

Test Report

Report No.: MTi221026005-04E2

Date of issue: 2022-11-28

Applicant: T&F Manufacturing CO., LTD

Product: 3 IN 1 Magnetic Wireless Charger

Model(s): TNF-202-005

FCC ID: 2A8C5-TNF202005

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

Instructions

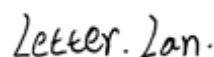
1. This test report shall not be partially reproduced without the written consent of the laboratory.
2. The test results in this test report are only responsible for the samples submitted
3. This test report is invalid without the seal and signature of the laboratory.
4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.
5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Contents

1	General Description	5
1.1	Description of the EUT	5
1.2	Description of test modes	5
1.3	Description of support units	7
2	Measurement uncertainty	7
3	Test facilities and accreditations.....	8
3.1	Test laboratory	8
4	List of test equipment	9
5	Test result	10
5.2	Test setup	11
5.3	Test Procedures.....	11
5.4	Equipment Approval Considerations item 5 b) of KDB 680106 D01 v03r01	12
5.5	Test results	13
	Photographs of the Test Setup.....	14
	Photographs of the EUT.....	14

Test Result Certification	
Applicant:	T&F Manufacturing CO., LTD
Address:	No.8 East 3rd Street, Xingfa South Road, Liwu, Wusha, ChangAn, Dongguan, China
Manufacturer:	T&F Manufacturing CO., LTD
Address:	No.8 East 3rd Street, Xingfa South Road, Liwu, Wusha, ChangAn, Dongguan, China
Product description	
Product name:	3 IN 1 Magnetic Wireless Charger
Trademark:	TNF
Model name:	TNF-202-005
Series Model:	N/A
Standards:	FCC CFR 47 PART 1, § 1.1310
Test method:	KDB 680106 v03r01
Date of Test	
Date of test:	2022-11-04 ~ 2022-11-28
Test result:	Pass

Test Engineer :



(Letter Lan)

Reviewed By :



(Leon Chen)

Approved By :



(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	3 IN 1 Magnetic Wireless Charger
Model name:	TNF-202-005
Series Model:	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V/2A, 9V/2A, 12V/1.5A Output: transmitter 1(Smart phone): 5W/7.5W/10W/15W transmitter 2(Airpods): 5W transmitter 3(Smart watch): 2.5W Type-C Output: DC 5V/2A 10W
Accessories:	N/A
Hardware version:	TF-V1.0
Software version:	TF-V2.2
RF specification:	
Operation frequency:	transmitter 1: 115 kHz – 205 kHz transmitter 2: 115 kHz – 205 kHz transmitter 3: 326.5kHz
Modulation type:	ASK
Antenna type:	Coil Antenna

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

No.	Emission test modes
Mode 1	Wireless Output(5W)
Mode 2	Wireless Output(7.5W)
Mode 3	Wireless Output(10W)
Mode 4	Wireless Output(15W)
Mode 5	Airpods(5W)
Mode 6	Watch(2.5W)
Mode 7	Wireless Output(5W)+Airpods(5W)
Mode 8	Wireless Output(5W)+Watch(2.5W)
Mode 9	Wireless Output(7.5W)+Airpods(5W)
Mode 10	Wireless Output(7.5W)+Watch(2.5W)

Mode 11	Wireless Output(10W)+Airpods(5W)
Mode 12	Wireless Output(10W)+Watch(2.5W)
Mode 13	Airpods(5W)+Watch(2.5W)
Mode 14	Wireless Output(5W)+Airpods(5W)+Watch(2.5W)
Mode 15	Stand by
The test data only show worst test mode: Mode 14	

1.3 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
Airpods	/	/	Apple
Watch	/	/	Apple
Adapter	HW-090200CH0	/	Huizhou BYD Electronics Co., Ltd.
Mobile phone	Find X3	/	OPPO
Support cable list			
Description	Length (m)	From	To
/	/	/	/

2 Measurement uncertainty

Parameter	Expanded Uncertainty
Magnetic field measurement (9kHz~30MHz)	$\pm 7.8\%$
Electric field measurements (9kHz~30MHz)	$\pm 7.8\%$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3 Test facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTI-E115	Electric and Magnetic Field Probe – Analyzer	Narda	EHP-200A	101166	2022/08/15	2023/08/14

5 Test result

5.1.1 Requirement

§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 (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) 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
300-1500			f/300	<6
1500-100000			5	<6
(ii) 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
300-1500			f/1500	<30
1500-100000			1.0	<30

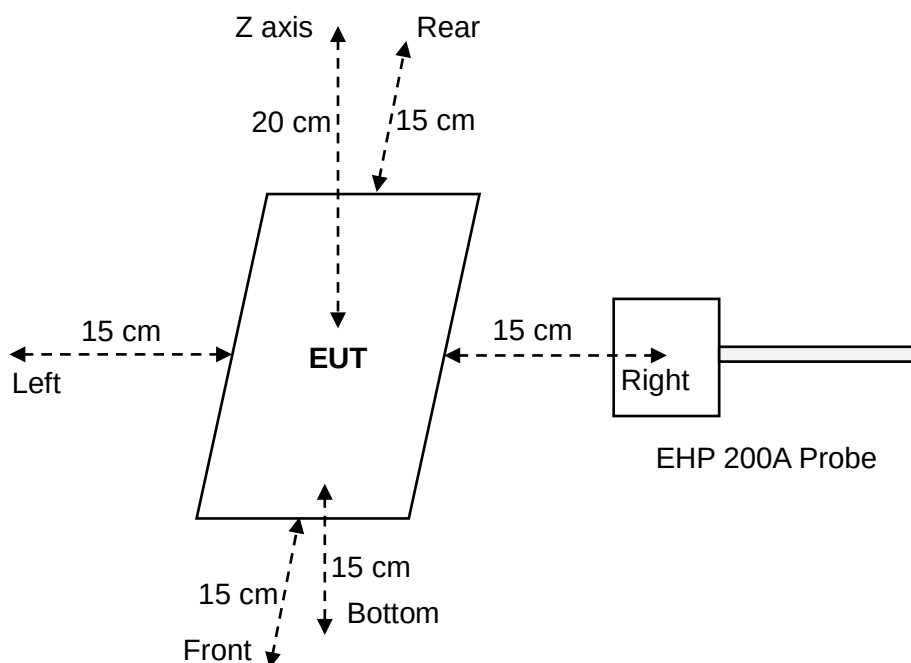
f = frequency in MHz

* = Plane-wave equivalent power density

Note 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

Note 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5.2 Test setup



5.3 Test Procedures

- The RF exposure test was performed in anechoic chamber.
- E and H-field measurements should be made with the center of the probe at a distance of 15 cm surrounding the device and 20 cm above the top surface of the primary/client pair.
- The highest emission level was recorded and compared with limit.
- The EUT was measured according to the dictates of KDB 680106 v03r01.

5.4 Equipment Approval Considerations item 5 b) of KDB 680106 D01 v03r01

Requirement	Device
1. Power transfer frequency is less than 1 MHz.	Yes. The operating frequencies are: transmitter 1: 115 kHz – 205 kHz transmitter 2: 115 kHz – 205 kHz transmitter 3: 326.5kHz
2. Output power from each primary coil is less than or equal to 15 watts	Yes. The maximum output power is: transmitter 1(Smart phone): 15W transmitter 2(Airpods): 5W transmitter 3(Smart watch): 2.5W
3. 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 EUT has three source primary coils.
4. Client device is placed directly in contact with the transmitter.	Yes. The client device is placed directly in contact with the transmitter.
5. Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes. Mobile exposure conditions only.
6. The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.	Yes. See the test result in item 4.5.

5.5 Test results

Test condition 1: Mode 14 operating mode with client device (1 % battery status of client device)

Antenna	Probe Position	E –field (V/m)			H–field (A/m)		
		Measurement	Limit	Max. Percentage (%)	Measurement	Limit	Max. Percentage (%)
1	Z axis	2.7484	614	0.45%	0.0664	1.63	7.74%
	Left	2.3838			0.0792		
	Right	2.4339			0.0554		
	Front	1.7383			0.0517		
	Rear	1.0089			0.1261		
	Bottom	0.8902			0.0752		

Test condition 2: Mode 14 operating mode with client device (50 % battery status of client device)

Antenna	Probe Position	E –field (V/m)			H–field (A/m)		
		Measurement	Limit	Percentage (%)	Measurement	Limit	Percentage (%)
1	Z axis	2.7414	614	0.45%	0.0686	1.63	7.34%
	Left	2.3929			0.0819		
	Right	2.444			0.0627		
	Front	1.7487			0.0598		
	Rear	1.0264			0.1196		
	bottom	0.8804			0.0658		

Test condition 3: Mode 14 operating mode with client device (99 % battery status of client device)

Antenna	Probe Position	E –field (V/m)			H–field (A/m)		
		Measurement	Limit	Percentage (%)	Measurement	Limit	Percentage (%)
1	Z axis	2.7388	614	0.45%	0.0586	1.63	7.45%
	Left	2.3687			0.0753		
	Right	2.4183			0.0481		
	Front	1.7359			0.0438		
	Rear	0.9902			0.1215		
	bottom	0.8742			0.0679		

Photographs of the Test Setup

See the Appendix - Test Setup Photos.

Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----