



Full

TEST REPORT

No. I20D00149-SRD05

For

Client: Asiatelco Technologies Co.

Production: Home Phone Connect

Model Name: V810T/V810TD/V810V/

V810VD/V810A/V810AD

Brand Name: ATEL

FCC ID: XYO-V810

Hardware Version: V1.0

Software Version: QC25_V8100_1.0.4.802

Issued date: 2020-12-17

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

Test Laboratory:

East China Institute of Telecommunications

Add: Block No.4, No.766, Jingang Road, Pudong District, Shanghai, P. R. China

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Revision Version

Report Number	Revision	Date	Memo
I20D00149-SRD05	00	2020-12-02	Initial creation of test report
I20D00149-SRD05	01	2020-12-17	First modification of test report

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1. Test Laboratory

1.1. Testing Location

Company Name	ECIT Shanghai, East China Institute of Telecommunications
Address	Block No.4, No.766, Jingang Road, Pudong District, Shanghai, P. R. China
Postal Code	201206
Telephone	(+86)-021-63843300
FCC registration No	CN1177

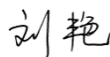
1.2. Testing Environment

Normal Temperature	15°C-35°C
Relative Humidity	25%-75%

1.3. Project data

Project Leader	Chen Minfei
Testing Start Date	2020-10-21
Testing End Date	2020-10-28

1.4. Signature



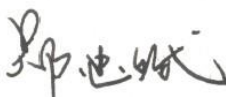
Liu Yan

(Prepared this test report)



Fan Songyan

(Reviewed this test report)



Zheng Zhongbin

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name	Asiatelco Technologies Co.
Address	#289 Bisheng Road, Building-8, 3F, Zhang jiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	/
Postcode	/

2.2. Manufacturer Information

Company Name	Asiatelco Technologies Co.
Address	#289 Bisheng Road, Building-8, 3F, Zhang jiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	/
Postcode	/

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Production	Home Phone Connect
Model name	V810T/V810TD/V810V/V810VD/ V810A/ V810AD
LTE Frequency Band	Band2/4/5/12/13/14/66/71
Type of modulation	QPSK/16QAM
Extreme Temperature	-20/+60°C
Nominal Voltage	4.75V
Extreme High Voltage	5.00 V
Extreme Low Voltage	5.25V

Note:

- Photographs of EUT are shown in ANNEX A of this test report.
- The value of the antenna gain is provided by the customer. For specific antenna information, please check the antenna specifications of the customer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N01	/	V1.0	QC25_V8100_1.0.4.802	2020-10-21
N05	/	V1.0	QC25_V8100_1.0.4.802	2020-10-21

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	RF cable	---

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	2018-10-01
FCC Part 22	PUBLIC MOBILE SERVICES	2018-10-01
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	2018-10-01
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	2018-10-01
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	2018-10-01
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.26	American National Standard of Procedures for Compliance Testing of Licensed Transmitters Used in Licensed Radio	2015
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v03r01

5. Test Results

5.1. Summary of Test Results

LTE Band 2

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	24.232(c)	A.1	P
2	Emission Limit	24.238(a), 2.1051	A.2	P

LTE Band 4

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(d)(4)	A.1	P
2	Emission Limit	27.53(h), 2.1051	A.2	P

LTE Band 5

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046(a), 22.913(a)	A.1	P
2	Emission Limit	22.917, 2.1051	A.2	P

LTE Band 12

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(c)(10)	A.1	P
2	Emission Limit	27.53(g), 2.1051	A.2	P

LTE Band 13

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(b)(10)	A.1	P
2	Emission Limit	27.53(c), 2.1051	A.2	P

LTE Band 14

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.0146/90.635(b)	A.1	P
2	Emission Limit	90.524	A.2	P

LTE Band 66

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(d)(4)	A.1	P
2	Emission Limit	27.53(h), 2.1051	A.2	P

LTE Band 71

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.0146	A.1	P
2	Emission Limit	27.53(h), 2.1051	A.2	P

Note: please refer to Annex C in this test report for the detailed test results.

The following terms are used in the above table.

P	Pass, the EUT complies with the essential requirements in the standard.
NM	Not measure, the test was not measured by ECIT.
NA	Not applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

5.2. Statements

The V810T/V810TD/V810V/V810VD/ V810A/ V810AD is a parent model for testing.

ECIT only performed test cases which identified with P/NM/NA/F results in Annex C.

In this report, we only retest output power and the radiation emission. And the rest test results please refer to report No: R1806A0301-R1V1 EC25-AF MINIPCIE FCC Part22; R1806A0301-R2V1 EC25-AF MINIPCIE FCC Part24; R1806A0301-R3V1 EC25-AF MINIPCIE FCC Part27; R1806A0301-R4V1 EC25-AF MINIPCIE FCC Part90-LTE14, which was prepared by East China Institute of Telecommunications.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

Note: The FCC ID reported by the reference module is XMR201808EC25AF.

6. Test Equipment Utilized

Climate chamber

No.	Equipment	Model	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Climate chamber	UT333 BT	C1919954 61	UNI-T	2020-05-10	1 years

Radiated emission test system

The test equipment and ancillaries used are as follows.

No.	Equipment	Model	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMW500	104178	R&S	2020-05-10	1 year
2	Test Receiver	ESU40	100307	R&S	2020-05-10	1 year
3	TRILOG Antenna	VULB916 3	VULB9163 -515	Schwarzbeck	2020-02-28	2 years
4	Double Ridged Guide Antenna	ETS-3117	135890	ETS	2020-02-28	2 years
5	2-Line V-Network	ENV216	101380	R&S	2020-05-10	1 year
7	RF Signal Generator	SMF100 A	102314	R&S	2020-05-10	1 year
9	Amplifier	SCU08	10146	R&S	2020-05-10	1 year

Conducted test system

No.	Name	Type	SN	Manufacture	Calibration date	Cal.interv al
1	Vector Signal Analyser	FSQ40	200063	R&S	2020-05-10	1 year
2	Wireless communication comprehensive tester	CMW500	148904	R&S	2020-05-10	1 year
3	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2020-05-10	1 year

software

Name	Version
Eagle CE WLAN auto test system	V3.0
EMC32	V9.15

Anechoic chamber

Fully anechoic chamber by ETS

7. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20%, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =25 %, Max. =75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

8. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty to see the column, k=2

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Maximum Peak Output Power	30MHz-3600MHz	95%	$\pm 0.544\text{dB}$
EBW and VBW	30MHz-3600MHz	95%	$\pm 62.04\text{Hz}$
Transmitter Spurious Emission-Conducted	30MHz-2GHz	95%	$\pm 0.90\text{dB}$
Transmitter Spurious Emission-Conducted	2GHz-3.6GHz	95%	$\pm 0.88\text{dB}$
Transmitter Spurious Emission-Conducted	3.6GHz-8GHz	95%	$\pm 0.96\text{dB}$
Transmitter Spurious Emission-Conducted	8GHz-20GHz	95%	$\pm 0.94\text{dB}$
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	$\pm 5.66\text{dB}$
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	$\pm 4.98\text{dB}$
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	$\pm 5.06\text{dB}$
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	$\pm 5.20\text{dB}$
Frequency stability	1MHz-16GHz	95%	$\pm 62.04\text{Hz}$

ANNEX A. MEASUREMENT RESULTS

ANNEX A.1. OUTPUT POWER

A.1.1. Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation.

In all cases, output power is within the specified limits.

CMW500 setting:

1: CMW500 is connected to the DUT

2; Set RX Expected PEP to 30 dBm

A.1.2. Conducted

A.1.2.1. Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

A.1.2.2 Measurement result

LTE band 2

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	1.4MHz		
			18607	18900	19193
QPSK	1	Low	22.89	22.16	21.98
		Middle	22.96	22.27	22.12
		High	22.91	22.28	22.02
	50%	Low	22.54	22.13	22.03
		Middle	22.66	22.75	22.24
		High	22.53	22.08	22.20
	100%	/	21.36	21.20	21.48
16QAM	1	Low	21.80	21.63	21.70
		Middle	21.72	21.76	22.12
		High	21.71	21.53	21.74
	50%	Low	21.58	21.15	21.21
		Middle	21.58	21.46	21.30
		High	21.39	21.25	21.26
	100%	/	20.48	20.24	20.42
Modulation	RB	RB Offset	3MHz		
			18615	18900	19185
QPSK	1	Low	22.91	22.20	22.01
		Middle	22.99	22.32	22.16

	50%	High	22.94	22.33	22.06
		Low	21.64	21.25	21.16
		Middle	21.78	21.85	21.36
		High	21.63	21.19	21.30
	100%	/	21.39	21.24	21.51
16QAM	1	Low	21.83	21.65	21.73
		Middle	21.75	21.81	22.16
		High	21.73	21.57	21.77
	50%	Low	20.69	20.28	20.33
		Middle	20.69	20.59	20.42
		High	20.49	20.37	20.39
	100%	/	20.51	20.28	20.45
Modulation	RB	RB Offset	5MHz		
			18625	18900	19175
QPSK	1	Low	22.88	22.18	21.97
		Middle	22.97	22.28	22.13
		High	22.91	22.28	22.02
	50%	Low	21.61	21.20	21.12
		Middle	21.76	21.81	21.31
		High	21.61	21.17	21.26
	100%	/	21.37	21.23	21.49
16QAM	1	Low	21.80	21.61	21.70
		Middle	21.72	21.79	22.13
		High	21.70	21.55	21.73
	50%	Low	20.67	20.24	20.30
		Middle	20.66	20.54	20.38
		High	20.46	20.32	20.35
	100%	/	20.49	20.24	20.40
Modulation	RB	RB Offset	10MHz		
			18650	18900	19150
QPSK	1	Low	22.90	22.19	22.00
		Middle	23.00	22.33	22.17
		High	22.93	22.32	22.05
	50%	Low	21.64	21.25	21.16
		Middle	21.79	21.86	21.35
		High	21.63	21.21	21.31
	100%	/	21.45	21.25	21.53
16QAM	1	Low	21.82	21.64	21.72
		Middle	21.75	21.83	22.16
		High	21.73	21.57	21.76
	50%	Low	20.70	20.29	20.34
		Middle	20.68	20.58	20.41

		High	20.49	20.37	20.39
	100%	/	20.52	20.29	20.44
Modulation	RB	RB Offset	15MHz		
			18675	18900	19125
QPSK	1	Low	22.89	22.15	21.98
		Middle	22.98	22.32	22.14
		High	22.90	22.27	22.01
	50%	Low	21.62	21.21	21.13
		Middle	21.76	21.81	21.31
		High	21.60	21.18	21.27
	100%	/	21.43	21.21	21.48
16QAM	1	Low	21.77	21.62	21.70
		Middle	21.73	21.80	22.14
		High	21.70	21.53	21.73
	50%	Low	20.67	20.27	20.31
		Middle	20.65	20.53	20.37
		High	20.47	20.33	20.36
	100%	/	20.49	20.24	20.40
Modulation	RB	RB Offset	20MHz		
			18700	18900	19100
QPSK	1	Low	22.86	22.11	21.95
		Middle	22.97	22.48	22.12
		High	22.88	22.26	21.98
	50%	Low	21.59	21.16	21.09
		Middle	21.74	21.77	21.28
		High	21.57	21.13	21.23
	100%	/	21.40	21.16	21.44
16QAM	1	Low	21.75	21.58	21.65
		Middle	21.69	21.78	22.10
		High	21.68	21.50	21.71
	50%	Low	20.64	20.23	20.28
		Middle	20.62	20.51	20.34
		High	20.44	20.28	20.32
	100%	/	20.47	20.20	20.37

LTE band 4

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	1.4MHz		
			19957	20175	20393
QPSK	1	Low	22.50	22.41	22.51
		Middle	22.46	22.50	22.69
		High	22.66	22.69	22.48
	50%	Low	22.18	22.35	22.65
		Middle	22.42	22.73	23.08
		High	22.38	22.40	22.53
	100%	/	21.28	21.31	21.62
16QAM	1	Low	22.07	21.97	22.29
		Middle	21.28	21.89	22.28
		High	21.42	22.11	22.25
	50%	Low	21.30	21.38	21.61
		Middle	21.51	21.81	22.06
		High	21.36	21.58	21.59
	100%	/	20.40	20.41	20.69
Modulation	RB	RB Offset	3MHz		
			19965	20175	20385
QPSK	1	Low	22.52	22.45	22.54
		Middle	22.49	22.55	22.73
		High	22.69	22.74	22.52
	50%	Low	21.28	21.47	21.78
		Middle	21.54	21.83	22.20
		High	21.48	21.51	21.63
	100%	/	21.31	21.35	21.65
16QAM	1	Low	22.10	21.99	22.32
		Middle	21.31	21.94	22.32
		High	21.44	22.15	22.28
	50%	Low	20.41	20.51	20.73
		Middle	20.62	20.94	21.18
		High	20.46	20.70	20.72
	100%	/	20.43	20.45	20.72
Modulation	RB	RB Offset	5MHz		
			19975	20175	20375
QPSK	1	Low	22.49	22.43	22.50
		Middle	22.47	22.51	22.70
		High	22.66	22.69	22.48
	50%	Low	21.25	21.42	21.74
		Middle	21.52	21.79	22.15
		High	21.46	21.49	21.59

	100%	/	21.29	21.34	21.63
16QAM	1	Low	22.07	21.95	22.29
		Middle	21.28	21.92	22.29
		High	21.41	22.13	22.24
	50%	Low	20.39	20.47	20.70
		Middle	20.59	20.89	21.14
		High	20.43	20.65	20.68
	100%	/	20.41	20.41	20.67
Modulation	RB	RB Offset	10MHz		
			20000	20175	20350
QPSK	1	Low	22.51	22.44	22.53
		Middle	22.50	22.56	22.74
		High	22.68	22.73	22.51
	50%	Low	21.28	21.47	21.78
		Middle	21.55	21.84	22.19
		High	21.48	21.53	21.64
	100%	/	21.37	21.36	21.67
16QAM	1	Low	22.09	21.98	22.31
		Middle	21.31	21.96	22.32
		High	21.44	22.15	22.27
	50%	Low	20.42	20.52	20.74
		Middle	20.61	20.93	21.17
		High	20.46	20.70	20.72
	100%	/	20.44	20.46	20.71
Modulation	RB	RB Offset	15MHz		
			20025	20175	20325
QPSK	1	Low	22.50	22.40	22.51
		Middle	22.48	22.55	22.71
		High	22.65	22.68	22.47
	50%	Low	21.26	21.43	21.75
		Middle	21.52	21.79	22.15
		High	21.45	21.50	21.60
	100%	/	21.35	21.32	21.62
16QAM	1	Low	22.04	21.96	22.29
		Middle	21.29	21.93	22.30
		High	21.41	22.11	22.24
	50%	Low	20.39	20.50	20.71
		Middle	20.58	20.88	21.13
		High	20.44	20.66	20.69
	100%	/	20.41	20.41	20.67
Modulation	RB	RB Offset	20MHz		
			20050	20175	20300

QPSK	1	Low	22.47	22.36	22.48
		Middle	22.47	22.51	22.69
		High	22.63	22.67	22.44
	50%	Low	21.23	21.38	21.71
		Middle	21.50	21.75	22.12
		High	21.42	21.45	21.56
	100%	/	21.32	21.27	21.58
16QAM	1	Low	22.02	21.92	22.24
		Middle	21.25	21.91	22.26
		High	21.39	22.08	22.22
	50%	Low	20.36	20.46	20.68
		Middle	20.55	20.86	21.10
		High	20.41	20.61	20.65
	100%	/	20.39	20.37	20.64

LTE band 5

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	1.4MHz		
			20407	20525	20643
QPSK	1	Low	23.09	23.79	23.67
		Middle	23.16	23.68	23.53
		High	23.36	23.61	23.34
	50%	Low	23.09	23.37	23.31
		Middle	23.17	23.37	23.32
		High	23.28	23.36	23.35
	100%	/	22.24	22.38	22.40
16QAM	1	Low	21.32	22.56	22.75
		Middle	22.83	22.30	22.45
		High	21.35	22.73	22.42
	50%	Low	22.16	22.46	22.33
		Middle	22.27	22.48	22.35
		High	22.28	22.52	22.35
	100%	/	21.32	21.45	21.38
Modulation	RB	RB Offset	3MHz		
			20415	20525	20635
QPSK	1	Low	23.11	23.83	23.70
		Middle	23.19	23.73	23.57
		High	23.39	23.66	23.38
	50%	Low	22.19	22.49	22.44
		Middle	22.29	22.47	22.44
		High	22.38	22.47	22.45
	100%	/	22.27	22.42	22.43
16QAM	1	Low	21.35	22.58	22.78

		Middle	22.86	22.35	22.49
		High	21.37	22.77	22.45
	50%	Low	21.27	21.59	21.45
		Middle	21.38	21.61	21.47
		High	21.38	21.64	21.48
	100%	/	21.35	21.49	21.41
Modulation	RB	RB Offset	5MHz		
			20425	20525	20625
QPSK	1	Low	23.08	23.81	23.66
		Middle	23.17	23.69	23.54
		High	23.36	23.61	23.34
	50%	Low	22.16	22.44	22.40
		Middle	22.27	22.43	22.39
		High	22.36	22.45	22.41
	100%	/	22.25	22.41	22.41
16QAM	1	Low	21.32	22.54	22.75
		Middle	22.83	22.33	22.46
		High	21.34	22.75	22.41
	50%	Low	21.25	21.55	21.42
		Middle	21.35	21.56	21.43
		High	21.35	21.59	21.44
	100%	/	21.33	21.45	21.36
Modulation	RB	RB Offset	10MHz		
			20450	20525	20600
QPSK	1	Low	23.06	23.74	23.64
		Middle	23.17	23.69	23.53
		High	23.33	23.59	23.30
	50%	Low	22.14	22.40	22.37
		Middle	22.25	22.39	22.36
		High	22.32	22.41	22.38
	100%	/	22.28	22.34	22.36
16QAM	1	Low	21.27	22.51	22.70
		Middle	22.80	22.32	22.43
		High	21.32	22.70	22.39
	50%	Low	21.22	21.54	21.40
		Middle	21.31	21.53	21.39
		High	21.33	21.55	21.41
	100%	/	21.31	21.41	21.33

LTE band 12

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	1.4MHz		
			23017	23095	23173
QPSK	1	Low	22.73	22.91	22.84
		Middle	23.07	23.29	22.91
		High	22.80	22.83	22.71
	50%	Low	22.73	23.01	22.98
		Middle	22.76	23.00	22.94
		High	22.91	22.96	22.90
	100%	/	21.78	21.90	22.05
16QAM	1	Low	21.66	22.04	21.66
		Middle	22.20	22.50	21.93
		High	21.98	21.83	21.48
	50%	Low	21.71	22.24	22.06
		Middle	21.95	22.19	22.08
		High	22.07	22.07	22.12
	100%	/	20.83	20.84	21.04
Modulation	RB	RB Offset	3MHz		
			23025	23095	23165
QPSK	1	Low	22.75	22.95	22.87
		Middle	23.10	23.34	22.95
		High	22.83	22.88	22.75
	50%	Low	21.83	22.13	22.11
		Middle	21.88	22.10	22.06
		High	22.01	22.07	22.00
	100%	/	21.81	21.94	22.08
16QAM	1	Low	21.69	22.06	21.69
		Middle	22.23	22.55	21.97
		High	22.00	21.87	21.51
	50%	Low	20.82	21.37	21.18
		Middle	21.06	21.32	21.20
		High	21.17	21.19	21.25
	100%	/	20.86	20.88	21.07
Modulation	RB	RB Offset	5MHz		
			23035	23095	23155
QPSK	1	Low	22.72	22.93	22.83
		Middle	23.08	23.30	22.92
		High	22.80	22.83	22.71
	50%	Low	21.80	22.08	22.07
		Middle	21.86	22.06	22.01
		High	21.99	22.05	21.96

	100%	/	21.79	21.93	22.06
16QAM	1	Low	21.66	22.02	21.66
		Middle	22.20	22.53	21.94
		High	21.97	21.85	21.47
	50%	Low	20.80	21.33	21.15
		Middle	21.03	21.27	21.16
		High	21.14	21.14	21.21
	100%	/	20.84	20.84	21.02
Modulation	RB	RB Offset	10MHz		
			23060	23095	23130
QPSK	1	Low	22.70	22.86	22.81
		Middle	23.08	23.30	22.91
		High	22.77	22.81	22.67
	50%	Low	21.78	22.04	22.04
		Middle	21.84	22.02	21.98
		High	21.95	22.01	21.93
	100%	/	21.82	21.86	22.01
16QAM	1	Low	21.61	21.99	21.61
		Middle	22.17	22.52	21.91
		High	21.95	21.80	21.45
	50%	Low	20.77	21.32	21.13
		Middle	20.99	21.24	21.12
		High	21.12	21.10	21.18
	100%	/	20.82	20.80	20.99

LTE band 13

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	5MHz		
			23035	23095	23155
QPSK	1	Low	23.98	24.02	23.97
		Middle	23.64	23.82	23.84
		High	24.06	23.99	24.07
	50%	Low	22.89	22.91	22.90
		Middle	22.95	23.00	22.99
		High	23.08	23.09	23.08
	100%	/	22.83	22.94	22.92
16QAM	1	Low	23.16	22.85	22.88
		Middle	22.74	22.76	22.74
		High	23.23	22.62	23.23
	50%	Low	22.15	22.03	22.12
		Middle	22.27	22.07	22.15
		High	22.32	22.15	22.15
	100%	/	21.97	21.92	21.96

Modulation	RB	RB Offset	10MHz		
			/	23230	/
QPSK	1	Low	/	23.95	/
		Middle	/	23.82	/
		High	/	23.97	/
	50%	Low	/	22.87	/
		Middle	/	22.96	/
		High	/	23.05	/
	100%	/	/	22.87	/
16QAM	1	Low	/	22.82	/
		Middle	/	22.75	/
		High	/	22.57	/
	50%	Low	/	22.02	/
		Middle	/	22.04	/
		High	/	22.11	/
	100%	/	/	21.88	/

LTE band 14

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	5MHz		
			23305	23330	23355
QPSK	1	Low	23.65	23.90	23.75
		Middle	23.91	24.01	23.95
		High	23.75	23.72	23.69
	50%	Low	22.96	22.94	22.92
		Middle	22.80	22.93	22.72
		High	22.89	22.82	22.92
	100%	/	22.76	22.97	22.81
16QAM	1	Low	23.72	23.16	23.29
		Middle	23.49	23.65	23.54
		High	23.36	23.27	23.16
	50%	Low	22.17	22.01	22.01
		Middle	21.82	22.01	22.03
		High	21.89	21.99	22.01
	100%	/	21.93	21.84	21.82
Modulation	RB	RB Offset	10MHz		
			/	23330	/
QPSK	1	Low	/	23.83	/
		Middle	/	24.01	/
		High	/	23.70	/
	50%	Low	/	22.90	/
		Middle	/	22.89	/
		High	/	22.78	/

	100%	/	/	22.90	/
16QAM	1	Low	/	23.13	/
		Middle	/	23.64	/
		High	/	23.22	/
	50%	Low	/	22.00	/
		Middle	/	21.98	/
		High	/	21.95	/
	100%	/	/	21.80	/

LTE band 66

LTE			Out put power (dBm)		
Modulation	RB	RB Offset	1.4MHz		
			131979	132322	132665
QPSK	1	Low	22.79	22.56	22.42
		Middle	22.67	22.81	22.62
		High	22.51	22.46	22.35
	50%	Low	22.54	22.54	22.36
		Middle	22.53	22.50	22.41
		High	22.59	22.36	22.44
	100%	/	21.51	21.54	21.36
16QAM	1	Low	22.43	22.16	21.91
		Middle	22.53	22.45	21.94
		High	22.53	22.38	21.83
	50%	Low	21.50	21.53	21.42
		Middle	21.60	21.55	21.41
		High	21.66	21.55	21.38
	100%	/	20.73	20.62	20.47
Modulation	RB	RB Offset	3MHz		
			131987	132322	132657
QPSK	1	Low	22.81	22.60	22.45
		Middle	22.70	22.86	22.66
		High	22.54	22.51	22.39
	50%	Low	21.64	21.66	21.49
		Middle	21.65	21.60	21.53
		High	21.69	21.47	21.54
	100%	/	21.54	21.58	21.39
16QAM	1	Low	22.46	22.18	21.94
		Middle	22.56	22.50	21.98
		High	22.55	22.42	21.86
	50%	Low	20.61	20.66	20.54
		Middle	20.71	20.68	20.53
		High	20.76	20.67	20.51
	100%	/	20.76	20.66	20.50

Modulation	RB	RB Offset	5MHz		
			131997	132322	132647
QPSK	1	Low	22.78	22.58	22.41
		Middle	22.68	22.82	22.63
		High	22.51	22.46	22.35
	50%	Low	21.61	21.61	21.45
		Middle	21.63	21.56	21.48
		High	21.67	21.45	21.50
	100%	/	21.52	21.57	21.37
16QAM	1	Low	22.43	22.14	21.91
		Middle	22.53	22.48	21.95
		High	22.52	22.40	21.82
	50%	Low	20.59	20.62	20.51
		Middle	20.68	20.63	20.49
		High	20.73	20.62	20.47
	100%	/	20.74	20.62	20.45
Modulation	RB	RB Offset	10MHz		
			132022	132322	132622
QPSK	1	Low	22.80	22.59	22.44
		Middle	22.71	22.87	22.67
		High	22.53	22.50	22.38
	50%	Low	21.64	21.66	21.49
		Middle	21.66	21.61	21.52
		High	21.69	21.49	21.55
	100%	/	21.60	21.59	21.41
16QAM	1	Low	22.45	22.17	21.93
		Middle	22.56	22.52	21.98
		High	22.55	22.42	21.85
	50%	Low	20.62	20.67	20.55
		Middle	20.70	20.67	20.52
		High	20.76	20.67	20.51
	100%	/	20.77	20.67	20.49
Modulation	RB	RB Offset	15MHz		
			132047	132322	132597
QPSK	1	Low	22.79	22.55	22.42
		Middle	22.69	22.86	22.64
		High	22.50	22.45	22.34
	50%	Low	21.62	21.62	21.46
		Middle	21.63	21.56	21.48
		High	21.66	21.46	21.51
	100%	/	21.58	21.55	21.36
16QAM	1	Low	22.40	22.15	21.91

		Middle	22.54	22.49	21.96
		High	22.52	22.38	21.82
	50%	Low	20.59	20.65	20.52
		Middle	20.67	20.62	20.48
		High	20.74	20.63	20.48
	100%	/	20.74	20.62	20.45
Modulation	RB	RB Offset	20MHz		
			132072	132322	132572
QPSK	1	Low	22.76	22.51	22.39
		Middle	22.68	22.82	22.62
		High	22.48	22.44	22.31
	50%	Low	21.59	21.57	21.42
		Middle	21.61	21.52	21.45
		High	21.63	21.41	21.47
	100%	/	21.55	21.50	21.32
16QAM	1	Low	22.38	22.11	21.86
		Middle	22.50	22.47	21.92
		High	22.50	22.35	21.80
	50%	Low	20.56	20.61	20.49
		Middle	20.64	20.60	20.45
		High	20.71	20.58	20.44
	100%	/	20.72	20.58	20.42

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Modulation	RB	RB Offset	5MHz		
			131997	132322	132647
QPSK	1	Low	22.58	22.84	22.49
		Middle	23.10	22.88	22.86
		High	22.59	22.87	22.66
	50%	Low	21.93	22.06	21.74
		Middle	22.39	22.08	22.31
		High	21.97	22.00	21.72
	100%	/	21.91	22.08	21.69
16QAM	1	Low	21.72	21.49	22.22
		Middle	22.52	21.71	22.58
		High	22.07	21.11	22.21
	50%	Low	20.89	20.72	20.72
		Middle	21.45	21.04	21.31
		High	20.78	20.71	20.65
	100%	/	20.79	20.96	20.81
Modulation	RB	RB Offset	10MHz		
			132022	132322	132622
QPSK	1	Low	22.60	22.85	22.52

		Middle	23.13	22.93	22.90
		High	22.61	22.91	22.69
	50%	Low	21.96	22.11	21.78
		Middle	22.42	22.13	22.35
		High	21.99	22.04	21.77
	100%	/	21.99	22.10	21.73
16QAM	1	Low	21.74	21.52	22.24
		Middle	22.55	21.75	22.61
		High	22.10	21.13	22.24
	50%	Low	20.92	20.77	20.76
		Middle	21.47	21.08	21.34
		High	20.81	20.76	20.69
	100%	/	20.82	21.01	20.85
Modulation	RB	RB Offset	15MHz		
			132047	132322	132597
QPSK	1	Low	22.59	22.81	22.50
		Middle	23.11	22.92	22.87
		High	22.58	22.86	22.65
	50%	Low	21.94	22.07	21.75
		Middle	22.39	22.08	22.31
		High	21.96	22.01	21.73
	100%	/	21.97	22.06	21.68
16QAM	1	Low	21.69	21.50	22.22
		Middle	22.53	21.72	22.59
		High	22.07	21.09	22.21
	50%	Low	20.89	20.75	20.73
		Middle	21.44	21.03	21.30
		High	20.79	20.72	20.66
	100%	/	20.79	20.96	20.81
Modulation	RB	RB Offset	20MHz		
			132072	132322	132572
QPSK	1	Low	22.56	22.77	22.47
		Middle	23.10	22.88	22.85
		High	22.56	22.85	22.62
	50%	Low	21.91	22.02	21.71
		Middle	22.37	22.04	22.28
		High	21.93	21.96	21.69
	100%	/	21.94	22.01	21.64
16QAM	1	Low	21.67	21.46	22.17
		Middle	22.49	21.70	22.55
		High	22.05	21.06	22.19
	50%	Low	20.86	20.71	20.70

		Middle	21.41	21.01	21.27
		High	20.76	20.67	20.62
	100%	/	20.77	20.92	20.78

A.1.3 Radiated

A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 27.50(d) specifies "Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP".

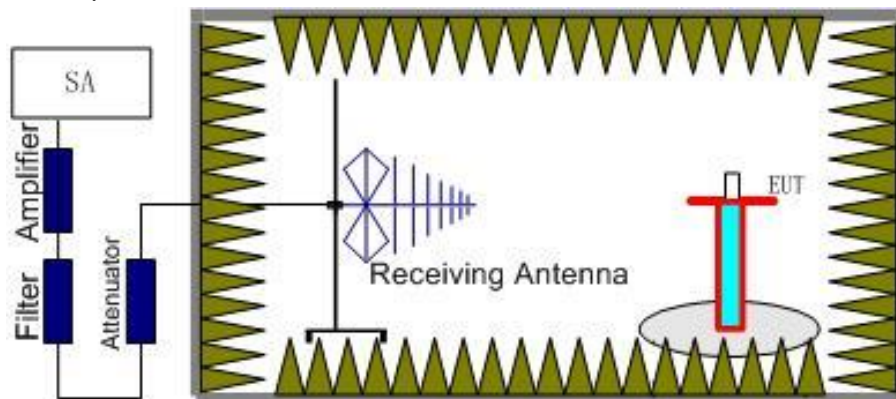
Rule Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP".

Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP".

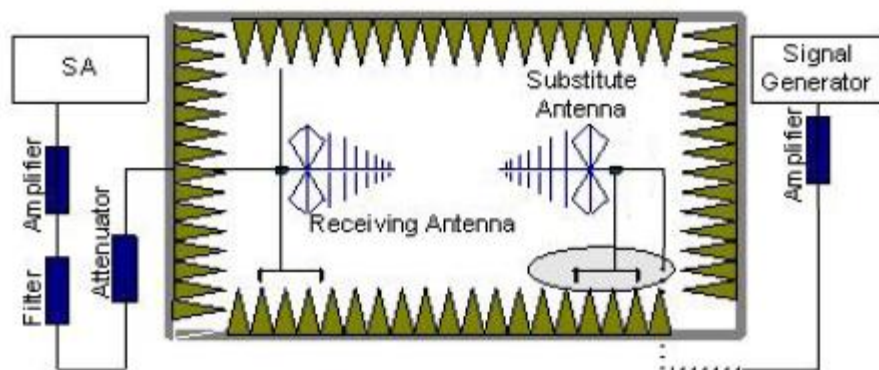
A.1.3.2 Method of Measurement

The measurements procedures in TIA-603E-2016 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.
The cable loss (P_{cl}), the substitution antenna Gain (G_a) and the amplifier Gain (P_{Ag}) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{Mea} + P_{Ag} - P_{cl} + G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

A.1.3.3 Measurement result

LTE Band 2- EIRP 24. 232(b) Limits: $\leq 33\text{dBm}$ (2W)

Bandwidth	Modulation	Channel	EIRP (dBm)	Limit (dBm)	Polarization
1.4MHz	QPSK	18607	20.29	33.00	H
		18900	19.56	33.00	H
		19193	19.38	33.00	H
	16QAM	18607	19.20	33.00	H
		18900	19.03	33.00	H
		19193	19.10	33.00	H
3MHz	QPSK	18615	20.31	33.00	H
		18900	19.60	33.00	H
		19185	19.41	33.00	H
	16QAM	18615	19.23	33.00	H
		18900	19.05	33.00	H
		19185	20.28	33.00	H
5MHz	QPSK	18625	19.58	33.00	H
		18900	19.37	33.00	H
		19175	19.20	33.00	H
	16QAM	18625	19.01	33.00	H
		18900	19.10	33.00	H
		19175	20.30	33.00	H
10MHz	QPSK	18650	19.59	33.00	H
		18900	19.40	33.00	H

	16QAM	19150	19.22	33.00	H
		18650	19.04	33.00	H
		18900	19.12	33.00	H
		19150	20.29	33.00	H
15MHz	QPSK	18675	19.55	33.00	H
		18900	19.38	33.00	H
		19125	19.17	33.00	H
	16QAM	18675	19.02	33.00	H
		18900	19.10	33.00	H
		19125	20.26	33.00	H
20MHz	QPSK	18700	19.51	33.00	H
		18900	19.35	33.00	H
		19100	19.15	33.00	H
	16QAM	18700	18.98	33.00	H
		18900	19.05	33.00	H
		19100	20.29	33.00	H

LTE Band 4- EIRP 27.50(d) Limits: ≤30dBm (1W)

Bandwidth	Modulation	Channel	EIRP (dBm)	Limit (dBm)	Polarization
1.4MHz	QPSK	19957	19.90	30.00	H
		20175	19.81	30.00	H
		20393	19.91	30.00	H
	16QAM	19957	19.47	30.00	H
		20175	19.37	30.00	H
		20393	19.69	30.00	H
3MHz	QPSK	19965	19.92	30.00	H
		20175	19.85	30.00	H
		20385	19.94	30.00	H
	16QAM	19965	19.50	30.00	H
		20175	19.39	30.00	H
		20385	19.72	30.00	H
5MHz	QPSK	19975	19.89	30.00	H
		20175	19.83	30.00	H
		20375	19.90	30.00	H
	16QAM	19975	19.47	30.00	H
		20175	19.35	30.00	H
		20375	19.69	30.00	H
10MHz	QPSK	20000	19.91	30.00	H
		20175	19.84	30.00	H
		20350	19.93	30.00	H

	16QAM	20000	19.49	30.00	H
		20175	19.38	30.00	H
		20350	19.71	30.00	H
15MHz	QPSK	20025	19.90	30.00	H
		20175	19.80	30.00	H
		20325	19.91	30.00	H
	16QAM	20025	19.44	30.00	H
		20175	19.36	30.00	H
		20325	19.69	30.00	H
20MHz	QPSK	20050	19.87	30.00	H
		20175	19.76	30.00	H
		20300	19.88	30.00	H
	16QAM	20050	19.42	30.00	H
		20175	19.32	30.00	H
		20300	19.64	30.00	H

LTE Band 5- ERP 22.913(a) Limits: ≤38.45dBm (7W)

Bandwidth	Modulation	Channel	ERP (dBm)	Limit (dBm)	Polarization
1.4MHz	QPSK	20407	19.14	38.45	H
		20525	19.84	38.45	H
		20643	19.72	38.45	H
	16QAM	20407	17.37	38.45	H
		20525	18.61	38.45	H
		20643	18.80	38.45	H
3MHz	QPSK	20415	19.16	38.45	H
		20525	19.88	38.45	H
		20635	19.75	38.45	H
	16QAM	20415	17.40	38.45	H
		20525	18.63	38.45	H
		20635	18.83	38.45	H
5MHz	QPSK	20425	19.13	38.45	H
		20525	19.86	38.45	H
		20625	19.71	38.45	H
	16QAM	20425	17.37	38.45	H
		20525	18.59	38.45	H
		20625	18.80	38.45	H
10MHz	QPSK	20450	19.11	38.45	H
		20525	19.79	38.45	H
		20600	19.69	38.45	H
	16QAM	20450	17.32	38.45	H

		20525	18.56	38.45	H
		20600	18.75	38.45	H

LTE Band 12 - ERP 27.50(c)(10) Limits: $\leq 34.77\text{dBm}$ (3W)

Bandwidth	Modulation	Channel	ERP (dBm)	Limit (dBm)	Polarization
1.4MHz	QPSK	23017	18.78	34.77	H
		23095	18.96	34.77	H
		23173	18.89	34.77	H
	16QAM	23017	17.71	34.77	H
		23095	18.09	34.77	H
		23173	17.71	34.77	H
3MHz	QPSK	23025	18.80	34.77	H
		23095	19.00	34.77	H
		23165	18.92	34.77	H
	16QAM	23025	17.74	34.77	H
		23095	18.11	34.77	H
		23165	17.74	34.77	H
5MHz	QPSK	23035	18.77	34.77	H
		23095	18.98	34.77	H
		23155	18.88	34.77	H
	16QAM	23035	17.71	34.77	H
		23095	18.07	34.77	H
		23155	17.71	34.77	H
10MHz	QPSK	23060	18.75	34.77	H
		23095	18.91	34.77	H
		23130	18.86	34.77	H
	16QAM	23060	17.66	34.77	H
		23095	18.04	34.77	H
		23130	17.66	34.77	H

LTE Band 13- ERP 27.50(c) (10) Limits: $\leq 34.77\text{dBm}$ (3W)

Bandwidth	Modulation	Channel	ERP (dBm)	Limit (dBm)	Polarization
5MHz	QPSK	23205	20.03	34.77	H
		23230	20.07	34.77	H
		23255	20.02	34.77	H
	16QAM	23205	19.21	34.77	H
		23230	18.90	34.77	H
		23255	18.93	34.77	H
10MHz	QPSK	23230	20.00	34.77	H
		23230	20.00	34.77	H

	16QAM	23230	20.00	34.77	H
		23230	18.87	34.77	H
		23230	18.87	34.77	H
		23230	18.87	34.77	H

LTE Band 14- ERP 90.542 Limits: ≤34.77dBm (3W)

Bandwidth	Modulation	Channel	ERP (dBm)	Limit (dBm)	Polarization
5MHz	QPSK	23205	19.70	34.77	H
		23230	19.95	34.77	H
		23255	19.80	34.77	H
	16QAM	23205	19.77	34.77	H
		23230	19.21	34.77	H
		23255	19.34	34.77	H
10MHz	QPSK	23230	19.88	34.77	H
		23230	19.88	34.77	H
		23230	19.88	34.77	H
	16QAM	23230	19.18	34.77	H
		23230	19.18	34.77	H
		23230	19.18	34.77	H

LTE Band 66- EIRP 27.50(d) Limits: ≤30dBm (1W)

Bandwidth	Modulation	Channel	EIRP (dBm)	Limit (dBm)	Polarization
1.4MHz	QPSK	131979	20.19	30.00	H
		132322	19.96	30.00	H
		132665	19.82	30.00	H
	16QAM	131979	19.83	30.00	H
		132322	19.56	30.00	H
		132665	19.31	30.00	H
3MHz	QPSK	131987	20.21	30.00	H
		132322	20.00	30.00	H
		132657	19.85	30.00	H
	16QAM	131987	19.86	30.00	H
		132322	19.58	30.00	H
		132657	19.34	30.00	H
5MHz	QPSK	131997	20.18	30.00	H
		132322	19.98	30.00	H
		132647	19.81	30.00	H
	16QAM	131997	19.83	30.00	H
		132322	19.54	30.00	H
		132647	19.31	30.00	H

10MHz	QPSK	132022	20.20	30.00	H
		132322	19.99	30.00	H
		132622	19.84	30.00	H
	16QAM	132022	19.85	30.00	H
		132322	19.57	30.00	H
		132622	19.33	30.00	H
15MHz	QPSK	132047	20.19	30.00	H
		132322	19.95	30.00	H
		132597	19.82	30.00	H
	16QAM	132047	19.80	30.00	H
		132322	19.55	30.00	H
		132597	19.31	30.00	H
20MHz	QPSK	132072	20.16	30.00	H
		132322	19.91	30.00	H
		132572	19.79	30.00	H
	16QAM	132072	19.78	30.00	H
		132322	19.51	30.00	H
		132572	19.26	30.00	H

LTE Band 71- EIRP 27.50(c)(10) Limits: ≤34.77dBm (3W)

Bandwidth	Modulation	Channel	EIRP (dBm)	Limit (dBm)	Polarization
5MHz	QPSK	131997	18.63	34.77	H
		132322	18.89	34.77	H
		132647	18.54	34.77	H
	16QAM	131997	17.77	34.77	H
		132322	17.54	34.77	H
		132647	18.27	34.77	H
10MHz	QPSK	132022	18.65	34.77	H
		132322	18.90	34.77	H
		132622	18.57	34.77	H
	16QAM	132022	17.79	34.77	H
		132322	17.57	34.77	H
		132622	18.29	34.77	H
15MHz	QPSK	132047	18.64	34.77	H
		132322	18.86	34.77	H
		132597	18.55	34.77	H
	16QAM	132047	17.74	34.77	H
		132322	17.55	34.77	H
		132597	18.27	34.77	H

20MHz	QPSK	132072	18.61	34.77	H
		132322	18.82	34.77	H
		132572	18.52	34.77	H
	16QAM	132072	17.72	34.77	H
		132322	17.51	34.77	H
		132572	18.22	34.77	H

ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwidths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

ANNEX A.2. EMISSION LIMIT

Reference

FCC: CFR 2.1051, 22.917, 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691.

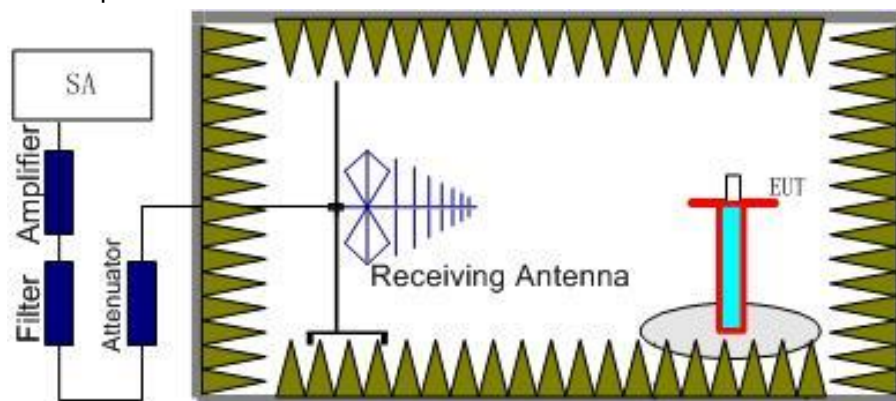
A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

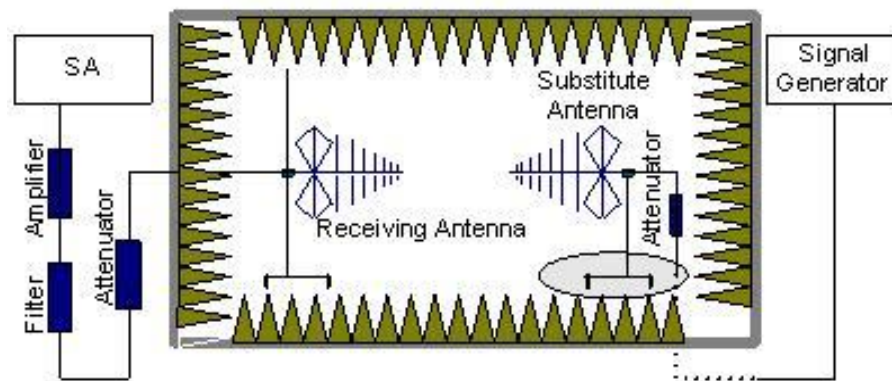
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2/4/5/12/13/14/66/71.

The procedure of radiated spurious emissions is as follows:

- Below 1 GHz, EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. Above 1 GHz, EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



- The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
- The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.

An amplifier should be connected in for the test.

The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{Mea} - P_{pl} + G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

A.2.2 Measurement Limit

Part 22.917, Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m) all specify that 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 specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.2.3 Measurement Results

7. Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2/4/5/12/13/14/66/71. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 2/4/5/12/13/14/66/71. Into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The evaluated frequency range is from 30MHz to 26GHz.

RSE-LTE2-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3700.4	-45.1	6.6	7.7	-44	-13	H
5550.8	-46.31	8.2	9.5	-45.01	-13	H
7400.8	-52.39	9.7	14.6	-47.49	-13	V
9251.6	-53.96	10.6	18.5	-46.06	-13	H
11099.4	-49.81	12.1	18.1	-43.81	-13	H
12951.6	-47.06	13.2	20.2	-40.06	-13	V

RSE-LTE2-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3758.8	-51.98	6.6	7.7	-50.88	-13	H
5638.4	-49.17	8.3	10.5	-46.97	-13	H
7530.0	-53.23	9.7	14.6	-48.33	-13	H
9527.6	-54.31	10.7	18.6	-46.41	-13	V
11607.6	-46.62	12.2	18.1	-40.72	-13	H
14803.8	-44.39	14.3	23.3	-35.39	-13	H

RSE-LTE2-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3817.6	-51.25	6.7	7.7	-50.25	-13	H
5726.8	-48.12	8.5	10.5	-46.12	-13	H
7635.2	-53.21	9.7	15.3	-47.61	-13	H
9544.4	-54.4	10.7	18.6	-46.5	-13	H
11445.2	-48.51	12.1	18.1	-42.51	-13	H
13361.8	-45.62	13.7	21.8	-37.52	-13	H

RSE-LTE4-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
4215.2	-52.98	7.0	7.7	-52.28	-13	H
6318.0	-52.14	8.8	10.8	-50.14	-13	V
8452.4	-56.1	10.2	18.1	-48.2	-13	V
10564.4	-50	11.6	17.1	-44.5	-13	V
12657.6	-46.73	12.7	19.2	-40.23	-13	V
14896.2	-46.22	14.3	24.4	-36.12	-13	V

RSE-LTE4-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
4266.4	-53.21	7.1	7.7	-52.61	-13	V
6396.0	-52	8.9	11.5	-49.4	-13	V
8532.8	-57.25	10.3	18.1	-49.45	-13	H
10811.6	-50.68	11.7	17.3	-45.08	-13	H
12710.8	-46.17	12.7	19.2	-39.67	-13	V
14862.6	-44.58	14.3	23.3	-35.58	-13	H

RSE-LTE4-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3507.6	-42.99	6.4	4.7	-44.69	-13	H
5280.8	-51.25	8.0	8.7	-50.55	-13	V
7052.4	-53.13	9.4	12.9	-49.63	-13	V
8552.4	-55.21	10.3	18.1	-47.41	-13	H
10675.2	-49.81	11.7	17.3	-44.21	-13	H
12895.6	-45.57	13.0	20.2	-38.37	-13	H

RSE-LTE5-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1648.7	-43.44	4.3	2.9	-44.84	-13	H
2459.6	-36.33	5.3	3.7	-37.93	-13	H
3296.8	-50.19	6.2	4.7	-51.69	-13	H
4106.8	-52.99	7.0	7.7	-52.29	-13	V
4938.0	-51.04	7.7	9.0	-49.74	-13	V
5732.4	-52.85	8.5	10.5	-50.85	-13	H

RSE-LTE5-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1672.2	-45.82	4.3	2.9	-47.22	-13	H
2508.5	-38.89	5.4	3.7	-40.59	-13	V
3344.4	-48.35	6.2	4.7	-49.85	-13	H
4178.0	-54.7	7.0	7.7	-54	-13	V
5042.0	-49.44	7.8	9.0	-48.24	-13	H
5889.2	-53.02	8.5	10.4	-51.12	-13	V

RSE-LTE5-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1659.7	-42.46	4.3	2.9	-43.86	-13	H
2400.4	-38.96	5.3	3.7	-40.56	-13	H
3319.2	-50.36	6.2	4.7	-51.86	-13	H
4145.6	-53.33	7.0	7.7	-52.63	-13	V
4977.6	-50.68	7.8	9.0	-49.48	-13	V
5824.4	-53.83	8.4	10.5	-51.73	-13	H

RSE-LTE12-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1398.4	-37.59	4.0	3.4	-38.19	-13	H
2098.8	-42.86	4.9	2.8	-44.96	-13	H
2797.3	-36.84	5.7	4.1	-38.44	-13	H
3496.0	-44.64	6.4	4.7	-46.34	-13	H
4195.2	-49.93	7.0	7.7	-49.23	-13	H
4887.6	-50.77	7.7	9.0	-49.47	-13	V

RSE-LTE12-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1414.0	-35.22	4.0	3.4	-35.82	-13	H
2126.5	-42.82	5.0	3.3	-44.52	-13	H
2879.6	-34.19	5.8	4.7	-35.29	-13	V
3535.6	-46.23	6.4	4.7	-47.93	-13	H
4241.6	-52.63	7.1	7.7	-52.03	-13	H
4951.2	-50.19	7.7	9.0	-48.89	-13	V

RSE-LTE12-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1429.5	-41.2	4.1	3.4	-41.9	-13	H
2141.9	-43.16	5.0	3.3	-44.86	-13	H
2860.0	-34.55	5.8	4.1	-36.25	-13	V
3574.4	-41.55	6.4	4.7	-43.25	-13	H
4289.2	-52.46	7.1	7.7	-51.86	-13	H
5045.2	-48.96	7.8	9.0	-47.76	-13	H

RSE-LTE13-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1562.8	-43.61	4.2	3.4	-44.41	-13	H
2459.6	-36.33	5.3	3.7	-37.93	-13	V
3118.8	-50.67	6.0	4.7	-51.97	-13	V
3896.0	-53.1	6.8	7.7	-52.2	-13	H
4678.4	-52.13	7.5	7.9	-51.73	-13	H
5495.2	-51.85	8.2	9.5	-50.55	-13	H

RSE-LTE13-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1567.7	-42.03	4.2	3.4	-42.83	-13	H
2448.1	-35.62	5.3	3.7	-37.22	-13	V
3168.4	-49.16	6.0	4.7	-50.46	-13	H
3920.0	-53.57	6.8	7.7	-52.67	-13	V
4684.0	-51.33	7.5	7.9	-50.93	-13	V
5478.8	-53.29	8.2	9.5	-51.99	-13	H

RSE-LTE13-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1569.0	-40.43	4.2	3.4	-41.23	-13	H
2463.8	-37.83	5.3	3.7	-39.43	-13	V
3142.4	-50.73	6.0	4.7	-52.03	-13	V
3930.0	-53.85	6.8	7.7	-52.95	-13	V
4739.2	-50.84	7.5	7.9	-50.44	-13	H
5494.4	-52.22	8.2	9.5	-50.92	-13	H

RSE-LTE14-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1585.0	-45.38	4.3	3.4	-46.28	-13	H
2458.5	-35.74	5.3	3.7	-37.34	-13	H
3168.0	-50.41	6.0	4.7	-51.71	-13	V
3958.8	-52.82	6.8	7.7	-51.92	-13	H
4761.6	-50.91	7.5	7.9	-50.51	-13	V
5540.4	-51.85	8.2	9.5	-50.55	-13	H

RSE-LTE14-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1583.9	-44.45	4.3	3.4	-45.35	-13	H
2369.6	-39.29	5.2	3.3	-41.19	-13	H
3173.2	-50.53	6.0	4.7	-51.83	-13	V
3983.2	-53.5	6.9	7.7	-52.7	-13	H
4760.0	-52	7.5	7.9	-51.6	-13	V
5552.8	-52.49	8.2	9.5	-51.19	-13	V

RSE-LTE14-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1589.1	-45.49	4.3	3.4	-46.39	-13	H
2386.5	-39.06	5.2	3.7	-40.56	-13	H
3179.2	-50.03	6.1	4.7	-51.43	-13	H
3979.6	-53.6	6.9	7.7	-52.8	-13	H
4781.6	-51.83	7.6	7.9	-51.53	-13	V
5571.2	-52.92	8.2	9.5	-51.62	-13	V

RSE-LTE66-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3420.8	-49.59	6.3	4.7	-51.19	-13	H
5124.4	-52.06	7.9	9.0	-50.96	-13	H
6854.8	-52.52	9.2	12.3	-49.42	-13	V
8562.8	-56.99	10.3	18.1	-49.19	-13	H
10275.2	-51.03	11.5	17.4	-45.13	-13	V
11968.8	-46.59	12.6	17.1	-42.09	-13	H

RSE-LTE66-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3488.8	-45.25	6.4	4.7	-46.95	-13	H
5233.6	-51.98	8.0	8.7	-51.28	-13	H
6989.6	-52.81	9.3	12.9	-49.21	-13	V
8729.6	-55.65	10.4	18.5	-47.55	-13	V
10471.2	-50.47	11.6	17.1	-44.97	-13	H
12239.0	-45.8	12.6	17.5	-40.9	-13	H

RSE-LTE66-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3557.6	-38.04	6.4	4.7	-39.74	-13	H
5339.6	-51.7	8.1	8.7	-51.1	-13	V
7140.4	-53.33	9.4	13.7	-49.03	-13	V
8894.0	-56.44	10.4	18.3	-48.54	-13	V
10667.2	-50.66	11.7	17.3	-45.06	-13	V
12447.6	-47.24	12.5	18.7	-41.04	-13	H

RSE-LTE71-L-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1331.2	-43.29	3.9	2.0	-45.19	-13	H
1996.9	-44.22	4.8	2.8	-46.22	-13	H
2665.8	-38.2	5.5	4.1	-39.6	-13	V
3328.0	-51.49	6.2	4.7	-52.99	-13	H
3987.2	-53.94	6.9	7.7	-53.14	-13	H
4656.0	-51.61	7.5	7.9	-51.21	-13	H

RSE-LTE71-M-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1364.8	-42.32	3.9	2.0	-44.22	-13	H
2158.8	-40.71	5.0	3.3	-42.41	-13	H
2706.9	-36.94	5.6	4.1	-38.44	-13	H
3402.8	-51.39	6.3	4.7	-52.99	-13	H
4071.6	-52.49	6.9	7.7	-51.69	-13	H
4776.8	-51.48	7.6	7.9	-51.18	-13	H

RSE-LTE71-H-N05

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1387.3	-42.55	4.0	3.4	-43.15	-13	H
2090.0	-42.8	4.9	2.8	-44.9	-13	V
2779.6	-36.38	5.7	4.1	-37.98	-13	H
3492.8	-50.09	6.4	4.7	-51.79	-13	H
4154.4	-52.96	7.0	7.7	-52.26	-13	V
4886.4	-50.44	7.7	9.0	-49.14	-13	H

ANNEX B. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

ANNEX C. Detailed Test Results**ANNEX C.1. Main Terms**

Verdict	Verdict of each test cases.
Test cases	Test cases identification number and description in ETSI EN 300 328 test specification and ETSI specification.

ANNEX C.2. Terms used in Condition column

Tnom	Normal temperature
Tmin	Low temperature
Tmax	High temperature
Vnom	Normal voltage

ANNEX C.3. Terms used in Verdict column

P	Pass, the EUT complies with the essential requirements in the standard.
NM	Not measure, the test was not measured by ECIT.
NA	Not applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

ANNEX C.4. Terms used in Note column

EUT ID	EUT ID (e.g N01, N02.....) is used to identify the EUT tested used for each test cases as specified in section 3 of this test report.
Lab Code	Lab code is used to identify the subcontracted lab if this test cases is performed in the subcontracted lab.

Subcontracted test lab code: N/A

ANNEX D. Accreditation Certificate



*****END OF REPORT*****