

# TEST REPORT

**Product Name** : RC speed boat  
**Model Number** : Please refer to page 5  
**FCC ID** : 2AW78202601

**Prepared for** : Shantou Hong XUN Jie Electronic Technology Co., Ltd.  
**Address** : No. 6, South of Dengfeng Road, Guangyi Street, Chenghai District, Shantou, 515800, China

**Prepared by** : EMTEK (SHENZHEN) CO., LTD.  
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**Report Number** : ENS2601060015W00401R  
**Date of sample receipt** : Jan 06, 2026  
**Date(s) of Tests** : Jan 06, 2026 to Jan 30, 2026  
**Date of issue** : Jan 31, 2026

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## 1 TEST RESULT CERTIFICATION

Applicant : Shantou Hong XUN Jie Electronic Technology Co., Ltd.  
Address : No. 6, South of Dengfeng Road, Guangyi Street, Chenghai District, Shantou, 515800, China  
Manufacturer : Shantou Hong XUN Jie Electronic Technology Co., Ltd.  
Address : No. 6, South of Dengfeng Road, Guangyi Street, Chenghai District, Shantou, 515800, China  
Factory : Shantou Hong XUN Jie Electronic Technology Co., Ltd.  
Address : No. 6, South of Dengfeng Road, Guangyi Street, Chenghai District, Shantou, 515800, China  
EUT : RC speed boat  
Model Name : Please refer to page 5  
Trademark : N/A

Measurement Procedure Used:

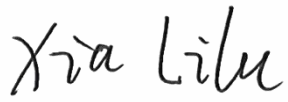
| APPLICABLE STANDARDS                                                 |             |
|----------------------------------------------------------------------|-------------|
| STANDARD                                                             | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J<br>FCC 47 CFR Part 15, Subpart C        | PASS        |
| IC RSS-GEN, Issue 5, February 2021<br>IC RSS-210, Issue 11, Jun 2024 | PASS        |

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2020) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.249, IC RSS-210 Issue 11 and IC RSS-GEN, Issue 5.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : Jan 06, 2026 to Jan 30, 2026

Prepared by :   
Yu Xiaolan /Editor

Reviewer :   
Xia Lili/Supervisor

Approve & Authorized Signer :   
Wang Li/Manager



## Modified History

| Version | Report No.           | Revision Date | Summary         |
|---------|----------------------|---------------|-----------------|
|         | ENS2601060015W00401R | /             | Original Report |
|         |                      |               |                 |
|         |                      |               |                 |



## 2 EUT TECHNICAL DESCRIPTION

| Characteristics           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name              | RC speed boat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Model number              | HJ822, HJ808, HJ809, HJ810B, HJ811, HJ812, HJ813, HJ815, HJ817, HJ818, HJ818PRO, HJ819, HJ819T, HJ820, HJ821, HJ821T, HJ823, HJ825, HJ825A, HJ825B, HJ826, HJ826A, HJ826B, HJ827, HJ827A, HJ827B, HJ828, HJ828A, HJ828B, HJ829, HJ829A, HJ829B, HJ830, HJ830A, HJ830B, HJ831, HJ831A, HJ831B, HJ832, HJ832A, HJ832B, HJ835, HJ835A, HJ835B, HJ836, HJ836A, HJ836B, HJ837, HJ837A, HJ837B, HJ838, HJ838A, HJ838B, HJ839, HJ839A, HJ839B<br>All control remoter of products are identical except the model number and the controlled (received) part boat. Here we selected HJ822 for all the test. |
| Device Type               | 2.4G SRD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Power Supply              | DC 6.0V from Battery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Modulation:               | GFSK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Operating Frequency Range | 2405MHz-2475MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Number of Channels        | 71 channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Max Field Strength        | 83.12 dBuV@3m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Antenna Type              | 2.4G Linear antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Antenna gain              | 2.97 dBi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Product SW/HW version:    | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Radio SW/HW version:      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Temperature Range:        | 0°C ~ +45°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

*Note: for more details, please refer to the User's manual of the EUT.*

### 3 SUMMARY OF TEST RESULT

| FCC Part Clause                                                                                                                                                                                                                   | IC Part Clause                               | Test Parameter             | Verdict | Remark |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------|---------|--------|
| 15.207                                                                                                                                                                                                                            | RSS-GEN Clause 8.8                           | Conducted Emission         | N/A     |        |
| 15.209                                                                                                                                                                                                                            | RSS-Gen.8.9<br>RSS-210 Annex B.10(a)         | Radiated Emission          | PASS    |        |
| 15.249                                                                                                                                                                                                                            | RSS-210 Annex B.10(a)                        | Radiated Spurious Emission | PASS    |        |
| 15.249                                                                                                                                                                                                                            | RSS-210 Annex B.10(a)                        | Band edge test             | PASS    |        |
| 15.249                                                                                                                                                                                                                            | RSS-GEN Clause 6.7<br>RSS-210 Annex B.10 (b) | Emission Bandwidth         | PASS    |        |
| 15.203                                                                                                                                                                                                                            | RSS-GEN Clause 6.8                           | Antenna Requirement        | PASS    |        |
| NOTE1: N/A (Not Applicable)                                                                                                                                                                                                       |                                              |                            |         |        |
| NOTE2: The report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits. |                                              |                            |         |        |

#### RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **FCC ID: 2AW78202601** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

## 4 TEST METHODOLOGY

### 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)

IC RSS-210, Issue 11, Jun 2024

### 4.2 MEASUREMENT EQUIPMENT USED

#### For Spurious Emissions Test

| Equipment         | Manufacturer    | Model No.       | Serial No.   | Last Cal. | Cal. Interval |
|-------------------|-----------------|-----------------|--------------|-----------|---------------|
| EMI Test Receiver | Rohde & Schwarz | ESU 26          | 100154       | 2025/5/9  | 1Year         |
| Pre-Amplifie      | Lunar EM        | LNA30M3G-25     | J10100000070 | 2025/5/9  | 1Year         |
| Bilog Antenna     | Schwarzbeck     | VULB9163        | 661          | 2025/5/18 | 2 Year        |
| Horn antenna      | Schwarzbeck     | BBHA9120D       | 9120D-1177   | 2025/5/17 | 2 Year        |
| Pre-Amplifie      | SKET            | LNPA_0118G-45   | SK2019051801 | 2025/5/9  | 1Year         |
| Loop Antenna      | Schwarzbeck     | FMZB1519        | 1519-012     | 2025/5/13 | 2Year         |
| Spectrum Analyzer | Rohde & Schwarz | FSV40           | 100967       | 2025/5/9  | 1Year         |
| Horn antenna      | Schwarzbeck     | BBHA9170        | 9170-399     | 2025/5/13 | 2Year         |
| Coaxial Cable     | TIMES           | NmNm-7-C15702   | N/A          | 2025/5/23 | 1Year         |
| Coaxial Cable     | TIMES           | HF290-NMSM-6.5M | N/A          | 2025/5/23 | 1Year         |
| Coaxial Cable     | TIMES           | LMR-240 N-N     | N/A          | 2025/5/23 | 1Year         |

#### For other test items:

| Equipment                    | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------------------------------|--------------|-----------|------------|-----------|---------------|
| Signal Analyzer              | Agilent      | N9010A    | MY53470879 | 2025/5/10 | 1Year         |
| Vector Signal Generator      | Agilent      | N5182B    | MY53050878 | 2025/5/10 | 1Year         |
| Analog Signal Generator      | Agilent      | N5171B    | MY53050553 | 2025/5/10 | 1Year         |
| RF Control Unit(Power Meter) | Tonscend     | JS0806-2  | \          | 2025/5/10 | 1Year         |
| Temperature&Humidity Chamber | ESPEC        | EL-02KA   | 12107166   | 2025/5/10 | 1Year         |

### 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

The EUT has been tested under its typical operating condition so those modulation and channel were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

The product is specially treated and the rating is used in the form of a channel collection. Samples of fixed frequency and rate are provided by the applicant for testing

Frequency and Channel list:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 1       | 2405            | 25      | 2429            | ...     | ...             |
| 2       | 2406            | 26      | 2430            | 69      | 2473            |
| 3       | 2407            | 27      | 2431            | 70      | 2474            |
| ...     | ...             | ...     | ...             | 71      | 2475            |

Note:  $f_c = 2404\text{MHz} + k \times 1\text{MHz}$   $k=1$  to 71

Test Frequency and Channel list:

| Lowest Frequency |                 | Middle Frequency |                 | Highest Frequency |                 |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel          | Frequency (MHz) | Channel          | Frequency (MHz) | Channel           | Frequency (MHz) |
| 1                | 2405            | 36               | 2440            | 71                | 2475            |

## 5 FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (SHENZHEN) CO., LTD.

Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 5.3 LABORATORY ACCREDITATIONS AND LISTINGS

#### Site Description

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC Lab.      | <p><b>Accredited by CNAS</b><br/>The Certificate Registration Number is L2291.<br/>The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)</p> <p><b>Accredited by FCC</b><br/>Designation Number: CN1204<br/>Test Firm Registration Number: 882943</p> <p><b>Accredited by A2LA</b><br/>The Certificate Number is 4321.01.</p> <p>Accredited by Industry Canada<br/>The Conformity Assessment Body Identifier is CN0008</p> |
| Name of Firm  | : EMTEK (SHENZHEN) CO., LTD.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Site Location | : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China                                                                                                                                                                                                                                                                                                                                                                                                  |

## 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

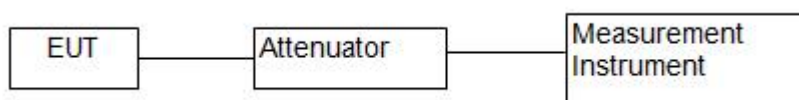
| Test Parameter               | Measurement Uncertainty |
|------------------------------|-------------------------|
| Frequency error              | ±20Hz                   |
| Occupied Bandwidth           | ±0.5KHz                 |
| Transmitter output power     | ±0.6dB                  |
| Conducted spurious emissions | ±3.2dB                  |
| Radiated spurious emissions  | ±4.5dB                  |
| Temperature                  | ±1.2°C                  |
| Humidity                     | ±3%                     |
| DC voltages                  | ±0.25V                  |
| Time                         | ±1%                     |

Measurement Uncertainty for a level of Confidence of 95%

## 7 SETUP OF EQUIPMENT UNDER TEST

### 7.1 RADIO FREQUENCY TEST SETUP 1

The Bluetooth component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



### 7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in ANSI C63.10-2020 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Measurements shall be taken, using the following steps, at a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment (see RSS-Gen for applicable versions of ANSI and CISPR standards).

(1) Line the ground plane with absorbers between the transmitter and the receive antenna to minimize reflections. The absorbers used should have a minimum-rated attenuation of 20 dB through the measurement frequency range of interest. The absorbers shall be positioned to replicate the layout used when compliance with the applicable acceptability criterion was achieved, as set forth in the aforementioned standards on site validation.

(2) Set the height of the receive antenna to 1.5 m. The receive antenna must be one that was designed and fabricated to operate over the entire frequency range of interest, for example, an appropriate standard gain horn.

(3) The distance between the receive antenna and the radiating source shall be sufficient in order to ensure far-field conditions.

(4) Mount the transmitter at a height of 1.5 m.

(5) Configure the device under test (DUT) to produce the maximum power spectral density as measured while assessing compliance with Section 6.2.2 (i.e. channel frequency, modulation type and data rate). If the DUT is equipped with a detachable antenna and the antenna is intended for remote installation (i.e.

tower-mounted), the DUT may be substituted with a suitable signal generator. The level and frequency settings on the generator shall be set so as to reproduce the maximum power spectral density, measured within a 1 MHz bandwidth, obtained while assessing compliance to Section 6.2.2.

(6) Position the transmitter or the radiating antenna so that elevation pattern measurements can be taken.

(7) Find the 0° reference point in the horizontal plane.

(8) Care should be taken when positioning the receive antenna to avoid cross-polarization. Antennas of known mounting polarization should be assessed with the receive antenna oriented in the same polarity. If the polarization of the transmit antenna is unknown or the transmit antenna can be mounted in either polarization, e.i.r.p. measurements should be performed to find which mounting polarity provides the highest e.i.r.p. value. Testing shall be carried out with the receive antenna and the DUT mounted in each polarity.

(9) The emission shall be centred on the display of the spectrum analyzer with the following settings:

i. If the power spectral density of the DUT was assessed with a peak detector and the antenna cannot be detached from the DUT, the spectrum analyzer shall be set to a peak detector with a resolution bandwidth and video bandwidth of 1 MHz.

ii. If the power spectral density of the DUT was assessed using a sample detector with power averaging and the antenna cannot be detached from the DUT, the spectrum analyzer shall be set to a sample detector, configured to produce 100 power averages and set with a resolution bandwidth, as well as a video bandwidth of 1 MHz.

iii. If the antenna can be detached from the DUT, a continuous wave (CW) signal equal to that of the power spectral density measurement may be used, the spectrum analyzer shall be set to peak detector with a resolution bandwidth and video bandwidth of 1 MHz.

(10) Rotate the turntable 360° recording the field strength at each step. Throughout the main beam of the antenna, the step size shall be kept to a maximum of 1°.

Once outside the main beam of the antenna, the maximum step size shall be as follows, when compared to the requirements of Section 6.2.2:

i. Between 0° and 8°, maximum step size of 2°;

ii. Between 8° and 40°, maximum step size of 4°;

iii. Between 40° and 45°, maximum step size of 1°;

iv. Between 45° and 90°, maximum step size of 5°.

Once the mask reaches 90°, the mask will be inverted and the step size will follow in the same manner as above.

For the purpose of this procedure, the main beam of the antenna is defined as the 3 dB beamwidth.

(11) Convert the measured field strength values in terms of e.i.r.p. density (dBW/1 MHz) using the following equation:

$$\text{e.i.r.p. density (dBW/MHz)} = 10 \log((E \cdot r)^2 / 30)$$

E = field strength in V/m

r = measurement distance in metres

(12) Plot the results against the emission mask with reference to the horizontal plane.

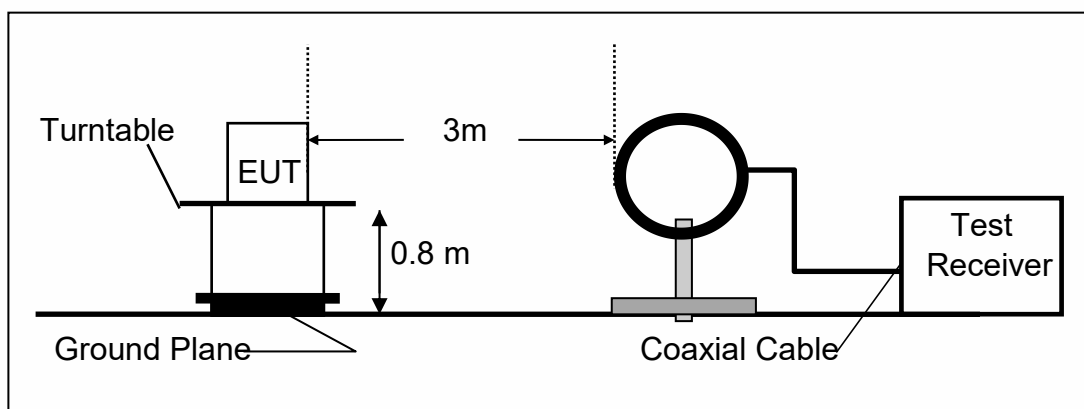
(13) Using the plot, the 0° can be rotated to determine the worst-case installation tilt angle.

(14) Testing shall be performed using the highest gain antenna for every antenna type, if applicable.

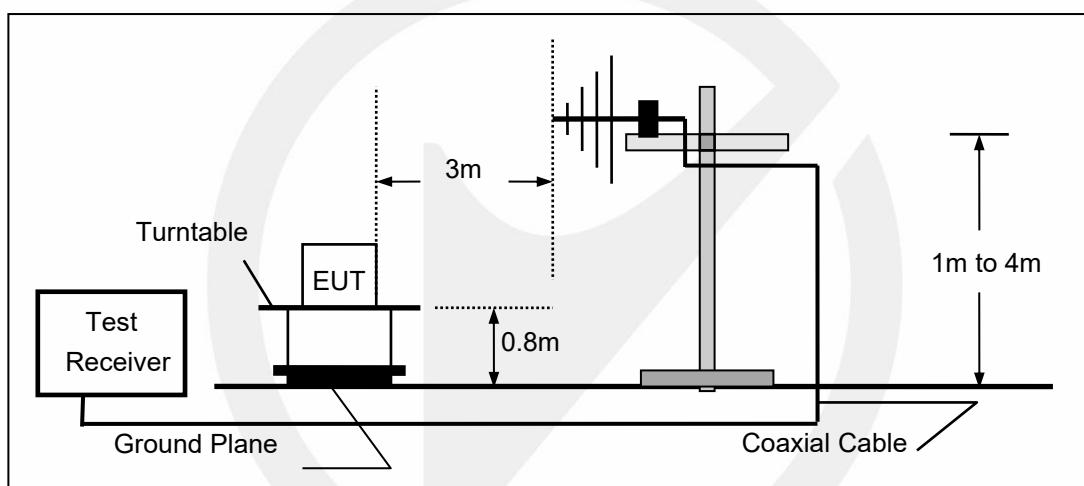
(15) Antenna type(s), antenna model number(s), and worst-case tilt angle(s) necessary to remain compliant with the elevation mask requirement set forth in Section 6.2.2(3) of RSS-247 shall be clearly indicated in the user manual.

The following figure is an example of a polar elevation mask measured using the Method 1 reference to dBμV/m at 3 m.

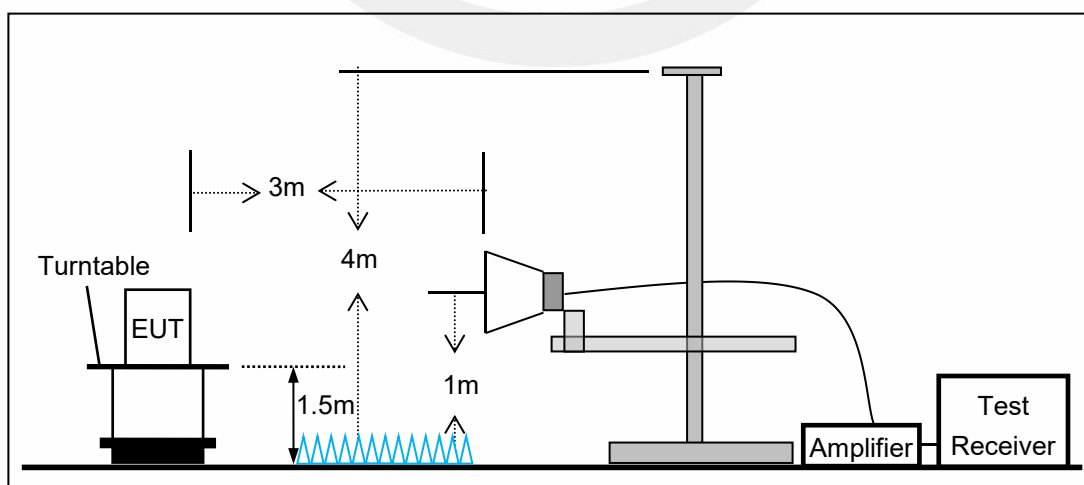
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

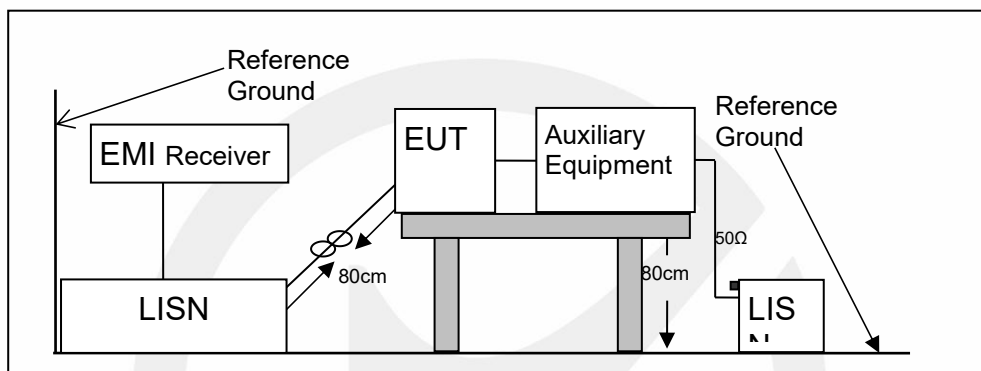


### 7.3 CONDUCTED EMISSION TEST SETUP

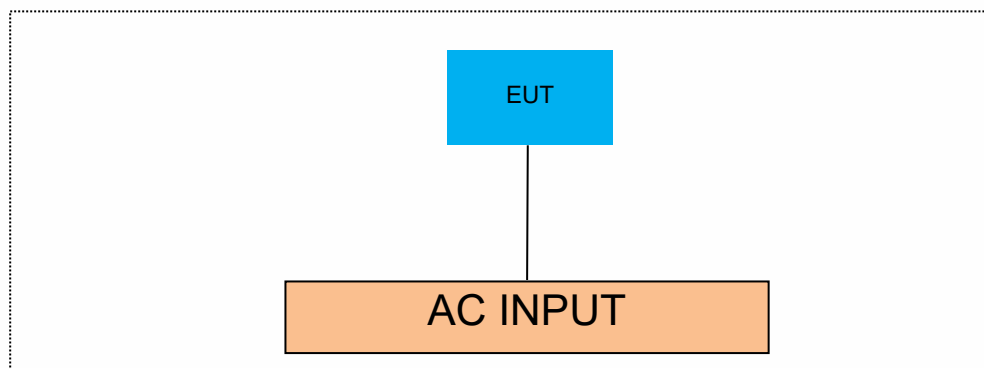
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8 m.

According to the requirements in ANSI C63.10-2020 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



#### 7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



#### 7.5 SUPPORT EQUIPMENT

| EUT Cable List and Details |              |       |               |
|----------------------------|--------------|-------|---------------|
| Description                | Manufacturer | Model | Serial Number |
| /                          | /            | /     | /             |

| Auxiliary Cable List and Details |            |                     |                        |
|----------------------------------|------------|---------------------|------------------------|
| Cable Description                | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| /                                | /          | /                   | /                      |
| /                                | /          | /                   | /                      |

| Auxiliary Equipment List and Details |              |       |               |
|--------------------------------------|--------------|-------|---------------|
| Description                          | Manufacturer | Model | Serial Number |
| /                                    | /            | /     | /             |
| /                                    | /            | /     | /             |
| /                                    | /            | /     | /             |

#### Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 8 TEST REQUIREMENTS

### 8.1 BANDWIDTH TEST

#### 8.1.1 Applicable Standard

According to FCC Part 15.249  
According to RSS-GEN Clause 6.7

#### 8.1.2 Conformance Limit

N/A

#### 8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

#### 8.1.4 Test Procedure

The EUT was operating in controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW  $\geq$  1% of the 20 dB bandwidth(100KHz)

Set the video bandwidth (VBW)  $\geq$  RBW(300KHz).

Set Span= approximately 2 to 3 times the 20 dB bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

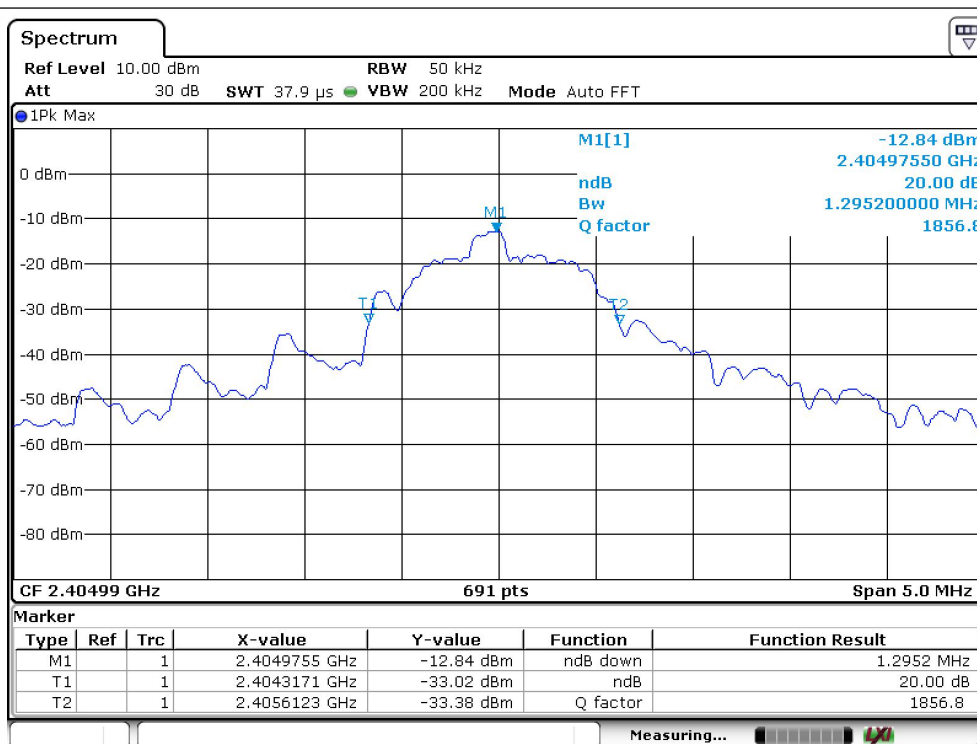
Measure and record the results in the test report.

#### Test Results

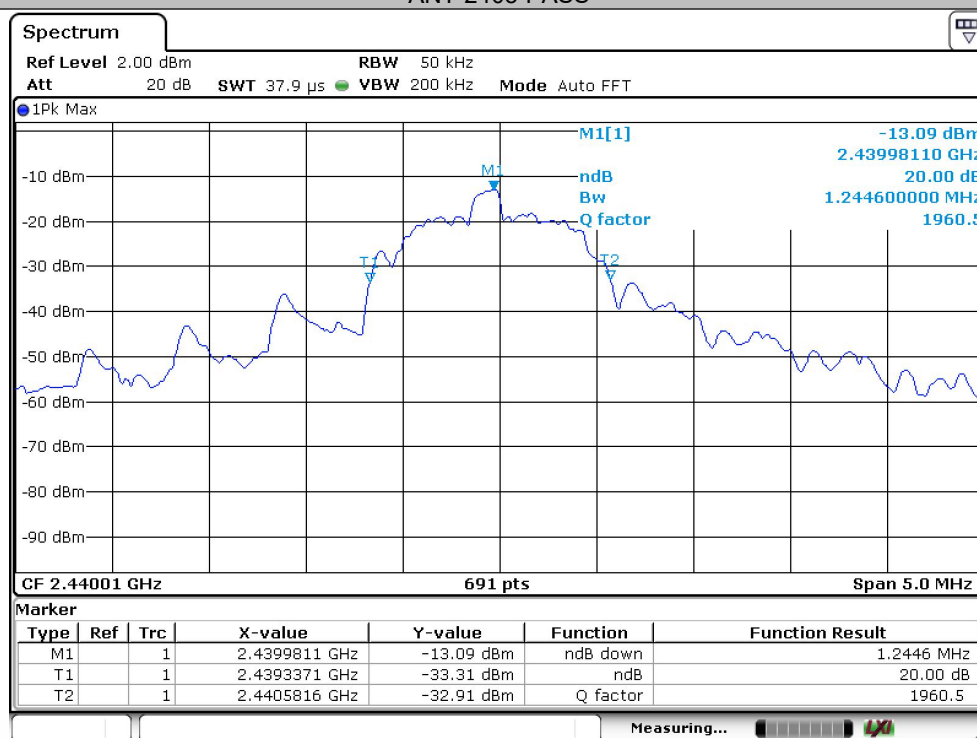
|                    |           |
|--------------------|-----------|
| Temperature:       | 25°C      |
| Relative Humidity: | 45%       |
| ATM Pressure:      | 1011 mbar |

Note: N/A

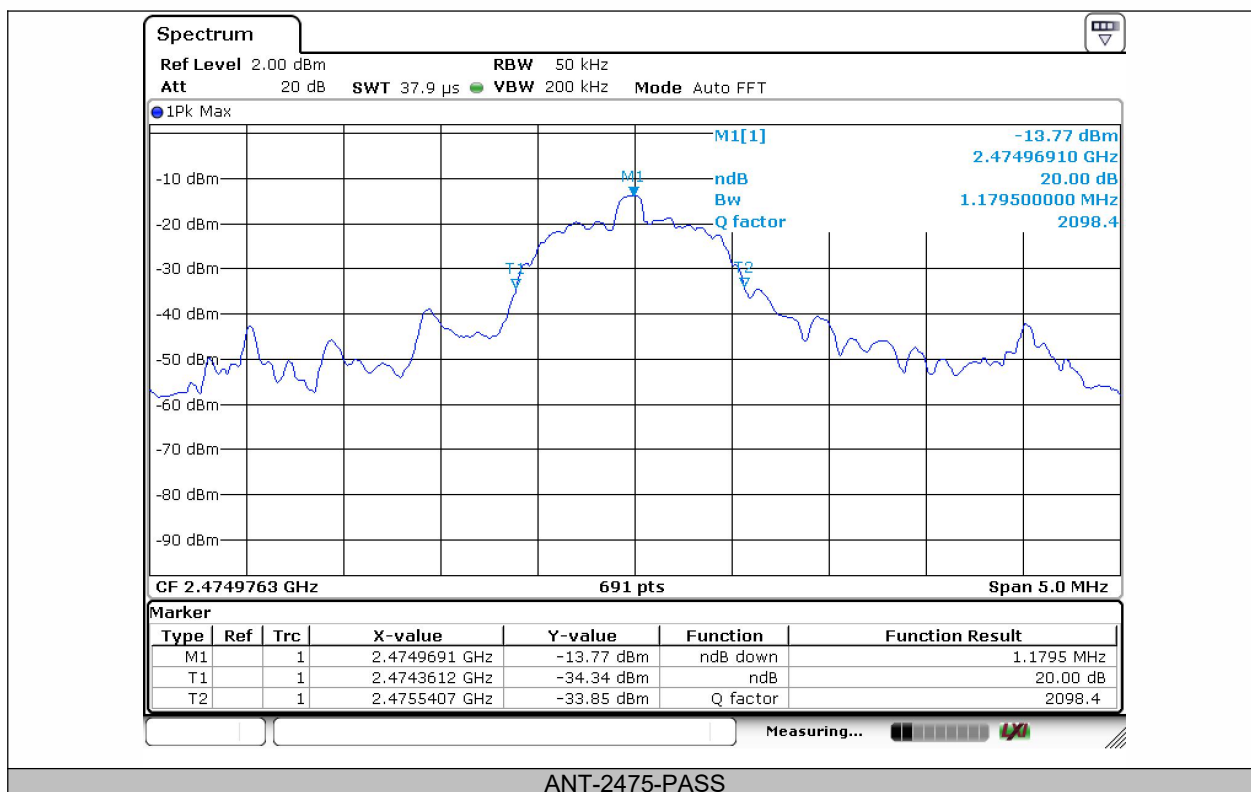
| Antenna | Frequency[MHz] | 20DB BW [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|---------|----------------|---------------|-----------|-----------|------------|---------|
| Ant1    | 2405           | 1.2952        | 2404.3171 | 2405.6123 | ----       | ----    |
| Ant1    | 2440           | 1.2446        | 2439.3371 | 2440.5816 | ----       | ----    |
| Ant1    | 2475           | 1.1795        | 2474.3612 | 2475.5407 | ----       | ----    |



ANT-2405-PASS



ANT-2440-PASS



## 8.2 99% BANDWIDTH

### 8.2.1 Applicable Standard

According to RSS-GEN Clause 6.7

### 8.2.2 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.2.3 Test Procedure

The EUT was operating in Bluetooth mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 1%-5% OBW(30 KHz).

Set the video bandwidth (VBW) =100 kHz.

Set Span=3 MHz

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

Use the 99 % power bandwidth function of the instrument

Measure the maximum width of the emission.

Measure and record the results in the test report.

### 8.2.4 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 25°C      |
| Relative Humidity: | 45%       |
| ATM Pressure:      | 1011 mbar |

Note: N/A

Not Applicable

### 8.3 RADIATED SPURIOUS EMISSION

#### 8.3.1 Applicable Standard

According to FCC Part 15.249 and 15.209

According to RSS-Gen.8.9, RSS-Gen 8.10 and RSS-210 Annex B.10

#### 8.3.2 Conformance Limit

According to FCC Part 15.249 and RSS-210 Annex B.10(a): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part15.205 and RSS-Gen.8.10, Restricted bands

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 10.495-0.505      | 16.69475-16.69525   | 608-614       | 5.35-5.46   |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75   |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5   |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2     |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5     |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7   |
| 6.26775-6.26825   | 123-138             | 2200-2300     | 14.47-14.5  |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2  |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4   |
| 8.37625-8.38675   | 156.7-156.9         | 2690-2900     | 22.01-23.12 |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0   |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8   |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5  |
| 12.57675-12.57725 | 322-335.4           | 3600-4400     | (2)         |
| 13.36-13.41       |                     |               |             |

According to FCC Part15.205 and RSS-Gen.8.9, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---------------------------|-----------------------|-------------------------|----------------------|
| 0.009-0.490               | 2400/F(KHz)           | 20 log (uV/m)           | 300                  |
| 0.490-1.705               | 24000/F(KHz)          | 20 log (uV/m)           | 30                   |
| 1.705-30                  | 30                    | 29.5                    | 30                   |
| 30-88                     | 100                   | 40                      | 3                    |
| 88-216                    | 150                   | 43.5                    | 3                    |
| 216-960                   | 200                   | 46                      | 3                    |
| Above 960                 | 500                   | 54                      | 3                    |

Remark :1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Distance extrapolation factor =40log(Specific distance/ test distance)( dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10\*Ig(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

Field strength of fundamental and Field strength of harmonics Limit:

| Fundamental frequency | Field strength of fundamental<br>(millivolts/meter) | Field strength of harmonics<br>(microvolts/meter) |
|-----------------------|-----------------------------------------------------|---------------------------------------------------|
| 902-928 MHz           | 50(94 dBV/m)                                        | 500(54 dBV/m)                                     |
| 2400-2483.5 MHz       | 50(94 dBV/m)                                        | 500(54 dBV/m)                                     |
| 5725-5875 MHz         | 50(94 dBV/m)                                        | 500(54 dBV/m)                                     |
| 24.0-24.25 GHz        | 250(108 dBV/m)                                      | 2500(68 dBV/m)                                    |

As shown in §15.35(b) and RSS-210 Annex B.10, for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation

For this report

| Fundamental Frequency | Field Strength<br>Of Fundamental | Field Strength of Spurious<br>Emissions |
|-----------------------|----------------------------------|-----------------------------------------|
| 2400-2483.5 MHz       | AV:94 dBuV/m at 3m distance      | AV:54 dBuV/m at 3m<br>distance          |
|                       | PK:114 dBuV/m at 3m<br>distance  | PK:74 dBuV/m at 3m<br>distance          |

### 8.3.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

### 8.3.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for  $f \geq 1$  GHz(1GHz to 25GHz), 100 kHz for  $f < 1$  GHz(30MHz to 1GHz)

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2020 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from  $20\log(\text{dwell time}/100 \text{ ms})$ , in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

### 8.3.5 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 24° C     |
| Relative Humidity: | 53%       |
| ATM Pressure:      | 1011 mbar |

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average= Peak Value+20log(Duty Cycle), where the duty factor is calculated from following formula:

The duty cycle is simply the on-time divided by the period:

2405MHz:

Duty Cycle=0.4348 ms /16.087 ms=0.0270

Therefore, the averaging factor is found by 20log(0.0270)=-31.37

2440MHz:

Duty Cycle=0.4348 ms /16.087 ms=0.0270

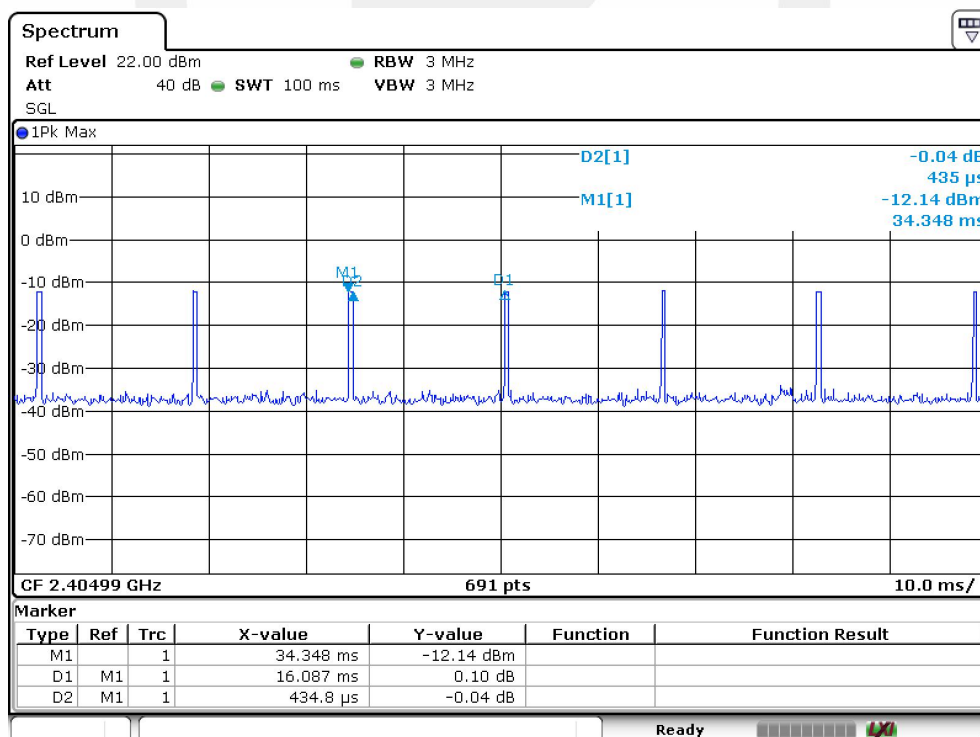
Therefore, the averaging factor is found by 20log(0.0270)=-31.37

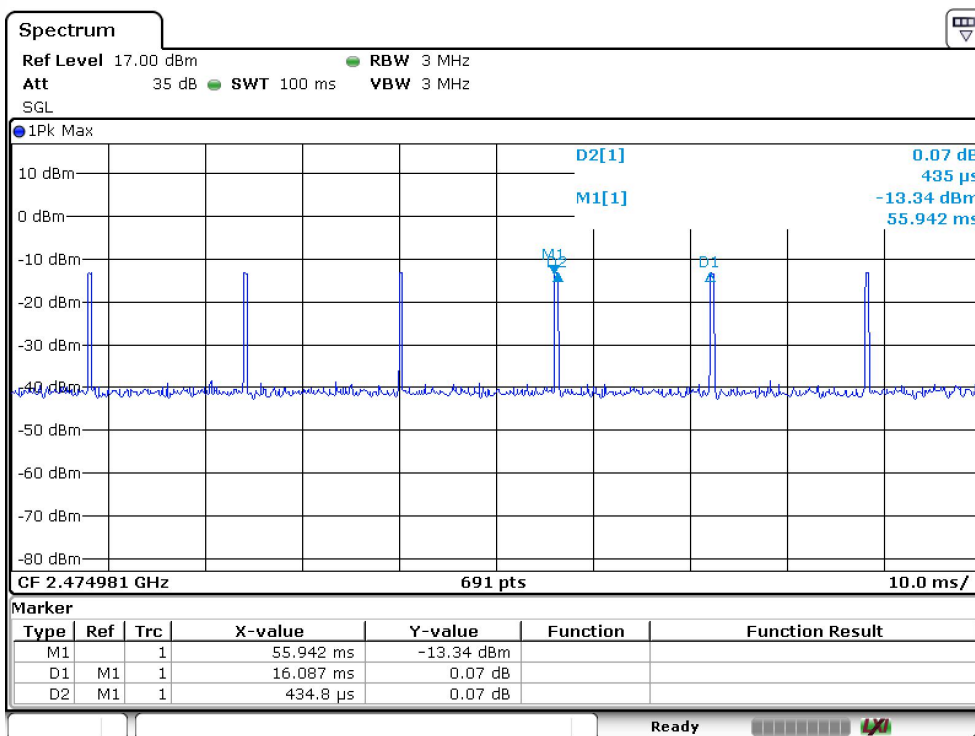
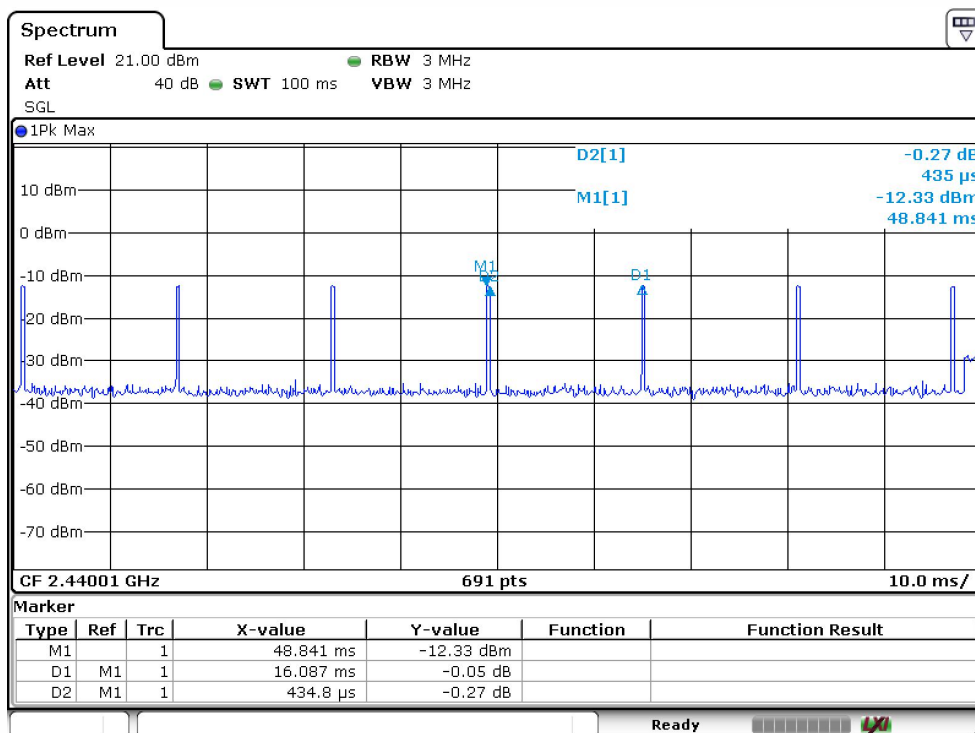
2475MHz:

Duty Cycle=0.4348 ms /16.087 ms=0.0270

Therefore, the averaging factor is found by 20log(0.0270)=-31.37

Please see the test plot below:





■ Spurious Emission below 30MHz (9KHz to 30MHz)

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |    | Limit 3m(dBuV/m) |    | Over(dB) |    |
|----------------|-----------------|---------------------------|----|------------------|----|----------|----|
|                |                 | PK                        | AV | PK               | AV | PK       | AV |
| --             | --              | --                        | -- | --               | -- | --       | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =  $40\log(\text{Specific distance} / \text{test distance})(\text{dB})$ ;

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ Field Strength of the fundamental signal

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |    | Over(dB) |        |
|----------------|-----------------|---------------------------|-------|------------------|----|----------|--------|
|                |                 | PK                        | AV    | PK               | AV | PK       | AV     |
| 2405           | V               | 69.67                     | 38.30 | 114              | 94 | -44.33   | -55.70 |
| 2405           | H               | 82.15                     | 50.78 | 114              | 94 | -31.85   | -43.22 |
|                |                 |                           |       |                  |    |          |        |
| 2440           | V               | 71.54                     | 40.17 | 114              | 94 | -42.46   | -53.83 |
| 2440           | H               | 80.50                     | 49.13 | 114              | 94 | -33.50   | -44.87 |
|                |                 |                           |       |                  |    |          |        |
| 2475           | V               | 69.00                     | 37.63 | 114              | 94 | -45.00   | -56.37 |
| 2475           | H               | 83.12                     | 51.75 | 114              | 94 | -30.88   | -42.25 |

Note: (1) Correct Factor= Antenna Factor +Cable Loss- Amplifier Gain

(2) Emission Level= Reading Level+Probe Factor +Cable Loss

## ■ Out of Band Emissions

Test mode: GFSK Frequency: Channel 1: 2405MHz

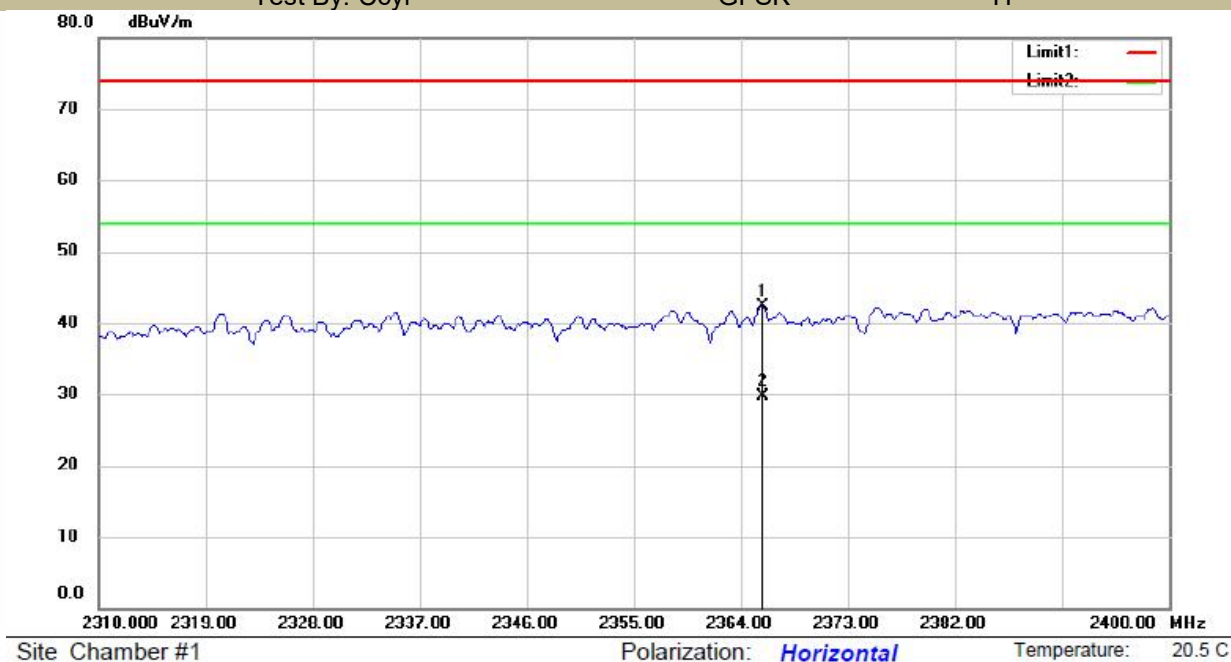
| Frequency (MHz) | Polarity | PK(dBuV/m)<br>(VBW=3MHz) | Limit 3m<br>(dBuV/m) | AV(dBuV/m)<br>(VBW=10Hz) | Limit 3m<br>(dBuV/m) |
|-----------------|----------|--------------------------|----------------------|--------------------------|----------------------|
| 2365.809        | H        | 42.31                    | 74.00                | 29.75                    | 54.00                |
| 2385.150        | V        | 43.00                    | 74.00                | 30.24                    | 54.00                |

Test mode: GFSK Frequency: Channel 71: 2471MHz

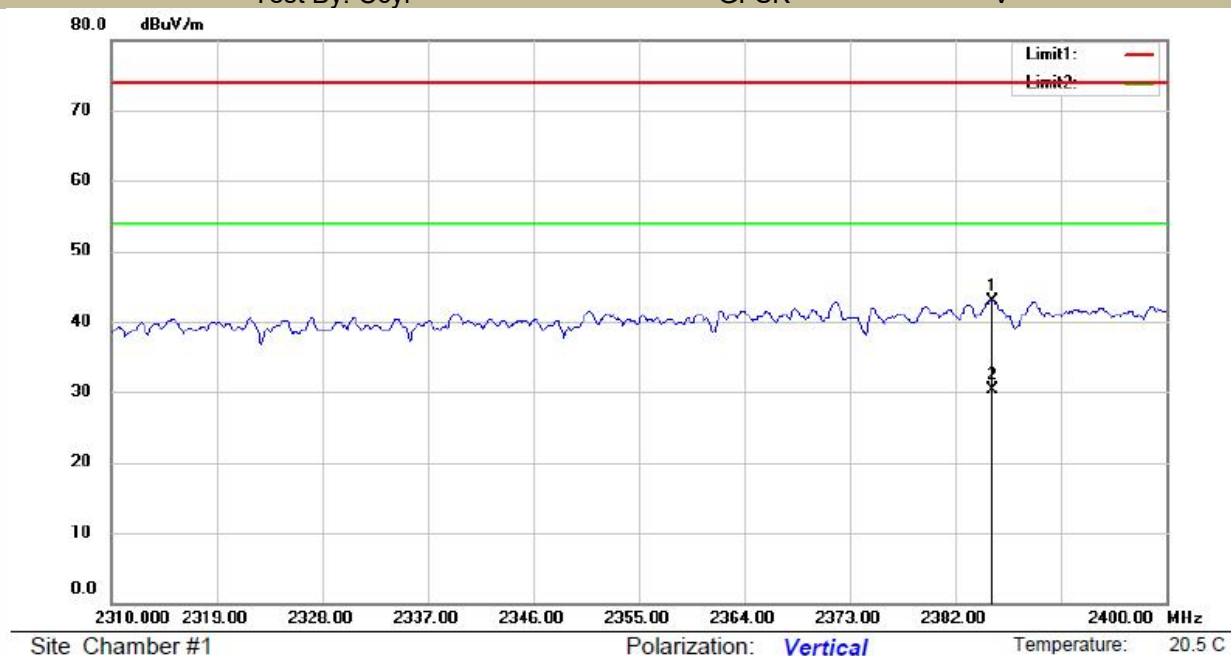
| Frequency (MHz) | Polarity | PK(dBuV/m)<br>(VBW=3MHz) | Limit 3m<br>(dBuV/m) | AV(dBuV/m)<br>(VBW=10Hz) | Limit 3m<br>(dBuV/m) |
|-----------------|----------|--------------------------|----------------------|--------------------------|----------------------|
| 2490.852        | H        | 44.86                    | 74.00                | 32.28                    | 54.00                |
| 2486.102        | V        | 45.00                    | 74.00                | 32.33                    | 54.00                |

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor +Cable Loss.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

|            |                |      |   |
|------------|----------------|------|---|
| Test Model | Band Emissions | GFSK | H |
|            | Low            |      |   |
|            | Test By: Ccyf  |      |   |



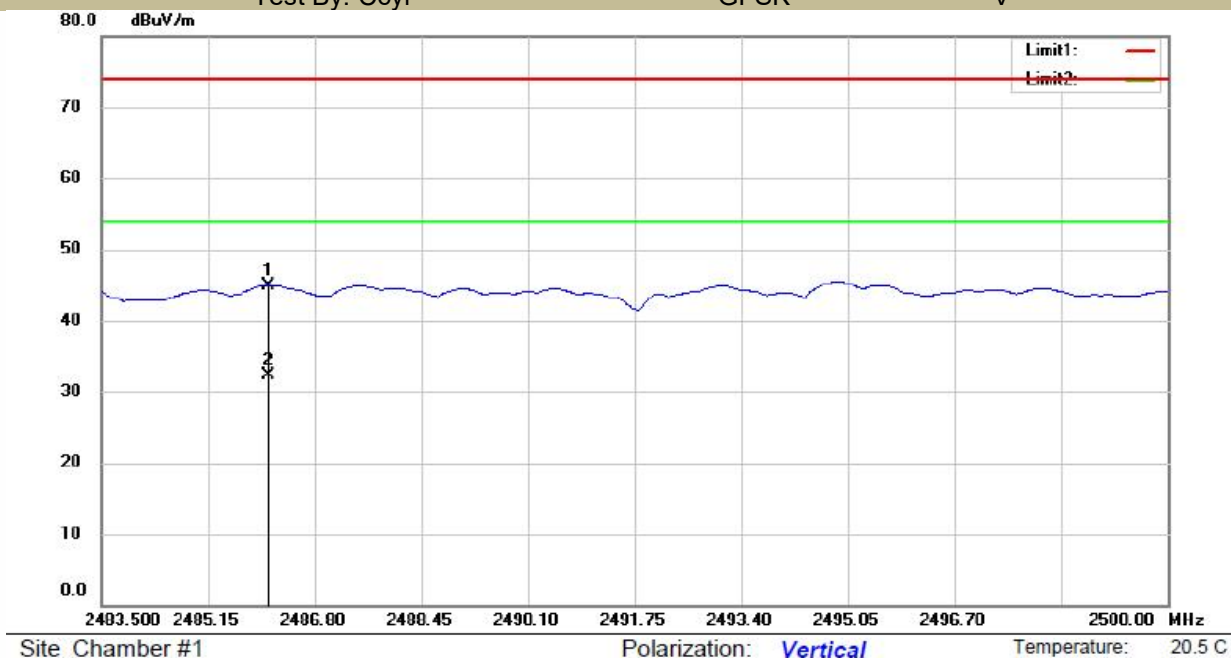
|            |                |      |   |
|------------|----------------|------|---|
| Test Model | Band Emissions | GFSK | V |
|            | Low            |      |   |
|            | Test By: Ccyf  |      |   |



|            |                |      |   |
|------------|----------------|------|---|
| Test Model | Band Emissions |      |   |
|            | High           |      |   |
|            | Test By: Ccyf  | GFSK | H |



|            |                |      |   |
|------------|----------------|------|---|
| Test Model | Band Emissions |      |   |
|            | High           |      |   |
|            | Test By: Ccyf  | GFSK | V |



■ Spurious Emission Above 1GHz (1GHz to 25GHz)

Test mode: GFSK Frequency: Channel 1: 2405MHz

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|-----------------|---------------------------|-------|------------------|-------|----------|--------|
|                |                 | PK                        | AV    | PK               | AV    | PK       | AV     |
| 4809.668       | V               | 52.71                     | 21.34 | 74.00            | 54.00 | -21.29   | -32.66 |
| 7895.767       | V               | 54.90                     | 23.53 | 74.00            | 54.00 | -19.1    | -30.47 |
| 11024.99       | V               | 54.53                     | 23.16 | 74.00            | 54.00 | -19.47   | -30.84 |
| 4809.668       | H               | 55.98                     | 24.61 | 74.00            | 54.00 | -18.02   | -29.39 |
| 7177.452       | H               | 54.59                     | 23.22 | 74.00            | 54.00 | -19.41   | -30.78 |
| 7866.154       | H               | 54.26                     | 22.89 | 74.00            | 54.00 | -19.74   | -31.11 |

Test mode: GFSK Frequency: Channel 36: 2440MHz

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|-----------------|---------------------------|-------|------------------|-------|----------|--------|
|                |                 | PK                        | AV    | PK               | AV    | PK       | AV     |
| 4879.681       | V               | 52.73                     | 21.36 | 74.00            | 54.00 | -21.27   | -32.64 |
| 7254.623       | V               | 54.73                     | 23.36 | 74.00            | 54.00 | -19.27   | -30.64 |
| 11302.47       | V               | 54.51                     | 23.14 | 74.00            | 54.00 | -19.49   | -30.86 |
| 4879.681       | H               | 56.09                     | 24.72 | 74.00            | 54.00 | -17.91   | -29.28 |
| 7719.749       | H               | 54.72                     | 23.35 | 74.00            | 54.00 | -19.28   | -30.65 |
| 11263.34       | H               | 54.58                     | 23.21 | 74.00            | 54.00 | -19.42   | -30.79 |

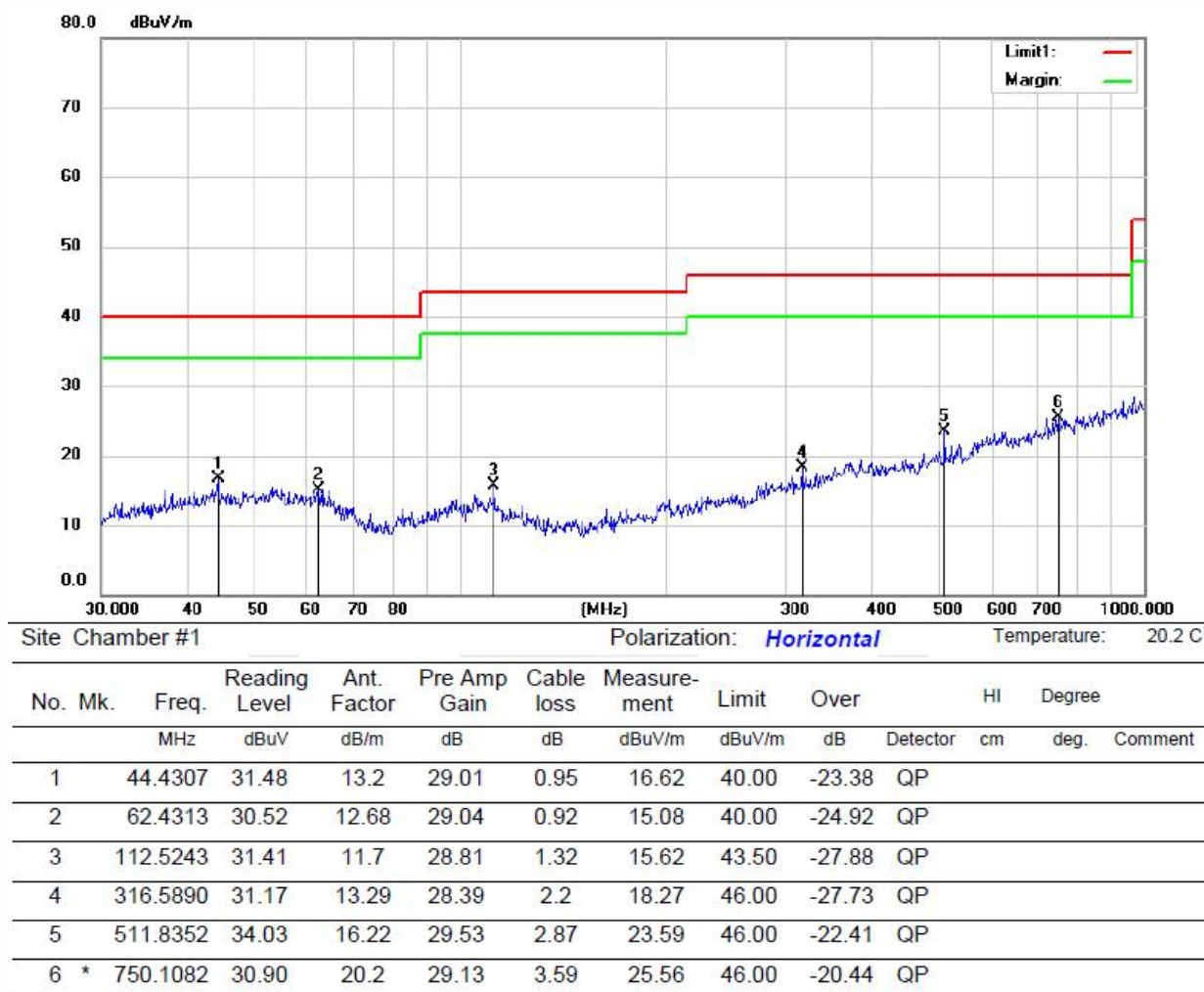
Test mode: GFSK Frequency: Channel 71: 2475MHz

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|-----------------|---------------------------|-------|------------------|-------|----------|--------|
|                |                 | PK                        | AV    | PK               | AV    | PK       | AV     |
| 4950.714       | V               | 52.65                     | 21.28 | 74.00            | 54.00 | -21.35   | -32.72 |
| 7456.584       | V               | 54.30                     | 22.93 | 74.00            | 54.00 | -19.7    | -31.07 |
| 10980.46       | V               | 53.97                     | 22.6  | 74.00            | 54.00 | -20.03   | -31.4  |
| 4950.714       | H               | 56.86                     | 25.49 | 74.00            | 54.00 | -17.14   | -28.51 |
| 7191.989       | H               | 54.68                     | 23.31 | 74.00            | 54.00 | -19.32   | -30.69 |
| 10838.57       | H               | 53.47                     | 22.1  | 74.00            | 54.00 | -20.53   | -31.9  |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4)Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission below 1GHz (30MHz to 1GHz)

All modes have been tested, and the worst result recorded was report as below:

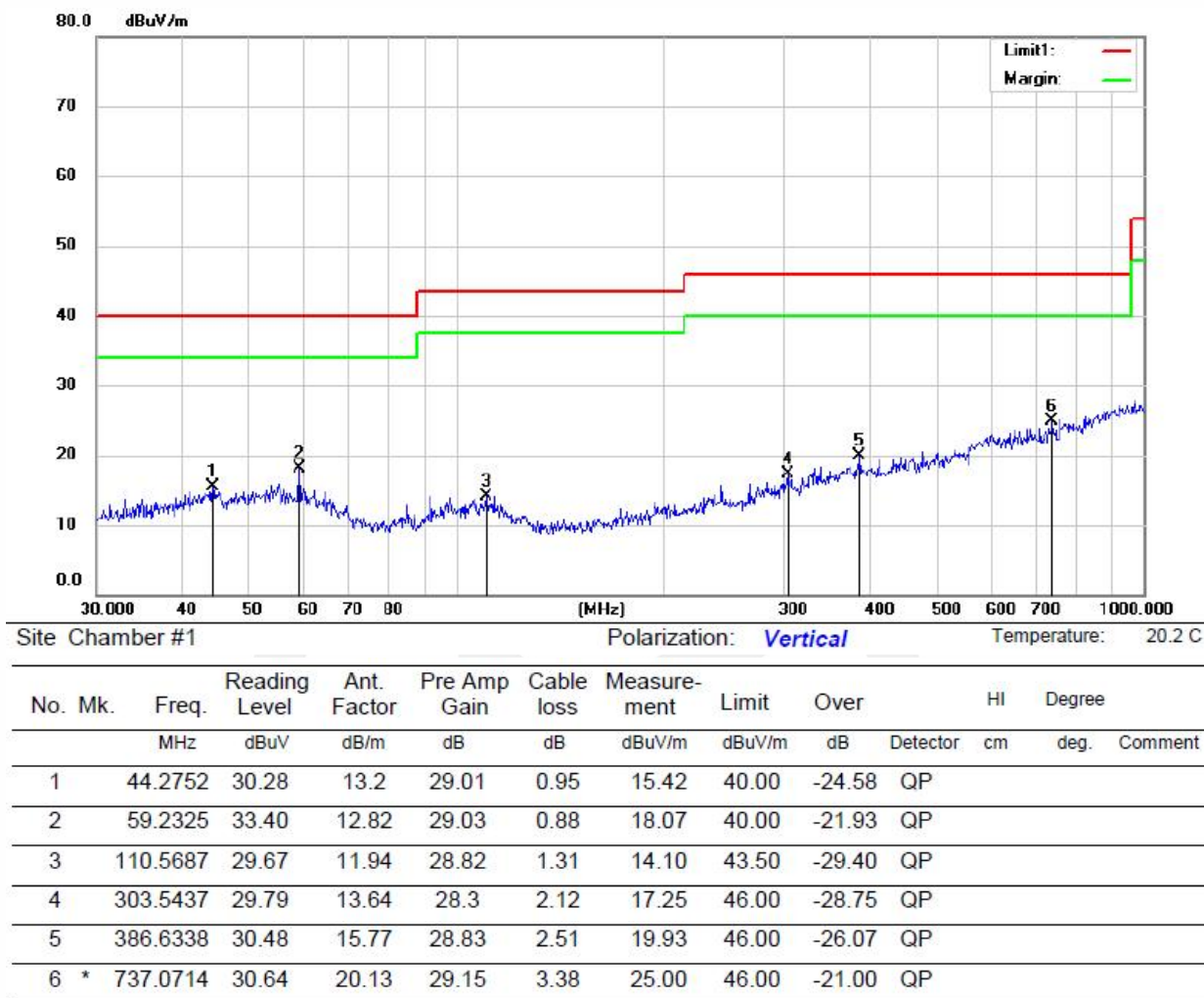


\*:Maximum data x:Over limit !:over margin

Operator: Ccyf

Remark:

1. Measurement (dBuV/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dBuV/m)
2. Over (dB) = Measurement (dBuV/m) - Limit (dBuV/m)



\*:Maximum data x:Over limit !:over margin

Operator: Ccyf

Remark:

1. Measurement (dBuV/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dBμV/m)
2. Over (dB) = Measurement (dBμV/m) - Limit (dBμV/m)

## 8.4 CONDUCTED EMISSIONS TEST

### 8.4.1 Applicable Standard

According to FCC Part 15.207(a)  
According to IC RSS-Gen 8.8

### 8.4.2 Conformance Limit

| Frequency(MHz) | Conducted Emission Limit |         |
|----------------|--------------------------|---------|
|                | Quasi-peak               | Average |
| 0.15-0.5       | 66-56                    | 56-46   |
| 0.5-5.0        | 56                       | 46      |
| 5.0-30.0       | 60                       | 50      |

Note: 1. The lower limit shall apply at the transition frequencies  
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 8.4.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

### 8.4.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.  
Maximum procedure was performed on the highest emissions to ensure EUT compliance.  
Repeat above procedures until all frequency measured were complete.

### 8.4.5 Test Results

N/A

The product is battery powered.

## 8.5 ANTENNA APPLICATION

### 8.5.1 Antenna Requirement

| Standard                   | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC CRF Part 15.203        | <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.</p> <p>The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.</p> |
| FCC 47 CFR Part 15.249 (b) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| RSS-Gen Section 6.8        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### 8.5.2 Result

PASS.

- Note:
- ☒ Antenna use a permanently attached antenna which is not replaceable.
  - ☐ Not using a standard antenna jack or electrical connector for antenna replacement
  - ☐ The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached document Internal Photos to show the antenna connector.

----- END OF REPORT -----