



RF TEST REPORT

Applicant Quectel Wireless Solutions Co., Ltd
FCC ID XMR2021EC21ADL
Product LTE Module
Brand Quectel
Model EC21-ADL, EC21-ADL MINIPCIE
Report No. R2110A0926-R2V2
Issue Date January 14, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR47 Part 27C (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

Table of Contents

1	Test Laboratory.....	6
1.1	Notes of the Test Report	6
1.2	Test facility	6
1.3	Testing Location.....	7
2	General Description of Equipment under Test	8
3	Applied Standards	10
4	Test Configuration	11
5	Test Case Results	12
5.1	RF Power Output	12
5.2	Effective Isotropic Radiated Power	16
5.3	Radiates Spurious Emission	21
6	Main Test Instruments	33
	ANNEX A: The EUT Appearance.....	34
	ANNEX B: Test Setup Photos.....	35
	ANNEX C: Verify data.....	36
	ANNEX D: Product Change Description.....	37



Version	Revision description	Issue Date
Rev.0	Initial issue of report.	December 31, 2021
Rev.1	Update description in Page 4-5.	January 13, 2022
Rev.2	Added antenna gain information in Page 7.	January 14, 2022

Note: This revised report (Report No. R2110A0926-R2V2) supersedes and replaces the previously issued report (Report No. R2110A0926-R2V1). Please discard or destroy the previously issued report and dispose of it accordingly.

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	<p style="text-align: center;">PASS</p> Refer to the original report: R1805A0226-R3V3; FCC ID: XMR201606EC21A And Variant report R2110A0926-R2V2; FCC ID: XMR2021EC21ADL
2	Effective Isotropic Radiated power	27.50(d)(4)	<p style="text-align: center;">PASS</p> Refer to the original report: R1805A0226-R3V3; FCC ID: XMR201606EC21A And Variant report R2110A0926-R2V2; FCC ID: XMR2021EC21ADL
3	Occupied Bandwidth	2.1049	Refer to the original report: RTWK160719001-00 FCC ID: MR201606EC21A
4	Band Edge Compliance	27.53(h) 27.53(g)	Refer to the original report: RTWK160719001-00 FCC ID: MR201606EC21A
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	Refer to the original report: RTWK160719001-00 FCC ID: MR201606EC21A
6	Frequency Stability	2.1055 / 27.54	Refer to the original report: RTWK160719001-00 FCC ID: MR201606EC21A
7	Spurious Emissions at Antenna Terminals	2.1051 27.53(h) 27.53(g)	Refer to the original report: RTWK160719001-00 FCC ID: MR201606EC21A
8	Radiates Spurious Emission	2.1053/27.53(h) /27.53(g)	<p style="text-align: center;">PASS</p> Refer to the original report: R1805A0226-R3V3; FCC ID: XMR201606EC21A And Variant report R2110A0926-R2V2; FCC ID: XMR2021EC21ADL

Date of Testing: (Original): May 24, 2018~ June 3, 2018
 (Variant): December 4, 2021 ~ December 16, 2021

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.



EC21-ADL, EC21-ADL MINIPCIE (Report No.: R2110A0926-R2V2) is a variant model of EC21-A, EC21-A MINIPCIE (Report No.: R1805A0226-R3V3).

The differences between the original device and the current one are as follows:

1. EC21-A, EC21-A MINIPCIE supports LTE&WCDMA, but EC21-ADL, EC21-ADL MINIPCIE disables WCDMA and voice functions through software.
2. Updated FCC ID, Hardware Version, Software Version and changes Model.

Verify data refer to the following table, other test values duplicated from the original report (Report No.: RTWK160719001-00; R1805A0226-R3V3). Please refer to Appendix C for Verify data.

Test Case	Original (R1805A0226-R3V3)	Variant (R2110A0926-R2V2)
RF Power Output and Effective Radiated Power	PASS	Retest(LTE Band 4/12)
Radiates Spurious Emission	PASS	Verify the worst combination of each frequency band(LTE Band 4/12)

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

Client Information

Applicant	Quectel Wireless Solutions Co., Ltd
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

General information

EUT Description			
Model	EC21-ADL, EC21-ADL MINIPCIE		
IMEI	Original	861108037284717	
	Variant	869019050000280(EC21- ADL)	
		869019050000454(EC21- ADL MINIPCIE)	
Hardware Version	R1.0		
Software Version	EC21ADLFAR07A01M4G		
Power Supply	External Power Supply		
Antenna Type	External Antenna		
Antenna Gain		Frequency(MHz)	Gain(dBi)
	LTE Band 4	1700	1.67
		1720	1.94
		1740	2.00
		1760	1.57
	LTE Band 12	700	1.66
		710	3.26
720		3.95	
Test Mode(s)	LTE Band 4; LTE Band 12;		
Test Modulation	(LTE)QPSK 16QAM;		
LTE Category	1		
Maximum E.I.R.P. / E.R.P.	LTE Band 4	26.49dBm	
	LTE Band 12	18.00dBm	
Rated Power Supply Voltage:	3.8V		
Extreme Voltage	Minimum: 3.3V Maximum: 4.3V		
Extreme Temperature	Lowest: -30°C Highest: +50°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 12	699 ~ 716	729 ~ 746



Note: 1. The information of the EUT is declared by the manufacturer.
2. The series model number is: EC21-ADL, EC21-ADL MINIPCIE. The difference of these models are have different marketing requirement.

3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 27C (2020)

FCC CFR47 Part 2 (2020)

Reference standard:

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4 Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated. Subsequently, only the worst case emissions are reported.

The following testing in LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/12:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 12	O	O	O	O	-	-	O	O	-	-	O	O	O	O
Radiates Spurious Emission	LTE 4	O	-	O	-	-	O	O	O	O	O	O	O	O	O
	LTE 12	O	-	O	O	-	-	O	O	O	O	O	O	O	O
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

5 Test Case Results

5.1 RF Power Output

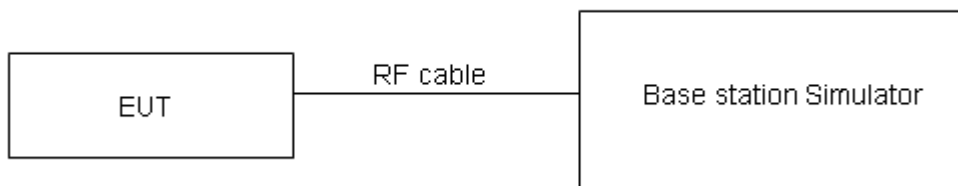
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=0.4$ dB.

Test Results

LTE Band 4				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	22.76	22.81	22.87
		1	2	22.92	22.94	22.99
		1	5	22.70	22.97	22.83
		3	0	22.54	22.79	22.71
		3	2	22.63	22.83	22.54
		3	3	22.55	22.73	22.69
	6	0	21.69	21.97	21.76	
	16QAM	1	0	21.94	22.18	22.13
		1	2	21.93	22.19	22.21
1		5	21.82	21.92	22.97	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.03	23.14	23.16
		1	7	23.17	23.05	22.98
		1	14	23.22	23.03	23.09
		8	0	21.86	21.87	21.99
		8	4	21.88	21.89	21.95
		8	7	22.04	21.90	21.72
	15	0	21.83	21.75	21.93	
	16QAM	1	0	21.70	21.83	21.91
		1	7	21.83	21.78	21.90
1		14	21.96	21.85	21.96	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	23.00	23.12	23.12
		1	13	23.15	23.01	22.95
		1	24	23.19	22.98	23.05
		12	0	21.83	21.82	21.95
		12	6	21.86	21.85	21.90
		12	13	22.02	21.88	21.68
	25	0	21.81	21.74	21.91	
	16QAM	1	0	21.67	21.79	21.88
		1	13	21.80	21.76	21.87
1		24	21.93	21.83	21.92	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	23.02	23.13	23.15
		1	25	23.18	23.06	22.99
		1	49	23.21	23.02	23.08



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20025/1717.5	20175/1732.5	20325/1747.5	
15MHz	QPSK	1	0	23.01	23.09	23.13	
		1	38	23.16	23.05	22.96	
		1	74	23.18	22.97	23.04	
		36	0	21.84	21.83	21.96	
		36	18	21.86	21.85	21.90	
		36	39	22.01	21.89	21.69	
		75	0	21.87	21.72	21.90	
15MHz	16QAM	1	0	21.64	21.80	21.88	
		1	38	21.81	21.77	21.88	
		1	74	21.93	21.81	21.92	
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)			
				20050/1720	20175/1732.5	20300/1745	
20MHz	QPSK	1	0	22.98	23.05	23.10	
		1	50	23.15	23.01	22.94	
		1	99	23.16	22.96	23.01	
		50	0	21.81	21.78	21.92	
		50	25	21.84	21.81	21.87	
		50	50	21.98	21.84	21.65	
		100	0	21.84	21.67	21.86	
	20MHz	16QAM	1	0	21.62	21.76	21.83
			1	50	21.77	21.75	21.84
			1	99	21.91	21.78	21.90
Note:							
1) The following testing in worst case based on the maximum RF Output Power.							

LTE Band 12				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23017/699.7	23095/707.5	23173/715.3
1.4MHz	QPSK	1	0	23.13	23.14	23.02
		1	2	23.11	23.27	23.04
		1	5	23.07	23.30	23.06
		3	0	22.87	22.91	22.85
		3	2	22.93	23.03	22.91
		3	3	22.82	23.08	22.84



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23025/700.5	23095/707.5	23165/714.5
	16QAM	6	0	22.20	22.41	22.24
		1	0	22.18	22.78	22.16
		1	2	22.70	22.89	22.01
		1	5	22.52	22.66	22.44
3MHz	QPSK	1	0	22.99	22.99	22.92
		1	7	23.13	23.32	22.90
		1	14	22.90	22.88	22.90
		8	0	22.30	22.38	22.46
		8	4	22.39	22.26	22.43
		8	7	22.49	22.36	22.39
		15	0	22.29	22.38	22.40
	16QAM	1	0	22.37	22.76	22.49
		1	7	22.61	23.07	22.36
		1	14	22.45	22.72	22.03
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	22.98	22.95	22.90
		1	13	23.11	23.31	22.87
		1	24	22.87	22.83	22.86
		12	0	22.28	22.34	22.43
		12	6	22.36	22.21	22.39
		12	13	22.46	22.33	22.35
		25	0	22.27	22.34	22.35
	16QAM	1	0	22.32	22.74	22.47
		1	13	22.59	23.04	22.34
		1	24	22.42	22.68	22.00
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	22.95	22.91	22.87
		1	25	23.10	23.27	22.85
		1	49	22.85	22.82	22.83
		25	0	22.25	22.29	22.39
		25	13	22.34	22.17	22.36
		25	25	22.43	22.28	22.31
		50	0	22.24	22.29	22.31
	16QAM	1	0	22.30	22.70	22.42
		1	25	22.55	23.02	22.30
		1	49	22.40	22.65	21.98

5.2 Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

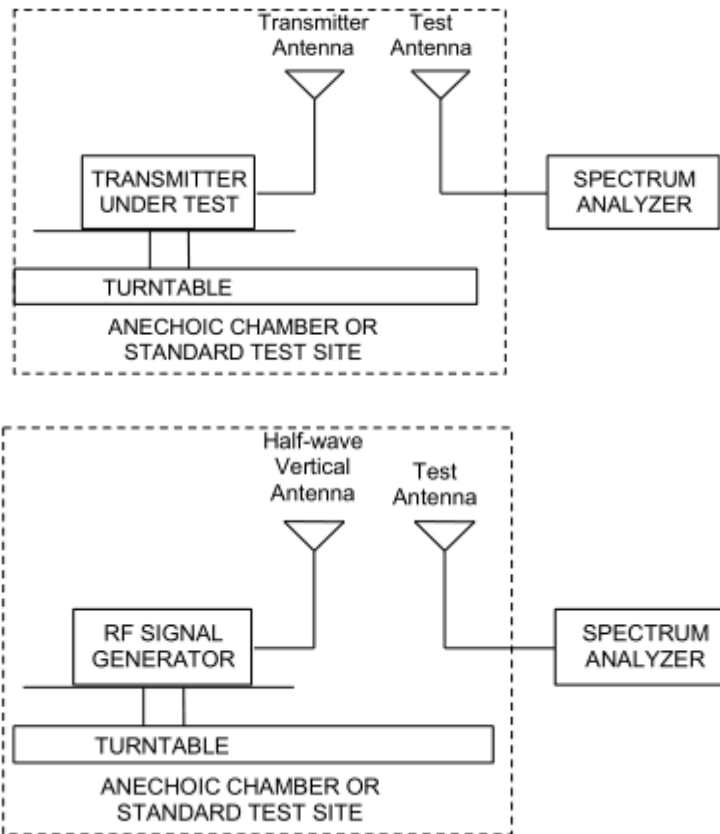
Methods of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).

- a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- f) The maximum ERP is the maximum value determined in the preceding step.
- g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:
 $ERP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBd)}$
 where: dBd refers to gain relative to an ideal dipole.
 $EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

The RB allocation refers to section 5.1, using the maximum output power configuration.

Test setup



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

**Limits**

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Part 27.50(c)(10)Limit	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(d)(4)Limit	$\leq 1 \text{ W}$ (30 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 1.19 \text{ dB}$

Test Results

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

LTE Band 4						
Bandwidth	Channel	Frequency (MHz)	Polarization	EIRP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	1710.7	Horizontal	26.26	30	Pass
	Mid	1732.5	Horizontal	25.84	30	Pass
	High	1754.3	Horizontal	25.80	30	Pass
3 MHz (QPSK)	Low	1711.5	Horizontal	26.49	30	Pass
	Mid	1732.5	Horizontal	25.98	30	Pass
	High	1753.5	Horizontal	25.71	30	Pass
5 MHz (QPSK)	Low	1712.5	Horizontal	26.20	30	Pass
	Mid	1732.5	Horizontal	25.86	30	Pass
	High	1752.5	Horizontal	25.80	30	Pass
10 MHz (QPSK)	Low	1715	Horizontal	26.43	30	Pass
	Mid	1732.5	Horizontal	25.96	30	Pass
	High	1750	Horizontal	25.84	30	Pass
15 MHz (QPSK)	Low	1717.5	Horizontal	26.06	30	Pass
	Mid	1732.5	Horizontal	25.84	30	Pass
	High	1747.5	Horizontal	25.72	30	Pass
20 MHz (QPSK)	Low	1720	Horizontal	26.06	30	Pass
	Mid	1732.5	Horizontal	26.11	30	Pass
	High	1745	Horizontal	25.97	30	Pass
1.4 MHz (16QAM)	Low	1710.7	Horizontal	25.98	30	Pass
	Mid	1732.5	Horizontal	25.51	30	Pass
	High	1754.3	Horizontal	25.53	30	Pass
3 MHz (16QAM)	Low	1711.5	Horizontal	26.19	30	Pass
	Mid	1732.5	Horizontal	25.79	30	Pass
	High	1753.5	Horizontal	25.35	30	Pass
5 MHz (16QAM)	Low	1712.5	Horizontal	26.03	30	Pass
	Mid	1732.5	Horizontal	25.69	30	Pass
	High	1752.5	Horizontal	25.61	30	Pass
10 MHz (16QAM)	Low	1715	Horizontal	26.18	30	Pass
	Mid	1732.5	Horizontal	25.79	30	Pass
	High	1750	Horizontal	25.67	30	Pass
15 MHz (16QAM)	Low	1717.5	Horizontal	25.79	30	Pass
	Mid	1732.5	Horizontal	25.61	30	Pass
	High	1747.5	Horizontal	25.32	30	Pass
20 MHz (16QAM)	Low	1720	Horizontal	25.87	30	Pass
	Mid	1732.5	Horizontal	25.93	30	Pass
	High	1745	Horizontal	25.61	30	Pass

LTE Band 12						
Bandwidth	Channel	Frequency (MHz)	Polarization	ERP (dBm)	Limit (dBm)	Conclusion
1.4 MHz (QPSK)	Low	699.7	Horizontal	17.52	34.77	Pass
	Mid	707.5	Horizontal	17.86	34.77	Pass
	High	715.3	Horizontal	17.97	34.77	Pass
3 MHz (QPSK)	Low	700.5	Horizontal	17.62	34.77	Pass
	Mid	707.5	Horizontal	17.98	34.77	Pass
	High	714.5	Horizontal	18.00	34.77	Pass
5 MHz (QPSK)	Low	701.5	Horizontal	17.27	34.77	Pass
	Mid	707.5	Horizontal	17.79	34.77	Pass
	High	713.5	Horizontal	17.73	34.77	Pass
10 MHz (QPSK)	Low	704	Horizontal	17.39	34.77	Pass
	Mid	707.5	Horizontal	17.75	34.77	Pass
	High	711	Horizontal	17.79	34.77	Pass
1.4 MHz (16QAM)	Low	699.7	Horizontal	17.28	34.77	Pass
	Mid	707.5	Horizontal	17.52	34.77	Pass
	High	715.3	Horizontal	17.38	34.77	Pass
3 MHz (16QAM)	Low	700.5	Horizontal	17.35	34.77	Pass
	Mid	707.5	Horizontal	17.71	34.77	Pass
	High	714.5	Horizontal	17.58	34.77	Pass
5 MHz (16QAM)	Low	701.5	Horizontal	17.20	34.77	Pass
	Mid	707.5	Horizontal	17.51	34.77	Pass
	High	713.5	Horizontal	17.43	34.77	Pass
10 MHz (16QAM)	Low	704	Horizontal	17.18	34.77	Pass
	Mid	707.5	Horizontal	17.70	34.77	Pass
	High	711	Horizontal	17.71	34.77	Pass

Note: 1. EIRP= E.R.P+2.15

5.3 Radiates Spurious Emission

Ambient condition

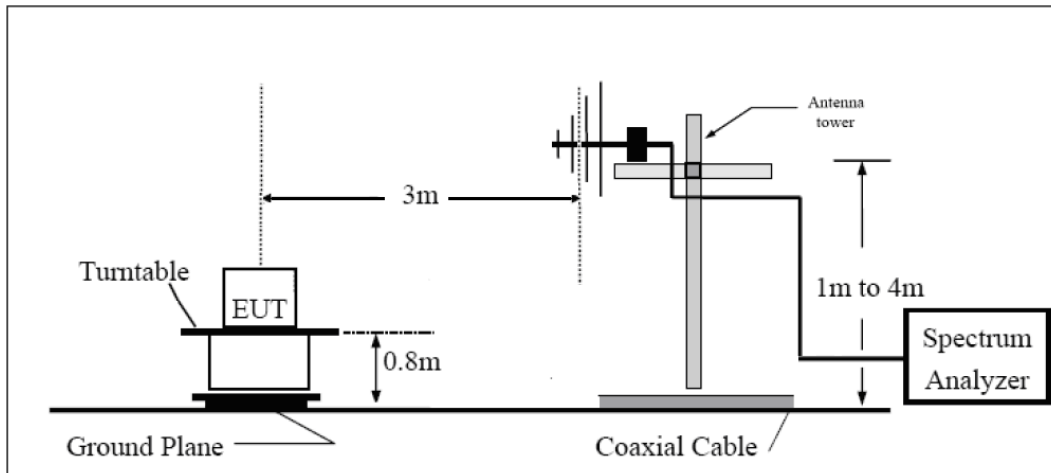
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

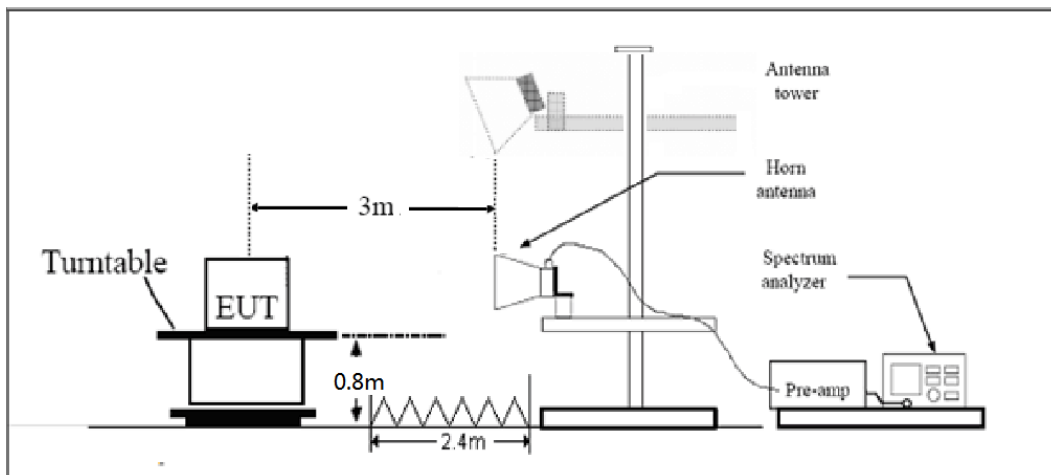
- The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).
- The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
- A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
- The EUT shall be replaced by a substitution antenna. 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 (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
- The measurement results are obtained as described below:
 $Power(EIRP) = PMea - PAg - Pcl + Ga$
 The measurement results are amend as described below:
 $Power(EIRP) = PMea - Pcl + Ga$
- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15dBi$.
 The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB..”

LTE -12 Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands



immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

LTE B4/12 Limit	-13 dBm
-----------------	---------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = \pm 1.96$, $U = \pm 3.55$ dB.

Test Result

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, from 30MHz to 1GHz are all noise floor will not be recorded in the report.

LTE Band 4 QPSK 1.4MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3421.4	-62.20	2.6	10.15	Horizontal	-54.65	-13.00	41.65	45
3	5131.1	-59.75	2.4	11.35	Horizontal	-50.80	-13.00	37.80	135
4	6842.8	-62.03	4.5	10.85	Horizontal	-55.68	-13.00	42.68	45
5	8553.5	-63.22	5.1	11.35	Horizontal	-56.97	-13.00	43.97	135
6	10264.2	-62.72	5.3	11.95	Horizontal	-56.07	-13.00	43.07	90
7	11974.9	-62.08	5.5	13.55	Horizontal	-54.03	-13.00	41.03	45
8	13685.6	-59.14	6.3	13.75	Horizontal	-51.69	-13.00	38.69	90
9	15396.3	-55.75	6.7	13.85	Horizontal	-48.60	-13.00	35.60	135
10	17107.0	-56.93	6.8	14.25	Horizontal	-49.48	-13.00	36.48	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.3	-65.33	2.6	10.75	Horizontal	-57.18	-13.00	44.18	225
3	5197.5	-60.06	2.4	11.05	Horizontal	-51.41	-13.00	38.41	270
4	6930.0	-61.69	4.5	11.15	Horizontal	-55.04	-13.00	42.04	270
5	8662.5	-62.15	5.1	11.35	Horizontal	-55.90	-13.00	42.90	135
6	10395.0	-61.05	5.3	11.95	Horizontal	-54.40	-13.00	41.40	135
7	12127.5	-61.30	5.5	13.55	Horizontal	-53.25	-13.00	40.25	45
8	13860.0	-60.34	6.3	13.75	Horizontal	-52.89	-13.00	39.89	0
9	15592.5	-56.67	6.7	13.85	Horizontal	-49.52	-13.00	36.52	180
10	17325.0	-55.79	6.8	14.25	Horizontal	-48.34	-13.00	35.34	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 1.4MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3507.8	-60.87	2.6	10.15	Horizontal	-53.32	-13.00	40.32	90
3	5261.6	-57.77	2.4	11.05	Horizontal	-49.12	-13.00	36.12	135
4	7017.2	-63.49	4.5	11.15	Horizontal	-56.84	-13.00	43.84	135
5	8771.5	-60.79	5.1	11.35	Horizontal	-54.54	-13.00	41.54	45
6	10525.8	-61.49	5.3	11.95	Horizontal	-54.84	-13.00	41.84	45
7	12280.1	-64.46	5.5	13.55	Horizontal	-56.41	-13.00	43.41	315
8	14034.4	-59.89	6.3	13.75	Horizontal	-52.44	-13.00	39.44	315
9	15788.7	-56.76	6.7	13.85	Horizontal	-49.61	-13.00	36.61	270
10	17543.0	-57.06	6.8	14.25	Horizontal	-49.61	-13.00	36.61	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3425.0	-62.40	2.6	10.15	Horizontal	-54.85	-13.00	41.85	135
3	5131.1	-59.86	2.4	11.35	Horizontal	-50.91	-13.00	37.91	45
4	6850.0	-61.36	4.5	10.85	Horizontal	-55.01	-13.00	42.01	225
5	8562.5	-63.34	5.1	11.35	Horizontal	-57.09	-13.00	44.09	270
6	10275.0	-62.03	5.3	11.95	Horizontal	-55.38	-13.00	42.38	225
7	11987.5	-63.08	5.5	13.55	Horizontal	-55.03	-13.00	42.03	270
8	13700.0	-59.46	6.3	13.75	Horizontal	-52.01	-13.00	39.01	270
9	15412.5	-56.87	6.7	13.85	Horizontal	-49.72	-13.00	36.72	270
10	17125.0	-55.75	6.8	14.25	Horizontal	-48.30	-13.00	35.30	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.5	-62.90	2.6	10.75	Horizontal	-54.75	-13.00	41.75	135
3	5191.5	-59.94	2.4	11.05	Horizontal	-51.29	-13.00	38.29	315
4	6930.0	-62.94	4.5	11.15	Horizontal	-56.29	-13.00	43.29	315
5	8662.5	-63.16	5.1	11.35	Horizontal	-56.91	-13.00	43.91	315
6	10395.0	-62.58	5.3	11.95	Horizontal	-55.93	-13.00	42.93	225
7	12127.5	-62.69	5.5	13.55	Horizontal	-54.64	-13.00	41.64	45
8	13860.0	-59.83	6.3	13.75	Horizontal	-52.38	-13.00	39.38	45
9	15592.5	-56.51	6.7	13.85	Horizontal	-49.36	-13.00	36.36	270
10	17325.0	-56.44	6.8	14.25	Horizontal	-48.99	-13.00	35.99	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3500.6	-62.87	2.6	10.15	Horizontal	-55.32	-13.00	42.32	270
3	5251.1	-63.75	2.4	11.05	Horizontal	-55.10	-13.00	42.10	45
4	7010.0	-62.26	4.5	11.15	Horizontal	-55.61	-13.00	42.61	135
5	8762.5	-62.92	5.1	11.35	Horizontal	-56.67	-13.00	43.67	135
6	10515.0	-62.37	5.3	11.95	Horizontal	-55.72	-13.00	42.72	135
7	12267.5	-60.73	5.5	13.55	Horizontal	-52.68	-13.00	39.68	225
8	14020.0	-59.50	6.3	13.75	Horizontal	-52.05	-13.00	39.05	45
9	15772.5	-55.41	6.7	13.85	Horizontal	-48.26	-13.00	35.26	45
10	17525.0	-54.72	6.8	14.25	Horizontal	-47.27	-13.00	34.27	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 20MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3440.0	-61.61	2.6	10.15	Horizontal	-54.06	-13.00	41.06	45
3	5133.4	-59.59	2.4	11.35	Horizontal	-50.64	-13.00	37.64	225
4	6880.0	-61.25	4.5	10.85	Horizontal	-54.90	-13.00	41.90	225
5	8600.0	-61.99	5.1	11.35	Horizontal	-55.74	-13.00	42.74	315
6	10320.0	-61.93	5.3	11.95	Horizontal	-55.28	-13.00	42.28	315
7	12040.0	-63.88	5.5	13.55	Horizontal	-55.83	-13.00	42.83	90
8	13760.0	-58.50	6.3	13.75	Horizontal	-51.05	-13.00	38.05	90
9	15480.0	-55.40	6.7	13.85	Horizontal	-48.25	-13.00	35.25	90
10	17200.0	-56.92	6.8	14.25	Horizontal	-49.47	-13.00	36.47	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3465.0	-58.92	2.6	10.75	Horizontal	-50.77	-13.00	37.77	0
3	5170.9	-59.24	2.4	11.05	Horizontal	-50.59	-13.00	37.59	135
4	6930.0	-61.36	4.5	11.15	Horizontal	-54.71	-13.00	41.71	45
5	8662.5	-60.93	5.1	11.35	Horizontal	-54.68	-13.00	41.68	90
6	10395.0	-62.19	5.3	11.95	Horizontal	-55.54	-13.00	42.54	135
7	12127.5	-60.96	5.5	13.55	Horizontal	-52.91	-13.00	39.91	0
8	13860.0	-59.24	6.3	13.75	Horizontal	-51.79	-13.00	38.79	0
9	15592.5	-57.33	6.7	13.85	Horizontal	-50.18	-13.00	37.18	0
10	17325.0	-56.31	6.8	14.25	Horizontal	-48.86	-13.00	35.86	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



LTE Band 4 QPSK 20MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3490.0	-63.64	2.6	10.15	Horizontal	-56.09	-13.00	43.09	0
3	5208.4	-60.53	2.4	11.05	Horizontal	-51.88	-13.00	38.88	0
4	6980.0	-61.51	4.5	11.15	Horizontal	-54.86	-13.00	41.86	135
5	8725.0	-60.90	5.1	11.35	Horizontal	-54.65	-13.00	41.65	315
6	10470.0	-62.34	5.3	11.95	Horizontal	-55.69	-13.00	42.69	270
7	12215.0	-62.06	5.5	13.55	Horizontal	-54.01	-13.00	41.01	270
8	13960.0	-60.46	6.3	13.75	Horizontal	-53.01	-13.00	40.01	270
9	15705.0	-56.02	6.7	13.85	Horizontal	-48.87	-13.00	35.87	270
10	17450.0	-56.87	6.8	14.25	Horizontal	-49.42	-13.00	36.42	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 1.4MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1399.4	-71.81	2.00	10.15	Horizontal	-63.66	-13.00	50.66	315
3	2099.1	-69.59	2.50	11.35	Horizontal	-60.74	-13.00	47.74	270
4	2798.8	-60.56	4.20	10.85	Horizontal	-53.91	-13.00	40.91	45
5	3498.5	-57.42	5.20	11.35	Horizontal	-51.27	-13.00	38.27	180
6	4198.2	-65.49	5.50	11.95	Horizontal	-59.04	-13.00	46.04	315
7	4897.9	-66.29	5.70	13.55	Horizontal	-58.44	-13.00	45.44	270
8	5597.6	-64.66	6.30	13.75	Horizontal	-57.21	-13.00	44.21	270
9	6297.3	-63.74	6.80	13.85	Horizontal	-56.69	-13.00	43.69	180
10	6997.0	-62.33	6.90	14.25	Horizontal	-54.98	-13.00	41.98	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-73.22	2.00	10.75	Horizontal	-64.47	-13.00	51.47	0
3	2122.5	-68.46	2.51	11.05	Horizontal	-59.92	-13.00	46.92	135
4	2830.0	-62.46	4.20	11.15	Horizontal	-55.51	-13.00	42.51	180
5	3537.5	-62.19	5.20	11.15	Horizontal	-56.24	-13.00	43.24	90
6	4245.0	-66.64	5.50	11.95	Horizontal	-60.19	-13.00	47.19	45
7	4952.5	-68.15	5.70	13.55	Horizontal	-60.30	-13.00	47.30	180
8	5660.0	-66.31	6.30	13.75	Horizontal	-58.86	-13.00	45.86	135
9	6367.5	-64.75	6.80	13.85	Horizontal	-57.70	-13.00	44.70	90
10	7075.0	-64.09	6.90	14.25	Horizontal	-56.74	-13.00	43.74	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 1.4MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1399.4	-72.05	2.00	10.15	Horizontal	-63.90	-13.00	50.90	135
3	2099.1	-67.80	2.51	11.05	Horizontal	-59.26	-13.00	46.26	180
4	2798.8	-62.12	4.20	11.15	Horizontal	-55.17	-13.00	42.17	225
5	3576.5	-61.03	5.20	11.15	Horizontal	-55.08	-13.00	42.08	225
6	4291.8	-66.88	5.50	11.95	Horizontal	-60.43	-13.00	47.43	270
7	5007.1	-66.21	5.70	13.55	Horizontal	-58.36	-13.00	45.36	315
8	5722.4	-64.54	6.30	13.75	Horizontal	-57.09	-13.00	44.09	270
9	6437.7	-62.93	6.80	13.85	Horizontal	-55.88	-13.00	42.88	225
10	7153.0	-66.06	6.90	14.25	Horizontal	-58.71	-13.00	45.71	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 5MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1403.0	-71.71	2.00	10.15	Horizontal	-63.56	-13.00	50.56	180
3	2104.5	-68.02	2.50	11.35	Horizontal	-59.17	-13.00	46.17	135
4	2806.0	-61.19	4.20	10.85	Horizontal	-54.54	-13.00	41.54	45
5	3507.5	-59.34	5.20	11.35	Horizontal	-53.19	-13.00	40.19	90
6	4209.0	-66.33	5.50	11.95	Horizontal	-59.88	-13.00	46.88	45
7	4910.5	-66.72	5.70	13.55	Horizontal	-58.87	-13.00	45.87	45
8	5612.0	-66.52	6.30	13.75	Horizontal	-59.07	-13.00	46.07	315
9	6313.5	-64.65	6.80	13.85	Horizontal	-57.60	-13.00	44.60	90
10	7015.0	-63.31	6.90	14.25	Horizontal	-58.11	-13.00	45.11	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-72.06	2.00	10.75	Horizontal	-63.31	-13.00	50.31	135
3	2122.5	-67.23	2.51	11.05	Horizontal	-58.69	-13.00	45.69	225
4	2830.0	-62.22	4.20	11.15	Horizontal	-55.27	-13.00	42.27	180
5	3537.5	-63.43	5.20	11.15	Horizontal	-57.48	-13.00	44.48	315
6	4245.0	-66.24	5.50	11.95	Horizontal	-59.79	-13.00	46.79	90
7	4952.5	-67.58	5.70	13.55	Horizontal	-59.73	-13.00	46.73	270
8	5660.0	-65.50	6.30	13.75	Horizontal	-58.05	-13.00	45.05	180
9	6367.5	-63.93	6.80	13.85	Horizontal	-56.88	-13.00	43.88	90
10	7075.0	-64.41	6.90	14.25	Horizontal	-57.06	-13.00	44.06	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



LTE Band 12 QPSK 5MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1427.0	-72.06	2.00	10.15	Horizontal	-63.91	-13.00	50.91	270
3	2140.5	-69.12	2.51	11.05	Horizontal	-60.58	-13.00	47.58	135
4	2854.0	-62.40	4.20	11.15	Horizontal	-55.45	-13.00	42.45	225
5	3567.5	-61.82	5.20	11.15	Horizontal	-55.87	-13.00	42.87	225
6	4281.0	-67.11	5.50	11.95	Horizontal	-60.66	-13.00	47.66	90
7	4994.5	-67.21	5.70	13.55	Horizontal	-59.36	-13.00	46.36	270
8	5708.0	-65.39	6.30	13.75	Horizontal	-57.94	-13.00	44.94	315
9	6421.5	-64.99	6.80	13.85	Horizontal	-57.94	-13.00	44.94	45
10	7135.0	-65.50	6.90	14.25	Horizontal	-58.15	-13.00	45.15	90

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 10MHz CH-Low, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1408.0	-72.15	2.00	10.15	Horizontal	-64.00	-13.00	51.00	315
3	2112.0	-68.31	2.51	11.35	Horizontal	-59.47	-13.00	46.47	270
4	2816.0	-61.93	4.20	10.85	Horizontal	-55.28	-13.00	42.28	45
5	3520.0	-59.30	5.20	11.35	Horizontal	-53.15	-13.00	40.15	225
6	4224.0	-66.96	5.50	11.95	Horizontal	-60.51	-13.00	47.51	315
7	4928.0	-65.74	5.70	13.55	Horizontal	-57.89	-13.00	44.89	90
8	5632.0	-66.57	6.30	13.75	Horizontal	-59.12	-13.00	46.12	180
9	6336.0	-63.80	6.80	13.85	Horizontal	-56.75	-13.00	43.75	135
10	7040.0	-65.44	6.90	14.25	Horizontal	-58.09	-13.00	45.09	45

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.
2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1415.0	-72.06	2.00	10.75	Horizontal	-63.31	-13.00	50.31	90
3	2122.5	-68.32	2.51	11.05	Horizontal	-59.78	-13.00	46.78	315
4	2830.0	-61.61	4.20	11.15	Horizontal	-54.66	-13.00	41.66	270
5	3537.5	-68.35	5.20	11.15	Horizontal	-62.40	-13.00	49.40	315
6	4245.0	-67.12	5.50	11.95	Horizontal	-60.67	-13.00	47.67	90
7	4952.5	-68.52	5.70	13.55	Horizontal	-60.67	-13.00	47.67	315
8	5660.0	-65.65	6.30	13.75	Horizontal	-58.20	-13.00	45.20	90
9	6367.5	-64.30	6.80	13.85	Horizontal	-57.25	-13.00	44.25	270
10	7075.0	-64.66	6.90	14.25	Horizontal	-57.31	-13.00	44.31	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 12 QPSK 10MHz CH-High, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1422.0	-72.21	2.00	10.15	Horizontal	-64.06	-13.00	51.06	225
3	2133.0	-68.27	2.51	11.05	Horizontal	-59.73	-13.00	46.73	45
4	2844.0	-62.76	4.20	11.15	Horizontal	-55.81	-13.00	42.81	90
5	3555.0	-62.25	5.20	11.15	Horizontal	-56.30	-13.00	43.30	45
6	4266.0	-67.14	5.50	11.95	Horizontal	-60.69	-13.00	47.69	90
7	4977.0	-67.81	5.70	13.55	Horizontal	-59.96	-13.00	46.96	225
8	5688.0	-65.54	6.30	13.75	Horizontal	-58.09	-13.00	45.09	315
9	6399.0	-64.32	6.80	13.85	Horizontal	-57.27	-13.00	44.27	270
10	7110.0	-66.27	6.90	14.25	Horizontal	-58.92	-13.00	45.92	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113645	2018-05-20	2019-05-19
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	2018-05-20	2019-05-19
Spectrum Analyzer	Key sight	N9010A	MY50210259	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
Signal generator	R&S	SMB 100A	102594	2018-05-20	2019-05-19
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2014-12-06	2019-12-05
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2020-01-29
Climatic Chamber	Re Ce	PT-30B	20101891	2015-07-18	2018-07-17
RF Cable	Agilent	SMA 15cm	0001	NA	NA
Preamplifier	R&S	SCU18	102327	2017-06-18	2018-06-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-20	2019-05-19
Software	R&S	EMC32	V 8.52.0	NA	NA

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

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.



ANNEX C: Verify data

The Verify data are submitted separately.

ANNEX D: Product Change Description

The Product Change Description are submitted separately.