



FCC RF Test Report

APPLICANT : Motorola Mobility, LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : 9653
FCC ID : IHDT56WA1
STANDARD : FCC 47 CFR Part 2, 22(H)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original test report. The product was received on May 02, 2017 and testing was completed on May 03, 2017. 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 / EIA-603-D-2010 and has been 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 INC., the test report shall not be reproduced except in full.

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Approved by: Jones Tsai / Manager



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FCC ID : IHDT56WA1

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APPENDIX A. TEST RESULTS OF RADIATED TEST



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1053 §22.917(a)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 35.56 dB at 1672.000 MHz



1 General Description

1.1 Applicant

Motorola Mobility, LLC

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

1.2 Manufacturer

Motorola Mobility, LLC

222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	9653
FCC ID	IHDT56WA1
IMEI Code	3351884080020946
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC/FM WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth BR/EDR/LE
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report by adding WPC Back cover. All the test cases were performed on original report which can be referred to Sporton Report Number FG720310A. Based on the original report, only worst case was verified.

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



1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM/GPRS/EDGE: 850: 824.2 MHz ~ 848.8 MHz 1900: 1850.2 MHz ~ 1909.8MHz WCDMA: Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz Band IV: 1712.4 MHz ~ 1752.6 MHz CDMA2000: BC0: 824.70 MHz ~ 848.31 MHz BC1: 1851.25 MHz ~ 1908.75 MHz
Rx Frequency	GSM/GPRS/EDGE: 850: 869.2 MHz ~ 893.8 MHz 1900: 1930.2 MHz ~ 1989.8 MHz WCDMA: Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz Band IV: 2112.4 MHz ~ 2152.6 MHz CDMA2000: BC0: 869.70 MHz ~ 893.31 MHz BC1: 1931.25 MHz ~ 1988.75 MHz
Antenna Type	Coupling type (LDS) Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK (Uplink) HSDPA: 64QAM (Downlink) HSUPA: QPSK (Uplink) CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: QPSK/8PSK

1.5 Modification of EUT

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



1.6 Testing Location

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, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. 03CH07-HY

1.7 Applicable Standards

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

- ♦ 47 CFR Part 2, 22(H)
- ♦ ANSI / TIA / EIA-603-D-2010
- ♦ 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 were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

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

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 18000 MHz for GSM850.

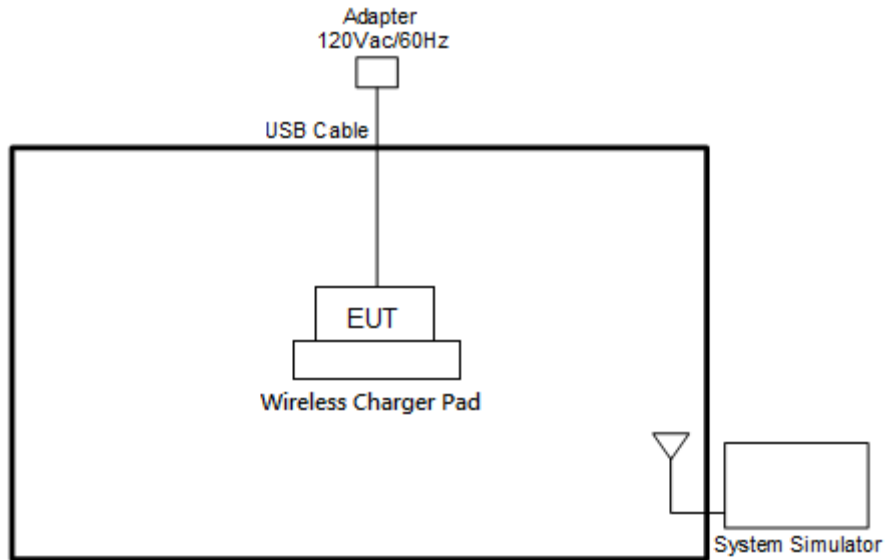
All modes and data rates and positions were investigated.

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

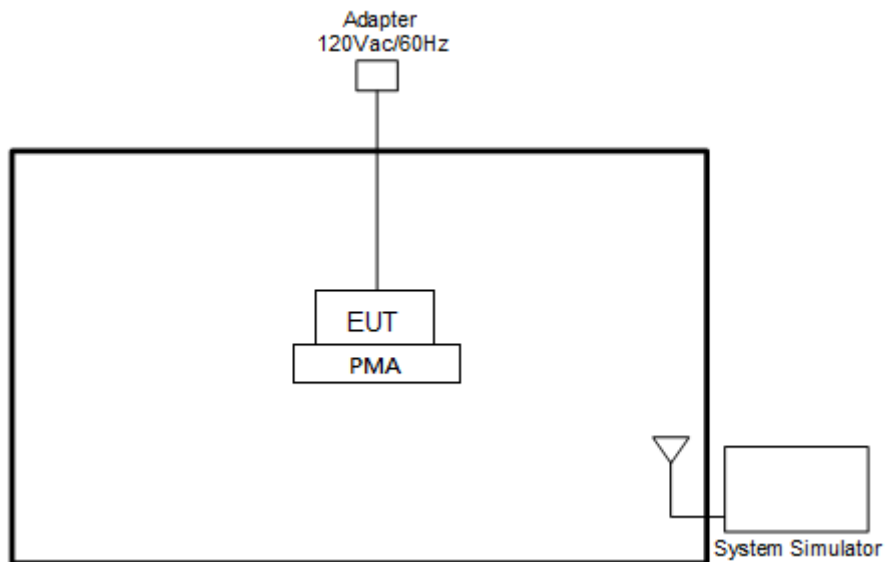
Test Modes	
Band	Radiated TCs
GSM 850	■ GPRS Class 8 Link

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.	Adapter	HUAWEI	HW-059200UHQ	FCC DoC	N/A	N/A
3.	USB Cable	HUAWEI	N/A	FCC DoC	N/A	N/A
4.	WPC Pad	LG	WCD-100	FCC DoC	N/A	N/A
5.	PMA Pad	DURACELL	M-018B-518A	FCC DoC	N/A	N/A

2.4 Frequency List of Low/Middle/High Channels

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
GSM850	Channel	-	189	-
	Frequency	-	836.4	-

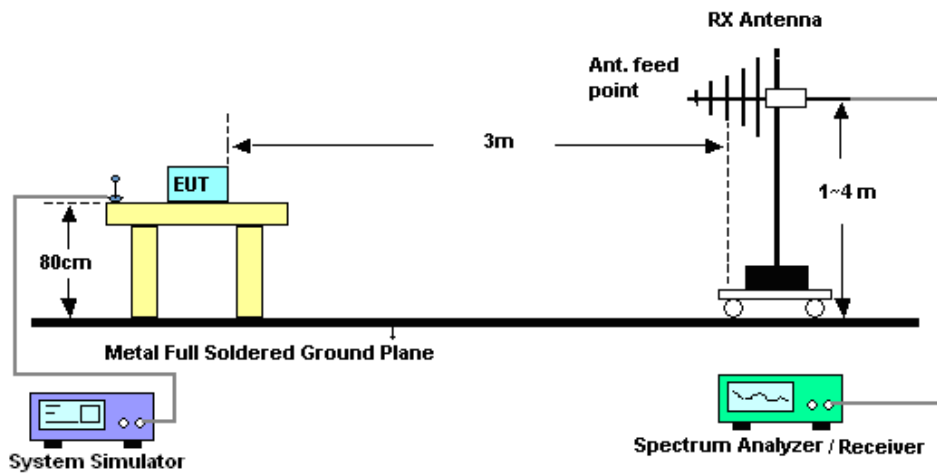
3 Radiated Test Items

3.1 Measuring Instruments

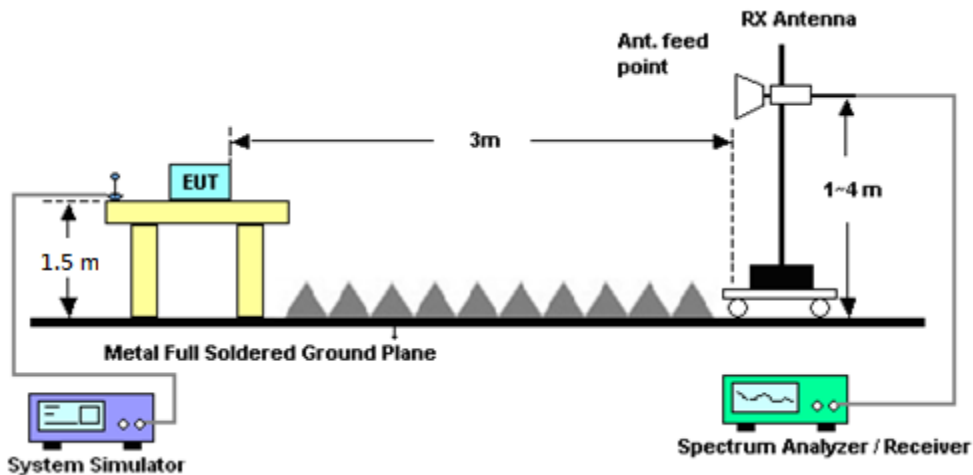
See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 For radiated test from 30MHz to 1GHz



3.2.2 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

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. 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.
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 for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking 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. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12. $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. 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
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2016	May 03, 2017	Aug. 18, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 26, 2016	May 03, 2017	Oct. 25, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	May 03, 2017	Sep. 01, 2017	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	May 03, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D&008	35419&03	30MHz to 1GHz	Jan. 07, 2017	May 03, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-1	1590075	1GHz ~ 18GHz	Apr. 25, 2017	May 03, 2017	Apr. 24, 2018	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	May 03, 2017	Jun. 13, 2017	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Apr. 17, 2017	May 03, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	May 03, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	May 03, 2017	N/A	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 08, 2016	May 03, 2017	Nov. 07, 2017	Radiation (03CH07-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 04, 2017	May 03, 2017	Jan. 03, 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% ($U = 2Uc(y)$)	5.7
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.5
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Appendix A. Test Results of Radiated Test

Radiated Spurious Emission

<WPC Charging Mode>

GSM850 (GPRS Class8)									
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	1672	-49.74	-13	-36.74	-37.21	-51.42	0.99	4.82	H
	2512	-59.87	-13	-46.87	-52.58	-61.84	1.29	5.41	H
	3345	-65.83	-13	-52.83	-60.78	-69.44	1.56	7.32	H
	1672	-48.56	-13	-35.56	-36.51	-50.24	0.99	4.82	V
	2512	-62.77	-13	-49.77	-55.94	-64.74	1.29	5.41	V
	3344	-65.58	-13	-52.58	-60.79	-69.19	1.56	7.31	V

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

<PMA Charging Mode>

GSM850 (GPRS Class8)									
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	1672	-61.87	-13	-48.87	-49.3	-63.55	0.99	4.82	H
	2512	-48.65	-13	-35.65	-41.42	-50.62	1.29	5.41	H
	3345	-65.82	-13	-52.82	-60.81	-69.43	1.56	7.32	H
	1672	-62.14	-13	-49.14	-50.06	-63.82	0.99	4.82	V
	2512	-56.88	-13	-43.88	-50.09	-58.85	1.29	5.41	V
	3344	-65.46	-13	-52.46	-60.66	-69.07	1.56	7.31	V

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