RF Test Report

Test in accordance with
Federal Communications Commission(FCC)
CFR TITLE 47, Parts 2,27

Product Name: LTE-FDD MODULE

Model No. : SIM7500V

FCC ID: UDV-201706

Applicant :Shanghai Simcom Ltd.
Address :SIM Technology Building.,No.633, Jinzhong Rd, Changning District, Shanghai, P.R.China

Date of Receipt : 06-30-2017

Test Date : 07-01-2017~07-02-2017

Issued Date : 07-03-2017

Report No. : UL15820170630FCC026-1

Report Version : V1.0

Notes：
The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Test Report Certification

Issued Date : 07-03-2017
Report No. : UL15820170630FCC026-1

Product Name :	LTE-FDD MODULE
Applicant :	Shanghai Simcom Ltd.
Address :	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China
Manufacturer :	Shanghai Simcom Ltd.
Address :	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China
Model No. :	SIM7500V
EUT Voltage :	MIN: 3.4V, NOR:3.8V, MAX:4.2V (DC)
Brand Name :	SIMCom
FCC ID:	UDV-201706
Applicable Standard :	ANSI/TIA-603-D-2010;FCC KDB 971168D01 Power Meas License Digital Systems v02r02;FCC CFR Title 47 Part 2;FCCCFR Title 47 Part 27
Test Result :	Complied
Performed Location :	Unilab (Shanghai) Co., Ltd. FCC 2.948 register number is 714465 No. 1350, Lianxi Rd. Pudong New District, Shanghai, China TEL: +86-21-50275125FAX: +86-21-50275126

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(Senior Engineer: Forest Cao)

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(Supervisor Engineer: Eva Wang)

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SUMMARY OF TEST RESULT

Report Section	SPECIFICATION FCC CFR 47	Description	Limit	Result
3	part2.1046	Conducted Output Power	N/A	PASS
3	part 27.50(b)(10)	Effective Radiated Power Equivalent Isotropic Radiated Power	<1 Watts <3 Watts	PASS
4	part2.1047	Modulation Characteristic	N/A	PASS
4	part 2.1049 part 27.53 (g)	Occupied Bandwidth	N/A	PASS
5	part 2.1051 part 27.53(g)	Band Edge Measurement	<43+10lg(P[Watts])	PASS
6	part 2.1051 part 27.53 (g)	Conducted Spurious Emission	<43+10lg(P[Watts])	PASS
6	part 2.1053 part 27.53(g)	Field Strength of Spurious Radiation	<43+10lg(P[Watts])	PASS
7	part 2.1055 part 27.54	Frequency Stability for Temperature &Voltage	N/A	PASS
8	part 2.1046 part 27.50	Peak to average	<13	PASS

1.General Information

1.1. EUT Description

Product Name:	LTE-FDD MODULE
Model Name:	SIM7500V
Hardware Version:	V1.02
Software Version:	SIM7500V_V1.1
RF Exposure Environment:	Uncontrolled
LTE	
Support Band:	LTE Band 4& LTE Band 13
Tx Frequency Range:	LTE Band 4: 1710 MHz -1755 MHz LTE Band 13: 777 MHz -787 MHz
Rx Frequency Range:	LTE Band 4: 2110 MHz -2155 MHz LTE Band 13: 746 MHz -756 MHz
Type of modulation:	LTE: QPSK,16-QAM,64QAM
Antenna Type:	External Antenna(SMA connector)
Antenna Peak Gain:	Band4: 3.49dBi Band13: 2.2dBi

Note: This EUT don't support full RB of the bandwidth more 10MHz at 16QAM mode.

1.2. Mode of Operation

Unilab has verified the construction and function in typical operation. EUT is inlink mode with base station emulator at maximum power level. All the test modes were carried out with the EUT in normal operation, which was shown in this test report is the worst test modeand defined as:

Mode	Band Width (MHz)	QPSK		16-QAM	
		RB Size	RB Offset	RB Size	RB Offset
LTE Band 4	1.4	1	0	1	0
	3	1	0	1	0
	5	1	0	1	0
	10	1	0	1	0
	15	1	0	1	0
	20	1	0	1	0
LTE Band 13	5	1	0	1	24
	10	1	0	1	0

Note:
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2.For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst (Z axis) result on this report.
3.For conducted test, both two Modulations(QPSK and 16-QAM) are tested for radiated test, only the maximum RF output power level are chosen.

The conducted power table is as follows:

Mode	Band Width	Channel	Frequeny (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	1.4 MHz	19957	1710.7	QPSK	**1**	**0**	**23.59**	**0.23**
					1	5	23.22	0.21
					5	1	23.20	0.21
					6	0	22.23	0.17
				16-QAM	**1**	**0**	**22.73**	**0.19**
					1	5	22.57	0.18
					5	1	22.38	0.17
					6	0	21.10	0.13
		20175	1732.5	QPSK	**1**	**0**	**23.44**	**0.22**
					1	5	23.41	0.22
					5	1	23.40	0.22
					6	0	22.52	0.18
				16-QAM	**1**	**0**	**22.72**	**0.19**
					1	5	22.62	0.18
					5	1	22.48	0.18
					6	0	21.53	0.14
		20393	1754.3	QPSK	1	0	23.42	0.22
					1	**5**	**23.57**	**0.23**
					5	1	23.29	0.21
					6	0	22.30	0.17
				16-QAM	1	0	21.95	0.16
					1	5	22.07	0.16
					5	**1**	**22.22**	**0.17**
					6	0	21.50	0.14
	3MHz	19965	1711.5	QPSK	**1**	**0**	**23.62**	**0.23**
					1	14	23.05	0.20
					6	9	22.28	0.17
					15	0	22.33	0.17
				16-QAM	**1**	**0**	**22.61**	**0.18**
					1	14	21.76	0.15
					6	9	21.22	0.13
					15	0	21.29	0.13
		20175	1732.5	QPSK	**1**	**0**	**23.39**	**0.22**
					1	14	23.34	0.22
					6	9	22.32	0.17
					15	0	22.37	0.17
				16-QAM	**1**	**0**	**22.55**	**0.18**
LTE Band 4					1	14	22.44	0.18
					6	9	21.25	0.13
					15	0	21.39	0.14
		20385	1753.5	QPSK	**1**	**0**	**23.31**	**0.21**
					1	14	23.28	0.21

					6	9	22.08	0.16
					15	0	22.11	0.16
					1	0	22.44	0.18
				16-QAM	**1**	**14**	**22.55**	**0.18**
					6	9	21.22	0.13
					15	0	21.15	0.13
					1	**0**	**23.49**	**0.22**
				QPSK	1	24	23.27	0.21
					8	17	23.24	0.21
		19975	1712.5		25	0	22.58	0.18
					1	**0**	**22.86**	**0.19**
				16-QAM	1	24	21.92	0.16
					8	17	22.24	0.17
					25	0	21.72	0.15
					1	**0**	**23.46**	**0.22**
				QPSK	1	24	23.29	0.21
					8	17	23.32	0.21
	5MHz	20175	1732.5		25	0	22.45	0.18
					1	**0**	**22.71**	**0.19**
				16-QAM	1	24	22.64	0.18
					8	17	22.45	0.18
					25	0	21.39	0.14
					1	**0**	**23.42**	**0.22**
				QPSK	1	24	23.38	0.22
					8	17	23.35	0.22
		20375	1752.5		25	0	22.42	0.17
					1	0	22.05	0.16
				16-QAM	1	24	22.23	0.17
					8	**17**	**22.54**	**0.18**
					25	0	21.47	0.14
					1	**0**	**23.39**	**0.22**
				QPSK	1	49	23.13	0.21
					16	34	22.45	0.18
		20000	1715.0		50	0	22.33	0.17
					1	**0**	**22.87**	**0.19**
				16-QAM	1	49	22.46	0.18
					16	34	21.48	0.14
					50	0	/	/
					1	**0**	**23.54**	**0.23**
				QPSK	1	49	23.11	0.20
					16	34	22.43	0.17
	10MHz	20175	1732.5		50	0	22.45	0.18
					1	**0**	**22.82**	**0.19**
				16-QAM	1	49	22.67	0.18
					16	34	21.49	0.14
LTE Band 4					50	0	/	/
					1	0	23.23	0.21
		20350	1750.0	QPSK	**1**	**49**	**23.42**	**0.22**
					16	34	22.28	0.17

					50	0	22.31	0.17
				16-QAM	1	0	22.34	0.17
					1	**49**	**22.54**	**0.18**
					16	34	21.36	0.14
					50	0	/	/
	15MHz	20025	1717.5	QPSK	**1**	**0**	**23.40**	**0.22**
					1	74	23.19	0.21
					24	51	22.17	0.16
					75	0	22.24	0.17
				16-QAM	**1**	**0**	**22.59**	**0.18**
					1	74	22.44	0.18
					24	51	21.20	0.13
					75	0	/	/
		20175	1732.5	QPSK	**1**	**0**	**23.52**	**0.22**
					1	74	23.08	0.20
					24	51	22.35	0.17
					75	0	22.30	0.17
				16-QAM	**1**	**0**	**22.67**	**0.18**
					1	74	22.57	0.18
					24	51	21.47	0.14
					75	0	/	/
		20325	1747.5	QPSK	**1**	**0**	**23.33**	**0.22**
					1	74	23.01	0.20
					24	51	22.01	0.16
					75	0	22.06	0.16
				16-QAM	**1**	**0**	**21.62**	**0.15**
					1	74	21.44	0.14
					24	51	21.06	0.13
					75	0	/	/
	20MHz	20050	1720.0	QPSK	**1**	**0**	**23.13**	**0.21**
					1	99	23.05	0.20
					24	76	22.28	0.17
					100	0	22.41	0.17
				16-QAM	**1**	**0**	**22.65**	**0.18**
					1	99	22.61	0.18
					24	76	21.33	0.14
					100	0	/	/
		20175	1732.5	QPSK	**1**	**0**	**23.36**	**0.22**
					1	99	23.11	0.20
					24	76	22.10	0.16
					100	0	22.27	0.17
				16-QAM	**1**	**0**	**22.15**	**0.16**
					1	99	21.79	0.15
					24	76	21.24	0.13
					100	0	/	/
LTE Band 4		20300	1745.0	QPSK	**1**	**0**	**23.33**	**0.22**
					1	99	23.18	0.21
					24	76	22.10	0.16
					100	0	22.17	0.16

				16-QAM	**1**	**0**	**23.23**	**0.21**
					1	99	23.07	0.20
					24	76	21.34	0.14
					100	0	/	/

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 13	5 MHz	23205	779.5	QPSK	**1**	**0**	**23.80**	**0.24**
					1	24	23.63	0.23
					8	17	23.73	0.24
					25	0	22.88	0.19
				16-QAM	**1**	**0**	**22.98**	**0.20**
					1	24	22.66	0.18
					8	17	22.79	0.19
					25	0	22.04	0.16
		23230	782.0	QPSK	**1**	**0**	**23.82**	**0.24**
					1	24	23.75	0.24
					8	17	23.81	0.24
					25	0	22.90	0.19
				16-QAM	1	0	23.12	0.21
					1	**24**	**23.42**	**0.22**
					8	17	23.00	0.20
					25	0	21.77	0.15
		23255	784.5	QPSK	**1**	**0**	**23.87**	**0.24**
					1	24	23.82	0.24
					8	17	23.75	0.24
					25	0	22.87	0.19
				16-QAM	1	0	22.52	0.18
					1	24	22.40	0.17
					8	**17**	**22.73**	**0.19**
					25	0	21.74	0.15
	10 MHz	23230	782.0	QPSK	**1**	**0**	**23.93**	**0.25**
					1	49	23.86	0.24
					16	34	22.87	0.19
					50	0	22.99	0.20
				16-QAM	**1**	**0**	**22.94**	**0.20**
					1	49	22.90	0.19
					16	34	21.92	0.16
					50	0	/	/

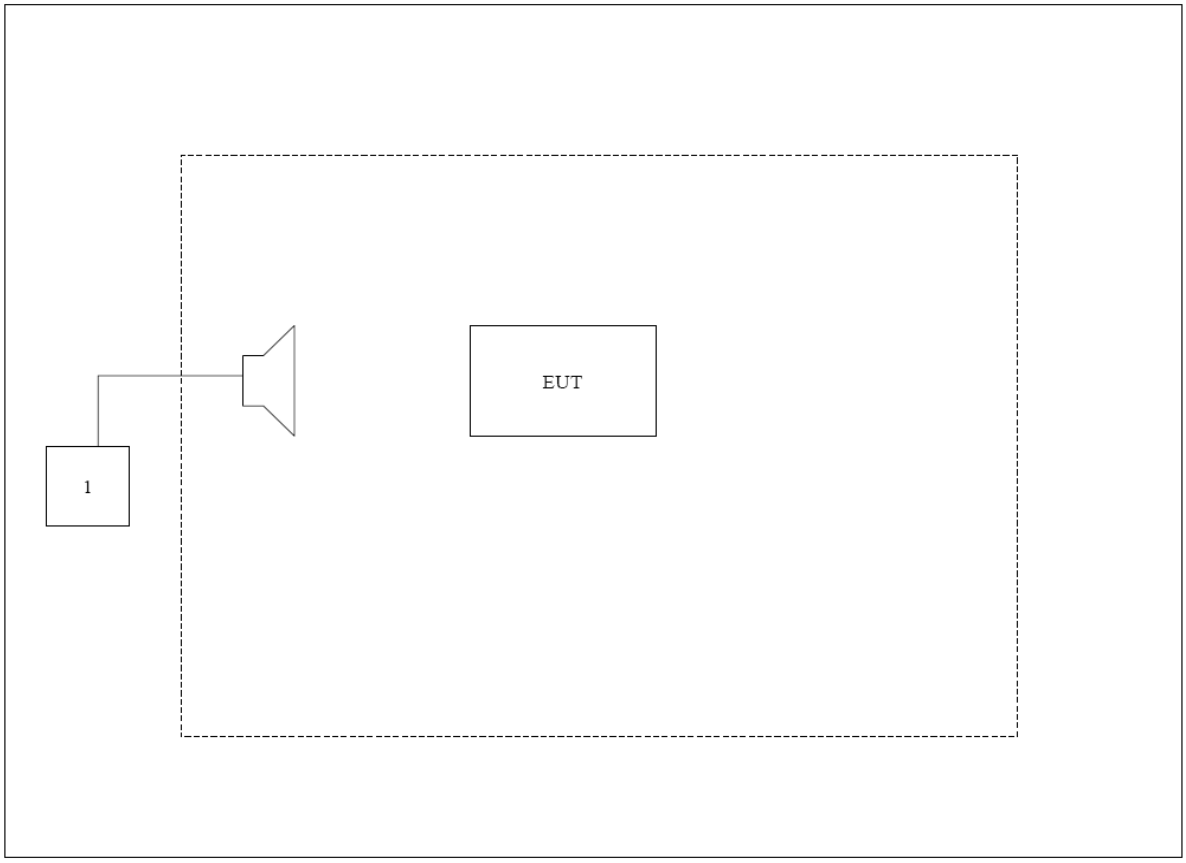
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model	Serial No.	Power Cord
Radio Communication Tester	R&S	CMW500	147483	N/A

1.4. Configuration of Tested System

Connection Diagram



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with CMW500, then select channel to test.

2. Technical Test

2.1. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (℃)	15-35	22
Humidity (%RH)	25-75	53
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

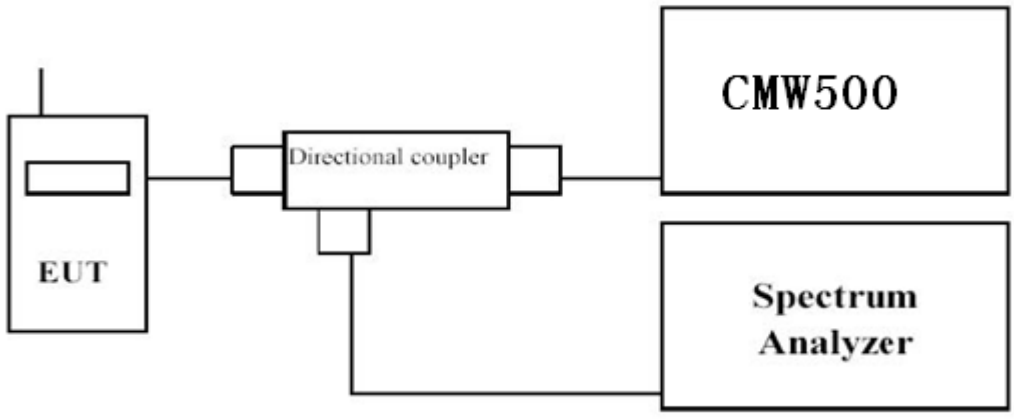
3.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
Radio Communication Tester	R&S	CMW500	147483	11/07/2017
Signal Generator	Agilent	N5183A	MY50140938	01/02/2018
Preamplifier	CEM	EM30180	3008A0245	02/25/2018
DC Power Supply	Agilent	6612C	MY43002989	03/23/2018
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	09/18/2017
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	09/18/2017

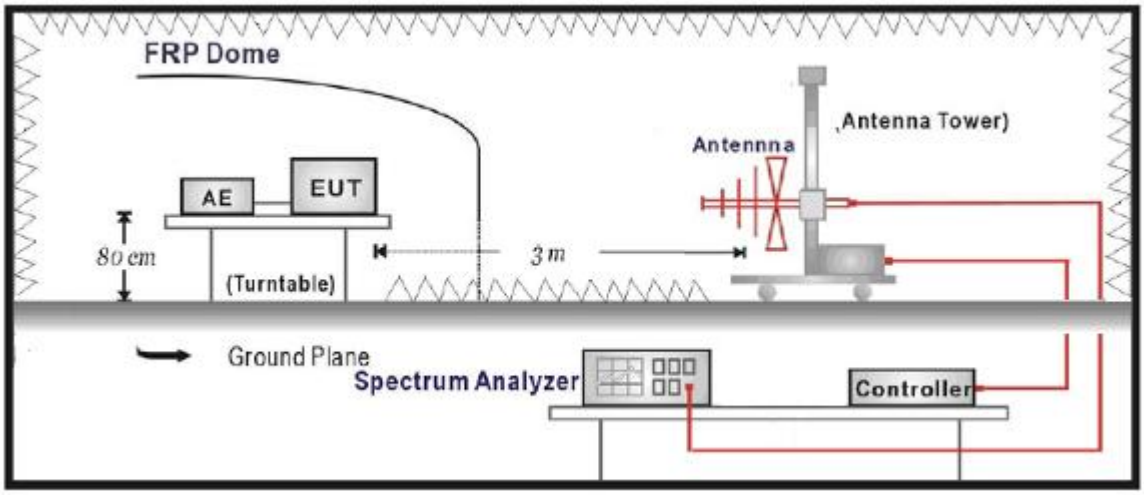
The measure equipment had been calibrated once a year.

3.2. Test Setup

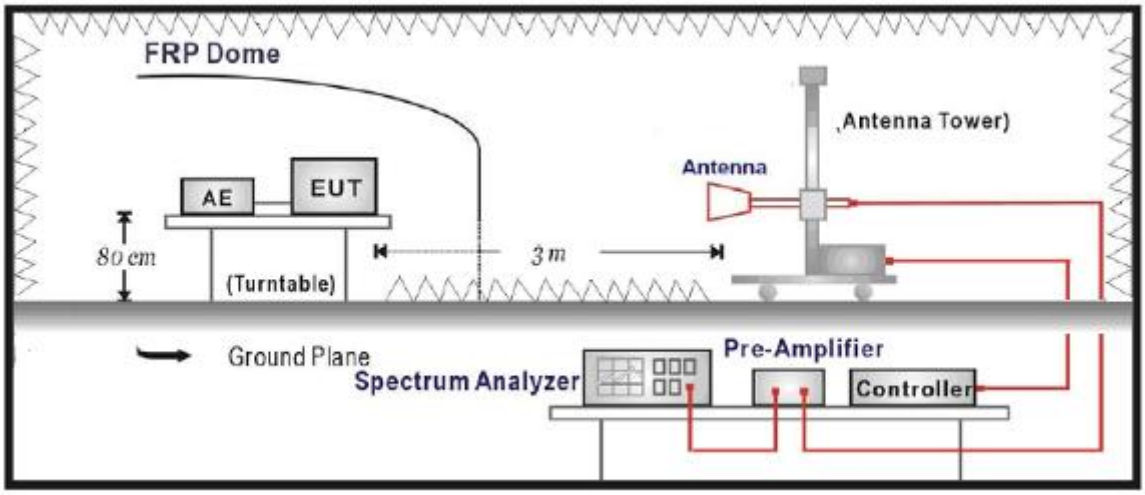
Conducted Power Measurement:



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



3.3. Limit

For FCC Part 27.50(d):
The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 1 Watt.

For FCC Part 27.50(b):
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 3 Watts.

3.4. Test Procedure

Conducted Power Measurement:
a. Place the EUT on a bench and set it in transmitting mode.
b.Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c. EUT Communicate with CMW500, then selects a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:
a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c. The output of the test antenna shall be connected to the measuring receiver.
d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f.The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h. The maximum signal level detected by the measuring receiver shall be noted.
i.The transmitter shall be replaced by a substitution antenna.
j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k. The substitution antenna shall be connected to a calibrated signal generator.
l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
q.Test site anechoic chamber refer to ANSI C63.4: 2014.

3.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement±1.1 dB,
for Radiated Power Measurement±3.1 dB

3.6. Test Result

The following table shows the two modes of modulation（QPSK&16-QAM） in different channels under the different RB configuration the largest conducted power measured result:

Mode	Band Width	Channel	Frequeny (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	1.4 MHz	19957	1710.7	**QPSK**	**1**	**0**	**23.59**	**0.23**
				16-QAM	**1**	**0**	**22.73**	**0.19**
		20175	1732.5	QPSK	1	0	23.44	0.22
				16-QAM	1	0	22.72	0.19
		20393	1754.3	QPSK	1	5	23.57	0.23
				16-QAM	5	1	22.22	0.17
	3MHz	19965	1711.5	**QPSK**	**1**	**0**	**23.62**	**0.23**
				16-QAM	**1**	**0**	**22.61**	**0.18**
		20175	1732.5	QPSK	1	0	23.39	0.22
				16-QAM	1	0	22.55	0.18
		20385	1753.5	QPSK	1	0	23.31	0.21
				16-QAM	1	14	22.55	0.18
	5MHz	19975	1712.5	**QPSK**	**1**	**0**	**23.49**	**0.22**
				16-QAM	**1**	**0**	**22.86**	**0.19**
		20175	1732.5	QPSK	1	0	23.46	0.22
				16-QAM	1	0	22.71	0.19
		20375	1752.5	QPSK	1	0	23.42	0.22
				16-QAM	8	17	22.54	0.18
	10MHz	20000	1715.0	QPSK	1	0	23.39	0.22
				16-QAM	**1**	**0**	**22.87**	**0.19**
		20175	1732.5	**QPSK**	**1**	**0**	**23.54**	**0.23**
				16-QAM	1	0	22.82	0.19
		20350	1750.0	QPSK	1	49	23.42	0.22
				16-QAM	1	49	22.54	0.18
	15MHz	20025	1717.5	QPSK	1	0	23.40	0.22
				16-QAM	1	0	22.59	0.18
		20175	1732.5	**QPSK**	**1**	**0**	**23.52**	**0.22**
				16-QAM	**1**	**0**	**22.67**	**0.18**
		20325	1747.5	QPSK	1	0	23.33	0.22
				16-QAM	1	0	21.62	0.15
	20MHz	20050	1720.0	QPSK	1	0	23.13	0.21
				16-QAM	1	0	22.65	0.18
		20175	1732.5	**QPSK**	**1**	**0**	**23.36**	**0.22**
				16-QAM	1	0	22.15	0.16
		20300	1745.0	QPSK	1	0	23.33	0.22
				16-QAM	**1**	**0**	**23.23**	**0.21**

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 13	5MHz	23205	779.5	QPSK	1	0	23.80	0.24
				16-QAM	1	0	22.98	0.20
		23230	782.0	QPSK	1	0	23.82	0.24
				16-QAM	**1**	**24**	**23.42**	**0.22**
		23255	784.5	**QPSK**	**1**	**0**	**23.87**	**0.24**
				16-QAM	8	17	22.73	0.19
	10MHz	23230	782.0	**QPSK**	**1**	**0**	**23.93**	**0.25**
				16-QAM	**1**	**0**	**22.94**	**0.20**

The following table shows the Radiated power measured:

LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19957(1710.7MHz)						
1710.7	H	20.28	6.15	9.42	23.55	0.23
1710.7	V	20.21	6.15	9.42	23.48	0.22
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.16	6.19	9.44	23.41	0.22
1732.5	V	20.07	6.19	9.44	23.32	0.21
High Channel 20393 (1754.3MHz)						
1754.3	H	20.2	6.2	9.47	23.47	0.22
1754.3	V	20.14	6.2	9.47	23.41	0.22

LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19957(1710.7MHz)						
1710.7	H	19.44	6.15	9.42	22.71	0.19
1710.7	V	19.46	6.15	9.42	22.73	0.19
Middle Channel 20175 (1732.5MHz)						
1732.5	H	19.43	6.19	9.44	22.68	0.19
1732.5	V	19.34	6.19	9.44	22.59	0.18
High Channel 20393 (1754.3MHz)						
1754.3	H	18.94	6.2	9.47	22.21	0.17
1754.3	V	18.9	6.2	9.47	22.17	0.16

LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19965(1711.5MHz)						
1711.5	H	20.31	6.15	9.42	23.58	0.23
1711.5	V	20.24	6.15	9.42	23.51	0.22
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.13	6.19	9.44	23.38	0.22
1732.5	V	20.1	6.19	9.44	23.35	0.22
High Channel 20385 (1753.5MHz)						
1753.5	H	20.01	6.2	9.47	23.28	0.21
1753.5	V	19.94	6.2	9.47	23.21	0.21

LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19965(1711.5MHz)						
1711.5	H	19.27	6.15	9.42	22.54	0.18
1711.5	V	18.96	6.15	9.42	22.23	0.17
Middle Channel 20175 (1732.5MHz)						
1732.5	H	19.17	6.19	9.44	22.42	0.17
1732.5	V	19.11	6.19	9.44	22.36	0.17
High Channel 20385 (1753.5MHz)						
1753.5	H	19.25	6.2	9.47	22.52	0.18
1753.5	V	19.24	6.2	9.47	22.51	0.18

LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19975(1712.5MHz)						
1712.5	H	20.17	6.15	9.42	23.44	0.22
1712.5	V	20.04	6.15	9.42	23.31	0.21
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.18	6.19	9.44	23.43	0.22
1732.5	V	20.06	6.19	9.44	23.31	0.21
High Channel 20375 (1752.5MHz)						
1752.5	H	20.02	6.2	9.47	23.29	0.21
1752.5	V	19.84	6.2	9.47	23.11	0.20

LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 19975(1712.5MHz)						
1712.5	H	19.54	6.15	9.42	22.81	0.19
1712.5	V	19.37	6.15	9.42	22.64	0.18
Middle Channel 20175 (1732.5MHz)						
1732.5	H	19.43	6.19	9.44	22.68	0.19
1732.5	V	19.19	6.19	9.44	22.44	0.18
High Channel 20375 (1752.5MHz)						
1752.5	H	19.21	6.2	9.47	22.48	0.18
1752.5	V	19.1	6.2	9.47	22.37	0.17

LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20000(1715.0MHz)						
1715.0	H	20.08	6.15	9.42	23.35	0.22
1715.0	V	19.94	6.15	9.42	23.21	0.21
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.13	6.19	9.44	23.38	0.22
1732.5	V	20.07	6.19	9.44	23.32	0.21
High Channel 20350 (1750.0MHz)						
1750.0	H	20.04	6.2	9.47	23.31	0.21
1750.0	V	19.88	6.2	9.47	23.15	0.21

LTE Band 4 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20000(1715.0MHz)						
1715.0	H	19.41	6.15	9.42	22.68	0.19
1715.0	V	19.34	6.15	9.42	22.61	0.18
Middle Channel 20175 (1732.5MHz)						
1732.5	H	19.46	6.19	9.44	22.71	0.19
1732.5	V	19.29	6.19	9.44	22.54	0.18
High Channel 20350 (1750.0MHz)						
1750.0	H	19.2	6.2	9.47	22.47	0.18
1750.0	V	19.06	6.2	9.47	22.33	0.17

LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20025(1717.5MHz)						
1717.5	H	20.05	6.15	9.42	23.32	0.21
1717.5	V	20.0	6.15	9.42	23.27	0.21
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.23	6.19	9.44	23.48	0.22
1732.5	V	20.16	6.19	9.44	23.41	0.22
High Channel 20325 (1747.5MHz)						
1747.5	H	20.02	6.2	9.47	23.29	0.21
1747.5	V	19.84	6.2	9.47	23.11	0.20

LTE Band 4 (16-QAM, Band Width 15MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20025(1717.5MHz)						
1717.5	H	19.3	6.15	9.42	22.57	0.18
1717.5	V	19.32	6.15	9.42	22.59	0.18
Middle Channel 20175 (1732.5MHz)						
1732.5	H	19.36	6.19	9.44	22.61	0.18
1732.5	V	19.19	6.19	9.44	22.44	0.18
High Channel 20325 (1747.5MHz)						
1747.5	H	18.34	6.2	9.47	21.61	0.18
1747.5	V	18.26	6.2	9.47	21.53	0.18

LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20050(1720.0MHz)						
1720.0	H	19.84	6.15	9.42	23.11	0.20
1720.0	V	19.71	6.15	9.42	22.98	0.20
Middle Channel 20175 (1732.5MHz)						
1732.5	H	20.08	6.19	9.44	23.33	0.22
1732.5	V	19.88	6.19	9.44	23.13	0.21
High Channel 20300 (1745.0MHz)						
1745.0	H	20.01	6.2	9.47	23.28	0.21
1745.0	V	19.95	6.2	9.47	23.22	0.21

LTE Band 4 (16-QAM, Band Width 20MHz,RB Size 1,RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 20050(1720.0MHz)						
1720.0	H	19.3	6.15	9.42	22.57	0.18
1720.0	V	19.15	6.15	9.42	22.42	0.17
Middle Channel 20175 (1732.5MHz)						
1732.5	H	18.86	6.19	9.44	22.11	0.16
1732.5	V	18.72	6.19	9.44	21.97	0.16
High Channel 20300 (1745.0MHz)						
1745.0	H	19.81	6.2	9.47	23.08	0.20
1745.0	V	19.84	6.2	9.47	23.11	0.20

LTE Band 13 (QPSK, Band Width 5MHz,RB Size 1 RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBd)	ERP (dBm)	ERP (W)
Low Channel 23205(779.5MHz)						
779.5	H	30.55	3.33	-3.55	23.67	0.23
779.5	V	30.46	3.33	-3.55	23.58	0.23
Middle Channel 23230 (782.0MHz)						
782.0	H	30.75	3.46	-3.48	23.81	0.24
782.0	V	30.71	3.46	-3.48	23.77	0.24
High Channel 23255 (784.5MHz)						
784.5	H	30.66	3.49	-3.41	23.76	0.24
784.5	V	30.54	3.49	-3.41	23.64	0.23

LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 1 RB Offset 24)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBd)	ERP (dBm)	ERP (W)
Low Channel 23205(779.5MHz)						
779.5	H	30.29	3.33	-3.55	23.41	0.22
779.5	V	30.25	3.33	-3.55	23.37	0.22
Middle Channel 23230 (782.0MHz)						
782.0	H	30.29	3.46	-3.48	23.35	0.22
782.0	V	30.22	3.46	-3.48	23.28	0.21
High Channel 23255 (784.5MHz)						
784.5	H	30.26	3.49	-3.41	23.36	0.22
784.5	V	30.28	3.49	-3.41	23.38	0.22

LTE Band 13 (QPSK, Band Width 10MHz,RB Size 1 RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBd)	ERP (dBm)	ERP (W)
Middle Channel 23230(782.0MHz)						
782.0	H	30.85	3.46	-3.48	23.91	0.25
782.0	V	30.82	3.46	-3.48	23.88	0.24

LTE Band 13 (16-QAM, Band Width 10MHz,RB Size 1 RB Offset 0)

Frequency(MHz)	Ant. Pol. (H/V)	SG Reading(dBm)	Cable Loss(dB)	Gain (dBd)	ERP (dBm)	ERP (W)
Middle Channel 23230(782.0MHz)						
782.0	H	29.85	3.46	-3.48	22.91	0.20
782.0	V	29.87	3.46	-3.48	22.93	0.20

4. Occupied Bandwidth

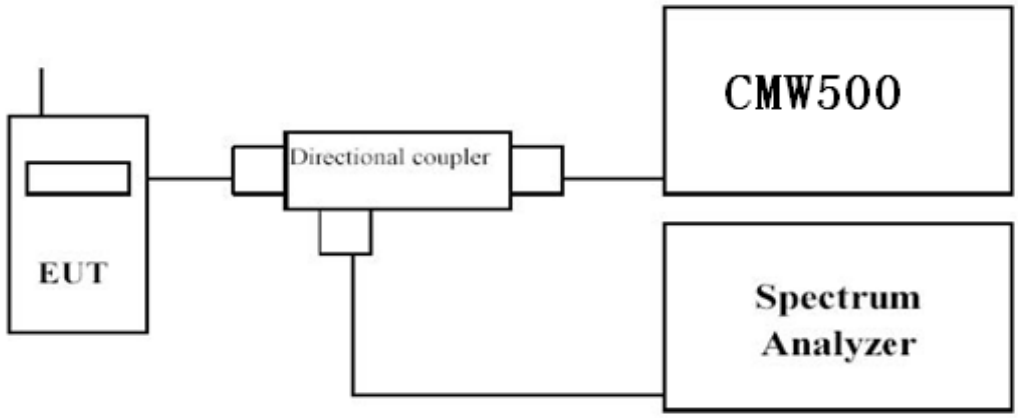
4.1. Test Equipment

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial No	Due Date
Radio Communication Tester	R&S	CMW500	147483	11/09/2017
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
DC Power Supply	Agilent	6612C	MY43002989	02/28/2018

The measure equipment had been calibrated once a year.

4.2. Test Setup



4.3. Limit

N/A

4.4. Test Procedure

1. The testing follows FCC KDB 971168 v02v02 Section 4.2;
2. Using Occupied Bandwidth measurement function of spectrum analyzer. In the Occupied Bandwidth measurement a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

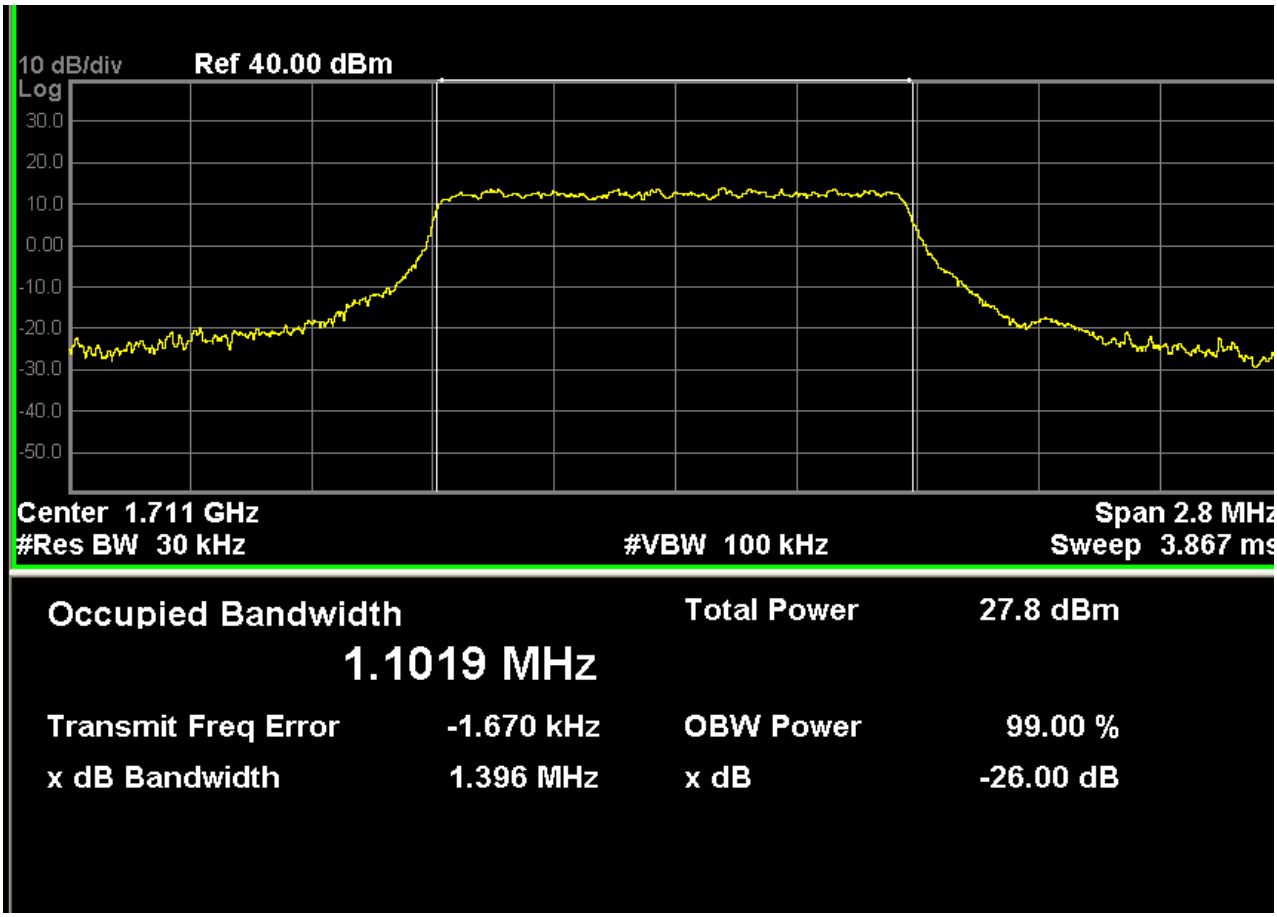
4.5. Uncertainty

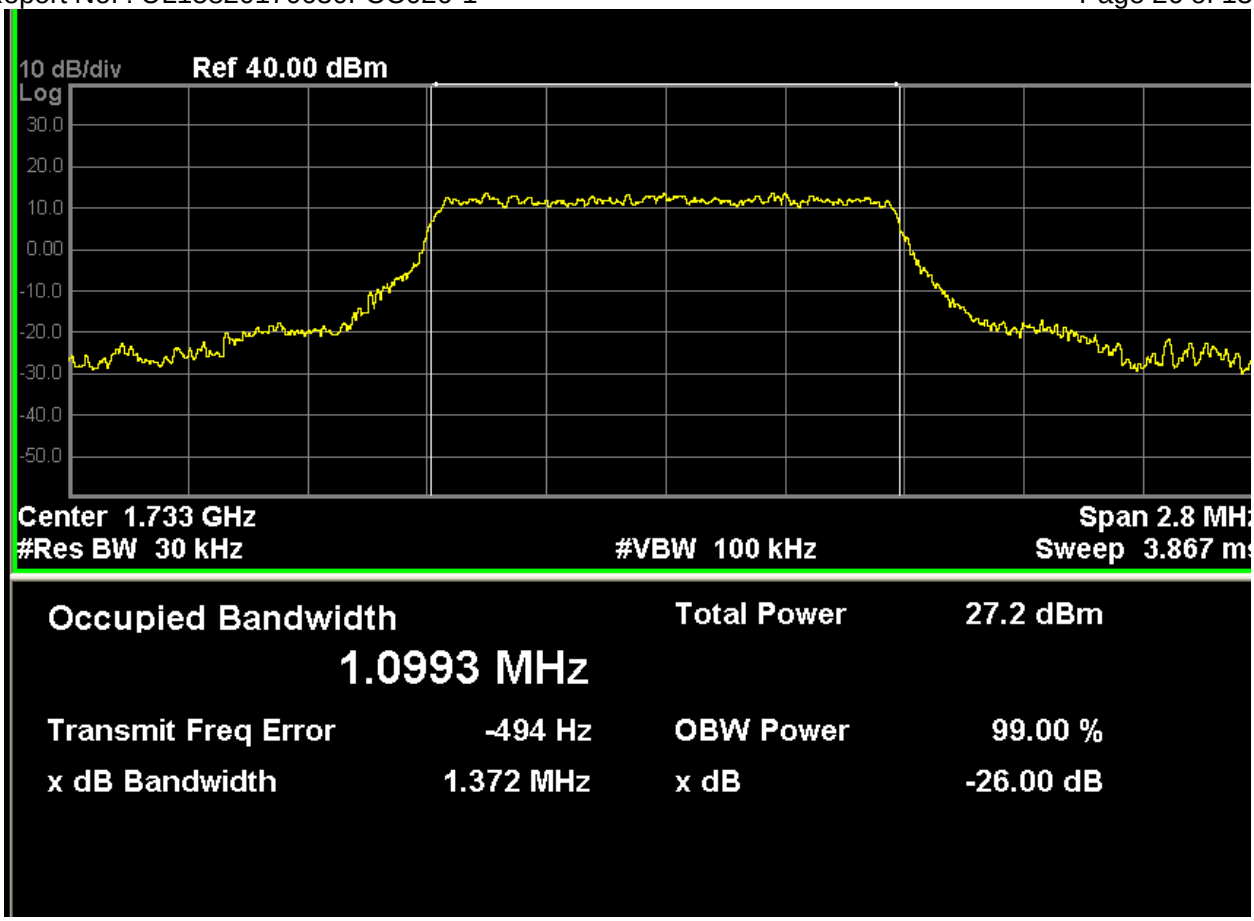
The measurement uncertainty is defined as±10 Hz

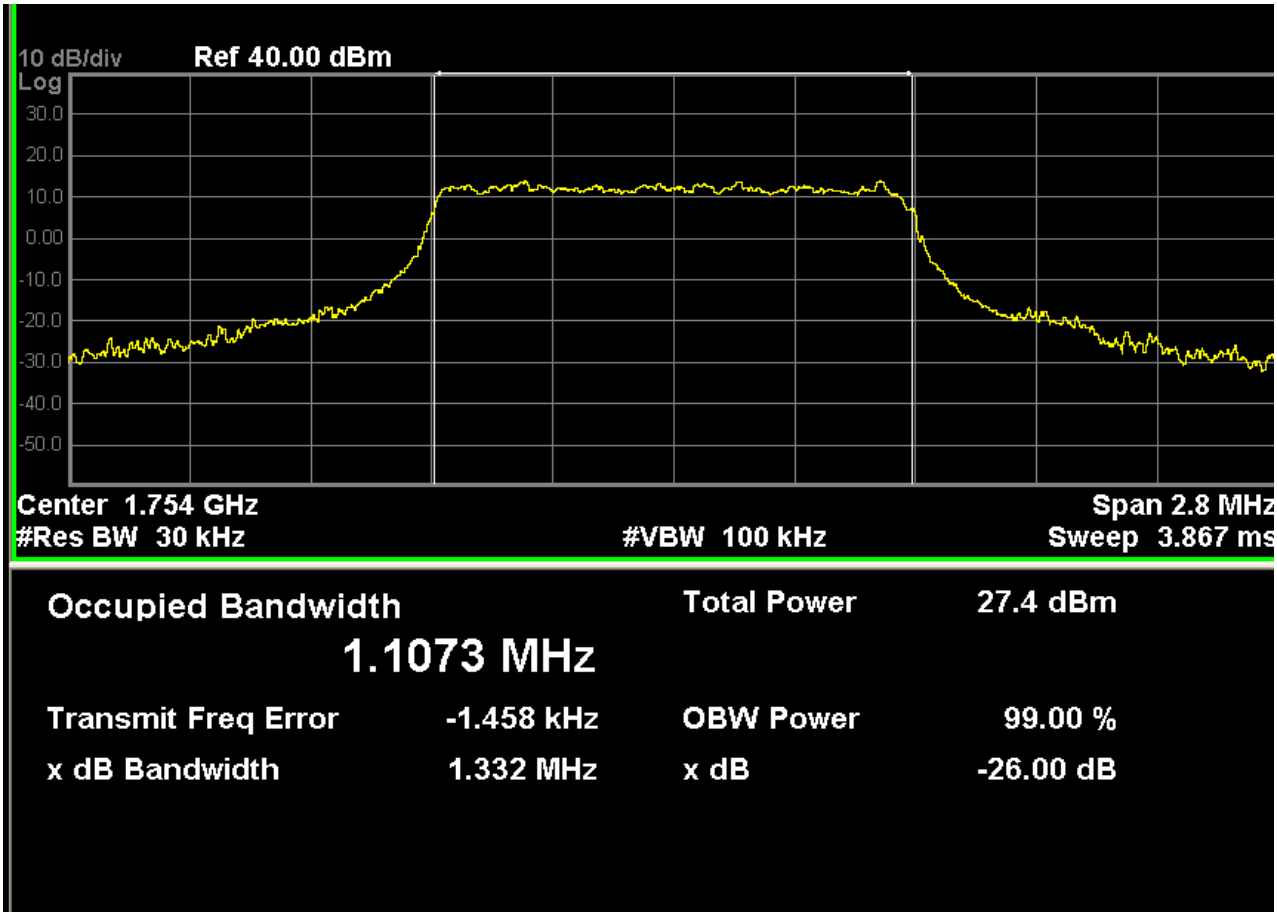
4.6. Test Result

LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 6,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.396	1.1019
20175	1732.5	1.372	1.0993
20393	1754.3	1.332	1.1073

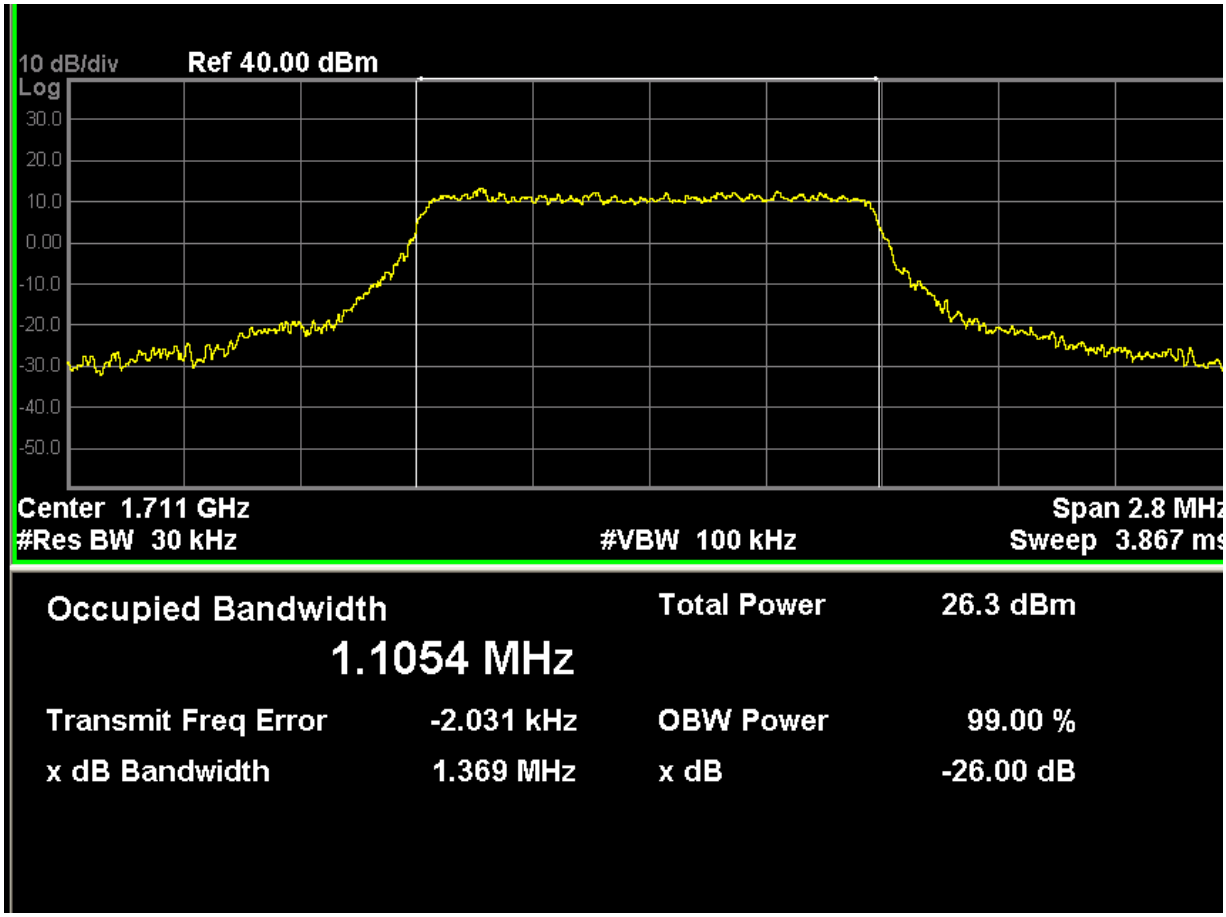


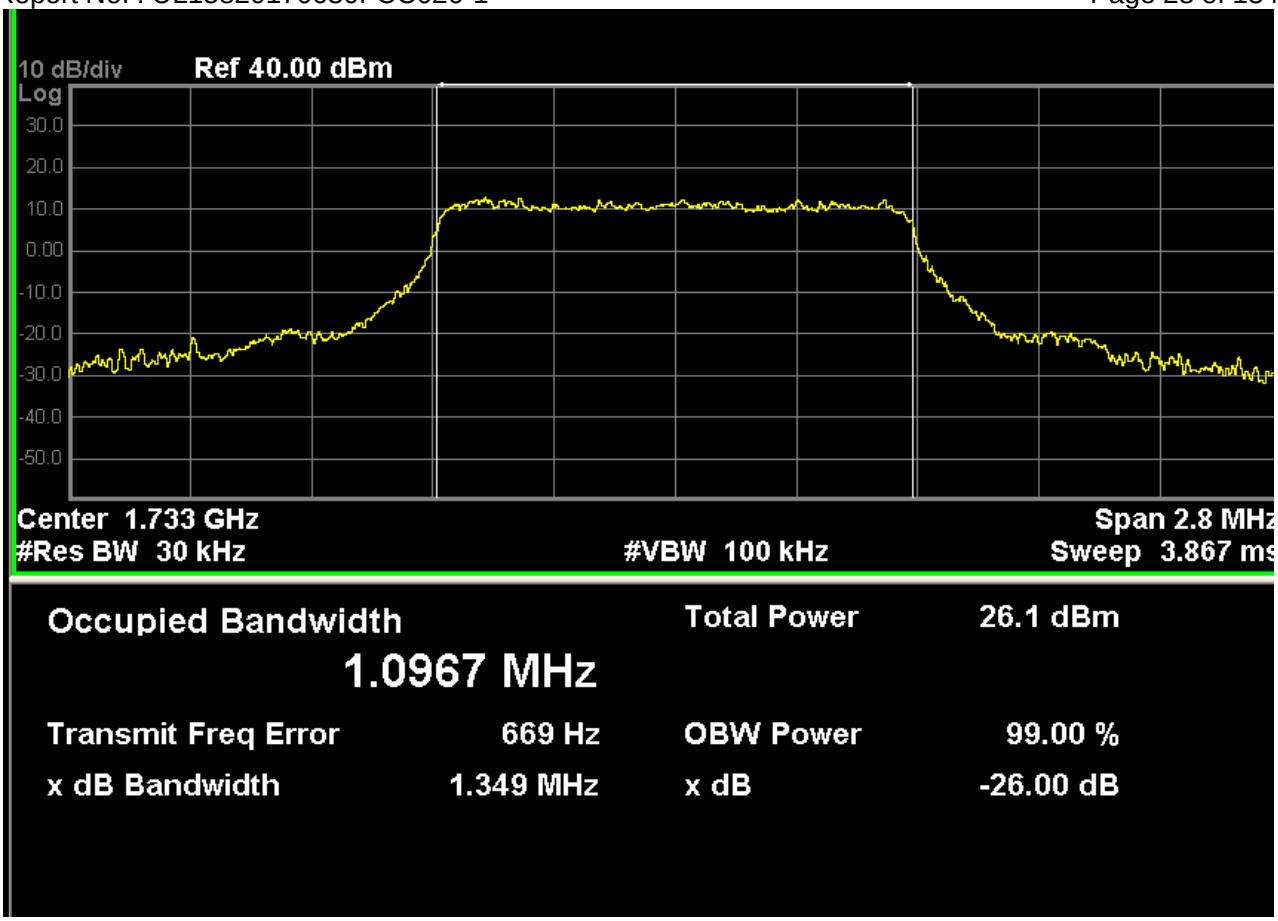

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2.8 MHz
Sweep 3.867 ms
Occupied Bandwidth
1.0993 MHz
Total Power 27.2 dBm
Transmit Freq Error -494 Hz
OBW Power 99.00 %
x dB Bandwidth 1.372 MHz
x dB -26.00 dB

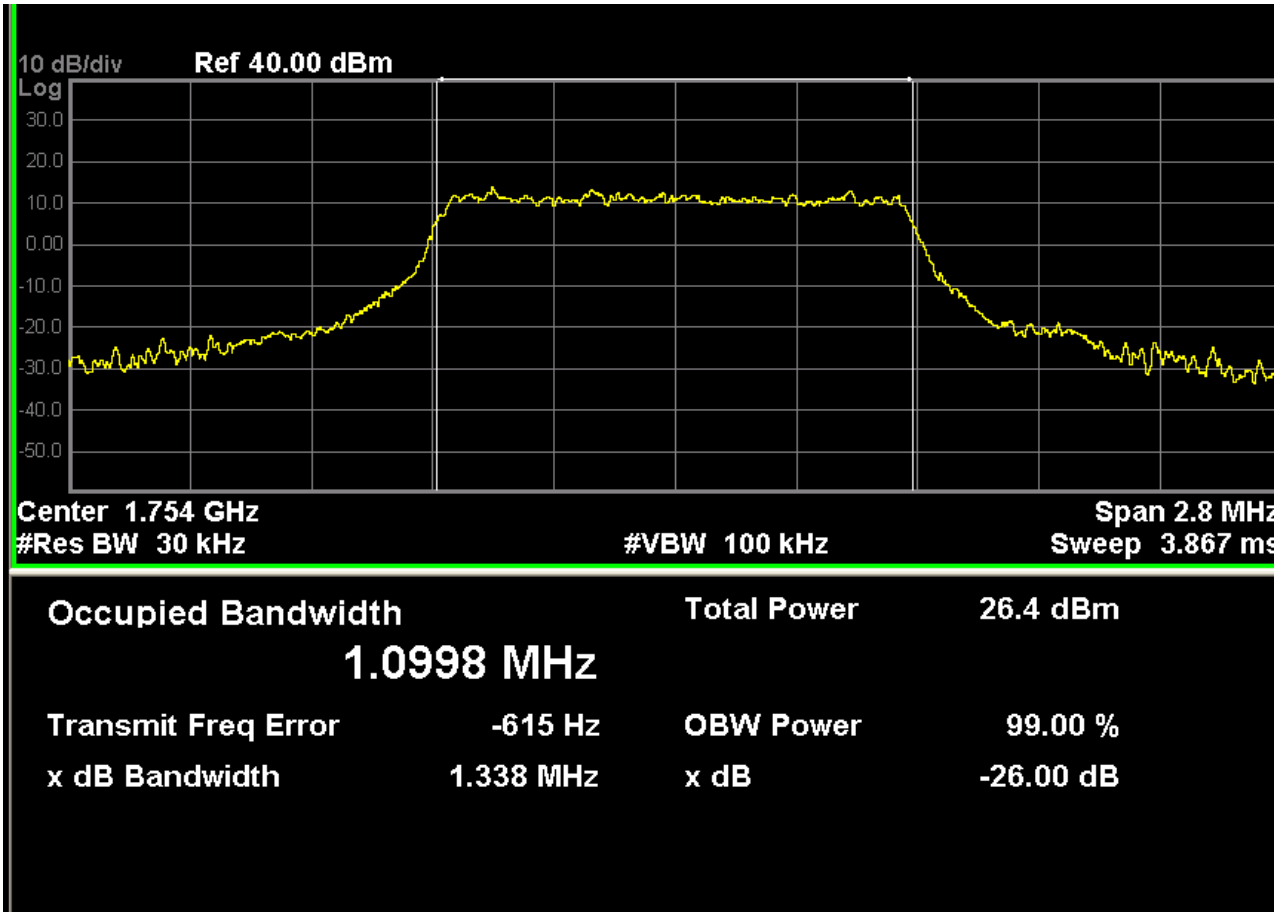

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.754 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2.8 MHz
Sweep 3.867 ms
Occupied Bandwidth
1.1073 MHz
Total Power 27.4 dBm
Transmit Freq Error -1.458 kHz
OBW Power 99.00 %
x dB Bandwidth 1.332 MHz
x dB -26.00 dB

LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 6,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.369	1.1054
20175	1732.5	1.349	1.0967
20393	1754.3	1.338	1.0998

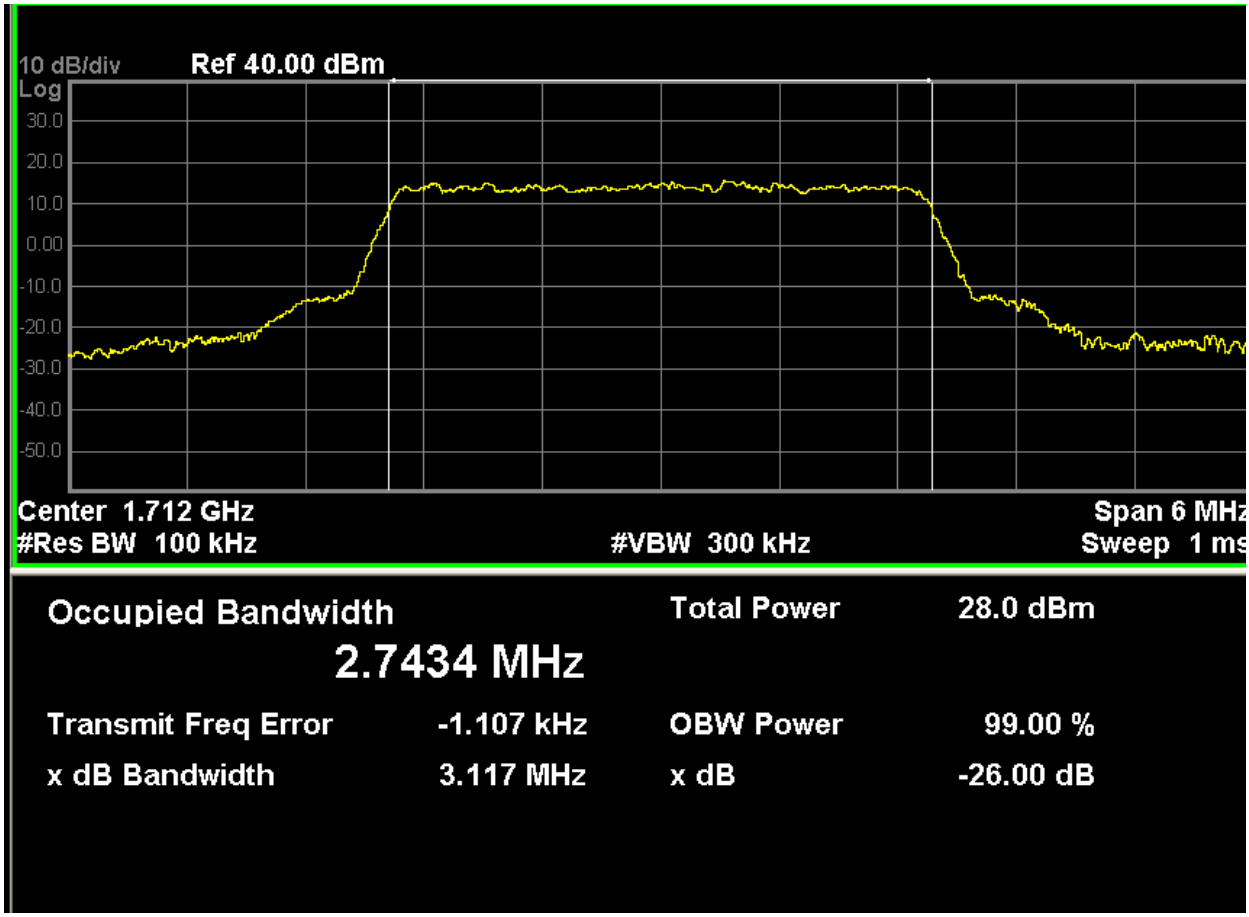


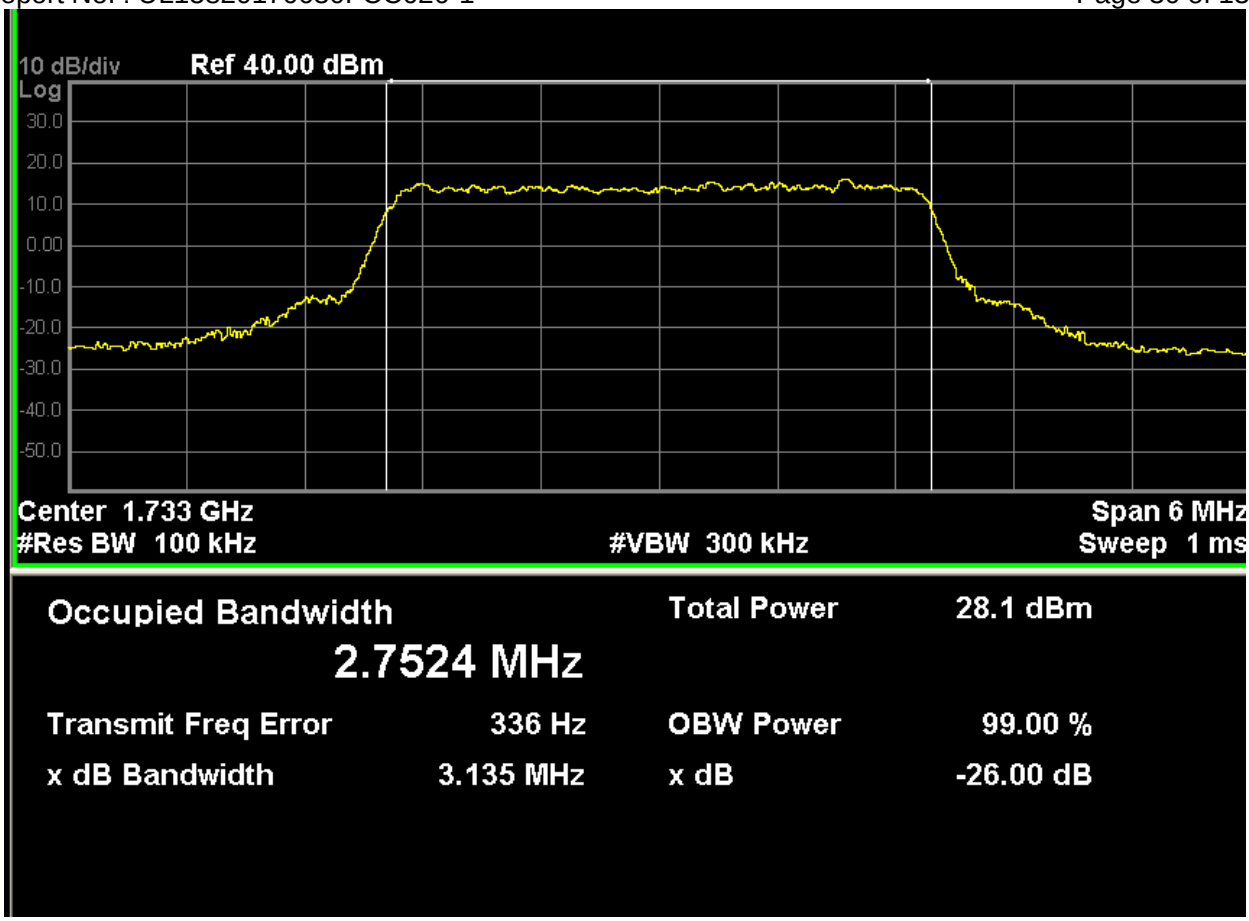

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2.8 MHz
Sweep 3.867 ms
Occupied Bandwidth
1.0967 MHz
Total Power 26.1 dBm
Transmit Freq Error 669 Hz
OBW Power 99.00 %
x dB Bandwidth 1.349 MHz
x dB -26.00 dB

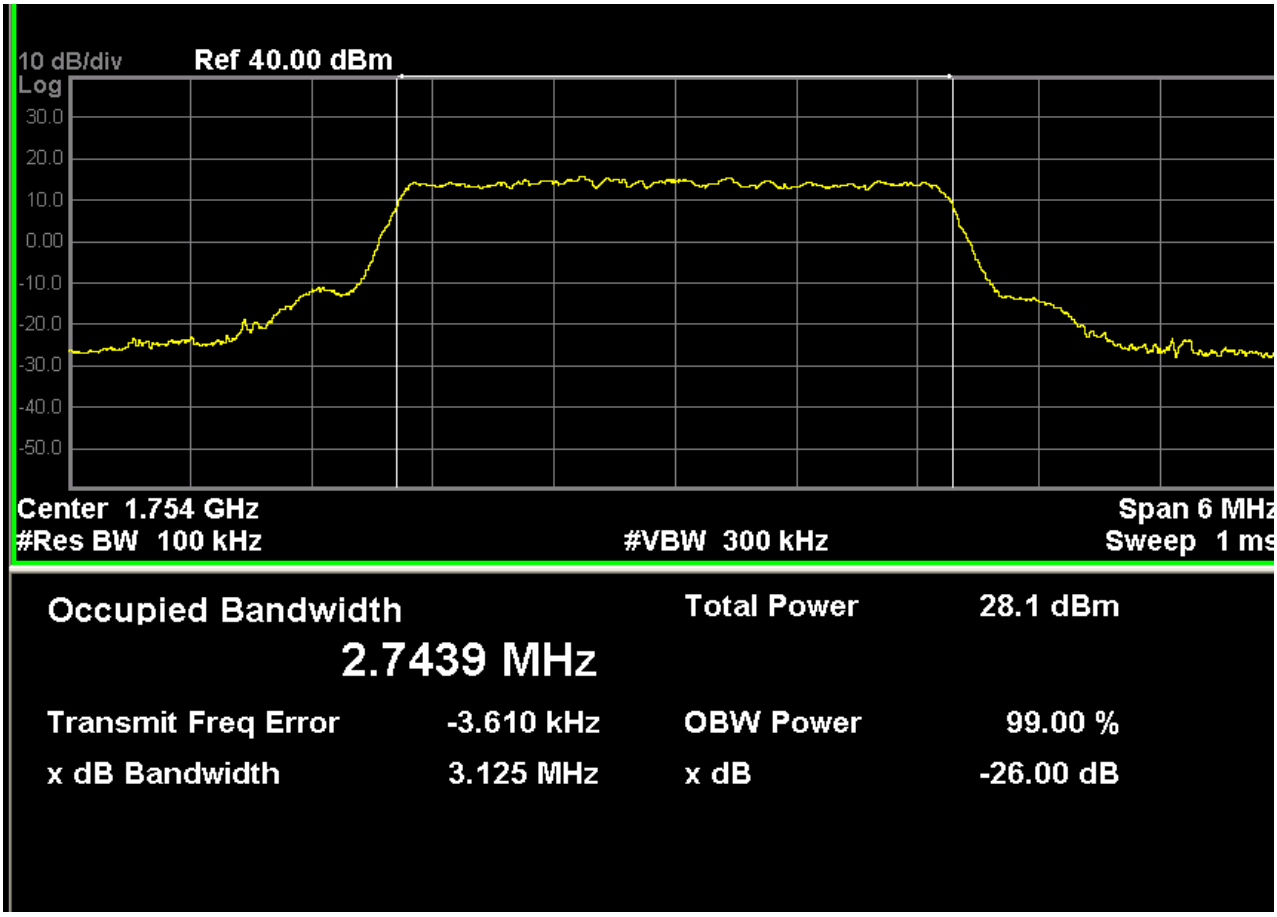

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.754 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 2.8 MHz
Sweep 3.867 ms
Occupied Bandwidth
1.0998 MHz
Total Power 26.4 dBm
Transmit Freq Error -615 Hz
OBW Power 99.00 %
x dB Bandwidth 1.338 MHz
x dB -26.00 dB

LTE Band 4 (QPSK, Band Width 3MHz,RB Size 15,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	3.117	2.7434
20175	1732.5	3.135	2.7524
20385	1753.5	3.125	2.7439

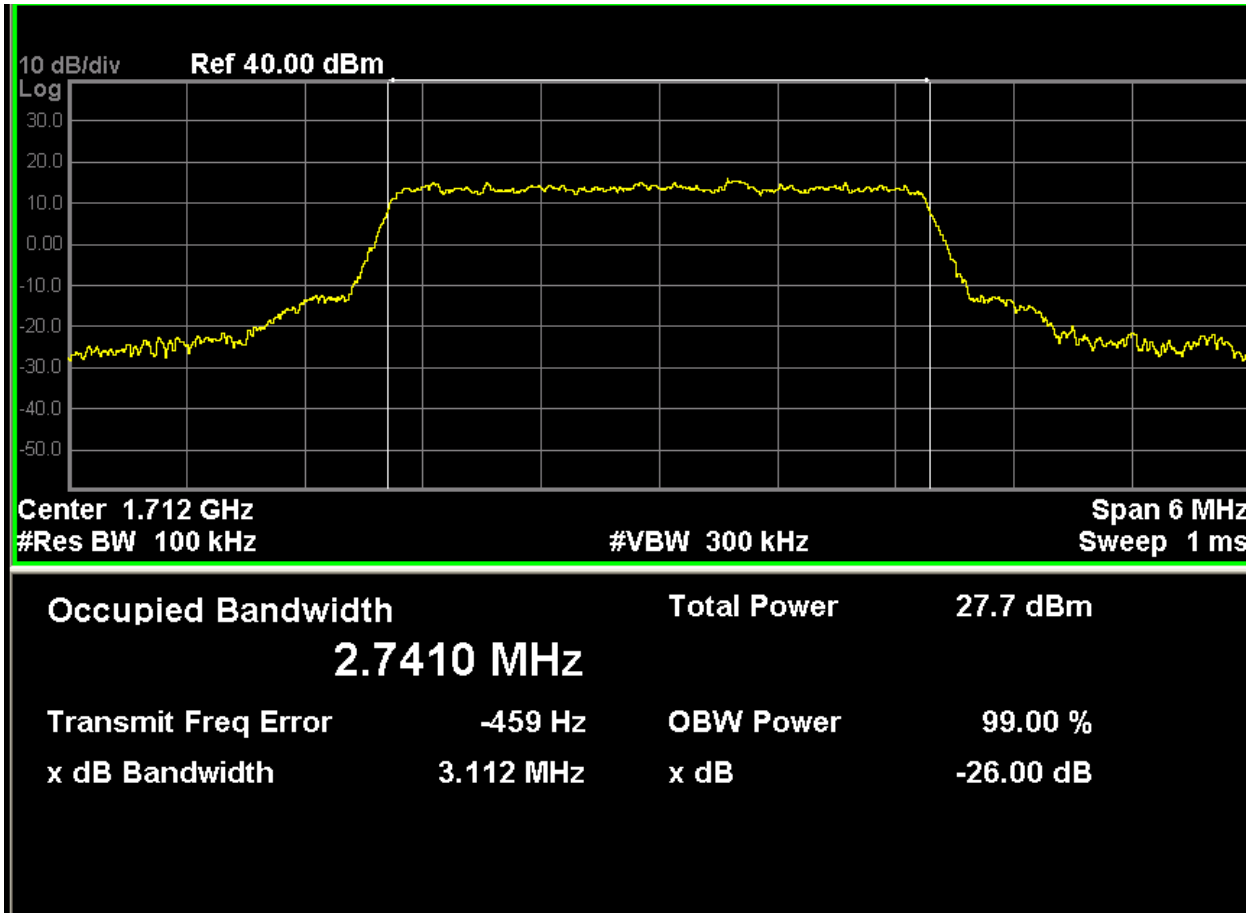


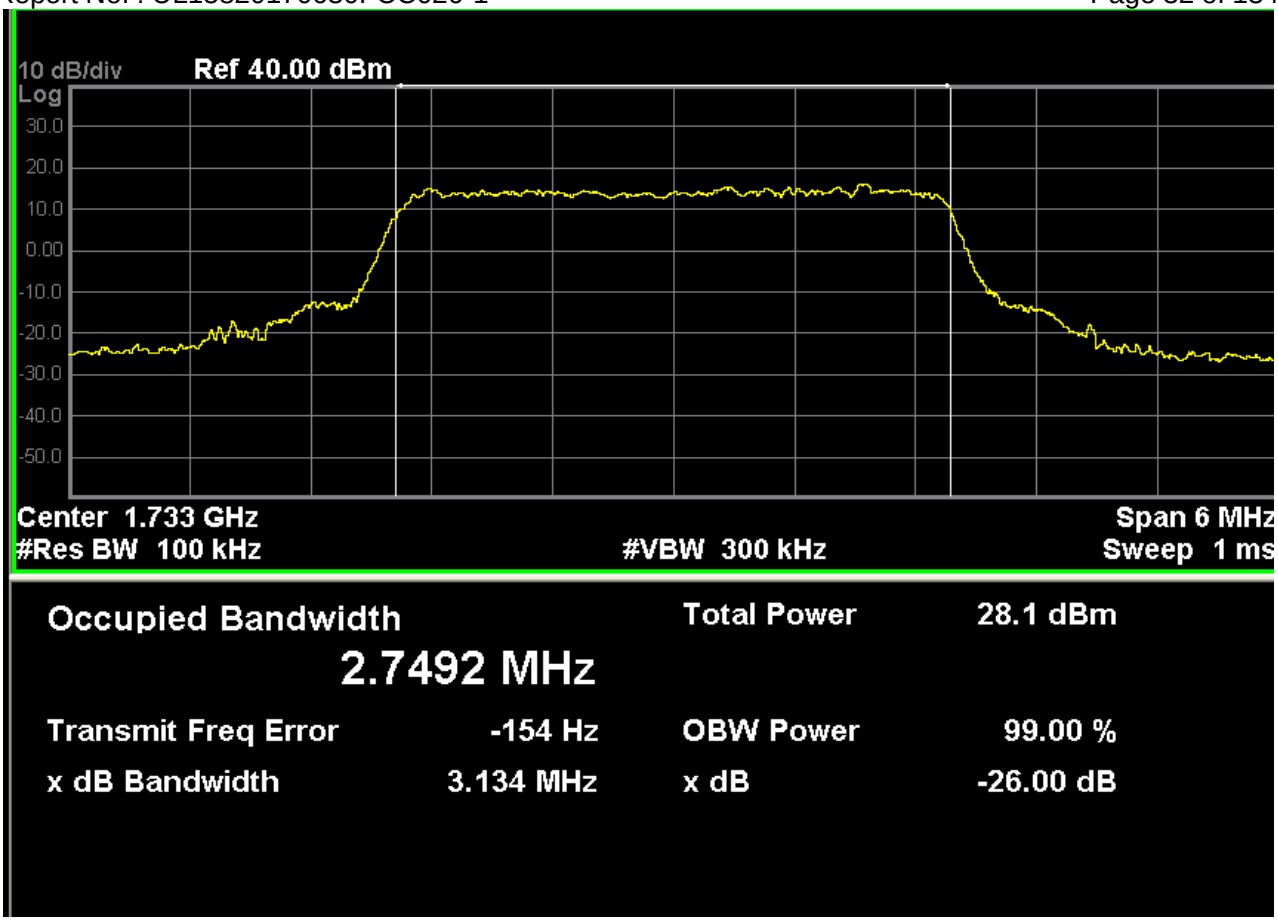

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 6 MHz
Sweep 1 ms
Occupied Bandwidth
2.7524 MHz
Total Power 28.1 dBm
Transmit Freq Error 336 Hz
OBW Power 99.00 %
x dB Bandwidth 3.135 MHz
x dB -26.00 dB

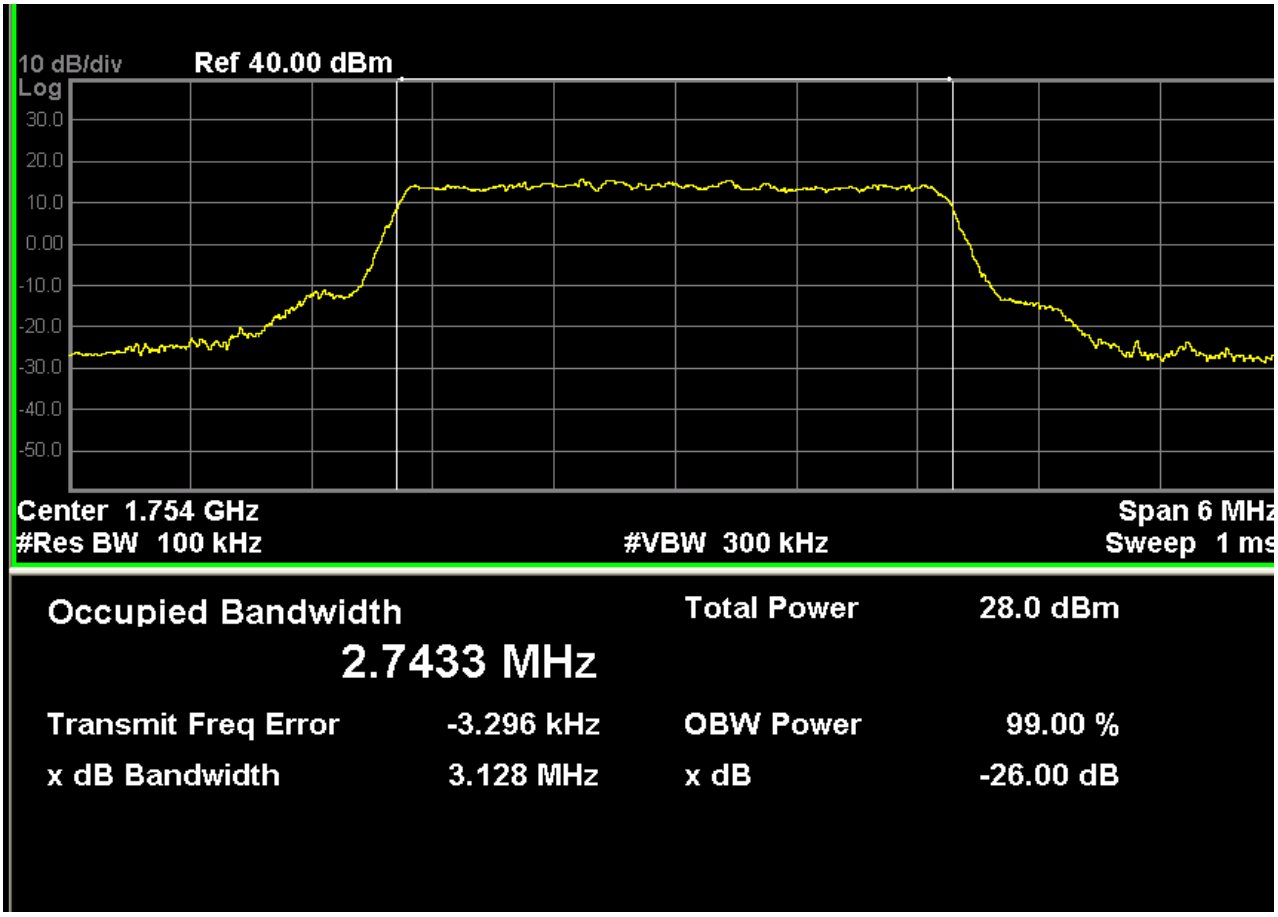

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.754 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 6 MHz
Sweep 1 ms
Occupied Bandwidth
2.7439 MHz
Total Power 28.1 dBm
Transmit Freq Error -3.610 kHz
OBW Power 99.00 %
x dB Bandwidth 3.125 MHz
x dB -26.00 dB

LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 15,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	3.112	2.7410
20175	1732.5	3.134	2.7492
20385	1753.5	3.128	2.7433

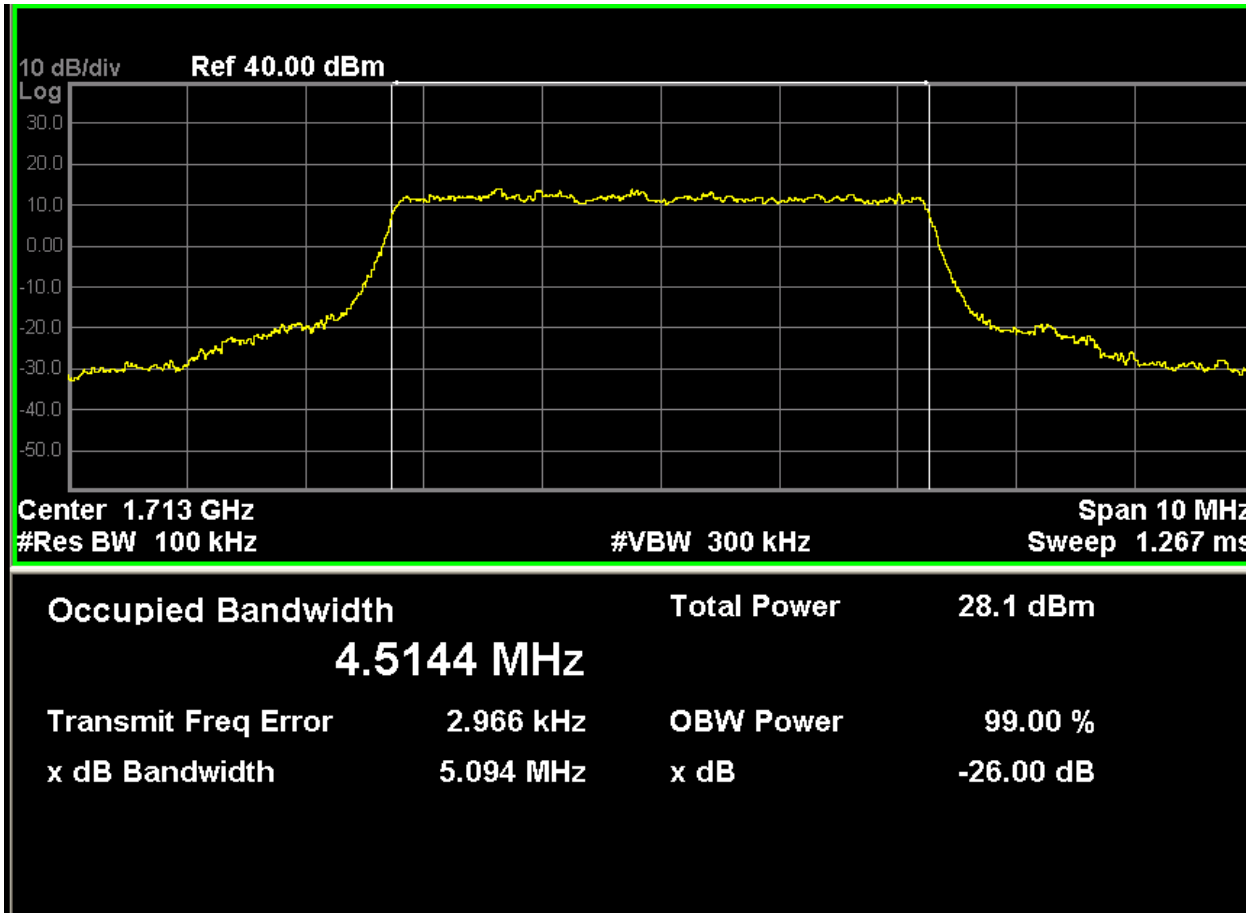


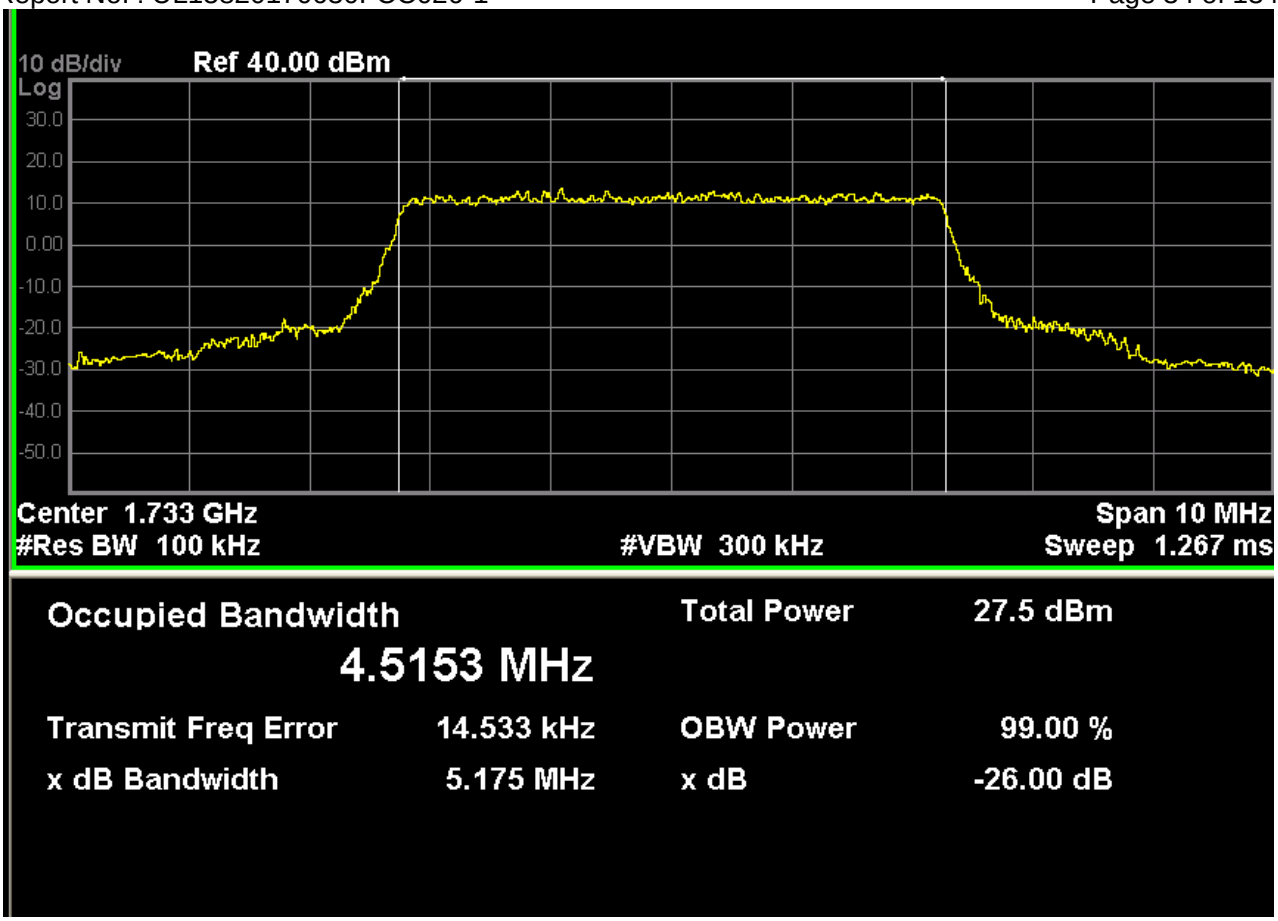

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 6 MHz
Sweep 1 ms
Occupied Bandwidth
2.7492 MHz
Total Power 28.1 dBm
Transmit Freq Error -154 Hz
OBW Power 99.00 %
x dB Bandwidth 3.134 MHz
x dB -26.00 dB

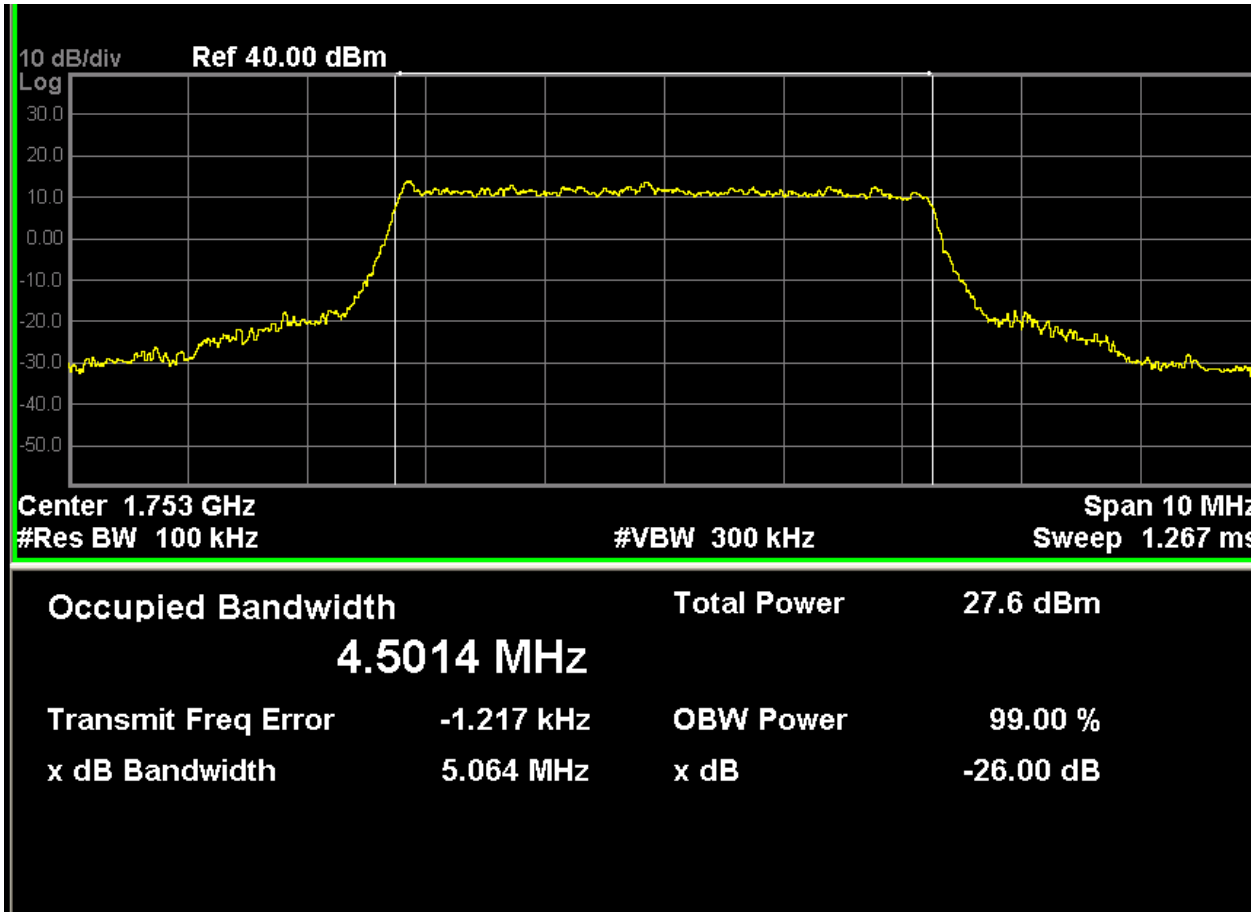

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.754 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 6 MHz
Sweep 1 ms
Occupied Bandwidth
2.7433 MHz
Total Power 28.0 dBm
Transmit Freq Error -3.296 kHz
OBW Power 99.00 %
x dB Bandwidth 3.128 MHz
x dB -26.00 dB

LTE Band 4 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19975	1712.5	5.094	4.5144
20175	1732.5	5.175	4.5153
20375	1752.5	5.064	4.5014

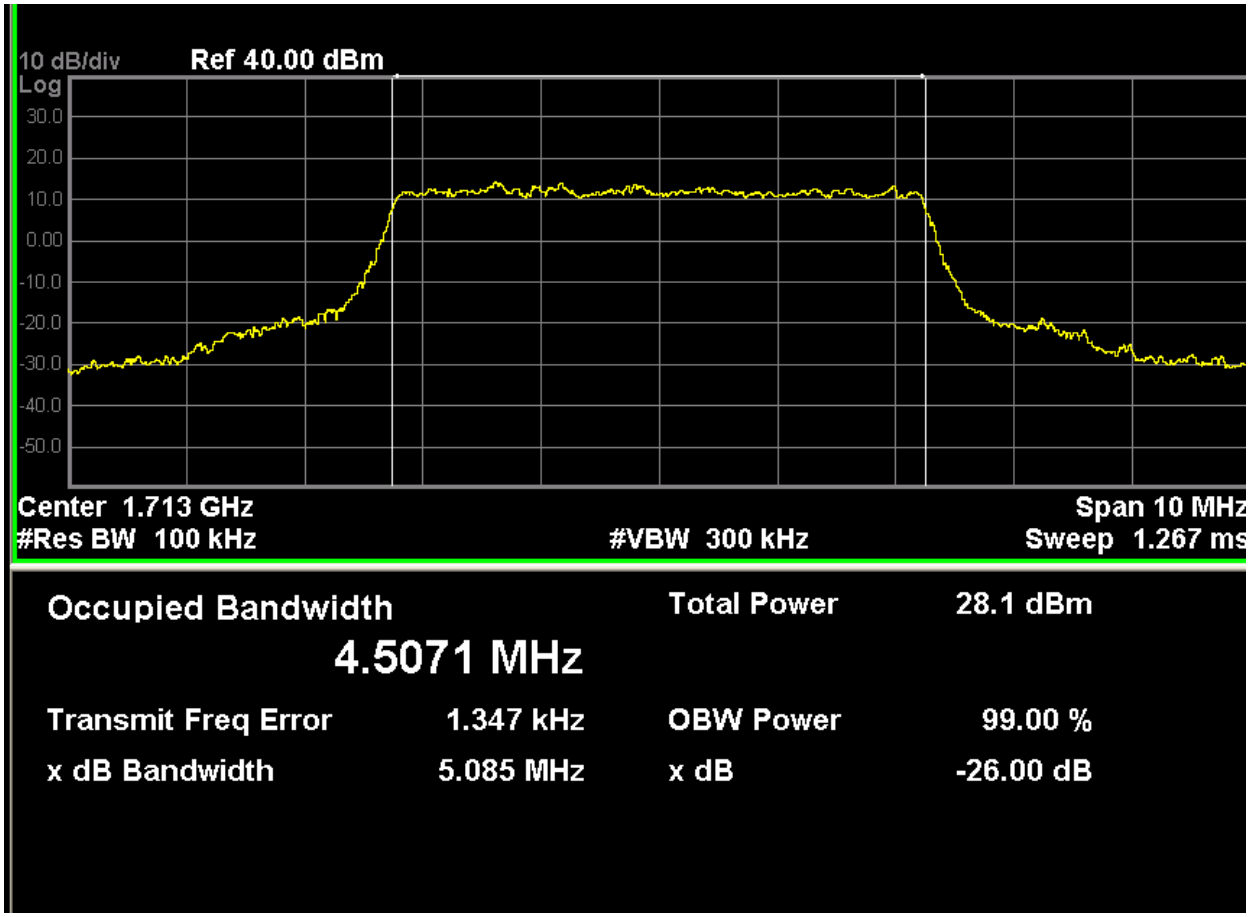


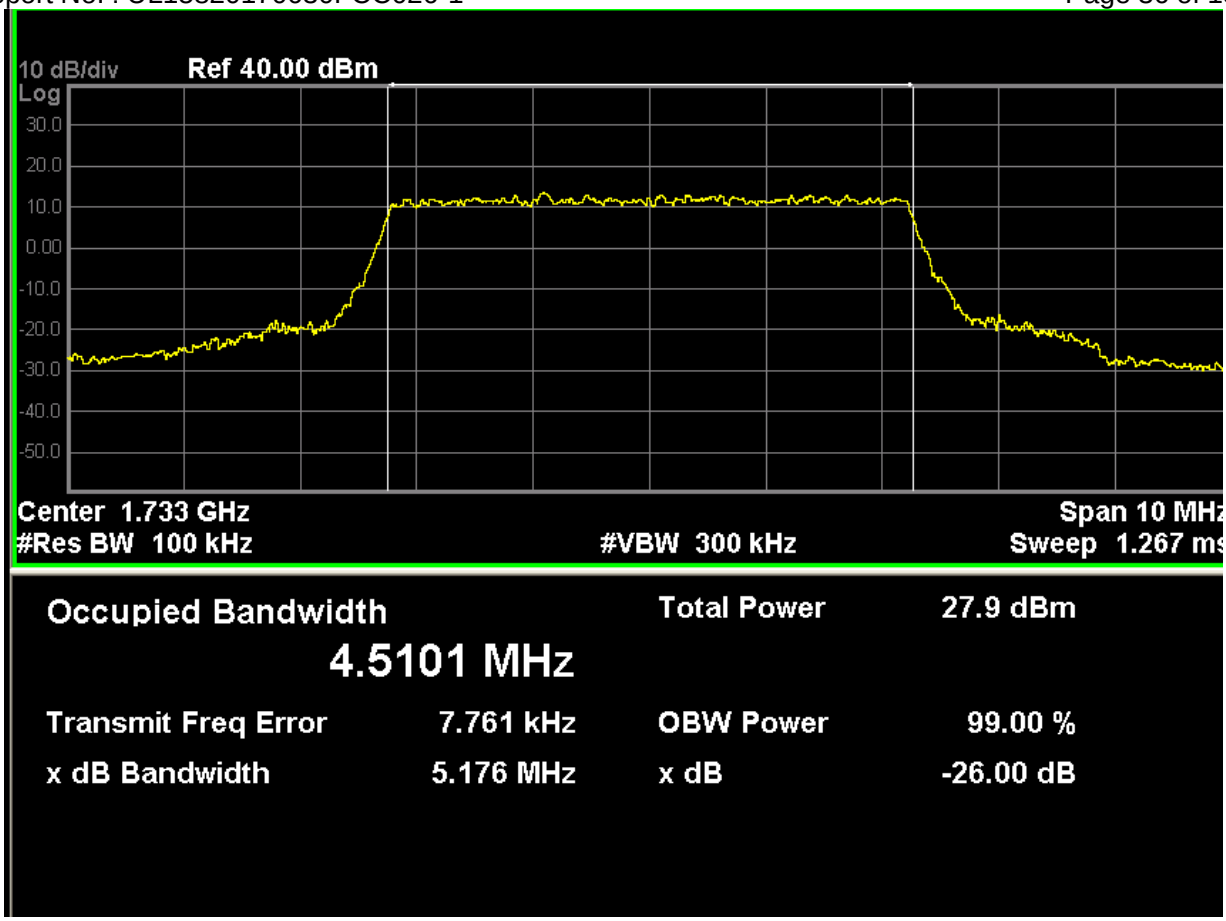

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 1.267 ms
Occupied Bandwidth
4.5153 MHz
Total Power 27.5 dBm
Transmit Freq Error 14.533 kHz
OBW Power 99.00 %
x dB Bandwidth 5.175 MHz
x dB -26.00 dB

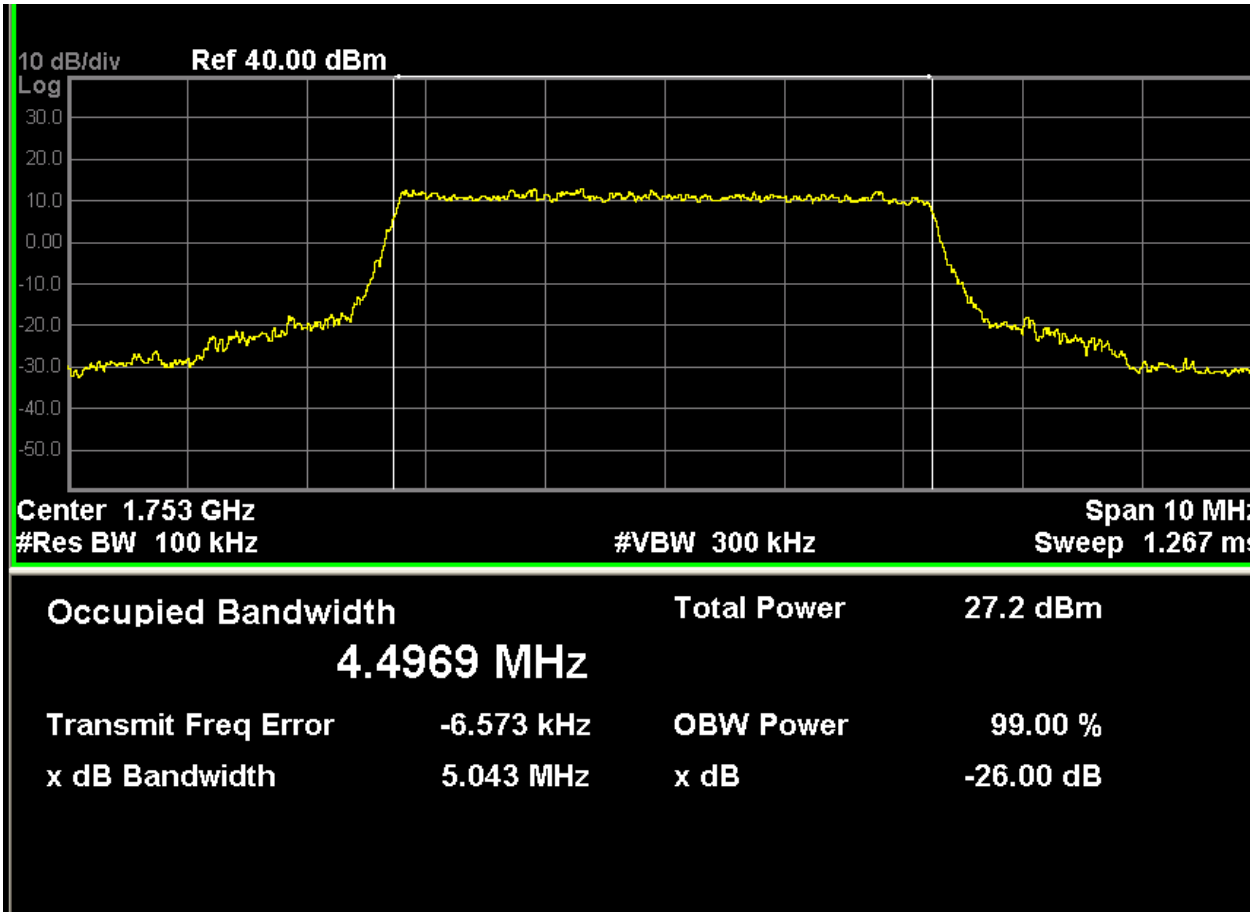

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.753 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 1.267 ms
Occupied Bandwidth
4.5014 MHz
Total Power 27.6 dBm
Transmit Freq Error -1.217 kHz
OBW Power 99.00 %
x dB Bandwidth 5.064 MHz
x dB -26.00 dB

LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
19975	1712.5	5.085	4.5071
20175	1732.5	5.176	4.5101
20375	1752.5	5.043	4.4969

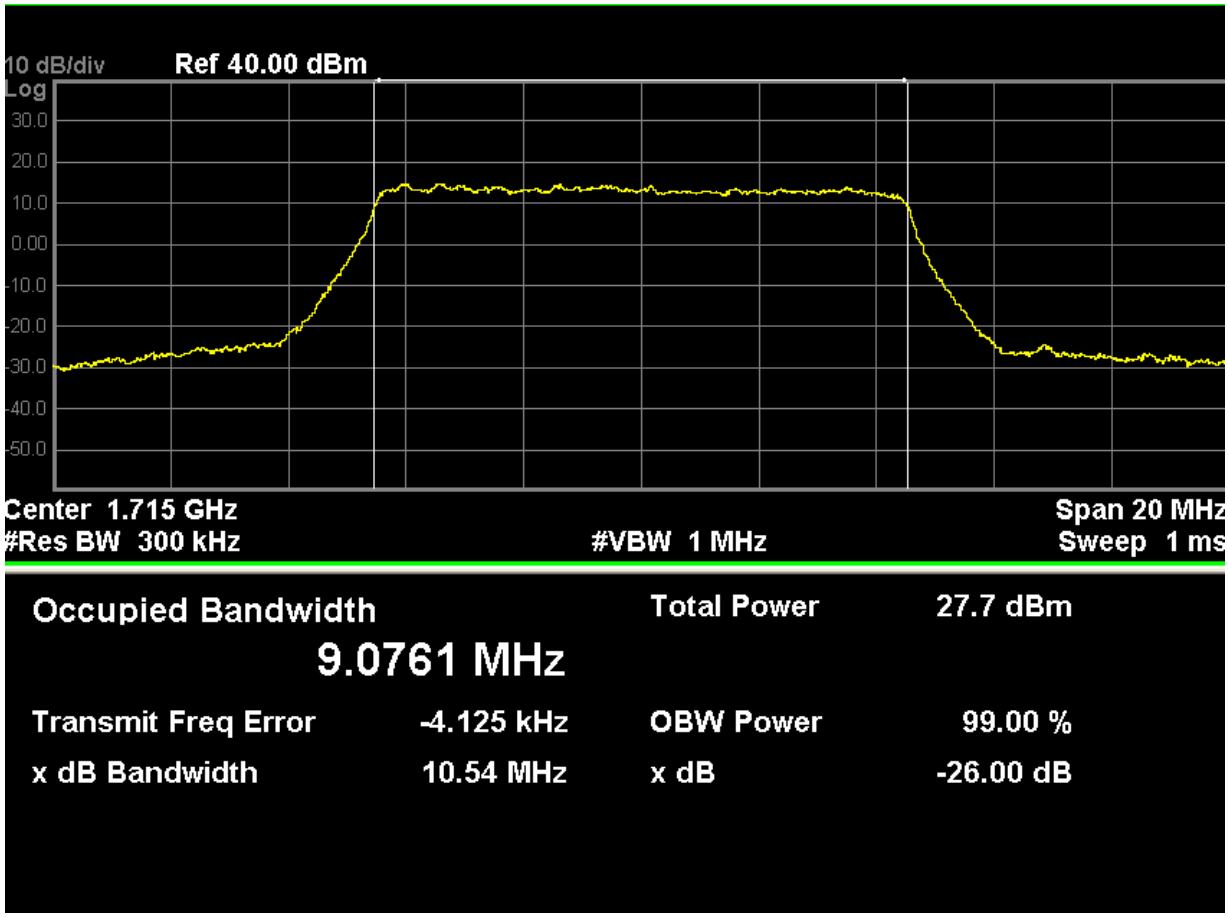


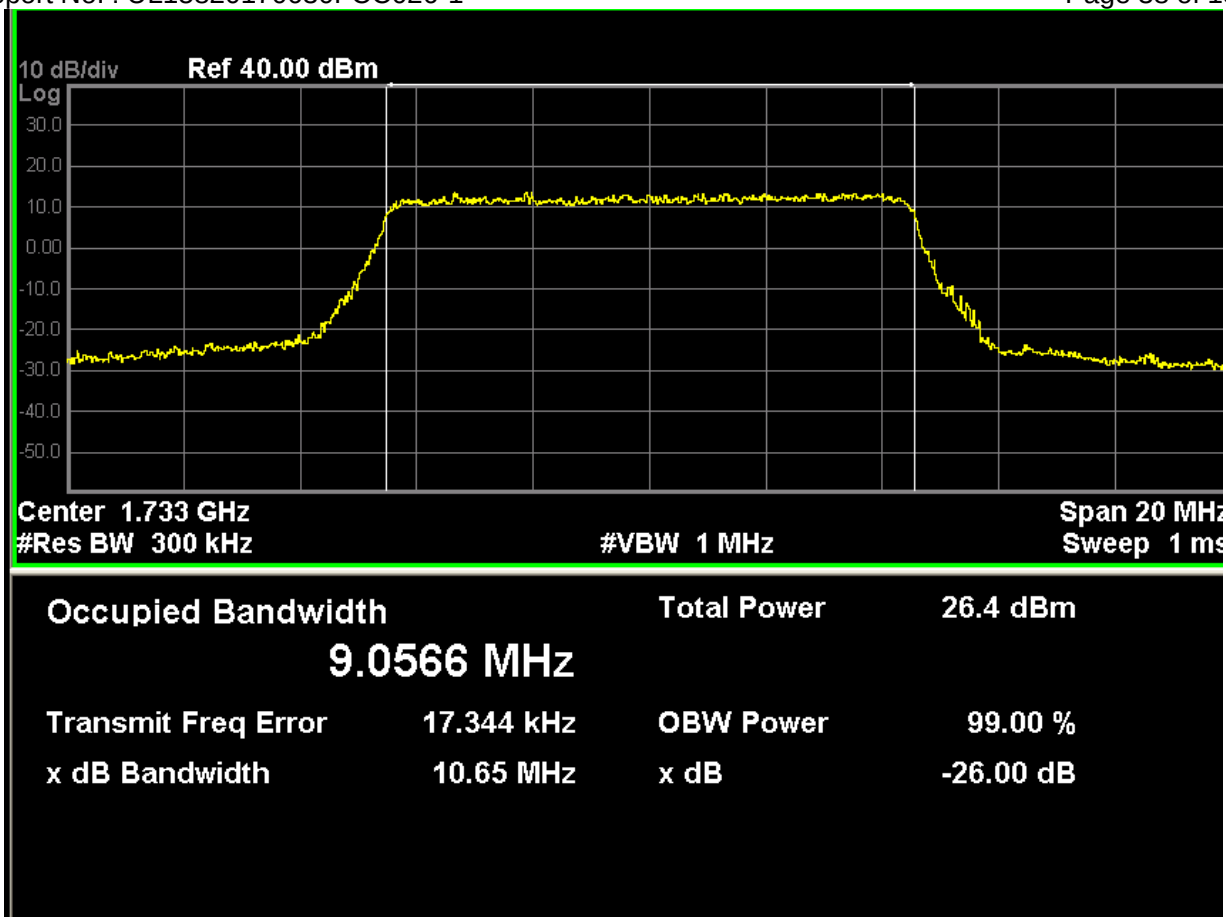

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 1.267 ms
Occupied Bandwidth
4.5101 MHz
Total Power 27.9 dBm
Transmit Freq Error 7.761 kHz
OBW Power 99.00 %
x dB Bandwidth 5.176 MHz
x dB -26.00 dB

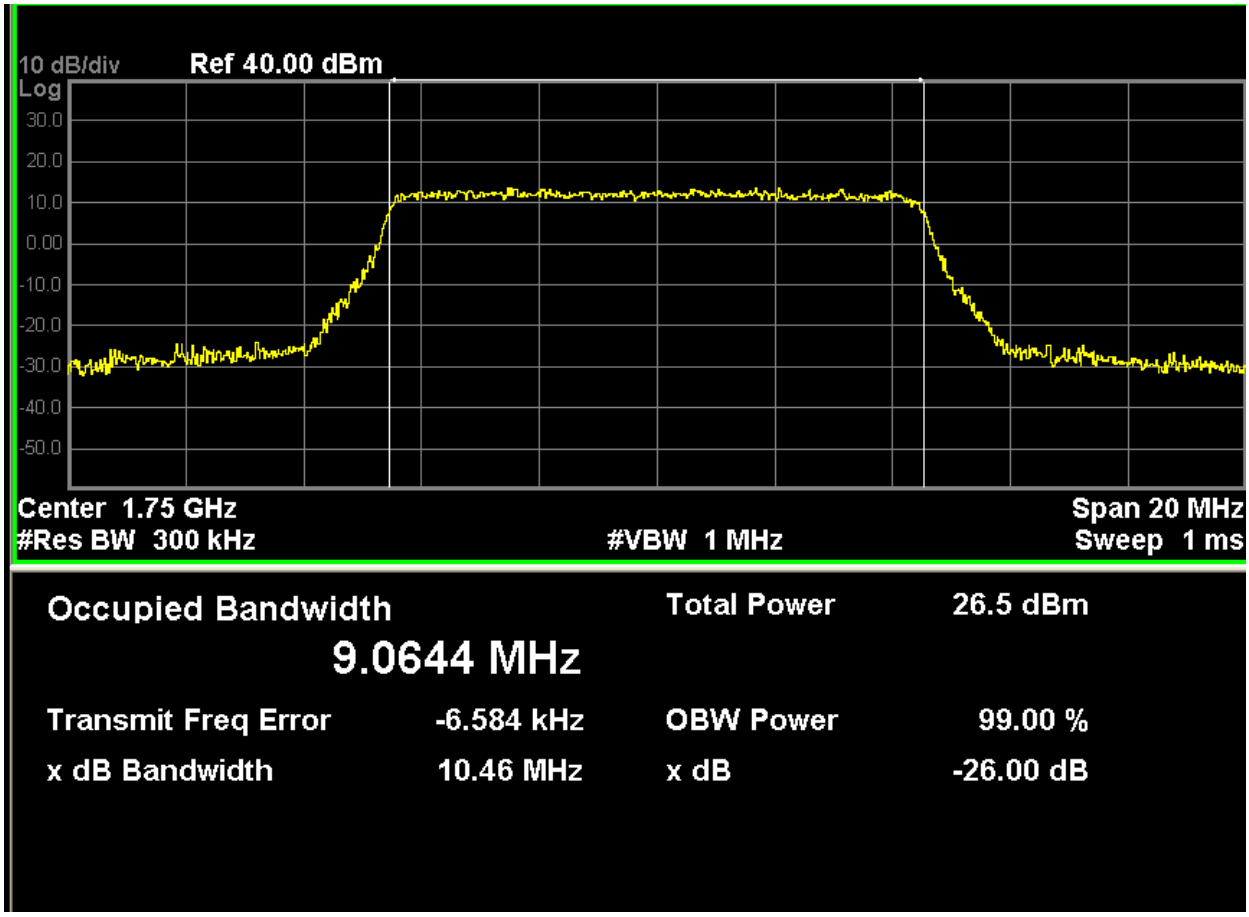

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.753 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 1.267 ms
Occupied Bandwidth
4.4969 MHz
Total Power 27.2 dBm
Transmit Freq Error -6.573 kHz
OBW Power 99.00 %
x dB Bandwidth 5.043 MHz
x dB -26.00 dB

LTE Band 4 (QPSK, Band Width 10MHz,RB Size 50,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
20000	1715.0	10.54	9.0761
20175	1732.5	10.65	9.0566
20350	1750.0	10.46	9.0644

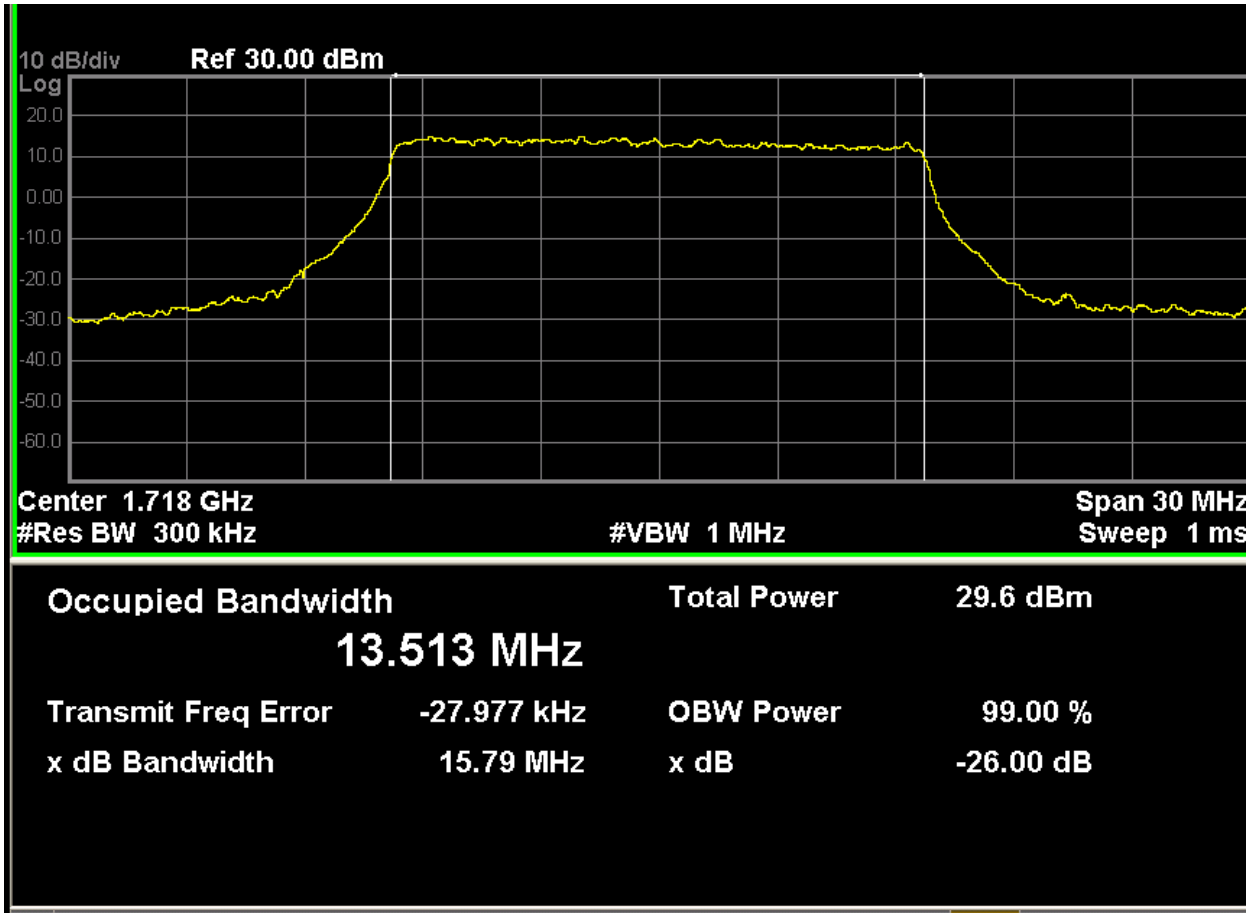


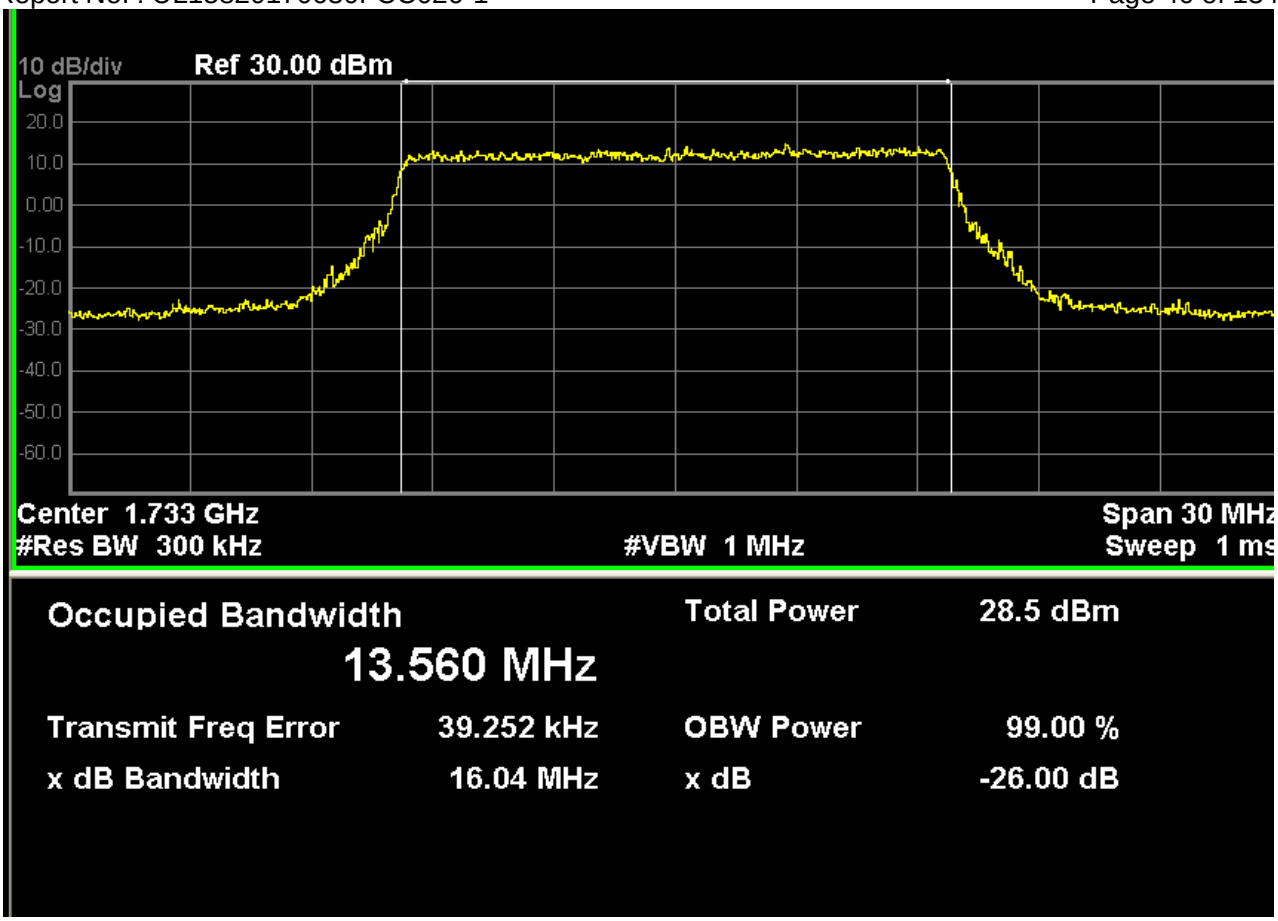

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.733 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 20 MHz
Sweep 1 ms
Occupied Bandwidth
9.0566 MHz
Total Power 26.4 dBm
Transmit Freq Error 17.344 kHz
OBW Power 99.00 %
x dB Bandwidth 10.65 MHz
x dB -26.00 dB

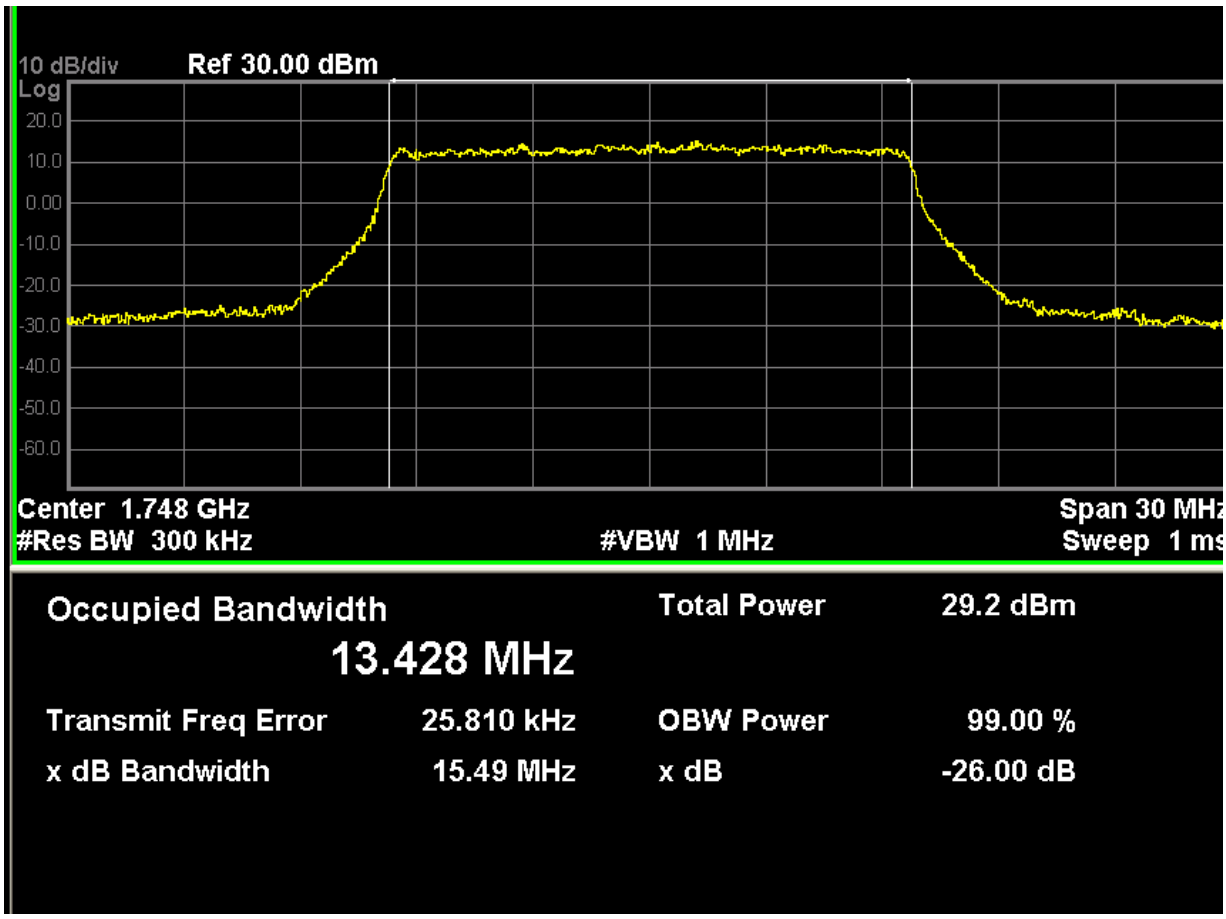

10 dB/div
Ref 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 1.75 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 20 MHz
Sweep 1 ms
Occupied Bandwidth
9.0644 MHz
Total Power 26.5 dBm
Transmit Freq Error -6.584 kHz
OBW Power 99.00 %
x dB Bandwidth 10.46 MHz
x dB -26.00 dB

LTE Band 4 (QPSK, Band Width 15MHz,RB Size 75,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
20025	1717.5	15.79	13.513
20175	1732.5	16.04	13.560
20325	1747.5	15.49	13.428

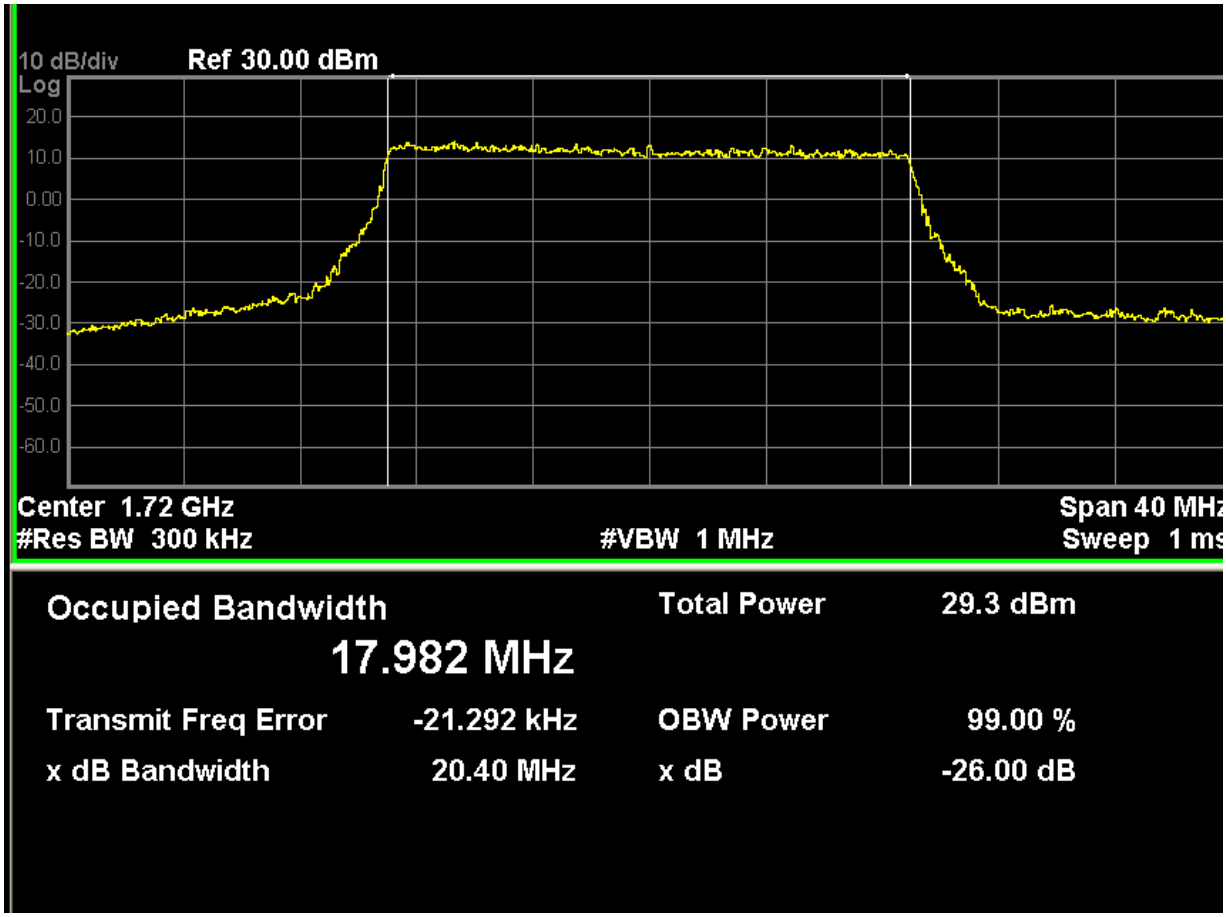


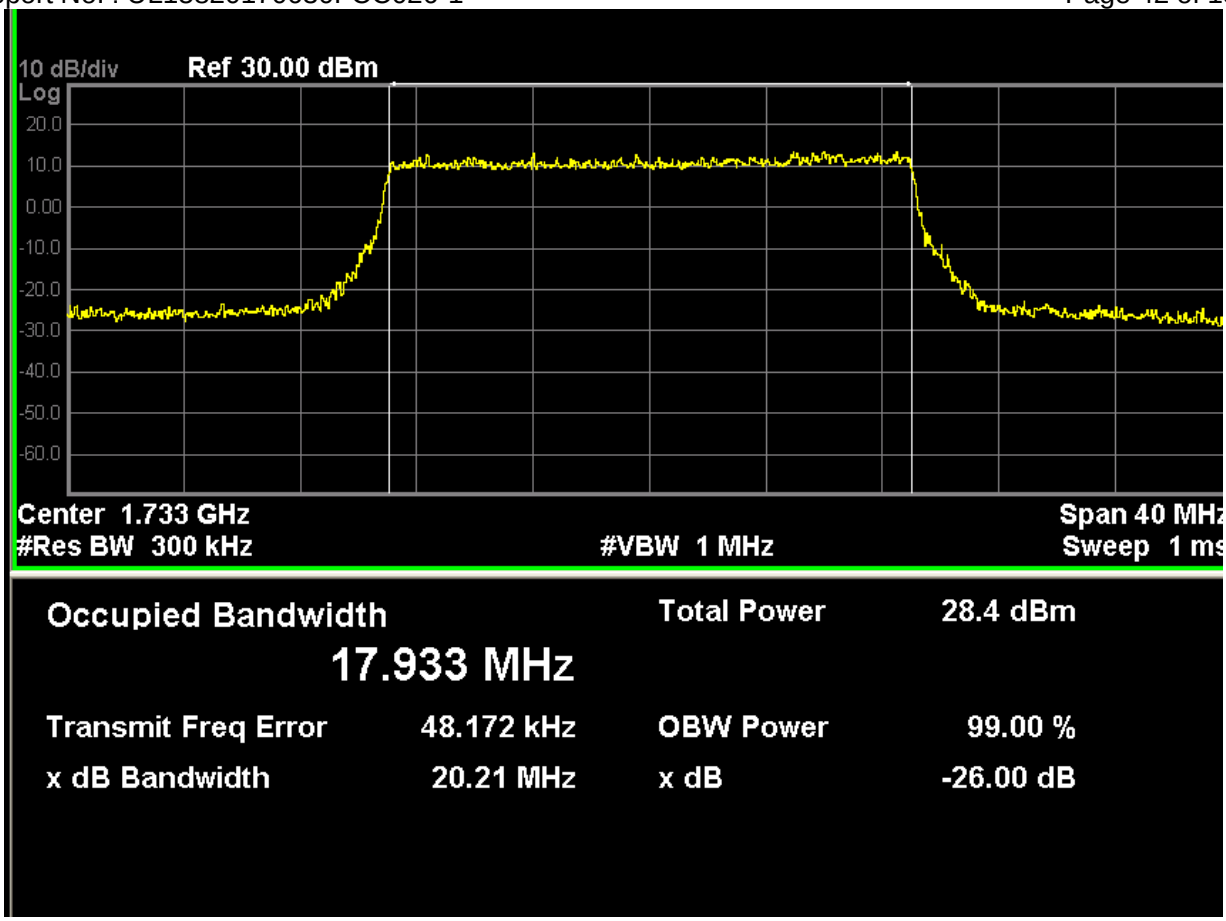

10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 1.733 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
13.560 MHz
Total Power 28.5 dBm
Transmit Freq Error 39.252 kHz
OBW Power 99.00 %
x dB Bandwidth 16.04 MHz
x dB -26.00 dB

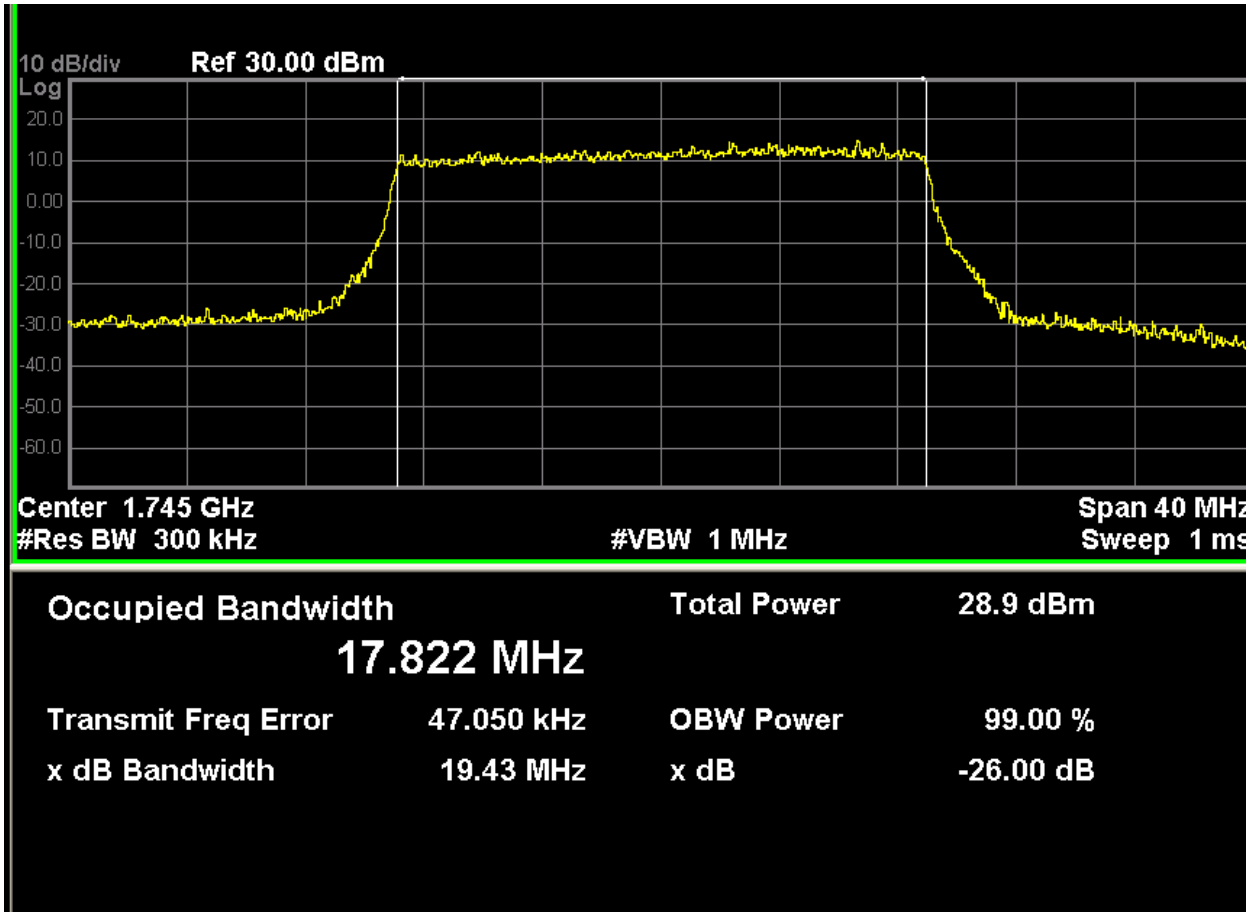

10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 1.748 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 30 MHz
Sweep 1 ms
Occupied Bandwidth
13.428 MHz
Total Power 29.2 dBm
Transmit Freq Error 25.810 kHz
OBW Power 99.00 %
x dB Bandwidth 15.49 MHz
x dB -26.00 dB

LTE Band 4 (QPSK, Band Width 20MHz,RB Size 100,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
20050	1720.0	20.40	17.982
20175	1732.5	20.21	17.933
20300	1745.0	19.43	17.822

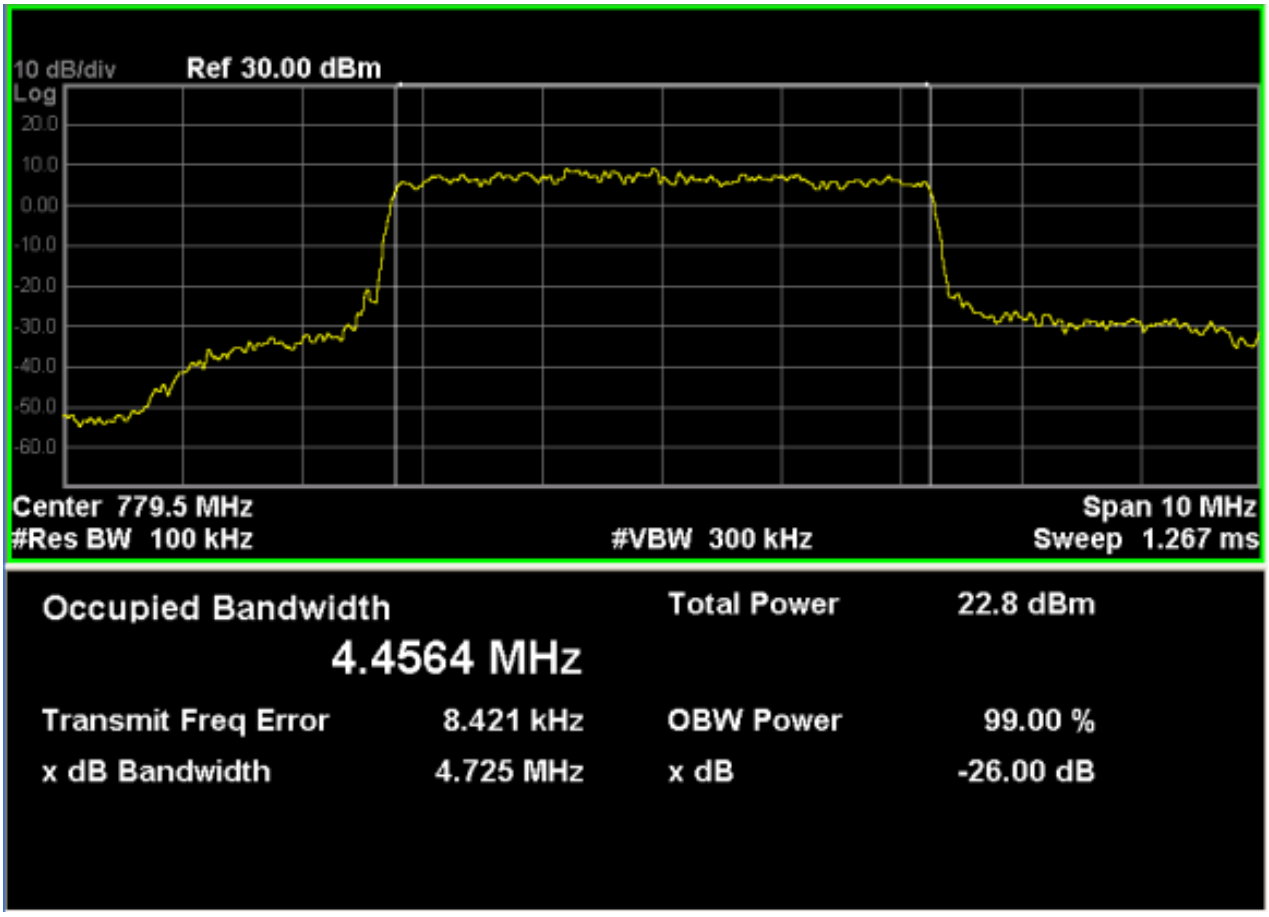


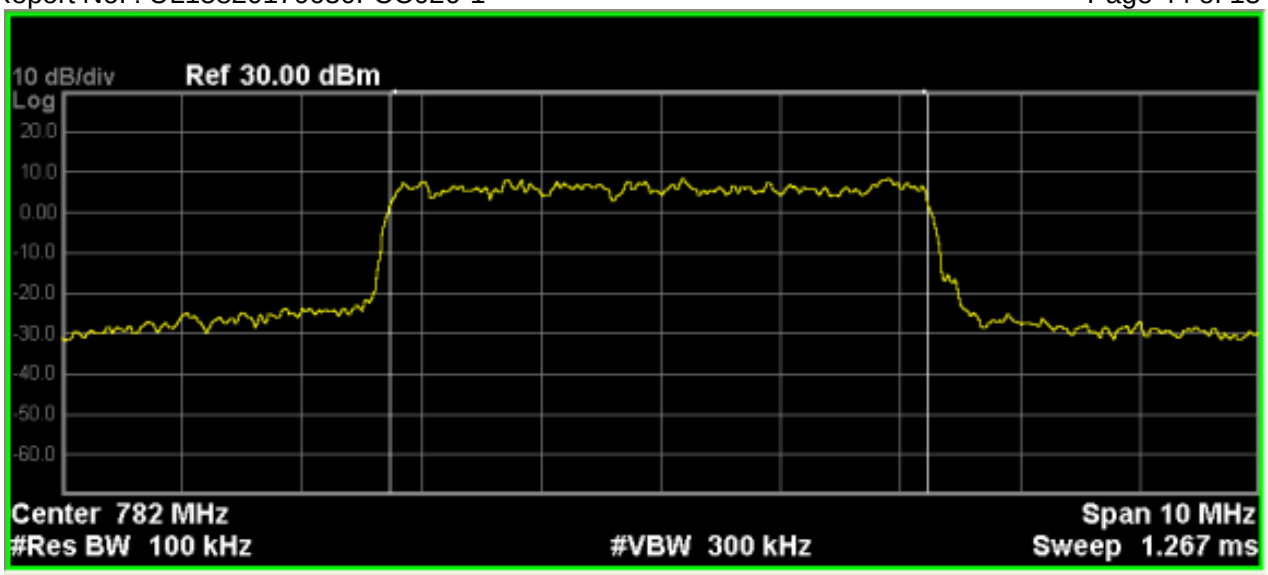

10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 1.733 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.933 MHz
Total Power 28.4 dBm
Transmit Freq Error 48.172 kHz
OBW Power 99.00 %
x dB Bandwidth 20.21 MHz
x dB -26.00 dB


10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 1.745 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.822 MHz
Total Power 28.9 dBm
Transmit Freq Error 47.050 kHz
OBW Power 99.00 %
x dB Bandwidth 19.43 MHz
x dB -26.00 dB

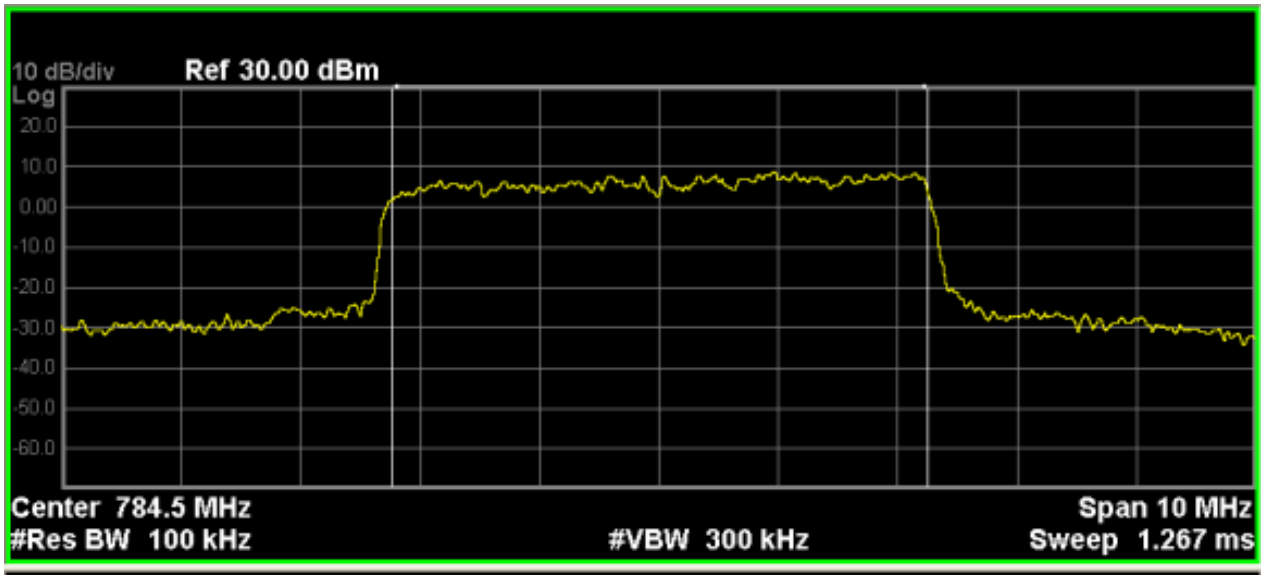
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
23205	779.5	4.725	4.4564
23230	782.0	4.849	4.4675
23255	784.5	4.769	4.4921





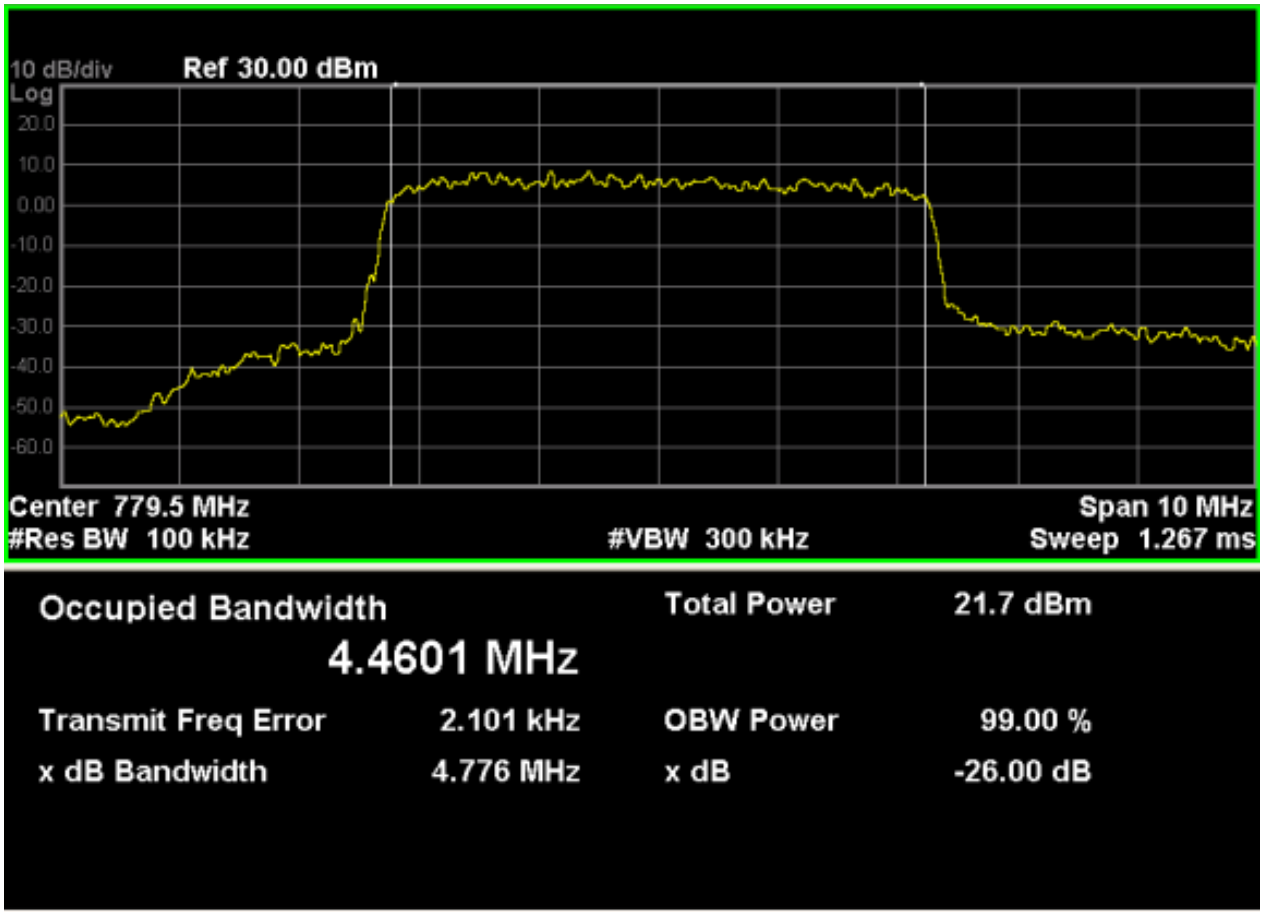
Occupied Bandwidth		Total Power	22.3 dBm
4.4675 MHz			
Transmit Freq Error	-8.269 kHz	OBW Power	99.00 %
x dB Bandwidth	4.849 MHz	x dB	-26.00 dB

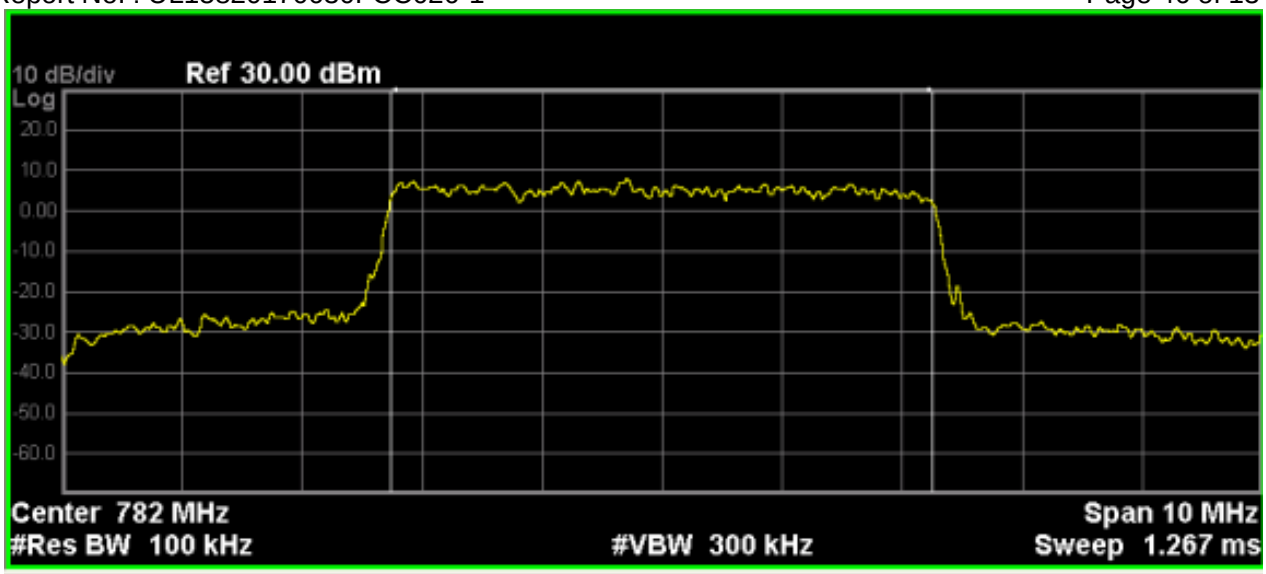


Occupied Bandwidth		Total Power	22.4 dBm
4.4921 MHz			
Transmit Freq Error	7.666 kHz	OBW Power	99.00 %
x dB Bandwidth	4.769 MHz	x dB	-26.00 dB

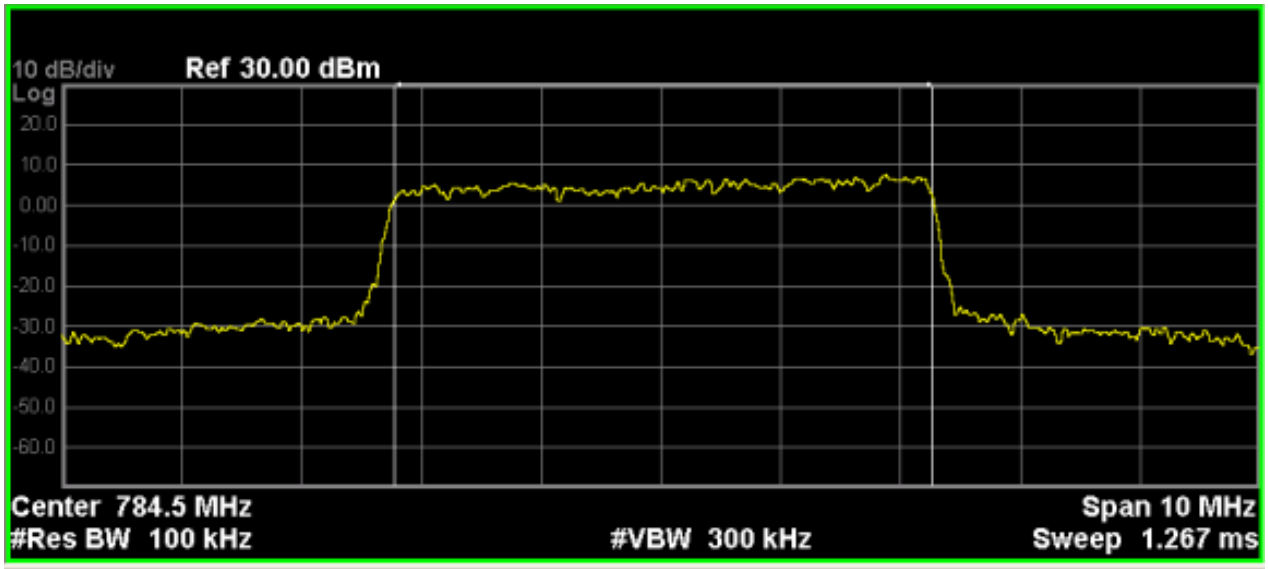
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
23205	779.5	4.776	4.4601
23230	782.0	4.850	4.5043
23255	784.5	4.775	4.4809





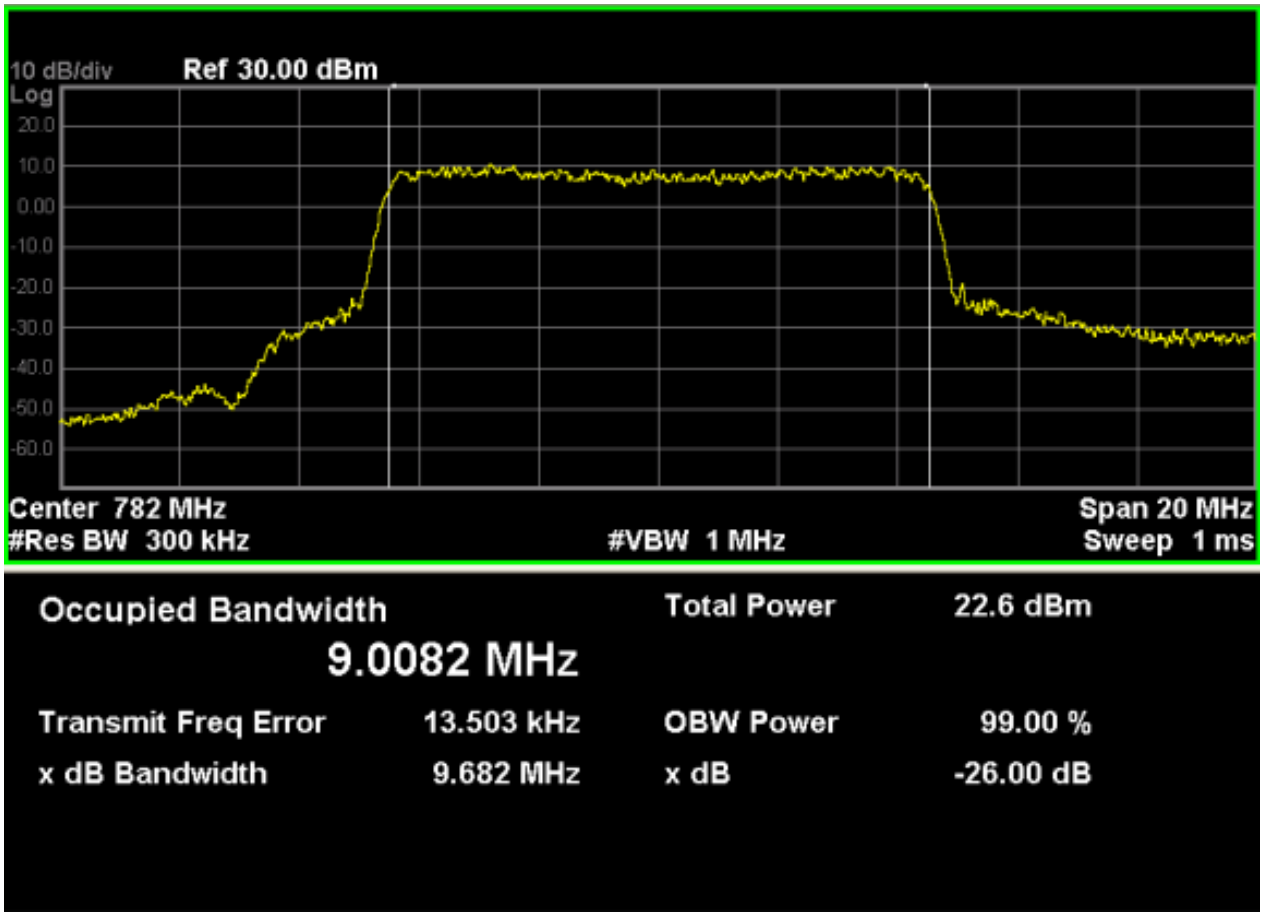
Occupied Bandwidth		Total Power	21.5 dBm
4.5043 MHz			
Transmit Freq Error	-1.948 kHz	OBW Power	99.00 %
x dB Bandwidth	4.850 MHz	x dB	-26.00 dB



Occupied Bandwidth		Total Power	21.1 dBm
4.4809 MHz			
Transmit Freq Error	18.703 kHz	OBW Power	99.00 %
x dB Bandwidth	4.775 MHz	x dB	-26.00 dB

LTE Band 13 (QPSK, Band Width 10MHz, RB Size 50,RB Offset 0)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
23230	782.0	9.682	9.0082



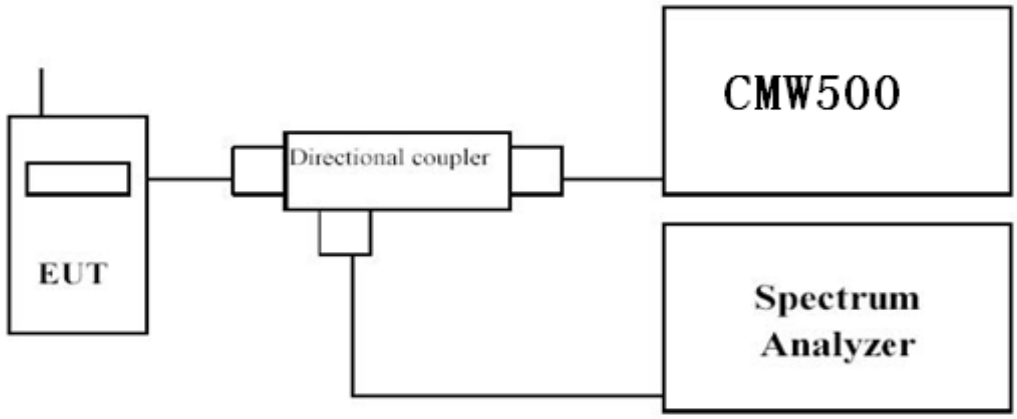
5.Spurious Emission At Antenna Terminals (+/- 1MHz)

5.1. Test Equipment

Instrument	Manufacturer	Model	Serial No	Due. Date
Radio Communication Tester	R&S	CMW500	147483	11/07/2017
SpectrumAnalyzer	Agilent	N9038A	MY51210142	11/04/2017
DC Power Supply	Agilent	6612C	MY43002989	02/28/2018

The measure equipment had been calibrated once a year.

5.2. Test Setup



5.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

5.4. Test Procedure

In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

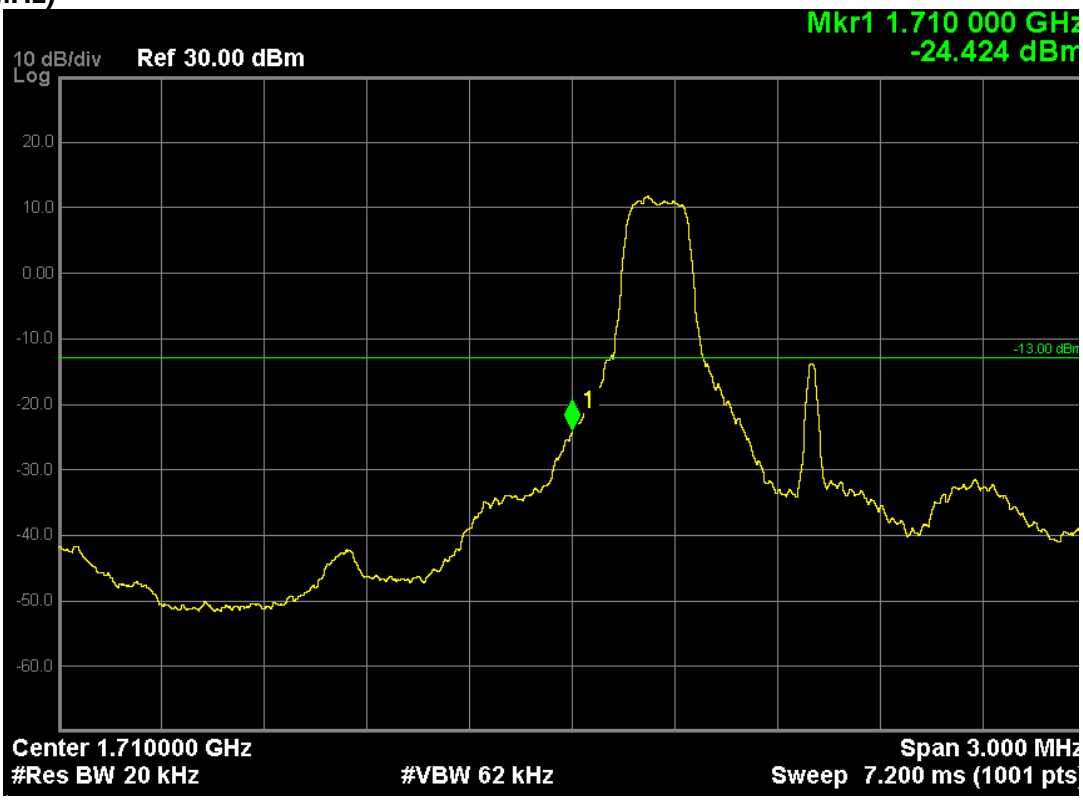
Procedure:
1. The testing follows FCC KDB 971168 v02v02 Section 6.0;
2. The EUT was connected to spectrum analyzer and the CMW500;
3. The band edges of low and high channels for the highest RF powers were measured.Set RBW≥ 1%OBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.

5.5. Uncertainty

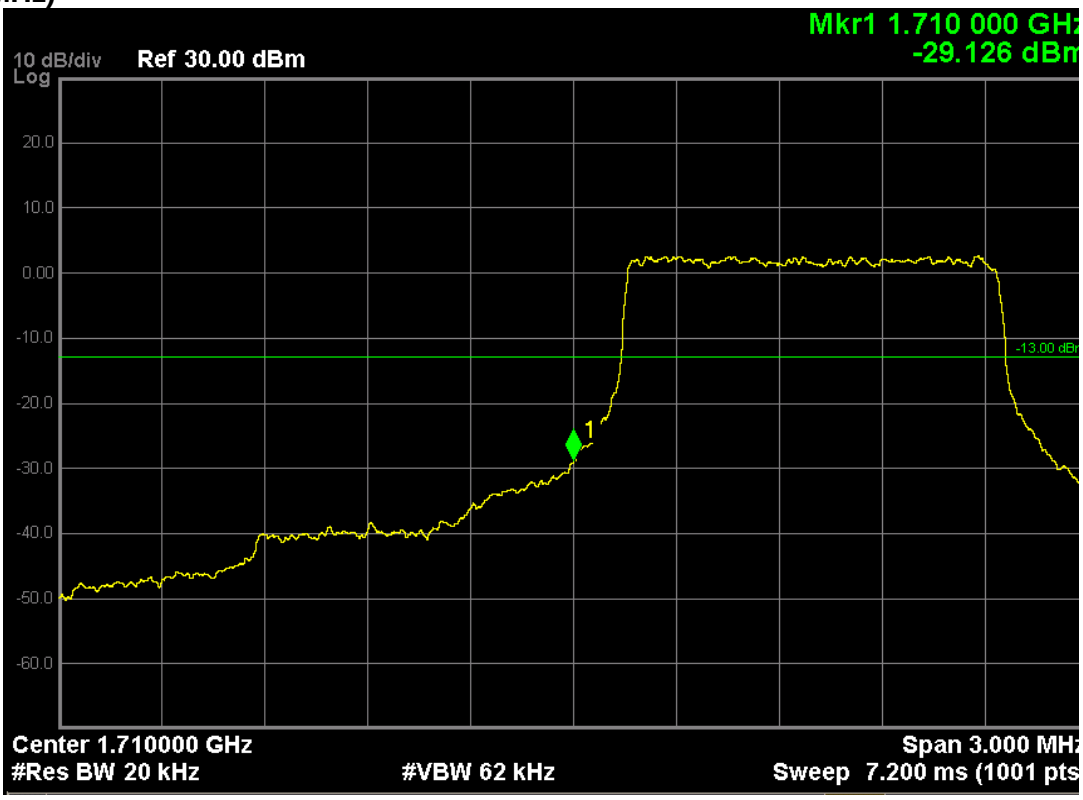
The measurement uncertainty is defined as ±1.2 dB.

5.6. Test Result

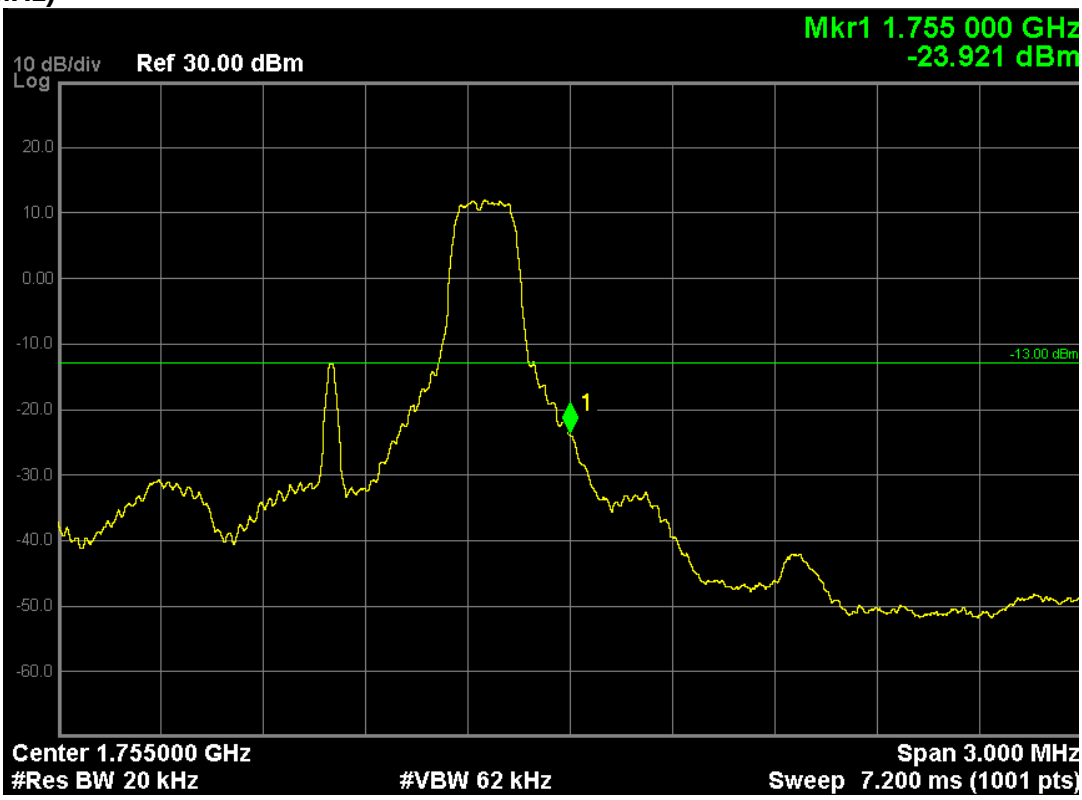
LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



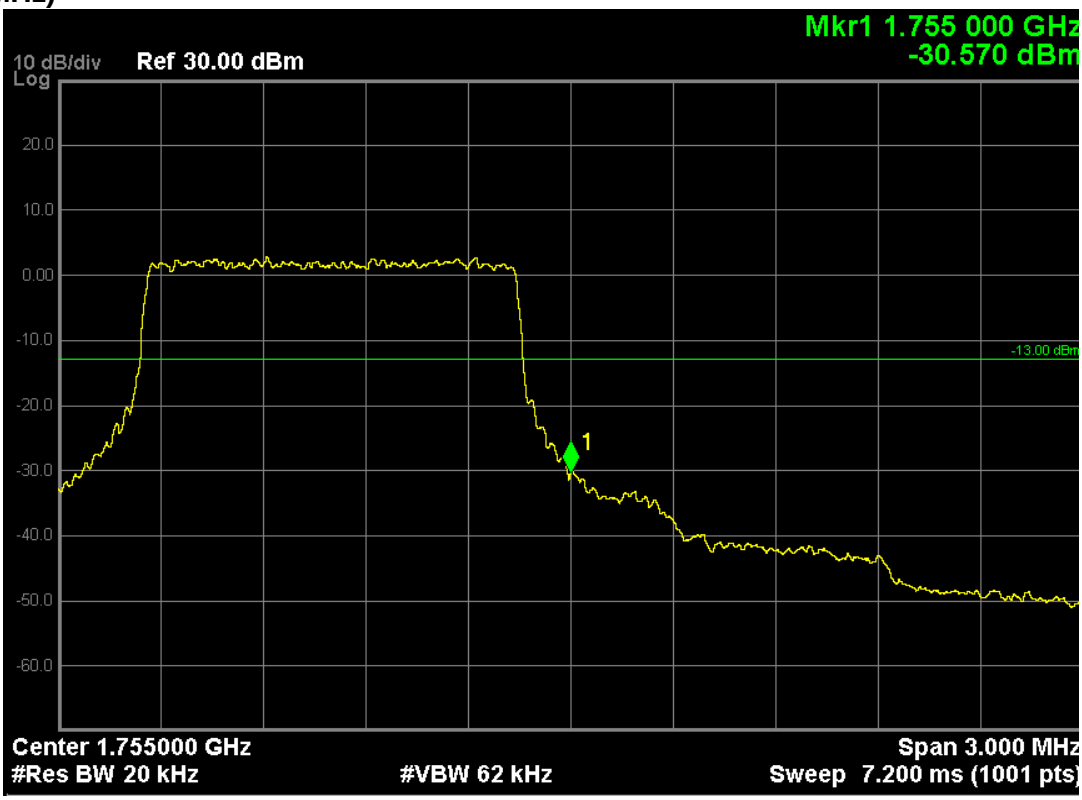
LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 6,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



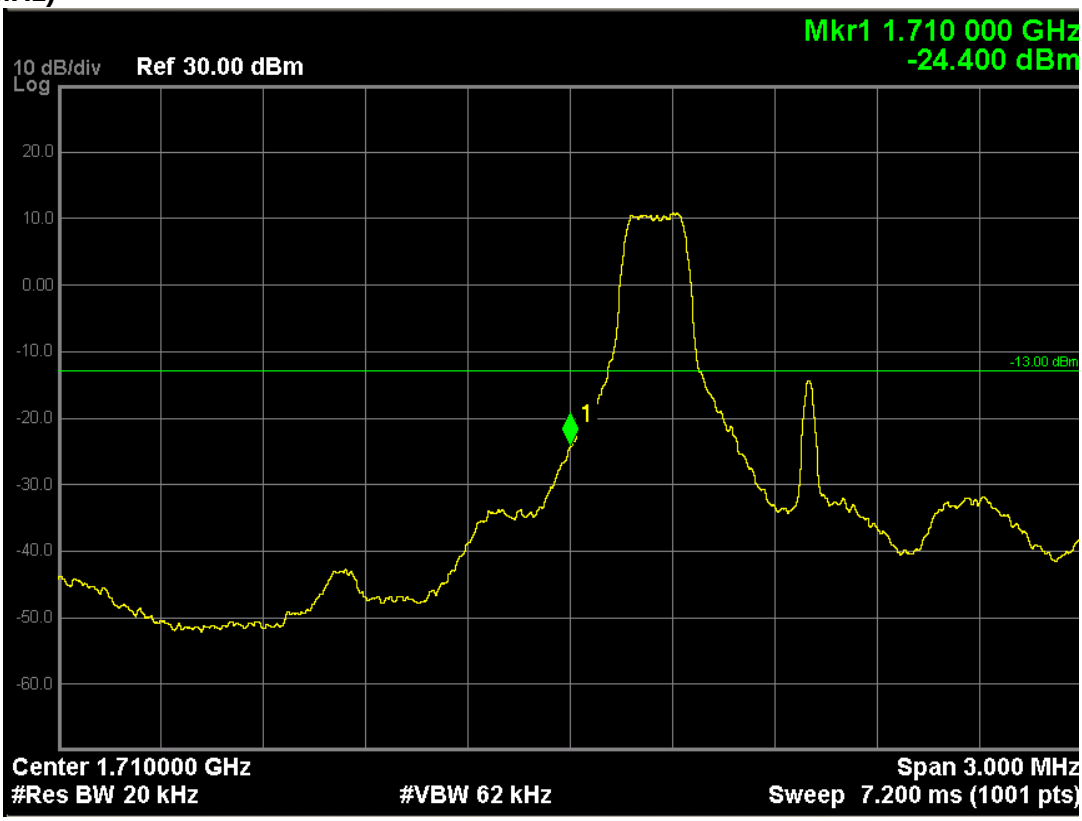
LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 5,Channel 20393,Frequeny 1754.3MHz)



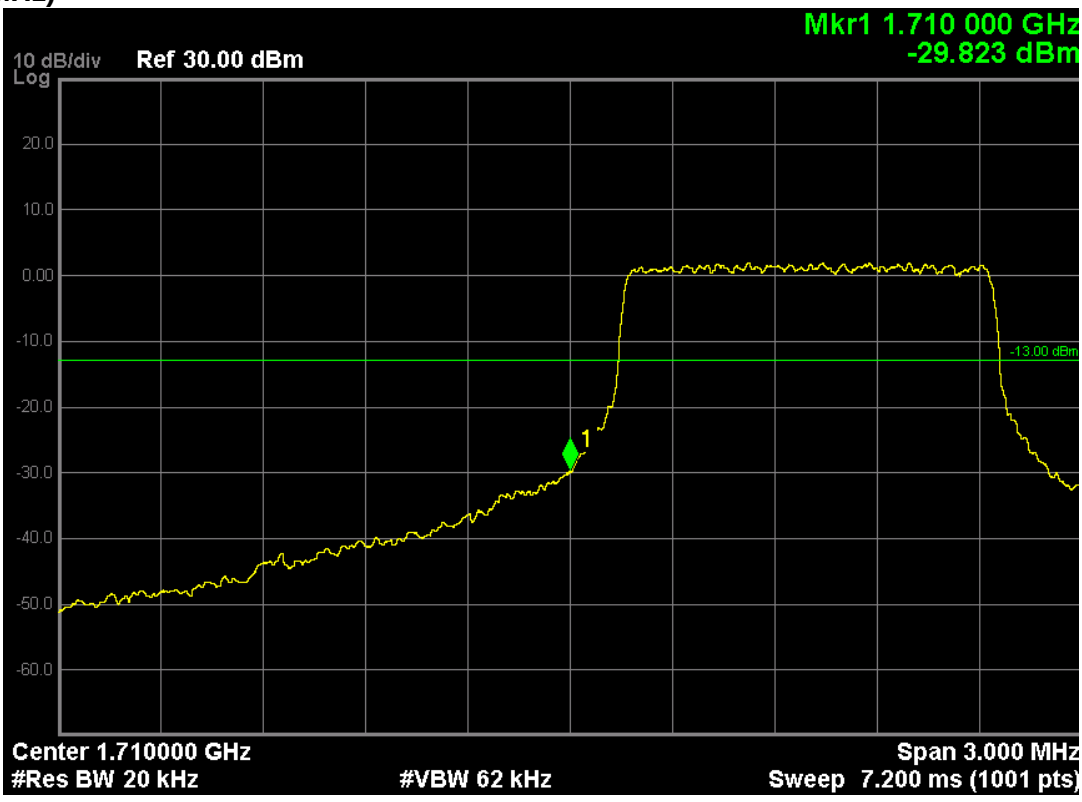
LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 6,RB Offset 0,Channel 20393,Frequeny 1754.3MHz)



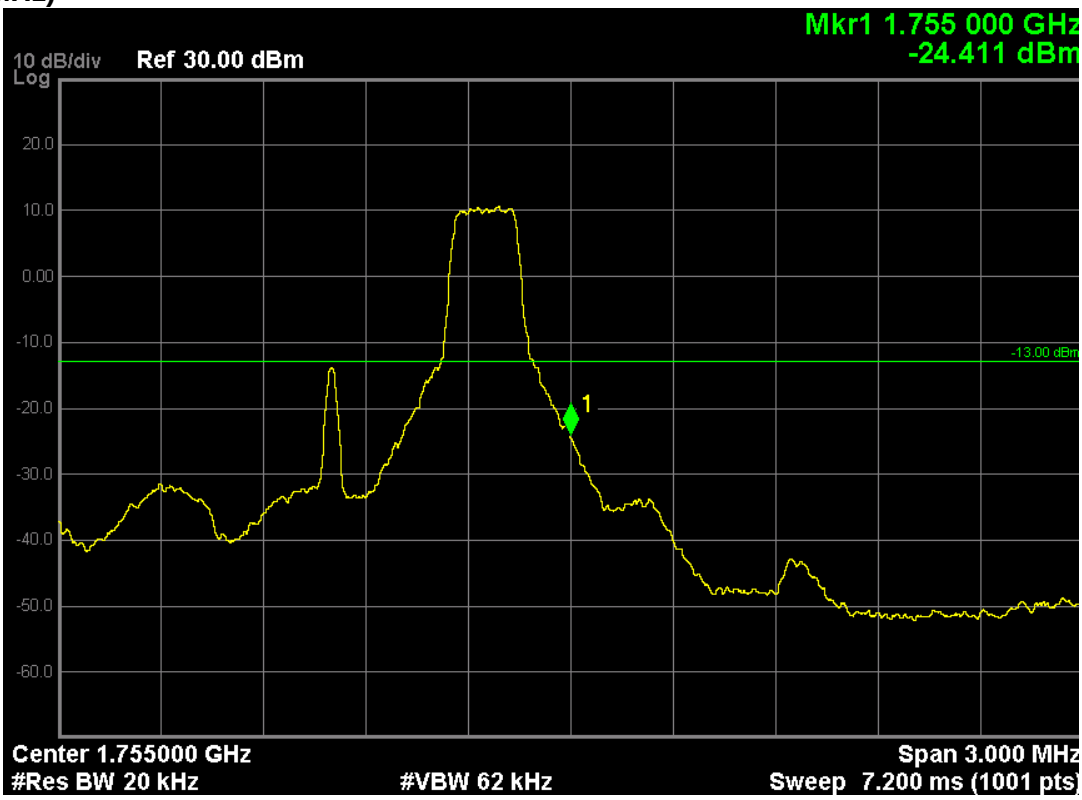
LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



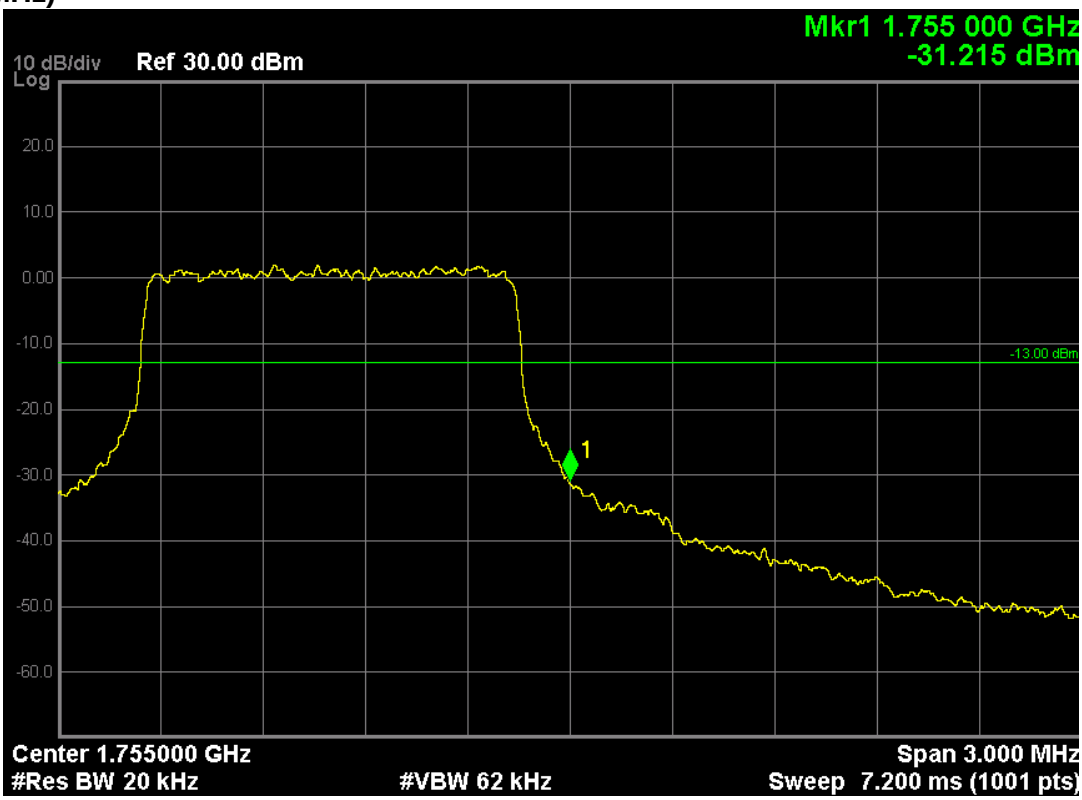
LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 6,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



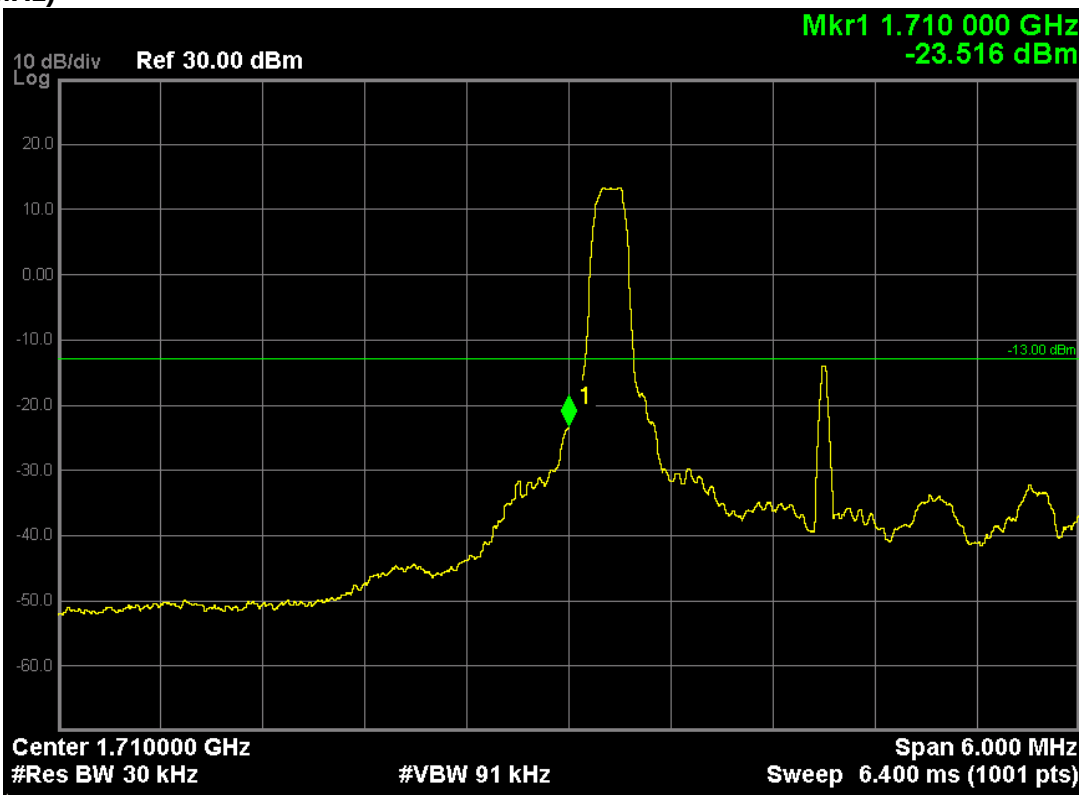
LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 1,RB Offset 5,Channel 20393,Frequeny 1754.3MHz)



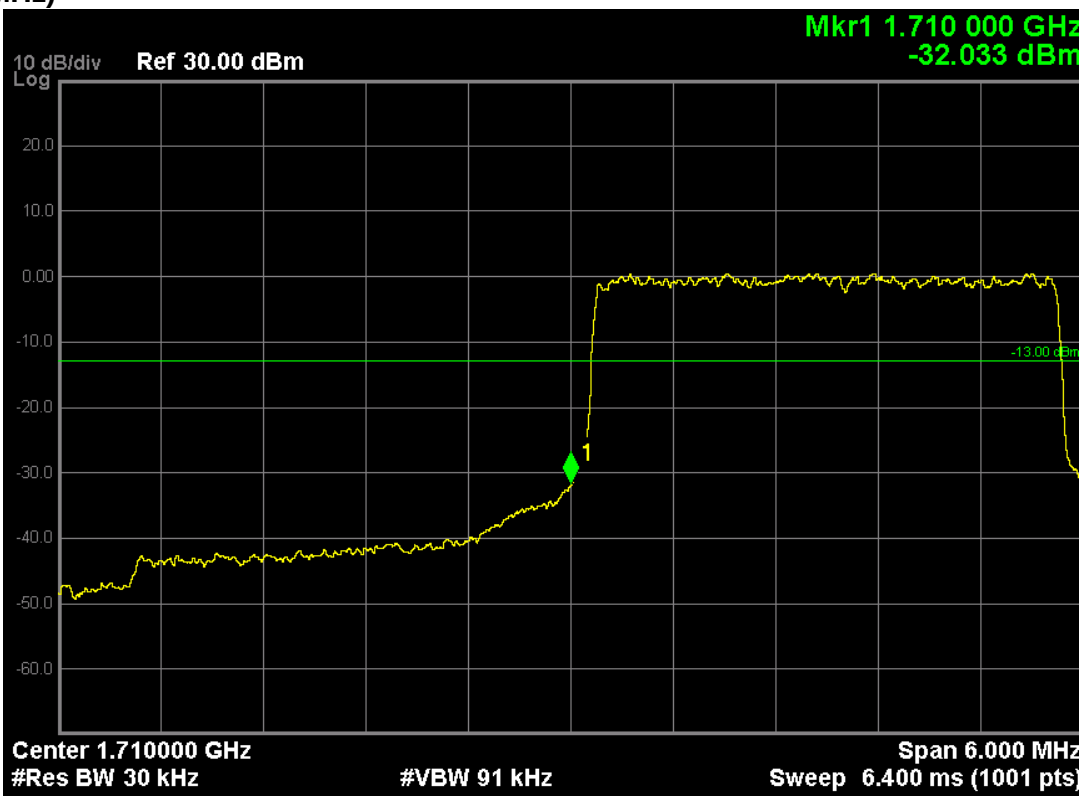
LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 6,RB Offset 0,Channel 20393,Frequeny 1754.3MHz)



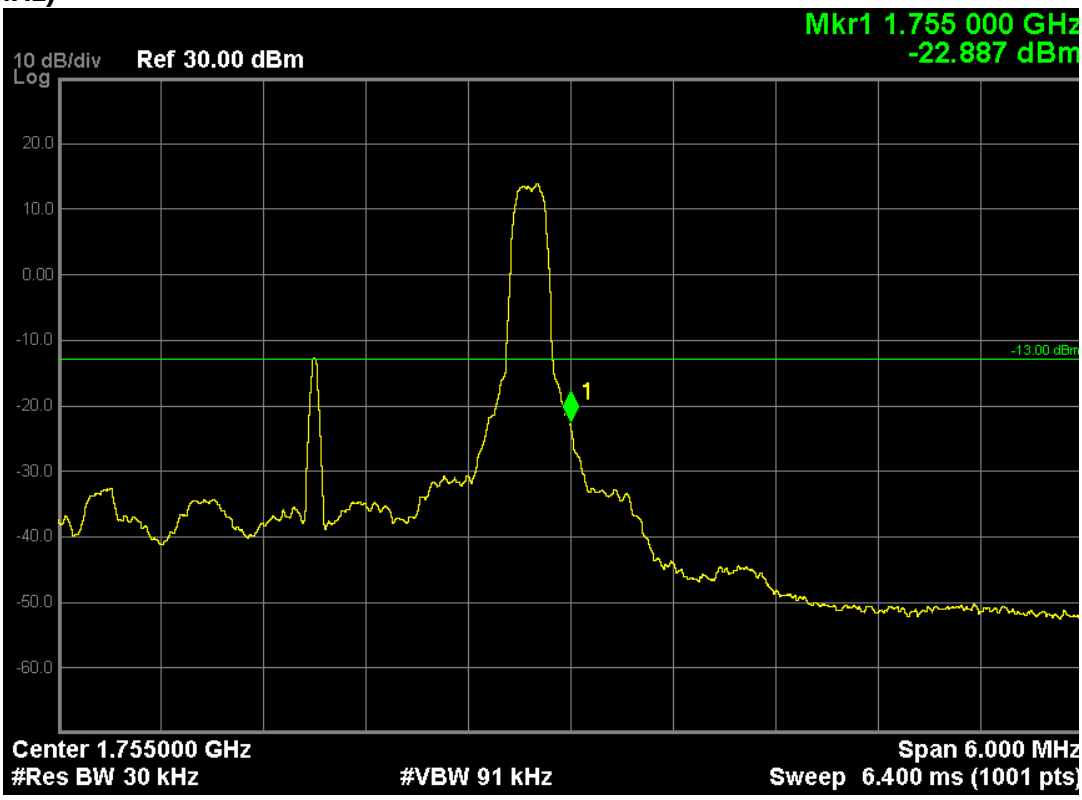
LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



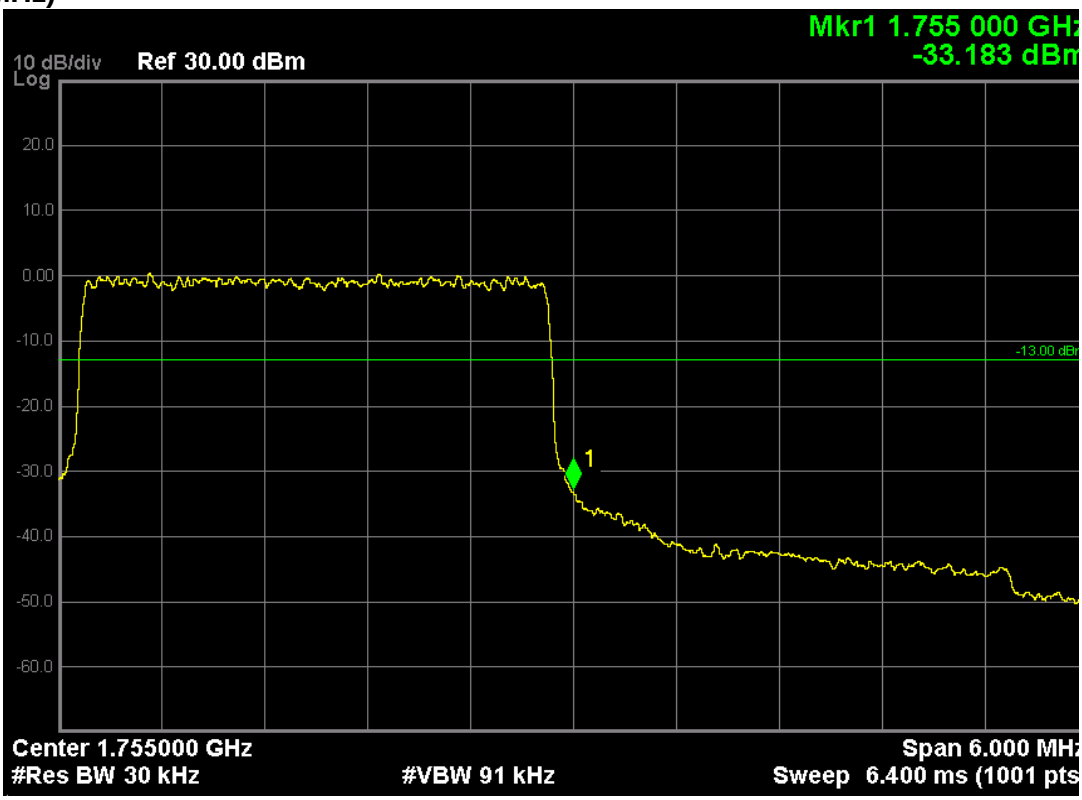
LTE Band 4 (QPSK, Band Width 3MHz,RB Size 15,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



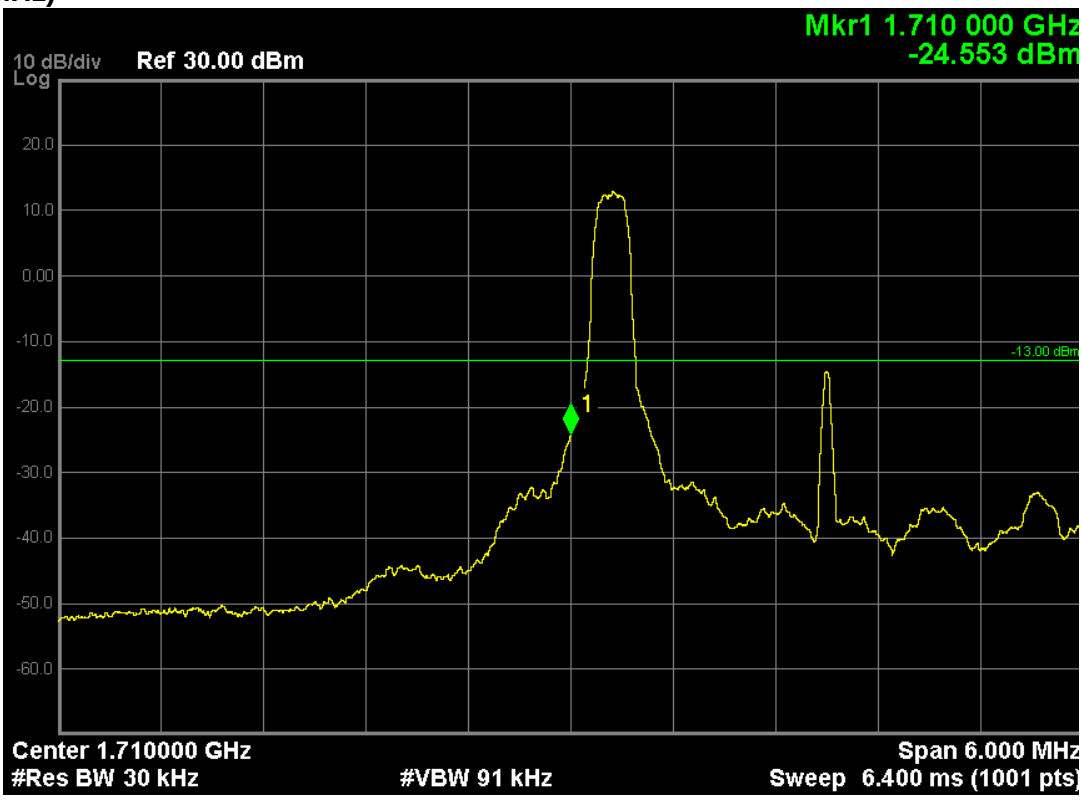
LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 14,Channel 20385,Frequeny 1753.5MHz)



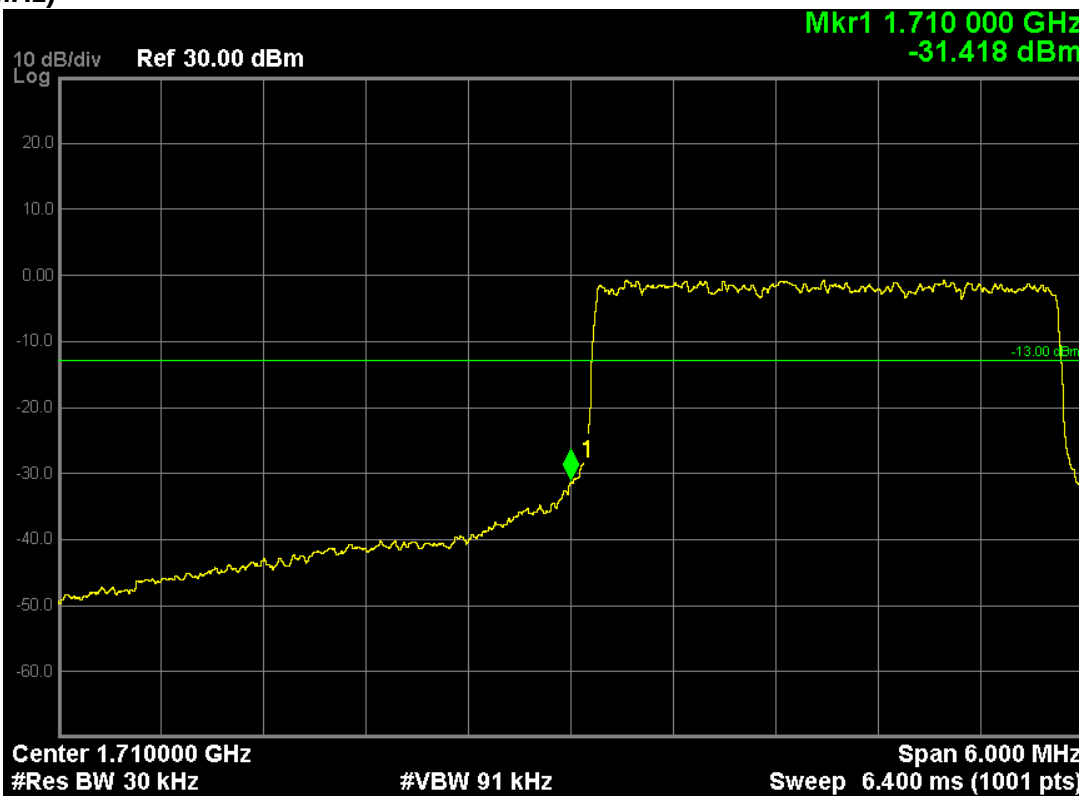
LTE Band 4 (QPSK, Band Width 3MHz,RB Size 15,RB Offset 0,Channel 20385,Frequeny 1753.5MHz)



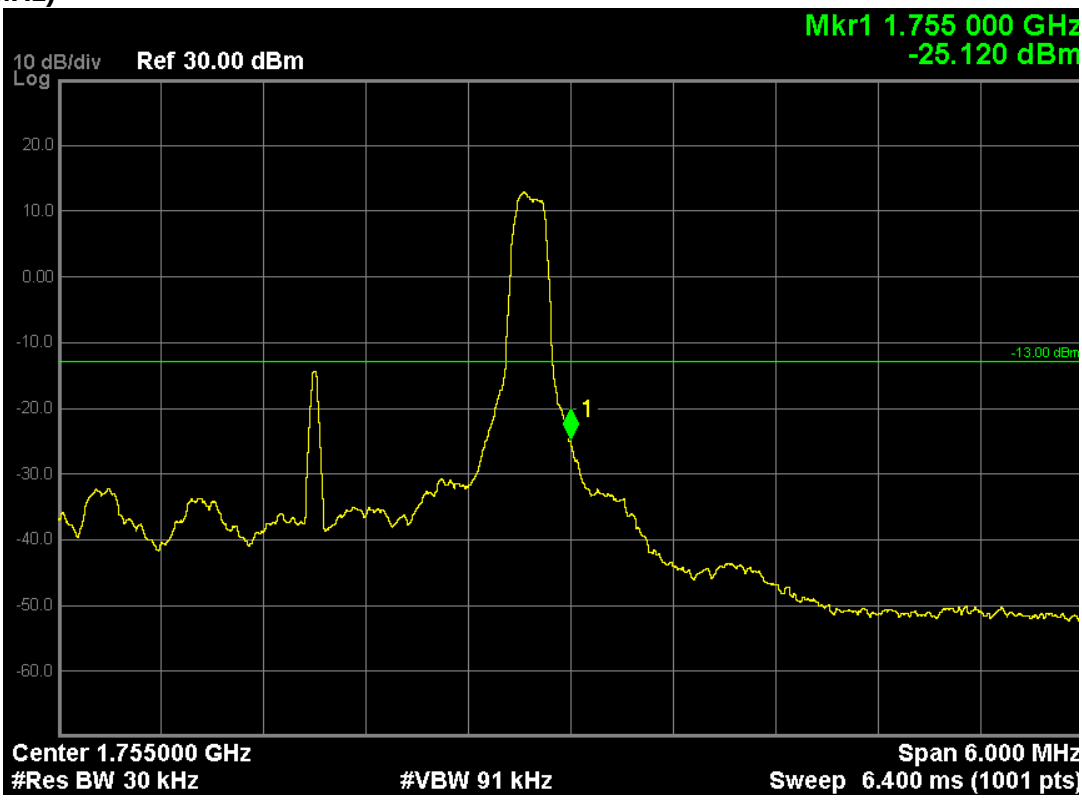
LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



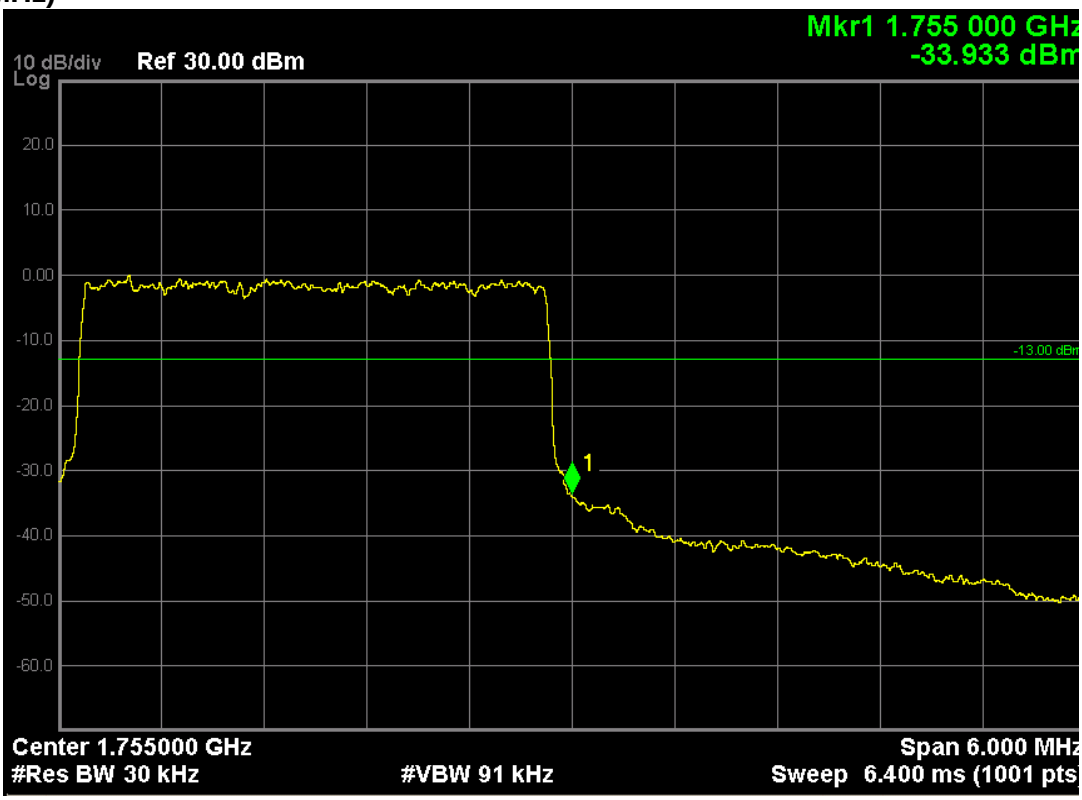
LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 15,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



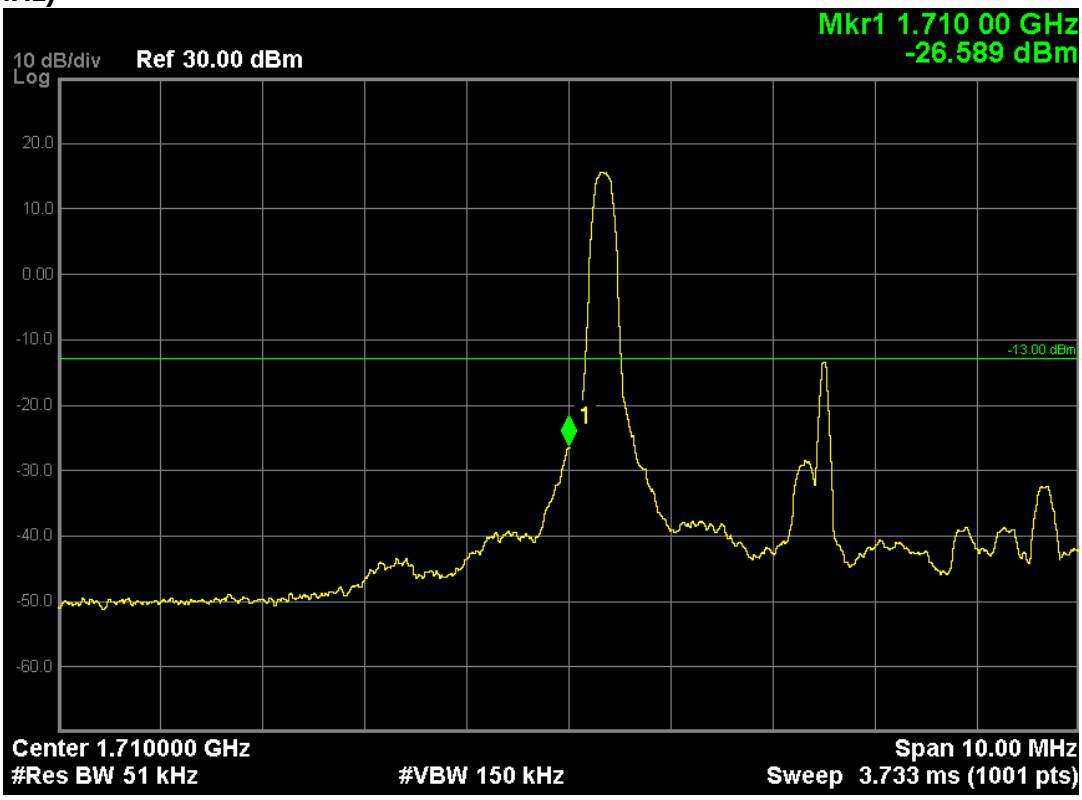
LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 1,RB Offset 14,Channel 20385,Frequeny 1753.5MHz)



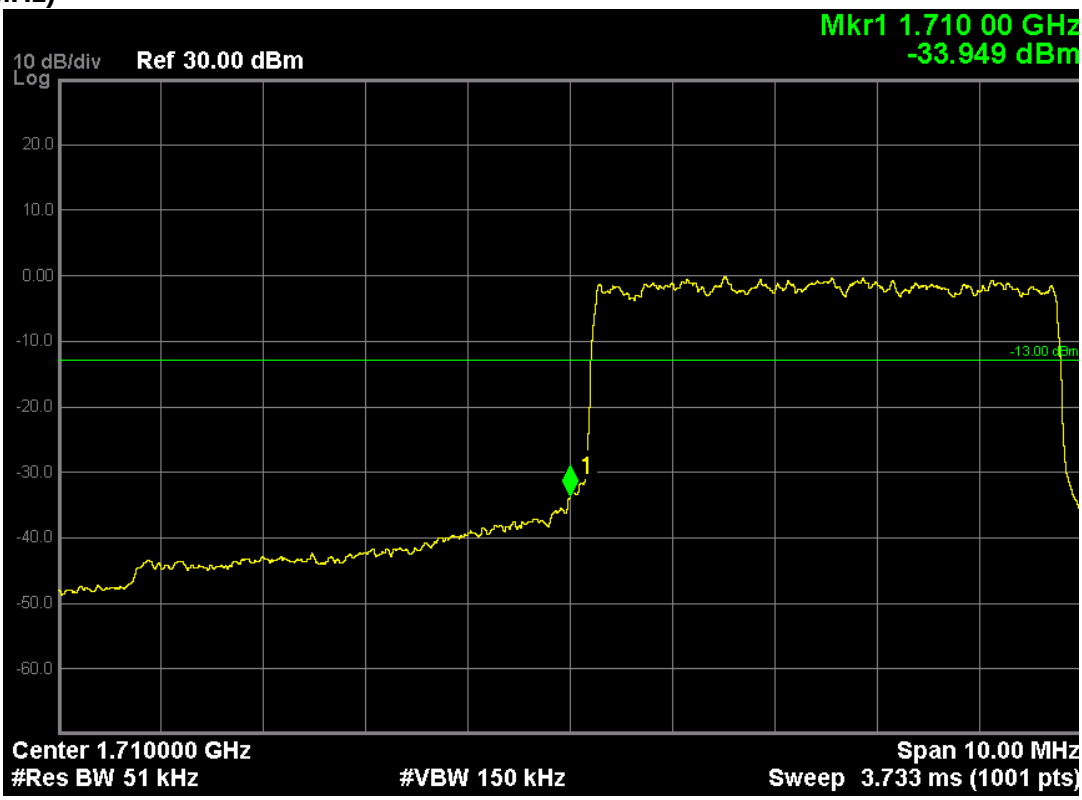
LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 15,RB Offset 0,Channel 20385,Frequeny 1753.5MHz)



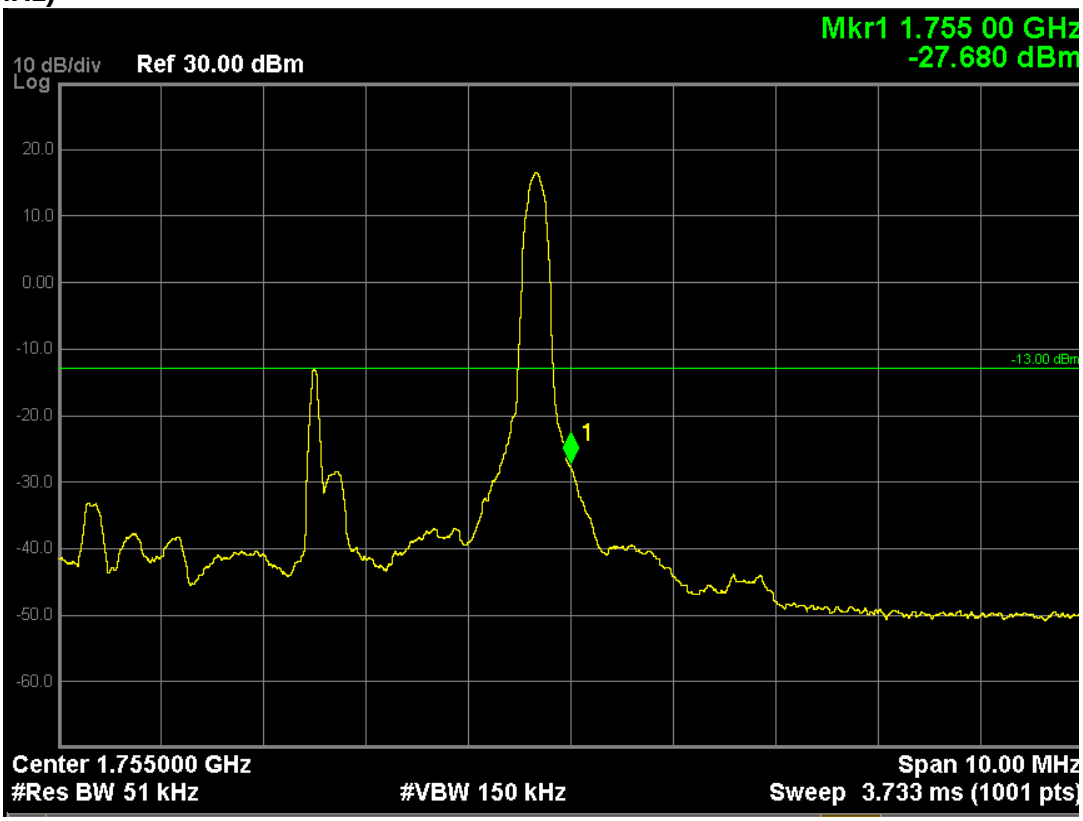
LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



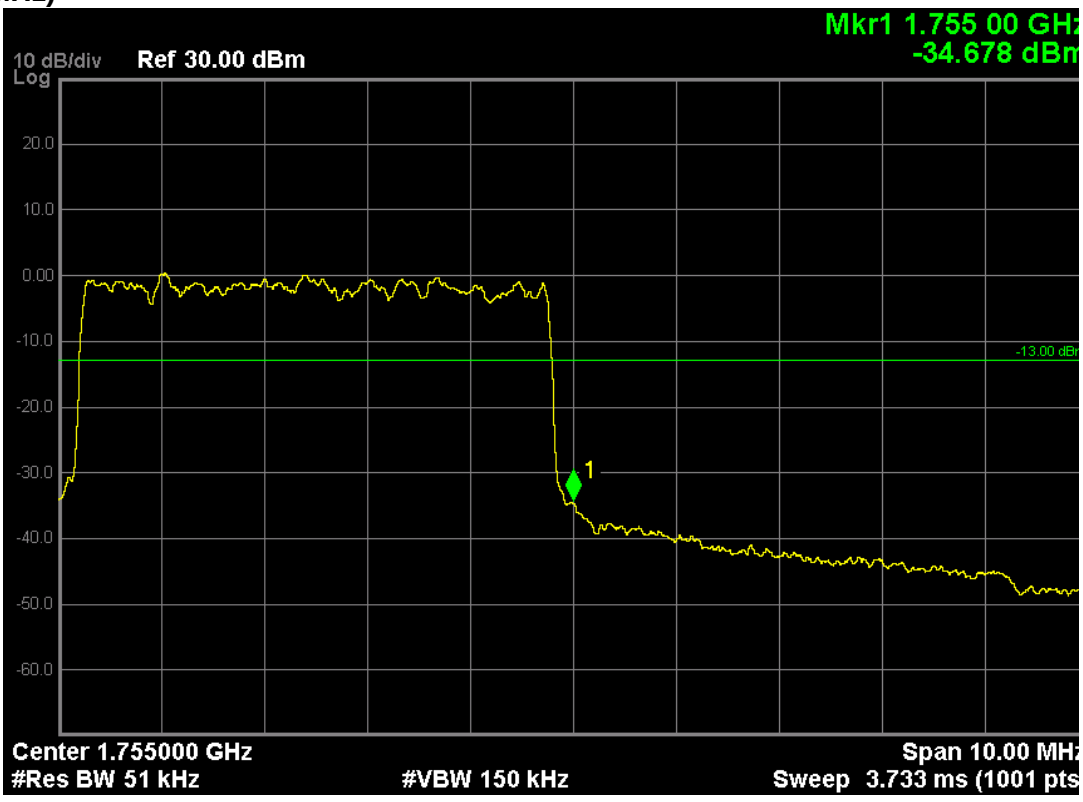
LTE Band 4 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



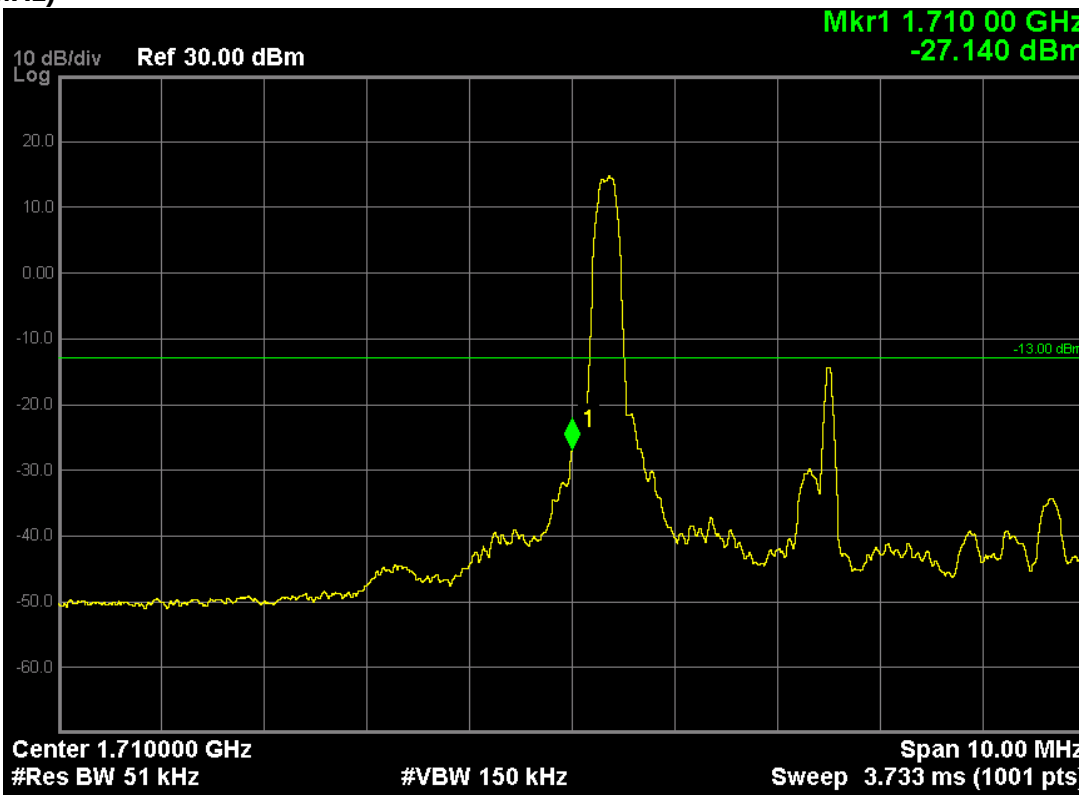
LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 20375,Frequeny 1752.5MHz)



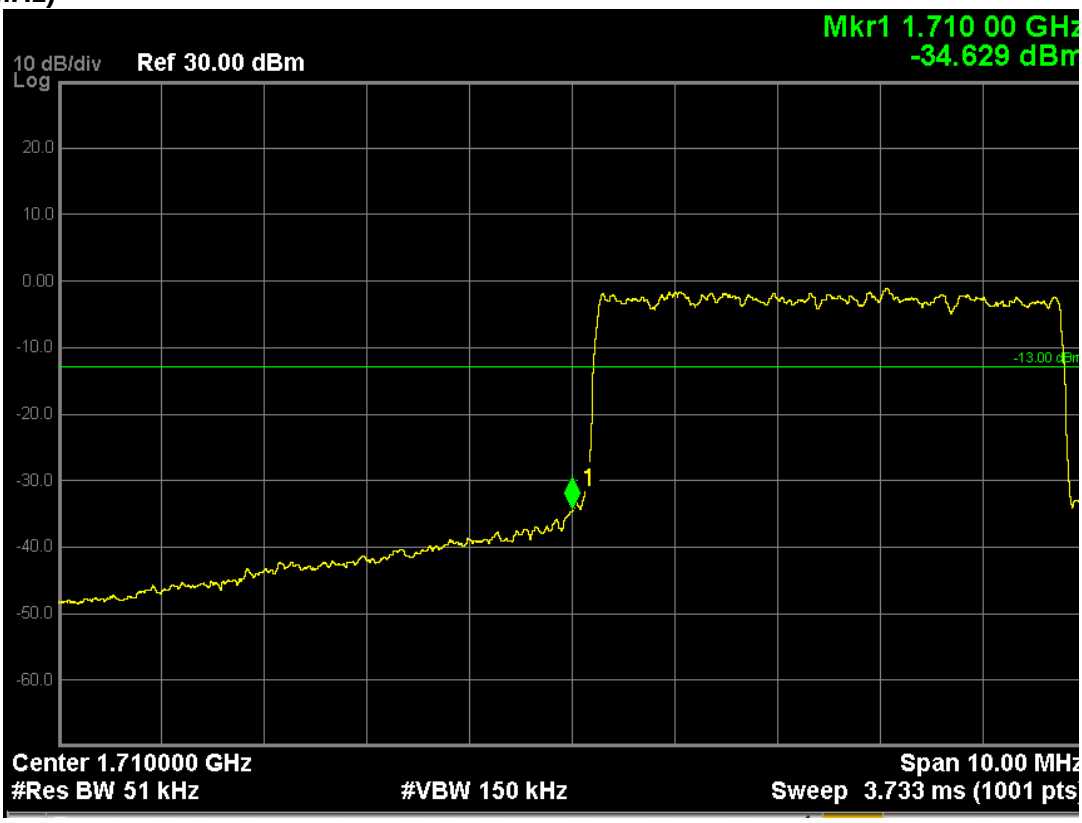
LTE Band 4 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 20375,Frequeny 1752.5MHz)



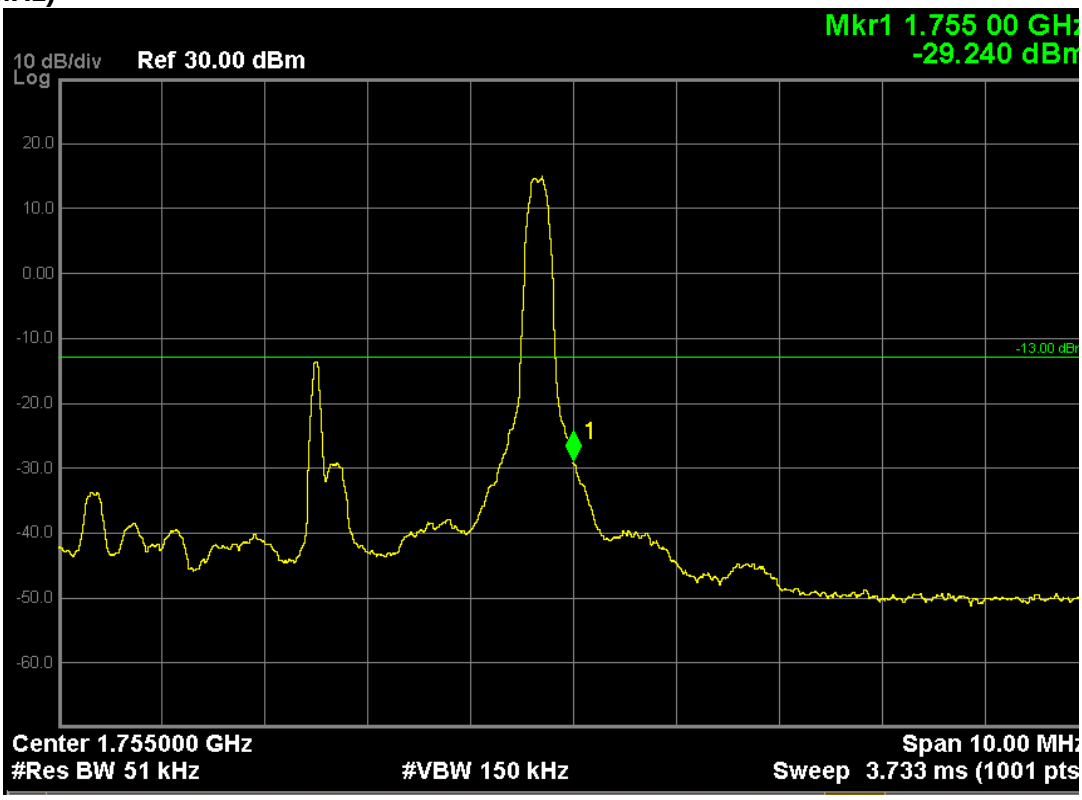
LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



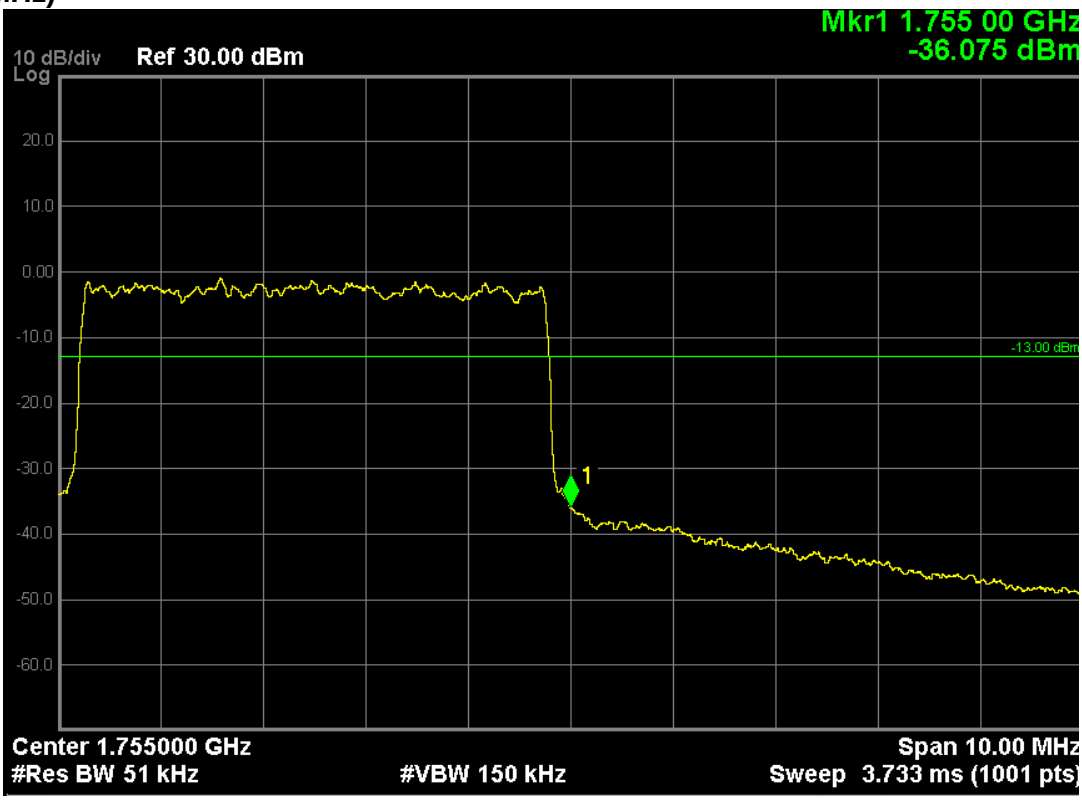
LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



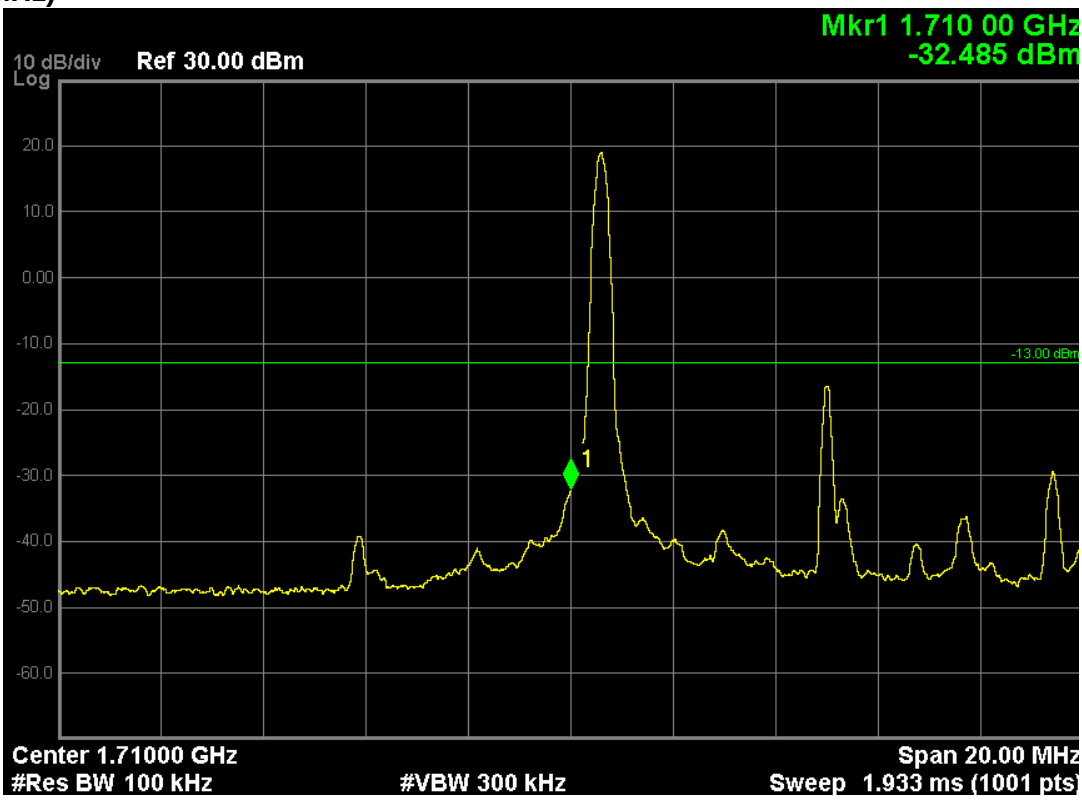
LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 20375,Frequeny 1752.5MHz)



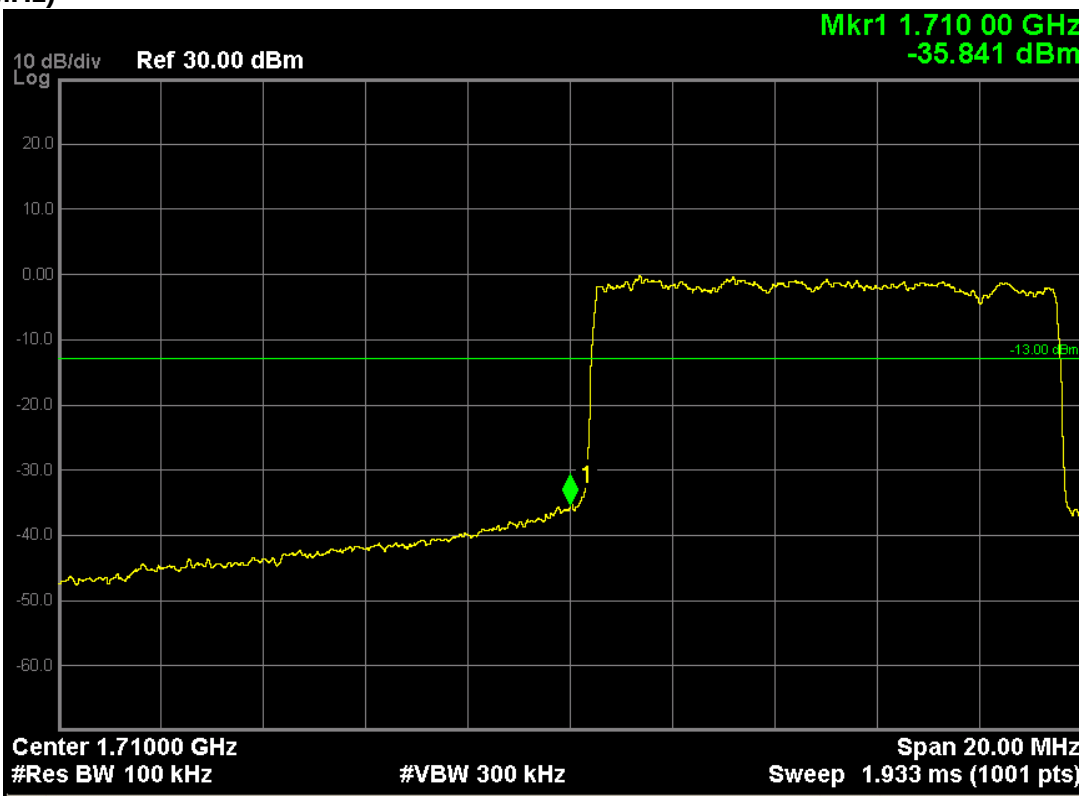
LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 20375,Frequeny 1752.5MHz)



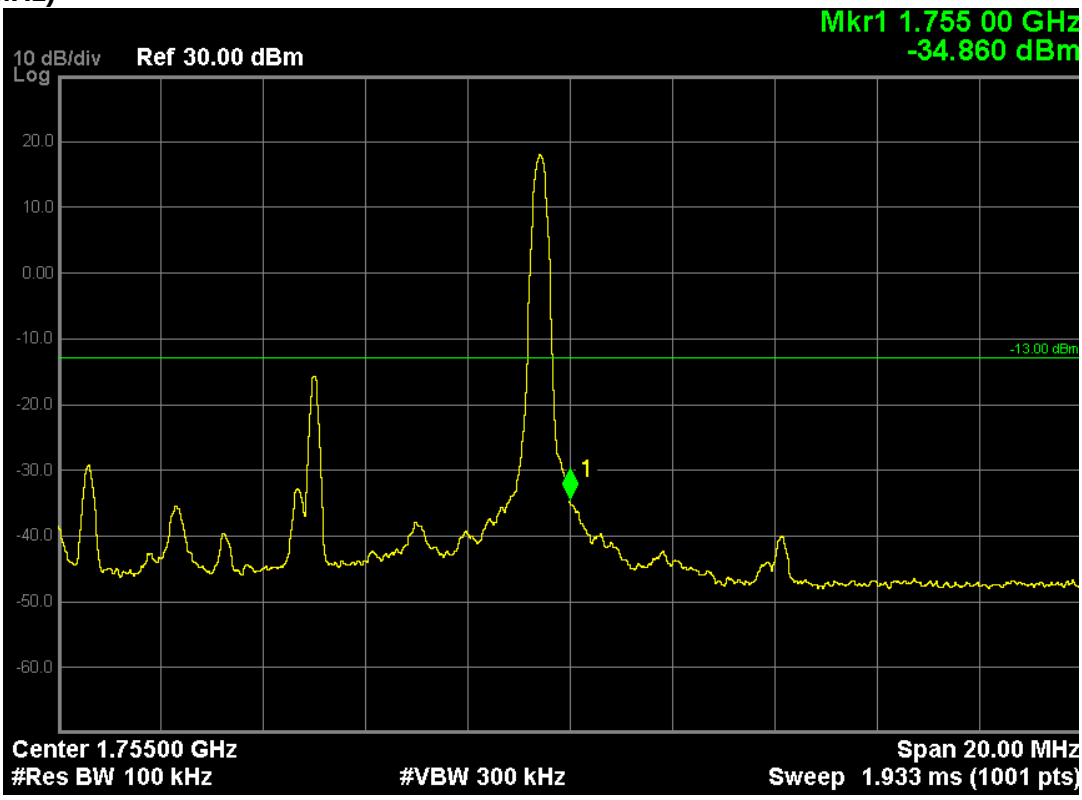
LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20000,Frequeny 1715.0MHz)



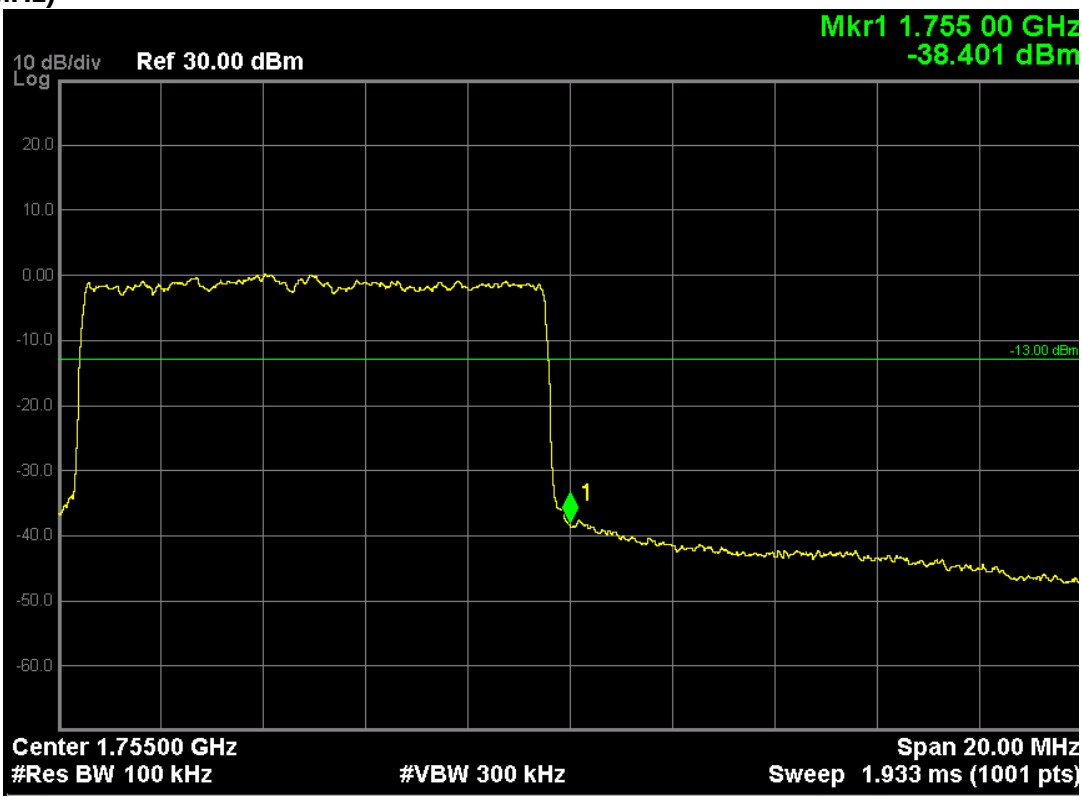
LTE Band 4 (QPSK, Band Width 10MHz,RB Size 50,RB Offset 0,Channel 20000,Frequeny 1715.0MHz)



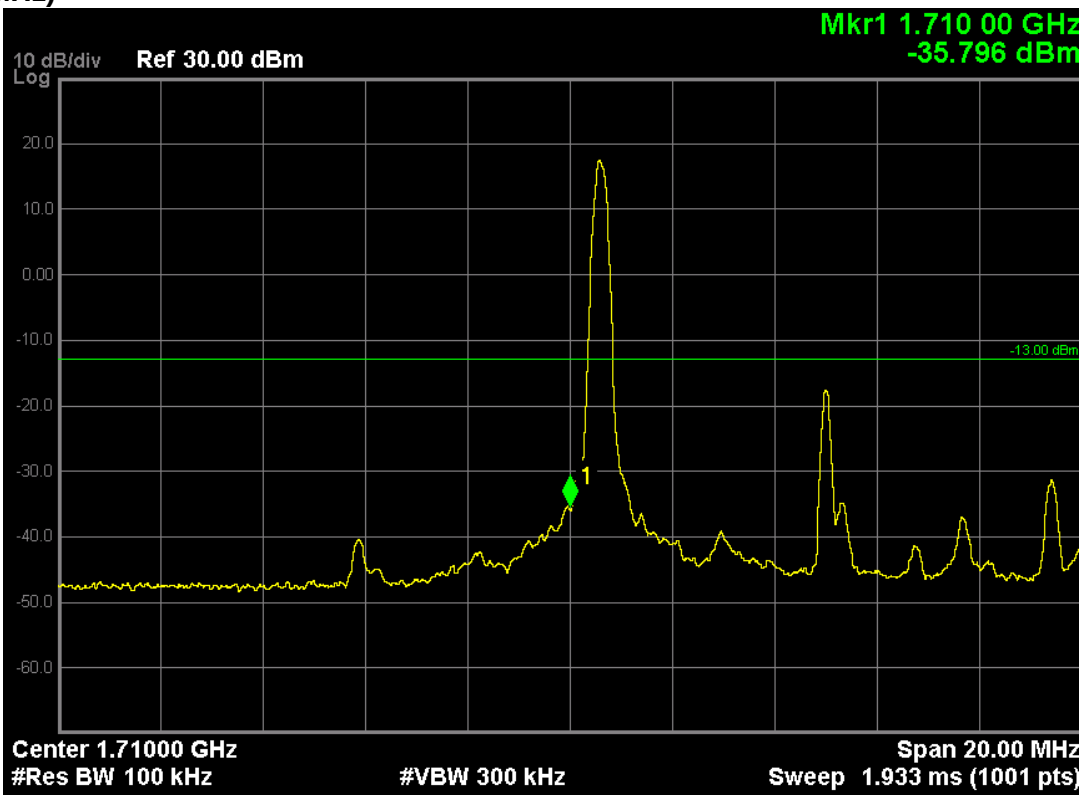
LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 49,Channel 20350,Frequeny 1750.0MHz)



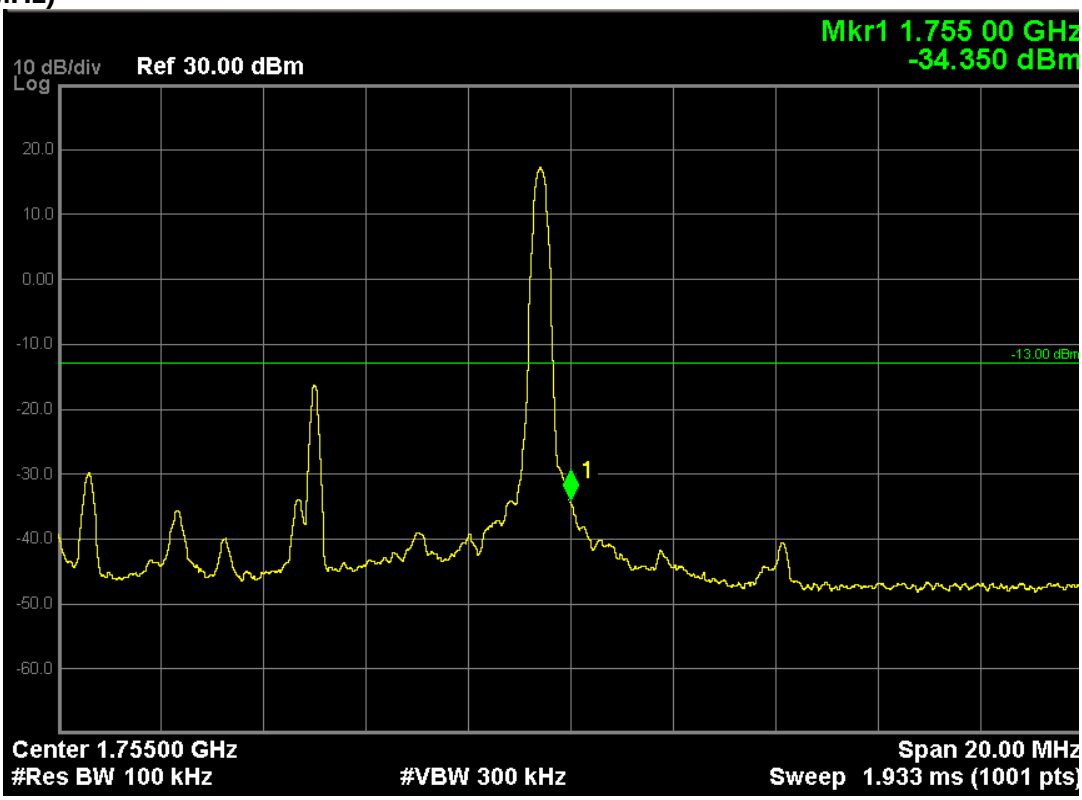
LTE Band 4 (QPSK, Band Width 10MHz,RB Size 50,RB Offset 0,Channel 20350,Frequeny 1750.0MHz)



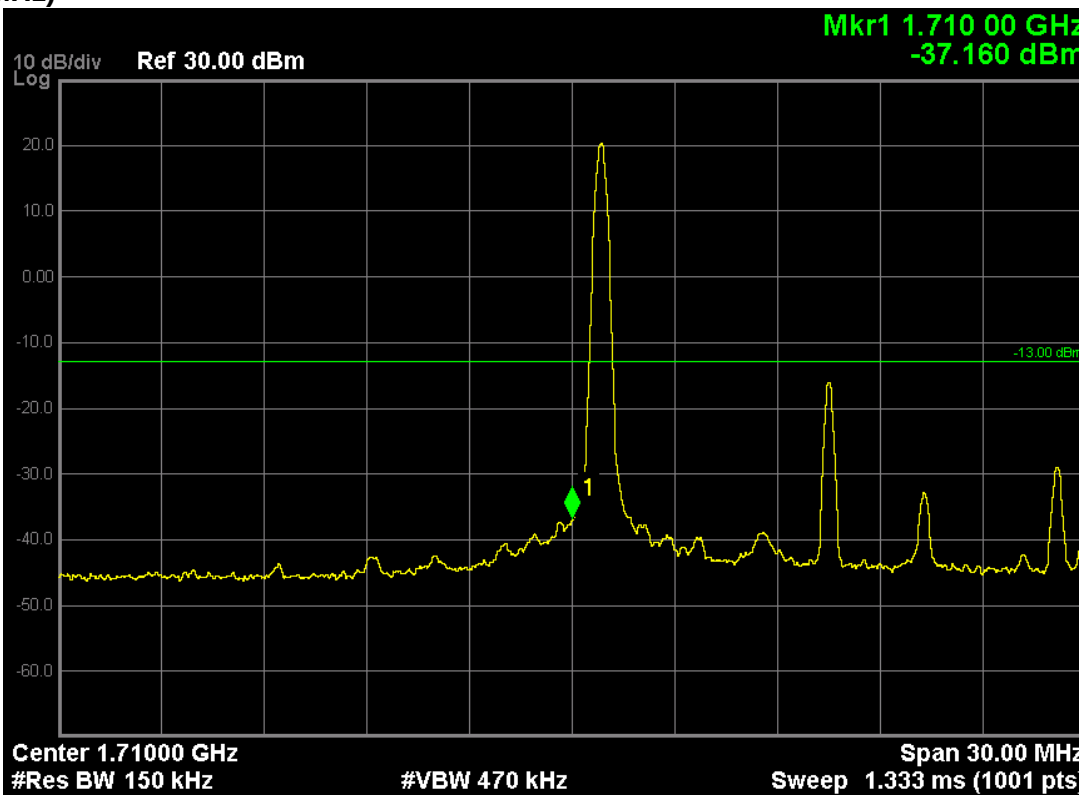
LTE Band 4 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20000,Frequeny 1715.0MHz)



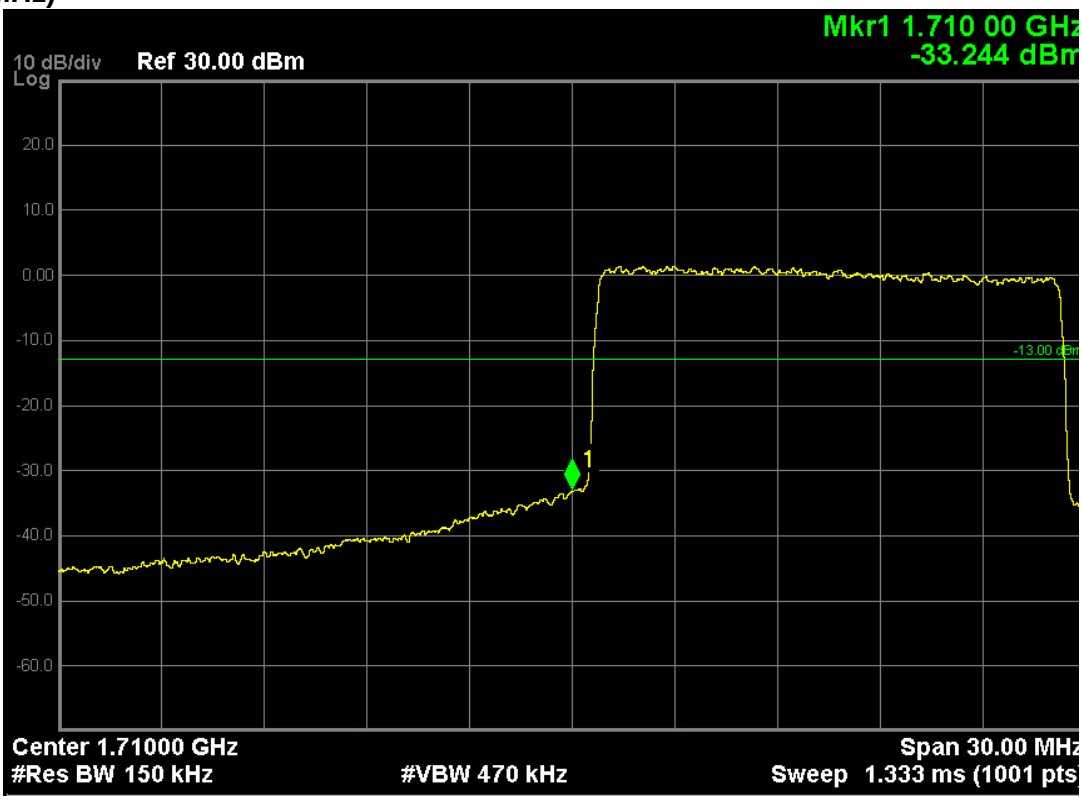
LTE Band 4 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 49,Channel 20350,Frequeny 1750.0MHz)



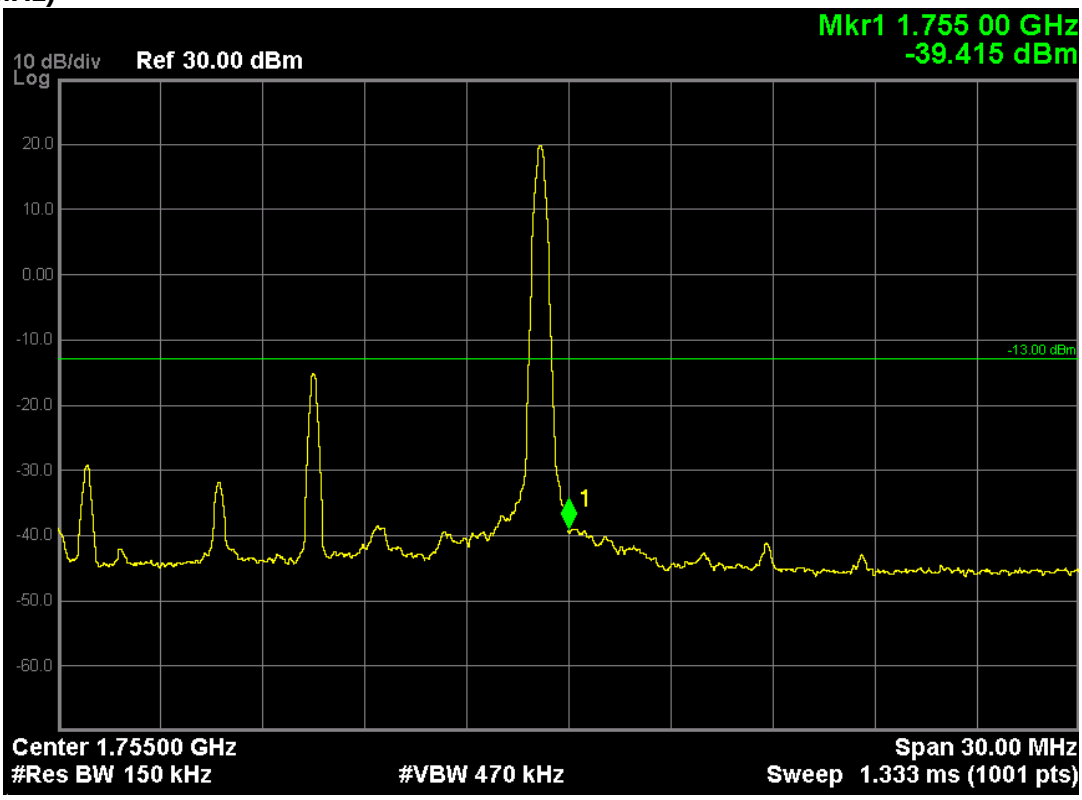
LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20025,Frequeny 1717.5MHz)



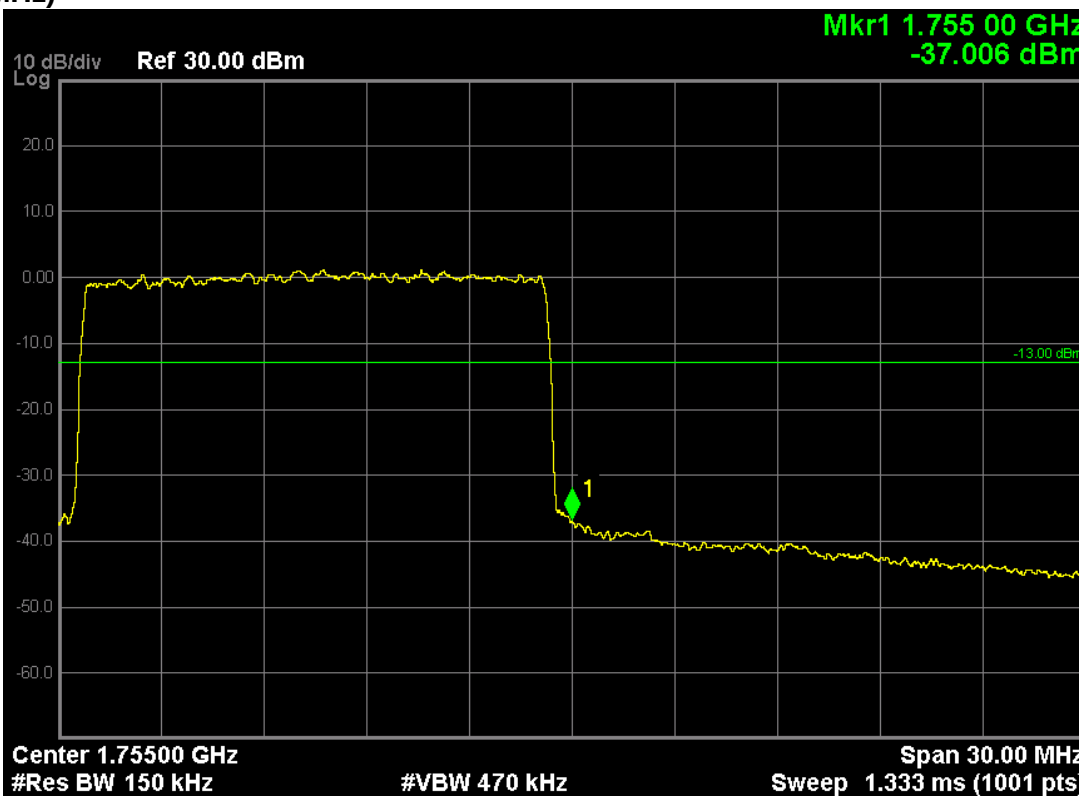
LTE Band 4 (QPSK, Band Width 15MHz,RB Size 75,RB Offset 0,Channel 20025,Frequeny 1717.5MHz)



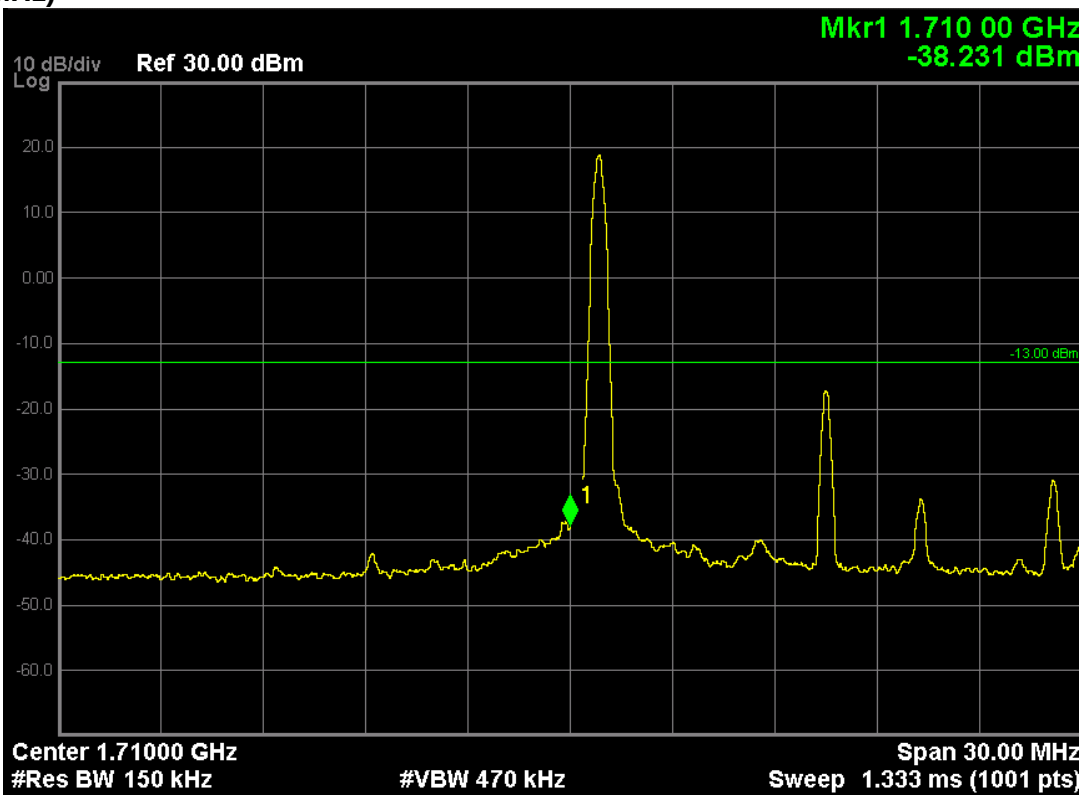
LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset 74,Channel 20325,Frequeny 1747.5MHz)



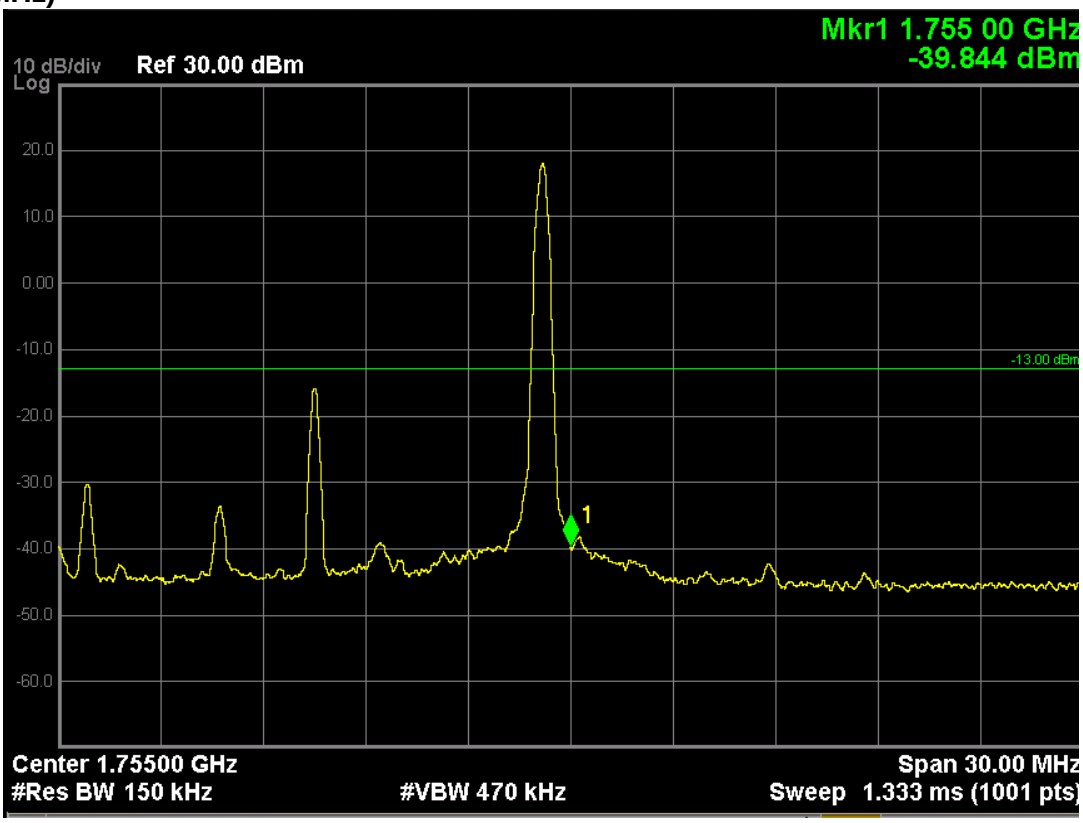
LTE Band 4 (QPSK, Band Width 15MHz,RB Size 75,RB Offset 0,Channel 20325,Frequeny 1747.5MHz)



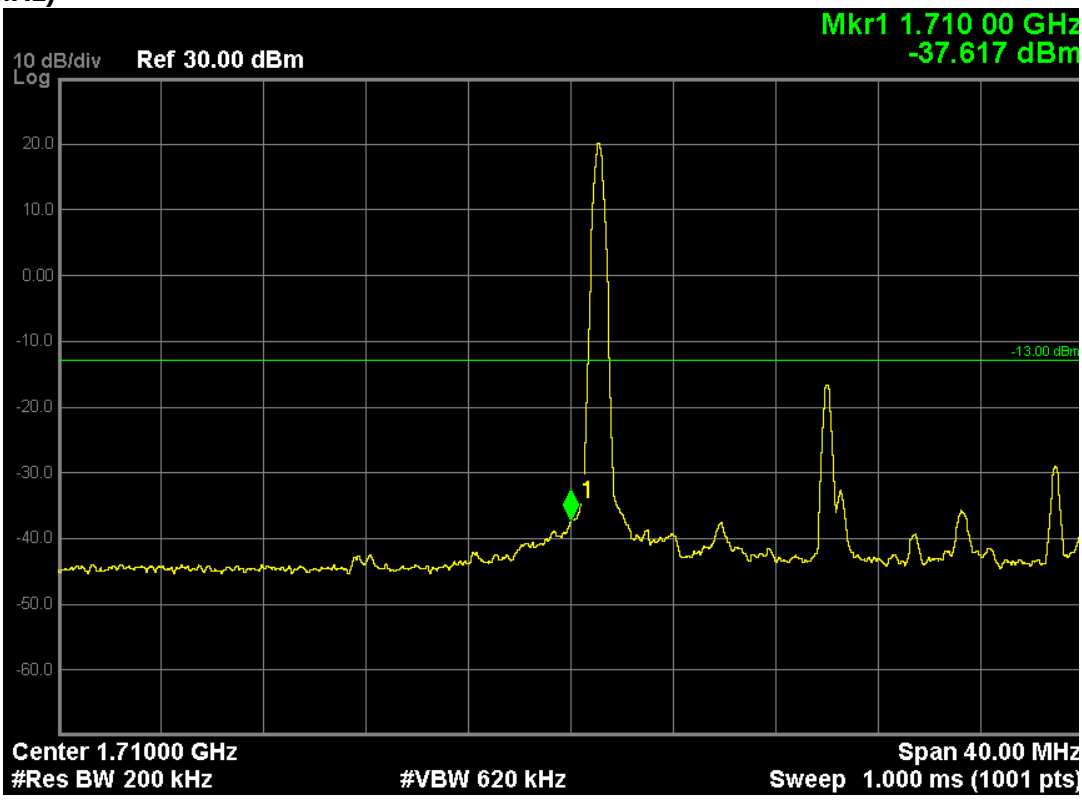
LTE Band 4 (16-QAM, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20025,Frequeny 1717.5MHz)



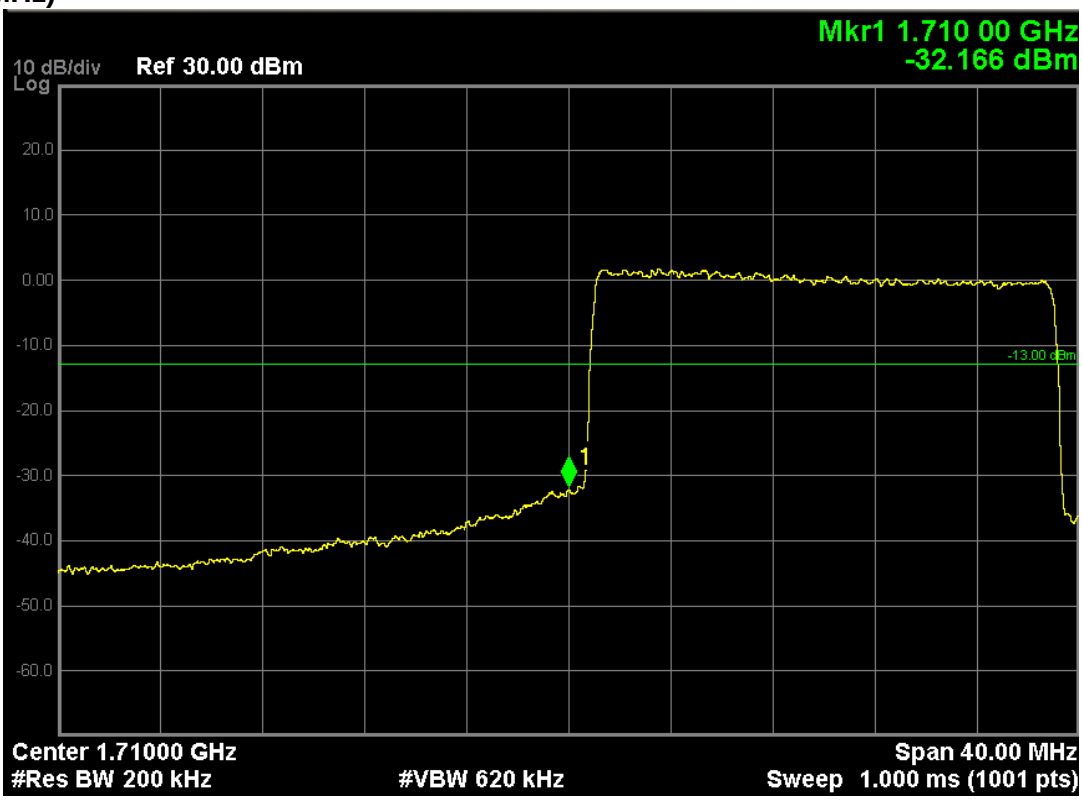
LTE Band 4 (16-QAM, Band Width 15MHz,RB Size 1,RB Offset 74,Channel 20325,Frequeny 1747.5MHz)



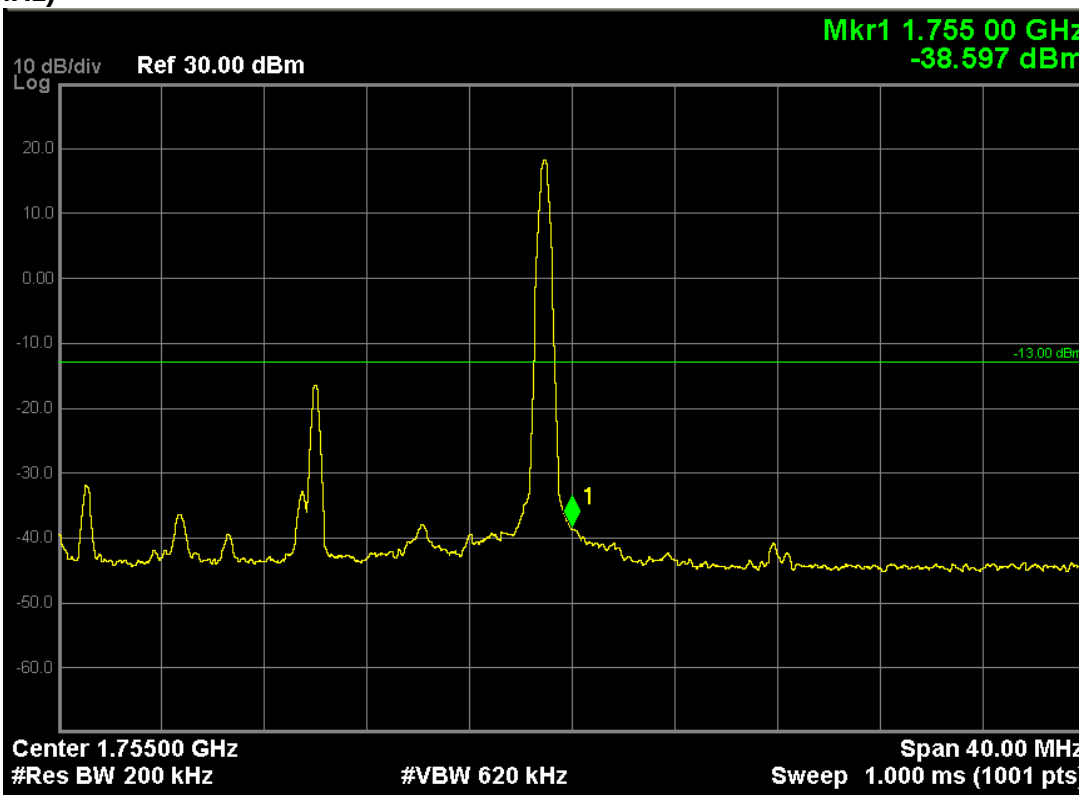
LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20050,Frequeny 1720.0MHz)



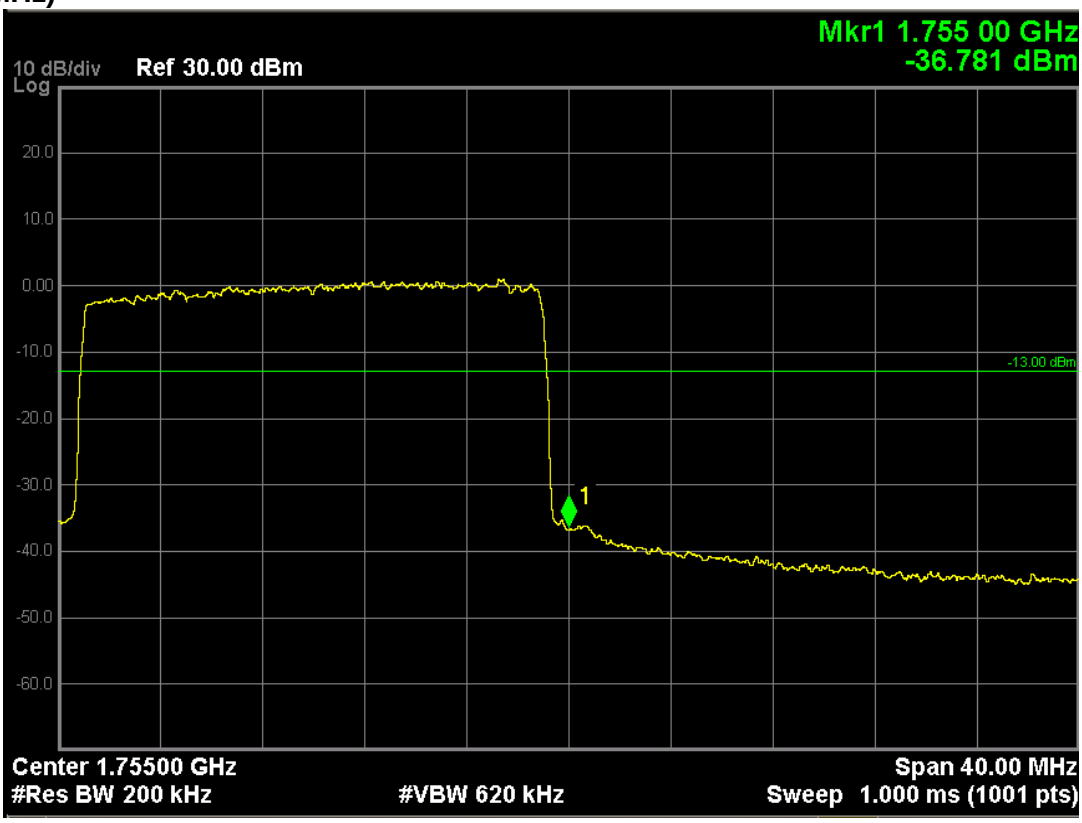
LTE Band 4 (QPSK, Band Width 20MHz,RB Size 100,RB Offset 0,Channel 20050,Frequeny 1720.0MHz)



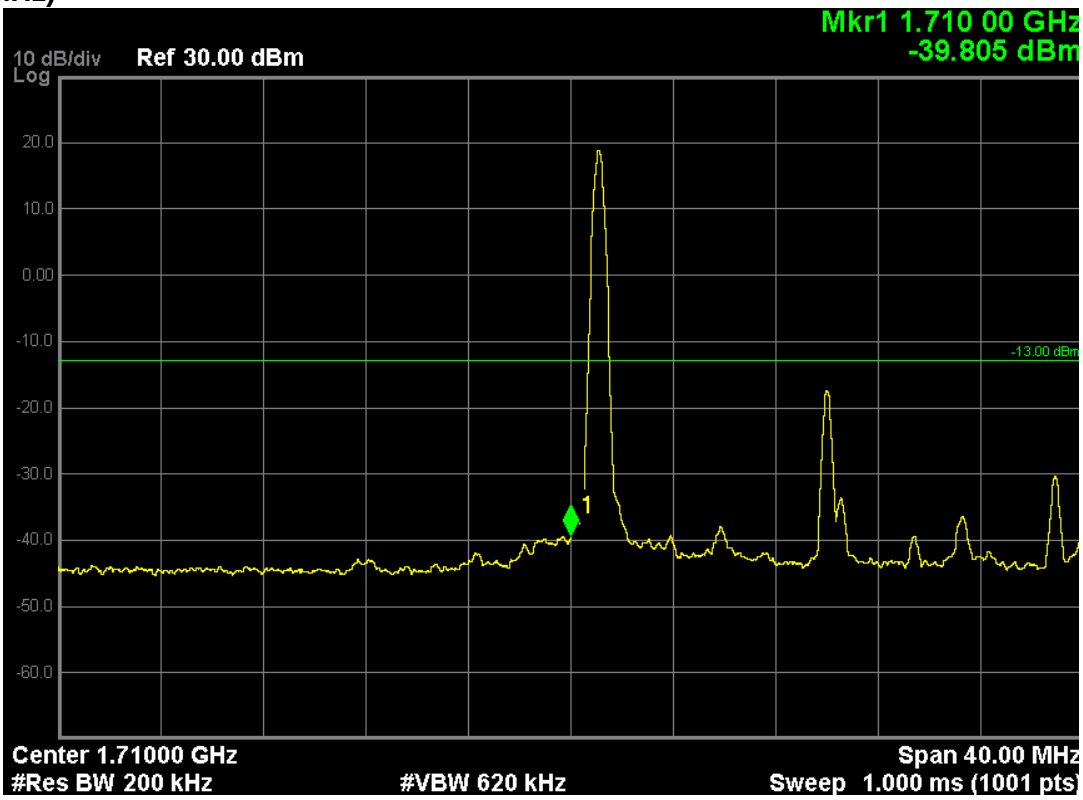
LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 99,Channel 20300,Frequeny 1745.0MHz)



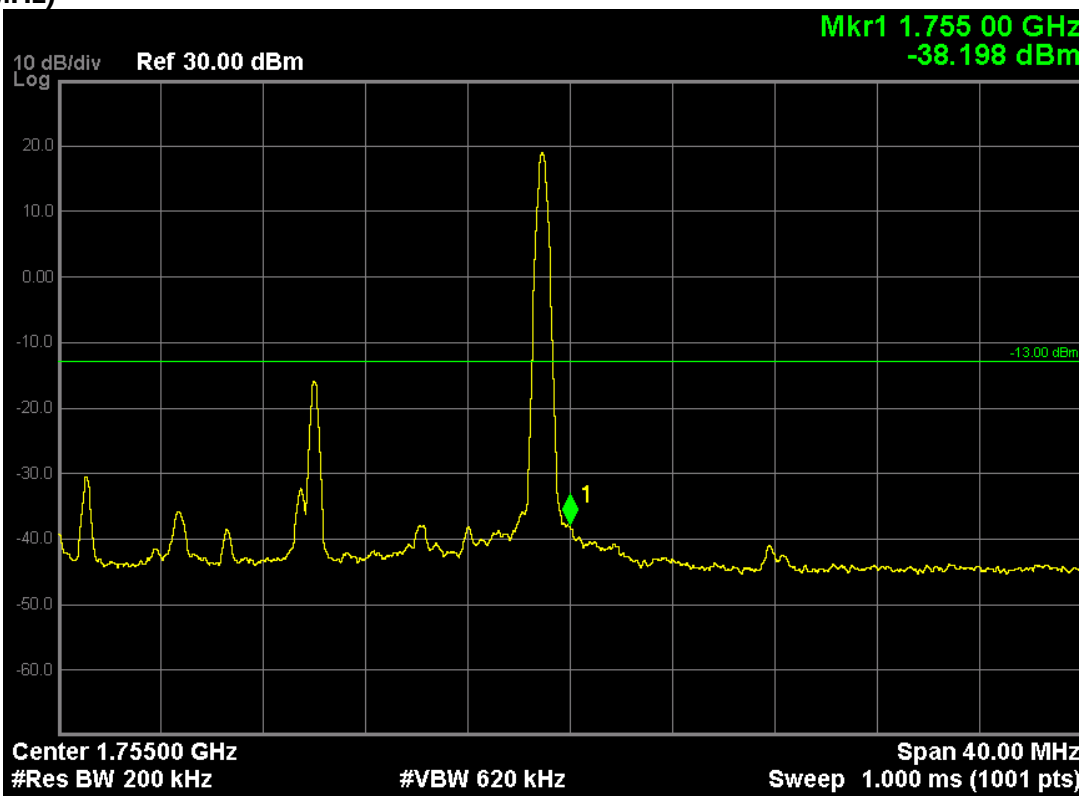
LTE Band 4 (QPSK, Band Width 20MHz,RB Size 100,RB Offset 0,Channel 20300,Frequeny 1745.0MHz)



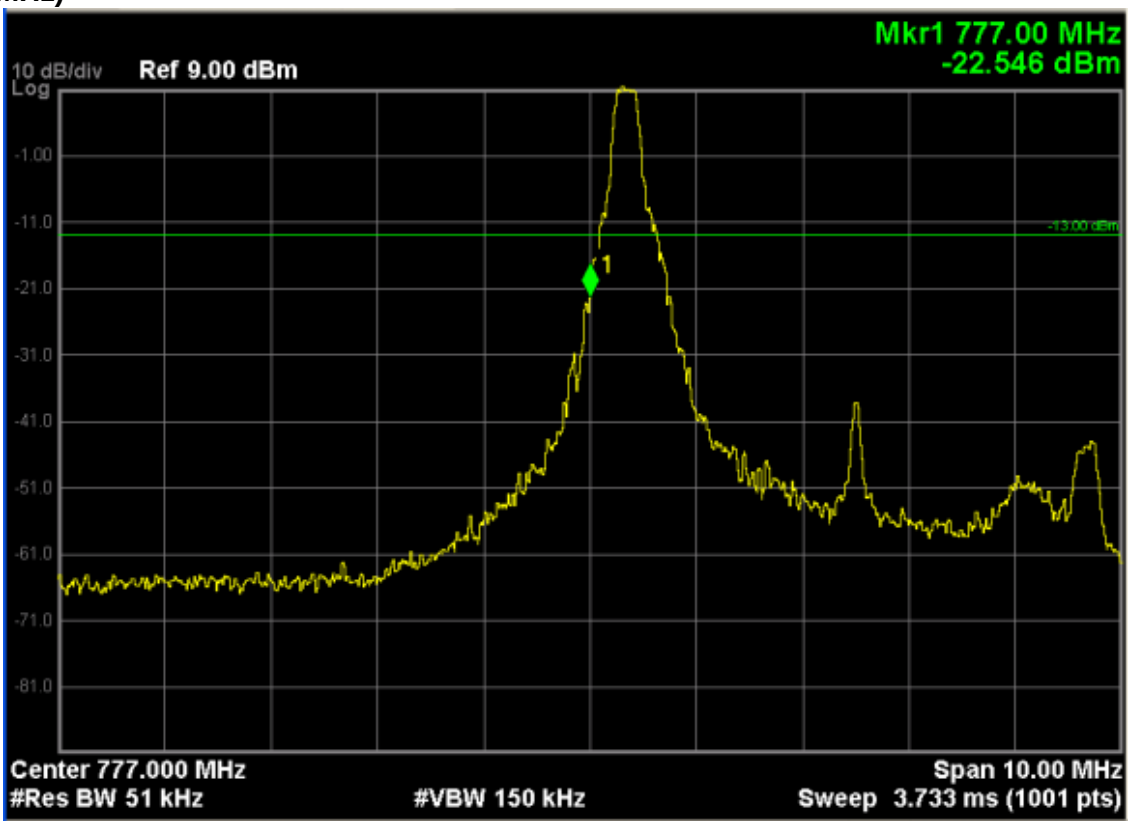
LTE Band 4 (16-QAM, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20050,Frequeny 1720.0MHz)



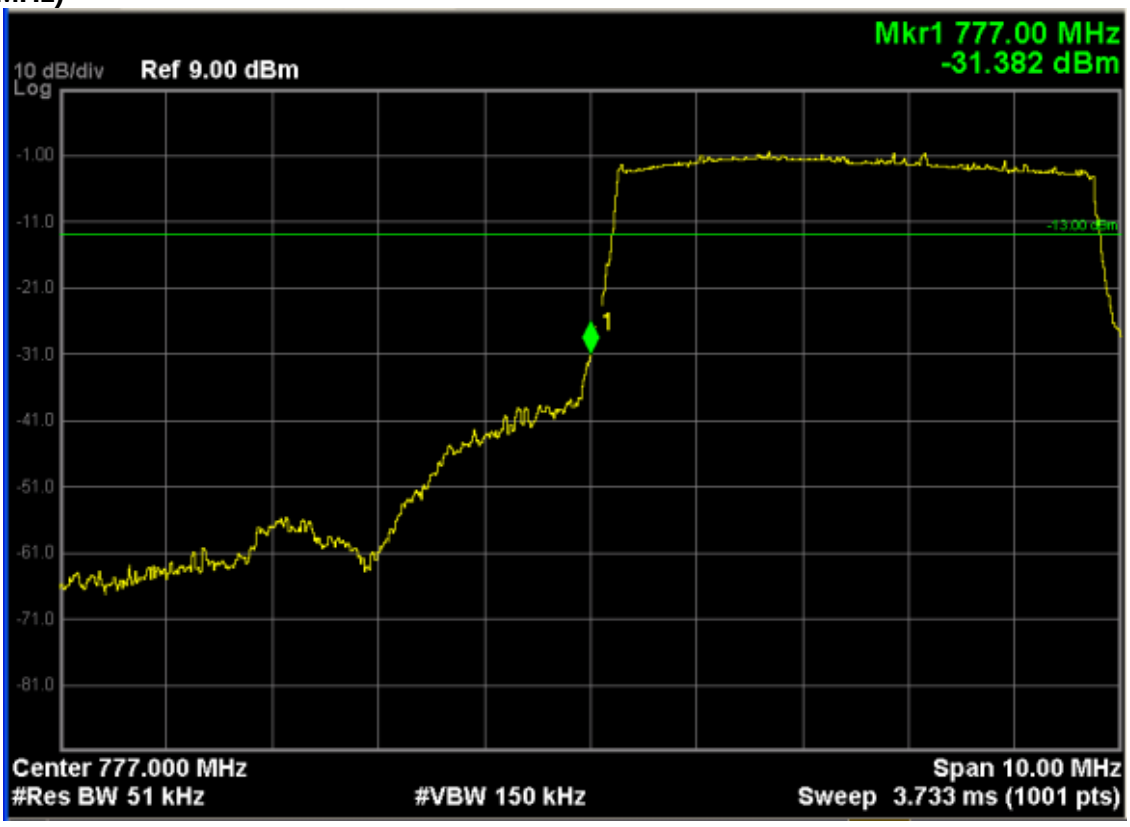
LTE Band 4 (16-QAM, Band Width 20MHz,RB Size 1,RB Offset 99,Channel 20300,Frequeny 1745.0MHz)



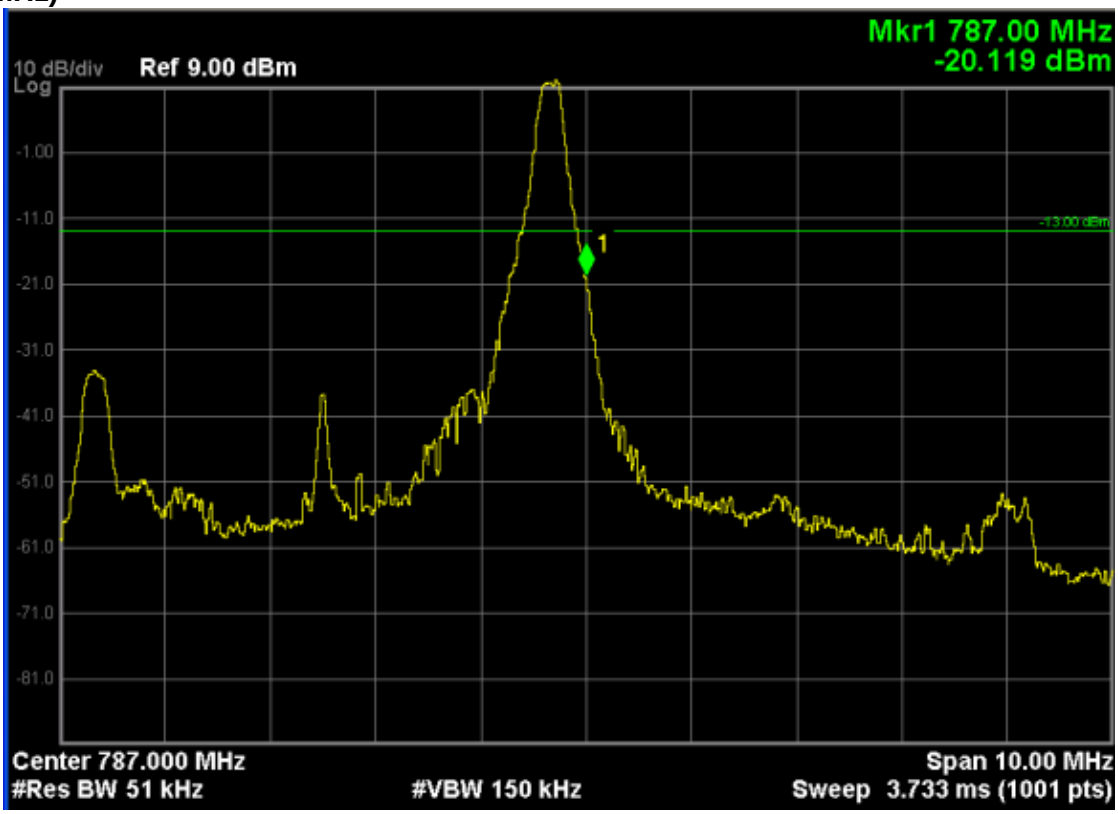
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 23205,Frequeny 779.5MHz)



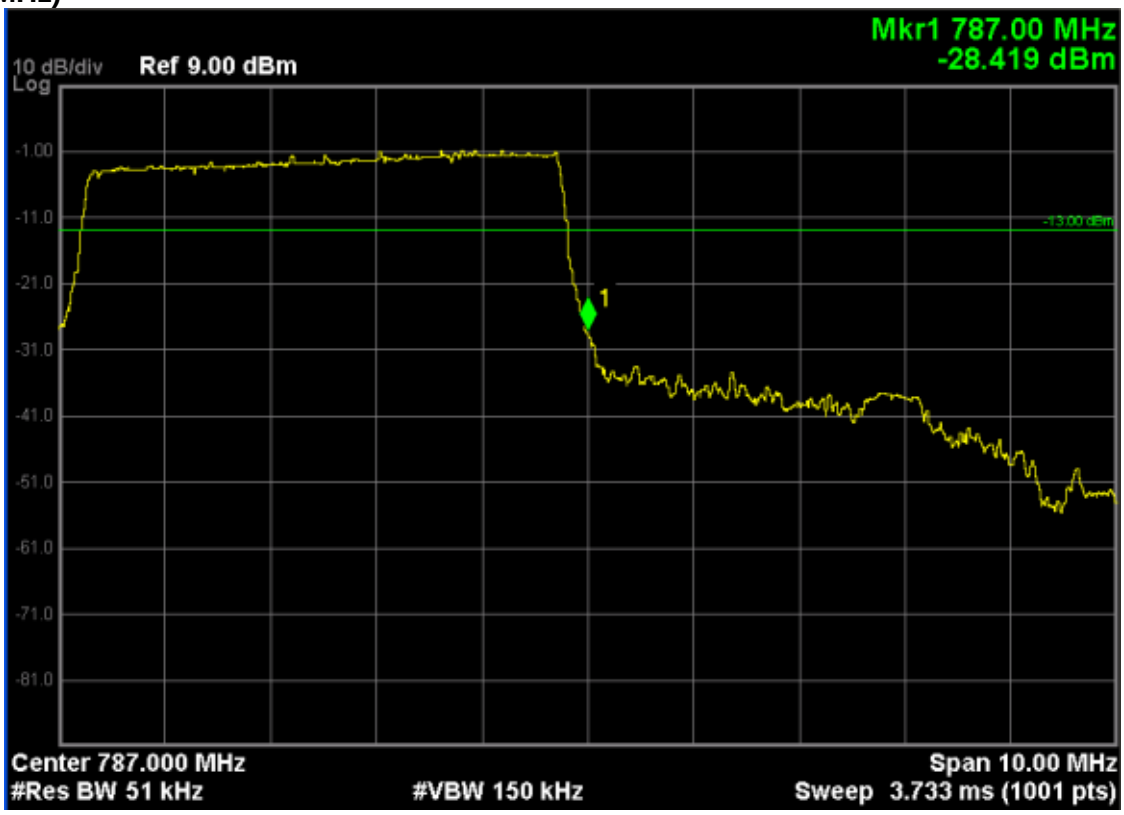
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 23205,Frequeny 779.5MHz)



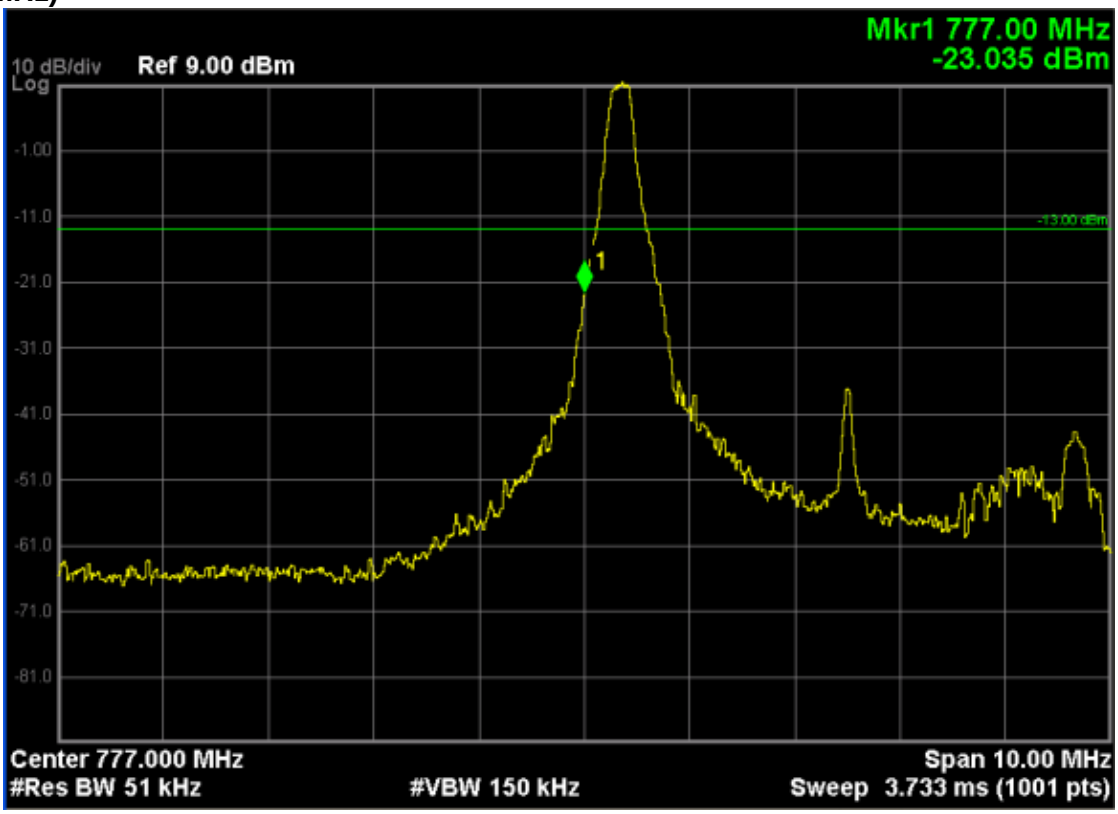
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 23255,Frequeny 784.5MHz)



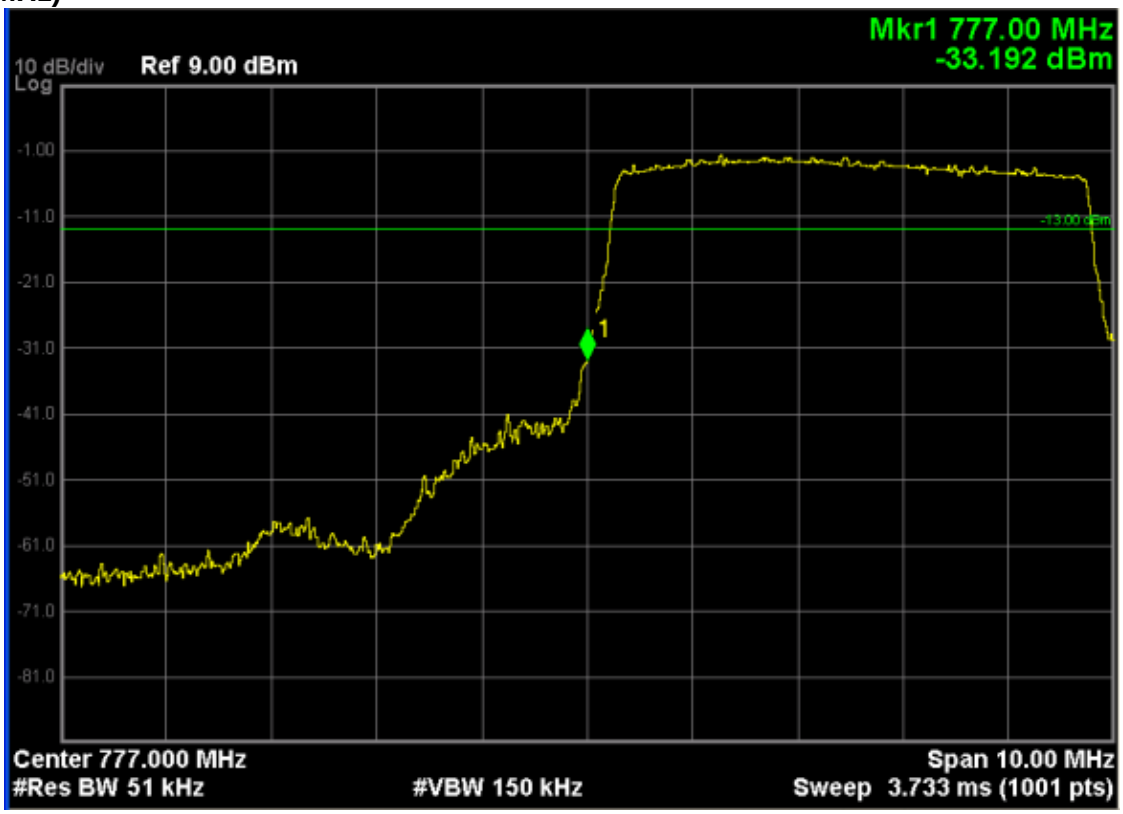
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 23255,Frequeny 784.5MHz)



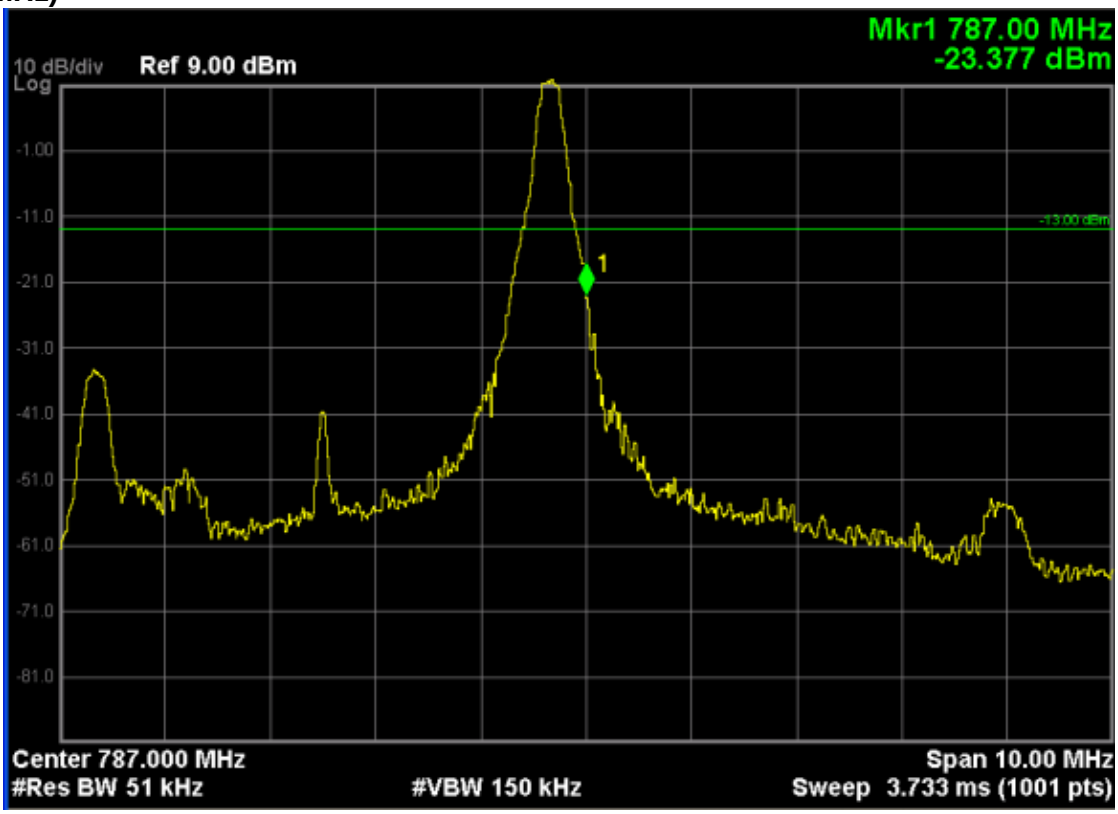
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 23205,Frequeny 779.5MHz)



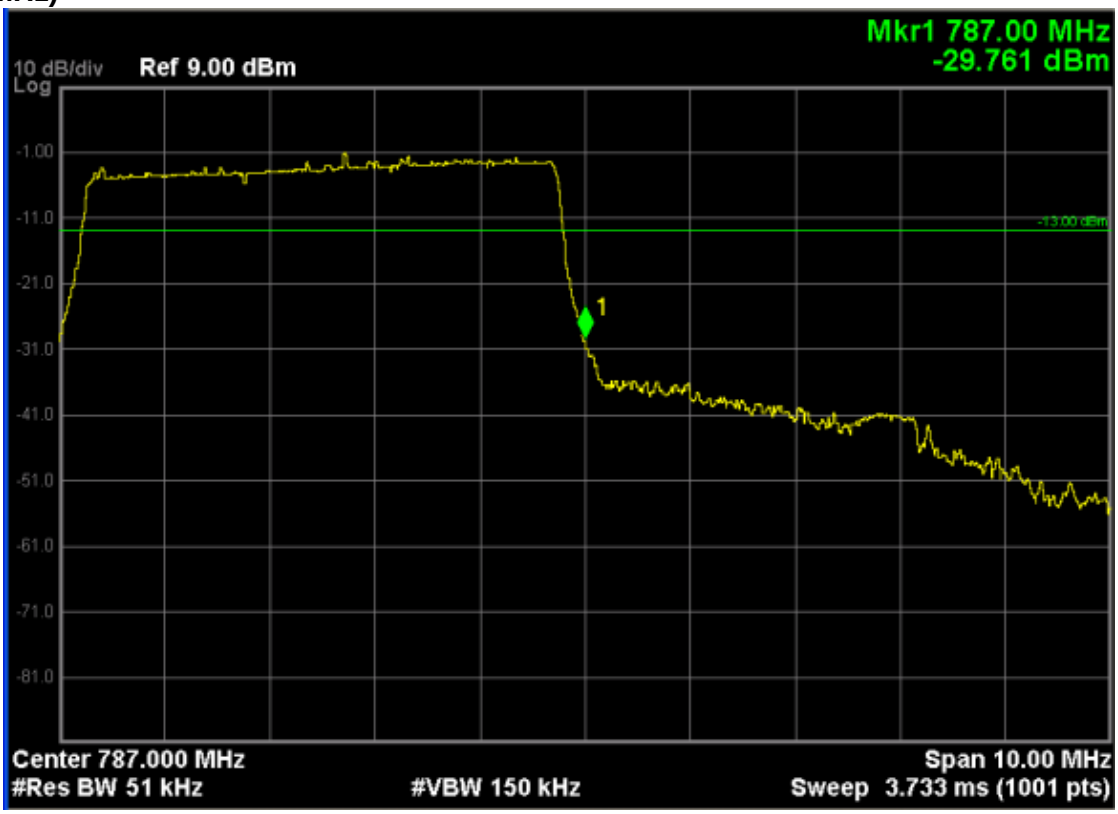
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 23205,Frequeny 779.5MHz)



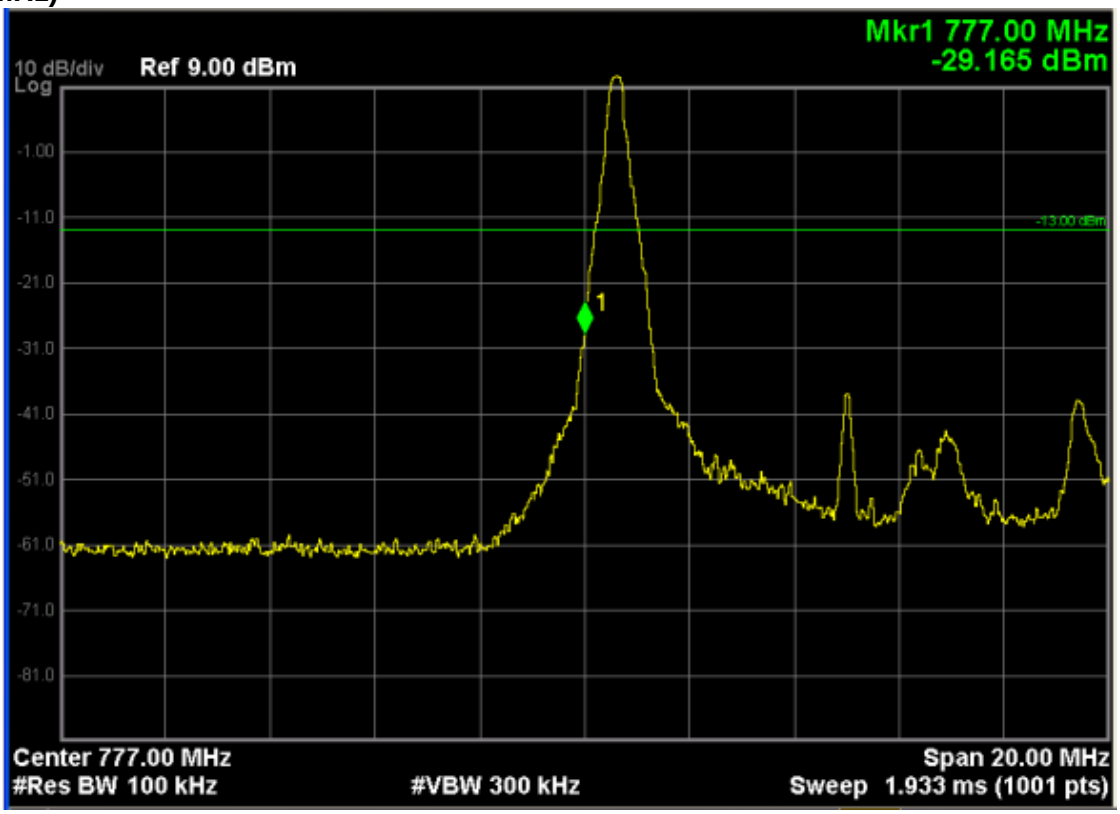
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 23255,Frequeny 784.5MHz)



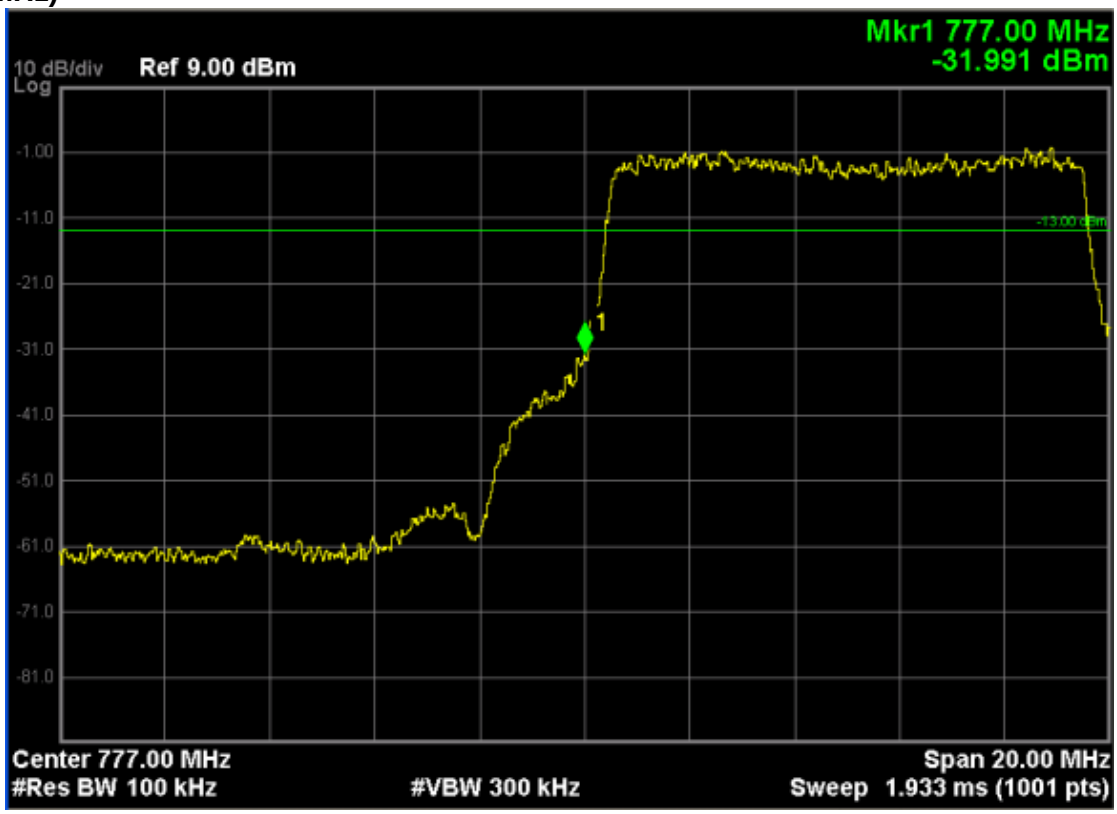
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 25,RB Offset 0,Channel 23255,Frequeny 784.5MHz)



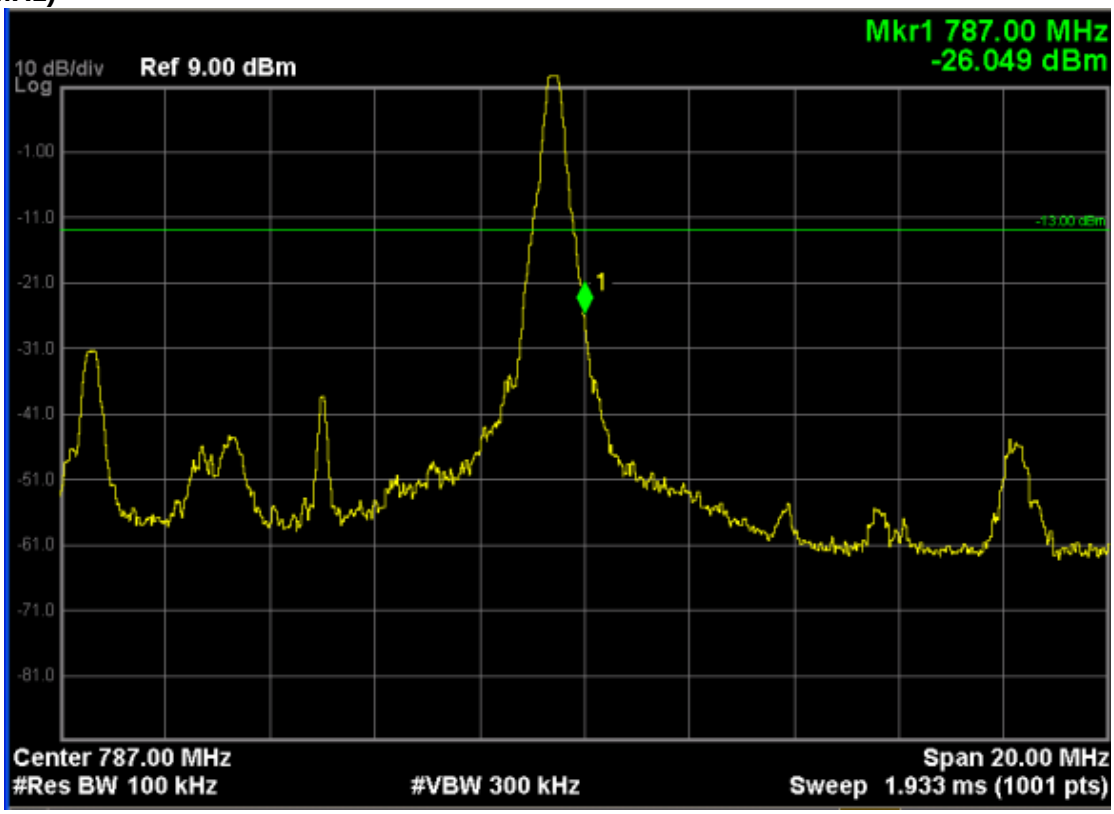
LTE Band 13 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)



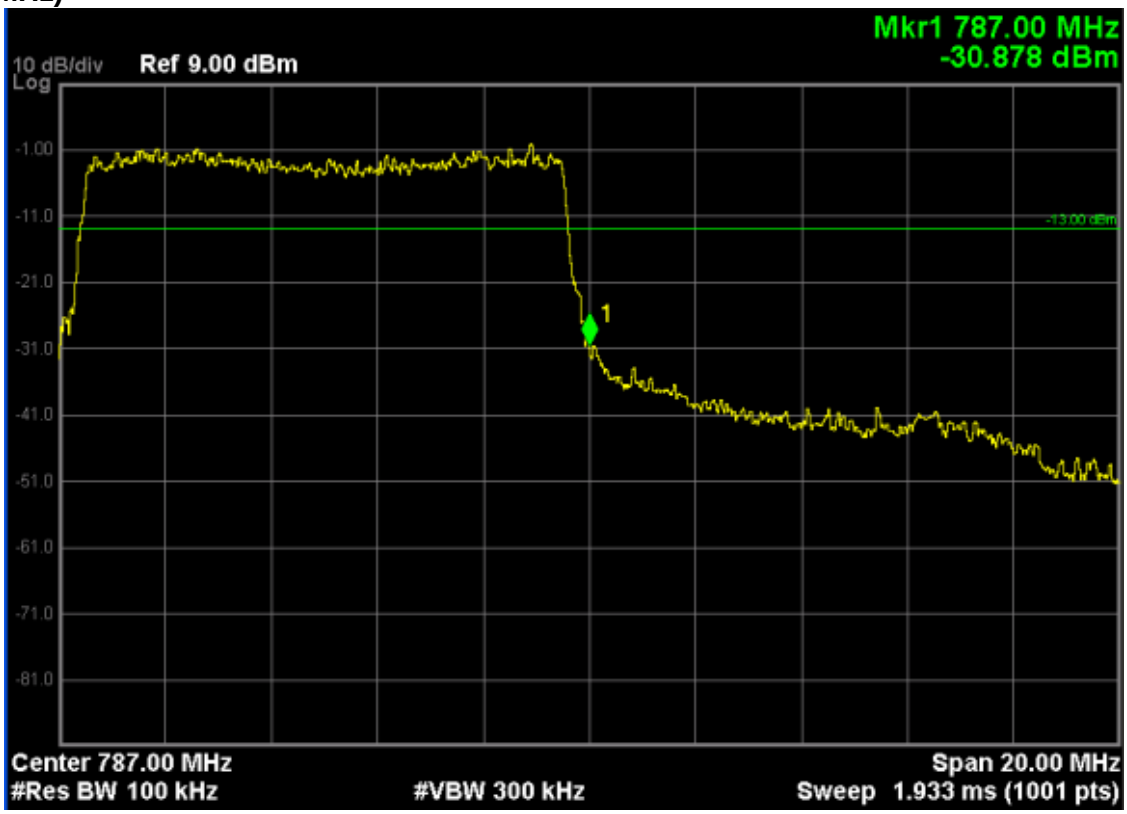
LTE Band 13 (QPSK, Band Width 10MHz,RB Size 50,RB Offset 0,Channel 23230,Frequeny 782.0MHz)



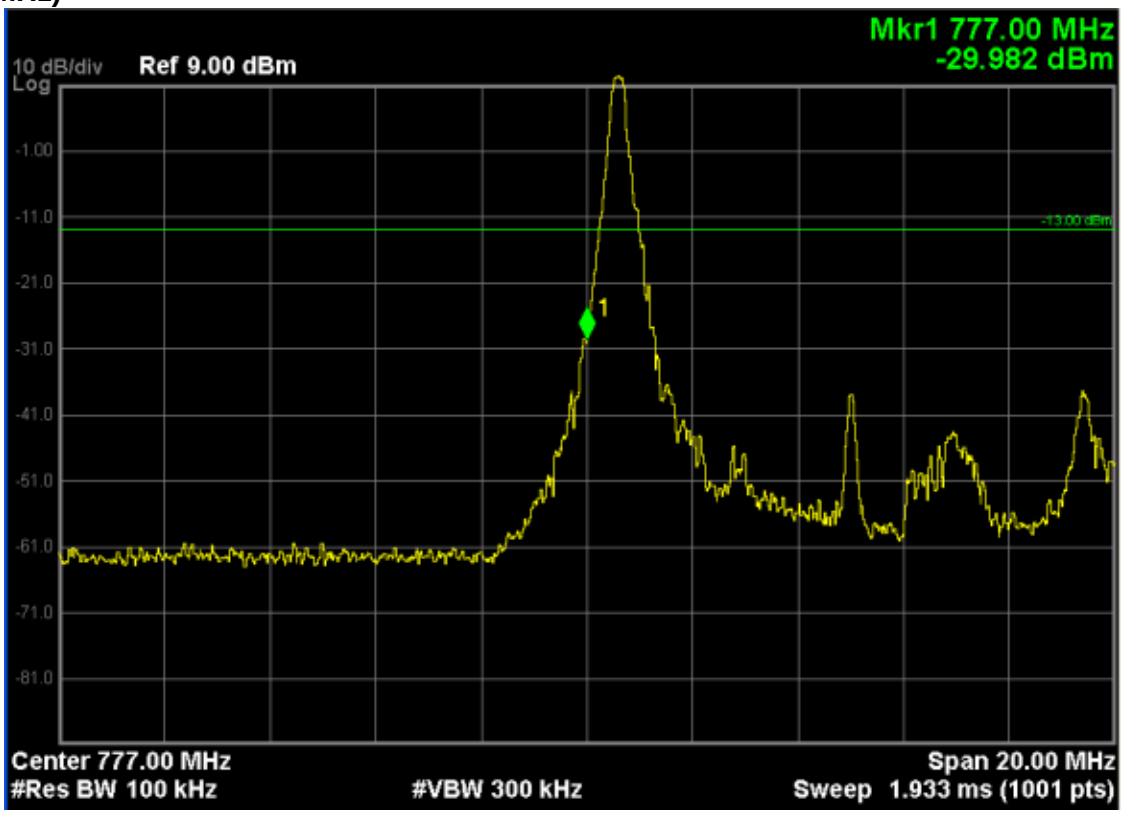
LTE Band 13 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 49,Channel 23230,Frequeny 782.0MHz)



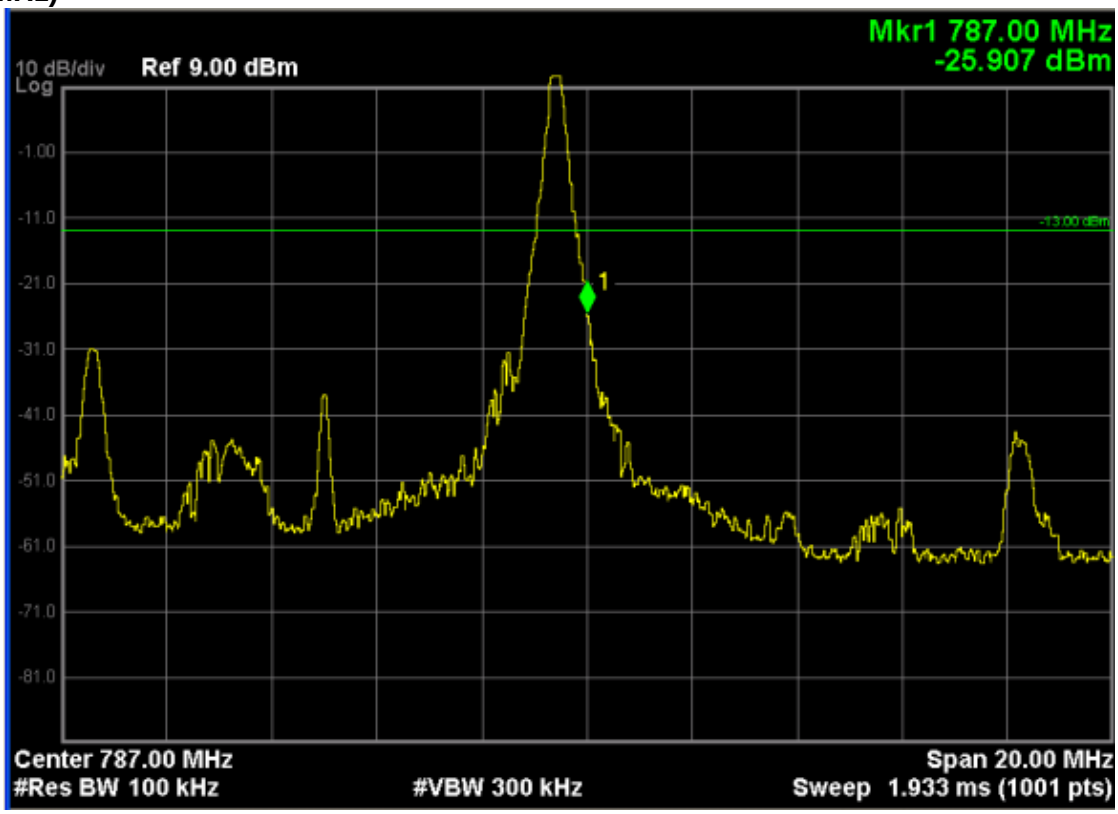
LTE Band 13 (QPSK, Band Width 10MHz,RB Size 50,RB Offset 0,Channel 23230,Frequeny 782.0MHz)



LTE Band 13 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)



LTE Band 13 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 49,Channel 23230,Frequeny 782.0MHz)



6.Spurious Emission

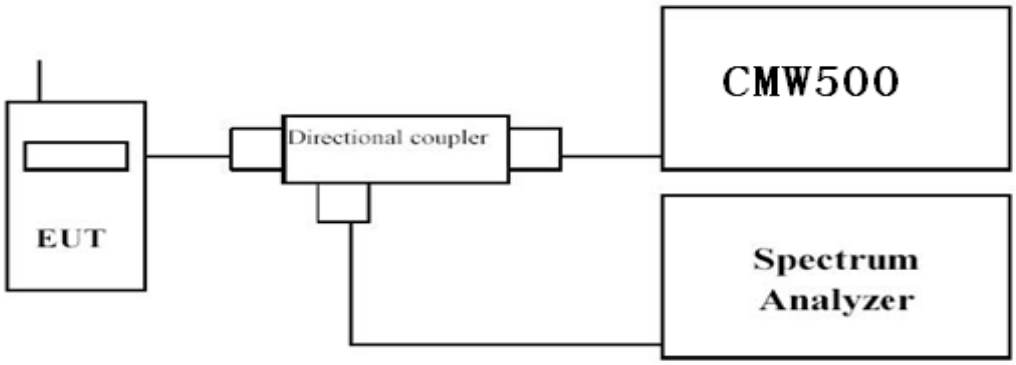
6.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
Radio Communication Tester	R&S	CMW500	147483	11/07/2017
Signal Generator	Agilent	N5183A	MY50140938	01/02/2018
Preamplifier	CEM	EM30180	3008A0245	02/25/2018
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	03/23/2018
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	09/18/2017
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	09/18/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	09/18/2017

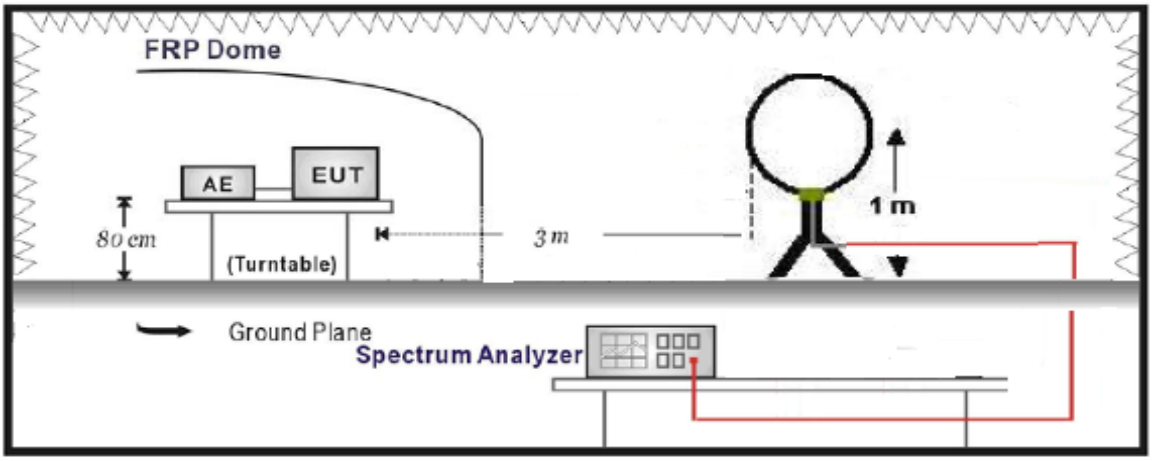
The measure equipment had been calibrated once a year.

6.2. Test Setup

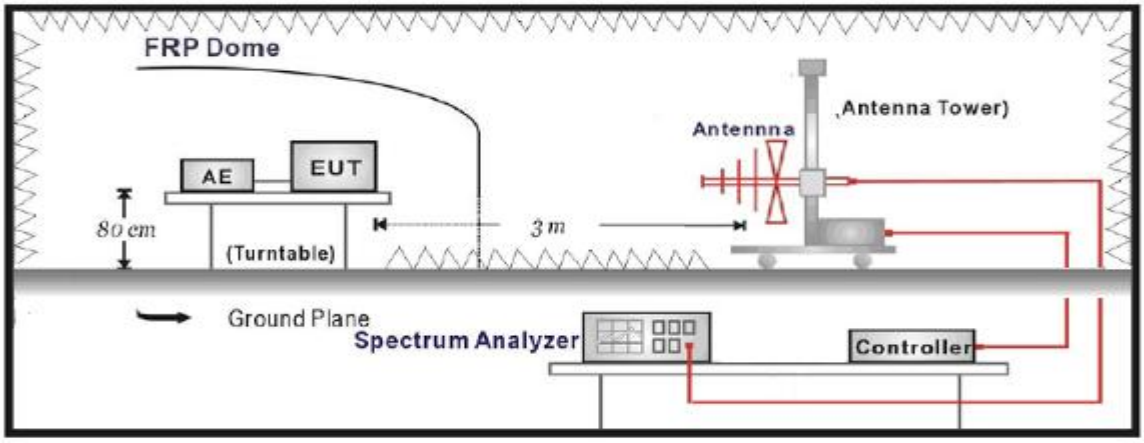
Conducted Spurious Emission Measurement:



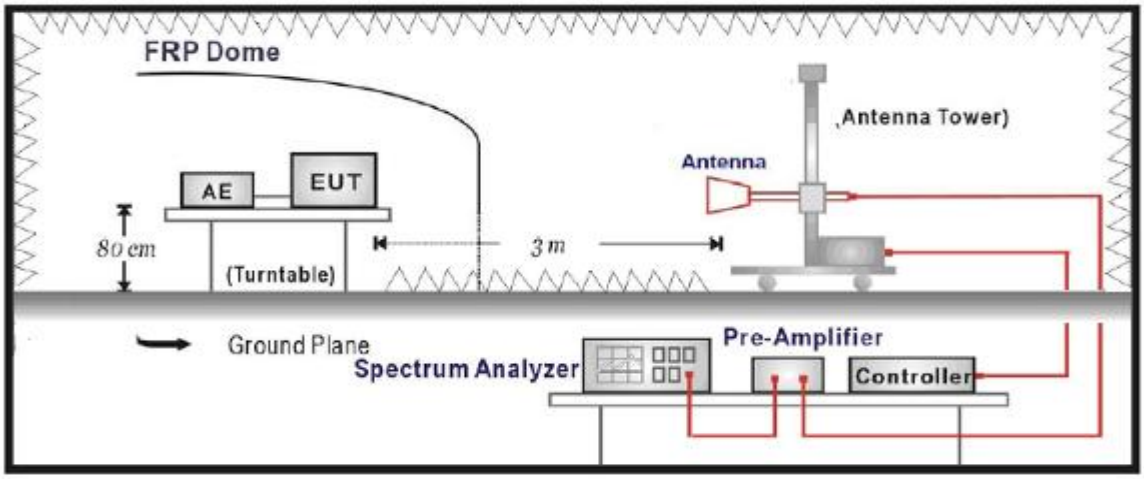
Radiated Spurious Measurement: below 30MHz



Radiated Spurious Measurement: 30MHz to 1GHz



Radiated Spurious Measurement: above 1GHz



6.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

6.4. Test Procedure

Conducted Spurious Measurement:

a. The testing follows FCC KDB 971168 v02v02 Section 6.0;
b.Place the EUT on a bench and set it in transmitting mode.
c.Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
d.EUT Communicate with CMW500, then select a channel for testing.
e.Add a correction factor to the display of spectrum, and then test.
f.The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

a. The testing follows FCC KDB 971168 v02v02 Section 5.8 and ANSI/TIA-603-D-2010 Section 2.2.12;
b.The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
c.The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
d.The output of the test antenna shall be connected to the measuring receiver.The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e.The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

g.The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h.The maximum signal level detected by the measuring receiver shall be noted.
i.The transmitter shall be replaced by a substitution antenna.
j.The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k. The substitution antenna shall be connected to a calibrated signal generator.
l.If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n.The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna ifnecessary.
q. The frequency range was checked up to 10^{th} harmonic.

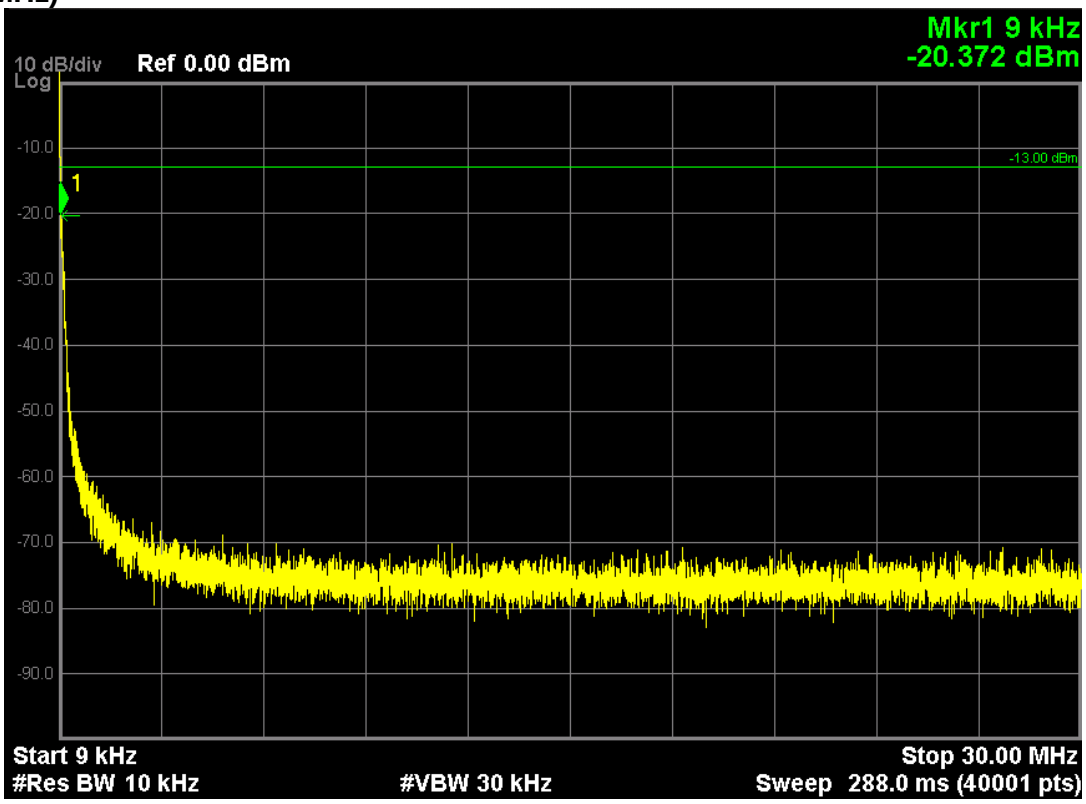
6.5. Uncertainty

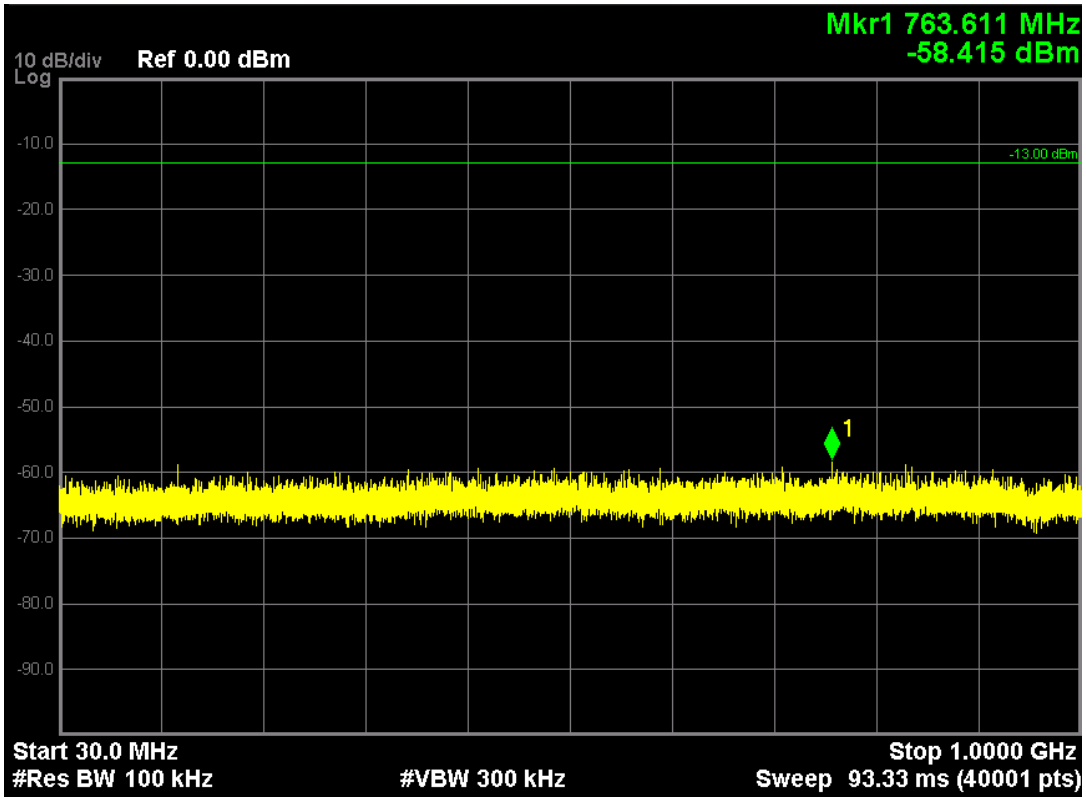
The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

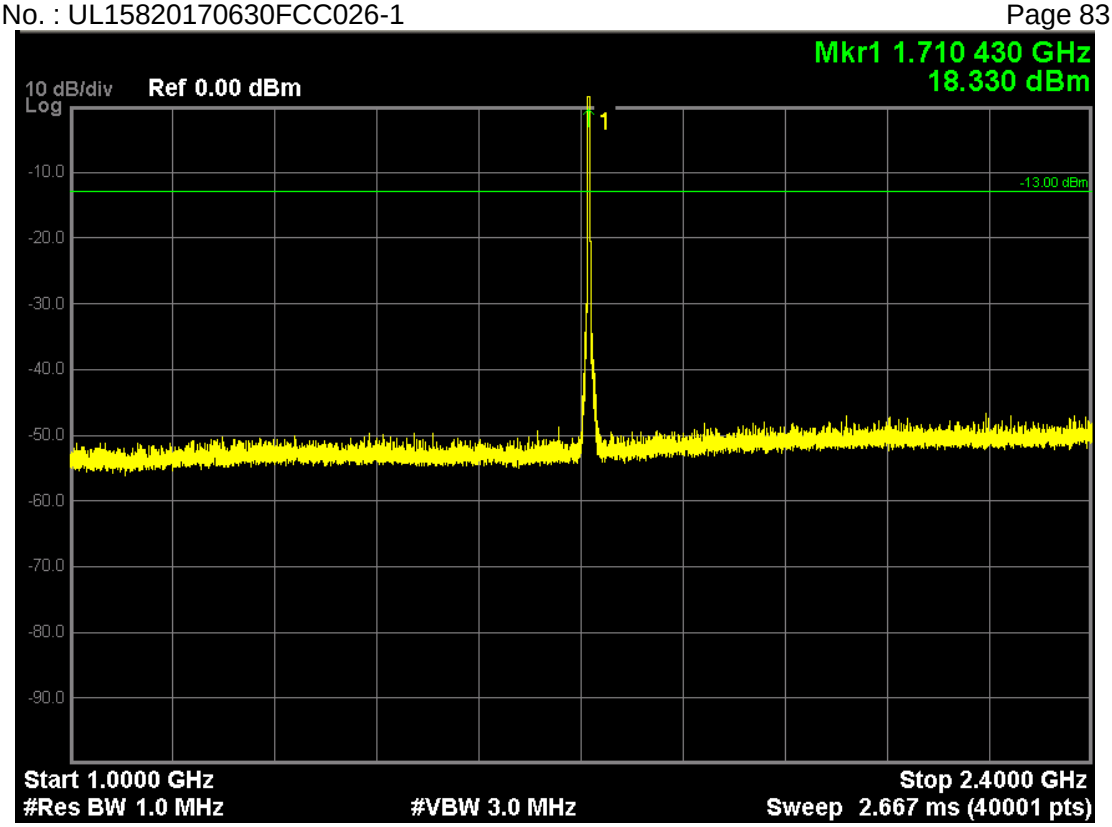
6.6. Test Result

Conducted Spurious Measurement:

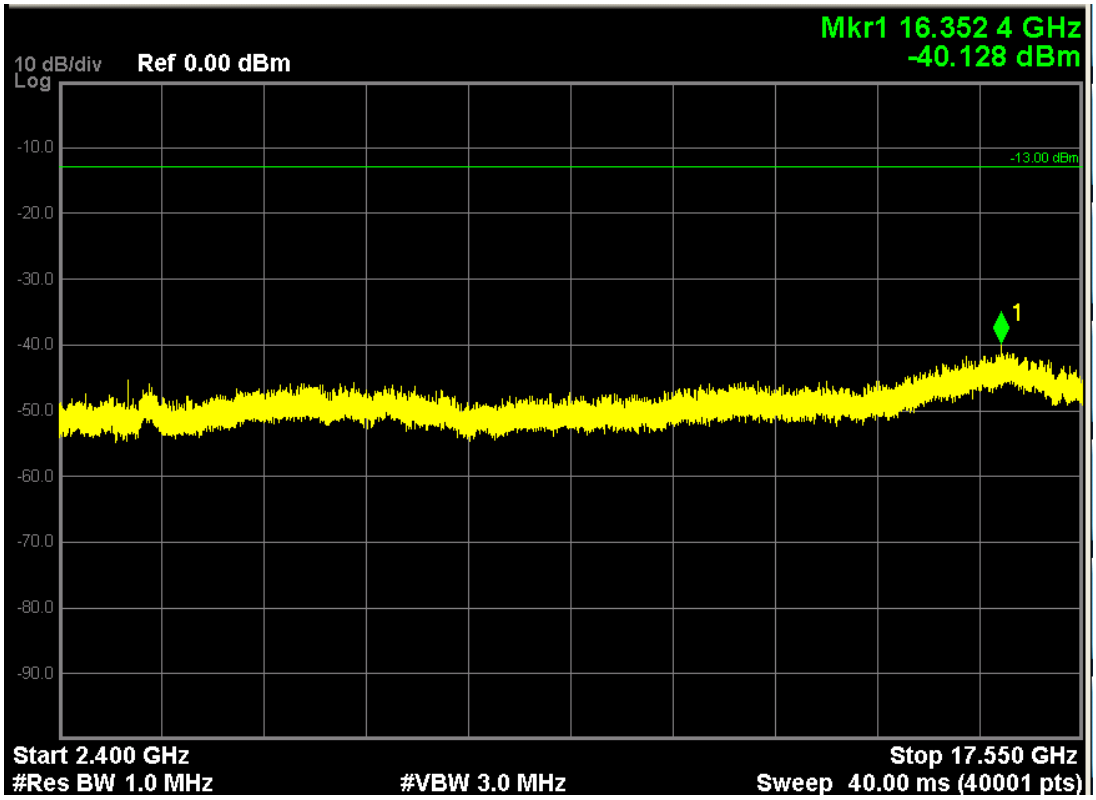
LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



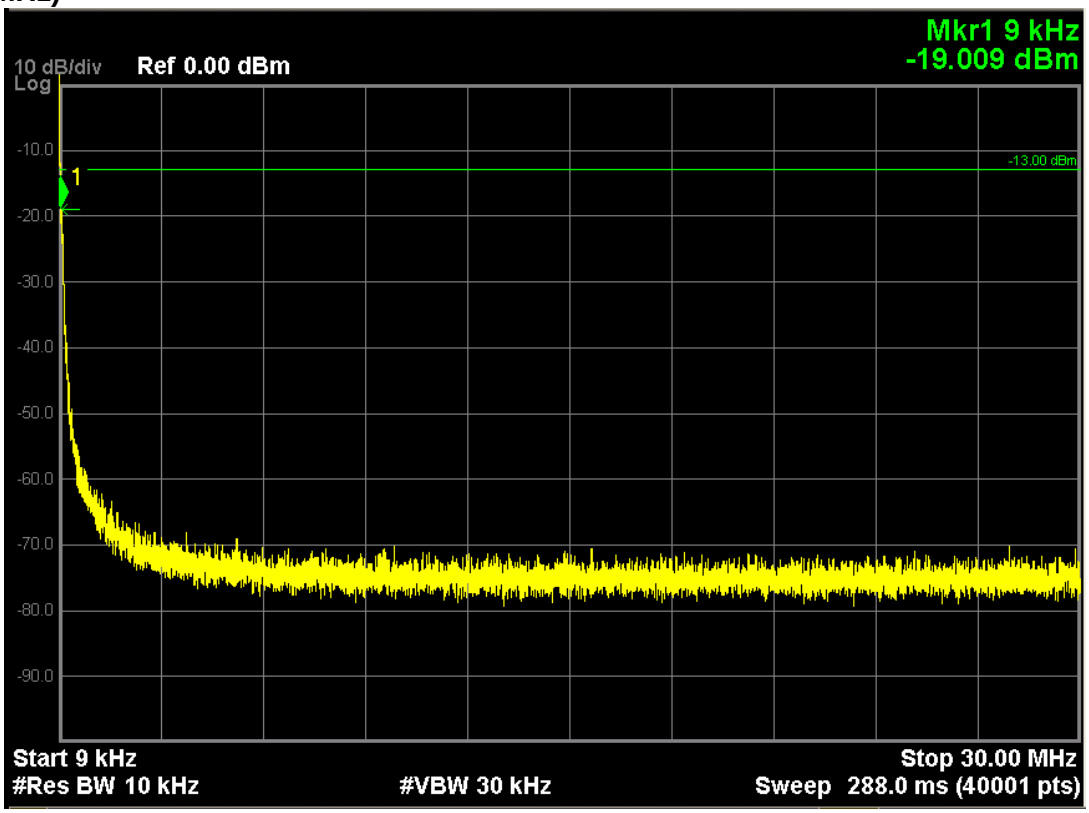


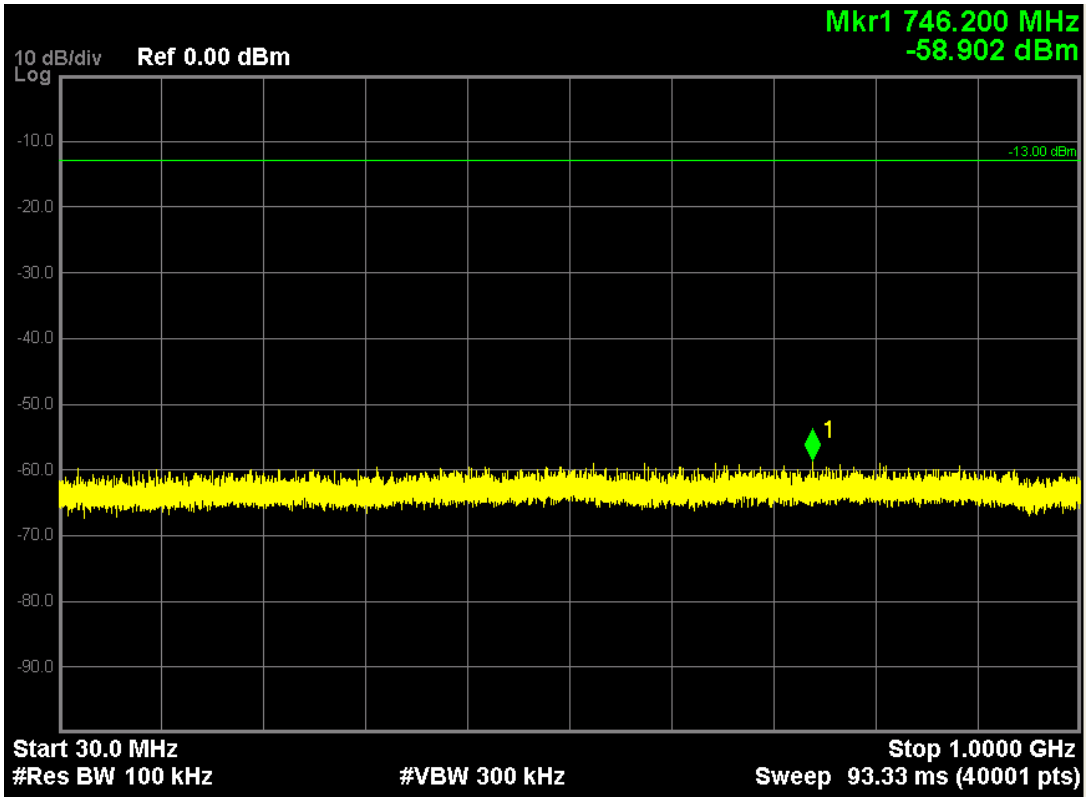


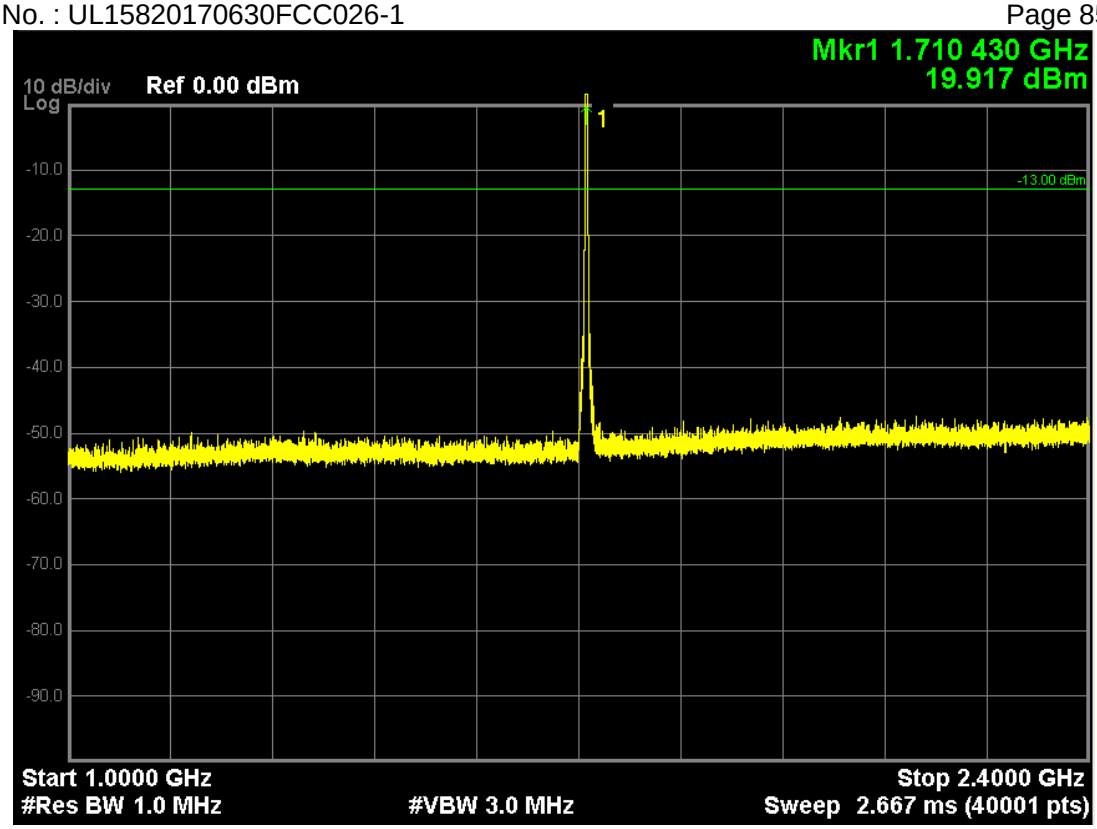
Note: The signal at point 1 is carrier



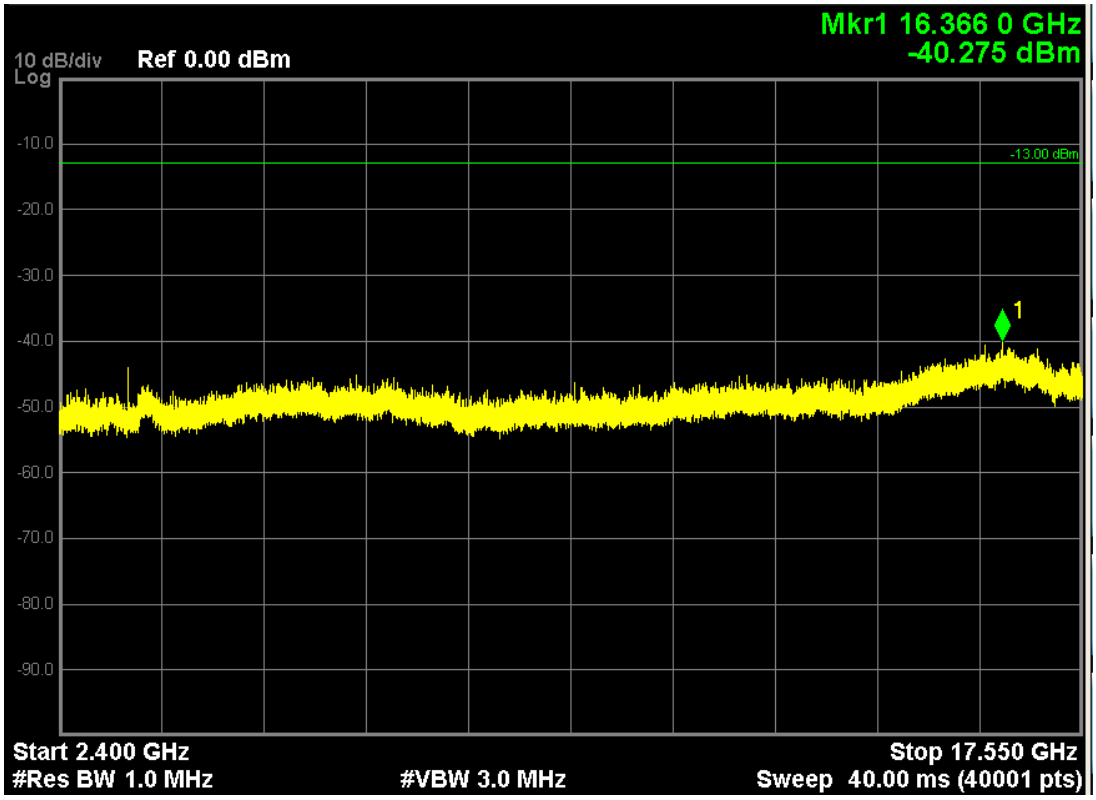
LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)



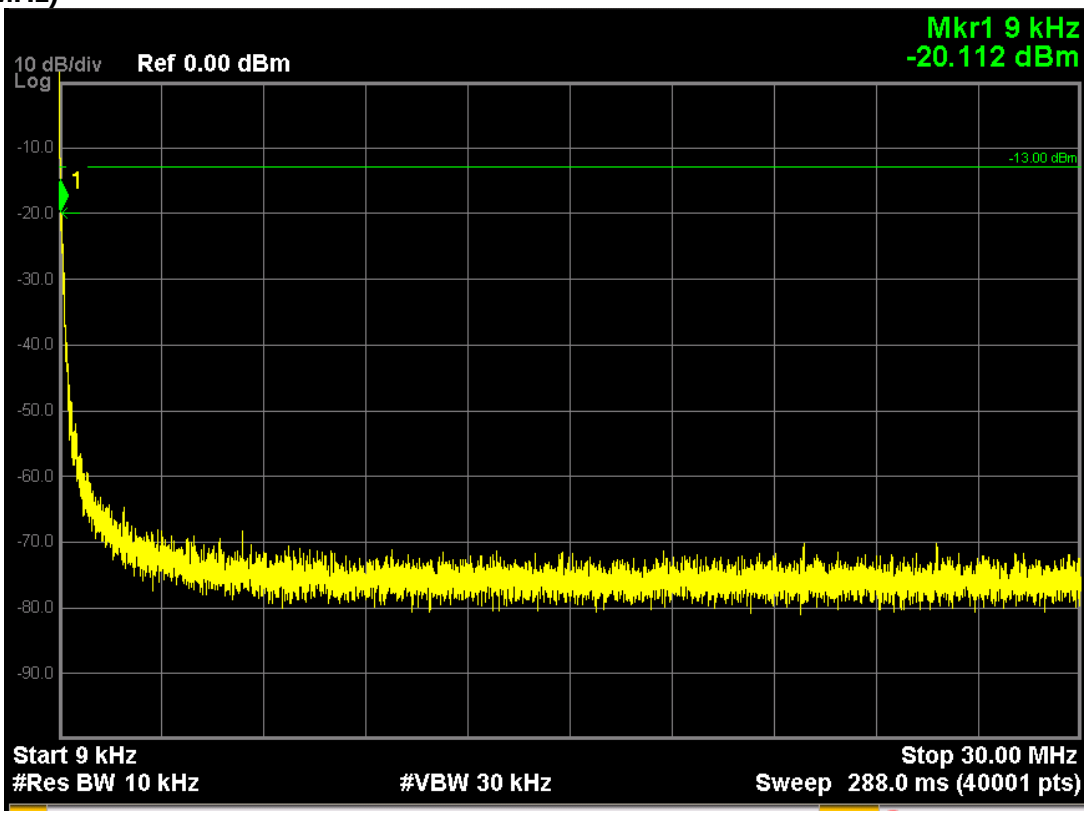


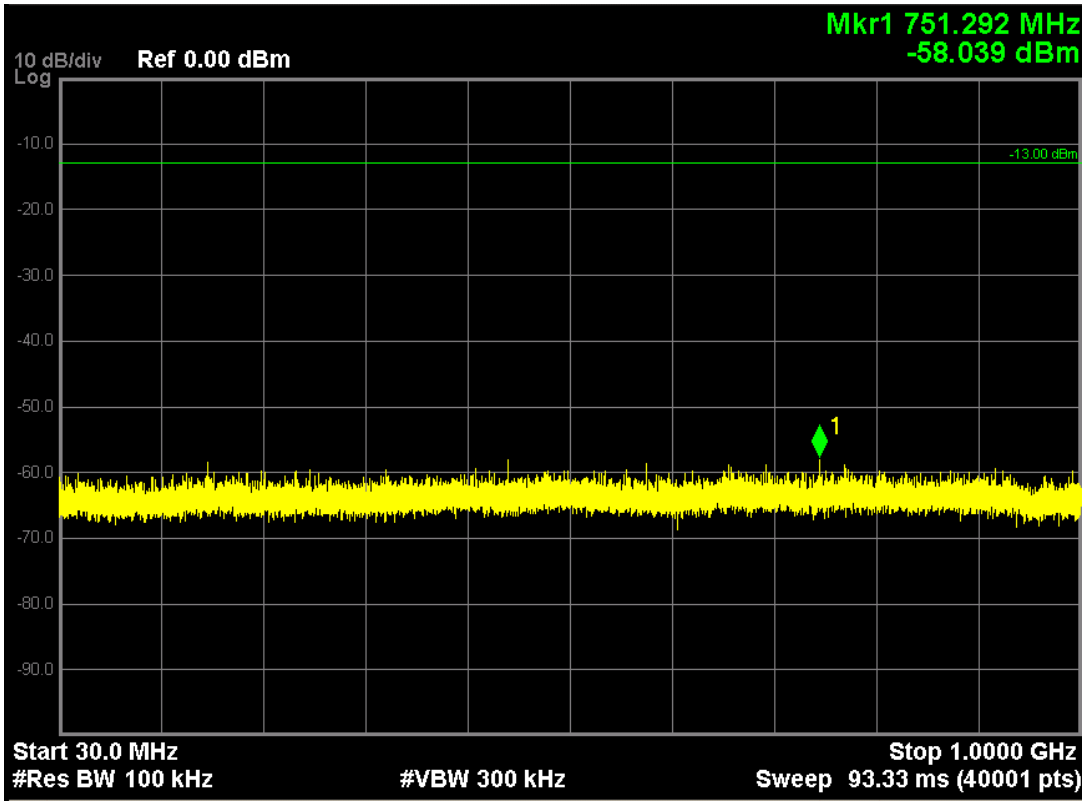


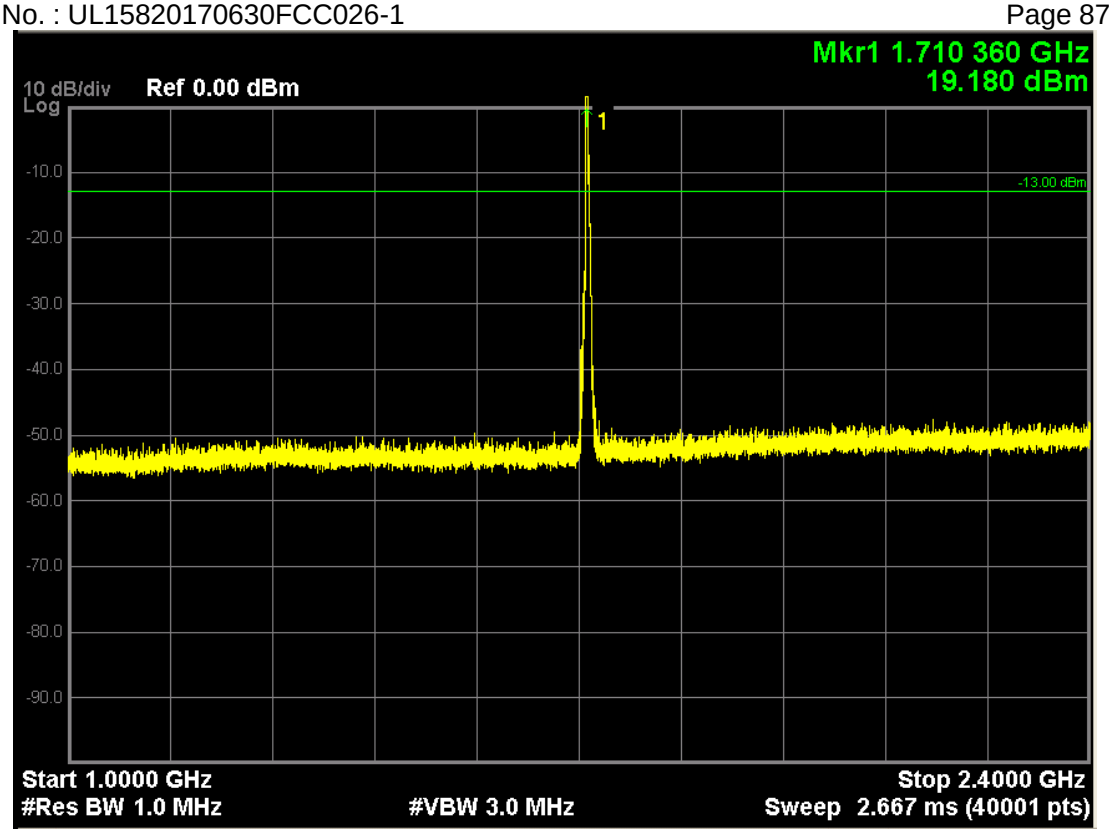
Note: The signal at point 1 is carrier



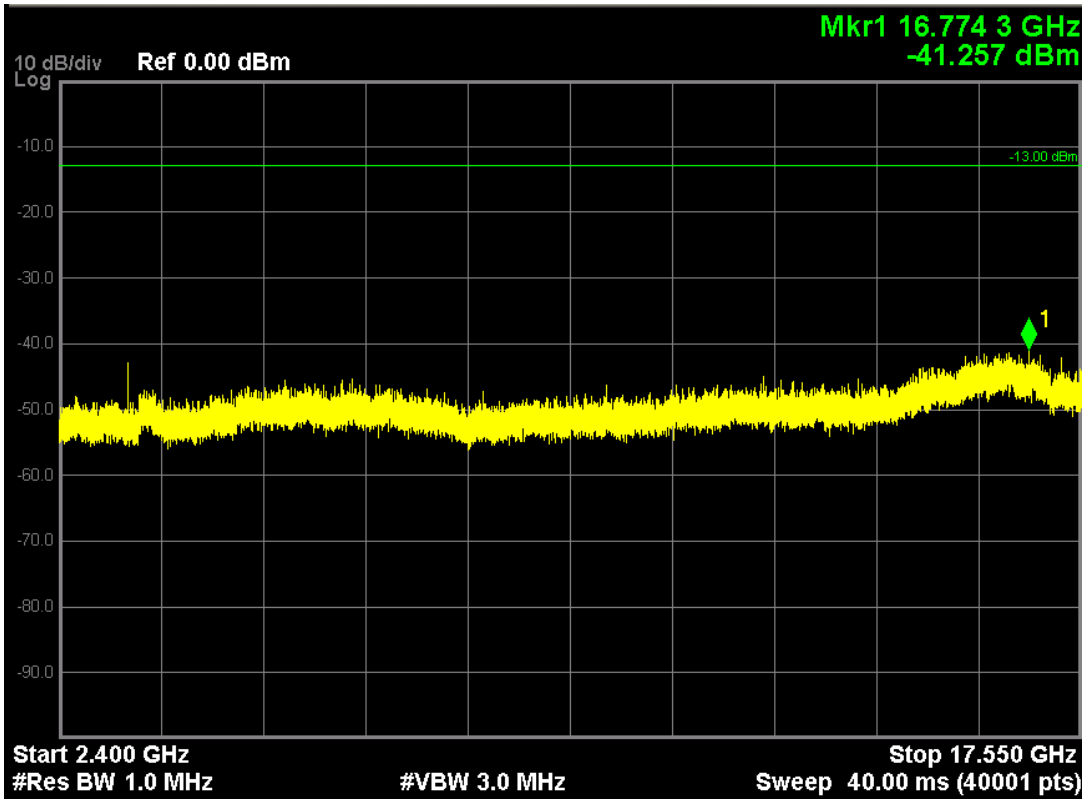
LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



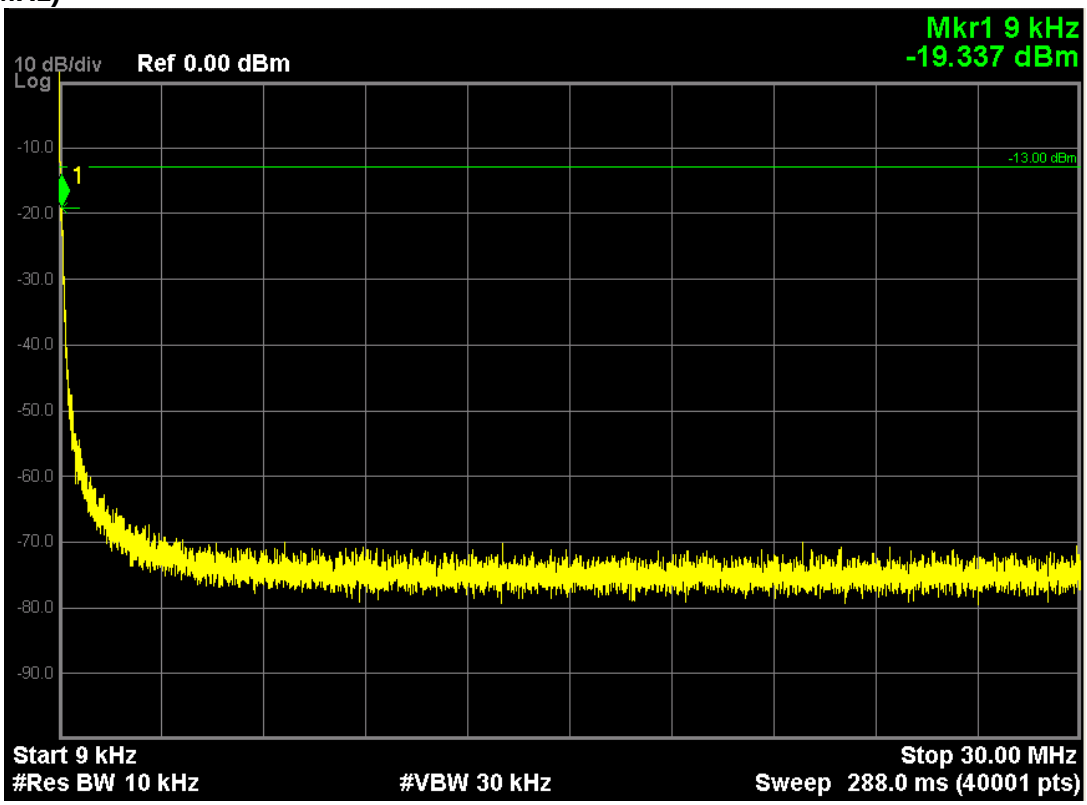


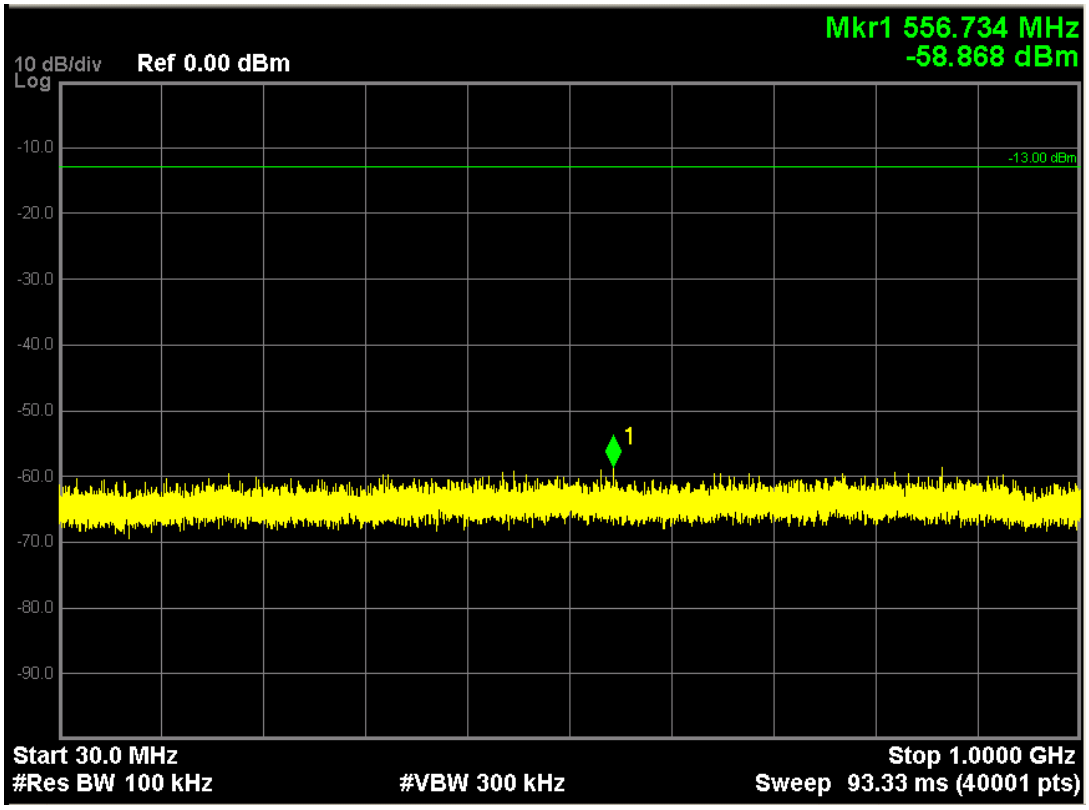


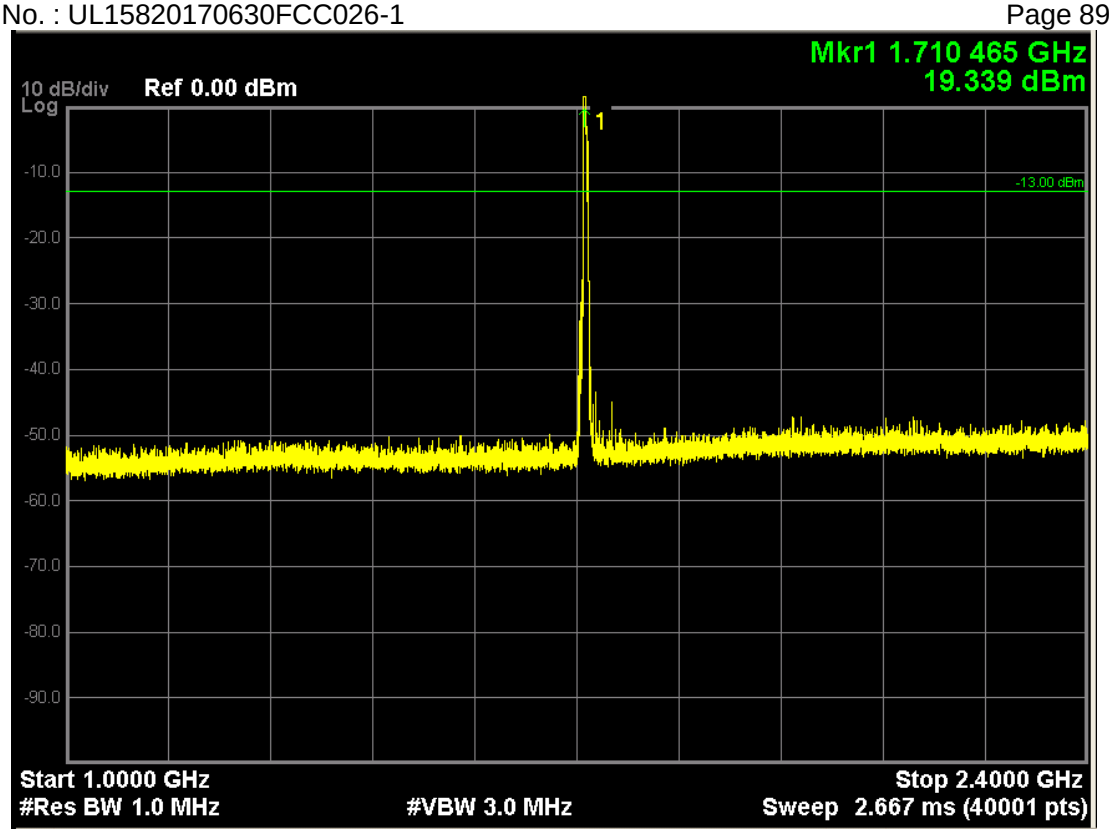
Note: The signal at point 1 is carrier



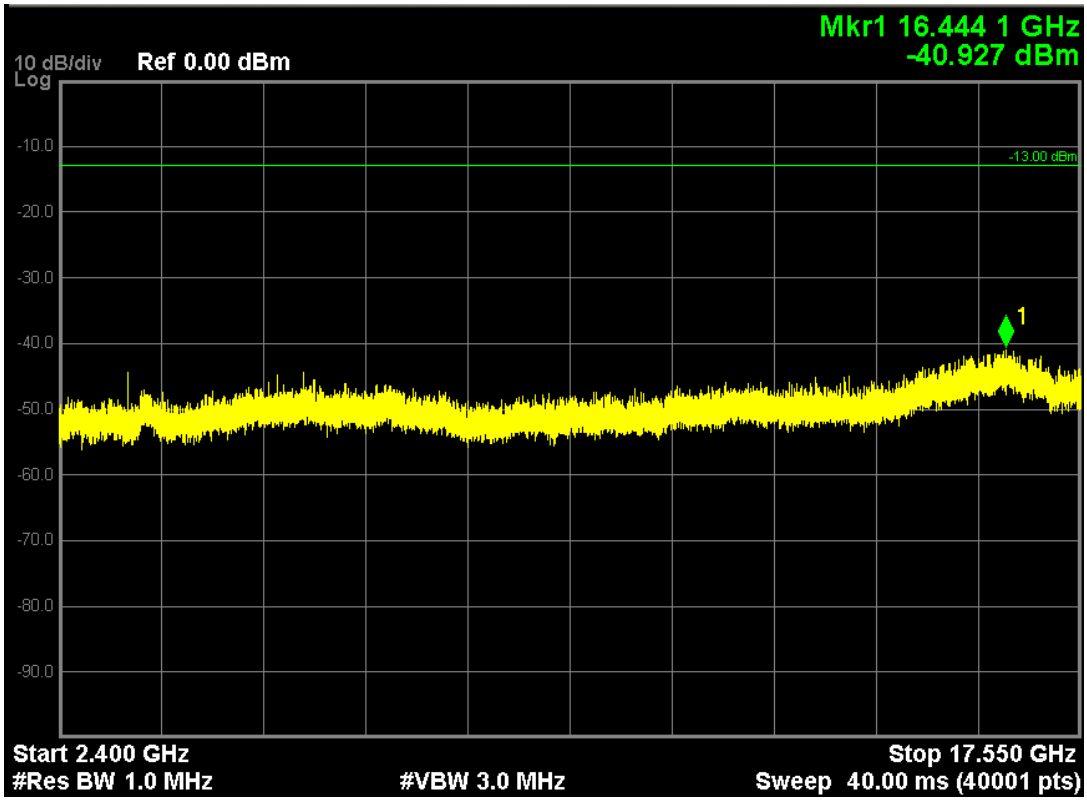
LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)



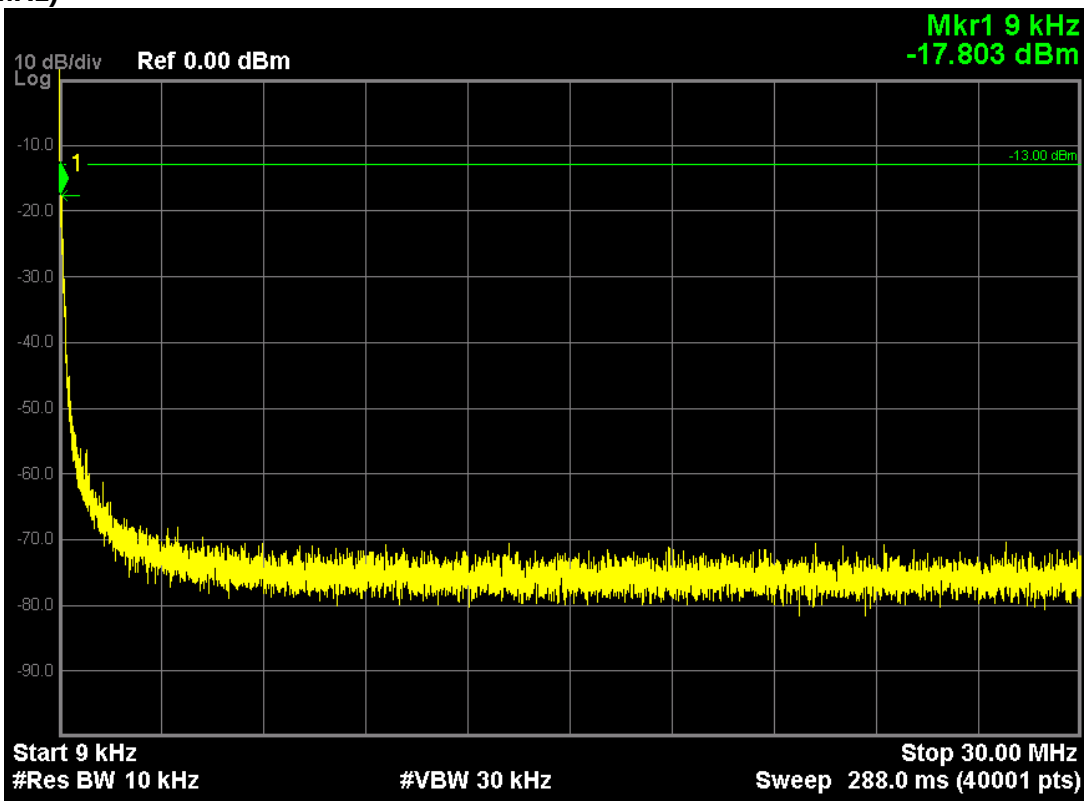


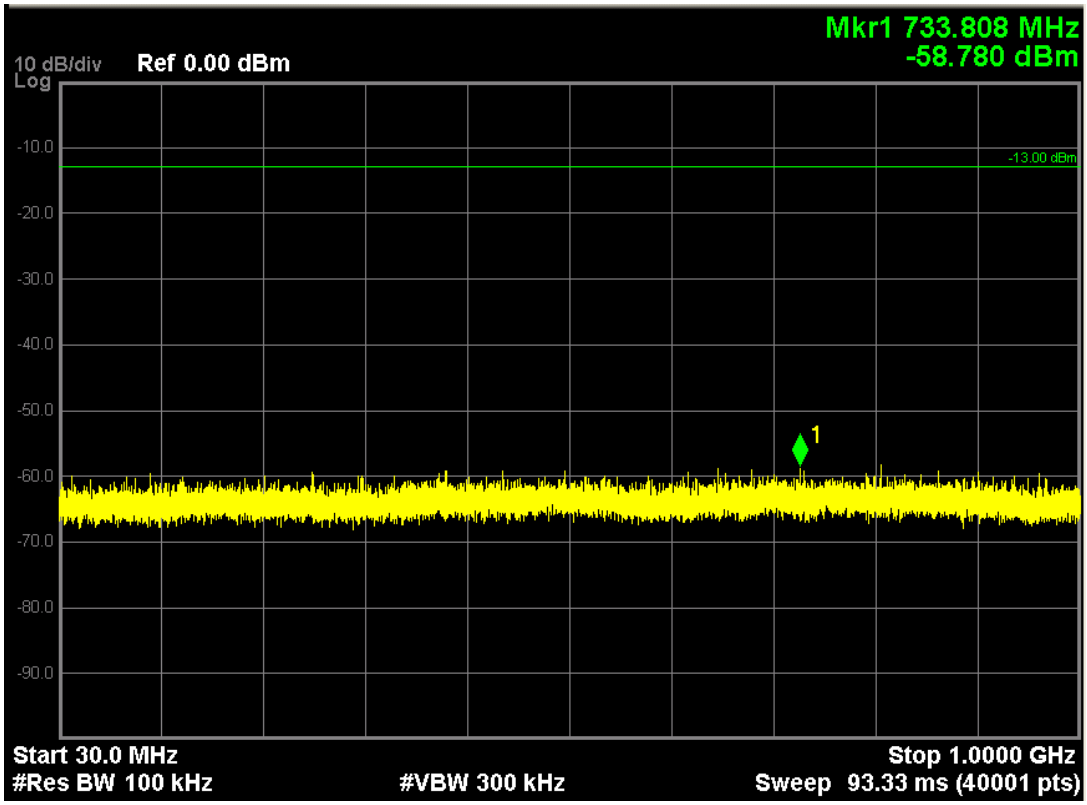


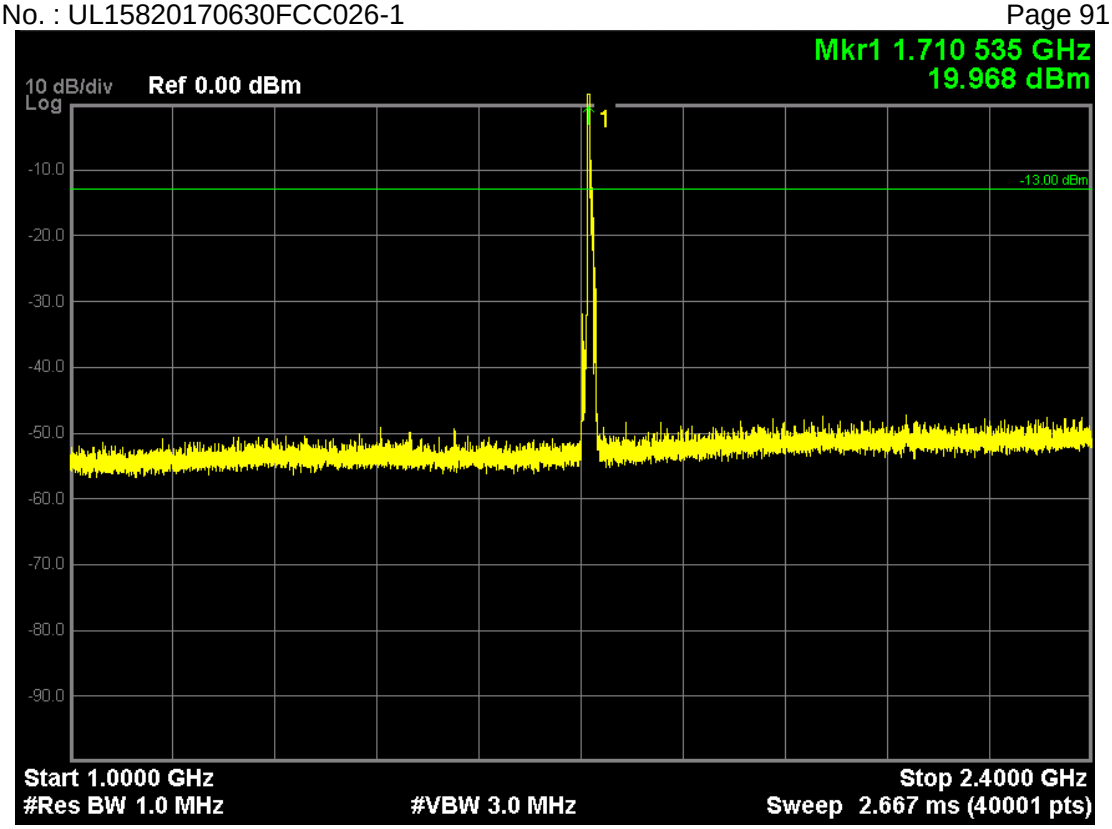
Note: The signal at point 1 is carrier



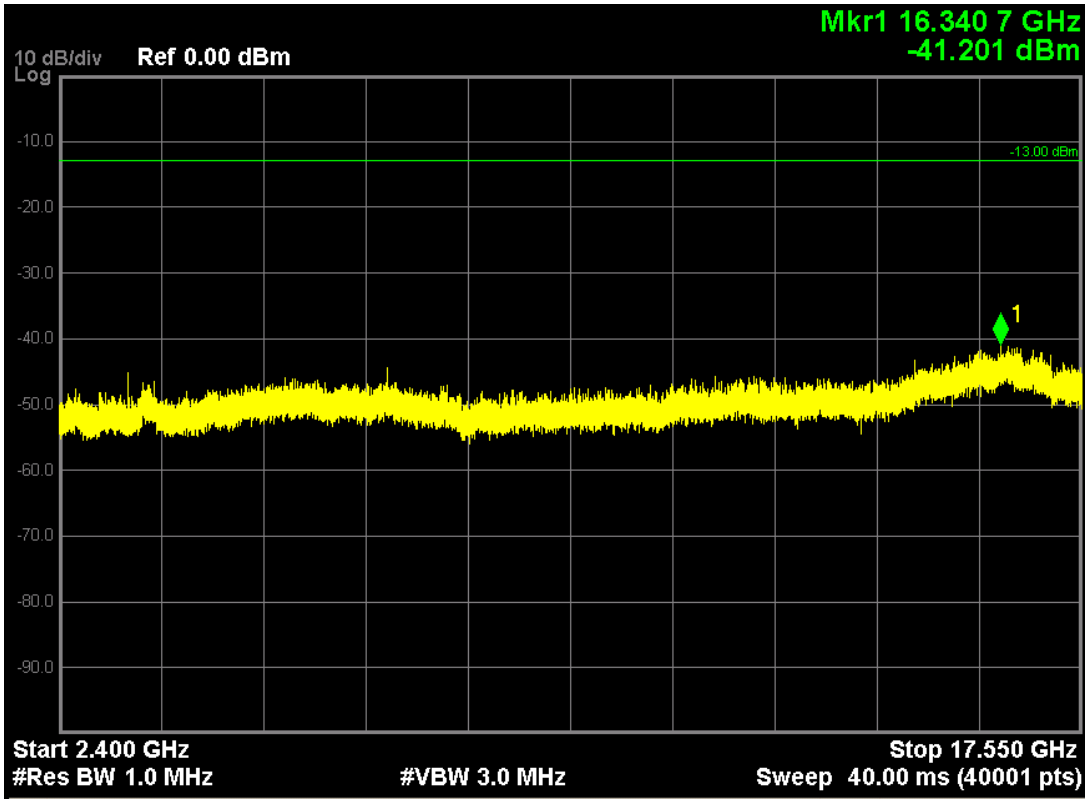
LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



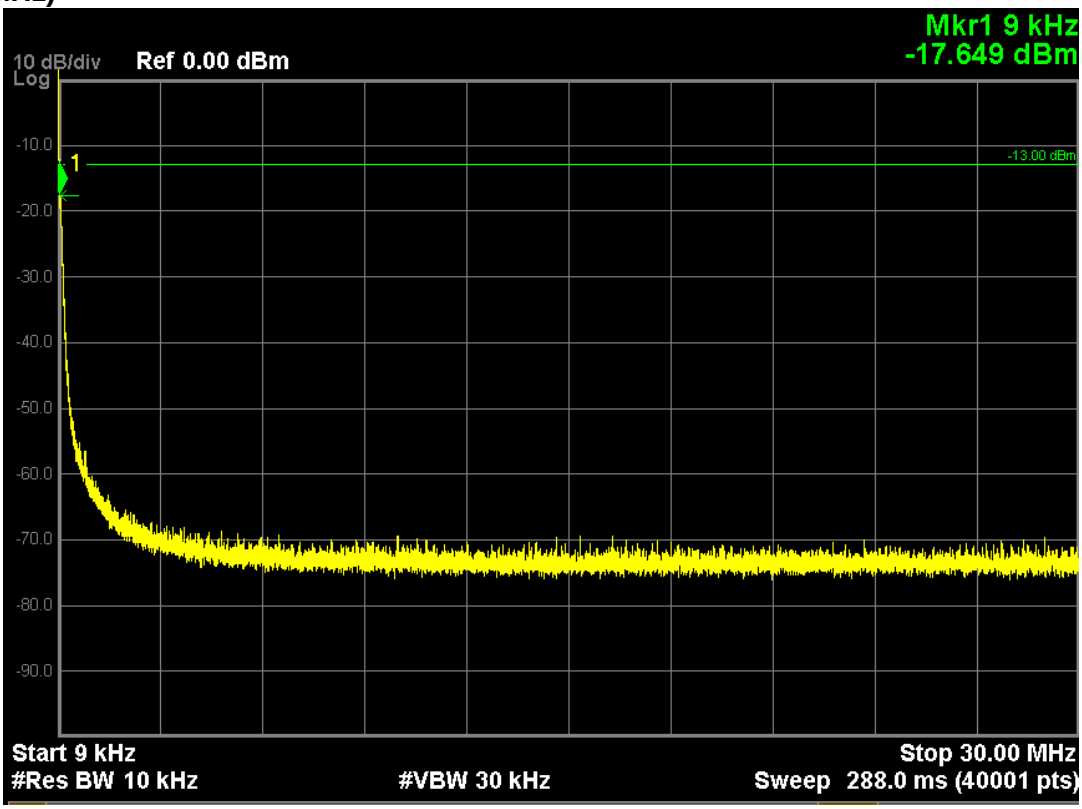


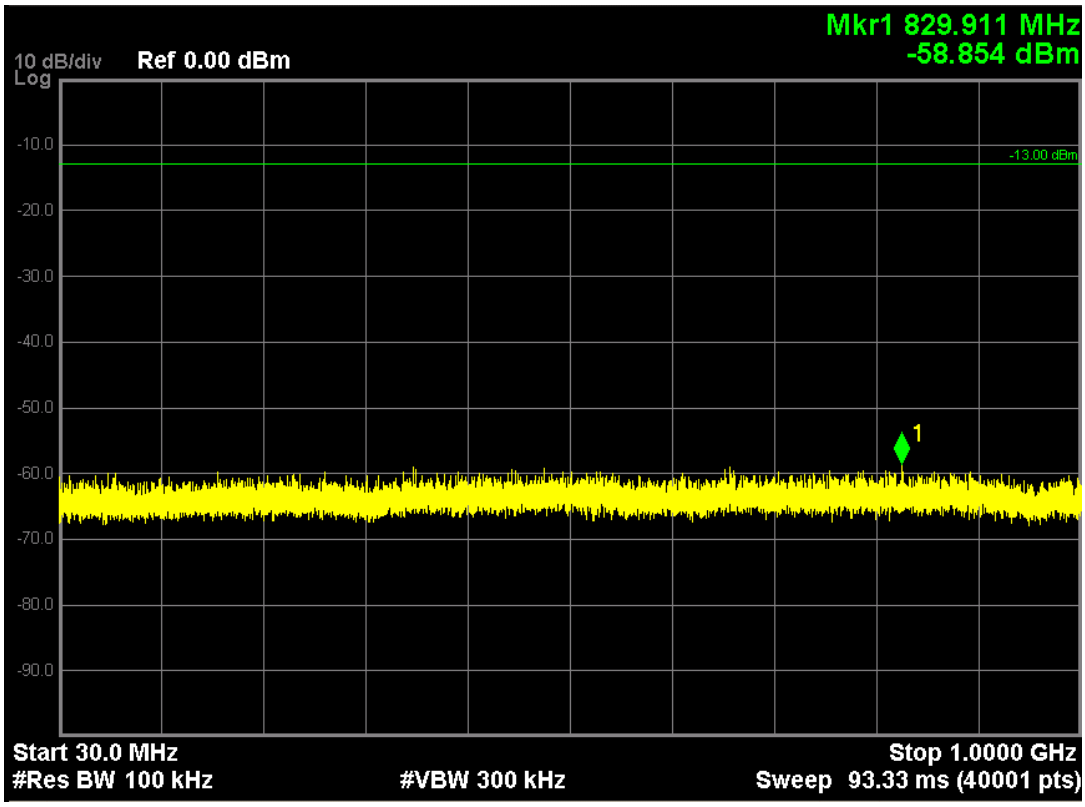


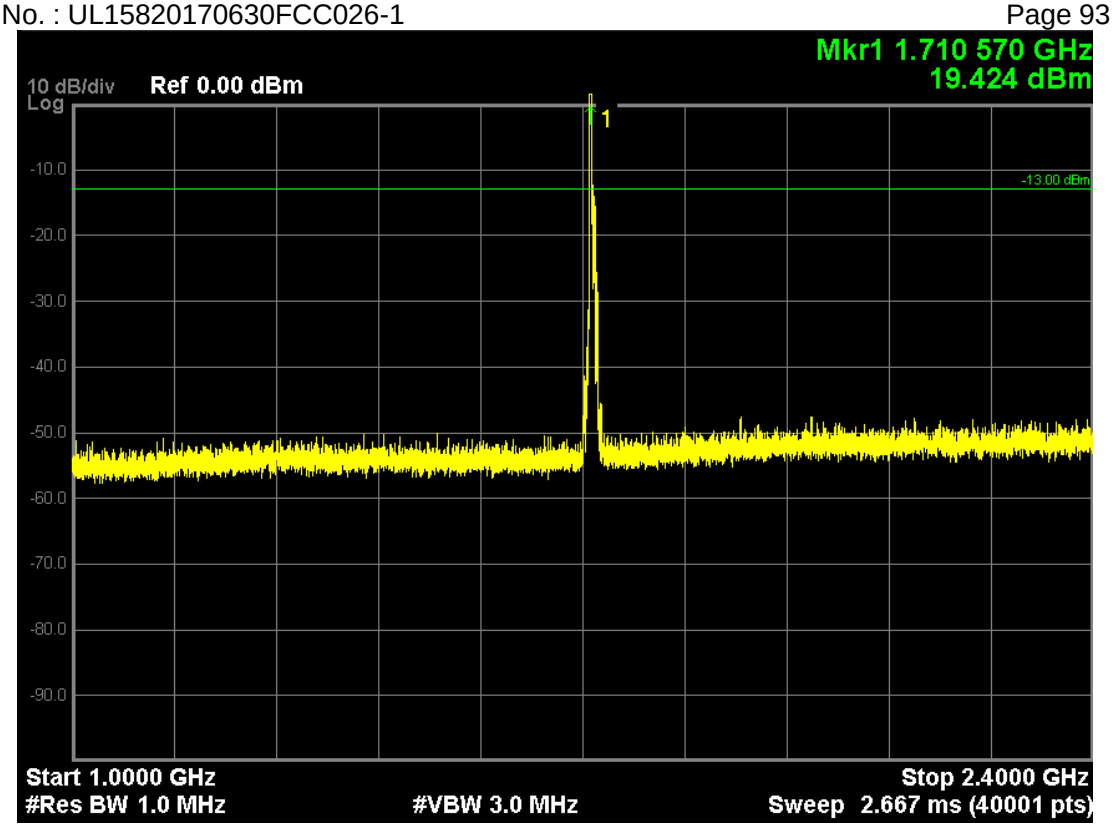
Note: The signal at point 1 is carrier



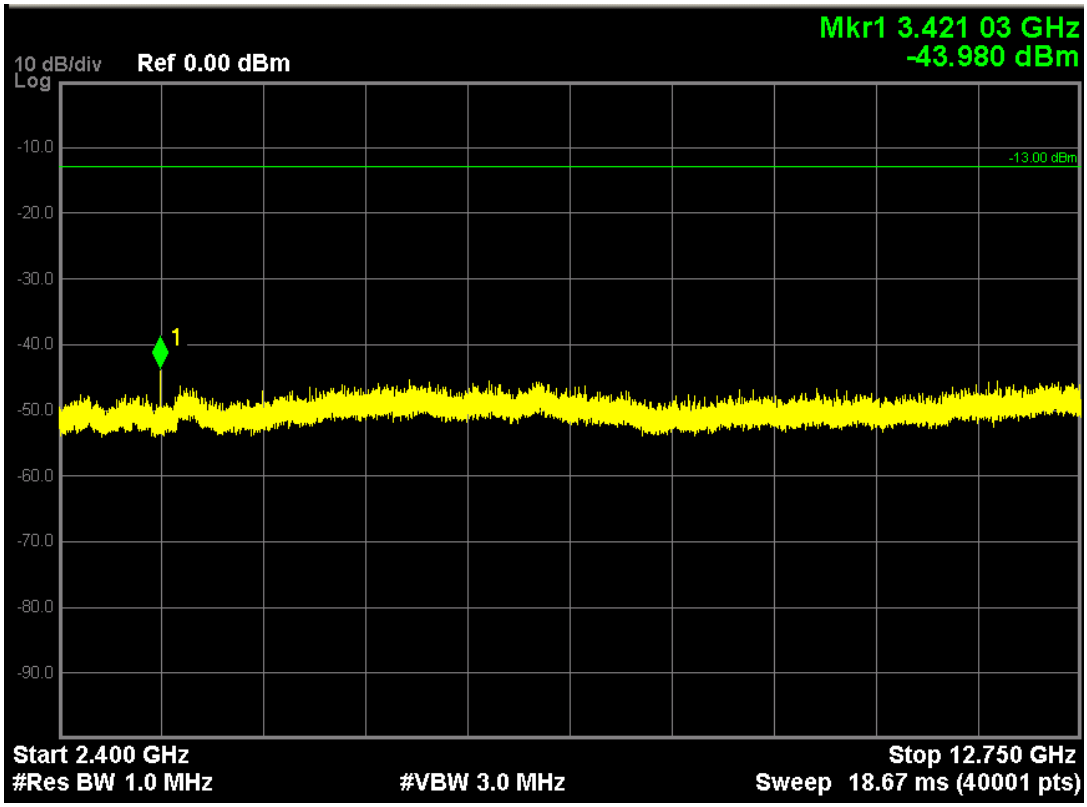
LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975,Frequeny 1712.5MHz)



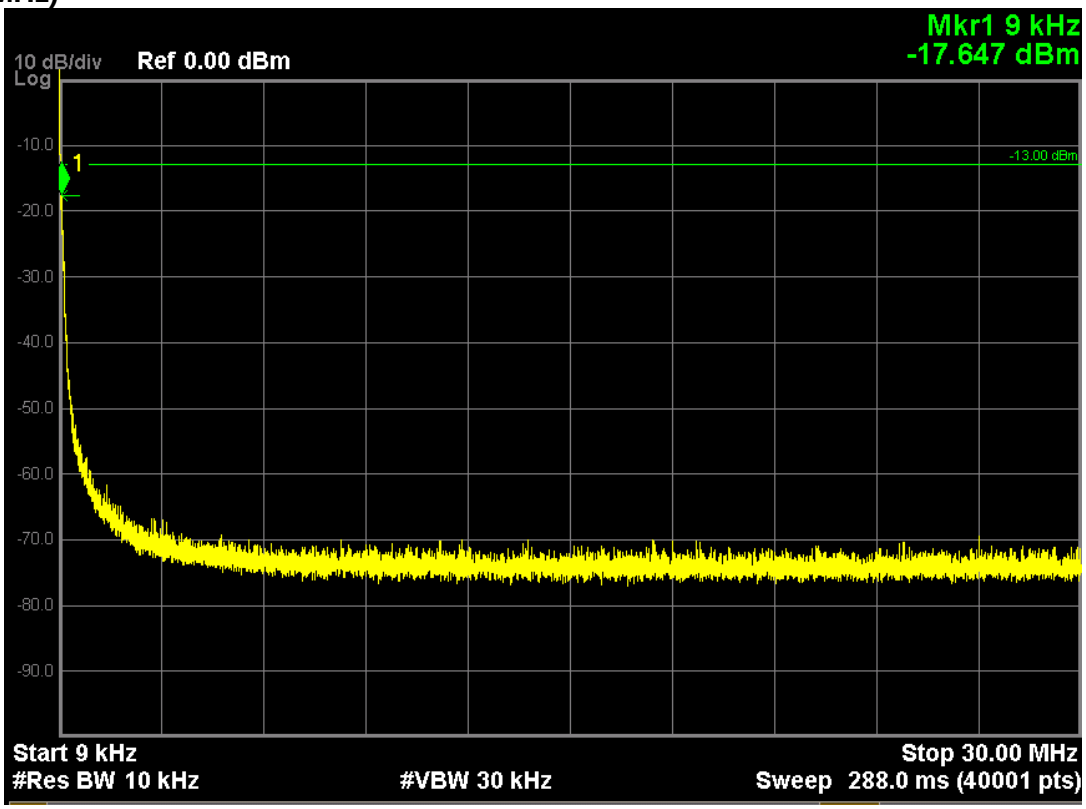


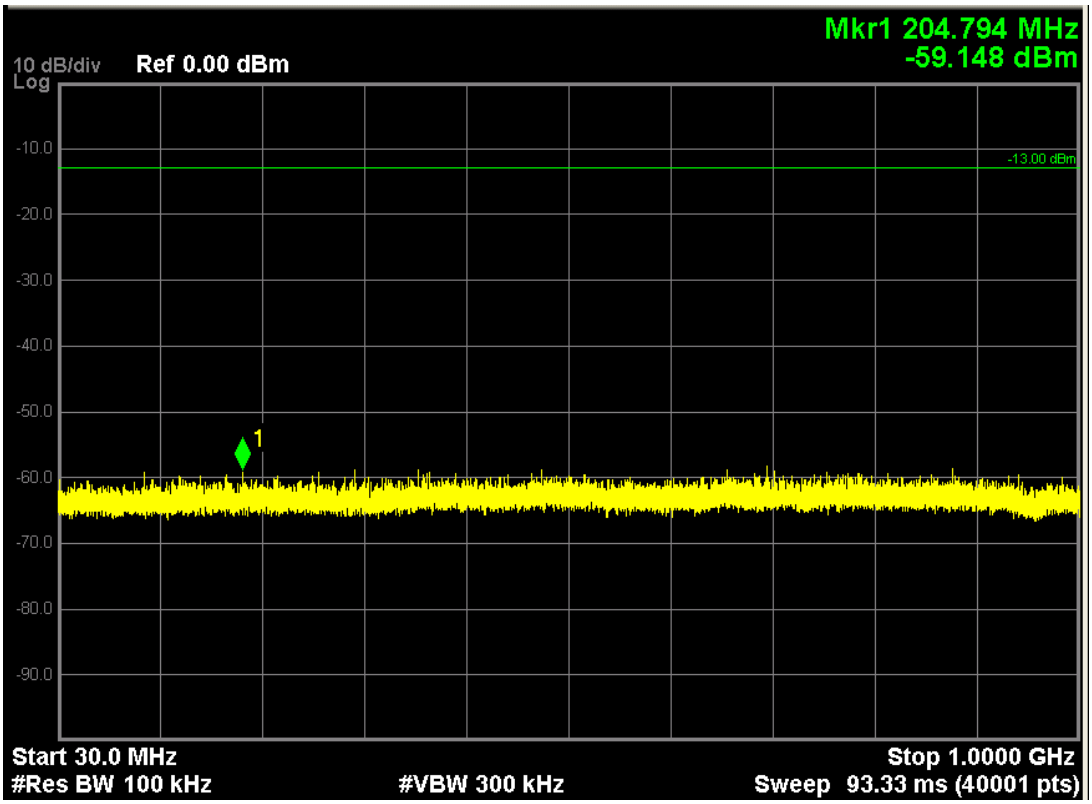


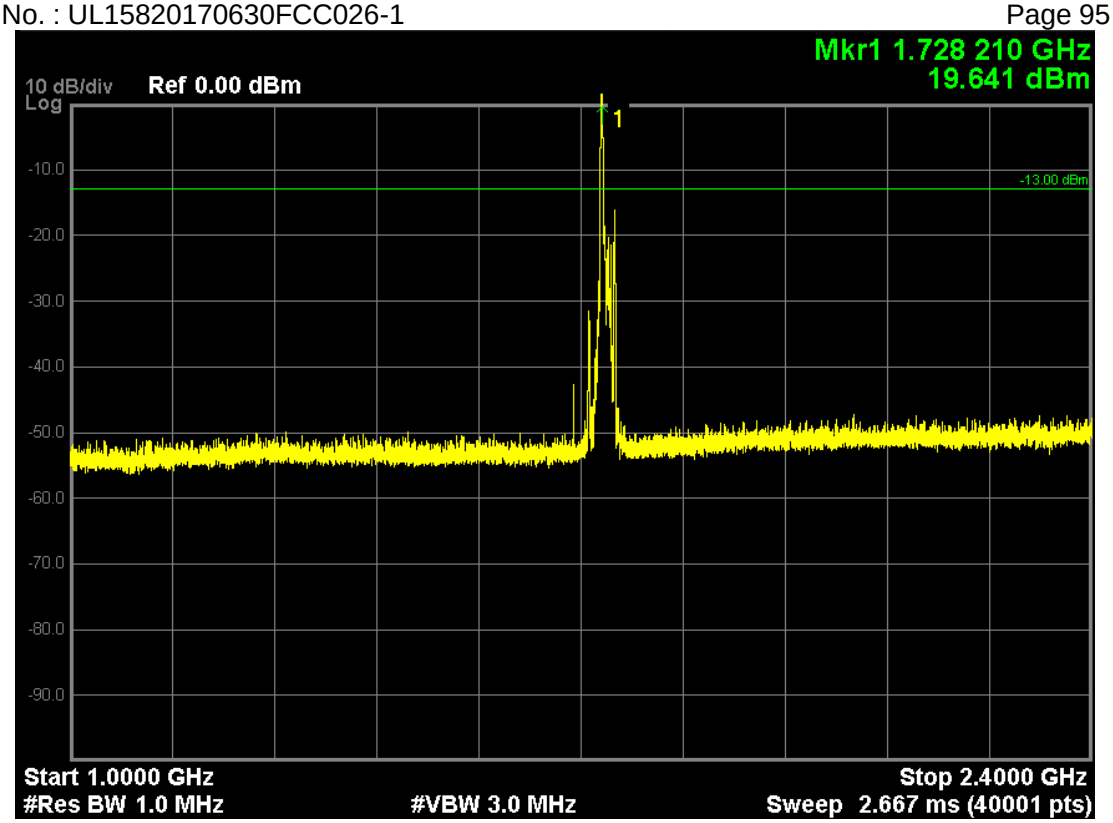
Note: The signal at point 1 is carrier



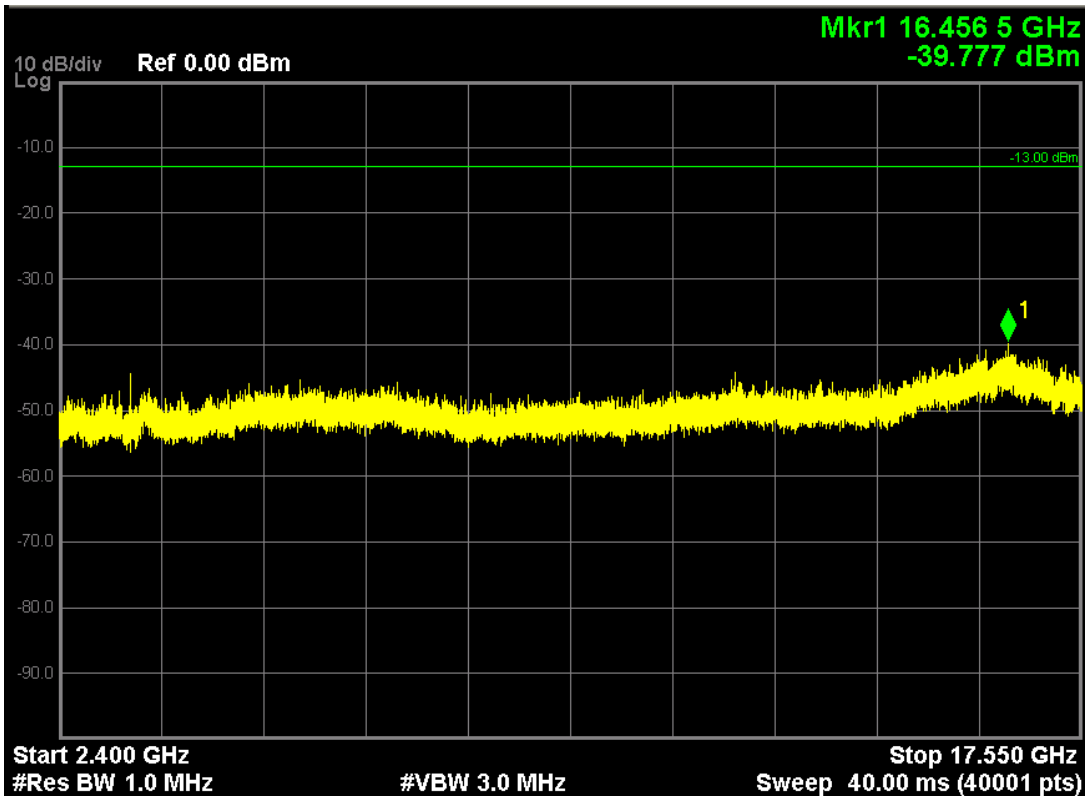
LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1721.5MHz)



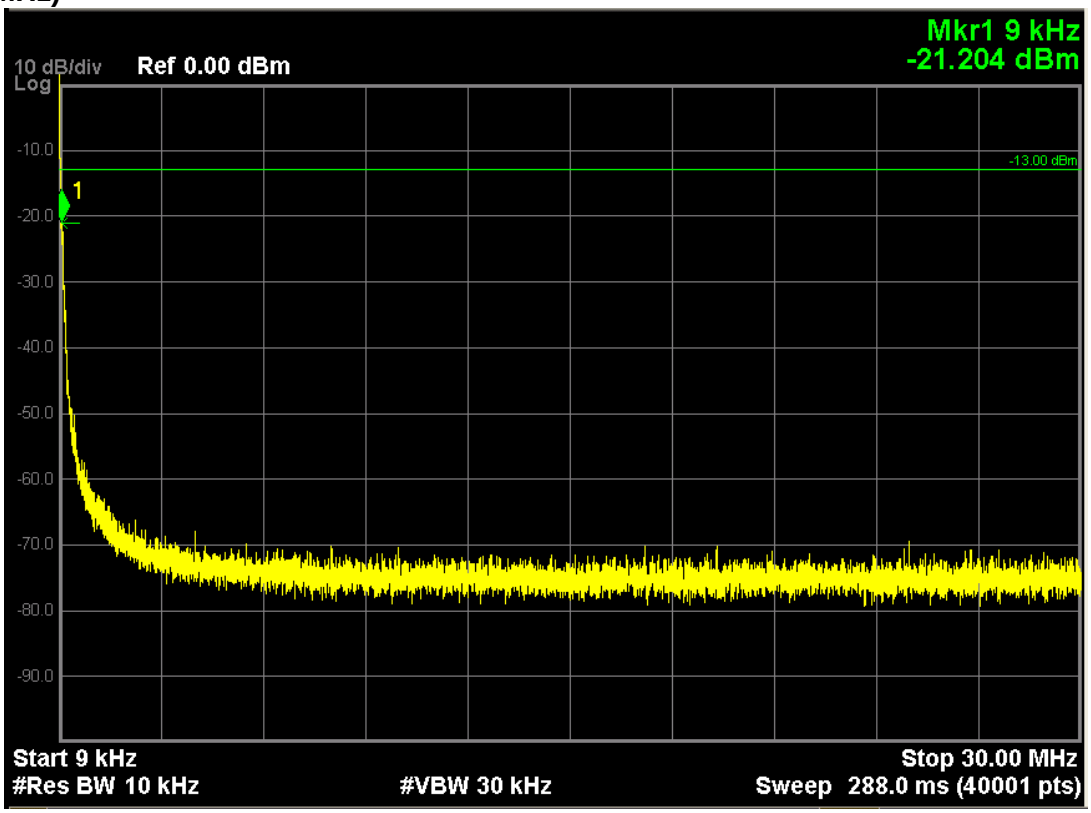


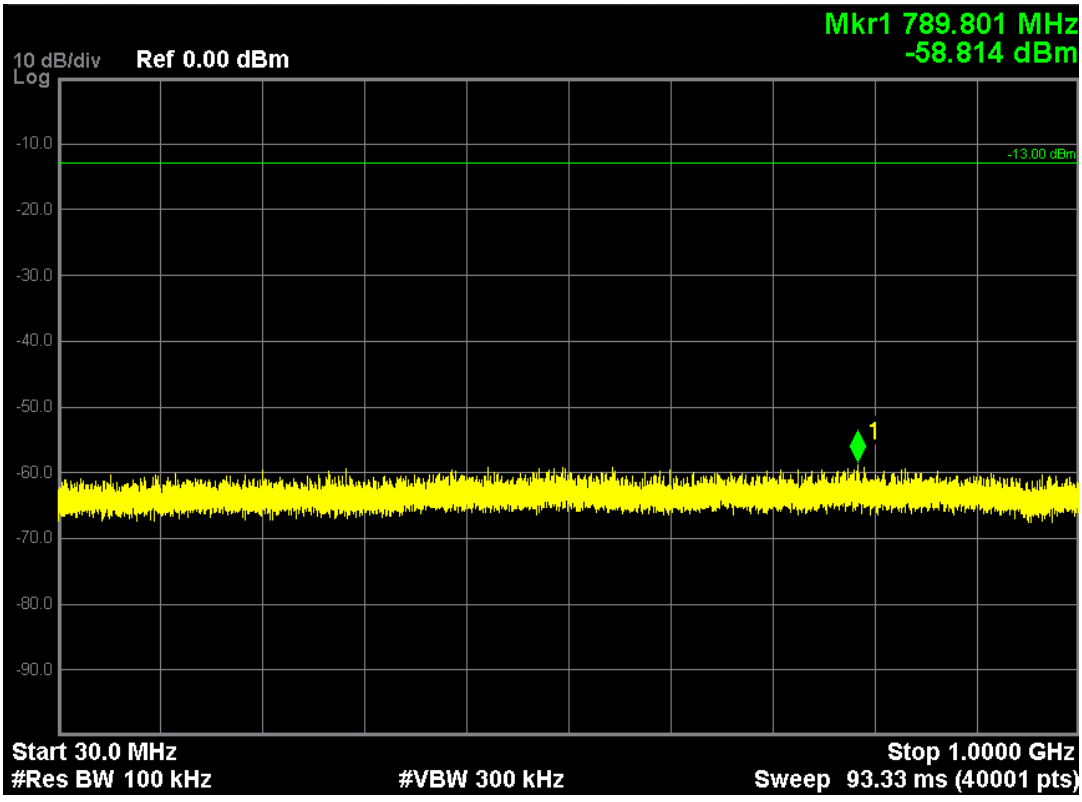


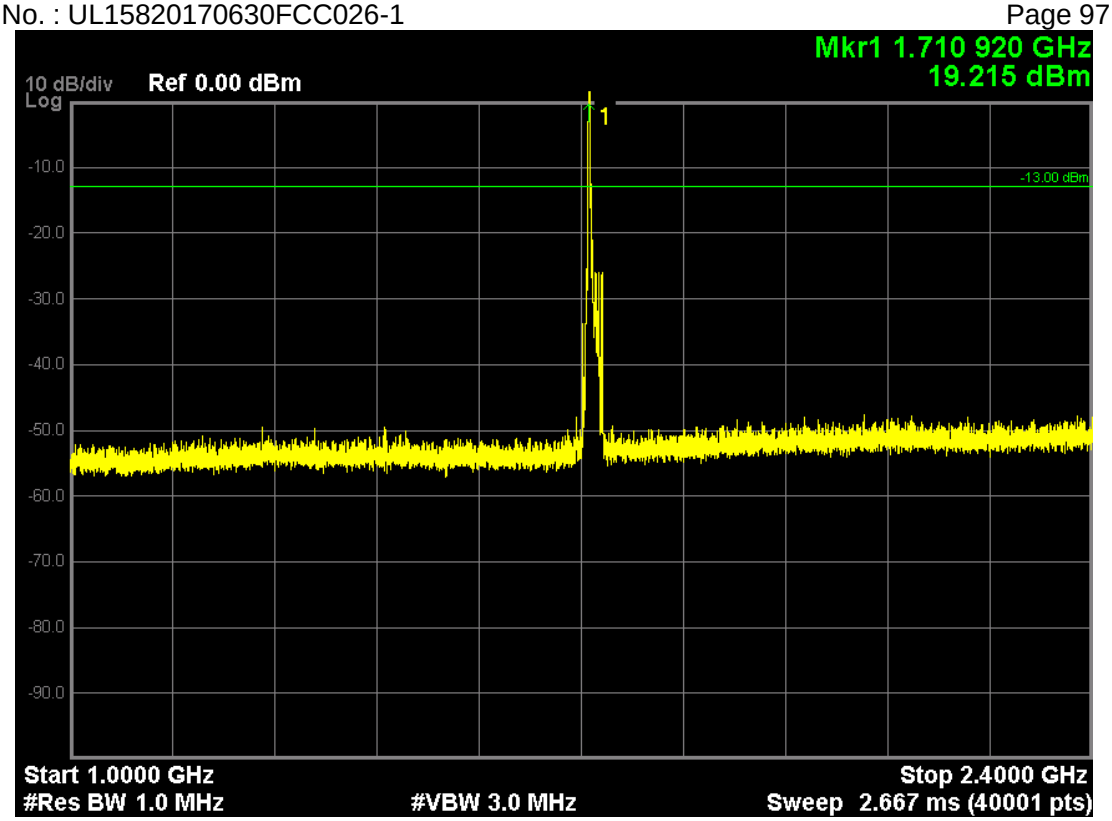
Note: The signal at point 1 is carrier



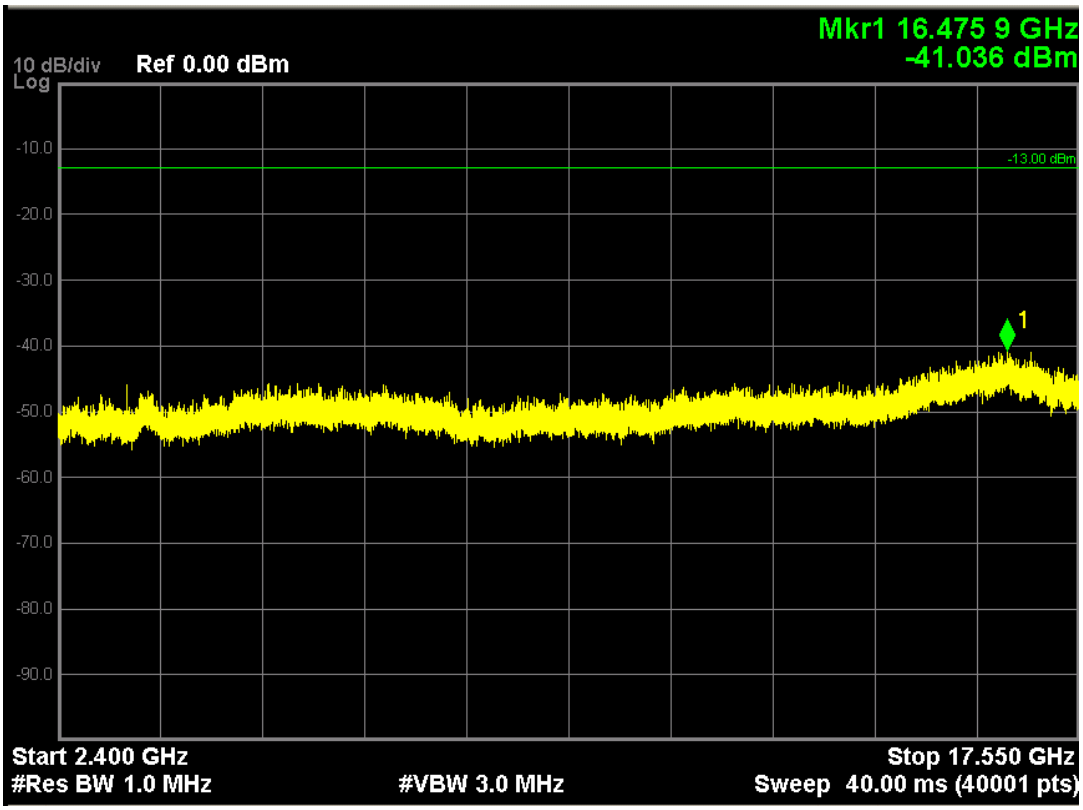
LTE Band 4 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20000,Frequeny 1715.0MHz)



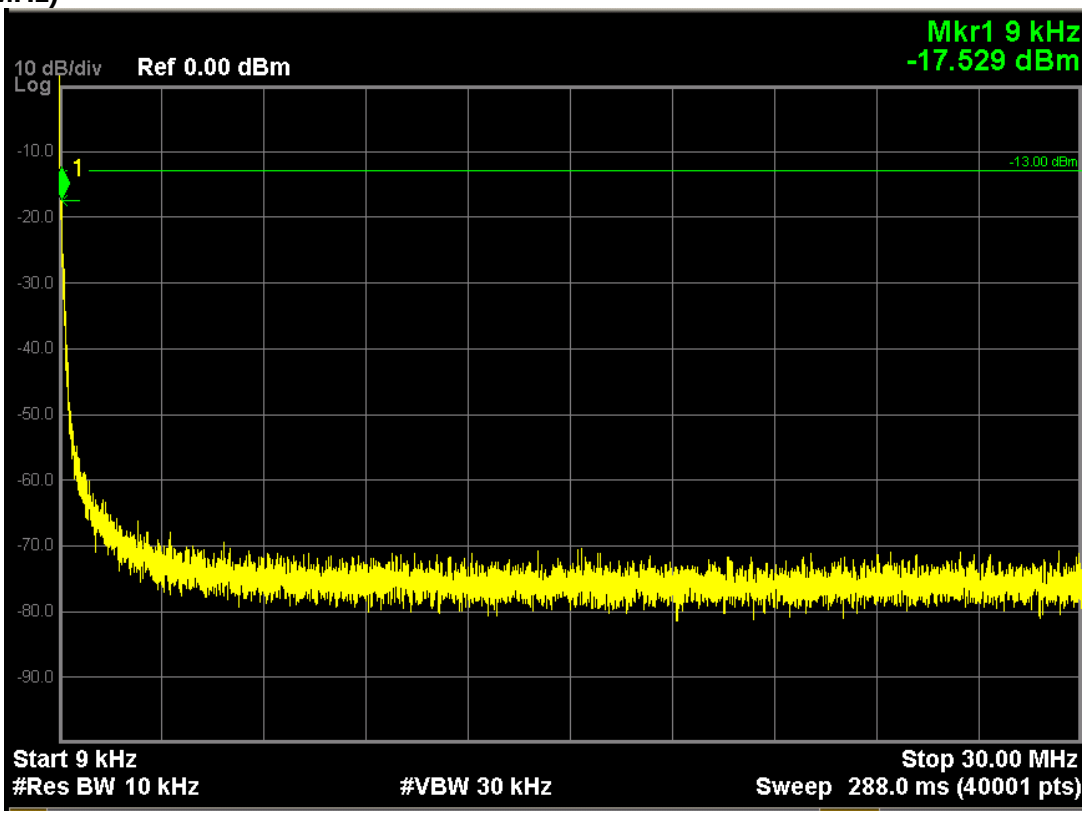


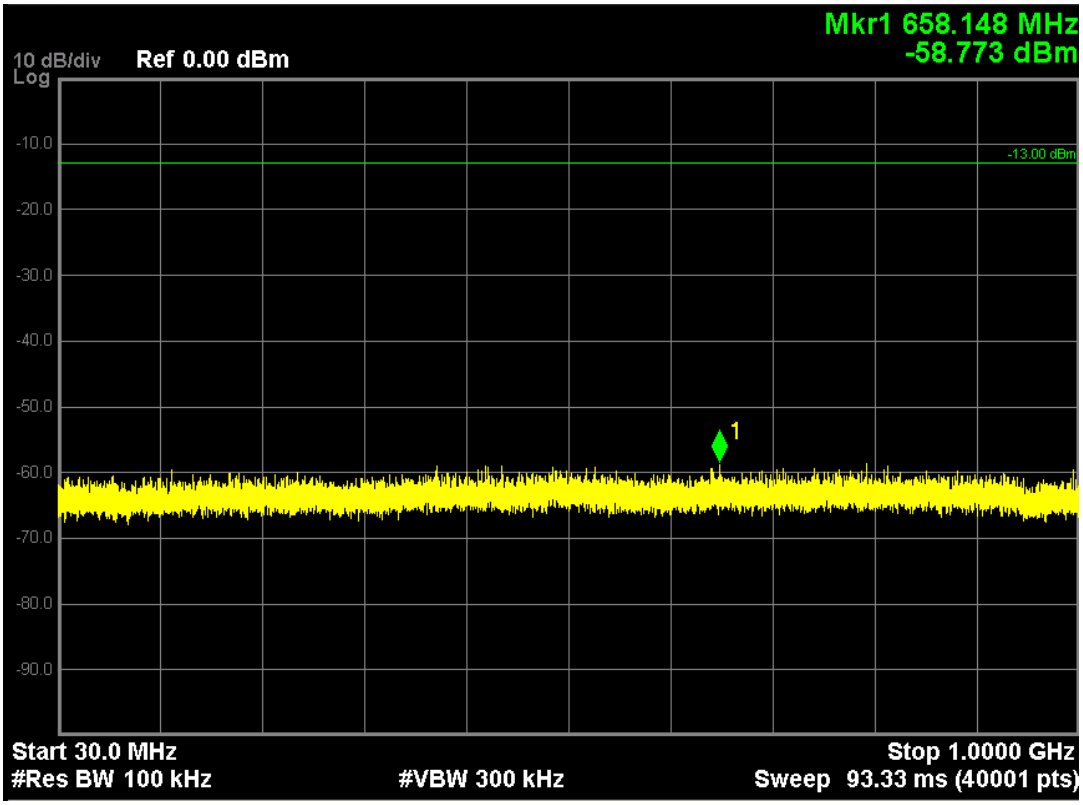


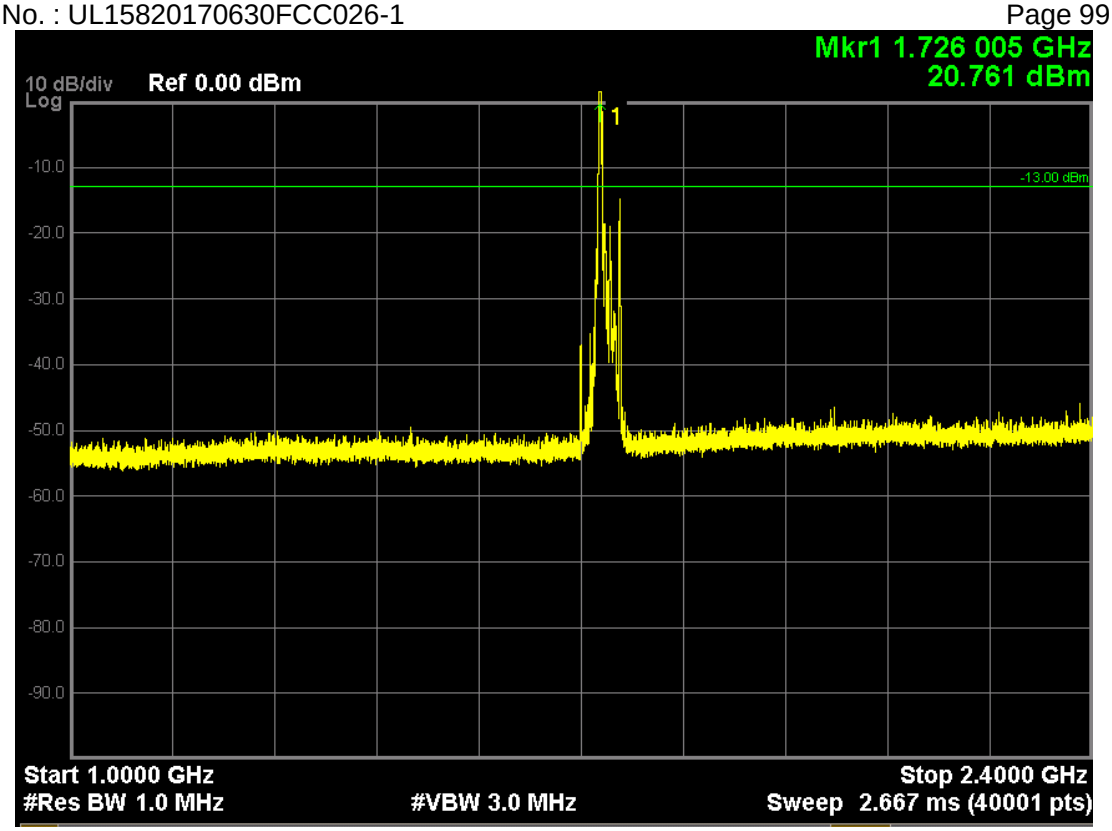
Note: The signal at point 1 is carrier



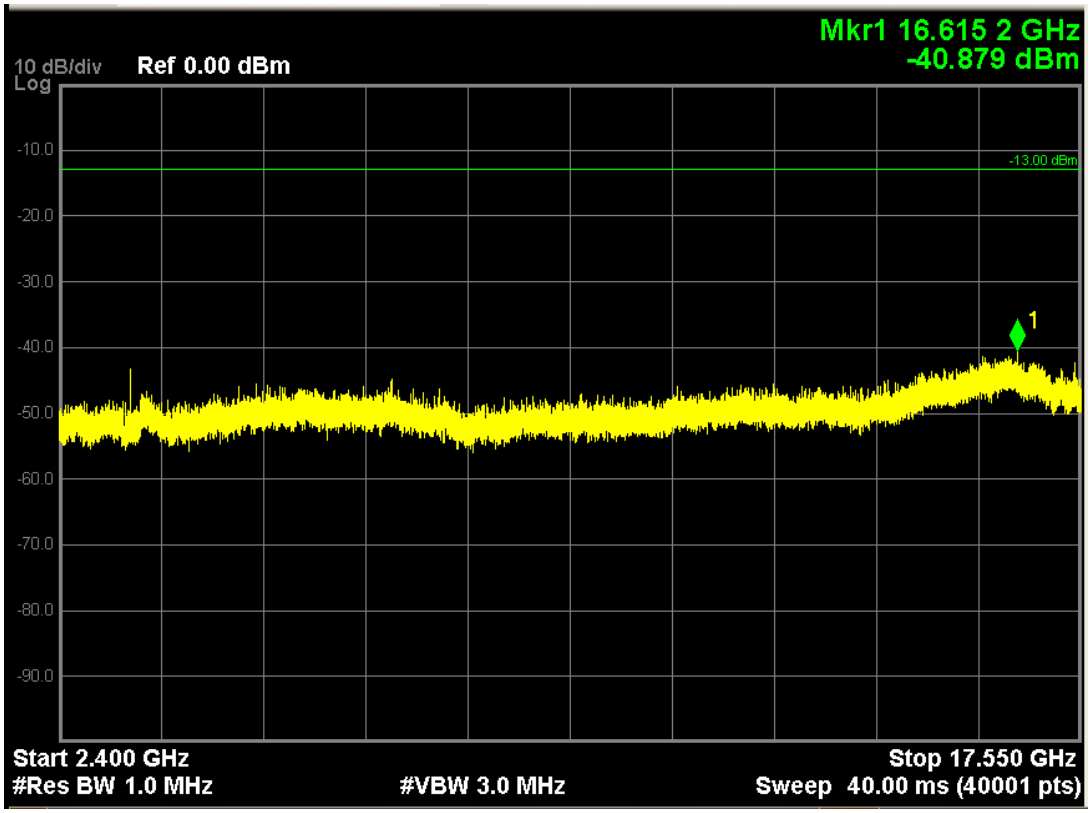
LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1732.5MHz)



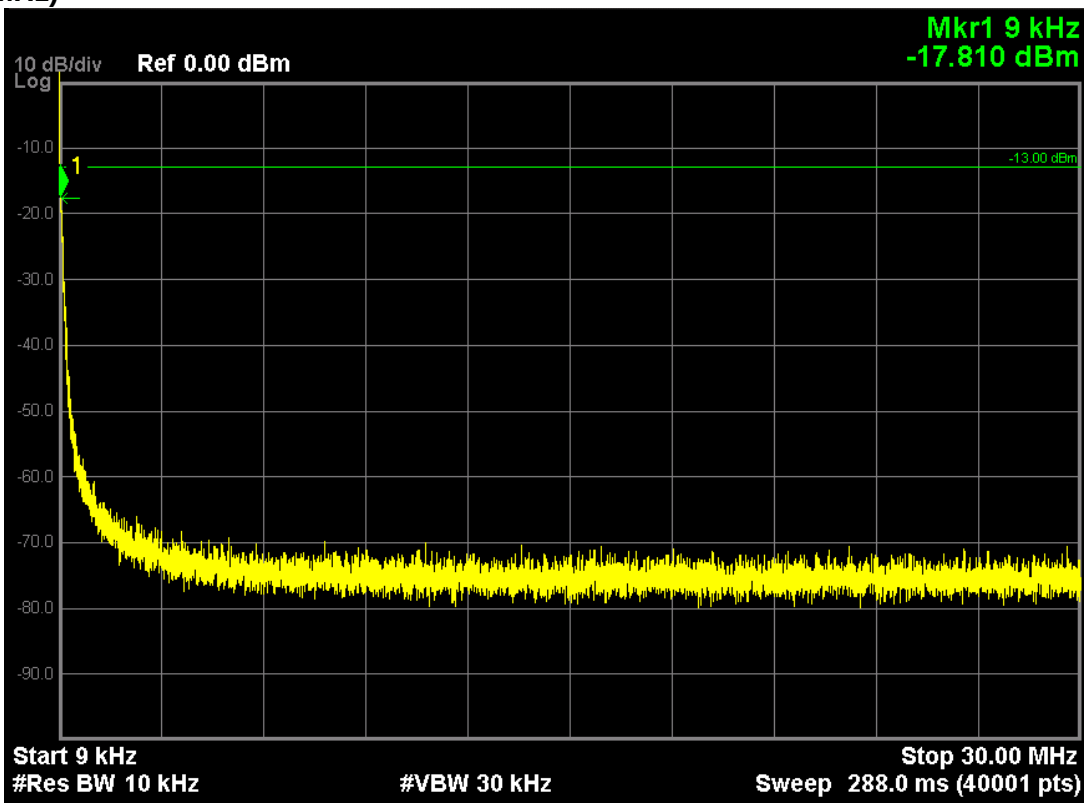


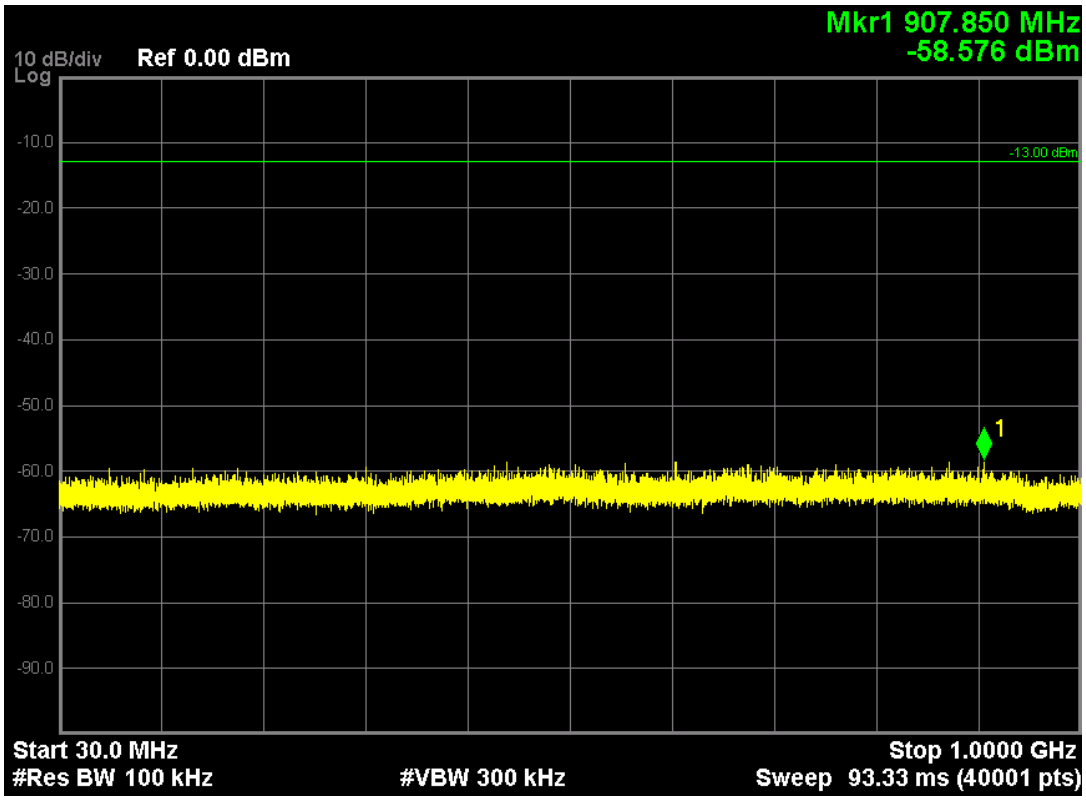


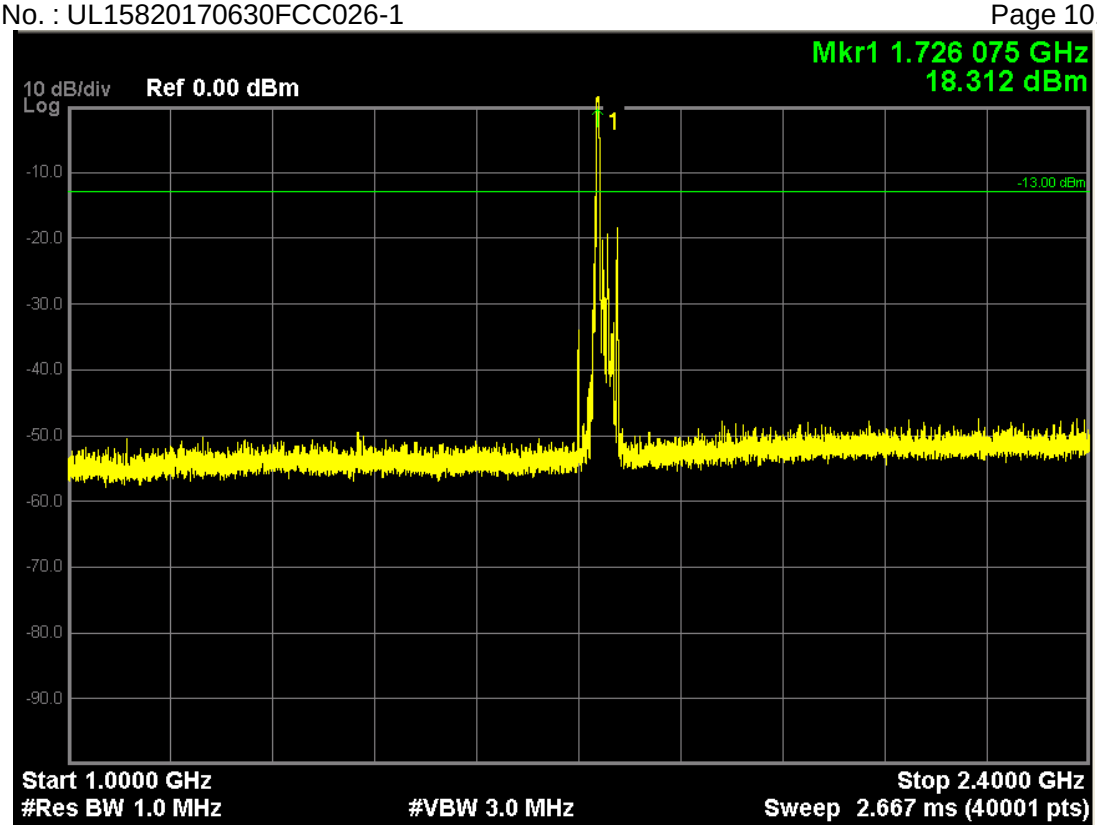
Note: The signal at point 1 is carrier



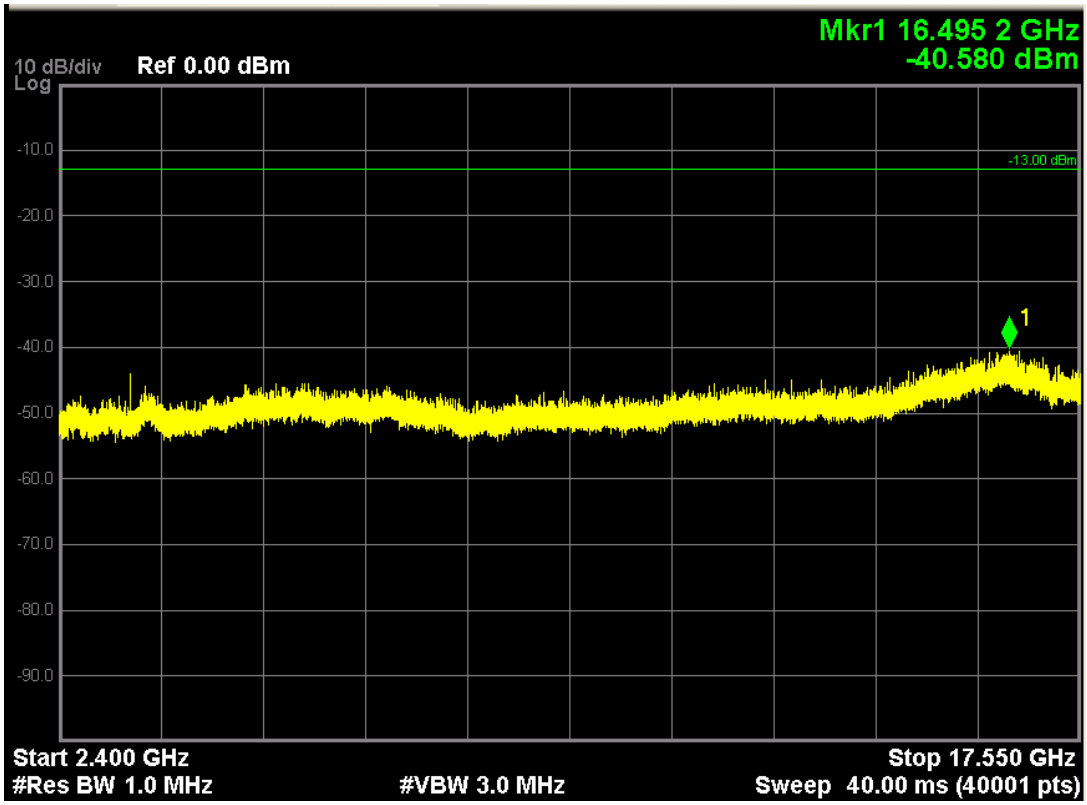
LTE Band 4 (16-QAM, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1732.5MHz)



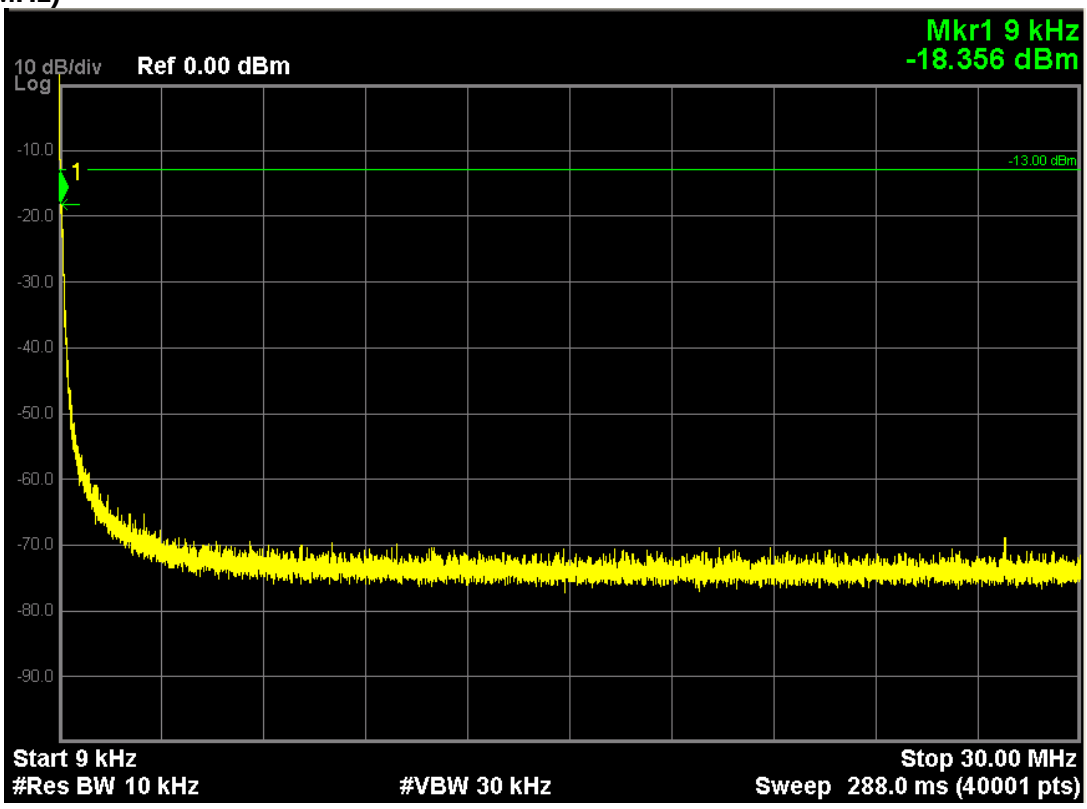


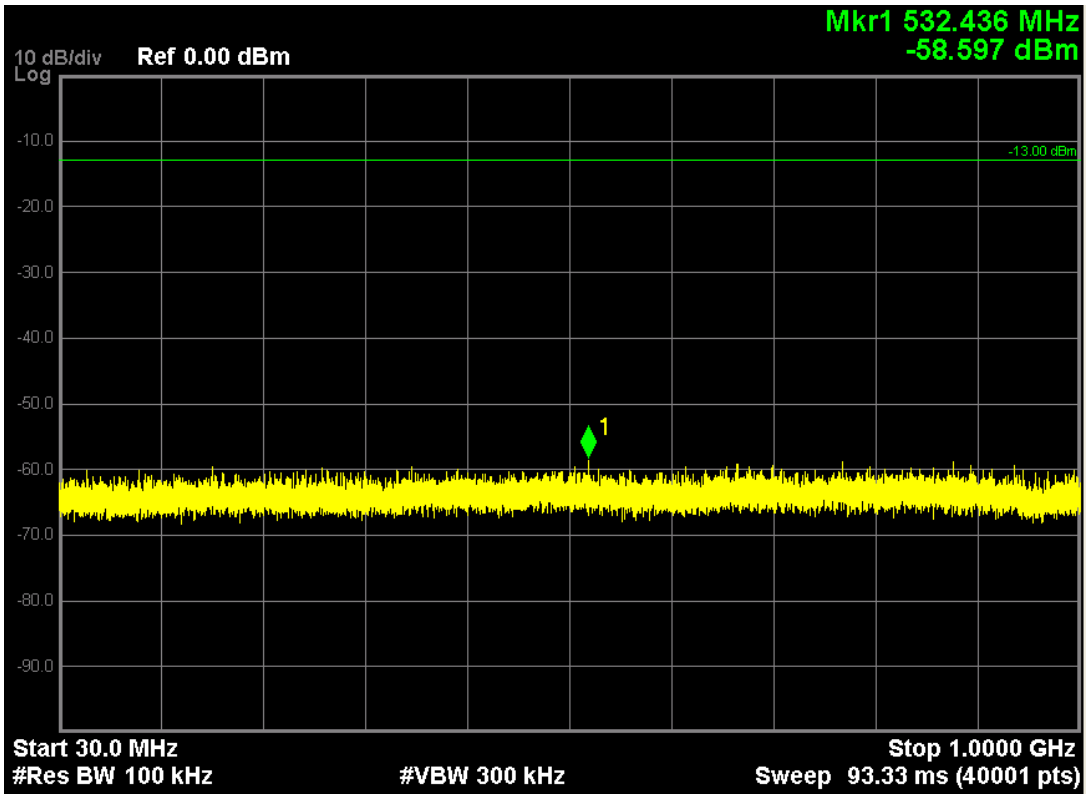


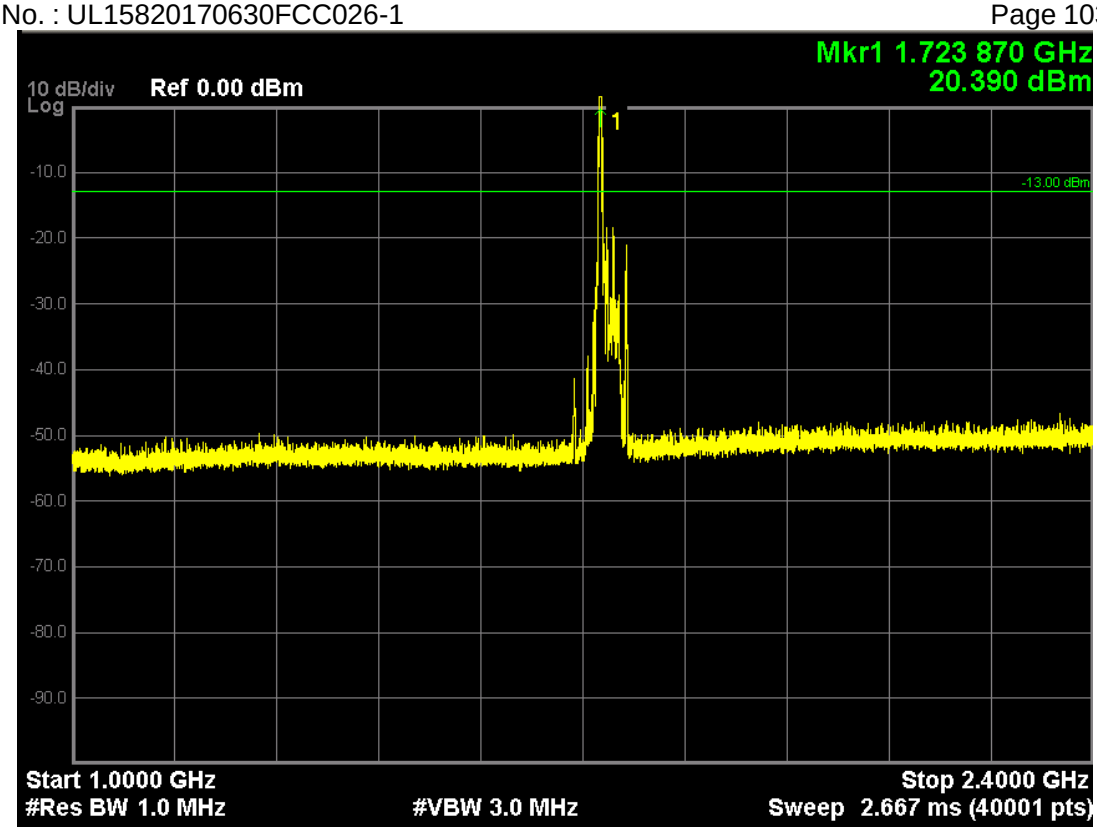
Note: The signal at point 1 is carrier



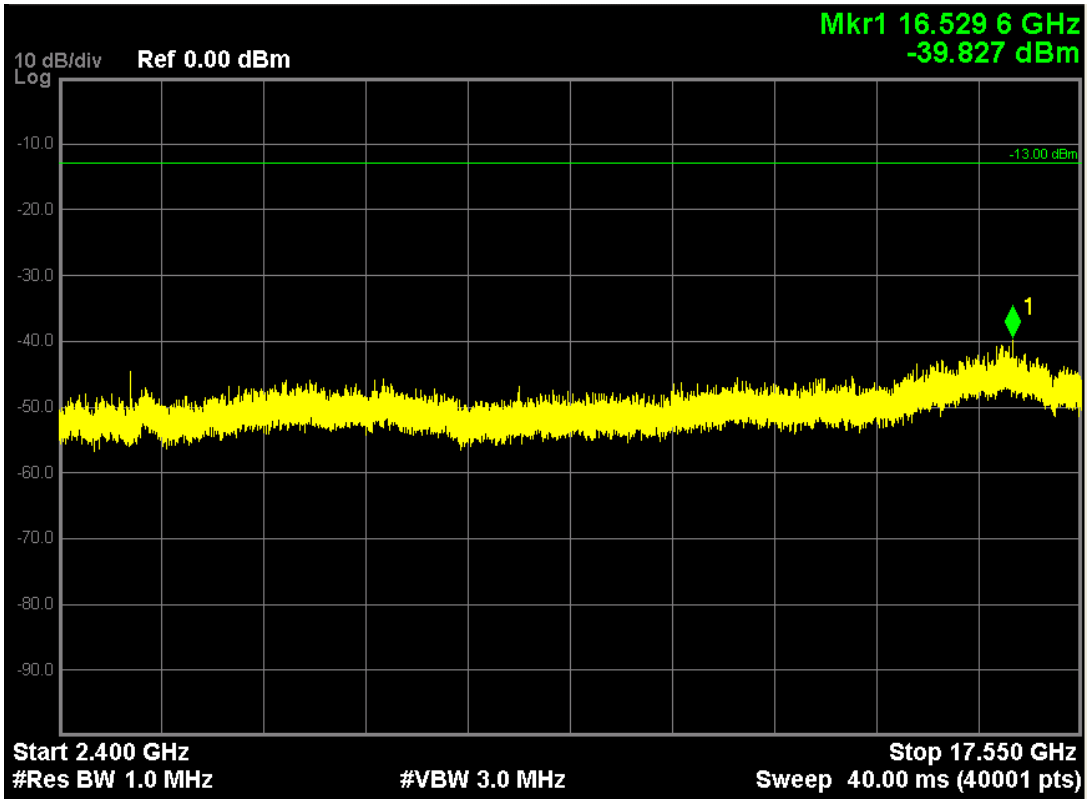
LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1732.5MHz)



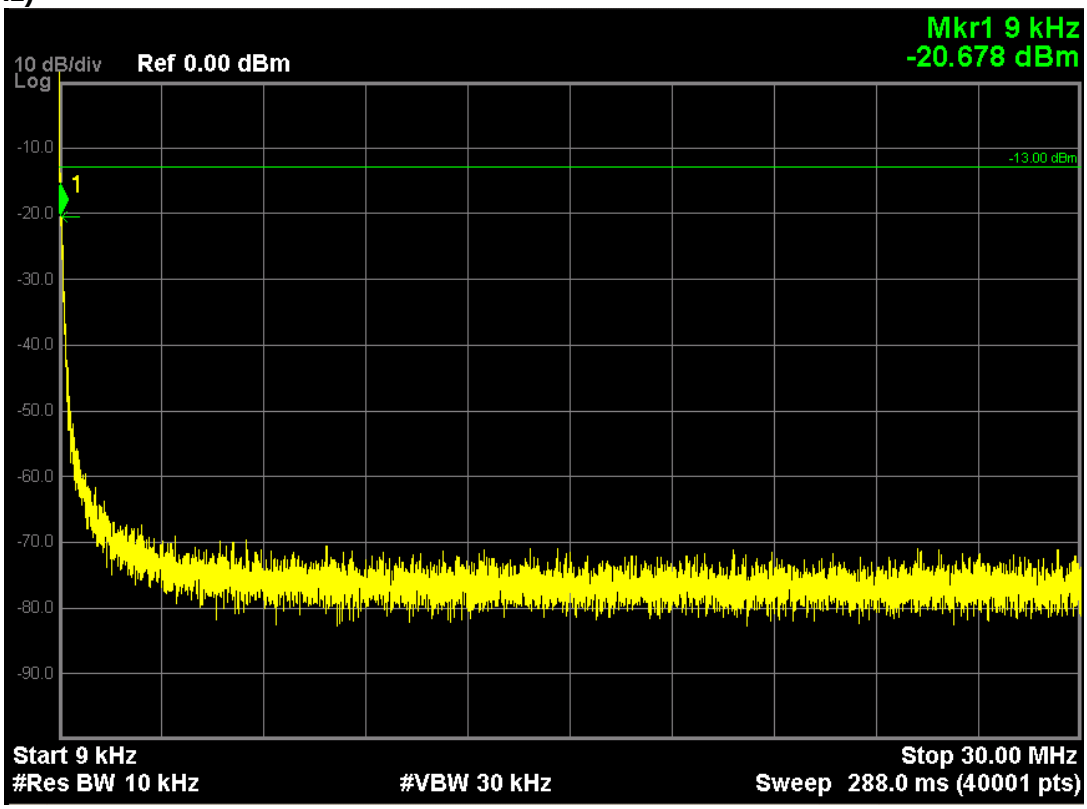


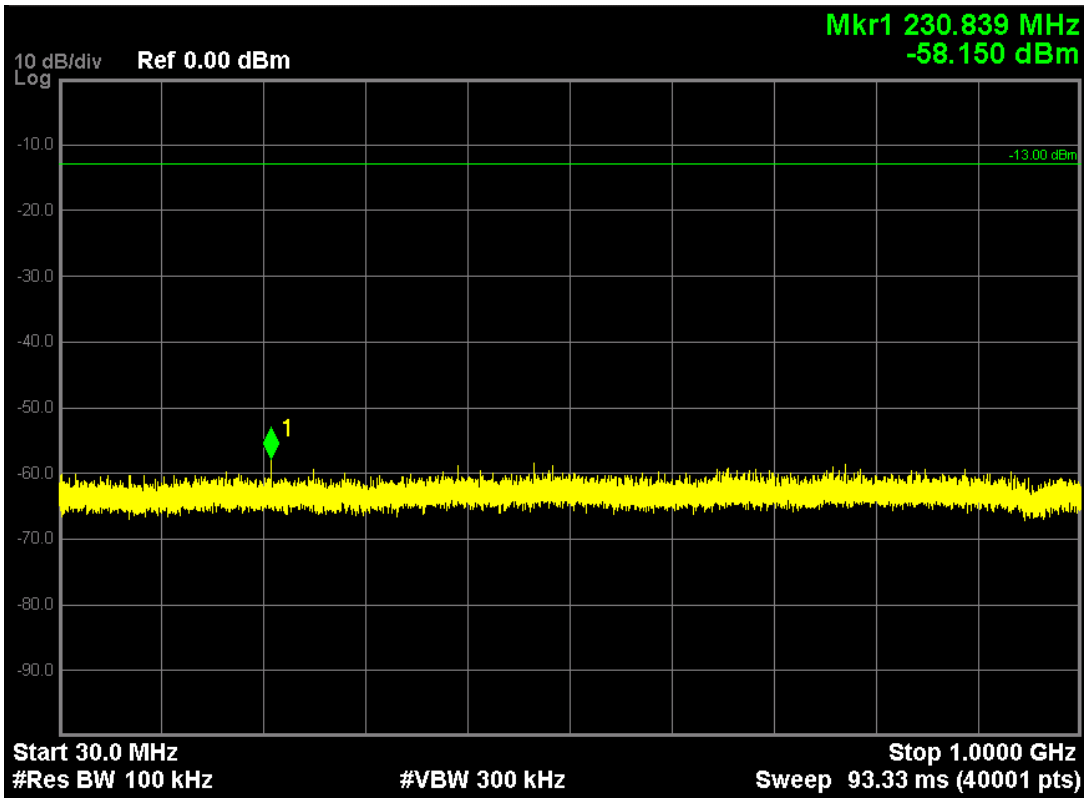


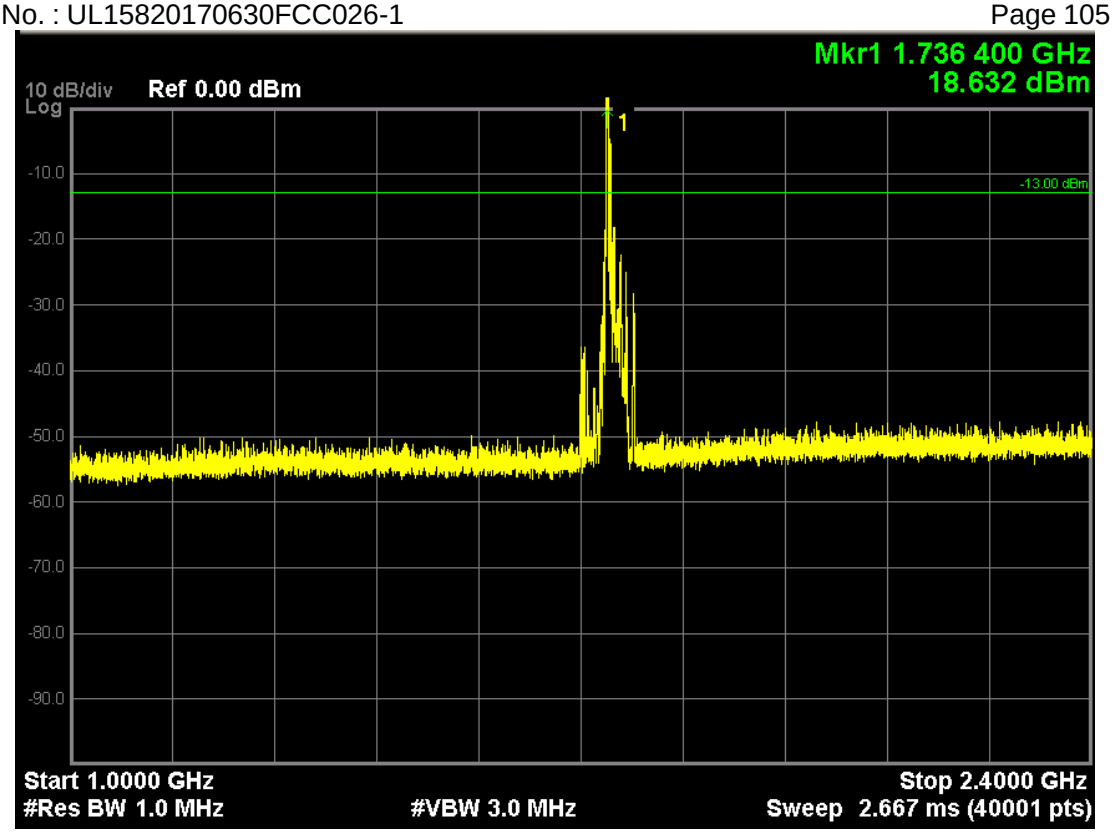
Note: The signal at point 1 is carrier



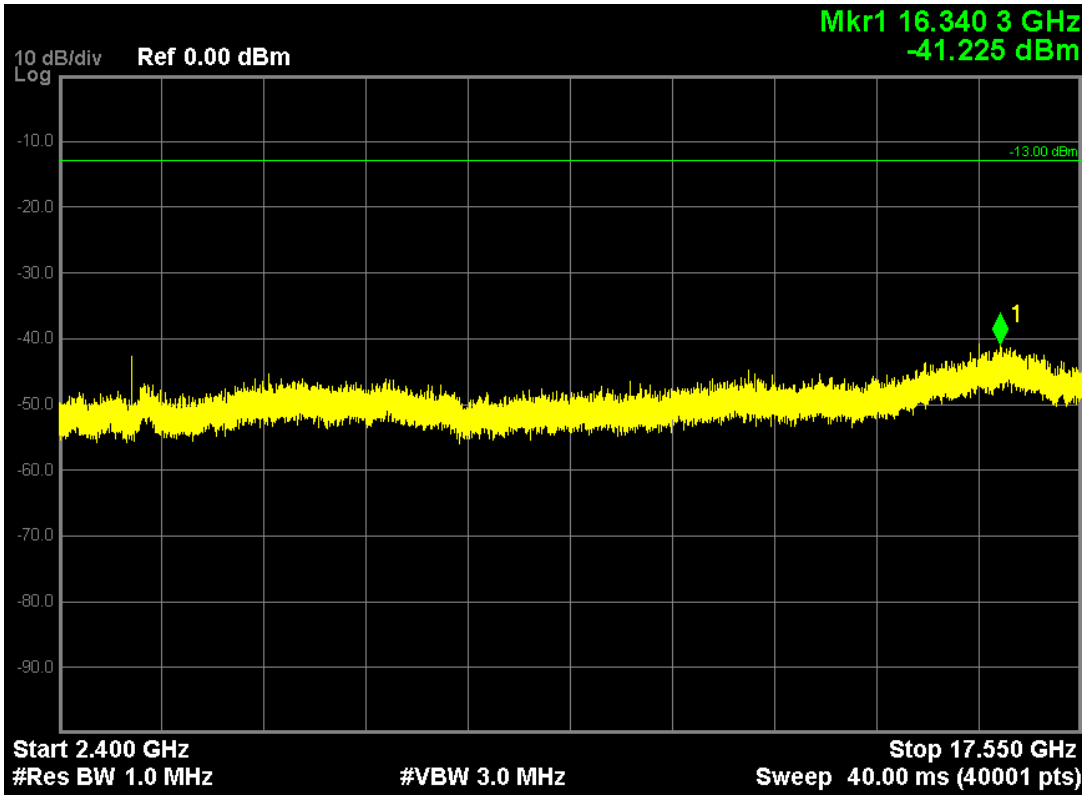
LTE Band 4 (16-QAM, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20300,Frequeny 1745MHz)



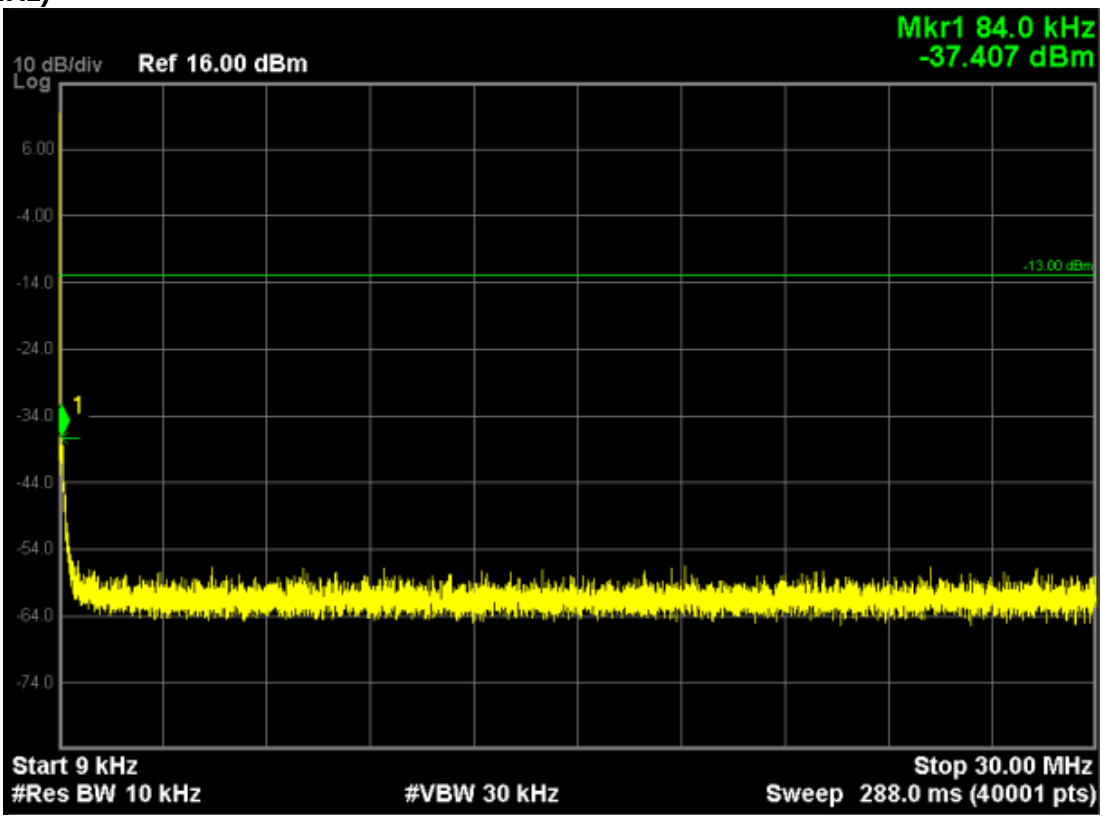


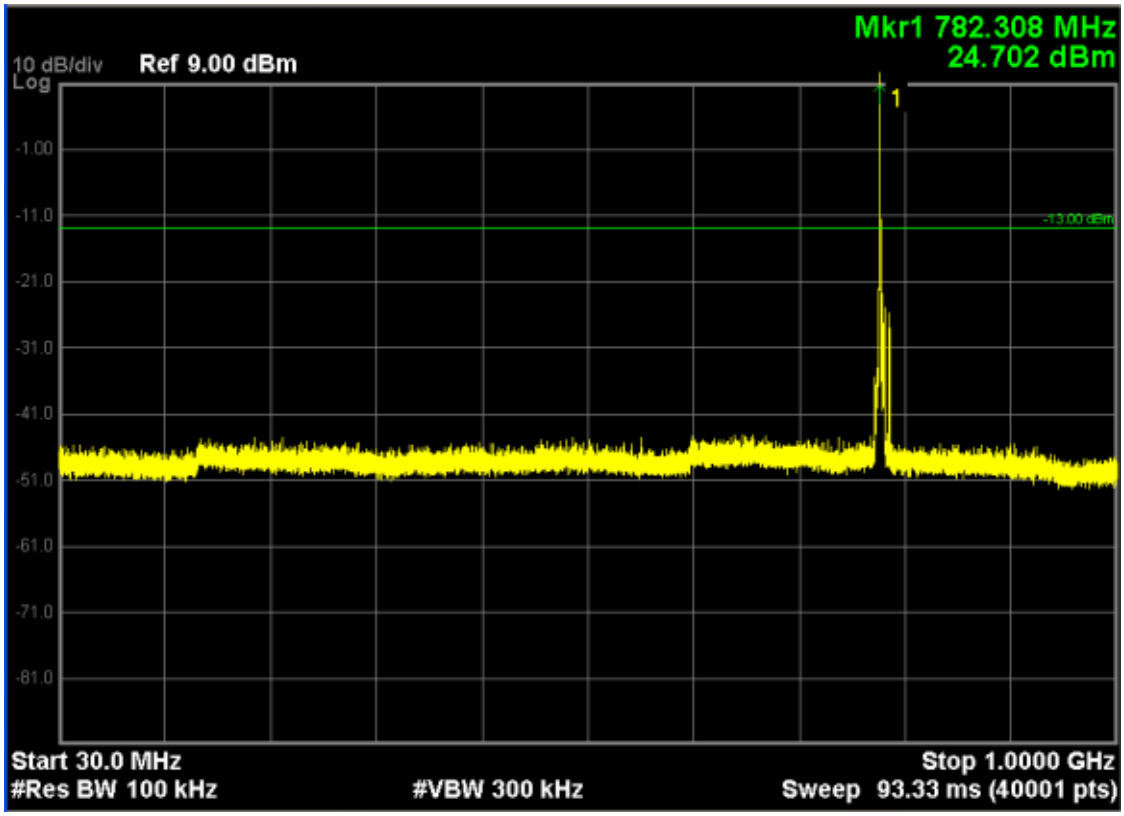


Note: The signal at point 1 is carrier

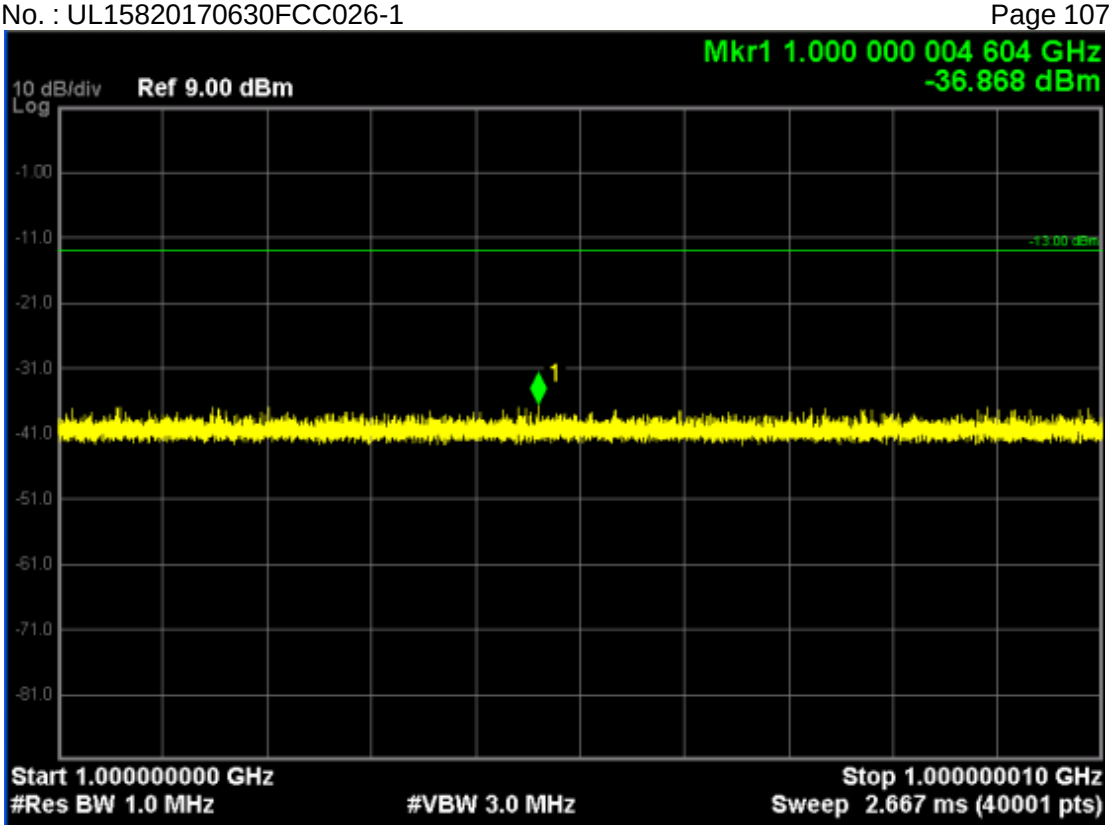


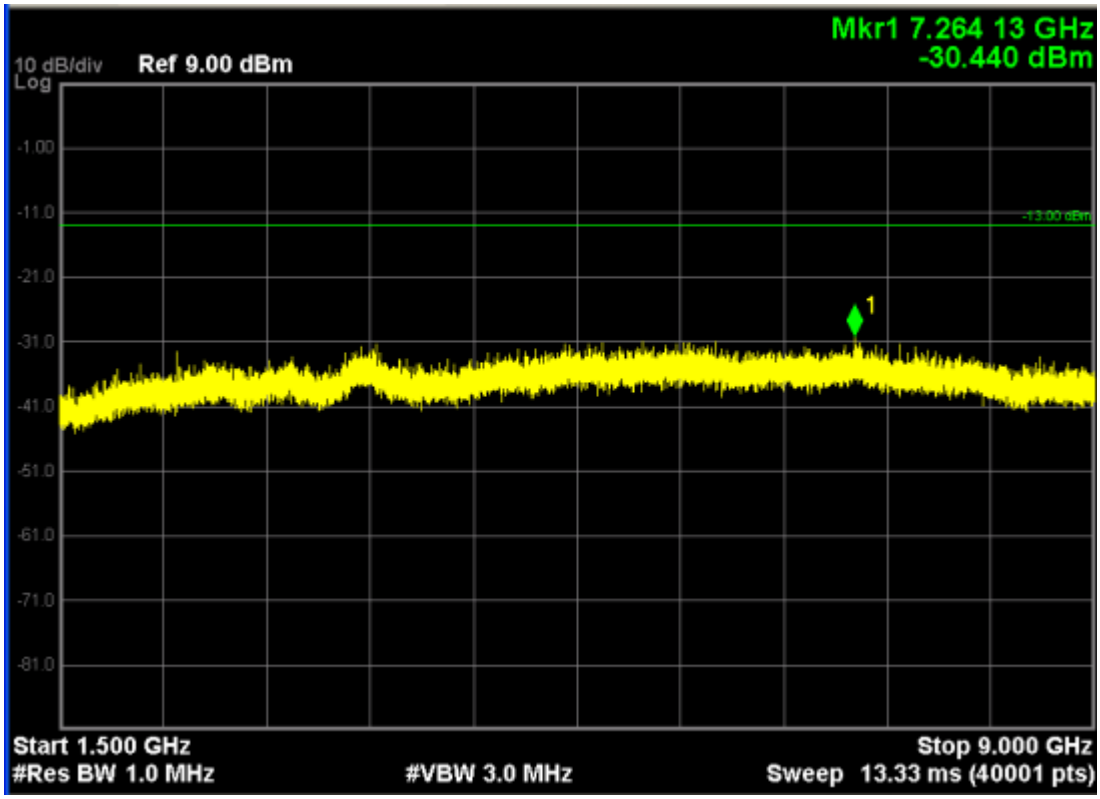
LTE Band 13 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 23255,Frequeny 784.5MHz)



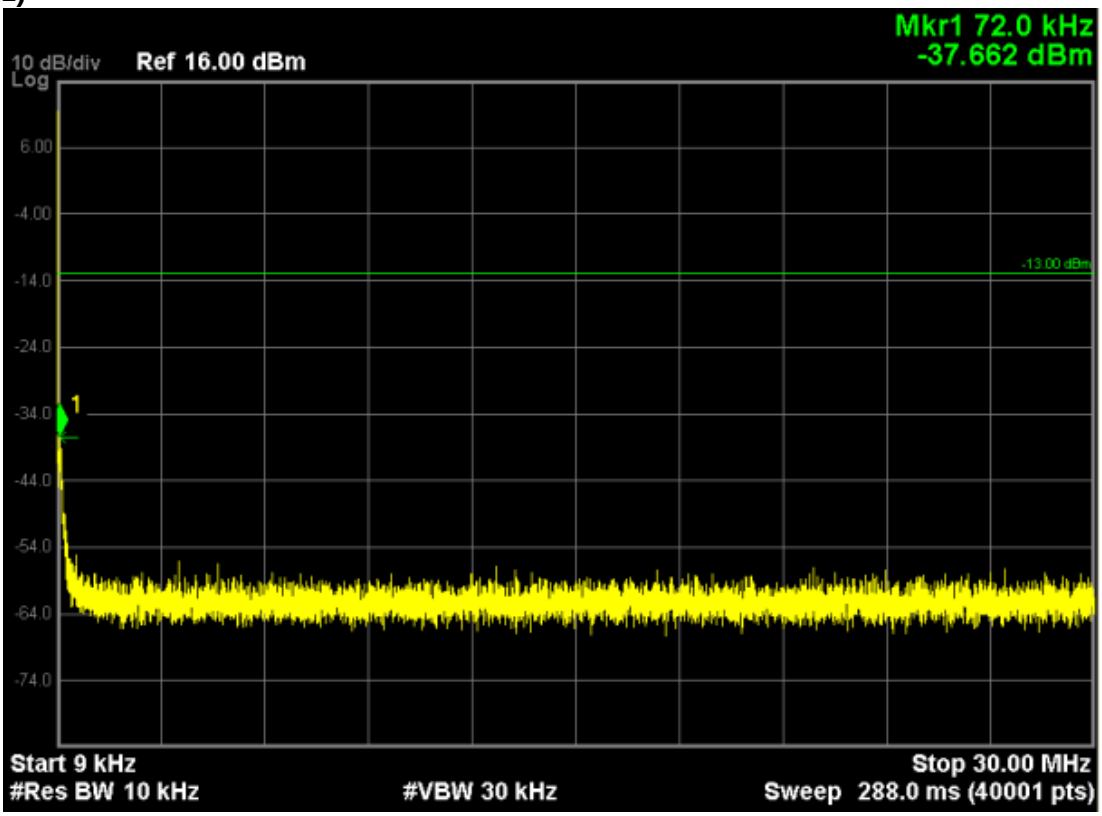


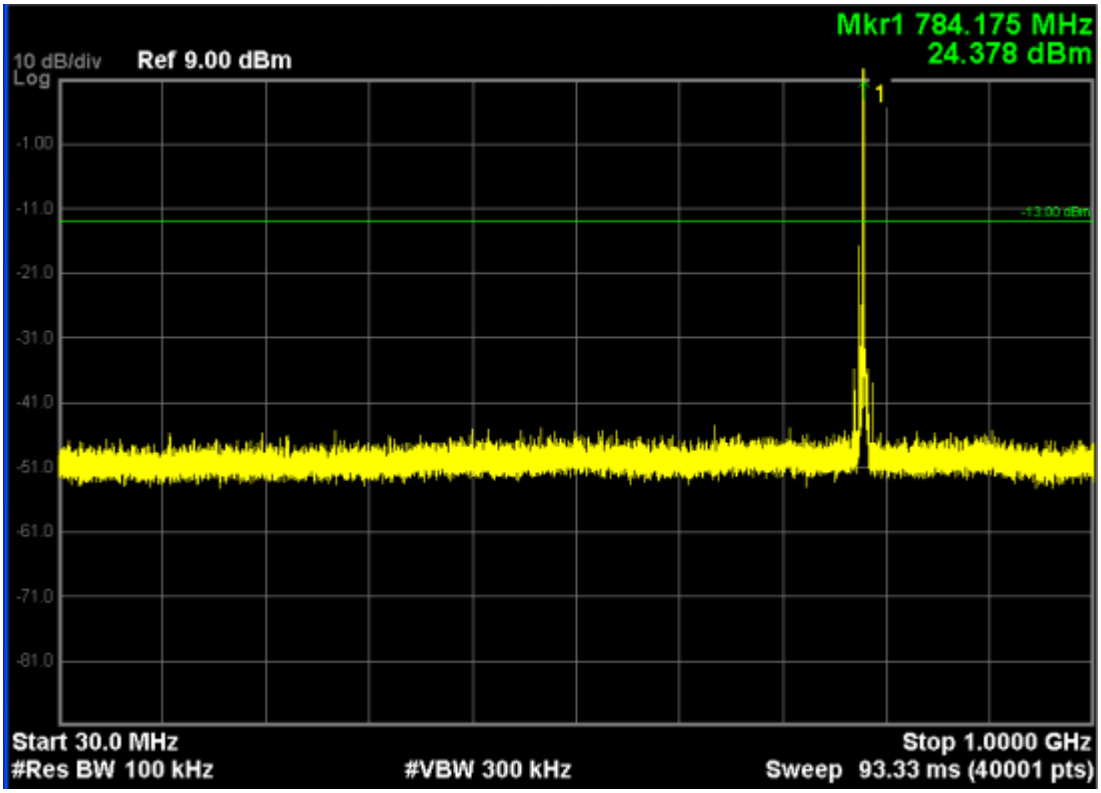
Note: The signal at point 1 is carrier


Mkr1 1.000 000 004 604 GHz
-36.868 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.000000000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 1.000000010 GHz
Sweep 2.667 ms (40001 pts)

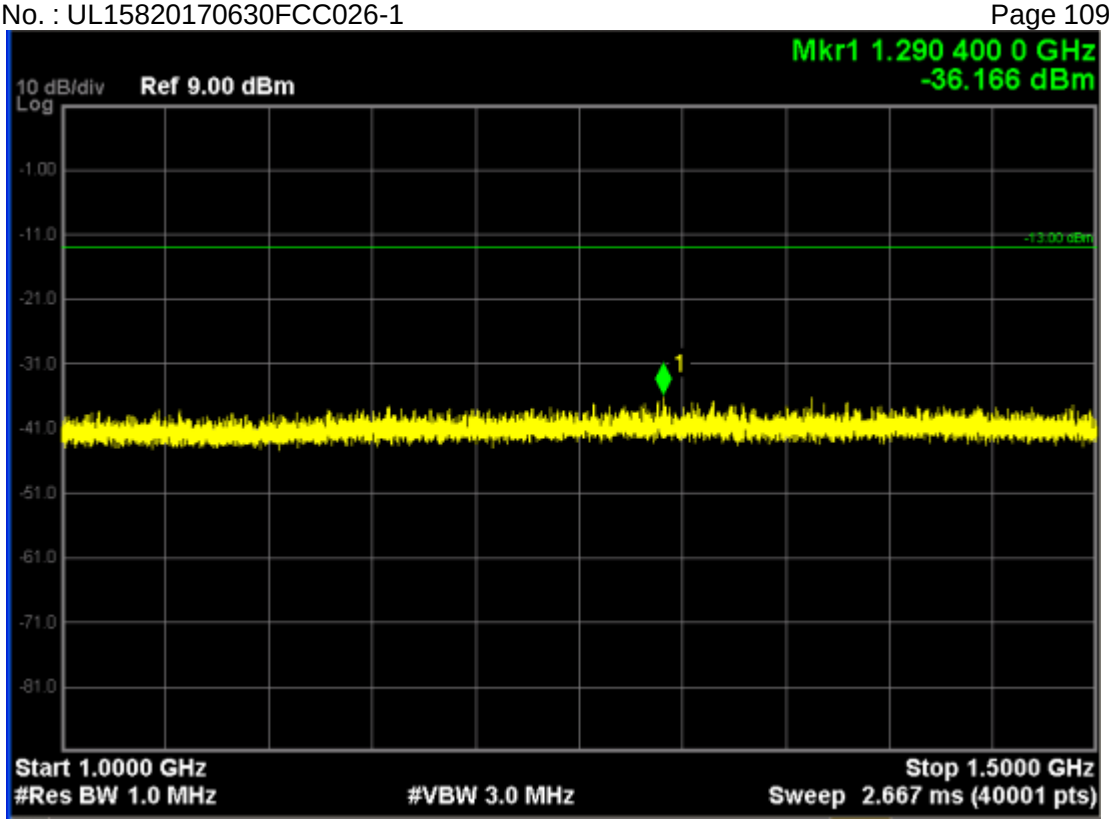

Mkr1 7.264 13 GHz
-30.440 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 9.000 GHz
Sweep 13.33 ms (40001 pts)

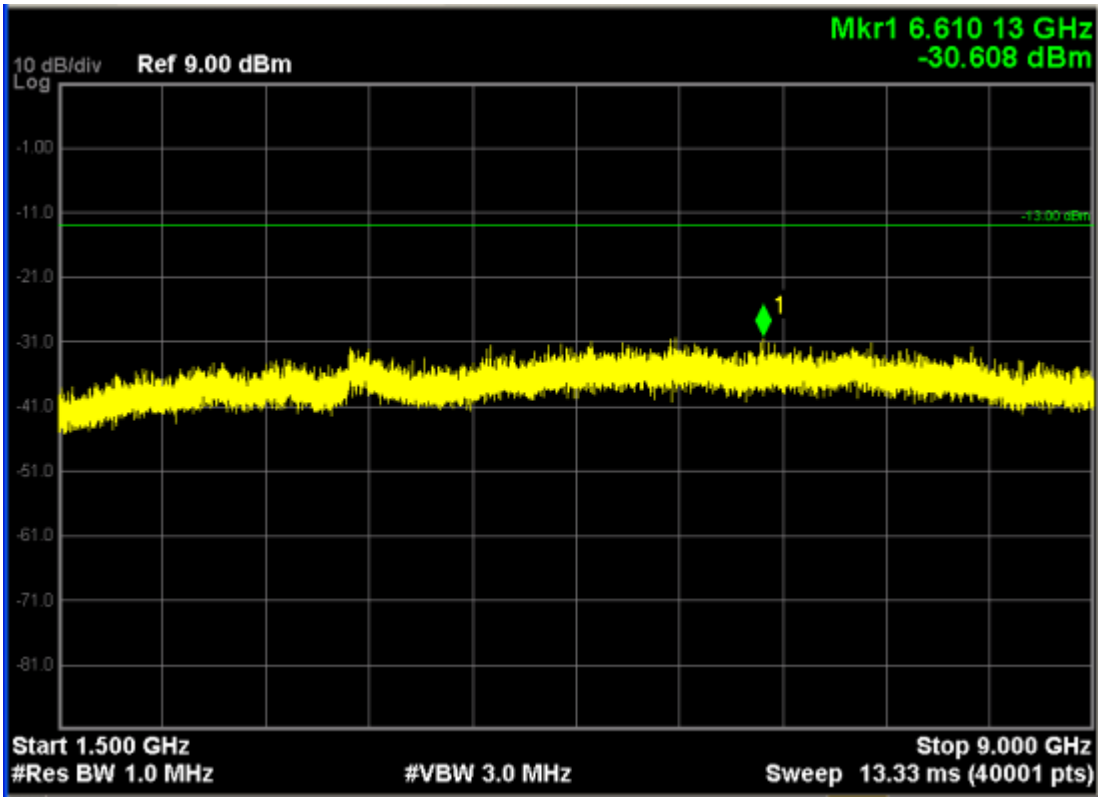
LTE Band 13 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 23230,Frequeny 782MHz)



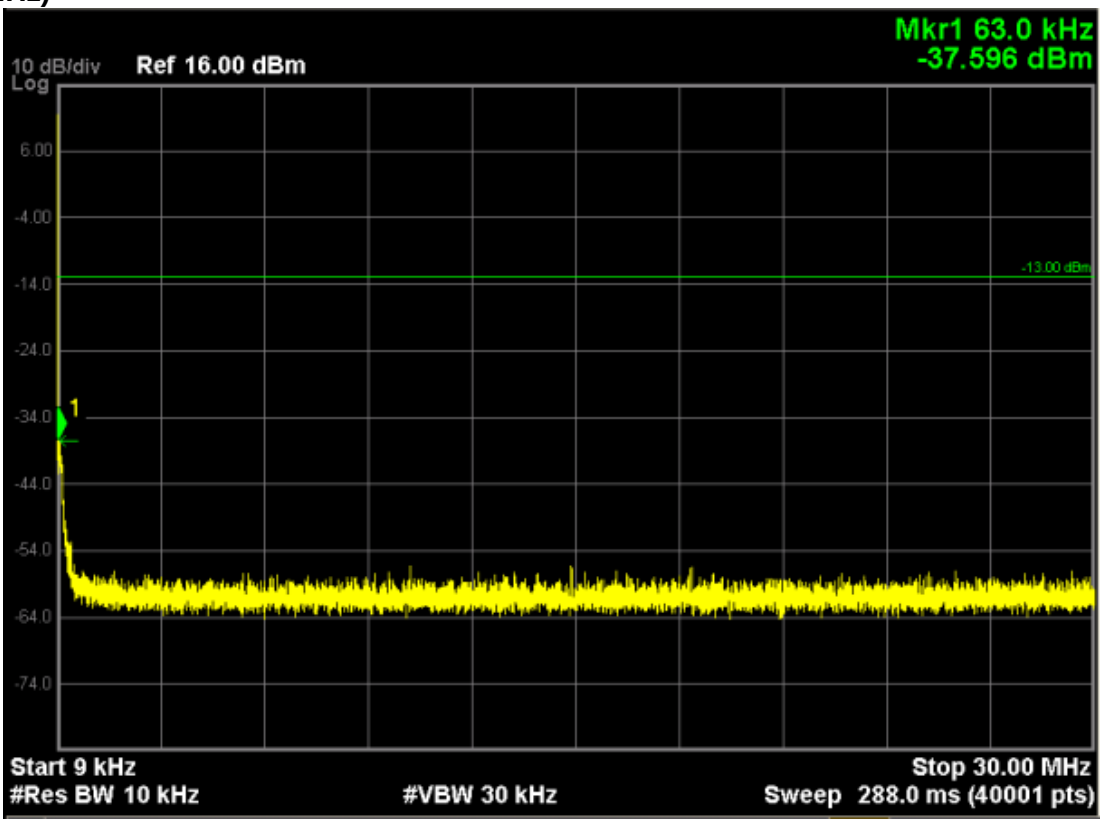


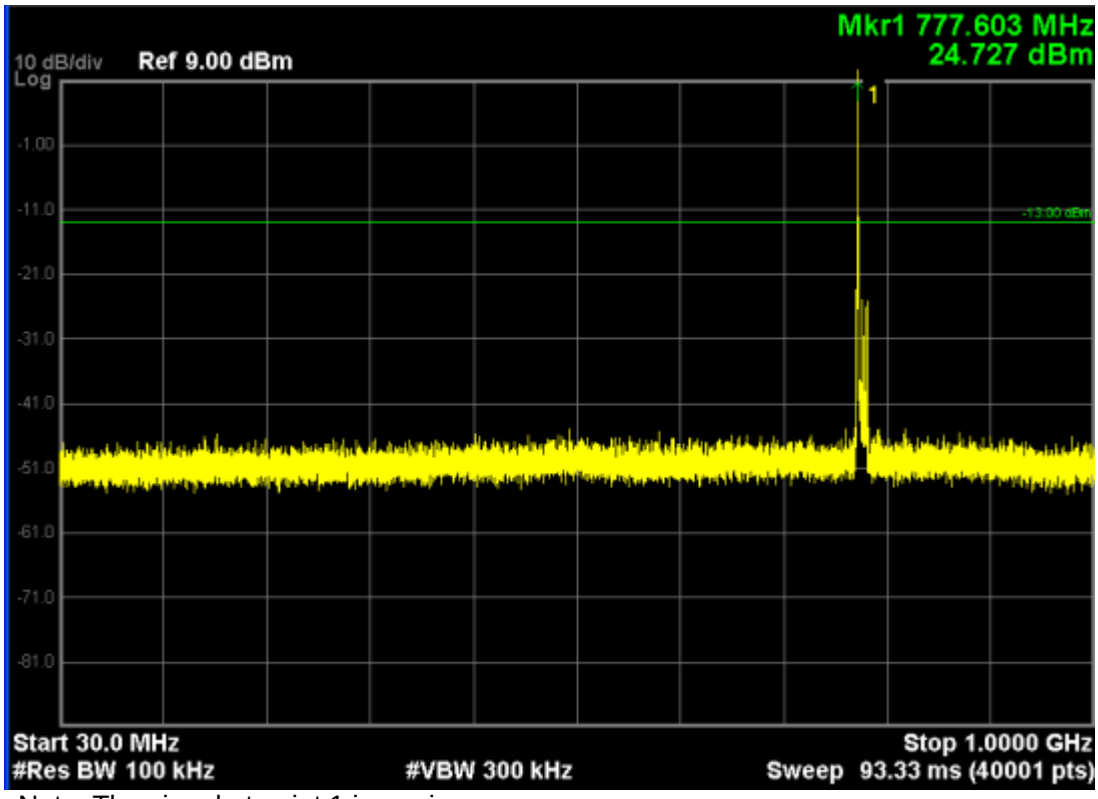
Note: The signal at point 1 is carrier


Mkr1 1.290 400 0 GHz
-36.166 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 1.5000 GHz
Sweep 2.667 ms (40001 pts)

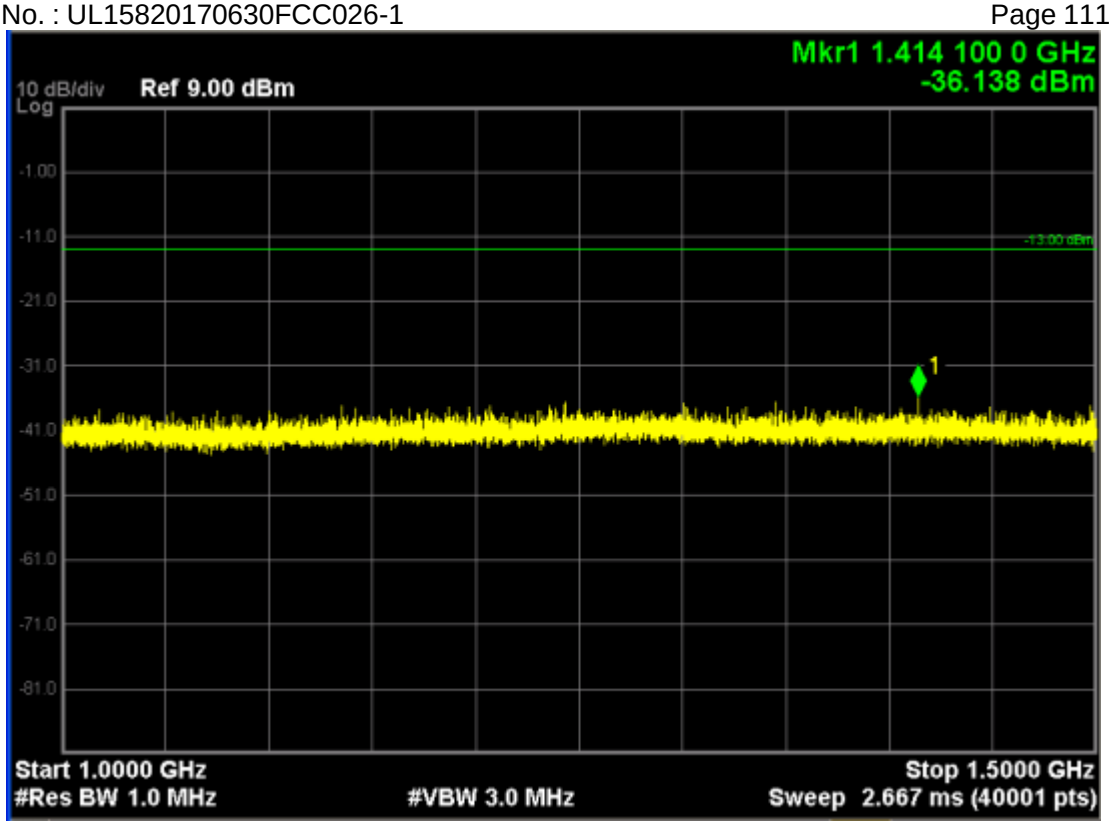

Mkr1 6.610 13 GHz
-30.608 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 9.000 GHz
Sweep 13.33 ms (40001 pts)

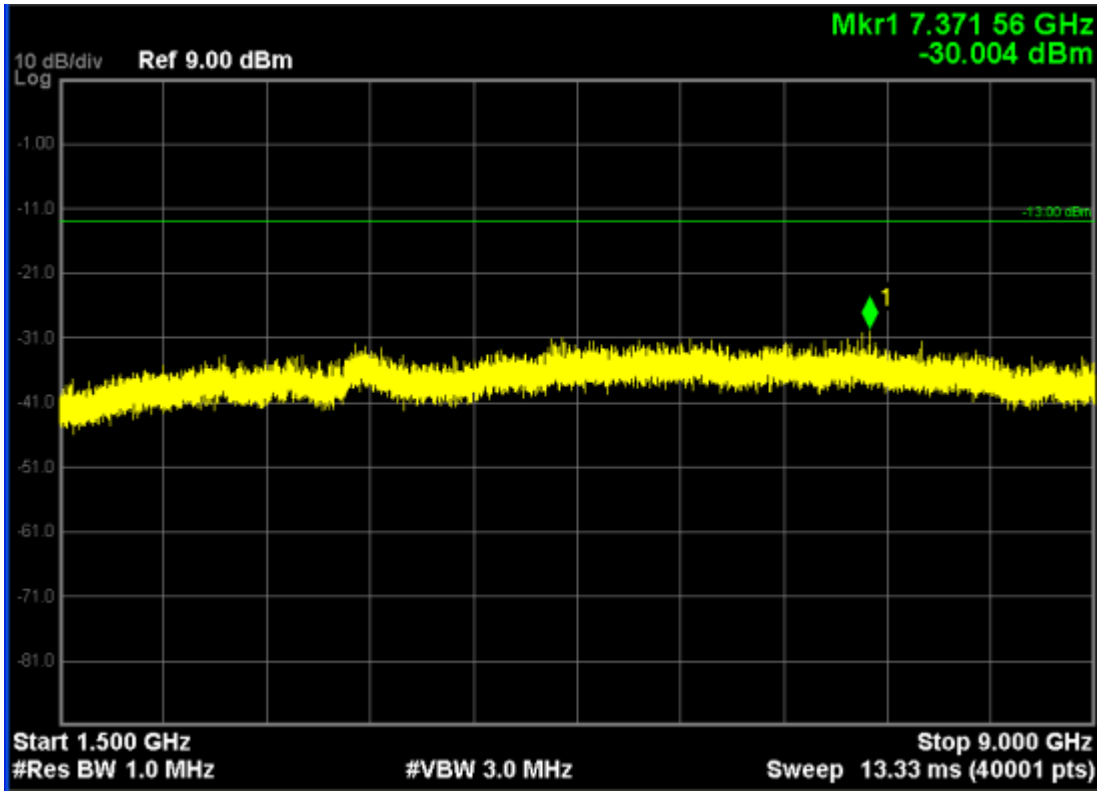
LTE Band 13 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)



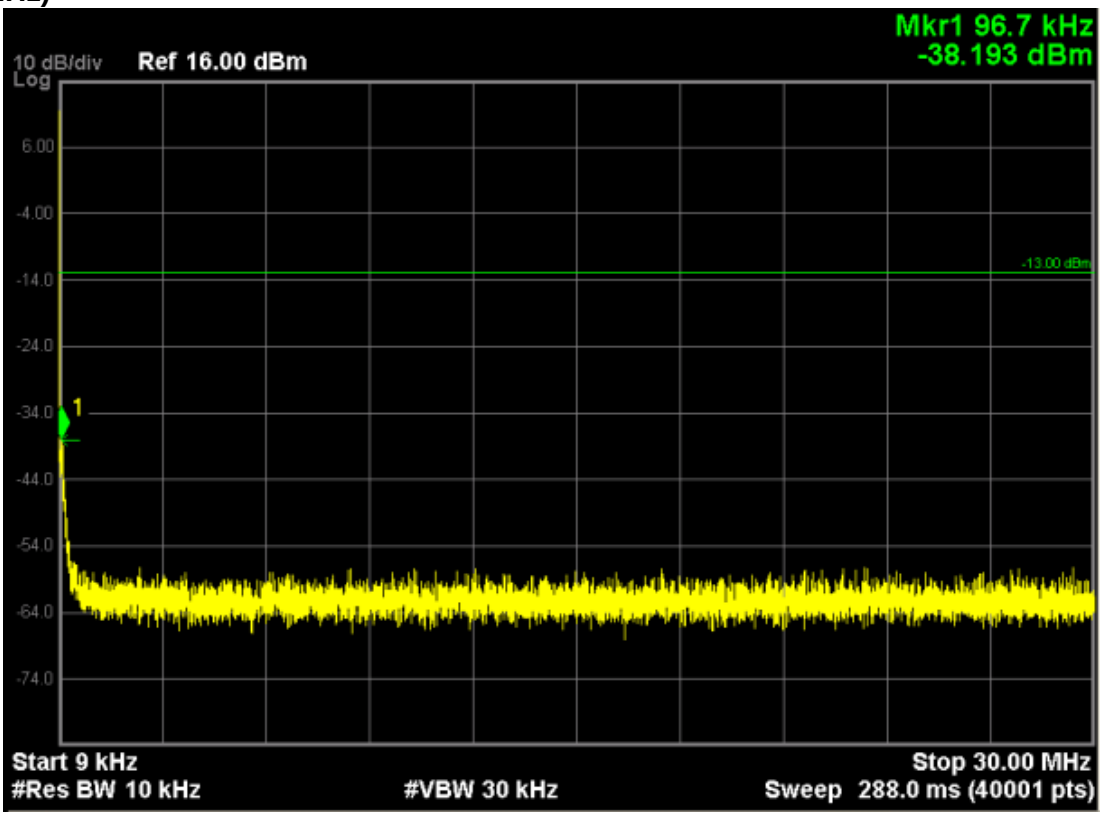


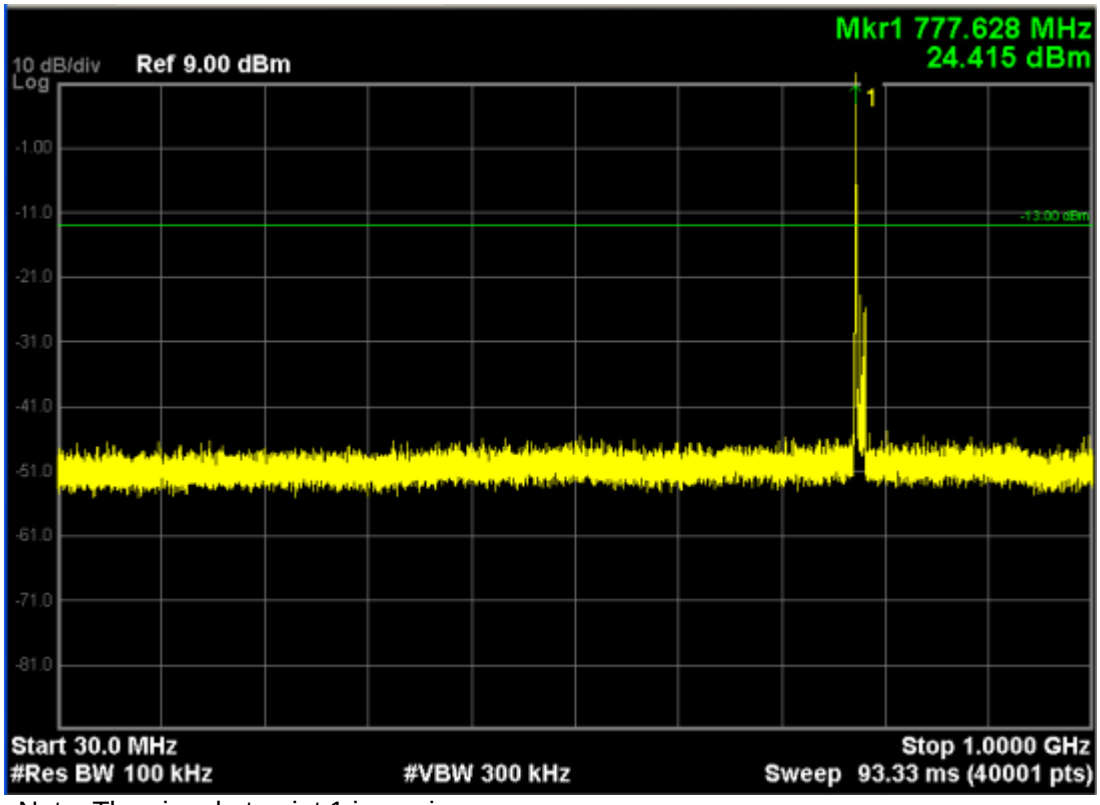
Note: The signal at point 1 is carrier


Mkr1 1.414 100 0 GHz
-36.138 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 1.5000 GHz
Sweep 2.667 ms (40001 pts)

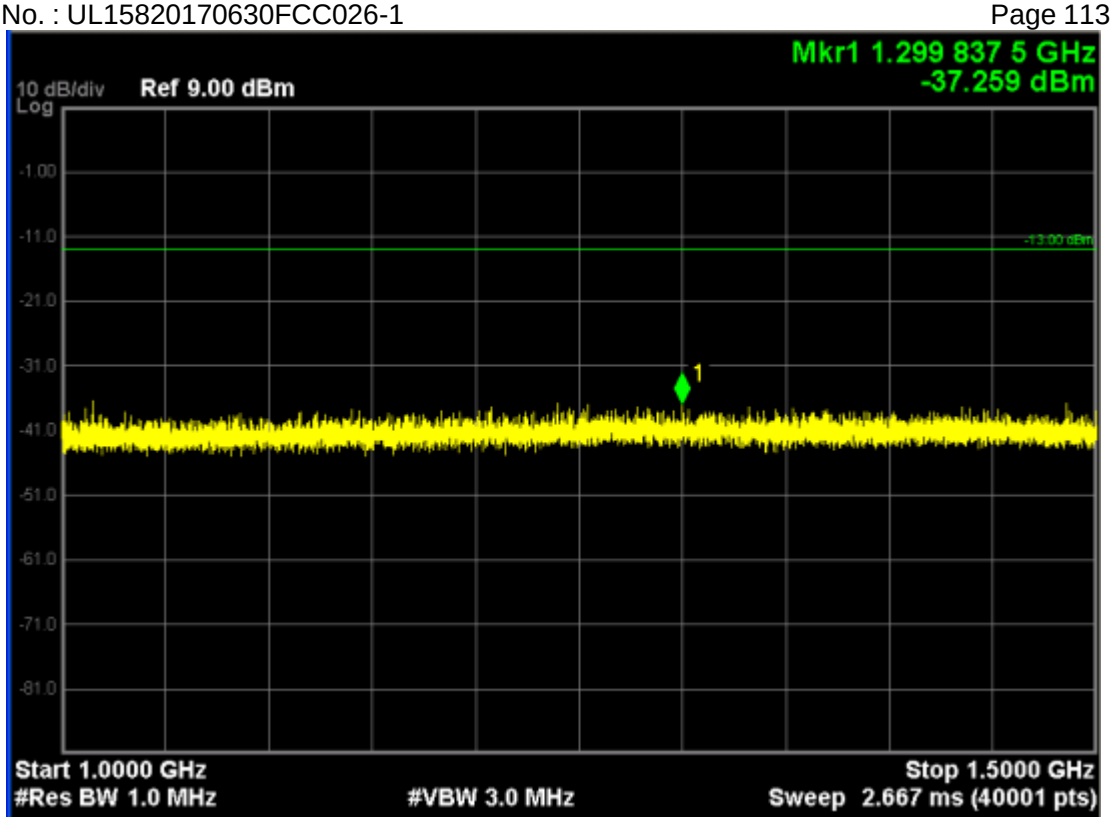

Mkr1 7.371 56 GHz
-30.004 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 9.000 GHz
Sweep 13.33 ms (40001 pts)

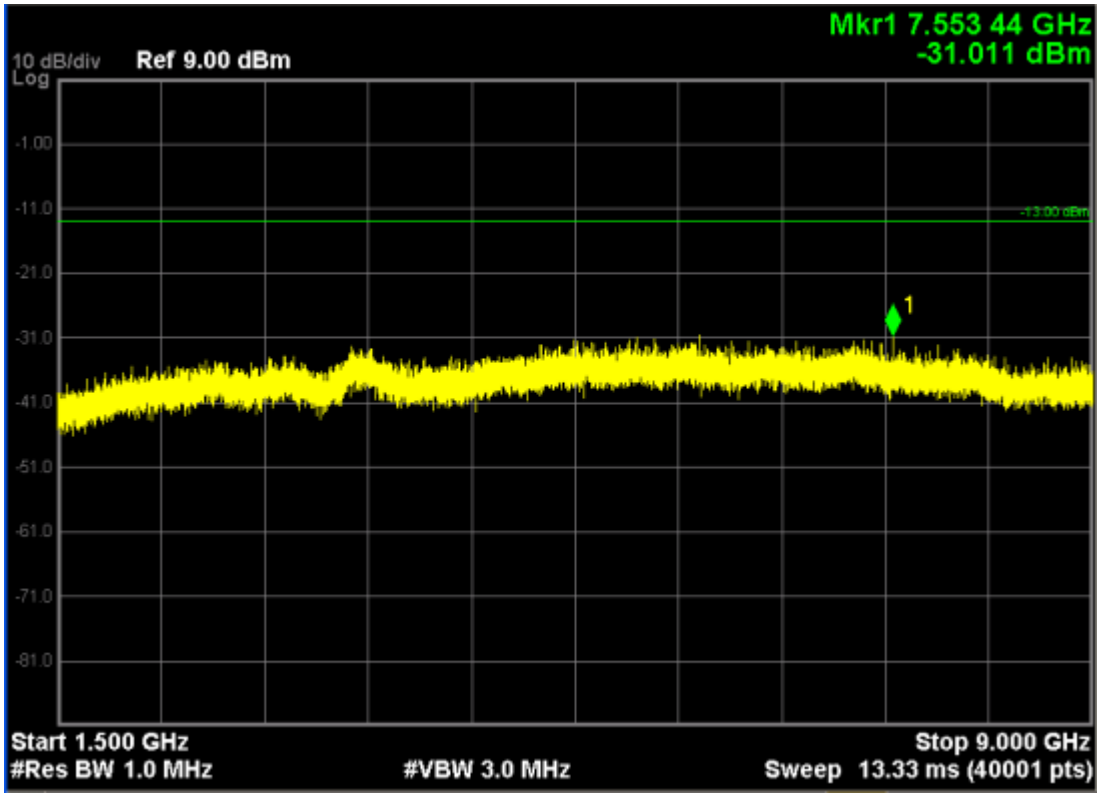
LTE Band 13 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)





Note: The signal at point 1 is carrier


Mkr1 1.299 837 5 GHz
-37.259 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 1.5000 GHz
Sweep 2.667 ms (40001 pts)


Mkr1 7.553 44 GHz
-31.011 dBm
10 dB/div
Log
Ref 9.00 dBm
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
-61.0
-71.0
-81.0
-13.00 dBm
1
Start 1.500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 9.000 GHz
Sweep 13.33 ms (40001 pts)

Radiated Spurious Measurement:

LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957,Frequeny 1710.7MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19957 (1710.7MHz)							
724.8	H	-47.32	3.42	-2.56	-53.3	-13	-40.3
724.8	V	-46.32	3.42	-2.56	-52.3	-13	-39.3

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19957 (1710.7MHz)							
3421.4	H	-48.03	8.56	11.53	-45.06	-13	-32.06
3421.4	V	-47.25	8.56	11.53	-44.28	-13	-31.28
5132.1	H	-51.29	9.68	12.8	-48.17	-13	-35.17
5132.1	V	-50.25	9.68	12.8	-47.13	-13	-34.13

LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965,Frequeny 1711.5MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19965 (1711.5MHz)							
720.7	H	-46.32	3.42	-2.56	-52.3	-13.0	-39.3
720.7	V	-45.32	3.42	-2.56	-51.3	-13.0	-38.3

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19965 (1711.5MHz)							
3423	H	-48.88	8.56	11.53	-45.91	-13.0	-32.91
3423	V	-47.36	8.56	11.53	-44.39	-13.0	-31.39
5134.5	H	-50.29	9.68	12.80	-47.17	-13.0	-34.17
5134.5	V	-49.33	9.68	12.80	-46.21	-13.0	-33.21

LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975,Frequeny1712.5MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19975 (1712.5MHz)							
730.6	H	-47.88	3.42	-2.56	-53.86	-13	-40.86
730.6	V	-46.83	3.42	-2.56	-52.81	-13	-39.81

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 19975 (1712.5MHz)							
3425	H	-48.22	8.56	11.53	-45.25	-13	-32.25
3425	V	-47.23	8.56	11.53	-44.26	-13	-31.26
5137.5	H	-50.21	9.68	12.8	-47.09	-13	-34.09
5137.5	V	-49.13	9.68	12.8	-46.01	-13	-33.01

LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1732.5MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20000 (1715MHz)							
727.3	H	-48.32	3.42	-2.56	-54.3	-13	-41.3
727.3	V	-47.25	3.42	-2.56	-53.23	-13	-40.23

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20000 (1715MHz)							
3465	H	-47.68	8.56	11.53	-44.71	-13	-31.71
3465	V	-46.58	8.56	11.53	-43.61	-13	-30.61
5197.5	H	-50.44	9.68	12.8	-47.32	-13	-34.32
5197.5	V	-49.33	9.68	12.8	-46.21	-13	-33.21

LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset0,Channel 20175,Frequeny 1732.5MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20325 (1747.5MHz)							
738.2	H	-48.26	3.42	-2.56	-54.24	-13	-41.24
738.2	V	-47.46	3.42	-2.56	-53.44	-13	-40.44

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20325 (1747.5MHz)							
3465	H	-49.24	8.56	11.53	-46.27	-13	-33.27
3465	V	-48.47	8.56	11.53	-45.5	-13	-32.5
5197.5	H	-50.45	9.68	12.8	-47.33	-13	-34.33
5197.5	V	-49.28	9.68	12.8	-46.16	-13	-33.16

LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20175,Frequeny 1732.5MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20300 (1745MHz)							
730.2	H	-48.65	3.42	-2.56	-54.63	-13	-41.63
730.2	V	-47.32	3.42	-2.56	-53.3	-13	-40.3

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 20300 (1745MHz)							
3465	H	-48.52	8.56	11.53	-45.55	-13	-32.55
3465	V	-47.15	8.56	11.53	-44.18	-13	-31.18
5197.5	H	-50.53	9.68	12.8	-47.41	-13	-34.41
5197.5	V	-49.58	9.68	12.8	-46.46	-13	-33.46

LTE Band 13 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 23230 (782.0MHz)							
738.2	H	-48.74	3.42	-2.56	-54.72	-13	-41.72
738.2	V	-47.29	3.42	-2.56	-53.27	-13	-40.27

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 23230 (782.0MHz)							
3465	H	-48.40	8.56	11.53	-45.43	-13	-32.43
3465	V	-47.31	8.56	11.53	-44.34	-13	-31.34
5197.5	H	-50.97	9.68	12.8	-47.85	-13	-34.85
5197.5	V	-49.27	9.68	12.8	-46.15	-13	-33.15

LTE Band 13 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230,Frequeny 782.0MHz)

9KHz to 30MHz

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 23230 (782.0MHz)							
730.2	H	-48.77	3.42	-2.56	-54.75	-13	-41.75
730.2	V	-47.56	3.42	-2.56	-53.54	-13	-40.54

Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 23230 (782.0MHz)							
3465	H	-48.85	8.56	11.53	-45.88	-13	-32.88
3465	V	-47.69	8.56	11.53	-44.72	-13	-31.72
5197.5	H	-50.68	9.68	12.8	-47.56	-13	-34.56
5197.5	V	-49.57	9.68	12.8	-46.45	-13	-33.45

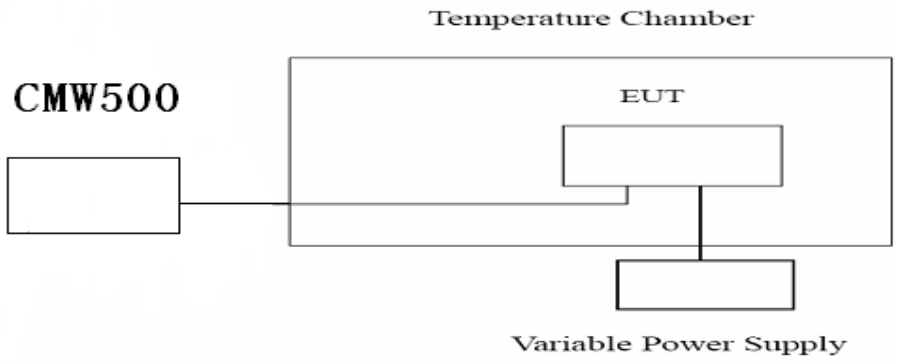
7.FrequencyStability Under Temperature &Voltage Variations

7.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
Radio Communication Tester	R&S	CMW500	147483	11/07/2017
DC Power Supply	Agilent	6612C	MY43002989	02/28/2018
Temperature Chamber	WEISS	DU/20/40	58226017340050	01/02/2018

The measure equipment had been calibrated once a year.

7.2. Test Setup



7.3. Limit

N/A

7.4. Test Procedure

1. The testing follows FCC KDB 971168 v02v02 Section 9.0;
2.Frequency Stability Under Temperature Variations:
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or CMW500. The EUT was placed inside the temperature chamber.

EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

3.Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

7.5. Uncertainty

The measurement uncertainty is defined as±10 Hz.

7.6. Test Result

LTE Band 4 (QPSK, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1710.7	-8.77	±4276.75
-20	1710.7	-6.33	±4276.75
-10	1710.7	-5.24	±4276.75
0	1710.7	-12.46	±4276.75
10	1710.7	3.59	±4276.75
20	1710.7	11.37	±4276.75
30	1710.7	7.72	±4276.75
40	1710.7	-1.53	±4276.75
50	1710.7	8.62	±4276.75

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1710.7	-3.50	±4276.75
3.8	1710.7	12.59	±4276.75
4.2	1710.7	-8.34	±4276.75

LTE Band 4 (16-QAM, Band Width 1.4MHz,RB Size 1,RB Offset 0,Channel 19957)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1710.7	8.33	±4276.75
-20	1710.7	7.18	±4276.75
-10	1710.7	-3.21	±4276.75
0	1710.7	-9.42	±4276.75
10	1710.7	-7.04	±4276.75
20	1710.7	3.68	±4276.75
30	1710.7	2.15	±4276.75
40	1710.7	-14.80	±4276.75
50	1710.7	7.59	±4276.75

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1710.7	9.52	±4276.75
3.8	1710.7	-7.72	±4276.75
4.2	1710.7	2.39	±4276.75

LTE Band 4 (QPSK, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1711.5	9.77	±4278.75
-20	1711.5	9.50	±4278.75
-10	1711.5	9.69	±4278.75
0	1711.5	-10.16	±4278.75
10	1711.5	8.60	±4278.75
20	1711.5	-14.84	±4278.75
30	1711.5	-2.83	±4278.75
40	1711.5	-12.72	±4278.75
50	1711.5	-6.96	±4278.75

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1711.5	8.12	±4278.75
3.8	1711.5	-7.56	±4278.75
4.2	1711.5	13.65	±4278.75

LTE Band 4 (16-QAM, Band Width 3MHz,RB Size 1,RB Offset 0,Channel 19965)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1711.5	6.78	±4278.75
-20	1711.5	10.03	±4278.75
-10	1711.5	-8.16	±4278.75
0	1711.5	-3.02	±4278.75
10	1711.5	4.58	±4278.75
20	1711.5	5.92	±4278.75
30	1711.5	-14.37	±4278.75
40	1711.5	-4.57	±4278.75
50	1711.5	-2.15	±4278.75

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1711.5	-6.00	±4278.75
3.8	1711.5	-4.61	±4278.75
4.2	1711.5	-3.36	±4278.75

LTE Band 4 (QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1712.5	-6.28	±4281.25
-20	1712.5	-3.29	±4281.25
-10	1712.5	-1.18	±4281.25
0	1712.5	-2.93	±4281.25
10	1712.5	11.10	±4281.25
20	1712.5	-6.30	±4281.25
30	1712.5	-14.26	±4281.25
40	1712.5	10.62	±4281.25
50	1712.5	-4.13	±4281.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1712.5	-11.49	±4281.25
3.8	1712.5	-7.05	±4281.25
4.2	1712.5	-10.86	±4281.25

LTE Band 4 (16-QAM, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 19975)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1712.5	2.58	±4281.25
-20	1712.5	3.59	±4281.25
-10	1712.5	7.49	±4281.25
0	1712.5	6.92	±4281.25
10	1712.5	-1.25	±4281.25
20	1712.5	2.09	±4281.25
30	1712.5	-9.31	±4281.25
40	1712.5	-4.77	±4281.25
50	1712.5	12.22	±4281.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1712.5	10.08	±4281.25
3.8	1712.5	9.58	±4281.25
4.2	1712.5	2.92	±4281.25

LTE Band 4 (QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20175)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1732.5	-7.32	±4331.25
-20	1732.5	-9.30	±4331.25
-10	1732.5	3.48	±4331.25
0	1732.5	-14.80	±4331.25
10	1732.5	-12.84	±4331.25
20	1732.5	2.19	±4331.25
30	1732.5	13.13	±4331.25
40	1732.5	-11.44	±4331.25
50	1732.5	-4.69	±4331.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1732.5	-4.02	±4331.25
3.8	1732.5	4.42	±4331.25
4.2	1732.5	-2.14	±4331.25

LTE Band 4 (16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 20000)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1715.0	-4.48	±4287.5
-20	1715.0	-6.16	±4287.5
-10	1715.0	7.07	±4287.5
0	1715.0	11.79	±4287.5
10	1715.0	-13.91	±4287.5
20	1715.0	8.78	±4287.5
30	1715.0	5.91	±4287.5
40	1715.0	2.74	±4287.5
50	1715.0	-9.63	±4287.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1715.0	11.96	±4287.5
3.8	1715.0	-1.09	±4287.5
4.2	1715.0	-14.64	±4287.5

LTE Band 4 (QPSK, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20175)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1732.5	5.83	±4331.25
-20	1732.5	10.10	±4331.25
-10	1732.5	7.74	±4331.25
0	1732.5	-7.49	±4331.25
10	1732.5	-12.89	±4331.25
20	1732.5	13.26	±4331.25
30	1732.5	1.38	±4331.25
40	1732.5	-2.78	±4331.25
50	1732.5	-6.93	±4331.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1732.5	14.86	±4331.25
3.8	1732.5	11.04	±4331.25
4.2	1732.5	-8.42	±4331.25

LTE Band 4 (16-QAM, Band Width 15MHz,RB Size 1,RB Offset 0,Channel 20175)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1732.5	-7.73	±4331.25
-20	1732.5	-9.14	±4331.25
-10	1732.5	-12.38	±4331.25
0	1732.5	-6.33	±4331.25
10	1732.5	14.31	±4331.25
20	1732.5	-10.57	±4331.25
30	1732.5	1.41	±4331.25
40	1732.5	8.46	±4331.25
50	1732.5	-12.97	±4331.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1732.5	-9.41	±4331.25
3.8	1732.5	-13.09	±4331.25
4.2	1732.5	3.36	±4331.25

LTE Band 4 (QPSK, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20175)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1732.5	-6.83	±4331.25
-20	1732.5	-5.75	±4331.25
-10	1732.5	-7.88	±4331.25
0	1732.5	-13.02	±4331.25
10	1732.5	-14.86	±4331.25
20	1732.5	-2.66	±4331.25
30	1732.5	7.84	±4331.25
40	1732.5	-4.62	±4331.25
50	1732.5	1.79	±4331.25

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1732.5	-4.26	±4331.25
3.8	1732.5	8.69	±4331.25
4.2	1732.5	1.12	±4331.25

LTE Band 4 (16-QAM, Band Width 20MHz,RB Size 1,RB Offset 0,Channel 20300)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	1745.0	-9.32	±4362.5
-20	1745.0	-11.99	±4362.5
-10	1745.0	-11.29	±4362.5
0	1745.0	1.04	±4362.5
10	1745.0	14.80	±4362.5
20	1745.0	-10.02	±4362.5
30	1745.0	2.63	±4362.5
40	1745.0	10.35	±4362.5
50	1745.0	-10.37	±4362.5

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	1745.0	6.53	±4362.5
3.8	1745.0	3.93	±4362.5
4.2	1745.0	-12.44	±4362.5

LTE Band 13(QPSK, Band Width 5MHz,RB Size 1,RB Offset 0,Channel 23255)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	782.0	-4.47	±1955.00
-20	782.0	-3.17	±1955.00
-10	782.0	-2.46	±1955.00
0	782.0	-0.89	±1955.00
10	782.0	0.26	±1955.00
20	782.0	-0.54	±1955.00
30	782.0	2.57	±1955.00
40	782.0	-3.67	±1955.00
50	782.0	-4.26	±1955.00

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	782.0	-3.46	±1955.00
3.8	782.0	-1.56	±1955.00
4.2	782.0	-4.25	±1955.00

LTE Band 13(16-QAM, Band Width 5MHz,RB Size 1,RB Offset 24,Channel 23230)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	779.5	-4.56	±1948.75
-20	779.5	-3.59	±1948.75
-10	779.5	-2.57	±1948.75
0	779.5	-0.89	±1948.75
10	779.5	0.57	±1948.75
20	779.5	1.32	±1948.75
30	779.5	-2.46	±1948.75
40	779.5	-3.57	±1948.75
50	779.5	-3.98	±1948.75

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	779.5	-5.46	±1948.75
3.8	779.5	-1.38	±1948.75
4.2	779.5	-3.86	±1948.75

LTE Band 13(QPSK, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	782.0	3.85	±1955.00
-20	782.0	2.47	±1955.00
-10	782.0	1.69	±1955.00
0	782.0	0.68	±1955.00
10	782.0	-0.48	±1955.00
20	782.0	-0.92	±1955.00
30	782.0	-2.43	±1955.00
40	782.0	3.86	±1955.00
50	782.0	4.28	±1955.00

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	782.0	3.12	±1955.00
3.8	782.0	1.57	±1955.00
4.2	782.0	3.19	±1955.00

LTE Band 13(16-QAM, Band Width 10MHz,RB Size 1,RB Offset 0,Channel 23230)

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-30	782.0	3.40	±1955.00
-20	782.0	3.12	±1955.00
-10	782.0	2.89	±1955.00
0	782.0	2.13	±1955.00
10	782.0	1.87	±1955.00
20	782.0	0.84	±1955.00
30	782.0	1.88	±1955.00
40	782.0	2.14	±1955.00
50	782.0	2.84	±1955.00

Frequency Stability under Voltage

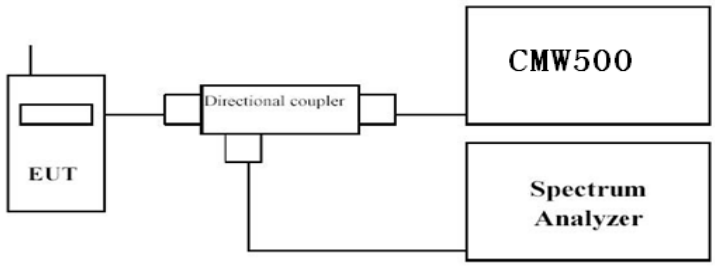
DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.4	782.0	2.58	±1955.00
3.8	782.0	1.65	±1955.00
4.2	782.0	2.35	±1955.00

8.Peak to Average

8.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	11/04/2017
Radio Communication Tester	R&S	CMW500	147483	11/07/2017
Signal Generator	Agilent	N5183A	MY50140938	01/03/2018
Preamplifier	CEM	EM30180	3008A0245	02/25/2018
DC Power Supply	Agilent	6612C	MY43002989	03/01/2018

8.2. Test Setup



8.3. Limit

In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

8.4. Test Procedure

A peak to average ratio measurement is performed at the conducted port of the EUT. For LTE signals,the spectrum analyzers Complementary Cumulative Distribution Function(CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given a bandwidth.The CCDF curve shows how much time the peak waveform spends at or above a given average power level.The percent of time the signal spends at or above the level defines the probability for that particular power level.
Procedure:
1. The testing follows FCC KDB 971168 v02v02 Section 5.7.1;
2.Place the EUT on a bench and set it in transmitting mode.
3. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by aDirectional Couple.
4.EUT Communicate with CMW500, then select a channel for testing.
5.Add a correction factor to the display of spectrum, and then test.
6. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

8.5. Uncertainty

The measurement uncertainty is defined as ±1.2 dB.

8.6. Test Result

Band	Band Width (MHz)	Channel	Frequency (MHz)	Modulation	RB Configuration		Test Result	Limit (dB)
					RB Size	RB Offset		
LTE Band 13	5	23205	779.5	QPSK	1	0	1.98	13
		23205	779.5	16-QAM	1	0	2.36	13
		23230	782.0	QPSK	1	0	2.08	13
		23230	782.0	16-QAM	1	24	2.42	13
		23255	784.5	QPSK	1	0	1.94	13
		23255	784.5	16-QAM	8	17	1.99	13
	10	23230	782.0	QPSK	1	0	1.88	13
		23230	782.0	16-QAM	1	0	1.80	13
LTE Band 4	1.4	19957	1710.7	QPSK	1	0	6.78	13
		19957	1710.7	16-QAM	1	0	6.50	13
	3	19965	1711.5	QPSK	1	0	6.40	13
		19965	1711.5	16-QAM	1	0	7.31	13
	5	19975	1712.5	QPSK	1	0	5.81	13
		19975	1712.5	16-QAM	1	0	6.59	13
	10	20175	1732.5	QPSK	1	0	6.39	13
		20000	1715.0	16-QAM	1	0	6.65	13
	15	20175	1732.5	QPSK	1	0	7.14	13
		20175	1732.5	16-QAM	1	0	7.62	13
	20	20175	1732.5	QPSK	1	0	6.79	13
		20300	1745.0	16-QAM	1	0	6.82	13

9. Attachment

PHOTOGRAPHS OF TEST SETUP

Please refer to the file named “Test Setup Photos”.

PHOTOGRAPHS OF EUT

Please refer to the two files named “External Photos” and “Internal Photos”.

----End of the report----