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# TEST REPORT

Report No. .... : CHTEW22080290 Report Verification: 

Project No. .... : SHT2207087101EW

FCC ID. .... : 2A3OORB39

Applicant's name ..... : Shenzhen Ysair Technology Co., LTD

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

Test item description ..... : Two Way Radio

Trade Mark ..... : RETEVIS

Model/Type reference..... : RB39

Listed Model(s) ..... : -

Standard ..... : FCC CFR Title 47 Part 95 Subpart B

Date of receipt of test sample..... : Aug.04, 2022

Date of testing ..... : Aug.04, 2022-Aug.23, 2022

Date of issue..... : Aug.24, 2022

Result..... : PASS

Compiled by  
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Testing Laboratory Name ..... : Shenzhen Huatongwei International Inspection Co., Ltd.

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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## 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Test Standards

The tests were performed according to following standards:

- [FCC Rules Part 95](#): PERSONAL RADIO SERVICES
- [FCC Rules Part 2](#): Frequency allocations and radio treaty matters; General rules and regulations
- [ANSI C63.26-2013](#): American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
- [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

### 1.2. Report version

| Revision No. | Date of issue | Description |
|--------------|---------------|-------------|
| N/A          | 2022-08-24    | Original    |
|              |               |             |
|              |               |             |
|              |               |             |
|              |               |             |

## 2. TEST DESCRIPTION

| Report clause | Test Items                              | Standard Requirement                   | Result |
|---------------|-----------------------------------------|----------------------------------------|--------|
| 5.1           | Carrier Output Power(ERP)               | Part 95.567<br>Part 2.1046(a)          | PASS   |
| 5.2           | 99% Occupied Bandwidth & 26dB bandwidth | Part 95.573<br>Part 2.1049             | PASS   |
| 5.3           | Emission Mask                           | Part 95.579(a)(1)(2)(3)<br>Part 2.1049 | PASS   |
| 5.4           | Modulation Limit                        | Part 95.575<br>Part 2.1047(b)          | PASS   |
| 5.5           | Audio Frequency Response                | Part 95.575<br>Part 2.1047(a)          | PASS   |
| 5.6           | Audio Low Pass Filter Response          | Part 95.575<br>Part 2.1047(a)          | PASS   |
| 5.7           | Frequency Stability V.S. Temperature    | Part 95.565<br>Part 2.1055             | PASS   |
| 5.8           | Frequency Stability V.S. Voltage        | Part 95.565<br>Part 2.1055             | PASS   |
| 5.9           | Transmit Radiated Spurious Emission     | Part 95.579(a)(3)<br>Part 2.1053       | PASS   |

Note:

- The measurement uncertainty is not included in the test result.

### 3. SUMMARY

#### 3.1. Client Information

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

#### 3.2. Product Description

|                      |                                                                                         |
|----------------------|-----------------------------------------------------------------------------------------|
| Name of EUT:         | Two Way Radio                                                                           |
| Trade Mark:          | RETEVIS                                                                                 |
| Model No.:           | RB39                                                                                    |
| Listed Model(s):     | -                                                                                       |
| Power supply:        | DC 3.7V from battery                                                                    |
| Battery information: | 3.7V/1000mAh/3.7Wh                                                                      |
| Adapter information: | Model:DSA-5PF07-05 FUS 050100<br>Input:100-240Va.c., 50/60Hz 0.2A<br>Output: 5Vd.c., 1A |
| Hardware version:    | V1.2                                                                                    |
| Software version:    | RB39-V303.04                                                                            |

### 3.3. Radio Specification Description

|                                     |                             |             |                  |         |              |                  |
|-------------------------------------|-----------------------------|-------------|------------------|---------|--------------|------------------|
| Support Frequency Range:            | <b>Frequency table(FRS)</b> |             |                  |         |              |                  |
|                                     | Channel                     | Frequency   | Max Power Output | Channel | Frequency    | Max Power Output |
|                                     | 1                           | 462.5625MHz | 2 W              | 12      | 467.6625MHz  | 0.5 W            |
|                                     | 2                           | 462.5875MHz | 2 W              | 13      | 467.6875MHz  | 0.5 W            |
|                                     | 3                           | 462.6125MHz | 2 W              | 14      | 467.7125MHz  | 0.5 W            |
|                                     | 4                           | 462.6375MHz | 2 W              | 15      | 462.5500 MHz | 2 W              |
|                                     | 5                           | 462.6625MHz | 2 W              | 16      | 462.5750 MHz | 2 W              |
|                                     | 6                           | 462.6875MHz | 2 W              | 17      | 462.6000 MHz | 2 W              |
|                                     | 7                           | 462.7125MHz | 2 W              | 18      | 462.6250 MHz | 2 W              |
|                                     | 8                           | 467.5625MHz | 0.5 W            | 19      | 462.6500 MHz | 2 W              |
|                                     | 9                           | 467.5875MHz | 0.5 W            | 20      | 462.6750 MHz | 2 W              |
|                                     | 10                          | 467.6125MHz | 0.5 W            | 21      | 462.7000 MHz | 2 W              |
|                                     | 11                          | 467.6375MHz | 0.5 W            | 22      | 462.7250 MHz | 2 W              |
| Modulation Type:                    | FM                          |             |                  |         |              |                  |
| Emission Designator: * <sup>1</sup> | 11K0F3E                     |             |                  |         |              |                  |
| Antenna Type:                       | Integral                    |             |                  |         |              |                  |
| Antenna Gain:                       | 1dBi                        |             |                  |         |              |                  |

Note:

(1) \*<sup>1</sup> According to FCC Part 2.202 requirements, the Necessary Bandwidth is calculated as follows:

- For FM Voice Modulation

Channel Spacing = 12.5 KHz, D = 2.5 KHz max, K = 1, M = 3 KHz

$B_n = 2M + 2DK = 2*3 + 2*2.5*1 = 11 \text{ KHz}$

Emission designation: 11K0F3E

(2) The device only supports voice communication.

### 3.4. Testing Laboratory Information

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

## 4. TEST CONFIGURATION

### 4.1. Test frequency list

According to ANSI C63.26 section 5.1.2.1:

Measurements of transmitters shall be performed and, if required, reported for each frequency band in which the EUT can be operated with the device transmitting at the number of frequencies in each band specified in Table 2.

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

| Test Channel     | Channel No. | Frequency (MHz) | Frequency band (MHz) |
|------------------|-------------|-----------------|----------------------|
| CH <sub>M1</sub> | CH4         | 462.6375        | 462.5625~462.7125    |
| CH <sub>M2</sub> | CH11        | 467.6375        | 467.5625~467.7125    |

The Product channel frequency table:

| Test Channel | Channel No.     | Frequency (MHz) | Frequency band (MHz) |
|--------------|-----------------|-----------------|----------------------|
| 01           | 462.5625        | 12              | 467.6625             |
| 02           | 462.5875        | 13              | 467.6875             |
| 03           | 462.6125        | 14              | 467.7125             |
| <b>04</b>    | <b>462.6375</b> | 15              | 462.5500             |
| 05           | 462.6625        | 16              | 462.5750             |
| 06           | 462.6875        | 17              | 462.6000             |
| 07           | 462.7125        | 18              | 462.6250             |
| 08           | 467.5625        | 19              | 462.6500             |
| 09           | 467.5875        | 20              | 462.6750             |
| 10           | 467.6125        | 21              | 462.7000             |
| <b>11</b>    | <b>467.6375</b> | 22              | 462.7250             |

### 4.2. Test mode

| Test mode | Transmitting | FRS |
|-----------|--------------|-----|
| TX-FRS    | √            | √   |

Note:

√: is operation mode.

| Modulation Type | Description                                                                                                                                                                                                           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UM              | Un-modulation                                                                                                                                                                                                         |
| AM2             | Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.                                                                                                           |
| AM6             | Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation, then increase the level from the audio generator by 20 dB |
| AM5             | Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation.                                                                       |



| Test item                               | Modulation Type | Test mode |
|-----------------------------------------|-----------------|-----------|
| Output Power(ERP)                       | UM              | TX-FRS    |
| 99% Occupied Bandwidth & 26dB bandwidth | AM6             | TX-FRS    |
| Emission Mask                           | AM5             | TX-FRS    |
| Modulation Limit                        | AM6             | TX-FRS    |
| Audio Frequency Response                | AM2             | TX-FRS    |
| Frequency Stability VS Temperature      | UM              | TX-FRS    |
| Frequency Stability VS Voltage          | UM              | TX-FRS    |
| Transmit Radiated Spurious Emission     | AM5             | TX-FRS    |
| AC Power Line Conducted Emission        | -               | -         |
| Radiated Emission                       | -               | -         |

#### 4.3. Support unit used in test configuration and system

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

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

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

#### 4.4. Testing environmental condition

| Type               | Requirement            | Actual   |
|--------------------|------------------------|----------|
| Temperature:       | 15~35°C                | 25°C     |
| Relative Humidity: | 25~75%                 | 50%      |
| Air Pressure:      | 860~1060mbar           | 1000mbar |
| Test voltage:      | Normal voltage:        | DC 3.7V  |
|                    | Extreme lower voltage: | DC 3.1V  |
|                    | Extreme upper voltage: | DC 4.2V  |

#### 4.5. Measurement uncertainty

| Test Item                                   | Measurement Uncertainty |
|---------------------------------------------|-------------------------|
| Frequency stability                         | 25 Hz                   |
| Carrier output power (ERP)                  | 2.20 dB                 |
| Occupied Bandwidth                          | 35 Hz                   |
| Modulation Limiting                         | 0.42 %                  |
| FM deviation                                | 25 Hz                   |
| Audio level                                 | 0.62 dB                 |
| Radiated Spurious Emission 30~1000MHz       | 4.65 dB                 |
| Radiated Spurious Emission 1~18GHz          | 5.16 dB                 |
| AC power line Conducted Emission 9KHz-30MHz | 3.39 dB                 |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

#### 4.6. Equipment Used during the Test

| ● TS8613 Test system         |                                       |                    |               |                   |             |                           |                           |
|------------------------------|---------------------------------------|--------------------|---------------|-------------------|-------------|---------------------------|---------------------------|
| Used                         | Test Equipment                        | Manufacturer       | Equipment No. | Model No.         | Serial No.  | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                            | Spectrum Analyzer                     | Agilent            | HTWE0286      | N9020A            | MY50510187  | 2021/09/13                | 2022/09/12                |
| ●                            | Signal & Spectrum Analyzer            | R&S                | HTWE0262      | FSW26             | 103440      | 2021/09/13                | 2022/09/12                |
| ●                            | RF Communication Test Set             | HP                 | HTWE0038      | 8920A             | 3813A10206  | 2021/09/13                | 2022/09/12                |
| ●                            | Digital intercom communication tester | Aeroflex           | HTWE0255      | 3920B             | 1001682041  | 2021/09/13                | 2022/09/12                |
| ●                            | Signal Generator                      | R&S                | HTWE0191      | SML02             | 100507      | 2021/09/13                | 2022/09/12                |
| ●                            | Signal Generator                      | R&S                | HTWE0337      | SMC100A           | 107268      | 2021/09/13                | 2022/09/12                |
| ●                            | RF Control Unit                       | Tonscend           | HTWE0294      | JS0806-2          | N/A         | N/A                       | N/A                       |
| ●                            | Filter-VHF                            | Microwave          | HTWE0309      | N26460M1          | 498702      | N/A                       | N/A                       |
| ●                            | Filter-UHF                            | Microwave          | HTWE0311      | N25155M2          | 498704      | N/A                       | N/A                       |
| ●                            | Power Divider                         | Microwave          | HTWE0043      | OPD1040-N-4       | N/A         | 2022/05/16                | 2023/05/15                |
| ●                            | Attenuator                            | JFW                | HTWE0292      | 50FH-030-100      | N/A         | 2022/05/16                | 2023/05/15                |
| ●                            | Attenuator                            | JFW                | HTWE0293      | 50-A-MFN-20       | 0322        | 2022/05/16                | 2023/05/15                |
| ●                            | Test software                         | HTW                | N/A           | Radio ATE         | N/A         | N/A                       | N/A                       |
| ● Auxiliary Equipment        |                                       |                    |               |                   |             |                           |                           |
| Used                         | Test Equipment                        | Manufacturer       | Equipment No. | Model No.         | Serial No.  | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                            | Climate chamber                       | ESPEC              | HTWE0254      | GPL-2             | N/A         | 2021/09/14                | 2022/09/13                |
| ●                            | DC Power Supply                       | Gwinstek           | HTWE0274      | SPS-2415          | GER835793   | N/A                       | N/A                       |
| ● Radiated Spurious Emission |                                       |                    |               |                   |             |                           |                           |
| Used                         | Test Equipment                        | Manufacturer       | Equipment No. | Model No.         | Serial No.  | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                            | Semi-Anechoic Chamber                 | Albatross projects | HTWE0122      | SAC-3m-01         | C11121      | 2018/09/27                | 2022/09/26                |
| ●                            | Spectrum Analyzer                     | R&S                | HTWE0098      | FSP40             | 100597      | 2021/09/13                | 2022/09/12                |
| ●                            | Loop Antenna                          | R&S                | HTWE0170      | HFH2-Z2           | 100020      | 2021/04/06                | 2024/04/05                |
| ●                            | Broadband Horn Antenna                | SCHWARZBECK        | HTWE0103      | BBHA9170          | BBHA9170472 | 2020/04/27                | 2023/04/26                |
| ●                            | Ultra-Broadband Antenna               | SCHWARZBECK        | HTWE0123      | VULB9163          | 538         | 2021/04/06                | 2024/04/05                |
| ●                            | Horn Antenna                          | SCHWARZBECK        | HTWE0126      | 9120D             | 1011        | 2020/04/01                | 2023/03/31                |
| ●                            | Pre-amplifier                         | CD                 | HTWE0071      | PAP-0102          | 12004       | 2021/11/05                | 2022/11/04                |
| ●                            | Broadband Preamplifier                | SCHWARZBECK        | HTWE0201      | BBV 9718          | 9718-248    | 2022/02/28                | 2023/02/27                |
| ●                            | RF Connection Cable                   | HUBER+SUHNER       | HTWE0120-01   | 6m 18GHz S Serisa | N/A         | 2022/02/25                | 2023/02/24                |
| ●                            | RF Connection Cable                   | HUBER+SUHNER       | HTWE0120-02   | 6m 3GHz RG Serisa | N/A         | 2022/02/25                | 2023/02/24                |
| ●                            | RF Connection Cable                   | HUBER+SUHNER       | HTWE0119-05   | 6m 3GHz RG Serisa | N/A         | 2022/02/25                | 2023/02/24                |
| ●                            | RF Connection Cable                   | HUBER+SUHNER       | HTWE0120-04   | 6m 3GHz RG Serisa | N/A         | 2022/02/25                | 2023/02/24                |
| ●                            | EMI Test Software                     | Audix              | N/A           | E3                | N/A         | N/A                       | N/A                       |

## 5. TEST CONDITIONS AND RESULTS

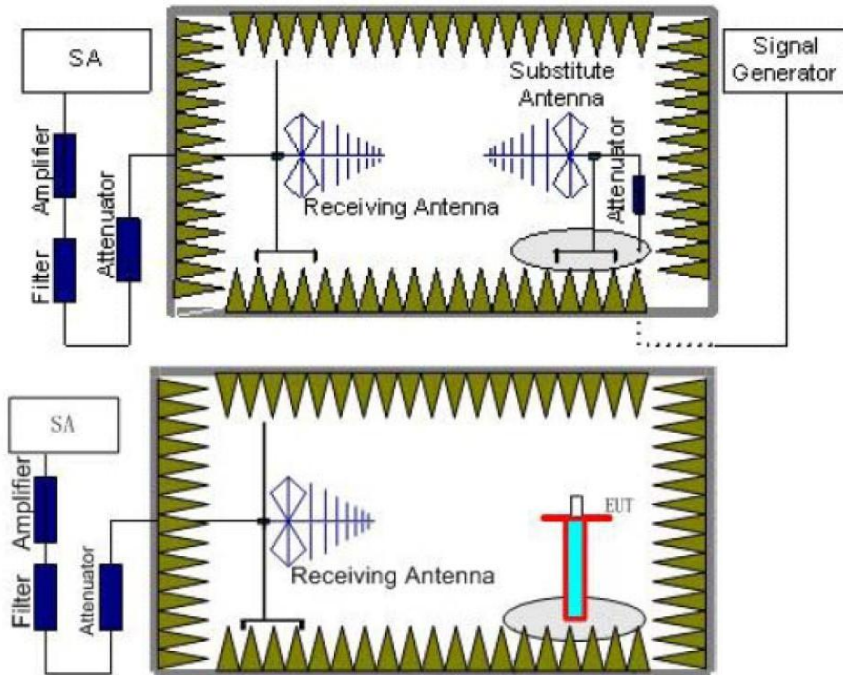
### 5.1. Carrier Output Power (ERP)

#### LIMIT

FCC Part FCC Part 95.567, FCC Part 2.1046

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 CONFIGURATION



#### TEST PROCEDURE

- 1) The measuring distance of at 3m shall be used for measurements
- 2) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- 3) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The spectrum setting for Equivalent Isotropically Radiated Power (EIRP) is RBW = 100kHz, VBW = 300kHz. Detector Mode is Positive Peak
- 5) Record the field strength level of the EUT from the spectrum
- 6) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be moved height from 1m to 4m to find the highest radiation. Adjust the S.G. output level and repeat this step to get the same field strength level as the EUT
- 7) The EIRP level = S.G. output level(dBm) - TX cable(dB) + Substituted Antenna Gain(dBi)
- 8) The ERP level = EIRP - 2.15

#### TEST MODE

Please reference to the section 4.2

#### TEST RESULTS

☒ Passed ☐ Not Applicable

#### TEST Data

Please refer to appendix A on the appendix report

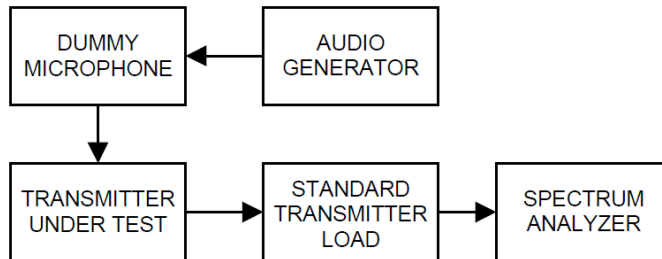
## 5.2. 99% Occupied Bandwidth & 26dB Bandwidth

### LIMIT

FCC Part 95.573, FCC Part 2.1049

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

### TEST CONFIGURATION



### TEST PROCEDURE

- 1) Connect the equipment as illustrated
- 2) Spectrum set as follow:  
Centre frequency = the nominal EUT channel center frequency,  
The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of  $1.5 \times \text{OBW}$  is sufficient)  
RBW = 1% to 5% of the anticipated OBW, VBW  $\geq 3 \times \text{RBW}$ , Sweep = auto,  
Detector function = peak, Trace = max hold
- 3) Set 99% Occupied Bandwidth and 26dB Bandwidth
- 4) Measure and record the results in the test report.

### TEST MODE

Please reference to the section 4.2

### TEST RESULTS

☒ Passed ☐ Not Applicable

### TEST Data

Please refer to appendix B on the appendix report

### 5.3. Emission Mask

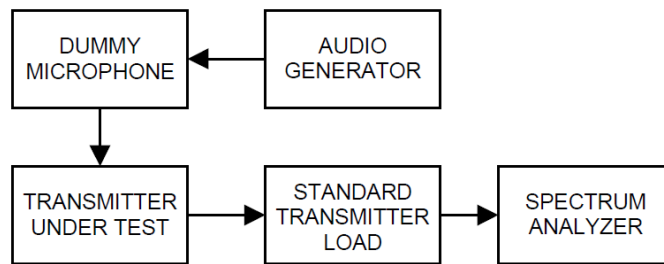
#### LIMIT

FCC Part 95.579(a)(1)(2)(3), FCC Part 2.1049

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits

- a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:
- (1) 25dB 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 CONFIGURATION



#### TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Spectrum set as follow:  
Centre frequency = fundamental frequency, RBW=300Hz, VBW=1000Hz, Sweep = auto,  
Detector function = peak, Trace = max hold
- 3) Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line.  
This is the 0dB reference for the measurement.
- 4) Apply Input Modulation Signal to EUT according to Section 4.2
- 5) Measure and record the results in the test report.

#### TEST MODE

Please reference to the section 4.2

#### TEST RESULTS

☒ Passed ☐ Not Applicable

#### TEST Data

Please refer to appendix C on the appendix report

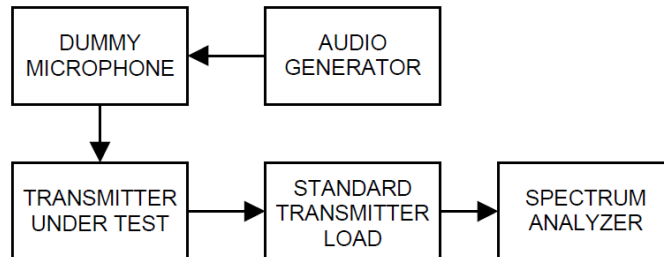
## 5.4. Modulation Limit

### LIMIT

FCC Part 95.575, FCC Part 2.1047(b)

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

### TEST CONFIGURATION



### TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- 3) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for  $\leq 0.25$  Hz to  $\geq 15,000$  Hz. Turn the de-emphasis function off.
- 4) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
- 5) Increase the level from the audio frequency generator by 20 dB in one step (rise time between the 10% and 90% points shall be 0.1 second maximum).
- 6) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level
- 7) With the level from the audio frequency generator held constant at the level obtained in step 4), slowly vary the audio frequency from 300 Hz to 3000 Hz and observe the steady-state deviation. Record the maximum deviation.

### TEST MODE

Please reference to the section 4.2

### TEST RESULTS

☒ Passed ☐ Not Applicable

### TEST Data

Please refer to appendix D on the appendix report

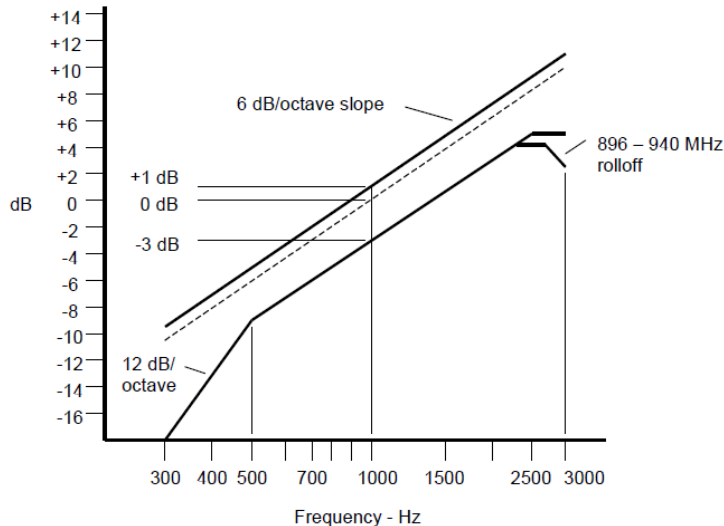
## 5.5. Audio Frequency Response

### LIMIT

FCC Part 95.575, FCC Part 2.1047(a):

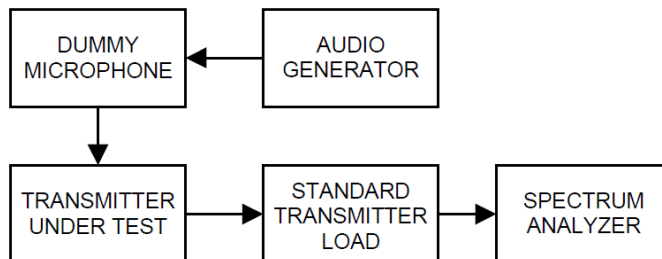
Each FRS transmitter type must be designed such that the peak frequency deviation does **not exceed 2.5kHz**, and the highest audio frequency contributing substantially to modulation must **not exceed 3.125kHz**.

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.



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.

### TEST CONFIGURATION



### TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for 50 Hz to 15,000 Hz. Turn the de-emphasis function off.
- 3) Set the DMM to measure rms voltage.
- 4) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- 5) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
- 6) Set the test receiver to measure rms deviation and record the deviation reading.
- 7) Record the DMM reading as  $V_{REF}$ .
- 8) Set the audio frequency generator to the desired test frequency between 300 Hz and 3000 Hz.
- 9) Vary the audio frequency generator output level until the deviation reading that was recorded in step 6) is obtained.
- 10) Record the DMM reading as  $V_{FREQ}$ .
- 11) Calculate the audio frequency response at the present frequency as:  
audio frequency response =  $20 \log_{10} (V_{FREQ}/V_{REF})$ .
- 12) Repeat steps 8) through 11) for all the desired test frequencies.



**TEST MODE**

Please reference to the section 4.2

**TEST RESULTS**

☒ **Passed**      ☐ **Not Applicable**

**TEST Data**

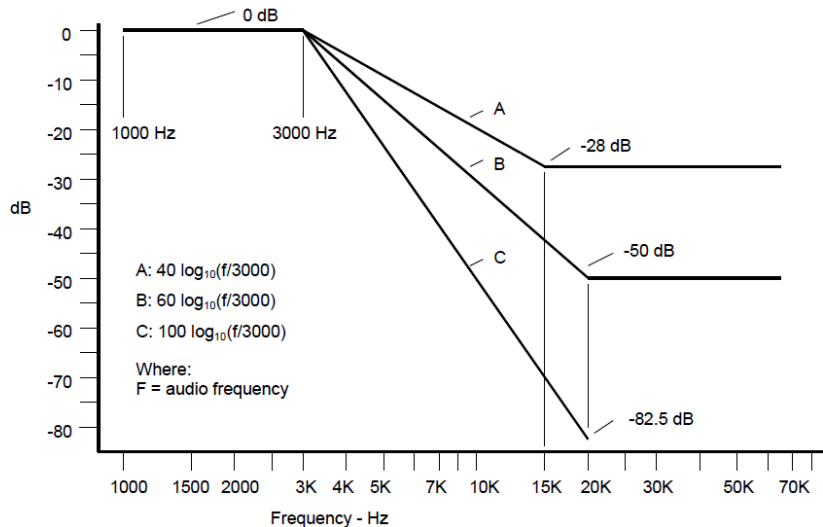
Please refer to appendix E on the appendix report

## 5.6. Audio Low Pass Filter Response

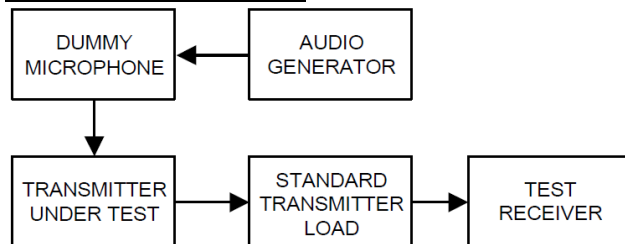
### LIMIT

FCC Part 95.575), FCC Part 2.1047(a):

The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least  $60 \log_{10}(f/3)$  dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz.



### TEST CONFIGURATION



### TEST PROCEDURE

- 1) Configure the EUT as shown in figure .
- 2) Apply a 1000 Hz tone from the audio signal generator and adjust the level per manufacturer's specifications. Record the dB level of the 1000 Hz tone as  $LEV_{REF}$ .
- 3) Set the audio signal generator to the desired test frequency between 3000 Hz and the upper low pass filter limit. Record the dB level at the test frequency as  $LEV_{FREQ}$ .
- 4) Calculate the audio frequency response at the test frequency as:  
 low pass filter response =  $LEV_{FREQ} - LEV_{REF}$

### TEST MODE

Please reference to the section 3.4

### TEST RESULTS

☒ Passed ☐ Not Applicable

Please refer to appendix F on the section 8 appendix report

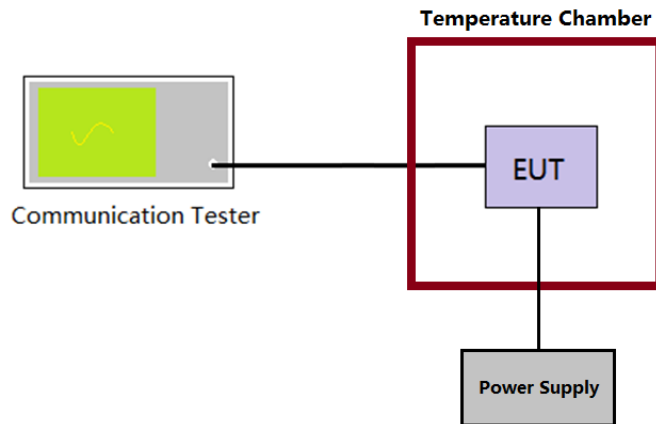
## 5.7. Frequency stability VS Temperature

### LIMIT

FCC Part 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 CONFIGURATION



### TEST PROCEDURE

- 1) The EUT output port was connected to communication tester.
- 2) The EUT was placed inside the temperature chamber.
- 3) Turn EUT off and set the chamber temperature to  $-30^{\circ}\text{C}$ . After the temperature stabilized for approximately 30 minutes recorded the frequency as  $MCF_{\text{MHz}}$ .
- 4) Calculate the ppm frequency error by the following:  
$$\text{ppm error} = (MCF_{\text{MHz}} / ACF_{\text{MHz}} - 1) * 10^6$$

where  
 $MCF_{\text{MHz}}$  is the Measured Carrier Frequency in MHz  
 $ACF_{\text{MHz}}$  is the Assigned Carrier Frequency in MHz
- 5) Repeat step 3 measure with  $10^{\circ}\text{C}$  increased per stage until the highest temperature of  $+50^{\circ}\text{C}$  reached.

### TEST MODE

Please reference to the section 4.2

### TEST RESULTS

☒ Passed      ☐ Not Applicable

### TEST Data

Please refer to appendix G on the appendix report

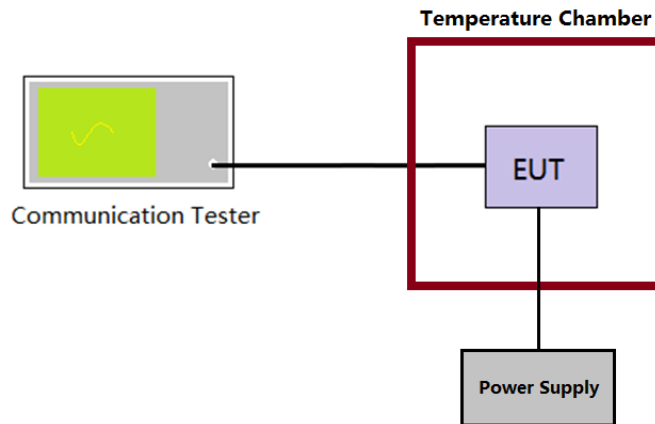
## 5.8. Frequency stability VS Voltage

### LIMIT

FCC Part 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 CONFIGURATION



### TEST PROCEDURE

- 1) The EUT output port was connected to communication tester.
- 2) The EUT was placed inside the temperature chamber at 25°C
- 3) Record the carrier frequency of the transmitter as  $MCF_{MHz}$
- 4) Calculate the ppm frequency error by the following:  
$$ppm\ error = (MCF_{MHz} / ACF_{MHz} - 1) * 10^6$$

where  
 $MCF_{MHz}$  is the Measured Carrier Frequency in MHz  
 $ACF_{MHz}$  is the Assigned Carrier Frequency in MHz
- 5) Repeat step 3 measure with varied  $\pm 15\%$  of the nominal value measured at the input to the EUT

### TEST MODE

Please reference to the section 4.2

### TEST RESULTS

☒ Passed      ☐ Not Applicable

### TEST Data

Please refer to appendix H on the appendix report

## 5.9. Transmit Radiated Spurious Emission

### LIMIT

FCC Part 95.579(a)(3):

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits

- a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:
- 1) 25dB 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.

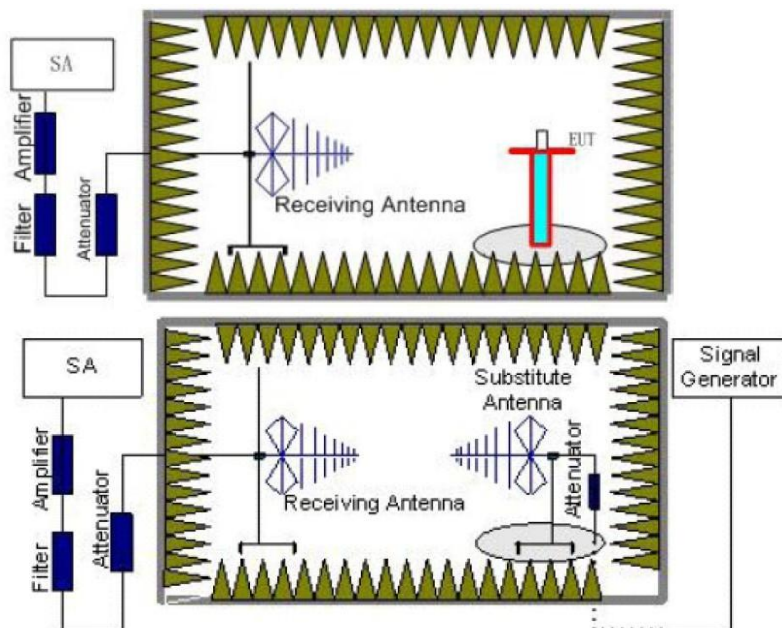
Note:

**Limit (dBm)** =  $EL - [43 + 10 \log(P)] = 10 \log(P \cdot 1000) - [43 + 10 \log(P)] = 10 \log(P) + 30 - 43 - 10 \log(P) = -13 \text{ dBm}$

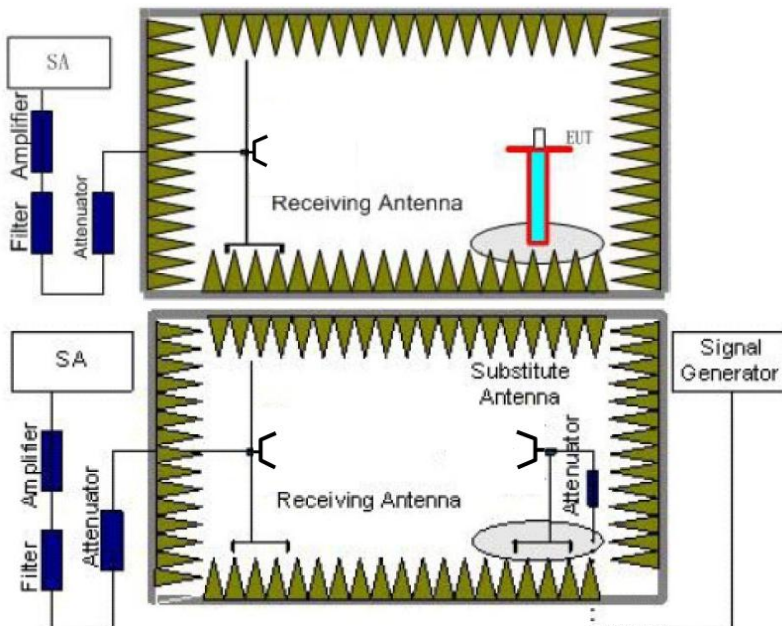
EL is the emission level of the Output Power expressed in dBm,

### TEST CONFIGURATION

Below 1GHz:



Above 1GHz:



**TEST PROCEDURE**

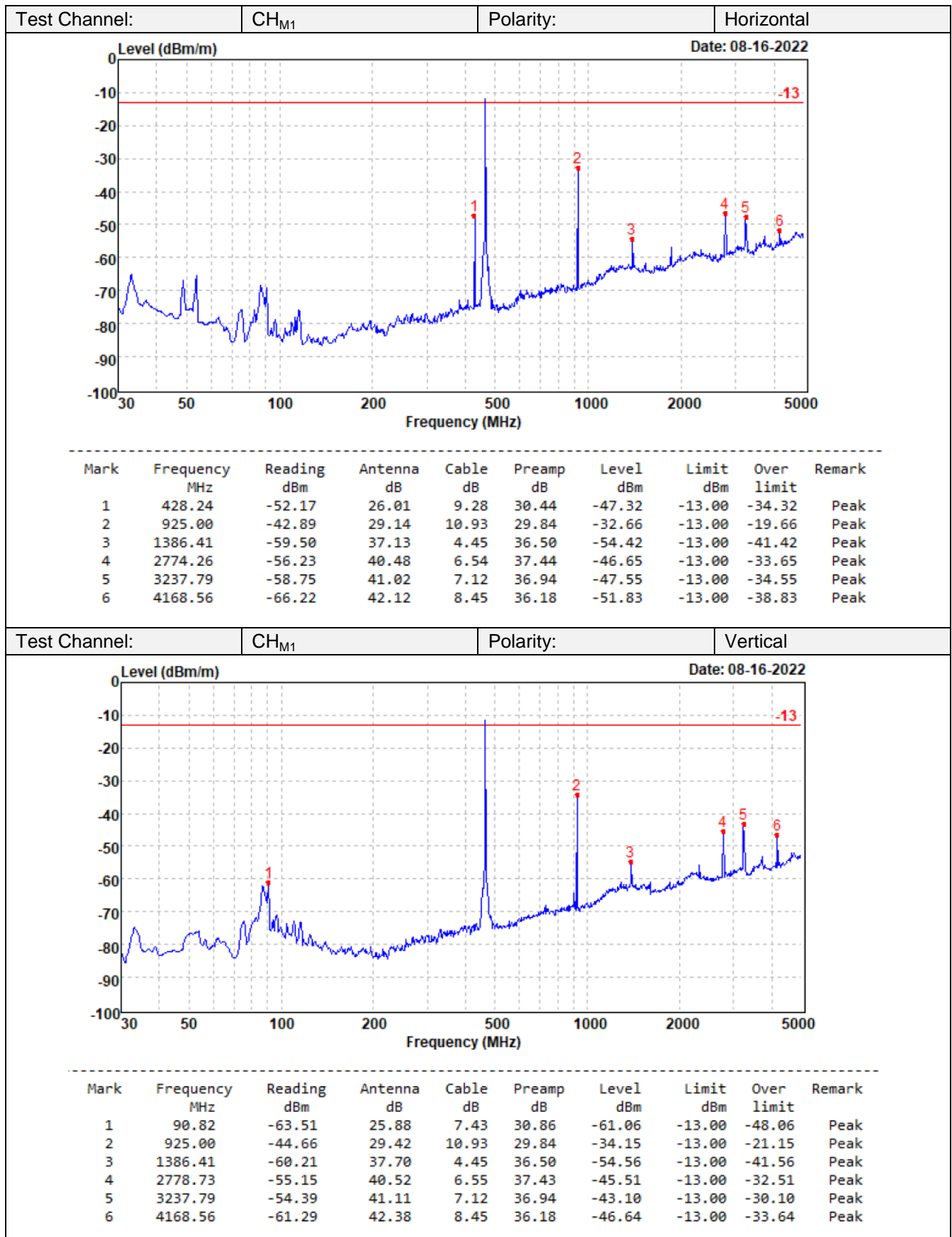
- 1) The measuring distance of at 3m shall be used for measurements
- 2) The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The table was rotated 360 degrees to determine the position of the highest radiation
- 3) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The spectrum setting as follow  
Below 1 GHz: RBW=120kHz, VBW=300kHz, Sweep time=auto, Detector =peak, Trace=max hold;  
Above 1GHz: RBW=1MHz, VBW=3MHz Sweep time=auto, Detector=peak, Trace=max hold
- 5) Record the field strength level of the EUT from the spectrum
- 6) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be moved height from 1m to 4m to find the highest radiation. Adjust the S.G. output level and repeat this step to get the same field strength level as the EUT
- 7) The EIRP level = S.G. output level(dBm)- TX cable(dB) + Substituted Antenna Gain(dBi)
- 8) Record the ERP value for below 1GHz, ERP value = EIRP-2.15; Record the EIRP for above 1GHz.

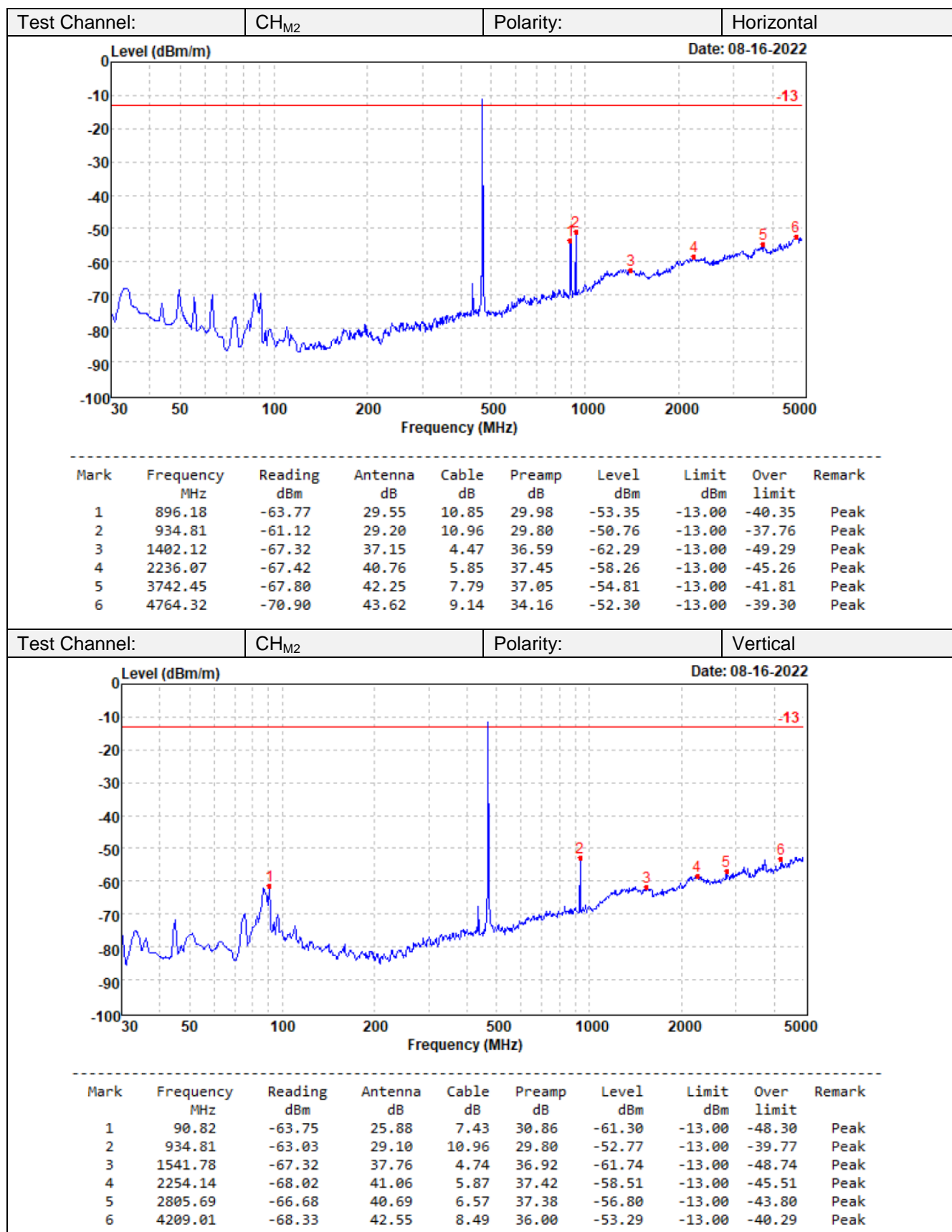
**TEST MODE**

Please reference to the section 4.2

**TEST RESULTS**

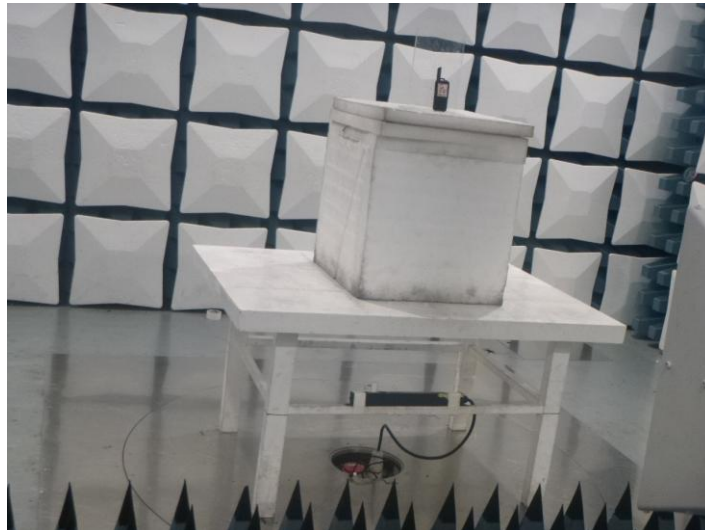
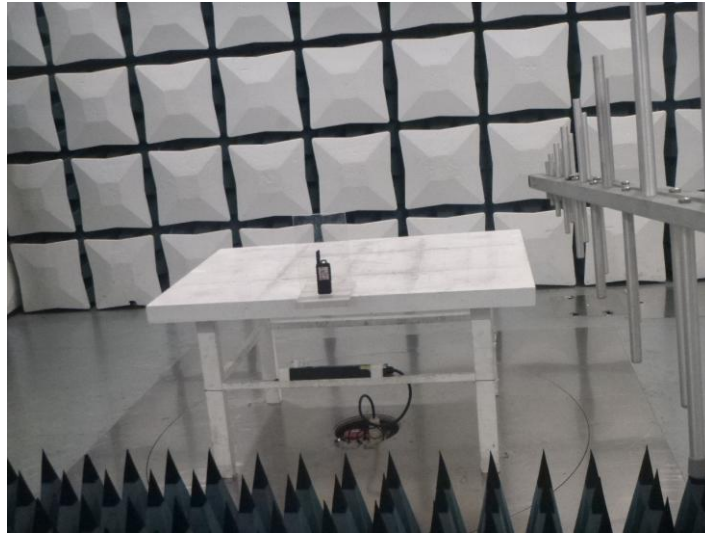
☒ **Passed**      ☐ **Not Applicable**







## 6. TEST SETUP PHOTOS





## 7. EXTERANAL AND INTERNAL PHOTOS

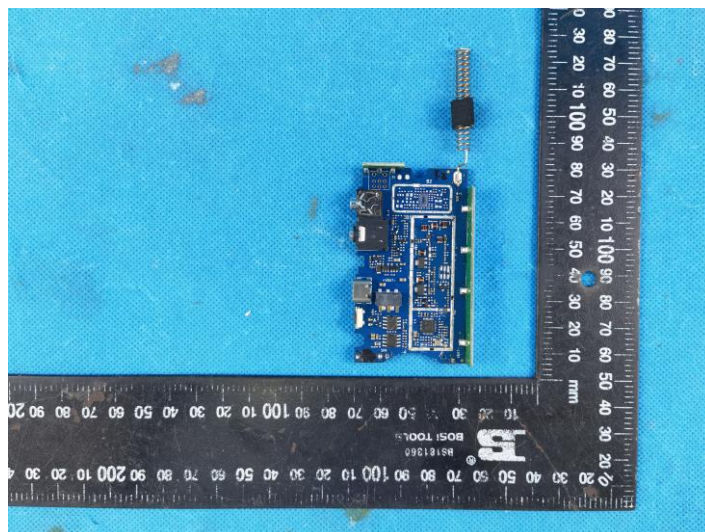
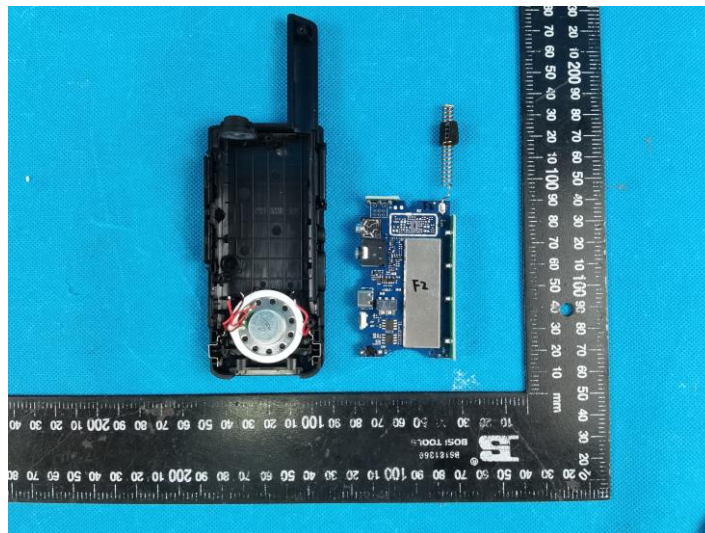
### 7.1. EXTERANAL PHOTOS



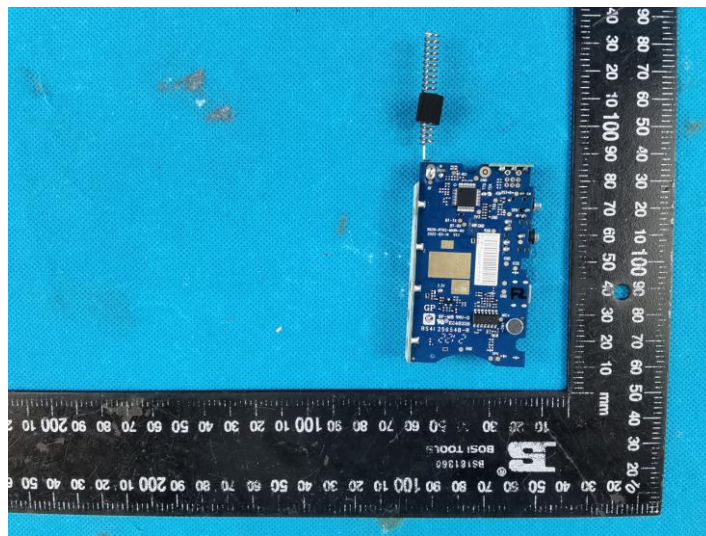
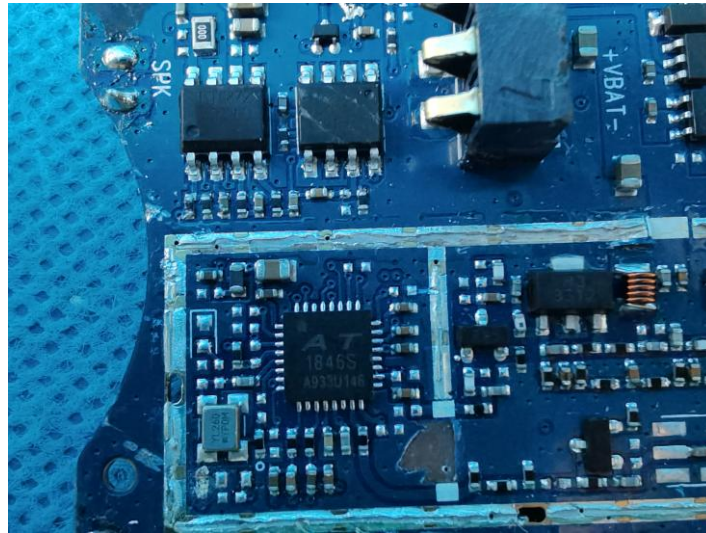




## 7.2. INTERNAL PHOTOS







## 8. APPENDIX REPORT

|                 |                    |             |                      |
|-----------------|--------------------|-------------|----------------------|
| Project No.     | SHT2207087101EW    |             |                      |
| Test sample No. | YPHT22070871001    | Model No.   | RB39                 |
| Start test date | 2022/8/9           | Finish date | 2022/8/12            |
| Temperature     | 23.8℃              | Humidity    | 50%                  |
| Test Engineer   | <i>Chunshui Gu</i> | Auditor     | <i>Xiaodong Zhao</i> |

| Appendix clause | Test Item                              | Test Result (PASS/FAIL) |
|-----------------|----------------------------------------|-------------------------|
| A               | Transmit Power (ERP)                   | PASS                    |
| B               | Occupied Bandwidth                     | PASS                    |
| C               | Emission Mask                          | PASS                    |
| D               | Modulation Limit                       | PASS                    |
| E               | Audio Frequency Response               | PASS                    |
| F               | Audio Low Pass Filter Response         | PASS                    |
| G               | Frequency Stability Test & Temperature | PASS                    |
| H               | Frequency Stability Test & Voltage     | PASS                    |

### Appendix A: Transmit Power (ERP)

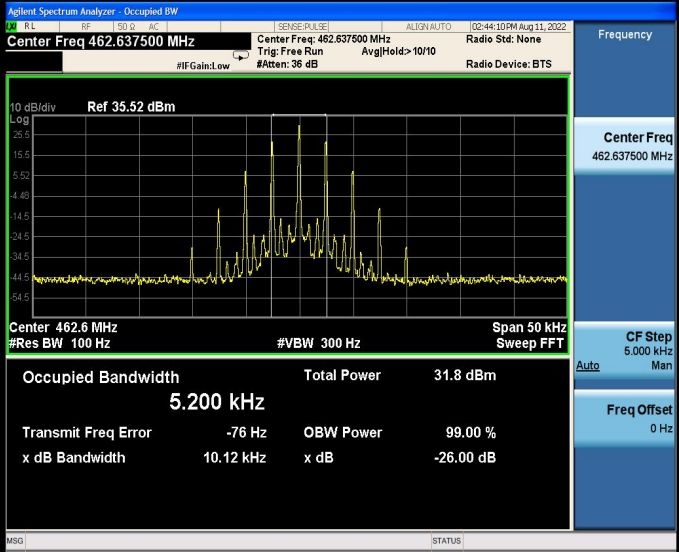
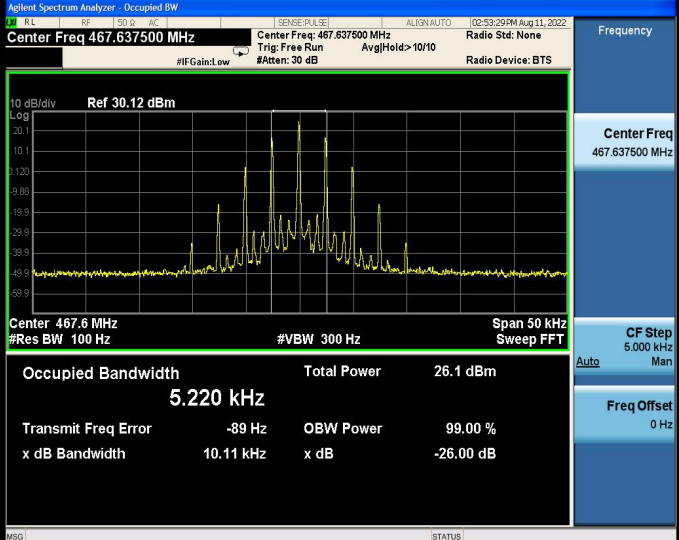
| Test Mode | Modulation Type | Test Channel     | Measured power (dBm) | Measured power (W) | Limit(W) | Result |
|-----------|-----------------|------------------|----------------------|--------------------|----------|--------|
| TX-FRS    | FM              | CH <sub>M1</sub> | 32.52                | 1.79               | ≤2       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 26.87                | 0.49               | ≤0.5     | PASS   |



### Appendix B: 99% Occupied Bandwidth & 26dB Bandwidth

| Test Mode | Modulation Type | Test Channel     | Occupied Bandwidth |           | 99% Limit(kHz) | Result |
|-----------|-----------------|------------------|--------------------|-----------|----------------|--------|
|           |                 |                  | 99%(kHz)           | 26dB(kHz) |                |        |
| TX-FRS    | FM              | CH <sub>M1</sub> | 5.20               | 10.12     | ≤12.5          | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 5.22               | 10.11     | ≤12.5          | PASS   |

## Appendix B: 99% Occupied Bandwidth & 26dB Bandwidth

| Operation Mode | Modulation Type | Test Channel     | TEST PLOT RESULT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX-FRS         | FM              | CH <sub>M1</sub> |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 462.637500 MHz</p> <p>Trig: Free Run</p> <p>#IF Gain: Low</p> <p>#Atten: 36 dB</p> <p>Avg/Hold: &gt;10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Frequency</p> <p>Center Freq 462.637500 MHz</p> <p>CF Step 5.000 kHz</p> <p>Auto</p> <p>Freq Offset 0 Hz</p> <p>Occupied Bandwidth 5.200 kHz</p> <p>Total Power 31.8 dBm</p> <p>Transmit Freq Error -76 Hz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 10.12 kHz</p> <p>x dB -26.00 dB</p> <p>MSG STATUS</p>  |
| TX-FRS         | FM              | CH <sub>M2</sub> |  <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 467.637500 MHz</p> <p>Trig: Free Run</p> <p>#IF Gain: Low</p> <p>#Atten: 30 dB</p> <p>Avg/Hold: &gt;10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Frequency</p> <p>Center Freq 467.637500 MHz</p> <p>CF Step 5.000 kHz</p> <p>Auto</p> <p>Freq Offset 0 Hz</p> <p>Occupied Bandwidth 5.220 kHz</p> <p>Total Power 26.1 dBm</p> <p>Transmit Freq Error -89 Hz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 10.11 kHz</p> <p>x dB -26.00 dB</p> <p>MSG STATUS</p> |

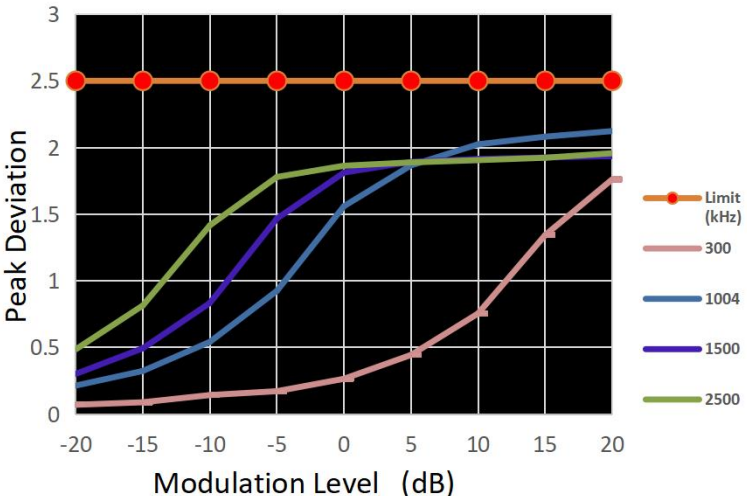
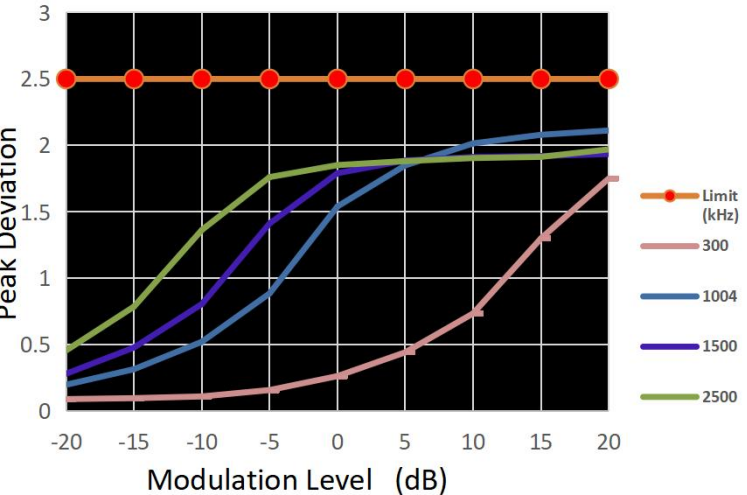
## Appendix C:Emission Mask

| Test Mode | Modulation Type | Test Channel     | TEST PLOT RESULT |
|-----------|-----------------|------------------|------------------|
| TX-FRS    | FM              | CH <sub>M1</sub> |                  |
| TX-FRS    | FM              | CH <sub>M2</sub> |                  |

## Appendix D:Modulation Limit

| Test Mode | Modulation Type | Test Channel     | Modulation Level (dB) | Peak Frequency Deviation (Hz) |       |       |       | Limit (kHz) | Result |
|-----------|-----------------|------------------|-----------------------|-------------------------------|-------|-------|-------|-------------|--------|
|           |                 |                  |                       | 300                           | 1004  | 1500  | 2500  |             |        |
| TX-FRS    | FM              | CH <sub>M1</sub> | -20                   | 0.070                         | 0.214 | 0.302 | 0.486 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | -15                   | 0.089                         | 0.324 | 0.494 | 0.815 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | -10                   | 0.143                         | 0.542 | 0.834 | 1.416 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | -5                    | 0.172                         | 0.925 | 1.467 | 1.779 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 0                     | 0.265                         | 1.560 | 1.812 | 1.863 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 5                     | 0.444                         | 1.866 | 1.892 | 1.888 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 10                    | 0.755                         | 2.024 | 1.914 | 1.905 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 15                    | 1.343                         | 2.081 | 1.925 | 1.923 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 20                    | 1.761                         | 2.123 | 1.935 | 1.957 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | -20                   | 0.092                         | 0.200 | 0.283 | 0.458 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | -15                   | 0.099                         | 0.317 | 0.480 | 0.788 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | -10                   | 0.112                         | 0.523 | 0.807 | 1.364 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | -5                    | 0.160                         | 0.887 | 1.413 | 1.762 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 0                     | 0.265                         | 1.541 | 1.791 | 1.852 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 5                     | 0.444                         | 1.850 | 1.887 | 1.882 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 10                    | 0.736                         | 2.015 | 1.913 | 1.905 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 15                    | 1.300                         | 2.080 | 1.920 | 1.914 | 2.5         | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 20                    | 1.751                         | 2.112 | 1.935 | 1.970 | 2.5         | PASS   |

# Appendix D:Modulation Limit

| Test Mode | Modulation Type | Test Channel     | TEST PLOT RESULT                                                                                                                                                                               |
|-----------|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX-FRS    | FM              | CH <sub>M1</sub> |  <p>Peak Deviation (kHz)</p> <p>Modulation Level (dB)</p> <p>Legend: Limit (kHz), 300, 1004, 1500, 2500</p>  |
| TX-FRS    | FM              | CH <sub>M2</sub> |  <p>Peak Deviation (kHz)</p> <p>Modulation Level (dB)</p> <p>Legend: Limit (kHz), 300, 1004, 1500, 2500</p> |

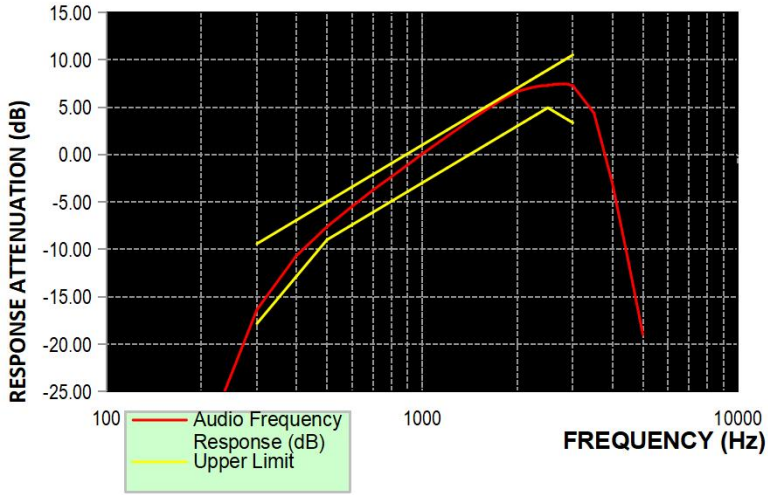
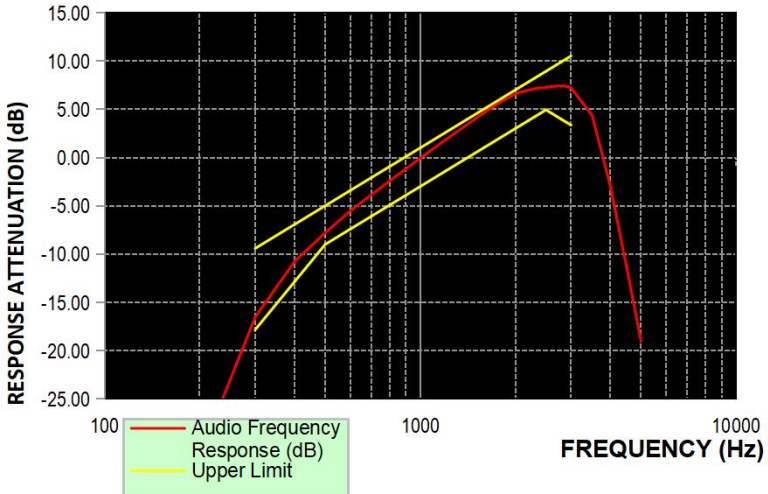
## Appendix E:Audio Frequency Response

| Test Mode | Modulation Type | Test Channel     | Frequency (Hz) | Audio Frequency Response (dB) | Lower Limit | Upper Limit | Result |
|-----------|-----------------|------------------|----------------|-------------------------------|-------------|-------------|--------|
| TX-FRS    | FM              | CH <sub>M1</sub> | 100            | -30.83                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 200            | -31.23                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 300            | -16.37                        | -17.84      | -9.42       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 400            | -10.68                        | -12.86      | -6.93       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 500            | -7.63                         | -9.00       | -5.00       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 600            | -5.49                         | -7.42       | -3.42       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 700            | -3.74                         | -6.09       | -2.09       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 800            | -2.35                         | -4.93       | -0.93       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 900            | -1.09                         | -3.91       | 0.09        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 1000           | 0.05                          | -3.00       | 1.00        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 1200           | 1.92                          | -1.42       | 2.58        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 1400           | 3.47                          | -0.09       | 3.91        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 1600           | 4.76                          | 1.07        | 5.07        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 1800           | 5.85                          | 2.09        | 6.09        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2000           | 6.64                          | 3.00        | 7.00        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2100           | 6.85                          | 3.42        | 7.42        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2200           | 7.03                          | 3.83        | 7.83        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2300           | 7.17                          | 4.21        | 8.21        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2400           | 7.26                          | 4.58        | 8.58        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2500           | 7.35                          | 4.93        | 8.93        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2600           | 7.41                          | 4.59        | 9.27        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2700           | 7.44                          | 4.27        | 9.60        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2800           | 7.44                          | 3.95        | 9.91        | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 2900           | 7.40                          | 3.65        | 10.22       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 3000           | 7.27                          | 3.35        | 10.51       | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 3500           | 4.39                          |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 4000           | -3.00                         |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 4500           | -11.33                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 5000           | -19.01                        |             |             | PASS   |

## Appendix E:Audio Frequency Response

| Test Mode | Modulation Type | Test Channel     | Frequency (Hz) | Audio Frequency Response (dB) | Lower Limit | Upper Limit | Result |
|-----------|-----------------|------------------|----------------|-------------------------------|-------------|-------------|--------|
| TX-FRS    | FM              | CH <sub>M2</sub> | 100            | -31.41                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 200            | -31.00                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 300            | -16.54                        | -17.84      | -9.42       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 400            | -10.78                        | -12.86      | -6.93       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 500            | -7.81                         | -9.00       | -5.00       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 600            | -5.54                         | -7.42       | -3.42       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 700            | -3.87                         | -6.09       | -2.09       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 800            | -2.43                         | -4.93       | -0.93       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 900            | -1.19                         | -3.91       | 0.09        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1000           | -0.07                         | -3.00       | 1.00        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1200           | 1.82                          | -1.42       | 2.58        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1400           | 3.36                          | -0.09       | 3.91        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1600           | 4.69                          | 1.07        | 5.07        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1800           | 5.77                          | 2.09        | 6.09        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2000           | 6.58                          | 3.00        | 7.00        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2100           | 6.81                          | 3.42        | 7.42        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2200           | 6.98                          | 3.83        | 7.83        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2300           | 7.11                          | 4.21        | 8.21        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2400           | 7.22                          | 4.58        | 8.58        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2500           | 7.31                          | 4.93        | 8.93        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2600           | 7.37                          | 4.59        | 9.27        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2700           | 7.40                          | 4.27        | 9.60        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2800           | 7.40                          | 3.95        | 9.91        | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 2900           | 7.35                          | 3.65        | 10.22       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 3000           | 7.23                          | 3.35        | 10.51       | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 3500           | 4.35                          |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 4000           | -3.02                         |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 4500           | -11.36                        |             |             | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 5000           | -19.05                        |             |             | PASS   |

## Appendix E:Audio Frequency Response

| Test Mode | Modulation Type | Test Channel     | TEST PLOT RESULT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX-FRS    | FM              | CH <sub>M1</sub> |  <p>The plot for CH<sub>M1</sub> shows the audio frequency response. The y-axis is 'RESPONSE ATTENUATION (dB)' ranging from -25.00 to 15.00. The x-axis is 'FREQUENCY (Hz)' on a logarithmic scale from 100 to 10000. A red line represents the 'Audio Frequency Response (dB)', which starts at approximately -25 dB at 100 Hz, rises to a peak of about 8 dB at 4000 Hz, and then drops sharply to -20 dB at 10000 Hz. A yellow line represents the 'Upper Limit', which starts at -10 dB at 100 Hz and rises linearly to 10 dB at 4000 Hz, then drops to 5 dB at 10000 Hz. The red line is below the yellow line throughout the measured range.</p>  |
| TX-FRS    | FM              | CH <sub>M2</sub> |  <p>The plot for CH<sub>M2</sub> shows the audio frequency response. The y-axis is 'RESPONSE ATTENUATION (dB)' ranging from -25.00 to 15.00. The x-axis is 'FREQUENCY (Hz)' on a logarithmic scale from 100 to 10000. A red line represents the 'Audio Frequency Response (dB)', which starts at approximately -25 dB at 100 Hz, rises to a peak of about 8 dB at 4000 Hz, and then drops sharply to -20 dB at 10000 Hz. A yellow line represents the 'Upper Limit', which starts at -10 dB at 100 Hz and rises linearly to 10 dB at 4000 Hz, then drops to 5 dB at 10000 Hz. The red line is below the yellow line throughout the measured range.</p> |



## Appendix F:Audio Low Pass Filter Response

| Test Mode | Modulation Type | Test Channel     | Audio Frequency(Hz) | Audio Frequency Response(dB) | Limit | Result |
|-----------|-----------------|------------------|---------------------|------------------------------|-------|--------|
| TX-FRS    | FM              | CH <sub>M1</sub> | 1000                | -16.93                       | 0     | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 3000                | -22.98                       | 0     | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 4000                | -42.12                       | -7.5  | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 5000                | -54.75                       | -13.3 | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 6000                | -55.01                       | -18.1 | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 8000                | -54.91                       | -25.6 | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 10000               | -55.16                       | -31.4 | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 15000               | -54.78                       | -41.9 | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 20000               | -54.60                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 30000               | -54.85                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 40000               | -55.26                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 50000               | -54.99                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 60000               | -55.19                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 70000               | -55.76                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 80000               | -55.78                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 90000               | -55.72                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M1</sub> | 100000              | -55.80                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 1000                | -17.03                       | 0     | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 3000                | -23.08                       | 0     | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 4000                | -42.22                       | -7.5  | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 5000                | -54.85                       | -13.3 | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 6000                | -55.11                       | -18.1 | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 8000                | -55.01                       | -25.6 | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 10000               | -55.26                       | -31.4 | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 15000               | -54.88                       | -41.9 | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 20000               | -54.70                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 30000               | -54.95                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 40000               | -55.36                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 50000               | -55.09                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 60000               | -55.29                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 70000               | -55.86                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 80000               | -55.88                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 90000               | -55.82                       | -50   | PASS   |
| TX-FRS    | FM              | CH <sub>M2</sub> | 100000              | -55.90                       | -50   | PASS   |

Appendix F:Audio Low Pass Filter Response

| Test Mode | Modulation Type | Test Channel     | TEST PLOT RESULT                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|-----------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX-FRS    | FM              | CH <sub>M1</sub> | <p>Audio Frequency Response (dB) vs Audio Frequency (Hz) for CH<sub>M1</sub>. The graph shows the audio frequency response in dB on the y-axis (0 to -70) against audio frequency in Hz on a logarithmic x-axis (1000 to 100,000). A red line indicates the limit, and a blue line shows the actual response. The response follows the limit closely, staying below it across the entire frequency range.</p> |
| TX-FRS    | FM              | CH <sub>M2</sub> | <p>Audio Frequency Response (dB) vs Audio Frequency (Hz) for CH<sub>M2</sub>. The graph shows the audio frequency response in dB on the y-axis (0 to -70) against audio frequency in Hz on a logarithmic x-axis (1000 to 100,000). A red line indicates the limit, and a blue line shows the actual response. The response follows the limit closely, staying below it across the entire frequency range.</p> |

### Appendix G:Frequency Stability Test & Temperature

| Test Mode | Modulation Type | Test Conditions |             | Frequency error (ppm) |                  | Limit (ppm) | Result |
|-----------|-----------------|-----------------|-------------|-----------------------|------------------|-------------|--------|
|           |                 | Voltage         | Temperature | CH <sub>M1</sub>      | CH <sub>M2</sub> |             |        |
| TX-FRS    | FM              | V <sub>N</sub>  | -30         | -0.010                | -0.033           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | -20         | -0.009                | -0.033           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | -10         | -0.009                | -0.032           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 0           | -0.009                | -0.032           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 10          | -0.009                | -0.032           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 20          | -0.009                | -0.031           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 30          | -0.010                | -0.034           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 40          | -0.009                | -0.032           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>N</sub>  | 50          | -0.009                | -0.033           | ±2.5        | PASS   |

### Appendix H:Frequency Stability Test & Voltage

| Test Mode | Modulation Type | Test Conditions |                | Frequency error (ppm) |                  | Limit (ppm) | Result |
|-----------|-----------------|-----------------|----------------|-----------------------|------------------|-------------|--------|
|           |                 | Voltage         | Temperature    | CH <sub>M1</sub>      | CH <sub>M2</sub> |             |        |
| TX-FRS    | FM              | V <sub>N</sub>  | T <sub>N</sub> | -0.009                | -0.031           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>L</sub>  | T <sub>N</sub> | -0.009                | -0.029           | ±2.5        | PASS   |
| TX-FRS    | FM              | V <sub>H</sub>  | T <sub>N</sub> | -0.009                | -0.032           | ±2.5        | PASS   |

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