



Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

## FCC PART 15 SUBPART C TEST REPORT

### FCC CFR 47 PART 95

Report Reference No.....: GTS20230505013-1-1

FCC ID.....: 2A685ODY-1209RG

Compiled by

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Date of issue .....: Jan. 23, 2024

Representative Laboratory Name.: Shenzhen Global Test Service Co.,Ltd.

Address .....: No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong, China

Applicant's name.....: ODYSSEY MARKETING CORP

Address .....: 20855 NE 16th Ave C-4 , Miami, Florida, 33179, USA

Test specification .....

Standard .....: FCC CFR 47 PART 95

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd.

Master TRF .....: Dated 2014-12

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Test item description .....: WATCHIE TALKIE

Trade Mark .....: N/A

Manufacturer .....: ODYSSEY MARKETING CORP

Model/Type reference .....: ODY-1209RG

Listed Models .....: N/A

Modulation Type.....: FM

Operation Frequency.....: From 462.5625MHz

Hardware Version .....: N/A

Software Version .....: N/A

Rating .....: DC 4.5V by AAA\*3

Result .....: PASS

## TEST REPORT

|                   |                    |                                |
|-------------------|--------------------|--------------------------------|
| Test Report No. : | GTS20230505013-1-1 | Jan. 23, 2024<br>Date of issue |
|-------------------|--------------------|--------------------------------|

Equipment under Test : WATCHIE TALKIE

Model /Type : ODY-1209RG

Listed model : N/A

Applicant : ODYSSEY MARKETING CORP

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|              |      |
|--------------|------|
| 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

|  |           |
|--|-----------|
| <b>1. TEST STANDARDS .....</b>                                 | <b>4</b>  |
| <b>2. SUMMARY .....</b>  | <b>5</b>  |
| 2.1. General Remarks .....                                     | 5         |
| 2.2. Product Description .....                                 | 5         |
| 2.3. Equipment Under Test .....                                | 6         |
| 2.4. Short description of the Equipment under Test (EUT) ..... | 6         |
| 2.5. EUT operation mode .....                                  | 6         |
| 2.6. Block Diagram of Test Setup .....                         | 6         |
| 2.7. EUT Exercise Software .....                               | 6         |
| 2.8. Special Accessories .....                                 | 7         |
| 2.9. External I/O Cable .....                                  | 7         |
| 2.10. Related Submittal(s) / Grant (s) .....                   | 7         |
| 2.11. Modifications .....                                      | 7         |
| <b>3. TEST ENVIRONMENT .....</b>                               | <b>8</b>  |
| 3.1. Address of the test laboratory .....                      | 8         |
| 3.2. Test Facility .....                                       | 8         |
| 3.3. Environmental conditions .....                            | 8         |
| 3.4. Statement of the measurement uncertainty .....            | 8         |
| 3.5. Test Description .....                                    | 9         |
| 3.6. Equipments Used during the Test .....                     | 10        |
| <b>4. TEST CONDITIONS AND RESULTS .....</b>                    | <b>11</b> |
| 4.1. Maximum Transmitter Power .....                           | 11        |
| 4.2. Occupied Bandwidth and Emission Mask .....                | 13        |
| 4.3. Modulation Characteristic .....                           | 15        |
| 4.4. Frequency Stability .....                                 | 18        |
| 4.5. Transmitter Radiated Spurious Emission .....              | 19        |
| <b>5. TEST SETUP PHOTOS OF THE EUT .....</b>                   | <b>21</b> |
| <b>6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</b>        | <b>22</b> |

## **1. TEST STANDARDS**

The tests were performed according to following standards:

[FCC Rules Part 95](#): PERSONAL RADIO SERVICES.

[ANSI/TIA-603-E-2016](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

## 2. SUMMARY

### 2.1. General Remarks

|                                |   |               |
|--------------------------------|---|---------------|
| Date of receipt of test sample | : | Jan. 08, 2024 |
| Testing commenced on           | : | Jan. 08, 2024 |
| Testing concluded on           | : | Jan. 22, 2024 |

### 2.2. Product Description

|                       |  |
|-----------------------|--|
| Product Name:         | WATCHIE TALKIE                                       |
| Trade Mark:           | N/A  |
| Model/Type reference: | ODY-1209RG   |
| List Model:           | N/A  |
| Model Declaration     | N/A  |
| Power supply:         | DC 4.5V by AAA*3                                     |
| Hardware Version      | N/A  |
| Software Version      | N/A  |
| Sample ID             | GTS20230505013-1-S0001-1#, GTS20230505013-1-S0001-2# |
| <b>FRS</b>            |  |
| Frequency Range       | 462.5625MHz  |
| Channel Number        | 1 channel  |
| Channel Spacing       | 12.5KHz  |
| Modulation Type       | FM   |
| Antenna Description   | Spring antenna, -9.63dBi(Max.) for 2.4G Band         |

### 2.3. Equipment Under Test

#### Power supply system utilised

|                      |   |                                  |                                  |                       |             |  |  |
|----------------------|---|----------------------------------|----------------------------------|-----------------------|-------------|--|--|
| Power supply voltage | : | <input type="radio"/>            | 230V / 50 Hz                     | <input type="radio"/> | 120V / 60Hz |  |  |
|                      |   | <input type="radio"/>            | 12 V DC                          | <input type="radio"/> | 24 V DC     |  |  |
|                      |   | <input checked="" type="radio"/> | Other (specified in blank below) |                       |             |  |  |

DC 4.5V

#### 2.4. Short description of the Equipment under Test (EUT)

This is a outdoor bullet IP camera

For more details, refer to the user's manual of the EUT.

#### 2.5. EUT operation mode

The EUT has been tested under typical operating condition. As, test modes selected as below by the technical parameters of the EUT:

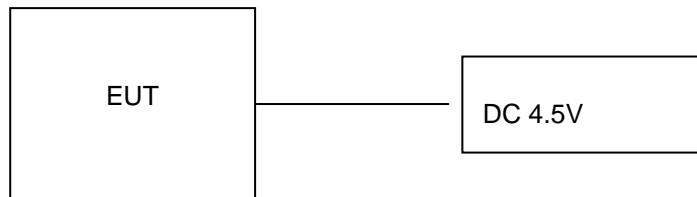
| Mode of Operations     | Frequency Range (MHz) | Data Rate (Mbps) |
|------------------------|-----------------------|------------------|
| (FM)                   | 462.5625              | 1                |
| For Conducted Emission |                       |                  |
| Test Mode              | TX Mode               |                  |
| For Radiated Emission  |                       |                  |
| Test Mode              | TX Mode               |                  |

| Channel | Frequency(MHz) |
|---------|----------------|
| 1       | 462.5625       |

Note1: In section 15.31(m), regards to the operating frequency range less than 1MHz, only one point centered in the frequency range of operation selected to measure.

Note2: The line display in grey was the channel selected for test. The tests for frequencies 462.5625MHz are manufacturer's requirements.

#### 2.6. Block Diagram of Test Setup



#### 2.7. EUT Exercise Software

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

## 2.8. Special Accessories

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|-------------|-------|---------------|-------------|
| --           | --          | --    | --            | --          |

## 2.9. External I/O Cable

| I/O Port Description | Quantity | Cable |
|----------------------|----------|-------|
| --                   | --       | --    |

## 2.10. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2A685ODY-1209RG** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

## 2.11. Modifications

No modifications were implemented to meet testing criteria.

### **3. TEST ENVIRONMENT**

#### **3.1. Address of the test laboratory**

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China.

#### **3.2. Test Facility**

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1234.

FCC Registered Test Site Number is 165725.

#### **3.3. Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 15-35 ° C    |
| Humidity:             | 30-60 %      |
| Atmospheric pressure: | 950-1050mbar |

#### **3.4. 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 CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service 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 GTS laboratory is reported:

| Test                  | Range      | Measurement Uncertainty | Notes |
|-----------------------|------------|-------------------------|-------|
| Radiated Emission     | 30~1000MHz | 4.10 dB                 | (1)   |
| Radiated Emission     | 1~18GHz    | 4.32 dB                 | (1)   |
| Radiated Emission     | 18~40GHz   | 5.54 dB                 | (1)   |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB                 | (1)   |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3.5. Test Description

| Applied Standard: FCC Part 95                         |                                      |  |           |        |
|---|--------------------------------------|--|-----------|--------|
| FCC Rules   | Description of Test                  | Test Sample  | Result    | Remark |
| FCC Part 2.1046<br>FCC Part 95.567 M                  | Maximum Transmitter Power            | GTS20230505013-1-S0001-1#                              | Compliant | Note 1 |
| FCC Part 2.1047<br>FCC Part 95.575                    | Modulation Characteristic            | GTS20230505013-1-S0001-1#                              | Compliant | Note 1 |
| FCC Part 2.1049<br>FCC Part 95.573<br>FCC Part 95.579 | Occupied Bandwidth and Emission Mask | GTS20230505013-1-S0001-1#                              | Compliant | Note 1 |
| FCC Part 2.1053<br>FCC Part 95.579                    | Radiated Spurious Emission           | GTS20230505013-1-S0001-1#<br>GTS20230505013-1-S0001-2# | Compliant | Note 1 |
| FCC Part 2.1055 (d)<br>FCC Part 95.565                | Frequency Stability                  | GTS20230505013-1-S0001-1#                              | Compliant | Note 1 |
| FCC Part 2.1093                                       | RF Exposure                          | /  | Compliant | Note 2 |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. Note 1 – Test results inside test report;
4. Note 2 – Test results in other test report (MPE Report).
5. We tested all test mode and recorded worst case in report

### 3.6. Equipments Used during the Test

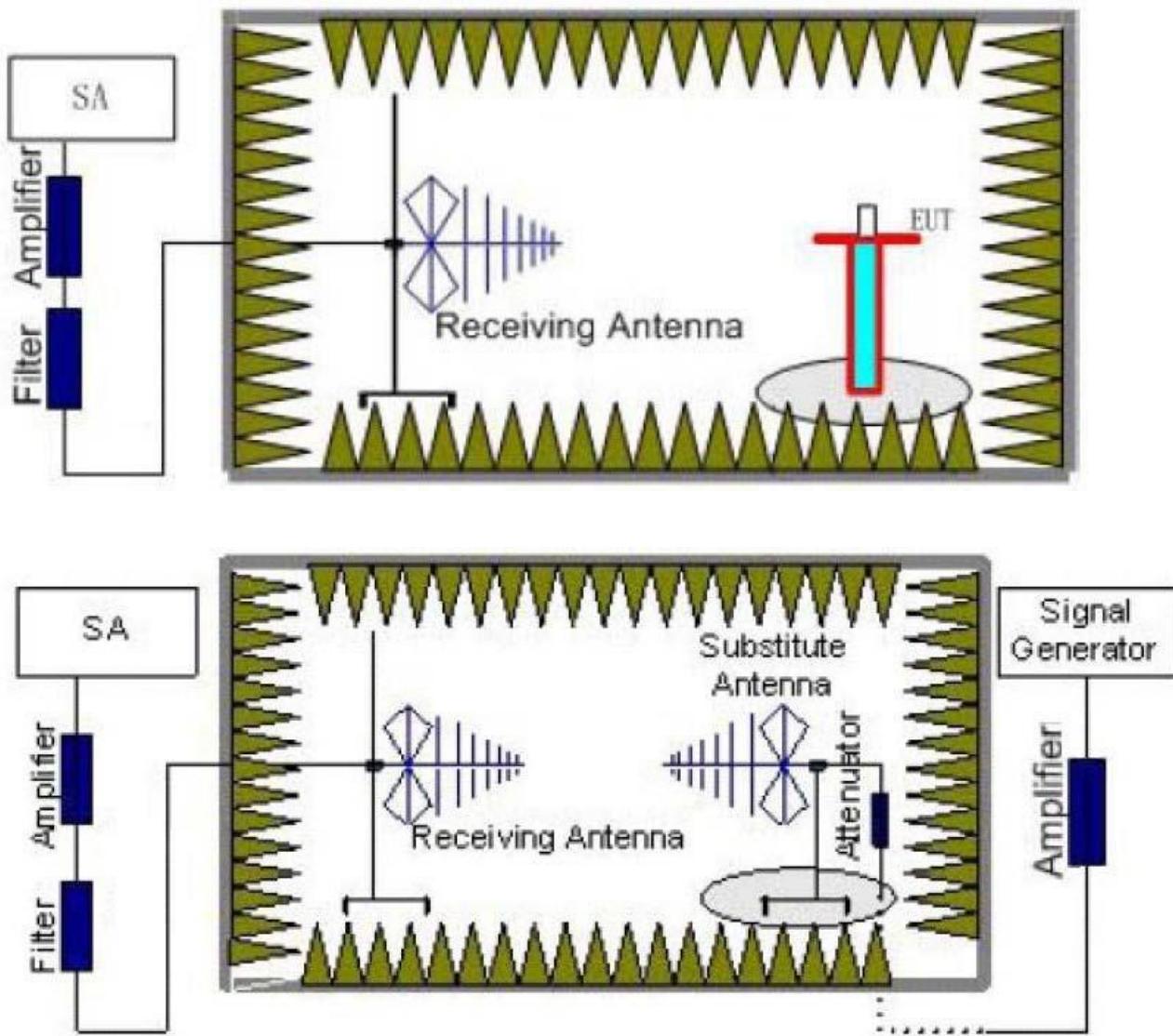
| Test Equipment             | Manufacturer                      | Model No.             | Serial No.      | Calibration Date | Calibration Due Date |
|----------------------------|-----------------------------------|-----------------------|-----------------|------------------|----------------------|
| LISN                       | CYBERTEK                          | EM5040A               | E1850400105     | 2023/07/13       | 2024/07/12           |
| LISN                       | R&S                               | ESH2-Z5               | 893606/008      | 2023/07/13       | 2024/07/12           |
| EMI Test Receiver          | R&S                               | ESPI3                 | 101841-cd       | 2023/07/14       | 2024/07/13           |
| EMI Test Receiver          | R&S                               | ESCI7                 | 101102          | 2023/07/13       | 2024/07/12           |
| Spectrum Analyzer          | Agilent                           | N9020A                | MY48010425      | 2023/08/28       | 2024/08/27           |
| Spectrum Analyzer          | R&S                               | FSV40                 | 100019          | 2023/07/13       | 2024/07/12           |
| Vector Signal generator    | Agilent                           | N5181A                | MY49060502      | 2023/07/13       | 2024/07/12           |
| Signal generator           | Agilent                           | N5182A                | 3610AO1069      | 2023/07/13       | 2024/07/12           |
| Climate Chamber            | ESPEC                             | EL-10KA               | A20120523       | 2023/07/13       | 2024/07/12           |
| Controller                 | EM Electronics                    | Controller EM 1000    | N/A             | N/A              | N/A                  |
| Horn Antenna               | Schwarzbeck                       | BBHA 9120D            | 01622           | 2023/07/13       | 2024/07/12           |
| Active Loop Antenna        | Beijing Da Ze Technology Co.,Ltd. | ZN30900C              | 15006           | 2023/07/13       | 2024/07/12           |
| Bilog Antenna              | Schwarzbeck                       | VULB9163              | 000976          | 2023/07/13       | 2024/07/12           |
| Broadband Horn Antenna     | SCHWARZBECK                       | BBHA 9170             | 791             | 2023/07/13       | 2024/07/12           |
| Amplifier                  | Schwarzbeck                       | BBV 9743              | #202            | 2023/07/14       | 2024/07/13           |
| Amplifier                  | Schwarzbeck                       | BBV9179               | 9719-025        | 2023/07/14       | 2024/07/13           |
| Amplifier                  | EMCI                              | EMC051845B            | 980355          | 2023/07/14       | 2024/07/13           |
| Temperature/Humidity Meter | Gangxing                          | CTH-608               | 02              | 2023/07/13       | 2024/07/12           |
| High-Pass Filter           | K&L                               | 9SH10-2700/X12750-O/O | KL142031        | 2023/08/30       | 2024/08/29           |
| High-Pass Filter           | K&L                               | 41H10-1375/U12750-O/O | KL142032        | 2023/08/30       | 2024/08/29           |
| RF Cable(below 1GHz)       | HUBER+SUHNE R                     | RG214                 | RE01            | 2023/07/13       | 2024/07/12           |
| RF Cable(above 1GHz)       | HUBER+SUHNE R                     | RG214                 | RE02            | 2023/07/13       | 2024/07/12           |
| Data acquisition card      | Agilent                           | U2531A                | TW53323507      | 2023/07/13       | 2024/07/12           |
| Power Sensor               | Agilent                           | U2021XA               | MY5365004       | 2023/07/13       | 2024/07/12           |
| Test Control Unit          | Tonscend                          | JS0806-1              | 178060067       | 2023/07/13       | 2024/07/12           |
| Automated filter bank      | Tonscend                          | JS0806-F              | 19F8060177      | 2023/07/13       | 2024/07/12           |
| EMI Test Software          | Tonscend                          | JS1120-1              | Ver 2.6.8.0518  | /                | /                    |
| EMI Test Software          | Tonscend                          | JS1120-3              | Ver 2.5.77.0418 | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-CE               | Ver 2.5         | /                | /                    |
| EMI Test Software          | Tonscend                          | JS32-RE               | Ver 2.5.1.8     | /                | /                    |

Note: 1. The Cal.Interval was one year.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. Maximum Transmitter Power

#### Block Diagram of Test Setup



#### TEST PROCEDURE

1. EUT was placed on a 1.5meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all test transmit frequencies were measured with peak detector.

2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

3.The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).

4.The EUT shall be replaced by a substitution antenna. In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

5.An amplifier may be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = \text{PMea} + \text{PAg} - \text{Pcl} + \text{Ga}$$

6.This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi) and known input power.

7.ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

### AC Power Conducted Emission Limit

#### **According to FCC Part 95.567:**

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.

### TEST RESULTS

|               |             |  |                |  |     |  |
|---------------|-------------|--|----------------|--|-----|--|
| Temperature   | 24°C        |  | Humidity       |  | 51% |  |
| Test Engineer | Evan Ouyang |  | Configurations |  | FRS |  |

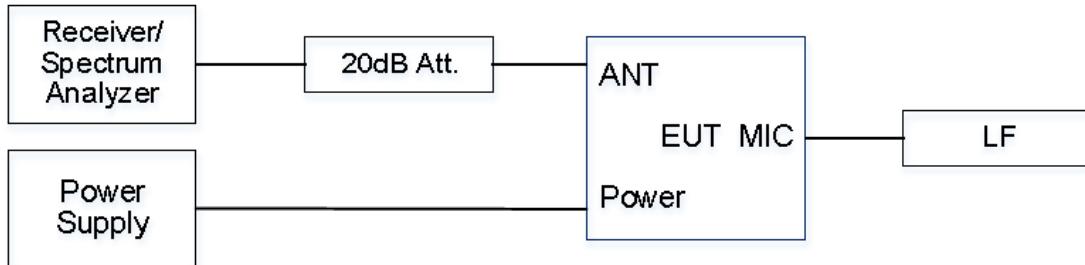
| Test Frequency (MHz) | PMea (dBm) | Pcl (dB) | Ga Antenna Gain (dBi) | Correction (dB) | PAg (dB) | ERP (dBm) | ERP (W) | Polarization | Limit (W) |
|----------------------|------------|----------|-----------------------|-----------------|----------|-----------|---------|--------------|-----------|
| 462.5625             | -30.76     | 2.08     | 7.69                  | 2.15            | 34.59    | 8.29      | 0.0067  | V            | 2.0       |
| 462.5625             | -30.65     | 2.08     | 7.69                  | 2.15            | 34.59    | 8.40      | 0.0069  | H            | 2.0       |

Remark:

- 1.EIRP=PMea(dBm) +PAg(dB) -Pcl(dB) +Ga(dBi)
- 2.ERP = EIRP – 2.15dBi as EIRP by subtracting the gain of the dipole.
- 3.The field strength of radiation emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The data show in this report only with the worst case setup. After exploratory measurement the worst case of Z axis and receiver antenna at vertical polarization was reported.

## 4.2. Occupied Bandwidth and Emission Mask

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was modulated by 2.5 KHz Sine wave audio signal; the level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing) and 5 kHz (25 kHz channel spacing).
2. Set SPA Center Frequency = fundamental frequency, RBW=300Hz, VBW= 3 KHz, span =50 KHz.
3. Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth.

### RADIATION LIMIT

According to FCC 95.573:

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

According to FCC 95.579:

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.

**TEST RESULTS**

|               |             |                |     |
|---------------|-------------|----------------|-----|
| Temperature   | 24°C        | Humidity       | 48% |
| Test Engineer | Evan Ouyang | Configurations | FRS |

**Occupied Bandwidth:**

| Emission Type | Frequency (MHz) | 99% OBW (kHz) | 26dB bandwidth (kHz) | Limit (KHz) | Result |
|---------------|-----------------|---------------|----------------------|-------------|--------|
| F3E           | 462.5625        | 5.946         | 6.128                | 12.5        | Pass   |

## Emission Designator

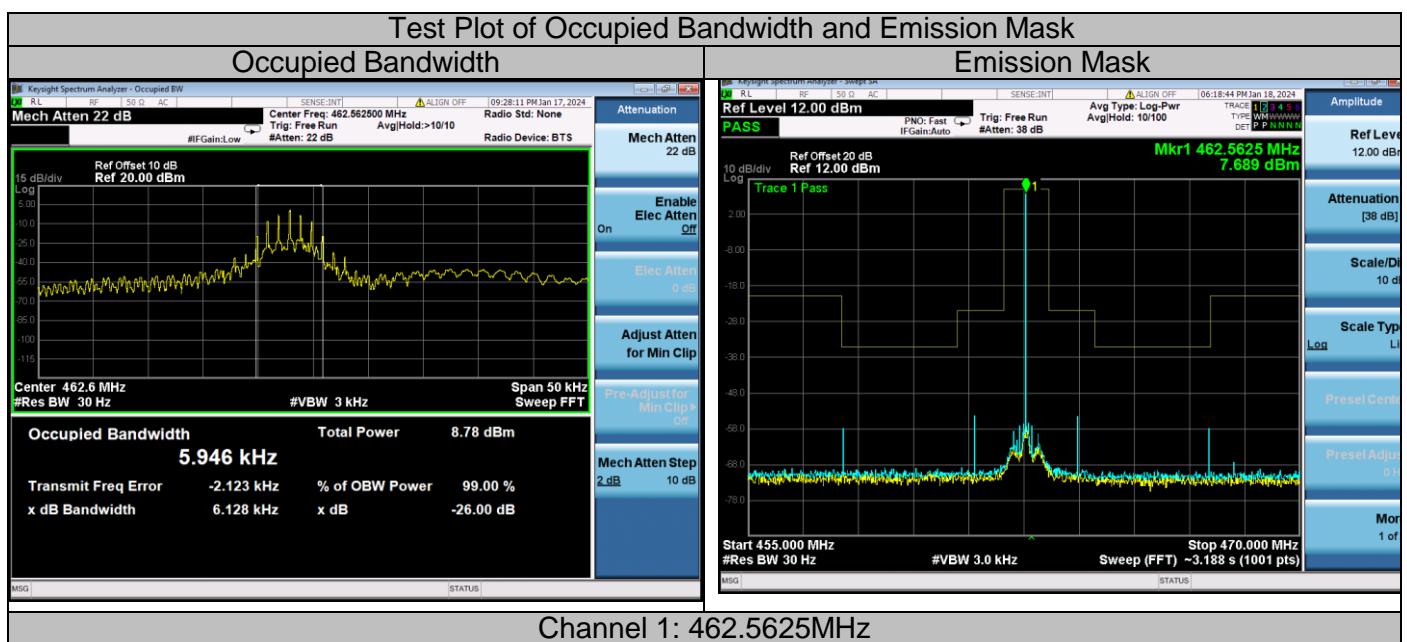
Per CFR 47 §2.201& §2.202, BW = 2M + 2D for FM Mode (Channel Spacing: 12.5 kHz) Emission Designator 11K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation. BW = 2\*(M+D) = 2\*(3.0 kHz + 2.5 kHz) = 11 kHz = 11K0

F3E portion of the designator represents an FM voice transmission

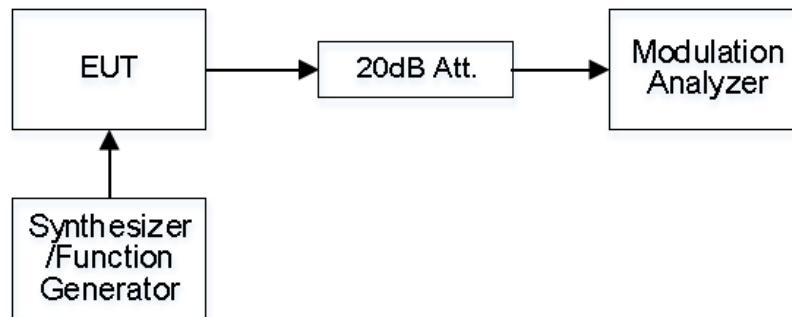
Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

**Please refer to following page.**



### 4.3. Modulation Characteristic

#### TEST CONFIGURATION



#### TEST PROCEDURE

According to ANSI/TIA-603-E-2016

#### LIMIT

According to CFR47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

According to FCC 95.575:

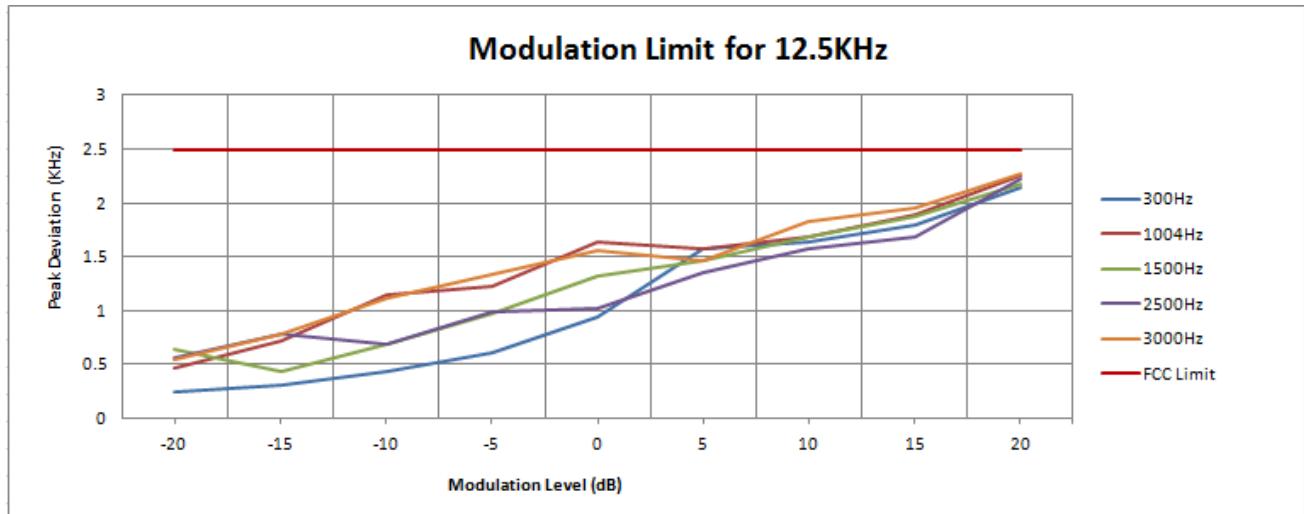
Each FRS transmitter type must be designed such that the peak frequency deviation does not exceed 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

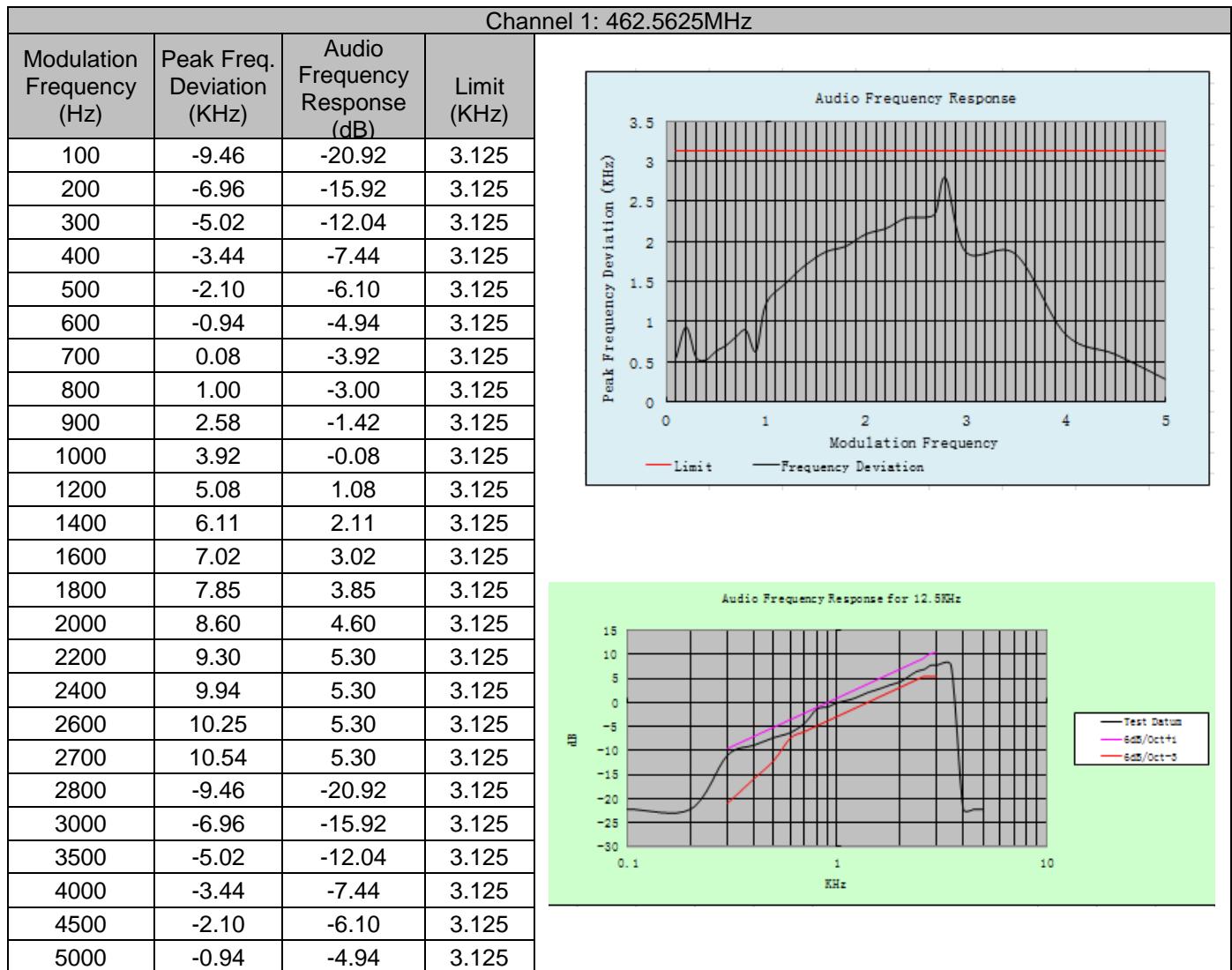
**TEST RESULTS**

|               |             |                |     |
|---------------|-------------|----------------|-----|
| Temperature   | 24°C        | Humidity       | 48% |
| Test Engineer | Evan Ouyang | Configurations | FRS |

Modulation Limit:

| Channel 1: 462.5625MHz |                                     |                                      |                                      |                                      |                                      |
|------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Modulation Level (dB)  | Peak Freq. Deviation At 300Hz (KHz) | Peak Freq. Deviation At 1004Hz (KHz) | Peak Freq. Deviation At 1500Hz (KHz) | Peak Freq. Deviation At 2500Hz (KHz) | Peak Freq. Deviation At 3000Hz (KHz) |
| -20                    | 0.25                                | 0.47                                 | 0.64                                 | 0.56                                 | 0.55                                 |
| -15                    | 0.31                                | 0.72                                 | 0.44                                 | 0.78                                 | 0.79                                 |
| -10                    | 0.43                                | 1.14                                 | 0.69                                 | 0.69                                 | 1.12                                 |
| -5                     | 0.61                                | 1.22                                 | 0.98                                 | 0.99                                 | 1.33                                 |
| 0                      | 0.94                                | 1.63                                 | 1.32                                 | 1.02                                 | 1.56                                 |
| +5                     | 1.57                                | 1.57                                 | 1.47                                 | 1.36                                 | 1.47                                 |
| +10                    | 1.63                                | 1.69                                 | 1.69                                 | 1.58                                 | 1.82                                 |
| +15                    | 1.79                                | 1.89                                 | 1.87                                 | 1.69                                 | 1.96                                 |
| +20                    | 2.15                                | 2.26                                 | 2.17                                 | 2.23                                 | 2.27                                 |

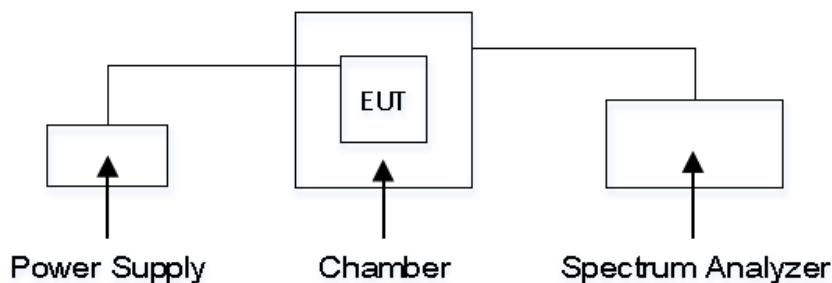


**Audio Frequency Response:**

Note: All the modes had been tested, but only the worst data recorded in the report.

## 4.4. Frequency Stability

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

### LIMIT

According to FCC 95.565

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

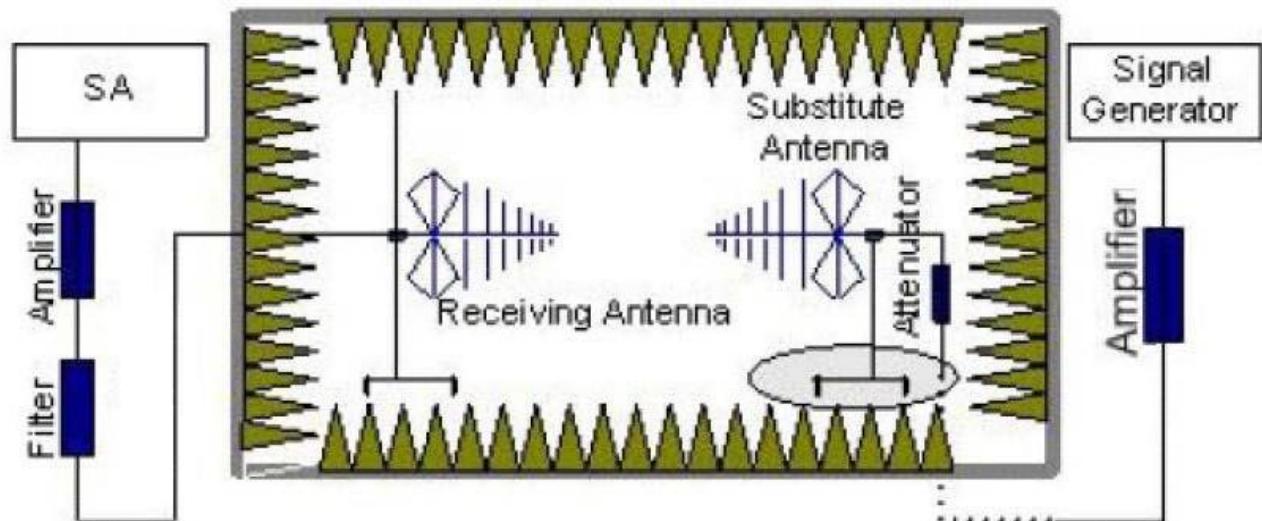
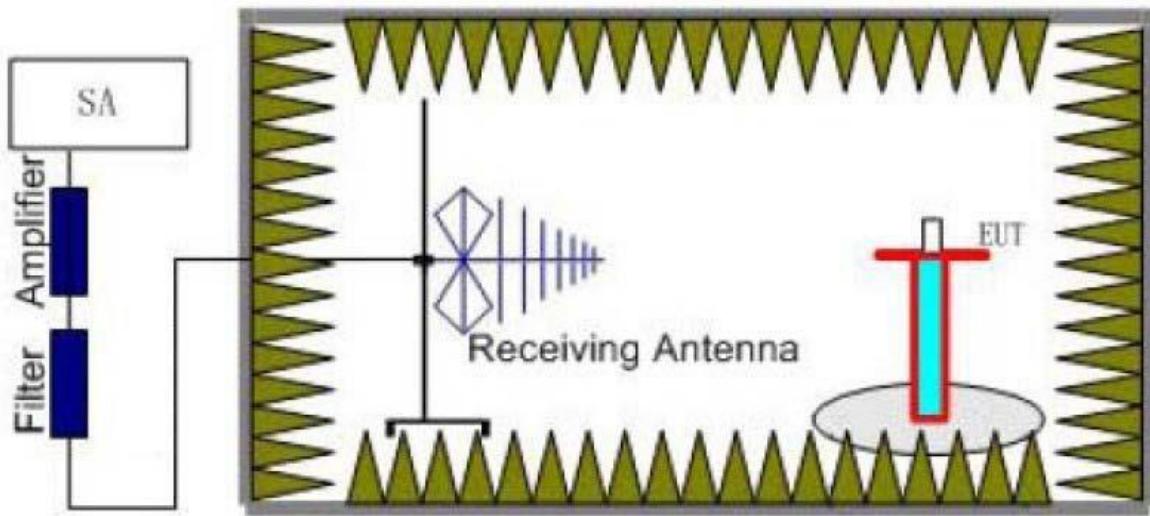
### TEST RESULTS

|               |             |                |     |
|---------------|-------------|----------------|-----|
| Temperature   | 24°C        | Humidity       | 48% |
| Test Engineer | Evan Ouyang | Configurations | FRS |

| Reference Frequency: 462.5625MHz |                  |                      |                         |           |        |
|----------------------------------|------------------|----------------------|-------------------------|-----------|--------|
| Voltage (V)                      | Temperature (°C) | Frequency error (Hz) | Frequency Tolerance (%) | Limit (%) | Result |
| 6.0                              | -30              | 331                  | 0.000099                | 0.00025%  | Pass   |
|                                  | -20              | 474                  | 0.000152                |           |        |
|                                  | -10              | 278                  | 0.000089                |           |        |
|                                  | 0                | 302                  | 0.000175                |           |        |
|                                  | 10               | 264                  | 0.000110                |           |        |
|                                  | 20               | 324                  | 0.000121                |           |        |
|                                  | 30               | 366                  | 0.000147                |           |        |
|                                  | 40               | 215                  | 0.000078                |           |        |
|                                  | 50               | 277                  | 0.000083                |           |        |
|                                  | 4.2              | 379                  | 0.000098                |           |        |
| 6.0                              | 25               | 365                  | 0.000082                |           |        |

## 4.5. Transmitter Radiated Spurious Emission

### TEST CONFIGURATION



### TEST PROCEDURE

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all test transmit frequencies were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum 100 kHz below 1GHz and 1MHz above 1GHz, Sweep from 30MHz to the 10th harmonic of the fundamental frequency; and recorded the level of the concerned spurious emission point as (Pr).

4. The EUT then replaced by a substitution antenna. In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

5. The measurement results are obtained as described below:

$$\text{Power (EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$

Where;

PMea is the recorded signal generator level

Pcl is the cable loss connect between instruments Ga Substitution Antenna Gain

6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi) and known input power.

7. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

8. Test site anechoic chamber refer to ANSI C63.10.

### LIMIT

According to FCC section 95.579, At least  $43 + 10 \log (\text{Transmit Power})$  dB on any frequency band removed from the channel center frequency by more than 31.25 kHz.

### TEST RESULTS

|               |             |  |                |  |     |  |  |  |
|---------------|-------------|--|----------------|--|-----|--|--|--|
| Temperature   | 24°C        |  | Humidity       |  | 48% |  |  |  |
| Test Engineer | Evan Ouyang |  | Configurations |  | FRS |  |  |  |

| Test Frequency (MHz) | Frequency (MHz) | PMea (dBm) | Pcl (dB) | Distance (m) | Ga Antenna Gain(dBi) | Peak EIRP (dBm) | Limit (dBm) | Margin (dB) | Pol. |
|----------------------|-----------------|------------|----------|--------------|----------------------|-----------------|-------------|-------------|------|
| 462.5625             | 149.27          | -45.71     | 3.73     | 3.00         | 8.51                 | -40.93          | -13.00      | -27.93      | V    |
|                      | 234.41          | -45.98     | 4.27     | 3.00         | 7.17                 | -43.07          | -13.00      | -30.07      | V    |
|                      | 557.96          | -41.85     | 3.77     | 3.00         | 8.56                 | -37.05          | -13.00      | -24.05      | V    |
|                      | 906.23          | -43.40     | 4.27     | 3.00         | 7.14                 | -40.53          | -13.00      | -27.53      | V    |

Remark:

1.  $\text{EIRP} = \text{PMea(dBm)} - \text{Pcl(dB)} + \text{Ga(dBi)}$

2. Margin = Limit - EIRP

3. The Report only recorded the worst result (462.5625MHz) .

4. The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency, and only recorded worst spurious emissions.

## 5. TEST SETUP PHOTOS OF THE EUT

Photo of Radiated Emissions Measurement



Fig. 1



Fig. 2

## **6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT**



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

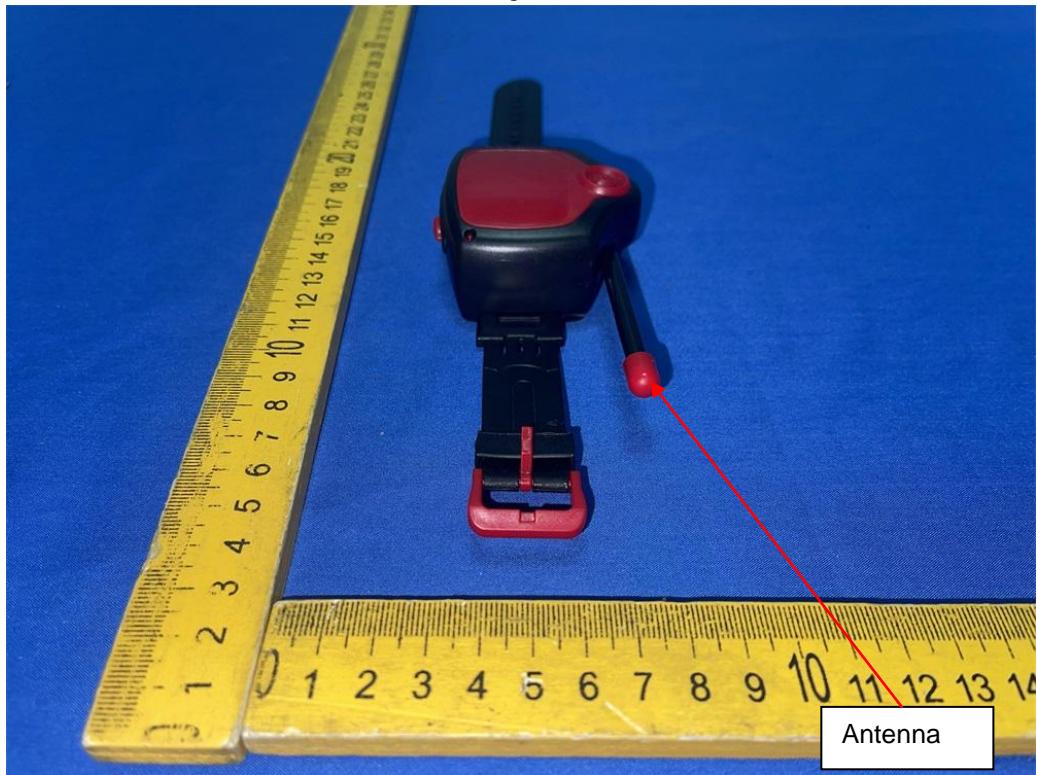


Fig. 6

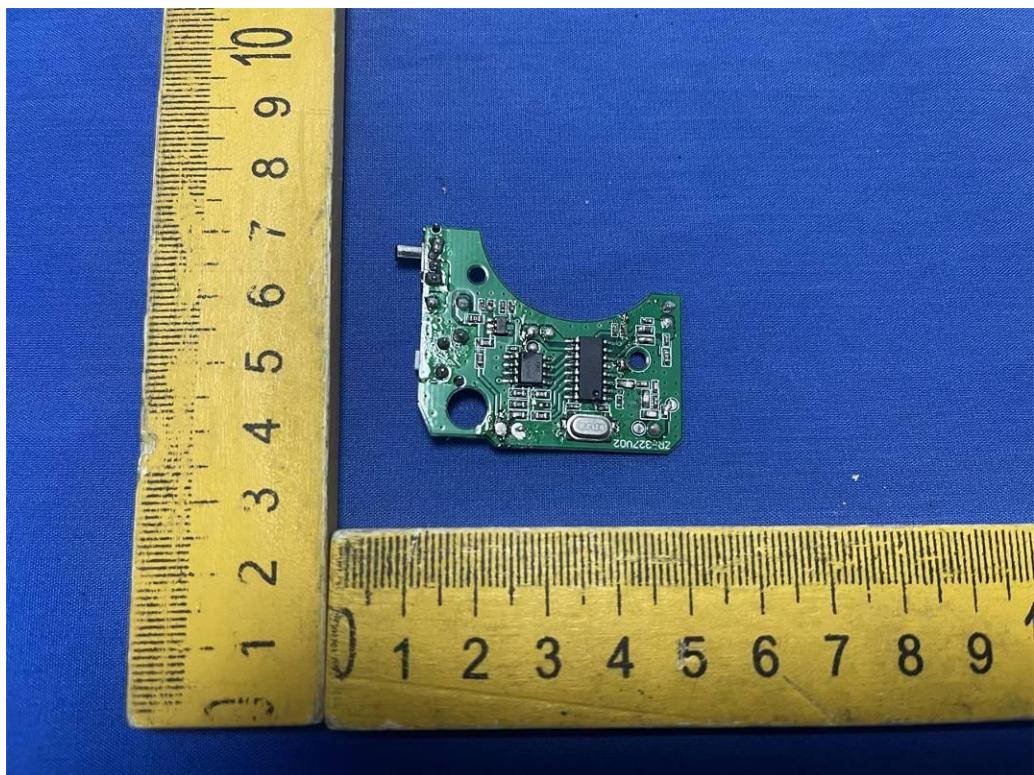


Fig. 7

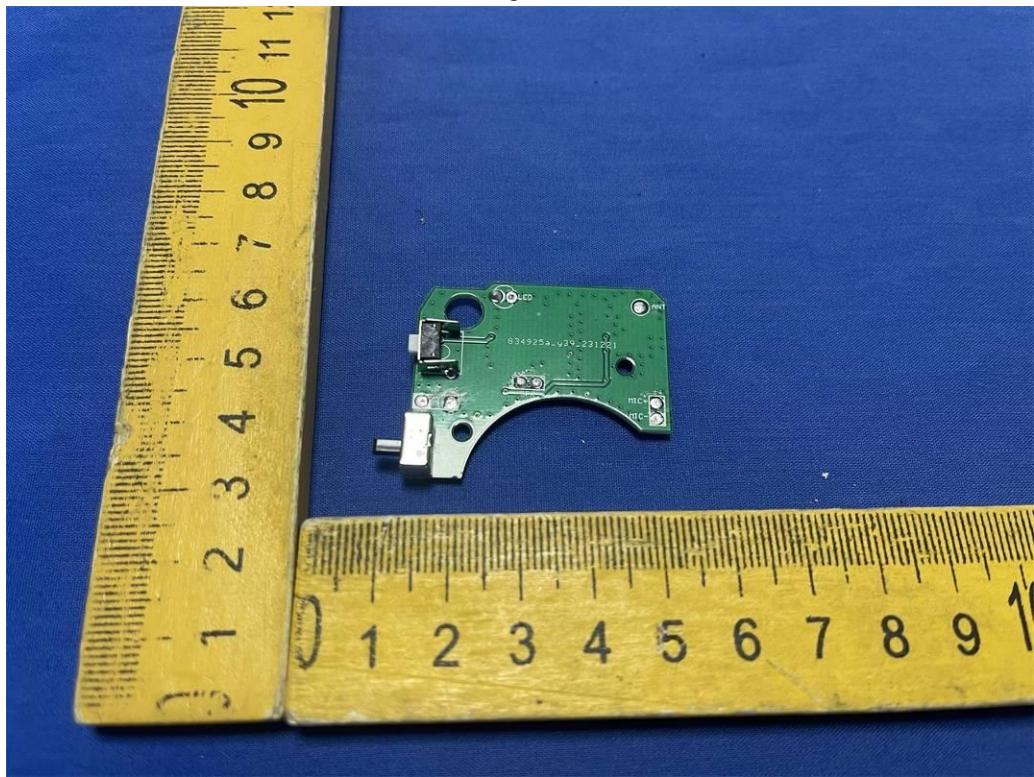


Fig. 8



Fig. 9

.....End of Report.....