FCC Test Report

(PART 27)

Report No.:	RF151005D01-4
FCC ID:	P279962MSEC
Test Model:	9962 Multi-Standard Enterprise Cell
Series Model:	9962 Multi-Standard Enterprise Cellxxxxx (where “x” is blank, number or any characters)
Received Date:	Oct. 5, 2015
Test Date:	Oct. 22 ~ 29, 2015
Issued Date:	Nov. 19, 2015
Applicant:	Sercomm Corp.
Address:	8F, No. 3-1, YuangQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF151005D01-4	Original release.	Nov. 19, 2015

1 Certificate of Conformity

Product:	9962 Multi-Standard AP; Metro Cell Indoor
Brand:	Alcatel-Lucent
Test Model:	9962 Multi-Standard Enterprise Cell
Series Model:	9962 Multi-Standard Enterprise Cellxxxxx (where "x" is blank, number or any characters)
Sample Status:	Engineering sample
Applicant:	Sercomm Corp.
Test Date:	Oct. 22 ~ 29, 2015
Standards:	FCC Part 27

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Annie Chang , **Date:** Nov. 19, 2015

Annie Chang / Senior Specialist

Approved by : Rex. Lai , **Date:** Nov. 19, 2015

Rex Lai / Assistant Manager

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(h)(2)	Equivalent Isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak to average ratio	PASS	Meet the requirement of limit.
2.1049 27.53(m)(6)	Emission Bandwidth	PASS	Meet the requirement of limit.
2.1051 27.53(m)(4)(6)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(m)(4)(6)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(m)(4)(6)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -4.74dB at 30.07MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	4.00 dB
Radiated Emissions above 1 GHz	3.36 dB

2.2 Test Site And Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 26, 2015	Feb. 25, 2016
HP Preamplifier	8449B	3008A01201	Feb. 26, 2015	Feb. 25, 2016
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Mar. 01, 2015	Feb. 28, 2016
Agilent Spectrum	E4446A	MY51100009	May 30, 2015	May 29, 2016
Agilent TEST RECEIVER	N9038A	MY51210129	Jan. 20, 2015	Jan. 19, 2016
Schwarzbeck Antenna	VULB 9168	139	Feb. 04, 2015	Feb. 03, 2016
Schwarzbeck Antenna	VHBA 9123	480	May 29, 2015	May 28, 2017
Schwarzbeck Horn Antenna	BBHA-9170	212	Feb. 09, 2015	Feb. 08, 2016
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Feb. 10, 2015	Feb. 09, 2016
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.4	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF104	CABLE-CH6	Aug. 15, 2015	Aug. 14, 2016
SUHNER RF cable With 3dB PAD	SF102	Cable-CH8-3.6m	Aug. 15, 2015	Aug. 14, 2016
EMCO Horn Antenna	3115	00028257	Feb. 05, 2015	Feb. 04, 2016
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2015	Sep. 22, 2016
Anritsu Power Sensor	MA2411B	0738404	Apr. 21, 2015	Apr. 20, 2016
Anritsu Power Meter	ML2495A	0842014	Apr. 21, 2015	Apr. 20, 2016
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 14, 2015	Jul. 13, 2016

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

3 General Information

3.1 General Description of EUT

Product	9962 Multi-Standard AP; Metro Cell Indoor	
Brand	Alcatel-Lucent	
Test Model	9962 Multi-Standard Enterprise Cell	
Series Model	9962 Multi-Standard Enterprise Cellxxxxx (where “x” is blank, number or any characters)	
Model Difference	Marketing purpose	
Status of EUT	Engineering sample	
Power Supply Rating	48Vdc from Adapter or 55Vdc from PoE	
Modulation Type	LTE	
Modulation Technology	QPSK, 16QAM, 64QAM	
Operating Frequency	**LTE Band 4 (Channel Bandwidth 5MHz)**	2112.5~2152.5MHz
	LTE Band 4 (Channel Bandwidth 10MHz)	2115.0~2150.0MHz
	LTE Band 4 (Channel Bandwidth 15MHz)	2117.5~2147.5MHz
	LTE Band 4 (Channel Bandwidth 20MHz)	2120.0~2145.0MHz
	LTE Band 12 (Channel Bandwidth 5MHz)	731.5~742.5MHz
	LTE Band 12 (Channel Bandwidth 10MHz)	734.0~740.0MHz
Max. EIRP Power	**LTE Band 4 (Channel Bandwidth 5MHz)**	426.58mW
	LTE Band 4 (Channel Bandwidth 10MHz)	575.44mW
	LTE Band 4 (Channel Bandwidth 15MHz)	479.73mW
	LTE Band 4 (Channel Bandwidth 20MHz)	414.95mW
Max. ERP Power	**LTE Band 12 (Channel Bandwidth 5MHz)**	311.89mW
	LTE Band 12 (Channel Bandwidth 10MHz)	422.67mW

Emission Designator	**LTE Band 4 (Channel Bandwidth 5MHz)**	QPSK: 4M43G7D, 16QAM: 4M43W7D, 64QAM: 4M43W7D
	LTE Band 4 (Channel Bandwidth 10MHz)	QPSK: 8M93G7D, 16QAM: 8M93W7D, 64QAM: 8M93W7D
	LTE Band 4 (Channel Bandwidth 15MHz)	QPSK: 13M3G7D, 16QAM: 13M4W7D, 64QAM: 13M4W7D
	LTE Band 4 (Channel Bandwidth 20MHz)	QPSK: 17M9G7D, 16QAM: 17M9W7D, 64QAM: 17M9W7D
	LTE Band 12 (Channel Bandwidth 5MHz)	QPSK: 4M43G7D, 16QAM: 4M42W7D, 64QAM: 4M43W7D
	LTE Band 12 (Channel Bandwidth 10MHz)	QPSK: 8M90G7D, 16QAM: 8M93W7D, 64QAM: 8M93W7D
Antenna Type	**LTE Band 4**	Dipole Antenna with 2.34dBi gain
	LTE Band 12	Dipole Antenna with 3.64dBi gain
Antenna Connector	SMA Connector	
Accessory Device	Adapter, PoE	
Data Cable Supplied	GPS cable (10m)	

Note:

1. The EUT uses following adapter or PoE:

Item	Brand	Model No.	Rating
Adapter 1	AmpowerTek	AU60AA-00	AC I/P: 100-240V, 50-60Hz, 1.5A DC O/P: 48V, 1.25A Non-shielded AC 3-Pin cable (1.5m) Non-shielded DC cable (1.2m) with one ferrite core
Adapter 2	LEI	NU60-S48012 5-I2	AC I/P: 100-240V, 50-60Hz, 1.4A DC O/P: 48V, 1.25A Non-shielded AC 3-Pin cable (1.5m) Non-shielded DC cable (1.2m) with one ferrite core
PoE	Microsemi	PD-9601G/AC	AC I/P: 100-240V, 50-60Hz, 1.35A DC O/P: 55V, 1.75A

After pre-tested, adapter 1 was the worst case, therefore, only its test data was recorded in the report.

2. SW version is V1.4.0.1.

3. HW version is D01_W.

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

LTE Band 4

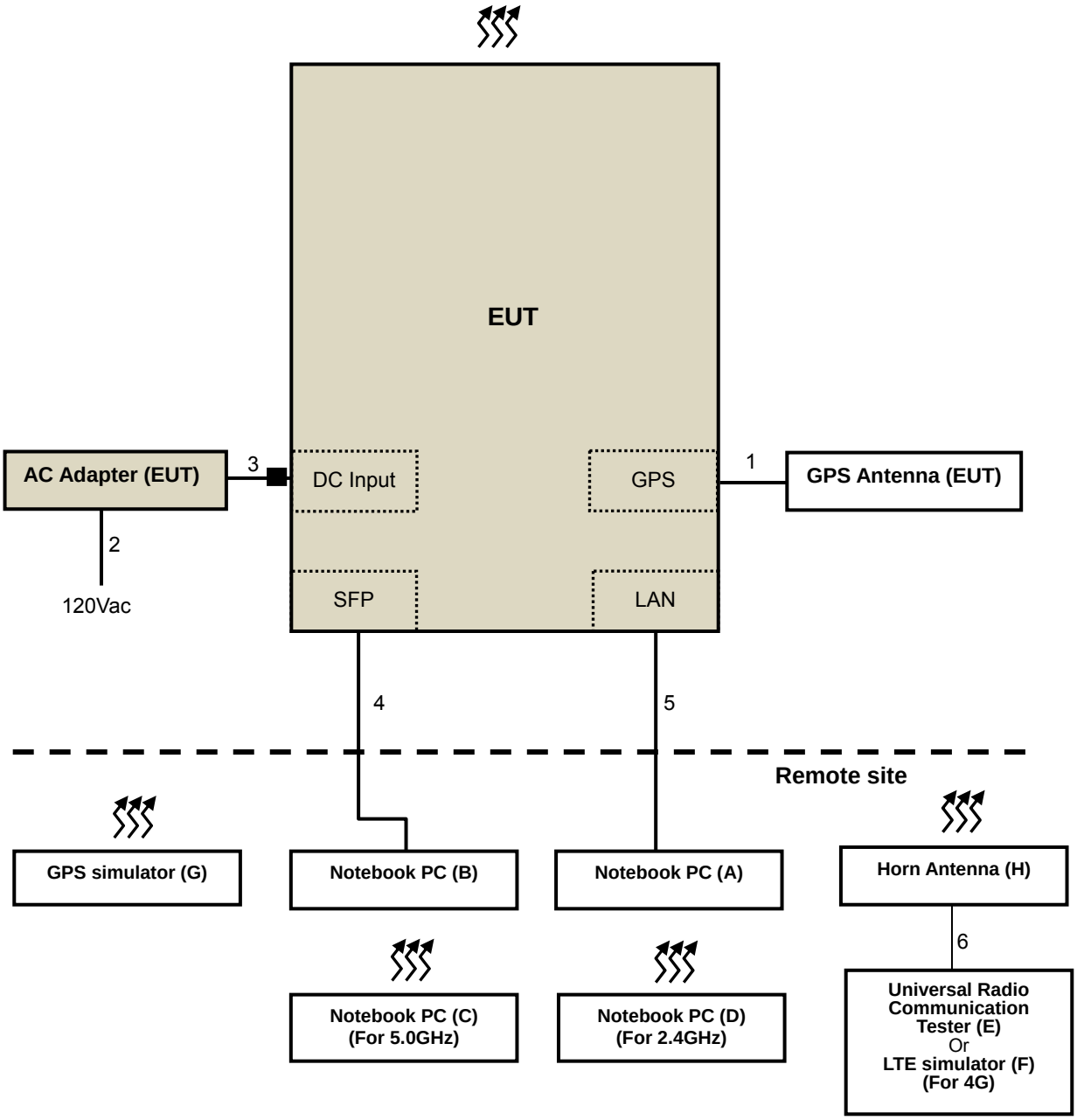
Channel Bandwidth (MHz)	Channel	Frequency (MHz)
5	Low	2112.5
	Middle	2132.5
	High	2152.5
10	Low	2115.0
	Middle	2132.5
	High	2150.0
15	Low	2117.5
	Middle	2132.5
	High	2147.5
20	Low	2120.0
	Middle	2132.5
	High	2145.0

LTE Band 12

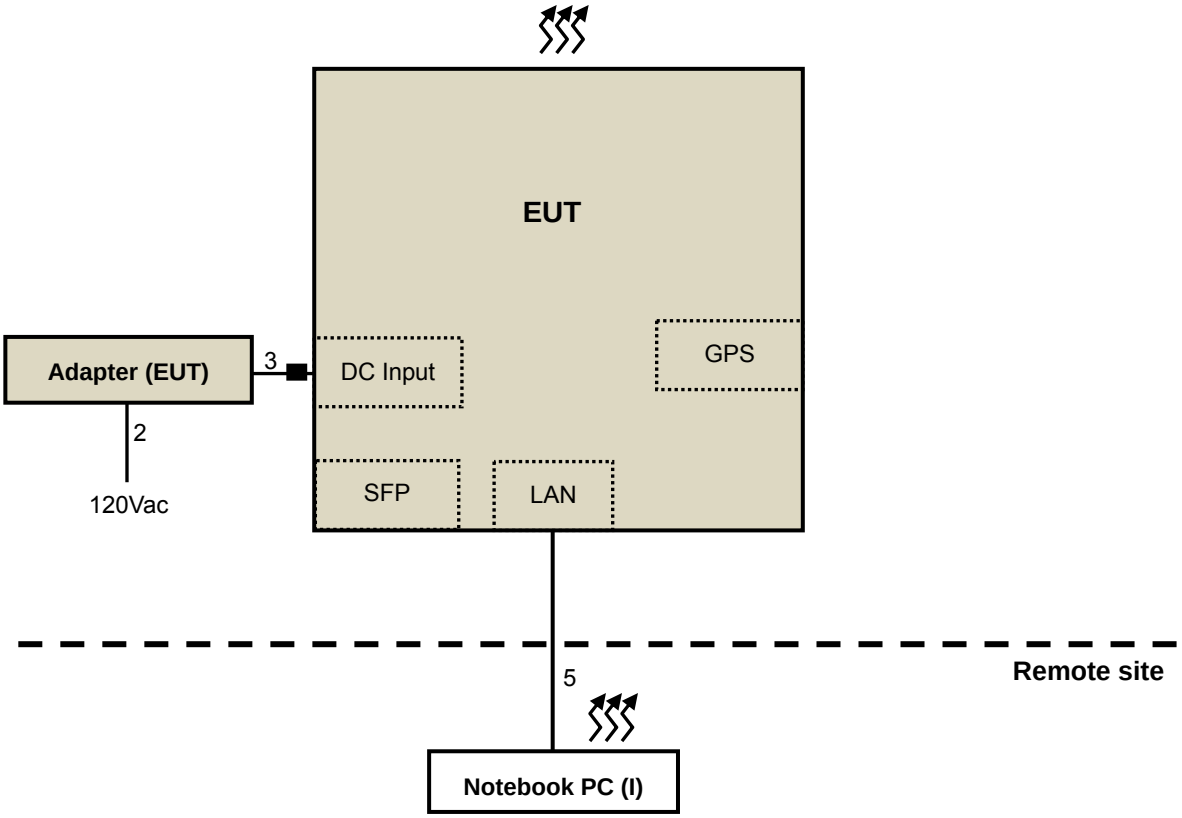
Channel Bandwidth (MHz)	Channel	Frequency (MHz)
5	Low	731.5
	Middle	737.0
	High	742.5
10	Low	734.0
	Middle	737.0
	High	740.0

3.3 Configuration of System Under Test

For Radiated up to1GHz test:



For Radiated above 1GHz test:



3.3.1 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook PC	DELL	PP04X	JV9ZZ1S	FCC DoC Approved	Provided by Lab
B.	Notebook PC	DELL	PP04X	1W9ZZ1S	FCC DoC Approved	Provided by Lab
C.	Notebook PC	SONY	SVS151A12P	275548477001024	FCC DoC Approved	Provided by Lab
D.	Notebook PC	SONY	SVS151A12P	275548477001087	FCC DoC Approved	Provided by Lab
E.	Universal Radio Communication Tester	R&S	CMU200	117260	N/A	Provided by Lab
F.	LTE simulator	Anritsu	LTE Band 11 & 18	N/A	N/A	Provided by Lab
G.	GPS simulator	PENDULUM	GSG-5	200447	N/A	Provided by Lab
H.	HORN Antenna	ETS	3117	00123980	N/A	Provided by Lab
I.	Notebook PC	DELL	E6530	9331GV1	FCC DoC Approved	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A~lacted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Antenna cable	1	8	Y	0	Supplied by client
2.	AC Power Cord	1	1.5	N	0	Supplied by client
3.	DC cable	1	1.2	N	1	Supplied by client
4.	SFP to LAN cable	1	10	N	0	Provided by Lab
5.	LAN cable	2	10	N	0	Provided by Lab
6.	Coaxial cable	1	10	Y	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

3.4 Test Mode Applicability and Tested Channel Detail

Following channel(s) was (were) selected for the final test as listed below:

Test Item	LTE Band	Available Frequency	Tested Frequency	Channel Bandwidth	Modulation
Output Power	Band 4	2112.5 to 2152.5	2115.5, 2132.5, 2152.5	5MHz	QPSK, 16QAM, 64QAM
		2115.0 to 2150.0	2115.0, 2132.5, 2150.0	10MHz	
		2117.5 to 2147.5	2117.5, 2132.5, 2147.5	15MHz	
		2120.0 to 2145.0	2120.0, 2132.5, 2145.0	20MHz	
	Band 12	731.5 to 742.5	731.5, 737.0, 742.5	5MHz	
		734.0 to 740.0	734.0, 737.0, 740.0	10MHz	
Frequency Stability	Band 4	2112.5 to 2152.5	2115.5	5MHz	-
Emission Bandwidth	Band 4	2112.5 to 2152.5	2115.5, 2132.5, 2152.5	5MHz	QPSK, 16QAM, 64QAM
		2115.0 to 2150.0	2115.0, 2132.5, 2150.0	10MHz	
		2117.5 to 2147.5	2117.5, 2132.5, 2147.5	15MHz	
		2120.0 to 2145.0	2120.0, 2132.5, 2145.0	20MHz	
	Band 12	731.5 to 742.5	731.5, 737.0, 742.5	5MHz	
		734.0 to 740.0	734.0, 737.0, 740.0	10MHz	
Peak To Average Ratio	Band 4	2112.5 to 2152.5	2115.5, 2132.5, 2152.5	5MHz	QPSK, 16QAM, 64QAM
		2115.0 to 2150.0	2115.0, 2132.5, 2150.0	10MHz	
		2117.5 to 2147.5	2117.5, 2132.5, 2147.5	15MHz	
		2120.0 to 2145.0	2120.0, 2132.5, 2145.0	20MHz	
	Band 12	731.5 to 742.5	731.5, 737.0, 742.5	5MHz	
		734.0 to 740.0	734.0, 737.0, 740.0	10MHz	
Band Edge	Band 4	2112.5 to 2152.5	2115.5, 2152.5	5MHz	QPSK, 16QAM, 64QAM
		2115.0 to 2150.0	2115.0, 2150.0	10MHz	
		2117.5 to 2147.5	2117.5, 2147.5	15MHz	
		2120.0 to 2145.0	2120.0, 2145.0	20MHz	
	Band 12	731.5 to 742.5	731.5, 742.5	5MHz	
		734.0 to 740.0	734.0, 740.0	10MHz	
Conducted Emission	Band 4	2112.5 to 2152.5	2115.5, 2132.5, 2152.5	5MHz	QPSK, 16QAM, 64QAM
		2115.0 to 2150.0	2115.0, 2132.5, 2150.0	10MHz	
		2117.5 to 2147.5	2117.5, 2132.5, 2147.5	15MHz	
		2120.0 to 2145.0	2120.0, 2132.5, 2145.0	20MHz	
	Band 12	731.5 to 742.5	731.5, 737.0, 742.5	5MHz	
		734.0 to 740.0	734.0, 737.0, 740.0	10MHz	
Radiated Emission Below 1GHz	Band 4	2115.0 to 2150.0	2150.0	10MHz	16QAM
	Band 12	734.0 to 740.0	740.0	10MHz	
Radiated Emission Above 1GHz	Band 4	2115.0 to 2150.0	2115.0, 2132.5, 2150.0	10MHz	16QAM
	Band 12	734.0 to 740.0	734.0, 737.0, 740.0	10MHz	

NOTE:

1. For radiated emission below 1 GHz, the low, mid and high channels were pre-tested in chamber. The high channel was the worst case and chosen for final test.
2. Select the worst mode from conducted output power of band 4 & 12. Therefore, RADIATED EMISSION was performed under QPSK mode for band 4 and 64QAM mode for band 12.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Output Power	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Frequency Stability	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Emission Bandwidth	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Peak To Average Ratio	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Band Edge	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Conducted Emission	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Condcudeted Emission	18deg. C, 71%RH	120Vac, 60Hz	Aaron You
Radiated Emission	18deg. C, 71%RH	120Vac, 60Hz	Aaron You

3.5 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.6 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-C 2004

NOTE: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for WCDMA mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

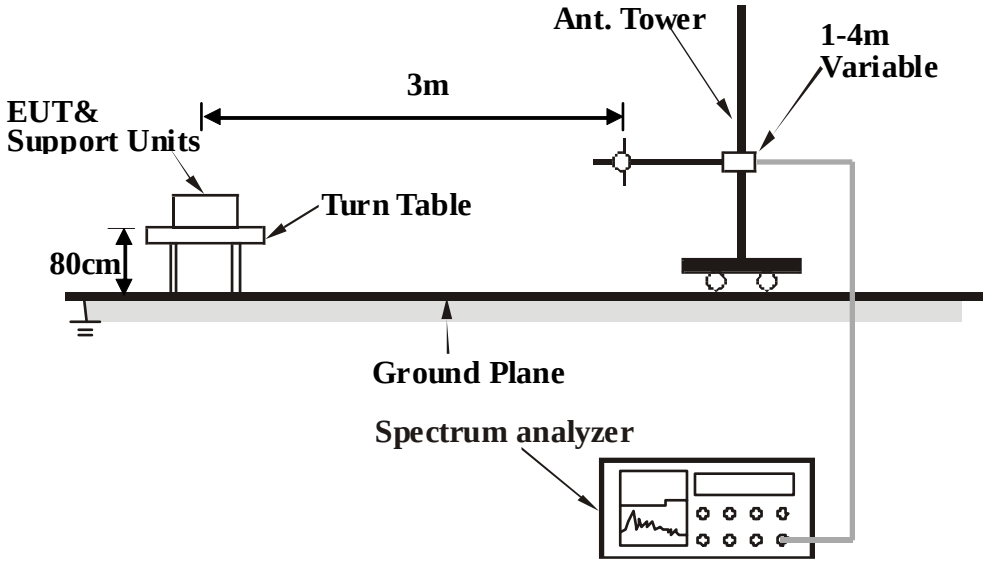
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

Conducted Power Measurement:

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.1.3 Test Setup

EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

CONDUCTED OUTPUT POWER (dBm)

LTE Band 4 (Channel Bandwidth 5MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2112.5	23.09	24.21	26.70	23.14	23.88	26.54	23.08	23.83	26.48
2132.5	23.51	23.86	26.70	23.56	23.90	26.74	23.52	23.82	26.68
2152.5	23.06	23.09	26.09	23.15	23.14	26.16	23.09	23.09	26.10

LTE Band 4 (Channel Bandwidth 10MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2115.0	24.22	24.85	27.56	23.88	24.37	27.14	23.84	24.29	27.08
2132.5	24.02	24.39	27.22	23.97	24.41	27.21	24.00	24.35	27.19
2150.0	23.58	23.59	26.60	23.61	23.64	26.64	23.58	23.56	26.58

LTE Band 4 (Channel Bandwidth 15MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2117.5	23.96	24.32	27.15	22.84	23.02	25.94	23.14	23.28	26.22
2132.5	23.89	24.13	27.02	22.59	22.85	25.73	23.01	23.13	26.08
2147.5	24.30	24.08	27.20	22.92	22.77	25.86	23.21	23.17	26.20

LTE Band 4 (Channel Bandwidth 20MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
2120.0	23.81	23.84	26.84	22.76	22.77	25.78	22.93	22.76	25.86
2132.5	23.85	23.86	26.87	22.72	22.91	25.83	22.70	22.82	25.77
2145.0	23.58	23.51	26.56	22.68	22.49	25.60	22.67	22.34	25.52

LTE Band 12 (Channel Bandwidth 5MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
731.5	22.34	22.35	25.36	23.86	23.77	26.83	23.75	23.65	26.71
737.0	23.59	23.66	26.64	23.65	23.72	26.70	23.54	23.68	26.62
742.5	23.68	23.71	26.71	23.74	23.77	26.77	23.63	23.71	26.68

LTE Band 12 (Channel Bandwidth 10MHz):

Frequency (MHz)	CONDUCTED OUTPUT POWER (dBm)								
	QPSK			16QAM			64QAM		
	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total	Chain 0	Chain 1	Total
734.0	23.68	23.78	26.74	23.71	23.81	26.77	23.62	23.76	26.70
737.0	24.00	24.16	27.09	24.03	24.20	27.13	23.98	24.14	27.07
740.0	25.10	25.21	28.17	25.08	25.23	28.17	25.06	25.19	28.14

EIRP Power (dBm)

LTE Band 4 (Channel Bandwidth 5MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2112.5	9.64	12.44	22.08	161.44	30.00	-7.92
2	2132.5	9.30	12.49	21.79	151.01	30.00	-8.21
3	2152.5	8.58	12.56	21.14	130.02	30.00	-8.86
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.5	13.41	12.44	25.85	384.59	30.00	-4.15
2	2132.5	13.68	12.49	26.17	414.00	30.00	-3.83
3	2152.5	13.33	12.56	25.89	388.15	30.00	-4.11

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 5MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.5	9.68	12.44	22.12	162.93	30.00	-7.88
2	2132.5	9.48	12.49	21.97	157.40	30.00	-8.03
3	2152.5	9.12	12.56	21.68	147.23	30.00	-8.32
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.5	13.66	12.44	26.1	407.38	30.00	-3.90
2	2132.5	13.81	12.49	26.3	**426.58**	30.00	-3.70
3	2152.5	13.14	12.56	25.7	371.54	30.00	-4.30

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 5MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.5	9.56	12.44	22.00	158.49	30.00	-8.00
2	2132.5	9.15	12.49	21.64	145.88	30.00	-8.36
3	2152.5	8.58	12.56	21.14	130.02	30.00	-8.86
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.5	12.91	12.44	25.35	342.77	30.00	-4.65
2	2132.5	13.65	12.49	26.14	411.15	30.00	-3.86
3	2152.5	12.84	12.56	25.40	346.74	30.00	-4.60

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 10MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	9.01	12.44	21.45	139.64	30.00	-8.55
2	2132.5	9.57	12.49	22.06	160.69	30.00	-7.94
3	2150.0	8.64	12.56	21.20	131.83	30.00	-8.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	15.16	12.44	27.60	**575.44**	30.00	-2.40
2	2132.5	14.91	12.49	27.40	549.54	30.00	-2.60
3	2150.0	14.29	12.56	26.85	484.17	30.00	-3.15

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 10MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	9.18	12.44	21.62	145.21	30.00	-8.38
2	2132.5	9.06	12.49	21.55	142.89	30.00	-8.45
3	2150.0	9.34	12.56	21.90	154.88	30.00	-8.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	14.00	12.44	26.44	440.55	30.00	-3.56
2	2132.5	15.09	12.49	27.58	572.80	30.00	-2.42
3	2150.0	13.24	12.56	25.80	380.19	30.00	-4.20

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 10MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	9.65	12.44	22.09	161.81	30.00	-7.91
2	2132.5	9.05	12.49	21.54	142.56	30.00	-8.46
3	2150.0	9.86	12.56	22.42	174.58	30.00	-7.58
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2115.0	14.09	12.44	26.53	449.78	30.00	-3.47
2	2132.5	14.53	12.49	27.02	503.50	30.00	-2.98
3	2150.0	13.24	12.56	25.80	380.19	30.00	-4.20

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 15MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	7.79	12.44	20.23	105.44	30.00	-9.77
2	2132.5	7.30	12.49	19.79	95.28	30.00	-10.21
3	2147.5	7.26	12.56	19.82	95.94	30.00	-10.18
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	14.28	12.44	26.72	469.89	30.00	-3.28
2	2132.5	13.96	12.49	26.45	441.57	30.00	-3.55
3	2147.5	14.25	12.56	26.81	**479.73**	30.00	-3.19

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 15MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	7.64	12.44	20.08	101.86	30.00	-9.92
2	2132.5	7.34	12.49	19.83	96.16	30.00	-10.17
3	2147.5	7.21	12.56	19.77	94.84	30.00	-10.23
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	12.71	12.44	25.15	327.34	30.00	-4.85
2	2132.5	12.58	12.49	25.07	321.37	30.00	-4.93
3	2147.5	12.55	12.56	25.11	324.34	30.00	-4.89

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 15MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	7.31	12.44	19.75	94.41	30.00	-10.25
2	2132.5	6.32	12.49	18.81	76.03	30.00	-11.19
3	2147.5	6.09	12.56	18.65	73.28	30.00	-11.35
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2117.5	13.38	12.44	25.82	381.94	30.00	-4.18
2	2132.5	12.68	12.49	25.17	328.85	30.00	-4.83
3	2147.5	12.87	12.56	25.43	349.14	30.00	-4.57

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 20MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	5.95	12.44	18.39	69.02	30.00	-11.61
2	2132.5	6.37	12.49	18.86	76.91	30.00	-11.14
3	2145.0	5.60	12.56	18.16	65.46	30.00	-11.84
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	13.59	12.44	26.03	400.87	30.00	-3.97
2	2132.5	13.69	12.49	26.18	**414.95**	30.00	-3.82
3	2145.0	13.49	12.56	26.05	402.72	30.00	-3.95

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 20MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	5.68	12.44	18.12	64.86	30.00	-11.88
2	2132.5	5.71	12.49	18.20	66.07	30.00	-11.80
3	2145.0	5.61	12.56	18.17	65.61	30.00	-11.83
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	12.70	12.44	25.14	326.59	30.00	-4.86
2	2132.5	12.77	12.49	25.26	335.74	30.00	-4.74
3	2145.0	12.54	12.56	25.10	323.59	30.00	-4.90

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4 (Channel Bandwidth 20MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	5.83	12.44	18.27	67.14	30.00	-11.73
2	2132.5	5.60	12.49	18.09	64.42	30.00	-11.91
3	2145.0	6.17	12.56	18.73	74.64	30.00	-11.27
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Margin (dB)
1	2120.0	12.82	12.44	25.26	335.74	30.00	-4.74
2	2132.5	12.83	12.49	25.32	340.41	30.00	-4.68
3	2145.0	12.52	12.56	25.08	322.11	30.00	-4.92

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 5MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	6.82	12.44	19.26	84.33	30.00	-10.74
2	737.0	9.03	12.49	21.52	141.91	30.00	-8.48
3	742.5	8.32	12.56	20.88	122.46	30.00	-9.12
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	11.67	12.44	24.11	257.63	30.00	-5.89
2	737.0	11.05	12.49	23.54	225.94	30.00	-6.46
3	742.5	12.26	12.56	24.82	303.39	30.00	-5.18

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 5MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	8.23	12.44	20.67	116.68	30.00	-9.33
2	737.0	7.99	12.49	20.48	111.69	30.00	-9.52
3	742.5	7.50	12.56	20.06	101.39	30.00	-9.94
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	12.50	12.44	24.94	**311.89**	30.00	-5.06
2	737.0	11.74	12.49	24.23	264.85	30.00	-5.77
3	742.5	11.42	12.56	23.98	250.03	30.00	-6.02

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 5MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	8.24	12.44	20.68	116.95	30.00	-9.32
2	737.0	7.82	12.49	20.31	107.40	30.00	-9.69
3	742.5	6.25	12.56	18.81	76.03	30.00	-11.19
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	731.5	10.95	12.44	23.39	218.27	30.00	-6.61
2	737.0	11.03	12.49	23.52	224.91	30.00	-6.48
3	742.5	11.52	12.56	24.08	255.86	30.00	-5.92

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 10MHz): QPSK

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	7.81	12.44	20.25	105.93	30.00	-9.75
2	737.0	8.19	12.49	20.68	116.95	30.00	-9.32
3	740.0	7.02	12.56	19.58	90.78	30.00	-10.42
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	12.06	12.44	24.50	281.84	30.00	-5.50
2	737.0	13.11	12.49	25.60	363.08	30.00	-4.40
3	740.0	12.63	12.56	25.19	330.37	30.00	-4.81

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 10MHz): 16QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	6.49	12.44	18.93	78.16	30.00	-11.07
2	737.0	8.79	12.49	21.28	134.28	30.00	-8.72
3	740.0	6.95	12.56	19.51	89.33	30.00	-10.49
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	12.70	12.44	25.14	326.59	30.00	-4.86
2	737.0	12.65	12.49	25.14	326.59	30.00	-4.86
3	740.0	12.46	12.56	25.02	317.69	30.00	-4.98

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12 (Channel Bandwidth 10MHz): 64QAM

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	6.93	12.44	19.37	86.50	30.00	-10.63
2	737.0	8.15	12.49	20.64	115.88	30.00	-9.36
3	740.0	8.90	12.56	21.46	139.96	30.00	-8.54
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Limit (dBm)	Margin (dB)
1	734.0	13.82	12.44	26.26	**422.67**	30.00	-3.74
2	737.0	13.38	12.49	25.87	386.37	30.00	-4.13
3	740.0	12.94	12.56	25.50	354.81	30.00	-4.50

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30℃ ~ 50℃.

4.2.2 Test Procedure

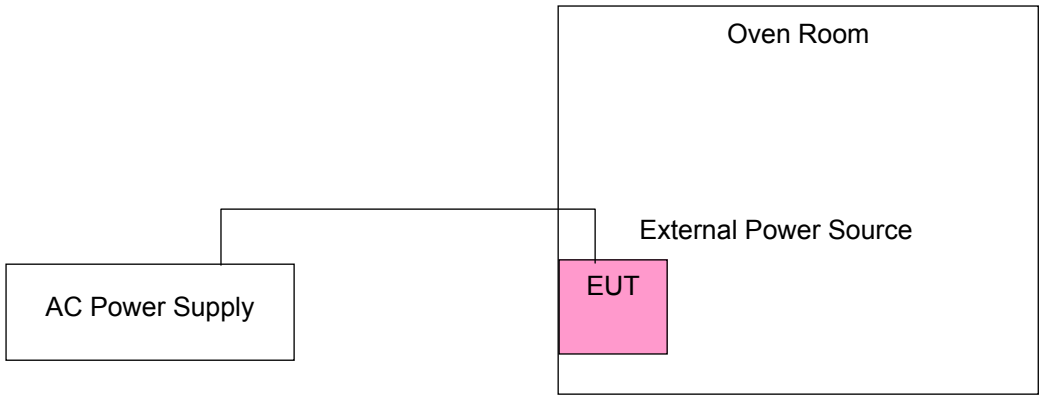
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

LTE Band 4 (Channel Bandwidth 5MHz):

Chain 0

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)	Limit (ppm)
126.5	0.0075739645	2.5
120.0	0.0052071006	2.5
93.5	0.0056804734	2.5

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (ppm)	Limit (ppm)
50	0.0080473373	2.5
40	0.0075739645	2.5
30	0.0061538462	2.5
20	0.0052071006	2.5
10	0.0042603550	2.5
0	0.0037869822	2.5
-10	0.0014201183	2.5
-20	0.0023668639	2.5

Chain 1

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)	Limit (ppm)
126.5	0.0080473373	2.5
120.0	0.0052071006	2.5
93.5	0.0066272189	2.5

Frequency Error vs. Temperature.

TEMP. (℃)	Frequency Error (ppm)	Limit (ppm)
50	0.0085207101	2.5
40	0.0080473373	2.5
30	0.0066272189	2.5
20	0.0052071006	2.5
10	0.0047337278	2.5
0	0.0047337278	2.5
-10	0.0023668639	2.5
-20	0.0028402367	2.5

4.3 Emission Bandwidth Measurement

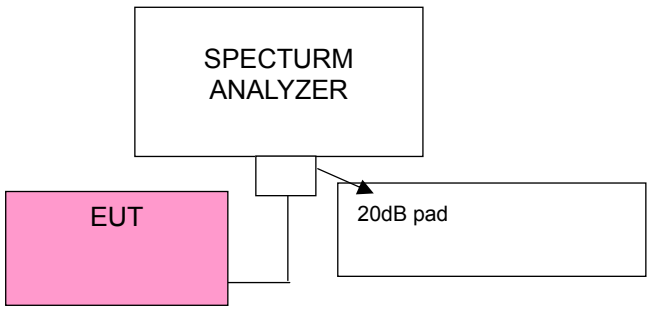
4.3.1 Limits Of Emission Bandwidth Measurement

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

4.3.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 200kHz and VBW = 620kHz (Channel Bandwidth: 10MHz and 15MHz), RBW = 430kHz and VBW = 1.2MHz (Channel Bandwidth: 20MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

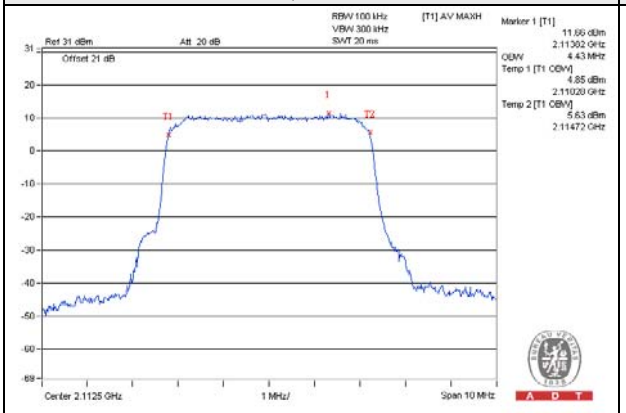
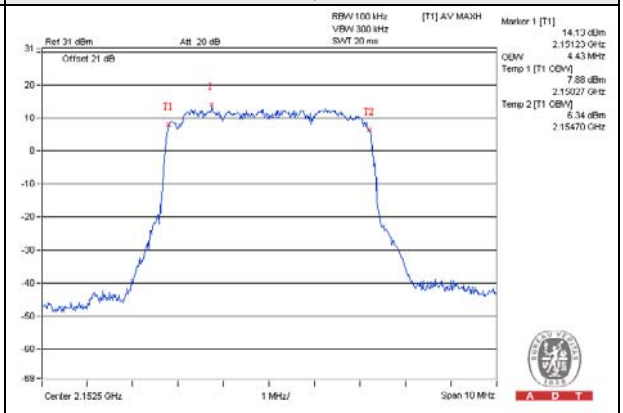
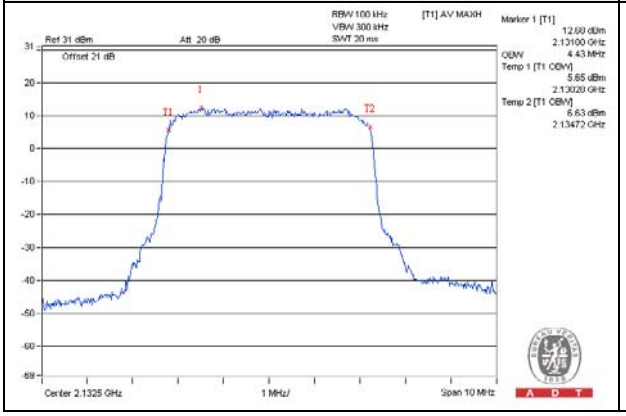
4.3.3 Test Setup



4.3.4 Test Result

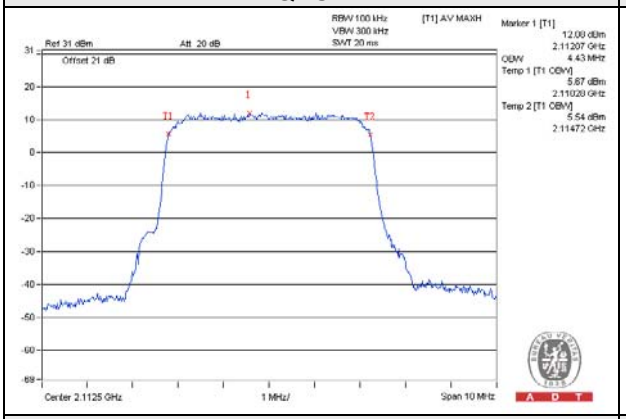
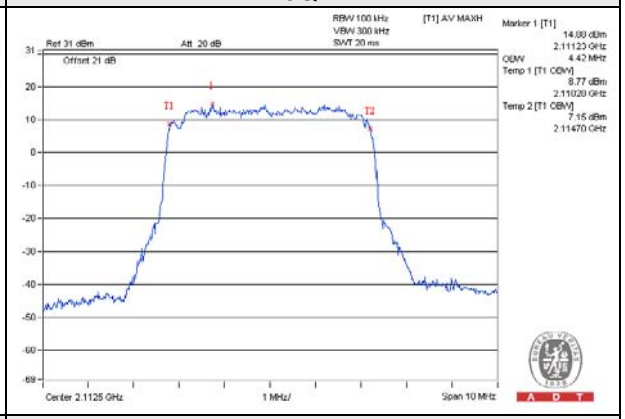
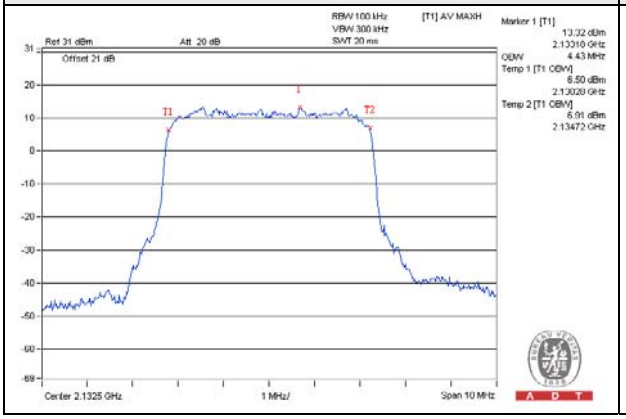
LTE Band 4 (Channel Bandwidth 5MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2112.5	4.43	4.42	4.42
2132.5	4.42	4.42	4.43
2152.5	4.42	4.43	4.43

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

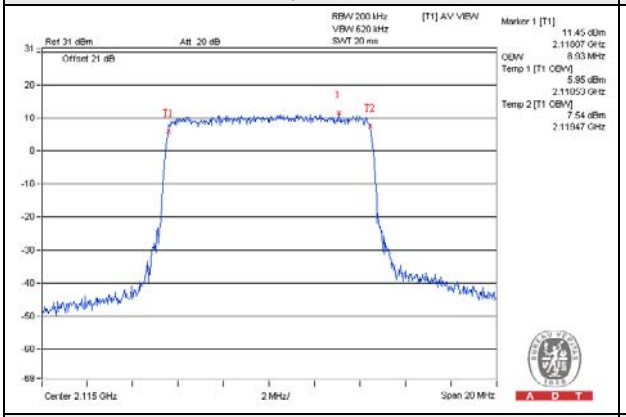
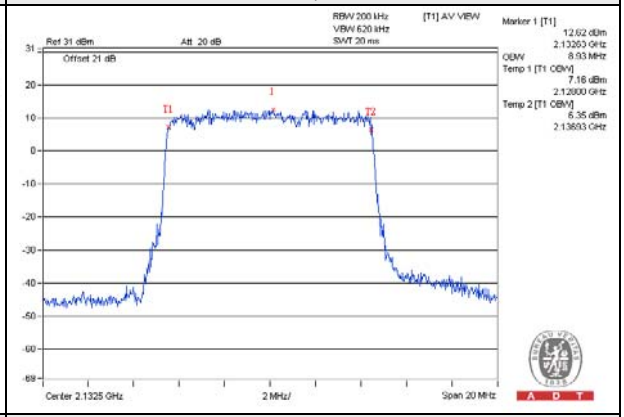
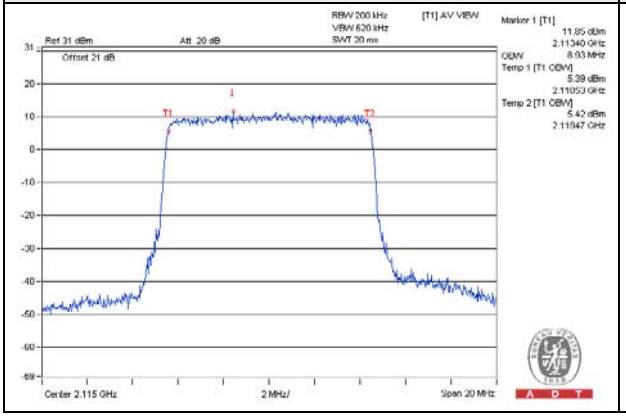
LTE Band 4 (Channel Bandwidth 5MHz): Chain 1

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2112.5	4.43	4.42	4.42
2132.5	4.42	4.42	4.43
2152.5	4.43	4.38	4.43

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

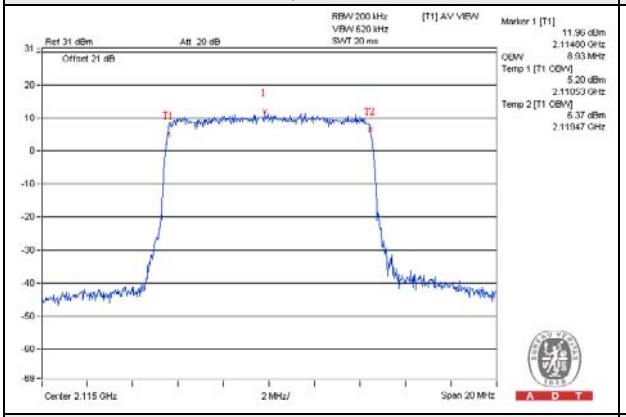
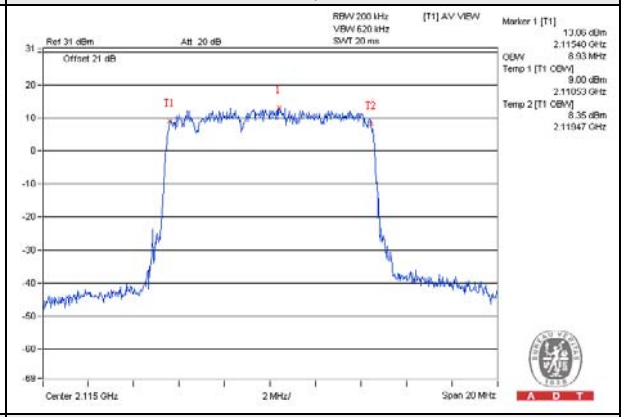
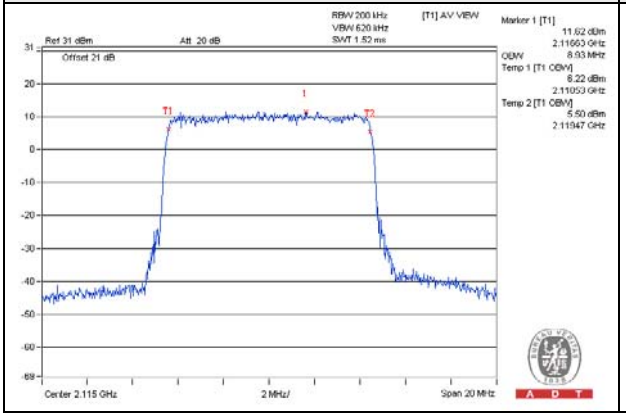
LTE Band 4 (Channel Bandwidth 10MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2115.0	8.93	8.87	8.93
2132.5	8.93	8.93	8.93
2150.0	8.90	8.87	8.90

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

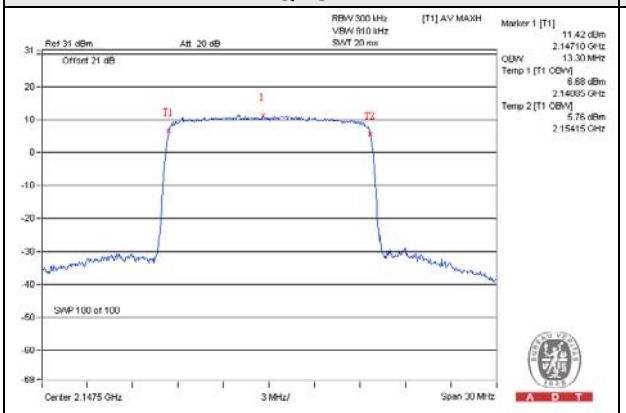
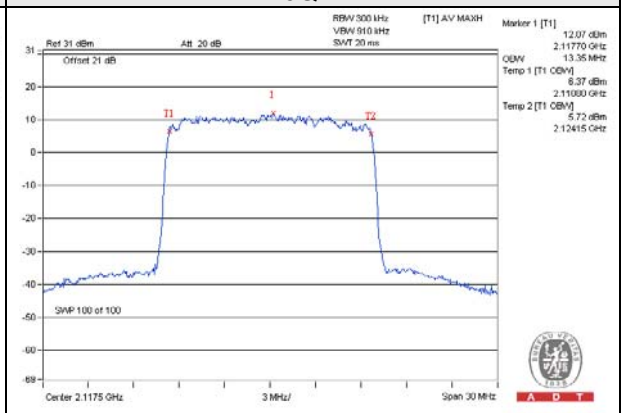
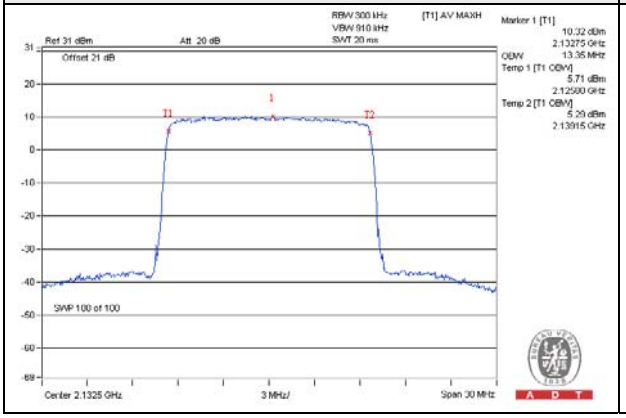
LTE Band 4 (Channel Bandwidth 10MHz): Chain 1

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2115.0	8.93	8.93	8.93
2132.5	8.93	8.93	8.93
2150.0	8.93	8.93	8.93

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

LTE Band 4 (Channel Bandwidth 15MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2117.5	13.25	13.35	13.30
2132.5	13.25	13.35	13.35
2147.5	13.30	13.35	13.30

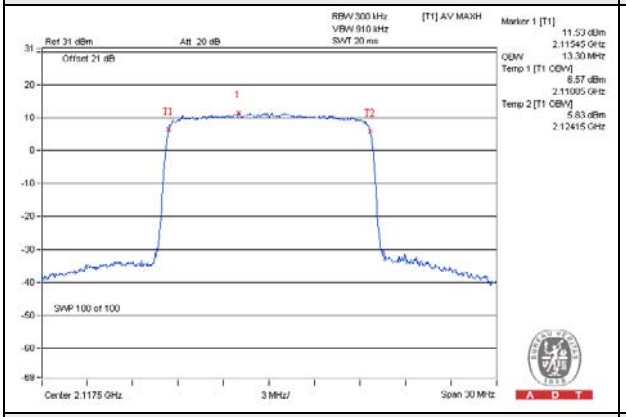
SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

LTE Band 4 (Channel Bandwidth 15MHz): Chain 1

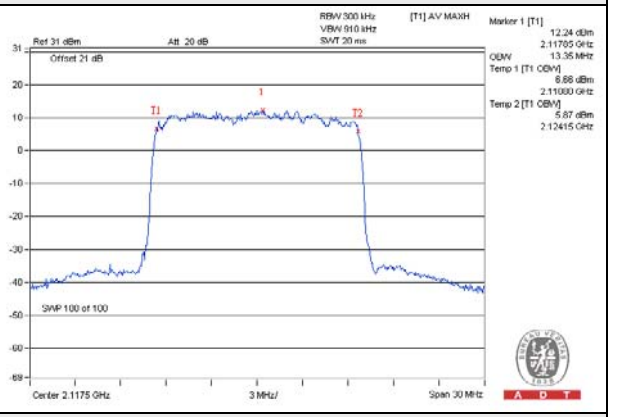
Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2117.5	13.30	13.35	13.30
2132.5	13.25	13.35	13.35
2147.5	13.25	13.35	13.30

SPECTRUM PLOT OF WORST VALUE

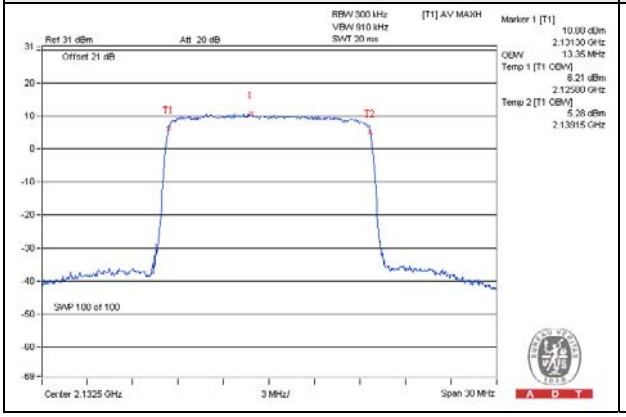
QPSK



16QAM

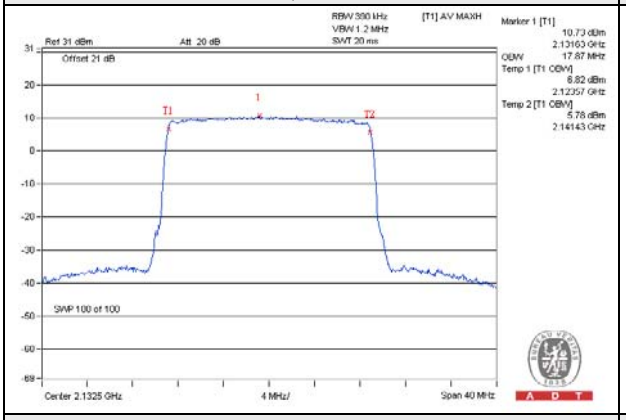
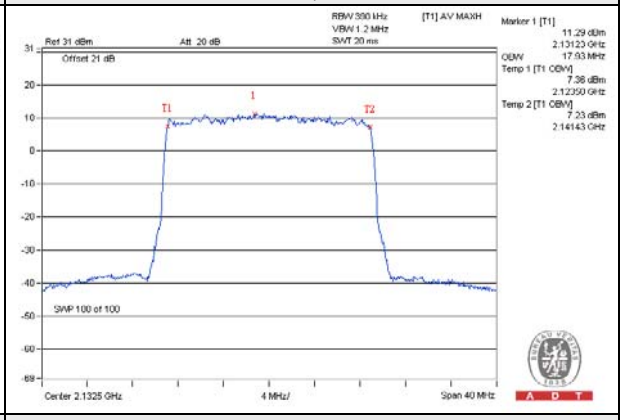
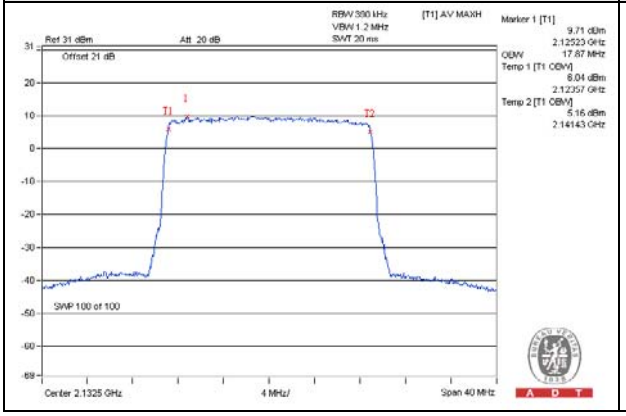


64QAM



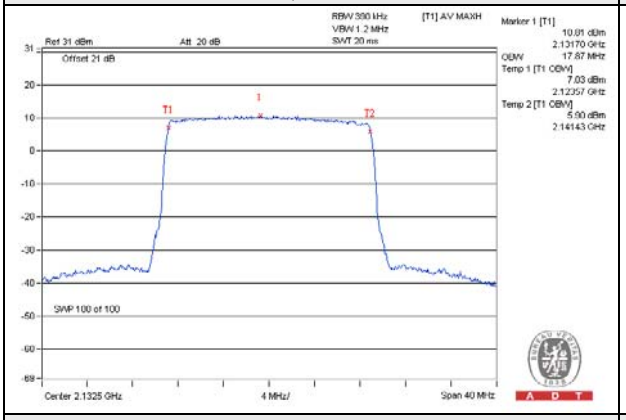
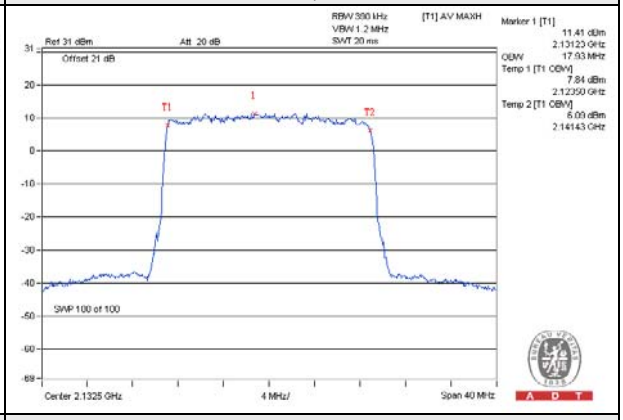
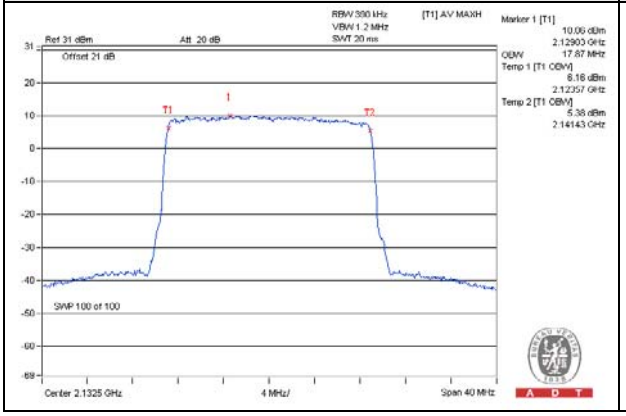
LTE Band 4 (Channel Bandwidth 20MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2120.0	17.80	17.87	17.80
2132.5	17.87	17.93	17.87
2145.0	17.80	17.93	17.80

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

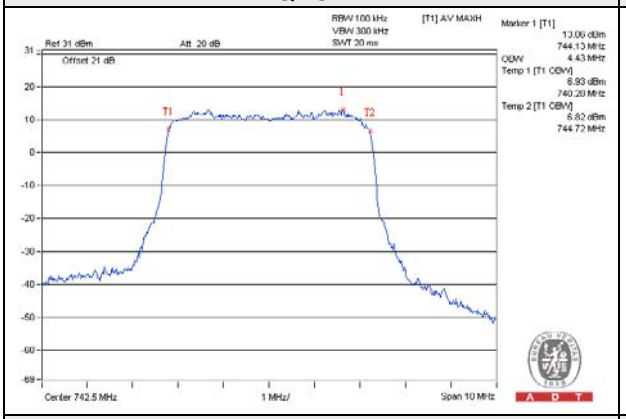
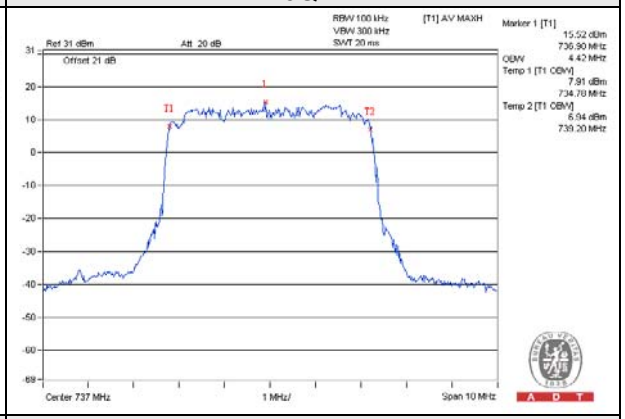
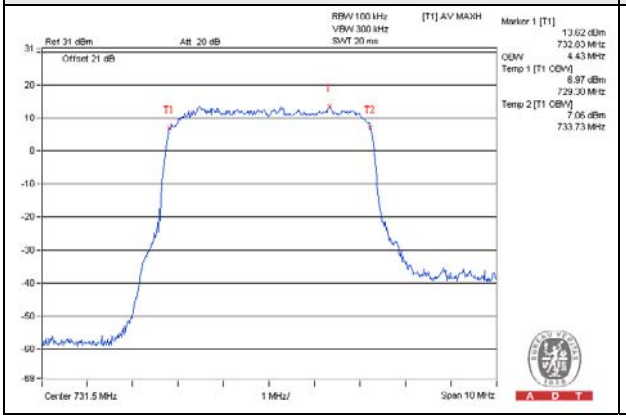
LTE Band 4 (Channel Bandwidth 20MHz): Chain 1

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
2120.0	17.80	17.87	17.80
2132.5	17.87	17.93	17.87
2145.0	17.87	17.93	17.87

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

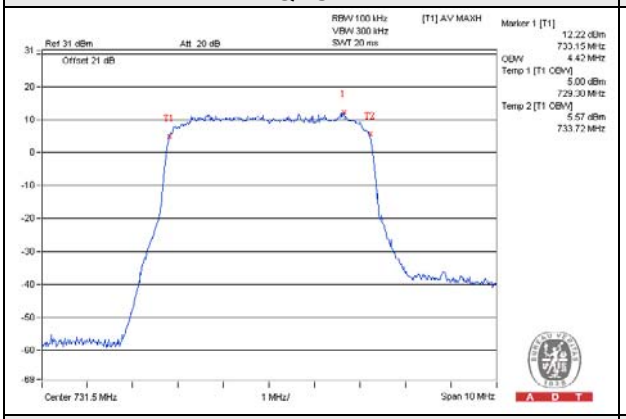
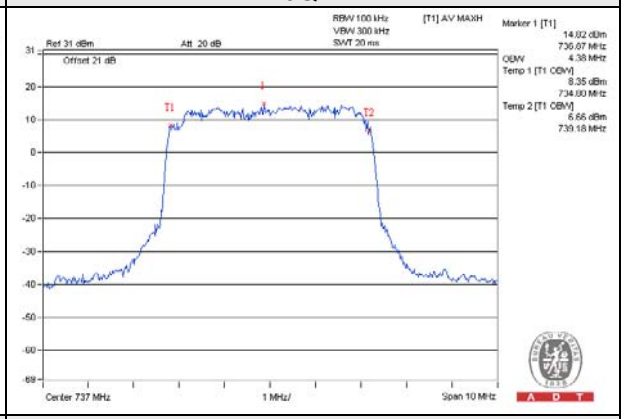
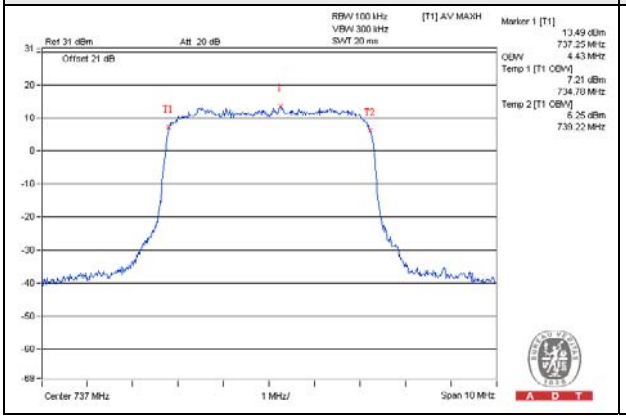
LTE Band 12 (Channel Bandwidth 5MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
731.5	4.42	4.38	4.43
737.0	4.40	4.42	4.43
742.5	4.43	4.38	4.43

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

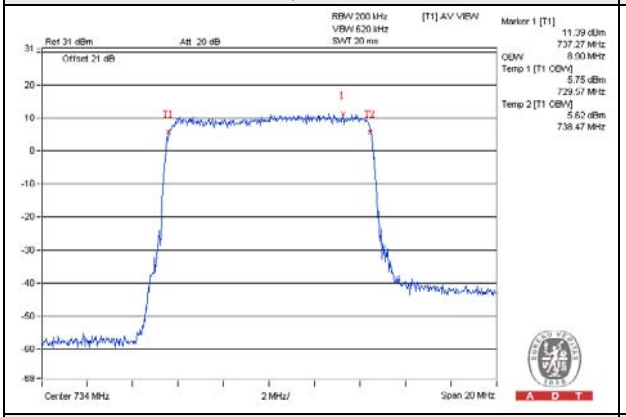
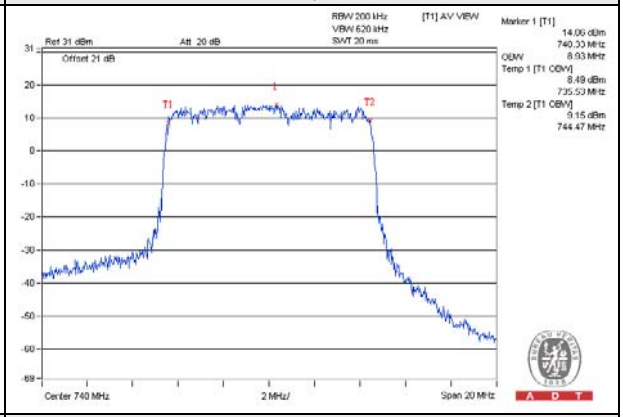
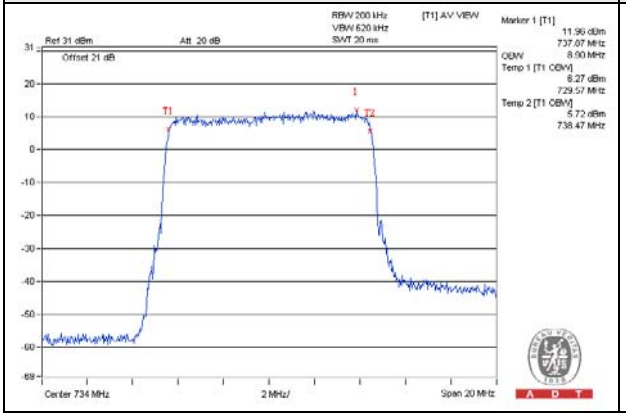
LTE Band 12 (Channel Bandwidth 5MHz): Chain 1

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
731.5	4.42	4.37	4.42
737.0	4.40	4.38	4.43
742.5	4.42	4.37	4.43

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

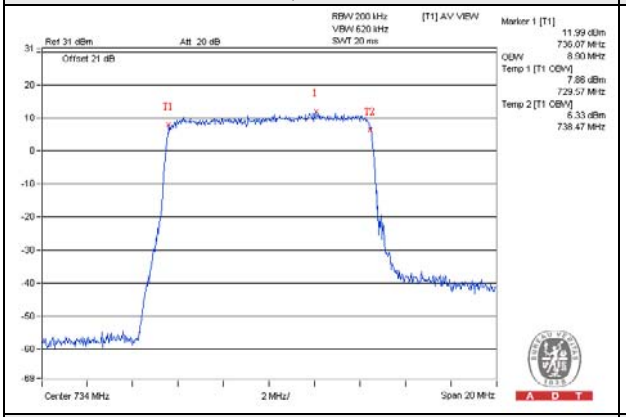
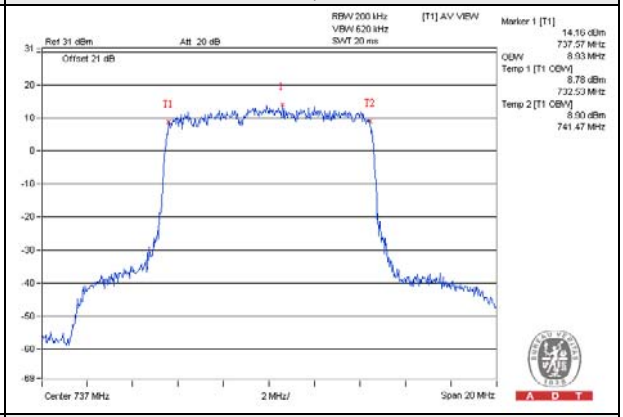
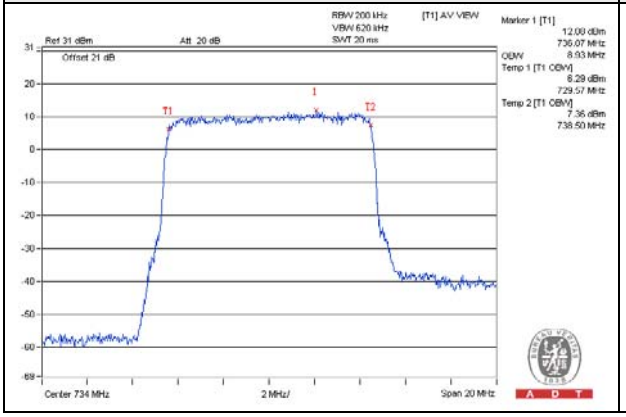
LTE Band 12 (Channel Bandwidth 10MHz): Chain 0

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
734.0	8.90	8.83	8.90
737.0	8.87	8.90	8.87
740.0	8.90	8.93	8.90

SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

LTE Band 12 (Channel Bandwidth 10MHz): Chain 1

Frequency (MHz)	Occupied Bandwidth (MHz)		
	QPSK	16QAM	64QAM
734.0	8.90	8.87	8.93
737.0	8.90	8.93	8.90
740.0	8.90	8.90	8.90

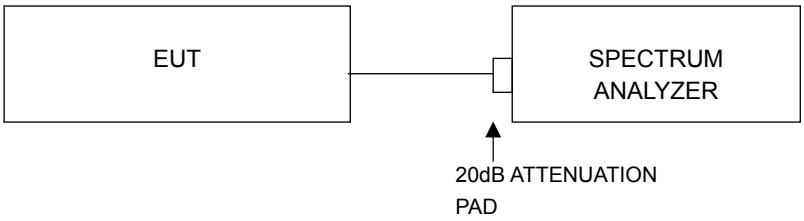
SPECTRUM PLOT OF WORST VALUE	
QPSK	16QAM
	
64QAM	
	

4.4 Peak To Average Ratio

4.5.1 Limits of Peak To Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.5.2 Test Setup



4.5.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

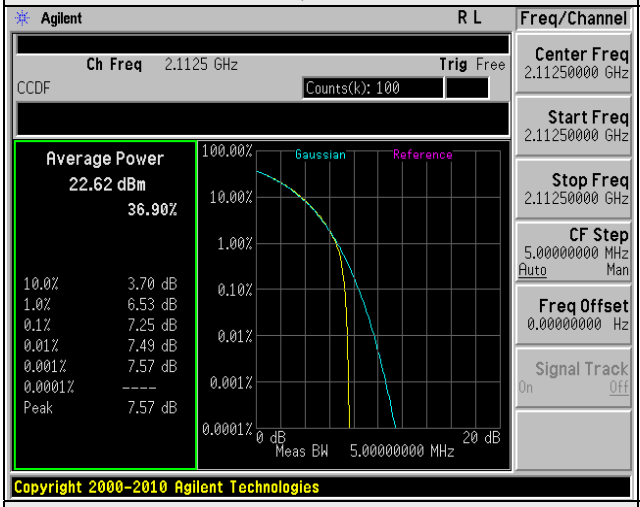
4.5.4 Test Results

LTE Band 4 (CHANNEL BANDWIDTH 5MHz): Chain 0

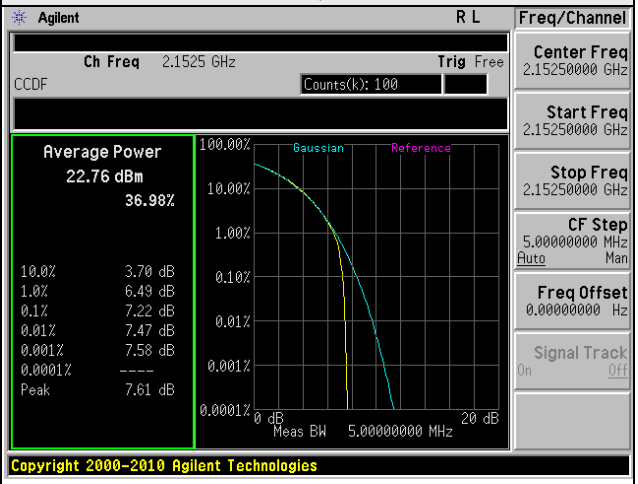
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2112.5	7.25	7.13	7.24
2132.5	7.23	7.17	7.23
2152.5	7.25	7.22	7.26

Spectrum Plot Of Worst Value

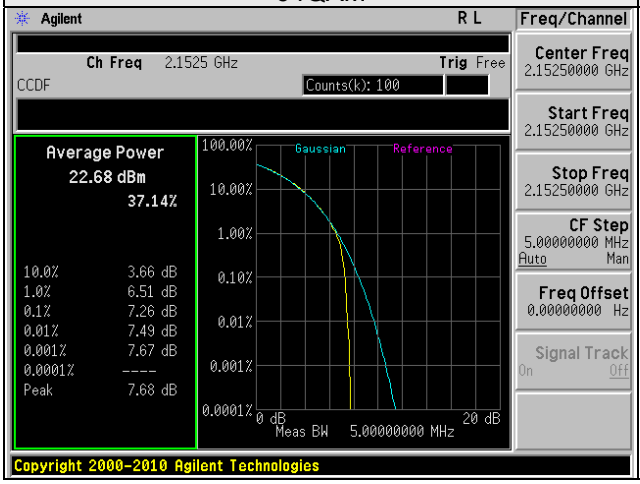
QPSK



16QAM



64QAM

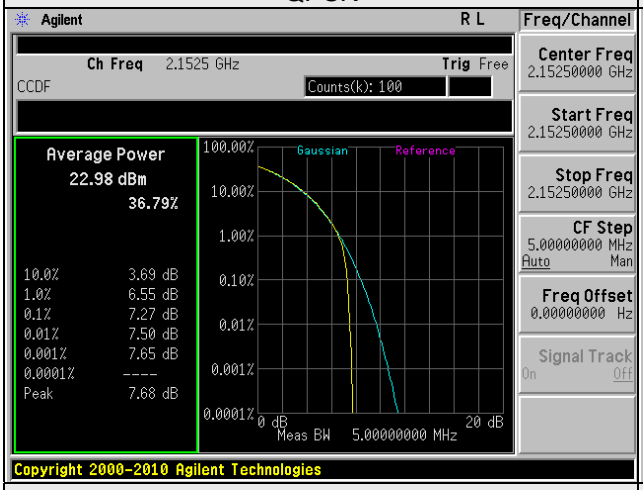


LTE Band 4 (CHANNEL BANDWIDTH 5MHz): Chain 1

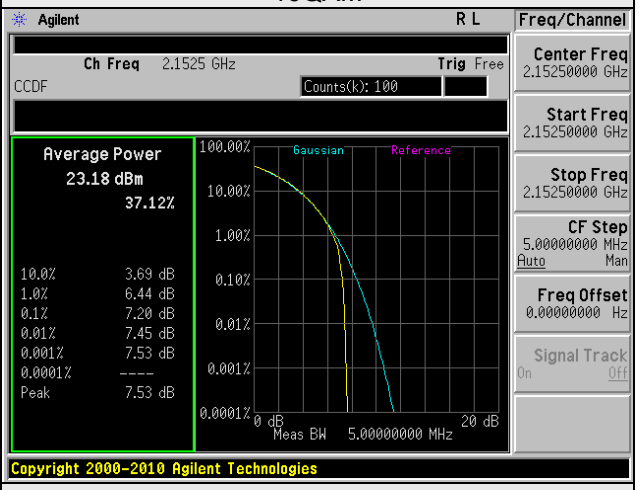
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2112.5	7.19	7.17	7.25
2132.5	7.21	7.16	7.28
2152.5	7.27	7.20	7.28

Spectrum Plot Of Worst Value

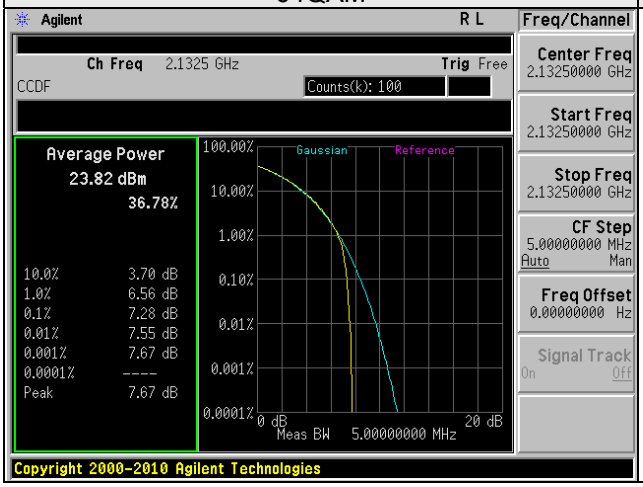
QPSK



16QAM



64QAM

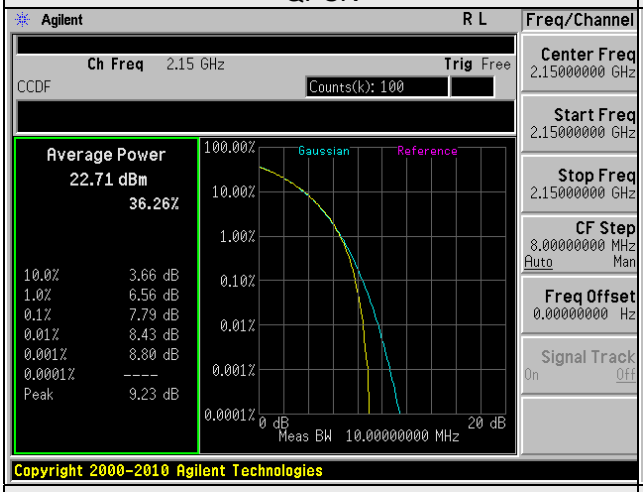


LTE Band 4 (CHANNEL BANDWIDTH 10MHz): Chain 0

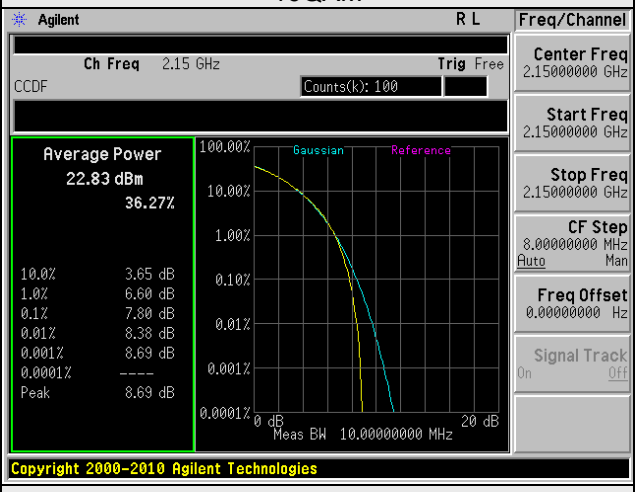
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2115.0	7.66	7.74	7.78
2132.5	7.74	7.71	7.79
2150.0	7.79	7.80	7.78

Spectrum Plot Of Worst Value

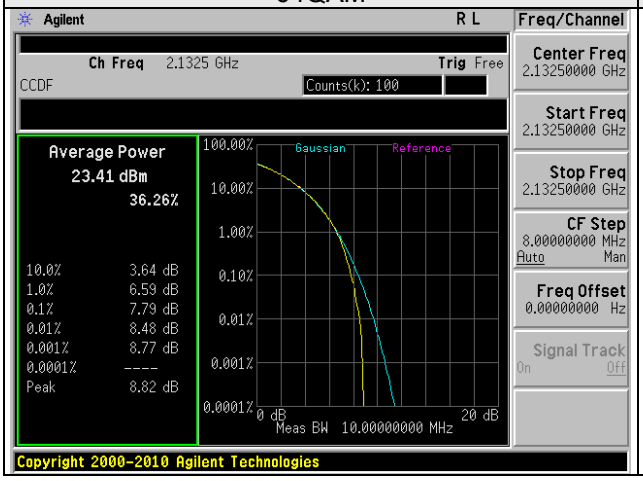
QPSK



16QAM



64QAM

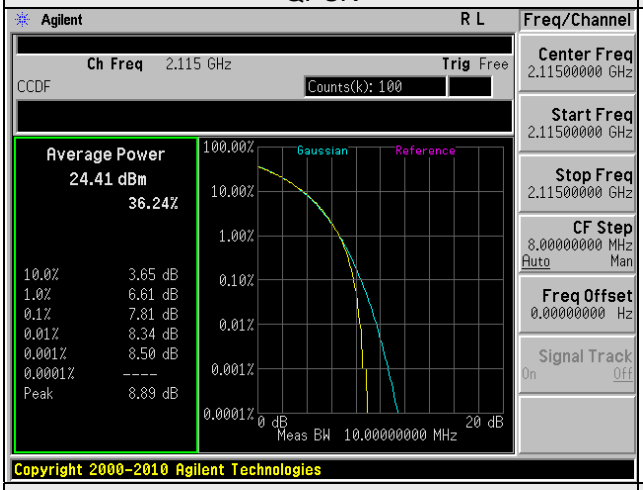


LTE Band 4 (CHANNEL BANDWIDTH 10MHz): Chain 1

Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2115.0	7.81	7.78	7.84
2132.5	7.81	7.79	7.78
2150.0	7.80	7.80	7.80

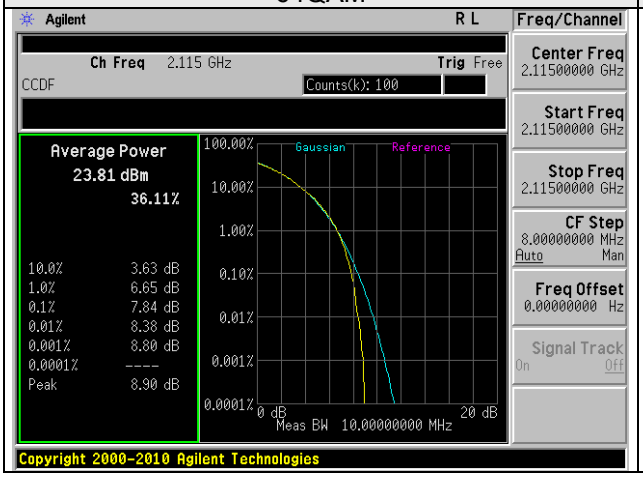
Spectrum Plot Of Worst Value

QPSK



16QAM

64QAM

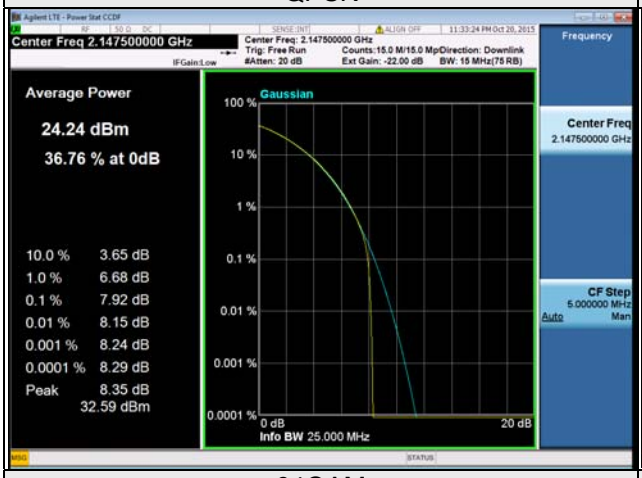


LTE Band 4 (CHANNEL BANDWIDTH 15MHz): Chain 0

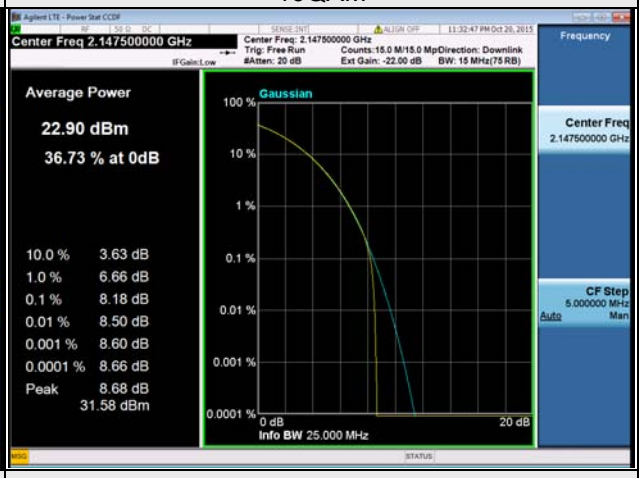
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2117.5	7.89	8.16	7.95
2132.5	7.85	8.14	7.94
2147.5	7.92	8.18	7.98

Spectrum Plot Of Worst Value

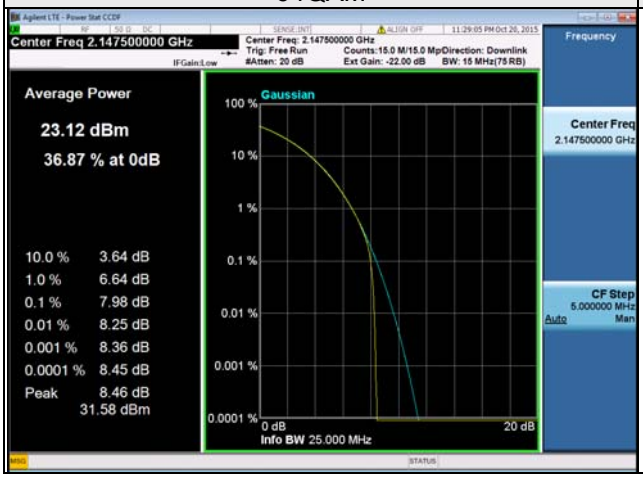
QPSK



16QAM



64QAM

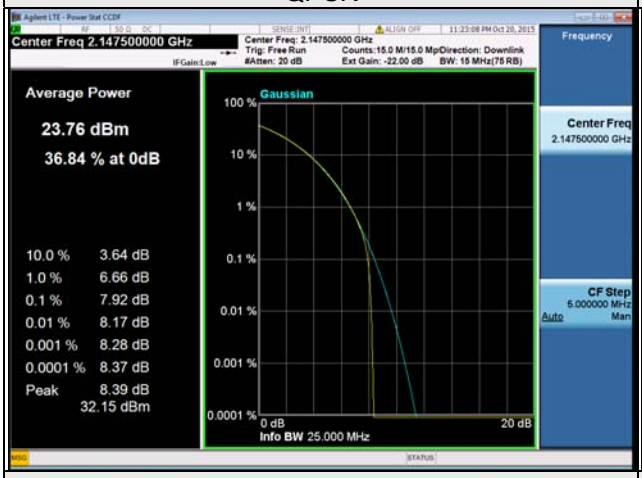


LTE Band 4 (CHANNEL BANDWIDTH 15MHz): Chain 1

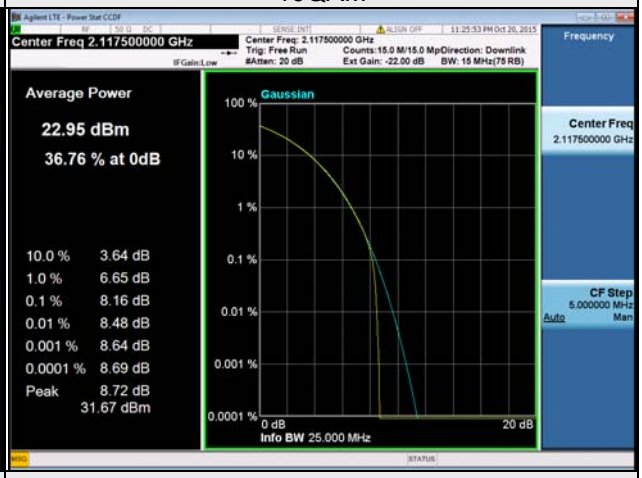
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2117.5	7.91	8.16	7.96
2132.5	7.90	8.15	7.94
2147.5	7.92	8.16	7.96

Spectrum Plot Of Worst Value

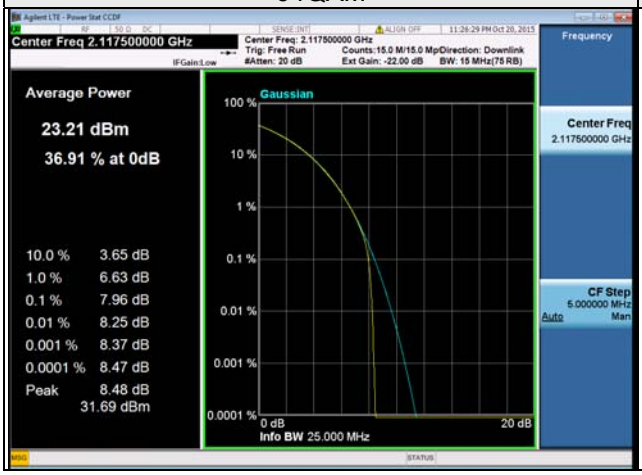
QPSK



16QAM



64QAM

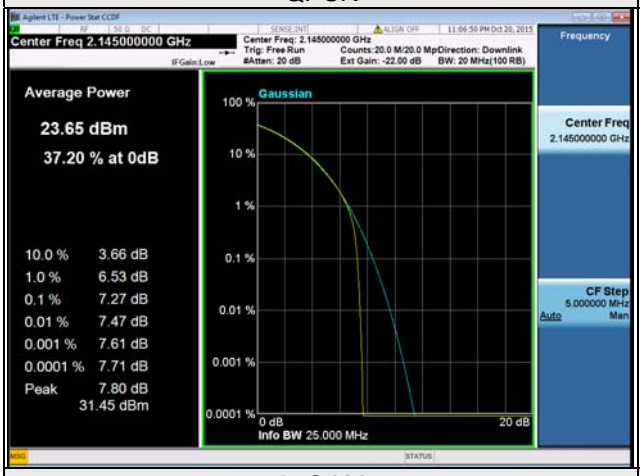


LTE Band 4 (CHANNEL BANDWIDTH 20MHz): Chain 0

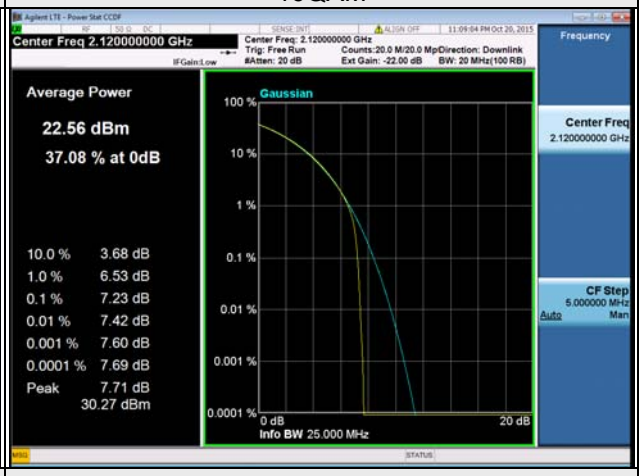
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2120.0	7.25	7.23	7.27
2132.5	7.21	7.19	7.23
2145.0	7.27	7.23	7.27

Spectrum Plot Of Worst Value

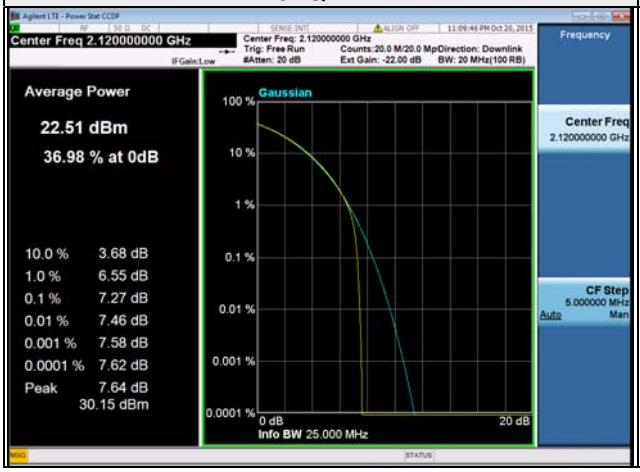
QPSK



16QAM



64QAM

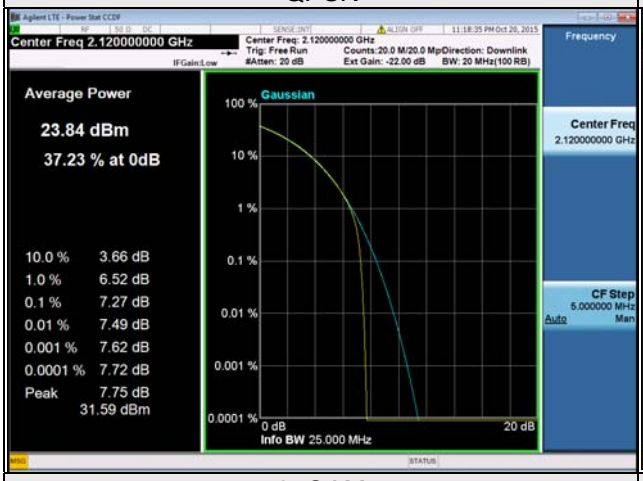


LTE Band 4 (CHANNEL BANDWIDTH 20MHz): Chain 1

Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
2120.0	7.27	7.23	7.27
2132.5	7.23	7.21	7.24
2145.0	7.25	7.22	7.25

Spectrum Plot Of Worst Value

QPSK



16QAM

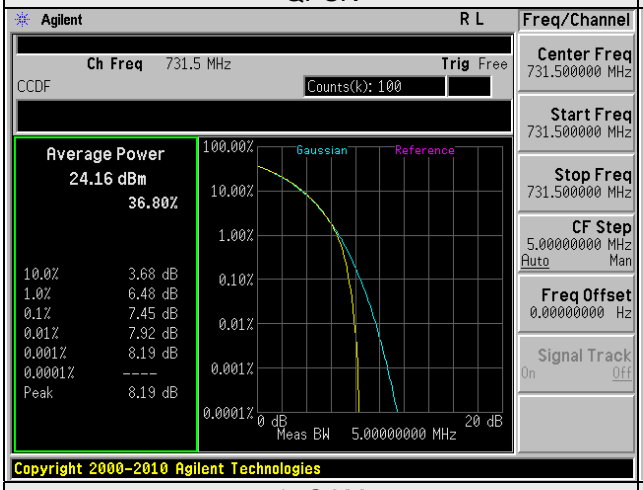
64QAM

LTE Band 12 (CHANNEL BANDWIDTH 5MHz): Chain 0

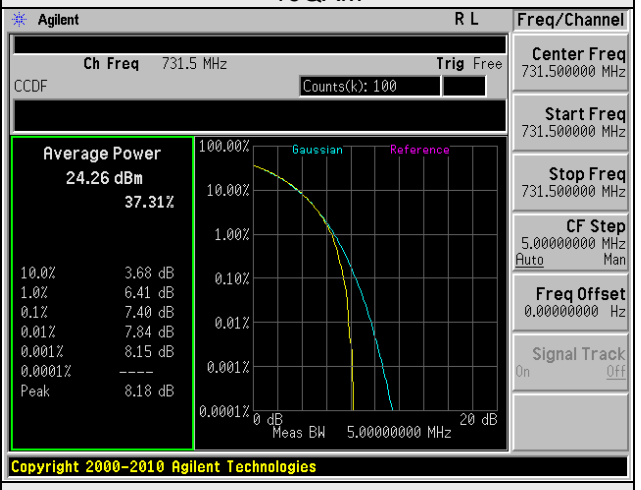
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
731.5	7.45	7.40	7.51
737.0	7.25	7.24	7.30
742.5	7.36	7.18	7.30

Spectrum Plot Of Worst Value

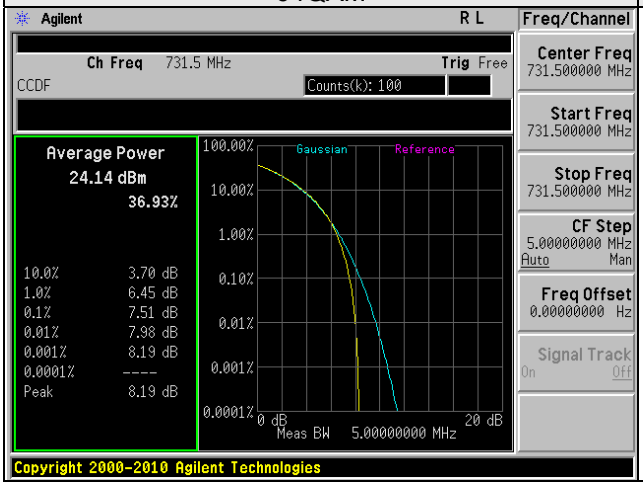
QPSK



16QAM



64QAM

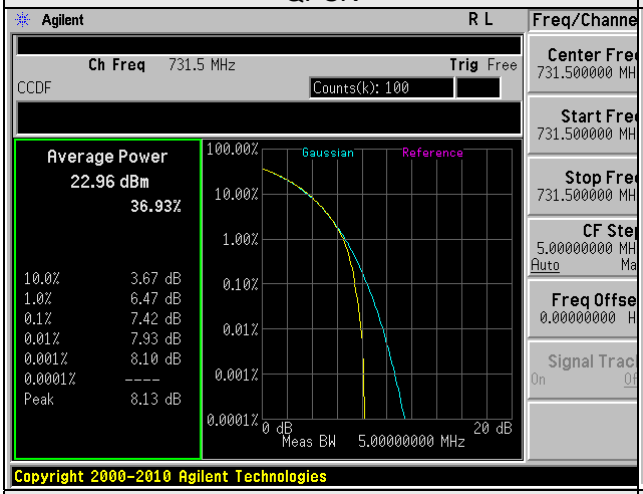


LTE Band 12 (CHANNEL BANDWIDTH 5MHz): Chain 1

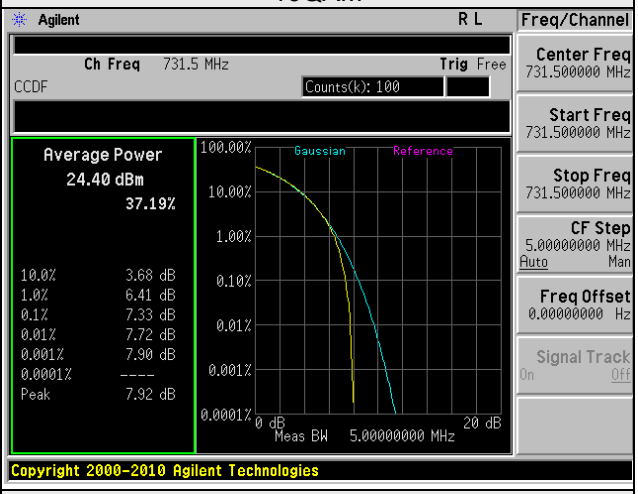
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
731.5	7.42	7.33	7.37
737.0	7.23	7.16	7.25
742.5	7.22	7.20	7.28

Spectrum Plot Of Worst Value

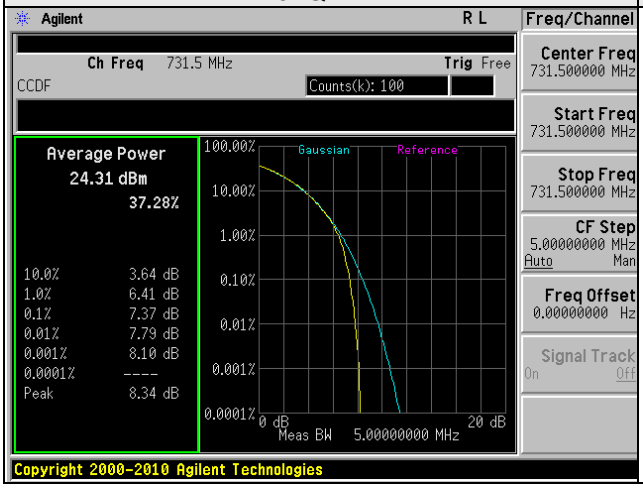
QPSK



16QAM



64QAM

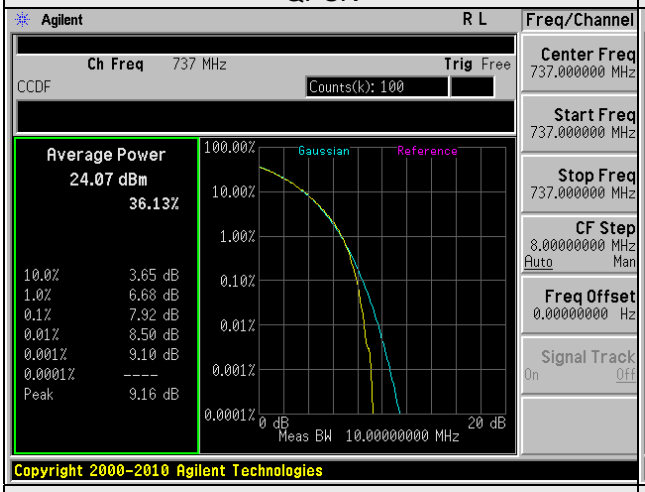


LTE Band 12 (CHANNEL BANDWIDTH 10MHz): Chain 0

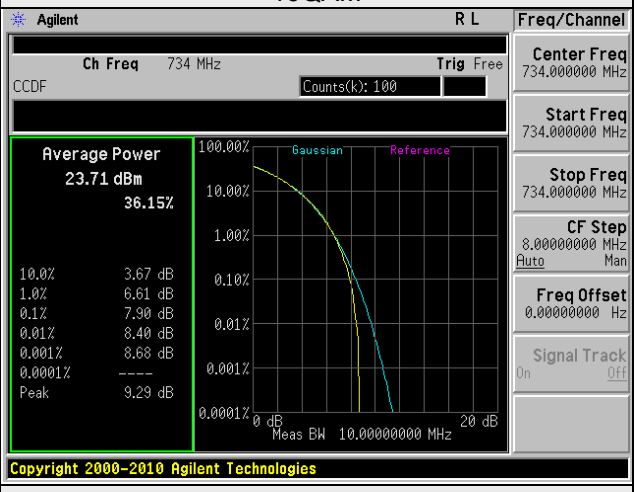
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
734.0	7.91	7.90	7.87
737.0	7.92	7.82	7.85
740.0	7.75	7.63	7.70

Spectrum Plot Of Worst Value

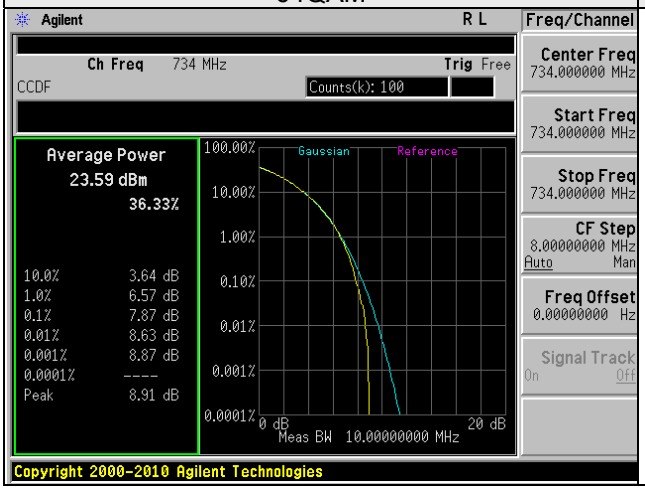
QPSK



16QAM



64QAM

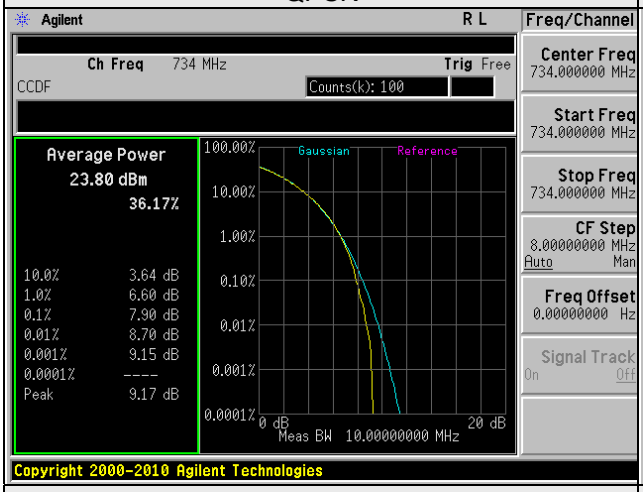


LTE Band 12 (CHANNEL BANDWIDTH 10MHz): Chain 1

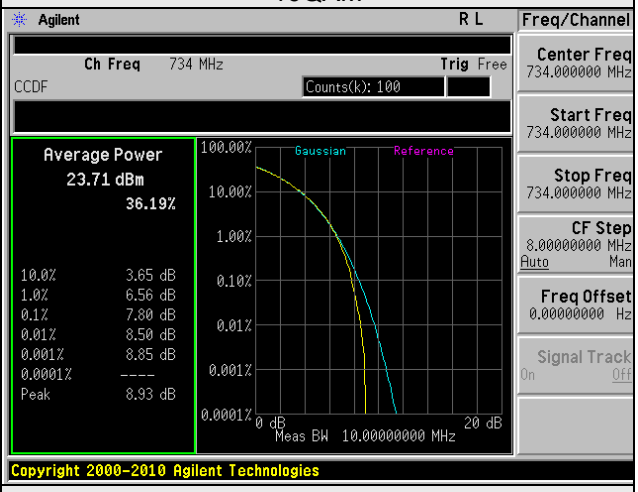
Frequency (MHz)	Peak To Average Ratio (dB)		
	QPSK	16QAM	64QAM
734.0	7.90	7.80	7.87
737.0	7.76	7.73	7.80
740.0	7.71	7.62	7.64

Spectrum Plot Of Worst Value

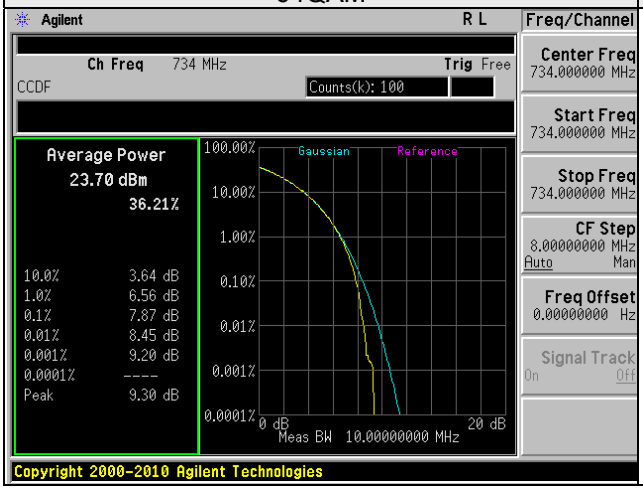
QPSK



16QAM



64QAM

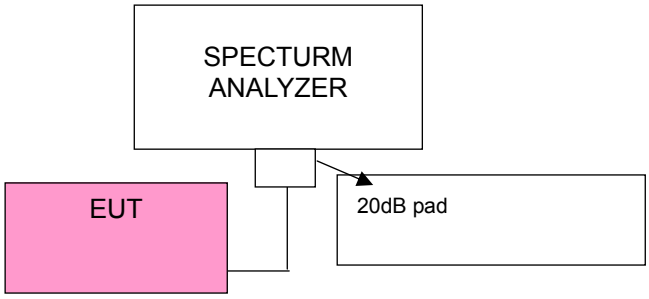


4.5 Channel Edge Measurement

4.5.1 Limits of Band Edge Measurement

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 43 + 10 log (P) dB at the channel edge, the limit of emission equal to –13dBm. And 55 + 10 log (P) dB at 5.5 MHz from the channel edges, the limit of emission equal to –25dBm.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.

4.5.2 Test Setup



4.5.3 Test Procedures

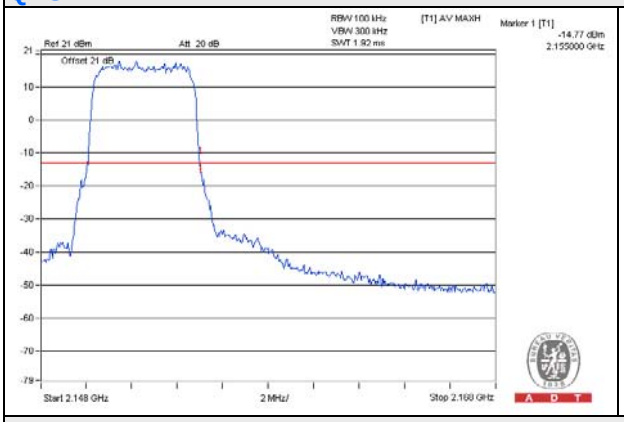
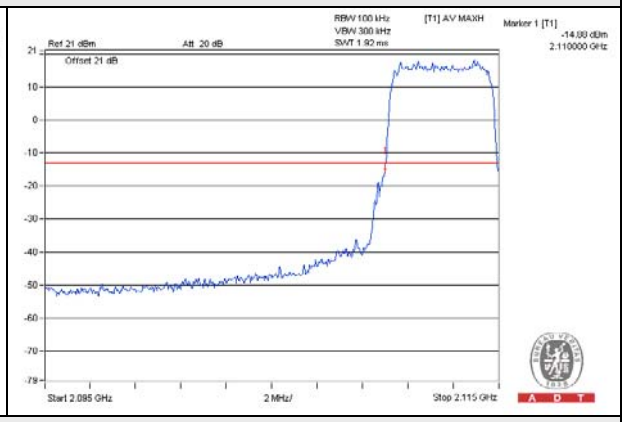
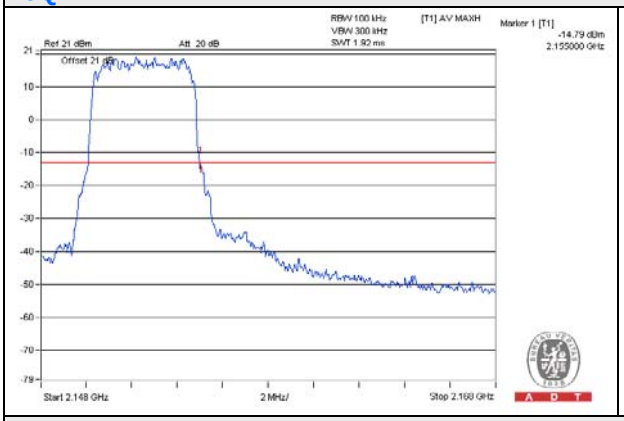
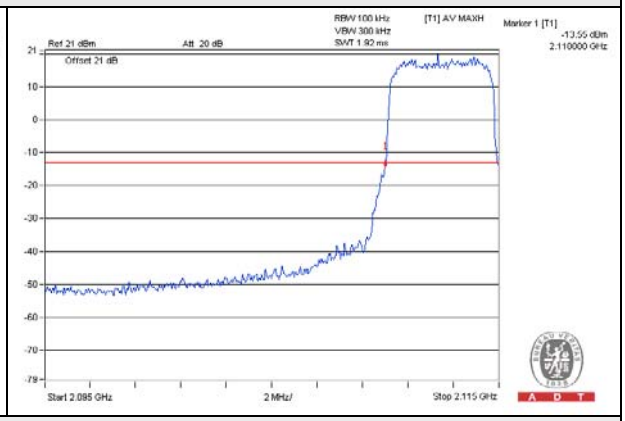
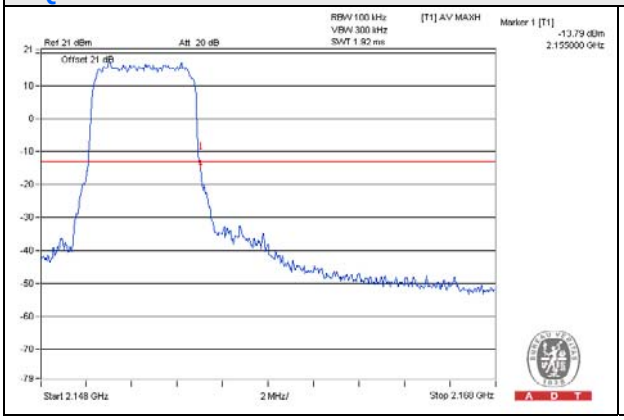
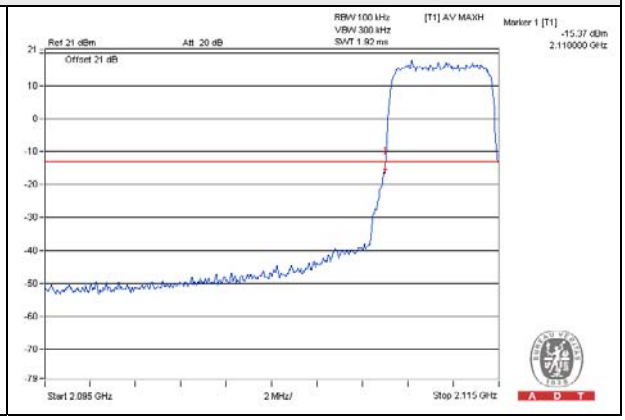
a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 30MHz (Channel Bandwidth: 10MHz) / 40MHz (Channel Bandwidth: 15MHz) / 50MHz (Channel Bandwidth: 25MHz). RBW of the spectrum is 100kHz (Channel Bandwidth: 10MHz) / 100kHz (Channel Bandwidth: 10MHz) / 150kHz (Channel Bandwidth: 15MHz) / 200kHz (Channel Bandwidth: 20MHz).

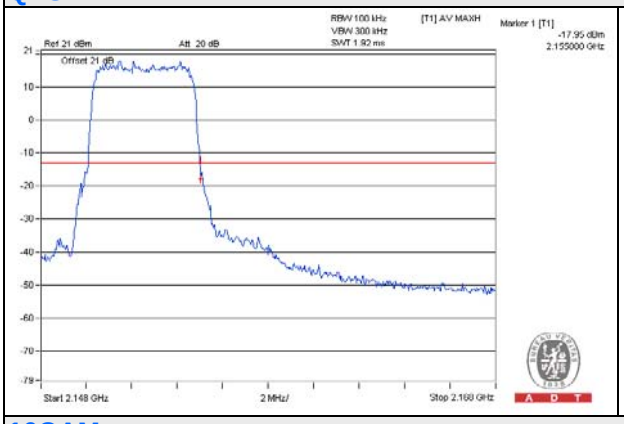
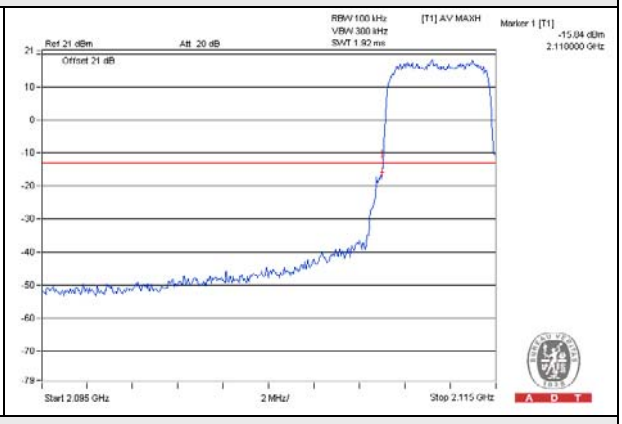
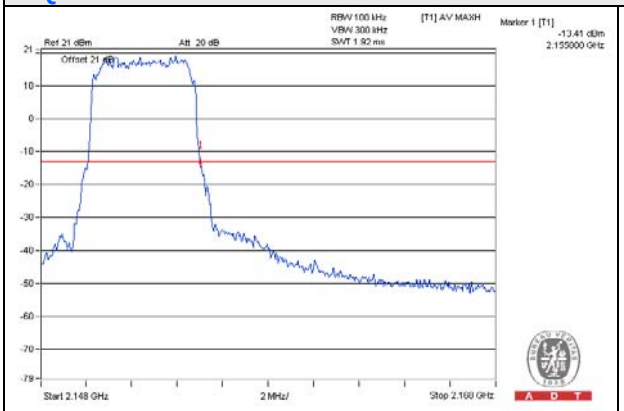
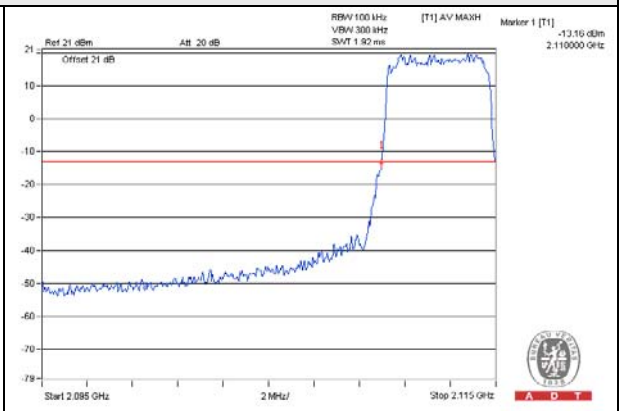
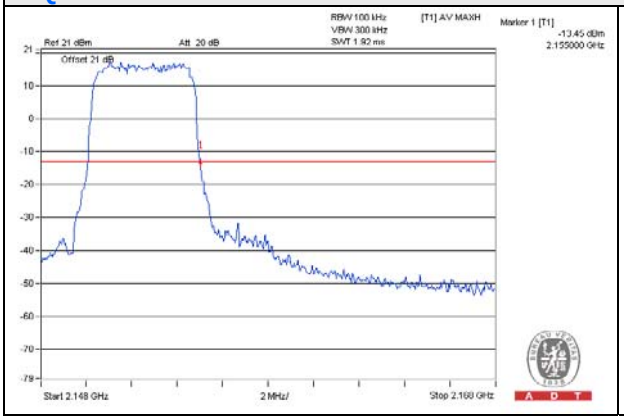
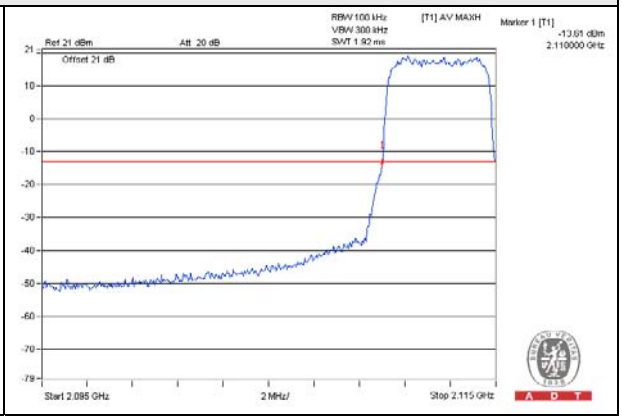
c. Record the max trace plot into the test report.

4.5.4 Test Results

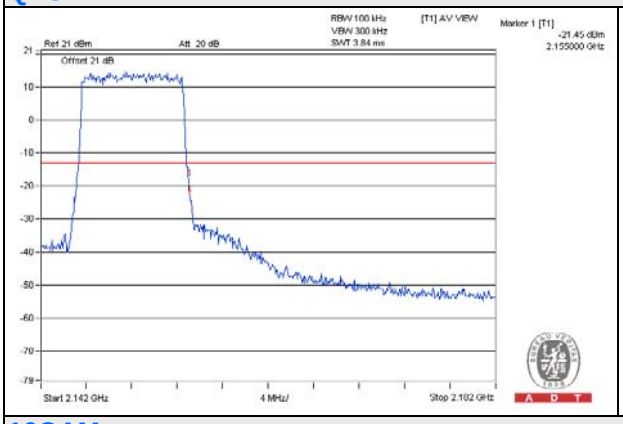
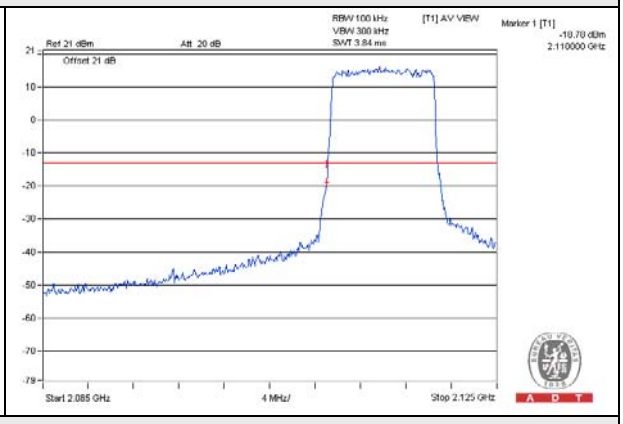
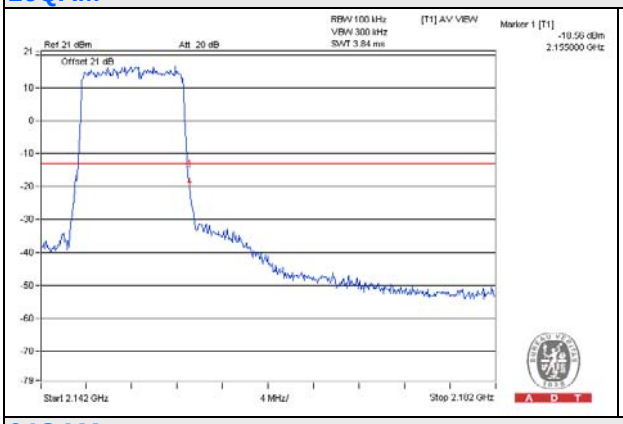
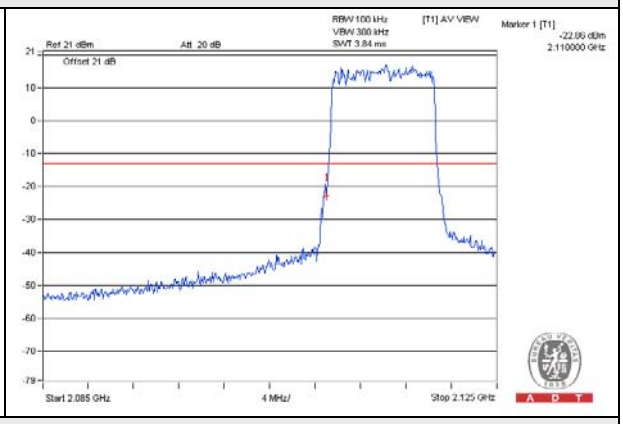
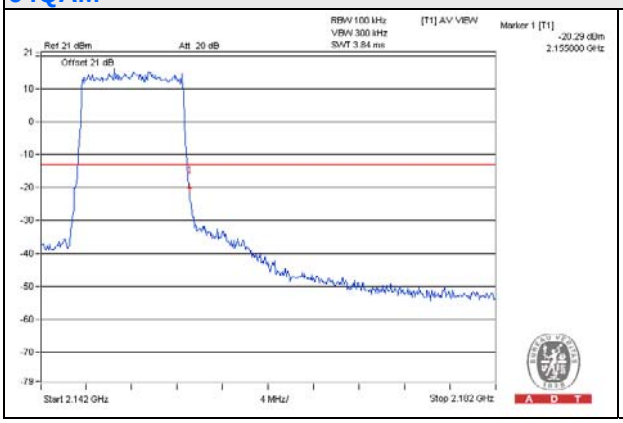
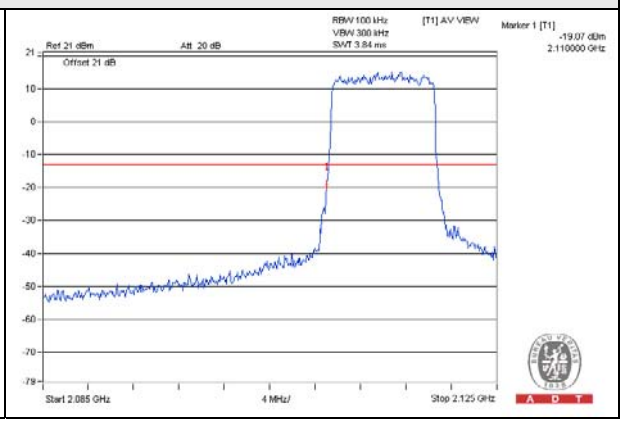
LTE Band 4 (Channel Bandwidth 5MHz): Chain 0

Frequency 2152.5	Frequency 2112.5
QPSK	
	
16QAM	
	
64QAM	
	

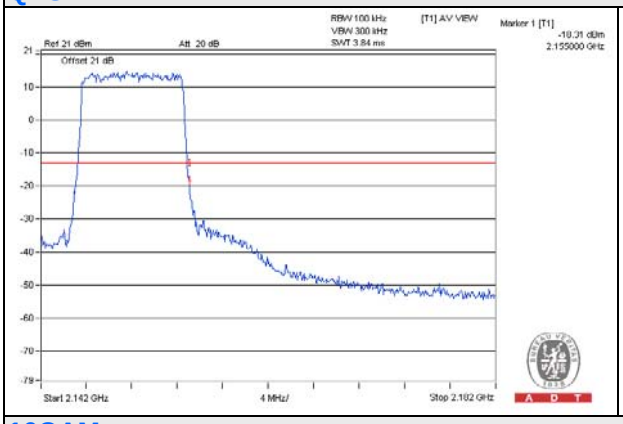
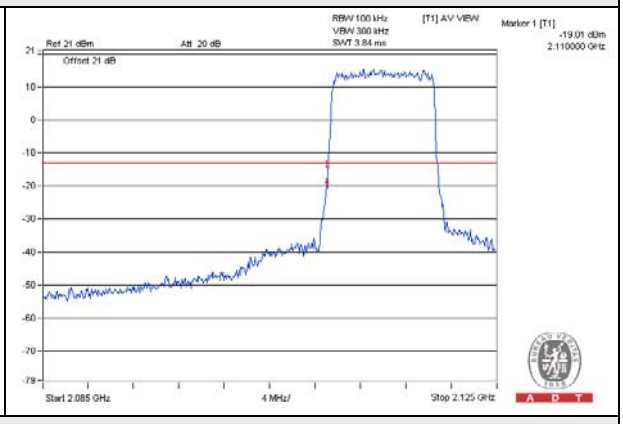
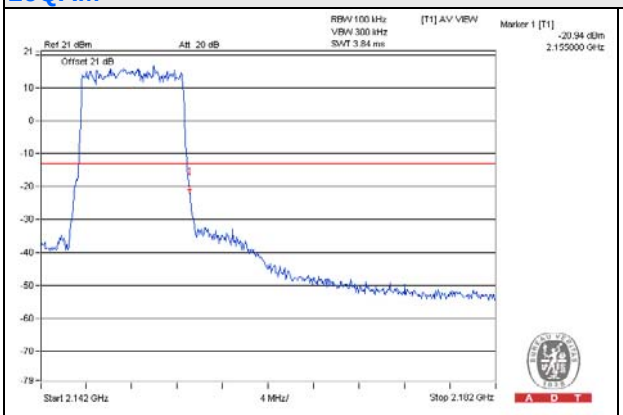
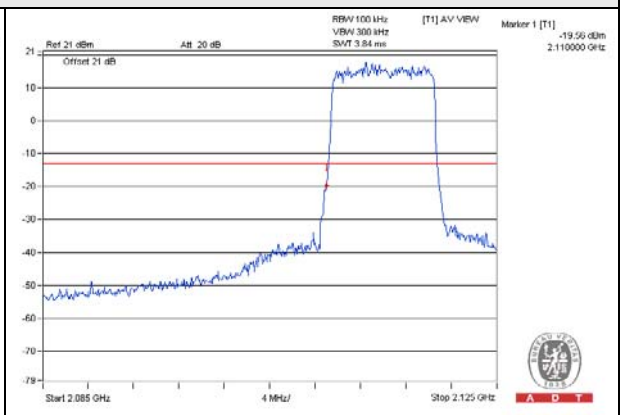
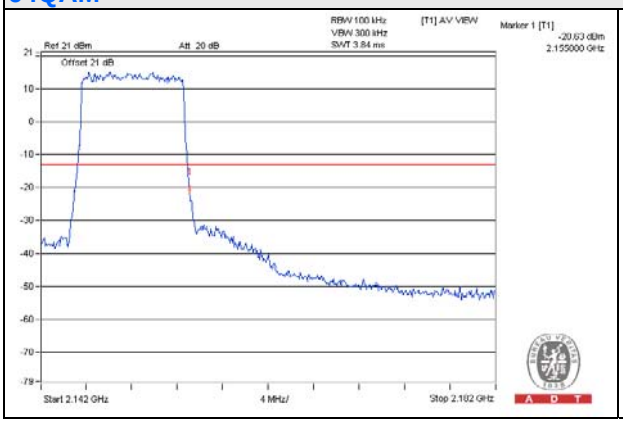
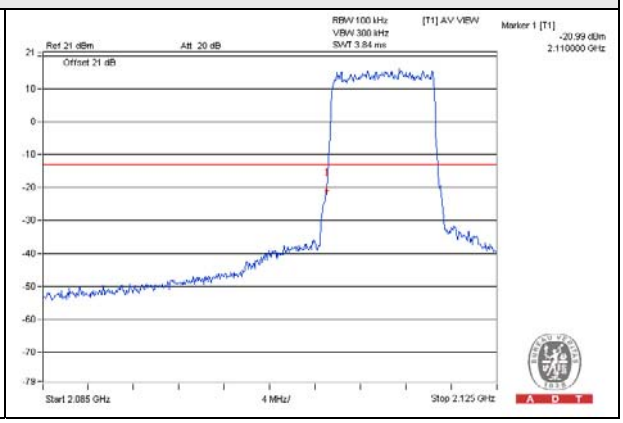
LTE Band 4 (Channel Bandwidth 5MHz): Chain 1

Frequency 2152.5	Frequency 2112.5
QPSK	
	
16QAM	
	
64QAM	
	

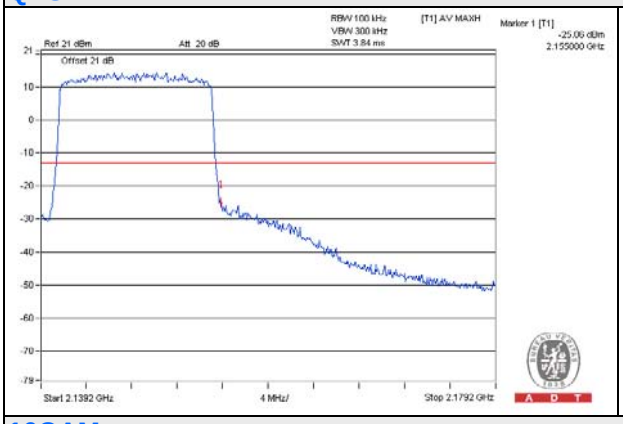
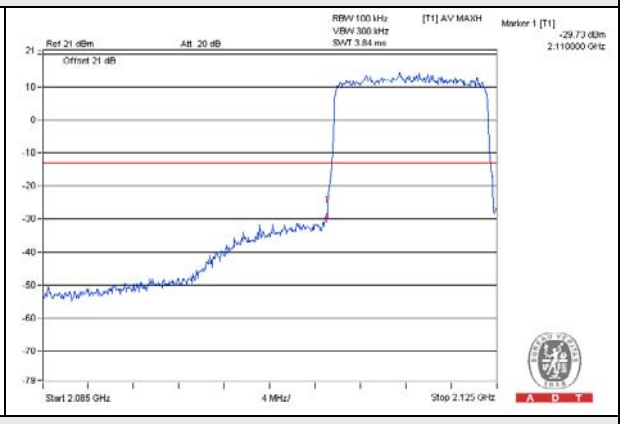
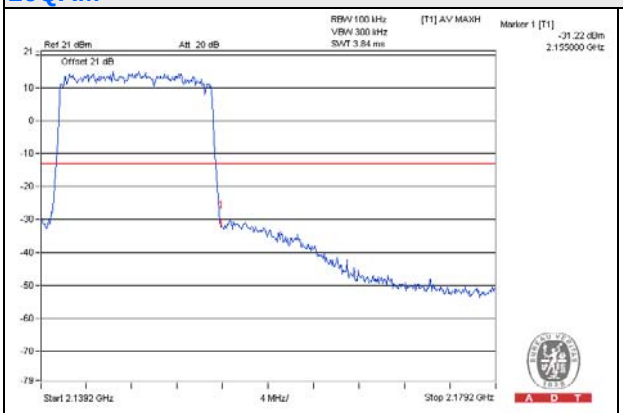
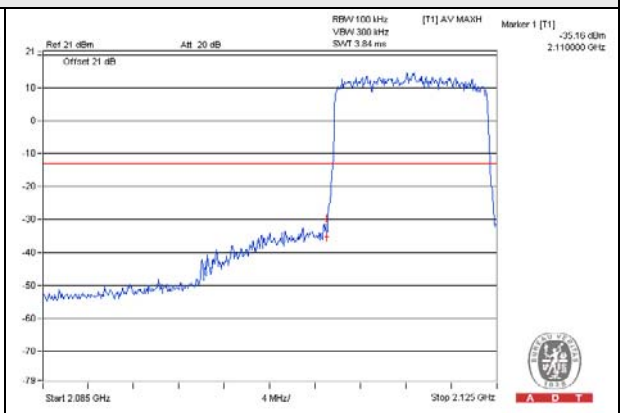
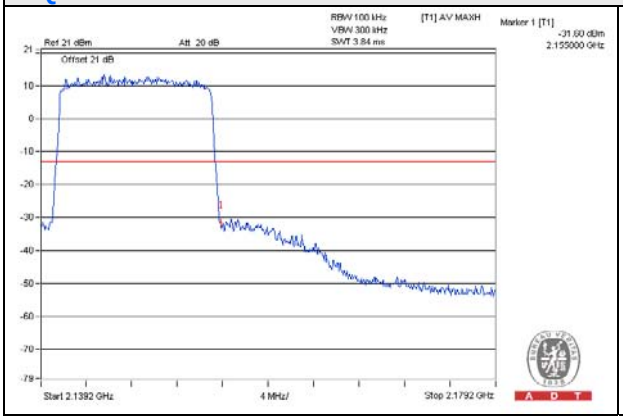
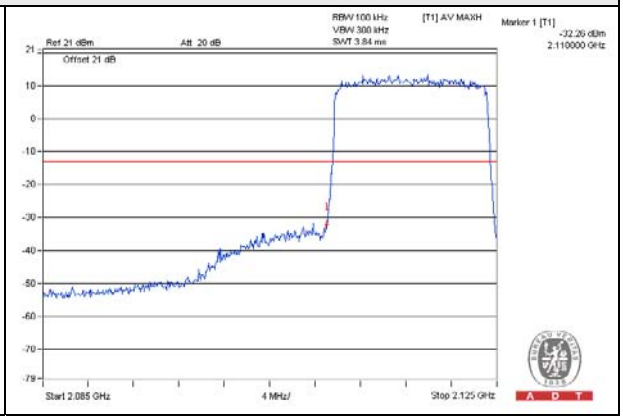
LTE Band 4 (Channel Bandwidth 10MHz): Chain 0

Frequency 2150.0	Frequency 2115.0
QPSK	
	
16QAM	
	
64QAM	
	

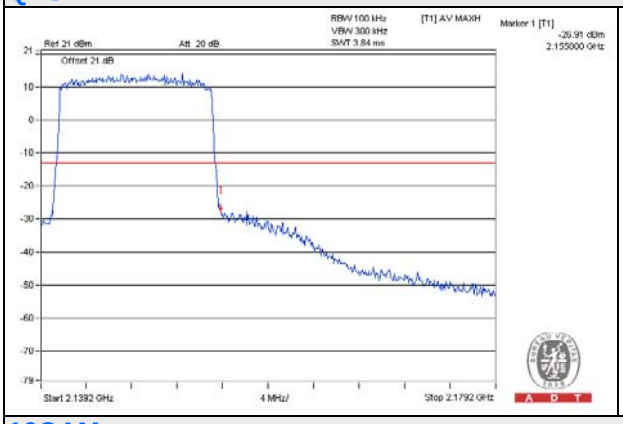
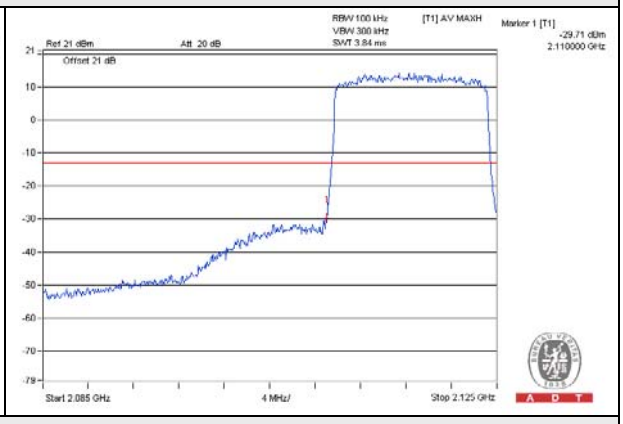
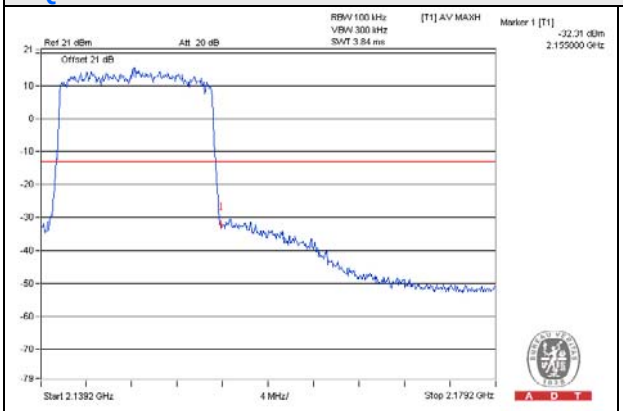
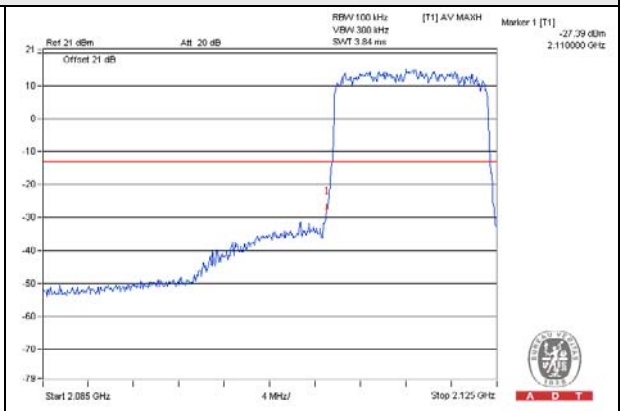
LTE Band 4 (Channel Bandwidth 10MHz): Chain 1

Frequency 2150.0	Frequency 2115.0
QPSK	
	
16QAM	
	
64QAM	
	

LTE Band 4 (Channel Bandwidth 15MHz): Chain 0

Frequency 2147.5	Frequency 2117.5
QPSK	
	
16QAM	
	
64QAM	
	

LTE Band 4 (Channel Bandwidth 15MHz): Chain 1

Frequency 2147.5	Frequency 2117.5
QPSK	
	
16QAM	
	
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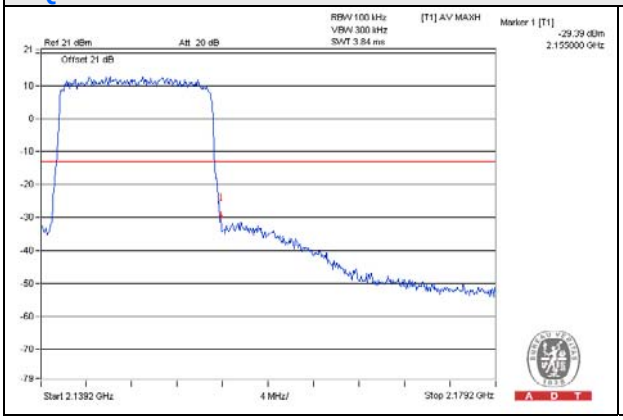
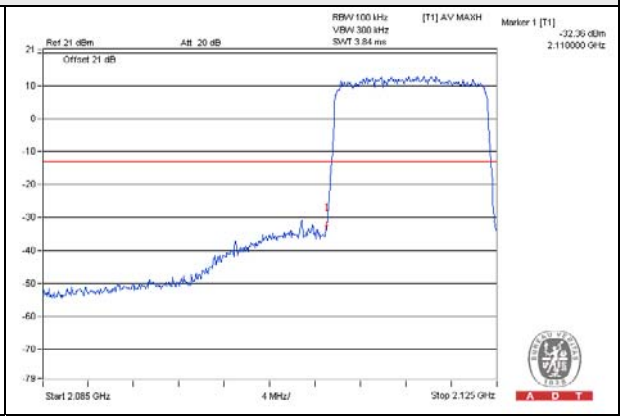
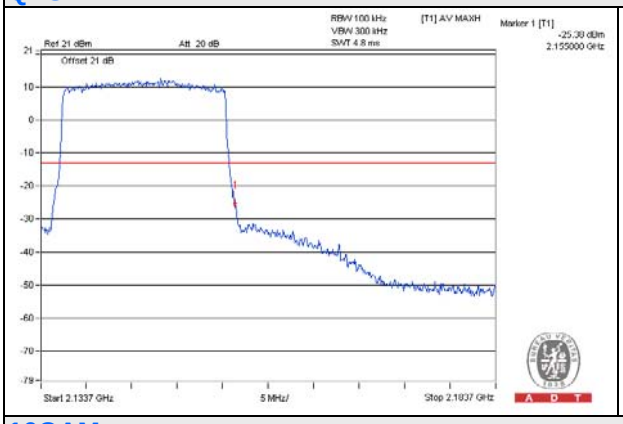
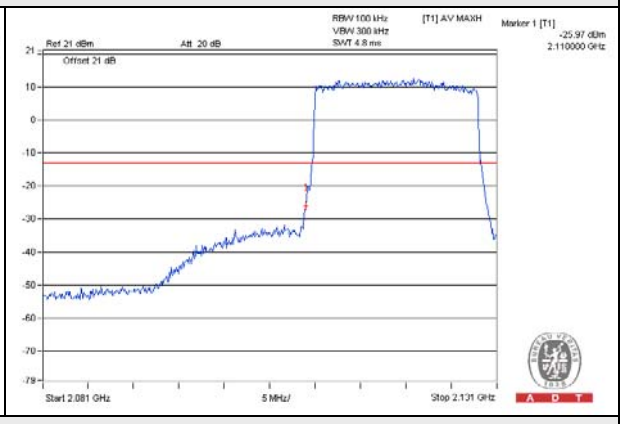
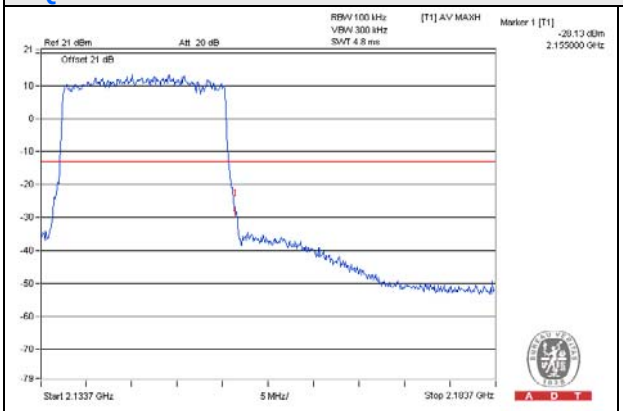
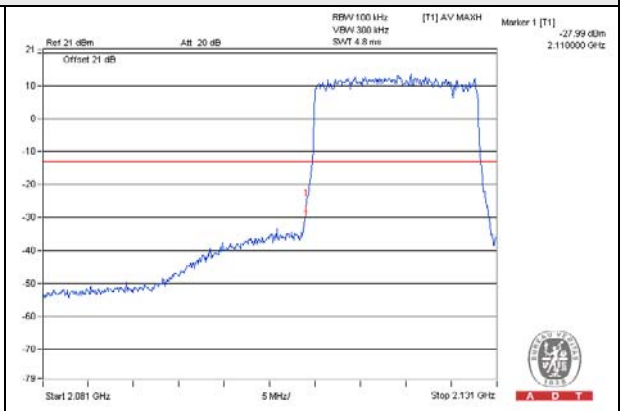
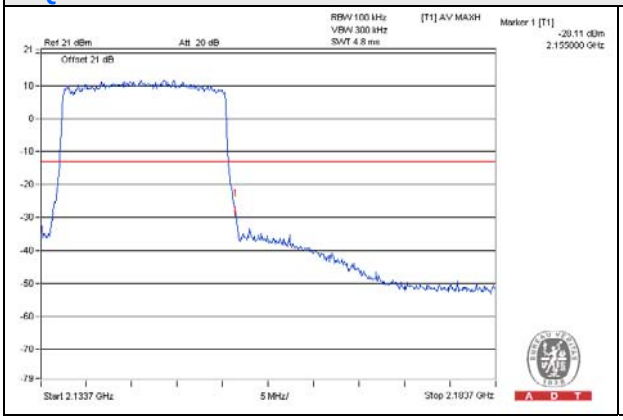
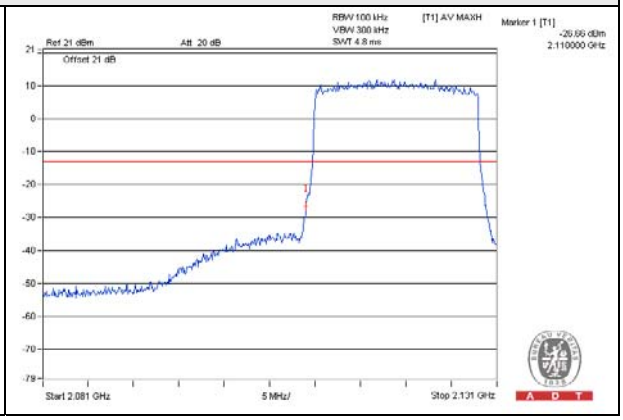
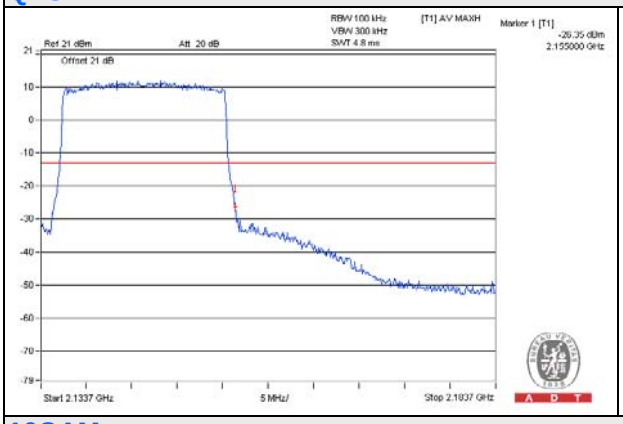
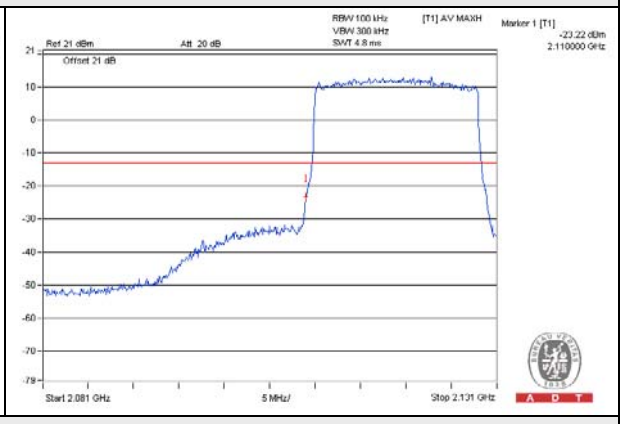
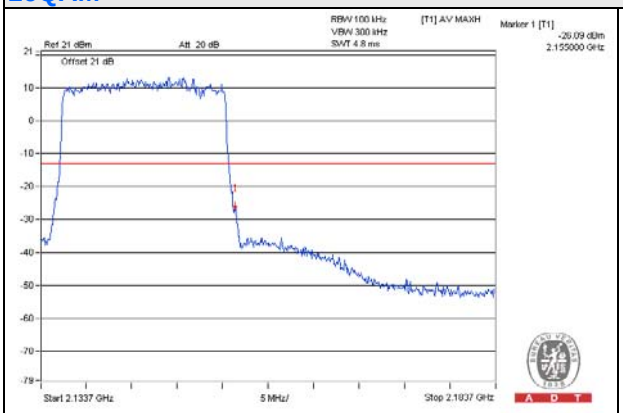
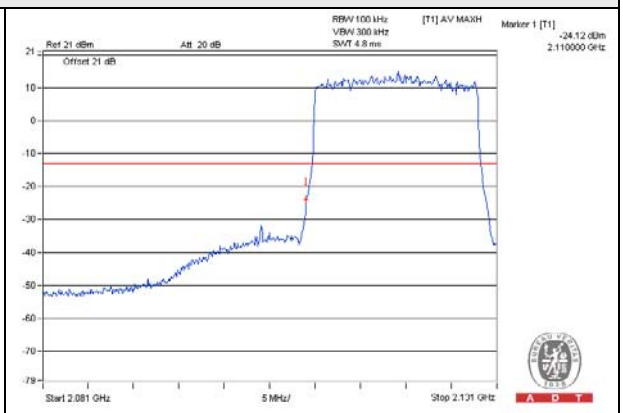
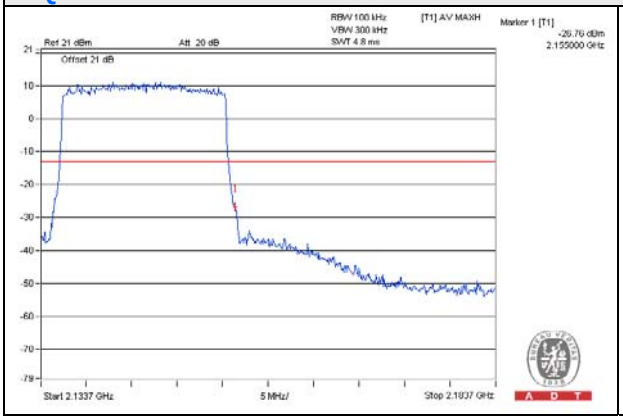
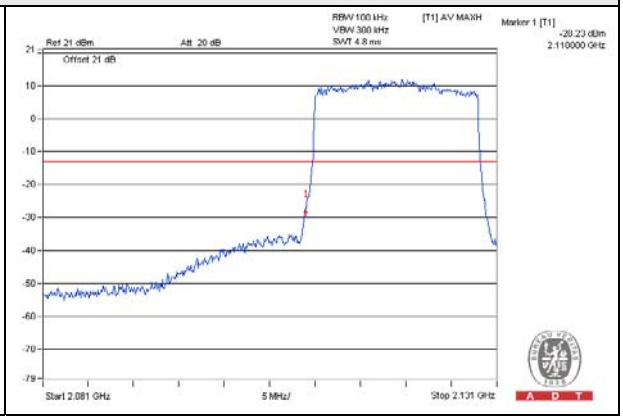
	

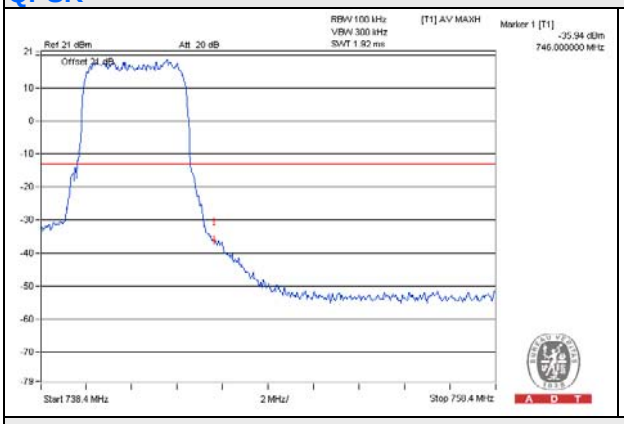
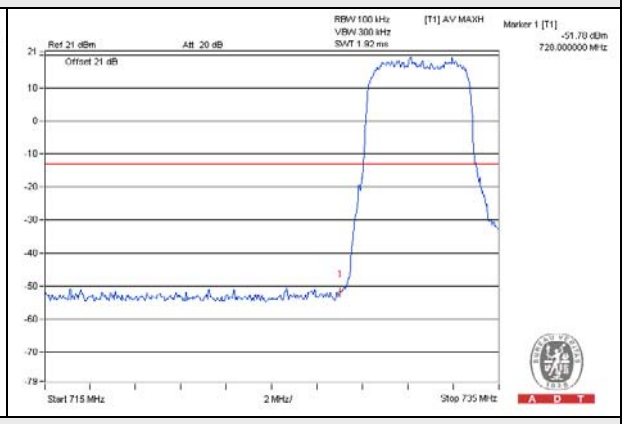
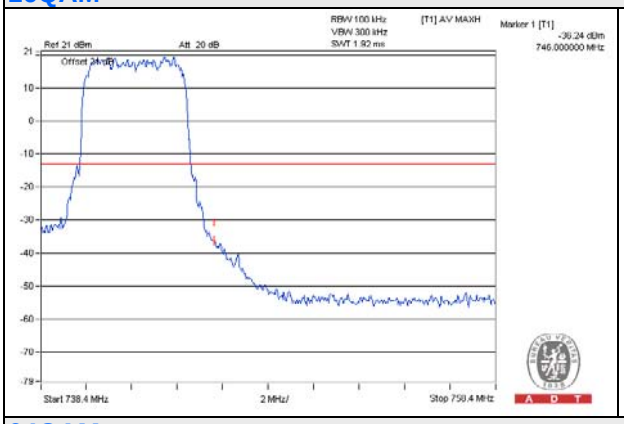
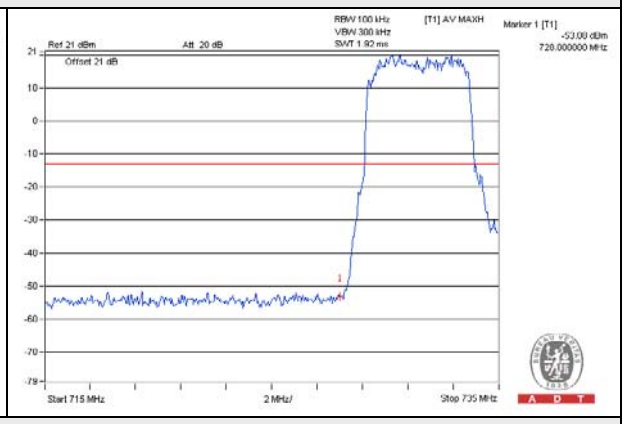
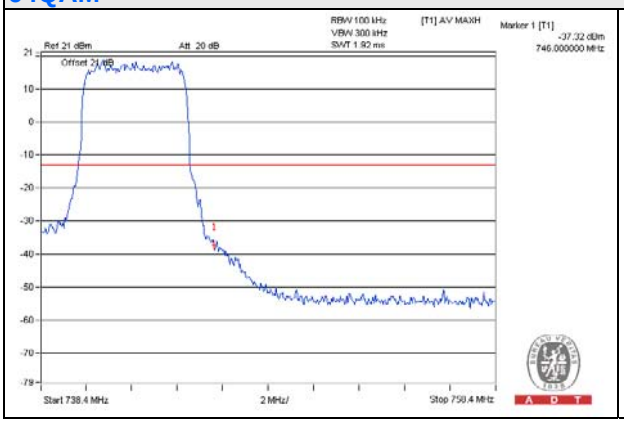
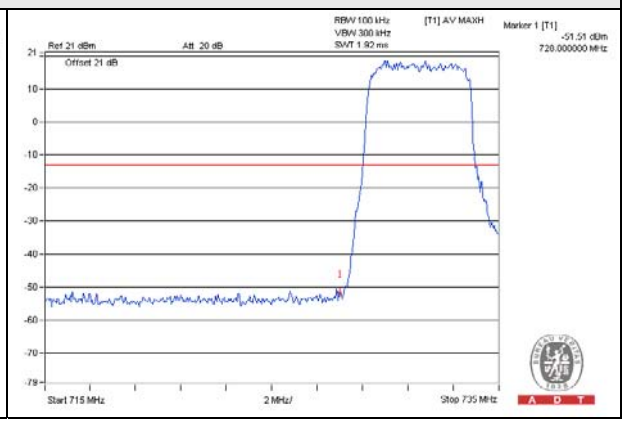
LTE Band 4 (Channel Bandwidth 20MHz): Chain 0

Frequency 2145.0	Frequency 2120.0
QPSK	
	
16QAM	
	
64QAM	
	

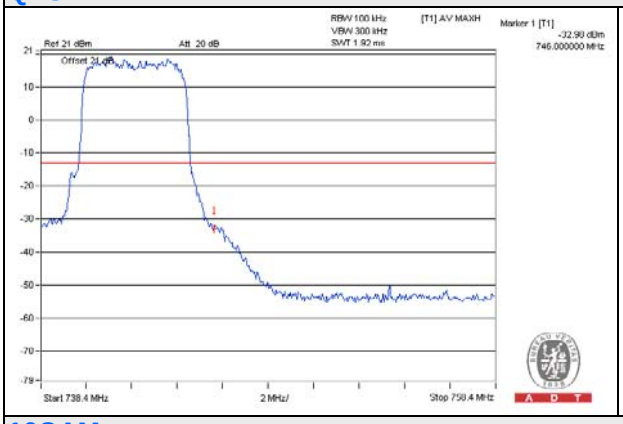
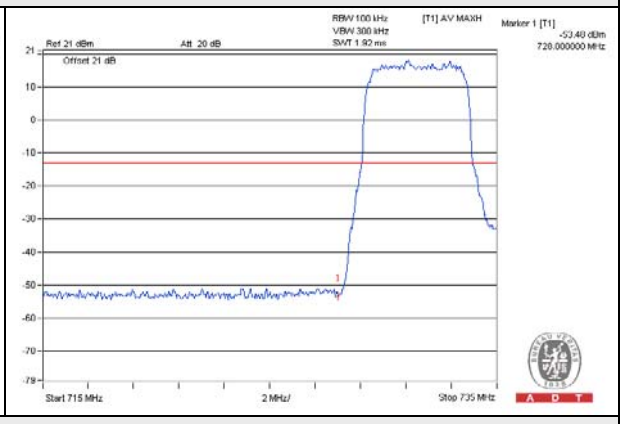
LTE Band 4 (Channel Bandwidth 20MHz): Chain 1

Frequency 2145.0	Frequency 2120.0
QPSK	
	
16QAM	
	
64QAM	
	

LTE Band 12 (Channel Bandwidth 5MHz): Chain 0

Frequency 742.5	Frequency 731.5
QPSK	
	
16QAM	
	
64QAM	
	

LTE Band 12 (Channel Bandwidth 5MHz): Chain 1

Frequency 742.5	Frequency 731.5
QPSK	
	
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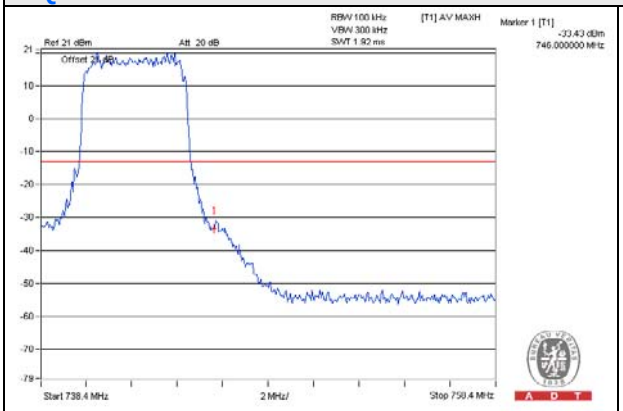	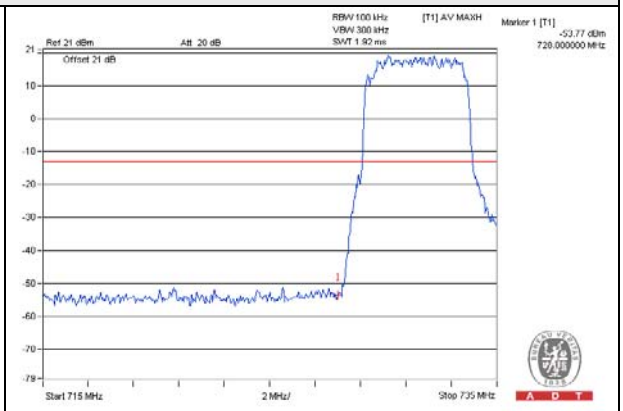
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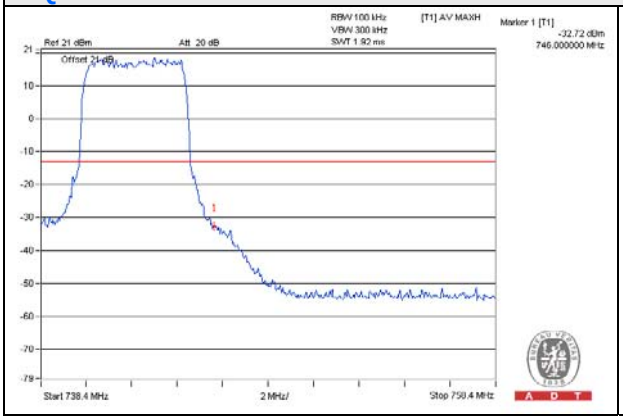
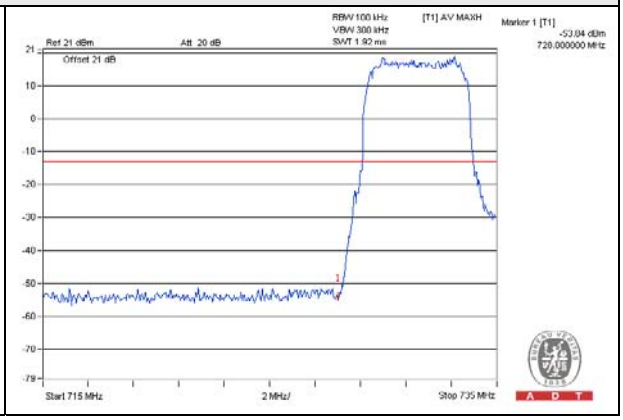
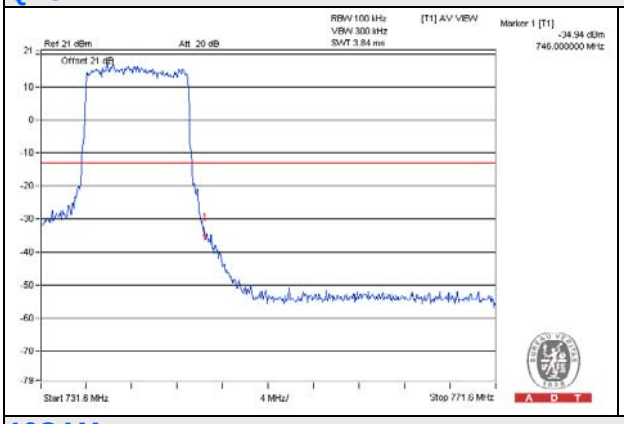
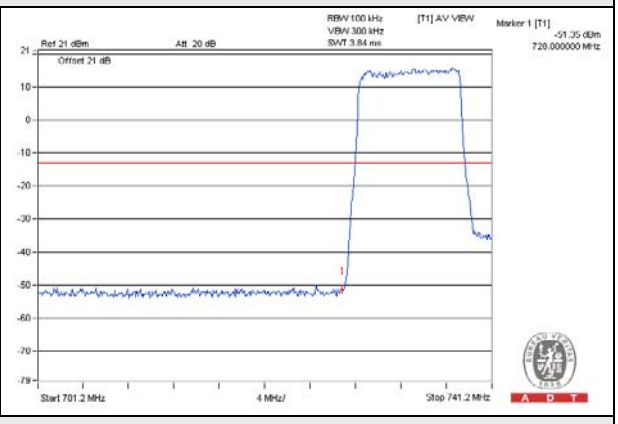
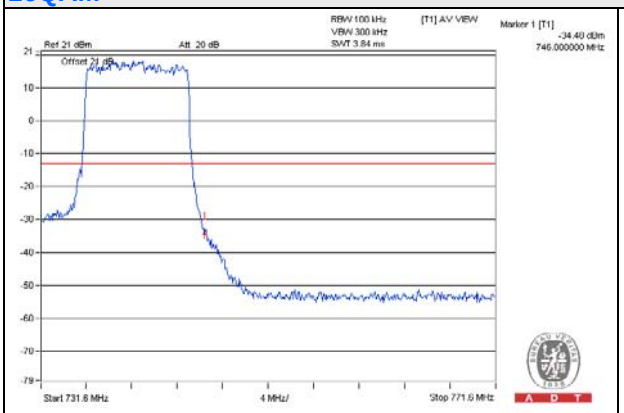
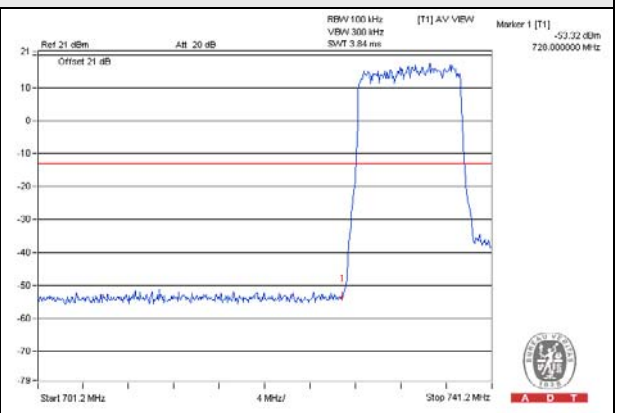
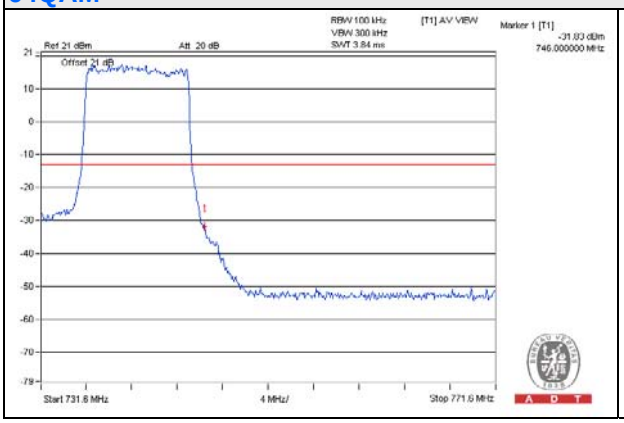
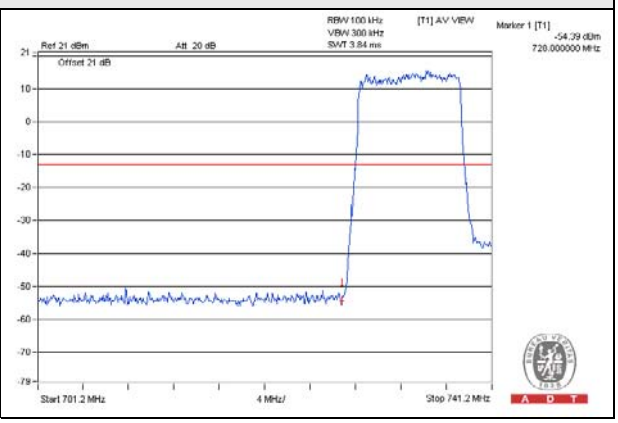
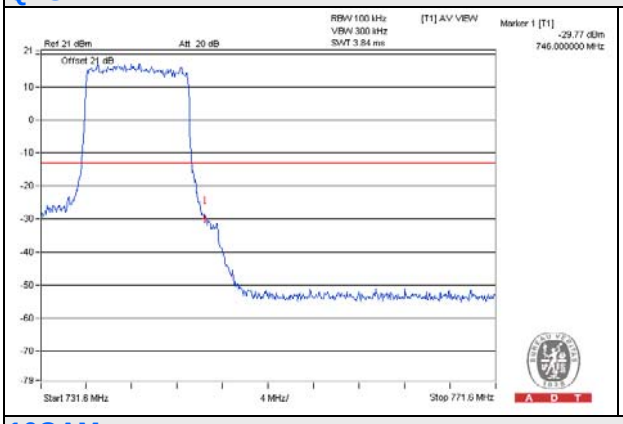
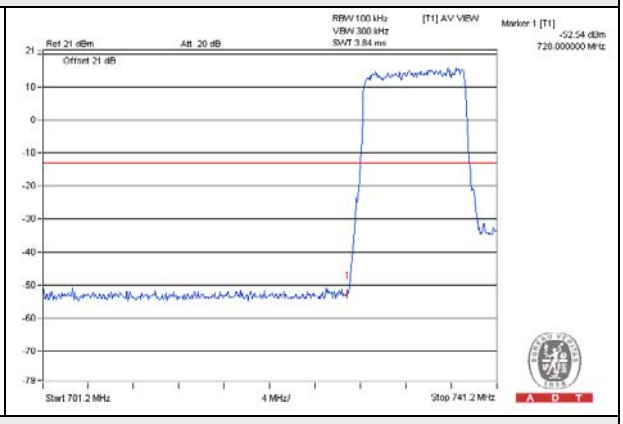
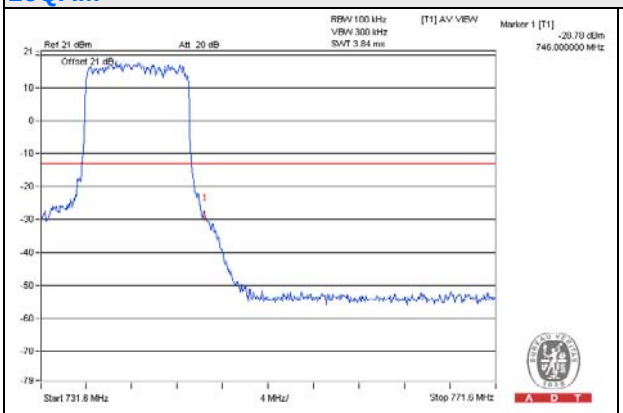
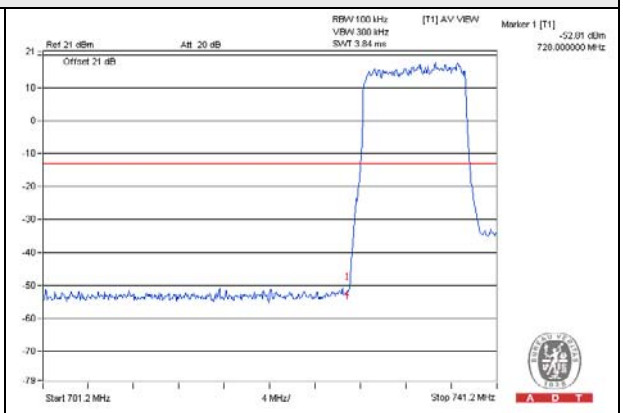
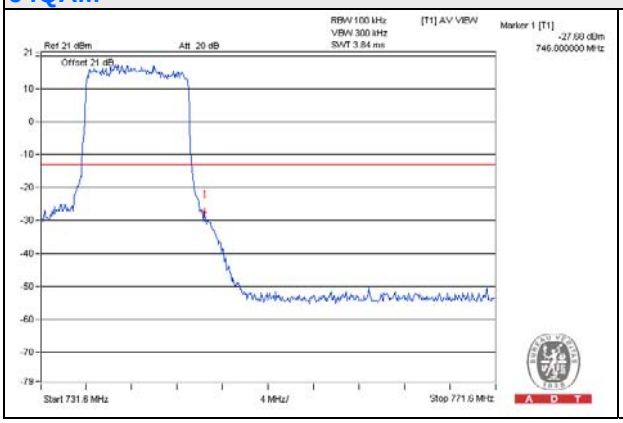
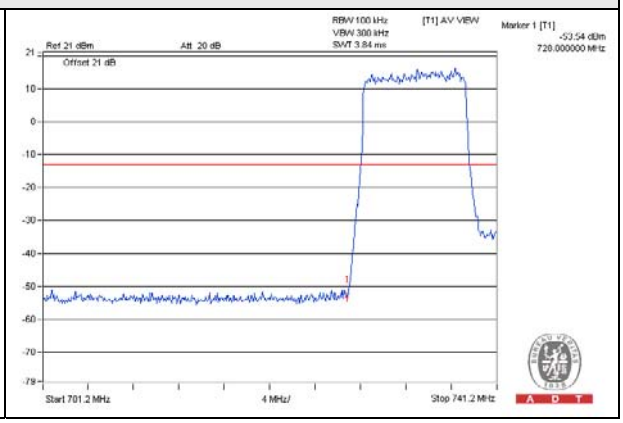
	

LTE Band 12 (Channel Bandwidth 10MHz): Chain 0

Frequency 740.0	Frequency 734.0
QPSK	
	
16QAM	
	
64QAM	
	

LTE Band 12 (Channel Bandwidth 10MHz): Chain 1

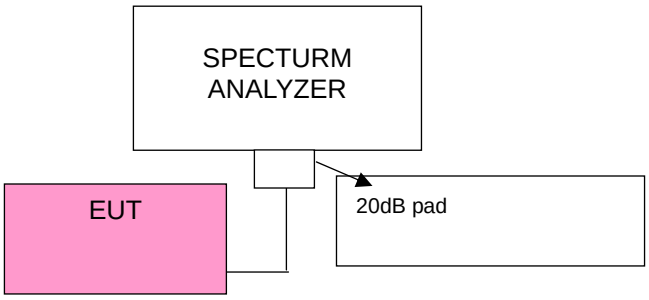
Frequency 740.0	Frequency 734.0
QPSK	
	
16QAM	
	
64QAM	
	

4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

In the FCC 27.53(m)(4), On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The emission limit equal to –13dBm.

4.6.2 Test Setup



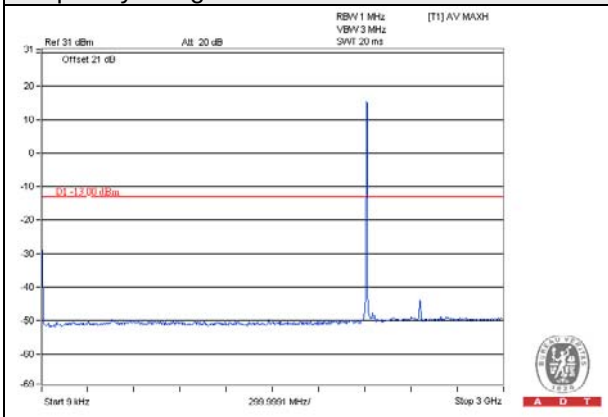
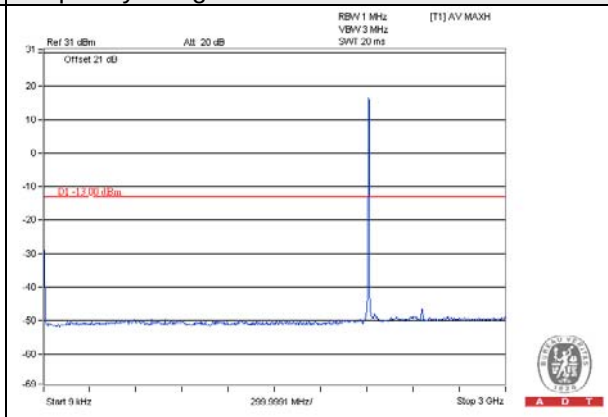
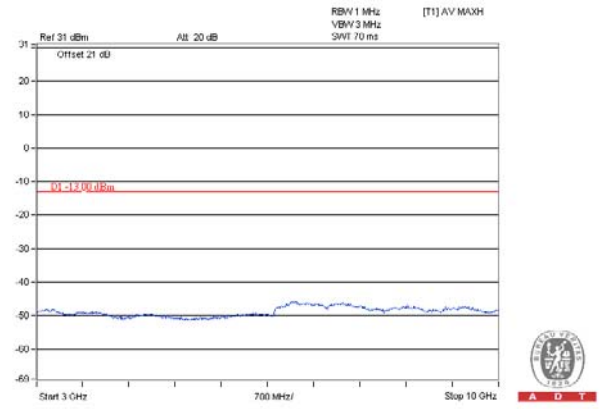
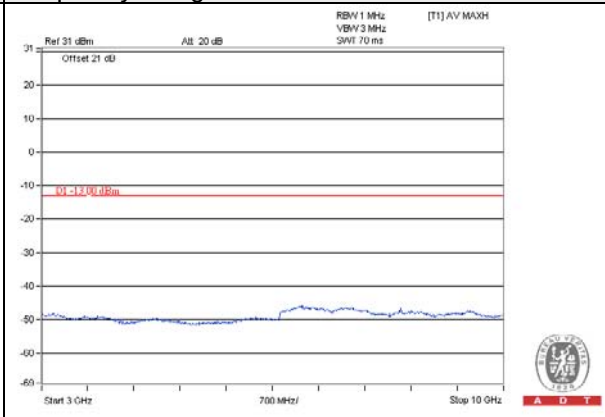
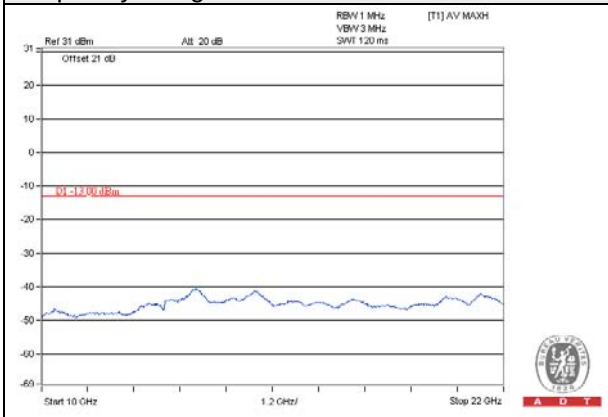
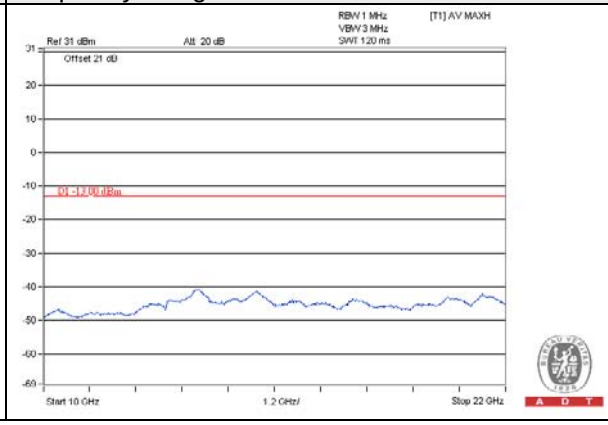
4.6.3 Test Procedure

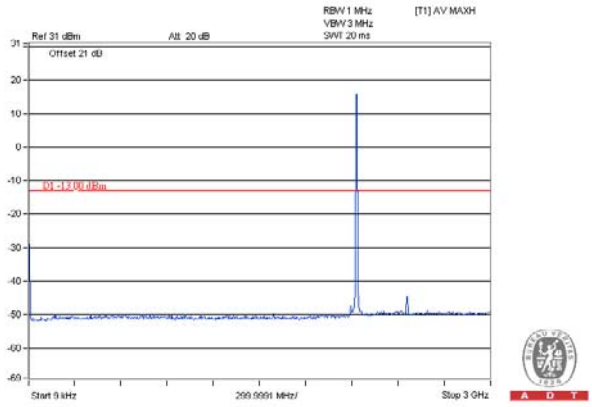
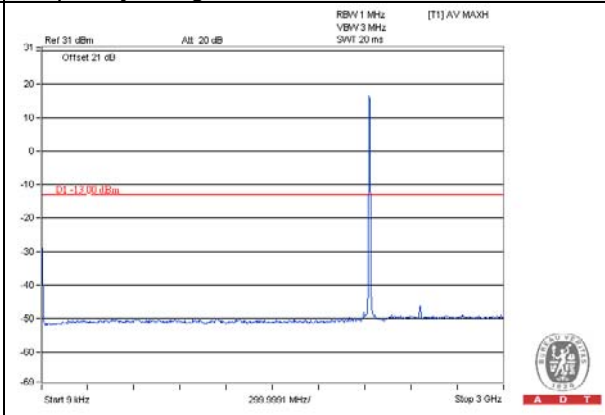
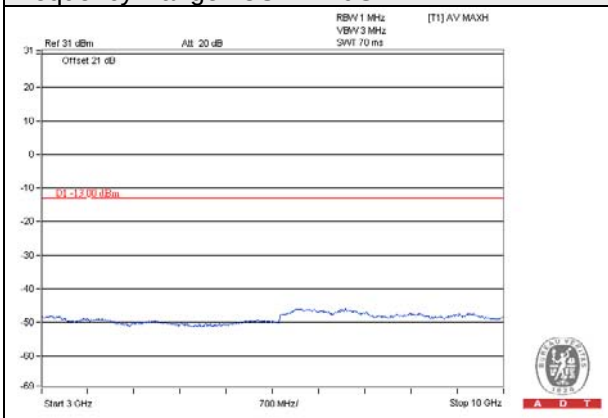
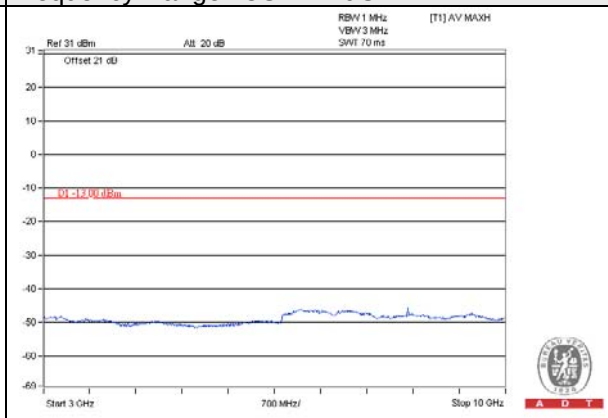
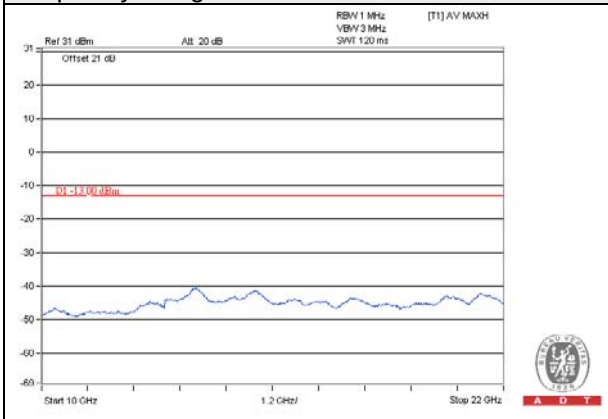
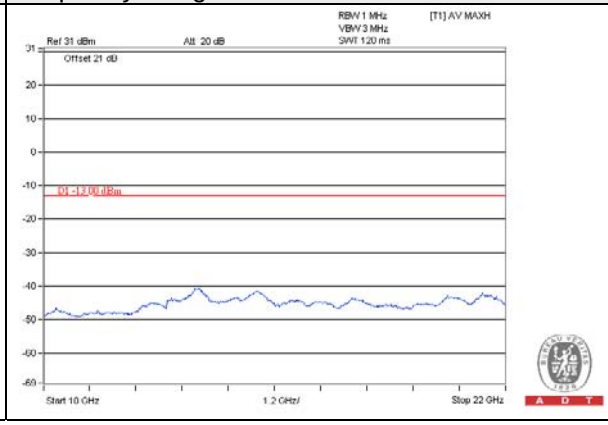
a. All measurements were done at 3 channels: low, middle and high operational frequency range.

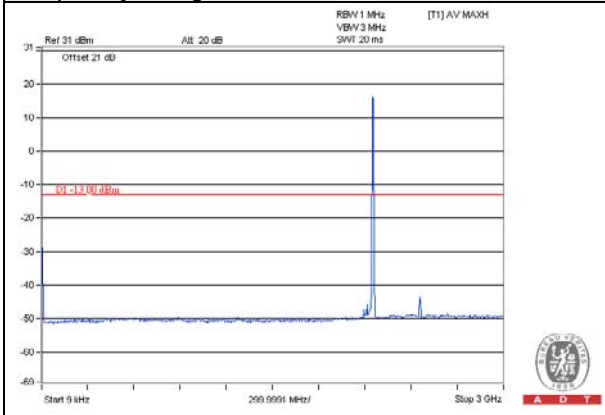
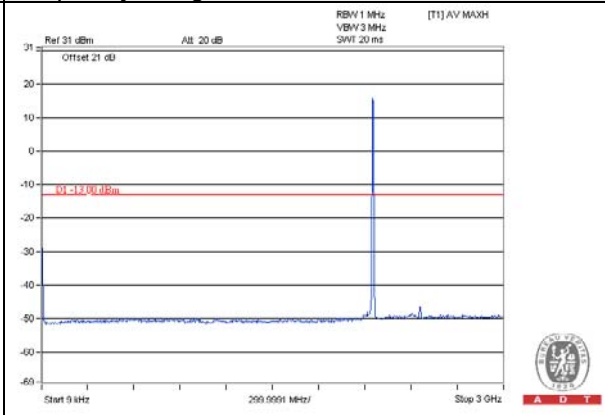
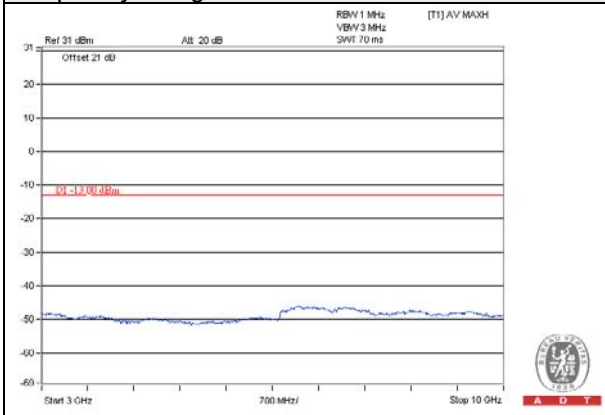
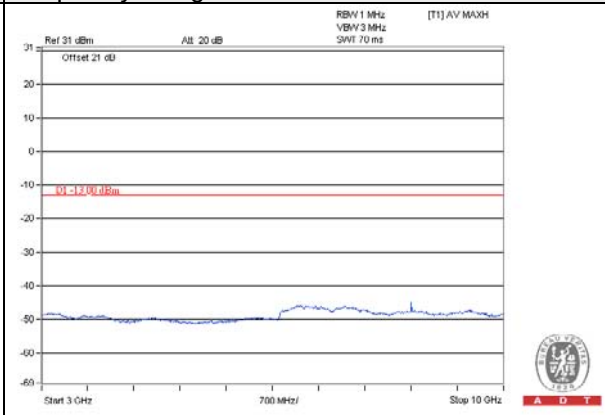
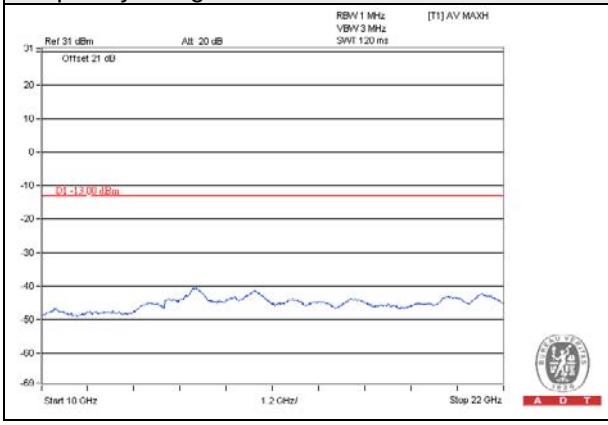
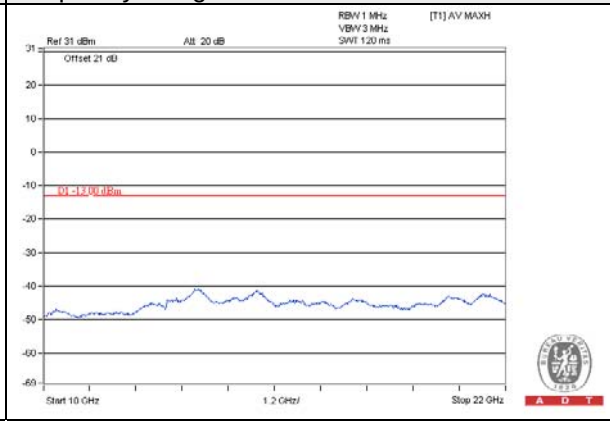
b. When the spectrum scanned from 9kHz to 22GHz, it shall be connected to the 20dB pad attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

4.6.4 Test Results

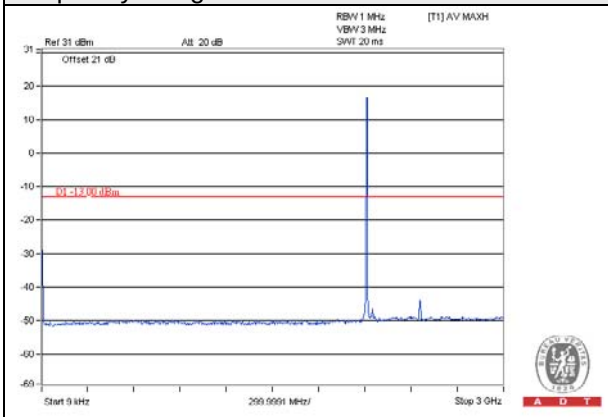
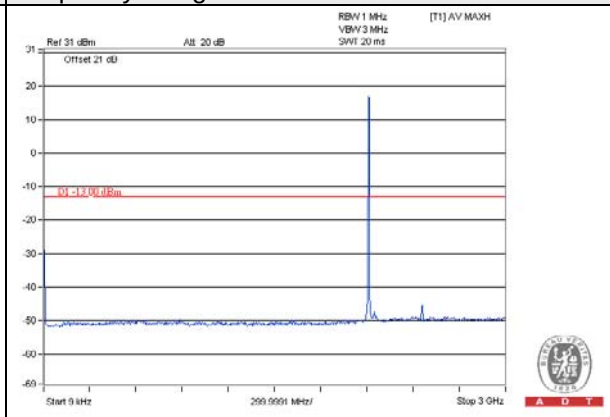
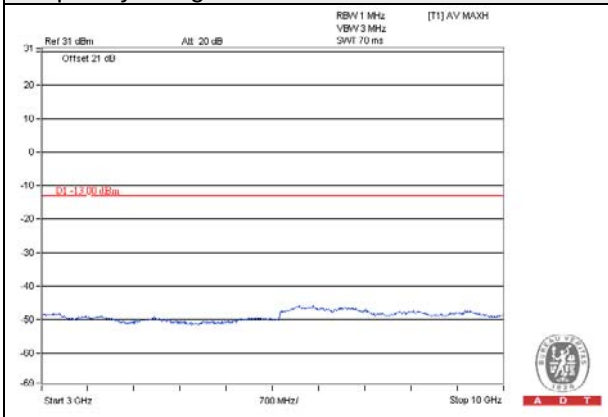
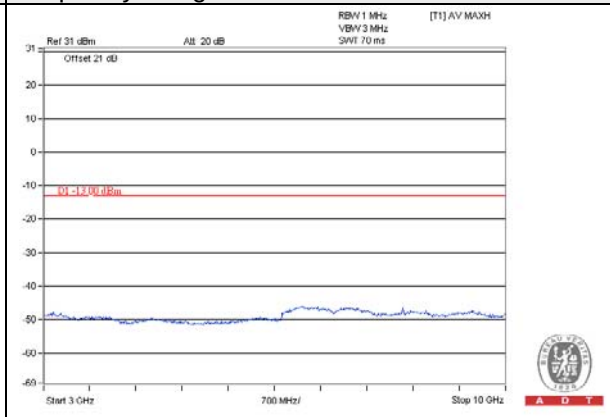
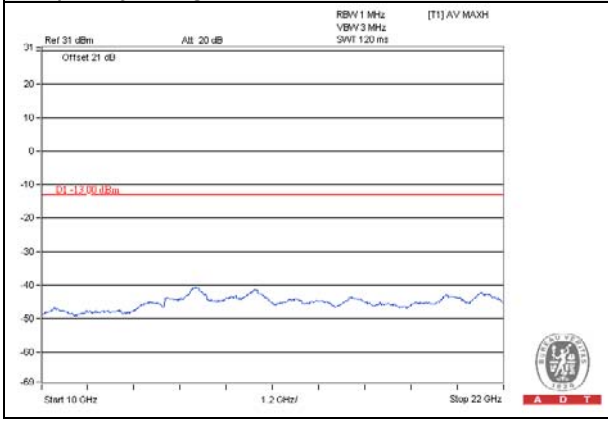
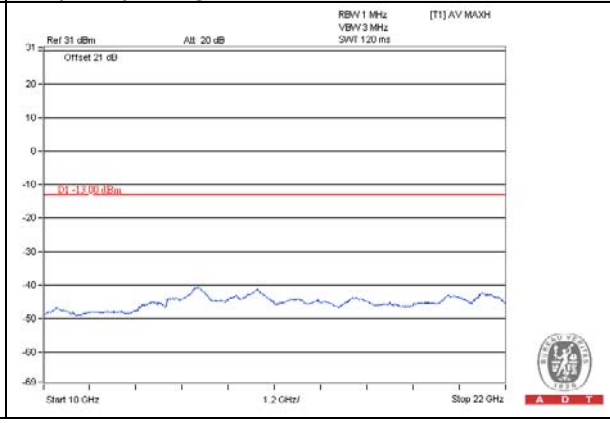
LTE Band 4 (Channel Bandwidth 5MHz): QPSK

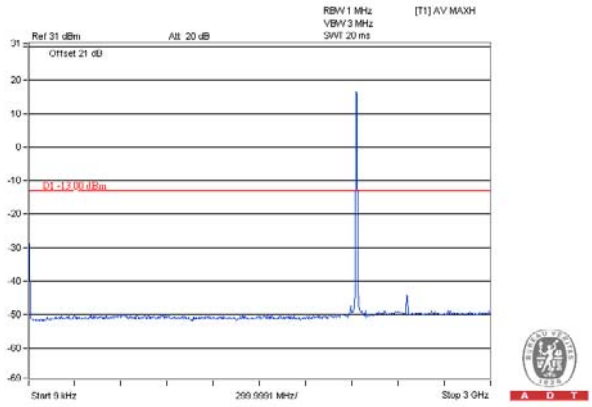
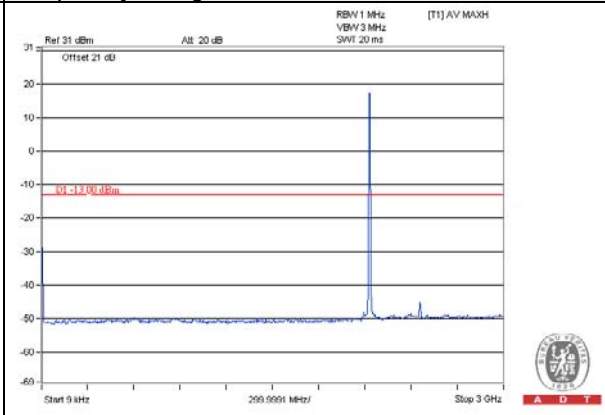
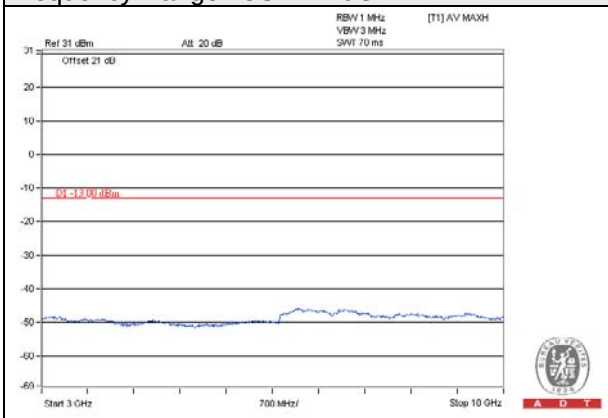
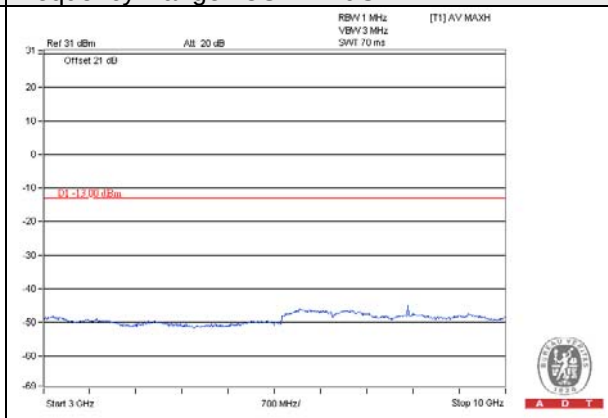
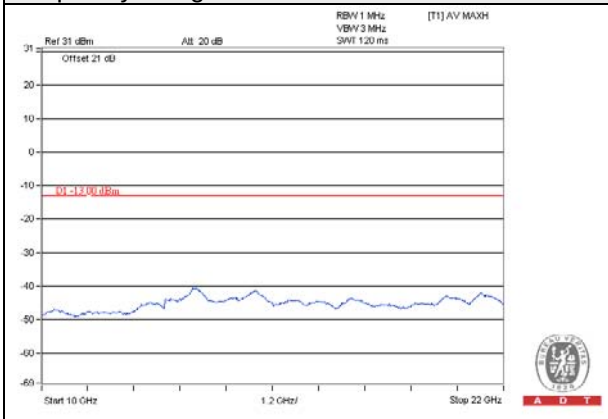
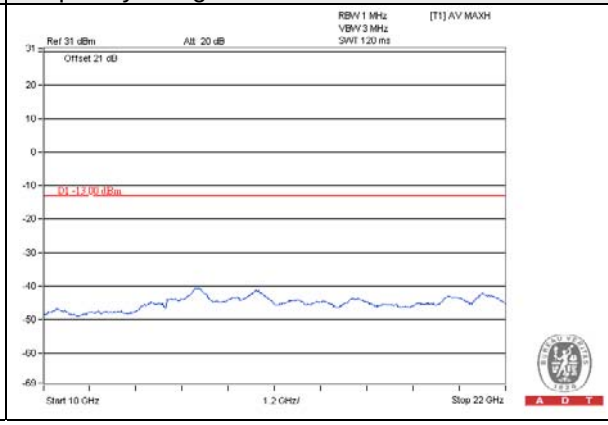
Frequency 2112.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

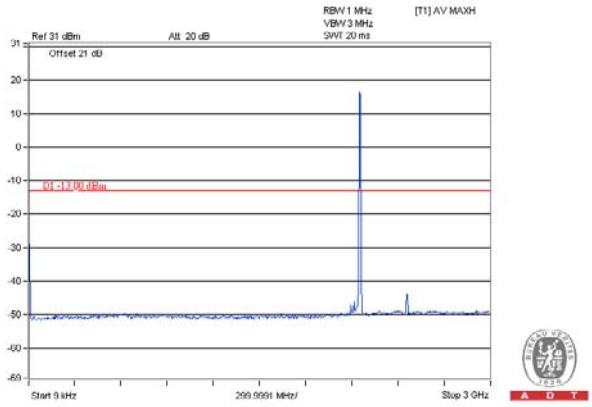
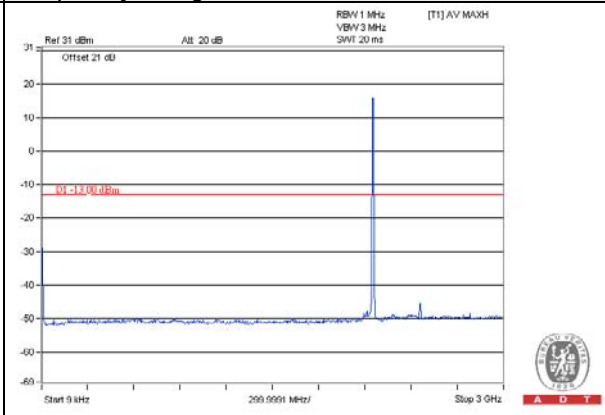
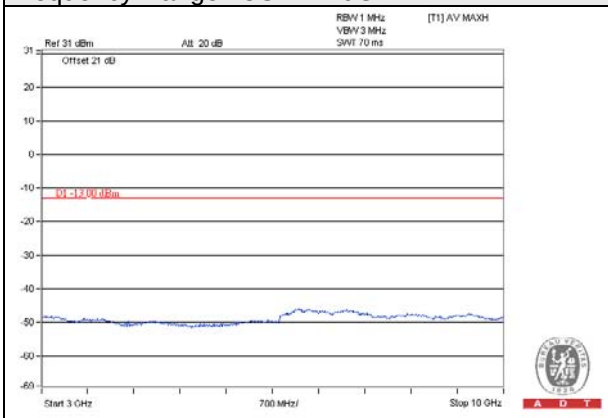
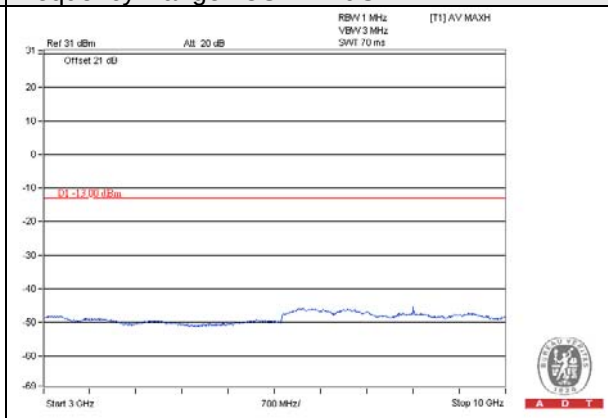
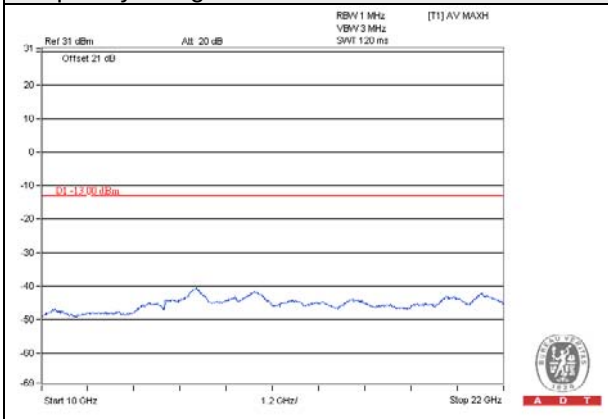
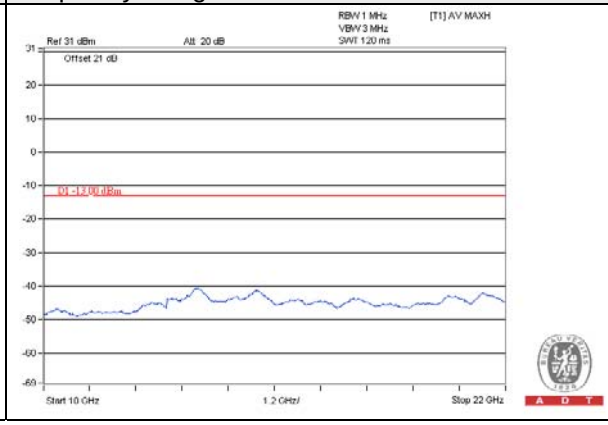
Frequency 2132.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

Frequency 2152.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

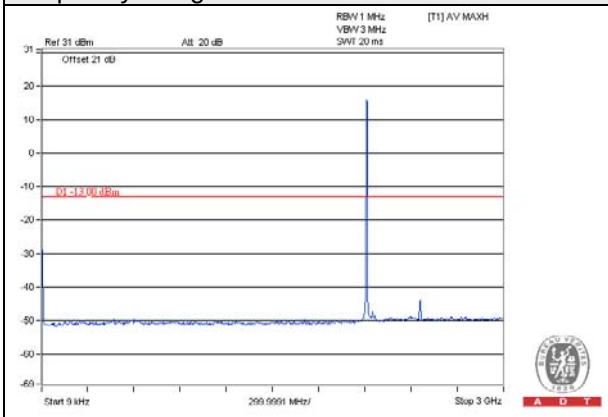
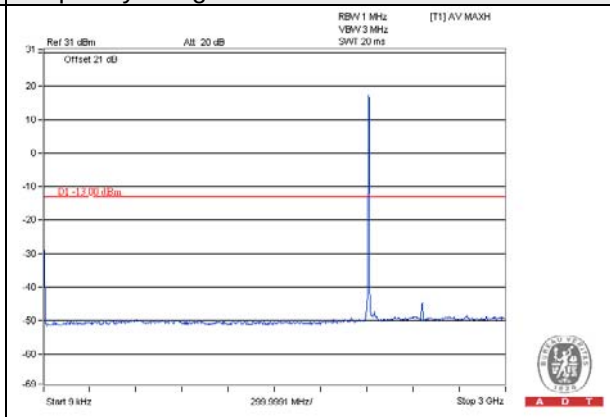
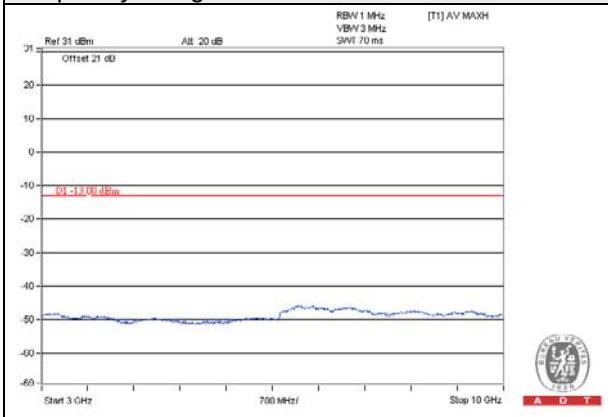
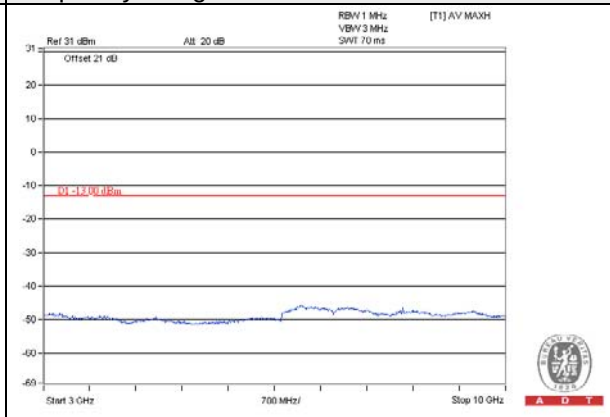
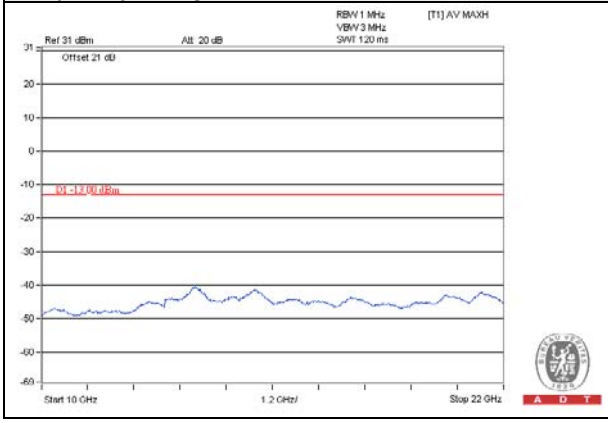
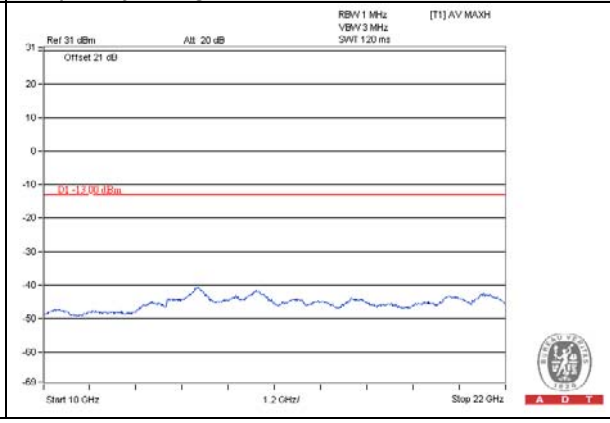
LTE Band 4 (Channel Bandwidth 5MHz): 16QAM

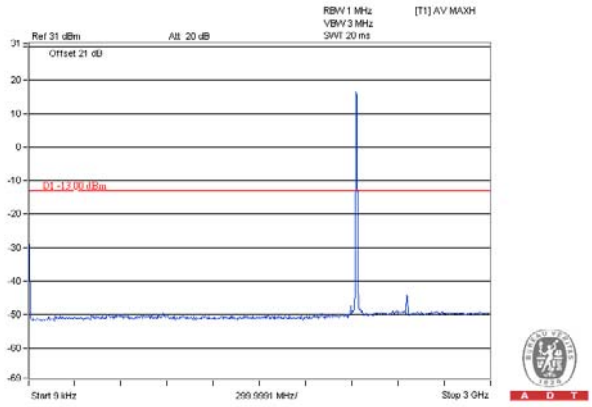
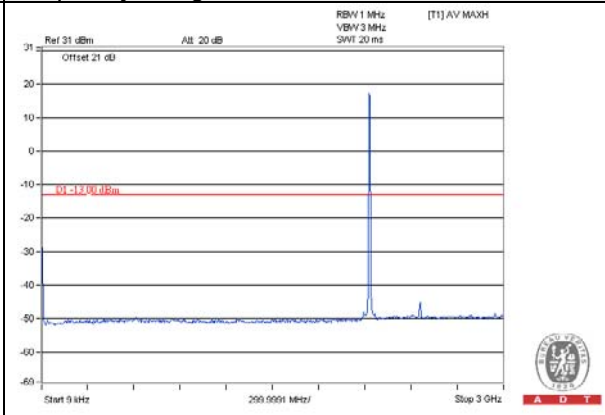
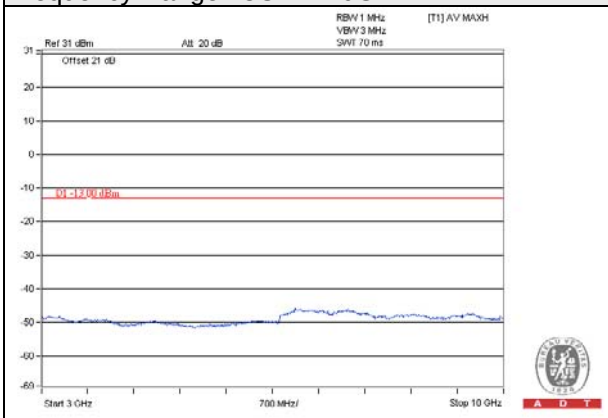
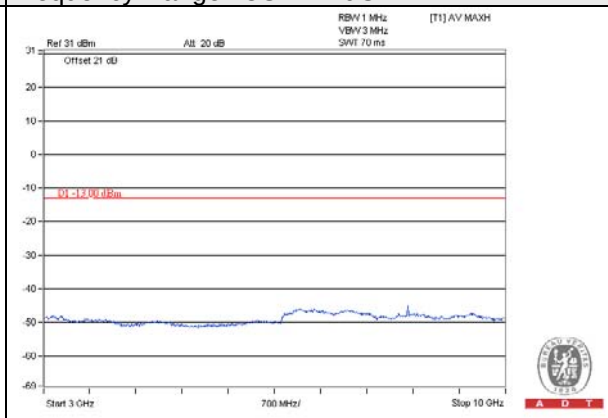
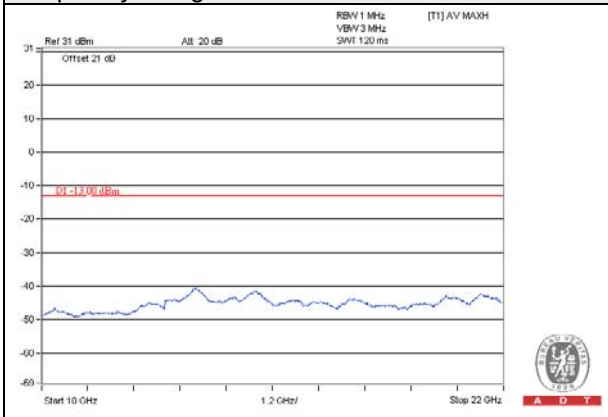
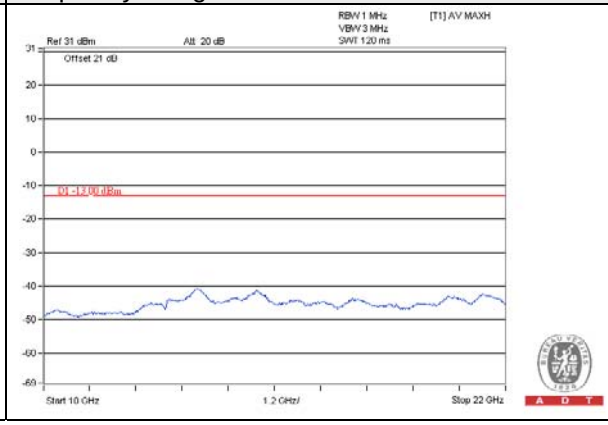
Frequency 2112.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

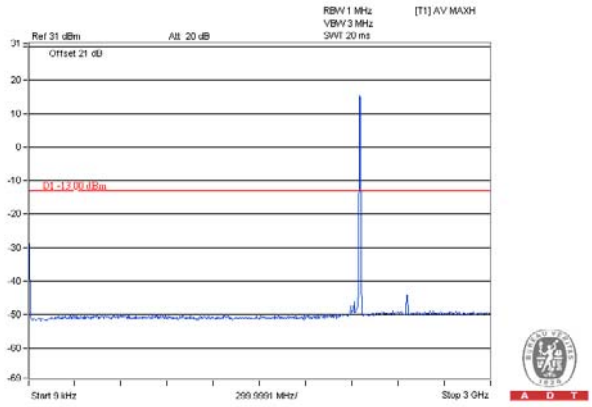
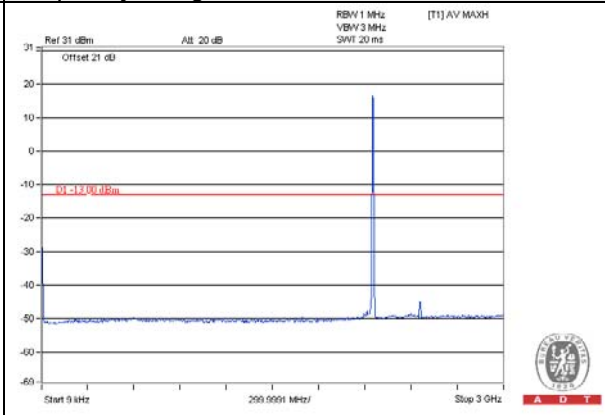
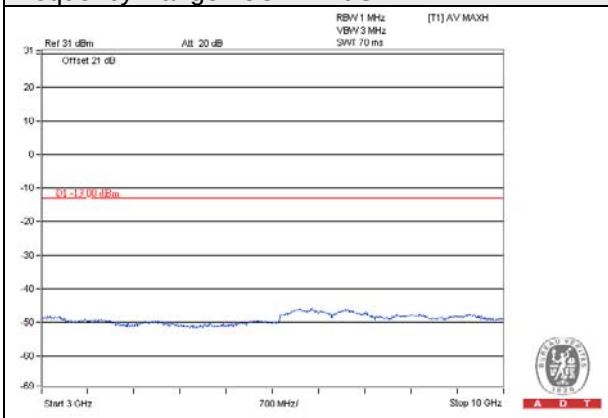
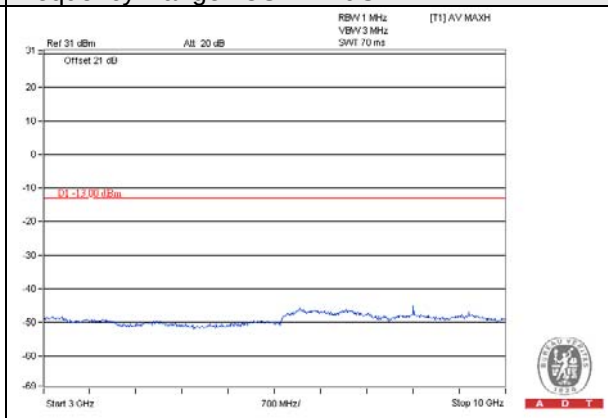
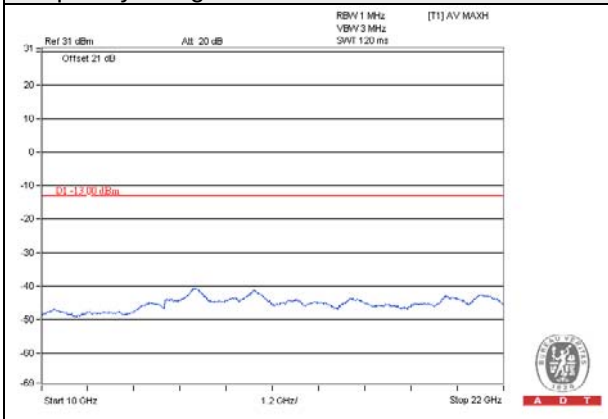
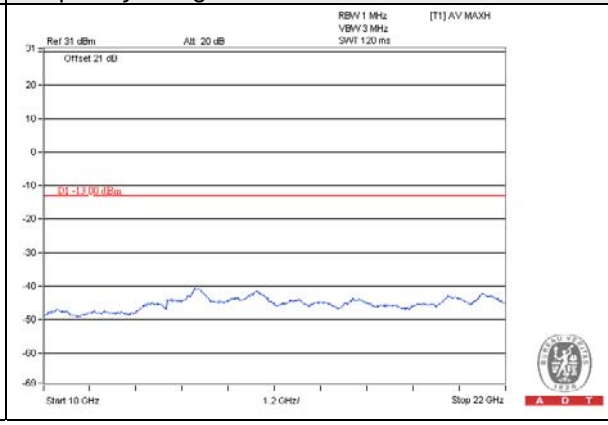
Frequency 2132.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

Frequency 2152.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

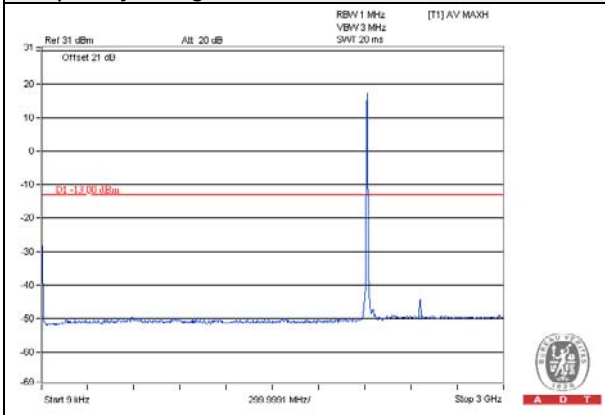
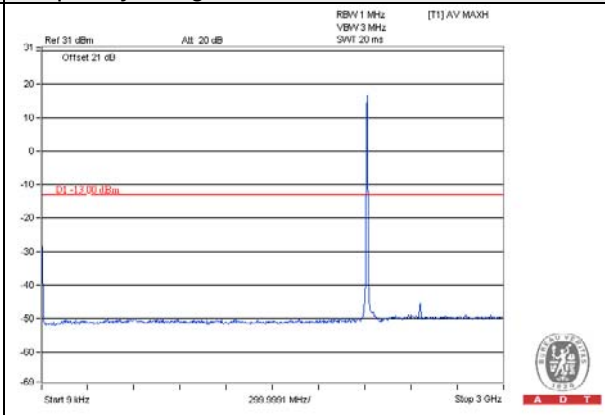
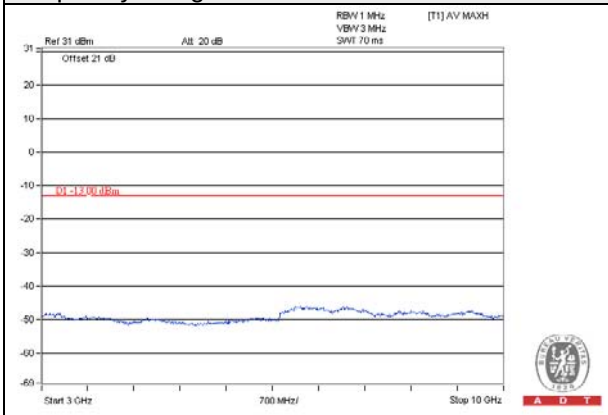
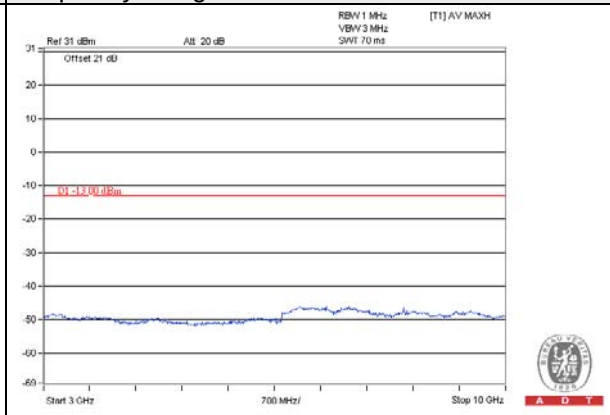
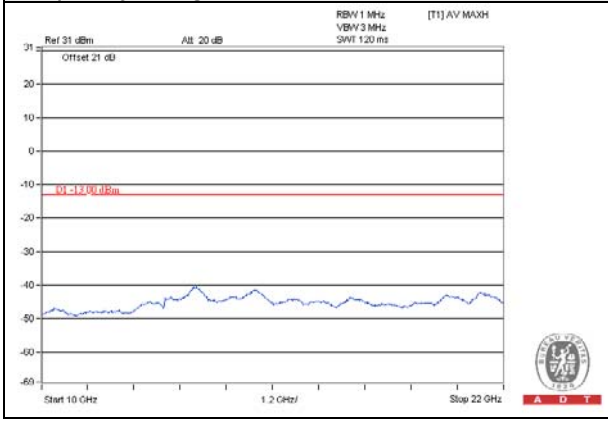
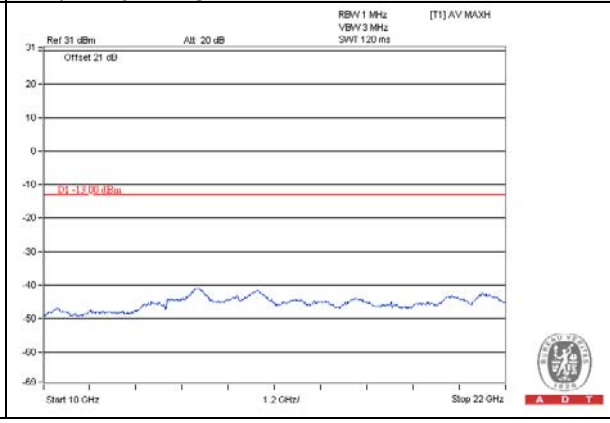
LTE Band 4 (Channel Bandwidth 5MHz): 64QAM

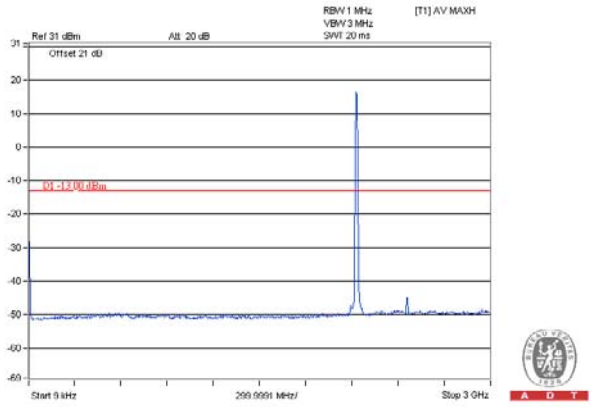
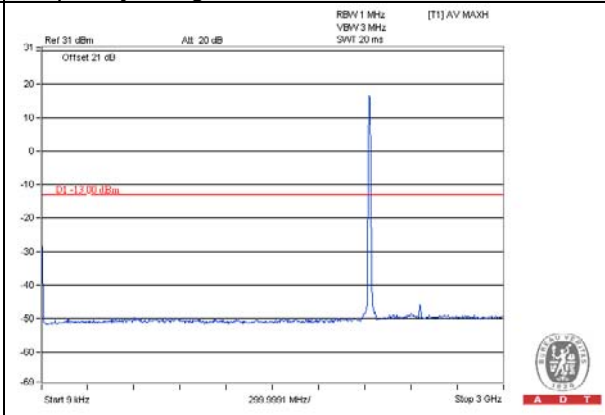
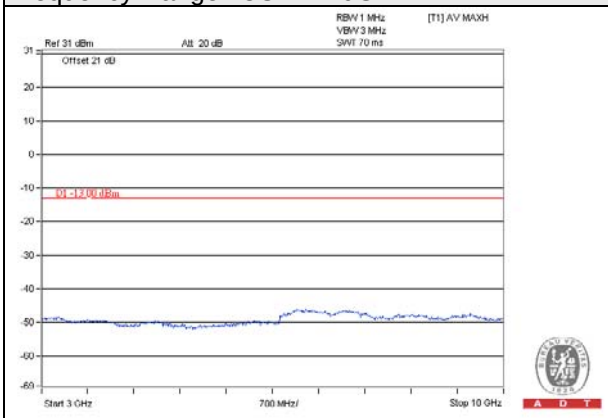
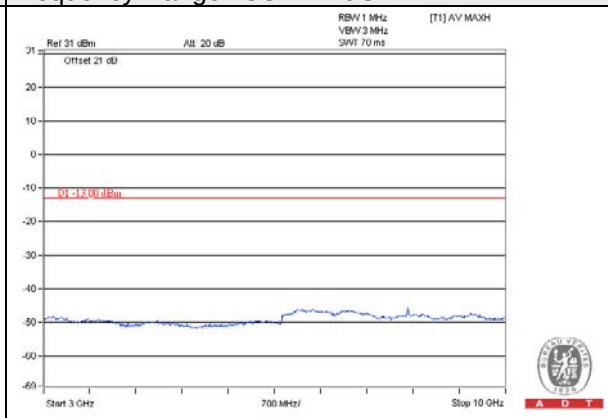
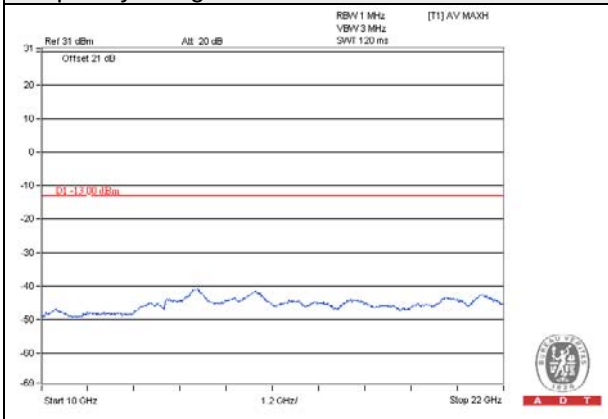
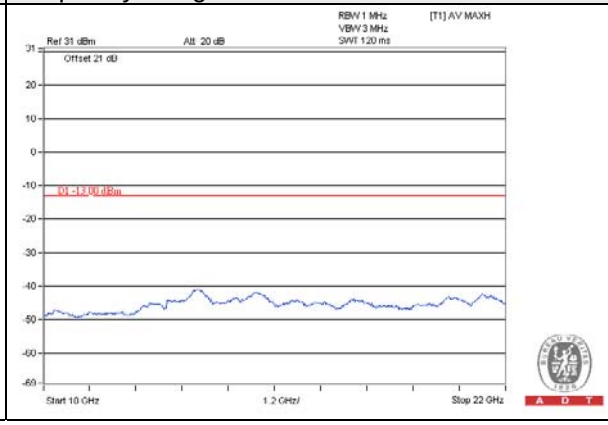
Frequency 2112.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

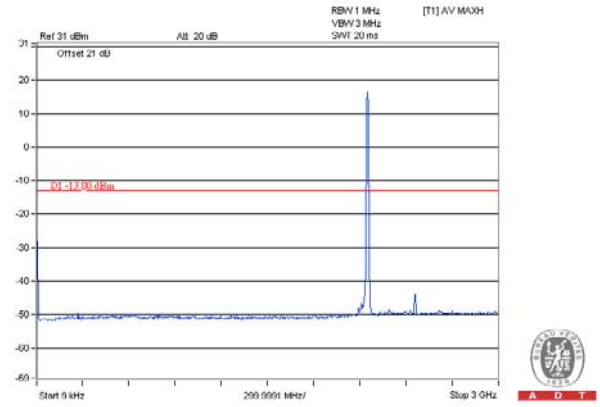
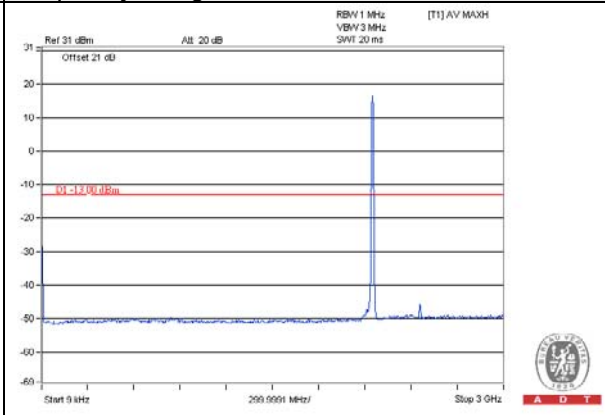
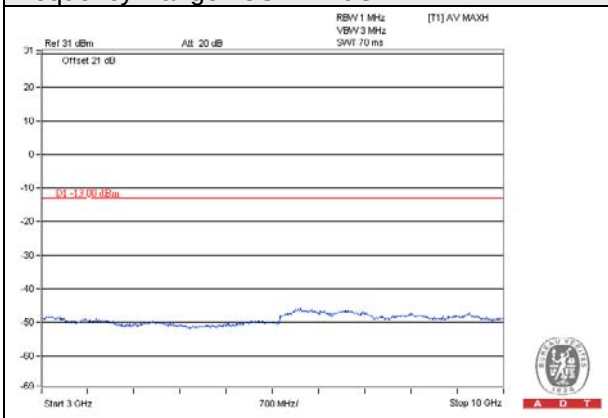
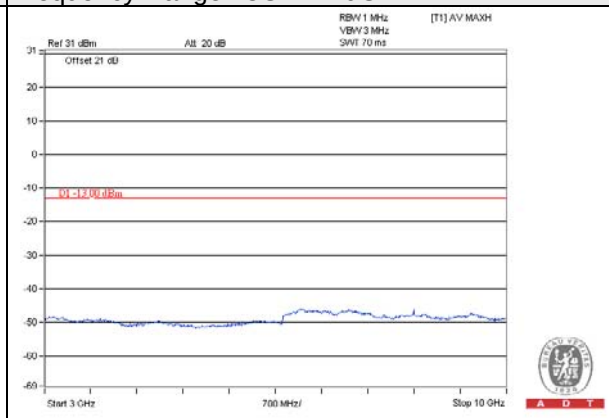
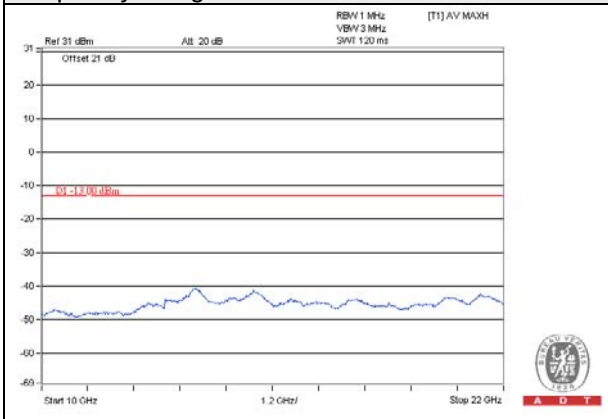
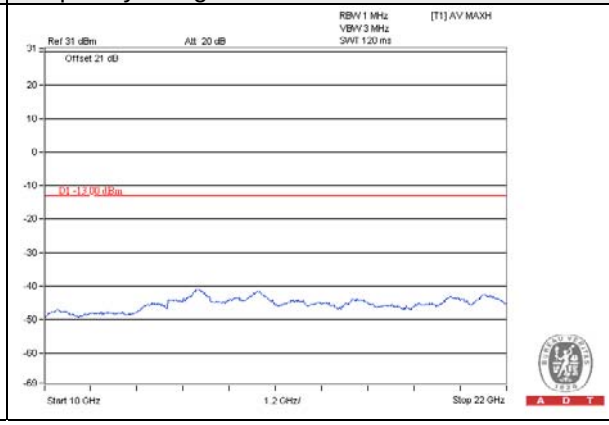
Frequency 2132.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

Frequency 2152.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

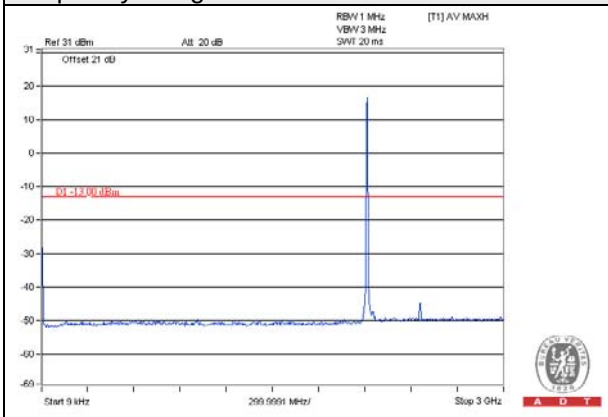
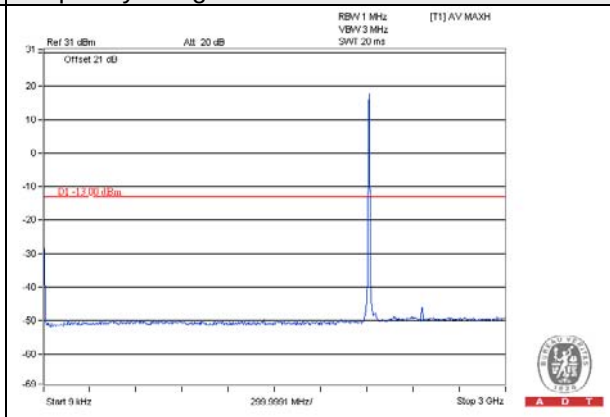
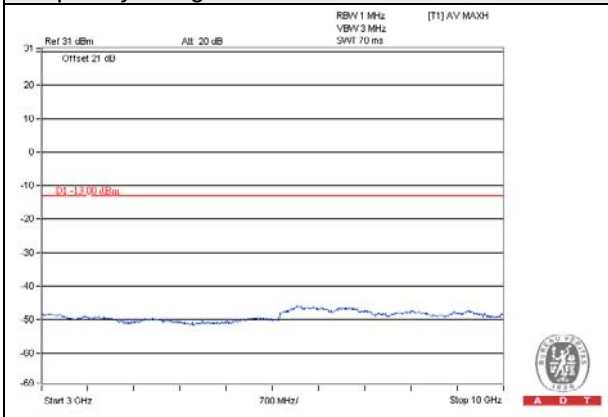
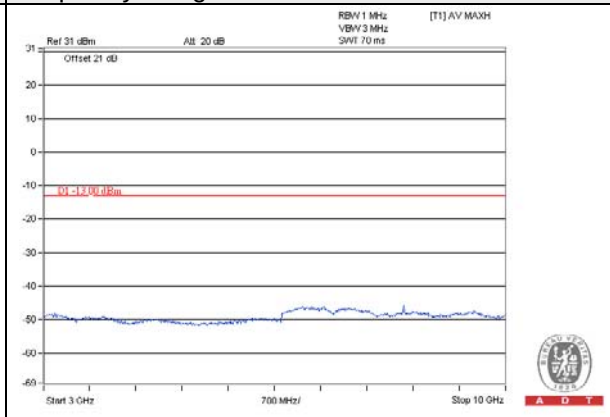
LTE Band 4 (Channel Bandwidth 10MHz): QPSK

Frequency 2115.0	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

Frequency 2132.5	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

Frequency 2150.0	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz
	

LTE Band 4 (Channel Bandwidth 10MHz): 16QAM

Frequency 2115.0	
Chain 0	**Chain 1**
Frequency Range : 9kHz~3GHz	Frequency Range : 9kHz~3GHz
	
Frequency Range : 3GHz~10GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~22GHz	Frequency Range : 10GHz~22GHz