

TEST REPORT

KCTL KCTL Inc.

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Report No.:
KR20-SRF0291-B
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KCTL

1. Client

- Name : Smart Guardians Inc.
- Address : #B-1425, 344, Yangcheon-ro, Gangseo-gu, Seoul 07791
South Korea
- Date of Receipt : 2020-10-20

2. Use of Report : Certification

3. Name of Product / Model : BeraShield Charger / BC03AI01

4. Manufacturer / Country of Origin : SHENZHEN UNIL ELECTRONICS
TECHNOLOGY CO LTD / China

5. FCC ID : 2AXTGB03AI01

6. Date of Test : 2020-11-02 to 2020-12-02

7. Location of Test : Permanent Testing Lab On Site Testing (Address: Address of testing location)

8. Test method used : 47 CFR Part 1.1310

9. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Sumin Kim 	Technical Manager Name : Heesu Ahn 
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2020-12-02

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
2020-11-18	Originally issued	-
2020-11-26	Updated	4
2020-12-02	Updated	1, 4, 5, 7-12

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Note. The report No. KR20-SRF0291-A is superseded by the report No. KR20-SRF0291-B.

General remarks for test reports

Nothing significant to report.

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1. General information

Client : Smart Guardians Inc.
 Address : #B-1425, 344, Yangcheon-ro, Gangseo-gu, Seoul 07791 South Korea
 Manufacturer : SHENZHEN UNIL ELECTRONICS TECHNOLOGY CO LTD
 Address : 2/F, B2 Building Huaxiayuan Industrial Zone, Fuping Road, Pingdi Town, Longgang District, Shenzhen City, China
 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
 Industry Canada Registration No. : 8035A
 KOLAS No.: KT231

2. Device information

Equipment under test : BeraShield Charger
 Model : BC03AI01
 Frequency range : 111 kHz ~ 129 kHz
 Modulation technique : AM
 Number of channels : 1 ch
 Power source : DC 5 V, DC 9 V
 Antenna specification : Coil Antenna
 Software version : Rev 1.0
 Hardware version : Rev 1.0
 Operation temperature : -20 °C ~ 50 °C

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
AC/DC Adapter	Dongguan Samsung Electro-mechanics Co., Ltd.	EP-TA20KWK	R37G2V66K91SE3	INPUT : AC 100-240V 50-60 Hz OUTPUT : DC 9.0V 1.67A
AC/DC Adapter	PNTELECOM	MCS-H05EP	PA5Z0023385	INPUT : AC 100-240V 50-60 Hz OUTPUT : DC 5.0V 1.8A
C-type cable	-	-	-	-
Wireless Charger	SHENZHEN UNIL ELECTRONICS TECHNOLOGY CO LTD	BC02AI01	-	-

2.2 Equipment Approval Considerations

Requirements of KDB 680106	Description
(1) Power transfer frequency is less than 1 MHz.	Operating frequency is 111 – 129 kHz
(2) Output power from each primary coil is less than or equal to 15 watts.	Maximum rated charging power is 15W.
(3) 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 device only has a single coil capable of coupling to a single secondary coil in the client device.
(4) Client device is placed directly in contact with the transmitter.	The client device has to be placed directly in contact with the charger.
(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	This device must be powered to operate and therefore is considered a mobile charger, not a portable charger.
(6) 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.	The highest measured H field was 0.1499 A/m which is 9.2 % of the limit.

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)

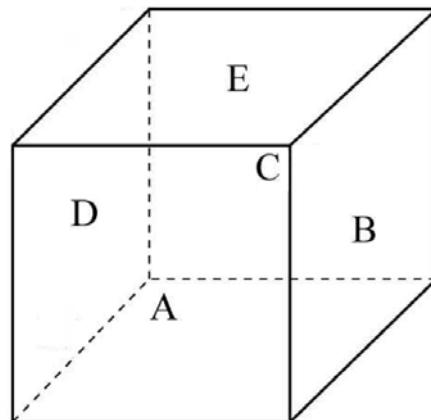
Frequency Range (MHz)	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm ²]	Averaging Time [minute]
(A) Limits for Occupational / Controlled Exposure				
0.3 ~ 3.0	614	1.63	*100	6
3.0 ~ 30	1842/f	4.89/f	*900/f ²	6
30 ~ 300	61.4	0.163	1.0	6
300 ~ 1 500	/	/	f/300	6
1 500 ~ 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 ²	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

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

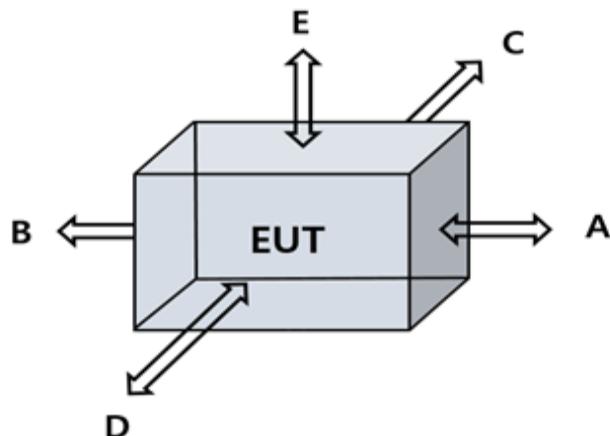
*Bottom of measurement probe is not used to measure RF exposure condition owing to connection with a stick.

At 15 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
15 cm	Front	Right	Rear	Left	Top
Measurement Point	A to B	B to C	C to D	D to A	N/A
15 cm	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
15 cm	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
Right	Left	Rear	Front	Top

- 3) Testing was performed each of test mode.(next page)

To evaluate RF exposure for the mobile operating condition E- and H-fields were measured in accordance with KDB 680106 D01 at 20cm from the top surface and 15cm from all sides.

Measurement Probe	EHP-200A (Manufacturer: Narda)
Measurement Method	15 cm distance measurement (EUT A, B, C, D) 20 cm distance measurement (EUT E)
Measurement Distance	Surface of the EUT to the Center of the Probe.

3.3. Test configuration (Description of test mode)

Test case configuration is reported as below.

Test Mode	Description
TM1	AC/DC adapter(Input voltage DC 5 V) + EUT + BC02AI01(Battery status: < 10%)
TM2	AC/DC adapter(Input voltage DC 5 V) + EUT + BC02AI01(Battery status: < 50%)
TM3	AC/DC adapter(Input voltage DC 5 V) + EUT + BC02AI01(Battery status: > 90%)
TM4	AC/DC adapter(Input voltage DC 9 V) + EUT + BC02AI01(Battery status: < 10%)
TM5	AC/DC adapter(Input voltage DC 9 V) + EUT + BC02AI01(Battery status: < 50%)
TM6	AC/DC adapter(Input voltage DC 9 V) + EUT + BC02AI01(Battery status: > 90%)

3.4. Test result

3.4.1. Test result of rotating the probe through various angles

- E-field measurement results (Sides of probe) _TM1

Frequency [MHz]	Distance [cm]	E-field Measurement [V/m]					Limits [V/m]	
		Probe rotation						
		A	B	C	D	E		
0.112	20	0.311 4	0.320 4	0.292 4	0.301 5	0.511 4	614	

- E-field measurement results (Rotation of probe) _TM1

Frequency [MHz]	Distance [cm]	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		
0.112	20	0.502 1	0.501 0	0.491 7	0.493 4	0.341 9	0.321 4	0.330 6	0.321 1	614	

- H-field measurement results (Sides of probe) _TM1

Frequency [MHz]	Distance [cm]	H-field Measurement [A/m]					Limits [A/m]	
		Probe rotation						
		A	B	C	D	E		
0.112	20	0.042 8	0.081 1	0.044 7	0.038 2	0.083 7	1.63	

- H-field measurement results (Rotation of probe) _TM1

Frequency [MHz]	Distance [cm]	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		
0.112	20	0.059 1	0.060 5	0.061 7	0.062 0	0.051 1	0.031 3	0.042 7	0.039 7	1.63	

- E-field measurement results (Sides of probe) _ TM4

Frequency [MHz]	Distance [cm]	E-field Measurement [V/m]					Limits [V/m]	
		Probe rotation						
		A	B	C	D	E		
0.112	20	0.312 7	0.316 7	0.302 5	0.312 4	0.524 7	614	

- E-field measurement results (Rotation of probe) _ TM4

Frequency [MHz]	Distance [cm]	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		
0.112	20	0.507 4	0.512 1	0.509 2	0.496 7	0.324 7	0.331 6	0.327 4	0.317 1	614	

- H-field measurement results (Sides of probe) _ TM4

Frequency [MHz]	Distance [cm]	H-field Measurement [A/m]					Limits [A/m]	
		Probe rotation						
		A	B	C	D	E		
0.112	20	0.041 7	0.047 5	0.057 4	0.049 7	0.086 1	1.63	

- H-field measurement results (Rotation of probe) _ TM4

Frequency [MHz]	Distance [cm]	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		
0.112	20	0.076 4	0.072 1	0.076 7	0.074 7	0.032 4	0.034 3	0.031 3	0.032 5	1.63	

Note:

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

3.4.2. Test result of EUT's sides about the distance**- E-field measurement results**

Test Mode	Frequency [MHz]	Distance [cm]	E-field Measurement [V/m]					Limits [V/m]	
			EUT sides						
			A	B	C	D	E		
TM1	0.112	15	0.511 4	0.320 5	0.305 7	0.311 6	-	614	
	0.112	20	-	-	-	-	0.467 4		
TM2	0.112	15	0.423 2	0.302 7	0.294 6	0.316 7	-	614	
	0.112	20	-	-	-	-	0.443 1		
TM3	0.112	15	0.313 7	0.278 0	0.236 7	0.306 4	-	614	
	0.112	20	-	-	-	-	0.336 4		
TM4	0.112	15	0.524 7	0.492 4	0.391 6	0.326 7	-	614	
	0.112	20	-	-	-	-	0.472 4		
TM5	0.112	15	0.435 4	0.407 6	0.397 5	0.401 1	-	614	
	0.112	20	-	-	-	-	0.431 6		
TM6	0.112	15	0.369 7	0.342 4	0.312 4	0.323 1	-	614	
	0.112	20	-	-	-	-	0.347 6		

- H-field measurement results

Test Mode	Frequency [MHz]	Distance [cm]	H-field Measurement [A/m]					Limits [A/m]	
			EUT sides						
			A	B	C	D	E		
TM1	0.112	15	0.083 7	0.078 7	0.051 1	0.046 3	-	1.63	
	0.112	20	-	-	-	-	0.149 9		
TM2	0.112	15	0.076 8	0.066 6	0.040 5	0.048 0	-	1.63	
	0.112	20	-	-	-	-	0.141 2		
TM3	0.112	15	0.074 2	0.065 9	0.041 0	0.047 9	-	1.63	
	0.112	20	-	-	-	-	0.146 8		
TM4	0.112	15	0.086 1	0.080 1	0.076 5	0.054 1	-	1.63	
	0.112	20	-	-	-	-	0.132 1		
TM5	0.112	15	0.074 5	0.070 5	0.072 7	0.062 4	-	1.63	
	0.112	20	-	-	-	-	0.131 1		
TM6	0.112	15	0.069 6	0.063 2	0.060 7	0.057 9	-	1.63	
	0.112	20	-	-	-	-	0.126 7		

Note:

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

4. Measurement Equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
E&H Field Probe	Narda	EHP-200A	170WX81015	21.02.14

End of test report