



# RF Test Report

## For

**Applicant Name:** hunanjiepaichuangyichuanmeiyouxiangongsi  
**Address:** chuanggushequbeichenzhongyanggongyuan  
**EUT Name:** DFQu22dong1207shi changshashi hunan sheng 410000  
**Brand Name:** Car iWatch Charger  
**Model Number:** AFLYDOG  
**Series Model Number:** M1-B  
**M1-W**

## Issued By

**Company Name:** **BTF Testing Lab (Shenzhen) Co., Ltd.**  
**Address:** F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China  
  
**Report Number:** BTF230724R01001  
**Test Standards:** 47 CFR Part 15 Subpart C  
**FCC ID:** 2A4T7-M1-B  
**Test Conclusion:** Pass  
**Test Date:** 2023-07-17 to 2023-07-21  
**Date of Issue:** 2023-07-21

Prepared By:

Elma.yang / Project Engineer  
2023-07-21

Date:

Approved By:

Ryan.CJ / EMC Manager  
2023-07-21

Date:



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Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-07-21	Original
<i>Note:</i>	<i>Once the revision has been made, then previous versions reports are invalid.</i>	

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## 1. Introduction

### 1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

### 1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number:	518915
Designation Number:	CN1330

### 1.3 Laboratory Condition

Ambient Temperature:	20°C to 25°C
Ambient Relative Humidity:	45% to 55%
Ambient Pressure:	100 kPa to 102 kPa

### 1.4 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

## 2. Product Information

### 2.1 Application Information

Company Name:	hunanjiepaichuangyichuanmeiyouxiangongsi
Address:	chuanggushequbeichenzhongyanggongyuan DFqu22dong1207shi changshashi hunan sheng 410000

### 2.2 Manufacturer Information

Company Name:	hunanjiepaichuangyichuanmeiyouxiangongsi
Address:	chuanggushequbeichenzhongyanggongyuan DFqu22dong1207shi changshashi hunan sheng 410000

### 2.3 Factory Information

Company Name:	hunanjiepaichuangyichuanmeiyouxiangongsi
Address:	chuanggushequbeichenzhongyanggongyuan DFqu22dong1207shi changshashi hunan sheng 410000

### 2.4 General Description of Equipment under Test (EUT)

EUT Name	Car iWatch Charger
Under Test Model Name	M1-B
Series Model Name	M1-W
Description of Model name differentiation	Except for the model and appearance color, all models have the same circuit and module.
Power supply	Input: DC 5V/1A Wireless Output: 2.5W(Max)
Hardware Version	1.1
Software and Firmware Version	1.1
Operation Frequency	300kHz-350kHz
Modulation type	ASK
Antenna Type	Inductive loop coil Antenna
Antenna gain	0dBi

## 2.5 Test mode

Test Modes		
Mode 1	Wireless Output(iWatch)	Record

Note: All modes of the device have been evaluated and tested, and the report only reflects the data for the worst mode 1.

### 3. Summary of Test Results

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

#### 3.2 Summary of Test Result

No.	Description	FCC Part No.	Verdict	Remark
1	Antenna Requirements	15.203	Pass	--
2	20dB Occupied Bandwidth	2.1049	Pass	--
3	AC Power Line Conducted Emissions	15.207	Pass	--
4	Spurious Emissions	15.209	Pass	--

#### 3.3 Uncertainty of Test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 and TR100 028-1/-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	69 KHz
RF output power, conducted	0.87 dB
Power Spectral Density, conducted	0.69 dB
Unwanted Emissions, conducted	0.94 dB
All emissions, radiated(<1GHz)	4.12 dB
All emissions, radiated(>1GHz)	4.16 dB
Temperature	0.82 °C
Humidity	4.1 %

## 4. Test Configuration

### 4.1 Environment Condition

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	20°C to 25°C	DC 3.7V from battery	30% to 60%	100 kPa to 102 kPa

### 4.2 Test Equipment List

Conducted Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
WIDEBAND RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094854	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2022.11.25	2023.11.24	<input checked="" type="checkbox"/>
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
RF Control Unit	TST	TST-Full	S01	/	/	<input checked="" type="checkbox"/>
RF Test software	TST	V2.0	/	/	/	<input checked="" type="checkbox"/>

Radiated Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2021.11.28	2023.11.27	<input checked="" type="checkbox"/>
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2021.11.28	2023.11.27	<input checked="" type="checkbox"/>
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/	<input checked="" type="checkbox"/>
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>

Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023.3.24	2024.3.23	<input checked="" type="checkbox"/>
RE Cable	Talent Microwave	A40-2.92M2.92 M-14M	22080539	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
RE Cable	Talent Microwave	A81-SMAMNM- 14M	22080538	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Preamplifier	SCHWARZBECK	BBV9744	00246	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2022.5.22	2024.5.21	<input checked="" type="checkbox"/>
Broadband Preamplifier	Schwarzbeck	BBV9718D	00008	2023.3.24	2024.3.23	<input checked="" type="checkbox"/>
Active loop Antenna	Schwarzbeck	FMZB 1519B	1519B- 245	2022.7.24	2024.7.23	<input checked="" type="checkbox"/>

#### Conducted disturbance Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
V-LISN	SCHWARZBECK	NSLK 8127	01073	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
LISN	AFJ	LS16/110VAC	16010020076	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Coaxial Switcher	SCHWARZBECK	CX210	CX210	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	2022.11.24	2023.11.23	<input checked="" type="checkbox"/>
EZ_EMC	Frad	EMC-CON 3A1.1+	/	/	/	<input checked="" type="checkbox"/>

### 4.3 Test Auxiliary Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Apple Watch	Apple Inc.	/	/	Auxiliary
2	Adapter	HONOR	HN-200325CP0	/	Auxiliary

## 5. Test Items

### 5.1 Antenna Requirements

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna:	The antenna is Loop antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details

## 5.2 20dB Occupied Bandwidth

### 5.2.1 Limit

1. Set RBW = 300Hz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

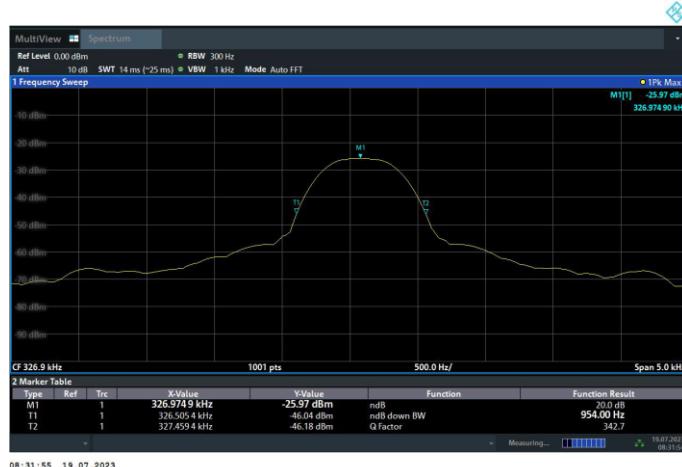
### 5.2.2 Test Setup



### 5.2.3 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa		

Frequency (kHz)	20dB bandwidth (Hz)	Result
326.975	954	Pass



## 5.3 AC Power Line Conducted Emissions

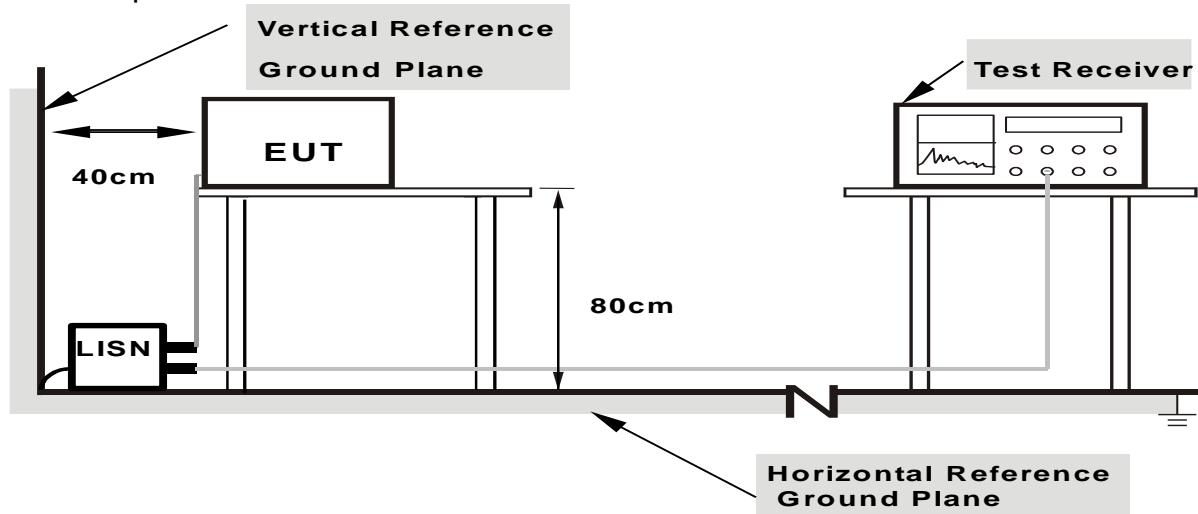
### 5.3.1 Limit

FCC §15.207

For an intentional radiator 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 within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

### 5.3.2 Test Setup



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

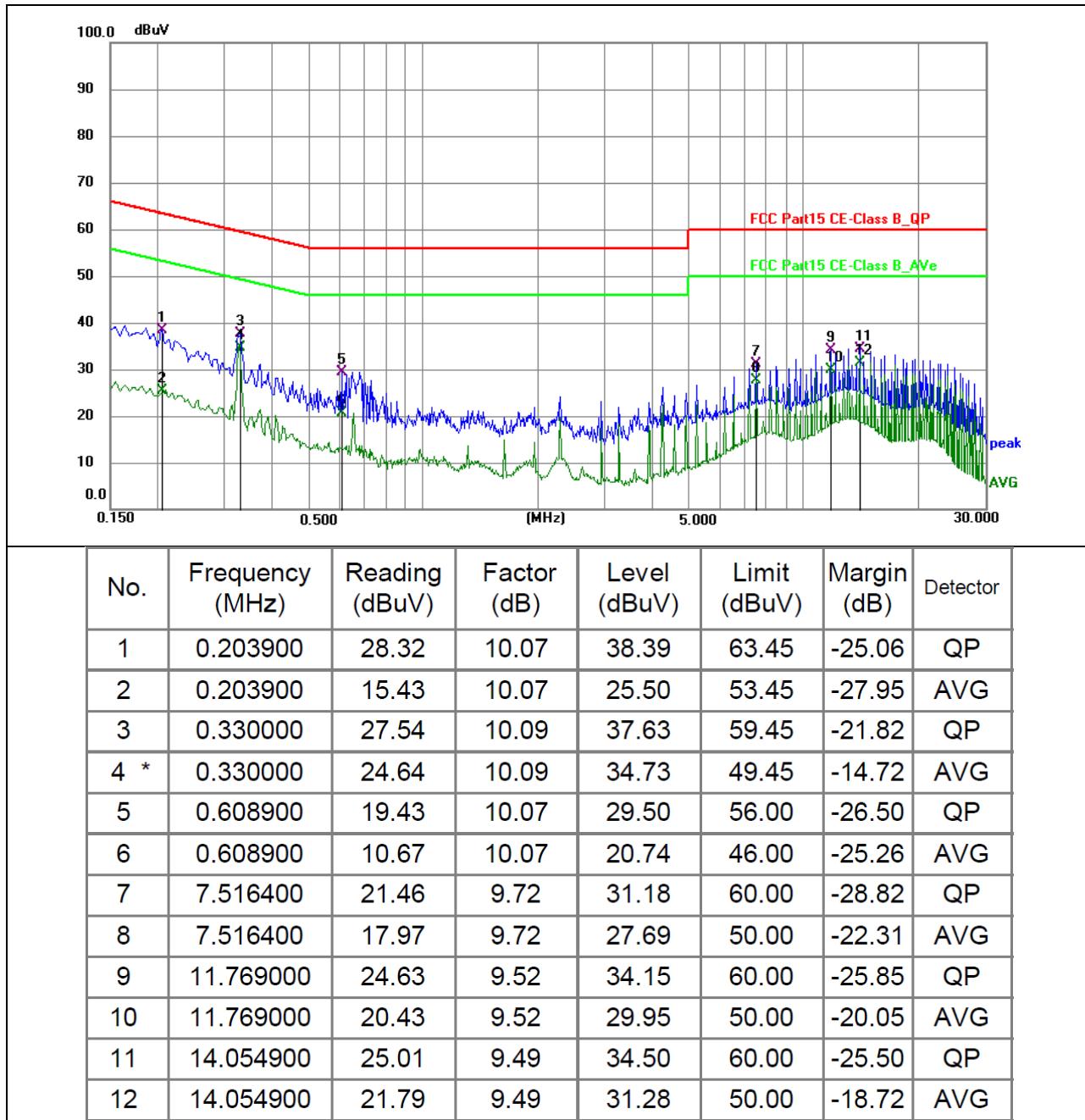
### 5.3.3 Test Procedure

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50 $\mu$ H of coupling impedance for the measuring instrument.

2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN at least 80 cm from nearest part of EUT chassis.
  - . For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 5.3.4 Test Result

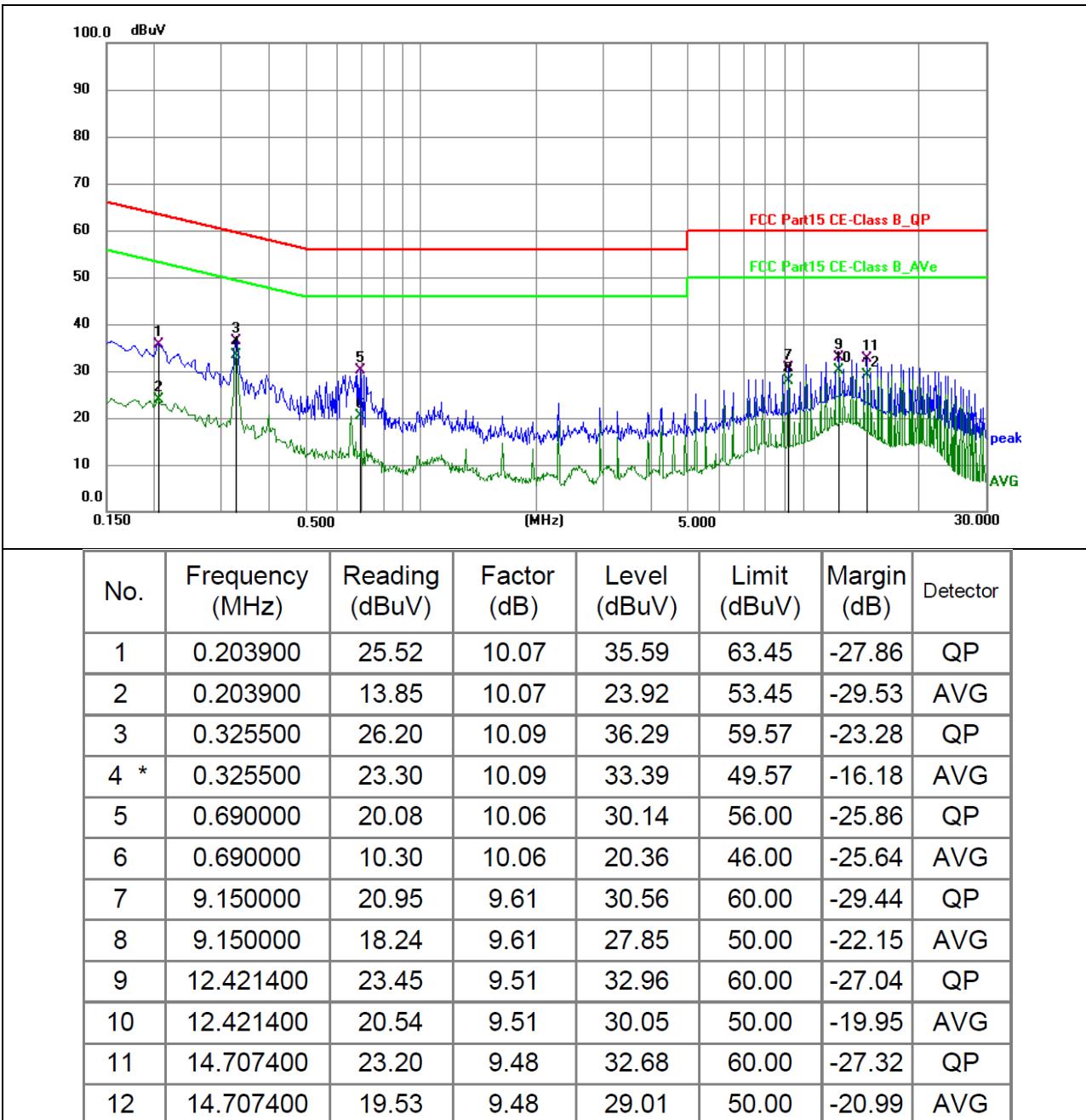
Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz		



Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz		


**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

## 5.4 Radiated Spurious Emission

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 1GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average

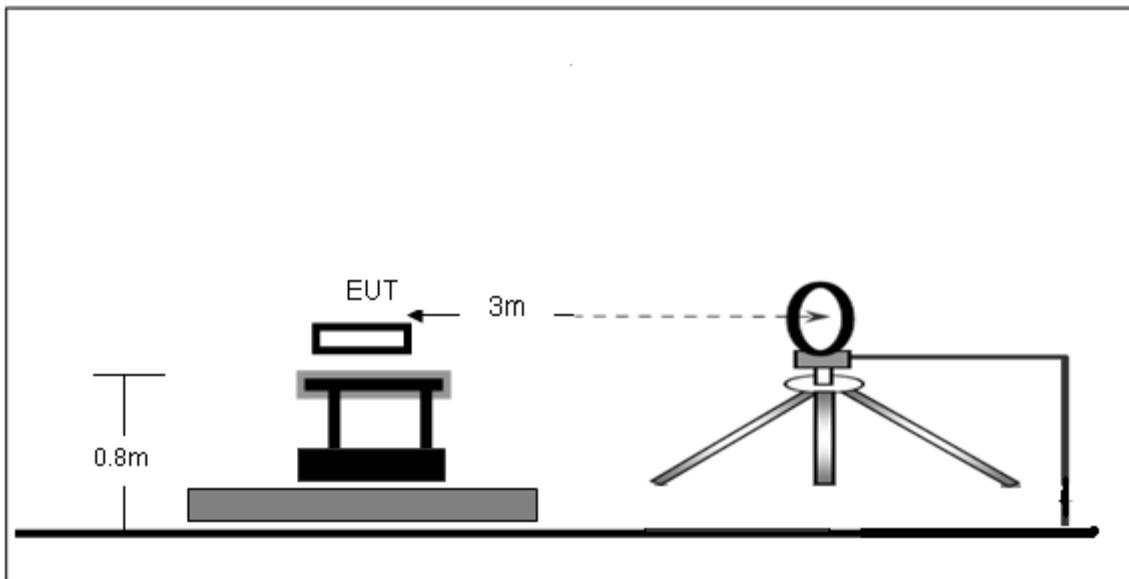
### 5.4.1 Radiated Emission Limits Limits for frequency below 30MHz

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

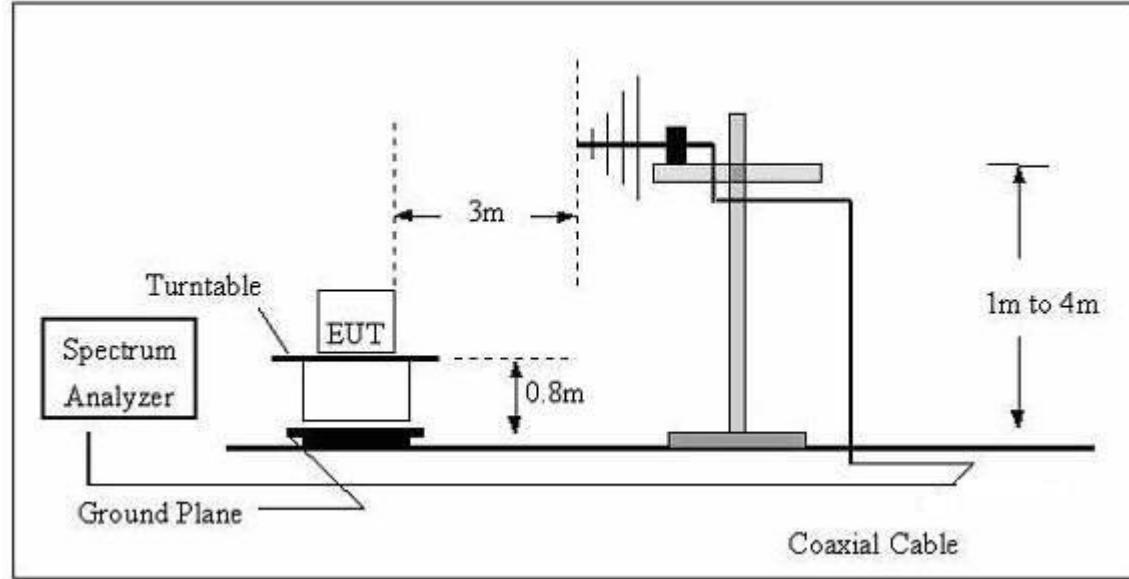
### Limits for frequency Above 30MHz

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

#### 5.4.2 Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the

maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

#### 5.4.3 Deviation From Test Standard

No deviation

#### 5.4.4 Test Result

9 kHz~30 MHz

Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
0.3272	36.05	19.29	55.34	94.31	-41.97	AV
0.3491	27.66	19.30	46.96	96.75	-49.79	AV
0.4714	32.95	19.33	52.28	94.14	-41.86	AV
0.5112	20.16	19.34	39.50	73.43	-33.93	QP
0.6363	23.01	19.35	42.36	71.54	-29.18	QP
0.6627	22.38	19.35	41.73	71.18	-29.45	QP

Note:

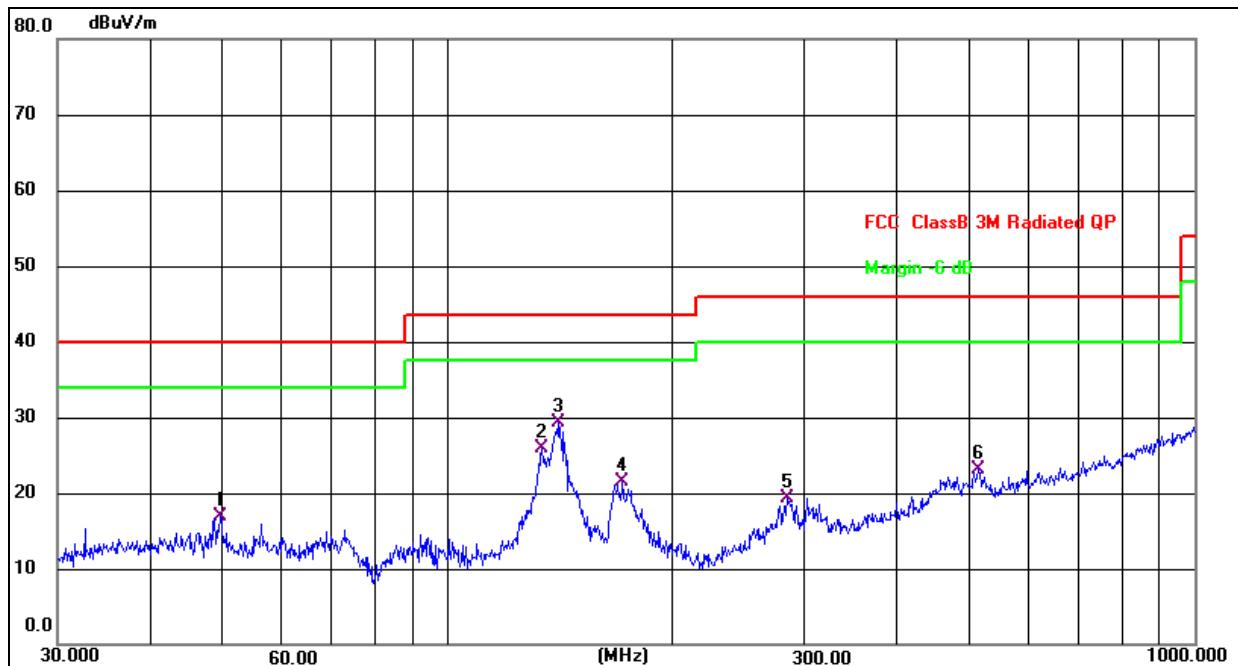
Pre-scan in the all of mode, the worst case in of was recorded.

Factor = antenna factor + cable loss – pre-amplifier.

Margin = Emission Level- Limit.

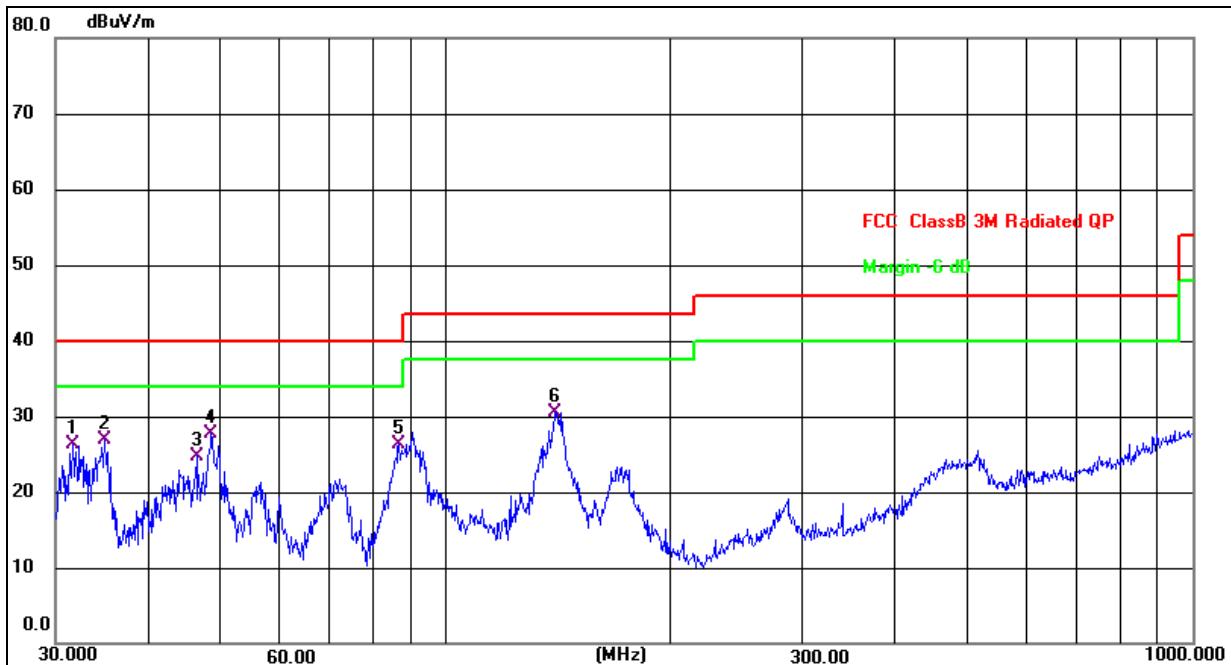
30MHz-1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	49.5328	31.28	-14.44	16.84	40.00	-23.16	QP
2	133.6188	40.71	-14.90	25.81	43.50	-17.69	QP
3 *	140.3421	43.47	-14.19	29.28	43.50	-14.22	QP
4	171.3926	36.09	-14.51	21.58	43.50	-21.92	QP
5	284.9767	32.71	-13.38	19.33	46.00	-26.67	QP
6	513.6331	30.14	-7.10	23.04	46.00	-22.96	QP

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.6201	41.71	-15.50	26.21	40.00	-13.79	QP
2	34.8822	41.91	-15.01	26.90	40.00	-13.10	QP
3	46.3402	38.96	-14.31	24.65	40.00	-15.35	QP
4 *	48.5015	42.13	-14.41	27.72	40.00	-12.28	QP
5	86.5027	45.35	-19.10	26.25	40.00	-13.75	QP
6	139.8508	44.67	-14.21	30.46	43.50	-13.04	QP

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 6. TEST SETUP PHOTO

Reference to the appendix I for details.

## 7. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.



BTF Testing Lab (Shenzhen) Co., Ltd.

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Bao'an District, Shenzhen, China

[www.btf-lab.com](http://www.btf-lab.com)

**--END OF REPORT--**