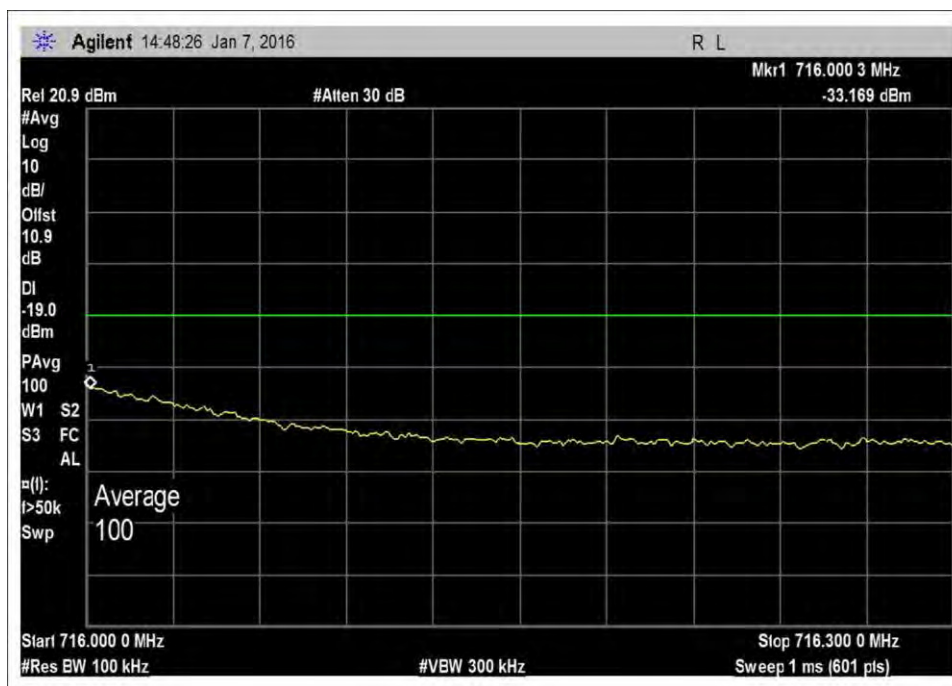


7.5_OBE_DL_2110-2155MHz_L_Max

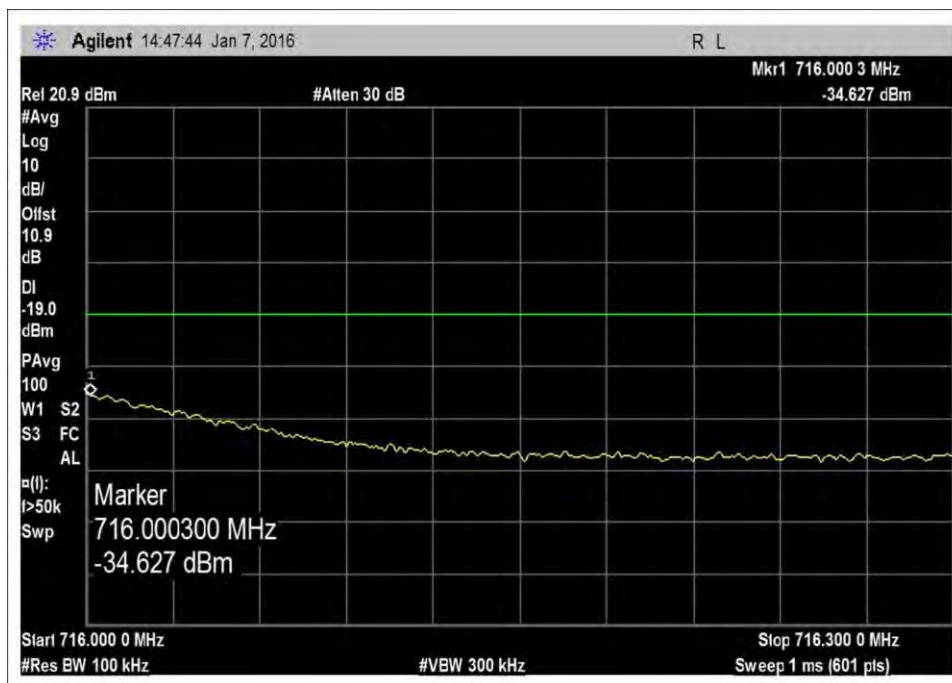


7.5_OBE_DL_2110-2155MHz_L_PreAGC

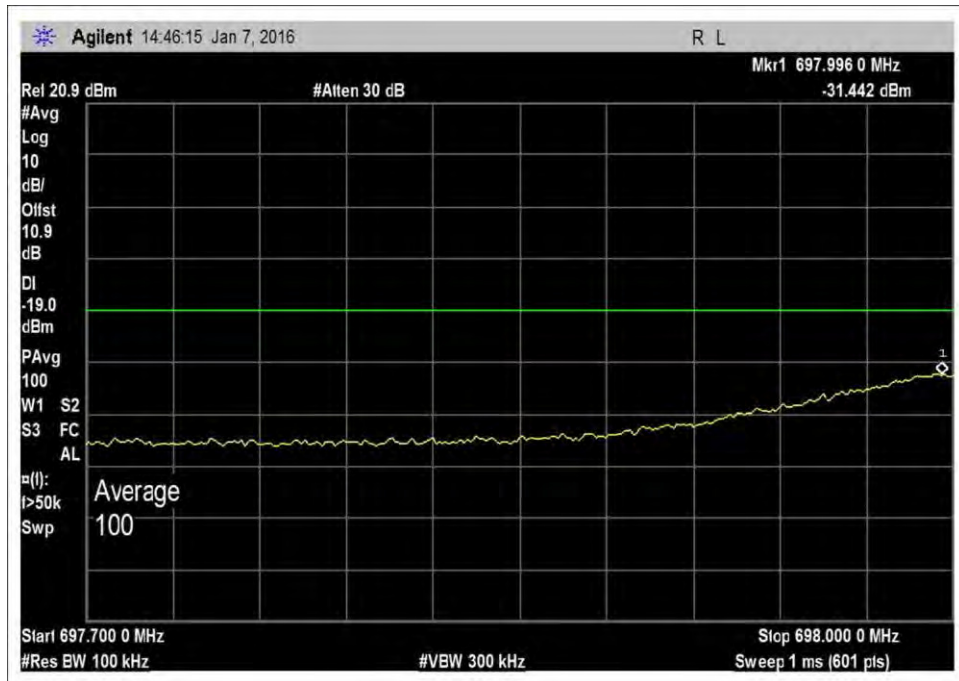
LTE



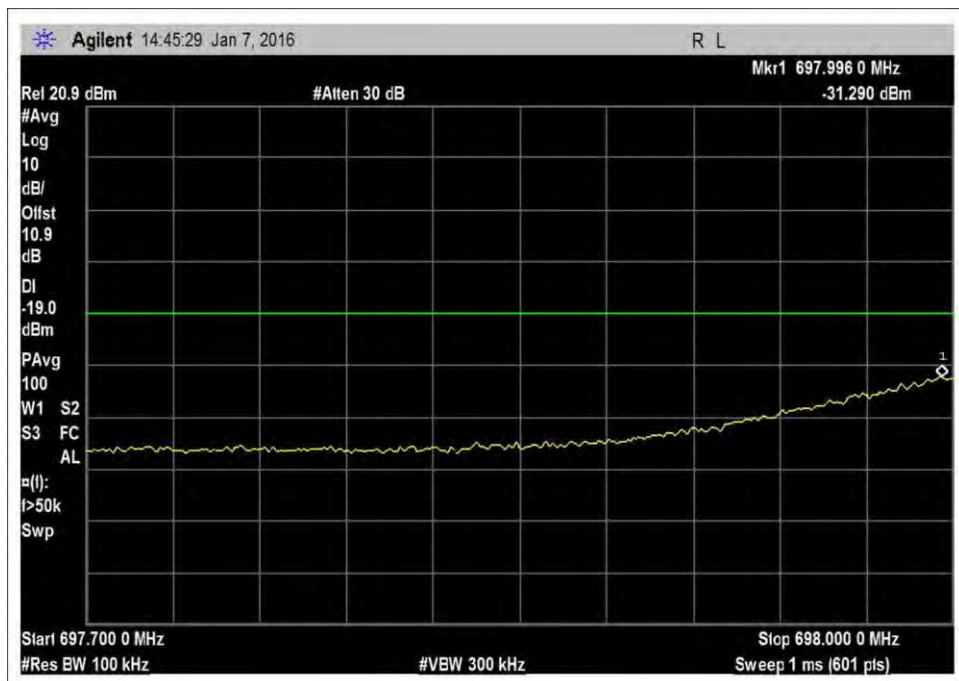
7.5_OBE_UL_698-716MHz_H_Max



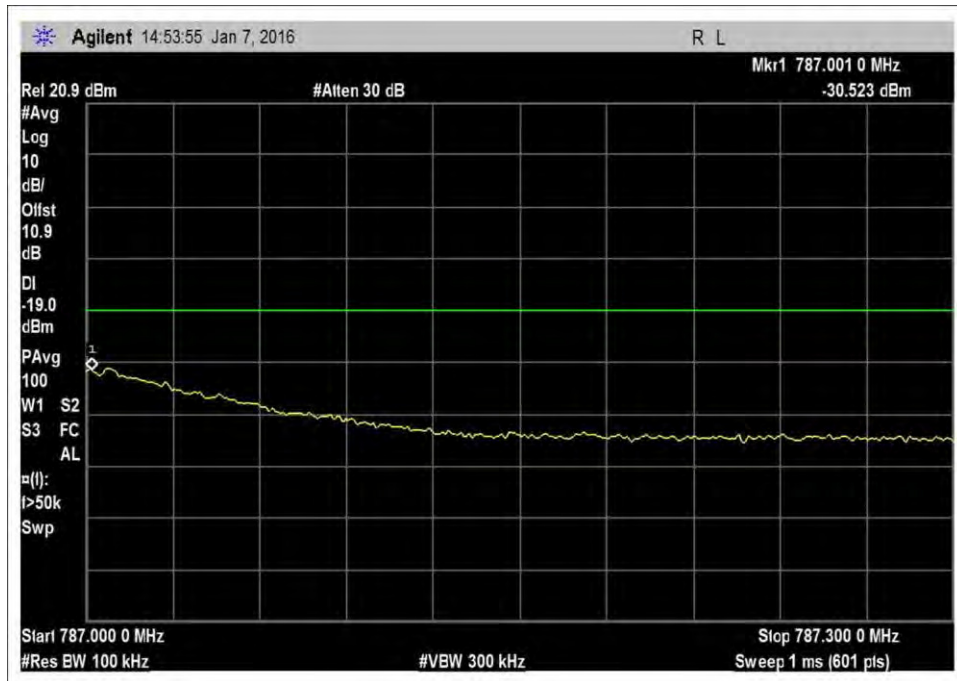
7.5_OBE_UL_698-716MHz_H_PreAGC



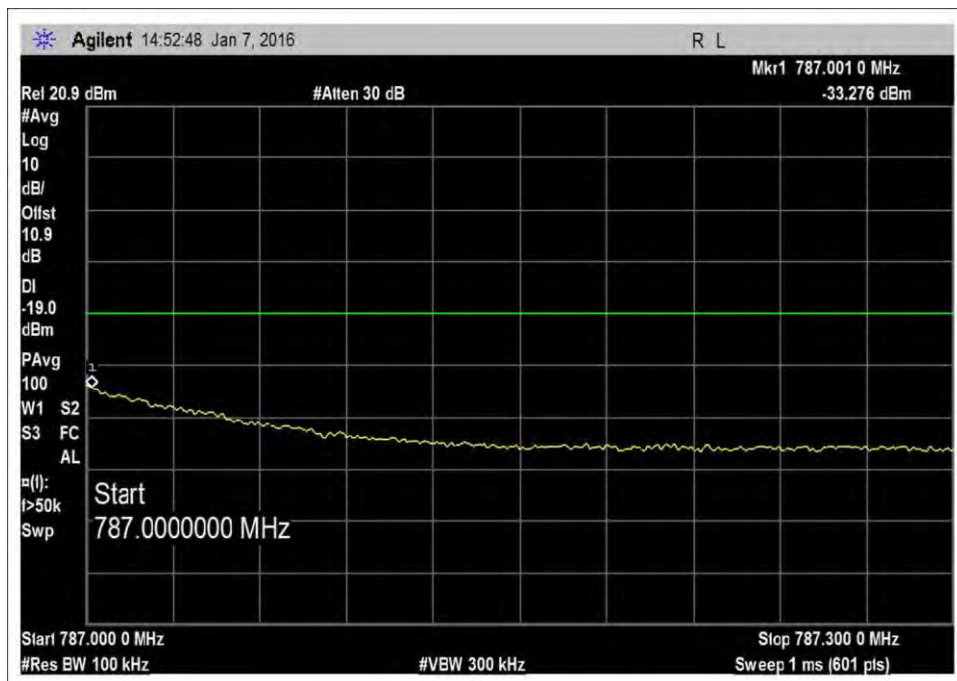
7.5_OBE_UL_698-716MHz_L_Max



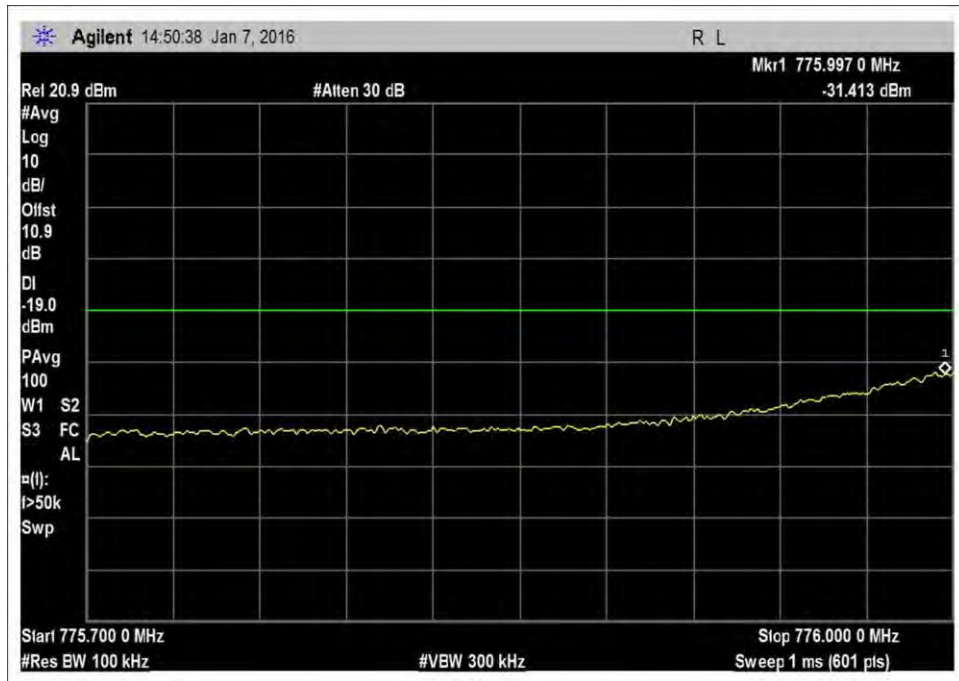
7.5_OBE_UL_698-716MHz_L_PreAGC



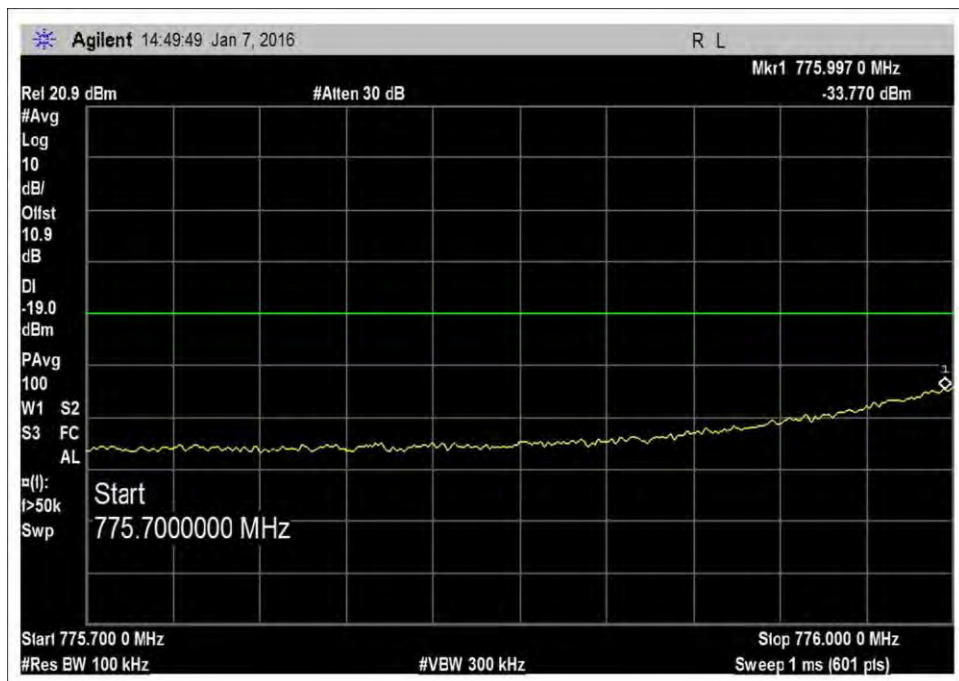
7.5_OBE_UL_776-787MHz_H_Max



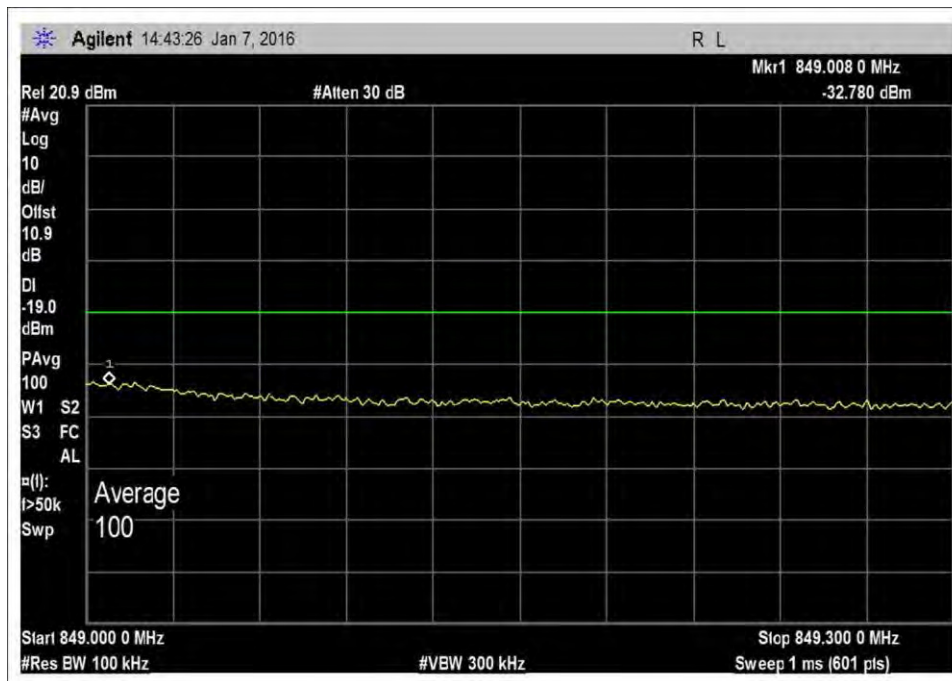
7.5_OBE_UL_776-787MHz_H_PreAGC



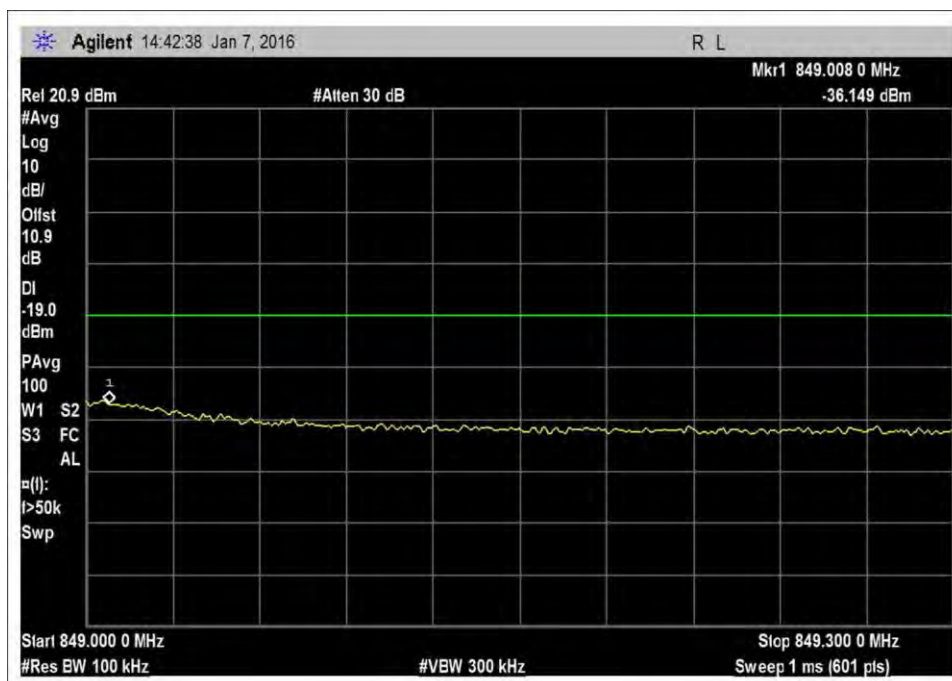
7.5_OBE_UL_776-787MHz_L_Max



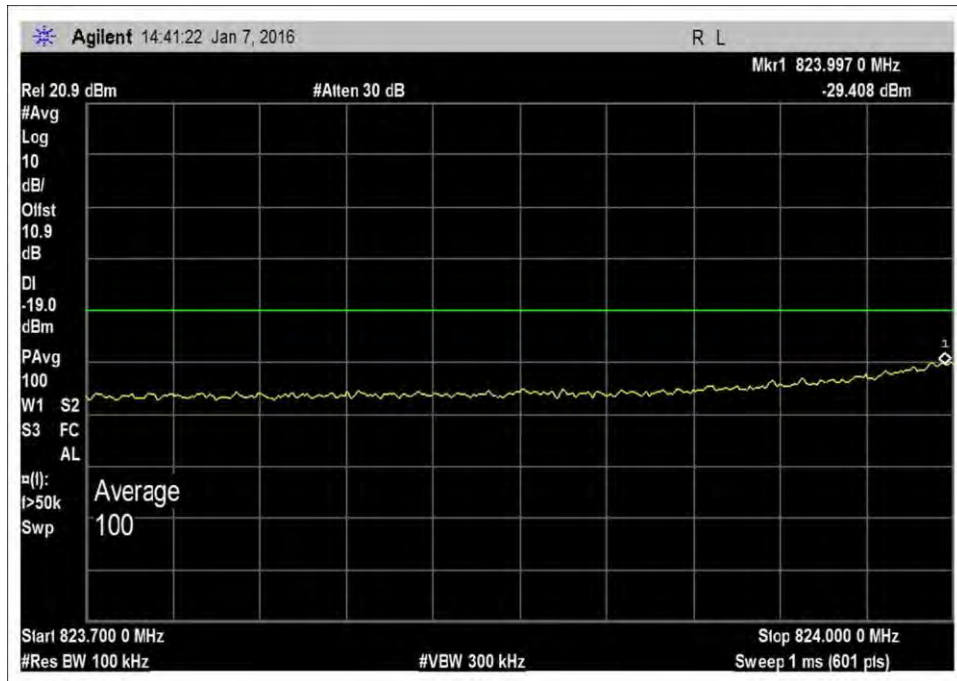
7.5_OBE_UL_776-787MHz_L_PreAGC



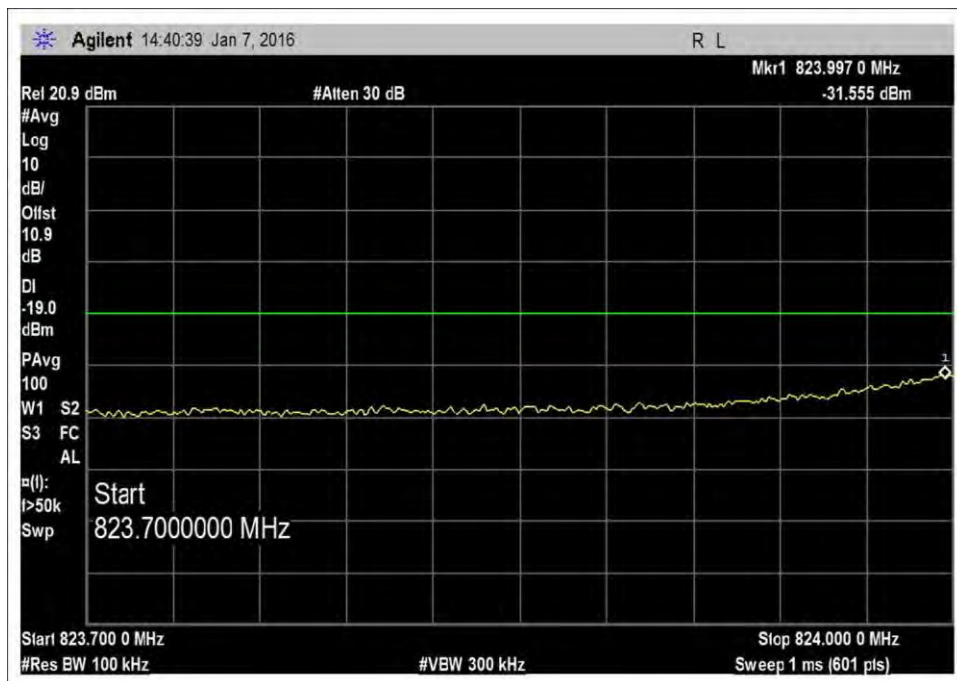
7.5_OBE_UL_824-849MHz_H_Max



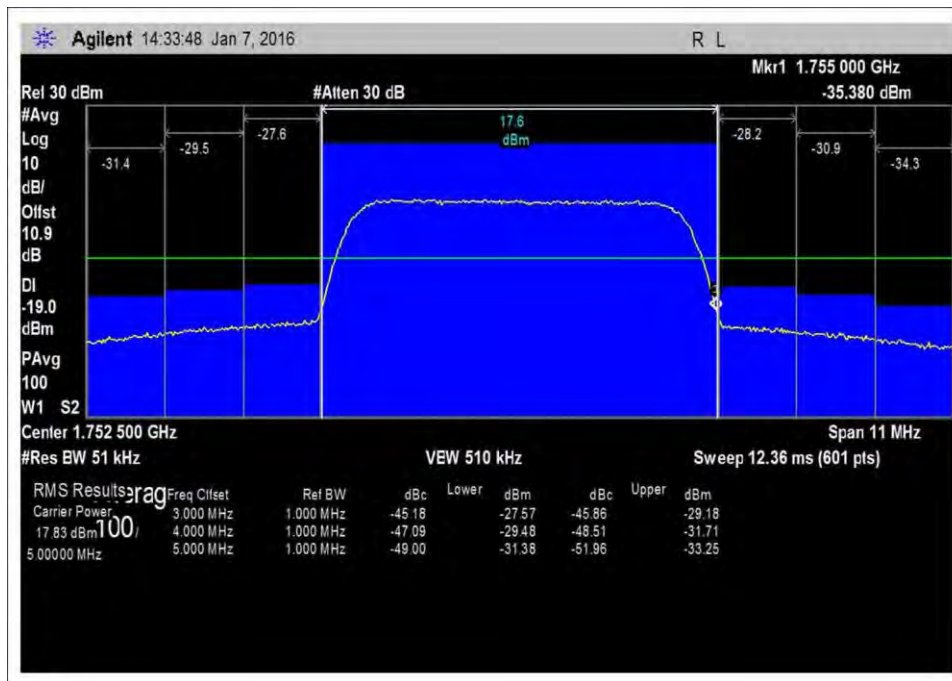
7.5_OBE_UL_824-849MHz_H_PreAGC



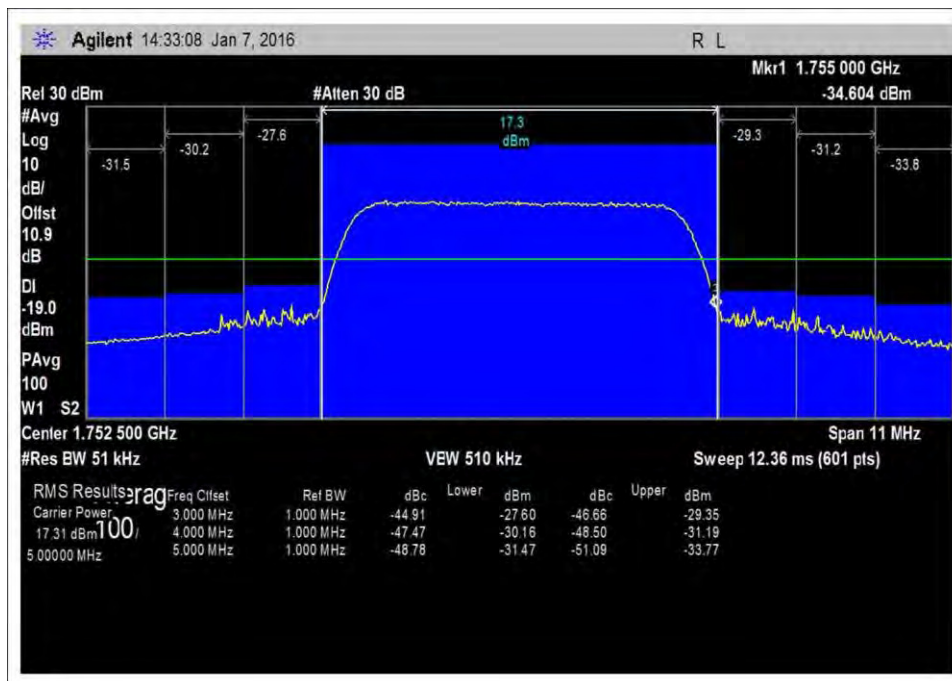
7.5_OBE_UL_824-849MHz_L_Max



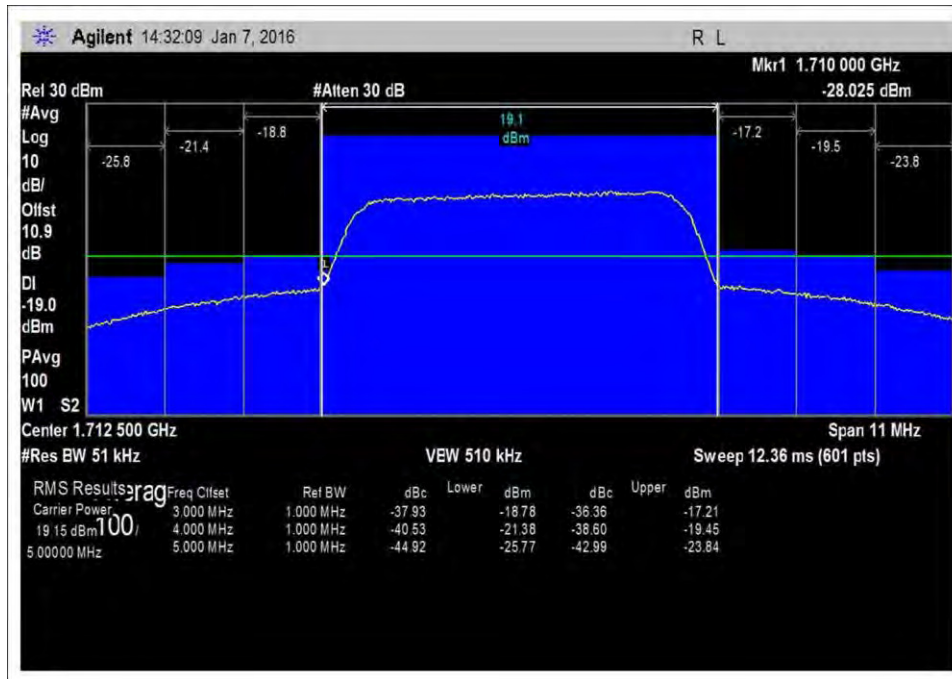
7.5_OBE_UL_824-849MHz_L_PreAGC



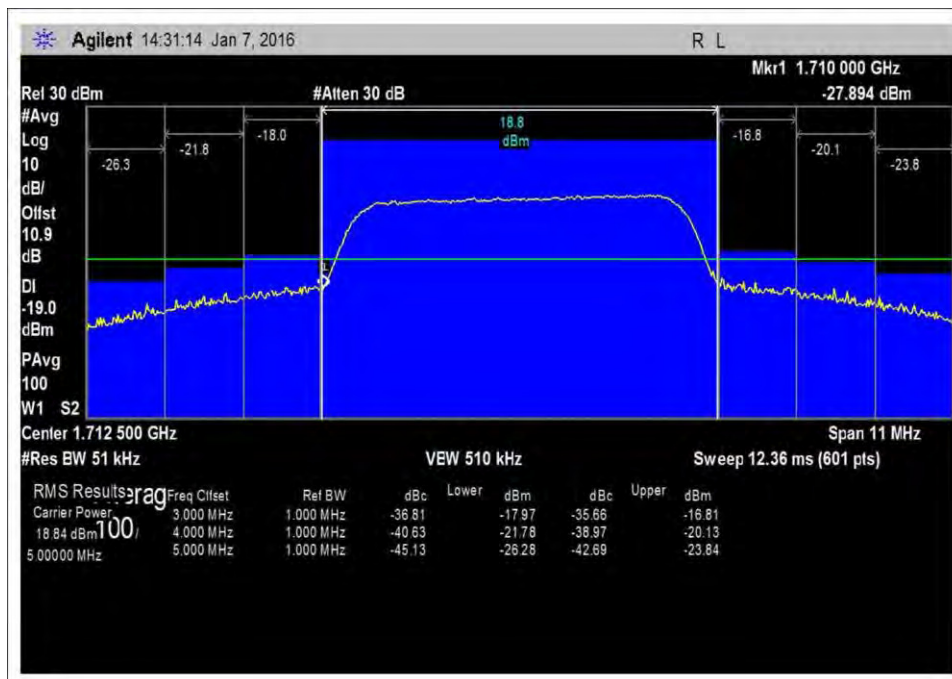
7.5_OBE_UL_1710-1755MHz_H_Max



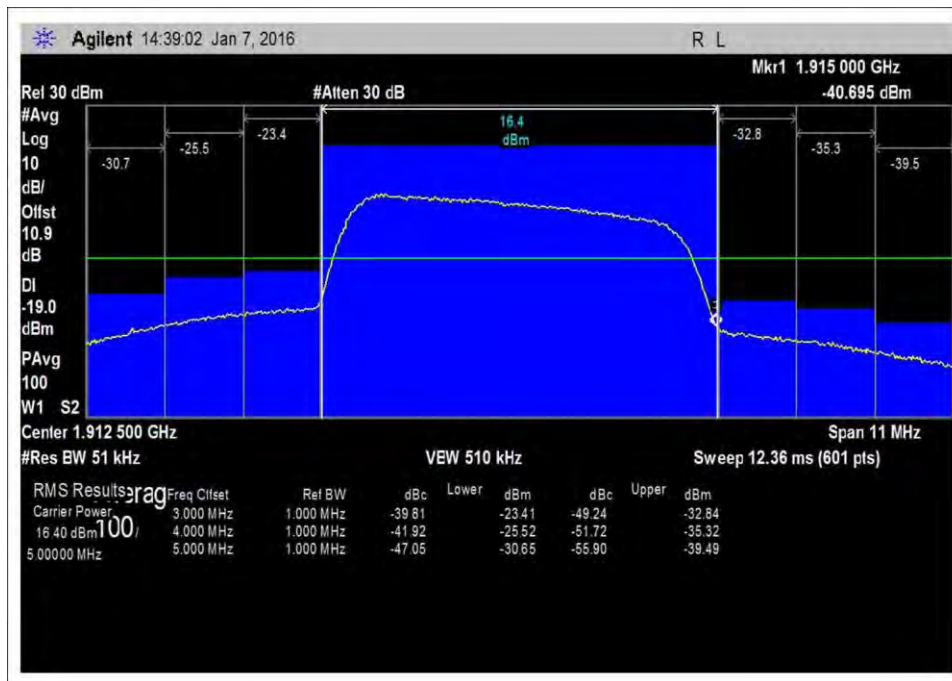
7.5_OBE_UL_1710-1755MHz_H_PreAGC



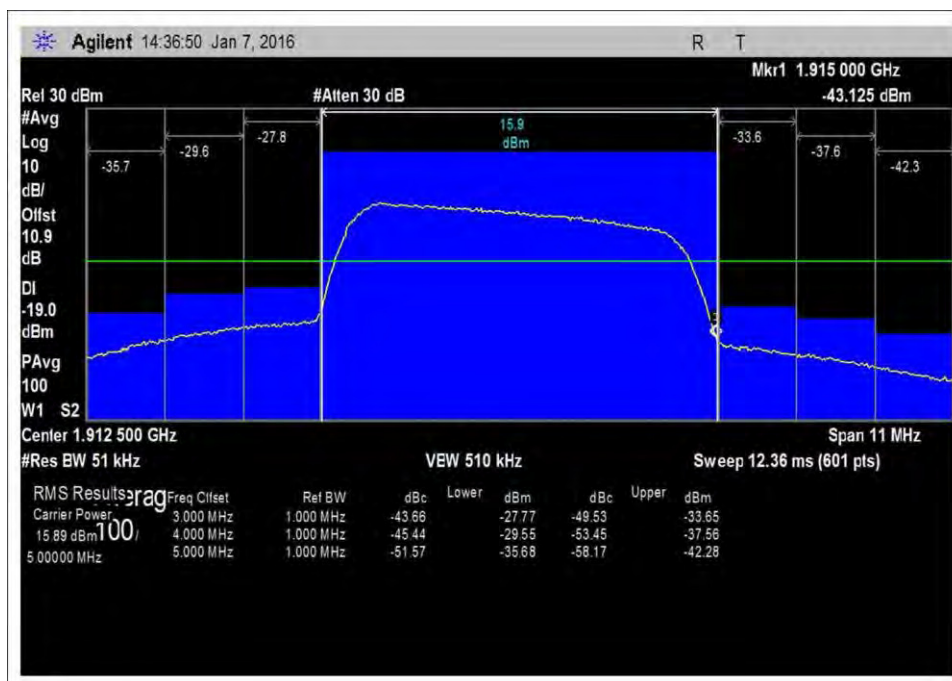
7.5_OBE_UL_1710-1755MHz_L_Max



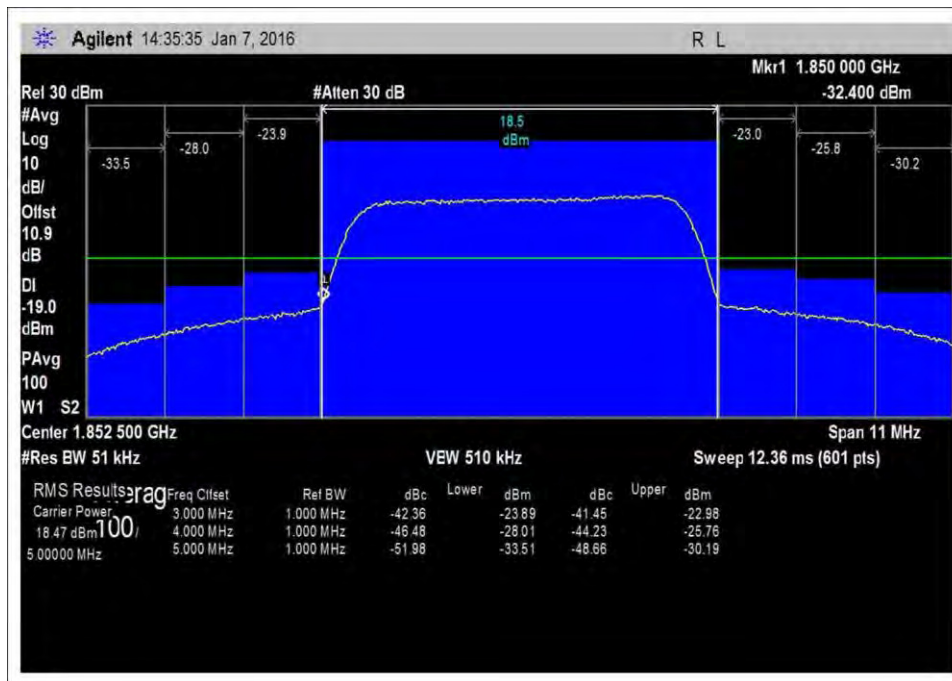
7.5_OBE_UL_1710-1755MHz_L_PreAGC



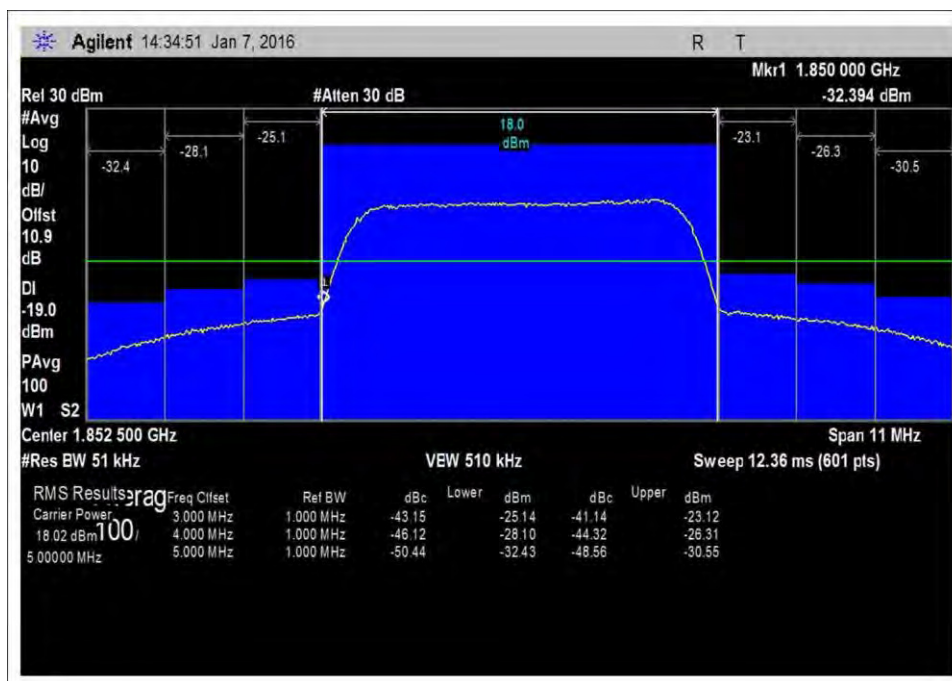
7.5_OBE_UL_1850-1915MHz_H_Max



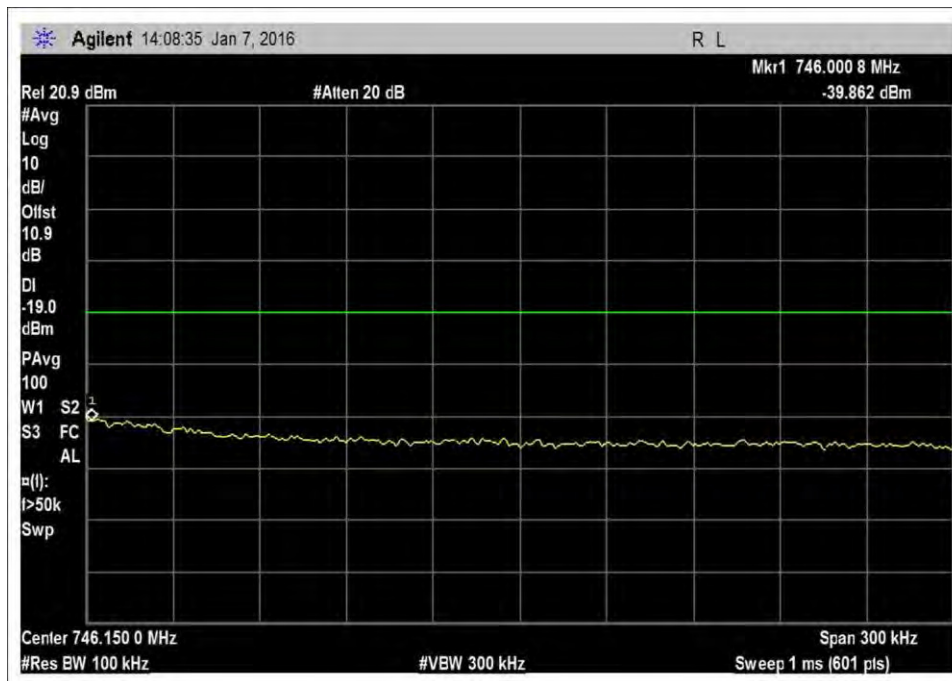
7.5_OBE_UL_1850-1915MHz_H_PreAGC



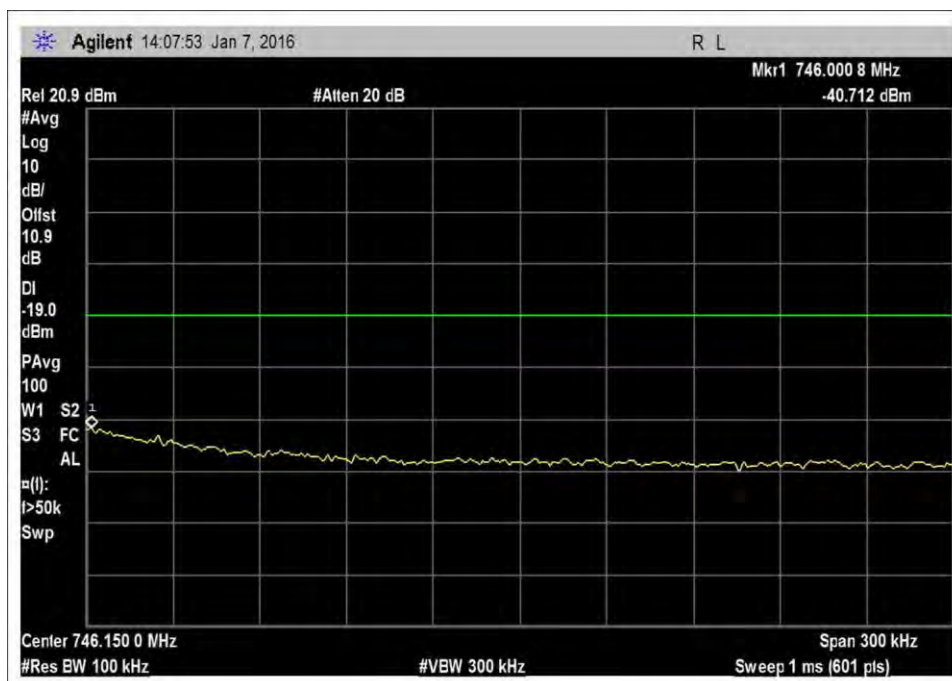
7.5_OBE_UL_1850-1915MHz_L_Max



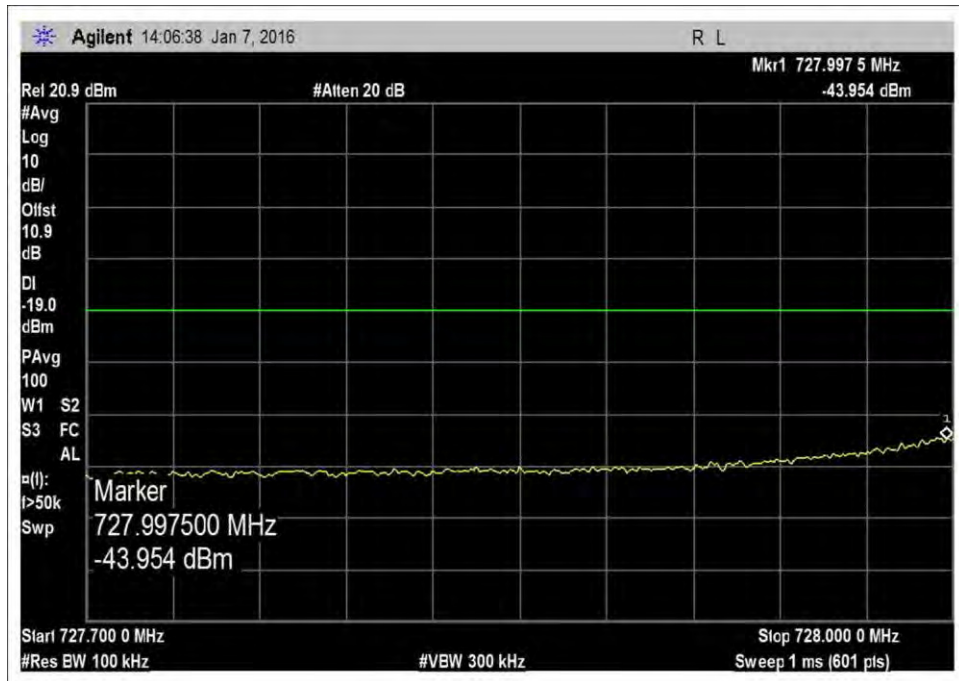
7.5_OBE_UL_1850-1915MHz_L_PreAGC



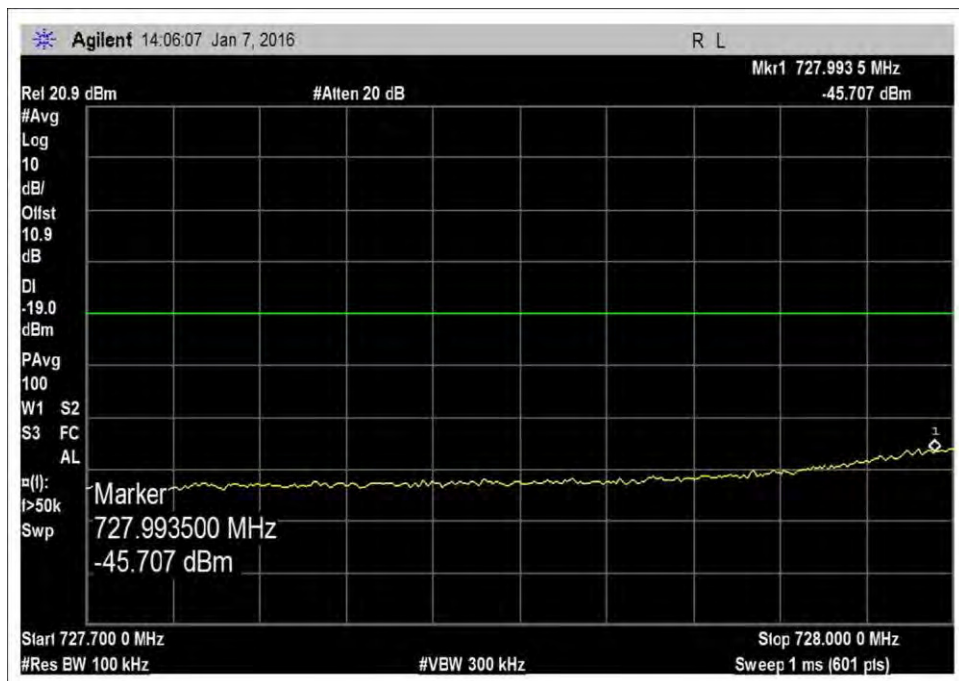
7.5_OBE_DL_728-746MHz_H_Max



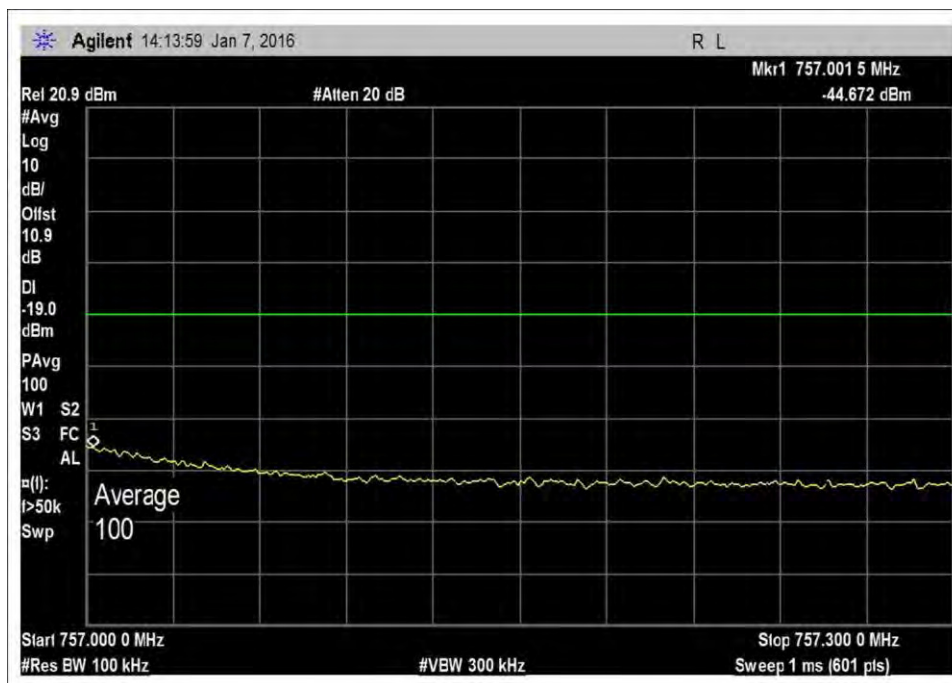
7.5_OBE_DL_728-746MHz_H_PreAGC



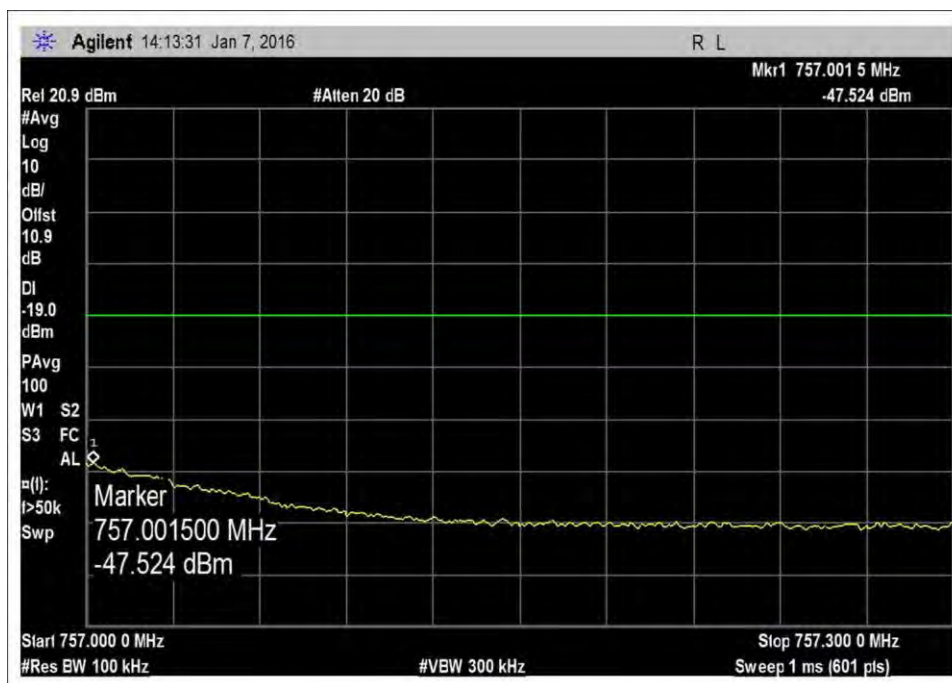
7.5_OBE_DL_728-746MHz_L_Max



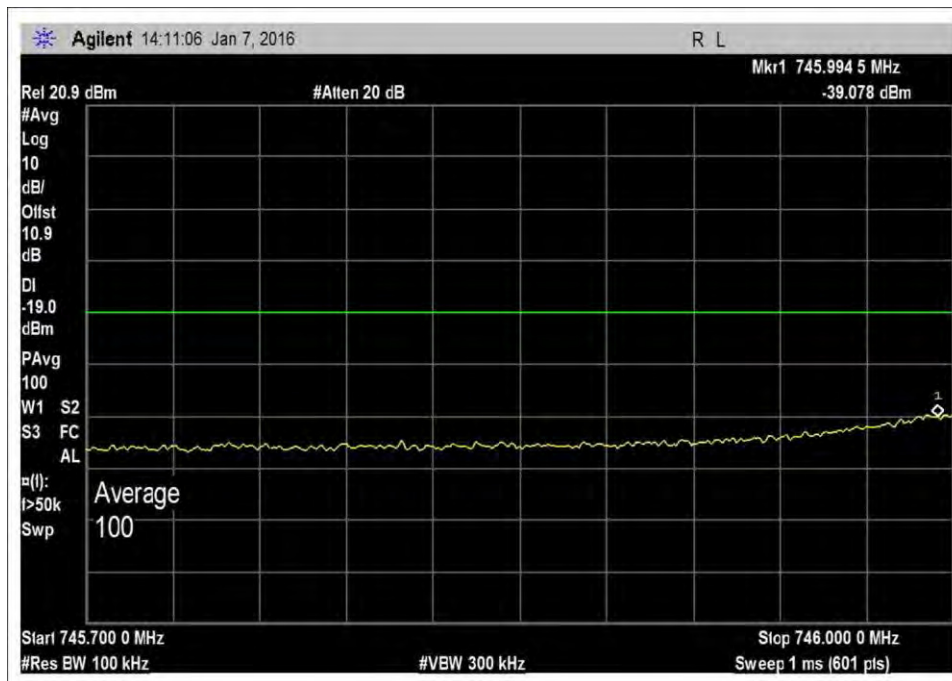
7.5_OBE_DL_728-746MHz_L_PreAGC



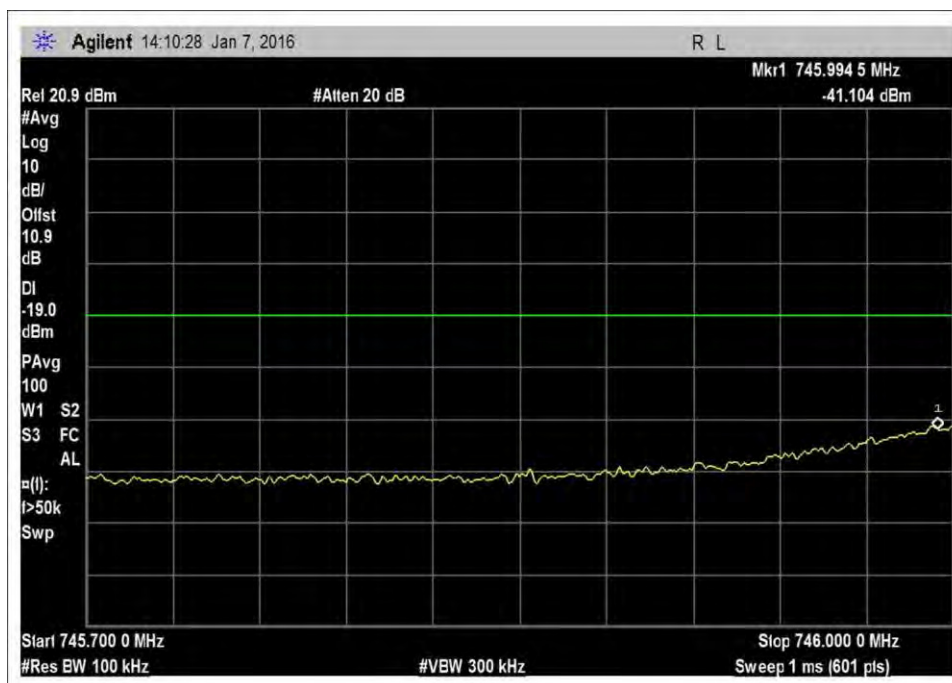
7.5_OBE_DL_746-757MHz_H_Max



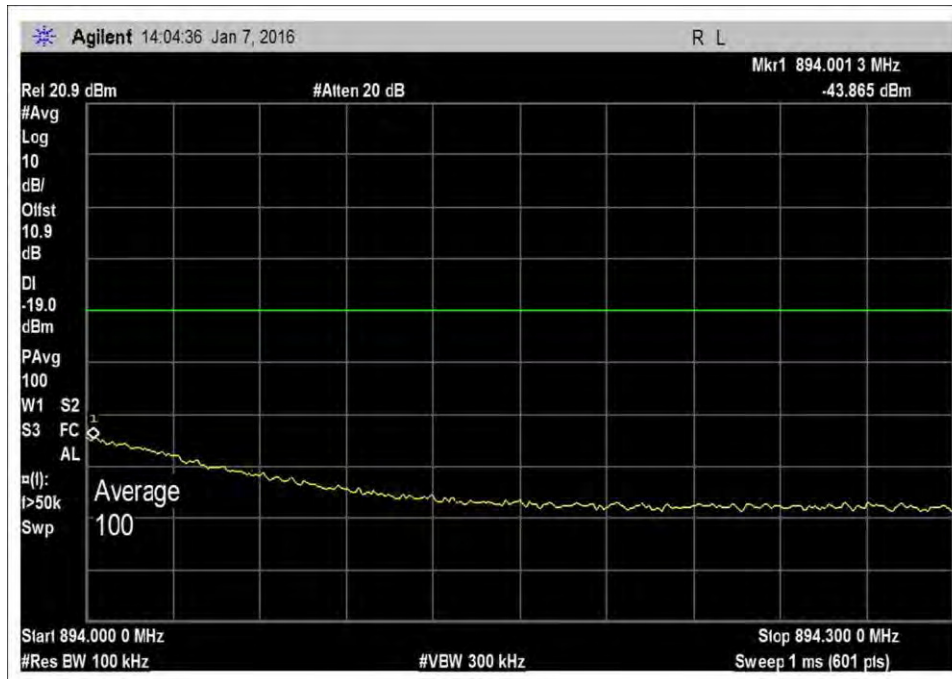
7.5_OBE_DL_746-757MHz_H_PreAGC



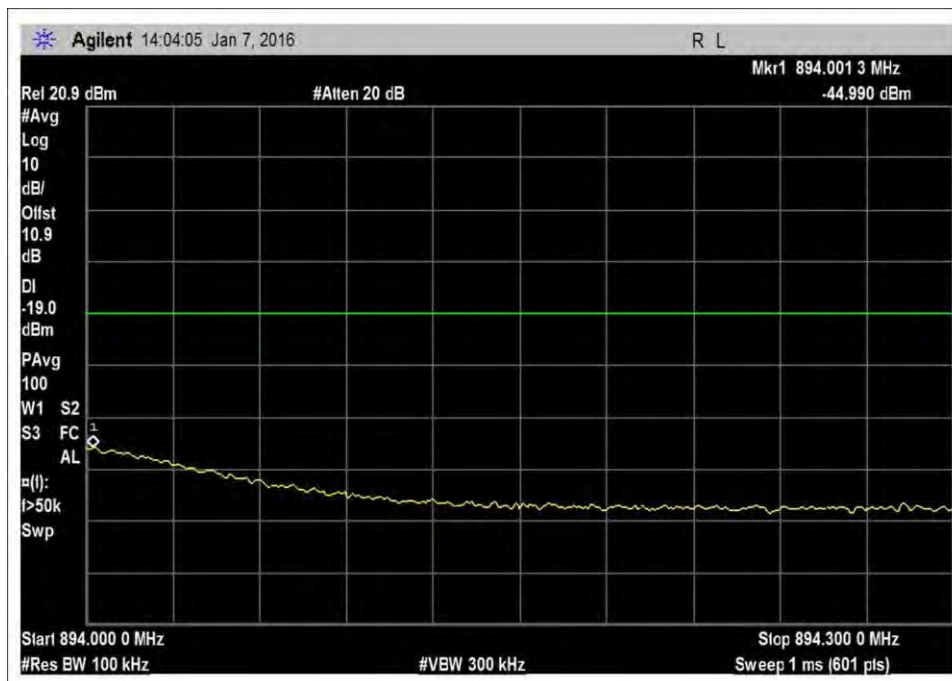
7.5_OBE_DL_746-757MHz_L_Max



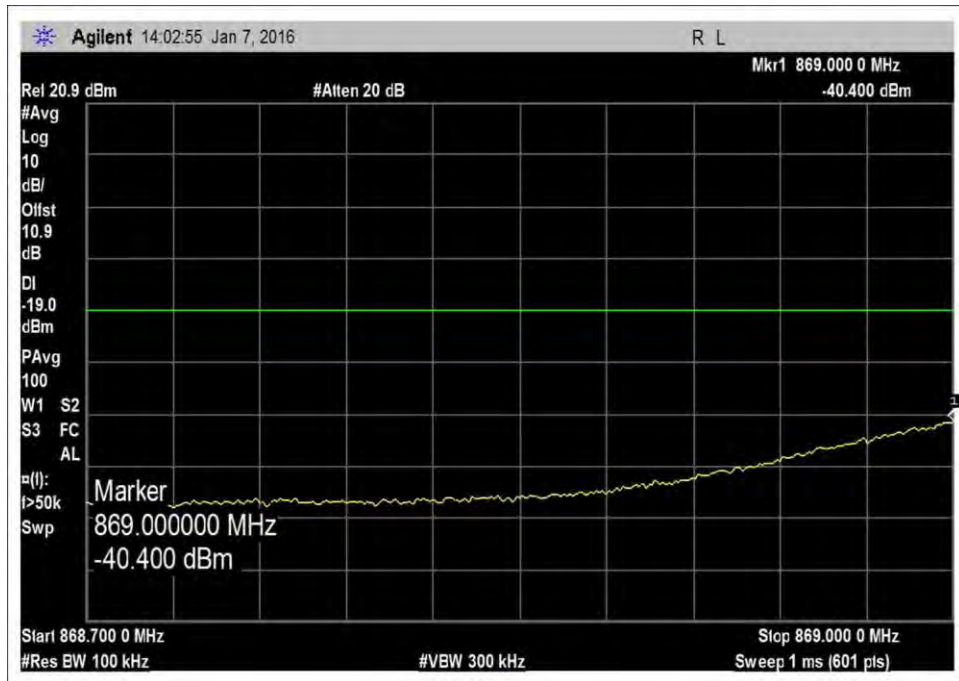
7.5_OBE_DL_746-757MHz_L_PreAGC



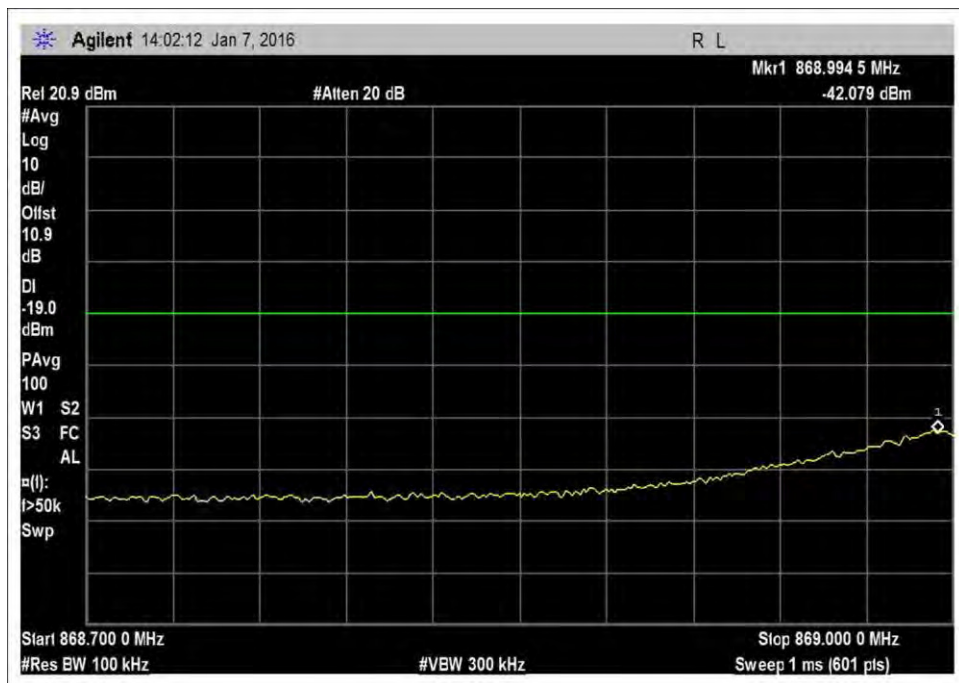
7.5_OBE_DL_869-894MHz_H_Max



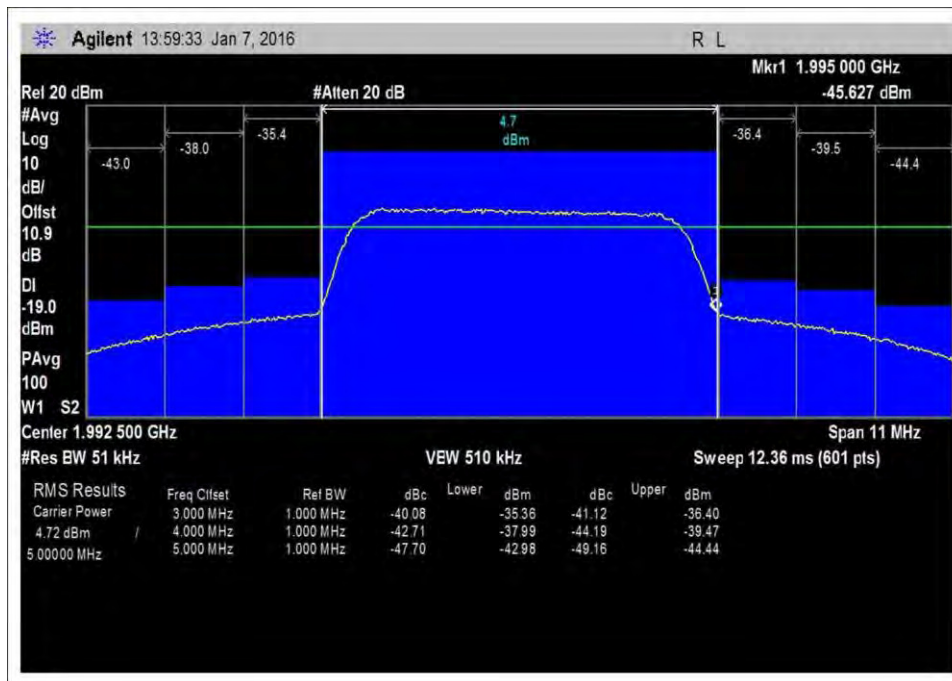
7.5_OBE_DL_869-894MHz_H_PreAGC



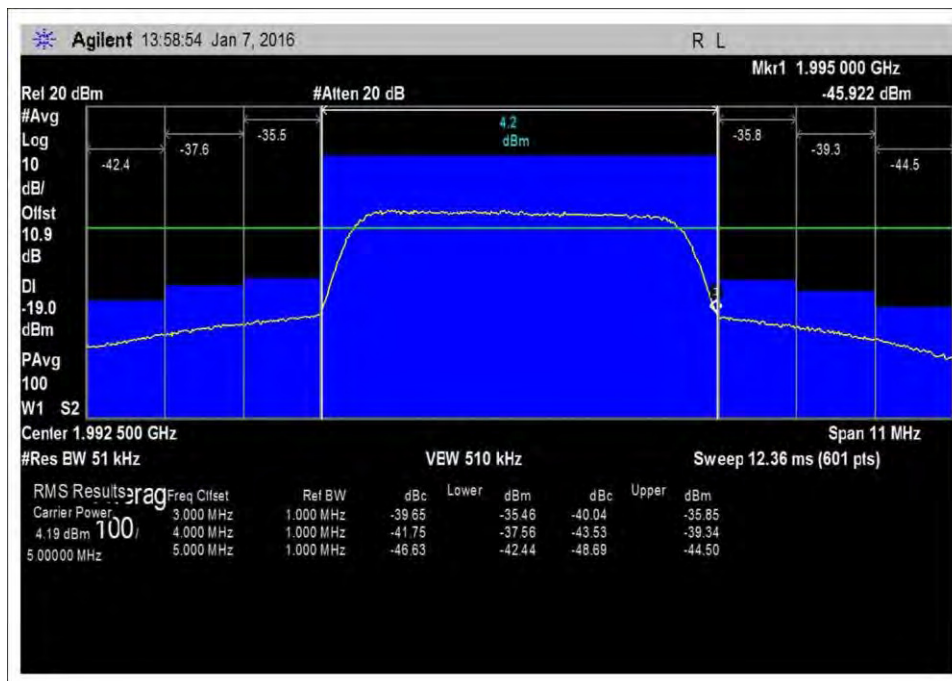
7.5_OBE_DL_869-894MHz_L_Max



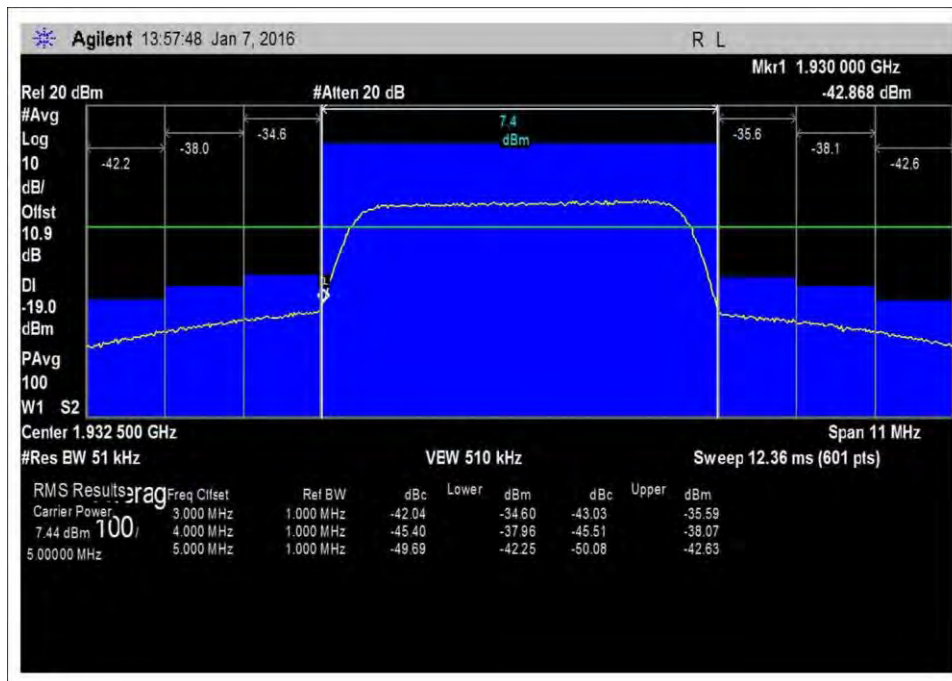
7.5_OBE_DL_869-894MHz_L_PreAGC



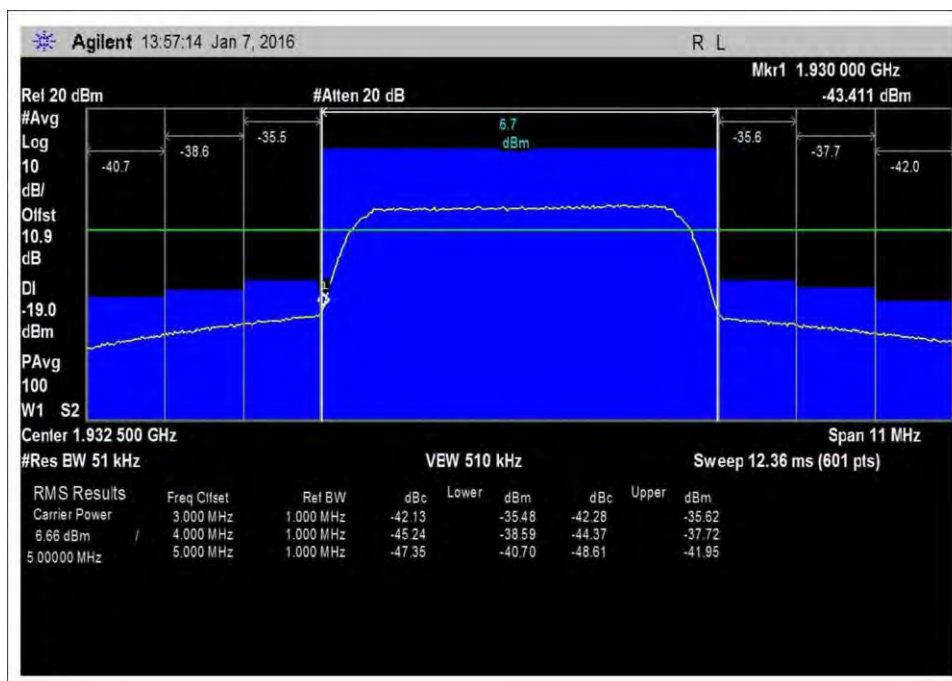
7.5_OBE_DL_1930-1995MHz_H_Max



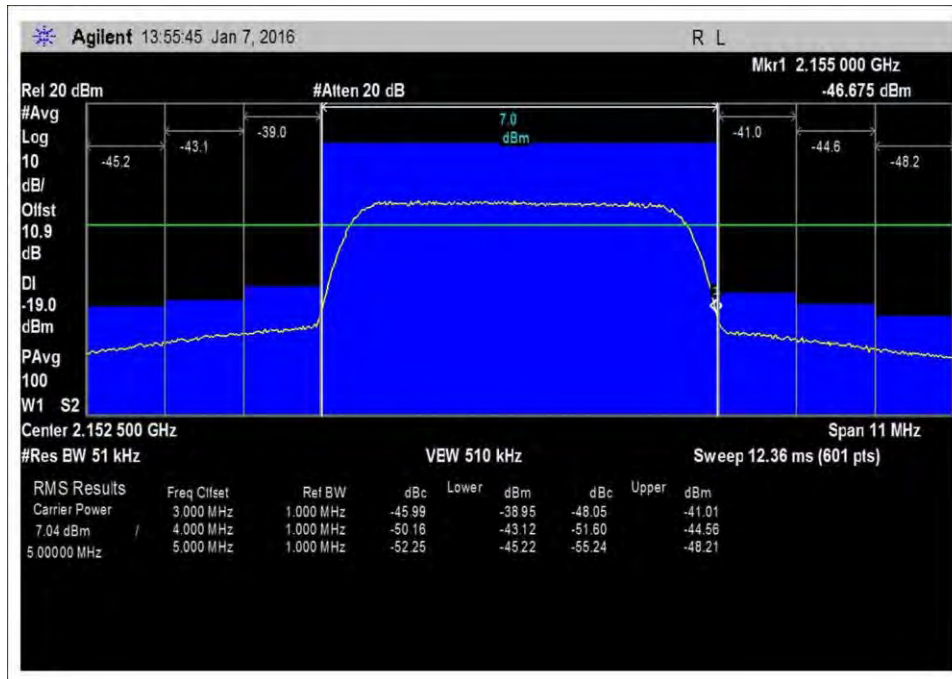
7.5_OBE_DL_1930-1995MHz_H_PreAGC



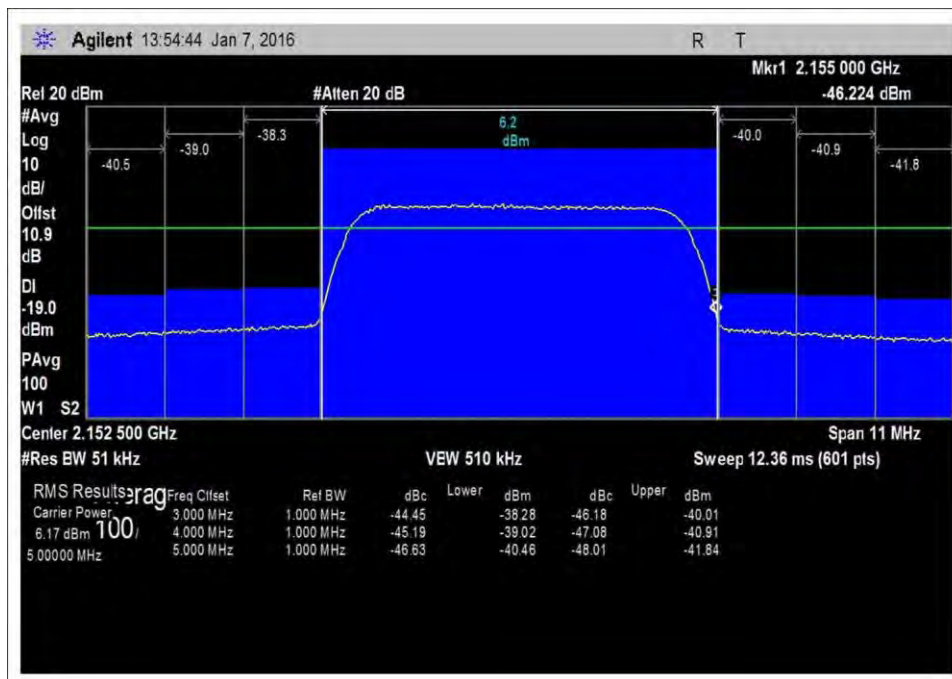
7.5_OBE_DL_1930-1995MHz_L_Max



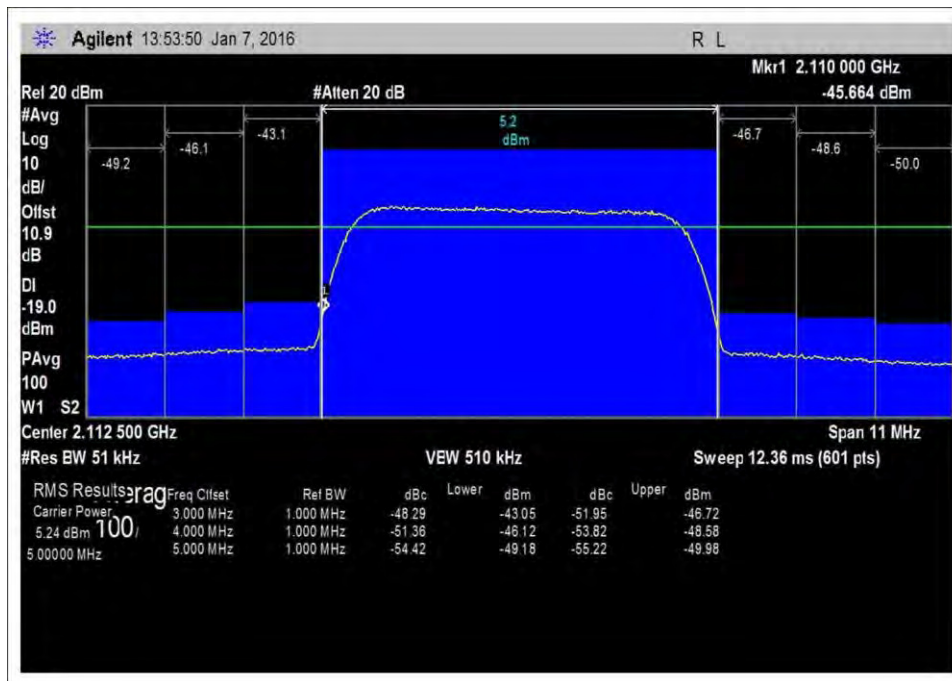
7.5_OBE_DL_1930-1995MHz_L_PreAGC



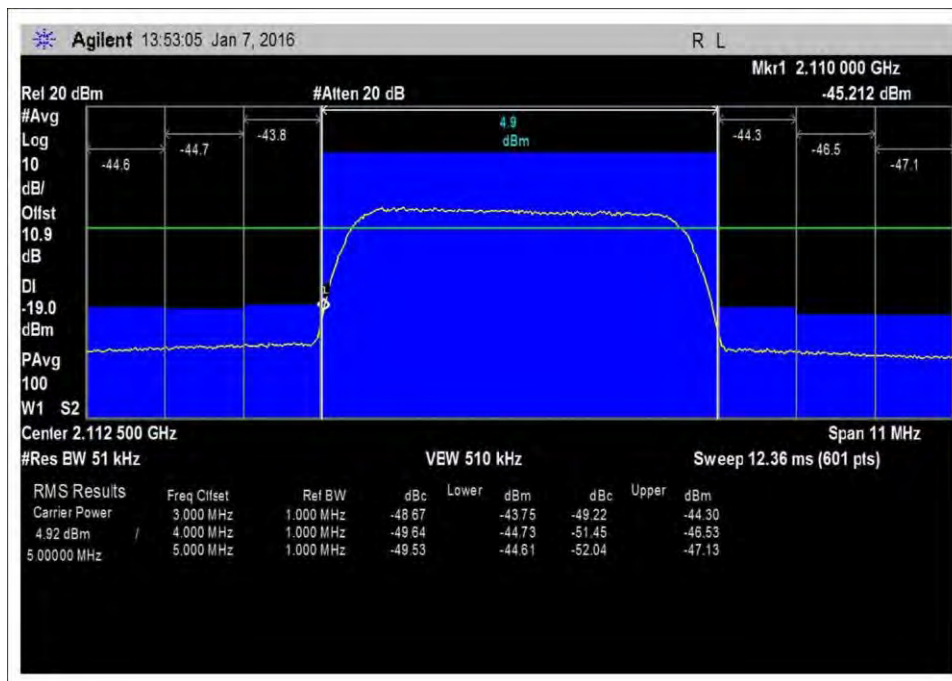
7.5_OBE_DL_2110-2155MHz_H_Max



7.5_OBE_DL_2110-2155MHz_H_PreAGC



7.5_OBE_DL_2110-2155MHz_L_Max



7.5_OBE_DL_2110-2155MHz_L_PreAGC

7.7 Noise limit

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.7 Noise Limit (Maximum Transmitter Noise Power Level / Variable UL Noise Timing)**
 Work Order #: **98021** Date: 01/07/2016
 Test Type: **Conducted Emissions** Time: 15:30:51
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.03.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed Wideband Consumer Booster.
 Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.
 The EUT is placed on the test bench.

7.7.1 Maximum Transmitter Noise Power Level

Per figure 3, input port was terminated with 50 Ohm Pasternack load (MN: PE6187 and SN: 1443).

7.7.2 Variable UL Noise Timing

Per figure 4, server port was terminated with 50 Ohm Pasternack load (MN: PE6187 and SN: 1443).

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 environment conditions: Temperature: 21.2°C, Relative Humidity: 42%, Pressure: 101.2 kPa

The test was performed in accordance with section 7.7 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.

Firmware: V3.0

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06710	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	AN02660	Spectrum Analyzer	E4446A	7/9/2015	7/9/2017
	ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
	ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

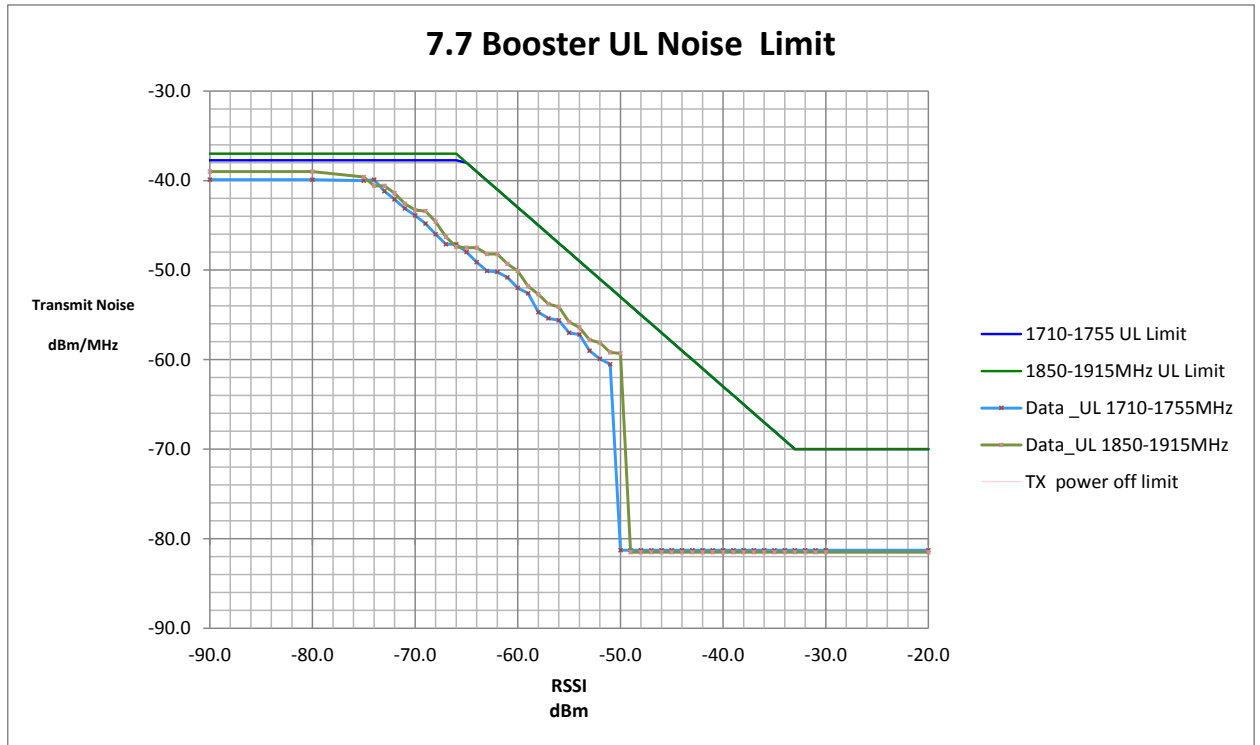
Summary of Results

7.7.1 Maximum transmitter noise power level

7.7.1 a-g: Maximum transmitter noise with 50-ohm shielded load

Maximum Noise Power			
Frequency	Measured	Limit	Margin
MHz	dBm./MHz	dBm/MHz	
UL1710-1755	-40.50	-37.7	-2.8
UL1850-1915	-39.57	-37.0	-2.6
UL824-894	-45.44	-44.1	-1.3
UL 698-716	-47.21	-45.5	-1.7
UL776-787	-47.54	-44.6	-2.9
DL2110-2155	-39.16	-37.7	-1.5
DL1930-1995	-40.06	-37.0	-3.1
DL869-894	-47.71	-44.1	-3.6
DL:728-746	-47.75	-45.5	-2.3
DL 746-757	-47.53	-44.6	-2.9

7.7.1 h-n: Maximum transmitter noise when varying the DL signal generator output level with a 4.1MHz AWGN signal

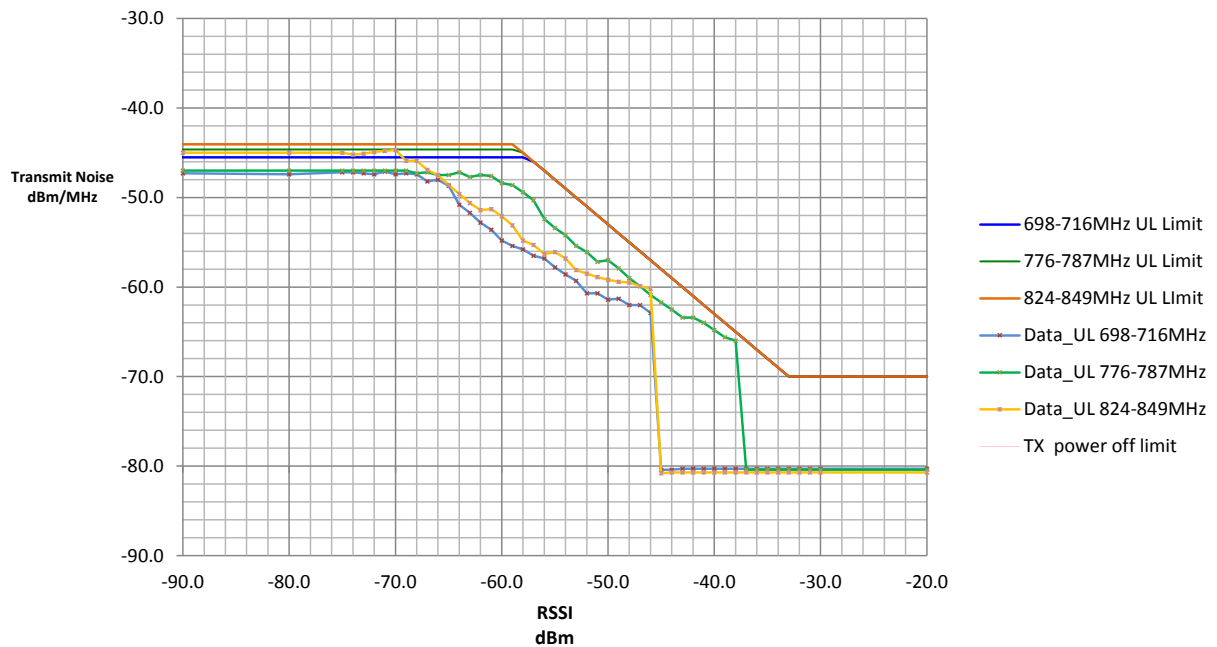


1710.0	1755.0	MHz			
		Limit			Margin
RSSI (dBm)	Measured Noise (dBm/MHz)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-39.9		-37.7		-2.2
-74.0	-39.9		-37.7		-2.2
-59.0	-52.6	-44.0			-8.6
-56.0	-55.6	-47.0			-8.6
-54.0	-57.2	-49.0			-8.2
-51.0	-60.5	-52.0			-8.5
-32.0	-81.3			-70	-11.3

1850.0	1915.0	MHz			
		Limit			Margin
RSSI (dBm)	Measured Noise (dBm/MHz)	RSSI Dependent	Fixed Booster Limit	TX off	
-90.0	-39.0		-37.0		-2.0
-75.0	-39.6		-37.0		-2.6
-62.0	-48.2	-41.0			-7.2
-60.0	-50.1	-43.0			-7.1
-56.0	-54.1	-47.0			-7.1
-52.0	-58.1	-51.0			-7.1
-32.0	-81.5			-70	-11.5

698.0	716.0	MHz			
		Limit			Margin
RSSI (dBm)	Measured Noise (dBm/MHz)	RSSI Dependent	Fixed Booster Limit	TX off	
-75.0	-47.2		-45.5		-1.7
-71.0	-47.1		-45.5		-1.6
-49.0	-61.3	-54.0			-7.3
-48.0	-62.0	-55.0			-7.0
-47.0	-62.0	-56.0			-6.0
-46.0	-62.9	-57.0			-5.9
-32.0	-80.3			-70	-10.3

7.7 Booster UL Noise Limit



776.0	787.0	MHz			
		Limit			Margin
RSSI (dBm)	Measured Noise (dBm/MHz)	RSSI Dependent	Fixed Booster Limit	TX off	
-80.0	-47.0		-44.6		-2.4
-67.0	-47.2		-44.6		-2.6
-41.0	-64.0	-62.0			-2.0
-40.0	-64.8	-63.0			-1.8
-39.0	-65.6	-64.0			-1.6
-38.0	-66.0	-65.0			-1.0
-32.0	-80.4			-70	-10.4

824.0	849.0	MHz			
		Limit			Margin
RSSI (dBm)	Measured Noise (dBm/MHz)	RSSI Dependent	Fixed Booster Limit	TX off	
-71.0	-44.8		-44.1		-0.7
-70.0	-44.7		-44.1		-0.6
-49.0	-59.4	-54.0			-5.4
-48.0	-59.5	-55.0			-4.5
-47.0	-59.9	-56.0			-3.9
-46.0	-60.2	-57.0			-3.2
-32.0	-80.7			-70	-10.7

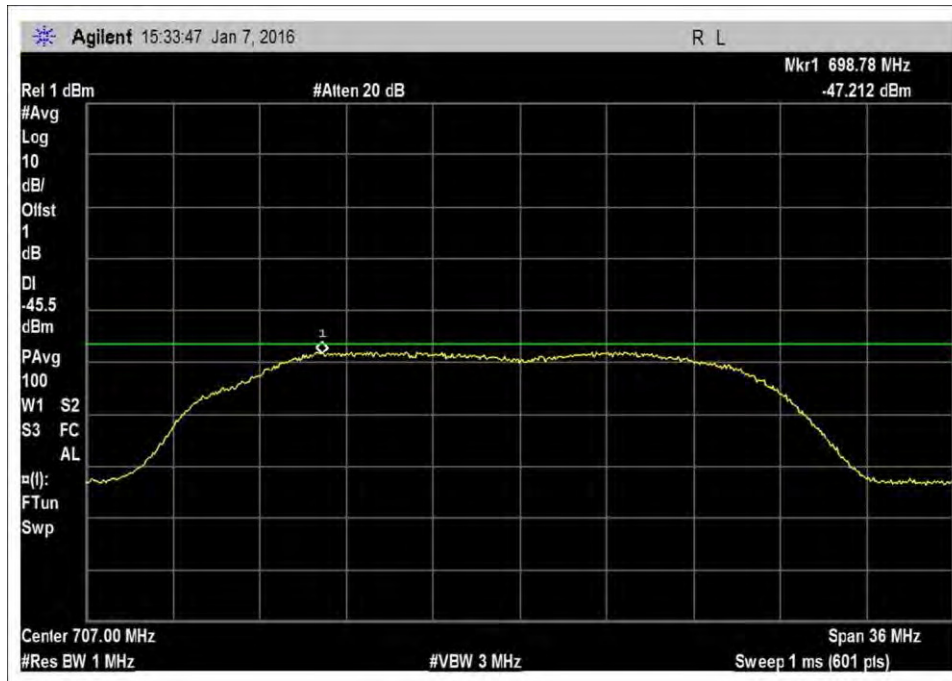
7.7.2 Variable uplink noise timing

Uplink Noise timing		
Frequency	Measured	Limit
MHz	Sec	Sec
UL1710-1755	0.35	3
UL1850-1915	0.37	3
UL824-894	0.3	3
UL 698-716	0.27	3
UL776-787	0.27	3

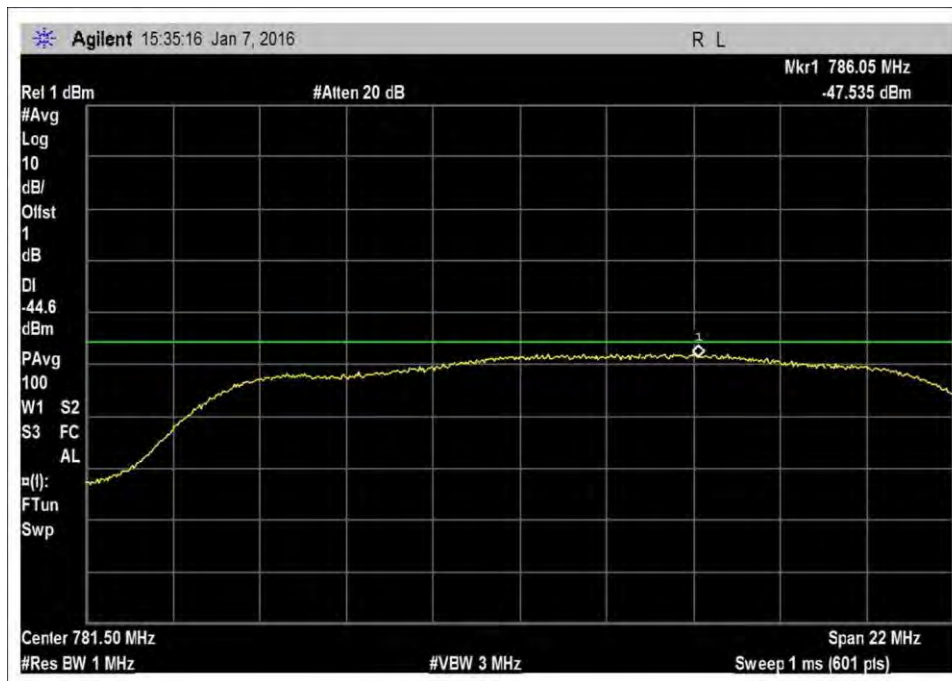
7.7.1 Maximum Transmitter Noise Power Level

Plots

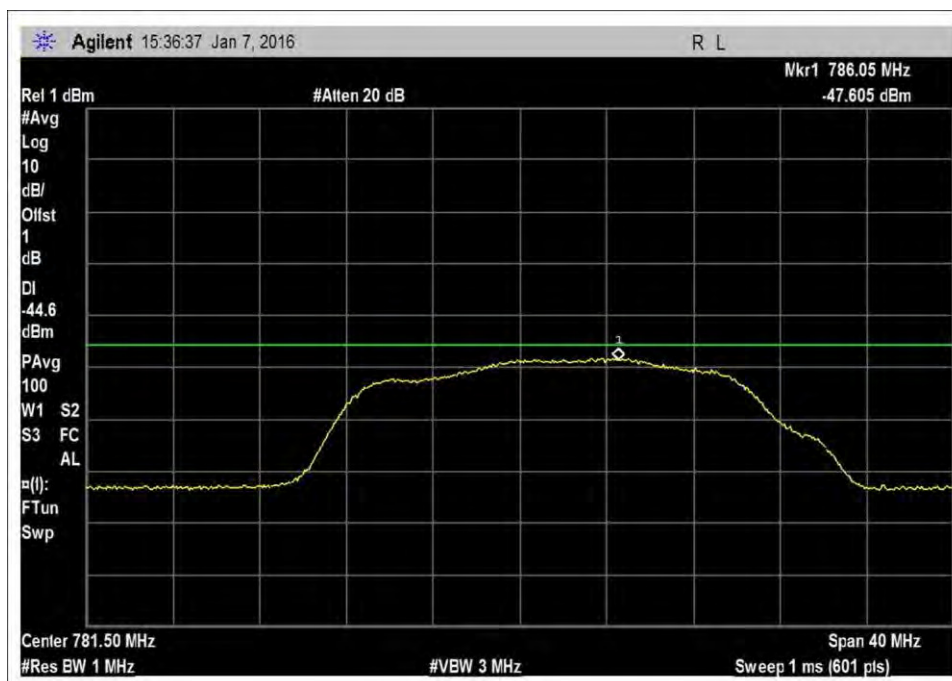
a – g Noise 50



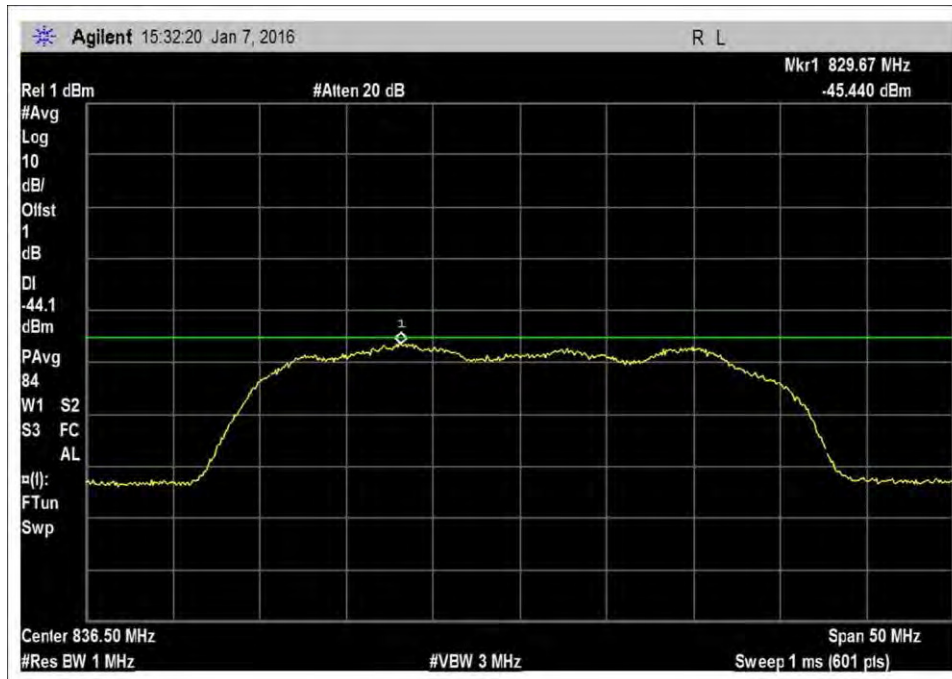
7.7_Noise_UL_698-716MHz



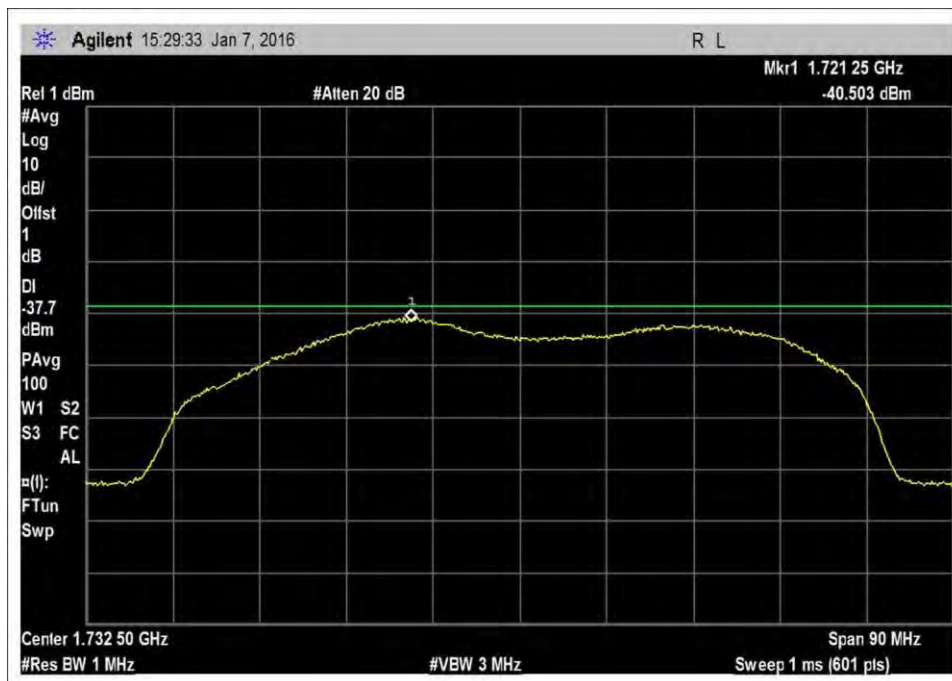
7.7_Noise_UL_776-787MHz



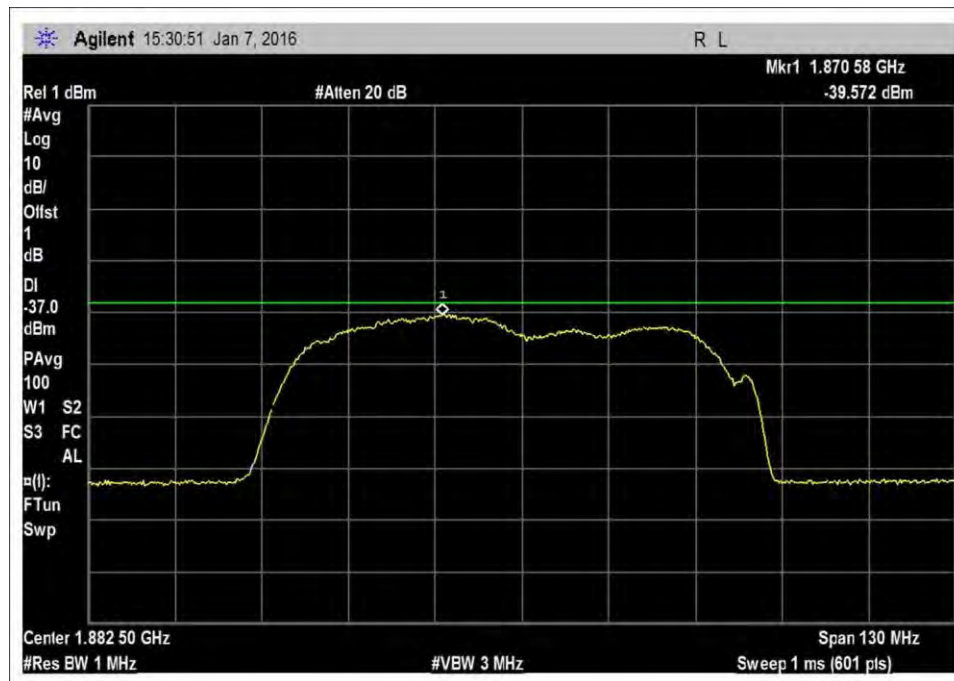
7.7_Noise_UL_776-787MHz-Zoom



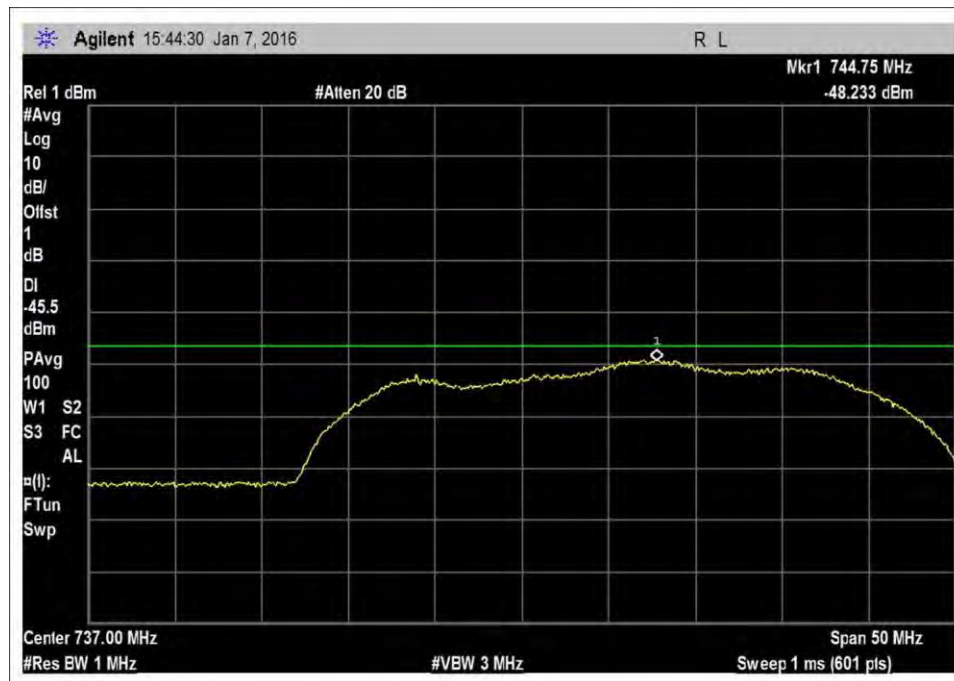
7.7_Noise_UL_824-849MHz



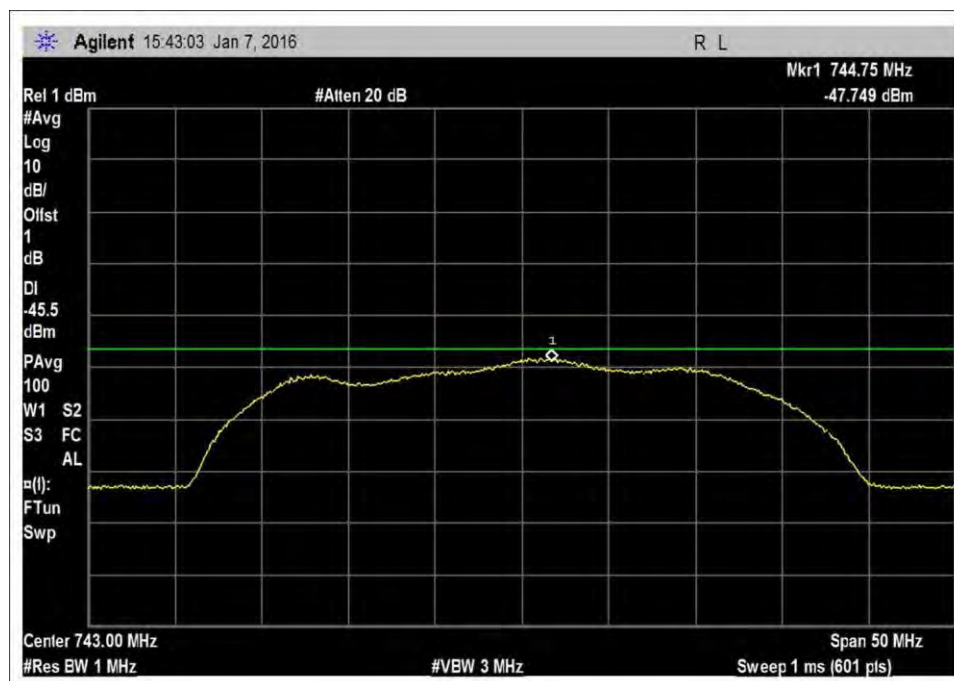
7.7_Noise_UL_1710-1755MHz



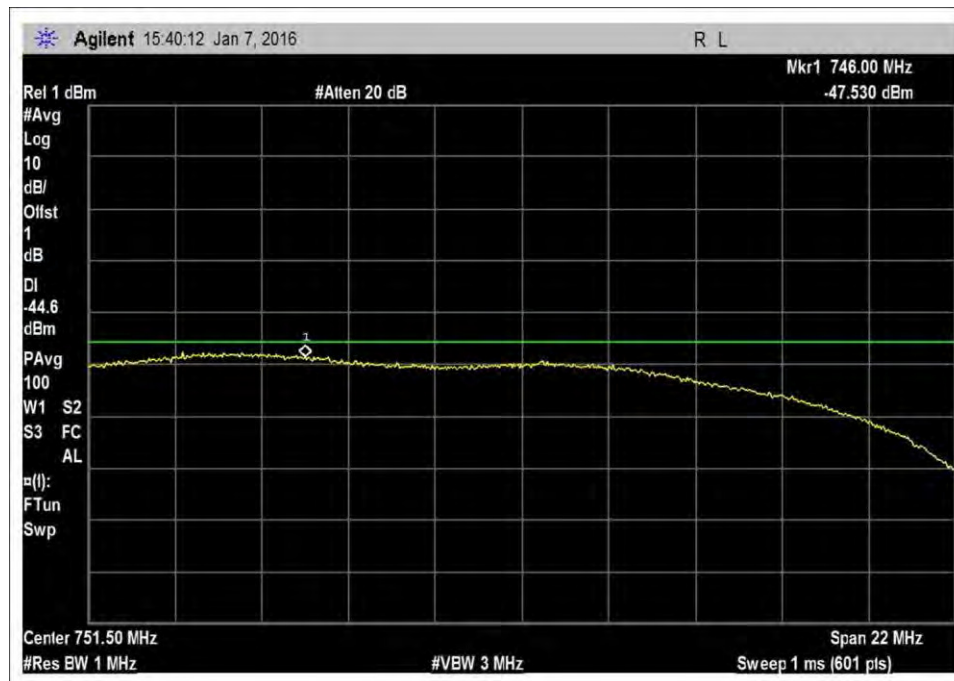
7.7_Noise_UL_1850-1915MHz



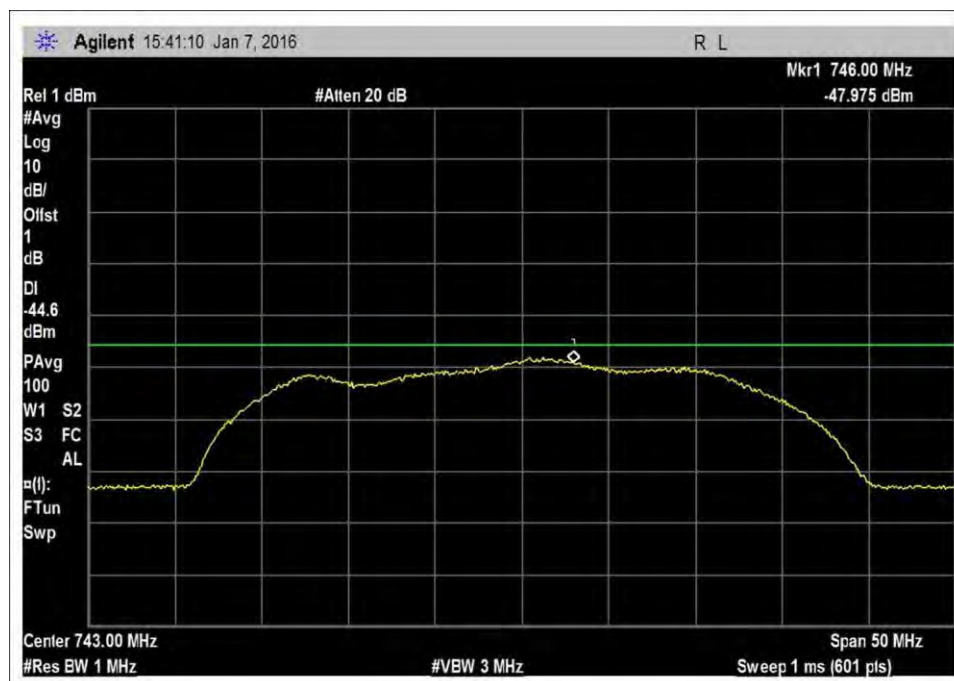
7.7_Noise_DL_728-746MHz



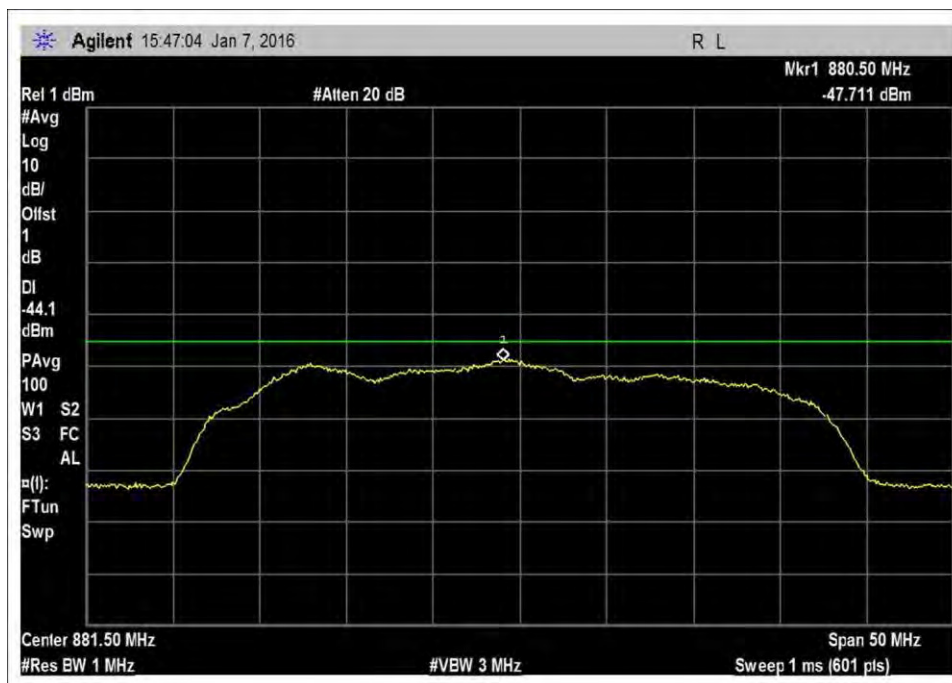
7.7_Noise_DL_728-746MHz-Zoom



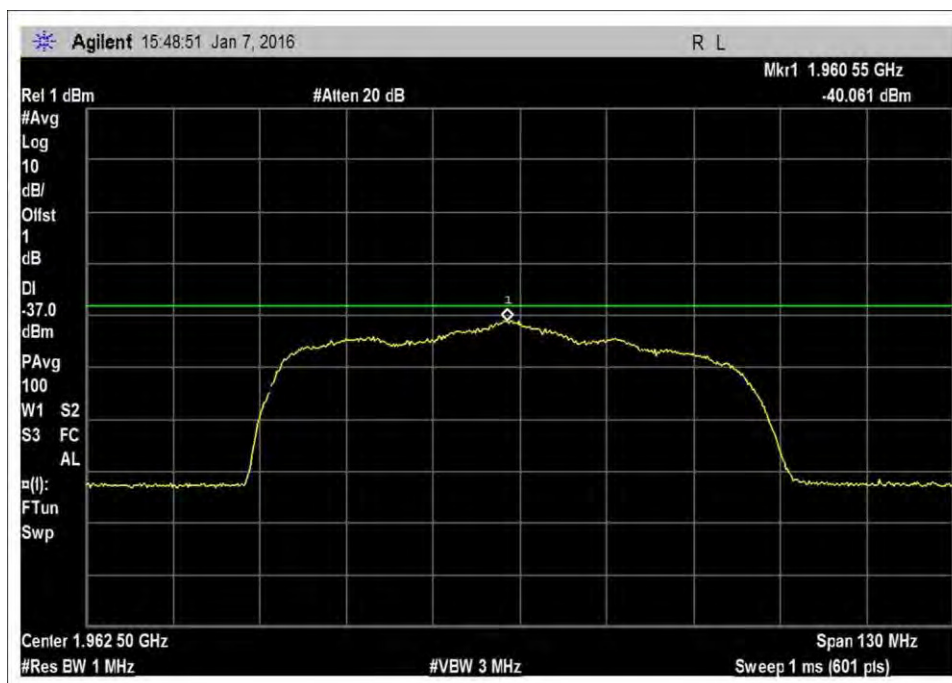
7.7_Noise_DL_746-757MHz



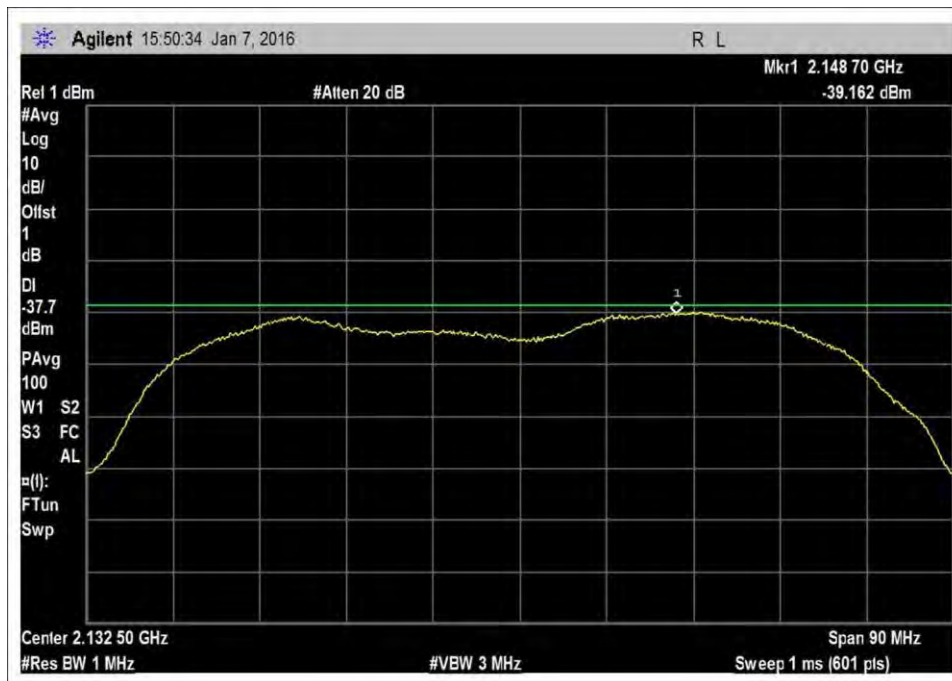
7.7_Noise_DL_746-757MHz-Zoom



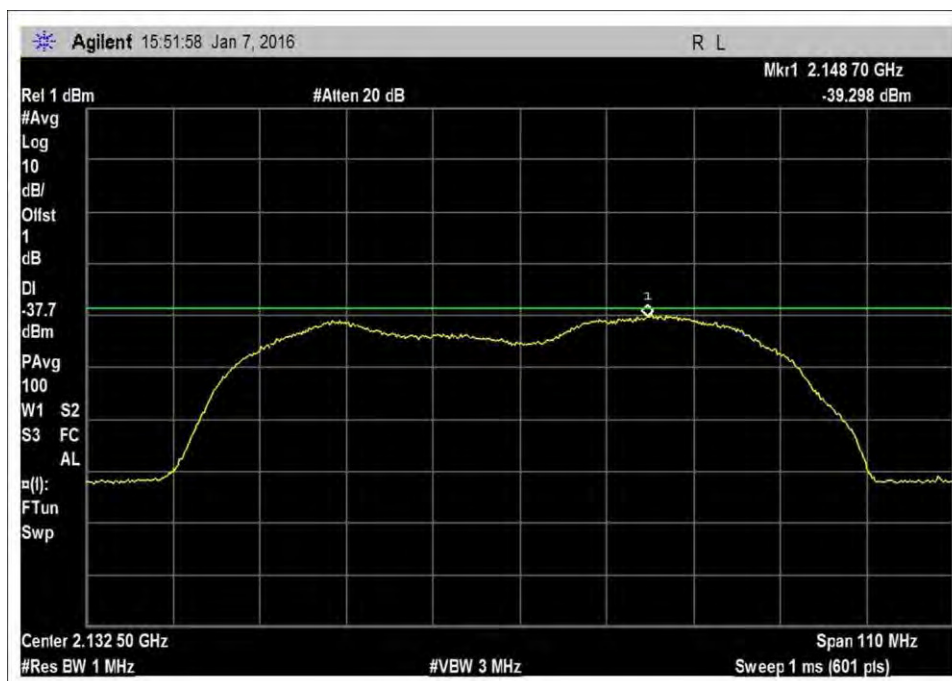
7.7_Noise_DL_869-894MHz



7.7_Noise_DL_1930-1995MHz



7.7_Noise_DL_2110-2155MHz



7.7_Noise_DL_2110-2155MHz-Zoom

h – n Tx Noise

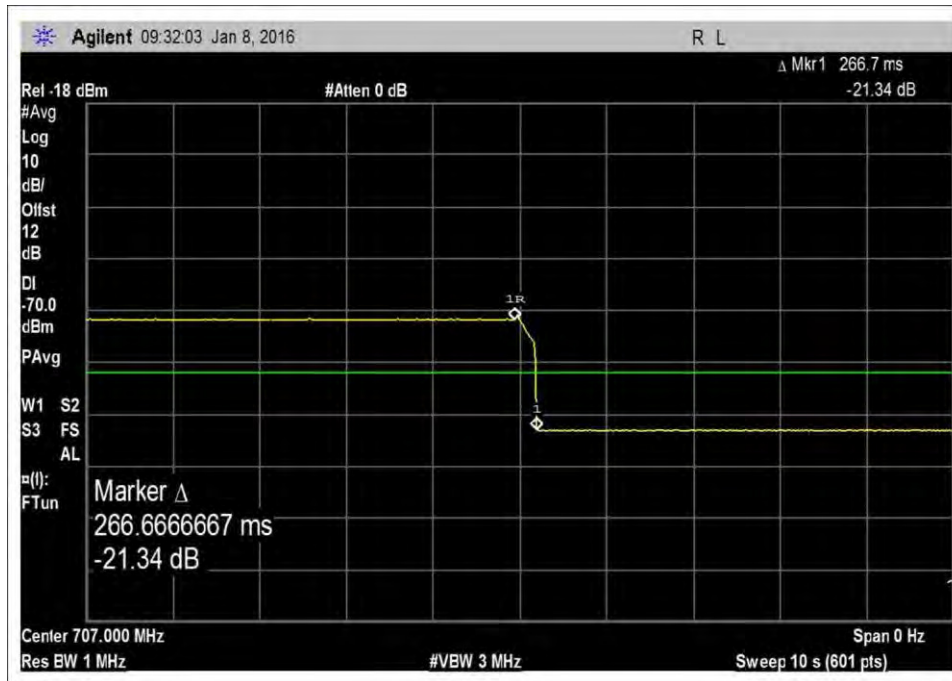
For this subsection, see summary of results of 7.7

7.7.1 h-n: Maximum transmitter noise when varying the DL signal generator output level with a 4.1MHz AWGN signal

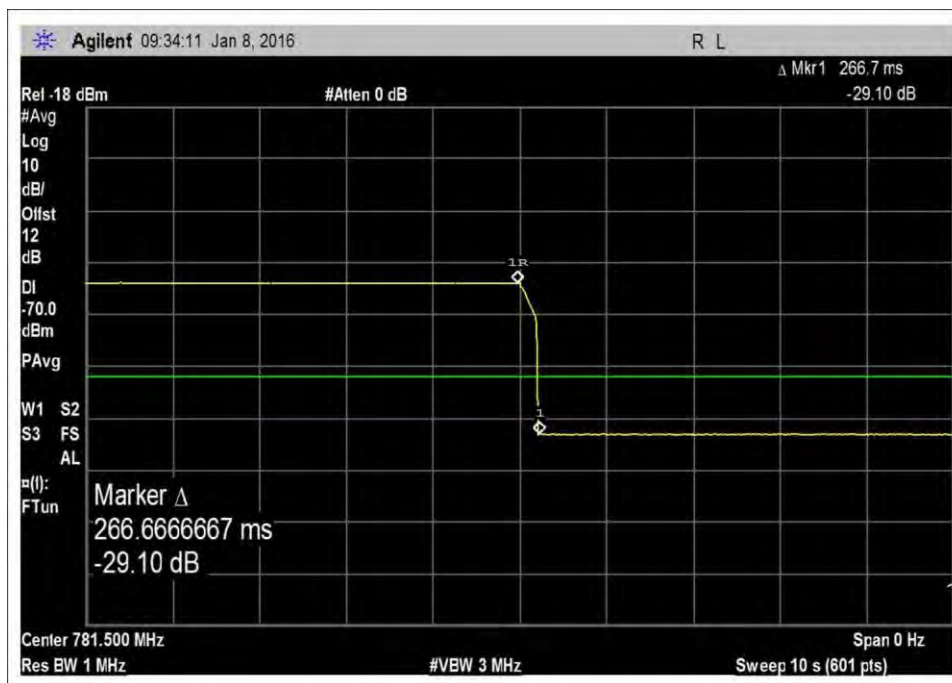
7.7.2 Variable UL Noise Timing

Plots

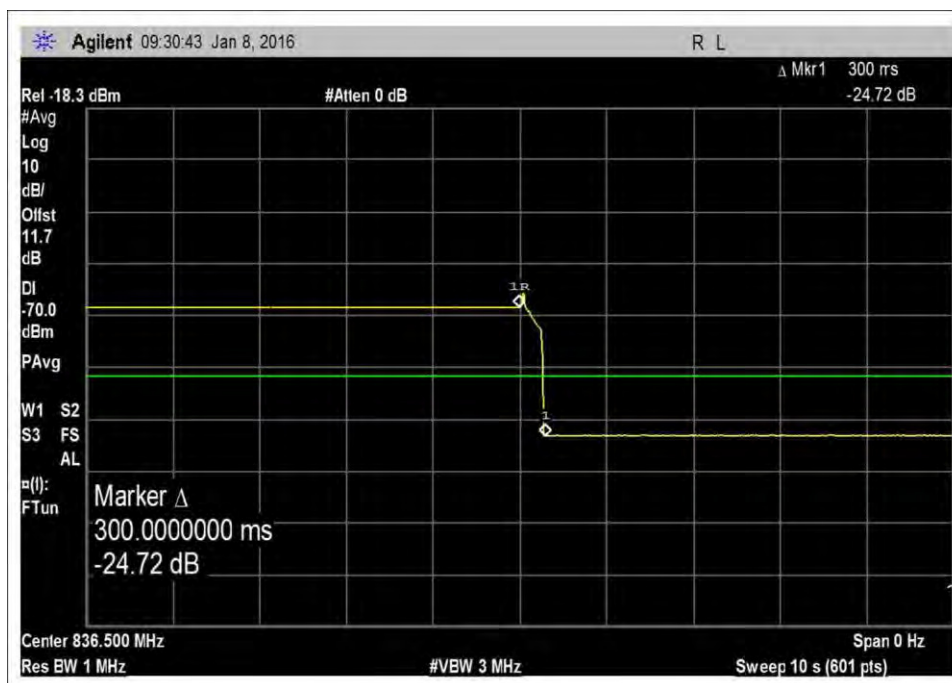
a – g Timing



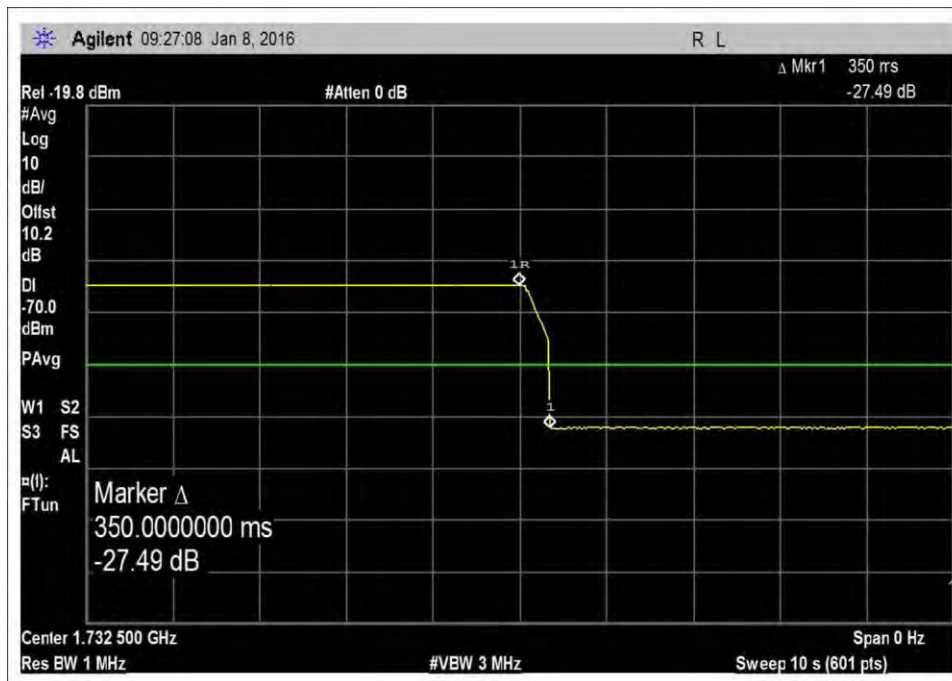
7.7_VarNoise_UL_698-716MHz



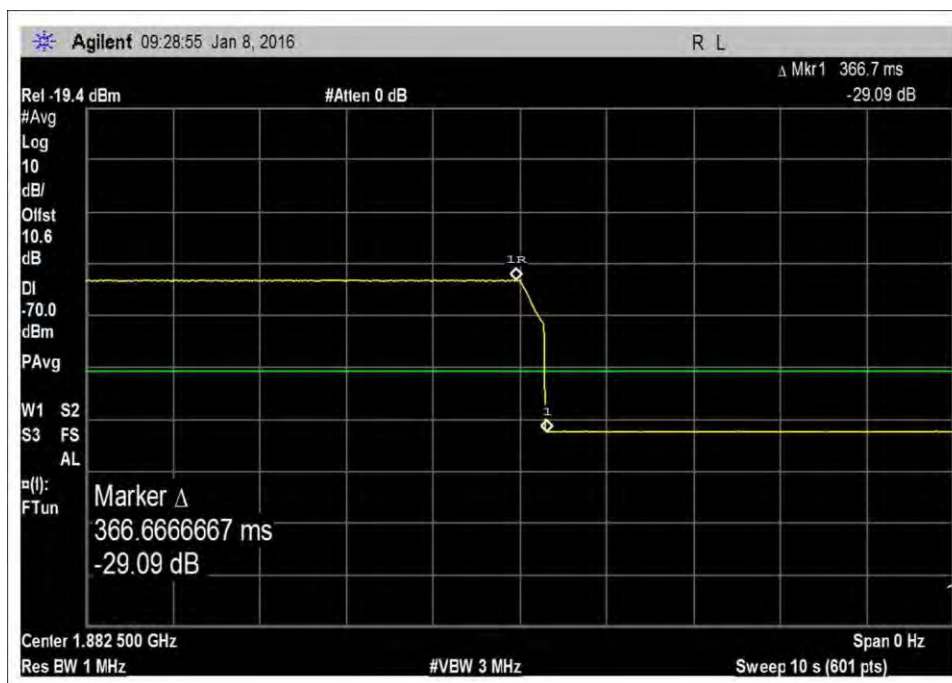
7.7_VarNoise_UL_776-787MHz



7.7_VarNoise_UL_824-849MHz



7.7_VarNoise_UL_1710-1755MHz



7.7_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 #: **98021** Date: 01/08/2016
 Test Type: **Conducted Emissions** Time: 09:47:17
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.03.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.

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 environment conditions: Temperature: 21.3°C, Relative Humidity: 40%, Pressure: 101.3 kPa

The test was performed in accordance with section 7.8 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.
 Firmware: V3.0

Test Equipment:

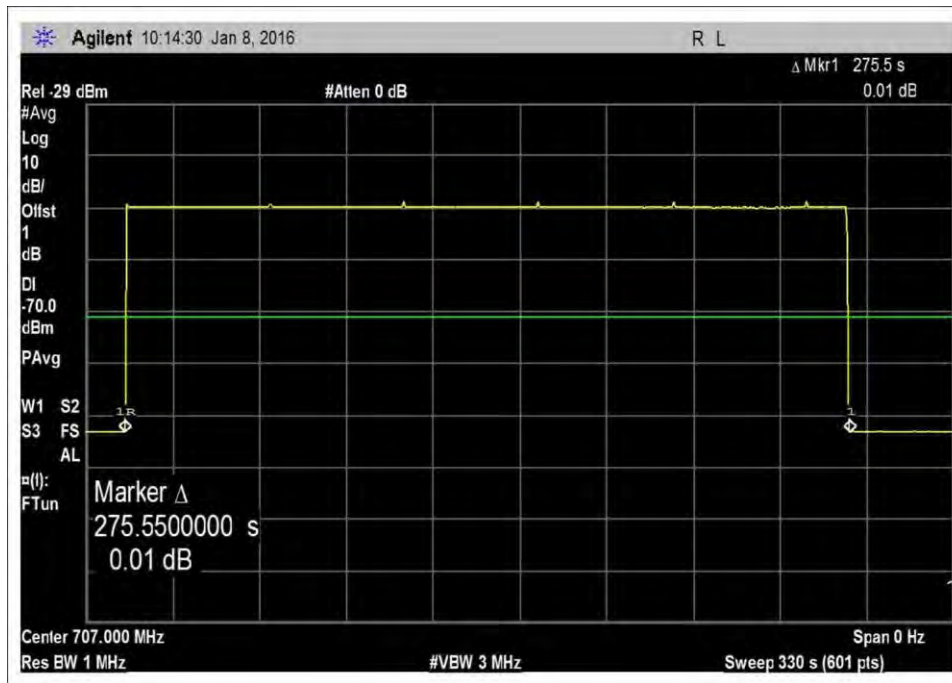
ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	AN02660	Spectrum Analyzer	E4446A	7/9/2015	7/9/2017
	ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

Summary of Results

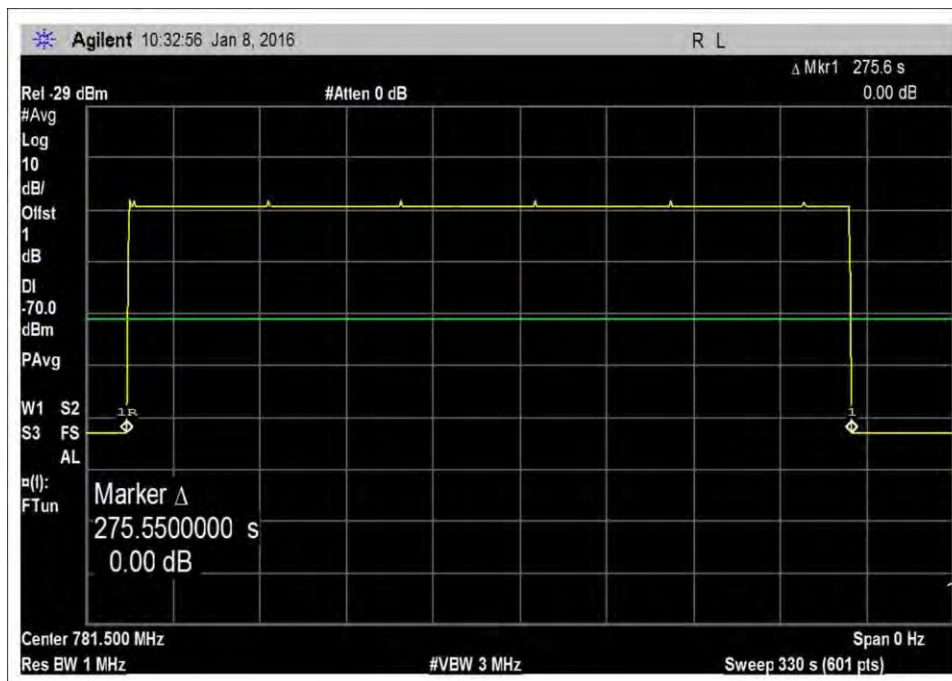
Pass: As demonstrated, when the booster is not serving an active device connection after 5 minutes the uplink noise power does not exceed -70dBm/MHz

Uplink Inactivity		
Frequency	Measured	Limit
MHz	Min	Min
UL1710-1755	4.17	5.0
UL1850-1915	4.26	5.0
UL824-894	4.26	5.0
UL 698-716	4.59	5.0
UL776-787	4.59	5.0

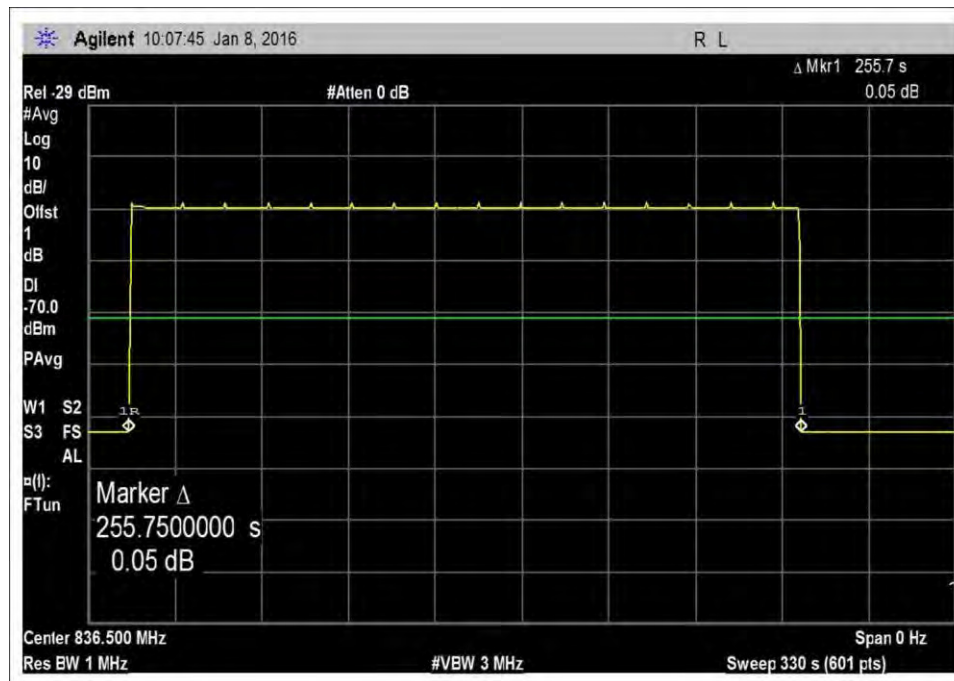
Plots



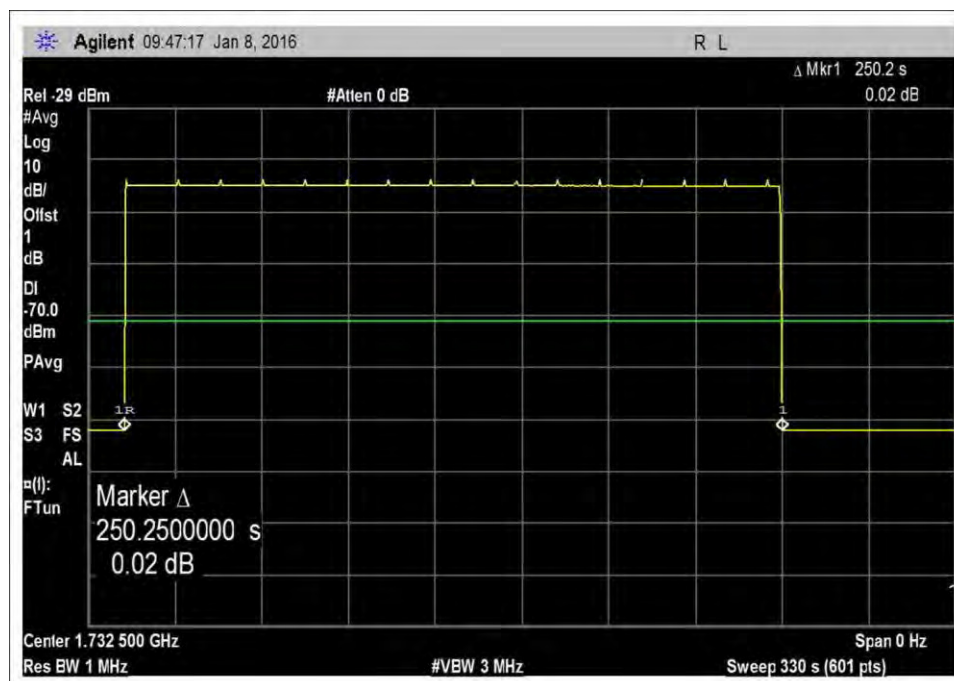
7.8_Inactivity_UL_698-707MHz



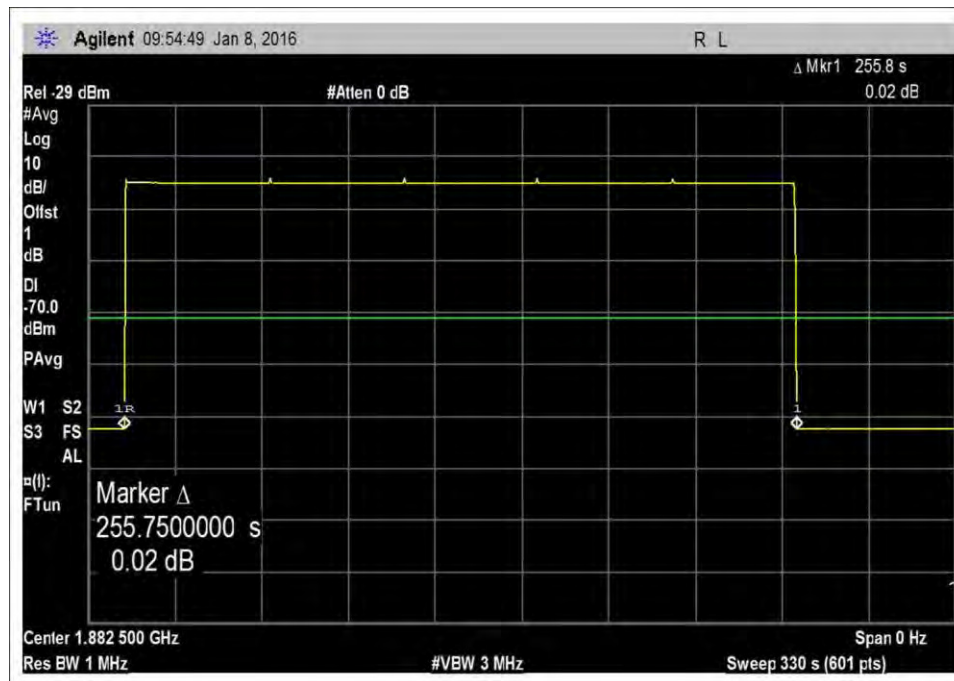
7.8_Inactivity_UL_776-787MHz



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 #: **98021** Date: 01/08/2016
 Test Type: **Conducted Emissions** Time: 10:40:04
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.03.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.

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 environment conditions: Temperature: 21.3°C, Relative Humidity: 40%, Pressure: 101.3 kPa

The test was performed in accordance with section 7.9 of the FCC document: 935210 D03 Wideband Consumer
 Signal Booster Measurement Guidance v03 Dated June 5, 2015.

Firmware: V3.0

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 = 2 meters.

MSCL

Frequency (MHz)	MSCL (dB)
1850-1915	43.6
824-849	38.9
698-716	37.4
776-787	37.3
1710-1755	42.8

Test Equipment:

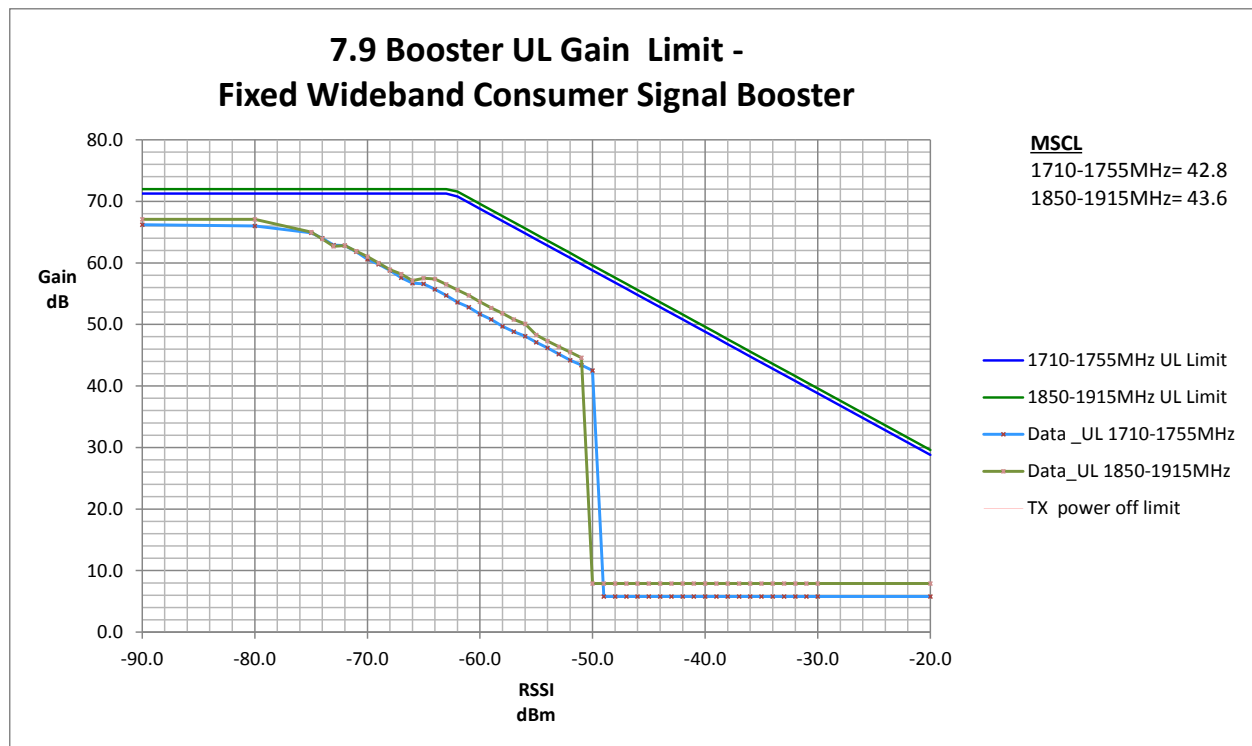
ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06710	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06138	Cable	32022-29094K-29094K-72TC	3/18/2015	3/18/2017
	AN02660	Spectrum Analyzer	E4446A	7/9/2015	7/9/2017
	ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016
	ANC00082	RF Coupler	722-10-1.500V	8/26/2015	8/26/2017
	ANC00087	Combiner	44000	01/09/2014	01/9/2016

Summary of Results

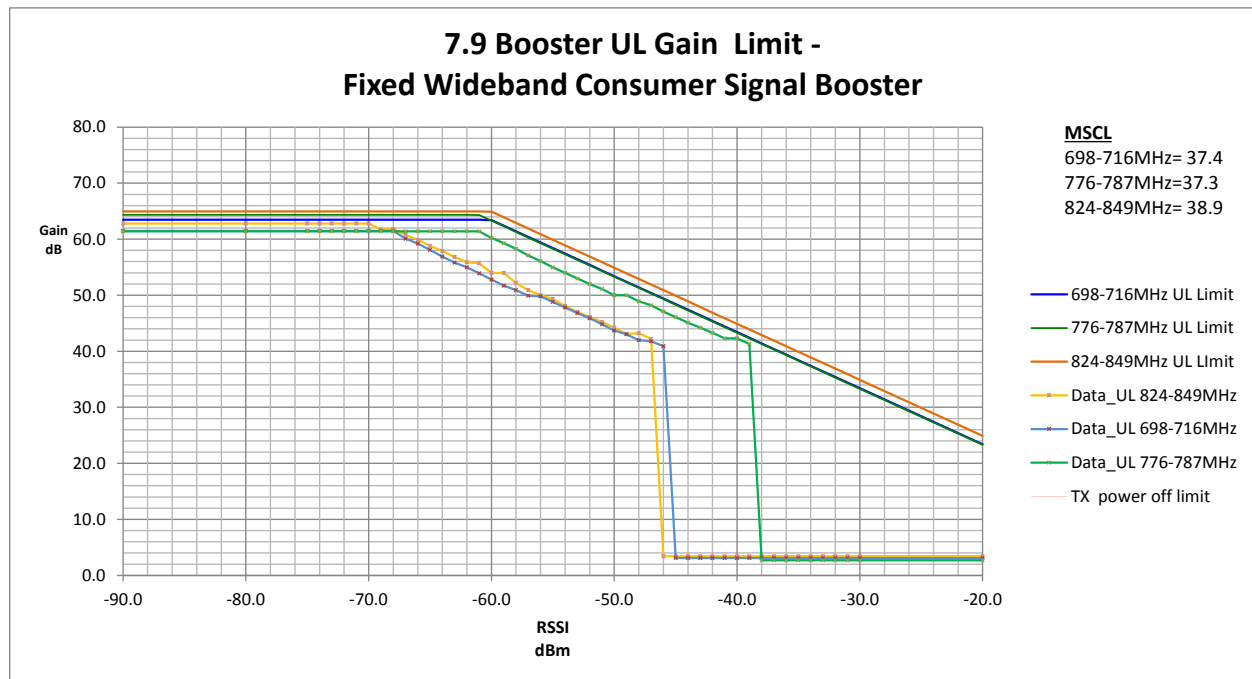
Pass: As demonstrated, computed gains are within the gain limit. All maximum variable uplink gain timings are within 3 second limit.

7.9.1 Maximum gain

1850.0				1915.0	MHz	Limit		Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent		Fixed Booster Limit	TX off	
-90.0	-54.2	12.9	67.1			72.0		-4.9
-80.0	-54.2	12.9	67.1			72.0		-4.9
-59.0	-54.2	-1.5	52.7	68.6				-15.9
-58.0	-54.2	-2.4	51.8	67.6				-15.8
-57.0	-54.2	-3.4	50.8	66.6				-15.8
-56.0	-54.2	-4.1	50.1	65.6				-15.5



1710.0 1755.0 MHz				Limit		Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off
-90.0	-52.5	13.7	66.2		71.3	-5.1
-80.0	-52.5	13.5	66.0		71.3	-5.3
-53.0	-52.5	-7.3	45.2	61.8		-16.6
-52.0	-52.5	-8.3	44.2	60.8		-16.6
-51.0	-52.5	-9.1	43.4	59.8		-16.4
-50.0	-52.5	-10.0	42.5	58.8		-16.3



824.0				849.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-80.0	-49.4	13.4	62.8		64.9		-2.1
-70.0	-49.4	13.4	62.8		64.9		-2.1
-59.0	-49.4	4.6	54.0	63.9			-9.9
-50.0	-49.4	-5.2	44.2	54.9			-10.7
-48.0	-49.4	-6.2	43.2	52.9			-9.7
-47.0	-49.4	-7.2	42.2	51.9			-9.7

698.0				716.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-75.0	-48.6	12.9	61.5		63.5		-2.0
-68.0	-48.6	12.9	61.5		63.5		-2.0
-49.0	-48.6	-5.6	43.0	52.4			-9.4
-48.0	-48.6	-6.6	42.0	51.4			-9.4
-47.0	-48.6	-6.8	41.8	50.4			-8.6
-46.0	-48.6	-7.7	40.9	49.4			-8.5

776.0				787.0	MHz		
				Limit			Margin
RSSI (dBm)	Input (dBm)	Measured Output (dBm)	Measured Gain (dBm)	RSSI Dependent	Fixed Booster Limit	TX off	
-75.0	-48.2	13.2	61.4		64.4		-3.0
-67.0	-48.2	13.2	61.4		64.4		-3.0
-42.0	-48.2	-4.9	43.3	45.3			-2.0
-41.0	-48.2	-5.9	42.3	44.3			-2.0
-40.0	-48.2	-5.9	42.3	43.3			-1.0
-39.0	-48.2	-6.9	41.3	42.3			-1.0

7.9.2 Variable uplink gain timing

Uplink Gain Timing		
Frequency (MHz)	Measured (Sec)	Limit (Sec)
UL1710-1755	0.37	3
UL1850-1915	0.35	3
UL824-894	0.35	3
UL 698-716	0.28	3
UL776-787	0.27	3

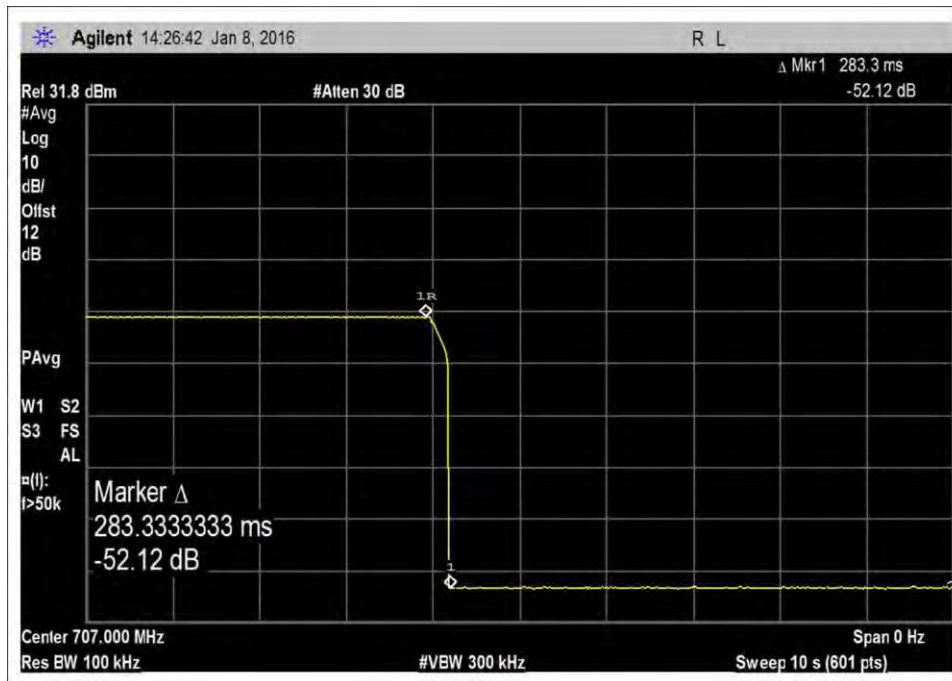
7.9.1 Maximum Gain

For this subsection, see summary of results of 7.9.

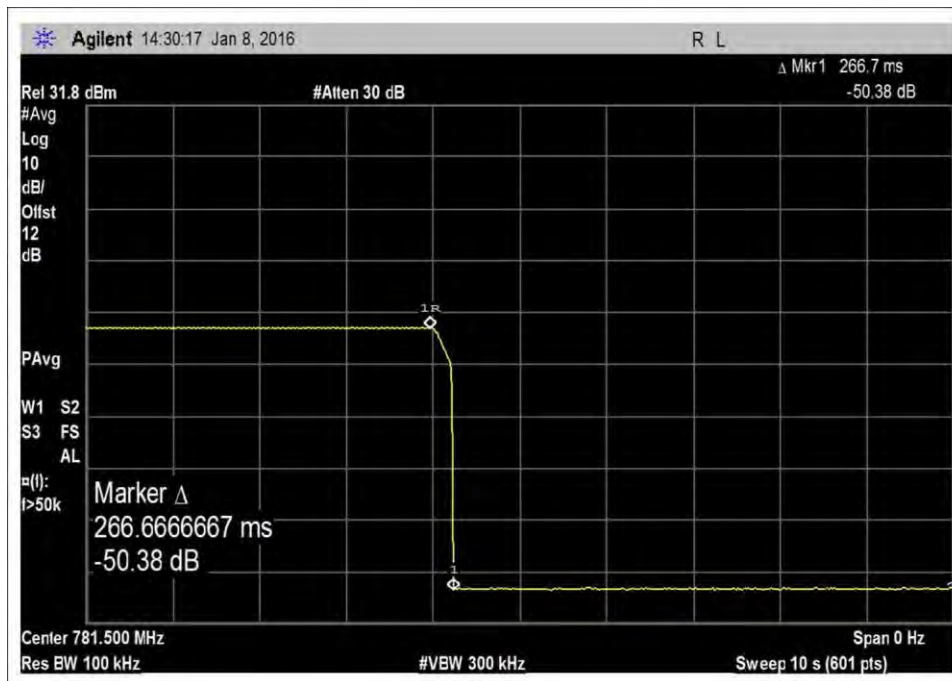
7.9.1 Maximum gain

7.9.2 Variable uplink Gain Timing

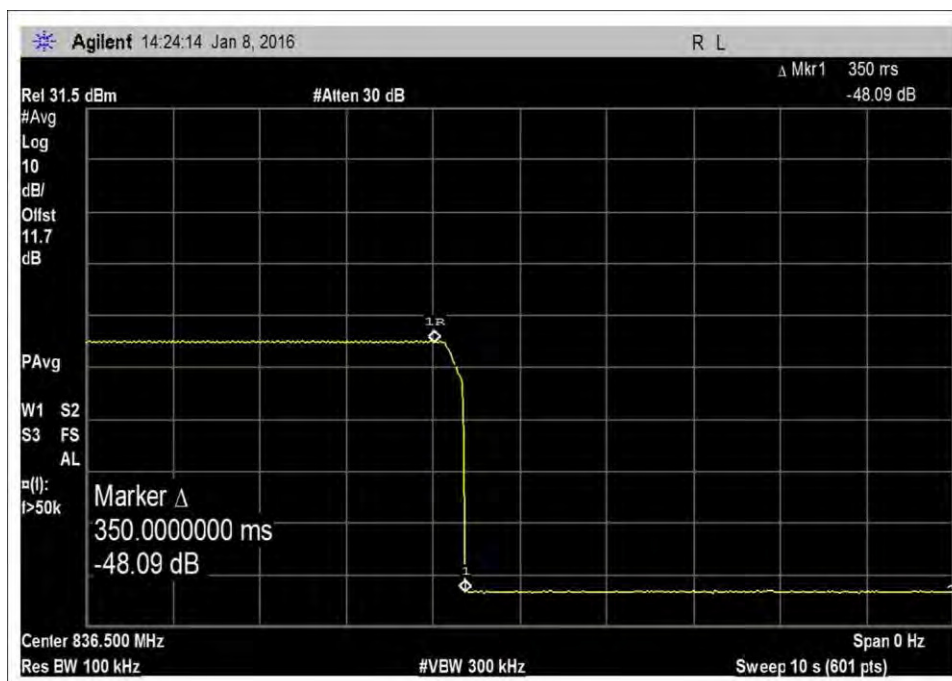
Plots



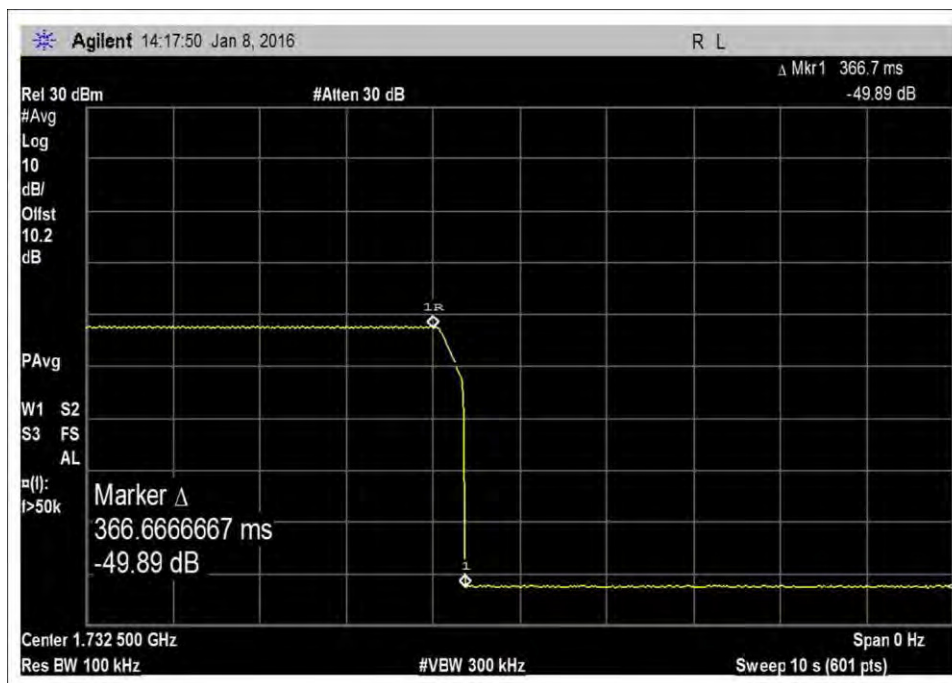
7.9.2_VarULGainTiming_UL_698-716MHz



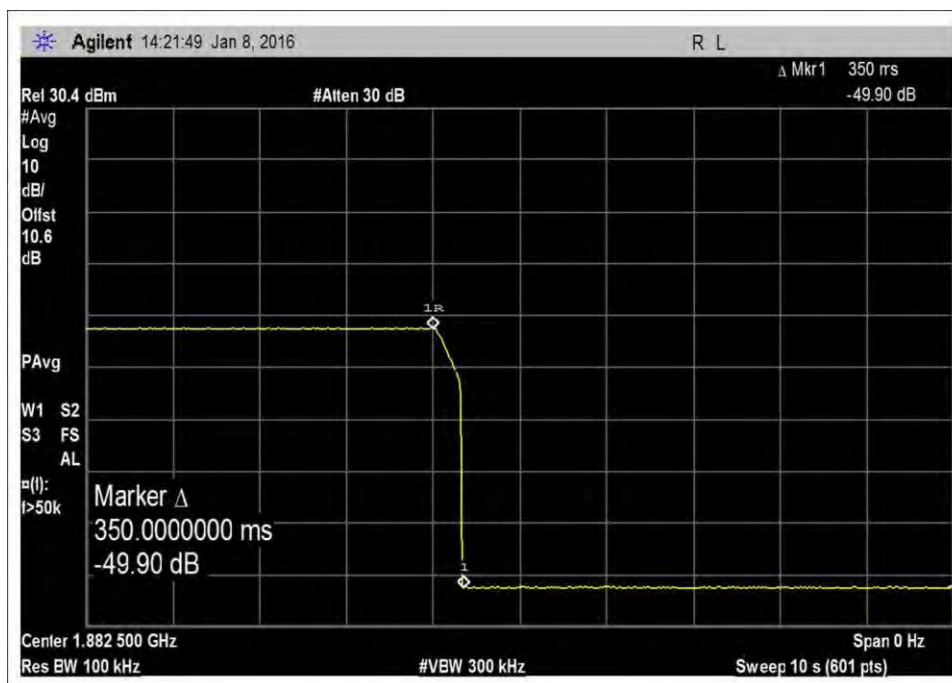
7.9.2_VarULGainTiming_UL_776-787MHz



7.9.2_VarULGainTiming_UL_824-849MHz



7.9.2_VarULGainTiming_UL_1710-1755MHz



7.9.2_VarULGainTiming_UL_1850-1915MHz

7.11 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 #: **98021** Date: 01/11/2016
 Test Type: **Conducted Emissions** Time: 13:26:23
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.03.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed Wideband Consumer Booster.
 The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.

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 environment conditions: Temperature: 21.2°C, Relative Humidity: 42%, Pressure: 101.3 kPa

The test was performed in accordance with section 7.11 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.

Firmware: V3.0

Note: UL-1710-1755-**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 1710-1755MHz.

+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 #/Serial #	Description	Model	Calibration Date	Cal Due Date
	ANP03143	Cable	32022-29094K-144TC	3/18/2015	3/18/2017
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06710	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06138	Cable	32022-29094K-29094K-72TC	3/18/2015	3/18/2017
	ANP06712	Cable	32022-29094K-29094K-48TC	9/18/2014	9/18/2016
	AN02660	Spectrum Analyzer	E4446A	7/9/2015	7/9/2017
	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
	ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
	ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016
	ANC00082	RF Coupler	722-10-1.500V	8/26/2015	8/26/2017
	ANC00087	Combiner	44000	1/07/2016	1/07/2018
	AN02748	Low Pass Filter	11SL10-2000/U6000-O/O	1/15/2014	1/15/2016

Summary of Results

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

7.11.2 Oscillation restart tests

Oscillation detection				Time Between restart		Number of restart	
Frequency	Measured	Limit	Peak Level	Measured	Limit	Measured	Limit
MHz	Sec	Sec	dBm	Sec	At least sec		
UL1710-1755	0.12	0.30	24.8	68	60	3	5
UL1850-1915	0.12	0.30	29.8	70	60	3	5
UL824-894	0.12	0.30	30.9	69	60	3	5
UL 698-716	0.14	0.30	31.7	67	60	3	5
UL776-787	0.13	0.30	32.0	66	60	3	5
DL2110-2155	0.13	1.00	18.0	68	60	3	5
DL1930-1995	0.12	1.00	26.9	69	60	3	5
DL869-894	0.12	1.00	25.9	68	60	3	5
DL:728-746	0.28	1.00	24.4	67	60	3	5
DL 746-757	0.12	1.00	24.2	66	60	3	5

The booster continues to mitigate at least 1 minute before restarting. The plots demonstrate after 3 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 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-51.5	-61.6	10.1	12.0
+4dB	-51.1	-62.0	(10.9)*	12.0
+3dB	-49.5	-62.3	(12.7)*	12.0
+2dB	-49.9	-63.7	(13.8)*	12.0
+1dB	-47.6	-62.1	(14.5)*	12.0
0dB	-43.8	-62.0	(18.2)*	12.0
-1dB	-37.8	-63.2	(25.4)*	12.0
-2dB	-14.0	-62.1	(48.1)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

DL 2110-2155 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-50.7	-61.8	11.1	12.0
+4dB	-50.5	-62.1	(11.6)*	12.0
+3dB	-50.2	-62.0	(11.7)*	12.0
+2dB	-48.9	-62.3	(13.4)*	12.0
+1dB	-47.4	-62.7	(15.3)*	12.0
0dB	**	**	0.0	12.0
-1dB	**	**	0.0	12.0
-2dB	**	**	0.0	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

UL1850-1915 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-49.2	-59.3	10.1	12.0
+4dB	-47.9	-59.7	(11.8)*	12.0
+3dB	-46.3	-60.2	(13.8)*	12.0
+2dB	-44.0	-60.6	(16.7)*	12.0
+1dB	-40.6	-61.2	(20.5)*	12.0
0dB	-33.8	-61.4	(27.6)*	12.0
-1dB	**	**	0.0	12.0
-2dB	**	**	0.0	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

DL 1930-1995 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-50.2	-60.2	10.0	12.0
+4dB	-49.6	-60.1	10.5	12.0
+3dB	-49.0	-60.1	11.1	12.0
+2dB	-47.0	-61.0	(14.0)*	12.0
+1dB	-45.4	-61.3	(15.9)*	12.0
0dB	-42.3	-62.1	(19.8)*	12.0
-1dB	-38.4	-62.5	(24.1)*	12.0
-2dB	-21.1	-62.8	(41.8)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

Note:

* The measured difference exceeds the limit for a period of less than 300 second before device mitigates and shuts down. The maximum recorded time prior to shutdown was 55 seconds for the Uplink bands and 1minute for the Downlink bands.

** The device shuts down immediately.

UL 824-894 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-54.5	-64.5	10.0	12.0
+4dB	-53.6	-64.7	(11.1)*	12.0
+3dB	-52.4	-65.1	(12.7)*	12.0
+2dB	-50.9	-64.8	(13.9)*	12.0
+1dB	-49.0	-65.2	(16.2)*	12.0
0dB	-46.7	-66.0	(19.4)*	12.0
-1dB	-42.1	-66.7	(24.6)*	12.0
-2dB	-26.9	-66.4	(39.5)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0
DL 869-894 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-58.9	-68.5	9.6	12.0
+4dB	-57.5	-69.2	(11.7)*	12.0
+3dB	-56.8	-69.2	(12.4)*	12.0
+2dB	-55.6	-69.1	(13.5)*	12.0
+1dB	-53.6	-70.0	(16.4)*	12.0
0dB	-51.0	-70.0	(19.0)*	12.0
-1dB	-45.2	-70.2	(25.1)*	12.0
-2dB	-27.2	-70.9	(43.7)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

UL 698-716 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-57.4	-65.7	(8.3)*	12.0
+4dB	-56.7	-66.2	(9.5)*	12.0
+3dB	-55.2	-66.0	(10.8)*	12.0
+2dB	-53.5	-66.5	(13.0)*	12.0
+1dB	-51.3	-67.1	(15.9)*	12.0
0dB	-48.2	-67.6	(19.4)*	12.0
-1dB	-41.8	-67.6	(25.8)*	12.0
-2dB	**	**	0.0	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0
DL 728-746 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-58.5	-68.0	9.5	12.0
+4dB	-57.5	-68.5	11.0	12.0
+3dB	-57.2	-68.4	11.2	12.0
+2dB	-55.8	-69.1	(13.3)*	12.0
+1dB	-53.0	-69.3	(16.3)*	12.0
0dB	-50.7	-69.6	(18.9)*	12.0
-1dB	-45.7	-69.8	(24.1)*	12.0
-2dB	-32.4	-70.7	(38.3)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

Note:

* The measured difference exceeds the limit for a period of less than 300 second before device mitigates and shuts down. The maximum recorded time prior to shutdown was 55 seconds for the Uplink bands and 1minute for the Downlink bands.

** The device shuts down immediately.

UL 776-787 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-57.7	-68.0	10.3	12.0
+4dB	-56.5	-68.1	(11.7)*	12.0
+3dB	-55.9	-68.6	(12.7)*	12.0
+2dB	-54.4	-68.7	(14.3)*	12.0
+1dB	-52.6	-68.8	(16.2)*	12.0
0dB	-50.1	-69.3	(19.2)*	12.0
-1dB	-46.6	-69.8	(23.1)*	12.0
-2dB	-37.7	-69.5	(31.9)*	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0
DL 746-775 MHz				
Max Gain				
Isolation	Peak	Min	Diff	Limit
dB	dBm	dBm	dB	dB
+5dB	-60.3	-68.7	8.3	12.0
+4dB	-58.8	-68.3	9.5	12.0
+3dB	-57.0	-68.7	(11.6)*	12.0
+2dB	-56.6	-68.7	(12.1)*	12.0
+1dB	-54.4	-69.6	(15.3)*	12.0
0dB	-51.8	-69.9	(18.2)*	12.0
-1dB	**	**	0.0	12.0
-2dB	**	**	0.0	12.0
-3dB	**	**	0.0	12.0
-4dB	**	**	0.0	12.0
-5dB	**	**	0.0	12.0

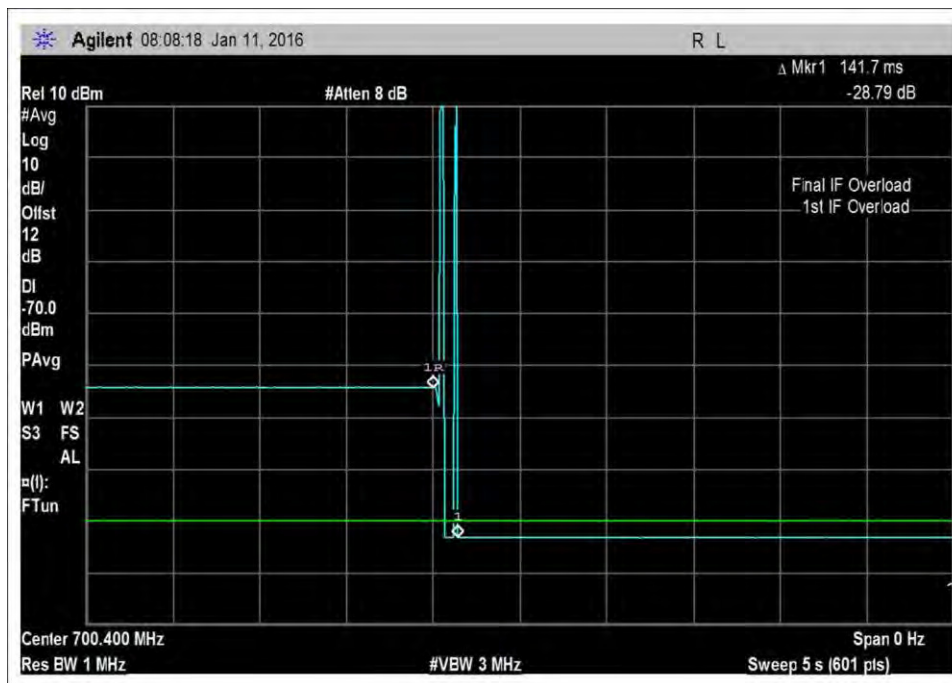
Note:

* The measured difference exceeds the limit for a period of less than 300 second before device mitigates and shuts down. The maximum recorded time prior to shutdown was 55 seconds for the Uplink bands and 1minute for the Downlink bands.

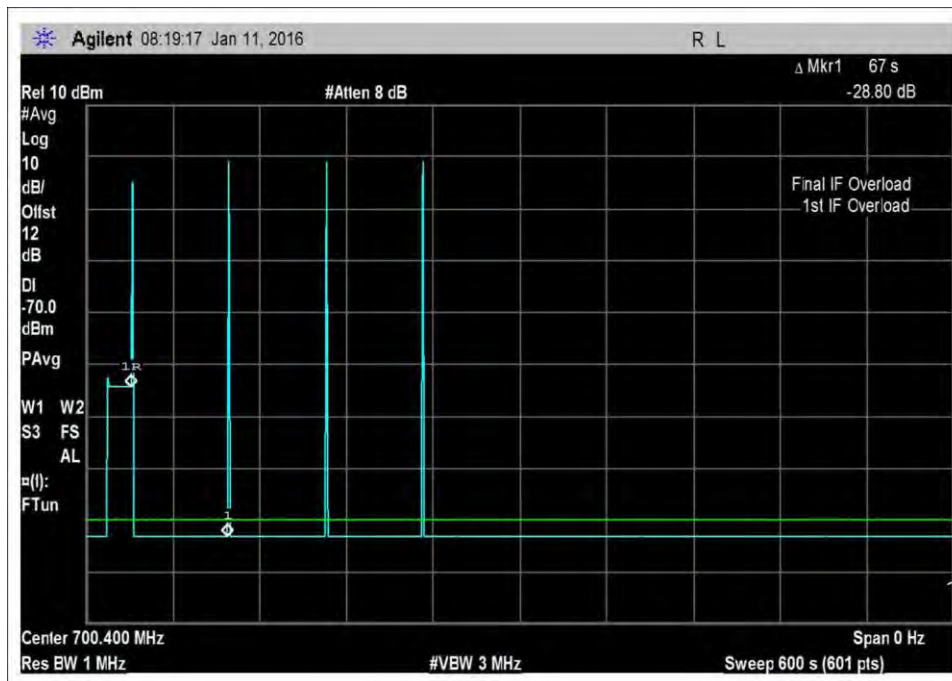
** The device shuts down immediately.

7.11.2 Oscillation Restart Tests

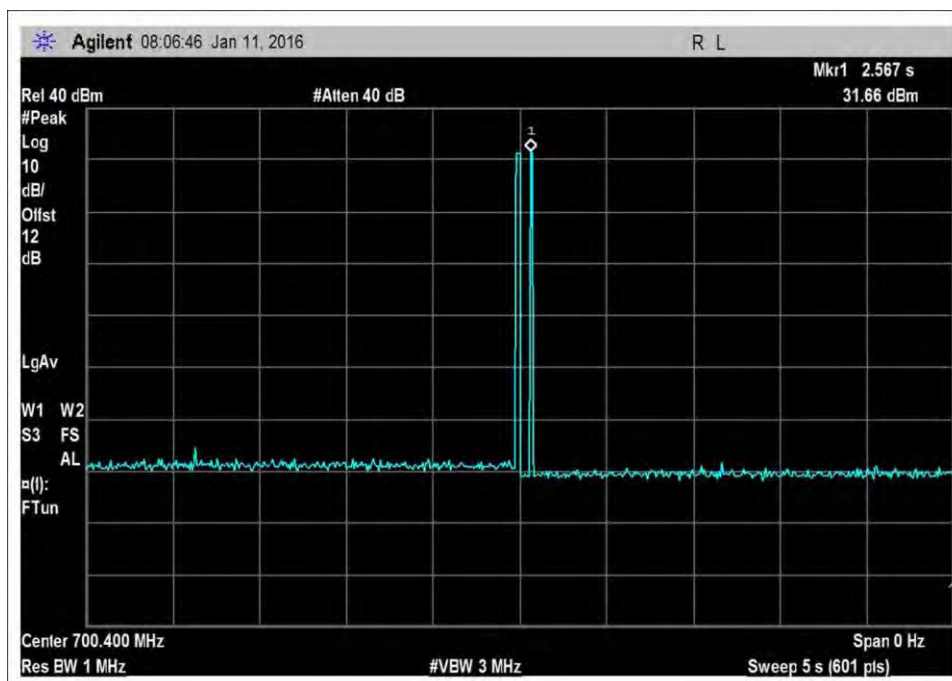
Plots



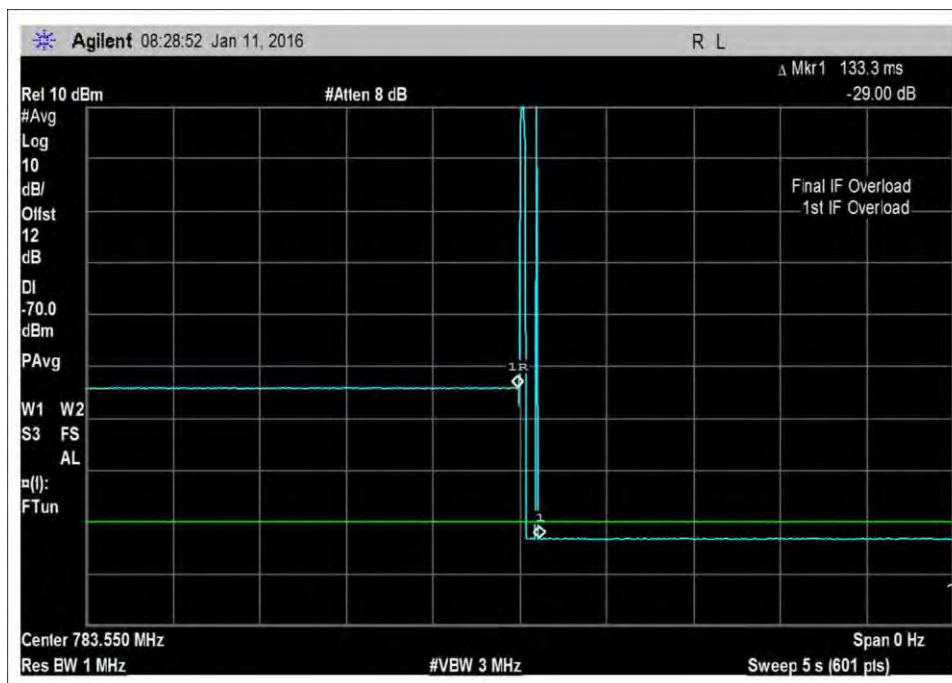
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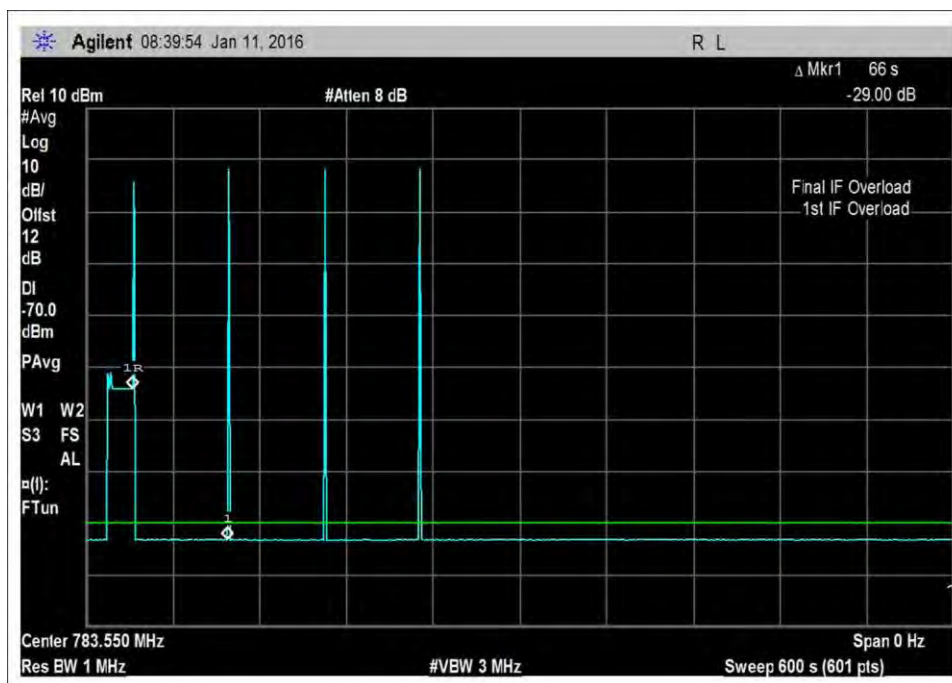
7.11_osc_UL-698-716MHz-600sec



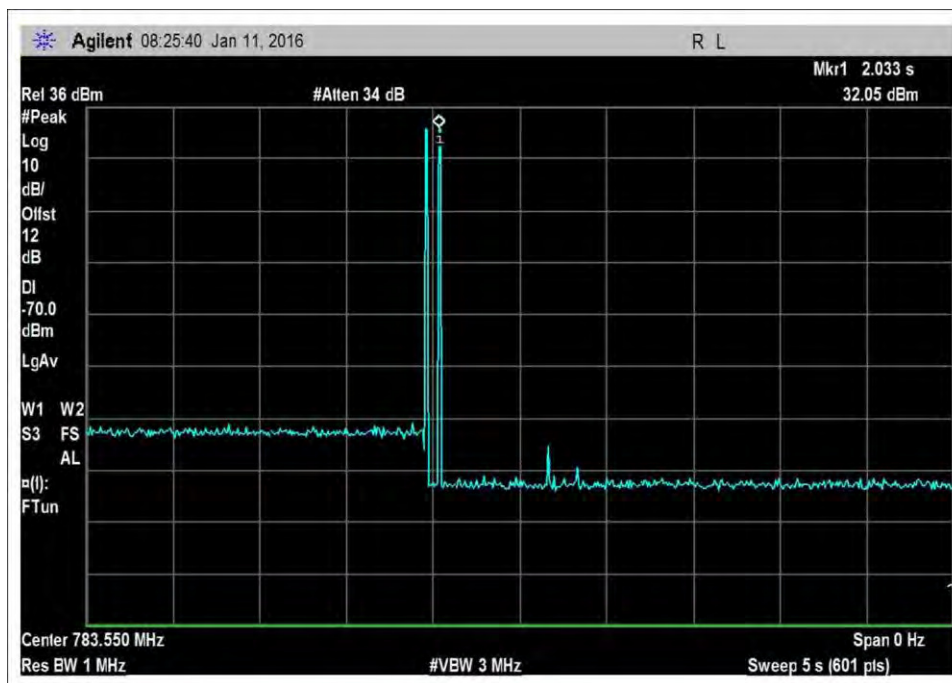
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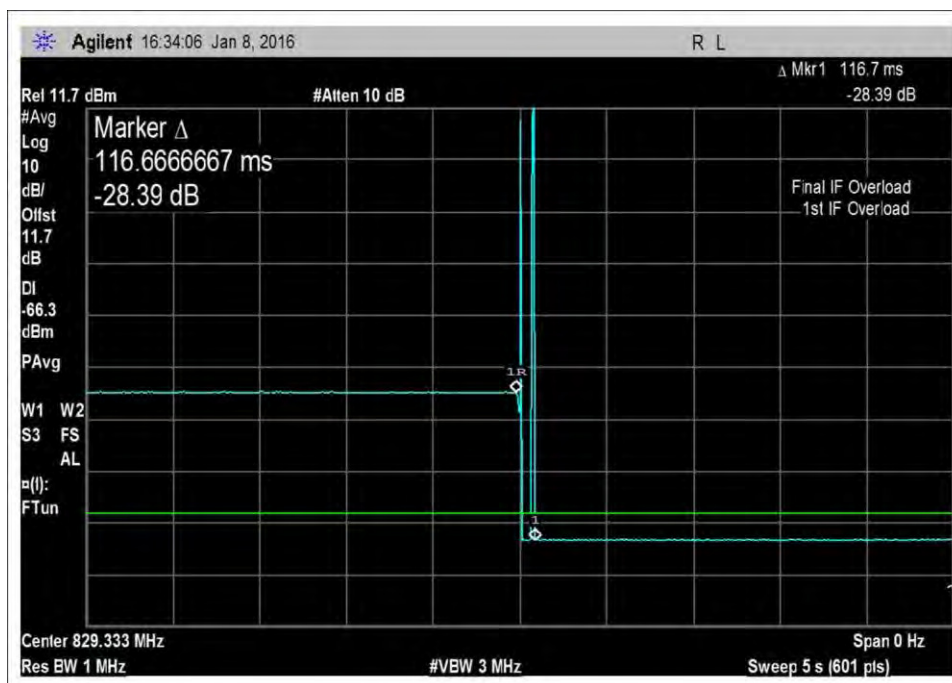
7.11_osc_UL-776-787MHz



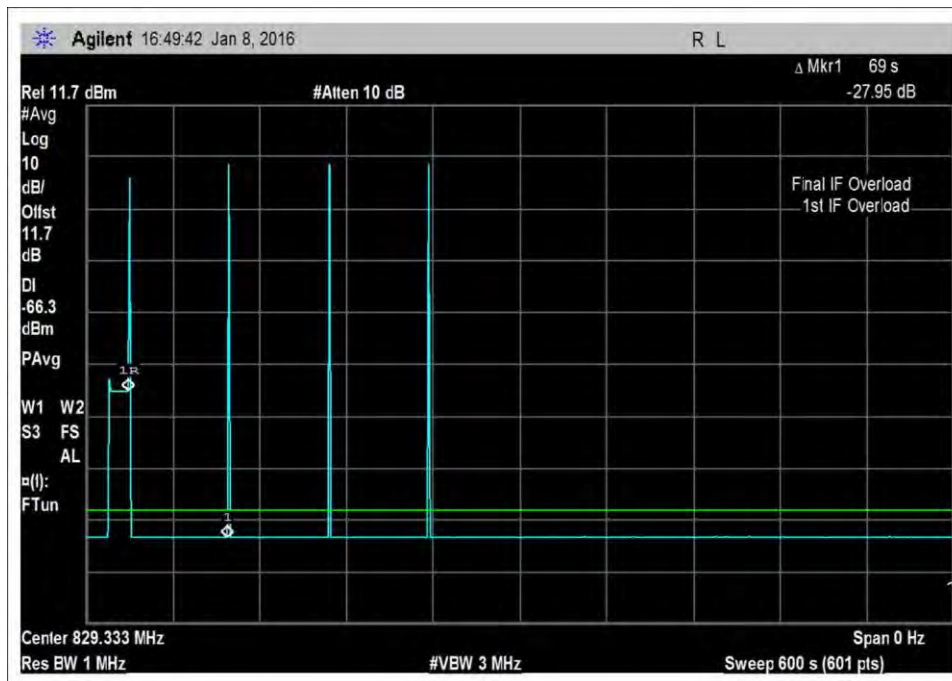
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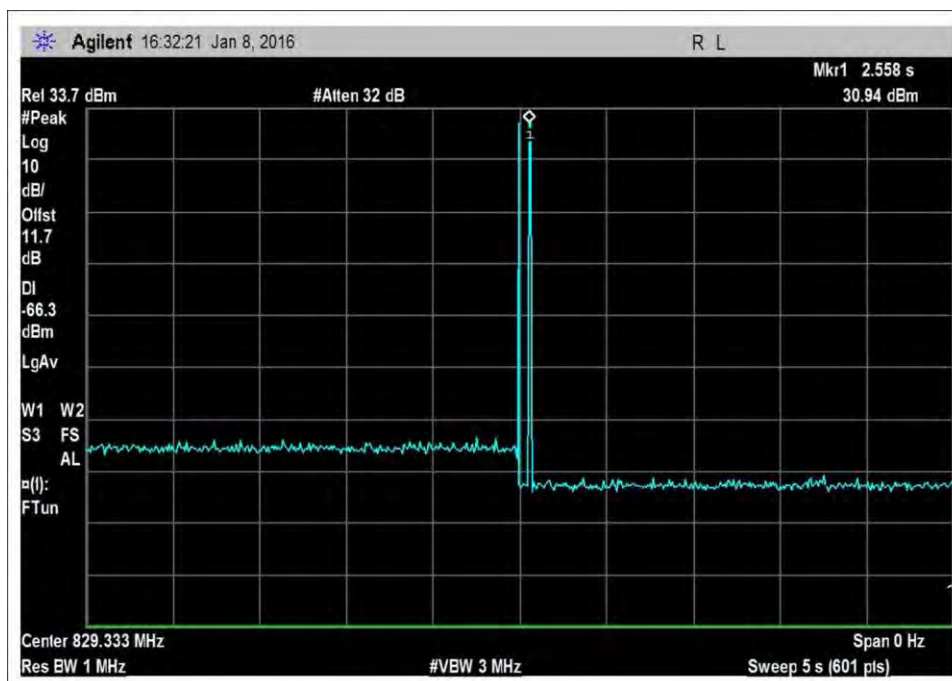
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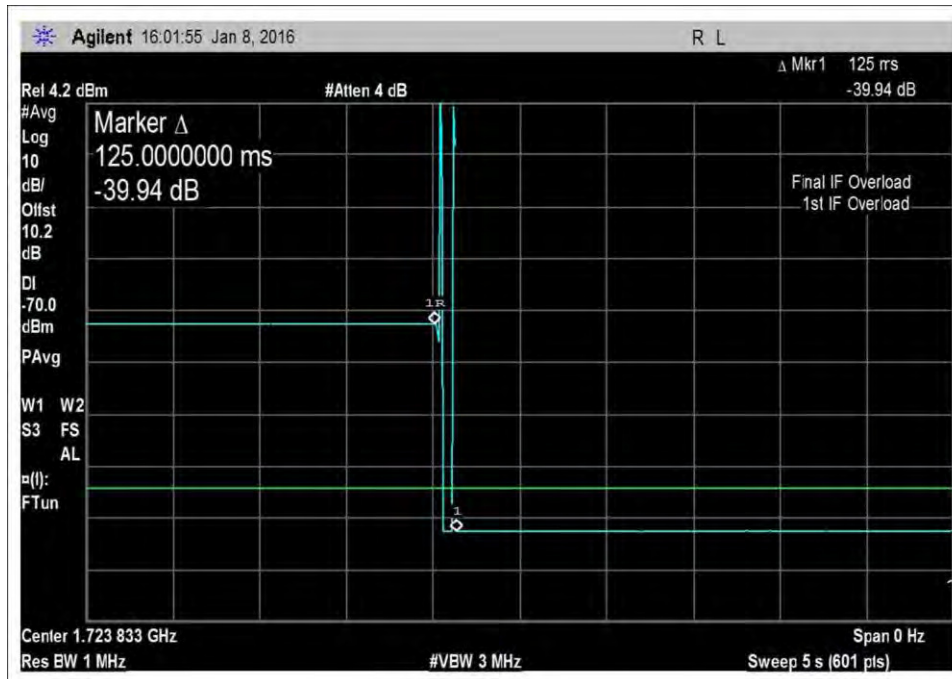
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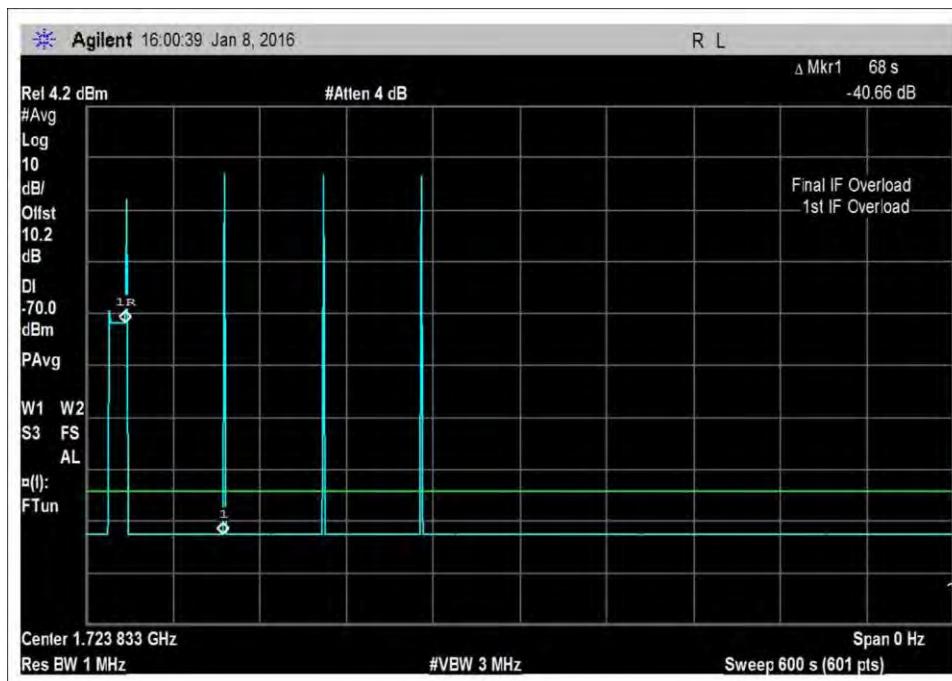
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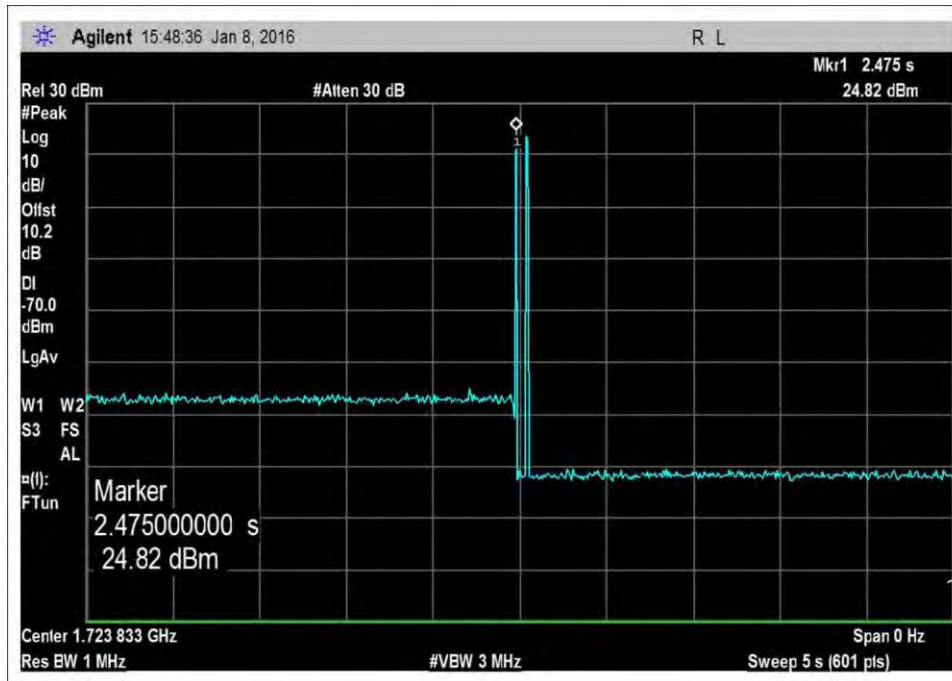
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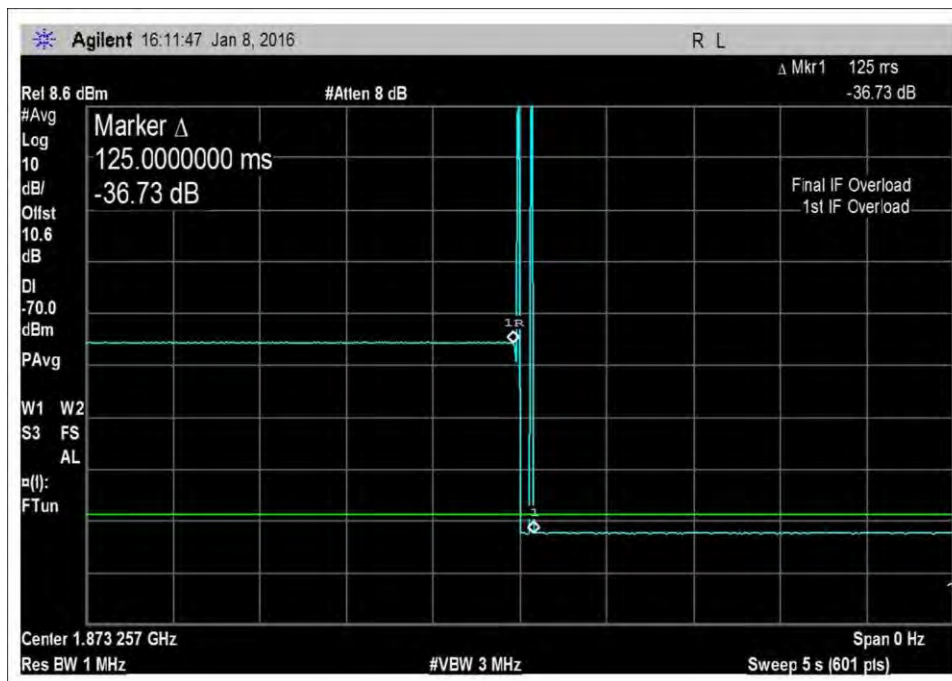
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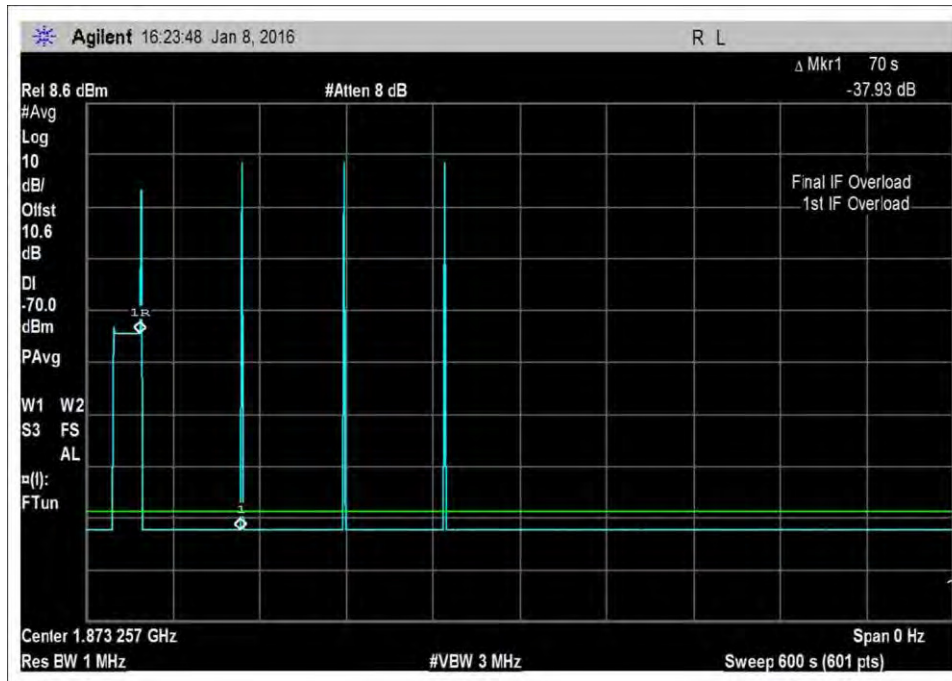
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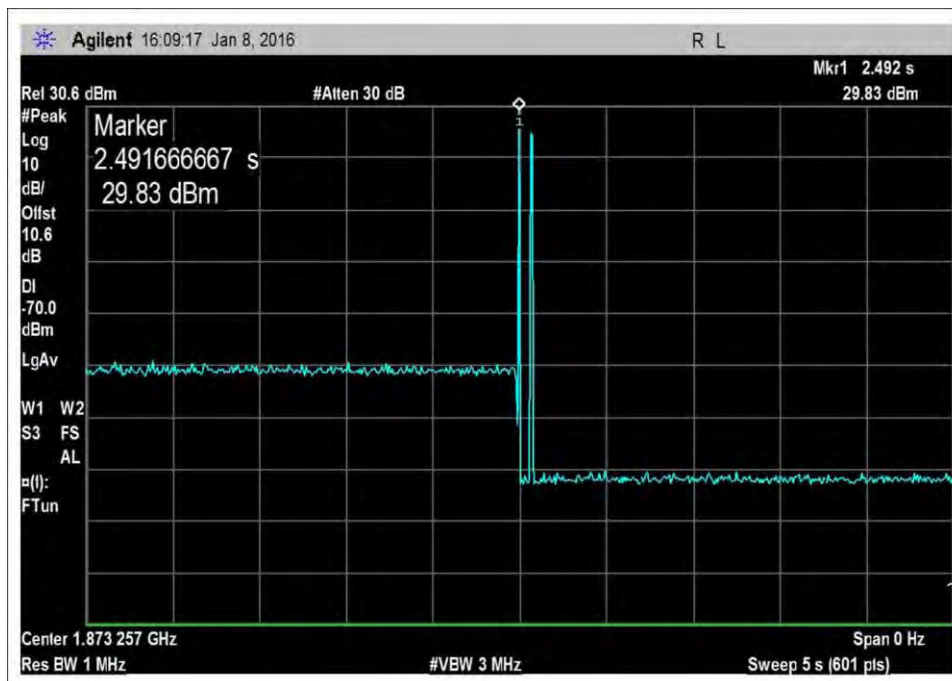
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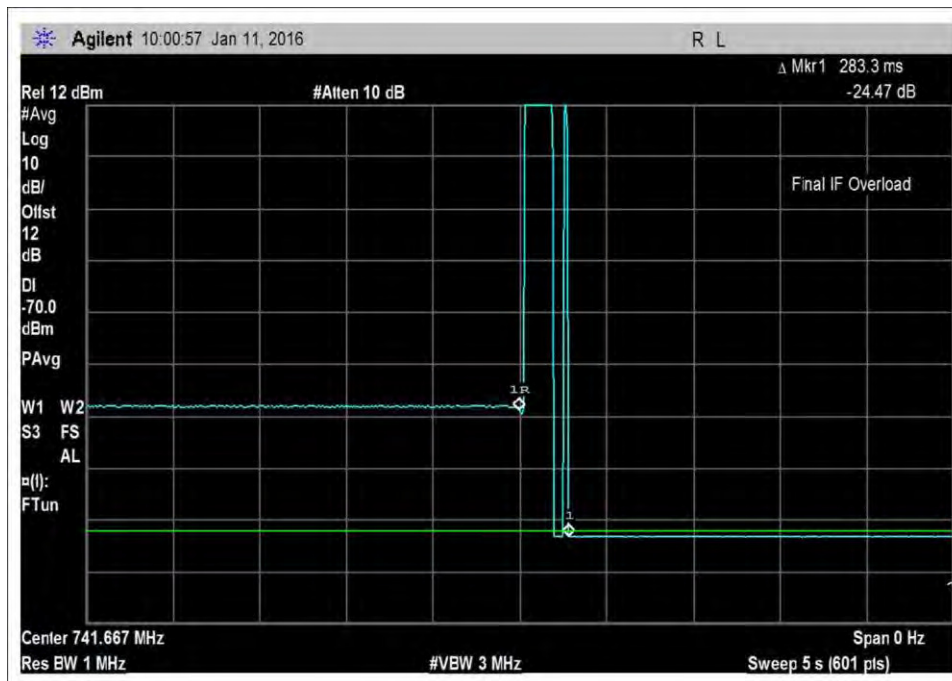
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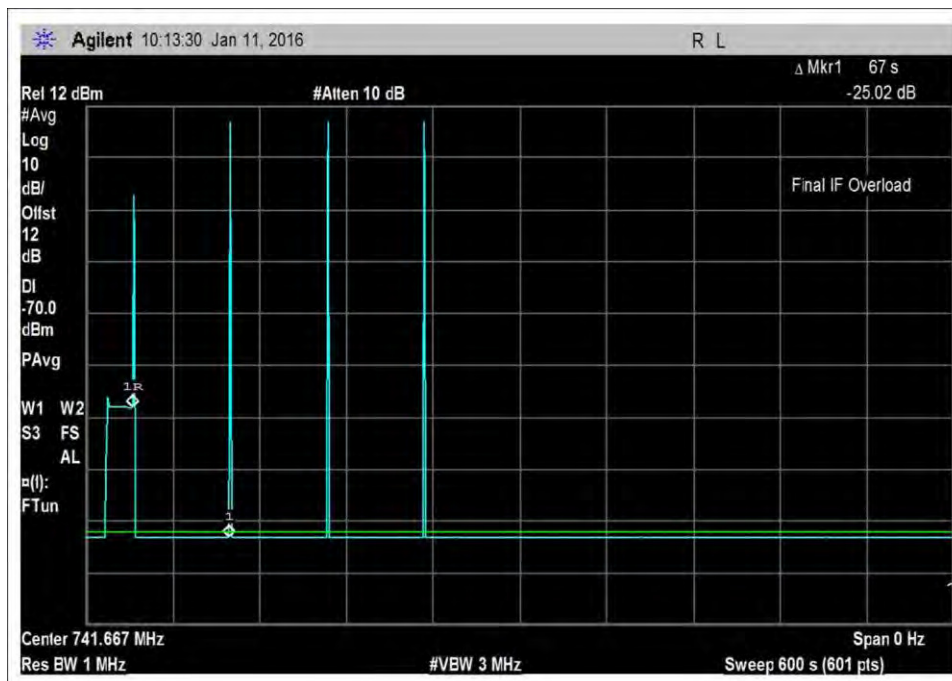
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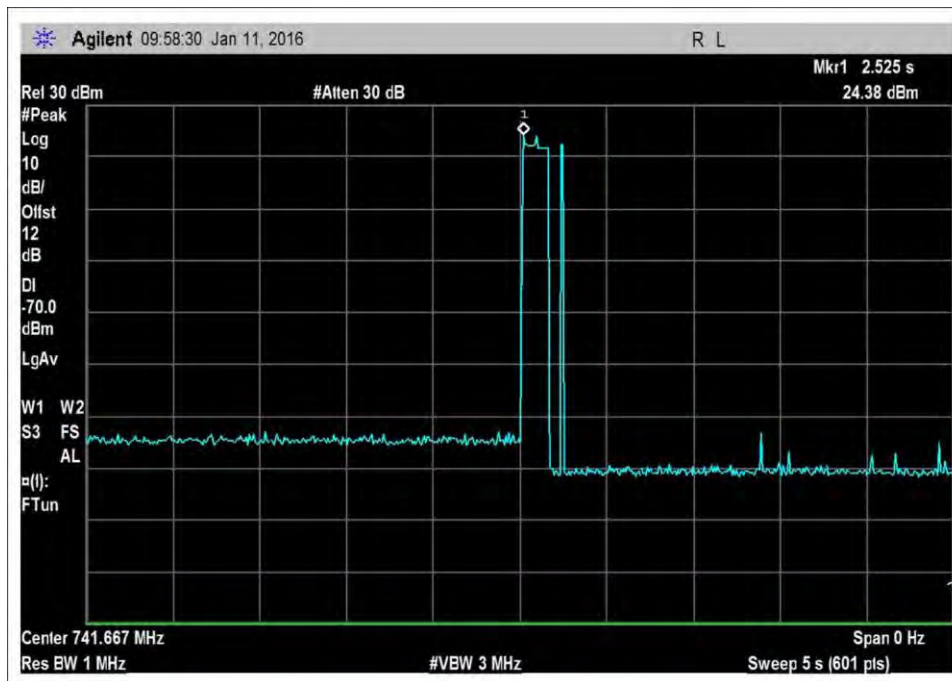
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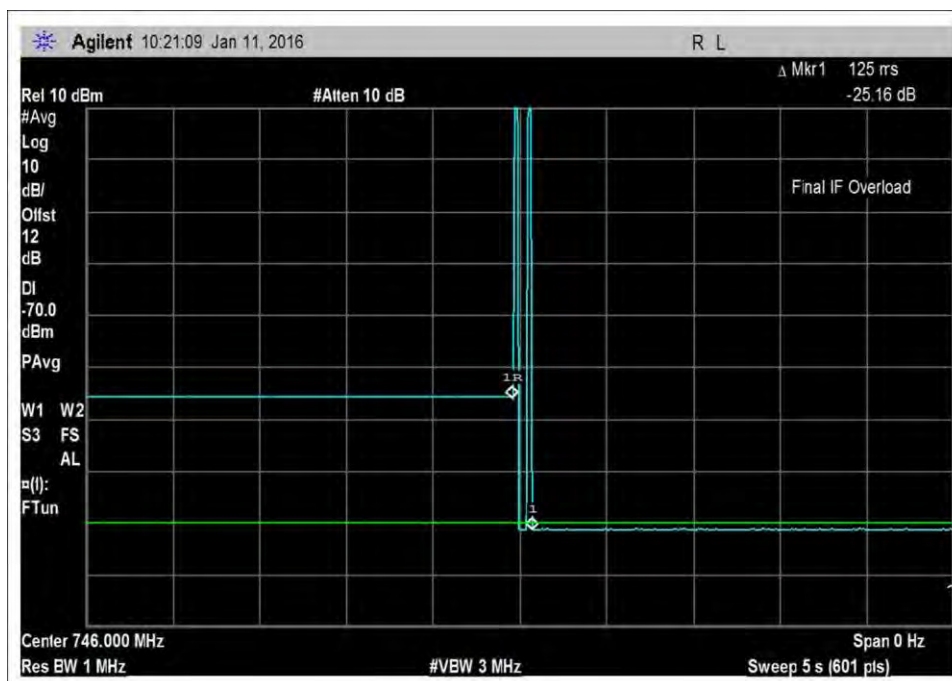
7.11_osc_DL-728-746MHz



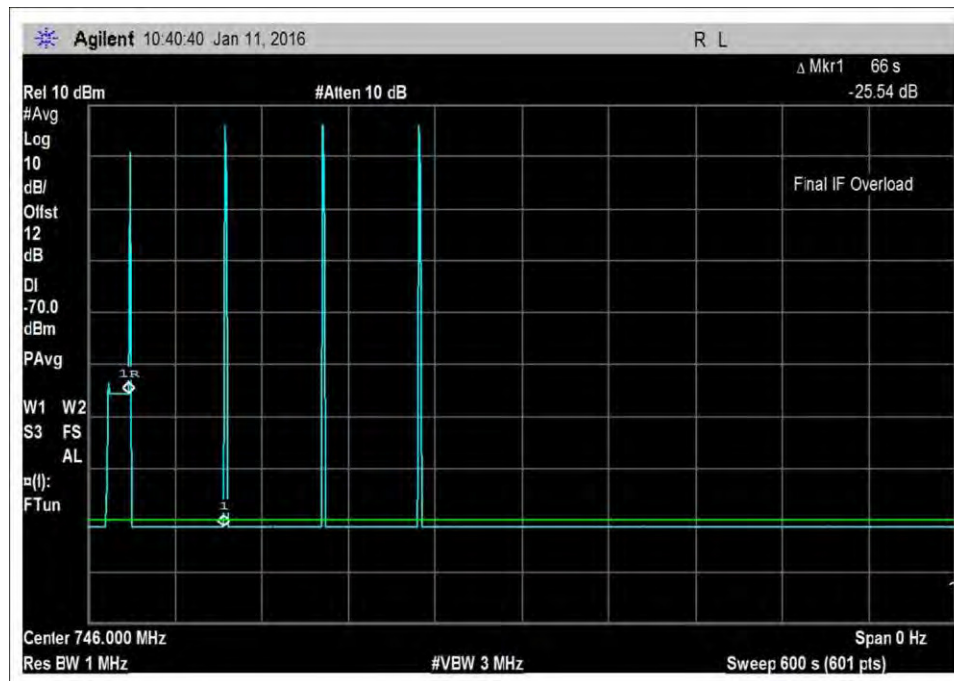
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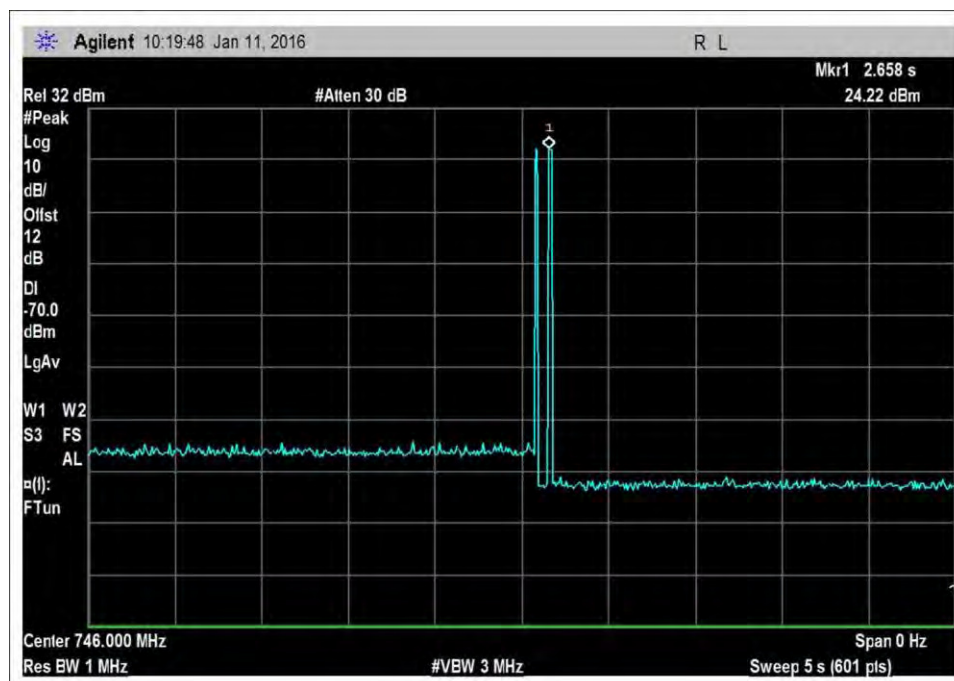
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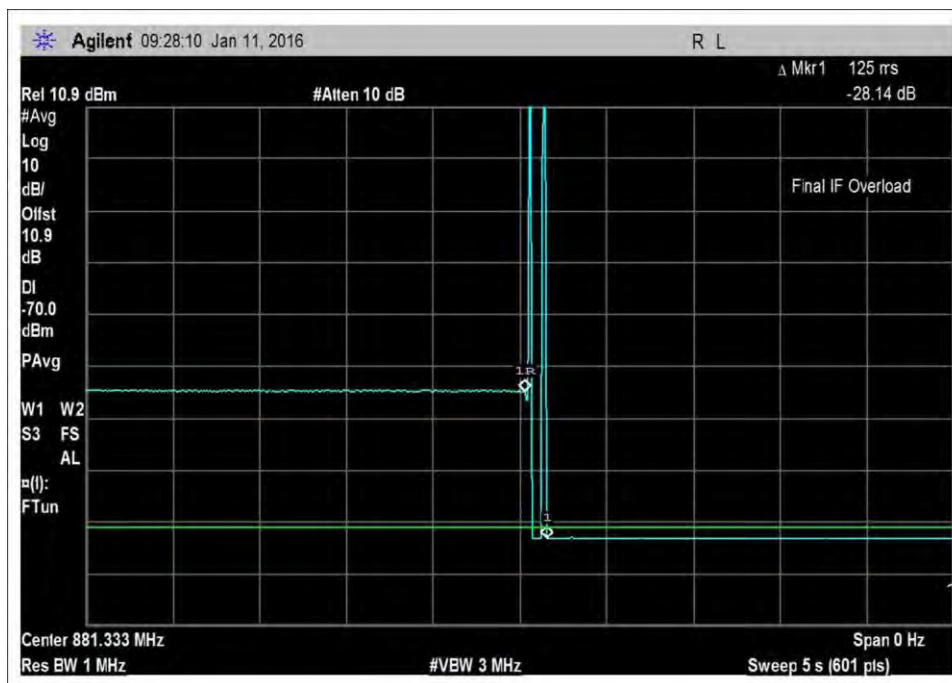
7.11_osc_DL-746-757MHz



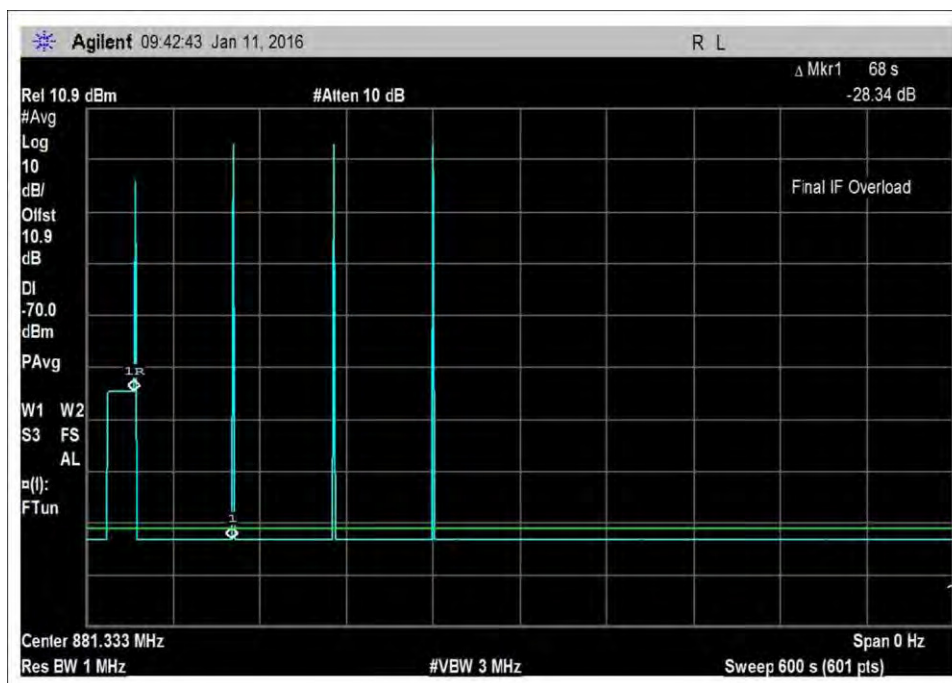
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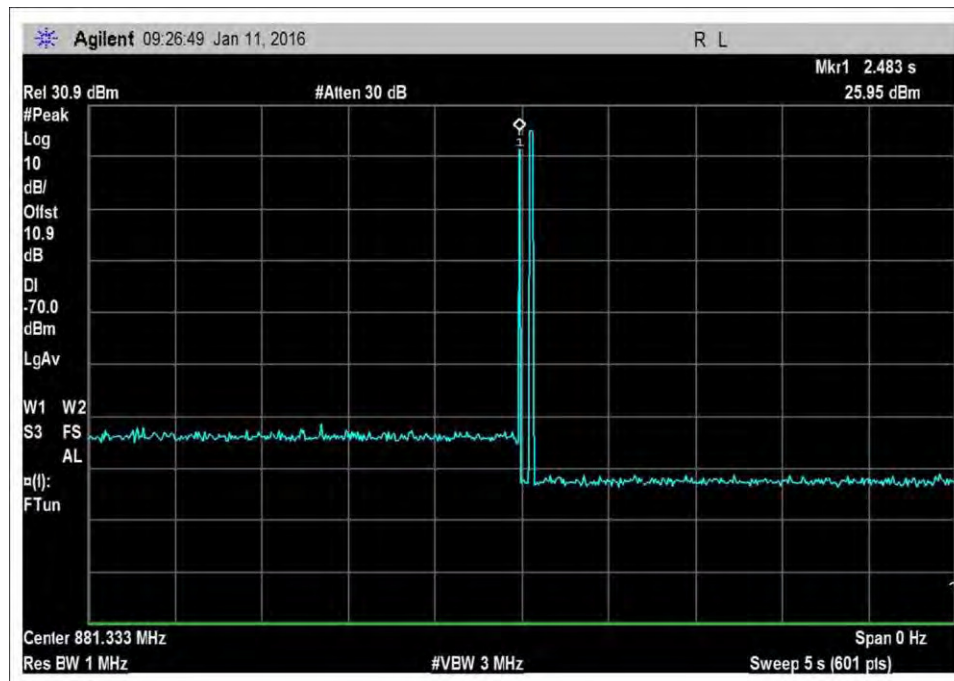
7.11_osc_DL-746-757MHz-Pk



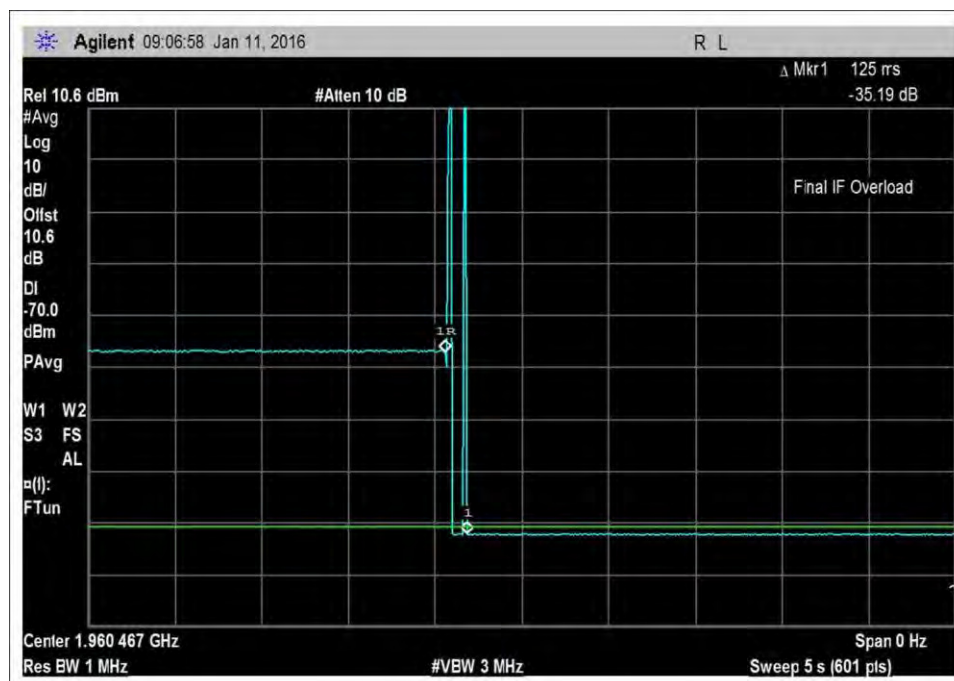
7.11_osc_DL-869-894MHz



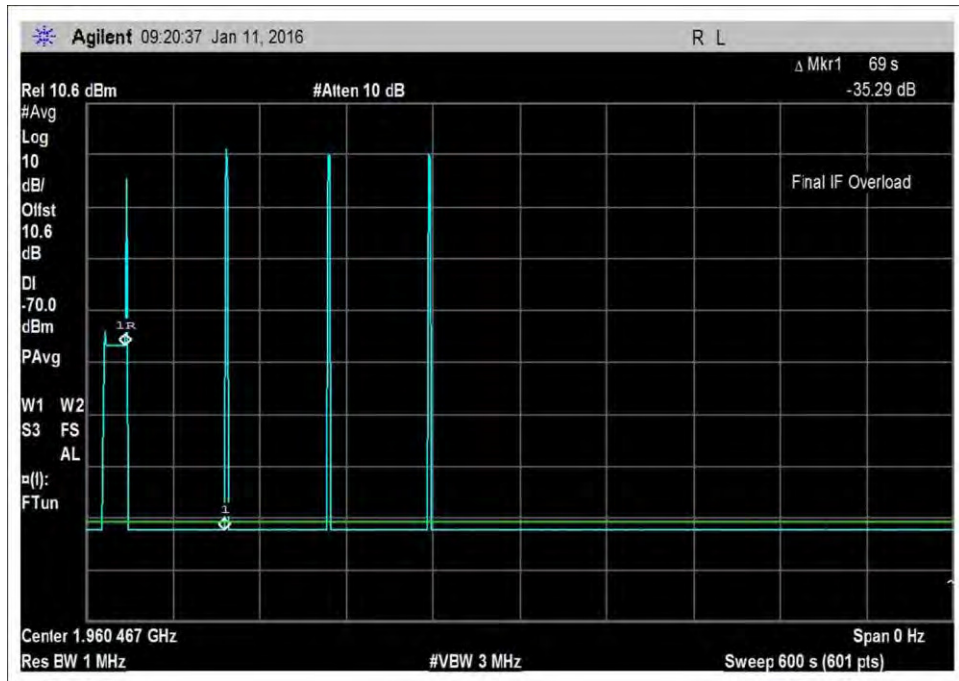
7.11_osc_DL-869-894MHz-600



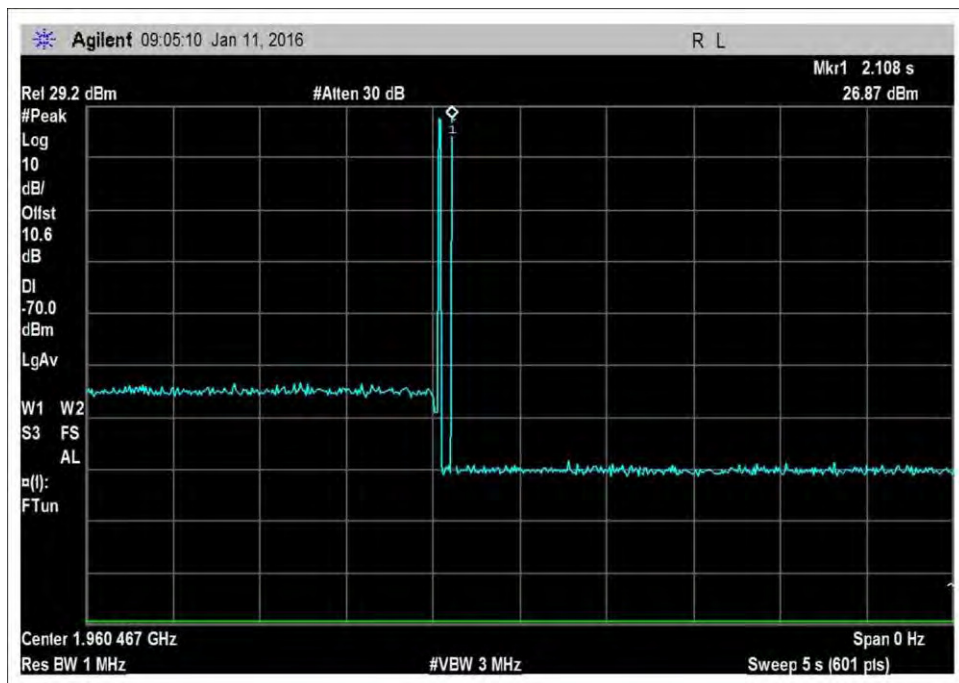
7.11_osc_DL-869-894MHz-Pk



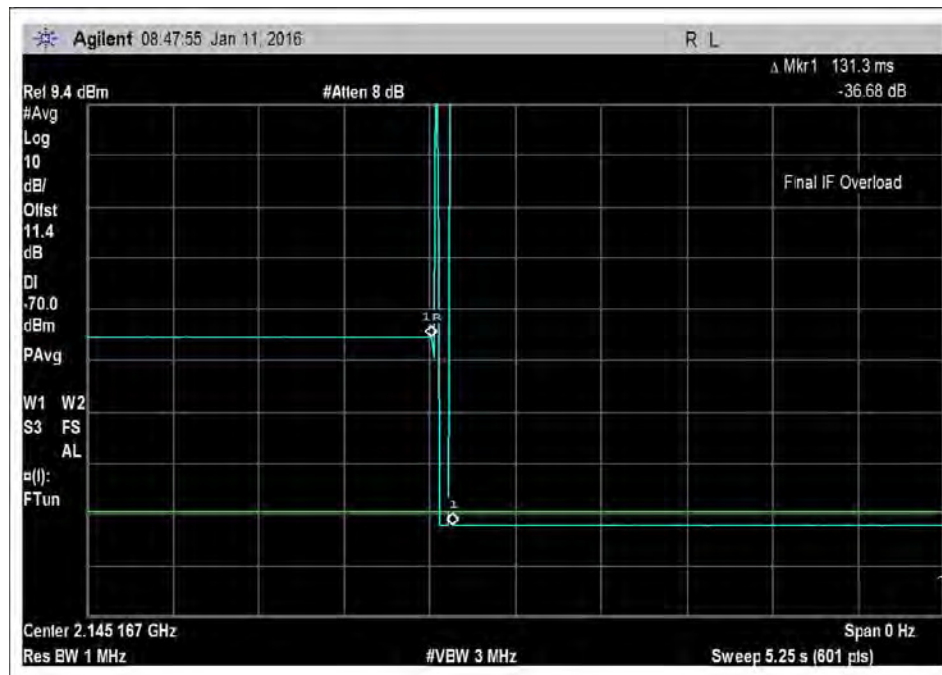
7.11_osc_DL-1930-1995MHz



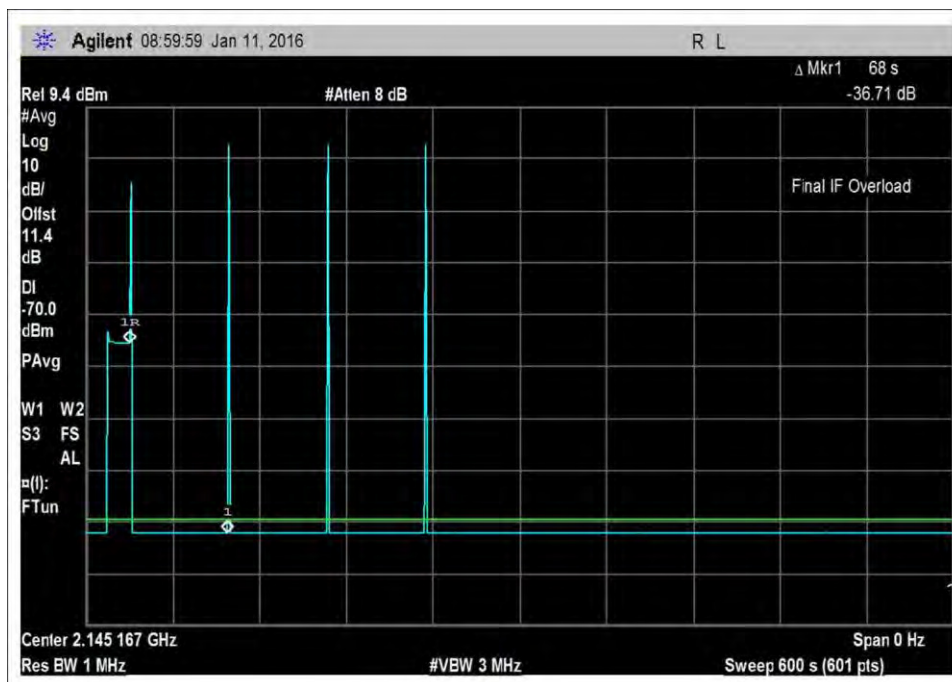
7.11_osc_DL-1930-1995MHz-600sec



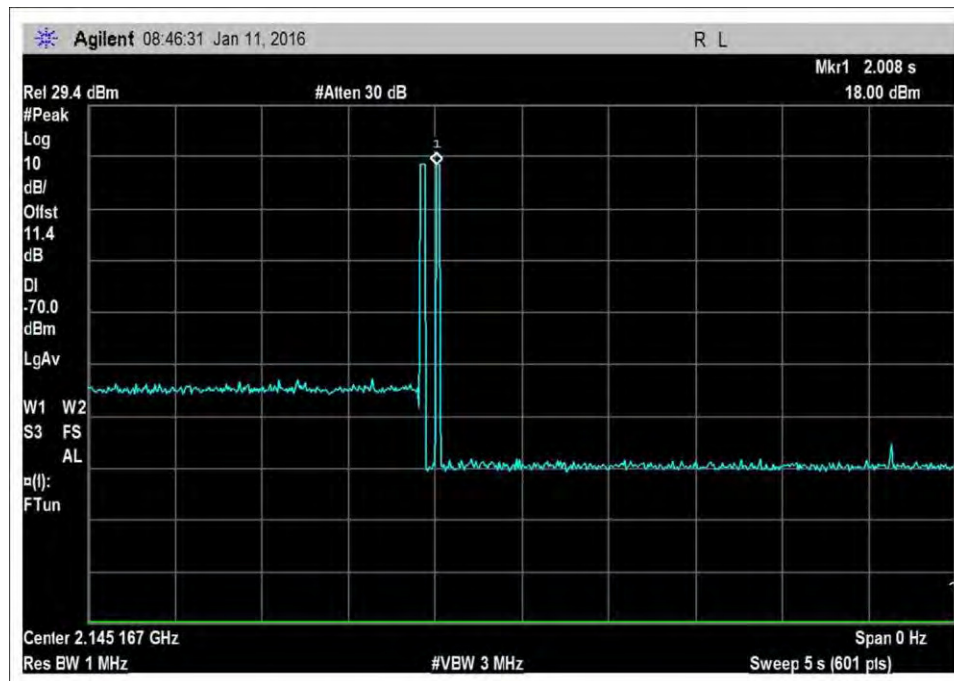
7.11_osc_DL-1930-1995MHz-Pk



7.11_osc_DL-2110-2155MHz



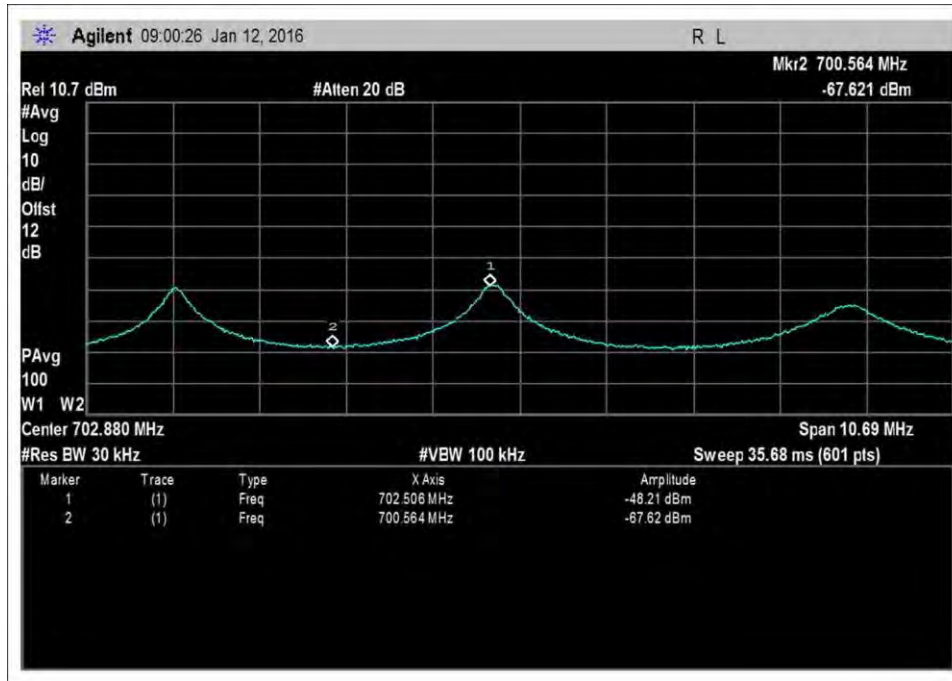
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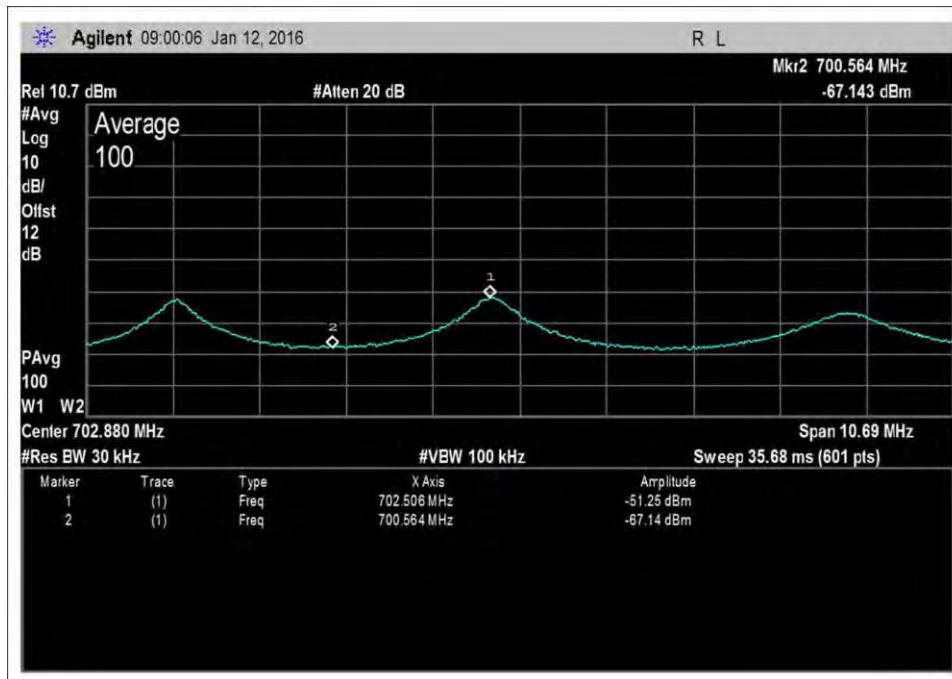
7.11_osc_DL-2110-2155MHz-Pk

7.11.3 Measuring Oscillation Mitigation or Shutdown

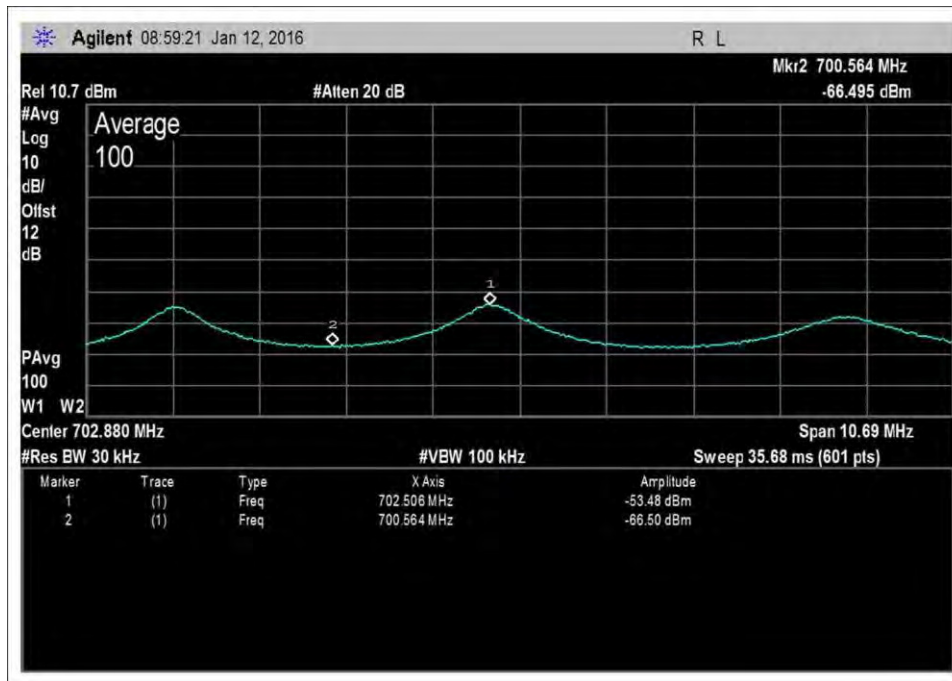
Plots



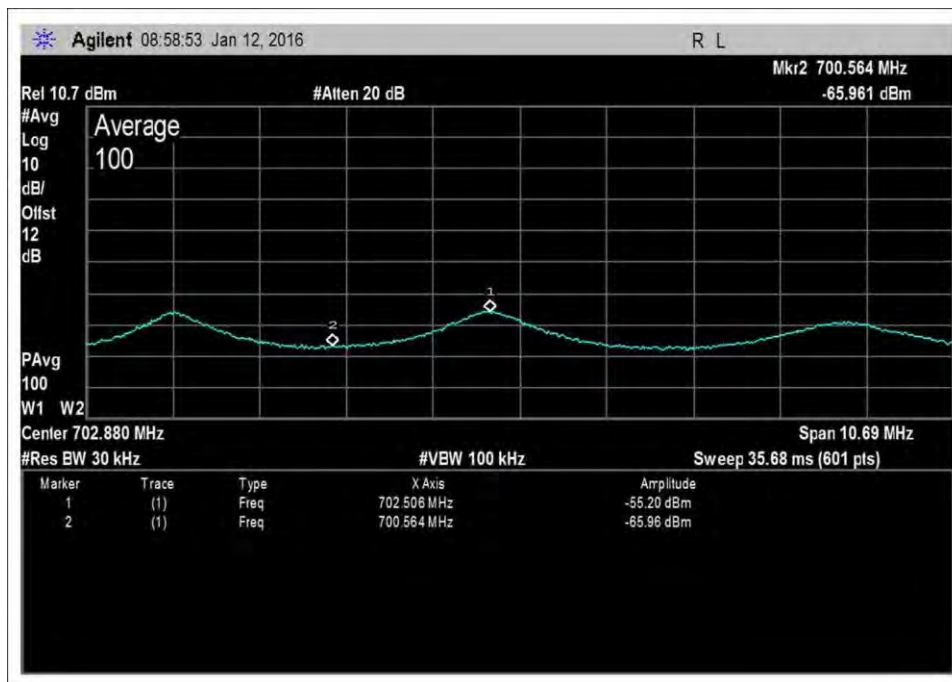
UL-698-716-AWG NR+0



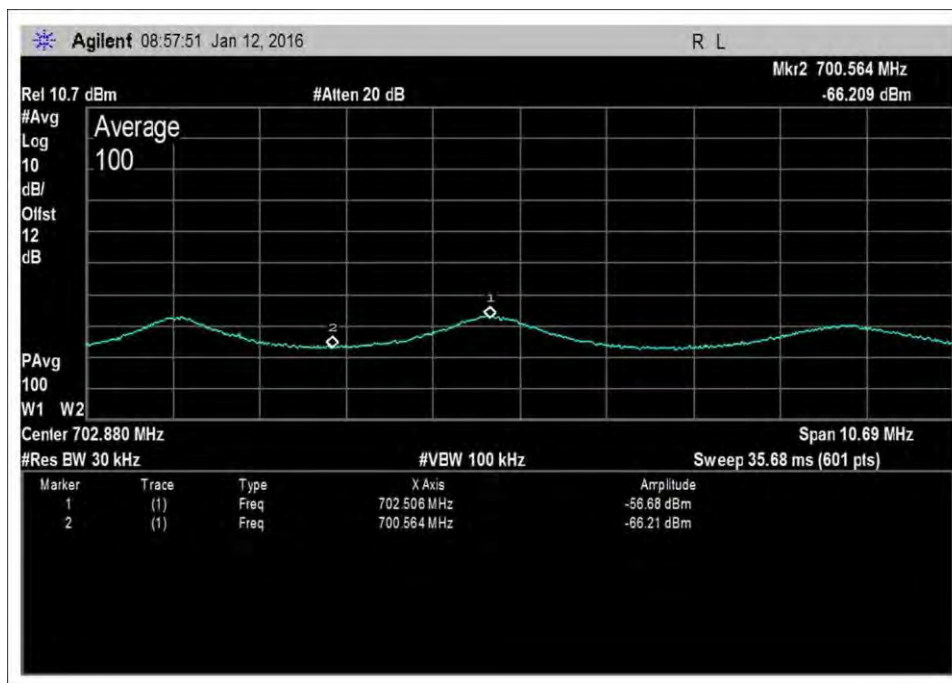
UL-698-716-AWGNR+1



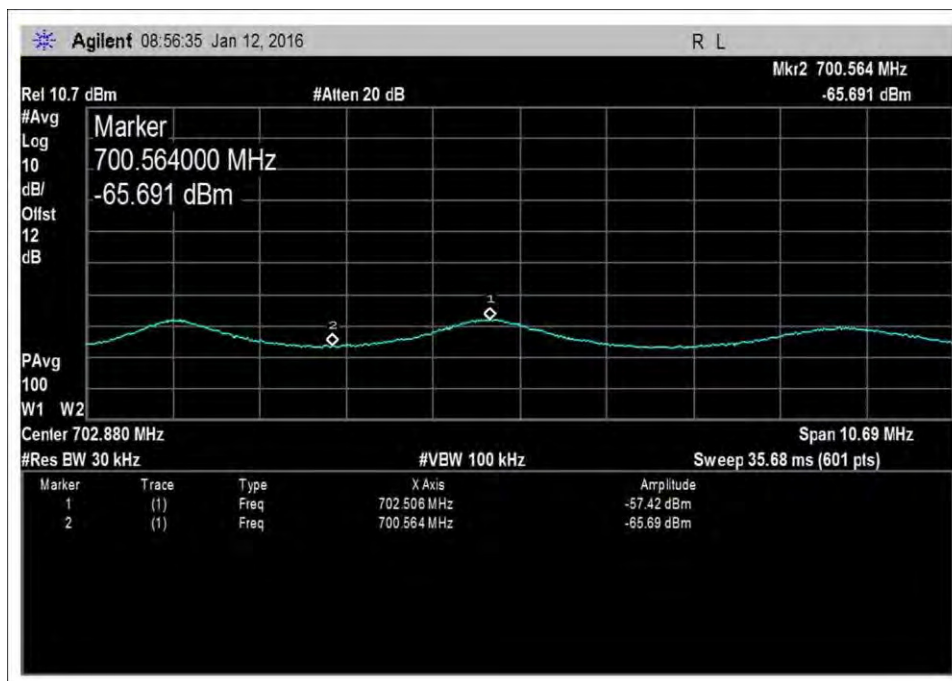
UL-698-716-AWGNR+2



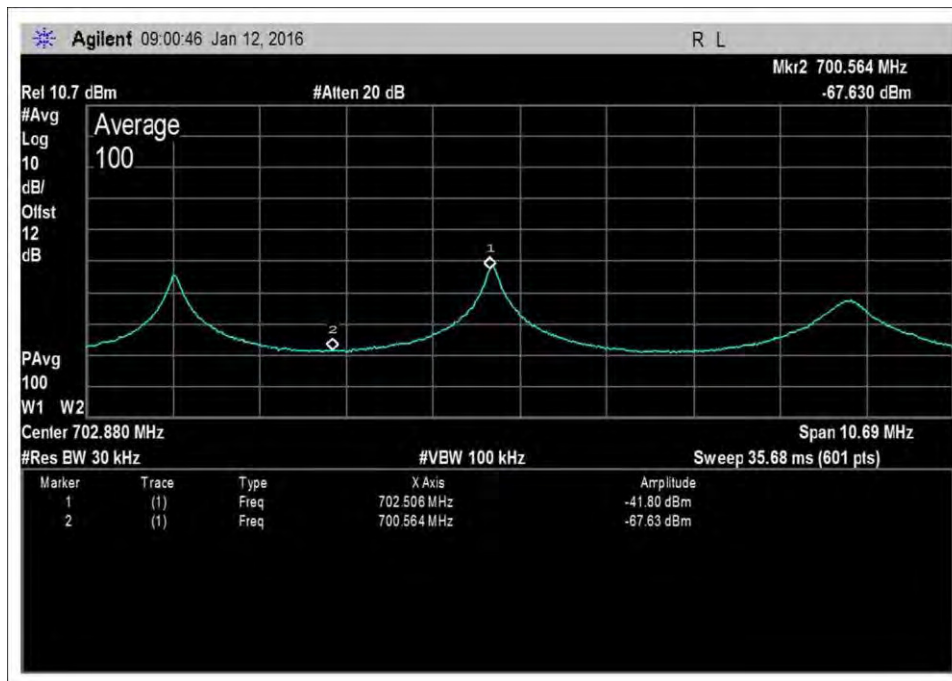
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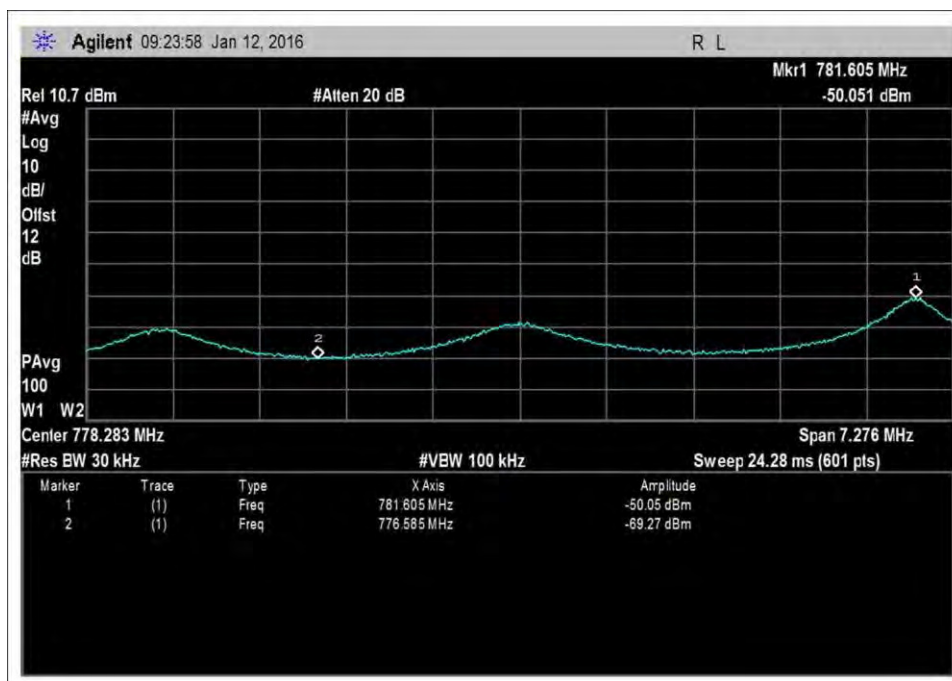
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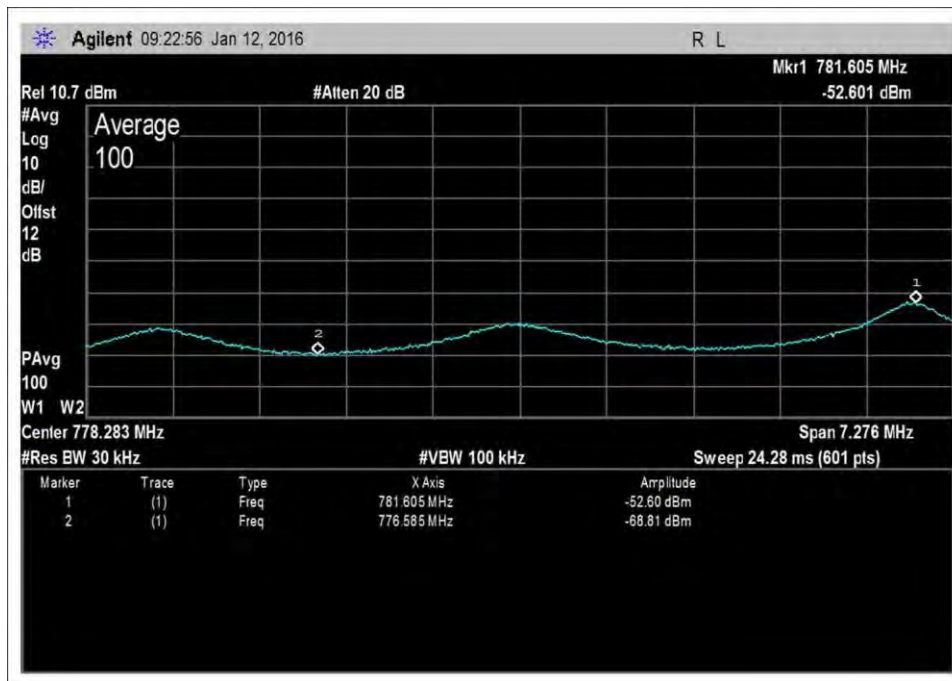
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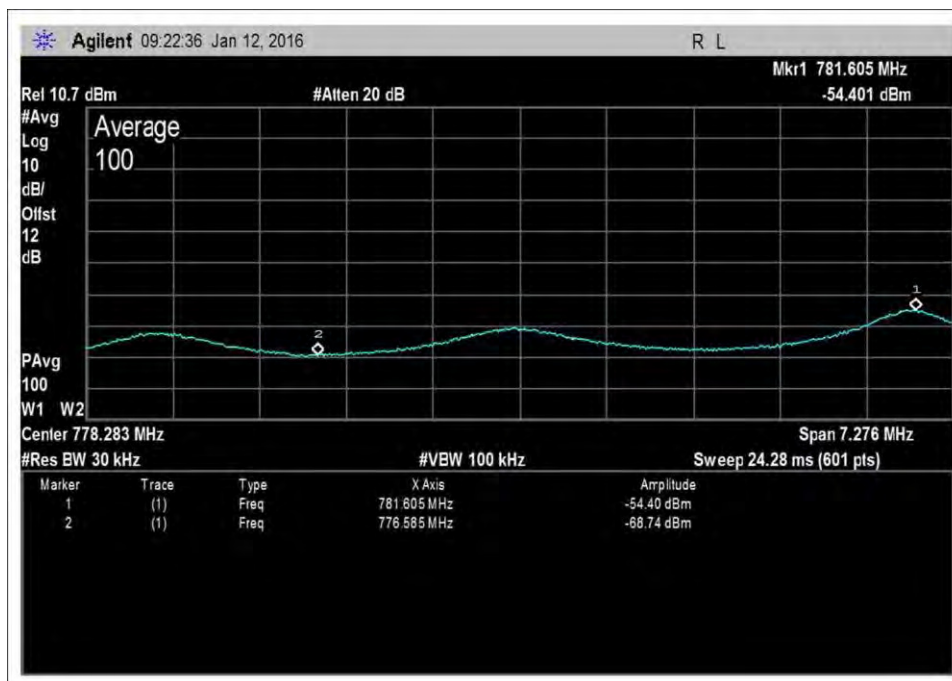
UL-698-716-AWG NR-1



UL-776-787-AWG NR+0



UL-776-787-AWGNR+1



UL-776-787-AWGNR+2