RF EXPOSURE REPORT

Equipment under test UTS-1 Wireless Charger

Model name UTS-1

FCC ID 2AWLH-UTS-1

Applicant Hana Technologies Inc.

Manufacturer
1. Hana Technologies Inc.
2. Hana Microelectronics Public Co.,Ltd.
3. Hana Microelectronics (Cambodia) Co., Ltd.

Date of test(s) 2020.05.20 ~ 2020.06.10

Date of issue 2020.06.15

Issued to

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Test and report completed by :	**Report approval by :**
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Revision history

Revision	Date of issue	Test report No.	Description
-	2020.06.15	KES-RF-20T0095	Initial

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1. General information

Applicant	Hana Technologies Inc.
Applicant address	2061 Case Parkway South, Unit # 6, Twinsburg, OH 44087, U.S.A.
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, Yeoju-si, Gyeonggi-do, Korea
Test Facility	FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s):	Part 15C
FCC ID:	2AUG3-MCD114
Test device serial No.	☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test	UTS-1 Wireless Charger
Frequency	0.1238 ~ 0.1467 ㎒
Inductive charging technique	Magnetic Induction
Model:	UTS-1
Antenna specification	Internal type(Coil antenna)
Power source	AC 120 V(Adapter DC output 12 V)
S/W Version	Rev 1.0
H/W version	Rev 1.0

1.2. Test configuration

The **Hana Technologies Inc. UTS-1 Wireless Charger FCC ID: 2AWLH-UTS-1**was tested according to the specification of EUT, the EUT must comply with following standards.

FCC Part 15C
ANSI C63.10-2013
KDB 680106 D01 V03

1.3. Test frequency

		Frequency Range
Power source	AC 120 V (Adapter DC output 12 V)	0.1238 ~ 0.1467 ㎒

1.4. Test mode

Mode	Charging current	Description
Charging mode With load	90%	Using Max load
	50%	Using Mid load
	10%	Using Min load

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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	SHENZHEN YINGHUI YUAN ELECTRONICS CO.,LTD	YHY-12003000	-	Output : DC 12 V, 3A

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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				
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

Note.

1. f= frequency in MHz
2. "*" means Plane-wave equivalent power density

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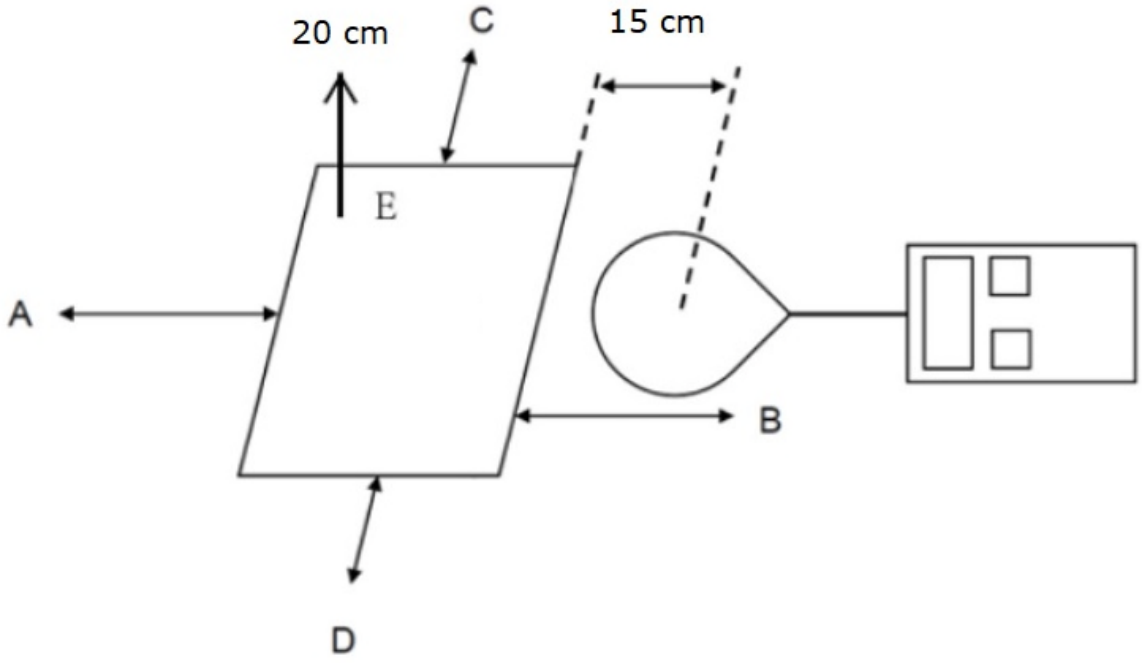
2.1. Test Setup



1. The test was performed on 360° turn table in anechoic chamber.
2. The probe was placed at distance 15 cm or 20 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 at distance 15 cm.
5. The EUT was measured according to the KDB 680106 D01v03.

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Note.

Equipment Approval Considerations item 5.b) of KDB 680106 D01 v03.

a) Power transfer frequency is less that 1 ㎒.

- The device operates at a frequency of 123.8 ~ 146.7 ㎑.

b) Output power from each primary coil is less than or equal to 15 watts.

- Output power from each primary coil : 5 watts or 9 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 placed directly in contact with the transmitter.

- Client device is placed directly.

e) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

- The device is a mobile device.

f) The aggregate H-field strengths at 15 ㎝ surrounding the device and 20 ㎝ above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50 % of the MPE limit.

- Refer to following test results.

The EUT H-Field Strength levels at 15 ㎝ < 50 % of the MPE H-Field Strength limit 1.63 A/m
0.537 A/m (Max) < 0.815 A/m

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2.2. Test results

Test mode : 5 W

E-Field Strength from each edges the EUT

Test Mode		Point A (V/m)	Point B (V/m)	Point C (V/m)	Point D (V/m)	Point E (V/m)
5W Charging mode	10 % load	2.215	4.839	8.325	4.560	8.963
	50 % load	2.135	4.823	8.245	4.487	8.745
	90 % load	2.145	4.742	8.064	4.532	8.714

H-Field Strength from each edges the EUT

Test Mode		Point A (A/m)	Point B (A/m)	Point C (A/m)	Point D (A/m)	Point E (A/m)
5W Charging mode	10 % load	0.227	0.380	0.506	0.296	0.340
	50 % load	0.182	0.313	0.484	0.266	0.304
	90 % load	0.171	0.275	0.450	0.258	0.284

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Test mode : 9 W

E-Field Strength from each edges the EUT

Test Mode		Point A (V/m)	Point B (V/m)	Point C (V/m)	Point D (V/m)	Point E (V/m)
9W Charging mode	10 % load	2.500	5.787	8.320	4.553	9.838
	50 % load	2.432	5.743	8.128	4.487	9.310
	90 % load	2.516	5.793	8.175	4.436	9.162

H-Field Strength from each edges the EUT

Test Mode		Point A (A/m)	Point B (A/m)	Point C (A/m)	Point D (A/m)	Point E (A/m)
9W Charging mode	10 % load	0.230	0.338	0.537	0.320	0.507
	50 % load	0.183	0.332	0.506	0.292	0.427
	90 % load	0.159	0.291	0.491	0.285	0.420

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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	2020.06.14
Magnetic Field Hitester	HIOKI	FT3470-50	120429926	1 year	2020.11.26

Peripheral device

Device	Manufacturer	Model No.	S/N	Note
Mobile phone	SAMSUNG	SM-N950N	-	-

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