RF Exposure evaluation

Report Reference No.....:	**GTS20251128005-1-14**
FCC ID. .....:	**2BUSS-UBI062603001**
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Date of issue .....:	Feb.10, 2026
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Applicant's name.....:	**Shanghai Ubiquitous Navigation Technology Co., Ltd.**
Address .....:	11th Floor, Building 6, Lane 308, Xumin Road, Qingpu District, Shanghai, China
Test specification .....:	
Standard.....:	**47CFR §1.1310 Basis and purpose** **47CFR §2.1091 Radiofrequency radiation exposure evaluation: mobile devices** **KDB447498 D01 General RF Exposure Guidance v06**
TRF Originator.....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF .....:	Dated 2014-12

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Test item description .....:	**Unmanned Surface Vehicle**
Trade Mark .....:	UbiNavi
Manufacturer .....:	Shanghai Ubiquitous Navigation Technology Co., Ltd.
Model/Type reference .....:	iUSV-6
Listed Models .....:	N/A
Hardware Version .....:	N/A
Software Version .....:	N/A
Rating .....:	DC 29.6V by battery*2
Result .....:	**PASS**

TEST REPORT

Test Report No. :	GTS20251128005-1-14	Feb.10, 2026 Date of issue

Equipment under Test	:	Unmanned Surface Vehicle
Model /Type	:	iUSV-6
Listed model	:	N/A
Applicant	:	**Shanghai Ubiquitous Navigation Technology Co., Ltd.**
Address	:	11th Floor, Building 6, Lane 308, Xumin Road, Qingpu District, Shanghai, China
Manufacturer	:	**Shanghai Ubiquitous Navigation Technology Co., Ltd.**
Address	:	11th Floor, Building 6, Lane 308, Xumin Road, Qingpu District, Shanghai, China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. SUMMARY

1.1 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

●	/	Length (m) :	/
		Shield :	/
		Detachable :	/

1.2 Product Description

Product Name	Unmanned Surface Vehicle
Trade Mark	UbiNavi
Model/Type reference	iUSV-6
List Models	N/A
Model Declaration	N/A
Power supply:	DC 29.6V by battery*2
Sample ID	GTS20251128005-1-S0001-1#GTS20251128005-1-S0001-2#
SRD(2.4G)	
Frequency Range	2411MHz ~ 2477MHz
Channel Number	7 channels
Channel Spacing	11MHz
Modulation Type	DSSS,OFDM
SRD(5.8G)	
Operation frequency	5730-5840MHz
Modulation Type	DSSS,OFDM
Channel Number	6 channels
Antenna Description	Dipole Antenna, 3.00dBi(Max.) for 2.4G Band and 3.00dBi (Max.) for 5G Band
3G	
UMTS Operation Frequency Band	UMTS FDD Band 2(1850 MHz -1910MHz) UMTS FDD Band 5(824 MHz -849MHz)
WCDMA Release Version	R7
HSDPA Release Version	Release 5
HSUPA Release Version	Release 6
HSPA+ Release Version	N/A
Modulation Type	QPSK for UMTS
Antenna Description	Dipole Antenna; 3.00dBi (max.) For WCDMA Band 2; 3.00dBi (max.) For WCDMA Band 5;
Power Class	Level 3
LTE	
LTE Operation Frequency Band	E-UTRA Band 2(1850 MHz -1910MHz) E-UTRA Band 4(1710 MHz -1755MHz) E-UTRA Band 5(824 MHz -849MHz) E-UTRA Band 7(2500 MHz -2570MHz) E-UTRA Band 12(699 MHz -716MHz) E-UTRA Band 25(1850 MHz -1915MHz)

	E-UTRA Band 26(814 MHz -824MHz) E-UTRA Band 26(824 MHz -849MHz) E-UTRA Band 41(2496 MHz -2690MHz) E-UTRA Band 66(1710 MHz -1780MHz)
LTE Release Version	R10
Type Of Modulation	QPSK/16QAM
Antenna Description	Dipole Antenna; 3.00dBi (max.) For LTE Band 2; 3.00dBi (max.) For LTE Band 4; 3.00dBi (max.) For LTE Band 5; 3.00dBi (max.) For LTE Band 7; 3.00dBi (max.) For LTE Band 12; 3.00dBi (max.) For LTE Band 25; 3.00dBi (max.) For LTE Band 26; 3.00dBi (max.) For LTE Band 41; 3.00dBi (max.) For LTE Band 66.

2. TEST ENVIRONMENT

2.1 Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

2.2 Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.
A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.
Industry Canada Registration Number. is 24189.
FCC Designation Number is CN1401.
FCC Registered Test Site Number is 684561.

2.3 Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01”Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1”and TR-100028-02 “Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 “ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	MeasurementUncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

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

3. METHOD OF MEASUREMENT

3.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
According to §1.1310 and §2.1091 RF exposure is calculated.
KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2 Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498 D01 General RF Exposure Guidance v06 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3.3 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
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 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

3.4 MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, as well as the gain of the used antenna is 3.00dBi for SRD&WCDMA&LTE, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained.

3.5 Antenna Information

iUSV-6 can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna Identification in Internal photos	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	SRD(2.4G&5.8G) ANT 0	Dipole antenna	2.4 – 2.5 GHz 5.0 – 6.0 GHz	3.00dBi(Max.) for 2.4G Band 3.00dBi (Max.) for 5G Band
Antenna1	WCDMA&LTE ANT 1	Dipole antenna	600 MHz -3000MHz	3.00dBi (max.) For WCDMA Band 2; 3.00dBi (max.) For WCDMA Band 5 3.00dBi (max.) For LTE Band2; 3.00dBi (max.) For LTE Band 4; 3.00dBi (max.) For LTE Band 5; 3.00dBi (max.) For LTE Band 7; 3.00dBi (max.) For LTE Band 12; 3.00dBi (max.) For LTE Band 25; 3.00dBi (max.) For LTE Band 26; 3.00dBi (max.) For LTE Band 41; 3.00dBi (max.) For LTE Band 66

4. Conducted Power Results

Antenna 0:

SRD

Mode	Channel	Frequency (MHz)	Measure Result(PK, dBuV/m)	EIRP(dBm)	Antenna Gain (dBi)	Conducted Power (dBm)
2.4G	01	2411	94.57	-0.63	-0.63	-3.63
	04	2444	94.73	-0.47	-0.47	-3.47
	07	2477	94.81	-0.39	-0.39	-3.39
5.8G	26	5730	94.54	-0.66	-0.66	-3.66
	29	5800	94.30	-0.90	-0.90	-3.90
	31	5840	94.58	-0.62	-0.62	-3.62

Antenna 1:

WCDMA

Test Mode		Channel	Max Conducted Power (dBm)
Band 2	Rel 99	LCH	23.52
		MCH	23.46
		HCH	23.50
	HSDPA	LCH	23.50
		MCH	23.54
		HCH	23.47
	HSUPA	LCH	22.64
		MCH	22.66
		HCH	22.70
Band 5	Rel 99	LCH	23.46
		MCH	23.58
		HCH	23.54
	HSDPA	LCH	23.61
		MCH	23.46
		HCH	23.55
	HSUPA	LCH	22.70
		MCH	22.68
		HCH	22.63

LTE

Test Mode		Channel	Max Conducted Power (dBm)
LTE	Band 2	LCH	23.88
		MCH	24.01
		HCH	23.99
	Band 4	LCH	23.40
		MCH	22.92
		HCH	23.24
	Band 5	LCH	23.84
		MCH	23.38
		HCH	23.41
	Band 7	LCH	23.37
		MCH	23.09
		HCH	23.04
	Band 12	LCH	23.89
		MCH	23.94
		HCH	23.98
	Band 25	LCH	23.56
		MCH	23.51
		HCH	23.48
	Band 26(814-824MHz)	LCH	23.56
		MCH	23.20
		HCH	23.28
	Band 26(824-849MHz)	LCH	23.17
		MCH	23.15
		HCH	23.19
	Band 41	LCH	23.30
		MCH	23.23
		HCH	23.21
	Band 66	LCH	23.43
		MCH	23.18
		HCH	23.39

5. Manufacturing Tolerance

Antenna 0:

SRD

2.4G			
Channel	Channel 01	Channel 04	Channel 07
Target (dBm)	-3.00	-3.00	-3.00
Tolerance ±(dB)	1.0	1.0	1.0
5.8G			
Channel	Channel 26	Channel 29	Channel 31
Target (dBm)	-3.00	-3.00	-3.00
Tolerance ±(dB)	1.0	1.0	1.0

Antenna 1:

WCDMA

Mode	Target Power
WCDMA BAND 2	23±1.0 dBm
WCDMA BAND 5	23±1.0 dBm

LTE

Mode	Target Power
LTE BAND 2	24±1.0 dBm
LTE BAND 4	23±1.0 dBm
LTE BAND 5	23±1.0 dBm
LTE BAND 7	23±1.0 dBm
LTE BAND 12	23±1.0 dBm
LTE BAND 25	23±1.0 dBm
LTE BAND 26-1	23±1.0 dBm
LTE BAND 26-2	23±1.0 dBm
LTE BAND 41	23±1.0 dBm
LTE BAND 66	23±1.0 dBm

6. Measurement Results

6.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

SRD

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
2.4G	-2.00	0.6310	3.00	1.9953	0.0003	1.00
5.8G	-2.00	0.6310	3.00	1.9953	0.0003	1.00

WCDMA

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
WCDMA BAND 2	24.00	251.1886	3.00	1.9953	0.0997	1.00
WCDMA BAND 5	24.00	251.1886	3.00	1.9953	0.0997	0.55

LTE

Modulation Type	**Output power**		**Antenna Gain (dBi)**	**Antenna Gain (linear)**	**MPE (mW/cm2)**	**MPE Limits (mW/cm2)**
	dBm	**mW**				
LTE BAND 2	25.00	316.2278	3.00	1.9953	0.1255	1.00
LTE BAND 4	24.00	251.1886	3.00	1.9953	0.0997	1.00
LTE BAND 5	24.00	251.1886	3.00	1.9953	0.0997	0.55
LTE BAND 7	24.00	251.1886	3.00	1.9953	0.0997	1.00
LTE BAND 12	24.00	251.1886	3.00	1.9953	0.0997	0.47
LTE BAND 25	24.00	251.1886	3.00	1.9953	0.0997	1.00
LTE BAND 26-1	24.00	251.1886	3.00	1.9953	0.0997	0.54
LTE BAND 26-2	24.00	251.1886	3.00	1.9953	0.0997	0.55
LTE BAND 41	24.00	251.1886	3.00	1.9953	0.0997	1.00
LTE BAND 66	24.00	251.1886	3.00	1.9953	0.0997	1.00

Remark:
1. Output power including tune-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

6.2 Simultaneous Transmission MPE

The sample support one SRD(2.4G&5.8G) modular,one WCDMA&LTE modular,and oneSRD(2.4G&5.8G) antenna, and oneWCDMA&LTE antenna, Need consider simultaneous transmission ;

According to KDB447498 D01 General RF Exposure Guidance v06 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

∑ of MPE ratios ≤ 1.0

6.2.1 Summary simultaneous transmission results

Maximum Simultaneous transmission MPE Ratios for **SRD, LTE band 2.**

Maximum MPE ratio SRD	Maximum MPE ratio LTE band 2	∑MPE ratios	Limit	Results
0.0003	0.1255	0.1258	1.0	PASS

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB447498 D01 General RF Exposure Guidance v06, No SAR is required.

.....End of Report.....