

Test Report

Report No. : MTi250107021-0201E6
Date of Issue : 2025-05-23
Applicant : Heltec Automation Technology Co., Ltd
Product : MeshPocket
Model(s) : HT-298A, HT-298B, HT-298C, HT-298D, HT-298G,
HT-298P, HT-298S, HT-298T, HT-298Z

Shenzhen Microtest Co., Ltd.

Table of contents

1	General description	4
1.1	Feature of equipment under test (EUT)	4
1.2	Description of test modes	4
1.3	Description of support units	5
1.4	Environmental conditions	5
1.5	Measurement uncertainty	5
2	Test Facilities and accreditations	6
2.1	Test laboratory	6
3	List of test equipment	6
4	RF exposure measurement	7
4.1	Introduction	7
4.2	Limits	7
4.4	Test Procedures	8
4.5	Information of test equipment	10
4.6	Test result	11
	Photographs of the Test Setup	12

Test Result Certification		
Applicant	Heltec Automation Technology Co., Ltd	
Applicant Address	1f, No.54, 56, 58, Zirui North Street, Gaoxin District, Chengdu	
Manufacturer	Heltec Automation Technology Co., Ltd	
Manufacturer Address	1f, No.54, 56, 58, Zirui North Street, Gaoxin District, Chengdu	
Product description		
Product name	MeshPocket	
Trademark		
Model name	HT-298A	
Series model	HT-298B, HT-298C, HT-298D, HT-298G, HT-298P, HT-298S, HT-298T, HT-298Z	
Standards	EN IEC 62311:2020 EN 50665:2017	
Date of Test		
Date of test	2024-10-29 to 2024-11-15	
Test result	Pass	
Prepared by	James Qin	
Reviewed by	David Lee	
Approved by	Lewis Lian	

1 General description

1.1 Feature of equipment under test (EUT)

Product name:	MeshPocket
Model name:	HT-298A
Series Model(s):	HT-298B, HT-298C, HT-298D, HT-298G, HT-298P, HT-298S, HT-298T, HT-298Z
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Type-C Input: DC 5V/3A, 9V/2.22A Type-C Output: DC 5V/3A, 9V/2.22A Battery: DC 3.87V 5000mAh 19.35Wh Wireless Output: 5W/7.5W/10W/15W
Accessories:	Cable: 1. USB-A Magnetic charging cable(60cm)*1 2. Type-C to Type-C cable(25cm) *1
Hardware version:	V1.0.0
Software version:	V1.0.0
Test sample(s) number:	MTi250107021-02-R001
RF specification	
Operating frequency range:	115-205kHz(5W/ 7.5W/ 10W) 360kHz(15W)
Modulation type:	ASK
Antenna(s) type:	Coil

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
Mode1	Charging+Wireless Output(5W)
Mode2	Charging+Wireless Output(7.5W)
Mode3	Wireless Output(5W)
Mode4	Wireless Output(7.5W)
Mode5	Wireless Output(10W)
Mode6	Wireless Output(15W)
Mode7	Stand by

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
Mobile Phone	iPhone 13	/	Apple
Moible Phone	Find X3	/	OPPO
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.4 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Humidity:	20 % RH ~ 75 % RH
Atmospheric pressure:	98 kPa~101 kPa

1.5 Measurement uncertainty

Measurement	Uncertainty
Magnetic field measurements(3kHz~10MHz)	± 14.8%
Electric field measurements(3kHz~10MHz)	± 17.5%
Temperature	±1 degree
Humidity	± 5 %

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

2 Test Facilities and accreditations

2.1 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

3 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTI-E143	Near-field Electric and Magnetic Field Sensor System	Speag	MAGPy-8H3 D+ED3 V2	3101	2024/3/12	2027/3/11

No.	Equipment	Manufacturer	Model	Software version:	Cal. date	Cal. Due
MTI-E016S	MPE test software	SPEAG	MAGPY 2.6	2.6	/	/

4 RF exposure measurement

4.1 Introduction

Introduction of EN 62311:

This standard applies to electronic and electrical equipment for which no dedicated product standard or product family standard regarding human exposure to electromagnetic fields applies. It covers equipment with intentional or non-intentional radiators as well as a combination thereof.

This standard provides assessment methods and criteria to evaluate equipment against limits on exposure of people related to electric, magnetic and electromagnetic fields. The frequency range covered is from 0 Hz to 300 GHz. If such a standard does exist then it shall be used and this standard shall not.

Introduction of EN 50665

The object of this generic standard is to provide a route for evaluation of such equipment against limits on human exposure to electric, magnetic and electromagnetic fields, and induced and contact current.

The frequency range covered is 0 Hz to 300 GHz.

This standard is intended to cover both intentional and non-intentional radiators.

This European Standard applies to electronic and electrical equipment for which no dedicated harmonized product- or product family standard, or standard relating to low power equipment, regarding human exposure to electromagnetic fields exists.

4.2 Limits

1999/519/EC Table 2 requirement:

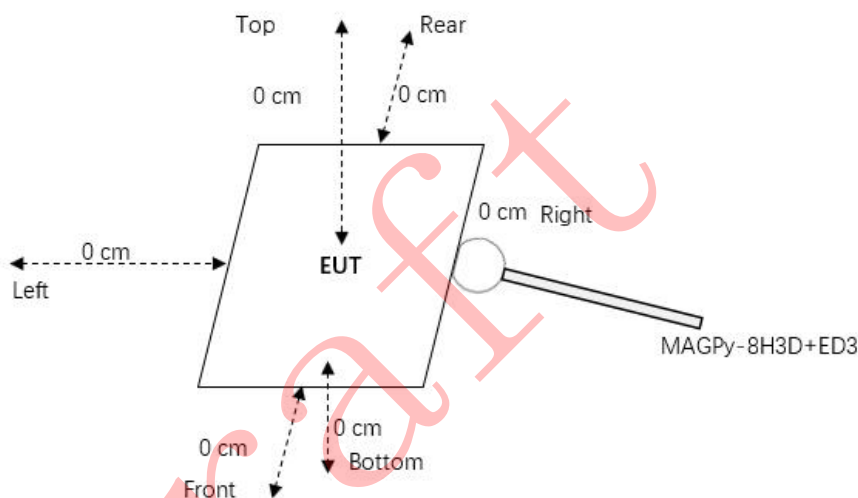
Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)				
Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m ²)
0-1Hz	-	3.2×10^4	4×10^4	-
1-8Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25Hz	10000	$4000 / f$	$5000 / f$	-
0.025-0.8kHz	$250 / f$	$4 / f$	$5 / f$	-
0.8-3kHz	$250 / f$	5	6.25	-
3-150kHz	87	5	6.25	-
0.15-1MHz	87	$0.73 / f$	$0.92 / f$	-
1-10MHz	$87 / f^{1/2}$	$0.73 / f$	$0.92 / f$	-
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1.375 f^{1/2}$	$0.037 f^{1/2}$	$0.0046 f^{1/2}$	$f / 200$
2-300GHz	61	0.16	0.2	10

Notes:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10GHz, S_{eq} , E^2 , H^2 and B^2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10GHz, S_{eq} , E^2 , H^2 and B^2 are to be averaged over any $68/f^{1.05}$ -minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

4.3 Test setup

0cm distance:



Note: tips mode of the test probe is used for 0cm measurement.

4.4 Test Procedures

The RF exposure test was performed in anechoic chamber.

H-field measurements should be made with the center of the probe at a distance of 0 cm surrounding the device.

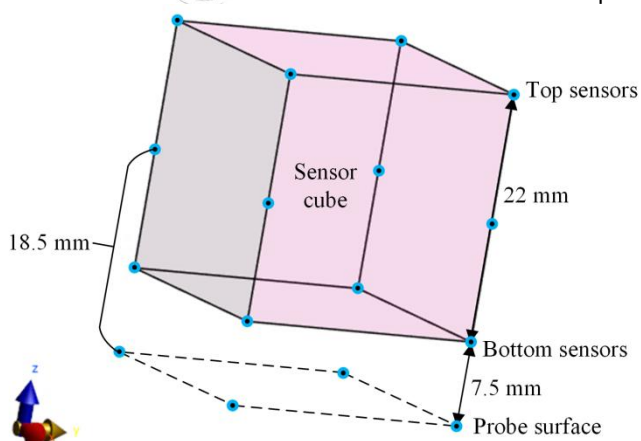
The highest emission level was recorded and compared with limit.

To measure at 0cm, the probe tip mode is used. The total H-field at the tip-surface $H_{tip-surface}$ can be extrapolated using the total H-field measured at the top and bottom sensors, H_{top} and H_{bottom} , as well as the normalized H-field gradient G_n . The field extrapolation formula is a polynomial function of G_n ($\Delta d = 18.5$ mm)

$$H_{tip-surface} = \frac{H_{bottom} + H_{top}}{2} \sum_{i=0}^7 ci(G_n \Delta d)^i$$

TEST REPORT

Report No.: MTi250107021-0201E6



4.5 Information of test equipment

Test equipment: MAGPy-8H3D+ED3	
Diameter	60mm
8 isotropic H-field sensors	Concentric loops of 1cm ² arranged at the corner of a cube of 22mm side length
1 isotropic E-field sensor	Orthogonal dipole/monopole (arm length: 50mm)
Measurement center	18.5mm from the probe tip
Dimensions	110*635*35mm (MAGPy-8H3D+E3D V2 & MAGPy-DAS V2)
	
Test probe, without the casing	

4.6 Test result

Note: All modes of the EUT have been tested, only the worst-case results reported.

Test condition 1: Mode 5 operating mode with client device (1 % battery status of client device)

Probe Position	E -field (V/m)		H-field (A/m)	
	Measure	Limit	Measure	Limit Instantaneous
Top	16.4	87	2.26	5
Bottom	65		2.15	
Left	18.6		2.02	
Right	27.1		1.57	
Front	21.8		1.69	
Back	8.21		0.54	

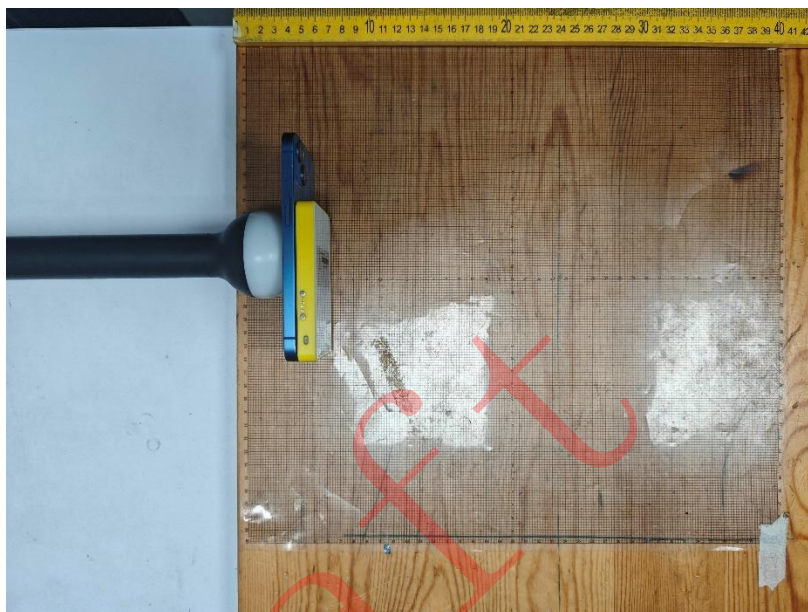
Test condition 2: Mode 6 operating mode with client device (1 % battery status of client device)

Probe Position	E -field (V/m)		H-field (A/m)	
	Measure	Limit	Measure	Limit Instantaneous
Top	45.4	87	0.84	2.02
Bottom	23.7		0.09	
Left	71.2		0.55	
Right	13.9		0.56	
Front	48.4		0.61	
Back	13.5		0.41	

Note: The limit of H-field strength is $0.73/f$ A/m, $f = 0.36\text{MHz}$

Photographs of the Test Setup

MPE



Statement

1. This report is invalid without the seal and signature of the laboratory.
2. The test results of this report are only responsible for the samples submitted. Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

***** END OF REPORT *****