

# FCC REPORT

**Applicant:** Shenzhen Benarlee Technology Co., Ltd

**Address of Applicant:** Third floor, Building B1, Nanshan Zhiyuan, Taoyuan Street, Nanshan District, ShenZhen, China

## Equipment Under Test (EUT)

**Product Name:** Wireless Charger

**Model No.:** V10, V10-1, V10-2, V10-3, V10-4, V10-5

**Trade mark:** BenarLee, TERICH, Auoplus, coolpad, cool

**FCC ID:** 2AOQUV10

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.209

**Date of sample receipt:** 04 May, 2018

**Date of Test:** 05 May, to 21 May, 2018

**Date of report issue:** 22 May, 2018

**Test Result:** PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

## 2 Version

Version No.	Date	Description
00	22 May, 2018	Original

**Prepared By:**

Zora Lee

**Date:**

22 May, 2018

Report Clerk

**Check By:**

Wimer Wang

**Date:**

22 May, 2018

Project Engineer

### 3 Contents

	Page
.....	1
<b>2 VERSION</b> .....	<b>2</b>
<b>3 CONTENTS</b> .....	<b>3</b>
<b>4 TEST SUMMARY</b> .....	<b>4</b>
<b>5 GENERAL INFORMATION</b> .....	<b>5</b>
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST MODE .....	5
5.4 DESCRIPTION OF SUPPORT UNITS.....	5
5.5 MEASUREMENT UNCERTAINTY.....	5
5.6 DESCRIPTION OF CABLE USED .....	6
5.7 LABORATORY FACILITY.....	6
5.8 LABORATORY LOCATION .....	6
5.9 TEST INSTRUMENTSLIST.....	7
<b>6 TEST RESULTS ANDMEASUREMENT DATA</b> .....	<b>8</b>
6.1 ANTENNA REQUIREMENT.....	8
6.2 RADIATED EMISSION .....	9
6.3 CONDUCTED EMISSION .....	15
6.4 20DB BANDWIDTH.....	18
<b>7 TEST SETUP PHOTOS</b> .....	<b>20</b>
<b>8 EUT CONSTRUCTIONAL PHOTOS</b> .....	<b>22</b>

## 4 Test Summary

Test Item	Section in CFR 47	Result
Spurious emissions	15.209	Pass
20dB Bandwidth	15.215(c)	Pass
Conducted Emission	15.207	Pass

*Remark:*  
*Pass: The EUT complies with the essential requirements in the standard.*

## 5 General Information

### 5.1 Client Information

Applicant:	Shenzhen Benarlee Technology Co., Ltd
Address:	Third floor, Building B1, Nanshan Zhiyuan, Taoyuan Street, Nanshan District, ShenZhen, China
Manufacturer:	Skytek Smart Communication Limited
Address:	5th Floor, Building H, Bantian snow east industrial Park, Buji town, Longgang District, Shenzhen, China

### 5.2 General Description of E.U.T.

Product Name:	Wireless Charger
Model No.:	V10, V10-1, V10-2, V10-3, V10-4, V10-5
Operation Frequency:	111kHz~180kHz
Modulation type:	ASK
Antenna Type:	Coil Antenna
Power supply:	Input: 5V, 2A / 9V, 2A / 12V, 1.5A Output: 5V, 1A / 9V, 1.1A / 9V, 1.67A
Remark:	Model No.: V10,V10-1,V10-2,V10-3,V10-4,V10-5 were identical inside, the electrical circuit design, layout, components used and internal wiring, with difference being brand,shell color and model name.

### 5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation
--------------------	---

### 5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Skytek	Wireless charging match load	N/A	N/A	N/A
Shenzhen HengChangshengding Electronics Co., Ltd.	Adapter	HCSD-12650100	N/A	N/A

### 5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB
Radiated Emission (18GHz ~ 26.5GHz)	±2.88 dB

## 5.6 Description of Cable Used

Cable Type	Description	Length	From	To
USB Cable	Detachable, Unshielded	1.0m	EUT	PC/Adapter

## 5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

## 5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

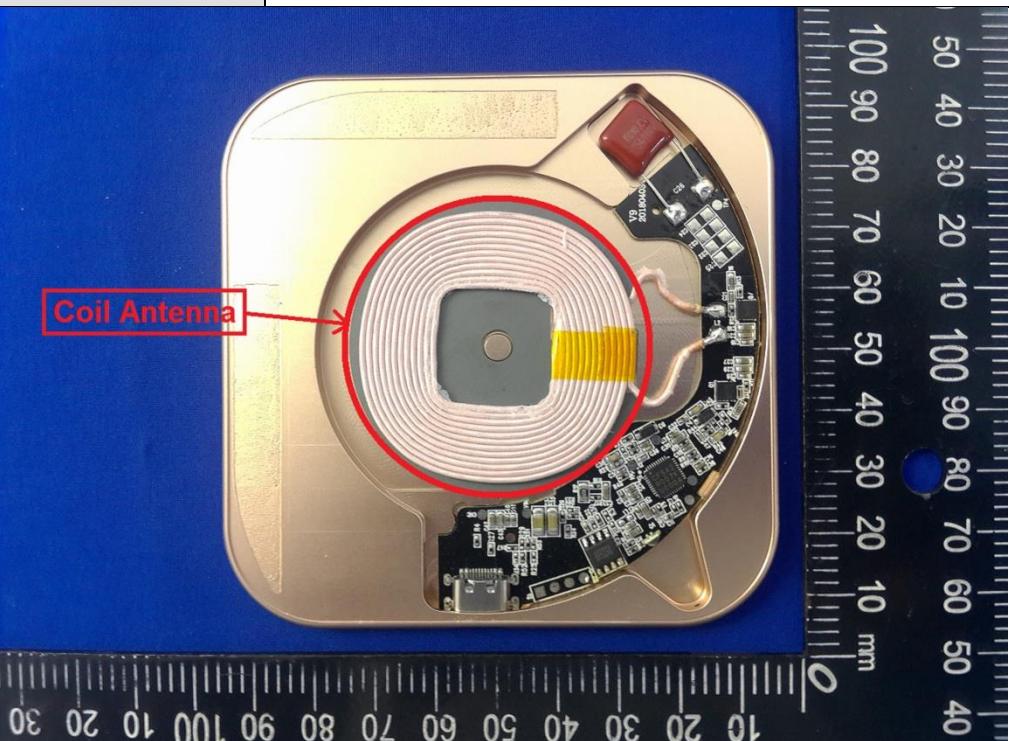
## 5.9 Test Instrumentslist

<b>Radiated Emission:</b>					
<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Date (mm-dd-yy)</b>	<b>Cal. Due date (mm-dd-yy)</b>
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Loop Antenna	SCHWARZBECK	FMZB 1519 B	00044	02-25-2018	02-24-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Simulated Station	Anritsu	MT8820C	6201026545	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019

<b>Conducted Emission:</b>					
<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Date (mm-dd-yy)</b>	<b>Cal. Due date (mm-dd-yy)</b>
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2017	07-20-2018
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A

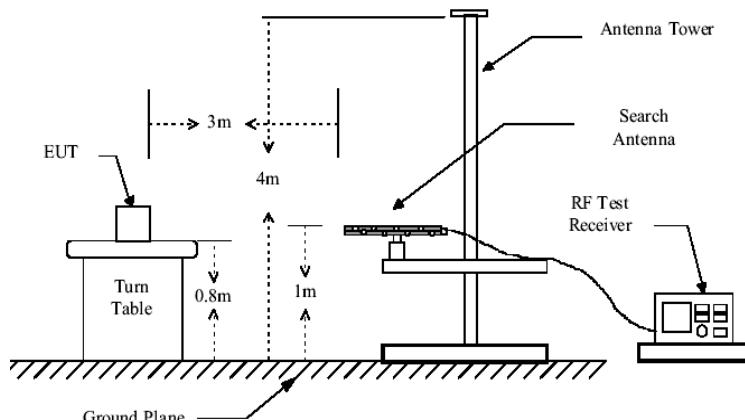
## 6 Test results and Measurement Data

### 6.1 Antenna requirement

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.
E.U.T Antenna:	

## 6.2 Radiated Emission

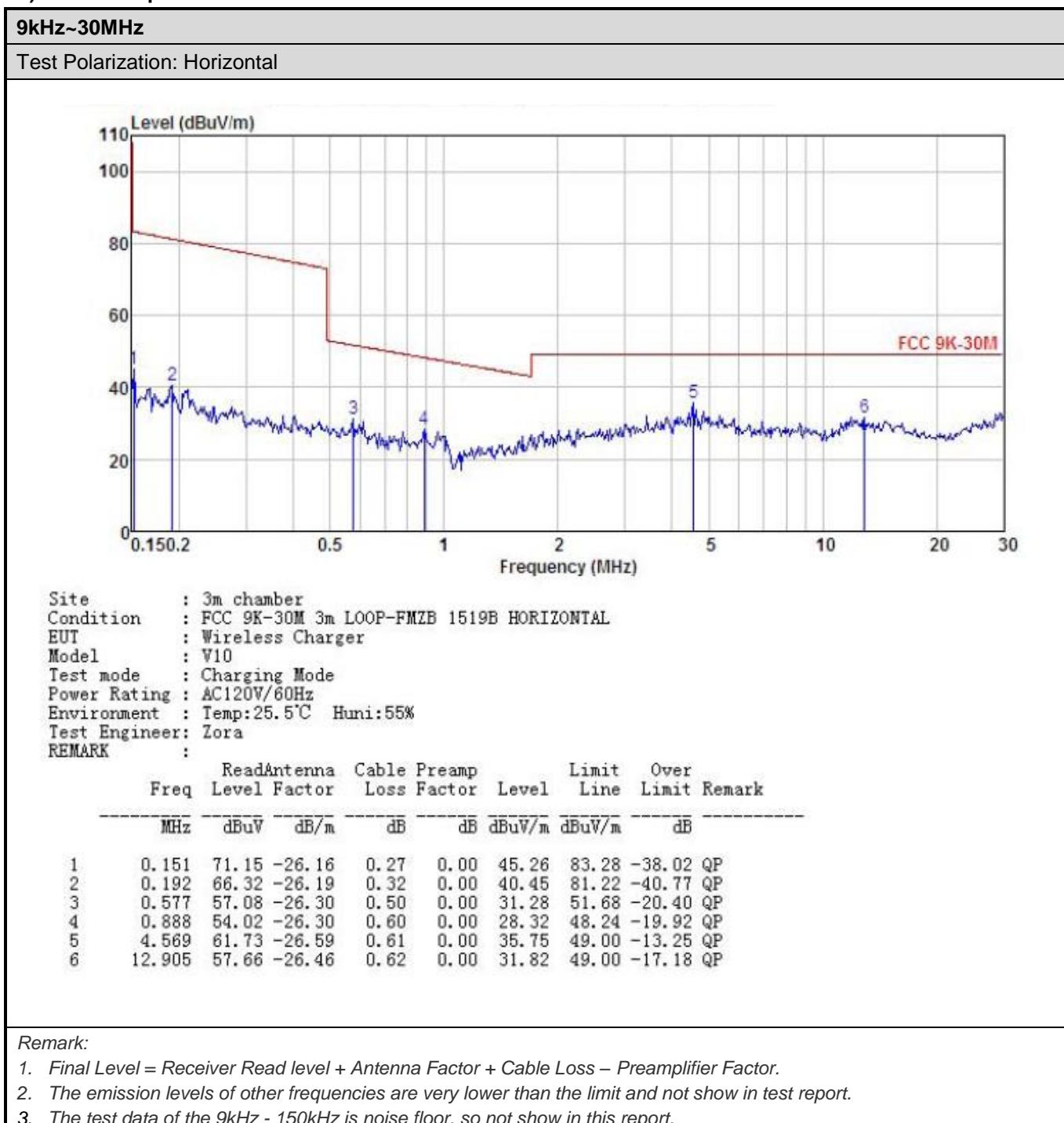
Test Requirement:	FCC Part15 C Section 15.209								
Test Method:	ANSI C63.4:2009								
Test Frequency Range:	9kHz to 1000MHz								
Test site:	Measurement Distance: 3m(Semi-Anechoic Chamber)								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	9kHz-150kHz	Quasi-peak	200Hz	600Hz	Quasi-peak Value				
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value				
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
Limit:	Frequency (MHz)	Limit (uV/m @3m)		Distance (m)					
	0.009-0.490	2400/F(kHz)		300					
	0.490-1.705	24000/F(kHz)		30					
	1.705-30	30		30					
	30-88	100		3					
	88-216	150		3					
	216-960	200		3					
	Above 1GHz	500		3					
Test Procedure:	<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p>								
Test setup:	<p>9kHz-30MHz</p> <p>30MHz-1GHz</p>								



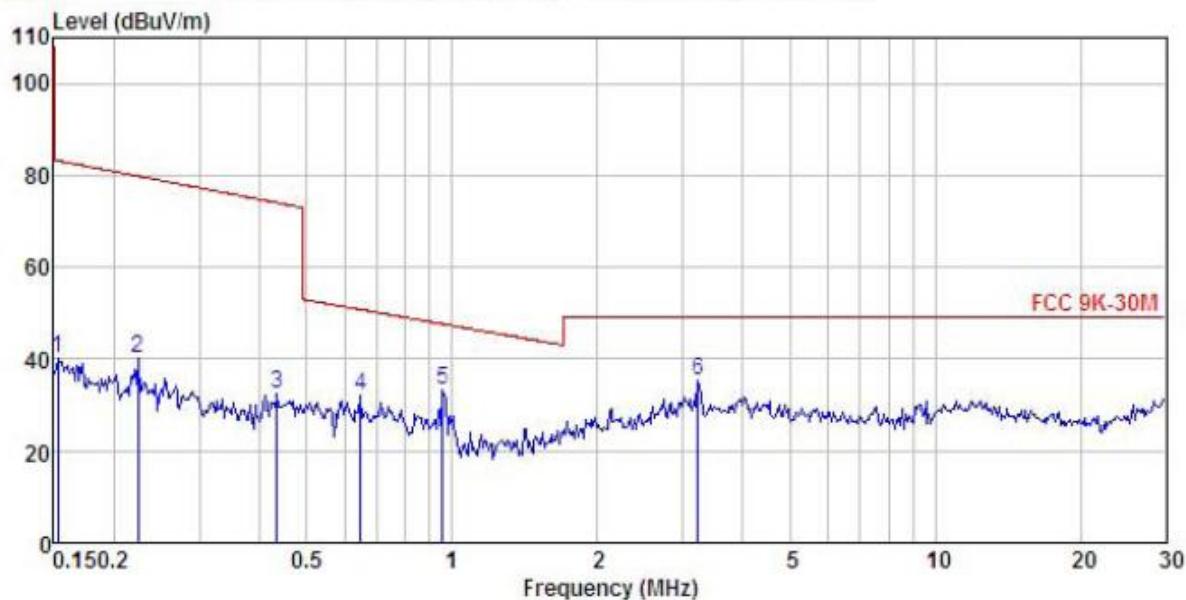
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass
Remark:	The emission levels of above 1 GHz are very lower than the limit and not show in test report.

**Measurement Data:****a) Fundamental field strength**

Frequency (kHz)	H-field@3m (dB $\mu$ V)	Limit@3m (dB $\mu$ V)	Result
115.20	55.54	66.38	Pass
178.50	50.79	62.57	Pass

**b) Radiated spurious:**

## Test Polarization: Vertical



Site : 3m chamber  
 Condition : FCC 9K-30M 3m LOOP-FMZB 1519B VERTICAL  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charging Mode  
 Power Rating : AC120V/60Hz  
 Environment : Temp:25.5°C Huni:55%  
 Test Engineer: Zora  
 REMARK :

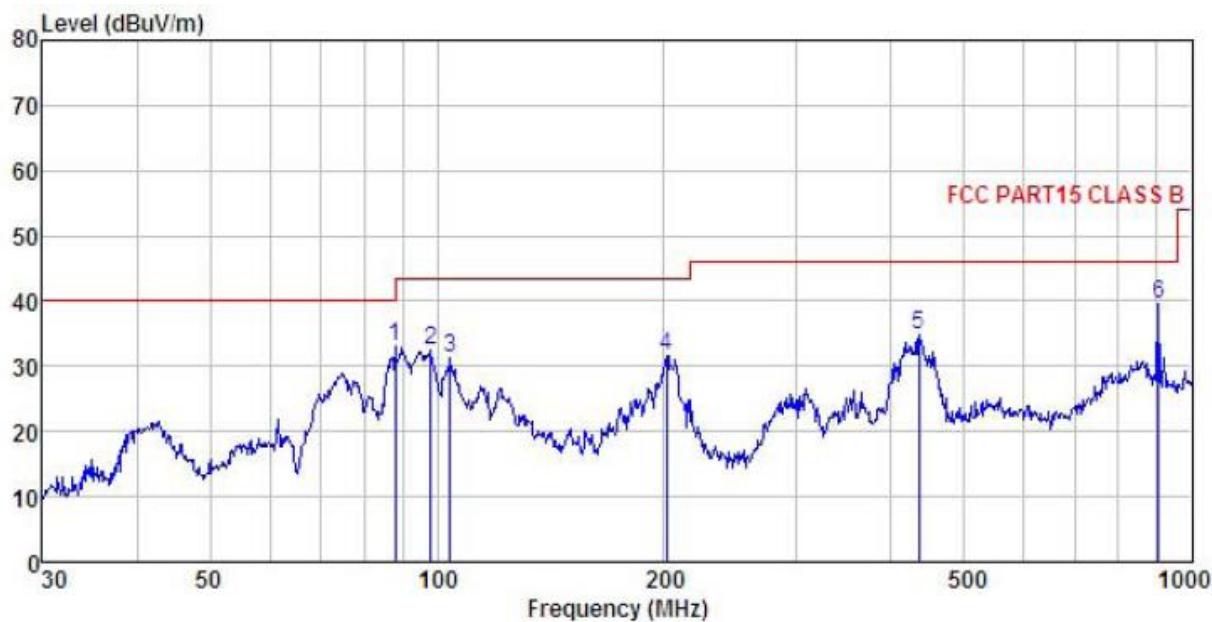
Freq	ReadAntenna	Cable	Preamp	Limit	Over	Remark	
	Freq	Level	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	0.153	65.90	-26.16	0.27	0.00	40.01	83.21 -43.20 QP
2	0.224	66.06	-26.21	0.34	0.00	40.19	79.87 -39.68 QP
3	0.435	58.22	-26.28	0.40	0.00	32.34	74.05 -41.71 QP
4	0.647	57.82	-26.30	0.54	0.00	32.06	50.77 -18.71 QP
5	0.955	59.03	-26.30	0.61	0.00	33.34	47.65 -14.31 QP
6	3.224	61.12	-26.55	0.66	0.00	35.23	49.00 -13.77 QP

## Remark:

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.
3. The test data of the 9kHz - 150kHz is noise floor, so not show in this report.

## 30MHz~1000MHz

Test Polarization: Horizontal



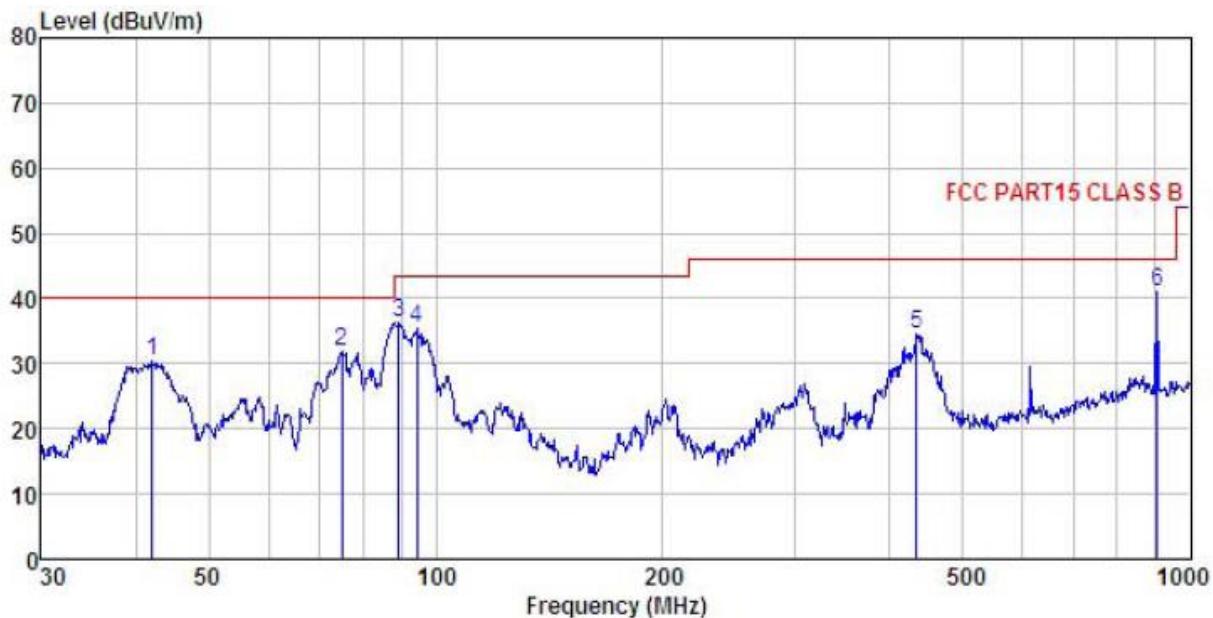
Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charging mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55% 101KPa  
 Test Engineer: Zora  
 REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	88.033	50.54	10.18	1.96	29.58	33.10	43.50 -10.40 QP
2	98.142	48.21	11.93	1.97	29.54	32.57	43.50 -10.93 QP
3	104.170	46.75	12.12	1.99	29.50	31.36	43.50 -12.14 QP
4	201.393	46.34	11.30	2.87	28.82	31.69	43.50 -11.81 QP
5	435.590	44.80	15.60	3.16	28.85	34.71	46.00 -11.29 QP
6	903.309	42.79	21.00	3.74	27.87	39.66	46.00 -6.34 QP

## Remark:

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

## Test Polarization: Vertical



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charging mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Huni:55% 101KPa  
 Test Engineer: Zora  
 REMARK :

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Remark
	Level	Factor	Loss	Factor			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	42.154	45.24	13.73	1.25	29.88	30.34	40.00 -9.66 QP
2	75.182	50.70	9.18	1.63	29.68	31.83	40.00 -8.17 QP
3	89.276	53.28	10.60	2.04	29.57	36.35	43.50 -7.15 QP
4	94.428	51.48	11.40	2.01	29.55	35.34	43.50 -8.16 QP
5	434.065	44.66	15.60	3.16	28.84	34.58	46.00 -11.42 QP
6	903.309	44.11	21.00	3.74	27.87	40.98	46.00 -5.02 QP

## Remark:

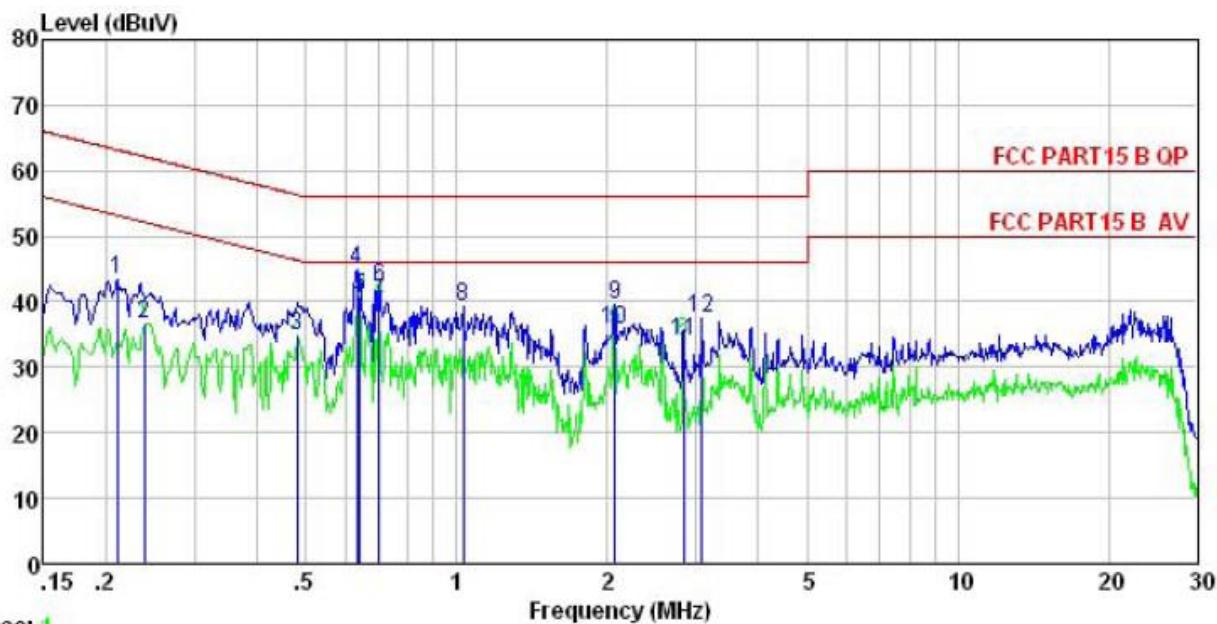
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

### 6.3 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.107					
Test Method:	ANSI C63.4:2014					
Test Frequency Range:	150kHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9kHz, VBW=30kHz					
Limit:	Frequency range (MHz)	Limit (dB $\mu$ V)				
		Quasi-peak	Average			
	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	0.5-30	60	50			
* Decreases with the logarithm of the frequency.						
Test setup:	<p><b>Reference Plane</b></p> <p><b>Test table/Insulation plane</b></p> <p><b>Remark:</b> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure	<ol style="list-style-type: none"> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). They provide a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</li> </ol>					
Test environment:	Temp.:	23 °C	Humid.:	56%	Press.:	101kPa
Test Instruments:	Refer to section 5.9 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

## Measurement data:

Test Phase: Line



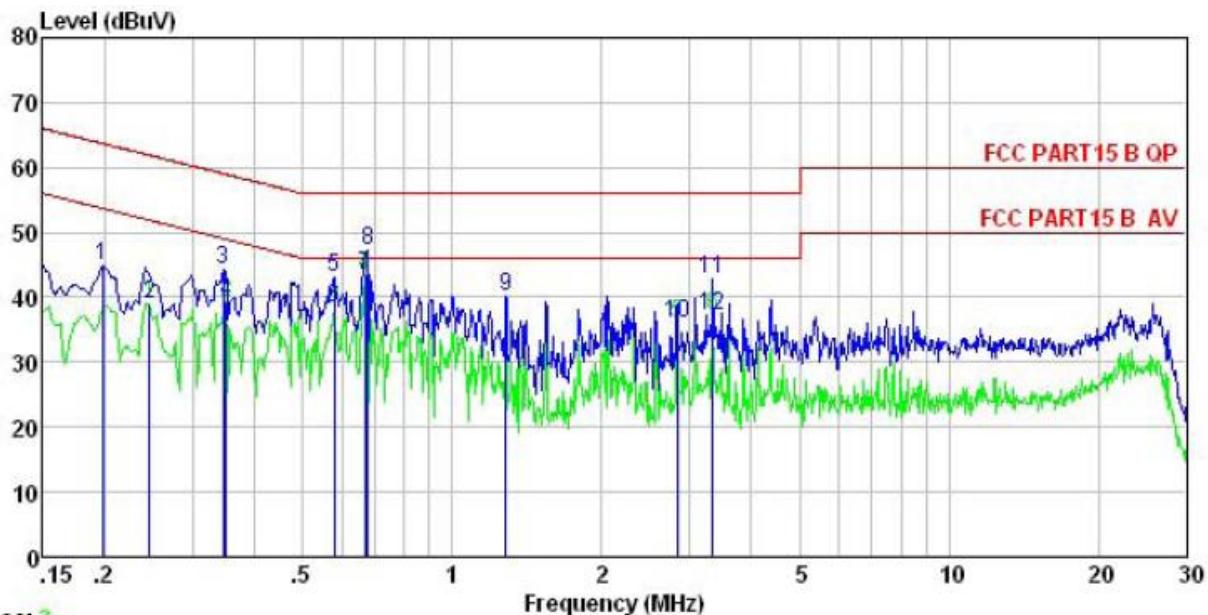
Site : CCIS Shielding Room  
 Condition : FCC PART15 B QP LISN LINE  
 EUT : Wireless Charger  
 Model : V10  
 Test mode : Charging Mode  
 Power Rating : AC 120V/60Hz  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: Zora  
 Remark :

	Read Freq	LISN Level	Cable Factor	Line Loss	Limit Level	Over Line Limit	Over Cable Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.211	32.45	0.15	10.76	43.36	63.18	-19.82	QP
2	0.238	25.78	0.14	10.75	36.67	52.17	-15.50	Average
3	0.481	23.87	0.12	10.75	34.74	46.32	-11.58	Average
4	0.634	33.86	0.13	10.77	44.76	56.00	-11.24	QP
5	0.641	29.91	0.13	10.77	40.81	46.00	-5.19	Average
6	0.701	31.42	0.13	10.77	42.32	56.00	-13.68	QP
7	0.701	28.89	0.13	10.77	39.79	46.00	-6.21	Average
8	1.032	28.25	0.13	10.87	39.25	56.00	-16.75	QP
9	2.066	28.37	0.14	10.96	39.47	56.00	-16.53	QP
10	2.066	24.61	0.14	10.96	35.71	46.00	-10.29	Average
11	2.839	22.90	0.16	10.93	33.99	46.00	-12.01	Average
12	3.090	26.37	0.17	10.92	37.46	56.00	-18.54	QP

## Notes:

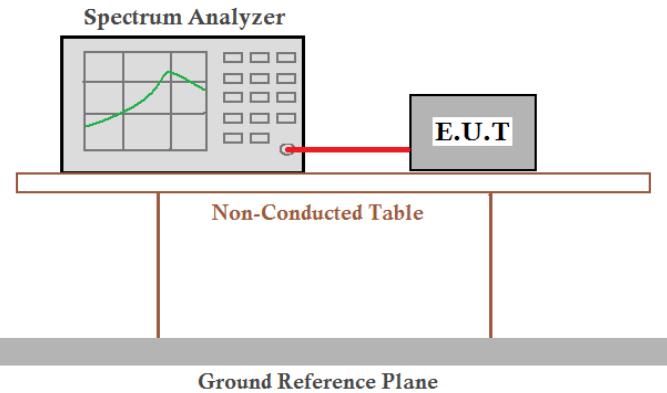
- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level =Receiver Read level + LISN Factor + Cable Loss.

Test Phase: Neutral

**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. Final Level =Receiver Read level + LISN Factor + Cable Loss.

## 6.4 20dB Bandwidth

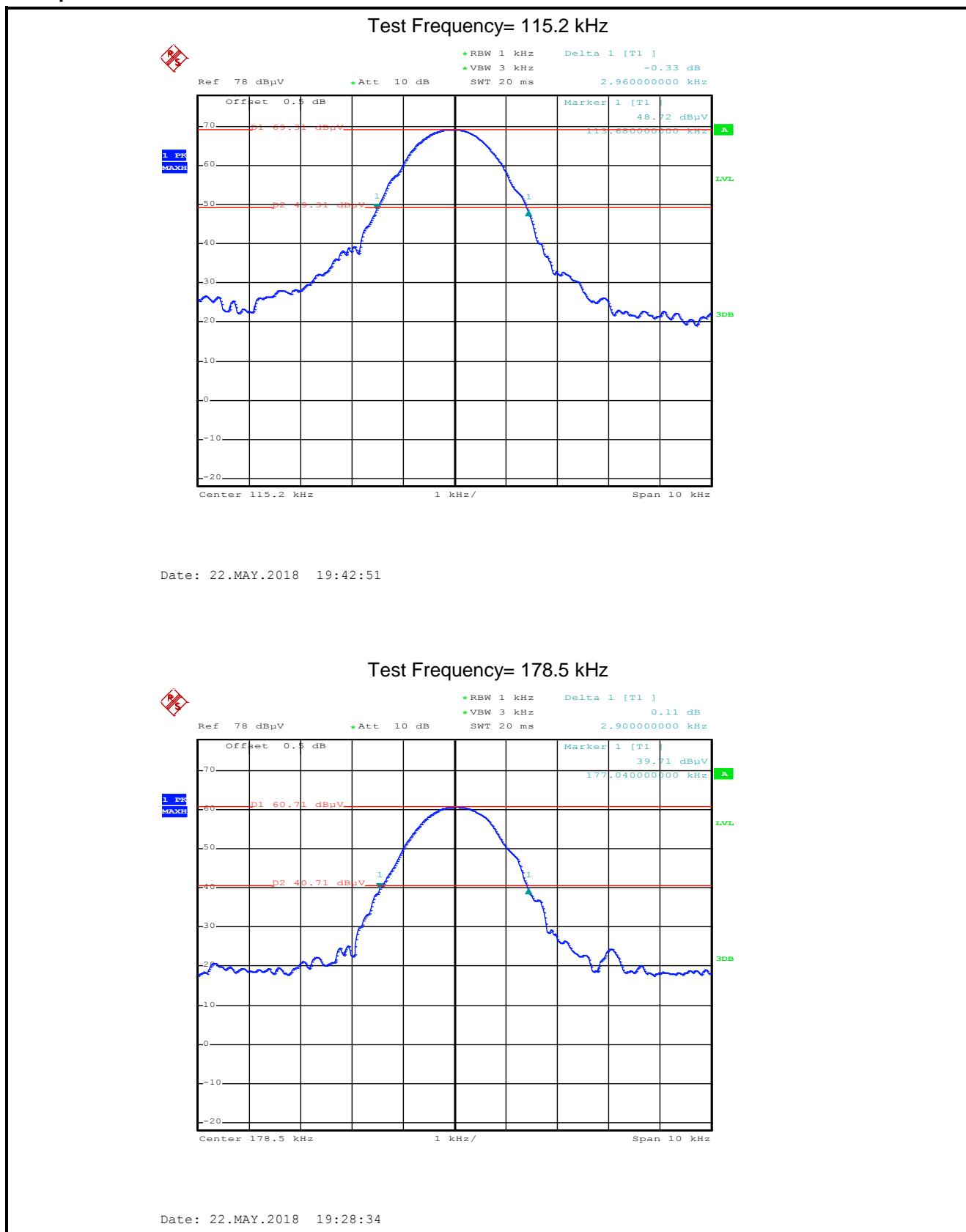
Test Requirement:	FCC Part15 C Section 15.215 (c)
Test Method:	ANSI C63.4:2009
Receiver setup:	RBW=1 kHz, VBW=3 kHz, detector: Peak
Limit:	The fundamental emission be kept within atleast the central 80% of the permitted band
Test Procedure:	<ol style="list-style-type: none"> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set the EUT to proper test channel.</li> <li>Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.</li> <li>Read 20dB bandwidth.</li> </ol>
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a cable. The setup is placed on a Non-Conducted Table, which sits above a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data

20dB bandwidth (kHz)	Limits
2.96	N/A
2.90	

Remark: For report purpose only.

Test plot as follows:

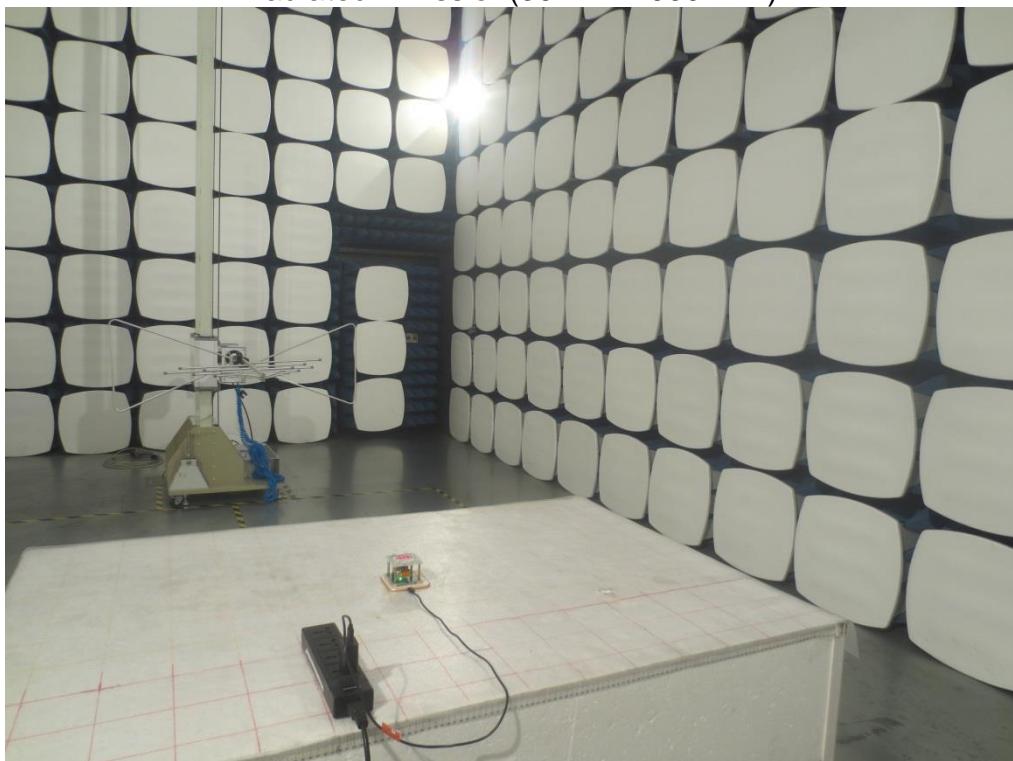


## 7 Test Setup Photos

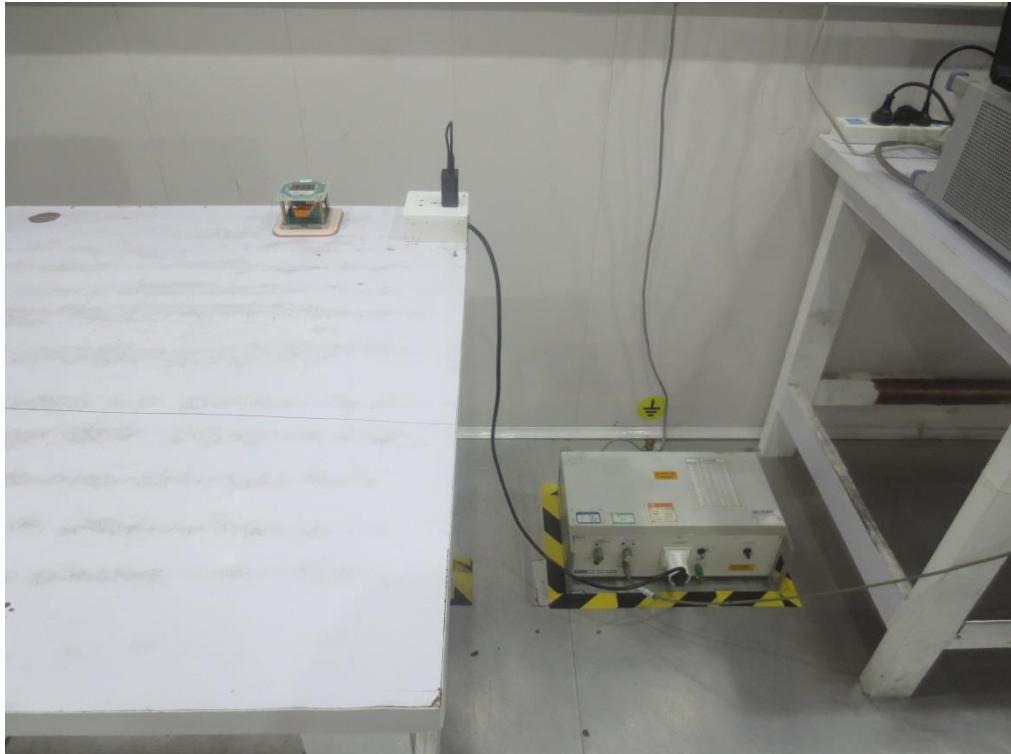
Radiated Emission(9kHz-30MHz)



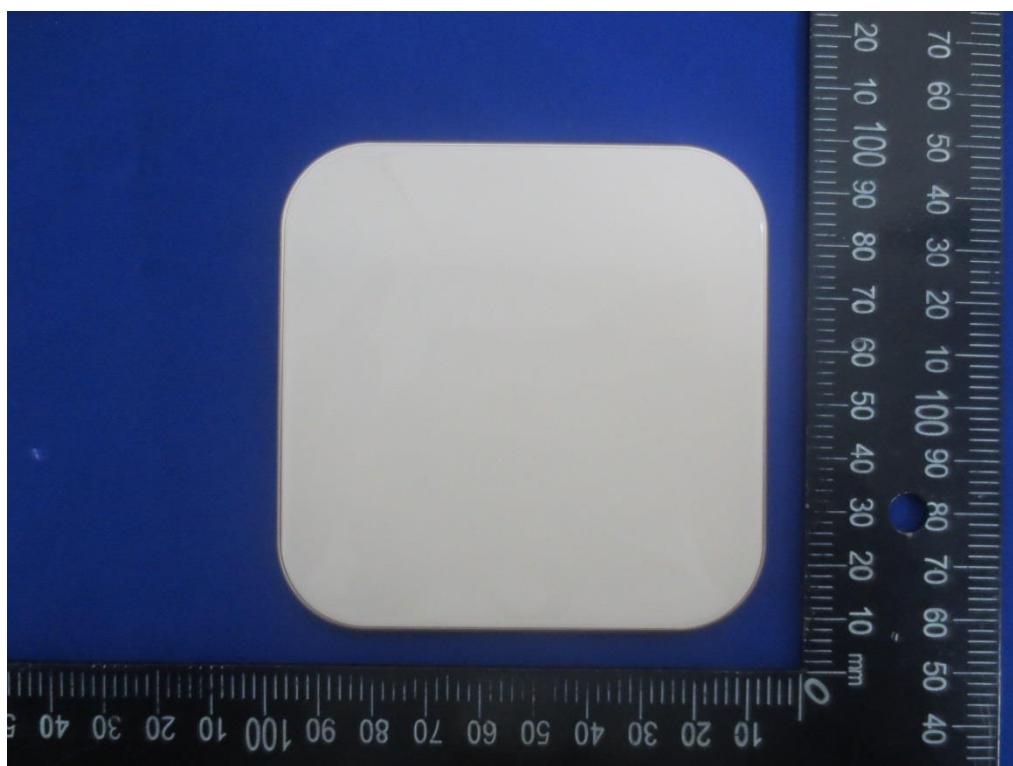
Radiated Emission(30MHz-1000MHz)

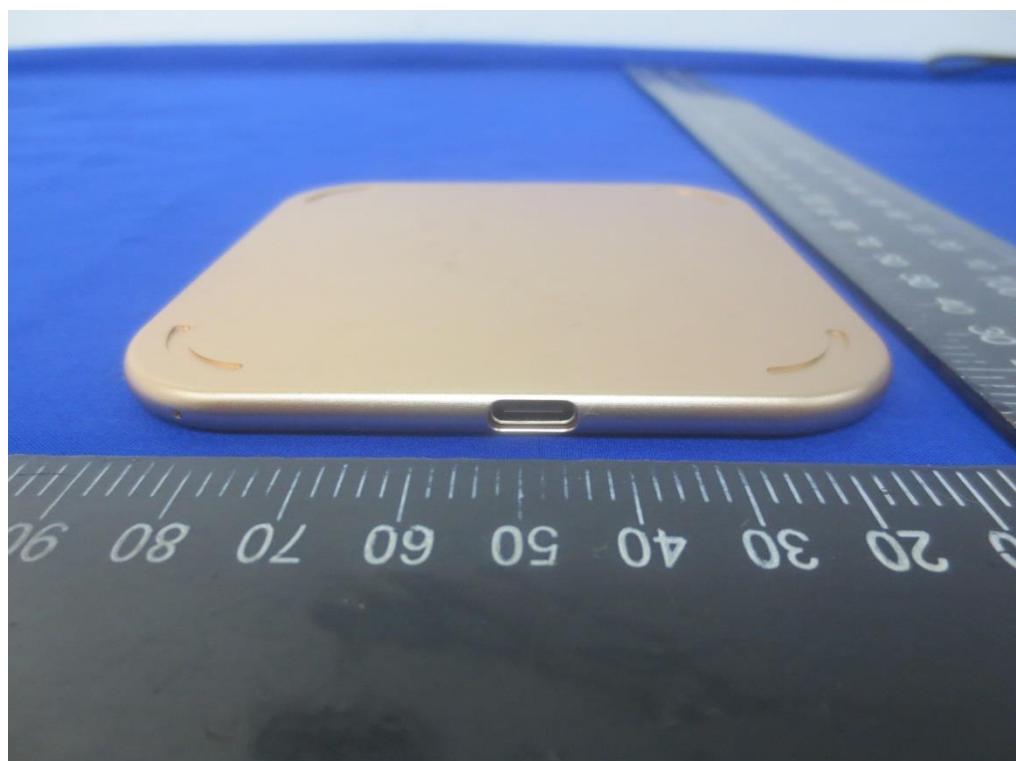
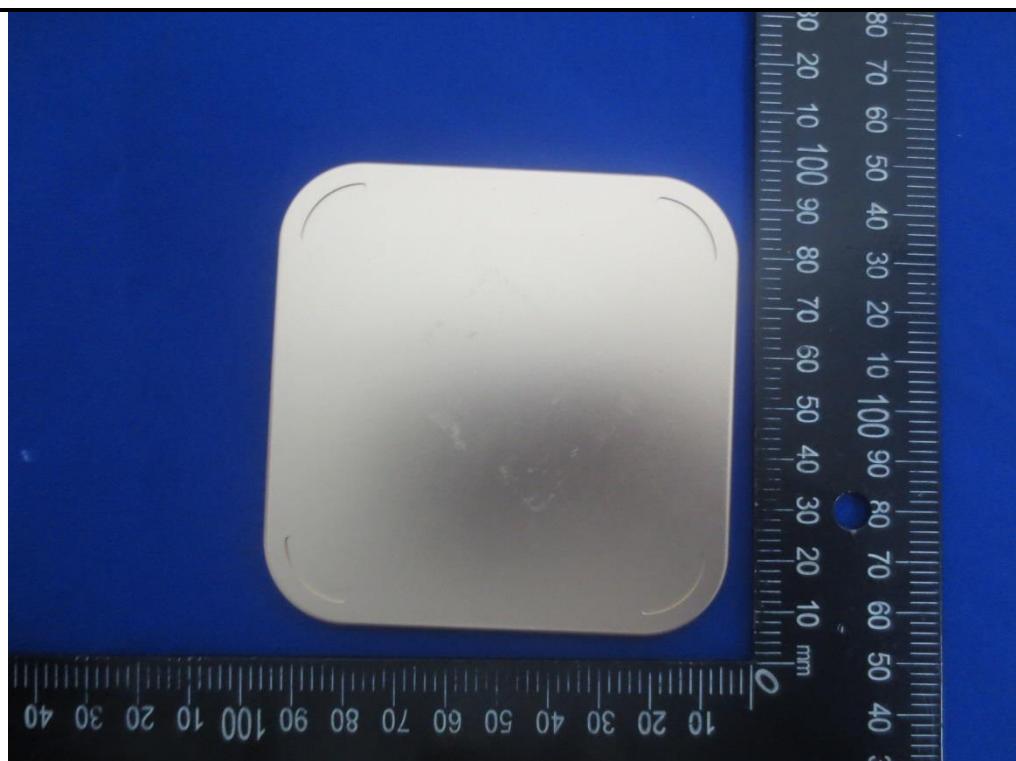


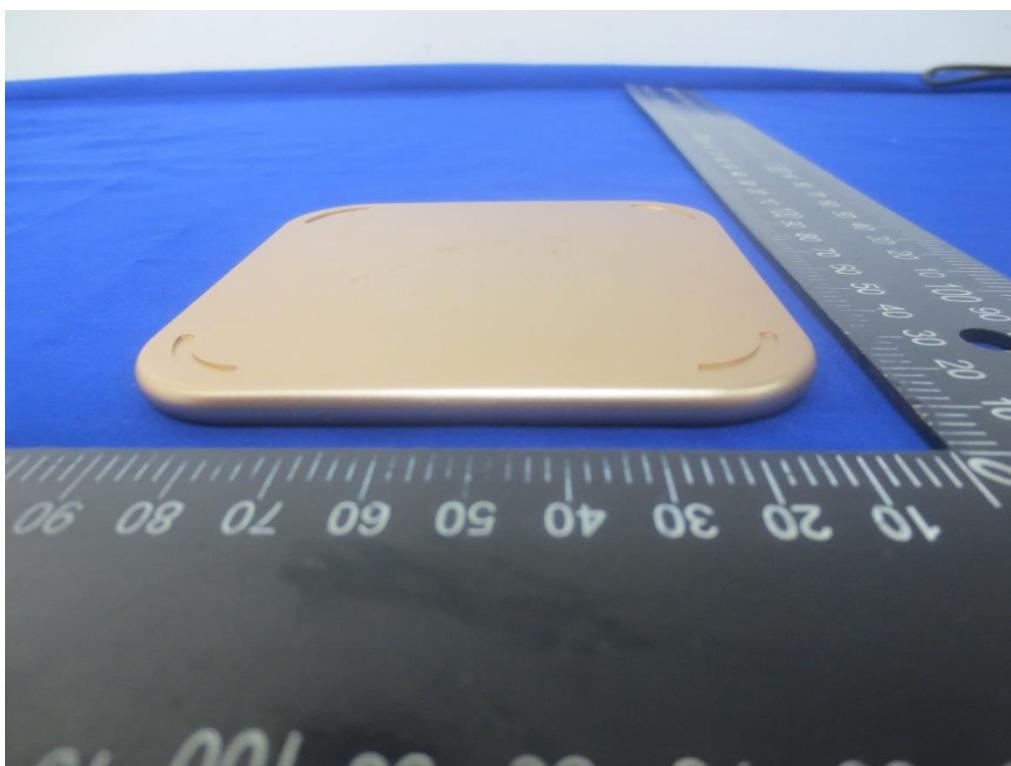
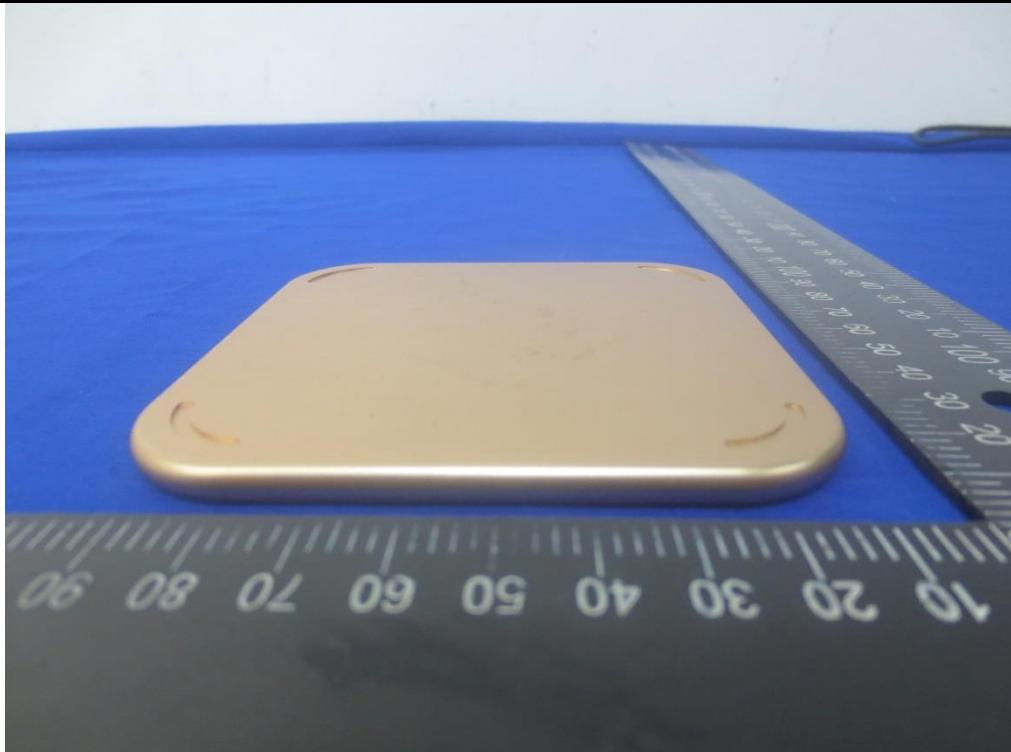
## Conducted Emission

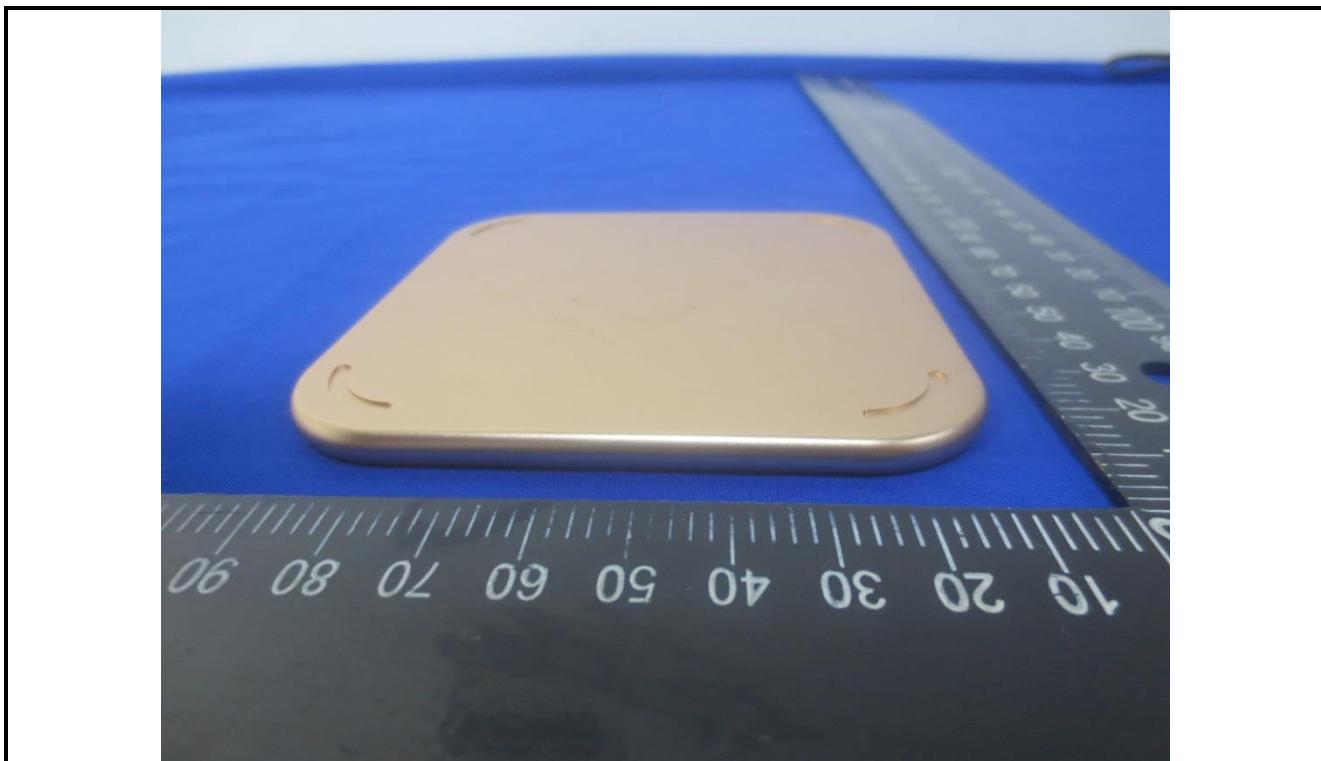


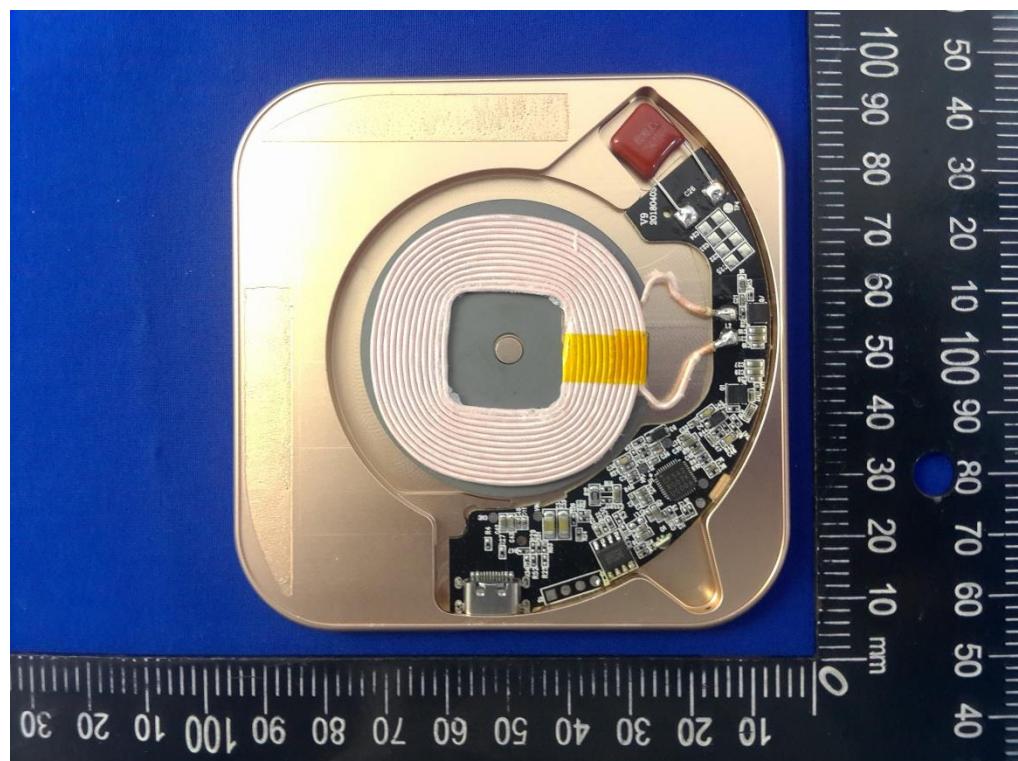
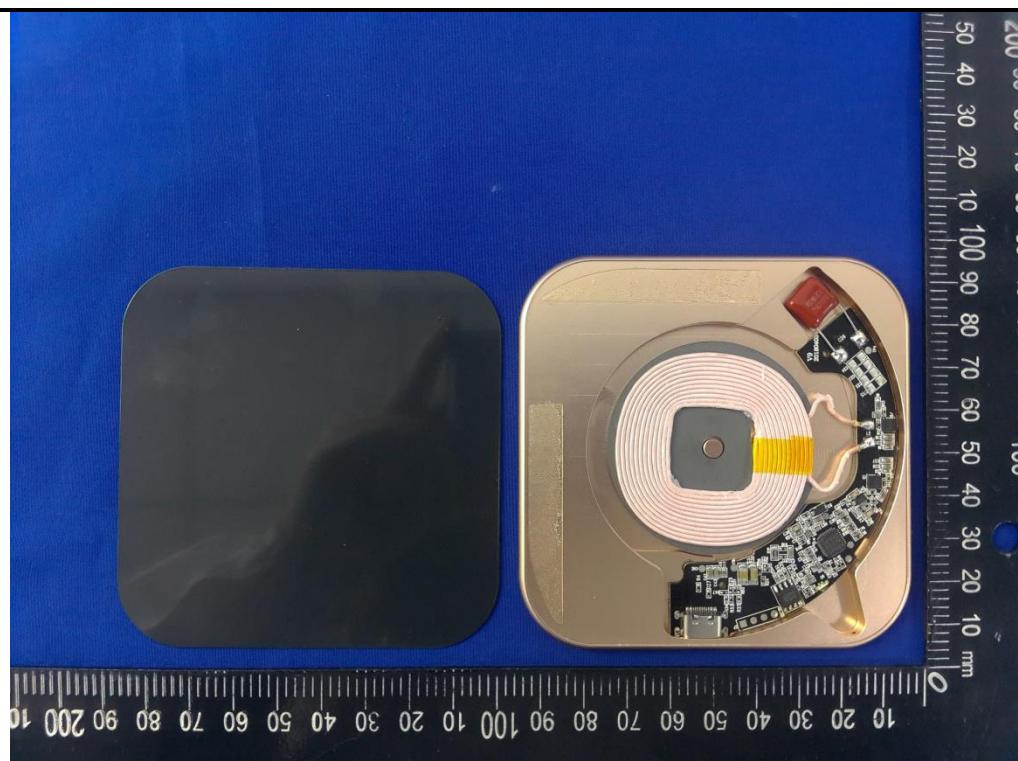
## 8 EUT Constructional Photos

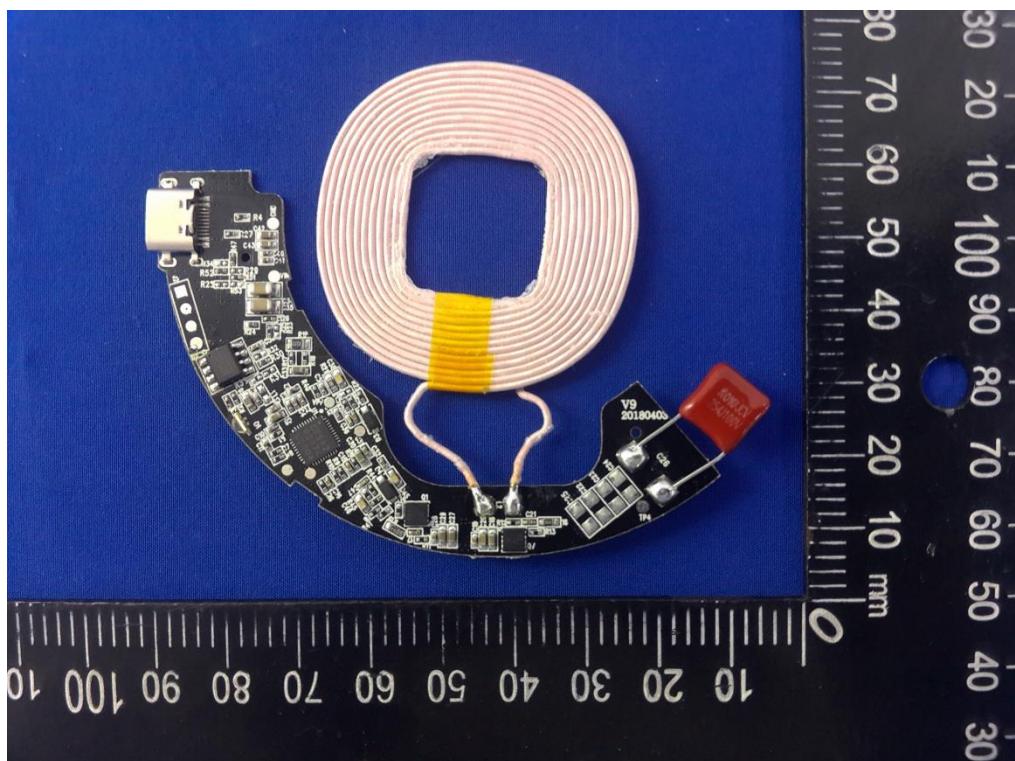
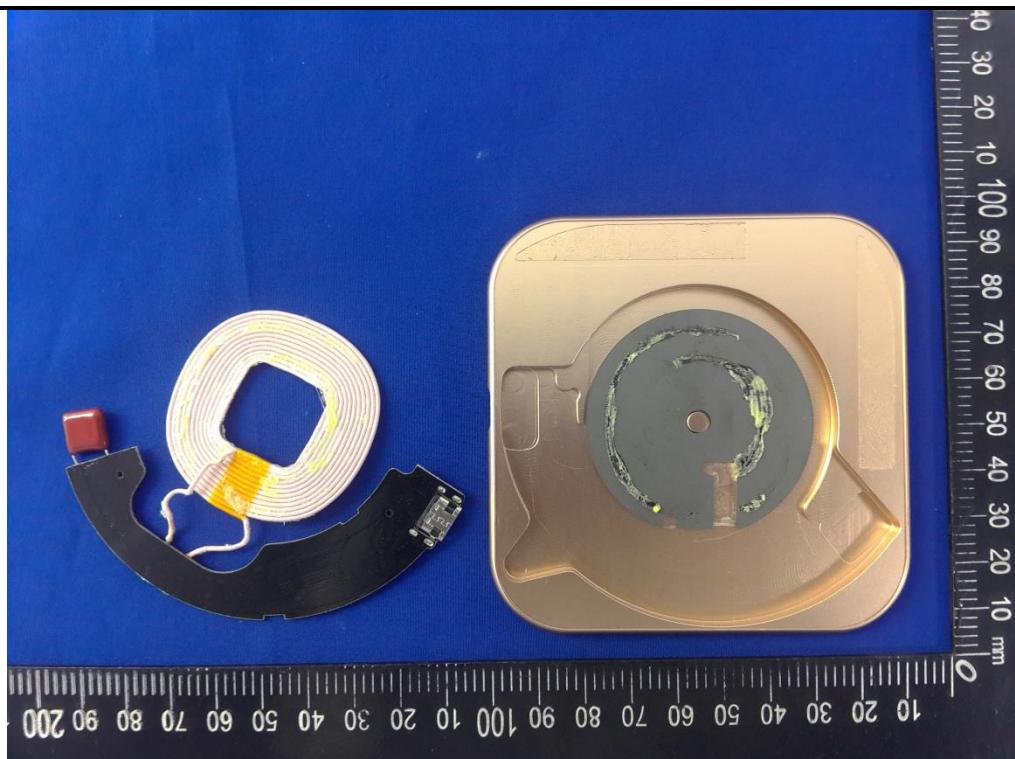












-----End of report-----