

# RF EXPOSURE REPORT


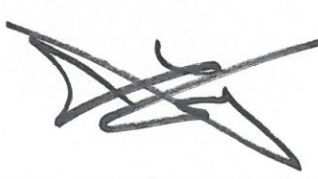
**Equipment under test** Fast Wireless Charger  
**Model name** PWC-1  
**FCC ID** 2AOJFPWC2  
**Applicant** PNTELECOM CO.,LTD  
**Manufacturer** WEIHAI PNTELECOM CO.,LTD  
PNTELECOM CO.,LTD  
**Date of test(s)** 2018.04.23 ~ 2018.05.12  
**Date of issue** 2018.05.14

**Issued to**

**PNTELECOM CO.,LTD**  
130 Anyangcheondong-ro, Dongan-gu,  
Anyang-si, Gyeonggi-do, Korea  
Tel: +82-31-448-8880 / Fax: +82-31-448-8882

**Issued by**

**KES Co., Ltd.**  
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,  
Gyeonggi-do, 14057, Korea  
473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Test and report completed by :	Report approval by :
	
Young-Jin Lee Test engineer	Hyeon-Su Jang Technical manager



---

### Revision history

Revision	Date of issue	Test report No.	Description
-	2018.05.03	KES-RF-18T0053	Initial
R1	2018.05.14	KES-RF-18T0053-R1	Add Electric Field Strength

---

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.



---

## TABLE OF CONTENTS

1.	General information .....	4
1.1.	EUT description .....	4
1.2.	Test configuration.....	4
1.3.	Test frequency .....	4
1.4.	Test mode .....	4
1.5.	Information about derivative model.....	5
1.6.	Device modifications .....	5
1.7.	Accessory information .....	5
2.	Environmental evaluation and exposure limit.....	6
2.1.	Test Setup .....	7
2.2.	Test results.....	9
	- E-Field Strength from each edges the EUT .....	9
	- H-Field Strength from each edges the EUT.....	10
	Appendix A. Measurement equipment .....	11
	Appendix B. Test setup photo.....	12

---

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

### 1. General information

Applicant PNTELECOM CO.,LTD  
 Applicant address 130 Anyangcheondong-ro, Dongan-gu, Anyang-si, Gyeonggi-do, Korea  
 Test site KES Co., Ltd.  
 Test site address 3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,  
 Gyeonggi-do, 14057, Korea  
 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, Korea  
 Test Facility FCC Accreditation Designation No.: KR0100, Registration No.: 444148  
 FCC rule part(s): Part 15C  
 FCC ID: 2AOJFPWC2  
 Test device serial No.  Production  Pre-production  Engineering

#### 1.1. EUT description

Equipment under test Fast Wireless Charger  
 Frequency 0.121 MHz ~ 0.205 MHz  
 Modulation type ASK  
 Model: PWC-1  
 Antenna specification Internal type(Coil antenna)  
 Power source DC 5.0 V / DC 9.0V

#### 1.2. Test configuration

The **PNTELECOM CO., LTD Fast Wireless Charger FCC ID: 2AOJFPWC2** was tested according to the specification of EUT, the EUT must comply with following standards and KDB documents.

FCC Part 15C  
 ANSI C63.10-2013  
 KDB 680106 D01 V03

#### 1.3. Test frequency

		Frequency Range
Power source	DC 5.0 V / 9.0 V	0.121 MHz ~ 0.205 MHz

#### 1.4. Test mode

Mode	Charging current	Description
Charging mode With load	90%	Using Max load
	50%	Using Mid load
	10%	Using Min load



**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Test report No.:  
KES-RF-18T0053-R1  
Page ( 5 ) of (13)

---

**1.5. Information about derivative model**

N/A

**1.6. Device modifications**

N/A

**1.7. Accessory information**

Equipment	Manufacturer	Model	Serial No.	Power source
-	-	-	-	-

---

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

## 2. Environmental evaluation and exposure limit

### Limits for Maximum Permissible Exposure (MPE)

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

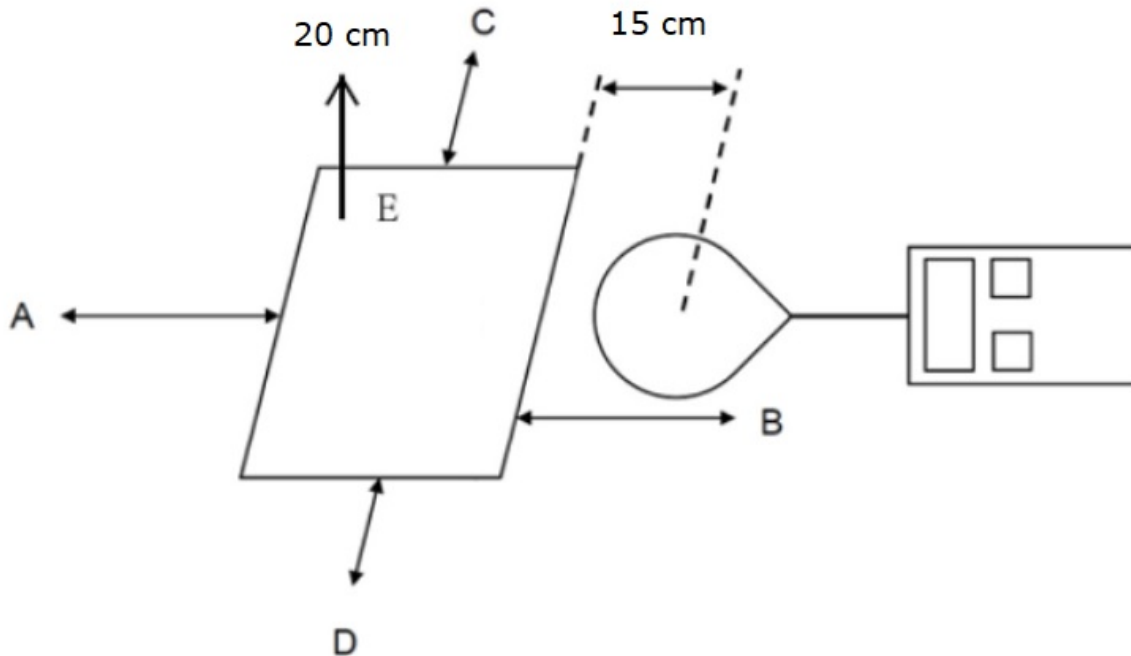
TABLE 1 - Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
(A) Limits for Occupational / Control Exposures				
0.3 - 3.0	614	1.63	*(100)	6
3.0 - 30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30 - 300	61.4	0.613	1.0	6
300 - 1 500			f/300	6
1 500 - 100 000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
<b><u>0.3-1.34</u></b>	<b><u>614</u></b>	<b><u>1.63</u></b>	*(100)	30
1.34 - 30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30 - 300	27.5	0.073	0.2	30
300 - 1 500			f/1 500	30
1 500 - 100 000			1.0	30

**Note.**

1. f= frequency in MHz
2. “\*” means Plane-wave equivalent power density

## 2.1. Test Setup



1. The test was performed on 360° turn table in anechoic chamber.
2. The probe was placed at distance 15 cm or 20 cm which is between the edge of the charger and the geometric center of the probe.
3. The highest emission level was recorded and compared with limit as soon as measurement of each point ; A, B, C, D, E were completed.
4. Point F is highest measured field from moving the probe around the device at distance 15 cm.
5. The EUT was measured according to the KDB 680106 D01v03.

---

**Note.**

Equipment Approval Considerations item 5.b) of KDB 680106 D01 v03.

a) Power transfer frequency is less than 1 MHz.

- The device operates at a frequency of 121 kHz to 205 kHz.

b) Output power from each primary coil is less than or equal to 15 watts.

- Output power from each primary coil : 5 watts or 9 watts.

c) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

- The transfer system including a charging system with single coil. .

d) Client device is placed directly in contact with the transmitter.

- Client device is placed directly.

e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

- The device is a mobile device.

f) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50 % of the MPE limit.

- Refer to following test results.

The EUT H-Field Strength levels at 15 cm < 50 % of the MPE H-Field Strength limit 1.63 A/m  
0.21 A/m (Max) < 0.815 A/m



## 2.2. Test results

### - E-Field Strength from each edges the EUT

#### 5W

Test Mode		Point A (V/m)	Point B (V/m)	Point C (V/m)	Point D (V/m)	Point E (V/m)	Point F (V/m)
Charging mode	10 % load	1.33	1.22	1.29	1.21	1.73	1.96
	50 % load	1.31	1.21	1.27	1.20	1.71	1.95
	90 % load	1.30	1.22	1.26	1.21	1.72	1.96

#### 9W

Test Mode		Point A (V/m)	Point B (V/m)	Point C (V/m)	Point D (V/m)	Point E (V/m)	Point F (V/m)
Charging mode	10 % load	1.48	1.44	1.51	1.44	2.02	2.15
	50 % load	1.46	1.42	1.48	1.40	2.01	2.15
	90 % load	1.45	1.43	1.49	1.42	2.01	2.12

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

**- H-Field Strength from each edges the EUT**

**5W**

Test Mode		Point A (A/m)	Point B (A/m)	Point C (A/m)	Point D (A/m)	Point E (A/m)	Point F (A/m)
Charging mode	10 % load	0.14	0.13	0.13	0.14	0.16	0.19
	50 % load	0.13	0.14	0.11	0.12	0.15	0.18
	90 % load	0.13	0.13	0.12	0.13	0.15	0.18

**9W**

Test Mode		Point A (A/m)	Point B (A/m)	Point C (A/m)	Point D (A/m)	Point E (A/m)	Point F (A/m)
Charging mode	10 % load	0.15	0.16	0.15	0.15	0.18	0.21
	50 % load	0.15	0.16	0.14	0.14	0.17	0.20
	90 % load	0.14	0.15	0.14	0.14	0.17	0.19

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.



**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Test report No.:  
KES-RF-18T0053-R1  
Page (11 ) of (13)

**Appendix A. Measurement equipment**

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Magnetic Field Sensor	HIOKI	0850-B1	3471	1 year	2018.06.12
Magnetic Field Hitester	HIOKI	FT3470-50	140430999	1 year	2018.06.12
Electric field probe	SCHAFFNER	EMC20	X-0028	1 year	2019.03.20

**Peripheral device**

Device	Manufacturer	Model No.	S/N	Note
AC/DC Adapter	WEIHAI PNTELECOM	MCS-H06KP	PB7Y0000322	Output Power : 9.0V / 5.0 V
10/50/90% Load	PNTELECOM CO.,LTD	N/A	N/A	N/A

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.