

RF EXPOSURE REPORT

Equipment under test Wireless Charging

Model name EA1702

FCC ID 2ACCCEA1702

Applicant KOMATECH Co.,Ltd.

Manufacturer KOMATECH Co.,Ltd.

Date of test(s) 2018.01.19~2018.01.25



Date of issue 2018.01.26

Issued to

KOMATECH Co.,Ltd.
62-16 19th st, Gamjeong-ro,
Gimpo-si, Gyeonggi-do, Korea
Tel: +82-31-999-3940 / Fax: +82-31-997-7900

Issued by

KES Co., Ltd.
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,
Gyeonggi-do, 14057, Korea
473-21, Gayeo-ro, Yeoju-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 |

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The results shown in this test report refer only to the sample(s) tested unless otherwise stated.



Revision history

| Revision | Date of issue | Test report No. | Description |
|----------|---------------|-----------------|-------------|
| - | 2018.01.26 | KES-RF-18T0017 | Initial |



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1. General information

Applicant KOMATECH Co.,Ltd.
Applicant address 62-16 19th st, Gamjeong-ro, Gimpo-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: 2ACCCEA1702
Test device serial No. ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test Wireless Charging
Frequency 0.110 MHz ~ 0.145 MHz
Modulation type ASK
Model: EA1702
Antenna specification Internal type(Coil antenna)
Power source DC 12.0 V

1.2. Test configuration

The **KOMATECH Co.,Ltd. Wireless Charging FCC ID: 2ACCCEA1702** 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 V02

1.3. Test frequency

| | | Frequency Range |
|--------------|-----------|-----------------------|
| Power source | DC 12.0 V | 0.110 MHz ~ 0.145 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 |



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 | DongGuan RulHeng Electronic Technology Co., LTD. | RH-120200-1KO | - | Output : 12V, 2A |

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.

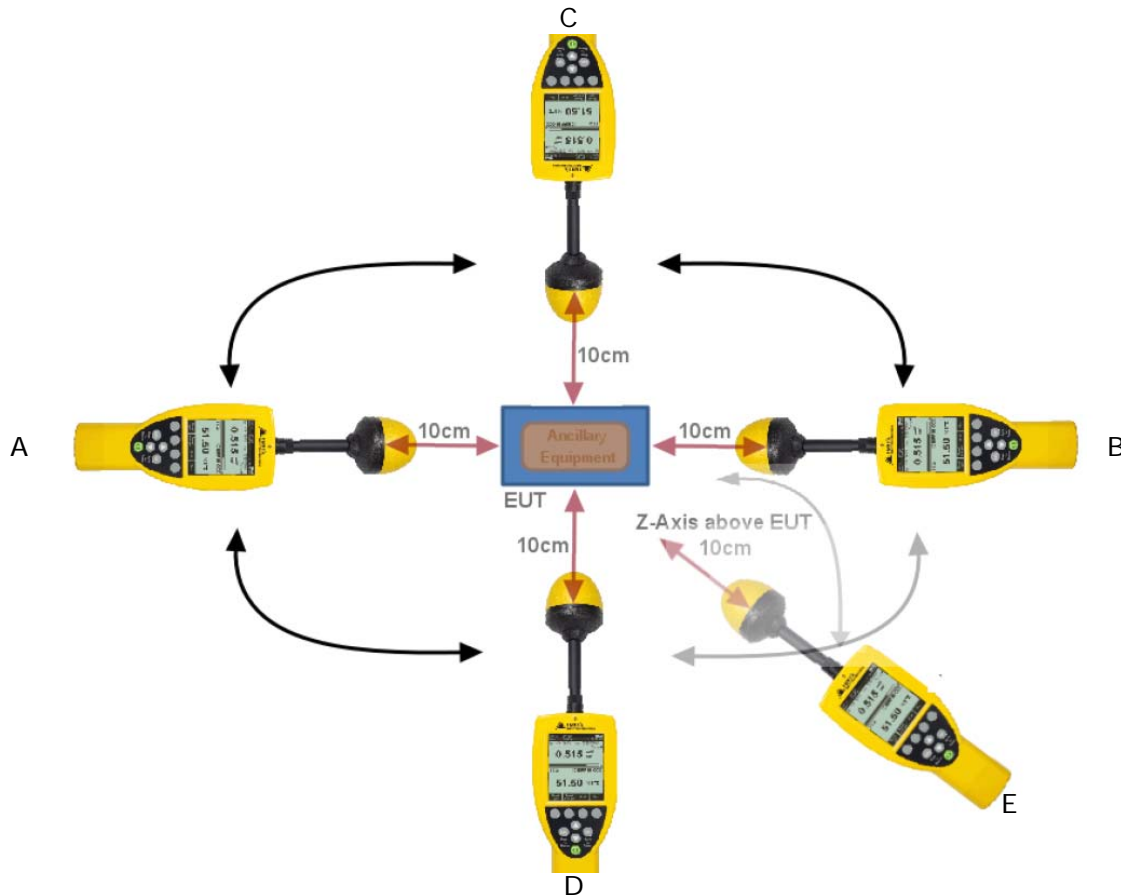
TABLE 1 - Limits for Maximum Permissible Exposure (MPE)

| 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 10 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.
5. The EUT was measured according to the KDB 680106 D01v02.

Note.

Equipment Approval Considerations item 5.2 of KDB 680106 D01 v02.

- a) Power transfer frequency is less than 1 MHz.
- The device operates at a frequency of 110 kHz to 145 kHz.
- b) Output power from each primary coil is less than 5 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 inserted in or placed directly in contact with the transmitter.
- Client device is placed directly in contact with the transmitter.
- e) The maximum coupling surface area of the transmit (charging) device is between 60 cm² and 400 cm².
- The EUT coupling surface area :
- (Type : Circle)
- $$\pi \times \text{Radius of width}^2 (\text{cm}^2) = 3.14 \times 12.00 (\text{cm})^2 = 452.16 \text{ cm}^2$$
- f) Aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30 % of the MPE limit.
- Refer to following test results.
- The EUT E-Field Strength levels at 10 cm < 30 % of the MPE E-Field Strength limit 614 V/m
6.33 V/m (Max. at 10 cm) < 184.20 V/m
- The EUT H-Field Strength levels at 10 cm < 30 % of the MPE H-Field Strength limit 1.63 A/m
0.81 A/m (Max. at 10 cm) ≥ 0.489 A/m

2.2. Test results

- E-Field Strength at 10 cm from each edges the EUT

15W

| 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) |
|------------------|-----------|------------------|------------------|------------------|------------------|------------------|------------------|
| Test Frequency | | 0.125MHz | | | | | |
| Charging mode | 10 % load | 4.85 | 4.84 | 4.92 | 4.90 | 6.25 | 6.33 |
| | 50 % load | 4.81 | 4.79 | 4.86 | 4.54 | 6.17 | 6.28 |
| | 90 % load | 4.78 | 4.80 | 4.71 | 4.52 | 6.15 | 6.22 |

- H-Field Strength at 10 cm from each edges the EUT

15W

| 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) |
|------------------|-----------|------------------|------------------|------------------|------------------|------------------|------------------|
| Test Frequency | | 0.125MHz | | | | | |
| Charging mode | 10 % load | 0.27 | 0.28 | 0.25 | 0.27 | 0.78 | 0.81 |
| | 50 % load | 0.26 | 0.28 | 0.26 | 0.27 | 0.68 | 0.67 |
| | 90 % load | 0.26 | 0.28 | 0.25 | 0.26 | 0.66 | 0.67 |

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- Power Density at 10 cm from each edges the EUT

15W

| Test Mode | | Point A (mW/cm ²) | Point B (mW/cm ²) | Point C (mW/cm ²) | Point D (mW/cm ²) | Point E (mW/cm ²) | Point F (mW/cm ²) |
|------------------|-----------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Test Frequency | | 0.125MHz | | | | | |
| Charging mode | 10 % load | 2.73 | 2.94 | 2.34 | 2.73 | 22.80 | 24.58 |
| | 50 % load | 2.53 | 2.94 | 2.53 | 2.73 | 17.33 | 16.82 |
| | 90 % load | 2.53 | 2.94 | 2.34 | 2.53 | 16.32 | 16.82 |

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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 | 2018.03.21 |
| Magnetic Field Sensor | HIOKI | 0850-B1 | 3471 | 1 year | 2018.06.12 |
| Magnetic Field Hitester | HIOKI | FT3470-50 | 140430999 | 1 year | 2018.06.12 |

Peripheral device

| Device | Manufacturer | Model No. | S/N | Note |
|----------------|--|---------------|-----|------------------|
| AC/DC Adapter | DongGuan RulHeng Electronic Technology Co., LTD. | RH-120200-1KO | | Output : 12V, 2A |
| 10/50/90% Load | PNTELECOM CO., LTD | N/A | N/A | N/A |