MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

SAMM 825

**MOTOROLA PENANG ADV. COMM. LABORATORY**
**Motorola Solutions Malaysia SDN BHD**
**Plot 2A, Medan Bayan Lepas,**
**Mukim 12 S.W.D., 11900 Bayan Lepas,**
**Penang, Malaysia.**

**FCC / IC TEST REPORT**

**Report Revision** : **Rev.A**

| | | |
|---|---|---|
| **Date/s Tested** | : | 19-August-2023 - 31-August-2023 |
| **Report Issue Date** | : | 01-September-2023 |
| **Manufacturer/Location** | : | Motorola Solutions Malaysia SDN BHD<br>Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D.,<br>11900 Bayan Lepas, Penang, Malaysia |
| **Requestor** | : | SZE KEAT NG |
| **Product Type** | : | Hand-held |
| **Model Number** | : | T803 |
| **Frequency Band** | : | 462-468 MHz |
| **Max. Output Power** | : | 0.5W ERP/2W ERP |
| **Firmware Version** | : | NA004 |
| **Applicant Name** | | Motorola Solutions Inc |
| **Applicant Address** | : | 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322. |
| **FCC Registration** | : | 461337 |
| **IC Registrations** | : | MY0001 |

**The equipment was tested accordance to the requirement listed below:**

**FCC 47 CFR Part 95** **PASS**



Prepared By:

**GAN BOON TEONG**
**Test Personnel**

Approved Signatory :

**VINCENT FOONG CHUEN KIT**
**Responsible Engineer**

# Table of Contents



| Revision History | Description | Date | Originator |
|---|---|---|---|
| Rev. A | Initial Report | **13-September-2023** | **Gan Boon Teong** |
| | | | |

## **1.0.** General Information

### EUT Description:

| Tx Frequency range | |
|---|---|
| 462.5500MHz to 467.7125MHz | |
| | |
| **Antenna type gain** | Fixed Helix, 462MHz: 1.93 dBi, 467MHz: 0.23 dBi |
| **Technologies** | FM |
| **Device voltage** | 4.5V DC |

The EUT contains following accessory devices and data cable:

| Item | Model or P/N |
|---|---|
| 1300MAH 3XAA NIMH RECHARGEABLE BATTERY PACK | 1532 |
| 800MAH 3XAA NIMH RECHARGEABLE BATTERY PACK | PMNN4477A |
| POWER SUPPLY ADAPTOR,SWITCH MODE, 3W, L6, 100 V - 240 V, MICRO USB, US/NOM/JP | 10998-PS000228A01-2 |
| T82_T47x_T8xx SERIES DUAL SLOT CHARGING TRAY | PMLN8219A-C2 |

Channel number and frequency information:

Product channel table:

FRS Channels

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|
| 1 | 462.5625 | 12 | 467.6625 |
| 2 | 462.5875 | 13 | 467.6875 |
| 3 | 462.6125 | 14 | 467.7125 |
| 4 | 462.6375 | 15 | 462.5500 |
| 5 | 462.6625 | 16 | 462.5750 |
| 6 | 462.6875 | 17 | 462.6000 |
| 7 | 462.7125 | 18 | 462.6250 |
| 8 | 467.5625 | 19 | 462.6500 |
| 9 | 467.5875 | 20 | 462.6750 |
| 10 | 467.6125 | 21 | 462.7000 |
| 11 | 467.6375 | 22 | 462.7250 |

GMRS main channels

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|
| 1 | 462.5500 | 9 | 467.5500 |
| 2 | 462.5750 | 10 | 467.5750 |
| 3 | 462.6000 | 11 | 467.6000 |
| 4 | 462.6250 | 12 | 467.6250 |
| 5 | 462.6500 | 13 | 467.6500 |
| 6 | 462.6750 | 14 | 467.6770 |
| 7 | 462.7000 | 15 | 467.7000 |
| 8 | 462.7250 | 16 | 467.7125 |

GMRS interstitial channels

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|
| 1 | 462.5625 | 8 | 467.5675 |
| 2 | 462.5875 | 9 | 467.5875 |
| 3 | 462.6125 | 10 | 467.6125 |
| 4 | 462.6375 | 11 | 467.6375 |
| 5 | 462.6625 | 12 | 467.6625 |
| 6 | 462.6875 | 13 | 467.6875 |
| 7 | 462.7125 | 14 | 467.7125 |

*In §15.31 (m), Frequency range over which device operates in1MHz or less, middle frequency of channel is selected to perform test.*

**General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

**ANSI C63.26**
**FCC Part 2 & 95**

**Deviation from standard**

Not applicable as no deviation from standard test method

**Modifications to EUT**

For RF conducted measurements a pigtail was soldered out of the board while for radiated measurements there were no modifications to the device

**Antenna gain disclaimer**
Antenna gain information is provided by customer. The validity of the results is dependent upon this information. The lab will not be held accountable in the event the supplied information affects compliance.

**Test configuration of EUT**
All relevant configurations involving radio models and accessories (including chargers, batteries, and antennas) were assessed. Only worst case configurations will be included in this report.

## **2.0.** Summary of Test Results

| FCC Clause | Test Item | Result | Remark | Tested by | Serial number | Environmental conditions |
|---|---|---|---|---|---|---|
| 95.567 95.1767 | Maximum Output Power | Pass | Highest output power: 33.01dBm (2.00W) | Gan | 17520ZN0387 | 25°C 50%RH |
| 95.575 95.1775 | Modulation Limiting | Pass | NA | Gan | 17520ZN0387 | 25°C 50%RH |
| 95.575 95.1775 | Audio Frequency Response | Pass | NA | Gan | 17520ZN0387 | 25°C 50%RH |
| 95.1775 | Audio Low Pass Filter | Pass | NA | NA | NA | NA |
| 95.565 95.1765 | Frequency Stability | Pass | NA | Gan | 17520ZN0387 | 25°C 50%RH |
| 95.573 95.1773 | Emission Bandwidth | Pass | 11K0F3E – 9.9776kHz | Gan | 17520ZN0387 | 25°C 50%RH |
| 95.579 95.1779 | Unwanted Radiation | Pass | Max spurious emission -30.51dBm (margin: 17.51dBm) | Aiman | 17520ZN0371, 17520ZN0372 | 22.5°C 66.3%RH |

## 3.0. Measurement Uncertainty

| Measurement | Frequency | Expended Uncertainty (k=1.96) (±dB) |
|---|---|---|
| Maximum Output Power | 462MHz ~ 468MHz | 5.01 |
| AC Power Line Conducted Spurious Emission | 150KHz ~ 30MHz | 3.48 |
| Radiated Emissions up to 1 GHz | 30MHz ~ 1000MHz | 4.03 |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz | 4.03 |
| | 18GHz ~ 40GHz | 4.03 |
| Frequency Stability | 9kHz ~ 12.75GHz | 0.0085 ppm |
| Audio Frequency Response / Low Pass Filter Response | 300Hz – 20kHz | 4.09 % |
| Modulation Limiting | 300Hz – 3kHz | 1.15 % |
| Occupied Bandwidth | 9kHz ~ 12.75GHz | 2.82 dB |

## **4.0.** Equipment List

### Analog ATE #9

| Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|
| RF TRANSCEIVER CONTROLLER | AX2007AI | AX2007AI002 | NA | NA |
| CHAMBER | SH-641 | 92006068 | 5-Apr-23 | 5-Apr-24 |
| AUDIO ANALYZER | 8903B | 3413A14586 | 23-Sep-22 | 23-Sep-23 |
| SIGNAL GENERATOR | 2042 | 203002/862 | 13-Oct-22 | 13-Oct-23 |
| SIGNAL GENERATOR | SMA100A | 111382 | 23-Nov-22 | 23-Nov-23 |
| MODULATION ANALYZER | 8901B | 3122A03662 | 13-Sep-22 | 13-Sep-23 |
| POWER SUPPLY | 6031A | 3018A01915 | 28-Sep-22 | 28-Sep-23 |
| SIGNAL GENERATOR | E4424B | MY43350130 | 17-Feb-23 | 17-Feb-24 |
| POWER METER | E4416A | MY50000114 | 28-Feb-23 | 28-Feb-24 |
| POWER SENSOR | E9301B | MY41498969 | 12-Mar-23 | 12-Mar-24 |
| TRANSCEIVER INTERFACE | 8954A | 2243A00330 | 11-May-23 | 11-May-24 |
| N to N RF cable # 1 | SUCOFLEX 104 | NA | NA | NA |
| N to N RF cable # 2 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 3 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 4 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 5 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 6 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 7 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 8 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 9 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 10 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 11 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 12 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 13 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 14 | 84188418 H+S MY 0812 | NA | NA | NA |
| N to N RF cable # 15 | 84188418 H+S MY 0812 | NA | NA | NA |
| BNC to BNC RF cable # 1 | NA | NA | NA | NA |
| BNC to BNC RF cable # 2 | NA | NA | NA | NA |
| BNC to BNC RF cable # 3 | NA | NA | NA | NA |
| BNC to BNC RF cable # 4 | NA | NA | NA | NA |
| BNC to BNC RF cable # 5 | NA | NA | NA | NA |
| BNC to BNC RF cable # 6 | NA | NA | NA | NA |
| BNC to BNC RF cable # 7 | NA | NA | NA | NA |
| BNC to BNC RF cable # 8 | NA | NA | NA | NA |
| Test Software | Analog ATE | | | |
| Version | 2.4.6 | | | |
| Test Software | FCC_FreqStability | | | |
| Version | Rev1.0.3 | | | |

## FCC Transient ATE #1: (SW version: FCC Transient ATE_R1.2.1)

| Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|
| SWITCH CONTROL UNIT | 3488A | 2719A36210 | NA | NA |
| OSCILLOSCOPE | MSO8064A | MY45003003 | 1-Nov-22 | 1-Nov-23 |
| AUDIO ANALYZER | 8903B | 2836A05866 | 10-Nov-22 | 10-Nov-23 |
| POWER SUPPLY | 6033A | 3506A08076 | 10-Jan-23 | 10-Jan-24 |
| ATTENUATOR / SWITCH DRIVER | 11713A | 3748A09090 | NA | NA |
| AUDIO ANALYZER | 8903B | 3011A08952 | 12-Sep-22 | 12-Sep-23 |
| SIGNAL GENERATOR | 8657B | 3315U04973 | 21-Sep-22 | 21-Sep-23 |
| POWER METER | E4416A | MY45101016 | 1-Mar-23 | 1-Mar-24 |
| STEP ATTENUATOR (DC to 4 GHz, 0 to 11 dB, 1 dB steps) | 8494G | MY52301411 | 16-Dec-22 | 16-Dec-23 |
| POWER SENSOR | E9301B | MY50180003 | 20-Jun-23 | 20-Jun-24 |
| STEP ATTENUATOR (DC to 4 GHz, 0 to 110 dB, 10 dB steps) | 8496G | MY52300757 | 20-Jun-23 | 20-Jun-24 |
| MODULATION ANALYZER | 8901B | 2619A00845 | 20-Sep-22 | 20-Sep-23 |
| SPECTRUM ANALYZER | E4445A | MY46181262 | 9-Jan-23 | 9-Jan-24 |
| N to N RF Cable # 1 | SF126/11N/11N | NA | NA | NA |
| N to N RF Cable # 2 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 3 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 4 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 5 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 6 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 7 | M17/128-RG400 | NA | NA | NA |
| N to N RF Cable # 8 | M17/128-RG400 | NA | NA | NA |
| BNC to BNC RF Cable # 1 | RG 58 | NA | NA | NA |
| BNC to BNC RF Cable # 2 | RG 58 | NA | NA | NA |
| BNC to BNC RF Cable # 3 | RG 58 | NA | NA | NA |
| BNC to BNC RF Cable # 4 | RG 58 | NA | NA | NA |
| BNC to BNC RF Cable # 5 | RG 58 | NA | NA | NA |
| BNC to BNC RF Cable # 6 | RG 58 | NA | NA | NA |
| BNC to N RF Cable # 1 | RG 58 | NA | NA | NA |
| Aeroflex Attenuator 10dB | 49-10-43-LIM | NA | NA | NA |
| Aeroflex Attenuator 10dB | 33-10-34-LIM | NA | NA | NA |

**Radiated Emission**

| DESCRIPTION | MODEL | SERIAL NUMBER | CALIBRATION DATE | CALIBRATION DUE DATE |
|---|---|---|---|---|
| EMI TEST RECEIVER | ESIB26 | 100017 | 09-Nov-22 | 08-Nov-23 |
| 3m Semi-anechoic Chamber | NA | 888032 | NA | NA |
| TURNTABLE FLUSH MOUNT 2M | T-200-S | N/A | NA | NA |
| PROGRAMMING CONTROLLER | MF-7802BS | N/A | NA | NA |
| POWER SUPPLY | 6032A | 2615A01178 | 18-Jun-23 | 18-Jun-24 |
| SIGNAL ANALYZER | FSV40 | 101432 | 10-Aug-23 | 09-Aug-24 |
| DATA LOGGER | SDL500 | A.016800 | 21-Jun-23 | 21-Jun-24 |
| BILOG ANTENNA | CBL6112D | 55546 | 23-Jun-22 | 23-Sep-23 |
| BILOG ANTENNA | CBL6112D | 30991 | 5-Jan-23 | 5-Jan-24 |
| DRG HORN FREQ. | SAS-571 | 566 | 22-Nov-22 | 22-Nov-23 |
| DRG HORN FREQ. | SAS-571 | 720 | 18-Apr-23 | 18-Apr-25 |
| PREAMPLIFIER | PAM-0118 | 427 | 18-Oct-21 | 18-Oct-24 |
| SIGNAL GENERATOR | SMB100A | 182511 | 04-Jun-21 | 04-Jun-24 |
| LOOP ANTENNA | 6502 | 00208416 | 12-Oct-22 | 12-Oct-23 |
| BROAD-BAND HORN ANTENNA | BBHA9170 | BBHA9170255 | 22-Feb-23 | 22-Feb-24 |
| EMI TEST RECEIVER | ESIB26 | 100017 | 09-Nov-22 | 08-Nov-23 |
| Test Software | EMC_FCC_IC_Bluetooth_RE_Test | | | |
| Version | EMC_FCC_RE_v1.6.5 | | | |

## 5.0. Test Mode Applicability and Test Channel Detail

Test Frequency list:

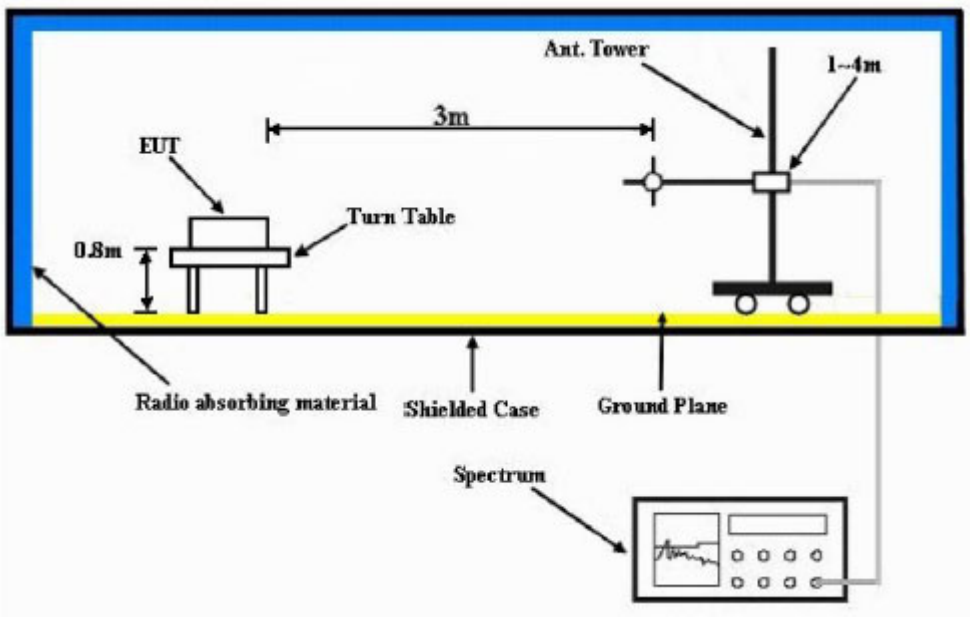
FRS

| Channel | Frequency |
|---|---|
| 4 | 462.6375 MHz |
| 11 | 467.6375 MHz |

# 6.0. Transmitter Test Parameters

## 6.1. Maximum Output Power

### 6.1.1. Test Setup




1) The spectrum setting for Equivalent Isotropically Radiated Power (EIRP) is RBW = 100 kHz, VBW = 300 kHz. Detector Mode is RMS.
2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The “Read Value” is the spectrum reading of maximum power value.
3) 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 rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
4) Alternatively, max ERP can be calculated using conducted power measurement + max antenna gain (dBd)

## 6.1.2. Test Limits

**§95.567 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.

**§95.567 GMRS Transmitting Power Limits**

This section contains transmitting power limits for GMRS stations. The maximum transmitting power depends on which channels are being used and the type of station.

(a) 462/467 MHz main channels. The limits in this paragraph apply to stations transmitting on any of the 462 MHz main channels or any of the 467 MHz main channels. Each GMRS transmitter type must be capable of operating within the allowable power range. GMRS licensees are responsible for ensuring that their GMRS stations operate in compliance with these limits.

(1) The transmitter output power of mobile, repeater and base stations must not exceed 50 Watts.

(2) The transmitter output power of fixed stations must not exceed 15 Watts.

(b) 462 MHz interstitial channels. The effective radiated power (ERP) of mobile, hand-held portable and base stations transmitting on the 462 MHz interstitial channels must not exceed 5 Watts.

(c) 467 MHz interstitial channels. The effective radiated power (ERP) of hand-held portable units transmitting on the 467 MHz interstitial channels must not exceed 0.5 Watt. Each GMRS transmitter type capable of transmitting on these channels must be designed such that the ERP does not exceed 0.5 Watt.

### 6.1.3. Test Data

# EIRP/ERP

**Channel Spacing : 12.5 kHz** **Tx Power: 2Watts**
**Accessory: NA** **Modulation: FM**
**Max antenna gain:1.93dBi**

| Frequency (MHz) | Measured conducted power (dBm) | Max ERP (dBm) |
|---|---|---|
| 462.6375 | 33.01 | 32.79 |

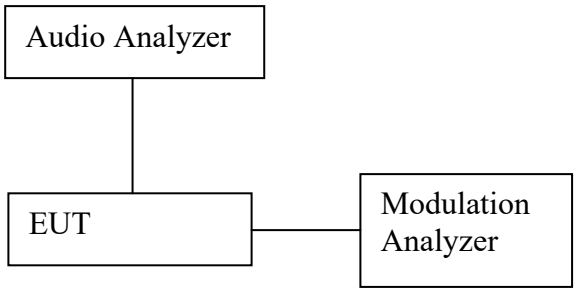
# EIRP/ERP

**Channel Spacing : 12.5 kHz** **Tx Power: 0.77Watts**
**Accessory: NA** **Modulation: FM**
**Max antenna gain: 0.23dBi**

| Frequency (MHz) | Measured conducted power (dBm) | Max ERP (dBm) |
|---|---|---|
| 467.6375 | 28.87 | 26.95 |

## 6.2. Modulation Limiting

### 6.2.1. Test Setup




1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the maximum deviation.
5) Record the frequency deviation as 0dB input level at 1kHz audio frequency.
6) Repeat the step and record the frequency deviation from -20dB to 20dB by 5dB increments and different audio freq 300Hz, 2.5 KHz and 3 KHz.

## 6.2.2. Test Limits

**§95.575 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.

**§95.1775 GMRS modulation requirements**

Each GMRS transmitter type must be designed to satisfy the modulation requirements in this section. Operation of GMRS stations must also be in compliance with these requirements.

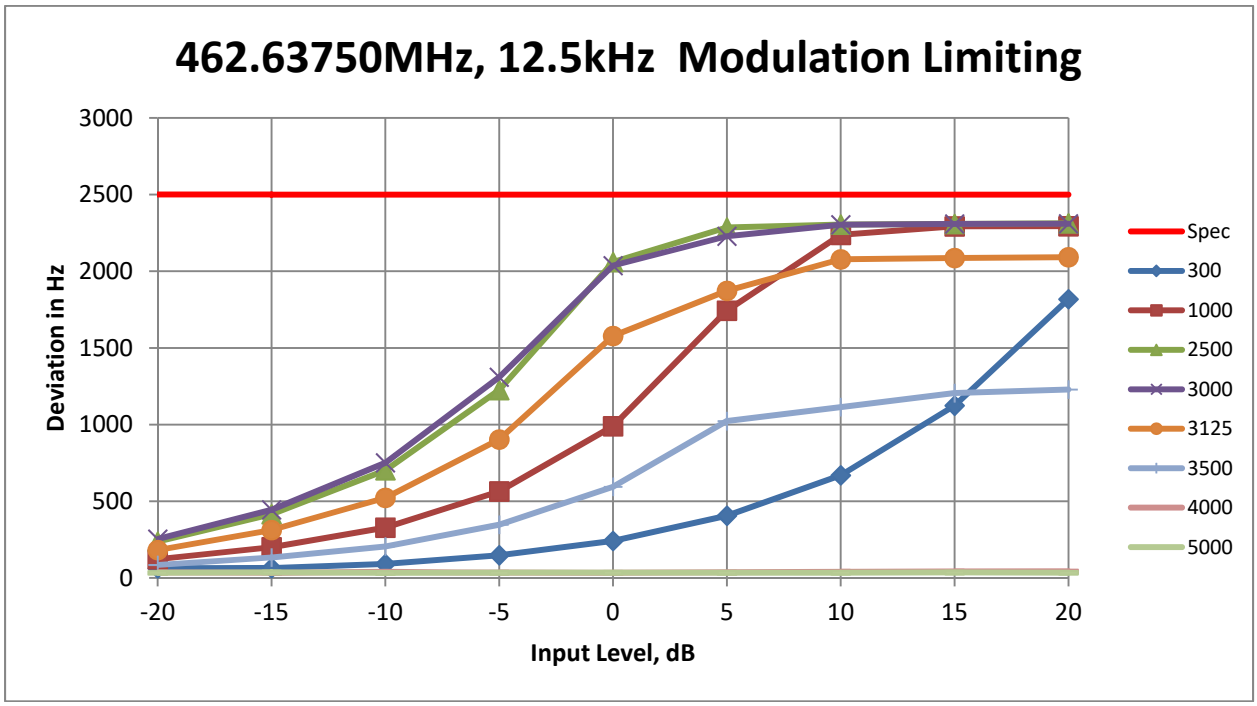
(a) Main channels. The peak frequency deviation for emissions to be transmitted on the main channels must not exceed ± 5 kHz.

(b) 462 MHz interstitial channels. The peak frequency deviation for emissions to be transmitted on the 462 MHz interstitial channels must not exceed ± 5 kHz.

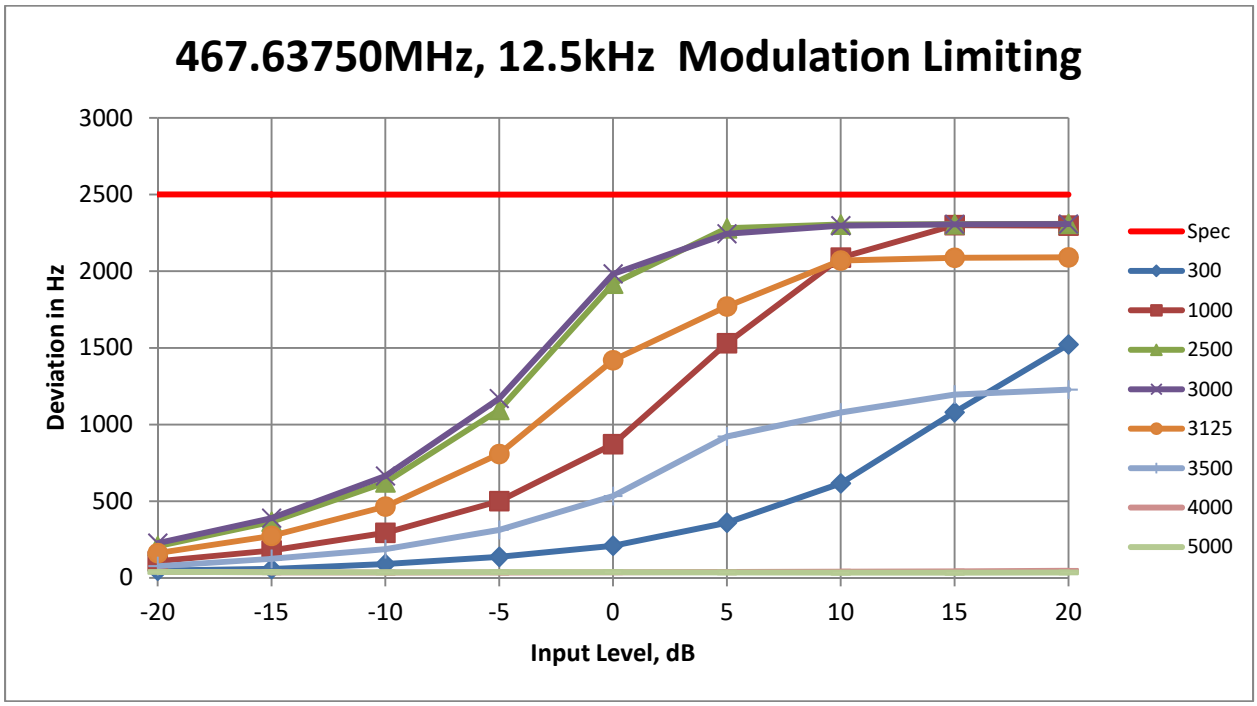
(c) 467 MHz interstitial channels. The peak frequency deviation for emissions to be transmitted on the 467 MHz interstitial channels must not exceed ± 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

(d) Overmodulation. Each GMRS transmitter type, except for a mobile station transmitter type with a transmitter power output of 2.5 W or less, must automatically prevent a higher than normal audio level from causing overmodulation.

### 6.2.3. Test Result



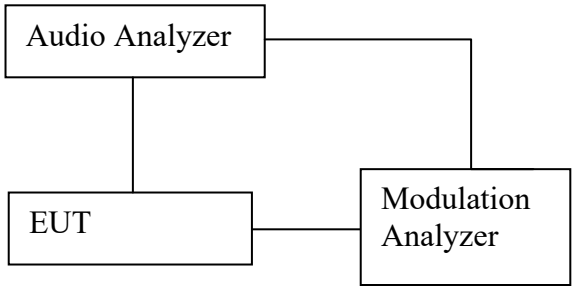

| Frequency / Channel Spacing | 462.63750MHz / 12.5kHz | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Voltage | 4.5V | | | | | | | | | | | | | | | | | |
| Temperature, °C | 25 | | | | | | | | | | | | | | | | | |
| Freq Deviation, Hz | 300 | | 1000 | | 2500 | | 3000 | | 3125 | | 3500 | | 4000 | | 5000 | | Spec | |
| Input Level, dB | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % |
| -20 | 63 | 2.5 | 122 | 4.9 | 237 | 9.5 | 253 | 10.1 | 182 | 7.3 | 85 | 3.4 | 35 | 1.4 | 33 | 1.3 | 2500 | 100 |
| -15 | 64 | 2.6 | 200 | 8.0 | 415 | 16.6 | 444 | 17.8 | 312 | 12.5 | 133 | 5.3 | 33 | 1.3 | 36 | 1.4 | 2500 | 100 |
| -10 | 91 | 3.6 | 328 | 13.1 | 702 | 28.1 | 751 | 30.0 | 522 | 20.9 | 205 | 8.2 | 40 | 1.6 | 33 | 1.3 | 2500 | 100 |
| -5 | 148 | 5.9 | 564 | 22.6 | 1225 | 49.0 | 1309 | 52.4 | 903 | 36.1 | 347 | 13.9 | 35 | 1.4 | 34 | 1.3 | 2500 | 100 |
| 0 | 241 | 9.6 | 989 | 39.6 | 2060 | 82.4 | 2037 | 81.5 | 1578 | 63.1 | 594 | 23.8 | 34 | 1.3 | 34 | 1.4 | 2500 | 100 |
| 5 | 406 | 16.2 | 1743 | 69.7 | 2286 | 91.4 | 2229 | 89.1 | 1873 | 74.9 | 1023 | 40.9 | 35 | 1.4 | 34 | 1.4 | 2500 | 100 |
| 10 | 669 | 26.8 | 2238 | 89.5 | 2305 | 92.2 | 2304 | 92.1 | 2078 | 83.1 | 1114 | 44.6 | 41 | 1.6 | 34 | 1.4 | 2500 | 100 |
| 15 | 1124 | 44.9 | 2293 | 91.7 | 2309 | 92.4 | 2309 | 92.4 | 2087 | 83.5 | 1205 | 48.2 | 42 | 1.7 | 35 | 1.4 | 2500 | 100 |
| 20 | 1818 | 72.7 | 2294 | 91.8 | 2313 | 92.5 | 2310 | 92.4 | 2092 | 83.7 | 1229 | 49.2 | 43 | 1.7 | 34 | 1.3 | 2500 | 100 |




| Frequency / Channel Spacing | 467.63750MHz / 12.5kHz | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Voltage | 4.5V | | | | | | | | | | | | | | | | | |
| Temperature, °C | 25 | | | | | | | | | | | | | | | | | |
| Freq Deviation, Hz | 300 | | 1000 | | 2500 | | 3000 | | 3125 | | 3500 | | 4000 | | 5000 | | Spec | |
| Input Level, dB | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % | Dev, Hz | % |
| -20 | 46 | 1.9 | 108 | 4.3 | 207 | 8.3 | 226 | 9.1 | 161 | 6.5 | 76 | 3.1 | 38 | 1.5 | 38 | 1.5 | 2500 | 100 |
| -15 | 58 | 2.3 | 178 | 7.1 | 365 | 14.6 | 389 | 15.6 | 274 | 10.9 | 124 | 5.0 | 36 | 1.4 | 36 | 1.5 | 2500 | 100 |
| -10 | 90 | 3.6 | 294 | 11.8 | 623 | 24.9 | 664 | 26.6 | 465 | 18.6 | 187 | 7.5 | 35 | 1.4 | 36 | 1.4 | 2500 | 100 |
| -5 | 137 | 5.5 | 500 | 20.0 | 1095 | 43.8 | 1169 | 46.8 | 808 | 32.3 | 313 | 12.5 | 34 | 1.4 | 37 | 1.5 | 2500 | 100 |
| 0 | 209 | 8.4 | 872 | 34.9 | 1919 | 76.8 | 1983 | 79.3 | 1419 | 56.8 | 534 | 21.3 | 36 | 1.5 | 37 | 1.5 | 2500 | 100 |
| 5 | 360 | 14.4 | 1530 | 61.2 | 2280 | 91.2 | 2244 | 89.8 | 1770 | 70.8 | 922 | 36.9 | 37 | 1.5 | 36 | 1.4 | 2500 | 100 |
| 10 | 616 | 24.7 | 2089 | 83.6 | 2304 | 92.2 | 2297 | 91.9 | 2070 | 82.8 | 1079 | 43.1 | 41 | 1.6 | 33 | 1.3 | 2500 | 100 |
| 15 | 1080 | 43.2 | 2300 | 92.0 | 2306 | 92.3 | 2306 | 92.2 | 2088 | 83.5 | 1196 | 47.8 | 42 | 1.7 | 33 | 1.3 | 2500 | 100 |
| 20 | 1522 | 60.9 | 2297 | 91.9 | 2309 | 92.3 | 2308 | 92.3 | 2090 | 83.6 | 1228 | 49.1 | 46 | 1.8 | 35 | 1.4 | 2500 | 100 |

## 6.3. Audio Frequency Response

### 6.3.1. Test Setup




1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Set the audio bandwidth filter to 15 kHz and 50kHz.
4) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 20% of the maximum deviation.
5) On audio analyzer, set the rated level as reference to zero.
6) Vary the audio frequency from 300Hz to 3 kHz. Record the change in dB on the audio analyzer.

### 6.3.2. Test Limits:

**§95.575 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.

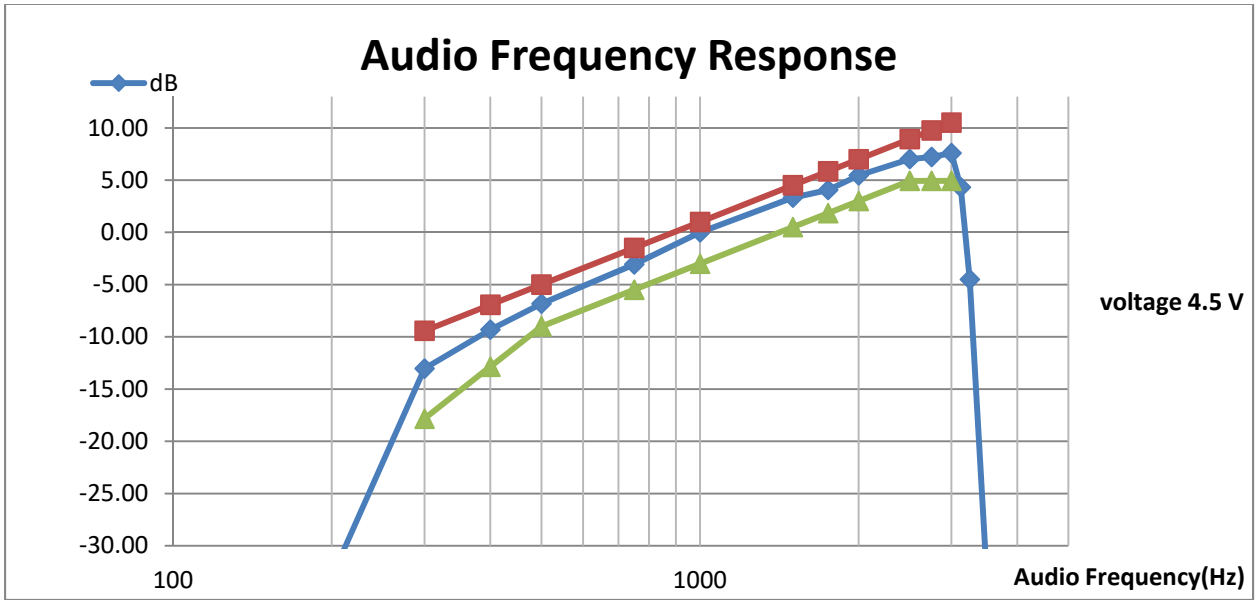
**§95.1775 GMRS modulation requirements**

(c) 467 MHz interstitial channels. The peak frequency deviation for emissions to be transmitted on the 467 MHz interstitial channels must not exceed ± 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

## 6.3.3. Test Result

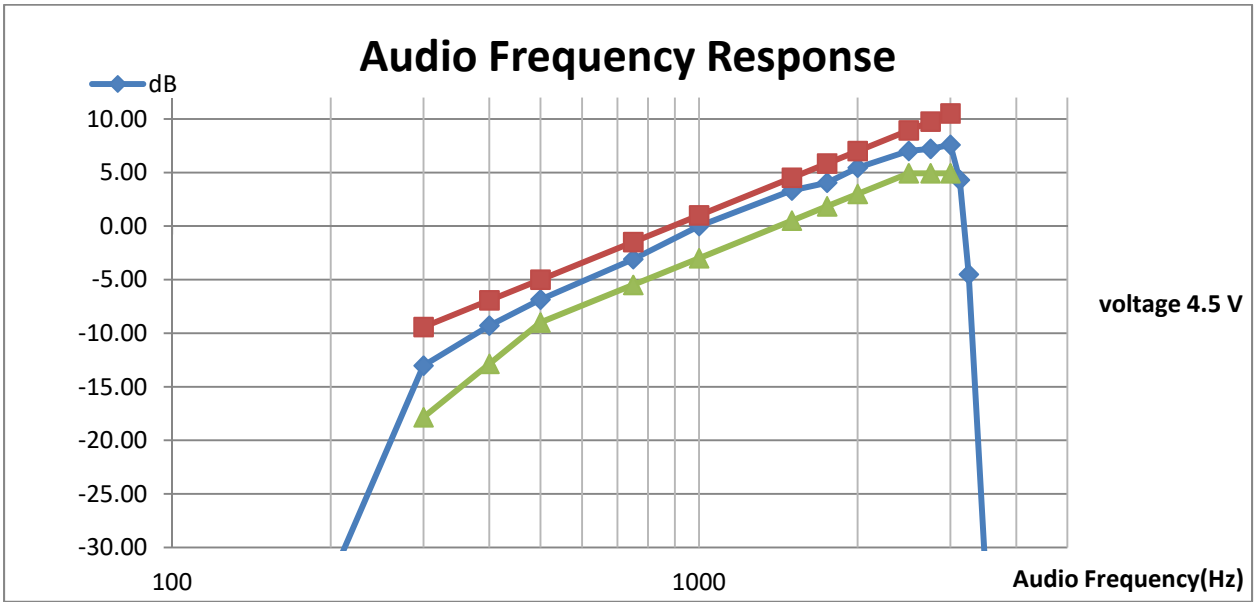
**Frequency : 462.6375 MHz 2.1W**

| voltage | 4.5 V | | |
|---|---|---|---|
| Temp. (°C) | 25 | | |
| Audio Frequency(Hz) | dB | HighSide Specs | LowSide Specs |
| 100 | -32.88 | | |
| 200 | -32.98 | | |
| 300 | -13.04 | -9.4218 | -17.8436 |
| 400 | -9.31 | -6.9316 | -12.8631 |
| 500 | -6.83 | -5.0000 | -9.0000 |
| 750 | -3.07 | -1.4902 | -5.4902 |
| 1000 | 0.00 | 1.0000 | -3.0000 |
| 1500 | 3.33 | 4.5098 | 0.5098 |
| 1750 | 4.06 | 5.8441 | 1.8441 |
| 2000 | 5.46 | 7.0000 | 3.0000 |
| 2500 | 7.02 | 8.9316 | 4.9316 |
| 2750 | 7.22 | 9.7566 | 4.9316 |
| 3000 | 7.59 | 10.5098 | 4.9316 |
| 3125 | 4.32 | | |
| 3250 | -4.50 | | |
| 3500 | -32.85 | | |
| 4000 | -32.68 | | |
| 5000 | -32.58 | | |



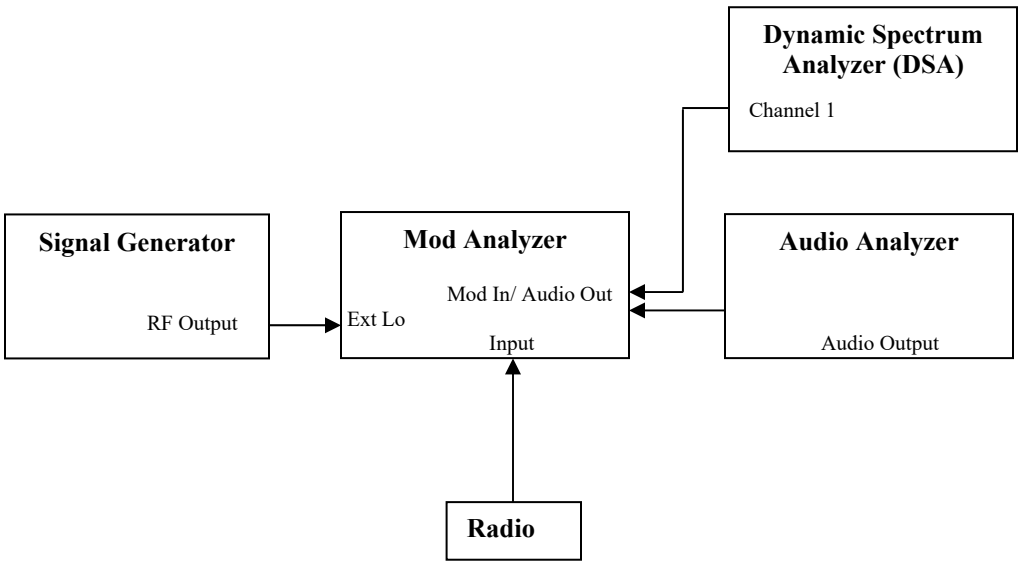
**Frequency : 467.6375 MHz 0.78W**

| voltage | 4.5 V | | |
|---|---|---|---|
| Temp. (°C) | 25 | | |
| Audio Frequency(Hz) | dB | HighSide Specs | LowSide Specs |
| 100 | -32.79 | | |
| 200 | -33.03 | | |
| 300 | -13.03 | -9.4218 | -17.8436 |
| 400 | -9.29 | -6.9316 | -12.8631 |
| 500 | -6.86 | -5.0000 | -9.0000 |
| 750 | -3.09 | -1.4902 | -5.4902 |
| 1000 | 0.00 | 1.0000 | -3.0000 |
| 1500 | 3.32 | 4.5098 | 0.5098 |
| 1750 | 4.05 | 5.8441 | 1.8441 |
| 2000 | 5.45 | 7.0000 | 3.0000 |
| 2500 | 7.01 | 8.9316 | 4.9316 |
| 2750 | 7.21 | 9.7566 | 4.9316 |
| 3000 | 7.58 | 10.5098 | 4.9316 |
| 3125 | 4.30 | | |
| 3250 | -4.51 | | |
| 3500 | -32.65 | | |
| 4000 | -33.22 | | |
| 5000 | -33.00 | | |



## 6.4. Audio Low Pass Filter

### 6.4.1. Test Setup




1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Press 23.1SPCL on modulation analyzer to enable the external LO from SIgen.
4) Set the Sigen frequency to Fc + 1.5MHz, RF output level to 0dBm without modulation.
5) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the maximum deviation.
6) Up the amplitude by 20dB.
7) On DSA, get the reference point to 0dB.
8) Vary the frequency on audio analyzer from 3 kHz to 30 kHz, record the audio tone from DSA.

### 6.4.2. Test Limits:

**§95.1775 GMRS modulation requirements**

(e) Audio filter. Each GMRS transmitter type must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of §95.1779 (without filtering).

(1)The filter must be between the modulation limiter and the modulated stage of the transmitter.

(2) At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least 60 log (f/3) dB more than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB more than the attenuation at 1 kHz.

**RSS-210 E.3.3(GMRS) Modulation Requirements**

| Table E3 — Audio Frequency Filter Attenuation for GMRS Devices | |
|---|---|
| **Frequency, f (kHz)** | **Attenuation Greater Than the Attenuation at 1 kHz (dB)** |
| $3 \leq f \leq 20$ | $60 \log_{10}(f/3)$ |
| $f > 20$ | 50 |

### 6.4.3. Test Result

**The audio low pass filter in BK4815N is realized in DSP unit, there is no low pass filter output pin for this measurement. Therefore, the method above can't be used to get the audio low pass filter response.**

**The response curve can neither be acquired through TX deviation. This is because the residue frequency modulation is dominated by the phase of the PLL.**

**The audio loss pass filter response of Bk4815N is given in the figure below. The low pass filter can be programmed to 2.55 KHZ comer for 12.5 KHZ channel spacing and 3 KHZ comer for 25 KHZ channel spacing.**



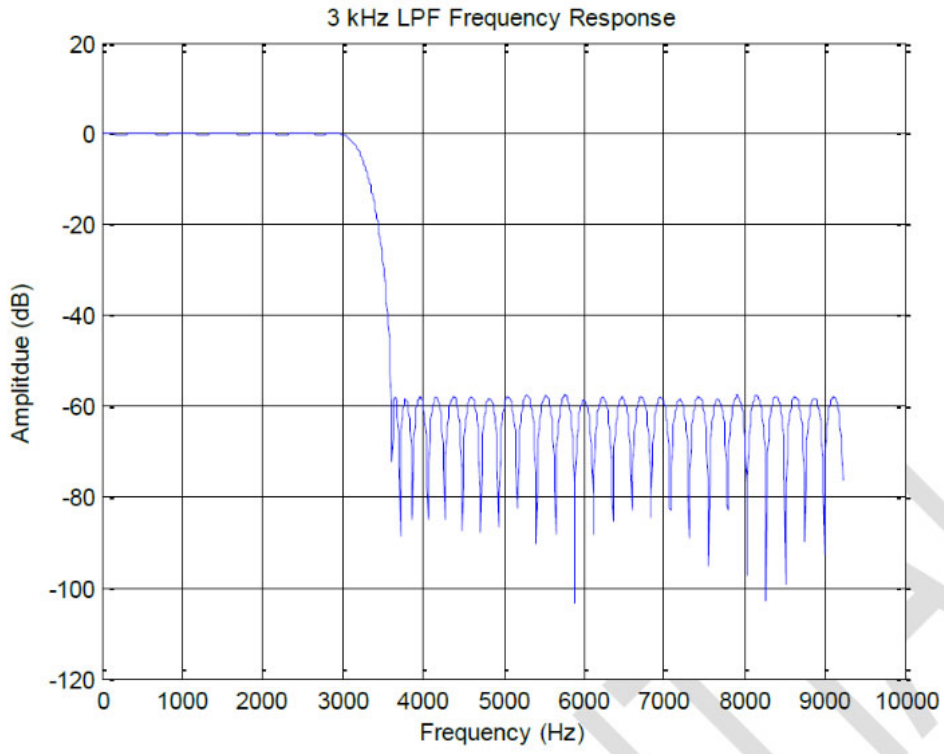
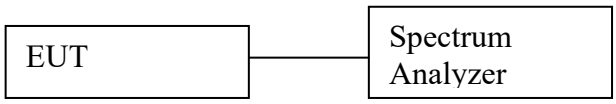



**Figure 10. Frequency Response of Low Pass Filter**

## 6.5. Frequency Stability

### 6.5.1. Test Setup




1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Transmit the DUT and record the freq in $MCF_{MHz}$.
3) Test in 2 conditions: Different Temperature & Supply Voltage input.
   - Temperature: Vary from -30°C to +50°C with Nominal supply voltage.
   - Supply Voltage: Vary +/-15 % in room temperature
4) Calculate the ppm frequency error by the following:

$$ppm\ error = \left( \frac{MCF_{MHz}}{ACF_{MHz}} - 1 \right) * 10^6$$

Where: *MCF*MHz is the Measured Carrier Frequency in MHz
*ACF*MHz is the Assigned Carrier Frequency in MHz

### 6.5.2. Test Limits:

**§95.565 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.

**§95.1765 GMRS frequency accuracy**

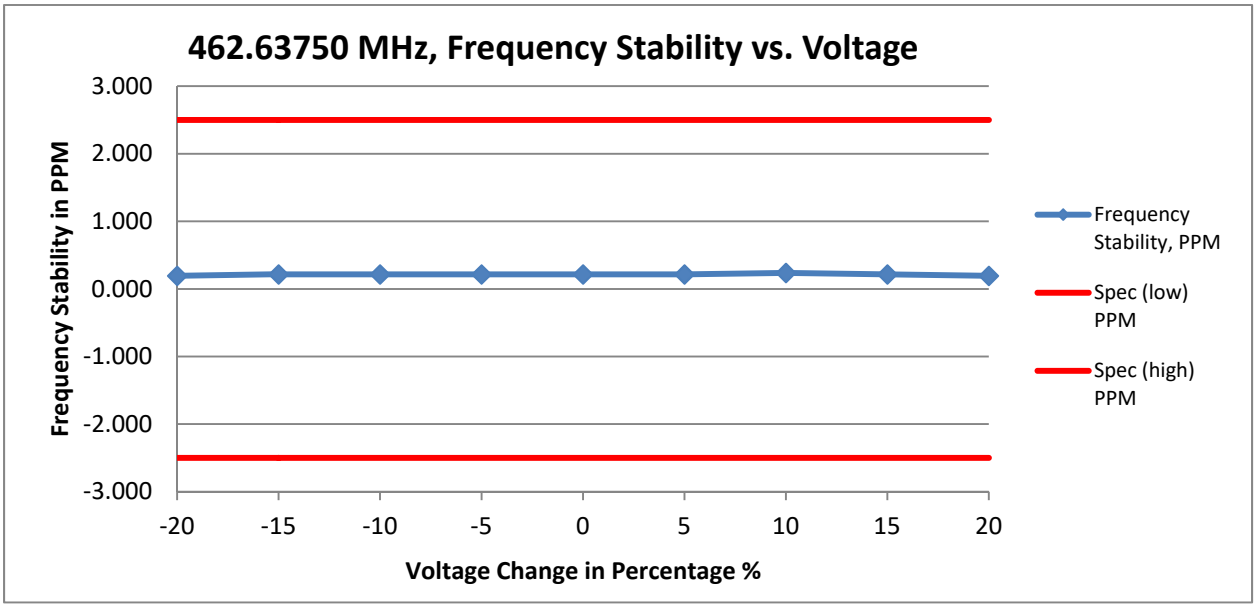
Each GMRS transmitter type must be designed to comply with the frequency accuracy requirements in this section under normal operating conditions. Operators of GMRS stations must also ensure compliance with these requirements.

(a) The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth greater than 12.5 kHz must remain within 5 parts-per-million (ppm) of the channel center frequencies listed in §95.1763 under normal operating conditions.
(b) The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth of 12.5 kHz or less must remain within 2.5 ppm of the channel center frequencies listed in §95.1763 under normal operating conditions.

### 6.5.3. Test Result

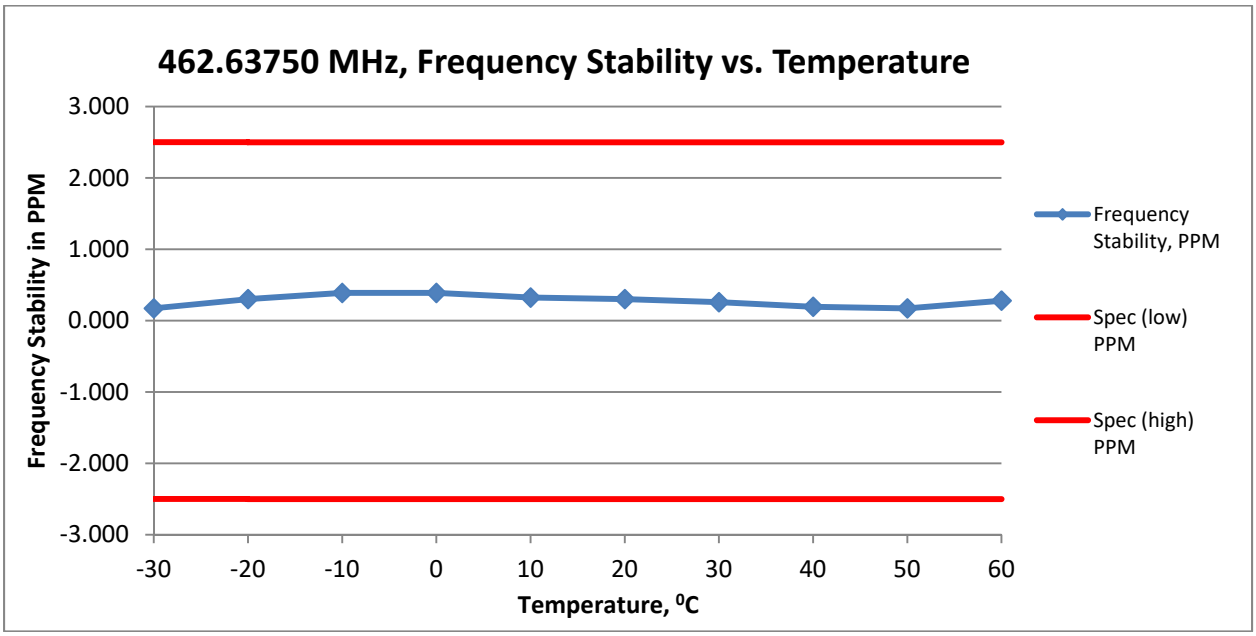
(i) Frequency Stability VS Voltage

| Frequency / Channel Spacing | 462.63750 MHz / 12.5 kHz | | | | |
|---|---|---|---|---|---|
| Temperature, $^0$C | 25 | | | | |
| Voltage % | Voltage, V | Frequency, MHz | Frequency Stability, PPM | Spec (low) PPM | Spec (high) PPM |
| -20 | 3.600 | 462.637590 | 0.195 | -2.500 | 2.500 |
| -15 | 3.825 | 462.637600 | 0.216 | -2.500 | 2.500 |
| -10 | 4.050 | 462.637600 | 0.216 | -2.500 | 2.500 |
| -5 | 4.275 | 462.637600 | 0.216 | -2.500 | 2.500 |
| 0 | 4.500 | 462.637600 | 0.216 | -2.500 | 2.500 |
| 5 | 4.725 | 462.637600 | 0.216 | -2.500 | 2.500 |
| 10 | 4.950 | 462.637610 | 0.238 | -2.500 | 2.500 |
| 15 | 5.175 | 462.637600 | 0.216 | -2.500 | 2.500 |
| 20 | 5.400 | 462.637590 | 0.195 | -2.500 | 2.500 |



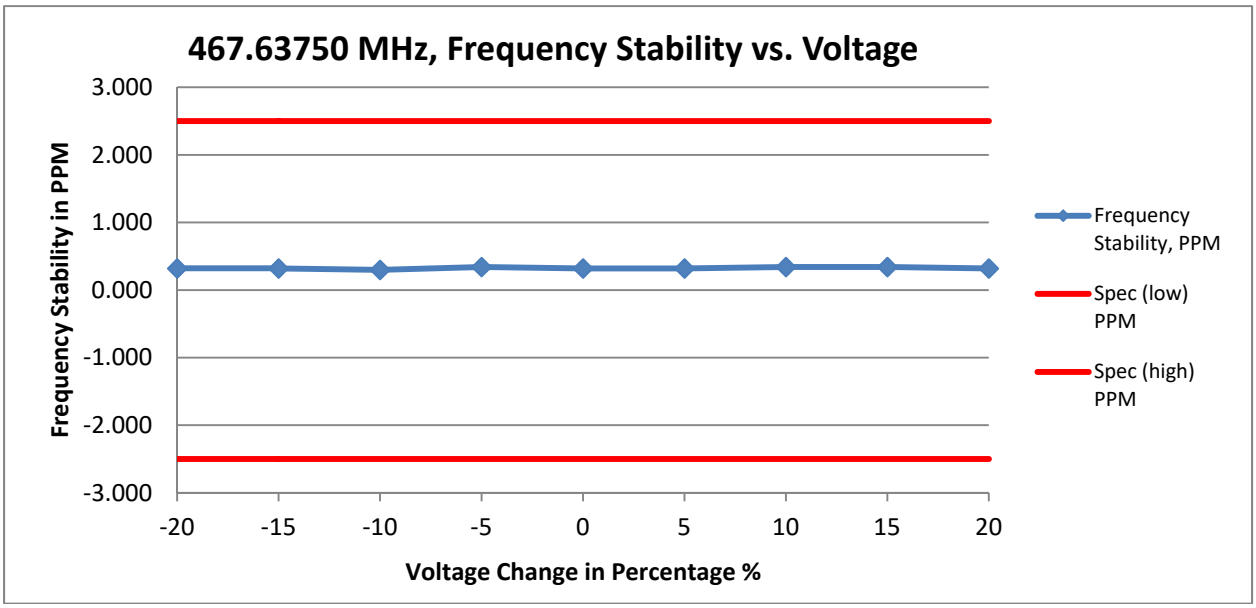
(ii) Frequency Stability VS temperature

| Frequency / Channel Spacing | 462.63750 MHz / 12.5 kHz | | | |
|---|---|---|---|---|
| Voltage, V | 7.5 | | | |
| Temperature, $^0$C | Frequency, MHz | Frequency Stability, PPM | Spec (low) PPM | Spec (high) PPM |
| -30 | 462.637580 | 0.173 | -2.500 | 2.500 |
| -20 | 462.637640 | 0.303 | -2.500 | 2.500 |
| -10 | 462.637680 | 0.389 | -2.500 | 2.500 |
| 0 | 462.637680 | 0.389 | -2.500 | 2.500 |
| 10 | 462.637650 | 0.324 | -2.500 | 2.500 |
| 20 | 462.637640 | 0.303 | -2.500 | 2.500 |
| 30 | 462.637620 | 0.259 | -2.500 | 2.500 |
| 40 | 462.637590 | 0.195 | -2.500 | 2.500 |
| 50 | 462.637580 | 0.173 | -2.500 | 2.500 |
| 60 | 462.637630 | 0.281 | -2.500 | 2.500 |



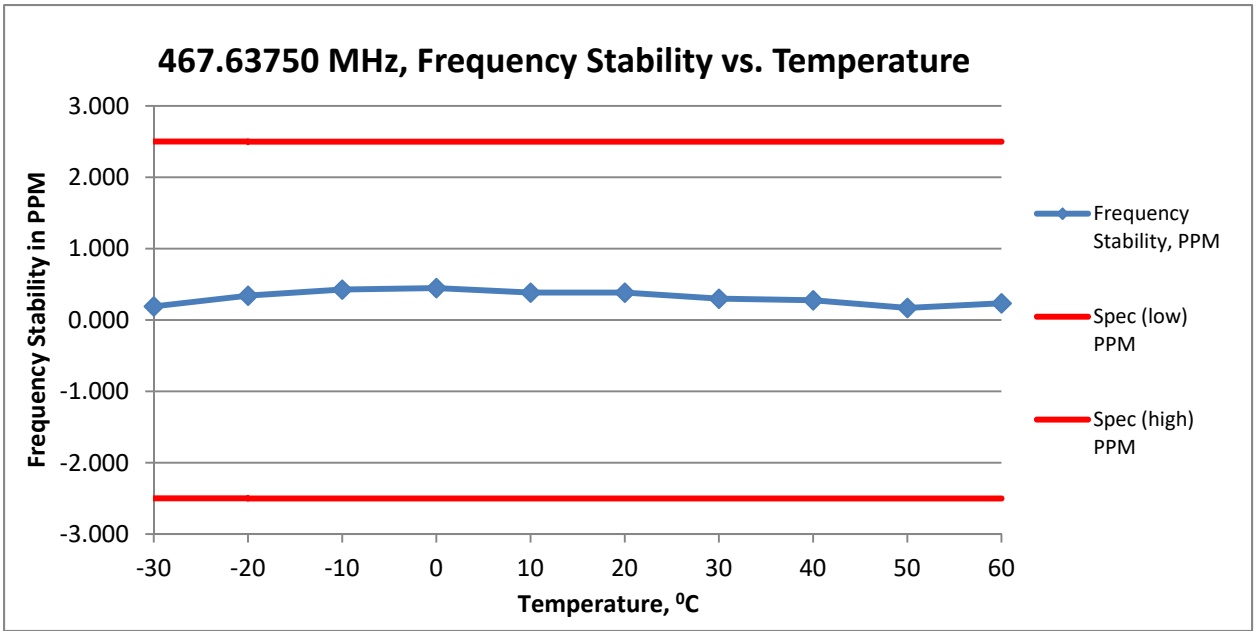
(i) Frequency Stability VS Voltage

| Frequency / Channel Spacing | 467.63750 MHz / 12.5 kHz | | | | |
|---|---|---|---|---|---|
| Temperature, $^0$C | 25 | | | | |
| Voltage % | Voltage, V | Frequency, MHz | Frequency Stability, PPM | Spec (low) PPM | Spec (high) PPM |
| -20 | 3.600 | 467.637650 | 0.321 | -2.500 | 2.500 |
| -15 | 3.825 | 467.637650 | 0.321 | -2.500 | 2.500 |
| -10 | 4.050 | 467.637640 | 0.299 | -2.500 | 2.500 |
| -5 | 4.275 | 467.637660 | 0.342 | -2.500 | 2.500 |
| 0 | 4.500 | 467.637650 | 0.321 | -2.500 | 2.500 |
| 5 | 4.725 | 467.637650 | 0.321 | -2.500 | 2.500 |
| 10 | 4.950 | 467.637660 | 0.342 | -2.500 | 2.500 |
| 15 | 5.175 | 467.637660 | 0.342 | -2.500 | 2.500 |
| 20 | 5.400 | 467.637650 | 0.321 | -2.500 | 2.500 |



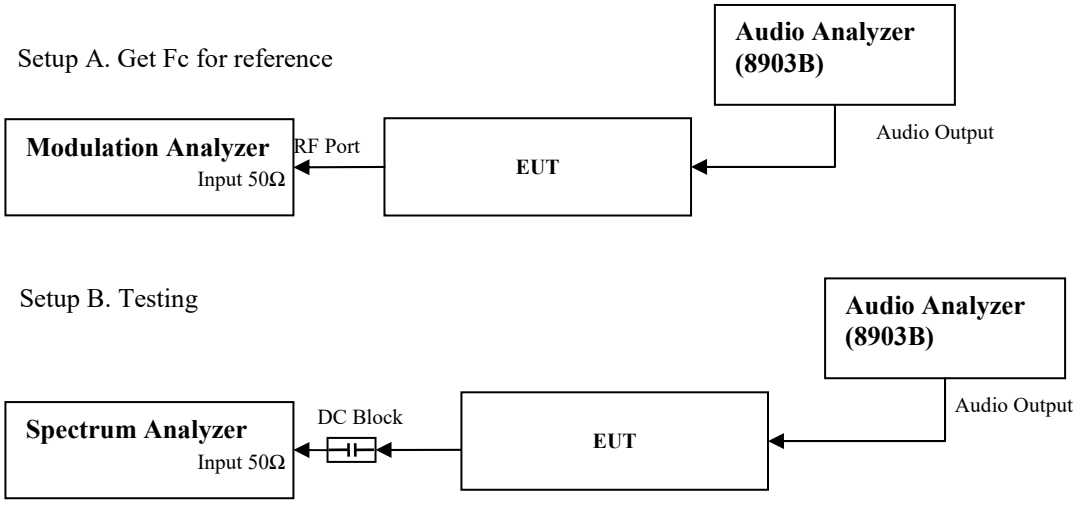
(ii) Frequency Stability VS temperature

| Frequency / Channel Spacing | 467.63750 MHz / 12.5 kHz | | | |
|---|---|---|---|---|
| Voltage, V | 7.5 | | | |
| Temperature, $^0$C | Frequency, MHz | Frequency Stability, PPM | Spec (low) PPM | Spec (high) PPM |
| -30 | 467.637590 | 0.192 | -2.500 | 2.500 |
| -20 | 467.637660 | 0.342 | -2.500 | 2.500 |
| -10 | 467.637700 | 0.428 | -2.500 | 2.500 |
| 0 | 467.637710 | 0.449 | -2.500 | 2.500 |
| 10 | 467.637680 | 0.385 | -2.500 | 2.500 |
| 20 | 467.637680 | 0.385 | -2.500 | 2.500 |
| 30 | 467.637640 | 0.299 | -2.500 | 2.500 |
| 40 | 467.637630 | 0.278 | -2.500 | 2.500 |
| 50 | 467.637580 | 0.171 | -2.500 | 2.500 |
| 60 | 467.637610 | 0.235 | -2.500 | 2.500 |



## 6.6. Emission Mask

### 6.6.1. Test Setup




1) The DUT transmitter output port was connected to Modulation Analyzer.
2) Path loss for the measurement included.
3) Key in the Fc to assigned center frequency with the span 100 kHz.
4) Set the spectrum analyzer with RBW= 300Hz and VBW= 900Hz.
5) Transmit the UUT and record the result.
6) Set modulation analyzer audio bandwidth filter to 15 kHz low pass filter and 50 kHz high pass filter.
7) Transmit the radio and set the audio analyzer to 2.5 kHz audio frequency and 60% of the maximum deviation.
8) Up the amplitude by 16dB and remove the audio tone from audio analyzer.
9) Capture the screen shot with and without modulation.

## 6.6.2. Test Limits:

### §95.579 FRS unwanted emissions limits

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.
(a) Attenuation requirements. The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:
(1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.
(2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.
(3) 43 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.
(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.
(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.

### §95.1779 GMRS unwanted emissions limits (1), (2), (7)

Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(a) Emission masks. Emission masks applicable to transmitting equipment in the GMRS are defined by the requirements in the following table. The numbers in the attenuation requirements column refer to rule paragraph numbers under paragraph (b) of this section.

| Emission types filter | Attenuation requirements |
|---|---|
| A1D, A3E, F1D, G1D, F2D, F3E, G3E with audio filter | (1), (2), (7) |
| A1D, A3E, F1D, G1D, F3E, G3E without audio filter | (3), (4), (7) |
| H1D, J1D, R1D, H3E, J3E, R2E | (5), (6), (7) |

(1) Filtering noted for GMRS transmitters refers to the requirement in §95.1775(e).

(2) Unwanted emission power may be measured as either mean power or peak envelope power, provided that the transmitter output power is measured the same way.

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

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(3) 83 log (fd ÷ 5) dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz up to and including 10 kHz.

(4) 116 log (fd ÷ 6.1) dB or 50 + 10 log (P) dB, whichever is the lesser attenuation, on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz), of more than 10 kHz up to and including 250% of the authorized bandwidth.

(5) 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 150% of the authorized bandwidth.

(6) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 150% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(c) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) through (4) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (b)(5) of this section is measured with a reference bandwidth of at least 30 kHz.

(d) Measurement conditions. The requirements in this section apply to each GMRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone, power cord and/or antenna.

### 6.6.3. Test Data

**BANDWIDTH CALCULATIONS:**

Carson's Rule for FM modulation is utilized to compute the bandwidth shown in the FCC emission designator. Carson's Rule is: BW = 2 * (M + D)

where: BW = Bandwidth
M = Maximum modulating frequency
D = Deviation

**Standard Audio Modulation (12.5 kHz Channelization, Analog Voice):**

Emission Designator 11K0F3E

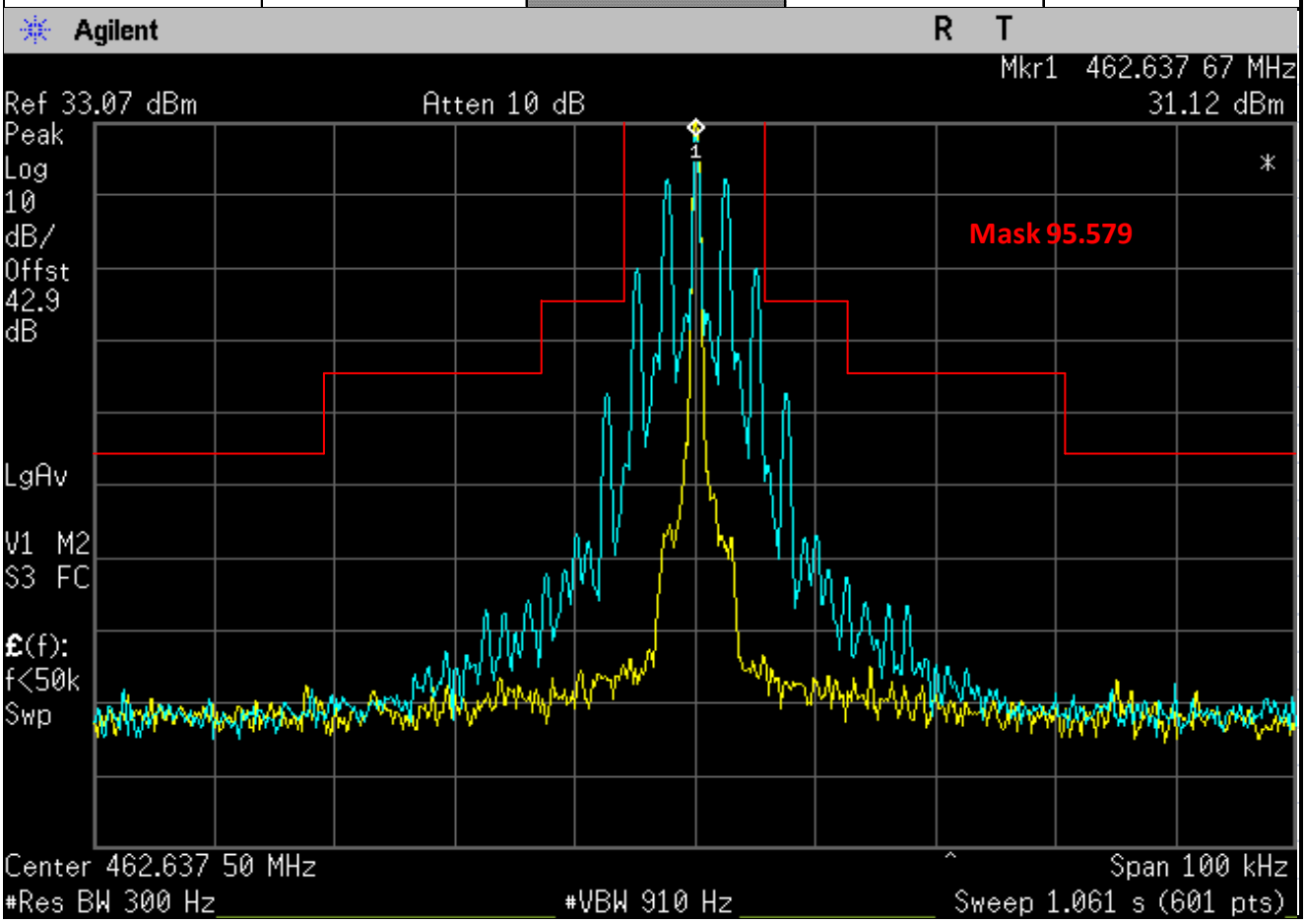
In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

BW = 2(M+D) = 2*(3.0 kHz + 2.5 kHz) = 11 kHz ➔ 11K0

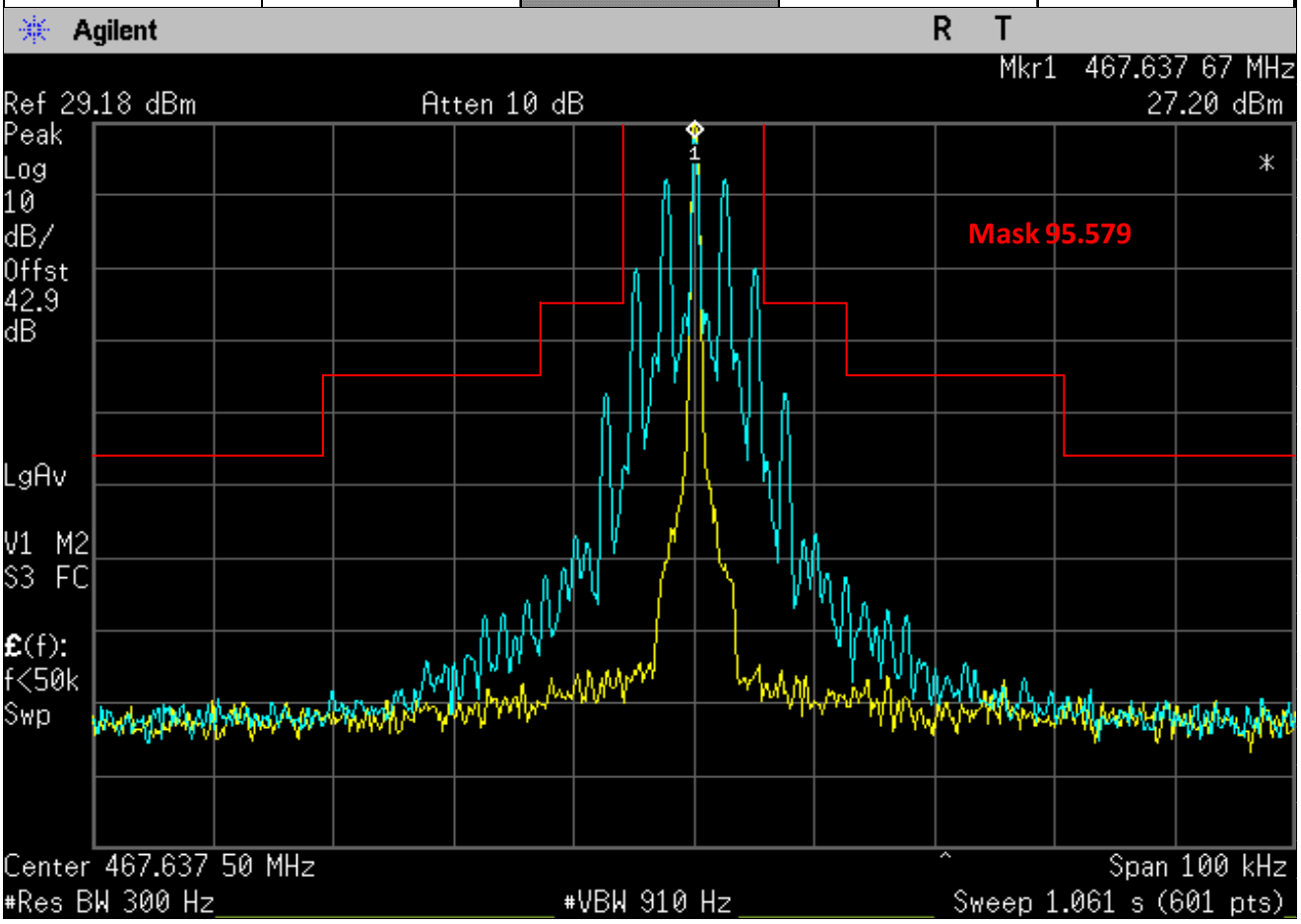
F3E portion of the designator indicates voice.

Therefore, the entire designator for 12.5 kHz channelization analog voice is 11K0F3E.

| Modulation | | | Rules Part | |
|---|---|---|---|---|
| Analog Voice | | | FCC Part 95.579 | |
| **Channel Frequency (MHz)** | **Channel Spacing (kHz)** | | **99% OCB (kHz)** | **Emission Designator** |
| 462.6375 | 12.5 | | 9.9774 | 11K0F3E |

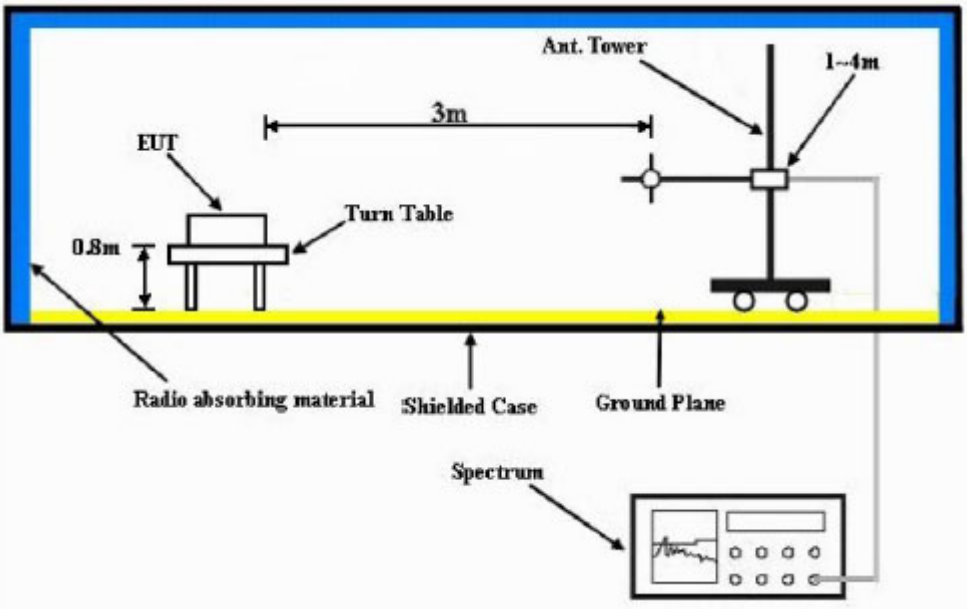


| Modulation | | | Rules Part | |
|---|---|---|---|---|
| Analog Voice | | | FCC Part 95.579 | |
| **Channel Frequency (MHz)** | **Channel Spacing (kHz)** | | **99% OCB (kHz)** | **Emission Designator** |
| 467.6375 | 12.5 | | 9.9776 | 11K0F3E |



## 6.7. Radiated Spurious Emission

### 6.7.1. Test Setup




1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1 MHz, VBW = 3 MHz. Detector mode is positive peak.
2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height (for frequencies < 1GHz) or 1.5m (for frequencies > 1GHz) of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3) 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 rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

## 6.7.2. Test Result

**SAC Transmitter Radiated Emission:**

**Model Number: T803** **S/N: 17520ZN0371** **SR:39731-EMC-00005**

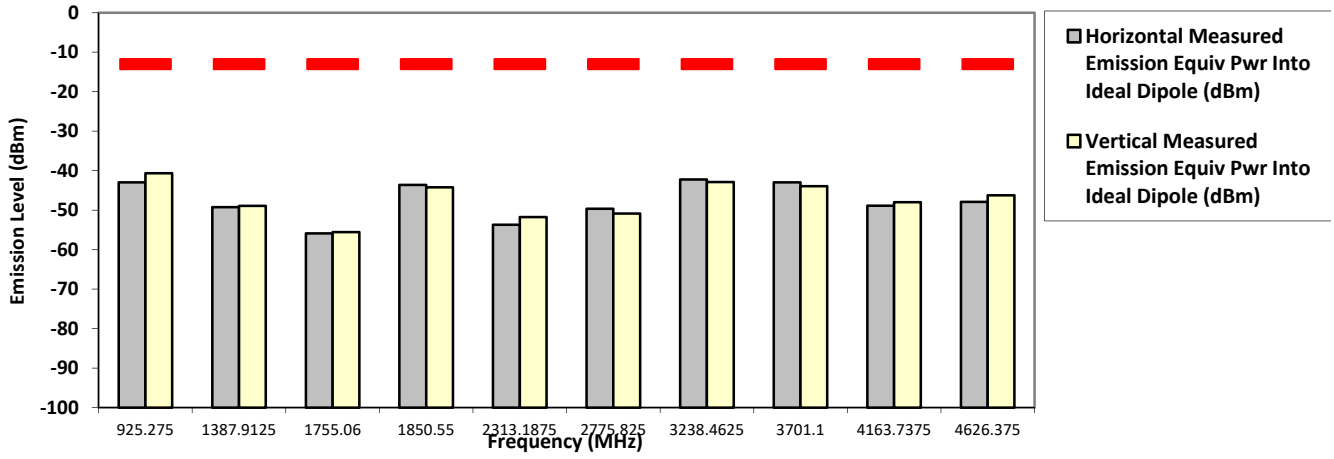
**Battery Part No: 1532** **Accy Part No: NA**

**Test Mode: TX Analog**

**462.637500 MHz** **12.5 kHz** **2.000 Watt(s) /Max Power**

| Frequency (MHz) | Limit | Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm) | Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm) |
|---|---|---|---|
| 925.2750 | -13.0000 | -42.9600 * | -40.6600 * |
| 1387.9125 | -13.0000 | -49.2300 * | -48.9100 * |
| 1755.0600 | -13.0000 | -55.8700 * | -55.5500 * |
| 1850.5500 | -13.0000 | -43.6200 * | -44.2000 * |
| 2313.1875 | -13.0000 | -53.7004 ** | -51.7454 ** |
| 2775.8250 | -13.0000 | -49.6351 ** | -50.8552 ** |
| 3238.4625 | -13.0000 | -42.2200 * | -42.9000 * |
| 3701.1000 | -13.0000 | -42.9700 * | -43.9500 * |
| 4163.7375 | -13.0000 | -48.8699 ** | -48.0045 ** |
| 4626.3750 | -13.0000 | -47.8979 ** | -46.2578 ** |
| | | | |
| | | | |
| | | | |
| | | | |

**RADIATED SPURIOUS EMISSIONS**




**The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.**

**Motorola Penang EMC Lab - Test Performed by: Aiman** **Sat, 19 Aug, 2023**

**Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.**

***Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported**

**Temp(Deg): 22.5 Hum(%RH): 66.3**

**System MU: 4.03 dB**

***Remarks:*** Passed Results | **Marginal Results** | **Failed Results**

**SAC Transmitter Radiated Emission:**

**Model Number: T803** **S/N: 17520ZN0371** **SR:39731-EMC-00005**

**Battery Part No: 1532** **Accy Part No: NA**

**Test Mode: TX Analog**

**467.637500 MHz** **12.5 kHz** **0.500 Watt(s) /Max Power**

| Frequency (MHz) | Limit | Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm) | Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm) |
|---|---|---|---|
| 935.2750 | -13.0000 | -41.5300 * | -39.8100* |
| 1402.9125 | -13.0000 | -58.5600 * | -58.4200 * |
| 1870.5500 | -13.0000 | -52.9784 ** | -54.0848 ** |
| 2338.1875 | -13.0000 | -51.7428 ** | -51.9197 ** |
| 2805.8250 | -13.0000 | -50.9192 ** | -51.9198 ** |
| 3273.4625 | -13.0000 | -50.1727 ** | -50.0142 ** |
| 3741.1000 | -13.0000 | -46.9392 ** | -48.7150 ** |
| 4208.7375 | -13.0000 | -47.9058 ** | -49.2688 ** |
| 4676.3750 | -13.0000 | -47.3011 ** | -47.2094 ** |
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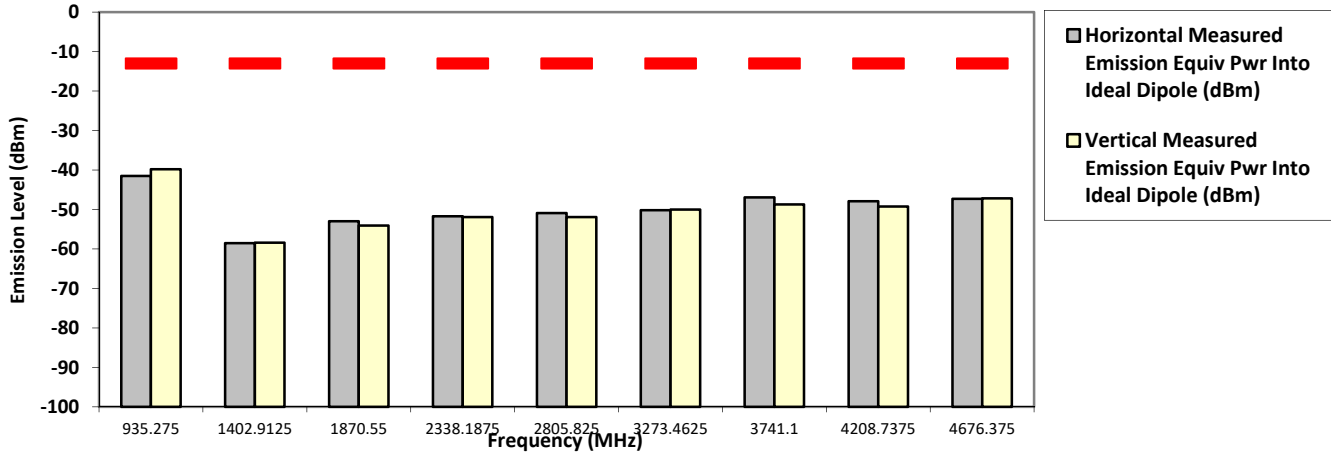
**RADIATED SPURIOUS EMISSIONS**




**The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.**

**Motorola Penang EMC Lab - Test Performed by: Aiman** **Sat, 19 Aug, 2023**

**Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.**

***Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported**

**Temp(Deg): 22.5 Hum(%RH): 66.3**

**System MU: 4.03 dB**

***Remarks:***

| Passed Results | **Marginal Results** | **Failed Results** |
|---|---|---|

**SAC Transmitter Radiated Emission:**

**Model Number: T803** **S/N: 17520ZN0371, 17520ZN0372** **SR:39731-EMC-00014**

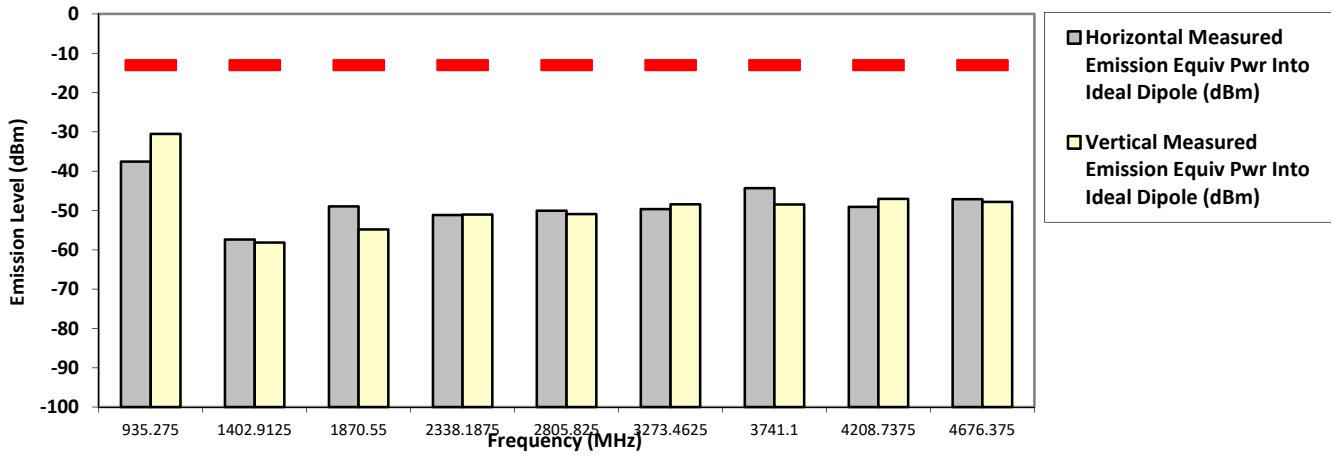
**Battery Part No: PMNN4477A, 1532** **Accy Part No: 10998-PS000228A01-2, PMLN8219A-C2**

**Test Mode: TX Analog**

**467.637500 MHz** **12.5 kHz** **0.500 Watt(s) /Max Power**

| Frequency (MHz) | Limit | Horizontal Measured Emission Equiv Pwr Into Ideal Dipole (dBm) | Vertical Measured Emission Equiv Pwr Into ideal Dipole (dBm) |
|---|---|---|---|
| 935.2750 | -13.0000 | -37.5700 * | -30.5100 |
| 1402.9125 | -13.0000 | -57.3800 * | -58.1500 * |
| 1870.5500 | -13.0000 | -48.9300 * | -54.8100 * |
| 2338.1875 | -13.0000 | -51.1600 * | -51.0400 * |
| 2805.8250 | -13.0000 | -50.0615 ** | -50.9116 ** |
| 3273.4625 | -13.0000 | -49.6293 ** | -48.4277 ** |
| 3741.1000 | -13.0000 | -44.2900 * | -48.4700 * |
| 4208.7375 | -13.0000 | -49.0731 ** | -47.0219 ** |
| 4676.3750 | -13.0000 | -47.0983 ** | -47.8225 ** |
| | | | |
| | | | |
| | | | |
| | | | |

**RADIATED SPURIOUS EMISSIONS**




**The data presented here was taken using the substitution method as found in the ANSI C63.26-2015 document.**

**Motorola Penang EMC Lab - Test Performed by: Aiman** **Fri, 25 Aug, 2023**

**Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.**

***Pursuant to CFR 47 Part 2.1057 ( c ), emissions attenuated more than 20 dB below the permissible limit are not reported**

**Temp(Deg): 23.6 Hum(%RH): 58.6**

**System MU: 4.03 dB**

***Remarks:***

| Passed Results | **Marginal Results** | **Failed Results** |
|---|---|---|

### 6.7.3. Test limit

At least 43 + 10 $\log_{10}$ (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

**§95.579 FRS unwanted emissions limits**

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

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

(1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.

(2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.

(3) 43 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.

(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.

(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.

**§95.1779 GMRS unwanted emissions limits (1), (2), (7)**

Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(a) Emission masks. Emission masks applicable to transmitting equipment in the GMRS are defined by the requirements in the following table. The numbers in the attenuation requirements column refer to rule paragraph numbers under paragraph (b) of this section.

| Emission types filter | Attenuation requirements |
|---|---|
| A1D, A3E, F1D, G1D, F2D, F3E, G3E with audio filter | (1), (2), (7) |
| A1D, A3E, F1D, G1D, F3E, G3E without audio filter | (3), (4), (7) |
| H1D, J1D, R1D, H3E, J3E, R2E | (5), (6), (7) |

(1) Filtering noted for GMRS transmitters refers to the requirement in §95.1775(e).

(2) Unwanted emission power may be measured as either mean power or peak envelope power, provided that the transmitter output power is measured the same way.

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

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(3) 83 log (fd ÷ 5) dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz up to and including 10 kHz.

(4) 116 log (fd ÷ 6.1) dB or 50 + 10 log (P) dB, whichever is the lesser attenuation, on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz), of more than 10 kHz up to and including 250% of the authorized bandwidth.

(5) 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 150% of the authorized bandwidth.

(6) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 150% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(c) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) through (4) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (b)(5) of this section is measured with a reference bandwidth of at least 30 kHz.

(d) Measurement conditions. The requirements in this section apply to each GMRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone, power cord and/or antenna.

End of Test Report -