RF Exposure Report

Report No.: AGC02129240902FH01

FCC ID	:	2AGPD-ZEQC01
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Quattro Wireless Charger Pro 4
BRAND NAME	:	Zens
MODEL NAME	:	ZEQC01W/00, ZEQC01W/06, ZEQC01B/00
APPLICANT	:	Zens International B.V.
DATE OF ISSUE	:	Oct. 16, 2024
STANDARD(S)	:	KDB680106 D01 RF Exposure Wireless Charging Base App v04
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 16, 2024	Valid	Initial Release

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1. General Information

Applicant	Zens International B.V.
Address	High Tech Campus 84, 5656 AG Eindhoven, The Netherlands
Manufacturer	Zens International B.V.
Address	High Tech Campus 84, 5656 AG Eindhoven, The Netherlands
Factory	Huizhou SPEED Wireless Technology Co., Ltd.
Address	No.138 Huize Road, Hi-Tech Industrial Park of East River, Zhongkai Hi-tech District, Huizhou City, Guangdong Province, China.
Product Designation	Quattro Wireless Charger Pro 4
Brand Name	Zens
Test Model	ZEQC01W/00
Series Model(s)	ZEQC01W/06, ZEQC01B/00
Difference Description	ZEQC01W/06 is the same as the test model except for the model names. ZEQC01B/00 is the same as the test model except for the model names and the color of appearance.
Date of receipt of test item	Sep. 18, 2024
Date of Test	Sep. 18, 2024~ Oct. 16, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-RF Exposure (WPT_MPE)-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Bibo Zhang (Project Engineer)	Oct. 16, 2024
Reviewed By	Calvin Liu (Reviewer)	Oct. 16, 2024
Approved By	Max Zhang Authorized Officer	Oct. 16, 2024

2. Product Information

2.1 Product Technical Description

EUT Information	
Equipment Specification	WPT
Operation Frequency	WPT Ant1: Band 1:128±5KHz; Band II:360±5KHz WPT Ant2: Band 1:128±5KHz; Band II:360±5KHz WPT Ant3: Band 1:128±5KHz; Band II:360±5KHz WPT Ant4: Band 1:128±5KHz; Band II:360±5KHz
Hardware Version	V1.1
Software Version	A00
Modulation Type	ASK
Field Strength of Fundamental	66.77dBμV/m (Max)
Antenna Designation	Coil Antenna
Antenna Gain	0dBi
Input Rating	DC24V 2.7A by adapter
Output Rating	WPT Ant1 Output: 5W/7.5W/15W Max WPT Ant2 Output: 5W/7.5W/15W Max WPT Ant3 Output: 5W/7.5W/15W Max WPT Ant4 Output: 5W/7.5W/15W Max
Adapter Information	
Manufacturer	Shenzhen Guijin Technology Co., Ltd.
Address	3rd Floor, 72 Building, Songxin Industrial, Hongxing Community, Songgang Street, Bao'an, Shenzhen, GuangDong, China
Brand Name	GLTL
Model Name	GJ60WD-2400270DP
Input Rating	AC100V-240V, 50/60Hz, 1500mA
Output Rating	DC24.0V, 2700mA

3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to FOLLOW CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20% - 75%
Pressure range (kPa)	86 - 106
Power supply	--

3.4 Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
E-Field Strength(0.003-0.4MHz)	±1.5dB
E-Field Strength(0.4-10MHz)	±1.3dB
H-Field Strength(0.003-0.4MHz)	±1.3dB
H-Field Strength(0.4-10MHz)	±1.2dB

3.5 List of Equipment Used

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-RF-011	Broadband Field Meter	WAVECONTROL	SMP2	J-0004	2024-06-06	2025-06-05
☒	AGC-RF-012	Probe FHP	WAVECONTROL	WP400	J-0015	2024-06-06	2025-06-05

4. Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Wireless Charging Load 1	YBZ-QI 2.0	Shenzhen Yuanzitong Technology Co., Ltd	5W/7.5W/15W Max	--
2	Wireless Charging Load 2	A1	Jingan	5W/7.5W/15W Max	--
3	Wireless Charging Load 3	W3	Jingan	5W/7.5W/15W Max	--
4	Wireless Charging Load 4	YBZ-QI 2.0	Shenzhen Yuanzitong Technology Co., Ltd	5W/7.5W/15W Max	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Adapter	Shenzhen Guijin Technology Co., Ltd.	GJ60WD-2400270 DP	AC100V-240V, 50/60Hz, 1500mA, DC24.0V, 2700mA	--

5. Description of Test Modes

NO.	Test Mode Description	Exposure Conditions
1	AC/DC Adapter Input+ EUT + WPT Ant1 Wireless Load(15W)	Mobile
2	AC/DC Adapter Input+ EUT + WPT Ant1 Wireless Load(7.5W)	Mobile
3	AC/DC Adapter Input+ EUT + WPT Ant1 Wireless Load(5W)	Mobile
4	AC/DC Adapter Input+ EUT + WPT Ant2 Wireless Load(15W)	Mobile
5	AC/DC Adapter Input+ EUT + WPT Ant2 Wireless Load(7.5W)	Mobile
6	AC/DC Adapter Input+ EUT + WPT Ant2 Wireless Load(5W)	Mobile
7	AC/DC Adapter Input+ EUT + WPT Ant3 Wireless Load(15W)	Mobile
8	AC/DC Adapter Input+ EUT + WPT Ant3 Wireless Load(7.5W)	Mobile
9	AC/DC Adapter Input+ EUT + WPT Ant3 Wireless Load(5W)	Mobile
10	AC/DC Adapter Input+ EUT + WPT Ant4 Wireless Load(15W)	Mobile
11	AC/DC Adapter Input+ EUT + WPT Ant4 Wireless Load(7.5W)	Mobile
12	AC/DC Adapter Input+ EUT + WPT Ant4 Wireless Load(5W)	Mobile
13	AC/DC Adapter Input+ EUT + WPT Ant1+ WPT Ant2+ WPT Ant3+WPT Ant4 Wireless Load(15W+15W+15W+15W)	Mobile
14	AC/DC Adapter Input+ EUT + WPT Ant1+ WPT Ant2+ WPT Ant3+WPT Ant4 Wireless Load(7.5W+7.5W+7.5W+7.5W)	Mobile

15	AC/DC Adapter Input+ EUT + WPT Ant1+ WPT Ant2+ WPT Ant3+WPT Ant4 Wireless Load(5W+5W+5W+5W)	Mobile
16	AC/DC Adapter Input+ EUT + WPT Ant1+ WPT Ant2+ WPT Ant3+WPT Ant4 Wireless Load(0W+0W+0W+0W)	Mobile

Note:
1. All test modes were pre-tested, but we only recorded the worst case in this report.
2. The product is equipped with four wireless charging coils of identical specifications, with operating frequencies of 128±5kHz and 360±5kHz. When the output power is 15W, the operating frequency is 360±5kHz; for other output levels, the operating frequency is 128±5kHz.
3. The EUT supports 15W, 10W, 7.5W, 5W "wireless output, and all modes have been tested at full load, half

6. RF Exposure Measurement

6.1 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 KDB680106 D01 RF Exposure Wireless Charging Apps v04: 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.

6.2 Measurement Limits

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

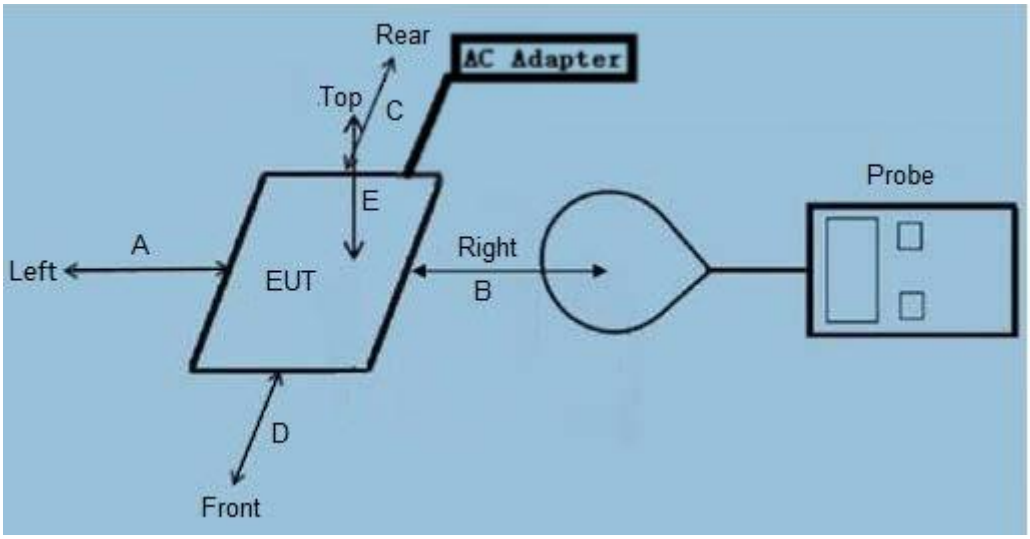
According to FCC KDB 680106 D01v04 Section 3. RF Exposure Requirements clause 3.2 the Emission-Limits in the frequency range from 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of CFR 47 – Section 1.1310 as following:

	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	$824/f$ ($=27.5_{30MHz}$)	$2.19/f$ ($=0.073_{30MHz}$)	--

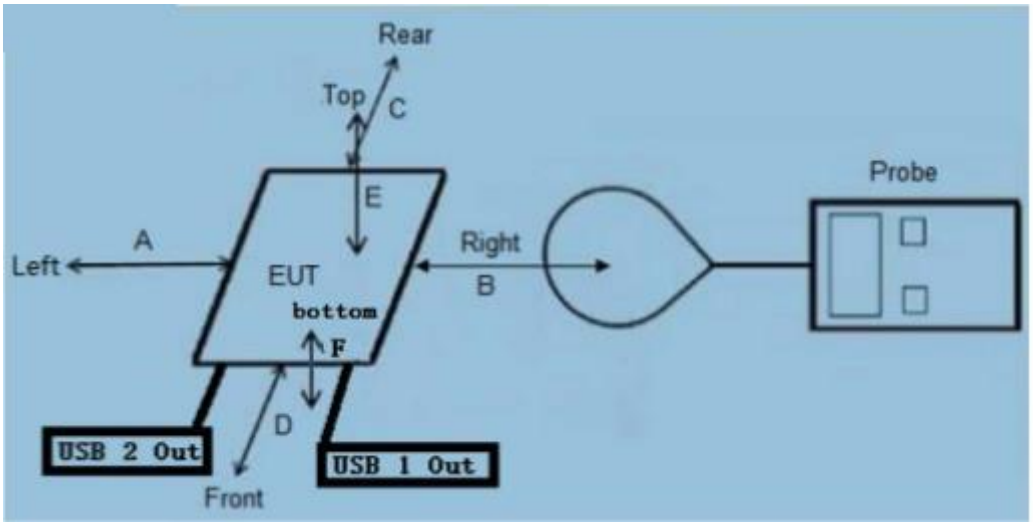
A KDB inquire was required to determine/confirm the applicable limits below 100kHz.

6.3 Measurement Setup

Mobile:



Portable:



Note:
-- RF exposure assessment tests are conducted in a shielded room.
-- Refer to the following test method description for the test distance between the edge of the charger and the measuring probe.
-- As shown in the above picture, the test layout is not for the real object, only the requirements of the test layout listed in the standard requirements are presented, for reference only.
-- The actual test EUT distinguishes the test type according to the requirements as shown in the figure above.

6.4 Measurement Procedure

6.4.1 For mobile RF exposure:

a) The RF exposure test was performed on 360 degree turn table in anechoic chamber.

b) E-field and H-field measurements should be taken with the probe geometric center located 20cm around the EUT and 20cm above the top surface of the master/client pair.

c) The highest emission level was recorded and compared with limit as soon as measurement of each point (A, B, C, D, E) were completed.

d) The EUT were measured according to the dictates of KDB 680106 D01v04

- Equipment Approval Considerations of KDB 680106 D01v04

Requirements of KDB 680106	Yes or No	Description
The power transfer frequency is below 1 MHz	No	The device operate in the frequency range WPT Band I: 128±5KHz WPT Band II: 360±5KHz.
Output power from each primary coil is lessthan 15 watts	Yes	The maximum output power of the primary coil is 15W.
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.	Yes	The transfer system includes single coil that is able to detect receiver device.
Client device is placed directly in contact withthe transmitter.	Yes	Client device is placed directly in contactwith the transmitter.
Mobile exposure conditions only (portable exposure conditions are not covered by thisexclusion).	Yes	Device can not be used in portable conditions.
The aggregate H-field strengths at 20 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.	Yes	The EUT H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.	Yes	The device has only four radiating structure and is tested at full load

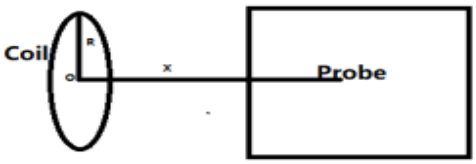
6.4.2 For portable RF exposure:

a) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
b) The measurement probe was placed at test distance (from 0 cm to 20 cm, in 2 cm maximum increment) which is between the edge of the charger and the geometric center of probe.
c) The highest emission level was recorded and compared with limit as soon as measurement of each point (A, B, C, D, E, F,) were completed.
d) The EUT were measured according to the dictates of KDB 680106 D01v04

Specific Assessment Methods:

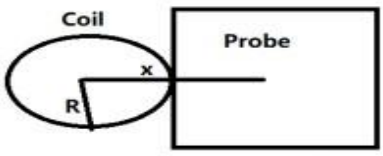
- Test performed with all the radiating structures operating at maximum power at the same time.
- H-field measurements are taken along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable.
- According to Calibration information and specification about WP400 Probe, The Probe WP400 Probe's sensitive elements center is located in the probe's center, and the distance from the sensitive elements center to the tip of probe is 6.25cm.
- For locations that cannot be reached by numerical calculations, the actual field strengths of 0 cm, 2 cm, 4 cm, and 6 cm need to be estimated.
- Use Biot-Savart Law formula theory to estimate the strength of the magnetic field that the measuring instrument cannot measure. According to Biot-Savart Law formula:

Top & Bottom Side:



$$B = \frac{\mu_0 * I * N * R^2}{2 * (R^2 + x^2)^{3/2}}$$

Front, left, right & rear Side:



$$B = \frac{\mu_0 * I * N}{2 * x}$$

- **B (Unit: A/m)**: means H-field value;
- **μ0** is space permeability; μ0=4π*10^{-7};
- **I(Unit: A):** A current element passing through a radiated coil;
- **R(Unit: m):**means the Radius of radiated coil, According to provided Antenna specification: R=42/2=21mm=0.21m;
- **Test Distance(Unit: m)**: The distance from the sensing element of the probe to the edge of the device surface.
- **x (Unit: m):** means the center of the coil to the sensing elements of the probe. (For top & bottom side: x=test distance; For other side: x=test distance+ R)
- **N:** Number of turns, according to providing "Antenna specification" files: N=14.

- For validation purposes: If the value to show a 30% agreement between the mode and the probe measurements for the two closest points to the device surface, and with 2cm increments. Then this extrapolation method is reasonable.

6.5 Measurement Results

Mobile devices are evaluated as follows:

Operate Mode	Field Strength	Measured H-Field Strength Values (A/m) Measured E-Field Strength Values (V/m)					FCC Limit	50%_FCC limit
		Position A	Position B	Position C	Position D	Position E		
Mode 1	nT	858.94	942.36	805.69	945.69	913.35	--	--
Mode 1	A/m	0.684	0.750	0.641	0.753	0.727	1.63	0.815
Mode 1	V/m	0.619	0.635	0.746	0.728	0.749	614	307

Note: Unit conversion formula: 1A/m =1250*nT

Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC02129240902AP02

-----End of Report-----

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.