FCC Test Report
(Part 24: LTE Band 2)

Report No.: RF160621C08-9

FCC ID: H8N-PCT5230

Test Model: ADR1776

Received Date: Jun. 21, 2016

Test Date: Jul. 29 ~ Aug. 25, 2016

Issued Date: Aug. 25, 2016

Applicant: ASKEY COMPUTER CORP.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF160621C08-9	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: Jul. 29 ~ Aug. 25, 2016

Standards: FCC Part 24, Subpart E

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

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Aug. 25, 2016

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective radiated power	PASS	Meet the requirement of limit.
2.1046 24.232(d)	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -19.4dB at 76.56MHz.

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, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02(309222 +248780)	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03(274092)	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 09, 2015	Aug. 08, 2016
			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
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	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	Oct. 16, 2015	Oct. 15, 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)	
Modulation Type	QPSK, 16QAM	
Operating Frequency	LTE Band 2 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1909.3MHz
	LTE Band 2 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1908.5MHz
	LTE Band 2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz
	LTE Band 2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz
	LTE Band 2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz
	LTE Band 2 (Channel Bandwidth 20MHz)	1860MHz ~ 1900MHz
Max. EIRP Power	LTE Band 2 (Channel Bandwidth 1.4MHz)	162.181mW (22.1dBm)
	LTE Band 2 (Channel Bandwidth 3MHz)	190.546mW (22.8dBm)
	LTE Band 2 (Channel Bandwidth 5MHz)	218.776mW (23.4dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	234.423mW (23.7dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	229.087mW (23.6dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	223.872mW (23.5dBm)
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:

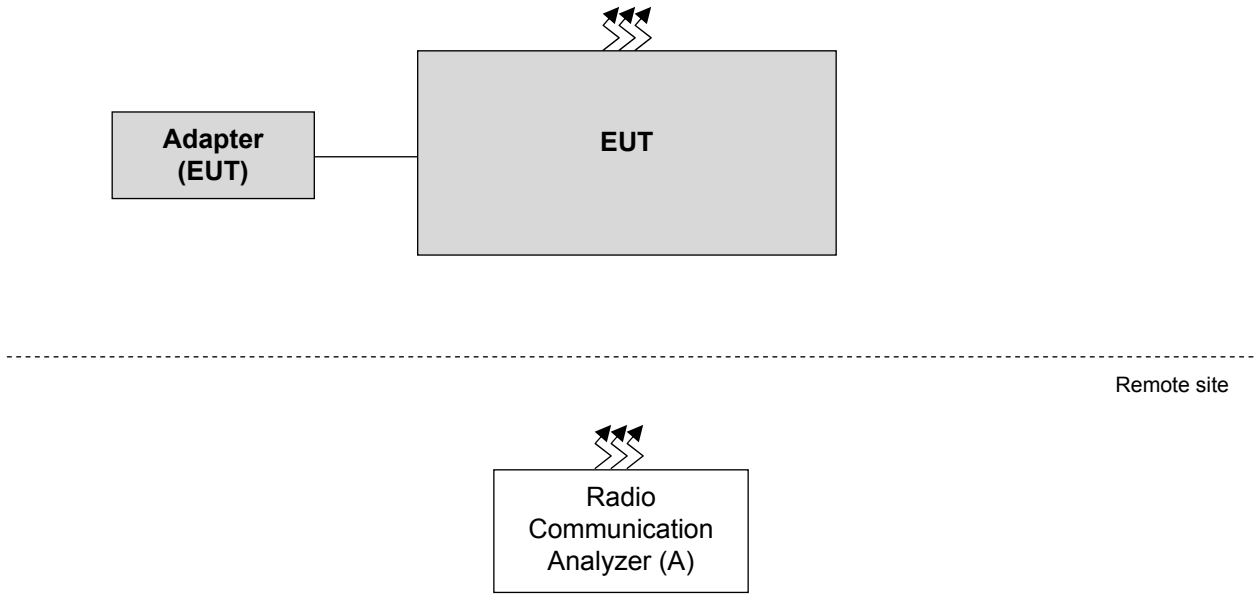
1. The EUT contains following accessory devices and data cable.

Item	Brand	Model	Specification
Battery	FUJI	492005	3.8V, 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	1850-1910	0.52	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.	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	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 2

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
EIRP	18607 to 19193	18607(1850.70MHz), 18900(1880.00MHz), 19193(1909.30MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz), 18900(1880.00MHz), 19185(1908.50MHz)	3MHz	QPSK	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz), 18900(1880.00MHz), 19175(1907.50MHz)	5MHz	QPSK	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz), 18900(1880.00MHz), 19150(1905.00MHz)	10MHz	QPSK	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz), 18900(1880.00MHz), 19125(1902.50MHz)	15MHz	QPSK	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz), 18900(1880.00MHz), 19100(1900.00 MHz)	20MHz	QPSK	1 RB / 99 RB Offset
Frequency Stability	18607 to 19193	18900(1880.00MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
Occupied Bandwidth	18607 to 19193	18607(1850.70MHz), 18900(1880.00MHz), 19193(1909.30MHz)	1.4MHz	QPSK / 16QAM	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz), 18900(1880.00MHz), 19185(1908.50MHz)	3MHz	QPSK / 16QAM	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz), 18900(1880.00MHz), 19175(1907.50MHz)	5MHz	QPSK / 16QAM	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz), 18900(1880.00MHz), 19150(1905.00MHz)	10MHz	QPSK / 16QAM	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz), 18900(1880.00MHz), 19125(1902.50MHz)	15MHz	QPSK / 16QAM	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz), 18900(1880.00MHz), 19100(1900.00 MHz)	20MHz	QPSK / 16QAM	1 RB / 99 RB Offset
Band Edge	18607 to 19193	18607(1850.70MHz), 19193(1909.30MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
	18615 to 19185	18615(1851.50MHz), 19185(1908.50MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
	18625 to 19175	18625(1852.50MHz), 19175(1907.50MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
	18650 to 19150	18650(1855.00MHz), 19150(1905.00MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
	18675 to 19125	18675(1857.50MHz), 19125(1902.50MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
	18700 to 19100	18700(1860.00MHz), 19100(1900.00 MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset

Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
Peak to Average Ratio	18607 to 19193	18607(1850.70MHz), 18900(1880.00MHz), 19193(1909.30MHz)	1.4MHz	QPSK / 16QAM	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz), 18900(1880.00MHz), 19185(1908.50MHz)	3MHz	QPSK / 16QAM	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz), 18900(1880.00MHz), 19175(1907.50MHz)	5MHz	QPSK / 16QAM	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz), 18900(1880.00MHz), 19150(1905.00MHz)	10MHz	QPSK / 16QAM	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz), 18900(1880.00MHz), 19125(1902.50MHz)	15MHz	QPSK / 16QAM	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz), 18900(1880.00MHz), 19100(1900.00MHz)	20MHz	QPSK / 16QAM	1 RB / 99 RB Offset
Conducted Emission	18607 to 19193	18607(1850.70MHz), 18900(1880.00MHz), 19193(1909.30MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz), 18900(1880.00MHz), 19185(1908.50MHz)	3MHz	QPSK	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz), 18900(1880.00MHz), 19175(1907.50MHz)	5MHz	QPSK	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz), 18900(1880.00MHz), 19150(1905.00MHz)	10MHz	QPSK	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz), 18900(1880.00MHz), 19125(1902.50MHz)	15MHz	QPSK	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz), 18900(1880.00MHz), 19100(1900.00MHz)	20MHz	QPSK	1 RB / 99 RB Offset
Radiated Emission Below 1GHz	18607 to 19193	18607(1850.70MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz)	3MHz	QPSK	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz)	5MHz	QPSK	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz)	10MHz	QPSK	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz)	15MHz	QPSK	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz)	20MHz	QPSK	1 RB / 99 RB Offset
Radiated Emission Above 1GHz	18607 to 19193	18607(1850.70MHz), 18900(1880.00MHz), 19193(1909.30MHz)	1.4MHz	QPSK	1 RB / 5 RB Offset
	18615 to 19185	18615(1851.50MHz), 18900(1880.00MHz), 19185(1908.50MHz)	3MHz	QPSK	1 RB / 14 RB Offset
	18625 to 19175	18625(1852.50MHz), 18900(1880.00MHz), 19175(1907.50MHz)	5MHz	QPSK	1 RB / 24 RB Offset
	18650 to 19150	18650(1855.00MHz), 18900(1880.00MHz), 19150(1905.00MHz)	10MHz	QPSK	1 RB / 49 RB Offset
	18675 to 19125	18675(1857.50MHz), 18900(1880.00MHz), 19125(1902.50MHz)	15MHz	QPSK	1 RB / 74 RB Offset
	18700 to 19100	18700(1860.00MHz), 18900(1880.00MHz), 19100(1900.00MHz)	20MHz	QPSK	1 RB / 99 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
EIRP	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	Bond Tseng 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 24
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 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 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

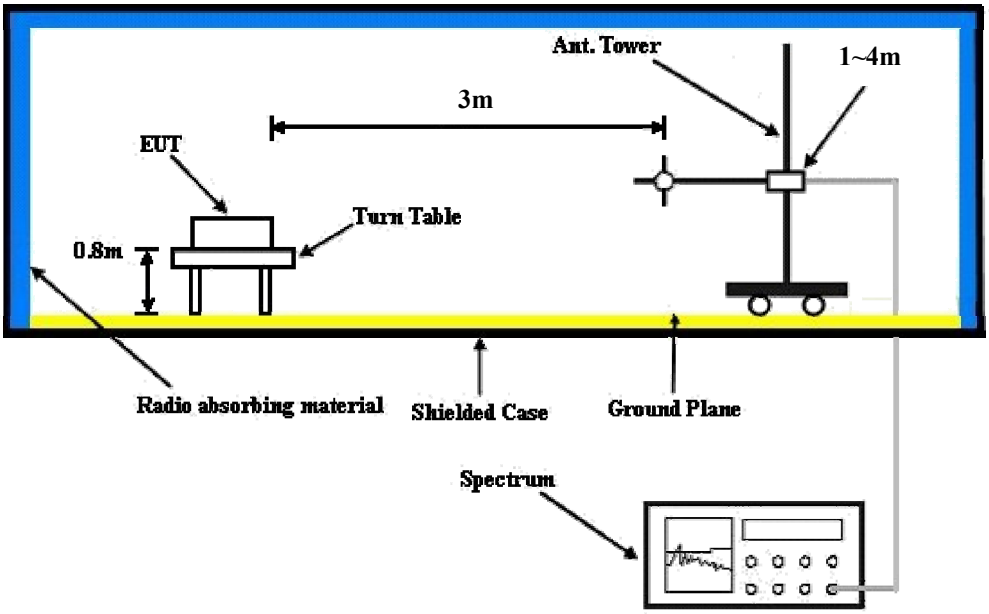
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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 18607	CH 18900	CH 19193	CH 18607	CH 18900	CH 19193
			1850.7 MHz	1880 MHz	1909.3 MHz	1850.7 MHz	1880 MHz	1909.3 MHz
2 / 1.4MHz	1	0	22.59	**22.80**	22.72	21.53	**21.74**	21.66
	1	2	22.57	22.78	22.70	21.51	21.72	21.64
	1	5	22.35	22.56	22.48	21.29	21.50	21.42
	3	0	22.14	22.35	22.27	21.08	21.29	21.21
	3	1	22.08	22.29	22.21	21.02	21.23	21.15
	3	3	22.07	22.28	22.20	21.01	21.22	21.14
	6	0	21.29	21.50	21.42	20.23	20.44	20.36

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 18615	CH 18900	CH 19185	CH 18615	CH 18900	CH 19185
			1851.5 MHz	1880 MHz	1908.5 MHz	1851.5 MHz	1880 MHz	1908.5 MHz
2 / 3MHz	1	0	22.67	**22.88**	22.80	21.61	**21.82**	21.74
	1	7	22.65	22.86	22.78	21.59	21.80	21.72
	1	14	22.43	22.64	22.56	21.37	21.58	21.50
	8	0	21.47	21.68	21.60	20.41	20.62	20.54
	8	3	21.41	21.62	21.54	20.35	20.56	20.48
	8	7	21.40	21.61	21.53	20.34	20.55	20.47
	15	0	21.37	21.58	21.50	20.31	20.52	20.44

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 18625	CH 18900	CH 19175	CH 18625	CH 18900	CH 19175
			1852.5 MHz	1880 MHz	1907.5 MHz	1852.5 MHz	1880 MHz	1907.5 MHz
2 / 5MHz	1	0	22.78	**22.99**	22.91	21.72	**21.93**	21.85
	1	12	22.76	22.97	22.89	21.70	21.91	21.83
	1	24	22.54	22.75	22.67	21.48	21.69	21.61
	12	0	21.58	21.79	21.71	20.52	20.73	20.65
	12	6	21.52	21.73	21.65	20.46	20.67	20.59
	12	13	21.51	21.72	21.64	20.45	20.66	20.58
	25	0	21.48	21.69	21.61	20.42	20.63	20.55

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 18650	CH 18900	CH 19150	CH 18650	CH 18900	CH 19150
			1855 MHz	1880 MHz	1905 MHz	1855 MHz	1880 MHz	1905 MHz
2 / 10MHz	1	0	22.91	**23.12**	23.04	21.85	**22.06**	21.98
	1	24	22.89	23.10	23.02	21.83	22.04	21.96
	1	49	22.67	22.88	22.80	21.61	21.82	21.74
	25	0	21.71	21.92	21.84	20.65	20.86	20.78
	25	12	21.65	21.86	21.78	20.59	20.80	20.72
	25	25	21.64	21.85	21.77	20.58	20.79	20.71
	50	0	21.61	21.82	21.74	20.55	20.76	20.68

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 18675	CH 18900	CH 19125	CH 18675	CH 18900	CH 19125
			1857.5 MHz	1880 MHz	1902.5 MHz	1857.5 MHz	1880 MHz	1902.5 MHz
2 / 15MHz	1	0	23.00	**23.21**	23.13	21.94	**22.15**	22.07
	1	37	22.98	23.19	23.11	21.92	22.13	22.05
	1	74	22.76	22.97	22.89	21.70	21.91	21.83
	36	0	21.80	22.01	21.93	20.74	20.95	20.87
	36	19	21.74	21.95	21.87	20.68	20.89	20.81
	36	39	21.73	21.94	21.86	20.67	20.88	20.80
	75	0	21.70	21.91	21.83	20.64	20.85	20.77

Band / BW	RB Size	RB Offset	QPSK			16QAM		
			CH 18700	CH 18900	CH 19100	CH 18700	CH 18900	CH 19100
			1860 MHz	1880 MHz	1900 MHz	1860 MHz	1880 MHz	1900 MHz
2 / 20MHz	1	0	23.12	**23.33**	23.25	22.06	**22.27**	22.19
	1	50	23.10	23.31	23.23	22.04	22.25	22.17
	1	99	22.88	23.09	23.01	21.82	22.03	21.95
	50	0	21.92	22.13	22.05	20.86	21.07	20.99
	50	25	21.86	22.07	21.99	20.80	21.01	20.93
	50	50	21.85	22.06	21.98	20.79	21.00	20.92
	100	0	21.82	22.03	21.95	20.76	20.97	20.89

EIRP Power (dBm)

LTE Band 2, Channel Bandwidth: 1.4MHz

MODE		TX channel 18607					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-21.2	19.0	0.1	19.1	33.0	-13.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-18.4	22.0	0.1	**22.1**	33.0	-10.9

MODE		TX channel 18900					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-22.3	18.2	0.0	18.2	33.0	-14.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.5	21.1	0.0	21.1	33.0	-11.9

MODE		TX channel 19193					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1909.30	-23.4	17.3	-0.1	17.2	33.0	-15.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1909.30	-20.9	19.9	-0.1	19.8	33.0	-13.2

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

LTE Band 2, Channel Bandwidth: 3MHz

MODE		TX channel 18615					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-20.4	19.8	0.1	19.9	33.0	-13.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-17.7	22.7	0.1	**22.8**	33.0	-10.2

MODE		TX channel 18900					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-20.5	20.0	0.0	20.0	33.0	-13.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.4	21.2	0.0	21.2	33.0	-11.8

MODE		TX channel 19185					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1908.50	-22.4	18.3	-0.1	18.2	33.0	-14.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1908.50	-20.4	20.4	-0.1	20.3	33.0	-12.7

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

LTE Band 2, Channel Bandwidth: 5MHz

MODE		TX channel 18625					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-19.6	20.6	0.1	20.7	33.0	-12.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-17.1	23.3	0.1	**23.4**	33.0	-9.6

MODE		TX channel 18900					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-20.7	19.8	0.0	19.8	33.0	-13.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.5	21.1	0.0	21.1	33.0	-11.9

MODE		TX channel 19175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1907.50	-21.5	19.2	-0.1	19.1	33.0	-13.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1907.50	-20.0	20.8	-0.1	20.7	33.0	-12.3

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

LTE Band 2, Channel Bandwidth: 10MHz

MODE		TX channel 18650					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-19.6	20.7	0.0	20.7	33.0	-12.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-16.8	23.7	0.0	**23.7**	33.0	-9.3

MODE		TX channel 18900					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-20.4	20.1	0.0	20.1	33.0	-12.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.5	21.1	0.0	21.1	33.0	-11.9

MODE		TX channel 19150					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1905.00	-21.5	19.2	-0.1	19.1	33.0	-13.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1905.00	-20.5	20.3	-0.1	20.2	33.0	-12.8

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

LTE Band 2, Channel Bandwidth: 15MHz

MODE	TX channel 18675						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-20.1	20.2	0.0	20.2	33.0	-12.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-16.9	23.6	0.0	**23.6**	33.0	-9.4

MODE	TX channel 18900						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-20.1	20.4	0.0	20.4	33.0	-12.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.0	21.6	0.0	21.6	33.0	-11.4

MODE	TX channel 19125						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1902.50	-21.2	19.5	-0.1	19.4	33.0	-13.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1902.50	-19.7	21.1	-0.1	21.0	33.0	-12.0

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

LTE Band 2, Channel Bandwidth: 20MHz

MODE	TX channel 18700						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-19.4	20.9	0.0	20.9	33.0	-12.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-17.0	23.5	0.0	**23.5**	33.0	-9.5

MODE	TX channel 18900						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-19.9	20.6	0.0	20.6	33.0	-12.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1880.00	-18.9	21.7	0.0	21.7	33.0	-11.3

MODE	TX channel 19100						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1900.00	-20.8	19.9	-0.1	19.8	33.0	-13.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1900.00	-18.0	22.8	-0.1	22.7	33.0	-10.3

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

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

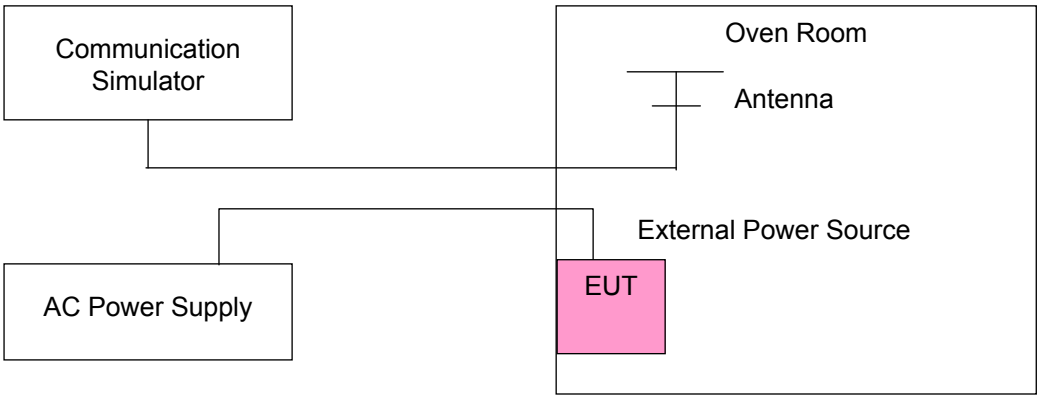
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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 2 18900(1880.00MHz)	
132	-0.007	2.5
120	-0.006	2.5
108	-0.006	2.5

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

Frequency Error vs. Temperature.

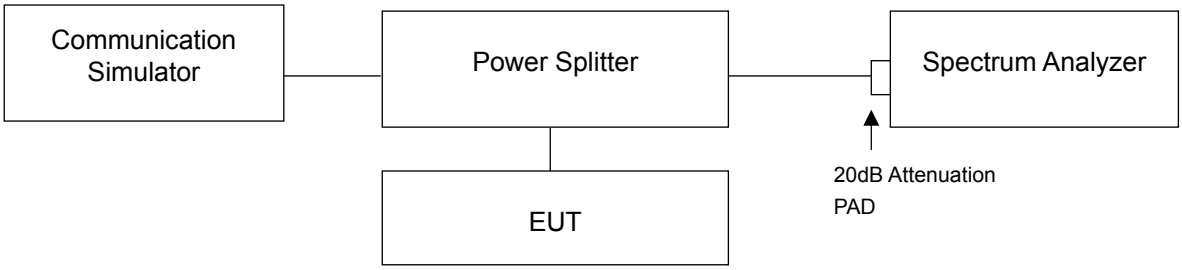
TEMP. (℃)	Frequency Error (ppm)	Limit (ppm)
	LTE Band 2 18900(1880.00MHz)	
70	-0.011	2.5
60	-0.011	2.5
50	-0.009	2.5
40	-0.007	2.5
30	-0.007	2.5
20	-0.006	2.5
10	-0.008	2.5
0	-0.009	2.5
-10	-0.010	2.5
-20	-0.012	2.5

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

LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.539	1.535
18900	1880.0	1.576	1.524
19193	1909.3	1.552	1.600

LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	3.077	3.093
18900	1880.0	3.076	3.080
19185	1908.5	3.061	3.106

LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	5.066	5.047
18900	1880.0	5.048	5.037
19175	1907.5	5.056	5.116

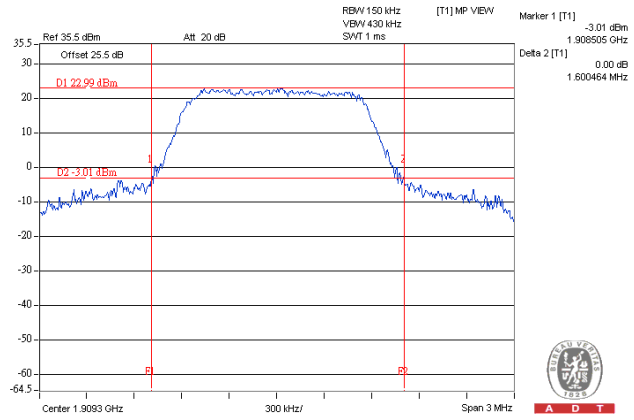
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	9.952	9.772
18900	1880.0	9.855	9.858
19150	1905.0	9.889	9.922

LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	14.627	14.694
18900	1880.0	14.627	14.529
19125	1902.5	14.746	14.671

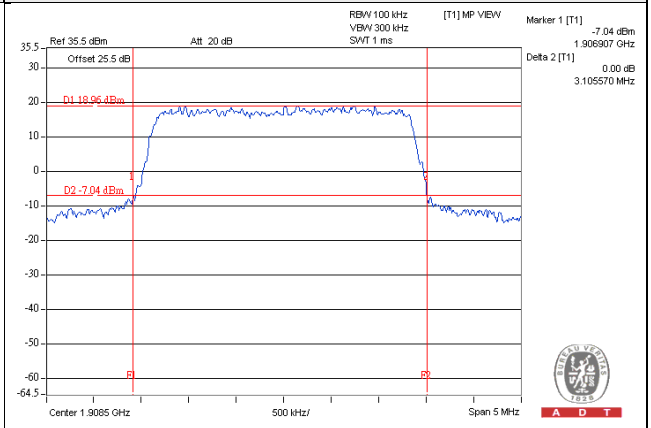
LTE Band 2, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	19.335	19.497
18900	1880.0	19.389	19.373
19100	1900.0	19.544	19.499

Spectrum Plot Of Worst Value

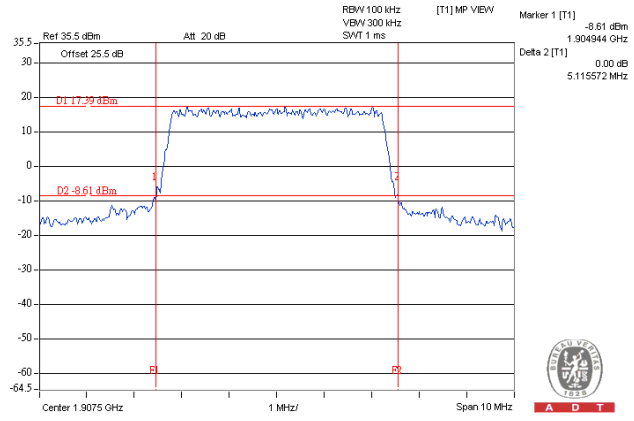
1.4MHz / 16QAM



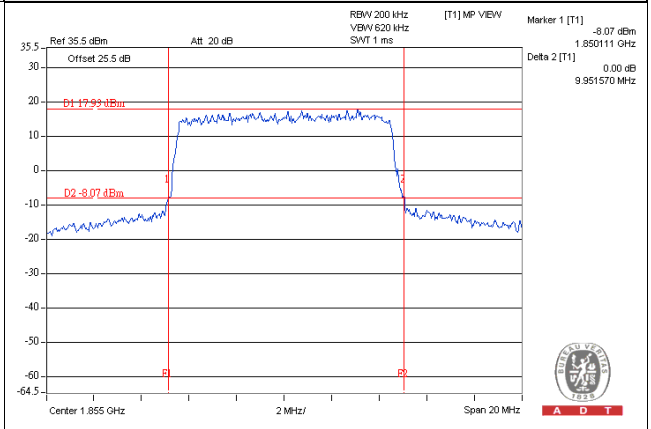
3MHz / 16QAM



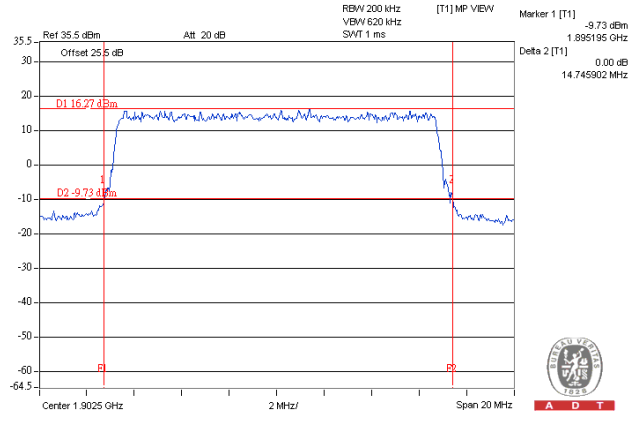
5MHz / 16QAM



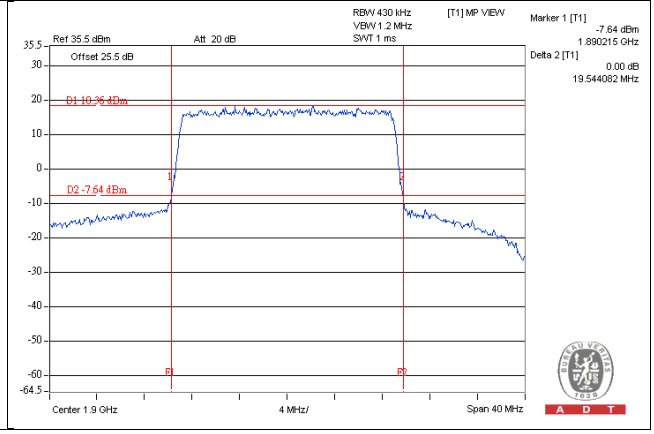
10MHz / QPSK



15MHz / QPSK



20MHz / QPSK



LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.10	1.10
18900	1880.0	1.10	1.10
19193	1909.3	1.10	1.10

LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	2.69	2.69
18900	1880.0	2.69	2.68
19185	1908.5	2.69	2.69

LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	4.48	4.48
18900	1880.0	4.48	4.48
19175	1907.5	4.48	4.47

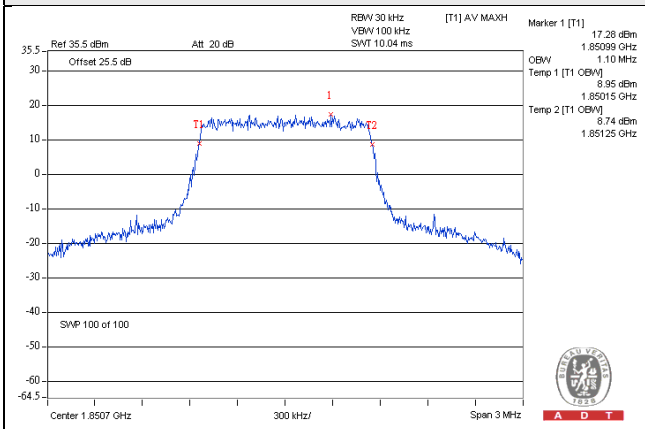
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	8.93	8.97
18900	1880.0	8.93	8.97
19150	1905.0	8.93	8.97

LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	13.37	13.47
18900	1880.0	13.47	13.43
19125	1902.5	13.40	13.43

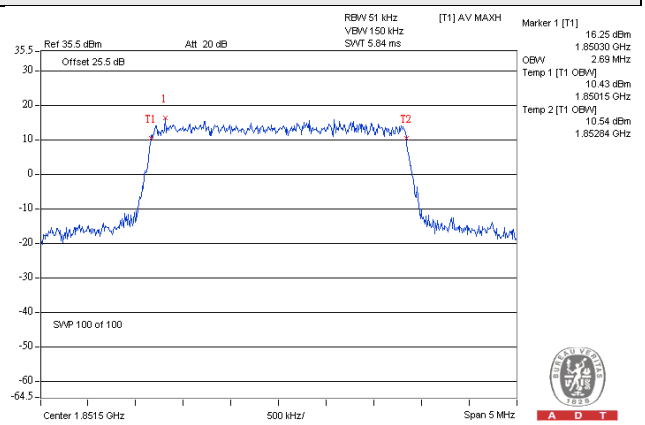
LTE Band 2, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	17.93	17.93
18900	1880.0	17.87	17.93
19100	1900.0	17.93	18.00

Spectrum Plot Of Worst Value

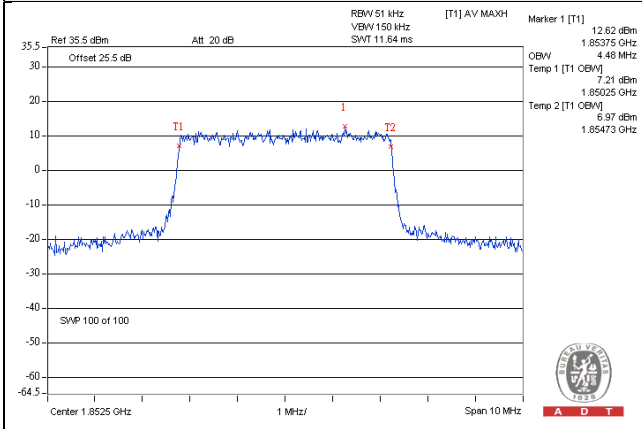
1.4MHz / QPSK



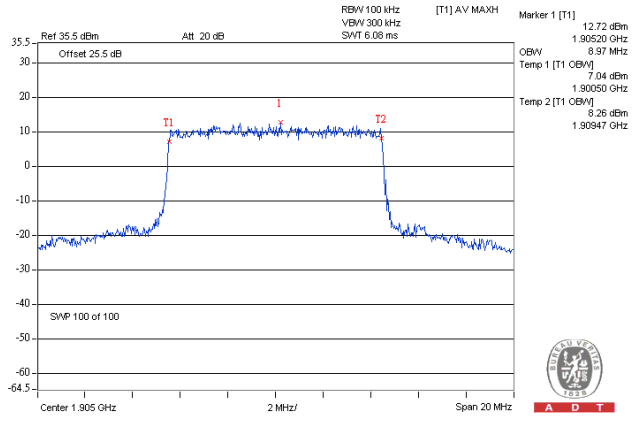
3MHz / QPSK



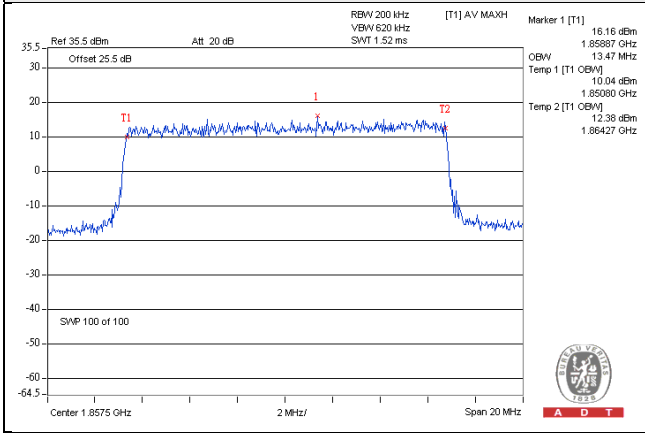
5MHz / QPSK



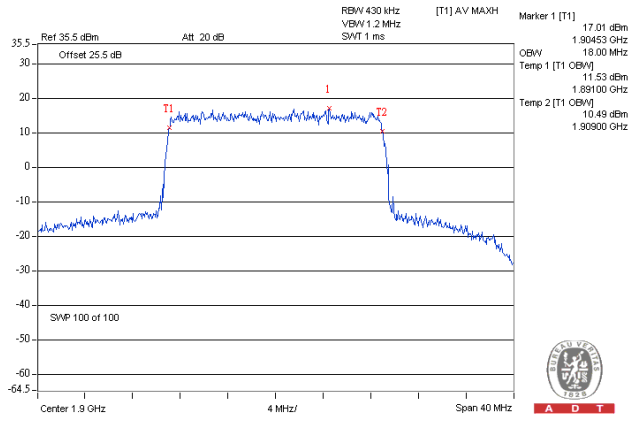
10MHz / 16QAM



15MHz / 16QAM



20MHz / 16QAM

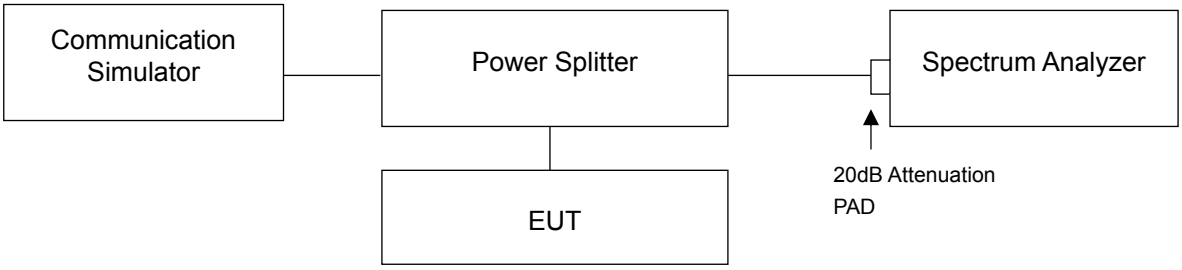


4.4 Band Edge Measurement

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

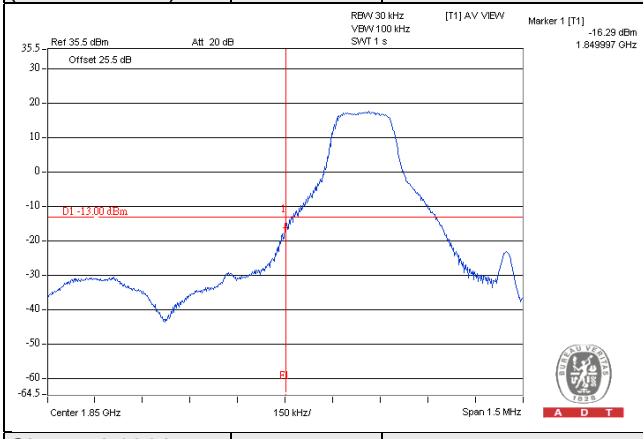


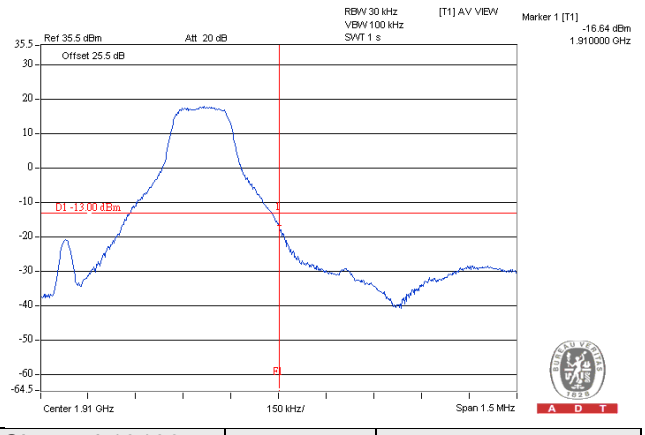
4.4.3 Test Procedures

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. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Channel Bandwidth 15MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 430kHz and VB of the spectrum is 1200kHz (LTE Channel Bandwidth 20MHz).
g. Record the max trace plot into the test report.

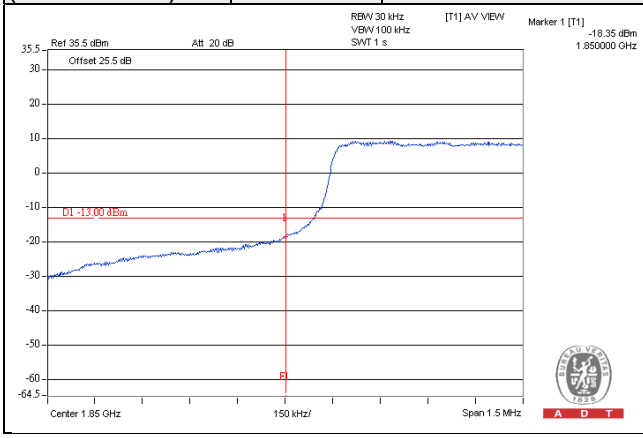
4.4.4 Test Results

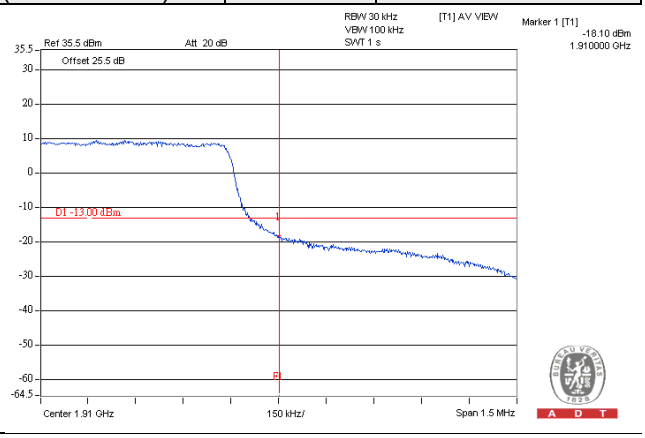
LTE Band 2, Channel Bandwidth 1.4MHz					
Channel 18607 (1850.70MHz)	QPSK	1 RB / 0 RB Offset	Channel 19193 (1909.30MHz)	QPSK	1 RB / 5 RB Offset



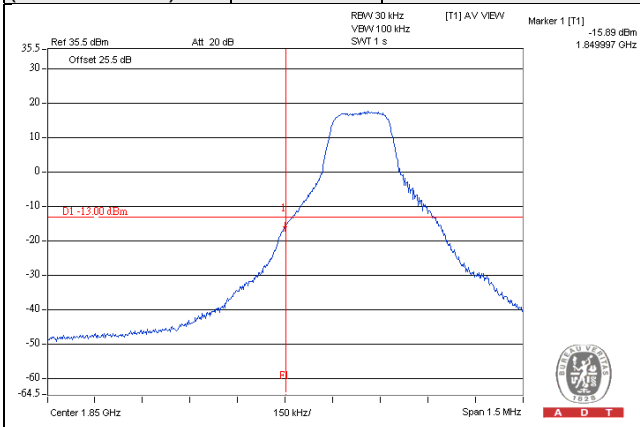


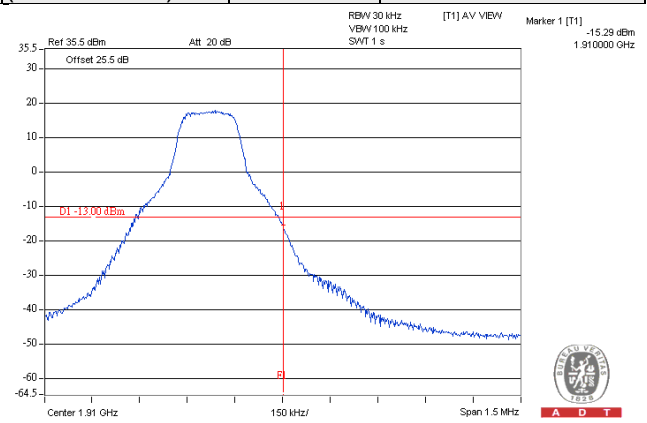
Channel 18607 (1850.70MHz)	QPSK	6 RB / 0 RB Offset	Channel 19193 (1909.30MHz)	QPSK	6 RB / 0 RB Offset



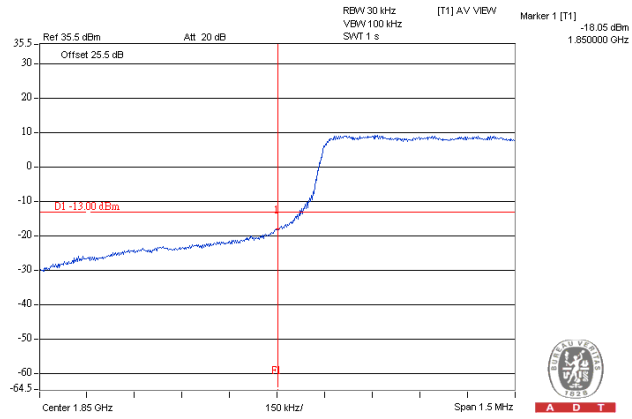


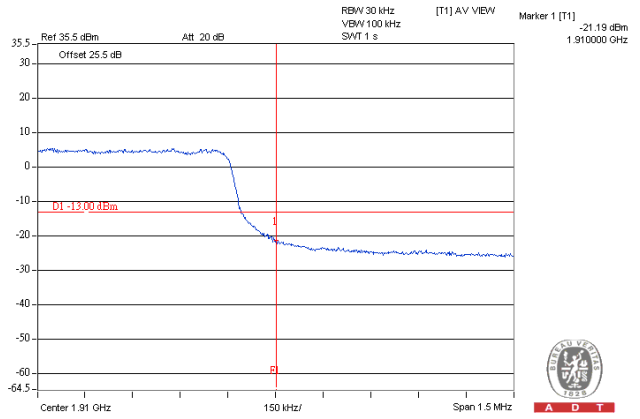
LTE Band 2, Channel Bandwidth 3MHz					
Channel 18615 (1851.50MHz)	QPSK	1 RB / 0 RB Offset	Channel 19185 (1908.50MHz)	QPSK	1 RB / 14 RB Offset



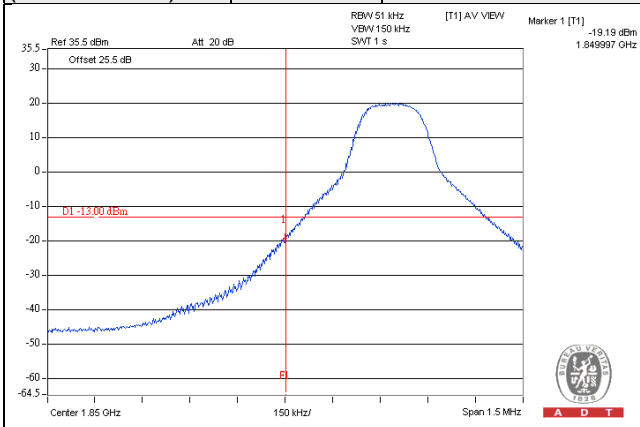


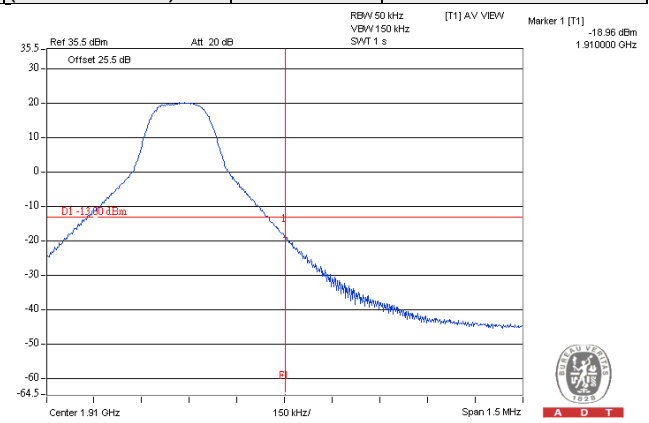
Channel 18615 (1851.50MHz)	QPSK	15 RB / 0 RB Offset	Channel 19185 (1908.50MHz)	QPSK	15 RB / 0 RB Offset



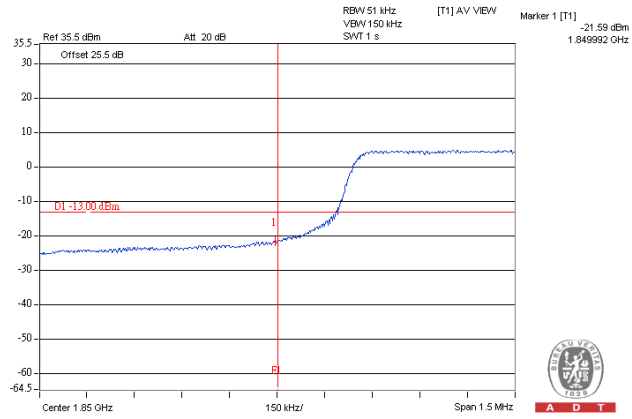


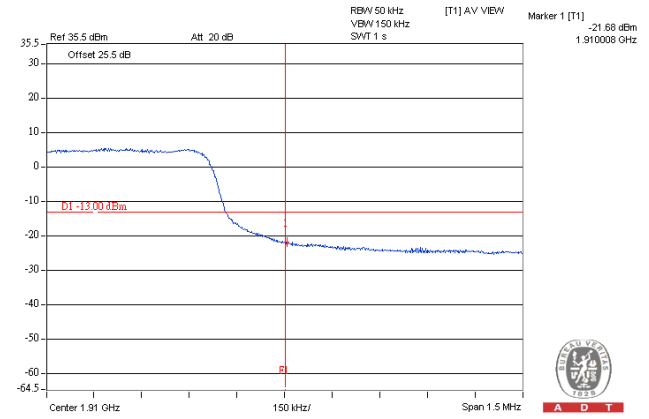
LTE Band 2, Channel Bandwidth 5MHz					
Channel 18625 (1852.50MHz)	QPSK	1 RB / 0 RB Offset	Channel 19175 (1907.50MHz)	QPSK	1 RB / 24 RB Offset



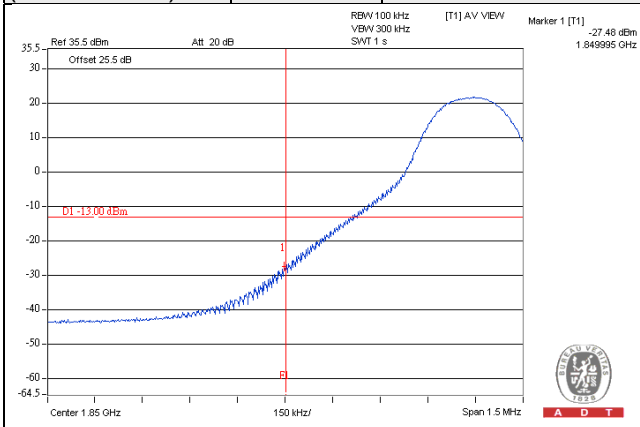


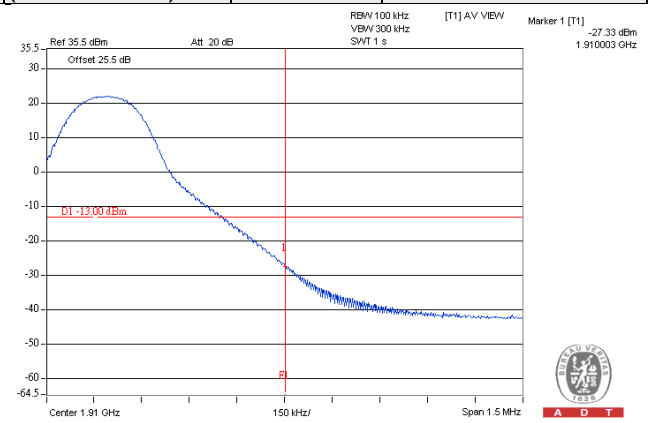
Channel 18625 (1852.50MHz)	QPSK	25 RB / 0 RB Offset	Channel 19175 (1907.50MHz)	QPSK	25 RB / 0 RB Offset



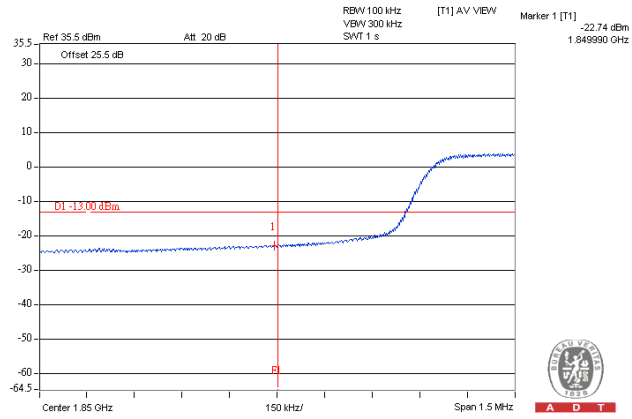


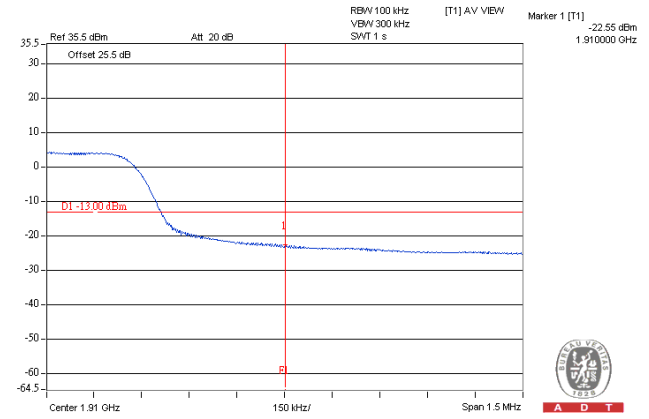
LTE Band 2, Channel Bandwidth 10MHz					
Channel 18650 (1855.00MHz)	QPSK	1 RB / 0 RB Offset	Channel 19150 (1905.00MHz)	QPSK	1 RB / 49 RB Offset



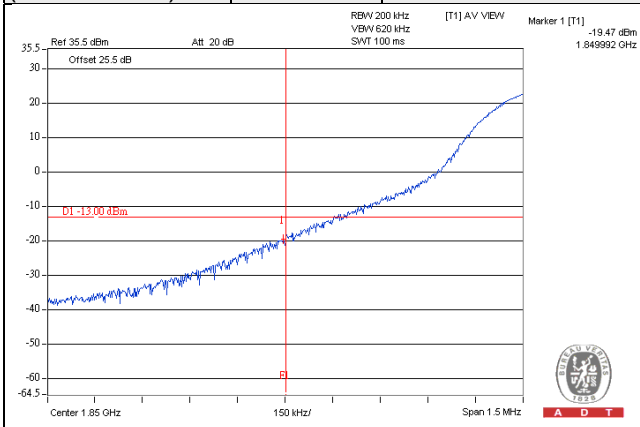


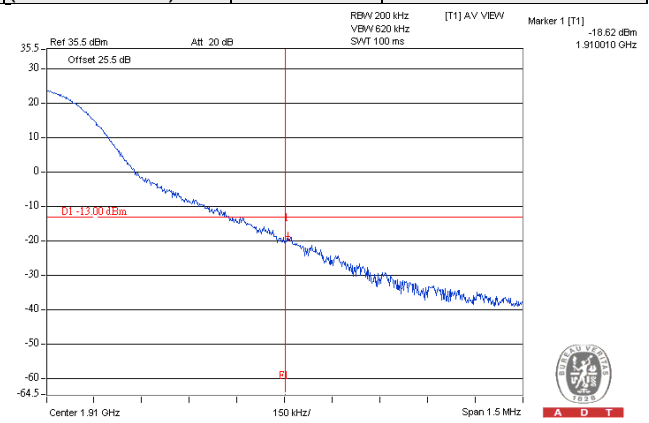
Channel 18650 (1855.00MHz)	QPSK	50 RB / 0 RB Offset	Channel 19150 (1905.00MHz)	QPSK	50 RB / 0 RB Offset



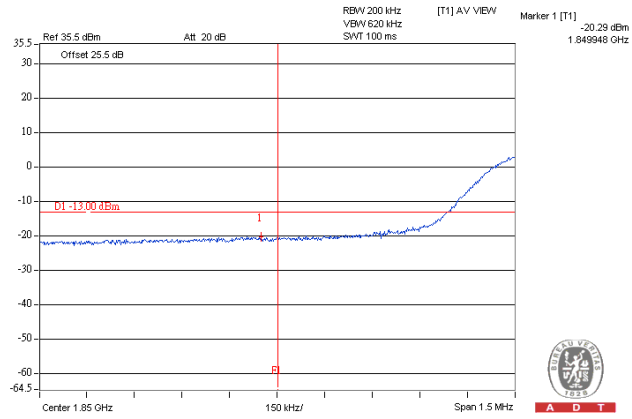


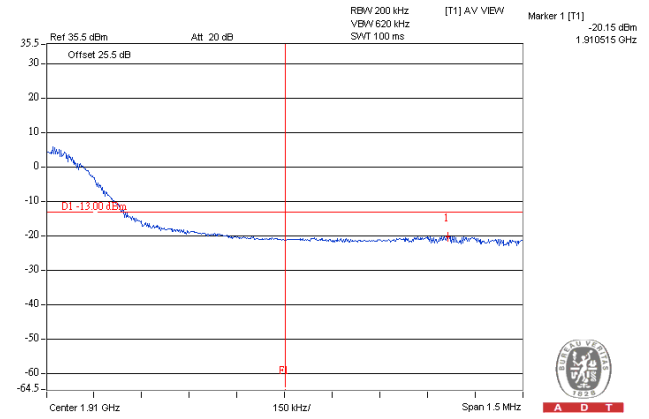
LTE Band 2, Channel Bandwidth 15MHz					
Channel 18675 (1857.50MHz)	QPSK	1 RB / 0 RB Offset	Channel 19125 (1902.50MHz)	QPSK	1 RB / 74 RB Offset



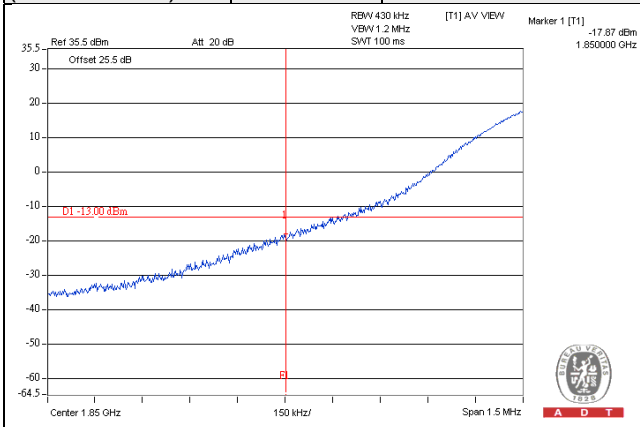


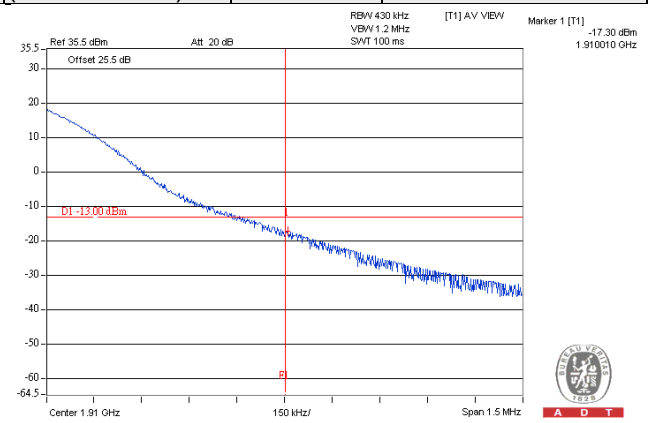
Channel 18675 (1857.50MHz)	QPSK	75 RB / 0 RB Offset	Channel 19125 (1902.50MHz)	QPSK	75 RB / 0 RB Offset



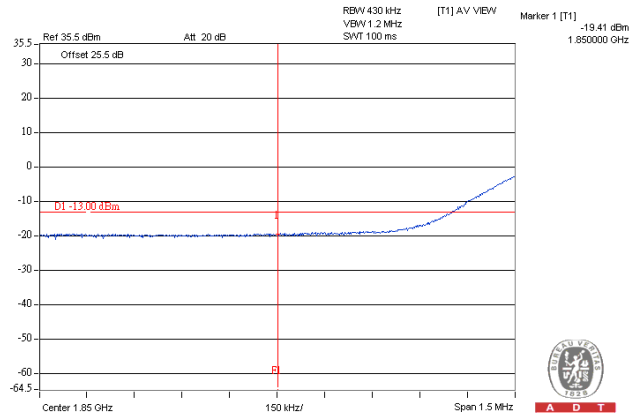


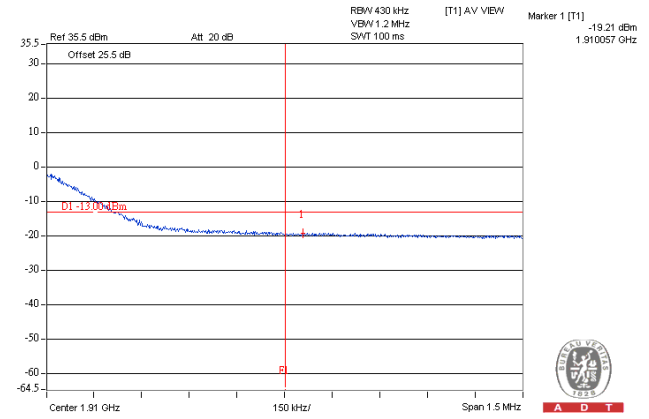
LTE Band 2, Channel Bandwidth 20MHz					
Channel 18700 (1860.00MHz)	QPSK	1 RB / 0 RB Offset	Channel 19100 (1900.00 MHz)	QPSK	1 RB / 99 RB Offset





Channel 18700 (1860.00MHz)	QPSK	100 RB / 0 RB Offset	Channel 19100 (1900.00 MHz)	QPSK	100 RB / 0 RB Offset



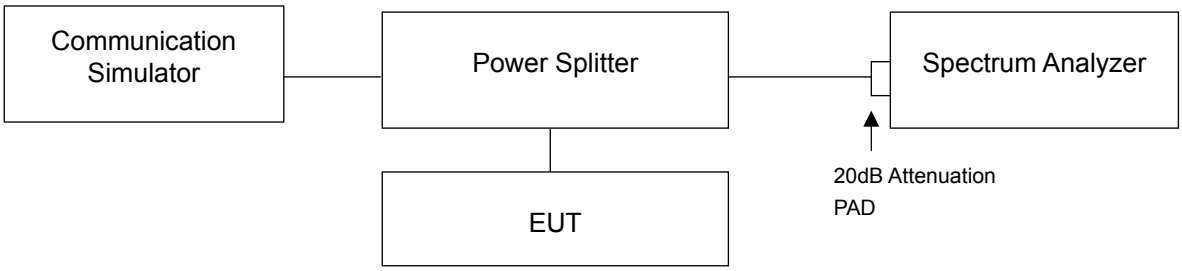


4.5 Peak to Average Ratio

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 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18607	1850.7	4.47	4.57
18900	1880.0	4.65	4.56
19193	1909.3	4.47	4.36

LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18615	1851.5	4.62	4.63
18900	1880.0	4.68	4.81
19185	1908.5	4.61	4.61

LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18625	1852.5	4.89	4.87
18900	1880.0	4.96	4.88
19175	1907.5	4.08	4.88

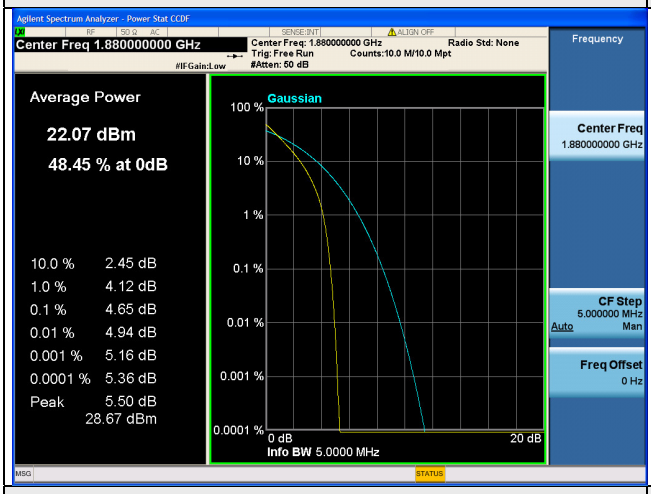
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18650	1855.0	4.91	4.97
18900	1880.0	4.99	4.93
19150	1905.0	5.03	4.98

LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18675	1857.5	5.13	5.22
18900	1880.0	5.03	5.14
19125	1902.5	5.03	5.14

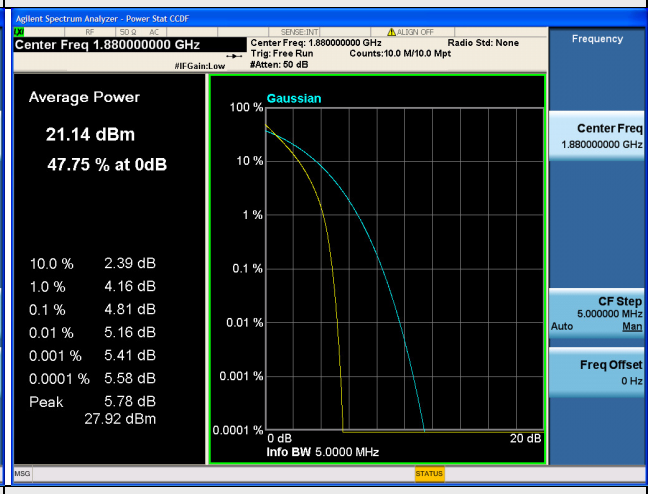
LTE Band 2, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18700	1860.0	5.24	5.23
18900	1880.0	5.02	5.15
19100	1900.0	5.09	5.43

Spectrum Plot Of Worst Value

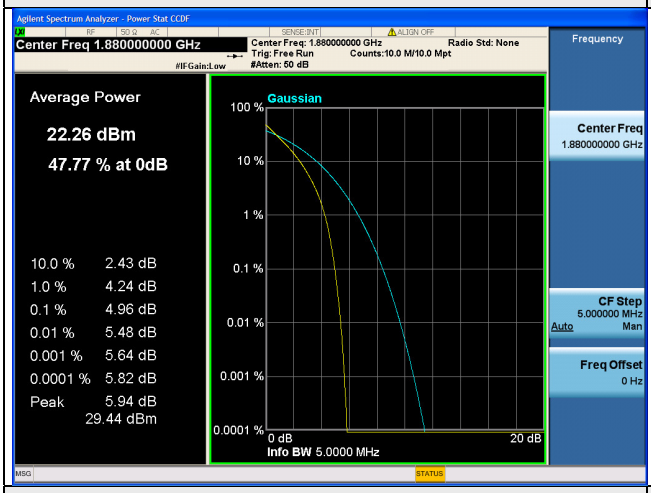
1.4MHz / QPSK



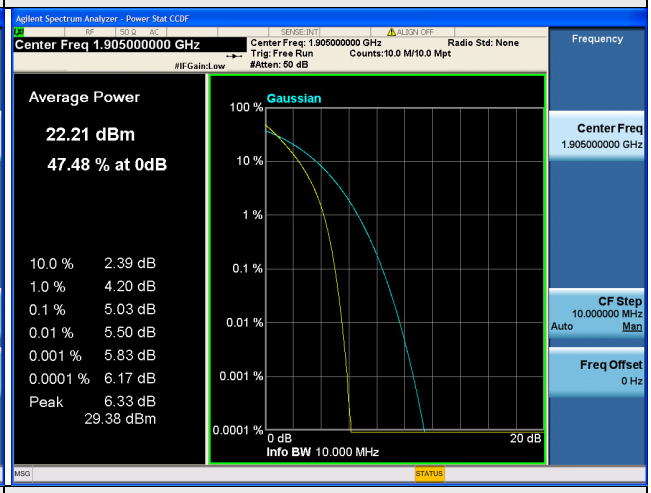
3MHz / 16QAM



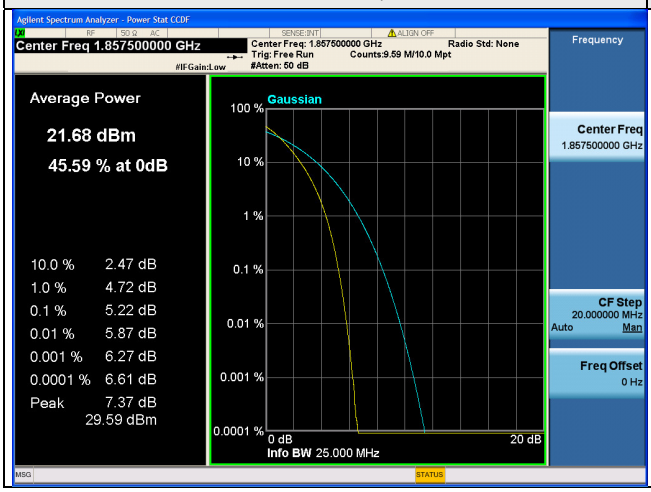
5MHz / QPSK



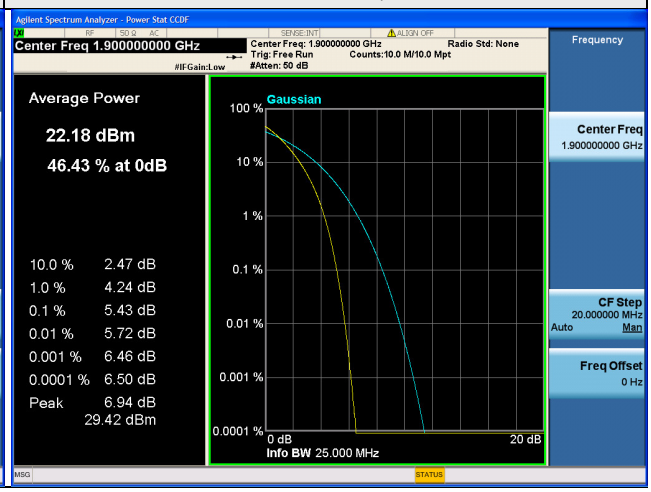
10MHz / QPSK



15MHz / 16QAM



20MHz / 16QAM

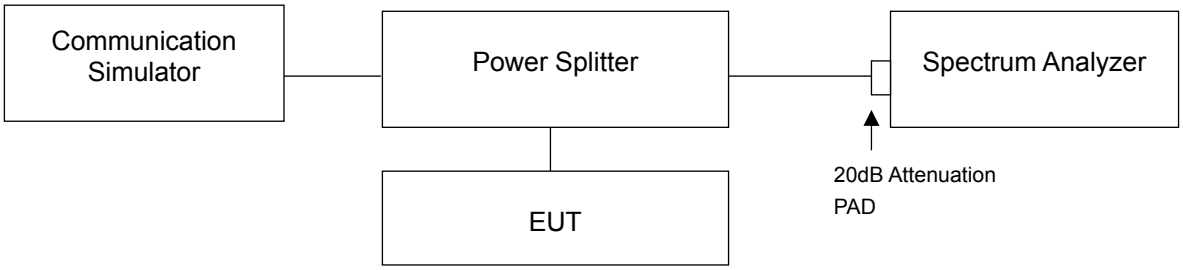


4.6 Conducted Spurious Emissions

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

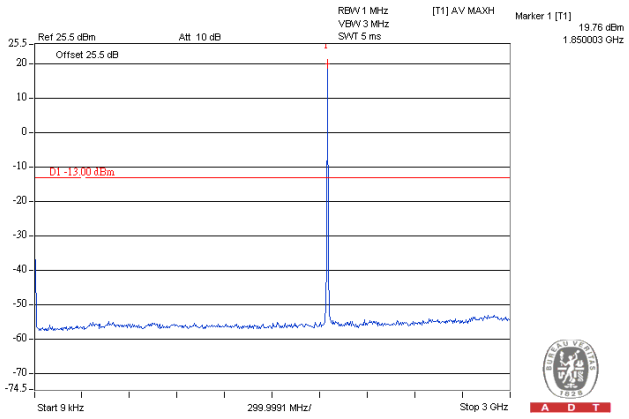
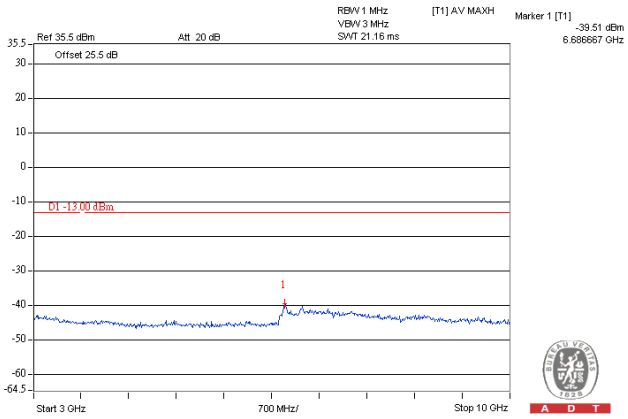
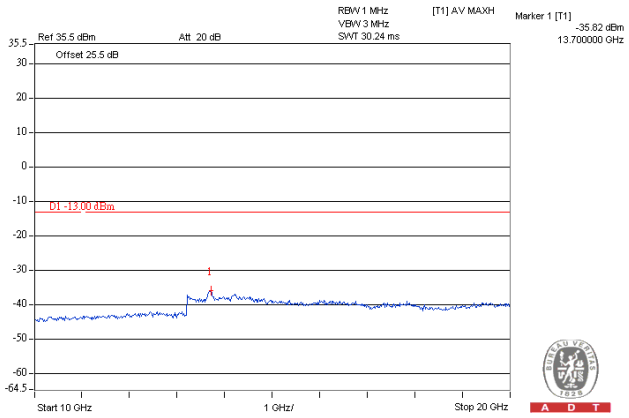


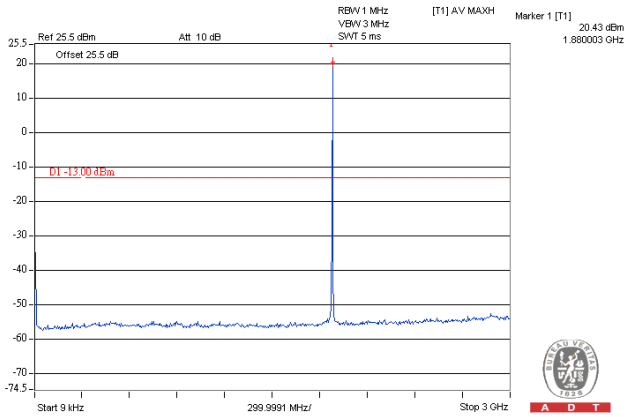
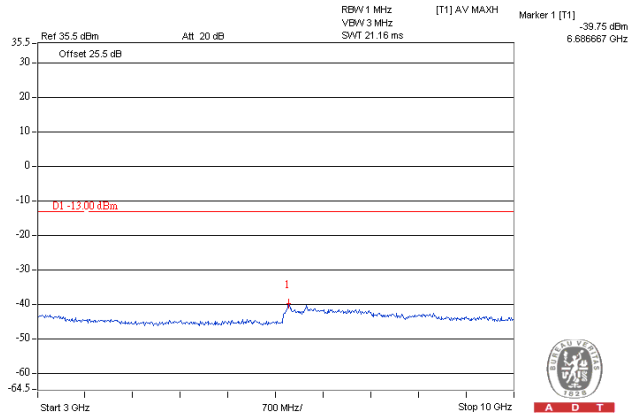
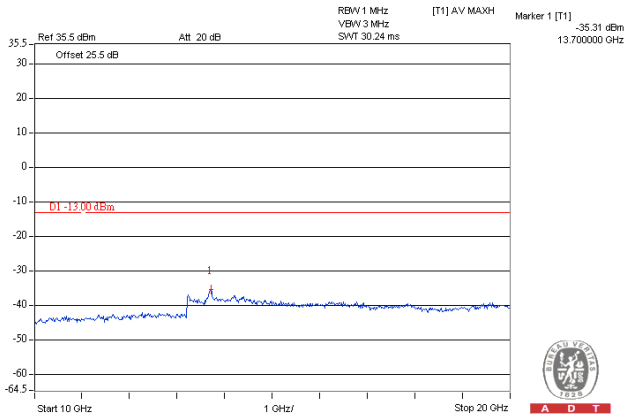
4.6.3 Test Procedure

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

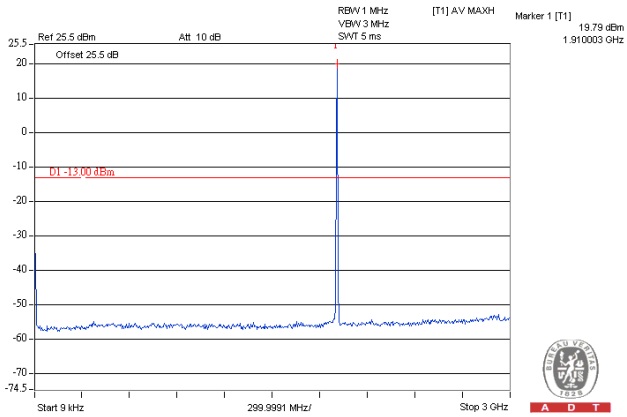
b. Measuring frequency range is from 9 kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

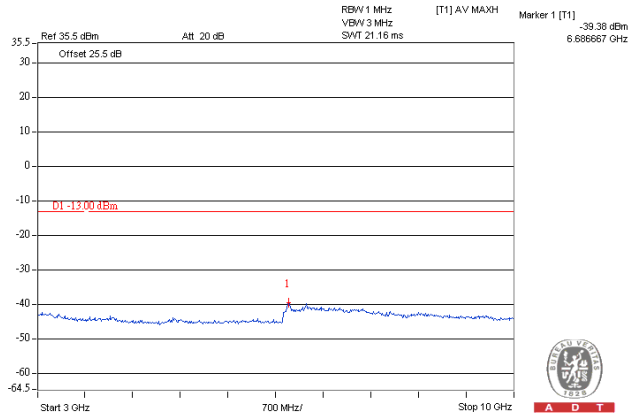
4.6.4 Test Results

LTE Band 2, Channel Bandwidth 1.4MHz	
Channel 18607 (1850.70MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

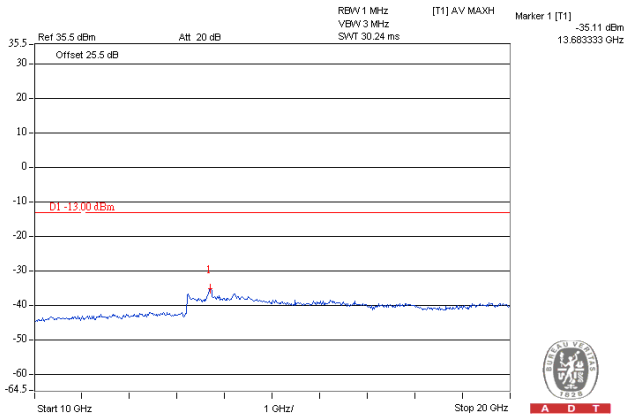
LTE Band 2, Channel Bandwidth 1.4MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

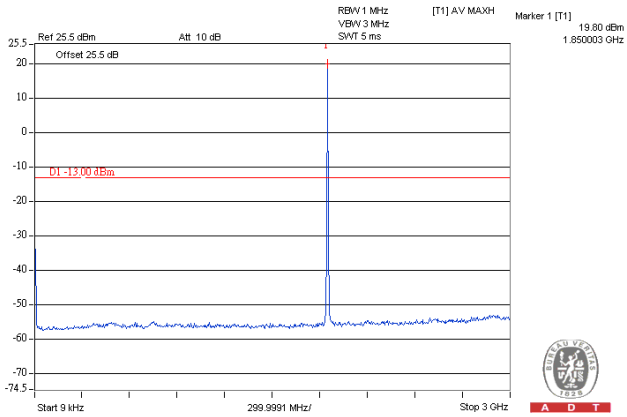
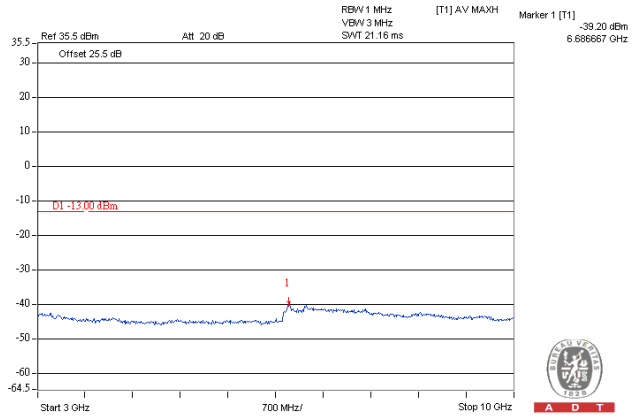
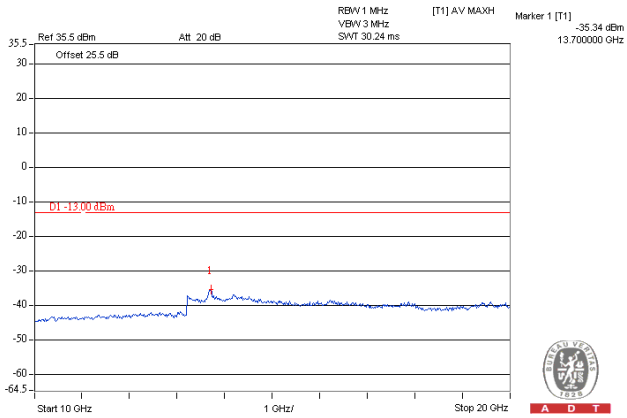
LTE Band 2, Channel Bandwidth 1.4MHz	
Channel 19193 (1909.30MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz

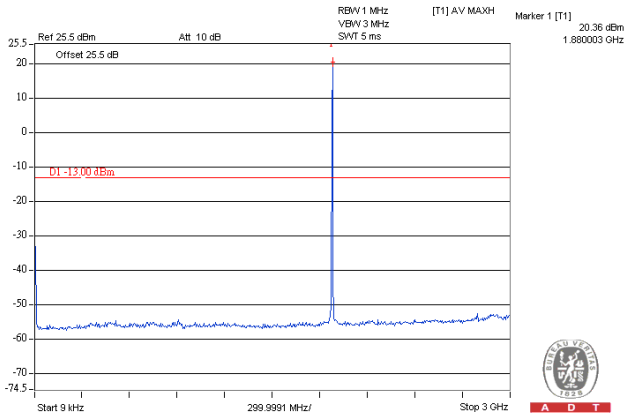
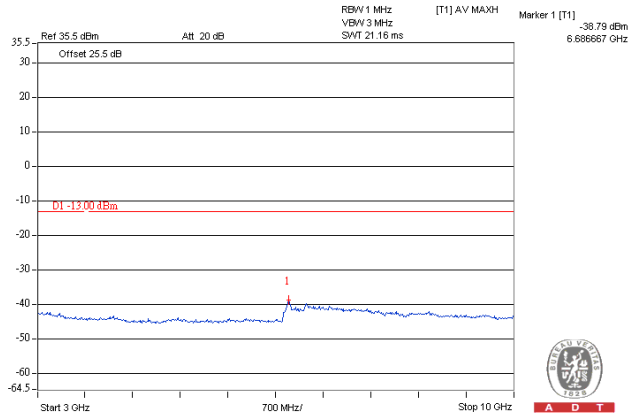
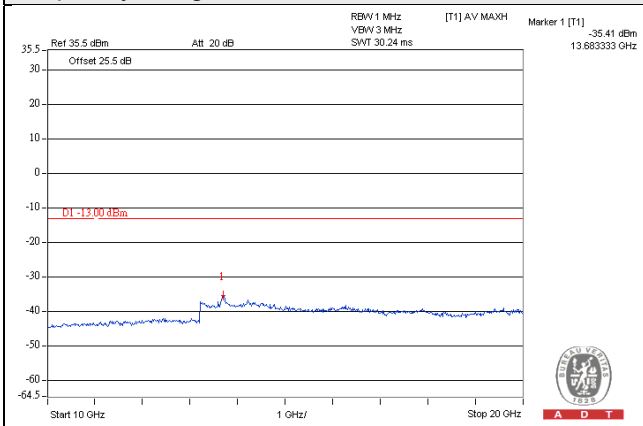




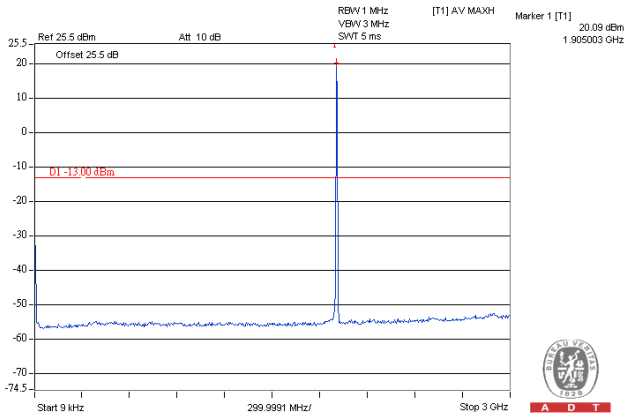
Frequency Range : 10GHz~20GHz	

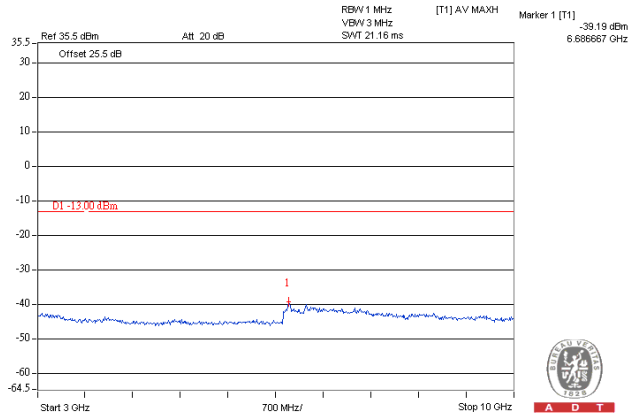


LTE Band 2, Channel Bandwidth 3MHz	
Channel 18615 (1851.50MHz),	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

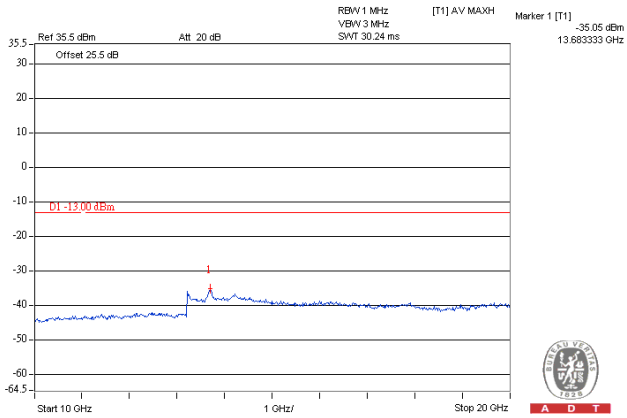
LTE Band 2, Channel Bandwidth 3MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

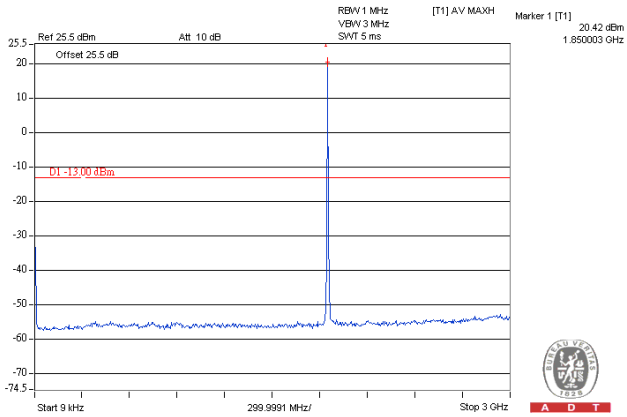
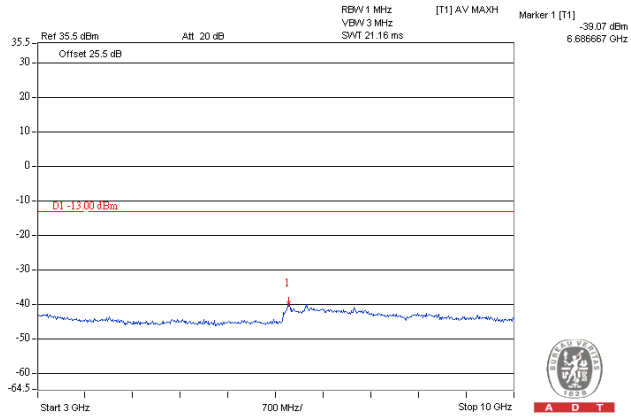
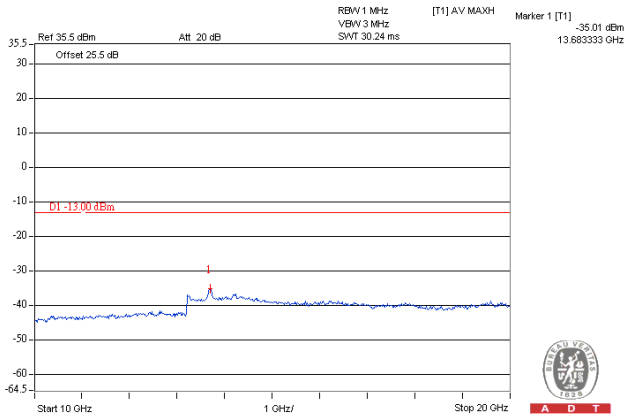
LTE Band 2, Channel Bandwidth 3MHz	
Channel 19185 (1908.50MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz



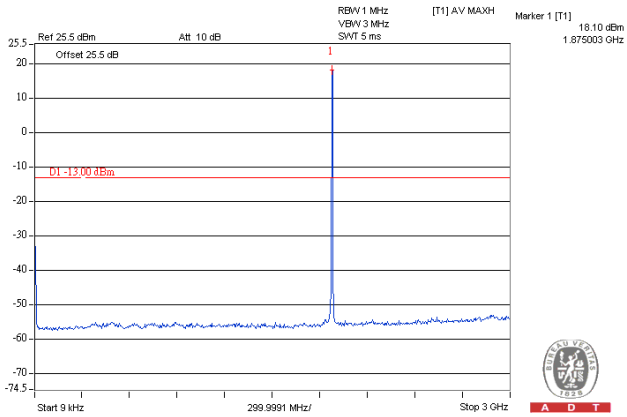


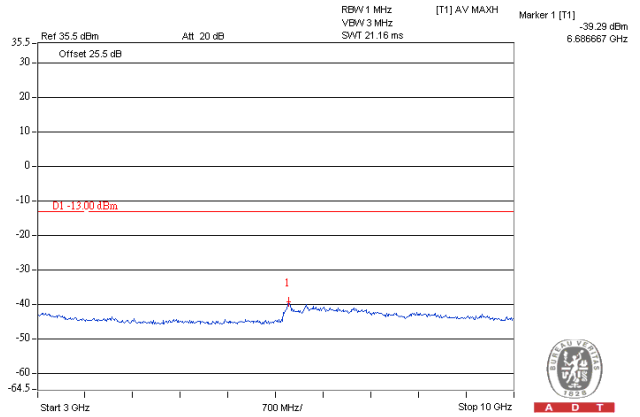
Frequency Range : 10GHz~20GHz	



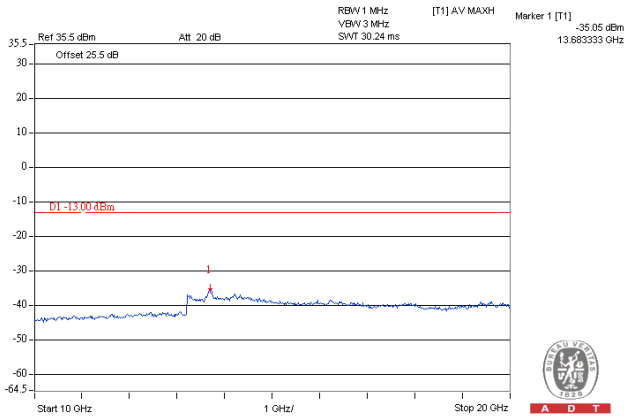
LTE Band 2, Channel Bandwidth 5MHz	
Channel 18625 (1852.50MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2, Channel Bandwidth 5MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz

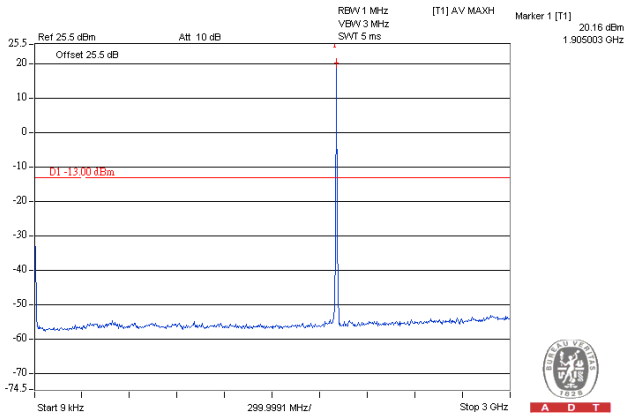


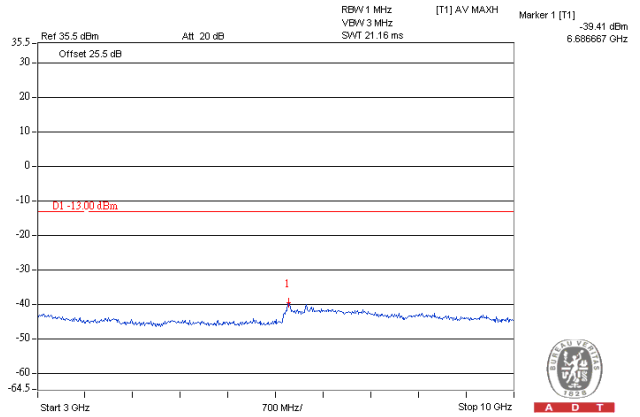


Frequency Range : 10GHz~20GHz	

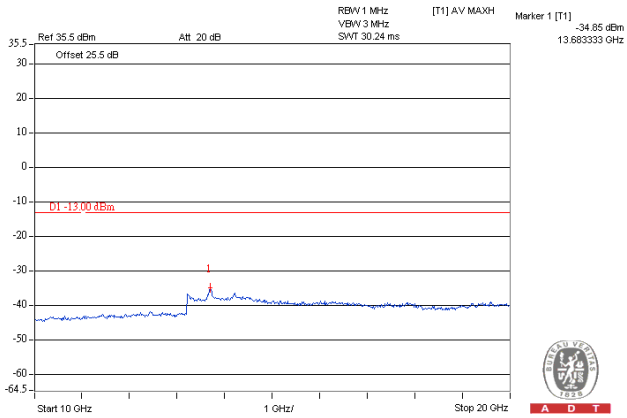


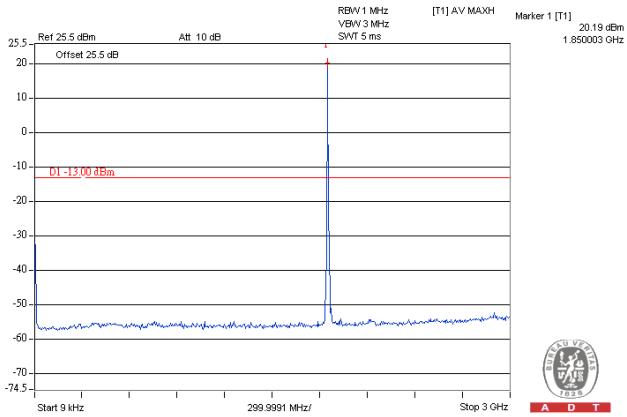
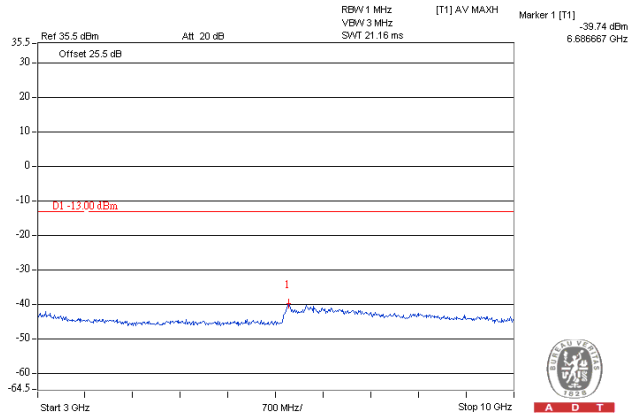
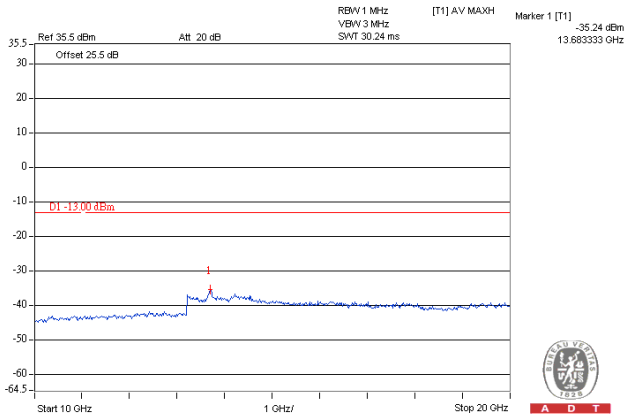
LTE Band 2, Channel Bandwidth 5MHz	
Channel 19175 (1907.50MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz



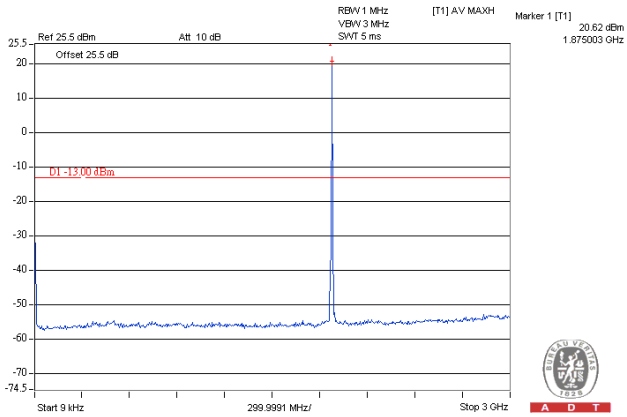


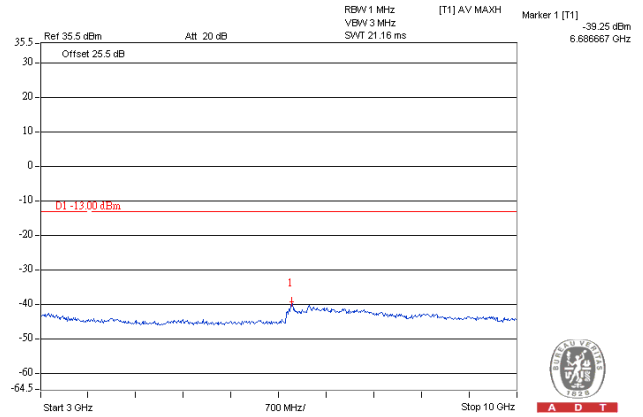
Frequency Range : 10GHz~20GHz	



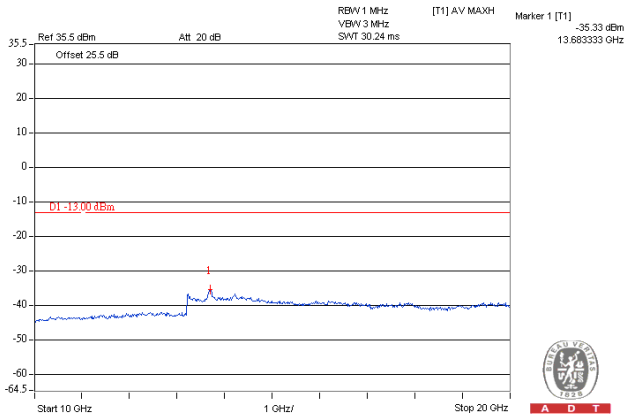
LTE Band 2, Channel Bandwidth 10MHz	
Channel 18650 (1855.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

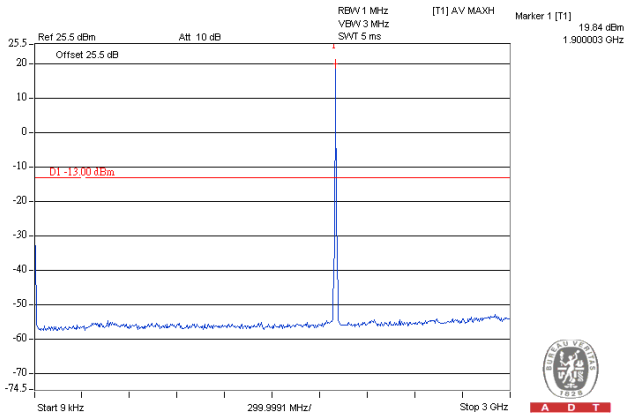
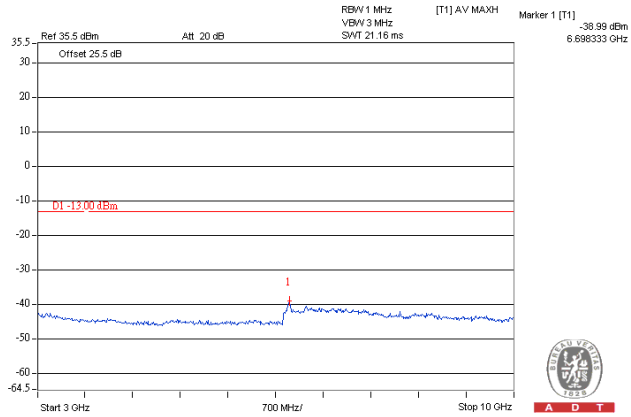
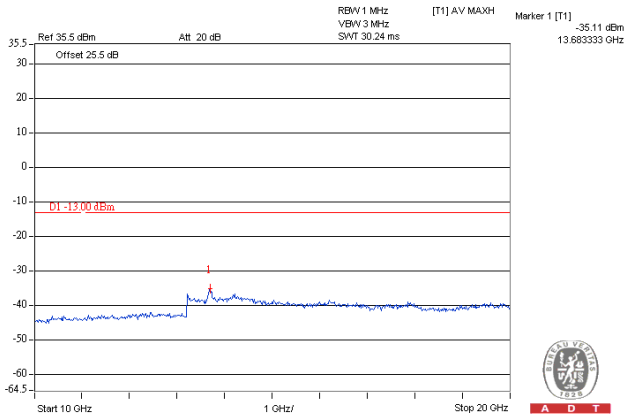
LTE Band 2, Channel Bandwidth 10MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz



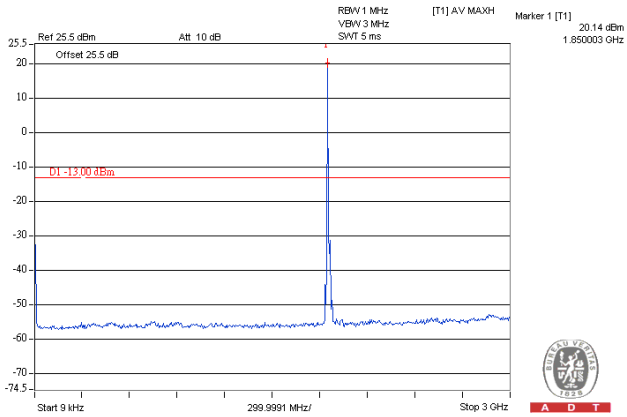


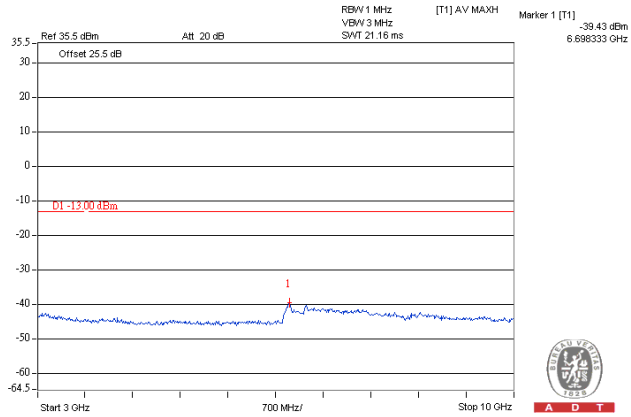
Frequency Range : 10GHz~20GHz	



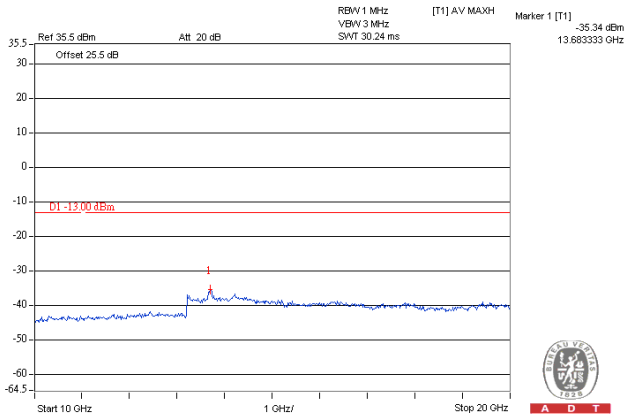
LTE Band 2, Channel Bandwidth 10MHz	
Channel 19150 (1905.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2, Channel Bandwidth 15MHz	
Channel 18675 (1857.50MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz

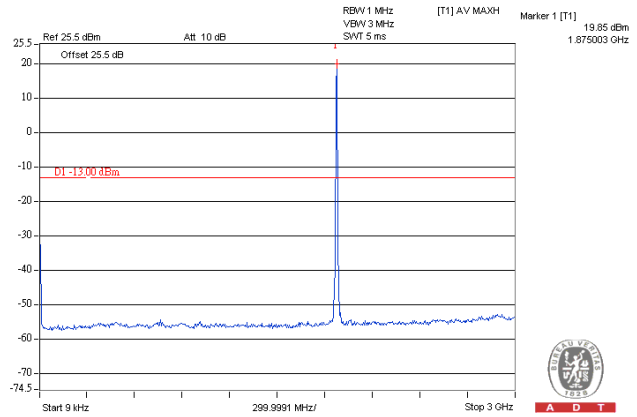


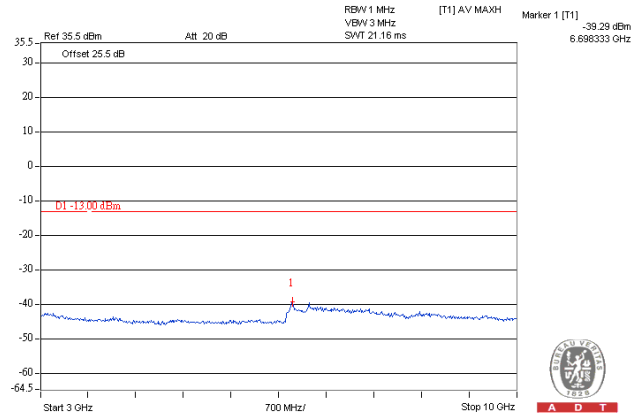


Frequency Range : 10GHz~20GHz	

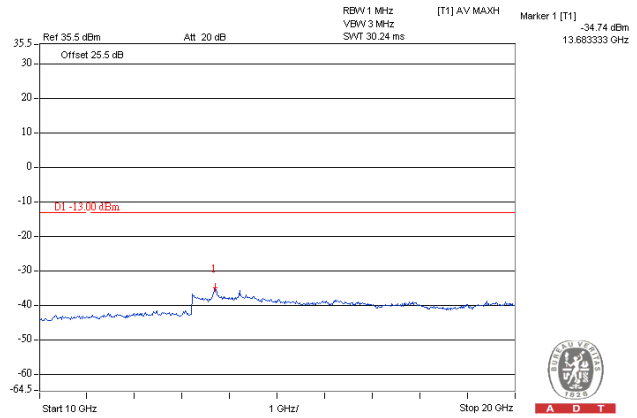


LTE Band 2, Channel Bandwidth 15MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz

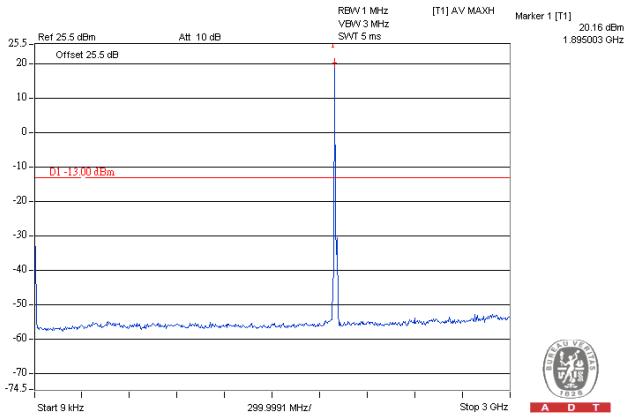


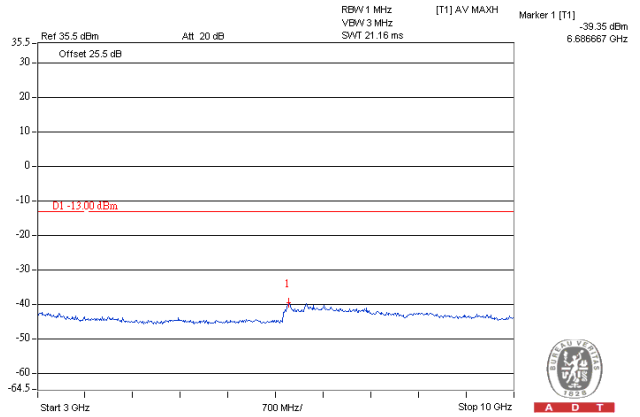


Frequency Range : 10GHz~20GHz	

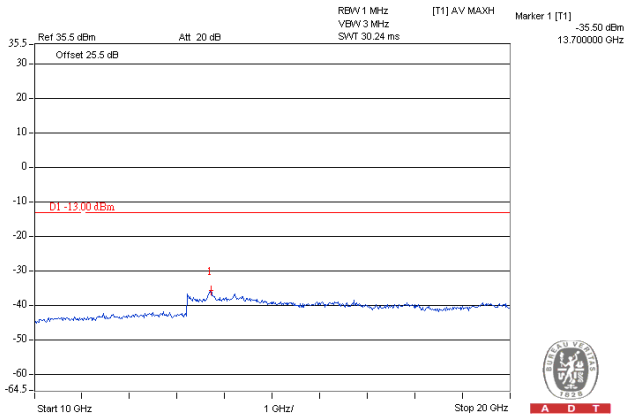


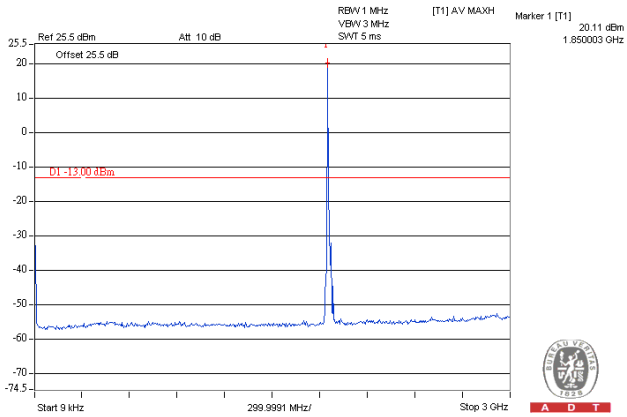
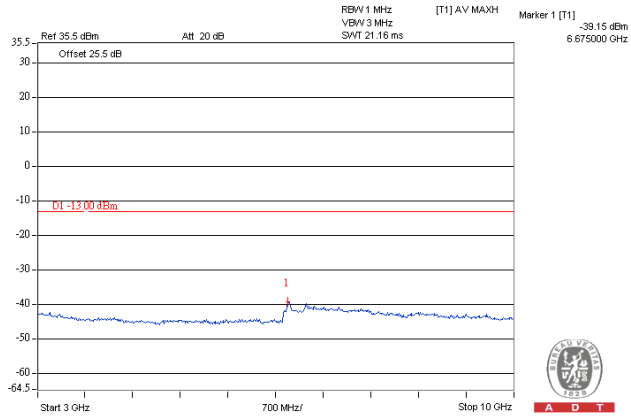
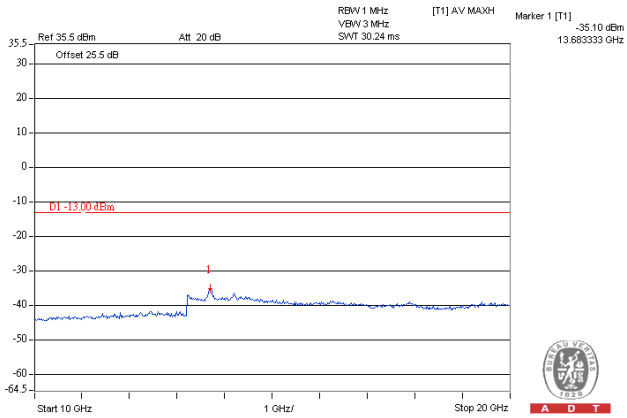
LTE Band 2, Channel Bandwidth 15MHz	
Channel 19125 (1902.50MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz



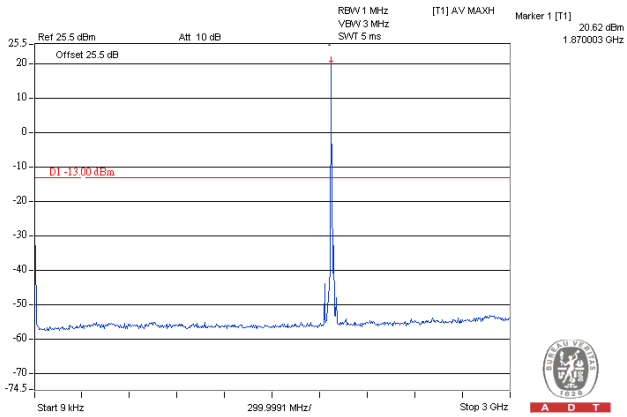


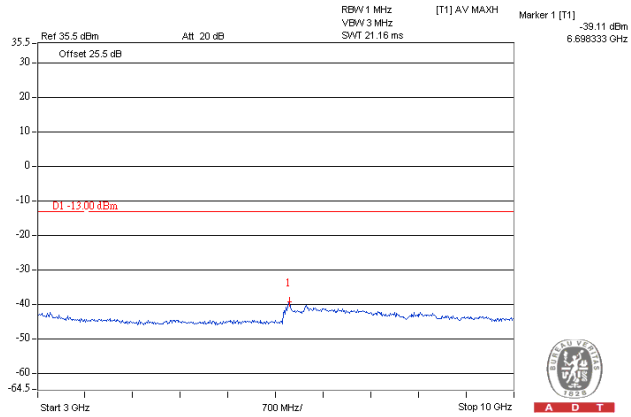
Frequency Range : 10GHz~20GHz	



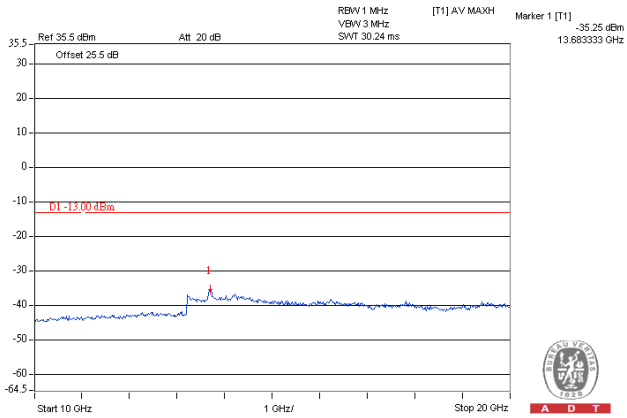
LTE Band 2, Channel Bandwidth 20MHz	
Channel 18700 (1860.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz
	
Frequency Range : 10GHz~20GHz	
	

LTE Band 2, Channel Bandwidth 20MHz	
Channel 18900 (1880.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz

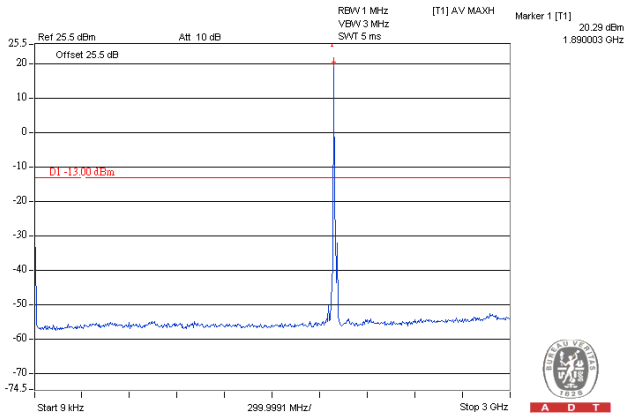


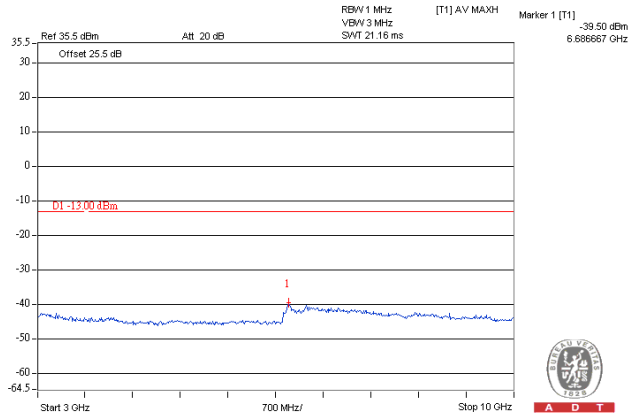


Frequency Range : 10GHz~20GHz	

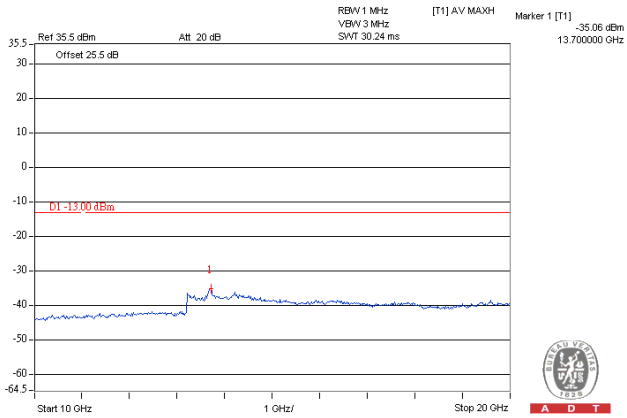


LTE Band 2, Channel Bandwidth 20MHz	
Channel 19100 (1900.00MHz)	
Frequency Range : 9kHz~3GHz	Frequency Range : 3GHz~10GHz





Frequency Range : 10GHz~20GHz	



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

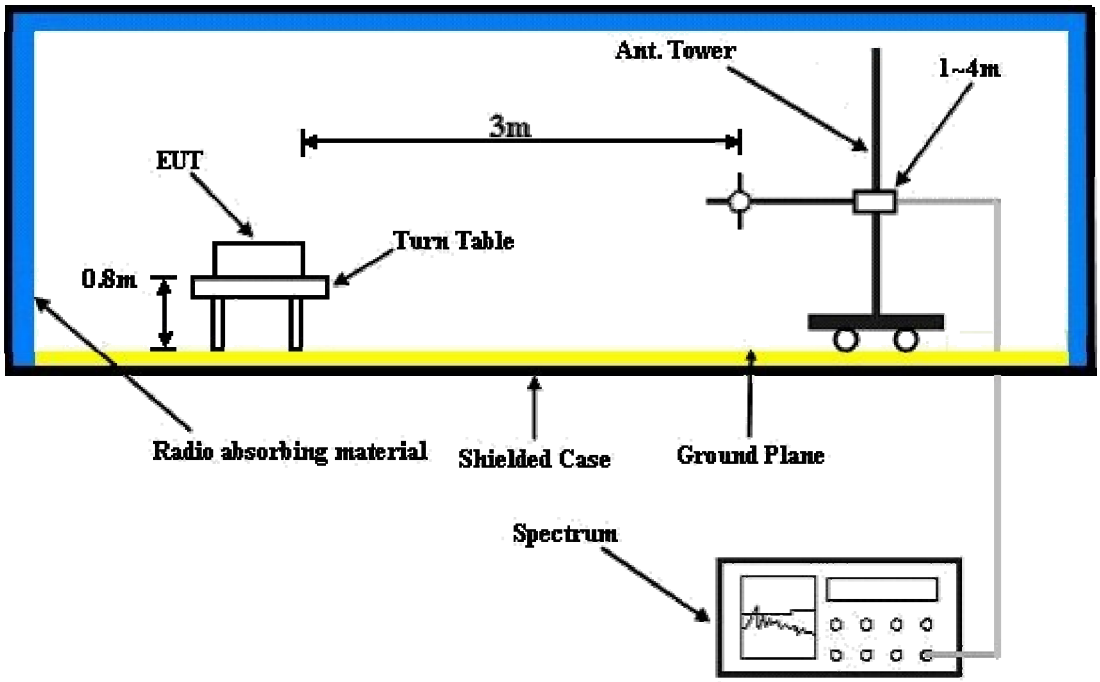
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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 2, Channel Bandwidth: 1.4MHz

Mode	TX channel 18607 (1850.70MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-58.5	-36.8	-18.3	-55.1	-13.0	-42.1
2	74.62	-41.0	-46.9	0.1	-46.8	-13.0	-33.8
3	111.48	-49.0	-54.2	-2.5	-56.7	-13.0	-43.7
4	148.34	-46.9	-48.7	-3.0	-51.7	-13.0	-38.7
5	183.26	-43.9	-49.3	-3.0	-52.3	-13.0	-39.3
6	330.70	-58.6	-66.5	4.0	-62.5	-13.0	-49.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-29.8	-20.3	-19.4	-39.7	-13.0	-26.7
2	57.16	-34.3	-36.5	-4.7	-41.2	-13.0	-28.2
3	86.26	-34.8	-40.8	0.1	-40.7	-13.0	-27.7
4	146.40	-49.7	-48.7	-3.0	-51.7	-13.0	-38.7
5	185.20	-51.4	-51.5	-2.8	-54.3	-13.0	-41.3
6	408.30	-58.9	-62.7	3.2	-59.5	-13.0	-46.5

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 2, Channel Bandwidth: 3MHz

Mode	TX channel 18615 (1851.50MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-53.2	-37.2	-13.7	-50.9	-13.0	-37.9
2	59.10	-43.9	-44.6	-3.8	-48.4	-13.0	-35.4
3	82.38	-43.5	-49.3	0.4	-48.9	-13.0	-35.9
4	142.52	-45.2	-47.3	-3.1	-50.4	-13.0	-37.4
5	187.14	-40.9	-46.4	-2.7	-49.1	-13.0	-36.1
6	363.68	-55.8	-62.2	3.9	-58.3	-13.0	-45.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-44.1	-34.6	-19.4	-54.0	-13.0	-41.0
2	57.16	-40.7	-42.9	-4.7	-47.6	-13.0	-34.6
3	82.38	-42.1	-47.0	0.4	-46.6	-13.0	-33.6
4	146.40	-52.4	-51.4	-3.0	-54.4	-13.0	-41.4
5	187.14	-55.8	-55.5	-2.7	-58.2	-13.0	-45.2
6	464.56	-60.0	-63.6	3.5	-60.1	-13.0	-47.1

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 2, Channel Bandwidth: 5MHz

Mode	TX channel 18625 (1852.50MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-51.7	-35.7	-13.7	-49.4	-13.0	-36.4
2	59.10	-45.0	-45.7	-3.8	-49.5	-13.0	-36.5
3	76.56	-43.4	-49.3	0.3	-49.0	-13.0	-36.0
4	144.46	-43.7	-45.6	-3.2	-48.8	-13.0	-35.8
5	183.26	-40.9	-46.3	-3.0	-49.3	-13.0	-36.3
6	352.04	-57.1	-64.2	3.9	-60.3	-13.0	-47.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-32.0	-22.5	-19.4	-41.9	-13.0	-28.9
2	57.16	-30.9	-33.1	-4.7	-37.8	-13.0	-24.8
3	**76.56**	**-26.7**	**-32.7**	**0.3**	**-32.4**	**-13.0**	**-19.4**
4	146.40	-48.5	-47.5	-3.0	-50.5	-13.0	-37.5
5	189.08	-50.8	-50.2	-2.8	-53.0	-13.0	-40.0
6	359.80	-57.4	-61.8	4.0	-57.8	-13.0	-44.8

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 2, Channel Bandwidth: 10MHz

Mode	TX channel 18650 (1855.00MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-49.6	-33.6	-13.7	-47.3	-13.0	-34.3
2	57.16	-49.7	-48.6	-4.7	-53.3	-13.0	-40.3
3	80.44	-50.2	-55.6	0.5	-55.1	-13.0	-42.1
4	154.16	-49.2	-50.6	-2.9	-53.5	-13.0	-40.5
5	185.20	-48.0	-53.5	-2.8	-56.3	-13.0	-43.3
6	429.64	-61.0	-65.0	3.5	-61.5	-13.0	-48.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-27.5	-18.0	-19.4	-37.4	-13.0	-24.4
2	59.10	-31.7	-34.7	-3.8	-38.5	-13.0	-25.5
3	86.26	-32.7	-38.7	0.1	-38.6	-13.0	-25.6
4	148.34	-47.4	-46.5	-3.0	-49.5	-13.0	-36.5
5	210.42	-49.7	-51.0	-2.0	-53.0	-13.0	-40.0
6	357.86	-55.9	-60.3	4.0	-56.3	-13.0	-43.3

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 2, Channel Bandwidth: 15MHz

Mode	TX channel 18675 (1857.50MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	35.82	-50.5	-31.1	-15.9	-47.0	-13.0	-34.0
2	59.10	-50.0	-50.7	-3.8	-54.5	-13.0	-41.5
3	80.44	-50.2	-55.6	0.5	-55.1	-13.0	-42.1
4	144.46	-50.0	-51.9	-3.2	-55.1	-13.0	-42.1
5	185.20	-48.0	-53.5	-2.8	-56.3	-13.0	-43.3
6	433.52	-62.5	-66.3	3.5	-62.8	-13.0	-49.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	33.88	-33.5	-27.0	-17.1	-44.1	-13.0	-31.1
2	57.16	-30.6	-32.8	-4.7	-37.5	-13.0	-24.5
3	88.20	-36.8	-43.0	-0.2	-43.2	-13.0	-30.2
4	146.40	-51.0	-50.0	-3.0	-53.0	-13.0	-40.0
5	189.08	-53.1	-52.5	-2.8	-55.3	-13.0	-42.3
6	357.86	-59.5	-63.9	4.0	-59.9	-13.0	-46.9

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 2, Channel Bandwidth: 20MHz

Mode	TX channel 18700 (1860.00MHz)	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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-54.3	-32.6	-18.3	-50.9	-13.0	-37.9
2	57.16	-52.5	-51.4	-4.7	-56.1	-13.0	-43.1
3	78.50	-52.4	-58.1	0.6	-57.5	-13.0	-44.5
4	152.22	-51.6	-53.0	-2.8	-55.8	-13.0	-42.8
5	185.20	-50.5	-56.0	-2.8	-58.8	-13.0	-45.8
6	359.80	-61.7	-68.4	4.0	-64.4	-13.0	-51.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-35.4	-27.6	-18.3	-45.9	-13.0	-32.9
2	59.10	-33.2	-36.2	-3.8	-40.0	-13.0	-27.0
3	88.20	-33.7	-39.9	-0.2	-40.1	-13.0	-27.1
4	150.28	-51.4	-50.5	-3.0	-53.5	-13.0	-40.5
5	189.08	-53.0	-52.4	-2.8	-55.2	-13.0	-42.2
6	464.56	-59.3	-62.9	3.5	-59.4	-13.0	-46.4

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 2, Channel Bandwidth: 1.4MHz

Mode	TX channel 18607 (1850.70MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3701.40	-59.4	-50.9	1.4	-49.5	-13.0	-36.5
2	5552.10	-59.4	-46.6	1.4	-45.2	-13.0	-32.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3701.40	-59.3	-51.1	1.4	-49.7	-13.0	-36.7
2	5552.10	-60.5	-48.5	1.4	-47.1	-13.0	-34.1

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-59.4	-50.9	1.3	-49.6	-13.0	-36.6
2	5640.00	-60.3	-47.3	1.3	-46.0	-13.0	-33.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3960.00	-59.8	-51.2	1.3	-49.9	-13.0	-36.9
2	5640.00	-60.6	-48.7	1.3	-47.4	-13.0	-34.4

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 19193 (1909.30MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3818.60	-60.2	-51.9	1.4	-50.5	-13.0	-37.5
2	5727.90	-60.8	-47.7	1.2	-46.5	-13.0	-33.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3818.60	-59.5	-51.3	1.4	-49.9	-13.0	-36.9
2	5727.90	-58.3	-46.1	1.2	-44.9	-13.0	-31.9

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 2, Channel Bandwidth: 3MHz

Mode	TX channel 18615 (1851.50MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3703.00	-58.8	-50.3	1.4	-48.9	-13.0	-35.9
2	5554.50	-59.7	-46.8	1.3	-45.5	-13.0	-32.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3703.00	-59.2	-51.0	1.4	-49.6	-13.0	-36.6
2	5554.50	-59.5	-47.4	1.3	-46.1	-13.0	-33.1

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-59.5	-51.0	1.3	-49.7	-13.0	-36.7
2	5640.00	-59.8	-46.8	1.3	-45.5	-13.0	-32.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-58.9	-50.6	1.3	-49.3	-13.0	-36.3
2	5640.00	-60.2	-48.3	1.3	-47.0	-13.0	-34.0

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 19185 (1908.50MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3817.00	-59.4	-51.1	1.4	-49.7	-13.0	-36.7
2	5725.50	-60.8	-47.7	1.2	-46.5	-13.0	-33.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3817.00	-59.3	-51.1	1.4	-49.7	-13.0	-36.7
2	5725.50	-60.7	-48.5	1.2	-47.3	-13.0	-34.3

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 2, Channel Bandwidth: 5MHz

Mode	TX channel 18625 (1852.50MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3705.00	-59.4	-50.9	1.4	-49.5	-13.0	-36.5
2	5557.50	-58.6	-45.7	1.3	-44.4	-13.0	-31.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3705.00	-59.0	-50.8	1.4	-49.4	-13.0	-36.4
2	5557.50	-60.0	-47.9	1.3	-46.6	-13.0	-33.6

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-59.5	-51.0	1.3	-49.7	-13.0	-36.7
2	5640.00	-60.3	-47.3	1.3	-46.0	-13.0	-33.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-58.7	-50.4	1.3	-49.1	-13.0	-36.1
2	5640.00	-60.2	-48.3	1.3	-47.0	-13.0	-34.0

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 19175 (1907.50MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.00	-59.6	-51.3	1.4	-49.9	-13.0	-36.9
2	5722.50	-60.9	-47.8	1.2	-46.6	-13.0	-33.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.00	-59.0	-50.8	1.4	-49.4	-13.0	-36.4
2	5722.50	-60.9	-48.8	1.2	-47.6	-13.0	-34.6

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 2, Channel Bandwidth: 10MHz

Mode	TX channel 18650 (1855.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3710.00	-58.2	-49.7	1.4	-48.3	-13.0	-35.3
2	5565.00	-57.9	-45.0	1.3	-43.7	-13.0	-30.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3710.00	-58.1	-49.9	1.4	-48.5	-13.0	-35.5
2	5565.00	-57.6	-45.6	1.3	-44.3	-13.0	-31.3

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-59.6	-51.1	1.3	-49.8	-13.0	-36.8
2	5640.00	-60.6	-47.6	1.3	-46.3	-13.0	-33.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-58.2	-49.9	1.3	-48.6	-13.0	-35.6
2	5640.00	-59.2	-47.3	1.3	-46.0	-13.0	-33.0

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 19150 (1905.00MHz)	Frequency Range	Above 1000MHz
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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3810.00	-59.4	-51.0	1.3	-49.7	-13.0	-36.7
2	5715.00	-60.7	-47.6	1.2	-46.4	-13.0	-33.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3810.00	-59.0	-50.7	1.3	-49.4	-13.0	-36.4
2	5715.00	-60.8	-48.7	1.2	-47.5	-13.0	-34.5

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 2, Channel Bandwidth: 15MHz

Mode	TX channel 18675 (1857.50MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3715.00	-60.7	-52.2	1.4	-50.8	-13.0	-37.8
2	5572.50	-60.9	-48.0	1.3	-46.7	-13.0	-33.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3715.00	-61.6	-53.4	1.4	-52.0	-13.0	-39.0
2	5572.50	-61.3	-49.3	1.3	-48.0	-13.0	-35.0

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-61.8	-53.3	1.3	-52.0	-13.0	-39.0
2	5640.00	-64.3	-51.3	1.3	-50.0	-13.0	-37.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-61.8	-53.5	1.3	-52.2	-13.0	-39.2
2	5640.00	-63.4	-51.5	1.3	-50.2	-13.0	-37.2

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 19125 (1902.50MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3805.00	-62.2	-53.8	1.3	-52.5	-13.0	-39.5
2	5707.50	-63.0	-49.9	1.2	-48.7	-13.0	-35.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3805.00	-62.2	-54.0	1.3	-52.7	-13.0	-39.7
2	5707.50	-62.4	-50.4	1.2	-49.2	-13.0	-36.2

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 2, Channel Bandwidth: 20MHz

Mode	TX channel 18700 (1860.00MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3720.00	-62.0	-53.5	1.4	-52.1	-13.0	-39.1
2	5580.00	-61.3	-48.3	1.3	-47.0	-13.0	-34.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3720.00	-62.0	-53.8	1.4	-52.4	-13.0	-39.4
2	5580.00	-60.6	-48.6	1.3	-47.3	-13.0	-34.3

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 18900 (1880.00MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-62.0	-53.5	1.3	-52.2	-13.0	-39.2
2	5640.00	-62.2	-49.2	1.3	-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)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00	-62.1	-53.8	1.3	-52.5	-13.0	-39.5
2	5640.00	-61.3	-49.4	1.3	-48.1	-13.0	-35.1

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 19100 (1900.00MHz)	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Bond Tseng		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3800.00	-62.5	-54.1	1.3	-52.8	-13.0	-39.8
2	5700.00	-62.6	-49.5	1.2	-48.3	-13.0	-35.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3800.00	-62.5	-54.3	1.3	-53.0	-13.0	-40.0
2	5700.00	-61.7	-49.8	1.2	-48.6	-13.0	-35.6

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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