

## RF EXPOSURE EVALUATION

### 1. TEST RESULT CERTIFICATION

<b>Applicant</b>	Rugged Radios
<b>Address</b>	951 E Grand Ave, Arroyo Grande, CA 93420
<b>manufacturer</b>	Rugged Radios
<b>Address</b>	951 E Grand Ave, Arroyo Grande, CA 93420
<b>Factory</b>	Rugged Radios
<b>Address</b>	951 E Grand Ave, Arroyo Grande, CA 93420
<b>Product Designation:</b>	Mobile Radio
<b>Brand Name:</b>	Rugged Radios
<b>Test Model:</b>	M1-G,
<b>Series Model</b>	M1
<b>Difference Description</b>	M1-G supports GPS, M1 without GPS
<b>FCC ID:</b>	2AWYH-M2RB
<b>Date of Test:</b>	Dec. 28, 2020~Jan. 25, 2021

## 2. TECHNICAL INFORMATION

A major technical description of EUT is described as following:

<b>Operation Frequency</b>	From 136MHz to 174MHz--VHF
<b>Modulation</b>	FM/4FSK
<b>Antenna Designation</b>	Detachable
<b>Antenna type</b>	External antenna
<b>Output power</b>	5W/25W/55W
<b>Antenna gain</b>	0dBi
<b>Power Supply</b>	DC 13.8V

### Channel List:

Operation mode	Channel Separation	Operation Frequency Range	Test channel	Test Frequency
Analog/ Digital	12.5 kHz	136-174MHz	Bottom	136.025 MHz
	12.5 kHz	136-174MHz	Middle	151.850 MHz
	12.5 kHz	136-174MHz	Middle	155.025 MHz
	12.5 kHz	136-174MHz	Middle	161.610 MHz
	12.5 kHz	136-174MHz	Top	173.975 MHz

### 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 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 148 cm away from the body of the user. Warning statement to the user for keeping at least 148 cm 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.

$$S=PG/4\pi R^2$$

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

Make the EUT to transmit at Bottom/Middle/Top channel.

## 6. TEST RESULTS

Note: report the worst result in this part

Antenna Gain=0dBi (Numeric 1.0),  $\pi=3.141$ , Duty cycle=50%

Frequency	Tune-up Tolerance	Max tune-up	Max tune-up	Power Density	Power Density Limit	Result
MHz	dBm	dBm	mW	mW/cm <sup>2</sup>	mW/ cm <sup>2</sup>	Pass/Fail
151.850	46.8±0.6	47.4	55000	0.199853303	0.2	Pass

Note:

1. The output power is refer to **AGC02931201208FE10**.
2. According to the user manual, the minimum separate distance which used for MPE calculate is 148cm.