FCC RF Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT2231-1, XT2231-5
FCC ID	:	IHDT56AC2
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System
TEST DATE(S)	:	Dec. 12, 2021 ~ Jan. 17, 2022

We, Sporton International Inc. (ShenZhen), 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. (ShenZhen), the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager

ACCREDITED Cert #5145.01

Sporton International Inc. (ShenZhen)

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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1N1011-05A	Rev. 01	Initial issue of report	Feb. 16, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.80 dB at 2487.520 MHz
3.3	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits.
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,IL60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza,Chicago,IL60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2231-1, XT2231-5
FCC ID	IHDT56AC2
IMEI Code	Conducted : 359986690032831/359986690038317 Radiation : 3599869006557 5/359986690072175
HW Version	DVT2
SW Version	STA32.48
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report for XT2231-1, XT2231-5. The change note could be referred to the XT2231-1, XT2231-5_Class II Permissive Change letter which is exhibit separately. Based on the similarity between current and previous project, only related test cases were verified for the differences from original test report (Sporton Report Number FR1N1011C)

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum Output Power to antenna	802.11b : 18.78 dBm (0.0755 W) 802.11g : 24.26 dBm (0.2667 W) 802.11n HT20 : 24.65 dBm (0.2917 W)
Antenna Type / Gain	PIFA Antenna type with gain -5.0 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH01-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH01-SZ	AUDIX	E3	6.2009-8-24

1.8 Applicable Standards

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

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2013

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

1.9 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-201
AC Adapter 1(EU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-202
AC Adapter 1(AR)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-206
AC Adapter 2(US)	**Brand Name**	Motorola (Acbel)	**Model Name**	MC-201
AC Adapter 2(EU)	**Brand Name**	Motorola (Acbel)	**Model Name**	MC-202
AC Adapter 2(AR)	**Brand Name**	Motorola (Acbel)	**Model Name**	MC-206
AC Adapter 2(CHILE)	**Brand Name**	Motorola (Acbel)	**Model Name**	MC-209
AC Adapter 3(IN)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-204
AC Adapter 4(IN)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-204
AC Adapter 5(BR)	**Brand Name**	Motorola (Flex)	**Model Name**	MC-207
AC Adapter 6(BR)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-207
AC Adapter 7(US)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-101
AC Adapter 7(EU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-102
AC Adapter 7(UK)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-103
AC Adapter 7(AU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-105
AC Adapter 8(US)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-101
AC Adapter 8(EU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-102
AC Adapter 8(UK)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-103
AC Adapter 8(AU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-105
AC Adapter 9(US)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-101
AC Adapter 9(EU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-102
AC Adapter 9(UK)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-103
AC Adapter 10(IN)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-104
AC Adapter 11(IN)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-104
AC Adapter 12(AU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-105
AC Adapter 13(EU)	**Brand Name**	Motorola (Salom)	**Model Name**	SC-42
AC Adapter 14(UK)	**Brand Name**	Motorola (Chenyang)	**Model Name**	SC-43
Earphone 1	**Brand Name**	Motorola (Iyand)	**Model Name**	LYM239-76C-003
Earphone 2	**Brand Name**	Motorola (LCHSE)	**Model Name**	MEND1432B875000
Earphone 3	**Brand Name**	Motorola (New Leader)	**Model Name**	MH202
USB Cable 1	**Brand Name**	Motorola(Yihuaxing)	**Model Name**	T365-011B
USB Cable 2	**Brand Name**	Motorola(SUNTOPS)	**Model Name**	336258
USB Cable 3	**Brand Name**	Motorola(SUNTOPS)	**Model Name**	336281
USB Cable 4	**Brand Name**	Motorola(I SHENG)	**Model Name**	SC18D33506
USB Cable 5	**Brand Name**	Motorola(Yihuaxing)	**Model Name**	T365-012B
Battery 1	**Brand Name**	Motorola(Sunwoda)	**Model Name**	NH50
Battery 2	**Brand Name**	Motorola(SCUD)	**Model Name**	NH50

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

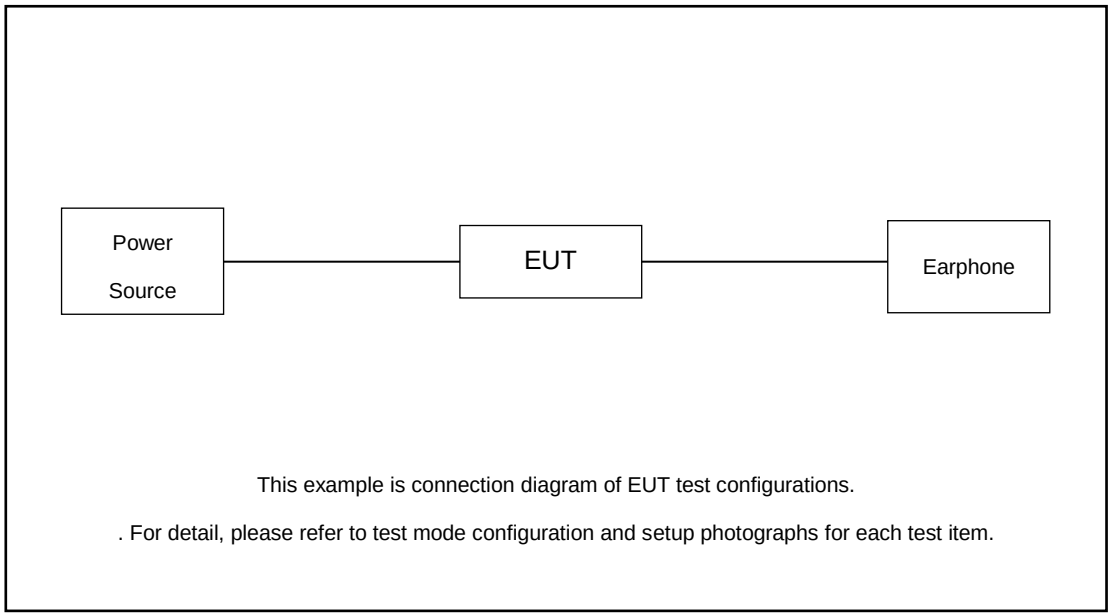
2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11b	**1 Mbps**

2.3 Connection Diagram of Test System

< Radiated Emission >



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

3 Test Result

3.1 Output Power Measurement

3.1.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

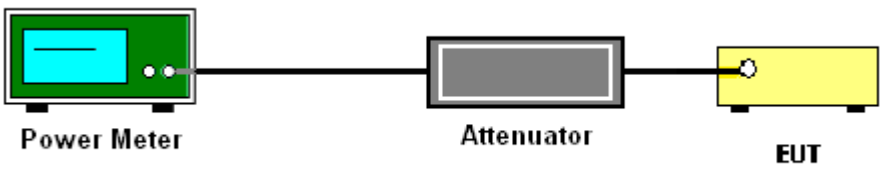
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.2 Method AVGPM-G method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 1	Ant 1	Ant 1	Ant 1	Ant 1	
11b	1Mbps	1	1	2412	16.34	30.00	-5.00	11.34	36.00	Pass
11b	1Mbps	1	6	2437	18.78	30.00	-5.00	13.78	36.00	Pass
11b	1Mbps	1	11	2462	18.07	30.00	-5.00	13.07	36.00	Pass
11g	6Mbps	1	1	2412	23.80	30.00	-5.00	18.80	36.00	Pass
11g	6Mbps	1	6	2437	24.26	30.00	-5.00	19.26	36.00	Pass
11g	6Mbps	1	11	2462	23.78	30.00	-5.00	18.78	36.00	Pass
HT20	MCS0	1	1	2412	24.12	30.00	-5.00	19.12	36.00	Pass
HT20	MCS0	1	6	2437	24.65	30.00	-5.00	19.65	36.00	Pass
HT20	MCS0	1	11	2462	24.20	30.00	-5.00	19.20	36.00	Pass

Note: Measured power (dBm) has offset with cable loss.

3.1.6 Test Result of Average Output Power

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant 1	Ant 1	Ant 1	Ant 1	Ant 1	
11b	1Mbps	1	1	2412	14.10	30.00	-5.00	9.10	36.00	Pass
11b	1Mbps	1	6	2437	16.80	30.00	-5.00	11.80	36.00	Pass
11b	1Mbps	1	11	2462	16.10	30.00	-5.00	11.10	36.00	Pass
11g	6Mbps	1	1	2412	14.90	30.00	-5.00	9.90	36.00	Pass
11g	6Mbps	1	6	2437	15.80	30.00	-5.00	10.80	36.00	Pass
11g	6Mbps	1	11	2462	14.30	30.00	-5.00	9.30	36.00	Pass
HT20	MCS0	1	1	2412	13.80	30.00	-5.00	8.80	36.00	Pass
HT20	MCS0	1	6	2437	16.00	30.00	-5.00	11.00	36.00	Pass
HT20	MCS0	1	11	2462	15.00	30.00	-5.00	10.00	36.00	Pass

Note: Measured power (dBm) has offset with cable loss.

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3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2 Measuring Instruments

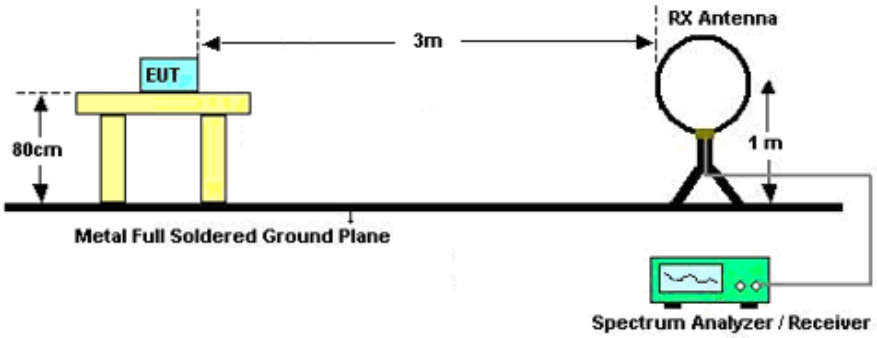
The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

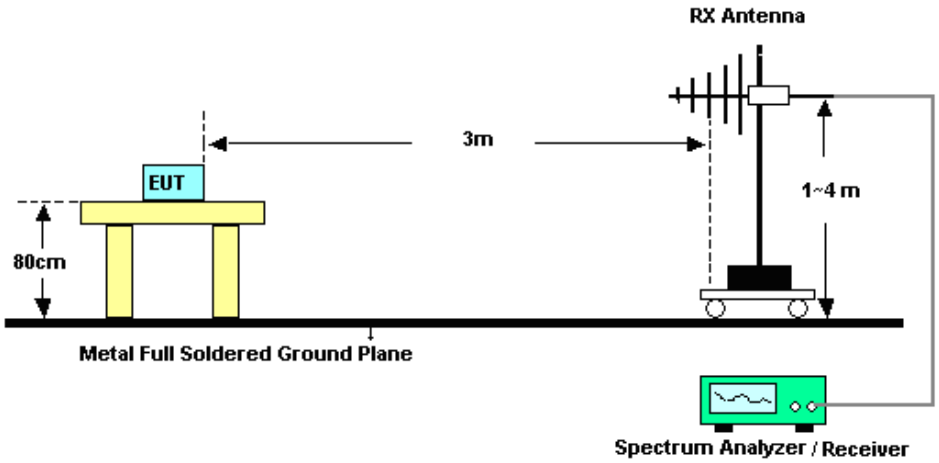
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.2.4 Test Setup

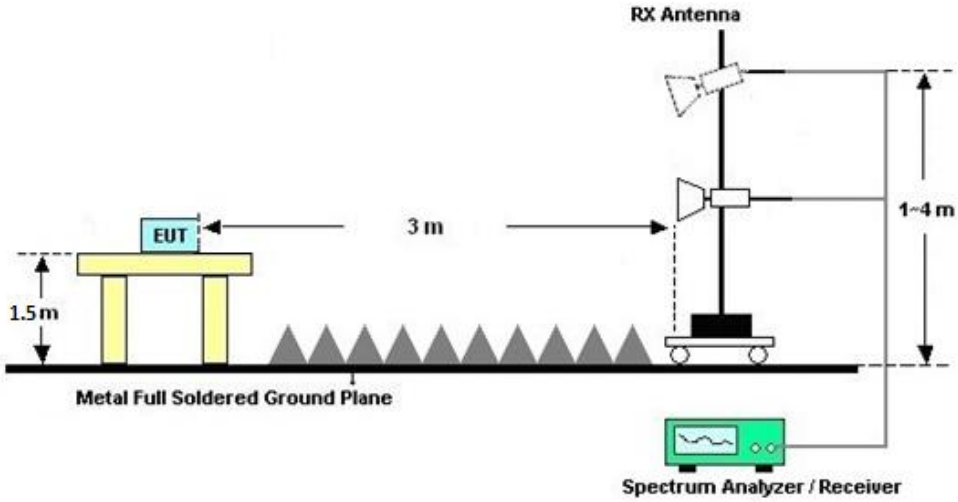
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

3.2.7 Duty Cycle

Please refer to Appendix B.

3.2.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix A.

3.3 Antenna Requirements

3.3.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in Db comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 08, 2021	Dec. 12, 2021	Apr. 07, 2022	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 25, 2020	Dec. 12, 2021	Dec. 24, 2021	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 25, 2020	Dec. 12, 2021	Dec. 24, 2021	Conducted (TH01-SZ)
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Dec. 02, 2021	Jan. 17, 2022	Dec. 01, 2022	Radiation (03CH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 21, 2021	Jan. 17, 2022	Jul. 20, 2022	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 22, 2021	Jan. 17, 2022	Jun. 21, 2022	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Jul. 15, 2021	Jan. 17, 2022	Jul. 14, 2022	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 25, 2021	Jan. 17, 2022	Jul. 24, 2022	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 11, 2021	Jan. 17, 2022	Apr. 10, 2022	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 07, 2021	Jan. 17, 2022	Apr. 06, 2022	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 16, 2021	Jan. 17, 2022	Oct. 15, 2022	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 16, 2021	Jan. 17, 2022	Oct. 15, 2022	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 21. 2021	Jan. 17, 2022	Jul. 20. 2022	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Jan. 17, 2022	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 17, 2022	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 17, 2022	NCR	Radiation (03CH01-SZ)

'NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. 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))	**4.2dB**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.3dB**

---------- THE END ----------

Appendix A. Radiated Spurious Emission

Test Engineer :	Zhao hui Liang	Temperature :	24~25°C
		Relative Humidity :	48~49%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2387.91	56.23	-17.77	74	47.29	32	9.64	32.7	106	219	P	H
		2387.07	44.67	-9.33	54	35.74	32	9.63	32.7	106	219	A	H
		2412	107.01	-	-	97.95	32.1	9.66	32.7	106	219	P	H
		2412	105.03	-	-	95.97	32.1	9.66	32.7	106	219	A	H
		2360.085	54.81	-19.19	74	45.84	32.07	9.6	32.7	143	188	P	V
		2389.59	43.38	-10.62	54	34.44	32	9.64	32.7	143	188	A	V
		2412	98.22	-	-	89.16	32.1	9.66	32.7	143	188	P	V
		2412	96.21	-	-	87.15	32.1	9.66	32.7	143	188	A	V
802.11b CH 06 2437MHz		2339.82	54.71	-19.29	74	45.73	32.1	9.58	32.7	325	29	P	H
		2363.76	43.56	-10.44	54	34.58	32.07	9.61	32.7	325	29	A	H
		2437	103.86	-	-	94.67	32.2	9.69	32.7	325	29	P	H
		2437	102.07	-	-	92.88	32.2	9.69	32.7	325	29	A	H
		2485.51	54.35	-19.65	74	45.13	32.17	9.75	32.7	325	29	P	H
		2483.76	43.6	-10.4	54	34.38	32.17	9.75	32.7	325	29	A	H
		2359.7	54.24	-19.76	74	45.27	32.07	9.6	32.7	185	192	P	V
		2389.24	43.69	-10.31	54	34.75	32	9.64	32.7	185	192	A	V
		2437	102.66	-	-	93.47	32.2	9.69	32.7	185	192	P	V
		2437	100.92	-	-	91.73	32.2	9.69	32.7	185	192	A	V
		2499.23	54.05	-19.95	74	44.88	32.1	9.77	32.7	185	192	P	V
		2484.18	43.66	-10.34	54	34.44	32.17	9.75	32.7	185	192	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz		2462	108.79	-	-	99.54	32.23	9.72	32.7	100	220	P	H
		2462	106.96	-	-	97.71	32.23	9.72	32.7	100	220	A	H
		2486.68	56.69	-17.31	74	47.47	32.17	9.75	32.7	100	220	P	H
		2487.52	46.2	-7.8	54	37.04	32.1	9.76	32.7	100	220	A	H
		2462	101.18	-	-	91.93	32.23	9.72	32.7	117	214	P	V
		2462	99.25	-	-	90	32.23	9.72	32.7	117	214	A	V
		2487.36	55.71	-18.29	74	46.49	32.17	9.75	32.7	117	214	P	V
		2487.24	44.09	-9.91	54	34.87	32.17	9.75	32.7	117	214	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	45.17	-28.83	74	51.45	33.85	12.01	52.14	-	-	P	H
		4824	45.2	-28.8	74	51.48	33.85	12.01	52.14	-	-	P	V
802.11b CH 06 2437MHz		4874	44.04	-29.96	74	50.37	33.73	12.04	52.1	-	-	P	H
		7311	48.94	-25.06	74	50.81	35.76	14.16	51.79	-	-	P	H
		4874	43.77	-30.23	74	50.1	33.73	12.04	52.1	-	-	P	V
		7311	47.49	-26.51	74	49.36	35.76	14.16	51.79	-	-	P	V
802.11b CH 11 2462MHz		4924	45.54	-28.46	74	51.83	33.7	12.07	52.06	-	-	P	H
		7386	47.91	-26.09	74	49.62	35.78	14.21	51.7	-	-	P	H
		4924	43.63	-30.37	74	49.92	33.7	12.07	52.06	-	-	P	V
		7386	48.33	-25.67	74	50.04	35.78	14.21	51.7	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz 802.11b (LF)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11b LF		106.63	20.44	-23.06	43.5	37.29	15.87	2.47	35.19	-	-	P	H
		159.01	26.04	-17.46	43.5	39.24	19.31	2.59	35.1	-	-	P	H
		193.93	26.04	-17.46	43.5	41.78	16.63	2.73	35.1	-	-	P	H
		338.46	21.35	-24.65	46	32.29	20.74	3.22	34.9	-	-	P	H
		594.54	25.91	-20.09	46	30.87	25.69	3.86	34.51	-	-	P	H
		850.62	28.37	-17.63	46	30	28.61	4.06	34.3	-	-	P	H
		47.46	28.23	-11.77	40	40.86	20.27	2.17	35.07	-	-	P	V
		178.41	27.41	-16.09	43.5	41.66	18.19	2.66	35.1	-	-	P	V
		278.32	20.79	-25.21	46	33.42	19.27	3.04	34.94	-	-	P	V
		443.22	23.17	-22.83	46	31.55	23.03	3.3	34.71	-	-	P	V
		592.6	25.9	-20.1	46	30.91	25.65	3.85	34.51	-	-	P	V
		742.95	28.36	-17.64	46	31.15	27.72	3.9	34.41	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

Appendix B. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	99.27	-	-	10Hz

802.11b