

Cellphone-Mate, Inc.

TEST REPORT FOR

**Wideband Consumer Booster
Model: SC-POLY-DT**

Tested to The Following Standard:

FCC Parts: 20.21, 22, 24 and 27

Report No.: 98648-12

Date of issue: July 7, 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.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

Representative: Dennis Findley
Customer Reference Number: CKC20160607

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: 98648

June 2, 2016

June 2-15, 2016

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	US0082	SL2-IN-E-1148R	3082B-1	958979	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Parts 20.21, 22, 24 and 27

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
7.9.1 a) - l) 7.9.2 a) - f)	Variable Booster Gain Variable Uplink Gain Timing	20.21(e)(8)(i)(C) (1), (2)(i) 20.21(e)(8)(i)(H)	Booster Gain Transmit Power Off Mode	NA	Pass

NA = Not Applicable

SUMMARY OF RESULTS 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		
7.10.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	MOD 1	Pass
7.13 a) - c)	Spectrum Block Filter	NA ¹	NA ¹	NA	NA ¹

NA = Not Applicable

NA¹ = 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
MOD 1: Added copper foil on the bottom side of PCB.
.

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
Switching Power Adapter	GME	GME18A-050300FUR	1511-0000069
Wideband Consumer Booster	Cellphone-Mate, Inc.	SC-POLY-DT	01

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

FCC PARTS 20.21, 22, 24 and 27

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 #: **98648** Date: 06/02/2016
 Test Type: **Conducted Emissions** Time: 10:44:49
 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 SMA connector and 50-ohm impedance.
 The EUT Donor port is type F connector and 75-ohm impedance.
 During testing there is a 75 ohm to 50 ohm matching pad connected to the EUT type F connector.
 This matching pad has a 5.8dB correction factor.
 Firmware: V1.0

Test environment conditions:
 Temperature: 23°C
 Relative Humidity: 40%
 Pressure: 101.4 kPa

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

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

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

Test procedure: The test was performed in accordance with section 7.1 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04 Dated February 12, 2016.

Test Equipment:

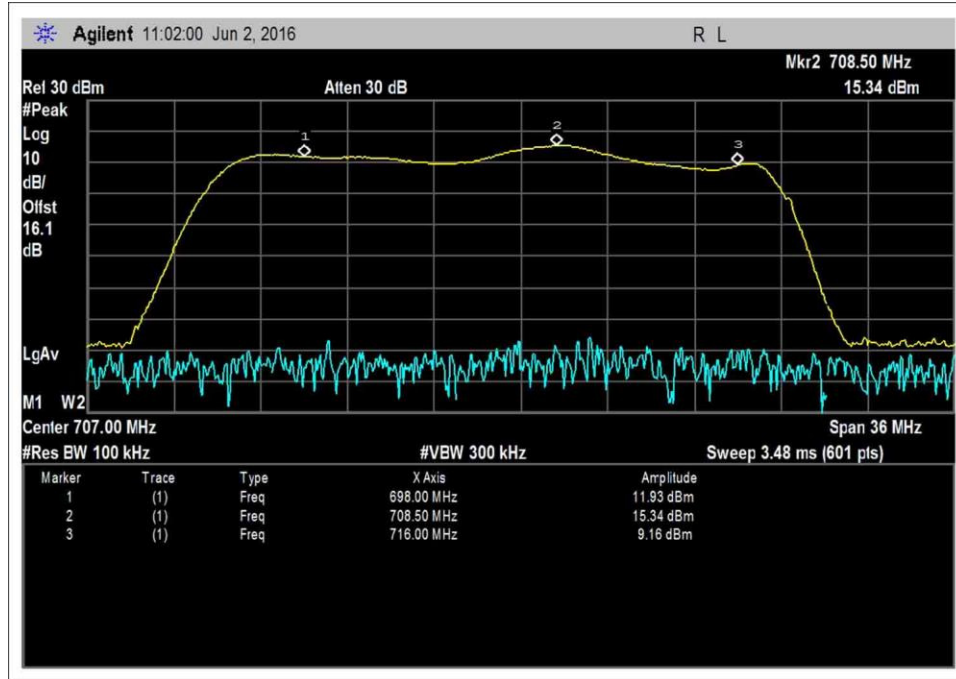
ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06710	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018
	ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
	ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018

Summary of Results

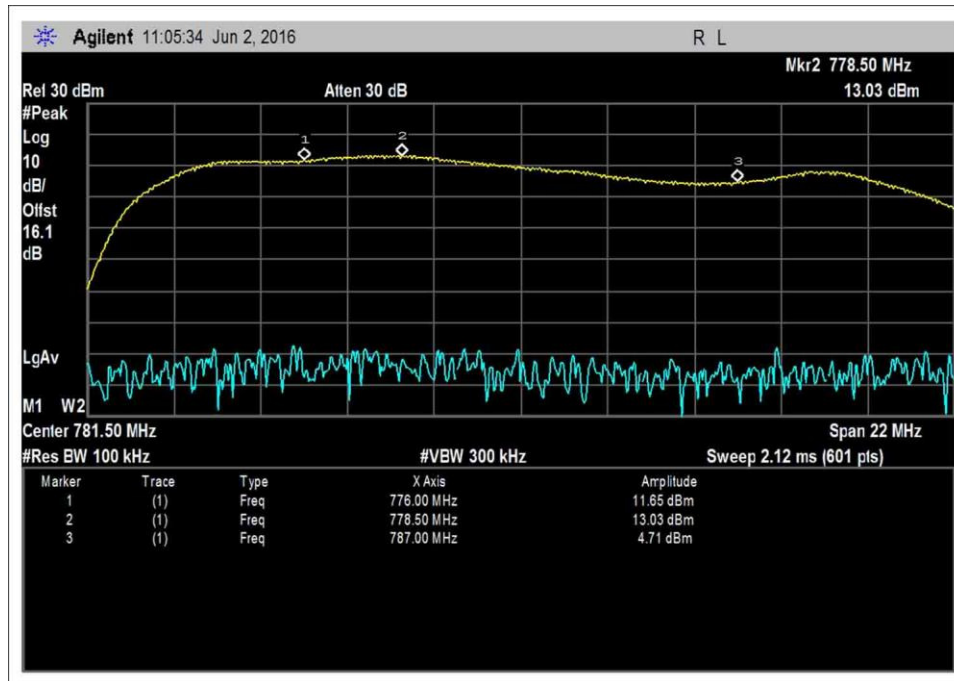
Pass: The plots below show the device only operates on the CMRS frequency bands authorized for use by the NPS.

Plots

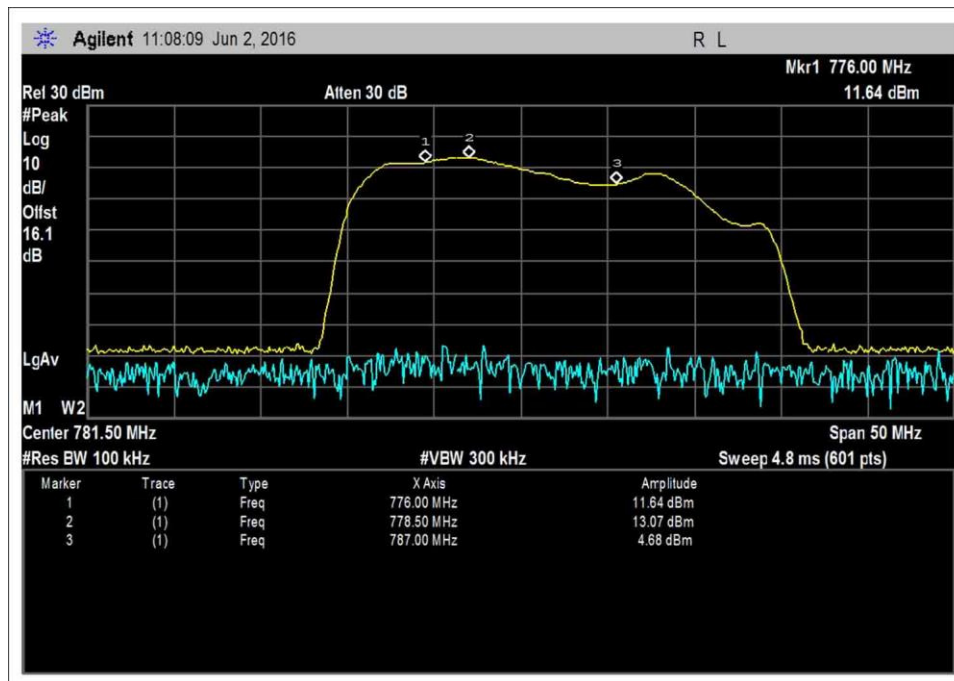
UL



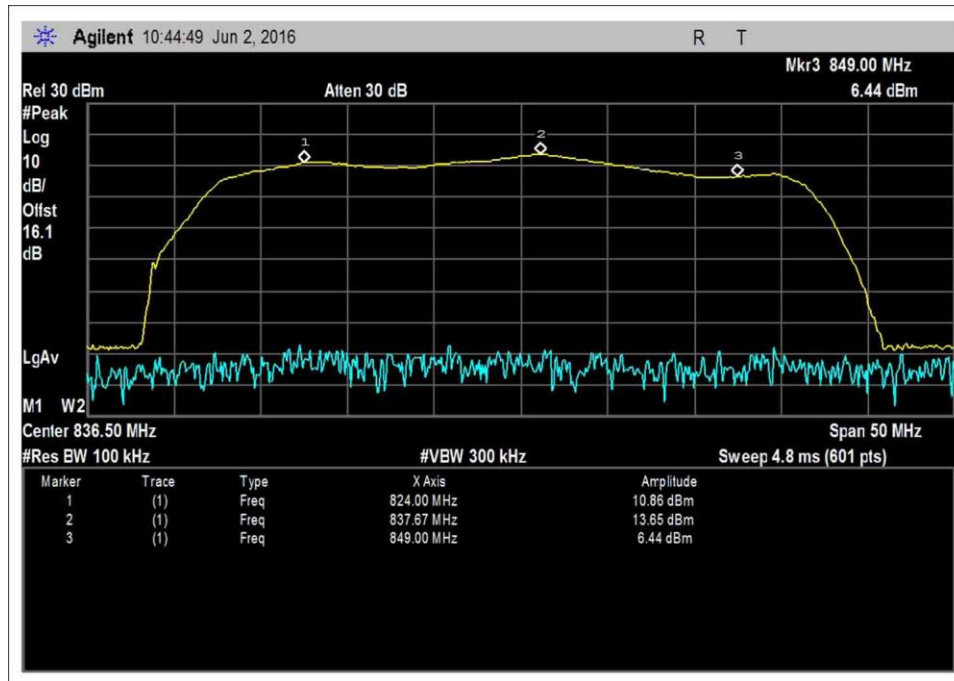
7.1_band verify_UL_698-716MHz



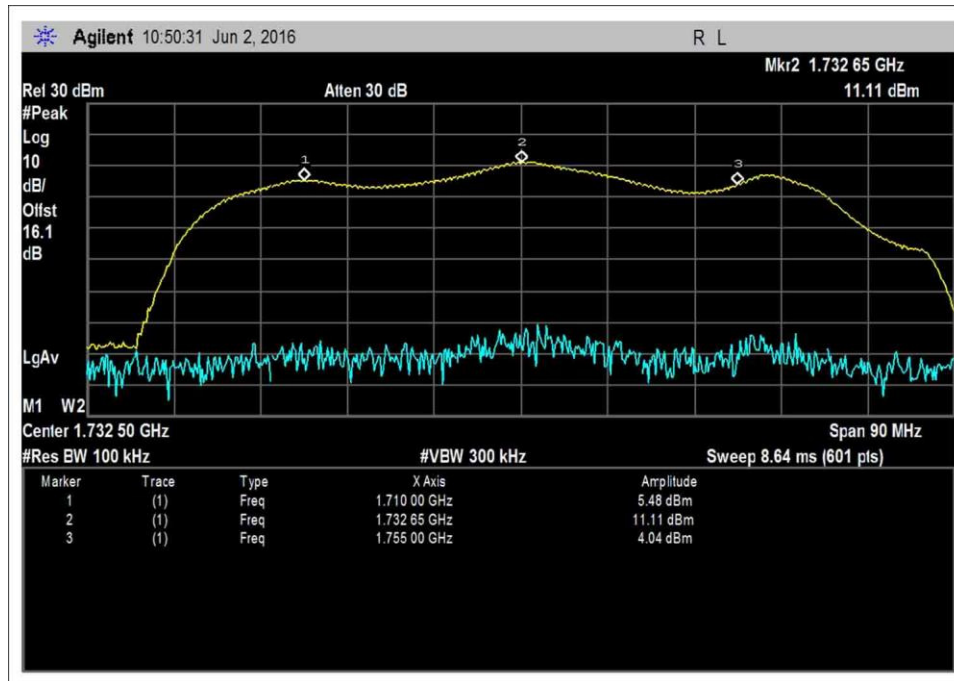
7.1_band verify_UL_776-787MHz



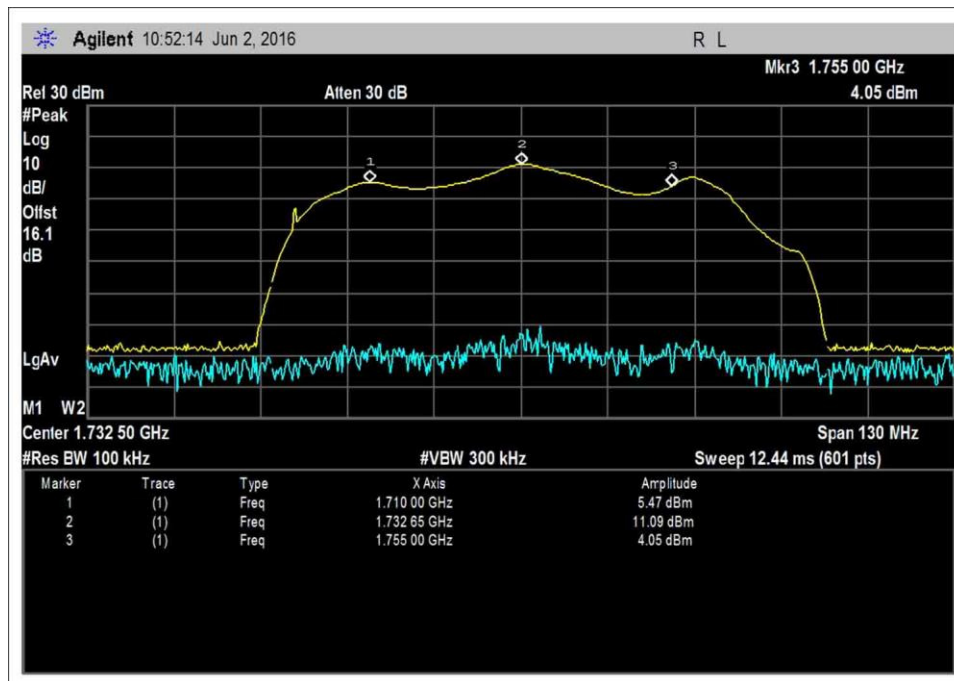
7.1_band verify_UL_776-787MHz-Zoom



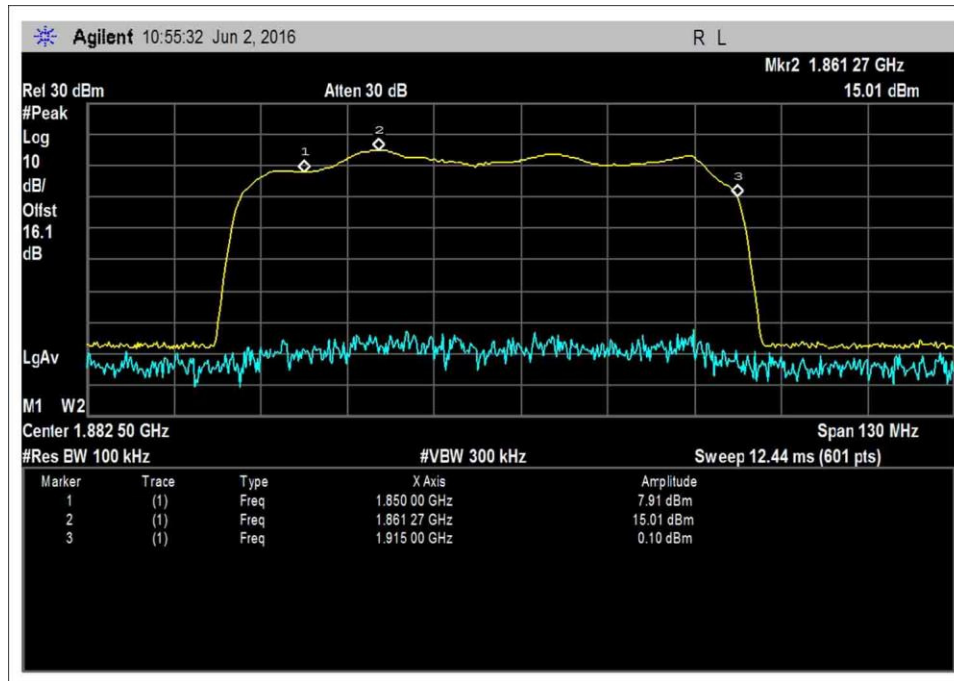
7.1_band verify_UL_824-849MHz



7.1_band verify_UL_1710-1755MHz

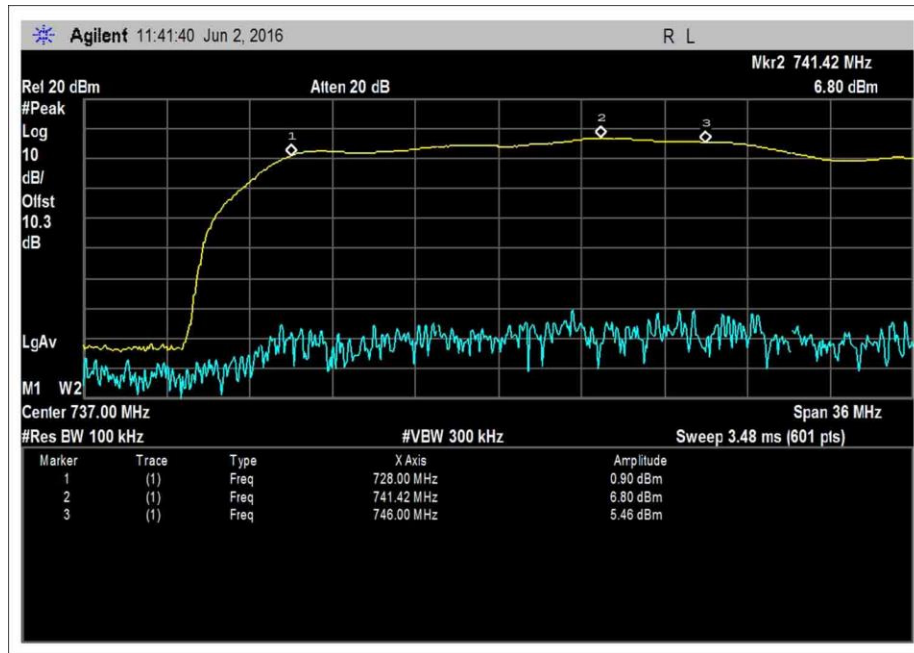


7.1_band verify_UL_1710-1755MHz-Zoom1

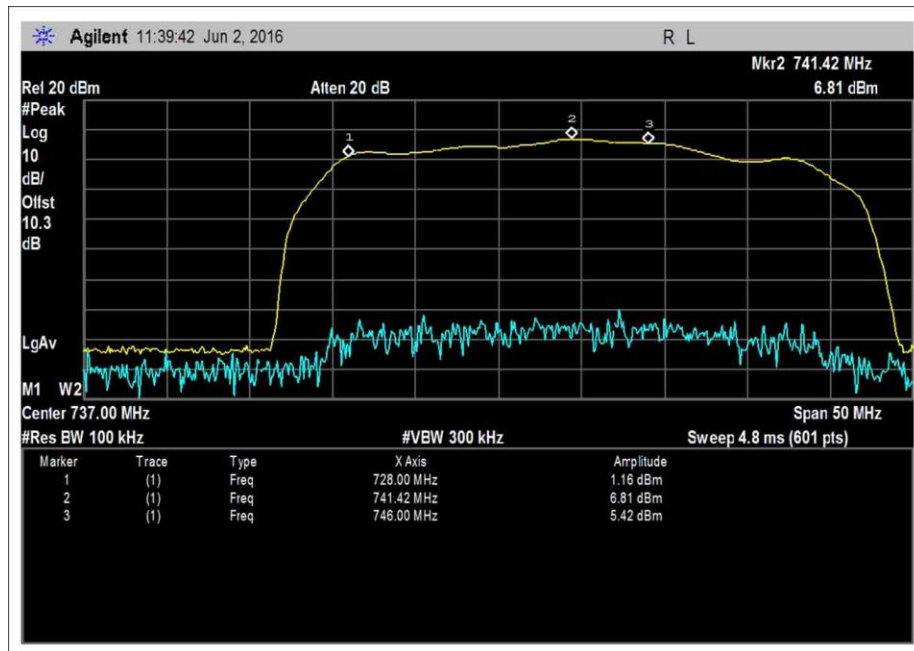


7.1_band verify_UL_1850-1915MHz

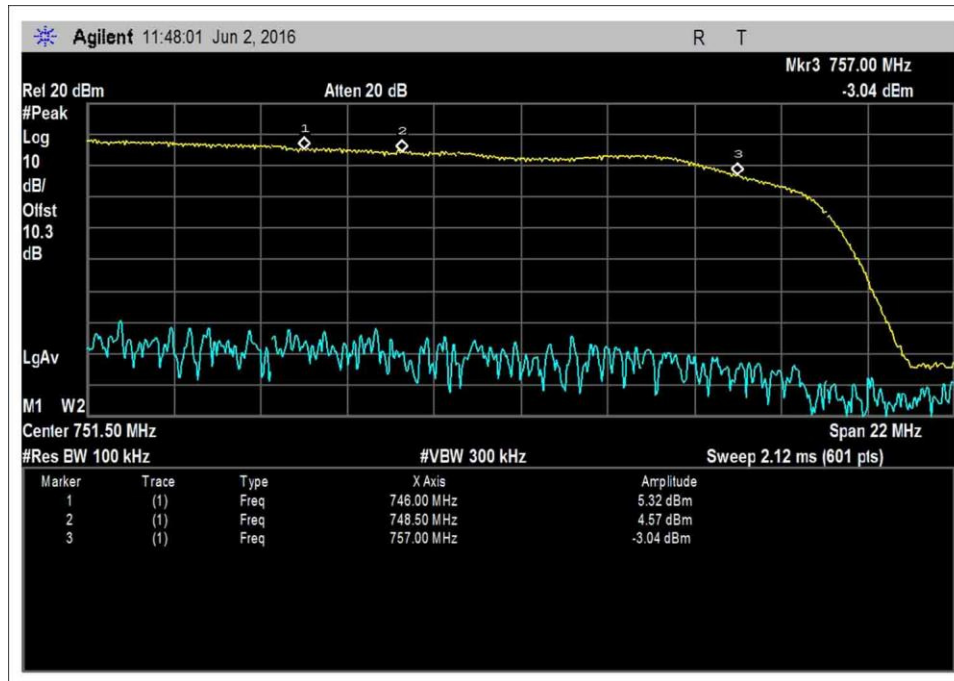
DL



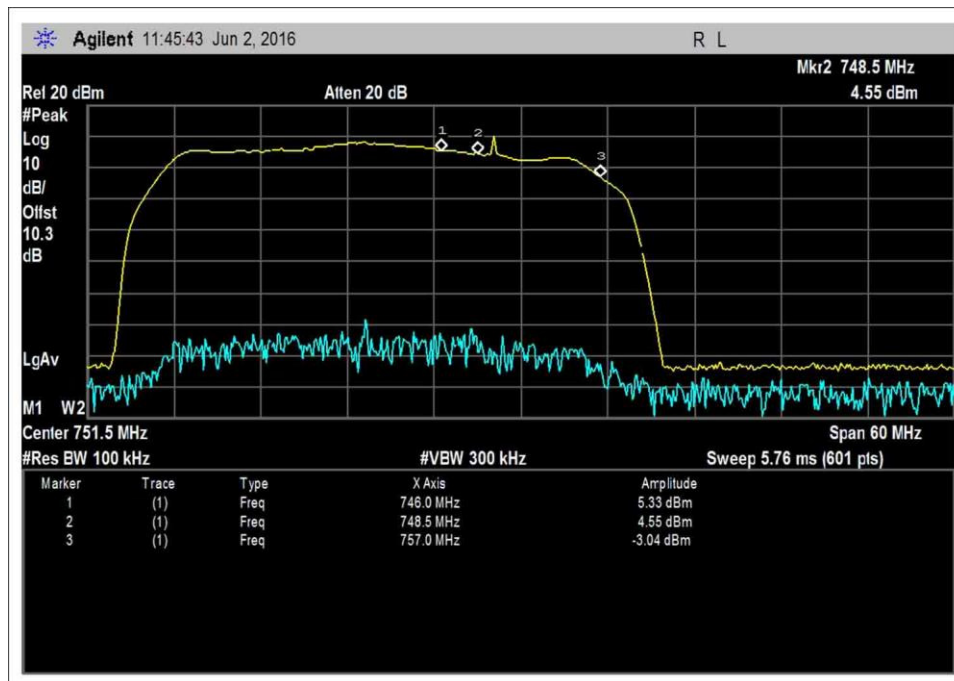
7.1_band verify_DL_728-746MHz



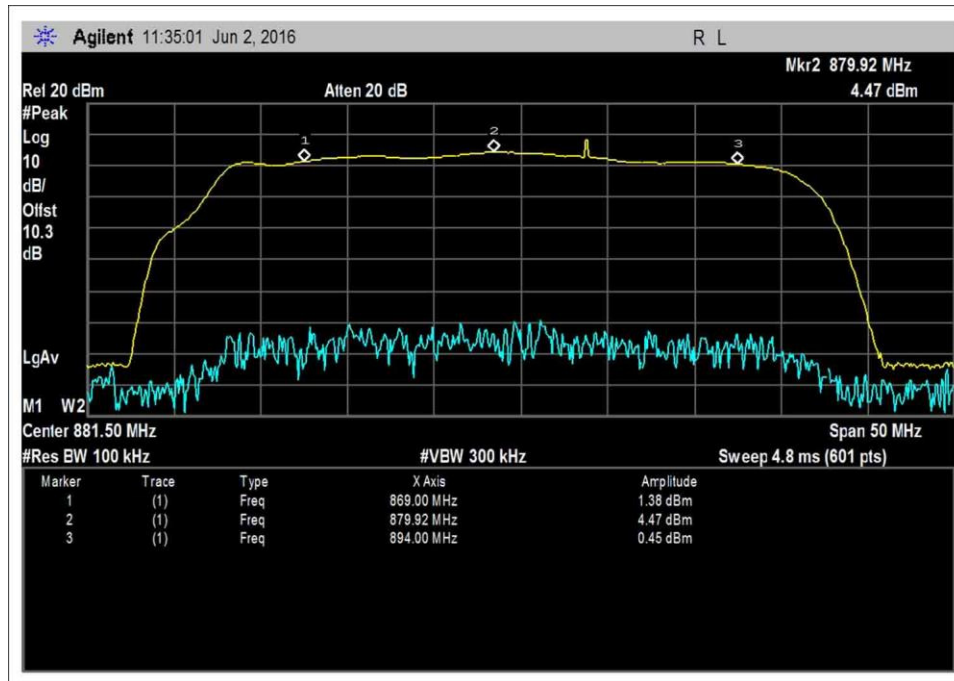
7.1_band verify_DL_728-746MHz-Zoom



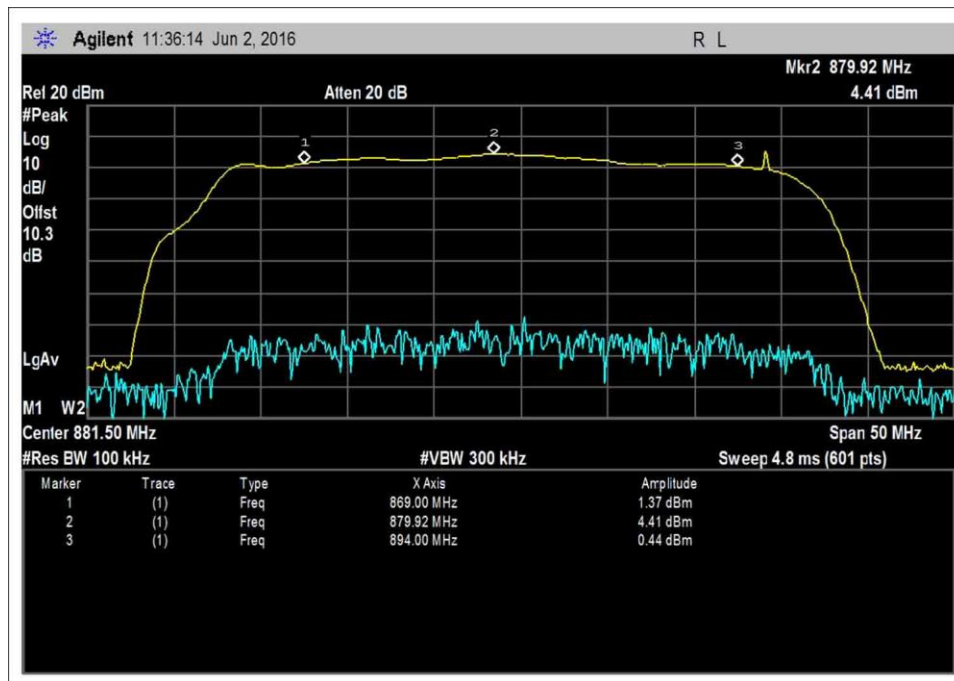
7.1_band verify_DL_746-757MHz



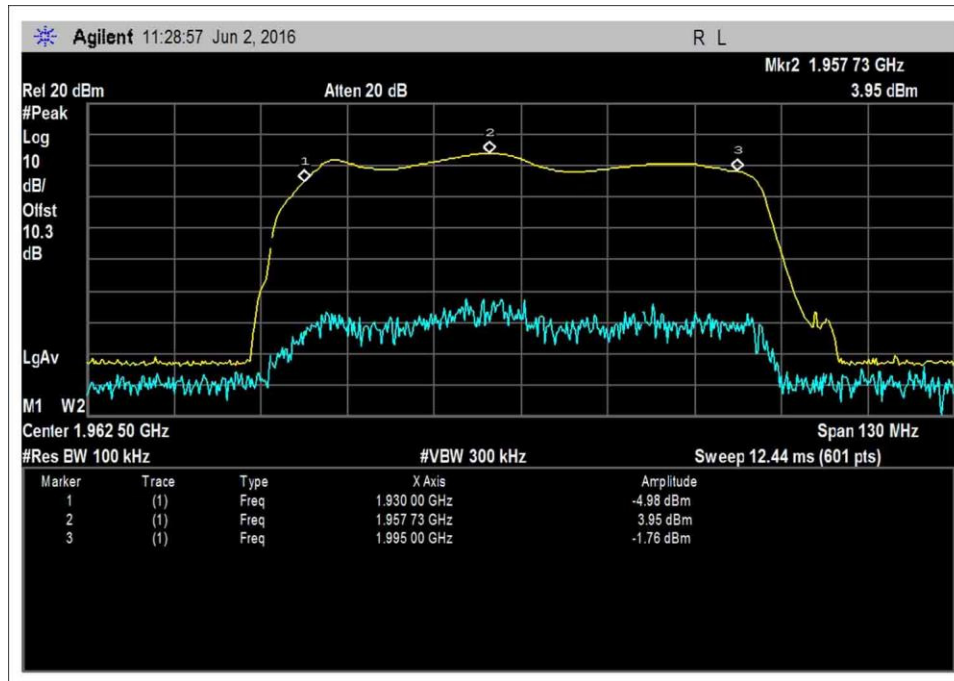
7.1_band verify_DL_746-757MHz-Zoom



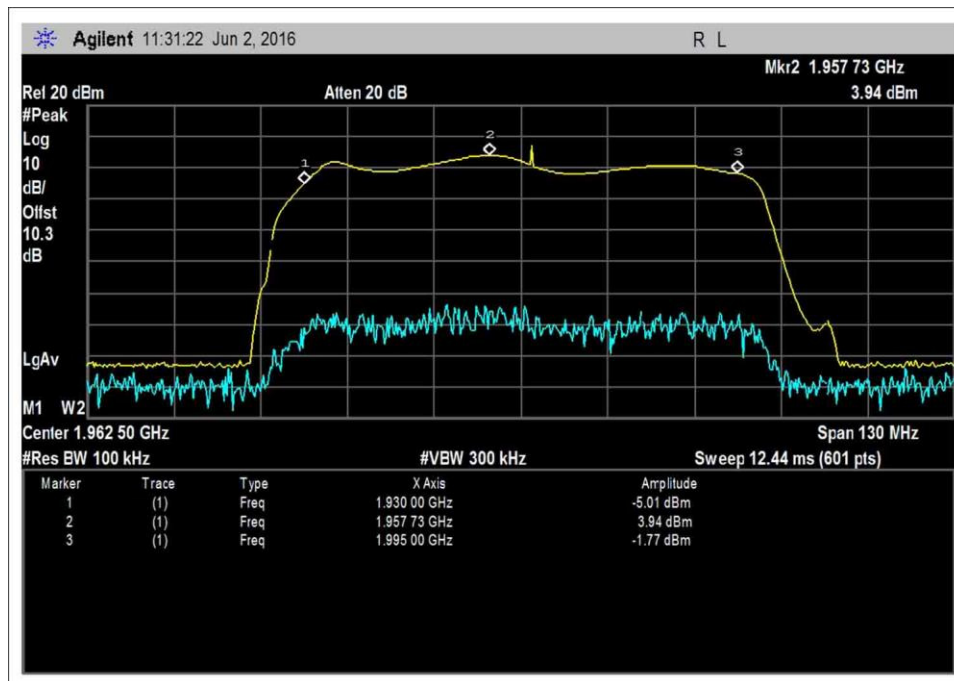
7.1_band verify_DL_869-894MHz-1



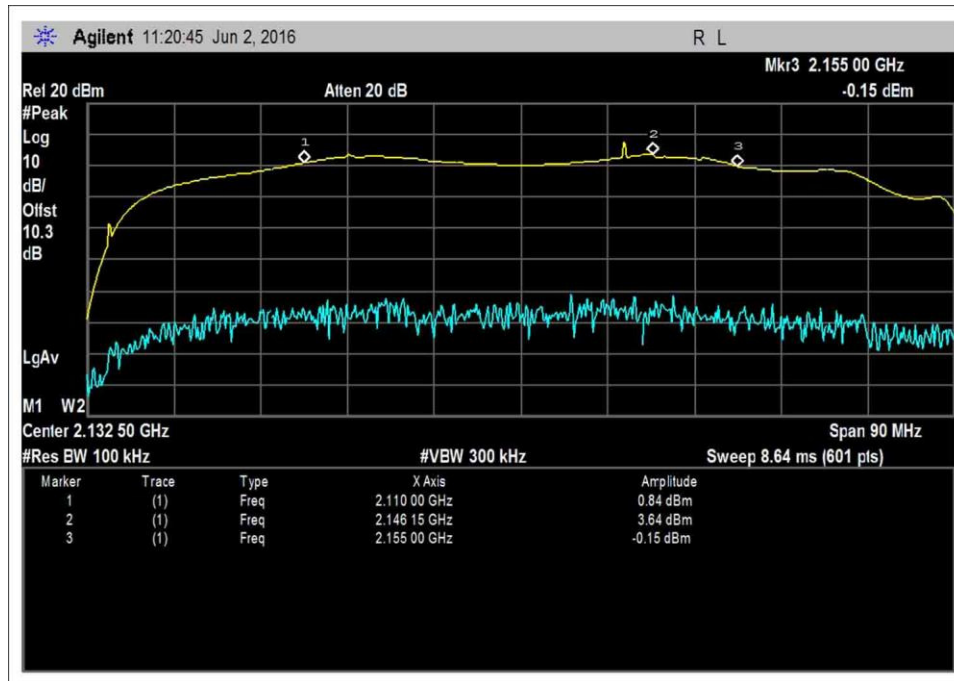
7.1_band verify_DL_869-894MHz-2



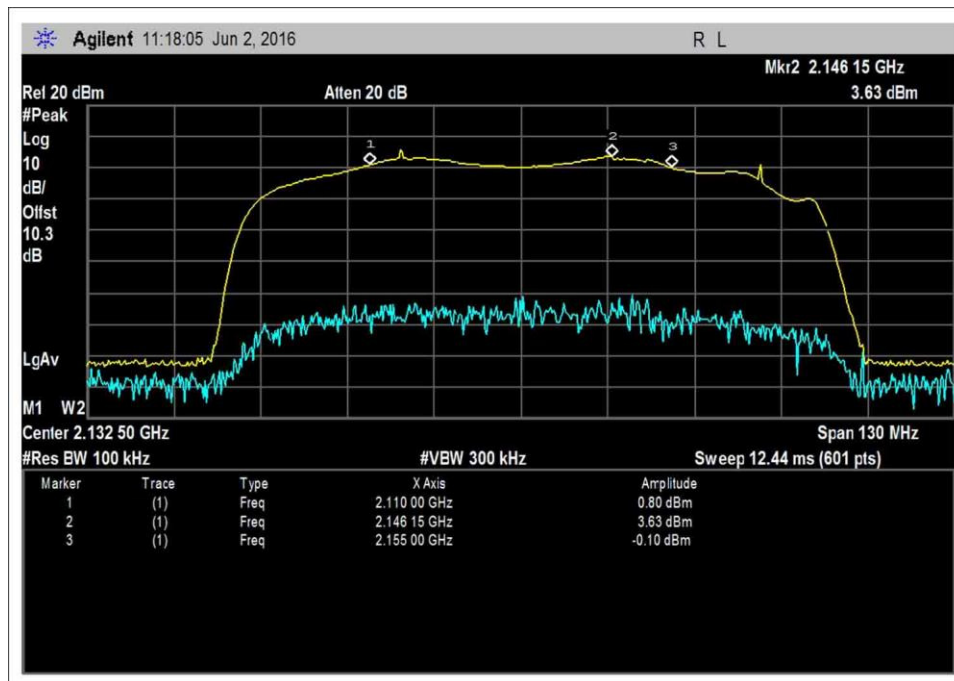
7.1_band verify_DL_1930-1995MHz-1



7.1_band verify_DL_1930-1995MHz-2



7.1_band verify_DL_2110-2155MHz



7.1_band verify_DL_2110-2155MHz-Zoom

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03418	Signal Generator	E4438C	7/30/2015	7/30/2017
	ANP06709	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	ANP06710	Cable	32026-29094K-29094K-72TC	9/18/2014	9/18/2016
	AN03471	Spectrum Analyzer	E4440A	1/4/2016	1/4/2018
	ANP06467	Attenuator	PE7014-10	5/13/2015	5/13/2017
	ANP05411	Attenuator	54A-10	1/18/2016	1/18/2018

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

Antenna Kitting Information

Component	Prod No. Description	Gain/Loss					Notes
		LTE-A	LTE-V	800MHz	1900MHz	1700MHz\2100MHz	
Outdoor Antenna*	CM288W	3dBi	3dBi	3dBi	4dBi	4dBi\4dBi	
	CM230W	10dBi	10dBi	10dBi	10dBi	10dBi\10dBi	
Outdoor Cable*	SC-RG6 -50 50Feet	3.32dB	3.32dB	3.75dB	6.42dB	6.22dB\6.68dB	50 Feet or longer
Indoor Antenna*	SC322W	2.5dBi	2.5dBi	3dBi	5dBi	4dBi\5dBi	

* All equivalent antennas and cables are suitable for use with the SC-POLY-DT. As above information. Remark: Lower gain antenna can also be used.

Summary of Results

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

Pre AGC				Pre AGC		
Frequency (MHz)	Input (dBm)	Pulse GSM		Input (dBm)	4.1 MHz AWGN	
		Output (dBm)	*Gain (dB)		Output (dBm)	*Gain (dB)
UL1710-1755	-46.3	18.6	64.9	-47.5	17.0	64.5
UL1850-1915	-44.5	19.6	64.1	-45.1	17.7	62.8
UL824-894	-41.8	19.9	61.7	-43.6	17.2	60.8
UL 698-716	-40.2	21.1	61.3	-43.1	17.2	60.3
UL776-787	-41.1	19.4	60.5	-42.5	17.3	59.8
DL2110-2155	-54.4	10.6	65.0	-59.3	4.9	64.2
DL1930-1995	-51.7	10.7	62.4	-53.9	8.0	61.9
DL869-894	-47.9	12.4	60.3	-51.0	8.5	59.5
DL:728-746	-47.5	11.8	59.3	-48.1	9.6	57.7
DL 746-757	-46.5	9.5	56.0	-47.8	7.0	54.8

*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	18.6	10	6.22	22.4	17	30
UL1850-1915	19.6	10	6.42	23.2	17	30
UL824-894	19.9	10	3.75	26.2	17	30
UL 698-716	21.1	10	3.32	27.8	17	30
UL776-787	19.4	10	3.32	26.1	17	30
DL2110-2155	10.6	5	0	15.6	na	17
DL1930-1995	10.7	5	0	15.7	na	17
DL869-894	12.4	3	0	15.4	na	17
DL:728-746	11.8	2.5	0	14.3	na	17
DL 746-757	9.5	2.5	0	12.0	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	17.0	10	6.22	20.8	17	30
UL1850-1915	17.7	10	6.42	21.3	17	30
UL824-894	17.2	10	3.75	23.5	17	30
UL 698-716	17.2	10	3.32	23.9	17	30
UL776-787	17.3	10	3.32	24.0	17	30
DL2110-2155	4.9	5	0	9.9	na	17
DL1930-1995	8.0	5	0	13.0	na	17
DL869-894	8.5	3	0	11.5	na	17
DL:728-746	9.6	2.5	0	12.1	na	17
DL 746-757	7.0	2.5	0	9.5	na	17

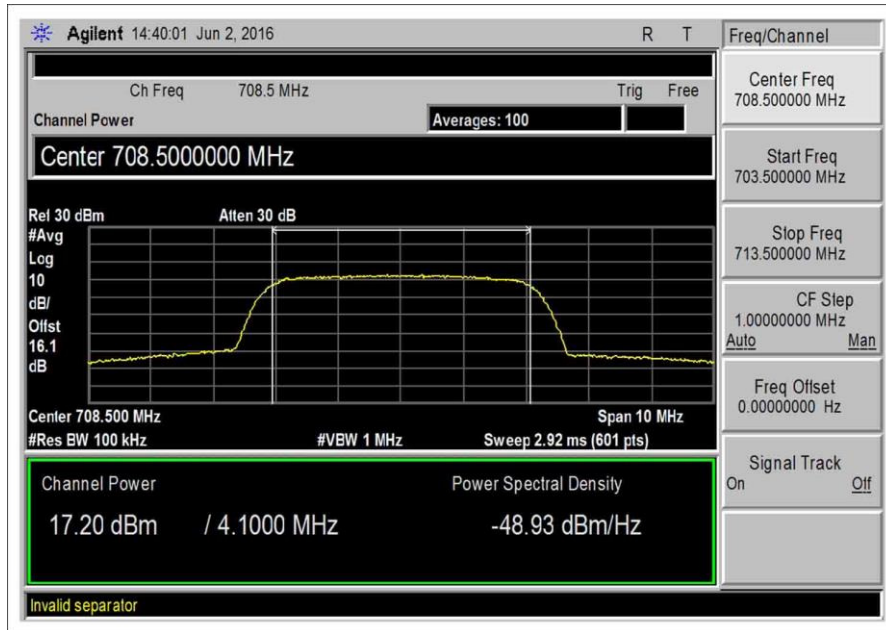
Section 5.5 power						
Frequency (MHz)	Input (dBm)	Pulse GSM			4.1 MHz AWGN	
		Output (dBm)	Gain (dB)	Input (dBm)	Output (dBm)	Gain (dB)
UL1710-1755	-35.9	18.0	53.9	-38.3	16.6	54.9
UL1850-1915	-35.6	19.6	55.2	-36.1	18.1	54.2
UL824-894	-32.8	19.6	52.4	-34.1	18.3	52.4
UL 698-716	-31.2	21.0	52.2	-31.0	20.0	51.0
UL776-787	-33.2	18.8	52.0	-31.6	19.3	50.9
DL2110-2155	-43.9	10.1	54.0	-50.4	4.2	54.6
DL1930-1995	-47.7	10.6	58.3	-47.4	8.0	55.4
DL869-894	-41.9	11.9	53.8	-43.0	8.8	51.8
DL:728-746	-40.0	12.4	52.4	-42.5	9.4	51.9
DL 746-757	-41.5	9.1	50.6	-43.0	6.9	49.9

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.

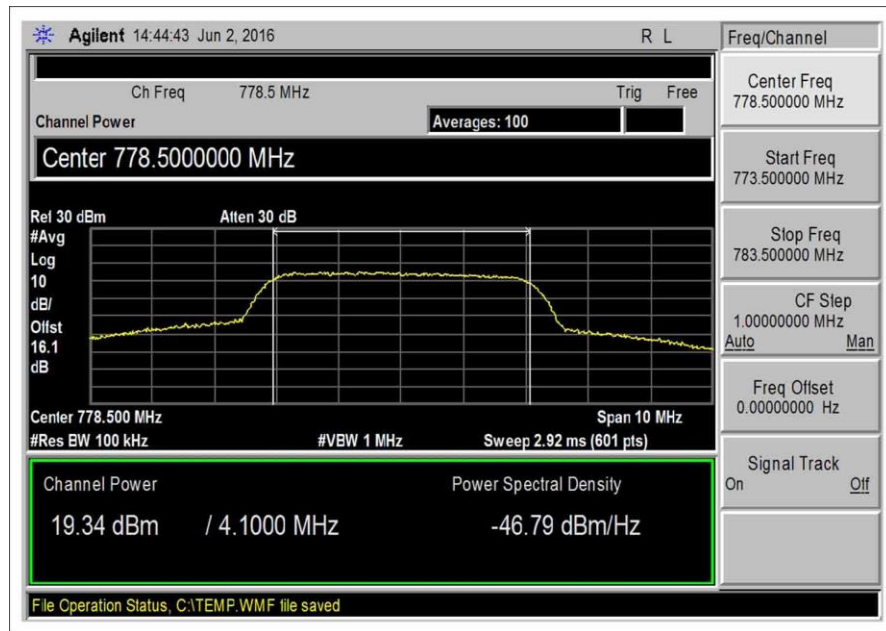
	Pulse GSM	4.1MHz AWGN	Limit (dB)
UL gain vs DL gain 1710/2110	-0.1	0.3	9.0
UL gain vs DL gain 1850/1930	1.7	0.8	9.0
UL gain vs DL gain 824/869	1.4	1.3	9.0
UL gain vs DL gain 776/728	2.0	2.6	9.0
UL gain vs DL gain 776/746	4.5	5.0	9.0

Plots

UL-AWGN



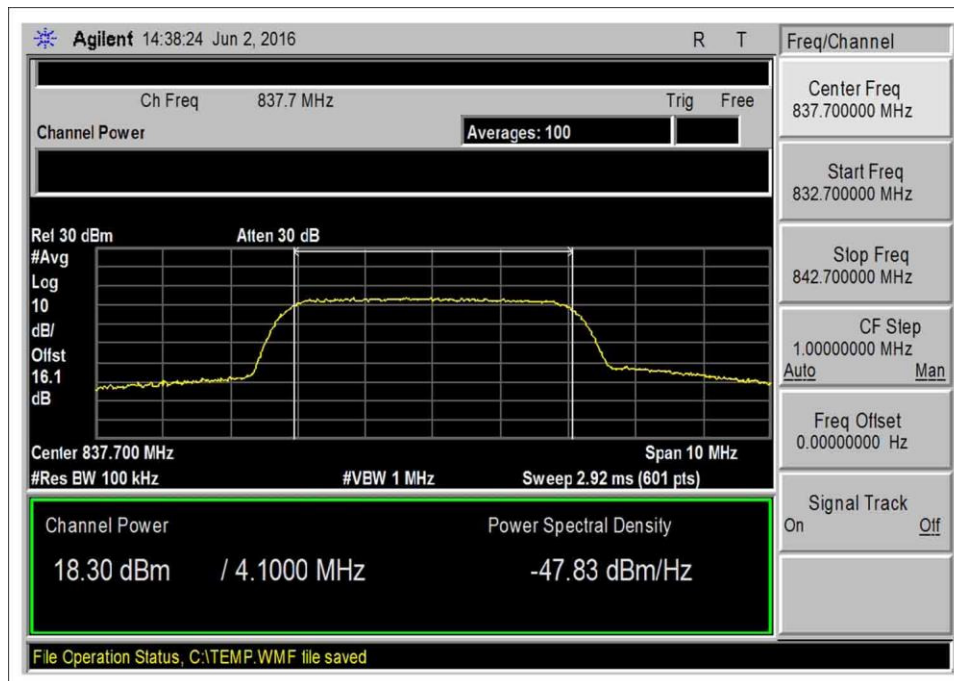
7.2_Power_UL_698-716_AWGN



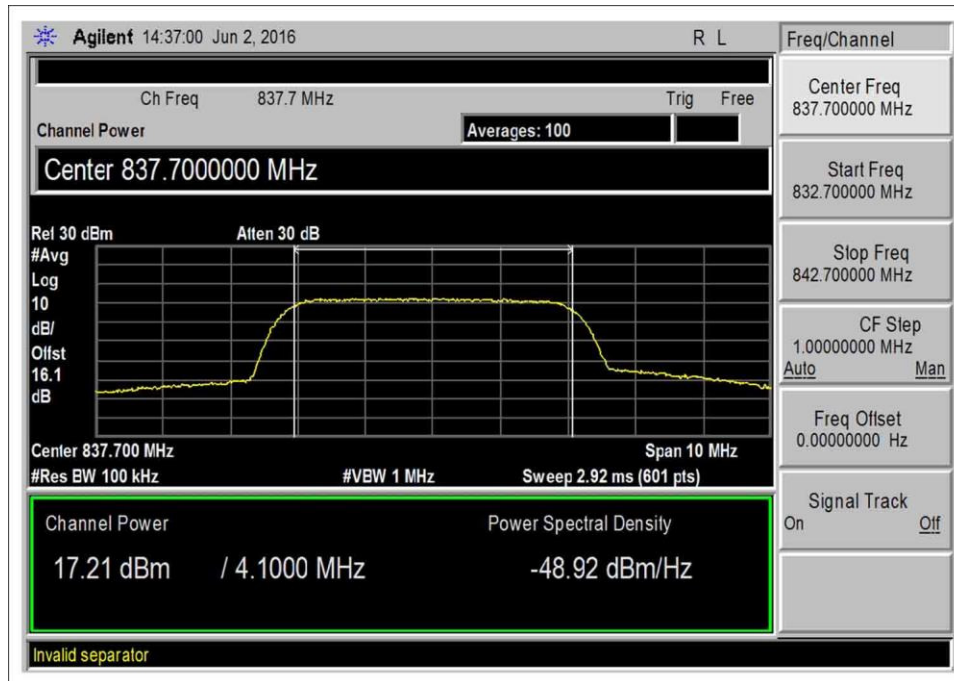
7.2_Power_UL_698-716_AWGN-Max



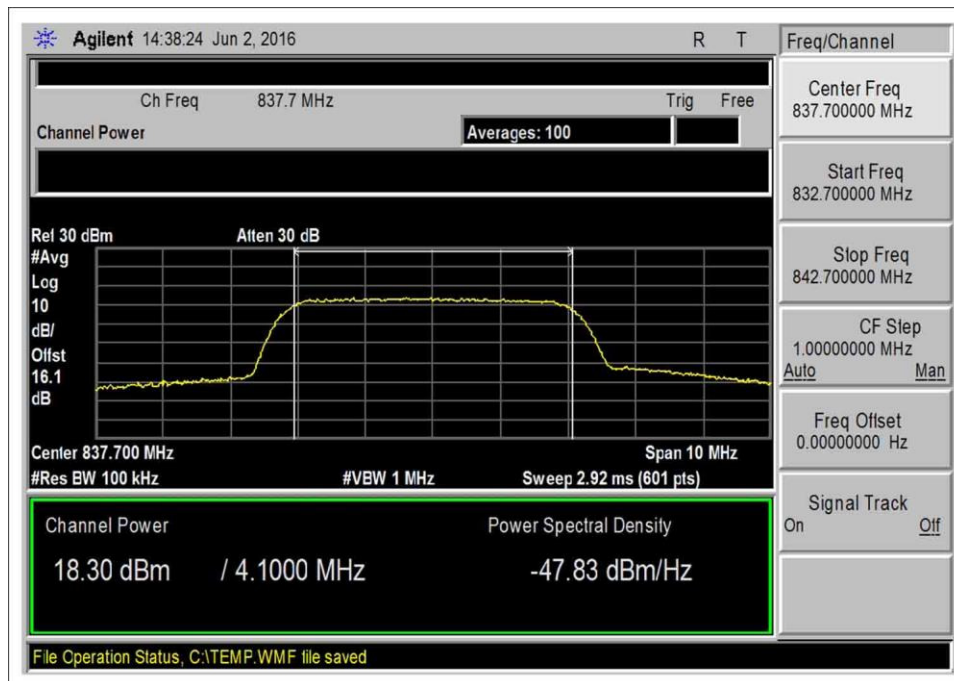
7.2_Power_UL_776-787_AWGN



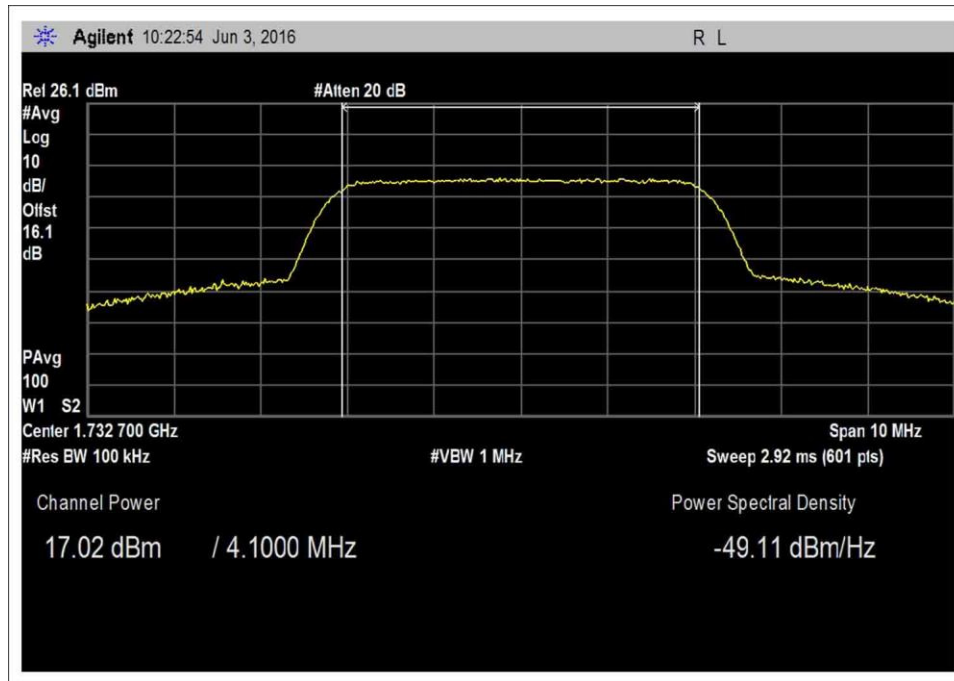
7.2_Power_UL_776-787_AWGN-Max



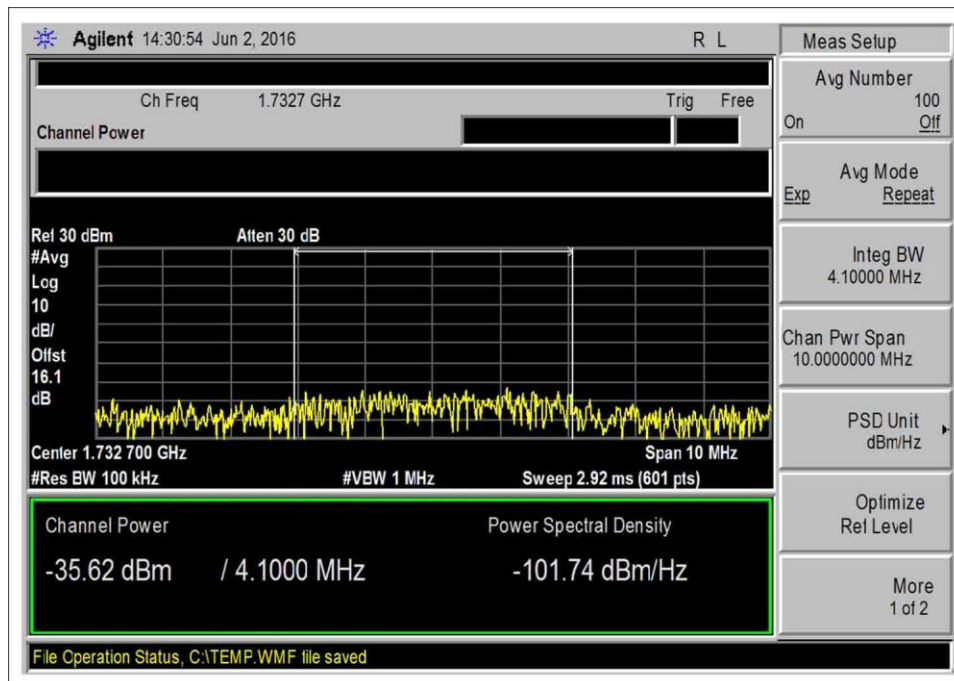
7.2_Power_UL_824-849_AWGN



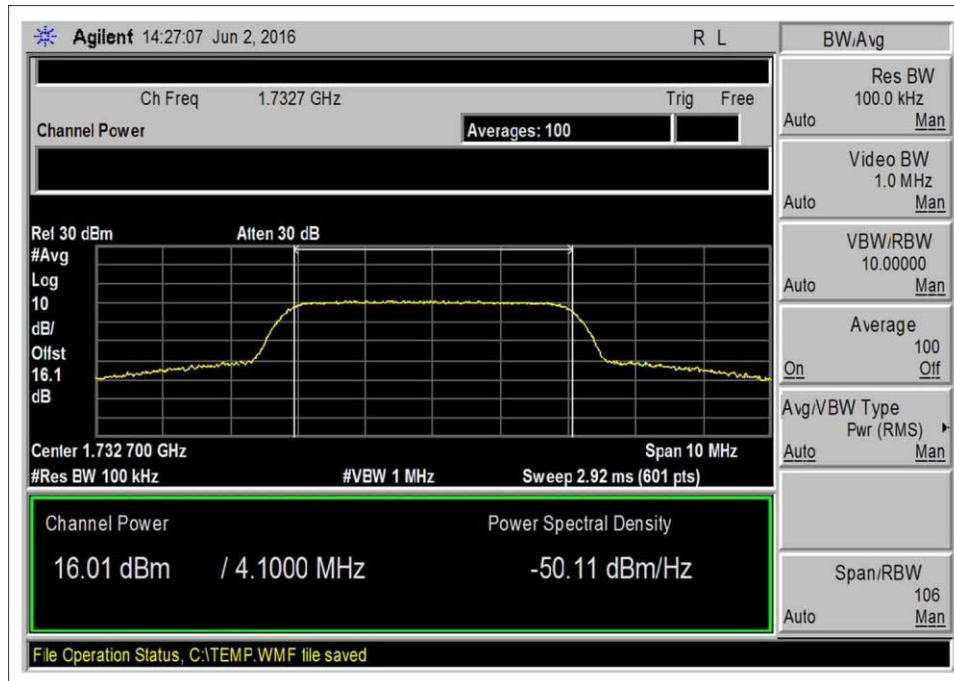
7.2_Power_UL_824-849_AWGN-Max



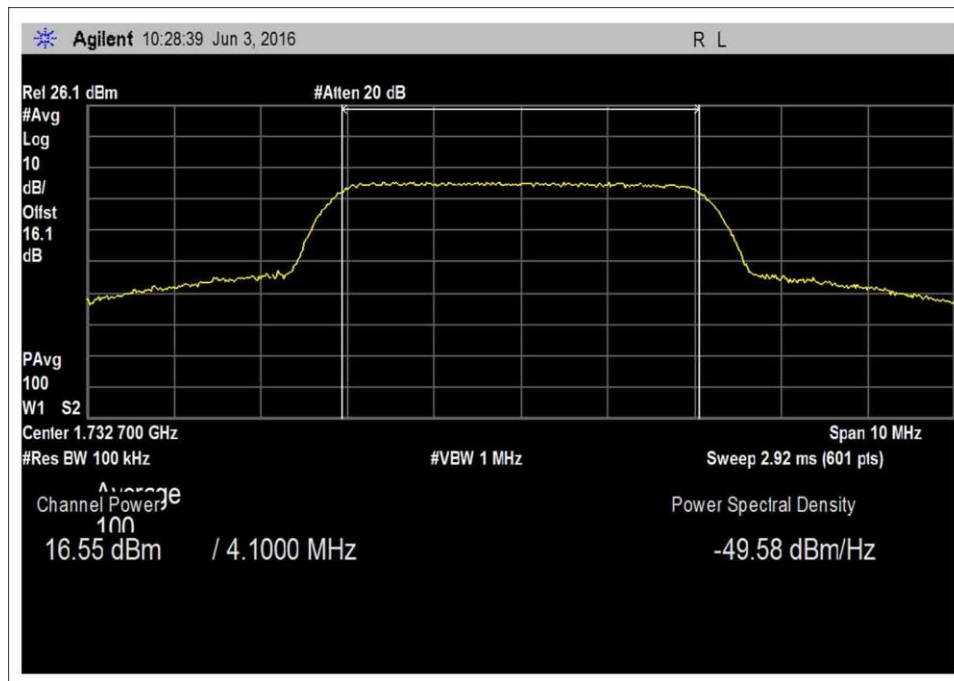
7.2_Power_UL_1710-1755_AWGN



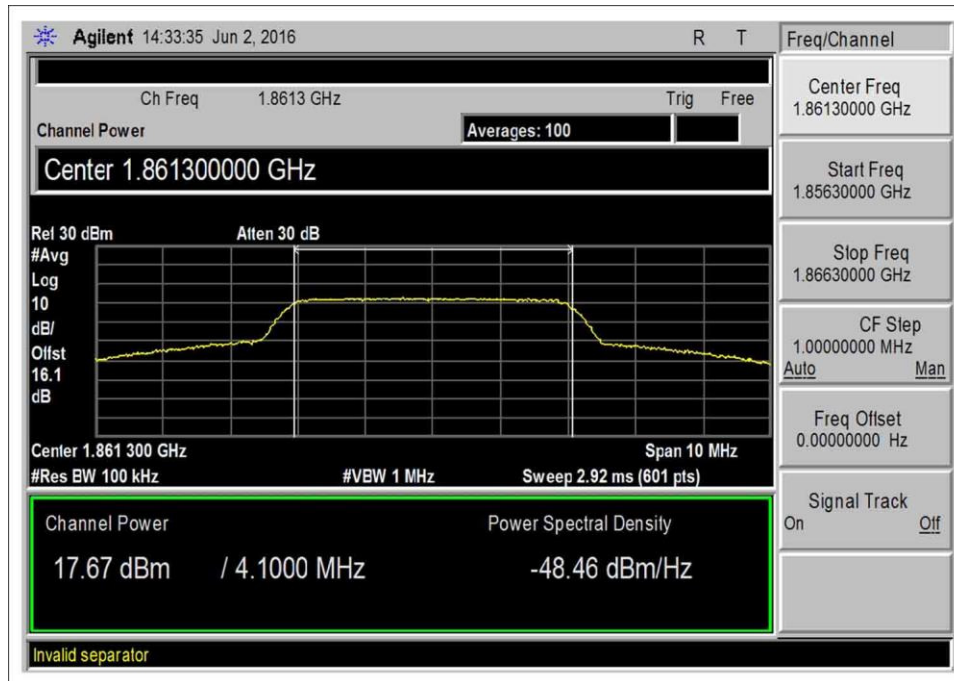
7.2_Power_UL_1710-1755_AWGN-0dBm



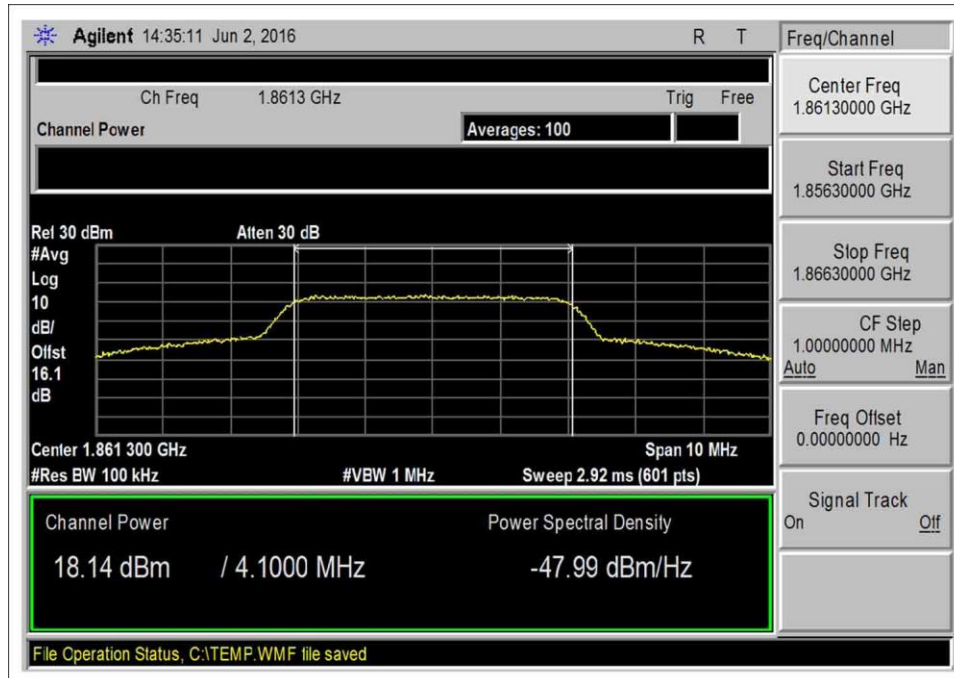
7.2_Power_UL_1710-1755_AWGN-ko



7.2_Power_UL_1710-1755_AWGN-Max

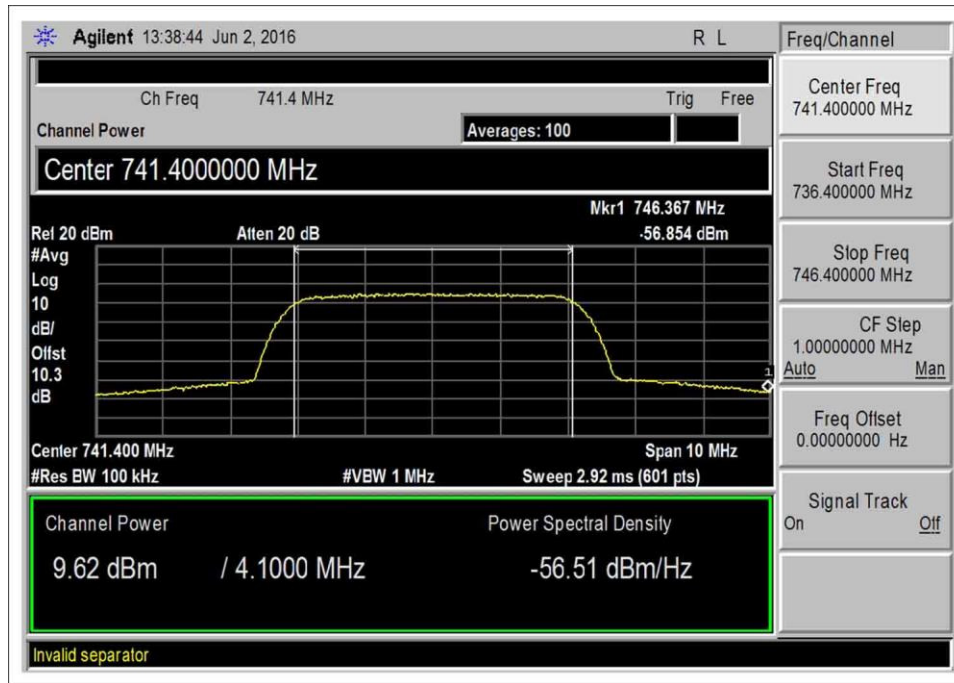


7.2_Power_UL_1850-1915_AWGN

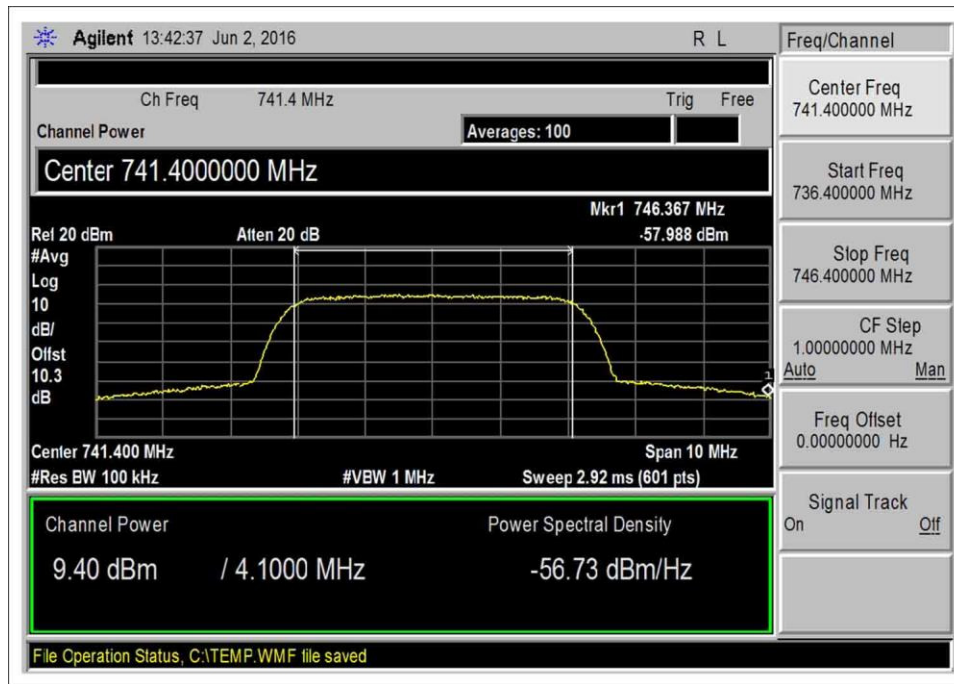


7.2_Power_UL_1850-1915_AWGN-Max

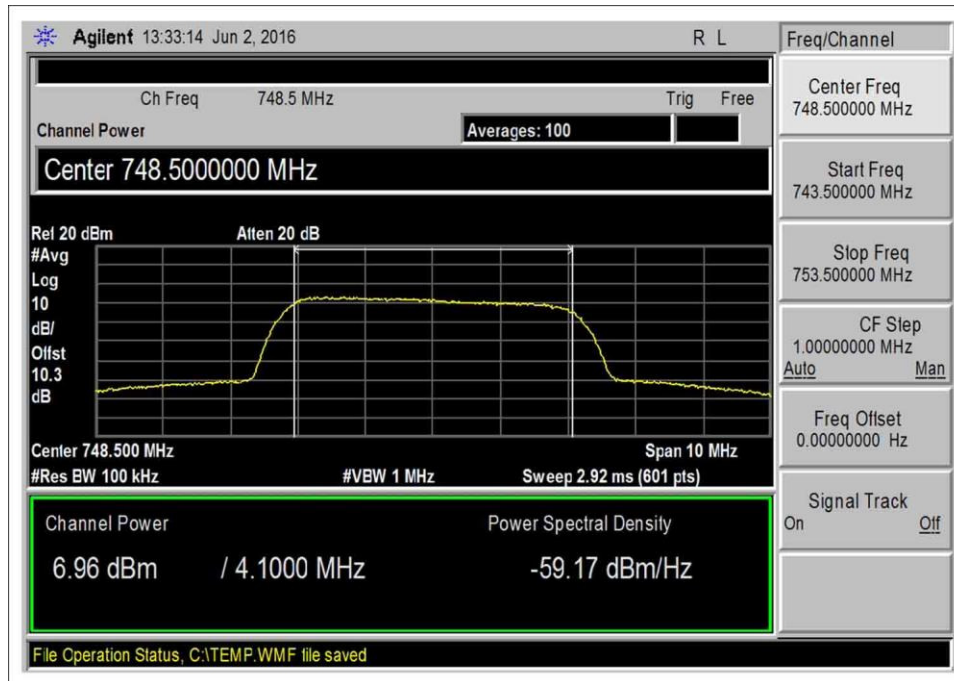
DL-AWGN



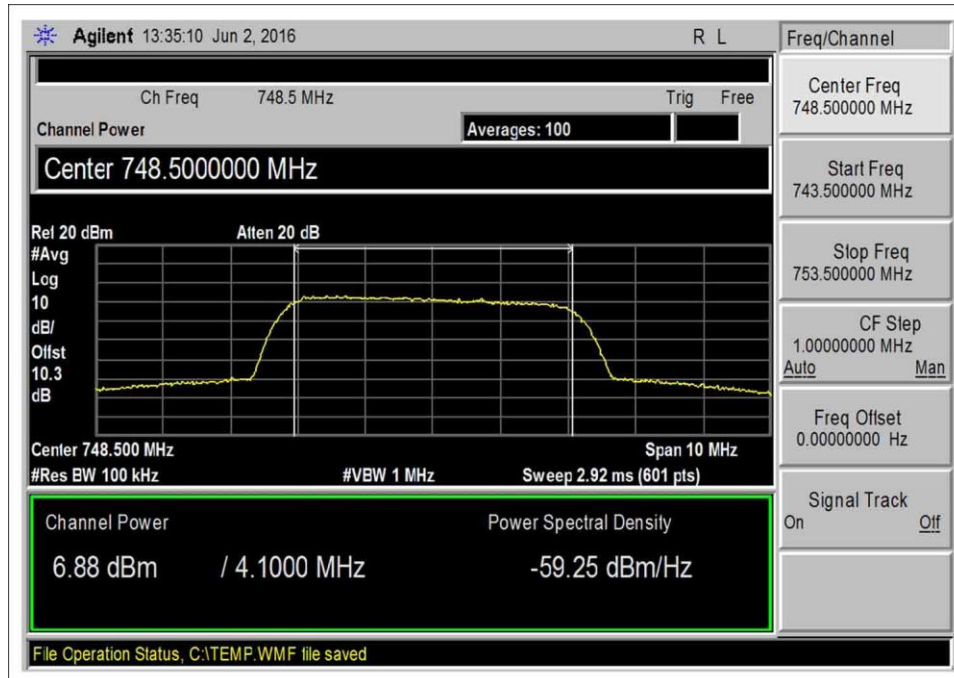
7.2_Power_DL_728-746_AWGN



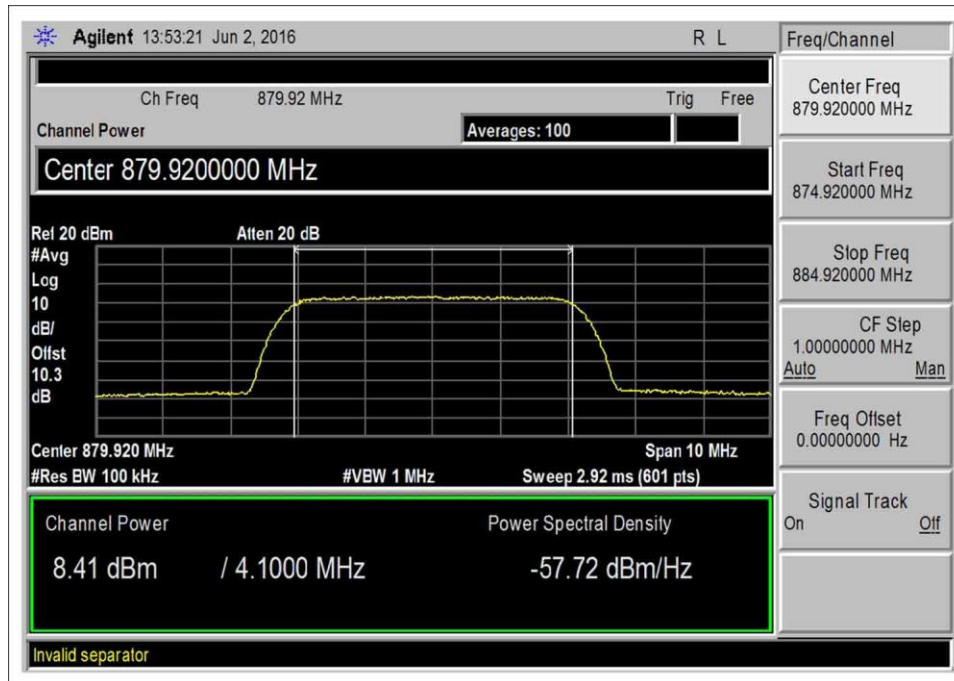
7.2_Power_DL_728-746_AWGN-Max



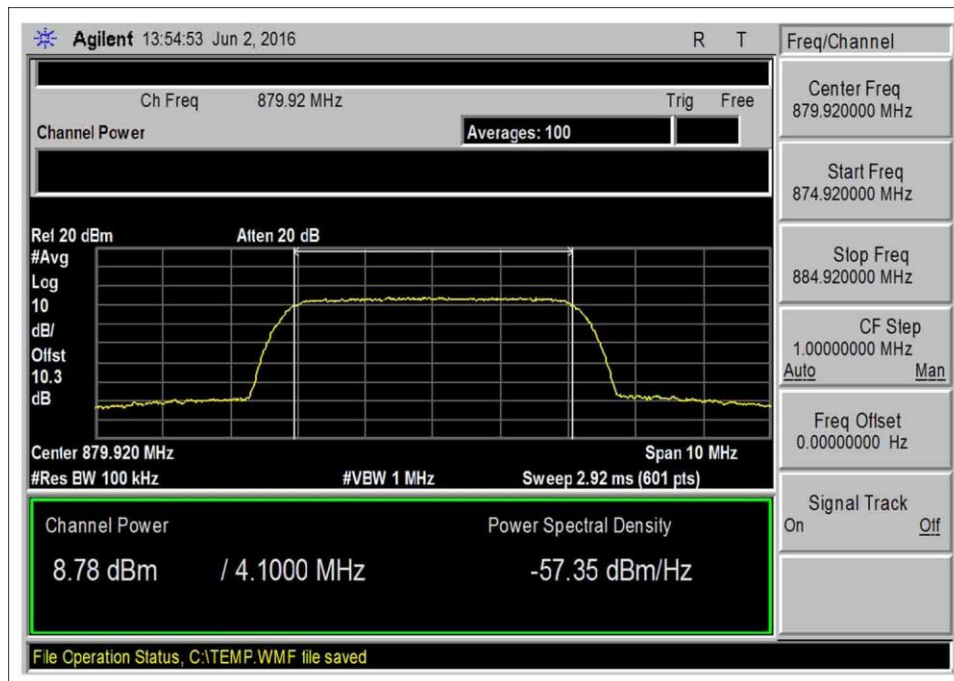
7.2_Power_DL_746-757_AWGN



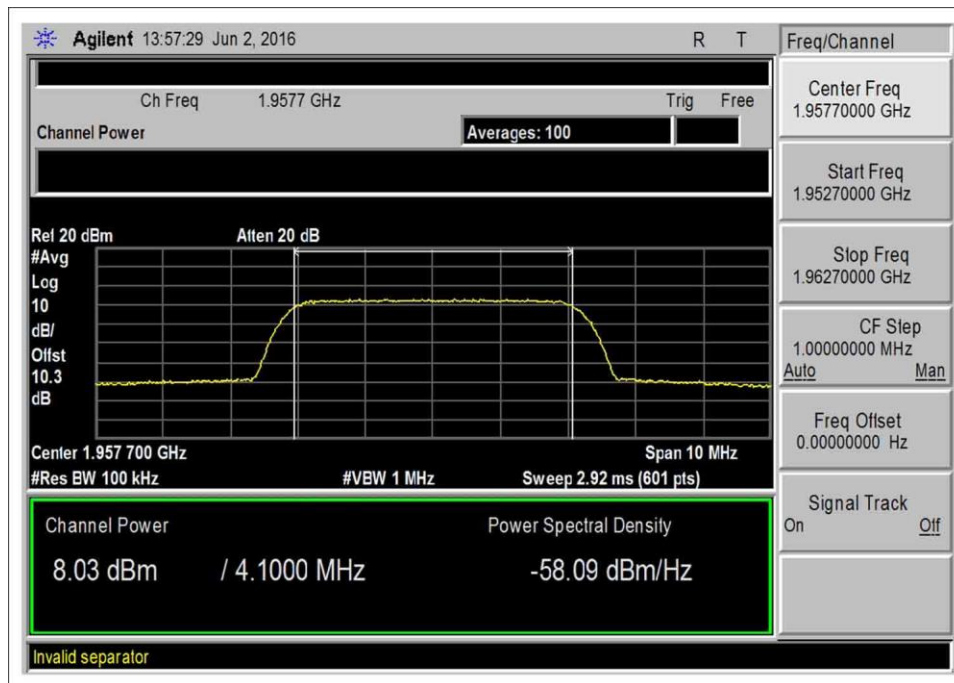
7.2_Power_DL_746-757_AWGN-Max



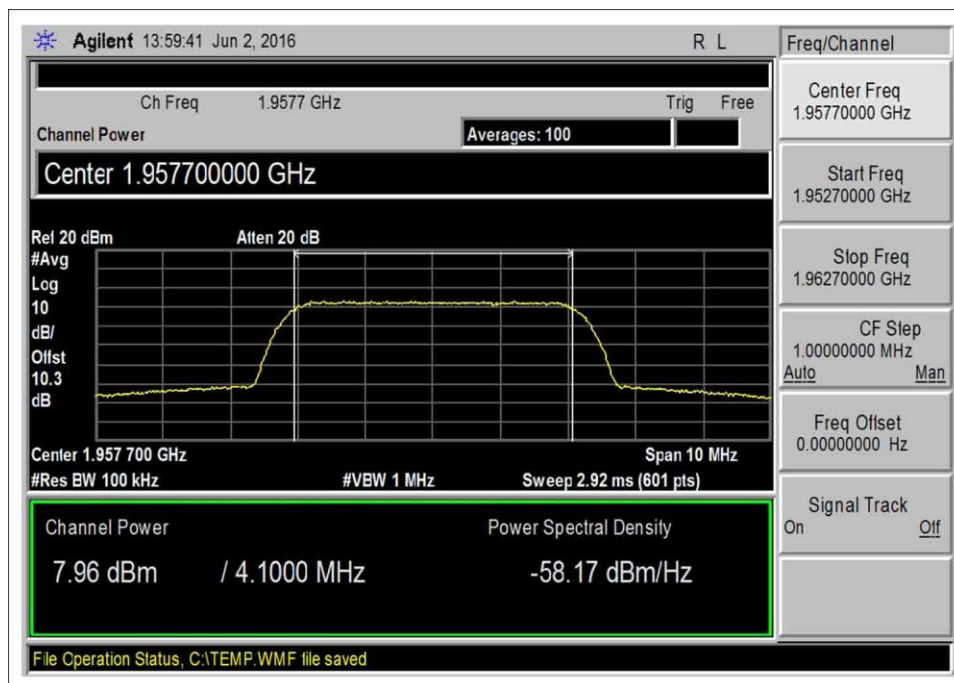
7.2_Power_DL_869-894_AWGN



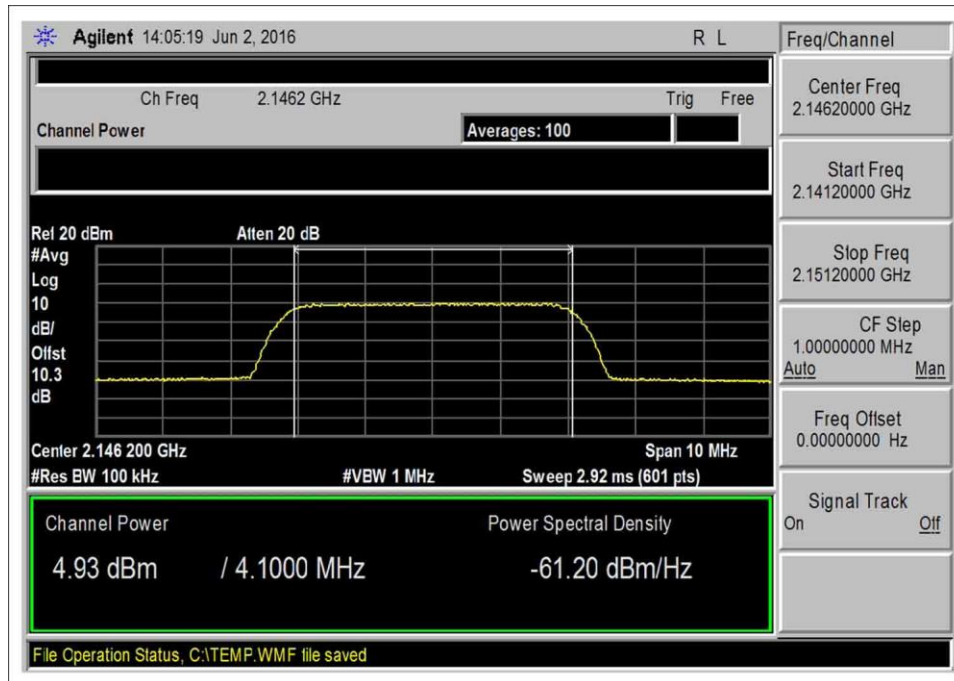
7.2_Power_DL_869-894_AWGN-Max



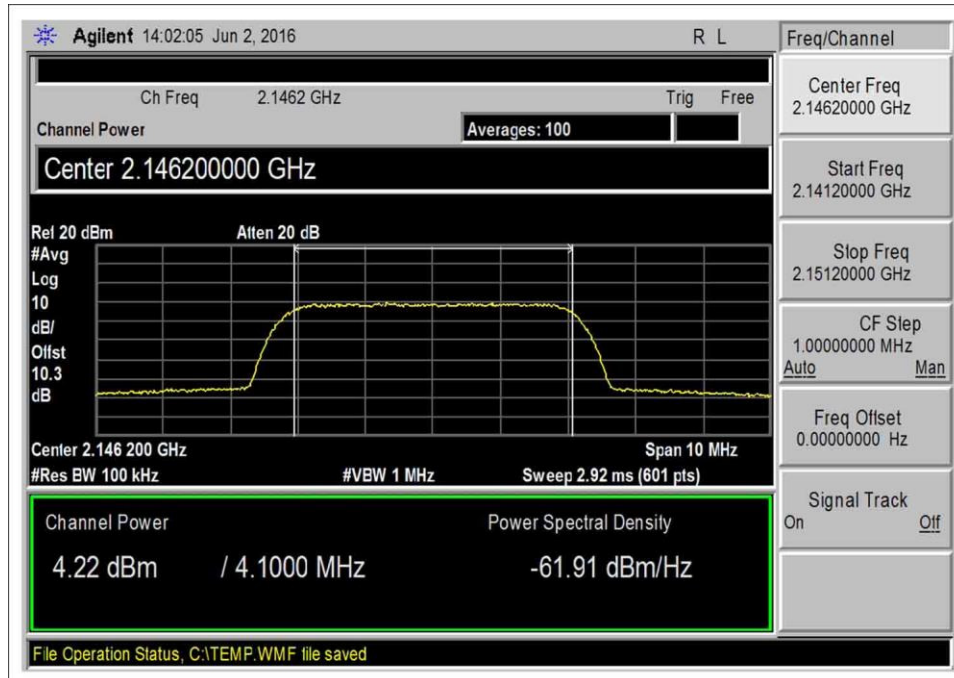
7.2_Power_DL_1930-1995_AWGN



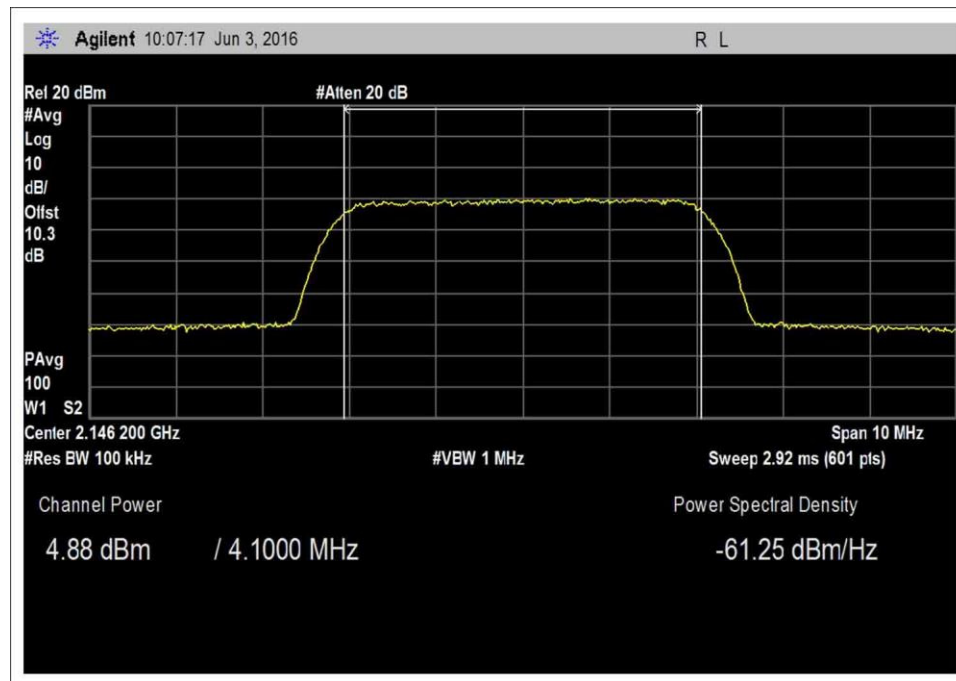
7.2_Power_DL_1930-1995_AWGN-Max



7.2_Power_DL_2110-2155_AWGN

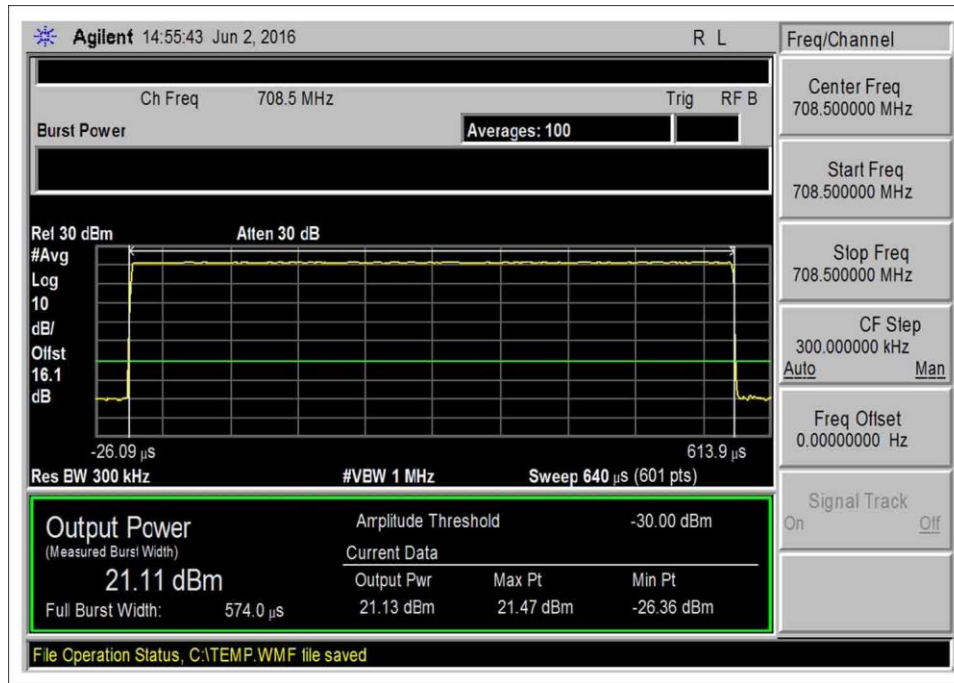


7.2_Power_DL_2110-2155_AWGN-Max



7.2_Power_DL_2110-2155_AWGN-Spare

UL-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