RF Exposure MPE

Report Reference No..... :	**HTT2024121249F05**
FCC ID..... :	**2A95C-AIO-6MAX**
Compiled by (position+printed name+signature) . :	File administrators Heber He
Supervised by (position+printed name+signature) . :	Project Engineer Bruce Zhu
Approved by (position+printed name+signature) . :	RF Manager Kevin Yu
Date of issue ..... :	Feb. 20, 2025
Testing Laboratory Name.....:	**Shenzhen HTT Technology Co.,Ltd.**
Address.....:	1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name.....:	**CHIGEE TECHNOLOGY CO., LTD.**
Address.....:	2 Building 2F, Da er shan Sanlian Industrial District, Tangtou Community, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province.
Standard .....:	**47CFR §1.1310** **47CFR §2.1091** **KDB447498 D01 General RF Exposure Guidance v06**

Test item description .....:	**Smart Riding System**
Manufacturer .....:	CHIGEE TECHNOLOGY CO., LTD.
Trade Mark	CHIGEE
Model/Type reference .....:	AIO-6 MAX
Rating .....:	DC 12V
Result .....:	**PASS**

T E S T R E P O R T

Equipment under Test	:	Smart Riding System
Model /Type	:	AIO-6 MAX
Listed Models	:	AIO-6, AIO-6 PRO, SRS-029, SRS-029A, SRS-029B, MFP0182
Model difference	:	The PCB board, circuit, structure and internal of these models are the same, Only model number is different for these model.
Applicant	**:**	**CHIGEE TECHNOLOGY CO., LTD.**
Address	:	2 Building 2F, Da er shan Sanlian Industrial District, Tangtou Community, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province.
Manufacturer	**:**	**CHIGEE TECHNOLOGY CO., LTD.**
Address	:	2 Building 2F, Da er shan Sanlian Industrial District, Tangtou Community, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province.

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.

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
FCC KDB 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Dec. 27, 2024
Testing commenced on	:	Dec. 27, 2024
Testing concluded on	:	Feb. 20, 2025

2.2 Product Description

Product Name:	Smart Riding System
Model No.:	AIO-6 MAX
Series model:	AIO-6, AIO-6 PRO, SRS-029, SRS-029A, SRS-029B, MFP0182
Test sample(s) ID:	HTT2024121249-1(Engineer sample) HTT2024121249-2(Normal sample)
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type:	Chip Antenna
Antenna gain:	4.3 dBi
Power Supply:	DC 12V
BLE:	
Operation frequency	2402~2480 MHz
Number of Channels	40
Modulation Type	GFSK
Channel separation	2MHz
Antenna Type:	Chip antenna
Antenna Gain:	4.3 dBi
Power Supply:	DC 12V
2.4GWIFI:	
Channel numbers:	802.11n(HT20): 11
Channel separation:	5MHz
Modulation technology:	802.11n(H20): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Chip Antenna
Antenna gain:	6.1 dBi
Power supply:	DC 12V
WIFI	

Supported type:	40MHz system
	802.11n
Operation frequency:	5190MHz-5230MHz
Modulation:	OFDM
Channel number:	2
Channel separation:	40MHz
Antenna Type:	Chip Antenna
Antenna gain:	3.67 dBi

2.3 Special Accessories

The following is the EUT test of the auxiliary equipment provided by the laboratory:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
/	/	/	/	/	/

2.4 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen HTT Technology Co.,Ltd.
1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

FCC-Registration No.: 779513 Designation Number: CN1319
Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6435.01
Shenzhen HTT Technology Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 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 compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen HTT Technology 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 HTT Technology Co.,Ltd. :

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	9KHz~30MHz	3.12 dB	(1)
Radiated Emission	30~1000MHz	4.37 dB	(1)
Radiated Emission	1~18GHz	5.40 dB	(1)
Radiated Emission	18-40GHz	5.45 dB	(1)
Conducted Disturbance	0.15~30MHz	2.68 dB	(1)

4 Test limit

4.1 Requirement

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	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/cm^2)	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

4.2 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

4.3 Conducted Power Results

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)	
				ANT1	Limit
GFSK	SISO	2402	DH5	3.9	<=20.97
		2441	DH5	4	<=20.97
		2480	DH5	4.65	<=20.97
Pi/4DQPSK	SISO	2402	2DH5	3.95	<=20.97
		2441	2DH5	4.63	<=20.97
		2480	2DH5	5.35	<=20.97
8DPSK	SISO	2402	3DH5	4.51	<=20.97
		2441	3DH5	4.75	<=20.97
		2480	3DH5	5.4	<=20.97

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	
			ANT1	Limit
1M	SISO	2402	3.62	<=30
		2440	3.99	<=30
		2480	4.72	<=30
2M	SISO	2402	3.3	<=30
		2440	3.63	<=30
		2480	4.48	<=30

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	
			ANT1	Limit
802.11n (HT20)	SISO	2412	23.43	<=29.9
		2437	23.15	<=29.9
		2462	23.14	<=29.9

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)	
			ANT1	Limit
802.11n (HT40)	SISO	5190	7.7	<=30
		5230	9.11	<=30

4.4 Manufacturing tolerance

Mode	Max. Peak Conducted Output Power (dBm)	Max. tune-up
BT	5.4	6.0±1
BLE	4.72	5.0±1
2.4GWIFI	23.43	22.0±1
Mode	Max. Peak Conducted Output Power (dBm)	Max. tune-up
5.2GWIFI	9.11	9.0±1

4.5 Standalone MPE Result

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 is refer to section 2.2, the RF power density can be obtained.

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
BT	7.0	5.0119	4.3	2.6915	0.0027	1.0000
BLE	6.0	3.9811	4.3	2.6915	0.0021	1.0000
2.4GWIFI	23.0	199.5262	6.1	4.0738	0.1618	1.0000
5.2GWIFI	10.0	10.0000	3.67	2.3281	0.0046	1.0000

Remark:
1. Output power (Peak) including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.
3. The sample support one BT/BLE/WiFi modular, they supports difference antenna, support simultaneous transmission;

4.6 Simultaneous Transmission for MPE Result

2.4GWIFI MPE (Ratio)	BT MPE (Ratio)	BLE MPE (Ratio)	simultaneous MPE (Ratio)	MPE Limits (Ratio)
0.1618	0.0027	0.0021	0.1666	1.0000

5 Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device Threshold per KDB 447498 D01v06

********** End of Report **********