



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Phone
BRAND NAME : Motorola,Lenovo
MODEL NAME : XT2155-3, XT2155-4
FCC ID : IHDT56ZW5
STANDARD : 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
Test Date(s) : May 24, 2021

This is a data re-used report which is only valid together with the original test report. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown 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 (Kunshan) Inc., the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

Approved by: Alex Wang / Manager



Sporton International (Kunshan) Inc.

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People's Republic of China



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-

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.



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 Phone
Brand Name	Motorola,Lenovo
Model Name	XT2155-3, XT2155-4
FCC ID	IHDT56ZW5
EUT supports Radios application	GSM/WCDMA/LTE WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth BR/EDR/LE FM Receiver, and GNSS
IMEI Code	Radiation: 356671880005978/356671880005974
HW Version	DVT2
SW Version	RON31.179-2
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 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM/GPRS/EDGE: 850: 824 MHz ~ 849 MHz 1900: 1850MHz ~ 1910MHz WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz
Rx Frequency	GSM/GPRS/EDGE: 850: 869 MHz ~ 894 MHz 1900: 1930 MHz ~ 1990 MHz WCDMA: Band V: 869 MHz ~ 894 MHz Band II: 1930 MHz ~ 1990 MHz
Antenna Type	Fixed Internal Antenna
Antenna Gain	Cellular Band: -3.6 dBi PCS Band: -1.3 dBi
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA : BPSK HSDPA/DC-HSDPA : QPSK HSUPA : QPSK HSPA+ : 16QAM DC-HSDPA : 64QAM

1.5 Modification of EUT

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



1.6 Re-use of Measured Data

1.6.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT2155-3, XT2155-4, FCC ID: IHDT56ZW5) is electrically identical to the reference device (Model: XT2155-1, FCC ID: IHDT56ZW4) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

1.6.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Product Equality Declaration.

The re-used RF data includes the following bands provided in Appendix C (Sporton RF Report No. FG142611A for the reference device Model: XT2155-1, FCC ID: IHDT56ZW4).

1.6.3 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test	Report Title/Section
PCE (2G/3G)	IHDT56ZW4	Part22H.24E.27L (FG142611A)	All sections applicable for GSM850/1900/WCDMA Band II/V except ERP/EIRP

1.6.4 Spot Check Verification Data Section

In order to confirm hardware similarity of the subject device with the reference device, spot check measurements were performed on the subject device for the following test items, the test result were consistent with FCC ID: IHDT56ZW4.

Assertions concerning the similarity of these devices are based on representations by the applicant. The applicant accepts full responsibility for the validity of the similarity claim, and for the determination that verification test data are sufficient to support it.

Test Item	Mode	IHDT56ZW4 Worst Result	IHDT56ZW5 Worst Result	Difference (dB)
Radiated Spurious Emission (dBm)	WCDMA II	-51.90	-52.23	-0.33



1.7 Maximum ERP/EIRP Power

FCC Rule	Frequency Band	Frequency Range (MHz)	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	GSM850 (GPRS)	824.2 ~ 848.8	GMSK	0.4977
Part 22	GSM850 (EDGE)	824.2 ~ 848.8	8PSK	0.1199
Part 22	WCDMA Band V	826.4 ~ 846.6	BPSK	0.0497
Part 24	GSM1900 (GSM)	1850.2 ~ 1909.8	GMSK	0.7047
Part 24	GSM1900 (EDGE)	1850.2 ~ 1909.8	8PSK	0.3673
Part 24	WCDMA Band II	1852.4 ~ 1907.6	BPSK	0.1368

1.8 Testing Location

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

Test Firm	Sporton International (Kunshan) Inc.		
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	CN1257	314309

1.9 Test Software

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



2 Conducted Test Result

2.1 Conducted Output Power and ERP/EIRP

2.1.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

2.1.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.



3 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 13, 2021	May 24, 2021	Apr. 12, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jun. 07, 2021	May 24, 2021	Jun. 06, 2022	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 18, 2021	May 24, 2021	Apr. 17, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Jan. 06, 2021	May 24, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	May 24, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 07, 2021	May 24, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1	2025788	1Ghz-18Ghz	Jan. 06, 2021	May 24, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	May 24, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 24, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 24, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 24, 2021	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 Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.3dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.8dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

GSM850	Burst Average Power (dBm)			ERP(W)		
	TX Channel	128	189			
Frequency (MHz)	824.2	836.4	848.8	L	M	H
GSM 1 Tx slot	32.61	32.42	32.59	0.4853	0.4645	0.4831
GPRS 1 Tx slot	32.72	32.43	32.36	0.4977	0.4656	0.4581
GPRS 2 Tx slots	30.15	30.15	30.19	0.2754	0.2754	0.2780
GPRS 3 Tx slots	28.37	28.13	28.35	0.1828	0.1730	0.1820
GPRS 4 Tx slots	25.93	25.93	25.87	0.1042	0.1042	0.1028
EDGE 1 Tx slot	26.47	26.51	26.54	0.1180	0.1191	0.1199
EDGE 2 Tx slots	26.22	26.29	26.20	0.1114	0.1132	0.1109
EDGE 3 Tx slots	25.19	25.05	24.92	0.0879	0.0851	0.0826
EDGE 4 Tx slots	22.86	22.92	22.60	0.0514	0.0521	0.0484

GSM1900	Burst Average Power (dBm)			EIRP(W)		
	TX Channel	512	661			
Frequency (MHz)	1850.2	1880	1909.8	L	M	H
GSM 1 Tx slot	29.78	29.51	29.37	0.7047	0.6622	0.6412
GPRS 1 Tx slot	29.68	29.48	29.47	0.6887	0.6577	0.6561
GPRS 2 Tx slots	26.44	26.11	26.19	0.3266	0.3027	0.3083
GPRS 3 Tx slots	24.83	24.96	24.71	0.2254	0.2323	0.2193
GPRS 4 Tx slots	24.16	23.97	23.89	0.1932	0.1849	0.1816
EDGE 1 Tx slot	26.86	26.95	26.92	0.3597	0.3673	0.3648
EDGE 2 Tx slots	26.76	26.74	26.90	0.3516	0.3499	0.3631
EDGE 3 Tx slots	25.09	25.10	25.10	0.2393	0.2399	0.2399
EDGE 4 Tx slots	23.44	23.39	23.31	0.1637	0.1618	0.1589



Band		WCDMA V			ERP(W)		
TX Channel		4132	4182	4233			
Rx Channel		4357	4407	4458			
Frequency (MHz)		826.4	836.4	846.6	L	M	H
3GPP Rel 99	AMR 12.2Kbps	22.67	22.67	22.49	0.0492	0.0492	0.0472
3GPP Rel 99	RMC 12.2Kbps	22.37	22.61	22.71	0.0459	0.0485	0.0497
3GPP Rel 6	HSDPA Subtest-1	21.40	21.30	21.46	0.0367	0.0359	0.0372
3GPP Rel 6	HSDPA Subtest-2	21.34	21.28	21.63	0.0362	0.0357	0.0387
3GPP Rel 6	HSDPA Subtest-3	20.83	20.75	21.02	0.0322	0.0316	0.0337
3GPP Rel 6	HSDPA Subtest-4	20.84	20.50	20.50	0.0323	0.0299	0.0299
3GPP Rel 8	DC-HSDPA Subtest-1	21.49	21.21	21.59	0.0375	0.0352	0.0384
3GPP Rel 8	DC-HSDPA Subtest-2	21.06	21.11	21.34	0.0340	0.0344	0.0362
3GPP Rel 8	DC-HSDPA Subtest-3	20.79	20.75	20.77	0.0319	0.0316	0.0318
3GPP Rel 8	DC-HSDPA Subtest-4	20.72	20.78	20.51	0.0314	0.0318	0.0299
3GPP Rel 6	HSUPA Subtest-1	21.55	21.75	21.68	0.0380	0.0398	0.0392
3GPP Rel 6	HSUPA Subtest-2	20.14	20.21	20.35	0.0275	0.0279	0.0288
3GPP Rel 6	HSUPA Subtest-3	21.03	20.91	21.24	0.0337	0.0328	0.0354
3GPP Rel 6	HSUPA Subtest-4	19.79	19.73	19.50	0.0254	0.0250	0.0237
3GPP Rel 6	HSUPA Subtest-5	21.40	21.20	21.20	0.0367	0.0351	0.0351
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	19.12	19.29	19.39	0.0217	0.0226	0.0231



Band		WCDMA II			EIRP(W)		
TX Channel		9262	9400	9538			
Rx Channel		9662	9800	9938			
Frequency (MHz)		1852.4	1880	1907.6	L	M	H
3GPP Rel 99	AMR 12.2Kbps	22.42	22.45	22.42	0.1294	0.1303	0.1294
3GPP Rel 99	RMC 12.2Kbps	22.43	22.49	22.66	0.1297	0.1315	0.1368
3GPP Rel 6	HSDPA Subtest-1	21.27	21.64	21.54	0.0993	0.1081	0.1057
3GPP Rel 6	HSDPA Subtest-2	21.42	21.38	21.44	0.1028	0.1019	0.1033
3GPP Rel 6	HSDPA Subtest-3	20.53	20.88	20.66	0.0838	0.0908	0.0863
3GPP Rel 6	HSDPA Subtest-4	20.51	20.58	20.80	0.0834	0.0847	0.0891
3GPP Rel 8	DC-HSDPA Subtest-1	21.50	21.63	21.51	0.1047	0.1079	0.1050
3GPP Rel 8	DC-HSDPA Subtest-2	21.43	21.17	21.32	0.1030	0.0971	0.1005
3GPP Rel 8	DC-HSDPA Subtest-3	20.51	20.81	20.65	0.0834	0.0893	0.0861
3GPP Rel 8	DC-HSDPA Subtest-4	20.85	20.89	20.81	0.0902	0.0910	0.0893
3GPP Rel 6	HSUPA Subtest-1	21.36	21.50	21.54	0.1014	0.1047	0.1057
3GPP Rel 6	HSUPA Subtest-2	19.65	19.71	19.68	0.0684	0.0693	0.0689
3GPP Rel 6	HSUPA Subtest-3	20.88	20.68	20.76	0.0908	0.0867	0.0883
3GPP Rel 6	HSUPA Subtest-4	19.28	19.22	19.08	0.0628	0.0619	0.0600
3GPP Rel 6	HSUPA Subtest-5	21.20	21.30	21.30	0.0977	0.1000	0.1000
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	18.97	19.03	18.92	0.0585	0.0593	0.0578



Appendix C. Reference Report

Please refer to Sporton report number FR142611A which is issued separately.