



FCC Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2513-1, XT2513-2, XT2513-3, XT2513V
FCC ID : IHDT56AT9
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Sep. 05, 2024 ~ Sep. 11, 2024

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

Jason Jia



Approved by: Jason Jia

Sporton International Inc. (ShenZhen)

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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
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 7.52 dB at 0.150 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.52 dB at 38.730 MHz for Quasi-Peak

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 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 Cellular Phone
Brand Name	Motorola
Model Name	XT2513-1, XT2513-2, XT2513-3, XT2513V
FCC ID	IHDT56AT9
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 GNSS/NFC/FM
IMEI Code	Conduction: 352291420056433/352291420056441 for sample 1 352291420078551/352291420078569 for sample 2 Radiation: 35229140054834/352291420054842 for sample 1 352291420078536/35229140078544 for sample 2
HW Version	DVT2
SW Version	VVK35.48
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. There are two types of EUT, the sample 1 is 1st source + Battery 1 and the sample 2 is 2nd source + Battery 2. The differences could be referred to the XT2513-1, XT2513-2, XT2513-3, XT2513V_Operational Description of Product Equality Declaration which is exhibit separately.
3. There are four models, the four models are for different markets and no other difference.



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 14 : 788 MHz ~ 798 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 30 : 2305 MHz ~ 2315 MHz LTE Band 38 : 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 48 : 3550 MHz ~ 3700 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz; 5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 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



	<p>LTE Band 7 : 2620 MHz ~ 2690 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 14 : 758 MHz ~ 768 MHz LTE Band 17 : 734 MHz ~ 746 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 859 MHz ~ 894 MHz LTE Band 29 : 717MHz~728MHz LTE Band 30 : 2350 MHz ~ 2360 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 48 : 3550 MHz ~ 3700 MHz LTE Band 66 : 2110 MHz~ 2200 MHz LTE Band 71 : 617 MHz ~ 652 MHz 5G NR n2 : 1930 MHz ~ 1990 MHz 5G NR n5 : 869 MHz ~ 894 MHz 5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n12 : 729 MHz ~ 746 MHz 5G NR n14 : 758 MHz ~ 768 MHz 5G NR n25 : 1930 MHz ~ 1995 MHz 5G NR n26 : 859 MHz ~ 894 MHz 5G NR n29 : 717 MHz ~ 728 MHz 5G NR n30 : 2350 MHz ~ 2360 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 2110 MHz~ 2200 MHz 5G NR n70 : 1995 MHz ~ 2020 MHz 5G NR n71 : 617 MHz ~ 652 MHz 5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz; 5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 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 : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna GNSS: PIFA Antenna NFC: Loop 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)</p>



	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
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1.5. Modification of EUT

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

1.6. Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	Motorola(AOHAI)	Model Name	MC-201L
AC Adapter 2	Brand Name	Motorola(Salcomp)	Model Name	MC-201L
USB Cable 1	Brand Name	Motorola(WASHIN)	Model Name	HX-TL-04
USB Cable 2	Brand Name	Motorola(SAIBAO)	Model Name	STN-A131A
USB Cable 3	Brand Name	Motorola(WASHIN)	Model Name	HX-TL-07
USB Cable 4	Brand Name	Motorola(SAIBAO)	Model Name	STN-A132A
Battery 1	Brand Name	Motorola(CosMX)	Model Name	RA50
Battery 2	Brand Name	Motorola(ATL)	Model Name	RA50

1.7. Test 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.
	CO01-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 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH05-SZ	CN1256	421272

1.8. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH05-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

1.9. 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 for sample 1	Mode 1: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 1 (Charging from Adapter 1) + (SD Card Load) + SIM 1 + Battery 1 for sample 1
	Mode 2: LTE Band 26(Low CH) + Camera(Front) + Earphone + USB Cable 2 (Charging from Adapter 2) + (SD Card Load) + E-SIM + Battery 1 for sample 1
	Mode 3: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 1 for sample 1
	Mode 4: LTE Band 13 Idle(High CH) + GNSS RX + (SD Card Load) + Earphone + USB Cable 4 (Charging from Adapter 2) + Battery 1 + E-SIM for sample 1
	Mode 5: LTE Band 14 Idle(Low CH) + NFC ON + (SD Card Load) + Earphone + USB Cable 1 (Data Link with Notebook) + EUT (eMMC) USB Data Link to NB + Battery 1 for sample 1
	Mode 6: NR SA n71 ((Middle CH) + FM(98MHz) Rx + (SD Card Load) + Earphone + USB Cable 1 (Data Link with Notebook) + NB USB Data Link to EUT (eMMC) + SIM 1 + Battery 1 for sample 1
	Mode 7: ENDC 2A + n71 (High CH) + Camera(Rear) + USB Cable 1 (Data Link with Notebook) + EUT (SD Card) USB Data Link to NB + SIM 1 + Battery 1 for sample 1
	Mode 8: LTE CA_2A-29A(Middle CH) + Camera(Rear) + (SD Card Link) + Earphone + USB Cable 1 (Data Link with Notebook) + NB USB Data Link to EUT (SD Card) + SIM 1 + Battery 1 for sample 1
	Mode 9: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 2 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 1 for sample 1
	Mode 10 : GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 3 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 1 for sample 1
	Mode 11 : GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 4 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 1 for sample 1



<p>AC Conducted Emission for sample 2</p>	<p>Mode 1: GSM 850 Idle(Middle CH) + Camera(Rear) + (SD Card Load) + Earphone + USB Cable 1 (Charging from Adapter 1) + Battery 2 + SIM 1 for sample 2</p> <p>Mode 2: LTE Band 26(Low CH) + Camera(Front) + Earphone + USB Cable 2 (Charging from Adapter 2) + (SD Card Load) + E-SIM + Battery 2 for sample 2</p> <p>Mode 3: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 4: LTE Band 13 Idle(High CH) + GNSS RX + (SD Card Load) + Earphone + USB Cable 4 (Charging from Adapter 2) + Battery 2 + E-SIM for sample 2</p> <p>Mode 5: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 1 (Data Link with Notebook) + (SD Card Load) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 6: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 2 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 7: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 3 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 8: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 4 (Data Link with Notebook) + (NB USB Data Link to EUT (eMMC))+ (SD Card Load) + SIM 1 + Battery 2 for sample 2</p>
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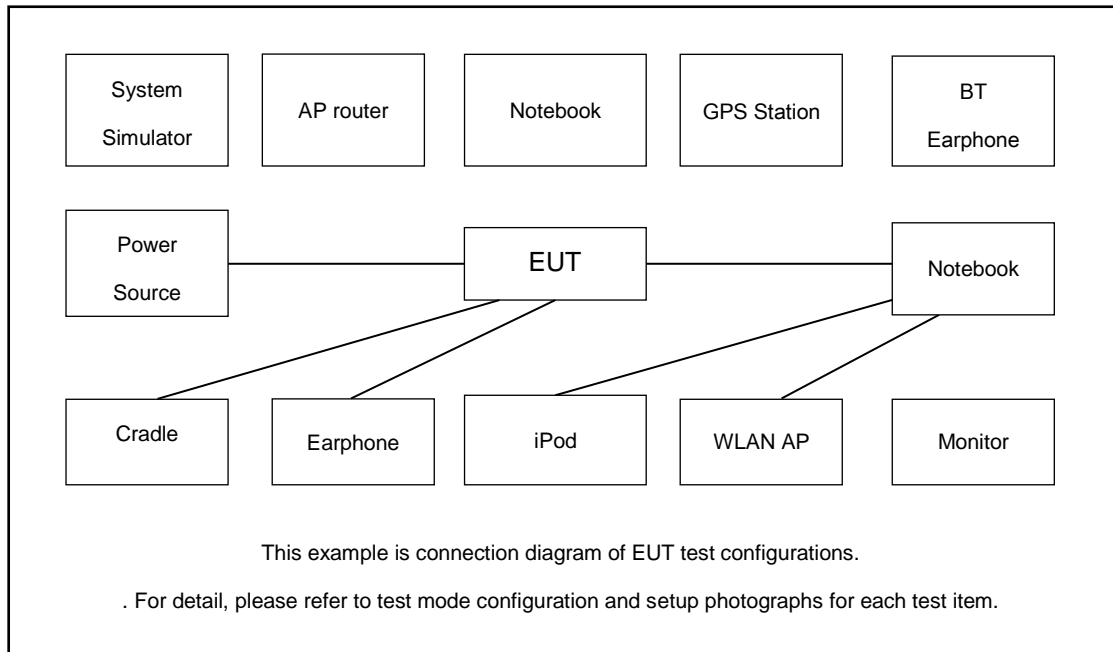


Radiated Emissions for sample 1	<p>Mode 1: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 1 (Charging from Adapter 1) + (SD Card Load) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 2: LTE Band 26(Low CH) + Camera(Front) + Earphone + USB Cable 2 (Charging from Adapter 2) + (SD Card Load) + E-SIM + Battery 1 for sample 1</p> <p>Mode 3: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 4: LTE Band 13 Idle(High CH) + GNSS RX + (SD Card Load) + Earphone + USB Cable 4 (Charging from Adapter 2) + Battery 1 + E-SIM for sample 1</p> <p>Mode 5: LTE Band 14 Idle(Low CH) + NFC ON + (SD Card Load) + Earphone + USB Cable 1 (Data Link with Notebook) + EUT (eMMC) USB Data Link to NB + Battery 1 for sample 1</p> <p>Mode 6: NR SA n71 ((Middle CH) + FM(98MHz) Rx + (SD Card Load) + Earphone + USB Cable 1 (Data Link with Notebook) + NB USB Data Link to EUT (eMMC) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 7: ENDC 2A + n71 (High CH) + Camera(Rear) + USB Cable 1 (Data Link with Notebook) + EUT (SD Card) USB Data Link to NB + SIM 1 + Battery 1 for sample 1</p> <p>Mode 8: LTE CA_2A-29A(Middle CH) + Camera(Rear) + (SD Card Link) + Earphone + USB Cable 1 (Data Link with Notebook) + NB USB Data Link to EUT (SD Card) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 9: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 2 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 10 : LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 1 for sample 1</p> <p>Mode 11 : LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 4 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 1 for sample 1</p>
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Radiated Emissions for sample 2	<p>Mode 1: GSM 850 Idle(Middle CH) + Camera(Rear) + Earphone + USB Cable 1 (Charging from Adapter 1) + (SD Card Load) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 2: LTE Band 26(Low CH) + Camera(Front) + Earphone + USB Cable 2 (Charging from Adapter 2) + (SD Card Load) + E-SIM + Battery 2 for sample 2</p> <p>Mode 3: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 4: LTE Band 13 Idle(High CH) + GNSS RX + (SD Card Load) + Earphone + USB Cable 4 (Charging from Adapter 2) + Battery 2 + E-SIM for sample 2</p> <p>Mode 5: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 1 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 6: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 2 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 7: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 3 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p> <p>Mode 8: LTE Band 12 Idle(Middle CH) + MPEG4(Run Color Bar) + Earphone + USB Cable 4 (Charging from Adapter 1) + (SD Card Link) + SIM 1 + Battery 2 for sample 2</p>
Remark:	
<ol style="list-style-type: none"> 1. The worst case of AC is mode 5 for Sample 2; only the test data of this mode is reported. 2. The worst case of RE is mode 3 for Sample 1; 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.	Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
3.	Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded,1.8m
4.	GNSS Station	Labsat	RLLS03-2P	N/A	N/A	Unshielded,1.8m
5.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
6.	NOTE BOOK	Lenovo	E540	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
7.	Earphone	apple	N/A	N/A	N/A	N/A
8.	USB HD	Lenovo	FH310	N/A	N/A	N/A
9.	iPod	apple	N/A	N/A	N/A	N/A
10.	SD Card	N/A	MicroSD HC	FCC DoC	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 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.

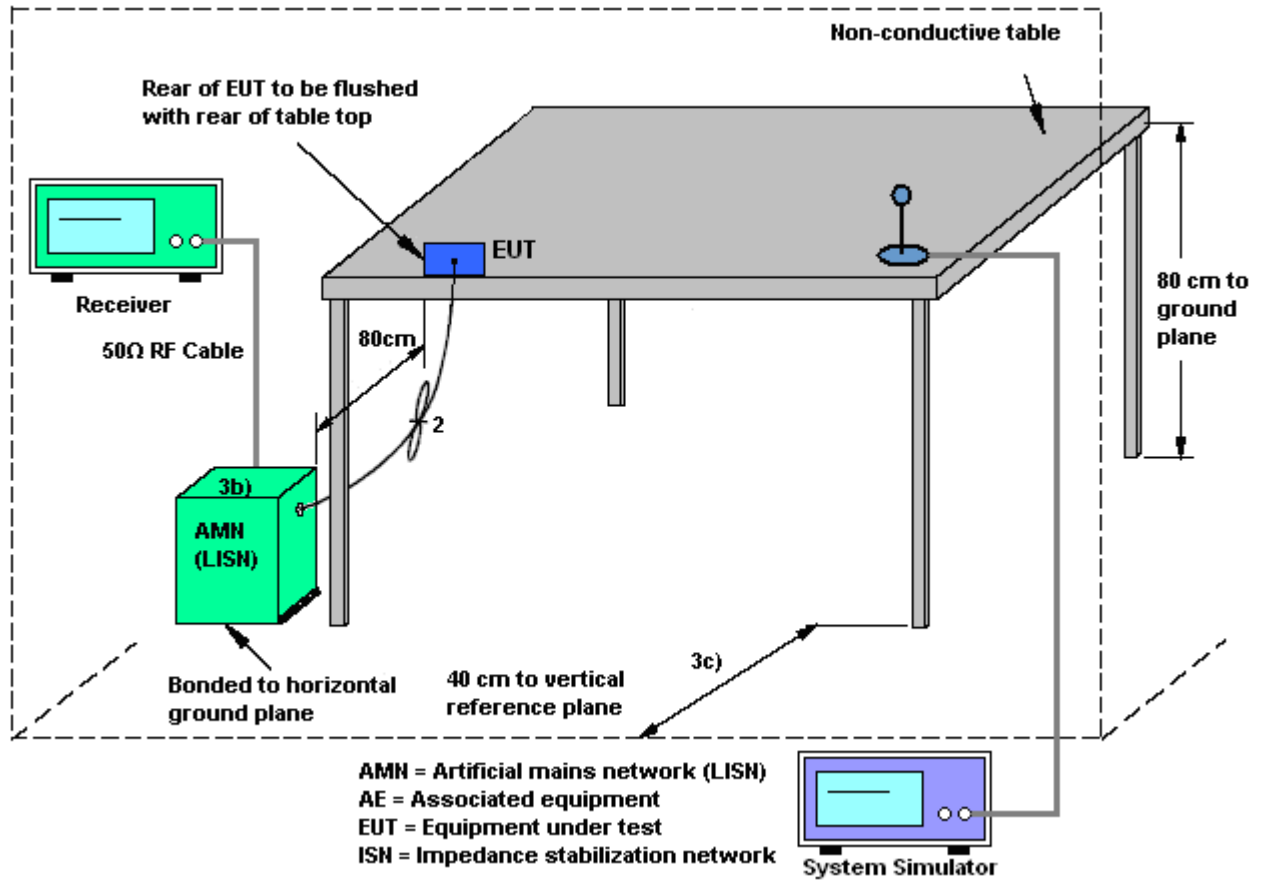
3.1.2 Measuring Instruments

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.

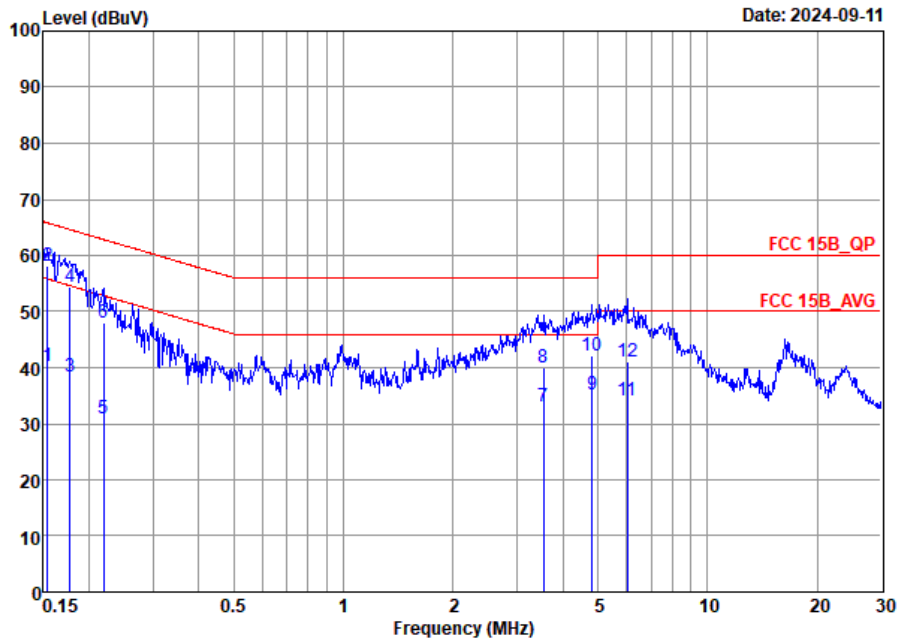
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Chase Nathon	Temperature :	22~24°C
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

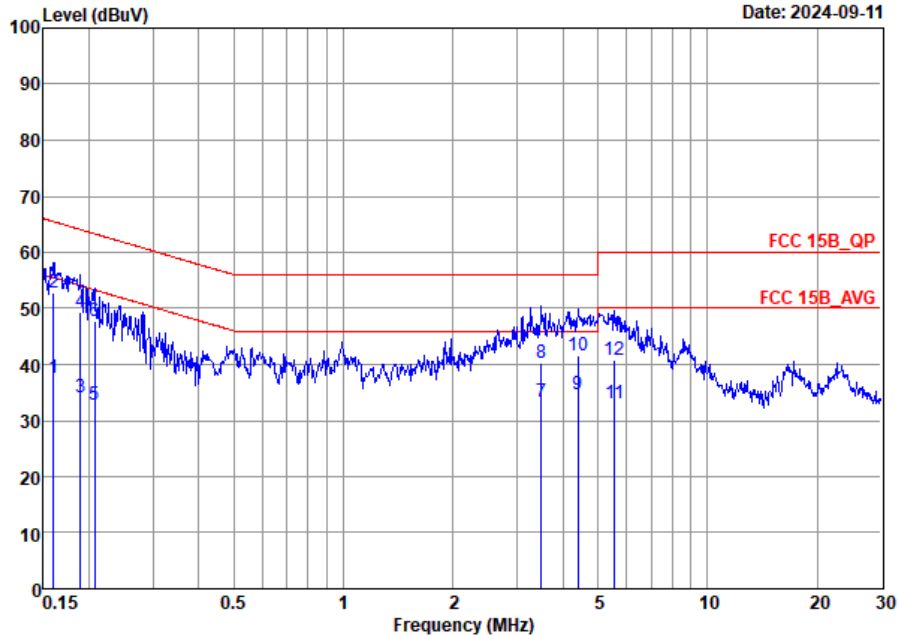


Site : CO01-SZ
 Condition: FCC 15B_QP AC LISN 100063_L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	40.26	-15.52	55.78	20.31	9.82	10.13	Average
2 *	0.15	58.26	-7.52	65.78	38.31	9.82	10.13	QP
3	0.18	38.36	-16.23	54.59	18.40	9.82	10.14	Average
4	0.18	54.46	-10.13	64.59	34.50	9.82	10.14	QP
5	0.22	31.03	-21.80	52.83	11.10	9.78	10.15	Average
6	0.22	48.03	-14.80	62.83	28.10	9.78	10.15	QP
7	3.55	33.16	-12.84	46.00	13.10	9.75	10.31	Average
8	3.55	40.06	-15.94	56.00	20.00	9.75	10.31	QP
9	4.82	35.21	-10.79	46.00	15.09	9.77	10.35	Average
10	4.82	42.11	-13.89	56.00	21.99	9.77	10.35	QP
11	6.02	34.01	-15.99	50.00	13.90	9.75	10.36	Average
12	6.02	41.11	-18.89	60.00	21.00	9.75	10.36	QP



Test Engineer :	Chase Nathon	Temperature :	22~24°C
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
 Condition: FCC 15B_QP AC LISN 100063_N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	37.51	-17.96	55.47	17.50	9.87	10.14	Average
2	0.16	52.81	-12.66	65.47	32.80	9.87	10.14	QP
3	0.19	34.12	-19.94	54.06	14.20	9.77	10.15	Average
4	0.19	49.42	-14.64	64.06	29.50	9.77	10.15	QP
5	0.21	32.78	-20.54	53.32	12.90	9.73	10.15	Average
6	0.21	47.78	-15.54	63.32	27.90	9.73	10.15	QP
7	3.49	33.32	-12.68	46.00	13.31	9.71	10.30	Average
8	3.49	40.22	-15.78	56.00	20.21	9.71	10.30	QP
9 *	4.41	34.65	-11.35	46.00	14.60	9.72	10.33	Average
10	4.41	41.65	-14.35	56.00	21.60	9.72	10.33	QP
11	5.56	33.19	-16.81	50.00	13.10	9.74	10.35	Average
12	5.56	40.89	-19.11	60.00	20.80	9.74	10.35	QP

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.

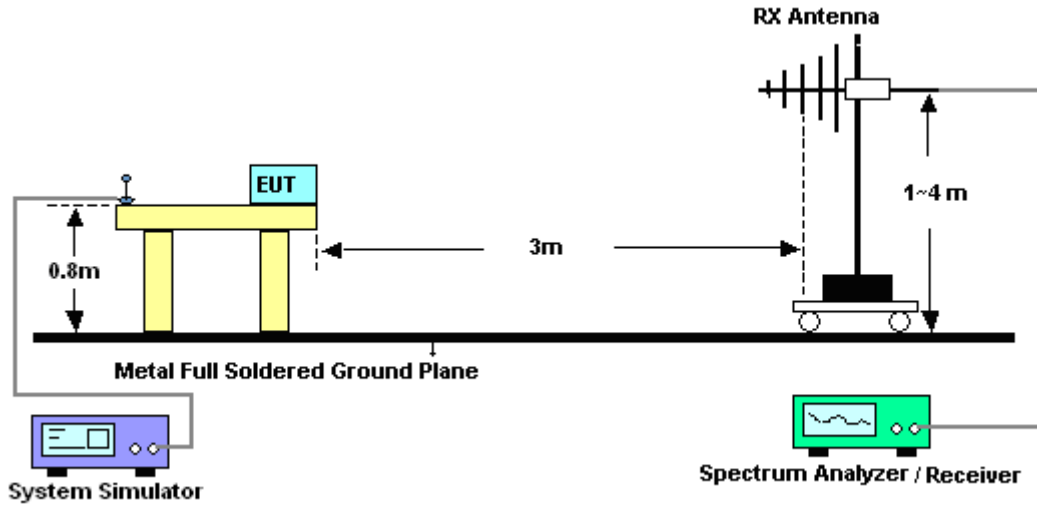


3.2.3. Test Procedures

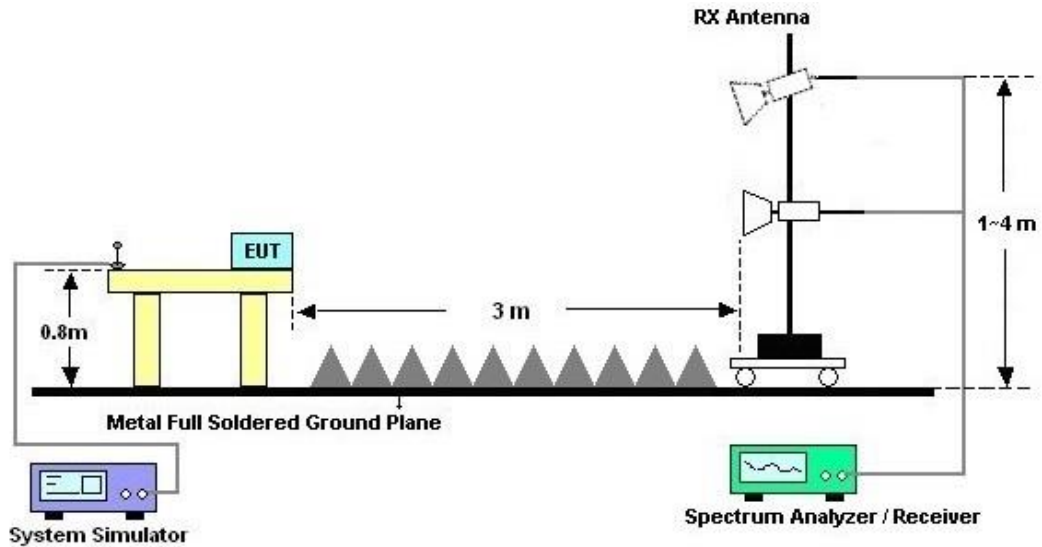
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 (dB μ V/m) = 20 log Emission level (μ V/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



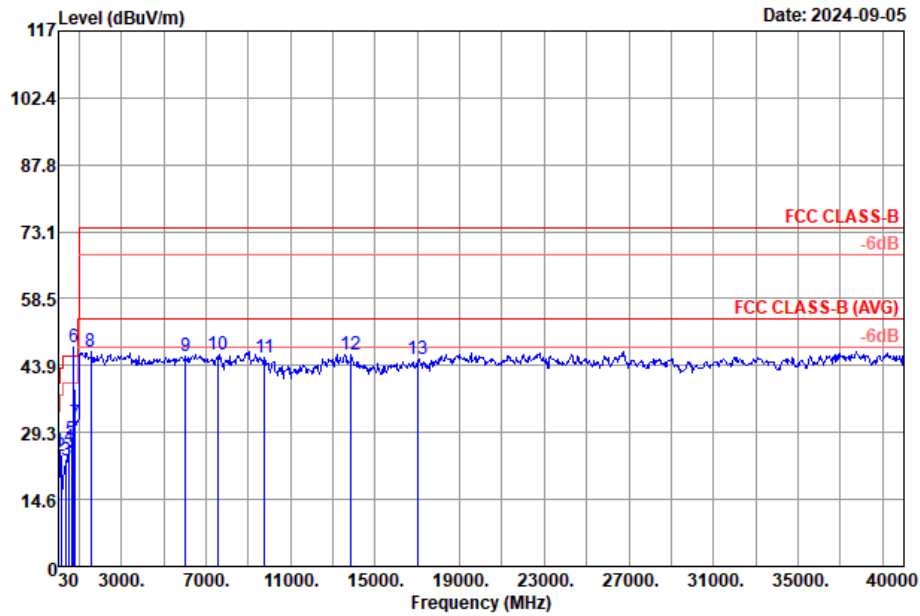
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Engineer :	ZhanSheng Liu	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#6 is system simulator signal which can be ignored.		



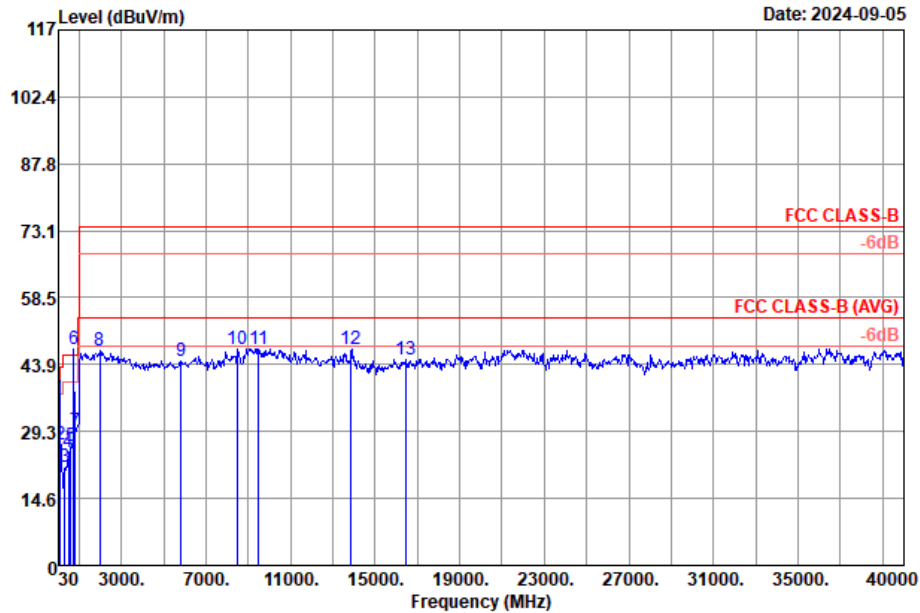
Site : 03CH05-SZ
 Condition : FCC CLASS-B 3m VULB9168--01003 HORIZONTAL

Plane : Y

	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	38.73	25.01	-14.99	40.00	39.53	19.12	1.33	34.97	---	---	Peak
2	143.49	24.23	-19.27	43.50	38.53	18.42	2.29	35.01	---	---	Peak
3	385.99	23.07	-22.93	46.00	33.22	21.13	3.35	34.63	---	---	Peak
4	530.52	26.21	-19.79	46.00	33.17	24.23	3.45	34.64	---	---	Peak
5	655.65	27.62	-18.38	46.00	31.99	26.45	3.68	34.50	---	---	Peak
6 *	737.50	48.04			51.05	27.61	3.73	34.35	---	---	Peak
7	807.94	31.12	-14.88	46.00	31.80	29.13	4.39	34.20	---	---	Peak
8	1568.00	46.78	-27.22	74.00	61.27	29.61	5.93	50.03	---	---	Peak
9	6024.00	45.83	-28.17	74.00	48.71	36.71	9.41	49.00	---	---	Peak
10	7608.00	46.20	-27.80	74.00	49.75	36.22	10.62	50.39	---	---	Peak
11	9765.00	45.52	-28.48	74.00	42.61	38.96	13.14	49.19	---	---	Peak
12	13842.00	46.43	-27.57	74.00	38.62	40.80	14.49	47.48	---	---	Peak
13	17037.00	45.22	-28.78	74.00	37.52	43.94	15.23	51.47	---	---	Peak



Test Engineer :	ZhanSheng Liu	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Vertical
Remark :	#6 is system simulator signal which can be ignored.		



Site : 03CH05-SZ
 Condition : FCC CLASS-B 3m VULB9168--01003 VERTICAL

Plane : Y

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg		
1	38.73	36.48	-3.52	40.00	51.00	19.12	1.33	34.97	100	58 QP	
2	129.91	26.31	-17.19	43.50	41.77	17.37	2.21	35.04	---	---	Peak
3	325.85	21.49	-24.51	46.00	33.13	19.83	3.33	34.80	---	---	Peak
4	515.97	24.71	-21.29	46.00	31.84	24.12	3.42	34.67	---	---	Peak
5	601.33	26.06	-19.94	46.00	31.24	25.73	3.59	34.50	---	---	Peak
6 *	737.50	47.42			50.43	27.61	3.73	34.35	---	---	Peak
7	806.97	29.46	-16.54	46.00	30.14	29.13	4.39	34.20	---	---	Peak
8	1984.00	46.80	-27.20	74.00	57.92	32.20	6.87	50.19	---	---	Peak
9	5816.00	44.76	-29.24	74.00	47.28	36.43	10.12	49.07	---	---	Peak
10	8504.00	47.12	-26.88	74.00	46.90	37.80	12.12	49.70	---	---	Peak
11	9504.00	47.34	-26.66	74.00	44.77	38.90	12.97	49.30	---	---	Peak
12	13878.00	47.21	-26.79	74.00	39.40	40.83	14.51	47.53	---	---	Peak
13	16452.00	45.11	-28.89	74.00	38.40	42.96	15.42	51.67	---	---	Peak

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 Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 04, 2024	Sep. 09, 2024 ~Sep. 11, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Jul. 04, 2024	Sep. 09, 2024 ~Sep. 11, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 16, 2023	Sep. 09, 2024 ~Sep. 11, 2024	Oct. 15, 2024	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	61602000089 1	100Vac~250Vac	Aug. 14, 2024	Sep. 09, 2024 ~Sep. 11, 2024	Aug. 13, 2025	Conduction (CO01-SZ)
EMI Test Receiver	R&S	ESR7	102261	9kHz~7GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071191	10Hz~44GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
Log-periodic Antenna	SCHWARZBE CK	VULB 9168	01001	20MHz~1.5GHz	Jul. 08, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Jul. 07, 2025	Radiation (03CH05-SZ)
Amplifier	EM Electronics	EM330	060756	0.01Hz ~3000MHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
Double Ridge Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-2206	1GHz~18GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
HF Amplifier	EM Electronics	EM01G18GA	060781	1GHz~18GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
HF Amplifier	EM Electronics	EM18G40G	060778	18GHz~40GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
Horn Antenna	SCHWARZBE CK	BBHA9170	00983	15GHz~40GHz	Apr. 09, 2024	Sep. 05, 2024 ~Sep. 11, 2024	Apr. 08, 2025	Radiation (03CH05-SZ)
AC Power Source	APC	AFV-S-600	F119050013	N/A	Oct. 18, 2023	Sep. 05, 2024 ~Sep. 11, 2024	Oct. 17, 2024	Radiation (03CH05-SZ)
Turn Table	EMEC	T-200-S-1	060925-T	0~360 degree	NCR	Sep. 05, 2024 ~Sep. 11, 2024	NCR	Radiation (03CH05-SZ)
Antenna Mast	EMEC	MBS-400-1	060927	1 m~4 m	NCR	Sep. 05, 2024 ~Sep. 11, 2024	NCR	Radiation (03CH05-SZ)

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))	2.50dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.2dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.1dB
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