

RF EXPOSURE REPORT

Equipment under test Wireless Charging Cradle

Model name HC-D112

FCC ID 2AUG3-HCD112

Applicant Cellreturn Co., Ltd.

Manufacturer Cellreturn Co., Ltd.

Date of test(s) 2019.12.09~2019.12.20

Date of issue 2020.01.30

Issued to

Cellreturn Co., Ltd.

237, Namdongseo-ro, Namdong-gu, Incheon, Republic of Korea

Tel: +82-1688-1026 / Fax: +82-32-714-3895

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 :
	
Yeong-Jun Cho Test engineer	Hyeon-Su Jang Technical manager

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.
The authenticity of the test report, contact shchoi@kes.co.kr

**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

Report No.:

KES-RF-20T0022

Page (2) of (12)

Revision history

Revision	Date of issue	Test report No.	Description
-	2020.01.30	KES-RF-20T0022	Initial

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.
The authenticity of the test report, contact shchoi@kes.co.kr



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

Report No.:

KES-RF-20T0022

Page (3) of (12)

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	9
Appendix A. Measurement equipment		10
Appendix B. Test setup photo		11

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.

The authenticity of the test report, contact shchoi@kes.co.kr

**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

Report No.:

KES-RF-20T0022

Page (4) of (12)

1. General information

Applicant Cellreturn Co., Ltd.
Applicant address 237, Namdongseo-ro, Namdong-gu, Incheon, Republic of 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, Yeoju-si, Gyeonggi-do, Korea
Test Facility FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s): Part 15C
FCC ID: 2AUG3-HCD112
Test device serial No. ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test Wireless Charging Cradle
Frequency 0.189 MHz
Inductive charging technique Magnetic Induction
Model: HC-D112
Antenna specification Internal type(Coil antenna)
Power source AC 120 V(Adapter DC output 5 V)
S/W Version 1.0.0

1.2. Test configuration

The **Cellreturn Co., Ltd. Wireless Charging Cradle FCC ID: 2AUG3-HCD112** was tested according to the specification of EUT, the EUT must comply with following standards.

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

1.3. Test frequency

		Frequency Range
Power source	AC 120 V (Adapter DC output 5 V)	0.189 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

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.
The authenticity of the test report, contact shchoi@kes.co.kr

**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

Report No.:

KES-RF-20T0022

Page (5) of (12)

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
AC/DC Adapter	Apower	APS-0530A	-	Output : DC 5 V, 3A
Hair Alpha- RAY(load)	Cellreturn Co., Ltd.	HA-M2192	-	-

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.
The authenticity of the test report, contact shchoi@kes.co.kr

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.

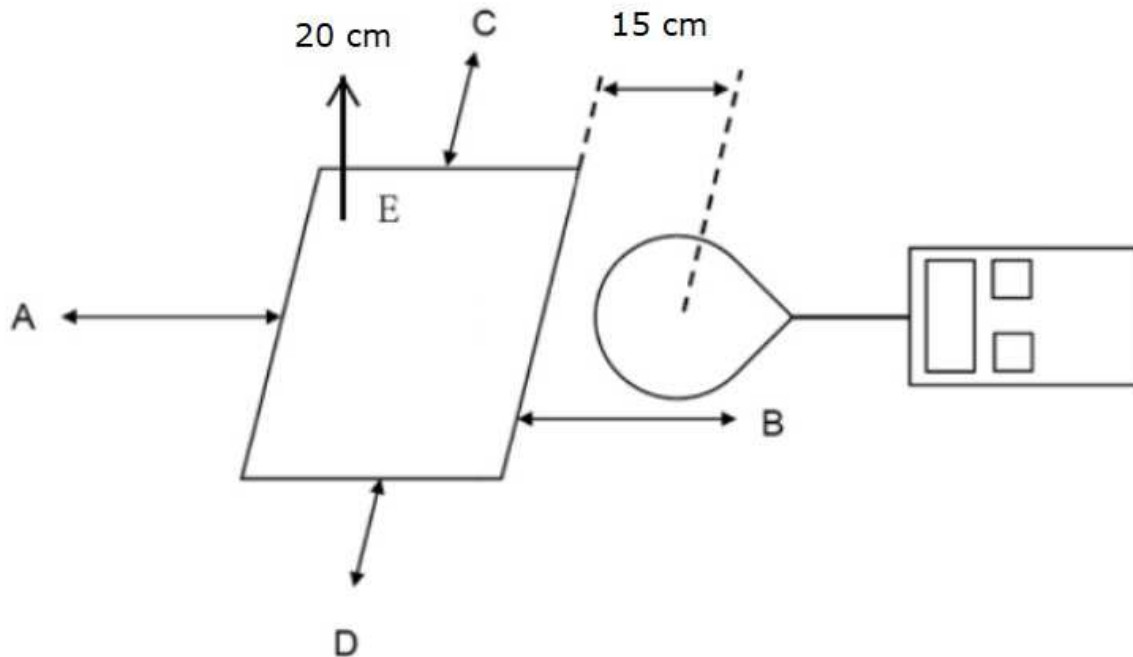
TABLE 1 - Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	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 ²)	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				
<u>0.3-1.34</u>	<u>614</u>	<u>1.63</u>	*(100)	30
1.34 - 30	824/f	2.19/f	*(180/f ²)	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 189 kHz.

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

- Output power from each primary coil : 15 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
0.210 A/m (Max) < 0.815 A/m

2.2. Test results

- E-Field Strength from each edges the EUT

Test Mode		Point A (V/m)	Point B (V/m)	Point C (V/m)	Point D (V/m)	Point E (V/m)
Charging mode	10 % load	0.40	0.38	0.42	0.36	0.37
	50 % load	0.39	0.37	0.42	0.37	0.38
	90 % load	0.39	0.37	0.42	0.37	0.37

- H-Field Strength from each edges the EUT

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

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.
 The authenticity of the test report, contact shchoi@kes.co.kr

**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

Report No.:

KES-RF-20T0022

Page (10) of (12)

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Isotropic electric Field Probe	ETS LINDGREN	HI-6105	00151770	1 year	2020.06.14
Magnetic Field Hitester	HIOKI	FT3470-50	120429926	1 year	2020.11.26

Peripheral device

Device	Manufacturer	Model No.	S/N	Note
Hair Alpha-RAY	Cellreturn Co., Ltd.	HA-M2192	-	-

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.
The authenticity of the test report, contact shchoi@kes.co.kr