# RF EXPOSURE REPORT

| | |
|---|---|
| **Equipment under test** | CUPLUS 2 |
| **Model name** | KP-CP2 |
| **FCC ID** | 2AUFG-KP-CP2 |
| **Applicant** | KORSIAM |
| **Manufacturer** | KORSIAM |
| **Date of test(s)** | 2019.10.17~2019.10.22 |
| **Date of issue** | 2019.10.31 |

**Issued to**

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| **Test and report completed by :** | **Report approval by :** |
|---|---|
| | |
| Won-Jun Sim<br>Test engineer | Hyeon-Su Jang<br>Technical manager |

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# Revision history

| Revision | Date of issue | Test report No. | Description |
|---|---|---|---|
| - | 2019.10.31 | KES-RF-19T0167 | Initial |

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# 1. General information

| | |
|---|---|
| Applicant | KORSIAM |
| Applicant address | B-202, 39, Jinbong-ro, 143beon-gil, Bucheon-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<br>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: | 2AUFG-KP-CP2 |
| Test device serial No. | ☒ Production ☐ Pre-production ☐ Engineering |

## 1.1. EUT description

| | |
|---|---|
| Equipment under test | CUPLUS 2 |
| Frequency | 0.110 ㎒ ~ 0.205 ㎒ |
| Modulation type | AM |
| Model: | KP-CP2 |
| Antenna specification | Internal type(Coil antenna) |
| Power source | DC 12V |

## 1.2. Test configuration

The **KORSIAM//CUPLUS// FCC ID: 2AUFG-KP-CP2** 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 12 V | 0.110 ㎒ ~ 0.205 ㎒ |

## 1.4. Test mode

| Mode | Description |
|---|---|
| Charging mode<br>With Client device | 100% full charging of Battery. |
| | Less than 50% of Battery |
| | Less than 1% of Battery |

## 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 |
|---|---|---|---|---|
| - | - | - | - | - |

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## 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.

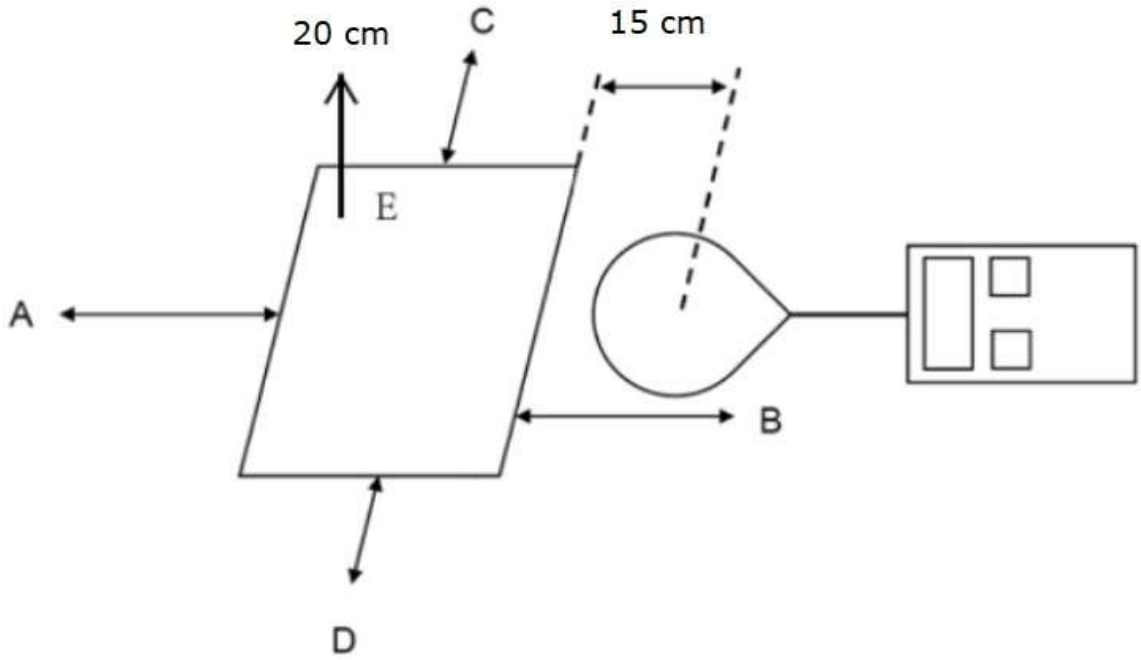
TABLE 1 - Limits for Maximum Permissible Exposure (MPE)

| 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 | | | | |
| **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 – 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 that 1 ㎒.

- The device operates at a frequency of 110 ㎑ to 205 ㎑.

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

- Output power from each primary coil : 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 ㎝ surrounding the device and 20 ㎝ 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 ㎝ < 50 % of the MPE H-Field Strength limit 1.63 A/m
0.078 A/m (Max) < 0.815 A/m

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## 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) | Point F (V/m) |
|---|---|---|---|---|---|---|---|
| Charging mode | Less than 1% of Battery | 0.739 | 1.068 | 0.753 | 0.747 | 0.716 | 0.777 |
| | Less than 50% of Battery | 0.742 | 1.038 | 0.791 | 0.774 | 0.790 | 0.727 |
| | 100% full charging of Battery. | 0.726 | 1.041 | 0.705 | 0.809 | 0.807 | 0.747 |

### - 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) | Point F (A/m) |
|---|---|---|---|---|---|---|---|
| Charging mode | Less than 1% of Battery | 0.071 | 0.062 | 0.065 | 0.058 | 0.055 | 0.072 |
| | Less than 50% of Battery | 0.068 | 0.056 | 0.070 | 0.050 | 0.049 | 0.066 |
| | 100% full charging of Battery. | 0.078 | 0.061 | 0.069 | 0.052 | 0.053 | 0.061 |

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## 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 |
| Exposure Level Meter | Narda | ELT-400 | N-0538 | 1 year | 2019.11.12 |

## Peripheral device

| Device | Manufacturer | Model No. | Note |
|---|---|---|---|
| Client device | Samsung | SM-N950N | Mobile Phone |

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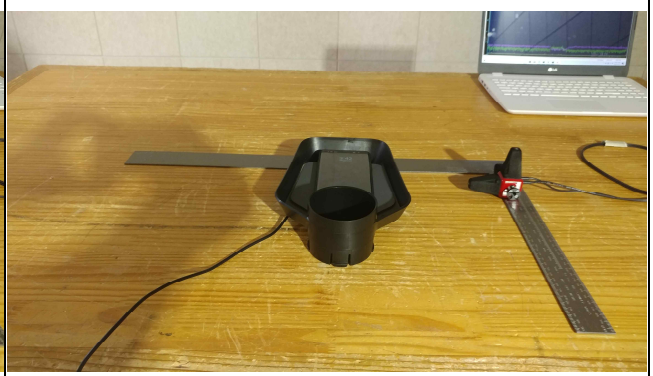
## Appendix B. Test setup photo

| E-Field | |
|---|---|
| **Position A** | **Position B** |
| | |
| **Position C** | **Position D** |
| |  |
| **Position E** | |
| | |

| H-Field | |
|---|---|
| **Position A** | **Position B** |
| | |
| **Position C** | **Position D** |
| | |
| **Position E** | |
| | |

**The end of test report.**

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