



FCC RADIO TEST REPORT

FCC ID : IHDT56XS1
Equipment : Mobile Cellular Phone
Brand Name : Motorola
Model Name : XT1980-4
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 : 47 CFR Part 2, 24(E)

The product was received on Mar. 05, 2019 and testing was started from Mar. 23, 2019 and completed on Mar. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 partial 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: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test	5
1.2 Product Specification of Equipment Under Test	5
1.3 Modification of EUT	5
1.4 Testing Location	6
1.5 Applicable Standards	6
2 Test Configuration of Equipment Under Test	7
2.1 Test Mode.....	7
2.2 Connection Diagram of Test System	7
2.3 Support Unit used in test configuration	8
2.4 Frequency List of Low/Middle/High Channels.....	8
3 Radiated Test Items	9
3.1 Measuring Instruments.....	9
3.2 Test Setup	9
3.3 Test Result of Radiated Test.....	9
3.4 Field Strength of Spurious Radiation Measurement	10
4 List of Measuring Equipment.....	11
5 Uncertainty of Evaluation	12
Appendix A. Test Results of Radiated Test	



History of this test report

Report No.	Version	Description	Issued Date
FG930415-06A	01	Initial issue of report	Apr. 19, 2019



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.4	§2.1053 §24.238 (a)	Field Strength of Spurious Radiation	Pass	Under limit 26.97 dB at 5640.000 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Maggie Chiang

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1980-4
FCC ID	IHDT56XS1
IMEI Code	352157100008509
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/GNSS/NFC/FM WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DVT2
EUT Stage	Identical Prototype

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

Accessory List	
WPC Cover	Brand Name : Motorola
	Model Name : MD100W

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	CDMA2000 BC1 1851.25 MHz ~ 1908.75 MHz
Rx Frequency	CDMA2000 BC1 1931.25 MHz ~ 1988.75 MHz
Antenna Type / Gain	Dipole Antenna with -1.0 dBi
Type of Modulation	CDMA2000 1xRTT: QPSK
	CDMA2000 1xEV-DO: QPSK/8PSK

1.3 Modification of EUT

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



1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH11-HY

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

FCC Designation No.: TW0007

1.5 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ 47 CFR Part 2, 24(E)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

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 were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated emissions were investigated as following frequency range:

30 MHz to 19100 MHz for CDMA BC1.

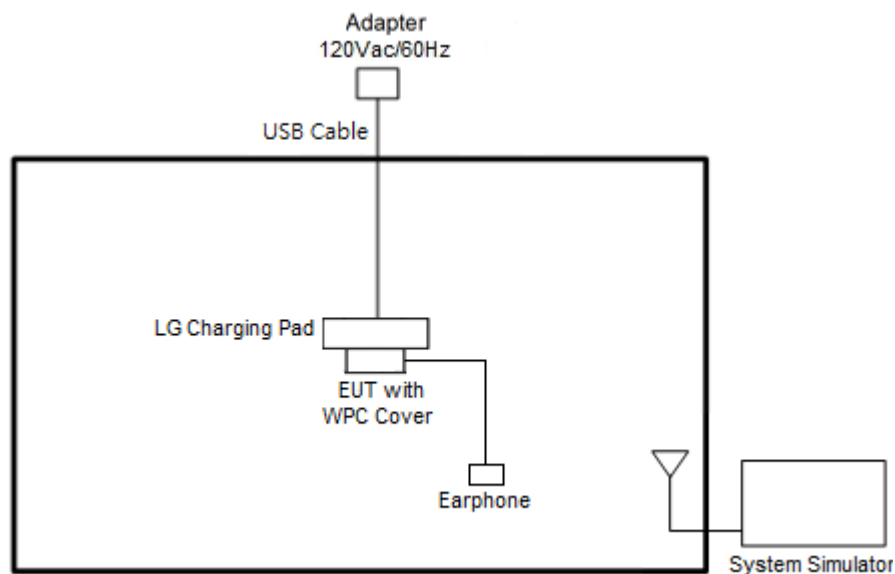
All modes and data rates and positions were investigated.

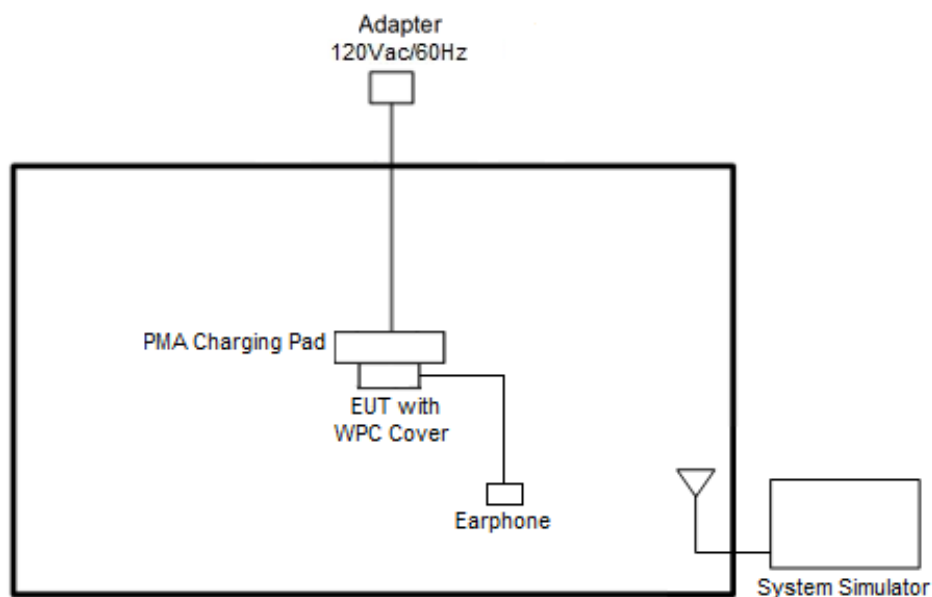
Test modes are chosen to be reported as the worst case configuration below:

Test Modes	
Band	Radiated TCs
CDMA BC1	■ 1xRTT Link

2.2 Connection Diagram of Test System

<WPC Charging Mode>



<PMA Charging Mode>

2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	LG Charging Pad	LG	WCD-110	FCC DoC	N/A	N/A
3.	PMA Charging pad	Moto	kinxie	N/A	N/A	N/A
4.	USB Cable	N/A	N/A	N/A	N/A	N/A
5.	Adapter	N/A	N/A	N/A	N/A	N/A
6.	Earphone	Moto	SH38C16618	FCC DoC	Unshielded, 1.0 m	N/A

2.4 Frequency List of Low/Middle/High Channels

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
CDMA2000 BC1	Channel	25	600	1175
	Frequency	1851.25	1880.0	1908.75

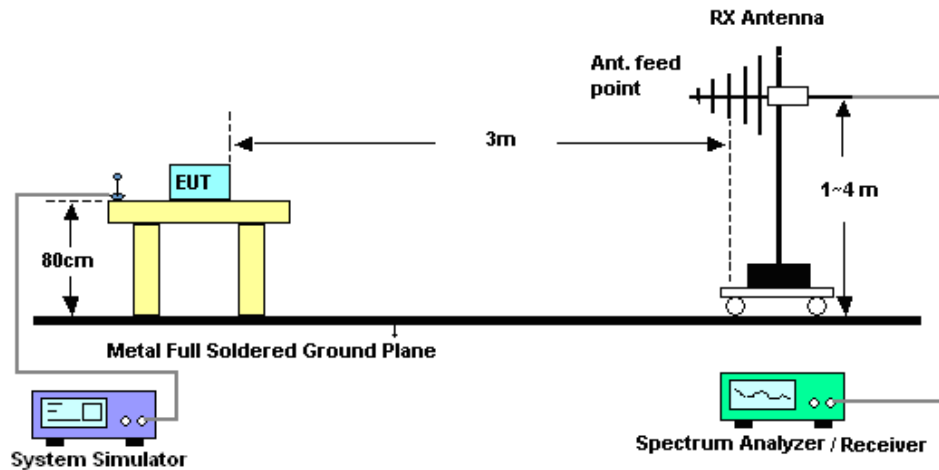
3 Radiated Test Items

3.1 Measuring Instruments

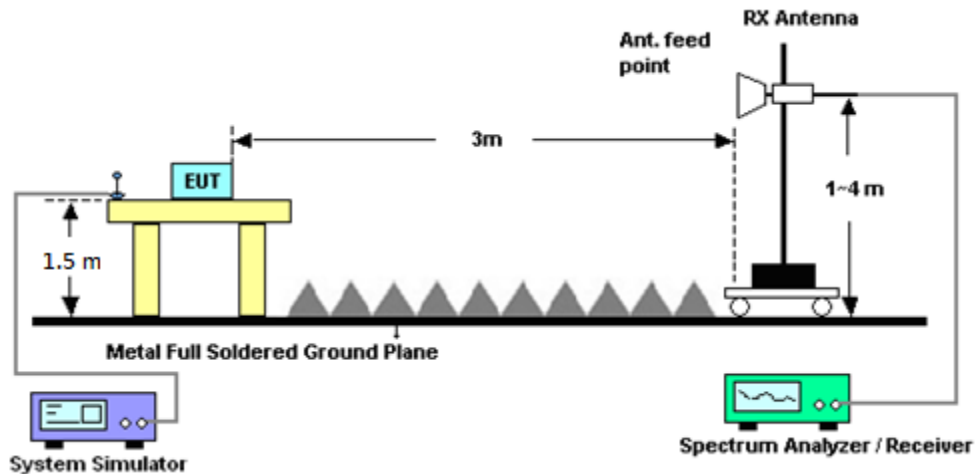
See list of measuring instruments of this test report.

3.2 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.3 Test Result of Radiated Test

Please refer to Appendix A.



3.4 Field Strength of Spurious Radiation Measurement

3.4.1 Description of Field Strength of Spurious Radiated Measurement

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

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the 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 for the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking 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. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
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)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Mar. 23, 2019	Jul. 15, 2019	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 04, 2018	Mar. 23, 2019	Dec. 03, 2019	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-06	35414&AT-N06 02	30MHz~1GHz	Oct. 13, 2018	Mar. 23, 2019	Oct. 12, 2019	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 15, 2018	Mar. 23, 2019	Oct. 14, 2019	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Nov. 09, 2018	Mar. 23, 2019	Nov. 08, 2019	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Mar. 23, 2019	Nov. 22, 2019	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270148	1GHz~26.5GHz	Nov. 14, 2018	Mar. 23, 2019	Nov. 13, 2019	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Oct. 18, 2018	Mar. 23, 2019	Oct. 17, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-1080 -1200-1500-60 SS	SN2	1.2G High Pass	Sep. 17, 2018	Mar. 23, 2019	Sep. 16, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OSS	SN3	2.7G High Pass	Sep. 17, 2018	Mar. 23, 2019	Sep. 16, 2019	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Mar. 23, 2019	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Mar. 23, 2019	N/A	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Jan. 19, 2019	Mar. 23, 2019	Jan. 18, 2020	Radiation (03CH11-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 22, 2018	Mar. 23, 2019	May 21, 2019	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz- 40GHz	May 08, 2018	Mar. 23, 2019	May 07, 2019	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Mar. 23, 2019	N/A	Radiation (03CH11-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.37
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.67
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.03
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Appendix A. Test Results of Radiated Test

<WPC Charging Mode>

<LG Charging pad>

CDMA 1900 1xRTT									
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	3762	-56.69	-13	-43.69	-73.22	-68.5	0.69	12.50	H
	5640	-39.97	-13	-26.97	-61.12	-52.1	0.98	13.12	H
	7520	-52.32	-13	-39.32	-77.06	-61.6	1.18	10.46	H
									H
	3762	-53.59	-13	-40.59	-71.34	-65.4	0.69	12.50	V
	5640	-42.37	-13	-29.37	-63.93	-54.5	0.98	13.12	V
	7520	-52.42	-13	-39.42	-77.21	-61.7	1.18	10.46	V
									V

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

<PMA Charging pad>

CDMA 1900 1xRTT									
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	3762	-56.09	-13	-43.09	-73.01	-67.9	0.69	12.50	H
	5640	-45.97	-13	-32.97	-67.7	-58.1	0.98	13.12	H
	7520	-52.92	-13	-39.92	-77.19	-62.2	1.18	10.46	H
									H
	3762	-55.69	-13	-42.69	-73.7	-67.5	0.69	12.50	V
	5640	-41.97	-13	-28.97	-63.41	-54.1	0.98	13.12	V
	7520	-52.42	-13	-39.42	-77.24	-61.7	1.18	10.46	V
									V

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

————THE END————