

Huaptec

TEST REPORT FOR

**Quint Band Signal Booster
Model: F10G-5S-LCD**

Tested To The Following Standard:

FCC Part 20.21

Report No.: 99439-8

Date of issue: February 23, 2017



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.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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REPORT PREPARED BY:

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REPRESENTATIVE: April

Project Number: 99439

DATE OF EQUIPMENT RECEIPT:

February 6, 2017

DATE(S) OF TESTING:

February 6 - 9, 2017

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.



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	5.03.02
EMITest Immunity	5.03.02

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Fremont, CA	US0082	SL2-IN-E-1148R	3082B-1	US1023	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Part 20.21

KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance, v04, Feb 12, 2016		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	Pass
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

NA = Not Applicable

Standard / Specification: FCC Part 20.21 - continued

KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance, v04, Feb 12, 2016		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)	Booster Gain	NA	Pass
7.9.2 a) - f)	Variable Uplink Gain Timing	20.21(e)(8)(i)(H)	Transmit Power Off Mode		
7.10.a) - j)	Occupied Band Width	2.1049/22/24/27	Occupied Band Width	NA	Pass
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	Pass
7.13 a) - c)	Spectrum Block Filter ²	NA ²	NA ²	NA	NA1

NA = Not Applicable

NA1 – Not applicable because the EUT does not employ spectrum block filter.

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
None

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 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
Quint Band Signal Booster	Huaptec	F10G-5S-LCD	01
AC/DC Adapter	NA	GM50-120300-F	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

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: Huaptec
 Specification: **7.1 Authorized Frequency Band Verification**
 Work Order #: **99439** Date: 2/6/2017
 Test Type: **Conducted Emissions** Time: 9:29:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
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.
 The EUT Server port is a type N connector and 50-ohm impedance.
 The EUT Donor port is type N connector and 50-ohm impedance.

Part 22
 UL: 824-849MHz
 DL: 869-894MHz

Part 24
 UL: 1850-1915MHz
 DL: 1930-1995MHz

Part 27
 UL: 1710-1755MHz, 698-716MHz, 776-787MHz
 DL: 2110-2155MHz, 728-746MHz, 746-757MHz

The test was performed in accordance with section 7.1 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04 Dated February 12, 2016.
 Firmware: AF17-5S-V02

Test environment conditions:
 Temperature: 23°C
 Relative Humidity: 43%
 Pressure: 101.1 kPa

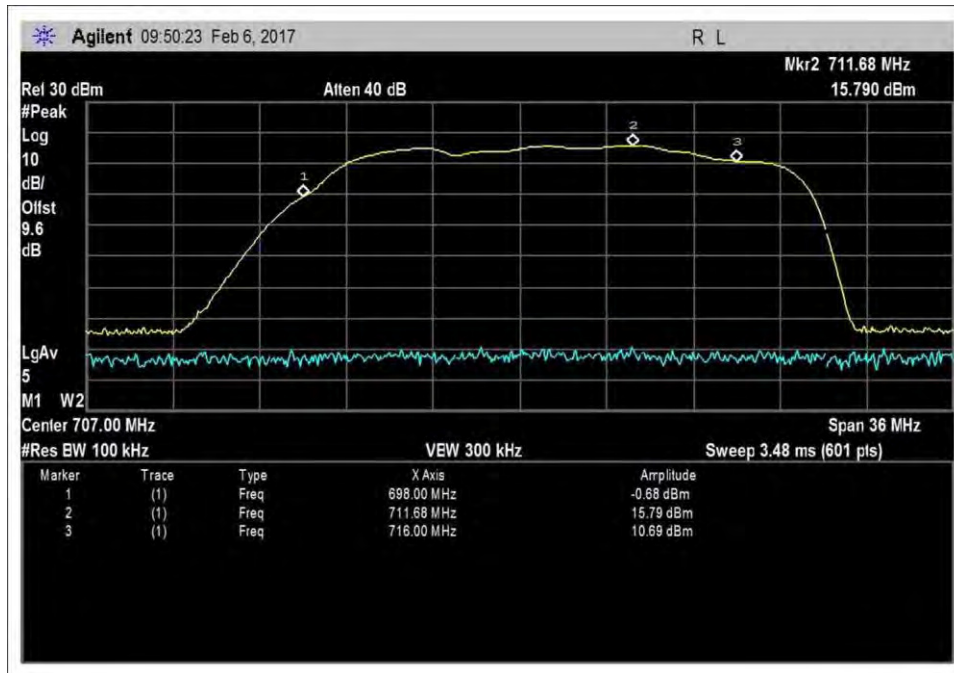
Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018

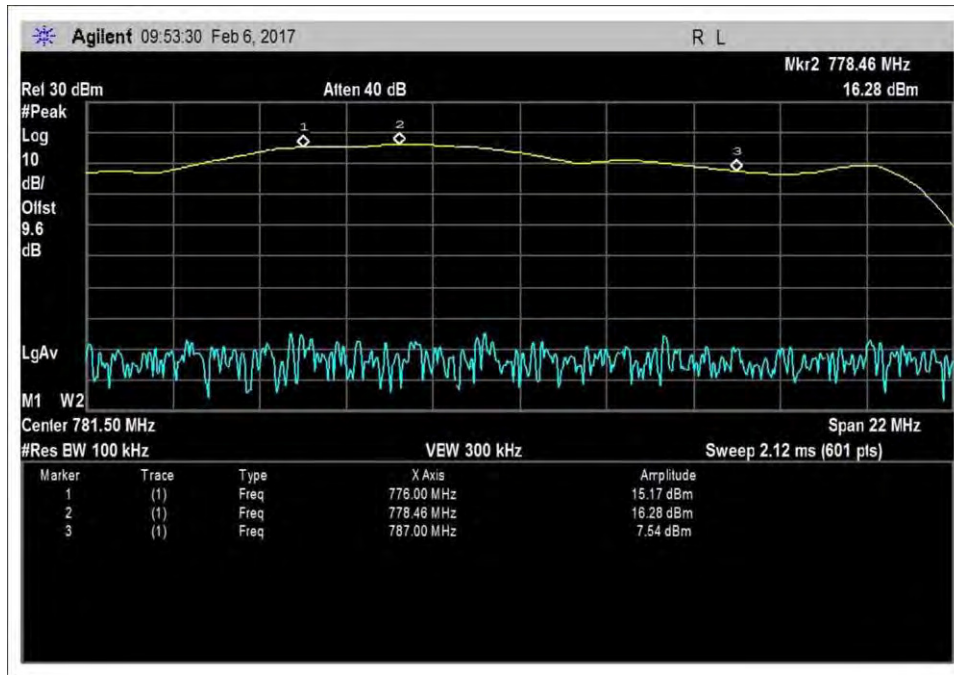
Summary of Results

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

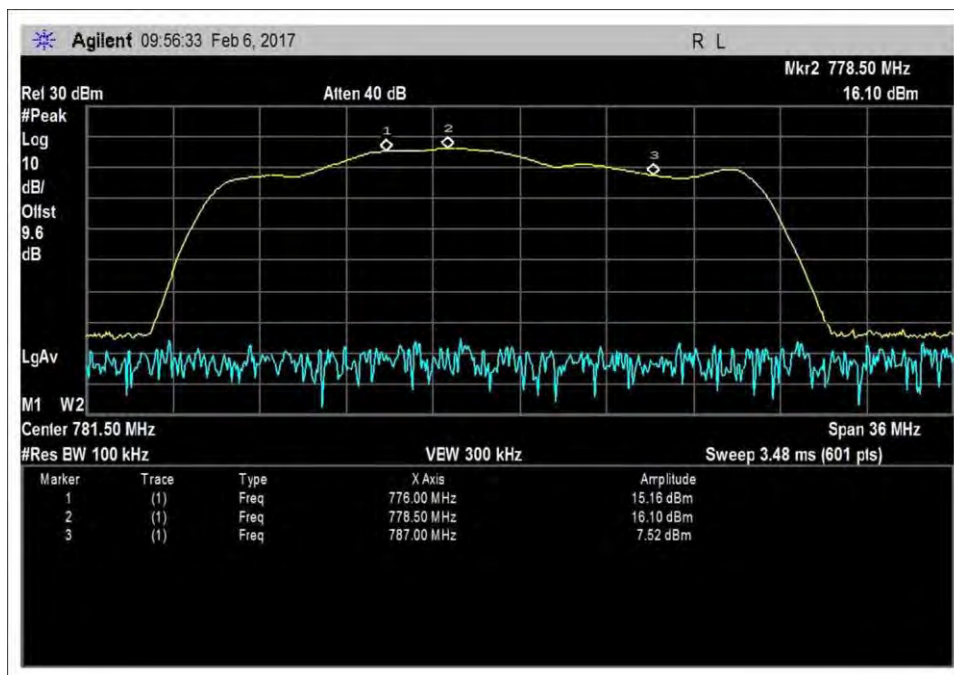
Plots



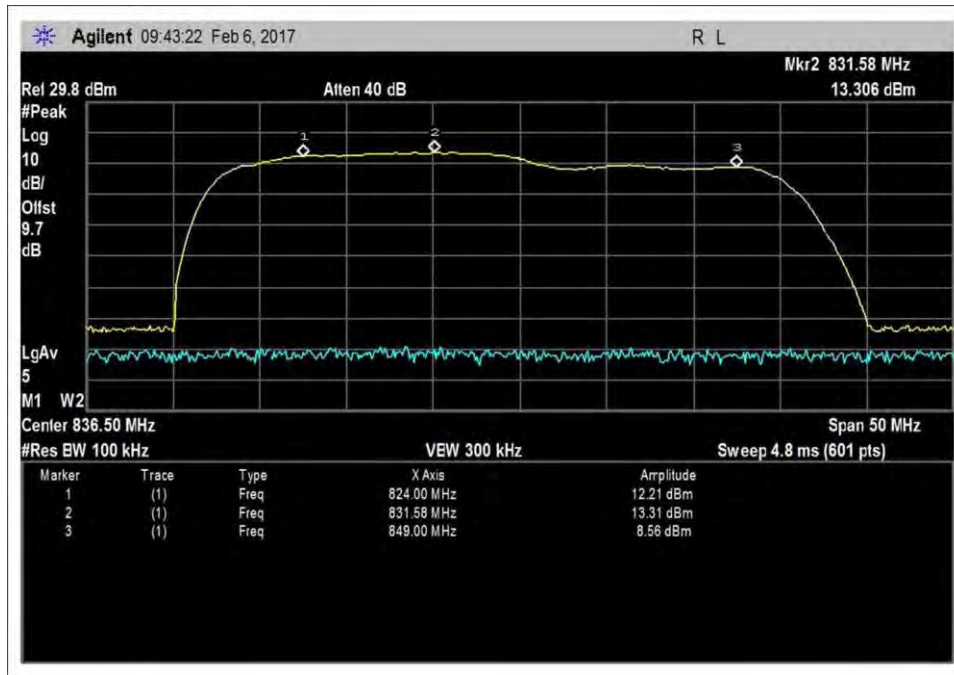
7.1_Band Verify_UL_698-716MHz



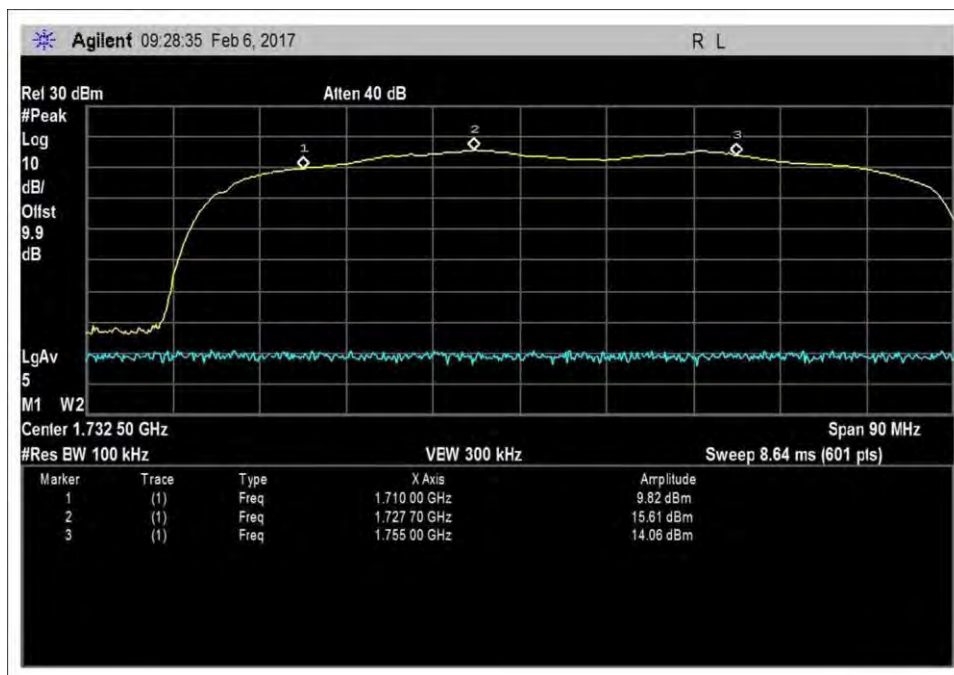
7.1_Band Verify_UL_776-787MHz



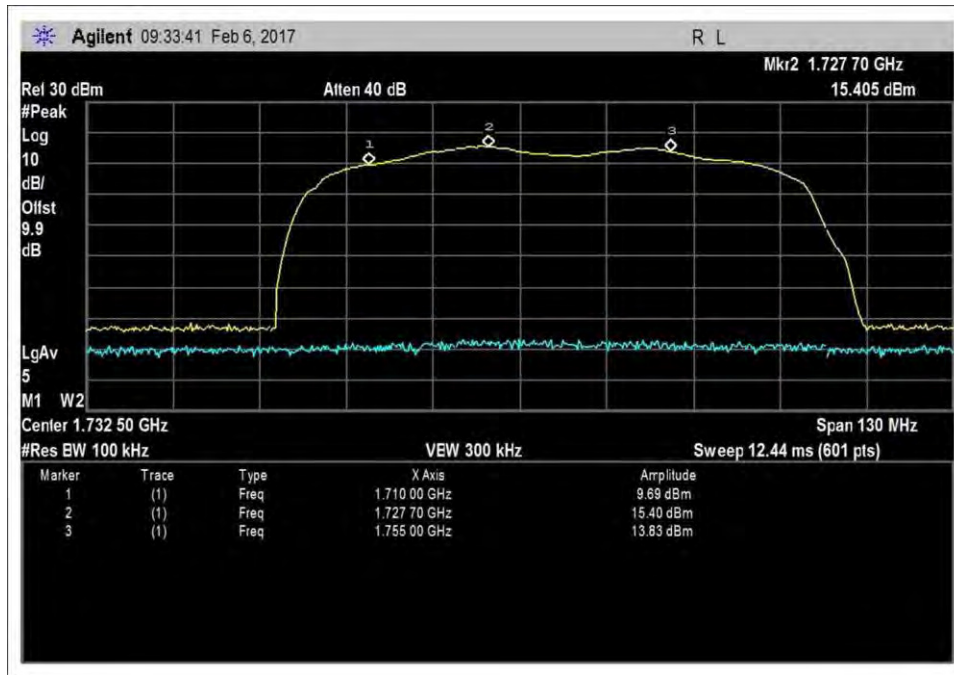
7.1_Band Verify_UL_776-787MHz-Zoom



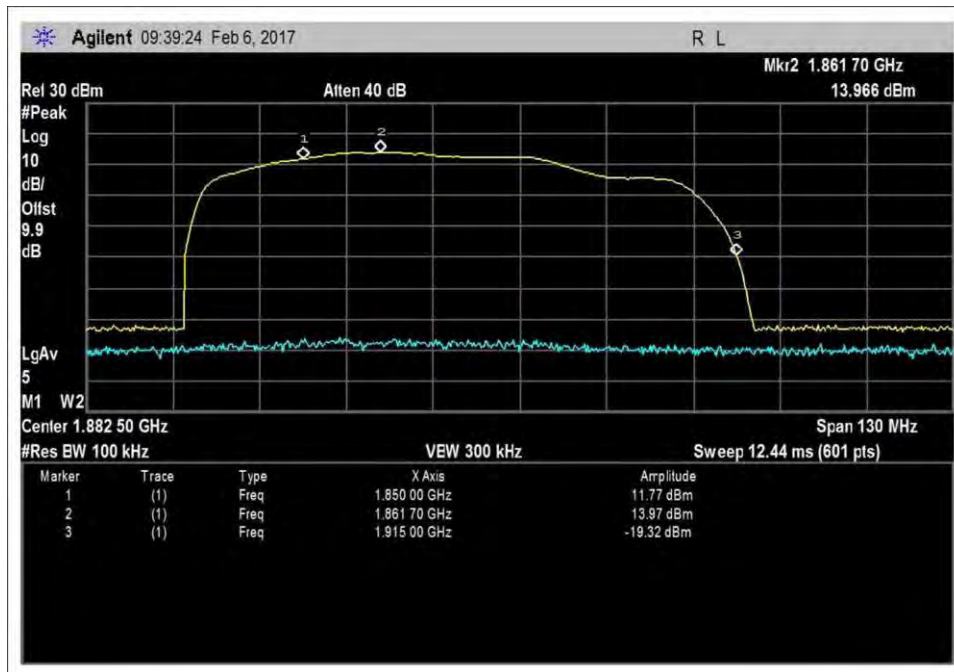
7.1_Band Verify_UL_824-849MHz



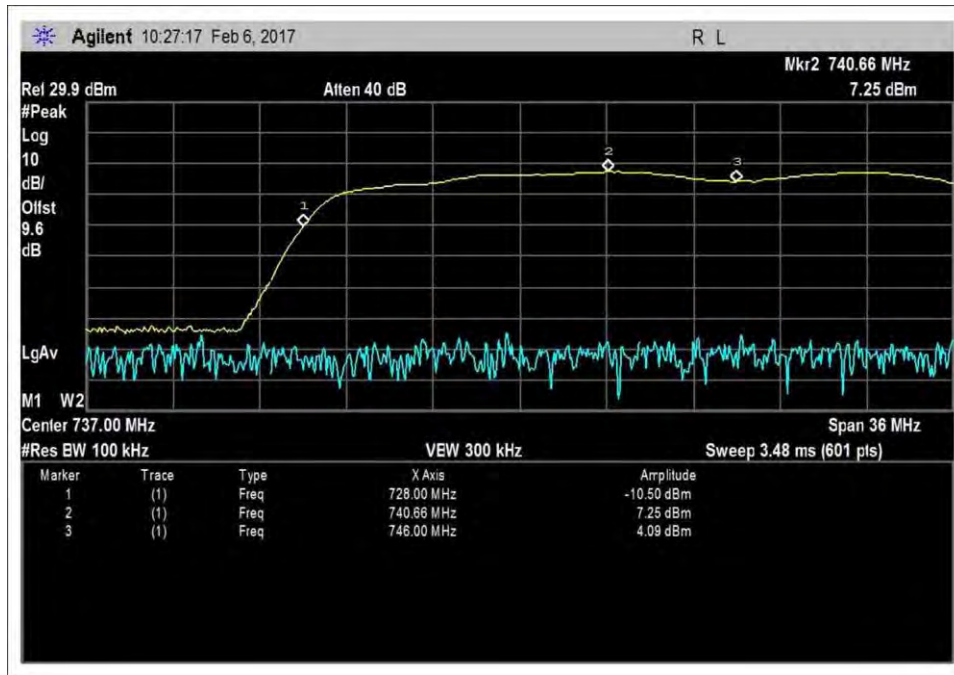
7.1_Band Verify_UL_1710-1755MHz



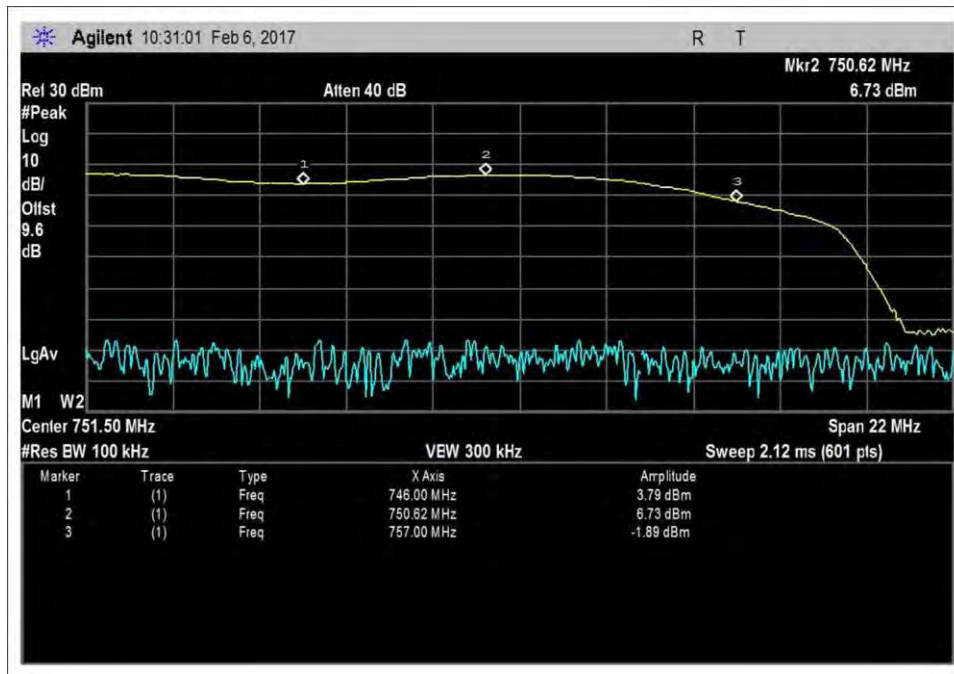
7.1_Band Verify_UL_1710-1755MHz_Zoom



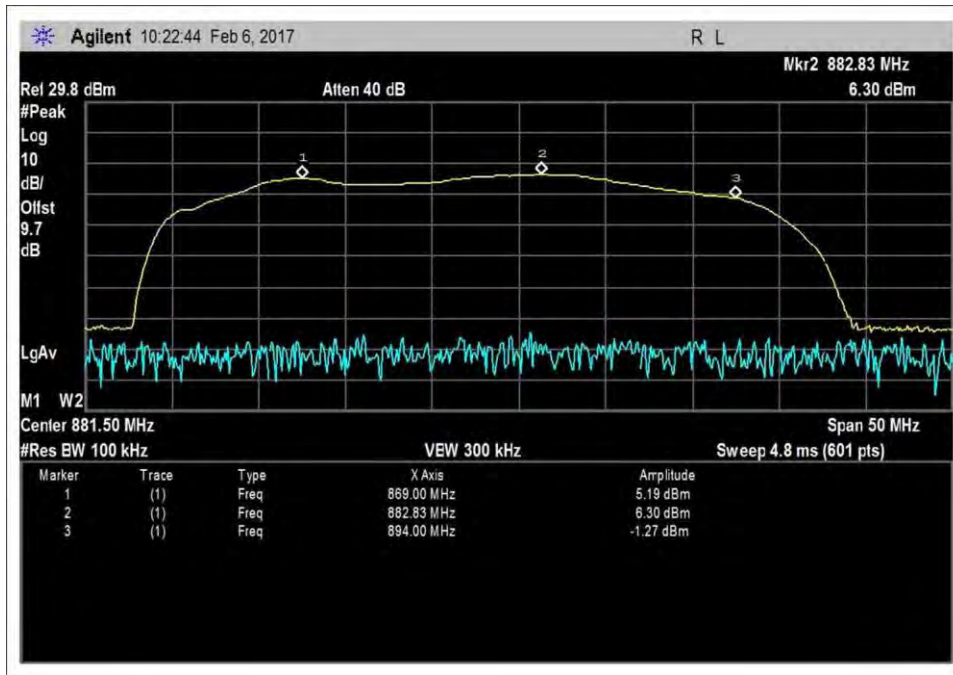
7.1_Band Verify_UL_1850-1915MHz



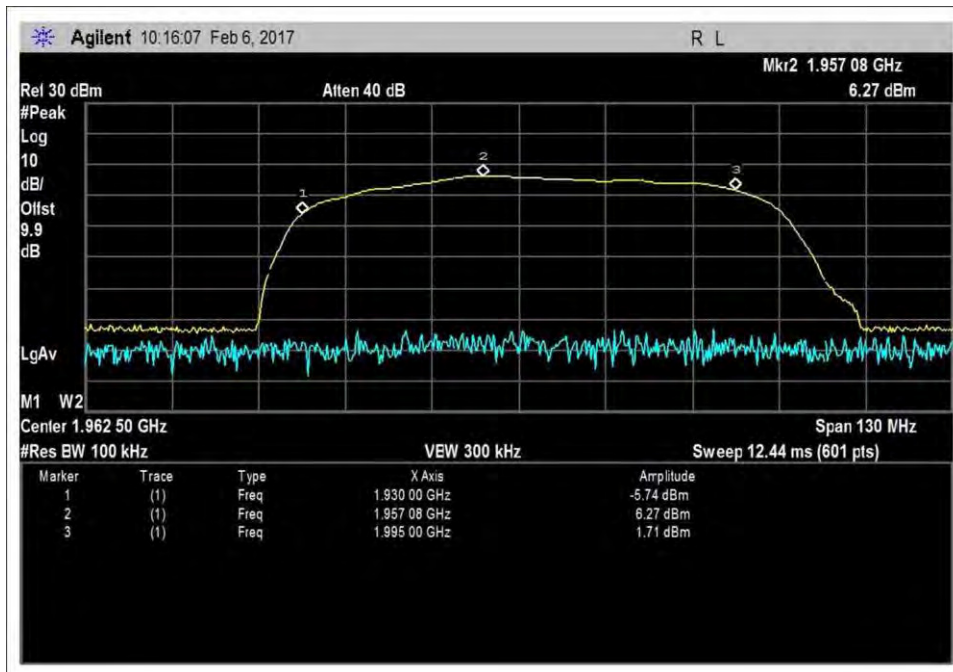
7.1_Band Verify_DL_728-746MHz



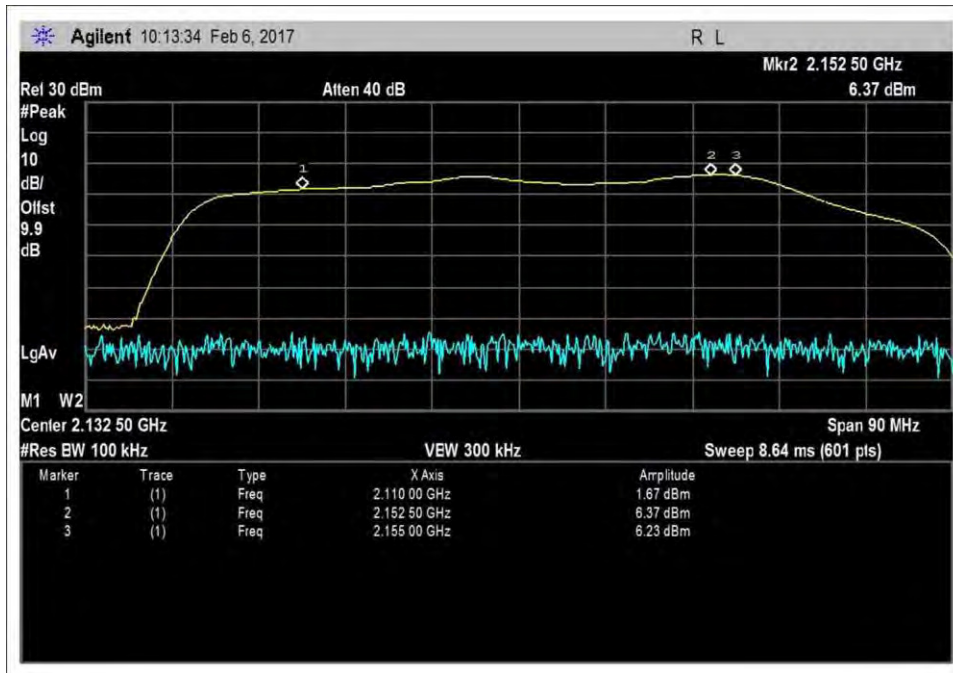
7.1_Band Verify_DL_746-757MHz



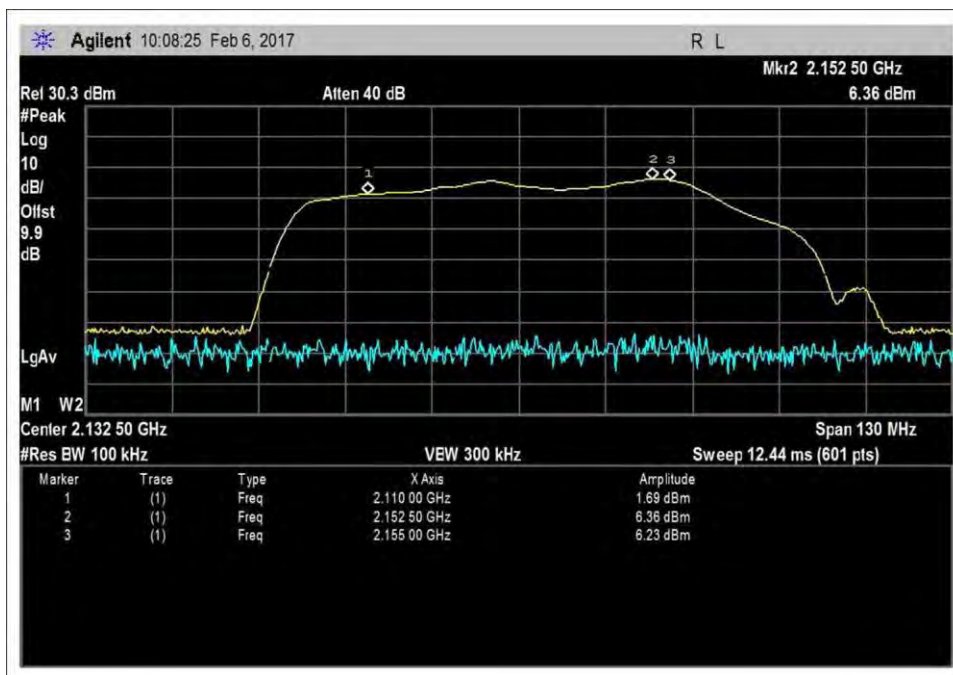
7.1_Band Verify_DL_869-894MHz



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 and 7.3 Maximum Gain

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Huaptec
 Specification: **7.2 Maximum Power Measurement**
7.3 Maximum Booster Gain

Work Order #: **99439** Date: 2/6/2017
 Test Type: **Conducted Emissions** Time: 10:42:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
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.
 The EUT Server port is a type N connector and 50-ohm impedance.
 The EUT Donor port is type N connector and 50-ohm impedance.

Part 22
 UL: 824-849MHz
 DL: 869-894MHz

Part 24
 UL: 1850-1915MHz
 DL: 1930-1995MHz

Part 27
 UL: 1710-1755MHz, 698-716MHz, 776-787MHz
 DL: 2110-2155MHz, 728-746MHz, 746-757MHz

The test was performed in accordance with section 7.2 and 7.3 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04 Dated February 12, 2016.
 Firmware: AF17-5S-V02

Test environment conditions:
 Temperature: 23°C
 Relative Humidity: 43%
 Pressure: 101.1 kPa

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018

Summary of Results

Pass: As summarized in tables below, measured EIRP, Gain and UL/DL gain ratio are within limits.

Pre AGC				Pre AGC		
	Pulse GSM			4.1 MHz AWGN		
Frequency (MHz)	Input (dBm)	Output (dBm)	*Gain (dB)	Input (dBm)	Output (dBm)	*Gain (dB)
UL1710-1755	-40.0	20.3	60.3	-42.7	18.1	60.8
UL1850-1915	-39.1	20.1	59.2	-41.2	18.0	59.2
UL824-894	-36.0	20.4	56.4	-38.3	18.2	56.5
UL 698-716	-36.7	20.9	57.6	-39.1	18.0	57.1
UL776-787	-35.2	20.6	55.8	-37.7	18.2	55.9
DL2110-2155	-46.7	10.3	57.0	-48.7	8.2	56.9
DL1930-1995	-47.9	10.4	58.3	-49.7	8.5	58.2
DL869-894	-45.6	10.7	56.3	-47.2	8.9	56.1
DL:728-746	-47.2	9.9	57.1	-48.3	8.7	57.0
DL 746-757	-46.3	10.5	56.8	-47.5	9.2	56.7

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

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	20.3	9.4	3.2	26.5	17	30
UL1850-1915	20.1	9.4	3.2	26.3	17	30
UL824-894	20.4	6.5	1.8	25.1	17	30
UL 698-716	20.9	6.5	1.8	25.6	17	30
UL776-787	20.6	6.5	1.8	25.3	17	30
DL2110-2155	10.3	3	2	11.3	NA	17
DL1930-1995	10.4	3	2	11.4	NA	17
DL869-894	10.7	3	1.6	12.1	NA	17
DL:728-746	9.9	3	1.6	11.3	NA	17
DL 746-757	10.5	3	1.6	11.9	NA	17

4.1 MHz 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	9.4	3.2	24.3	17	30
UL1850-1915	18.0	9.4	3.2	24.2	17	30
UL824-894	18.2	6.5	1.8	22.9	17	30
UL 698-716	18.0	6.5	1.8	22.7	17	30
UL776-787	18.2	6.5	1.8	22.9	17	30
DL2110-2155	8.2	3	2	9.2	NA	17
DL1930-1995	8.5	3	2	9.5	NA	17
DL869-894	8.9	3	1.6	10.3	NA	17
DL:728-746	8.7	3	1.6	10.1	NA	17
DL 746-757	9.2	3	1.6	10.6	NA	17

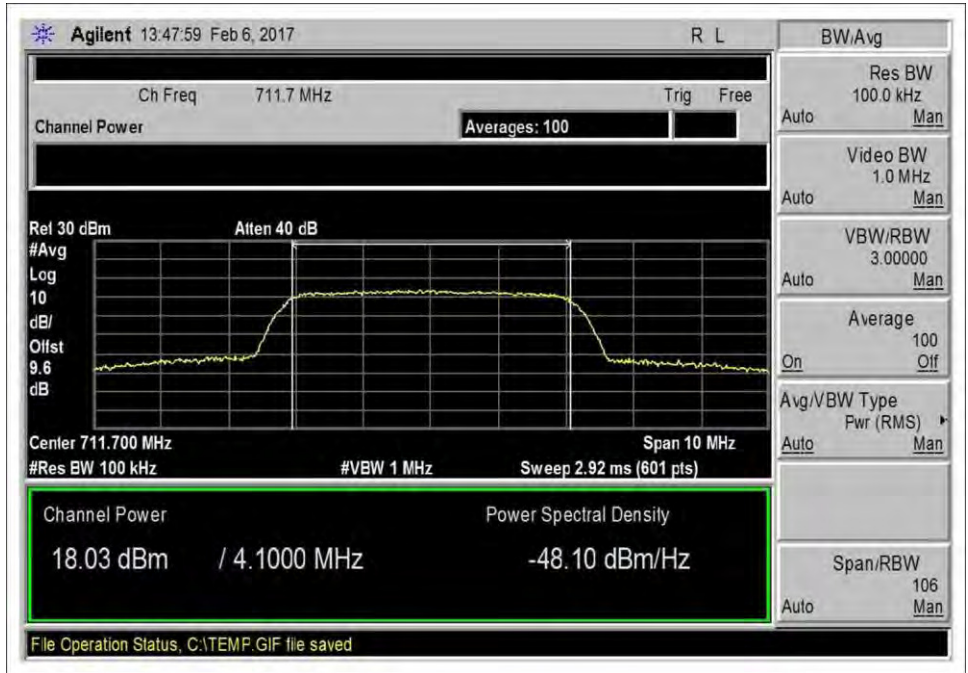
Section 5.5 power						
	Pulse GSM			4.1 MHz AWGN		
Frequency (MHz)	Input (dBm)	Output (dBm)	Gain (dB)	Input (dBm)	Output (dBm)	Gain (dB)
UL1710-1755	-23.2	20.8	44.0	-23.2	18.9	42.1
UL1850-1915	-23.2	20.1	43.3	-23.2	18.4	41.6
UL824-894	-21.0	20.3	41.3	-23.0	18.8	41.8
UL 698-716	-20.9	20.9	41.8	-21.9	17.8	39.7
UL776-787	-21.0	20.9	41.9	-21.0	18.5	39.5
DL2110-2155	-33.2	10.5	43.7	-32.2	8.8	41.0
DL1930-1995	-34.2	10.0	44.2	-32.2	8.9	41.1
DL869-894	-32.1	10.9	43.0	-32.1	9.2	41.3
DL:728-746	-32.9	9.6	42.5	-32.9	9.0	41.9
DL 746-757	-31.9	10.7	42.6	-31.9	9.9	41.8

Note: The booster went into Transmitter off mode at Max input power in accordance with section 5.5. Results presented on the above table are at 1 dB below the Transmit off RF input level.

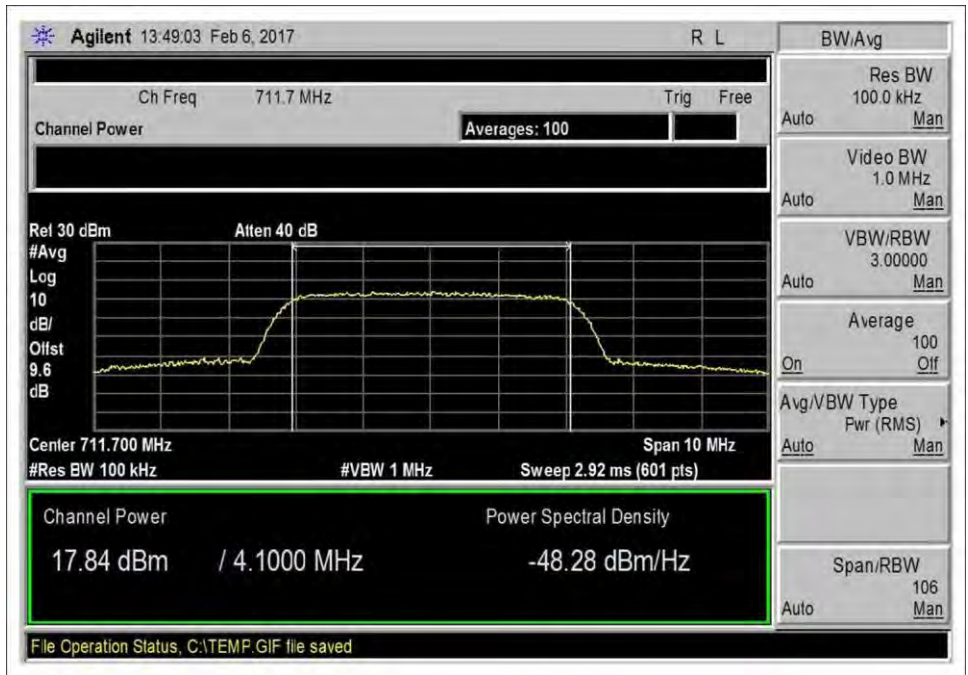
UL gain vs DL gain	Pulse GSM (dB)	4.1MHz AWGN (dB)	Limit (dB)
UL gain vs DL gain 1710/2110	3.3	3.9	9.0
UL gain vs DL gain 1850/1930	0.9	1.0	9.0
UL gain vs DL gain 824/869	0.1	0.5	9.0
UL gain vs DL gain 776/728	0.5	0.1	9.0
UL gain vs DL gain 776/746	-1.0	-0.9	9.0

Plots

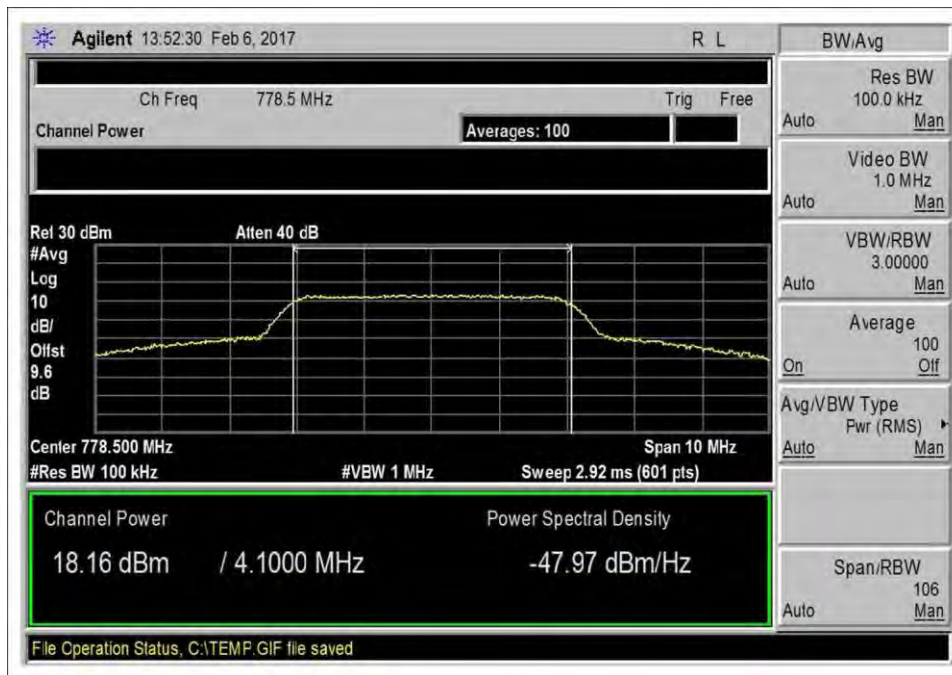
AWGN



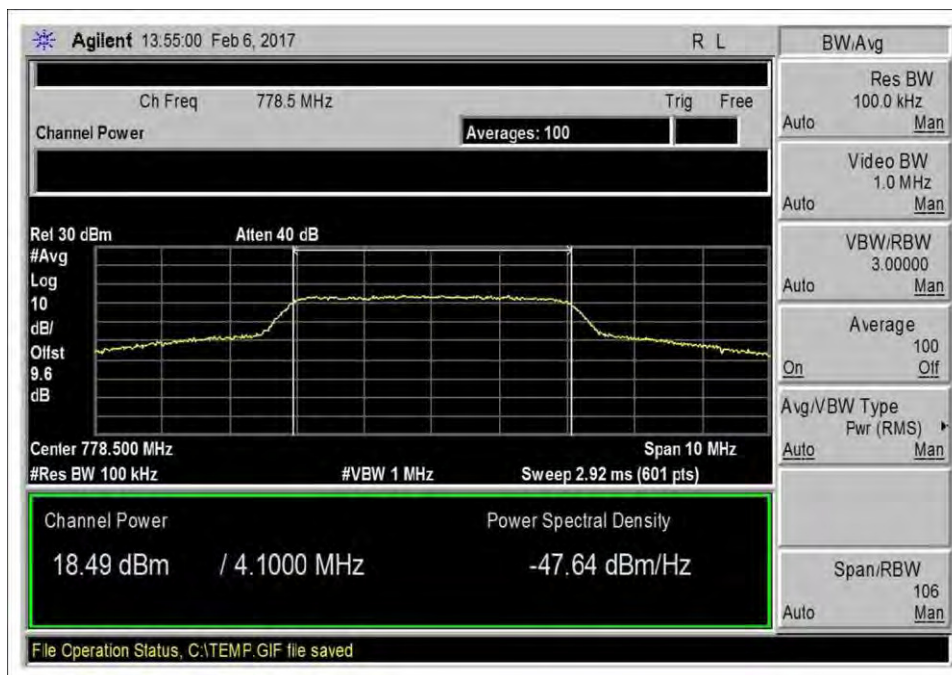
7.2_Power_UL_698-716MHz



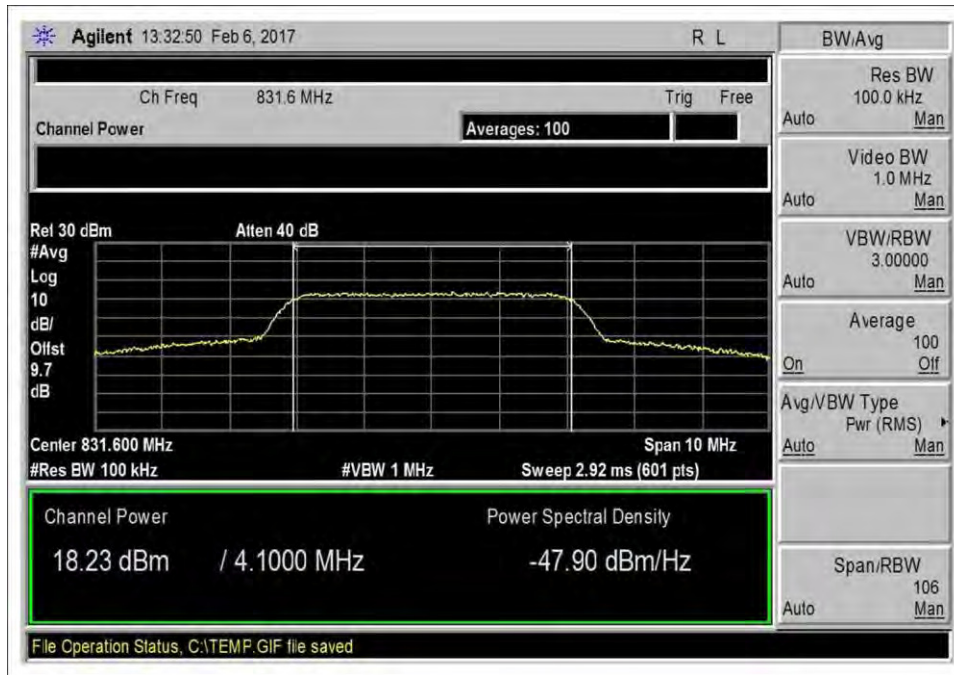
7.2_Power_UL_698-716MHz-Max



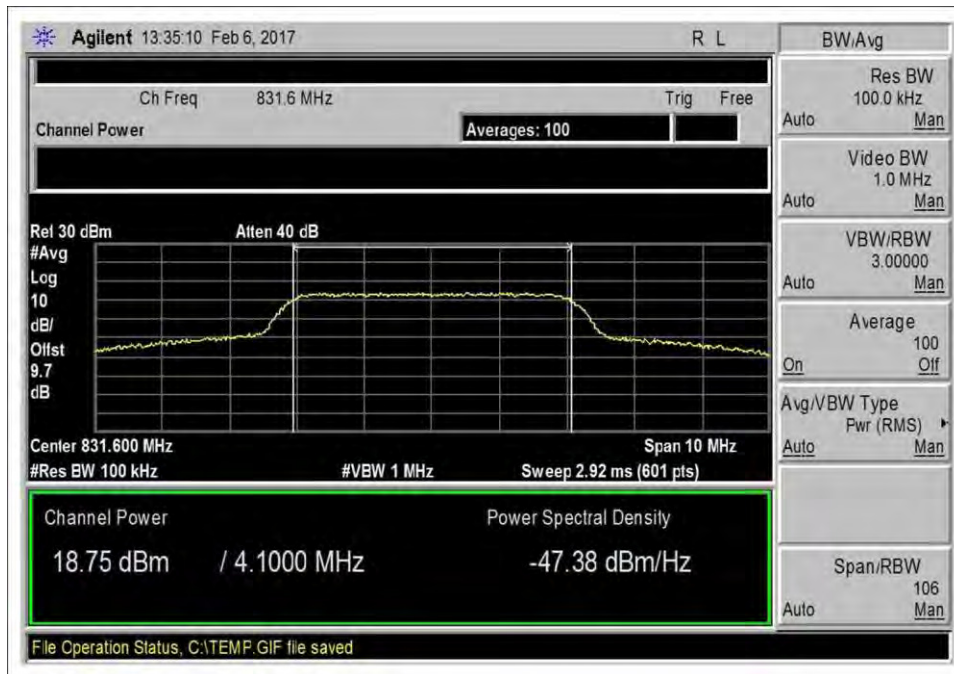
7.2_Power_UL_776-787MHz



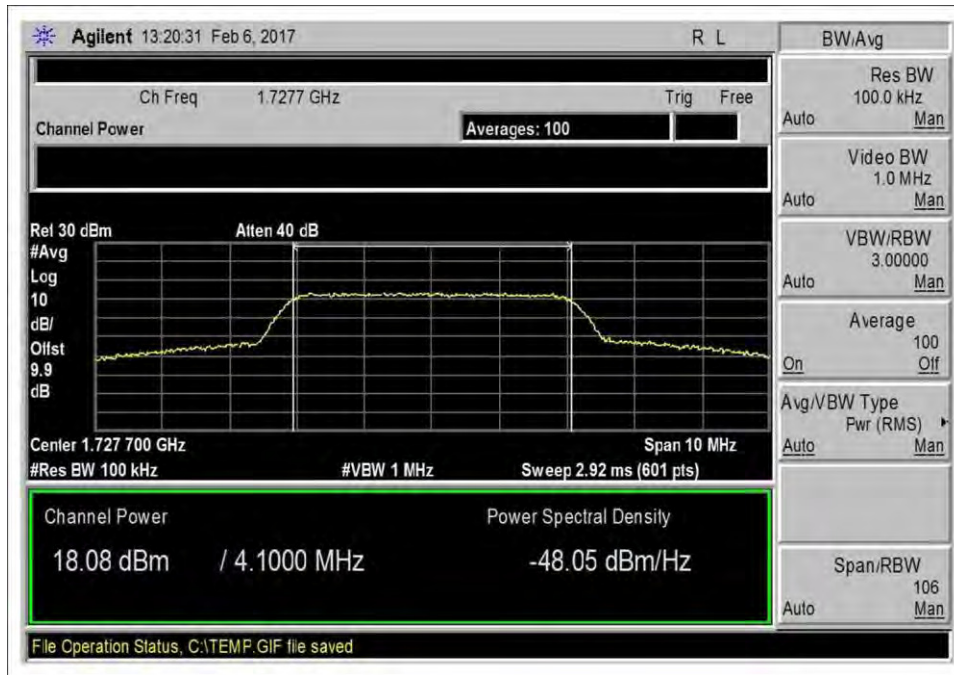
7.2_Power_UL_776-787MHz-Max



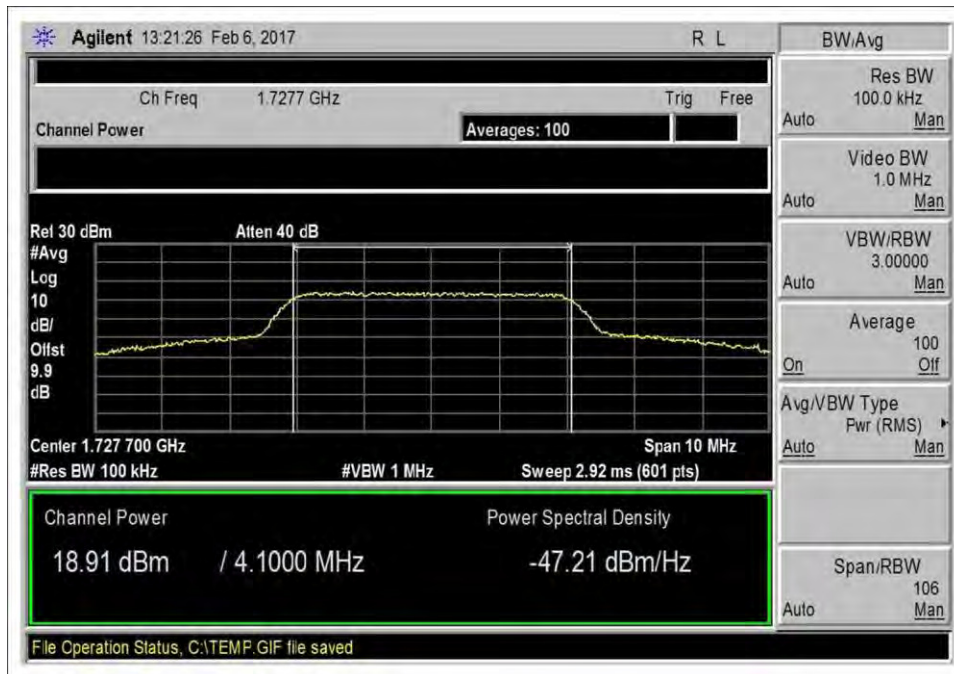
7.2_Power_UL_824-849MHz



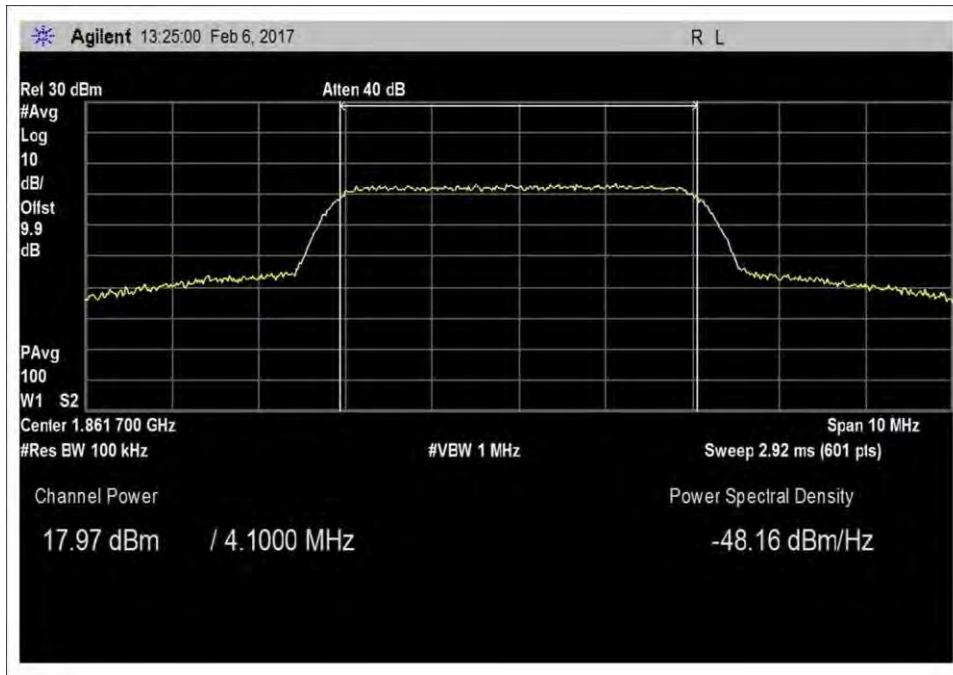
7.2_Power_UL_824-849MHz-Max



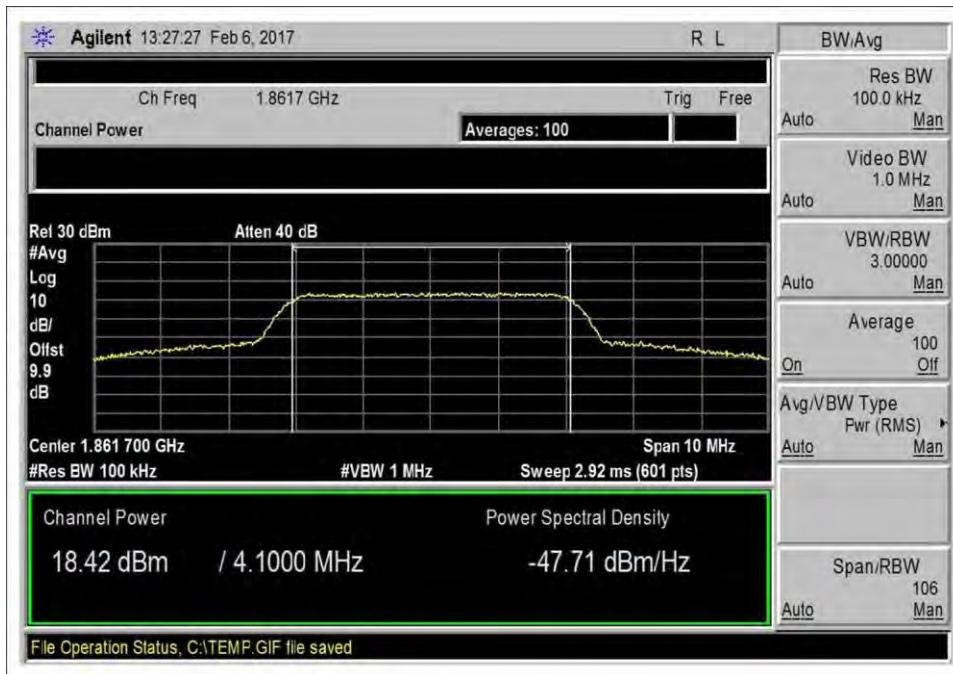
7.2_Power_UL_1710-1755MHz



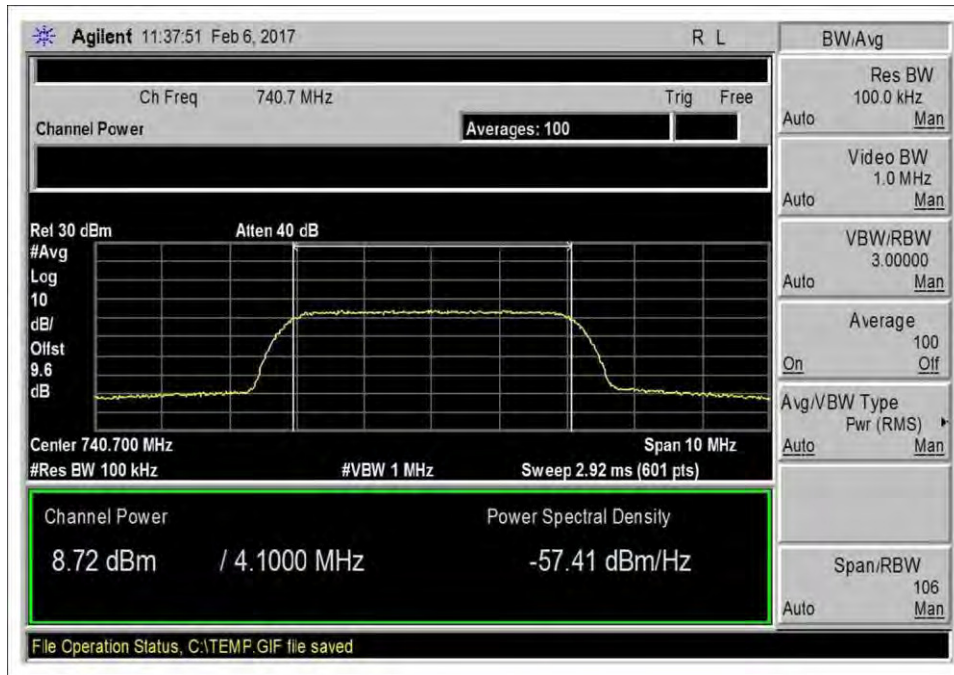
7.2_Power_UL_1710-1755MHz-Max



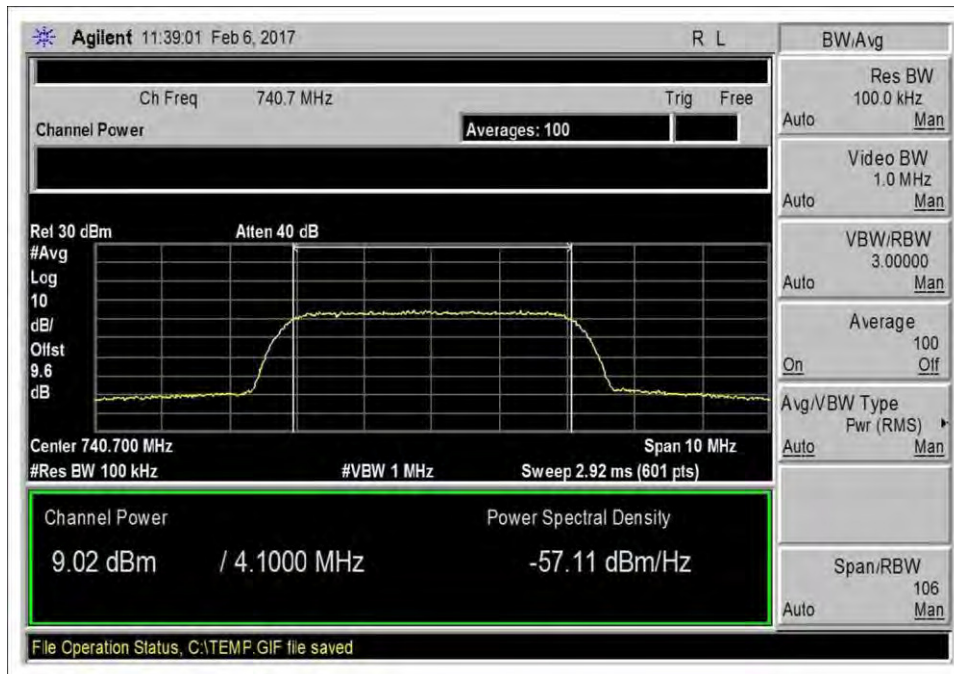
7.2_Power_UL_1850-1915MHz



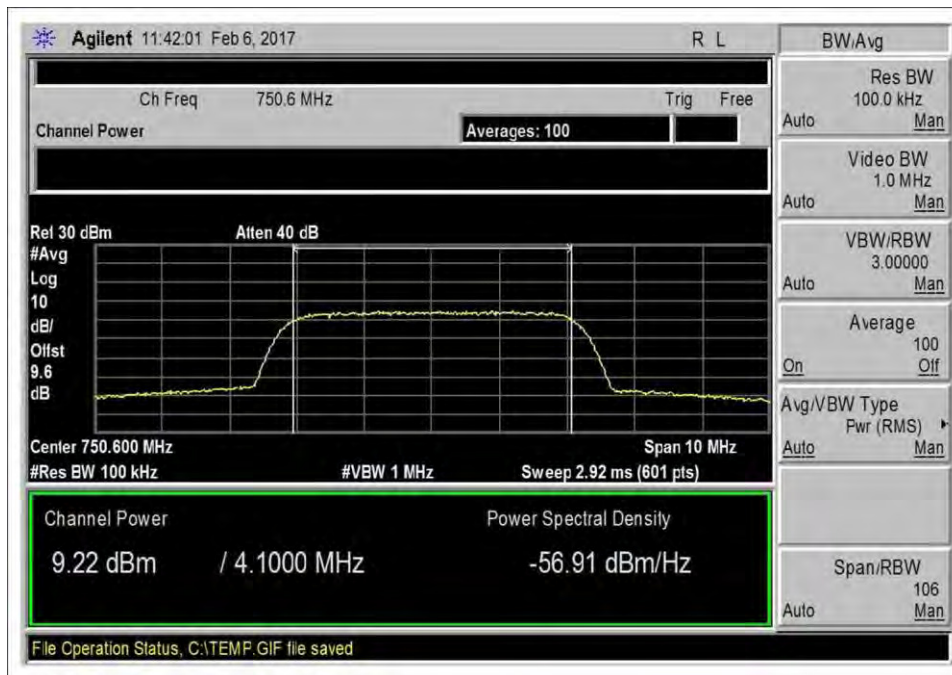
7.2_Power_UL_1850-1915MHz-Max



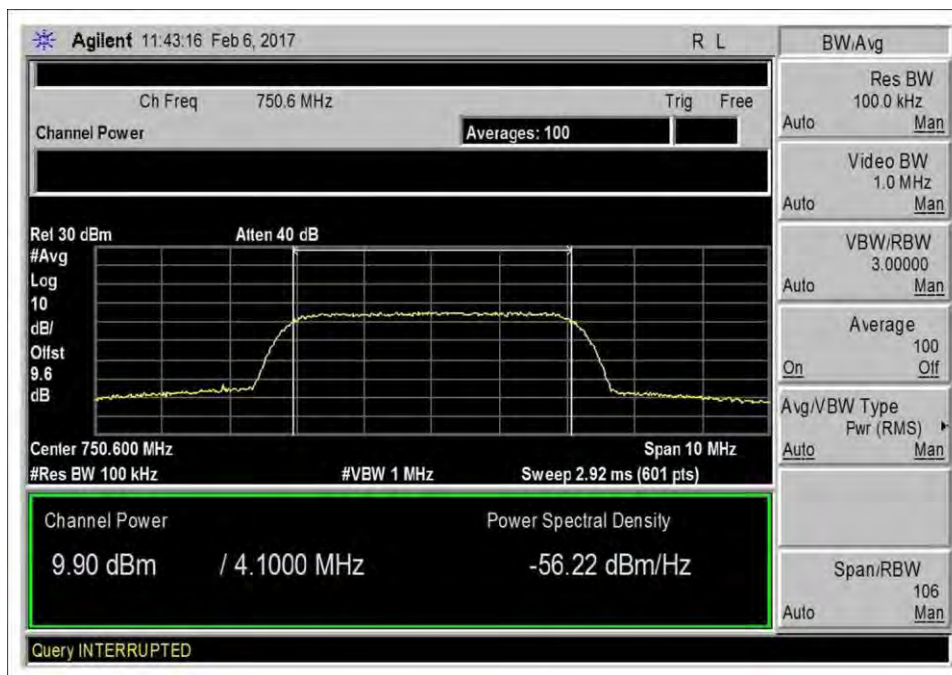
7.2_Power_DL_728-746MHz



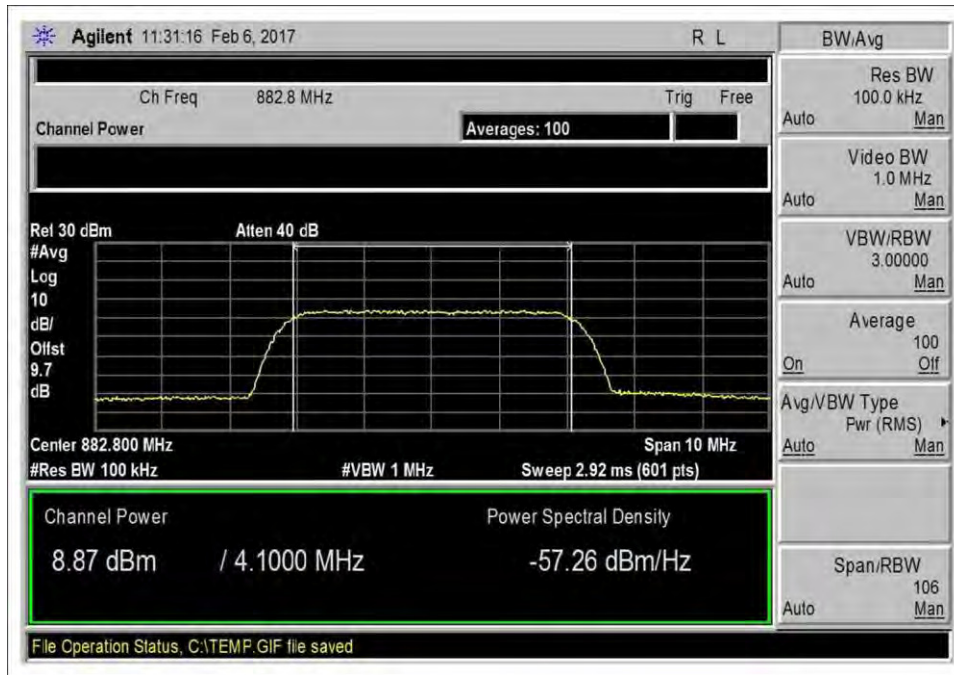
7.2_Power_DL_728-746MHz-Max



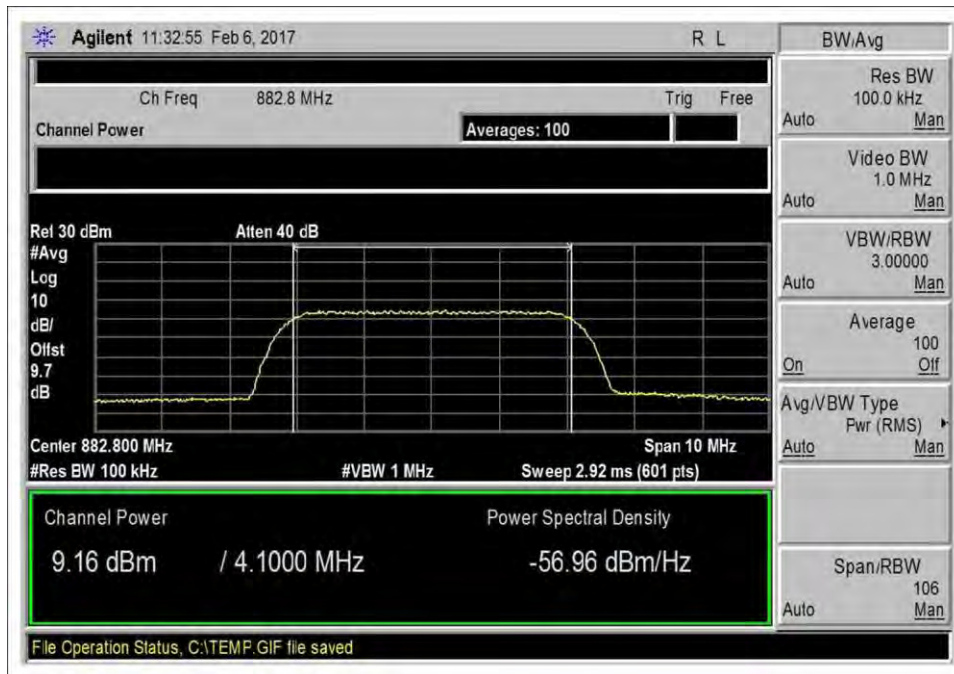
7.2_Power_DL_746-757MHz



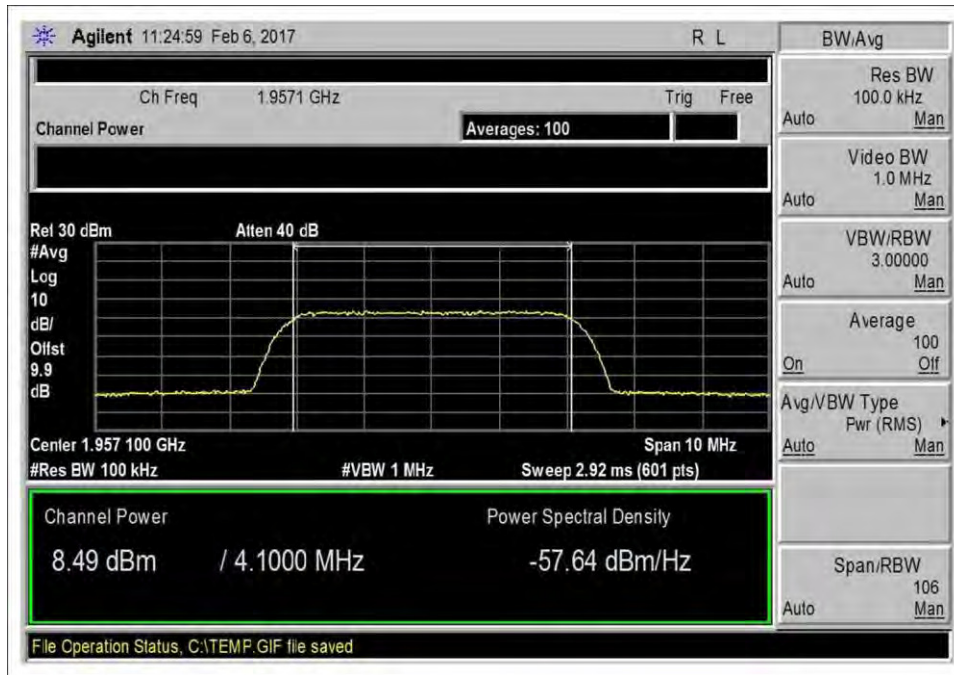
7.2_Power_DL_746-757MHz-Max



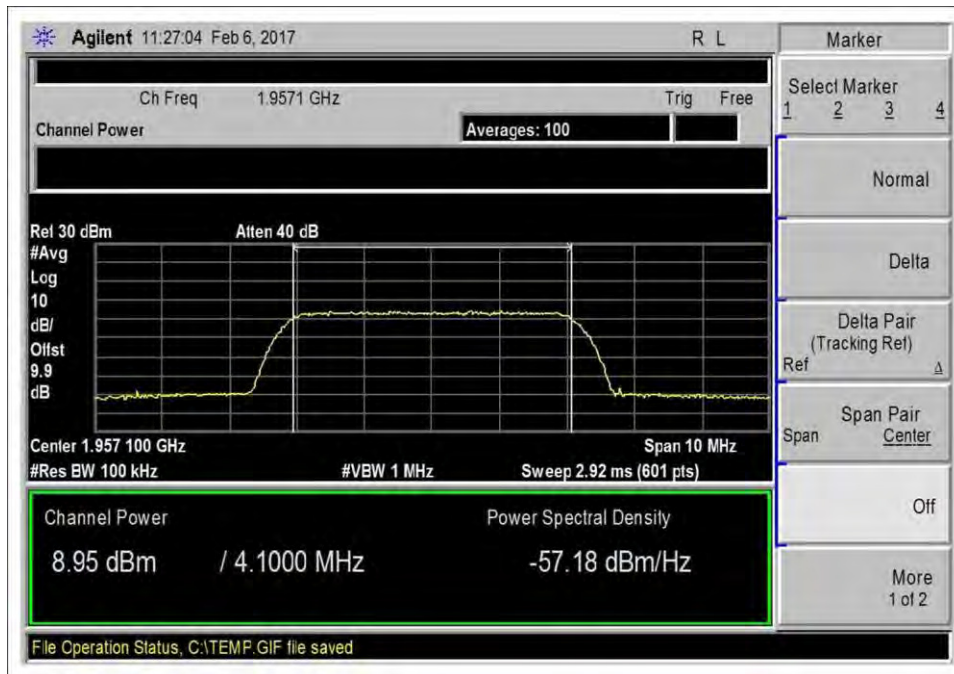
7.2_Power_DL_869-894MHz



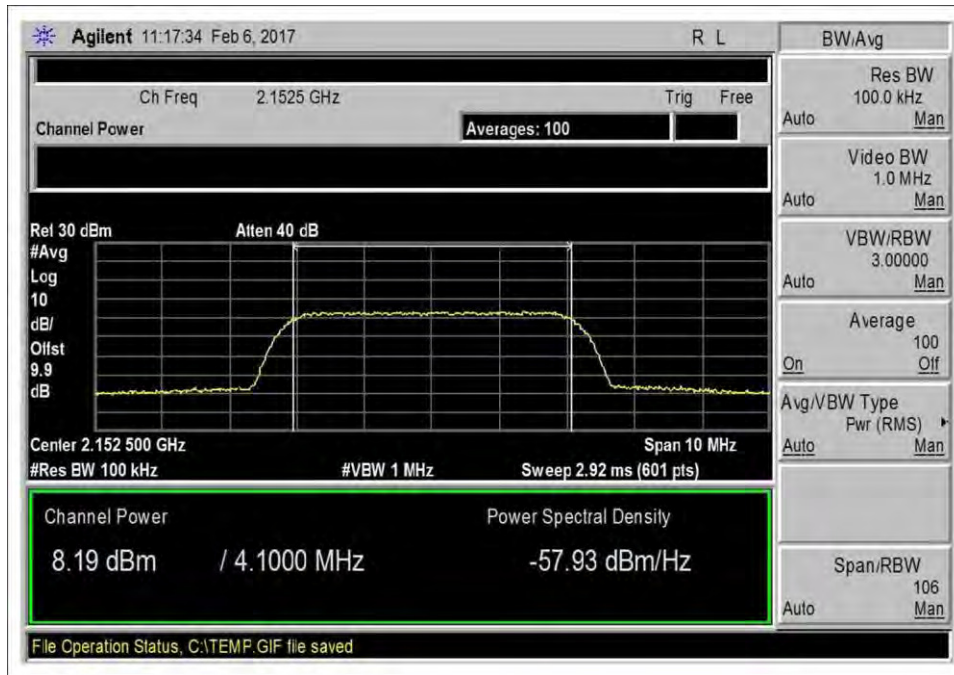
7.2_Power_DL_869-894MHz-Max



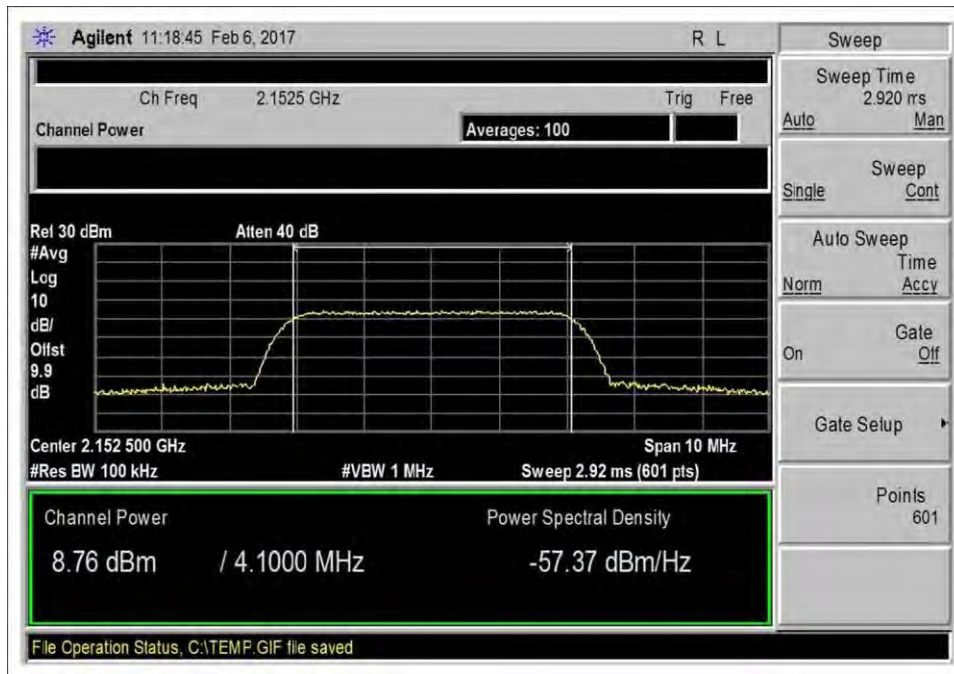
7.2_Power_DL_1930-1995MHz



7.2_Power_DL_1930-1995MHz-Max

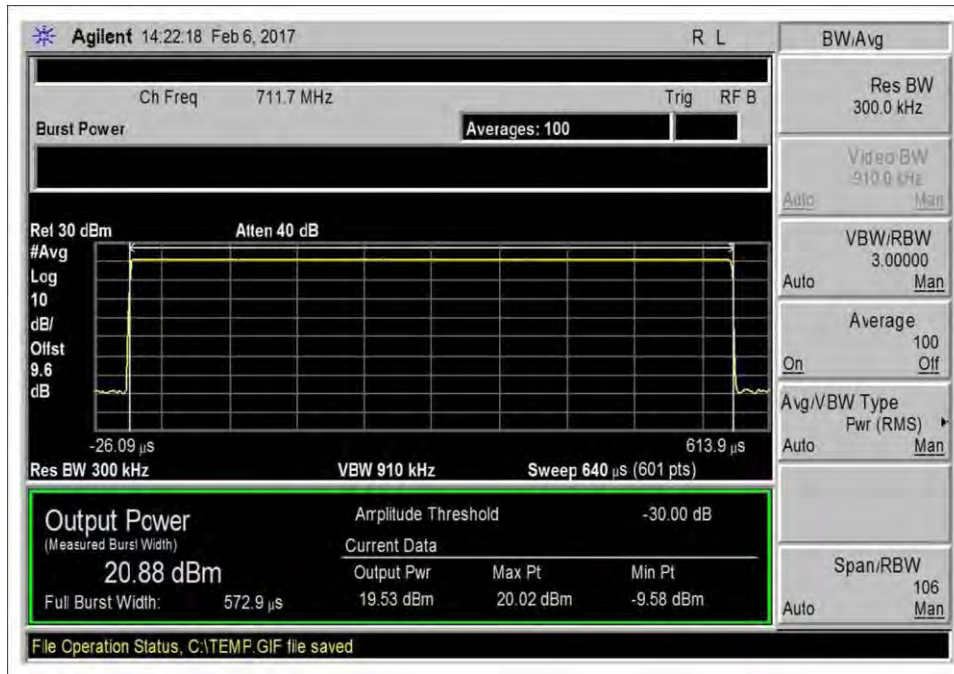


7.2_Power_DL_2110-2155MHz

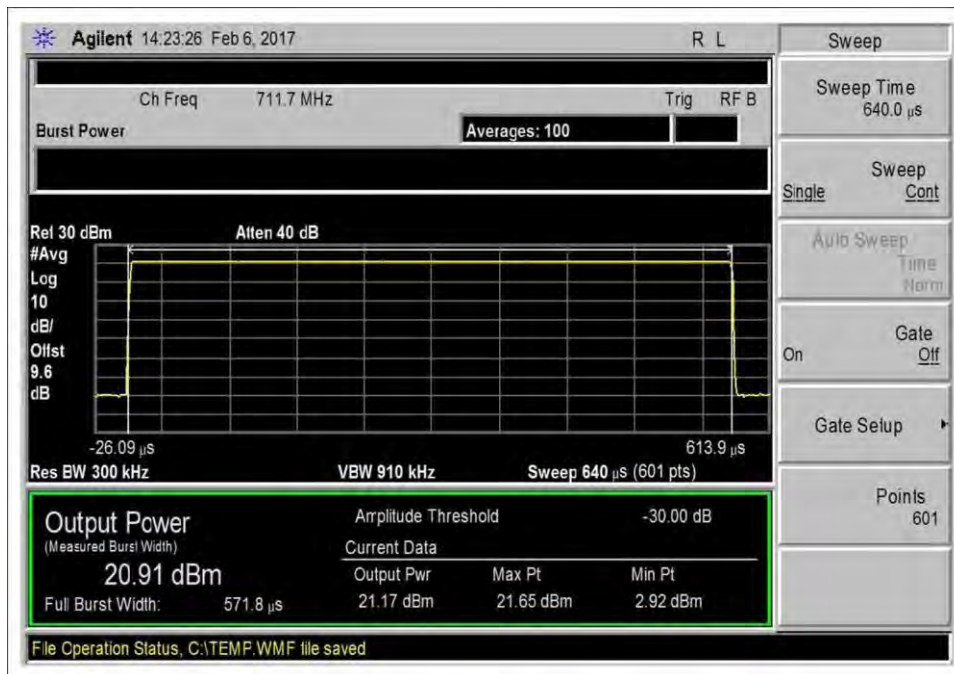


7.2_Power_DL_2110-2155MHz-Max

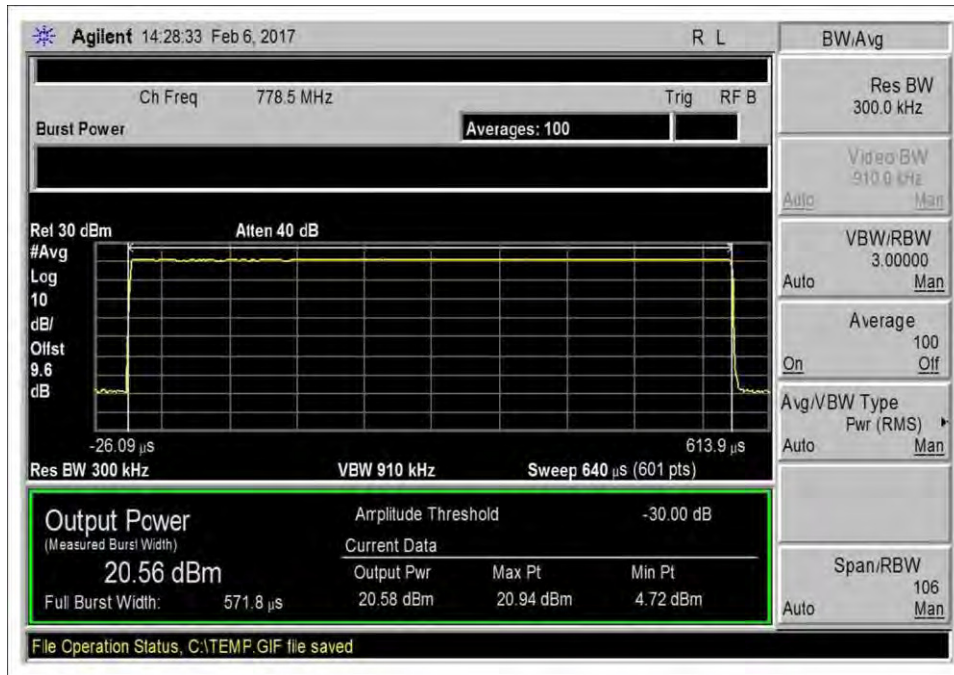
GSM



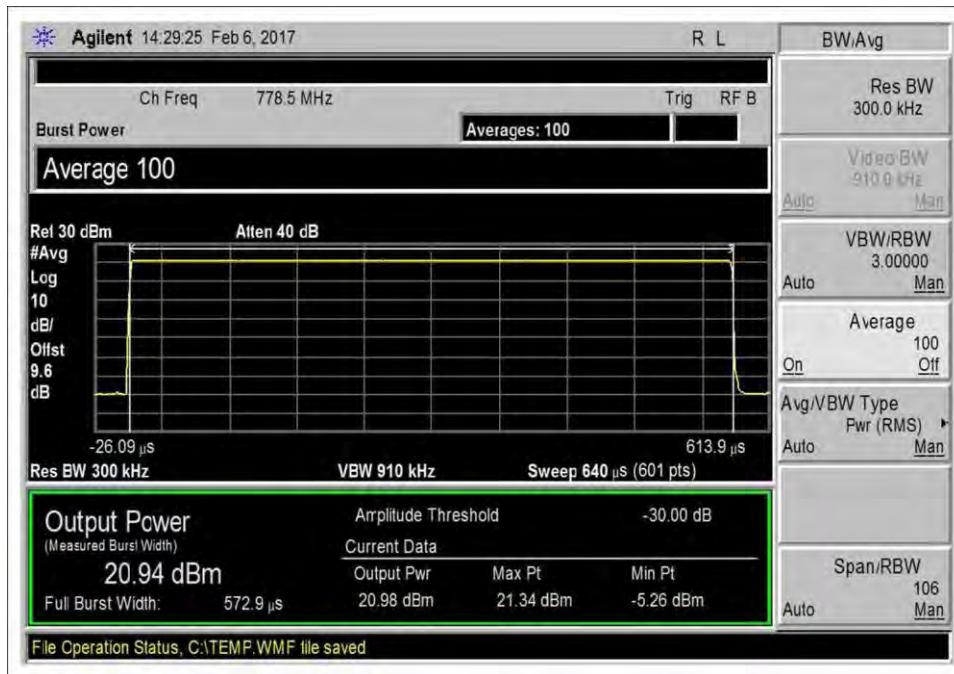
7.2_Power_UL_698-716MHz



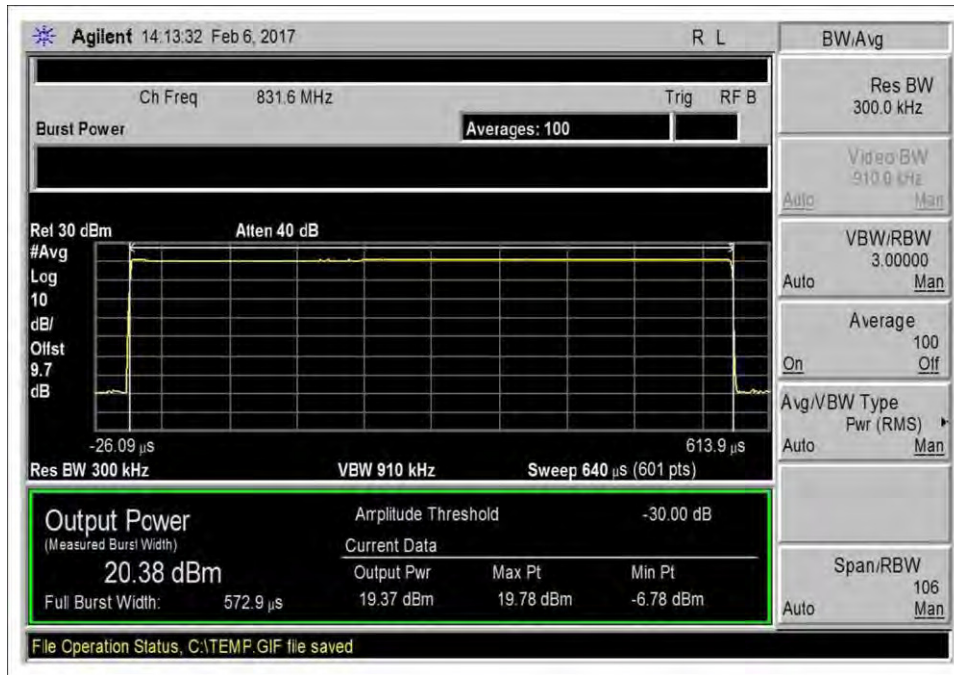
7.2_Power_UL_698-716MHz-Max



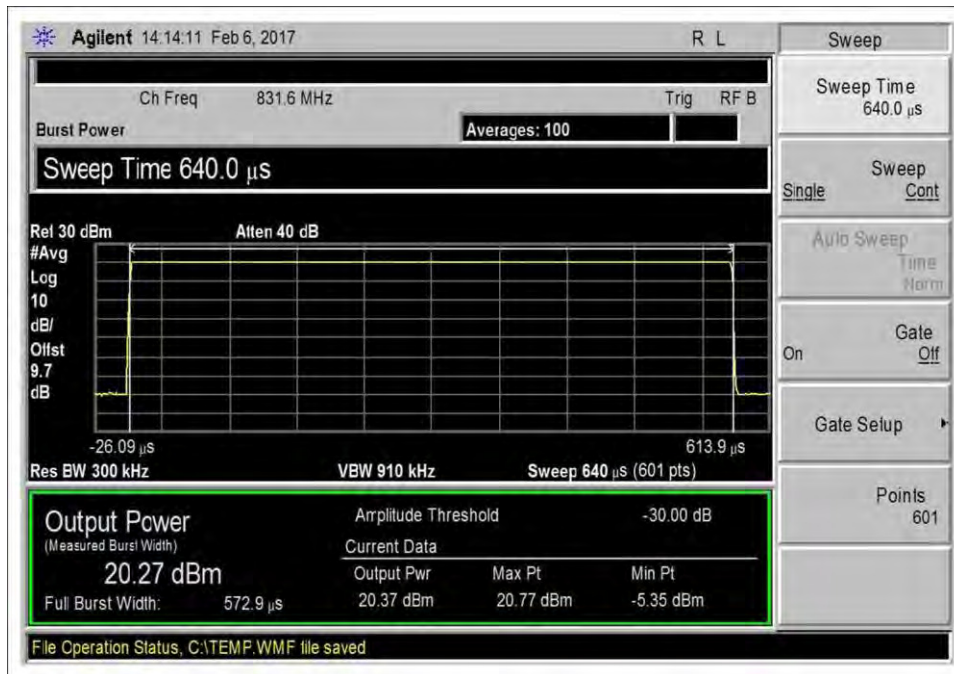
7.2_Power_UL_776-787MHz



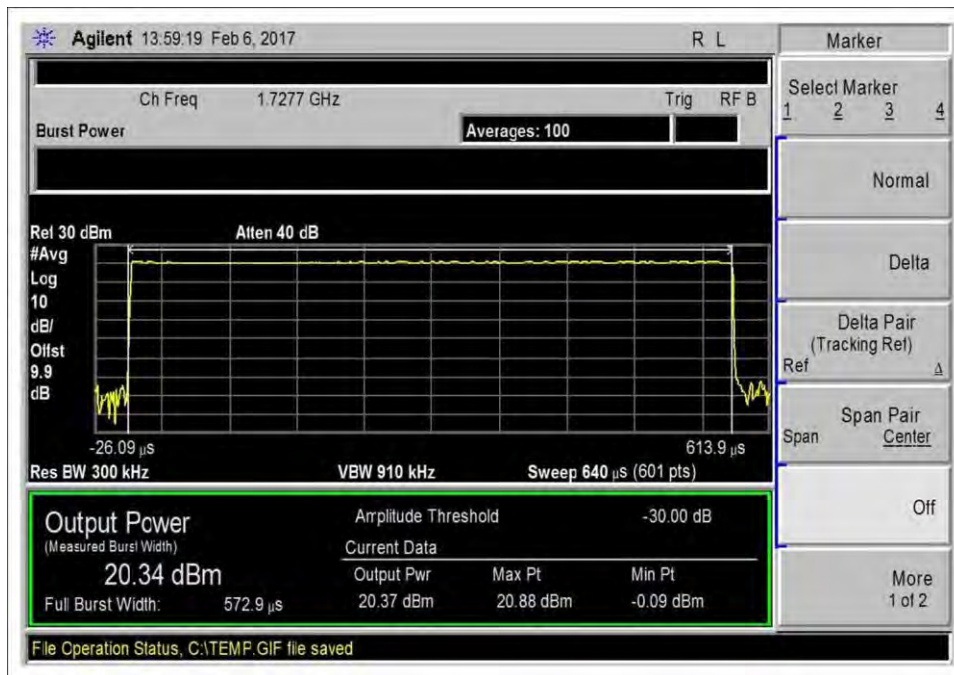
7.2_Power_UL_776-787MHz-Max



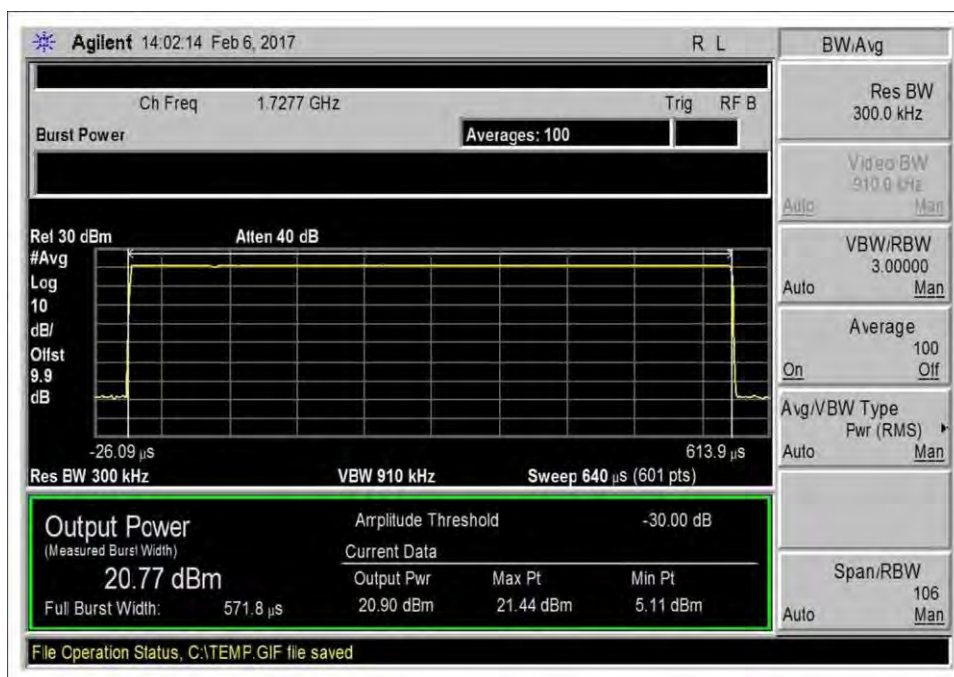
7.2_Power_UL_824-849MHz



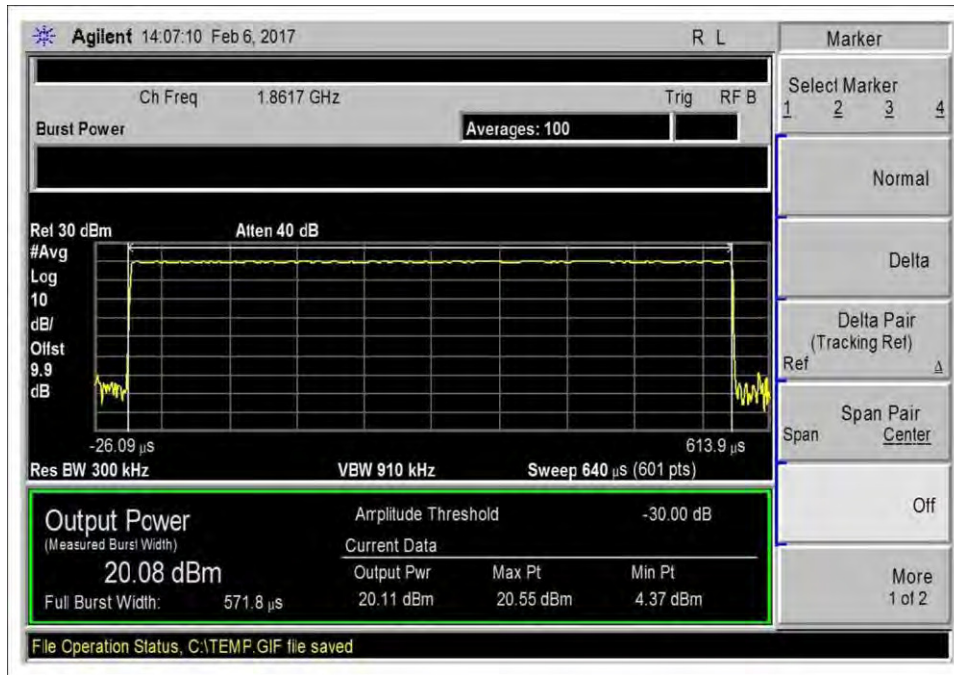
7.2_Power_UL_824-849MHz-Max



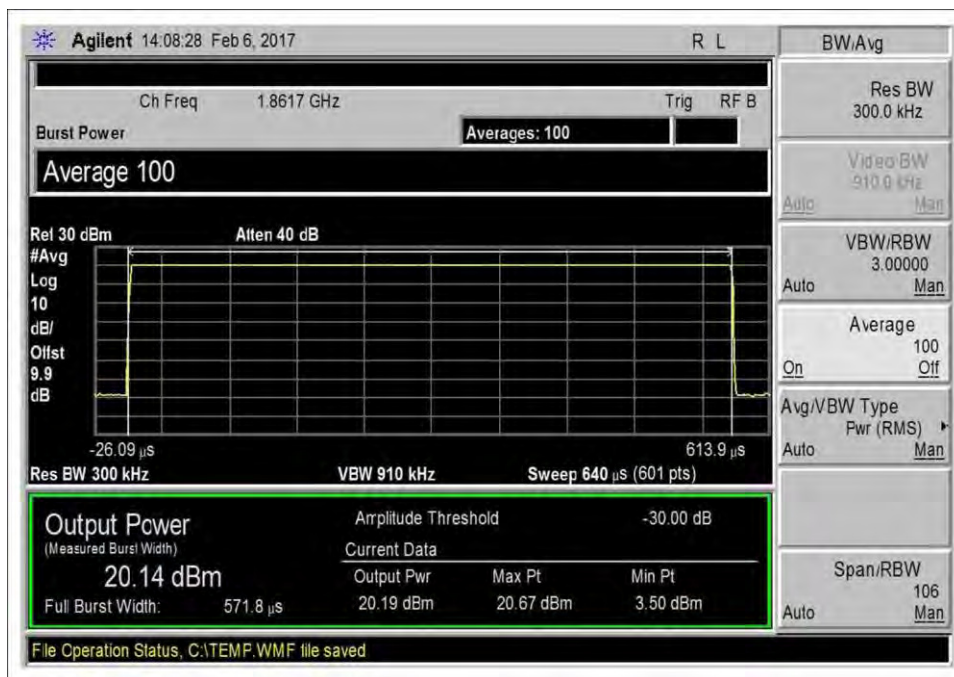
7.2_Power_UL_1710-1755MHz



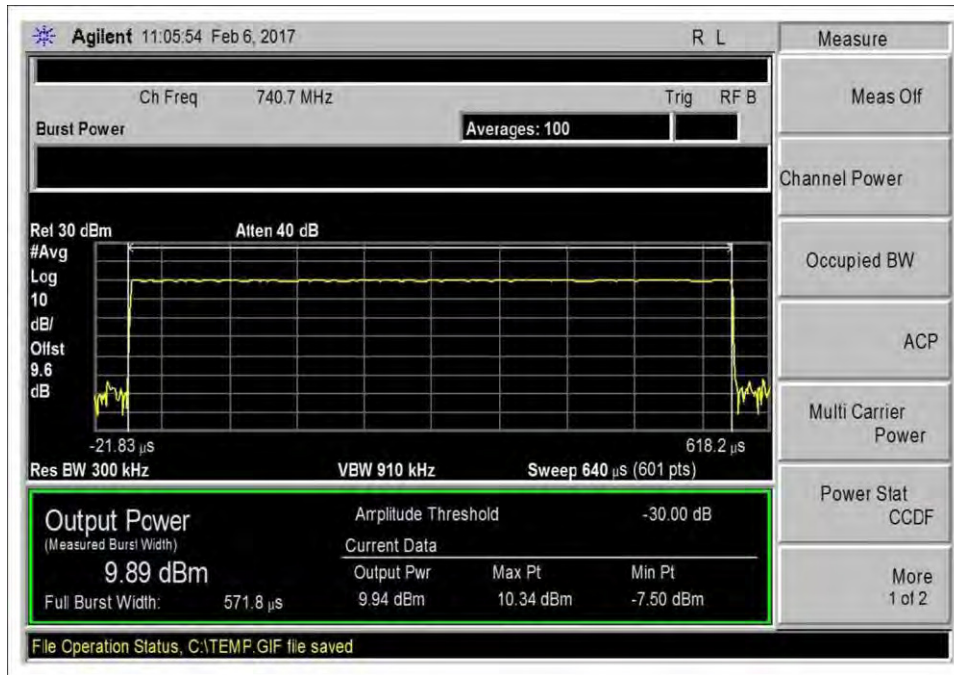
7.2_Power_UL_1710-1755MHz-Max



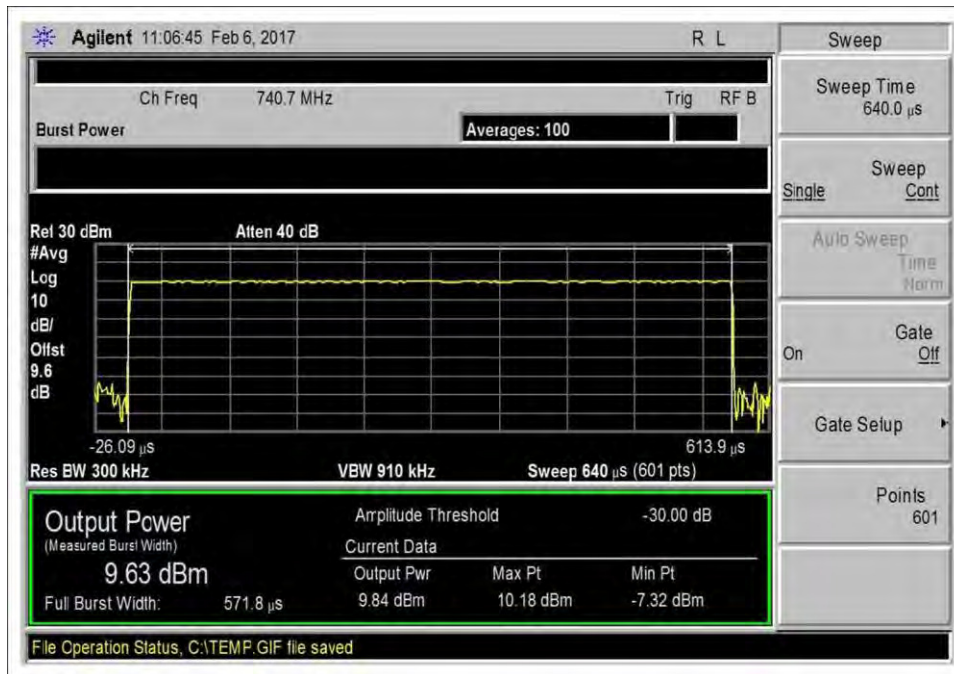
7.2_Power_UL_1850-1915MHz



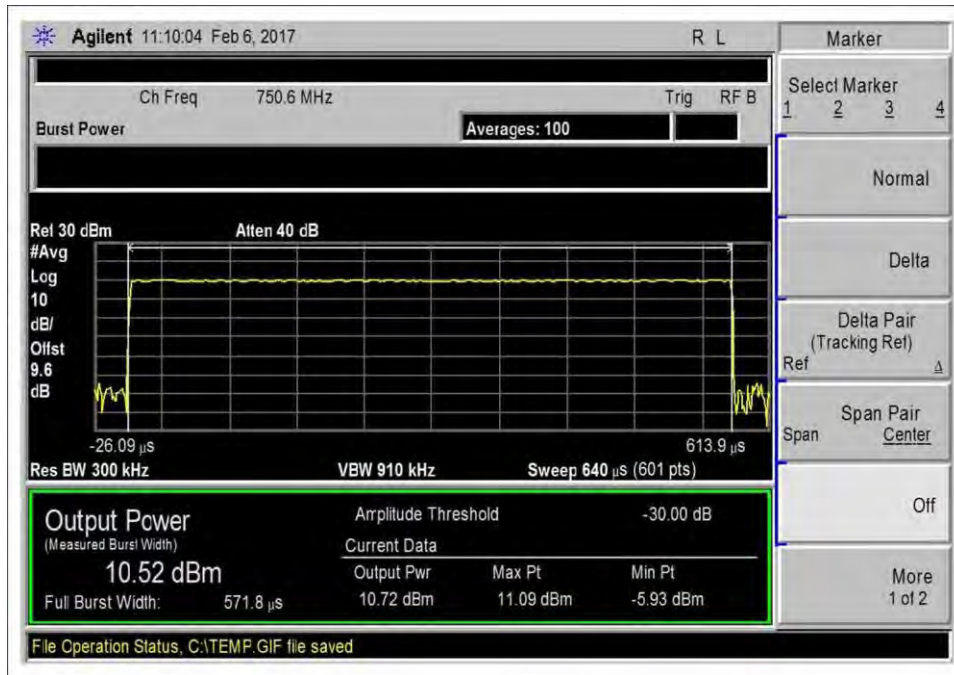
7.2_Power_UL_1850-1915MHz-Max



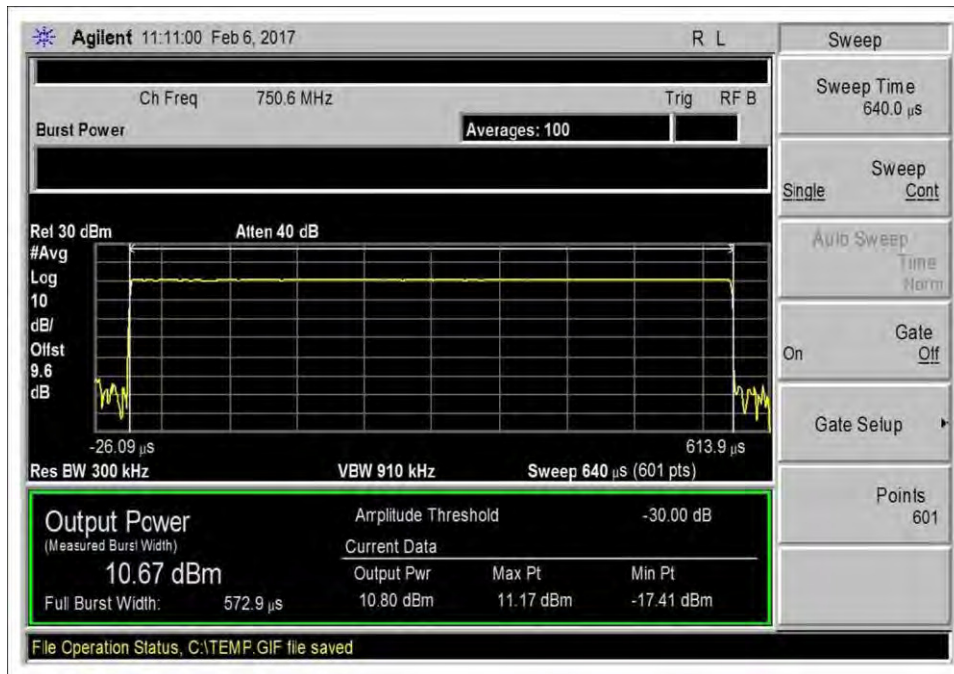
7.2_Power_DL_728-746MHz



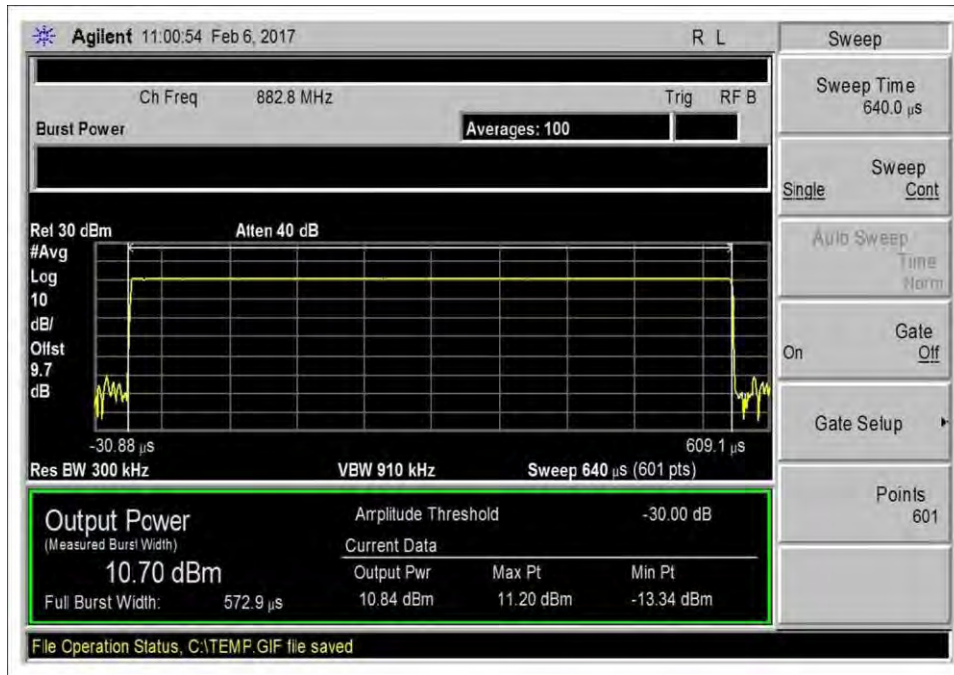
7.2_Power_DL_728-746MHz-Max



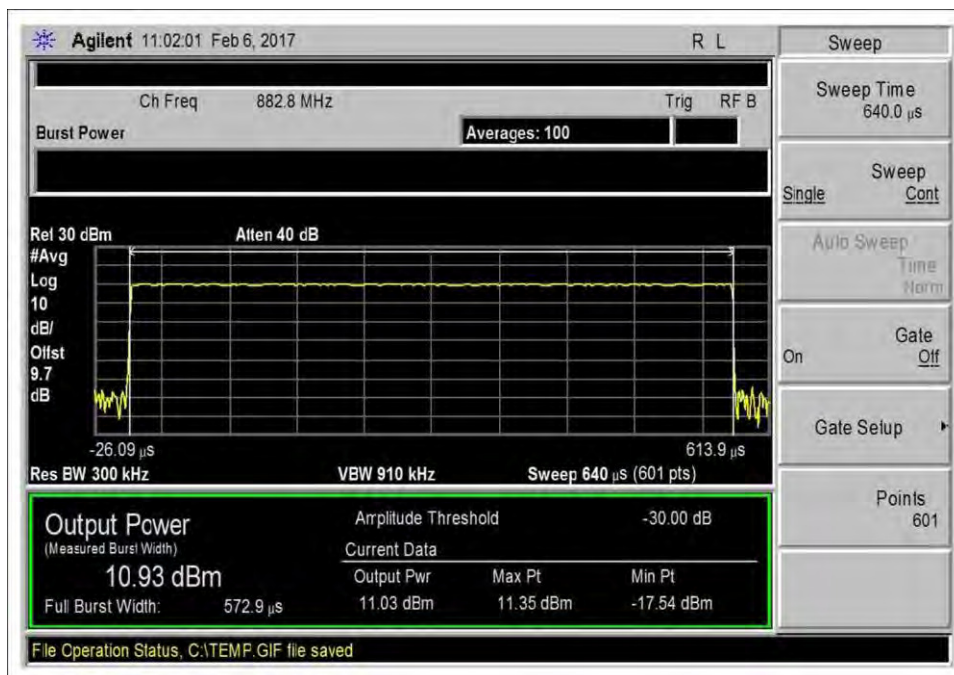
7.2_Power_DL_746-757MHz



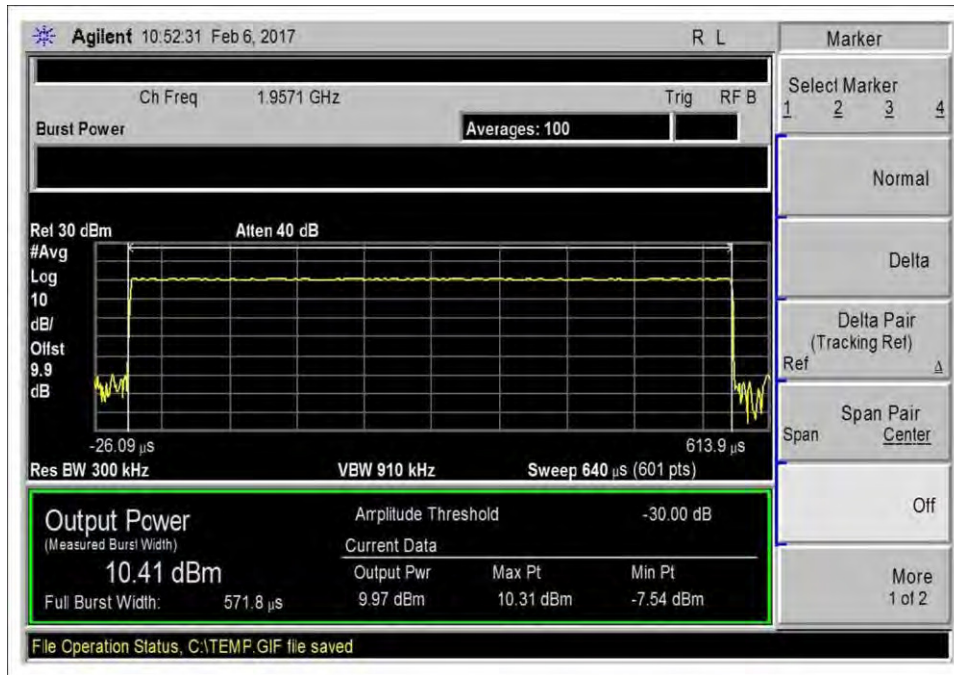
7.2_Power_DL_746-757MHz-Max



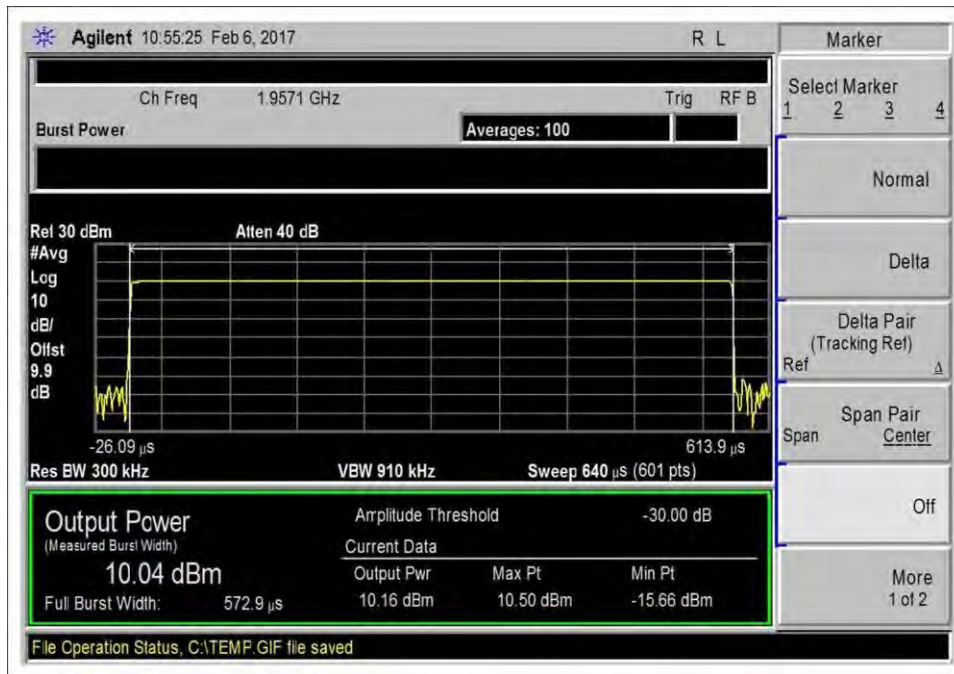
7.2_Power_DL_869-894MHz



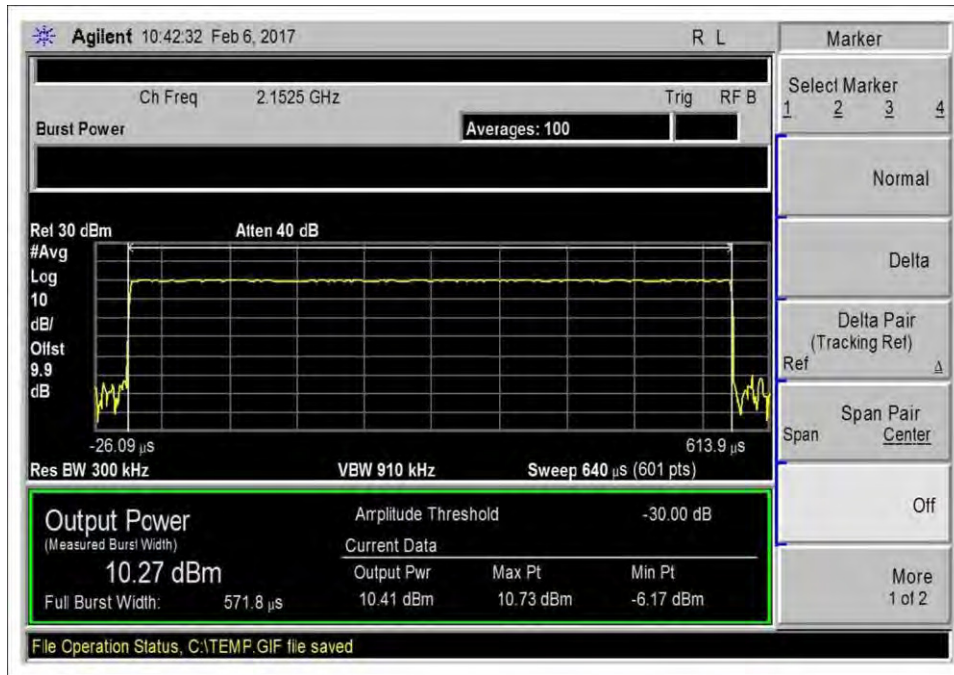
7.2_Power_DL_869-894MHz-Max



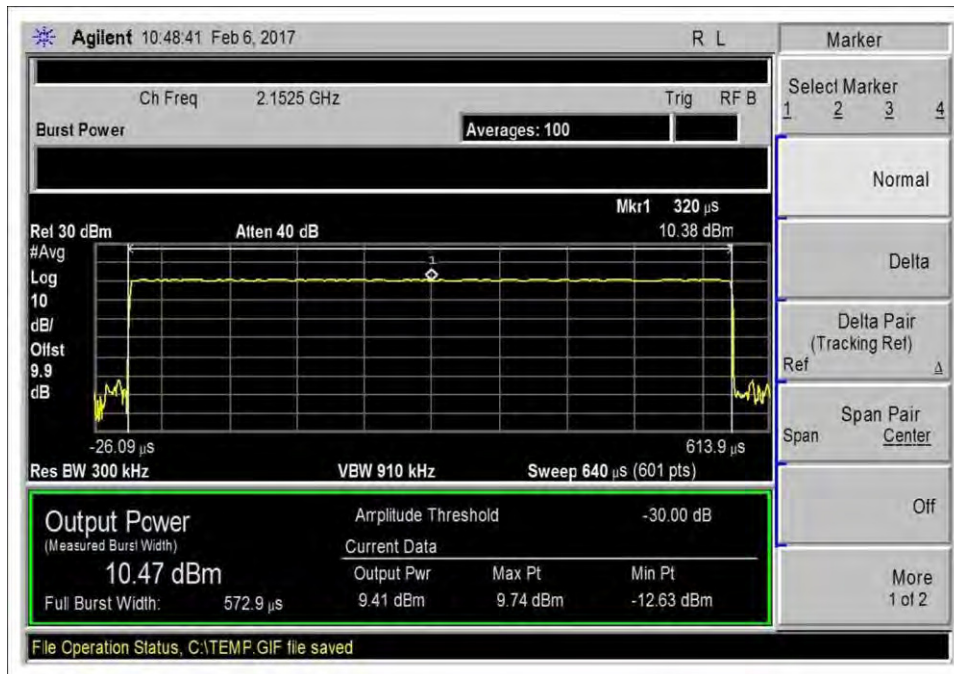
7.2_Power_DL_1930-1995MHz



7.2_Power_DL_1930-1995MHz-Max



7.2_Power_DL_2110-2155MHz



7.2_Power_DL_2110-2155MHz_Max

7.4 Intermodulation Product

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Huaptec
 Specification: **7.4 Intermodulation Product**
 Work Order #: **99439** Date: 2/6/2017
 Test Type: **Conducted Emissions** Time: 3:30:00 PM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
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.
 The EUT Server port is a type N connector and 50-ohm impedance.
 The EUT Donor port is type N connector and 50-ohm impedance.

Part 22
 UL: 824-849MHz
 DL: 869-894MHz
 Part 24
 UL: 1850-1915MHz
 DL: 1930-1995MHz
 Part 27
 UL: 1710-1755MHz, 698-716MHz, 776-787MHz
 DL: 2110-2155MHz, 728-746MHz, 746-757MHz

The test was performed in accordance with section 7.4 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04 Dated February 12, 2016.
 Firmware: AF17-5S-V02

Test environment conditions:
 Temperature: 23°C
 Relative Humidity: 43%
 Pressure: 101.1 kPa

Test Equipment:

Asset #	Description	Model	Calibration Date	Cal Due Date
AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06897	Cable	32022-29094K- 29094K-48TC	12/30/2015	12/30/2017
ANP06898	Cable	32022-29094K- 29094K-48TC	12/30/2015	12/30/2017
ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018

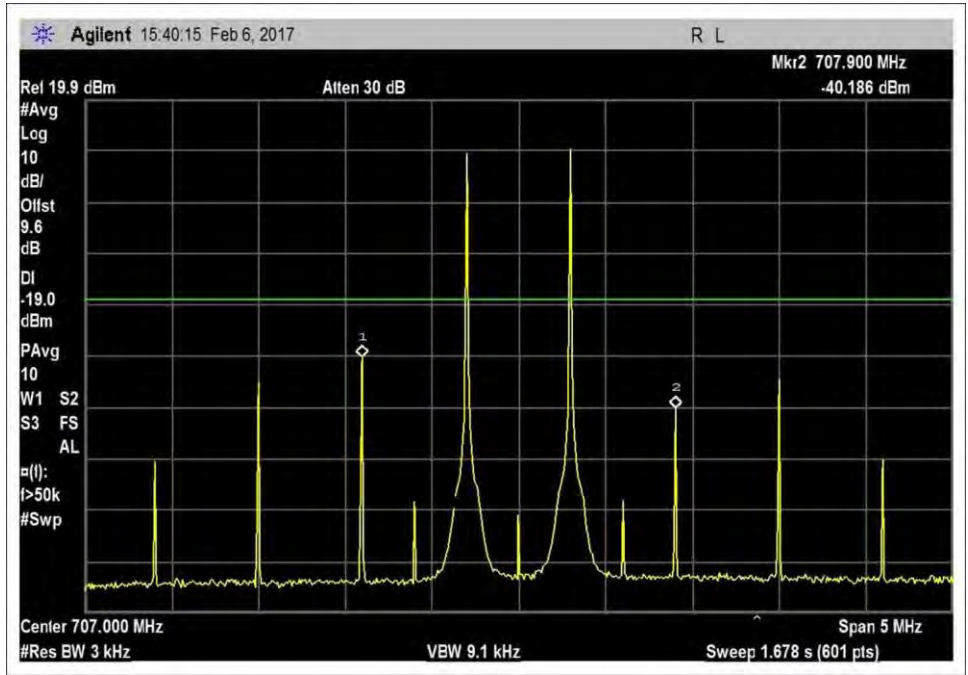
Summary of Results

Pass: As shown on the plots, all intermodulation products are measured below -19dbm limit.

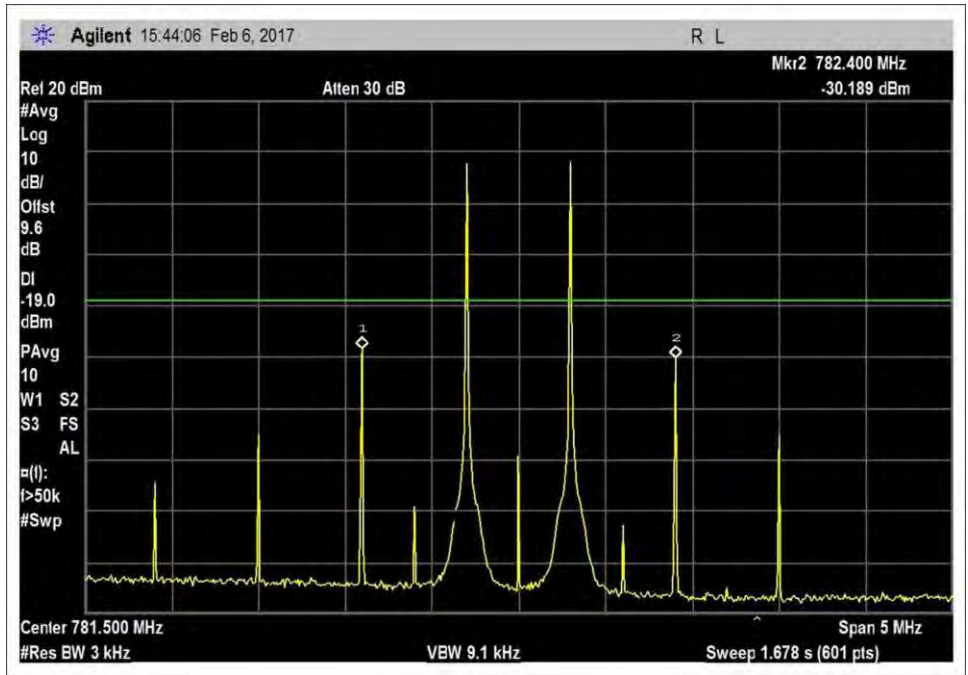
Inter Modulation Product			
Frequency (MHz)	Pre AGC (dBm)	Limit (dBm)	Results
UL 1710-1755	-27.1	-19	Pass
UL 1850-1915	-32.1	-19	Pass
UL 824-894	-32.3	-19	Pass
UL 698-716	-30.2	-19	Pass
UL 776-787	-28.3	-19	Pass
DL 2110-2155	-39.3	-19	Pass
DL 1930-1995	-45.4	-19	Pass
DL 869-894	-47.3	-19	Pass
DL 728-746	-41.4	-19	Pass
DL 746-757	-39.7	-19	Pass

Note: The EUT maintains compliance with the intermodulation limit at input power of AGC+10dB

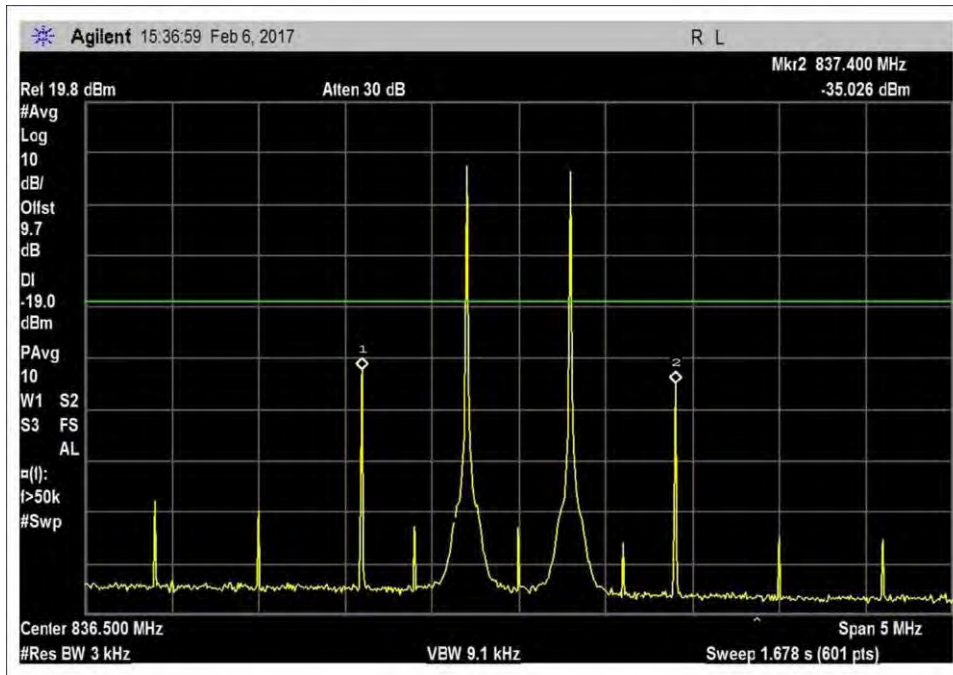
Plots



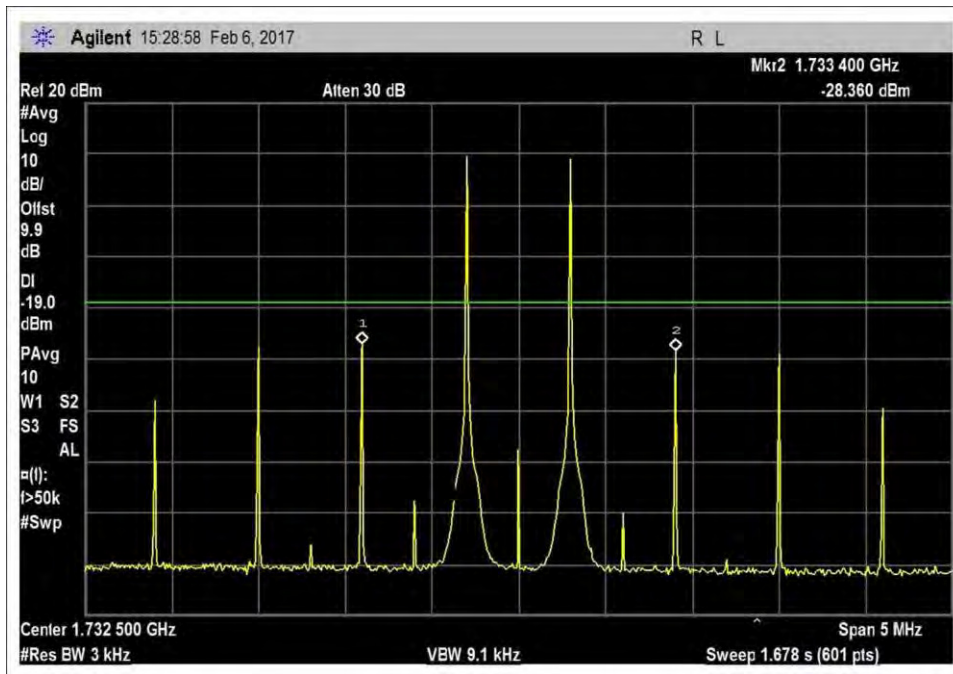
7.4_Intermod_UL_698-716MHz



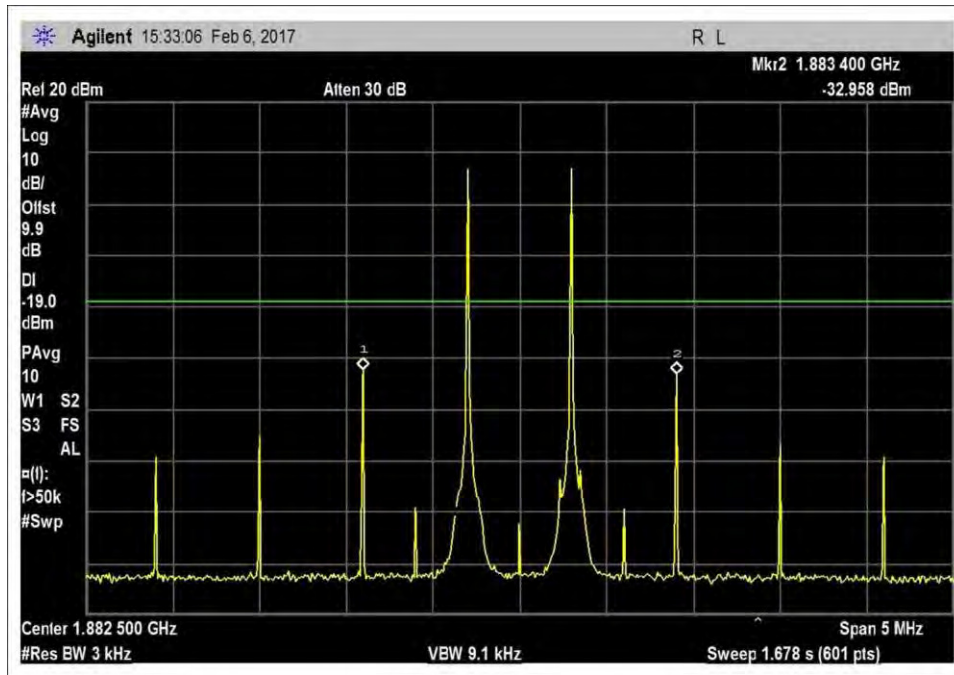
7.4_Intermod_UL_776-787MHz



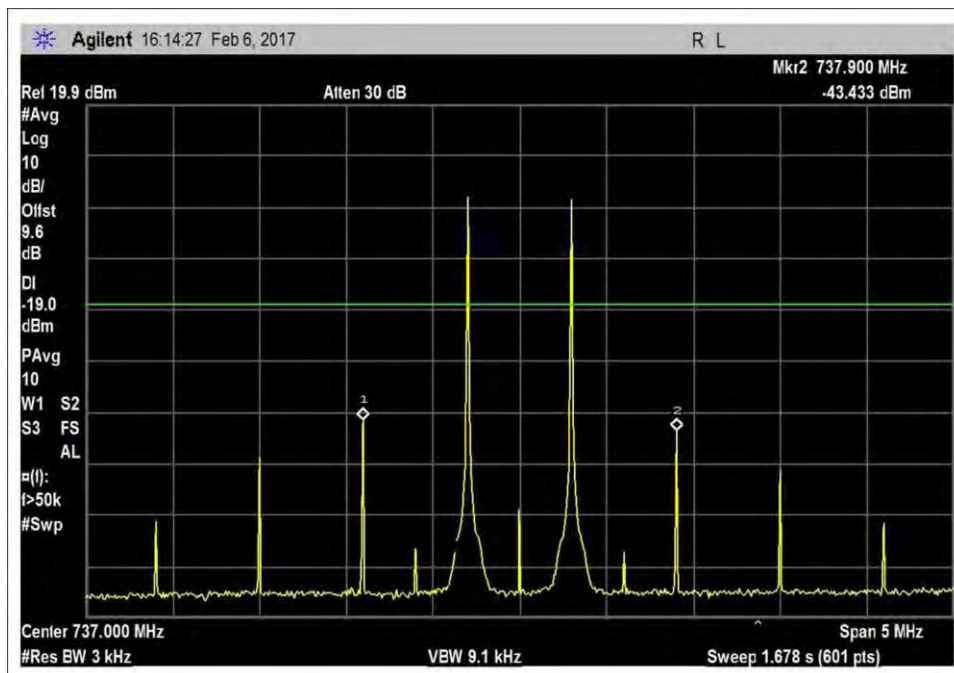
7.4_Intermod_UL_824-849MHz



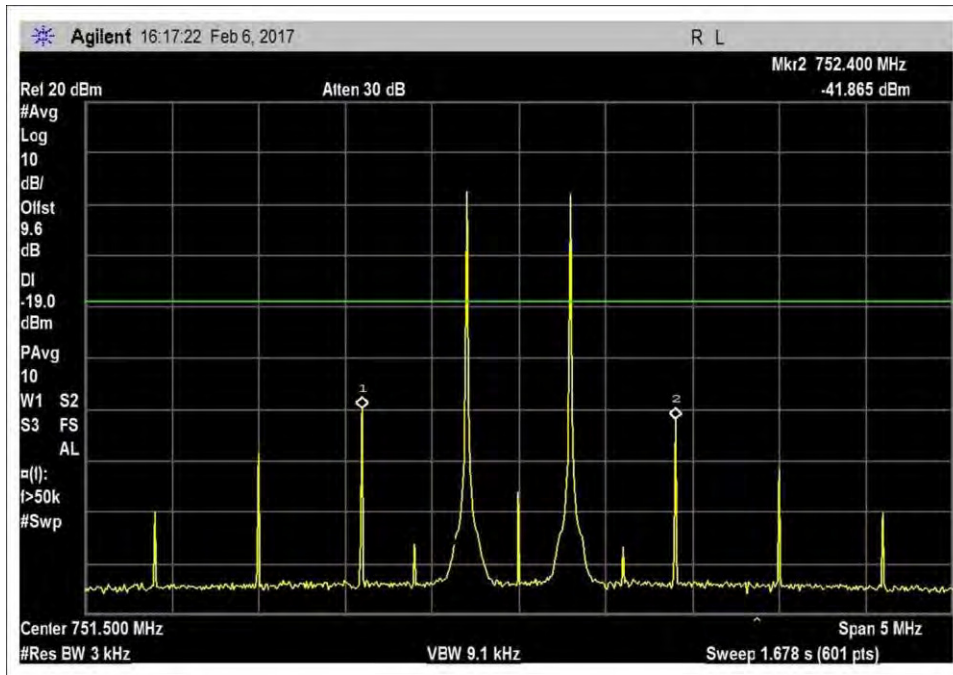
7.4_Intermod_UL_1710-1755MHz



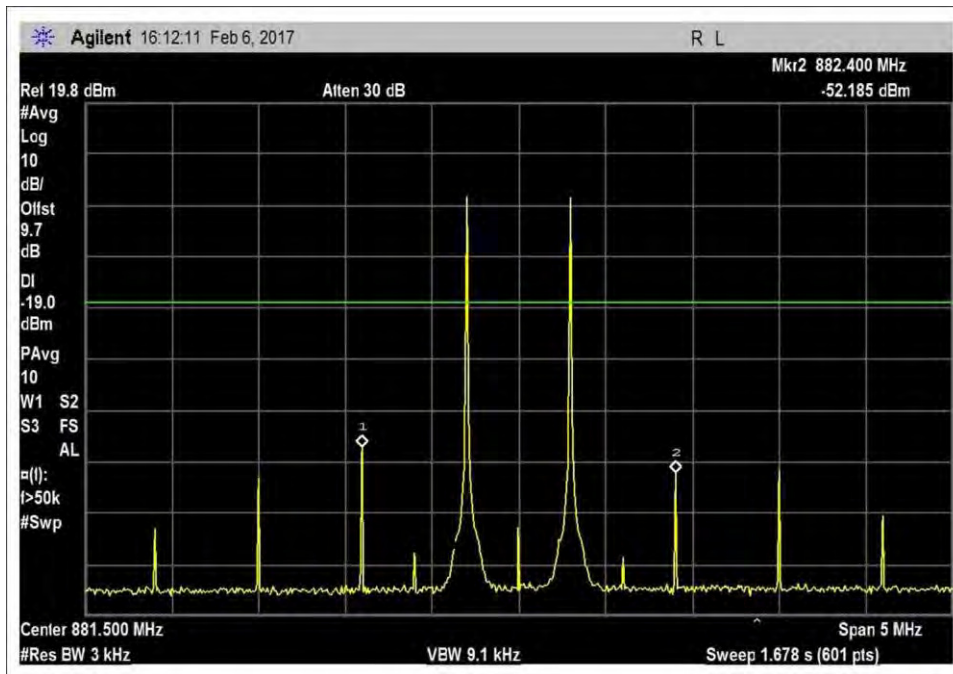
7.4_Intermod_UL_1850-1915MHz



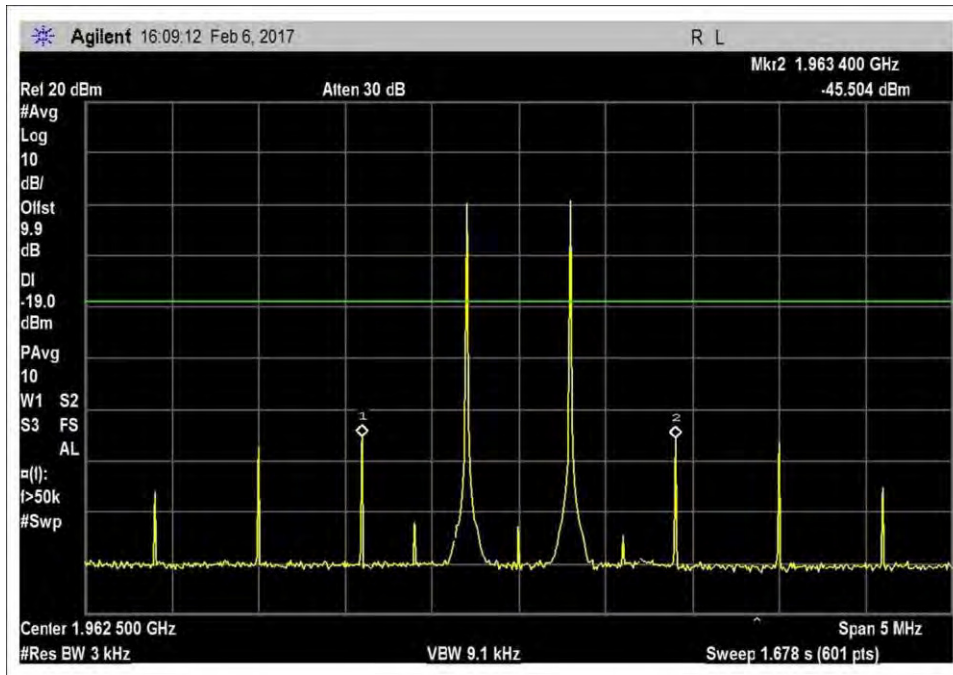
7.4_Intermod_DL_728-746MHz



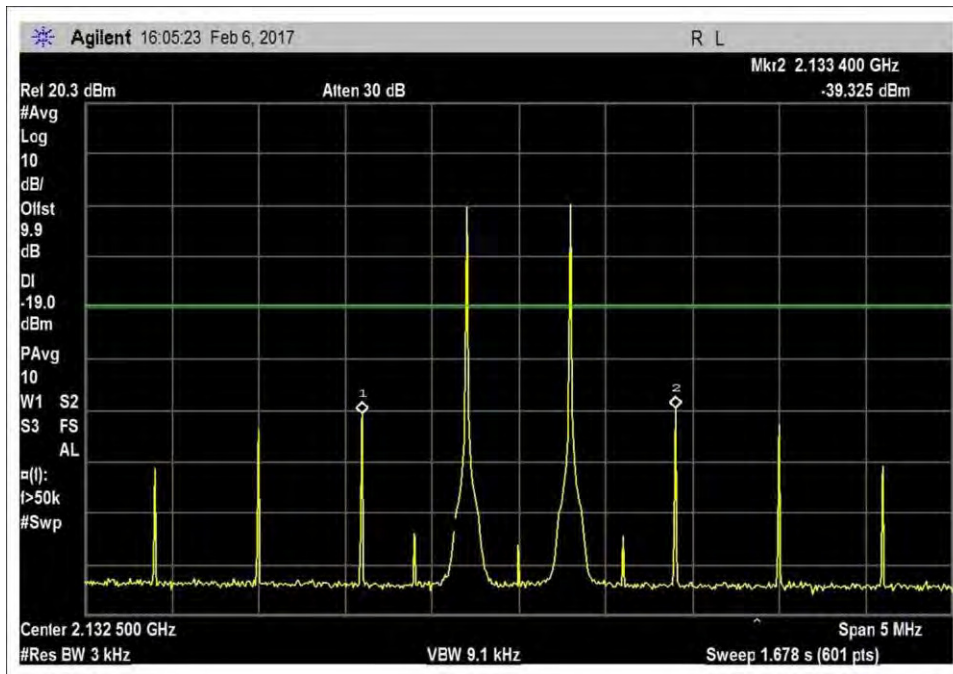
7.4_Intermod_DL_746-757MHz



7.4_Intermod_DL_869-894MHz



7.4_Intermod_DL_1930-1995MHz



7.4_Intermod_DL_2110-2155MHz

7.5 Out of Band Emissions

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: Huaptec
 Specification: **7.5 Out-of-band Emissions**
 Work Order #: **99439** Date: 2/7/2017
 Test Type: **Conducted Emissions** Time: 8:21:00 AM
 Tested By: **Daniel Bertran** Sequence#: 1
 Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
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.
 The EUT Server port is a type N connector and 50-ohm impedance.
 The EUT Donor port is type N connector and 50-ohm impedance.
 Part 22
 UL: 824-849MHz
 DL: 869-894MHz
 Part 24
 UL: 1850-1915MHz
 DL: 1930-1995MHz
 Part 27
 UL: 1710-1755MHz, 698-716MHz, 776-787MHz
 DL: 2110-2155MHz, 728-746MHz, 746-757MHz

The test was performed in accordance with section 7.5 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04 Dated February 12, 2016.
 Firmware: AF17-5S-V02
 Test environment conditions: Temperature: 22°C, Relative Humidity: 42% relative humidity, Pressure: 101.2 kPa

Additional plots taken at 1dB before EUT shuts down and before reaching the maximum input level indicated in section 5.5 of 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 #	Description	Model	Calibration Date	Cal Due Date
AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
ANP06897	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP06898	Cable	32022-29094K-29094K-48TC	12/30/2015	12/30/2017
ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018
AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018

Summary of Results

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

GSM

Low			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-27.8	-19	Pass
UL1850-1915	-26.2	-19	Pass
UL824-849	-26.9	-19	Pass
UL 698-716	-34.8	-19	Pass
UL776-787	-27.0	-19	Pass
DL2110-2155	-34.1	-19	Pass
DL1930-1995	-35.7	-19	Pass
DL869-894	-34.7	-19	Pass
DL:728-746	-46.3	-19	Pass
DL 746-757	-35.8	-19	Pass

High			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-26.2	-19	Pass
UL1850-1915	-37.3	-19	Pass
UL824-849	-26.6	-19	Pass
UL 698-716	-28.4	-19	Pass
UL776-787	-31.9	-19	Pass
DL2110-2155	-35.9	-19	Pass
DL1930-1995	-36.4	-19	Pass
DL869-894	-37.2	-19	Pass
DL:728-746	-36.1	-19	Pass
DL 746-757	-37.1	-19	Pass

CDMA (alternative 1.25 MHz AWGN)

Low			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-29.5	-19	Pass
UL1850-1915	-33.2	-19	Pass
UL824-849	-31.0	-19	Pass
UL 698-716	-48.3	-19	Pass
UL776-787	-36.6	-19	Pass
DL2110-2155	-47.2	-19	Pass
DL1930-1995	-47.6	-19	Pass
DL869-894	-52.4	-19	Pass
DL:728-746	-68.7	-19	Pass
DL 746-757	-57.0	-19	Pass

High			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-30.4	-19	Pass
UL1850-1915	-39.3	-19	Pass
UL824-849	-26.8	-19	Pass
UL 698-716	-39.7	-19	Pass
UL776-787	-51.1	-19	Pass
DL2110-2155	-44.1	-19	Pass
DL1930-1995	-47.5	-19	Pass
DL869-894	-57.2	-19	Pass
DL:728-746	-60.8	-19	Pass
DL 746-757	-61.5	-19	Pass

LTE (alternative 4.1MHz AWGN)

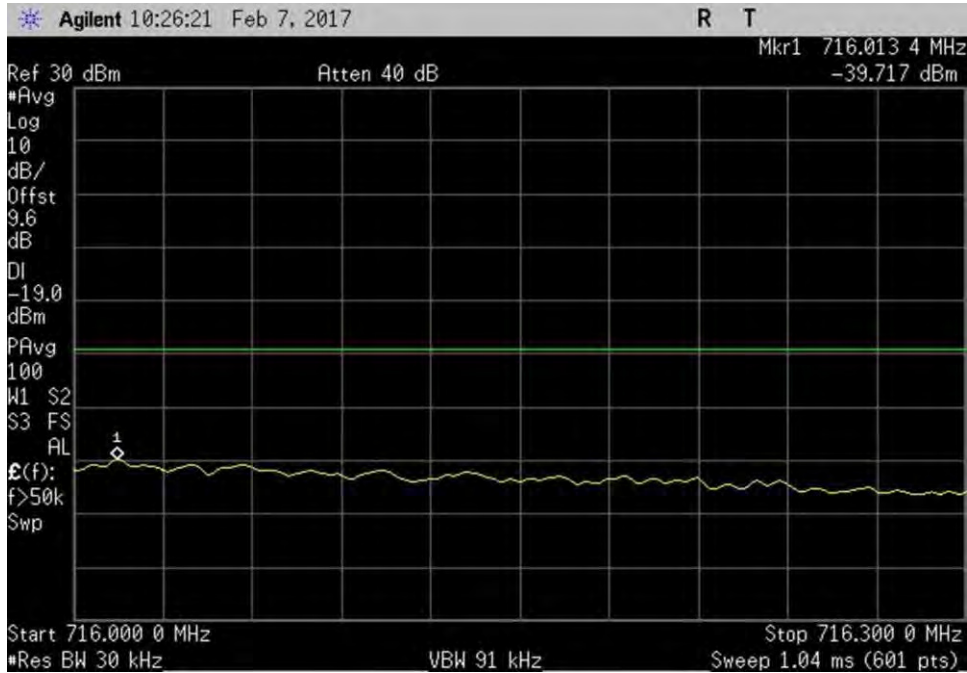
Low			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-30.3	-19	Pass
UL1850-1915	-19.1	-19	Pass
UL824-849	-23.3	-19	Pass
UL 698-716	-37.1	-19	Pass
UL776-787	-24.7	-19	Pass
DL2110-2155	-38.0	-19	Pass
DL1930-1995	-42.0	-19	Pass
DL869-894	-33.9	-19	Pass
DL:728-746	-47.0	-19	Pass
DL 746-757	-34.0	-19	Pass

High			
Out of Band Emission			
Frequency (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-22.8	-19	Pass
UL1850-1915	-37.4	-19	Pass
UL824-849	-24.7	-19	Pass
UL 698-716	-27.3	-19	Pass
UL776-787	-28.6	-19	Pass
DL2110-2155	-35.5	-19	Pass
DL1930-1995	-37.8	-19	Pass
DL869-894	-38.3	-19	Pass
DL:728-746	-35.2	-19	Pass
DL 746-757	-38.0	-19	Pass

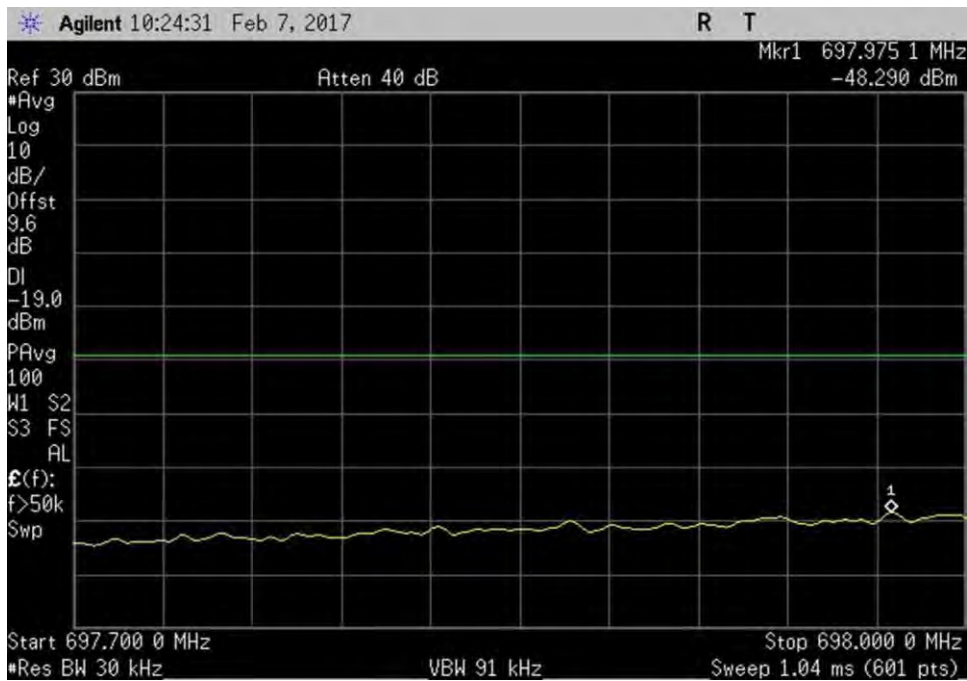
Note: The EUT also maintains compliance with the out-of-band emissions limit at input power indicated in section 5.5.

Plots

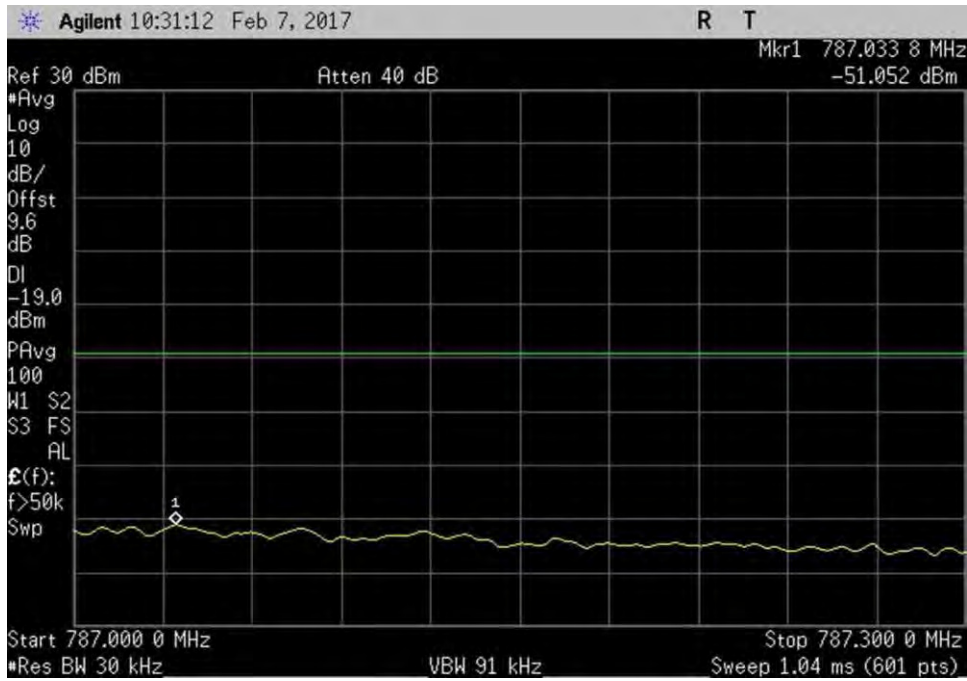
CDMA



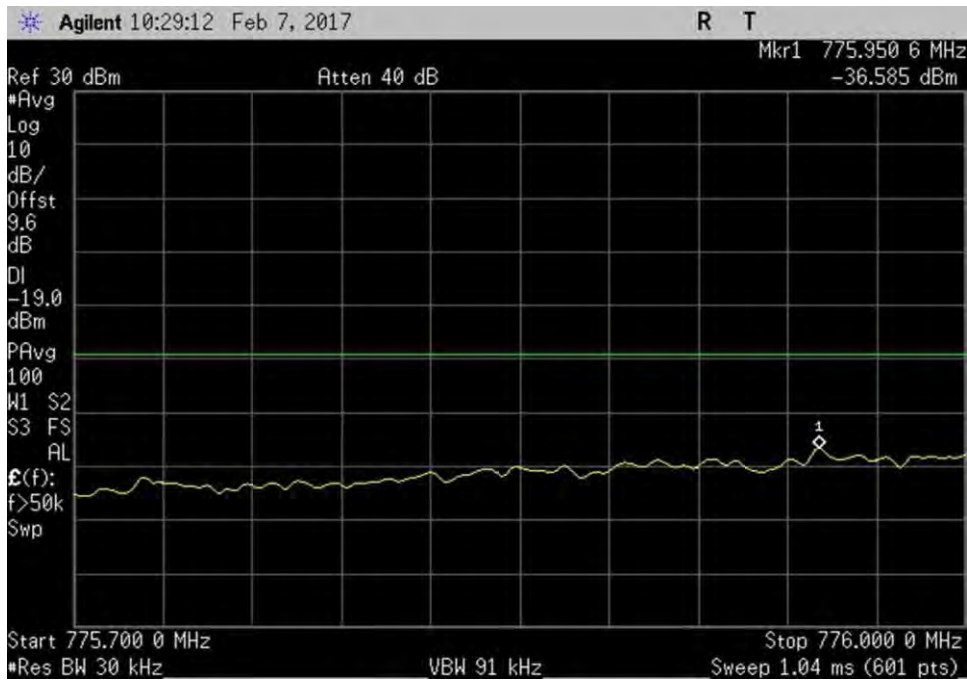
7.5_OBE_UL_698-716MHz_H_PreAGC_CDMA



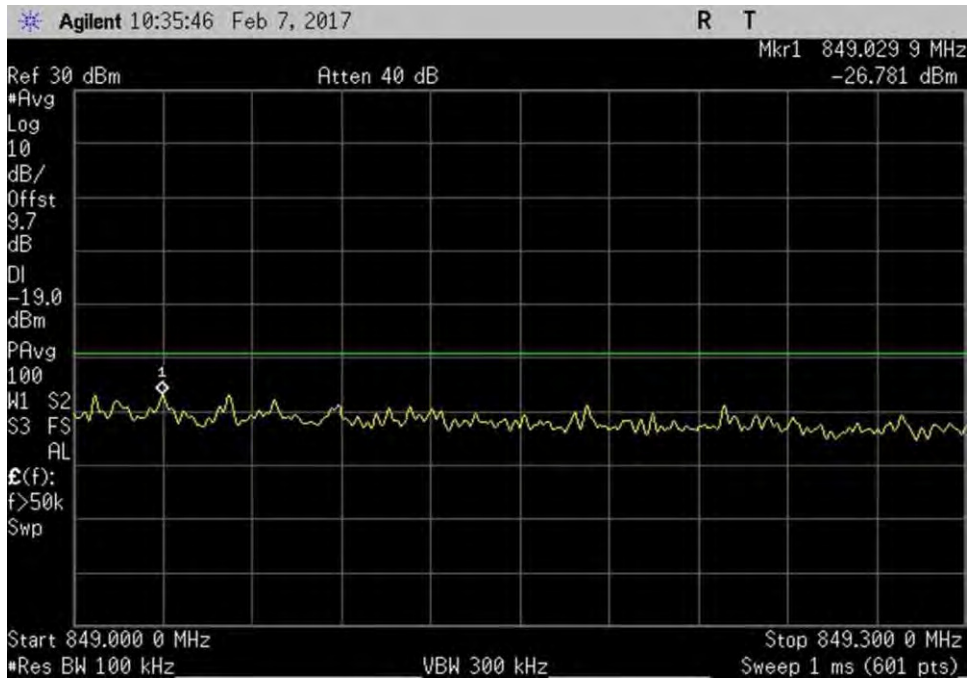
7.5_OBE_UL_698-716MHz_L_PreAGC_CDMA



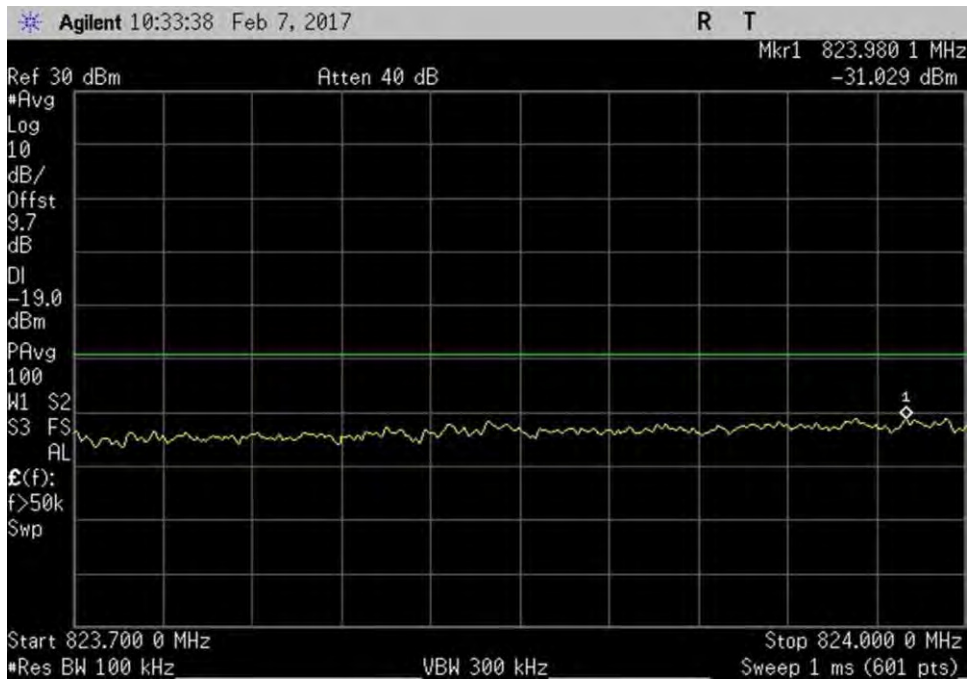
7.5_OBE_UL_776-787MHz_H_PreAGC_CDMA



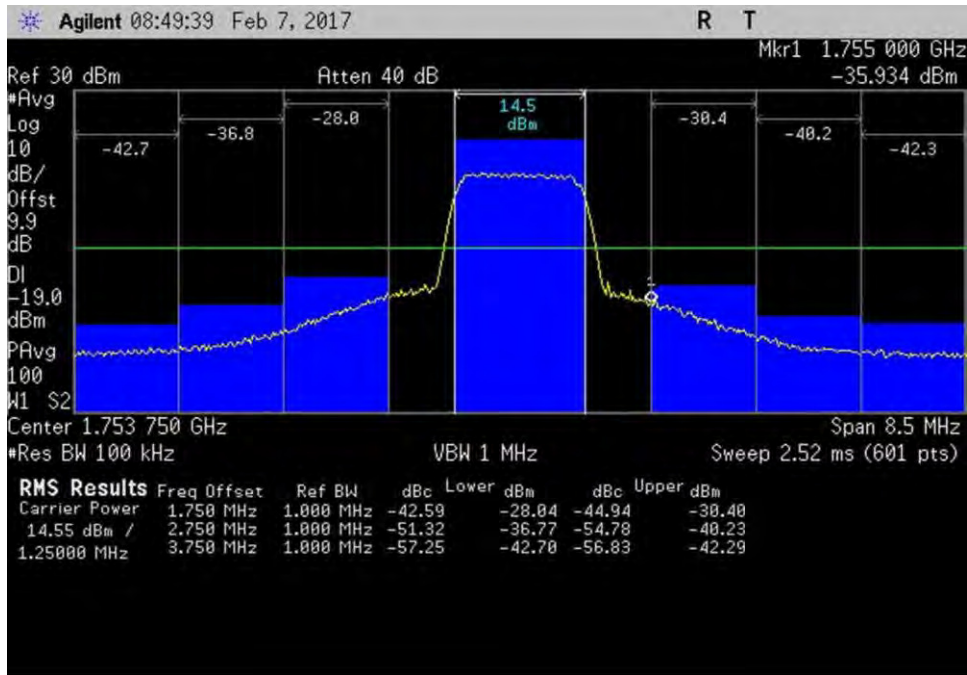
7.5_OBE_UL_776-787MHz_L_PreAGC_CDMA



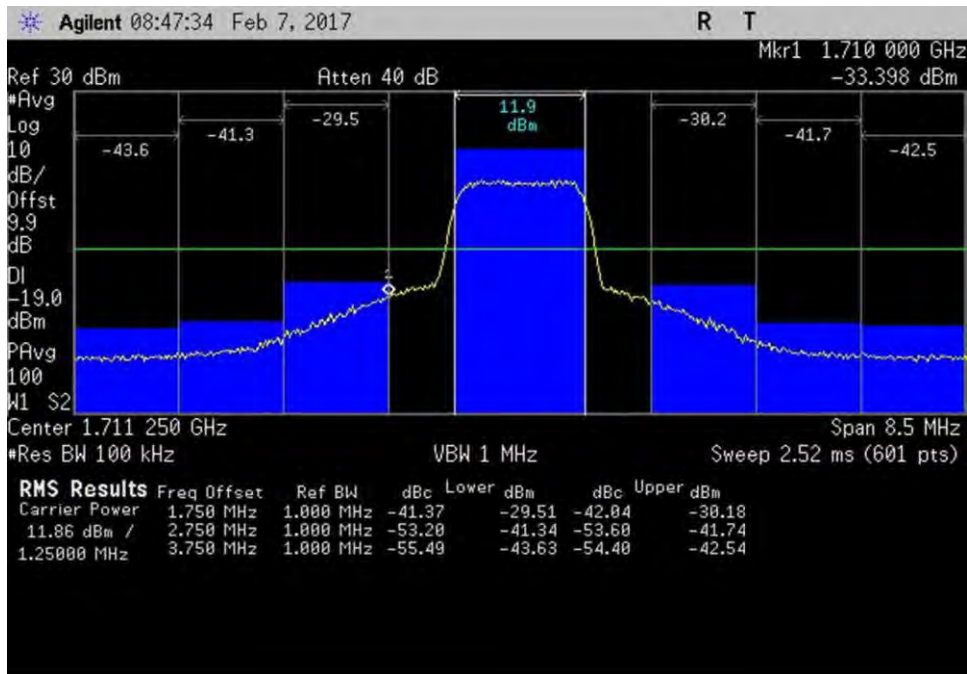
7.5_OBE_UL_824-849MHz_H_PreAGC_CDMA



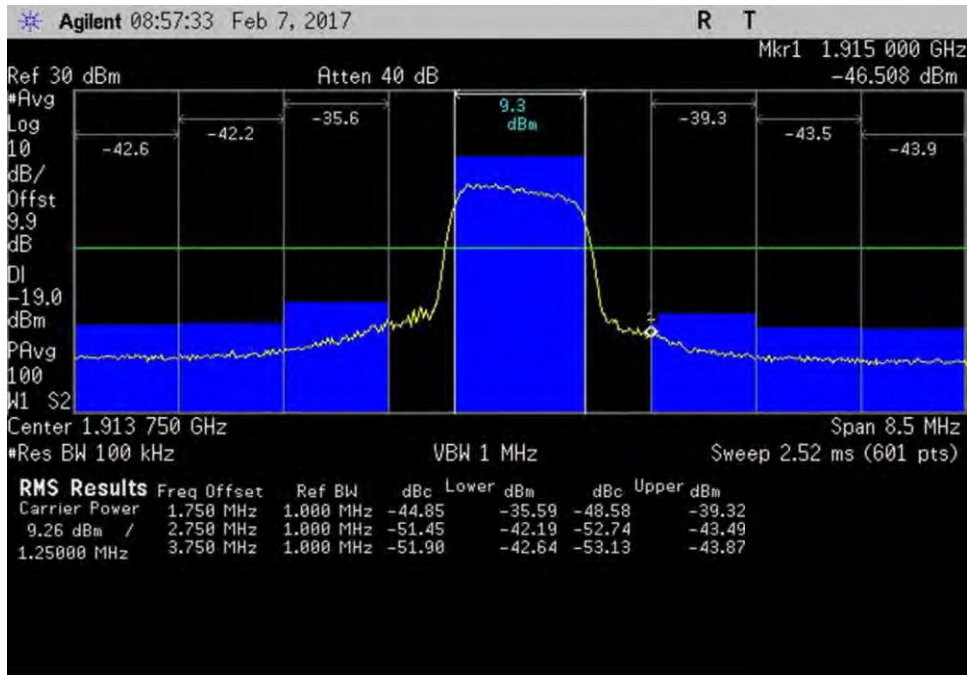
7.5_OBE_UL_824-849MHz_L_PreAGC_CDMA



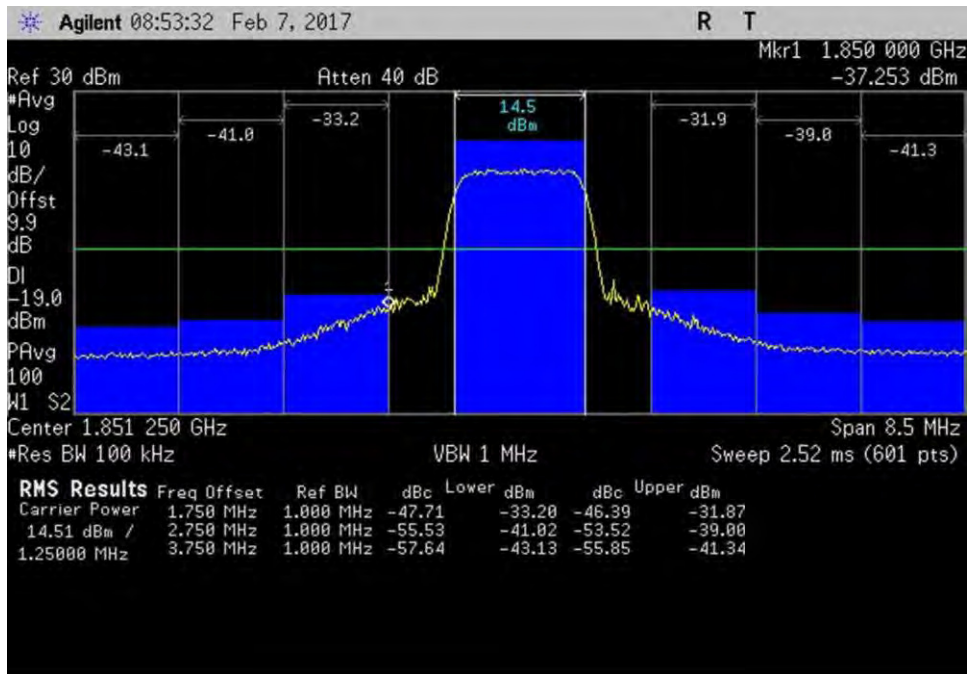
7.5_OBE_UL_1710-1755MHz_H_PreAGC_CDMA



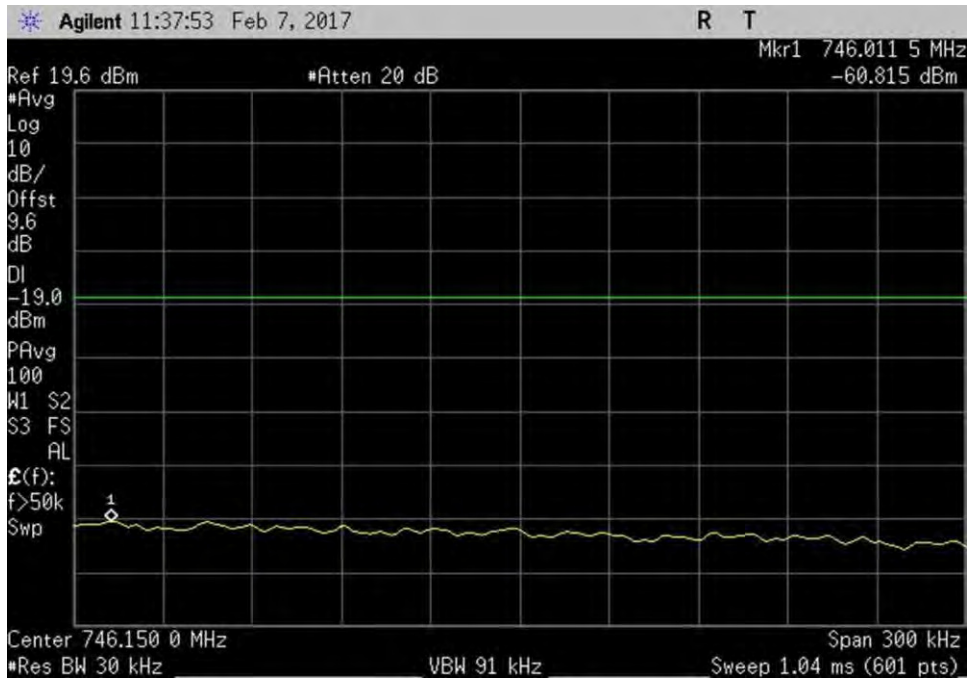
7.5_OBE_UL_1710-1755MHz_L_PreAGC_CDMA



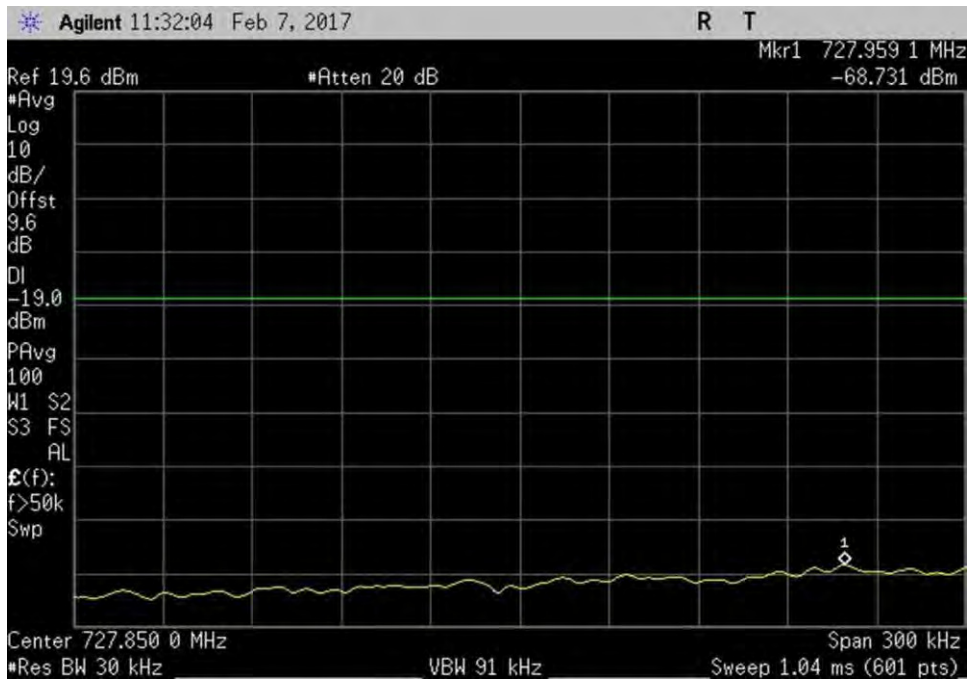
7.5_OBE_UL_1850-1915MHz_H_PreAGC_CDMA



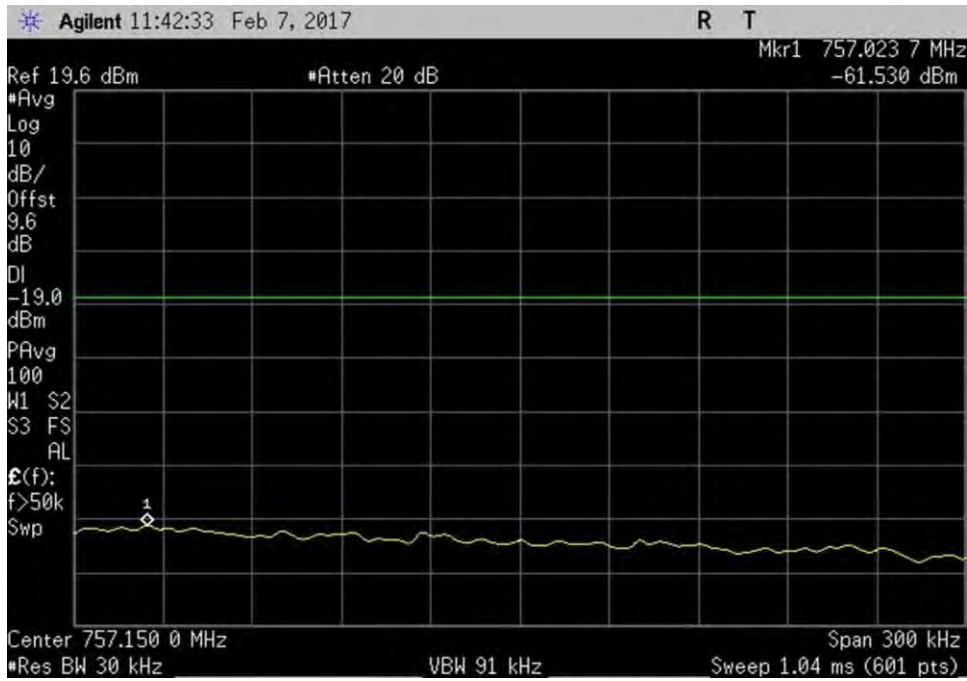
7.5_OBE_UL_1850-1915MHz_L_PreAGC_CDMA



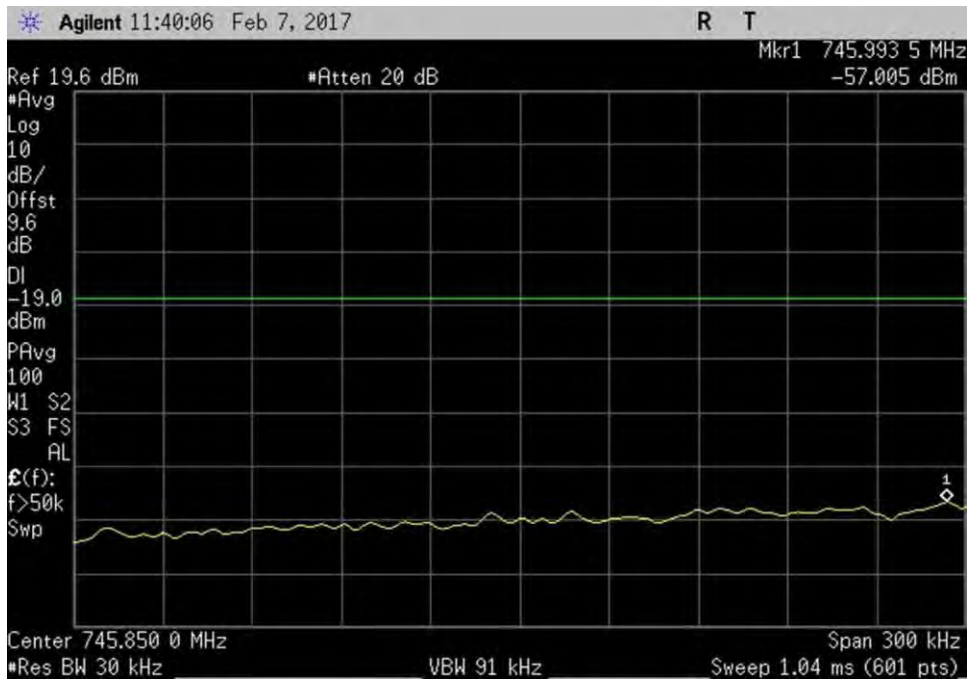
7.5_OBE_DL_728-746MHz_H_PreAGC_CDMA



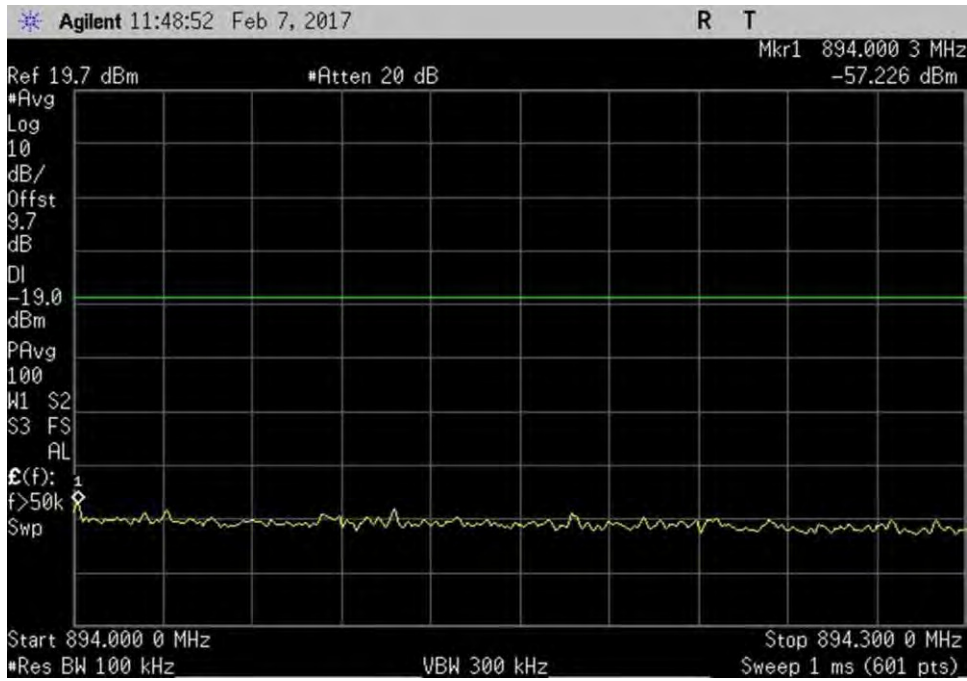
7.5_OBE_DL_728-746MHz_L_PreAGC_CDMA.



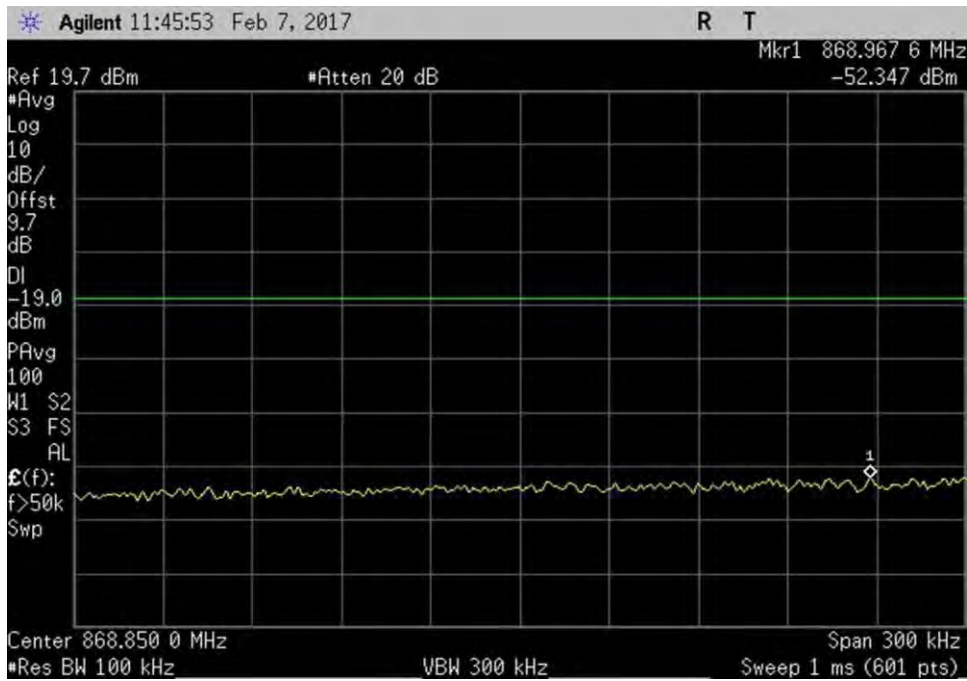
7.5_OBE_DL_746-757MHz_H_PreAGC_CDMA



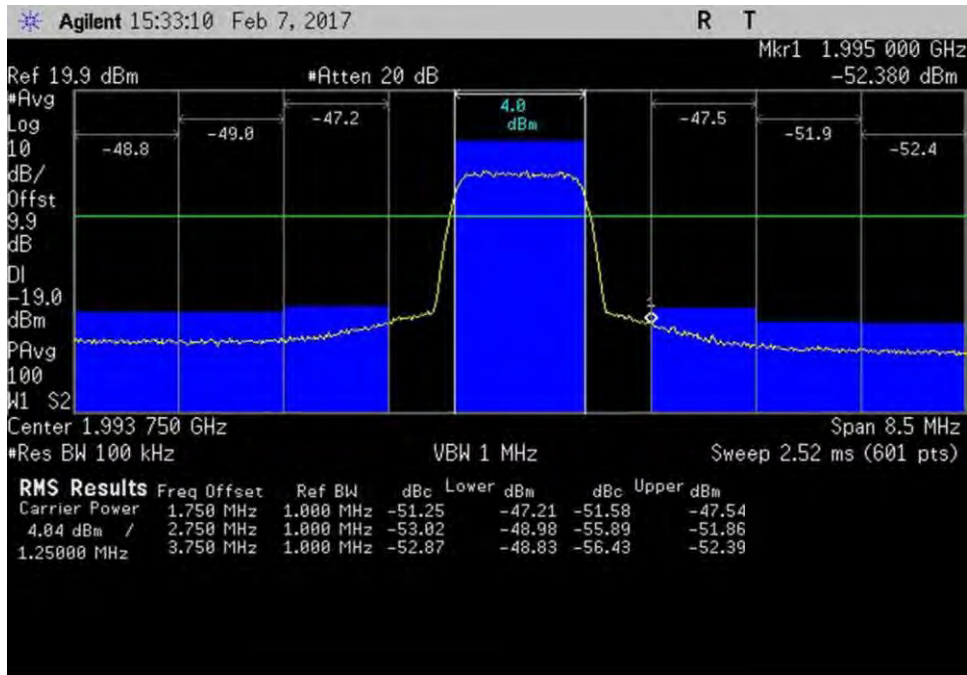
7.5_OBE_DL_746-757MHz_L_PreAGC_CDMA



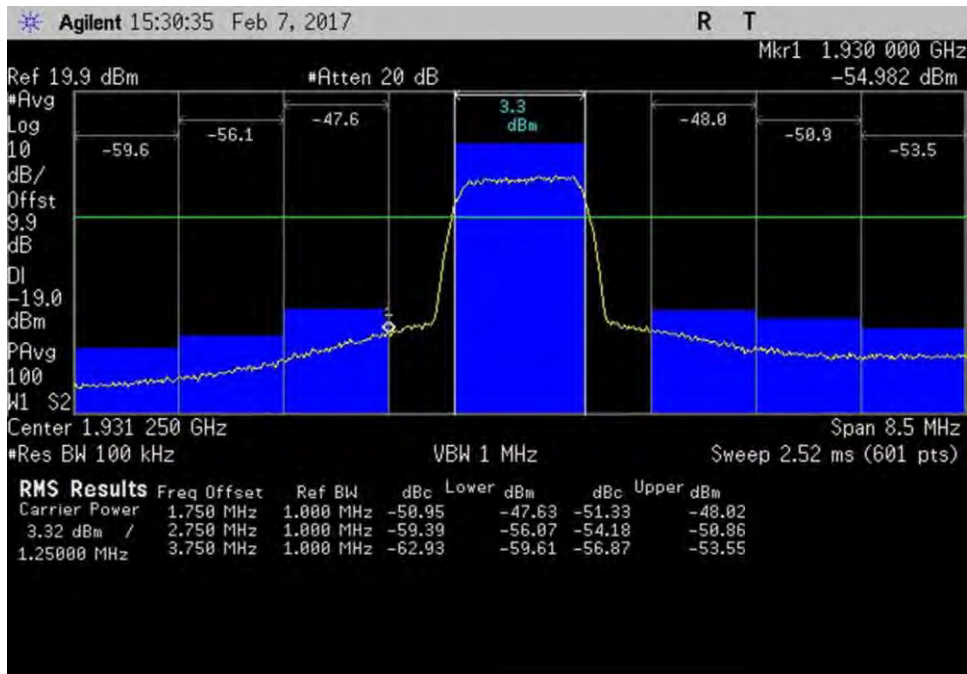
7.5_OBE_DL_869-894MHz_H_PreAGC_CDMA



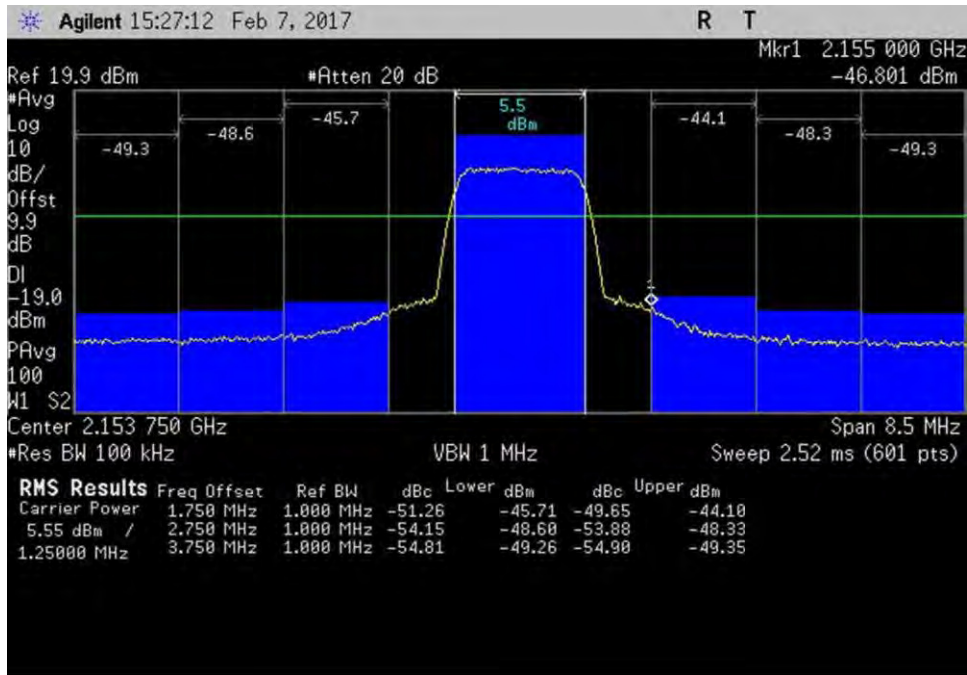
7.5_OBE_DL_869-894MHz_L_PreAGC_CDMA



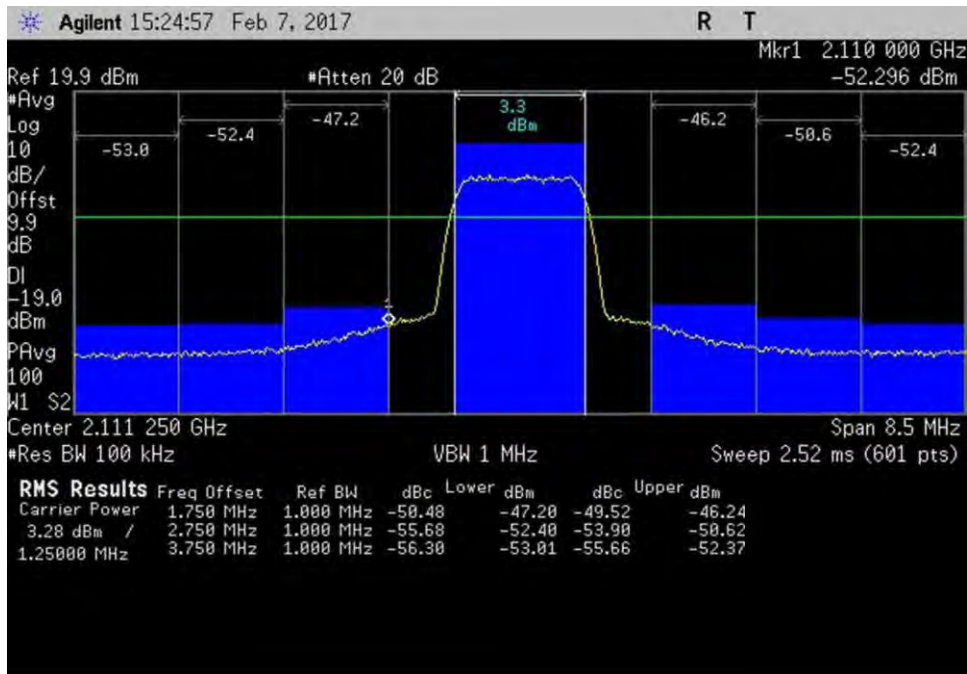
7.5_OBE_DL_1930-1995MHz_H_PreAGC_CDMA



7.5_OBE_DL_1930-1995MHz_L_PreAGC_CDMA

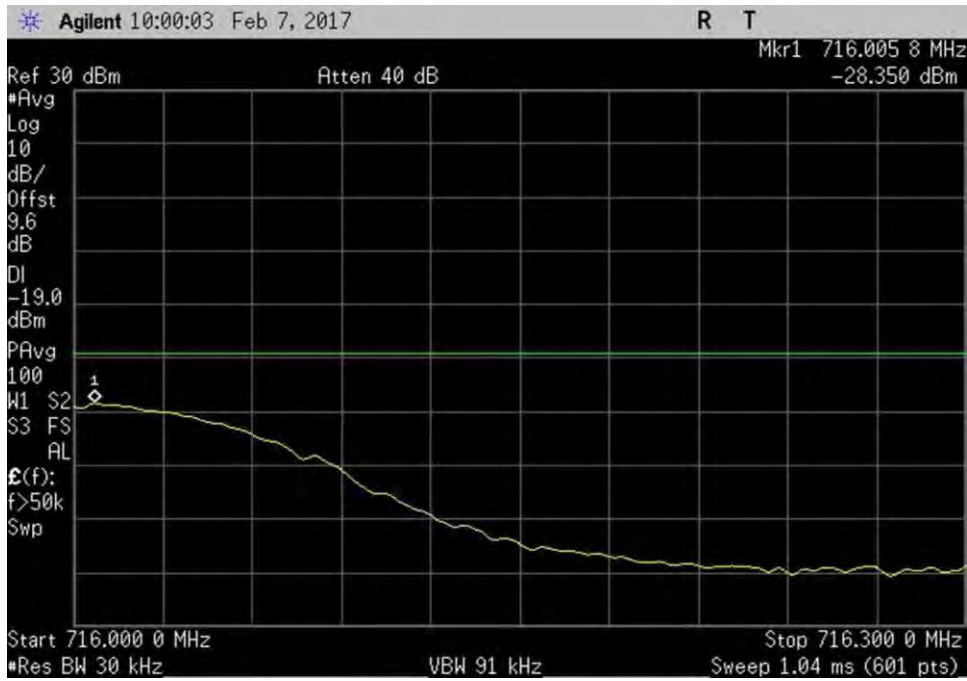


7.5_OBE_DL_2110-2155MHz_H_PreAGC_CDMA

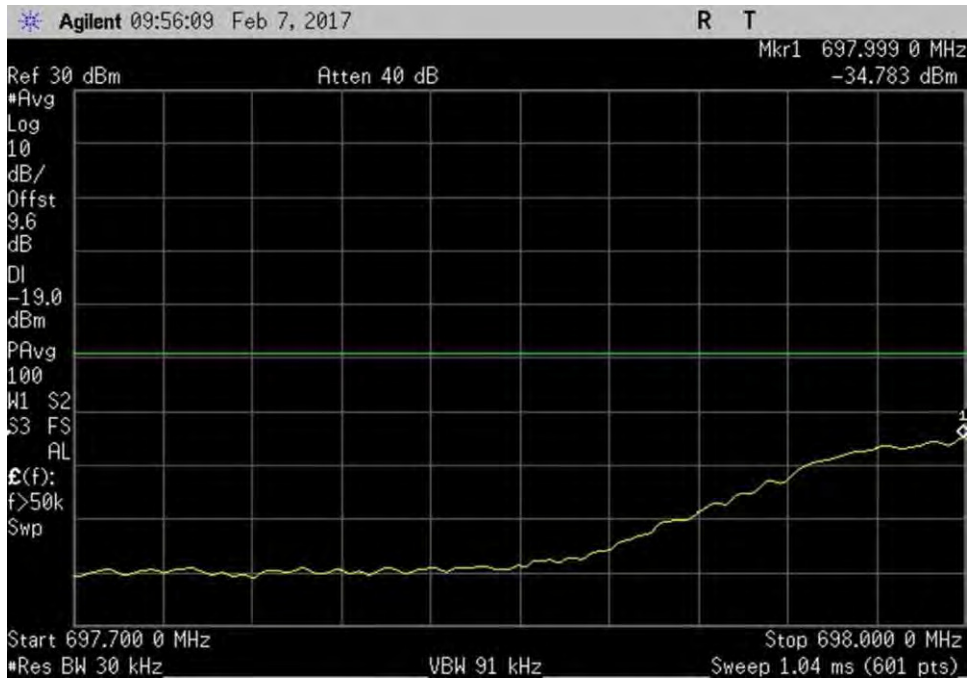


7.5_OBE_DL_2110-2155MHz_L_PreAGC_CDMA

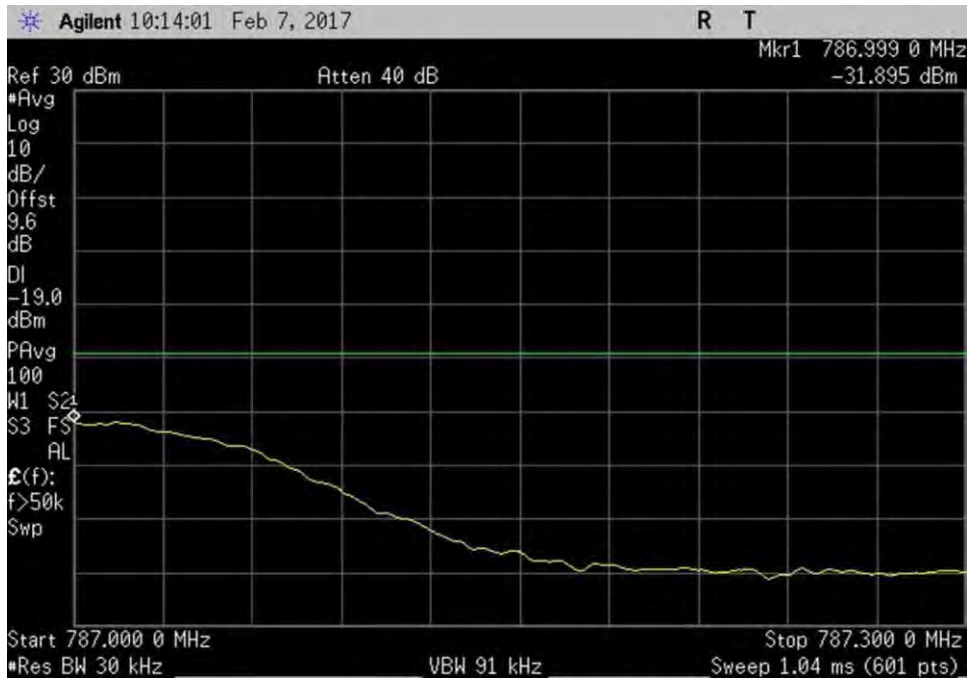
GSM



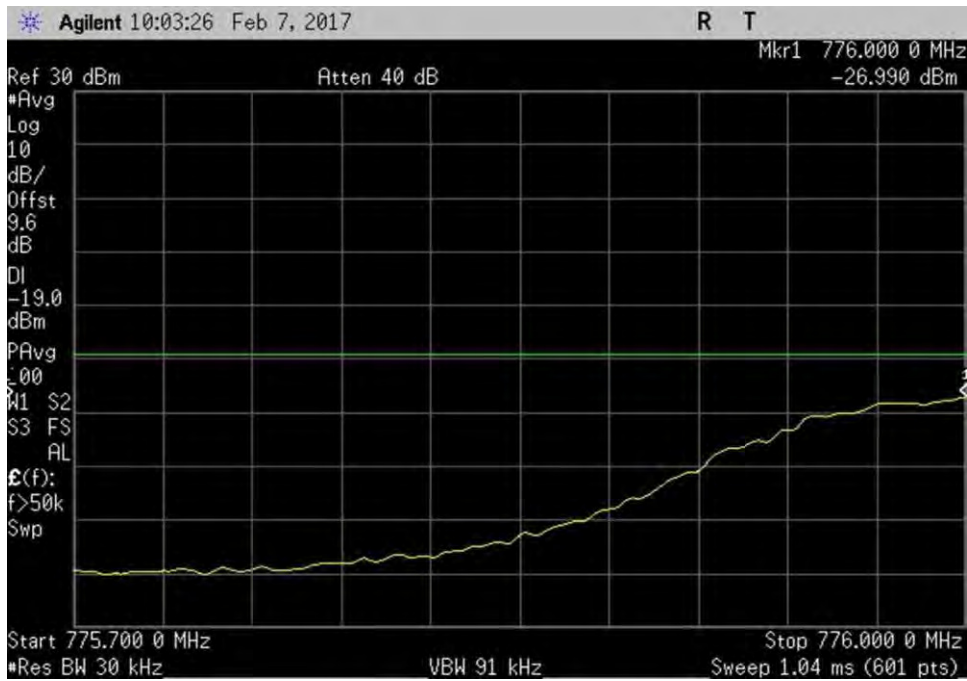
7.5_OBE_UL_698-716MHz_H_PreAGC_GSM



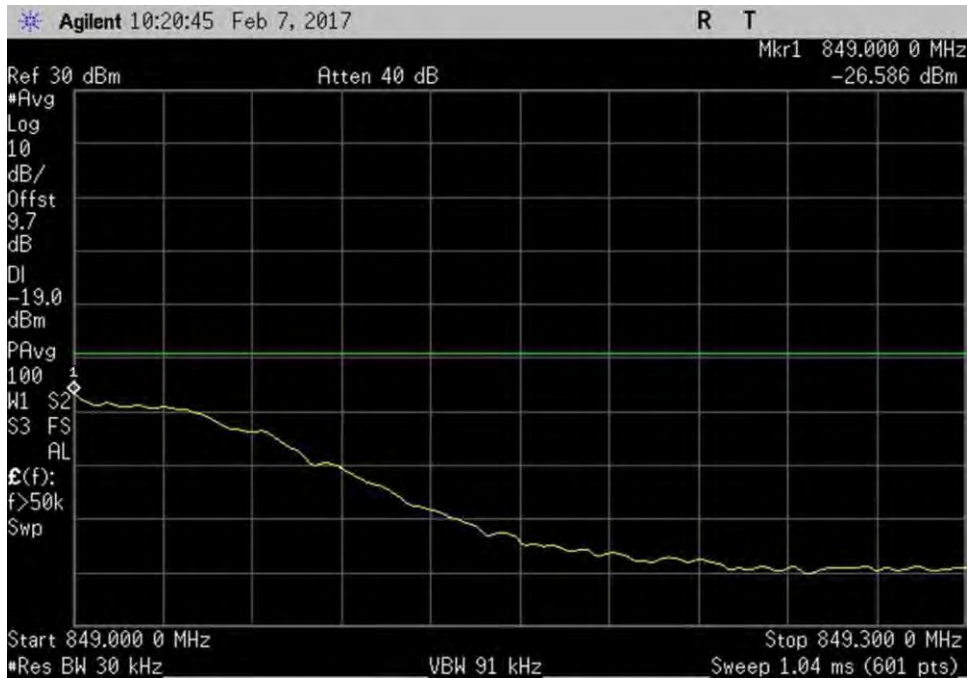
7.5_OBE_UL_698-716MHz_L_PreAGC_GSM



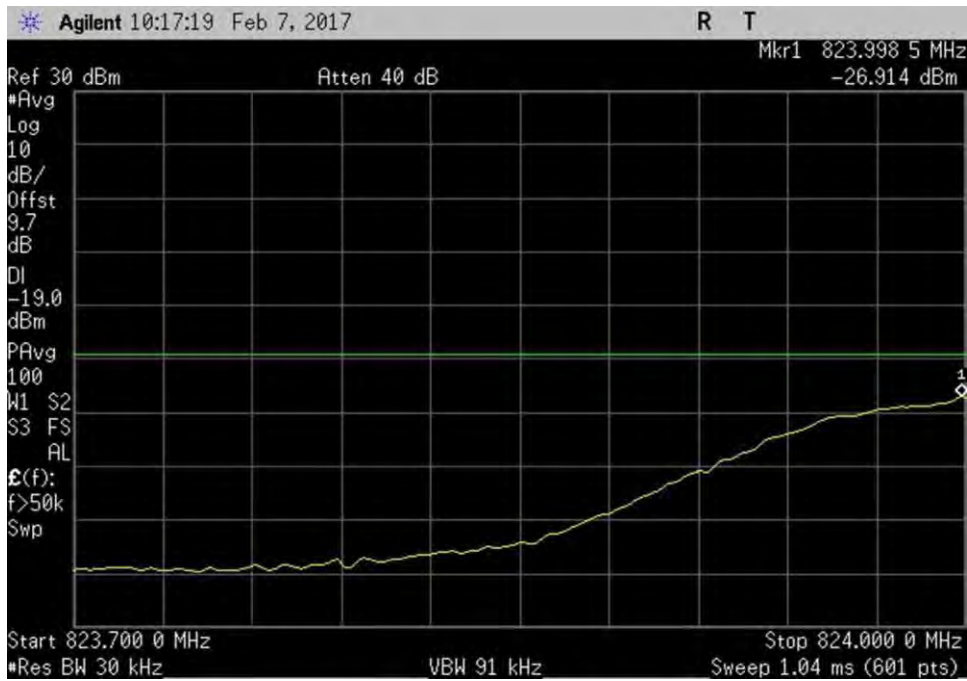
7.5_OBE_UL_776-787MHz_H_PreAGC_GSM



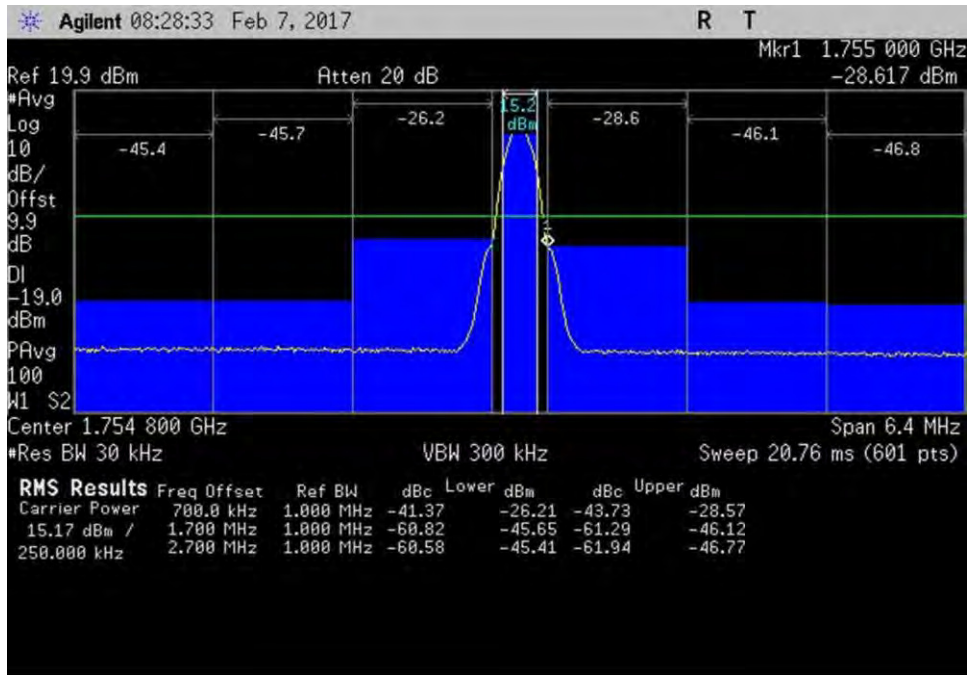
7.5_OBE_UL_776-787MHz_L_PreAGC_GSM



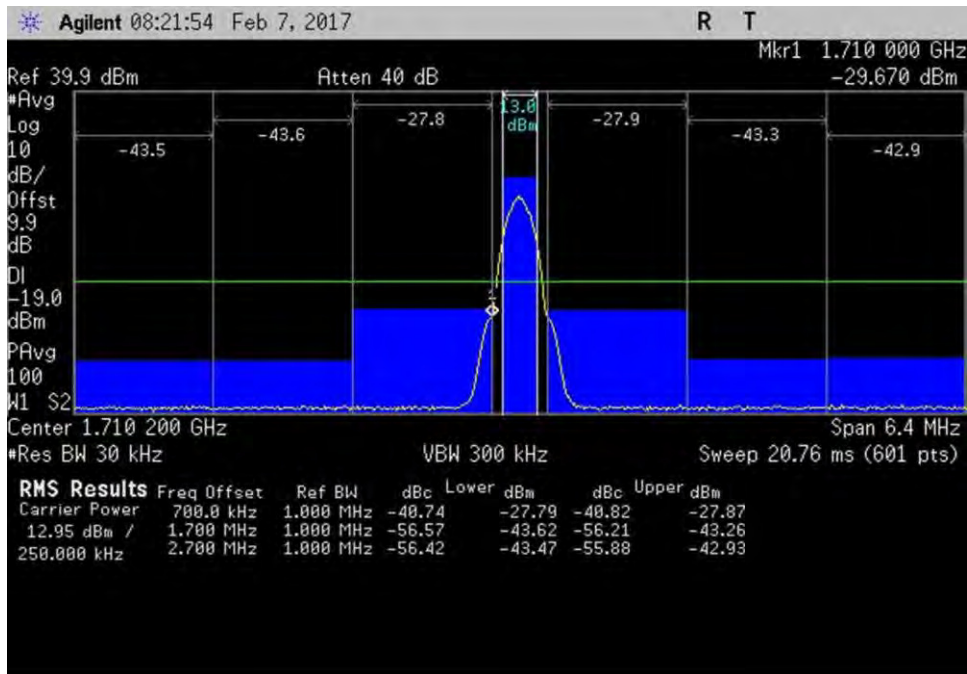
7.5_OBE_UL_824-849MHz_H_PreAGC_GSM



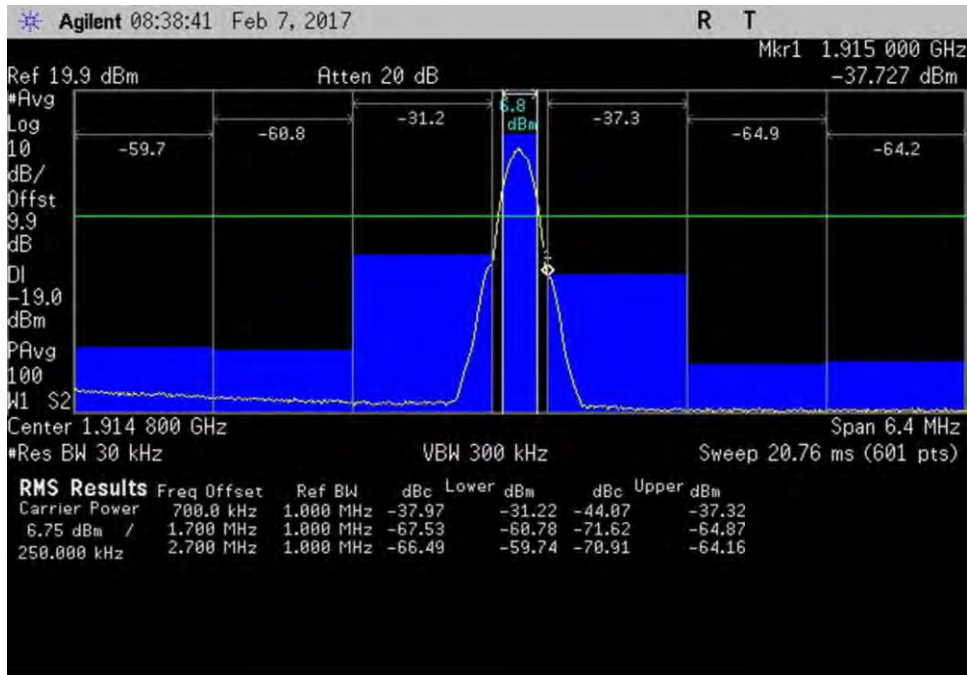
7.5_OBE_UL_824-849MHz_L_PreAGC_GSM



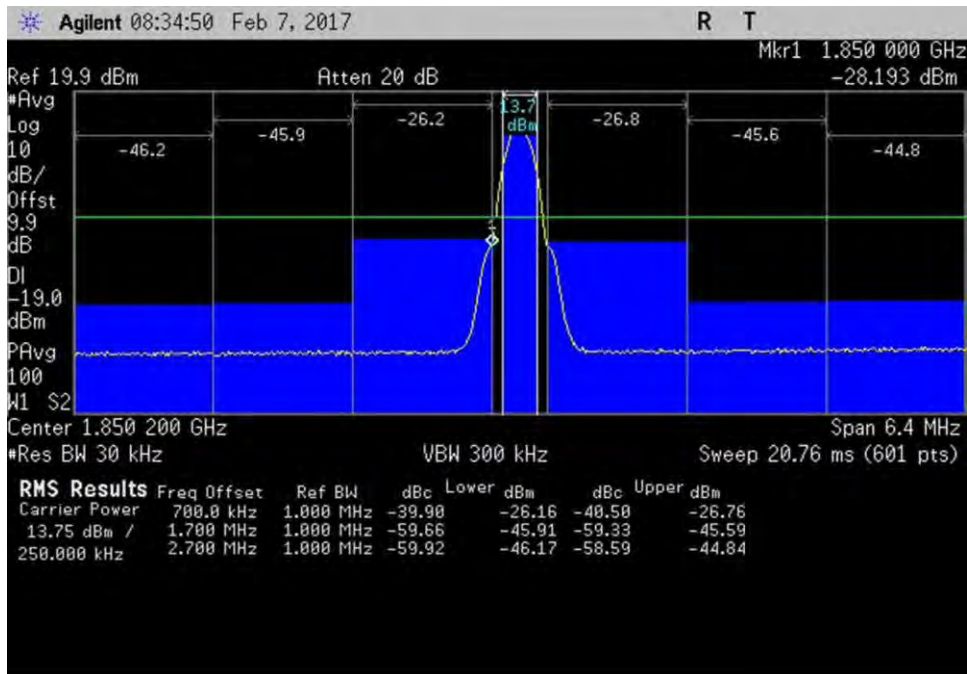
7.5_OBE_UL_1710-1755MHz_H_PreAGC_GSM



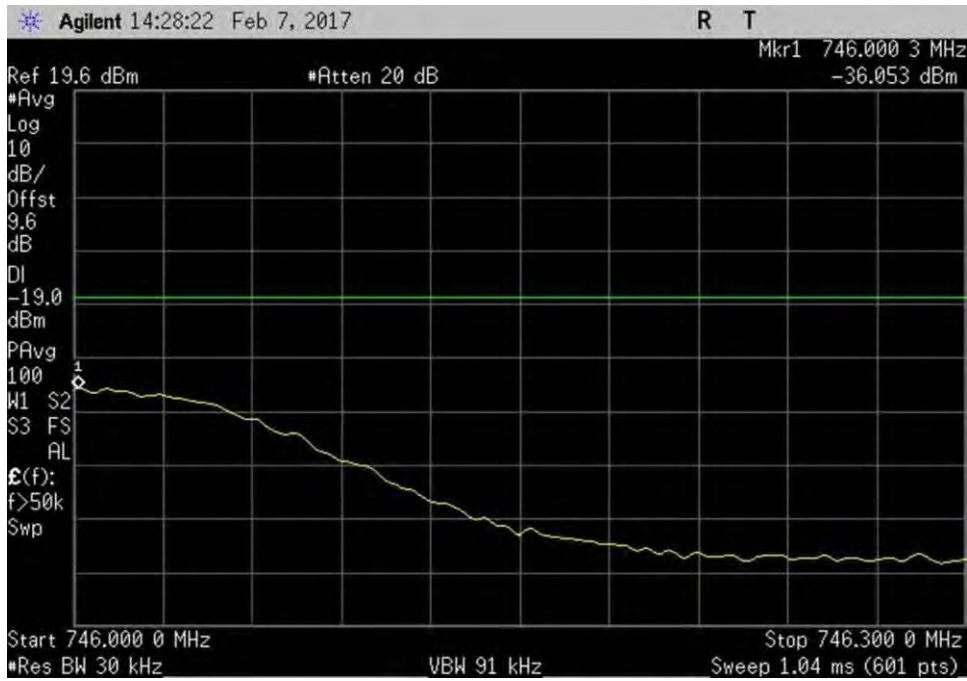
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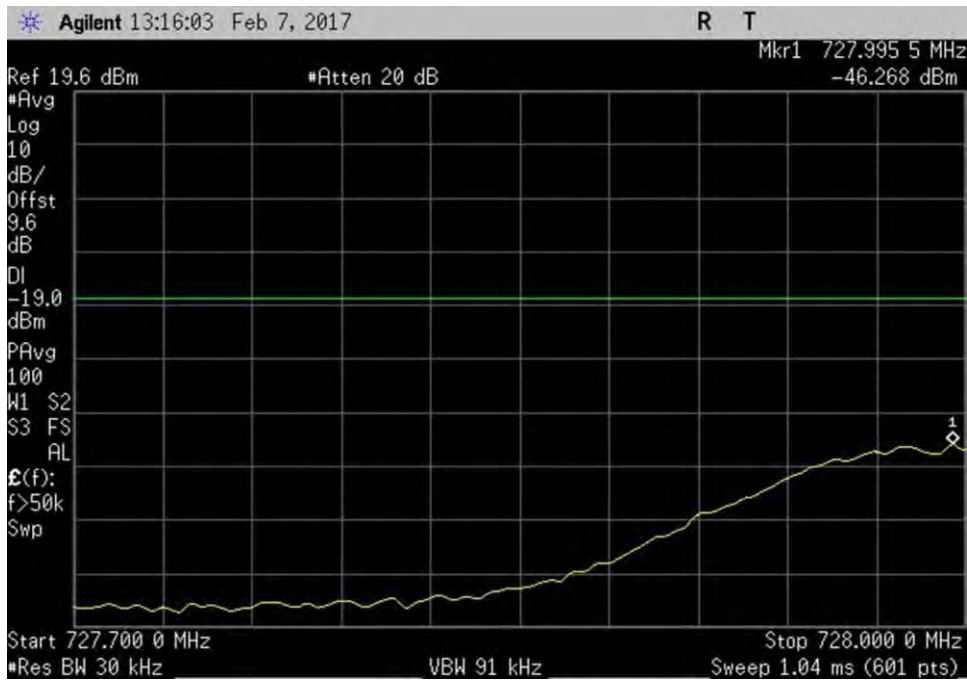
7.5_OBE_UL_1850-1915MHz_H_PreAGC_GSM



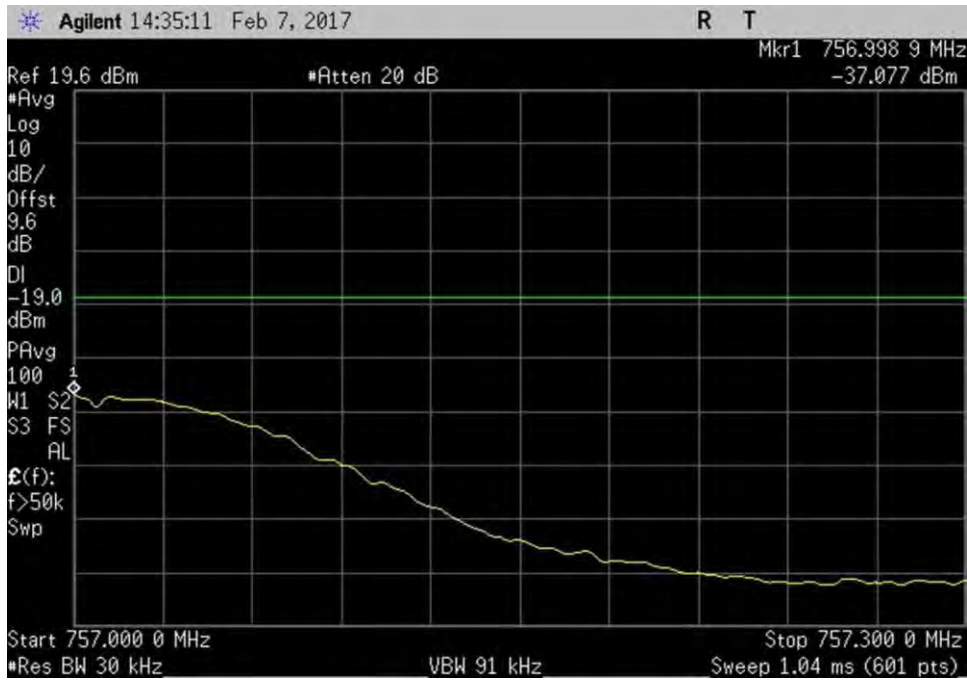
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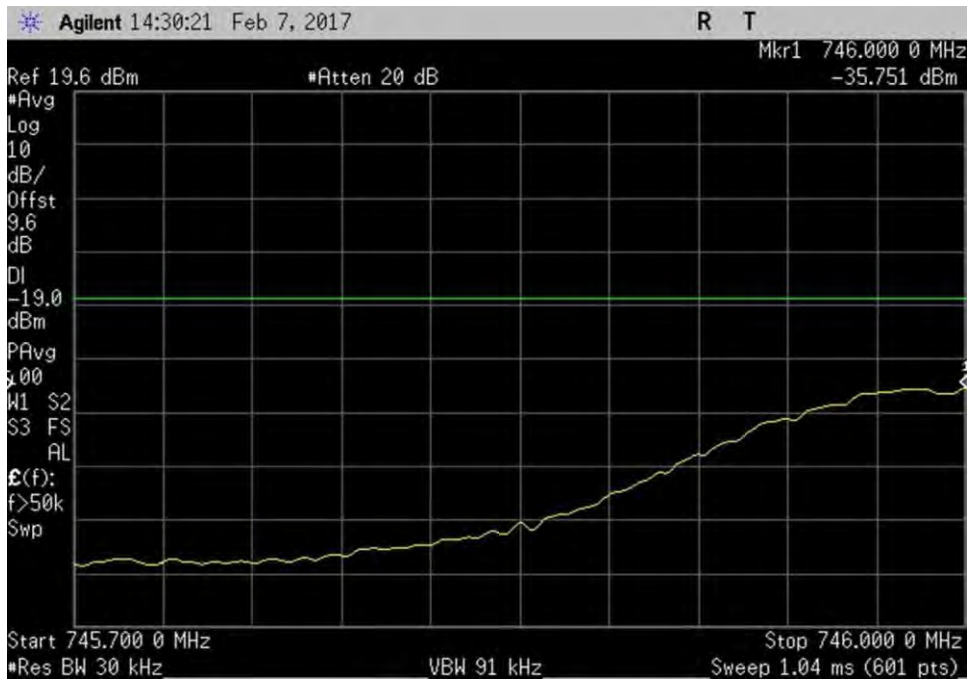
7.5_OBE_DL_728-746MHz_H_PreAGC_GSM



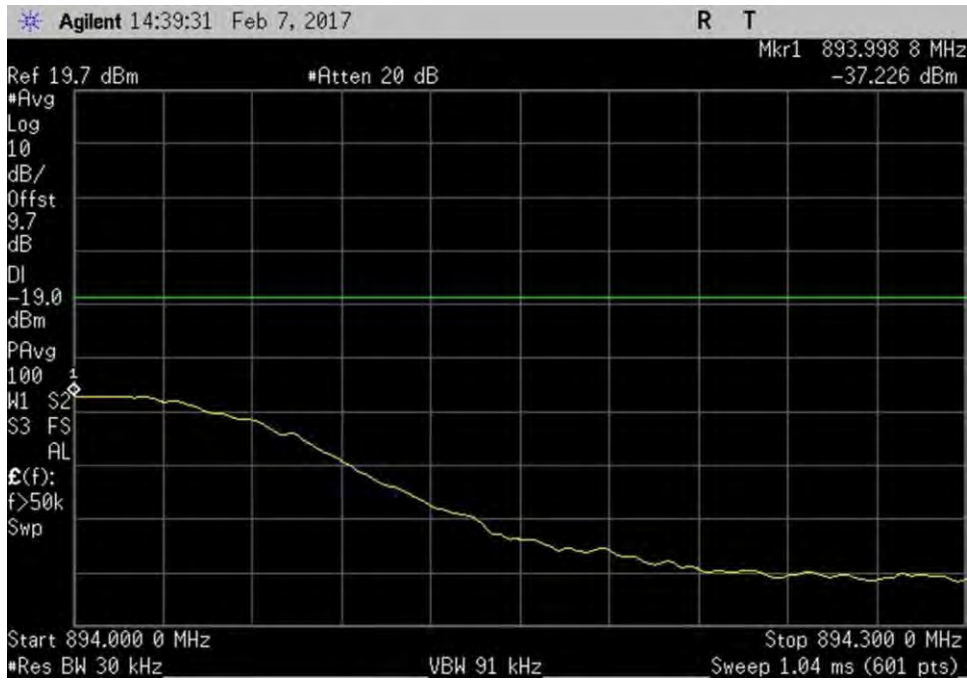
7.5_OBE_DL_728-746MHz_L_PreAGC_GSM



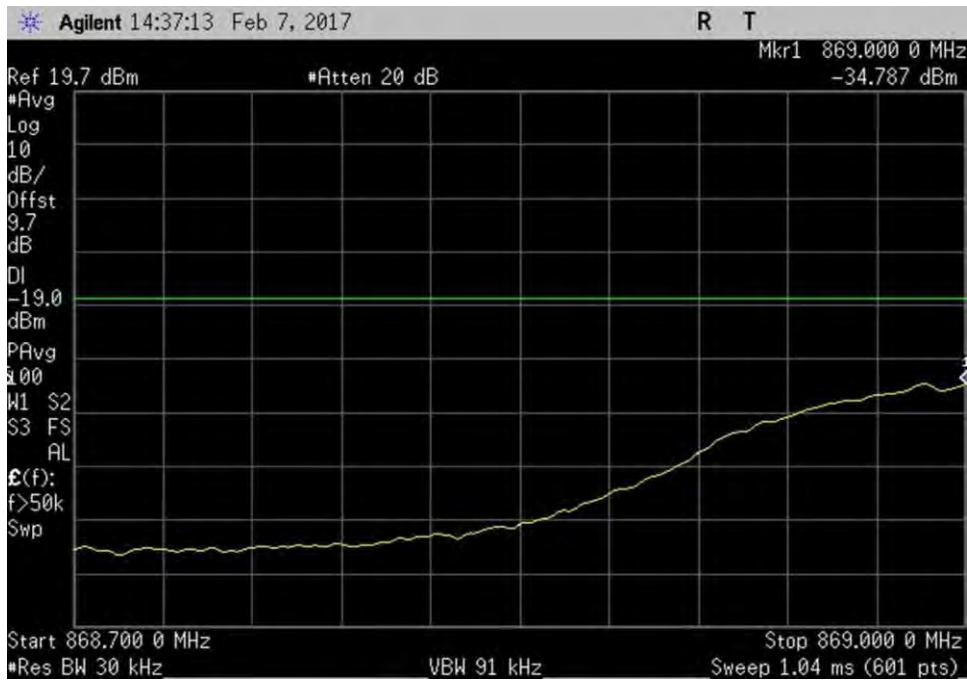
7.5_OBE_DL_746-757MHz_H_PreAGC_GSM



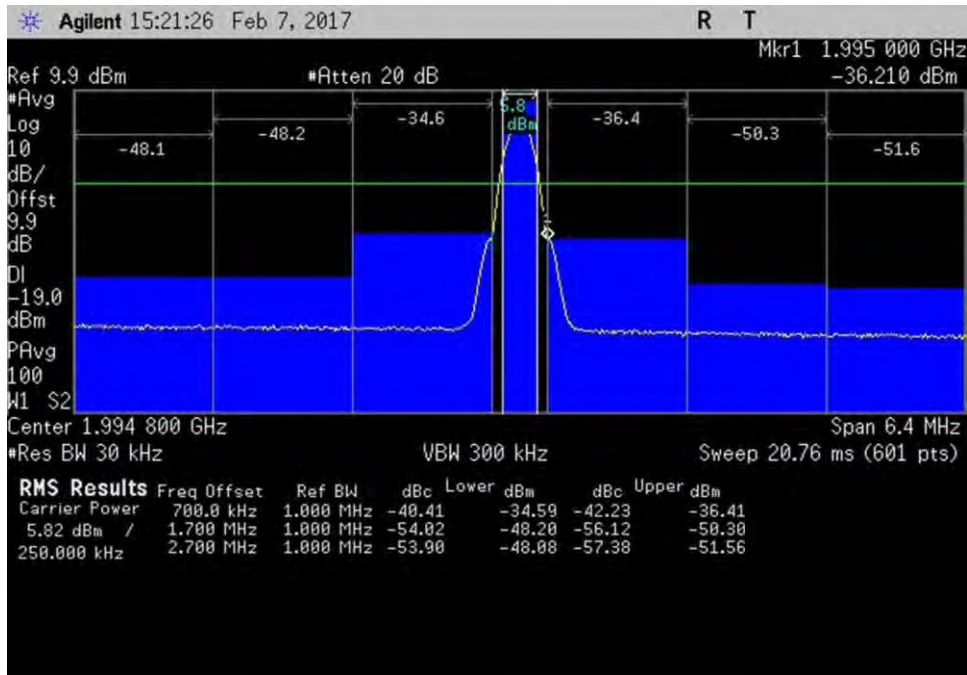
7.5_OBE_DL_746-757MHz_L_PreAGC_GSM



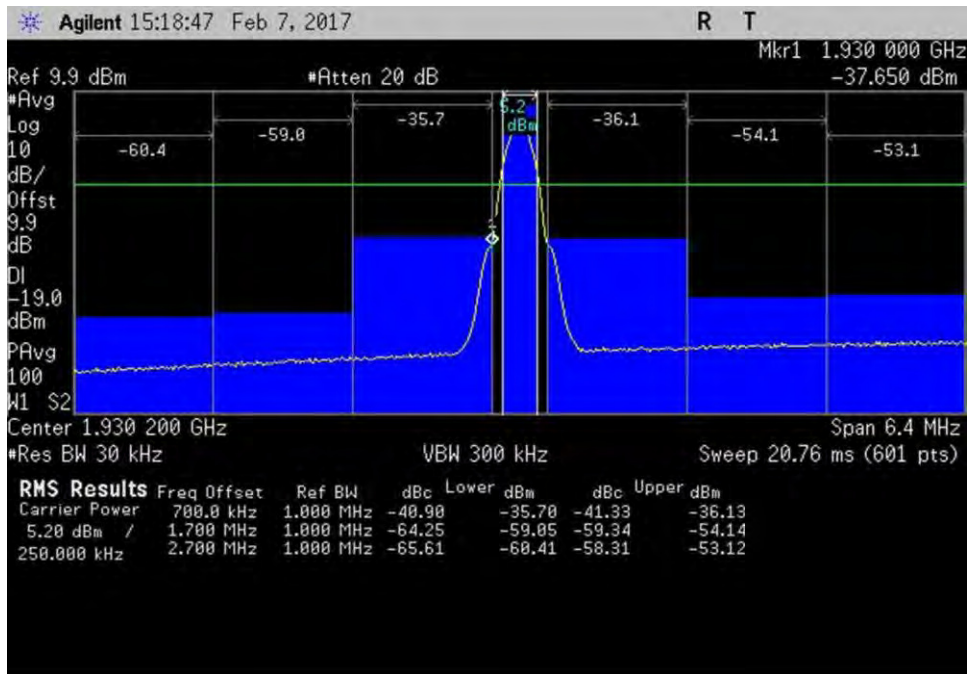
7.5_OBE_DL_869-894MHz_H_PreAGC_GSM



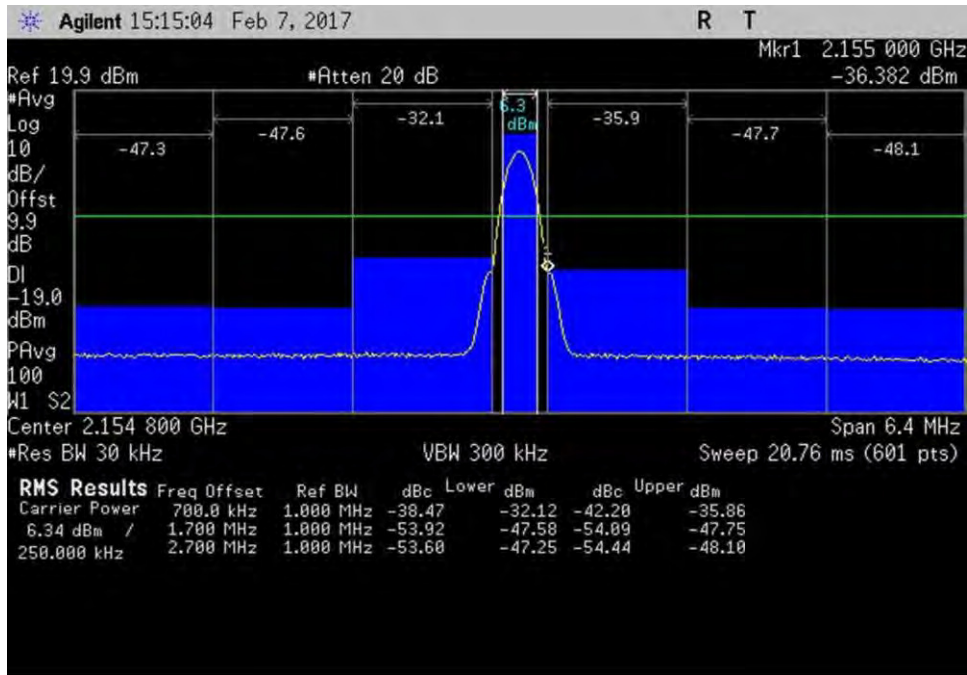
7.5_OBE_DL_869-894MHz_L_PreAGC_GSM



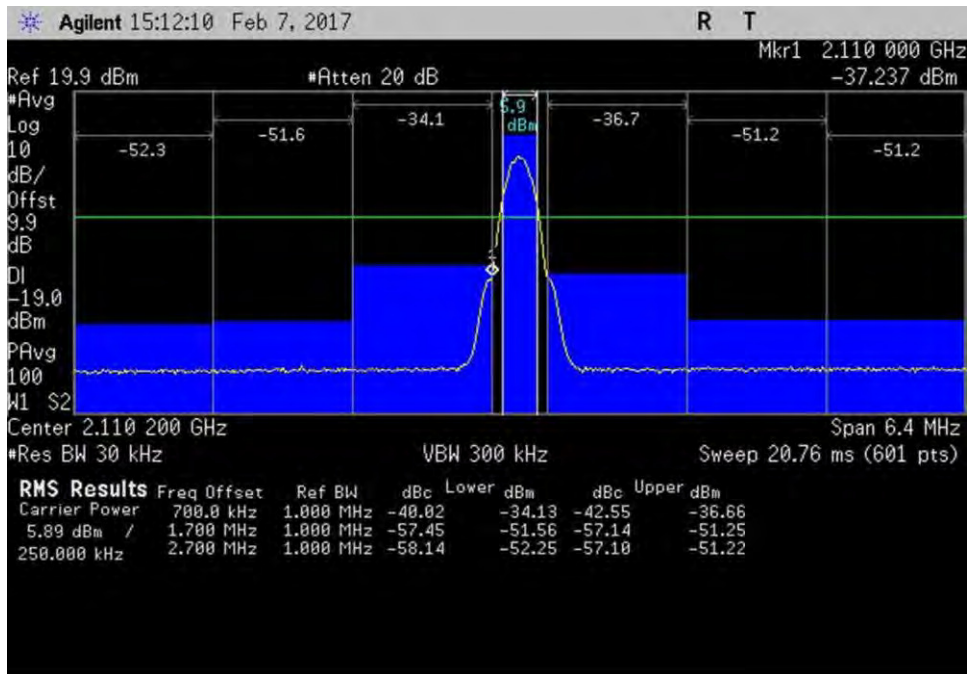
7.5_OBE_DL_1930-1995MHz_H_PreAGC_GSM



7.5_OBE_DL_1930-1995MHz_L_PreAGC_GSM

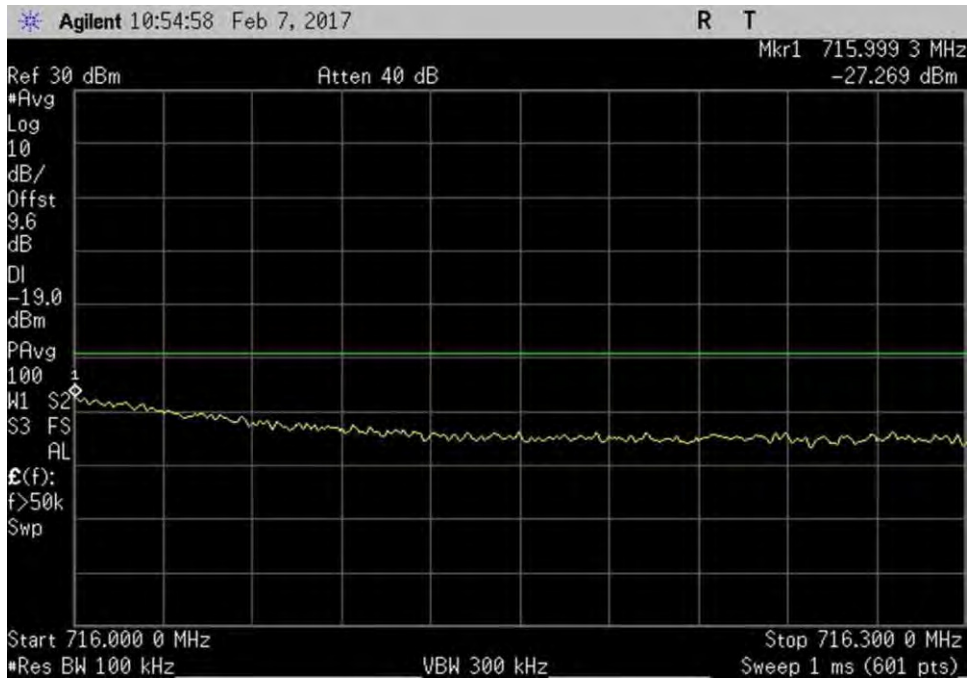


7.5_OBE_DL_2110-2155MHz_H_PreAGC_GSM

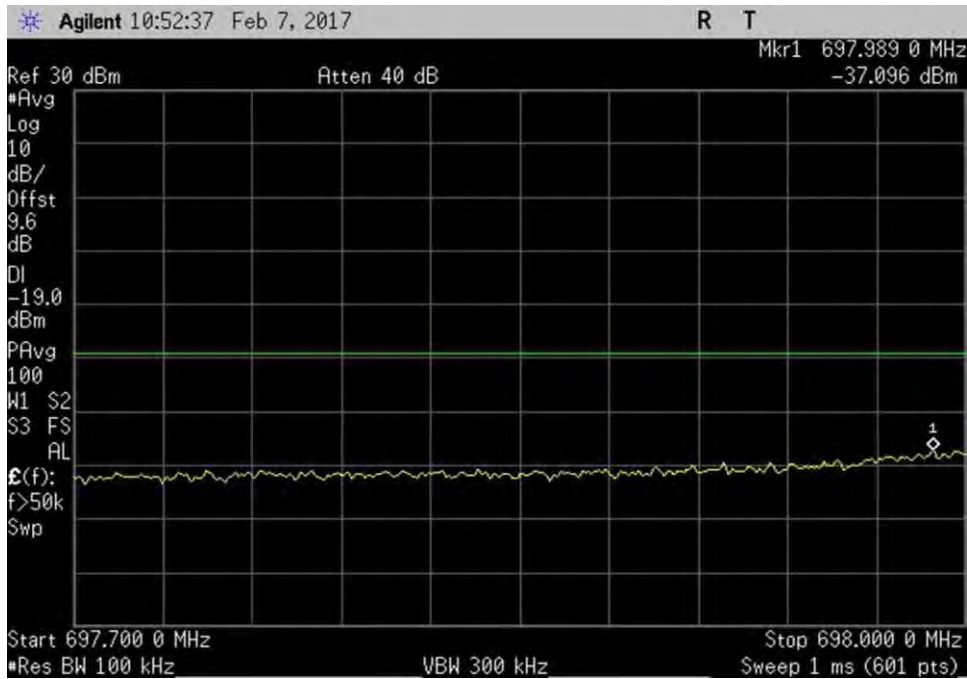


7.5_OBE_DL_2110-2155MHz_L_PreAGC_GSM

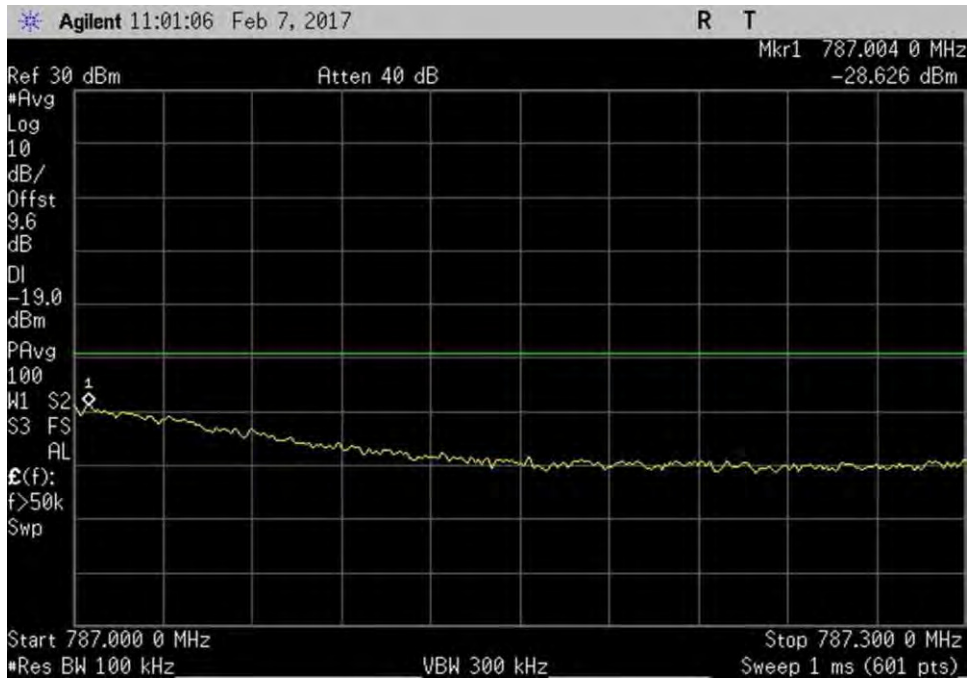
LTE



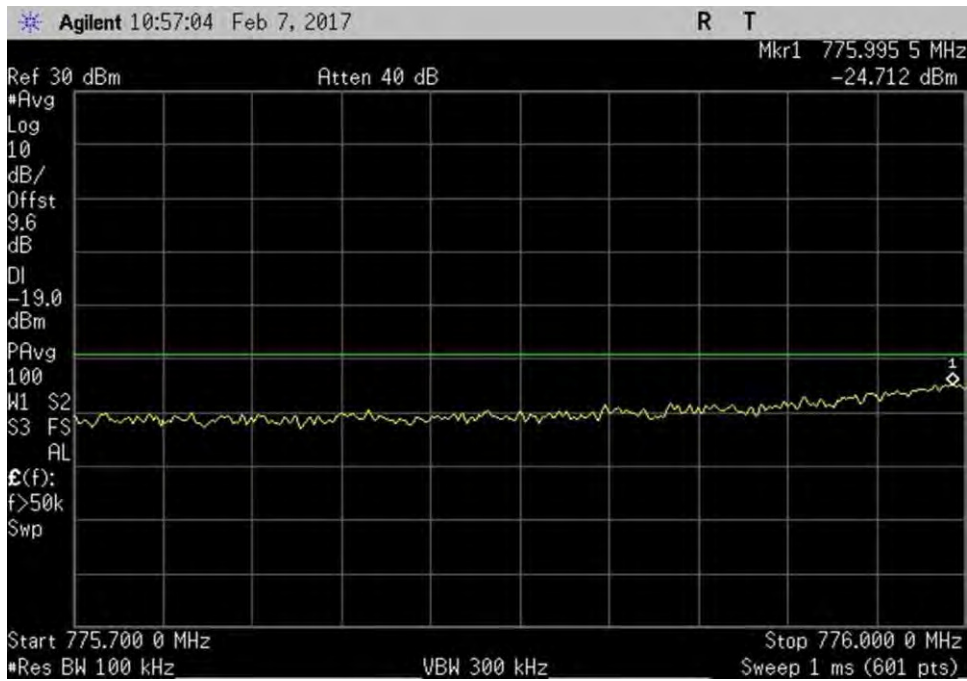
7.5_OBE_UL_698-716MHz_H_PreAGC_LTE



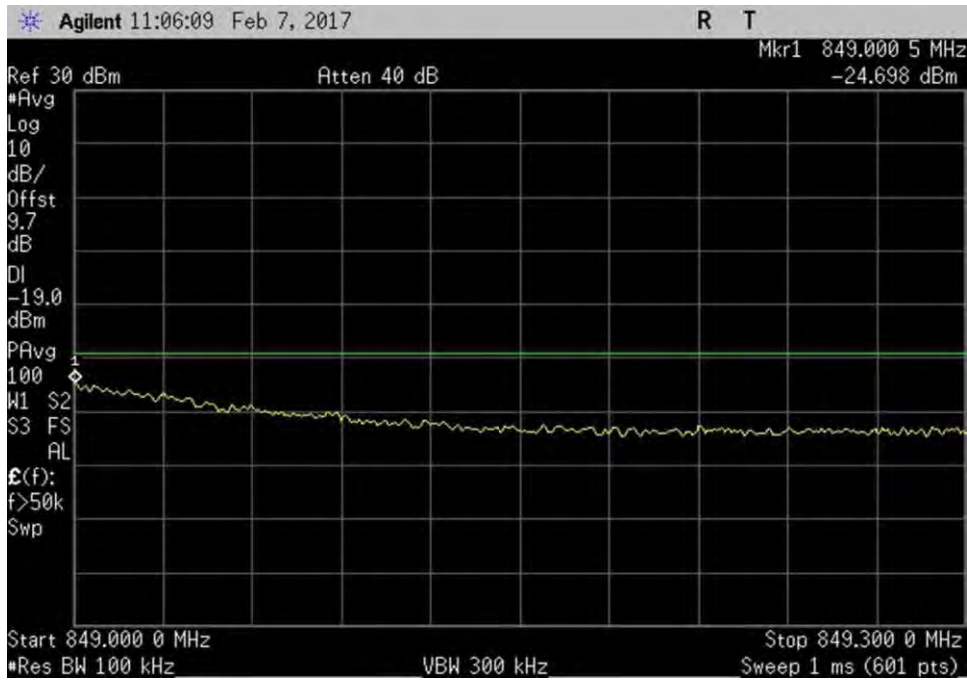
7.5_OBE_UL_698-716MHz_L_PreAGC_LTE



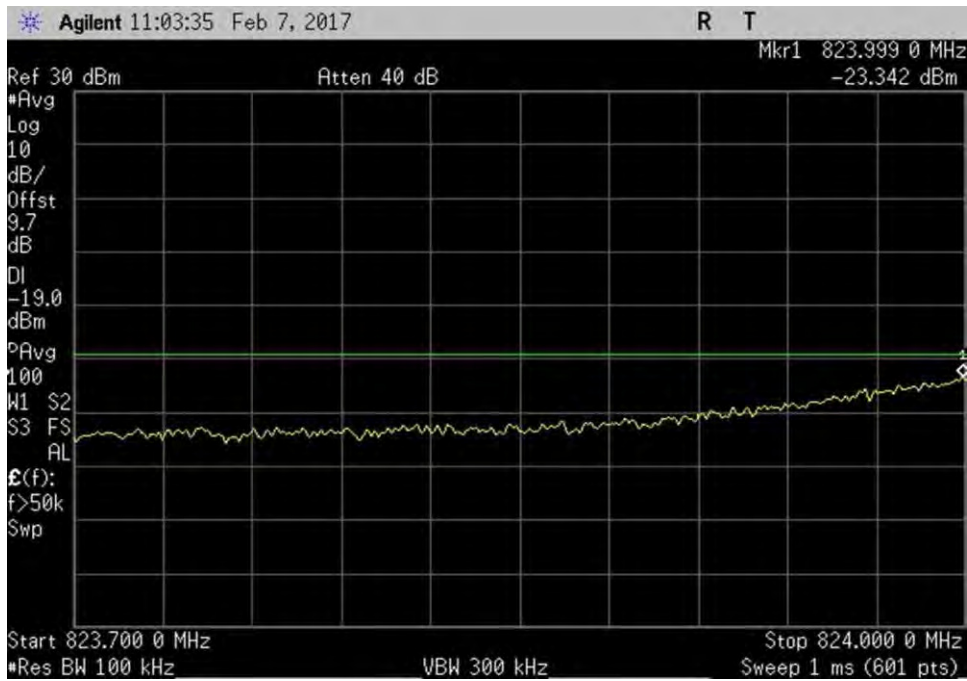
7.5_OBE_UL_776-787MHz_H_PreAGC_LTE



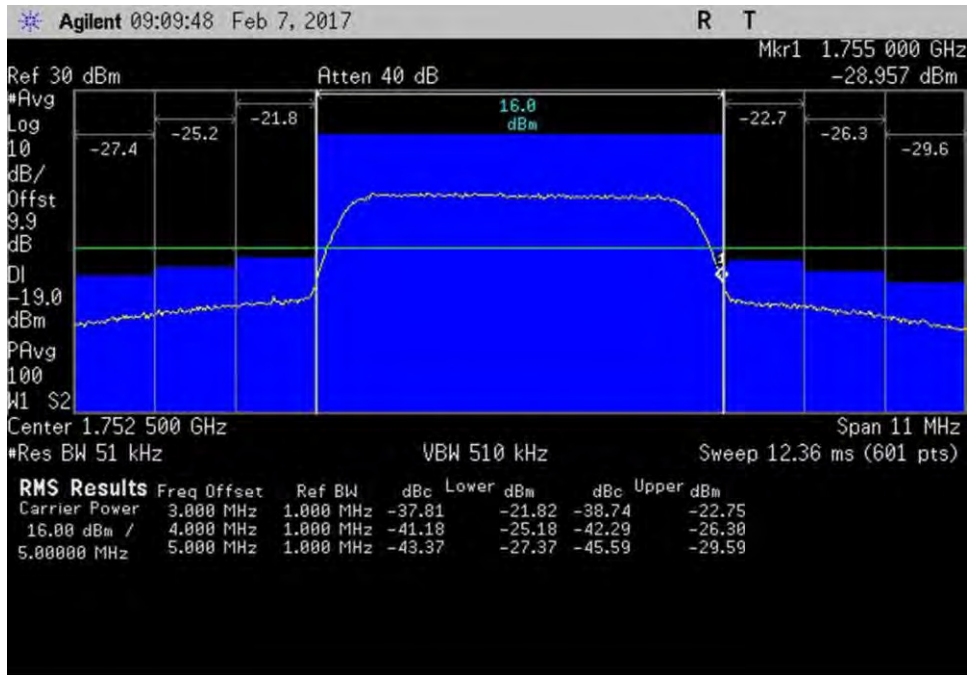
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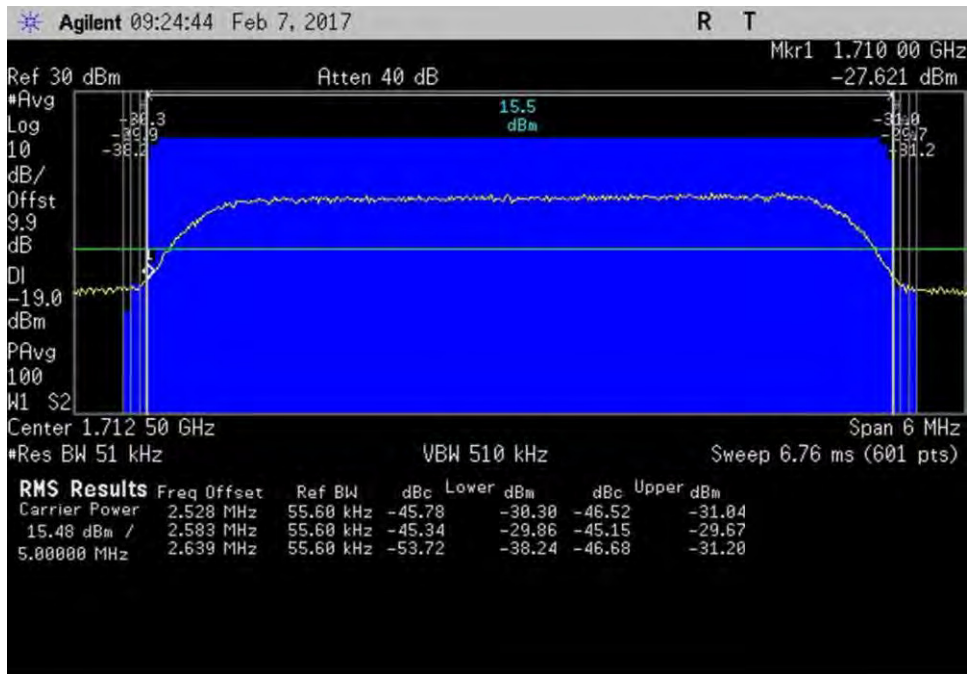
7.5_OBE_UL_824-849MHz_H_PreAGC_LTE



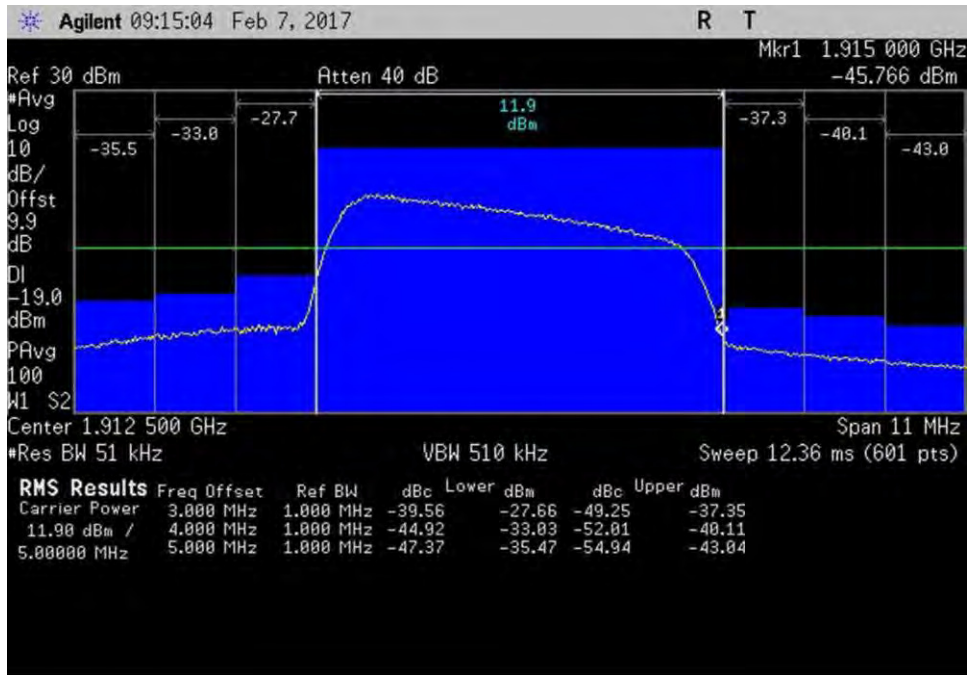
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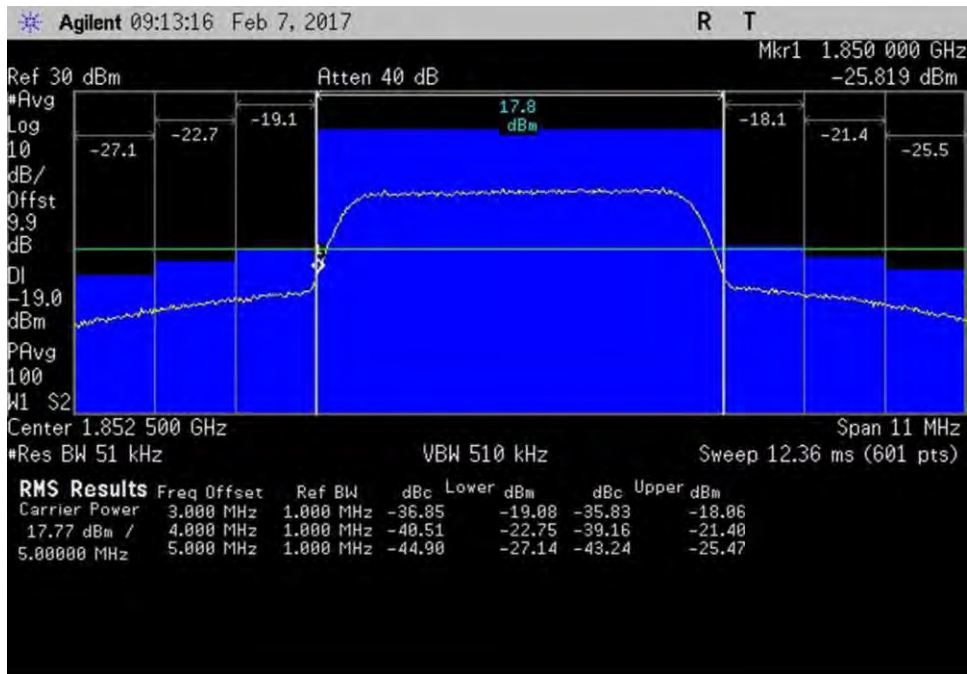
7.5_OBE_UL_1710-1755MHz_H_PreAGC_LTE



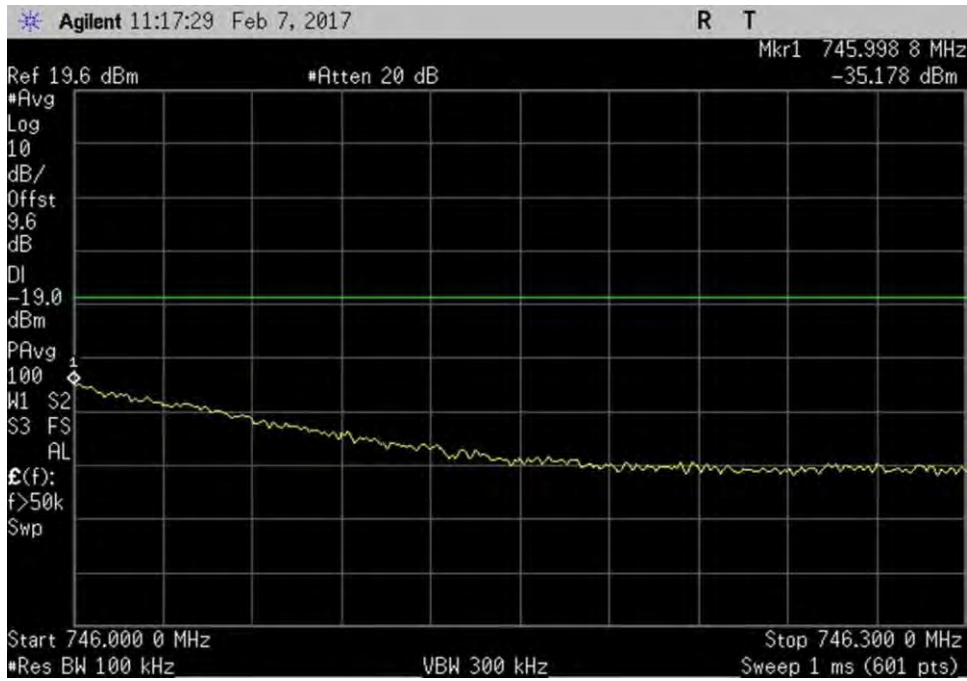
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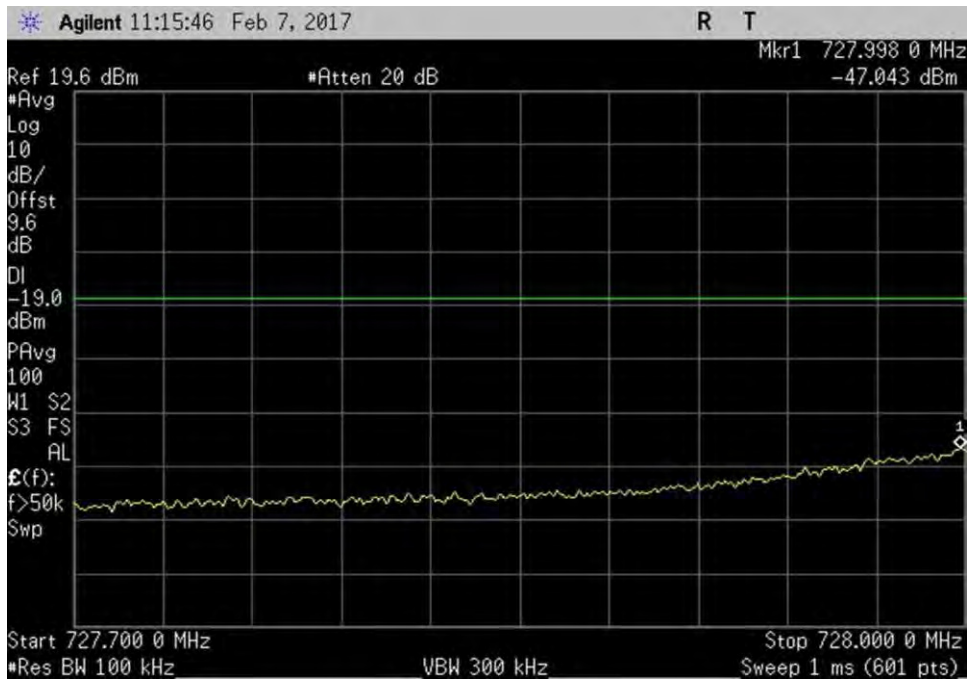
7.5_OBE_UL_1850-1915MHz_H_PreAGC_LTE



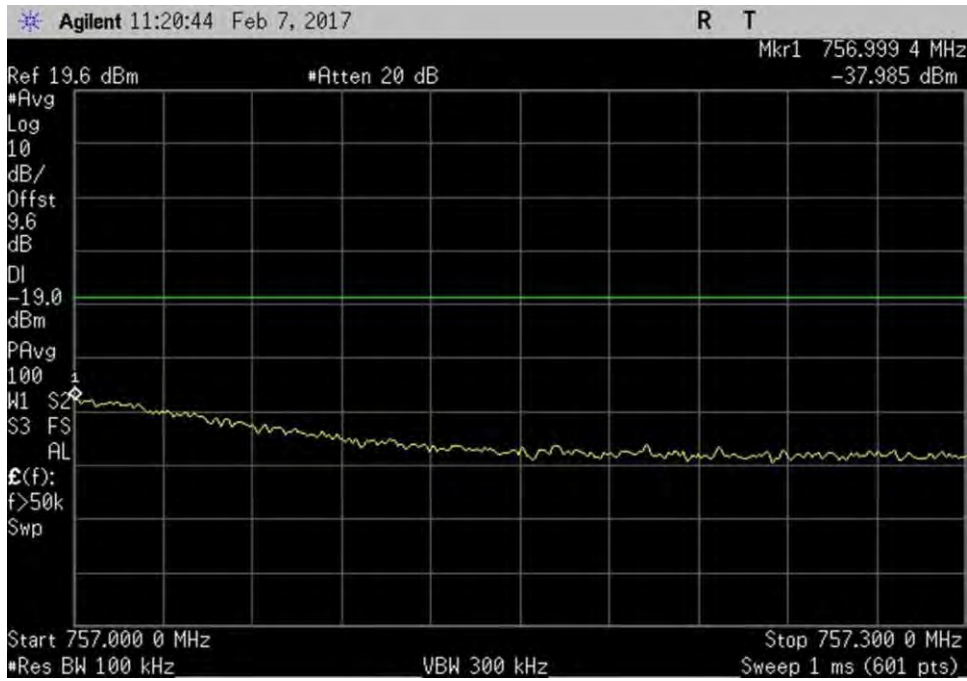
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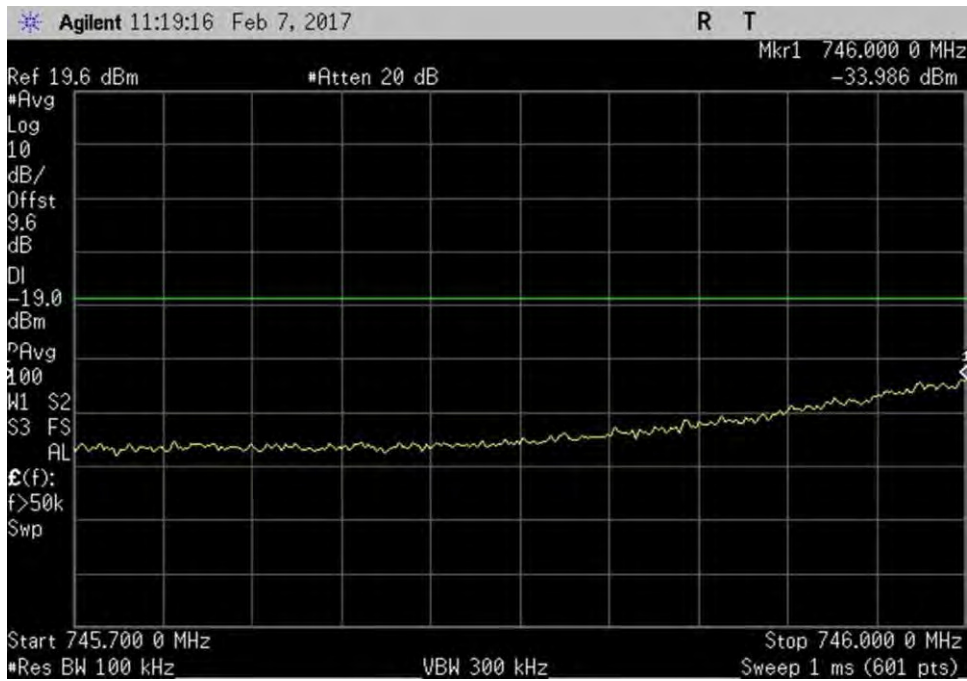
7.5_OBE_DL_728-746MHz_H_PreAGC_LTE



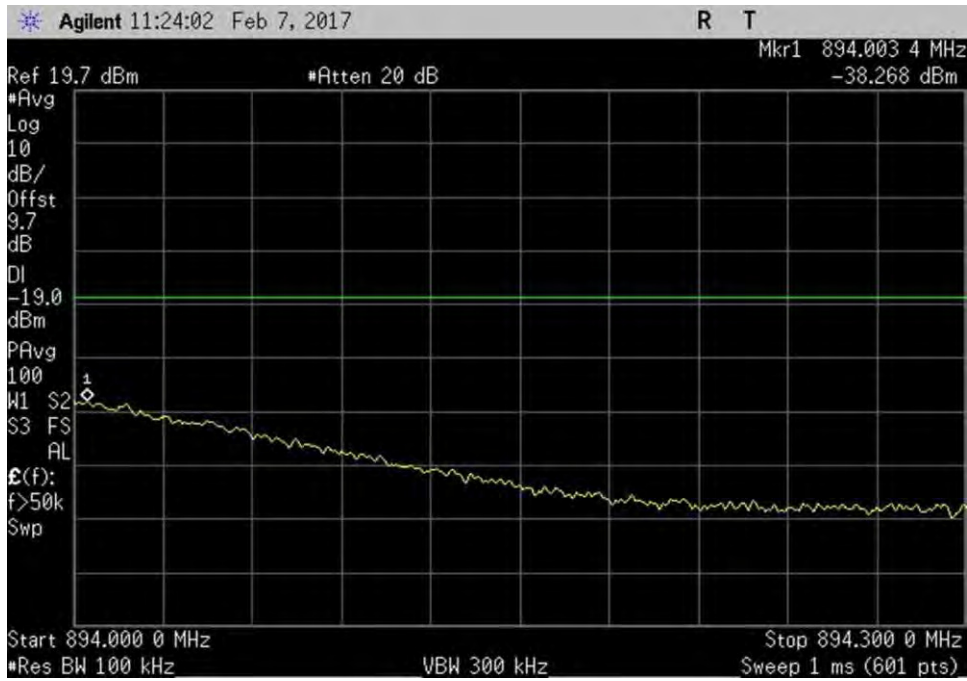
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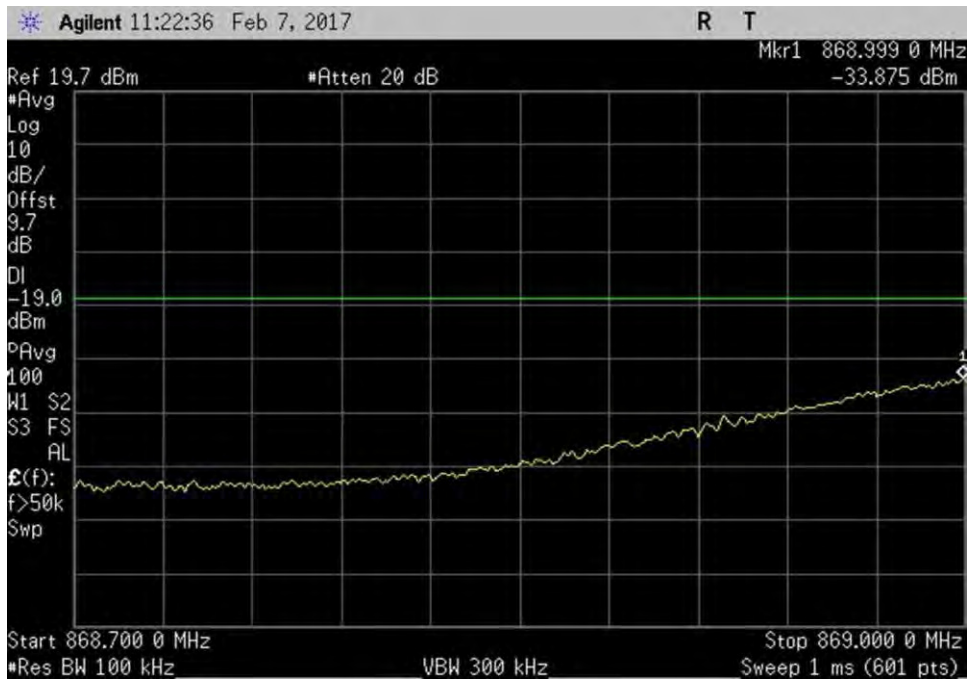
7.5_OBE_DL_746-757MHz_H_PreAGC_LTE



7.5_OBE_DL_746-757MHz_L_PreAGC_LTE



7.5_OBE_DL_869-894MHz_H_PreAGC_LTE



7.5_OBE_DL_869-894MHz_L_PreAGC_LTE