

## FCC PART 95

## TEST REPORT

For

### QUANZHOU DAYTECH ELECTRONICS CO., LTD.

Hengdali Business Center, North Quanan Road, Jinjiang City, Quanzhou, Fujian, China

**FCC ID: 2AWYQWT08-US-4**

|                                        |                                                                                                                                                                                                                               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Original Report | <b>Product Type:</b><br>Two Way Radio                                                                                                                                                                                         |
| <b>Test Engineer:</b>                  | CK Huang                                                                                                                                                                                                                      |
| <b>Report Number:</b>                  | RXM200825061-00B                                                                                                                                                                                                              |
| <b>Report Date:</b>                    | 2020-10-20                                                                                                                                                                                                                    |
| <b>Reviewed By:</b>                    | Oscar Ye<br>EMC Manager                                                                                                                                                                                                       |
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                            |                                                                    |
|----------------------------|--------------------------------------------------------------------|
| Applicant                  | QUANZHOU DAYTECH ELECTRONICS CO., LTD.                             |
| Tested Model               | WT08-US-4                                                          |
| Series Model               | WT08-US-2, WT06-US, W2-01BL-US                                     |
| Model Difference           | Model name                                                         |
| Product Type               | Two Way Radio                                                      |
| Modulation Mode            | FM                                                                 |
| Channel Spacing            | 12.5 kHz                                                           |
| Maximum Output Power (ERP) | 462.5500-462.7250MHz: 22.87 dBm<br>467.5625-467.7125MHz: 22.44 dBm |
| Operation Frequency        | 462.5500-462.7250 MHz;<br>467.5625-467.7125 MHz                    |
| Power Supply               | DC 3.7V from battery and DC 5V from adapter                        |
| Antenna Gain               | 1.8 dBi                                                            |

*Note: The difference between tested model and series model was explained in the attached declaration letter.*

*\*All measurement and test data in this report was gathered from production sample serial number: 20200825061.  
(Assigned by the BACL. The EUT supplied by the applicant was received on 2020-08-25)*

### Objective

This test report is prepared on behalf of *QUANZHOU DAYTECH ELECTRONICS CO., LTD.* in accordance with Part 2 and Part 95, Subpart B of the Federal Communication Commissions rules.

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

No related submittal(s).

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart B and Subpart E of the Federal Communication Commissions rules with TIA-603-E, Land Mobile FM or PM- Communications Equipment-Measurement and Performance Standards.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Measurement Uncertainty**

| Item                          | Uncertainty                              |
|-------------------------------|------------------------------------------|
| Occupied Channel Bandwidth    | $\pm 5\%$                                |
| RF output power, conducted    | $\pm 0.61\text{dB}$                      |
| Unwanted Emissions, radiated  | 30MHz~1GHz: 5.85dB<br>1G~26.5GHz: 5.23dB |
| Unwanted Emissions, conducted | $\pm 1.5\text{dB}$                       |
| Temperature                   | $\pm 1.0^{\circ}\text{C}$                |
| Humidity                      | $\pm 5\%$                                |
| DC and low frequency voltages | $\pm 0.4\%$                              |
| Duty Cycle                    | 1%                                       |

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

Test channel list as below, EUT was tested with channel 4 and 11.

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

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

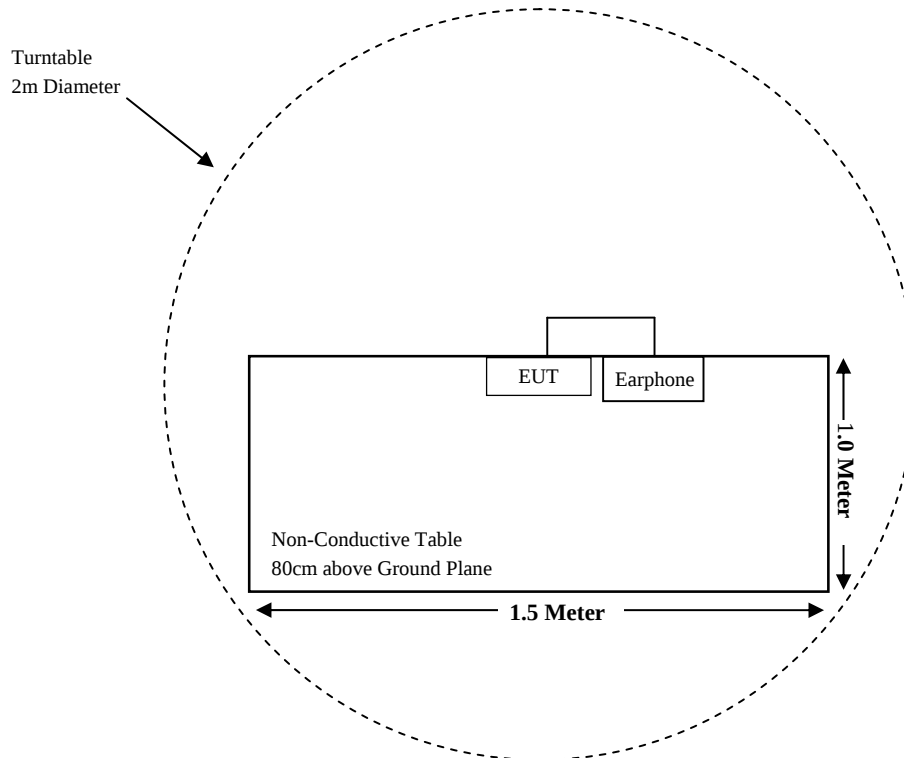
| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|-------|---------------|
| /            | /           | /     | /             |

### External I/O Cable

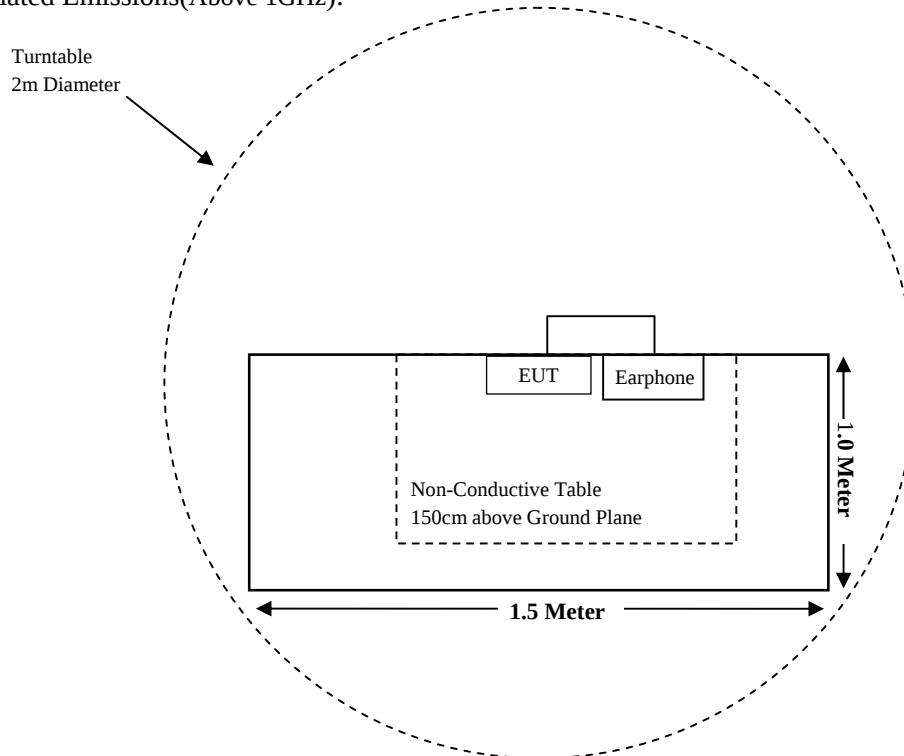
| Cable Description | Length (m) | From Port | To |
|-------------------|------------|-----------|----|
| /                 | /          | /         | /  |

## Block Diagram of Test Setup

For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



**SUMMARY OF TEST RESULTS**

| FCC Rules                 | Description of Test                  | Results                        |
|---------------------------|--------------------------------------|--------------------------------|
| §2.1093                   | RF Exposure                          | Compliant                      |
| §2.1046, §95.567          | RF Output Power                      | Compliant                      |
| §2.1047, §95.575          | Modulation Characteristic            | Compliant                      |
| §2.1049, §95.573, §95.579 | Authorized Bandwidth & Emission Mask | Compliant                      |
| §2.1053, §95.579          | Spurious Radiated Emissions          | Compliant                      |
| §2.1055(d), §95.565       | Frequency Stability                  | Compliant                      |
| §95.587                   | Digital data transmissions           | Not Applicable<br>(See Note 1) |

Note 1: The EUT is analogue.

**TEST EQUIPMENT LIST**

| Manufacturer                               | Description                    | Model                | Serial Number | Calibration Date | Calibration Due Date |
|--------------------------------------------|--------------------------------|----------------------|---------------|------------------|----------------------|
| <b>Radiated Emission Test (Chamber 1#)</b> |                                |                      |               |                  |                      |
| Rohde & Schwarz                            | EMI Test Receiver              | ESCI                 | 100195        | 2019-12-14       | 2020-12-13           |
| Sunol Sciences                             | Broadband Antenna              | JB3                  | A090413-1     | 2017-12-26       | 2020-12-25           |
| Sunol Sciences                             | Bilog antenna                  | JB3                  | A060217       | 2020-08-04       | 2023-08-03           |
| HP                                         | Signal Generator               | N5183A               | MY51040755    | 2019-12-14       | 2020-12-13           |
| Sonoma Instrunent                          | Pre-amplifier                  | 310N                 | 171205        | 2020-08-14       | 2021-08-13           |
| Rohde & Schwarz                            | Auto test Software             | EMC32                | 100361        | /                | /                    |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-8              | 008           | 2020-08-15       | 2021-08-14           |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-9              | 009           | 2020-08-15       | 2021-08-14           |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-10             | 010           | 2020-08-15       | 2021-08-14           |
| <b>Radiated Emission Test (Chamber 2#)</b> |                                |                      |               |                  |                      |
| HP                                         | Signal Generator               | N5183A               | MY51040755    | 2019-12-14       | 2020-12-13           |
| Rohde & Schwarz                            | EMI Test Receiver              | ESU40                | 100207        | 2020-04-01       | 2021-03-31           |
| ETS-LINDGREN                               | Horn Antenna                   | 3115                 | 9207-3900     | 2019-07-15       | 2023-07-14           |
| ETS-LINDGREN                               | Horn Antenna                   | 3115                 | 6229          | 2020-01-10       | 2023-01-09           |
| A.H.Systems,inc                            | Amplifier                      | PAM-0118P            | 512           | 2020-02-20       | 2021-02-19           |
| Rohde & Schwarz                            | Auto test Software             | EMC32                | 100361        | /                | /                    |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-6              | 006           | 2020-08-15       | 2021-08-14           |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-11             | 011           | 2020-08-15       | 2021-08-14           |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-12             | 012           | 2020-08-15       | 2021-08-14           |
| MICRO-COAX                                 | Coaxial Cable                  | Cable-13             | 013           | 2020-08-15       | 2021-08-14           |
| <b>RF Conducted Test</b>                   |                                |                      |               |                  |                      |
| Rohde & Schwarz                            | Signal Analyzer                | FSV40                | 101116        | 2020-08-05       | 2021-08-04           |
| Narda                                      | Attenuator                     | 10dB                 | 010           | 2020-08-15       | 2021-08-14           |
| BACL                                       | Temperature & Humidity Chamber | BTH-150              | 30023         | 2019-12-20       | 2020-12-19           |
| ZHAOXIN                                    | DC Power Supply                | RXN-605D             | DC002         | 2019-10-10       | 2020-10-09           |
| ZHAOXIN                                    | DC Power Supply                | RXN-605D             | DC002         | 2020-10-10       | 2021-10-09           |
| HP                                         | RF communication test SET.     | 8920B                | 079           | 2020-04-01       | 2021-03-31           |
| QUANZHOU DAYTECH                           | RF Cable                       | QUANZHOU DAYTECH C01 | C01           | Each Time        | /                    |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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## **FCC §2.1093 - RF EXPOSURE**

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### **Applicable Standard**

According to §2.1093 and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

### **Measurement Result**

Please refer to SAR Report: RXM200825061-20

## **FCC §2.1046, §95.567 - RF OUTPUT POWER**

### **Applicable Standard**

According to FCC §95.567

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

### **Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the emissions were measured by the substitution.

### **Test Data**

#### **Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.9 °C   |
| <b>Relative Humidity:</b> | 52 %      |
| <b>ATM Pressure:</b>      | 100.7 kPa |

*The testing was performed by CK Huang on 2020-09-07.*

*Test Result: Compliant.*

*Test Mode: Transmitting*

**ERP:**

| Frequency<br>(MHz)     | Polar<br>(H/V) | Receiver<br>Reading<br>(dBuV) | Substituted                 |                       |                          | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|------------------------|----------------|-------------------------------|-----------------------------|-----------------------|--------------------------|----------------------------|----------------|----------------|
|                        |                |                               | Submitted<br>Level<br>(dBm) | Cable<br>Loss<br>(dB) | Antenna<br>Gain<br>(dBd) |                            |                |                |
| Frequency: 462.6375MHz |                |                               |                             |                       |                          |                            |                |                |
| 462.6375               | H              | 124.79                        | 25.15                       | 0.55                  | -1.73                    | 22.87                      | 33             | 10.13          |
| 462.6375               | V              | 124.69                        | 25.05                       | 0.55                  | -1.73                    | 22.77                      | 33             | 10.23          |
| Frequency: 467.6375MHz |                |                               |                             |                       |                          |                            |                |                |
| 467.6375               | H              | 124.85                        | 24.75                       | 0.55                  | -1.76                    | 22.44                      | 27             | 4.56           |
| 467.6375               | V              | 124.22                        | 24.12                       | 0.55                  | -1.76                    | 21.81                      | 27             | 5.19           |

Note: Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

**FCC §2.1047, §95.575 - MODULATION CHARACTERISTIC**

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**Applicable Standard**

Per FCC §2.1047 and §95.575:

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

**Test Procedure**

Test Method: TIA/EIA-603-E

**Test Data****Environmental Conditions**

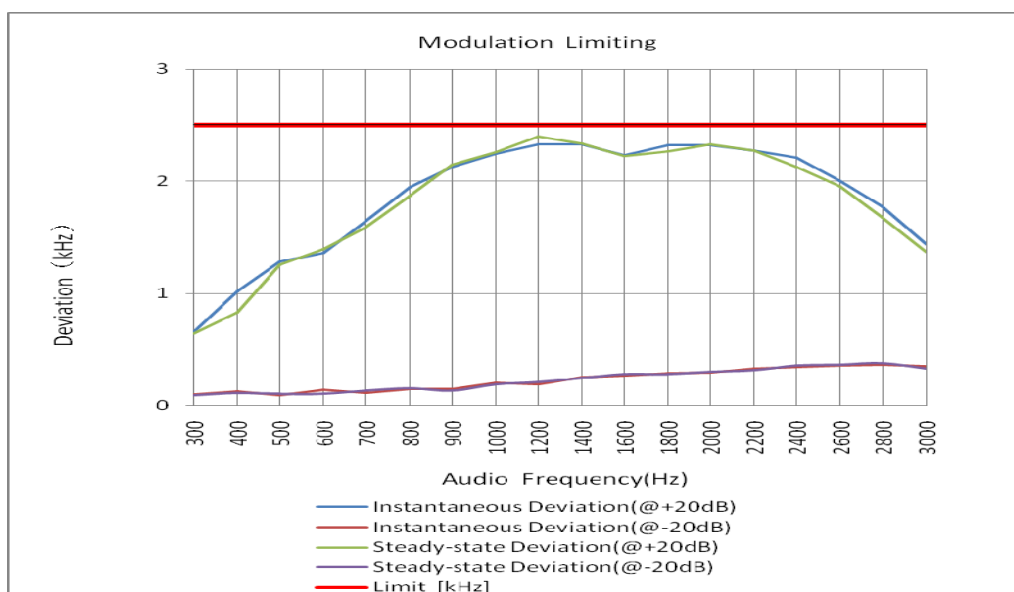
|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.9 °C   |
| <b>Relative Humidity:</b> | 52 %      |
| <b>ATM Pressure:</b>      | 100.7 kPa |

*The testing was performed by CK Huang on 2020-09-07.*

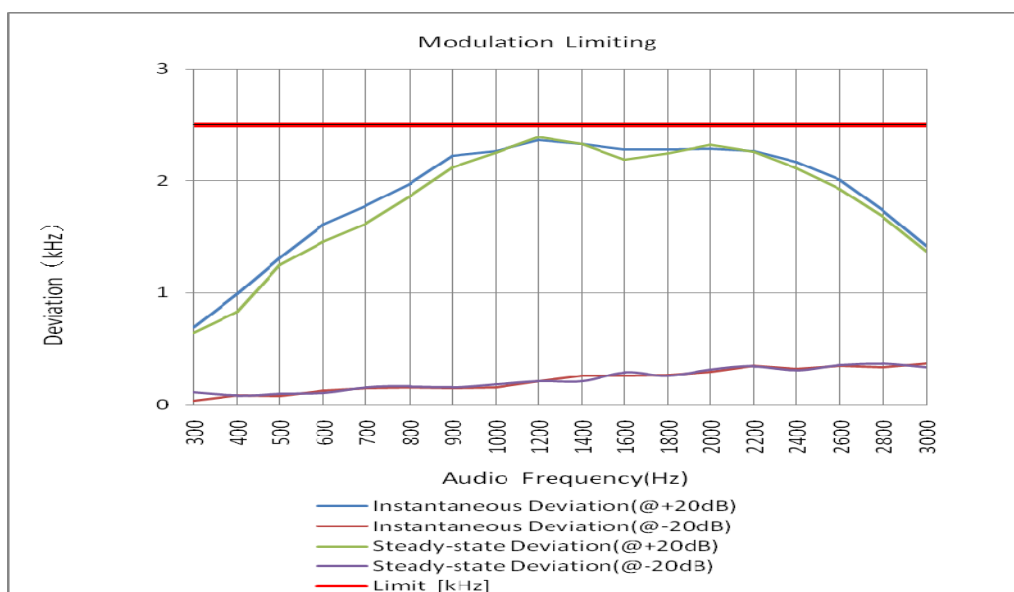
*Test Mode: Transmitting*

**MODULATION LIMITING**

| Carrier Frequency: 462.6375MHz |                          |                          |                          |                          |             |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------|
| Audio Frequency (Hz)           | Instantaneous            |                          | Steady-state             |                          | Limit (kHz) |
|                                | Deviation (@+20dB) (kHz) | Deviation (@-20dB) (kHz) | Deviation (@+20dB) (kHz) | Deviation (@-20dB) (kHz) |             |
| 300                            | 0.680                    | 0.069                    | 0.611                    | 0.103                    | 2.5         |
| 400                            | 1.017                    | 0.099                    | 0.835                    | 0.089                    | 2.5         |
| 500                            | 1.299                    | 0.093                    | 1.251                    | 0.094                    | 2.5         |
| 600                            | 1.616                    | 0.159                    | 1.425                    | 0.141                    | 2.5         |
| 700                            | 1.768                    | 0.152                    | 1.591                    | 0.146                    | 2.5         |
| 800                            | 1.913                    | 0.189                    | 1.908                    | 0.182                    | 2.5         |
| 900                            | 2.193                    | 0.183                    | 2.160                    | 0.190                    | 2.5         |
| 1000                           | 2.243                    | 0.170                    | 2.219                    | 0.197                    | 2.5         |
| 1200                           | 2.378                    | 0.233                    | 2.401                    | 0.181                    | 2.5         |
| 1400                           | 2.327                    | 0.219                    | 2.298                    | 0.267                    | 2.5         |
| 1600                           | 2.256                    | 0.231                    | 2.175                    | 0.259                    | 2.5         |
| 1800                           | 2.328                    | 0.278                    | 2.294                    | 0.280                    | 2.5         |
| 2000                           | 2.330                    | 0.341                    | 2.319                    | 0.315                    | 2.5         |
| 2200                           | 2.306                    | 0.288                    | 2.261                    | 0.362                    | 2.5         |
| 2400                           | 2.155                    | 0.367                    | 2.117                    | 0.316                    | 2.5         |
| 2600                           | 2.034                    | 0.347                    | 1.955                    | 0.344                    | 2.5         |
| 2800                           | 1.734                    | 0.347                    | 1.737                    | 0.360                    | 2.5         |
| 3000                           | 1.431                    | 0.316                    | 1.340                    | 0.304                    | 2.5         |

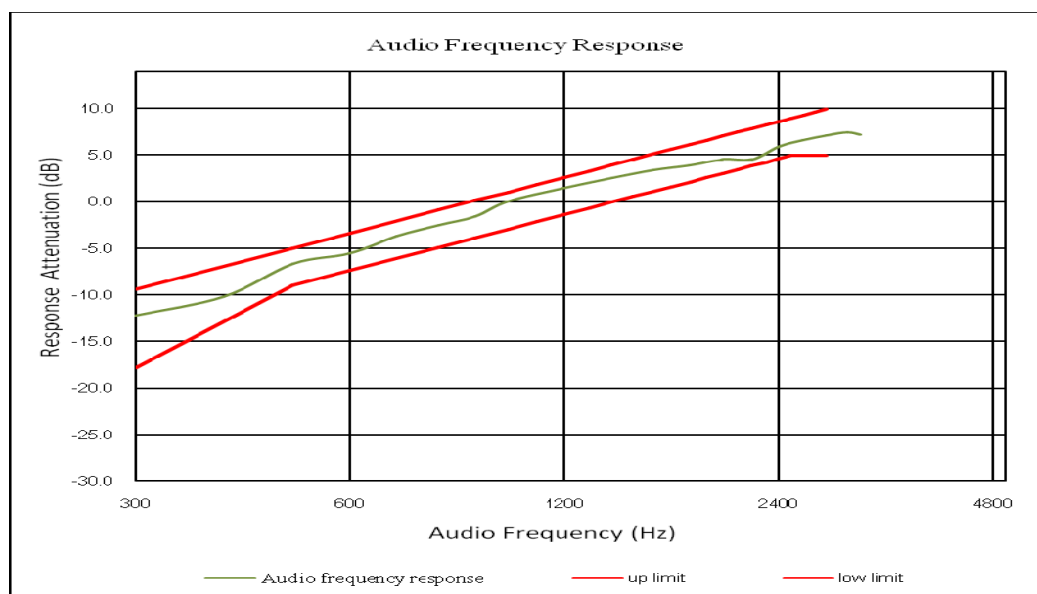


| Carrier Frequency: 467.6375MHz |                          |                          |                          |                          |             |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------|
| Audio Frequency (Hz)           | Instantaneous            |                          | Steady-state             |                          | Limit (kHz) |
|                                | Deviation (@+20dB) (kHz) | Deviation (@-20dB) (kHz) | Deviation (@+20dB) (kHz) | Deviation (@-20dB) (kHz) |             |
| 300                            | 0.705                    | 0.049                    | 0.623                    | 0.089                    | 2.5         |
| 400                            | 0.981                    | 0.075                    | 0.846                    | 0.134                    | 2.5         |
| 500                            | 1.286                    | 0.123                    | 1.231                    | 0.089                    | 2.5         |
| 600                            | 1.587                    | 0.162                    | 1.451                    | 0.123                    | 2.5         |
| 700                            | 1.744                    | 0.113                    | 1.656                    | 0.137                    | 2.5         |
| 800                            | 1.918                    | 0.140                    | 1.923                    | 0.135                    | 2.5         |
| 900                            | 2.209                    | 0.182                    | 2.129                    | 0.172                    | 2.5         |
| 1000                           | 2.237                    | 0.163                    | 2.231                    | 0.164                    | 2.5         |
| 1200                           | 2.369                    | 0.198                    | 2.412                    | 0.206                    | 2.5         |
| 1400                           | 2.298                    | 0.236                    | 2.273                    | 0.275                    | 2.5         |
| 1600                           | 2.311                    | 0.229                    | 2.202                    | 0.297                    | 2.5         |
| 1800                           | 2.311                    | 0.316                    | 2.233                    | 0.325                    | 2.5         |
| 2000                           | 2.310                    | 0.296                    | 2.323                    | 0.313                    | 2.5         |
| 2200                           | 2.283                    | 0.356                    | 2.267                    | 0.330                    | 2.5         |
| 2400                           | 2.198                    | 0.353                    | 2.102                    | 0.314                    | 2.5         |
| 2600                           | 1.990                    | 0.329                    | 1.922                    | 0.327                    | 2.5         |
| 2800                           | 1.708                    | 0.351                    | 1.709                    | 0.326                    | 2.5         |
| 3000                           | 1.402                    | 0.342                    | 1.340                    | 0.352                    | 2.5         |

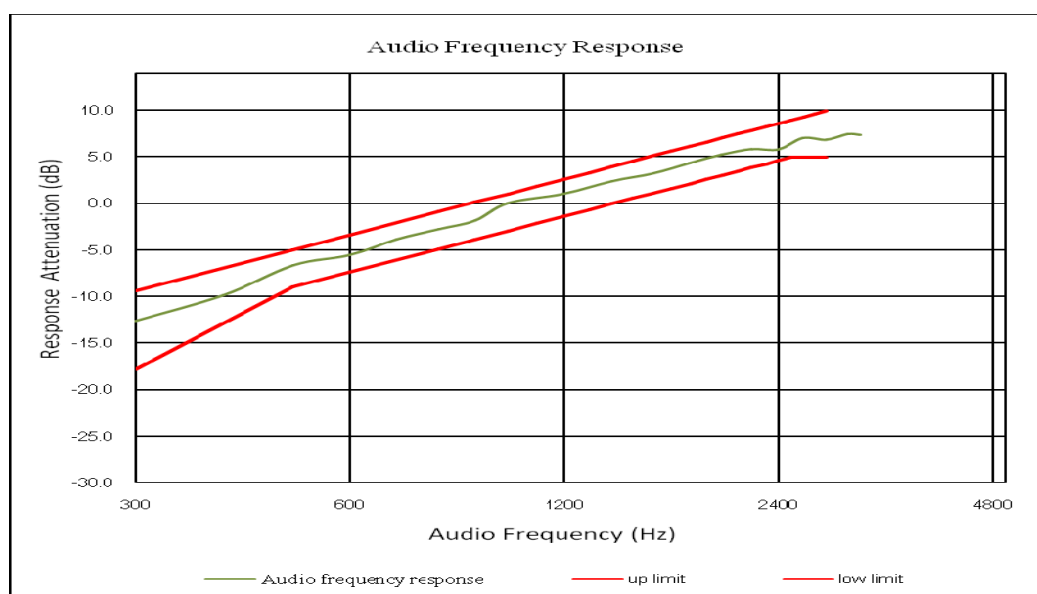


**Audio Frequency Response**

| Carrier Frequency: 462.6375MHz |                           |
|--------------------------------|---------------------------|
| Audio Frequency (Hz)           | Response Attenuation (dB) |
| 300                            | -12.40                    |
| 400                            | -10.10                    |
| 500                            | -6.70                     |
| 600                            | -5.50                     |
| 700                            | -3.50                     |
| 800                            | -2.40                     |
| 900                            | -1.60                     |
| 1000                           | 0.00                      |
| 1200                           | 1.10                      |
| 1400                           | 2.10                      |
| 1600                           | 2.70                      |
| 1800                           | 3.60                      |
| 2000                           | 4.00                      |
| 2200                           | 5.20                      |
| 2400                           | 6.30                      |
| 2600                           | 6.80                      |
| 2800                           | 7.20                      |
| 3000                           | 7.30                      |
| 3125                           | 6.70                      |

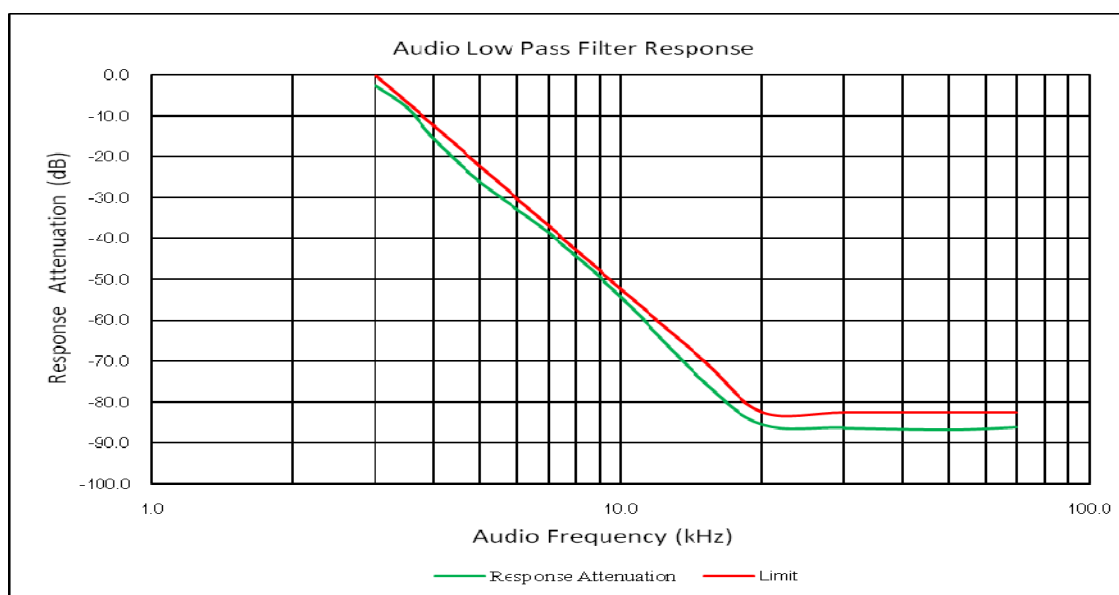


| Carrier Frequency: 467.6375MHz |                           |
|--------------------------------|---------------------------|
| Audio Frequency (Hz)           | Response Attenuation (dB) |
| 300                            | -12.60                    |
| 400                            | -10.00                    |
| 500                            | -7.10                     |
| 600                            | -5.80                     |
| 700                            | -4.30                     |
| 800                            | -3.10                     |
| 900                            | -1.90                     |
| 1000                           | 0.00                      |
| 1200                           | 1.11                      |
| 1400                           | 2.00                      |
| 1600                           | 3.80                      |
| 1800                           | 4.00                      |
| 2000                           | 5.40                      |
| 2200                           | 5.80                      |
| 2400                           | 5.80                      |
| 2600                           | 6.90                      |
| 2800                           | 7.00                      |
| 3000                           | 7.40                      |
| 3125                           | 6.80                      |

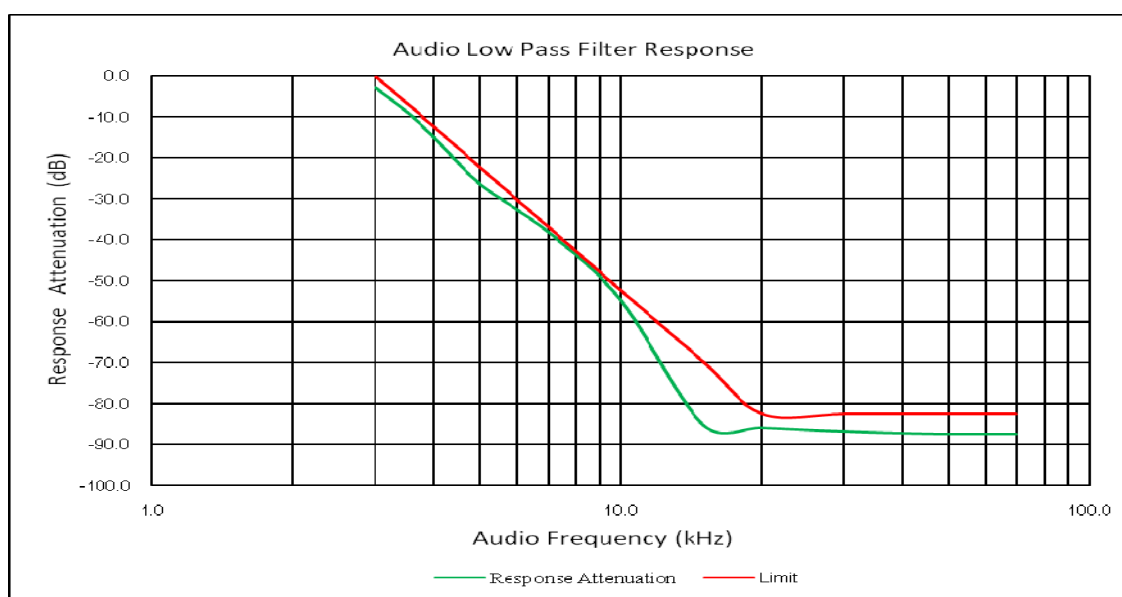


**Audio Low Pass Filter Response**

| Carrier Frequency: 462.6375MHz |                           |            |
|--------------------------------|---------------------------|------------|
| Audio Frequency (kHz)          | Response Attenuation (dB) | Limit (dB) |
| 3.0                            | -2.7                      | 0          |
| 3.5                            | -7.7                      | -6.7       |
| 4.0                            | -15.8                     | -12.5      |
| 5.0                            | -26.3                     | -22.2      |
| 7.0                            | -39.1                     | -36.8      |
| 10.0                           | -54.6                     | -52.3      |
| 15.0                           | -74.9                     | -69.9      |
| 20.0                           | -85.6                     | -82.5      |
| 30.0                           | -87.0                     | -82.5      |
| 50.0                           | -86.6                     | -82.5      |
| 70.0                           | -86.1                     | -82.5      |



| Carrier Frequency: 467.6375MHz |                           |            |
|--------------------------------|---------------------------|------------|
| Audio Frequency (kHz)          | Response Attenuation (dB) | Limit (dB) |
| 3.0                            | -3.3                      | 0          |
| 3.5                            | -9.5                      | -6.7       |
| 4.0                            | -15.3                     | -12.5      |
| 5.0                            | -26.9                     | -22.2      |
| 7.0                            | -40.0                     | -36.8      |
| 10.0                           | -56.1                     | -52.3      |
| 15.0                           | -74.6                     | -69.9      |
| 20.0                           | -87.2                     | -82.5      |
| 30.0                           | -86.8                     | -82.5      |
| 50.0                           | -86.6                     | -82.5      |
| 70.0                           | -88.3                     | -82.5      |



## FCC §2.1049, §95.573, §95.579 - AUTHORIZED BANDWIDTH AND EMISSION MASK

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### Applicable Standard

According to §95.573

Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz.  
According to §95.579

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.

### Test Procedure

TIA-603-E, section 2.2.11

### Test Data

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 25.7 °C   |
| Relative Humidity: | 50 %      |
| ATM Pressure:      | 102.3 kPa |

*The testing was performed by CK Huang on 2020-10-19.*

*Test Mode: Transmitting*

| Modulation | fc<br>(MHz) | 99% Occupied<br>Bandwidth<br>(kHz) | 20dB<br>Bandwidth<br>(kHz) | Limit<br>(kHz) |
|------------|-------------|------------------------------------|----------------------------|----------------|
| FM         | 462.6375    | 10.35                              | 12.01                      | 12.5           |
|            | 467.6875    | 10.42                              | 12.01                      | 12.5           |

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

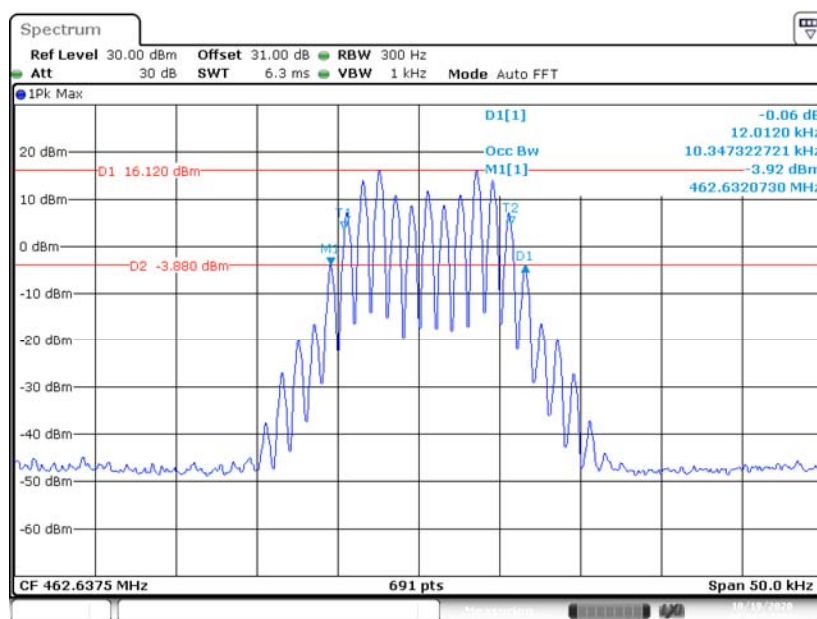
In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

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

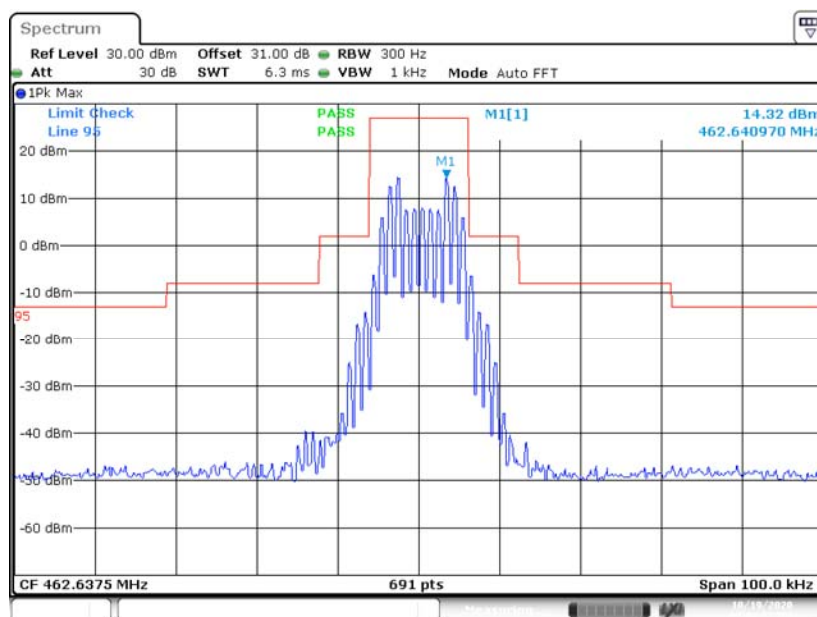
F3E portion of the designator represents an FM voice transmission

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

462.6375 MHz

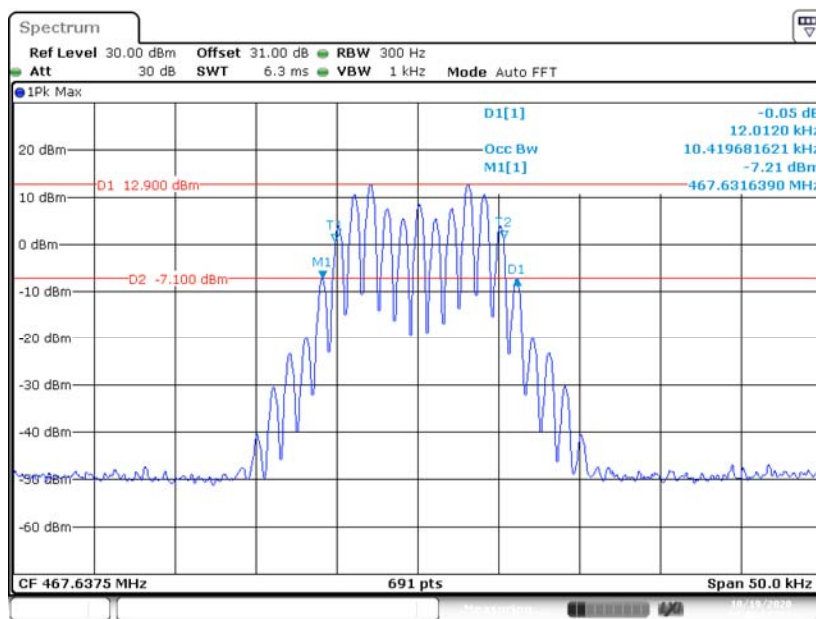


Date: 19.OCT.2020 13:11:54

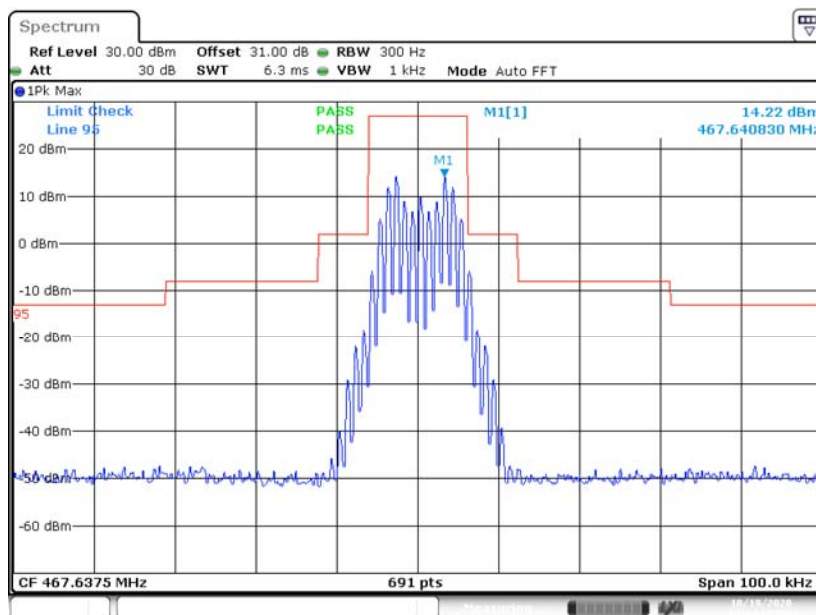


Date: 19.OCT.2020 13:03:52

467.6375 MHz



Date: 19.OCT.2020 13:09:05



Date: 19.OCT.2020 13:04:38

**FCC §2.1053 & §95.579 - RADIATED SPURIOUS EMISSION**

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**Applicable Standard**

FCC §2.1053 and §95.579

**Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB = 43+10 Log10 (power out in Watts)

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25.3 °C   |
| <b>Relative Humidity:</b> | 51 %      |
| <b>ATM Pressure:</b>      | 101.4 kPa |

*The testing was performed by CK Huang on 2020-09-07.*

*Test Mode: Transmitting*

**30MHz-5GHz:**

| Frequency<br>(MHz)         | Polar<br>(H/V) | Receiver<br>Reading<br>(dBuV) | Substituted                 |                       |                              | Absolute<br>Level<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|----------------------------|----------------|-------------------------------|-----------------------------|-----------------------|------------------------------|----------------------------|----------------|----------------|
|                            |                |                               | Submitted<br>Level<br>(dBm) | Cable<br>Loss<br>(dB) | Antenna<br>Gain<br>(dBd/dBi) |                            |                |                |
| FM, Frequency: 462.6375MHz |                |                               |                             |                       |                              |                            |                |                |
| 925.2750                   | H              | 81.13                         | -16.53                      | 0.64                  | -1.05                        | -18.22                     | -13            | 5.22           |
| 925.2750                   | V              | 81.02                         | -16.64                      | 0.64                  | -1.05                        | -18.33                     | -13            | 5.33           |
| 1387.9125                  | H              | 64.98                         | -36.15                      | 0.88                  | 9.69                         | -27.34                     | -13            | 14.34          |
| 1387.9125                  | V              | 64.3                          | -36.83                      | 0.88                  | 9.69                         | -28.02                     | -13            | 15.02          |
| 1850.5500                  | H              | 69.81                         | -42.14                      | 0.84                  | 8.76                         | -34.22                     | -13            | 21.22          |
| 1850.5500                  | V              | 69.02                         | -42.93                      | 0.84                  | 8.76                         | -35.01                     | -13            | 22.01          |
| 4163.7375                  | H              | 62.31                         | -44.09                      | 0.99                  | 9.70                         | -35.38                     | -13            | 22.38          |
| 4163.7375                  | V              | 61.25                         | -45.15                      | 0.99                  | 9.70                         | -36.44                     | -13            | 23.44          |
| FM, Frequency: 467.6375MHz |                |                               |                             |                       |                              |                            |                |                |
| 935.2750                   | H              | 85.06                         | -12.70                      | 0.64                  | -1.09                        | -14.43                     | -13            | 1.43           |
| 935.2750                   | V              | 84.67                         | -13.09                      | 0.64                  | -1.09                        | -14.82                     | -13            | 1.82           |
| 1402.9125                  | H              | 81.04                         | -33.13                      | 0.82                  | 7.93                         | -26.02                     | -13            | 13.02          |
| 1402.9125                  | V              | 81.9                          | -32.27                      | 0.82                  | 7.93                         | -25.16                     | -13            | 12.16          |
| 1870.5500                  | H              | 71.32                         | -40.49                      | 0.84                  | 8.79                         | -32.54                     | -13            | 19.54          |
| 1870.5500                  | V              | 70.71                         | -41.10                      | 0.84                  | 8.79                         | -33.15                     | -13            | 20.15          |
| 4208.7375                  | H              | 62.52                         | -38.61                      | 0.88                  | 9.69                         | -29.80                     | -13            | 16.80          |
| 4208.7375                  | V              | 63.16                         | -37.97                      | 0.88                  | 9.69                         | -29.16                     | -13            | 16.16          |

Note 1: The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

Note 2: Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level.

**FCC§2.1055 (d), §95.565 - FREQUENCY STABILITY****Applicable Standard**

According to FCC §2.1055(a) (1),

The frequency stability shall be measured with variation of ambient temperature from –30 °C to +50 °C, and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.565

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

**Test Procedure**

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Frequency Counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Frequency Counter.

Frequency Stability vs. Voltage:

1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.9 °C   |
| <b>Relative Humidity:</b> | 51 %      |
| <b>ATM Pressure:</b>      | 101.2 kPa |

*The testing was performed by CK Huang on 2020-09-07.*

*Test Mode: Transmitting*

| FM,Reference Frequency: 462.6375MHz |                            |               |                       |             |
|-------------------------------------|----------------------------|---------------|-----------------------|-------------|
| Temperature (°C)                    | Voltage (V <sub>DC</sub> ) | Reading (MHz) | Frequency Error (ppm) | Limit (ppm) |
| -30                                 | 3.7                        | 462.63801     | 1.10                  | ±2.5        |
| -20                                 |                            | 462.63802     | 1.12                  |             |
| -10                                 |                            | 462.63816     | 1.43                  |             |
| 0                                   |                            | 462.63826     | 1.64                  |             |
| 10                                  |                            | 462.63835     | 1.84                  |             |
| 20                                  |                            | 462.63834     | 1.82                  |             |
| 30                                  |                            | 462.63813     | 1.36                  |             |
| 40                                  |                            | 462.63835     | 1.84                  |             |
| 50                                  |                            | 462.63816     | 1.43                  |             |
| 20                                  | 3.5                        | 462.63716     | -0.73                 |             |
| 20                                  | 4.2                        | 462.63786     | 0.78                  |             |

| FM,Reference Frequency: 467.6375MHz |                            |               |                       |             |
|-------------------------------------|----------------------------|---------------|-----------------------|-------------|
| Temperature (°C)                    | Voltage (V <sub>DC</sub> ) | Reading (MHz) | Frequency Error (ppm) | Limit (ppm) |
| -30                                 | 3.7                        | 467.63801     | 1.09                  | ±2.5        |
| -20                                 |                            | 467.63808     | 1.24                  |             |
| -10                                 |                            | 467.63809     | 1.26                  |             |
| 0                                   |                            | 467.63815     | 1.39                  |             |
| 10                                  |                            | 467.63826     | 1.63                  |             |
| 20                                  |                            | 467.63838     | 1.88                  |             |
| 30                                  |                            | 467.63833     | 1.77                  |             |
| 40                                  |                            | 467.63829     | 1.69                  |             |
| 50                                  |                            | 467.63825     | 1.60                  |             |
| 20                                  | 3.5                        | 467.63818     | 1.45                  |             |
| 20                                  | 4.2                        | 467.63828     | 1.67                  |             |

### **Declarations**

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '\*'. Customer model name, addresses, names, trademarks etc. are not considered data.

2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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**\*\*\*\*\* END OF REPORT\*\*\*\*\***