



FCC RF Test Report

APPLICANT : Maestro Wireless Holdings Limited
EQUIPMENT : 4G WIFI Router
BRAND NAME : Maestro
MODEL NAME : E228VZ
MARKETING NAME : E228 VZ
FCC ID : WN6-E228VZ
STANDARD : 47 CFR Part 2, 27(L), 27(F)
CLASSIFICATION : Licensed Non-Broadcast Station Transmitter

The product was received on Aug. 17, 2015 and completely tested on Sep. 07, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

**1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town,
Nanshan District, Shenzhen, Guangdong, P. R. China**



TABLE OF CONTENTS

1	GENERAL DESCRIPTION	5
1.1	Applicant	5
1.2	Manufacturer	5
1.3	Product Feature of Equipment Under Test	5
1.4	Product Specification subjective to this standard	5
1.5	Modification of EUT	5
1.6	Maximum Emission Designator, Frequency Tolerance, and ERP/EIRP Power	6
1.7	Testing Location	7
1.8	Applicable Standards	7
2	TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1	Test Mode	8
2.2	Connection Diagram of Test System	9
2.3	Support Unit used in test configuration and system	9
3	CONDUCTED TEST ITEMS	10
3.1	Measuring Instruments	10
3.2	Test Setup	10
3.3	Conducted Output Power	10
3.4	Peak-to-Average Ratio	11
3.5	99% Occupied Bandwidth and 26dB Bandwidth Measurement	11
3.6	Conducted Band Edge	11
3.7	Conducted Spurious Emission	11
3.8	Frequency Stability	11
4	RADIATED TEST ITEMS	12
4.1	Measuring Instruments	12
4.2	Test Setup	12
4.3	Test Result of Radiated Test	12
4.4	Effective Radiated Power and Effective Isotropic Radiated Power	13
4.5	Radiated Spurious Emission	15
5	LIST OF MEASURING EQUIPMENT	16
6	UNCERTAINTY OF EVALUATION	17
APPENDIX A. TEST RESULTS OF CONDUCTED TEST		
APPENDIX B. TEST RESULTS OF RADIATED TEST		
APPENDIX C. TEST SETUP PHOTOGRAPHS		



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG581706	Rev. 01	Initial issue of report	Sep. 22, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.3	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.4	N/A	Peak-to-Average Ratio	<13 dB	PASS	Note 1
3.5	§2.1049	99% Occupied Bandwidth and 26dB Bandwidth	Reporting Only	PASS	Note 1
3.6	§2.1051 §27.53(c)(2)(4) §27.53(h)	Conducted Band Edge Measurement (Band 4) (Band 13)	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Note 1
3.7	§2.1051 §27.53(c)(2) §27.53(h)	Conducted Spurious Emission (Band 4) (Band 13)	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Note 1
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	Note 1
4.4	§27.50(b)(10)	Effective Radiated Power (Band 13)	ERP < 3 Watt	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
4.5	§2.1053 §27.53(c)(2) §27.53(f) §27.53(h)	Radiated Spurious Emission (Band 4) (Band 13)	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 21.66 dB at 1559.500 MHz

Note 1: Please refer to report (Report No. : "FG370901B4" for LTE Band 4 and "FG370901B13" for LTE Band 13 from module report)



1 General Description

1.1 Applicant

Maestro Wireless Holdings Limited

FLAT A & B, 9/F, WING CHEONG FACTORY BUILDING, 121 KING LAM STREET, CHEUNG SHA WAN, HONG KONG

1.2 Manufacturer

Maestro Wireless Holdings Limited

FLAT A & B, 9/F, WING CHEONG FACTORY BUILDING, 121 KING LAM STREET, CHEUNG SHA WAN, HONG KONG

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	4G WIFI Router
Brand Name	Maestro
Model Name	E228VZ
Marketing Name	E228 VZ
FCC ID	WN6-E228VZ
EUT supports Radios application	LTE/WLAN2.4GHz 802.11b/g/n HT20/HT40
IMEI Code	Radiation: 358227051004718
HW Version	V05
SW Version	V1.0.0
EUT Stage	Pre-Production

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 4 : 1711.5 MHz ~ 1753.5 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz
Rx Frequency	LTE Band 4 : 2111.5 MHz ~ 2153.5 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz
Bandwidth	LTE Band 4 : 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 13 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 4 : 22.98 dBm LTE Band 13 : 22.71 dBm
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

No modifications are made to the EUT during all test items.



1.6 Maximum Emission Designator, Frequency Tolerance, and ERP/EIRP Power

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

LTE Band 4	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
3	-	-	0.1285	-	-	0.1446
5	-	-	0.0949	-	-	0.1292
10	-	-	0.0968	-	-	0.1174
15	-	-	0.1107	-	-	0.1146
20	-	-	0.1073	-	-	0.1118

LTE Band 13	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	-	-	0.1076	-	-	0.1096
10	-	-	0.0801	-	-	0.0923

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4 2009 requirement.

1.8 Applicable Standards

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

- 47 CFR Part 2, 27(L), 27(F)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



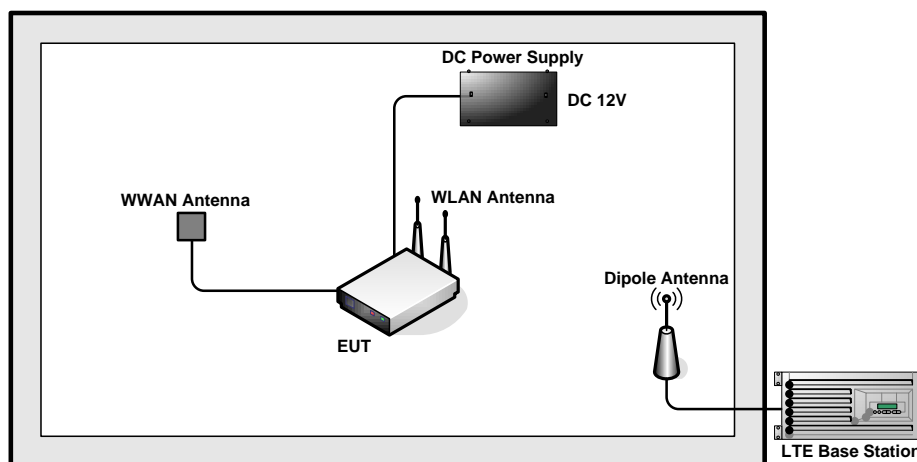
2 Test Configuration of Equipment Under Test

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 v02r02 with maximum output power.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	4		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	13	-	-	✓		-	-	✓	✓	✓	✓	✓	✓	✓	✓
	13				✓			✓	✓		✓			✓	
E.R.P./ E.I.R.P.	4	-	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
	13	-	-	✓		-	-	✓	✓	✓			✓	✓	✓
	13				✓			✓	✓	✓				✓	
Radiated Spurious Emission	4		✓	✓	✓	✓	✓	✓		✓				✓	
	13	-	-	✓	✓	-	-	✓		✓				✓	
Note	<ol style="list-style-type: none"> The mark "✓" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. 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.	DC Power Supply	N/A	N/A	N/A	N/A	N/A
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	WWAN Antenna	N/A	N/A	N/A	N/A	N/A
4.	WLAN Antenna	N/A	N/A	N/A	N/A	N/A

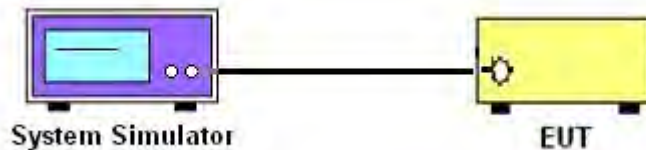
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 Conducted Output Power



3.3 Conducted Output Power

3.3.1 Description of the Conducted Output Power Measurement

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

3.3.2 Test Procedures

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

3.3.3 Test Result of Conducted Output Power Test

Please refer to Appendix A.



3.4 Peak-to-Average Ratio

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

3.5 99% Occupied Bandwidth and 26dB Bandwidth Measurement

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

3.6 Conducted Band Edge

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

3.7 Conducted Spurious Emission

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

3.8 Frequency Stability

Please refer to report (Report No. : “FG370901B4” for LTE Band 4 and “FG370901B13” for LTE Band 13 from module report)

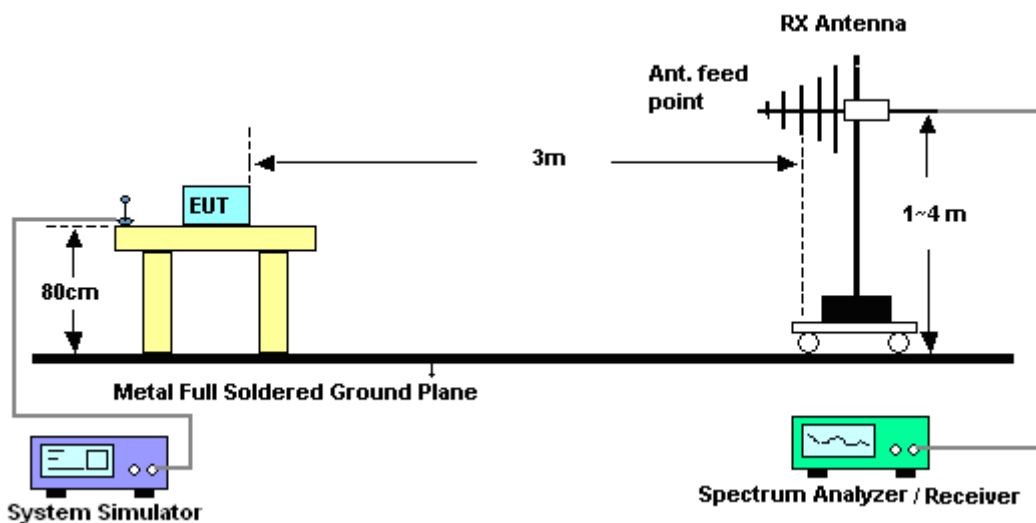
4 Radiated Test Items

4.1 Measuring Instruments

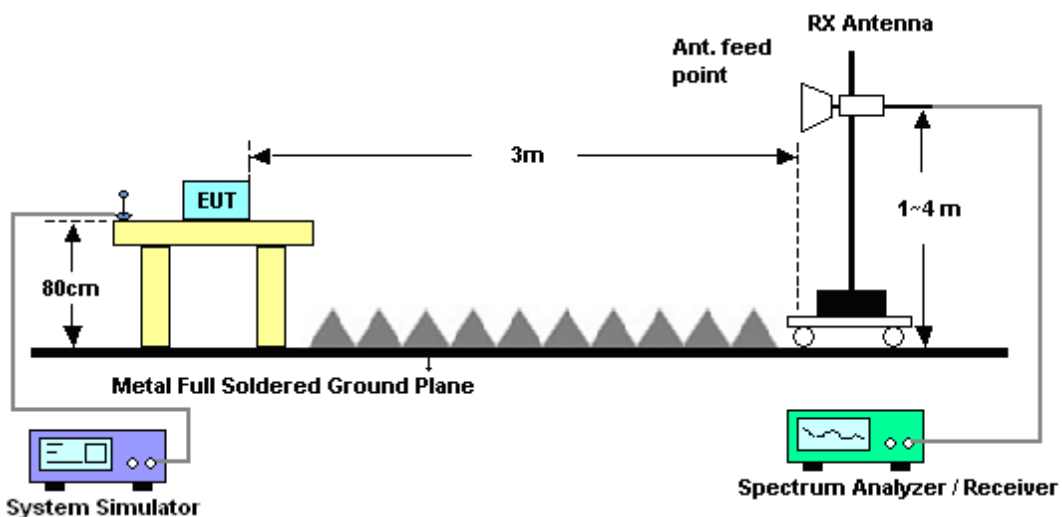
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Effective Radiated Power and Effective Isotropic Radiated Power

4.4.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average ERP of 3 watts with LTE band13.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 1 watt with LTE band 4.

4.4.2 Test Procedures

1. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
1. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
2. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$. Take the record of the output power at substitution antenna.



	LTE Average					
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1MHz	1MHz	1MHz
Detector	RMS	RMS	RMS	RMS	RMS	RMS
Trace	Average	Average	Average	Average	Average	Average
Average Type	Power	Power	Power	Power	Power	Power
Sweep Count	100	100	100	100	100	100

4.5 Radiated Spurious Emission

4.5.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. 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 LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions 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.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.5.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2004 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
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. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
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)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

12. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
13. ERP (dBm) = EIRP - 2.15



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Sep. 07, 2015	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz;Ma x 30dBm	Sep. 25, 2014	Sep. 07, 2015	Sep. 24, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Nov. 07, 2014	Sep. 07, 2015	Nov. 06, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Sep. 07, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 17, 2015	Sep. 07, 2015	Aug. 16, 2016	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz / 30 dB	Jan. 28, 2015	Sep. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 05, 2015	Sep. 07, 2015	May 04, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 28, 2015	Sep. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)



6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.9dB
--	--------------



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.68	22.53	21.90
3	1	7		22.52	22.43	21.89
3	1	14		22.37	22.66	21.73
3	8	0		22.55	22.25	21.77
3	8	4		22.46	22.18	21.68
3	8	7		22.33	22.23	21.58
3	15	0		22.38	22.14	21.63
3	1	0	16-QAM	22.96	22.64	22.29
3	1	7		22.63	22.49	22.18
3	1	14		22.70	22.42	21.97
3	8	0		22.54	22.41	21.82
3	8	4		22.49	22.46	21.75
3	8	7		22.41	22.32	21.65
3	15	0		22.42	22.18	21.62



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.50	22.73	22.52
5	1	12		22.17	22.57	22.32
5	1	24		22.10	22.81	22.08
5	12	0		22.26	22.55	22.36
5	12	6		22.04	22.56	22.17
5	12	11		21.92	22.61	22.03
5	25	0		22.07	22.68	22.14
5	1	0	16-QAM	22.60	22.86	22.72
5	1	12		22.33	22.73	22.51
5	1	24		22.31	22.97	22.32
5	12	0		22.17	22.62	22.30
5	12	6		22.08	22.58	22.18
5	12	11		22.05	22.62	22.06
5	25	0		22.13	22.64	22.21
10	1	0	QPSK	22.58	22.63	22.86
10	1	24		22.19	22.59	22.66
10	1	49		22.01	22.20	22.31
10	25	0		22.12	22.20	22.78
10	25	12		22.03	22.56	22.48
10	25	24		21.97	22.77	22.20
10	50	0		22.08	22.72	22.52
10	1	0	16-QAM	22.76	22.86	22.89
10	1	24		22.43	22.98	22.79
10	1	49		22.18	22.97	22.36
10	25	0		22.23	22.70	22.76
10	25	12		22.09	22.65	22.53
10	25	24		22.03	22.71	22.30
10	50	0		22.09	22.74	22.55



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	22.63	22.58	22.93
15	1	37		22.25	22.60	22.82
15	1	74		22.19	22.87	22.47
15	36	0		22.18	22.53	22.90
15	36	18		22.09	22.63	22.65
15	36	37		22.03	22.71	22.35
15	75	0		22.11	22.64	22.65
15	1	0	16-QAM	22.79	22.87	22.91
15	1	37		22.43	22.82	22.89
15	1	74		22.35	22.90	22.34
15	36	0		22.24	22.59	22.88
15	36	18		22.12	22.68	22.71
15	36	37		22.05	22.73	22.40
15	75	0		22.15	22.72	22.65
20	1	0	QPSK	22.60	22.56	22.94
20	1	49		22.09	22.60	22.93
20	1	99		22.27	22.89	22.49
20	50	0		22.18	22.57	22.89
20	50	24		22.05	22.69	22.79
20	50	49		22.10	22.74	22.49
20	100	0		22.18	22.63	22.74
20	1	0	16-QAM	22.74	22.84	22.89
20	1	49		22.30	22.81	22.91
20	1	99		22.39	22.91	22.37
20	50	0		22.22	22.59	22.86
20	50	24		22.06	22.66	22.82
20	50	49		22.13	22.73	22.53
20	100	0		22.14	22.71	22.72



LTE Band 13 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	21.91	22.00	22.02
5	1	12		22.02	22.07	22.08
5	1	24		22.29	22.12	21.80
5	12	0		21.81	21.89	21.89
5	12	6		21.92	21.93	21.96
5	12	11		21.96	21.99	21.95
5	25	0		21.91	21.97	22.00
5	1	0	16-QAM	22.62	22.37	22.02
5	1	12		22.49	22.38	22.68
5	1	24		22.71	22.54	22.03
5	12	0		21.85	21.99	21.94
5	12	6		21.88	22.00	22.01
5	12	11		22.10	21.93	22.00
5	25	0		22.21	22.05	22.01
10	1	0	QPSK		21.71	
10	1	24			22.12	
10	1	49			22.05	
10	25	0			21.74	
10	25	12			21.90	
10	25	24			21.96	
10	50	0			21.91	
10	1	0	16-QAM		21.93	
10	1	24			22.23	
10	1	49			21.45	
10	25	0			21.88	
10	25	12			22.01	
10	25	24			22.13	
10	50	0			21.94	



Appendix B. Test Results of Radiated Test

ERP/EIRP

LTE Band 4 / 3MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.94	0.0784	17.57	0.0571
Middle		1	14	21.09	0.1285	19.30	0.0851
Highest		1	0	19.54	0.0899	17.65	0.0583
Lowest	16QAM	1	0	19.21	0.0834	17.76	0.0598
Middle		1	0	21.60	0.1446	19.70	0.0933
Highest		1	0	19.58	0.0908	17.80	0.0602
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.20	0.0660	16.69	0.0467
Middle		1	24	19.77	0.0949	18.61	0.0726
Highest		1	0	19.36	0.0862	18.20	0.0661
Lowest	16QAM	1	0	18.71	0.0743	17.90	0.0617
Middle		1	24	21.11	0.1292	19.33	0.0857
Highest		1	0	19.94	0.0986	18.07	0.0642
Limit	EIRP < 1W			Result		PASS	



LTE Band 4/ 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.43	0.0697	16.85	0.0484
Middle		25	24	19.76	0.0947	17.88	0.0614
Highest		1	0	19.86	0.0968	18.12	0.0649
Lowest	16QAM	1	0	19.22	0.0835	17.87	0.0613
Middle		1	24	20.70	0.1174	18.85	0.0768
Highest		1	0	20.43	0.1105	18.54	0.0715
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 15MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.59	0.0723	16.76	0.0474
Middle		1	74	20.44	0.1107	18.83	0.0764
Highest		1	0	19.84	0.0965	18.36	0.0685
Lowest	16QAM	1	0	19.80	0.0956	17.39	0.0548
Middle		1	74	20.51	0.1126	18.93	0.0782
Highest		1	0	20.59	0.1146	19.08	0.0809
Limit	EIRP < 1W			Result		PASS	

LTE Band 4 / 20MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	0	18.31	0.0678	16.50	0.0447
Middle		1	99	19.87	0.0971	18.45	0.0700
Highest		1	0	20.31	0.1073	18.81	0.0761
Lowest	16QAM	1	0	19.59	0.0910	17.18	0.0522
Middle		1	99	20.13	0.1031	18.52	0.0710
Highest		1	49	20.49	0.1118	18.61	0.0725
Limit	EIRP < 1W			Result		PASS	



LTE Band 13 / 5MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	1	24	20.32	0.1076	19.33	0.0858
Middle		1	24	19.91	0.0979	16.48	0.0444
Highest		1	12	18.89	0.0774	17.36	0.0544
Lowest	16QAM	1	24	20.40	0.1096	17.03	0.0505
Middle		1	24	20.17	0.1040	16.78	0.0477
Highest		1	12	19.95	0.0989	16.64	0.0461
Limit	ERP < 3W			Result		PASS	

LTE Band 13 / 10MHz (Average)							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	QPSK	-	-	-	-	-	-
Middle		1	24	19.04	0.0801	15.85	0.0385
Highest		-	-	-	-	-	-
Lowest	16QAM	-	-	-	-	-	-
Middle		1	24	19.65	0.0923	16.79	0.0477
Highest		-	-	-	-	-	-
Limit	ERP < 3W			Result		PASS	



Radiated Spurious Emission

LTE Band 4 / 3MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (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	3462.3	-50.95	-13	-37.95	-62.75	-62.74	0.81	12.60	H
	5193.45	-53.57	-13	-40.57	-69.44	-65.32	0.95	12.70	H
	6924.6	-53.48	-13	-40.48	-70.11	-64.05	1.13	11.70	H
	3462.3	-45.93	-13	-32.93	-56.14	-57.72	0.81	12.6	V
	5193.45	-57.25	-13	-44.25	-69.85	-69.00	0.95	12.7	V
	6924.6	-51.90	-13	-38.90	-69.08	-62.47	1.13	11.7	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 4 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (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	3460.68	-42.36	-13	-29.36	-54.16	-54.15	0.81	12.60	H
	5191.02	-44.64	-13	-31.64	-60.51	-56.39	0.95	12.70	H
	6921.36	-53.37	-13	-40.37	-70.00	-63.94	1.13	11.70	H
	3460.68	-40.95	-13	-27.95	-52.52	-52.74	0.81	12.6	V
	5191.02	-42.75	-13	-29.75	-57.58	-54.50	0.95	12.7	V
	6921.36	-53.15	-13	-40.15	-70.33	-63.72	1.13	11.7	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 4 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (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	3456.18	-45.84	-13	-32.84	-57.64	-57.63	0.81	12.60	H
	5184.27	-43.09	-13	-30.09	-58.96	-54.84	0.95	12.70	H
	6912.36	-53.34	-13	-40.34	-69.97	-63.91	1.13	11.70	H
	3456.18	-48.67	-13	-35.67	-58.9	-60.46	0.81	12.6	V
	5184.27	-41.79	-13	-28.79	-57	-53.54	0.95	12.7	V
	6912.36	-53.38	-13	-40.38	-70.56	-63.95	1.13	11.7	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 4 / 15MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (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	3451.68	-44.37	-13	-31.37	-56.17	-56.16	0.81	12.60	H
	5177.52	-40.95	-13	-27.95	-56.82	-52.70	0.95	12.70	H
	6903.36	-53.01	-13	-40.01	-69.64	-63.58	1.13	11.70	H
	3451.68	-44.55	-13	-31.55	-55.01	-56.34	0.81	12.6	V
	5177.52	-42.24	-13	-29.24	-57.3	-53.99	0.95	12.7	V
	6903.36	-52.85	-13	-39.85	-70.03	-63.42	1.13	11.7	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 4 / 20MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (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	3447.18	-44.61	-13	-31.61	-56.41	-56.40	0.81	12.60	H
	5170.77	-40.11	-13	-27.11	-55.98	-51.86	0.95	12.70	H
	6894.36	-53.42	-13	-40.42	-70.05	-63.99	1.13	11.70	H
	3447.18	-43.20	-13	-30.20	-54.22	-54.99	0.81	12.6	V
	5170.77	-41.22	-13	-28.22	-56.54	-52.97	0.95	12.7	V
	6894.36	-53.55	-13	-40.55	-70.73	-64.12	1.13	11.7	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 13 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	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	1559.5	-61.66	-40	-21.66	-63.27	-68.35	0.56	9.40	H
	2339.25	-63.27	-13	-50.27	-67.17	-70.97	0.75	10.60	H
	3119	-58.71	-13	-45.71	-68.01	-68.31	0.85	12.60	H
	1559.5	-64.02	-40	-24.02	-66.47	-70.71	0.56	9.40	V
	2339.25	-63.28	-13	-50.28	-67.66	-70.98	0.75	10.60	V
	3119	-61.89	-13	-48.89	-68.75	-71.49	0.85	12.60	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 13 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	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	1555.18	-61.34	-13	-48.34	-62.95	-68.03	0.56	9.40	H
	2332.77	-63.26	-13	-50.26	-67.16	-70.96	0.75	10.60	H
	3110.36	-58.43	-13	-45.43	-67.73	-68.03	0.85	12.60	H
	1555.18	-63.06	-13	-50.06	-65.51	-69.75	0.56	9.40	V
	2332.77	-62.84	-13	-49.84	-67.22	-70.54	0.75	10.60	V
	3110.36	-61.28	-13	-48.28	-68.14	-70.88	0.85	12.60	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.