Spot Check Evaluation

APPLICANT	**:**	**Motorola Mobility LLC**
EQUIPMENT	**:**	**Mobile Cellular Phone**
BRAND NAME	**:**	**Motorola**
MODEL NAME	**:**	**XT2421-3**
FCC ID	**:**	**IHDT56AR2**
STANDARD	**:**	**47 CFR Part 2, 27(M)** **47 CFR Part 15 Subpart C §15.247** **47 CFR Part 15 Subpart E §15.407**

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures 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. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
381718	Rev. 01	Initial issue of report	Nov. 28, 2023

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. 2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

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 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2421-3
FCC ID	IHDT56AR2
IMEI Code	Conducted: 359058510002855/359058510002863 Radiation: 359058510028157/359058510028165
HW Version	DVT2
SW Version	ULA34.53
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 Modification of EUT

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

1.5 Testing Site

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	SPORTON	FCC 15C-15E Test Tools Ver10.0_210607	10.0
2.	TH01-KS	SPORTON	FCC BT2.0 Ver3.0_For_CHINA_190111	3.0
3.	TH01-KS	SPORTON	FCC LTE_Ver2.0 Auto_china_210503	2.0
4.	03CH04-KS	AUDIX	E3	210616

1.7 Applicable Standards

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

- FCC KDB 484596 D01 Referencing Test Data v02r01
- 47 CFR Part 2, 27(M)
- 47 CFR Part 15 Subpart C §15.247
- 47 CFR Part 15 Subpart E §15.407
- ANSI C63.10-2013
- ANSI C63.26-2015

1.8 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-101
AC Adapter 1(EU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-102
AC Adapter 1(UK)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-103
AC Adapter 1(AU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-105
AC Adapter 1(CHILE)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-109
AC Adapter 2(US)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-101
AC Adapter 2(EU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-102
AC Adapter 2(UK)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-103
AC Adapter 2(AU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-105
AC Adapter 3(US)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-101
AC Adapter 3(EU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-102
AC Adapter 3(UK)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-103
AC Adapter 3(AU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-105
Battery 1	**Brand Name**	Motorola (ATL)	**Model Name**	QF50
Battery 2	**Brand Name**	Motorola (sunwoda)	**Model Name**	QF50
Battery 3	**Brand Name**	Motorola (SCUD)	**Model Name**	QF50
Earphone 1	**Brand Name**	Motorola (New leader)	**Model Name**	NLD-EM313A-20SF
Earphone 2	**Brand Name**	Motorola (JWELL)	**Model Name**	JWEP1205-L20H
USB Cable 1	**Brand Name**	Motorola (JWELL)	**Model Name**	JWUB1631-L20H
USB Cable 2	**Brand Name**	Motorola (saibao)	**Model Name**	SLQ-A238A

2 Re-use of Measured Data

2.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT2421-3, FCC ID: IHDT56AR2) is electrically identical to the reference device (Model: XT2421-2, FCC ID: IHDT56AR1) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the FCC Part 15C (equipment class: DTS, DSS) and FCC Part 15E (equipment class: NII) and FCC Part 27 (equipment class: PCE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 Referencing Test Data v02r01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: IHDT56AR2 .

2.2 Model Difference Information

The **main** difference between FCC ID: IHDT56AR1 and FCC ID: IHDT56AR2 is as below:

- Remove GSM1900, WCDMA II/ IV, LTE B2/4/13/26/66.
- Add LTE B20/41.

Other differences and all the details of similarity and difference can be found in the confidential documents (XT2421-3_Operational Description of Product Equality Declaration).

2.3 Reference detail Section:

Rule Part	Equipment Class	Frequency Band (MHz)	Reference FCC ID (Parent)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Report Title/Section
15C	DSS (BR/EDR)	2400~2483.5	IHDT56AR1	Original Grant	FR381717A	IHDT56AR2	All sections applicable
	DTS (BLE)	2400~2483.5	IHDT56AR1	Original Grant	FR381717B	IHDT56AR2	All sections applicable
	DTS (WLAN)	2400~2483.5	IHDT56AR1	Original Grant	FR381717C	IHDT56AR2	All sections applicable
15E	U-NII	5180~5240	IHDT56AR1	Original Grant	FR381717D	IHDT56AR2	All sections applicable
		5260~5320	IHDT56AR1	Original Grant	FR381717D FZ381717	IHDT56AR2	All sections applicable
		5500~5700	IHDT56AR1	Original Grant	FR381717D FZ381717	IHDT56AR2	All sections applicable
		5745~5825	IHDT56AR1	Original Grant	FR381717D	IHDT56AR2	All sections applicable
27	PCE (LTE)	B7	IHDT56AR1	Original Grant	FG381717B	IHDT56AR2	All sections applicable

2.4 Spot Check Verification Data Section

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

All test procedures follow the related section of parent report.

For any given test, the maximum identified difference between spot check and reference data shall be no larger than 25%, in linear units.

$$|spot\ check\ data - reference\ data| \,/\, |reference\ data| \leq 0.25$$

where "| |" is the absolute value of the measured quantity.

Summary for power and RSE spot check for each rule entry and technology is listed as below:

Test Item	Mode	IHDT56AR1 Parent Worst mode Test Result	IHDT56AR2 Variant Check Test Result	Difference	Limit
Conducted Power (dBm)	BT BR/EDR	10.42	9.82	0.129	0.25
	BLE 1M	1.05	0.98	0.016	0.25
	BLE 2M	1.03	0.77	0.058	0.25
	11b	20.37	20.25	0.027	0.25
	11g	24.68	24.52	0.036	0.25
	11n20	24.59	24.43	0.036	0.25
	11a UNII-1	18.48	18.44	0.009	0.25
	11a UNII-2A	18.17	17.94	0.052	0.25
	11a UNII-2C	18.53	18.41	0.027	0.25
	11a UNII-3	18.25	18.16	0.021	0.25
	11n20 UNII-1	18.45	18.39	0.014	0.25
	11n20 UNII-2A	18.18	17.97	0.047	0.25
	11n20 UNII-2C	18.58	18.42	0.036	0.25
	11n20 UNII-3	18.39	18.31	0.018	0.25
	11ac20 UNII-1	17.49	17.36	0.029	0.25
	11ac20 UNII-2A	17.39	17.12	0.060	0.25
	11ac20 UNII-2C	17.67	17.36	0.069	0.25
	11ac20 UNII-3	17.53	17.25	0.062	0.25
	LTE Band 7	22.41	22.55	0.033	0.25

For example:

BT BR/EDR (dBm): mW = 10^(dBm/10)

Difference = |*spot check data – reference data*| / |*reference data*|

= |10^(9.82/10) - 10^(10.42/10)| / |10^(10.42/10)|

= 0.129

Test Item	Mode	IHDT56AR1 Parent Worst Result	IHDT56AR2 Variant Check Result	Difference	Limit
Radiated Spurious Emission (dBm)	LTE Band 7	-56.45	-56.95	0.109	0.25

Conclusion:
Radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result, the test data from the original model is representative for the variant model. The power level and RSE spot check are shown within expected level compliant to limit line.

We are using power and ERP/EIRP measurements from the original parent model reports to list on the grant.

The same DFS detection is used in the variant. Hence, there is no spot check data for DFS.

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v02r01 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.

3 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Nov. 06, 2023	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 05, 2023	Nov. 06, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2023	Nov. 06, 2023	Jan. 04, 2024	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Nov. 06, 2023	NCR	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Nov. 07, 2023	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Apr. 09, 2023	Nov. 07, 2023	Apr. 08, 2024	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Nov. 07, 2023	Jan. 07, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	Nov. 07, 2023	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2023	Nov. 07, 2023	Jan. 04, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.

4 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±0.46 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.82dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.56dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.54dB

-THE END-