Cellphone-Mate, Inc.

REVISED TEST REPORT TO 101463-13

Mobile Booster
Model: N- Range

Tested to The Following Standard:

FCC Part 20.21 / 22 / 24 / 27

Report No.: 101463-13A

Date of issue: March 27, 2019

Test Certificate # 803.06

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 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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Fremont, CA 94538

Representative: Dennis Findley
Customer Reference Number: CKC06282018

REPORT PREPARED BY:

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Project Number: 101463

DATE OF EQUIPMENT RECEIPT: July 11, 2018
DATE(S) OF TESTING: July 11, 2018
March 4, 2019

Revision History

Original: Testing of the Mobile Booster Model: N- Range to FCC Parts: 20.21, 22, 24 and 27.
Revision A: To replace section 7.4 with corrected test data.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, 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	5.03.11
EMITest Immunity	5.03.10

Site Registration & Accreditation Information

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

SUMMARY OF RESULTS

Standard / Specification: FCC Part 20.21/22/24/27
Wideband Consumer Signal Booster Measurement Guidance: KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v04r02, June 19, 2018

Correlation Matrix & Results					
Guidance Section	**Guidance Description**	**FCC Section**	**FCC Rule Description**	**Mods**	**Results**
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 because no modifications were used during testing.

Standard / Specification: FCC Part 20.21/22/24/27 - continued

Correlation Matrix & Results					
Guidance Section	**Guidance Description**	**FCC Section**	**FCC Rule Description**	**Mods**	**Results**
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
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			NA	NA1
7.14	Additional requirements for dual-enclosure wideband consumer signal boosters	NA	NA	NA	NA2

NA = Not applicable
NA1 = Not applicable because the EUT does not have spectrum blocking.
NA2 = Not applicable because the EUT is not a dual enclosure wideband consumer signal booster.

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
Mobile Booster	Cellphone-Mate, Inc.	N-Range	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
Power Supply	Surecall	C101U 12010B-1	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Equipment	Wideband Consumer booster/Zone Enhancer
Operating Frequency Range:	UL: 824-849MHz DL: 869-894MHz UL: 1850-1915MHz DL: 1930-1995MHz UL: 1710-1755MHz, 698-716MHz, 776-787MHz DL: 2110-2155MHz, 728-746MHz, 746-757MHz
OBW and Emissions Type(s):	GXW (GSM) G7W (EDGE) F9W(CDMA) F9W(WCDMA) W7D (LTE)) See table below for OBW
Modulation Type(s):	0.3 GMSK (GSM) 3p/8 8-PSK (EDGE) QPSK (CDMA) BPSK/QPSK (WCDMA) OFDM (LTE)
Number of TX Chains:	1
Antenna Type(s) and Gain:	Dedicated, See antenna kitting information
Beamforming Type:	N/A
Antenna Connection Type:	Donor/Outdoor antenna/ UL: 50-ohm SMA Server / indoor antenna/ DL: 50-ohm Non removable cable with SMA connector
Nominal Input Voltage:	12VDC
Firmware / Software used for Test:	CarTop_FCC_V_1_0_No1.hex

OBW and Emissions Type(s)

Frequency Range (MHz)	Carrier Output (Watts)	Occupied Bandwidth (kHz)	Emissions Designator
824-849	0.2818	244.6	245KGXW
869-894	0.0008	240.1	241KGXW
824-849	0.2818	244.8	245KG7W
869-894	0.0008	245.9	246KG7W
824-849	0.1738	1247.8	1M25F9W
869-894	0.0008	1252.8	1M25F9W
824-849	0.1738	4222.3	4M22F9W
869-894	0.0008	4178.9	4M18F9W
824-849	0.1738	4402.4	4M40W7D
869-894	0.0008	4458.6	4M46W7D
824-849	0.1738	4402.4	4M40G7D
869-894	0.0008	4458.6	4M46G7D
1850-1915	0.3890	244.6	245KGXW
1930-1995	0.0012	244.6	245KGXW
1850-1915	0.3890	240.8	241KG7W
1930-1995	0.0012	242.6	243KG7W
1850-1915	0.2042	1247.6	1M25F9W
1930-1995	0.0009	1248.6	1M25F9W
1850-1915	0.2042	4182.3	4M18F9W
1930-1995	0.0009	4170.4	4M17F9W
1850-1915	0.2042	4438.4	4M44W7D
1930-1995	0.0009	4452.4	4M45W7D
1850-1915	0.2042	4438.4	4M44G7D
1930-1995	0.0009	4452.4	4M45G7D

Frequency Range (MHz)	Carrier Output (Watts)	Occupied Bandwidth (kHz)	Emissions Designator
698-716	0.3236	245.6	246KGXW
728-746	0.0009	244.8	245KGXW
698-716	0.3236	249	249KG7W
728-746	0.0009	241.6	242KG7W
698-716	0.1950	1247.2	1M25F9W
728-746	0.0007	1252	1M25F9W
698-716	0.1950	4201.1	4M20F9W
728-746	0.0007	4184	4M18F9W
698-716	0.1950	4427.5	4M43W7D
728-746	0.0007	4449.1	4M45W7D
698-716	0.1950	4427.5	4M43G7D
728-746	0.0007	4449.1	4M45G7D
777-787	0.2344	246.9	247KGXW
746-756	0.0006	246.1	247KGXW
777-787	0.2344	242.1	243KG7W
746-756	0.0006	245.5	246KG7W
777-787	0.1862	1257.9	1M26F9W
746-756	0.0005	1255.5	1M26F9W
777-787	0.1862	4107.4	4M11F9W
746-756	0.0005	4182.7	4M18F9W
777-787	0.1862	4411.1	4M41W7D
746-756	0.0005	4472.9	4M47W7D
777-787	0.1862	4411.1	4M41G7D
746-756	0.0005	4472.9	4M47G7D
1710-1755	0.1445	244.6	245KGXW
2110-2155	0.0008	240.4	241KGXW
1710-1755	0.1445	243.3	244KG7W
2110-2155	0.0008	243.6	244KG7W
1710-1755	0.1445	1262.2	1M26F9W
2110-2155	0.0013	1257.4	1M26F9W
1710-1755	0.1445	4211.4	4M21F9W
2110-2155	0.0013	4186.8	4M19F9W
1710-1755	0.1445	4464.8	4M46W7D
2110-2155	0.0013	4438.1	4M44W7D
1710-1755	0.1445	4464.8	4M46G7D
2110-2155	0.0013	4438.1	4M44G7D

FCC PART 20.21/22/24/27

General Test Setup

Summary of Conditions
General setup The equipment under test (EUT) is a direct contact coupling, Mobile Wideband Consumer Booster intended for automotive. The EUT is placed on the Styrofoam platform for radiated emission and a test bench for conducted emission measurement. Donor port is a temporary SMA connector. Server port is a SMA connector located at the end of non-removable RF cable. UL: 824-849MHz DL: 869-894MHz UL: 1850-1915MHz DL: 1930-1995MHz UL: 1710-1755MHz, 698-716MHz, 776-787MHz DL: 2110-2155MHz, 728-746MHz, 746-757MHz Test procedure: The test was performed IAW the FCC document: 935210 D03 Signal Booster Measurements v04r02, dated June19, 2018. Firmware: CarTop_FCC_V_1_0_No1.hex Device is powered by a support 12V DC power supply.

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 #: **101463** Date 07/03/18
Test Type: **Conducted Emissions**
Tested By: **Hieu Song Nguyenpham**
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

Test environment conditions: 22.3°C, 48% relative humidity,101.6 kPa

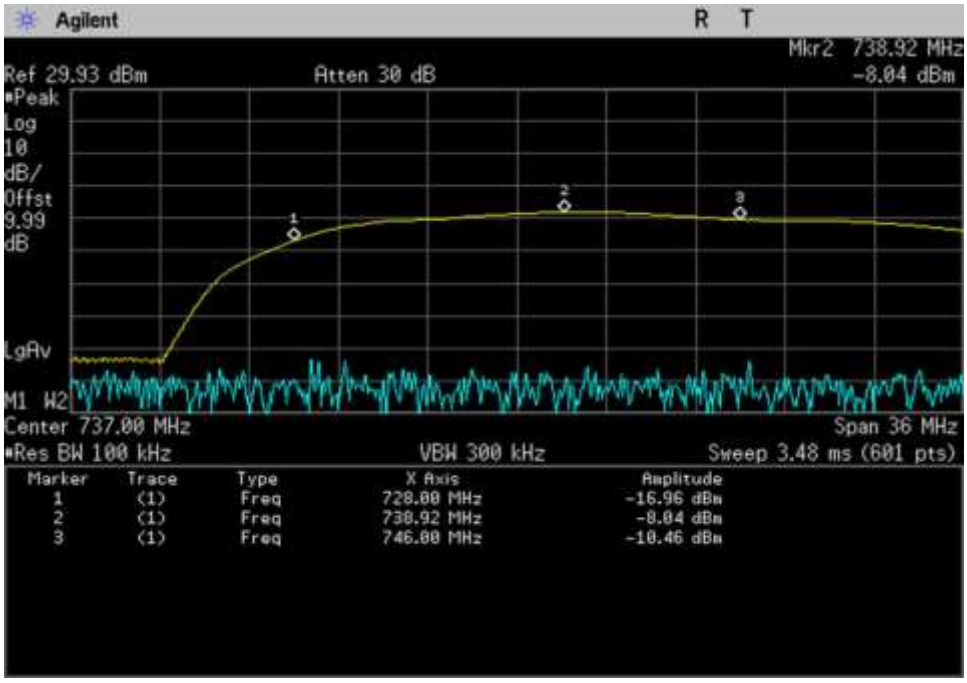
Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020

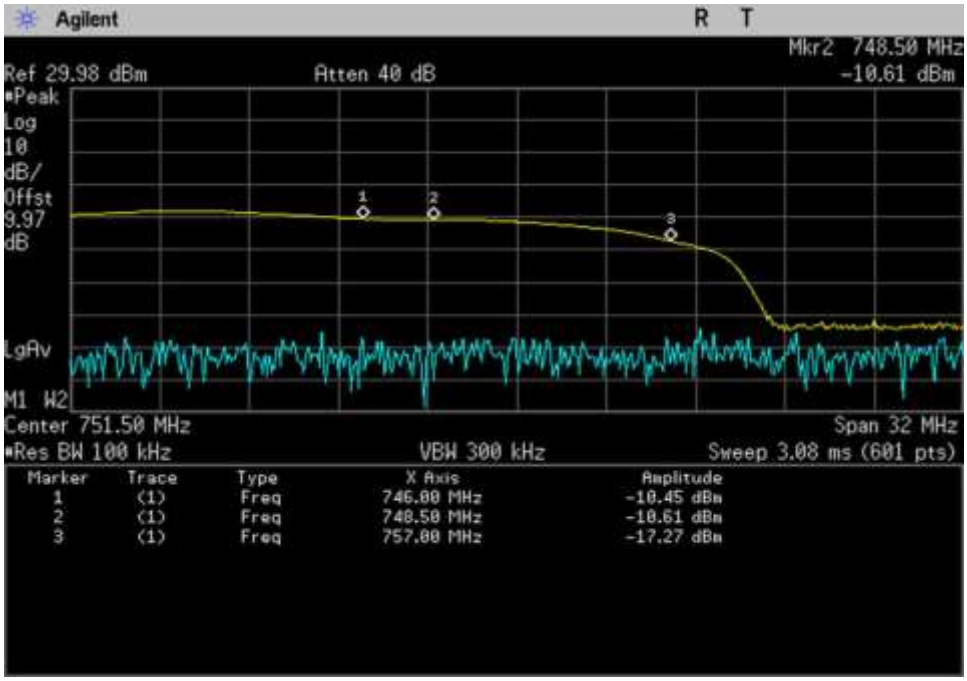
Summary of Results

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

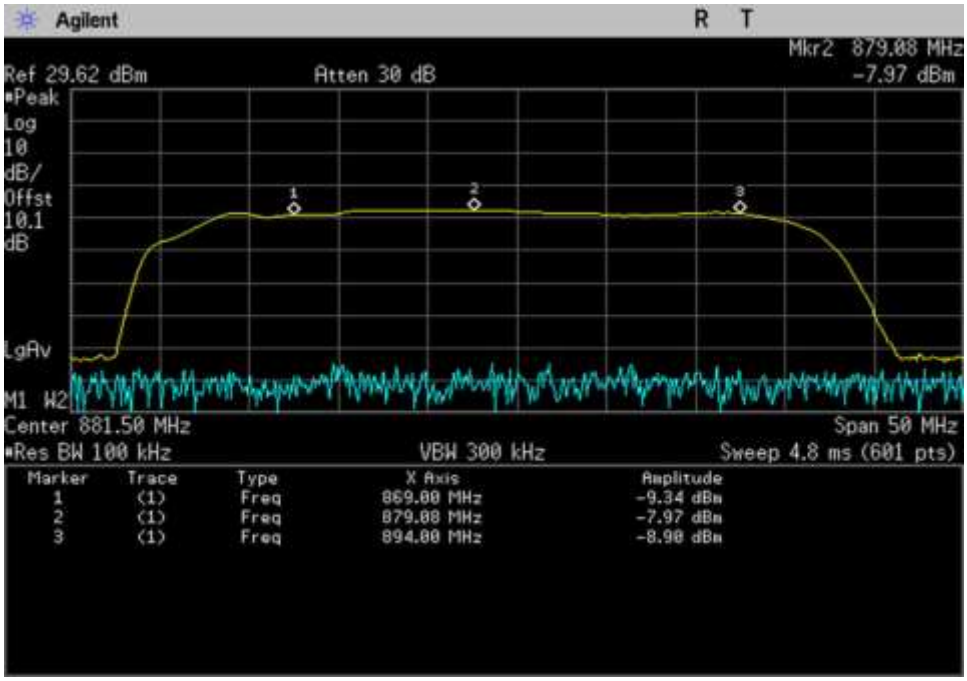
Plots



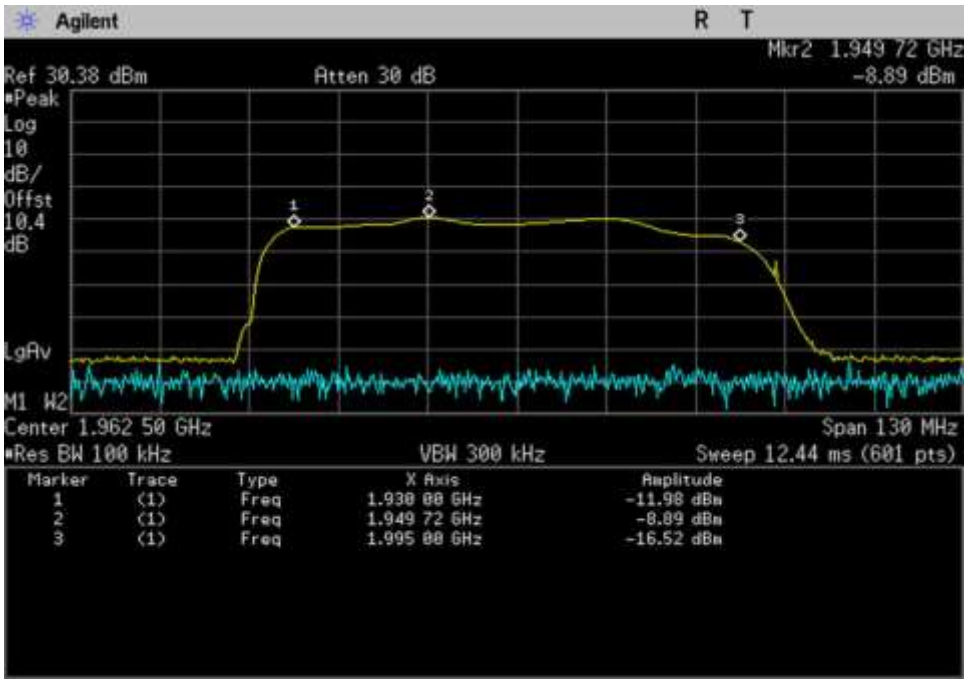
7.1 Band Ver_DL_728-746_ 728- 738.92MHz



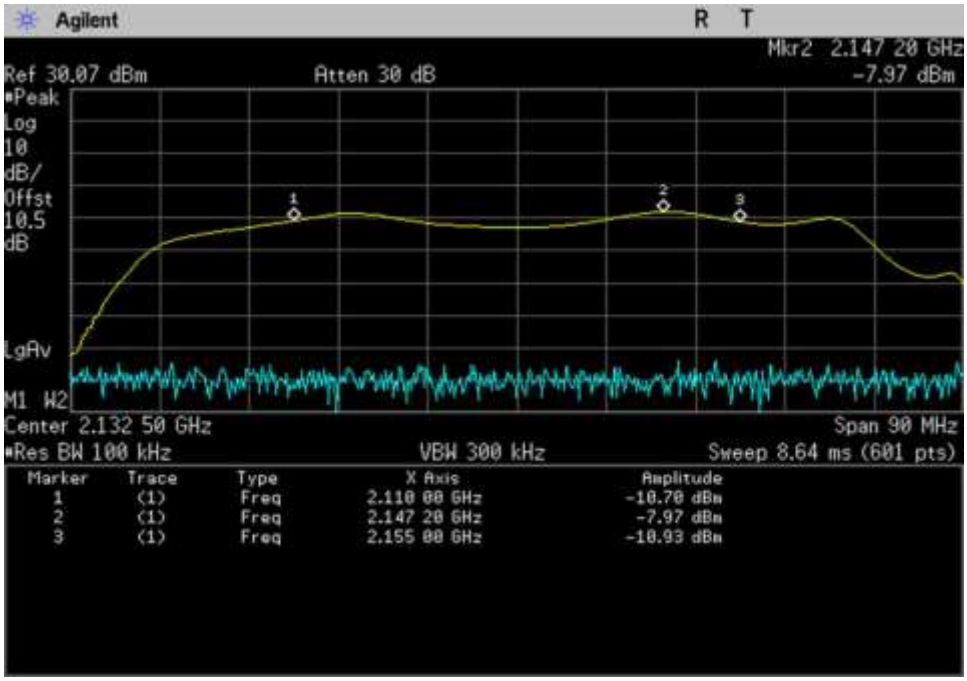
7.1 Band Ver_DL_746-757_ 746- 748.5MHz



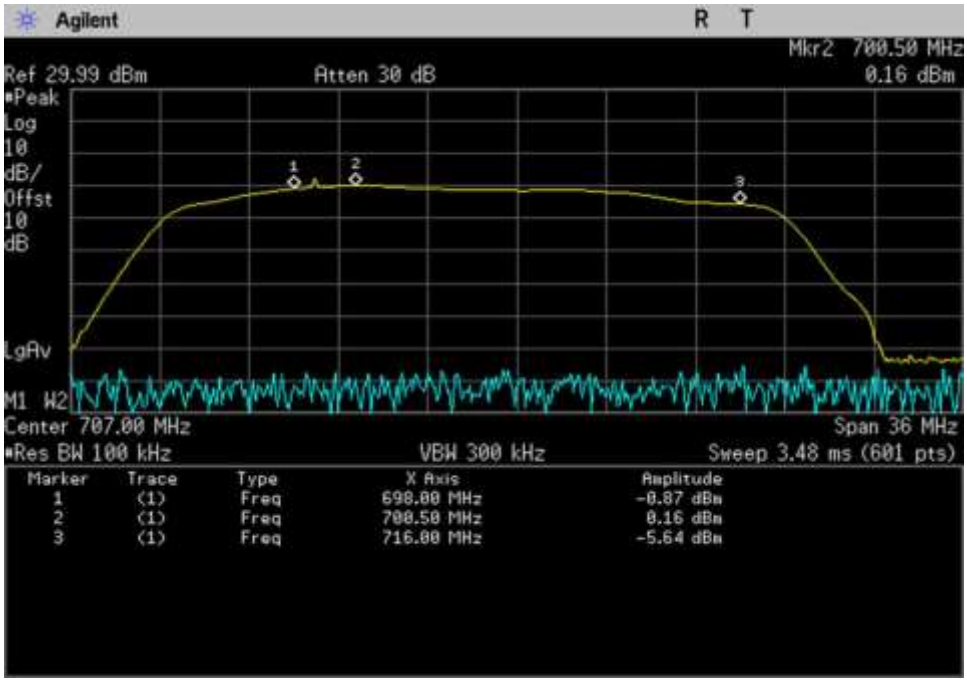
7.1 Band Ver_DL_869-894_ 869- 879.08MHz



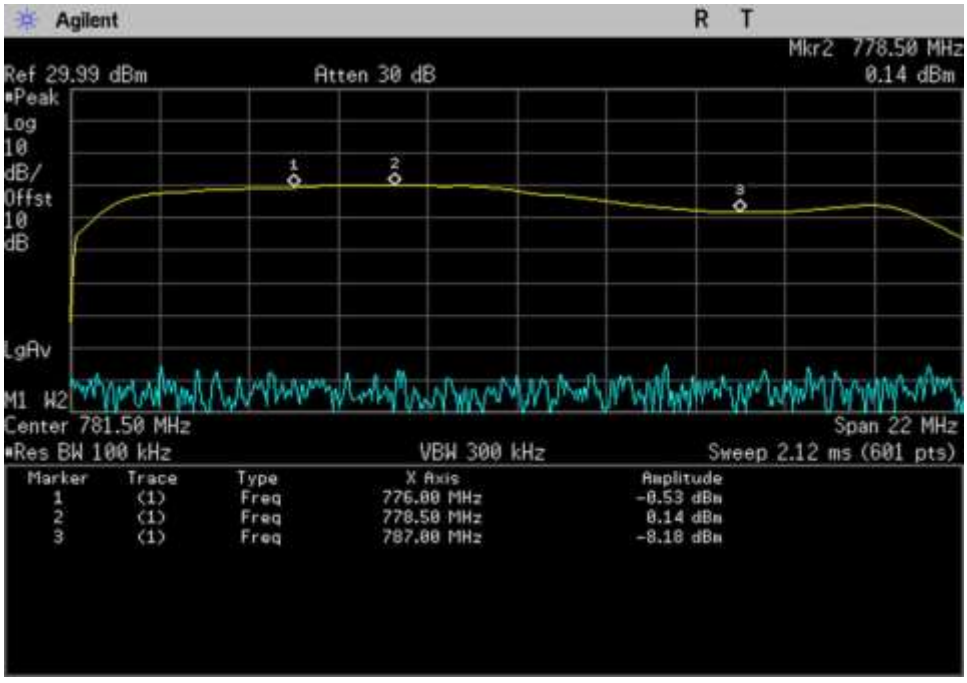
7.1 Band Ver_DL_1930-1995_ 1930- 1949.72MHz



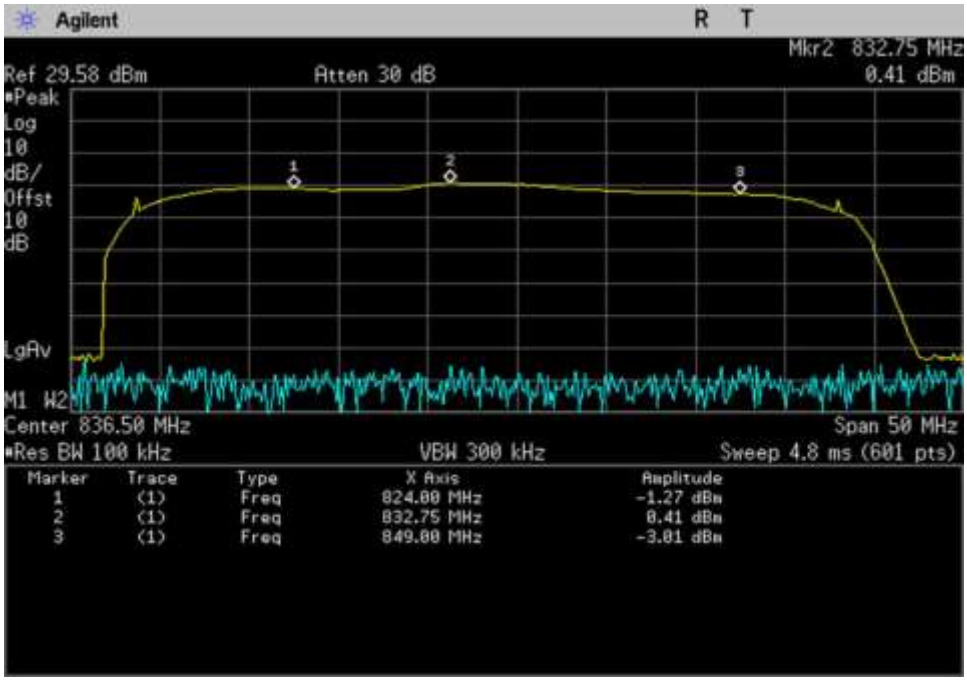
7.1 Band Ver_DL_2110-2155_ 2110- 2147.2MHz



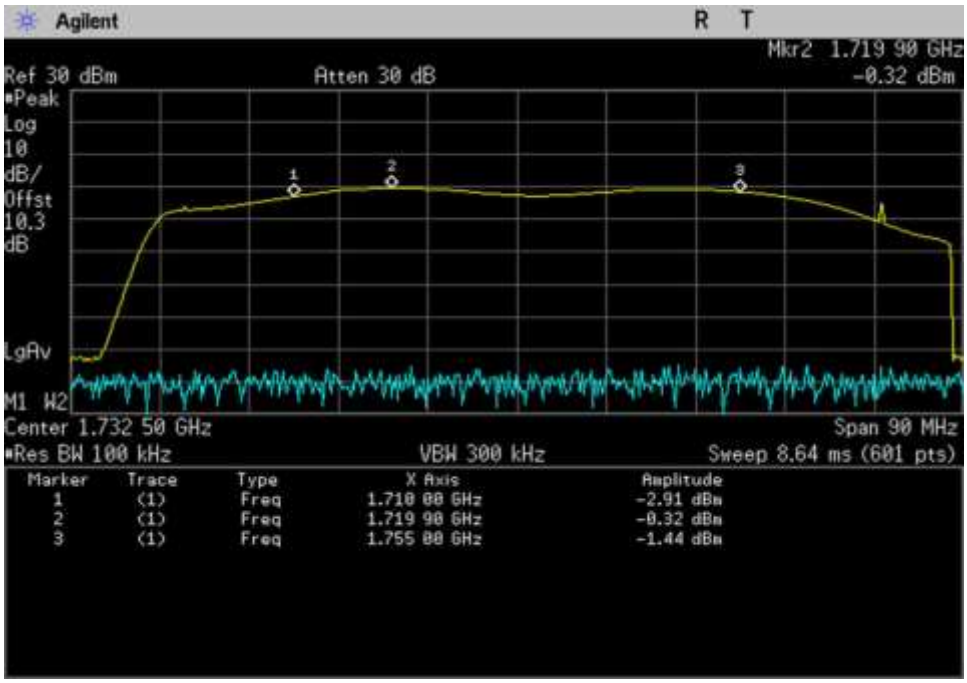
7.1 Band Ver_UL_698-716_ 698- 700.5MHz



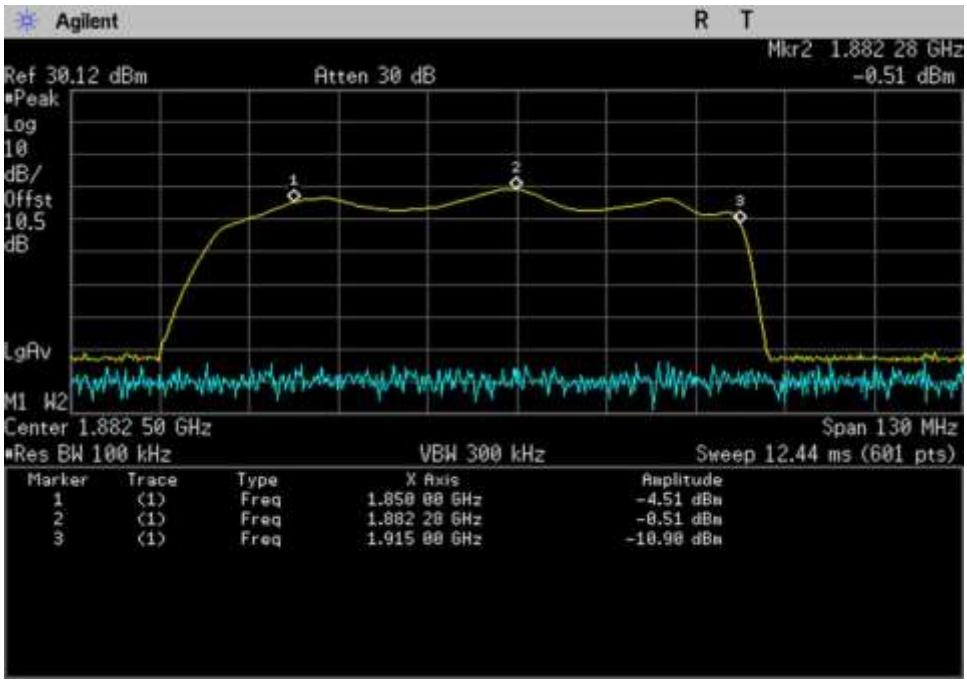
7.1 Band Ver_UL_776-787_ 776- 778.5MHz



7.1 Band Ver_UL_824-849_ 824- 832.75MHz



7.1 Band Ver_UL_1710-1755_ 1710- 1719.9MHz



7.1 Band Ver_UL_1850-1915_ 1850- 1882.28MHz

7.2 Maximum Power / 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:	**7.2 Maximum Power Measurement** **7.3 Maximum Booster Gain**		
Work Order #:	**101463**	Date	07/03/18 and 07/05/18
Test Type:	**Conducted Emissions**		
Tested By:	**Hieu Song Nguyenpham**		
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

07/03/18: Test environment conditions: 22.3 Deg C, 48% relative humidity,101.6 kPa
07/05/18: Test environment conditions: 21.6 Deg C, 47.6% relative humidity,102.1kPa

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020
P06909	Attenuator	Pasternack	PE7083	12/20/2017	12/20/2019

Summary of Results

Pass: as summarized in table 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	0.9	21.6	20.7	1.2	21.6	20.4
UL1850-1915	5.8	25.9	20.1	2.9	23.1	20.2
UL824-894	2.9	24.5	21.6	1.5	22.4	20.9
UL 698-716	2.4	25.1	22.7	2.0	22.9	20.9
UL776-787	1.4	23.7	22.3	1.7	22.7	21.0
DL2110-2155	-23.7	-1.2	22.5	-20.4	1.2	21.6
DL1930-1995	-20.7	0.8	21.5	-22.4	-0.7	21.7
DL869-894	-22.8	-1.1	21.7	-23.5	-1.0	22.5
DL:728-746	-21.9	-0.4	21.5	-23.2	-1.6	21.6
DL 746-757	-21.0	-2.4	18.6	-22.4	-3.4	19.0

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	21.6	2.0	0.0	23.6	17	30
UL1850-1915	25.9	2.5	0.0	28.4	17	30
UL824-894	24.5	0.0	0.0	24.5	17	30
UL 698-716	25.1	-1.0	0.0	24.1	17	30
UL776-787	23.7	-1.0	0.0	22.7	17	30
DL2110-2155	-1.2	3.2	2.9	-0.9	na	17
DL1930-1995	0.8	3.0	2.8	1.0	na	17
DL869-894	-1.1	-0.3	1.7	-3.1	na	17
DL:728-746	-0.4	-0.1	1.6	-2.1	na	17
DL 746-757	-2.4	-0.1	1.6	-4.1	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	21.6	2.0	0.0	23.6	17	30
UL1850-1915	23.1	2.5	0.0	25.6	17	30
UL824-894	22.4	0.0	0.0	22.4	17	30
UL 698-716	22.9	-1.0	0.0	21.9	17	30
UL776-787	22.7	-1.0	0.0	21.7	17	30
DL2110-2155	1.2	3.2	2.9	1.5	na	17
DL1930-1995	-0.7	3.0	2.8	-0.5	na	17
DL869-894	-1.0	-0.3	1.7	-3.0	na	17
DL:728-746	-1.6	-0.1	1.6	-3.3	na	17
DL 746-757	-3.4	-0.1	1.6	-5.1	na	17

* Antenna gain and cable losses indicated from the Car-Top antenna kitting V1.0

UL SC326W

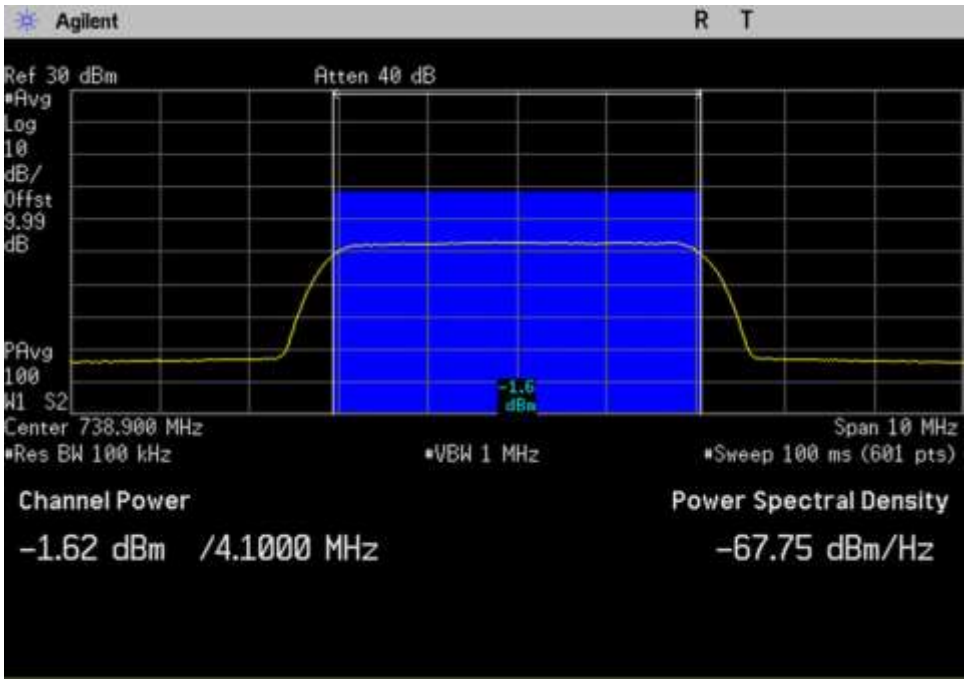
DL SC128W and SC174-6FT

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	3.7	21.6	17.9	9.9	21.1	11.2
UL1850-1915	7.0	25.4	18.4	10.0	23.3	13.3
UL824-894	5.1	24.8	19.7	2.7	21.9	19.2
UL 698-716	5.2	24.8	19.6	10.0	23.0	13.0
UL776-787	5.8	23.8	18.0	10.0	21.9	11.9
DL2110-2155	-20.0	-1.4	18.6	-20.0	0.6	20.6
DL1930-1995	-20.0	0.7	20.7	-20.0	-1.2	18.8
DL869-894	-20.0	-1.1	18.9	-20.0	-1.8	18.2
DL:728-746	-20.0	-0.6	19.4	-20.0	-1.8	18.2
DL 746-757	-20.0	-2.6	17.4	-20.0	-3.8	16.2

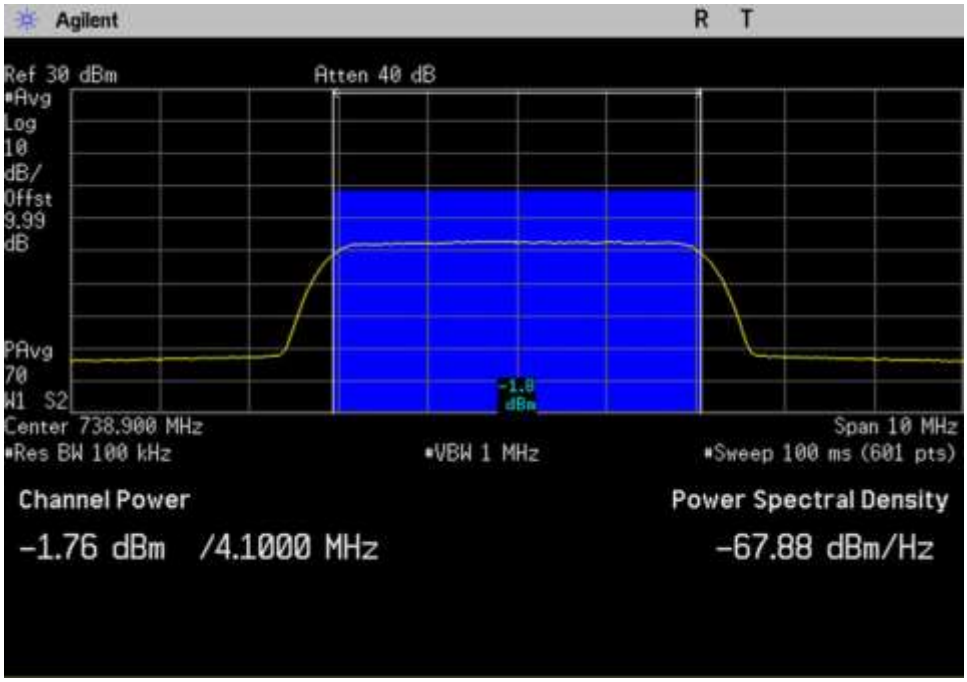
Note: The booster went into Transmitter off mode at Max input power iaw section 5.5. Results presented on the above table are at 1 dB below the Transmit off RF input level.

UL gain vs DL gain	Pulse GSM (dB)	4.1MHz AWGN (dB)	Limit (dB)
UL gain vs DL gain 1710/2110	-1.8	-1.2	9.0
UL gain vs DL gain 1850/1930	-1.4	-1.5	9.0
UL gain vs DL gain 824/869	-0.1	-1.6	9.0
UL gain vs DL gain 776/728	1.2	-0.7	9.0
UL gain vs DL gain 776/746	3.7	2.0	9.0

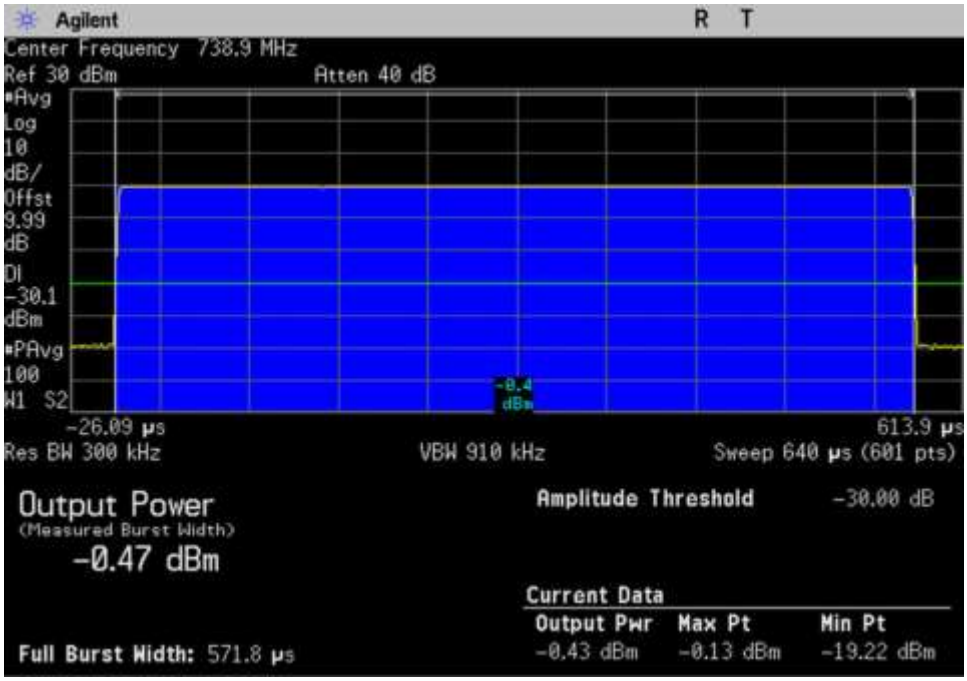
Plots



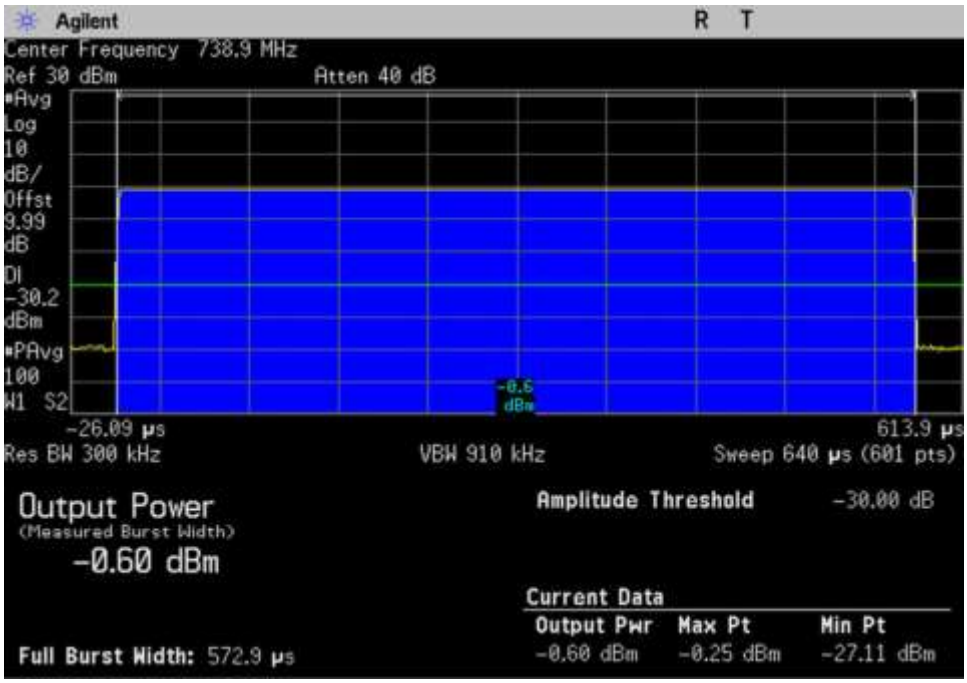
7.2-7.3 Power Gain_DL_728-746_AWGN_ 738.9MHz



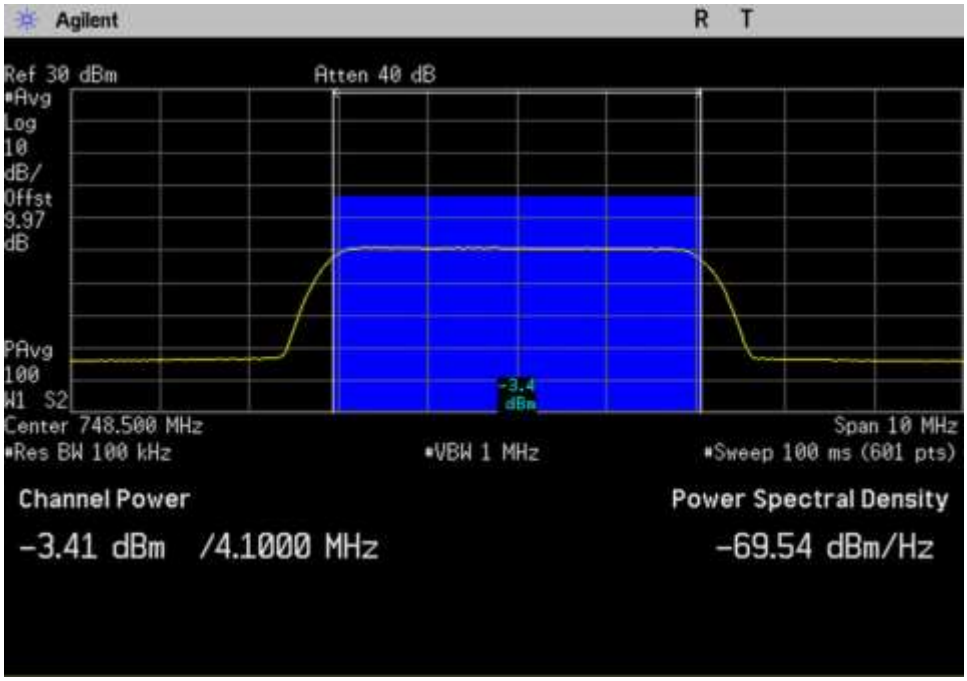
7.2-7.3 Power Gain_DL_728-746_AWGN_Max_ 738.9MHz



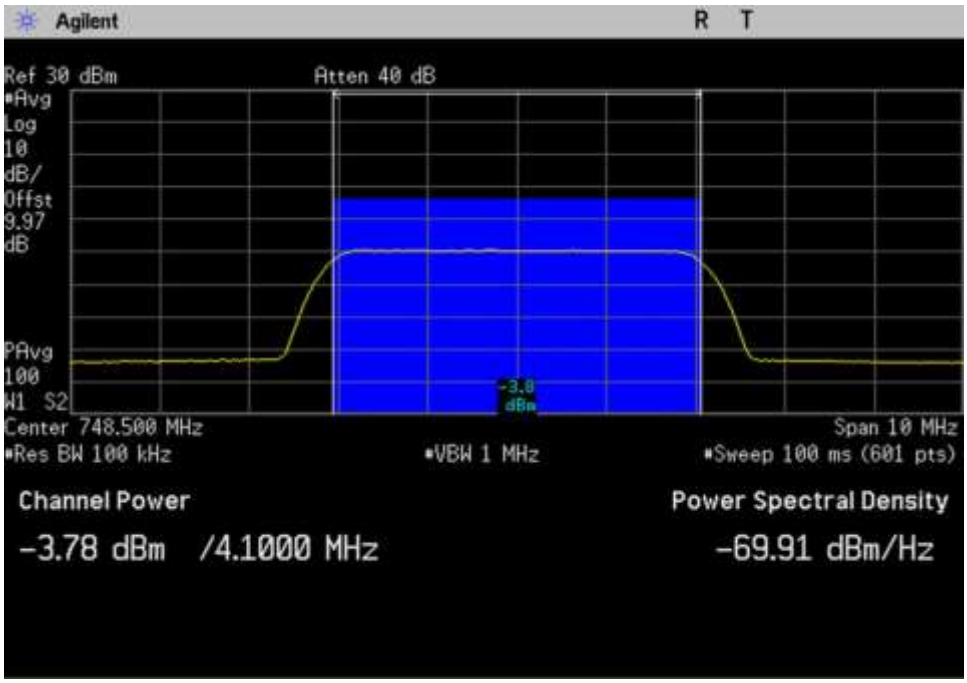
7.2-7.3 Power Gain_DL_728-746_GSM_ 738.9MHz



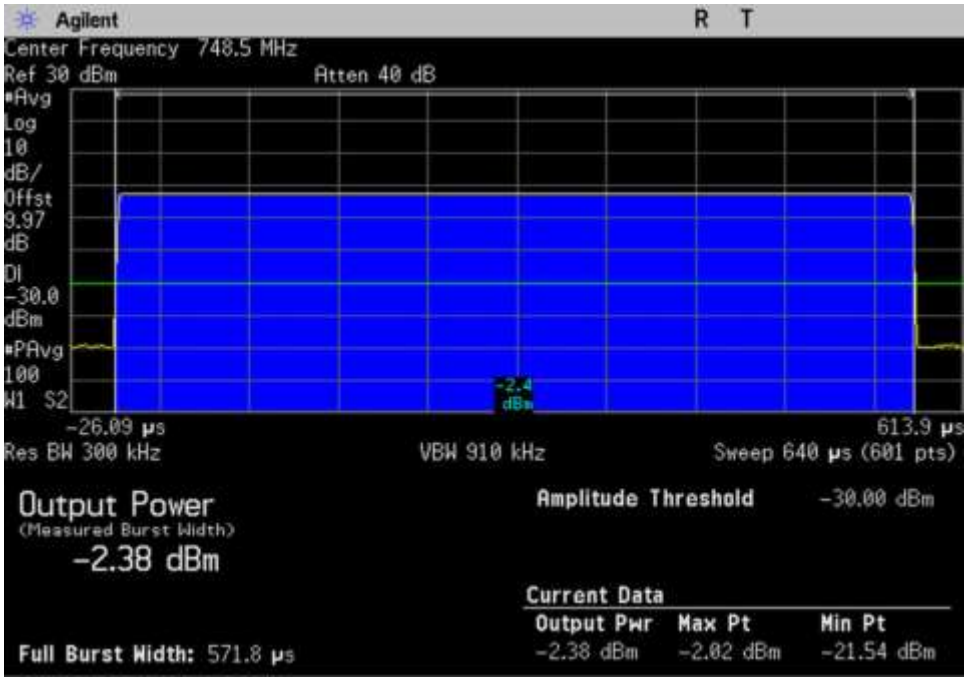
7.2-7.3 Power Gain_DL_728-746_GSM_Max_ 738.9MHz



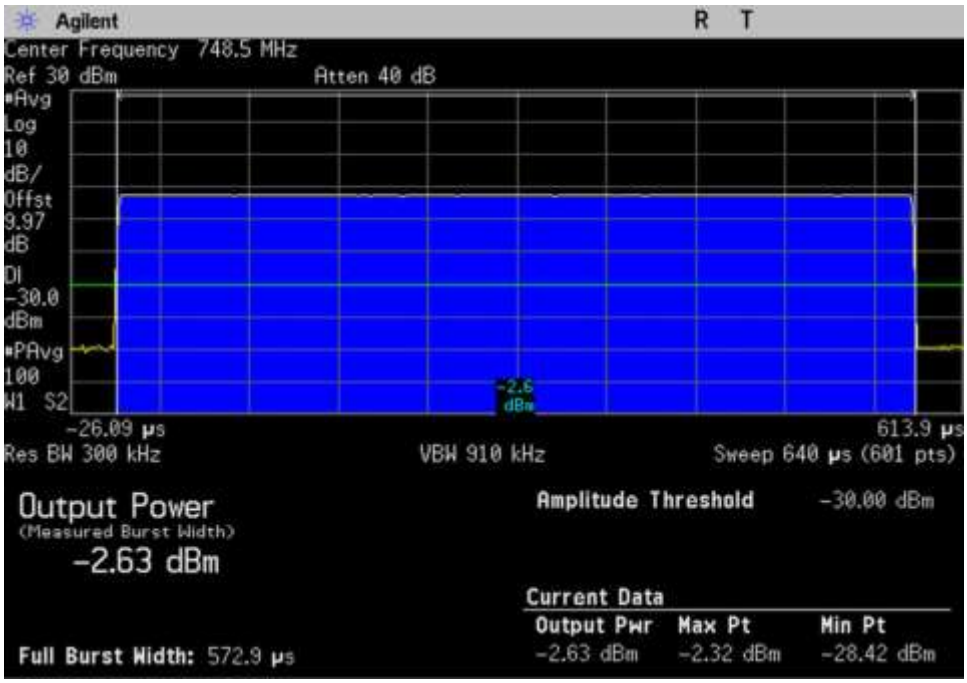
7.2-7.3 Power Gain_DL_746-757_AWGN_ 748.5MHz



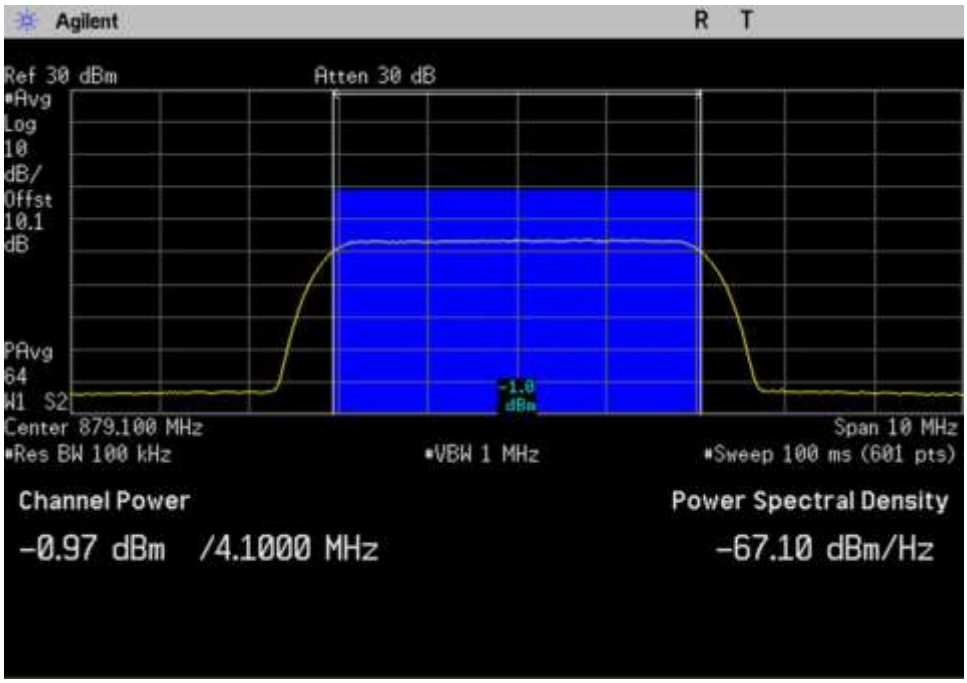
7.2-7.3 Power Gain_DL_746-757_AWGN_Max_ 748.5MHz



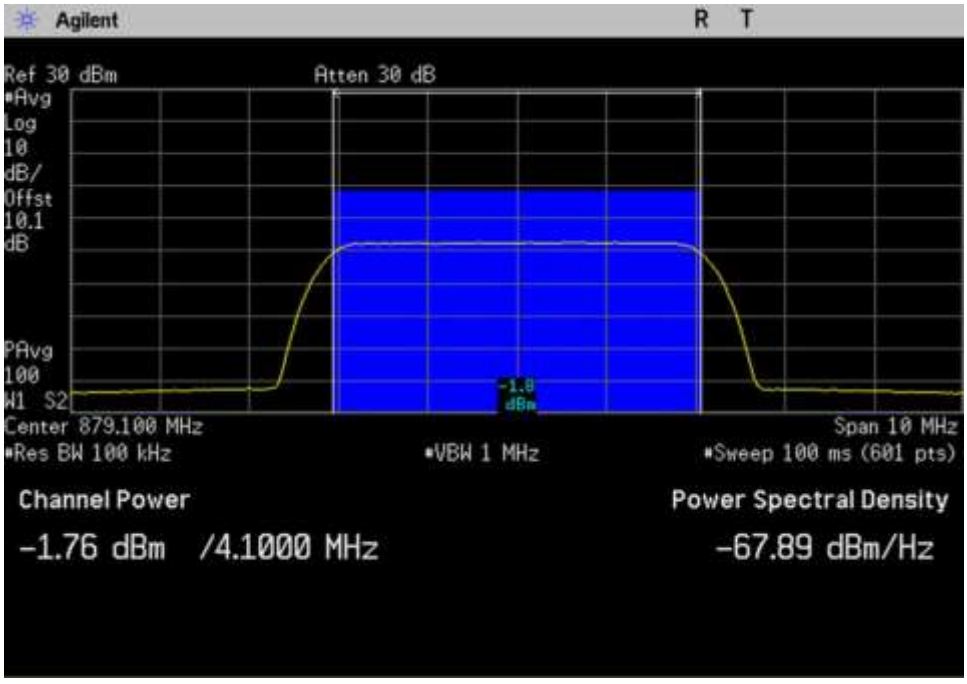
7.2-7.3 Power Gain_DL_746-757_GSM_ 748.5MHz



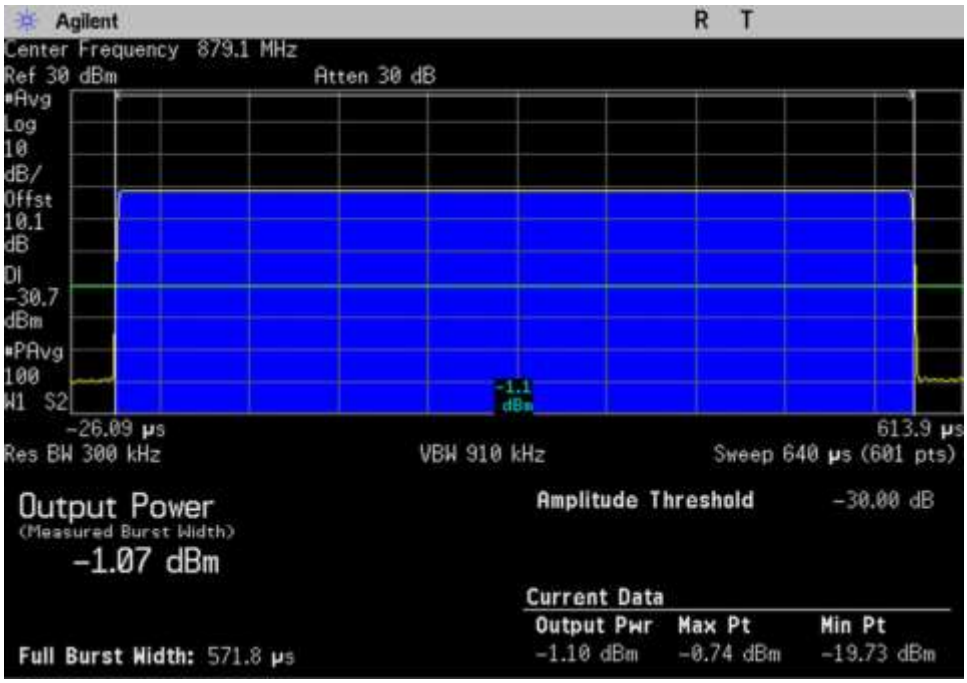
7.2-7.3 Power Gain_DL_746-757_GSM_Max_ 748.5MHz



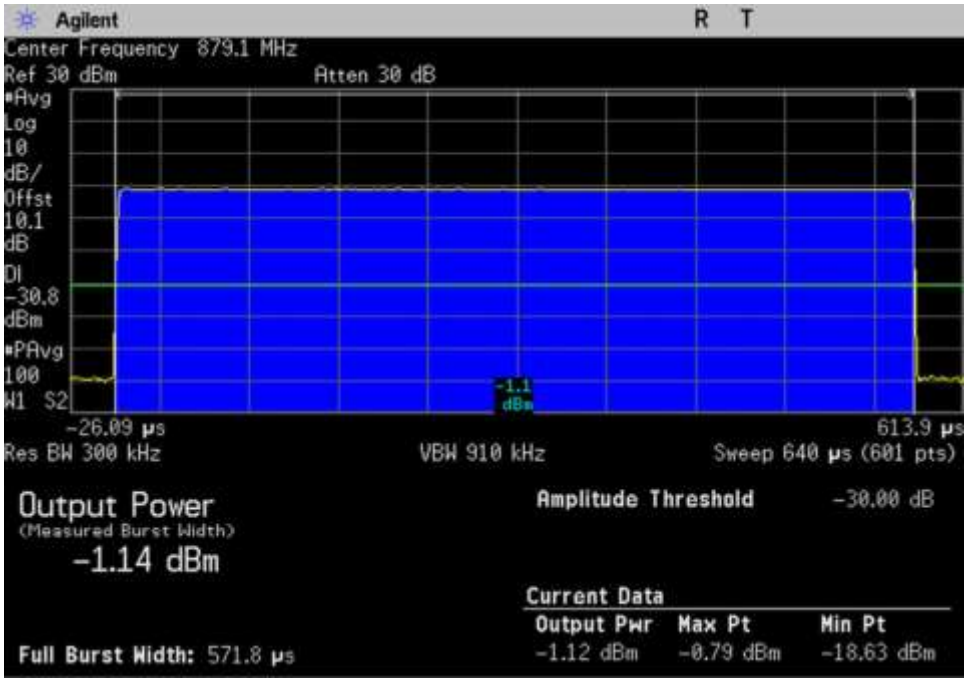
7.2-7.3 Power Gain_DL_869-894_AWGN_ 879.1MHz



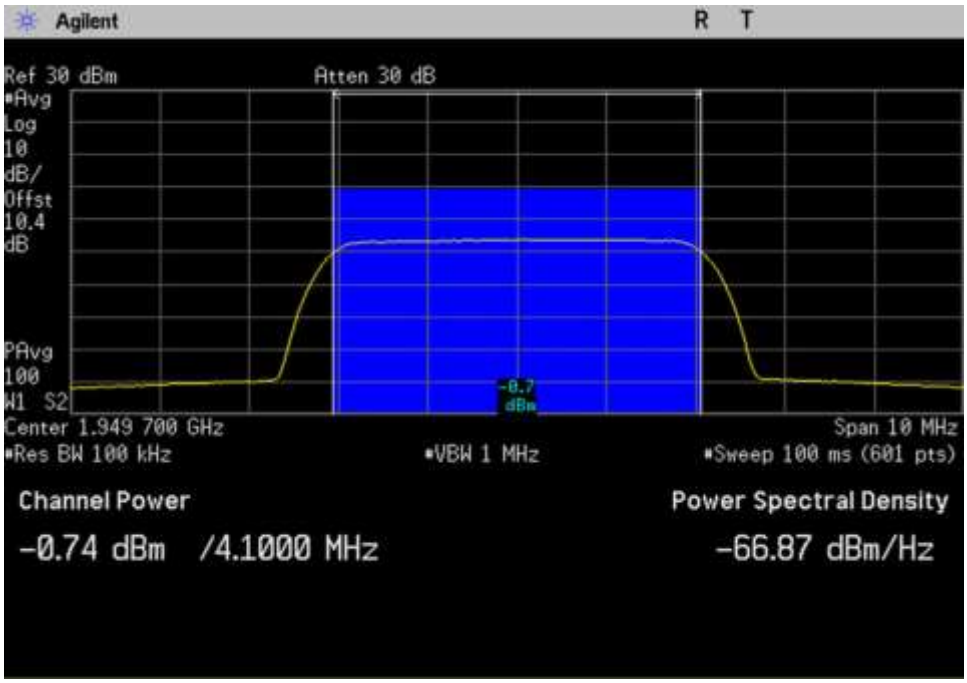
7.2-7.3 Power Gain_DL_869-894_AWGN_Max_ 879.1MHz



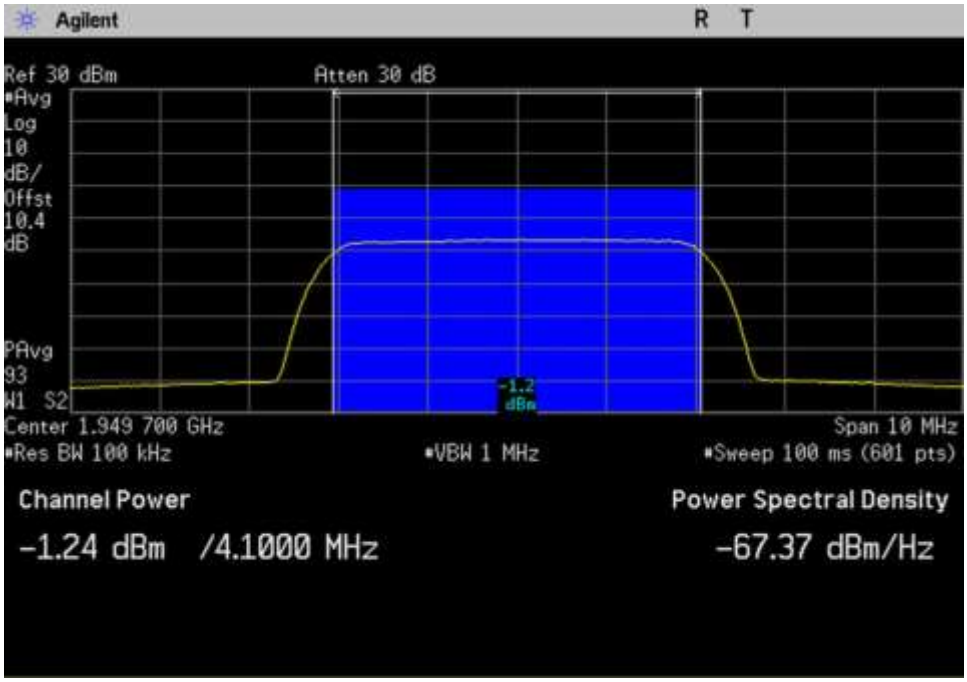
7.2-7.3 Power Gain_DL_869-894_GSM_ 879.1MHz



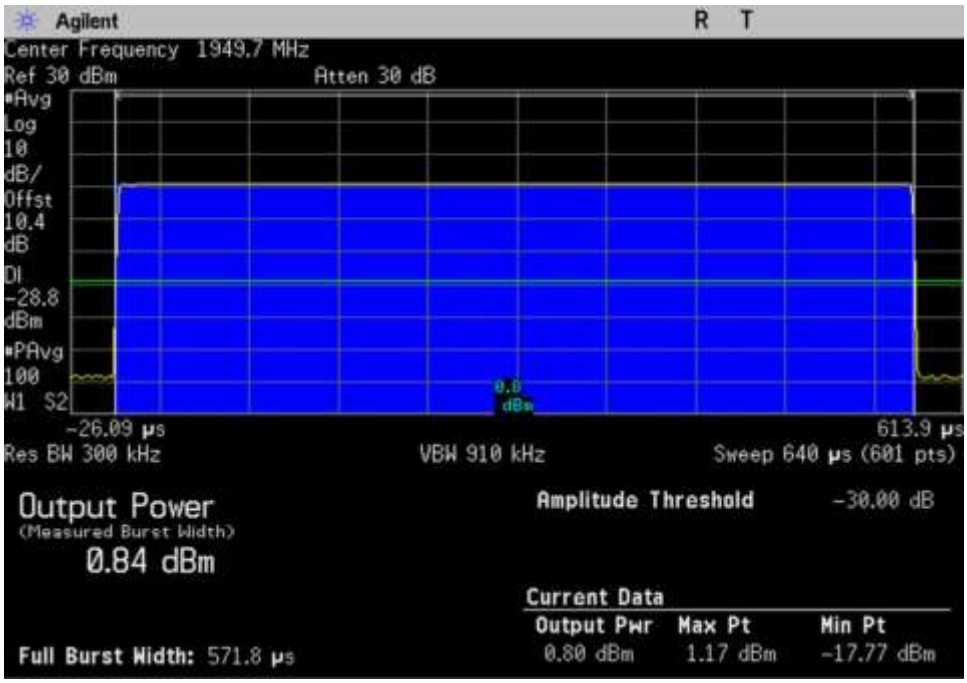
7.2-7.3 Power Gain_DL_869-894_GSM_Max_ 879.1MHz



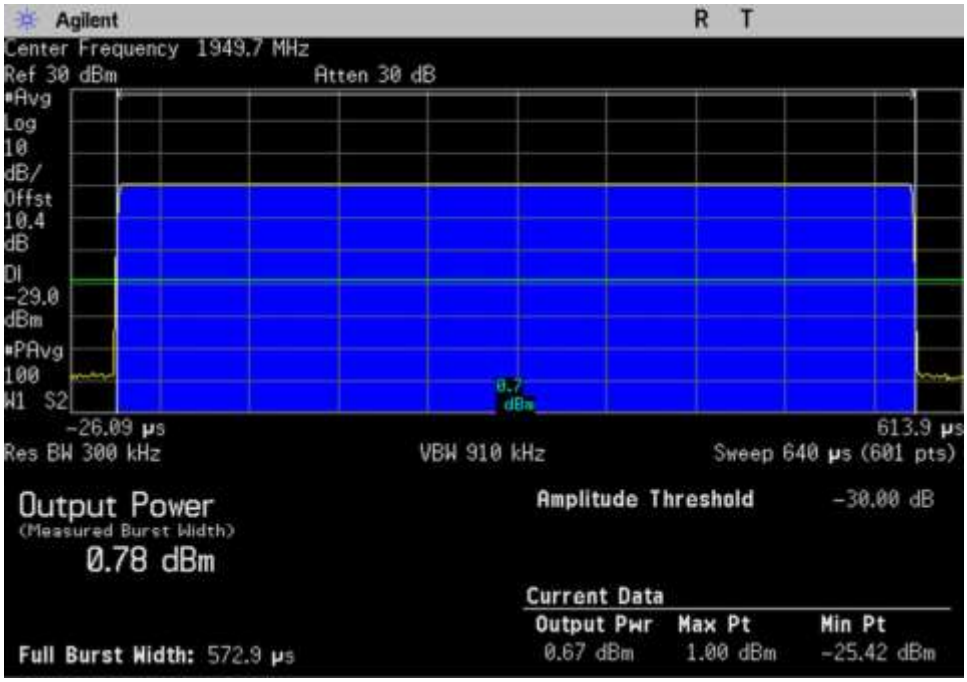
7.2-7.3 Power Gain_DL_1930-1995_AWGN_ 1949.7MHz



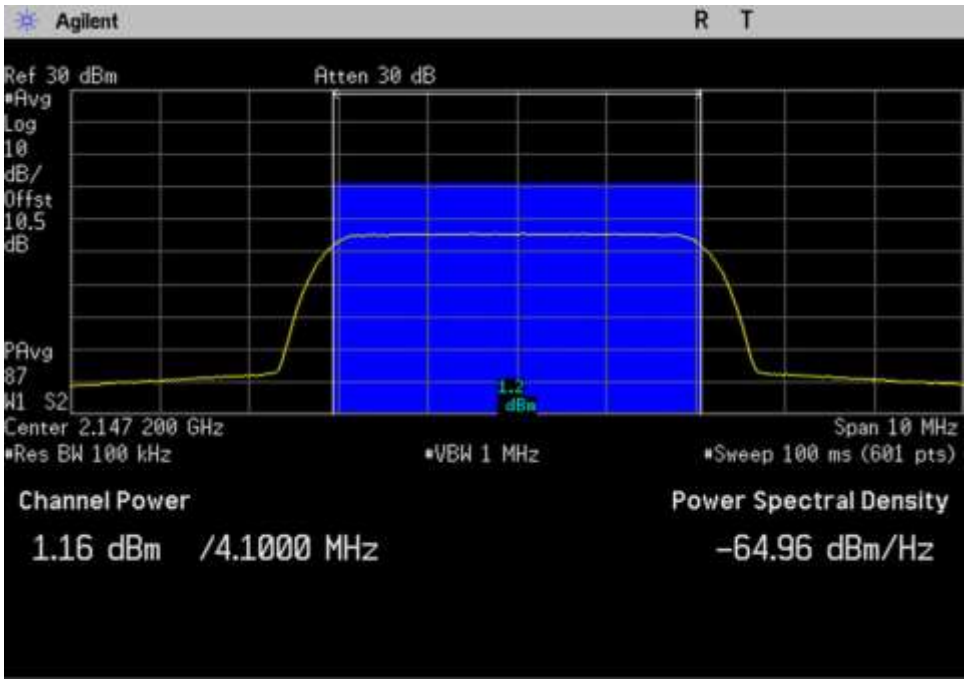
7.2-7.3 Power Gain_DL_1930-1995_AWGN_Max_ 1949.7MHz



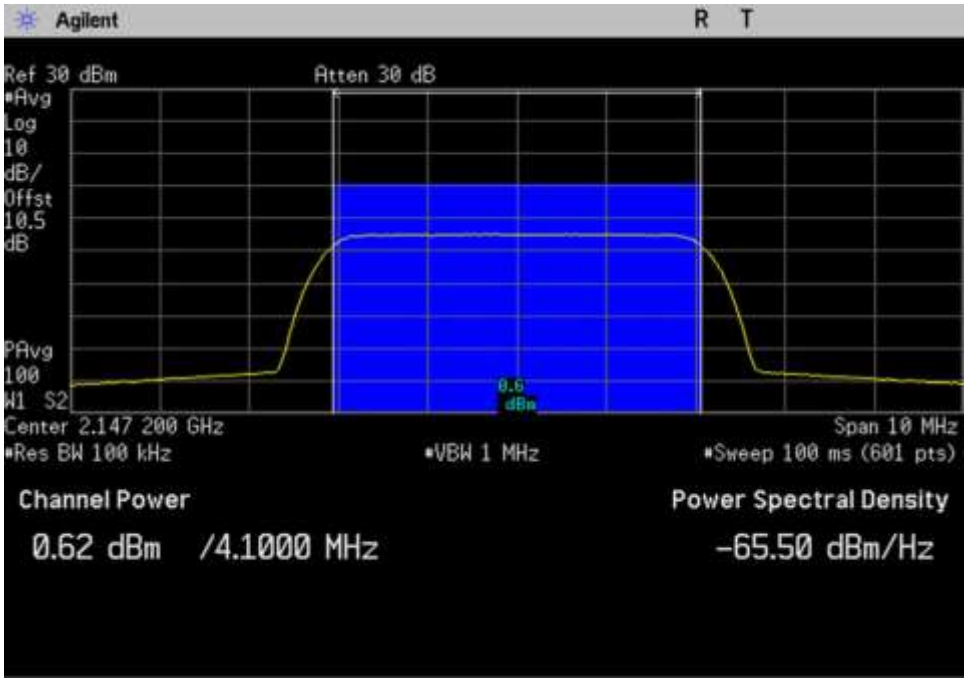
7.2-7.3 Power Gain_DL_1930-1995_GSM_ 1949.7MHz



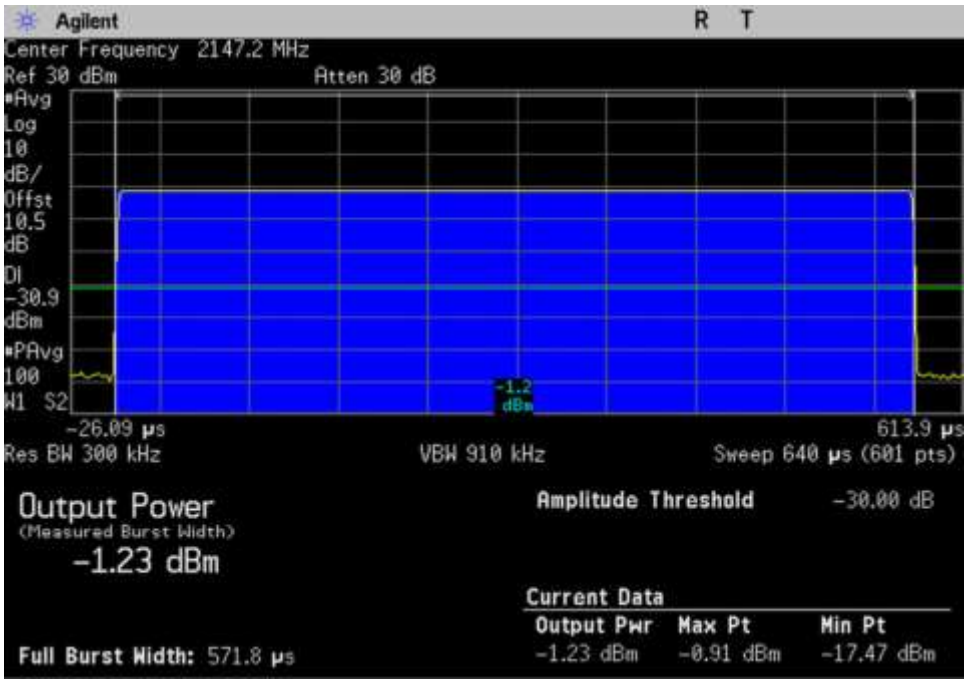
7.2-7.3 Power Gain_DL_1930-1995_GSM_Max_ 1949.7MHz



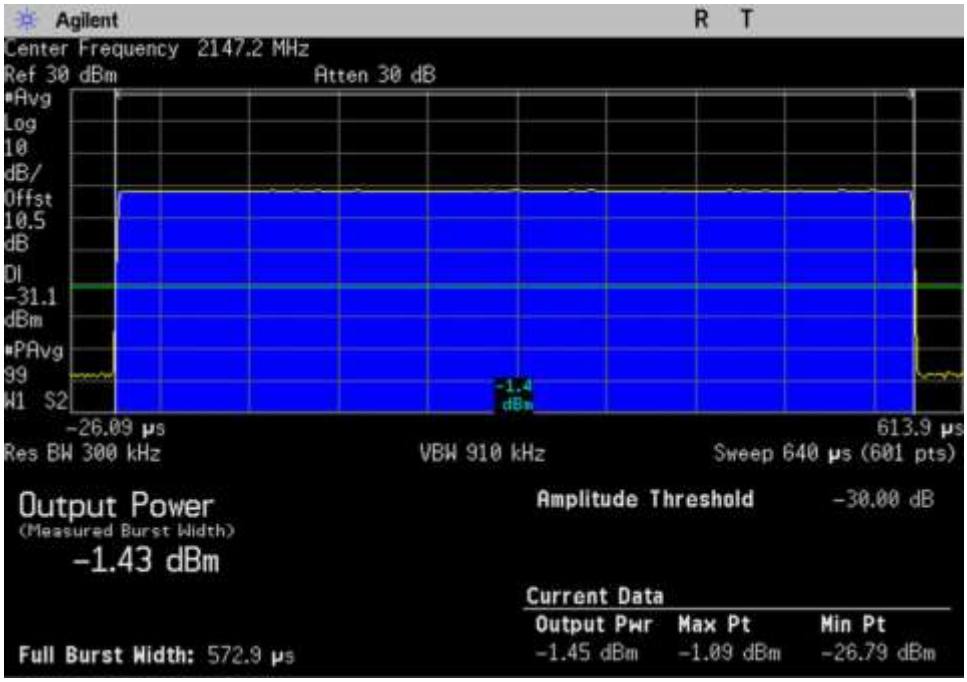
7.2-7.3 Power Gain_DL_2110-2155_AWGN_ 2147.2MHz



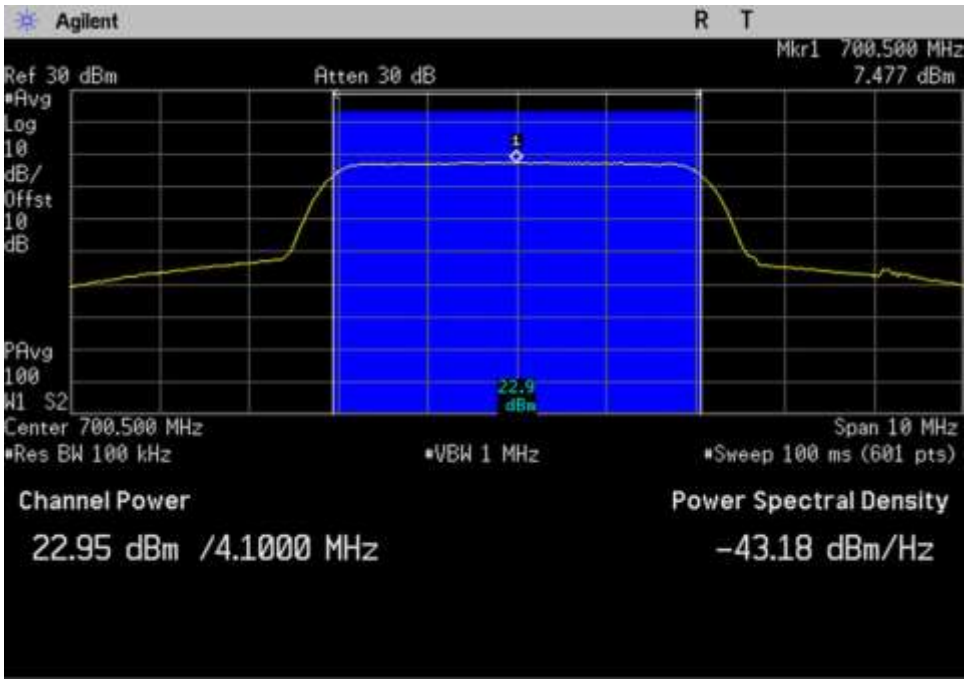
7.2-7.3 Power Gain_DL_2110-2155_AWGN_Max_ 2147.2MHz



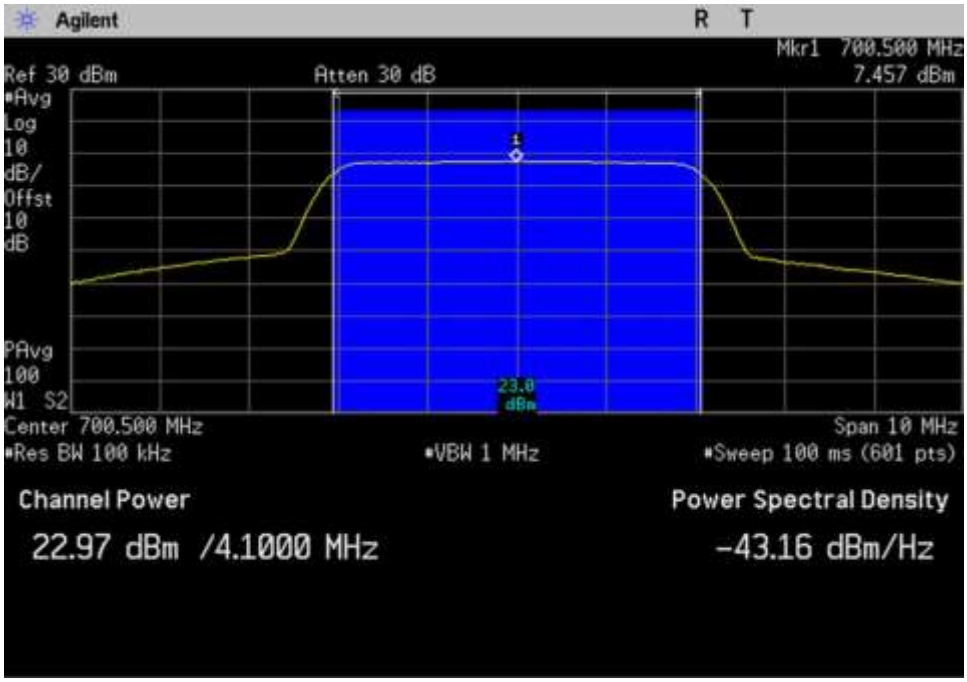
7.2-7.3 Power Gain_DL_2110-2155_GSM_ 2147.2MHz



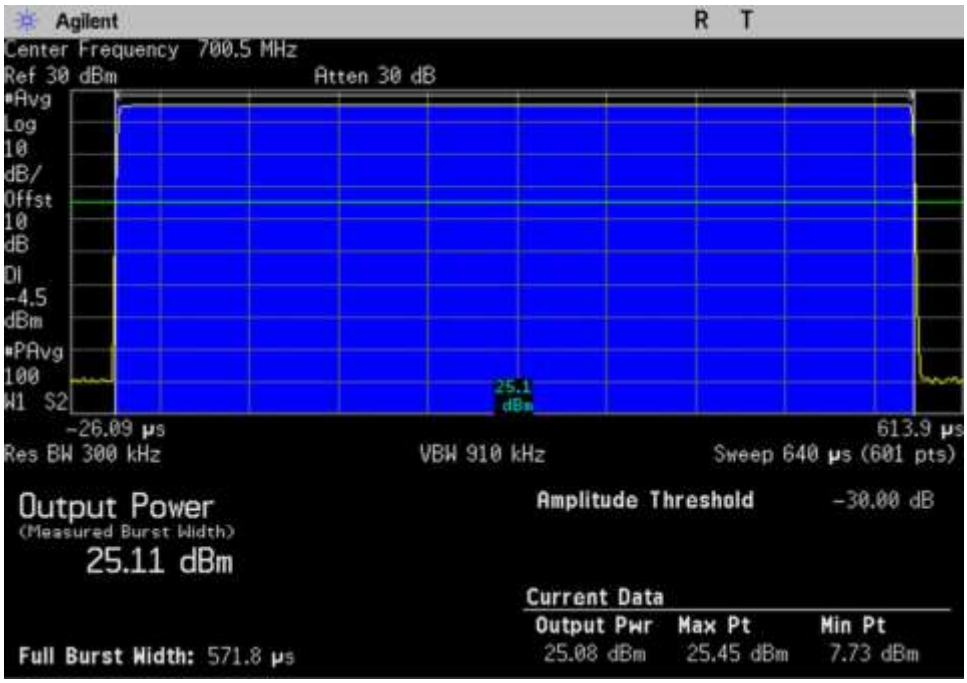
7.2-7.3 Power Gain_DL_2110-2155_GSM_Max_ 2147.2MHz



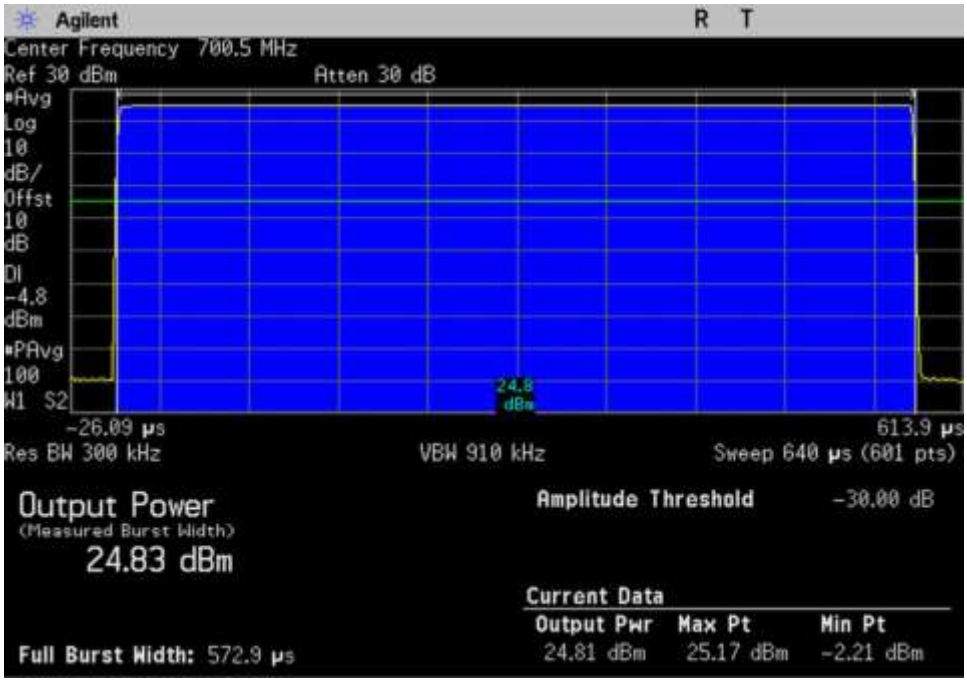
7.2-7.3 Power Gain_UL_698-716_AWGN_ 700.5MHz



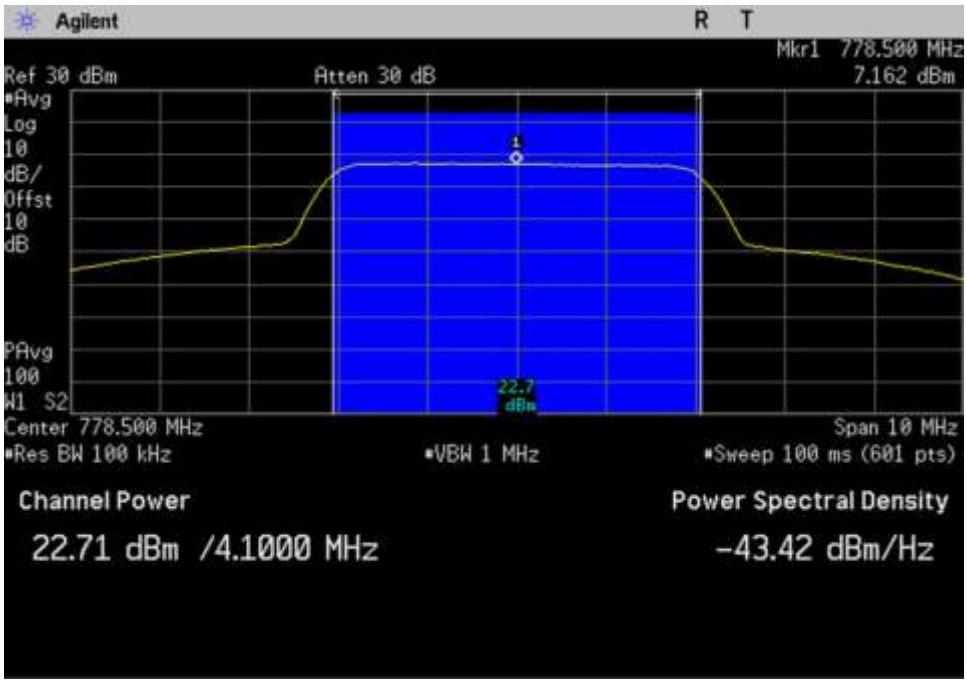
7.2-7.3 Power Gain_UL_698-716_AWGN_Max_ 700.5MHz



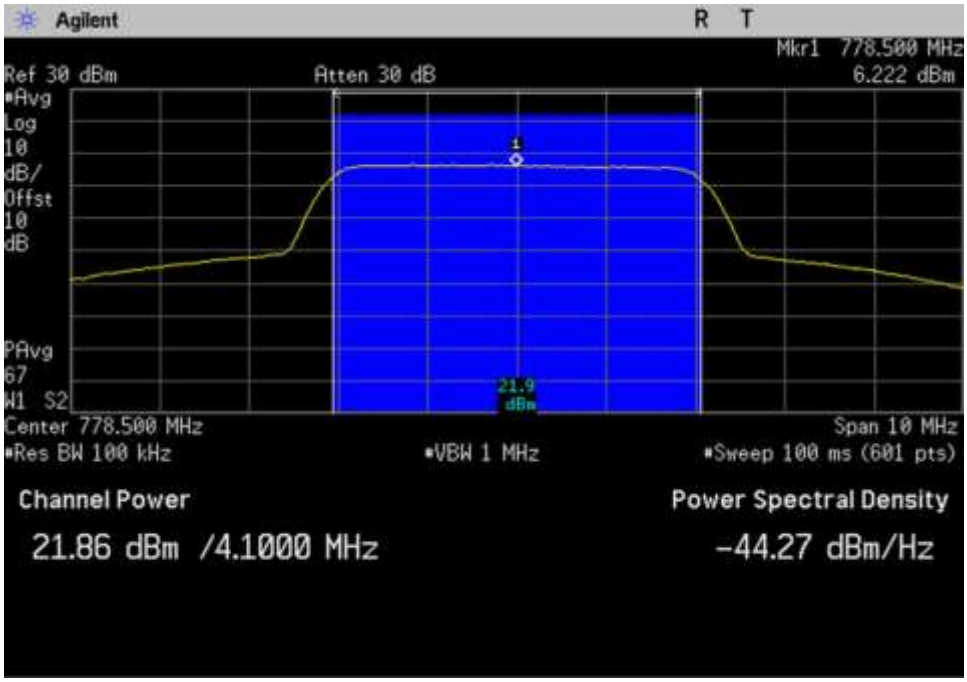
7.2-7.3 Power Gain_UL_698-716_GSM_ 700.5MHz



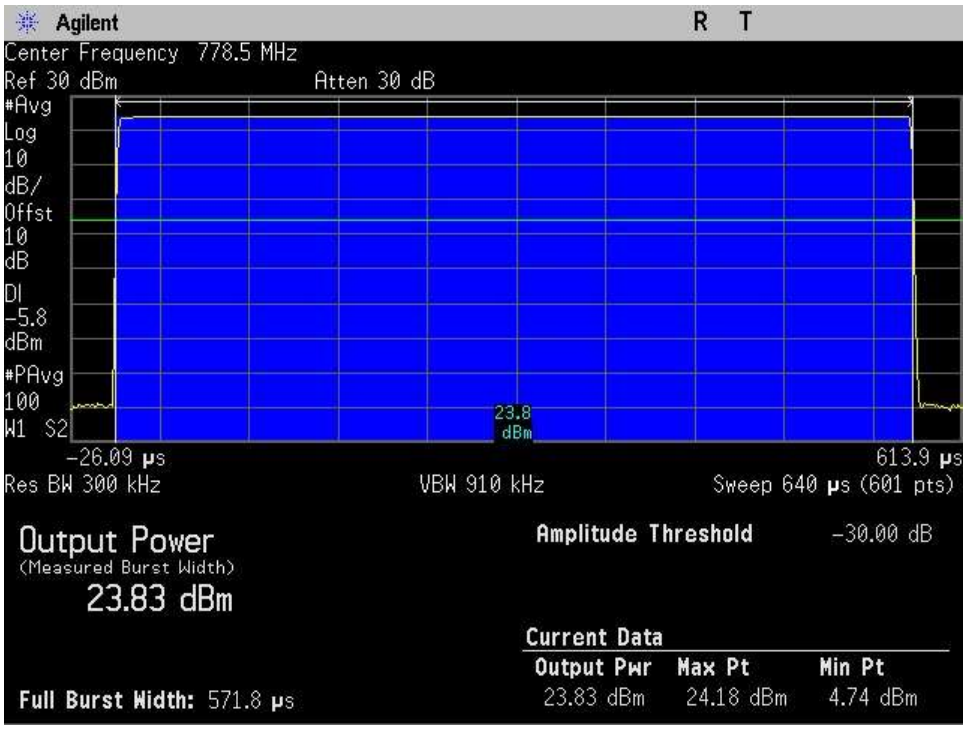
7.2-7.3 Power Gain_UL_698-716_GSM_Max_ 700.5MHz



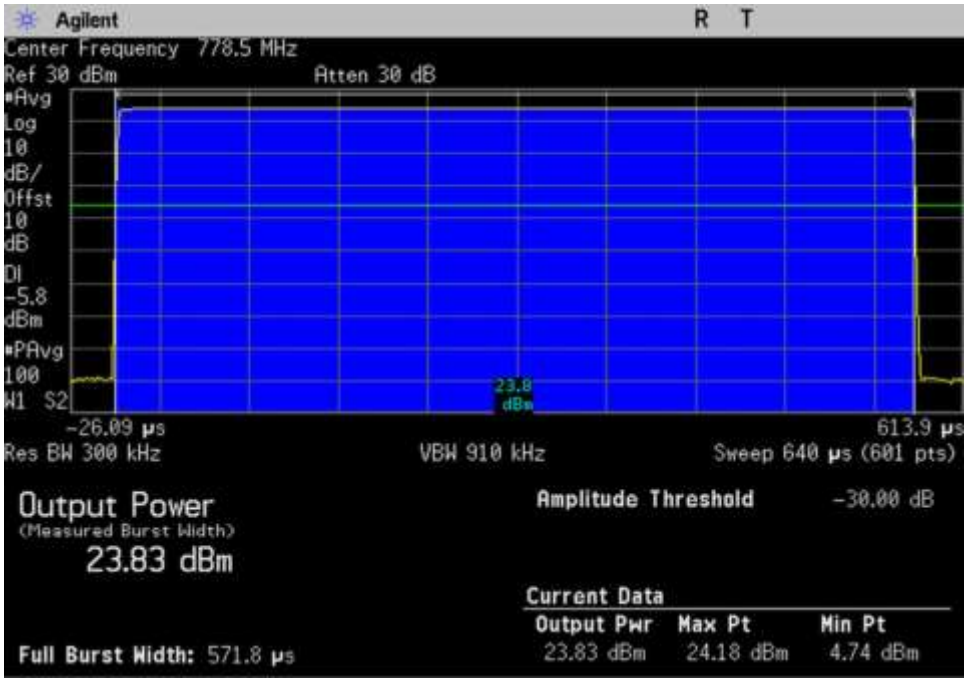
7.2-7.3 Power Gain_UL_776-787_AWGN_ 778.5MHz



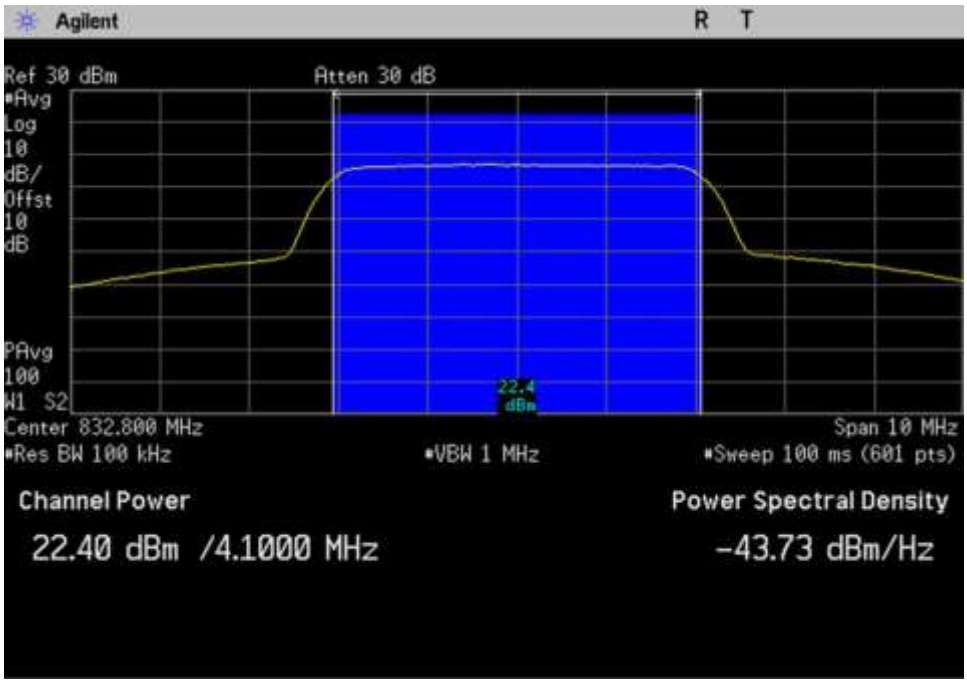
7.2-7.3 Power Gain_UL_776-787_AWGN_Max_ 778.5MHz



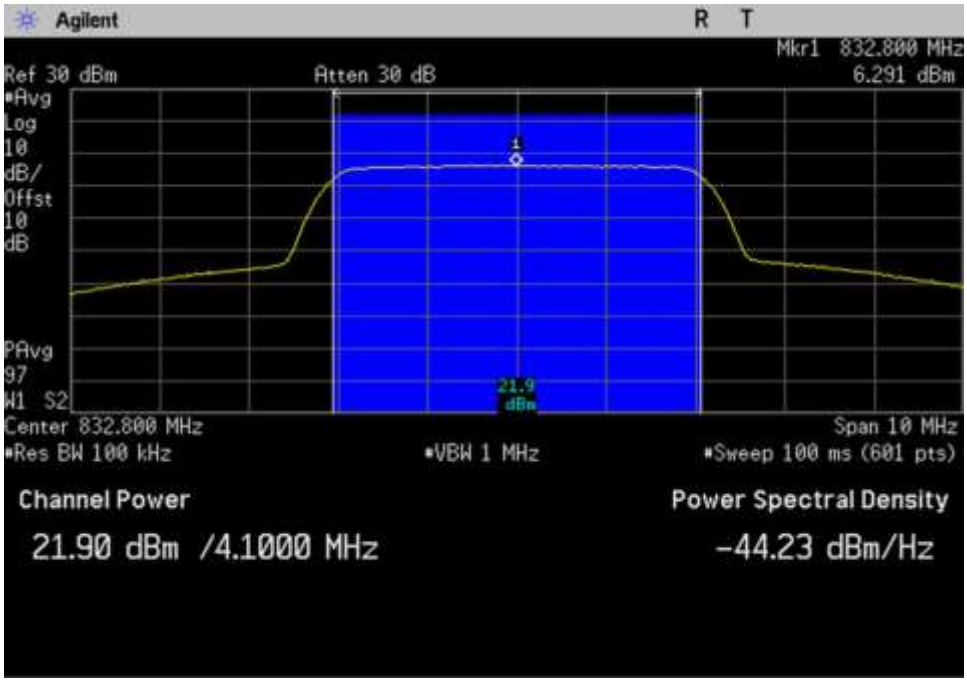
7.2-7.3 Power Gain_UL_776-787_GSM_ 778.5MHz



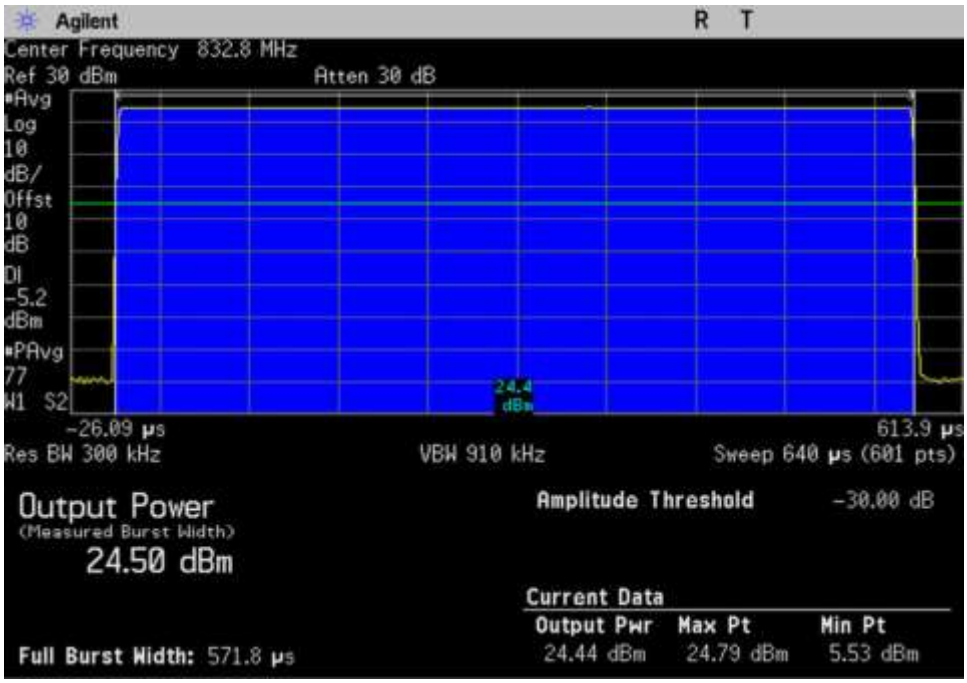
7.2-7.3 Power Gain_UL_776-787_GSM_Max_ 778.5MHz



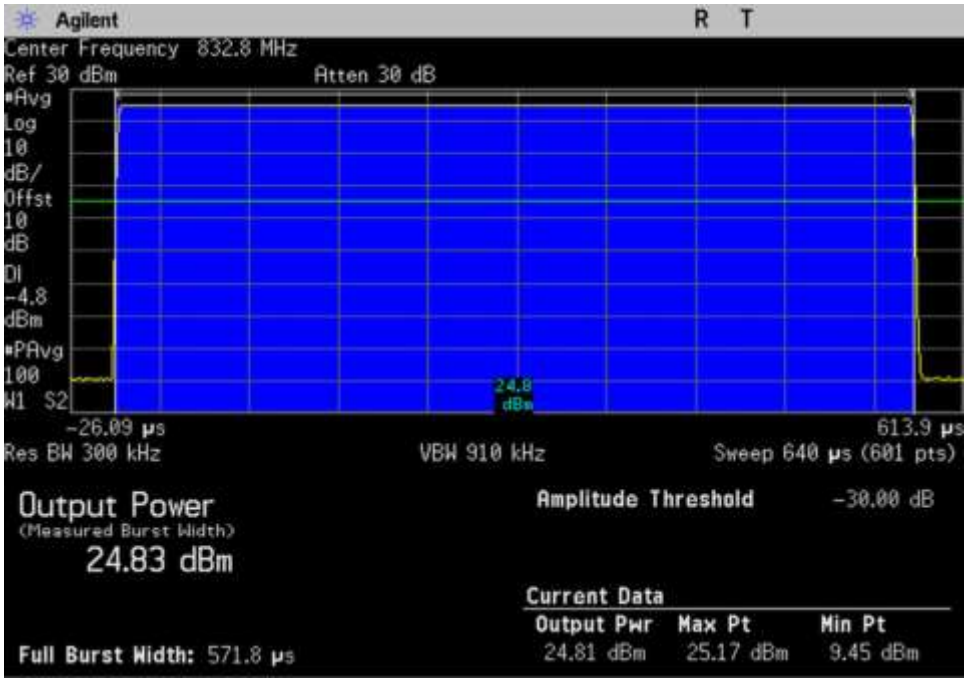
7.2-7.3 Power Gain_UL_824-849_AWGN_ 832.8MHz



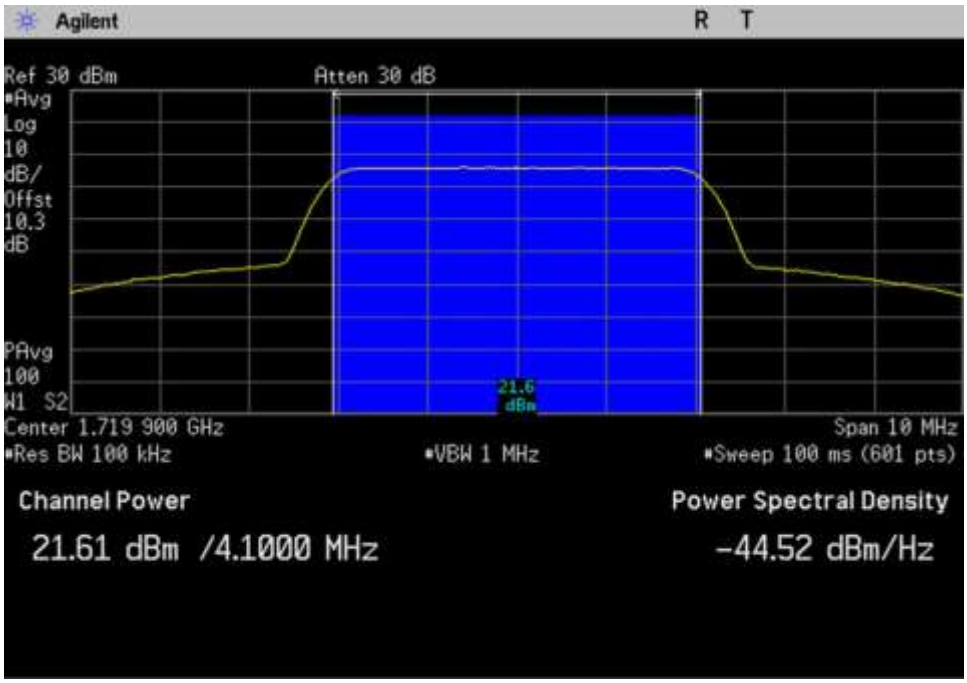
7.2-7.3 Power Gain_UL_824-849_AWGN_Max_ 832.8MHz



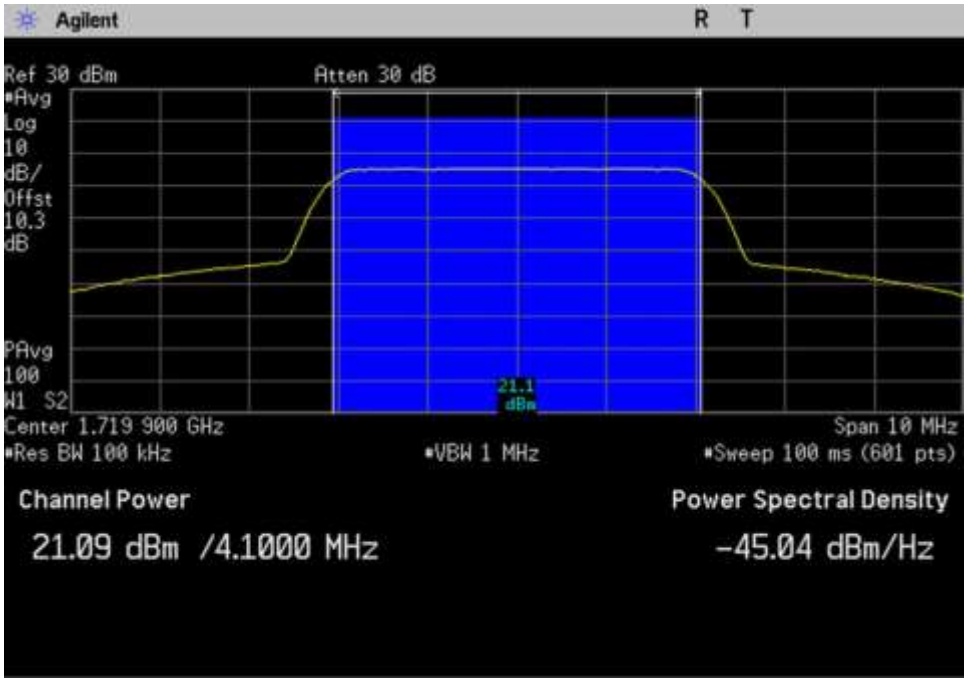
7.2-7.3 Power Gain_UL_824-849_GSM_ 832.8MHz



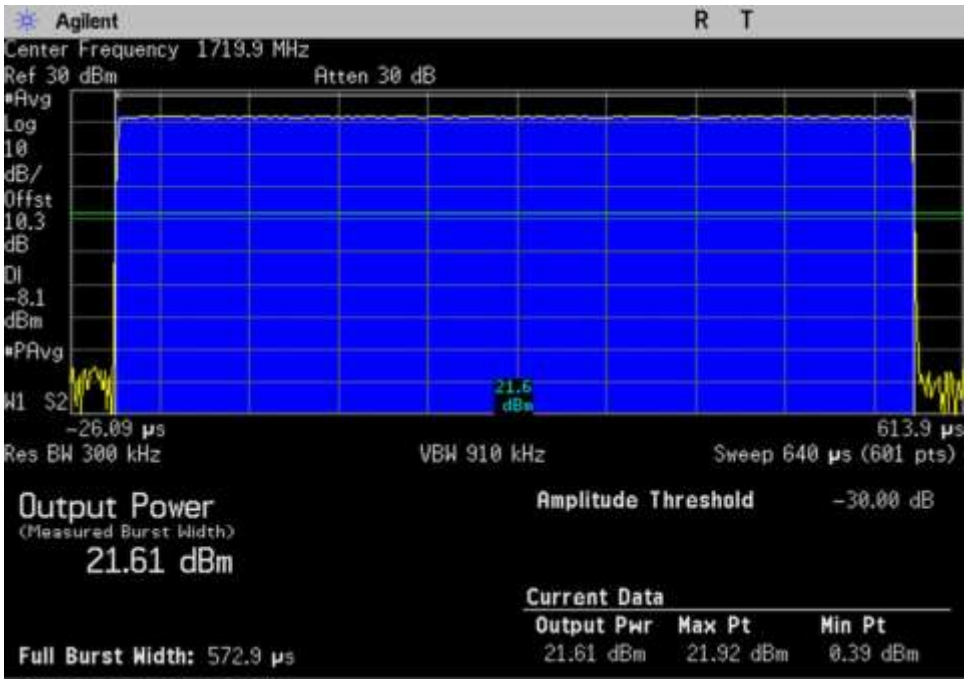
7.2-7.3 Power Gain_UL_824-849_GSM_Max_ 832.8MHz



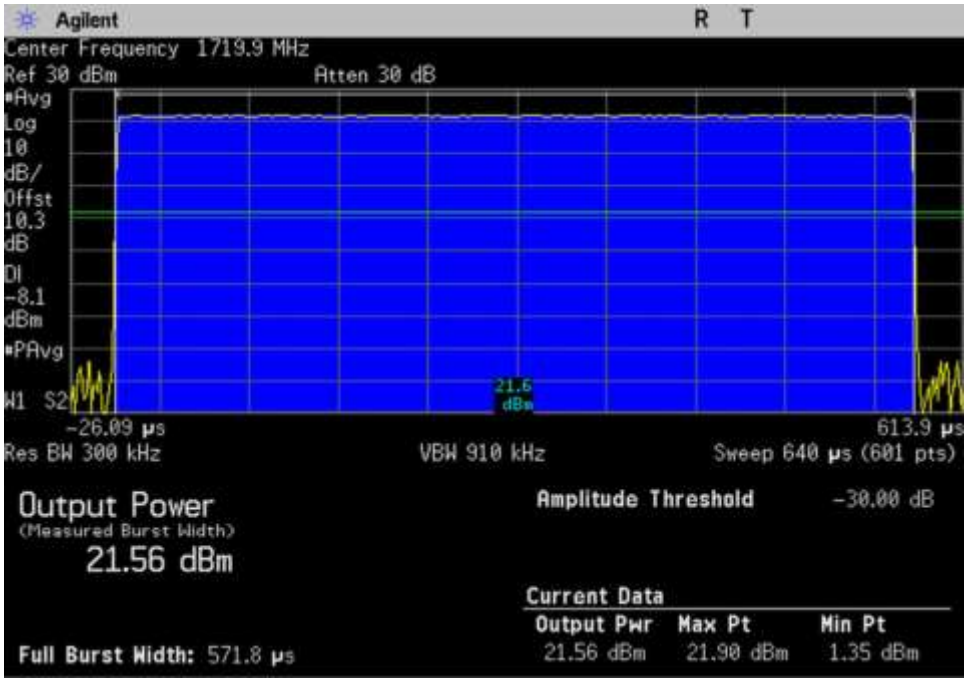
7.2-7.3 Power Gain_UL_1710-1755_AWGN_ 1719.9MHz



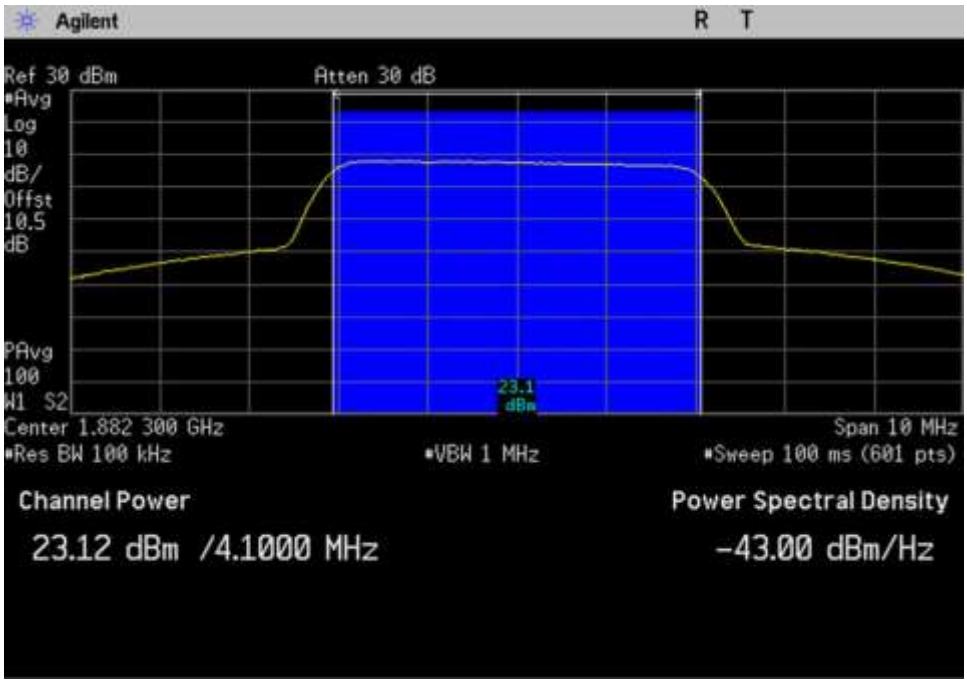
7.2-7.3 Power Gain_UL_1710-1755_AWGN_Max_ 1719.9MHz



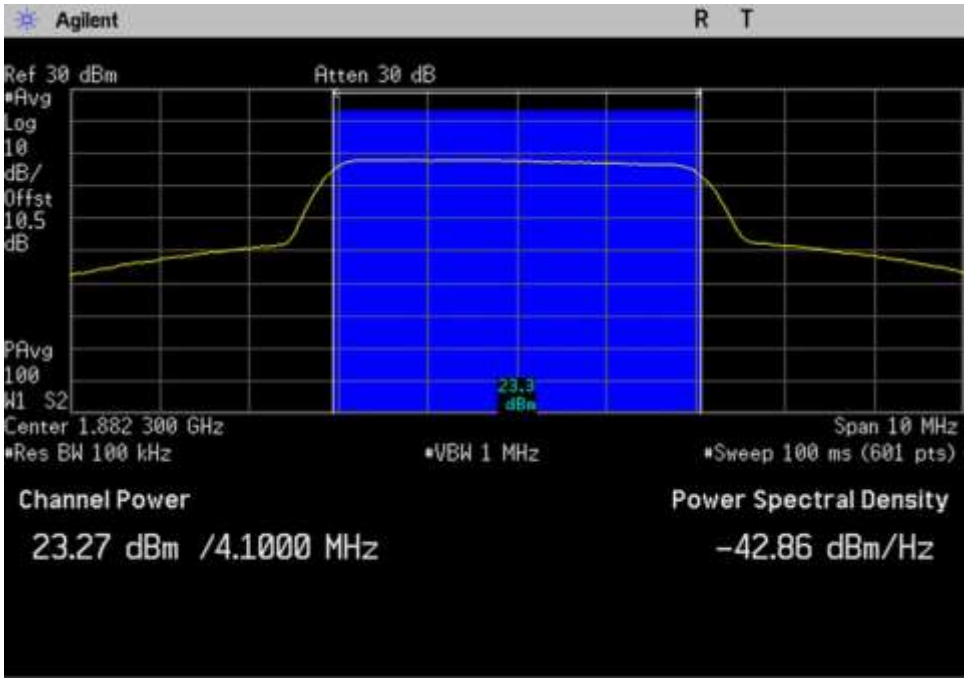
7.2-7.3 Power Gain_UL_1710-1755_GSM_ 1719.9MHz



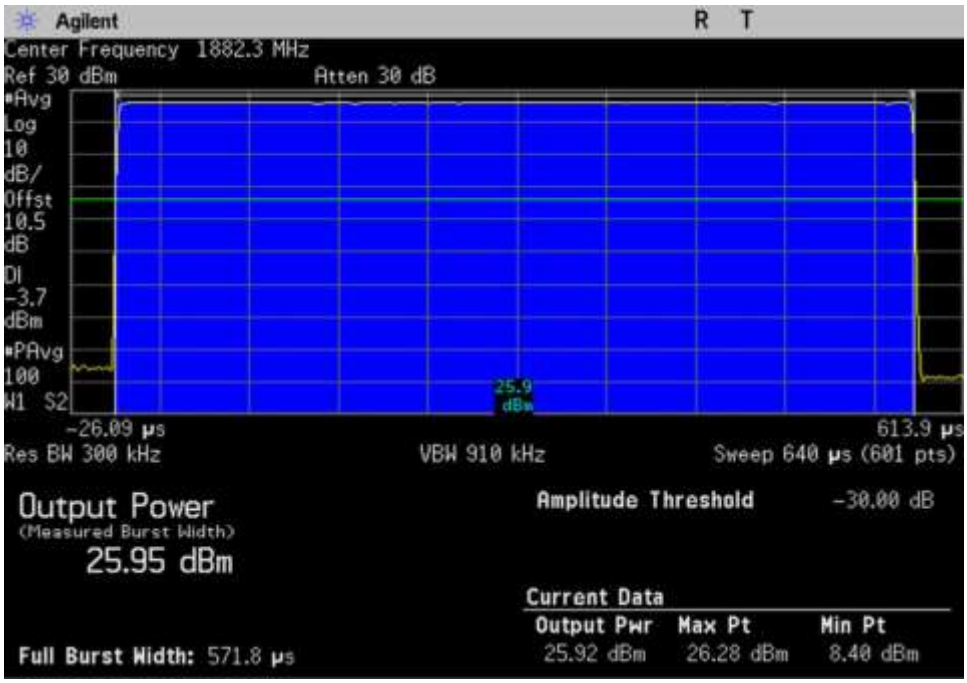
7.2-7.3 Power Gain_UL_1710-1755_GSM_Max_ 1719.9MHz



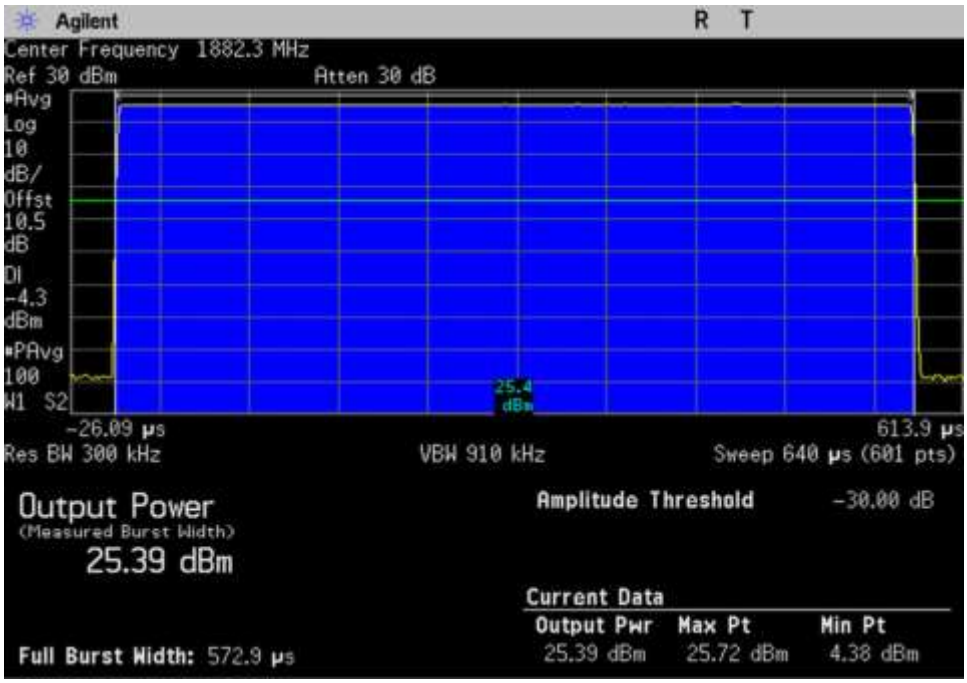
7.2-7.3 Power Gain_UL_1850-1915_AWGN_ 1882.3MHz



7.2-7.3 Power Gain_UL_1850-1915_AWGN_Max_ 1882.3MHz



7.2-7.3 Power Gain_UL_1850-1915_GSM_ 1882.3MHz



7.2-7.3 Power Gain_UL_1850-1915_GSM_Max_ 1882.3MHz

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 #:	**101463** Date 03/04/2019
Test Type:	**Conducted Emissions**
Tested By:	**Hieu S. Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Test environment conditions:
Temperature: 20.8° C
Relative Humidity: 40%
Pressure: 102.1kPa

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03471	Spectrum Analyzer	Agilent	E4440A	1/18/2018	1/18/2020

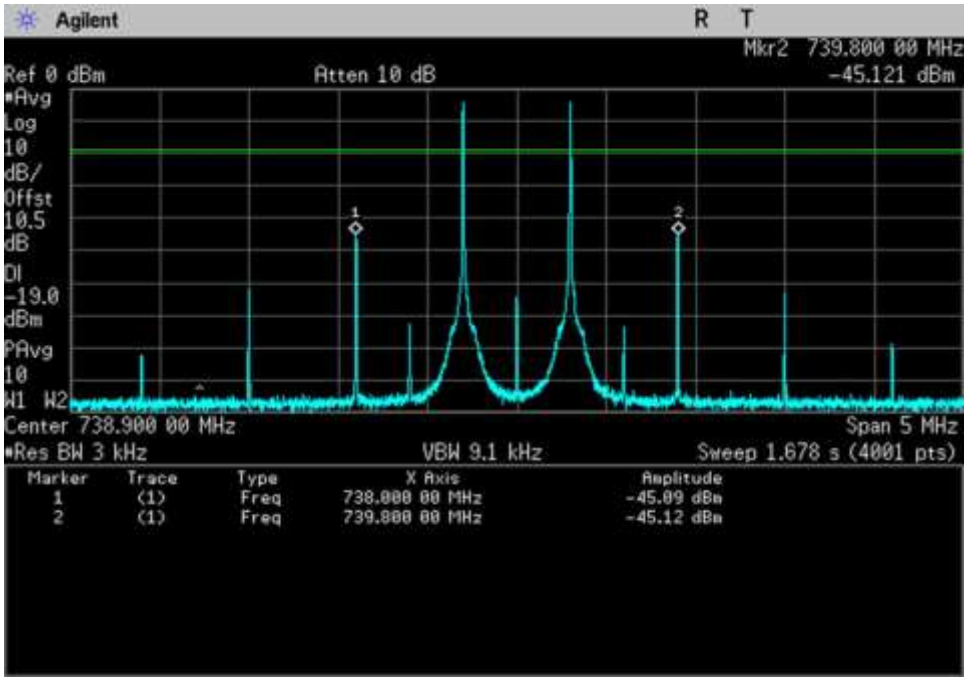
Summary of Results

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

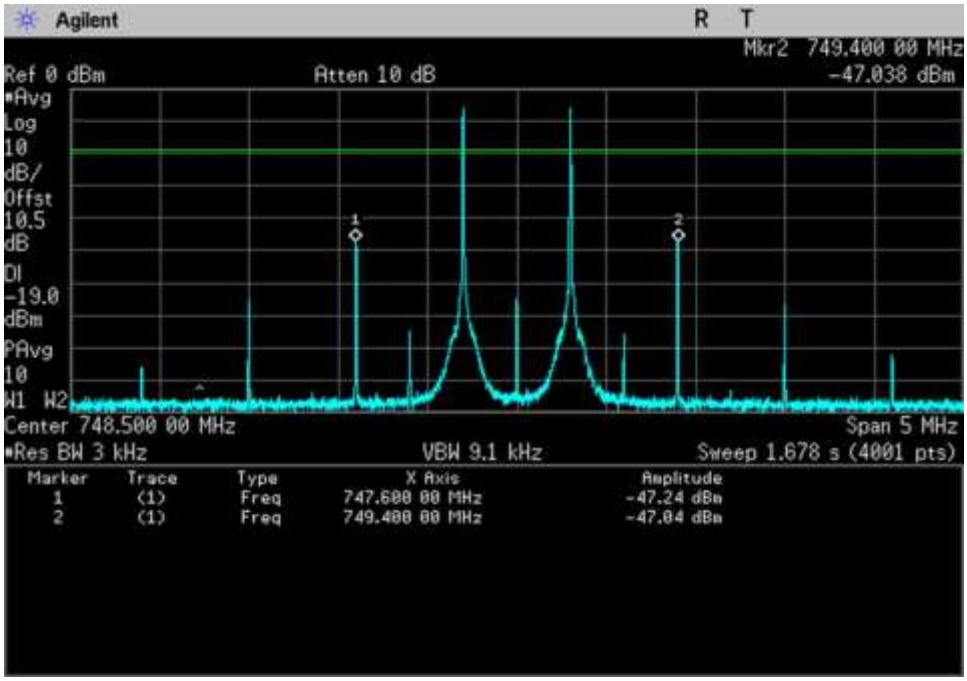
Inter Modulation Product			
Freq (MHz)	Pre AGC (dBm)	Limit (dBm)	Results
UL 1710-1755	-22.3	-19	Pass
UL 1850-1915	-19.8	-19	Pass
UL 824-894	-19.8	-19	Pass
UL 698-716	-26.9	-19	Pass
UL 776-787	-21.8	-19	Pass
DL 2110-2155	-47.1	-19	Pass
DL 1930-1995	-48.9	-19	Pass
DL 869-894	-56.3	-19	Pass
DL 728-746	-45.1	-19	Pass
DL 746-757	-47.0	-19	Pass

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

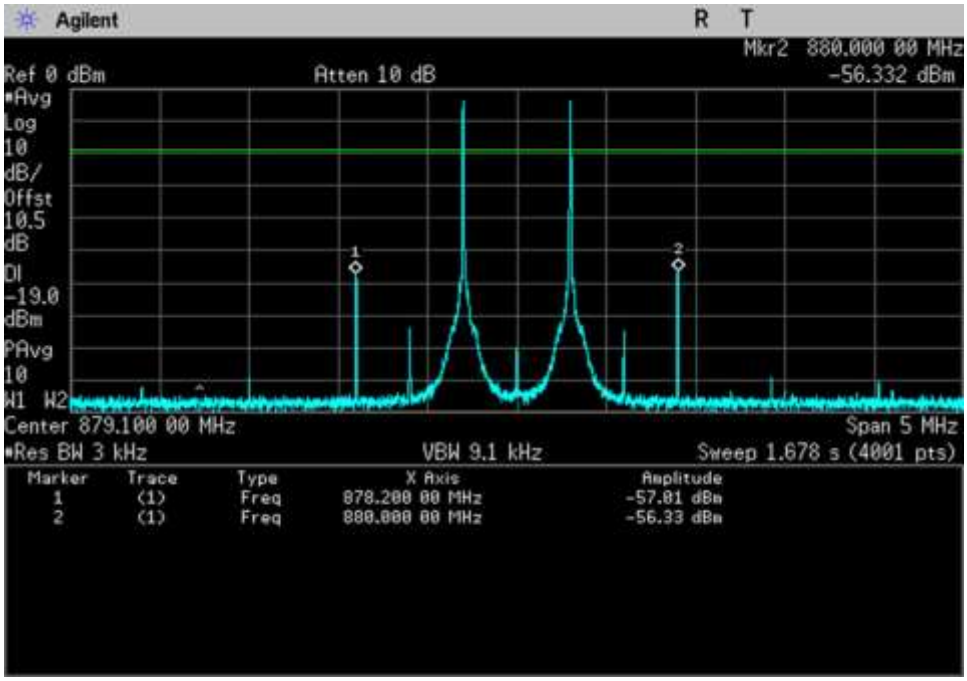
Plots



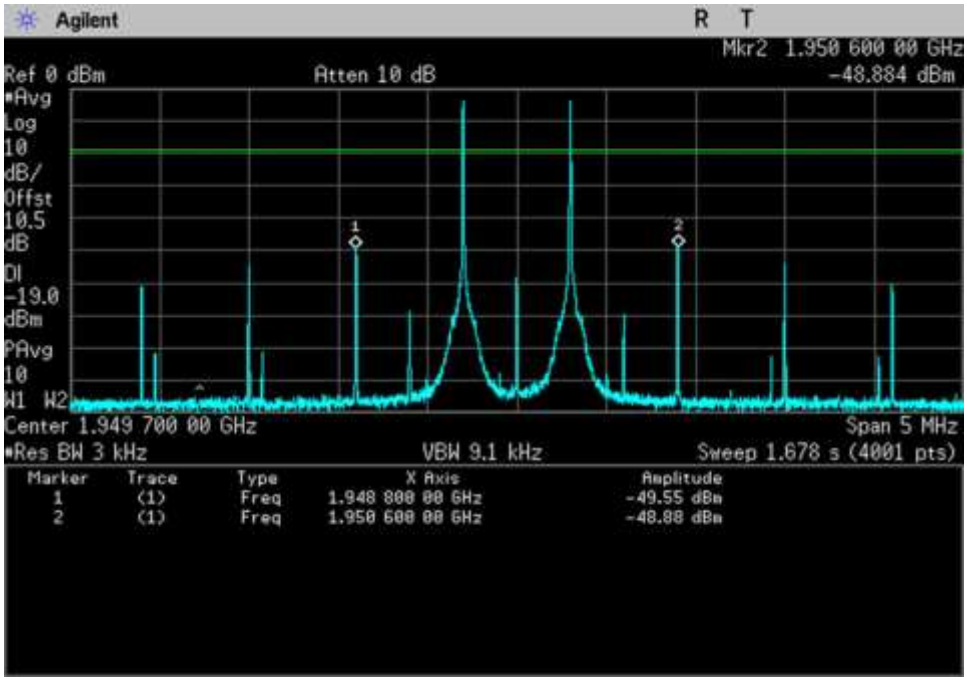
7.4 Intermod_DL_728-746_ 738.9MHz



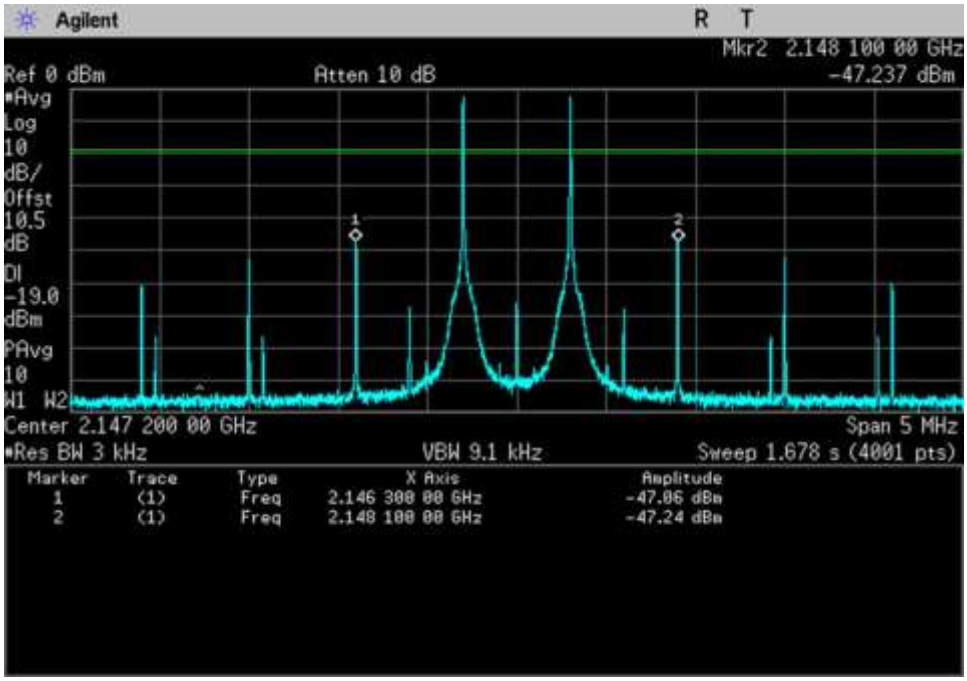
7.4 Intermod_DL_746-757_ 748.5MHz



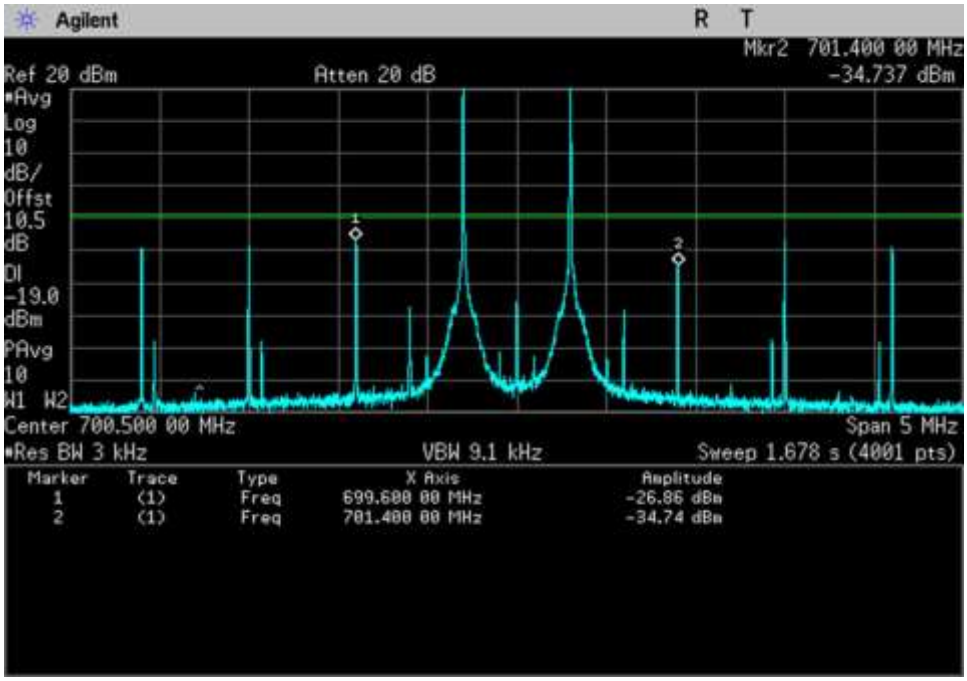
7.4 Intermod_DL_869-894_ 879.1MHz



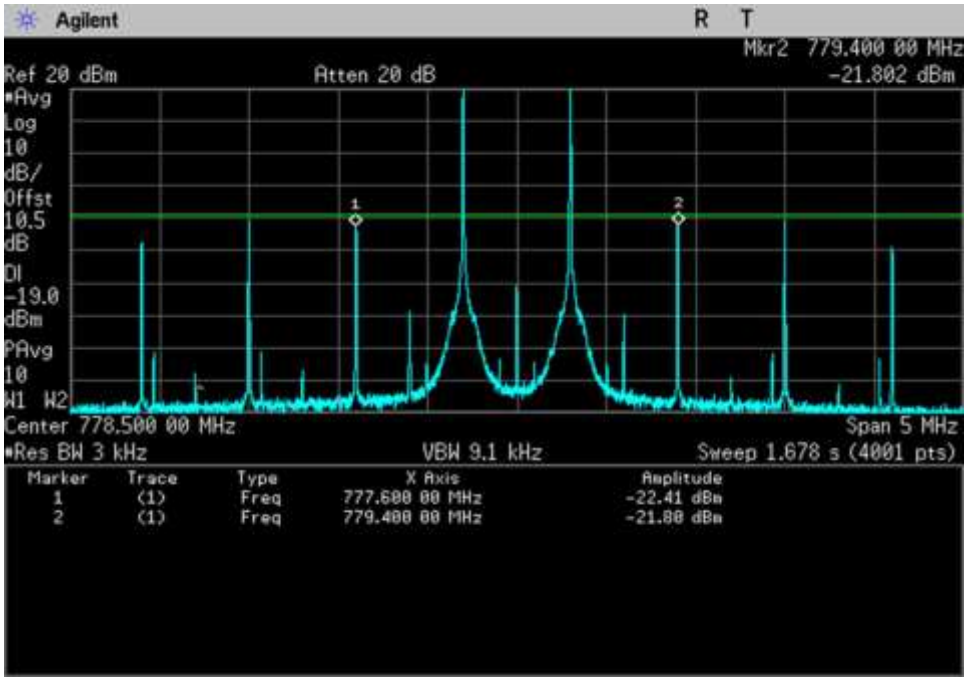
7.4 Intermod_DL_1930-1995_ 1949.7MHz



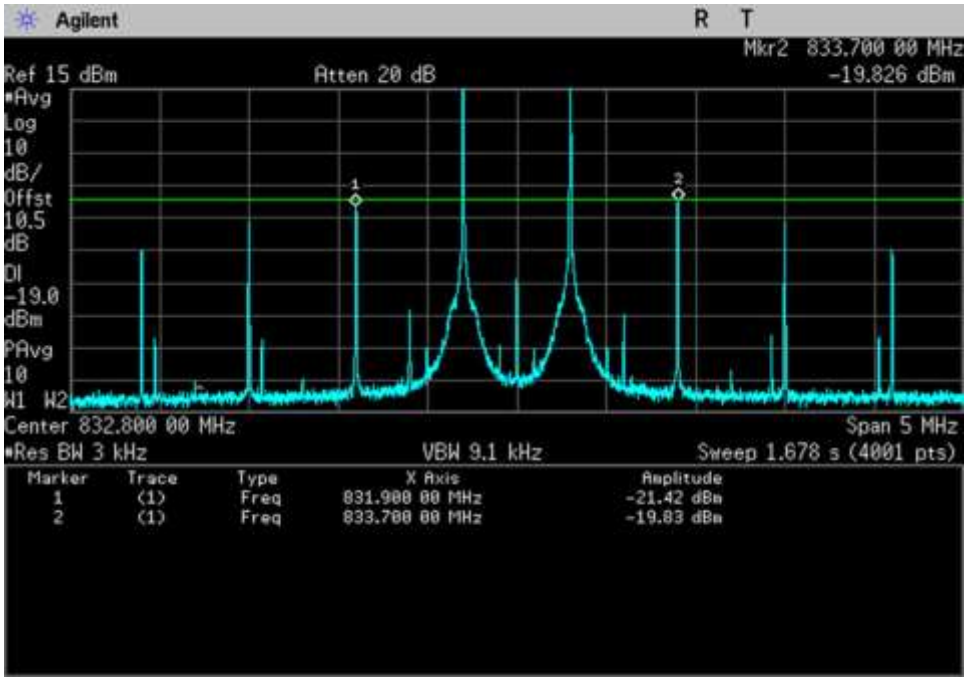
7.4 Intermod_DL_2110-2155_ 2147.2MHz



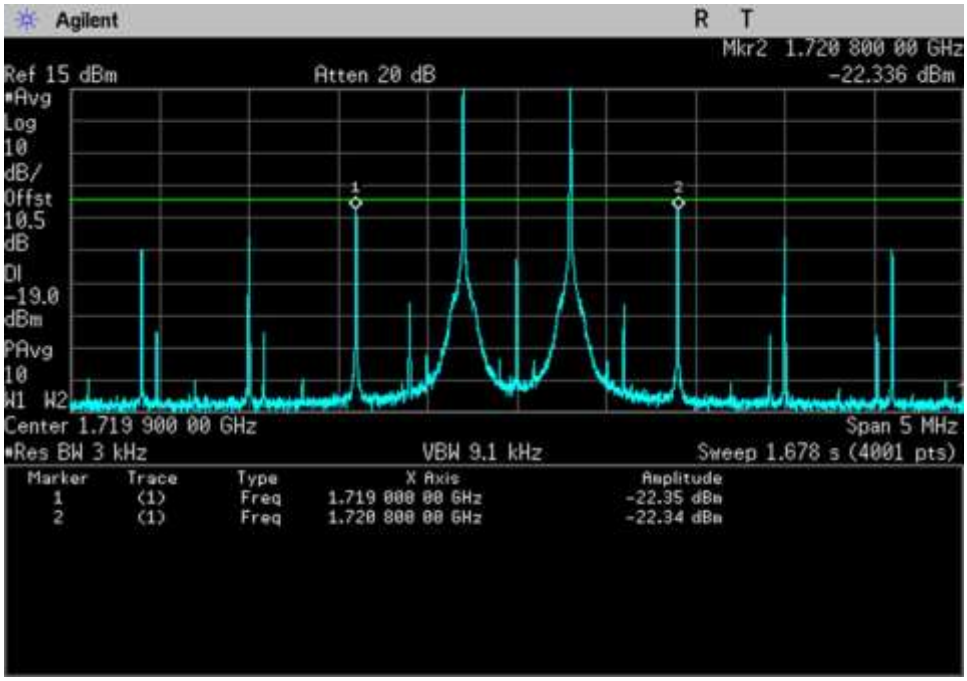
7.4 Intermod_UL_698-716_ 700.5MHz



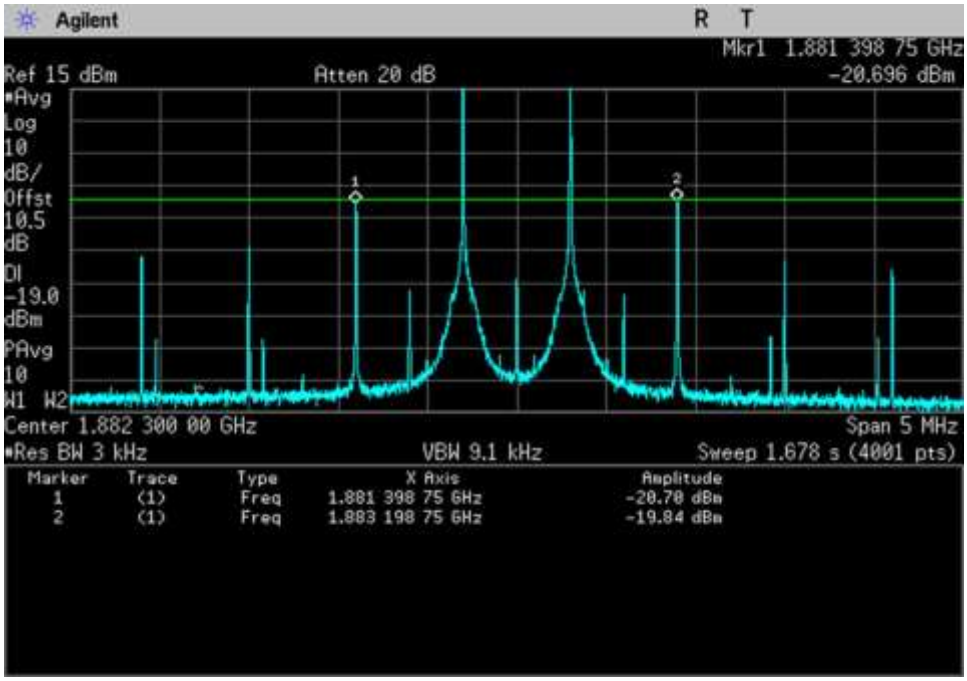
7.4 Intermod_UL_776-787_ 778.5MHz



7.4 Intermod_UL_824-849_ 832.8MHz



7.4 Intermod_UL_1710-1755_ 1719.9MHz



7.4 Intermod_UL_1850-1915_ 1882.3MHz

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 #: **101463** Date 07/05/18 and 07/06/18
Test Type: **Conducted Emissions**
Tested By: **Hieu Song Nguyenpham**
Software: EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

07/05/18: Test environment conditions: 21.6°C, 47.6% relative humidity,102.1kPa
07/06/18: Test environment conditions: 21.8 °C, 44.5% relative humidity,102.5kPa

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020

Summary of Results

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

GSM

Low

Out of Band Emission			
Freq (MHz)	**Pre AGC**	**Limit (dBm)**	**Results**
UL1710-1755	-26.0	-19	Pass
UL1850-1915	-28.6	-19	Pass
UL824-849	-26.2	-19	Pass
UL 698-716	-22.8	-19	Pass
UL776-787	-24.4	-19	Pass
DL2110-2155	-46.3	-19	Pass
DL1930-1995	-47.3	-19	Pass
DL869-894	-46.2	-19	Pass
DL:728-746	-50.4	-19	Pass
DL 746-757	-48.5	-19	Pass

Hi

Out of Band Emission			
Freq (MHz)	**Pre AGC**	**Limit (dBm)**	**Results**
UL1710-1755	-25.7	-19	Pass
UL1850-1915	-34.7	-19	Pass
UL824-849	-27.0	-19	Pass
UL 698-716	-25.3	-19	Pass
UL776-787	-30.4	-19	Pass
DL2110-2155	-44.4	-19	Pass
DL1930-1995	-48.0	-19	Pass
DL869-894	-46.5	-19	Pass
DL:728-746	-49.1	-19	Pass
DL 746-757	-52.4	-19	Pass

CDMA (alternative 1.25 MHz AWGN)

Low

Out of Band Emission			
Freq (MHz)	**Pre AGC**	**Limit (dBm)**	**Results**
UL1710-1755	-30.4	-19	Pass
UL1850-1915	-31.0	-19	Pass
UL824-849	-22.2	-19	Pass
UL 698-716	-25.0	-19	Pass
UL776-787	-24.6	-19	Pass
DL2110-2155	-62.5	-19	Pass
DL1930-1995	-59.7	-19	Pass
DL869-894	-65.5	-19	Pass
DL:728-746	-66.0	-19	Pass
DL 746-757	-66.0	-19	Pass

Hi

Out of Band Emission			
Freq (MHz)	**Pre AGC**	**Limit (dBm)**	**Results**
UL1710-1755	-27.6	-19	Pass
UL1850-1915	-38.7	-19	Pass
UL824-849	-24.9	-19	Pass
UL 698-716	-40.0	-19	Pass
UL776-787	-36.2	-19	Pass
DL2110-2155	-60.2	-19	Pass
DL1930-1995	-53.5	-19	Pass
DL869-894	-68.8	-19	Pass
DL:728-746	-67.2	-19	Pass
DL 746-757	-70.4	-19	Pass

LTE (alternative 4.1MHz AWGN)

Low

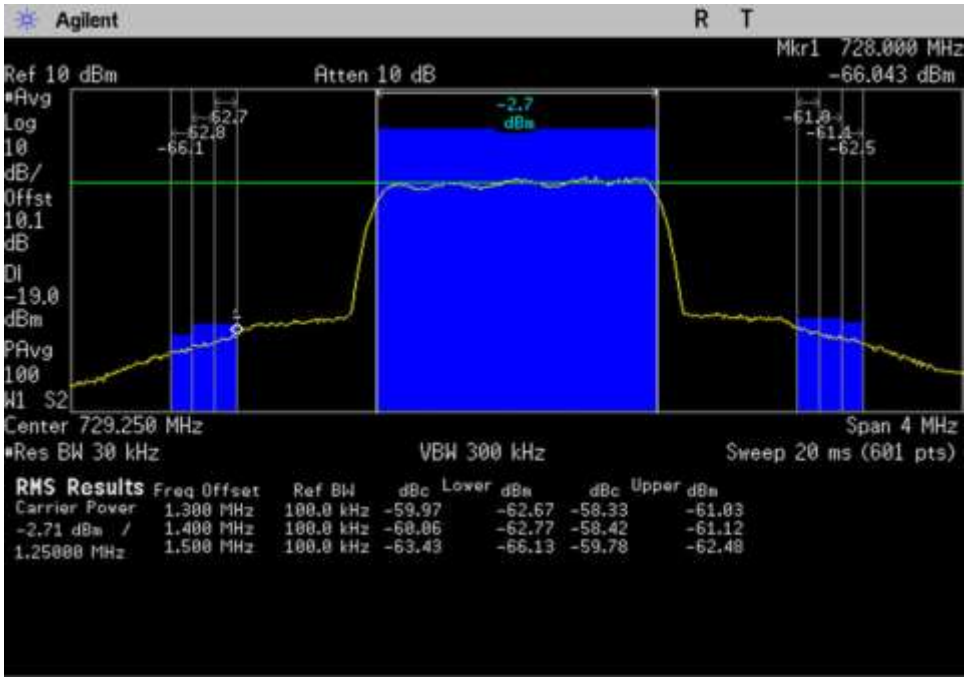
Out of Band Emission			
Freq (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-29.5	-19	Pass
UL1850-1915	-30.9	-19	Pass
UL824-849	-30.5	-19	Pass
UL 698-716	-30.1	-19	Pass
UL776-787	-27.0	-19	Pass
DL2110-2155	-52.9	-19	Pass
DL1930-1995	-51.4	-19	Pass
DL869-894	-53.3	-19	Pass
DL:728-746	-59.0	-19	Pass
DL 746-757	-55.5	-19	Pass

Hi

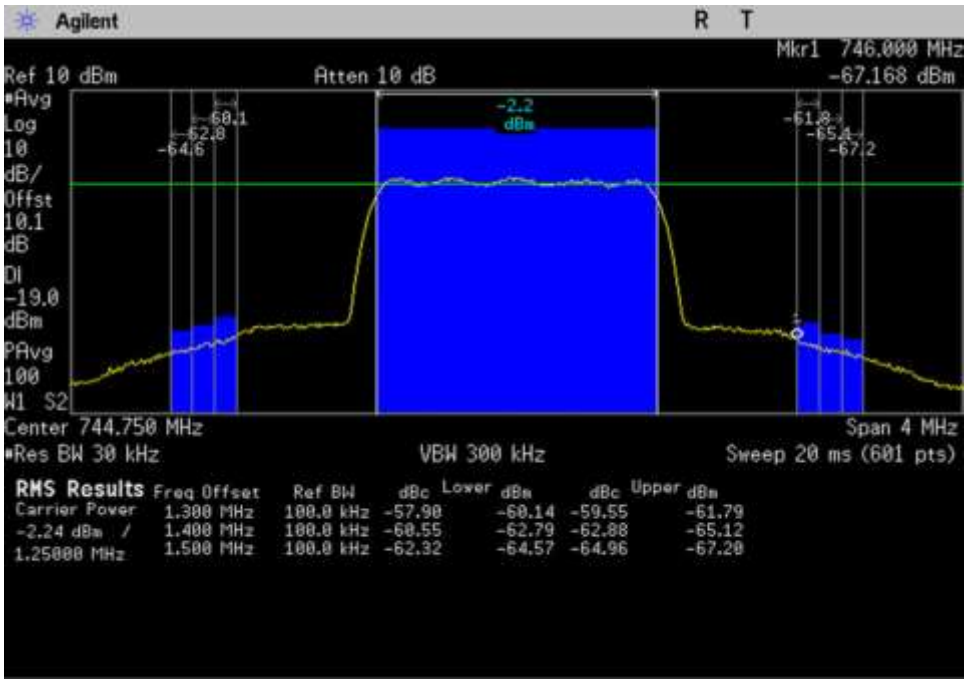
Out of Band Emission			
Freq (MHz)	Pre AGC	Limit (dBm)	Results
UL1710-1755	-28.9	-19	Pass
UL1850-1915	-38.6	-19	Pass
UL824-849	-31.9	-19	Pass
UL 698-716	-35.4	-19	Pass
UL776-787	-33.3	-19	Pass
DL2110-2155	-50.9	-19	Pass
DL1930-1995	-54.1	-19	Pass
DL869-894	-54.9	-19	Pass
DL:728-746	-56.6	-19	Pass
DL 746-757	-62.1	-19	Pass

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

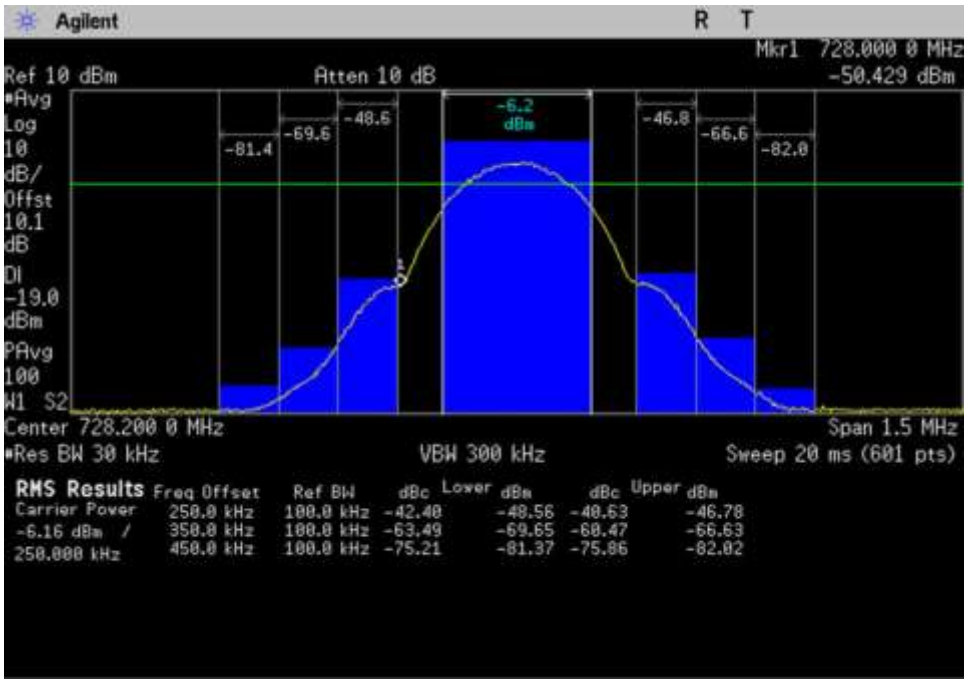
Plots



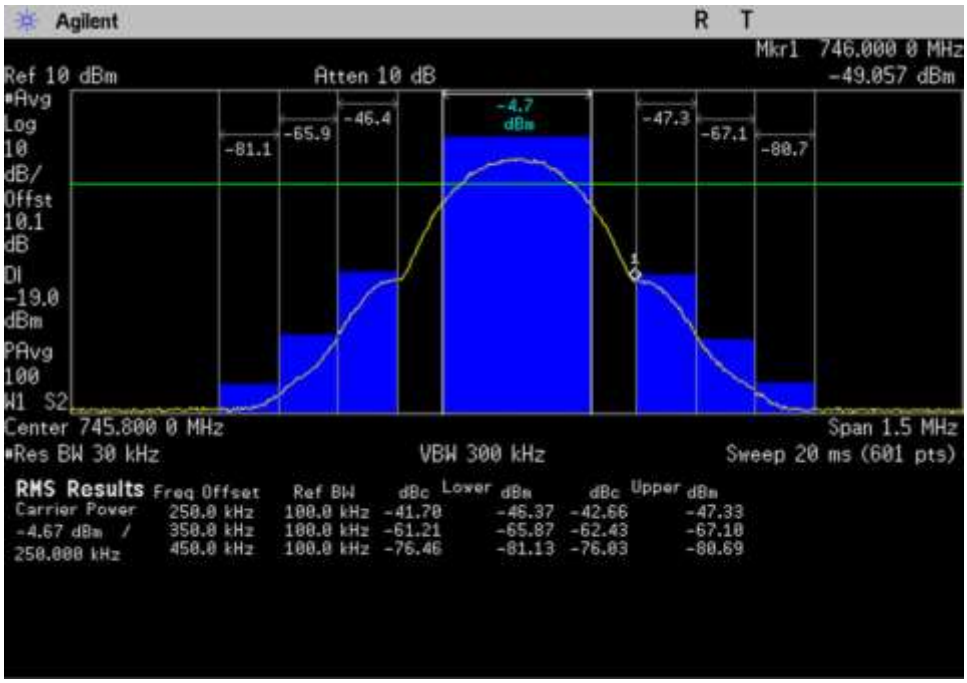
7.5 OBE_DL_728-746_CDMA_ 727.25- 731.25MHz



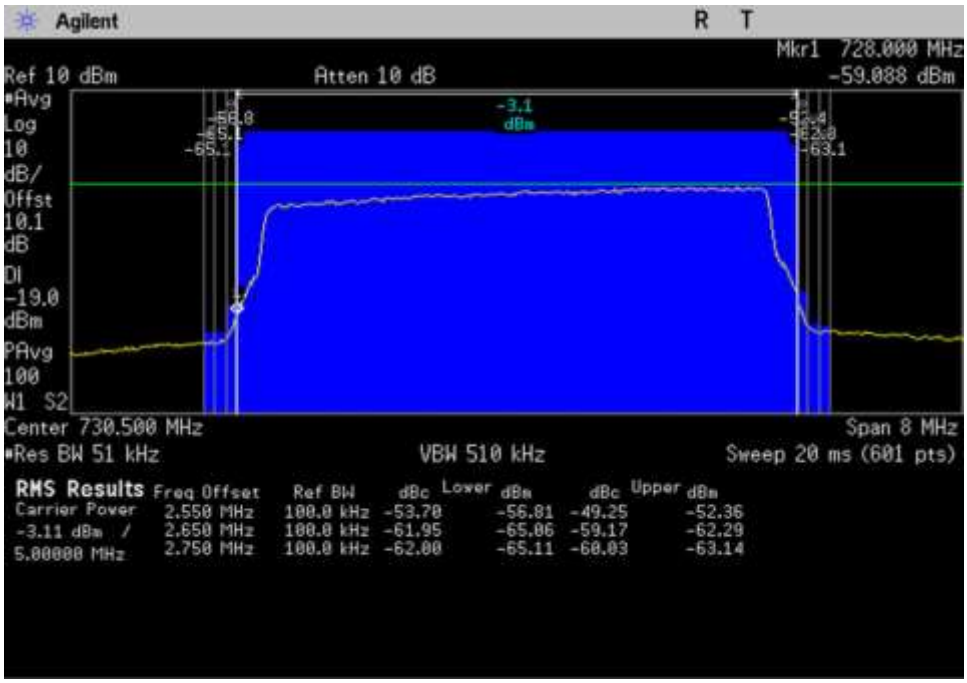
7.5 OBE_DL_728-746_CDMA_ 742.75- 746.75MHz



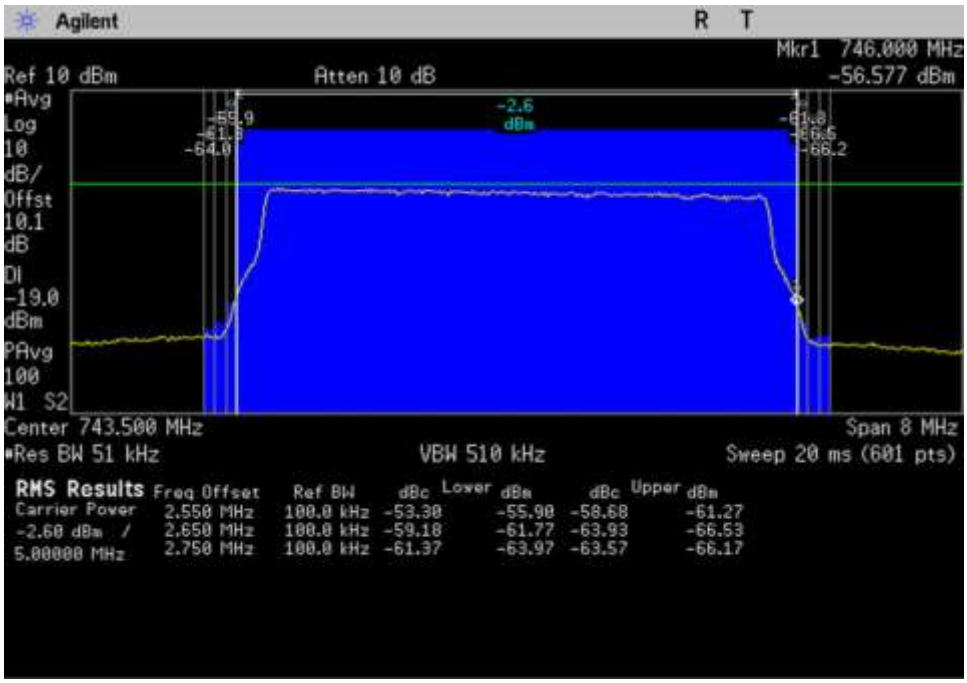
7.5 OBE_DL_728-746_GSM_ 727.45- 728.95MHz



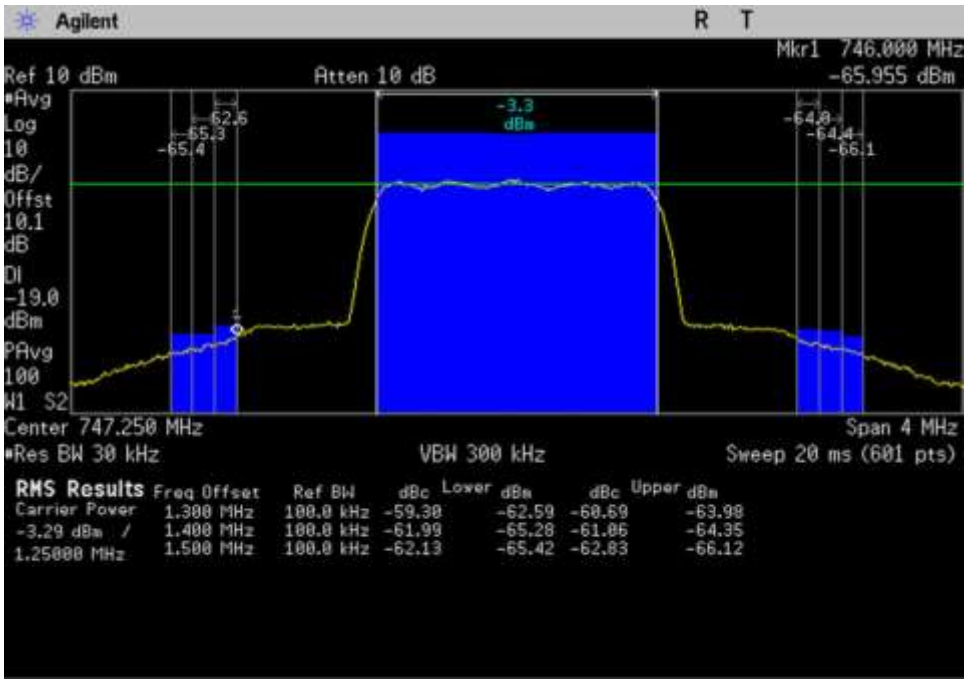
7.5 OBE_DL_728-746_GSM_ 745.05- 746.55MHz



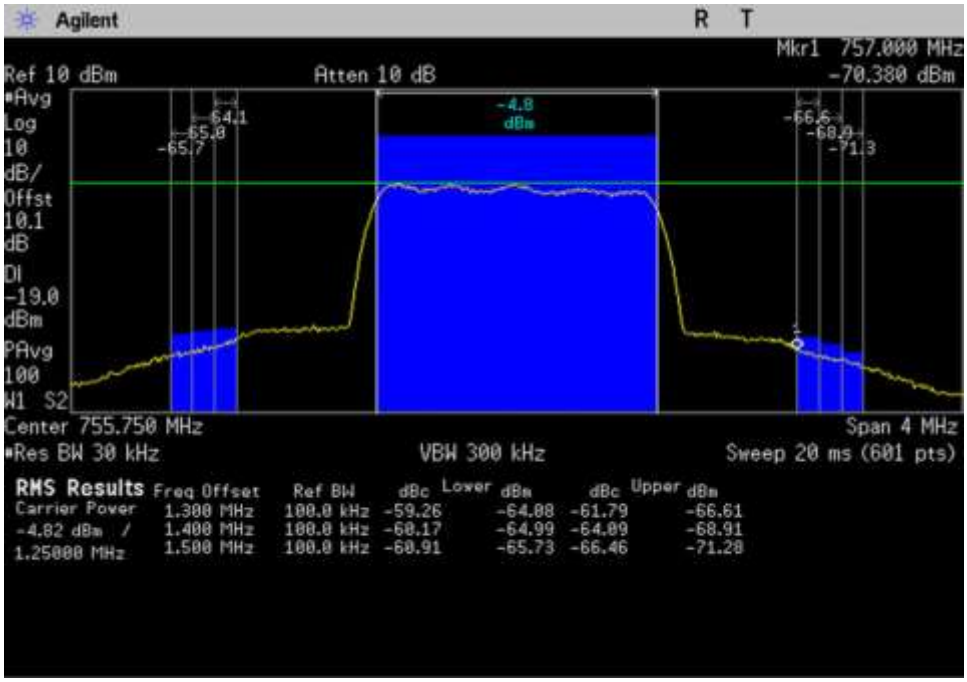
7.5 OBE_DL_728-746_LTE_ 726.5- 734.5MHz



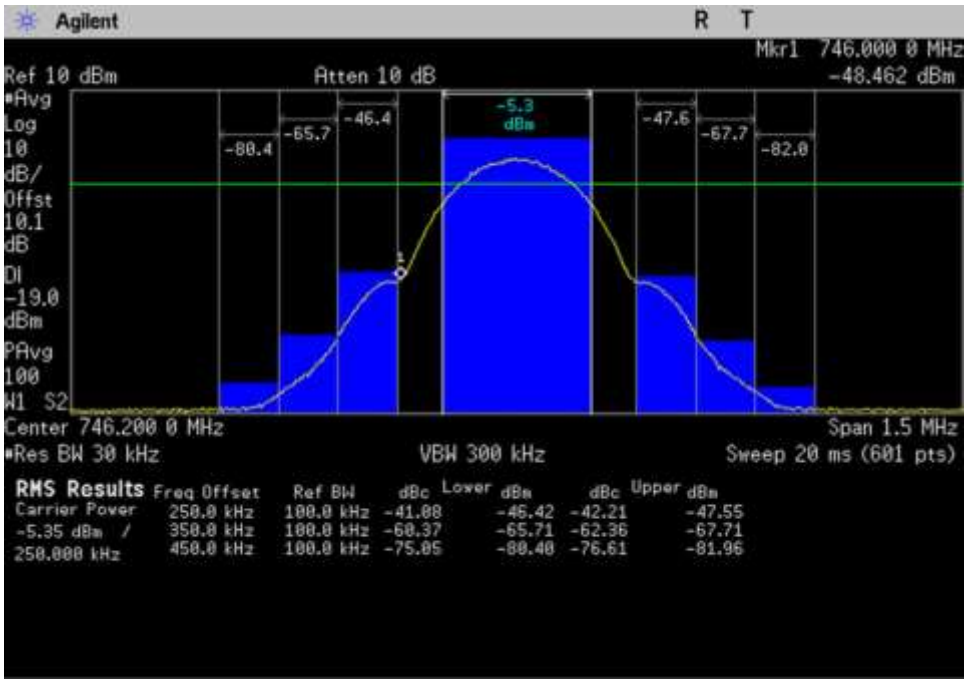
7.5 OBE_DL_728-746_LTE_ 739.5- 747.5MHz



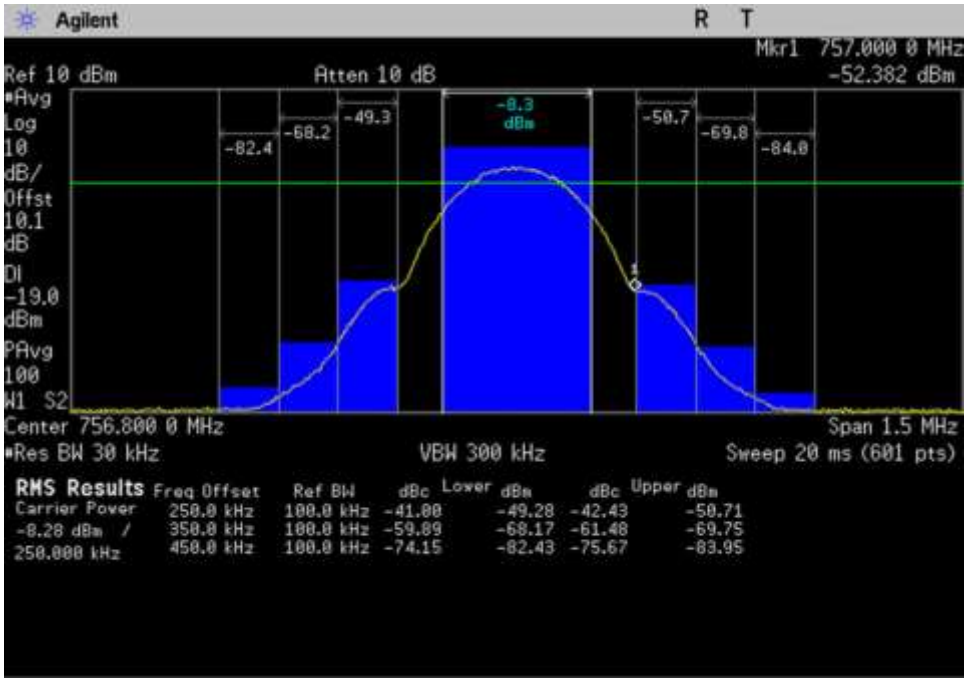
7.5 OBE_DL_746-757_CDMA_ 745.25- 749.25MHz



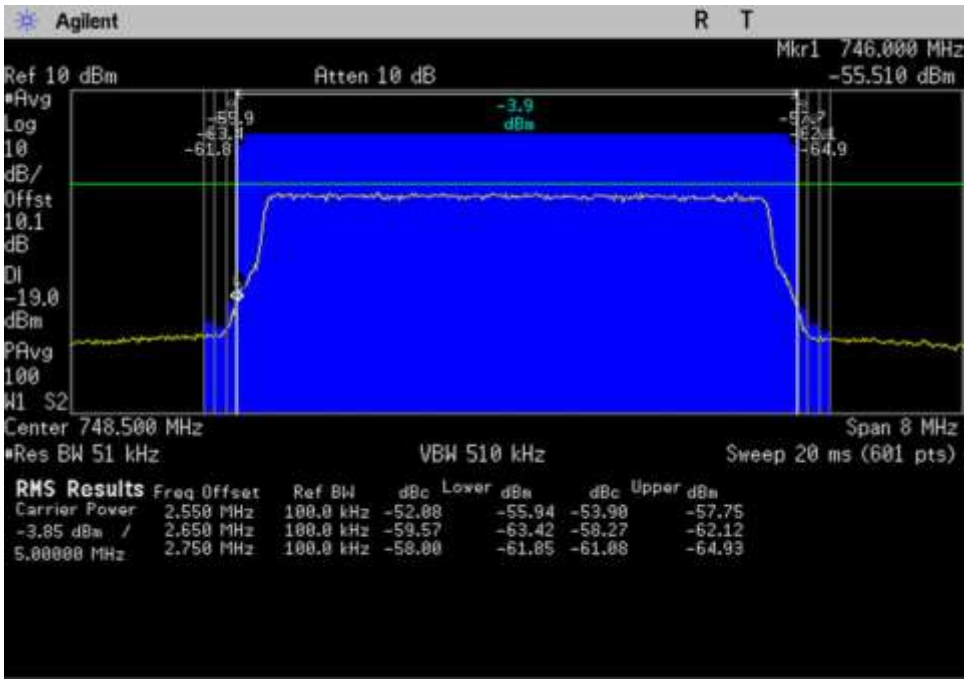
7.5 OBE_DL_746-757_CDMA_ 753.75- 757.75MHz



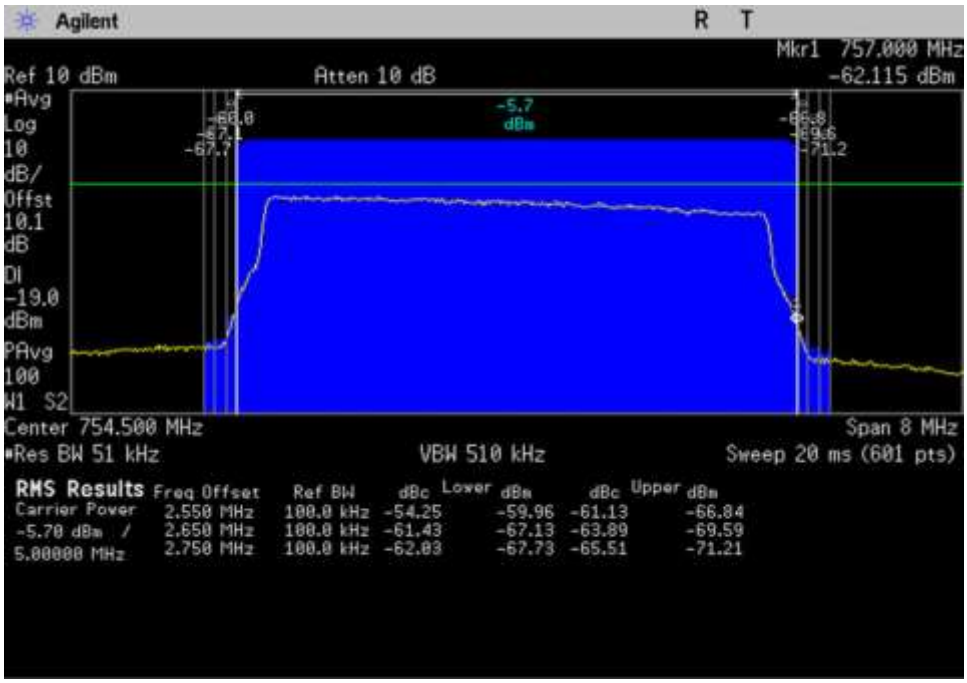
7.5 OBE_DL_746-757_GSM_ 745.45- 746.95MHz



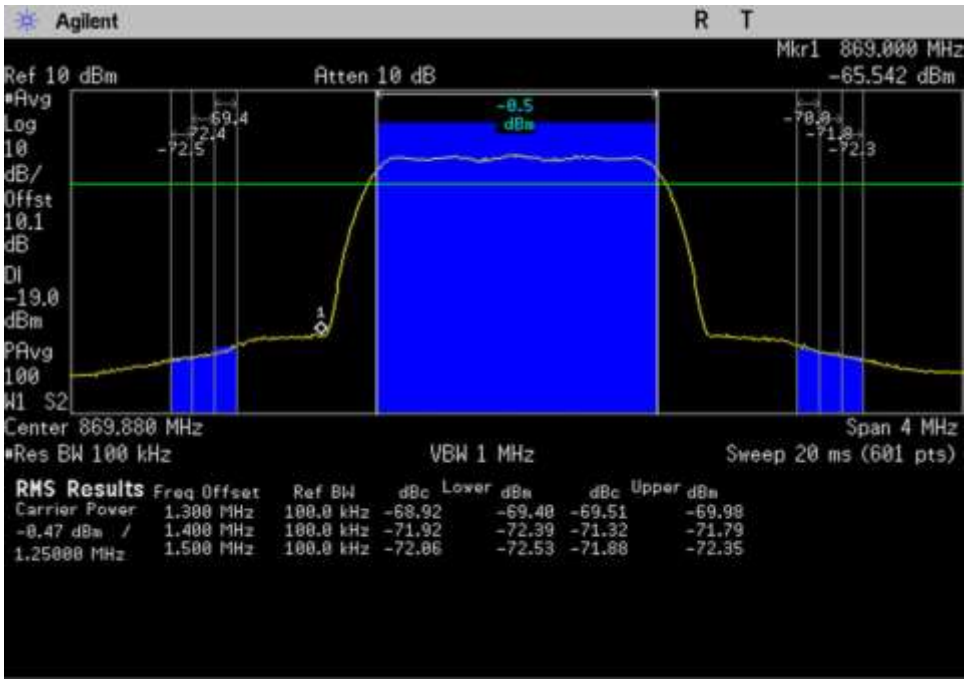
7.5 OBE_DL_746-757_GSM_ 756.05- 757.55MHz



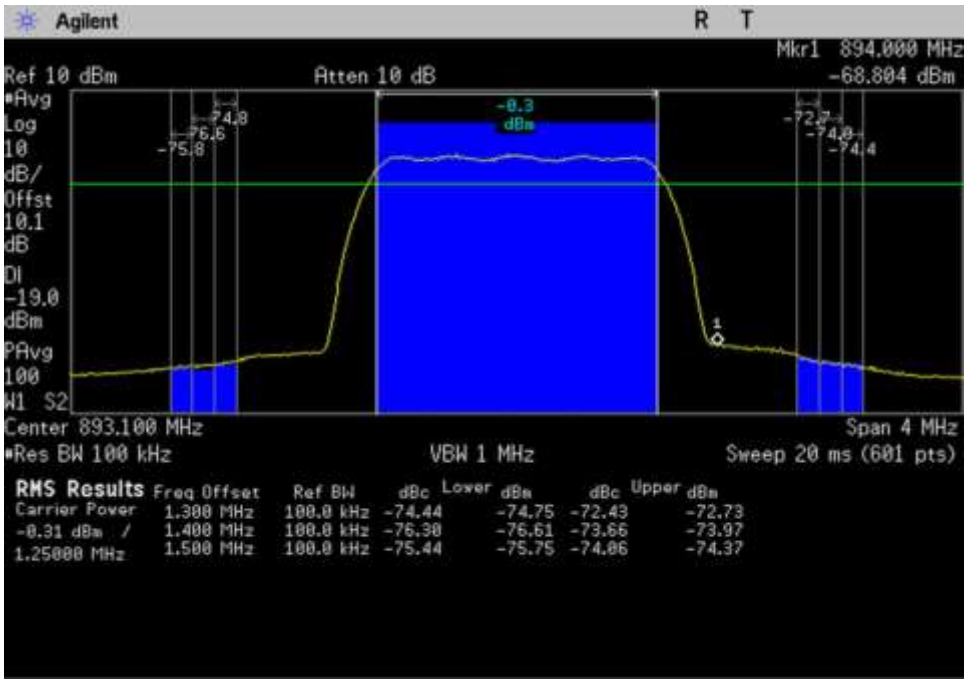
7.5 OBE_DL_746-757_LTE_ 744.5- 752.5MHz



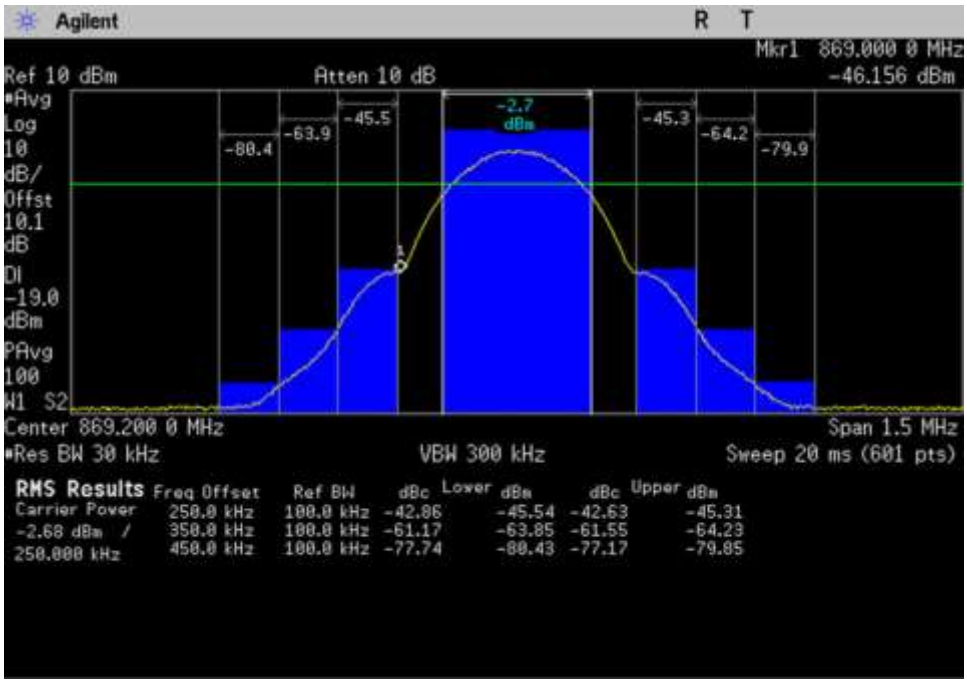
7.5 OBE_DL_746-757_LTE_ 750.5- 758.5MHz



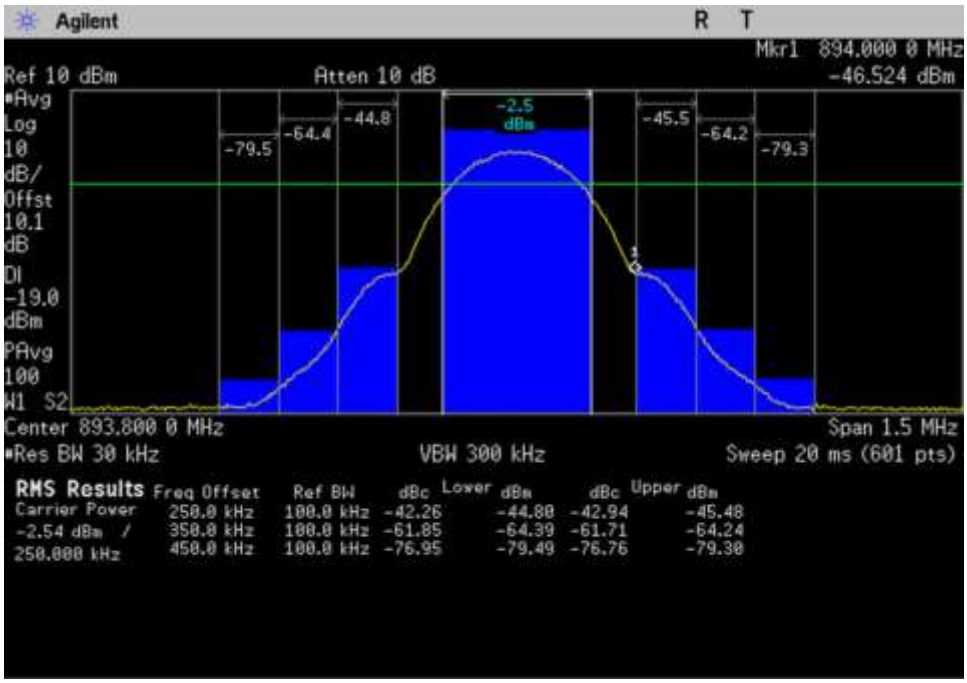
7.5 OBE_DL_869-894_CDMA_ 867.88- 871.88MHz



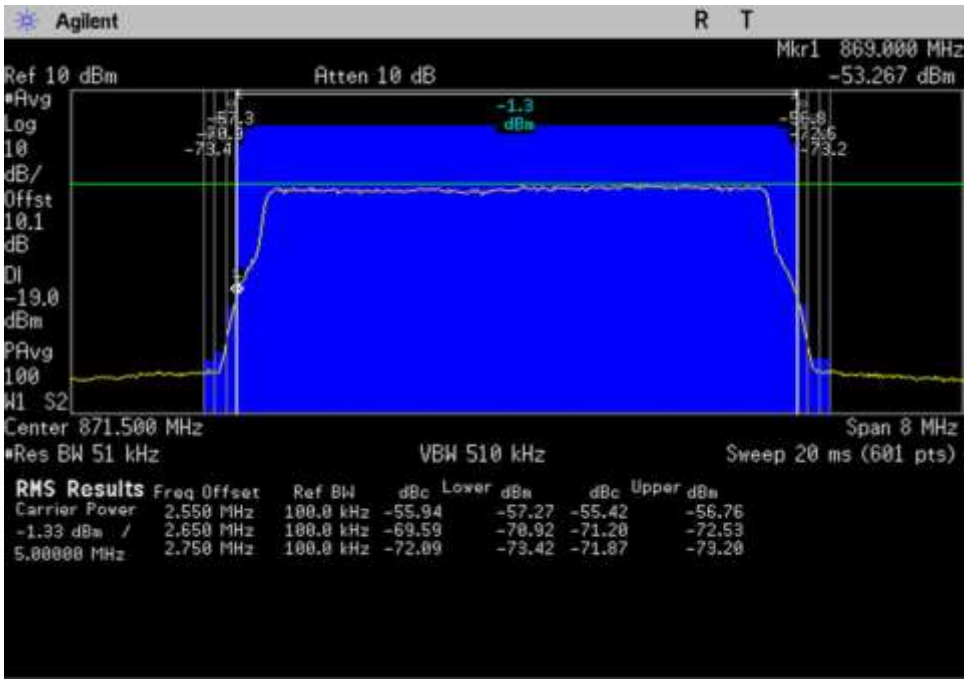
7.5 OBE_DL_869-894_CDMA_ 891.1- 895.1MHz



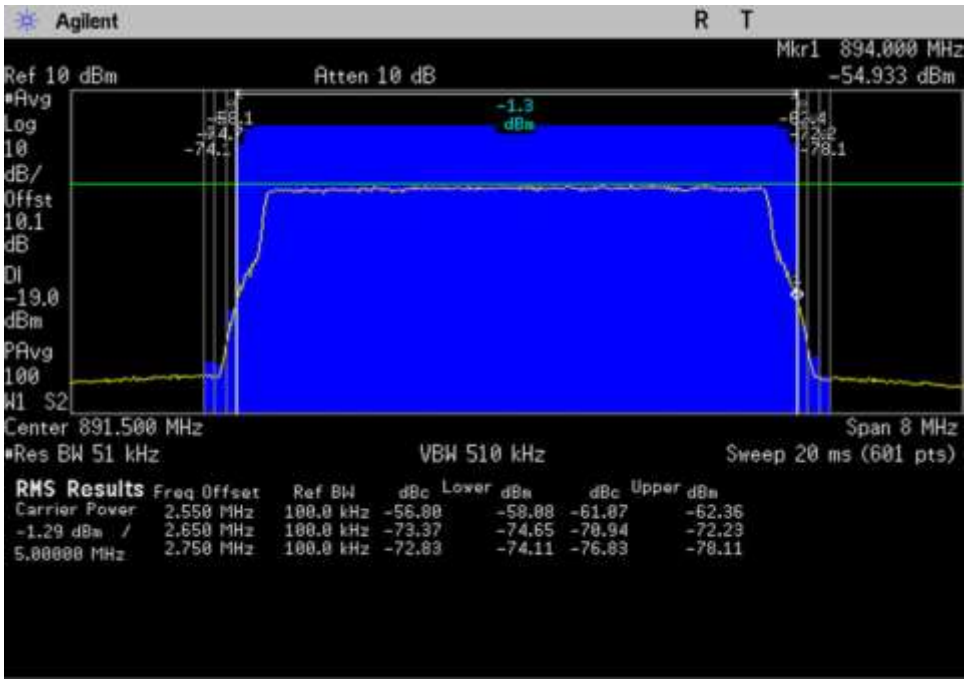
7.5 OBE_DL_869-894_GSM_ 868.45- 869.95MHz



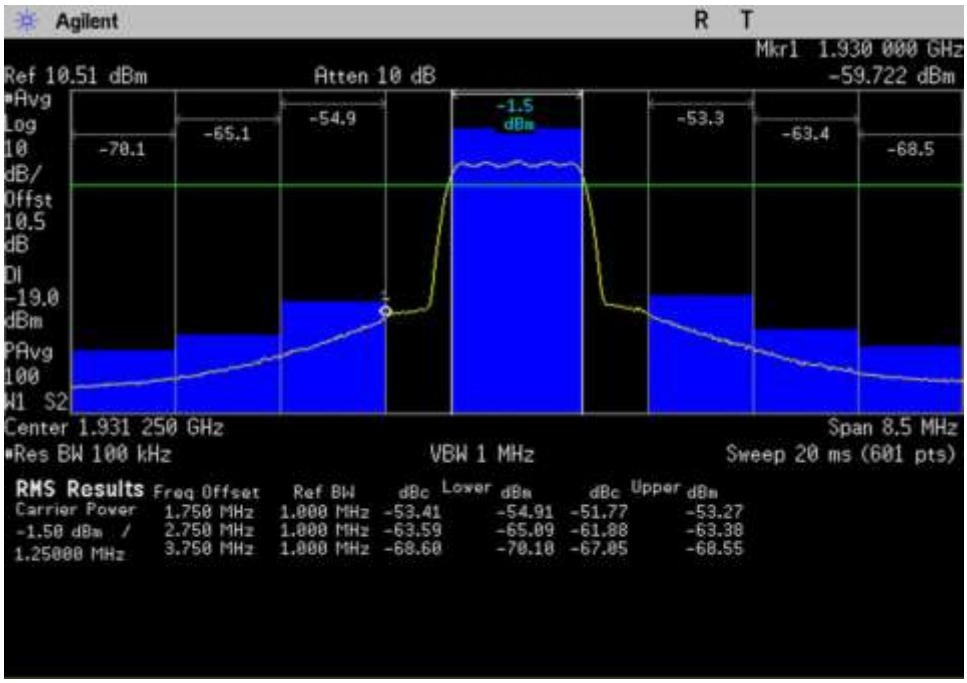
7.5 OBE_DL_869-894_GSM_ 893.05- 894.55MHz



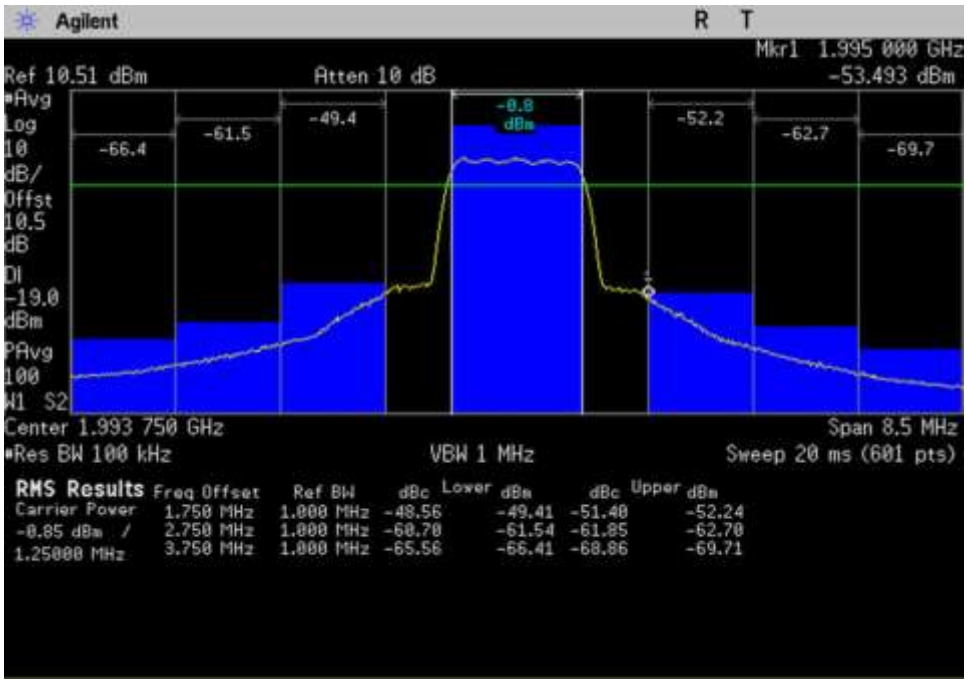
7.5 OBE_DL_869-894_LTE_ 867.5- 875.5MHz



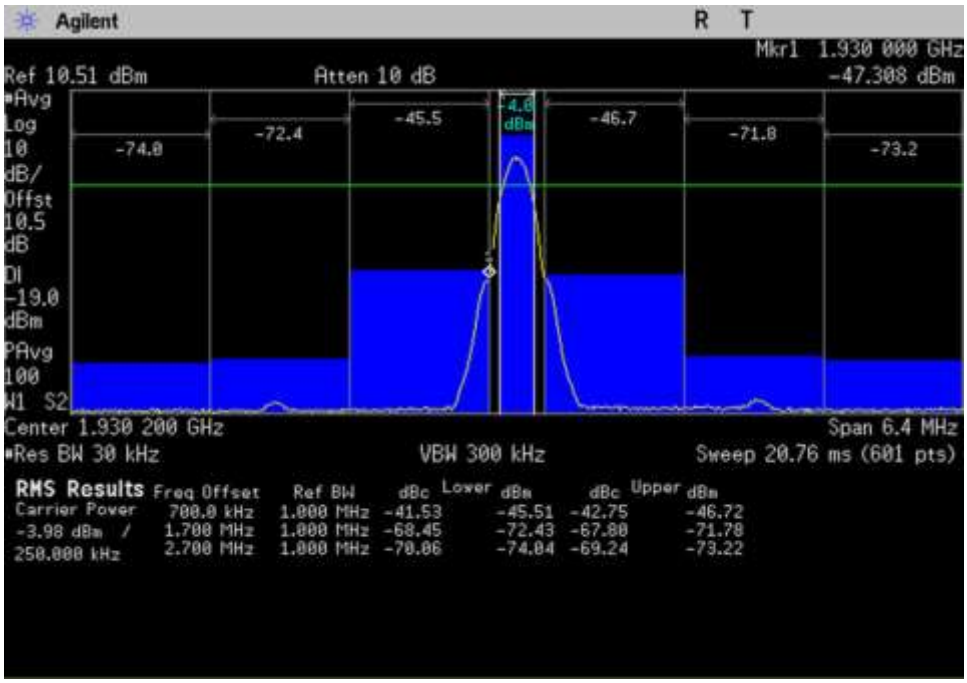
7.5 OBE_DL_869-894_LTE_ 887.5- 895.5MHz



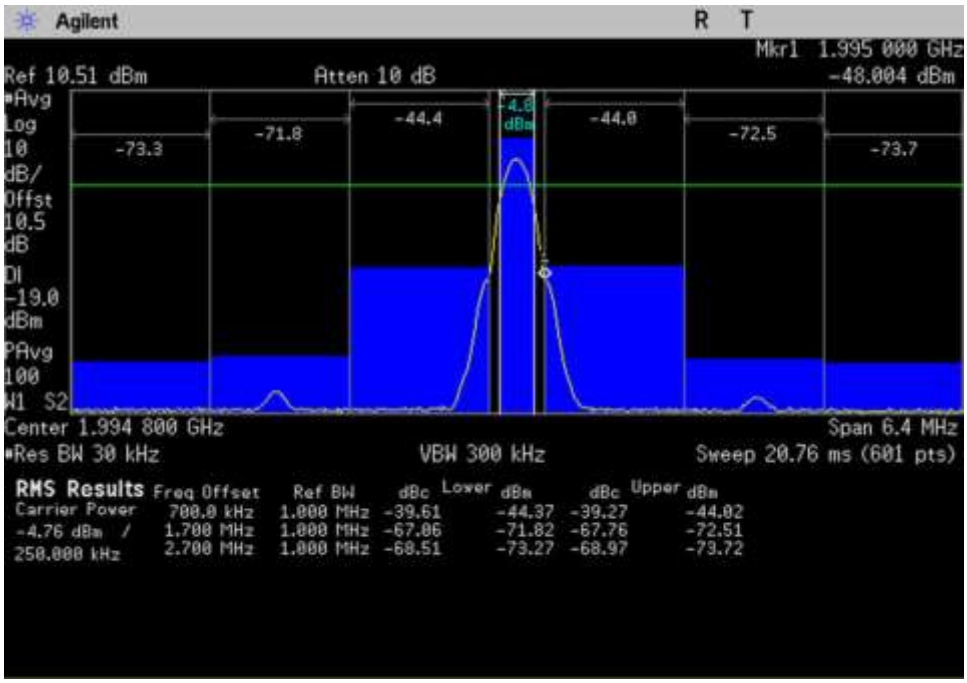
7.5 OBE_DL_1930-1995_CDMA_ 1927- 1935.5MHz



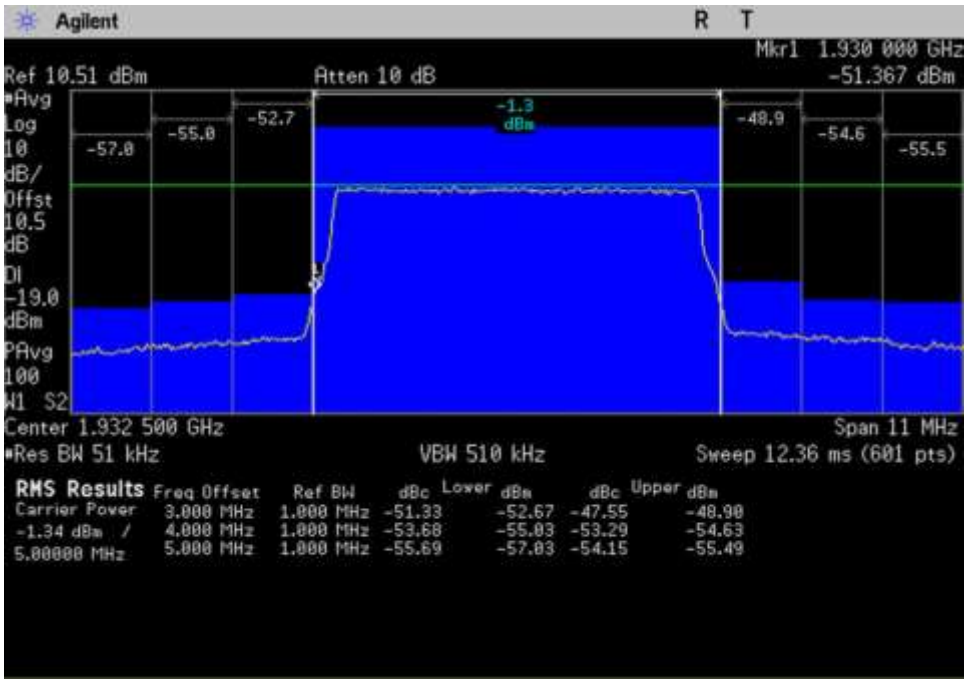
7.5 OBE_DL_1930-1995_CDMA_ 1989.5- 1998MHz



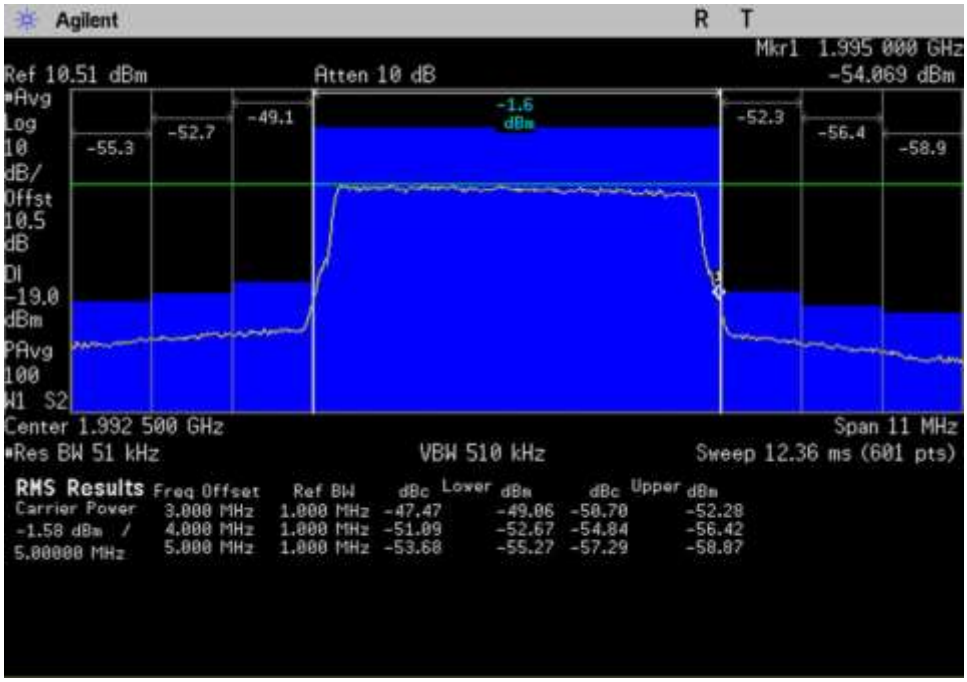
7.5 OBE_DL_1930-1995_GSM_ 1927- 1933.4MHz



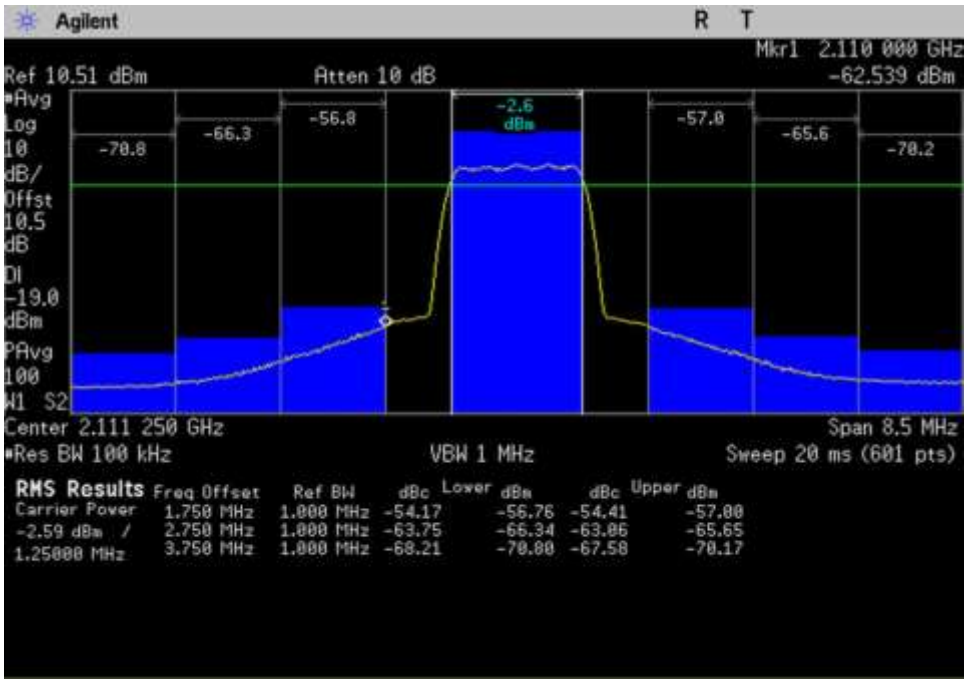
7.5 OBE_DL_1930-1995_GSM_ 1991.6- 1998MHz



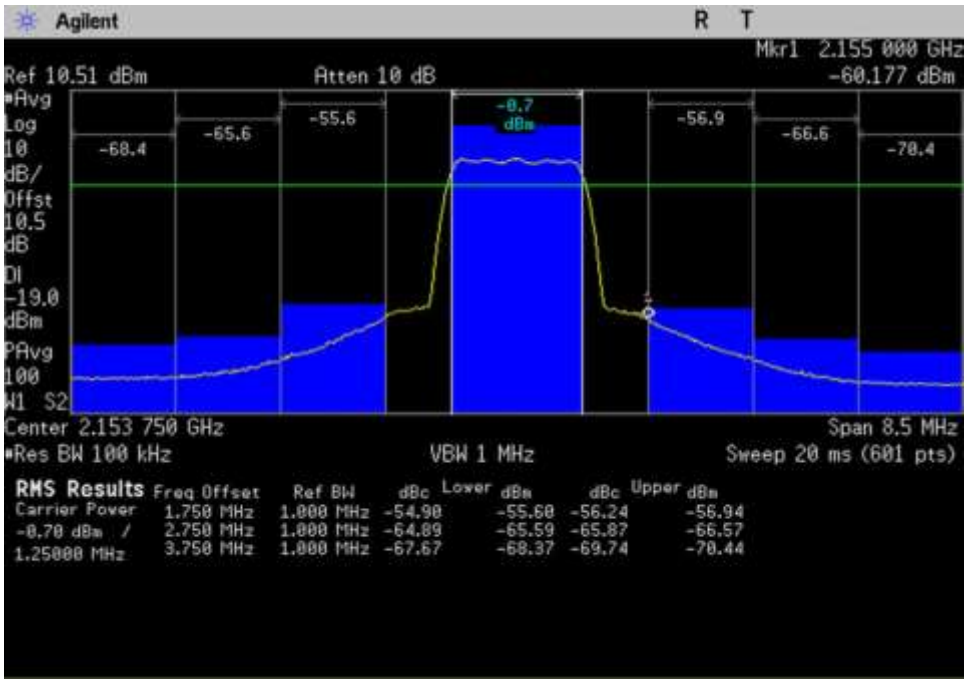
7.5 OBE_DL_1930-1995_LTE_ 1927- 1938MHz



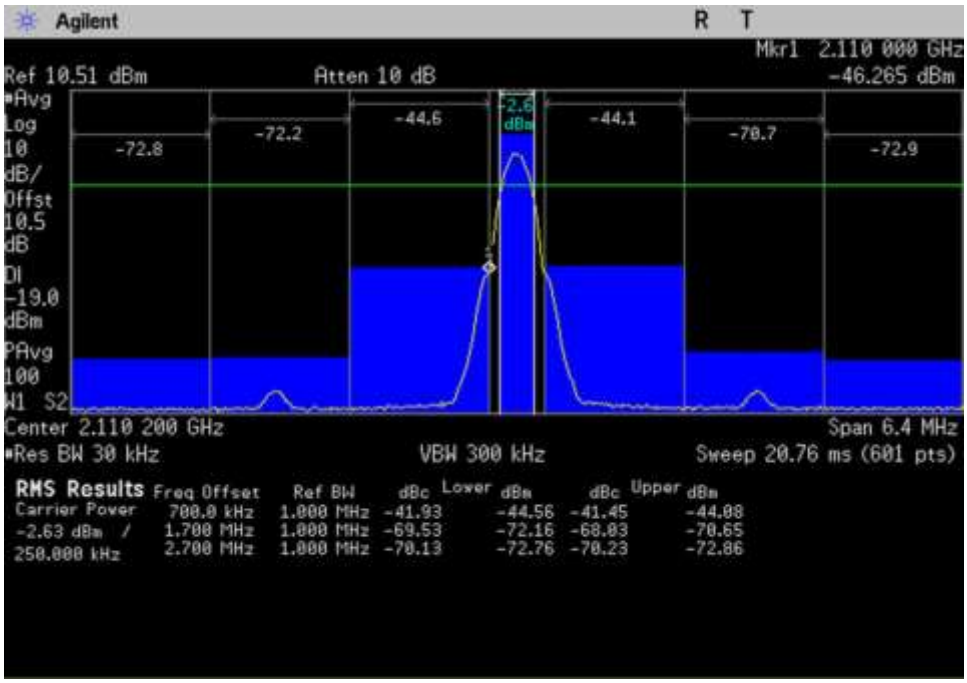
7.5 OBE_DL_1930-1995_LTE_ 1987- 1998MHz



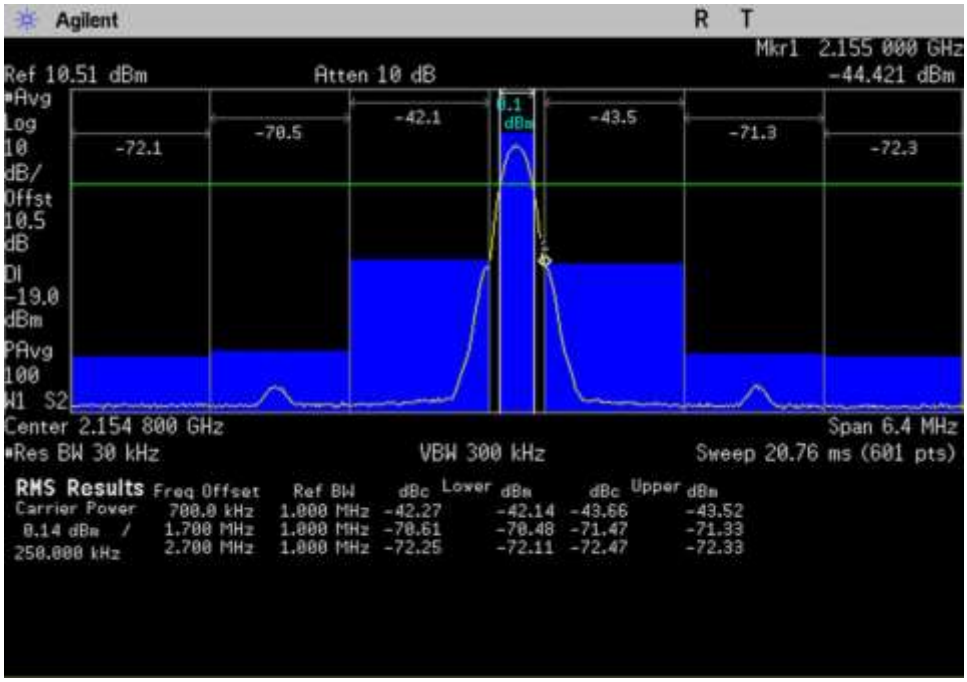
7.5 OBE_DL_2110-2155_CDMA_ 2107- 2115.5MHz



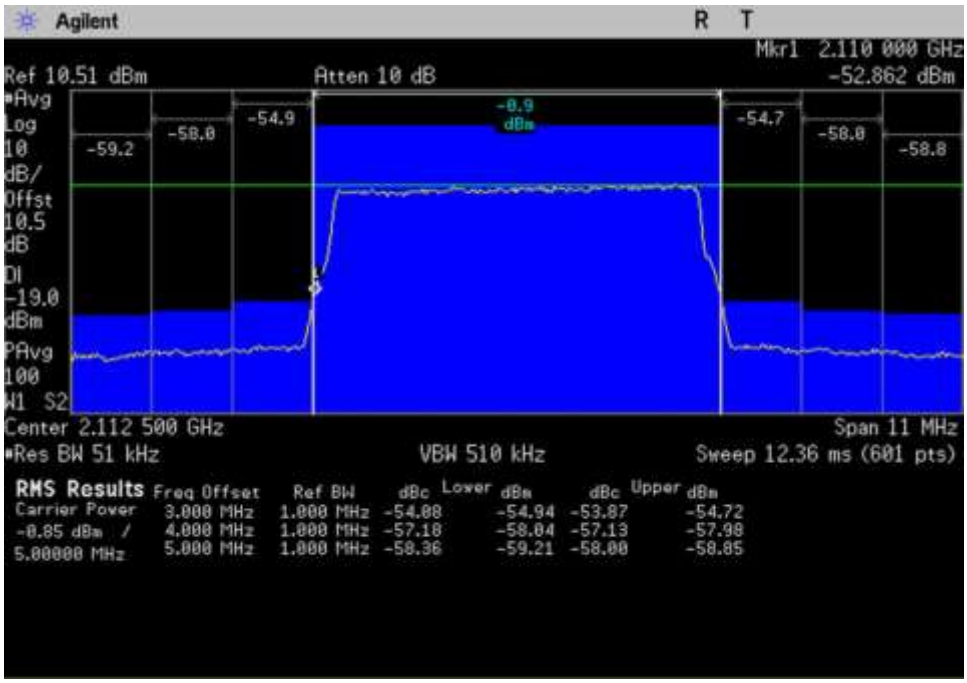
7.5 OBE_DL_2110-2155_CDMA_ 2149.5- 2158MHz



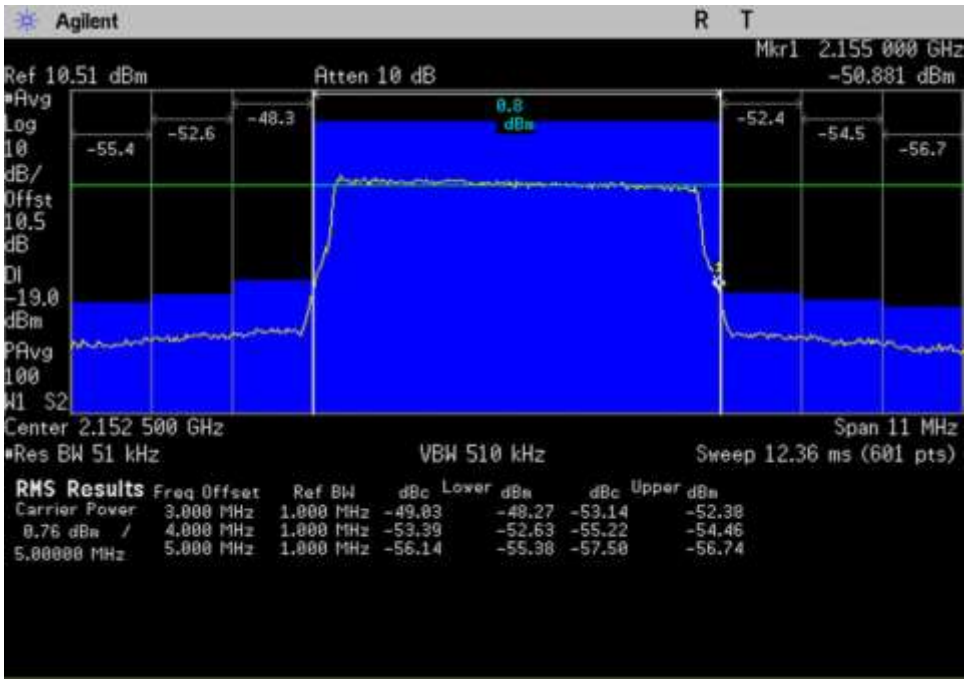
7.5 OBE_DL_2110-2155_GSM_ 2107- 2113.4MHz



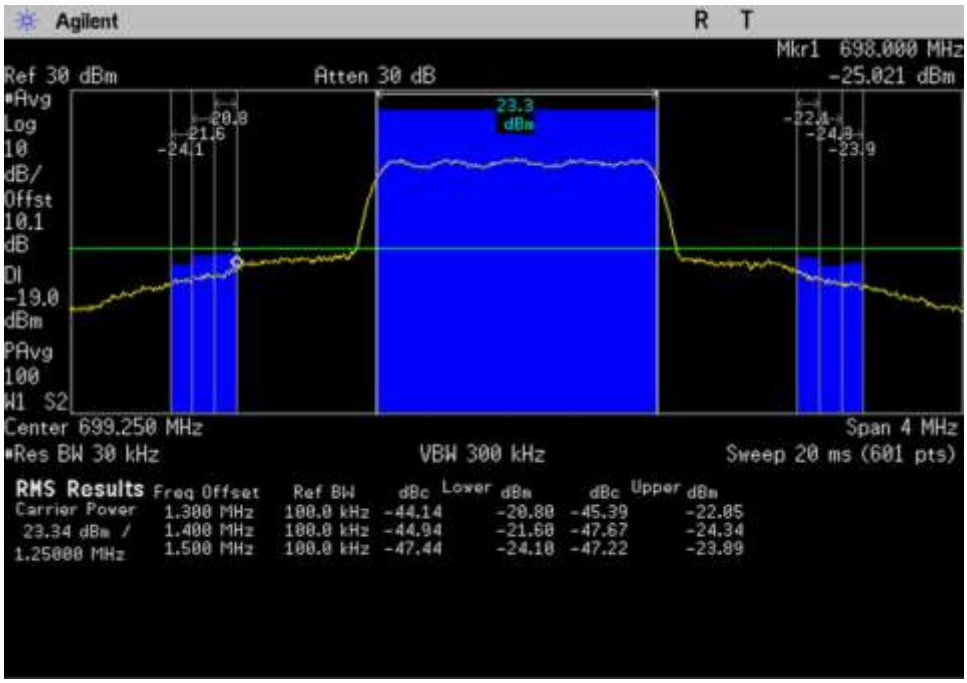
7.5 OBE_DL_2110-2155_GSM_ 2151.6- 2158MHz



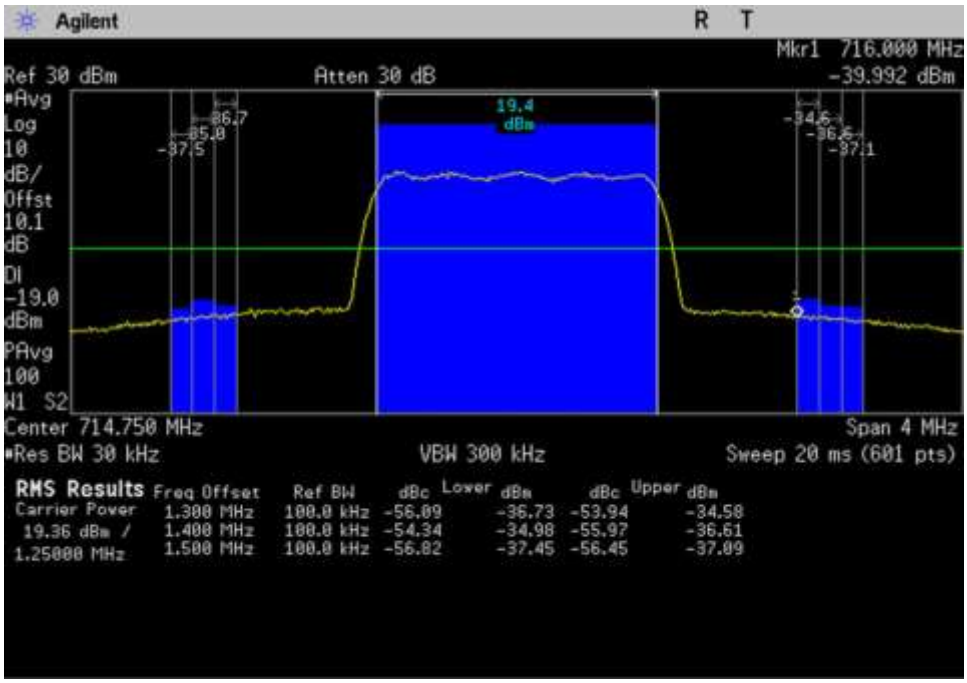
7.5 OBE_DL_2110-2155_LTE_ 2107- 2118MHz



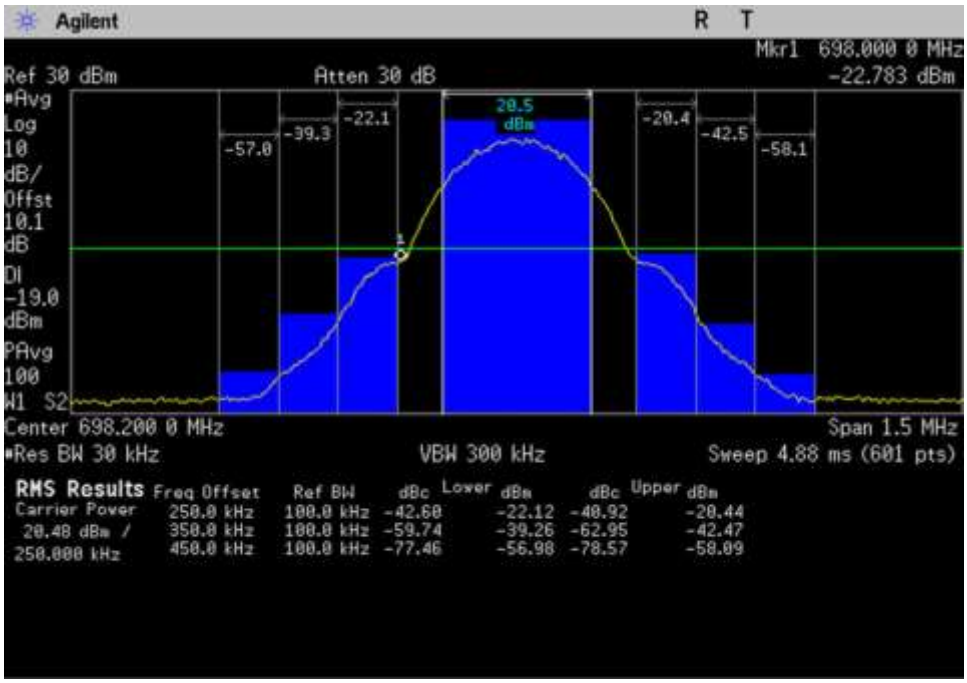
7.5 OBE_DL_2110-2155_LTE_ 2147- 2158MHz



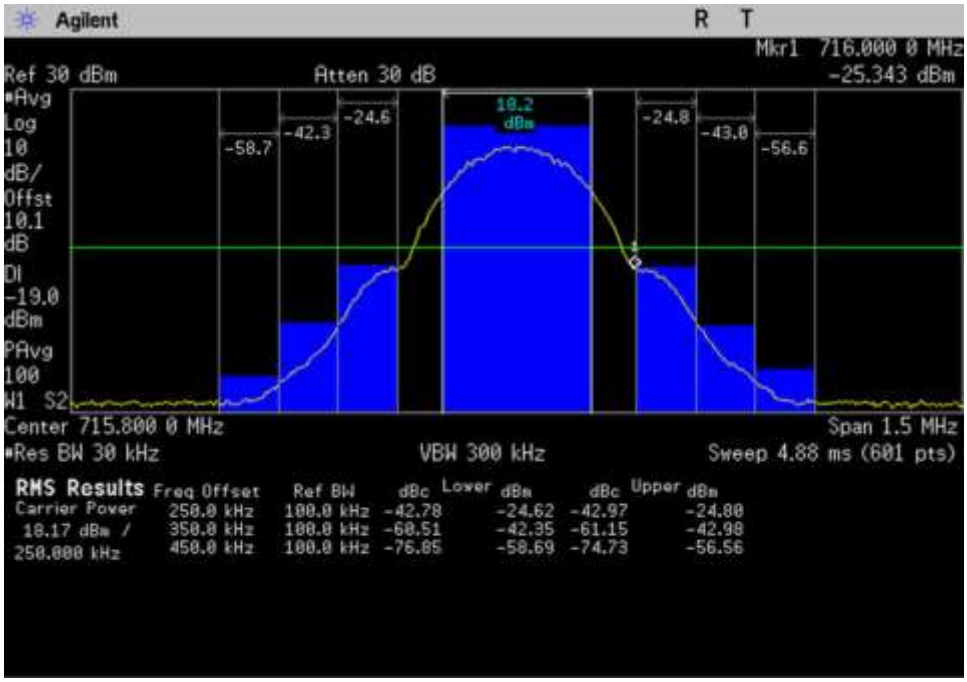
7.5 OBE_UL_698-716_CDMA_ 697.25- 701.25MHz



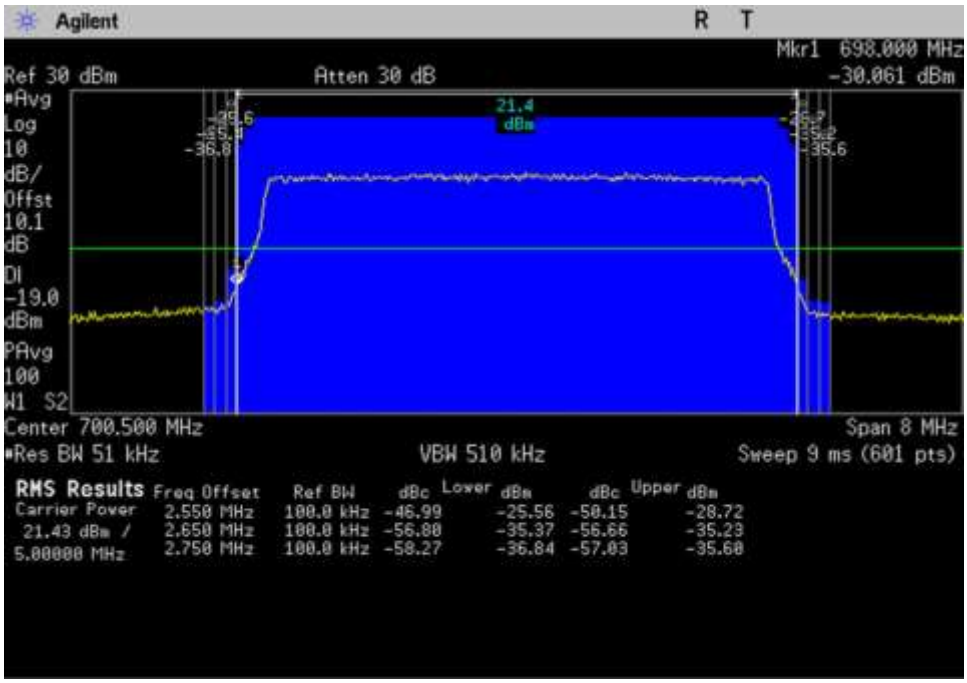
7.5 OBE_UL_698-716_CDMA_ 712.75- 716.75MHz



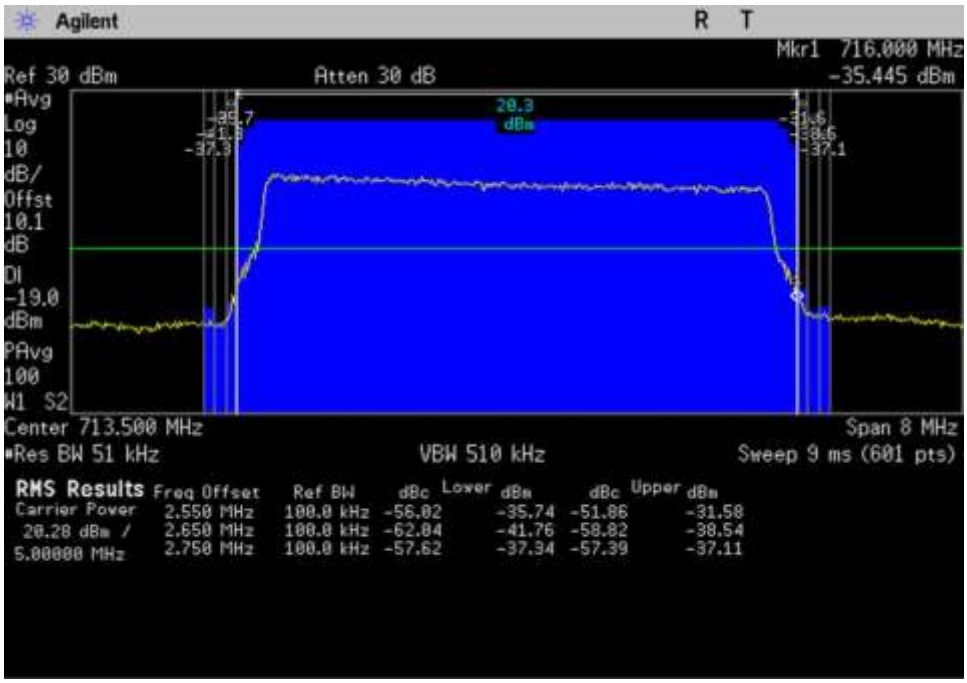
7.5 OBE_UL_698-716_GSM_ 697.45- 698.95MHz



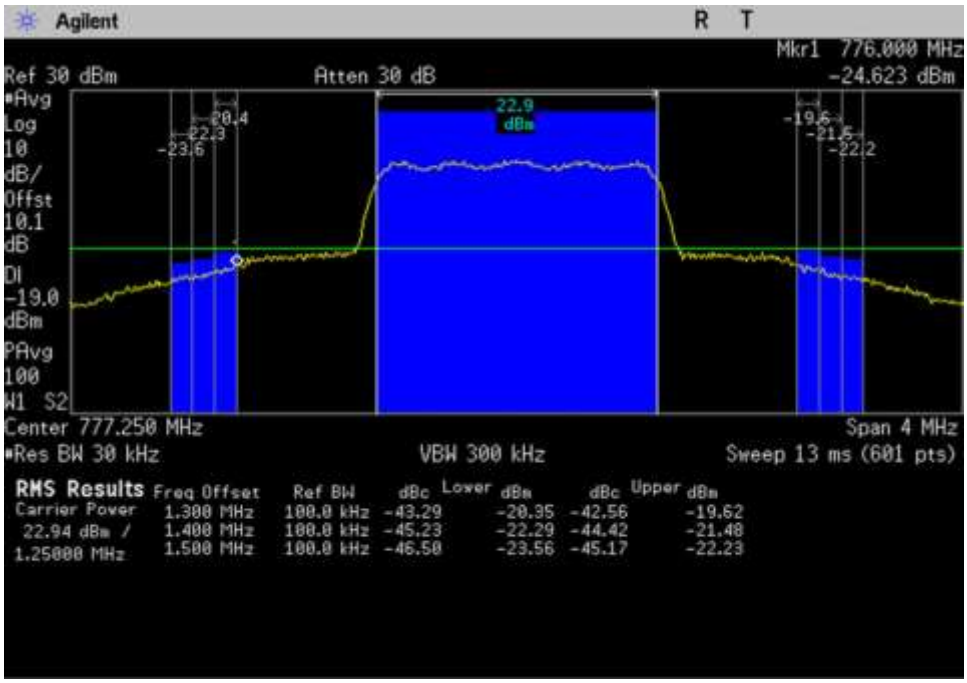
7.5 OBE_UL_698-716_GSM_ 715.05- 716.55MHz



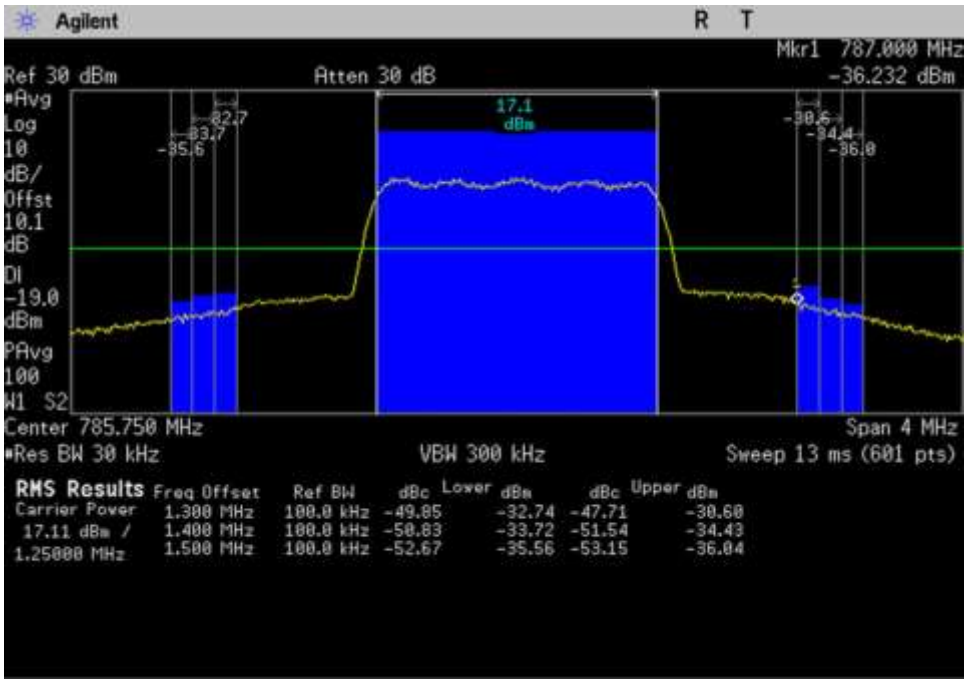
7.5 OBE_UL_698-716_LTE_ 696.5- 704.5MHz



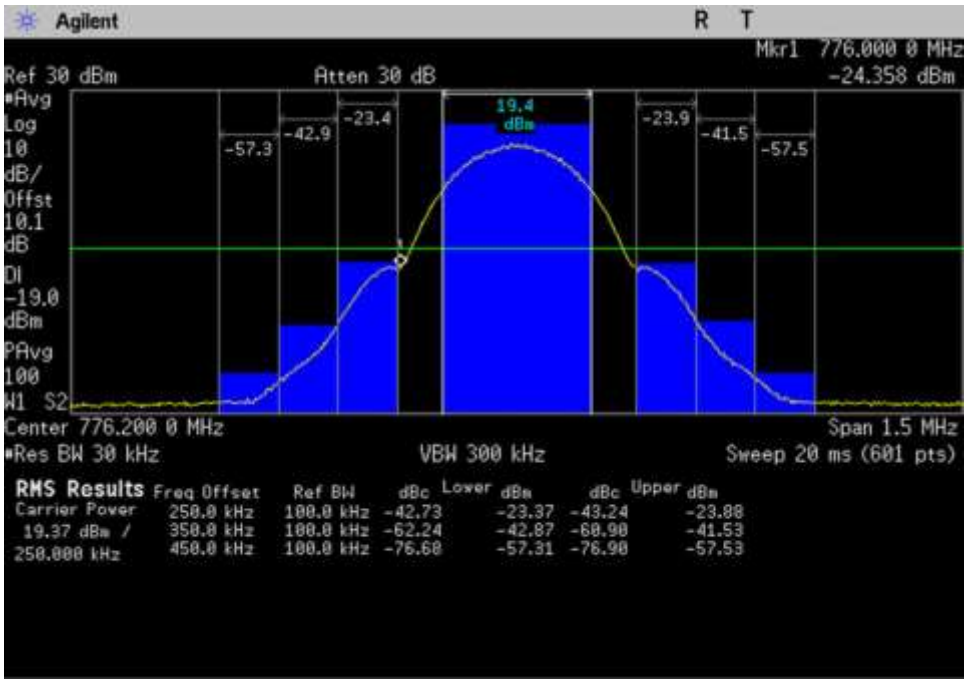
7.5 OBE_UL_698-716_LTE_ 709.5- 717.5MHz



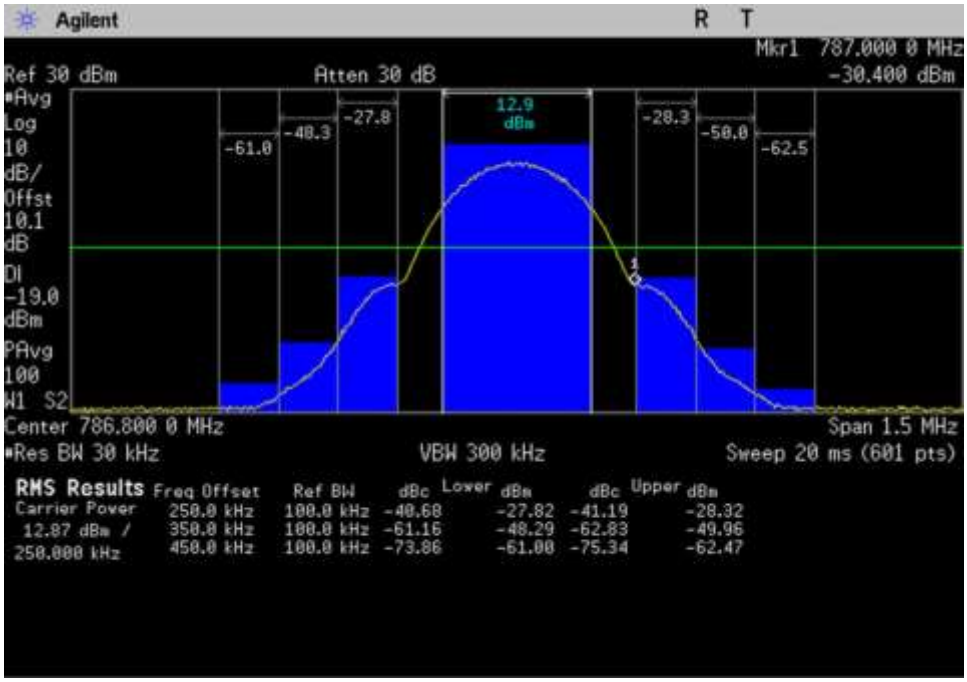
7.5 OBE_UL_776-787_CDMA_ 775.25- 779.25MHz



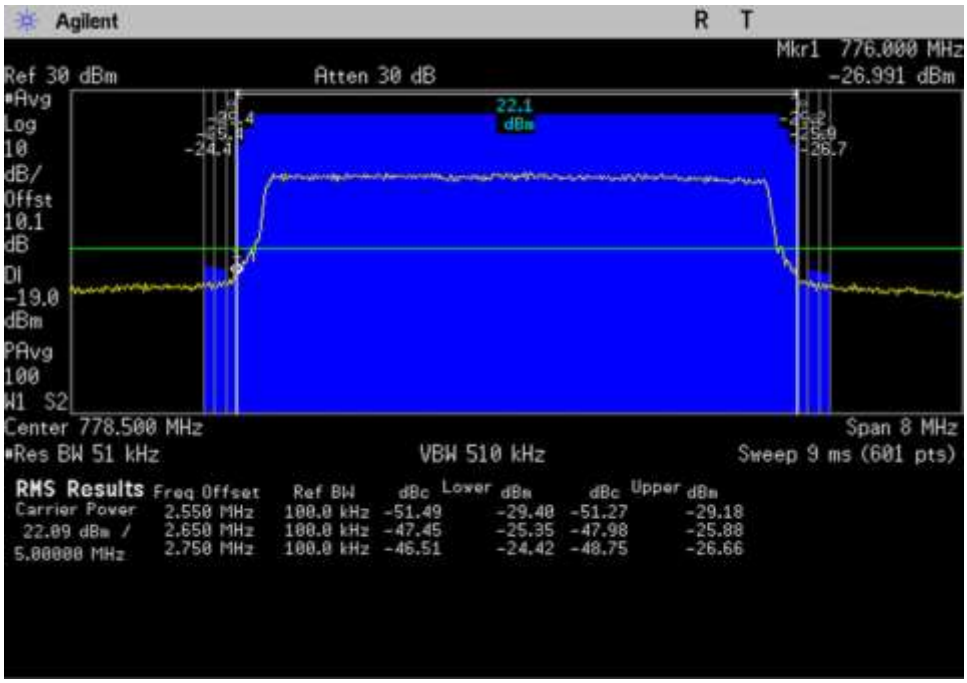
7.5 OBE_UL_776-787_CDMA_ 783.75- 787.75MHz



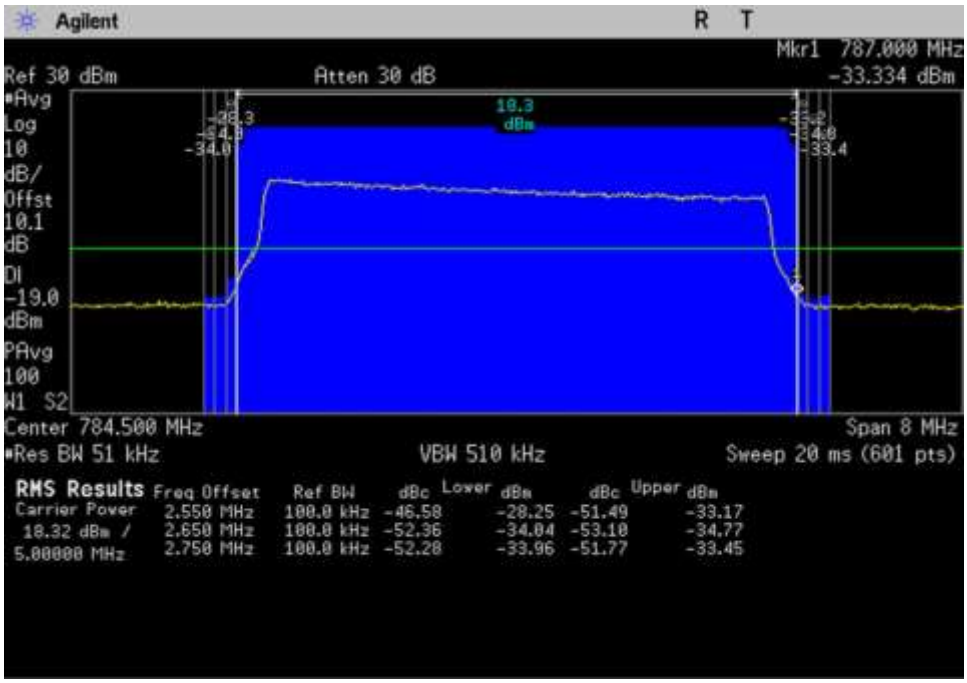
7.5 OBE_UL_776-787_GSM_ 775.45- 776.95MHz



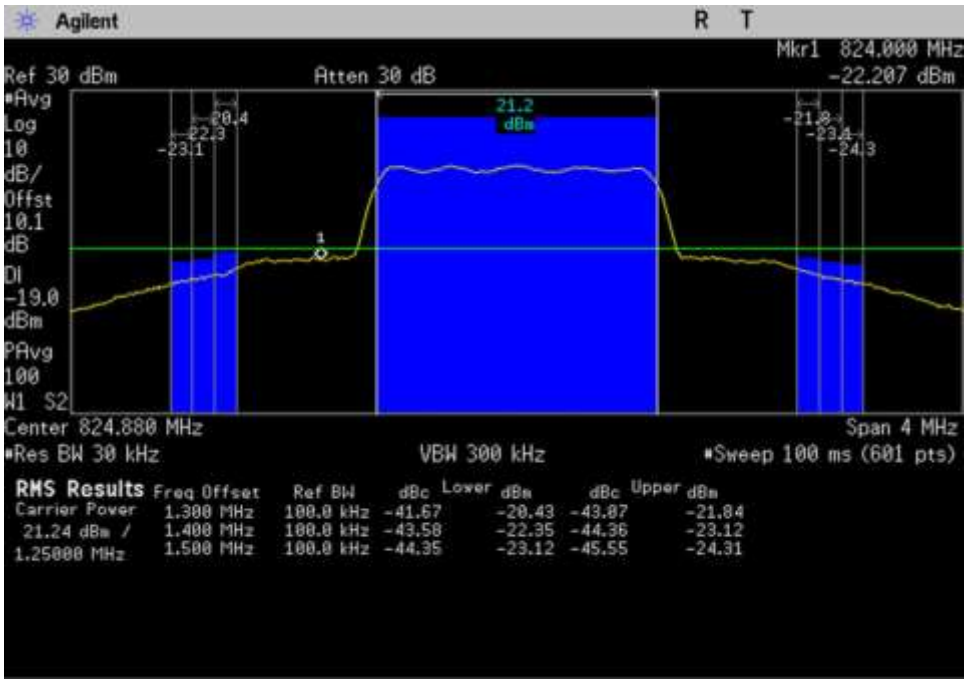
7.5 OBE_UL_776-787_GSM_ 786.05- 787.55MHz



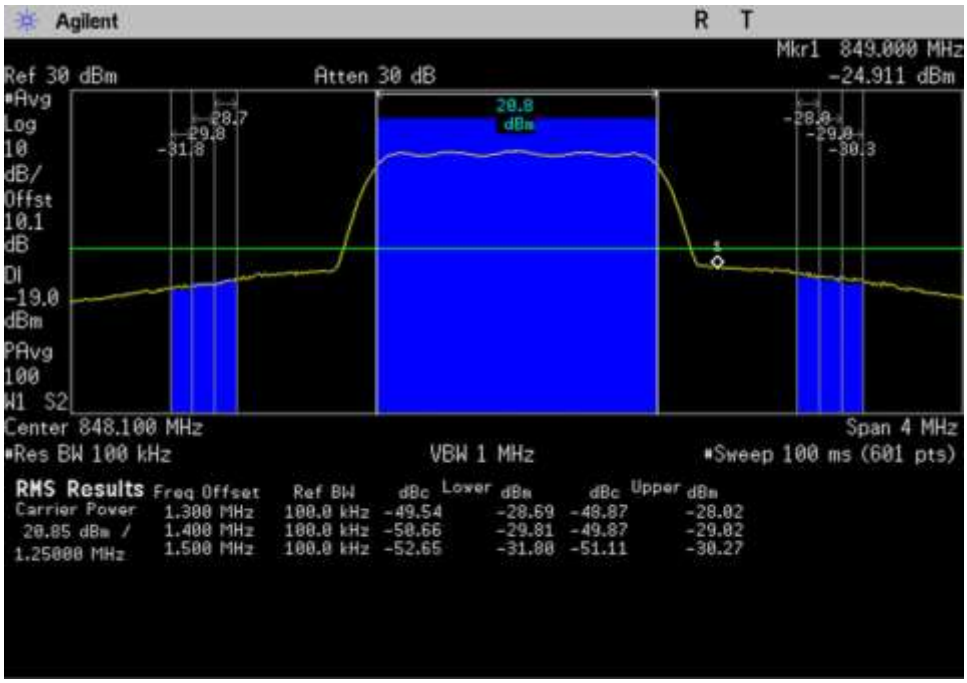
7.5 OBE_UL_776-787_LTE_ 774.5- 782.5MHz



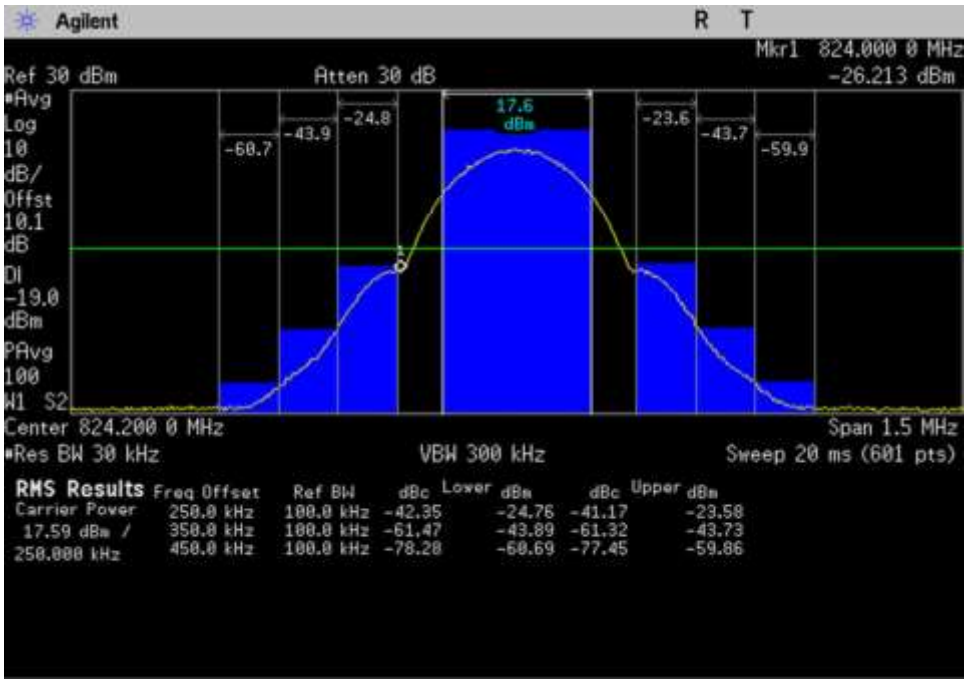
7.5 OBE_UL_776-787_LTE_ 780.5- 788.5MHz



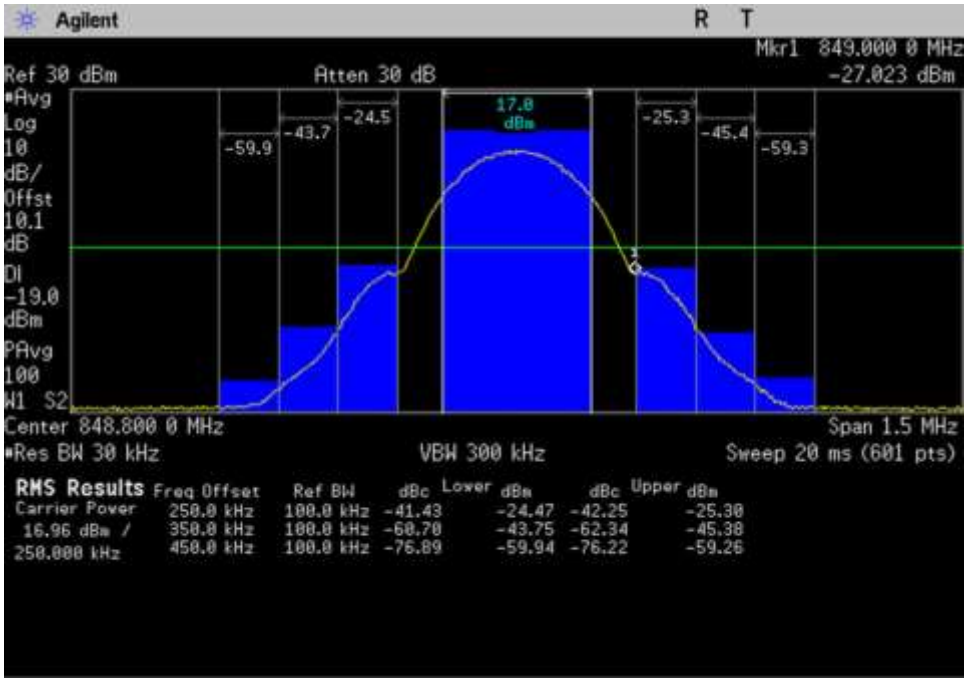
7.5 OBE_UL_824-849_CDMA_ 822.88- 826.88MHz



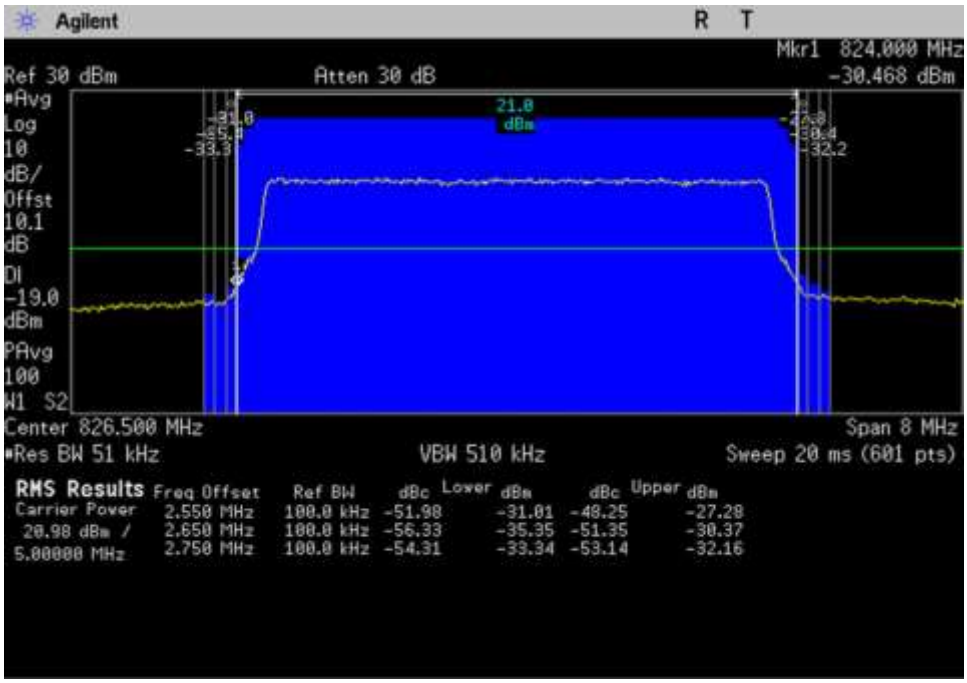
7.5 OBE_UL_824-849_CDMA_ 846.1- 850.1MHz



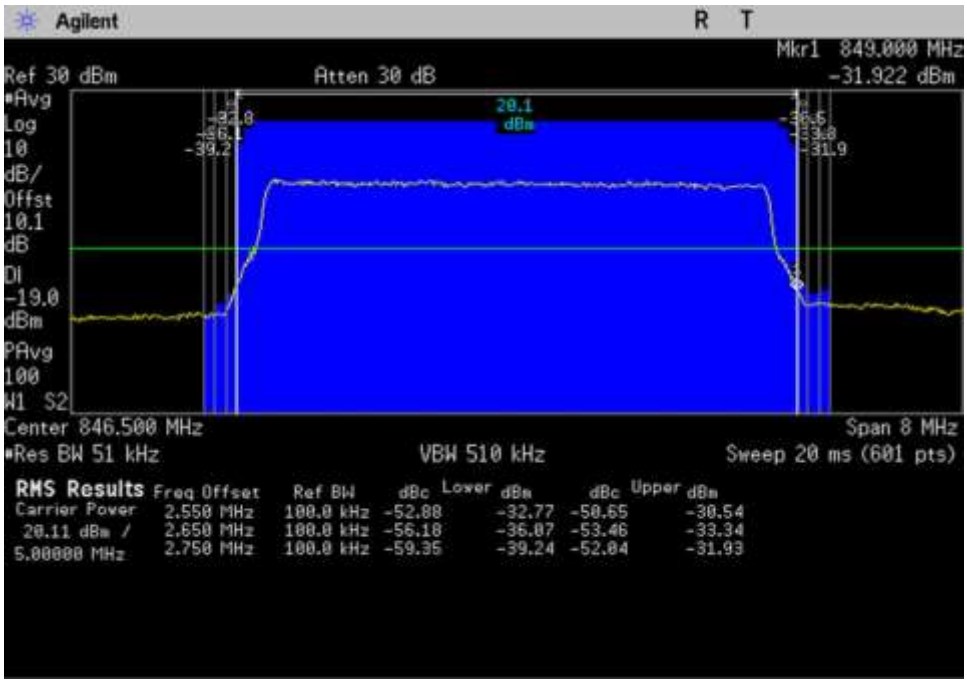
7.5 OBE_UL_824-849_GSM_ 823.45- 824.95MHz



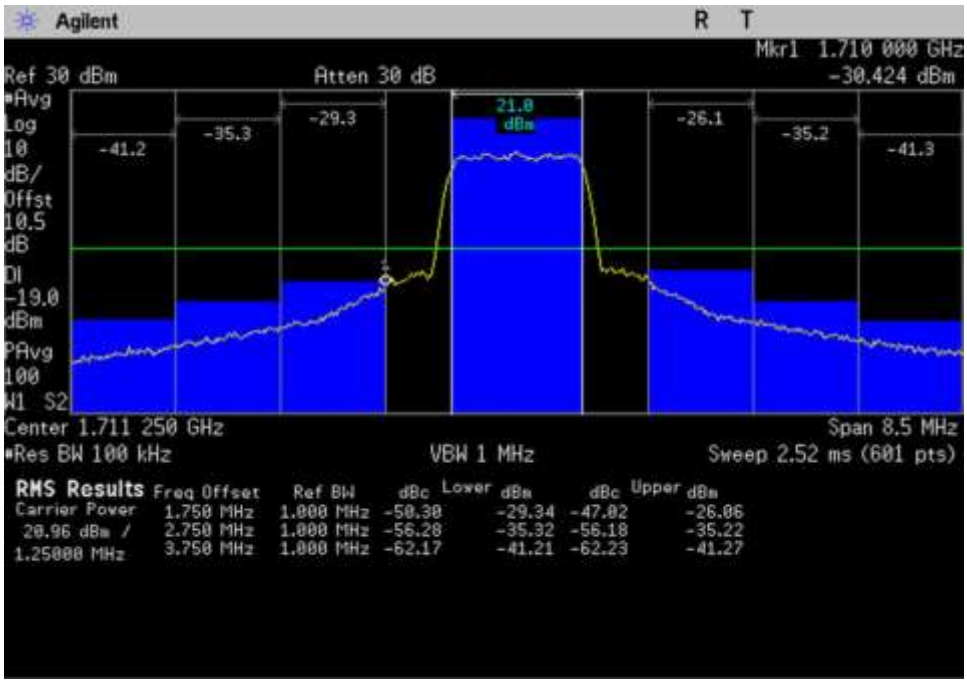
7.5 OBE_UL_824-849_GSM_ 848.05- 849.55MHz



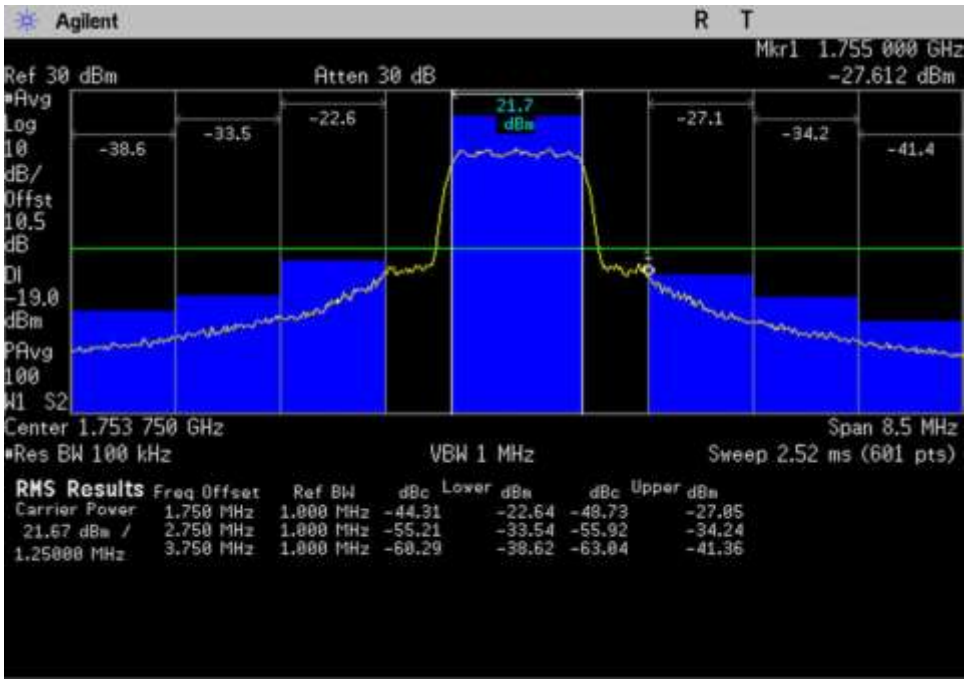
7.5 OBE_UL_824-849_LTE_ 822.5- 830.5MHz



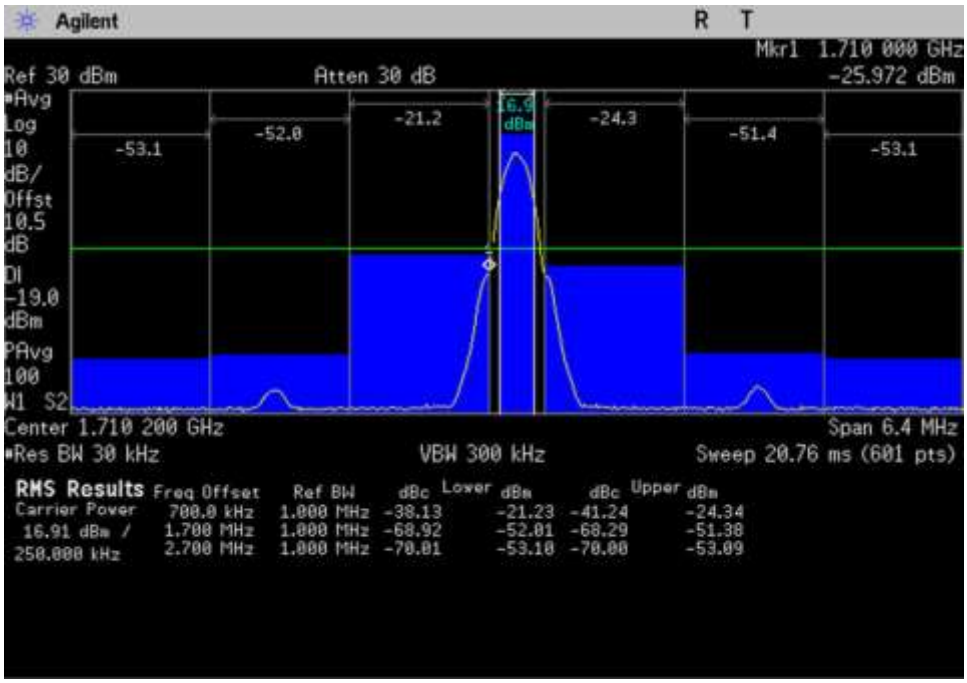
7.5 OBE_UL_824-849_LTE_ 842.5- 850.5MHz



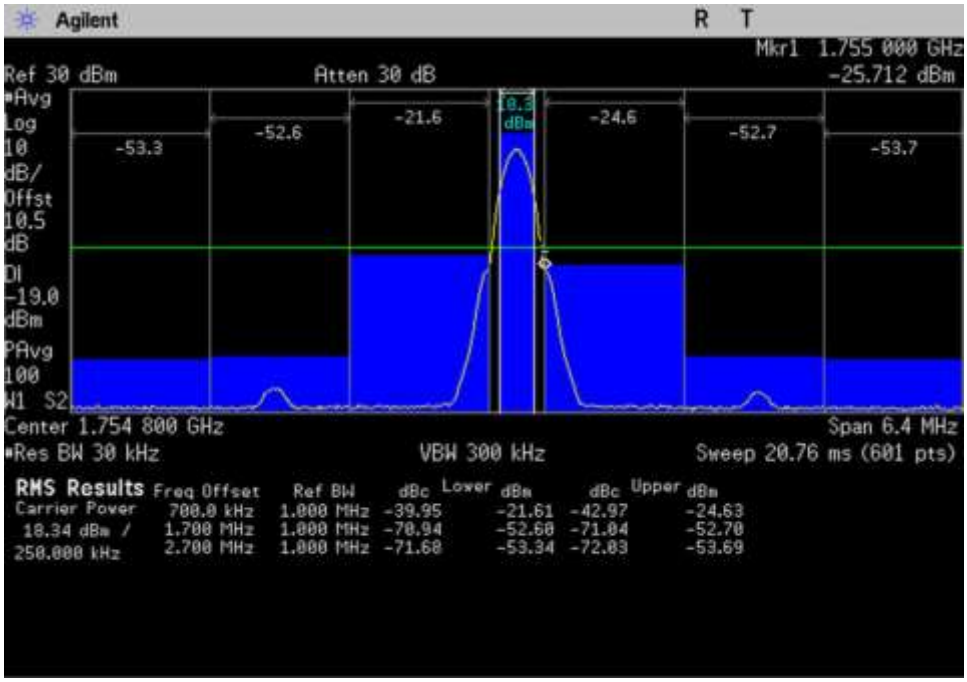
7.5 OBE_UL_1710-1755_CDMA_ 1707- 1715.5MHz



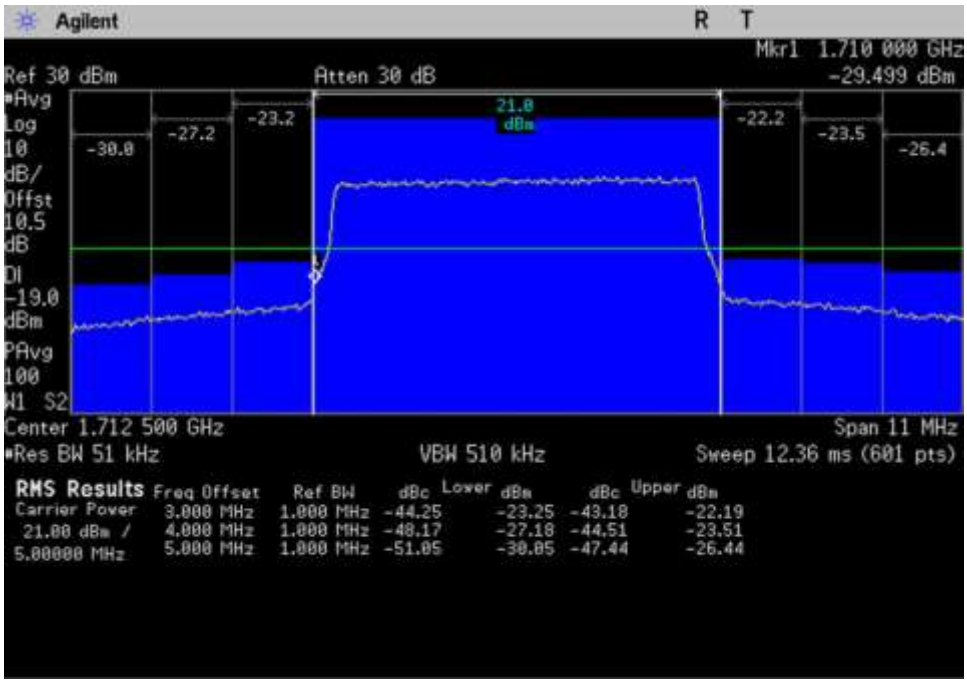
7.5 OBE_UL_1710-1755_CDMA_ 1749.5- 1758MHz



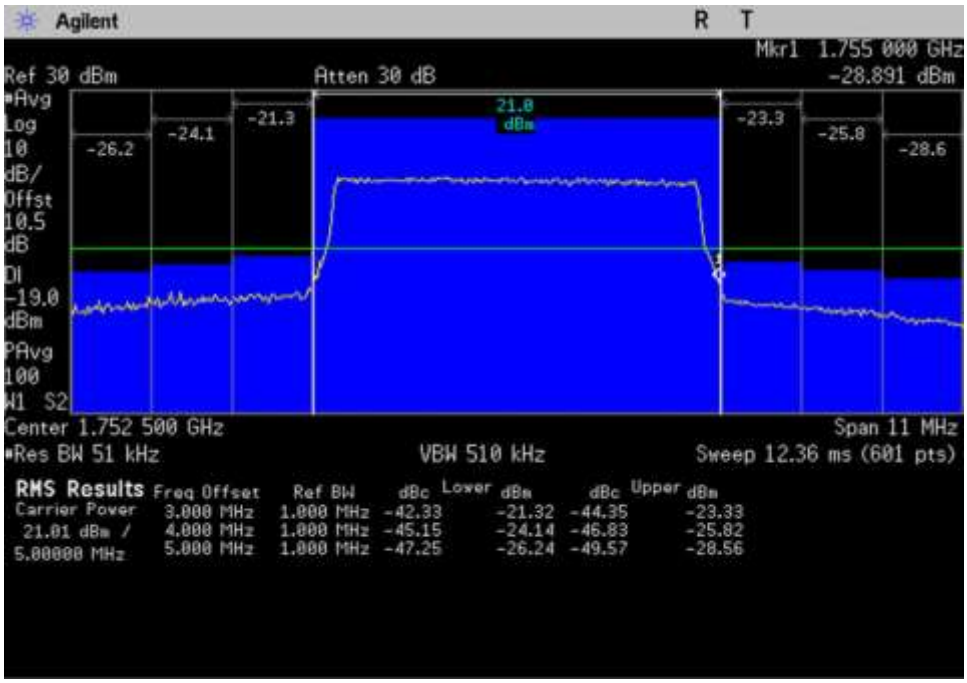
7.5 OBE_UL_1710-1755_GSM_ 1707- 1713.4MHz



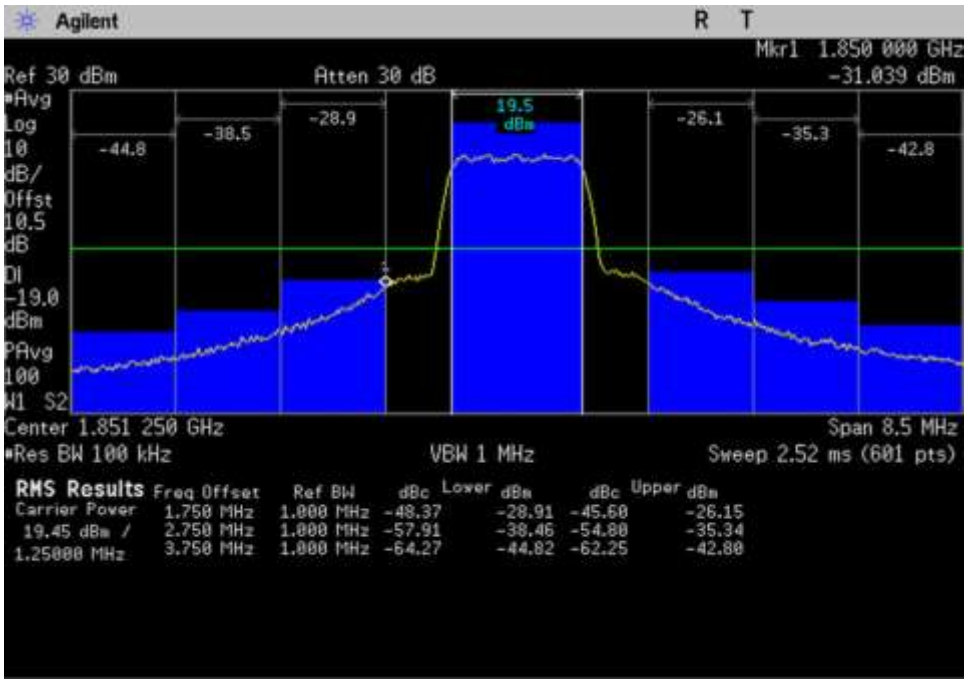
7.5 OBE_UL_1710-1755_GSM_ 1751.6- 1758MHz



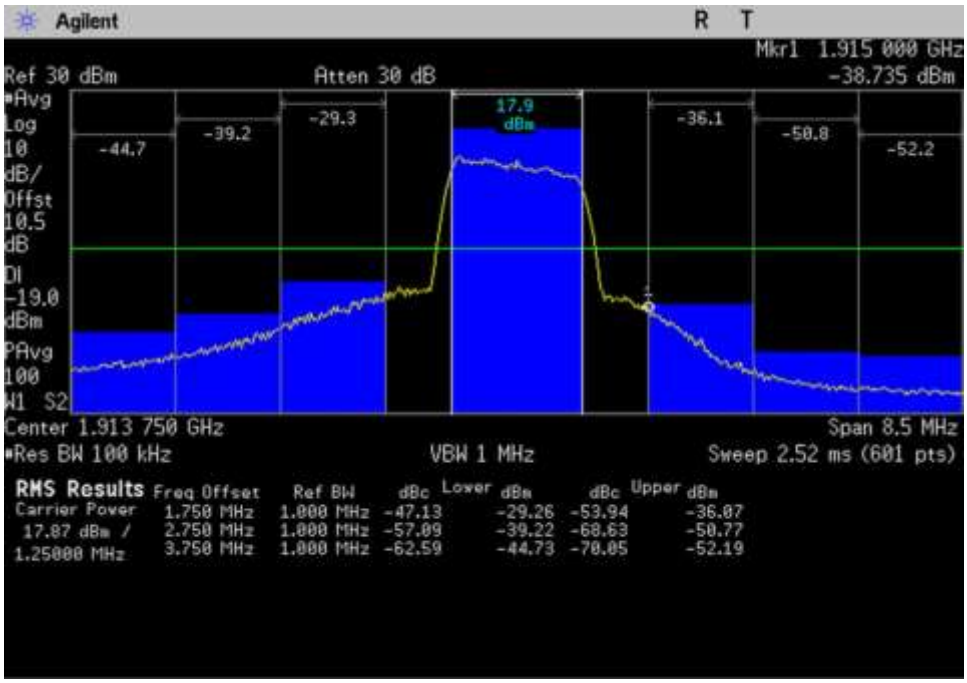
7.5 OBE_UL_1710-1755_LTE_ 1707- 1718MHz



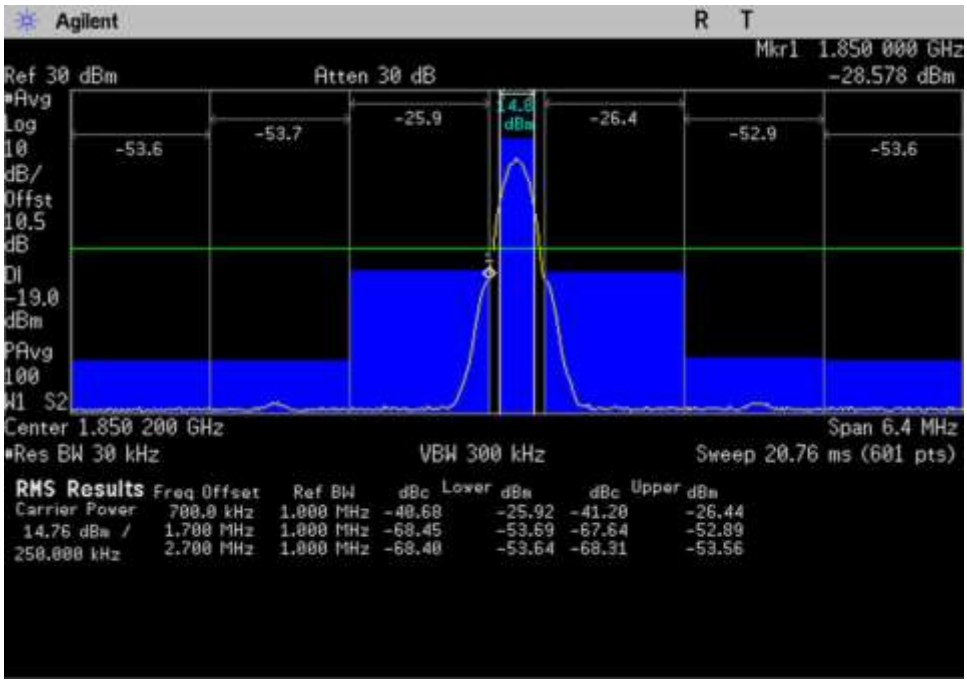
7.5 OBE_UL_1710-1755_LTE_ 1747- 1758MHz



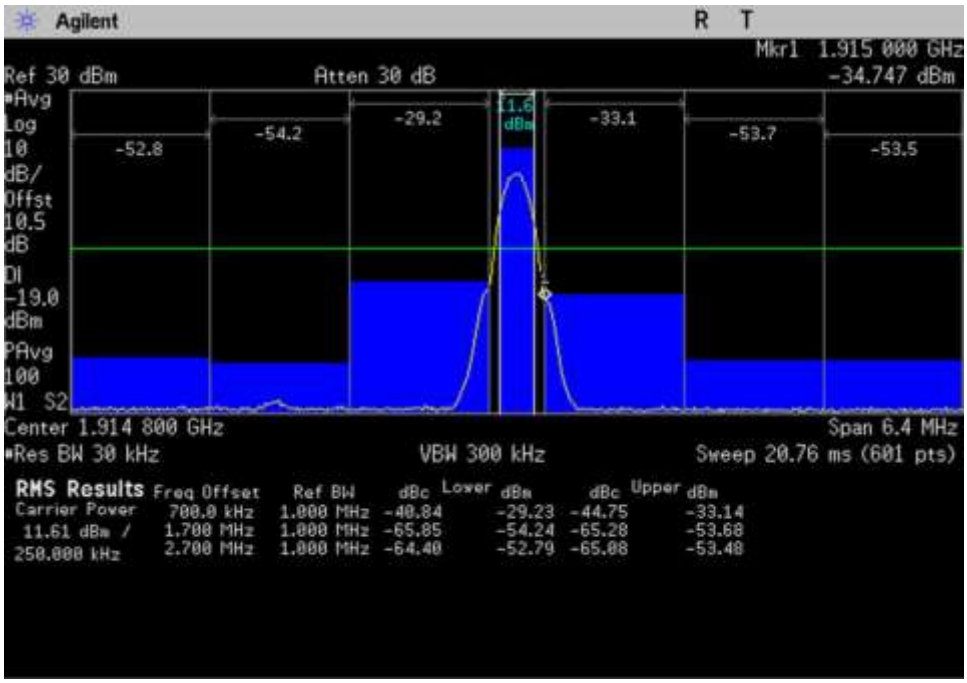
7.5 OBE_UL_1850-1915_CDMA_ 1847- 1855.5MHz



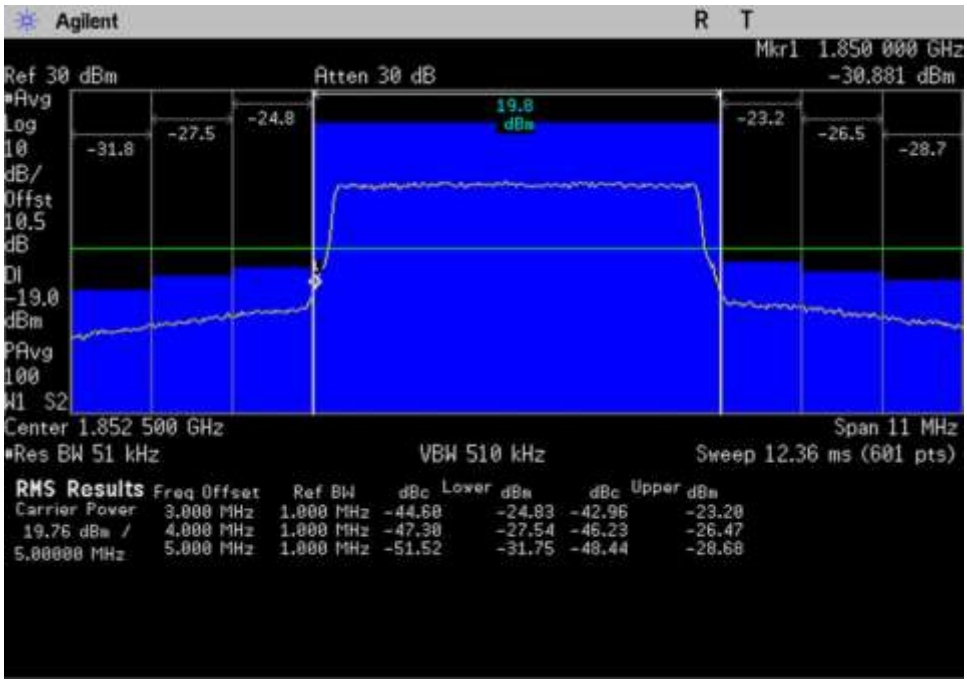
7.5 OBE_UL_1850-1915_CDMA_ 1909.5- 1918MHz



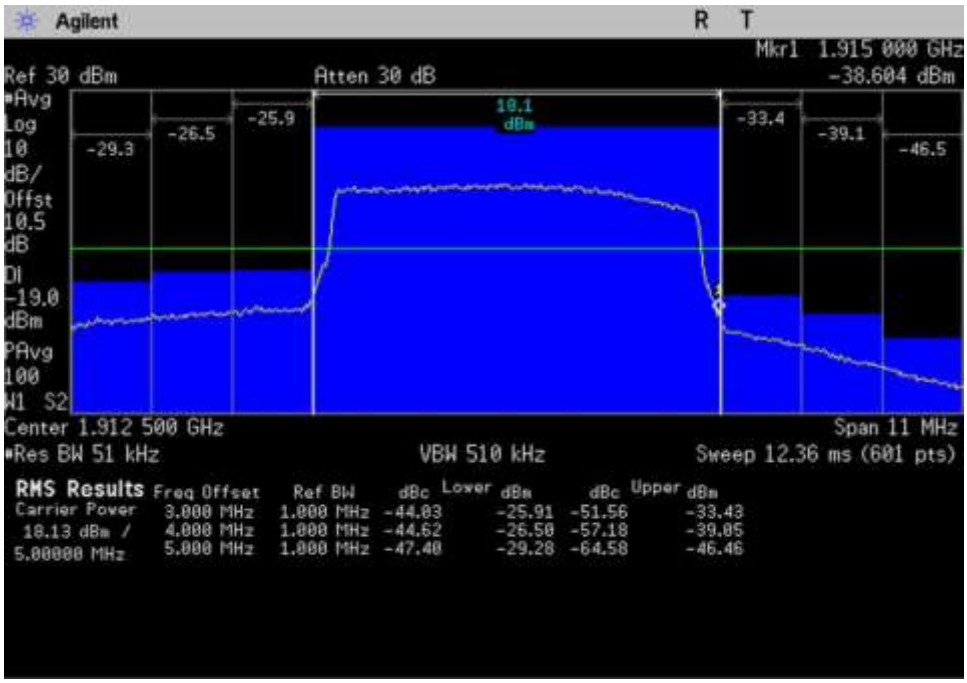
7.5 OBE_UL_1850-1915_GSM_ 1847- 1853.4MHz



7.5 OBE_UL_1850-1915_GSM_ 1911.6- 1918MHz



7.5 OBE_UL_1850-1915_LTE_ 1847- 1858MHz



7.5 OBE_UL_1850-1915_LTE_ 1907- 1918MHz

7.6 Conducted Spurious Emissions

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc
Specification:	**7.6 Conducted Spurious Emissions / 47 CFR §2.1051 Spurious Emissions at Antenna Terminals**
Work Order #:	**101463** Date 07/06/18
Test Type:	**Conducted Emissions**
Tested By:	**Hieu S Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

Test environment conditions: 21.8°C, 44.5% relative humidity,102.5kPa

Frequency range of measurement = 30MHz- 22GHz.
30 MHz - 1000MHz -> RBW*= 1MHz VBW= 3MHz
1000 MHz - 22000MHz ->RBW= 1MHz VBW= 3MHz

*Note: As specified on 7.6 Conducted spurious emissions test procedure of 935210 D03 Signal Booster Measurements v04r02, for frequencies below 1 GHz, a RBW of 1 MHz may be used in a preliminary measurement. If non-compliant emissions are detected, a final measurement shall be made with a 100 kHz RBW. Additionally, a peak detector may also be used for the preliminary measurement. If non-compliant emissions are detected, then a final measurement of these emissions shall be made with the power averaging (RMS) detector.

27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P05411	Attenuator	Weinschel	54A-10	1/19/2018	1/19/2020
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020

Summary of Results

Pass: As summarized in plots below, the conducted spurious emissions are within limits.

9 KHz-30 MHz

No Conducted Spurious Emissions were found within 20dB of the limit.

Per section 27.53 (f), the 1559-1610 band was also investigated and found emission within limits using applied correction (see calculation below).

Limit Line Calculation*					
Freq (MHz)	Antenna Gain- cable loss (dBi)		Limit line EIRP (dBW/MHz)	Limit line EIRP (dBm)	Limit line EIRP corrected (dBm)
UL 776-787	-0.52		-70.0	-40	-40.52

LIMIT LINE FOR SPURIOUS CONDUCTED EMISSION

REQUIRED ATTENUATION = 43+10 LOG P DB

Limit line (dBuV) = V_{dBuv} - Attenuation

$$V_{dBuV} = 20 \text{ Log } \frac{V}{1 \text{ x } 10^{-6}}$$

$$= 20\left(\text{Log } V - \text{Log } 1 \text{ x } 10^{-6}\right)$$

$$= 20 \text{ Log } V - 20 \text{ Log} 1 \text{ x } 10^{-6}$$

$$= 20 \text{ Log } V - 20(-6)$$

$$= 20 \text{ Log } V + 120$$

$$\text{Attenuatio n} = 43 + 10 \text{ Log P}$$

$$= 43 + 10 \text{ Log } \frac{V^2}{R}$$

$$= 43 + 10\left(\text{Log } V^2 \text{ - Log R}\right)$$

$$= 43 + 10\left(2 \text{ Log V - Log R}\right)$$

$$= 43 + 20 \text{ Log V - 10 Log R}$$

Limit line = V_{dBuv} - Attenuation

= 20 Log V + 120 – (43 + 20 Log V – 10Log R)

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

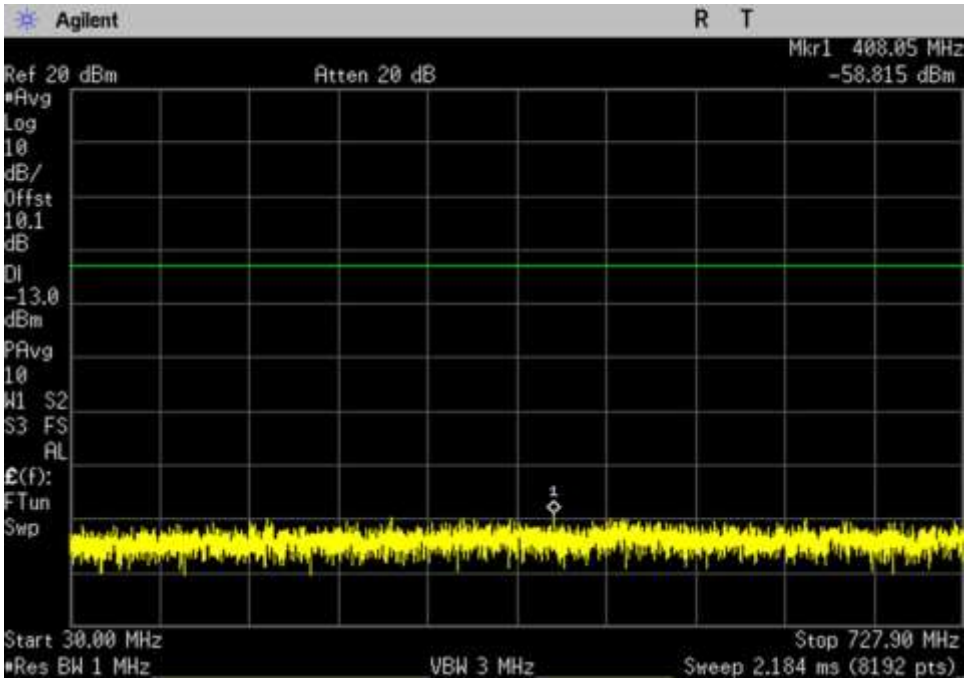
= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 120 – 43 + 10 Log 50 Note : R = 50 Ω

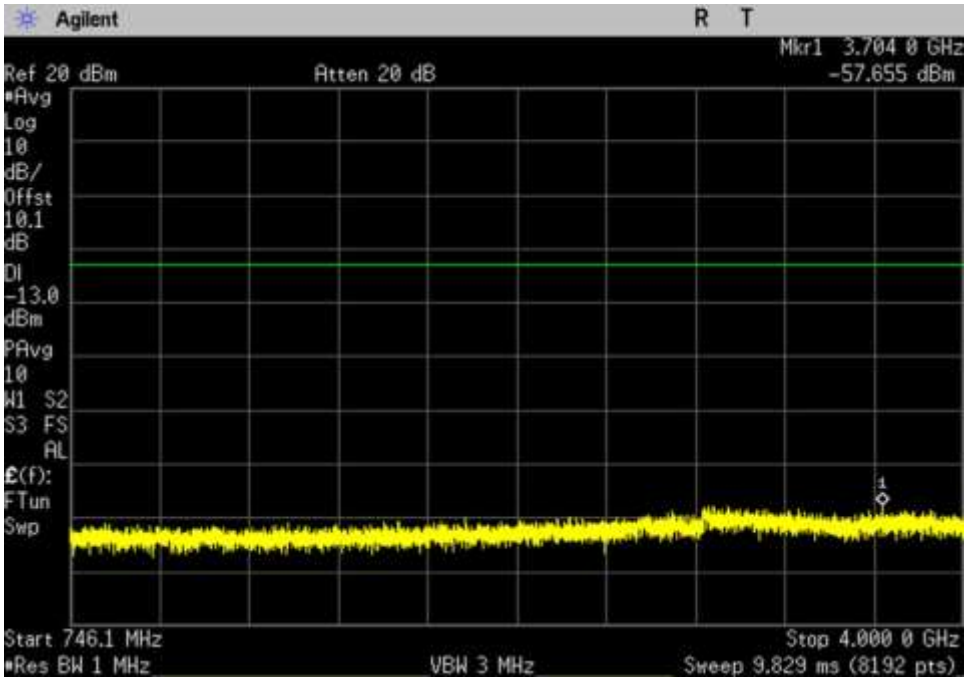
= 120 –43 + 16.897

= 94 dBuV at any power level

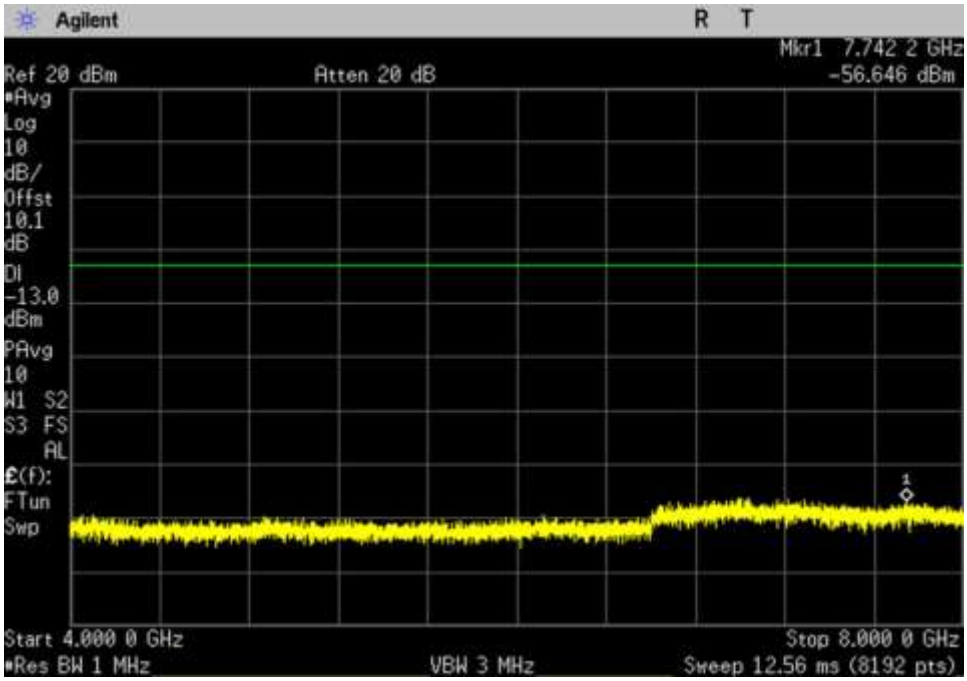
Plots



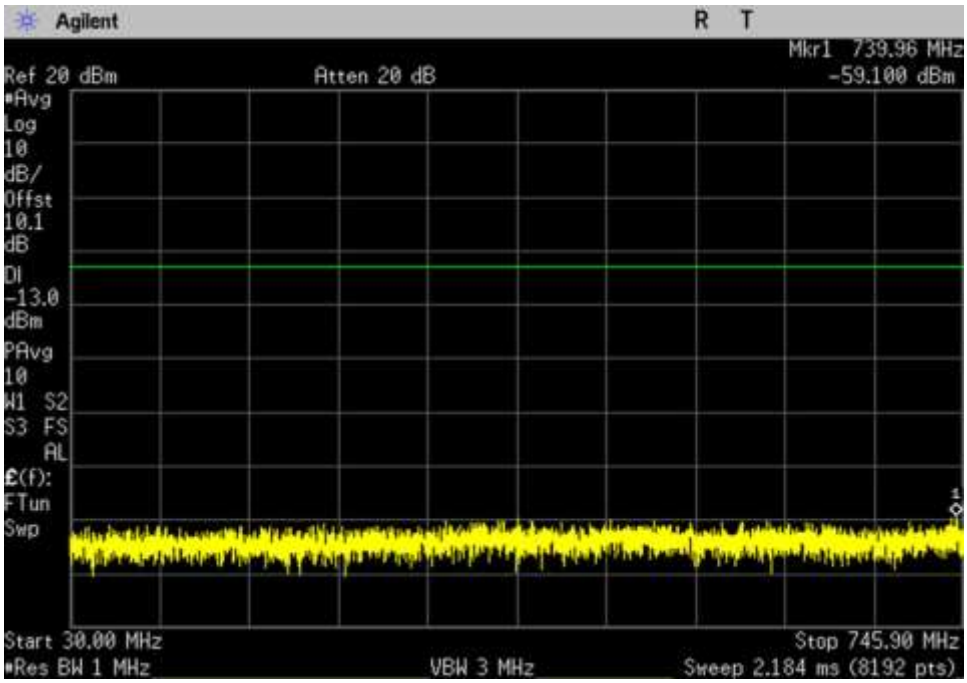
7.6 CSE_DL_728-746_ 30- 727.9MHz



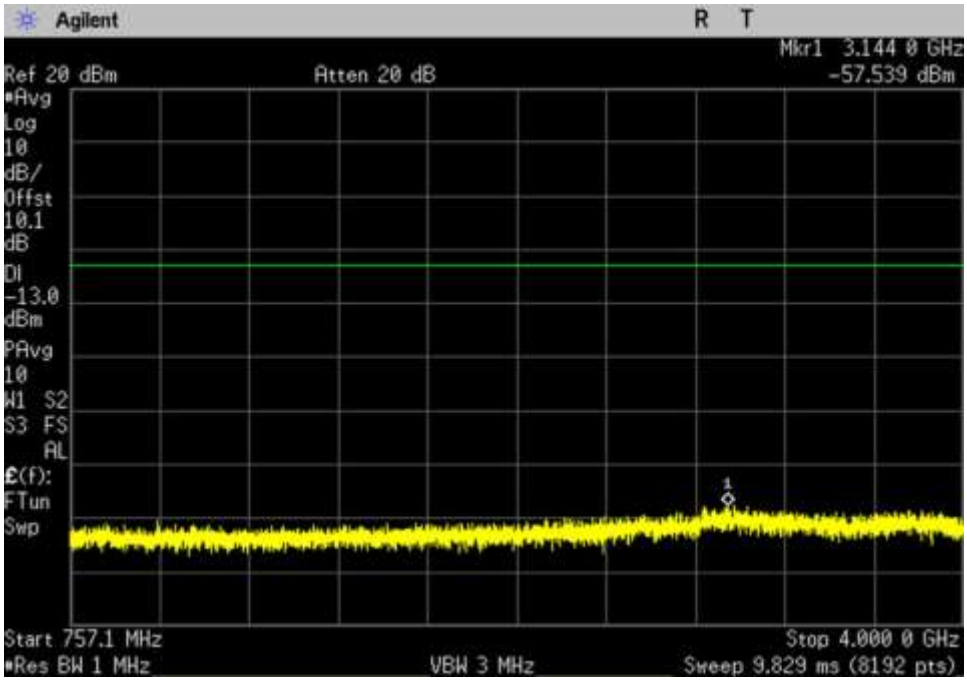
7.6 CSE_DL_728-746_ 746.1- 4000MHz



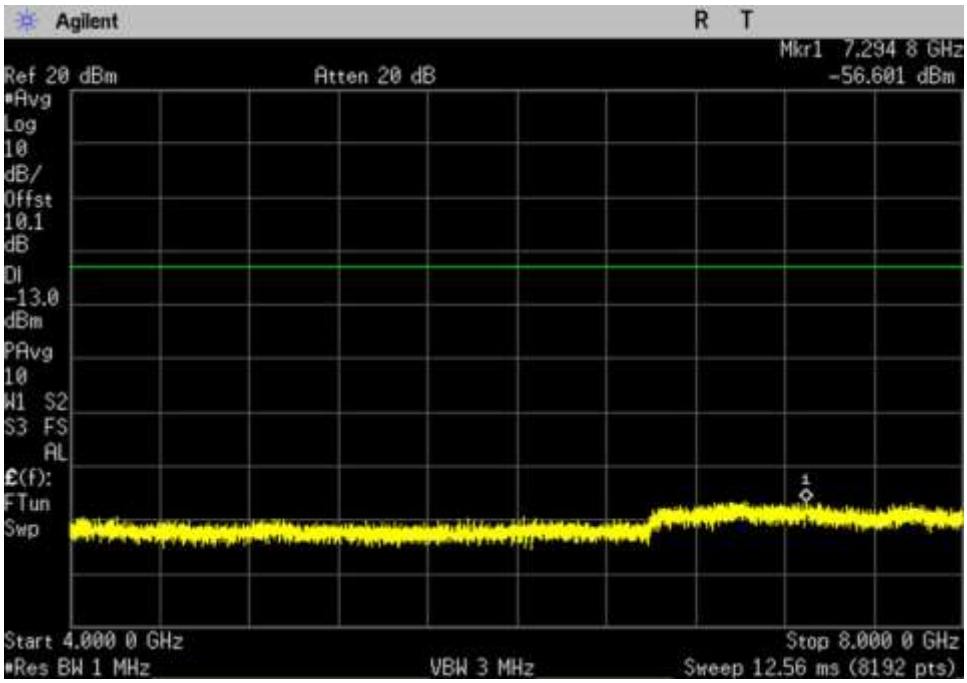
7.6 CSE_DL_728-746_ 4000- 8000MHz



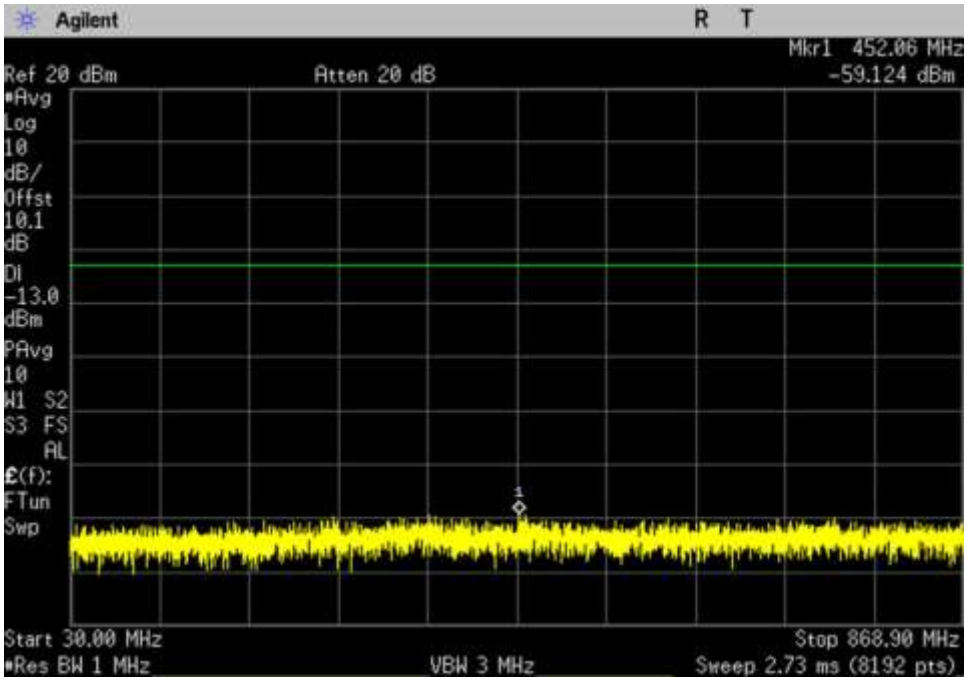
7.6 CSE_DL_746-757_ 30- 745.9MHz



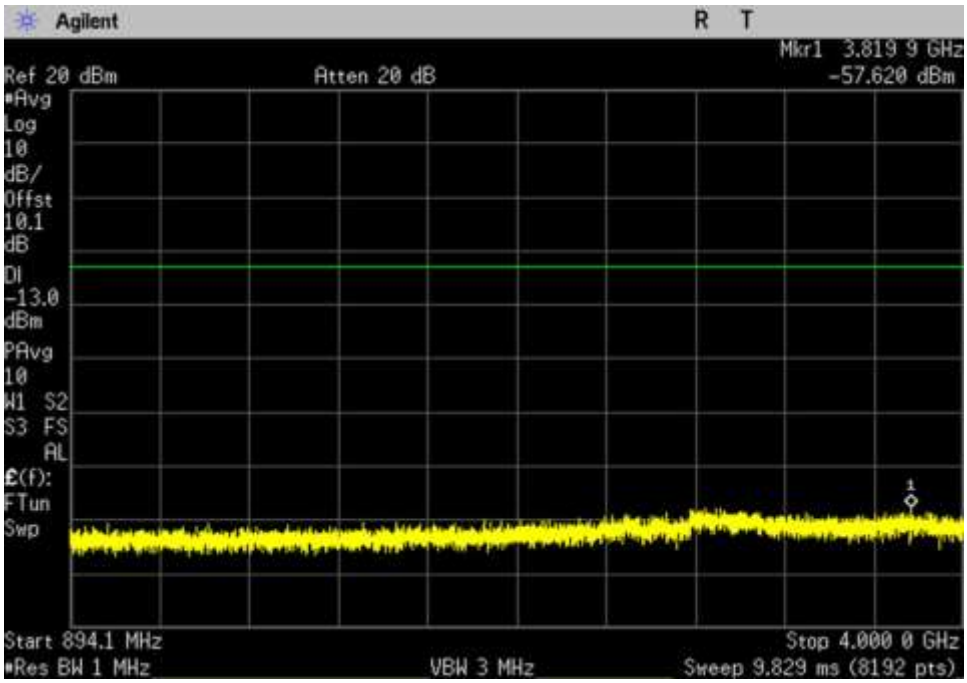
7.6 CSE_DL_746-757_ 757.1- 4000MHz



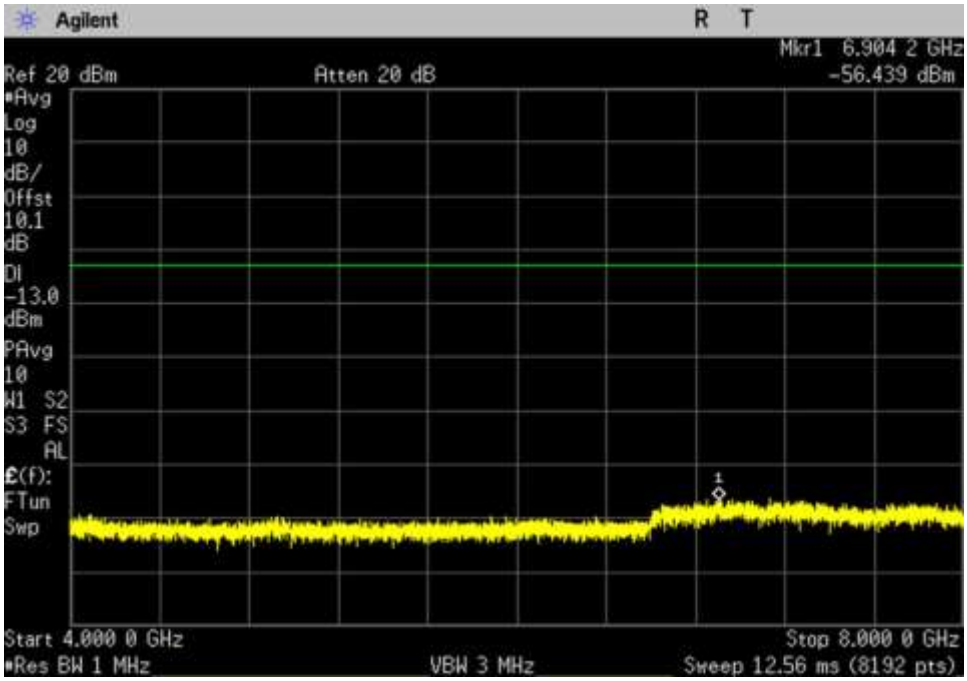
7.6 CSE_DL_746-757_ 4000- 8000MHz



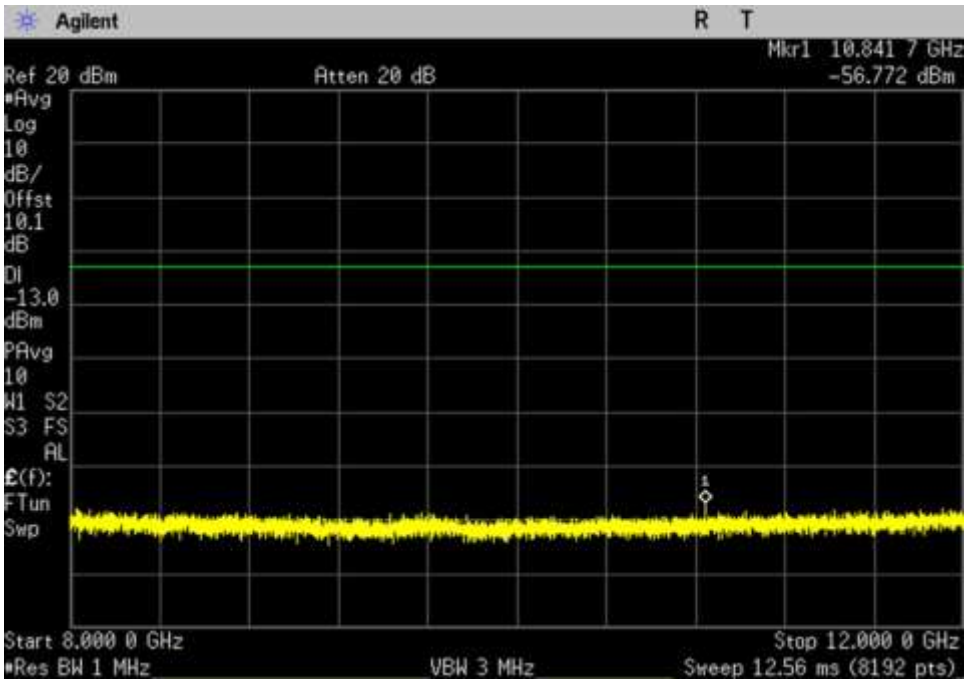
7.6 CSE_DL_869-894_ 30- 868.9MHz



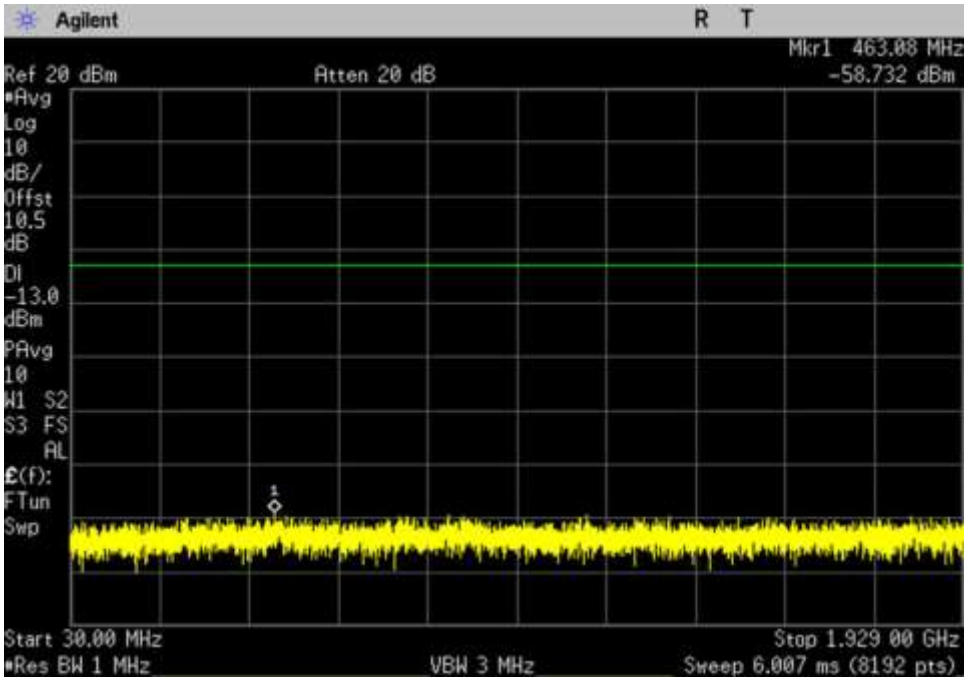
7.6 CSE_DL_869-894_ 894.1- 4000MHz



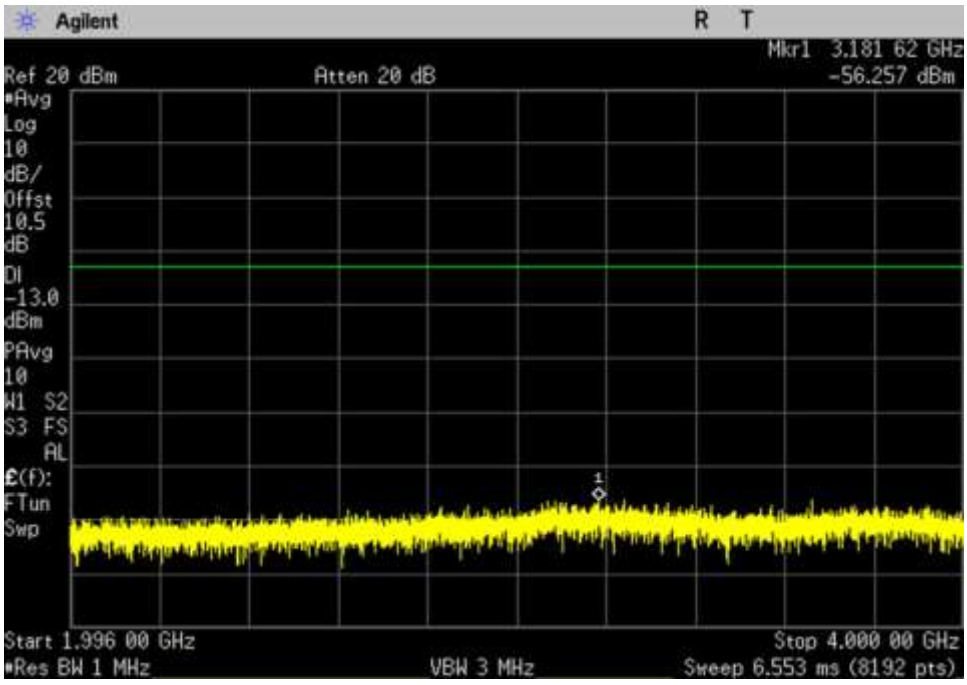
7.6 CSE_DL_869-894_ 4000- 8000MHz



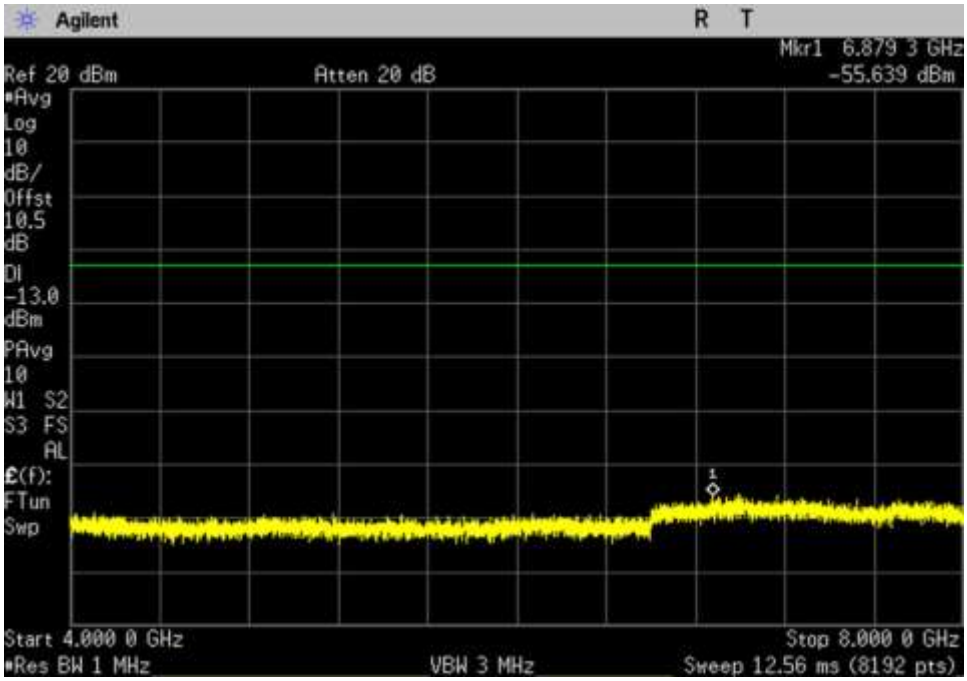
7.6 CSE_DL_869-894_ 8000- 12000MHz



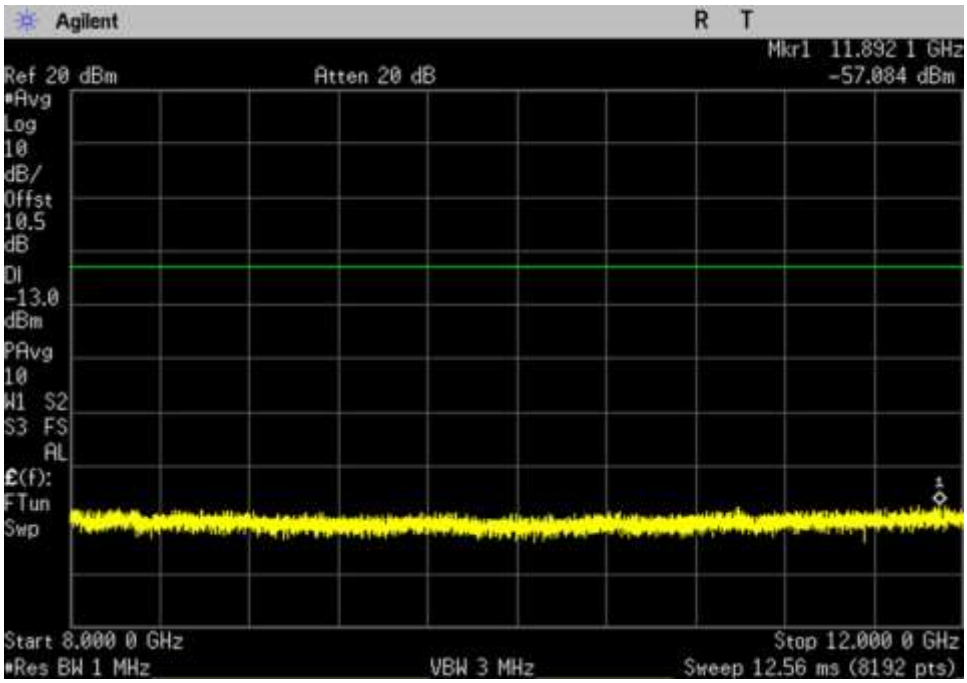
7.6 CSE_DL_1930-1995_ 30- 1929MHz



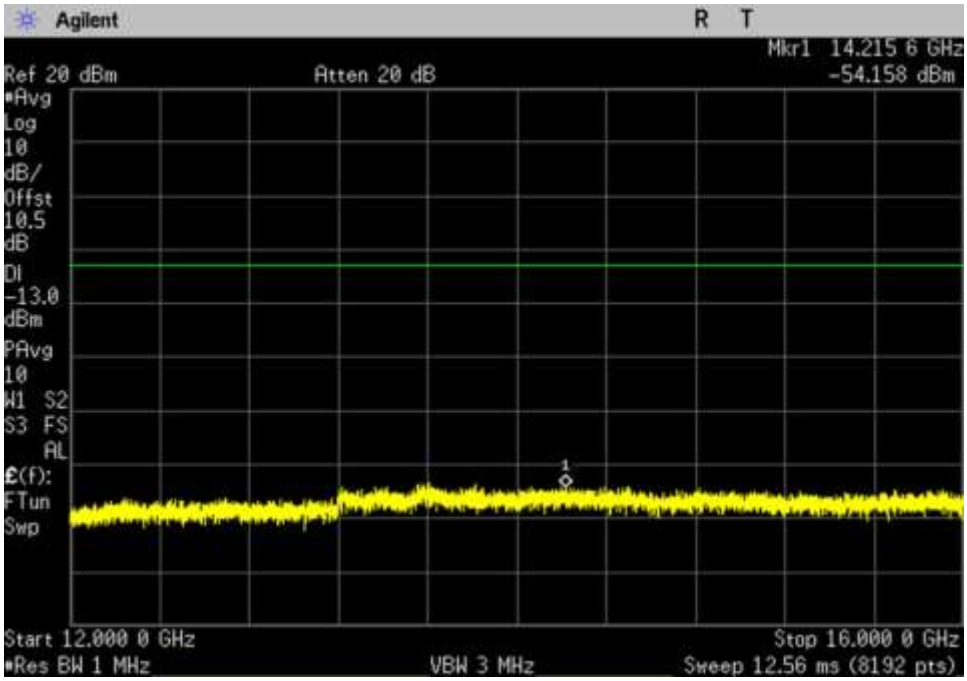
7.6 CSE_DL_1930-1995_ 1996- 4000MHz



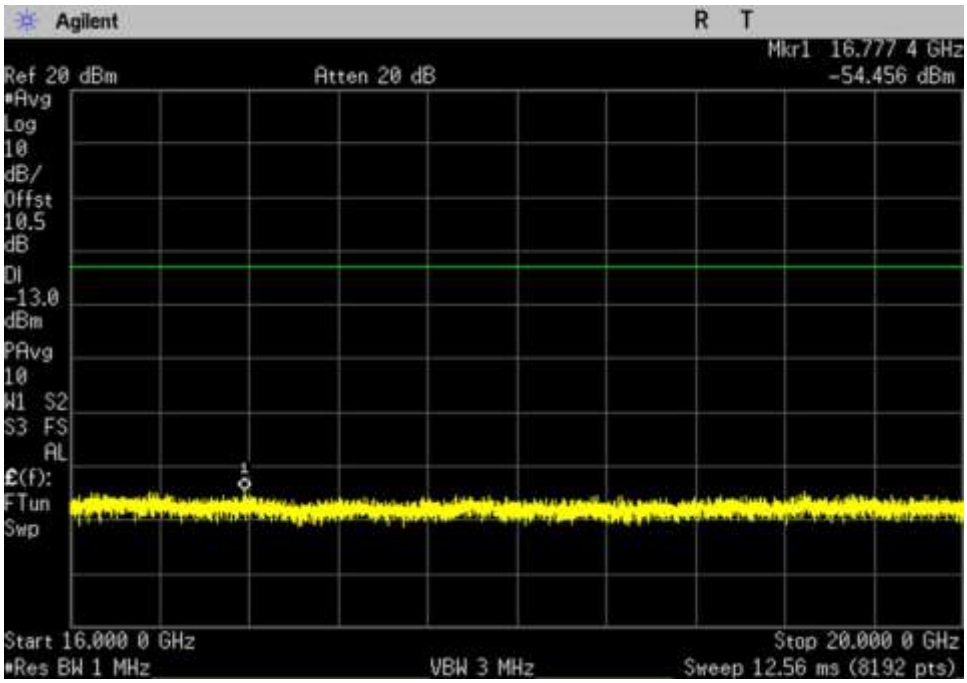
7.6 CSE_DL_1930-1995_ 4000- 8000MHz



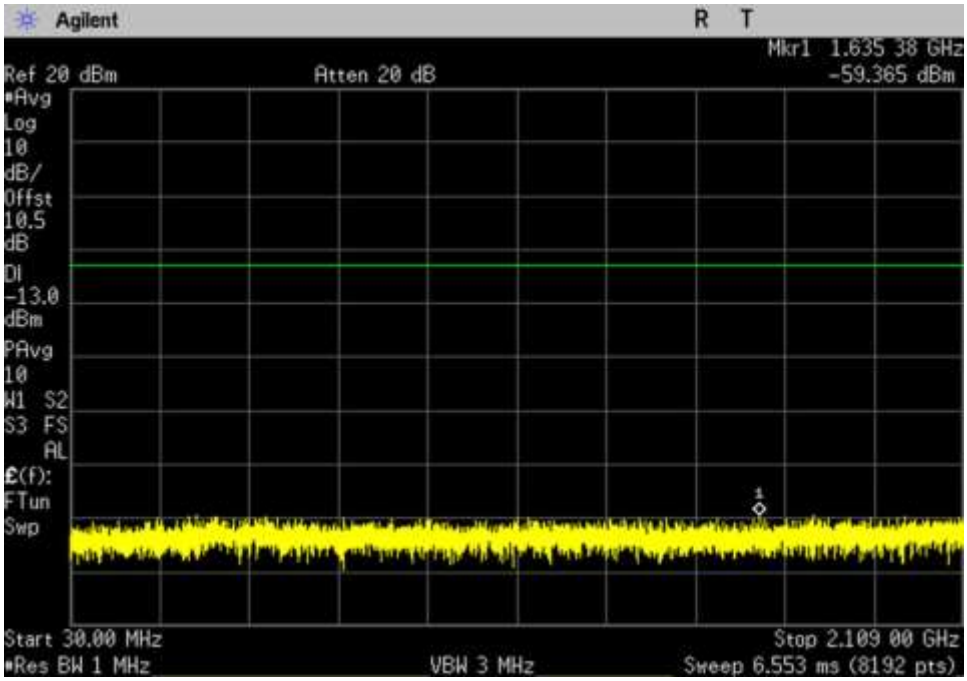
7.6 CSE_DL_1930-1995_ 8000- 12000MHz



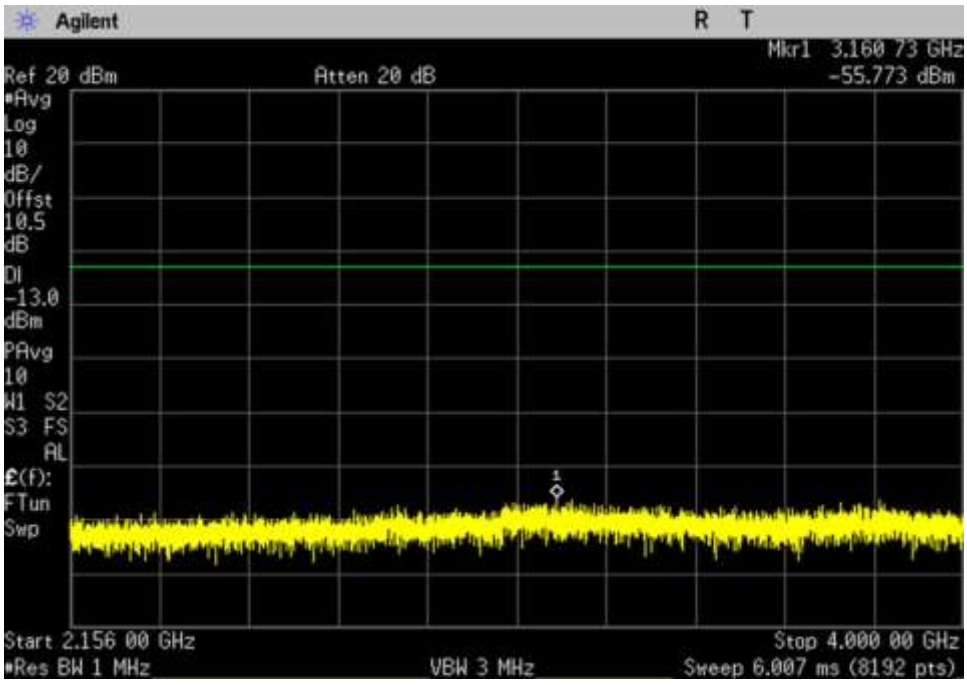
7.6 CSE_DL_1930-1995_ 12000- 16000MHz



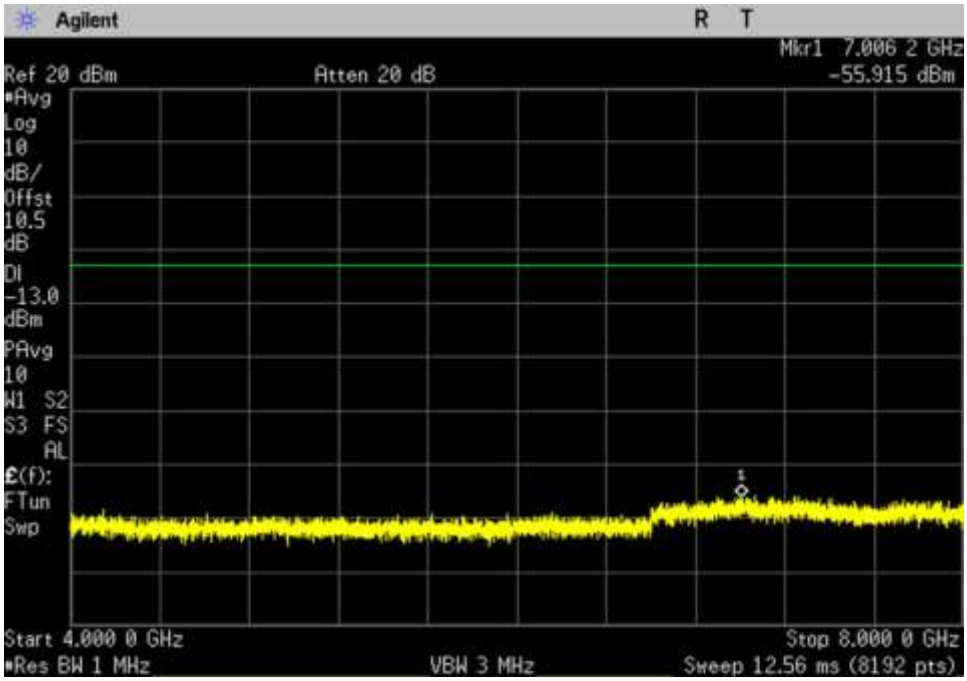
7.6 CSE_DL_1930-1995_ 16000- 20000MHz



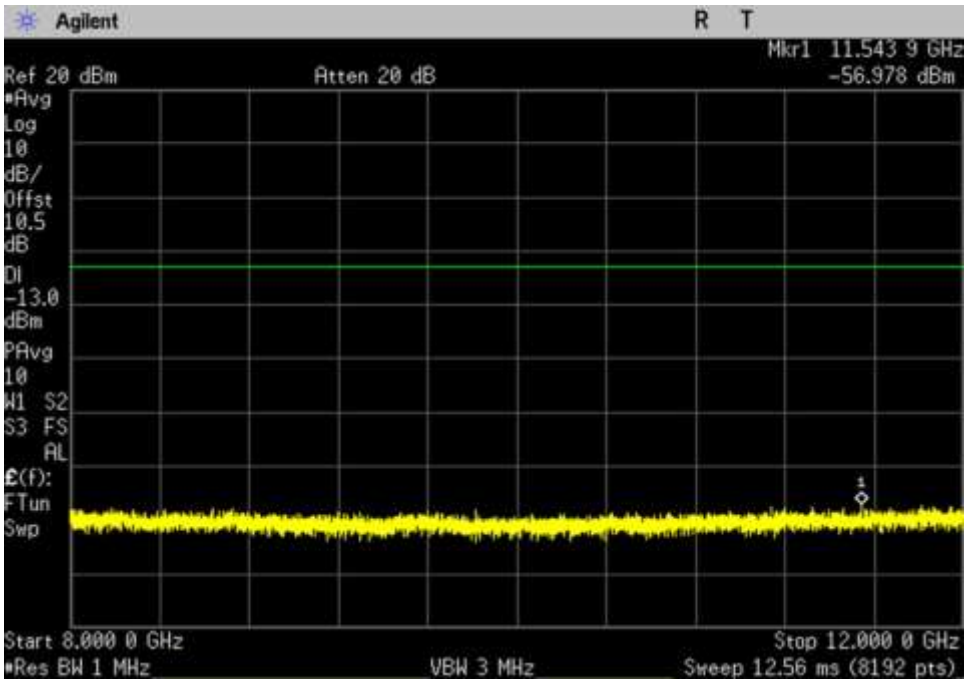
7.6 CSE_DL_2110-2155_ 30- 2109MHz



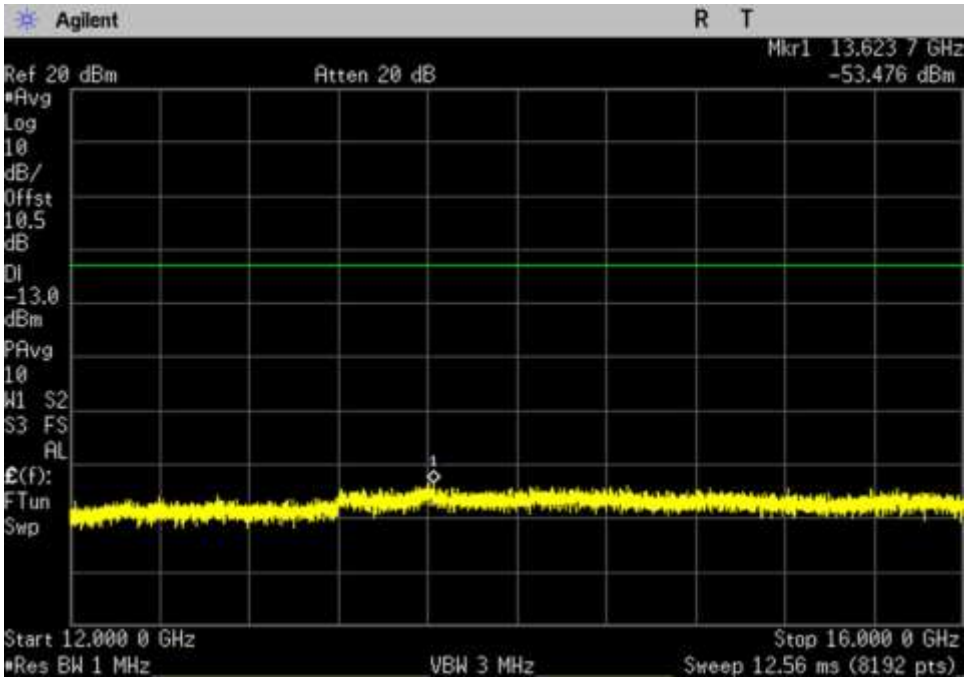
7.6 CSE_DL_2110-2155_ 2156- 4000MHz



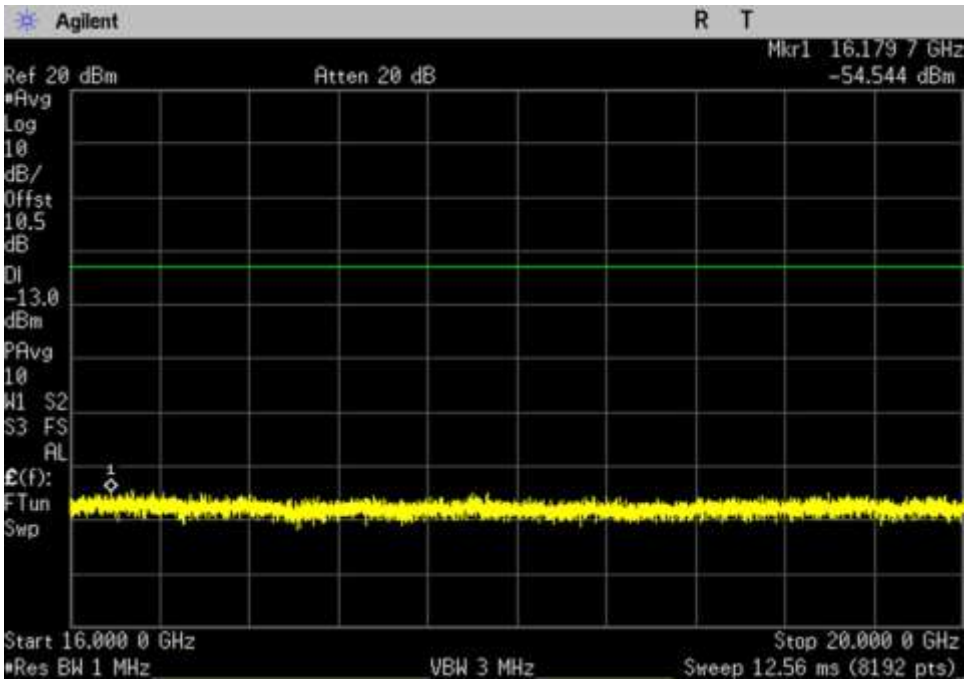
7.6 CSE_DL_2110-2155_ 4000- 8000MHz



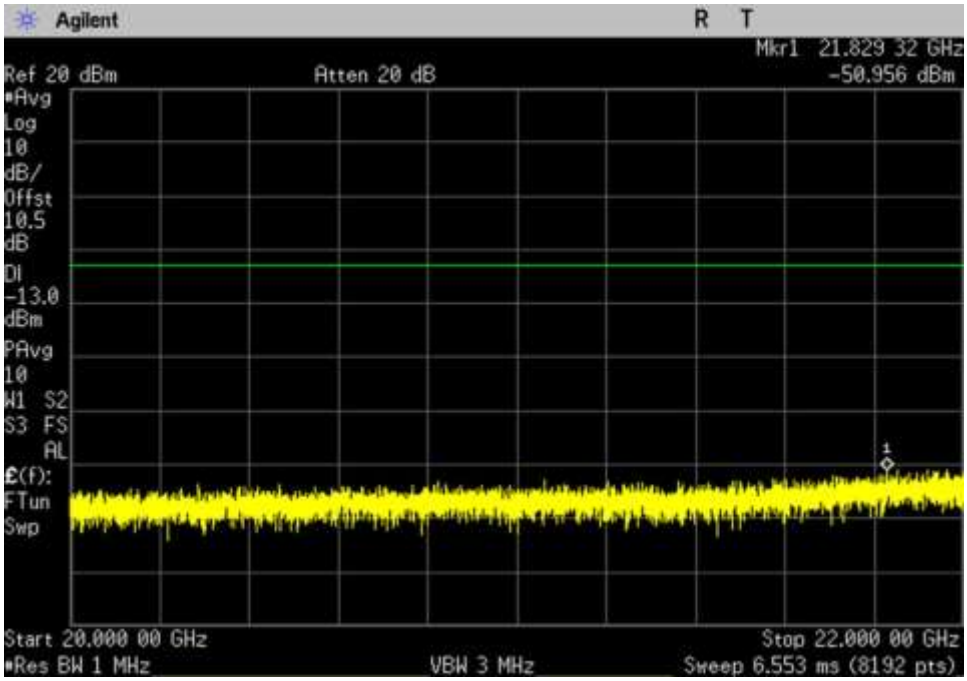
7.6 CSE_DL_2110-2155_ 8000- 12000MHz



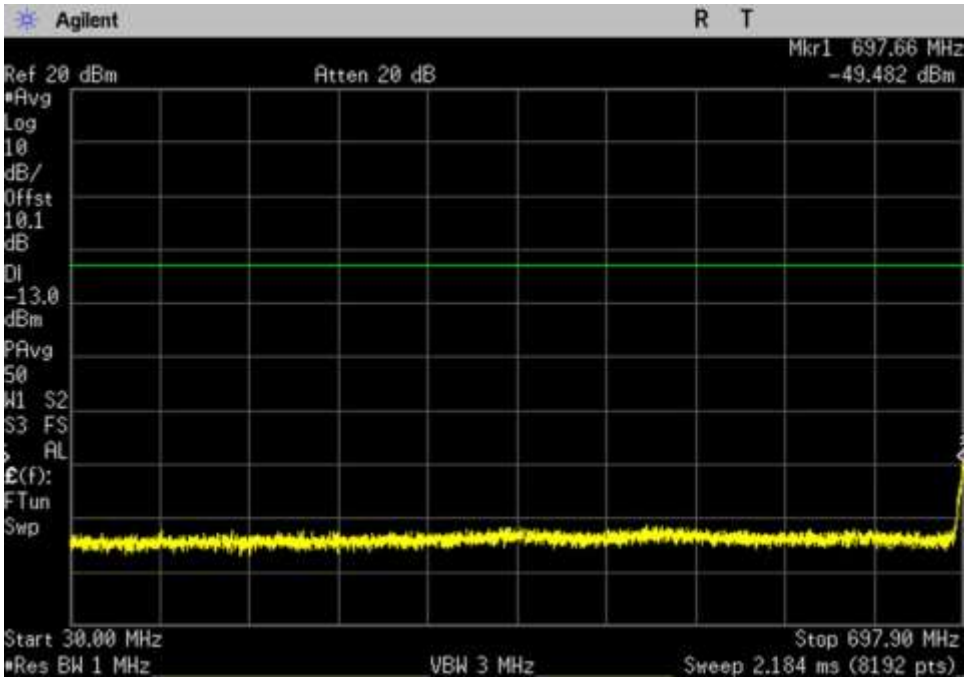
7.6 CSE_DL_2110-2155_ 12000- 16000MHz



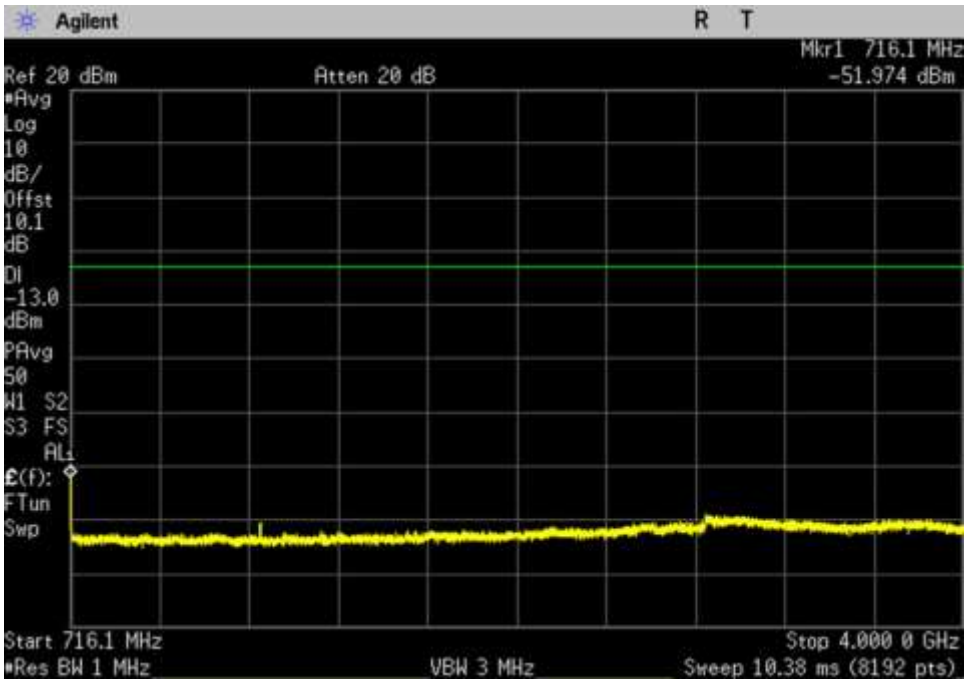
7.6 CSE_DL_2110-2155_ 16000- 20000MHz



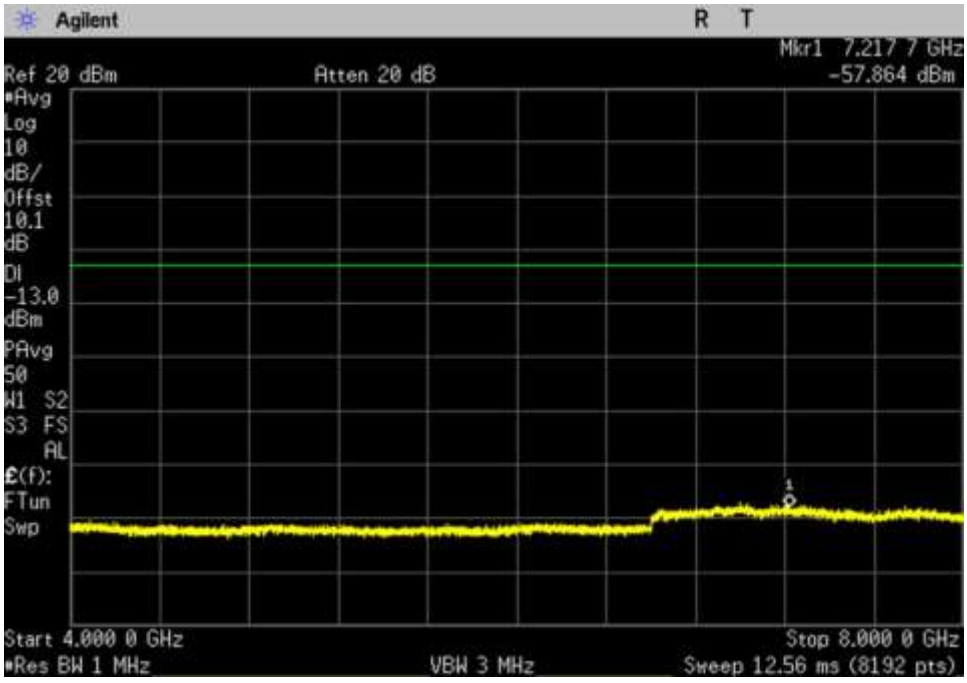
7.6 CSE_DL_2110-2155_ 20000- 22000MHz



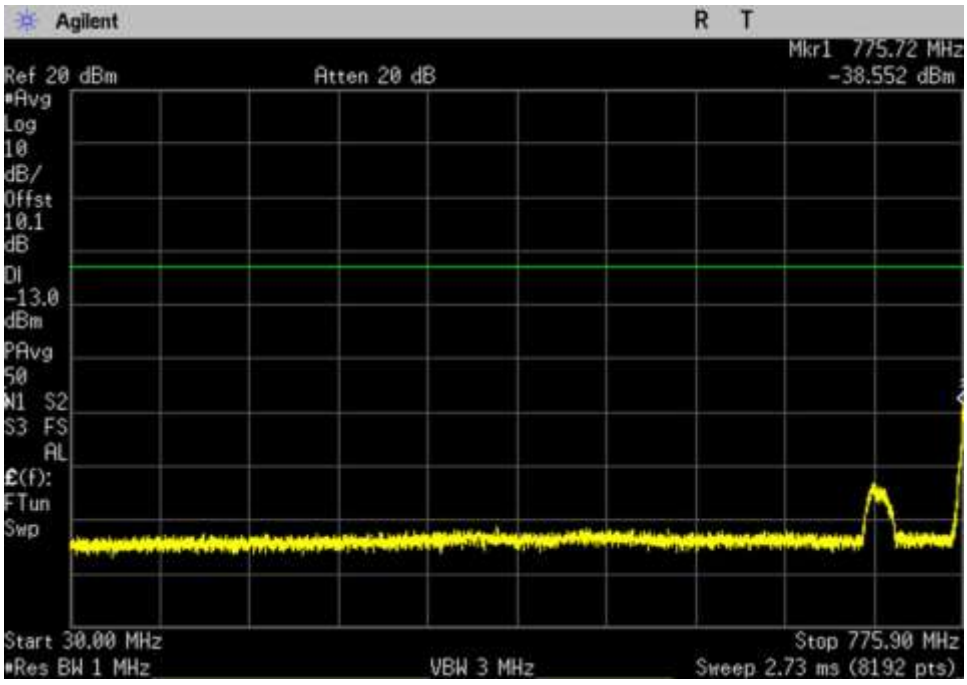
7.6 CSE_UL_698-716_ 30- 697.9MHz



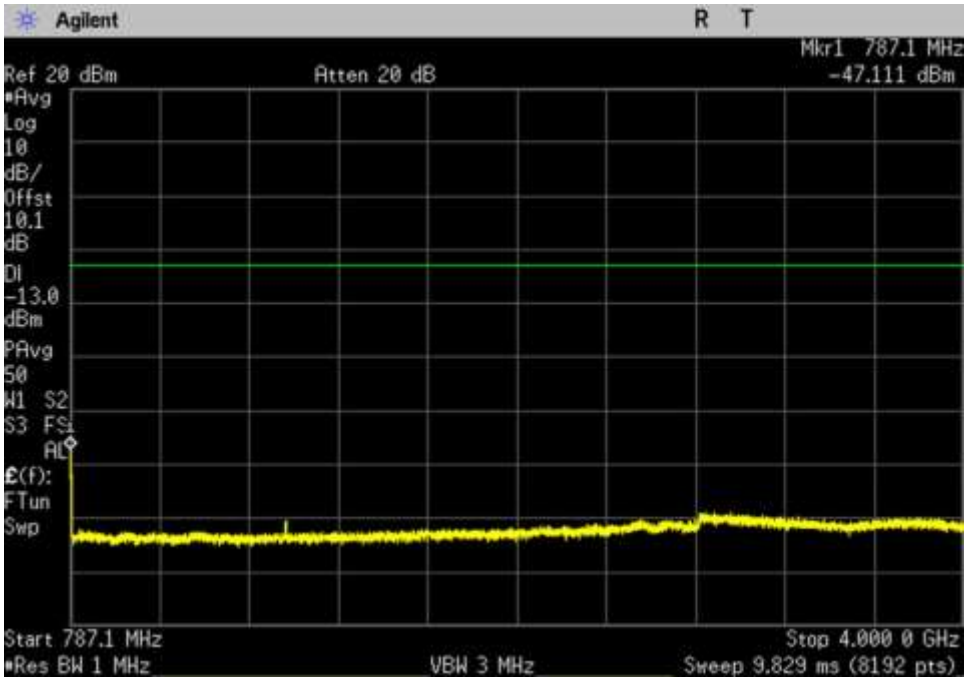
7.6 CSE_UL_698-716_ 716.1- 4000MHz



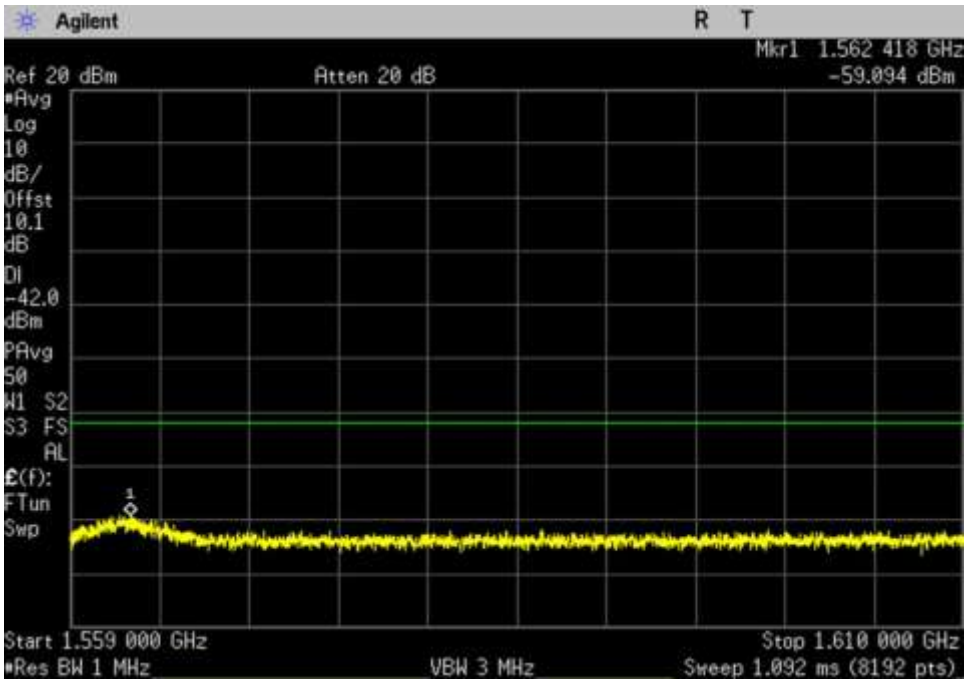
7.6 CSE_UL_698-716_ 4000- 8000MHz



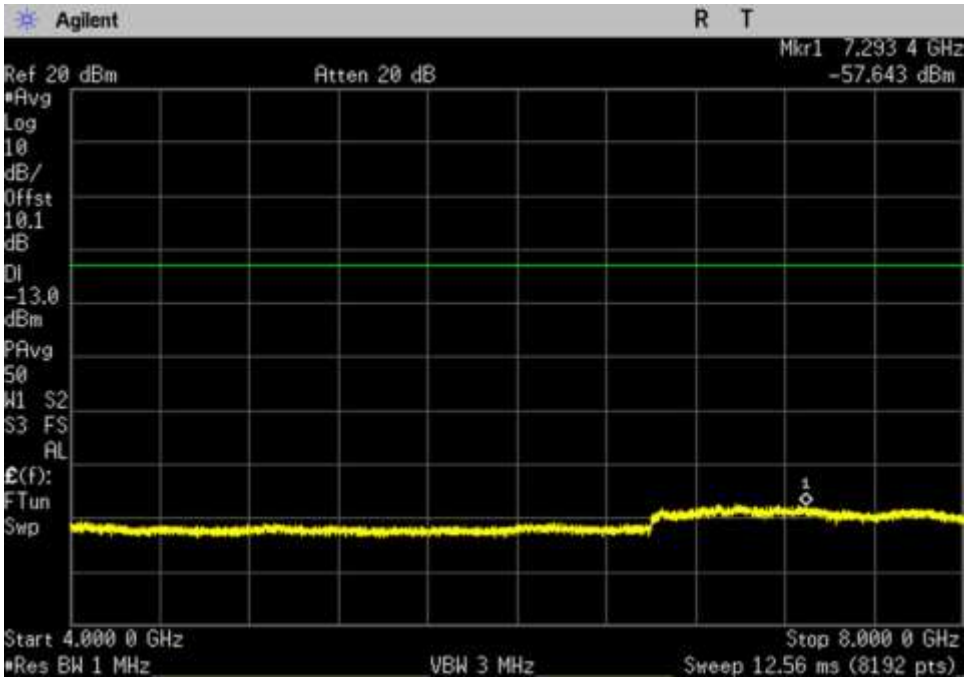
7.6 CSE_UL_776-787_ 30- 775.9MHz



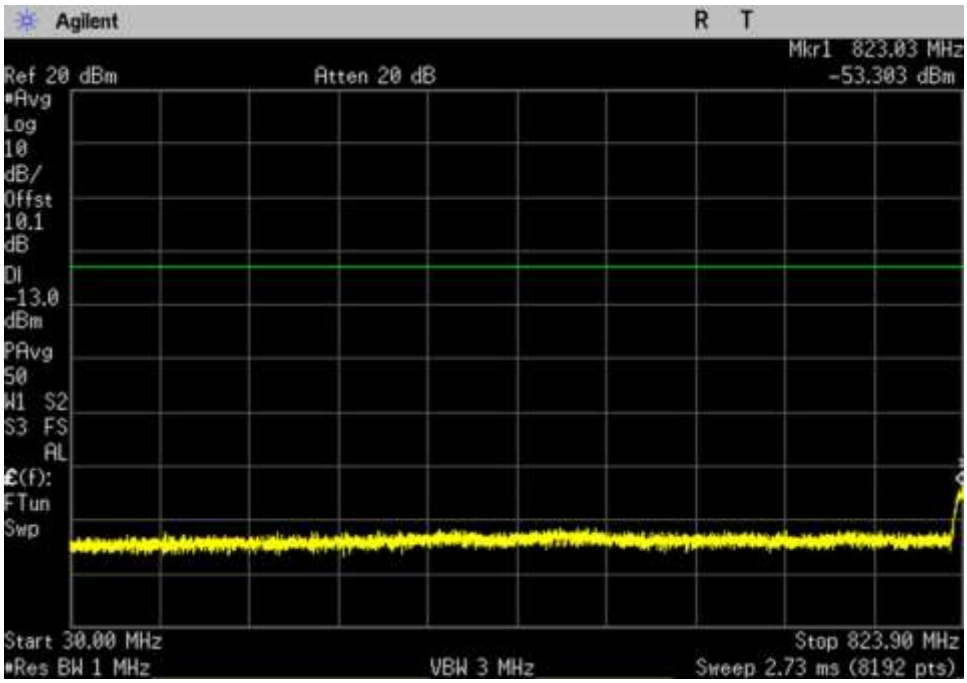
7.6 CSE_UL_776-787_ 787.1- 4000MHz



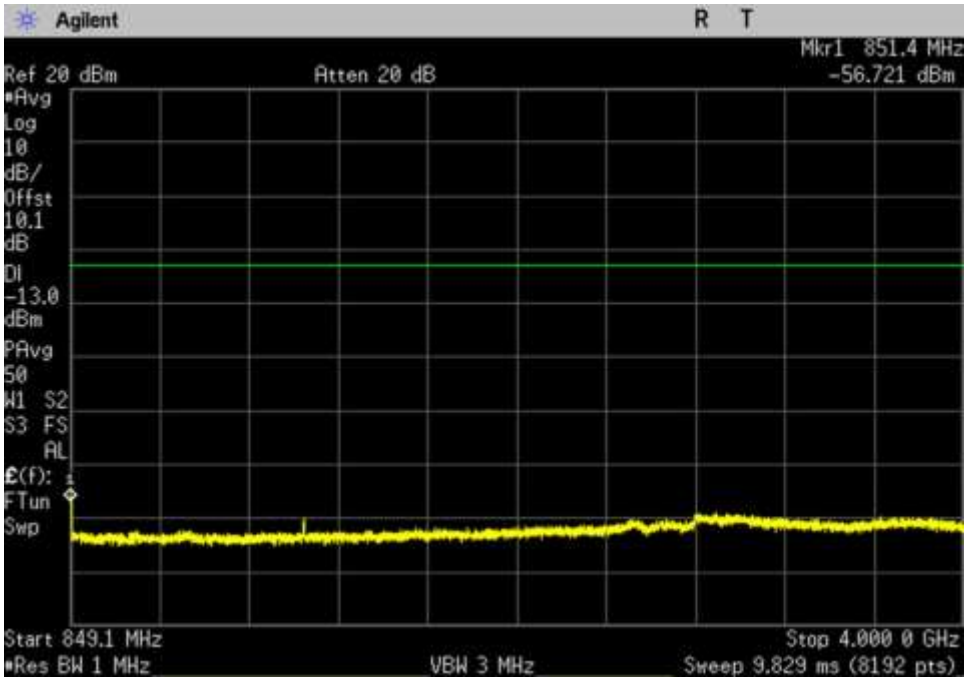
7.6 CSE_UL_776-787_ 1559- 1610MHz



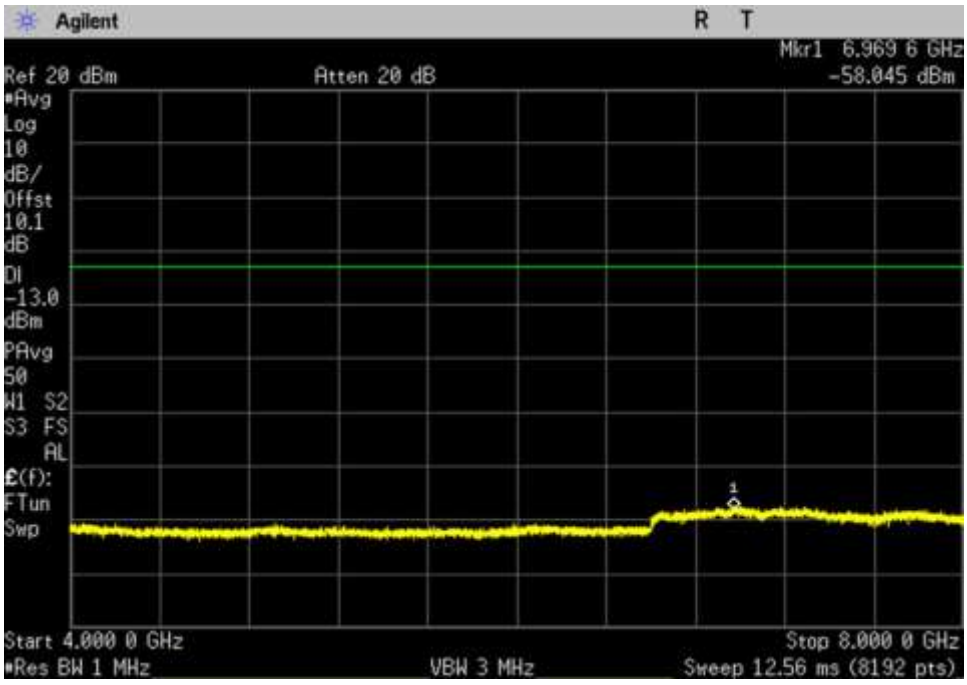
7.6 CSE_UL_776-787_ 4000- 8000MHz



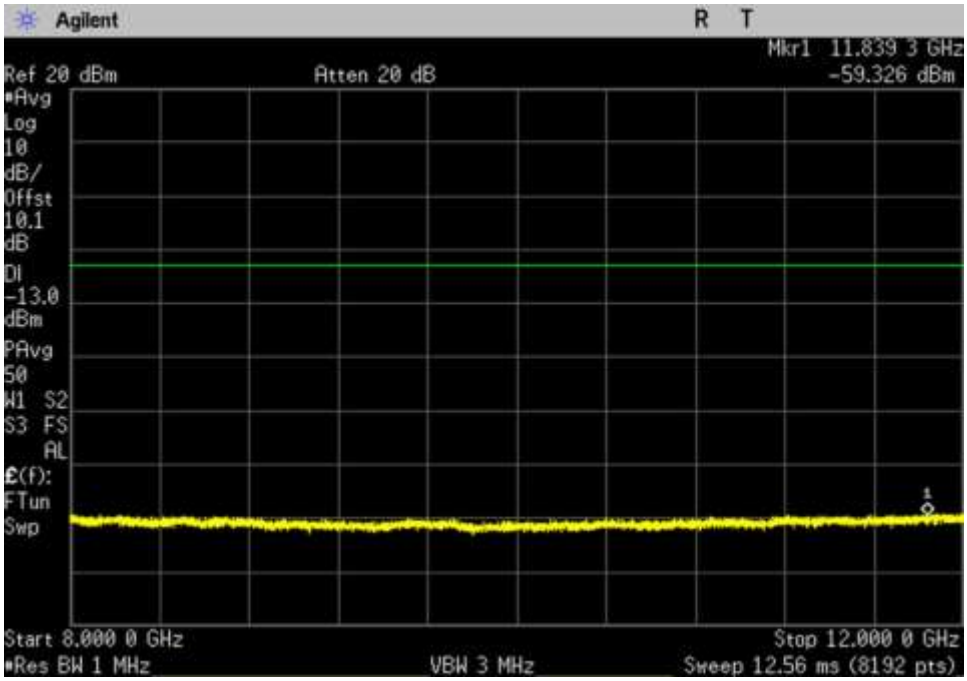
7.6 CSE_UL_824-849_ 30- 823.9MHz



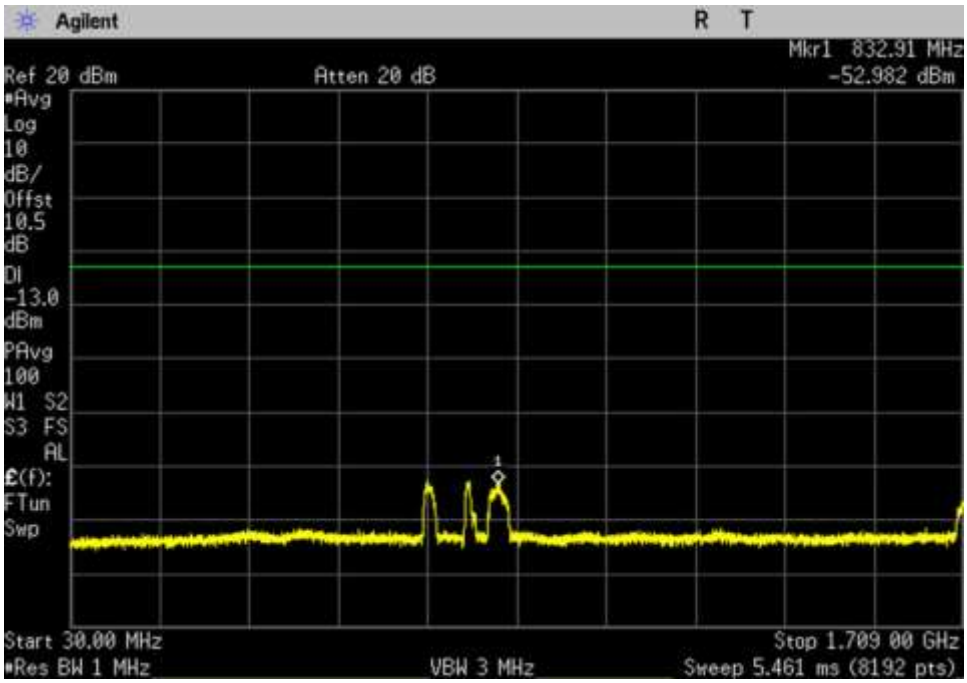
7.6 CSE_UL_824-849_ 849.1- 4000MHz



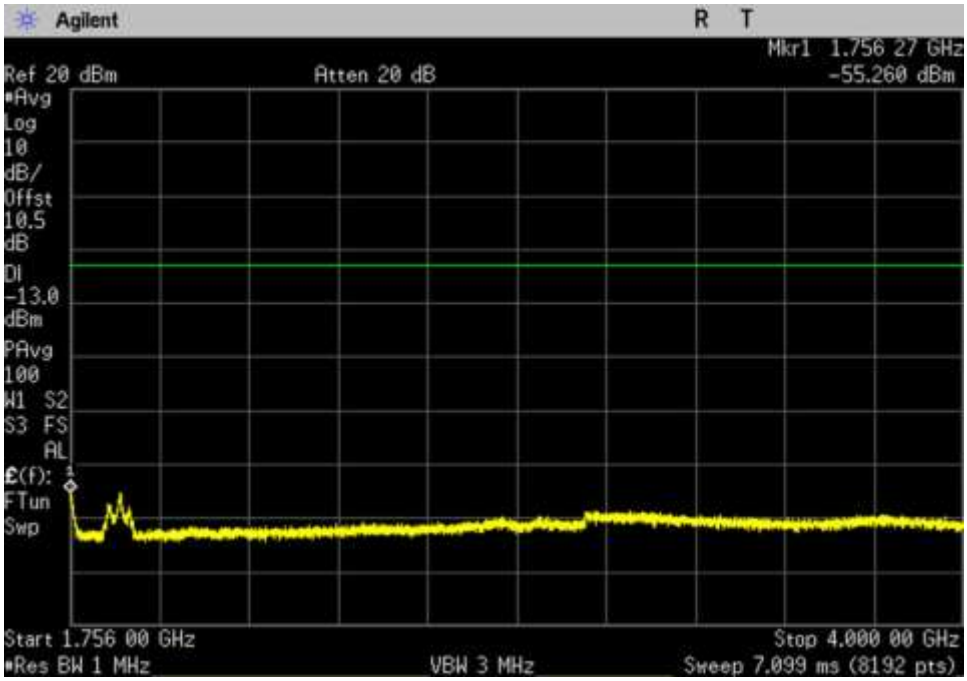
7.6 CSE_UL_824-849_ 4000- 8000MHz



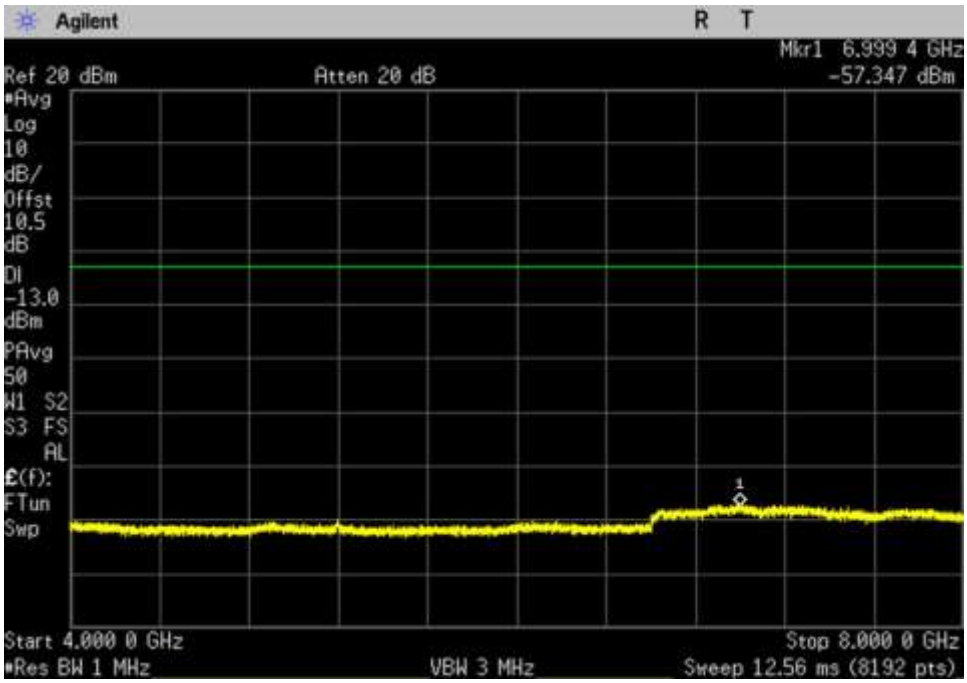
7.6 CSE_UL_824-849_ 8000- 12000MHz



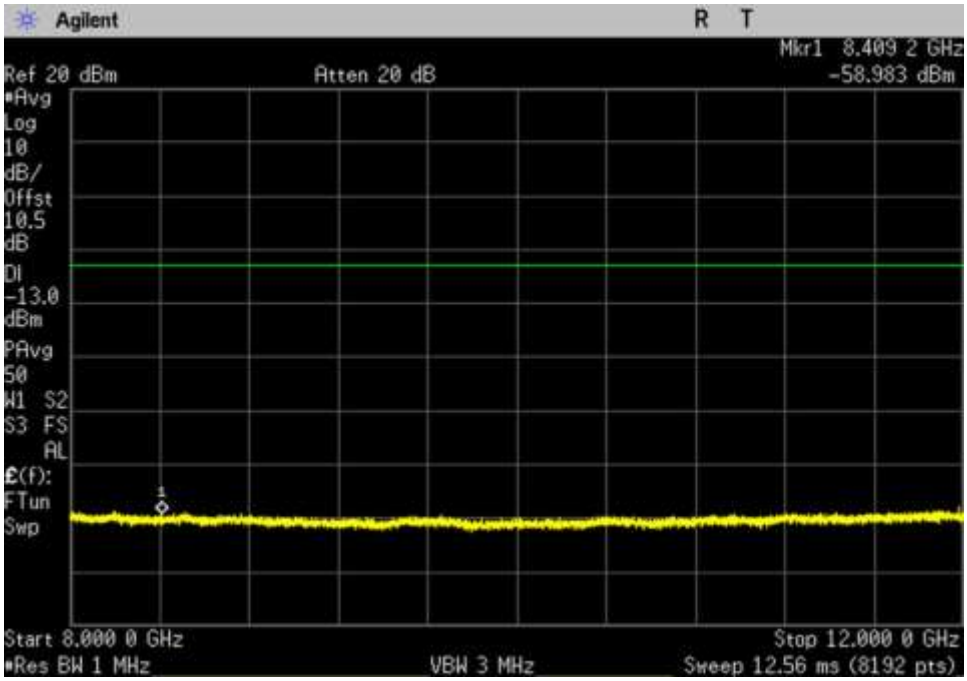
7.6 CSE_UL_1710-1755_ 30- 1709MHz



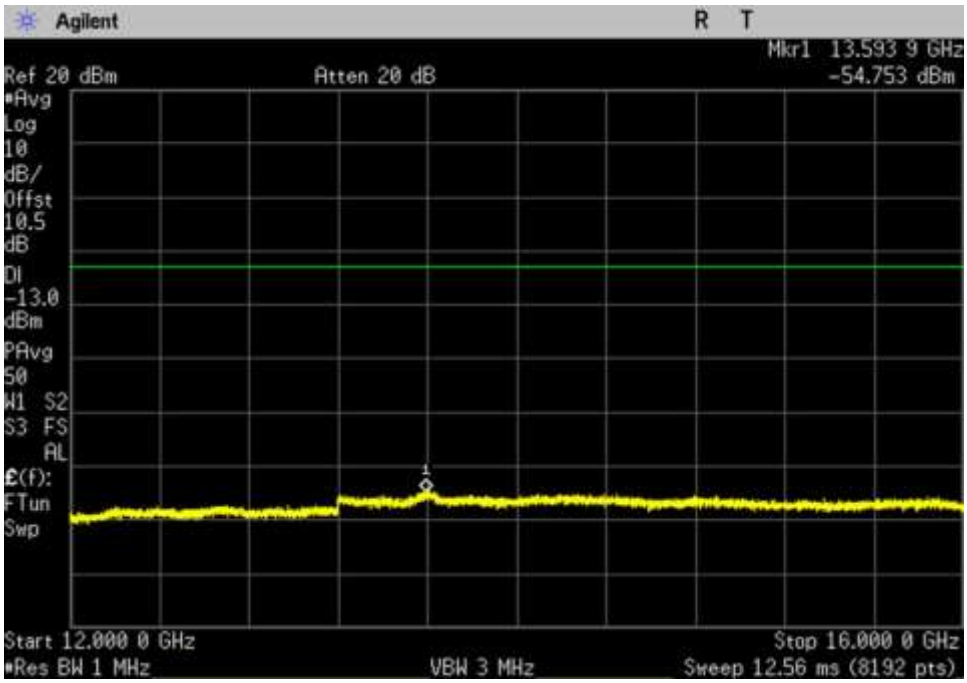
7.6 CSE_UL_1710-1755_ 1756- 4000MHz



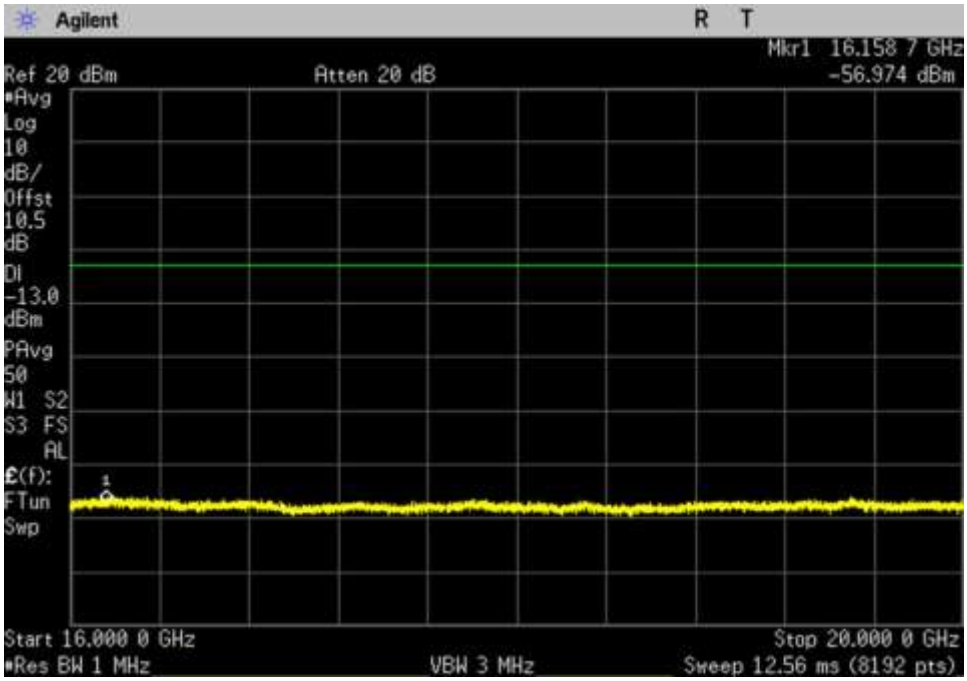
7.6 CSE_UL_1710-1755_ 4000- 8000MHz



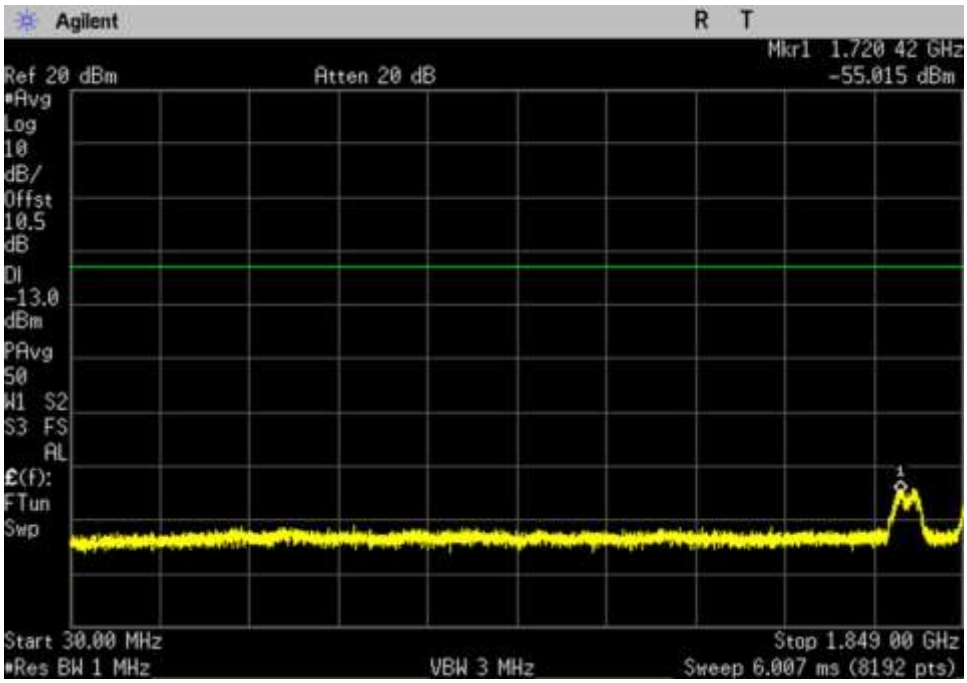
7.6 CSE_UL_1710-1755_ 8000- 12000MHz



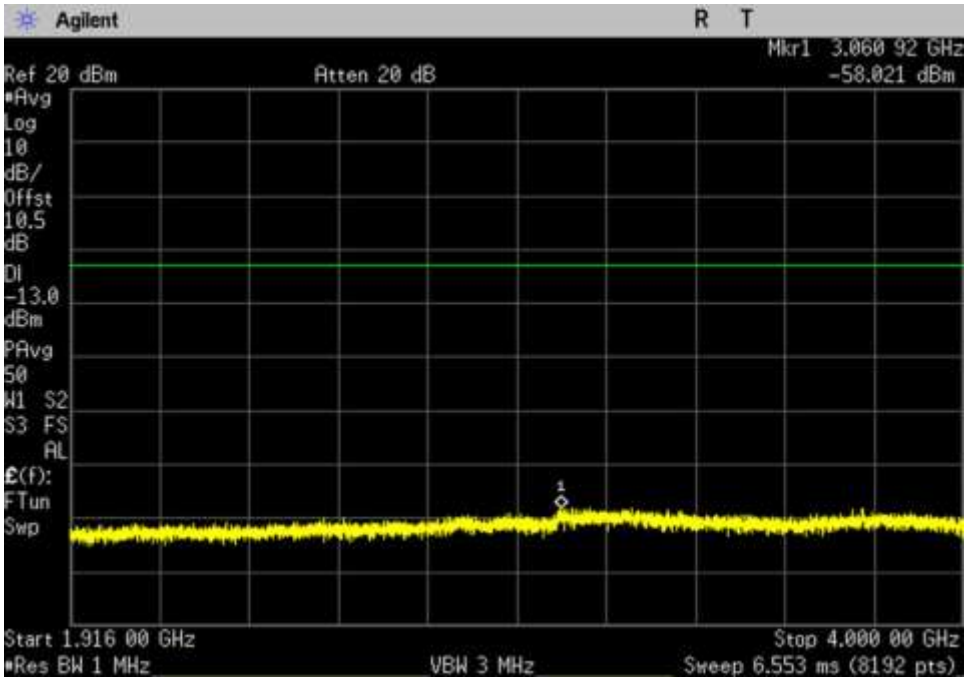
7.6 CSE_UL_1710-1755_ 12000- 16000MHz



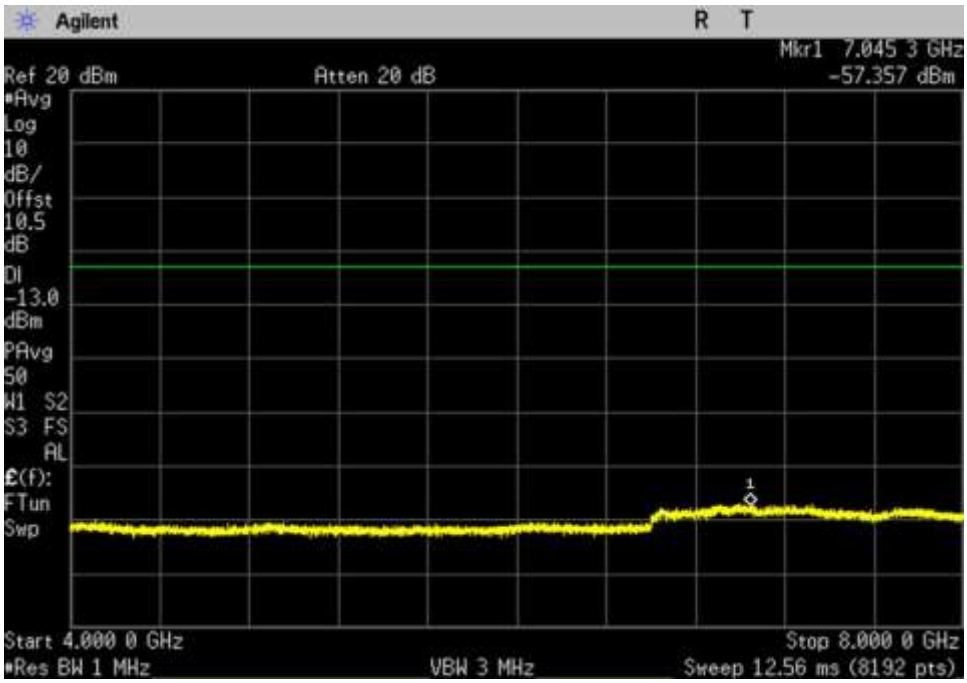
7.6 CSE_UL_1710-1755_ 16000- 20000MHz



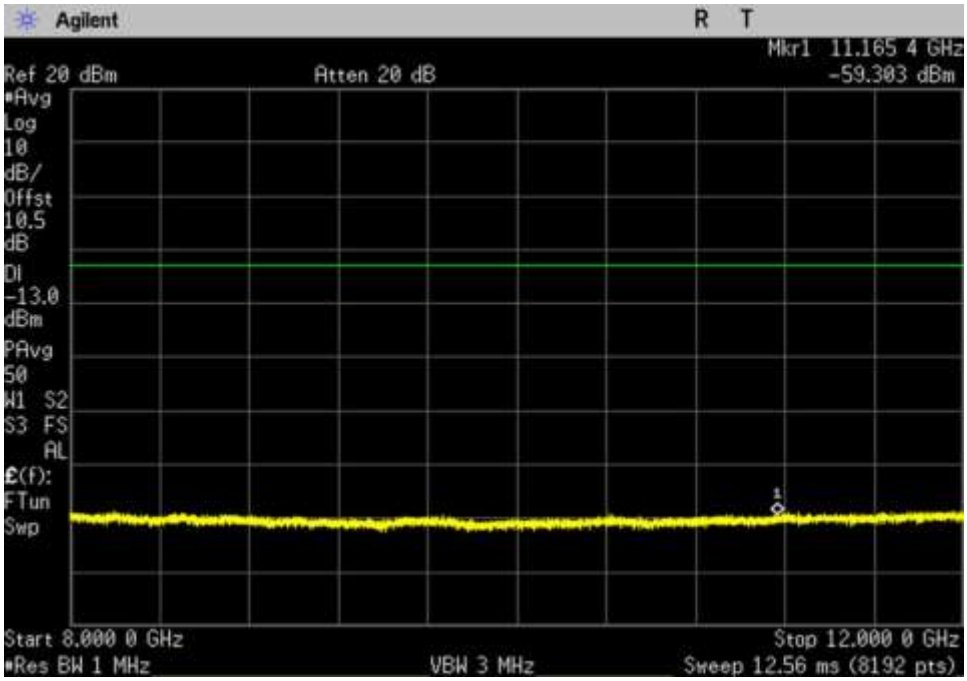
7.6 CSE_UL_1850-1915_ 30- 1849MHz



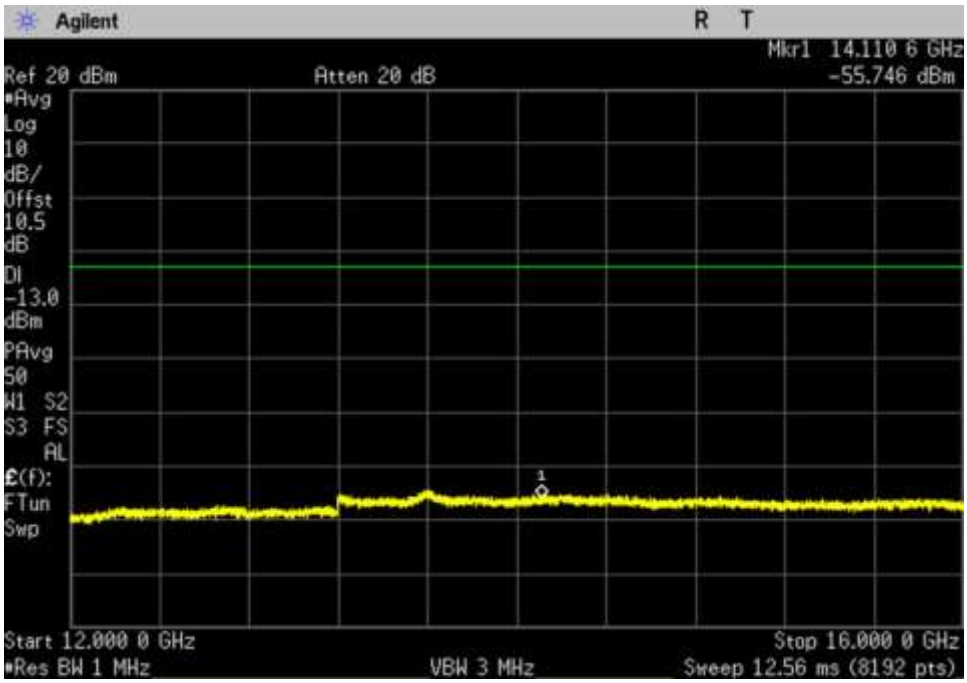
7.6 CSE_UL_1850-1915_ 1916- 4000MHz



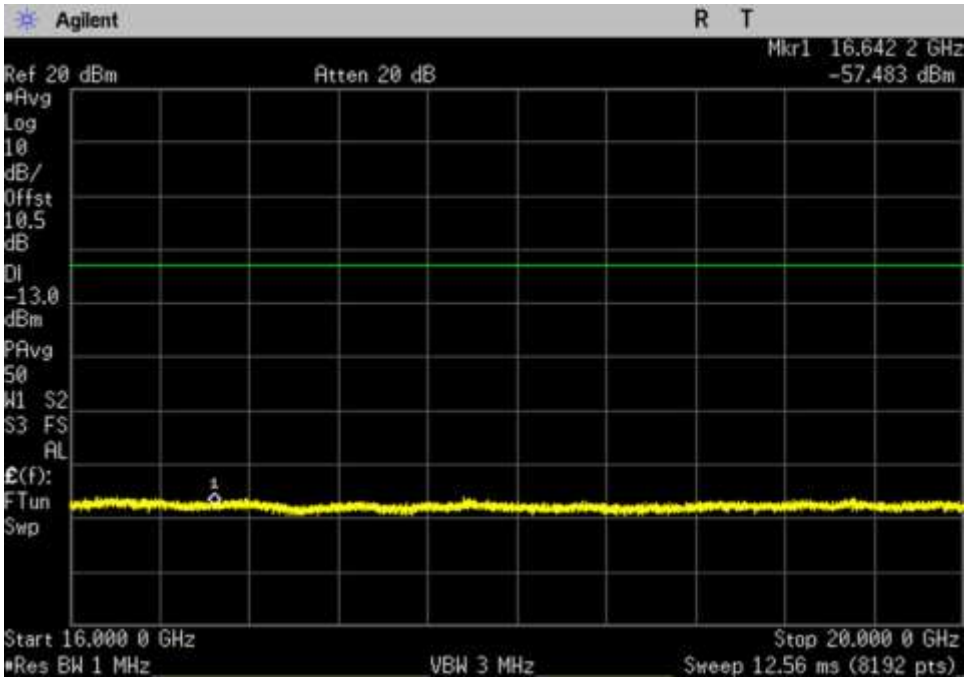
7.6 CSE_UL_1850-1915_ 4000- 8000MHz



7.6 CSE_UL_1850-1915_ 8000- 12000MHz



7.6 CSE_UL_1850-1915_ 12000- 16000MHz



7.6 CSE_UL_1850-1915_ 16000- 20000MHz

7.7 Noise limit

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer:	Cellphone-Mate, Inc
Specification:	**7.7 Noise Limit (Maximum Transmitter Noise Power Level / Variable UL Noise Timing)**
Work Order #:	**101463** Date: 07/06/18
Test Type:	**Conducted Emissions**
Tested By:	**Hieu Song Nguyenpham**
Software:	EMITest 5.03.11

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N

Test Conditions / Notes:

Test environment conditions: 21.8°C, 44.5% relative humidity,102.5kPa

Test Equipment:

Asset #	Description	Manufacturer	Model	Calibration Date	Cal Due Date
P07192	Cable	Astro	32022-29094K-29094K-48TC	10/9/2017	10/9/2019
P07191	Cable	Astro	32022-29094K-29094K-48TC	10/30/2017	10/30/2019
03418	Signal Generator	Agilent	E4438C	6/19/2017	6/19/2019
03470	Spectrum Analyzer	Agilent	E4440A	1/3/2018	1/3/2020
C00082	Directional Coupler	MECA Electronics, Inc	722-10-1.500V	9/18/2017	9/18/2019

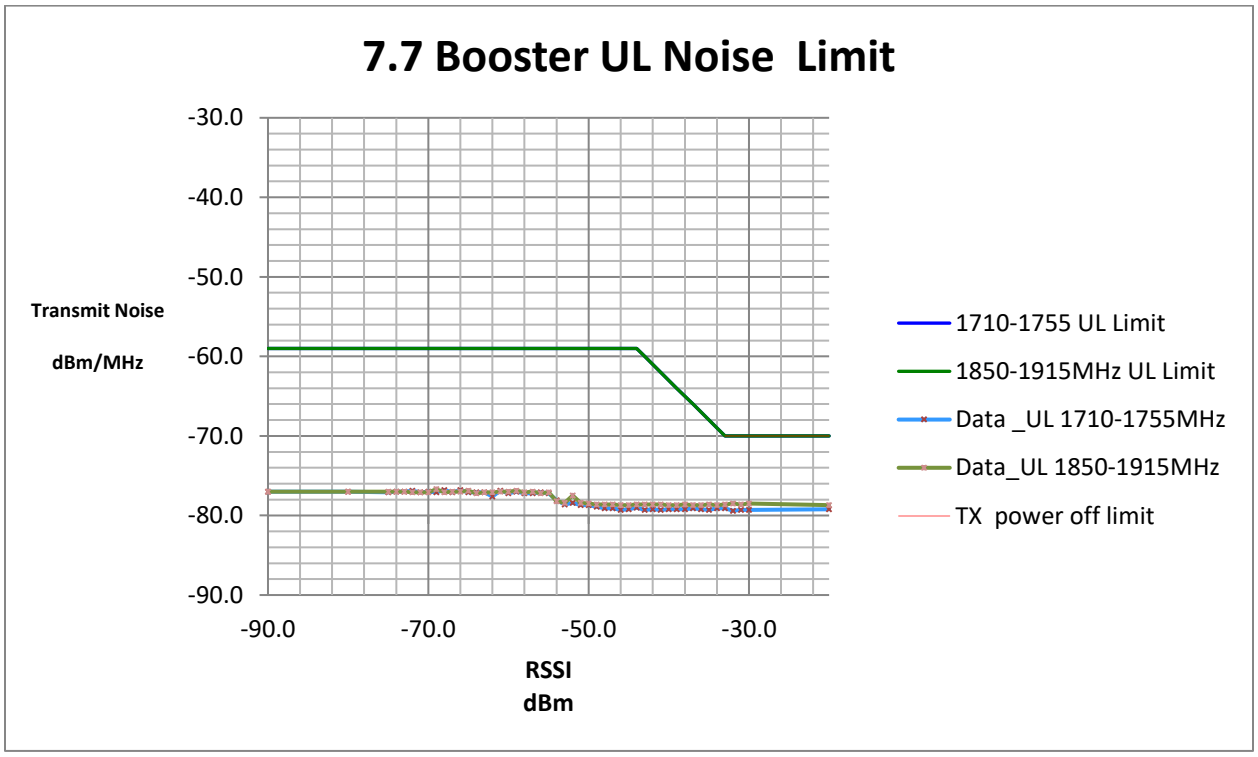
Summary of Results

7.7.1 Maximum transmitter noise power level

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

Maximum Noise Power			
Freq	**Measured**	**Limit**	**Margin**
MHz	dBm./MHz	dBm/MHz	
UL 1710-1755	-77.4	-59.0	-18.4
UL 1850-1915	-77.4	-59.0	-18.4
UL 824-849	-76.9	-59.0	-17.9
UL 698-716	-74.2	-59.0	-15.2
UL 776-787	-73.8	-59.0	-14.8
DL 2110-2155	-81.8	-59.0	-22.8
DL 1930-1995	-79.3	-59.0	-20.3
DL 869-894	-80.7	-59.0	-21.7
DL 728-746	-82.4	-59.0	-23.4
DL 746-757	-82.6	-59.0	-23.6

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


7.7 Booster UL Noise Limit
Transmit Noise
dBm/MHz
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-90.0
-70.0
-50.0
-30.0
RSSI
dBm
1710-1755 UL Limit
1850-1915MHz UL Limit
Data _UL 1710-1755MHz
Data_UL 1850-1915MHz
TX power off limit