

MPE TEST REPORT

OF

FCC CFR 47 part 1, 1.1307(b), 1.1310 / IC RSS-102 Issue 4

FCC ID: 2AAJPEP-P100IEWEGWW
IC Certification: 11207A-EPP100IEWE

Equipment Under Test : S Charger pad
Model Name : EP-P100IEWEGWW
Serial No. : N/A
Applicant : Hansol Technics Co., Ltd.
Manufacturer : Hansol Technics Co., Ltd.
Date of Test(s) : 2013.06.03 ~ 2013.06.07
Date of Issue : 2013.07.05

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

Tested By:



Alvin Kim

Date:

2013.07.05

Approved By:



Feel Jeong

Date:

2013.07.05

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1. General information

1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 705, Dongchun-Dong Sooji-Gu, Yongin-Shi, Kyungki-Do, South Korea.
- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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1.2. Details of applicant

Applicant : Hansol Technics Co., Ltd.

Address : 55, Hansam-ro, Deoksan-myeon, Jincheon-gun, Chungcheongbuk-do, Korea

Contact Person : Lee, Weon-seo

Phone No. : +82 43 530 8554

1.3. Description of EUT

| | |
|-------------------------------|--------------------------------------------------------|
| Kind of Product | S Charger Pad |
| Model Name | EP-P100IEWEGWW |
| Serial Number | N/A |
| Power Supply | AC 120 V (Used adapter: DC 5 V / 2 A) |
| Frequency Range | 115 kHz ~ 205 kHz |
| Operating Conditions | -20 °C ~ 50 °C |
| Maximum Field strength | 84.47 dB μ V/m at 3 m / 4.47 dB μ V/m at 300 m |
| Antenna Type | Inductive loop coil antenna |

1.4. Declarations by the manufacturer

- Operation temperature: -20 °C ~ 50 °C

1.5. Test report revision

| Revision | Report number | Description |
|----------|------------------------|--------------------------------|
| 0 | F690501/RF-RTL006613 | Initial |
| 1 | F690501/RF-RTL006613-1 | Modify applicant's information |
| 2 | F690501/RF-RTL006613-2 | Modify typo error |

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1.6. Test Equipment List

| Equipment | Manufacturer | Model | S/N | Cal Date | Cal Interval | Cal Due. |
|----------------------|----------------|--------------------------------------|-------------|---------------|--------------|---------------|
| Spectrum Analyzer | R&S | FSW | 100578 | May. 20, 2013 | Annual | May. 20, 2014 |
| Loop Antenna | R&S | HZ-10 | 100143 | Jun. 15, 2012 | Biennial | Jun. 15, 2014 |
| E-Field Probe | Schaffner | 2244/90.20 | AE-0023 | Sep. 10, 2012 | Annual | Sep. 10, 2013 |
| EM Radiation Meter | Schaffner | EMC-20 | AR-0044 | Sep. 10, 2012 | Annual | Sep. 10, 2013 |
| B-Field Probe | Narda | BN 2300/90.10 | J-0025 | Jan. 21, 2013 | Annual | Jan. 21, 2014 |
| Exposure Level Meter | Narda | ELT-400 | J-0015 | Jan. 21, 2013 | Annual | Jan. 21, 2014 |
| Turn Table | INN-CO | DS 1200 S | N/A | N/A | N/A | N.C.R. |
| Anechoic Chamber | SY Corporation | L x W x H (9.6 m x 6.4 m x 6.6 m) | N/A | N/A | N/A | N.C.R. |
| Shield Box | Tescom | TC-5916A | 5916A000279 | N/A | N/A | N.C.R. |
| Mobile Test Unit | Agilent | E5515C | GB43345198 | Mar. 29, 2013 | Annual | Mar. 29, 2014 |

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 | Charging current (mA) | Mobile phone | Description |
|----------------------------------------------------|-----------------------|-------------------------|-------------------------------|
| Charging Mode ¹⁾ with resistive load | 300 | | Minimum resistive load |
| | 600 | | Medium resistive load |
| | 1 000 | | Maximum resistive load |
| Charging Mode ³⁾ with client device | | SHV-E300S ²⁾ | Less than 1% of battery |
| | | SHV-E300S | Less than 50% of battery |
| | | SHV-E300S | 100% full charging of battery |

- Test Jig was used during the test to satisfy each current status by using resistive loads.
Output voltage = 5 V, Output current = 300 mA / 600 mA / 1 000 mA
 - (Maximum load) $16.67 \Omega = 5 \text{ V} / 0.3 \text{ A}$
 - (Medium load) $8.33 \Omega = 5 \text{ V} / 0.6 \text{ A}$
 - (Minimum load) $5.00 \Omega = 5 \text{ V} / 1.0 \text{ A}$
- FCC ID: A3LSHVE300SA (Client device: SHV-E300S)
- WPC device with client device was investigated each battery status and compared in two operating configurations.

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Battery status during charging condition

- Less than 1% of battery
- Less than 50% of battery
- 100% of battery



Plot#1 – less than 1% of battery

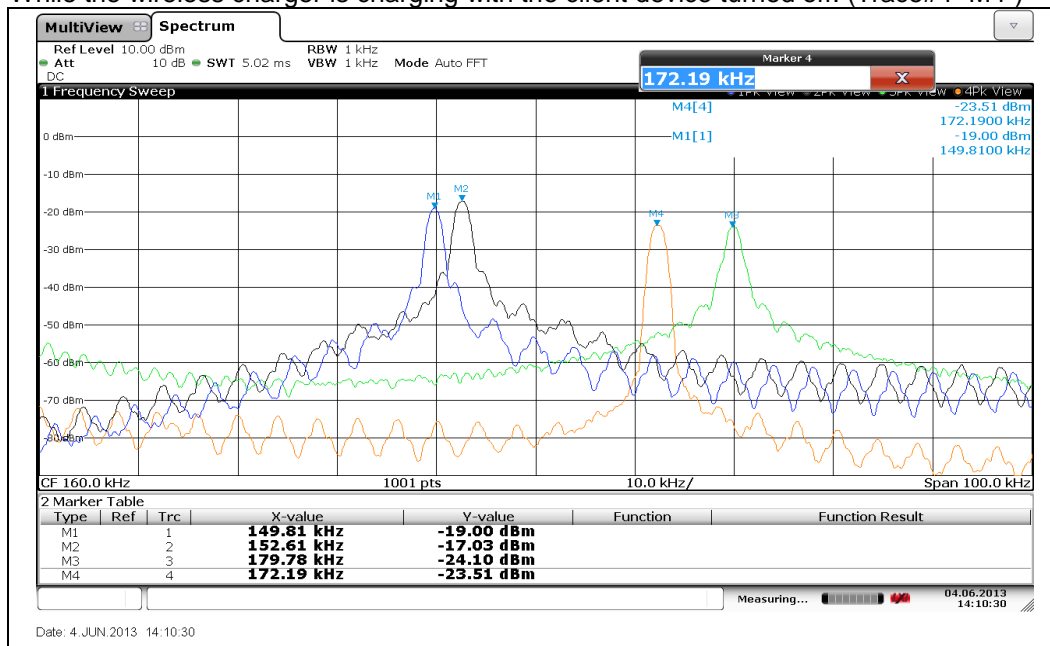
Plot#2 – less than 50% of battery

Plot#3 – 100% of battery

Operating configurations

- While the client device was in airplane mode (Trace#1 “M1”)
- While the client device was connected to an active data connection (Trace#2 “M2”)

The device was tested under all modes and bands like 2G and 3G.
In the result, **GSM900 / GPRS / 2 TX** was found in **Middle channel**.
- While the wireless charger is charging without the client device. (Trace#3 “M3”)
- While the wireless charger is charging with the client device turned off. (Trace#4 “M4”)



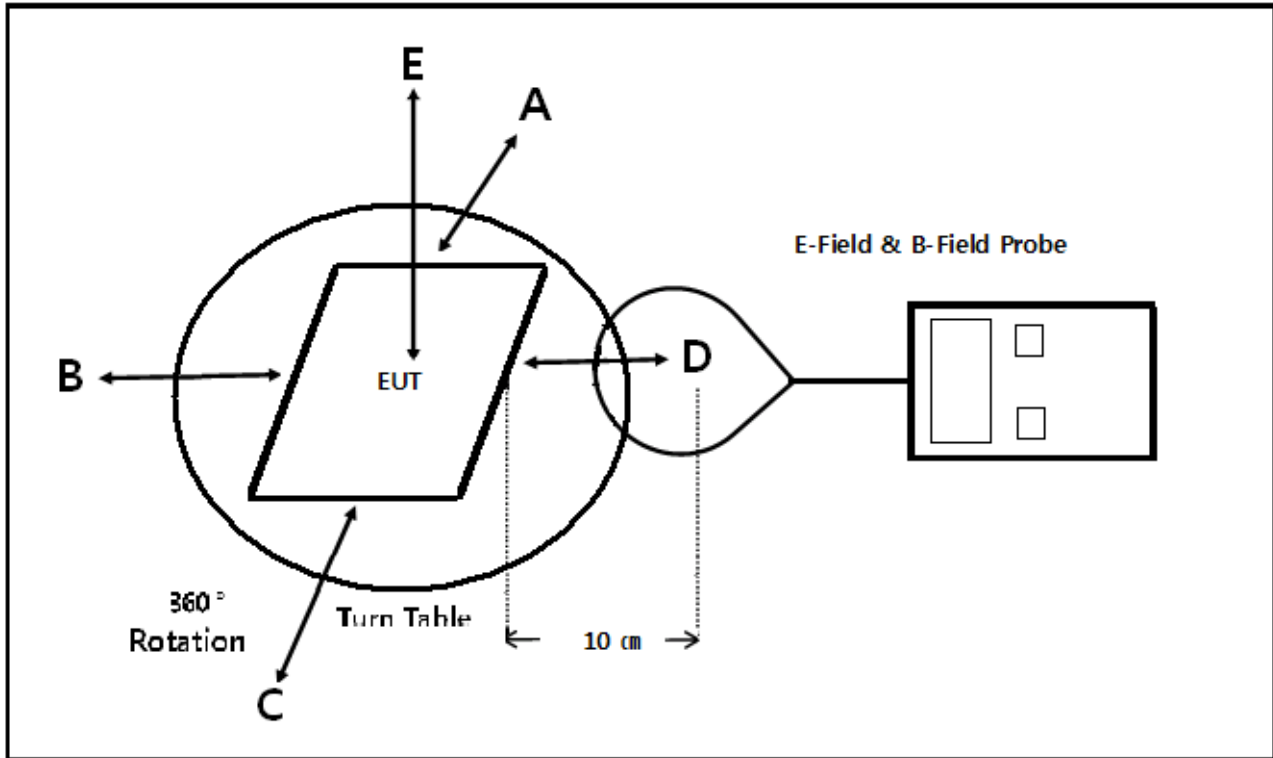
Plot#4 – fundamental emission comparison

- The level of Trace#2 was more than Trace#1, 3 and 4 so Trace#2 was selected.
- Trace#2 as **GSM900 / GPRS / 2 TX** which was found in **Middle channel** should be tested with the client device as a worst case.

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2. Test Result

2.1. Test Setup



2.2. Measurement procedure

- The RF exposure test was performed on 360 degree turn table 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 turn table was rotated 360 degree to search of highest strength
- the highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.

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2.2. 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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2.3. E and H field strength

Test Mode : Charging mode with resistive loads

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

Test condition: Charging mode with resistive load (300 mA status)

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.40 | 0.86 | 0.80 | 0.78 | 5.31 | 614.00 |

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

Test condition: Charging mode with resistive load (600 mA status)

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.64 | 1.32 | 0.93 | 1.09 | 10.70 | 614.00 |

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

Test condition: Charging mode with resistive load (1 000 mA status)

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.94 | 2.27 | 1.48 | 1.55 | 10.90 | 614.00 |

Test Mode : Charging mode with client device

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

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

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 3.18 | 6.16 | 2.55 | 4.43 | 7.84 | 614.00 |

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

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

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.80 | 0.85 | 0.70 | 0.66 | 2.94 | 614.00 |

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

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

| 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) | Limits (V/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.44 | 0.52 | 0.61 | 0.67 | 2.11 | 614.00 |

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Test Mode : Charging mode with resistive loads

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

Test condition: Charging mode with resistive load (300 mA status)

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 1.03 | 1.28 | 1.16 | 1.19 | 1.38 | 1.63 |

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

Test condition: Charging mode with resistive load (600 mA status)

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 1.03 | 1.05 | 0.96 | 1.16 | 1.32 | 1.63 |

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

Test condition: Charging mode with resistive load (1 000 mA status)

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.98 | 1.00 | 0.96 | 1.05 | 1.28 | 1.63 |

Test Mode : Charging mode with client device

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

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

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.87 | 0.90 | 1.02 | 0.98 | 0.90 | 1.63 |

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

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

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 0.92 | 0.85 | 0.90 | 0.98 | 1.05 | 1.63 |

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

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

| 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) | Limits (A/m) |
|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------|
| 115 ~ 205 | 1.00 | 0.98 | 1.05 | 0.92 | 1.00 | 1.63 |

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