FCC Test Report

APPLICANT	:	**Honeywell International Inc.** **Honeywell Safety and Productivity Solutions**
EQUIPMENT	:	**RT10A**
BRAND NAME	:	**Honeywell**
MODEL NAME	:	**RT10AL0N**
FCC ID	:	**HD5-RT10AL0N**
STANDARD	:	**47 CFR Part 15 Subpart B**
CLASSIFICATION	:	**Certification**
TEST DATE(S)	:	**Jun. 07, 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

ACCREDITED Cert #5145.02

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
FC052309-01	Rev. 01	Initial issue of report	Jun. 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 6.73 dB at 0.484 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 4.04 dB at 71.710 MHz for Peak

Note:

This is a variant report for RT10AL0N. The change note could be referred to the RT10AL0N_Operational Description of Product Equality Declaration which is exhibit separately. Based on the similarity between current and previous project, only the related test cases from original test report (Sporton Report Number FC052309) were verified for the differences.

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.
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc.
Honeywell Safety and Productivity Solutions
9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	RT10A
Brand Name	Honeywell
Model Name	RT10AL0N
FCC ID	HD5-RT10AL0N
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n (HT20) WLAN 5GHz 802.11a/n (HT20/HT40) WLAN 5GHz 802.11ac (VHT20/VHT40/VHT80) Bluetooth BR/EDR/LE NFC
SN Code	22098R0044
HW Version	V1.0
SW Version	OS.05.001-HON.03.002.DO
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Rx Frequency	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
Antenna Type	WLAN : PIFA Antenna Bluetooth : PIFA Antenna NFC: Loop Antenna
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) :π/4-DQPSK Bluetooth (3Mbps) : 8-DPSK NFC: ASK

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 03CH02-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24a
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

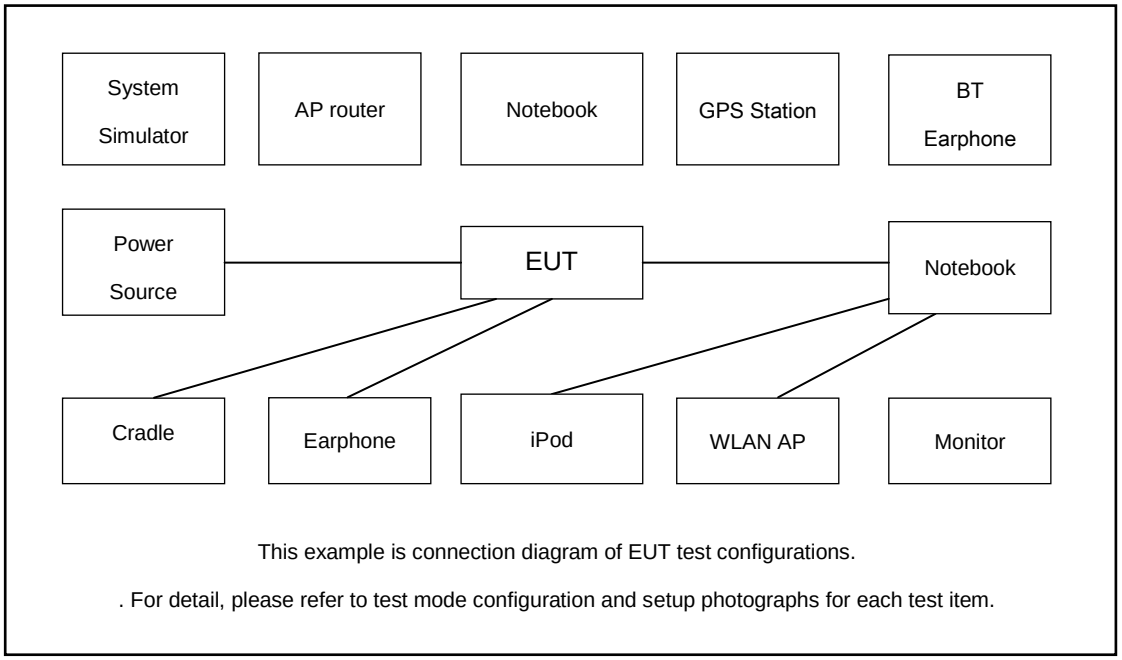
2.1. Test Mode

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: Bluetooth Idle+ WLAN (2.4G) Idle+ Camera(Rear) + Earphone1 + Battery 1 + NFC On + smart Reader With Read Card + USB Link With NB (Type-c Port) + USB Link With U Disk + USB Cable 1(Charging from Adapter1)
Radiated Emissions	Mode 1: Bluetooth Link+ WLAN (2.4G) Link+ Camera(Rear) + Earphone1 + Battery 1 + NFC On + smart Reader With Read Card + USB Link With NB (Type-c Port) + USB Link With U Disk + USB Cable1 (Charging from Adapter1)
Remark: Data Link with Notebook means data application transferred mode between EUT and Notebook.	

2.2. Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

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

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

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded,1.8m
2.	Bluetooth Earphone	Xiaomi	LYEJ02LM	N/A	N/A	N/A
3.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	Unshielded, 1.8 m
4.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
5.	SD Card	SanDisk	Uitra	N/A	N/A	N/A
6.	Earphone	Lenovo	P121	N/A	N/A	Unshielded,1.2m
7.	NFC Card	N/A	N/A	N/A	N/A	N/A
8.	Smart Card Reader	N/A	N/A	N/A	N/A	N/A

2.4. EUT Operation Test Setup

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 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.

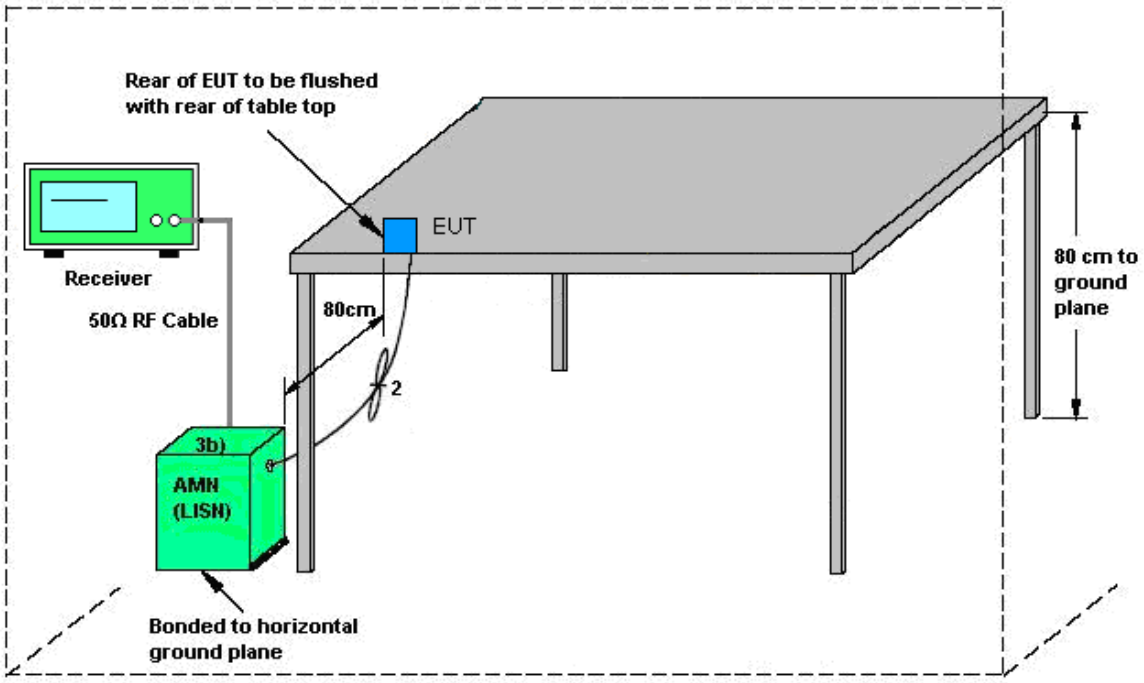
3.1.2 Measuring Instruments

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.

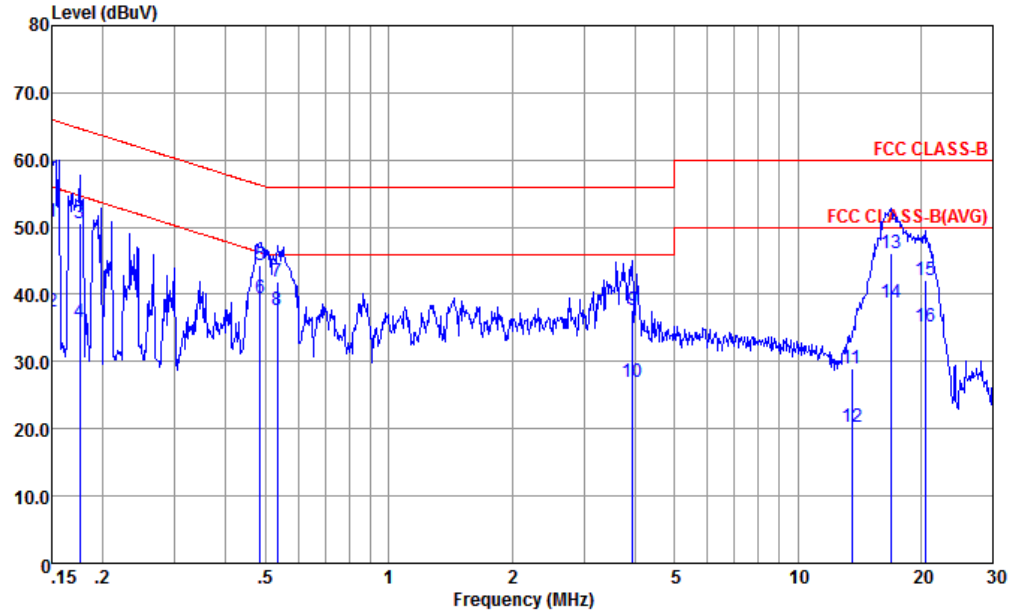
3.1.4 Test Setup



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

3.1.5 Test Result of AC Conducted Emission

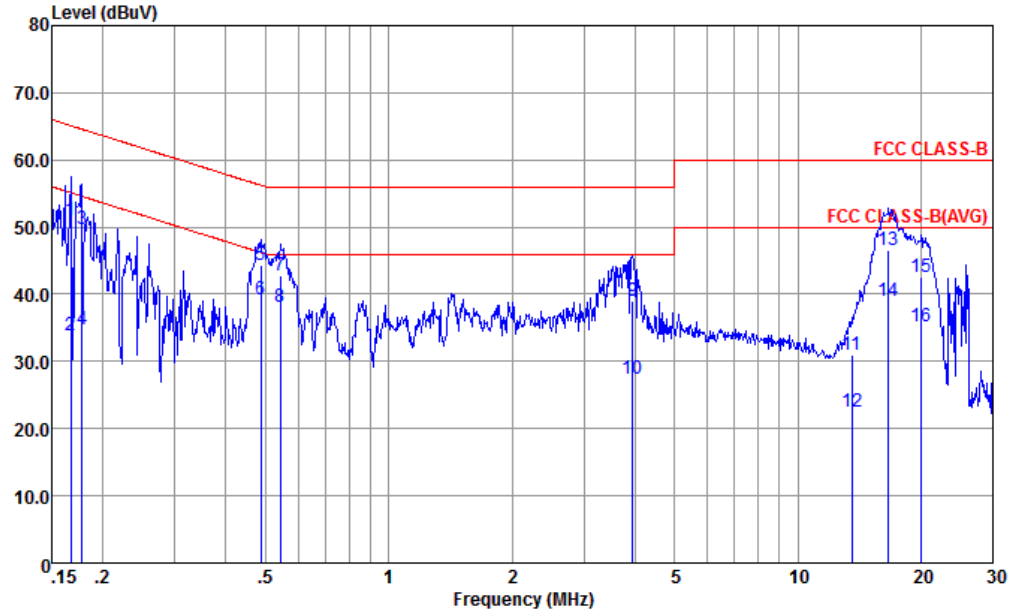
Test Engineer :	Amos Zhang	**Temperature :**	24.2~25.6℃
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC CLASS-B LISN-060105-L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.150	50.70	-15.30	66.00	40.20	0.02	10.48	QP
2		0.150	37.40	-18.60	56.00	26.90	0.02	10.48	Average
3		0.176	50.65	-14.03	64.68	40.20	0.03	10.42	QP
4		0.176	35.95	-18.73	54.68	25.50	0.03	10.42	Average
5		0.484	44.24	-12.03	56.27	33.90	0.10	10.24	QP
6	*	0.484	39.54	-6.73	46.27	29.20	0.10	10.24	Average
7		0.535	41.94	-14.06	56.00	31.60	0.10	10.24	QP
8		0.535	37.64	-8.36	46.00	27.30	0.10	10.24	Average
9		3.943	37.62	-18.38	56.00	27.20	0.17	10.25	QP
10		3.943	27.02	-18.98	46.00	16.60	0.17	10.25	Average
11		13.560	28.86	-31.14	60.00	18.20	0.28	10.38	QP
12		13.560	20.26	-29.74	50.00	9.60	0.28	10.38	Average
13		16.928	46.11	-13.89	60.00	35.29	0.38	10.44	QP
14		16.928	38.71	-11.29	50.00	27.89	0.38	10.44	Average
15		20.486	42.21	-17.79	60.00	31.20	0.51	10.50	QP
16		20.486	35.21	-14.79	50.00	24.20	0.51	10.50	Average

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



Site : CO01-KS
Condition : FCC CLASS-B LISN-060105-N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.167	51.04	-14.08	65.12	40.49	0.11	10.44	QP
2		0.167	33.84	-21.28	55.12	23.29	0.11	10.44	Average
3		0.178	49.71	-14.88	64.59	39.20	0.10	10.41	QP
4		0.178	34.71	-19.88	54.59	24.20	0.10	10.41	Average
5		0.486	44.25	-11.98	56.23	33.90	0.11	10.24	QP
6	*	0.486	39.25	-6.98	46.23	28.90	0.11	10.24	Average
7		0.544	42.85	-13.15	56.00	32.50	0.11	10.24	QP
8		0.544	38.15	-7.85	46.00	27.80	0.11	10.24	Average
9		3.943	38.92	-17.08	56.00	28.50	0.17	10.25	QP
10		3.943	27.32	-18.68	46.00	16.90	0.17	10.25	Average
11		13.560	30.87	-29.13	60.00	20.20	0.29	10.38	QP
12		13.560	22.57	-27.43	50.00	11.90	0.29	10.38	Average
13		16.661	46.61	-13.39	60.00	35.80	0.38	10.43	QP
14		16.661	38.91	-11.09	50.00	28.10	0.38	10.43	Average
15		20.056	42.51	-17.49	60.00	31.50	0.52	10.49	QP
16		20.056	35.11	-14.89	50.00	24.10	0.52	10.49	Average

Note:

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

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

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

<Class B Limit>

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

3.2.2. Measuring Instruments

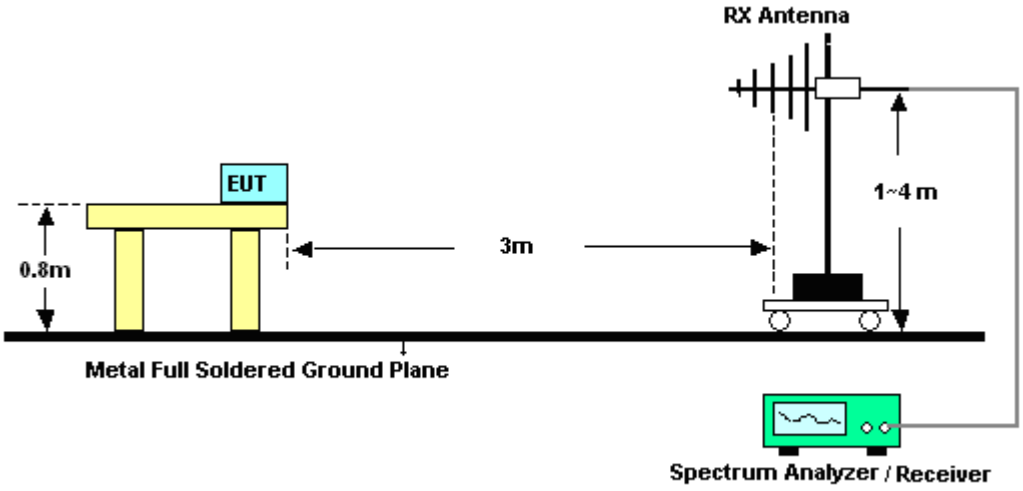
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

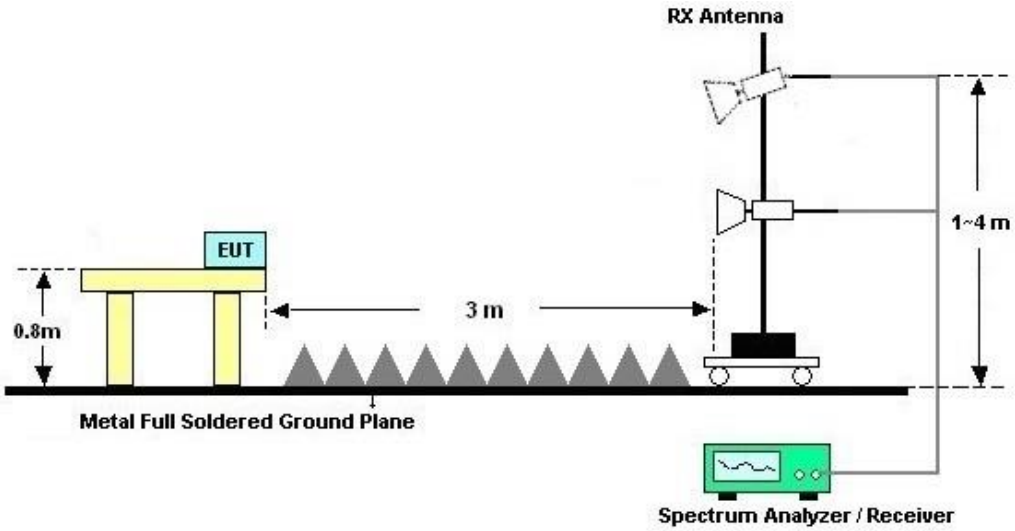
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

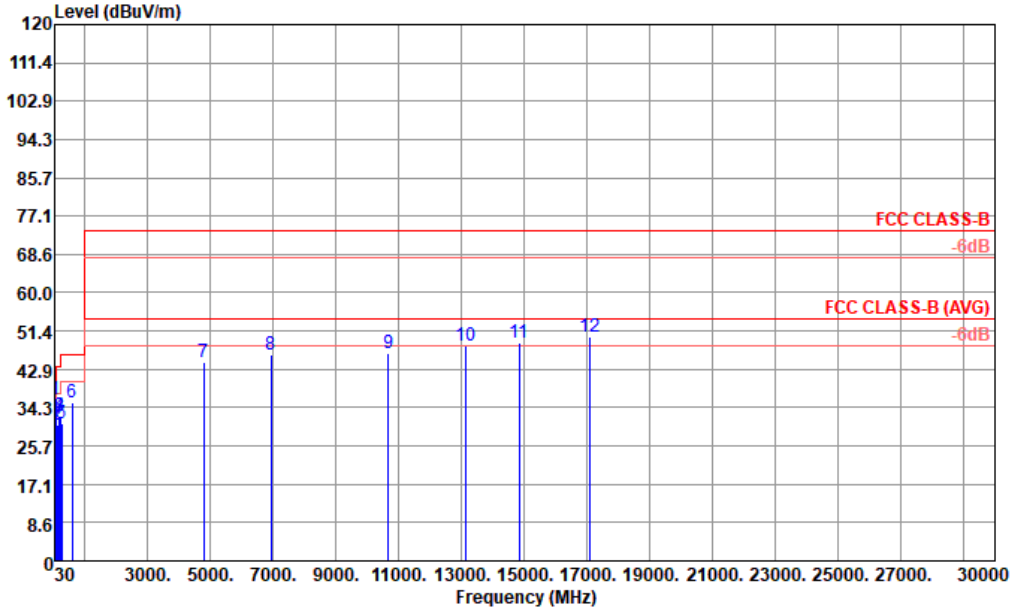


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

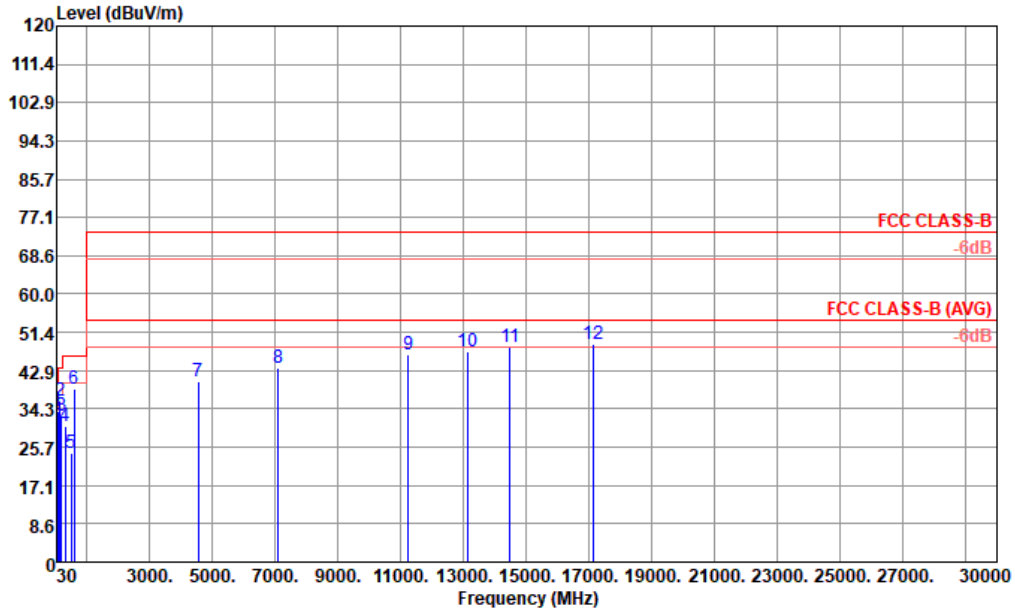
Test Engineer :	Peng Fang	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal



Site : 03CH02-KS
Condition : FCC CLASS-B 3m CBL 6111D 59913 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	71.7100	35.96	-4.04	40.00	54.66	12.50	1.20	32.40	100	0	Peak
2	120.2100	30.44	-13.06	43.50	43.81	17.40	1.63	32.40	---	---	Peak
3	184.2300	32.32	-11.18	43.50	48.13	14.60	1.99	32.40	---	---	Peak
4	199.7500	32.30	-11.20	43.50	47.81	14.80	2.09	32.40	---	---	Peak
5	263.7700	30.65	-15.35	46.00	40.83	20.00	2.22	32.40	---	---	Peak
6	600.3600	35.59	-10.41	46.00	38.85	25.50	3.64	32.40	---	---	Peak
7	4791.0000	44.31	-29.69	74.00	64.55	34.32	10.80	65.36	---	---	Peak
8	6933.0000	46.19	-27.81	74.00	62.30	35.97	13.01	65.09	---	---	Peak
9	10656.000	46.49	-27.51	74.00	59.15	37.76	16.39	66.81	---	---	Peak
10	13121.000	48.27	-25.73	74.00	56.43	39.20	18.26	65.62	---	---	Peak
11	14838.000	48.86	-25.14	74.00	54.41	39.87	19.39	64.81	---	---	Peak
12	17082.000	50.27	-23.73	74.00	51.66	42.45	21.06	64.90	---	---	Peak

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



Site : 03CH02-KS
Condition : FCC CLASS-B 3m CBL 6111D 59913 VERTICAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	71.7100	33.84	-6.16	40.00	52.54	12.50	1.20	32.40	---	---	Peak
2	127.9700	36.20	-7.30	43.50	49.52	17.40	1.68	32.40	---	---	Peak
3	185.2000	32.63	-10.87	43.50	48.44	14.60	1.99	32.40	---	---	Peak
4	314.2100	30.27	-15.73	46.00	40.78	19.28	2.61	32.40	---	---	Peak
5	494.6300	24.41	-21.59	46.00	29.97	23.70	3.14	32.40	---	---	Peak
6	600.3600	38.62	-7.38	46.00	41.88	25.50	3.64	32.40	---	---	Peak
7	4536.0000	40.42	-33.58	74.00	61.07	34.27	10.28	65.20	---	---	Peak
8	7086.0000	43.52	-30.48	74.00	59.52	35.98	13.27	65.25	---	---	Peak
9	11234.000	46.39	-27.61	74.00	58.00	38.04	16.84	66.49	---	---	Peak
10	13121.000	47.17	-26.83	74.00	55.33	39.20	18.26	65.62	---	---	Peak
11	14481.000	48.05	-25.95	74.00	54.10	39.57	19.24	64.86	---	---	Peak
12	17116.000	48.87	-25.13	74.00	50.31	42.39	21.07	64.90	---	---	Peak

Note:

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

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 24, 2022	Jun. 07, 2022	May 23, 2023	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Jun. 07, 2022	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 24, 2022	Jun. 07, 2022	May 23, 2023	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Jun. 07, 2022	Oct. 13, 2022	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Oct. 16, 2021	Jun. 07, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 16, 2021	Jun. 07, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 22, 2021	Jun. 07, 2022	Dec. 21, 2022	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 30, 2021	Jun. 07, 2022	Oct. 29, 2022	Radiation (03CH02-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Jun. 07, 2022	Jan. 04, 2023	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Apr. 13, 2022	Jun. 07, 2022	Apr. 12, 2023	Radiation (03CH02-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 16, 2021	Jun. 07, 2022	Oct. 15, 2022	Radiation (03CH02-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Jun. 07, 2022	Jan. 04, 2023	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Jun. 07, 2022	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 07, 2022	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 07, 2022	NCR	Radiation (03CH02-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))	**2.94dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.9dB**

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

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

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

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