Spot Check Evaluation

APPLICANT	:	**Motorola Mobility LLC**
EQUIPMENT	:	**Mobile Cellular Phone**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**XT2331-2**
FCC ID	:	**IHDT56AH7**
STANDARD	:	**47 CFR Part 2, 22(H), 24(E), 27(M)** **47 CFR Part 15 Subpart C §15.209** **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
282501-02	Rev. 01	Initial issue of report	Nov. 09, 2022

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	XT2331-2
FCC ID	IHDT56AH7
IMEI Code	Conducted: 356378170012892/356378170012900 Radiation: 356378170013197
HW Version	DVT2
SW Version	THA33.23
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 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-101
AC Adapter 1(EU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-102
AC Adapter 1(UK)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-103
AC Adapter 1(IN)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-104
AC Adapter 1(AU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-105
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(Salcomp)	**Model Name**	MC-101
AC Adapter 3(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-102
AC Adapter 3(UK)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-103
AC Adapter 3(AU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-105
AC Adapter 4(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-201L
AC Adapter 4(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-202L
AC Adapter 4(AR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-206L
AC Adapter 4(BR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-207L
AC Adapter 4(CHILE)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-209L
AC Adapter 5(US)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-201L
AC Adapter 5(EU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-202L
AC Adapter 5(AR)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-206L
AC Adapter 5(CHILE)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-209L
AC Adapter 6(BR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-207
Battery 1	**Brand Name**	Motorola(SUNWODA)	**Model Name**	NH50
Battery 2	**Brand Name**	Motorola(ATL)	**Model Name**	NH50
Earphone 1	**Brand Name**	Motorola(Xinlide)	**Model Name**	MH202
Earphone 2	**Brand Name**	Motorola(Lianyun)	**Model Name**	MH202
USB Cable 1	**Brand Name**	Motorola(KingPower)	**Model Name**	K235-08073-H0
USB Cable 2	**Brand Name**	Motorola(Broad)	**Model Name**	HO0004
USB Cable 3	**Brand Name**	Motorola(KINGHOME)	**Model Name**	4G data cable

1.6 Testing Location

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 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

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: XT2331-2, FCC ID: IHDT56AH7) is electrically identical to the reference device (Model: XT2331-1,XT2333-1, FCC ID: IHDT56AH6) 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 22, 24, 27 (equipment class: PCE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: IHDT56AH7 .

2.2 Model Difference Information

The **main** difference between FCC ID: IHDT56AH6 and FCC ID: IHDT56AH7 is as below:

- Remove WCDMA Band IV and LTE Band 4/13/26/28/66.
- Add NFC function and LTE Band 20/41.

Other differences and all the details of similarity and difference can be found in the confidential documents (XT2331-2_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	IHDT56AH6	Original Grant	FR282501A	IHDT56AH7	All sections applicable
	DTS (BLE)	2400~2483.5	IHDT56AH6	Original Grant	FR282501B	IHDT56AH7	All sections applicable
	DTS (WLAN)	2400~2483.5	IHDT56AH6	Original Grant	FR282501C	IHDT56AH7	All sections applicable
15E	U-NII-1	5150~5250	IHDT56AH6	Original Grant	FR282501D	IHDT56AH7	All sections applicable
	U-NII-2A	5250~5350	IHDT56AH6	Original Grant	FR282501D	IHDT56AH7	All sections applicable
	U-NII-2C	5470~5725	IHDT56AH6	Original Grant	FR282501D	IHDT56AH7	All sections applicable
	U-NII-3	5725~5850	IHDT56AH6	Original Grant	FR282501D	IHDT56AH7	All sections applicable
	DFS	5250~5350 5470~5725	IHDT56AH6	Original Grant	FZ282501	IHDT56AH7	All sections applicable
22, 24, 27	PCE (GSM)	GSM 850/1900	IHDT56AH6	Original Grant	FG282501A	IHDT56AH7	All sections applicable
	PCE (WCDMA)	Band II,V	IHDT56AH6	Original Grant	FG282501A	IHDT56AH7	All sections applicable
	PCE (LTE)	B2/5/7/38	IHDT56AH6	Original Grant	FG282501B	IHDT56AH7	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

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

Test Item	Mode	FCC ID Parent Worst Result	FCC ID Variant Check Result	Difference (dB)
Conducted Power (dBm)	BT BR/EDR	10.06	10.05	-0.01
	BLE 1Mbps	2.13	2.03	-0.1
	BLE 2Mbps	2.14	2.08	-0.06
	11b, 2.4GHz	20.09	20.52	0.43
	11g, 2.4GHz	24.82	24.56	-0.26
	11n HT20, 2.4GHz	24.49	24.32	-0.17
	11n HT40, 2.4GHz	24.11	24.37	0.26
	11a, 5.2GHz	17.88	17.74	-0.14
	11a, 5.3GHz	17.97	17.88	-0.09
	11a, 5.5GHz	17.94	17.77	-0.17
	11a, 5.8GHz	18.2	18.1	-0.1
	11n HT20, 5.2GHz	17.75	17.66	-0.09
	11n HT20, 5.3GHz	17.83	17.69	-0.14
	11n HT20, 5.5GHz	17.82	17.61	-0.21
	11n HT20, 5.8GHz	17.99	17.88	-0.11
	11n HT40, 5.2GHz	16.62	16.46	-0.16
	11n HT40, 5.3GHz	16.65	16.49	-0.16
	11n HT40, 5.5GHz	16.73	16.56	-0.17
	11n HT40, 5.8GHz	17.04	16.91	-0.13
	11ac VHT20, 5.2GHz	17.81	17.71	-0.1
	11ac VHT20, 5.3GHz	17.87	17.75	-0.12
	11ac VHT20, 5.5GHz	17.9	17.73	-0.17
	11ac VHT20, 5.8GHz	18.05	17.94	-0.11
	11ac VHT40, 5.2GHz	16.65	16.58	-0.07
	11ac VHT40, 5.3GHz	16.7	16.61	-0.09
	11ac VHT40, 5.5GHz	16.75	16.76	0.01
	11ac VHT40, 5.8GHz	17.06	17	-0.06
	11ac VHT80, 5.2GHz	14.55	14.41	-0.14
	11ac VHT80, 5.3GHz	14.79	14.66	-0.13
	11ac VHT80, 5.5GHz	16.09	16.13	0.04
	11ac VHT80, 5.8GHz	16.46	16.4	-0.06
	GSM850	32.67	32.99	0.32
	GSM1900	29.67	29.67	0
	WCDMA B2	22.81	22.69	-0.12
	WCDMA B5	22.93	22.77	-0.16
	LTE B2	22.8	22.68	-0.12
	LTE B5	22.47	22.87	0.4
	LTE B7	23.05	22.98	-0.07
	LTE B38	22.96	22.95	-0.01

Test Item	Mode	FCC ID Parent Worst Result	FCC ID Variant Check Result	Difference (dB)
Radiated Spurious Emission (dBm)	Part 24E GSM 1900	-28.19	-38.12	-9.93
	Part 24E WCDMA 1900	-39.12	-39.35	-0.23
	Part 24E LTE B2 BW 20M	-33.85	-38.5	4.65

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 mechanism/software is used in the variant. Hence, there is no spot check data for DFS EUD hand-shaking mechanism.

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v01 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. 12, 2022	Nov. 02, 2022	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 25, 2022	Nov. 02, 2022	Aug. 24, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Nov. 02, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	1339163	300MHz~40GHz	Oct. 12, 2022	Nov. 02, 2022	Oct. 11, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	Oct. 17, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Oct. 17, 2022	Oct. 29, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24, 2022	Oct. 17, 2022	May 23, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Jan. 05, 2022	Oct. 17, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Oct. 17, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 05, 2022	Oct. 17, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Oct. 17, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 12, 2022	Oct. 17, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	Oct. 17, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Oct. 17, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Oct. 17, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Oct. 17, 2022	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.

4 Uncertainty of Evaluation

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	±0.56 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.3dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

-THE END-