FCC Test Report

Test Report
On Behalf of
Toccata Technologies Inc
For
3-in-1 Wireless Charging Station
Model No.: WC10-018

FCC ID: 2BFL6-WC10-018

Prepared For : **Toccata Technologies Inc**

8854 Commerce Loop Drive, Columbus, OH, 43240, USA

Prepared By : **Shenzhen HUAK Testing Technology Co., Ltd.**
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: **Mar. 13, 2024 ~ Mar. 20, 2024**
Date of Report: **Mar. 20, 2024**
Report Number: **HK2403131139-1E**

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Test Result Certification

Applicant's Name..... : Toccata Technologies Inc

Address..... : 8854 Commerce Loop Drive, Columbus, OH, 43240, USA

Manufacturer's Name ..... : NINGBO WISEASIA CO.,LTD

Address..... : 2F,Unit 7, No.688 Jinda Road, Yinzhou, Ningbo, 315040, China

Product Description

Trade Mark ..... : CYBERGIANT

Product Name ..... : 3-in-1 Wireless Charging Station

Model and/or Type Reference: WC10-018

Standards ..... : FCC CFR 47 PART 18

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Date of Test .....:

Date (s) of performance of tests .....: **Mar. 13, 2024 ~ Mar. 20, 2024**

Date of Issue.....: **Mar. 20, 2024**

Test Result.....: **Pass**

Testing Engineer : Len Liao

(Len Liao)

Technical Manager : Sliver Wan

(Sliver Wan)

Authorized Signatory : Jason Zhou

(Jason Zhou)

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Mar. 20, 2024	Jason Zhou

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1. Test Summary

1.1. Test Procedures and Results

Description of Test	Section Number	Result
Conducted Emissions Test	18.307	COMPLIANT
Radiated Emission Test	18.305	COMPLIANT

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

1.2. Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.
Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:
A2LA Accreditation Code is 4781.01.
FCC Designation Number is CA100229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

1.3. Measurement Uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.71dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.90dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	3.90dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.28dB, k=2

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2. General Information

2.1. General Description of EUT

Equipment:	3-in-1 Wireless Charging Station
Model Name:	WC10-018
Series Models:	N/A
Model Difference:	N/A
Trade Mark:	CYBERGIANT
FCC ID:	2BFL6-WC10-018
Antenna Type:	Coil Antenna
Antenna Gain:	0dBi
Operation Frequency:	112KHz~205KHz Watch: 314KHz
Test Frequency:	Mobile Phone: 136KHz Earphone: 128KHz Watch: 314KHz
Modulation Type:	ASK
Power Source:	Input: 9V/3A Output: Magnetic Wireless Charger: 5W/7.5W/10W/15W Earphone Charger: 5W Smart Watch Charger: 2W
Power Rating:	Input: 9V/3A Output: Magnetic Wireless Charger: 5W/7.5W/10W/15W Earphone Charger: 5W Smart Watch Charger: 2W
Note: The transfer system includes three coils, 3 coils can work individually or can work at the same time. All the situation has been tested, only the worst situation was recorded in the report.	

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2.2. Carrier Frequency of Channels

	Test Frequency
01	128KHz
02	136KHz
03	314KHz

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2.3. Test Mode

Test Item	Test Mode	Description
Radiated & Conducted Test Cases	Mode 1	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Earphones (Battery Status: <1%) + Watch (Battery Status: <1%)
	Mode 2	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Earphones (Battery Status: <50%) + Watch (Battery Status: <1%)
	Mode 3	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Earphones (Battery Status: >95%) + Watch (Battery Status: <1%)
	Mode 4	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Earphones (Battery Status: <1%) + Watch (Battery Status: <50%)
	Mode 5	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Earphones (Battery Status: <50%) + Watch (Battery Status: <50%)
	Mode 6	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Earphones (Battery Status: >95%) + Watch (Battery Status: <50%)
	Mode 7	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Earphones (Battery Status: <1%) + Watch (Battery Status: >95%)
	Mode 8	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Earphones (Battery Status: <50%) + Watch (Battery Status: >95%)
	Mode 9	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Earphones (Battery Status: >95%) + Watch (Battery Status: >95%)
	Mode 10	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%)
	Mode 11	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%)
	Mode 12	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%)
	Mode 13	AC/DC Adapter + EUT + Earphones (Battery Status: <1%)
	Mode 14	AC/DC Adapter + EUT + Earphones (Battery Status: <50%)
	Mode 15	AC/DC Adapter + EUT + Earphones (Battery Status: >95%)
	Mode 16	AC/DC Adapter + EUT + Watch (Battery Status: <1%)
	Mode 17	AC/DC Adapter + EUT + Watch (Battery Status: <50%)
	Mode 18	AC/DC Adapter + EUT + Watch (Battery Status: >95%)
	Mode 19	AC/DC Adapter + EUT (Null Load)

Note: 1. All modes and configurations above have been tested, Only the result of the worst case was recorded in the report, the worst-case configuration is Mode 1.

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. The wireless load replaces the Mobile Phone and Watch by Lab.

4. According to the manufacturer's design principle, the wireless charging power will reach its maximum when the client device's battery level is between 1% and 10%.

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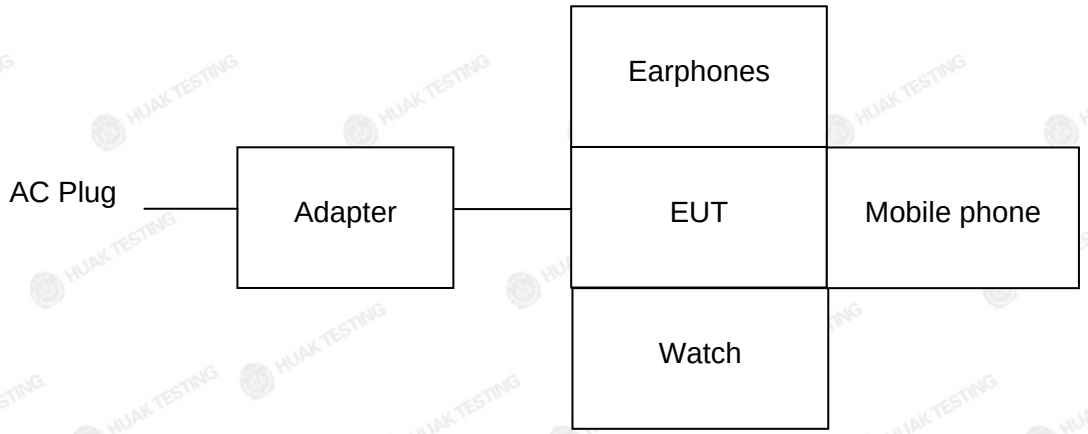
2.4. Description of Test Setup

Operation of EUT during Testing:



The sample was placed (0.8m (30MHz~1GHz), 0.8m (9KHz~30MHz)) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.

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2.5. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Specification	Remark
1	3-in-1 Wireless Charging Station	CYBERGIANT	WC10-018	N/A	EUT
2	USB Cable	N/A	N/A	Length:1.0m	Accessory
3	Adapter	N/A	XY-2115-PD	Input: 110-240VAC, 50/60Hz, 0.5A Output: 5V/3A, 9V/2.22A, 12V/2.25A, 12V/1.67A	Accessory
4	Mobile phone	APPLE	iPhone 13	Wireless input 15W	Peripheral
5	Earphones	APPLE	AirPods	Wireless input 2W	Peripheral
6	Watch	APPLE	Ultra 2	Wireless input 2.5W	Peripheral

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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2.6. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Feb. 20, 2024	1 Year
2.	Receiver	R&S	ESR-7	HKE-005	Feb. 20, 2024	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 20, 2024	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 21, 2024	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 21, 2024	2 Year
10.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Feb. 20, 2024	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 20, 2024	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	N/A	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 20, 2024	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 20, 2024	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 20, 2024	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 09, 2021	3 Year
19.	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 20, 2024	1 Year

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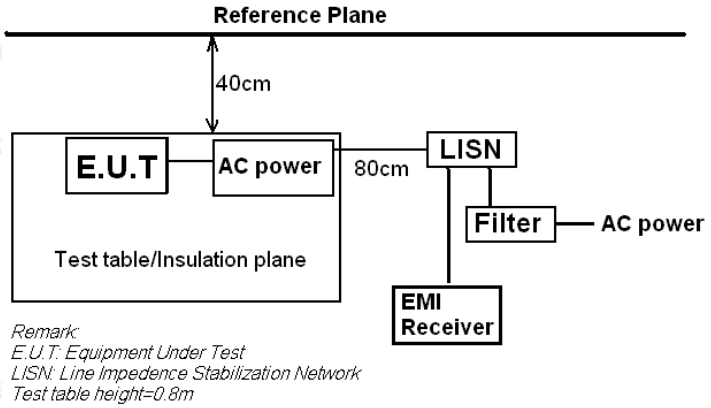
3. Conducted Emission Test

3.1. Block Diagram of Test Setup



3.2. Conducted Power Line Emission Limit

According to FCC Part 18.307(b)

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §18.307 Line Conducted Emission Limit is same as above table.

3.3. Test Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

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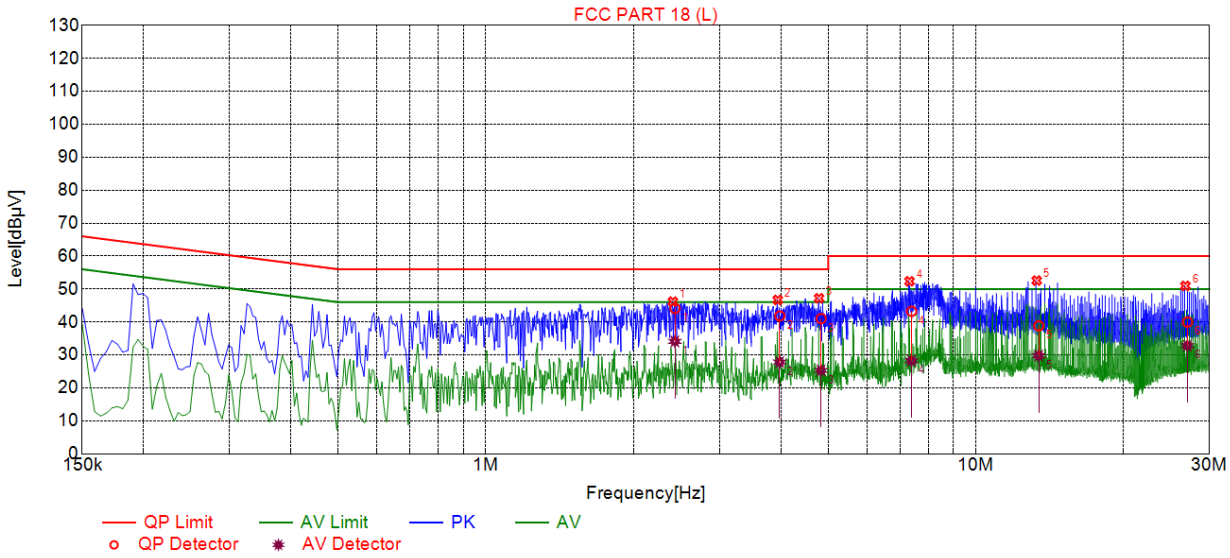
3.4. Test Result

PASS

All the test modes completed for test. Only the worst result was reported as below:

Test Specification: Line



Suspected List								
NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	2.4090	46.17	20.18	56.00	9.83	25.99	PK	L
2	3.9435	46.70	20.25	56.00	9.30	26.45	PK	L
3	4.7895	47.20	20.26	56.00	8.80	26.94	PK	L
4	7.3275	52.36	20.18	60.00	7.64	32.18	PK	L
5	13.3215	52.57	19.96	60.00	7.43	32.61	PK	L
6	26.7990	50.95	20.26	60.00	9.05	30.69	PK	L

Final Data List											
NO.	Freq. [MHz]	Correction factor[dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	AV Reading [dBμV]	Type
1	2.4318	20.18	44.13	56.00	11.87	23.95	34.11	46.00	11.89	13.93	L
2	3.9808	20.25	41.85	56.00	14.15	21.60	27.83	46.00	18.17	7.58	L
3	4.8348	20.26	41.03	56.00	14.97	20.77	25.31	46.00	20.69	5.05	L
4	7.3969	20.18	43.24	60.00	16.76	23.06	28.23	50.00	21.77	8.05	L
5	13.4476	19.96	38.85	60.00	21.15	18.89	29.80	50.00	20.20	9.84	L
6	27.0526	20.26	39.97	60.00	20.03	19.71	32.81	50.00	17.19	12.55	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

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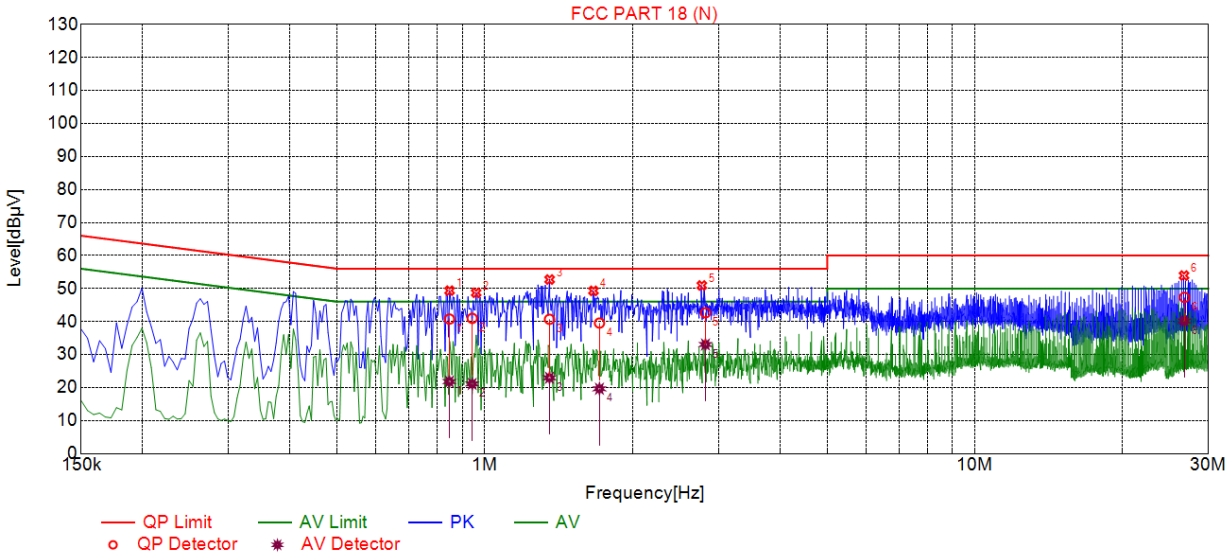
Test Specification: Neutral



Suspected List								
NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.8475	49.37	20.06	56.00	6.63	29.31	PK	N
2	0.9600	48.71	20.06	56.00	7.29	28.65	PK	N
3	1.3560	52.73	20.10	56.00	3.27	32.63	PK	N
4	1.6665	49.31	20.12	56.00	6.69	29.19	PK	N
5	2.7735	50.93	20.21	56.00	5.07	30.72	PK	N
6	26.7495	53.93	20.26	60.00	6.07	33.67	PK	N

Final Data List											
NO.	Freq. [MHz]	Correction factor[dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	AV Reading [dBμV]	Type
1	0.8465	20.06	40.77	56.00	15.23	20.71	21.81	46.00	24.19	1.75	N
2	0.9422	20.06	40.98	56.00	15.02	20.92	21.11	46.00	24.89	1.05	N
3	1.3550	20.10	40.70	56.00	15.30	20.59	22.97	46.00	23.03	2.86	N
4	1.7138	20.13	39.54	56.00	16.46	19.41	19.64	46.00	26.36	-0.49	N
5	2.8208	20.21	42.66	56.00	13.34	22.45	33.05	46.00	12.95	12.84	N
6	26.7968	20.26	47.35	60.00	12.65	27.09	40.17	50.00	9.83	19.91	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

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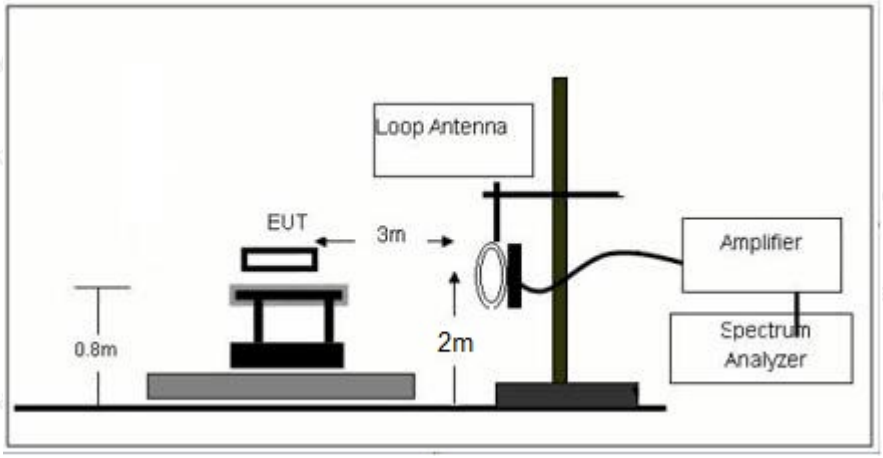
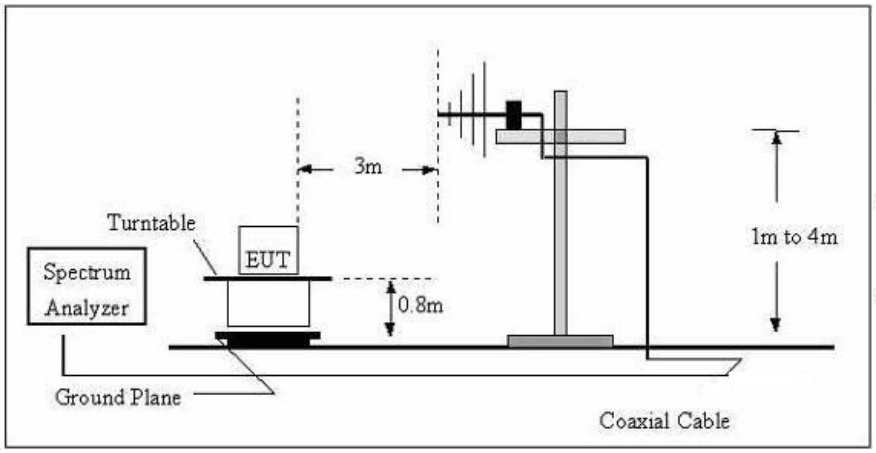
4. Radiated Emissions

4.1. Block Diagram of Test Setup





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4.2. Rules and Specifications

Except as provided elsewhere in this Subpart 18.305 (b), the field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following table:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
(miscellaneous)				
	Any non-ISM frequency	Below 500 500 or more	15 15 × SQRT(power/500)	300 [1]300

Remark:

(1) Emission level dBuV/m for 0.009~30MHz = 20log (15) + 40log (300/3) dBuV/m;

(2) Calculated according FCC 18.305.

(3) The smaller limit shall apply at the cross point between two frequency bands.

(4) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.3. Test Procedure

Measurement distance 3m
For the measurement range up to 30MHz in the following plots the field strength result from 3m
Distance measurements are extrapolated to 300m and 30m distance respectively, by 40dB/decade, Per antenna factor scaling.
Measurements below 1000MHz are performed with a peak detector and compared to average limits, Measurements with an average detector are not required.

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4. Test Result

PASS

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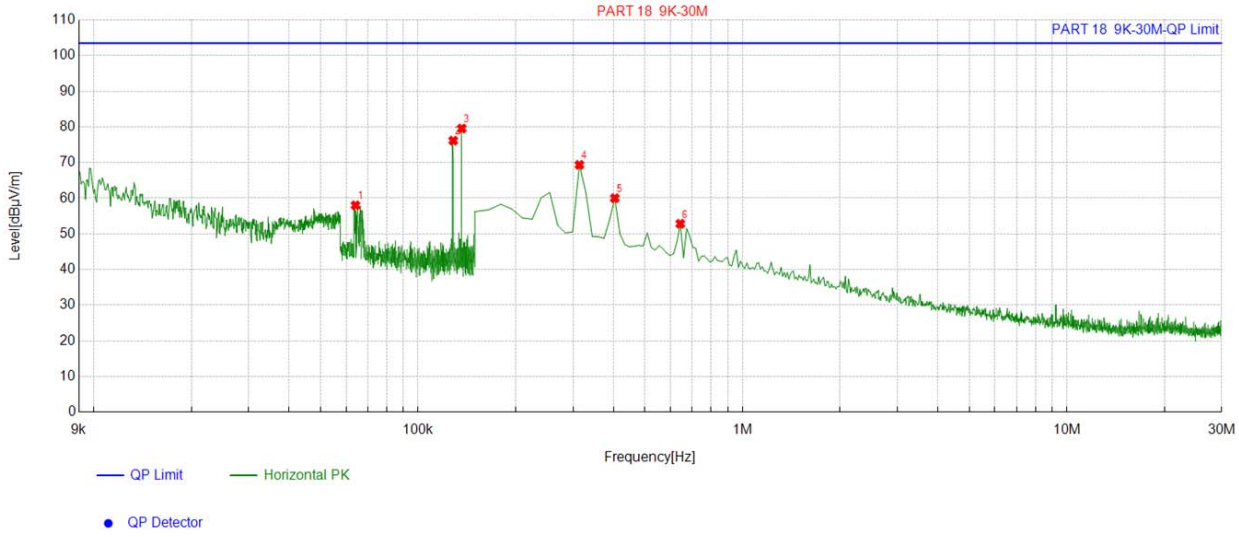
For 9KHz - 30MHz



Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
1	0.064088	13.97	44.05	58.02	103.50	45.48
2	0.128275	13.78	62.38	76.16	103.50	27.34
3	0.136316	13.78	65.78	79.56	103.50	23.94
4	0.314257	13.70	55.66	69.36	103.50	34.14
5	0.403852	13.79	46.24	60.03	103.50	43.47
6	0.642771	13.75	39.11	52.86	103.50	50.64

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

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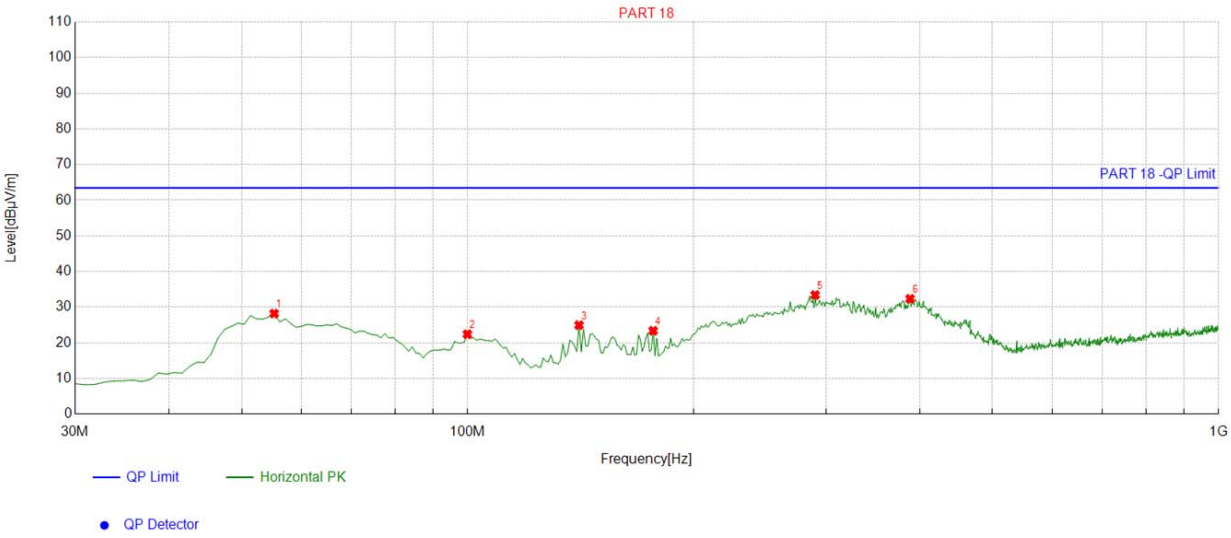
For 30MHz-1GHz

Antenna polarity: H



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	55.245245	-14.32	42.53	28.21	63.50	35.29	100	207	Horizontal
2	99.90991	-15.13	37.56	22.43	63.50	41.07	100	19	Horizontal
3	140.69069	-18.07	43.04	24.97	63.50	38.53	100	144	Horizontal
4	176.61661	-17.08	40.48	23.40	63.50	40.10	100	196	Horizontal
5	290.22022	-12.32	45.75	33.43	63.50	30.07	100	180	Horizontal
6	388.28828	-10.17	42.53	32.36	63.50	31.14	100	185	Horizontal

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

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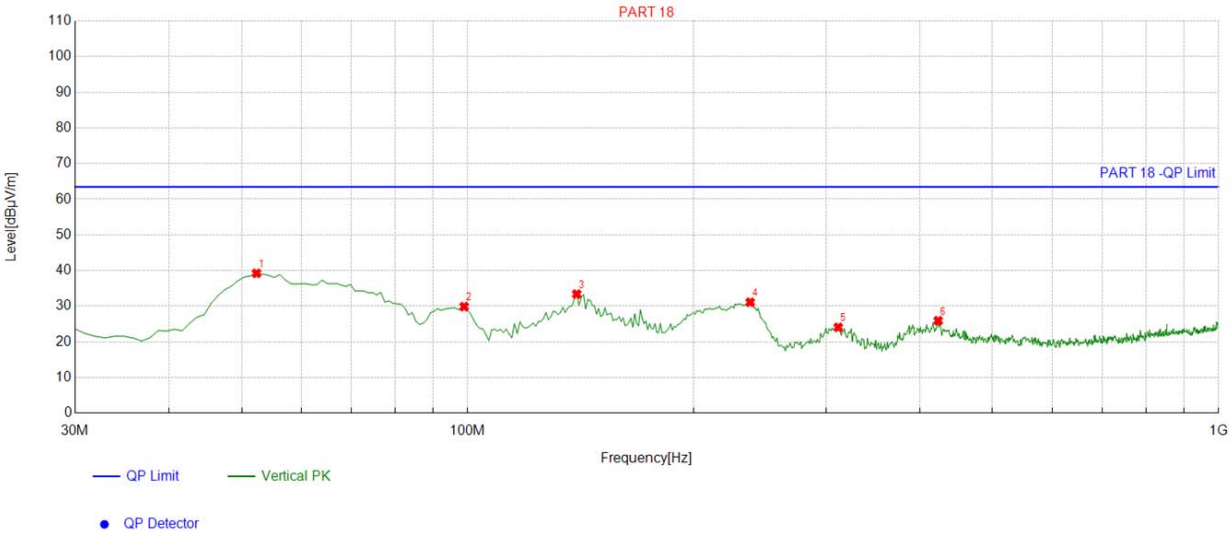
Antenna polarity: V



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.332332	-14.35	53.58	39.23	63.50	24.27	100	172	Vertical
2	98.938939	-15.53	45.42	29.89	63.50	33.61	100	185	Vertical
3	139.71972	-17.94	51.34	33.40	63.50	30.10	100	55	Vertical
4	237.78778	-13.37	44.48	31.11	63.50	32.39	100	120	Vertical
5	311.58158	-11.80	35.87	24.07	63.50	39.43	100	55	Vertical
6	423.24324	-8.63	34.57	25.94	63.50	37.56	100	272	Vertical

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

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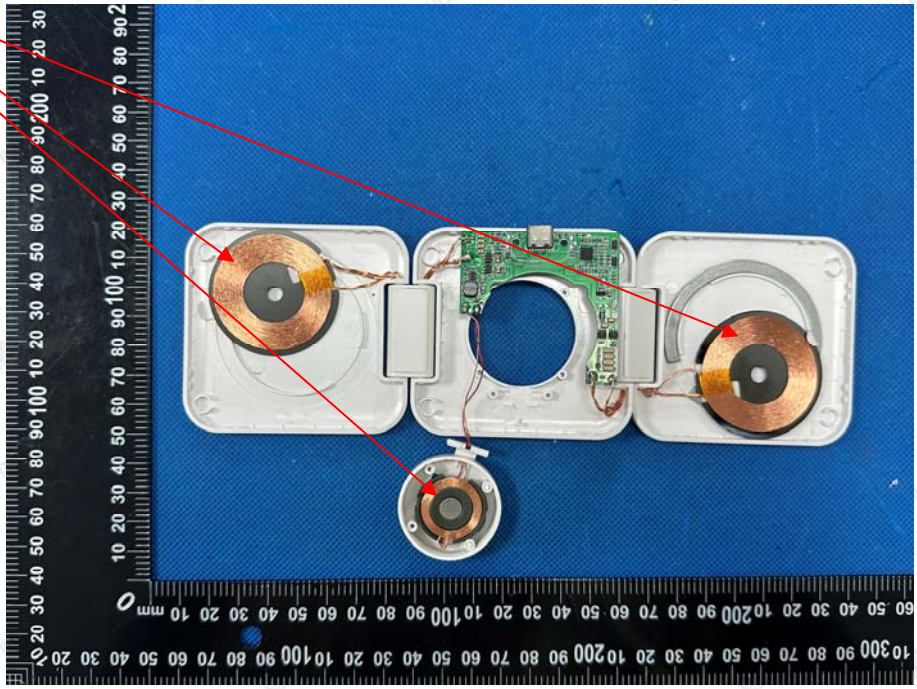
5. Antenna Requirement

Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction
The antenna used in this product is Coil Antenna, which permanently attached. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 0dBi.

Antenna



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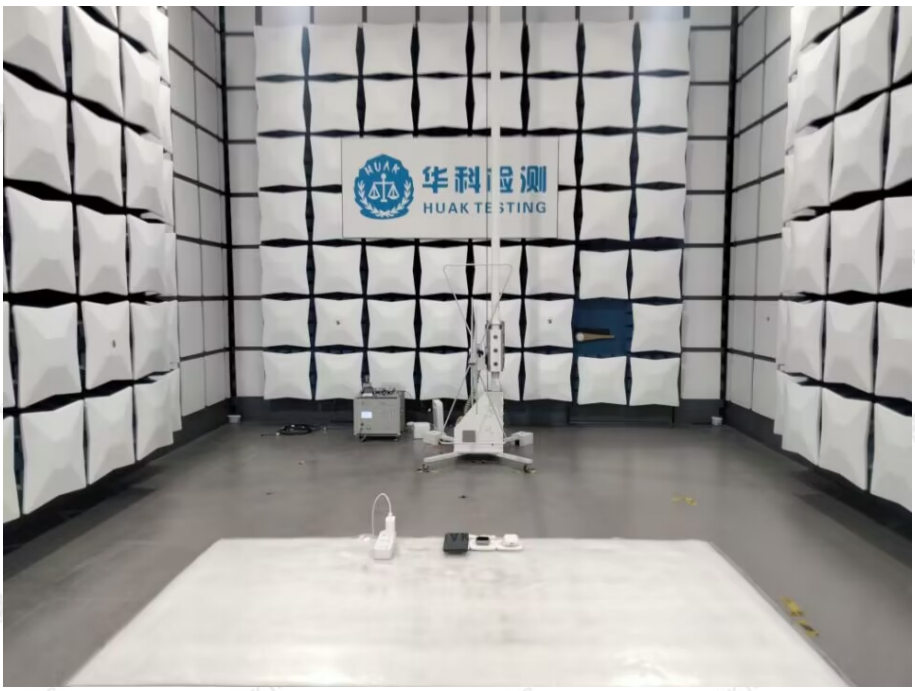
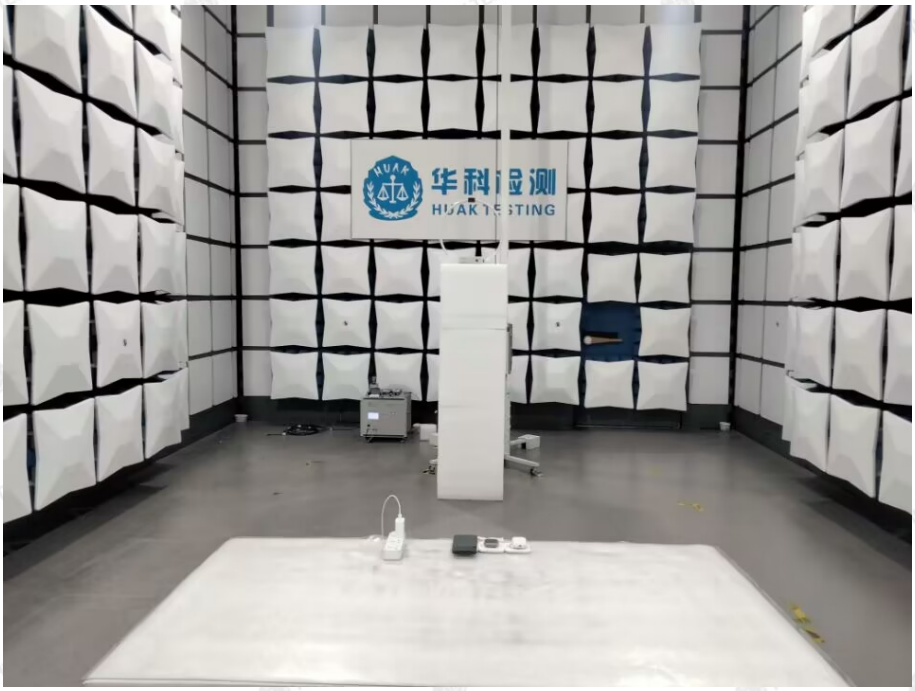
6. Photographs of Test

Radiated Emission





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Conducted Emission

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Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

7. Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

---------End of test report---------

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