



# FCC CO-LOCATION RADIO TEST REPORT

**FCC ID** : IHDT56ZB2  
**Equipment** : Mobile Cellular Phone  
**Brand Name** : Motorola  
**Model Name** : XT2071-4  
**Applicant** : Motorola Mobility, LLC  
222 W Merchandise Mart Plaza, Suite 1800,  
Chicago, IL 60654, United States  
**Manufacturer** : Motorola Mobility, LLC  
222 W Merchandise Mart Plaza, Suite 1800,  
Chicago, IL 60654, United States  
**Standard** : FCC 47 CFR Part 2, 22(H)

The product was received on May 12, 2020 and testing was started from May 30, 2020 and completed on Jun. 23, 2020. 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 test results in this 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.

*Louis Wu*

Approved by: Louis Wu

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.4	§2.1053 §22.917 (a)	Field Strength of Spurious Radiation (GSM850)	Pass	Under limit 32.82 dB at 1672.000 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: Yvonne Cheng



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2071-4
FCC ID	IHDT56ZB2
IMEI Code	<b>Radiation :</b> IMEI 1: 351648110008993 IMEI 2: 351648110009009
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/ GNSS/NFC 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.



<b>Accessory List</b>	
<b>AC Adapter 1 (US)</b>	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Chenyang
<b>AC Adapter 1 (EU)</b>	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Chenyang
<b>AC Adapter 1 (UK)</b>	Brand Name : Motorola
	Model Name : SC-53UK
	Manufacturer : Chenyang
<b>AC Adapter 1 (AR)</b>	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Chenyang
<b>AC Adapter 1 (AU)</b>	Brand Name : Motorola
	Model Name : SC-55AU
	Manufacturer : Chenyang
<b>AC Adapter 2 (US)</b>	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Acbel
<b>AC Adapter 2 (EU)</b>	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Acbel
<b>AC Adapter 2 (AR)</b>	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Acbel
<b>AC Adapter 3 (IN)</b>	Brand Name : Motorola
	Model Name : SC-54
	Manufacturer : Salom
<b>Battery 1</b>	Brand Name : Motorola
	Model Name : LS30
	Manufacturer : ATL
<b>Battery 2</b>	Brand Name : Motorola
	Model Name : LS40
	Manufacturer : ATL
<b>Standard 3.5mm Headset 1</b>	Brand Name : Motorola
	Model Name : SH38C37773
	Manufacturer : Lianyun
<b>Standard 3.5mm Headset 2</b>	Brand Name : Motorola
	Model Name : SH38C44959
	Manufacturer : Lianyun
<b>USB-C to 3.5mm headset adaptor 1</b>	Brand Name : Motorola
	Model Name : SC18C27844
<b>USB-C to 3.5mm headset adaptor 2</b>	Brand Name : Motorola
	Model Name : SC18C27845
<b>USB Cable 1</b>	Brand Name : Motorola
	Model Name : SC18C24367
	Manufacturer : Saibao
<b>USB Cable 2</b>	Brand Name : Motorola
	Model Name : SC18C24368
	Manufacturer : Luxshare



## 1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz
Antenna Type	Fixed Internal Antenna
Antenna Gain	Cellular Band: -4.7 dBi
Type of Modulation	GSM / GPRS: GMSK EGPRS: GMSK for MCS 0 ~ 4 & 8PSK for MCS5 ~9

## 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. EMC & Wireless Communications Laboratory
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.	<b>Sporton Site No.</b> 03CH11-HY
Test Engineer	Cookie Ku, Fu Chen and Troye Hsieh
Temperature	19.1~26.4°C
Relative Humidity	50~68.9%

**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 C63.10-2013
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H)
- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

**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.a
3. The TAF code is not including all the FCC KDB listed without accreditation.



## 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.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z and Accessory (Earphone or Adapter). The worst cases (Close Mode with PT Antenna: Y Plane) were recorded in this report.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM850

All modes and data rates and positions were investigated.

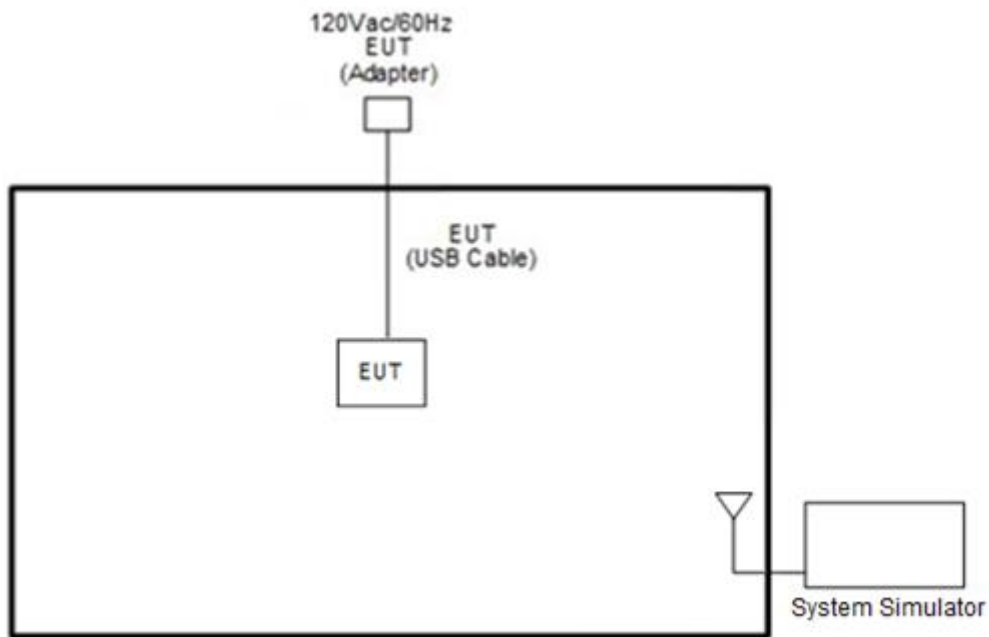
Test modes are chosen to be reported as the worst case configuration below:

Test Modes	
Band	Radiated TCs
GSM850	■ EDGE Class 8 Link

**Remark:**

1. All the radiated test cases were performed with AC Adapter 1 (US), USB Cable 1, and SIM 1.
2. During the Radiated Spurious Emission test, the EUT turn on the WLAN function simultaneously.

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration

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

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
GSM850	Channel	128	189	251
	Frequency	824.2	836.4	848.8

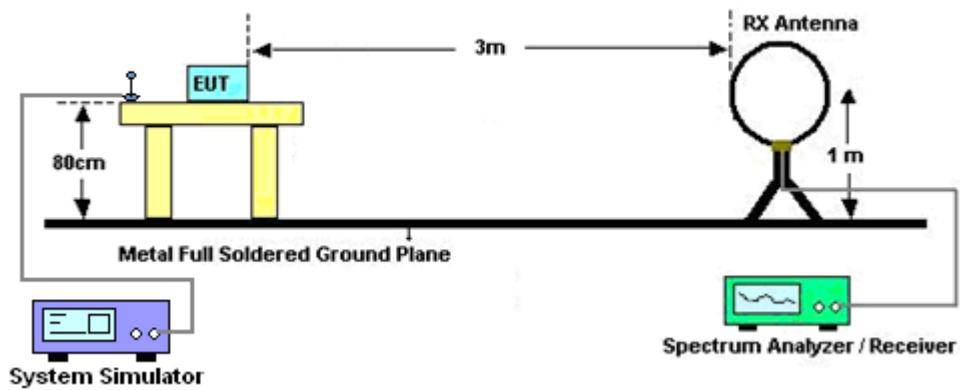
### 3 Radiated Test Items

#### 3.1 Measuring Instruments

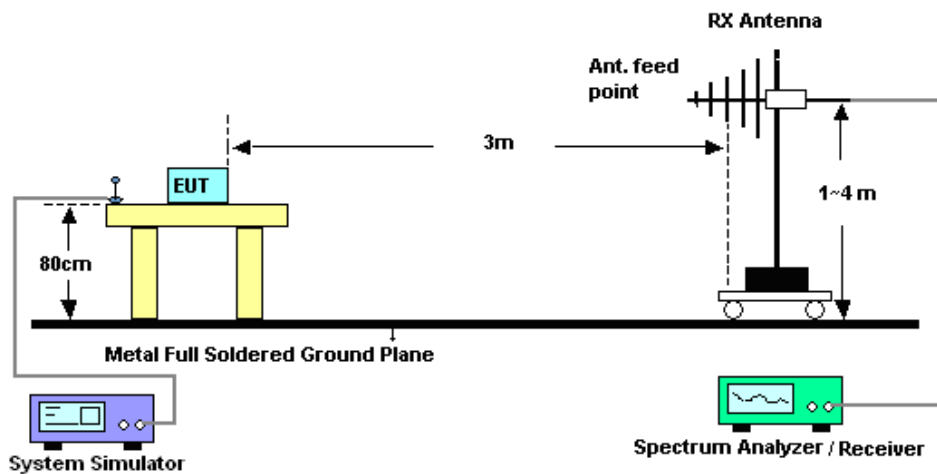
See list of measuring instruments of this test report.

#### 3.2 Test Setup

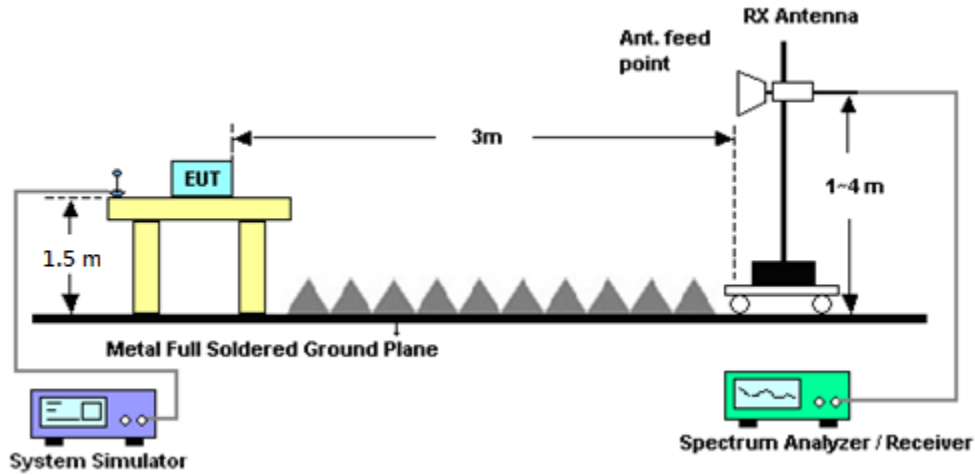
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



### 3.3 Test Result of Radiated Test

Please refer to Appendix A.

**Note:** There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



## 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 7 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.  $EIRP (dBm) = S.G. Power - Tx Cable Loss + Tx Antenna Gain$
11.  $ERP (dBm) = EIRP - 2.15$
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
Preamplifier	EMCE	EMC184045B	980192	18GHz ~ 40GHz	Aug. 01, 2019	May 30, 2020~ Jun. 23, 2020	Jul. 31, 2020	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 03, 2019	May 30, 2020~ Jun. 23, 2020	Dec. 02, 2020	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 12, 2019	May 30, 2020~ Jun. 23, 2020	Oct. 11, 2020	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Nov. 04, 2019	May 30, 2020~ Jun. 23, 2020	Nov. 03, 2020	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 09, 2020	May 30, 2020~ Jun. 23, 2020	Jan. 08, 2021	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 13, 2019	May 30, 2020~ Jun. 23, 2020	Nov. 12, 2020	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Oct. 28, 2019	May 30, 2020~ Jun. 23, 2020	Oct. 27, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN11	1.53G Low Pass	Sep. 15, 2019	May 30, 2020~ Jun. 23, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OSS	SN3	3GHz High Pass	Sep. 15, 2019	May 30, 2020~ Jun. 23, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	May 30, 2020~ Jun. 23, 2020	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	May 30, 2020~ Jun. 23, 2020	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	May 30, 2020~ Jun. 23, 2020	N/A	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Jan. 19, 2019	May 30, 2020~ Jun. 23, 2020	Jan. 18, 2020	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	May 30, 2020~ Jun. 23, 2020	N/A	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP161237	N/A	Oct. 25, 2019	May 30, 2020~ Jun. 23, 2020	Oct. 24, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 12, 2020	May 30, 2020~ Jun. 23, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 12, 2020	May 30, 2020~ Jun. 23, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	30M-18G	Mar. 12, 2020	May 30, 2020~ Jun. 23, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 12, 2020	May 30, 2020~ Jun. 23, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Nov. 07, 2019	May 30, 2020~ Jun. 23, 2020	Nov. 06, 2020	Radiation (03CH11-HY)
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	Nov. 12, 2018	May 30, 2020~ Jun. 23, 2020	Nov. 11, 2020	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% ( $U = 2Uc(y)$ )	3.09
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.44
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### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.95
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# Appendix A. Test Results of Radiated Test

<Close Mode>

<PT Antenna>

## EDGE 850

Part 22H_EDGE 850									
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	1672	-45.82	-13	-32.82	-56.77	-52.82	0.53	9.68	H
	2510	-59.99	-13	-46.99	-74.37	-67.99	0.66	10.81	H
	3344	-57.65	-13	-44.65	-75.22	-66.87	0.76	12.13	H
									H
									H
									H
									H
	1672	-47.55	-13	-34.55	-58.1	-54.55	0.53	9.68	V
	2510	-59.43	-13	-46.43	-74.21	-67.43	0.66	10.81	V
	3344	-57.78	-13	-44.78	-75.14	-67	0.76	12.13	V
									V
									V
									V
									V

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

————THE END————