FCC Test Report

APPLICANT	:	Beijing Xiaomi Electronics Co., Ltd.
EQUIPMENT	:	Xiaomi Mesh System AC1200
BRAND NAME	:	Xiaomi
MODEL NAME	:	RD13
FCC ID	:	2AIMRRD13
STANDARD	:	47 CFR Part 15 Subpart B
CLASSIFICATION	:	Certification
TEST DATE(S)	:	May 24, 2024 ~ May 27, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 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

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

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC442207	Rev. 01	Initial issue of report	Jul. 17, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 12.93 dB at 0.535 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.15 dB at 39.70 MHz

Conformity Assessment Condition:
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. Please refer to each test results 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

Beijing Xiaomi Electronics Co., Ltd.
Room 802, Floor 8, Building 5, No.15 KeChuang 10th Road, Beijing Economic and Technological Development Zone, Beijing City, China.

1.2. Manufacturer

Beijing Xiaomi Electronics Co., Ltd.
Room 802, Floor 8, Building 5, No.15 KeChuang 10th Road, Beijing Economic and Technological Development Zone, Beijing City, China.

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Xiaomi Mesh System AC1200
Brand Name	Xiaomi
Model Name	RD13
FCC ID	2AIMRRD13
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80
SN Code	56838/A4Q400085
HW Version	1.0
SW Version	1.0.5
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	802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz;
Rx Frequency	802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz;
Antenna Type	WLAN : Dipole Antenna
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

1.5. Modification of EUT

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

1.6. Test 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		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH02-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24al
2.	CO01-KS	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 B
- ANSI C63.4-2014

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

2. Test Configuration of Equipment Under Test

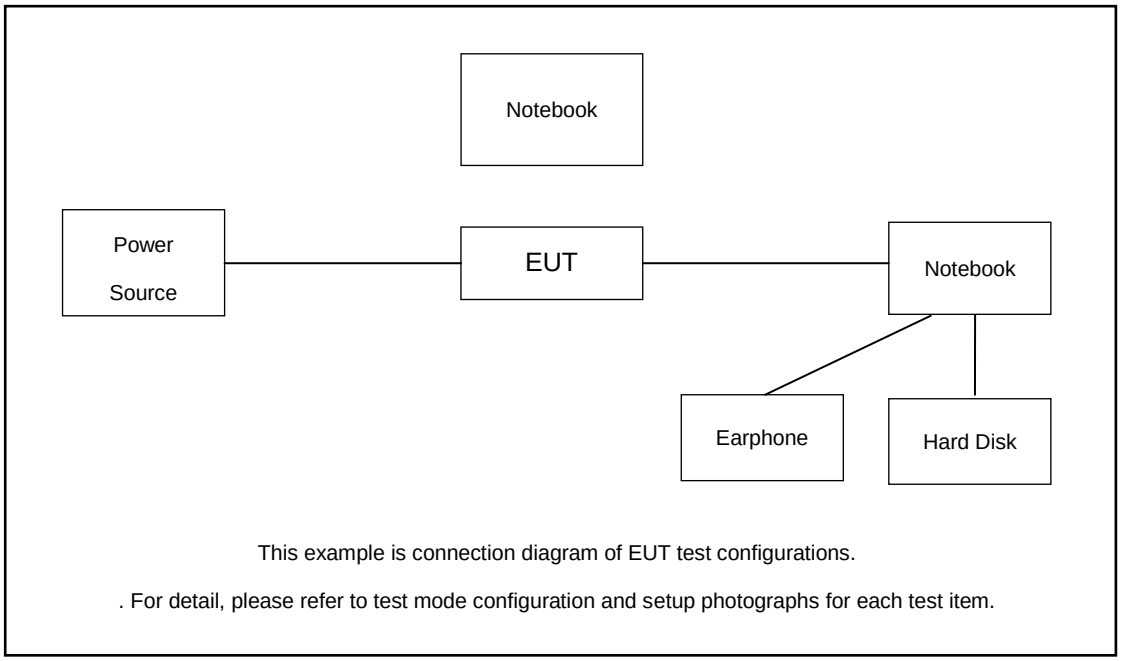
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: WIFI Idle + LAN1 Link(1G)+ Lan2 Link(1G)+ Power from Adapter
Radiated Emissions	Mode 1: WIFI Idle + LAN1 Link(1G)+ Lan2 Link(1G)+ Power from Adapter

2.2. Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

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

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
2.	Notebook	acer	N20C5	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
3.	Notebook	ThinkPad	E15 Gen2	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
5.	Hard disk*2	WD	Elements	N/A	N/A	N/A
6.	Hard DISK*2	WD	C6B	N/A	N/A	N/A
7.	Earphone*2	N/A	N/A	N/A	N/A	N/A

2.4. EUT Operation Test Setup

1. EUT Lan link with notebook.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

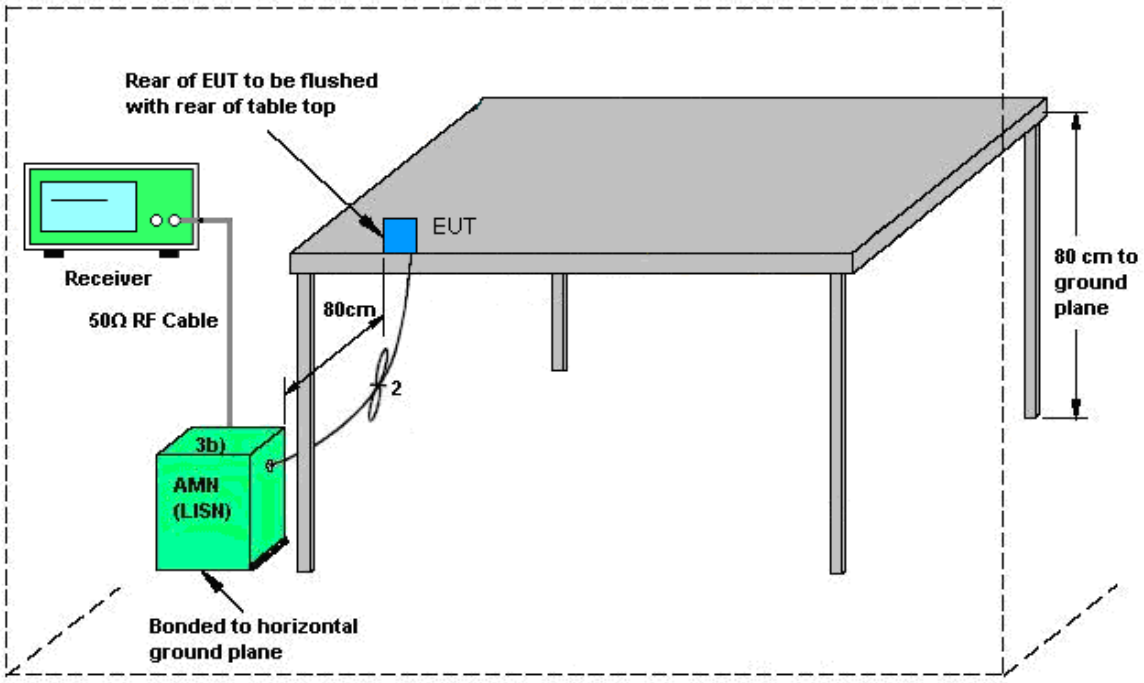
3.1.2 Measuring Instruments

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

3.1.3 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

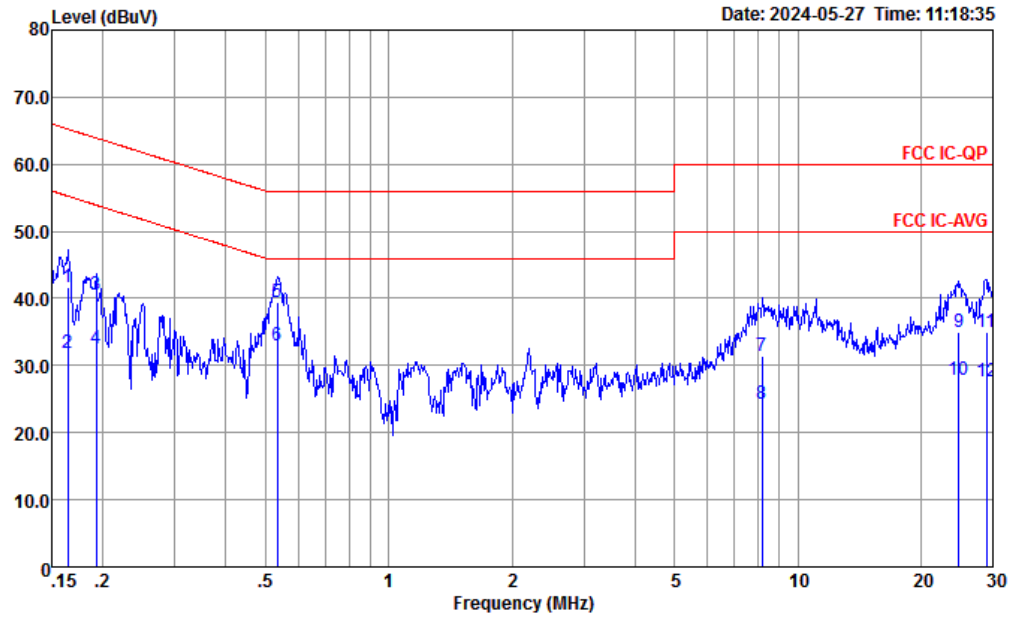
3.1.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.1.5 Test Result of AC Conducted Emission

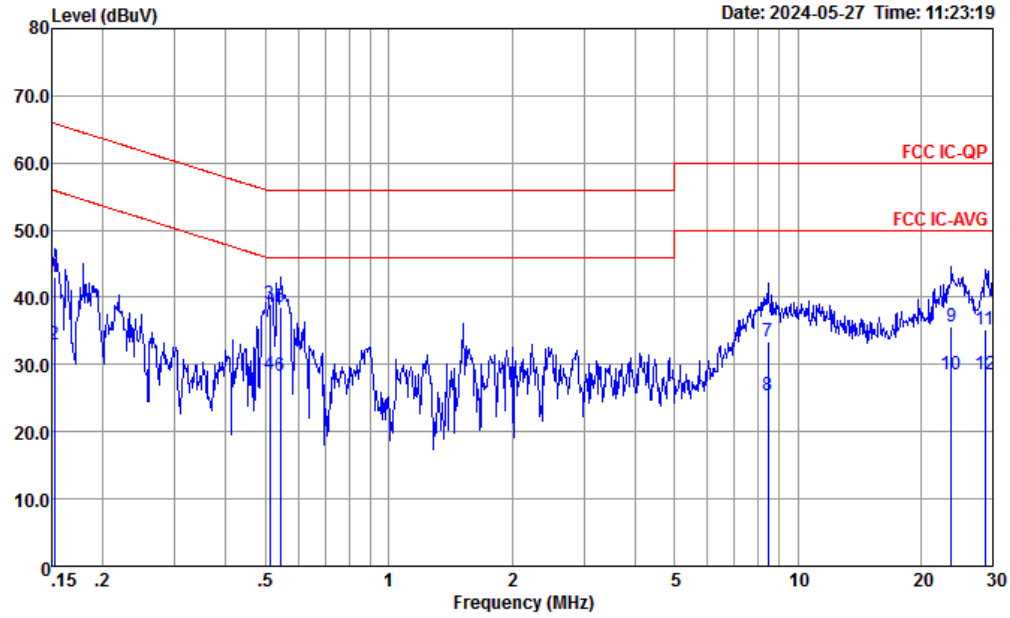
Test Engineer :	Amos Zhang	**Temperature :**	24.2~25.6℃
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC IC-QP LISN-060105-L 2023 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.164	41.66	-23.59	65.25	31.20	0.04	10.42	QP
2		0.164	31.96	-23.29	55.25	21.50	0.04	10.42	Average
3		0.192	40.64	-23.29	63.93	30.20	0.03	10.41	QP
4		0.192	32.54	-21.39	53.93	22.10	0.03	10.41	Average
5		0.535	39.37	-16.63	56.00	29.21	-0.04	10.20	QP
6	*	0.535	33.07	-12.93	46.00	22.91	-0.04	10.20	Average
7		8.192	31.48	-28.52	60.00	21.20	-0.15	10.43	QP
8		8.192	24.18	-25.82	50.00	13.90	-0.15	10.43	Average
9		24.790	35.03	-24.97	60.00	23.80	-0.29	11.52	QP
10		24.790	27.83	-22.17	50.00	16.60	-0.29	11.52	Average
11		28.908	34.91	-25.09	60.00	23.60	-0.37	11.68	QP
12		28.908	27.61	-22.39	50.00	16.30	-0.37	11.68	Average

Test Engineer :	Amos Zhang	**Temperature :**	24.2~25.6℃
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC IC-QP LISN-060105-N 2023 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.152	42.96	-22.91	65.87	32.50	0.04	10.42	QP
2		0.152	33.06	-22.81	55.87	22.60	0.04	10.42	Average
3	*	0.513	38.94	-17.06	56.00	28.80	-0.07	10.21	QP
4		0.513	28.44	-17.56	46.00	18.30	-0.07	10.21	Average
5		0.544	38.63	-17.37	56.00	28.50	-0.07	10.20	QP
6		0.544	28.33	-17.67	46.00	18.20	-0.07	10.20	Average
7		8.456	33.51	-26.49	60.00	23.19	-0.15	10.47	QP
8		8.456	25.51	-24.49	50.00	15.19	-0.15	10.47	Average
9		23.762	35.60	-24.40	60.00	24.50	-0.39	11.49	QP
10		23.762	28.60	-21.40	50.00	17.50	-0.39	11.49	Average
11		28.755	35.18	-24.82	60.00	23.90	-0.39	11.67	QP
12		28.755	28.58	-21.42	50.00	17.30	-0.39	11.67	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

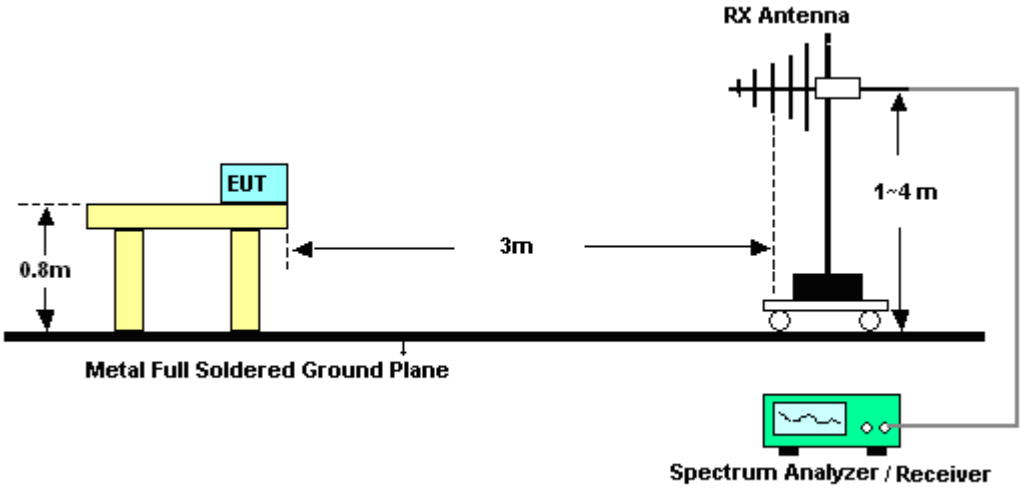
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

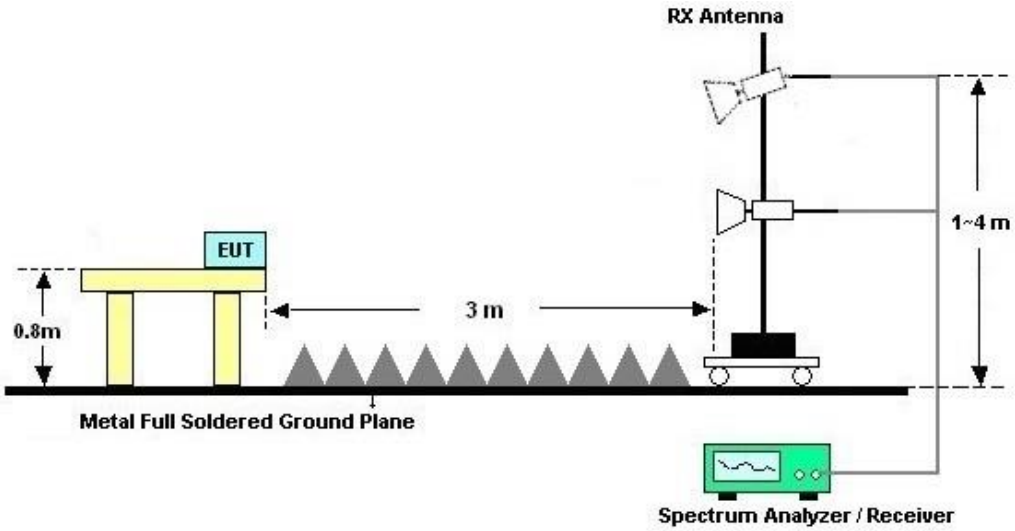
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, 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.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

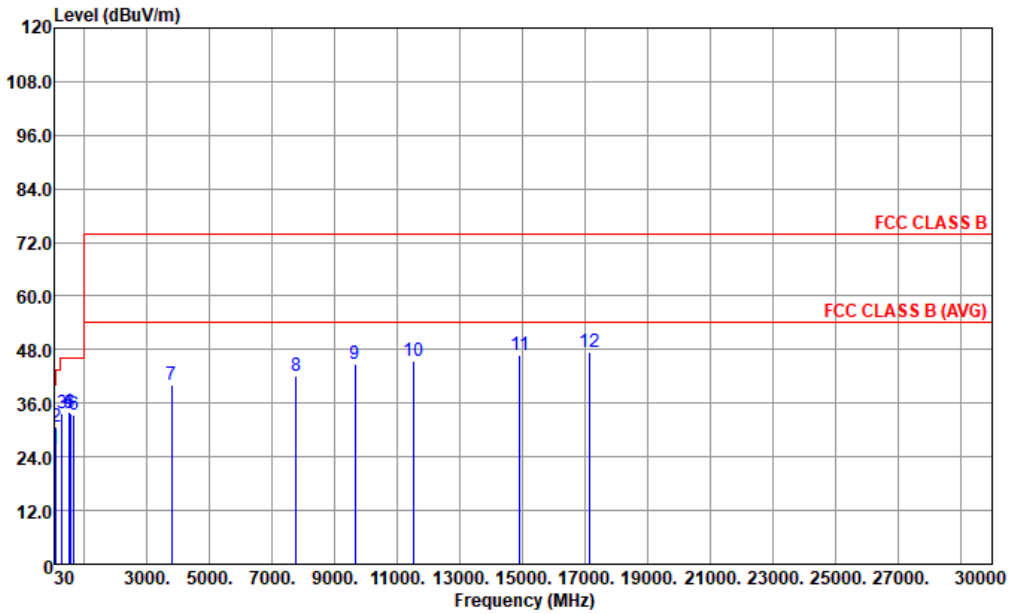


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

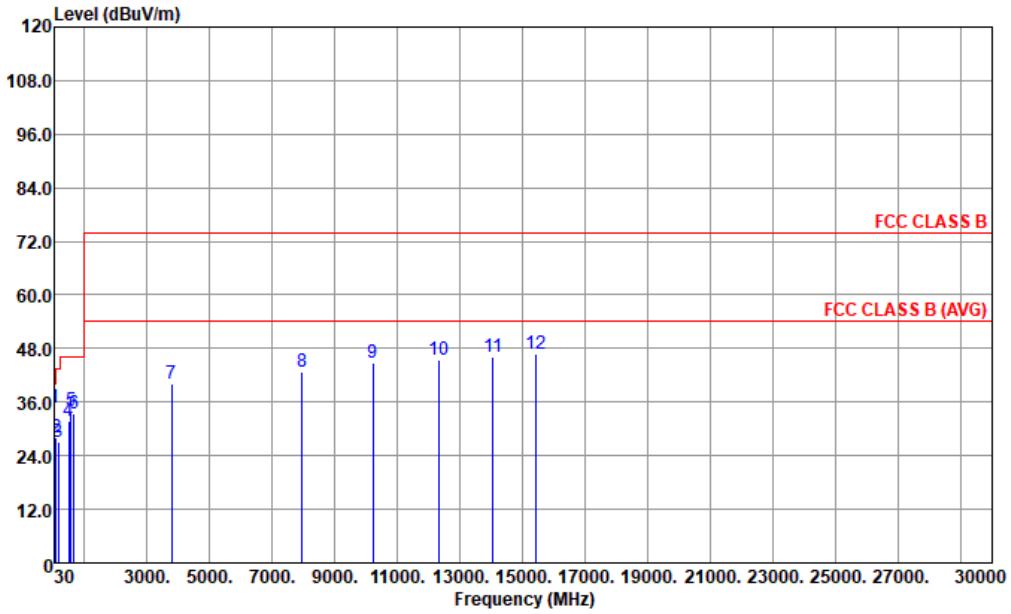
Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal



Site : 03CH02-KS
Condition : FCC CLASS B 3m 3117 00218652 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	37.76	25.76	-14.24	40.00	37.24	20.70	0.82	33.00	---	---	Peak
2 p	86.26	30.85	-9.15	40.00	48.16	14.06	1.33	32.70	---	---	Peak
3	278.32	33.66	-12.34	46.00	45.62	18.62	2.35	32.93	---	---	Peak
4	499.48	34.11	-11.89	46.00	40.56	23.78	3.14	33.37	---	---	Peak
5	553.80	33.75	-12.25	46.00	38.22	25.87	3.22	33.56	---	---	Peak
6	667.29	33.31	-12.69	46.00	36.89	26.15	3.81	33.54	---	---	Peak
7	3771.00	40.08	-33.92	74.00	61.09	33.40	9.40	63.81	---	---	Peak
8	7766.00	42.01	-31.99	74.00	55.67	35.87	13.89	63.42	---	---	Peak
9	9653.00	44.79	-29.21	74.00	54.07	36.95	15.96	62.19	---	---	Peak
10	11523.00	45.62	-28.38	74.00	51.80	38.32	17.12	61.62	---	---	Peak
11	14906.00	46.81	-27.19	74.00	49.83	39.66	19.42	62.10	---	---	Peak
12	17133.00	47.57	-26.43	74.00	48.41	41.07	21.07	62.98	---	---	Peak

Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH02-KS
Condition : FCC CLASS B 3m 3117 00218652 VERTICAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 p	39.70	34.85	-5.15	40.00	47.40	19.61	0.86	33.02	100	0	Peak
2	85.29	28.12	-11.88	40.00	45.55	13.93	1.33	32.69	---	---	Peak
3	167.74	27.00	-16.50	43.50	42.20	15.64	1.88	32.72	---	---	Peak
4	499.48	31.86	-14.14	46.00	38.31	23.78	3.14	33.37	---	---	Peak
5	573.20	33.98	-12.02	46.00	38.35	25.79	3.40	33.56	---	---	Peak
6	663.41	33.47	-12.53	46.00	37.07	26.15	3.79	33.54	---	---	Peak
7	3771.00	40.08	-33.92	74.00	61.09	33.40	9.40	63.81	---	---	Peak
8	7953.00	42.72	-31.28	74.00	56.66	35.85	13.37	63.16	---	---	Peak
9	10214.00	44.89	-29.11	74.00	53.40	37.59	16.11	62.21	---	---	Peak
10	12339.00	45.50	-28.50	74.00	49.64	38.94	17.79	60.87	---	---	Peak
11	14039.00	46.15	-27.85	74.00	49.41	38.85	19.05	61.16	---	---	Peak
12	15399.00	46.90	-27.10	74.00	49.30	39.94	19.81	62.15	---	---	Peak

Note:

1. Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 10, 2023	May 24, 2024	Oct. 09, 2024	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 10, 2023	May 24, 2024	Oct. 09, 2024	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 21, 2023	May 24, 2024	Dec. 20, 2024	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 23, 2024	May 24, 2024	Nov. 22, 2024	Radiation (03CH02-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	May 24, 2024	Jan. 04, 2025	Radiation (03CH02-KS)
Amplifier	EM	EM18G40GGA	060852	18~40GHz	Jan. 05, 2024	May 24, 2024	Jan. 04, 2025	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 06, 2023	May 24, 2024	Jul. 05, 2024	Radiation (03CH02-KS)
Amplifier	EM	EM01G18G	060806	1GHz~18GHz	Oct. 10, 2023	May 24, 2024	Oct. 09, 2024	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	May 24, 2024	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	May 24, 2024	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	May 24, 2024	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	May 27, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	May 27, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	May 27, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	May 27, 2024	Oct. 10, 2024	Conduction (CO01-KS)

NCR: No Calibration Required

5. Measurement Uncertainty

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.84 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.04 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.12 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.30 dB**

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