

FCC Test Report

Report No.: 2405X35052EC

Applicant: Shenzhen Hui Ke Electronics Co., LTD.

Address: Room A, 2 Floor, 5 Building, Hezhou Yuye Industrial park, Xixiang,
Baoan District, Shenzhen China

Product Name: Walkie Talkie

Product Model: HK-588

Multiple Models: T-388, HK-188, HK-288, HK-688, HK-888, HK-988, HK-005, HK-002,
HK-001

Trade Mark: N/A

FCC ID: 2ASRN-HK-188

Standards: FCC CFR Title 47 Part 95B

Test Date: 2024-09-11 to 2024-09-13

Test Result: Complied

Issue Date: 2024-09-18

Reviewed by:

Abel chen

Abel Chen
Project Engineer

Approved by:

Jacob Kong

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Prepared by:

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Revision History

| Version No. | Issued Date | Description |
|-------------|-------------|-------------|
| 00 | 2024-09-18 | Original |

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1 General Information

1.1 Client Information

| | |
|---------------|---|
| Applicant: | Shenzhen Hui Ke Electronics Co., LTD. |
| Address: | Room A, 2 Floor, 5 Building, Hezhou Yuye Industrial park, Xixiang, Baoan District, Shenzhen China |
| Manufacturer: | Shenzhen Hui Ke Electronics Co., LTD. |
| Address: | Room A, 2 Floor, 5 Building, Hezhou Yuye Industrial park, Xixiang, Baoan District, Shenzhen China |

1.2 Product Description of EUT

The EUT is Walkie Talkie that contains FRS radio, this report covers the full testing of the FRS radio.

| | |
|---------------------------|--|
| Sample Serial number | 2RAT-3 for RE, 2RAT-4 for RF conducted test (assigned by WATC) |
| Sample Received Date | 2024-09-09 |
| Sample Status | Good Condition |
| Frequency Range | 462.5500- 462.7250MHz 467.5625-467.7125MHz |
| Maximum ERP | 462.5500-462.7250MHz: 22.64dBm 467.5625-467.7125MHz: 22.41dBm |
| Modulation Technology | FM |
| Spatial Streams | SISO (1TX, 1RX) |
| Antenna Type | Integral |
| Antenna Gain [#] | 0.5dBi |
| Power Supply | DC 5V from Type-C port or DC 3.7V from battery |
| Adapter Information | N/A |
| Modification | Sample No Modification by the test lab |

1.3 Measurement Uncertainty

| Parameter | | Expanded Uncertainty (Confidence of 95%(U = 2Uc(y))) |
|--|-------------|---|
| AC Power Lines Conducted Emissions | | ±3.14dB |
| Emissions, Radiated | Below 30MHz | ±2.78dB |
| | Below 1GHz | ±4.84dB |
| | Above 1GHz | ±5.44dB |
| Emissions, Conducted | | 1.75dB |
| Conducted Power | | 0.74dB |
| Frequency Error | | 150Hz |
| Bandwidth | | 0.34% |
| Modulation Limiting | | 1.32% |
| <p>Note 1: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.</p> <p>Note 2: The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)</p> | | |

1.4 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.5 Test Methodology

FCC CFR Title 47 Part 2, 95B

ANSI C63.26-2015

ANSI TIA-603-E-2016

2 Description of Measurement

2.1 Test Configuration

| Operating channels: | | | | | |
|--|-----------------|-------------|-----------------|-------------|-----------------|
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 1 | 462.5625 | 8 | 467.5625 | 15 | 462.5500 |
| 2 | 462.5875 | 9 | 467.5875 | 16 | 462.5750 |
| 3 | 462.6125 | 10 | 467.6125 | 17 | 462.6000 |
| 4 | 462.6375 | 11 | 467.6375 | 18 | 462.6250 |
| 5 | 462.6625 | 12 | 467.6625 | 19 | 462.6500 |
| 6 | 462.6875 | 13 | 467.6875 | 20 | 462.6750 |
| 7 | 462.7125 | 14 | 467.7125 | 21 | 462.7000 |
| / | / | / | / | 22 | 462.7250 |
| According to Per C63.26-2015, section 5.1, Channel 4 and Channel 11 was selected to test | | | | | |

| Test Mode: | |
|--------------------|---|
| Transmitting mode: | Keep the EUT in continuous transmitting with modulation |

| Worst-Case Configuration: |
|---|
| For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report |
| For radiated emission was investigated from 30MHz to 10 times of fundamental with the EUT transmits at the highest output power as worst-case scenario. |

2.2 Test Auxiliary Equipment

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|-------|---------------|
| / | / | / | / |

2.3 Interconnecting Cables

| Manufacturer | Description | Length(m) | From | To |
|--------------|-------------|-----------|------|----|
| / | / | / | / | / |

2.4 Block Diagram of Connection between EUT and AE

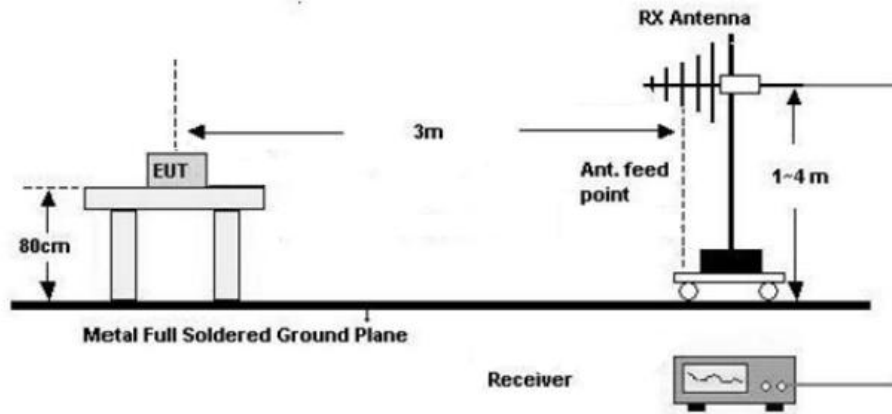


Note: for reference only, the actual connection setup used for testing please refer to the test photos.

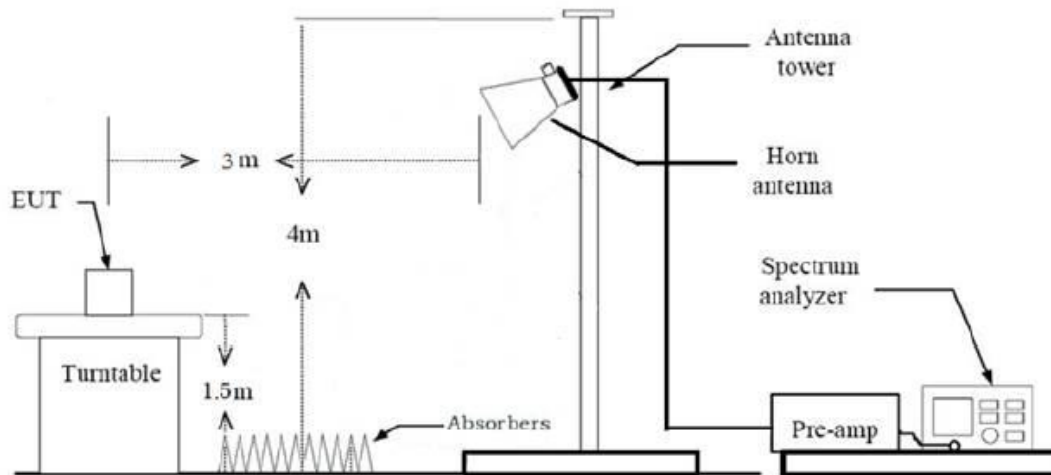
2.5 Test Setup

1) Radiated emission measurement:

30MHz-1GHz (3m SAC)

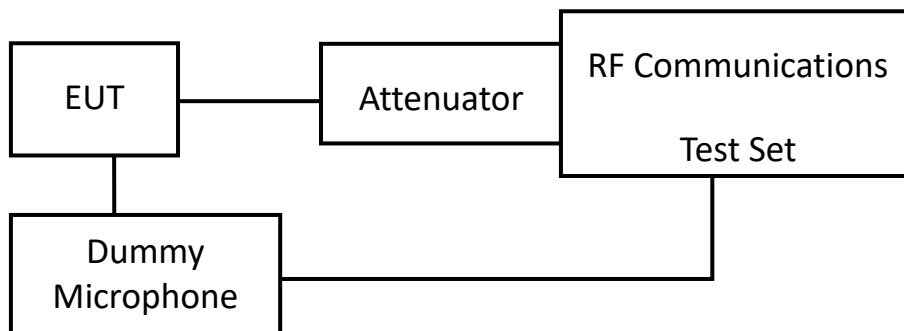


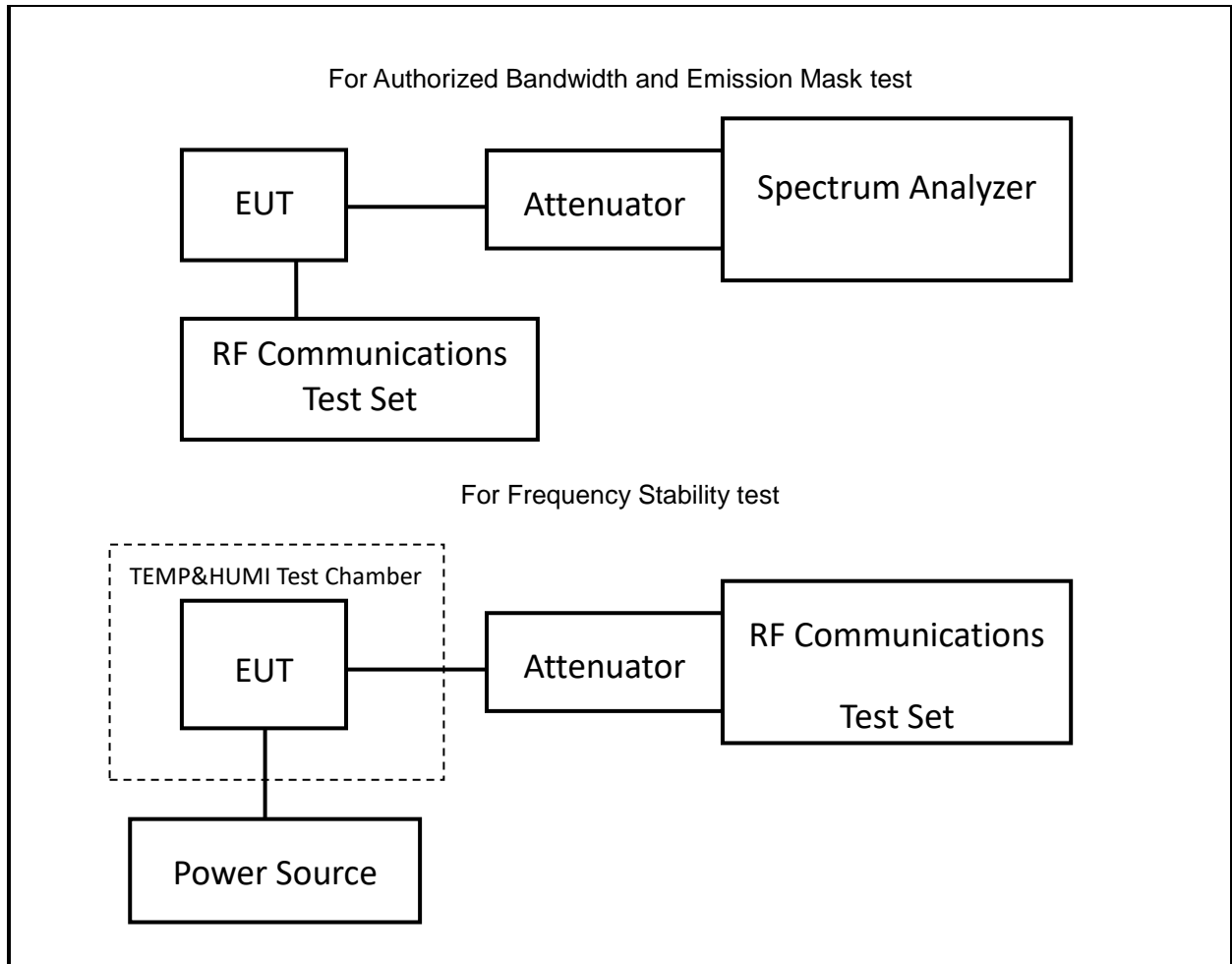
1GHz-5GHz(3m FAC)



2) RF Conducted Test

For Modulation Limiting/Audio Frequency Response test





2.6 Test Procedure

Radiated Emission Procedure:

a) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

b) For above 1GHz:

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.

RF Conducted Test:

1. The antenna port of EUT was connected to the RF port of the test equipment (RF Communications Test Set or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss of 10.5dB (including 10.0dB Attenuator and 0.5dB cable) was entered as an offset in the spectrum analyzer. Note: Actual cable loss was unavailable at the time of testing, therefore a loss of 0.5dB was assumed as worst case. This was later verified to be true by laboratory. (if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode with modulation signals required.

2.7 Measurement Method

| Description of Test | Measurement Method |
|--|---|
| Modulation Limiting | ANSI C63.26-2015 section 5.3.2 |
| Audio Frequency Response | ANSI C63.26-2015 section 5.3.3.2 |
| Audio frequency filter | ANSI TIA-603-E-2016 section 2.2.15 |
| Authorized Bandwidth | ANSI C63.26-2015 section 5.4.4 |
| Transmitter output power and effective radiated power (e.r.p.) | ANSI C63.26-2015 section 5.2.3.3&5.2.5.5 or ANSI C63.26-2015 section 5.5.4 |
| Emission Mask | ANSI C63.26-2015 section 5.7.3 |
| Frequency Stability | ANSI C63.26-2015 section 5.6 |
| Radiated Unwanted Emissions | ANSI C63.26-2015 section 5.5.4 |

2.8 Measurement Equipment

| Manufacturer | Description | Model | Management No. | Calibration Date | Calibration Due Date |
|------------------------|---------------------------------|-----------|----------------|------------------|----------------------|
| Radiated Emission Test | | | | | |
| R&S | EMI test receiver | ESR3 | 102758 | 2024/6/4 | 2025/6/3 |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSV40-N | 101608 | 2024/6/4 | 2025/6/3 |
| SONOMA INSTRUMENT | Low frequency amplifier | 310 | 186014 | 2024/6/4 | 2025/6/3 |
| COM-POWER | preamplifier | PAM-118A | 18040152 | 2024/6/4 | 2025/6/3 |
| SCHWARZBECK | Log - periodic wideband antenna | VULB 9163 | 9163-872 | 2023/7/7 | 2026/7/6 |
| Astro Antenna Ltd | Horn antenna | AHA-118S | 3015 | 2023/7/6 | 2026/7/5 |
| N/A | Coaxial Cable | NO.9 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.14 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.15 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.16 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.17 | N/A | 2024/6/4 | 2025/6/3 |
| Audix | Test Software | E3 | 191218 V9 | / | / |
| RF Conducted Test | | | | | |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSV40 | 101419 | 2024/6/4 | 2025/6/3 |
| HP | RF communication test set | HP8920A | N/A | 2024/1/16 | 2025/1/15 |
| BACL | TEMP&HUMI Test Chamber | BTH-150 | 30022 | 2024/7/11 | 2025/7/10 |
| FLUKE | Digital Multimeter | 15B+ | N/A | 2024/6/6 | 2025/6/5 |
| Unknown | 10dB attenuator | 10dB | 10-1 | 2024/6/4 | 2025/6/3 |
| UNI-T | DC Power Supply | UTP1310S | C221286498 | NCR | NCR |

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

| FCC Rules | Description of Test | Result |
|------------------------|-------------------------------|------------|
| §2.1055(d), §95.565 | FRS Frequency Accuracy | Compliance |
| §2.1046, §95.567 | FRS transmit Power | Compliance |
| §95.571 | FRS Emission Types | Compliance |
| §2.1049, §95.573 | FRS Authorized Bandwidth | Compliance |
| §95.579 | Emission Mask | Compliance |
| §2.1047, §95.575 | FRS Modulation Limits | Compliance |
| §2.1053, §95.579 | FRS Unwanted Emissions Limits | Compliance |
| §95.587 | FRS Additional Requirements | Compliance |

3.2 Limit

| Test items | Limit |
|-------------------------------|---|
| FRS Frequency Accuracy | Each FRS transmitter type must be designed such that the carrier frequencies remain within ± 2.5 parts-per-million of the channel center frequencies specified in § 95.563 during normal operating conditions. |
| FRS transmit Power | 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. |
| FRS Emission Types | Each FRS transmitter type must be designed such that it can transmit only the following emission types: F3E, G3E, F2D, and G2D. |
| FRS Authorized Bandwidth | Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz. |
| FRS Modulation Limits | 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. |
| FRS Unwanted Emissions Limits | <p>Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.</p> <p>(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:</p> <p>(1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.</p> <p>(2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.</p> <p>(3) $43 + 10 \log (P)$ dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.</p> <p>(b) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (a)(1) and (2) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (a)(3) is measured with a reference bandwidth of at least 30 kHz.</p> <p>(c) Measurement conditions. The requirements in this section apply to each FRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone and/or power cord.</p> |

3.3 Radiated emission Test Data

3.3.1 Effective Radiated Power (e.r.p.)

| | | | |
|-------------------------------|--|-----------------|---------|
| Test Date: | 2024-09-13 | Test By: | Luke Li |
| Environment condition: | Temperature: 22.2°C; Relative Humidity:66%; ATM Pressure: 100kPa | | |

| Frequency (MHz) | Reading level (dBμV) | Polar (H/V) | Corrected Factor (dB/m) | Corrected Amplitude (dBμV/m) | EIRP CF | ERP (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----------------|----------------------|-------------|-------------------------|------------------------------|---------|-----------|-------------|-------------|--------|
| 462.6375MHz | | | | | | | | | |
| 462.6375 | 83.77 | horizontal | 24.97 | 108.74 | 95.20 | 11.39 | 33.0 | -21.61 | Peak |
| 462.6375 | 95.02 | vertical | 24.97 | 119.99 | 95.20 | 22.64 | 33.0 | -10.36 | Peak |
| 467.6375MHz | | | | | | | | | |
| 467.6375 | 83.67 | horizontal | 25.05 | 108.72 | 95.20 | 11.37 | 27.0 | -15.63 | Peak |
| 467.6375 | 94.71 | vertical | 25.05 | 119.76 | 95.20 | 22.41 | 27.0 | -4.59 | Peak |

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Result – Limit

According to ANSI C63.26-2015 section 5.2.7:

$EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

Test was performed on 3meters distance, so

$EIRP = \text{Corrected Amplitude} + 20\log(3) - 104.8$

$= \text{Corrected Amplitude} - 95.2$

According to ANSI C63.26-2015 Annex C, C.4 :

$ERP = EIRP - 2.15 \text{ dB}$

So $ERP = \text{Corrected Amplitude} - 95.2 - 2.15$

3.3.2 Radiated Unwanted Emissions

| | | | |
|-------------------------------|--|-----------------|---------|
| Test Date: | 2024-09-13 | Test By: | Luke Li |
| Environment condition: | Temperature: 22.2°C; Relative Humidity:66%; ATM Pressure: 100kPa | | |

| Frequency (MHz) | Reading level (dBμV) | Polar (H/V) | Corrected Factor (dB/m) | Corrected Amplitude (dBμV/m) | EIRP CF | Result (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----------------|----------------------|-------------|-------------------------|------------------------------|---------|--------------|-------------|-------------|--------|
| 462.6375MHz | | | | | | | | | |
| 925.275 | 33.23 | horizontal | 32.80 | 66.03 | 95.20 | -29.17 | -13.00 | -16.17 | Peak |
| 1387.912 | 76.42 | horizontal | -3.52 | 72.9 | 95.20 | -22.30 | -13.00 | -9.30 | Peak |
| 1850.550 | 66.02 | horizontal | -2.92 | 63.1 | 95.20 | -32.10 | -13.00 | -19.10 | Peak |
| 2313.188 | 64.71 | horizontal | -2.25 | 62.46 | 95.20 | -32.74 | -13.00 | -19.74 | Peak |
| 2775.825 | 53.62 | horizontal | -1.86 | 51.76 | 95.20 | -43.44 | -13.00 | -30.44 | Peak |
| 3238.462 | 56.14 | horizontal | -2.28 | 53.86 | 95.20 | -41.34 | -13.00 | -28.34 | Peak |
| 3701.100 | 53.70 | horizontal | -2.18 | 51.52 | 95.20 | -43.68 | -13.00 | -30.68 | Peak |
| 4163.737 | 59.53 | horizontal | -3.26 | 56.27 | 95.20 | -38.93 | -13.00 | -25.93 | Peak |
| 4626.375 | 55.00 | horizontal | -2.34 | 52.66 | 95.20 | -42.54 | -13.00 | -29.54 | Peak |
| 925.275 | 44.33 | vertical | 32.80 | 77.13 | 95.20 | -18.07 | -13.00 | -5.07 | Peak |
| 1387.912 | 74.51 | vertical | -3.52 | 70.99 | 95.20 | -24.21 | -13.00 | -11.21 | Peak |
| 1850.550 | 61.96 | vertical | -2.92 | 59.04 | 95.20 | -36.16 | -13.00 | -23.16 | Peak |
| 2313.188 | 61.33 | vertical | -2.25 | 59.08 | 95.20 | -36.12 | -13.00 | -23.12 | Peak |
| 2775.825 | 54.54 | vertical | -1.86 | 52.68 | 95.20 | -42.52 | -13.00 | -29.52 | Peak |
| 3238.462 | 57.20 | vertical | -2.28 | 54.92 | 95.20 | -40.28 | -13.00 | -27.28 | Peak |
| 3701.100 | 53.52 | vertical | -2.18 | 51.34 | 95.20 | -43.86 | -13.00 | -30.86 | Peak |
| 4163.737 | 65.45 | vertical | -3.26 | 62.19 | 95.20 | -33.01 | -13.00 | -20.01 | Peak |
| 4626.375 | 57.69 | vertical | -2.34 | 55.35 | 95.20 | -39.85 | -13.00 | -26.85 | Peak |
| 467.6375MHz | | | | | | | | | |
| 935.275 | 32.41 | horizontal | 32.84 | 65.25 | 95.20 | -29.95 | -13.00 | -16.95 | Peak |
| 1402.912 | 76.66 | horizontal | -3.46 | 73.2 | 95.20 | -22.00 | -13.00 | -9.00 | Peak |
| 1870.550 | 66.05 | horizontal | -3.03 | 63.02 | 95.20 | -32.18 | -13.00 | -19.18 | Peak |
| 2338.188 | 67.21 | horizontal | -2.17 | 65.04 | 95.20 | -30.16 | -13.00 | -17.16 | Peak |
| 2805.825 | 51.75 | horizontal | -1.88 | 49.87 | 95.20 | -45.33 | -13.00 | -32.33 | Peak |

| | | | | | | | | | |
|----------|-------|------------|-------|-------|-------|--------|--------|--------|------|
| 3273.462 | 61.25 | horizontal | -2.26 | 58.99 | 95.20 | -36.21 | -13.00 | -23.21 | Peak |
| 3741.100 | 54.49 | horizontal | -2.30 | 52.19 | 95.20 | -43.01 | -13.00 | -30.01 | Peak |
| 4208.737 | 61.37 | horizontal | -3.38 | 57.99 | 95.20 | -37.21 | -13.00 | -24.21 | Peak |
| 4676.375 | 53.80 | horizontal | -1.81 | 51.99 | 95.20 | -43.21 | -13.00 | -30.21 | Peak |
| 935.275 | 42.64 | vertical | 32.84 | 75.48 | 95.20 | -19.72 | -13.00 | -6.72 | Peak |
| 1402.912 | 74.80 | vertical | -3.46 | 71.34 | 95.20 | -23.86 | -13.00 | -10.86 | Peak |
| 1870.550 | 63.69 | vertical | -3.03 | 60.66 | 95.20 | -34.54 | -13.00 | -21.54 | Peak |
| 2338.188 | 62.47 | vertical | -2.17 | 60.3 | 95.20 | -34.90 | -13.00 | -21.90 | Peak |
| 2805.825 | 51.42 | vertical | -1.88 | 49.54 | 95.20 | -45.66 | -13.00 | -32.66 | Peak |
| 3273.462 | 58.55 | vertical | -2.26 | 56.29 | 95.20 | -38.91 | -13.00 | -25.91 | Peak |
| 3741.100 | 56.29 | vertical | -2.30 | 53.99 | 95.20 | -41.21 | -13.00 | -28.21 | Peak |
| 4208.737 | 65.25 | vertical | -3.38 | 61.87 | 95.20 | -33.33 | -13.00 | -20.33 | Peak |
| 4676.375 | 55.12 | vertical | -1.81 | 53.31 | 95.20 | -41.89 | -13.00 | -28.89 | Peak |

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Result – Limit

According to ANSI C63.26-2015 section 5.2.7:

$EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

Test was performed on 3meters distance, so

Result = Corrected Amplitude + $20\log(3) - 104.8$

= Corrected Amplitude - 95.2

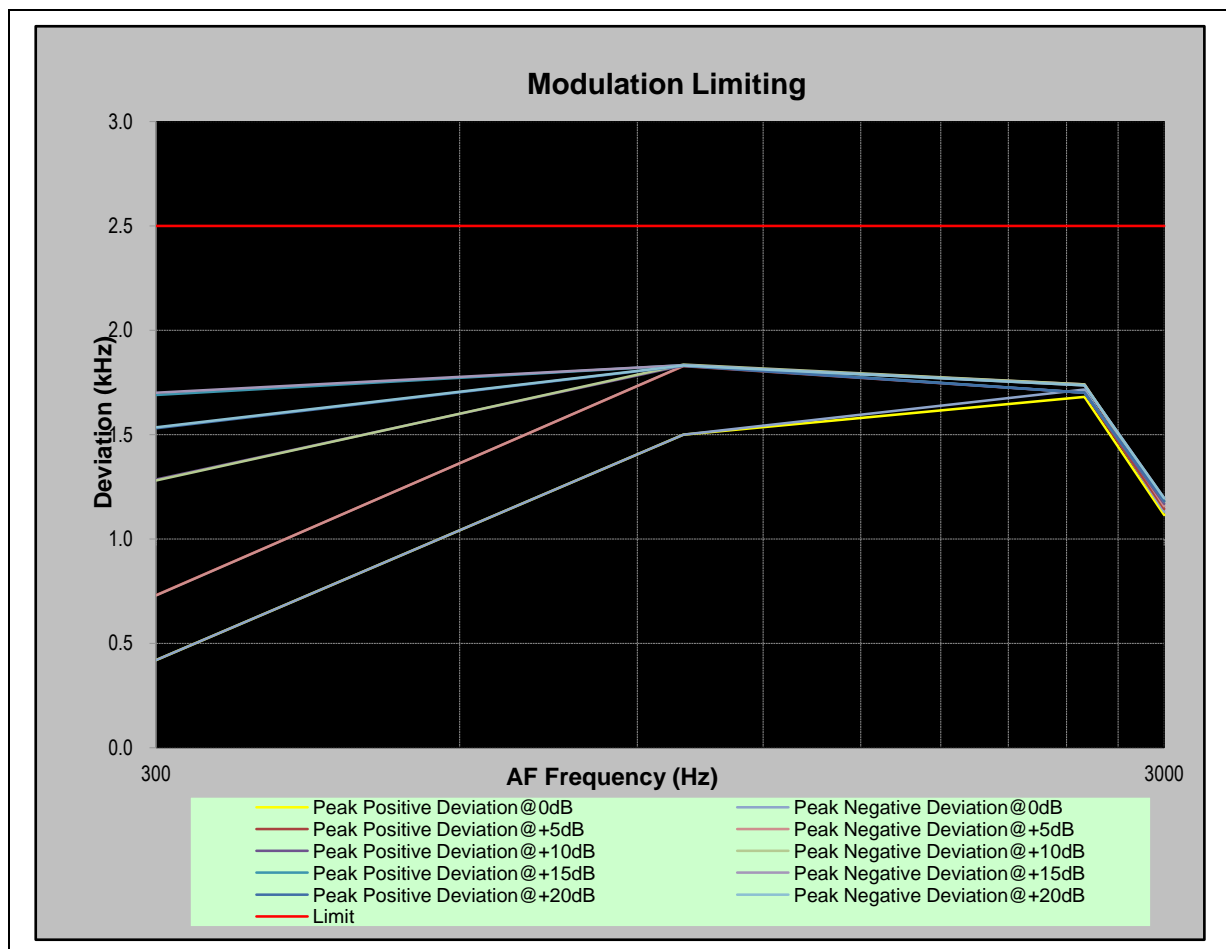
The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.

3.4 RF Conducted Test Data

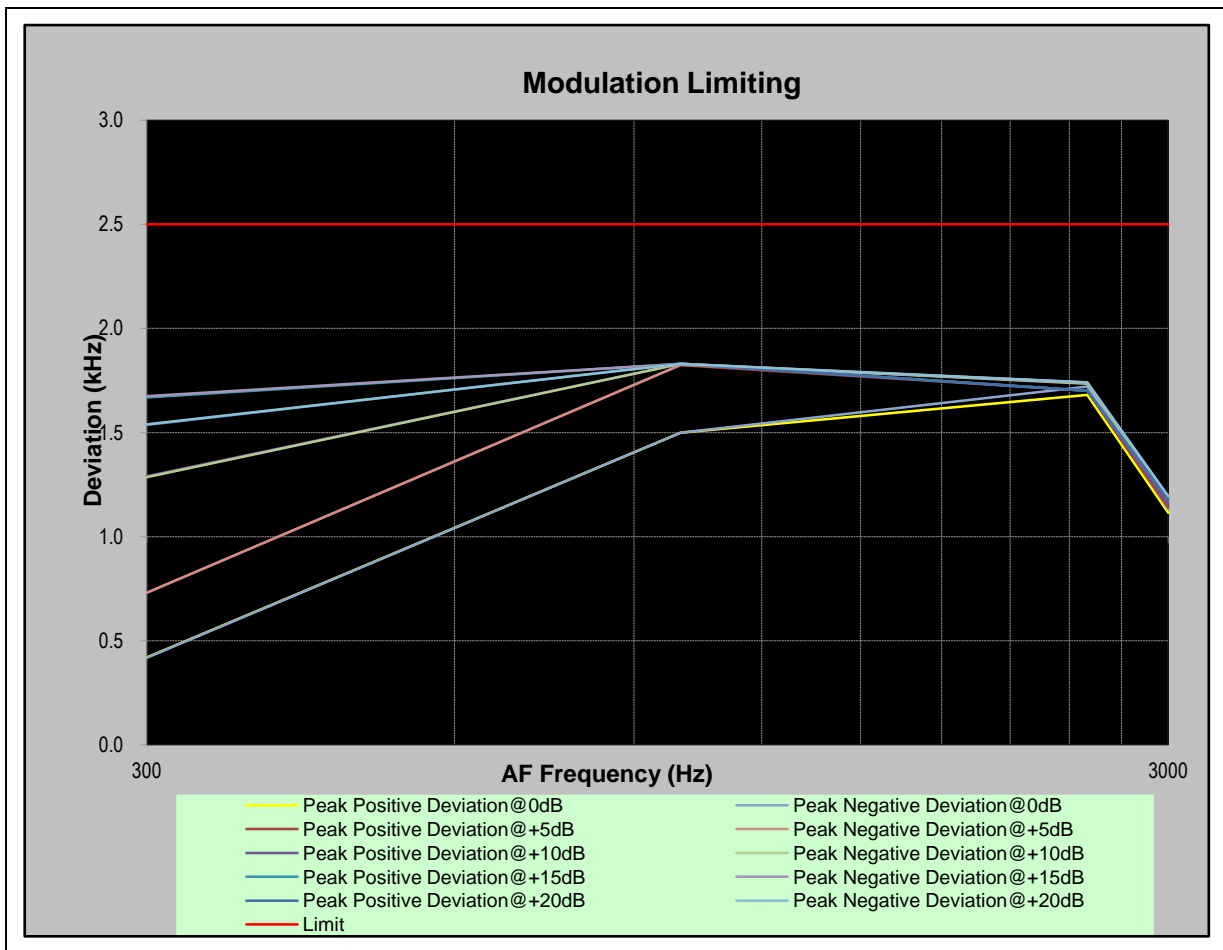
| | | | |
|------------------------|--|----------|------------|
| Test Date: | 2024-09-13 | Test By: | Ryan Zhang |
| Environment condition: | Temperature: 25.2°C; Relative Humidity:56%; ATM Pressure: 100.1kPa | | |

3.4.1 MODULATION LIMITING

| Carrier Frequency: 462.6375MHz separation:12.5kHz | | | | | | | | | | | |
|---|-------------------------|-------|-------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|-------------|
| Audio Frequency (Hz) | Deviation (@+0dB) [kHz] | | Deviation (@+5dB) [kHz] | | Deviation (@+10dB) [kHz] | | Deviation (@+15dB) [kHz] | | Deviation (@+20dB) [kHz] | | Limit [kHz] |
| | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | |
| 300 | 0.420 | 0.419 | 0.731 | 0.730 | 1.284 | 1.280 | 1.690 | 1.701 | 1.530 | 1.534 | 2.500 |
| 1000 | 1.500 | 1.500 | 1.827 | 1.830 | 1.831 | 1.835 | 1.833 | 1.832 | 1.830 | 1.831 | 2.500 |
| 2500 | 1.680 | 1.716 | 1.700 | 1.740 | 1.701 | 1.740 | 1.700 | 1.735 | 1.700 | 1.736 | 2.500 |
| 3000 | 1.115 | 1.130 | 1.143 | 1.156 | 1.168 | 1.180 | 1.180 | 1.196 | 1.180 | 1.195 | 2.500 |

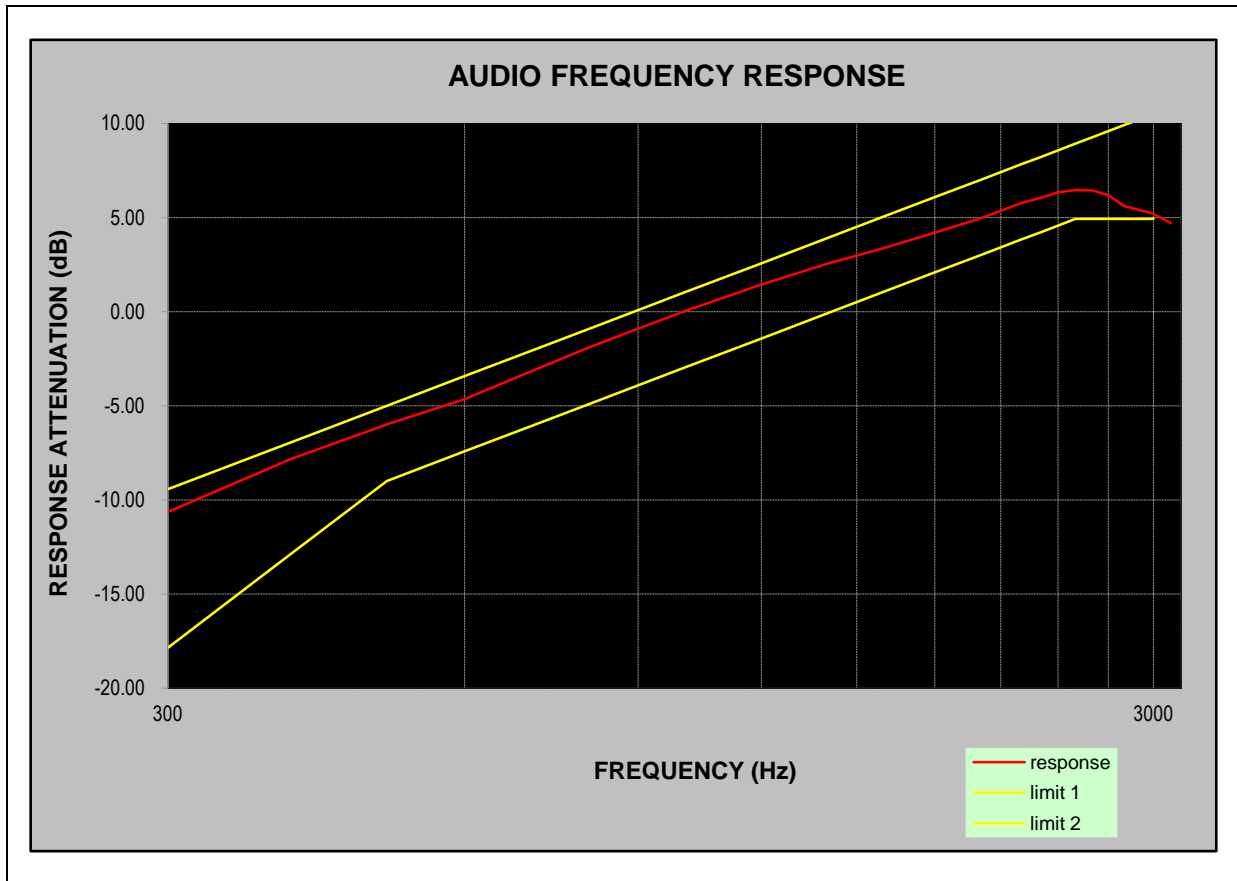


| Carrier Frequency: 467.6375MHz separation:12.5kHz | | | | | | | | | | | |
|---|-------------------------|-------|-------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|-------------|
| Audio Frequency (Hz) | Deviation (@+0dB) [kHz] | | Deviation (@+5dB) [kHz] | | Deviation (@+10dB) [kHz] | | Deviation (@+15dB) [kHz] | | Deviation (@+20dB) [kHz] | | Limit [kHz] |
| | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | Peak+ | Peak- | |
| 300 | 0.420 | 0.419 | 0.731 | 0.730 | 1.290 | 1.285 | 1.668 | 1.675 | 1.536 | 1.540 | 2.500 |
| 1000 | 1.500 | 1.500 | 1.823 | 1.825 | 1.830 | 1.830 | 1.830 | 1.830 | 1.831 | 1.830 | 2.500 |
| 2500 | 1.680 | 1.720 | 1.700 | 1.740 | 1.701 | 1.735 | 1.700 | 1.739 | 1.701 | 1.740 | 2.500 |
| 3000 | 1.115 | 1.130 | 1.140 | 1.160 | 1.160 | 1.180 | 1.179 | 1.190 | 1.180 | 1.195 | 2.500 |

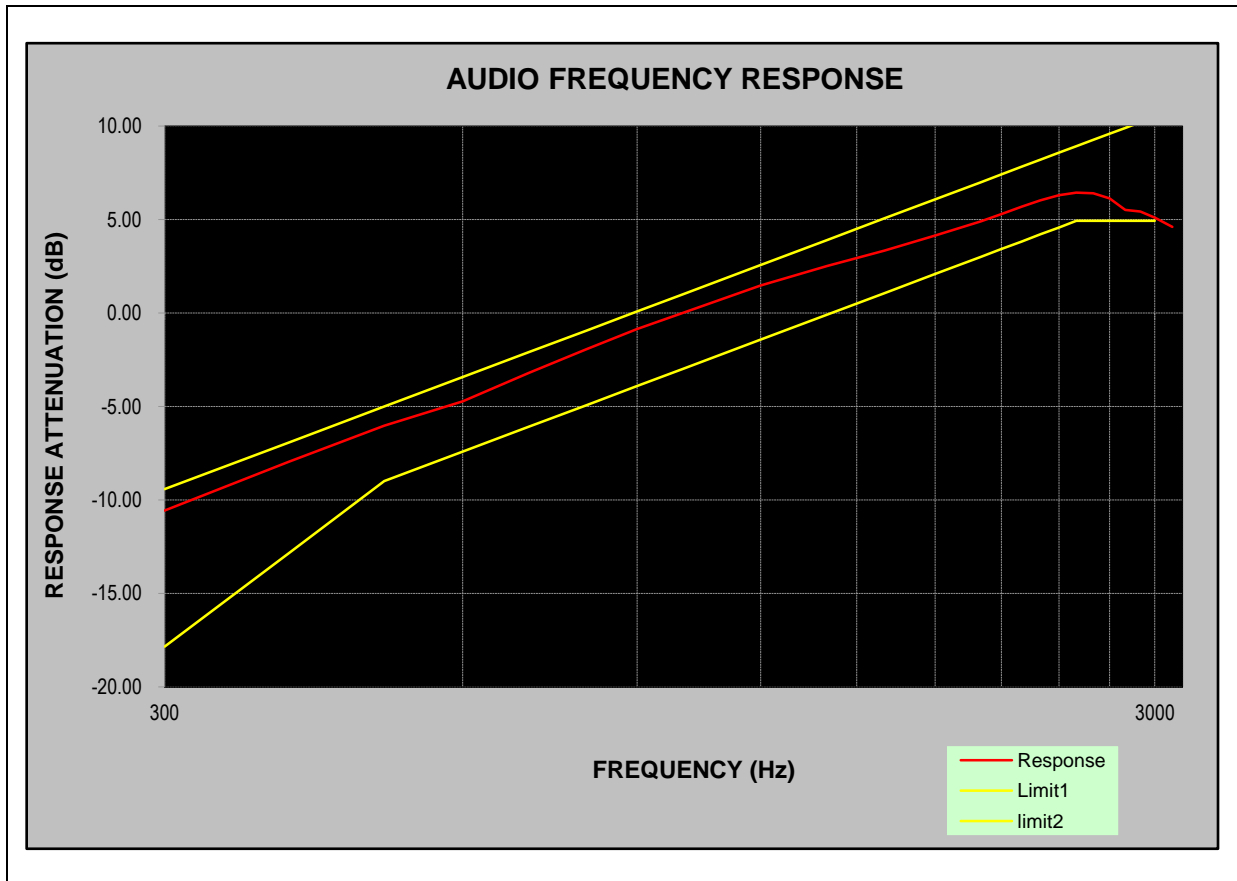


3.4.2 Audio Frequency Response

| Test Frequency: 462.6375MHz | | | |
|-----------------------------|------------------------------|--------------------|-------------------|
| Audio Frequency (Hz) | Response Attenuation (dB) | High Limit (dB) | Low Limit (dB) |
| 300 | -10.63 | -9.4 | -17.8 |
| 400 | -7.83 | -6.9 | -12.9 |
| 500 | -5.99 | -5.0 | -9.0 |
| 600 | -4.64 | -3.4 | -7.4 |
| 700 | -3.17 | -2.1 | -6.1 |
| 800 | -1.92 | -0.9 | -4.9 |
| 900 | -0.90 | 0.1 | -3.9 |
| 1000 | 0.00 | 1.0 | -3.0 |
| 1200 | 1.45 | 2.6 | -1.4 |
| 1400 | 2.56 | 3.9 | -0.1 |
| 1600 | 3.38 | 5.1 | 1.1 |
| 1800 | 4.20 | 6.1 | 2.1 |
| 2000 | 4.96 | 7.0 | 3.0 |
| 2100 | 5.35 | 7.4 | 3.4 |
| 2200 | 5.76 | 7.8 | 3.8 |
| 2300 | 6.05 | 8.2 | 4.2 |
| 2400 | 6.35 | 8.6 | 4.6 |
| 2500 | 6.47 | 8.9 | 4.9 |
| 2600 | 6.45 | 9.3 | 4.9 |
| 2700 | 6.20 | 9.6 | 4.9 |
| 2800 | 5.62 | 9.9 | 4.9 |
| 2900 | 5.42 | 10.2 | 4.9 |
| 3000 | 5.20 | 10.5 | 4.9 |
| 3125 | 4.71 | - | - |



| Test Frequency: 467.6375MHz | | | |
|-----------------------------|------------------------------|--------------------|-------------------|
| Audio Frequency (Hz) | Response Attenuation (dB) | High Limit (dB) | Low Limit (dB) |
| 300 | -10.57 | -9.4 | -17.8 |
| 400 | -7.96 | -6.9 | -12.9 |
| 500 | -6.02 | -5.0 | -9.0 |
| 600 | -4.73 | -3.4 | -7.4 |
| 700 | -3.20 | -2.1 | -6.1 |
| 800 | -1.94 | -0.9 | -4.9 |
| 900 | -0.86 | 0.1 | -3.9 |
| 1000 | 0.00 | 1.0 | -3.0 |
| 1200 | 1.48 | 2.6 | -1.4 |
| 1400 | 2.53 | 3.9 | -0.1 |
| 1600 | 3.35 | 5.1 | 1.1 |
| 1800 | 4.15 | 6.1 | 2.1 |
| 2000 | 4.91 | 7.0 | 3.0 |
| 2100 | 5.30 | 7.4 | 3.4 |
| 2200 | 5.69 | 7.8 | 3.8 |
| 2300 | 6.03 | 8.2 | 4.2 |
| 2400 | 6.30 | 8.6 | 4.6 |
| 2500 | 6.44 | 8.9 | 4.9 |
| 2600 | 6.41 | 9.3 | 4.9 |
| 2700 | 6.13 | 9.6 | 4.9 |
| 2800 | 5.52 | 9.9 | 4.9 |
| 2900 | 5.43 | 10.2 | 4.9 |
| 3000 | 5.11 | 10.5 | 4.9 |
| 3125 | 4.62 | - | - |



3.4.3 Authorized Bandwidth and Emission Mask

| Test Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 20dB Bandwidth (kHz) | Limit (kHz) | Emission Mask | Limit |
|----------------------|------------------------------|----------------------|-------------|-----------------|-----------------|
| 462.6375 | 5.282 | 5.282 | ≤ 12.5 | Refer test plot | Refer test plot |
| 467.6375 | 5.210 | 5.355 | ≤ 12.5 | Refer test plot | Refer test plot |

Note:

Emission bandwidth was based on calculation method instead of measurement.

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.

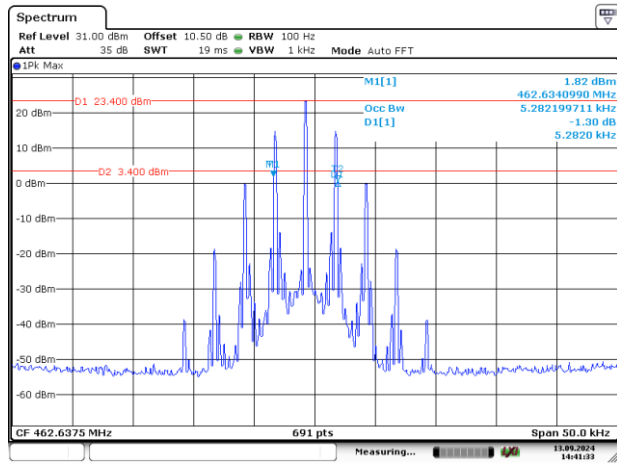
$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0$

F3E portion of the designator represents an FM voice transmission

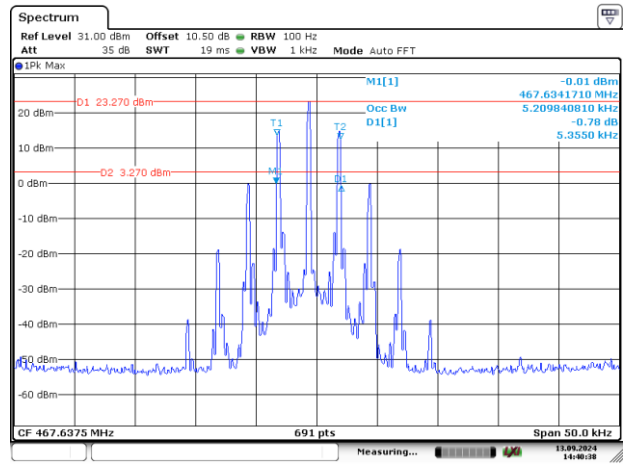
Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

BW

462.6375MHz

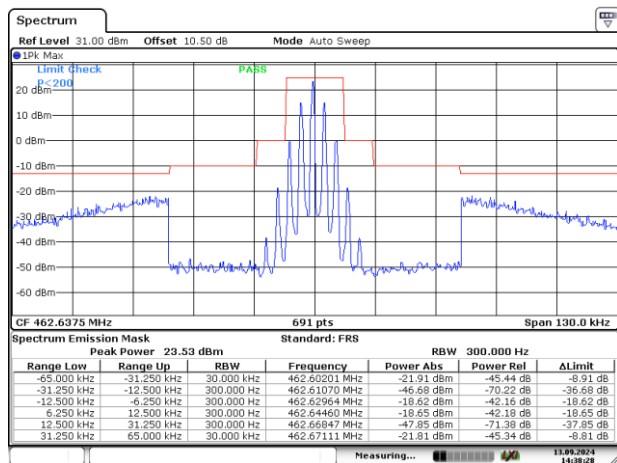


467.6375MHz

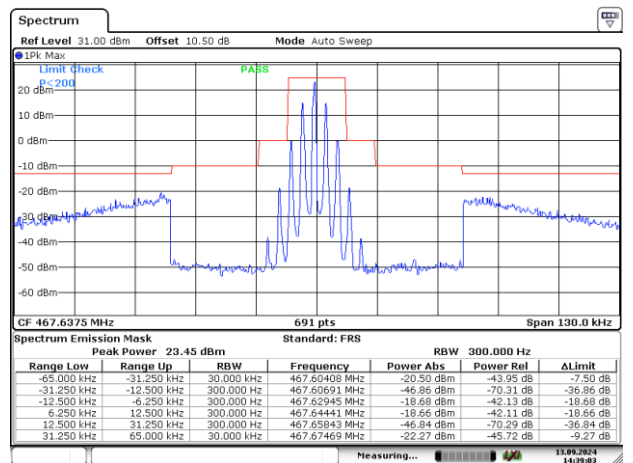


Emission Mask

462.6375MHz



467.6375MHz



Frequency stability

| Test Item | Temperature (°C) | Voltage (Vdc) | Center Frequency (MHz) | Measured Frequency (MHz) | Frequency Error (ppm) | limit (ppm) |
|---|------------------|---------------|------------------------|--------------------------|-----------------------|-------------|
| Frequency Stability vs. Temperature & Voltage | -20 | 3.7 | 462.6375 | 462.637426 | -0.16 | ≤2.5 |
| | -10 | 3.7 | 462.6375 | 462.637439 | -0.13 | ≤2.5 |
| | 0 | 3.7 | 462.6375 | 462.637442 | -0.13 | ≤2.5 |
| | 10 | 3.7 | 462.6375 | 462.637437 | -0.14 | ≤2.5 |
| | 20 | 3.7 | 462.6375 | 462.637450 | -0.11 | ≤2.5 |
| | 30 | 3.7 | 462.6375 | 462.637441 | -0.13 | ≤2.5 |
| | 40 | 3.7 | 462.6375 | 462.637435 | -0.14 | ≤2.5 |
| | 50 | 3.7 | 462.6375 | 462.637427 | -0.16 | ≤2.5 |
| | 20 | 3.5 | 462.6375 | 462.637420 | -0.17 | ≤2.5 |
| | 20 | 4.2 | 462.6375 | 462.637442 | -0.13 | ≤2.5 |

| Test Item | Temperature (°C) | Voltage (Vdc) | Center Frequency (MHz) | Measured Frequency (MHz) | Frequency Error (ppm) | limit (ppm) |
|---|------------------|---------------|------------------------|--------------------------|-----------------------|-------------|
| Frequency Stability vs. Temperature & Voltage | -20 | 3.7 | 467.6375 | 467.637435 | -0.14 | ≤2.5 |
| | -10 | 3.7 | 467.6375 | 467.637445 | -0.12 | ≤2.5 |
| | 0 | 3.7 | 467.6375 | 467.637466 | -0.07 | ≤2.5 |
| | 10 | 3.7 | 467.6375 | 467.637474 | -0.06 | ≤2.5 |
| | 20 | 3.7 | 467.6375 | 467.637428 | -0.15 | ≤2.5 |
| | 30 | 3.7 | 467.6375 | 467.637435 | -0.14 | ≤2.5 |
| | 40 | 3.7 | 467.6375 | 467.637447 | -0.11 | ≤2.5 |
| | 50 | 3.7 | 467.6375 | 467.637441 | -0.13 | ≤2.5 |
| | 20 | 3.5 | 467.6375 | 467.637436 | -0.14 | ≤2.5 |
| | 20 | 4.2 | 467.6375 | 467.637450 | -0.11 | ≤2.5 |

4 FCC §95.587 FRS Additional Requirements

Each FRS transmitter type must be designed to meet the following additional requirements.

(a) Transmit frequency capability. FRS transmitter types must not be capable of transmitting on any frequency or channel other than those listed in §95.563.

Judgment: Compliance, please refer the operating channels list which provide by applicant record in section 2.1 of report

(b) Antenna. The antenna of each FRS transmitter type must meet the following requirements.

(1) The antenna must be a non-removable integral part of the FRS transmitter type.

(2) The gain of the antenna must not exceed that of a half-wave dipole antenna.

(3) The antenna must be designed such that the electric field of the emitted waves is vertically polarized when the unit is operated in the normal orientation.

Judgment: Compliance, please refer section 1.2 of report and EUT photo

(c) Digital data transmissions. FRS transmitter types having the capability to transmit digital data must be designed to meet the following requirements.

(1) FRS units may transmit digital data containing location information, or requesting location information from one or more other FRS or GMRS units, or containing a brief text message to another specific FRS or GMRS unit or units.

(2) Digital data transmissions may be initiated by a manual action or command of the operator or on an automatic or periodic basis, and FRS units may be designed to automatically respond with location data upon receiving an interrogation request from another

(3) Digital data transmissions must not exceed one second in duration.

(4) Digital data transmissions must not be sent more frequently than one digital data transmission within a thirty-second period, except that an FRS unit may automatically respond to more than one interrogation request received within a thirty-second period.

Judgment: Not Applicable, no digital modulation function.

(d) Packet mode. FRS transmitter types must not be capable of transmitting data in the store-and-forward packet operation mode.

Judgment: Not Applicable, no digital modulation function.

(e) Effective September 30, 2019, no person shall manufacture or import hand-held portable radio equipment capable of operating under this subpart (FRS) and other licensed or licensed-by-rule services in this chapter (part 15 unlicensed equipment authorizations are permitted if consistent with part 15 rules).

Judgment: Compliance, the devices are not include transmitter(s) (or transmitting modes) operating in other licence and licence-exempt services.

5 Test Setup Photo

Please refer to the attachment 2405X35052EC Test Setup photo.

6 E.U.T Photo

Please refer to the attachment 2405X35052EC External photo and 2405X35052EC Internal photo.

---End of Report---