

Cellphone-Mate, Inc.

ADDENDUM TO TEST REPORT 97491-18

**Consumer Booster with WiFi
Model: Fusion 7**

Tested To The Following Standard:

FCC Part 20.21

Report No.: 97491-18A

Date of issue: April 15, 2016



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

TABLE OF CONTENTS

Administrative Information	4
Test Report Information	4
Revision History	4
Report Authorization	4
Test Facility Information	5
Software Versions	5
Site Registration & Accreditation Information	5
Summary of Results	6
Modifications During Testing	8
Conditions During Testing	8
Equipment Under Test	8
FCC Part 20.21	9
7.1 Authorized Frequency Band Verification	9
Summary of Results	10
7.2 Maximum Power	20
Summary of Results	22
7.3 Maximum Gain	45
Summary of Results	46
7.4 Intermodulation Product	47
Summary of Results	48
7.5 Out of Band Emissions	66
Summary of Results	67
7.7 Noise limit	129
Summary of Results	130
7.7.1 Maximum Transmitter Noise Power Level	135
7.7.2 Variable UL Noise Timing	143
7.8 Uplink Inactivity	146
Summary of Results	147
7.9 Booster Gain Limit	151
Summary of Results	153
7.9.1 Maximum Gain	156
7.9.2 Variable uplink Gain Timing	156

7.11 Oscillation Detection	159
Summary of Results	161
7.11.2 Oscillation Restart Tests	165
7.11.3 Measuring Oscillation Mitigation or Shutdown	181
7.13 Spectrum Block Filter	210
Exhibit A: Test Setup Photos	211
Supplemental Information	215
Measurement Uncertainty	215
Emissions Test Details	215

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Cellphone-Mate, Inc.
48346 Milmont Drive
Fremont, CA 94538

Representative: Dennis Findley
Customer Reference Number: SC20150828

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

Dianne Dudley
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 97491

October 12, 2015

October 12-14, 2015

Revision History

Original: Testing of Consumer Booster with WiFi, Model: Fusion 7 to FCC Part 20.21.

Addendum A: To add updated graphs and tables to sections 7.9 per customer provided new parameters.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink that reads "Steve Behm". The signature is written in a cursive style and is positioned above a horizontal line.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.02.00
EMITest Immunity	5.02.00

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Fremont	US0082	SL2-IN-E-1148R	3082B-1	958979	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Part 20.21

KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03, June 5, 2015		FCC Part Section Correlation		Mods	Results
Guidance Sec #	Guidance Description	FCC Sec #	FCC Rule Description		
7.1 a) - k)	Authorized Frequency Band Verification Test	20.21(e)(3)	Frequency Bands	NA	Pass
7.2.2 a) - k)	Maximum Power Measurement Procedure	2.1046/20.21(e)(8)(i)(D)	Power Limit	NA	Pass
7.3 a) - d)	Maximum Booster Gain Computation	20.21(e)(8)(i)(B)	Bidirectional Capabilities	NA	Pass
7.4 a) - n)	Intermodulation Product	20.21(e)(8)(i)(F)	Intermodulation Limit	NA	Pass
7.5 a) - n)	Out of Band Emissions	20.21(e)(8)(i)(E)	Out of Band Emission	NA	Pass
7.6 a) - e)	Conducted Spurious Emission	2.1051/22/24/27	Spurious emission	NA	NA ¹
7.7.1 a) - g) 7.7.1 h) - n) 7.7.2 a) - g)	Noise Limit Procedure Variable Noise Variable Noise Timing	20.21(e)(8)(i)(A)(2)(i) 20.21(e)(8)(i)(A)(1) 20.21(e)(8)(i)(H)	Noise Limits Transmit Power Off Mode	NA	Pass
7.8 a) - l)	Uplink inactivity	20.21(e)(8)(i)(I)	Uplink Inactivity	NA	Pass

Standard / Specification: FCC Part 20.21 - continued

KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03, June 5, 2015		FCC Part Section Correlation		Mods	Results
Guidance Sec #	Guidance Description	FCC Sec #	FCC Rule Description		
7.9.1 a) - l)	Variable Booster Gain	20.21(e)(8)(i)(C) (1), (2)(i) 20.21(e)(8)(i)(H)	Booster Gain	NA	Pass
7.9.2 a) - f)	Variable Uplink Gain Timing		Transmit Power Off Mode		
7.10.a) - j)	Occupied Band Width	2.1049/22/24/27	Occupied Band Width	NA	NA ¹
7.11.2 a) - r) 7.11.3 a) - h) 7.11.4 a) - h) (alternate to 7.11.3)	Anti-Oscillation	20.21(e)(8)(ii)(A)	Anti-Oscillation	NA	Pass
7.12a) - f)	Radiated Spurious Emission	2.1053/ 22/24/27	Spurious Emission	NA	NA ¹
7.13 a) - c)	Spectrum Block Filter ²	NA ²	NA ²	NA	NA ²

NA¹ = A different standard applies; see applicable test report.

NA² = Not applicable. See the section in the report for the reason.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
Testing was performed prior to February 12, 2016 however the test procedures and requirement of 935210 D03 Signal Booster Measurements v03 and 935210 D03 Signal Booster Measurements v04 is identical, except for an additional timing requirement.
The data presented in this test report includes the additional timing requirement which was addressed in the test lab. KDB 852800, therefore meets the requirement of 935210 D03 Signal Booster Measurements v04, February 12, 2016.

EQUIPMENT UNDER TEST (EUT)

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 4

Equipment Tested:

Device	Manufacturer	Model #	S/N
Consumer Booster with WiFi	Cellphone-Mate, Inc.	Fusion 7	01
AC/DC Adapter	Sony	PCGA-AC16V	1477749530023127
HDTV Antenna	Cellphone-Mate, Inc.	SC305H	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Sony	PCG-6C2L	CXSM507BRD01-D480
AC/DC Power Adapter	Cellphone-Mate, Inc.	GFP451DA-1238-1	1411-0000920
Signal Generator	Agilent	E4433B	US40052164
Signal Generator	Agilent	E4438C	MY42082260

FCC PART 20.21

7.1 Authorized Frequency Band Verification

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.1 Authorized Frequency Band Verification**
 Work Order #: **97491** Date: 10/12/2015
 Test Type: **Conducted Emissions** Time: 08:51:56
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed CMRS Wideband Consumer Booster with a Wi-Fi Router and TV amplifier installed. The CMRS DL signal and the Wi-Fi Signal are combined at the diplexer and transmit via the indoor antenna.

The Consumer booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with Wi-Fi transmitting at Mid channel, 802.11b.

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

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.6°C, Relative Humidity: 42%, Pressure: 101.5kPa

The test was performed in accordance with section 7.1 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015. Firmware: V2.0

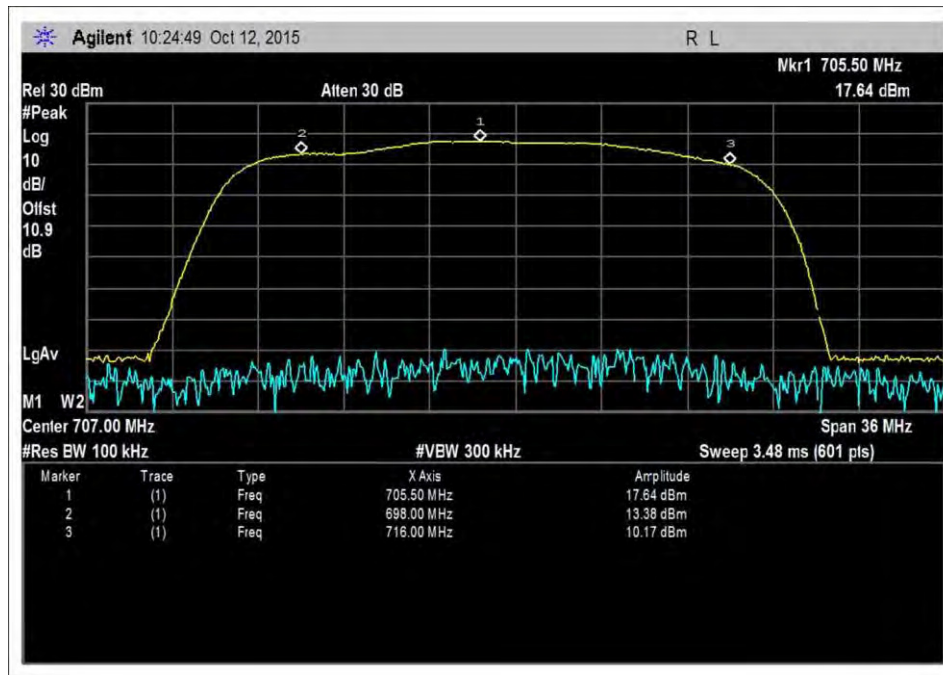
Test Equipment:

ID	Asset #	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
	AN03470	Spectrum Analyzer	E4440A	12/2/2013	12/2/2015
	ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
	ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

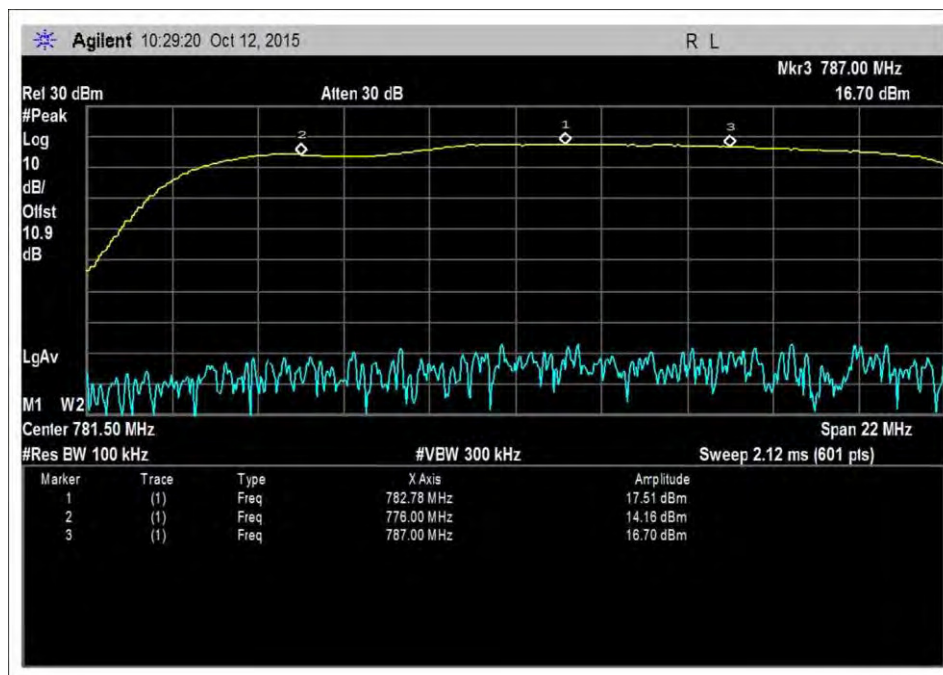
Summary of Results

Pass: The plots below show the device only operates on the CMRS frequency bands authorized for use by the NPS.

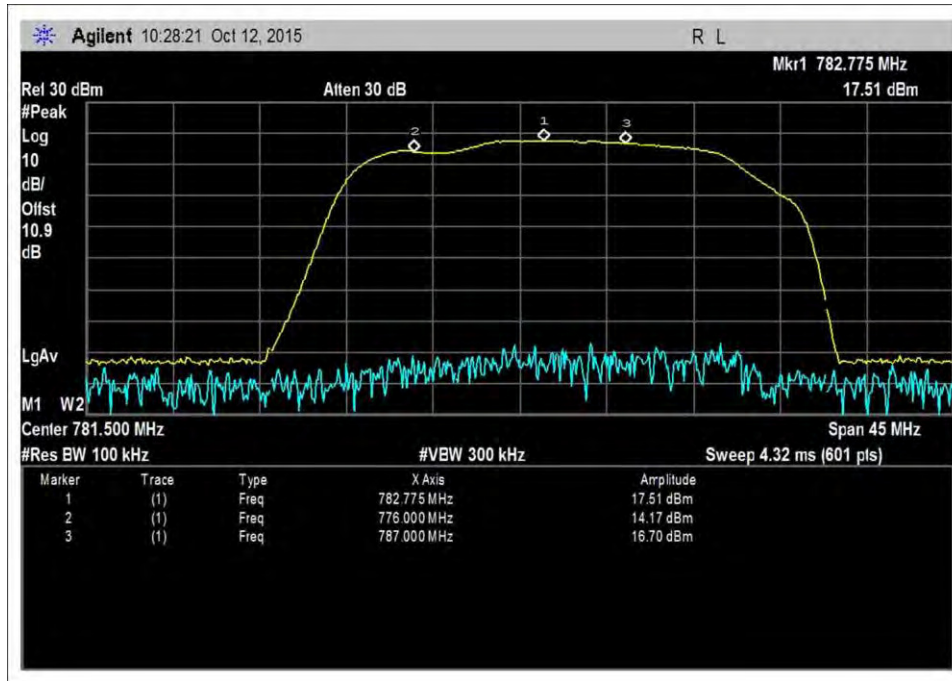
Plots



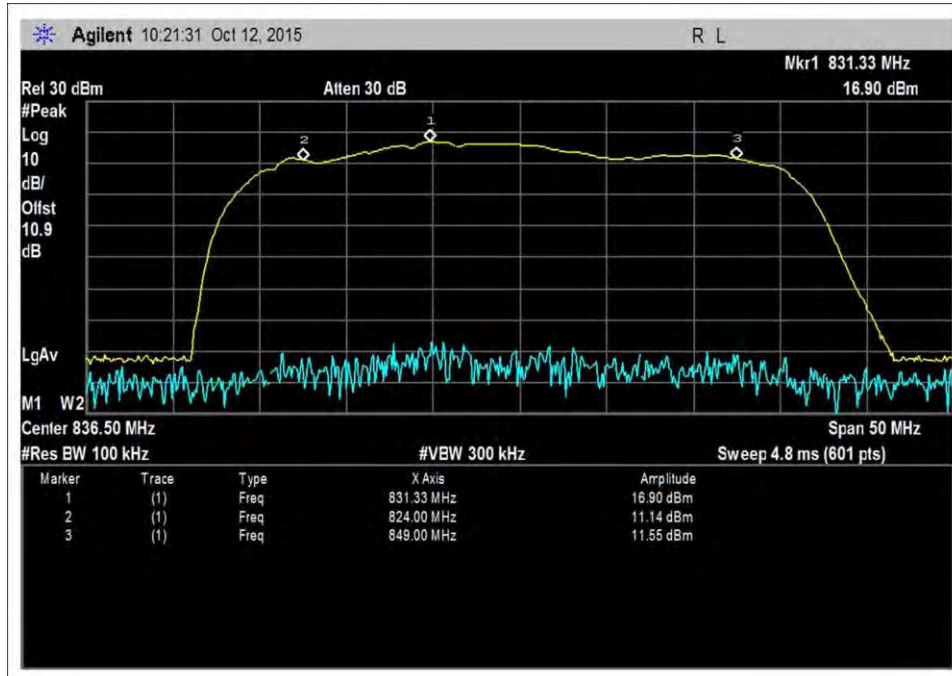
7.1_band verify_UL_698-716MHz



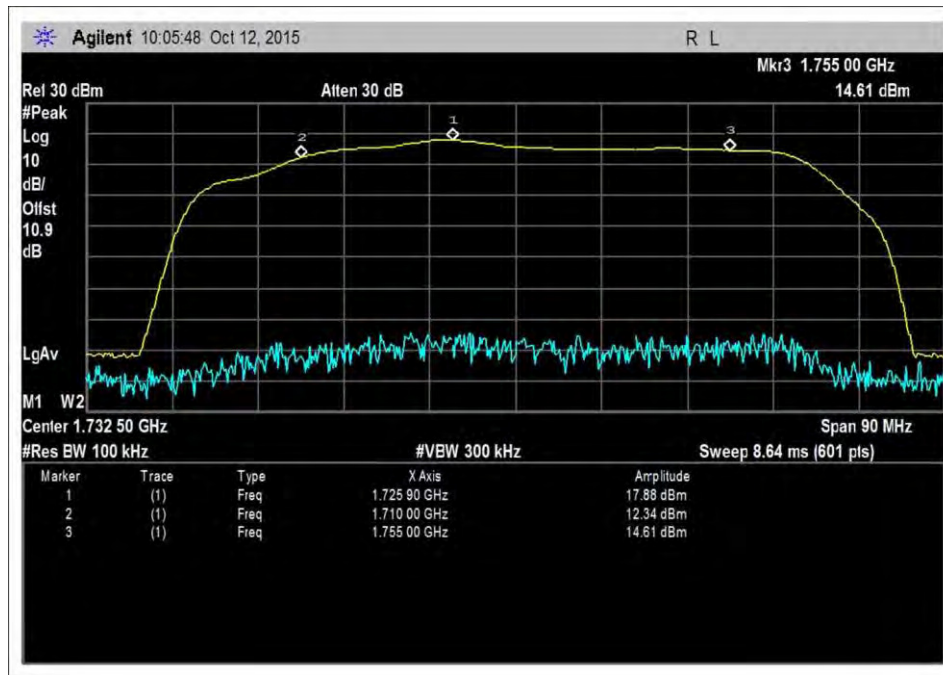
7.1_band verify_UL_776-787MHz



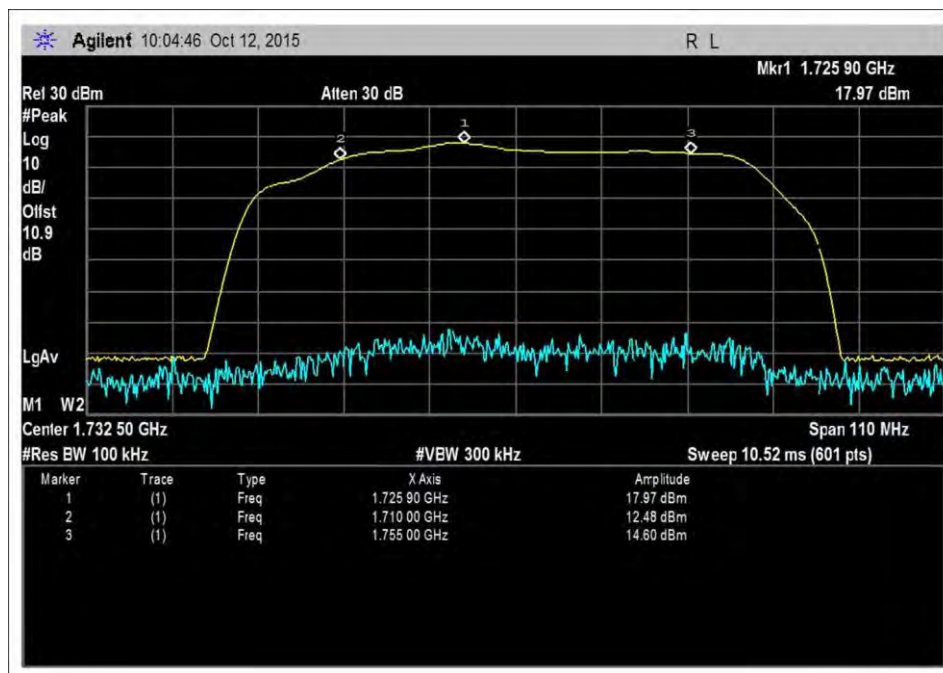
7.1_band verify_UL_776-787MHz-Zoom



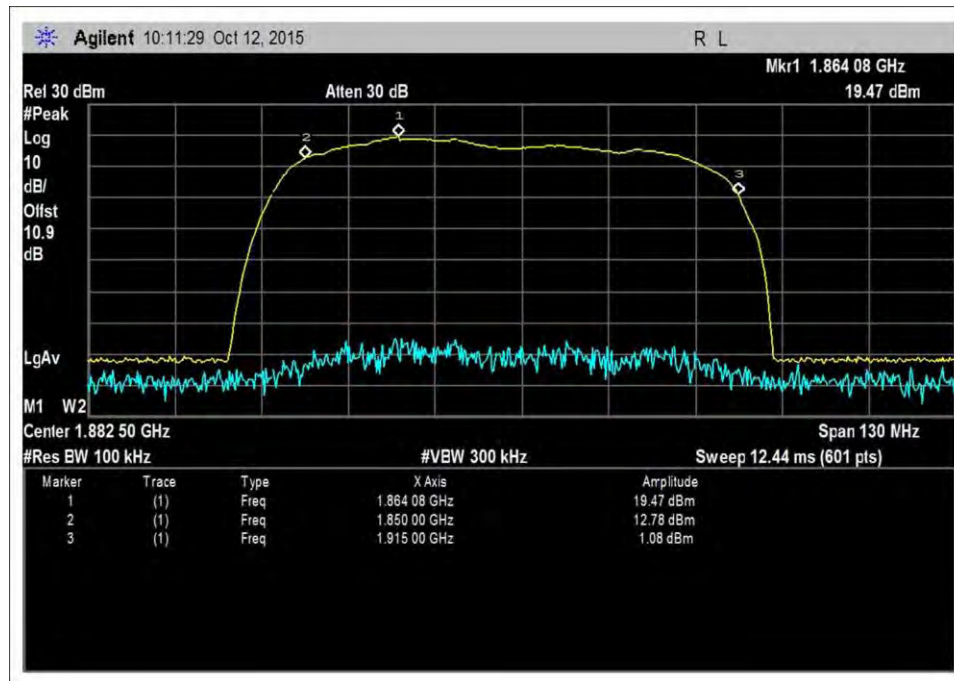
7.1_band verify_UL_824-849MHz



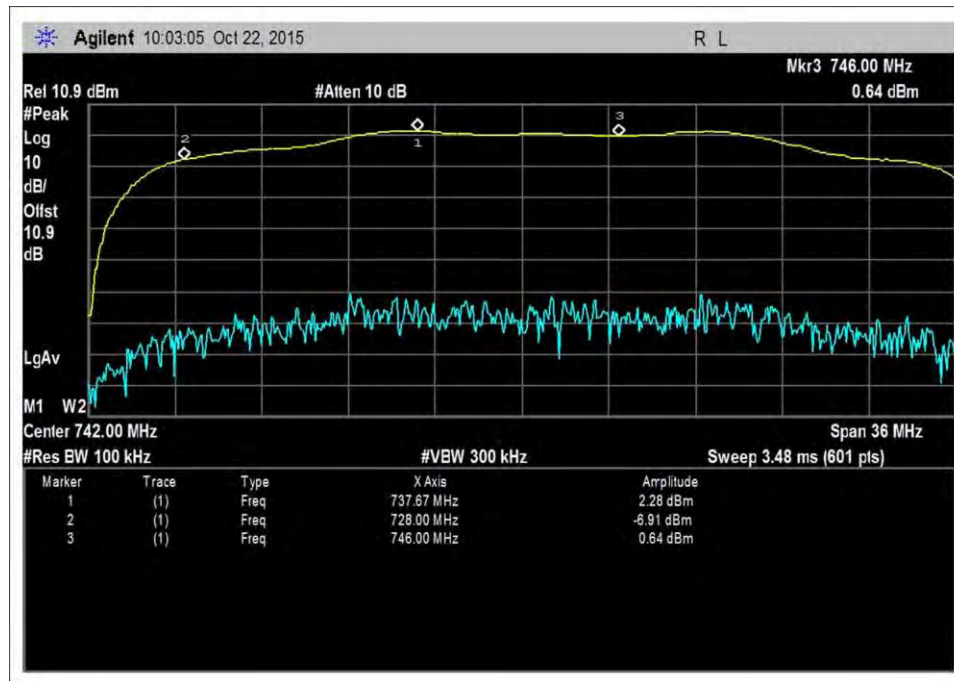
7.1_band verify_UL_1710-1755MHz



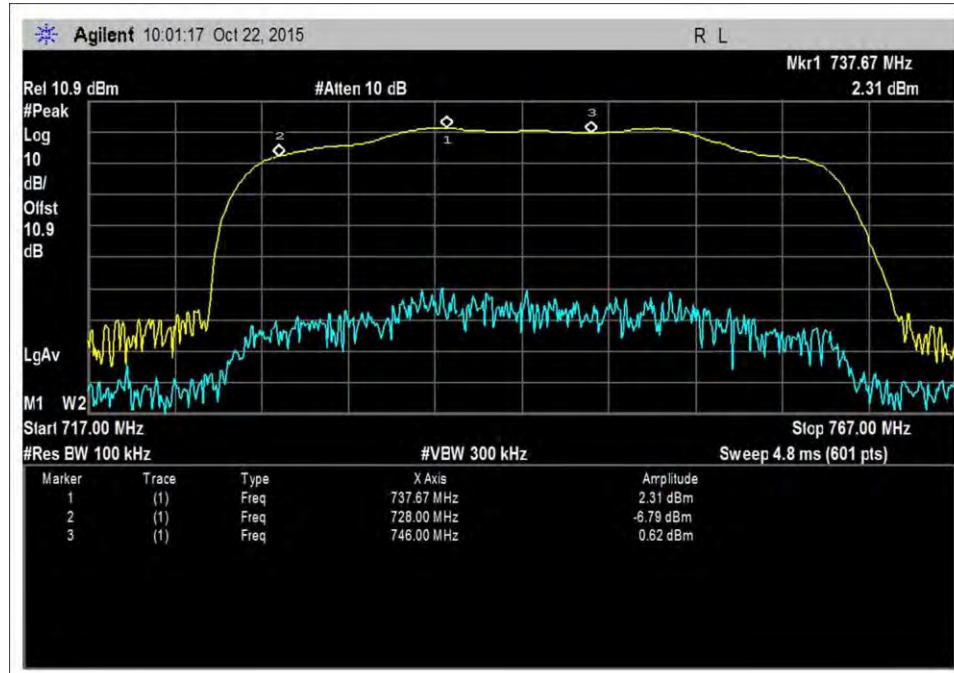
7.1_band verify_UL_1710-1755MHz-Zoom



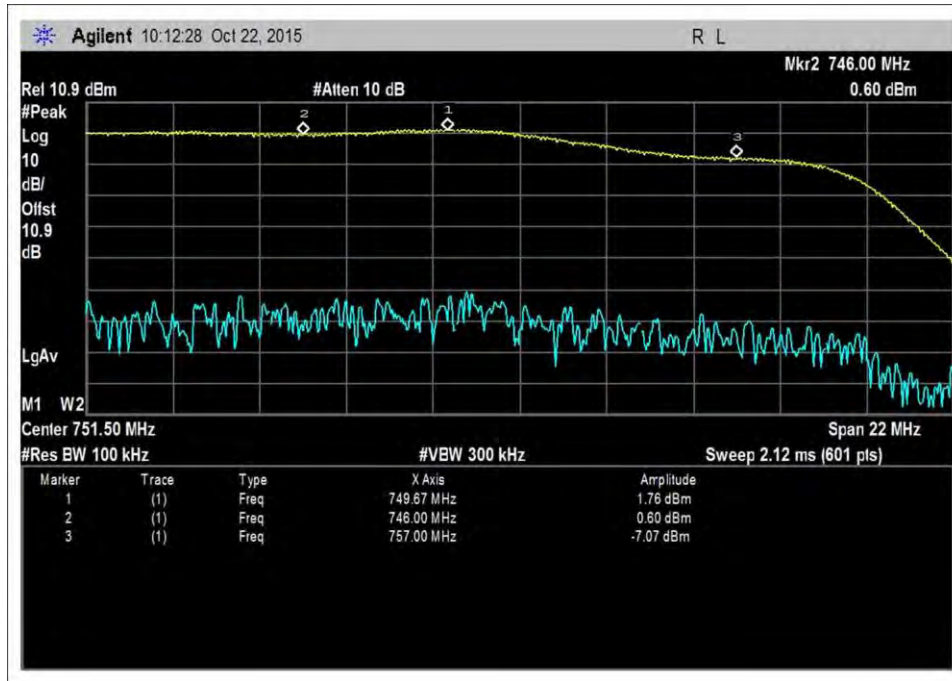
7.1_band verify_UL_1850-1915MHz



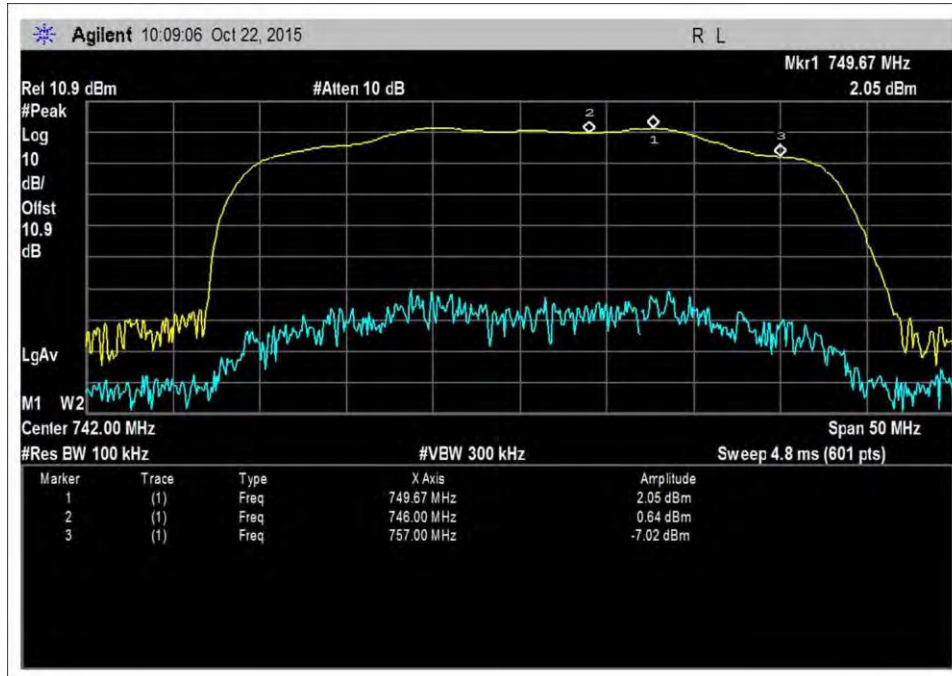
7.1_band verify_DL_728-746MHz



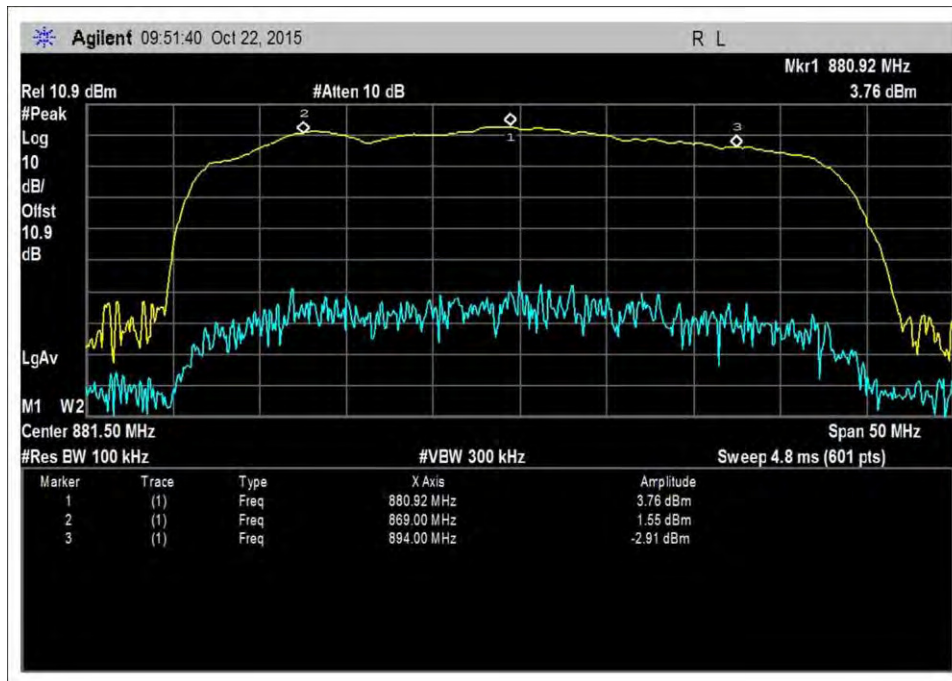
7.1_band verify_DL_728-746MHz-Zoom



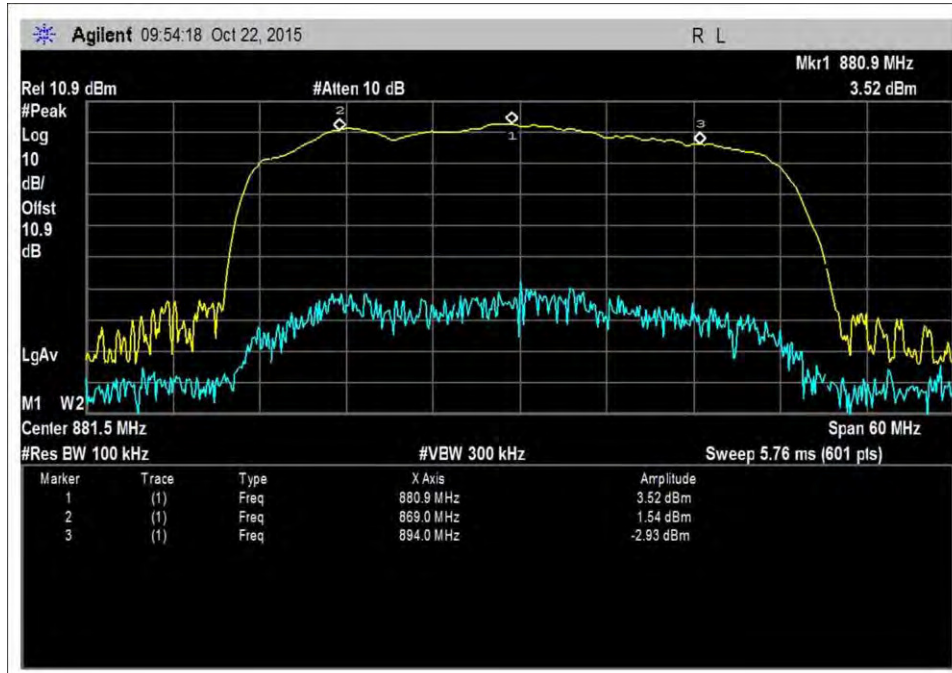
7.1_band verify_DL_746-757MHz



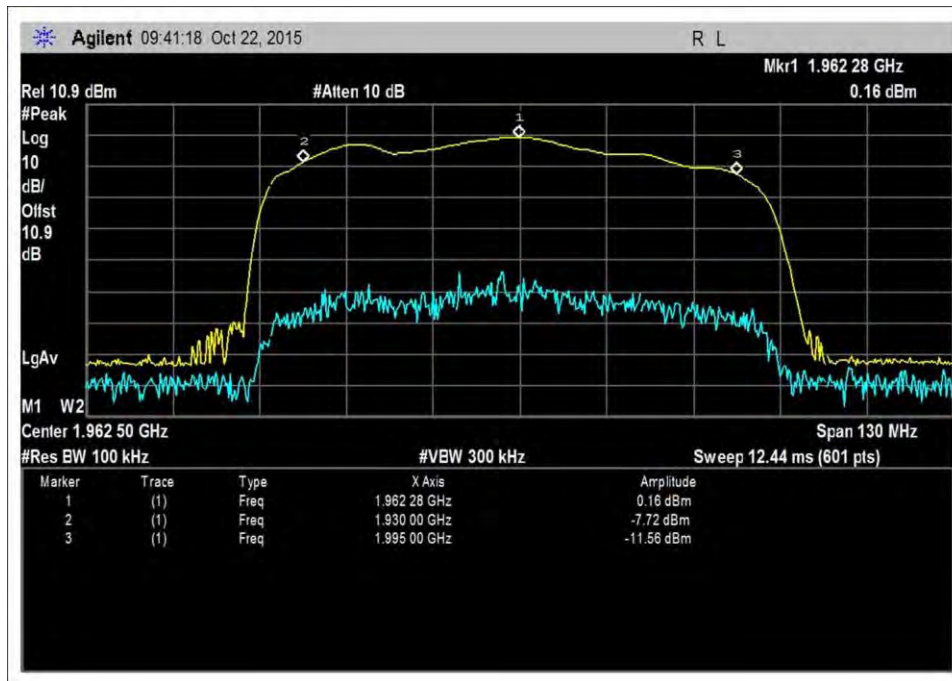
7.1_band verify_DL_746-757MHz-Zoom



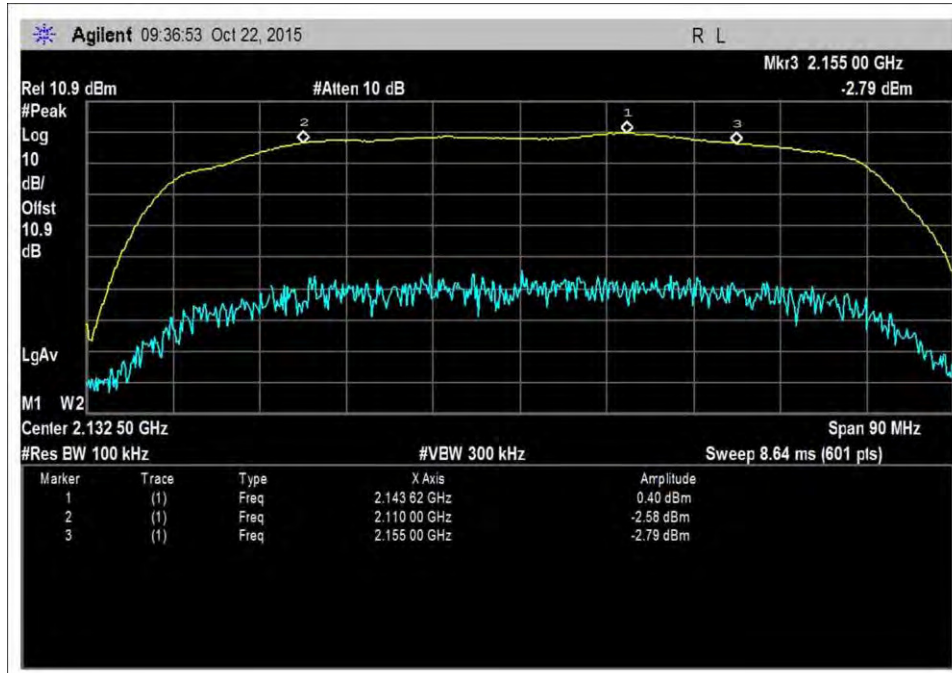
7.1_band verify_DL_869-894MHz



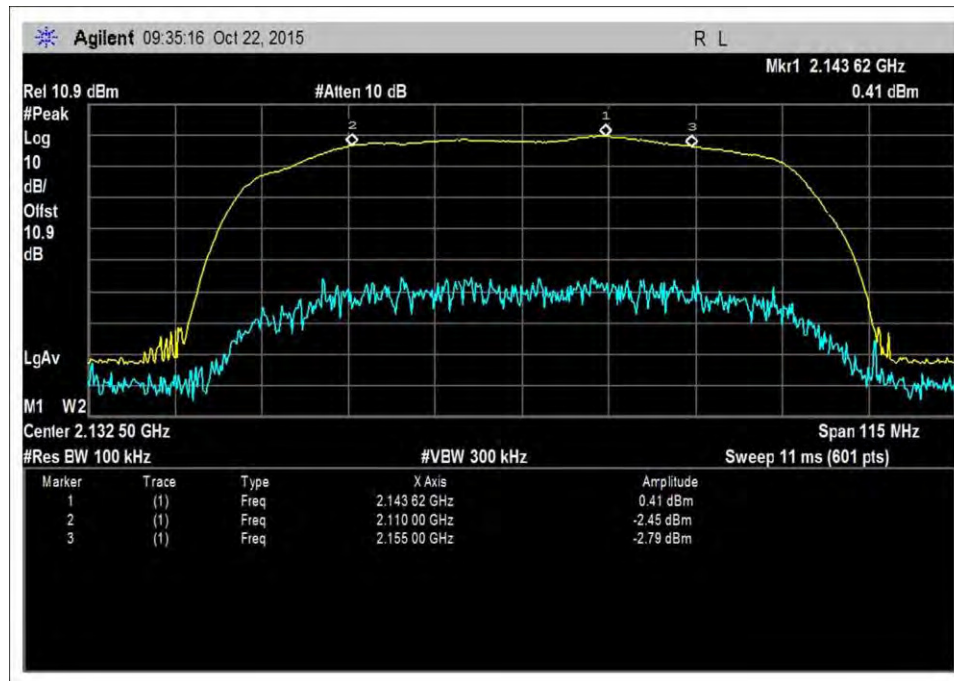
7.1_band verify_DL_869-894MHz-Zoom



7.1_band verify_DL_1930-1995MHz



7.1_band verify_DL_2110-2155MHz



7.1_band verify_DL_2110-2155MHz-Zoom

7.2 Maximum Power

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.2 Maximum Power Measurement**
 Work Order #: **97491** Date: 10/12/2015
 Test Type: **Conducted Emissions** Time: 10:57:50
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed CMRS Wideband Consumer Booster with a Wi-Fi Router and TV amplifier installed. The CMRS DL signal and the Wi-Fi Signal are combined at the diplexer and transmit via the indoor antenna.

The Consumer booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with Wi-Fi transmitting at Mid channel, 802.11b.

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

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.6°C, Relative Humidity: 42%, Pressure: 101.5kPa

The test was performed in accordance with section 7.2 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015. Firmware: V2.0

The booster is to be deployed with antenna kit with the following characteristic:

Antenna Kitting Information

Component	Prod No. Description	Gain/Loss							Notes
		HDTV	LTE-A	LTE-V	800MHz	1900MHz	1700MHz\2100MHz	2400MHz	
Outdoor Antenna	SC288W		3dBi	3dBi	3dBi	4dBi	4dBi\4dBi	4dBi	With N connector
	SC230W		10dBi	10dBi	10dBi	10dBi	10dBi\10dBi	11dBi	With N connector
Outdoor Cable	SC240-40FN 40Feet		3.52dB	3.52dB	3.98dB	6.52dB	6.12dB\6.92dB	7.32dB	With N connector
	SC400-30NN 30Feet		2.05dB	2.05dB	2.12dB	2.83dB	2.68dB\2.98dB	3.1dB	With N connector
Indoor Cable	SC400-75NN 75Feet		4.22dB	4.22dB	4.41dB	6.17dB	5.8dB\6.54dB	6.85 dB	With RP-TNC connector
Indoor Antenna	SC222W		3dBi	3dBi	3dBi	6dBi	6dBi\6dBi	6dBi	With RP-TNC connector
	SC248W		7dBi	7dBi	7dBi	10dBi	10dBi\10dBi	10dBi	With RP-TNC connector
HDTV Out Antenna	SC305H	3dBi	/	/	/	/	/	/	With F connector
	SC306H	3dBi	/	/	/	/	/	/	With F connector

Test Equipment:

Asset #	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
ANP06712	Cable	32022-29094K-29094K-48TC	9/18/2014	9/18/2016
AN03470	Spectrum Analyzer	E4440A	12/2/2013	12/2/2015
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

Summary of Results

Pass: Summarized in the table below, measured EIRP, Gain and UL/DL gain ratio are within limits.

Pre AGC				Pre AGC		
Frequency (MHz)	Pulse GSM			4.1 MHz AWGN		
	Input (dBm)	Output (dBm)	Gain (dB)	Input (dBm)	Output (dBm)	Gain (dB)
UL1710-1755	-45.5	18.3	63.8	-48.1	18.1	66.2
UL1850-1915	-45.3	18.6	63.9	-45.0	18.3	63.3
UL824-894	-40.6	17.8	58.4	-40.5	18.0	58.5
UL 698-716	-41.0	18.5	59.5	-40.9	18.1	59.0
UL776-787	-40.6	20.1	60.7	-40.2	19.4	59.6
DL2110-2155	-59.0	6.2	65.2	-62.7	2.7	65.4
DL1930-1995	-59.7	5.0	64.7	-63.0	2.7	65.7
DL869-894	-49.6	8.4	58.0	-53.8	5.2	59.0
DL:728-746	-50.5	8.4	58.9	-52.8	5.1	57.9
DL 746-757	-50.0	7.8	57.8	-54.7	3.2	57.9

Pulse GSM					Conducted	Conducted and EIRP
Frequency (MHz)	Output Power (dBm)	Ant Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit Min (dBm)	Limit Max (dBm)
UL1710-1755	18.3	10	2.68	25.6	17	30
UL1850-1915	18.6	10	2.83	25.7	17	30
UL824-894	17.8	10	2.12	25.7	17	30
UL 698-716	18.5	10	2.05	26.4	17	30
UL776-787	20.1	10	2.05	28.0	17	30
DL2110-2155	6.2	10	3.76	12.4	NA	17
DL1930-1995	5.0	10	3.56	11.4	NA	17
DL869-894	8.4	7	2.29	13.2	NA	17
DL:728-746	8.4	7	2.06	13.3	NA	17
DL 746-757	7.8	7	2.06	12.7	NA	17

**4.1MHz
AWGN**

					Conducted	Conducted and EIRP
Frequency (MHz)	Output Power (dBm)	Ant Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit Min (dBm)	Limit Max (dBm)
UL1710-1755	18.1	10	2.68	25.4	17	30
UL1850-1915	18.3	10	2.83	25.5	17	30
UL824-894	18.0	10	2.12	25.9	17	30
UL 698-716	18.1	10	2.05	26.1	17	30
UL776-787	19.4	10	2.05	27.4	17	30
DL2110-2155	2.7	10	3.76	8.9	NA	17
DL1930-1995	2.7	10	3.56	9.1	NA	17
DL869-894	5.2	7	2.29	9.9	NA	17
DL:728-746	5.1	7	2.06	10.1	NA	17
DL 746-757	3.2	7	2.06	8.1	NA	17

Section 5.5 power						
Frequency (MHz)	Pulse GSM			4.1 MHz AWGN		
	Input (dBm)	Output (dBm)	Gain (dB)	Input (dBm)	Output (dBm)	Gain (dB)
UL1710-1755	-32.5	18.4	50.9	-33.0	18.3	51.3
UL1850-1915	-31.1	17.9	49.0	-30.6	19.0	49.6
UL824-894	-25.8	17.9	43.7	-24.8	18.6	43.4
UL 698-716	-26.2	18.7	44.9	-26.8	18.8	45.6
UL776-787	-25.7	20.2	45.9	-26.2	19.4	45.6
DL2110-2155	-51.4	6.3	57.7	-53.2	3.6	56.8
DL1930-1995	-50.6	5.3	55.9	-53.6	2.1	55.7
DL869-894	-46.1	9.1	55.2	-49.9	5.3	55.2
DL:728-746	-46.2	8.8	55.0	-49.8	5.0	54.8
DL 746-757	-47.0	7.9	54.9	-50.5	3.7	54.2

Note: The booster went into Transmitter off mode at Max input power of +0dBm (UL) and -20dBm (DL). Results presented on the above table are at 1 dB below the Transmit off RF input level. This table it is for reference only.

Power/Gain Verification with Booster ON and OFF

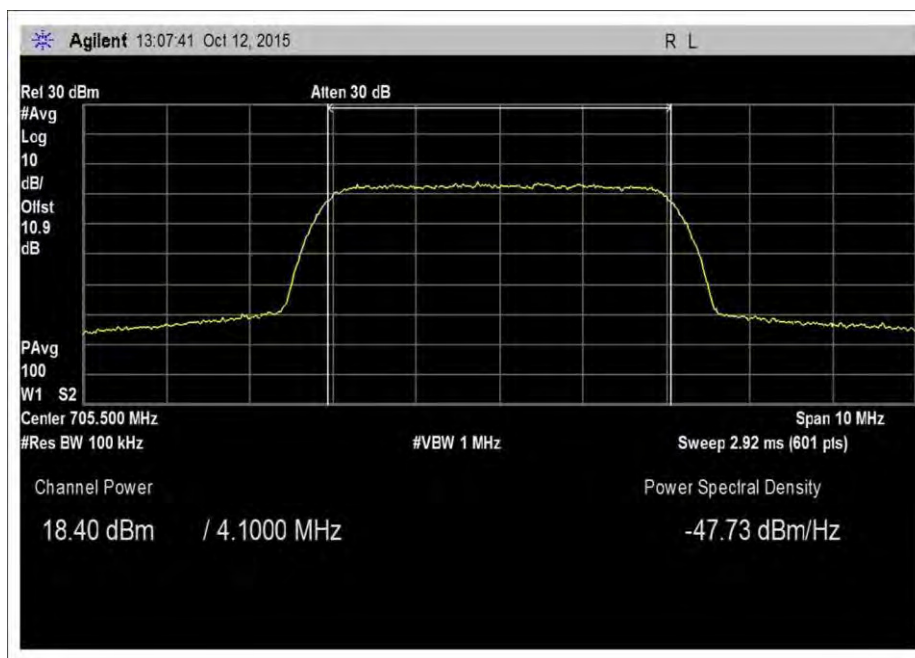
The Consumer Booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with WiFi transmitting at Mid channel, 802.11b. Results shown further below were obtained for report 97491-16.

DL 2132.5	b			g			N20			N40		
AWGN	Off	On	Diff	Off	On	Diff	Off	On	Diff	Off	On	Diff
Low	21.47	21.34	-0.13	19.22	19.28	0.06	17.51	17.5	-	15.83	15.77	-0.06
Mid	21.31	21.08	-0.23	19.1	19.26	0.16	17.34	17.25	-	15.64	15.5	-0.14
High	20.5	19.84	-0.66	17.91	17.89	-	16.31	16.03	-	15.03	14.92	-0.11
DL 881.5	b			g			N20			N40		
AWGN	Off	On	Diff	Off	On	Diff	Off	On	Diff	Off	On	Diff
Low	21.47	21.39	-0.08	19.22	19.14	-	17.51	17.4	-	15.83	15.81	-0.02
Mid	21.31	21.02	-0.29	19.1	18.96	-	17.34	17.19	-	15.64	15.5	-0.14
High	20.5	19.94	-0.56	17.91	17.75	-	16.31	16.05	-	15.03	14.9	-0.13
DL 2132.5	b			g			N20			N40		
GSM	Off	On	Diff	Off	On	Diff	Off	On	Diff	Off	On	Diff
Low	21.47	21.36	-0.11	19.22	19.09	-	17.51	17.26	-	15.83	15.61	-0.22
Mid	21.31	21.09	-0.22	19.1	18.87	-	17.34	17.22	-	15.64	15.4	-0.24
High	20.5	19.86	-0.64	17.91	17.68	-	16.31	15.95	-	15.03	14.87	-0.16
DL 881.5	b			g			N20			N40		
GSM	Off	On	Diff	Off	On	Diff	Off	On	Diff	Off	On	Diff
Low	21.47	21.17	-0.3	19.22	19.01	-	17.51	17.27	-	15.83	15.5	-0.33
Mid	21.31	20.95	-0.36	19.1	18.84	-	17.34	17.05	-	15.64	15.31	-0.33
High	20.5	19.73	-0.77	17.91	17.6	-	16.31	15.8	-	15.03	14.75	-0.28

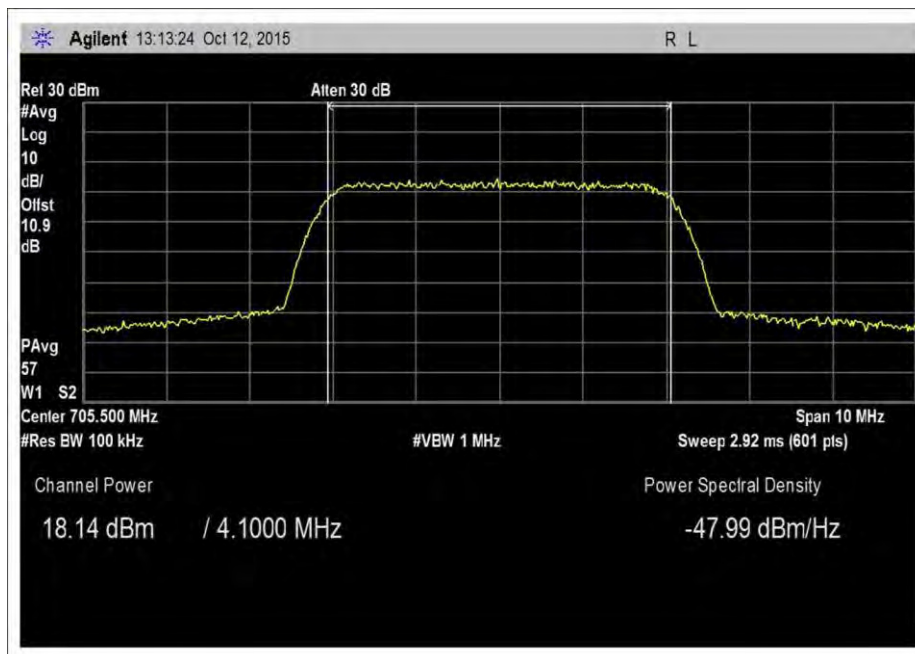
Attenuator for B Mode=32
Attenuator for G Mode=38
Attenuator for N 20MHz Mode=35
Attenuator for N 40MHz Mode=32

Plots

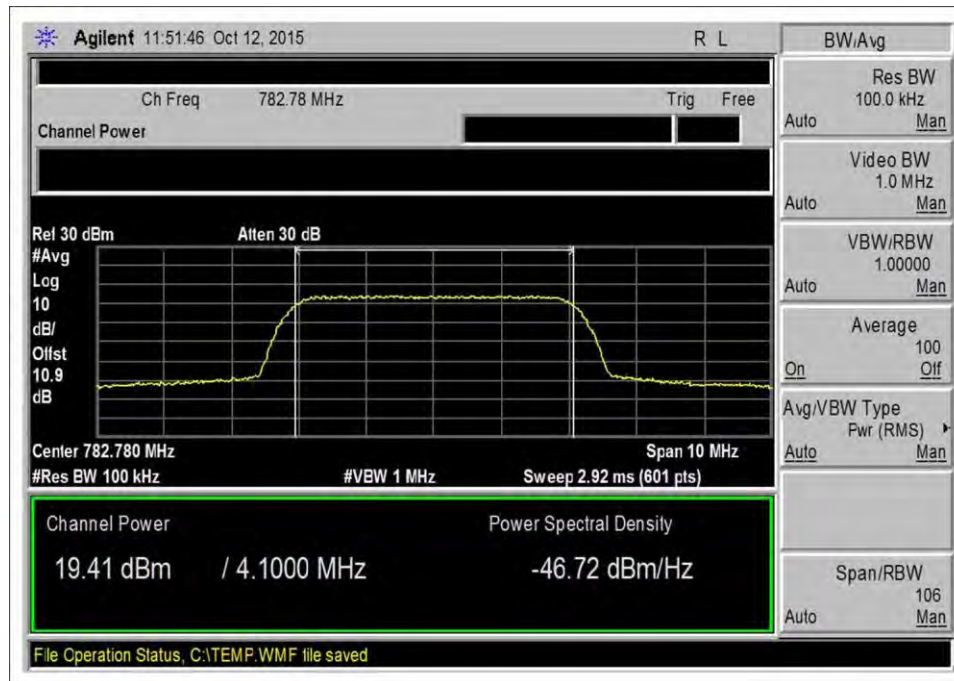
AWGN



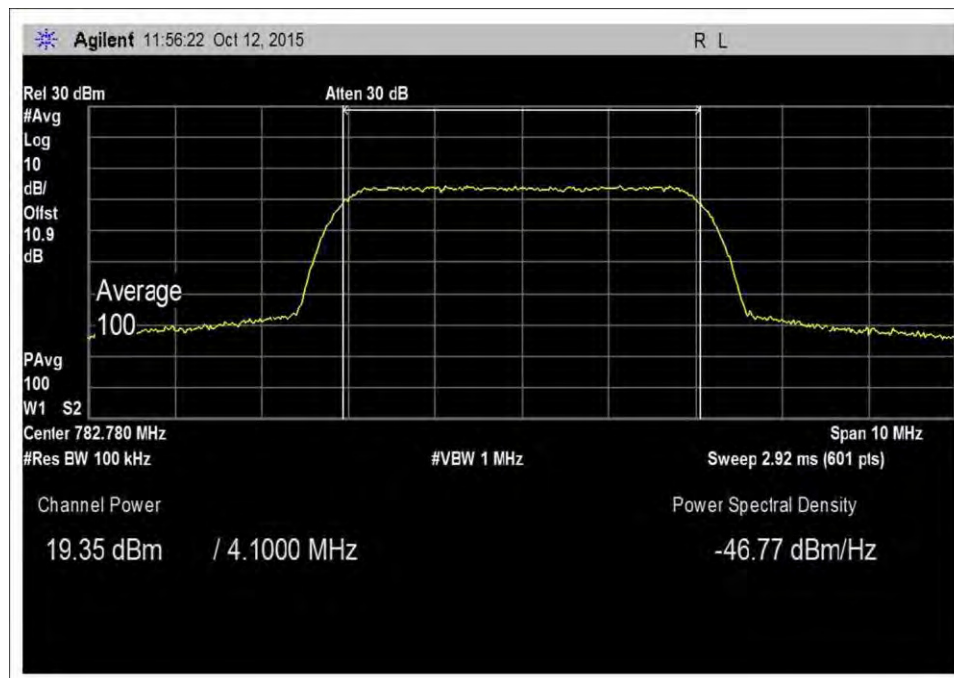
7.2_Power_UL_698-716_AWGN



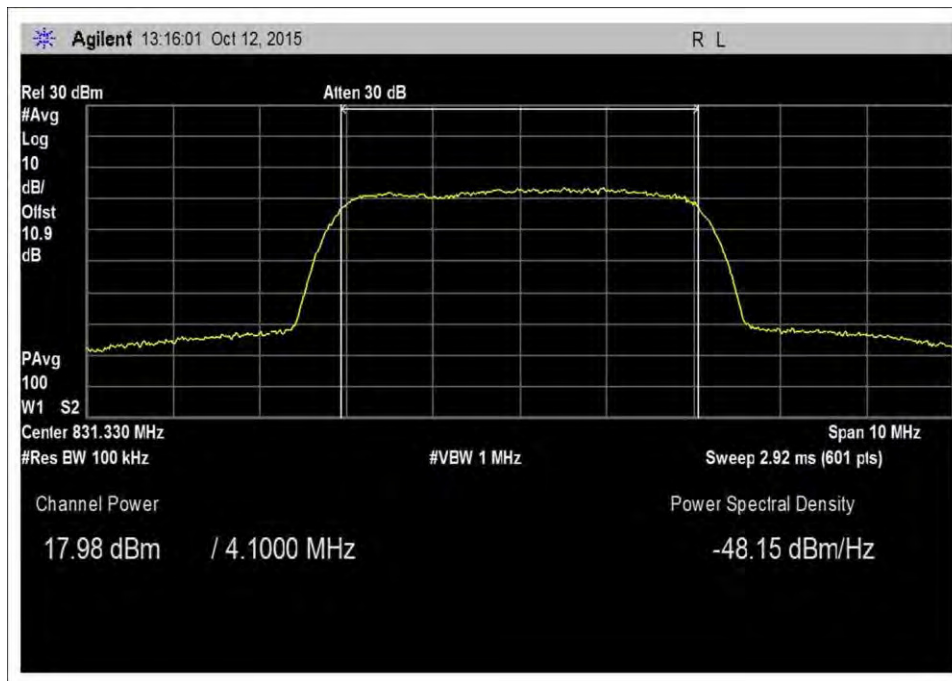
7.2_Power_UL_698-716_AWGN-Max



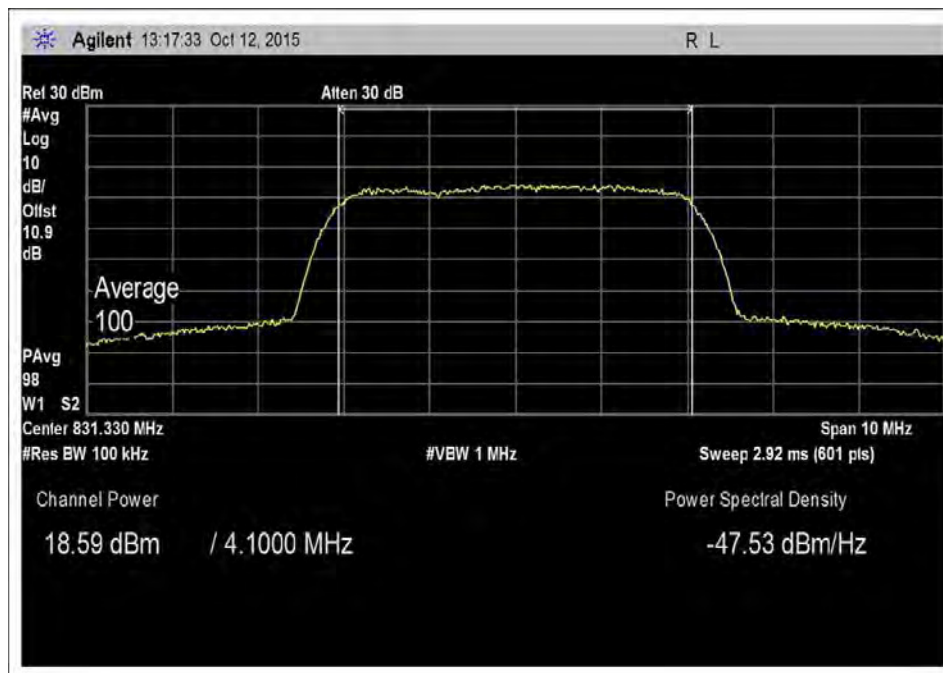
7.2_Power_UL_776-787_AWGN



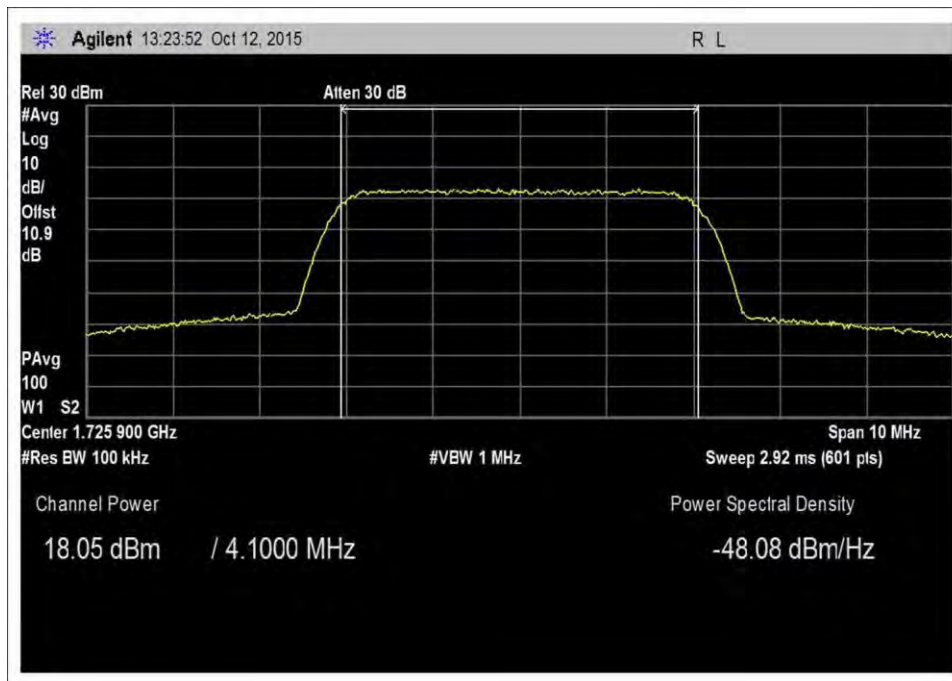
7.2_Power_UL_776-787_AWGN-Max



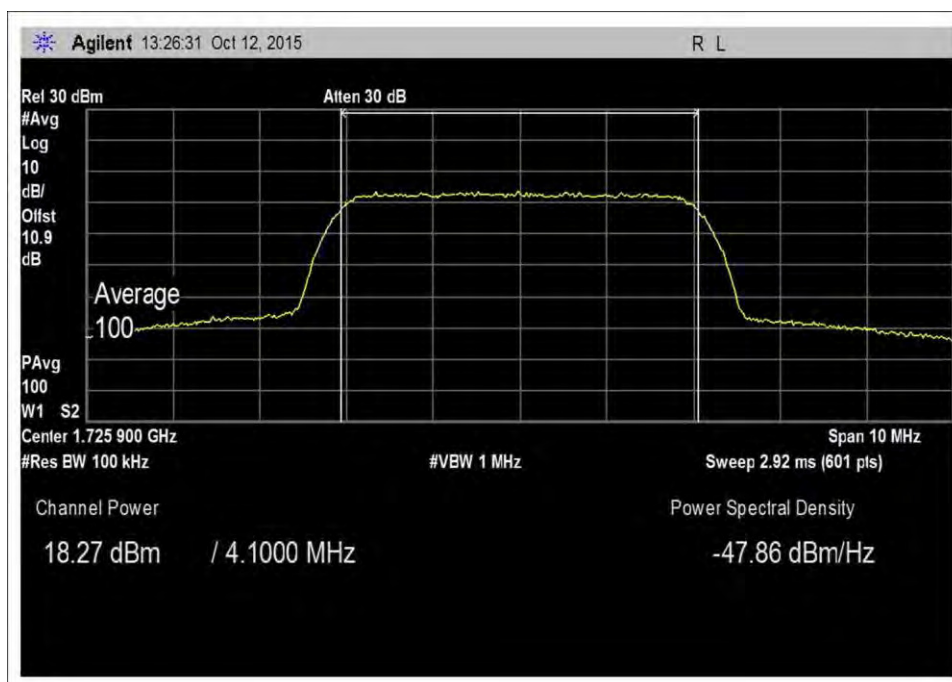
7.2_Power_UL_824-849_AWGN



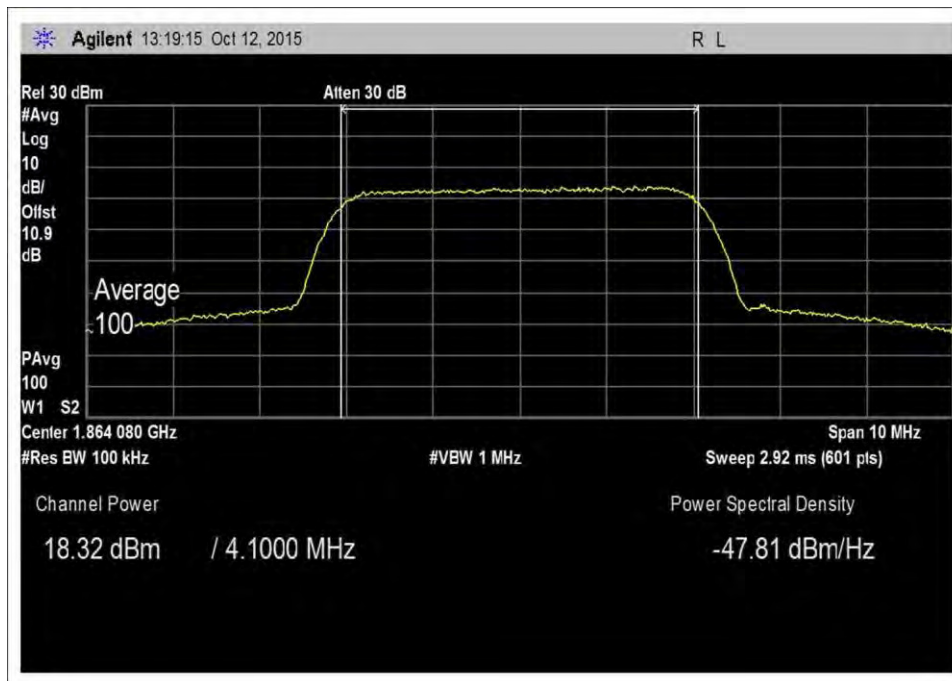
7.2_Power_UL_824-849_AWGN-Max



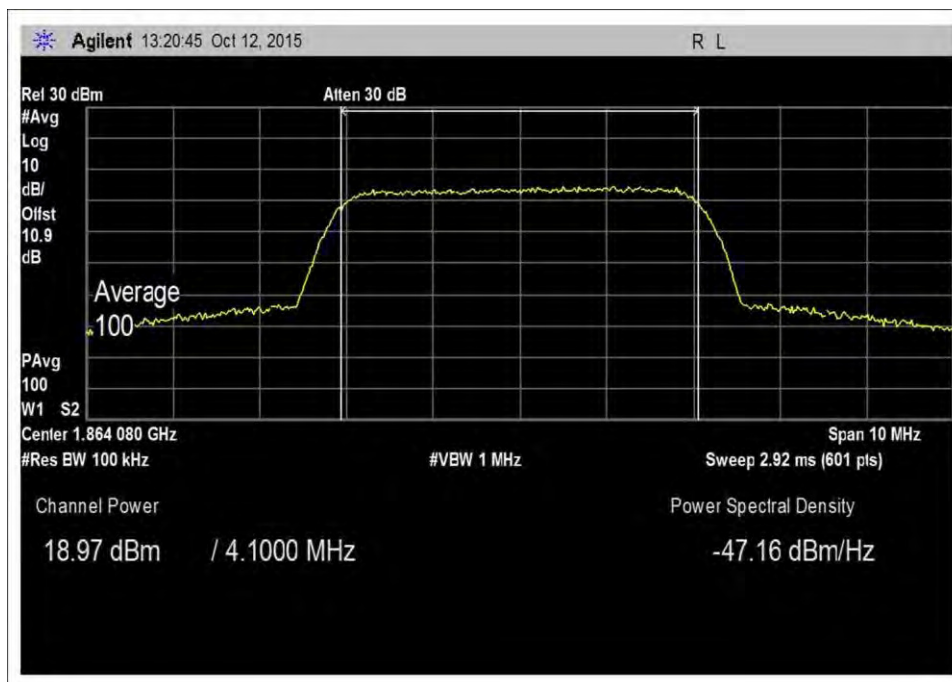
7.2_Power_UL_1710-1755_AWGN



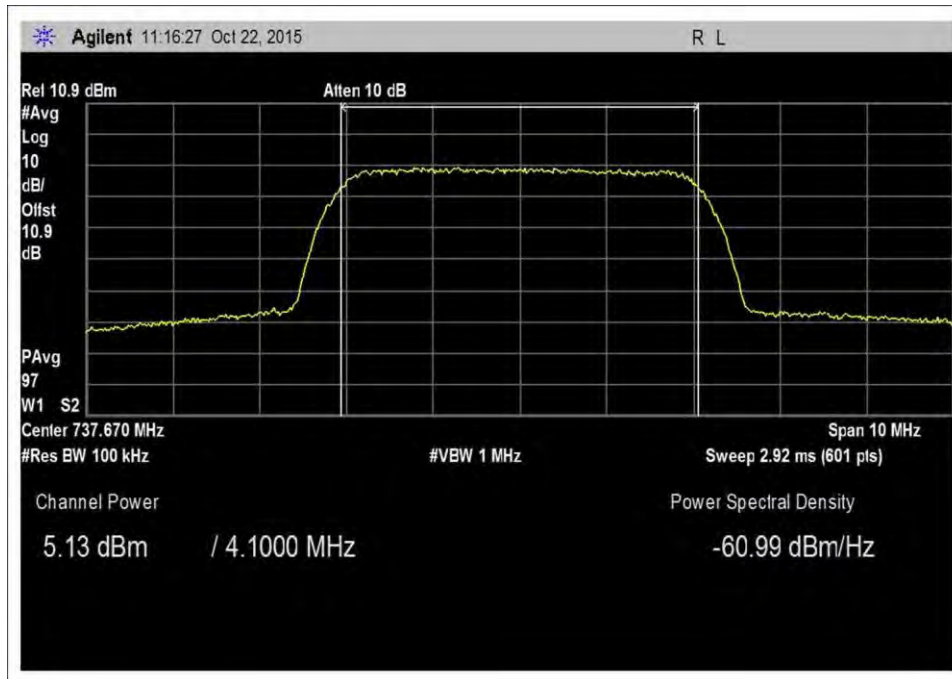
7.2_Power_UL_1710-1755_AWGN-Max



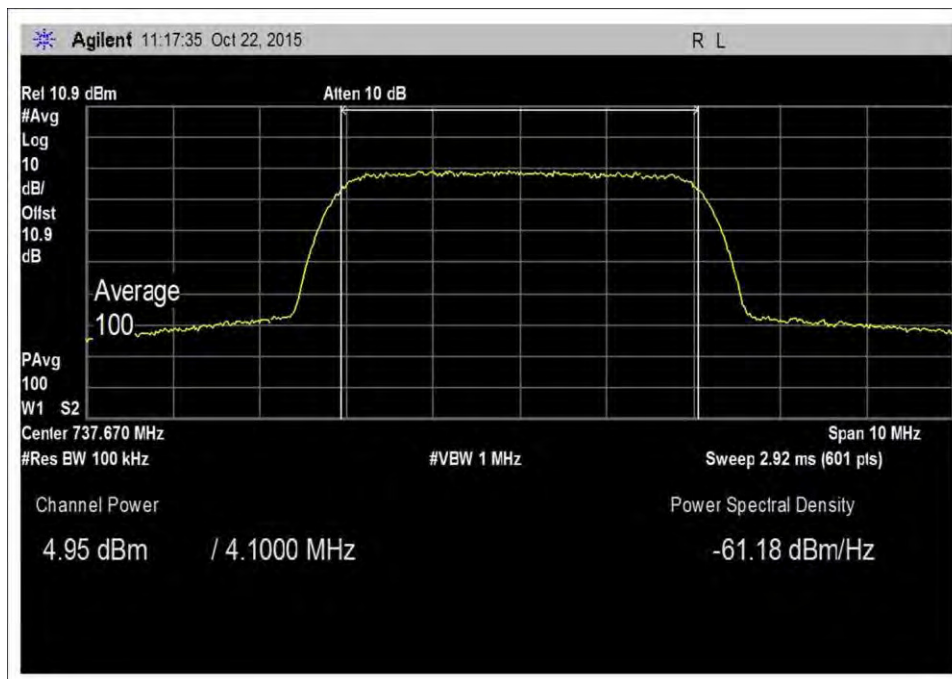
7.2_Power_UL_1850-1915_AWGN



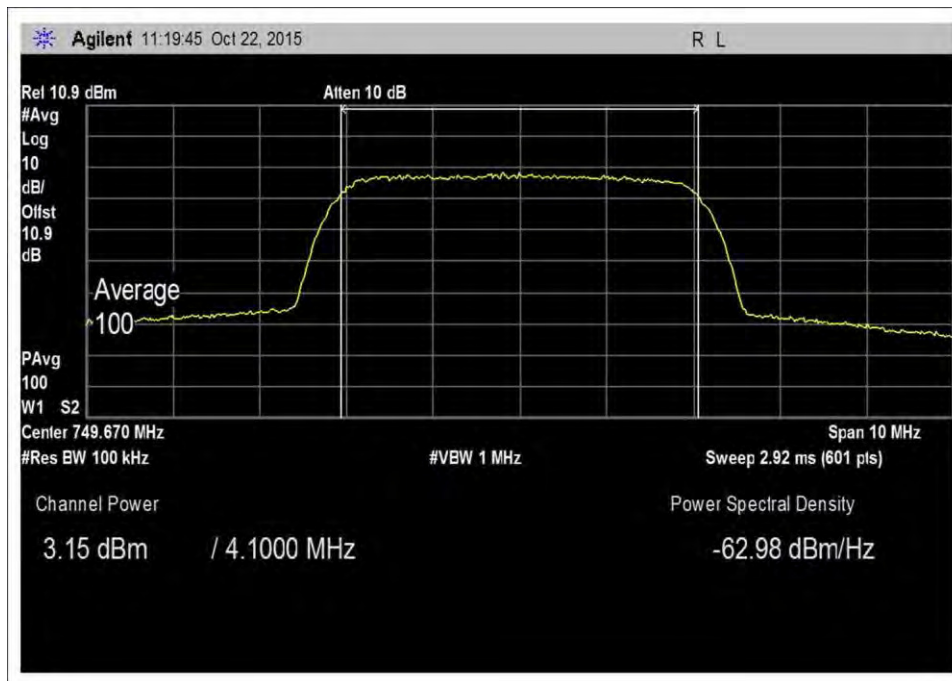
7.2_Power_UL_1850-1915_AWGN-Max



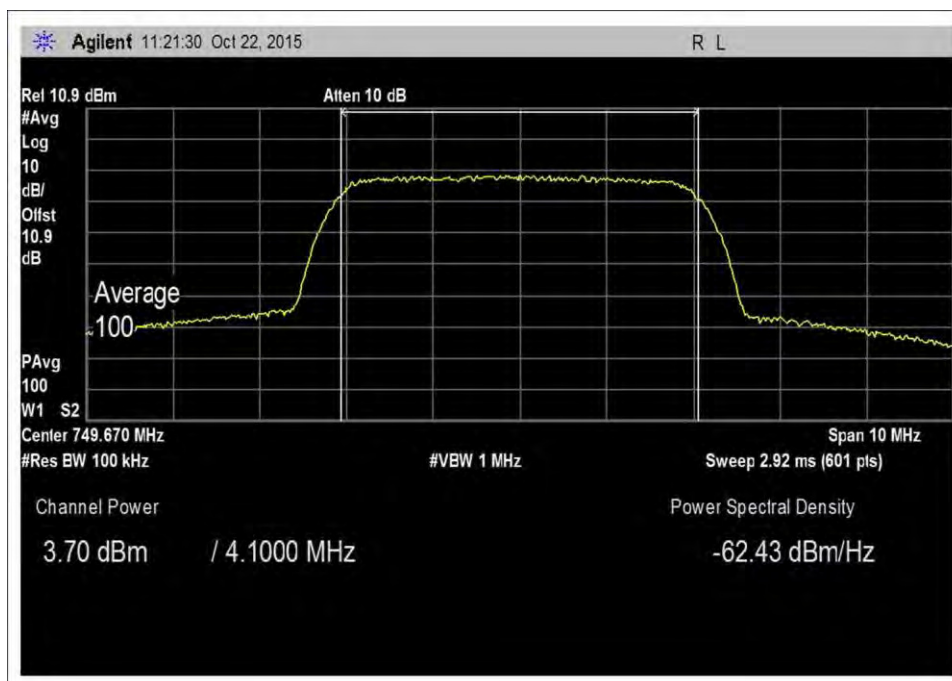
7.2_Power_DL_728-746_AWGN



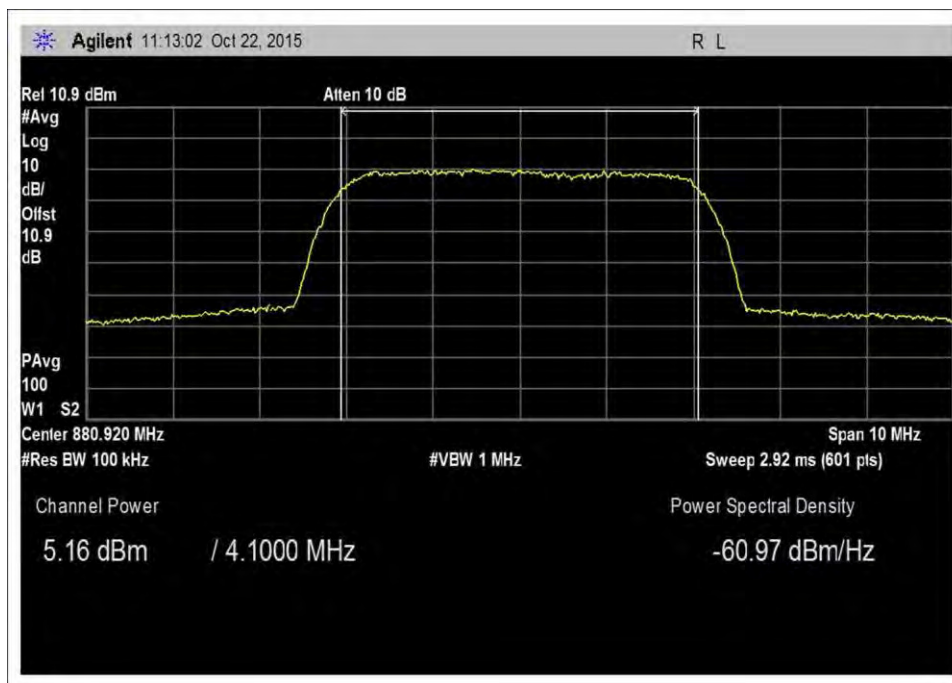
7.2_Power_DL_728-746_AWGN-Max



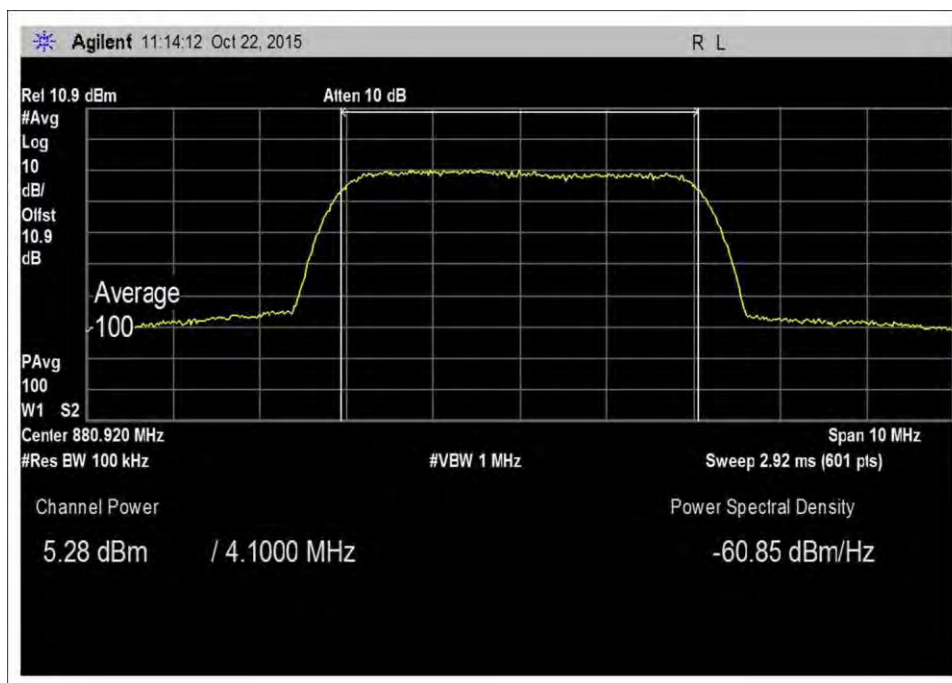
7.2_Power_DL_746-757_AWGN



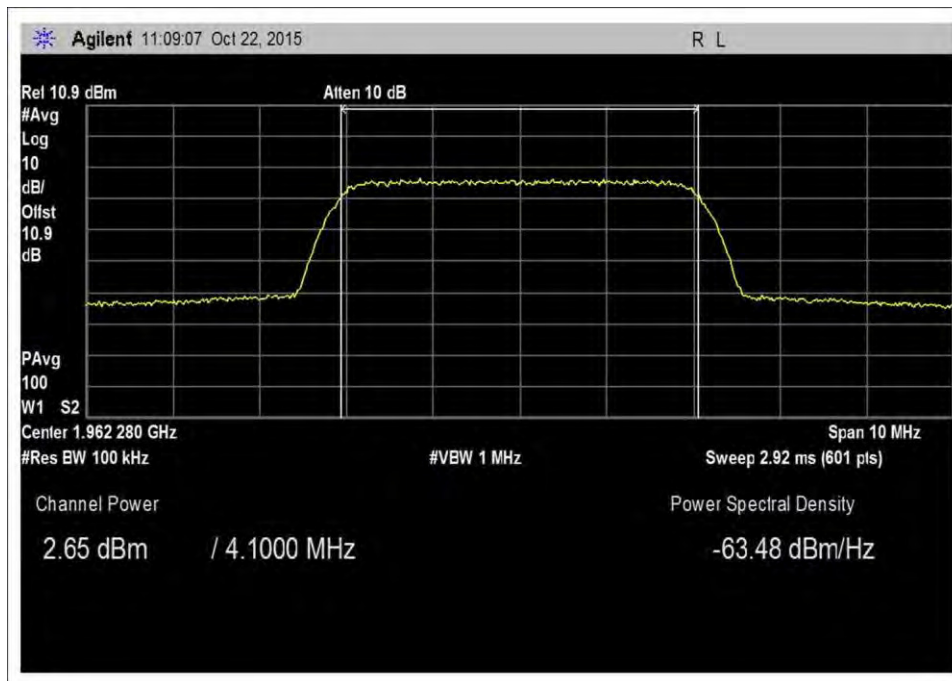
7.2_Power_DL_746-757_AWGN-Max



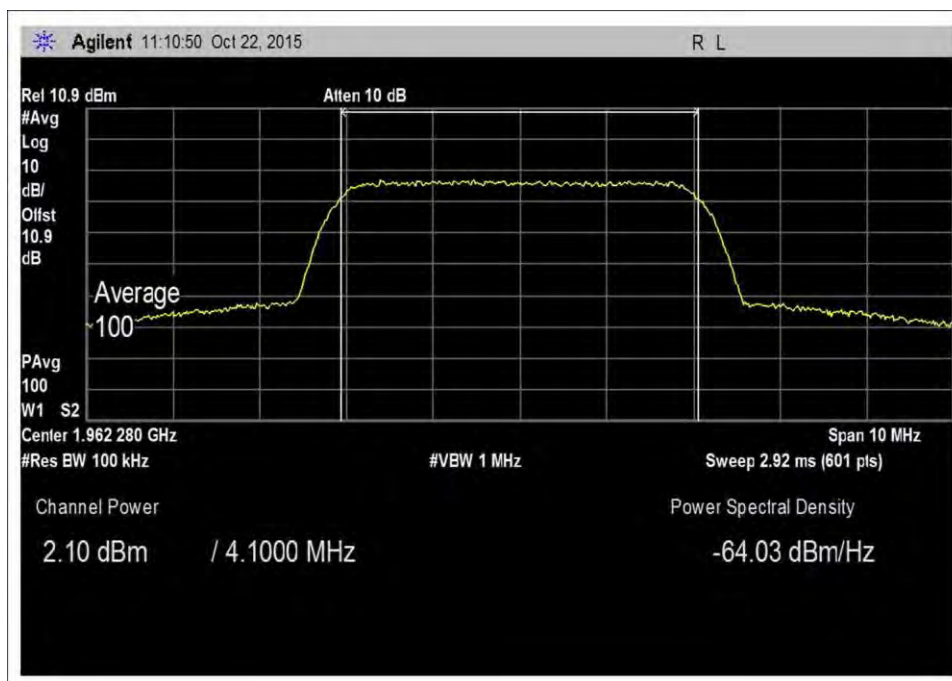
7.2_Power_DL_869-894_AWGN



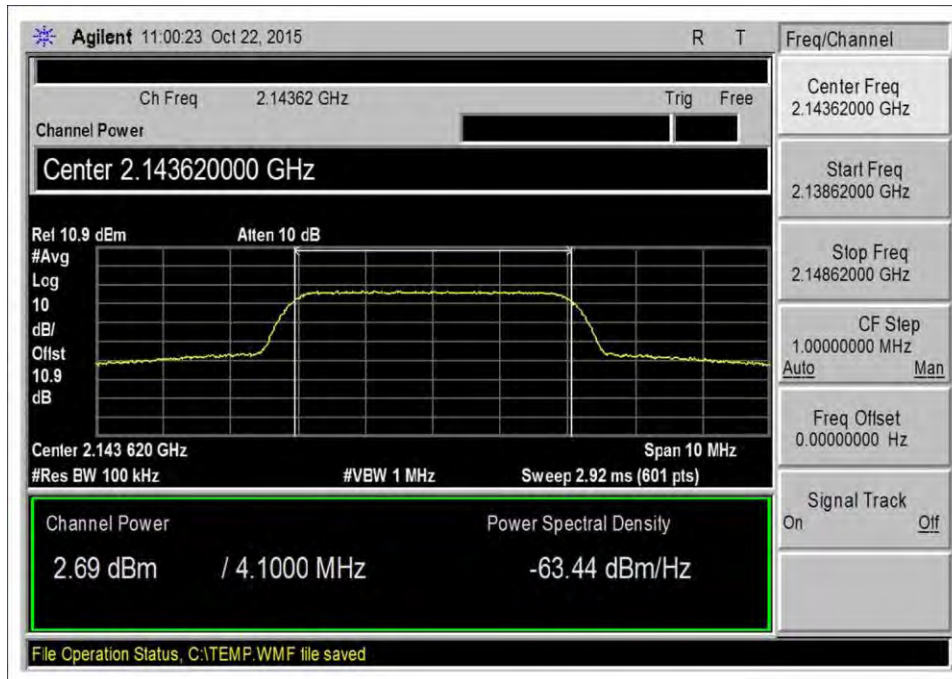
7.2_Power_DL_869-894_AWGN-Max



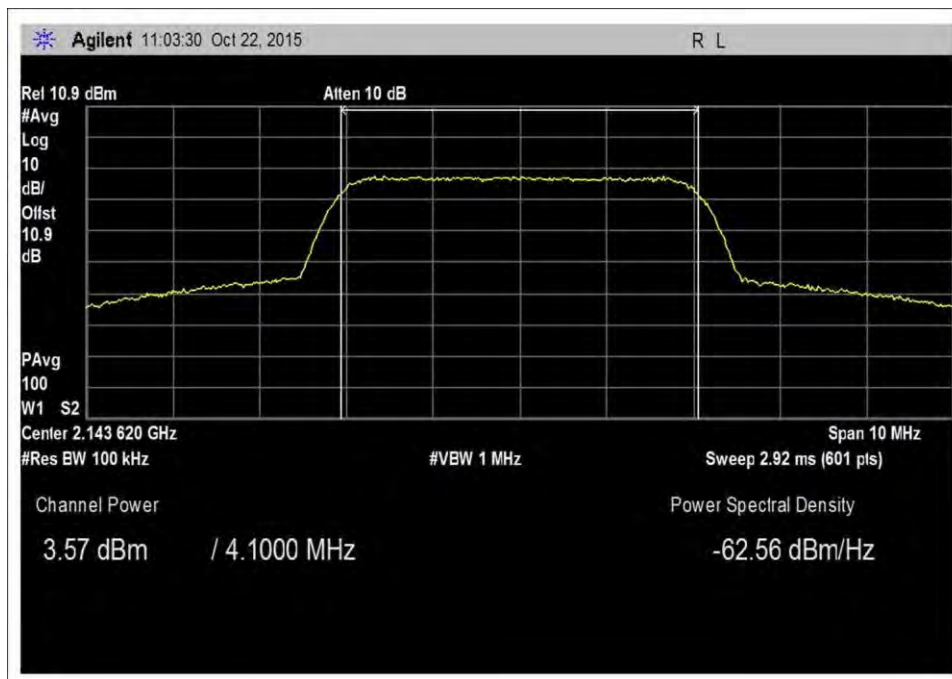
7.2_Power_DL_1930-1995_AWGN



7.2_Power_DL_1930-1995_AWGN-Max

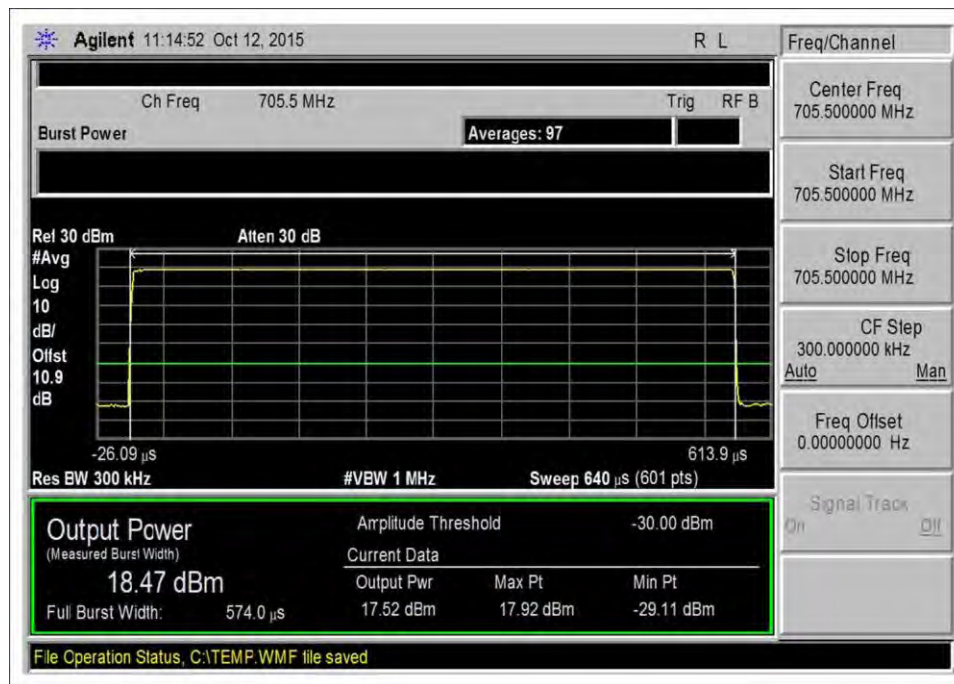


7.2_Power_DL_2110-2155_AWGN

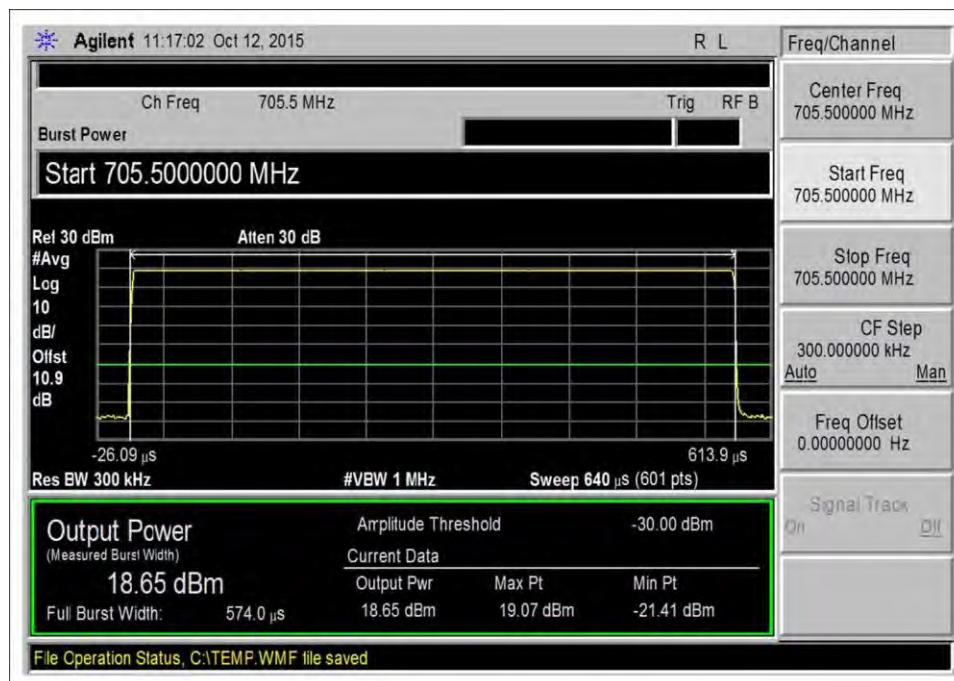


7.2_Power_DL_2110-2155_AWGN-Max

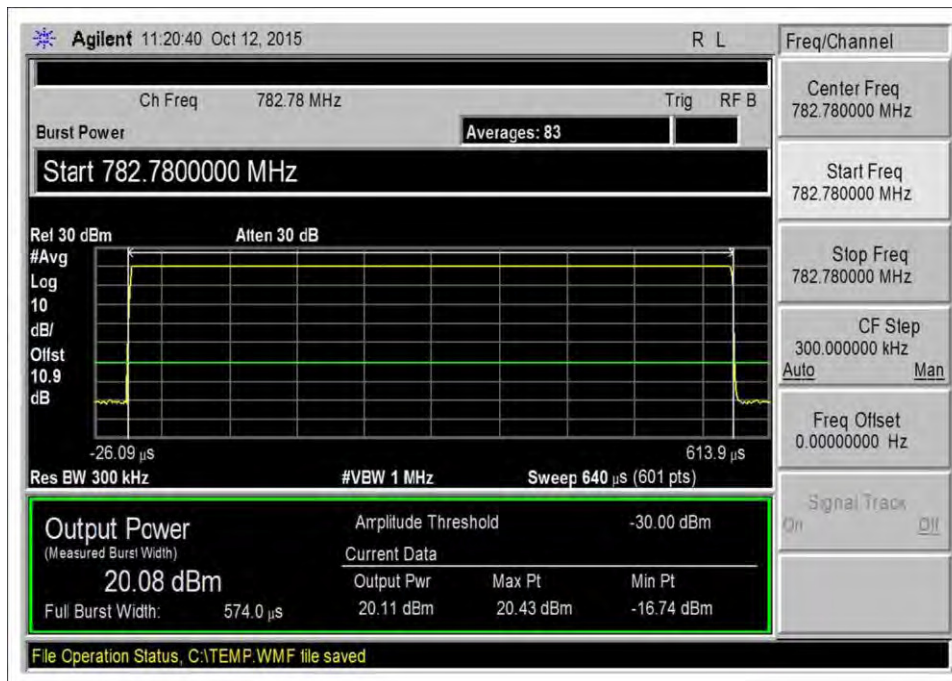
GSM



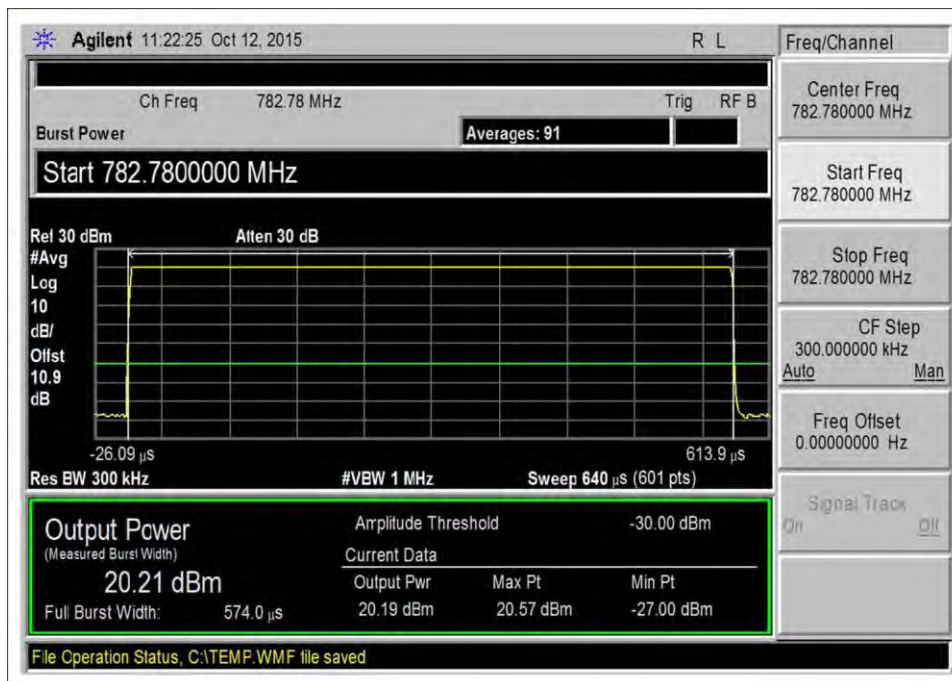
7.2_Power_UL_698-716_GSM



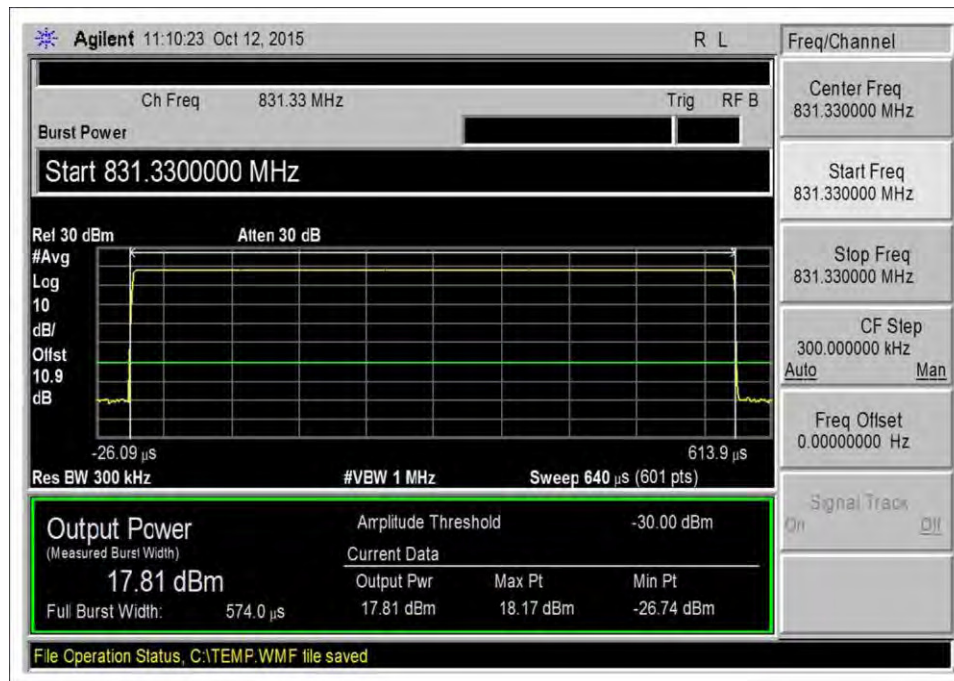
7.2_Power_UL_698-716_GSM-Max



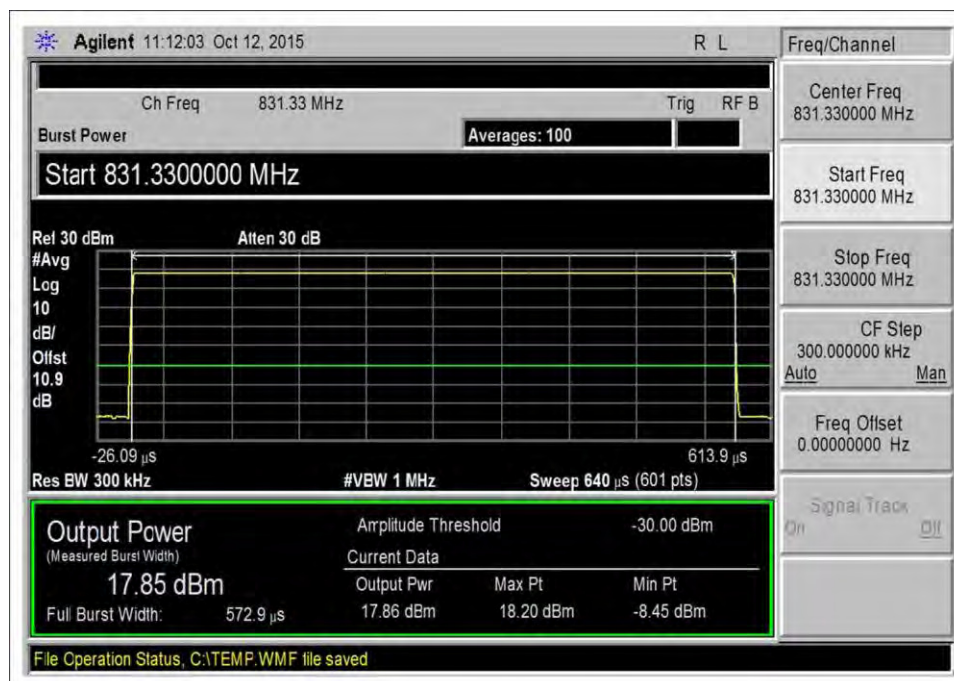
7.2_Power_UL_776-787_GSM



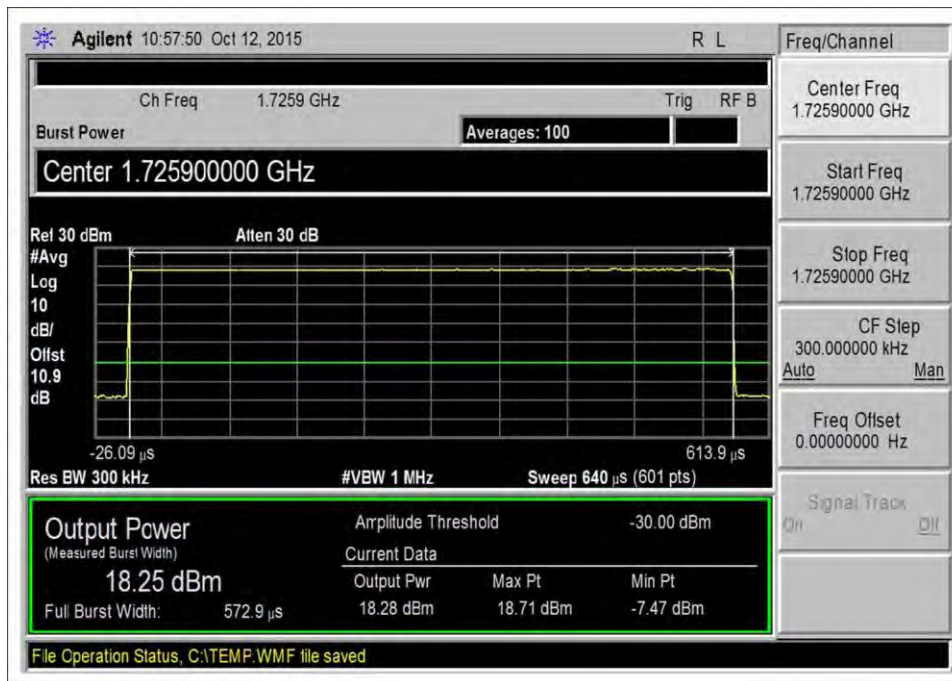
7.2_Power_UL_776-787_GSM-Max



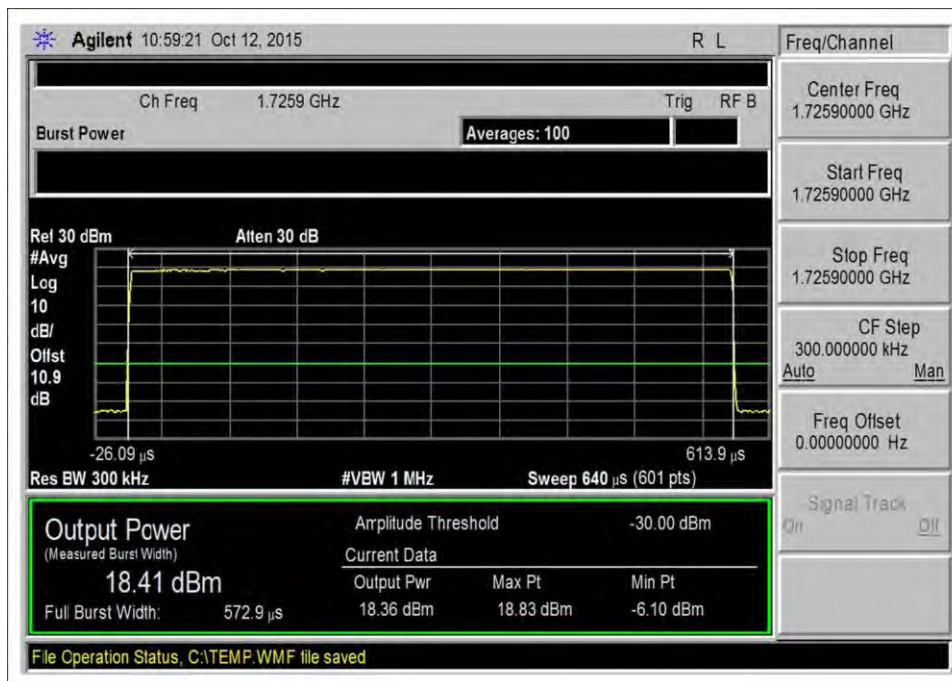
7.2_Power_UL_824-849_GSM



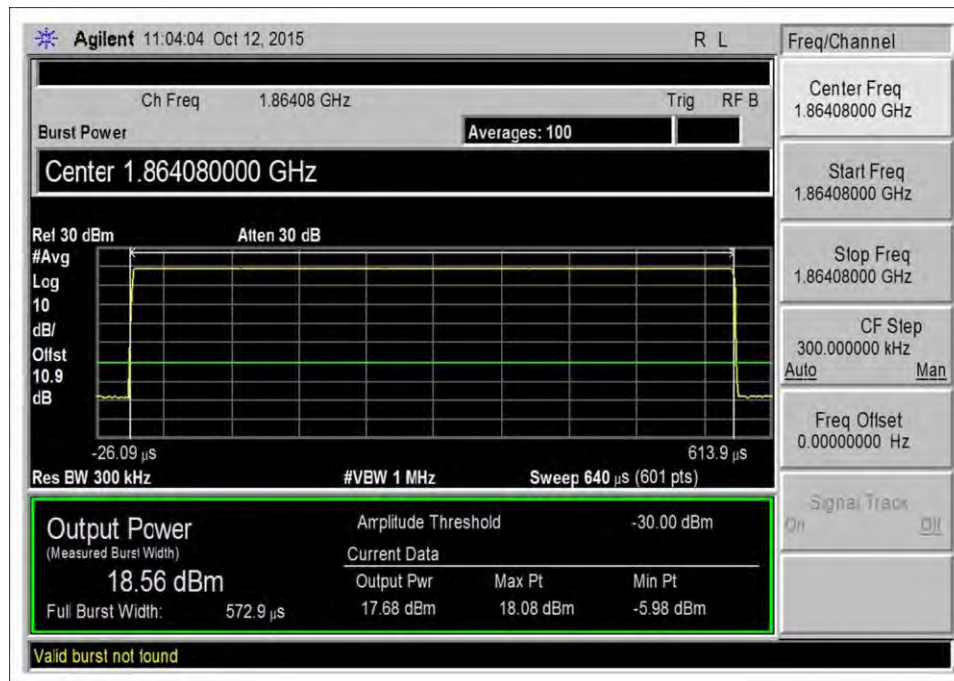
7.2_Power_UL_824-849_GSM-Max



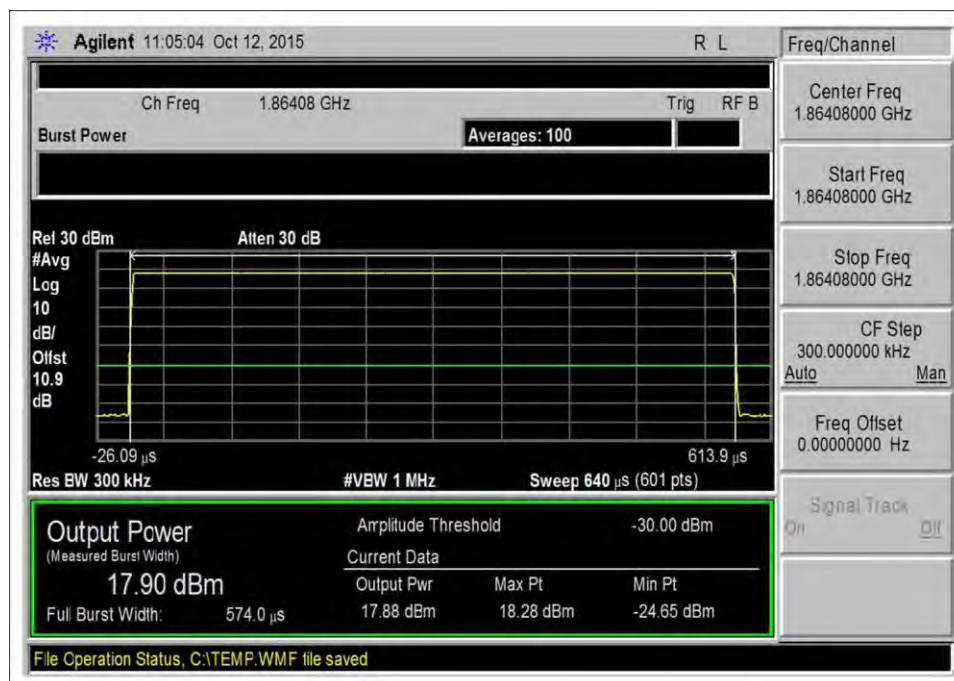
7.2_Power_UL_1710-1755_GSM



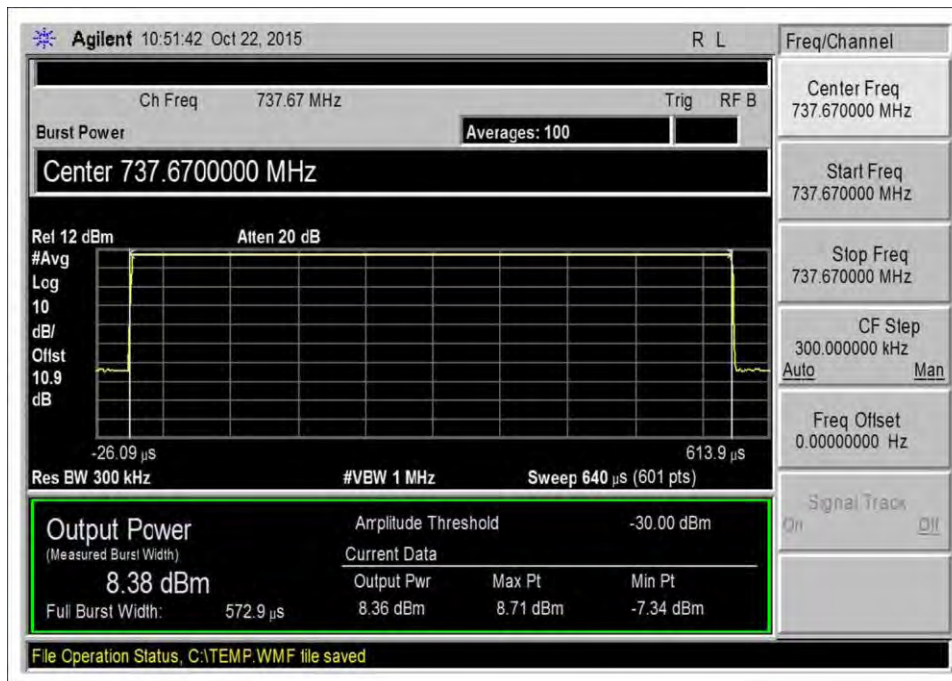
7.2_Power_UL_1710-1755_GSM-Max



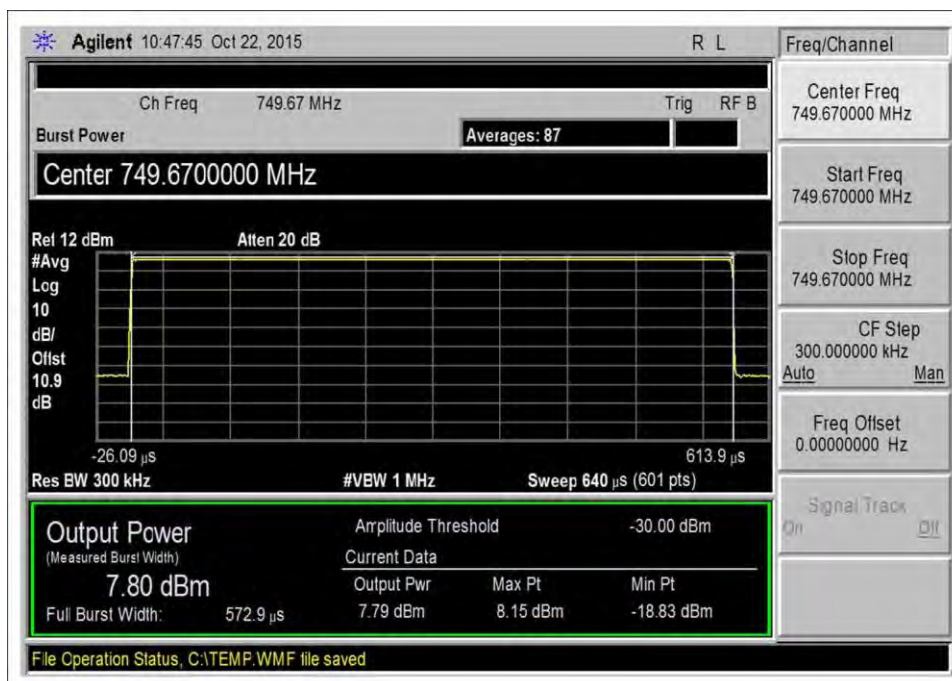
7.2_Power_UL_1850-1915_GSM



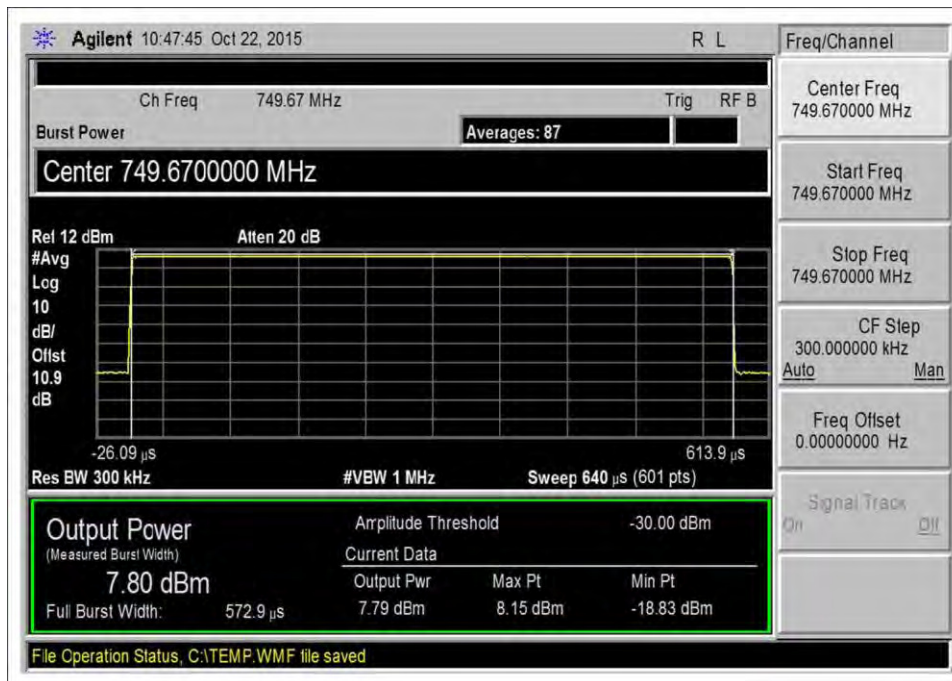
7.2_Power_UL_1850-1915_GSM-Max



7.2_Power_DL_728-746_GSM



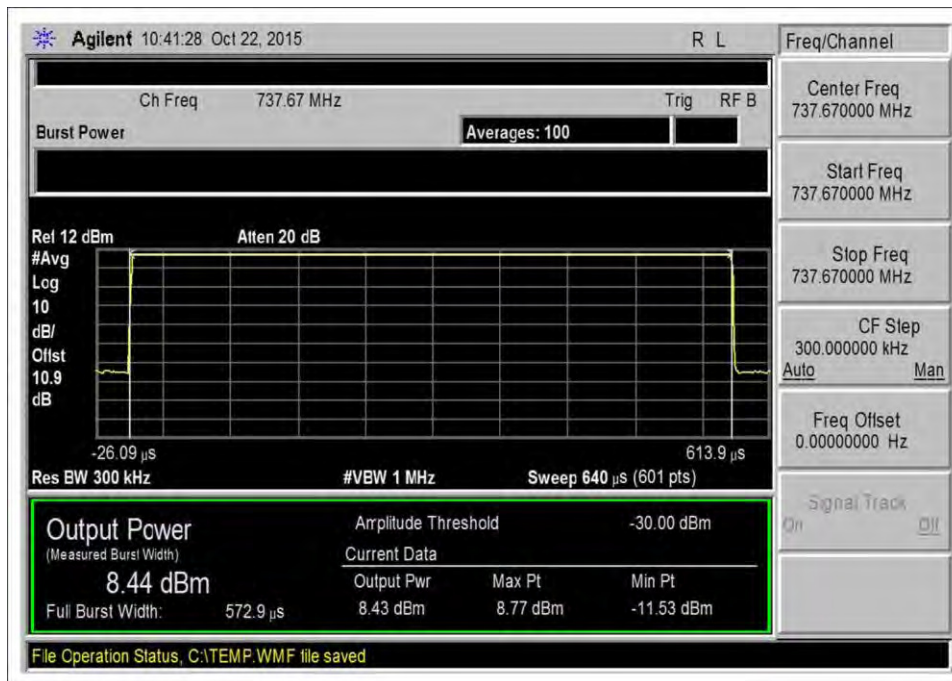
7.2_Power_DL_728-746_GSM-Max



7.2_Power_DL_746-757_GSM



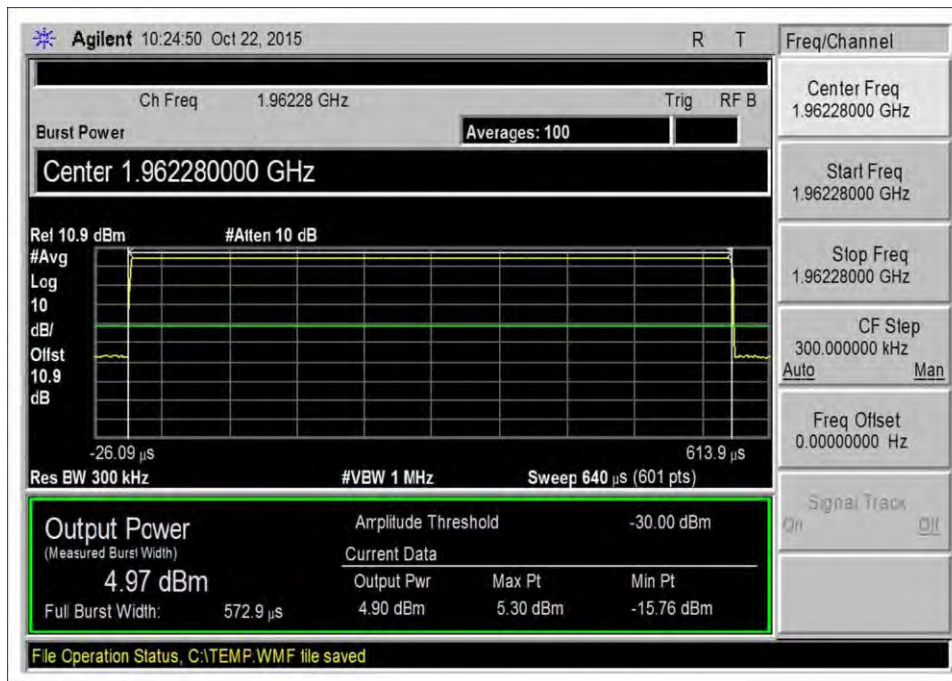
7.2_Power_DL_746-757_GSM-Max



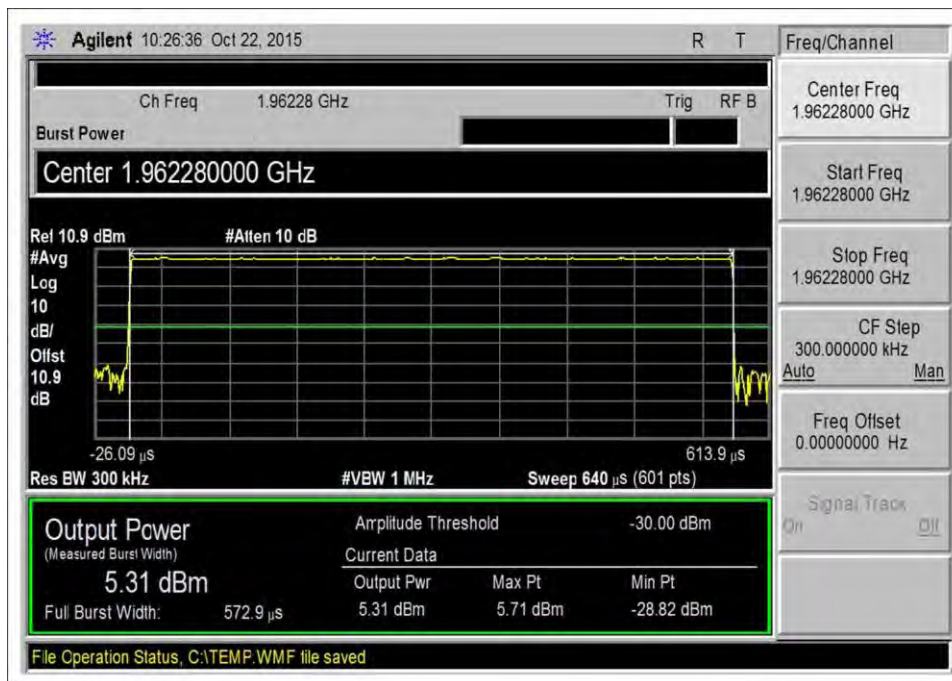
7.2_Power_DL_869-894_GSM



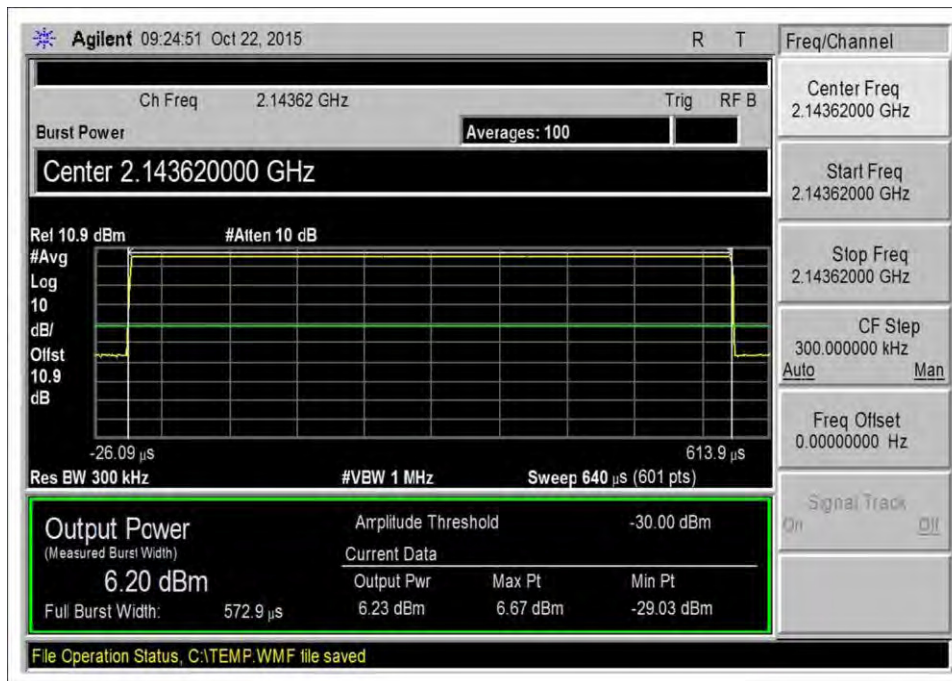
7.2_Power_DL_869-894_GSM-Max



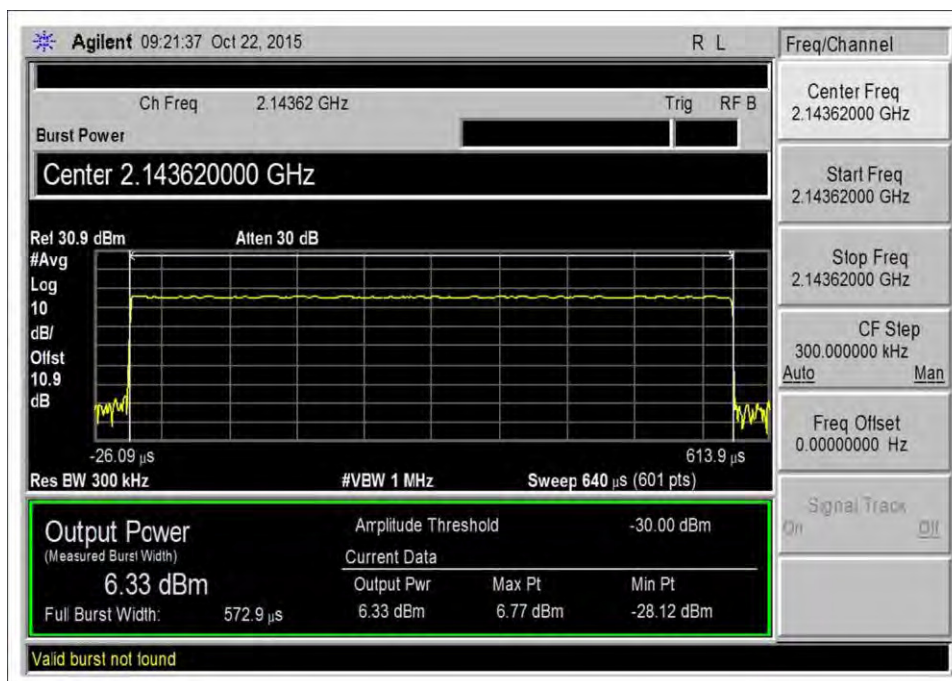
7.2_Power_DL_1930-1995_GSM



7.2_Power_DL_1930-1995_GSM-Max



7.2_Power_DL_2110-2155_GSM



7.2_Power_DL_2110-2155_GSM-Max

7.3 Maximum Gain

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.3 Maximum Booster Gain**
 Work Order #: **97491** Date: 10/12/2015
 Test Type: **Conducted Emissions** Time: 10:57:50
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed CMRS Wideband Consumer Booster with a Wi-Fi Router and TV amplifier installed. The CMRS DL signal and the Wi-Fi Signal are combined at the diplexer and transmit via the indoor antenna.

The Consumer booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with Wi-Fi transmitting at Mid channel, 802.11b.

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

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.6°C, Relative Humidity: 42%, Pressure: 101.5kPa

Test procedure: The test was performed in accordance with section 7.3 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015. Firmware: V2.0

Test Equipment:

Asset #	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
ANP06711	Cable	32022-29094K-29094K-132TC	11/21/2014	11/21/2016
AN03470	Spectrum Analyzer	E4440A	12/2/2013	12/2/2015
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

Summary of Results

Pass: Summarized in the table below.

Pre AGC				Pre AGC		
Frequency (MHz)	Input (dBm)	Pulse GSM Output (dBm)	*Gain (dB)	Input (dBm)	4.1 MHz AWGN Output (dBm)	*Gain (dB)
UL1710-1755	-45.5	18.3	63.8	-48.1	18.1	66.2
UL1850-1915	-45.3	18.6	63.9	-45.0	18.3	63.3
UL824-894	-40.6	17.8	58.4	-40.5	18.0	58.5
UL 698-716	-41.0	18.5	59.5	-40.9	18.1	59.0
UL776-787	-40.6	20.1	60.7	-40.2	19.4	59.6
DL2110-2155	-59.0	6.2	65.2	-62.7	2.7	65.4
DL1930-1995	-59.7	5.0	64.7	-63.0	2.7	65.7
DL869-894	-49.6	8.4	58.0	-53.8	5.2	59.0
DL:728-746	-50.5	8.4	58.9	-52.8	5.1	57.9
DL 746-757	-50.0	7.8	57.8	-54.7	3.2	57.9

*Fixed Booster maximum gain shall not exceed $6.5 \text{ dB} + 20 \log_{10}(\text{Frequency})$, where Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

Gain vs Gain	Pulse GSM	4.1MHz AWGN	Limit (dB)
UL gain vs DL gain 1710/2110	-1.5	0.8	9
UL gain vs DL gain 1850/1930	-0.8	-2.3	9
UL gain vs DL gain 824/869	0.4	-0.5	9
UL gain vs DL gain 776/728	0.6	1.1	9
UL gain vs DL gain 776/746	2.9	1.8	9

7.4 Intermodulation Product

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.4 Intermodulation Product**
 Work Order #: **97491** Date: 10/13/2015
 Test Type: **Conducted Emissions** Time: 09:42:47
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed CMRS Wideband Consumer Booster with a Wi-Fi Router and TV amplifier installed. The CMRS DL signal and the Wi-Fi Signal are combined at the diplexer and transmit via the indoor antenna.

The Consumer booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with Wi-Fi transmitting at Mid channel, 802.11b.

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

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.6°C, Relative Humidity: 42%, Pressure: 101.5kPa

The test was performed in accordance with section 7.4 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015. Firmware: V2.0

Test Equipment:

Asset #	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
ANP06711	Cable	32022-29094K-29094K-132TC	11/21/2014	11/21/2016
AN03470	Spectrum Analyzer	E4440A	12/2/2013	12/2/2015
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	01/09/2014	01/9/2016

Summary of Results

Pass: All intermodulation products are measured below -19dbm limit.

Max Inter modulation product			
Frequency (MHz)	Pre AGC (dBm)	AGC+10dB (dBm)	Limit (dBm)
UL1710-1755	-28.0	-27.8	-19.0
UL1850-1915	-26.2	-27.7	-19.0
UL824-894	-32.6	-34.2	-19.0
UL 698-716	-33.1	-33.2	-19.0
UL776-787	-28.6	-28.7	-19.0
DL2110-2155	-40.1	-39.9	-19.0
DL1930-1995	-49.3	-45.7	-19.0
DL869-894	-46.1	-46.3	-19.0
DL:728-746	-50.3	-50.3	-19.0
DL 746-757	-53.0	-50.6	-19.0

Additional Intermodulation products proposed by FCC were measured after raising a KDB inquiry. As shown below, measurements are within limit.

PreAGC

Booster	Wi-Fi	Freq F1	Amp F1	Freq F2	Amp F2	Freq F3	Amp F3	Freq F4	Amp F4
Freq	L M H	2f1-f2	2f1-f2	(2f1+f2)*	2f1+f2	2f2-f1	2f2-f1	2f2+f1	2f2+f1
(MHz)	(MHz)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)
728	2412	956	-95.14	3868	-93.94	4096	-93.21	5552	-94.12
746	2412	920	-95.01	3904	-93.37	4078	-93.4	5570	-94.3
757	2412	898	-62.34	3926	-93.1	4067	-93.7	5581	-94.45
869	2412	674	-94.8	4150	-93.8	3955	-92.98	5693	-93.46
894	2412	624	-94.57	4200	-93.79	3930	-93	5718	-93.65
1930	2412	1448	-95.14	6272	-93.81	2894	-61.24	6754	-92.09
1995	2412	1578	-95.09	6402	-93.95	2829	-65.15	6819	-91.61
2110	2412	1808	-90.42	6632	-92.63	2714	-57.44	6934	-91.98
2155	2412	1898	-94.43	6722	-92.74	2669	-58.06	6979	-92.49
728	2437	981	-95.18	3893	-94.34	4146	-94.61	5602	-95.3
746	2437	945	-94.33	3929	-94.25	4128	-95.06	5620	-94.87
757	2437	923	-66.18	3951	-94.6	4117	-94.85	5631	-95.08
869	2437	699	-95.42	4175	-94.79	4005	-93.98	5743	-95.18
894	2437	649	-95.37	4225	-95.01	3980	-94.37	5768	-94.92
1930	2437	1423	-95.75	6297	-94.49	2944	-57.9	6804	-93.16
1995	2437	1553	-95.22	6427	-95.06	2879	-62.02	6869	-92.66
2110	2437	1783	-95.4	6657	-93.54	2764	-54.86	6984	-92.44
2155	2437	1873	-95.1	6747	-92.93	2719	-54.31	7029	-92.81
728	2462	1006	-94.94	3918	-93.53	4196	-93.43	5652	-93.78
746	2462	970	-94.63	3954	-93.15	4178	-94.14	5670	-94.03
757	2462	948	-74.97	3976	-93.51	4167	-93.94	5681	-93.84
869	2462	724	-81.52	4200	-93.71	4055	-92.65	5793	-93.46
894	2462	674	-87.12	4250	-93.5	4030	-93.11	5818	-93.93
1930	2462	1398	-95.29	6322	-93.88	2994	-78.04	6854	-92.12
1995	2462	1528	-95.4	6452	-93.3	2929	-81.74	6919	-92.08
2110	2462	1758	-95.28	6682	-92.79	2814	-71.75	7034	-91.2
2155	2462	1848	-94.55	6772	-91.93	2769	-75.14	7079	-90.01

PreAGC

Booster	Wi-Fi	Freq F5	Amp F5	Freq F6	Amp F6	Freq F7	Amp F7	Freq F8	Amp F8
Freq	L M H	3f1-2f2	3f1-2f2	3f1+2f2	3f1+2f2	3f2-2f1	3f2-2f1	3f2+2f1	3f2+2f1
(MHz)	(MHz)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)
728	2412	2640	-94.49	7008	-91.91	5780	-94.18	8692	-92.6
746	2412	2586	-87.25	7062	-91.96	5744	-94.07	8728	-93
757	2412	2553	-83.35	7095	-91.45	5722	-94.16	8750	-93.3
869	2412	2217	-94.01	7431	-91.83	5498	-93.46	8974	-93.2
894	2412	2142	-62.7	7506	-91.74	5448	-93.74	9024	-93
1930	2412	966	-94.59	10614	-92.64	3376	-93	11096	-92.5
1995	2412	1161	-95.46	10809	-92.43	3246	-92.14	11226	-93.2
2110	2412	1506	-86.32	11154	-92.82	3016	-93.01	11456	-93.1
2155	2412	1641	-95.63	11289	-92.75	2926	-93.66	11546	-92.5
728	2437	2690	-95.05	7058	-91.61	5855	-94.37	8767	-94
746	2437	2636	-94.94	7112	-91.74	5819	-95.21	8803	-94.7
757	2437	2603	-85.9	7145	-92.29	5797	-94.96	8825	-94.1
869	2437	2267	-82.94	7481	-92.42	5573	-95.52	9049	-94.2
894	2437	2192	-95.08	7556	-92.61	5523	-94.51	9099	-94
1930	2437	916	-95.68	10664	-93.69	3451	-93.36	11171	-93.8
1995	2437	1111	-95.83	10859	-93.74	3321	-93.28	11301	-93.4
2110	2437	1456	-96.04	11204	-93.96	3091	-93.21	11531	-93.3
2155	2437	1591	-95.48	11339	-93.54	3001	-93.66	11621	-93.5
728	2462	2740	-92.35	7108	-90.71	5930	-93.73	8842	-92.9
746	2462	2686	-93.67	7162	-91.29	5894	-93.5	8878	-92.5
757	2462	2653	-94.13	7195	-91.34	5872	-93.86	8900	-92.6
869	2462	2317	-68.67	7531	-90.93	5648	-93.95	9124	-92.8
894	2462	2242	-93.38	7606	-91.97	5598	-93.89	9174	-93.4
1930	2462	866	-69.51	10714	-93.12	3526	-92.27	11246	-93
1995	2462	1061	-94.8	10909	-93.23	3396	-92.68	11376	-93.4
2110	2462	1406	-95.05	11254	-91.83	3166	-92.15	11606	-91.8
2155	2462	1541	-94.6	11389	-93	3076	-90.98	11696	-93.2

PreAGC

Booster	Wi-Fi	Margin	Margin	Margin	Margin	Margin	Margin	Margin	Margin
Freq	L M H	F1	F2	F3	F4	F5	F6	F7	F8
(MHz)	(MHz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
728	2412	-76.1	-74.9	-74.2	-75.1	-75.5	-72.9	-75.2	-73.58
746	2412	-76	-74.4	-74.4	-75.3	-68.3	-73	-75.1	-74
757	2412	-43.3	-74.1	-74.7	-75.5	-64.4	-72.5	-75.2	-74.34
869	2412	-75.8	-74.8	-74	-74.5	-75	-72.8	-74.5	-74.16
894	2412	-75.6	-74.8	-74	-74.7	-43.7	-72.7	-74.7	-74.02
1930	2412	-76.1	-74.8	-42.2	-73.1	-75.6	-73.6	-74	-73.51
1995	2412	-76.1	-75	-46.2	-72.6	-76.5	-73.4	-73.1	-74.2
2110	2412	-71.4	-73.6	-38.4	-73	-67.3	-73.8	-74	-74.1
2155	2412	-75.4	-73.7	-39.1	-73.5	-76.6	-73.8	-74.7	-73.51
728	2437	-76.2	-75.3	-75.6	-76.3	-76.1	-72.6	-75.4	-75.03
746	2437	-75.3	-75.3	-76.1	-75.9	-75.9	-72.7	-76.2	-75.67
757	2437	-47.2	-75.6	-75.9	-76.1	-66.9	-73.3	-76	-75.06
869	2437	-76.4	-75.8	-75	-76.2	-63.9	-73.4	-76.5	-75.21
894	2437	-76.4	-76	-75.4	-75.9	-76.1	-73.6	-75.5	-75.02
1930	2437	-76.8	-75.5	-38.9	-74.2	-76.7	-74.7	-74.4	-74.78
1995	2437	-76.2	-76.1	-43	-73.7	-76.8	-74.7	-74.3	-74.37
2110	2437	-76.4	-74.5	-35.9	-73.4	-77	-75	-74.2	-74.34
2155	2437	-76.1	-73.9	-35.3	-73.8	-76.5	-74.5	-74.7	-74.54
728	2462	-75.9	-74.5	-74.4	-74.8	-73.4	-71.7	-74.7	-73.86
746	2462	-75.6	-74.2	-75.1	-75	-74.7	-72.3	-74.5	-73.5
757	2462	-56	-74.5	-74.9	-74.8	-75.1	-72.3	-74.9	-73.55
869	2462	-62.5	-74.7	-73.7	-74.5	-49.7	-71.9	-75	-73.76
894	2462	-68.1	-74.5	-74.1	-74.9	-74.4	-73	-74.9	-74.39
1930	2462	-76.3	-74.9	-59	-73.1	-50.5	-74.1	-73.3	-73.98
1995	2462	-76.4	-74.3	-62.7	-73.1	-75.8	-74.2	-73.7	-74.37
2110	2462	-76.3	-73.8	-52.8	-72.2	-76.1	-72.8	-73.2	-72.83
2155	2462	-75.6	-72.9	-56.1	-71	-75.6	-74	-72	-74.22

AGC+10dB

Booster	Wi-Fi	Freq F1	Amp F1	Freq F2	Amp F2	Freq F3	Amp F3	Freq F4	Amp F4
Freq	L M H	2f1-f2	2f1-f2	(2f1+f2)*	2f1+f2	2f2-f1	2f2-f1	2f2+f1	2f2+f1
(MHz)	(MHz)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)
728	2412	956	-94.96	3868	-93.6	4096	-93.79	5552	-94.05
746	2412	920	-94.43	3904	-93.43	4078	-93.98	5570	-94.3
757	2412	898	-61.87	3926	-93.43	4067	-93.98	5581	-93.92
869	2412	674	-94.9	4150	-93.93	3955	-93.35	5693	-93.63
894	2412	624	-94.53	4200	-93.76	3930	-93.62	5718	-93.32
1930	2412	1448	-95.02	6272	-94.12	2894	-48.5	6754	-91.9
1995	2412	1578	-94.29	6402	-93.54	2829	-51.43	6819	-92.01
2110	2412	1808	-90.33	6632	-93.15	2714	-46.09	6934	-92.26
2155	2412	1898	-93.94	6722	-92.52	2669	-48.93	6979	-92.46
728	2437	981	-94.31	3893	-93.64	4146	-94.02	5602	-94.37
746	2437	945	-94.33	3929	-93.58	4128	-93.78	5620	-93.85
757	2437	923	-67.32	3951	-93.5	4117	-93.32	5631	-94.36
869	2437	699	-94.99	4175	-94.11	4005	-93.71	5743	-93.8
894	2437	649	-94.24	4225	-93.38	3980	-93.17	5768	-93.68
1930	2437	1423	-94.65	6297	-93.88	2944	-48.08	6804	-92.28
1995	2437	1553	-94.33	6427	-93.82	2879	-51	6869	-91.45
2110	2437	1783	-92.53	6657	-92.87	2764	-46.29	6984	-91.94
2155	2437	1873	-93.59	6747	-92.41	2719	-47.76	7029	-91.66
728	2462	1006	-94.52	3918	-93.24	4196	-93.51	5652	-94.31
746	2462	970	-94.32	3954	-93.29	4178	-93.43	5670	-94.04
757	2462	948	-58.68	3976	-93.14	4167	-93.46	5681	-94.08
869	2462	724	-81.71	4200	-93.35	4055	-93.54	5793	-93.89
894	2462	674	-94.35	4250	-93.59	4030	-93.4	5818	-93.04
1930	2462	1398	-94.42	6322	-94.08	2994	-49.11	6854	-91.79
1995	2462	1528	-94.73	6452	-93.73	2929	-51.68	6919	-92.3
2110	2462	1758	-93.2	6682	-92.36	2814	-43.68	7034	-91.63
2155	2462	1848	-93.97	6772	-92.55	2769	-49.03	7079	-91.12

AGC+10dB

Booster	Wi-Fi	Freq F5	Amp F5	Freq F6	Amp F6	Freq F7	Amp F7	Freq F8	Amp F8
Freq	L M H	3f1-2f2	3f1-2f2	3f1+2f2	3f1+2f2	3f2-2f1	3f2-2f1	3f2+2f1	3f2+2f1
(MHz)	(MHz)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)	(MHz)	(dBm)
728	2412	2640	-94.08	7008	-91.56	5780	-94.37	8692	-92.9
746	2412	2586	-85.16	7062	-91.32	5744	-94.3	8728	-93
757	2412	2553	-72.21	7095	-90.23	5722	-94.25	8750	-92.9
869	2412	2217	-93.9	7431	-91.65	5498	-94.03	8974	-92.9
894	2412	2142	-62.87	7506	-91.53	5448	-94.23	9024	-93.3
1930	2412	966	-94.9	10614	-92.87	3376	-92.53	11096	-92.5
1995	2412	1161	-95.3	10809	-92.88	3246	-92.29	11226	-93
2110	2412	1506	-77.03	11154	-92.68	3016	-93.16	11456	-92.9
2155	2412	1641	-94.62	11289	-92.38	2926	-92.84	11546	-92.7
728	2437	2690	-93.63	7058	-90.97	5855	-93.91	8767	-93.3
746	2437	2636	-93.23	7112	-90.54	5819	-93.18	8803	-93.6
757	2437	2603	-90.49	7145	-91.59	5797	-94.23	8825	-93.6
869	2437	2267	-88.05	7481	-90.34	5573	-94.09	9049	-91.8
894	2437	2192	-93.63	7556	-91.63	5523	-93.76	9099	-92.7
1930	2437	916	-94.61	10664	-92.47	3451	-92.45	11171	-93.3
1995	2437	1111	-94.24	10859	-92.67	3321	-92.96	11301	-92.4
2110	2437	1456	-94.66	11204	-93.28	3091	-91.51	11531	-93.1
2155	2437	1591	-94.9	11339	-92.25	3001	-93	11621	-91.8
728	2462	2740	-93.03	7108	-91.5	5930	-93.54	8842	-93.1
746	2462	2686	-93.73	7162	-90.32	5894	-93.84	8878	-92.4
757	2462	2653	-93.81	7195	-90.95	5872	-93.86	8900	-93.2
869	2462	2317	-68.78	7531	-91.51	5648	-93.91	9124	-93
894	2462	2242	-93.61	7606	-91.94	5598	-94.21	9174	-93.2
1930	2462	866	-68.88	10714	-93.36	3526	-92.2	11246	-92.3
1995	2462	1061	-94.52	10909	-92.68	3396	-92.48	11376	-92.3
2110	2462	1406	-95.11	11254	-92.59	3166	-91.97	11606	-92.1
2155	2462	1541	-94.48	11389	-92.8	3076	-91.43	11696	-93.6

AGC+10dB

Booster	Wi-Fi	Margin	Margin	Margin	Margin	Margin	Margin	Margin	Margin
Freq	L M H	F1	F2	F3	F4	F5	F6	F7	F8
(MHz)	(MHz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
728	2412	-76	-74.6	-74.8	-75.1	-75.1	-72.6	-75.4	-73.89
746	2412	-75.4	-74.4	-75	-75.3	-66.2	-72.3	-75.3	-74.01
757	2412	-42.9	-74.4	-75	-74.9	-53.2	-71.2	-75.3	-73.86
869	2412	-75.9	-74.9	-74.4	-74.6	-74.9	-72.7	-75	-73.88
894	2412	-75.5	-74.8	-74.6	-74.3	-43.9	-72.5	-75.2	-74.25
1930	2412	-76	-75.1	-29.5	-72.9	-75.9	-73.9	-73.5	-73.47
1995	2412	-75.3	-74.5	-32.4	-73	-76.3	-73.9	-73.3	-74.04
2110	2412	-71.3	-74.2	-27.1	-73.3	-58	-73.7	-74.2	-73.85
2155	2412	-74.9	-73.5	-29.9	-73.5	-75.6	-73.4	-73.8	-73.72
728	2437	-75.3	-74.6	-75	-75.4	-74.6	-72	-74.9	-74.27
746	2437	-75.3	-74.6	-74.8	-74.9	-74.2	-71.5	-74.2	-74.56
757	2437	-48.3	-74.5	-74.3	-75.4	-71.5	-72.6	-75.2	-74.57
869	2437	-76	-75.1	-74.7	-74.8	-69.1	-71.3	-75.1	-72.8
894	2437	-75.2	-74.4	-74.2	-74.7	-74.6	-72.6	-74.8	-73.66
1930	2437	-75.7	-74.9	-29.1	-73.3	-75.6	-73.5	-73.5	-74.25
1995	2437	-75.3	-74.8	-32	-72.5	-75.2	-73.7	-74	-73.4
2110	2437	-73.5	-73.9	-27.3	-72.9	-75.7	-74.3	-72.5	-74.13
2155	2437	-74.6	-73.4	-28.8	-72.7	-75.9	-73.3	-74	-72.76
728	2462	-75.5	-74.2	-74.5	-75.3	-74	-72.5	-74.5	-74.09
746	2462	-75.3	-74.3	-74.4	-75	-74.7	-71.3	-74.8	-73.36
757	2462	-39.7	-74.1	-74.5	-75.1	-74.8	-72	-74.9	-74.15
869	2462	-62.7	-74.4	-74.5	-74.9	-49.8	-72.5	-74.9	-73.99
894	2462	-75.4	-74.6	-74.4	-74	-74.6	-72.9	-75.2	-74.21
1930	2462	-75.4	-75.1	-30.1	-72.8	-49.9	-74.4	-73.2	-73.34
1995	2462	-75.7	-74.7	-32.7	-73.3	-75.5	-73.7	-73.5	-73.32
2110	2462	-74.2	-73.4	-24.7	-72.6	-76.1	-73.6	-73	-73.14
2155	2462	-75	-73.6	-30	-72.1	-75.5	-73.8	-72.4	-74.57

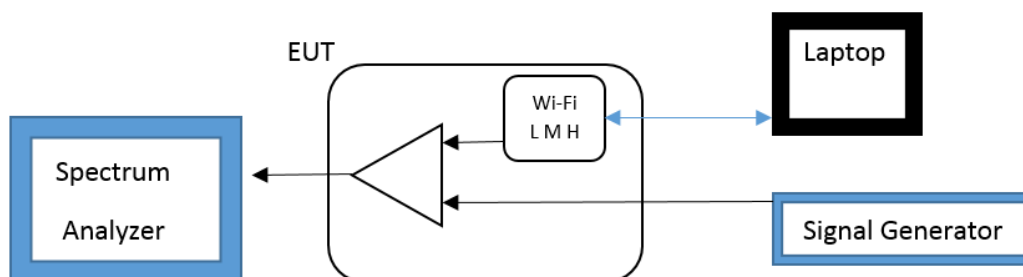
*($2f_1+f_2$) Frequencies proposed by FCC (listed below) has been corrected. Formulas shown below take into account column D instead of C.

Frequency list provided by FCC											Formulas proposed by FCC										
	f1	f2	3rd	2f1+f2	2f1+f2	2f2+f1	5th	3f1-2f2	3f1+2f2	3f2-2f1	3f2+2f1										
	3412	2155	2669	7493	1898	6722	2926	11546	1641	11289											
	3412	2110	2714	7538	1808	6632	3016	11456	1506	11154											
	2437	2155	2719	7593	1879	6747	3001	11621	1591	11339											
	2437	2110	2764	7638	1783	6657	3091	11531	1456	11204											
	2462	2155	2769	7693	1848	6772	3076	11696	1541	11389											
	2462	2110	2814	7738	1758	6682	3166	11606	1406	11254											
	2412	1995	2829	7653	1578	6402	3246	11226	1161	10809											
	2437	1995	2879	7753	1553	6427	3321	11301	1111	10859											
	2412	1930	2894	7718	1448	6272	3376	11096	966	10614											
	2462	1995	2929	7853	1528	6452	3396	11376	1061	10909											
	2437	1930	2944	7818	1423	6297	3451	11171	816	10664											
	2462	1930	2994	7918	1398	6322	3526	11246	866	10714											
	2412	894	3930	8754	624	4200	5448	9024	2142	7506											
	2412	869	3955	8779	674	4150	5498	8974	2217	7481											
	2437	894	3980	8854	649	4225	5523	9099	2192	7556											
	2437	869	4005	8879	699	4175	5573	9049	2267	7481											
	2462	894	4030	8954	674	4250	5598	9174	2242	7606											
	2462	869	4055	8979	724	4200	5648	9124	2317	7531											
	2412	757	4067	8881	888	3926	5722	8750	2553	7095											
	2412	746	4078	8902	920	3904	5744	8728	2586	7062											
	2412	746	4078	8902	920	3904	5744	8728	2586	7062											
	2412	728	4096	8920	956	3868	5780	8692	2640	7008											
	2437	757	4117	8991	923	3951	5797	8825	2603	7145											
	2437	746	4128	9002	945	3929	5819	8803	2636	7112											
	2437	746	4128	9002	945	3929	5819	8803	2636	7112											
	2437	728	4146	9020	981	3893	5855	8767	2690	7058											
	2462	757	4167	9091	948	3976	5872	8900	2653	7195											
	2462	746	4178	9102	970	3954	5894	8878	2686	7162											
	2462	746	4178	9102	970	3954	5894	8878	2686	7162											
	2462	728	4196	9120	1006	3918	5930	8842	2740	7108											

Test procedure for additional intermodulation product testing

Similar test procedure to 7.4 was used to demonstrate compliance to the additional intermodulation products specified by FCC after a KDB inquiry for a fixed wideband consumer signal boosters with Wi-Fi and HDTV built in. Shown below are the main differences:

- Spectrum analyzer is set to the frequency listed on the above table.
- EUT and test equipment are connected as shown in the next figure:

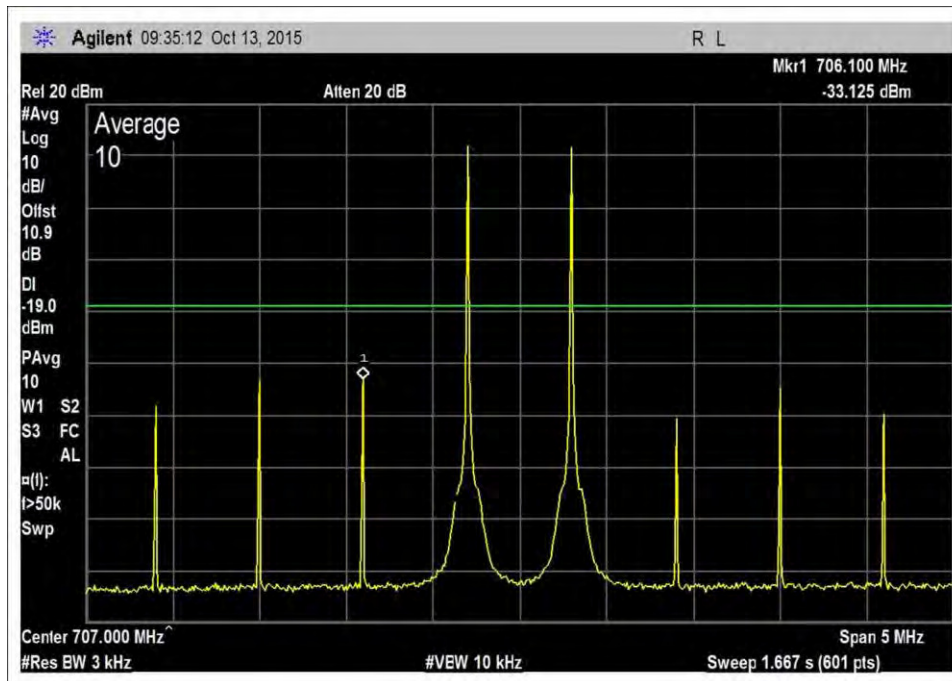


- Laptop is used to select low, medium and high channel and to adjust the worst settings obtained on report 97491-16 for testing the Wi-Fi portion of the EUT (15.247).

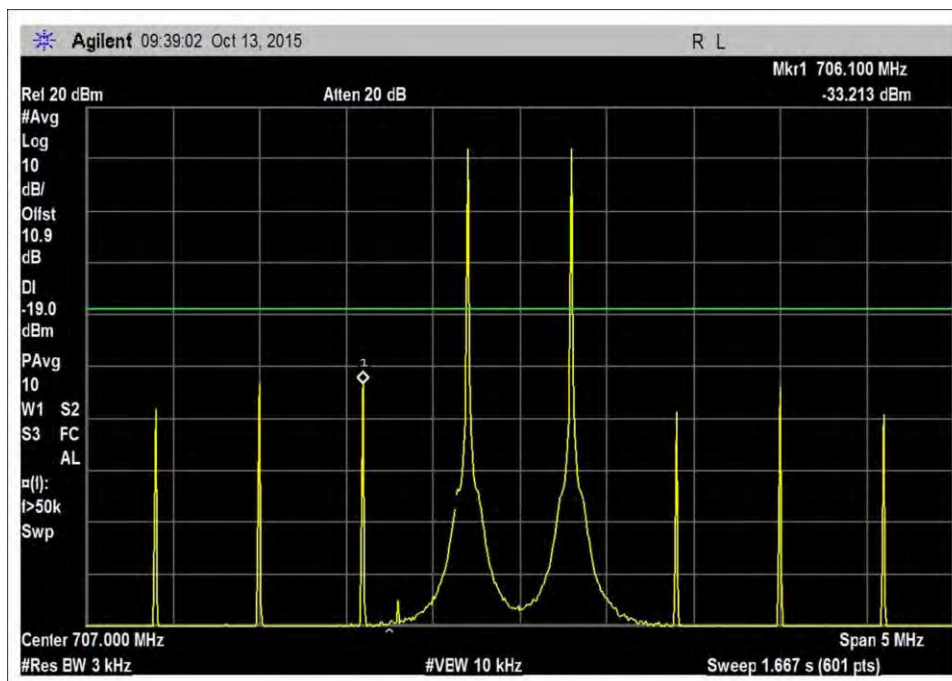
Worst settings: Mode=B, Data rate=2MHz and attenuator=32dB.

- Signal generator amplitude level is set just before the EUT begins AGC.
- Maximum intermodulation product amplitude level observed is recorded for each frequency listed on the above table.
- Test is repeated with AGC+10dB.

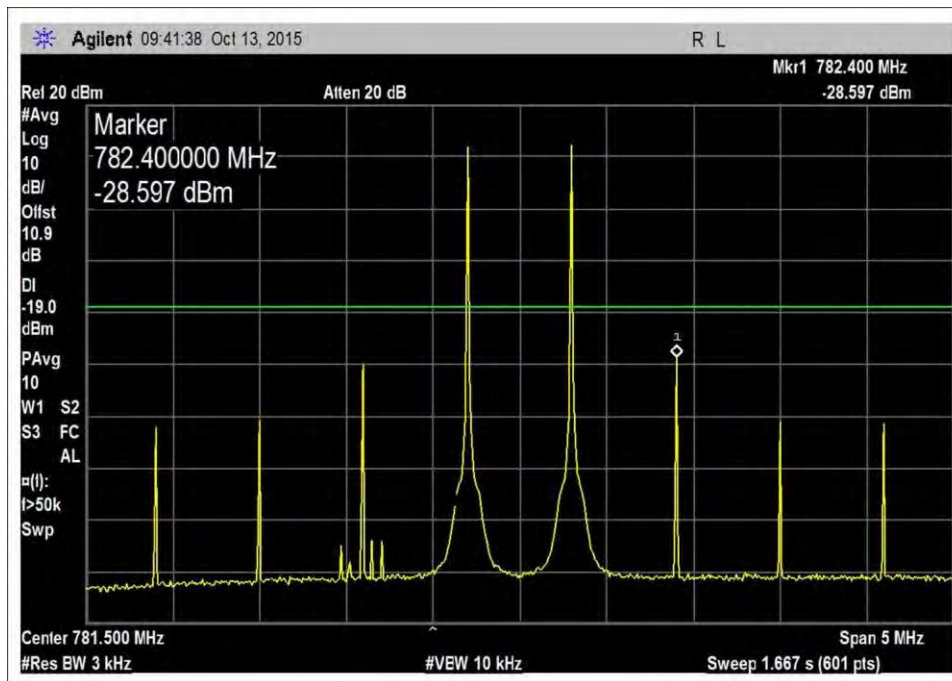
Plots



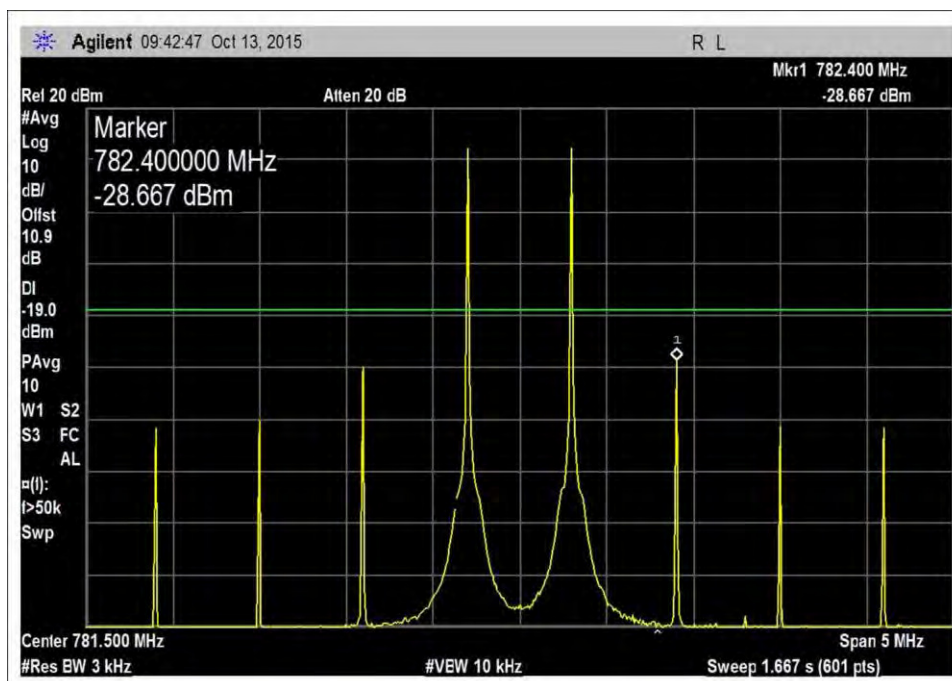
7.4_Intermod_UL_698-716MHz



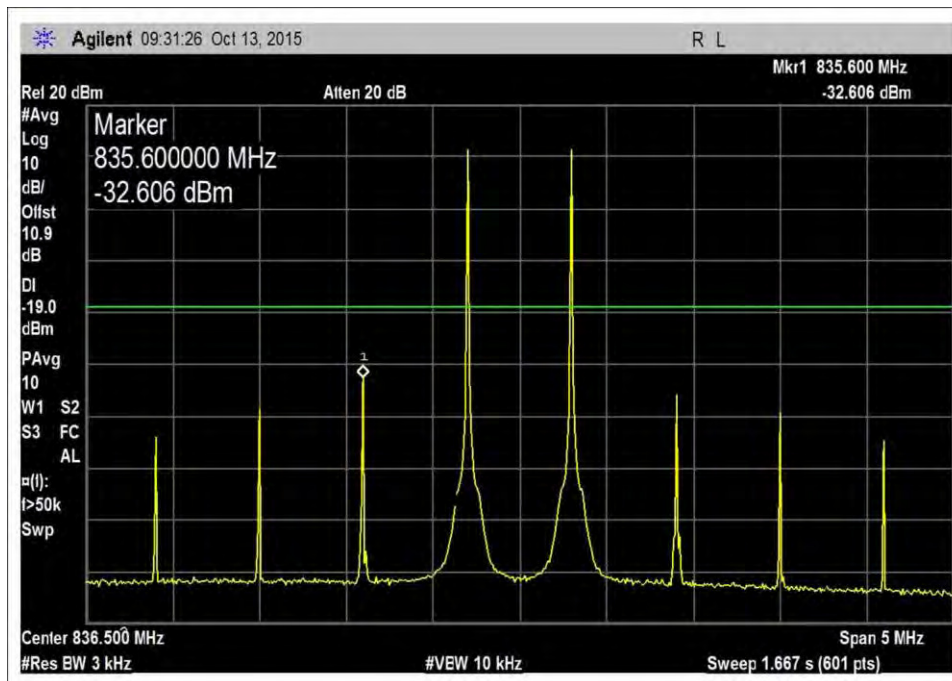
7.4_Intermod_UL_698-716MHz+10dB



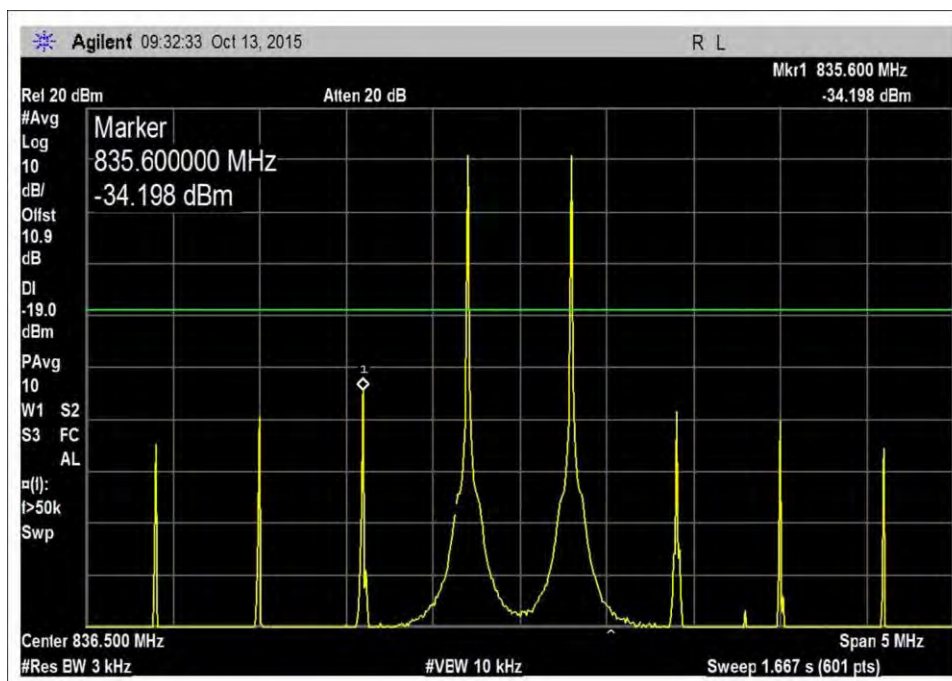
7.4_Intermod_UL_776-787MHz



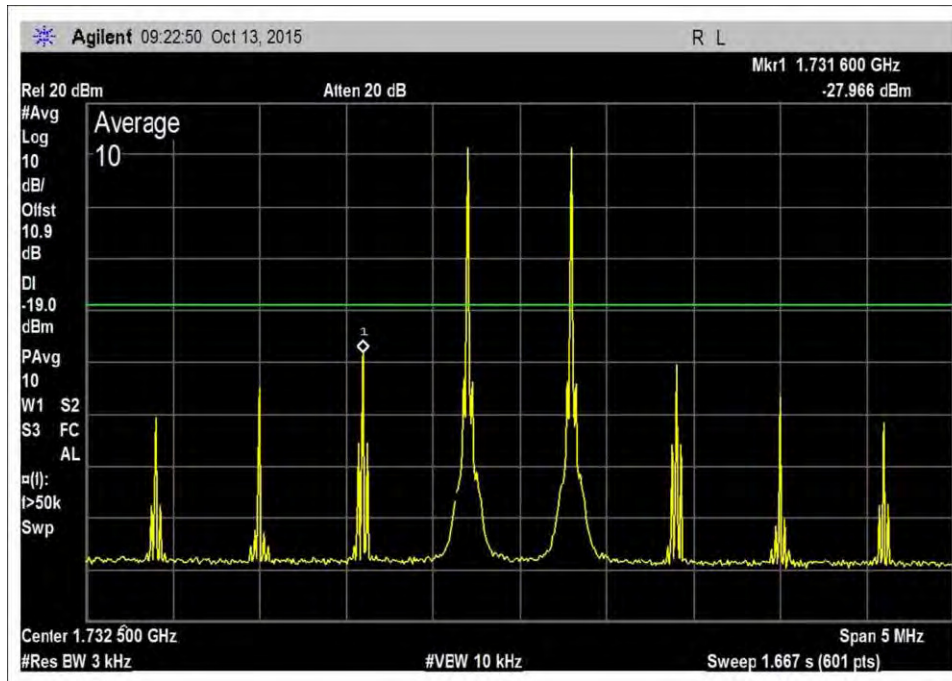
7.4_Intermod_UL_776-787MHz+10dB



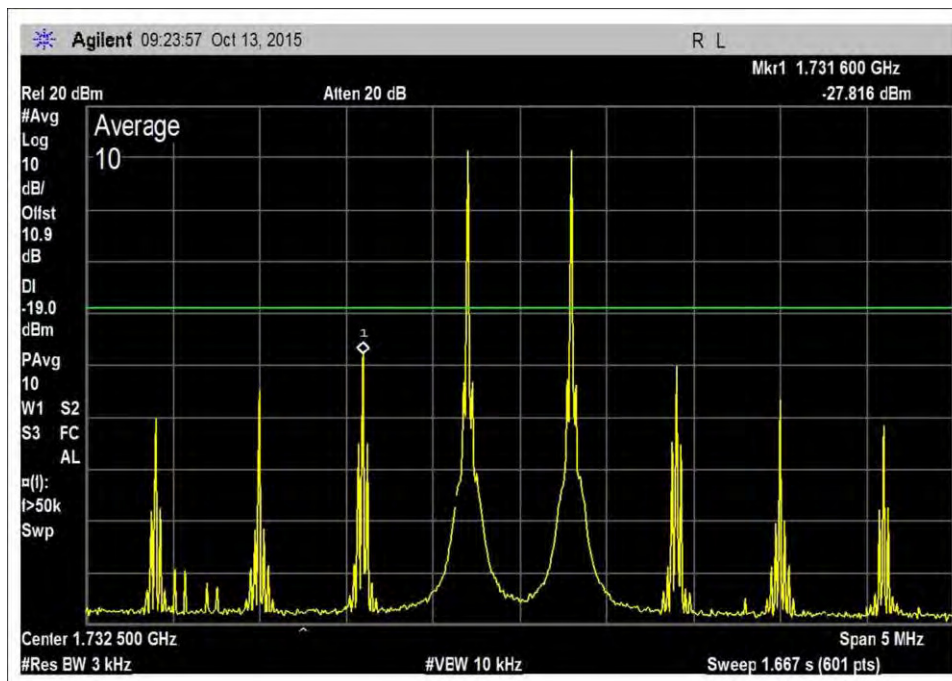
7.4_Intermod_UL_824-849MHz



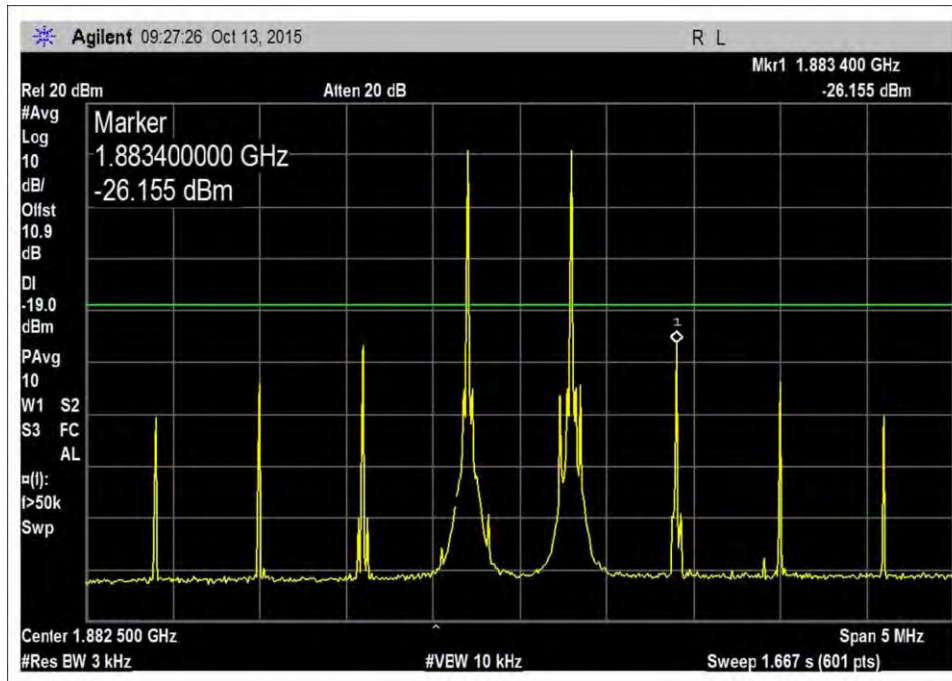
7.4_Intermod_UL_824-849MHz+10dB



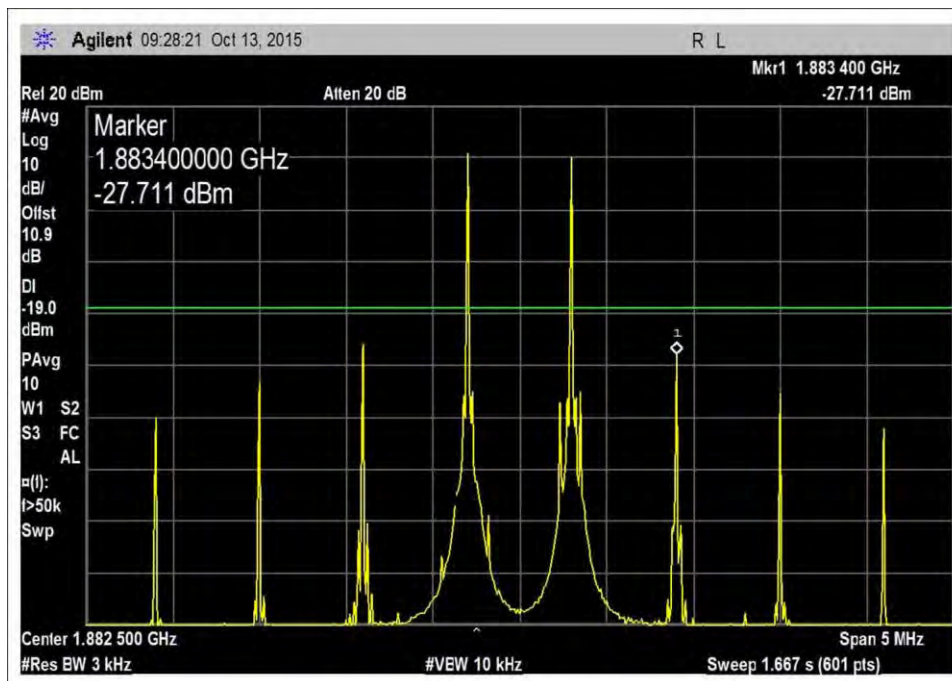
7.4_Intermod_UL_1710-1755MHz



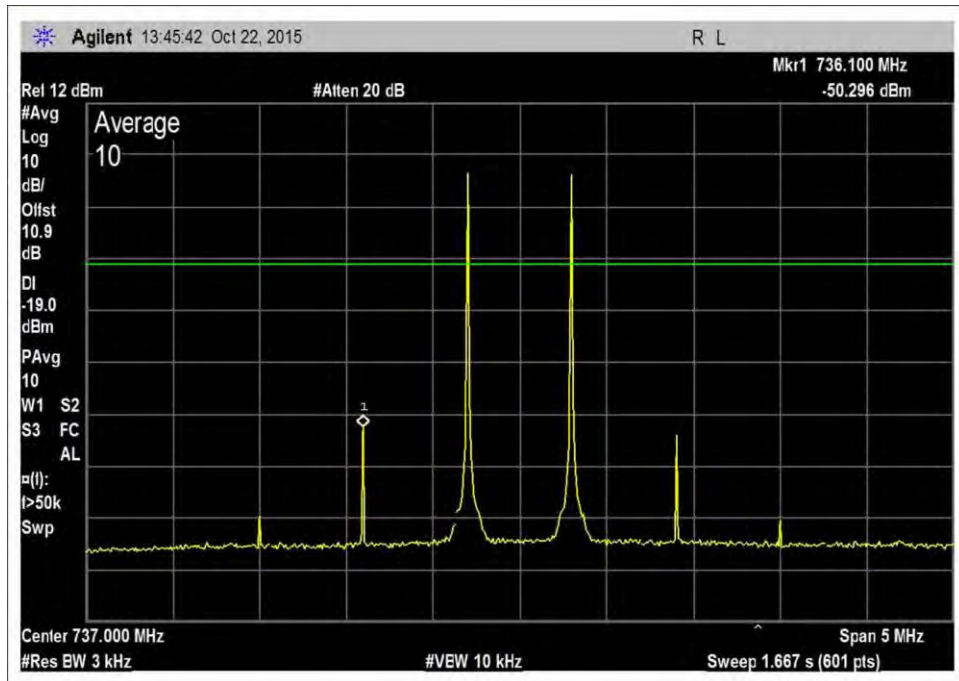
7.4_Intermod_UL_1710-1755MHz+10dB



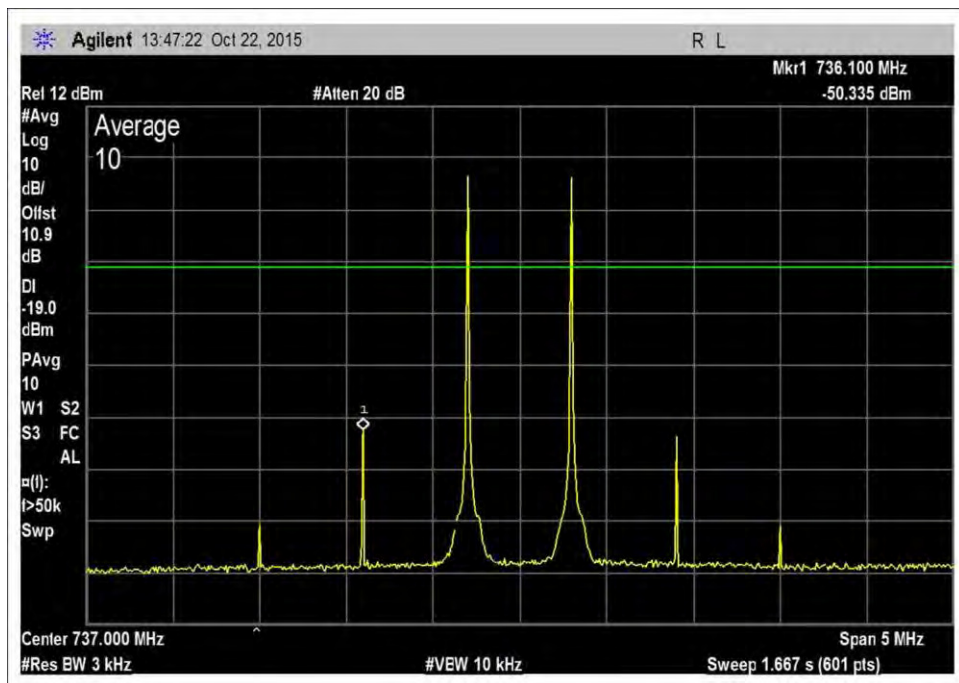
7.4_Intermod_UL_1850-1915MHz



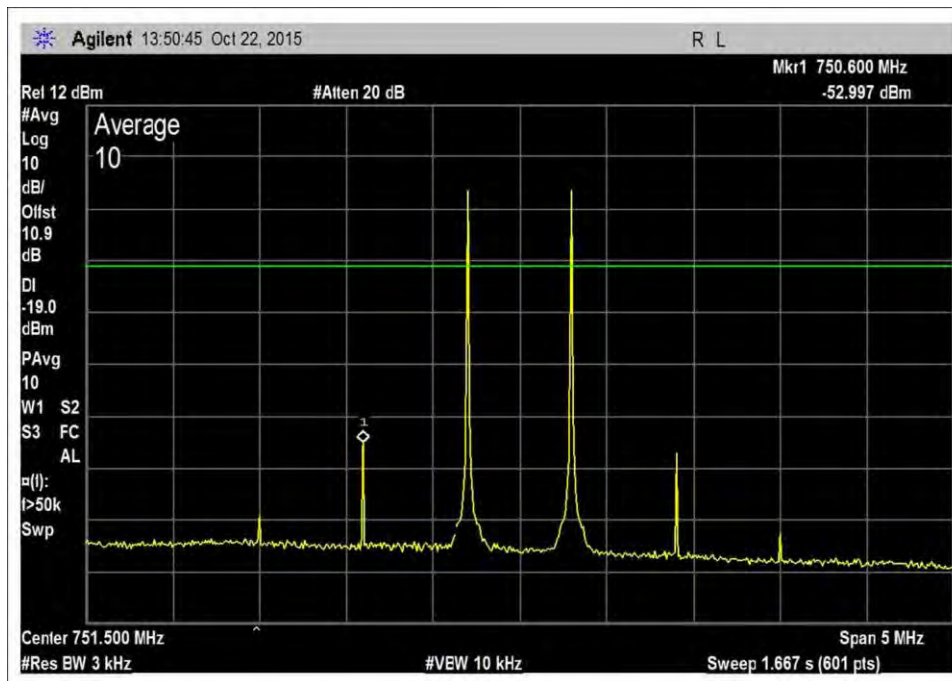
7.4_Intermod_UL_1850-1915MHz+10dB



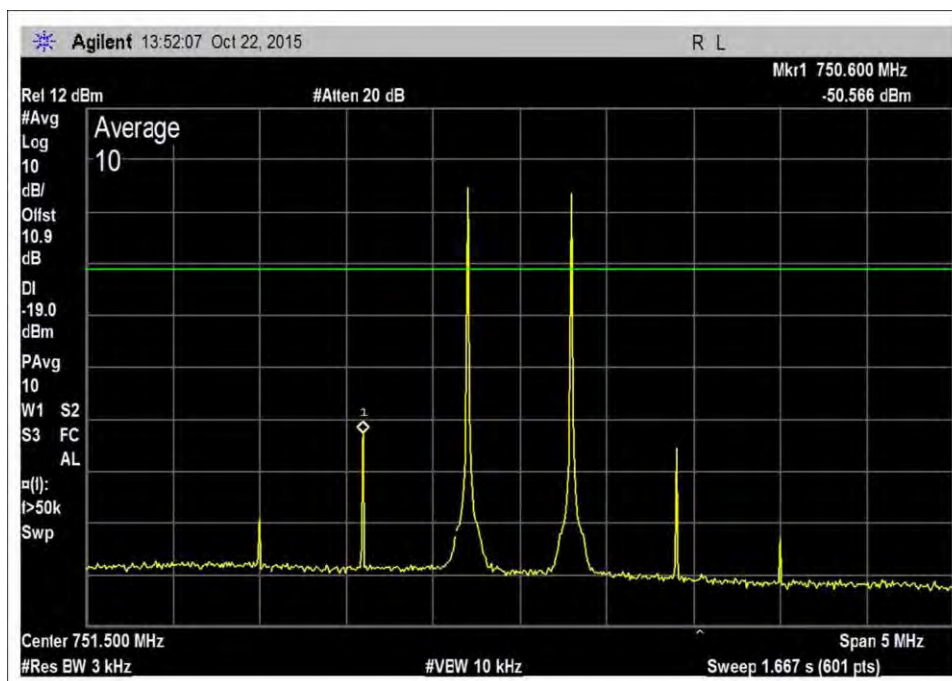
7.4_Intermod_DL_728-746MHz



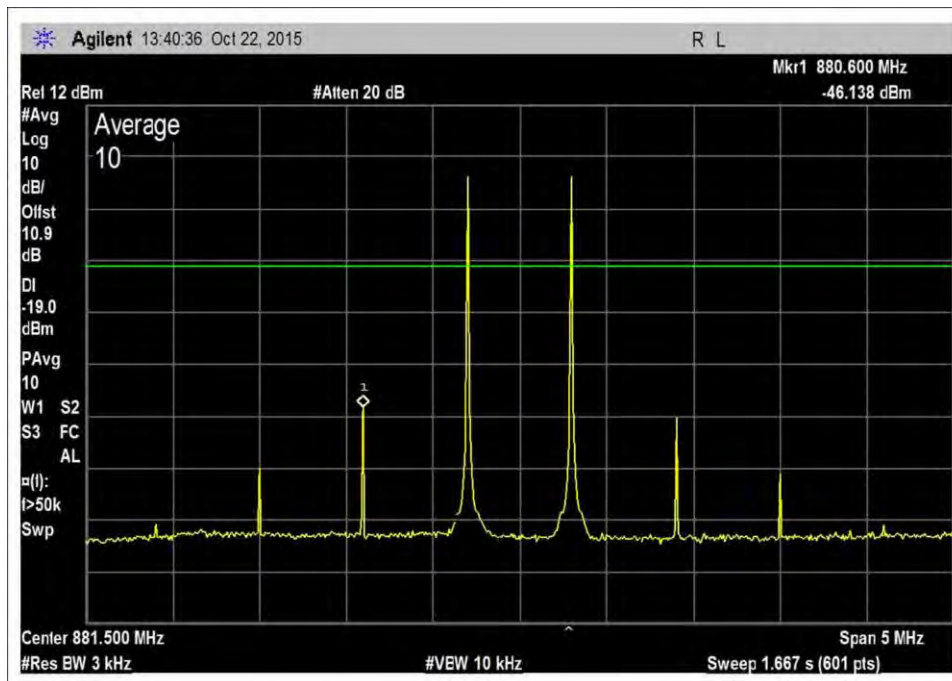
7.4_Intermod_DL_728-746MHz+10dB



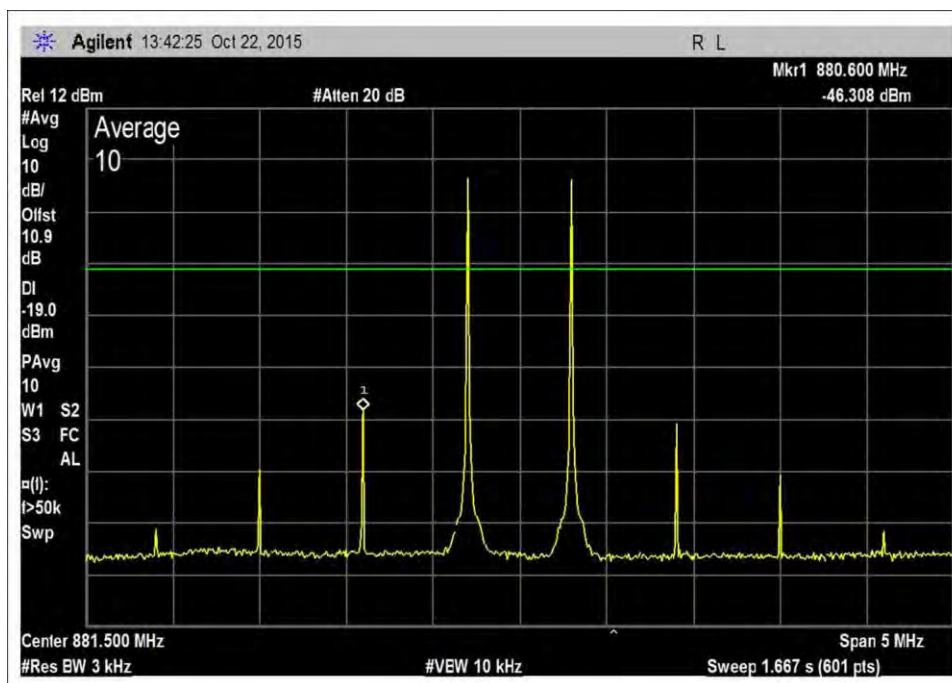
7.4_Intermod_DL_746-757MHz



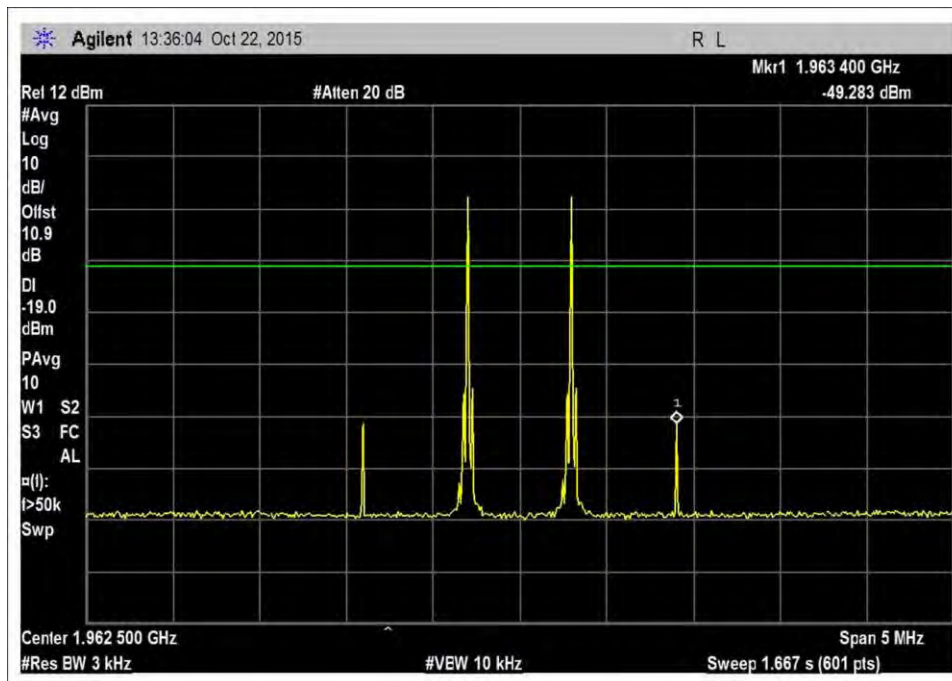
7.4_Intermod_DL_746-757MHz+10dB



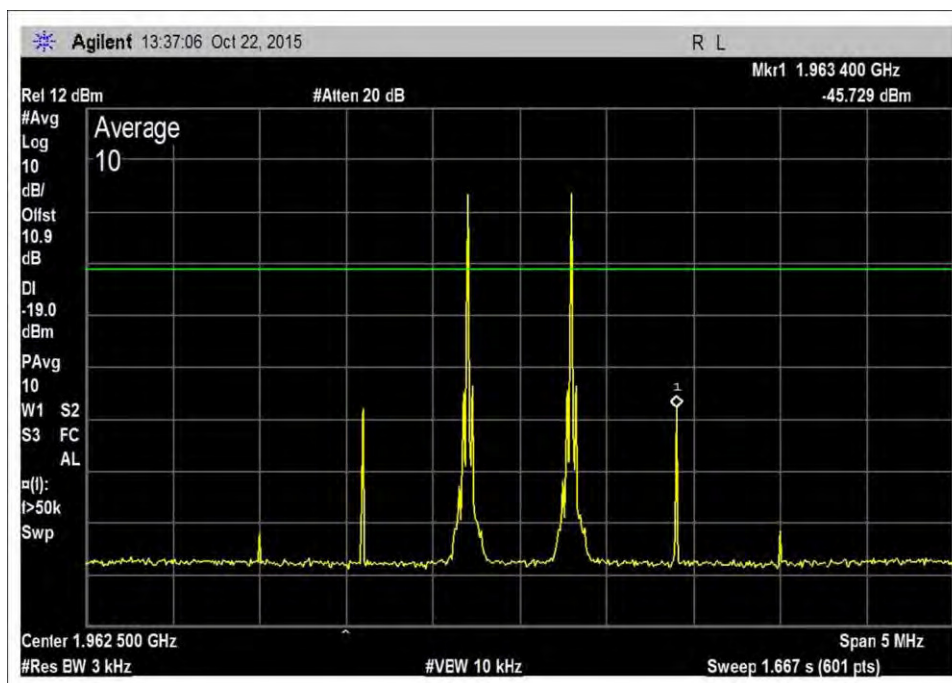
7.4_Intermod_DL_869-894MHz



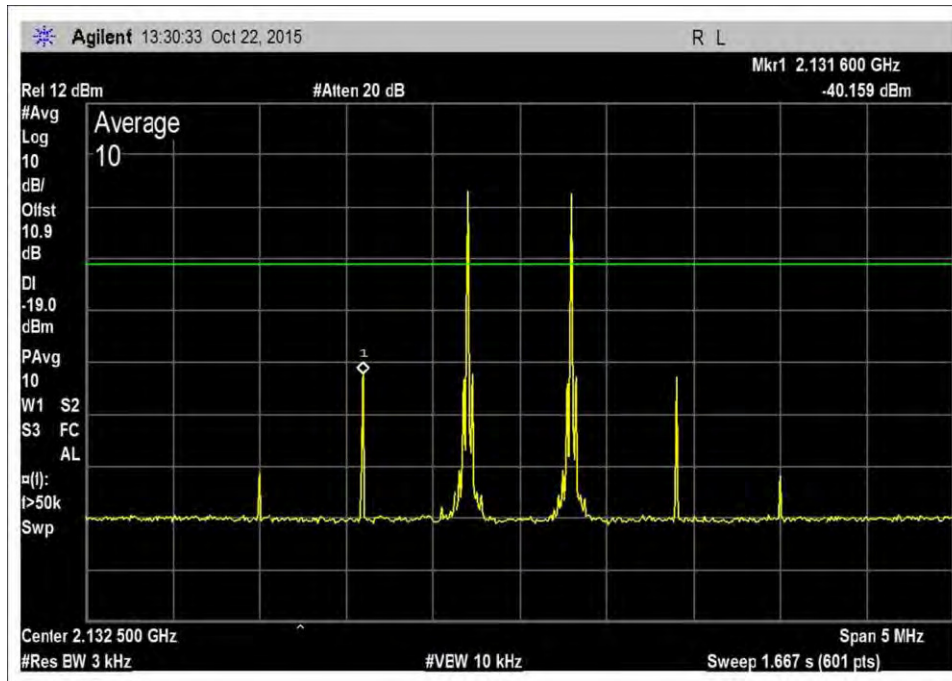
7.4_Intermod_DL_869-894MHz+10dB



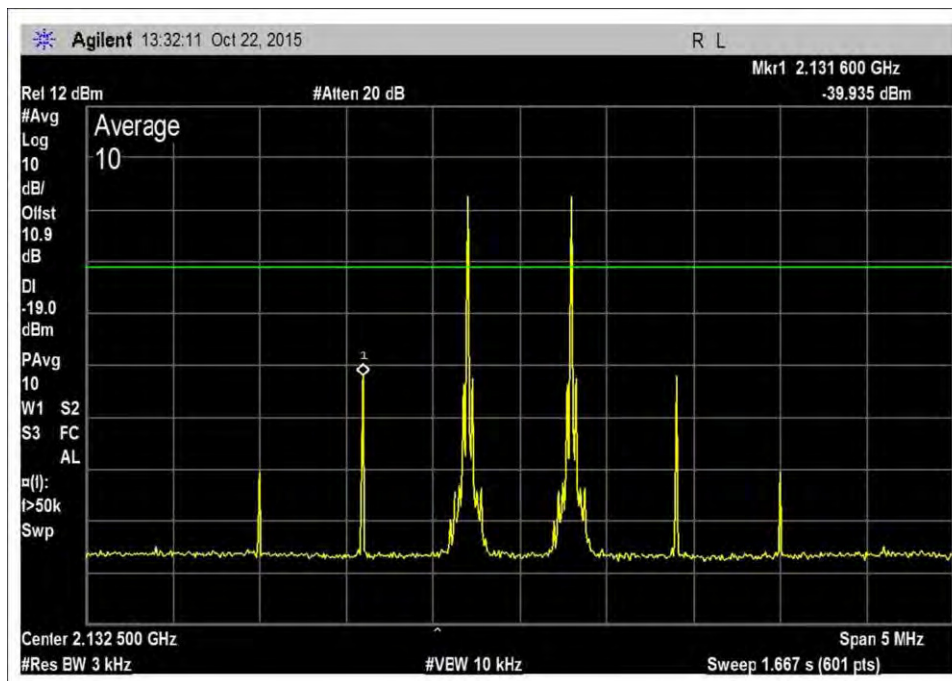
7.4_Intermod_DL_1930-1995MHz+10dB



7.4_Intermod_DL_1930-1995MHz+10dB



7.4_Intermod_DL_2110-2155MHz



7.4_Intermod_DL_2110-2155MHz+10dB

7.5 Out of Band Emissions

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Cellphone-Mate, Inc.
 Specification: **7.5 Out-of-band Emissions**
 Work Order #: **97491** Date: 10/13/2015
 Test Type: **Conducted Emissions** Time: 10:54:49
 Tested By: Daniel Bertran Sequence#: 1
 Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 4			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 4			

Test Conditions / Notes:

The equipment under test (EUT) is a Fixed CMRS Wideband Consumer Booster with a Wi-Fi Router and TV amplifier installed. The CMRS DL signal and the Wi-Fi Signal are combined at the diplexer and transmit via the indoor antenna.

The Consumer booster UL and DL power and gain parameters are initially measured with Wi-Fi transmitting at mid channel using sequentially 802.11b, g, n20 and n40 signal. Since no significant change in measured power was observed, all other parameters are obtained with Wi-Fi transmitting at Mid channel, 802.11b.

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

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.6°C, Relative Humidity: 42%, Pressure: 101.5kPa

The test was performed in accordance with section 7.5 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015. Firmware: V2.0

Additional plots taken at 1dB before EUT shuts down and before reaching the maximum input level indicated in section 5.5 of FCC document referenced above document.

- Maximum uplink transmitter test levels for fixed wideband consumer signal booster: +0 dBm
- The maximum downlink input level for all device types is -20 dBm

Lower RBW was used as applicable per rule part, in addition integration power function of the Spectrum Analyzers' Adjacent Channel Power tool was used to show compliance in instances where accuracy can be improved by integrating power measured in smaller RBW and linearly summed into standard bandwidth.

Used for testing the alternative test modulation types:

- CDMA (alternative 1.25 MHz AWGN*)
- LTE 5 MHz (alternative 4.1 MHz AWGN*)

*AWGN test signal, the bandwidth was measured 99% occupied bandwidth.

Test Equipment:

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
AN03470	Spectrum Analyzer	E4440A	12/2/2013	12/2/2015
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06239	Attenuator	54A-10	7/9/2014	7/9/2016

Summary of Results

Pass: Indicated in the plots below, all OBE are under the limit of -19dBm.

GSM

Low			
Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-26.65	-25.62	-19.0
UL1850-1915	-25.67	-25.10	-19.0
UL824-894	-25.05	-24.74	-19.0
UL 698-716	-25.84	-24.71	-19.0
UL776-787	-22.88	-22.34	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	-25.59	-22.28	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

High			
Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-25.35	-24.52	-19.0
UL1850-1915	-29.16	-29.93	-19.0
UL824-894	-26.55	-26.10	-19.0
UL 698-716	-28.08	-26.28	-19.0
UL776-787	-23.10	-23.58	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	< -39.00	< -39.00	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

CDMA

Low

Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-36.80	-36.65	-19.0
UL1850-1915	-35.54	-37.33	-19.0
UL824-894	-40.33	-38.79	-19.0
UL 698-716	-45.02	-45.36	-19.0
UL776-787	-41.74	-41.02	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	< -39.00	< -39.00	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

High

Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-37.64	-37.38	-19.0
UL1850-1915	-41.05	-38.41	-19.0
UL824-894	-41.28	-41.15	-19.0
UL 698-716	-51.19	-50.91	-19.0
UL776-787	-40.10	-39.35	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	< -39.00	< -39.00	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

LTE

Low

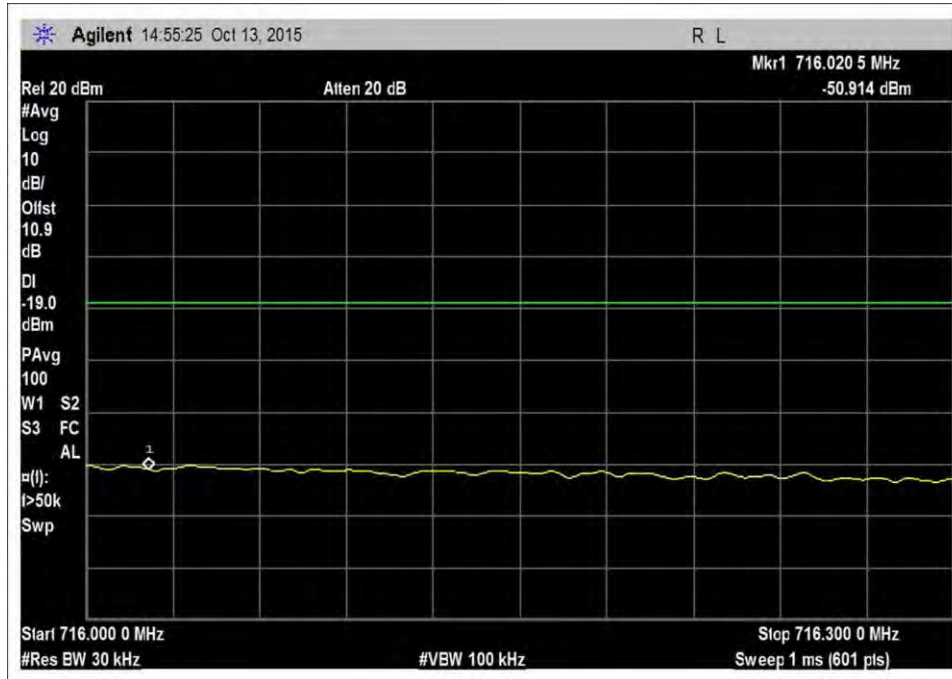
Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-34.34	-35.14	-19.0
UL1850-1915	-33.98	-34.26	-19.0
UL824-894	-36.50	-36.43	-19.0
UL 698-716	-39.11	-39.57	-19.0
UL776-787	-36.88	-36.82	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	< -39.00	< -39.00	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

High

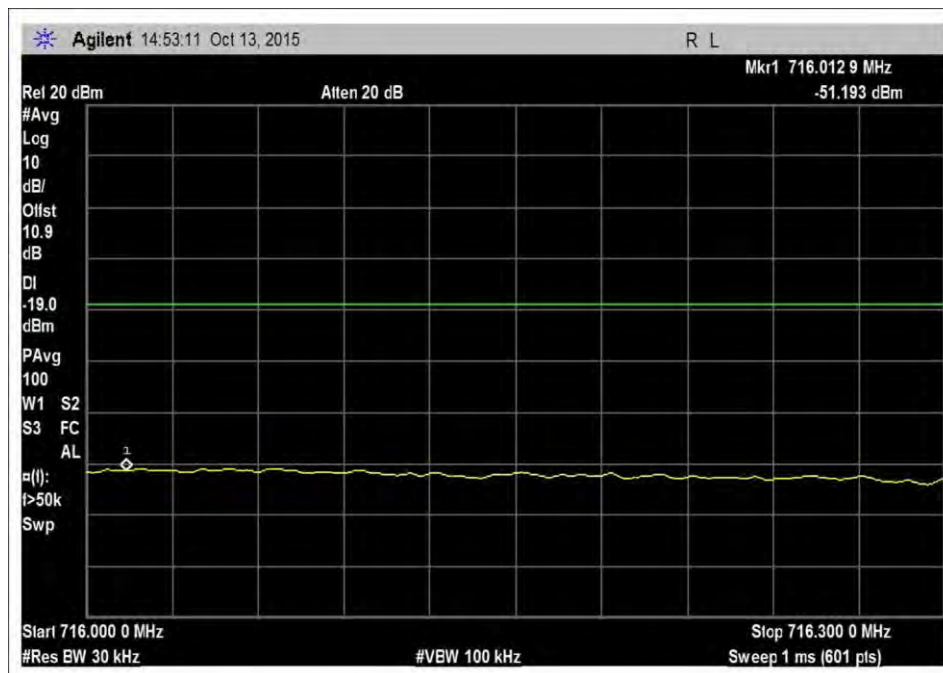
Out of Band Emission			
Freq	Pre AGC	Max input	Limit
MHz	dBm	+0dBm	dBm
UL1710-1755	-33.75	-33.26	-19.0
UL1850-1915	-40.45	-39.20	-19.0
UL824-894	-35.33	-35.35	-19.0
UL 698-716	-43.34	-43.80	-19.0
UL776-787	-36.55	-35.71	-19.0
		-20dBm	
DL2110-2155	< -39.00	< -39.00	-19.0
DL1930-1995	< -39.00	< -39.00	-19.0
DL869-894	< -39.00	< -39.00	-19.0
DL:728-746	< -39.00	< -39.00	-19.0
DL 746-757	< -39.00	< -39.00	-19.0

Plots

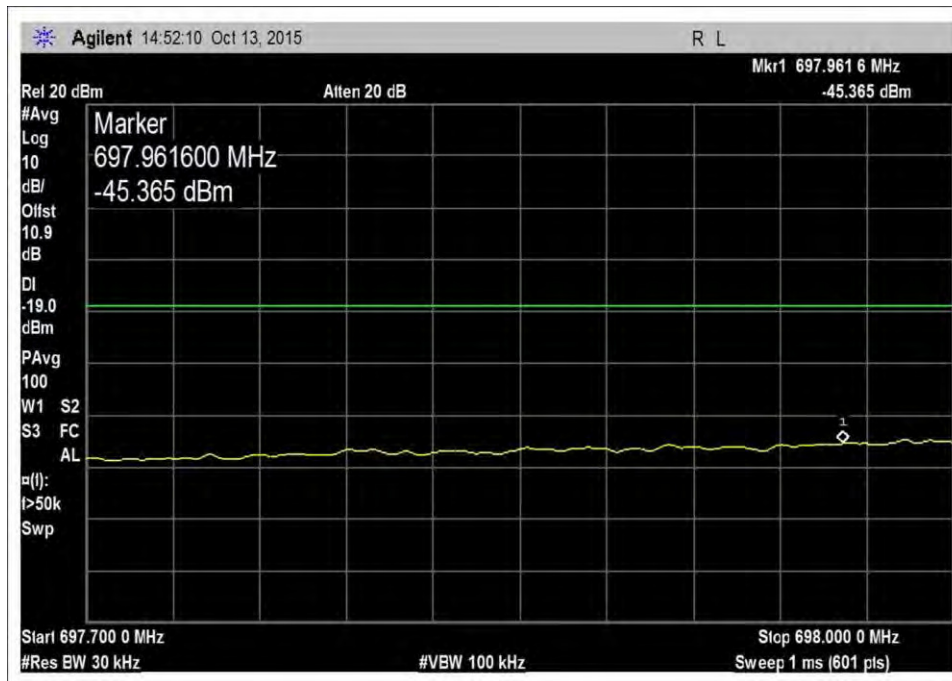
CDMA



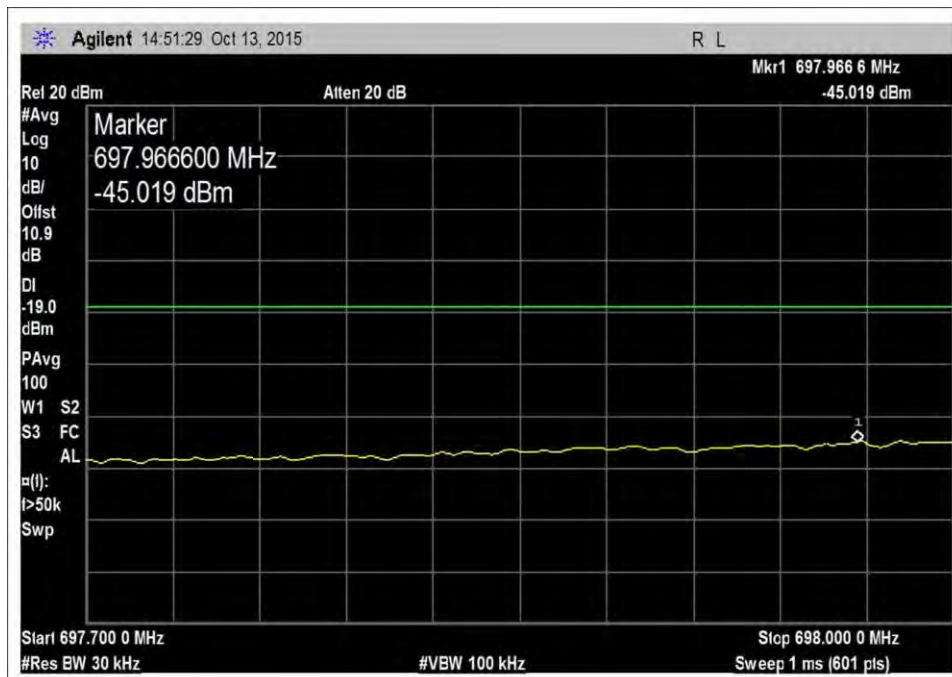
7.5_OBE_UL_698-716MHz_H_Max



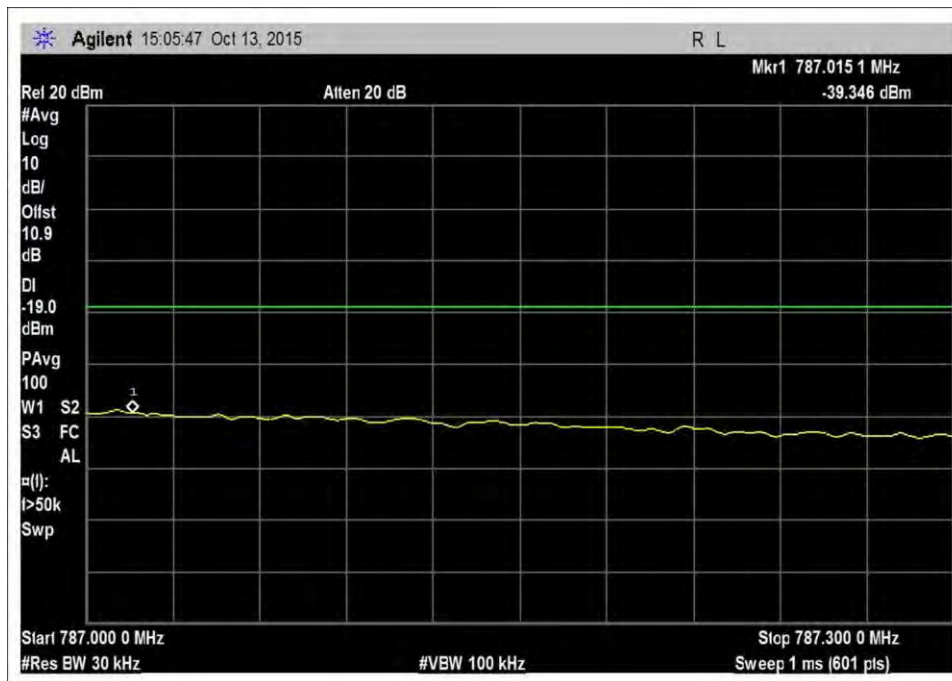
7.5_OBE_UL_698-716MHz_H_PreAGC



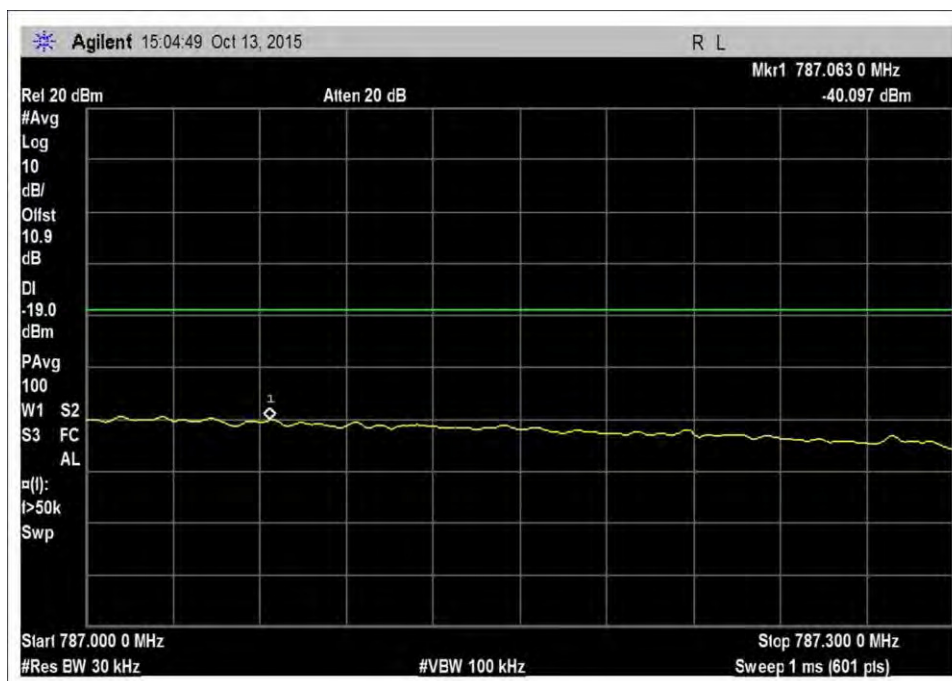
7.5_OBE_UL_698-716MHz_L_Max



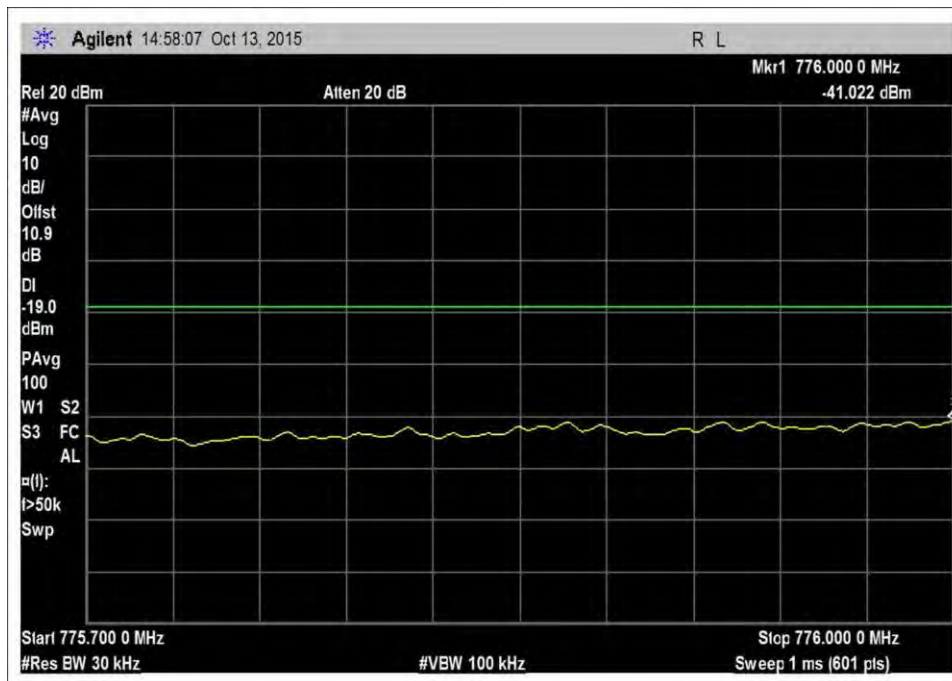
7.5_OBE_UL_698-716MHz_L_PreAGC



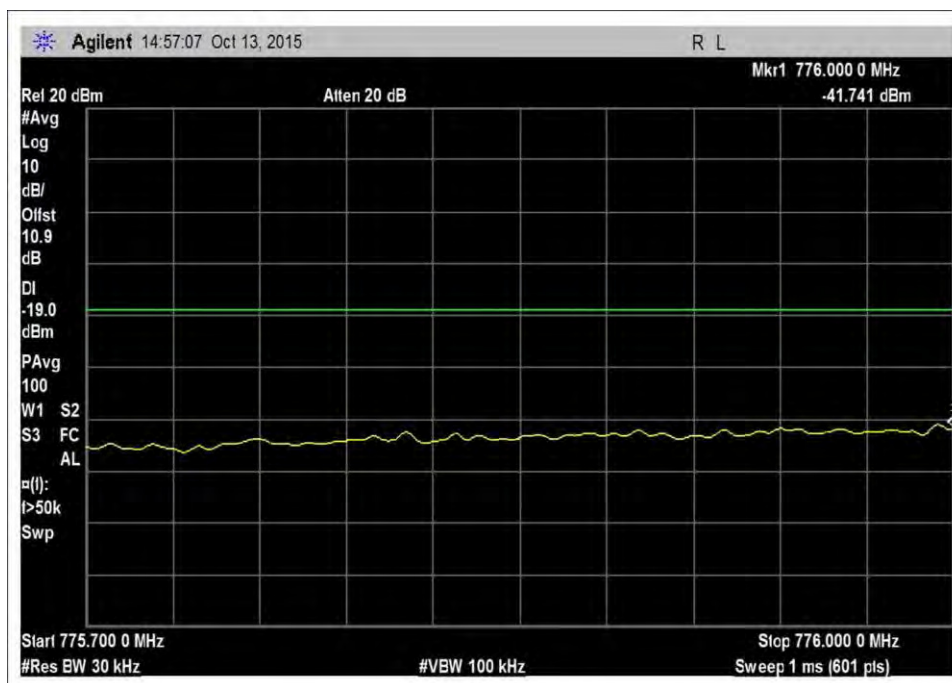
7.5_OBE_UL_776-787MHz_H_Max



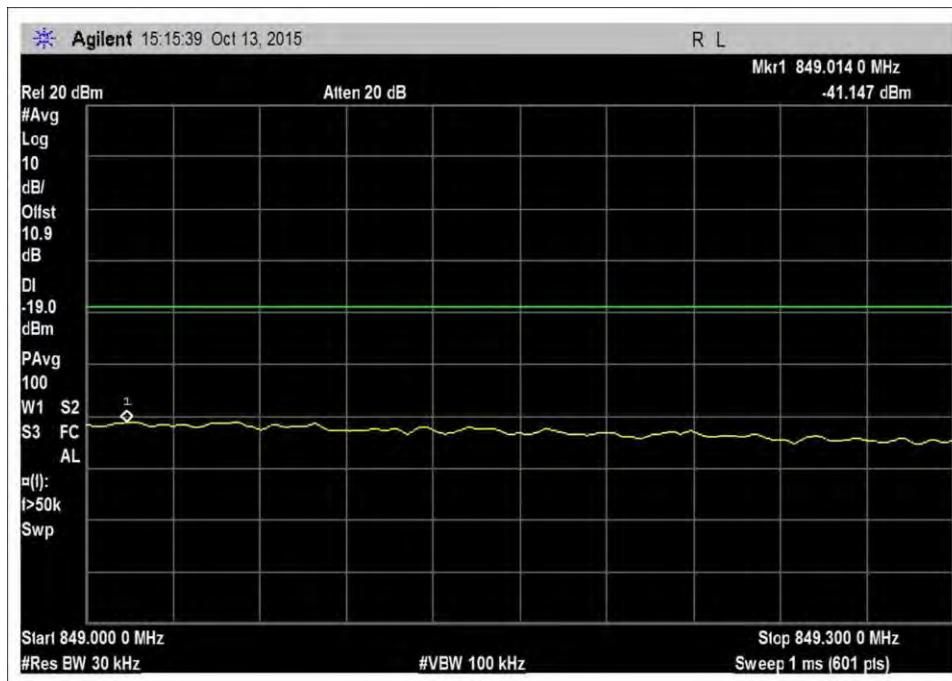
7.5_OBE_UL_776-787MHz_H_PreAGC



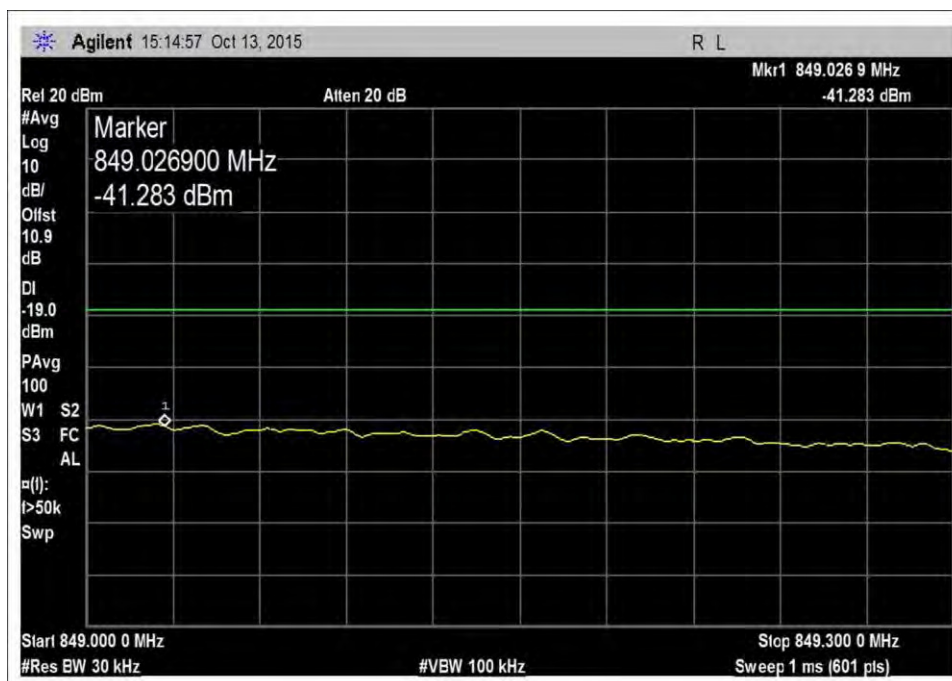
7.5_OBE_UL_776-787MHz_L_Max



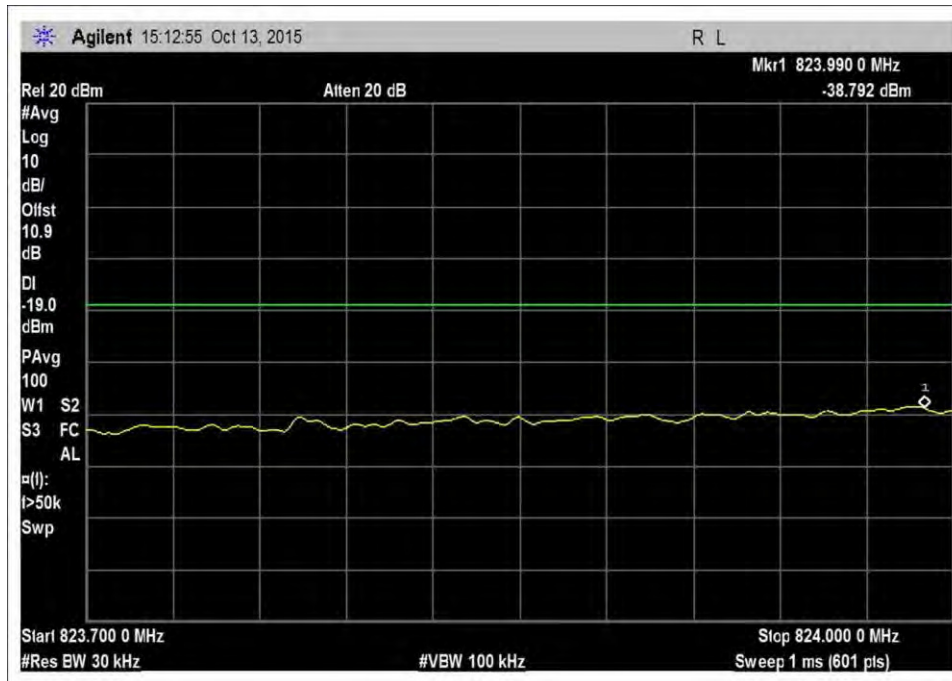
7.5_OBE_UL_776-787MHz_L_PreAGC



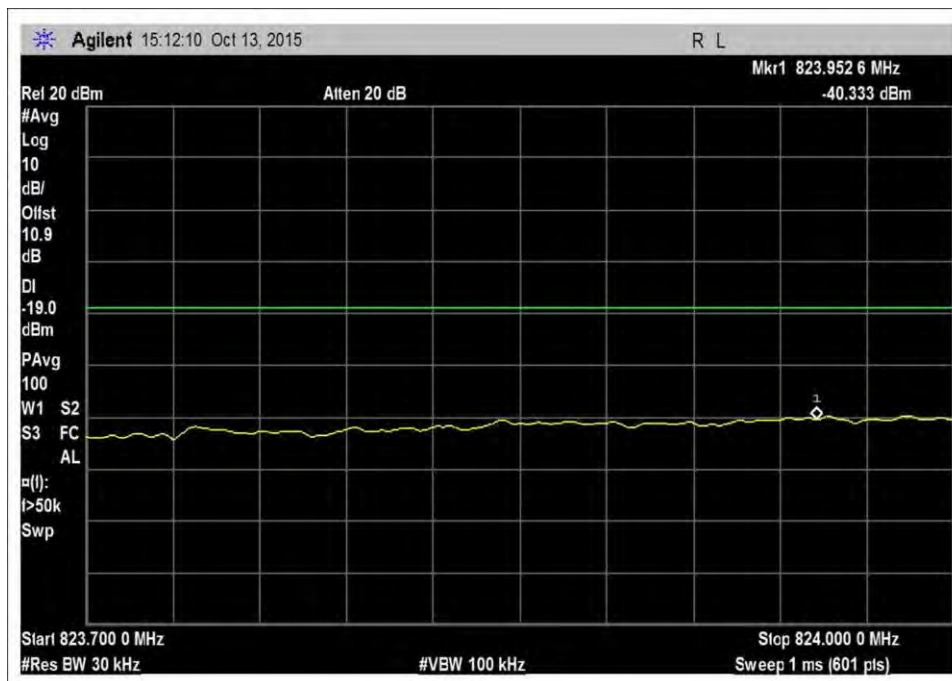
7.5_OBE_UL_824-849MHz_H_Max



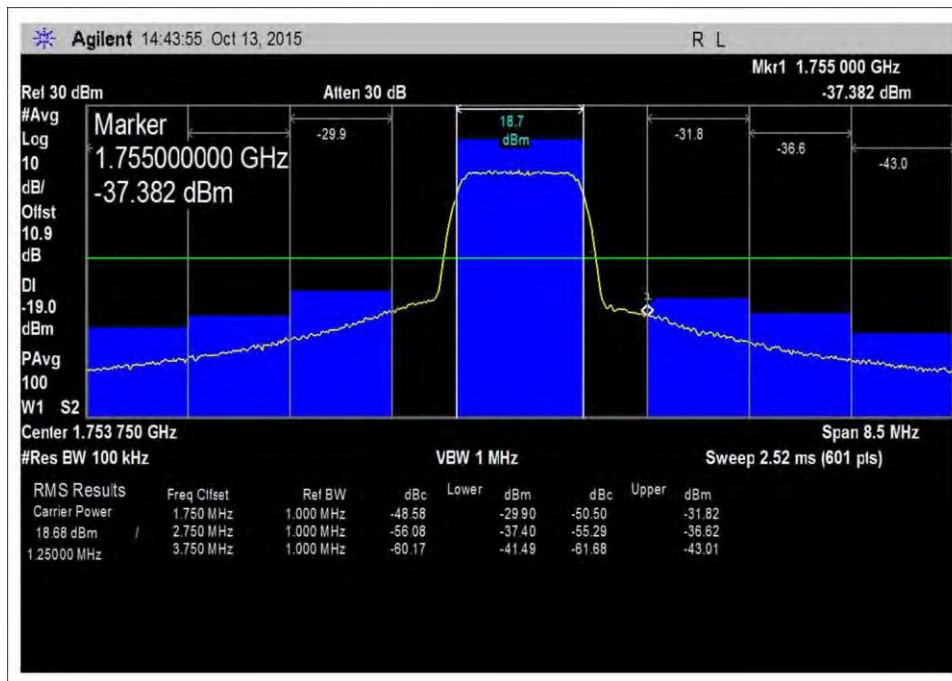
7.5_OBE_UL_824-849MHz_H_PreAGC



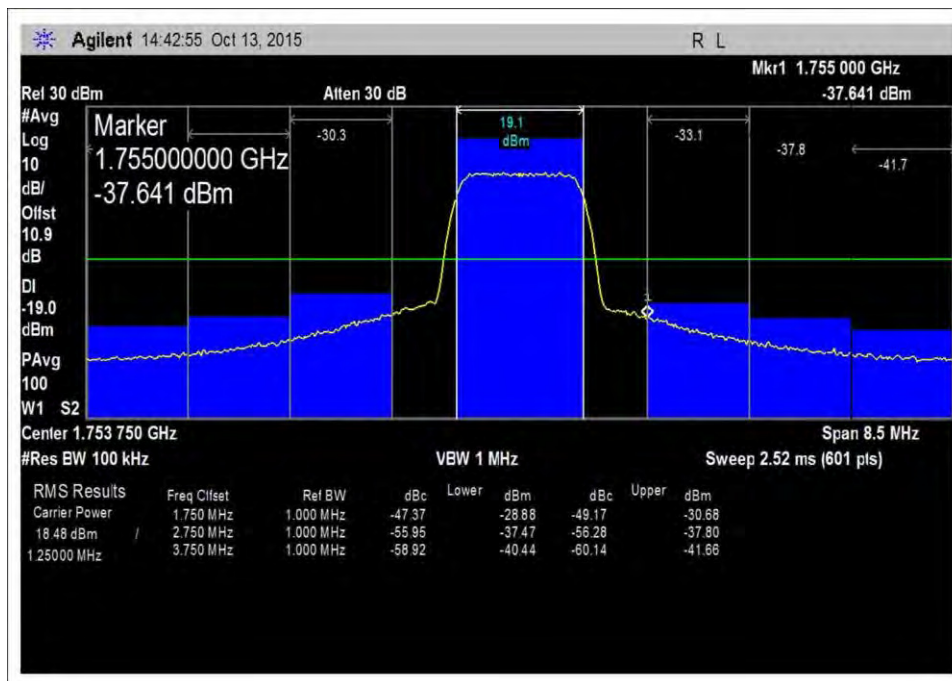
7.5_OBE_UL_824-849MHz_L_Max



7.5_OBE_UL_824-849MHz_L_PreAGC



7.5_OBE_UL_1710-1755MHz_H_Max



7.5_OBE_UL_1710-1755MHz_H_PreAGC