

TEST REPORT

Reference No. : WTK20S12093301W001
FCC ID : 2AYFD-W01
Applicant : ShenZhen Waikit Electronic Technology Co.,Ltd
Address : Room 109, 1/F, CuiHuMingYuan Business Center, No.366, North Xuegang Road, ShenZhen
Manufacturer : Shenzhen keyouwei Technology Co.,Ltd
Address : 1F/3F, BuildingA1, GuiGuDongLi Auto mobile Creative Industry Park, GuanLan Town, Long Hua District, ShenZhen, China.
Product : Magnetic Wireless Charger
Model(s) : W01, W02, W03, W04, W05, W06, W07, W08, W09, W10
Standards : FCC CFR47 Part 15C
Date of Receipt sample : 2020-12-04
Date of Test : 2020-12-07 to 2020-12-14
Date of Issue : 202-12-16
Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTK20S12093 301W001	2020-12-04	2020-12-07 to 2020-12-14	202-12-16	original	-	Valid

4 General Information

4.1 General Description of E.U.T

Product:	Magnetic Wireless Charger
Model(s):	W01, W02, W03, W04, W05, W06, W07, W08, W09, W10
Model Difference:	All these models are same in all respects, only the model names are different. The test sample model is W01.
Type of Modulation:	ASK
Frequency Range:	110-205kHz
Antenna installation:	Inductive loop coil Antenna
Hardware Version:	C85UC-V21E
Software Version:	RC20201025-153
Input:	DC 5V2A, 9V2A, 12V/1.25A

4.2 Details of accessories

Ratings:	Adapter: Input: 100-240V ~ 50/60Hz, 1.8A Output: 5V==2A / 9V==2A / 12V==2A / 20V == 3.25A
Adapter:	Model: HW-200325CP0

4.3 Test Mode

Test Mode	Descriptions
Standby mode	EUT alone powered by AC/DC adapter
Charging mode	Loading of 5 W
	Loading of 10 W
	Loading of 15 W

Note :

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

4.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with

the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the

FCC is maintained in our files. Registration number 523476, September 10, 2019.

5 Test Summary

Test Items	Test Requirement	Result
Conducted Emission	47CFR part 15 § 15.207	PASS
Radiated Emission	47CFR part 15 § 15.209	PASS
20dB Bandwidth	47CFR part 15 § 15.215	PASS
Antenna Requirement	47CFR part 15 § 15.203	PASS
RF Exposure	FCC CFR 47 part1 § 1.1310 KDB 680106 D01 v03	PASS

Note: Pass=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable

Note: -

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Valid
1.	EMI Test Receiver	R&S	ESCI	100947	2020-07-30	1Year
2.	LISN	R&S	ENV216	100115	2020-07-30	1Year
3.	Cable	Top	TYPE16(3.5M)	-	2020-07-30	1Year
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Valid
1.	EMI Test Receiver	R&S	ESCI	101155	2020-07-30	1Year
2.	LISN	SCHWARZBECK	NSLK 8128	8128-259	2020-07-30	1Year
3.	Limiter	CYBERTEK	EM5010	261115-001-0024	2020-07-30	1Year
4.	Cable	Laplace	RF300	-	2020-07-30	1Year
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Valid
1	Test Receiver	R&S	ESCI	101296	2020-04-20	1Year
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020-04-25	1Year
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2020-05-06	1Year
4	Amplifier	ANRITSU	MH648A	M43381	2020-04-20	1Year
5	Cable	HUBER+SUHNER	CBL2	525178	2020-04-20	1Year
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Valid
1	Spectrum Analyzer	R&S	FSP30	100091	2020-04-20	1Year
2	Amplifier	Agilent	8447D	2944A10178	2020-08-26	1Year
4	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2020-08-22	1Year
5	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2020-04-20	1Year
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Valid
1.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2020-04-20	1Year
2	Spectrum Analyzer	R&S	FSP40	100501	2020-07-30	1Year

6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Simulated load	/	/	/
Adapter	HUAWEI	HW-200325CP0	N/A

6.3 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz) ± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	$\pm 1 \times 10^{-7}$ Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7 dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval: 95%. Confidence factor: k=2	

6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P. R. China.

7 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity:

Limit:

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

7.1 EUT Operation

Operating Environment :

Temperature: 24.6 °C

Humidity: 45.8 % RH

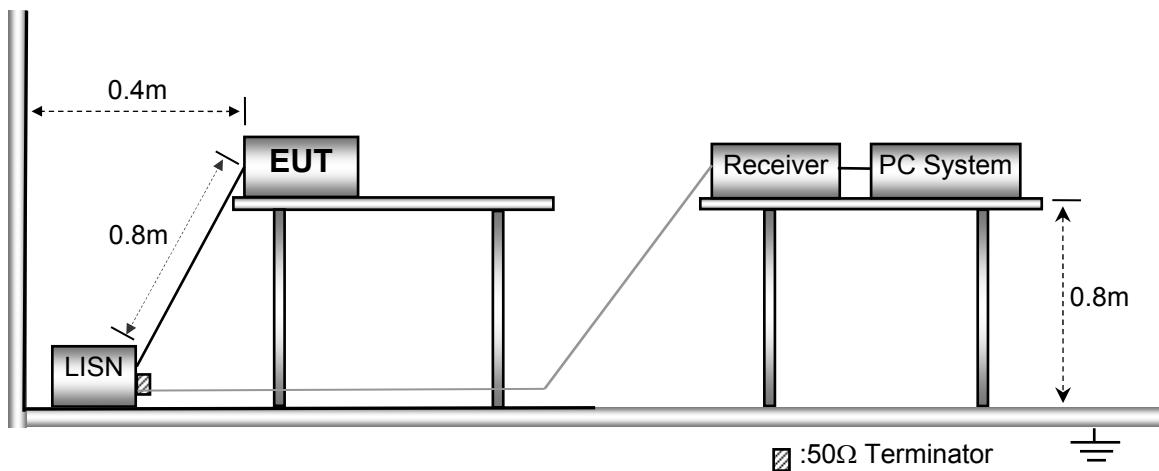
Atmospheric Pressure: 101.2kPa

EUT Operation : Charging mode: Loading of 15 W

Only the worst case transmitting mode were record in the report.

7.2 EUT Setup

The EUT was placed on the test table in shielding room.

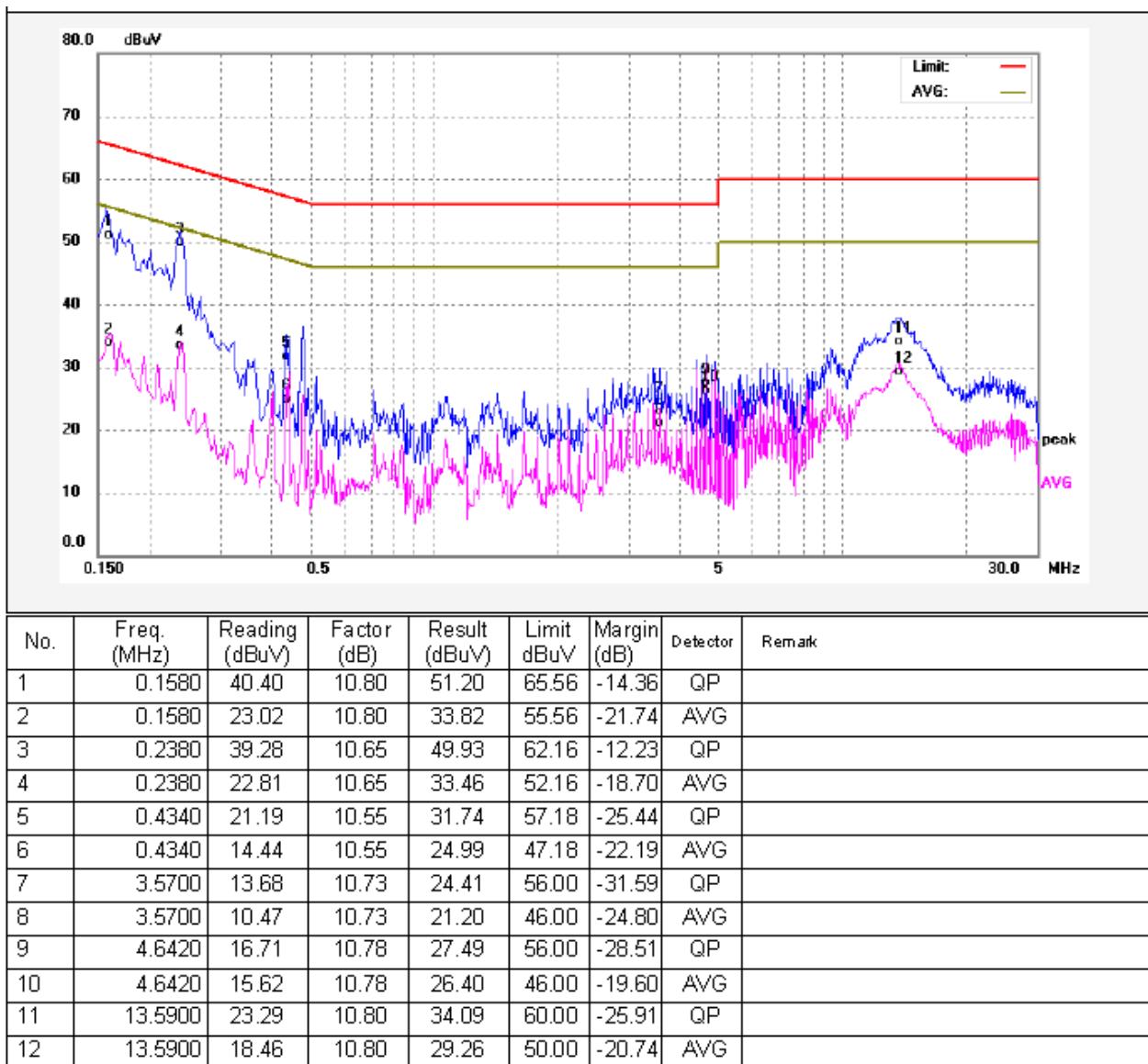


7.3 Measurement Description

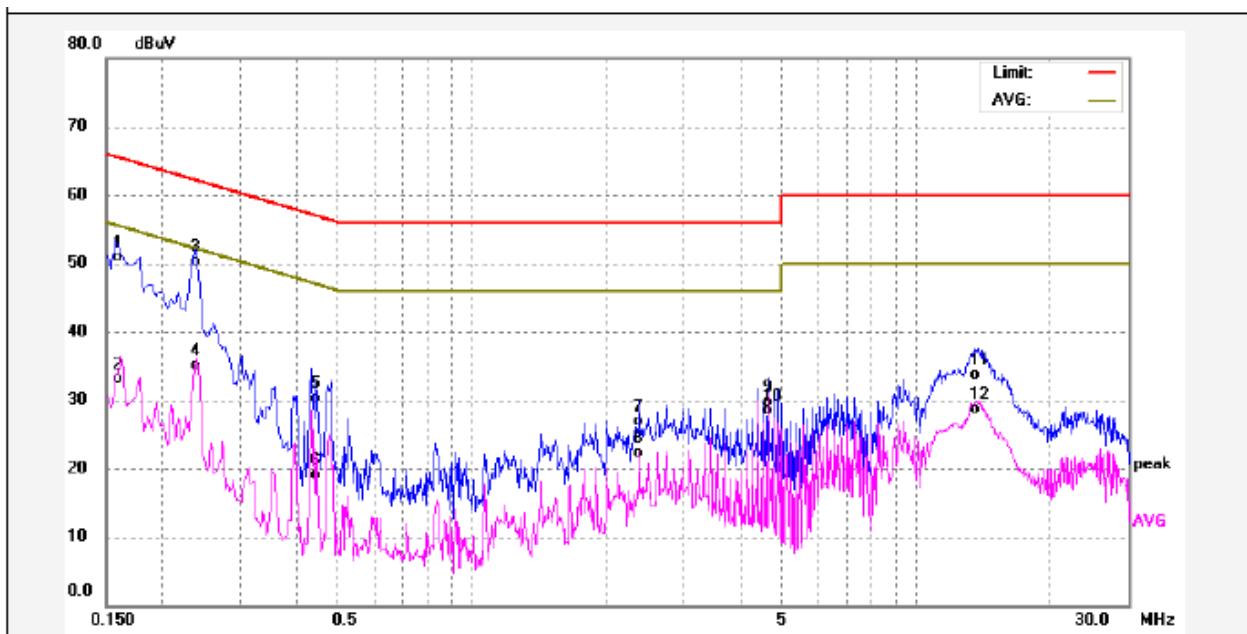
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

Live line:



Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	40.01	10.80	50.81	65.56	-14.75	QP	
2	0.1580	22.35	10.80	33.15	55.56	-22.41	AVG	
3	0.2380	39.60	10.65	50.25	62.16	-11.91	QP	
4	0.2380	24.52	10.65	35.17	52.16	-16.99	AVG	
5	0.4460	19.69	10.55	30.24	56.95	-26.71	QP	
6	0.4460	8.52	10.55	19.07	46.95	-27.88	AVG	
7	2.3780	16.17	10.64	26.81	56.00	-29.19	QP	
8	2.3780	11.67	10.64	22.31	46.00	-23.69	AVG	
9	4.6380	18.89	10.78	29.67	56.00	-26.33	QP	
10	4.6380	17.79	10.78	28.57	46.00	-17.43	AVG	
11	13.6140	22.81	10.80	33.61	60.00	-26.39	QP	
12	13.6140	18.00	10.80	28.80	50.00	-21.20	AVG	

8 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	μV/m	Distance (m)	μV/m	dBμV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	20log ^{(2400/F(kHz))} + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log ^{(24000/F(kHz))} + 40
1.705 ~ 30	30	30	100 * 30	20log ⁽³⁰⁾ + 40
30 ~ 88	100**	3	100	20log ⁽¹⁰⁰⁾
88 ~ 216	150**	3	150	20log ⁽¹⁵⁰⁾
216 ~ 960	200**	3	200	20log ⁽²⁰⁰⁾
Above 960	500	3	500	20log ⁽⁵⁰⁰⁾

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

In the emission table above, the tighter limit applies at the band edges.

Note:

According to § 15.209(d), the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

According to § 15.31(f)(2):

3m Measurement level (dBμV/m)= 300m Measurement level (dBμV/m) + 40log(300/3) (dBμV/m).

8.1 EUT Operation

Operating Environment :

Temperature: 26 °C

Humidity: 54 % RH

Atmospheric Pressure: 101.2kPa

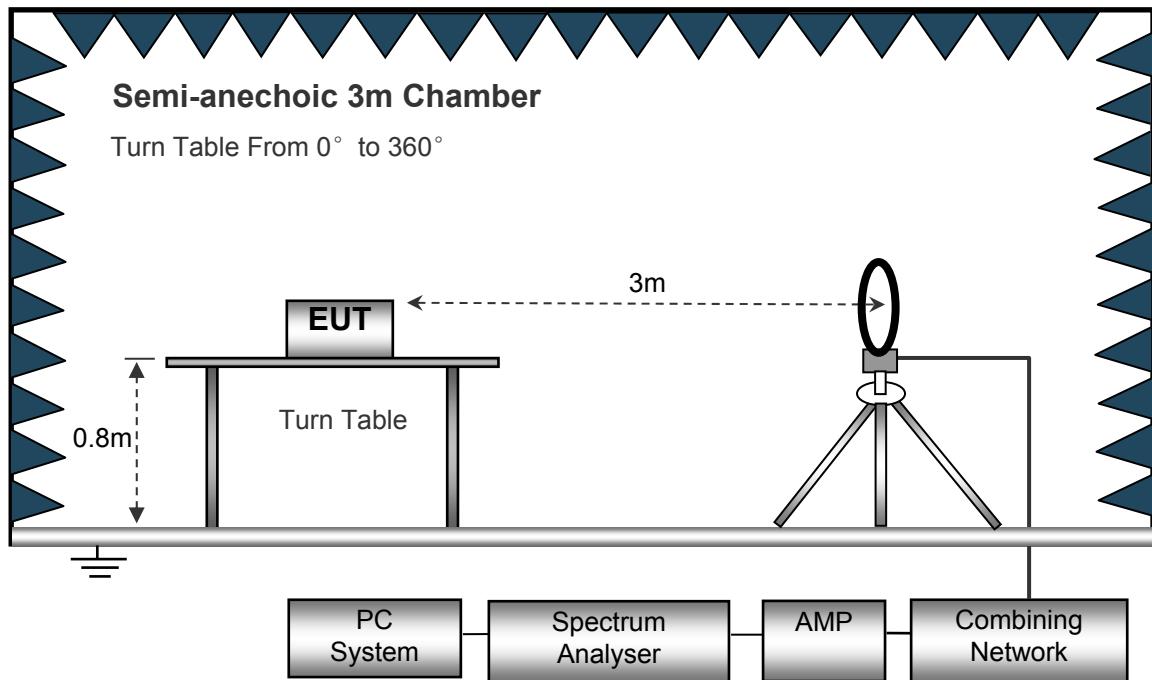
EUT Operation : Charging mode: Loading of 10 W

Only the worst case transmitting mode were record in the report.

8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI 63.10:2013.

The test setup for emission measurement below 30MHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed	Auto
IF Bandwidth.....	10kHz
Video Bandwidth.....	10kHz
Resolution Bandwidth.....	10kHz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane, EUT is set 3m away from the receiving antenna(Height of the centre of the loop above the GRP of the SAC is 1 m).
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both vertical coaxial and vertical coplanar.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.

Note:

Although these test were performed other than open area test site, adequate comparison measurements were confirmed against 300m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

8.6 Summary of Test Results

Field Strength of Fundamental Test Result

Frequency (MHz)	Measurement results dB μ V @3m	Polarity 0° /90°	Detector QP/Ave	Correct factor dB/m	Measurement results (calculated) dB μ V/m @3m	Limits dB μ V/m @3m	Margin dB
0.118	70.02	0°	Ave	15.38	65.4	81.3	15.9
-	-	-	-	-	-	-	-

Harmonics and Spurious emission test result

Test Frequency: 9KHz ~ 30MHz

Frequency (MHz)	Measurement results dB μ V @3m	Polarity 0° /90°	Detector QP/Ave	Correct factor dB/m	Measurement results (calculated) dB μ V/m @3m	Limits dB μ V/m @3m	Margin dB
0.235	60.58	0°	Ave	14.87	55.5	81	25.5

Note: 1. Correct factor = Cable loss + Antenna factor - Amplifier Gain

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

9 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215

Test Method: ANSI C63.10:2013

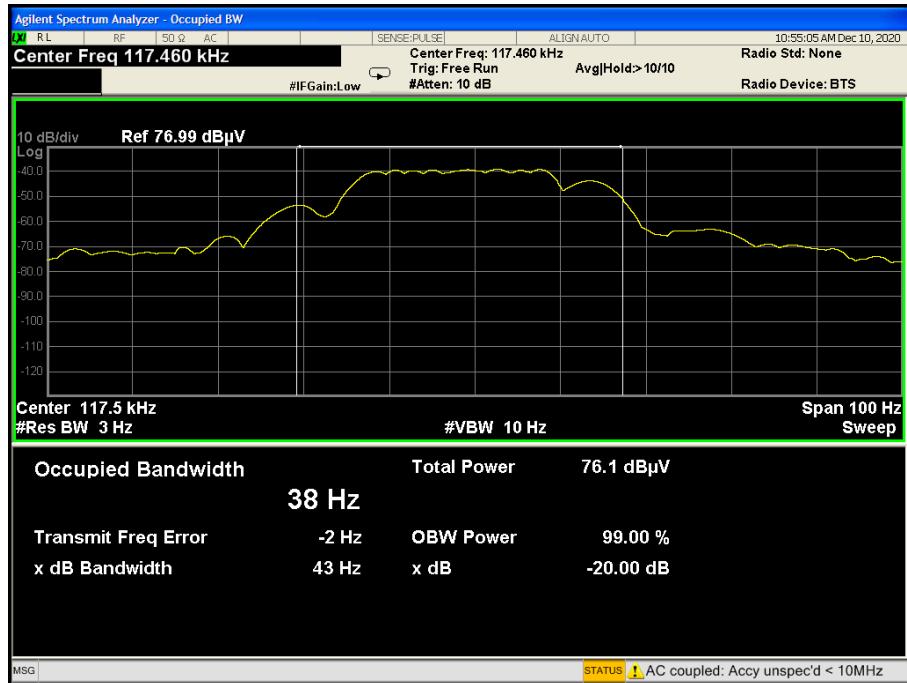
9.1 Test Procedure

- 1 The transmitter shall be operated at its maximum carrier power measured under normal test conditions;
2. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) , video bandwidth (VBW) is set to approximately 3 times of the RBW.
4. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

9.2 Test Result Plot:

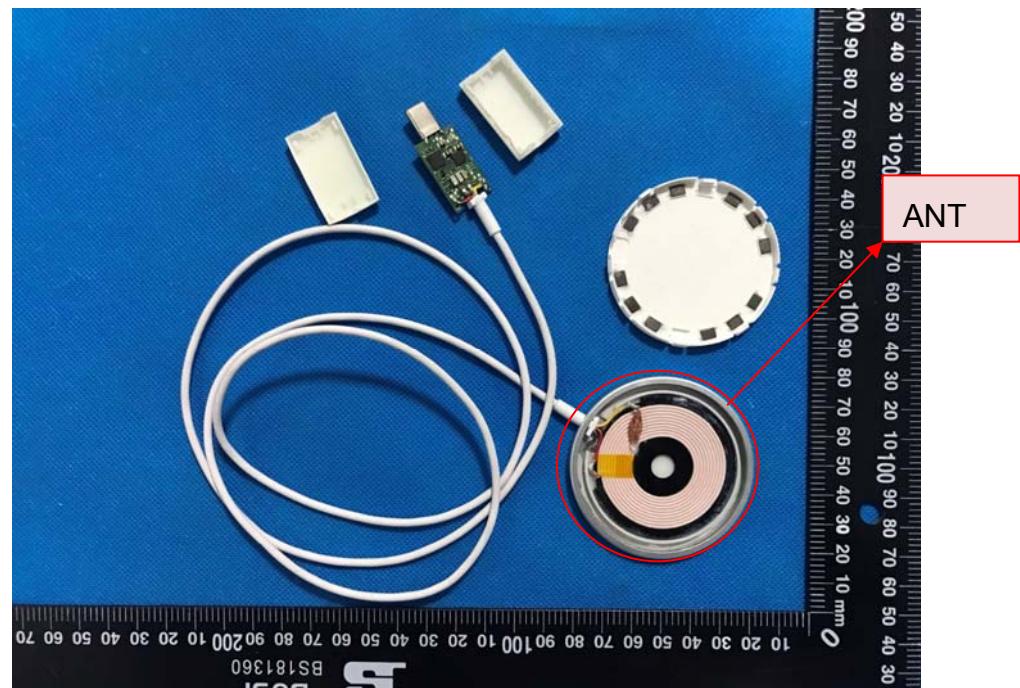
Test Channel(kHz)	99% Bandwidth(kHz)	20dB Bandwidth Emission(KHz)
117.5	0.038	0.043

Test result plot as follows:



10 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, 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 to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a Inductive loop coil Antenna antenna, fulfill the requirement of this section.



11 RF Exposure

Note: Please refer to RF Exposure test report: WTK20S12093301W002.

12 Photographs of test setup and EUT

Note:

Please refer to appendix: Appendix-W01 Test Setup Photos, Appendix-W01 External Photos, Appendix-W01 Internal Photos.

===== End of Report =====