



FCC Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2453-1
FCC ID : IHDT56AR8
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Mar. 23, 2024 ~ Apr. 07, 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**



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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 8.34 dB at 0.150 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.26 dB at 40.67 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 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	XT2453-1
FCC ID	IHDT56AR8
EUT supports Radios application	GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 WLAN 5GHz 802.11ax HE20/HE40/HE80 WLAN 6GHz 802.11ax HE20/HE40/HE80 Bluetooth BR/EDR/LE GNSS/NFC/WPT
IMEI Code	Conduction/ Radiation: 354373470019574/354373470019582
HW Version	DVT2
SW Version	U3UC34.23
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	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 n77 : 3700 MHz ~ 3980 MHz; 5G NR n78 : 3700 MHz ~ 3800 MHz; 802.11b/g/n/ax: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac/ax: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz 5725 MHz ~ 5850 MHz 802.11ax: 5925 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz WPT: 110kHz~ 148 kHz
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



	<p>LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 42 : 3450 MHz ~ 3550 MHz LTE Band 66 : 2110 MHz~ 2200 MHz 5G NR n2 : 1930 MHz ~ 1990 MHz 5G NR n5 : 869 MHz ~ 894 MHz 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 n77 : 3700 MHz ~ 3980 MHz; 5G NR n78 : 3700 MHz ~ 3800 MHz; 802.11b/g/n/ax: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac/ax: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz 5725 MHz ~ 5850 MHz 802.11ax: 5925 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz GNSS : 1559 MHz ~ 1610 MHz, 1164 MHz ~ 1215 MHz WPT: 110kHz~ 148 kHz</p>
Antenna Type	<p>WWAN : Fixed Internal Antenna WLAN : IFA Antenna & Metal Antenna Bluetooth : IFA Antenna GNSS: IFA Antenna NFC: Coil loop Antenna WPT: Copper Coil Antenna</p>
Type of Modulation	<p>GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSDPA/DC-HSDPA : QPSK HSUPA : 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) 802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM /1024QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) :$\pi/4$-DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK NFC: ASK WPT: ASK</p>



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(US)	Brand Name	Motorola(Chenyang)	Model Name	MC-331
AC Adapter 1(EU)	Brand Name	Motorola(Chenyang)	Model Name	MC-332
AC Adapter 1(AU)	Brand Name	Motorola(Chenyang)	Model Name	MC-335
AC Adapter 1(AR)	Brand Name	Motorola(Chenyang)	Model Name	MC-336
AC Adapter 1(BR)	Brand Name	Motorola(Chenyang)	Model Name	MC-337
AC Adapter 1(PRC)	Brand Name	Motorola(Chenyang)	Model Name	MC-338
AC Adapter 2(US)	Brand Name	Motorola(AOHAI)	Model Name	MC-331
AC Adapter 2(EU)	Brand Name	Motorola(AOHAI)	Model Name	MC-332
AC Adapter 2(UK)	Brand Name	Motorola(AOHAI)	Model Name	MC-333
AC Adapter 2(IN)	Brand Name	Motorola(AOHAI)	Model Name	MC-334
AC Adapter 3(US)	Brand Name	Motorola(Salcomp)	Model Name	MC-331
AC Adapter 3(EU)	Brand Name	Motorola(Salcomp)	Model Name	MC-332
AC Adapter 3(UK)	Brand Name	Motorola(Salcomp)	Model Name	MC-333
AC Adapter 3(IN)	Brand Name	Motorola(Salcomp)	Model Name	MC-334
AC Adapter 3(AU)	Brand Name	Motorola(Salcomp)	Model Name	MC-335
AC Adapter 3(AR)	Brand Name	Motorola(Salcomp)	Model Name	MC-336
AC Adapter 3(BR)	Brand Name	Motorola(Salcomp)	Model Name	MC-337
AC Adapter 3(PRC)	Brand Name	Motorola(Salcomp)	Model Name	MC-338
AC Adapter 3(CHILE)	Brand Name	Motorola(Salcomp)	Model Name	MC-339
AC Adapter 3(KR)	Brand Name	Motorola(Salcomp)	Model Name	MC-330
AC Adapter 4(IN)	Brand Name	Motorola(XIHI)	Model Name	MC-334
AC Adapter 5(BR)	Brand Name	Motorola(Cliptech)	Model Name	MC-337
Battery 1	Brand Name	Motorola(ATL)	Model Name	QR11
Battery 2	Brand Name	Motorola(ATL)	Model Name	QR31
USB Cable 1	Brand Name	Motorola(Saibao)	Model Name	SC18D22297
USB Cable 2	Brand Name	Motorola(Cabletech)	Model Name	SC18D22298
Wireless Earphones	Brand Name	Motorola	Model Name	XT2441-1



1.7. 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

1.8. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH07-KS	AUDIX	E3	210616
2.	CO01-KS	AUDIX	E3	6.2009-8-24

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.

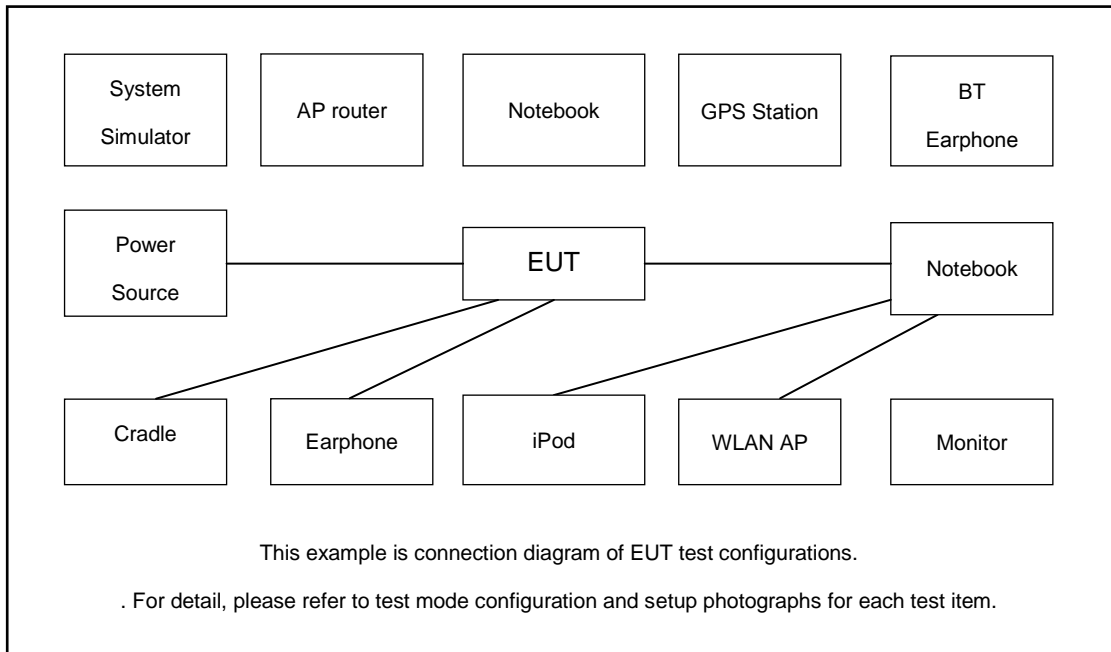
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + Camera(Rear) + Battery + open folding screen + USB Cable 1(Charging from Adapter 1) + SIM 1
	Mode 2: WCDMA Band V Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + Camera(Front) + Battery + open folding screen + USB Cable 2(Charging from Adapter 2) + ESIM
	Mode 3: LTE Band 5 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + NFC On + Battery + open folding screen + USB Cable 1(Charging from Adapter 3) + SIM 1
	Mode 4: LTE Band 12 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery + open folding screen + USB Cable 1(Charging from Adapter 4) + SIM 1
	Mode 5: LTE Band 13 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + GNSS Rx1 + Battery + open folding screen + USB Cable 1(Charging from Adapter 5) + SIM 1
	Mode 6: LTE Band 17 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery + open folding screen + USB Cable 1(Charging from Adapter 4) + SIM 1
	Mode 7: LTE Band 26 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + GNSS Rx2 + Battery + open folding screen + USB Cable 1(Data Link with Notebook) EUT (eMMC) USB Data Link to PC/NB + SIM 1
	Mode 8: LTE Band 12 Rx(High) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery + open folding screen + USB Cable 1(Data Link with Notebook) PC/NB USB Data Link to EUT (eMMC) + SIM 1
	Mode 9: n5 Rx(High) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Battery + open folding screen + USB Cable 2(Data Link with Notebook) EUT (eMMC) USB Data Link to PC/NB + SIM 1
	Mode 10: n5 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery + USB Cable 1(EUT Charging from Wireless charger) + open folding screen + Adapter Connect to Wireless charger
	Mode 11: LTE Band 12 Rx (Low) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery + USB Cable 1(Charging from Adapter 4) + Closed folding screen + SIM 1



Radiated Emissions	<p>Mode 1: GSM 850 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + Camera(Rear) + Battery + open folding screen + USB Cable1 (Charging from Adapter 1) + SIM 1</p> <p>Mode 2: WCDMA Band V Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + Camera(Front) + Battery + open folding screen + USB Cable 2(Charging from Adapter 2) + ESIM</p> <p>Mode 3: LTE Band 5 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + NFC On + Battery + open folding screen + USB Cable 1(Charging from Adapter 3) + SIM 1</p> <p>Mode 4: LTE Band 12 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Battery + open folding screen + USB Cable 1(Charging from Adapter 4) + SIM 1</p> <p>Mode 5: LTE Band 13 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + GNSS Rx1 + Battery + open folding screen + USB Cable 1(Charging from Adapter 5) + SIM 1</p> <p>Mode 6: LTE Band 17 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone + Battery + open folding screen + SIM 1</p> <p>Mode 7: LTE Band 26 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + GNSS Rx2 + Battery + open folding screen + USB Cable 1(Data Link with Notebook) EUT (eMMC) USB Data Link to PC/NB + SIM 1</p> <p>Mode 8: LTE Band 12 Rx(High) + Bluetooth Idle With BT Earphone + WLAN (5G) Idle + NFC On + Battery + open folding screen + USB Cable 1(Data Link with Notebook) PC/NB USB Data Link to EUT (eMMC)+ SIM 1</p> <p>Mode 9: n5 Rx(High) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + NFC On + Battery + open folding screen + USB Cable 1(Data Link with Notebook) EUT (eMMC) USB Data Link to PC/NB + SIM 1</p> <p>Mode 10 : n5 Rx(Low) + Bluetooth Idle With BT Earphone + WLAN 6E Idle + Battery + USB Cable 1(EUT Charging from Wireless charger) + Adapter Connect to Wireless charger + open folding screen + SIM 1</p> <p>Mode 11 : LTE Band 5 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + Stand alone + Battery + Closed folding screen + EUT Wireless Charge the BT Earphone + SIM 1</p> <p>Mode 12 : LTE Band 5 Rx(Middle) + Bluetooth Idle With BT Earphone + WLAN (2.4G) Idle + NFC On + Battery + USB Cable 1(Charging from Adapter 3) + Closed folding screen + SIM 1</p>
<p>Remark:</p> <ol style="list-style-type: none"> 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 3; only the test data of this mode is reported. 3. Data Link with Notebook / PC means data application transferred mode between EUT and Notebook / PC. 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.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
2.	System Simulator	Anritsu	MT8000A	N/A	N/A	Unshielded,1.8m
3.	Vector Signal Generator	R&S	SMBV100A	N/A	N/A	Unshielded,1.8m
4.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
5.	WLAN AP	HUAWEI	WS7100	N/A	N/A	Unshielded,1.8m
6.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
7.	Notebook	Acer	N20C5	N/A	N/A	Unshielded,1.8m
8.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
9.	Hard disk	KINGSHARE	KSP6120G	N/A	Shielded, 1.2m	N/A
10.	Wireless charger	N/A	N/A	N/A	N/A	N/A
11.	Earphone	N/A	N/A	N/A	N/A	N/A
12.	SD Card	Kingston	8GB	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 GNSS function to make the EUT receive continuous signals from GNSS station.
5. Turn on NFC function
6. Wireless Charge from a Wireless Charger.
7. Wireless Charge for the BT Earphone.



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.

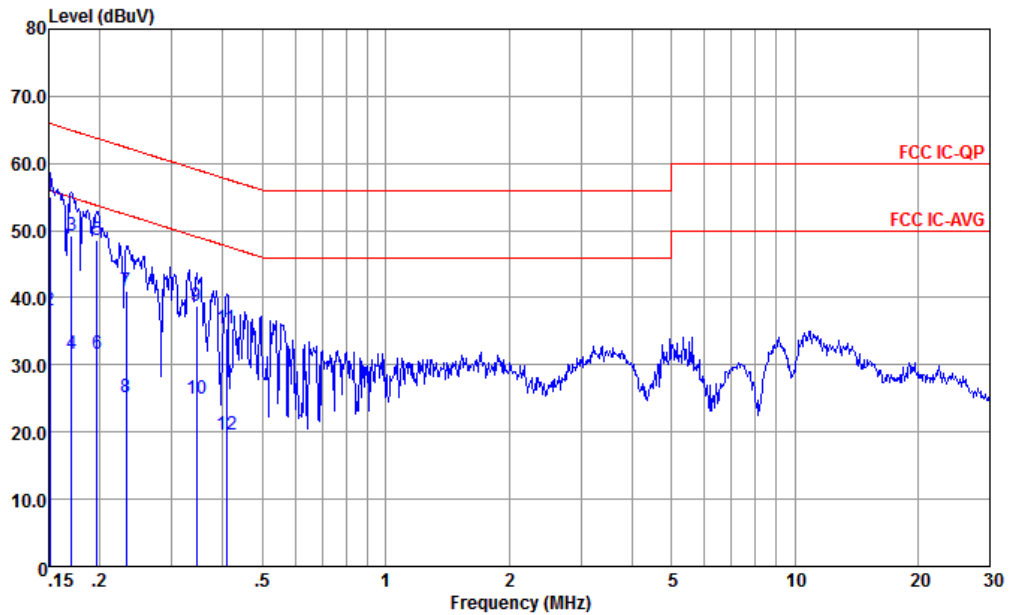
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Amos Zhang	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.		

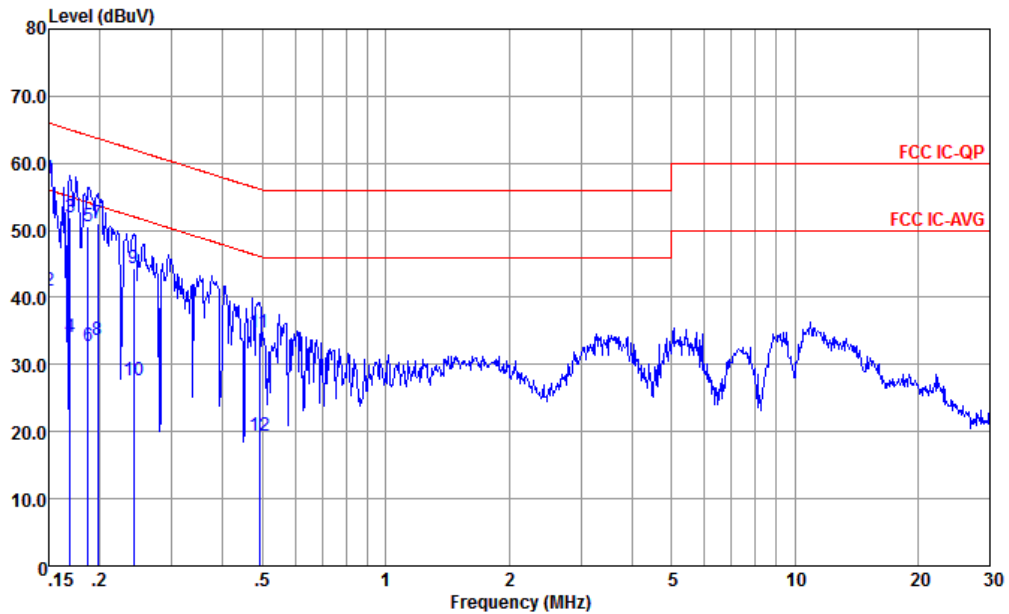


Site : CO01-KS
 Condition : FCC IC-QP LISN-060105-L 2023 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.151	54.97	-10.99	65.96	44.50	0.05	10.42	QP
2	0.151	38.07	-17.89	55.96	27.60	0.05	10.42	Average
3	0.170	49.36	-15.58	64.94	38.90	0.04	10.42	QP
4	0.170	31.66	-23.28	54.94	21.20	0.04	10.42	Average
5	0.197	48.64	-15.12	63.76	38.20	0.03	10.41	QP
6	0.197	31.64	-22.12	53.76	21.20	0.03	10.41	Average
7	0.232	40.92	-21.47	62.39	30.51	0.03	10.38	QP
8	0.232	25.22	-27.17	52.39	14.81	0.03	10.38	Average
9	0.345	38.83	-20.26	59.09	28.50	0.02	10.31	QP
10	0.345	24.93	-24.16	49.09	14.60	0.02	10.31	Average
11	0.408	35.47	-22.21	57.68	25.20	0.00	10.27	QP
12	0.408	19.57	-28.11	47.68	9.30	0.00	10.27	Average



Test Engineer :	Amos Zhang	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	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.150	57.66	-8.34	66.00	47.20	0.04	10.42	QP
2	0.150	41.06	-14.94	56.00	30.60	0.04	10.42	Average
3	0.169	51.96	-13.03	64.99	41.50	0.04	10.42	QP
4	0.169	34.06	-20.93	54.99	23.60	0.04	10.42	Average
5	0.187	50.66	-13.49	64.15	40.20	0.05	10.41	QP
6	0.187	32.76	-21.39	54.15	22.30	0.05	10.41	Average
7	0.198	51.06	-12.65	63.71	40.60	0.05	10.41	QP
8	0.198	33.66	-20.05	53.71	23.20	0.05	10.41	Average
9	0.242	44.28	-17.76	62.04	33.90	0.01	10.37	QP
10	0.242	27.58	-24.46	52.04	17.20	0.01	10.37	Average
11	0.491	34.76	-21.38	56.14	24.61	-0.07	10.22	QP
12	0.491	19.36	-26.78	46.14	9.21	-0.07	10.22	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.

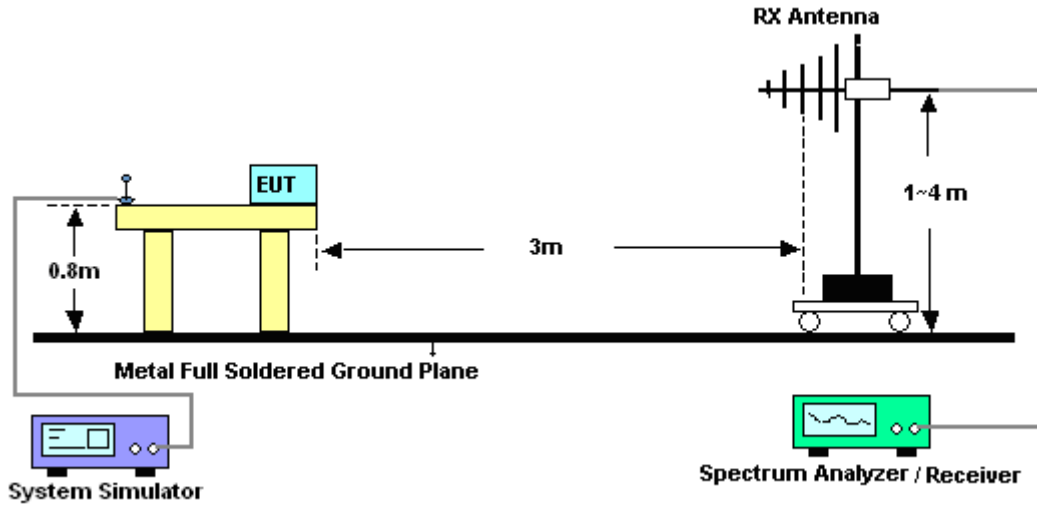


3.2.3. Test Procedures

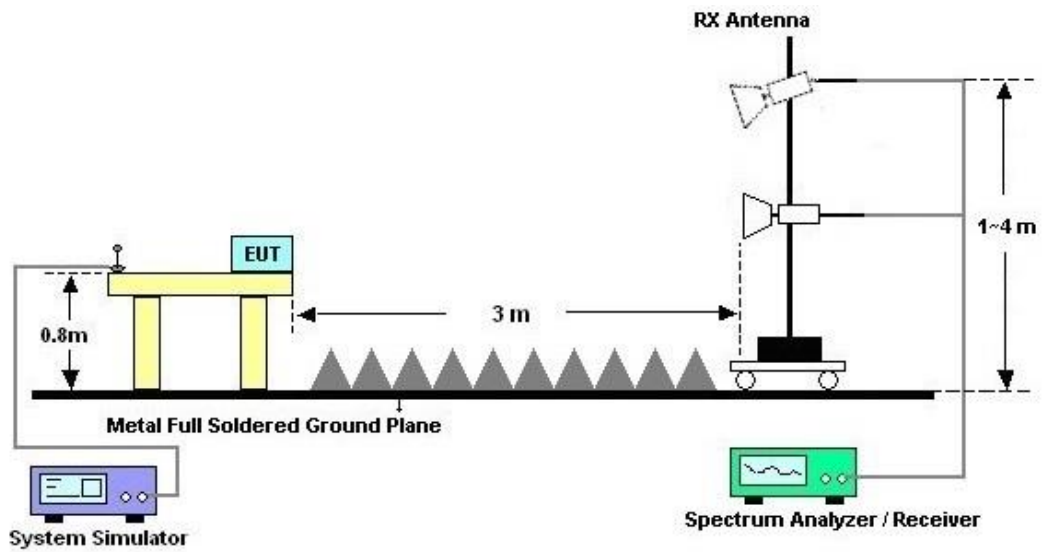
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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



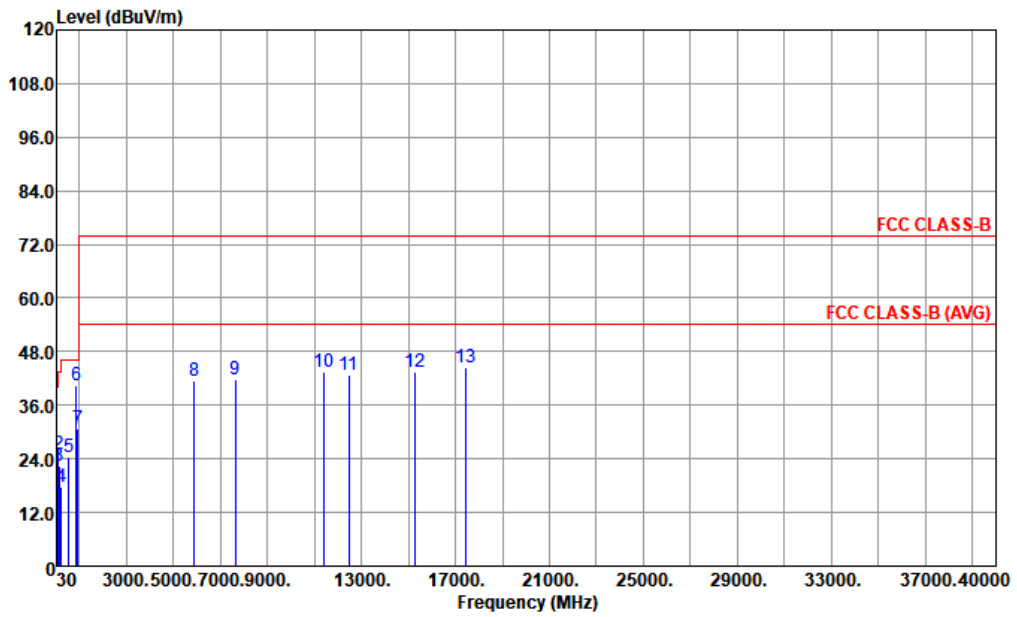
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

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

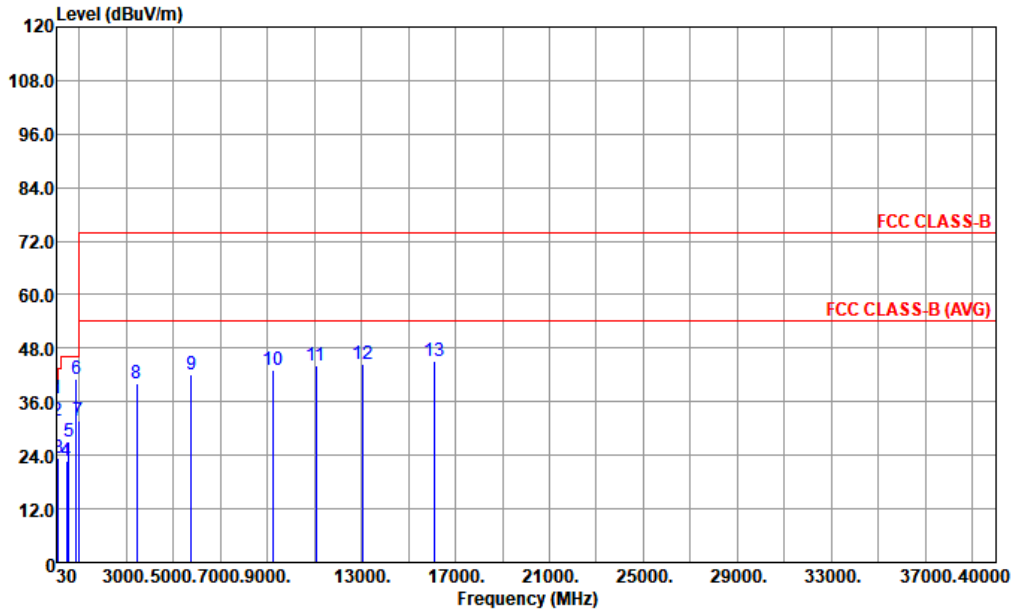


Site : 03CH07-KS
 Condition : FCC CLASS-B 3m CRI 6111D 59915 HORIZONTAL

	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	40.67	22.50	-17.50	40.00	34.79	19.16	0.64	32.09	---	---	Peak
2	102.75	25.11	-18.39	43.50	39.41	16.26	1.48	32.04	---	---	Peak
3	130.88	22.52	-20.98	43.50	35.45	17.47	1.65	32.05	---	---	Peak
4	252.13	17.82	-28.18	46.00	28.92	18.64	2.31	32.05	---	---	Peak
5	559.62	24.40	-21.60	46.00	27.04	26.22	3.44	32.30	---	---	Peak
6 p	880.69	40.32			38.18	29.21	4.32	31.39	---	---	Peak
7	947.62	30.64	-15.36	46.00	26.29	30.84	4.48	30.97	---	---	Peak
8	5879.00	41.51	-32.49	74.00	58.85	35.12	11.44	63.90	---	---	Peak
9	7647.00	41.77	-32.23	74.00	56.40	35.90	13.05	63.58	---	---	Peak
10	11387.00	43.31	-30.69	74.00	50.77	38.15	16.09	61.70	---	---	Peak
11	12475.00	42.71	-31.29	74.00	47.69	39.10	16.80	60.88	---	---	Peak
12	15263.00	43.61	-30.39	74.00	46.90	40.25	18.63	62.17	---	---	Peak
13	17422.00	44.58	-29.42	74.00	46.13	41.35	20.00	62.90	---	---	Peak



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



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

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable Loss	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 p	40.67	36.74	-3.26	40.00	49.03	19.16	0.64	32.09	100	113 Peak	
2	57.16	31.88	-8.12	40.00	50.88	12.19	0.87	32.06	---	---	Peak
3	102.75	23.27	-20.23	43.50	37.57	16.26	1.48	32.04	---	---	Peak
4	450.01	22.84	-23.16	46.00	29.02	22.86	3.09	32.13	---	---	Peak
5	550.89	26.99	-19.01	46.00	30.34	25.52	3.41	32.28	---	---	Peak
6	880.69	41.17			39.03	29.21	4.32	31.39	---	---	Peak
7	962.17	31.68	-22.32	54.00	27.02	30.99	4.51	30.84	---	---	Peak
8	3431.00	40.02	-33.98	74.00	62.08	32.87	8.59	63.52	---	---	Peak
9	5777.00	41.97	-32.03	74.00	59.75	34.68	11.37	63.83	---	---	Peak
10	9228.00	43.07	-30.93	74.00	54.37	36.33	14.36	61.99	---	---	Peak
11	11064.00	44.23	-29.77	74.00	52.11	38.03	15.93	61.84	---	---	Peak
12	13087.00	44.55	-29.45	74.00	49.09	39.13	17.30	60.97	---	---	Peak
13	16096.00	45.09	-28.91	74.00	47.33	40.84	19.07	62.15	---	---	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 Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 10, 2023	Apr. 07, 2024	Oct. 09, 2024	Radiation (03CH07-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 10, 2023	Apr. 07, 2024	Oct. 09, 2024	Radiation (03CH07-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 12, 2023	Apr. 07, 2024	Aug. 11, 2024	Radiation (03CH07-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 05, 2024	Apr. 07, 2024	Apr. 04, 2025	Radiation (03CH07-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Oct. 16, 2023	Apr. 07, 2024	Oct. 15, 2024	Radiation (03CH07-KS)
Amplifier	EM	EM18G40GGA	060851	18~40GHz	Jan. 04, 2024	Apr. 07, 2024	Jan. 03, 2025	Radiation (03CH07-KS)
Amplifier	SONOMA	310N	413741	9KHz-1GHz	Jan. 04, 2024	Apr. 07, 2024	Jan. 03, 2025	Radiation (03CH07-KS)
Amplifier	EM	EM01G18GA	060834	1Ghz-18Ghz	Oct. 10, 2023	Apr. 07, 2024	Oct. 09, 2024	Radiation (03CH07-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Apr. 07, 2024	NCR	Radiation (03CH07-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Apr. 07, 2024	NCR	Radiation (03CH07-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Apr. 07, 2024	NCR	Radiation (03CH07-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	May 16, 2023	Mar. 23, 2024	May 15, 2024	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Mar. 23, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 16, 2023	Mar. 23, 2024	May 15, 2024	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Mar. 23, 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))	2.84dB
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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))	6.20dB
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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))	4.86dB
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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))	5.24dB
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