



FCC Test Report

APPLICANT : Honeywell International Inc
EQUIPMENT : Mobile computer/Smart phone
BRAND NAME : Honeywell
MODEL NAME : CT47X1N
FCC ID : HD5-CT47X1N
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Sep. 16, 2022 ~ Oct. 24, 2022

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC272913	Rev. 01	Initial issue of report	Dec. 28, 2022



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 10.26 dB at 0.156 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.55 dB at 30 MHz for Quasi-Peak

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



1. General Description

1.1. Applicant

Honeywell International Inc
9680 Old Bailes Rd, Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc
9680 Old Bailes Rd, Fort Mill, SC 29707 United States

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile computer/Smart phone
Brand Name	Honeywell
Model Name	CT47X1N
FCC ID	HD5-CT47X1N
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/VHT160 WLAN 5GHz 802.11ax HE20/HE40/HE80/HE160 WLAN 6GHz 802.11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE GNSS/NFC
IMEI Code / SN Code	Conduction: 990019560024574/990019560024582 for Sample 1 990019560049514 for Sample 2 22211E3261 for Sample 3 Radiation: 990019560023956 for Sample 1 990019560049514 for Sample 2 22211E3261 for Sample 3
HW Version	V1.0
SW Version	OS.21.001-HON.21.001
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 three types of EUT, the differences could be referred to the CT47X1N_Operational Description of Product Equality Declaration which is exhibit separately. According to the difference, we choose sample 1 to full test and the sample 2/3 is verified for the 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 42 : 3450 MHz ~ 3600 MHz LTE Band 43 : 3600 MHz ~ 3700 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 n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 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/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
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 30 : 2350 MHz ~ 2360 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 42 : 3450 MHz ~ 3600 MHz LTE Band 43 : 3600 MHz ~ 3700 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 n30 : 2350 MHz ~ 2360 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 2110 MHz~ 2200 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/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 FM : 88 MHz ~ 108 MHz</p>
Antenna Type	<p>WWAN : PIFA Antenna WLAN/Bluetooth/GNSS : LDS Internal Antenna NFC: FPC Antenna</p>
Type of Modulation	<p>GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSDPA/HSUPA : QPSK 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</p>

	Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK NFC: ASK
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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 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS 03CH04-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a1
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: GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + USB Cable (Charging from Adapter) + SIM 1 for Sample 1
	Mode 2: LTE Band 13 Rx(High) + Bluetooth Idle 1 + WLAN (5G) Idle + Camera(Front) + Battery 1 + Holster + USB Cable(Charging from Adapter) + SIM 2 for Sample 1
	Mode 3: LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery 1 + USB Cable (Data Link with Notebook) + pouch + EUT (eMMC) USB Data Link to PC/NB + SIM 1 for Sample 1
	Mode 4: LTE Band 26 Rx(Low) + Bluetooth Idle 1 + WLAN (2.4G) Idle + NFC On + Battery 1 + USB Cable (Data Link with Notebook)+ PC/NB USB Data Link to EUT (eMMC) + SIM 2 for Sample 1
	Mode 5: LTE Band 12 Rx(Middle) + Bluetooth Idle 1 + WLAN (5G) Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + SIM 1 for Sample 1
	Mode 6: LTE Band 71 Rx(Middle) + Bluetooth Idle 1 + WLAN 6E Idle + GNSS Rx + Battery 1 + USB Cable (Data Link with Notebook)+ PC/NB USB Data Link to EUT (SD) + SIM 2 for Sample 1
	Mode 7: 5G NR n5 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + USB Cable (Data Link with Notebook) + EUT (IPSM CARD) USB Data Link to PC/NB + SIM 2 for Sample 1
	Mode 8: 5G NR n12 Rx(Low) + Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery 1 + USB Cable (Data Link with Notebook)+ PC/NB USB Data Link to EUT (IPSM CARD) + SIM 1 for Sample 1
	Mode 9: LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery 1 + Charging from cradle for Sample 1
	Mode 10 : LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook) + pouch + EUT (eMMC) USB Data Link to PC/NB + SIM 1 for Sample 2
	Mode 11 : LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook) + pouch + EUT (eMMC) USB Data Link to PC/NB + SIM 1 for Sample 3
	Mode 12 : LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery 2 + USB Cable (Data Link with Notebook) + pouch + EUT (eMMC) USB Data Link to PC/NB + handstrap + SIM 1 for Sample 1

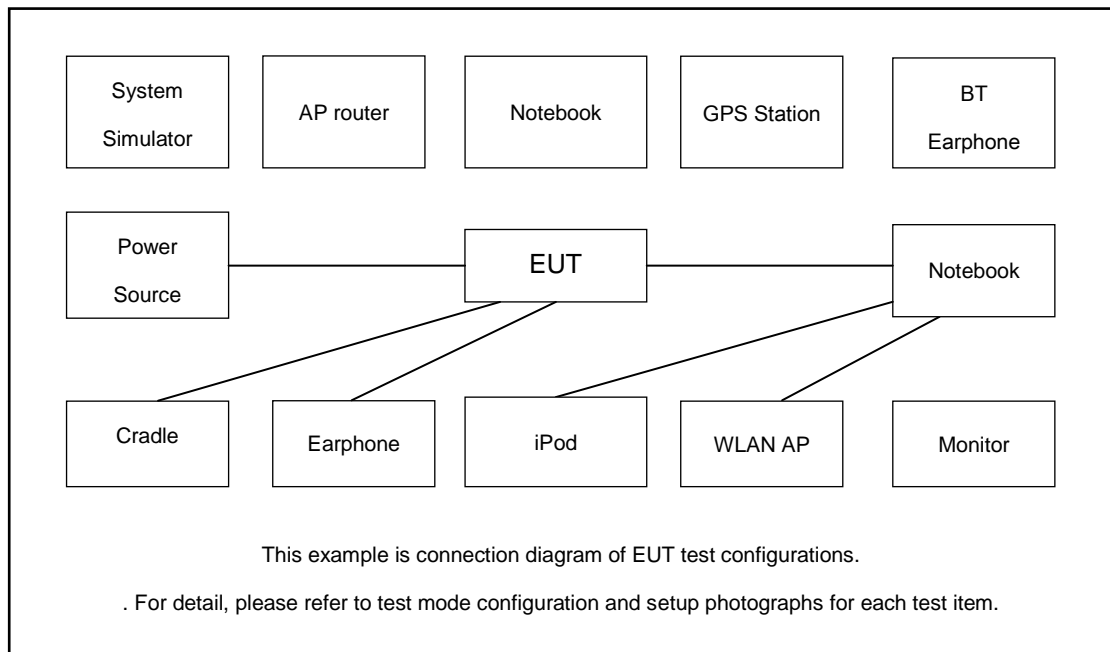


Radiated Emissions	Mode 1 : GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + USB Cable (Charging from Adapter) + SIM 1 for Sample 1
	Mode 2 : LTE Band 13 Rx(High) + Bluetooth Idle 1 + WLAN (5G) Idle + Camera(Front) + Earphone + Battery 1 + Holster + handstrap + SIM 2 for Sample 1
	Mode 3 : LTE Band 14 Rx(High) + Bluetooth Idle 1 + WLAN 6E Idle + MPEG4(Run Color Bar) + Battery 1 + pouch+ USB Cable (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + handstrap + SIM 1for Sample 1
	Mode 4 : LTE Band 26 Rx(Low) + Bluetooth Idle 1 + WLAN (2.4G) Idle + NFC On + Battery 1 + USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + handstrap + SIM 2 for Sample 1
	Mode 5 : LTE Band 12 Rx(Middle) + Bluetooth Idle 1 + WLAN (5G) Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + handstrap + SIM 1 for Sample 1
	Mode 6 : LTE Band 71 Rx(Middle) + Bluetooth Idle 1 + WLAN 6E Idle + GNSS Rx + Battery 1 + USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + handstrap + SIM 2 for Sample 1
	Mode 7 : 5G NR n5 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + USB Cable (Data Link with Notebook) + EUT ((IPSM CARD) USB Data Link to PC/NB + handstrap + SIM 2 for Sample 1
	Mode 8 : 5G NR n12 Rx(Low) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + PC/NB USB Data Link to EUT (IPSM CARD)+ USB Cable (Data Link with Notebook) + handstrap + SIM 1 for Sample 1
	Mode 9 : Bluetooth Idle 2 + Phone turn-off for Sample 1
	Mode 10 : GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 1 + Charging from cradle + SIM 1 for Sample 1
	Mode 11 : GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook)+ PC/NB USB Data Link to EUT (eMMC) + SIM 1 for Sample 2
	Mode 12 : GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + scanning + Battery 1 + USB Cable (Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + SIM 1 for Sample 3
	Mode 13 : GSM 850 Rx(Middle) + Bluetooth Idle 1 + WLAN (2.4G) Idle + Camera(Rear) + Battery 2 + USB Cable (Data Link with Notebook) + SIM 1 for Sample 1

Remark:

1. The worst case of AC is mode 3; only the test data of this mode is reported.
2. The worst case of RE is mode 1; 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 for GSM 850/LTE Band 12/13/14/26/71/5G NR n5/n12, the worst channel was recorded in this report.
5. Bluetooth Idle 1 is a Bluetooth module 1 which could normal idle
6. Bluetooth Idle 2 is a Bluetooth module 2 which could work in switch OFF state

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.	5G NR Base Station	Anritus	MT8000A	N/A	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
4.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
5.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
6.	Vector Signal Generator	R&S	SMBV100A	258305	N/A	N/A
7.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
8.	Bluetooth Earphone	Xiaomi	LYEJ02LM	N/A	N/A	N/A
9.	Router	TP-Link	TL-WDR5600	N/A	N/A	Router
10.	Notebook	Lenovo	V130-14IKB001	N/A	N/A	Notebook
11.	SD Card	SanDisk	Ultra	N/A	N/A	SD Card



12.	Hard disk	KINGSHARE	KSP6120G	N/A	N/A	Hard disk
13.	Cradle	N/A	N/A	N/A	N/A	N/A
14.	Adapter for Cradle	N/A	N/A	N/A	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in GSM/LTE/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. Execute “H Pattern” to show H Pattern via USB Cable on the Notebook.
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.

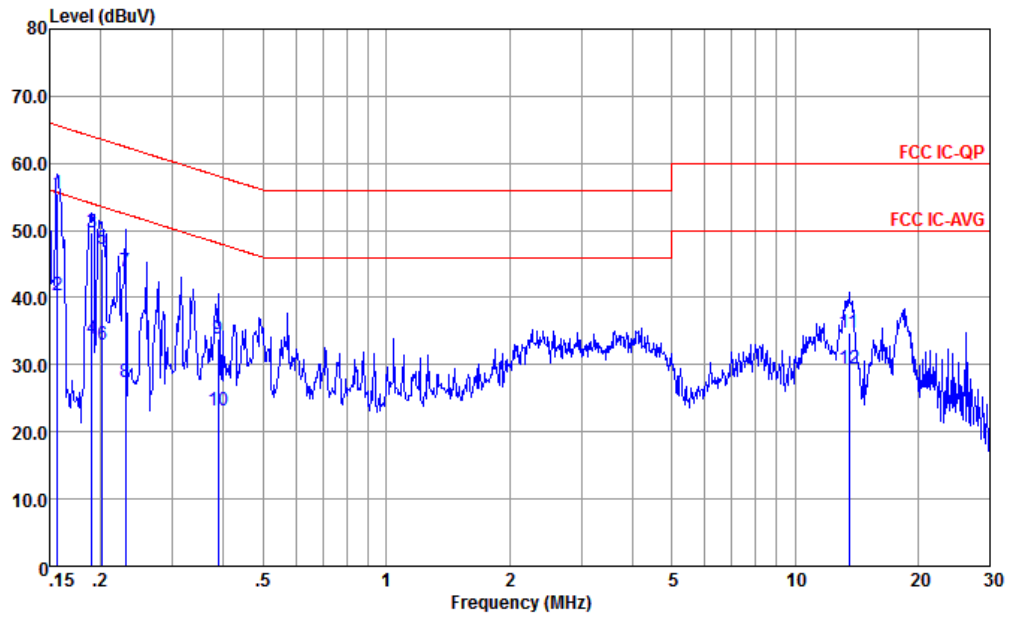
3.1.4 Test Setup





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.		

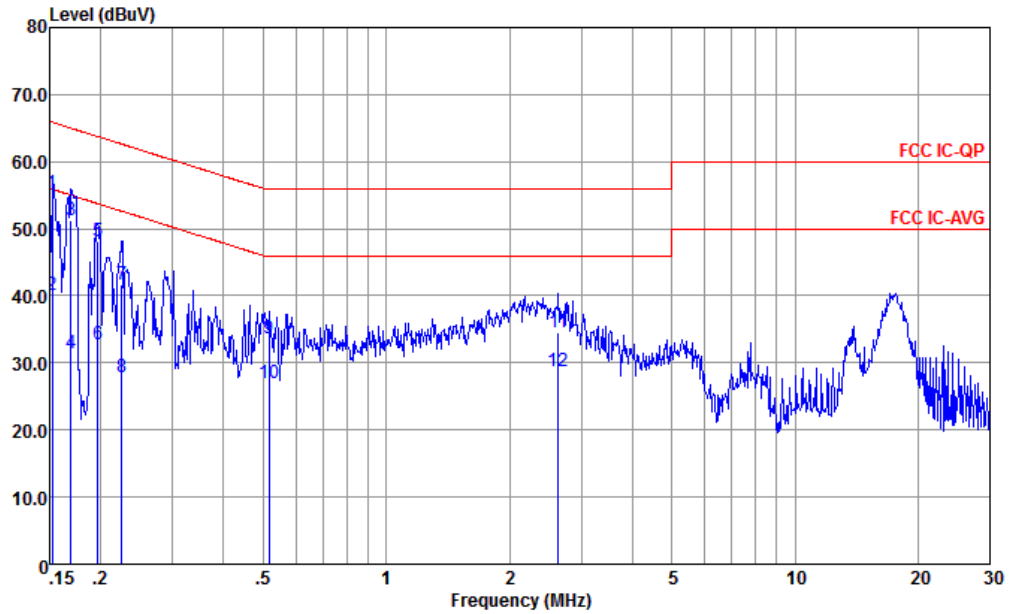


Site : CO01-KS
 Condition : FCC IC-QP LISN-060105-LINE LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.156	55.39	-10.26	65.65	44.90	0.06	10.43	QP
2	0.156	40.39	-15.26	55.65	29.90	0.06	10.43	Average
3	0.190	49.65	-14.37	64.02	39.20	0.03	10.42	QP
4	0.190	33.95	-20.07	54.02	23.50	0.03	10.42	Average
5	0.202	47.24	-16.30	63.54	36.80	0.02	10.42	QP
6	0.202	33.04	-20.50	53.54	22.60	0.02	10.42	Average
7	0.230	43.93	-18.51	62.44	33.50	0.03	10.40	QP
8	0.230	27.33	-25.11	52.44	16.90	0.03	10.40	Average
9	0.387	33.82	-24.30	58.12	23.50	0.01	10.31	QP
10	0.387	23.12	-25.00	48.12	12.80	0.01	10.31	Average
11	13.551	34.82	-25.18	60.00	23.90	-0.20	11.12	QP
12	13.551	29.42	-20.58	50.00	18.50	-0.20	11.12	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-NEUTRAL NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1 *	0.152	55.26	-10.61	65.87	44.80	0.03	10.43	QP
2	0.152	40.06	-15.81	55.87	29.60	0.03	10.43	Average
3	0.169	51.36	-13.63	64.99	40.89	0.04	10.43	QP
4	0.169	31.48	-23.51	54.99	21.01	0.04	10.43	Average
5	0.197	48.07	-15.69	63.76	37.60	0.05	10.42	QP
6	0.197	32.67	-21.09	53.76	22.20	0.05	10.42	Average
7	0.226	41.62	-20.99	62.61	31.20	0.02	10.40	QP
8	0.226	27.92	-24.69	52.61	17.50	0.02	10.40	Average
9	0.516	33.62	-22.38	56.00	23.49	-0.08	10.21	QP
10	0.516	27.02	-18.98	46.00	16.89	-0.08	10.21	Average
11	2.636	34.53	-21.47	56.00	24.60	-0.13	10.06	QP
12	2.636	28.73	-17.27	46.00	18.80	-0.13	10.06	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.

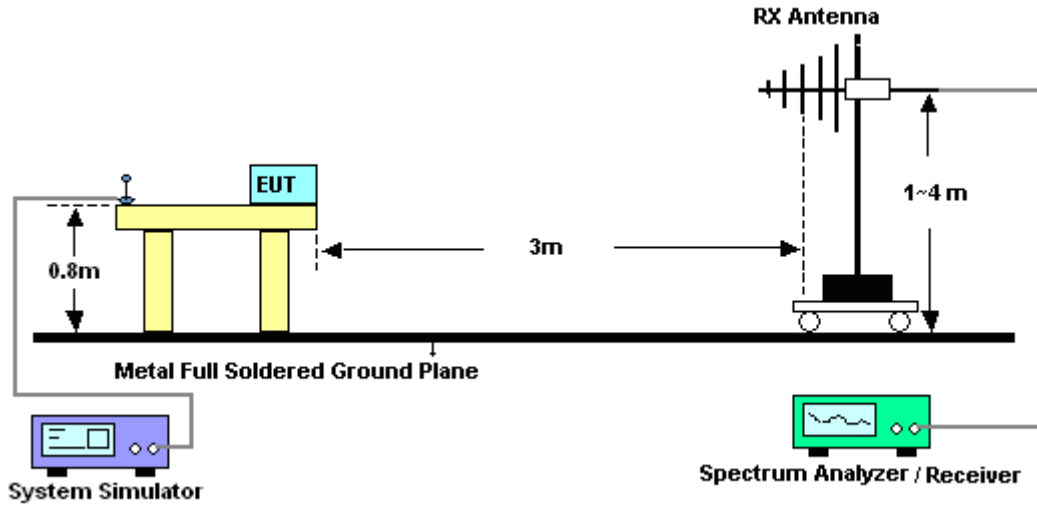


3.2.3. Test Procedures

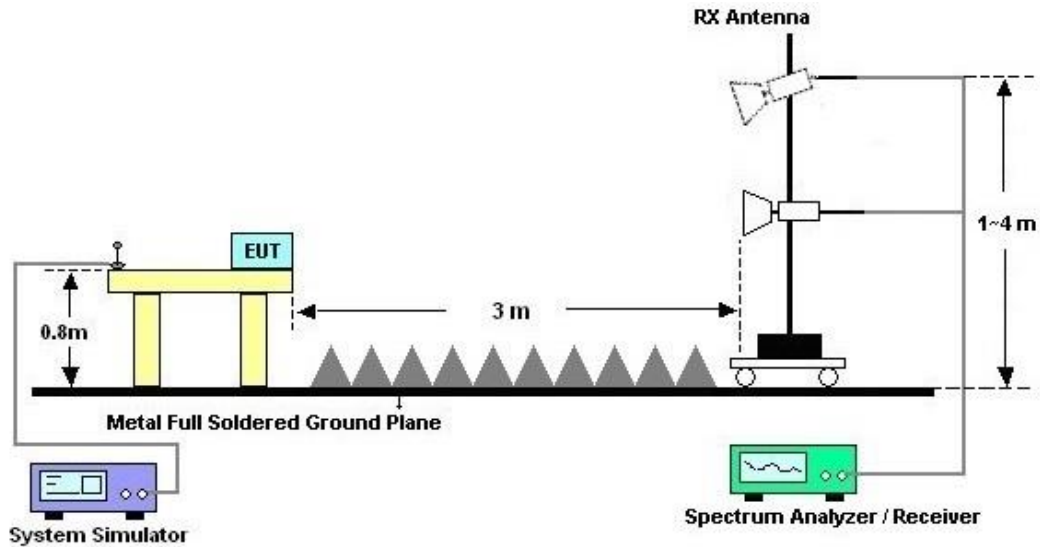
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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



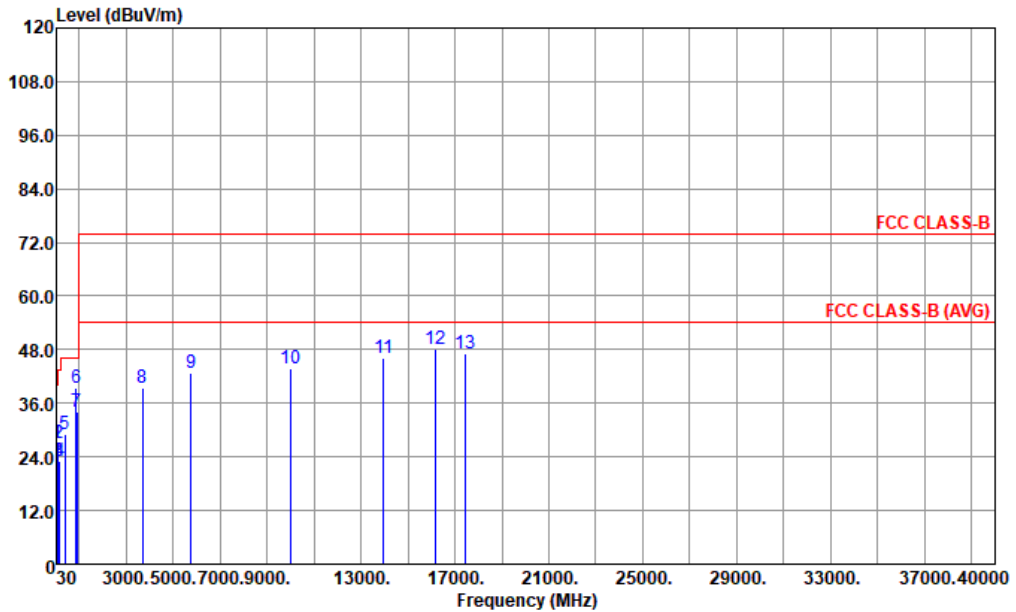
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

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

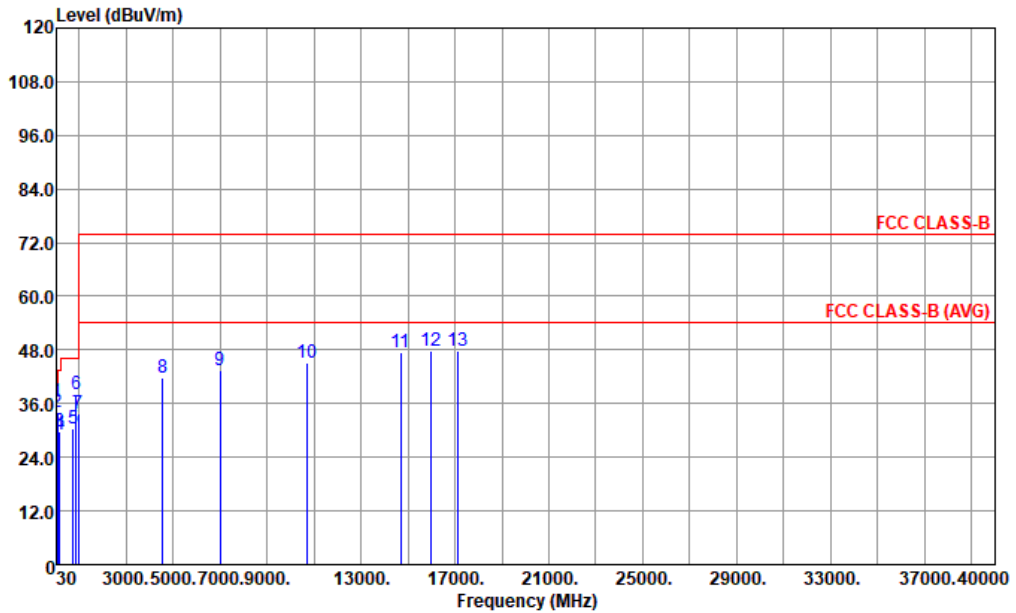


Site : 03CH04-KS
 Condition : FCC CLASS-B 3m 3117 0227860 HORIZONTAL

	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	30.00	26.95	-13.05	40.00	31.78	25.69	0.88	31.40	---	---	Peak
2	95.96	27.00	-16.50	43.50	41.49	15.35	1.56	31.40	---	---	Peak
3	113.42	22.92	-20.58	43.50	35.73	16.90	1.69	31.40	---	---	Peak
4	160.95	23.18	-20.32	43.50	36.52	16.04	2.02	31.40	---	---	Peak
5	394.72	29.13	-16.87	46.00	36.00	21.41	3.17	31.45	---	---	Peak
6	881.66	39.30			36.56	28.94	4.73	30.93	---	---	Peak
7	898.15	34.26	-11.74	46.00	30.94	29.18	4.77	30.63	---	---	Peak
8	3686.00	39.51	-34.49	74.00	60.55	32.21	10.18	63.43	---	---	Peak
9	5777.00	42.70	-31.30	74.00	59.46	34.51	12.45	63.72	---	---	Peak
10	9976.00	43.67	-30.33	74.00	52.63	36.80	16.55	62.31	---	---	Peak
11	13954.00	46.03	-27.97	74.00	50.52	38.63	19.80	62.92	---	---	Peak
12	16181.00	48.07	-25.93	74.00	49.66	40.64	21.37	63.60	---	---	Peak
13	17439.00	47.11	-26.89	74.00	47.16	40.90	22.31	63.26	---	---	Peak



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



Site : 03CH04-KS
 Condition : FCC CLASS-B 3m 3117 0227860 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	30.00	36.45	-3.55	40.00	41.28	25.69	0.88	31.40	100	286 QP
2	82.38	34.04	-5.96	40.00	50.43	13.57	1.44	31.40	---	--- Peak
3	161.92	29.64	-13.86	43.50	43.03	15.98	2.03	31.40	---	--- Peak
4	179.38	28.97	-14.53	43.50	43.42	14.81	2.14	31.40	---	--- Peak
5	756.53	30.51	-15.49	46.00	29.43	28.02	4.39	31.33	---	--- Peak
6	881.66	38.04			35.30	28.94	4.73	30.93	---	--- Peak
7	973.81	33.87	-20.13	54.00	28.63	30.57	4.97	30.30	---	--- Peak
8	4553.00	41.87	-32.13	74.00	59.77	33.26	12.41	63.57	---	--- Peak
9	7001.00	43.43	-30.57	74.00	56.87	35.37	13.75	62.56	---	--- Peak
10	10690.00	44.97	-29.03	74.00	52.34	37.24	17.13	61.74	---	--- Peak
11	14702.00	47.31	-26.69	74.00	51.31	39.23	20.24	63.47	---	--- Peak
12	15960.00	47.63	-26.37	74.00	49.61	40.37	21.21	63.56	---	--- Peak
13	17116.00	47.95	-26.05	74.00	48.20	41.21	22.06	63.52	---	--- 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	ESC17	100768	9kHz~7GHz;	May 24, 2022	Sep. 16, 2022	May 23, 2023	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2021	Sep. 16, 2022	Oct. 12, 2022	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 24, 2022	Sep. 16, 2022	May 23, 2023	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2021	Sep. 16, 2022	Oct. 11, 2022	Conduction (CO01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;M ax 30dBm	Oct. 13, 2022	Oct. 24, 2022	Oct. 12, 2023	Radiation (03CH04-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz~44G,MAX 30dB	Oct. 12, 2022	Oct. 24, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz~1GHz	May 24, 2022	Oct. 24, 2022	May 23, 2023	Radiation (03CH05-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Jan. 05, 2022	Oct. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Oct. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Jan. 05, 2022	Oct. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Oct. 24, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz~18Ghz	Oct. 12, 2022	Oct. 24, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz~18Ghz	Oct. 12, 2022	Oct. 24, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Oct. 24, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Oct. 24, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Oct. 24, 2022	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



5. Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.78dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
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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% ($U = 2Uc(y)$)	5.1dB
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