

# TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID : 2AJKSKSC100H

Equipment Under Test : WIRELESS CHARGER  
Model Name : KSC-100H  
Applicant : Kum Oh Electronics Co., Ltd.  
Manufacturer : Kum Oh Electronics Co., Ltd.  
Date of Receipt : 2017.06.29  
Date of Test(s) : 2017.07.12 ~ 2017.07.18  
Date of Issue : 2017.07.21

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Jinhyoung Cho

Date:

2017.07.21

Technical  
Manager:



Harim Lee

Date:

2017.07.21

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**SGS Korea Co., Ltd. (Gunpo Laboratory)** 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 1. General information

### 1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Phone No. : +82 31 688 0901

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### 1.2. Details of applicant

Applicant : Kum Oh Electronics Co., Ltd.

Address : 35, Gilju-ro 444beon-gil, Wonmi-gu, Bucheon-si, Gyeonggi-do, 14556, Korea

Contact Person : Park, Chan-Hong

Phone No. : +82 10 4407 6607

### 1.3. Description of EUT

|                       |                             |
|-----------------------|-----------------------------|
| Kind of Product       | WIRELESS CHARGER            |
| Model Name            | KSC-100H                    |
| Power Supply          | DC 5.0 V                    |
| Frequency Range       | 120 kHz ~ 190 kHz           |
| Operating Temperature | -20 °C ~ 60 °C              |
| Antenna Type          | Inductive loop coil antenna |
| H/W Version           | Rev0.5A                     |
| S/W Version           | 0923                        |

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**1.4. Test Equipment List**

| Equipment               | Manufacturer          | Model                                | S/N           | Cal. Date     | Cal. Interval | Cal. Due      |
|-------------------------|-----------------------|--------------------------------------|---------------|---------------|---------------|---------------|
| E-Field Probe           | D.A.R.E!! Instruments | RadiSense 4                          | 13I00444SNO04 | Aug. 02, 2016 | Annual        | Aug. 02, 2017 |
| Magnetic Field Sensor   | HIOKI                 | 0850-C1                              | 3472          | Jun. 26, 2017 | Annual        | Jun. 26, 2018 |
| Magnetic Field Hitester | HIOKI                 | FT3470-50                            | 140430999     | Jun. 12, 2017 | Annual        | Jun. 12, 2018 |
| DC Power Supply         | R&S                   | HMP2020                              | 019922876     | Apr. 26, 2017 | Annual        | Apr. 26, 2018 |
| Anechoic Chamber        | SY Corporation        | L × W × H<br>(9.6 m × 6.4 m × 6.6 m) | N/A           | N.C.R.        | N/A           | N.C.R.        |

**► Support equipment**

| Description           | Manufacturer                  | Model    | FCC ID     |
|-----------------------|-------------------------------|----------|------------|
| Smart Wearable Device | Samsung Electronics Co., Ltd. | SM-R765U | A3LSMR765U |

**1.5. Test report revision**

| Revision | Report number        | Date of Issue | Description |
|----------|----------------------|---------------|-------------|
| 0        | F690501/RF-RTL011648 | 2017.07.21    | Initial     |

**1.6. Worst case of test configurations**

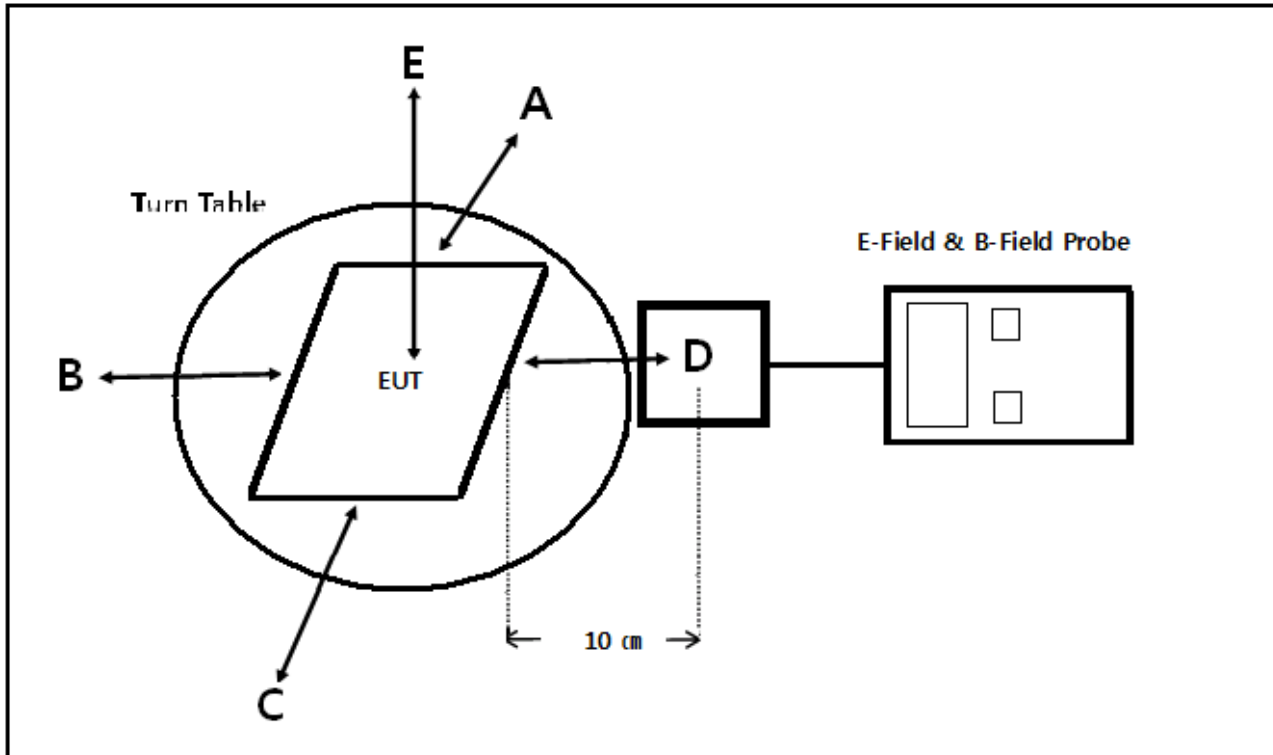
In order to check all kinds of possible configurations, EUT was evaluated with appropriate client and under each charging condition as below table.

| EUT configuration                                                                 | Description                    |
|-----------------------------------------------------------------------------------|--------------------------------|
| Charging Mode<br>with client device<br>(Model : SM-R765U,<br>FCC ID : A3LSMR765U) | Less than 1 % of battery       |
|                                                                                   | Less than 50 % of battery      |
|                                                                                   | 100 % full charging of battery |

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## 2. Test Result

### 2.1. Test Setup



### 2.2. Measurement procedure

- The RF exposure test was performed in anechoic chamber.
- The measurement probe was placed at test distance (10 cm) which is between the edge of the charger and the geometric center of probe.
- The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E, F) were completed.
- The EUT was measured according to the dictates of KDB 680106 D01 v02.

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### 2.3. 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 120 kHz to 190 kHz.
- b) Output power from each primary coil is less than 5 watts
  - Output power from primary coil : 5 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 one primary coils is to detect and allow only between individual pairs of coils.
- 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 cm<sup>2</sup> and 400 cm<sup>2</sup>.
  - The EUT coupling surface area :  
 Radius of width<sup>2</sup> (cm<sup>2</sup>) = 4.665 × 6.372 (cm) = 29.72 cm<sup>2</sup>, 29.72 cm<sup>2</sup> < 60 cm<sup>2</sup> < 400 cm<sup>2</sup>
- 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  
 13.20 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  
 0.100 A/m (Max. at 10 cm) < 0.489 A/m

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## 2.4. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

§1.1310 : The criteria listed in the following table shall be used to evaluate the environment 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 FCC part 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 <sup>2</sup> ) | 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 <sup>2</sup> )              | 6                      |
| 30 – 300                                                | 61.4                         | 0.163                         | 1.0                                 | 6                      |
| 300 – 1 500                                             |                              |                               | f/300                               | 6                      |
| 1 500 – 100 000                                         |                              |                               | 5                                   | 6                      |
| (B) Limits for General Population / Uncontrol Exposures |                              |                               |                                     |                        |
| <b><u>0.3 – 1.34</u></b>                                | <b><u>614</u></b>            | <b><u>1.63</u></b>            | *(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 – 100 000                                         |                              |                               | 1.0                                 | 30                     |

f = frequency in MHz

\* = Plane wave equivalent power density

Note 1 to Table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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## 2.5. E and H field strength

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

### 2.5.1. E-Field Strength at 10 cm from the edges surrounding the EUT

Test condition: Charging mode (less than 1 % battery status of client device)

| Frequency Range<br>(kHz) | Probe Position<br>A<br>(V/m) | Probe Position<br>B<br>(V/m) | Probe Position<br>C<br>(V/m) | Probe Position<br>D<br>(V/m) | Probe Position<br>E<br>(V/m) | Probe Position<br>F<br>(V/m) | Limits<br>(V/m) |
|--------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------|
| 120 ~ 190                | 5.97                         | 7.58                         | 8.19                         | 6.67                         | 5.75                         | 13.20                        | 614.00          |

Test condition: Charging mode (less than 50 % battery status of client device)

| Frequency Range<br>(kHz) | Probe Position<br>A<br>(V/m) | Probe Position<br>B<br>(V/m) | Probe Position<br>C<br>(V/m) | Probe Position<br>D<br>(V/m) | Probe Position<br>E<br>(V/m) | Probe Position<br>F<br>(V/m) | Limits<br>(V/m) |
|--------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------|
| 120 ~ 190                | 5.93                         | 7.50                         | 8.31                         | 6.51                         | 5.50                         | 12.80                        | 614.00          |

Test condition: Charging mode (100 % battery status of client device)

| Frequency Range<br>(kHz) | Probe Position<br>A<br>(V/m) | Probe Position<br>B<br>(V/m) | Probe Position<br>C<br>(V/m) | Probe Position<br>D<br>(V/m) | Probe Position<br>E<br>(V/m) | Probe Position<br>F<br>(V/m) | Limits<br>(V/m) |
|--------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------|
| 120 ~ 190                | 6.11                         | 7.42                         | 8.21                         | 6.64                         | 5.79                         | 13.10                        | 614.00          |

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## 2.5.2. H-Field Strength at 10 cm from the edges surrounding the EUT

Test condition: Charging mode (less than 1 % battery status of client device)

| Frequency Range (kHz) | Probe Position A (A/m) | Probe Position B (A/m) | Probe Position C (A/m) | Probe Position D (A/m) | Probe Position E (A/m) | Probe Position F (A/m) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 120 ~ 190             | 0.08                   | 0.09                   | 0.08                   | 0.09                   | 0.09                   | 0.09                   | 1.630        |

Test condition: Charging mode (less than 50 % battery status of client device)

| Frequency Range (kHz) | Probe Position A (A/m) | Probe Position B (A/m) | Probe Position C (A/m) | Probe Position D (A/m) | Probe Position E (A/m) | Probe Position F (A/m) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 120 ~ 190             | 0.09                   | 0.08                   | 0.07                   | 0.09                   | 0.08                   | 0.08                   | 1.630        |

Test condition: Charging mode (100 % battery status of client device)

| Frequency Range (kHz) | Probe Position A (A/m) | Probe Position B (A/m) | Probe Position C (A/m) | Probe Position D (A/m) | Probe Position E (A/m) | Probe Position F (A/m) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 120 ~ 190             | 0.08                   | 0.10                   | 0.08                   | 0.09                   | 0.09                   | 0.09                   | 1.630        |

Note;

1. H-field strength (A/m) = B-field (μT) / 1.25

**- End of the Test Report -**

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