

# RF EXPOSURE EVALUATION

## 1. TEST RESULT CERTIFICATION

<b>Applicant</b>	Qixiang Electron Science & Technology Co., Ltd.
<b>Address</b>	Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China
<b>manufacturer</b>	Qixiang Electron Science & Technology Co., Ltd.
<b>Address</b>	Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China
<b>Factory</b>	Qixiang Electron Science & Technology Co., Ltd.
<b>Address</b>	Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China
<b>Product Designation:</b>	DMR Digital and Analog VHF/UHF Mobile Radio
<b>Brand Name:</b>	ANYTONE
<b>Test Model</b>	AT-D578UV PLUS
<b>Series Model</b>	AT-D578UV, AT-D578UVG, AT-D578UVB, AT-D578UV RC, AT-D578UV PRO
<b>Difference description</b>	All the same except the model name.
<b>FCC ID:</b>	PODGMRS-45
<b>Date of Test:</b>	Aug. 25, 2019~Oct. 22, 2019

## 2. TECHNICAL INFORMATION

A major technical description of EUT is described as following:

### Walkie talkie:

<b>Operation Frequency</b>	VHF:136MHz-174MHz UHF:400MHz-480MHz
<b>Modulation</b>	FM/4FSK
<b>Antenna Designation</b>	Detachable
<b>Antenna type</b>	External Antenna
<b>Output power</b>	VHF:60W/25W/10W/1W; UHF:45W/25W/10W/1W
<b>Antenna gain</b>	0dBi
<b>Power Supply</b>	DC 13.8V

### BT

<b>Operation Frequency</b>	BT:2402-2480MHz
<b>Modulation</b>	GFSK/ $\pi$ /4 DQPSK/8DPSK
<b>Antenna type</b>	PCB Antenna
<b>Output power</b>	3.755dBm
<b>Antenna gain</b>	1.5dBi
<b>Power Supply</b>	DC 13.8V

### 3. RF EXPOSURE MEASUREMENT

#### 3.1 INTRODUCTION

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

The 1992 ANSI/IEEE standard (See Listed limit table) specifies a minimum separation distance of 20 cm for performing reliable field measurements to determine adherence to MPE limits.

If the minimum separation distance between a transmitter and nearby persons is more than 20 cm under normal operating conditions, compliance with MPE limits may be determined at such distance from the transmitter. When applicable, operation instructions and prominent warning labels may be used to alert the exposed persons to maintain a specified distance from the transmitter or to limit their exposure durations and usage conditions to ensure compliance.

#### 3.2 FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

LIMITS FOR Occupational/Controlled Exposure

Frequency Range (MHz)	E-field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (Minutes)
0.3 -- 1.34	614	1.63	(100)*	30
1.34 -- 30	1842/f	4.89/f	(900/f <sup>2</sup> )*	30
30 -- 300	61.4	0.163	1.0	30
300 -- 1500	--	--	f/300	30
1500 -- 100,000	--	--	1.0	30

LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE

Frequency Range (MHz)	E-field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (Minutes)
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 -- 1500	--	--	f/1500	30
1500 -- 100,000	--	--	1.0	30

\*Note:

1. f= Frequency in MHz \* Plane-wave Equivalent Power Density
2. The averaging time for General Population/Uncontrolled exposure to fixed transmitters is not applicable for mobile and portable transmitters. See 47 CFR §§2.1091 and 2.1093 on source-based time-averaging requirement for mobile and portable transmitters.

#### 4. CLASSIFICATION OF THE ASSESSMENT METHODS

According to user manual, The antenna of the product, under normal use condition is at least 69.2 cm away from the body of the user. Warning statement to the user for keeping at least 69.2cm separation distance and the prohibition of operating to a person has been printed on the user's manual. So, this product under normal use is located on electromagnetic far field between the human body.

$$S = \frac{PG}{4\pi R^2}$$

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

## 5. EUT OPERATION CONDITION

Enable EUT to transmit on low, medium, and high channels in each mode

## 6. TEST RESULTS

Note: report the worst result in this part

Antenna Gain=0 dBi (Numeric 1),  $\pi=3.141$ , Duty cycle=50%

**VHF:**

Frequency	Output Power	Output Power	Correct Power	Power Density	Power Density Limit	Result
MHz	dBm	mW	mW	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	Pass/Fail
155.025	47.65	58210	29105	0.9675145	1	Pass

Frequency	Output Power	Output Power	Tune Up Power	Power Density	Power Density Limit	Result
MHz	dBm	mW	W	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	Pass/Fail
155.025	47.78	60000	58±2	0.997266278	1	Pass

**UHF:**

Frequency	Output Power	Output Power	Correct Power	Power Density	Power Density Limit	Result
MHz	dBm	mW	mW	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	Pass/Fail
453.225	46.42	43853	21926.5	0.728885301	1.51	Pass

Frequency	Output Power	Output Power	Tune Up Power	Power Density	Power Density Limit	Result
MHz	dBm	mW	W	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	Pass/Fail
453.225	46.53	45000	43±2	0.747949708	1.51	Pass

Note:

- 1.The output power is refer to **AGC02294181204FE10**.
2. Correct Power=Output Power\*Duty cycle.
3. According to the user manual, the minimum separate distance which used for MPE calculate is 69.2cm.

Antenna Gain=1.5 dBi (Numeric 1.41),  $\pi=3.141$

**BT**

Frequency	Output Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>
2440	3.755	2.374	0.0000394585	1

Frequency	Tune up Power	Output Power	Power Density	Power Density Limit
MHz	dBm	mW	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>
2440	3.7±0.1	2.390	0.0000397244	1

Note:

1. Only the worst case recorded.
2. The output power is refer to **AGC01284190607FE02**.
3. According to the user manual, the minimum separate distance which used for MPE calculate is 69.2cm.