FCC RF Test Report

APPLICANT	:	**Motorola Mobility LLC**
EQUIPMENT	:	**Mobile Cellular Phone**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**XT2201-4**
FCC ID	:	**IHDT56AB3**
STANDARD	:	**47 CFR Part 2, 96**
CLASSIFICATION	:	**Citizens Band End User Devices (CBE)**
EQUIPMENT TYPE	:	**End User Equipment**
TEST DATE(S)	:	**Apr. 29, 2022**

We, Sporton International Inc. (Kunshan), 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 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

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FG192317-13A	01	Initial issue of report	May 05, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§96.41	Maximum E.I.R.P	Pass	-

Note: This is a variant report for XT2201-4. To enable 5G NR n48 by software and update Antenna gain for LTE band 48. According to the difference, only EIRP was re-tested from original report (Sporton Report Number FG192317-02C).

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 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2201-4
FCC ID	IHDT56AB3
Tx Frequency	LTE Band 48: 3550 MHz ~ 3700 MHz
Rx Frequency	LTE Band 48: 3550 MHz ~ 3700 MHz
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 48 : 22.54 dBm LTE Band 48C : 22.26 dBm
Antenna Gain / Type	LTE Band 48 : -2.2 dBi / PIFA Antenna
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM
IMEI Code	357193870007566
HW Version	DVT2
SW Version	S1SH32.10
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 Maximum EIRP Power and Emission Designator

LTE Band 48		QPSK	16QAM/64QAM/256QAM
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
20	3560~3690	0.1081	0.0857

LTE Band 48 CA	QPSK	16QAM/64QAM/256QAM
BW (MHz) Frequency (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
20MHz+20MHz (3560 ~ 3690 MHz)	0.1014	0.1002

Note:

1. All modulations have been tested, and only the maximum bandwidth and the worst test results of PSK & QAM are shown in the report.

2. Manufacturer declares that LTE Band 48 channels shall be set NS_10 to reduce the conducted power for LTE B48C.

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

1.6 Applied Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS v03
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.7 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola(Salom)	**Model Name**	MC-301
AC Adapter 2(US)	**Brand Name**	Motorola(Acbel)	**Model Name**	MC-301
Battery	**Brand Name**	Motorola(ATL)	**Model Name**	NA50
Earphone	**Brand Name**	Motorola (Lyand)	**Model Name**	MD211(SH38D20195)
USB Cable 1	**Brand Name**	Motorola(Saibao)	**Model Name**	SC18D13215
USB Cable 2	**Brand Name**	Motorola(Cabletech)	**Model Name**	SC18D13216
USB Cable 3	**Brand Name**	Motorola(Luxshare)	**Model Name**	SC18D13217
Type C to HDMI Cable /USBC Cable	**Brand Name**	Motorola(Linxee)	**Model Name**	SC18D02146
Stylus	**Brand Name**	Motorola smart stylus	**Model Name**	XT2201-S
Smart Folio	**Brand Name**	Motorola(Techson)	**Model Name**	SS68D36907,SS68D36906
Wireless Dongle	**Brand Name**	Motorola	**Model Name**	MD-02
HDMI Cable	**Brand Name**	Motorola	**Model Name**	HC-01
USB Cable(Type A/C)	**Brand Name**	Motorola	**Model Name**	SC18C24367

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256 QAM	1	Half	Full	L	M	H
E.R.P / E.I.R.P	48	-	-	v	v	v	v	v	v	v	v	v		v	v	v	v
Remark	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. All test items are based on engineering evaluation.																

Test Items	Band	Bandwidth (MHz)							Modulation				RB #			Test Channel		
		20+20	20+15	15+20	20+10	10+20	20+5	5+20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
E.R.P / E.I.R.P	48C	v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. All test items are based on engineering evaluation.																	

2.2 Frequency List of Low/Middle/High Channels

LTE Band 48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	55340	55990	56640
	Frequency	3560.0	3625.0	3690.0
15	Channel	55315	55990	56665
	Frequency	3557.5	3625.0	3692.5
10	Channel	55290	55990	56690
	Frequency	3555.0	3625.0	3695.0
5	Channel	55265	55990	56715
	Frequency	3552.5	3625.0	3697.5

LTE Band 48C_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
5 + 20	PCC	Channel	55273	55898	56523
		Frequency	3553.3	3615.8	3678.3
	SCC	Channel	55390	56015	56640
		Frequency	3565	3627.5	3690
20 + 5	PCC	Channel	55340	55965	56590
		Frequency	3560	3622.5	3685
	SCC	Channel	55457	56082	56707
		Frequency	3571.7	3634.2	3696.7
10 + 20	PCC	Channel	55295	55896	56496
		Frequency	3555.5	3615.6	3675.6
	SCC	Channel	55439	56040	56640
		Frequency	3569.9	3630	3690
20 + 10	PCC	Channel	55340	55941	56541
		Frequency	3560	3620.1	3680.1
	SCC	Channel	55484	56085	56685
		Frequency	3574.4	3634.5	3694.5
15 + 20	PCC	Channel	55318	55893	56469
		Frequency	3557.8	3615.3	3672.9
	SCC	Channel	55489	56064	56640
		Frequency	3574.9	3632.4	3690
20 + 15	PCC	Channel	55340	55916	56491
		Frequency	3560	3617.6	3675.1
	SCC	Channel	55511	56087	56662
		Frequency	3577.1	3634.7	3692.2
20 +20	PCC	Channel	55340	55891	56442
		Frequency	3560	3615.1	3670.2
	SCC	Channel	55538	56089	56640
		Frequency	3579.8	3634.9	3690

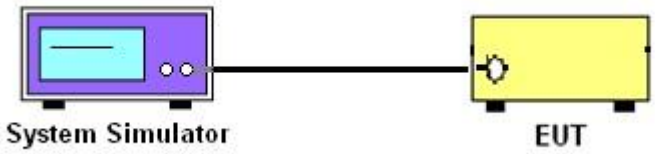
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.2 EIRP

3.2.1 Description of the EIRP Measurement

EIRP limits for CBRS equipment as below table:

Device		Maximum EIRP (dBm/10 MHz)
Applied	**End User Device**	23
☐	**Category A CBSD**	30
☐	**Category B CBSD**	47

Remark: The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz)

3.2.2 Test Procedures for EIRP

1. Establishing a communications link with the call box (Base station) to measure the Maximum conducted power, the parameters were set to force the EUT transmitting at maximum output power level. Use the average power measurement function to measure total channel power of each channel bandwidth (per ANSI C63.26-2015 Section 5.2.1)

2. Determining ERP and/or EIRP from conducted RF output power measurements (Per ANSI C63.26-2015 Section 5.2.5.5)

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

4 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. 14, 2021	Apr. 29, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 26, 2021	Apr. 29, 2022	Aug. 25, 2022	Conducted (TH01-KS)

NCR: No Calibration Required

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Appendix A. Test Results of Conducted Test

Test Engineer :	Yong He	Temperature :	21~24℃
		Relative Humidity :	45~51%

Conducted Output Power(Average power) and EIRP

LTE Band 48:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				55340	55990	56640			
Frequency (MHz)				3560	3625	3690	L	M	H
20	QPSK	1	0	22.42	22.54	22.47	0.1052	0.1081	0.1064
20	QPSK	1	99	22.33	22.42	22.31	0.1030	0.1052	0.1026
20	QPSK	100	0	21.25	21.41	21.36	0.0804	0.0834	0.0824
20	16QAM	1	0	21.34	21.53	21.39	0.0820	0.0857	0.0830
20	64QAM	1	0	20.34	20.44	20.31	0.0652	0.0667	0.0647
20	256QAM	1	0	17.35	17.35	17.51	0.0327	0.0327	0.0340
Channel				55315	55990	56665	EIRP(W)		
Frequency (MHz)				3557.5	3625	3692.5	L	M	H
15	QPSK	1	0	22.32	22.43	22.30	0.1028	0.1054	0.1023
15	16QAM	1	0	21.21	21.35	21.28	0.0796	0.0822	0.0809
Channel				55290	55990	56690	EIRP(W)		
Frequency (MHz)				3555	3625	3695	L	M	H
10	QPSK	1	0	22.13	22.39	22.32	0.0984	0.1045	0.1028
10	16QAM	1	0	21.27	21.42	21.22	0.0807	0.0836	0.0798
Channel				55265	55990	56715	EIRP(W)		
Frequency (MHz)				3552.5	3625	3697.5	L	M	H
5	QPSK	1	0	22.36	22.40	22.30	0.1038	0.1047	0.1023
5	16QAM	1	0	21.26	21.40	21.20	0.0805	0.0832	0.0794

LTE Band 48C:

BW [MHz]	Modulation	RB Size/RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel			L	M	H	L	M	H
20+20	QPSK	1RB01RBMAX	5.41	11.92	5.58	0.0021	0.0094	0.0022
	QPSK	1RBMAX1RB0	18.56	22.26	18.84	0.0433	0.1014	0.0461
	QPSK	FULL	12.25	18.78	12.65	0.0101	0.0455	0.0111
	16QAM	1RBMAX1RB0	18.60	22.21	18.75	0.0437	0.1002	0.0452
	64QAM	1RBMAX1RB0	18.74	21.37	18.93	0.0451	0.0826	0.0471
	256QAM	1RBMAX1RB0	18.25	18.34	18.32	0.0403	0.0411	0.0409
20+15	QPSK	1RB01RBMAX	5.37	12.03	5.59	0.0021	0.0096	0.0022
	QPSK	1RBMAX1RB0	17.06	22.13	17.62	0.0306	0.0984	0.0348
	QPSK	FULL	12.43	18.52	12.62	0.0105	0.0429	0.0110
	16QAM	1RBMAX1RB0	17.16	21.69	17.55	0.0313	0.0889	0.0343
	64QAM	1RBMAX1RB0	16.89	21.36	17.22	0.0294	0.0824	0.0318
	256QAM	1RBMAX1RB0	17.02	18.35	17.36	0.0303	0.0412	0.0328
20+10	QPSK	1RB01RBMAX	5.52	12.09	5.43	0.0021	0.0097	0.0021
	QPSK	1RBMAX1RB0	17.16	21.48	17.24	0.0313	0.0847	0.0319
	QPSK	FULL	12.43	18.77	12.73	0.0105	0.0454	0.0113
	16QAM	1RBMAX1RB0	17.03	21.73	17.62	0.0304	0.0897	0.0348
	64QAM	1RBMAX1RB0	17.36	21.34	17.58	0.0328	0.0820	0.0345
	256QAM	1RBMAX1RB0	17.15	18.31	17.24	0.0313	0.0408	0.0319
20+5	QPSK	1RB01RBMAX	5.33	12.14	5.63	0.0021	0.0099	0.0022
	QPSK	1RBMAX1RB0	18.14	21.26	18.42	0.0393	0.0805	0.0419
	QPSK	FULL	11.43	19.25	11.76	0.0084	0.0507	0.0090
	16QAM	1RBMAX1RB0	17.96	21.18	18.21	0.0377	0.0791	0.0399
	64QAM	1RBMAX1RB0	18.01	21.11	18.24	0.0381	0.0778	0.0402
	256QAM	1RBMAX1RB0	17.86	18.34	18.13	0.0368	0.0411	0.0392
15+20	QPSK	1RB01RBMAX	5.24	12.27	5.34	0.0020	0.0102	0.0021
	QPSK	1RBMAX1RB0	17.10	22.03	17.32	0.0309	0.0962	0.0325
	QPSK	FULL	12.14	18.77	12.63	0.0099	0.0454	0.0110
	16QAM	1RBMAX1RB0	17.15	22.14	17.24	0.0313	0.0986	0.0319
	64QAM	1RBMAX1RB0	17.29	21.34	17.53	0.0323	0.0820	0.0341
	256QAM	1RBMAX1RB0	17.11	18.36	17.25	0.0310	0.0413	0.0320

10+20	QPSK	1RB01RBMAX	5.31	11.93	5.33	0.0020	0.0094	0.0021
	QPSK	1RBMAX1RB0	17.15	21.69	17.33	0.0313	0.0889	0.0326
	QPSK	FULL	12.41	18.74	12.59	0.0105	0.0451	0.0109
	16QAM	1RBMAX1RB0	17.05	21.43	17.32	0.0305	0.0838	0.0325
	64QAM	1RBMAX1RB0	17.28	21.33	17.41	0.0322	0.0818	0.0332
	256QAM	1RBMAX1RB0	17.16	18.33	17.28	0.0313	0.0410	0.0322
5+20	QPSK	1RB01RBMAX	5.14	11.95	5.34	0.0020	0.0094	0.0021
	QPSK	1RBMAX1RB0	17.43	21.13	17.85	0.0333	0.0782	0.0367
	QPSK	FULL	11.31	19.21	11.63	0.0081	0.0502	0.0088
	16QAM	1RBMAX1RB0	17.61	21.22	17.91	0.0348	0.0798	0.0372
	64QAM	1RBMAX1RB0	17.63	21.14	18.03	0.0349	0.0783	0.0383
	256QAM	1RBMAX1RB0	17.76	18.14	17.99	0.0360	0.0393	0.0379