

RF TEST REPORT

Report Reference No......: **MAX25110612P01-R01RF**

FCC ID.....: **2BS9S-TU1228**

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Applicant's name.....: **Yuhuan Clangsonic Ultrasonic CO.,LTD.**

Address.....: Houwan Industrial Park, Yuhuan City, ZheJiang province, 317600 China

Test specification.....:

Standard.....: **KDB 680106 D01**

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Test item description.....: **Ultrasonic Generator**

Trade Mark.....: CLANGSONIC

Manufacturer.....: Yuhuan Clangsonic Ultrasonic CO.,LTD.

Model/Type reference.....: TU1228

Listed Models: TU1828, TU2428, TU1240, TU1840, TU1880, TU12132, TU06200, TU06260

Operation Frequency.....: 28KHz

Rating.....: AC 120V

Result.....: **PASS**

RF Exposure Evaluation

1. Product Information

Applicant's Name	Yuhuan Clangsonic Ultrasonic CO.,LTD.
Address	Houwan Industrial Park, Yuhuan City, ZheJiang province, 317600 China
Product name	Ultrasonic Generator
Test Model	TU1228
Additional Model No.	TU1828, TU2428, TU1240, TU1840, TU1880, TU12132, TU06200, TU06260
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	AC 120V/60Hz
Hardware Version	V1.0
Software Version	V1.0
Ultrasonic	
Operating Frequency	28KHz
Rated Power	1200W
EUT Size	412*160*238 mm(L*W*H)
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Devices

2. Evaluation Method

Per KDB 680106 D01 Section 3. RF Exposure Requirements;

- 1) The RF exposure limits, as set forth in § 1.1310, do not cover the frequency range below 100 kHz for Specific Absorption Rate (SAR) and below 300 kHz for Maximum Permitted Exposure (MPE). In addition, present limitations of RF exposure evaluation systems prevent an accurate evaluation of SAR below 4 MHz. For these reasons, a specific MPE-based RF Exposure compliance procedure for devices operating in the low-frequency ranges has been set in place. This procedure is applicable to Equipment Authorization of all RF devices, thus including, but not limited to, Part 18 and WPT devices. Accordingly, for § 2.1091-*Mobile* devices, the MPE limits between 100 kHz to 300 kHz are to be considered the same as those at 300 kHz in Table 1 of § 1.1310, that is, 614 V/m and 1.63 A/m, for the electric field and magnetic field, respectively. For § 2.1093-*Portable* devices below 4 MHz and down to 100 kHz, the MPE limits in § 1.1310 (with the 300 kHz limit applicable all the way down to 100 kHz) can be used for the purpose of equipment authorization in lieu of SAR evaluations.

Furthermore, consistent with FCC's equipment authorization RF exposure guidance, any device (both portable and mobile) operating at frequencies below 100 kHz is considered compliant for the purpose of equipment authorization when the external (unperturbed) temporal peak field strengths do not exceed the following reference levels:

83 V/m for the electric field strength (*E*)

and 90 A/m for the magnetic field strength (*H*)

These data may be provided through measurements and/or numerical simulations, and for all the positions in space relevant for any possible body exposure.

- 2) "Large size" probes may prevent the measurement of E- and/or H-fields near the surface of the radiating structure (e.g., a WPT source coil), as in the example shown in Figure 1.

If the center of the probe sensing element is located more than 5 mm from the probe outer surface, the field strengths need to be estimated through modeling for those positions that are not reachable. The estimates may be done either via numerical calculation, or via analytic model: e.g., approximated formulas for circular coils, dipoles, etc., may be acceptable if it is shown that the model is applicable for the design parameters considered. A typical example is the use of a quasi-static approximation formula for a low-frequency magnetic field source. These estimates shall include points spaced no more than 2 cm from each other. Thus, in the example of

Figure 1, at least the estimates at 0 cm and 2 cm are required, while only one point would not be sufficient. In addition, the model needs to be validated through the probe measurements for the two closest points to the device surface, and with 2-cm increments, as indicated in Figure 1. In that example, the same model must also be applied to the 4 cm and 6 cm positions, and then compared with the measured data, for validation purposes. The validation is considered sufficient if a 30% agreement between the model and the (E- and/or H-field) probe measurements is demonstrated. If such a level of agreement cannot be shown, a more accurate model (and/or a smaller probe) shall be used.

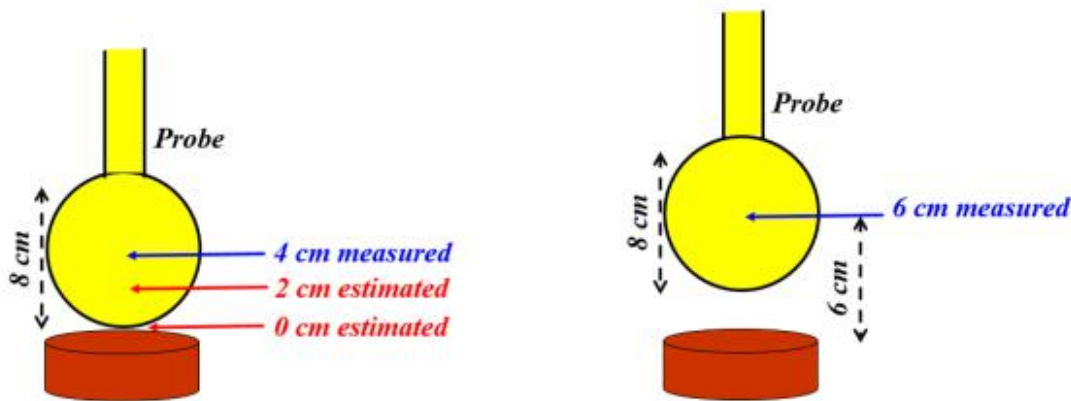


Figure 1. Example of probe (in yellow) measurements in points close to the WPT device (in red/brown). The probe radius is 4 cm, thus the closest point to the device where the field can be measured is at 4 cm from the surface (this example assumes that the probe calibration refers to the center of the sensing element structure, in this case a sphere of 4 cm radius). Data at 0 cm and 2 cm must be estimated through a model, and then the same model must be validated via comparison with the actual measurements at 4 cm and 6 cm, where the probe center can be positioned and collect valid data.

- 3) Spatial averaging of E-field exposure is performed over the vertical extent of the human body. It is conservatively assumed that this extent is 180 cm, representing a tall adult. The full extent shall first be scanned to identify the location of maximum exposure. Additional measurements shall be performed at a minimum of five discrete heights, as illustrated in Figure B-1. This would provide for 40 cm spacing between sample points. If one of these points coincides with the location of maximum exposure, it shall only be included once in the spatial averaging calculation.

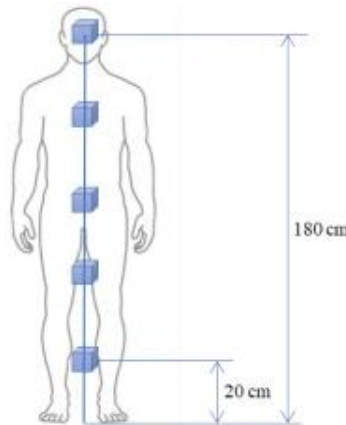


Figure B-1: Illustration of minimum requirements for discrete sampling when performing E- field spatial averaging measurements.

4) H -field

In the case of H-field spatial averaging, it is assumed that the source is a loop or coil antenna. Averaging is performed over a planar area, which is parallel to the plane of the antenna aperture and positioned such that the worst-case exposure is captured. The dimensions of the averaging area should match those of the source antenna; however, a no point shall the height and width of the area exceed 60 cm and 30 cm, respectively as these dimensions approximate the average size of a human torso.

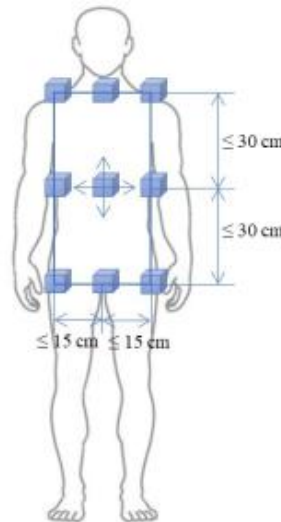


Figure B-2: Illustration of minimum requirements for discrete sampling when performing H- field spatial averaging measurements.

3. Evaluation Limit

3.1 Refer Evaluation Method

[ANSI C95.1–1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 680106 D01 RF Exposure Wireless Charging Apps v03](#): RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

[FCC KDB publication 447498 D04 Interim General RF Exposure Guidance v01](#): RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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/1500	30
1,500-100,000	/	/	1.0	30

F=frequency in MHz

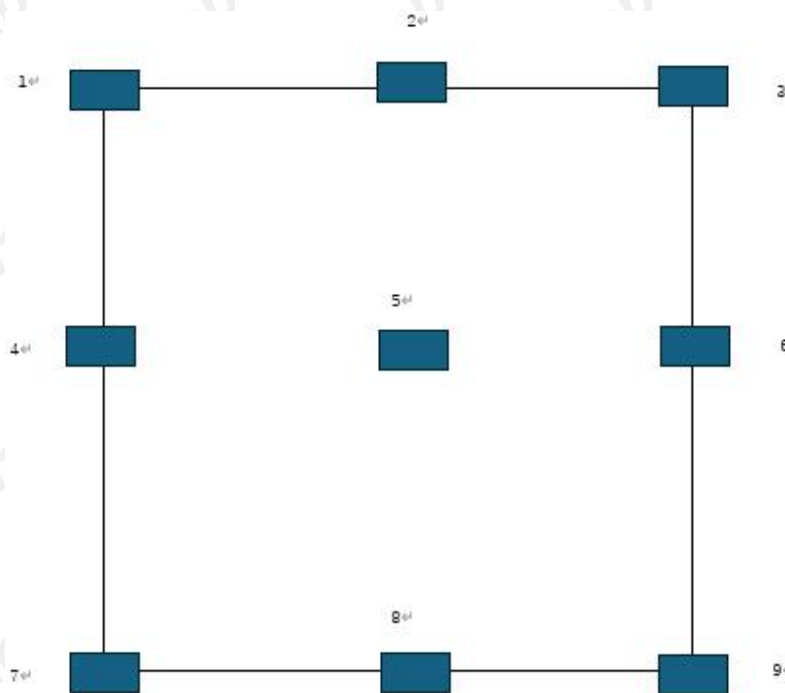
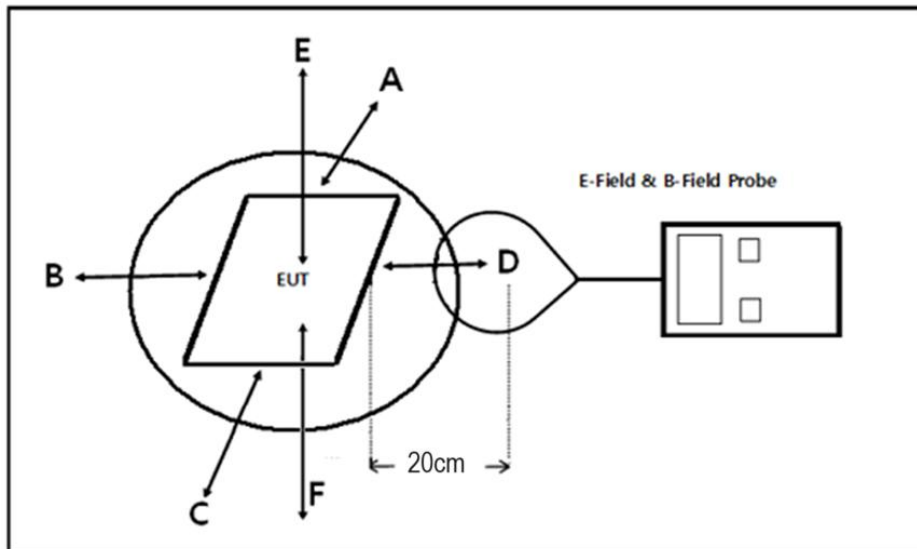
*=Plane-wave equivalent power density

According to FCC KDB 680106 D01 Section 3. RF Exposure Requirements clause 3 the Emission-Limits in the frequency range from 100 KHz to 300 KHz should be assessed versus the limits at 300 KHz in Table 1 of CFR 47 – Section1.310 as following (measured distance shall be 15cm from the center of the probe to the edge of the device):

	E-Field	*/*	B-Field
Frequency	V/m	A/m	uT
0.3 MHz – 3.0 MHz	614	1.613	2.0
3.0 MHz – 30 MHz	824/f (=27.530MHz)	2.19/f (=0.07330MHz)	--

A KDB inquire was required to determine/confirm the applicable limits below 100 KHz.

4. Test Setup



4.1 Test Procedure

- 1) The RF exposure test was performed in anechoic chamber.
- 2) The measurement probe was placed at test distance (15 cm from all sides and 20 cm from the top) which is between the edge of the charger and the geometric center of probe.
- 3) The highest emission level was recorded and compared with limit as soon as measurement of each point (1, 2, 3, 4, 5, 6, 7, 8, 9) were completed.
- 4) The EUT was measured according to the dictates of KDB 680106 D01v03.

Remark: The EUT's test position 1, 2, 3, 4, 5, 6, 7, 8, 9 is valid for the E and H field measurements.

5. Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Exposure Level Tester	Narda	ELT-400	N-0231	2025/11/2	2026/11/01
Magnetic field probe 100cm ²	Narda	ELT probe 100cm ²	M0675	2025/11/2	2026/11/01

6. Test Result

H/E-Field Strength at 20 cm from the edges surrounding the EUT and 20cm from the top surface of the EUT

Unit	Frequency Range (MHz)	Measured E-Field Strength Values (A/m) @ Test Point									FCC H/E-Field Strength Limits (A/m)
		1	2	3	4	5	6	7	8	9	
uT	0.028	0.264	0.268	0.265	0.266	0.267	0.258	0.262	0.261	0.262	--
A/m	0.028	0.211	0.214	0.212	0.213	0.214	0.206	0.210	0.209	0.210	1.63
V/m	0.028	79.62	80.83	79.92	80.23	80.53	77.81	79.02	78.72	79.02	614.0

Note: A/m = uT/1.25

Note: V/m = A/m * 377

7. Conclusion

A minimum safety distance of 20 cm above the top surface of the device is required. The detected emissions with 20 cm surrounding the device are below the limitations according to FCC KDB 680106 D01 Section 3. RF Exposure Requirement Clause 3.

8. Test Set-up Photo



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