

# MPE TEST REPORT

**Report No.** ..... : **CHTEW2202000601**      Report verification   
**Project No.** ..... : **SHT2111103501EW**  
**FCC ID**..... : **2A3OORB86**  
**Applicant's name**..... : **Shenzhen Ysair Technology Co., LTD**  
 Address..... : 6/F, building 6, Yunli intelligent park, No. 3, Changfa Middle Road, Yangmei community, Bantian street, Longgang District, Shenzhen, Guangdong, China  
**Test item description** ..... : **GMRS Mobile Radio**  
 Trade Mark ..... : RETEVIS  
 Model/Type reference..... : RB86  
 Listed Model(s) ..... : RT98  
**Standard** ..... : **FCC Per 47 CFR 2.1091(b)**  
 Date of receipt of test sample..... : Dec.02, 2021  
 Date of testing..... : Dec.02, 2021- Feb.09, 2022  
 Date of issue..... : Feb.10, 2022  
**Result**..... : **PASS**

Compiled by ( position+printed name+signature)...	File administrators Fanghui Zhu	
Supervised by ( position+printed name+signature)...	Project Engineer Cheng Xiao	
Approved by ( position+printed name+signature)...	RF Manager Hans Hu	

**Testing Laboratory Name** ..... : **Shenzhen Huatongwei International Inspection Co., Ltd**  
 Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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*The test report merely corresponds to the test sample.*

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# **1 TEST STANDARDS AND REPORT VERSION**

## **1.1. Test Standards**

The tests were performed according to following standards:

[FCC Rules Part 1.1310](#): Radiofrequency radiation exposure limits.

[FCC Rules Part 1.1307](#): Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

[FCC Rules Part 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices.

[KDB447498 v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

[IEEE Std C95.1: 2005](#): "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz".

[FCC OET Bulletin 65, Edition 97-01](#): "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields".

[FCC Supplement C to OET Bulletin 65, Edition 01-01](#): "Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emission".

[IEEE Std C95.3: 2002](#): "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz – 300 GHz",

## **1.2. Report revised information**

Revised No.	Date of issued	Description
N/A	2022-02-10	Original

## 2 **SUMMARY**

### 2.1 Client Information

Applicant:	Shenzhen Ysair Technology Co., LTD
Address:	6/F, building 6, Yunli intelligent park, No. 3, Changfa Middle Road, Yangmei community, Bantian street, Longgang District, Shenzhen,Guangdong,China
Manufacturer:	Shenzhen Ysair Technology Co., LTD
Address:	6/F, building 6, Yunli intelligent park, No. 3, Changfa Middle Road, Yangmei community, Bantian street, Longgang District, Shenzhen,Guangdong,China

### 2.2 Product Description

Name of EUT:	GMRS Mobile Radio
Trade Mark:	RETEVIS
Model No.:	RB86
Listed Model(s):	RT98
Power supply:	DC 13.8V
Hardware version:	Th8600_UpdataFile2021_08_17_2_23JT
Software version:	TH-8600-RF-V1.4

### 2.3 Radio Specification Description

Support Frequency Range:	462MHz Main channel:	462.5500-462.7250MHz
	462MHz interstitial channel:	462.5625-462.7125MHz
	467MHz Main channel:	467.5500-467.7250MHz
Modulation Type:	FM	
Emission Designator: * <sup>1</sup>	16K0F3E, 11K0F3E	
Antenna Type:	Detachable	
Antenna Gain:	5.2dBi	

## 2.4 Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Tel: 86-755-26715499 E-mail: <a href="mailto:cs@szhtw.com.cn">cs@szhtw.com.cn</a> <a href="http://www.szhtw.com.cn">http://www.szhtw.com.cn</a>	
Qualifications	Type	Accreditation Number
	FCC	762235

## 3 TEST CONFIGURATION

### 3.1 Test frequency list

According to ANSI C63.26 section 5.1.2.1:

Measurements of transmitters shall be performed and, if required, reported for each frequency band in which the EUT can be operated with the device transmitting at the number of frequencies in each band specified in below table

Frequency range over which EUT operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

Test Channel	Frequency range	Type	Frequency (MHz)
CH <sub>M1</sub>	462MHz	Main	462.6500
CH <sub>M2</sub>	467MHz	Main	467.6500
CH <sub>M3</sub>	462MHz	Interstitial	462.6375

### 3.2 Operation mode

Test mode	Transmitting	GMRS
TX-GMRS	√	√

### 3.3 Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

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

Whether support unit is used?					
✓ No					
Item	Equipement	Trade Name	Model No.	FCC ID	Power cord
1					
2					

### 3.4 Equipment Used during the Test

Name of Equipment	Manufacturer	Model	Serial Number	Last Cal.
Field Probe	ETS-LINDGREN	HI-6005	00064170	2022/11/12
Field Meter	AR	FM 5004	300239	2022/11/12

### 3.5 Applicable Standard

According to FCC Part 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 FCC Part 1.1310 and FCC Part 2.1091 RF exposure is calculated.

IEEE Std C95.1: 2005: "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz".

FCC OET Bulletin 65, Edition 97-01: "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields".

FCC Supplement C to OET Bulletin 65, Edition 01-01: "Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emission".

IEEE Std C95.3: 2002: "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz – 300 GHz",

## 4 TEST CONDITIONS AND RESULTS

### 4.1. Limit

FCC Part 1.1310(e):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			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

Test Frequency (MHz)	Max. Output Power (dBm)	Max Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (Numeric)	Power Density Limit (mW/cm <sup>2</sup> )	Safety Distance(cm)
462.65	43.5627	22710	5.2	3.311	0.308	139.42

Note: If the antenna gain is 5.2 dBi.

### 4.3. Antenna Information

Antenna Type:	Detachable
Antenna Gain:	5.2dBi

#### 4.4. Measurement Procedure

1. Polarization of the EUT's antenna was vertical, which is its polarization in actual use.
2. The EUT at the chosen modulation was set to transmit at the chosen frequency at maximum RF power and at 50% duty cycle (50% duty cycle is simulated either by lowering the radio's power by 3dB or by using a 3 dB pad on the output of the radio). During preliminary measurements, we set the distance between the power density probe and the investigated EUT's antenna equal to the average calculated  $R_{safe}$  applicable either for controlled or uncontrolled environments.
3. Power density measurements were taken at different heights of the probe from the ground (0.1 to 2 meters) while rotating versus azimuth (from 0° to 360°) the antenna.
4. The azimuth between the probe and the antenna position corresponding to the highest MPE level was chosen as the "worst case" position for the final measurements.
5. For the final measurements, we adjusted the distance between the test probe and the tested antenna to the real safe distance,  $R_{real}$ , such that the measured highest power density in the "worst case" position was the same or slightly less than the test limit.
6. The measurement results of final measurements conducted at the chosen azimuth and different heights of the probe above the ground.
7. Average values of power density were calculated for the imaginary whole human body (0.1–2.0 m), for the lower part of the body (0.1–0.9 m) and for the upper part of the body (1.0–2.0 m).

## 4.5. Test Results

EME Data:

Measuring Antenna Height (cm)	FCC Part 2.1091		
	Controlled RF Exposure(mW/cm <sup>2</sup> )		
	5.2dBi Antenna139.42cm	5.2dBi Antenna 149.42cm	5.2dBi Antenna 159.42cm
10	0.13	0.12	0.10
20	0.11	0.10	0.11
30	0.14	0.12	0.11
40	0.14	0.12	0.10
50	0.23	0.21	0.22
60	0.25	0.23	0.24
70	0.26	0.24	0.20
80	0.30	0.28	0.24
90	0.29	0.24	0.22
100	0.28	0.23	0.21
110	0.26	0.24	0.24
120	0.24	0.23	0.22
130	0.15	0.14	0.11
140	0.16	0.13	0.14
150	0.14	0.14	0.14
160	0.12	0.12	0.13
170	0.10	0.10	0.10
180	0.05	0.01	0.05
190	0.05	0.02	0.02
200	0.06	0.04	0.04

EME for Body Parts:

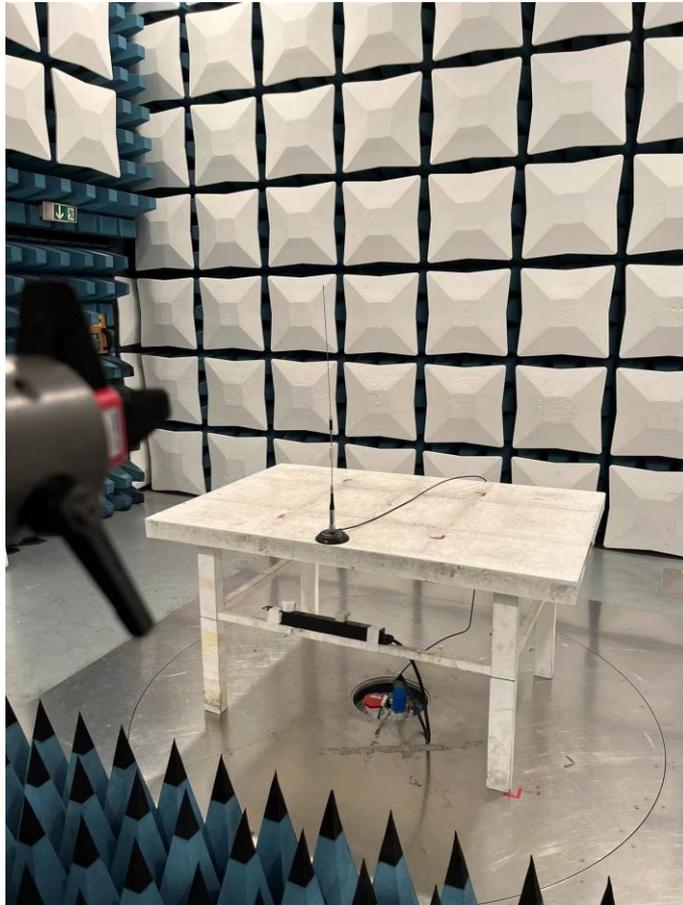
Part of the body/averaging points(m)	FCC Part 2.1091	
	Controlled RF Exposure	
	5.2dBi Antenna 139.42 cm (mW/cm <sup>2</sup> )	
Whole body (0.1 to 2.0)	0.35	
Lower body (0.1 to 0.9)	0.21	
Upper body (1.0 to 2.0)	0.15	

## 4.6. Conclusion

The User Manual shall include RF radiation safety warnings:

The antenna of this device must be installed on the roof or trunk of the vehicle. If the gain of the used antenna is 5.2dBi, the minimum mobile separation distance  $R_{safe} = 139.42$  cm.

## 5 TEST SETUP PHOTOS OF THE EUT



## 6 EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Reference to the test report No.: CHTEW22020005

-----End of Report-----