



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT1944-6
FCC ID : IHDT56XF5
STANDARD : FCC 47 CFR Part 2, and 90(S)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Dec. 20, 2017 and testing was completed on Feb. 01, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/TIA-603-E 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 (Kunshan) Inc., the test report shall not be reproduced except in full.



Approved by: James Huang / Manager

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China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FW7D2007-01	Rev. 01	Initial issue of report	Feb. 23, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting only	PASS	-
3.2	§2.1053 §90.691	Field Strength of Spurious Radiation	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 29.92 dB at 2450.00 MHz



1 General Description

1.1 Applicant

Motorola Mobility LLC

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1944-6
FCC ID	IHDT56XF5
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR/ Bluetooth v 4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE/
IMEI Code	Radiation: 354134090006213/354134090006221
HW Version	DVT1B
SW Version	nora_row_n-userdebug 8.0.0 OPP27.60 222 intcfg,test-keys
EUT Stage	Identical Prototype

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 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	LTE Band 26 : 814.7 ~ 823.3 MHz
Rx Frequency	LTE Band 26 : 859.7 ~ 868.3 MHz
Bandwidth	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz
Maximum Output Power to Antenna	23.20 dBm
Antenna Type	LDS Antenna
Type of Modulation	QPSK / 16QAM

Remark: This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).

1.5 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola (Acbel)	Model Name	SPN5945A C-P35
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 1(EU)	Brand Name	Motorola (Acbel)	Model Name	SPN5944A C-P36
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 1(UK)	Brand Name	Motorola (Acbel)	Model Name	SPN5940A C-P37
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 1(IN)	Brand Name	Motorola (Acbel)	Model Name	SA18C19493 C-P49
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 1(AU)	Brand Name	Motorola (Acbel)	Model Name	SPN5953A C-P48
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 1(AR)	Brand Name	Motorola (Acbel)	Model Name	SPN5942A C-P47
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5.2Vdc,2000mA		
AC Adapter 2(US)	Brand Name	Motorola (Salom)	Model Name	SSW-2919UMTJ C-P35
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 2(EU)	Brand Name	Motorola (Salom)	Model Name	SSW-2919EU C-P36
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 2(UK)	Brand Name	Motorola (Salom)	Model Name	SSW-2919UK C-P37
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 2(AU)	Brand Name	Motorola (Salom)	Model Name	SSW-2919AU C-P48
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA		
AC Adapter 2(AR)	Brand Name	Motorola (Salom)	Model Name	SSW-2919AR C-P47
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5.2Vdc,2000mA		
Battery	Brand Name	Lenovo (SCUD)	Model Name	BL270
	Power Rating	3.85/4.4Vdc,4000mAh	Type	Li-ion
Earphone	Brand Name	Motorola (NEW Leaders)	Model Name	NLD-EM300V-01SF
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
USB Cable	Brand Name	Motorola (Saibao)	Model Name	SLQ-A081A
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		

1.6 Modification of EUT

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



1.7 Re-use of Measured Data

1.7.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT1944-6, FCC ID: IHDT56XF5) is electrically identical to the reference device (Model: XT1922-1, FCC ID: IHDT56XB6) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

1.7.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., some difference of population/depopulation to enable support of different cellular bands, please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix D (Sporton RF Report No. FW7D0507-01 for the reference device Model: XT1922-1, FCC ID: IHDT56XB6):

1.7.3 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for Conducted Band-edge and Conducted spurious emission, the test result were consistent with FCC ID: IHDT56XB6 and radiated spurious emission to re-test.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

1.7.4 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test	Report Title/Section
PCE (LTE)	IHDT56XB6	Part90S (FW7D0507-01)	All conducted sections applicable

1.8 Maximum Conducted Power

FCC Rule	System	Type of Modulation	BW	Maximum Conducted power(W)
Part 90S	LTE Band 26	QPSK	1.4 MHz	0.2014
Part 90S	LTE Band 26	16QAM	1.4 MHz	0.1667
Part 90S	LTE Band 26	QPSK	3 MHz	0.2000
Part 90S	LTE Band 26	16QAM	3 MHz	0.1596
Part 90S	LTE Band 26	QPSK	5 MHz	0.2089
Part 90S	LTE Band 26	16QAM	5 MHz	0.1694
Part 90S	LTE Band 26	QPSK	10 MHz	0.1936
Part 90S	LTE Band 26	16QAM	10 MHz	0.1496
Part 90S	LTE Band 26	QPSK	15 MHz	0.1954
Part 90S	LTE Band 26	16QAM	15 MHz	0.1671

1.9 Testing Site

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.	
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	03CH03-KS	630927

Note: The test site complies with ANSI C63.4 2014 requirement.

1.10 Applied Standards

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

- FCC 47 CFR Part 2, 90
- ANSI/TIA-603-E
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03
- FCC KDB 971168 D02 Misc Rev Approv License Devices v02r01

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

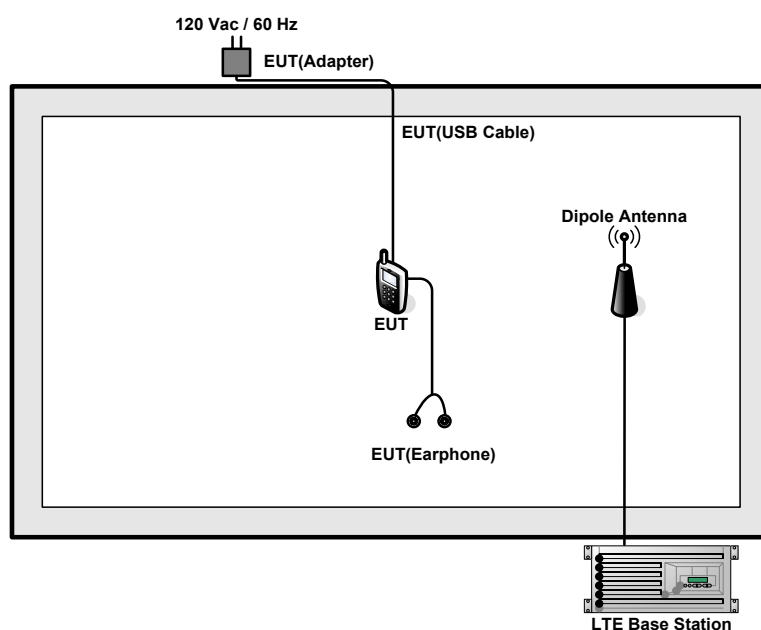
2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is 30 MHz to 10th harmonic.

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	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v
Radiated Spurious Emission	26			v			-	v		v				v	
Note	- The mark "v" 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 BW/RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. - LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.														

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Frequency List of Low/Middle/High Channels

LTE Band 26 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26765	-	-
	Frequency	821.5	-	-
10	Channel	-	26740	-
	Frequency	-	819	-
5	Channel	26715	26740	26765
	Frequency	816.5	819	821.5
3	Channel	26705	26740	26775
	Frequency	815.5	819	822.5
1.4	Channel	26697	26740	26783
	Frequency	814.7	819	823.3

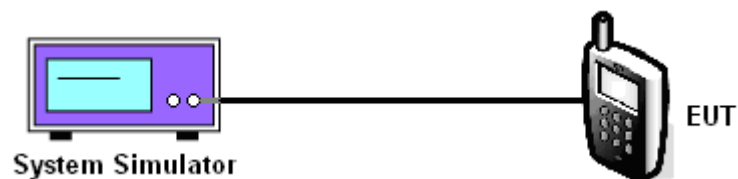
3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

3.1.2 Test Setup



3.1.3 Test Result of Conducted Output Power

Please refer to Appendix A.

3.2 Field Strength of Spurious Radiation Measurement

3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

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 $43 + 10 \log_{10}(P[\text{Watts}])$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.2.2 Measuring Instruments

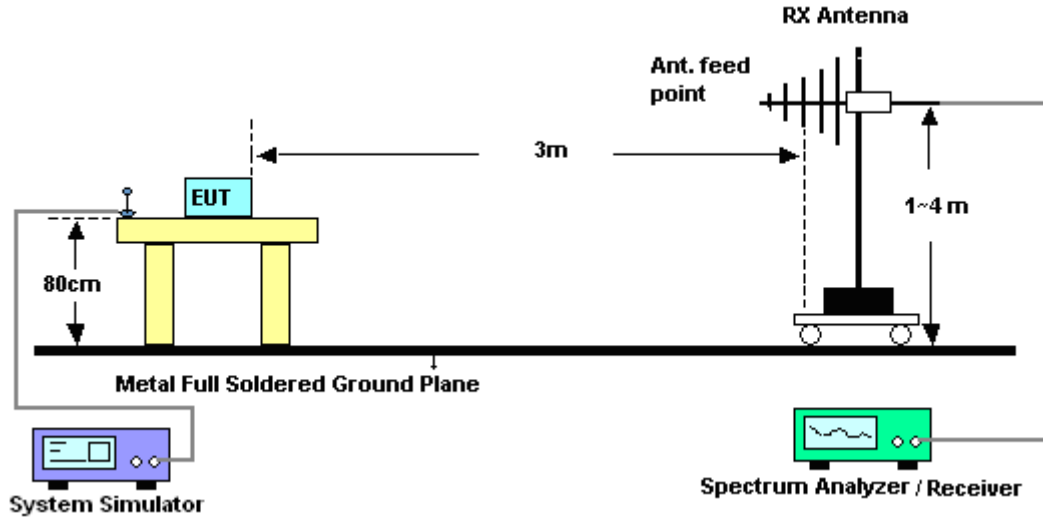
The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

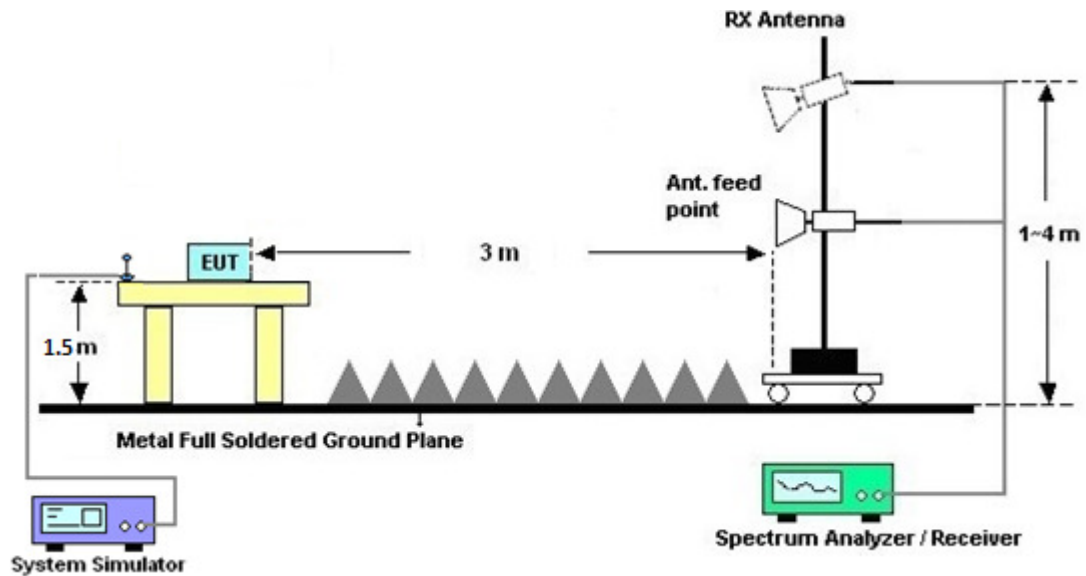
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11. $\text{ERP (dBm)} = \text{EIRP} - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from $43 + 10 \log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10 \log(P)] \text{ (dB)}$
 $= [30 + 10 \log(P)] \text{ (dBm)} - [43 + 10 \log(P)] \text{ (dB)}$
 $= -13 \text{ dBm}.$

3.2.4 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.2.5 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	Keysight	N9010A	MY5515024 4	10Hz~44GHz	Apr. 18, 2017	Feb. 01, 2018	Apr. 17, 2018	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz~2GHz	Apr. 22, 2017	Feb. 01, 2018	Apr. 21, 2018	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120 D	9120D-1356	1GHz~18GHz	Apr. 22, 2017	Feb. 01, 2018	Apr. 21, 2018	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA17024 9	15GHz~40GHz	Feb. 15, 2017	Feb. 01, 2018	Feb. 14, 2018	Radiation (03CH03-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1000MHz / 32 dB	Apr. 18, 2017	Feb. 01, 2018	Apr. 17, 2018	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 12, 2017	Feb. 01, 2018	Oct. 11, 2018	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Feb. 01, 2018	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Feb. 01, 2018	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Feb. 01, 2018	NCR	Radiation (03CH03-KS)

NCR: No Calibration Required



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.8dB
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.3dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power (Average power)

LTE Band 26 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest		
15	1	0	QPSK	22.91	-	-		
15	1	37		22.88				
15	1	74		22.89				
15	36	0		21.99				
15	36	20		22.00				
15	36	39		21.96				
15	75	0		22.02				
15	1	0	16-QAM	22.23				
15	1	37		22.14				
15	1	74		22.16				
15	36	0		20.87				
15	36	20		20.90				
15	36	39		20.85				
15	75	0		20.89				
10	1	0	QPSK	-	22.87	-		
10	1	25			22.82			
10	1	49			22.62			
10	25	0			21.92			
10	25	12			21.97			
10	25	25			21.88			
10	50	0			21.94			
10	1	0	16-QAM		21.60			
10	1	25			21.75			
10	1	49			21.59			
10	25	0			20.94			
10	25	12			20.88			
10	25	25			20.79			
10	50	0			20.85			



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.82	22.63	22.76
5	1	12		23.10	23.20	22.93
5	1	24		22.79	22.96	22.56
5	12	0		21.99	21.85	22.00
5	12	7		22.02	21.92	21.97
5	12	13		21.89	21.94	21.82
5	25	0		21.92	21.83	21.93
5	1	0	16-QAM	21.99	21.98	21.18
5	1	12		22.29	22.13	21.49
5	1	24		21.89	21.18	21.80
5	12	0		21.02	20.66	20.90
5	12	7		20.95	21.05	20.99
5	12	13		21.02	20.95	20.84
5	25	0		20.83	20.77	20.95
3	1	0	QPSK	22.95	22.70	22.73
3	1	8		23.01	22.94	22.90
3	1	14		23.01	22.88	22.72
3	8	0		22.06	22.04	21.83
3	8	4		22.11	21.88	21.87
3	8	7		22.09	21.98	21.87
3	15	0		21.95	21.98	21.86
3	1	0	16-QAM	21.89	22.00	21.42
3	1	8		22.03	21.95	21.48
3	1	14		21.85	21.46	21.18
3	8	0		20.99	20.90	20.80
3	8	4		21.03	20.92	20.86
3	8	7		20.95	21.01	20.88
3	15	0		21.09	20.83	20.93



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	22.86	22.76	22.74
1.4	1	3		22.94	22.85	22.82
1.4	1	5		22.70	22.81	22.80
1.4	3	0		22.95	22.89	22.88
1.4	3	1		23.02	22.94	22.86
1.4	3	3		23.04	22.96	22.89
1.4	6	0		22.10	21.82	21.85
1.4	1	0	16-QAM	22.22	21.54	21.50
1.4	1	3		22.21	21.27	21.22
1.4	1	5		22.14	21.22	21.12
1.4	3	0		21.89	21.54	21.64
1.4	3	1		22.01	21.70	21.83
1.4	3	3		21.97	21.64	21.86
1.4	6	0		20.87	20.64	20.58



Appendix B. Test Results of Radiated Test

LTE Band 26 / 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	1634	-56.26	-13	-43.26	-61.35	-58.17	1.14	5.20	H
	2450	-56.56	-13	-43.56	-67.67	-59.19	1.12	5.90	H
	3267	-51.93	-13	-38.93	-61.90	-55.14	1.34	6.70	H
	1634	-57.17	-13	-44.17	-62.50	-59.08	1.14	5.20	V
	2450	-42.92	-13	-29.92	-54.05	-45.55	1.12	5.90	V
	3267	-56.00	-13	-43.00	-66.13	-59.21	1.34	6.70	V

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



Appendix D. Reference Report

Please refer to Sporton report number FW7D0507-01 which is issued separately.