

RF Test Report

For

Applicant name: Shanghai Huace Navigation Technology Ltd.
Address: 577 Songying Road, Qingpu District, 201706 Shanghai, China
EUT name: Geodetic GNSS Receiver
Brand name: 
Model number: i100
Series model number: N/A
FCC ID: SY4-A02066

Issued By

Company name: BTF Testing Lab (Shenzhen) Co., Ltd.
Address: 101/201/301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Report number: BTF250722R00106
Test standards: 47 CFR Part 2 Subpart J Section 2.1091
Test conclusion: Pass
Date of sample receipt: 2025-07-22
Test date: 2025-07-23 to 2025-09-04
Date of issue: 2025-09-04

Prepared by:

Chris Liu

Chris Liu / Project engineer



Ryan.CJ / EMC Manager

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue date	Revisions content
R_V0	2025-09-04	Original

Table of Contents

1 Introduction	4
1.1 Laboratory Location	4
1.2 Laboratory Facility	4
1.3 Announcement.....	4
2 Product Information.....	5
2.1 Application Information	5
2.2 Manufacturer Information.....	5
2.3 Factory Information	5
2.4 General Description of Equipment under Test (EUT)	5
2.5 Technical Information	5
3 RF Output Power.....	6
4 Applied Reference Documents	7
5 Device Category and RF Exposure Limit.....	7
6 RF Exposure Assessment.....	9

1 Introduction

1.1 Laboratory Location

Test location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	101/201/301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at 101/201/301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Phone number:	+86-0755-23146130
Fax number:	+86-0755-23146130

1.2 Laboratory Facility

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

- **FCC - Designation No.: CN1409**
BTF Testing Lab (Shenzhen) Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 695374.
- **CNAS - Registration No.: CNAS L17568**
BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.
- **A2LA - Registration No.: 6660.01**
BTF Testing Lab (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

1.3 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.
- (7) All entrusted information in this report is provided by the client and has been confirmed through consultation with the client; The testing items for this report have been discussed and confirmed with the client, and our company is only responsible for the content reflected in the report.

2 Product Information

2.1 Application Information

Company name:	Shanghai Huace Navigation Technology Ltd.
Address:	577 Songying Road, Qingpu District, 201706 Shanghai, China

2.2 Manufacturer Information

Company name:	Shanghai Huace Navigation Technology Ltd.
Address:	577 Songying Road, Qingpu District, 201706 Shanghai, China

2.3 Factory Information

Company name:	Shanghai Huace Navigation Technology Ltd.
Address:	577 Songying Road, Qingpu District, 201706 Shanghai, China

2.4 General Description of Equipment under Test (EUT)

EUT name	Geodetic GNSS Receiver
Under test model name	i100
Series model name	N/A
Description of model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Rating:	Input: 9V \approx 2A, 12V \approx 2A, 15V \approx 2A Adapter: MODEL:EU204ASAR AC INPUT:100-240Vac, 1.5A, 50-60Hz DC OUTPUT: C:5.0V \approx 3.0A 15.0W or 9.0V \approx 3.0A 27.0W or 12.0V \approx 3.0A 36.0W or 15.0V \approx 3.0A 45.0W or 12.0V \approx 3.0A 36.0W or 15.0V \approx 3.0A 45.0W or 20.0V \approx 2.25A 45.0W A:5.0V \approx 3.0A 15.0W or 9.0V \approx 2.0A 18.0W or 12.0V \approx 1.5A 18.0W C+A: C: 5.0V \approx 3.0A 15.0W or 9.0V \approx 2.22A 20.0W or 12.0V \approx 1.66A 20.0W or 15.0V \approx 0.33A 20.0W or 20.0V \approx 1.0A 20.0W A:5.0V \approx 2.0A 10.0W

2.5 Technical Information

Frequency Bands:	Bluetooth	2402MHz-2480MHz
	WLAN 2.4GHz	2412MHz-2462MHz
	5GWIFI	5150MHz—5850MHz
Antenna type:	Internal Antenna	
Antenna Gain:	Bluetooth :0.56 dBi (declare by Applicant)	
	WLAN 2.4GHz:0.56dBi(declare by Applicant)	
	5GWIFI:4.37 dBi(declare by Applicant)	
Antenna transmit mode:	SISO (1TX, 1RX)	

3 RF Output Power

Mode	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
BLE 1Mbps	2402	9.06
	2440	9.60
	2480	9.31
BLE 2Mbps	2402	9.65
	2440	9.64
	2480	9.33
Maximum Tune-up (dBm)		10.0

Mode	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
GFSK	2402	9.16
	2441	9.14
	2480	8.85
Pi/4DQPSK	2402	8.50
	2441	8.52
	2480	8.20
8DPSK	2402	8.64
	2441	8.61
	2480	8.27
Maximum Tune-up (dBm)		10.0

Mode	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
802.11b	2412	17.95
	2437	16.91
	2462	17.07
802.11g	2412	17.21
	2437	19.41
	2462	18.93
802.11n (HT20)	2412	15.83
	2437	18.62
	2462	18.05
802.11n (HT40)	2422	13.60
	2437	14.88
	2452	14.46
802.11ax (HEW20)	2412	18.20
	2437	20.30

	2462	19.99
802.11ax (HEW40)	2422	15.95
	2437	16.96
	2452	16.58
Maximum Tune-up (dBm)		21.0

Mode	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
802.11ac (VHT80)	5210	6.45
	5290	7.23
	5530	8.85
	5610	8.25
	5775	6.36
802.11ax (HEW80)	5210	6.99
	5290	7.27
	5530	9.37
	5610	8.93
	5775	6.72
Maximum Tune-up (dBm)		10.0

Note 1: According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

4 Applied Reference Documents

Identity	Document Title
47 CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: mobile devices
KDB 447498 D01v06	General RF Exposure Guidance

5 Device Category and RF Exposure Limit

Per user manual, Based on 47 CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.	
Mobile Devices:	<p>47 CFR 2.1091(b)</p> <p>For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location.</p> <p>Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.</p>
General Population/Uncontrolled Exposure:	<p>The general population/uncontrolled exposure limits are applicable to 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 made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.</p>
Test Standards:	<p>The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.</p> <p>Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.</p>

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b) 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)
(A) Limits for Occupational/Controlled Exposures				
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

1500–100,000	-	-	5	6
(B) 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
1500–100,000	-	-	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

6 RF Exposure Assessment

➤ Standalone Transmission Assessment:

Bands	Frequency (MHz)	Tune-up Power(dBm)	Antenna Gain(dBi)	Power Density (mW/cm ²)	Limit for MPE (mW/cm ²)
Bluetooth	2402	10	0.56	0.0023	1.0
BLE	2412	10	0.56	0.0023	1.0
WLAN 2.4GHz	2437	21	0.56	0.0285	1.0
5GWIFI	5530	10	4.37	0.0054	1.0

Note:

1. According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

2. MPE calculate method

$$S = PG/4\pi R^2$$

Where:

S = Power density (in appropriate units, e.g. mW/cm²)

P = Time-average maximum tune-up power (in appropriate units, e.g. dBm)

G = numeric gain of the antenna (in appropriate units, e.g. dBi)

R = Separation distance to the centre of radiation of the antenna (20cm)

➤ Conclusion:

According to 47 CFR §2.1091, this device complies with human exposure basic restrictions.



BTF Testing Lab (Shenzhen) Co., Ltd.

101/201/301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China

www.btf-lab.com

--END OF REPORT--