American Technology Components, Incorporated

MPE ASSESSMENT REPORT

Report Type:
FCC MPE assessment report

Model:
WC7562O

REPORT NUMBER:
201203307SHA-003

ISSUE DATE:
May 25, 2021

DOCUMENT CONTROL NUMBER:
TTRFFCCMPE-01_V1

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TEST REPORT

Report no.: 201203307SHA-003

Applicant:	American Technology Components, Incorporated
Address of Applicant:	2905 Lavanture Place ELkhart, IN 46514
Manufacturer:	American Technology Components, Incorporated
Address of Manufacturer:	2905 Lavanture Place ELkhart, IN 46514
FCC ID:	2AYP4-WC7562O

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:
FCC PART 1 SECTION 1.1310

TESTED BY:	**PREPARED BY:**	**REVIEWED BY:**
Test Engineer Kieron Luo Shenzhen UnionTrust Quality and Technology Co., Ltd.	Project Engineer Sky Yang Intertek Testing Services Shanghai	Reviewer Wakeyou Wang Intertek Testing Services Shanghai

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Revision History

Report No.	Version	Description	Issued Date
201203307SHA-003	Rev. 01	Initial issue of report	May 18, 2021
201203307SHA-003	Rev. 02	Correct operating frequency	May 25, 2021

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Wireless Charger
Type/Model:	WC7562O
Description of EUT:	Wireless Charger
Rating:	12V⎓2.0A Max
Category of EUT:	Class B
EUT type:	☒ Table top ☐ Floor standing
Operating Frequency:	127.8kHz
Antenna Type:	Coil antenna
Sample received date:	December 14, 2020
Date of test:	December 28, 2020 to December 28, 2020

1.2 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road (North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN1175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

All tests were sub-contracted.

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng Science and Technology Park, Longhua District, Shenzhen, China 518109

Telephone: +86 (0) 755 2823 0888

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

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1

The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

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A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

2 TEST SPECIFICATIONS

2.1 Standards or specification

FCC PART 1 SECTION 1.1310
KDB 680106 D01 RF Exposure Wireless Charging App v03

2.2 Mode of operation during the test

Within this test report, EUT was tested under all modes and tested under its rating voltage and frequency. Other voltage and frequency are specified if used. The worst data was listed in the report.

2.3 Test peripherals list

Item No.	Name	Band and Model	Description
1	Lead-acid Battery	Camel, 58500	N/A
2	Mobile phone	Samsung Galaxy 7	N/A

2.4 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (kPa)
RF Exposure	25.8	56	101.2

2.5 Instrument list

Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☒	Probe	STT	LF-04	I-1044	June 29, 2020	June 28, 2021
☒	Probe holder	STT	TR-01	N/A	N/A	N/A
☒	Optical fiber line	STT	L=5M	N/A	N/A	N/A

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3 MPE Assessment

Test result: Pass

3.1 MPE Assessment Limit

According to 47 CFR §1.1310, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
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

Note: f = frequency in MHz: * = Plane-wave equivalents power density.

3.2 Testing Procedure

Enabled the EUT to transmit and receive data continue

a. The field strength of both E-field and H-field was measured at 15 cm surrounding the device and 20 cm above the top surface using the equipment list above for determining compliance with the MPE requirements of FCC Part 1.1310.

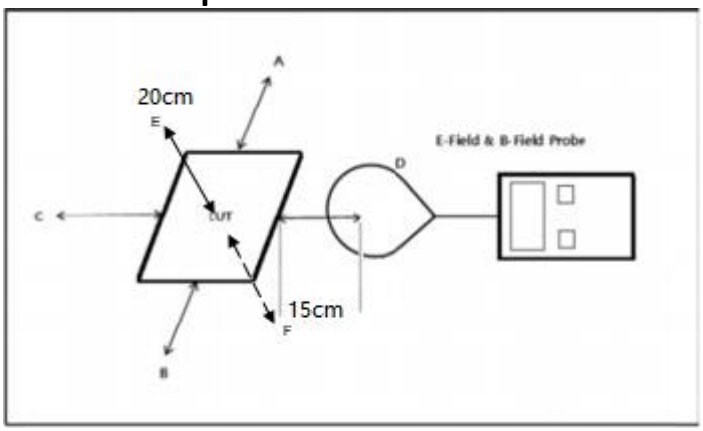
b. The RF power density was measured with the battery at 3 different charge conditions: battery at less than 1 % , battery at 50% charger, battery at 99% charger,.

c. Maximum E-field and H-field measurements were made 15cm from each side of the EUT. Along the side of the EUT and still 15cm away from the edge of the EU T, the field probes were positioned at the location where there is maximum field strength. The maximum E-field and H-field is reported below.

d. This device uses a wireless charging circuit for power transfer operating at the frequency of X

kHz. Thus, the 300 kHz limits were used: E-field Limit = 614 (V/m); H-field limit = 1.63 (A/m).

3.3 Test setup



Note

The RF exposure test is performed in the shield room

The test distance is between the edge of the charger and the geometric center of probe

The aggregate at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated.

3.4 TEST DATA

E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	15	0.47	0.45	0.46	614	Pass
B: Left	15	0.32	0.30	0.31	614	Pass
C: Front	15	0.33	0.34	0.35	614	Pass
D: Back	15	0.25	0.23	0.21	614	Pass
E: Top	20	0.17	0.14	0.13	614	Pass
F: Bottom	15	0.08	0.07	0.06	614	Pass

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H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	15	0.0172	0.0168	0.0165	1.63	Pass
B: Left	15	0.0268	0.0262	0.0259	1.63	Pass
C: Front	15	0.0041	0.0038	0.0036	1.63	Pass
D: Back	15	0.0145	0.0144	0.0142	1.63	Pass
E: Top	20	0.0045	0.0042	0.0040	1.63	Pass
F: Bottom	15	0.0178	0.0173	0.0175	1.63	Pass

Note: Test with 15cm distance from the center of the probe(s) to the edge of the device, 20 cm for top(Position E) test

All simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

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Since the product is installed on the ship, to ensure the device can be operated at any installation location on the boat(s), test all four sides and top of the device at a test distance of 0cm, 2cm, 4cm, 6cm, 8cm and 10cm.

E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	10	0.59	0.54	0.52	614	Pass
B: Left	10	0.39	0.36	0.38	614	Pass
C: Front	10	0.48	0.42	0.43	614	Pass
D: Back	10	0.40	0.36	0.34	614	Pass
E: Top	10	0.17	0.11	0.15	614	Pass
F: Bottom	10	0.21	0.16	0.14	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	10	0.0212	0.0198	0.0201	1.63	Pass
B: Left	10	0.0270	0.0256	0.0239	1.63	Pass
C: Front	10	0.0095	0.0070	0.0056	1.63	Pass
D: Back	10	0.0219	0.0215	0.0212	1.63	Pass
E: Top	10	0.0113	0.0108	0.0097	1.63	Pass
F: Bottom	10	0.0229	0.0219	0.0193	1.63	Pass

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E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	8	0.75	0.75	0.70	614	Pass
B: Left	8	0.50	0.47	0.44	614	Pass
C: Front	8	0.58	0.58	0.53	614	Pass
D: Back	8	0.42	0.41	0.39	614	Pass
E: Top	8	0.45	0.39	0.40	614	Pass
F: Bottom	8	0.22	0.17	0.19	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	8	0.0440	0.0432	0.0410	1.63	Pass
B: Left	8	0.0727	0.0710	0.0690	1.63	Pass
C: Front	8	0.0193	0.0166	0.0164	1.63	Pass
D: Back	8	0.0493	0.0462	0.0477	1.63	Pass
E: Top	8	0.0387	0.0349	0.0369	1.63	Pass
F: Bottom	8	0.0351	0.0326	0.0351	1.63	Pass

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E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	6	0.82	0.77	0.80	614	Pass
B: Left	6	0.63	0.58	0.61	614	Pass
C: Front	6	0.60	0.58	0.58	614	Pass
D: Back	6	0.57	0.52	0.56	614	Pass
E: Top	6	0.53	0.49	0.47	614	Pass
F: Bottom	6	0.37	0.31	0.36	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	6	0.0570	0.0549	0.0534	1.63	Pass
B: Left	6	0.0835	0.0825	0.0827	1.63	Pass
C: Front	6	0.0230	0.0194	0.0215	1.63	Pass
D: Back	6	0.0647	0.0614	0.0636	1.63	Pass
E: Top	6	0.0468	0.0445	0.0466	1.63	Pass
F: Bottom	6	0.0454	0.0427	0.0453	1.63	Pass

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E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	4	0.93	0.87	0.91	614	Pass
B: Left	4	0.73	0.71	0.72	614	Pass
C: Front	4	0.75	0.68	0.69	614	Pass
D: Back	4	0.70	0.68	0.69	614	Pass
E: Top	4	0.78	0.71	0.71	614	Pass
F: Bottom	4	0.65	0.62	0.63	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	4	0.0655	0.0638	0.0650	1.63	Pass
B: Left	4	0.0854	0.0843	0.0817	1.63	Pass
C: Front	4	0.0318	0.0302	0.0295	1.63	Pass
D: Back	4	0.0882	0.0880	0.0851	1.63	Pass
E: Top	4	0.0619	0.0617	0.0581	1.63	Pass
F: Bottom	4	0.0808	0.0779	0.0807	1.63	Pass

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E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	2	0.98	0.92	0.93	614	Pass
B: Left	2	0.83	0.82	0.82	614	Pass
C: Front	2	1.03	0.97	1.00	614	Pass
D: Back	2	0.80	0.79	0.78	614	Pass
E: Top	2	1.14	1.08	1.12	614	Pass
F: Bottom	2	0.66	0.66	0.60	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	2	0.1118	0.1082	0.1103	1.63	Pass
B: Left	2	0.1310	0.1303	0.1273	1.63	Pass
C: Front	2	0.0906	0.0897	0.0882	1.63	Pass
D: Back	2	0.1443	0.1405	0.1443	1.63	Pass
E: Top	2	0.0685	0.0680	0.0652	1.63	Pass
F: Bottom	2	0.1361	0.1339	0.1327	1.63	Pass

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E-Field Strength

Test Position	Test distance (cm)	Test result (V/m)			Limit (V/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	0	1.11	1.11	1.09	614	Pass
B: Left	0	1.23	1.22	1.22	614	Pass
C: Front	0	1.13	1.11	1.08	614	Pass
D: Back	0	1.14	1.13	1.08	614	Pass
E: Top	0	1.61	1.54	1.57	614	Pass
F: Bottom	0	1.02	0.98	1.02	614	Pass

H-Field Strength

Test Position	Test distance (cm)	Test result (A/m)			Limit (A/m)	Result (Pass/Fail)
		<1% Battery status	<50% Battery status	<99% Battery status		
A: Right	0	0.1750	0.1728	0.1742	1.63	Pass
B: Left	0	0.1482	0.1462	0.1452	1.63	Pass
C: Front	0	0.1082	0.1082	0.1063	1.63	Pass
D: Back	0	0.1721	0.1721	0.1701	1.63	Pass
E: Top	0	0.0865	0.0826	0.0831	1.63	Pass
F: Bottom	0	0.1955	0.1931	0.1950	1.63	Pass

All simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

TEST REPORT

Equipment Approval Considerations

Requirements of section 5 of KDB680106 D01 RF Exposure Wireless Charging App v03	Yes/No	Description
Power transfer frequency is less than 1 MHz.	Yes	The device operates in the frequency 127.8kHz
Output power from each primary coil is less than or equal to 15 watts.	Yes	The maximum output power of the primary coil is 15W
The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.	Yes	The transfer system includes only single coil
Client device is placed directly in contact with the transmitter.	Yes	Client device is placed directly in contact with the transmitter
Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes	Product is not a portable device.
The aggregate 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.	Yes	See the test data in section 3.4 of this report

TEST REPORT

Appendix I: Photograph of test setup

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

Appendix II: Photograph of equipment under test

Refer to Appendix 2 for EUT external and internal photos.

********** END **********