FCC Test Report
(Part 22: LTE Band 5)

Report No.: RF160621C08-7

FCC ID: H8N-PCT5230

Test Model: ADR1776

Received Date: Jun. 21, 2016

Test Date: Aug. 05 ~ Aug. 24, 2016

Issued Date: Aug. 25, 2016

Applicant: ASKEY COMPUTER CORP.

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Release Control Record

Issue No.	Description	Date Issued
RF160621C08-7	Original release.	Aug. 25, 2016

1 Certificate of Conformity

Product: Smart Phone

Brand: Turbonet

Test Model: ADR1776

Sample Status: Engineering sample

Applicant: ASKEY COMPUTER CORP.

Test Date: Aug. 05 ~ Aug. 24, 2016

Standards: FCC Part 22, Subpart H

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 : _____ , **Date:** Aug. 25, 2016
Polly Chien / Specialist

Approved by : _____ , **Date:** Aug. 25, 2016
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	PASS	Meet the requirement of limit.
---	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	PASS	Meet the requirement of limit.
2.1049	Occupied Bandwidth	PASS	Meet the requirement of limit.
22.917	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -24.7dB at 59.10MHz.

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	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 23, 2015	Dec. 22, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Apr. 19, 2016	Apr. 18, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Jan. 18, 2016	Jan. 17, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Jan. 08, 2016	Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2016	Aug. 08, 2017
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02(309222 +248780)	Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03(274092)	Aug. 09, 2016	Aug. 08, 2017
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 09, 2016	Aug. 08, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2016	Jun. 07, 2017
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Jun. 09, 2015	Jun. 08, 2016
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 215374.
5. The IC Site Registration No. is IC 7450F-9.

3 General Information

3.1 General Description of EUT

Product	Smart Phone	
Brand	Turbonet	
Test Model	ADR1776	
Sample Status	Engineering sample	
Power Supply Rating	3.8Vdc (Battery) 5Vdc or 9Vdc (Adapter or host equipment) 9Vdc (Adapter)	
Modulation Type	QPSK, 16QAM	
Operating Frequency	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.30MHz
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth 10MHz)	829MHz ~ 844MHz
Max. ERP Power	LTE Band 5 (Channel Bandwidth 1.4MHz)	295.121mW (24.7dBm)
	LTE Band 5 (Channel Bandwidth 3MHz)	275.423mW (24.4dBm)
	LTE Band 5 (Channel Bandwidth 5MHz)	251.189mW (24.0dBm)
	LTE Band 5 (Channel Bandwidth 10MHz)	245.471mW (23.9dBm)
Antenna Type	Refer to Note for more details	
Antenna Connector	Refer to Note for more details	
Accessory Device	Refer to Note for more details	
Data Cable Supplied	Refer to Note for more details	

Note:

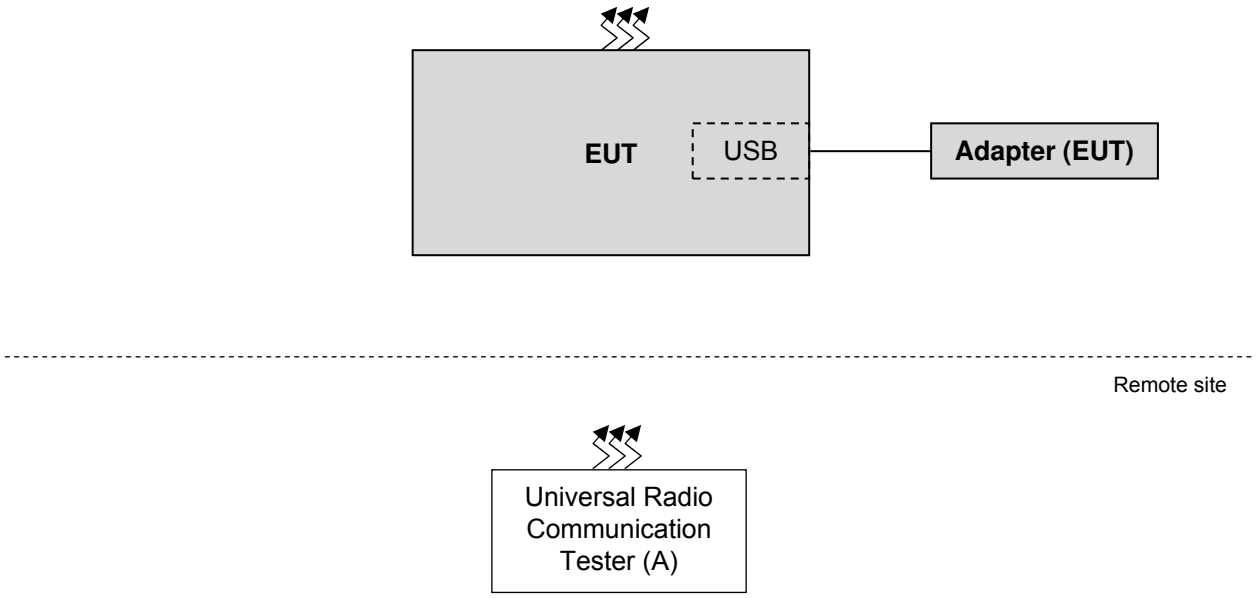
1. The EUT contains following accessory devices and data cable.

Item	Brand	Model	Specification
Battery	FUJI	492005	3.8Vdc, 11.21Wh or 2950mAh
USB cable	N/A	N/A	0.95m shielded cable without core
Adapter	DELTA Electronics, INC.	ADP-18GW B	I/P: 100-240Vac, 0.5A, 50-60Hz O/P: 5Vdc, 2A charger 9Vdc, 2A fast charger

2. The EUT uses following antennas.

Antenna	Frequency Range (MHz)	Antenna Gain (dBi)	Antenna Type	Antenna Connector
WWAN	824-849	-0.33	Embedded	Spring

3.2 Configuration of System Under Test



3.2.1 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.	Universal Radio Communication Tester	R&S	CMU200	123112	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

LTE Band 5

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 5 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 14 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 24 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 49 RB Offset
Frequency Stability	20407 to 20643	20525	1.4MHz	QPSK	1 RB / 5 RB Offset
Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK / 16QAM	5 RB / 0RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK / 16QAM	14 RB / 0RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK / 16QAM	24RB / 0RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK / 16QAM	49RB / 0RB Offset
Band Edge	20407 to 20643	20407, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK / 16QAM	1 RB / 5 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK / 16QAM	1 RB / 14 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK / 16QAM	1 RB / 24 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK / 16QAM	1 RB / 49 RB Offset
Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 5 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 14 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 24 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 49 RB Offset
Radiated Emission Below 1GHz	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 5 RB Offset
	20415 to 20635	20415	3MHz	QPSK	1 RB / 14 RB Offset
	20425 to 20625	20525	5MHz	QPSK	1 RB / 24 RB Offset
	20450 to 20600	20450	10MHz	QPSK	1 RB / 49 RB Offset
Radiated Emission Above 1GHz	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 5 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 14 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 24 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 49 RB Offset

Note:

1. For radiated emission below 1GHz, the low, mid and high channels were pre-tested in chamber. The low channel was the worst case and chosen for final test.
2. The conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
ERP	25deg. C, 69%RH	120Vac, 60Hz	Tank Wu
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Radiated Emission	20deg. C, 69%RH 25deg. C, 69%RH	120Vac, 60Hz	Tank Wu

3.4 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

3.5 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 22
KDB 971168 D01 Power Meas License Digital Systems v02r02
ANSI/TIA/EIA-603-C 2004

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

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 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 10MHz for LTE 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

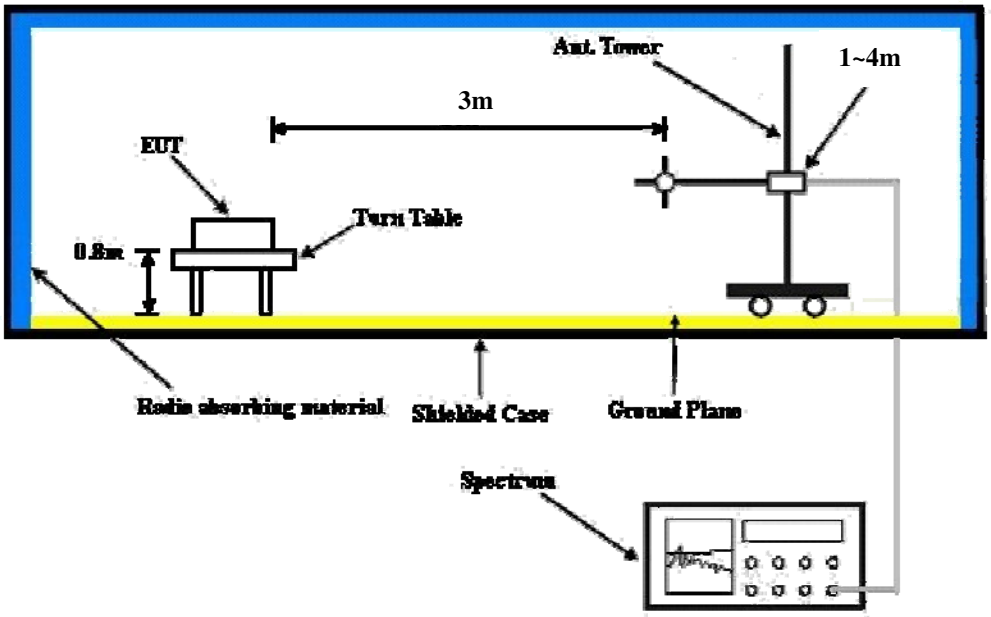
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Conducted Power Measurement:

The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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)

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 20407	CH 20525	CH 20643	CH 20407	CH 20525	CH 20643
			824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
5 / 1.4MHz	1	0	22.33	**22.52**	22.46	21.30	**21.49**	21.43
	1	2	22.21	22.40	22.34	21.18	21.37	21.31
	1	5	22.13	22.32	22.26	21.10	21.29	21.23
	3	0	22.32	22.51	22.45	21.14	21.33	21.27
	3	1	22.24	22.43	22.37	21.06	21.25	21.19
	3	3	22.18	22.37	22.31	21.01	21.19	21.13
	6	0	21.07	21.26	21.20	20.04	20.23	20.17

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 20415	CH 20525	CH 20635	CH 20415	CH 20525	CH 20635
			825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
5 / 3MHz	1	0	22.44	**22.63**	22.57	21.41	**21.60**	21.54
	1	7	22.32	22.51	22.45	21.29	21.48	21.42
	1	14	22.24	22.43	22.37	21.21	21.40	21.34
	8	0	21.28	21.47	21.41	20.25	20.44	20.38
	8	3	21.20	21.39	21.33	20.17	20.36	20.30
	8	7	21.14	21.33	21.27	20.11	20.30	20.24
	15	0	21.18	21.37	21.31	20.15	20.34	20.28

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 20425	CH 20525	CH 20625	CH 20425	CH 20525	CH 20625
			826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
5 / 5MHz	1	0	22.52	**22.71**	22.65	21.49	**21.68**	21.62
	1	12	22.40	22.59	22.53	21.37	21.56	21.50
	1	24	22.32	22.51	22.45	21.29	21.48	21.42
	12	0	21.36	21.55	21.49	20.33	20.52	20.46
	12	6	21.28	21.47	21.41	20.25	20.44	20.38
	12	13	21.22	21.41	21.35	20.19	20.38	20.32
	25	0	21.26	21.45	21.39	20.23	20.42	20.36

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 20450	CH 20525	CH 20600	CH 20450	CH 20525	CH 20600
			829.0 MHz	836.5 MHz	844.0 MHz	829.0 MHz	836.5 MHz	844.0 MHz
5 / 10MHz	1	0	22.64	**22.83**	22.77	21.61	**21.80**	21.74
	1	24	22.52	22.71	22.65	21.49	21.68	21.62
	1	49	22.44	22.63	22.57	21.41	21.60	21.54
	25	0	21.48	21.67	21.61	20.45	20.64	20.58
	25	12	21.40	21.59	21.53	20.37	20.56	20.50
	25	25	21.34	21.53	21.47	20.31	20.50	20.44
	50	0	21.38	21.57	21.51	20.35	20.54	20.48

ERP Power (dBm)
LTE Band 5, Channel Bandwidth: 1.4MHz

MODE	TX channel 20407						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	824.70	-18.0	9.6	3.9	13.5	38.5	-25.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	824.70	-7.6	20.8	3.9	**24.7**	38.5	-13.8

MODE	TX channel 20525						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-18.1	9.4	3.8	13.2	38.5	-25.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-8.0	20.1	3.8	23.9	38.5	-14.6

MODE	TX channel 20643						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.30	-17.3	10.4	3.4	13.8	38.5	-24.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.30	-8.4	19.7	3.4	23.1	38.5	-15.4

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

LTE Band 5, Channel Bandwidth: 3MHz

MODE		TX channel 20415					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	825.50	-18.6	9.0	3.9	12.9	38.5	-25.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	825.50	-7.9	20.5	3.9	**24.4**	38.5	-14.1

MODE		TX channel 20525					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-17.9	9.6	3.8	13.4	38.5	-25.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-8.0	20.1	3.8	23.9	38.5	-14.6

MODE		TX channel 20635					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	847.50	-17.3	10.3	3.4	13.7	38.5	-24.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	847.50	-8.4	19.8	3.4	23.4	38.5	-15.3

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

LTE Band 5, Channel Bandwidth: 5MHz

MODE		TX channel 20425					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-19.4	8.2	3.9	12.1	38.5	-26.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-8.8	19.6	3.9	23.5	38.5	-15.0

MODE		TX channel 20525					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-18.9	8.6	3.8	12.4	38.5	-26.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-7.9	20.2	3.8	**24.0**	38.5	-14.5

MODE		TX channel 20625					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	846.50	-17.4	10.2	3.4	13.6	38.5	-24.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	846.50	-8.6	19.6	3.4	23.0	38.5	-15.5

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

LTE Band 5, Channel Bandwidth: 10MHz

MODE		TX channel 20450					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-18.1	9.6	3.9	13.5	38.5	-25.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-8.2	20.0	3.9	**23.9**	38.5	-14.6

MODE		TX channel 20525					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-18.8	8.7	3.8	12.5	38.5	-26.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.50	-8.0	20.1	3.8	**23.9**	38.5	-14.6

MODE		TX channel 20600					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	844.00	-17.9	9.6	3.7	13.3	38.5	-25.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	844.00	-8.5	19.9	3.7	23.6	38.5	-14.9

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

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

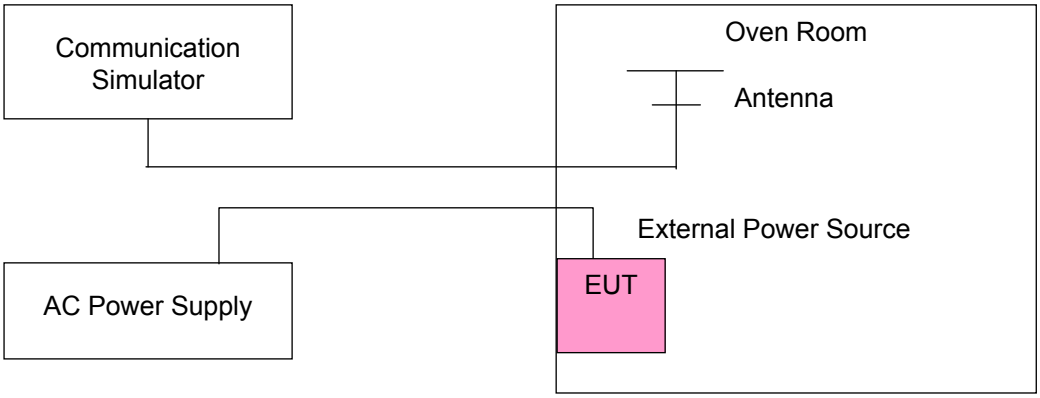
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)	Limit (ppm)
	LTE Band 5	
132	-0.016	2.5
120	-0.012	2.5
108	-0.015	2.5

NOTE: The applicant defined the normal working voltage is from 108Vac to 132Vac.

Frequency Error vs. Temperature.

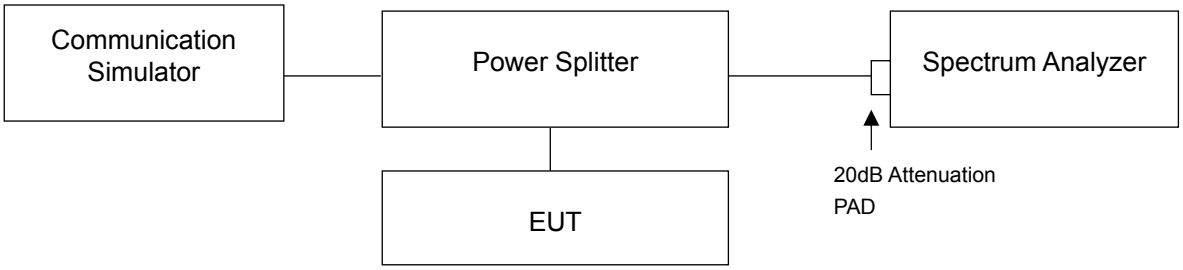
TEMP. (℃)	Frequency Error (ppm)	Limit (ppm)
	LTE Band 5	
70	-0.025	2.5
60	-0.023	2.5
50	-0.019	2.5
40	-0.017	2.5
30	-0.018	2.5
20	-0.012	2.5
10	-0.017	2.5
0	-0.021	2.5
-10	-0.023	2.5
-20	-0.027	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.2 Test Setup



4.3.3 Test Result (26 dB Bandwidth)

LTE Band 5, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.504008	1.521928
20525	836.5	1.498664	1.523316
20643	848.3	1.521582	1.497027

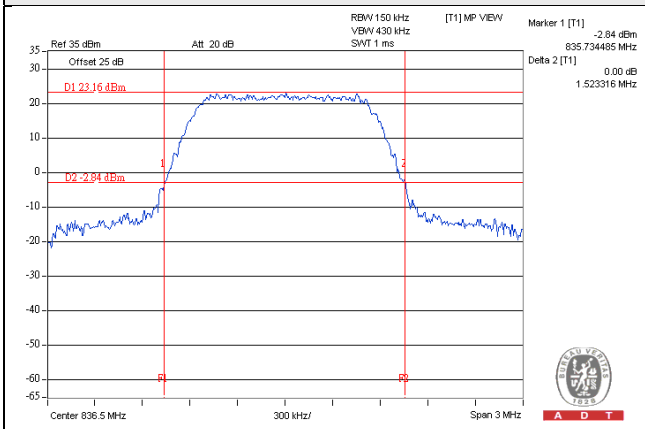
LTE Band 5, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	3.084774	3.051337
20525	836.5	3.062920	3.032996
20635	847.5	3.069920	3.051703

LTE Band 5, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	5.003515	5.177330
20525	836.5	5.055648	5.049335
20625	846.5	5.033909	5.048872

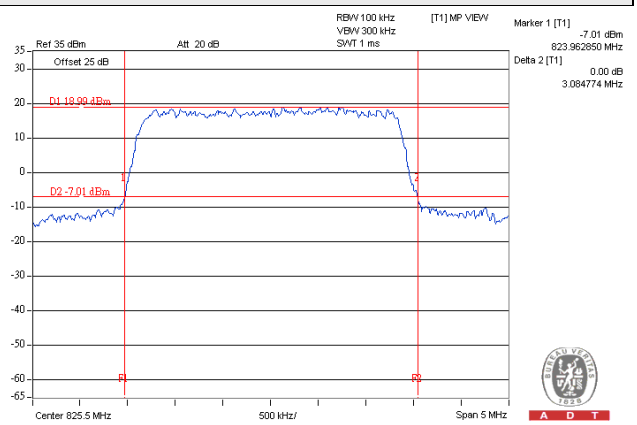
LTE Band 5, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20450	829.0	9.827756	9.911698
20525	836.5	9.891949	9.959466
20600	844.0	9.858126	9.775229

Spectrum Plot Of Worst Value

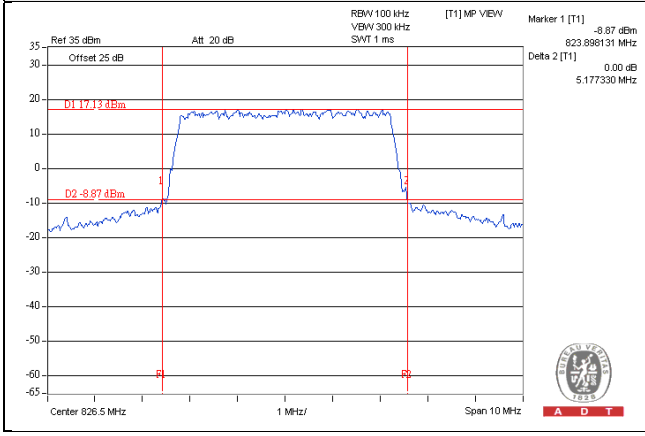
1.4MHz / 16QAM



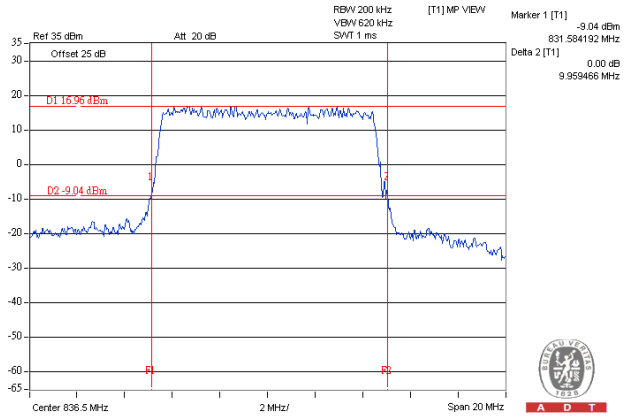
3MHz / QPSK



5MHz / 16QAM



10MHz / 16QAM



4.3.4 Test Result (Occupied Bandwidth)

LTE Band 5, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.10	1.10
20525	836.5	1.09	1.09
20643	848.3	1.10	1.10

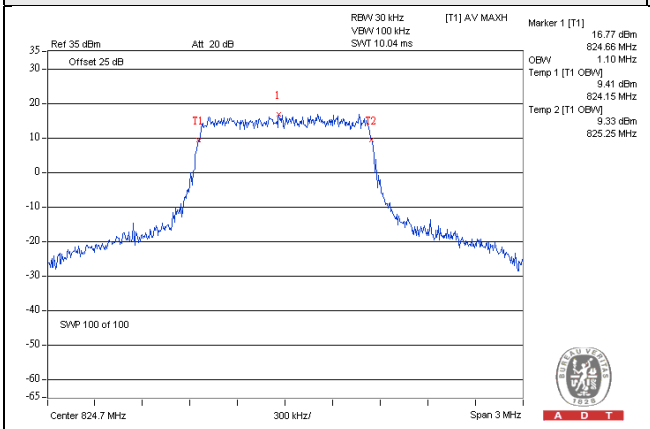
LTE Band 5, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	2.69	2.69
20525	836.5	2.68	2.68
20635	847.5	2.69	2.69

LTE Band 5, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	4.48	4.48
20525	836.5	4.48	4.48
20625	846.5	4.47	4.47

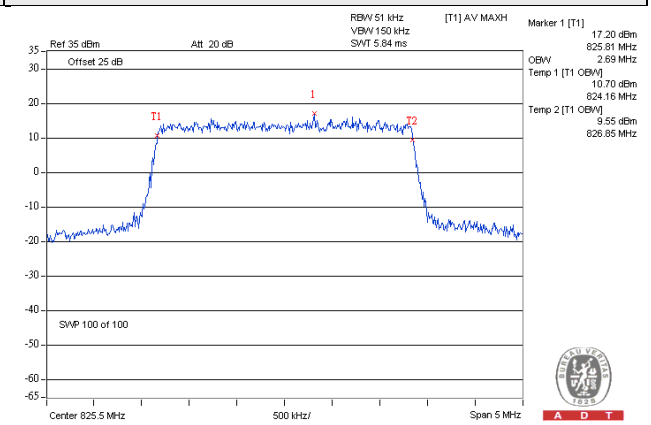
LTE Band 5, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20450	829.0	8.93	8.90
20525	836.5	8.97	8.97
20600	844.0	8.93	8.93

Spectrum Plot Of Worst Value

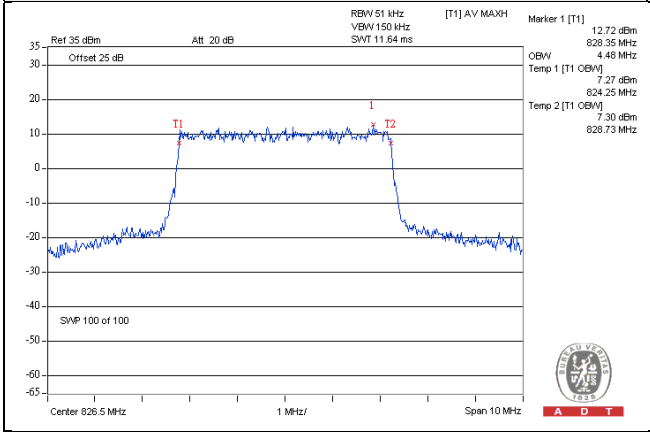
1.4MHz / QPSK



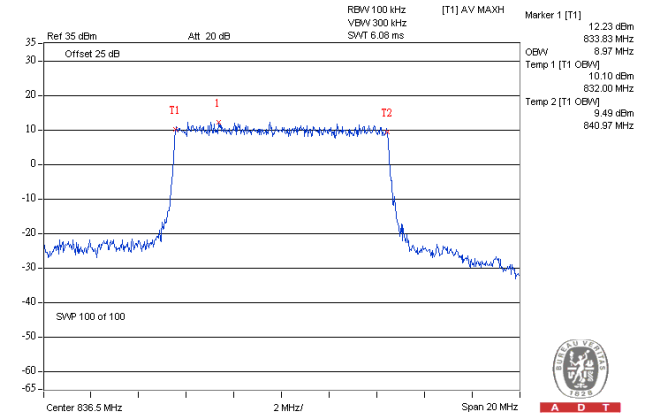
3MHz / QPSK



5MHz / QPSK



10MHz / QPSK

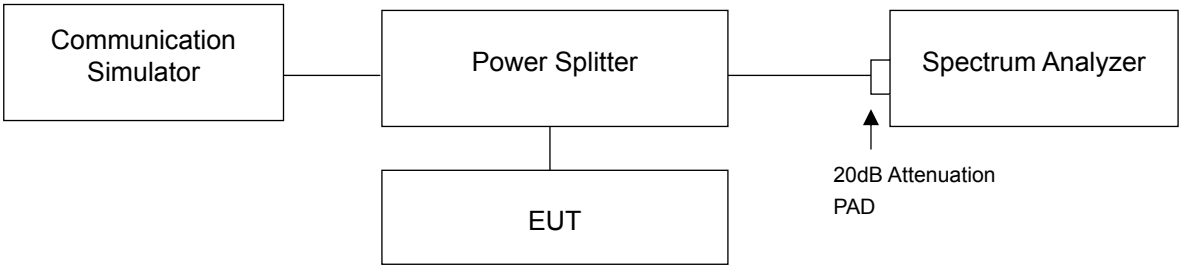


4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz 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.

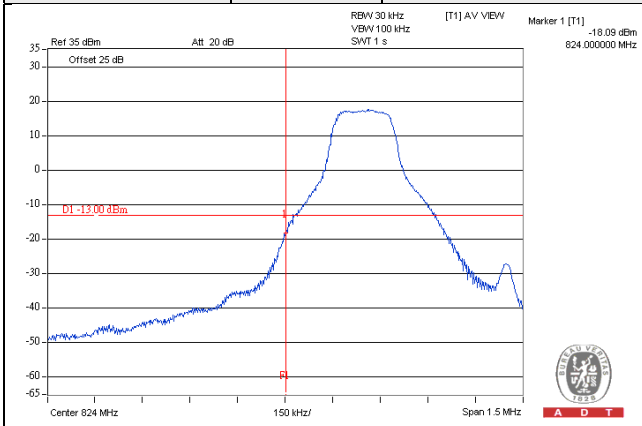
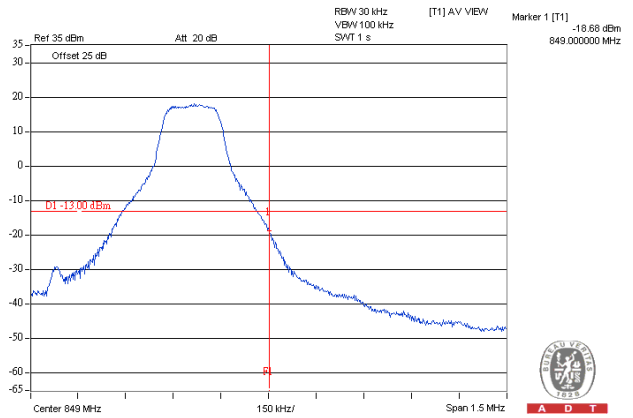
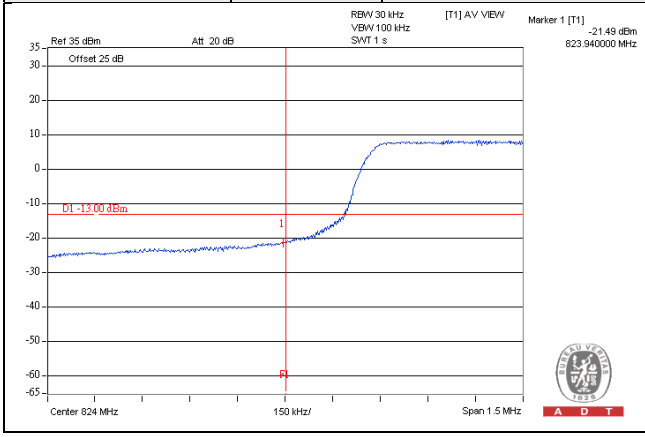
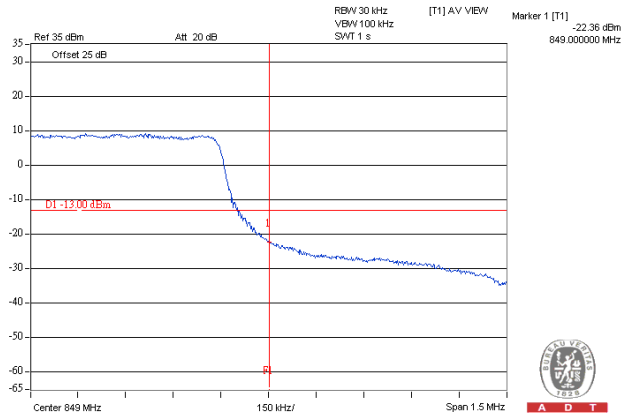
4.4.2 Test Setup

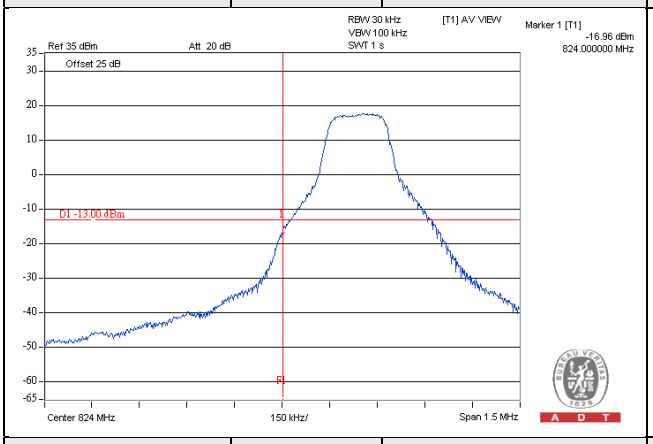
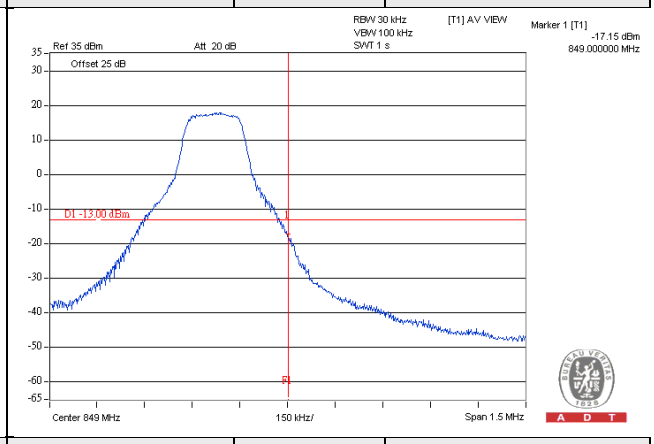
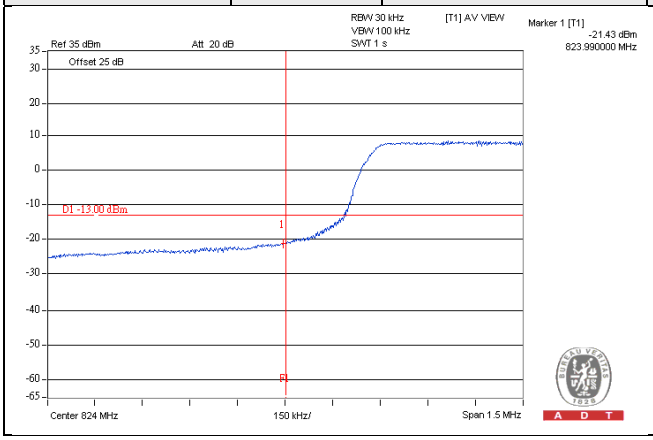
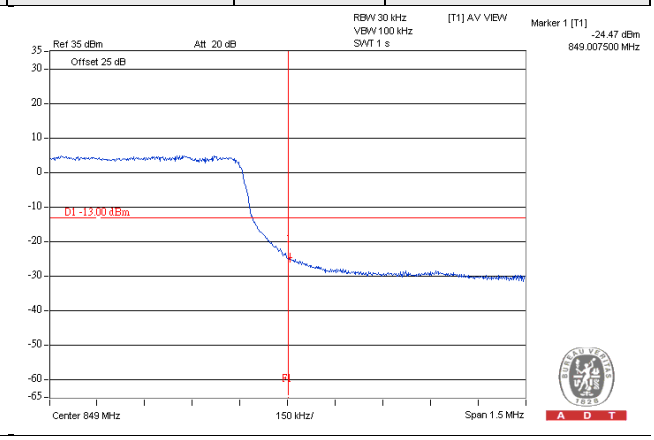


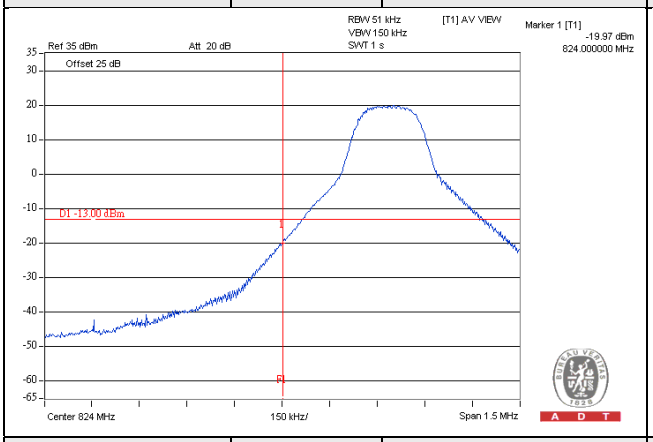
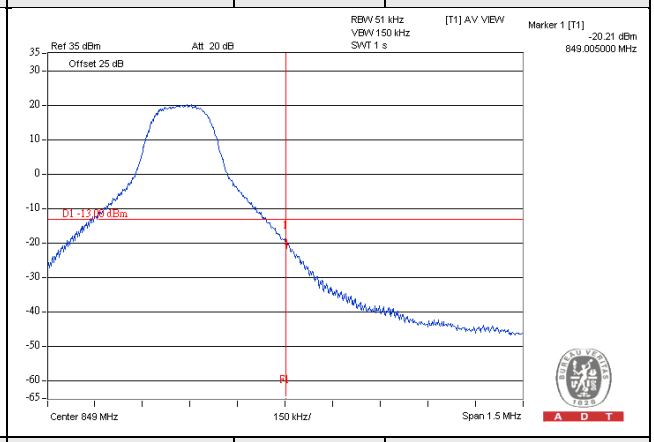
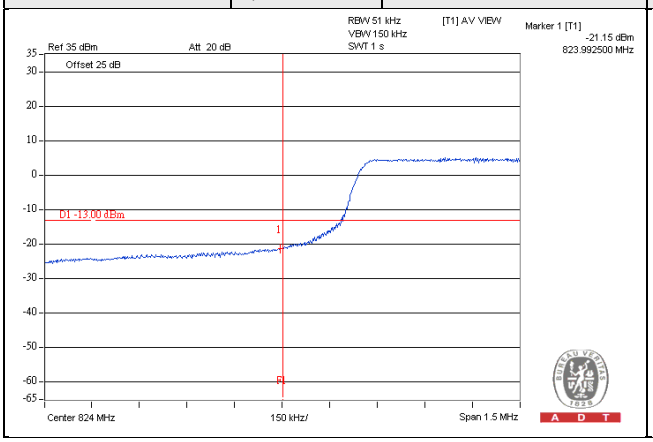
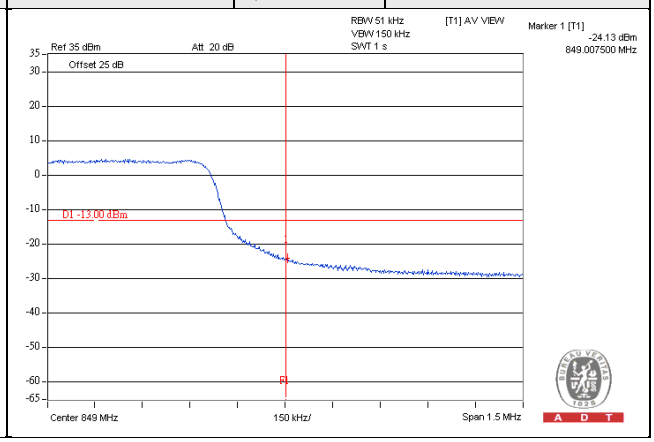
4.4.3 Test Procedures

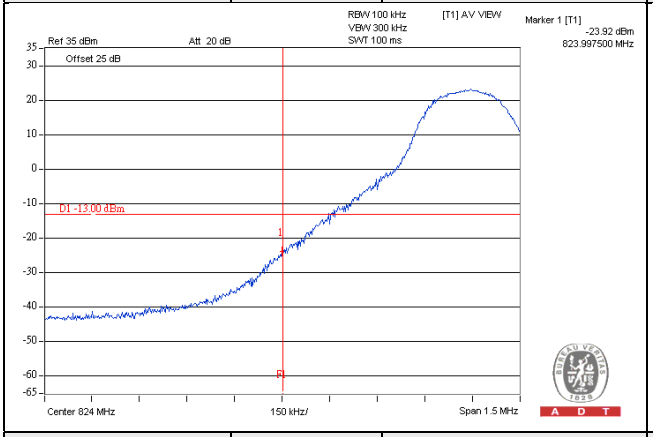
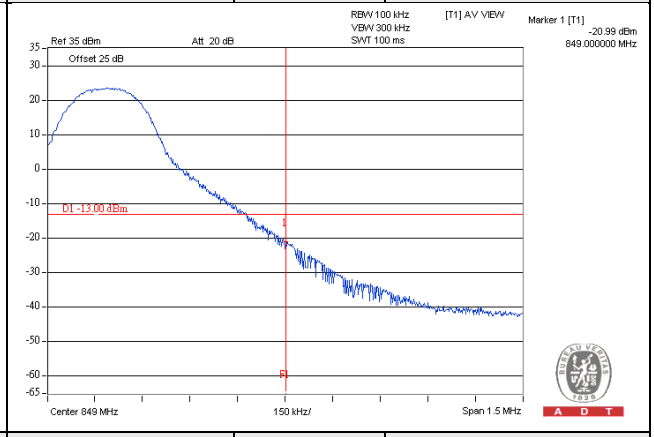
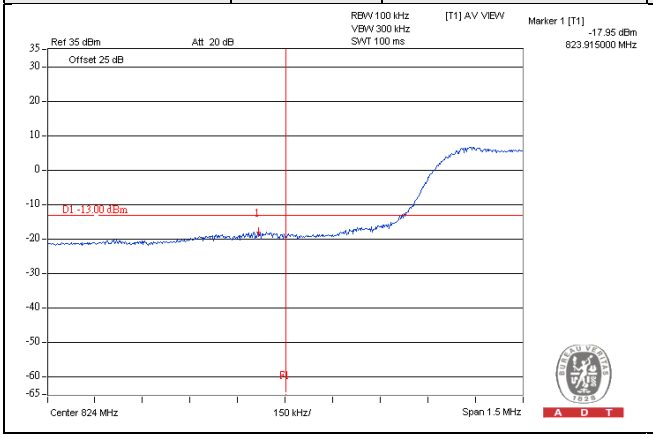
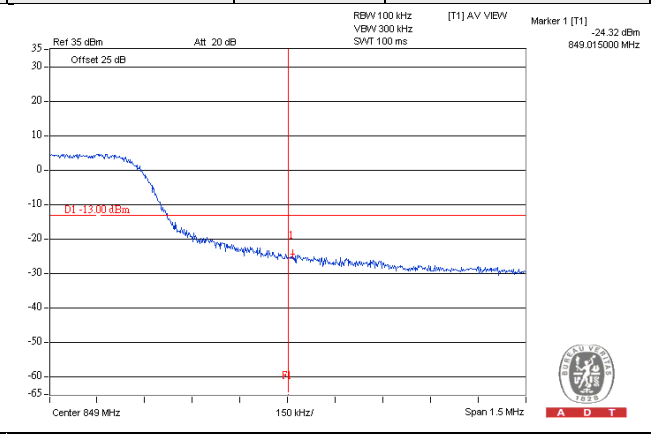
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 1.4MHz and 3MHz).
c. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Channel Bandwidth 5MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
e. Record the max trace plot into the test report.

4.4.4 Test Results

LTE Band 5, Channel Bandwidth 1.4MHz					
Channel 20407	QPSK	1 RB / 0 RB Offset	Channel 20643	QPSK	1 RB / 5 RB Offset
					
Channel 20407	QPSK	6 RB / 0 RB Offset	Channel 20643	QPSK	6 RB / 0 RB Offset
					

LTE Band 5, Channel Bandwidth 3MHz					
Channel 20415	QPSK	1 RB / 0 RB Offset	Channel 20635	QPSK	1 RB / 14 RB Offset
					
Channel 20415	QPSK	15 RB / 0 RB Offset	Channel 20635	QPSK	15 RB / 0 RB Offset
					

LTE Band 5, Channel Bandwidth 5MHz					
Channel 20425	QPSK	1 RB / 0 RB Offset	Channel 20625	QPSK	1 RB / 24 RB Offset
					
Channel 20425	QPSK	25 RB / 0 RB Offset	Channel 20625	QPSK	25 RB / 0 RB Offset
					

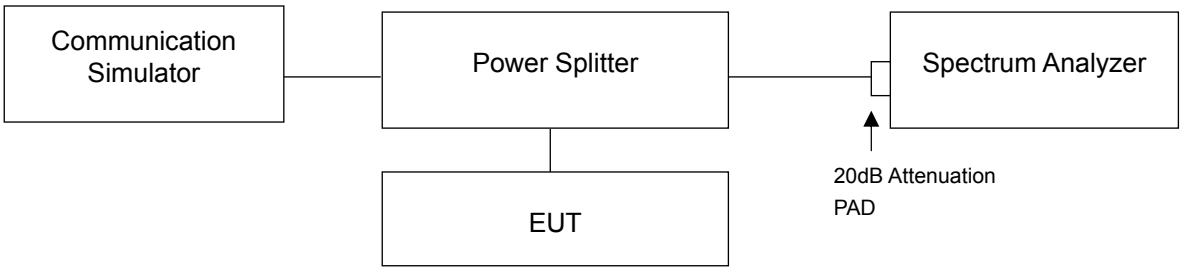
LTE Band 5, Channel Bandwidth 10MHz					
Channel 20450	QPSK	1 RB / 0 RB Offset	Channel 20600	QPSK	1 RB / 49 RB Offset
					
Channel 20450	QPSK	50 RB / 0 RB Offset	Channel 20600	QPSK	50 RB / 0 RB Offset
					

4.5 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%.

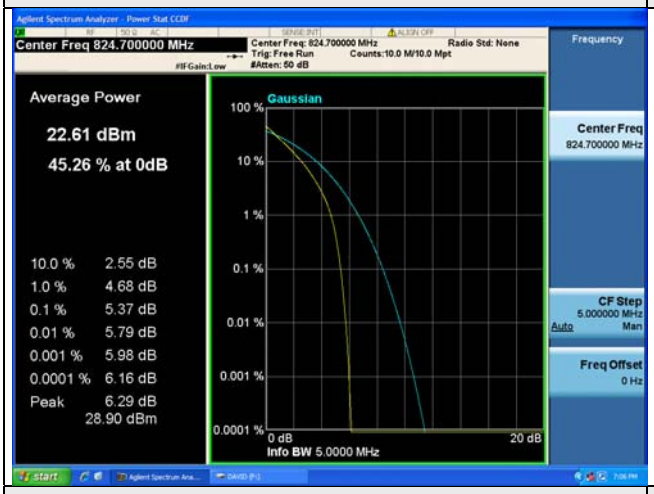
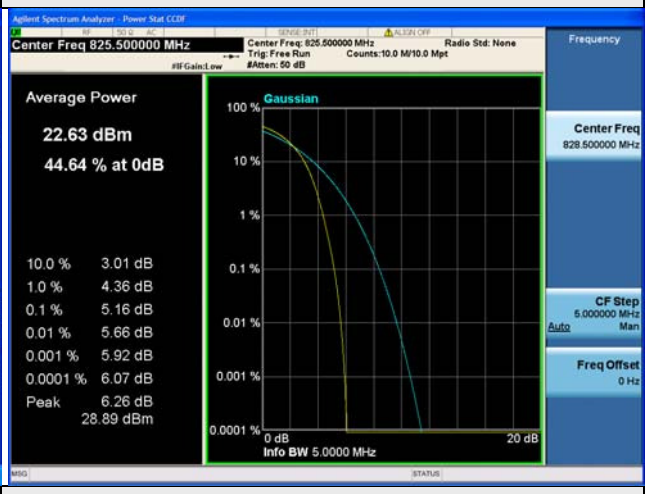
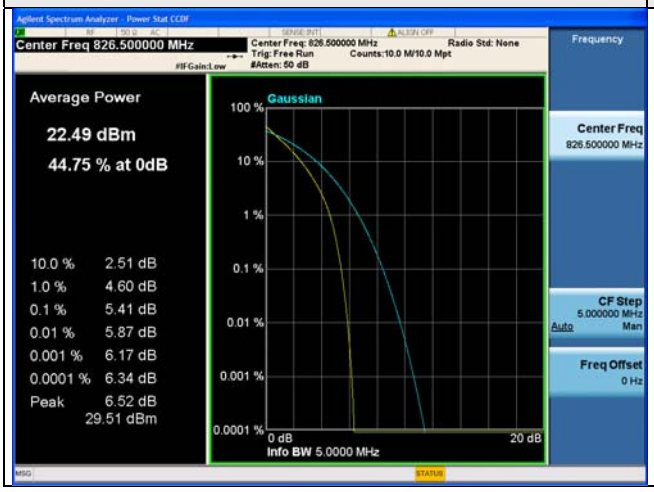
4.5.4 Test Results

LTE Band 5, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
20407	824.7	5.37	5.18
20525	836.5	4.96	4.97
20643	848.3	4.52	4.41

LTE Band 5, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
20415	825.5	5.16	5.11
20525	836.5	5.11	5.11
20635	847.5	4.75	4.77

LTE Band 5, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
20425	826.5	5.41	5.40
20525	836.5	5.24	5.24
20625	846.5	5.08	5.04

LTE Band 5, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
20450	829.0	4.81	4.79
20525	836.5	4.85	4.84
20600	844.0	4.75	4.75

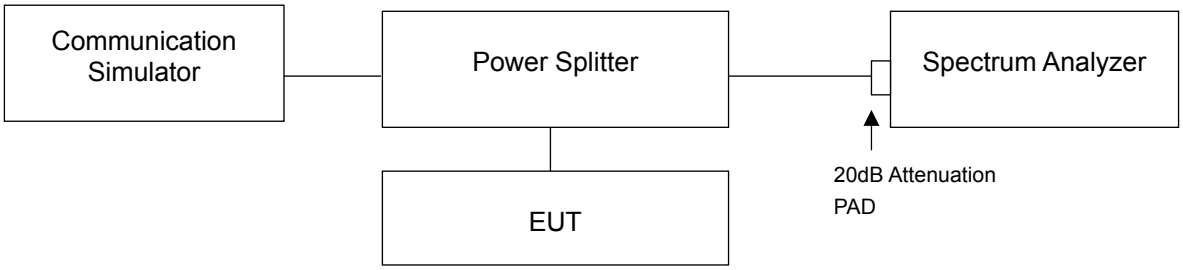
Spectrum Plot Of Worst Value	
1.4MHz / QPSK	3MHz / QPSK
	
5MHz / QPSK	10MHz / QPSK
	

4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.6.2 Test Setup

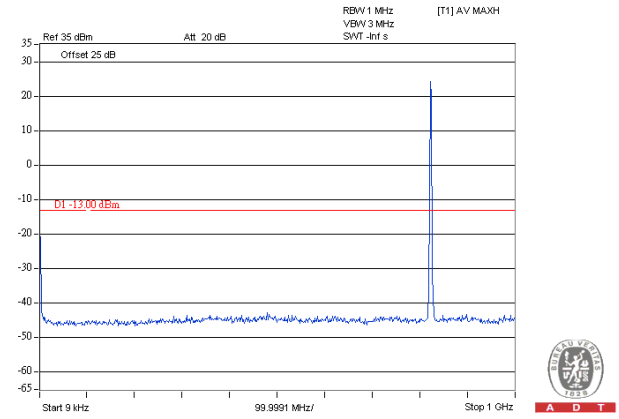
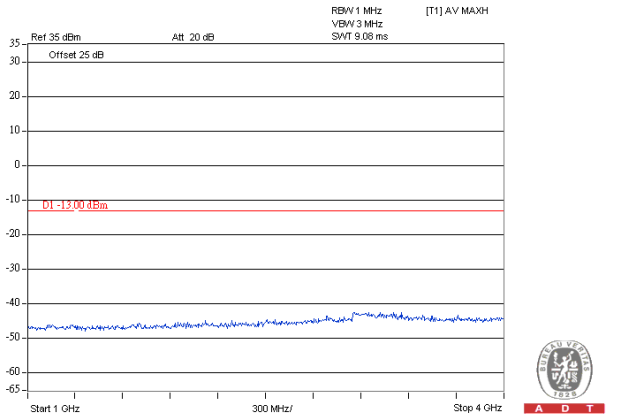
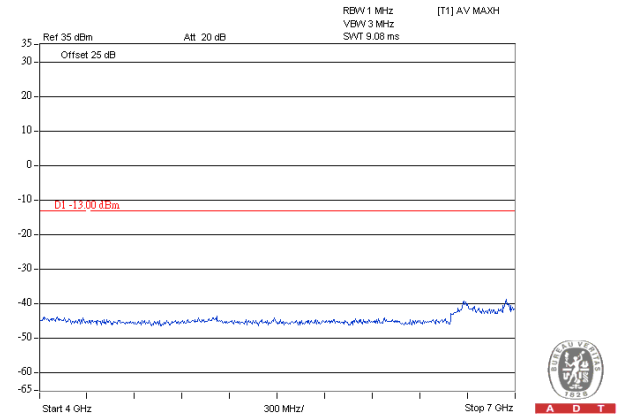
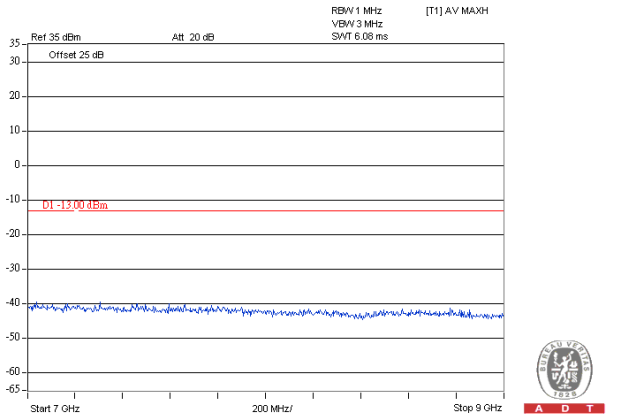


4.6.3 Test Procedure

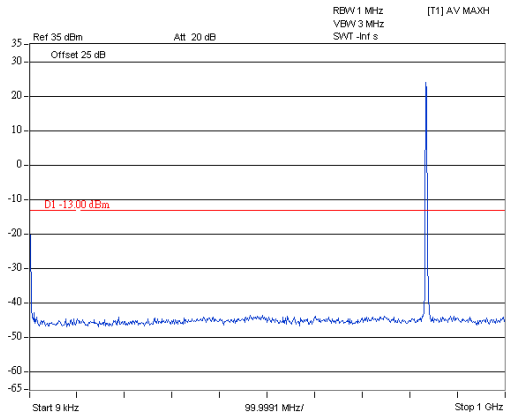
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

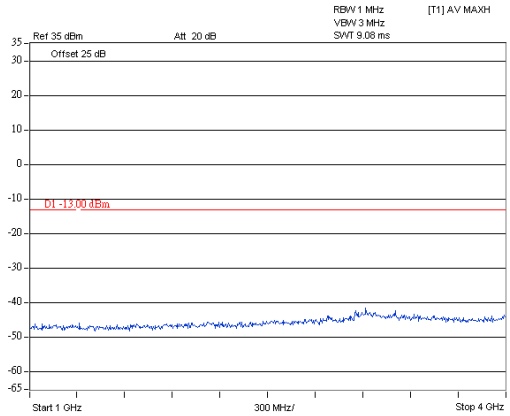
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.6.4 Test Results

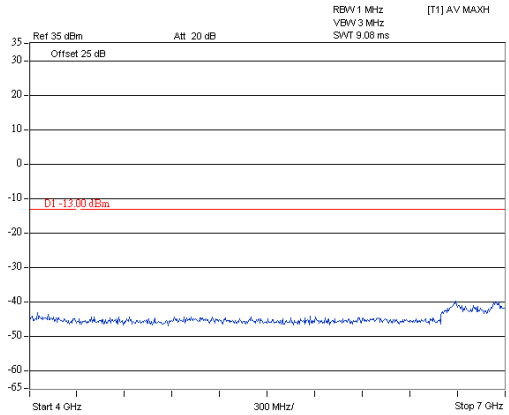
LTE Band 5, Channel Bandwidth 1.4MHz	
Channel 20407	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

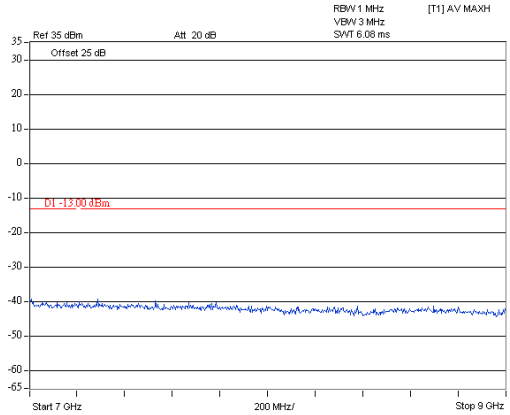
LTE Band 5, Channel Bandwidth 1.4MHz	
Channel 20525	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz

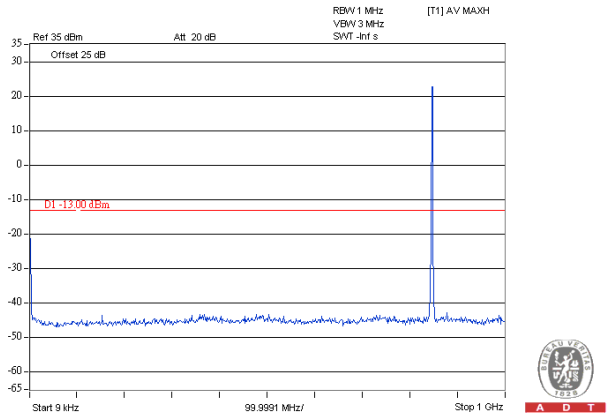
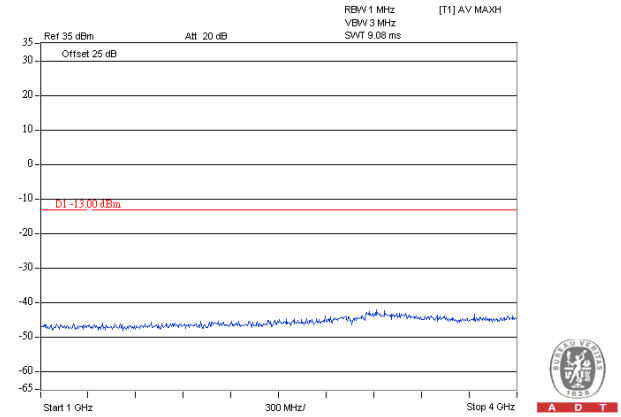
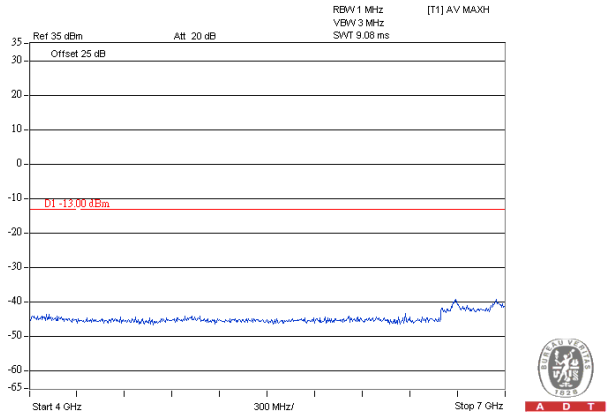
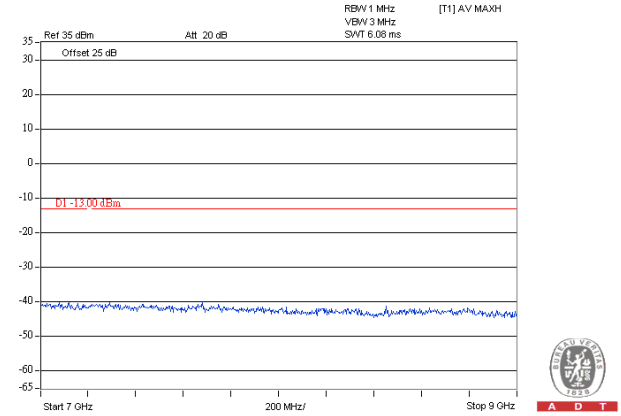


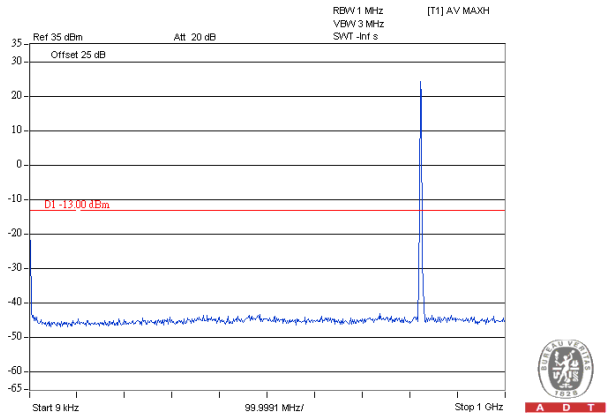
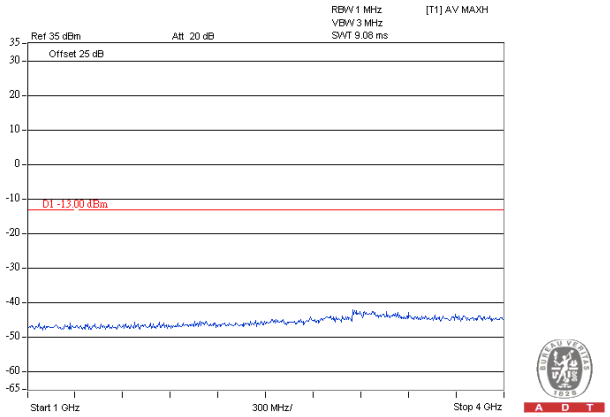
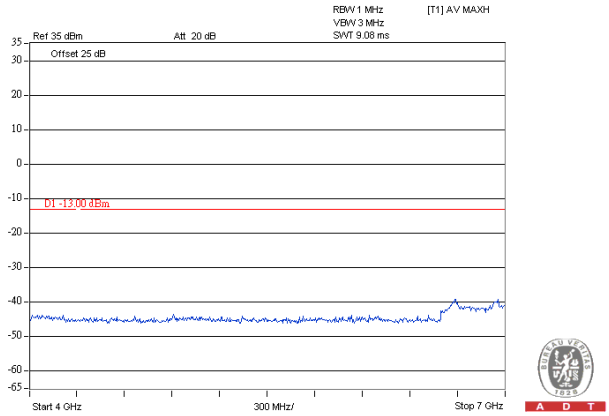
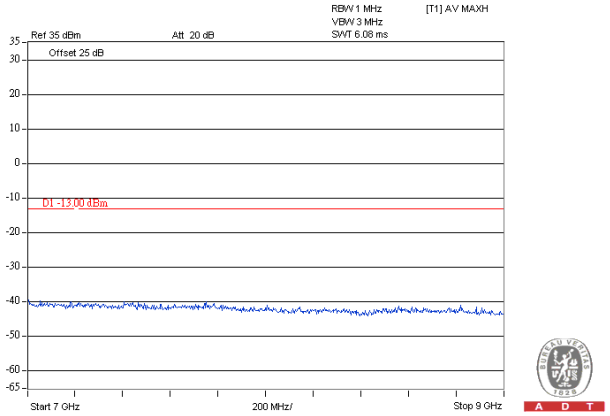


Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz

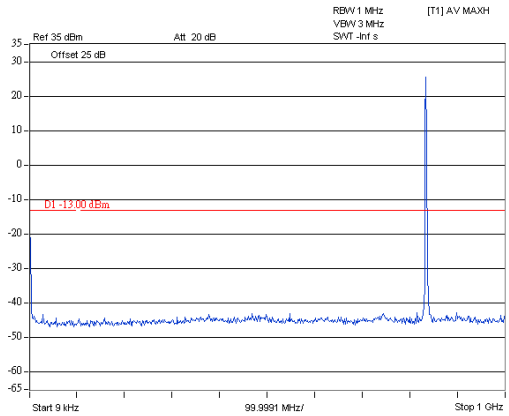


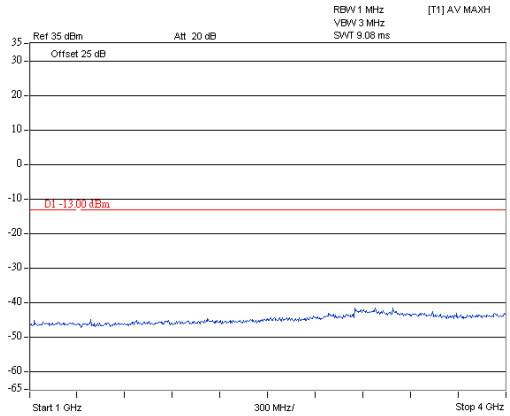


LTE Band 5, Channel Bandwidth 1.4MHz	
Channel 20643	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

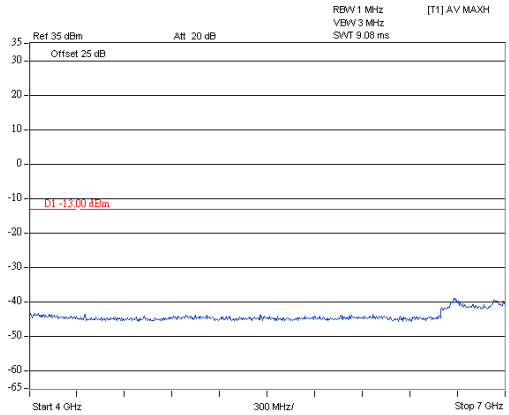
LTE Band 5, Channel Bandwidth 3MHz	
Channel 20415	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

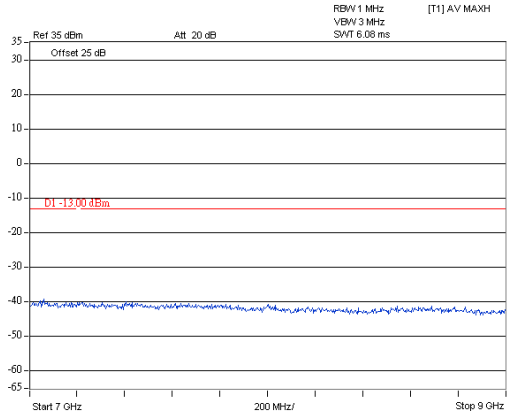
LTE Band 5, Channel Bandwidth 3MHz	
Channel 20525	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz



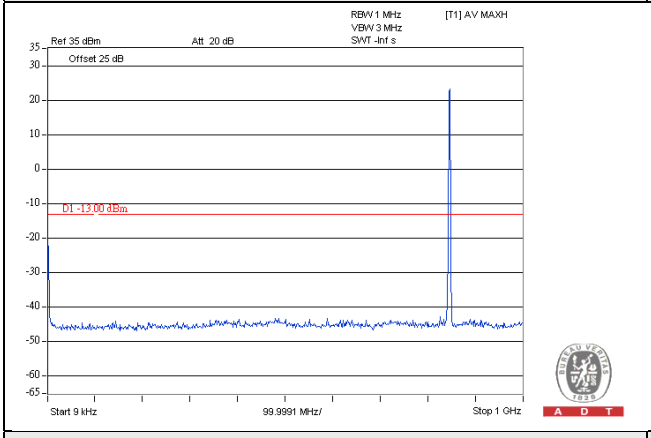


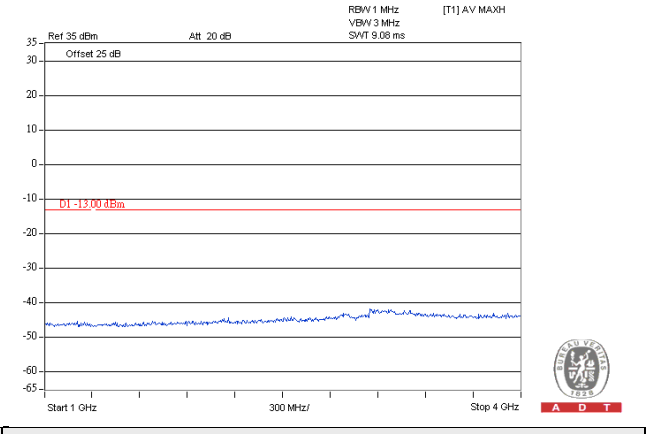
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz



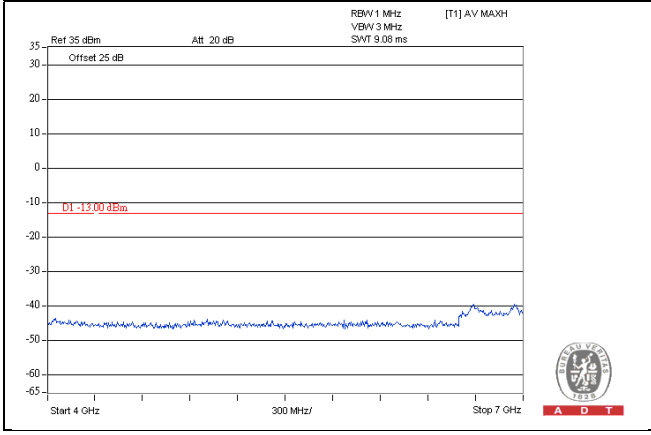


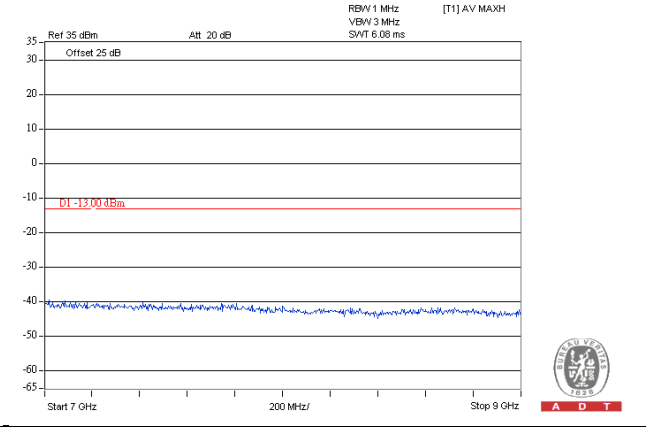
LTE Band 5, Channel Bandwidth 3MHz	
Channel 20635	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz

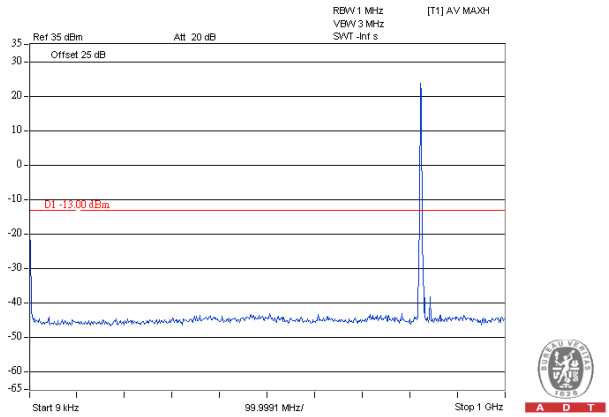
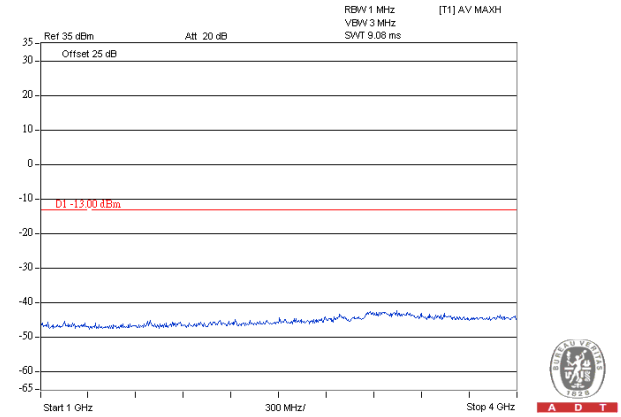
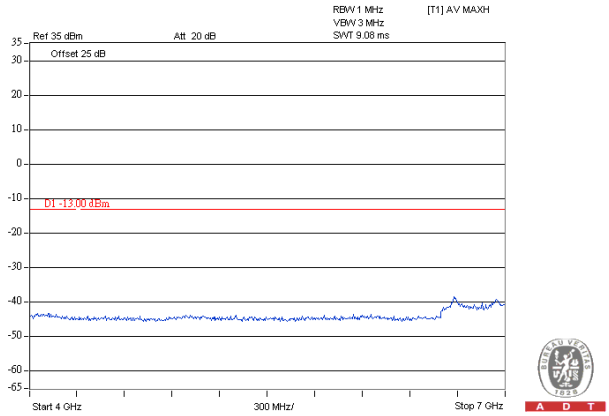
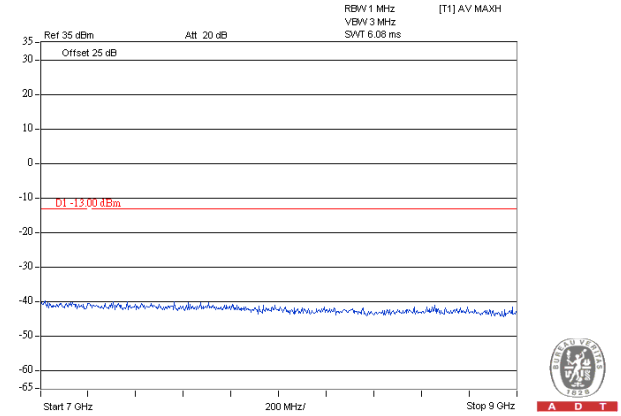




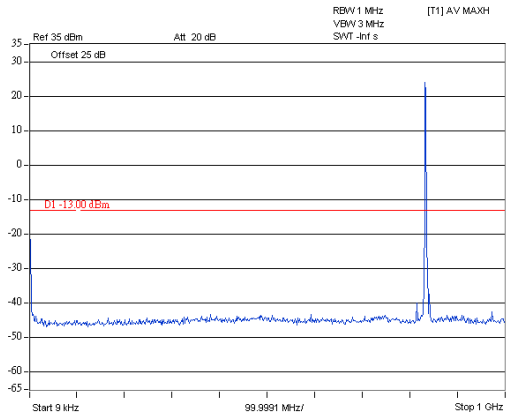
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz

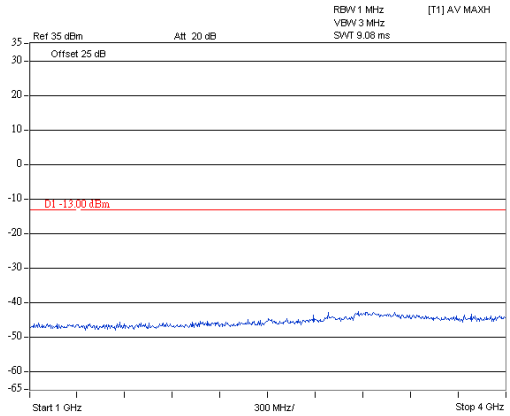




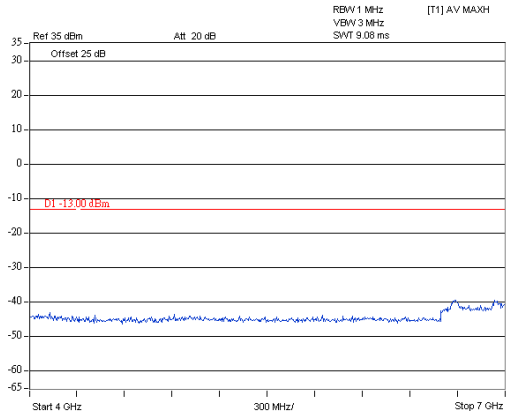
LTE Band 5, Channel Bandwidth 5MHz	
Channel 20425	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

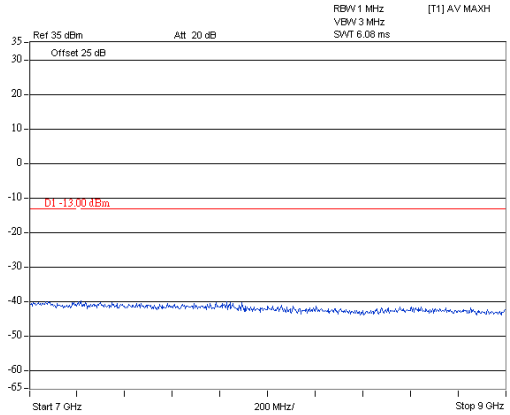
LTE Band 5, Channel Bandwidth 5MHz	
Channel 20525	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz



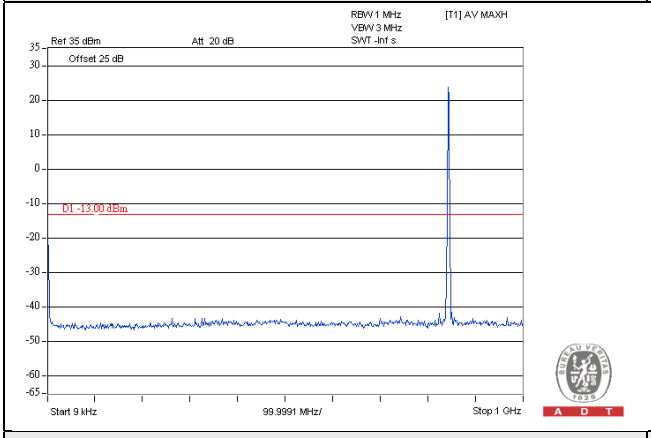


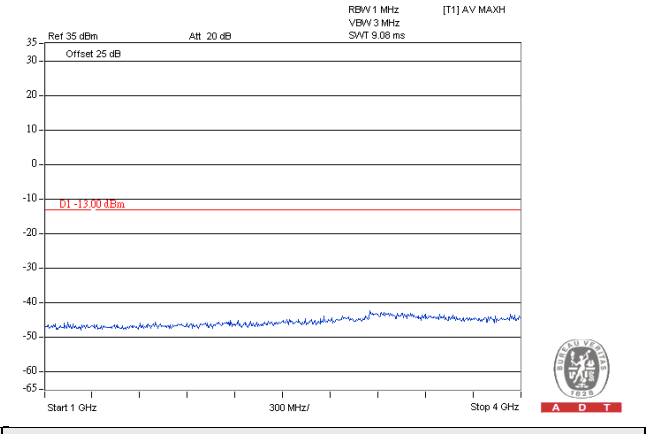
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz



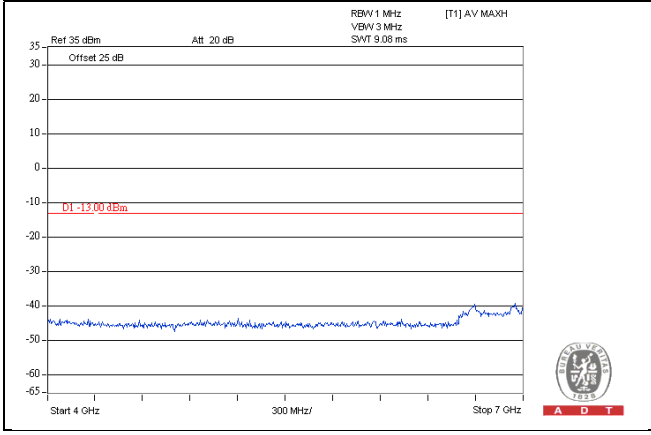


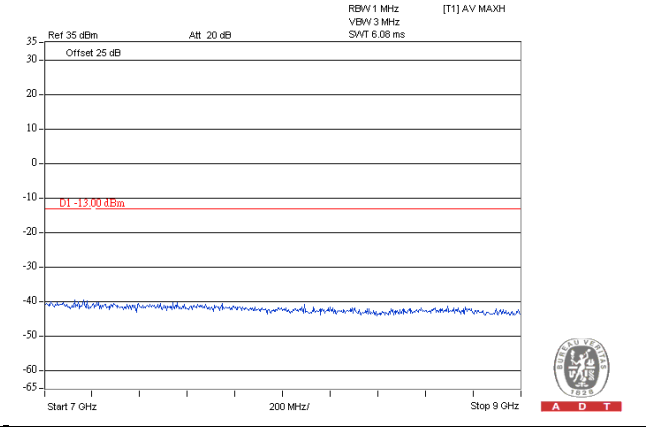
LTE Band 5, Channel Bandwidth 5MHz	
Channel 20625	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz

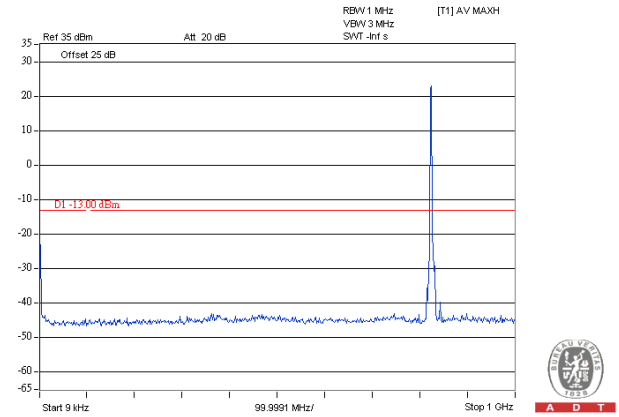
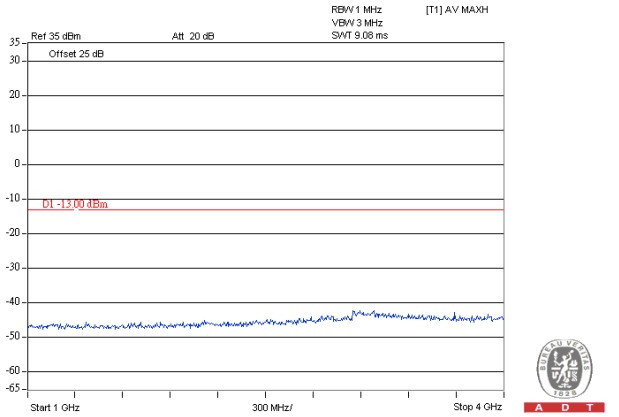
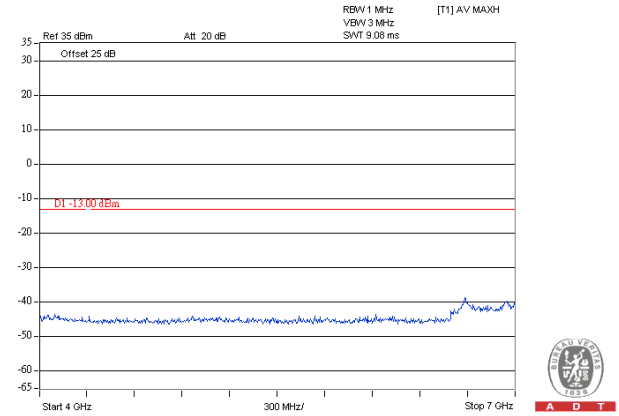
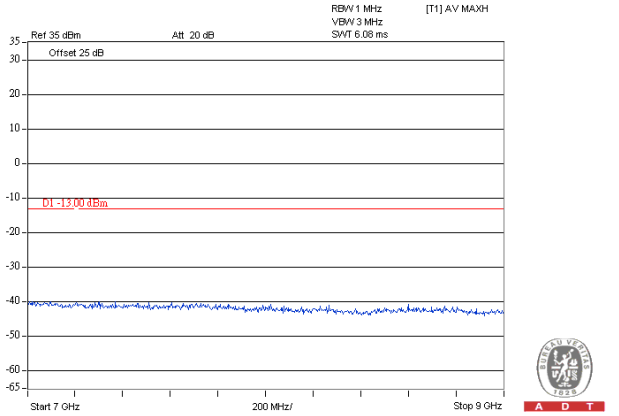




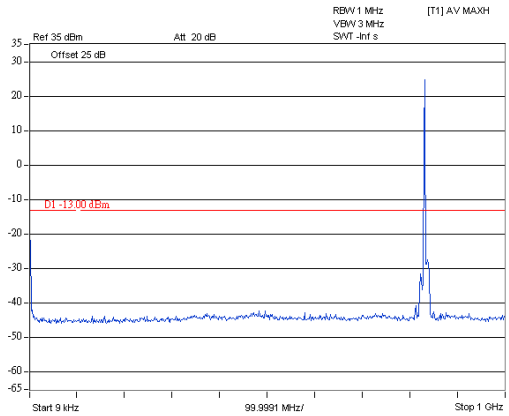
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz

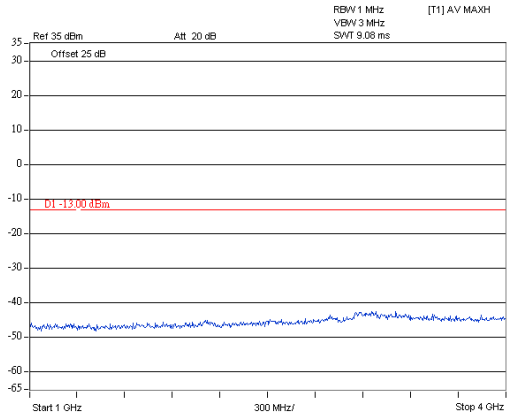




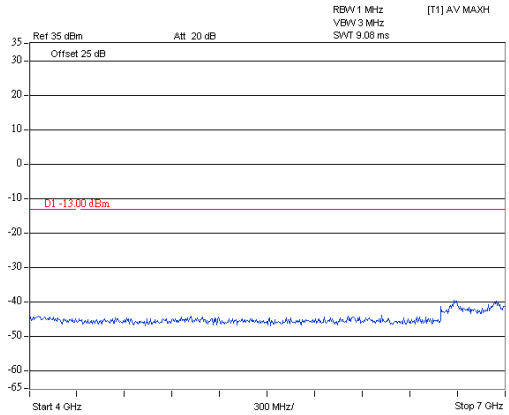
LTE Band 5, Channel Bandwidth 10MHz	
Channel 20450	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

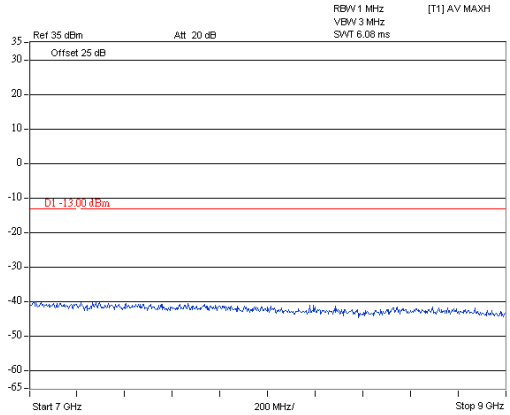
LTE Band 5, Channel Bandwidth 10MHz	
Channel 20525	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz

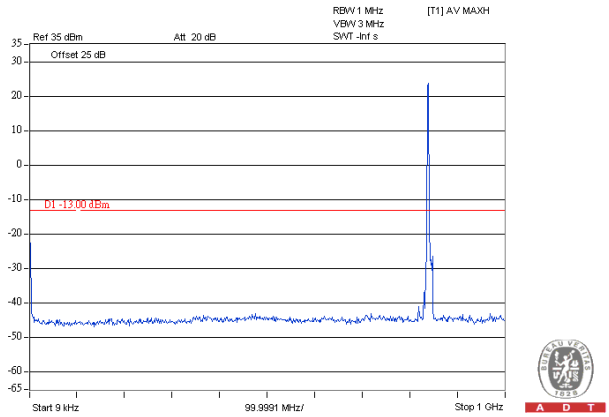
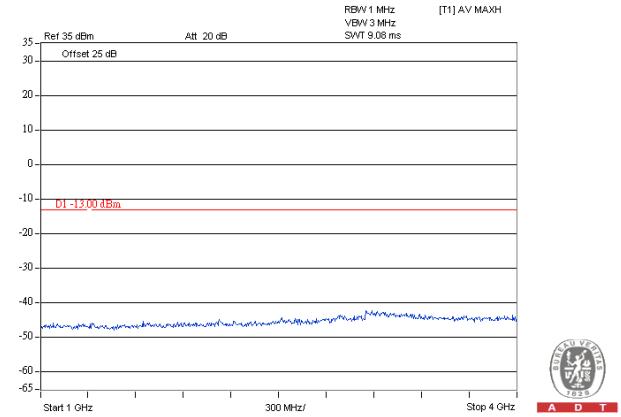
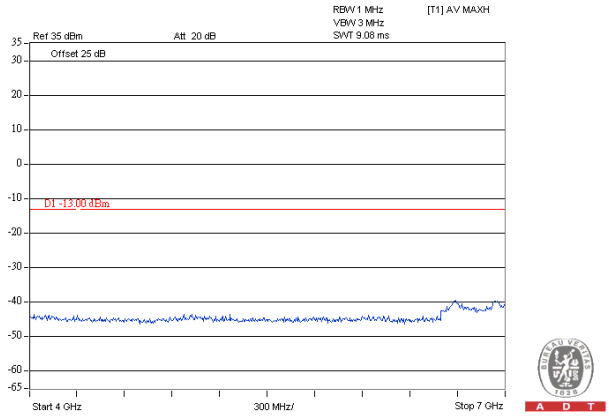
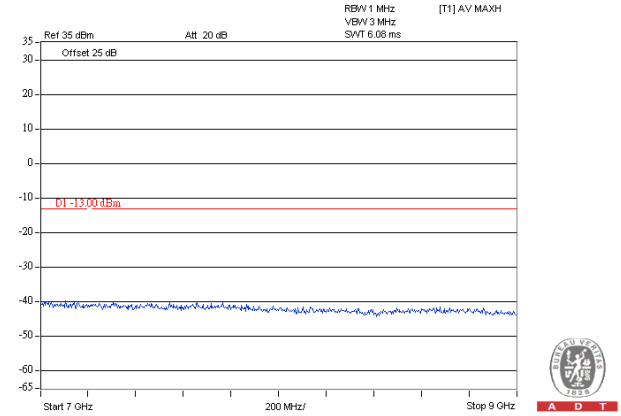




Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz





LTE Band 5, Channel Bandwidth 10MHz	
Channel 20600	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.7.2 Test Procedure

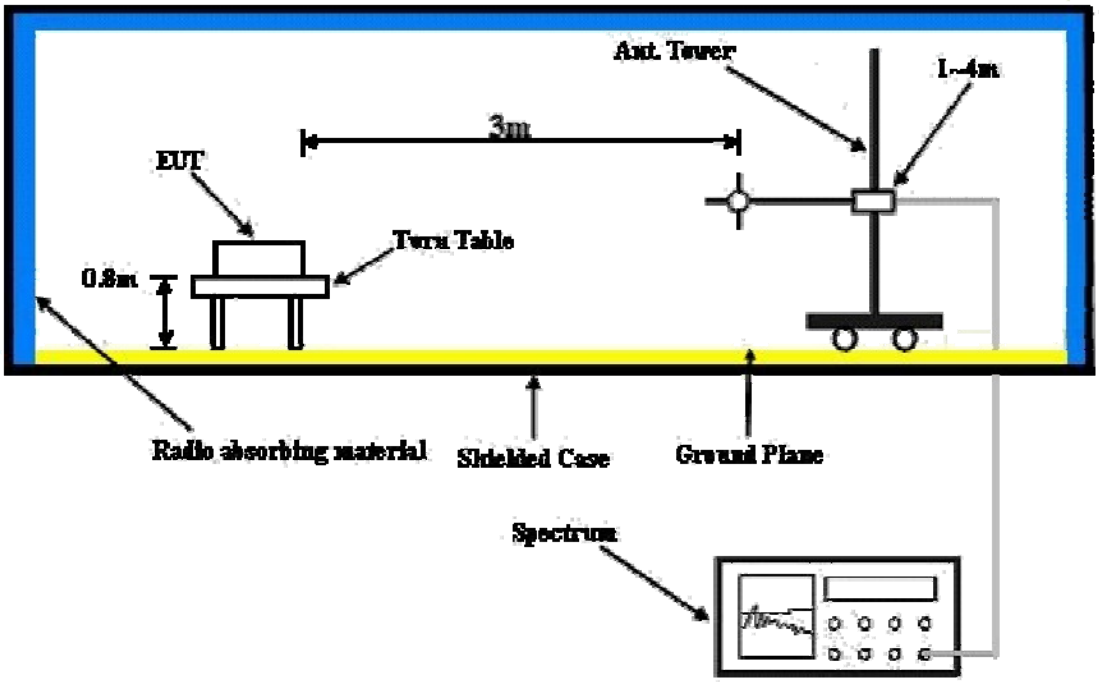
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. 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 a. Record the power level of S.G
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. 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.R.P power - 2.15dBi.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup



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

4.7.5 Test Results

Below 1GHz

LTE Band 5, Channel Bandwidth: 1.4MHz

Mode	TX channel 20407	Frequency Range	Below 1000 MHz
Environmental Conditions	20deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-49.8	-26.4	-19.4	-45.8	-13.0	-32.8
2	57.16	-47.8	-46.7	-4.7	-51.4	-13.0	-38.4
3	78.50	-44.4	-50.1	0.6	-49.5	-13.0	-36.5
4	154.16	-45.7	-47.1	-2.9	-50.0	-13.0	-37.0
5	185.20	-39.7	-45.2	-2.8	-48.0	-13.0	-35.0
6	332.64	-55.8	-63.6	4.0	-59.6	-13.0	-46.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-30.6	-22.8	-18.3	-41.1	-13.0	-28.1
2	59.10	-31.1	-34.1	-3.8	-37.9	-13.0	-24.9
3	86.26	-32.0	-38.0	0.1	-37.9	-13.0	-24.9
4	146.40	-43.5	-42.5	-3.0	-45.5	-13.0	-32.5
5	185.20	-50.2	-50.3	-2.8	-53.1	-13.0	-40.1
6	429.64	-57.7	-61.6	3.5	-58.1	-13.0	-45.1

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 3MHz

Mode	TX channel 20415	Frequency Range	Below 1000 MHz
Environmental Conditions	20deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-48.8	-32.8	-13.7	-46.5	-13.0	-33.5
2	59.10	-44.1	-44.8	-3.8	-48.6	-13.0	-35.6
3	76.56	-43.6	-49.5	0.3	-49.2	-13.0	-36.2
4	144.46	-44.1	-46.0	-3.2	-49.2	-13.0	-36.2
5	189.08	-39.8	-45.4	-2.8	-48.2	-13.0	-35.2
6	355.92	-56.7	-63.7	4.0	-59.7	-13.0	-46.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-29.7	-21.9	-18.3	-40.2	-13.0	-27.2
2	57.16	-31.0	-33.2	-4.7	-37.9	-13.0	-24.9
3	84.32	-33.8	-39.2	0.4	-38.8	-13.0	-25.8
4	152.22	-47.3	-46.4	-2.8	-49.2	-13.0	-36.2
5	187.14	-50.3	-50.0	-2.7	-52.7	-13.0	-39.7
6	458.74	-56.9	-60.5	3.5	-57.0	-13.0	-44.0

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 5MHz

Mode	TX channel 20525	Frequency Range	Below 1000 MHz
Environmental Conditions	20deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-52.0	-30.3	-18.3	-48.6	-13.0	-35.6
2	59.10	-43.4	-44.1	-3.8	-47.9	-13.0	-34.9
3	78.50	-45.0	-50.7	0.6	-50.1	-13.0	-37.1
4	154.16	-44.3	-45.7	-2.9	-48.6	-13.0	-35.6
5	181.32	-40.7	-45.9	-3.0	-48.9	-13.0	-35.9
6	330.70	-55.5	-63.4	4.0	-59.4	-13.0	-46.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-31.6	-23.8	-18.3	-42.1	-13.0	-29.1
2	59.10	-31.1	-34.1	-3.8	-37.9	-13.0	-24.9
3	88.20	-32.9	-39.1	-0.2	-39.3	-13.0	-26.3
4	148.34	-48.5	-47.6	-3.0	-50.6	-13.0	-37.6
5	204.60	-50.7	-50.6	-2.0	-52.6	-13.0	-39.6
6	462.62	-55.3	-58.8	3.4	-55.4	-13.0	-42.4

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 10MHz

Mode	TX channel 20450	Frequency Range	Below 1000 MHz
Environmental Conditions	20deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-51.0	-35.0	-13.7	-48.7	-13.0	-35.7
2	57.16	-44.7	-43.6	-4.7	-48.3	-13.0	-35.3
3	78.50	-43.5	-49.2	0.6	-48.6	-13.0	-35.6
4	140.58	-43.7	-46.3	-3.0	-49.3	-13.0	-36.3
5	185.20	-39.8	-45.3	-2.8	-48.1	-13.0	-35.1
6	332.64	-56.0	-63.8	4.0	-59.8	-13.0	-46.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-27.5	-19.7	-18.3	-38.0	-13.0	-25.0
2	**59.10**	**-30.9**	**-33.9**	**-3.8**	**-37.7**	**-13.0**	**-24.7**
3	88.20	-33.4	-39.6	-0.2	-39.8	-13.0	-26.8
4	150.28	-48.9	-48.0	-3.0	-51.0	-13.0	-38.0
5	187.14	-50.3	-50.0	-2.7	-52.7	-13.0	-39.7
6	456.80	-57.0	-60.7	3.5	-57.2	-13.0	-44.2

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Above 1GHz

LTE Band 5, Channel Bandwidth: 1.4MHz

Mode	TX channel 20407	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-57.5	-49.8	0.9	-48.9	-13.0	-35.9
2	2474.10	-58.3	-52.0	0.1	-51.9	-13.0	-38.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-55.8	-48.5	0.9	-47.6	-13.0	-34.6
2	2474.10	-57.4	-53.3	0.1	-53.2	-13.0	-40.2

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20525	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-55.5	-47.8	0.8	-47.0	-13.0	-34.0
2	2509.50	-56.5	-50.3	0.2	-50.1	-13.0	-37.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-55.4	-48.0	0.8	-47.2	-13.0	-34.2
2	2509.50	-56.5	-52.6	0.2	-52.4	-13.0	-39.4

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20643	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.60	-56.5	-49.0	0.7	-48.3	-13.0	-35.3
2	2544.90	-53.9	-47.8	0.2	-47.6	-13.0	-34.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.60	-56.2	-48.9	0.7	-48.2	-13.0	-35.2
2	2544.90	-58.4	-54.3	0.2	-54.1	-13.0	-41.1

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 3MHz

Mode	TX channel 20415	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1651.00	-56.2	-48.5	0.9	-47.6	-13.0	-34.6
2	2476.50	-54.7	-48.3	0.1	-48.2	-13.0	-35.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1651.00	-55.4	-48.2	0.9	-47.3	-13.0	-34.3
2	2476.50	-57.0	-53.0	0.1	-52.9	-13.0	-39.9

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20525	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-56.8	-49.2	0.8	-48.4	-13.0	-35.4
2	2509.50	-55.0	-48.7	0.2	-48.5	-13.0	-35.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-53.4	-46.0	0.8	-45.2	-13.0	-32.2
2	2509.50	-56.9	-52.9	0.2	-52.7	-13.0	-39.7

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20635	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1695.00	-57.0	-49.5	0.7	-48.8	-13.0	-35.8
2	2542.50	-55.4	-49.2	0.2	-49.0	-13.0	-36.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1695.00	-52.8	-45.5	0.7	-44.8	-13.0	-31.8
2	2542.50	-57.5	-53.4	0.2	-53.2	-13.0	-40.2

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 5MHz

Mode	TX channel 20425	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1653.00	-58.1	-50.4	0.9	-49.5	-13.0	-36.5
2	2479.50	-55.2	-48.9	0.1	-48.8	-13.0	-35.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1653.00	-56.1	-48.9	0.9	-48.0	-13.0	-35.0
2	2479.50	-58.1	-54.1	0.1	-54.0	-13.0	-41.0

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
.

Mode	TX channel 20525	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-55.5	-47.9	0.8	-47.1	-13.0	-34.1
2	2509.50	-56.0	-49.8	0.2	-49.6	-13.0	-36.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-53.6	-46.3	0.8	-45.5	-13.0	-32.5
2	2509.50	-58.0	-54.1	0.2	-53.9	-13.0	-40.9

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20625	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.00	-55.5	-47.9	0.7	-47.2	-13.0	-34.2
2	2539.50	-57.2	-51.1	0.2	-50.9	-13.0	-37.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.00	-53.5	-46.2	0.7	-45.5	-13.0	-32.5
2	2539.50	-59.0	-55.0	0.2	-54.8	-13.0	-41.8

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

LTE Band 5, Channel Bandwidth: 10MHz

Mode	TX channel 20450	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1658.00	-55.9	-48.3	0.9	-47.4	-13.0	-34.4
2	2487.00	-54.5	-48.2	0.2	-48.0	-13.0	-35.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1658.00	-54.9	-47.6	0.9	-46.7	-13.0	-33.7
2	2487.00	-56.8	-52.8	0.2	-52.6	-13.0	-39.6

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20525	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-55.8	-48.2	0.8	-47.4	-13.0	-34.4
2	2509.50	-58.0	-51.8	0.2	-51.6	-13.0	-38.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-53.1	-45.8	0.8	-45.0	-13.0	-32.0
2	2509.50	-56.2	-52.3	0.2	-52.1	-13.0	-39.1

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 20600	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Tank Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1688.00	-56.0	-48.3	0.7	-47.6	-13.0	-34.6
2	2532.00	-54.2	-48.1	0.2	-47.9	-13.0	-34.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1688.00	-53.0	-45.7	0.7	-45.0	-13.0	-32.0
2	2532.00	-57.4	-53.3	0.2	-53.1	-13.0	-40.1

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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