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TEST REPORT

of

FCC CFR 47 part1, 1.1307(b), 1.1310

FCC ID: 2AV76-NMOK-300W

Equipment Under Test	:	WIRELESS POWER CHARGING SYSTEM
Model Name	:	NMOK-300W
Variant Model Name(s)	:	-
Applicant	:	NIDEC MOBILITY KOREA CORPORATION
Manufacturer	:	NIDEC MOBILITY KOREA CORPORATION
Date of Receipt	:	2022.03.23
Date of Test(s)	:	2022.05.12 ~ 2022.08.26
Date of Issue	:	2022.12.06

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
3) This test report cannot be reproduced, except in full, without prior written permission of the Company.
4) The data marked ※ in this report was provided by the customer and may affect the validity of the test results.
We are responsible for all the information of this test report except for the data(※) provided by the customer.

Tested by: Teo Kim

Technical Manager: Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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1.2. Details of Applicant

Applicant : NIDEC MOBILITY KOREA CORPORATION
Address : 790-12, Bogaewonsam-ro, Bogae-myeon, Anseong-si, Gyeonggi-do, South Korea, 17507
Contact Person : Nam, Sang-il
Phone No. : +82 2 850 5789

1.3. Details of Manufacturer

Company : Same as applicant
Address : Same as applicant

1.4. Description of EUT

Kind of Product	WIRELESS POWER CHARGING SYSTEM
Model Name	NMOK-300W
Serial Number	001
Power Supply	DC 12 V
Operation Mode	5 W, 10 W
Frequency Range	120 ㎑
Antenna Type	Loop Coil Antenna
Antenna Part Number	CM00000484
H/W Version	1.0
S/W Version	1.0

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Electric and Magnetic field Probe analyzer	NARDA	EHP 200AC	170WX91017	Dec. 02, 2021	Annual	Dec. 02, 2022
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
Portable Handset	Samsung Electronics Co., Ltd.	SM-G906S	A3LSMG906S
Portable Handset	Samsung Electronics Co., Ltd.	SM-G975U	A3LSMG975U
Lap top	Dell	Latitude 3510	-

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 1 Subpart I		
Section	**Test Item(s)**	**Result**
1.1307(b) 1.1310(e)(1)	Electronic Field, Magnetic Field	Complied

1.7. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL003410	2022.09.02	Initial
1	F690501-RF-RTL003410-1	2022.11.28	Modified the distance of clause 2.1.
2	F690501-RF-RTL003410-2	2022.12.06	Modified the table of clause 2.5.1 and 2.5.2.

1.8. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Electric Field	19.78 %
Magnetic Field	13.66 %

All measurement uncertainty values are shown with a coverage factor of *k*=2 to indicate a 95 % level of confidence.

1.9. 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.

Charging mode with client device	Mode		Description
Model: SM-G906S FCC ID: 649E-SMG906S Model: SM-G975U FCC ID: 649E-SMG975U	5 W	10 W	1 % of battery 50 % of battery 99 % of battery
	Ant. 1: 120 ㎑	Ant. 1: 120 ㎑	
	SM-G906S	SM-G975U	

Mode	Battery	Frequency (㎑)	E-field Strength (V/m)	H-field Strength (A/m)
5 W	1 %	120	**75.11**	**1.606**
	50 %		74.56	1.562
	99 %		73.76	1.504
10 W	1 %	120	**82.03**	**1.543**
	50 %		81.57	1.505
	99 %		81.28	1.481

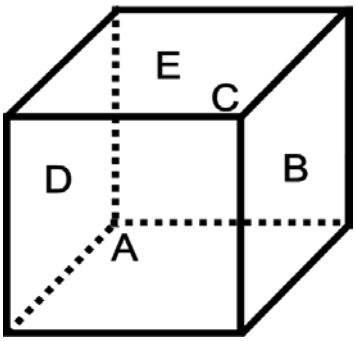
Note;

- EUT was investigated with client device under normal charging condition as above then worst value was only reported.

2. Test Result

2.1. Isotropic Probe Test Setup

The measurement probe (EHP-200AC) is a regular hexahedron and supports 3-axis isotropic probe.



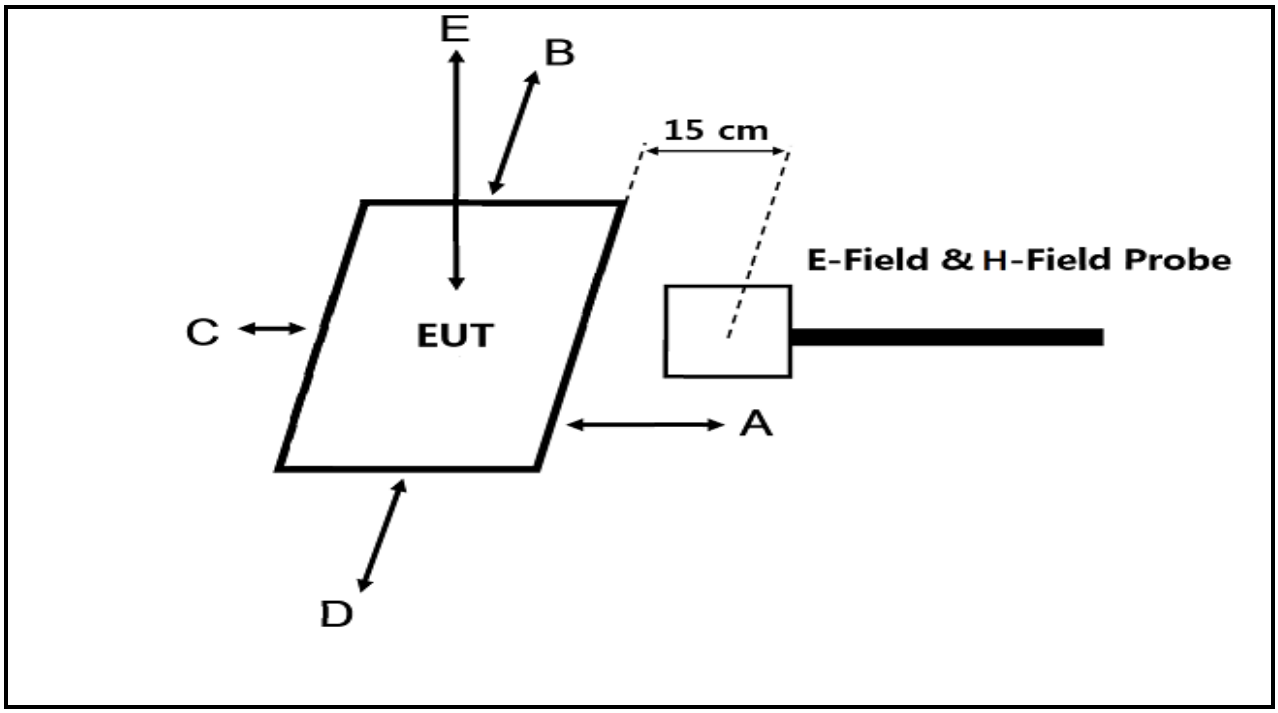
A: Front of measurement probe
B: Right of measurement probe
C: Rear of measurement probe
D: Left of measurement probe
E: Top of measurement probe
***Bottom of measurement probe is not used to measure RF exposure condition owing to connection with a stick.

- At 4 cm distance, measurement isotropic probe was investigated by rotating the probe through various angles for one of the EUT's sides as below.

Measurement Point	**A**	**B**	**C**	**D**	**E**
Direction	Front	Right	Rear	Left	Top
Measurement Point	**A to B**	**B to C**	**C to D**	**D to A**	**N/A**
Direction	Front to Right	Right to Rear	Rear to Left	Left to Front	-
Measurement Point	**A to E**	**B to E**	**C to E**	**D to E**	**N/A**
Direction	Front to Top	Right to Top	Rear to Top	Left to Top	-

- When the worst angle among all angles was found, RF exposure measurement should be adjusted from worst angle.
- Worst Case
E-field: One of the several angles was found as **Point A** of isotropic probe.
H-field: One of the several angles was found as **Point C** of isotropic probe.

2.2. EUT Test Setup



2.3. Measurement procedure

a) The RF exposure test was performed in anechoic chamber.
b) The measurement probe was placed at test distance (4, 6, 8, 10, 15 ㎝) which is between the edge of the charger and the geometric center of probe.
c) Measurement was performed on each side of the EUT as described above picture (A, B, C, D, E).
d) The EUT was measured according to the dictates of KDB 680106 D01 RF Exposure Wireless Charging Apps v03.

Note;

- Because of measurement probe antenna size, minimum distance between charger and probe is 4 cm for E-Field and H-Field.
- The EUT installed to the vehicle was charged from the top, so it was measured from 5 sides except the bottom.

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 to § 1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

Frequency Range (㎒)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (㎽/㎠)	Average Time (minutes)
(i) 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
(ii) Limits for General Population/Uncontrolled Exposures				
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

f = frequency in ㎒. * = Plane wave equivalent power density.

2.5. E and H field strength

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

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

Test Condition: 5 W Operating mode with client device (1 % battery status of client device)

Frequency (㎑)	Distance (㎝)	EUT Sides					Limits (V/m)
		A (V/m)	B (V/m)	C (V/m)	D (V/m)	E (V/m)	
120	15	3.19	5.57	3.84	6.74	8.66	614
	10	8.04	8.61	5.07	9.42	10.16	
	8	12.40	18.05	11.44	21.06	30.73	
	6	19.50	30.32	15.34	34.68	47.14	
	Contact, 4	32.68	**75.11**	30.53	71.63	73.62	

Test Condition: 10 W Operating mode with client device (1 % battery status of client device)

Frequency (㎑)	Distance (㎝)	EUT Sides					Limits (V/m)
		A (V/m)	B (V/m)	C (V/m)	D (V/m)	E (V/m)	
120	15	4.97	5.04	3.73	2.69	8.34	614
	10	9.74	11.90	6.63	6.90	20.20	
	8	13.38	19.02	8.15	10.98	30.25	
	6	21.96	36.10	11.16	19.69	48.55	
	Contact, 4	31.15	63.50	25.67	61.30	**82.03**	

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

Test Condition: 5 W Operating mode with client device (1 % battery status of client device)

Frequency (㎑)	Distance (㎝)	EUT Sides					Limits (A/m)
		A (A/m)	B (A/m)	C (A/m)	D (A/m)	E (A/m)	
120	15	0.226	0.283	0.164	0.382	0.236	1.63
	10	0.619	0.319	0.216	0.337	0.530	
	8	0.460	0.691	0.546	0.484	0.789	
	6	0.792	1.473	0.934	0.593	1.259	
	Contact, 4	1.594	1.033	0.872	0.829	**1.606**	

Test Condition: 10 W Operating mode with client device (1 % battery status of client device)

Frequency (㎑)	Distance (㎝)	EUT Sides					Limits (A/m)
		A (A/m)	B (A/m)	C (A/m)	D (A/m)	E (A/m)	
120	15	0.159	0.163	0.159	0.161	0.166	1.63
	10	0.379	0.356	0.226	0.225	0.338	
	8	0.480	0.532	0.324	0.326	0.634	
	6	0.739	1.021	0.649	0.543	0.862	
	Contact, 4	1.317	**1.543**	0.939	0.711	1.236	

- End of the Test Report -