

FCC RF Test Report

APPLICANT : Ericsson Enterprise Wireless Solutions, Inc.
EQUIPMENT : 5G Sub-6 GHz LGA Module
BRAND NAME : Ericsson
MODEL NAME : RG650V-NA
FCC ID : UXX-2024RG650VNA
STANDARD : 47 CFR Part 90(R)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TEST DATE(S) : Dec. 23, 2024 ~ Jan. 24, 2025

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (ShenZhen), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG4D0656B	Rev. 01	Initial issue of report	Feb. 17, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.2	§2.1046	Conducted Output Power	—	PASS	-
	§90.542 (a)(7)	Effective Radiated Power	ERP < 3Watt		-
4.4	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 20.69 dB at 1586.50 MHz

Remark : This report by changing module trace design and adding Antenna.

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Ericsson Enterprise Wireless Solutions, Inc.
1100 W. Idaho St. Boise, ID 83702

1.2 Manufacturer

Ericsson Enterprise Wireless Solutions, Inc.
1100 W. Idaho St. Boise, ID 83702

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	5G Sub-6 GHz LGA Module
Brand Name	Ericsson
Model Name	RG650V-NA
FCC ID	UXX-2024RG650VNA
Tx Frequency	LTE Band 14: 788 MHz ~ 798 MHz
Rx Frequency	LTE Band 14: 758 MHz ~ 768 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	22.89 dBm
Antenna Gain	<Ant.1>: 3.16 dBi
Antenna Type	Dipole Antenna
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM
IMEI Code	Conducted: 357214899990622 Radiation: 866838070003881
HW Version	RG650V-NA
SW Version	RG650VNA01AAR01A04G8G
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Maximum Conducted Power

LTE Band 14		QPSK	16QAM / 64QAM / 256QAM
BW (MHz)	Frequency Range (MHz)	Maximum Conducted power (W)	Maximum Conducted power (W)
5	790.5~795.5	0.1897	0.1652
10	793	0.1945	0.1679

1.5 Testing Site

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	TH01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH02-SZ	CN1256	421272

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH02-SZ	AUDIX	E3	6.2009-8-24a

1.7 Applied Standards

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

- ♦ 47 CFR Part 90(R)
- ♦ ANSI C63.26
- ♦ KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ KDB 412172 D01 Determining ERP and EIRP v01r01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

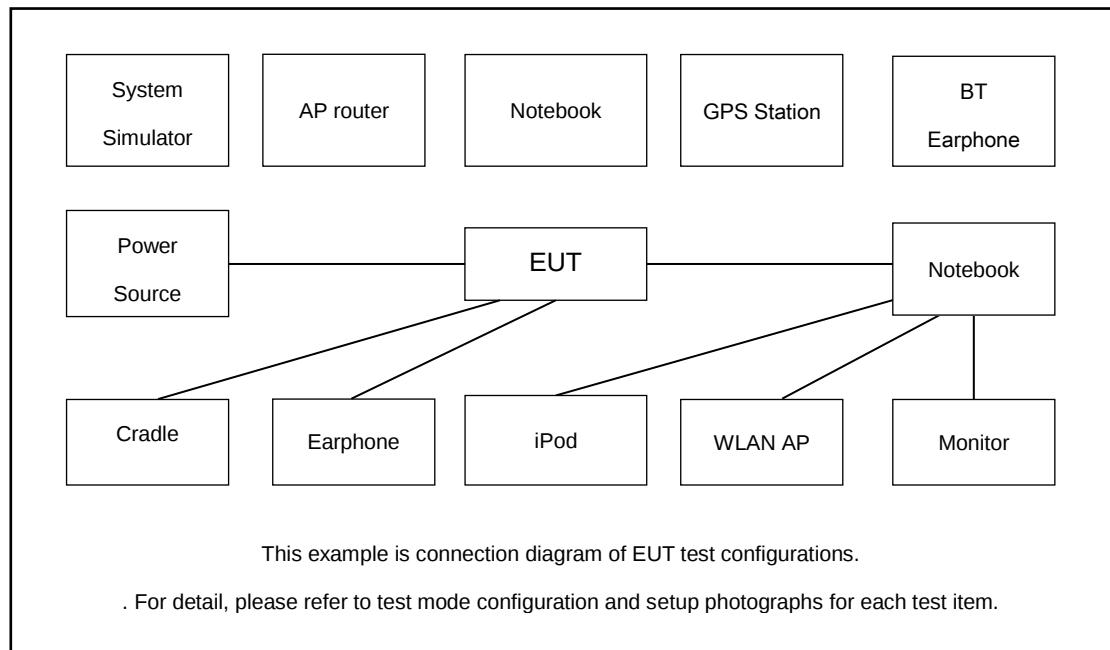
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output	14	-	-	V	-	-	-	V	V	V	V	V	V	V	V	V	V
Power	14	-	-		V	-	-	V	V	V	V	V	V	V	V	V	V
E.R.P	14	-	-	V		-	-	V	V	V	V	V	V	V	V	V	V
	14	-	-		V	-	-	V	V	V	V	V	V	V	V	V	V
Radiated Spurious Emission	14	worse case													V	V	V
Note	1. The mark “v “ means that this configuration is chosen for testing 2. The mark “-“ means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.																

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8821C	Fcc DoC	N/A	Shielded, 1.5m

2.4 Frequency List of Low/Middle/High Channels

LTE Band 14 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	23330	-
	Frequency	-	793	-
5	Channel	23305	23330	23355
	Frequency	790.5	793	795.5

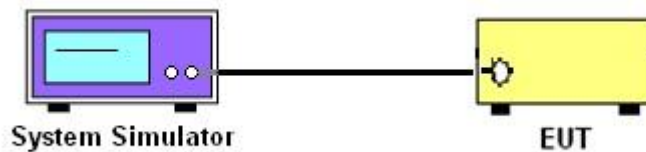
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and ERP

3.2.1 Description of the Conducted Output Power Measurement and ERP

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

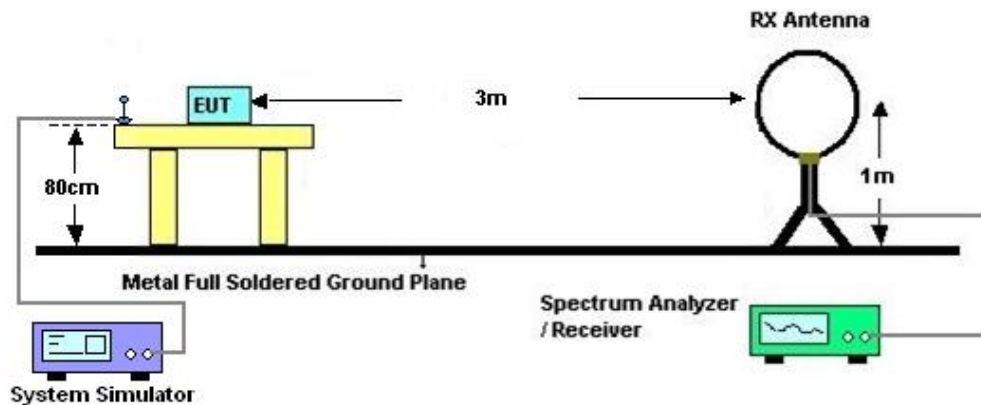
4 Radiated Test Items

4.1 Measuring Instruments

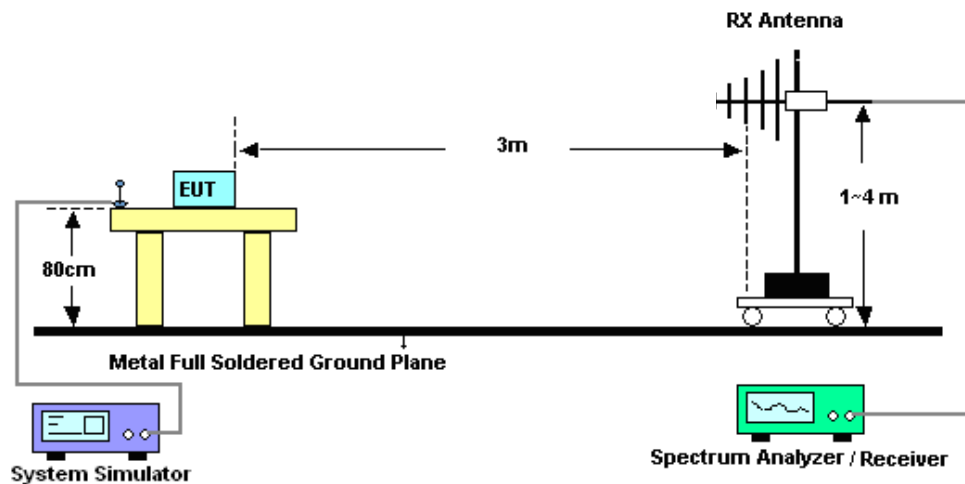
See list of measuring instruments of this test report.

4.2 Test Setup

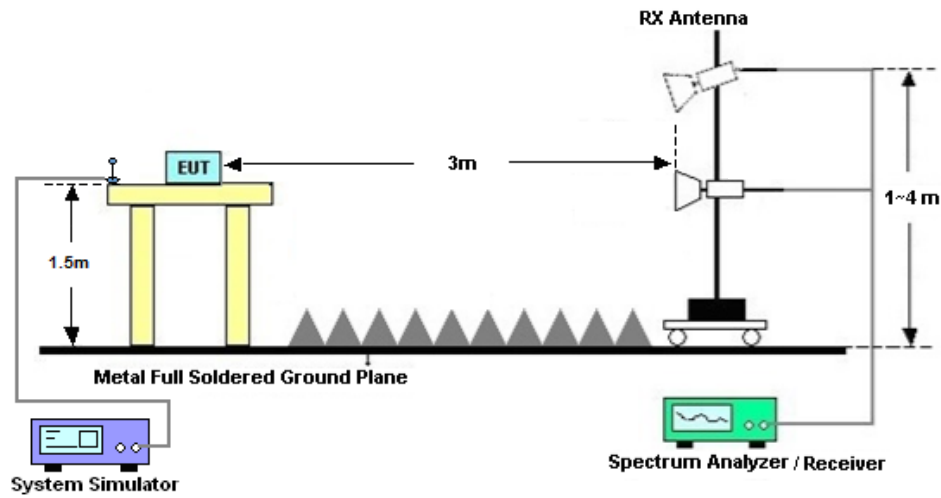
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
10. $ERP \text{ (dBm)} = EIRP - 2.15$
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	Jan. 24, 2025	Apr. 08, 2025	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V , 3A	Oct. 14, 2024	Jan. 24, 2025	Oct. 13, 2025	Conducted (TH01-SZ)
Power Divider	Titan	P02N005180	923402	0.4GHz~26.5GHz	Nov. 08, 2024	Jan. 24, 2025	Nov. 07, 2025	Conducted (TH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 03, 2024	Dec. 23, 2024	Jul. 02, 2025	Radiation (03CH02-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 29, 2023	Dec. 23, 2024	Dec. 28, 2024	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	Oct. 24, 2023	Dec. 23, 2024	Oct. 23, 2025	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 04, 2024	Dec. 23, 2024	Jul. 04, 2025	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 03, 2024	Dec. 23, 2024	Jul. 03, 2025	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Apr. 09, 2024	Dec. 23, 2024	Apr. 08, 2025	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 18, 2024	Dec. 23, 2024	Oct. 17, 2025	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 14, 2024	Dec. 23, 2024	Oct. 13, 2025	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010003043	N/A	Oct. 18, 2024	Dec. 23, 2024	Oct. 17, 2025	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Dec. 23, 2024	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Dec. 23, 2024	NCR	Radiation (03CH02-SZ)

NCR: No Calibration Required

6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	± 1.34 dB

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.47 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.47 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.31 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.72 dB
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----- THE END -----



Appendix A. Test Results of Conducted Test

Test Engineer :	Eason Wu	Temperature :	22~23°C
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and ERP

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23330					
Frequency (MHz)				793				M	
10	QPSK	1	0		22.89			0.2455	
10	QPSK	1	25		22.87			0.2443	
10	QPSK	1	49		22.82			0.2415	
10	QPSK	25	0		21.90			0.1954	
10	QPSK	25	12		21.89			0.1950	
10	QPSK	25	25		21.86			0.1936	
10	QPSK	50	0		21.85			0.1932	
10	16QAM	1	0		22.18			0.2084	
10	16QAM	1	25		22.25			0.2118	
10	16QAM	1	49		22.22			0.2104	
10	16QAM	25	0		20.87			0.1542	
10	16QAM	25	12		20.92			0.1560	
10	16QAM	25	25		20.90			0.1552	
10	16QAM	50	0		20.87			0.1542	
10	64QAM	1	0		21.02			0.1596	
10	64QAM	1	25		21.14			0.1641	
10	64QAM	1	49		21.00			0.1589	
10	64QAM	25	0		19.84			0.1216	
10	64QAM	25	12		19.92			0.1239	
10	64QAM	25	25		19.88			0.1227	
10	64QAM	50	0		19.88			0.1227	
10	256QAM	1	0		18.02			0.0800	
10	256QAM	1	25		18.05			0.0805	
10	256QAM	1	49		18.07			0.0809	
10	256QAM	25	0		18.00			0.0796	
10	256QAM	25	12		17.99			0.0794	
10	256QAM	25	25		18.01			0.0798	
10	256QAM	50	0		18.04			0.0804	
Channel				23305	23330	23355	ERP(W)		
Frequency (MHz)				790.5	793	795.5	L	M	H
5	QPSK	1	0	22.78	22.70	22.69	0.2393	0.2350	0.2344
5	QPSK	1	12	22.74	22.72	22.76	0.2371	0.2360	0.2382

5	QPSK	1	24	22.67	22.75	22.68	0.2333	0.2377	0.2339
5	QPSK	12	0	21.78	21.75	21.82	0.1901	0.1888	0.1919
5	QPSK	12	7	21.77	21.77	21.88	0.1897	0.1897	0.1945
5	QPSK	12	13	21.81	21.73	21.73	0.1914	0.1879	0.1879
5	QPSK	25	0	21.78	21.70	21.80	0.1901	0.1866	0.1910
5	16QAM	1	0	22.10	22.15	22.07	0.2046	0.2070	0.2032
5	16QAM	1	12	22.17	22.18	22.18	0.2080	0.2084	0.2084
5	16QAM	1	24	22.18	22.10	22.11	0.2084	0.2046	0.2051
5	16QAM	12	0	20.78	20.84	20.72	0.1510	0.1531	0.1489
5	16QAM	12	7	20.77	20.86	20.89	0.1507	0.1538	0.1549
5	16QAM	12	13	20.79	20.86	20.75	0.1514	0.1538	0.1500
5	16QAM	25	0	20.78	20.86	20.75	0.1510	0.1538	0.1500
5	64QAM	1	0	20.95	20.96	20.94	0.1570	0.1574	0.1567
5	64QAM	1	12	21.06	21.12	21.12	0.1611	0.1633	0.1633
5	64QAM	1	24	20.94	20.96	20.85	0.1567	0.1574	0.1535
5	64QAM	12	0	19.83	19.79	19.72	0.1213	0.1202	0.1183
5	64QAM	12	7	19.77	19.78	19.91	0.1197	0.1199	0.1236
5	64QAM	12	13	19.79	19.87	19.83	0.1202	0.1225	0.1213
5	64QAM	25	0	19.78	19.74	19.86	0.1199	0.1189	0.1222
5	256QAM	1	0	17.99	17.97	17.90	0.0794	0.0791	0.0778
5	256QAM	1	12	17.93	17.94	18.02	0.0783	0.0785	0.0800
5	256QAM	1	24	17.94	17.97	17.96	0.0785	0.0791	0.0789
5	256QAM	12	0	17.97	17.93	17.96	0.0791	0.0783	0.0789
5	256QAM	12	7	17.87	17.86	17.90	0.0773	0.0771	0.0778
5	256QAM	12	13	18.00	17.92	17.92	0.0796	0.0782	0.0782
5	256QAM	25	0	17.90	17.98	18.00	0.0778	0.0793	0.0796



Appendix B. Test Results of Radiated Test

Field Strength of Spurious Radiated

Test Engineer :	Reid Huang	Temperature :	22~25°C
		Relative Humidity :	48~52%

LTE Band 14 / 5MHz / QPSK / ANT 1									
Bandwidth	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1576.5	-62.99	-42.15	-20.84	-72.92	-66.22	3.98	9.36	H
	2364.75	-62.82	-13	-49.82	-77.55	-66.37	4.85	10.55	H
	3153	-60.58	-13	-47.58	-77.91	-65.51	5.50	12.58	H
	1576.5	-63.95	-42.15	-21.80	-74.01	-67.18	3.98	9.36	V
	2364.75	-62.81	-13	-49.81	-77.53	-66.36	4.85	10.55	V
	3153	-60.48	-13	-47.48	-77.81	-65.41	5.50	12.58	V
Middle	1581.5	-63.12	-42.15	-20.97	-73.06	-66.37	4.00	9.40	H
	2372.25	-62.73	-13	-49.73	-77.41	-66.30	4.88	10.60	H
	3163	-60.73	-13	-47.73	-78.06	-65.66	5.52	12.60	H
	1581.5	-65.15	-42.15	-23.00	-75.22	-68.40	4.00	9.40	V
	2372.25	-62.95	-13	-49.95	-77.62	-66.52	4.88	10.60	V
	3163	-60.90	-13	-47.90	-78.23	-65.83	5.52	12.60	V
Highest	1586.5	-62.84	-42.15	-20.69	-72.78	-66.01	4.10	9.42	H
	2379.75	-62.61	-13	-49.61	-77.30	-66.19	4.90	10.63	H
	3173	-60.62	-13	-47.62	-78.04	-65.54	5.55	12.62	H
	1586.5	-65.46	-42.15	-23.31	-75.53	-68.63	4.10	9.42	V
	2379.75	-62.44	-13	-49.44	-77.12	-66.02	4.90	10.63	V
	3173	-60.68	-13	-47.68	-78.08	-65.60	5.55	12.62	V
Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.									
Test Result					PASS				

LTE Band 14 / 10MHz / QPSK / ANT 1									
Bandwidth	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1577	-63.05	-42.15	-20.90	-72.98	-66.30	4.00	9.40	H
	2365.5	-62.72	-13	-49.72	-77.45	-66.29	4.88	10.60	H
	3154	-60.72	-13	-47.72	-78.05	-65.65	5.52	12.60	H
	1577	-64.41	-42.15	-22.26	-74.47	-67.66	4.00	9.40	V
	2365.5	-62.77	-13	-49.77	-77.49	-66.34	4.88	10.60	V
	3154	-60.78	-13	-47.78	-78.11	-65.71	5.52	12.60	V
Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.									
Test Result					PASS				