



FCC Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Phone
BRAND NAME : Motorola
MODEL NAME : XT2433-2, XT2433-1
FCC ID : IHDT56AS4
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : May. 08, 2024 ~ Jun. 01, 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 3

SUMMARY OF TEST RESULT 4

1. GENERAL DESCRIPTION 5

 1.1. Applicant..... 5

 1.2. Manufacturer 5

 1.3. Product Feature of Equipment Under Test 5

 1.4. Product Specification of Equipment Under Test 6

 1.5. Modification of EUT 7

 1.6. Test Location 8

 1.7. Test Software 8

 1.8. Applicable Standards 8

 1.9. Specification of Accessory 9

2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST 10

 2.1. Test Mode 10

 2.2. Connection Diagram of Test System 12

 2.3. Support Unit used in test configuration and system 12

 2.4. EUT Operation Test Setup 13

3. TEST RESULT 14

 3.1. Test of AC Conducted Emission Measurement 14

 3.2. Test of Radiated Emission Measurement 18

4. LIST OF MEASURING EQUIPMENT 23

5. MEASUREMENT UNCERTAINTY 24

APPENDIX A. SETUP PHOTOGRAPHS



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC422904	Rev. 01	Initial issue of report	Jul. 26, 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 4.38 dB at 13.56 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 4.64 dB at 42.61 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

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 Phone
Brand Name	Motorola
Model Name	XT2433-2, XT2433-1
FCC ID	IHDT56AS4
EUT supports Radios application	GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC / GNSS / FM
IMEI /SN Code	Conduction: 356304130012830 for Sample 1 356304130086057 for Sample 2 356304130090422 for Sample 3 Radiation: 356304130013655 for Sample 1 356304130086057 for Sample 2 356304130090653 for Sample 3
HW Version	DVT2
SW Version	UOA34.101
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. The two models are only different for market segment, all the others are same.
3. There are three samples under test, sample 1 is 1st source, samle 2 is 2nd source, sample 3 is 3rd source, the detailed differences could be referred to the XT2433-2, XT2433-1_Operational Description of Product Equality Declaration which is exhibit separately. According to the difference, sample 1 perform full test and sample 2/3 verify the worst cases.



1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850MHz ~ 1910MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 38 : 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 42 : 3450 MHz ~ 3550 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n78 : 3450 MHz ~ 3550 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz; 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Rx Frequency	GSM850: 869 MHz ~ 894 MHz GSM1900: 1930 MHz ~ 1990 MHz WCDMA Band II: 1930 MHz ~ 1990 MHz WCDMA Band IV : 2110 MHz ~ 2155 MHz WCDMA Band V: 869 MHz ~ 894 MHz LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 7 : 2620 MHz ~ 2690 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 17 : 734 MHz ~ 746 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 859 MHz ~ 894 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 42 : 3450 MHz ~ 3550 MHz LTE Band 66 : 2110 MHz~ 2180 MHz 5G NR n2 : 1930 MHz ~ 1990 MHz 5G NR n5 : 869 MHz ~ 894 MHz



	<p>5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n26 : 859 MHz ~ 894 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 2110 MHz~ 2200 MHz 5G NR n78 : 3450 MHz ~ 3550 MHz 802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz; 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz GNSS : 1559 MHz ~ 1610 MHz FM : 88 MHz ~ 108 MHz</p>
Antenna Type	<p>WWAN : IFA Antenna / Loop Antenna WLAN : IFA Antenna Bluetooth : IFA Antenna GNSS: IFA Antenna NFC: coil Antenna FM : External Earphone Antenna</p>
Type of Modulation	<p>GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSPA : QPSK HSPA+ : 16QAM DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM / 256QAM 5G NR: DFT-s-OFDM (PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM) 802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) :$\pi/4$-DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK NFC: ASK FM</p>

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 03CH07-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH07-KS	AUDIX	E3	210616
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.



1.9.Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola(AOHAI)	Model Name	MC-201L
AC Adapter 1(EU)	Brand Name	Motorola(AOHAI)	Model Name	MC-202L
AC Adapter 1(UK)	Brand Name	Motorola(AOHAI)	Model Name	MC-203L
AC Adapter 1(IN)	Brand Name	Motorola(AOHAI)	Model Name	MC-204
AC Adapter 1(AU)	Brand Name	Motorola(AOHAI)	Model Name	MC-205L
AC Adapter 1(AR)	Brand Name	Motorola(AOHAI)	Model Name	MC-206L
AC Adapter 2(US)	Brand Name	Motorola(Salcomp)	Model Name	MC-201L
AC Adapter 2(EU)	Brand Name	Motorola(Salcomp)	Model Name	MC-202L
AC Adapter 2(UK)	Brand Name	Motorola(Salcomp)	Model Name	MC-203L
AC Adapter 2(AU)	Brand Name	Motorola(Salcomp)	Model Name	MC-205L
AC Adapter 2(AR)	Brand Name	Motorola(Salcomp)	Model Name	MC-206L
AC Adapter 2(BR)	Brand Name	Motorola(Salcomp)	Model Name	MC-207L
AC Adapter 2(Chile)	Brand Name	Motorola(Salcomp)	Model Name	MC-209L
AC Adapter 3(US)	Brand Name	Motorola(Chenyang)	Model Name	MC-201L
AC Adapter 3(EU)	Brand Name	Motorola(Chenyang)	Model Name	MC-202L
AC Adapter 3(AR)	Brand Name	Motorola(Chenyang)	Model Name	MC-206L
AC Adapter 3(BR)	Brand Name	Motorola(Chenyang)	Model Name	MC-207L
AC Adapter 4(BR)	Brand Name	Motorola(Cliptech)	Model Name	MC-207L
AC Adapter 5(IN)	Brand Name	Motorola(XIHI)	Model Name	MC-204
Battery 1	Brand Name	Motorola(ATL)	Model Name	QG50
Battery 2	Brand Name	Motorola(Sunwoda)	Model Name	QG50
Battery 3	Brand Name	Motorola(JIADE)	Model Name	QG50
USB Cable 1	Brand Name	Saibao	Model Name	SZN-A026A
USB Cable 2	Brand Name	Juwei	Model Name	JWUB1606-ZN01H



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: GSM 850 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Earphone + Battery 1 + USB Cable 1 (Charging from Adapter 1) + SIM for Sample 1
	Mode 2: WCDMA Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Front) + Earphone + Battery 1 + USB Cable 2 (Charging from Adapter 2) + E-SIM for Sample 1
	Mode 3: LTE Band 26 Rx(Low) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone + Battery 1 + USB Cable 1 (Charging from Adapter 3) + SIM for Sample 1
	Mode 4: LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable1(Charging from Adapter 4) + SIM for Sample 1
	Mode 5: LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHZ) + Earphone + Battery 1 + USB Cable1(Charging from Adapter 5) + SIM for Sample 1
	Mode 6: LTE Band 13 RX(Low) + Bluetooth Idle + WLAN (5G) Idle + GNSS Rx + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + SIM for Sample 1
	Mode 7: 5G N5 Rx(Low) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + SIM for Sample 1
	Mode 8: LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + SIM for Sample 1
	Mode 9: LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + SIM for Sample 1
	Mode 10 :LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable 2(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + SIM for Sample 1
	Mode 11 :LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + Camera(Rear) + Earphone + Battery 2 + USB Cable1 (Charging from Adapter4) + SIM for Sample 2
	Mode 12 :LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (2.4G) Idle + NFC On + Earphone + Battery 2 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + SIM for Sample 2
	Mode 13 : LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 3 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + SIM for Sample 3

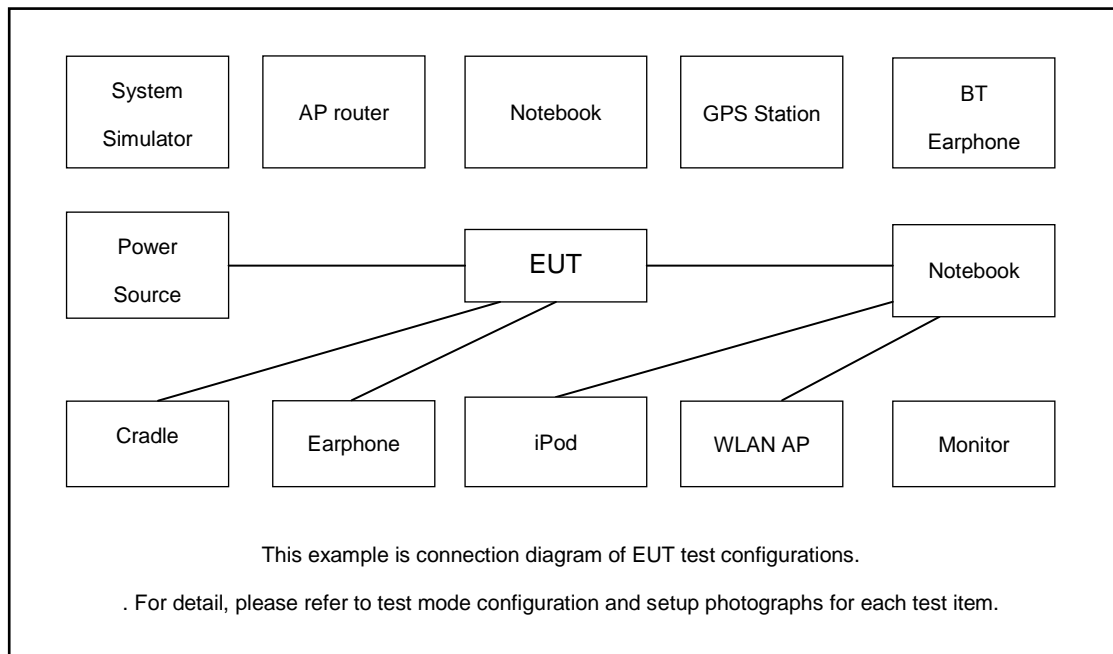


Radiated Emissions	<p>Mode 1 : GSM 850 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Earphone + Battery 1 + USB Cable 1 (Charging from Adapter 1) + SIM for Sample 1</p> <p>Mode 2 : WCDMA Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Front) + Earphone + Battery 1 + USB Cable 2 (Charging from Adapter 2) + E-SIM for Sample 1</p> <p>Mode 3 : LTE Band 26 Rx(Low) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone + Battery 1 + USB Cable1 (Charging from Adapter 3) + SIM for Sample 1</p> <p>Mode 4 : LTE Band 26 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery 1 + USB Cable1(Charging from Adapter 4) + SIM for Sample 1</p> <p>Mode 5 : LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHZ) + Earphone + Battery 1 + USB Cable1(Charging from Adapter 5) + SIM for Sample 1</p> <p>Mode 6 : LTE Band 13 RX(Low) + Bluetooth Idle + WLAN (5G) Idle + GNSS Rx + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + SIM for Sample 1</p> <p>Mode 7 : 5G N5 Rx(Low) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHz) + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + SIM for Sample 1</p> <p>Mode 8 : LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHz) + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + SIM for Sample 1</p> <p>Mode 9 : LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHz) + Earphone + Battery 1 + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + SIM for Sample 1</p> <p>Mode 10 :LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + FM Rx(98MHz) + Earphone + Battery 1 + USB Cable 2(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + SIM for Sample 1</p> <p>Mode 11 :LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Earphone + Battery 2 + USB Cable1 (Charging from Adapter 5) + SIM for Sample 2</p> <p>Mode 12 :LTE Band 12 RX(High) + Bluetooth Idle + WLAN (2.4G) Idle+ MPEG4(Run Color Bar) + Earphone + Battery 2 + USB Cable 2 (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + SIM for Sample 2</p> <p>Mode 13 :LTE Band 13 RX(Low) + Bluetooth Idle + WLAN (5G) Idle + GNSS Rx + Earphone + Battery 3 + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + SIM for Sample 3</p>
--------------------	---

Remark:

1. The worst case of AC is mode 4; only the test data of this mode is reported.
2. The worst case of RE is mode 5; only the test data of this mode is reported.
3. Data Link with Notebook means data application transferred mode between EUT and Notebook.
4. Pre-scanned Low/Middle/High channel, the worst channel was recorded in this report.

2.2. Connection Diagram of Test System



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.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
2.	LTE Base Station	Anritus	MT8820C	N/A	N/A	N/A
3.	5GNR Base Station	Anritus	MT8000A	N/A	N/A	Unshielded,1.8m
4.	Signal Generator	R&S	SMBV100A	N/A	N/A	N/A
5.	Notebook	Lenovo	V130-14IKB001	N/A	N/A	N/A
6.	Notebook	Lenovo	G480	N/A	N/A	Unshielded AC I/P cable 1.8m
7.	SD Card	SanDisk	Ultra	N/A	N/A	N/A
8.	SD Card	Kingston	8GB	N/A	N/A	N/A
9.	Hard disk	KINGSHARE	KSP6120G	N/A	N/A	N/A
10.	Hard Disk	Lenovo	F310	N/A	N/A	Shielded, 1.2m
11.	WLAN AP	D-link	DIR-655	N/A	N/A	Unshielded,1.8m
12.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	N/A
13.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A



2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE or 5G NR idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between notebook and EUT via USB cable.
2. Turn on camera to capture images.
3. Turn on MPEG4 function.
4. Turn on FM function to make the EUT receive continuous signals from FM station.
5. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.
6. Turn on NFC function

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.

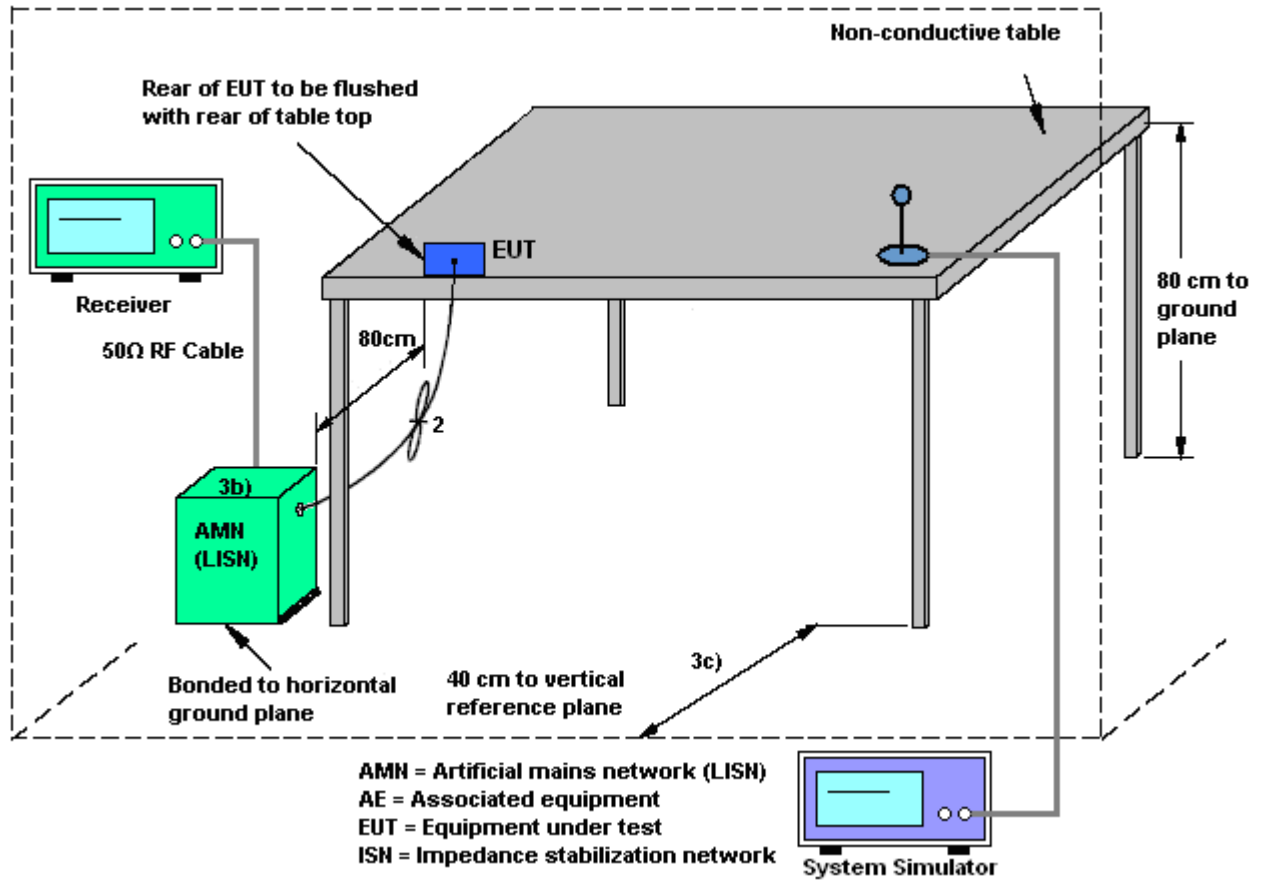
3.1.2 Measuring Instruments

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.

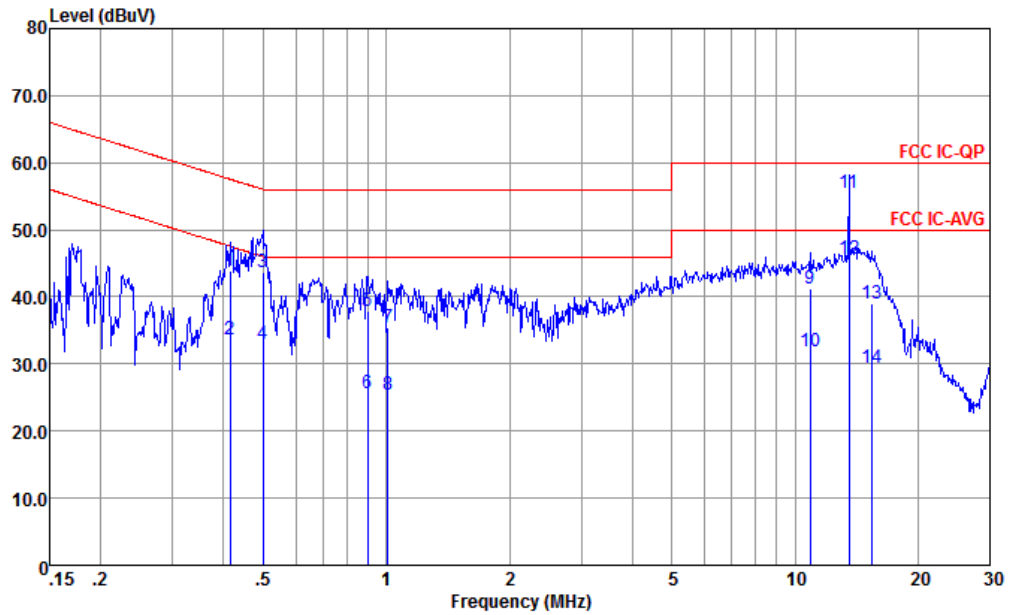
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Amos	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

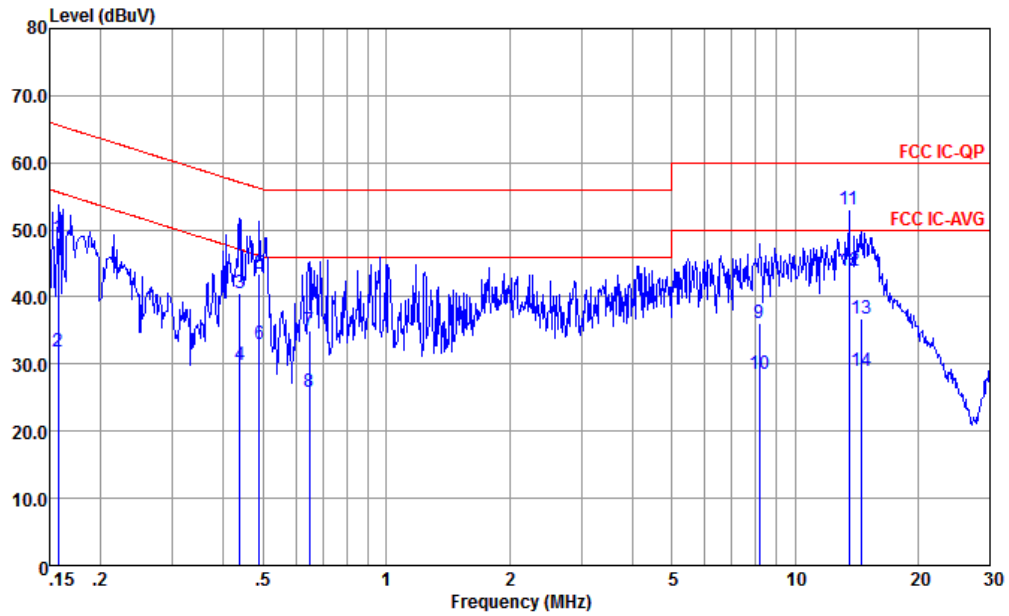


Site : CO01-KS
 Condition : FCC IC-QP LISN-060105-L 2023 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.415	43.87	-13.68	57.55	33.60	0.00	10.27	QP
2	0.415	33.67	-13.88	47.55	23.40	0.00	10.27	Average
3	0.499	43.59	-12.42	56.01	33.40	-0.03	10.22	QP
4	0.499	32.99	-13.02	46.01	22.80	-0.03	10.22	Average
5	0.899	37.91	-18.09	56.00	27.90	-0.09	10.10	QP
6	0.899	25.71	-20.29	46.00	15.70	-0.09	10.10	Average
7	1.010	35.39	-20.61	56.00	25.40	-0.10	10.09	QP
8	1.010	25.39	-20.61	46.00	15.40	-0.10	10.09	Average
9	10.905	41.22	-18.78	60.00	30.56	-0.15	10.81	QP
10	10.905	31.96	-18.04	50.00	21.30	-0.15	10.81	Average
11	13.560	55.38	-4.62	60.00	44.40	-0.13	11.11	QP
12 *	13.560	45.62	-4.38	50.00	34.64	-0.13	11.11	Average
13	15.388	38.98	-21.02	60.00	27.90	-0.14	11.22	QP
14	15.388	29.38	-20.62	50.00	18.30	-0.14	11.22	Average



Test Engineer :	Amos	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
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	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.157	48.76	-16.84	65.60	38.30	0.04	10.42	QP
2	0.157	31.86	-23.74	55.60	21.40	0.04	10.42	Average
3	0.437	40.49	-16.62	57.11	30.29	-0.06	10.26	QP
4	0.437	29.79	-17.32	47.11	19.59	-0.06	10.26	Average
5	0.489	43.36	-12.83	56.19	33.20	-0.07	10.23	QP
6	0.489	33.06	-13.13	46.19	22.90	-0.07	10.23	Average
7	0.647	34.99	-21.01	56.00	24.90	-0.07	10.16	QP
8	0.647	25.89	-20.11	46.00	15.80	-0.07	10.16	Average
9	8.192	36.09	-23.91	60.00	25.80	-0.14	10.43	QP
10	8.192	28.49	-21.51	50.00	18.20	-0.14	10.43	Average
11	13.560	53.03	-6.97	60.00	42.05	-0.13	11.11	QP
12 *	13.560	43.88	-6.12	50.00	32.90	-0.13	11.11	Average
13	14.594	36.78	-23.22	60.00	25.71	-0.11	11.18	QP
14	14.594	28.98	-21.02	50.00	17.91	-0.11	11.18	Average

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- 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.

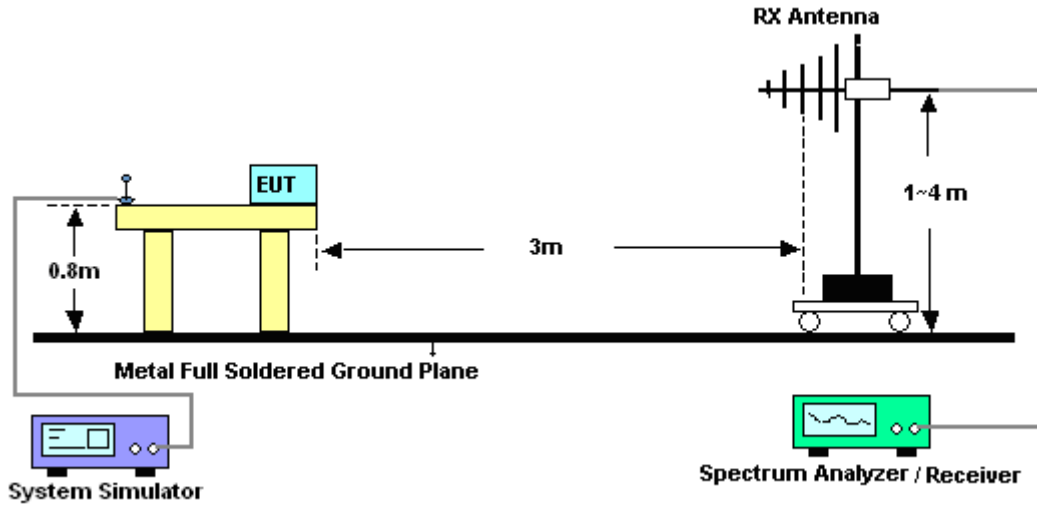


3.2.3. Test Procedures

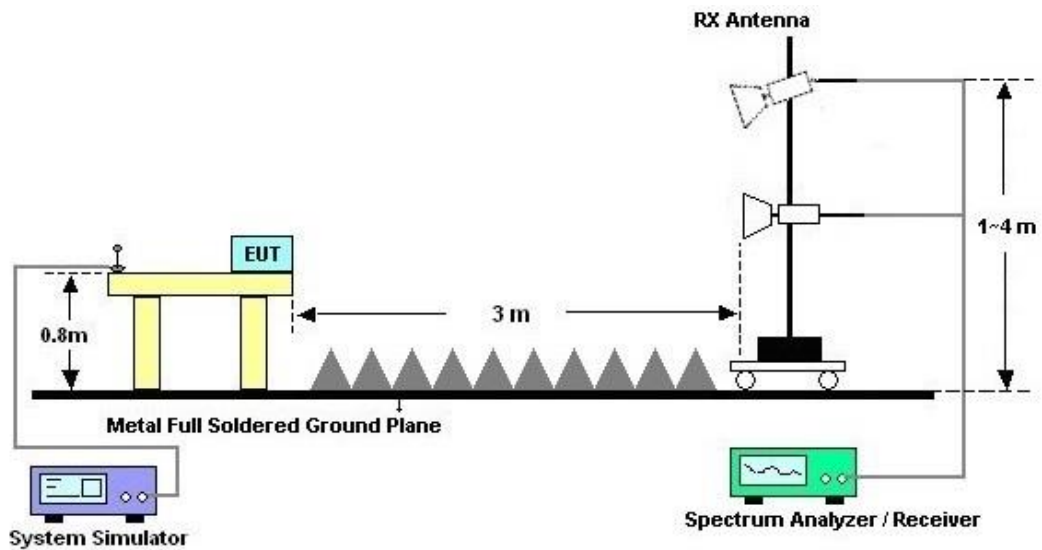
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. 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.
6. 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.
7. 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).
8. 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.
9. Emission level (dB μ V/m) = 20 log Emission level (μ V/m)
10. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
11. 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



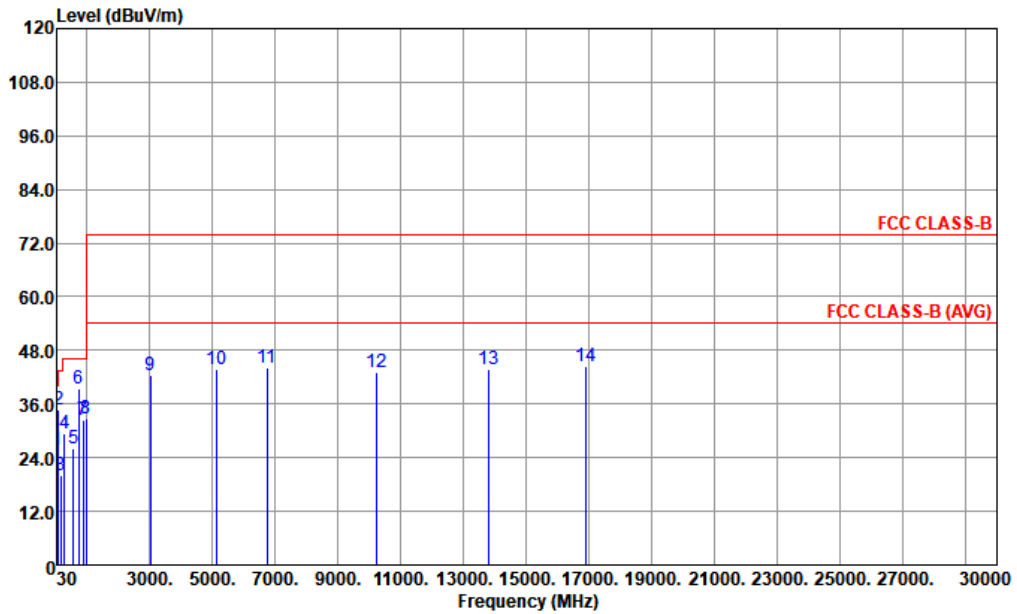
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#2 is FM station signal which can be ignored. #6 is LTE RF signal which can be ignored.		

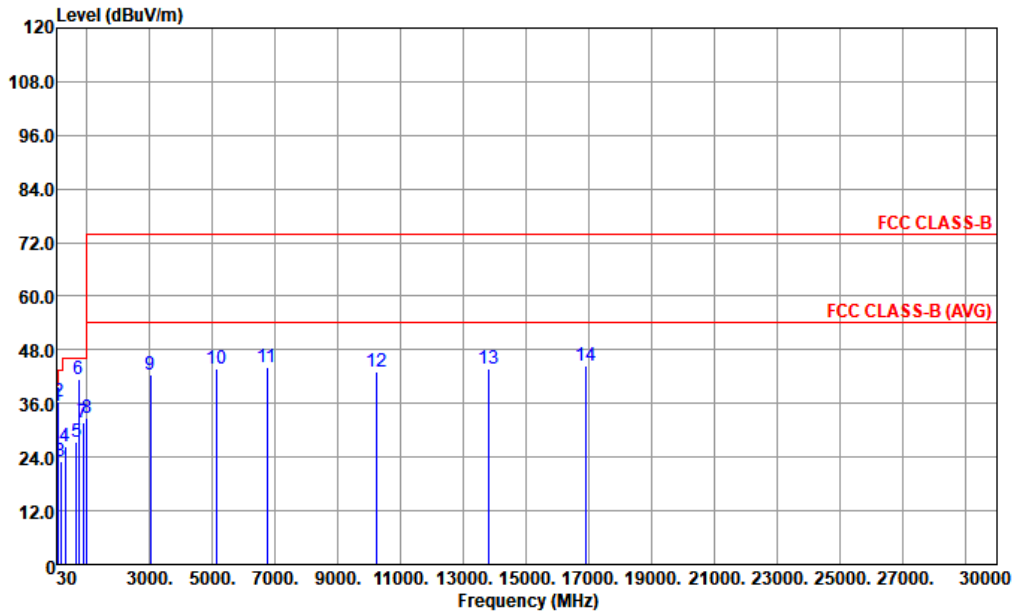


Site : 03CH07-KS
Condition : FCC CLASS-B 3m CBL6111D 59915 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	40.67	25.74	-14.26	40.00	38.03	19.16	0.64	32.09	---	---	Peak
2	97.90	34.82			49.78	15.66	1.44	32.06	---	---	Peak
3	163.86	20.21	-23.29	43.50	34.37	16.09	1.85	32.10	---	---	Peak
4	268.62	29.49	-16.51	46.00	40.19	18.97	2.39	32.06	---	---	Peak
5	568.35	26.19	-19.81	46.00	28.97	26.07	3.47	32.32	---	---	Peak
6 p	743.92	39.54			39.28	28.36	3.98	32.08	---	---	Peak
7	887.48	32.43	-13.57	46.00	30.29	29.15	4.34	31.35	---	---	Peak
8	972.84	32.88	-21.12	54.00	28.15	30.94	4.54	30.75	---	---	Peak
9	3023.00	42.56	-31.44	74.00	62.70	32.82	8.90	61.86	---	---	Peak
10	5131.00	43.66	-30.34	74.00	58.68	34.77	11.85	61.64	---	---	Peak
11	6729.00	43.96	-30.04	74.00	56.28	35.77	13.42	61.51	---	---	Peak
12	10248.00	43.26	-30.74	74.00	51.03	37.55	16.77	62.09	---	---	Peak
13	13784.00	43.85	-30.15	74.00	46.73	39.19	19.64	61.71	---	---	Peak
14	16878.00	44.52	-29.48	74.00	44.24	41.55	21.88	63.15	---	---	Peak



Test Engineer :	Moon	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Remark :	#2 is FM station signal which can be ignored. #6 is LTE RF signal which can be ignored.		



Site : 03CH07-KS
Condition : FCC CLASS-B 3m CBL6111D 59915 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	42.61	35.36	-4.64	40.00	48.76	18.03	0.67	32.10	100	182 Peak
2	97.90	36.50			51.46	15.66	1.44	32.06	---	---
3	162.89	23.15	-20.35	43.50	37.21	16.18	1.85	32.09	---	---
4	296.75	26.46	-19.54	46.00	36.88	19.12	2.53	32.07	---	---
5	659.53	27.49	-18.51	46.00	29.68	26.30	3.75	32.24	---	---
6 p	743.92	41.51			41.25	28.36	3.98	32.08	---	---
7	879.72	31.81	-14.19	46.00	29.66	29.22	4.32	31.39	---	---
8	989.33	32.77	-21.23	54.00	28.05	30.75	4.57	30.60	---	---
9	3023.00	42.56	-31.44	74.00	62.70	32.82	8.90	61.86	---	---
10	5131.00	43.66	-30.34	74.00	58.68	34.77	11.85	61.64	---	---
11	6729.00	43.96	-30.04	74.00	56.28	35.77	13.42	61.51	---	---
12	10248.00	43.26	-30.74	74.00	51.03	37.55	16.77	62.09	---	---
13	13784.00	43.85	-30.15	74.00	46.73	39.19	19.64	61.71	---	---
14	16878.00	44.52	-29.48	74.00	44.24	41.55	21.88	63.15	---	---

Note:

- Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
- 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. 11, 2023	May 08, 2024	Oct. 10, 2024	Radiation (03CH07-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 11, 2023	May 08, 2024	Oct. 10, 2024	Radiation (03CH07-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	May 08, 2024	Aug. 18, 2024	Radiation (03CH07-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	May 08, 2024	Oct. 22, 2024	Radiation (03CH07-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Oct. 15, 2023	May 08, 2024	Oct. 14, 2024	Radiation (03CH07-KS)
Amplifier	SONOMA	310N	413740	9KHz-1GHz	Jan. 03, 2024	May 08, 2024	Jan. 02, 2025	Radiation (03CH07-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 11, 2023	May 08, 2024	Oct. 10, 2024	Radiation (03CH07-KS)
Amplifier	EM	EM18G40GGA	060851	18~40GHz	Jan. 03, 2024	May 08, 2024	Jan. 02, 2025	Radiation (03CH07-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	May 08, 2024	NCR	Radiation (03CH07-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	May 08, 2024	NCR	Radiation (03CH07-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	May 08, 2024	NCR	Radiation (03CH07-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr 18, 2024	Jun. 01, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Jun. 01, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr 18, 2024	Jun. 01, 2024	Apr 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Jun. 01, 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))	6.06 dB
---	---------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.16 dB
---	---------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.28 dB
---	---------

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