

TEST REPORT

of

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

FCC ID : A3LEPYO600

Equipment Under Test : WIRELESS CHARGER
Model Name : EP-YO600
Applicant : Samsung Electronics Co., Ltd.
Manufacturer : Samsung Electronics Co., Ltd.
Date of Receipt : 2017.07.06
Date of Test(s) : 2017.07.10 ~ 2017.07.18
Date of Issue : 2017.07.26

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

Tested By:


Jaeha Chung

Date:

2017.07.26

Technical
Manager:


Hyunchoe You

Date:

2017.07.26

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RTT5041-19(2017.07.10)(0)

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A4(210 mm x 297 mm)

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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 : Samsung Electronics Co., Ltd.

Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea

Contact Person : Shin, Hyo-Hoon

Phone No. : +82 31 301 1613

1.3. Details of manufacturer

Company : Samsung Electronics Co., Ltd.

Address : Yen Phong 1 Industrial park, Yen Phong District Bac Ninh Province VIETNAM

1.4. Description of EUT

Kind of Product	WIRELESS CHARGER
Model Name	EP-YO600
Power Supply	DC 5.0 V
Frequency Range	120 kHz ~ 190 kHz
Antenna Type	Inductive loop coil antenna
H/W Version	0.5
S/W Version	gearpop_c0622_OTP0

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1.5. 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 (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-R600	A3LSMR600

1.6. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL011667	2017.07.26	Initial

1.7. 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 with client device (Model : SM-R600, FCC ID : A3LSMR600)	Less than 1 % of battery
	Less than 50 % of battery
	100 % full charging of battery

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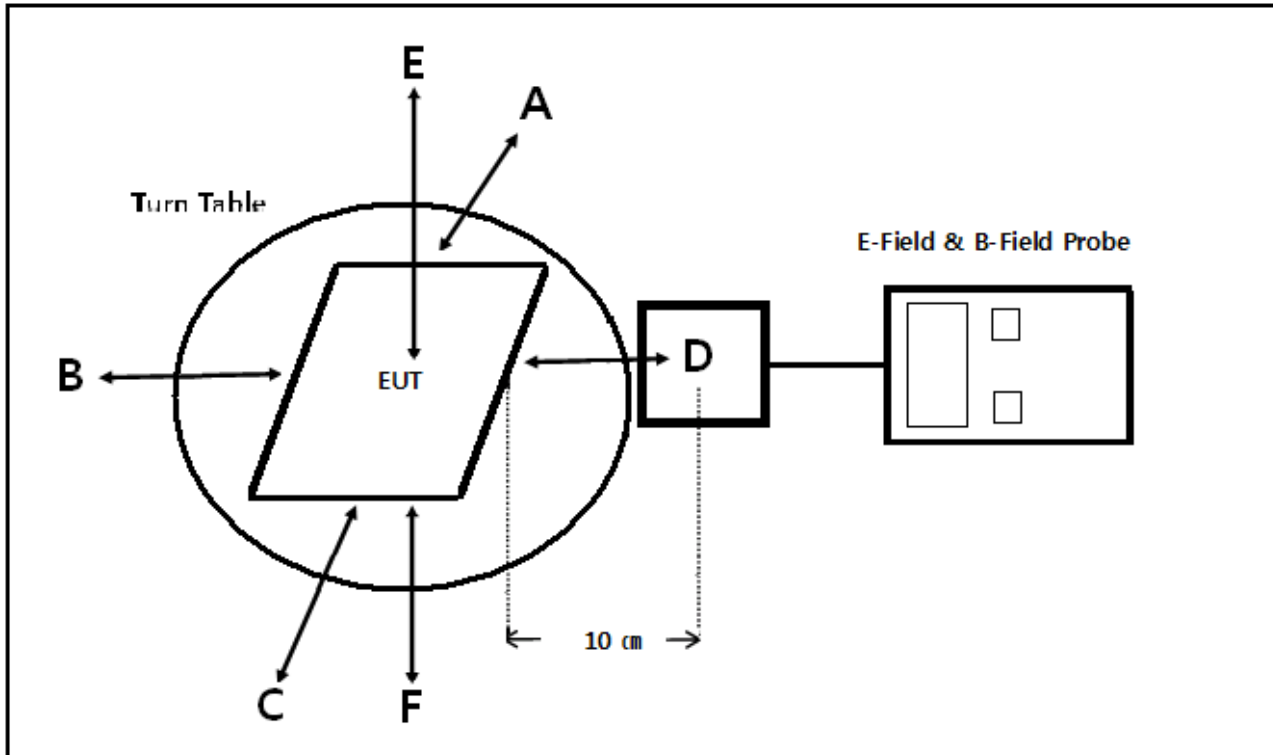
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2. Test Result

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 cm² and 400 cm².
 - The EUT coupling surface area : 4.623 cm (W) × 5.132 cm (H) = 23.725 cm²,
23.725 cm² < 60 cm²
- 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
 18.70 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
 0.360 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 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	0.163	1.0	6
300 – 1 500			f/300	6
1 500 – 100 000			5	6
(B) Limits for General Population / Uncontrol Exposures				
<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

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 (kHz)	Probe Position A (V/m)	Probe Position B (V/m)	Probe Position C (V/m)	Probe Position D (V/m)	Probe Position E (V/m)	Probe Position F (V/m)	Limits (V/m)
120 ~ 190	6.42	18.30	6.63	6.52	8.11	3.42	614.00

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

Frequency Range (kHz)	Probe Position A (V/m)	Probe Position B (V/m)	Probe Position C (V/m)	Probe Position D (V/m)	Probe Position E (V/m)	Probe Position F (V/m)	Limits (V/m)
120 ~ 190	6.21	18.20	6.58	6.67	8.25	3.72	614.00

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

Frequency Range (kHz)	Probe Position A (V/m)	Probe Position B (V/m)	Probe Position C (V/m)	Probe Position D (V/m)	Probe Position E (V/m)	Probe Position F (V/m)	Limits (V/m)
120 ~ 190	6.18	18.70	6.36	6.72	7.95	3.55	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	0.10	0.32	0.08	0.08	0.07	0.06	1.63

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	0.10	0.30	0.08	0.06	0.08	0.06	1.63

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	0.12	0.36	0.09	0.08	0.08	0.08	1.63

Note;

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

- End of the Test Report -

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