




# TEST REPORT

<b>KCTL Inc.</b> 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 <a href="http://www.kctl.co.kr">www.kctl.co.kr</a>	Report No.: KR21-SRF0145 Page (1) of (12)	
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## 1. Client

- Name : Vieworks Co., Ltd.
- Address : 41-3, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055, Republic of Korea
- Date of Receipt : 2021-01-04

2. Use of Report : Certification

3. Name of Product / Model : Wireless Power Transmitter / FXRC-05A

4. Manufacturer / Country of Origin : Vieworks Co., Ltd. / Korea

5. FCC ID : PFRFXRC05A



6. IC Certificate No. : 11233A-FXRC05A

7. Date of Test : 2021-03-31 to 2021-04-26

8. Location of Test :  Permanent Testing Lab  On Site Testing  
 (Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

9. Test method used : 47 CFR Part 1.1310

10. Test Result : Refer to the test result in the test report

Affirmation	Tested by  Name : Hosung Lee  (Signature)	Technical Manager  Name : Heesu Ahn  (Signature)
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2021-06-18

## KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

**REPORT REVISION HISTORY**

Date	Revision	Page No
2021-06-18	Originally issued	-

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**General remarks for test reports**

**Statement concerning the uncertainty of the measurement systems used for the tests**

(may be required by the product standard or client)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

**Procedure number, issue date and title:**

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

Statement not required by the standard or client used for type testing

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## 1. General information

Client : Vieworks Co., Ltd.  
 Address : 41-3, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055, Republic of Korea  
 Manufacturer : Vieworks Co., Ltd.  
 Address : 41-3, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055, Republic of Korea  
 Laboratory : KCTL Inc.  
 Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea  
 Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132  
 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056  
 CAB Identifier: KR0040, ISED Number: 8035A  
 KOLAS No.: KT231

## 2. Device information

Equipment under test : Wireless Power Transmitter  
 Model : FXRC-05A  
 Frequency range : 127.7 kHz  
 Modulation technique : ASK  
 Power source : DC 17 V  
 Antenna specification : FPCB Coil Antenna  
 Software version : 1.0  
 Hardware version : 1.0  
 Test device serial No. : N/A  
 Operation temperature : 0 °C ~ 40 °C  
 Equipment under test : Wireless Power Transmitter

### 2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
N/A	-	-	-	-

## 2.2. Frequency/channel operations

This device contains the following capabilities:

WPT

Ch.	Frequency (kHz)
01	127.7

Table 2.2.1. WPT

## 2.3. Normal and extreme test conditions

- Ambient Conditions

	Temperature [°C]	Relative humidity [%]
Requirement for tests	0 to 40	20 to 75
Ambient Conditions	22	51

## 3. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of  $k=2$  to indicated a 95 % level of confidence. The measurement data shown herein meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty ( $\pm$ )	
E-Field	3 kHz ~ 10 MHz	11.04 %
H-Field	3 kHz ~ 10 MHz	13.80 %

### 3. RF Exposure

#### 3.1. FCC Regulation

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC rules and Regulations. The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1. According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

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> ]	Averaging Time [minute]
(A) Limits for Occupational / Controlled Exposure				
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	0.163	1.0	6
300 ~ 1 500	/	/	f/300	6
1 500 ~ 15 000	/	/	5	6
(B) Limits for General Population / Uncontrolled Exposure				
0.3 ~ 1.34	614	1.63	*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 ~ 15 000	/	/	1.0	30

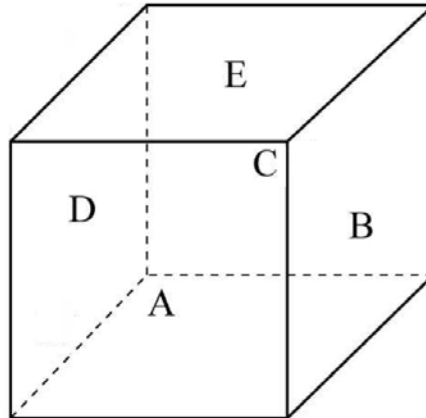
*f*=frequency in MHz, \*=*plane-wave equivalent power density*

Per the guidance of KDB 680106, the E-field and H-field limits shown in the table above are extended down to 100 kHz

## 3.2. Test Set-up

### 3.2.1. Isotropic Probe test setup

The measurement probe (EHP-200A) is a regular hexahedron and supports 3-axis (X, Y and Z) isotropic probe.



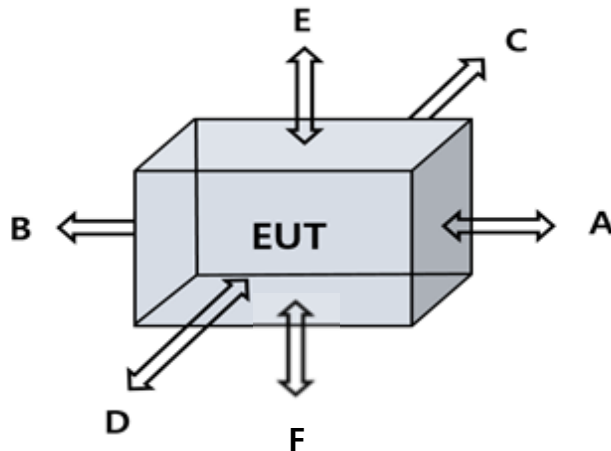
- A: Front of measurement probe
- B: Right of measurement probe
- C: Rear of measurement probe
- D: Left of measurement probe
- E: Top of measurement probe

\*Bottom of measurement probe is not used to measure RF exposure condition owing to connection with a stick.

At 0 cm distance, measurement isotropic probe was investigated by rotating the probe through various angles for one of the EUT's sides as below.

Measurement Point	A	B	C	D	E
Direction	Front	Right	Rear	Left	Top
Measurement Point	A to B	B to C	C to D	D to A	N/A
Direction	Front to Right	Right to Rear	Rear to Left	Left to Front	-
Measurement Point	A to E	B to E	C to E	D to E	N/A
Direction	Front to Top	Right to Top	Rear to Top	Left to Top	-

When the worst angle among all angles was found, RF exposure measurement should be adjusted from worst angle.

**3.2.2. EUT test setup**

- 1) Testing was performed with a calibrated field probe.
- 2) Measurement was performed on each side of the EUT as described per below table.

A	B	C	D	E	F
Right	Left	Rear	Front	Top	Bottom

- 3) Test was performed at the distances and different battery level as indicated on test result table.

## - Test mode

In order to measure E-field, H-field in portable condition, we refer to KDB680106 D01. KDB680106 D01 is a guide for evaluating RF exposure and explains how to measure E-field and H-field strength for the surface of EUT. In addition that more detail measurement guidance was referred to previous PAG.

We measure E-field and H-field level of EUT's surface from 0 cm (contact) to possible reading distance (Not Detected level) per 2cm.

- ✓ Further away: measurement distance of EUT was confirmed until isotropic probe could not read fundamental level anymore (Not detected level).
- ✓ Moving closer: measurement isotropic probe directly contacts with sides of EUT (0 cm)
- ✓ When the worst level of EUT's sides is found out, several measurements should be checked through various distance (2 cm step).

<b>Measurement Probe</b>	EHP-200A (Manufacturer: Narda)
<b>Measurement Method</b>	Direct measurement
<b>Measurement Distance</b>	Surface of the EUT to the center of the probe.



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

- a) Power transfer frequency is less than 1 MHz.
  - ▶ This device is operates at a frequency of 127.7 kHz.
  
- b) Output power from each primary coil is less than or equal to 15 watts.
  - ▶ DC 5.0 V condition / Output power from each primary coil : 0.23 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 includes only single primary and secondary coils.
  
- d) Client device is placed directly in contact with the transmitter.
  - ▶ The client device is placed directly in contact with the transmitter.
  
- e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion)
  - ▶ This device is mobile exposure condition.
  
- f) The aggregate H-field strengths at 15cm surrounding the device and 20cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
  - ▶ The EUT field strength levels < 50 % of the MPE limit 1.63 A/m  
 0.814 A/m (Max) < 0.815 A/m

**3.3. Test configuration (Description of test mode)**

Test case configuration is reported as below.

Test Mode	Description
TM1	EUT + Mobile phone(Battery status: < 10%)
TM2	EUT + Mobile phone(Battery status: < 50%)
TM3	EUT + Mobile phone(Battery status: > 90%)

### 3.4. Test result

**3.4.1. Test mode: test result of rotating the probe through various angles**  
**Distance : 15cm surrounding the device and 20cm above the top surface.**

- E-field measurement results (Sides of probe)

Frequency [MHz]	E-field Measurement [V/m]					Limits [V/m]
	Probe rotation					
	A	B	C	D	E	
0.127 7	<b>0.6490</b>	0.4414	0.5460	0.6002	0.4264	614.00

- H-field measurement results (Sides of probe)

Frequency [MHz]	H-field Measurement [A/m]					Limits [A/m]
	Probe rotation					
	A	B	C	D	E	
0.127 7	<b>0.1284</b>	0.0916	0.1442	0.0962	0.1306	1.63

- E-field measurement results (Rotation of probe)

Frequency [MHz]	E-field Measurement [V/m]								Limits [V/m]
	Probe rotation								
	A to B	B to C	C to D	D to A	A to E	B to E	C to E	D to E	
0.127 7	0.5196	0.4160	0.4730	0.5392	0.5434	0.4270	0.4738	0.3930	614

- H-field measurement results (Rotation of probe)

Frequency [MHz]	H-field Measurement [A/m]								Limits [A/m]
	Probe rotation								
	A to B	B to C	C to D	D to A	A to E	B to E	C to E	D to E	
0.127 7	0.0706	0.1020	0.1576	0.0540	0.0780	0.1032	0.0862	0.0522	1.63

**Note:**

- Worst Case: one of the several angles was found as **A-side** of isotropic probe.

**3.4.2. Test mode: Test result of EUT's sides about the distance**  
**Distance : 15cm surrounding the device and 20cm above the top surface.**

**- E-field measurement results**

Test Mode	Frequency [MHz]	E-field Measurement [V/m]						Limits [V/m]
		EUT sides						
		A	B	C	D	E	F	
TM1	0.127 7	1.160	2.015	2.455	1.059	1.078	0.903	614
TM2	0.127 7	1.139	1.976	2.421	1.020	1.007	0.883	
TM3	0.127 7	0.928	1.743	2.162	0.812	0.936	0.573	

**- H-field measurement results**

Test Mode	Frequency [MHz]	H-field Measurement [A/m]						Limits [A/m]
		EUT sides						
		A	B	C	D	E	F	
TM1	0.127 7	0.141	0.391	0.814	0.146	0.108	0.263	1.63
TM2	0.127 7	0.103	0.371	0.804	0.114	0.070	0.238	
TM3	0.127 7	0.068	0.340	0.803	0.079	0.216	0.216	

**Note:**

- Above RF exposure measurement was performed considering worst position (A-side) of isotropic probe.

**6. Measurement Equipment**

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
E&H Field Probe	narda	EHP-200A	170WX81015	22.01.29
DC Power Supply	AGILENT	E3632A	MY40016393	21.07.28

**End of test report**