



FCC RADIO TEST REPORT

FCC ID : IHDT56XP4
Equipment : Mobile Cellular Phone
Brand Name : Motorola
Model Name : XT1962-6
Applicant : Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL
60654 USA
Manufacturer : Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL
60654 USA
Standard : FCC 47 CFR Part 2, and 90(S)

The product was received on Sep. 08, 2018 and testing was started from Sep. 29, 2018 and completed on Oct. 10, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FG890804-04C	01	Initial issue of report	Oct. 30, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046 §90.635	Conducted Output Power and Effective Radiated Power	Pass	-
-	-	Peak-to-Average Ratio	Not Required	-
-	§2.1049 §90.209	Occupied Bandwidth and 26dB Bandwidth	Not Required	-
-	§2.1051 §90.691	Emission masks – In-band emissions	Not Required	-
-	§2.1051 §90.691	Emission masks – Out of band emissions	Not Required	-
-	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	Not Required	-
3.3	§2.1053 §90.691	Field Strength of Spurious Radiation	Pass	Under limit 22.32 dB at 2464.000 MHz
Remark: 1. Not required means after assessing, test items are not necessary to carry out. 2. This is a variant report. All the test cases were performed on original report which can be referred to Sporton Report Number FG890804C and FG890804-02C.				

Reviewed by: Wii Chang

Report Producer: Natasha Hsieh



1 General Description

1.1 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1962-6
FCC ID	IHDT56XP4
IMEI Code	Conducted : IMEI1:355579090011036 IMEI2:355579090011044 Radiation : IMEI1: 355579090014212 IMEI2: 355579090014220
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/GNSS/FM WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	DVT1B
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.



Accessory List	
AC Adapter 1	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Salom
AC Adapter 1	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Salom
AC Adapter 1	Brand Name : Motorola
	Model Name : SC-53
	Manufacturer : Salom
AC Adapter 1	Brand Name : Motorola
	Model Name : SC-55
	Manufacturer : Salom
AC Adapter 1 (IN)	Brand Name : Motorola
	Model Name : SC-55
	Manufacturer : Salom
AC Adapter 1 (IN Local Build)	Brand Name : Motorola
	Model Name : SC-54
	Manufacturer : Flex
AC Adapter 2	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Chenyang
AC Adapter 2	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Chenyang
AC Adapter 2	Brand Name : Motorola
	Model Name : SC-53
	Manufacturer : Chenyang
AC Adapter 2	Brand Name : Motorola
	Model Name : SC-55
	Manufacturer : Chenyang
AC Adapter 2 (IN Local Build)	Brand Name : Motorola
	Model Name : SC-54
	Manufacturer : Chenyang
Battery	Brand Name : Motorola
	Model Name : JG30
	Manufacturer : Amperex
Earphone	Brand Name : Motorola
	Model Name : SH38C37773
	Manufacturer : Lyand
USB Cable 1	Brand Name : Cabletech
	Model Name : SKN6473A
USB Cable 2	Brand Name : Saibao
	Model Name : SKN6473A
USB Cable 3	Brand Name : Luxshare
	Model Name : SKN6473A

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 26 : 814.7 ~ 823.3 MHz
Rx Frequency	LTE Band 26 : 859.7 ~ 868.3 MHz
Bandwidth	LTE Band 26 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz
Maximum Output Power to Antenna	LTE Band 26: 23.25 dBm
Antenna Type	Fixed Internal Antenna and Dipole Antenna
Antenna Gain	LTE Band 26: 0.0 dBi
Type of Modulation	QPSK / 16QAM

1.3 Modification of EUT

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

1.4 Testing Site

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH05-HY	03CH07-HY

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



1.5 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
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ Interim Guidance for Equipment Authorization of Devices with Channel Bandwidths Combined Across Two Contiguous Service Rule Allocations OET/Lab/EACB, June 6, 2013

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

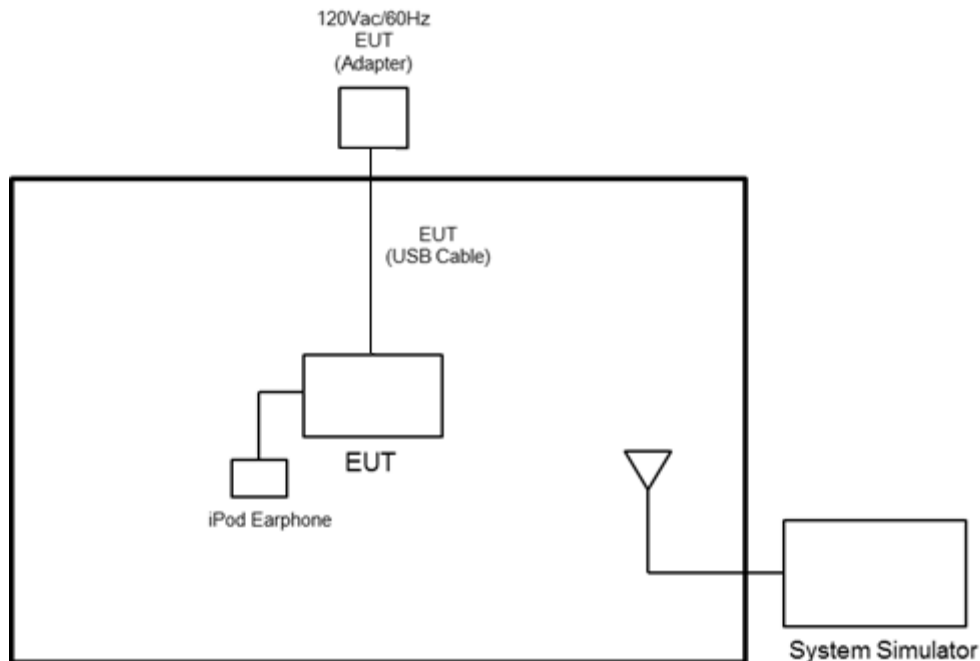
During all testing, EUT is in link mode with base station emulator at maximum power level.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

Frequency range investigated for radiated emission is 30 MHz to 9000 MHz.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	26	V	V	V	V	V	-	V	V	V	V	V	V	V	V	V
E.R.P.	26					V	-	V	V	V	V			V	V	V
Radiated Spurious Emission	26	Worst Case													V	
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. 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. 4. All the radiated test cases were performed with Adapter 1 and USB Cable 1 Type C															

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

2.4 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

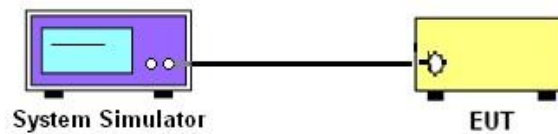
3 Conducted Test Items

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 Measurement and ERP Measurement

3.2.1 Description of the Conducted Output Power Measurement and ERP 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.

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 26.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, 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 transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through 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 Field Strength of Spurious Radiation Measurement

3.3.1 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.

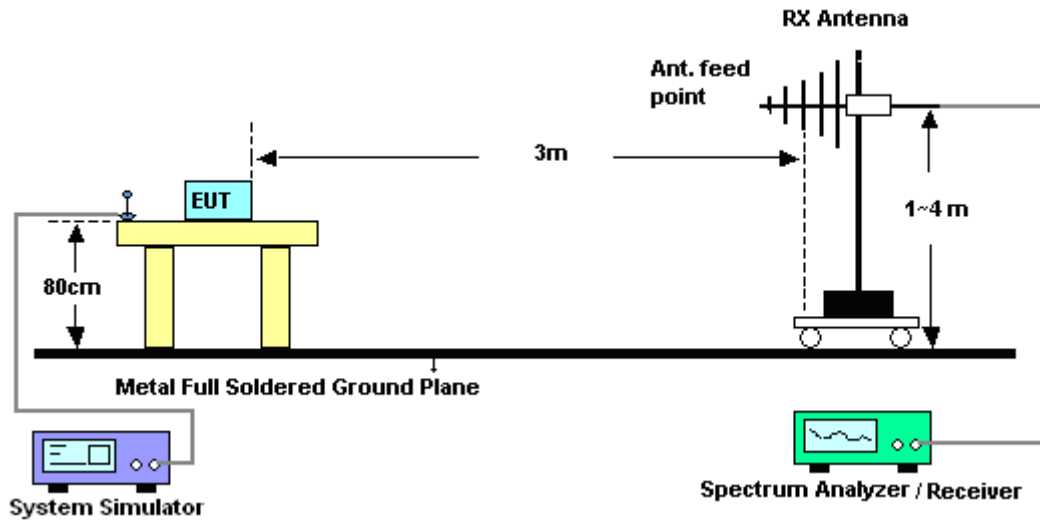
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log_{10}(P[\text{Watts}])$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.3.2 Test Procedures

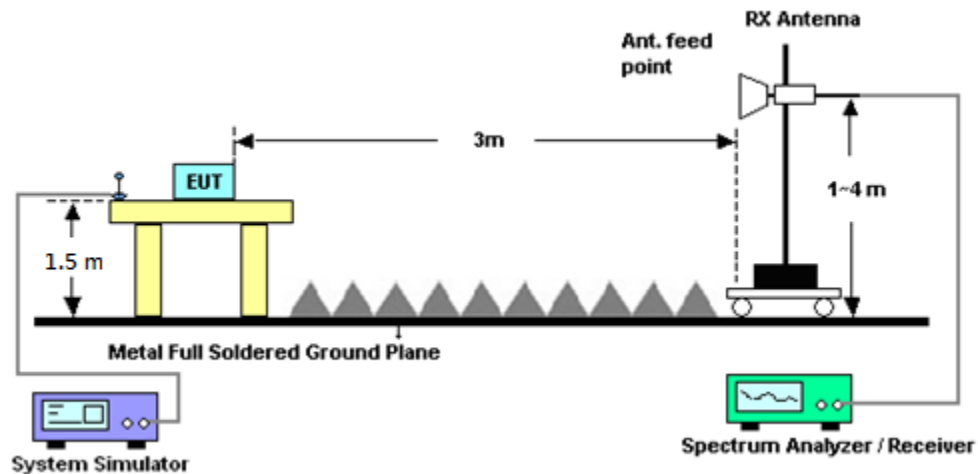
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
1. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
2. The table was rotated 360 degrees to determine the position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

3.3.3 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.3.4 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
LTE Base Station	Anritsu	MT8820C	6201432821	GSM/GPRS /WCDMA/LTE	Oct. 13, 2017	Oct. 10, 2018	Oct. 12, 2018	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890089	1V~20V 0.5A~5A	Jan. 12, 2018	Oct. 10, 2018	Jan. 11, 2019	Conducted (TH05-HY)
Coupler	Warison	1-18GHz 20 dB 25WSM A Directional Coupler	#B	1G~18GHz	Dec. 04, 2017	Oct. 10, 2018	Dec. 03, 2018	Conducted (TH05-HY)
Bilog Antenna	TESEQ	CBL 6111D&0080 0N1D01N-06	35419&03	30MHz to 1GHz	Dec. 18, 2017	Sep. 29, 2018~ Oct. 01, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00211469	1GHz ~ 18GHz	Aug. 06, 2018	Sep. 29, 2018~ Oct. 01, 2018	Aug. 05, 2019	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00066583	1GHz ~ 18GHz	Aug. 06, 2018	Sep. 29, 2018~ Oct. 01, 2018	Aug. 05, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-001 01800-30-10 P	1590075	1GHz ~ 18GHz	Apr. 25, 2018	Sep. 29, 2018~ Oct. 01, 2018	Apr. 24, 2019	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY5347011 8	10Hz~44GHz	Apr. 17, 2018	Sep. 29, 2018~ Oct. 01, 2018	Apr. 16, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 27, 2018	Sep. 29, 2018~ Oct. 01, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 27, 2018	Sep. 29, 2018~ Oct. 01, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 27, 2018	Sep. 29, 2018~ Oct. 01, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Sep. 29, 2018~ Oct. 01, 2018	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF7802083 68	Control Ant Mast	N/A	Sep. 29, 2018~ Oct. 01, 2018	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Sep. 29, 2018~ Oct. 01, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Sep. 29, 2018~ Oct. 01, 2018	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Sep. 29, 2018~ Oct. 01, 2018	Jul. 15, 2019	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 10, 2017	Sep. 29, 2018~ Oct. 01, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 16, 2018	Sep. 29, 2018~ Oct. 01, 2018	Jan. 15, 2019	Radiation (03CH07-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 22, 2018	Sep. 29, 2018~ Oct. 01, 2018	May 21, 2019	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	80504004656H	N/A	N/A	Sep. 29, 2018~ Oct. 01, 2018	N/A	Radiation (03CH07-HY)
Filter	Microwave	H1G013G1	SN477215	1.0G High Pass	Dec. 07, 2017	Sep. 29, 2018~ Oct. 01, 2018	Dec. 06, 2018	Radiation (03CH07-HY)
Filter	Microwave	H3G018G1	SN477220	3.0G High Pass	Nov. 21, 2017	Sep. 29, 2018~ Oct. 01, 2018	Nov. 20, 2018	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT2500/2700-10/20-10SSK	SN3	WCDMA Band 8	Nov. 03, 2017	Sep. 29, 2018~ Oct. 01, 2018	Nov. 02, 2018	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.70
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.50
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.20
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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	23.14	-	-
15	1	37		23.25	-	-
15	1	74		23.12	-	-
15	36	0		22.29	-	-
15	36	20		22.29	-	-
15	36	39		22.06	-	-
15	75	0		22.21	-	-
15	1	0	16-QAM	22.53	-	-
15	1	37		22.46	-	-
15	1	74		22.44	-	-
15	36	0		21.25	-	-
15	36	20		21.21	-	-
15	36	39		21.07	-	-
15	75	0		21.20	-	-
10	1	0	QPSK	-	22.84	-
10	1	25		-	23.14	-
10	1	49		-	23.02	-
10	25	0		-	22.10	-
10	25	12		-	22.05	-
10	25	25		-	21.96	-
10	50	0		-	21.85	-
10	1	0	16-QAM	-	22.01	-
10	1	25		-	22.36	-
10	1	49		-	21.78	-
10	25	0		-	21.00	-
10	25	12		-	21.06	-
10	25	25		-	20.98	-
10	50	0		-	20.92	-



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	22.83	22.86	22.68
5	1	12		23.03	23.03	22.89
5	1	24		23.13	22.78	22.68
5	12	0		22.29	22.05	21.97
5	12	7		22.27	21.96	21.91
5	12	13		22.15	22.02	21.91
5	25	0		22.28	22.00	21.90
5	1	0	16-QAM	22.42	22.21	22.16
5	1	12		22.41	22.19	22.10
5	1	24		22.46	22.13	22.05
5	12	0		21.25	21.12	20.93
5	12	7		21.19	21.18	20.93
5	12	13		21.34	21.06	20.99
5	25	0		21.14	21.07	20.95
3	1	0	QPSK	22.90	23.10	22.96
3	1	8		23.13	22.71	22.98
3	1	14		23.09	22.89	22.80
3	8	0		22.07	22.08	21.89
3	8	4		22.21	21.91	21.99
3	8	7		22.09	22.07	21.89
3	15	0		22.24	21.98	21.93
3	1	0	16-QAM	22.31	22.21	22.15
3	1	8		22.36	22.21	22.19
3	1	14		22.35	22.11	21.94
3	8	0		21.34	21.22	21.12
3	8	4		21.37	21.18	21.03
3	8	7		21.34	21.05	21.08
3	15	0		21.13	20.99	20.80



LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0	QPSK	22.87	22.58	22.64
1.4	1	3		22.97	22.71	22.82
1.4	1	5		23.00	22.72	22.59
1.4	3	0		22.79	22.66	22.67
1.4	3	1		22.85	22.82	22.74
1.4	3	3		22.91	22.63	22.54
1.4	6	0		22.24	22.32	22.10
1.4	1	0	16-QAM	22.88	22.45	22.49
1.4	1	3		22.85	22.64	22.51
1.4	1	5		22.80	22.50	22.55
1.4	3	0		22.20	22.27	22.33
1.4	3	1		22.47	22.28	22.26
1.4	3	3		22.43	22.23	22.18
1.4	6	0		21.57	21.36	21.21



Appendix B. Test Results of ERP and Radiated Test

ERP

<Reporting Only>

LTE Band 26 / 15MHz (Channel 26765) (GT - LC = 0 dB)							
Channel	Mode	RB		Conducted		ERP	
		Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	37	23.25	0.2113	21.10	0.1288
Middle		-	-	-	-	-	-
Highest		-	-	-	-	-	-
Lowest	16QAM	1	0	22.53	0.1791	20.38	0.1091
Middle		-	-	-	-	-	-
Highest		-	-	-	-	-	-
Limit	ERP < 7W			Result		PASS	

**Radiated Spurious Emission****Part 90S LTE Band 26**

LTE Band 26 / 5MHz / QPSK									
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	1640	-55.84	-13	-42.84	-68.22	-57.62	0.97	4.91	H
	2464	-35.32	-13	-22.32	-52.84	-37.18	1.28	5.29	H
	4104	-56.87	-13	-43.87	-77.59	-61.52	1.82	8.62	H
									H
									H
									H
									H
	1640	-59.66	-13	-46.66	-72.46	-61.44	0.97	4.91	V
	2464	-40.33	-13	-27.33	-58.27	-42.19	1.28	5.29	V
	4104	-56.65	-13	-43.65	-77.55	-61.3	1.82	8.62	V
									V
									V
									V
									V

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