FCC Test Report

Test Report
On Behalf of
Shenzhen Xiangdangwen Technology Co.,Ltd.
For
C TO C/L/Watch 3-in-1 data cable
Model No.: 2E348, 2E348-0.5M, 2E348-1M, 2E348-1.5M, 2E348-1.8M, 2E348-2M

FCC ID: 2AW73-2E348

Prepared For:	**Shenzhen Xiangdangwen Technology Co.,Ltd.** **106, 1/F, No.313-4 Building, Huachang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China**
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:	**Jun. 17, 2024 ~ Jun. 25, 2024**
Date of Report:	**Jun. 25, 2024**
Report Number:	**HK2406173141-1E**

Test Result Certification

Applicant's Name	:	Shenzhen Xiangdangwen Technology Co.,Ltd.
Address	:	106, 1/F, No.313-4 Building, Huachang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China
Manufacturer's Name	:	Huizhou Yimai Electronics Technology Co., Ltd.
Address	:	3rd Floor, Building B, Huakai High-tech Industrial Park, Electronic City Road, Longxi Street, Boluo Country, China

Product Description

Trade Mark	:	LISEN, AINOPE, VEICO
Product Name	:	C TO C/L/Watch 3-in-1 data cable
Model and/or Type Reference:		2E348, 2E348-0.5M, 2E348-1M, 2E348-1.5M, 2E348-1.8M, 2E348-2M
Standards	:	FCC CFR 47 PART 18

Date of Test	:	
Date (s) of Performance of Tests	:	**Jun. 17, 2024 ~ Jun. 25, 2024**
Date of Issue	:	**Jun. 25, 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	Jun. 25, 2024	Jason Zhou

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 CN1229.
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

2. General Information

2.1. General Description of EUT

Equipment:	C TO C/L/Watch 3-in-1 data cable
Model Name:	2E348
Series Models:	2E348-0.5M, 2E348-1M, 2E348-1.5M, 2E348-1.8M, 2E348-2M
Model Difference:	All model's the function, software and electric circuit are the same, only with product model named different. Test sample model: 2E348.
Trade Mark:	LISEN, AINOPE, VEICO
FCC ID:	2AW73-2E348
Antenna Type:	Coil Antenna
Antenna Gain:	0dBi
Operation Frequency:	329KHz
Test Frequency:	329KHz
Number of Channels:	1
Modulation Type:	ASK
Power Source:	Input: DC20V/3A Type-C Output: DC20V/3A 60W MAX Lightning Output: DC9V/3A 27W MAX Watch Output: DC5V/0.5A 2.5W MAX C+L+Watch Output: DC5V/3.5A MAX
Power Rating:	Input: DC20V/3A Type-C Output: DC20V/3A 60W MAX Lightning Output: DC9V/3A 27W MAX Watch Output: DC5V/0.5A 2.5W MAX C+L+Watch Output: DC5V/3.5A MAX
Note: 1. Antenna gain Refer to the antenna specifications. 2. The cable loss data is obtained from the supplier. 3. The test results in the report only apply to the tested sample.	

2.2. Carrier Frequency of Channels

Operation Frequency each of channel	
Channel	Frequency
Middle CH	329KHz

2.3. Operation of EUT during Testing

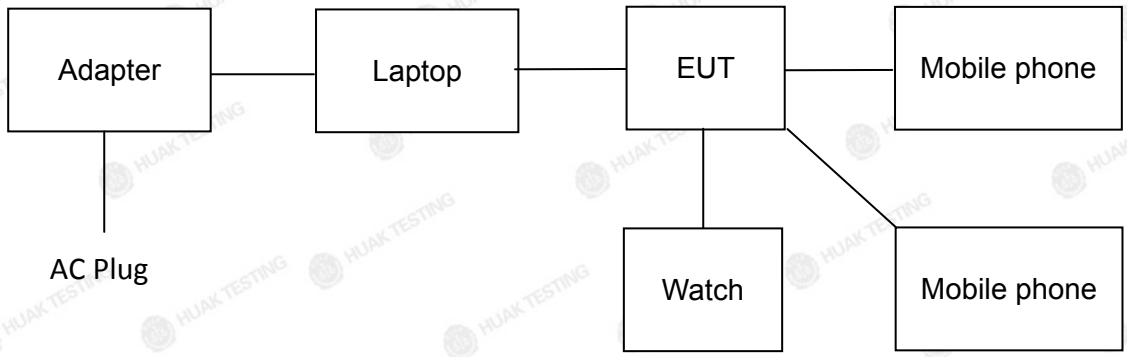
Test Item	Test mode	Description
Radiated & Conducted Test Cases	Mode 1	AC/DC Adapter+ EUT + Watch (Battery Status: <1%)
	Mode 2	AC/DC Adapter+ EUT + Watch (Battery Status: <50%)
	Mode 3	AC/DC Adapter+ EUT + Watch (Battery Status: >95%)

Note:

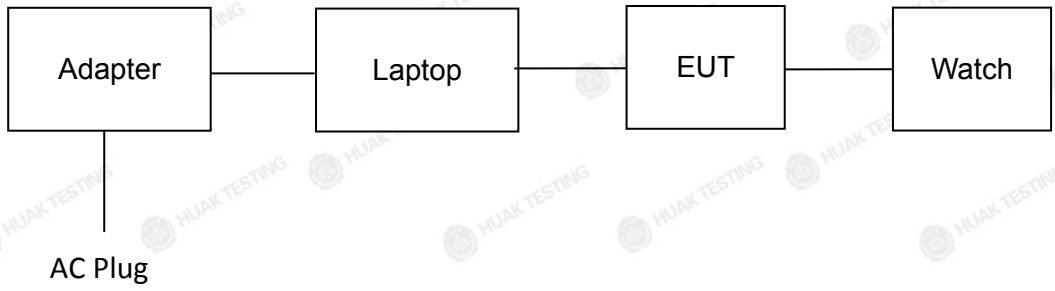
1. All modes and configurations above have been tested, Only the result of the worst case was recorded in the report, the worst-case configuration is Mode 1.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. The Watch provided by Lab.
4. According to the manufacturer's design principle, the wireless charging power will reach its maximum when the client device's battery level is between 1% and 10%.

2.4. Description of Test Setup

Operation of EUT during conducted testing and below 1GHz radiation testing:



Operation of EUT during below 30MHz radiation 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.

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	Note
1	C TO C/L/Watch 3-in-1 data cable	LISEN, AINOPE, VEICO	2E348	N/A	EUT
2	Laptop	Lenovo	TP00096A	Input: DC20V, 2.25~3.25A Output: DC5V, 0.5A	Peripheral
3	Adapter	Lenovo	ADLX65YCC3A	Input: AC100-240V, 1.8A, 50-60Hz Output: DC20V/3.25A, DC15V/3A, DC12V/3A, DC9V/2A, DC5V/2A	Peripheral
4	Mobile phone	Apple	iPhone 13	N/A	Peripheral
5	Mobile phone	Redmi	K60	N/A	Peripheral
6	Watch	Apple	Ultra	N/A	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.

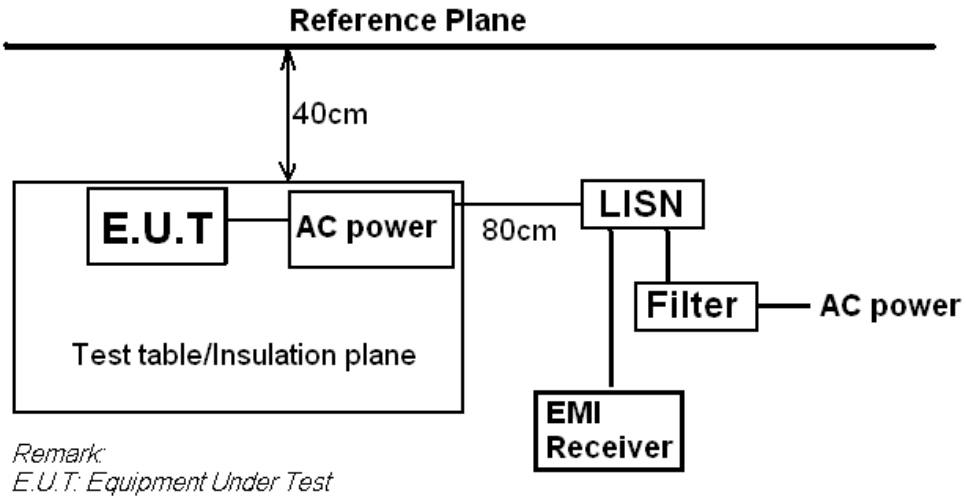
3. Wireless load (Load 1) is a device containing rechargeable batteries or capacity loads, connected via charging control circuit that receives power from a source via a coupling antenna.

2.6. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N.	R&S	ENV216	HKE-002	Feb. 20, 2024	1 Year
2.	L.I.S.N.	R&S	ENV216	HKE-059	Feb. 20, 2024	1 Year
3.	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 20, 2024	1 Year
4.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 20, 2024	1 Year
6.	Preamplifier	EMCI	EMC051845 S	HKE-006	Feb. 20, 2024	1 Year
7.	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 20, 2024	1 Year
8.	Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 20, 2024	1 Year
9.	6dB Attenuator	Pasternack	6db	HKE-184	Feb. 20, 2024	1 Year
10.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	1 Year
11.	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	2 Year
12.	Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	2 Year
13.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
14.	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15.	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/

3. Conducted Emission Test

3.1. Block Diagram of Test Setup



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

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

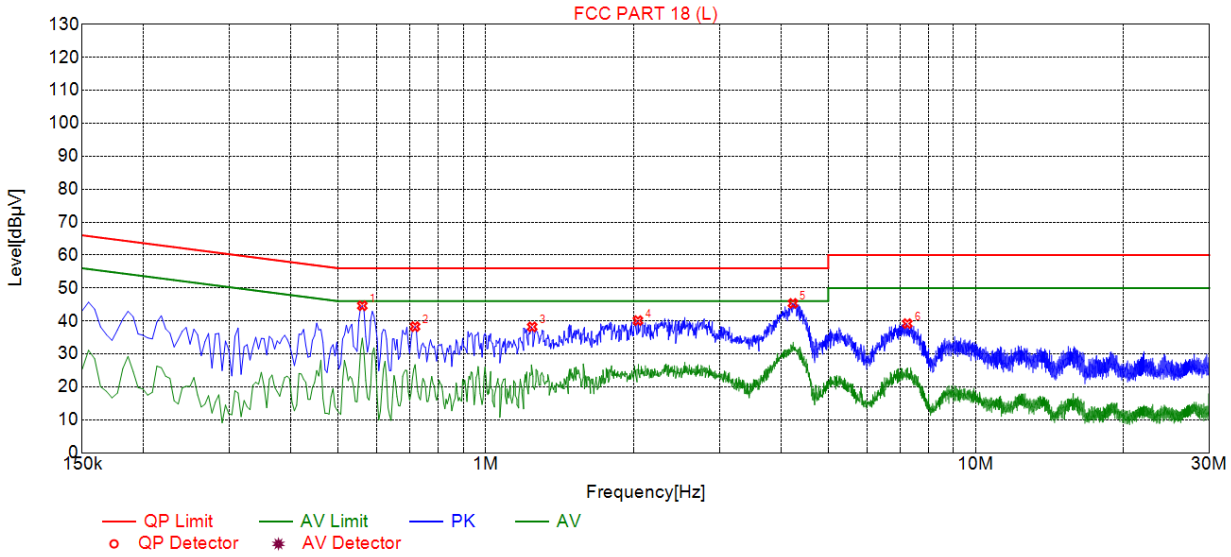
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI 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.

3.4. Test Result

PASS

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

Test Specification: Line



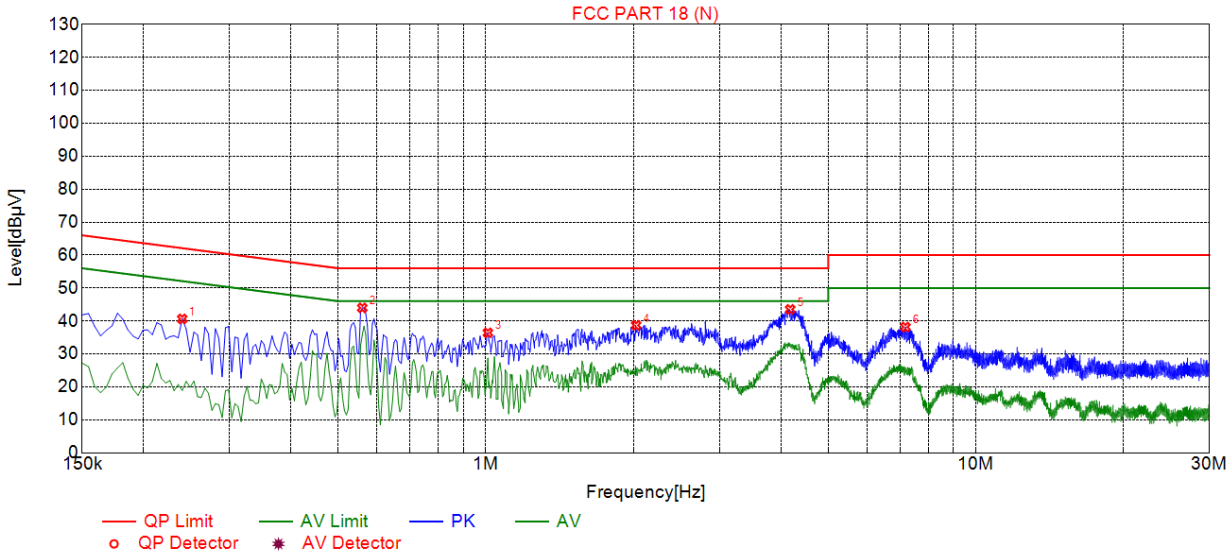
Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.5595	44.62	19.86	56.00	11.38	24.76	PK	L
2	0.7170	38.28	19.86	56.00	17.72	18.42	PK	L
3	1.2435	38.21	19.90	56.00	17.79	18.31	PK	L
4	2.0445	40.12	19.97	56.00	15.88	20.15	PK	L
5	4.2360	45.35	20.09	56.00	10.65	25.26	PK	L
6	7.2510	39.21	20.06	60.00	20.79	19.15	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

Test Specification: Neutral



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2400	40.63	19.73	62.10	21.47	20.90	PK	N
2	0.5595	43.98	19.75	56.00	12.02	24.23	PK	N
3	1.0095	36.41	19.74	56.00	19.59	16.67	PK	N
4	2.0265	38.69	19.84	56.00	17.31	18.85	PK	N
5	4.1820	43.52	19.98	56.00	12.48	23.54	PK	N
6	7.1880	38.16	19.96	60.00	21.84	18.20	PK	N

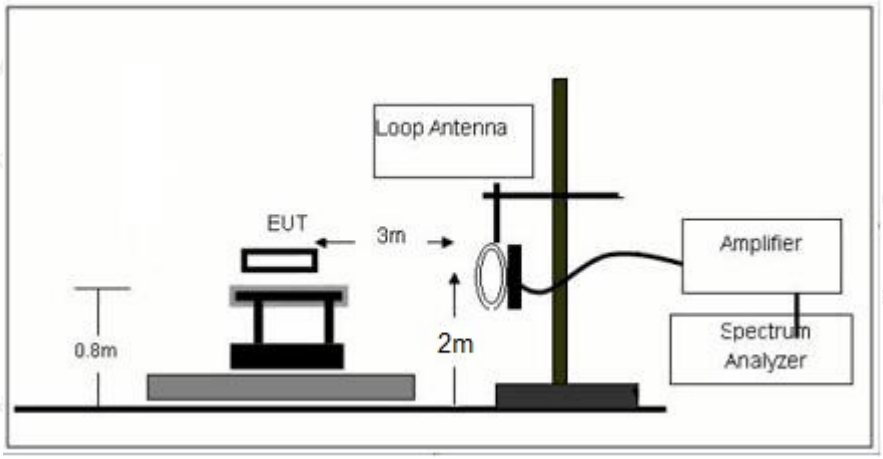
Remark: Margin = Limit – Level

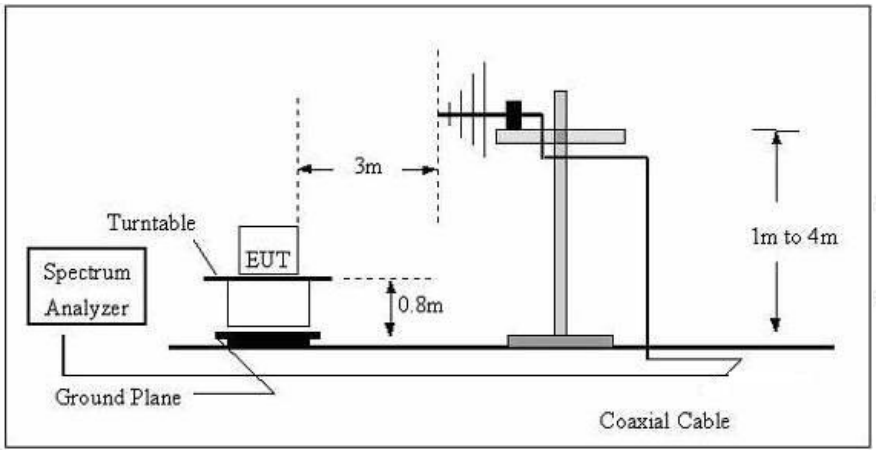
Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

4. Radiated Emissions

4.1. Block Diagram of Test Setup





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

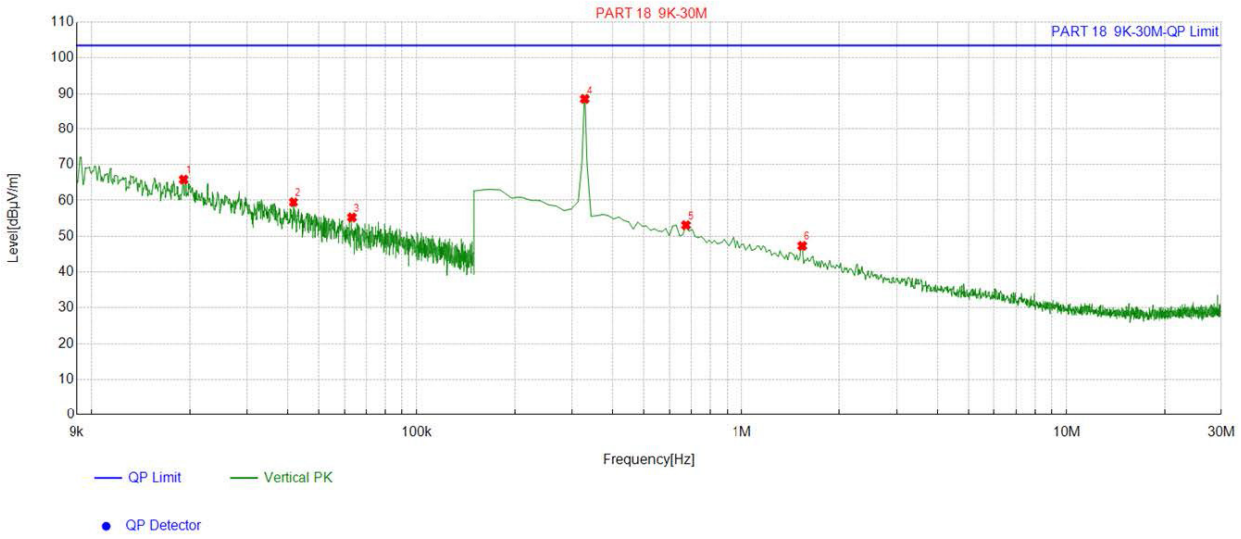
Measurement distance 3m
For the measurement range up to 30MHz in the following plots the field strength result from 3m
Distance measurements are extrapolated to 300m and 30m distance respectively, by 40dB/decade, Per antenna factor scaling.
Measurements below 1000MHz are performed with a peak detector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

4.4. Test Result

PASS

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

For 9KHz - 30MHz



Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
1	0.019157	20.32	45.49	65.81	103.50	37.69
2	0.041728	20.52	38.98	59.50	103.50	44.00
3	0.063242	20.45	34.80	55.25	103.50	48.25
4	0.32919	20.06	68.69	88.75	103.50	14.75
5	0.672636	20.25	32.83	53.08	103.50	50.42
6	1.538719	20.50	26.81	47.31	103.50	56.19

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

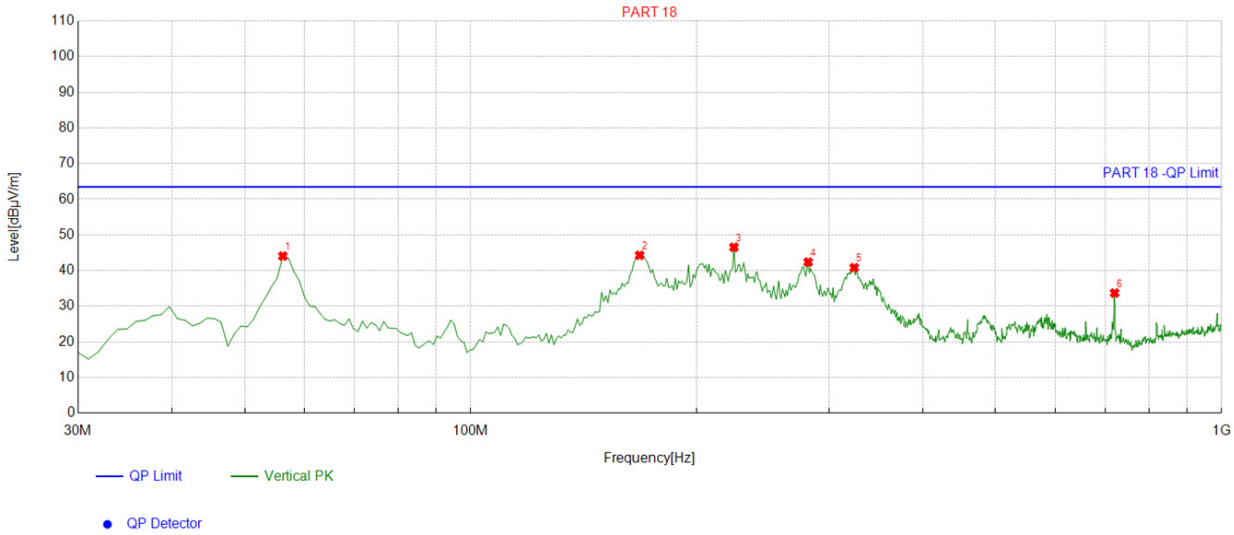
For 30MHz-1GHz

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	57.187187	-13.76	56.53	42.77	63.50	20.73	100	197	Horizontal
2	169.81982	-17.13	65.92	48.79	63.50	14.71	100	80	Horizontal
3	200.89089	-15.16	69.71	54.55	63.50	8.95	100	125	Horizontal
4	238.75875	-13.74	68.16	54.42	63.50	9.08	100	116	Horizontal
5	279.53954	-12.64	64.92	52.28	63.50	11.22	100	225	Horizontal
6	327.11711	-10.96	61.35	50.39	63.50	13.11	100	144	Horizontal

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

Antenna polarity: V



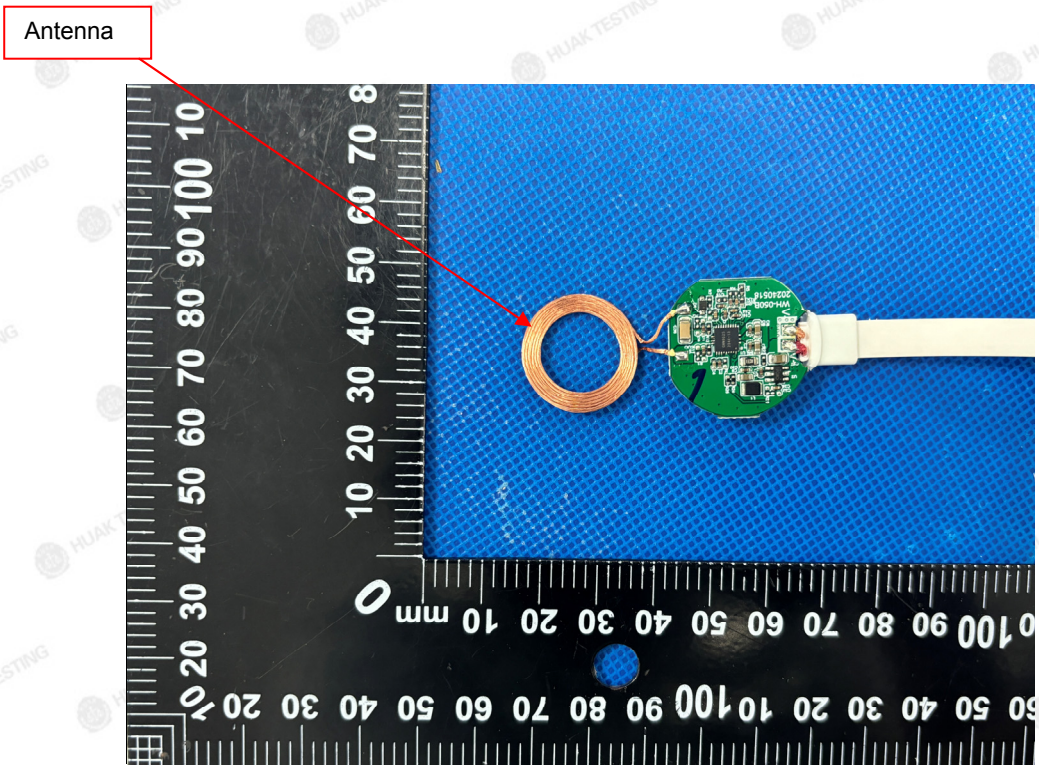
Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	56.216216	-13.94	58.00	44.06	63.50	19.44	100	268	Vertical
2	167.87787	-17.31	61.60	44.29	63.50	19.21	100	143	Vertical
3	224.19419	-14.01	60.55	46.54	63.50	16.96	100	185	Vertical
4	281.48148	-12.59	54.96	42.37	63.50	21.13	100	276	Vertical
5	324.20420	-11.03	51.84	40.81	63.50	22.69	100	96	Vertical
6	720.36036	-4.25	37.96	33.71	63.50	29.79	100	140	Vertical

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

5. Antenna Requirement

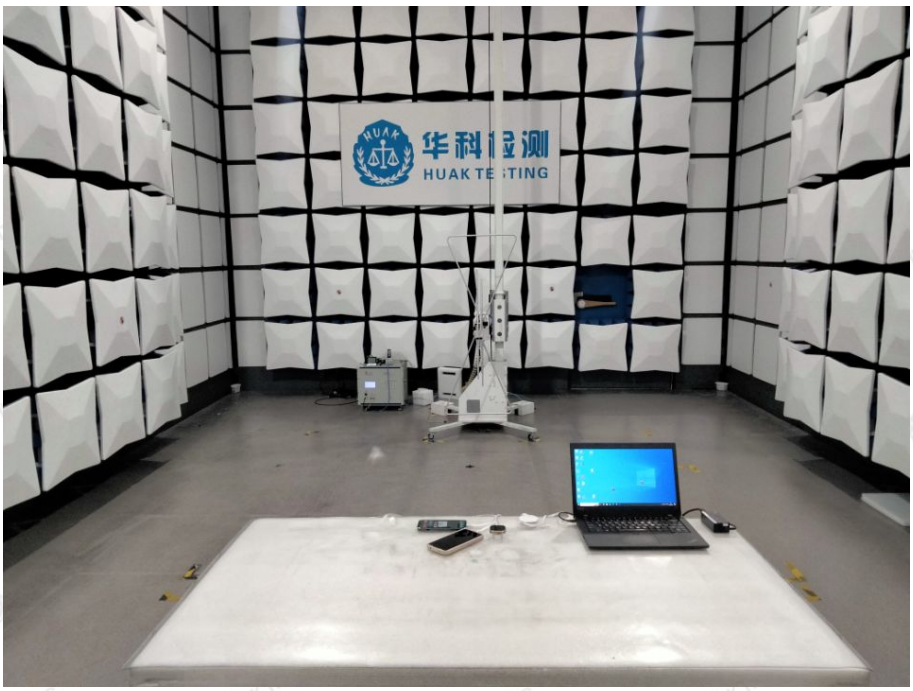
Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

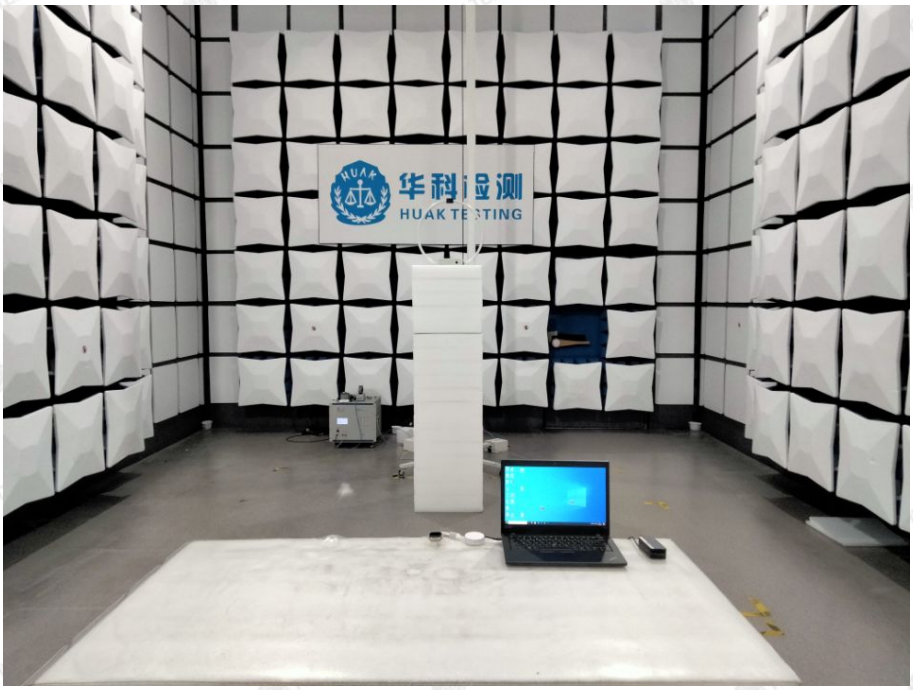
Antenna Connected Construction
The antenna used in this product is a Coil Antenna, which permanently attached. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 0dBi.



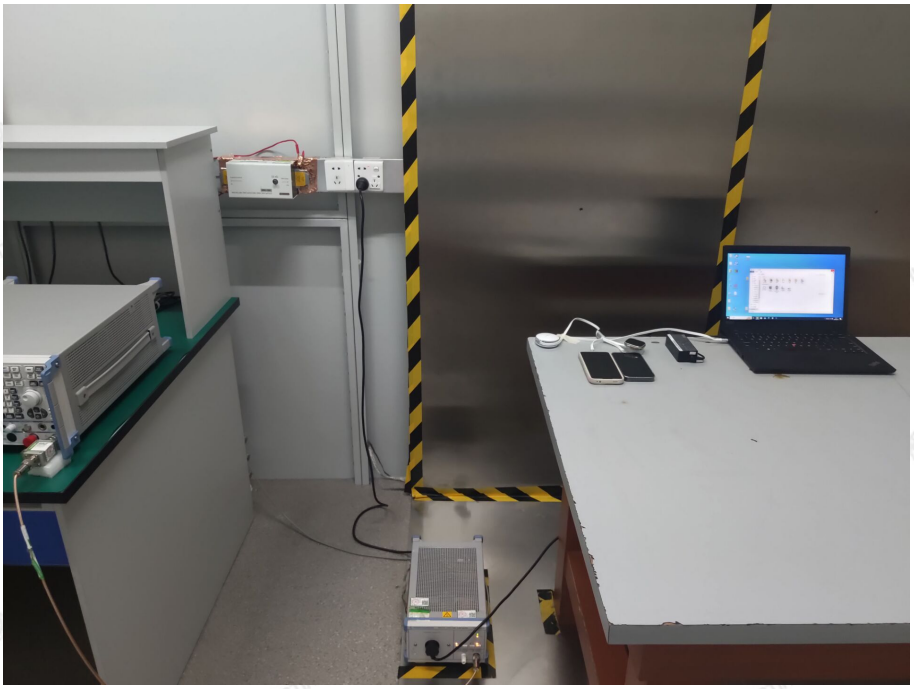
6. Photographs of Test

Radiated Emission





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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