



## MEASUREMENT REPORT

### FCC PART 95 Walkie Talkie

---

**FCC ID:** 2ARLQ-T799

**APPLICANT:** Shenzhen Tuotian Network Co., Ltd.

**Application Type:** Certification

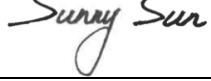
**Product:** Walkie Talkie

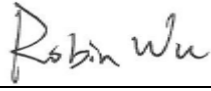
**Model No.:** T799

**FCC Rule Part(s):** FCC Part 95 Subpart B

**Test Procedure(s):** ANSI/TIA-603-E: 2016  
ANSI C63.26: 2015

**Test Date:** November 01 ~ 27, 2018

Reviewed By :   
( Sunny Sun )

Approved By :   
( Robin Wu )



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI/TIA-603-E:2016 and ANSI C63.26. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

### Revision History

| Report No.    | Version | Description    | Issue Date | Note  |
|---------------|---------|----------------|------------|-------|
| 1810RSU004-U1 | Rev. 01 | Initial report | 11-27-2018 | Valid |
|               |         |                |            |       |

## CONTENTS

| Description                                       | Page      |
|---|-----------|
| <b>§2.1033 General Information .....</b>          | <b>5</b>  |
| <b>1. INTRODUCTION .....</b>                      | <b>6</b>  |
| 1.1. Scope .....                                  | 6         |
| 1.2. MRT Test Location .....                      | 6         |
| <b>2. PRODUCT INFORMATION .....</b>               | <b>7</b>  |
| 2.1. Equipment Description.....                   | 7         |
| 2.2. Operating Frequency and Channel List.....    | 7         |
| 2.3. Test Channels .....                          | 8         |
| 2.4. Applicable standards .....                   | 8         |
| 2.5. Test Methodology .....                       | 8         |
| 2.6. EMI Suppression Device(s)/Modifications..... | 8         |
| 2.7. Labeling Requirements.....                   | 9         |
| <b>3. ANTENNA REQUIREMENTS.....</b>               | <b>10</b> |
| <b>4. TEST EQUIPMENT CALIBRATION DATE .....</b>   | <b>11</b> |
| <b>5. MEASUREMENT UNCERTAINTY .....</b>           | <b>12</b> |
| <b>6. TEST RESULT .....</b>                       | <b>13</b> |
| 6.1. Summary .....                                | 13        |
| 6.2. Frequency Accuracy .....                     | 14        |
| 6.2.1. Test Limit .....                           | 14        |
| 6.2.2. Test Procedure.....                        | 14        |
| 6.2.3. Test Setup.....                            | 15        |
| 6.2.4. Test Result.....                           | 16        |
| 6.3. Transmit Power.....                          | 18        |
| 6.3.1. Test Limit .....                           | 18        |
| 6.3.2. Test Procedure.....                        | 18        |
| 6.3.3. Test Setup.....                            | 19        |
| 6.3.4. Test Result.....                           | 20        |
| 6.4. Occupied Bandwidth.....                      | 22        |
| 6.4.1. Test Limit .....                           | 22        |
| 6.4.2. Test Procedure.....                        | 22        |
| 6.4.3. Test Setup.....                            | 22        |
| 6.4.4. Test Result.....                           | 23        |
| 6.5. Unwanted Emissions Mask.....                 | 24        |

|           |   |           |
|-----------|---|-----------|
| 6.5.1.    | Test Limit .....                                | 24        |
| 6.5.2.    | Test Procedure.....                             | 24        |
| 6.5.3.    | Test Setup.....                                 | 25        |
| 6.5.4.    | Test Result.....                                | 26        |
| 6.6.      | Modulation Characteristics.....                 | 29        |
| 6.6.1.    | Test Limit .....                                | 29        |
| 6.6.2.    | Test Procedure.....                             | 30        |
| 6.6.3.    | Test Setup.....                                 | 31        |
| 6.6.4.    | Test Result.....                                | 32        |
| 6.7.      | Radiated Unwanted Emissions .....               | 41        |
| 6.7.1.    | Test Limit .....                                | 41        |
| 6.7.2.    | Test Procedure.....                             | 41        |
| 6.7.3.    | Test Setup.....                                 | 42        |
| 6.7.4.    | Test Result.....                                | 44        |
| <b>7.</b> | <b>CONCLUSION.....</b>                          | <b>45</b> |
|           | <b>APPENDIX A - TEST SETUP PHOTOGRAPH .....</b> | <b>46</b> |
|           | <b>APPENDIX B - EUT PHOTOGRAPH .....</b>        | <b>47</b> |

## §2.1033 General Information

|                                |   |
|--------------------------------|---|
| <b>Applicant:</b>              | Shenzhen Tuotian Network Co., Ltd.  |
| <b>Applicant Address:</b>      | C313, No. 225, Bulong Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen, China                             |
| <b>Manufacturer:</b>           | Shenzhen ChangTaiWei Electronic CO., LTD  |
| <b>Manufacturer Address:</b>   | G513, Wisdom Valley, YinTian Road, XiXiang, BaoAn, ShenZhen, China  |
| <b>Test Site:</b>              | MRT Technology (Suzhou) Co., Ltd  |
| <b>Test Site Address:</b>      | D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China  |
| <b>FCC Registration No.:</b>   | 893164  |
| <b>FCC designation No.:</b>    | CN1166  |
| <b>Test Device Serial No.:</b> | N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering |

### Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.



## 1. INTRODUCTION

### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

### 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



## 2. PRODUCT INFORMATION

### 2.1. Equipment Description

|                                |   |
|--------------------------------|---|
| Product Name:                  | Walkie Talkie   |
| Model No.:                     | T799  |
| Frequency Range:               | 462.5625 ~ 462.7125MHz (1~7 channel)<br>467.5625 ~ 467.7125MHz (8~14 channel)<br>462.5500 ~ 462.7250MHz (15~22 channel) |
| Maximum Radiated Output Power: | 26.53dBm  |
| Power Supply:                  | Three AAA batteries   |
| Working Voltage:               | 3.6 ~ 4.5V  |
| Type of Modulation:            | FM  |
| Emission Designator:           | 10K0F3E   |
| Antenna Type:                  | Fixed external  |

Note: According to FCC Part 2.202 requirements, the Necessary Bandwidth is calculated as follows:

Channel Spacing = 12.5 KHz, D= 2 KHz max, K=1, M = 3 KHz

$B_n = 2M + 2DK = (2 \times 3 + 2 \times 2 \times 1) \text{ KHz} = 10 \text{ KHz}$

Emission Designator: 10K0F3E

### 2.2. Operating Frequency and Channel List

| FRS Channel | FRS Frequency | FRS Channel | FRS Frequency |
|-------------|---------------|-------------|---------------|
| 01          | 462.5625MHz   | 12          | 467.6625 MHz  |
| 02          | 462.5875 MHz  | 13          | 467.6875 MHz  |
| 03          | 462.6125 MHz  | 14          | 467.7125 MHz  |
| 04          | 462.6375 MHz  | 15          | 462.5500 MHz  |
| 05          | 462.6625 MHz  | 16          | 462.5750 MHz  |
| 06          | 462.6875 MHz  | 17          | 462.6000 MHz  |
| 07          | 462.7125 MHz  | 18          | 462.6250 MHz  |
| 08          | 467.5625 MHz  | 19          | 462.6500 MHz  |
| 09          | 467.5875 MHz  | 20          | 462.6750 MHz  |
| 10          | 467.6125 MHz  | 21          | 462.7000 MHz  |
| 11          | 467.6375 MHz  | 22          | 462.7250 MHz  |

### 2.3. Test Channels

| Channel | Frequency   |
|---------|-------------|
| 01      | 462.5625MHz |
| 08      | 467.5625MHz |
| 22      | 462.7250MHz |

### 2.4. Applicable standards

The following report is prepared on behalf of the Shenzhen Tuotian Network Co., Ltd. in accordance with FCC Part 95 Subpart A and Subpart B and FCC Part 2 of the Federal Communication Commission rules.

The objective is to determine compliance with FCC Part 95 Subpart A and Subpart B and FCC Part 2 of the Federal Communication Commission rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

### 2.5. Test Methodology

All measurements contained in this report were conducted with TIA-603-E-2016 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

### 2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.



## **2.7. Labeling Requirements**

### Per 2.1074; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device. Please see attachment for FCC ID label and label location.

### 3. ANTENNA REQUIREMENTS

#### Excerpt from §95.587 of the FCC Rules/Regulations:

The antenna of each FRS transmitter type must meet the following requirements.

- (1) The antenna must be a non-removable integral part of the FRS transmitter type.
- (2) The gain of the antenna must not exceed that of a half-wave dipole antenna.
- (3) The antenna must be designed such that the electric field of the emitted waves is vertically polarized when the unit is operated in the normal orientation.

- The antenna of this device is **permanently attached**.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The unit complies with the requirement of §95.587.

#### 4. TEST EQUIPMENT CALIBRATION DATE

Conducted Test - TR3

| Instrument                     | Manufacturer | Type No.  | Asset No.   | Cali. Interval | Cali. Due Date |
|--------------------------------|--------------|-----------|-------------|----------------|----------------|
| Power Meter                    | Agilent      | U2021XA   | MRTSUE06030 | 1 year         | 2018/12/06     |
| Temperature & Humidity Chamber | BAOYT        | BYH-150CL | MRTSUE06051 | 1 year         | 2018/12/06     |
| EXA Signal Analyzer            | Keysight     | N9020A    | MRTSUE06106 | 1 year         | 2019/04/20     |
| EXA Signal Analyzer            | Keysight     | N9010B    | MRTSUE06452 | 1 year         | 2019/07/20     |
| Audio Analyzer                 | Agilent      | U8903B    | MRTSUE06143 | 1 year         | 2019/08/15     |
| Modulation Analyzer            | HP           | 8901A     | MRTSUE06098 | 1 year         | 2019/10/18     |
| Thermohygrometer               | testo        | 608-H1    | MRTSUE06401 | 1 year         | 2019/08/15     |

Unwanted Radiated Spurious - AC1

| Instrument                 | Manufacturer | Type No.    | Asset No.   | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|-------------|-------------|----------------|----------------|
| EMI Test Receiver          | R&S          | ESR7        | MRTSUE06001 | 1 year         | 2019/08/14     |
| EXA Signal Analyzer        | Agilent      | N9020A      | MRTSUE06106 | 1 year         | 2019/04/20     |
| Loop Antenna               | Schwarzbeck  | FMZB 1519   | MRTSUE06025 | 1 year         | 2018/11/20     |
| Microwave System Amplifier | Agilent      | 83017A      | MRTSUE06076 | 1 year         | 2018/11/17     |
| Bilog Period Antenna       | Schwarzbeck  | VULB 9168   | MRTSUE06172 | 1 year         | 2019/04/12     |
| Broad-Band Horn Antenna    | Schwarzbeck  | BBHA9120D   | MRTSUE06023 | 1 year         | 2019/10/20     |
| Hygrothermograph           | Testo        | 608-H1      | MRTSUE06403 | 1 year         | 2019/08/15     |
| Anechoic Chamber           | TDK          | Chamber-AC1 | MRTSUE06212 | 1 year         | 2019/05/02     |

| Software | Version | Function          |
|----------|---------|-------------------|
| e3       | v 8.3.5 | EMI Test Software |

## 5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

### Radiated Emission Measurement - AC1

Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ):

9kHz ~ 1GHz:  $\pm 4.18\text{dB}$

1GHz ~ 18GHz:  $\pm 4.76\text{dB}$

## 6. TEST RESULT

### 6.1. Summary

Product Name: Walkie Talkie

FCC ID: 2ARLQ-T799

| FCC Part Section(s) | Test Description            | Test Result | Reference   |
|---------------------|-----------------------------|-------------|-------------|
| §95.565, §2.1055    | Frequency Accuracy          | Pass        | Section 6.2 |
| §95.567, §2.1046    | Transmit Power              | Pass        | Section 6.3 |
| §95.573, §2.1049,   | Authorized Bandwidth        | Pass        | Section 6.4 |
| §95.579, §2.1049,   | Unwanted Emission Mask      | Pass        | Section 6.5 |
| §95.575, §2.1047,   | Modulation Characteristics  | Pass        | Section 6.6 |
| §95.579, §2.1053,   | Radiated Spurious Emissions | Pass        | Section 6.7 |

#### Notes:

- (1) All modes of operation were investigated. The test results shown in the following sections represent the worst case emissions.
- (2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- (3) Conducted testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

## **6.2. Frequency Accuracy**

### **6.2.1. Test Limit**

Each FRS transmitter type must be designed such that the carrier frequencies remain within  $\pm 2.5$  parts-per-million (ppm) of the channel center frequencies specified in §95.563 during normal operating conditions.

### **6.2.2. Test Procedure**

#### **Frequency Stability Under Temperature Variations:**

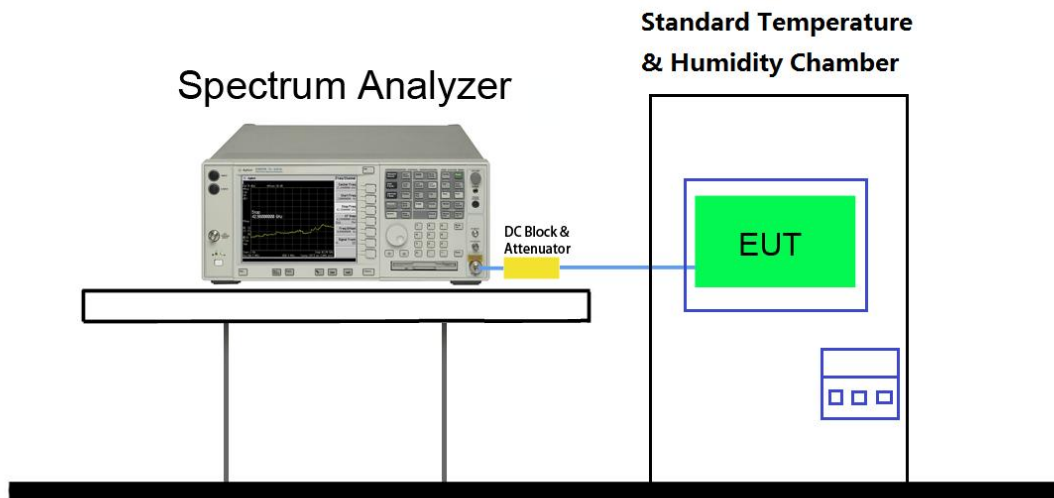
The equipment under test was powered by three AAA batteries. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

#### **Frequency Stability Under Voltage Variations:**

Set chamber temperature to 20°C. Use a DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to the battery operating end point, record the maximum frequency change.

### 6.2.3. Test Setup



#### 6.2.4. Test Result

|               |               |                   |            |
|---------------|---------------|-------------------|------------|
| Product       | Walkie Talkie | Temperature       | 25°C       |
| Test Engineer | Vincent Yu    | Relative Humidity | 56%        |
| Test Site     | TR3           | Test Date         | 2018/11/02 |

| Test Channel               | Test Voltage (VDC) | Test Temperature (°C) | Measured Frequency (MHz) | Frequency Deviation (ppm) | Limit (ppm) | Result |
|----------------------------|--------------------|-----------------------|--------------------------|---------------------------|-------------|--------|
| Channel 1<br>(462.5625MHz) | 4.5                | - 30                  | 462.562505553            | 0.01                      | ±2.5        | Pass   |
|                            |                    | - 20                  | 462.562664207            | 0.35                      | ±2.5        | Pass   |
|                            |                    | - 10                  | 462.562538338            | 0.08                      | ±2.5        | Pass   |
|                            |                    | 0                     | 462.562651214            | 0.33                      | ±2.5        | Pass   |
|                            |                    | + 10                  | 462.562575289            | 0.16                      | ±2.5        | Pass   |
|                            |                    | + 20 (Ref)            | 462.562561595            | 0.13                      | ±2.5        | Pass   |
|                            |                    | + 30                  | 462.562534915            | 0.08                      | ±2.5        | Pass   |
|                            |                    | + 40                  | 462.562619518            | 0.26                      | ±2.5        | Pass   |
|                            |                    | + 50                  | 462.562564264            | 0.14                      | ±2.5        | Pass   |
|                            | 3.6                | + 20                  | 462.562584112            | 0.18                      | ±2.5        | Pass   |
| Channel 8<br>(467.5625MHz) | 4.5                | - 30                  | 467.562627961            | 0.27                      | ±2.5        | Pass   |
|                            |                    | - 20                  | 467.562631655            | 0.28                      | ±2.5        | Pass   |
|                            |                    | - 10                  | 467.562632726            | 0.28                      | ±2.5        | Pass   |
|                            |                    | 0                     | 467.562627557            | 0.27                      | ±2.5        | Pass   |
|                            |                    | + 10                  | 467.562636325            | 0.29                      | ±2.5        | Pass   |
|                            |                    | + 20 (Ref)            | 467.562608896            | 0.23                      | ±2.5        | Pass   |
|                            |                    | + 30                  | 467.562634458            | 0.29                      | ±2.5        | Pass   |
|                            |                    | + 40                  | 467.562629133            | 0.28                      | ±2.5        | Pass   |
|                            |                    | + 50                  | 467.562628076            | 0.27                      | ±2.5        | Pass   |
|                            | 3.6                | + 20                  | 467.562626381            | 0.27                      | ±2.5        | Pass   |

Note: Frequency Deviation = (Measured Frequency - Declared Frequency) / Declared Frequency\*10<sup>6</sup>.



| Test Channel                | Test Voltage (V) | Test Temperature (°C) | Measured Frequency (MHz) | Frequency Deviation (ppm) | Limit (ppm) | Result |
|-----------------------------|------------------|-----------------------|--------------------------|---------------------------|-------------|--------|
| Channel 22<br>(462.7250MHz) | 4.5              | -30                   | 462.725089377            | 0.19                      | ±2.5        | Pass   |
|                             |                  | -20                   | 462.725089058            | 0.19                      | ±2.5        | Pass   |
|                             |                  | -10                   | 462.725092878            | 0.20                      | ±2.5        | Pass   |
|                             |                  | 0                     | 462.725102341            | 0.22                      | ±2.5        | Pass   |
|                             |                  | 10                    | 462.725099135            | 0.21                      | ±2.5        | Pass   |
|                             |                  | 20                    | 462.725091001            | 0.20                      | ±2.5        | Pass   |
|                             |                  | 30                    | 462.725088228            | 0.19                      | ±2.5        | Pass   |
|                             |                  | 40                    | 462.725098409            | 0.21                      | ±2.5        | Pass   |
|                             |                  | 50                    | 462.725082434            | 0.18                      | ±2.5        | Pass   |
|                             | 3.6              | 25                    | 462.724845050            | -0.33                     | ±2.5        | Pass   |

Note: Frequency Deviation = (Measured Frequency - Declared Frequency) / Declared Frequency\*10<sup>6</sup>.

### **6.3. Transmit Power**

#### **6.3.1. Test Limit**

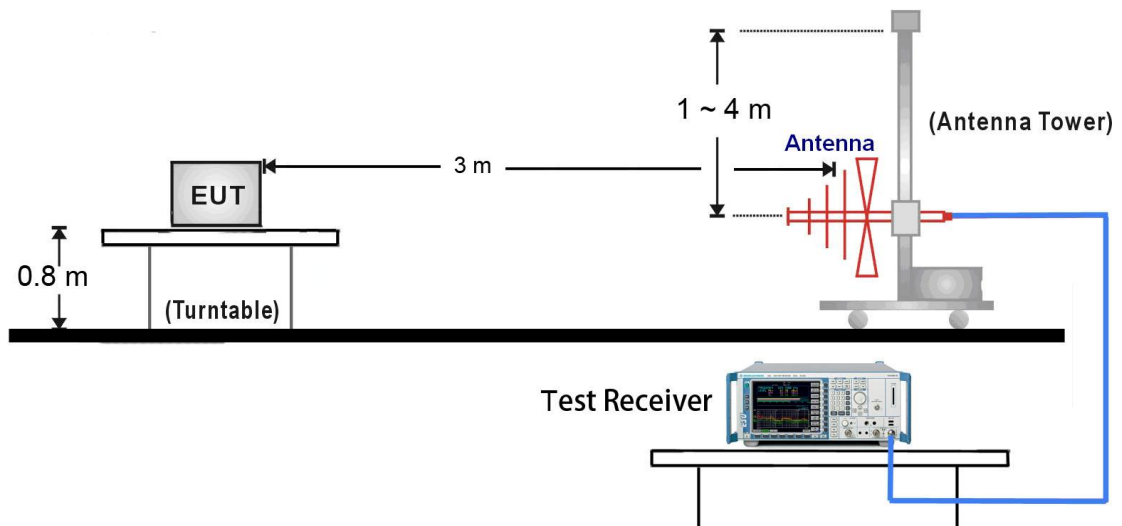
Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2.0 Watts.

#### **6.3.2. Test Procedure**

1. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
2. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
3. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
4. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The measurement shall be repeated with the test antenna set to horizontal polarization.
10. Replace the antenna with a proper Antenna (substitution antenna).
11. The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
12. The substitution antenna shall be connected to a calibrated signal generator.
13. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

14. The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
15. The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
16. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
17. The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

### 6.3.3. Test Setup



### 6.3.4. Test Result

|               |                                |                   |            |
|---------------|--------------------------------|-------------------|------------|
| Product       | Walkie Talkie                  | Temperature       | 25°C       |
| Test Engineer | Max Wang                       | Relative Humidity | 56%        |
| Test Site     | AC1                            | Test Date         | 2018/11/02 |
| Test Item     | Effective Radiated Power (ERP) |                   |            |

| Channel No. | Frequency (MHz) | SG Reading (dBm) | Cable Loss (dB) | Substitute Antenna Gain (dBd) | ERP (dBm) | ERP (W) | ERP Limit (W) | Result |
|-------------|-----------------|------------------|-----------------|-------------------------------|-----------|---------|---------------|--------|
| 1           | 462.5625        | 7.66             | 0.44            | 7.76                          | 14.98     | 0.03    | 2.0           | Pass   |
| 4           | 462.6375        | 7.27             | 0.44            | 7.76                          | 14.59     | 0.03    | 2.0           | Pass   |
| 7           | 462.7125        | 7.26             | 0.44            | 7.76                          | 14.58     | 0.03    | 2.0           | Pass   |
| 8           | 467.5625        | 6.28             | 0.44            | 7.76                          | 13.60     | 0.02    | 0.5           | Pass   |
| 11          | 467.6375        | 6.35             | 0.44            | 7.76                          | 13.67     | 0.02    | 0.5           | Pass   |
| 14          | 467.7125        | 6.37             | 0.44            | 7.76                          | 13.69     | 0.02    | 0.5           | Pass   |
| 15          | 462.5500        | 7.13             | 0.44            | 7.76                          | 14.45     | 0.03    | 2.0           | Pass   |
| 19          | 462.6500        | 7.02             | 0.44            | 7.76                          | 14.34     | 0.03    | 2.0           | Pass   |
| 22          | 462.7250        | 7.15             | 0.44            | 7.76                          | 14.47     | 0.03    | 2.0           | Pass   |

Note: ERP (dBm) = SG Reading (dBm) - Cable Loss (dB) + Substitute Antenna Gain (dBd)

|               |                 |                   |            |
|---------------|-----------------|-------------------|------------|
| Product       | Walkie Talkie   | Temperature       | 25°C       |
| Test Engineer | Max Wang        | Relative Humidity | 56%        |
| Test Site     | AC1             | Test Date         | 2018/11/02 |
| Test Item     | Conducted Power |                   |            |

| Channel | Frequency<br>(MHz) | Power (dBm)    |                | Result |
|---------|--------------------|----------------|----------------|--------|
|         |                    | Measured Power | Declared Power |        |
| 1       | 462.5625           | 26.53          | 27.0           | Pass   |
| 2       | 462.5875           | 26.37          | 27.0           | Pass   |
| 3       | 462.6125           | 26.52          | 27.0           | Pass   |
| 4       | 462.6375           | 26.41          | 27.0           | Pass   |
| 5       | 462.6625           | 26.32          | 27.0           | Pass   |
| 6       | 462.6875           | 26.28          | 27.0           | Pass   |
| 7       | 462.7125           | 26.30          | 27.0           | Pass   |
| 8       | 467.5625           | 25.82          | 27.0           | Pass   |
| 9       | 467.5875           | 26.02          | 27.0           | Pass   |
| 10      | 467.6125           | 26.04          | 27.0           | Pass   |
| 11      | 467.6375           | 25.70          | 27.0           | Pass   |
| 12      | 467.6625           | 25.89          | 27.0           | Pass   |
| 13      | 467.6875           | 25.89          | 27.0           | Pass   |
| 14      | 467.7125           | 26.00          | 27.0           | Pass   |
| 15      | 462.5500           | 25.81          | 27.0           | Pass   |
| 16      | 462.5750           | 26.02          | 27.0           | Pass   |
| 17      | 462.6000           | 26.18          | 27.0           | Pass   |
| 18      | 462.6250           | 26.06          | 27.0           | Pass   |
| 19      | 462.6500           | 26.08          | 27.0           | Pass   |
| 20      | 462.6750           | 25.80          | 27.0           | Pass   |
| 21      | 462.7000           | 25.80          | 27.0           | Pass   |
| 22      | 462.7250           | 26.33          | 27.0           | Pass   |

## 6.4. Occupied Bandwidth

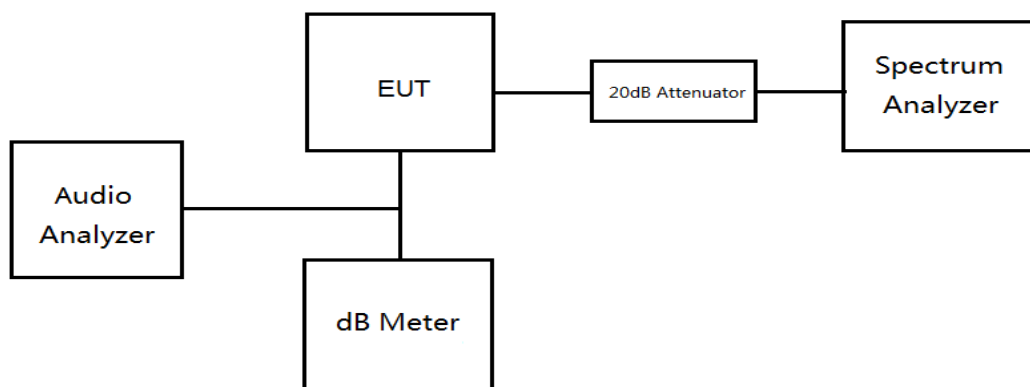
### 6.4.1. Test Limit

Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz.

### 6.4.2. Test Procedure

1. The set-up test equipment in the following configuration:
2. Setting the SPA Center Frequency = fundamental frequency,
3. Set span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 x OBW is sufficient)
4.  $RBW = 1\%$  to  $5\%$  of the anticipated OBW,  $VBW \geq 3 \times RBW$ ,
5. Sweep = auto, Detector function = peak, Trace = max hold
6. Set 99% Occupied Bandwidth and 26dB Bandwidth
7. Measure and record the results in the test report.

### 6.4.3. Test Setup



#### 6.4.4. Test Result

|               |   |                   |            |
|---------------|---|-------------------|------------|
| Product       | Walkie Talkie                           | Temperature       | 25°C       |
| Test Engineer | Milo Li                                 | Relative Humidity | 58%        |
| Test Site     | TR3                                     | Test Date         | 2018/11/27 |
| Remark        | 99% Occupied Bandwidth & 26dB Bandwidth |                   |            |

| Channel No. | Frequency (MHz) | 99% Occupied Bandwidth (KHz) | 26dB Bandwidth (KHz) | Limit (KHz) | Result |
|-------------|-----------------|------------------------------|----------------------|-------------|--------|
| 01          | 462.5625        | 3.96                         | 4.16                 | ≤ 12.5      | Pass   |
| 08          | 467.5625        | 3.96                         | 4.15                 | ≤ 12.5      | Pass   |
| 22          | 462.7250        | 3.95                         | 4.16                 | ≤ 12.5      | Pass   |



## **6.5. Unwanted Emissions Mask**

### **6.5.1. Test Limit**

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.

(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:

- (1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.
- (2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.
- (3)  $43 + 10 \log (P)$  dB in any frequency band removed from the channel center frequency by more than 31.25 kHz

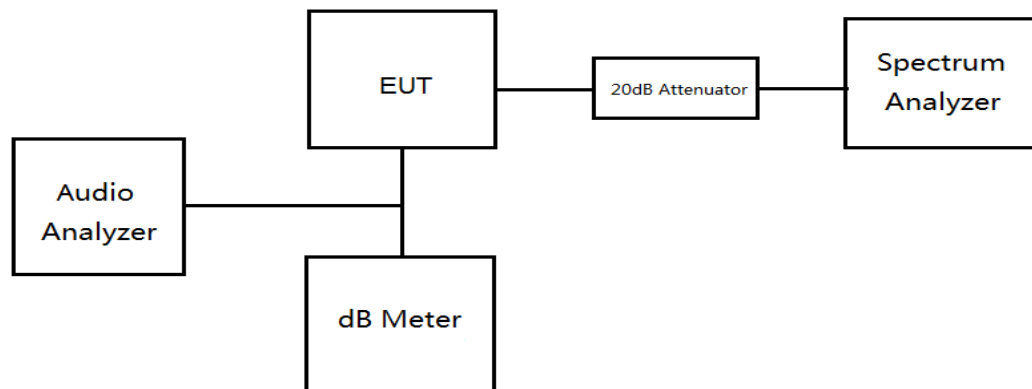
### **6.5.2. Test Procedure**

1. Connect a signal generator to the input of the EUT.
2. Configure the signal generator to transmit the applicable radio service signal.
3. Configure the signal level to be just below the AGC threshold.
4. Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.
5. Set the spectrum analyzer center frequency to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between  $2 \times \text{OBW}$  and  $5 \times \text{OBW}$ .
6. The nominal RBW shall be 300 Hz for 16K0F3E and 100 Hz for all other emissions types.
7. Set the reference level of the spectrum analyzer to level as f0.
8. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
9. Confirm the signal is within the appropriate emissions mask.
10. Capture the emissions mask plot for inclusion in the test report.
11. Repeat step d) to step j) with input signal amplitude set at 3 dB above the AGC threshold



12. Repeat step b) to step k) for all operational bands and emissions types.
13. Measure the input signal for all operational bands and emission types and include results in the test report.

### 6.5.3. Test Setup

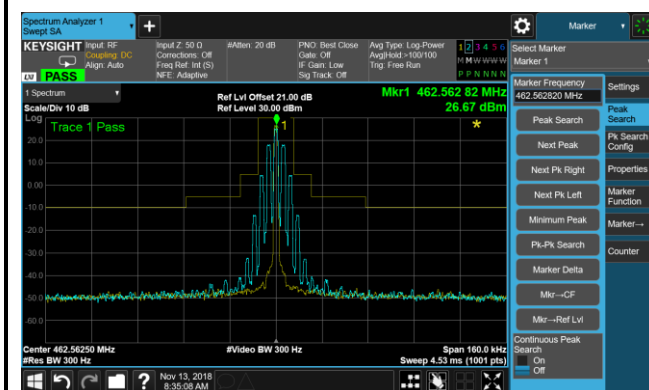


#### 6.5.4. Test Result

|               |               |                   |            |
|---------------|---------------|-------------------|------------|
| Product       | Walkie Talkie | Temperature       | 25°C       |
| Test Engineer | Milo Li       | Relative Humidity | 59%        |
| Test Site     | TR3           | Test Date         | 2018/11/13 |

#### Channel 01 (462.5625MHz)

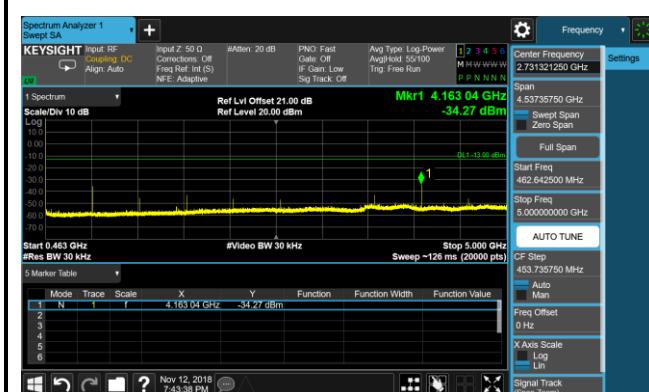
##### Mask



##### Spurious Emission

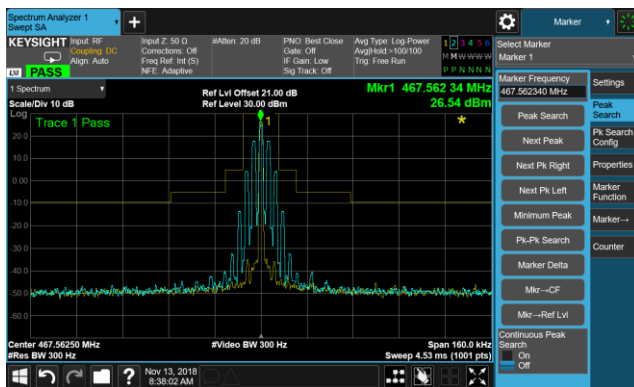


##### Spurious Emission

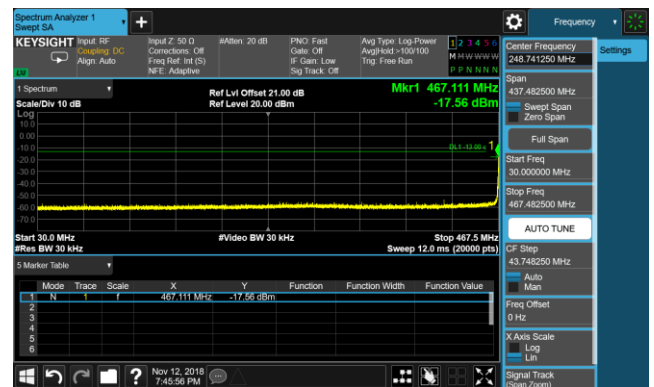


## Channel 08 (467.5625MHz)

## Mask



## Spurious Emission



## Spurious Emission



## Spurious Emission



The screenshot displays the Keysight Spectrum Analyzer 1 interface. The main display shows a frequency spectrum with a peak labeled 'Mkr1 4.164 43 GHz -34.34 dBm'. The x-axis represents frequency, ranging from 0.463 GHz to 5.000 GHz. The y-axis represents power, ranging from -100 dBm to 0 dBm. The interface includes various control panels for input, resolution, and display settings.

**Top Panel:**

- Input:** RF, Coaxial DC, Align. Auto
- Input 2:** 50 Ω, Connections: Off, Freq Ref: Int (CS), NFE: Adaptive
- Attenuation:** 20 dB
- PN1:** Fast Gate: Off, IF Scan: Low, Sig Track: Off
- Aug Type:** Log Power, Avg Mode: 30/100, Twp: Free Run
- Frequency:** 2.731402500 GHz

**Left Panel:**

- Scale/Div:** 10 dB
- Log**
- Start:** 0.463 GHz
- Stop:** 5.000 GHz
- #Res:** BW 30 kHz
- #Video:** BW 30 kHz
- Sweep:** -126 ms (20000 pts)

**Right Panel:**

- Span:** 4.53719500 GHz
- Sweep Span:** Zero Span
- Full Span**
- Start Freq:** 462.805000 MHz
- Stop Freq:** 5.000000000 GHz
- AUTO TUNE**
- CF Stop:** 453.719500 MHz
- Auto**
- Min**
- Freq Offset:** 0 Hz
- X-Axis Scale:** Log
- Lin**
- Signal Track:** Sweep (Zoom)

**Bottom Panel:**

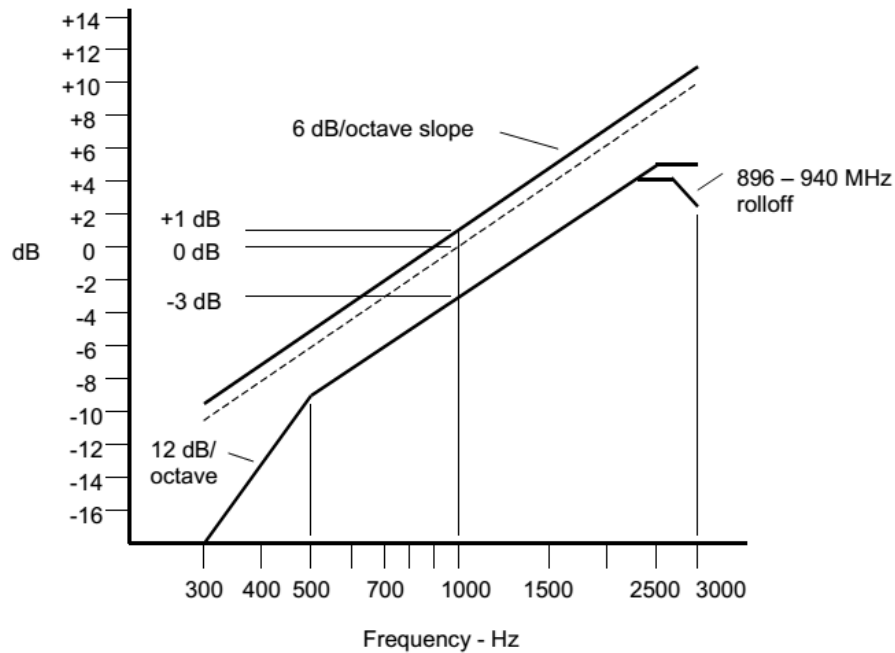
| Mode | Trace | X | Y            | Function   | Function Width | Function Value |
|------|-------|---|--------------|------------|----------------|----------------|
| 1    | N     | f | 4.164 43 GHz | -34.34 dBm |                |                |
| 2    |       |   |              |            |                |                |
| 3    |       |   |              |            |                |                |
| 4    |       |   |              |            |                |                |
| 5    |       |   |              |            |                |                |
| 6    |       |   |              |            |                |                |

## 6.6. Modulation Characteristics

### 6.6.1. Test Limit

Each FRS transmitter type must be designed such that the peak frequency deviation does not exceed 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.



### Audio Frequency Response Limit

An additional 6 dB per octave attenuation is allowed from 2500 Hz to 3000 Hz in equipment operating in the 25 MHz to 869 MHz range.

## 6.6.2. Test Procedure

### Frequency deviation

1. Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0dB) and vary the input level from –20 to +20dB. Record the frequency deviation obtained as a function of the input level.
2. Repeat step (1) with input frequency changing to 500, 1000, 2500 and 3125Hz in sequence.

### Modulation Frequency Response

1. Configure the EUT as shown in figure 1.
2. Adjust the audio signal generator frequency to the sound pressure level 107dB SPL at the microphone of the EUT.
3. Vary the Audio frequency from 100 Hz to 5 KHz and record the frequency deviation.
4. The peak frequency deviation must not exceed 2.5 KHz.

### Audio Frequency Response

1. Connect the equipment in figure 2.
2. Set the test receiver to measure peak positive deviation. Set the audio bandwidth for  $\leq 50$  Hz to  $\geq 15,000$  Hz. Turn the de-emphasis function off.
3. Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
4. Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
5. Set the test receiver to measure rms deviation and record the deviation reading as  $DEV_{REF}$ .
6. Set the audio frequency generator to the desired test frequency between 300 Hz and 3000Hz.
7. Record the test receiver deviation reading as  $DEV_{FREQ}$ .
8. Calculate the audio frequency response at the present frequency as:

$$\text{Audio Frequency Response} = 20 \cdot \log_{10}(DEV_{FREQ} / DEV_{REF})$$

9. Repeat steps 6 through 8 for all the desired test frequencies.

### 6.6.3. Test Setup

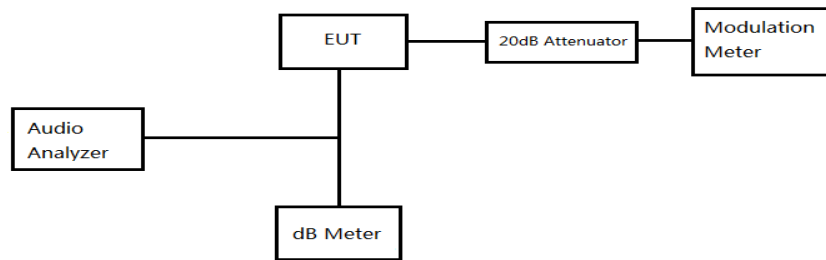


Figure 1

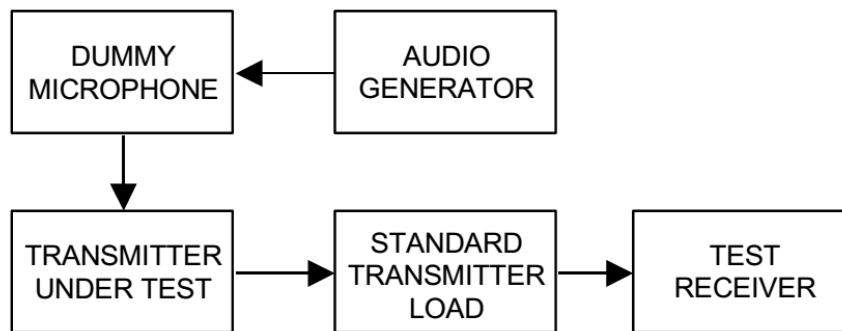
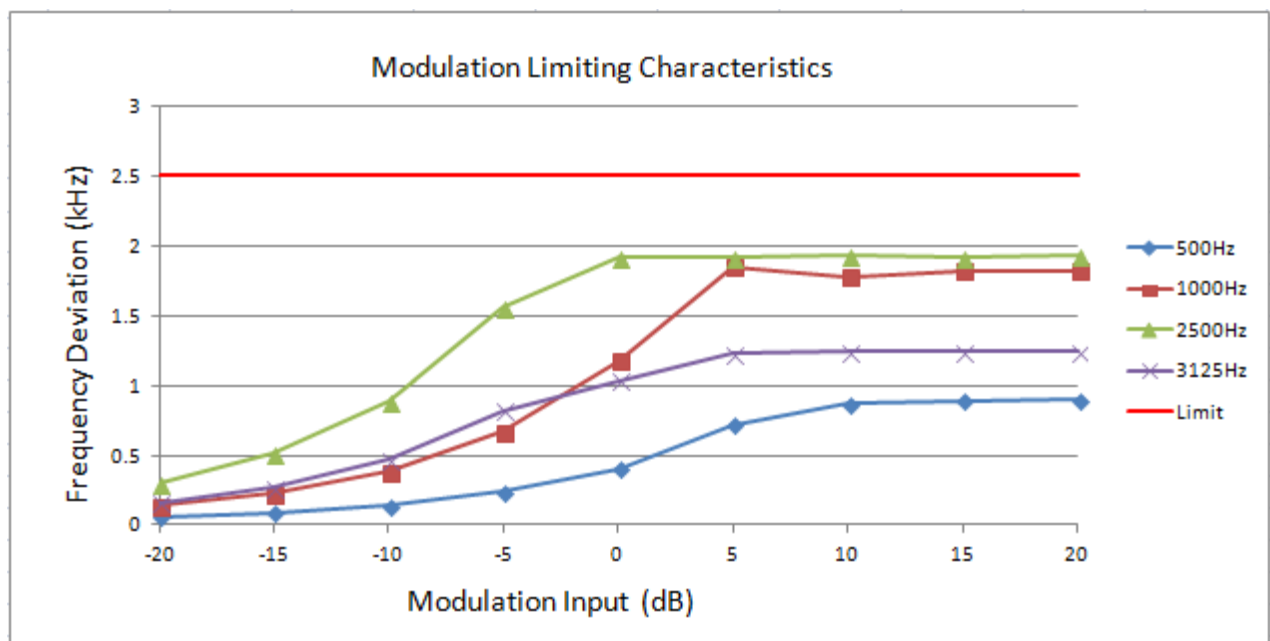


Figure 2

#### 6.6.4. Test Result

|               |                     |                   |            |
|---------------|---------------------|-------------------|------------|
| Product       | Walkie Talkie       | Temperature       | 25°C       |
| Test Engineer | Milo Li             | Relative Humidity | 59%        |
| Test Site     | TR3                 | Test Date         | 2018/11/13 |
| Test Item     | Frequency Deviation |                   |            |

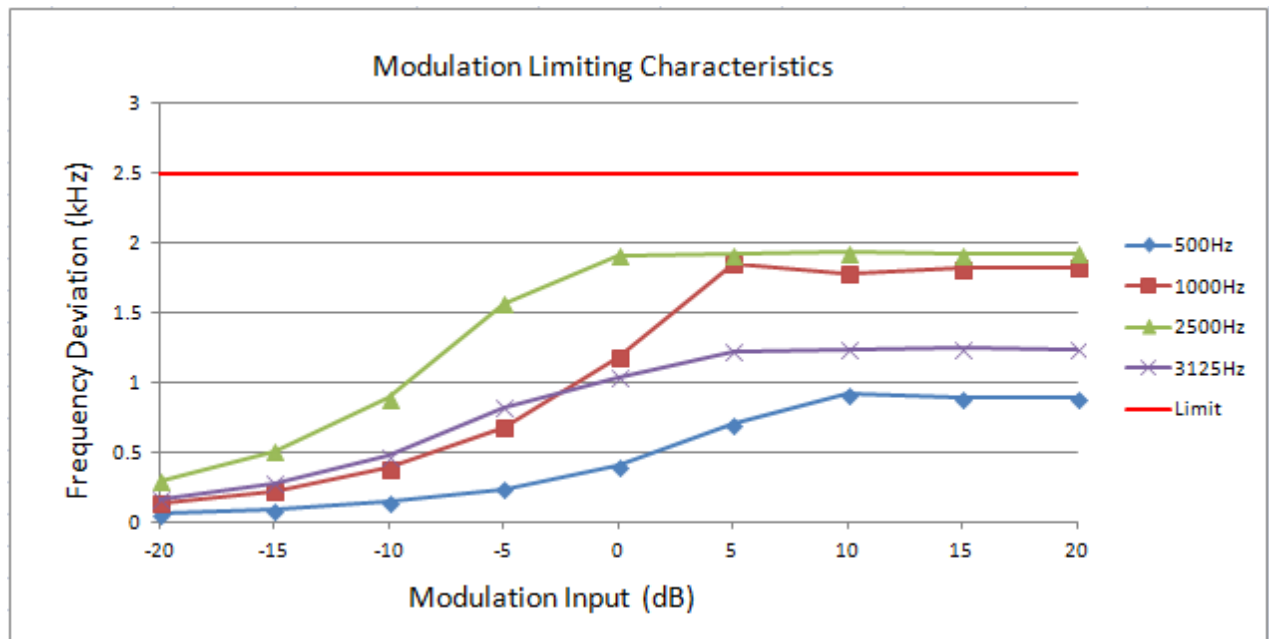
| Channel 01 (462.5625MHz) |   |  |  |  |             |
|--------------------------|---|--|--|--|-------------|
| Modulation Input (dB)    | Peak Frequency Deviation (kHz) at 500Hz | Peak Frequency Deviation (kHz) at 1000Hz | Peak Frequency Deviation (kHz) at 2500Hz | Peak Frequency Deviation (kHz) at 3125Hz | Limit (kHz) |
| -20.00                   | 0.057                                   | 0.135                                    | 0.294                                    | 0.161                                    | 2.5         |
| -15.00                   | 0.088                                   | 0.224                                    | 0.509                                    | 0.272                                    | 2.5         |
| -10.00                   | 0.141                                   | 0.383                                    | 0.889                                    | 0.470                                    | 2.5         |
| -5.00                    | 0.236                                   | 0.669                                    | 1.565                                    | 0.822                                    | 2.5         |
| 0.00                     | 0.406                                   | 1.176                                    | 1.917                                    | 1.037                                    | 2.5         |
| 5.00                     | 0.718                                   | 1.852                                    | 1.918                                    | 1.224                                    | 2.5         |
| 10.00                    | 0.871                                   | 1.780                                    | 1.932                                    | 1.240                                    | 2.5         |
| 15.00                    | 0.894                                   | 1.818                                    | 1.921                                    | 1.243                                    | 2.5         |
| 20.00                    | 0.895                                   | 1.823                                    | 1.929                                    | 1.243                                    | 2.5         |





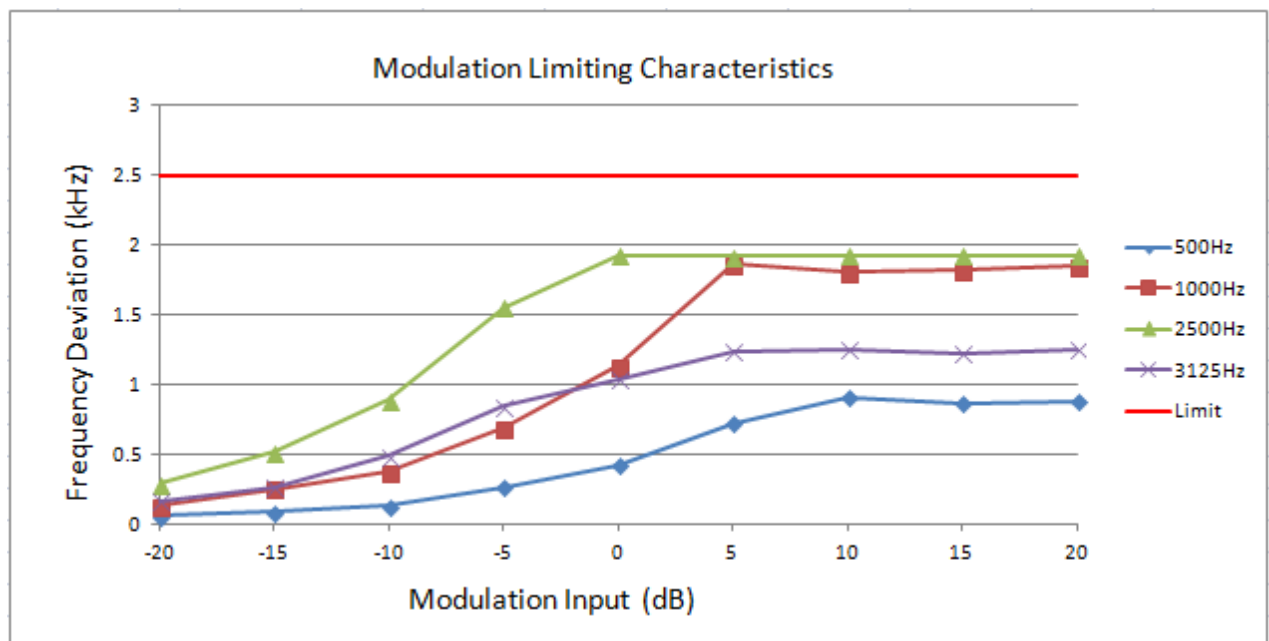
|               |                     |                   |            |
|---------------|---------------------|-------------------|------------|
| Product       | Walkie Talkie       | Temperature       | 25°C       |
| Test Engineer | Milo Li             | Relative Humidity | 59%        |
| Test Site     | TR3                 | Test Date         | 2018/11/13 |
| Test Item     | Frequency Deviation |                   |            |

| Channel 08 (467.5625MHz) |   |  |  |  |             |
|--------------------------|---|--|--|--|-------------|
| Modulation Input (dB)    | Peak Frequency Deviation (kHz) at 500Hz | Peak Frequency Deviation (kHz) at 1000Hz | Peak Frequency Deviation (kHz) at 2500Hz | Peak Frequency Deviation (kHz) at 3125Hz | Limit (kHz) |
| -20.00                   | 0.057                                   | 0.133                                    | 0.294                                    | 0.162                                    | 2.50        |
| -15.00                   | 0.085                                   | 0.224                                    | 0.508                                    | 0.274                                    | 2.50        |
| -10.00                   | 0.14                                    | 0.385                                    | 0.891                                    | 0.471                                    | 2.50        |
| -5.00                    | 0.235                                   | 0.672                                    | 1.567                                    | 0.823                                    | 2.50        |
| 0.00                     | 0.406                                   | 1.18                                     | 1.915                                    | 1.039                                    | 2.50        |
| 5.00                     | 0.706                                   | 1.854                                    | 1.917                                    | 1.225                                    | 2.50        |
| 10.00                    | 0.915                                   | 1.78                                     | 1.931                                    | 1.241                                    | 2.50        |
| 15.00                    | 0.884                                   | 1.816                                    | 1.921                                    | 1.243                                    | 2.50        |
| 20.00                    | 0.885                                   | 1.823                                    | 1.927                                    | 1.241                                    | 2.50        |



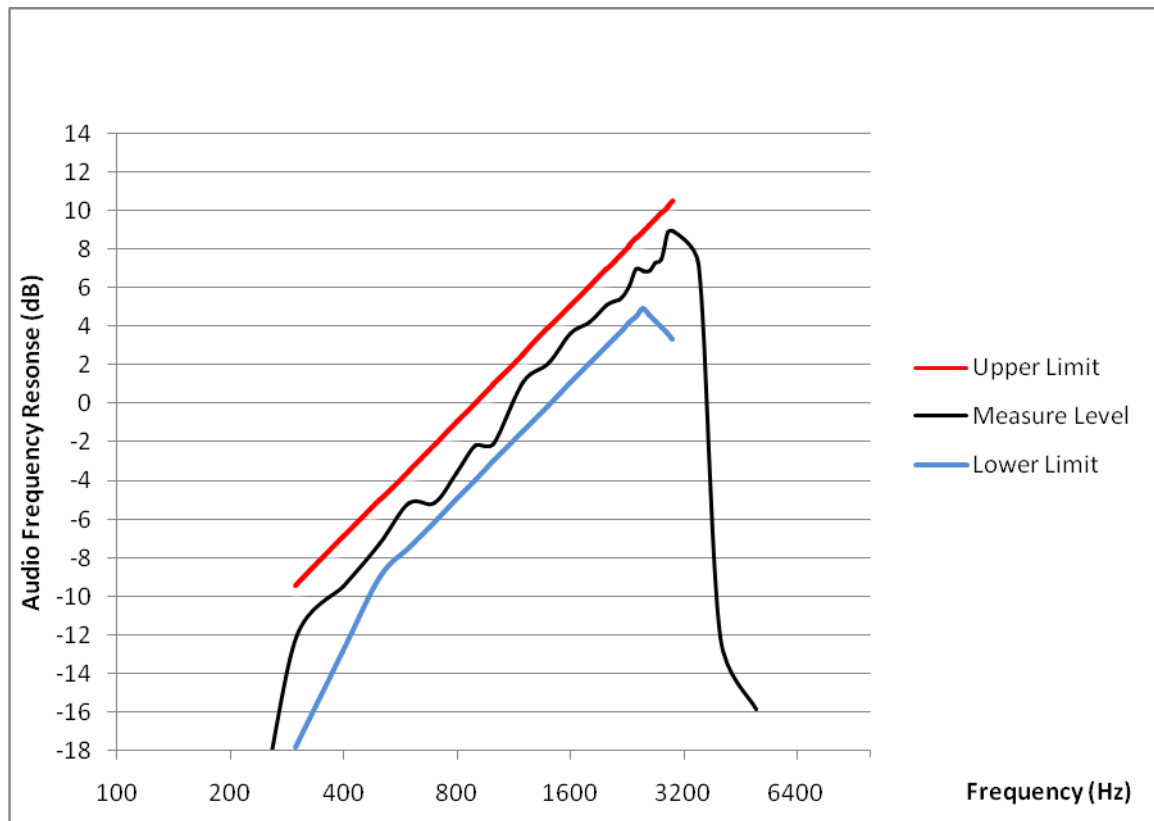
|               |                     |                   |            |
|---------------|---------------------|-------------------|------------|
| Product       | Walkie Talkie       | Temperature       | 25°C       |
| Test Engineer | Milo Li             | Relative Humidity | 59%        |
| Test Site     | TR3                 | Test Date         | 2018/11/13 |
| Test Item     | Frequency Deviation |                   |            |

| Channel 22 (462.7250MHz) |   |  |  |  |             |
|--------------------------|---|--|--|--|-------------|
| Modulation Input (dB)    | Peak Frequency Deviation (kHz) at 500Hz | Peak Frequency Deviation (kHz) at 1000Hz | Peak Frequency Deviation (kHz) at 2500Hz | Peak Frequency Deviation (kHz) at 3125Hz | Limit (kHz) |
| -20.00                   | 0.053                                   | 0.127                                    | 0.286                                    | 0.158                                    | 2.50        |
| -15.00                   | 0.082                                   | 0.252                                    | 0.511                                    | 0.264                                    | 2.50        |
| -10.00                   | 0.125                                   | 0.378                                    | 0.884                                    | 0.483                                    | 2.50        |
| -5.00                    | 0.256                                   | 0.688                                    | 1.552                                    | 0.841                                    | 2.50        |
| 0.00                     | 0.422                                   | 1.132                                    | 1.922                                    | 1.03                                     | 2.50        |
| 5.00                     | 0.714                                   | 1.862                                    | 1.919                                    | 1.232                                    | 2.50        |
| 10.00                    | 0.907                                   | 1.801                                    | 1.928                                    | 1.253                                    | 2.50        |
| 15.00                    | 0.867                                   | 1.821                                    | 1.925                                    | 1.224                                    | 2.50        |
| 20.00                    | 0.878                                   | 1.844                                    | 1.925                                    | 1.253                                    | 2.50        |



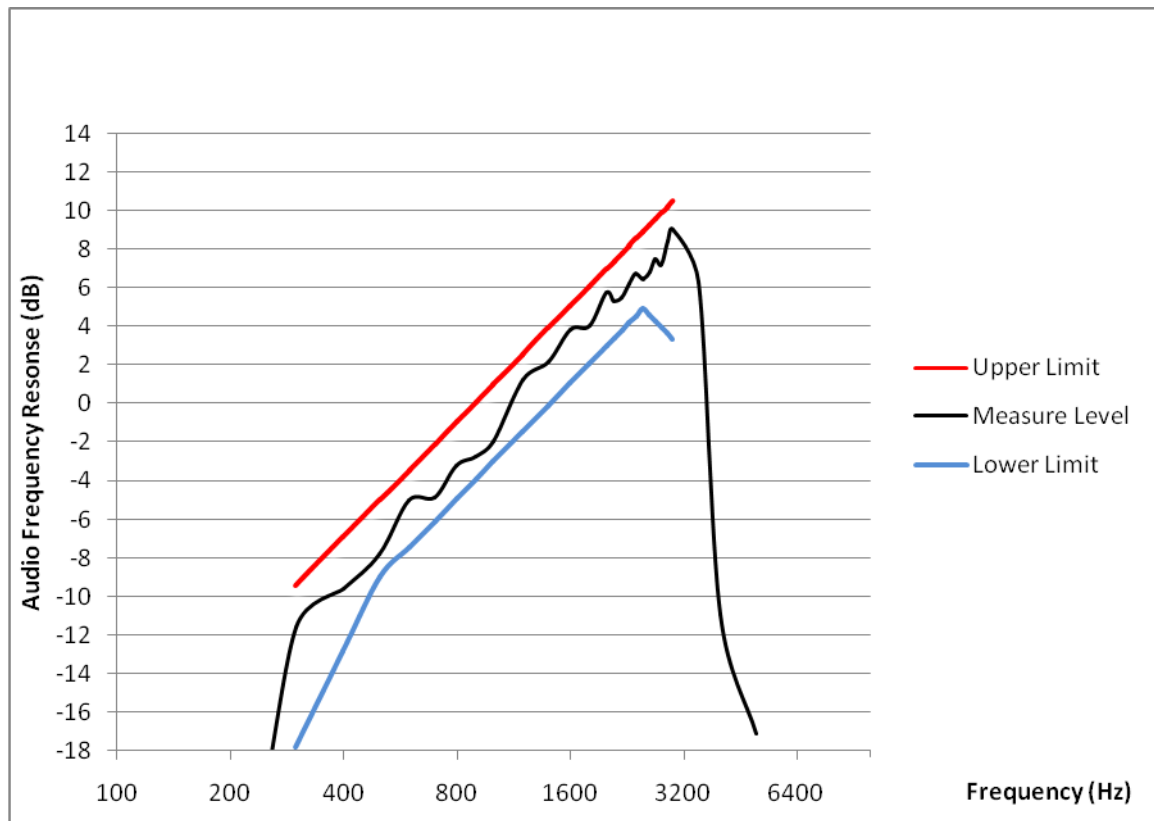
|               |                          |                   |            |
|---------------|--------------------------|-------------------|------------|
| Product       | Walkie Talkie            | Temperature       | 25°C       |
| Test Engineer | Milo Li                  | Relative Humidity | 59%        |
| Test Site     | TR3                      | Test Date         | 2018/11/13 |
| Test Item     | Audio Frequency Response |                   |            |

| Channel 01 (462.5625MHz)  |                               |             |             |        |
|---------------------------|-------------------------------|-------------|-------------|--------|
| Modulation Frequency (Hz) | Audio Frequency Response (dB) | Lower Limit | Upper Limit | Result |
| 100                       | -25.13                        | --          | --          | Pass   |
| 200                       | -26.22                        | --          | --          | Pass   |
| 300                       | -12.11                        | -17.84      | -9.42       | Pass   |
| 400                       | -9.44                         | -12.86      | -6.93       | Pass   |
| 500                       | -7.26                         | -9.00       | -5.00       | Pass   |
| 600                       | -5.14                         | -7.42       | -3.42       | Pass   |
| 700                       | -5.12                         | -6.09       | -2.09       | Pass   |
| 800                       | -3.58                         | -4.93       | -0.93       | Pass   |
| 900                       | -2.17                         | -3.91       | 0.09        | Pass   |
| 1000                      | -2.08                         | -3.00       | 1.00        | Pass   |
| 1200                      | 1.13                          | -1.42       | 2.58        | Pass   |
| 1400                      | 2.09                          | -0.09       | 3.91        | Pass   |
| 1600                      | 3.66                          | 1.07        | 5.07        | Pass   |
| 1800                      | 4.23                          | 2.09        | 6.09        | Pass   |
| 2000                      | 5.11                          | 3.00        | 7.00        | Pass   |
| 2100                      | 5.34                          | 3.42        | 7.42        | Pass   |
| 2200                      | 5.49                          | 3.83        | 7.83        | Pass   |
| 2300                      | 6.14                          | 4.21        | 8.21        | Pass   |
| 2400                      | 6.96                          | 4.58        | 8.58        | Pass   |
| 2500                      | 6.88                          | 4.93        | 8.93        | Pass   |
| 2600                      | 6.93                          | 4.59        | 9.27        | Pass   |
| 2700                      | 7.32                          | 4.27        | 9.60        | Pass   |
| 2800                      | 7.51                          | 3.95        | 9.91        | Pass   |
| 2900                      | 8.89                          | 3.65        | 10.22       | Pass   |
| 3000                      | 8.96                          | 3.35        | 10.51       | Pass   |
| 3500                      | 7.24                          | --          | --          | Pass   |
| 4000                      | -12.13                        | --          | --          | Pass   |
| 5000                      | -15.86                        | --          | --          | Pass   |



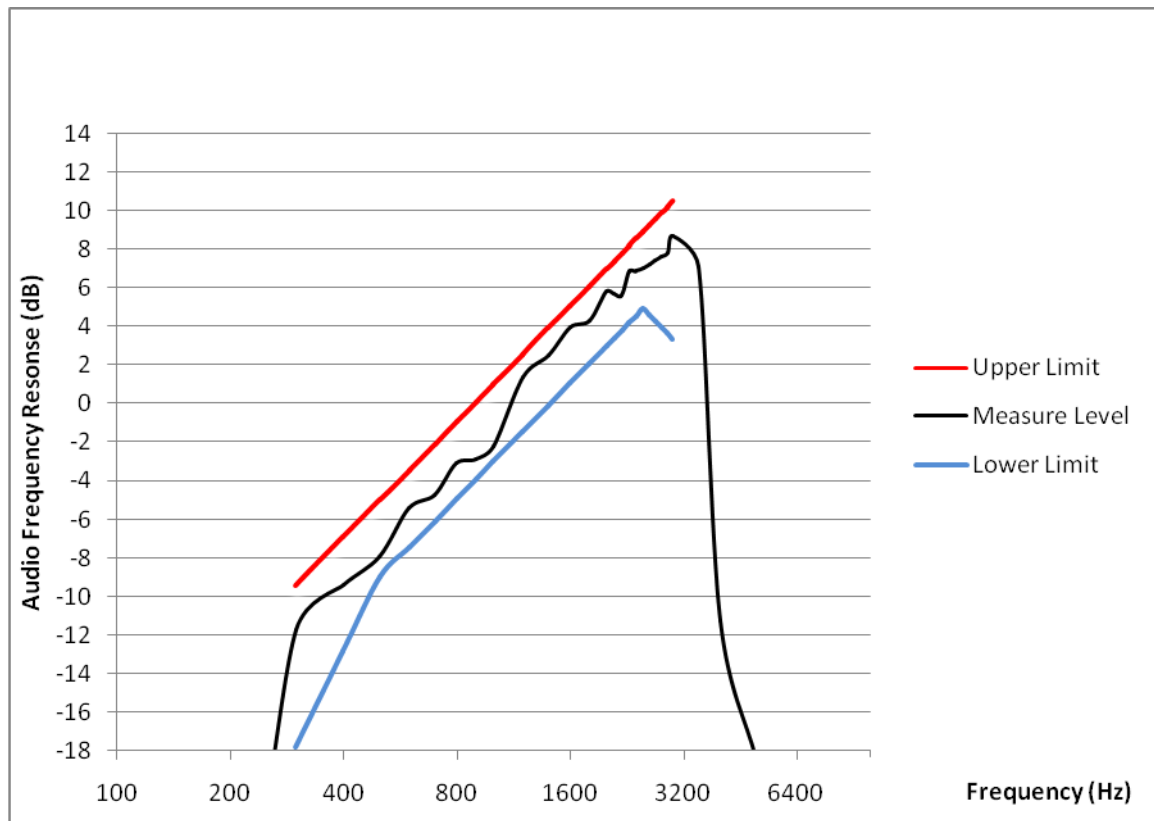
|               |                          |                   |            |
|---------------|--------------------------|-------------------|------------|
| Product       | Walkie Talkie            | Temperature       | 25°C       |
| Test Engineer | Milo Li                  | Relative Humidity | 59%        |
| Test Site     | TR3                      | Test Date         | 2018/11/13 |
| Test Item     | Audio Frequency Response |                   |            |

| Channel 08 (467.5635MHz)  |                               |             |             |        |
|---------------------------|-------------------------------|-------------|-------------|--------|
| Modulation Frequency (Hz) | Audio Frequency Response (dB) | Lower Limit | Upper Limit | Result |
| 100                       | -26.58                        | --          | --          | Pass   |
| 200                       | -27.22                        | --          | --          | Pass   |
| 300                       | -11.61                        | -17.84      | -9.42       | Pass   |
| 400                       | -9.59                         | -12.86      | -6.93       | Pass   |
| 500                       | -7.83                         | -9.00       | -5.00       | Pass   |
| 600                       | -5.02                         | -7.42       | -3.42       | Pass   |
| 700                       | -4.88                         | -6.09       | -2.09       | Pass   |
| 800                       | -3.21                         | -4.93       | -0.93       | Pass   |
| 900                       | -2.75                         | -3.91       | 0.09        | Pass   |
| 1000                      | -1.96                         | -3.00       | 1.00        | Pass   |
| 1200                      | 1.22                          | -1.42       | 2.58        | Pass   |
| 1400                      | 2.16                          | -0.09       | 3.91        | Pass   |
| 1600                      | 3.84                          | 1.07        | 5.07        | Pass   |
| 1800                      | 4.03                          | 2.09        | 6.09        | Pass   |
| 2000                      | 5.79                          | 3.00        | 7.00        | Pass   |
| 2100                      | 5.33                          | 3.42        | 7.42        | Pass   |
| 2200                      | 5.51                          | 3.83        | 7.83        | Pass   |
| 2300                      | 6.26                          | 4.21        | 8.21        | Pass   |
| 2400                      | 6.77                          | 4.58        | 8.58        | Pass   |
| 2500                      | 6.49                          | 4.93        | 8.93        | Pass   |
| 2600                      | 6.86                          | 4.59        | 9.27        | Pass   |
| 2700                      | 7.49                          | 4.27        | 9.60        | Pass   |
| 2800                      | 7.22                          | 3.95        | 9.91        | Pass   |
| 2900                      | 8.47                          | 3.65        | 10.22       | Pass   |
| 3000                      | 9.03                          | 3.35        | 10.51       | Pass   |
| 3500                      | 6.32                          | --          | --          | Pass   |
| 4000                      | -10.96                        | --          | --          | Pass   |
| 5000                      | -17.14                        | --          | --          | Pass   |



|               |                          |                   |            |
|---------------|--------------------------|-------------------|------------|
| Product       | Walkie Talkie            | Temperature       | 25°C       |
| Test Engineer | Milo Li                  | Relative Humidity | 59%        |
| Test Site     | TR3                      | Test Date         | 2018/11/13 |
| Test Item     | Audio Frequency Response |                   |            |

| Channel 22 (462.7250MHz)  |                               |             |             |        |
|---------------------------|-------------------------------|-------------|-------------|--------|
| Modulation Frequency (Hz) | Audio Frequency Response (dB) | Lower Limit | Upper Limit | Result |
| 100                       | -28.11                        | --          | --          | Pass   |
| 200                       | -29.36                        | --          | --          | Pass   |
| 300                       | -11.76                        | -17.84      | -9.42       | Pass   |
| 400                       | -9.42                         | -12.86      | -6.93       | Pass   |
| 500                       | -7.91                         | -9.00       | -5.00       | Pass   |
| 600                       | -5.43                         | -7.42       | -3.42       | Pass   |
| 700                       | -4.72                         | -6.09       | -2.09       | Pass   |
| 800                       | -3.11                         | -4.93       | -0.93       | Pass   |
| 900                       | -2.89                         | -3.91       | 0.09        | Pass   |
| 1000                      | -2.21                         | -3.00       | 1.00        | Pass   |
| 1200                      | 1.39                          | -1.42       | 2.58        | Pass   |
| 1400                      | 2.52                          | -0.09       | 3.91        | Pass   |
| 1600                      | 3.96                          | 1.07        | 5.07        | Pass   |
| 1800                      | 4.32                          | 2.09        | 6.09        | Pass   |
| 2000                      | 5.83                          | 3.00        | 7.00        | Pass   |
| 2100                      | 5.71                          | 3.42        | 7.42        | Pass   |
| 2200                      | 5.64                          | 3.83        | 7.83        | Pass   |
| 2300                      | 6.88                          | 4.21        | 8.21        | Pass   |
| 2400                      | 6.89                          | 4.58        | 8.58        | Pass   |
| 2500                      | 7.05                          | 4.93        | 8.93        | Pass   |
| 2600                      | 7.26                          | 4.59        | 9.27        | Pass   |
| 2700                      | 7.41                          | 4.27        | 9.60        | Pass   |
| 2800                      | 7.63                          | 3.95        | 9.91        | Pass   |
| 2900                      | 7.82                          | 3.65        | 10.22       | Pass   |
| 3000                      | 8.71                          | 3.35        | 10.51       | Pass   |
| 3500                      | 7.11                          | --          | --          | Pass   |
| 4000                      | -11.24                        | --          | --          | Pass   |
| 5000                      | -18.47                        | --          | --          | Pass   |





## **6.7. Radiated Unwanted Emissions**

### **6.7.1. Test Limit**

The unwanted emission should be attenuated below the carrier power output in Watts (P) by at least  $43+10 \log (P)$  dB.

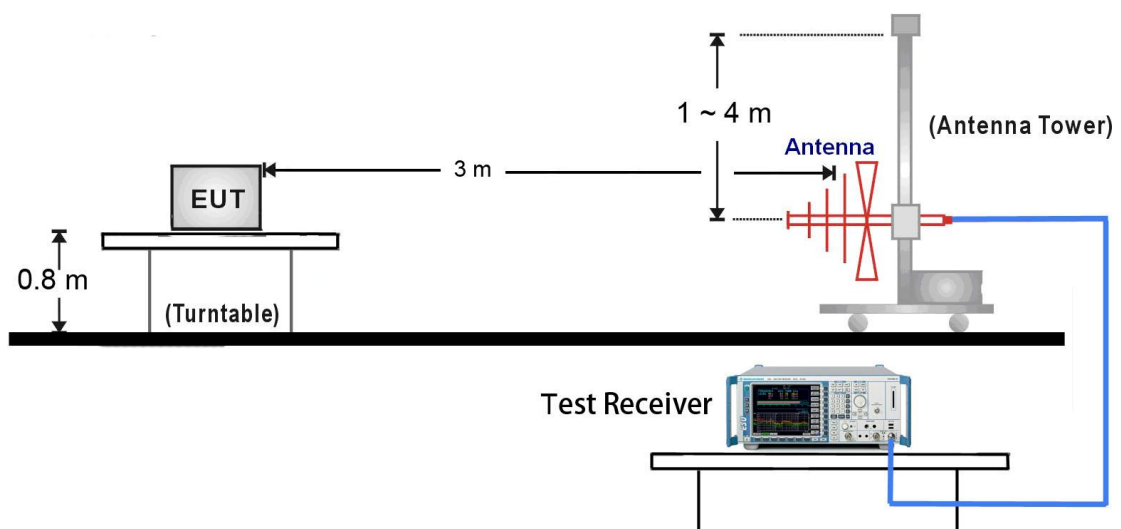
### **6.7.2. Test Procedure**

1. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
2. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
3. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
4. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The measurement shall be repeated with the test antenna set to horizontal polarization.
10. Replace the antenna with a proper Antenna (substitution antenna).
11. The substitution antenna shall be oriented for vertical polarization and, if necessary, the length

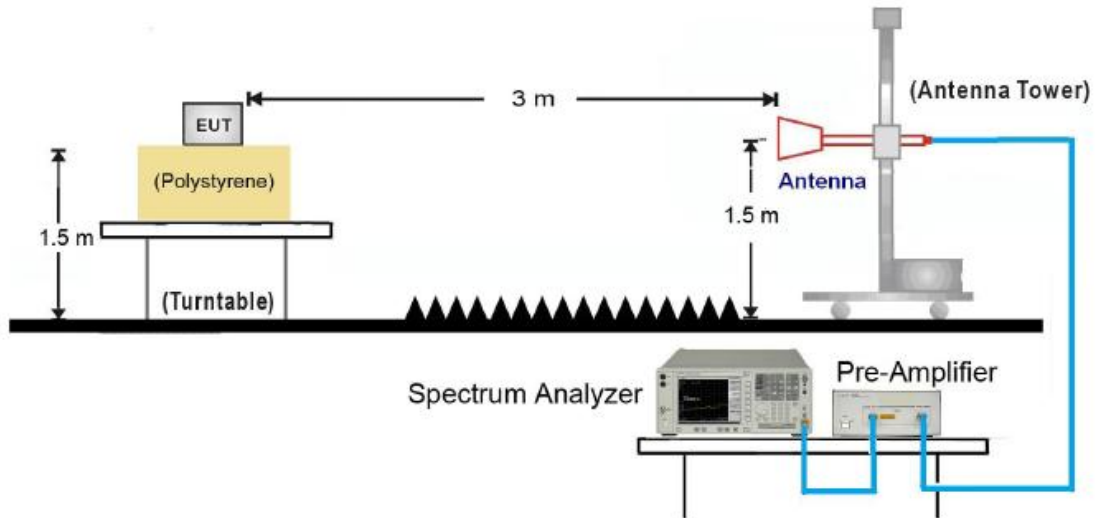
- of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
12. The substitution antenna shall be connected to a calibrated signal generator.
  13. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
  14. The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
  15. The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
  16. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
  17. The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

### 6.7.3. Test Setup

#### 30MHz ~ 1GHz Test Setup:



### Above 1GHz Test Setup:



#### 6.7.4. Test Result

|               |               |                   |            |
|---------------|---------------|-------------------|------------|
| Product       | Walkie Talkie | Temperature       | 25°C       |
| Test Engineer | Max Wang      | Relative Humidity | 56%        |
| Test Site     | AC1           | Test Date         | 2018/11/01 |

| Frequency (MHz)          | Ant. Pol. (H/V) | SG Reading (dBm) | Cable Loss (dB) | Substitute Antenna Gain (dBd) | ERP (dBm) | Limit (dBm) | Result |
|--------------------------|-----------------|------------------|-----------------|-------------------------------|-----------|-------------|--------|
| Channel 01 (462.5625MHz) |                 |                  |                 |                               |           |             |        |
| 1388.0                   | H               | -36.5            | 0.6             | 7.9                           | -29.2     | -13.0       | Pass   |
| 1850.0                   | H               | -38.2            | 0.7             | 10.4                          | -28.5     | -13.0       | Pass   |
| 1850.0                   | V               | -23.7            | 0.7             | 10.4                          | -14.0     | -13.0       | Pass   |
| 2312.0                   | V               | -28.0            | 0.8             | 9.7                           | -19.1     | -13.0       | Pass   |
| Channel 08 (467.5625MHz) |                 |                  |                 |                               |           |             |        |
| 1402.0                   | H               | -38.5            | 0.6             | 8.0                           | -31.1     | -13.0       | Pass   |
| 1870.0                   | H               | -37.0            | 0.7             | 10.4                          | -27.3     | -13.0       | Pass   |
| 1870.0                   | V               | -24.1            | 0.7             | 10.4                          | -14.4     | -13.0       | Pass   |
| 2338.0                   | V               | -27.1            | 0.7             | 9.9                           | -17.9     | -13.0       | Pass   |
| Channel 22 (462.7250MHz) |                 |                  |                 |                               |           |             |        |
| 1388.0                   | H               | -36.4            | 0.6             | 7.9                           | -29.1     | -13.0       | Pass   |
| 1850.0                   | H               | -38.0            | 0.7             | 10.4                          | -28.3     | -13.0       | Pass   |
| 1852.0                   | V               | -25.0            | 0.7             | 10.4                          | -15.3     | -13.0       | Pass   |
| 2314.0                   | V               | -28.1            | 0.8             | 9.7                           | -19.2     | -13.0       | Pass   |

#### Notes:

- Spurious emissions within 30-1000MHz were found more than 20dB below the limit, therefore no data appear in the report.
- $ERP\ (dBm) = SG\ Reading\ (dBm) - Cable\ Loss\ (dB) + Substitute\ Antenna\ Gain\ (dBd)$ .

## 7. CONCLUSION

The data collected relate only the item(s) tested and show that the device is in compliance with Part 95 of the FCC Rules.

---

The End

## **APPENDIX A - TEST SETUP PHOTOGRAPH**

Refer to “1810RSU004-UT” file.

## **APPENDIX B - EUT PHOTOGRAPH**

Refer to "1810RSU004-UE" file.