Test Report

Verified code: 103159

Report No.: E202411154120-3EN

Customer:	Shanghai Huace Navigation Technology Ltd.
Address:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Sample Name:	X500 Rotor UAV
Sample Model:	X500
Receive Sample Date:	Dec.05,2024
Test Date:	Dec.16,2024 ~ Dec.23,2024
Reference Document:	47 CFR, FCC Part 2.1091 Radio frequency radiation exposure evaluation: mobile devices
Test Result:	Pass

Prepared by: Wen Wenwen Reviewed by: Jiang Tao Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2025-01-13

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5. This testing report is only for scientific research, teaching, internal quality control, etc.

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TABLE OF CONTENTS

1. GENERAL DESCRIPTION OF EUT 5
1.1 APPLICANT 5
1.2 MANUFACTURER 5
1.3 FACTORY 5
1.4 BASIC DESCRIPTIONOF EQUIPMENTUNDER TEST 5
2. LABORATORY 7
2.1 LABORATORY 7
2.2 ACCREDITATIONS 7
3. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE 8
4. CALCULATION METHOD 9
5. ESTIMATION RESULT 9
5.1 MEASUREMENT RESULTS 9
6. CONCLUSION 10

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202411154120-3EN	Original Issue	2024-12-25

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1. GENERAL DESCRIPTION OF EUT

1.1 APPLICANT

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

1.2 MANUFACTURER

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

1.3 FACTORY

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

1.4 BASIC DESCRIPTIONOF EQUIPMENTUNDER TEST

Product Name:	X500 Rotor UAV
Product Model:	X500
Trade Name:	/
Additional Model:	/
Power Supply:	DC 47.04V by batteries
Battery:	Model: B10 Max charge voltage: 53.4V, rated capacity: 10000mAh, 470.4Wh, nominal voltage: 47.04V
FCC ID:	SY4-A02061
Frequency Band:	2402MHz - 2480MHz for Bluetooth LE with 1M & 2M 2406.5MHz – 2476.5MHz for OFDM
Transmit Power:	BLE 1Mbps: 3.39dBm BLE 2Mbps: 3.38dBm 2.4G: 10.65dBm
Modulation type:	GFSK for Bluetooth LE, OFDM for 2406.5MHz – 2476.5MHz
Antenna Type:	For BLE_1Mbps & 2Mbps Internal antenna with 2.63dBi (Max.), 2.4G OFDM: The EUT have two antennas, the antenna 1 support transmitting and receiving, the antenna 2 is receiving only. Internal antenna 1 & antenna 2 with 2.64dBi (Max.)
Temperature Range:	-20 ℃ ~ +50 ℃
Hardware Version:	v2.1.0

Software Version:	v2.9.6
Sample No:	E202411154120-0001, E202411154120-0003
Note:	The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

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2. LABORATORY

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
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2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA	A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

General

According to the KDB 447498 D04 Interim General RF Exposure Guidance v01,General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table 4.1 to support an exemption from further evaluation from 300 kHz through 100 GHz.

TABLE 4.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			**Minimum Distance**			**Threshold ERP**
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 R^2f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

For mobile devices that are not exempt per Table 4.1 at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (4.1).

Formula (4.1):

$$P_{\text{th}}\ (\text{mW}) = ERP_{20\ \text{cm}}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

4. CALCULATION METHOD

Predication of MPE limit at a given distance

EIRP(dBm)=Maximum Tune-up Output power (dBm)+Maximum antenna gain(dBi)

ERP(dBm)=EIRP(dBm)-2.15

R=minimum distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the maximum gain of the used as following information, the RF power ERP can be obtained.

Table 1 Antenna Specification

Mode	Antenna type	Internal Identification	Maximum antenna gain
Bluetooth LE	Internal antenna	Antenna 1	2.63dBi
2.4G OFDM	Internal antenna	Antenna 1	2.64dBi

Table 2 Transmit Power

Mode	Maximum Output Power (dBm)	Maximum Tune-up Output power (dBm)
Bluetooth LE 1M	3.39	3.00±1.00
Bluetooth LE 2M	3.38	3.00±1.00
2.4G OFDM	10.65	10.00±1.00

5. ESTIMATION RESULT

5.1 MEASUREMENT RESULTS

STANDALONE MPE

Mode	Frequency (MHz)	Maximum Tune-up Output power (dBm)	Antenna Gain (dBi)	Maximum Tune-up EIRP (dBm)	ERP (dBm)	Maximum Tune-up ERP (W)	Threshold ERP(W)
BLE 1M	2402 - 2480	4.00	2.63	6.63	4.48	0.0028	0.768
BLE 2M	2402 - 2480	4.00	2.63	6.63	4.48	0.0028	0.768
2.4G OFDM	2406.5 – 2476.5	11.00	2.64	13.64	11.49	0.0141	0.768

Remark:

1. RF Exposure use distance is 20cm from manufacturer declaration of user manual.
2. Threshold ERP(W)= 19.2R ²(W)=19.2*0.2*0.2(W)=0.768(W).
3. ERP(dBm)=EIRP(dBm)-2.15

Maximum Simultaneous transmission MPE Ratio for 2.4G OFDM, BLE:

Maximum MPE ratio 2.4G OFDM	Maximum MPE ratio BLE	∑ MPEratios	Limit	Results
0.0184	0.0036	0.0220	1.000	Pass

Remark:
According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations ∑of MPE ratios≤ 1.0

6. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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