

# FCC TEST REPORT

## FCC ID:2BLVP-AS-PS01

**Product** : Wireless Speaker  
**Model Name** : AS-PS01, AS-PS02, AS-SP03  
**Brand** : Bissbox, Asiamac  
**Report No.** : SZNTT26023903E1-1

Prepared for

**Shenzhen Gulf Asiamac Enterprise Co., Limited**

**4F, Bldg.C, Hengmingzhu Industrial Park, Xixiang Street, Baoan District, Shenzhen, China**

Prepared by

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## 1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Gulf Asiamac Enterprise Co., Limited

Address : 4F, Bldg.C, Hengmingzhu Industrial Park, Xixiang Street, Baoan District, Shenzhen, China

Manufacture's name : Shenzhen Gulf Asiamac Enterprise Co., Limited

Address : 4F, Bldg.C, Hengmingzhu Industrial Park, Xixiang Street, Baoan District, Shenzhen, China

Product name : Wireless Speaker

Model name : AS-PS01

Additional model : AS-PS02, AS-SP03

Standards : FCC CFR47 Part 15 Section 15.247

Test procedure : ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 KDB 558074 D01 15.247 Meas Guidance v05r02

Test Date : Jun. 05, 2026 to Jun. 30, 2026

Date of Issue : Jul. 01, 2026

Test Result : Pass

This device described above has been tested by NTT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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|                                                                     |           |
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## 2 Test Summary

| Test Items                  | Test Requirement                 | Result |
|-----------------------------|----------------------------------|--------|
| Radiated Spurious Emissions | 15.205(a)<br>15.209<br>15.247(d) | PASS   |
| Band edge                   | 15.247(d)<br>15.205(a)           | PASS   |
| Conduct Emission            | 15.207                           | PASS   |
| 20dB Bandwidth              | 15.247(a)(1)                     | PASS   |
| Maximum Peak Output Power   | 15.247(b)(1)                     | PASS   |
| Frequency Separation        | 15.247(a)(1)                     | PASS   |
| Number of Hopping Frequency | 15.247(a)(1)(iii)                | PASS   |
| Dwell time                  | 15.247(a)(1)(iii)                | PASS   |
| Antenna Requirement         | 15.203                           | PASS   |

Remark:

1. "N/A" denotes test is not applicable in this Test Report.



### 3 TEST FACILITY

Site Description

Designation Number: CN3446

EMC Lab.

:

Test Firm Registration Number: 129414

Accredited by ANAB, Dec. 19, 2025

The Certificate Registration Number is AT-3446

Name of Firm

:

Shenzhen NTT Testing Technology Co., Ltd.

Site Location

:

1B, Building 2, Factory Building & 103, Building 3, Factory Building, Dayang Industrial Park No.4, Industrial Avenue, Tangwei Community, Fuhai Sub-district, Bao'an District, Shenzhen City, China

## 4 General Information

### 4.1 General Description of E.U.T.

|                                                                                                                                                                                                                |   |                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------|
| Product Name                                                                                                                                                                                                   | : | Wireless Speaker                                                                               |
| Model Name                                                                                                                                                                                                     | : | AS-PS01                                                                                        |
| Sample ID                                                                                                                                                                                                      | : | SZNTT26023903E1-001#                                                                           |
| Sample(s) Status:                                                                                                                                                                                              | : | Engineer sample                                                                                |
| Series Model                                                                                                                                                                                                   | : | AS-PS02, AS-SP03                                                                               |
| Model Difference                                                                                                                                                                                               | : | All the models are the same circuit and RF module, except the model name and appearance color. |
| Operating frequency                                                                                                                                                                                            | : | 2402-2480MHz                                                                                   |
| Numbers of Channel                                                                                                                                                                                             | : | 79 channels                                                                                    |
| Antenna Type                                                                                                                                                                                                   | : | PCB antenna                                                                                    |
| Antenna Gain                                                                                                                                                                                                   | : | -0.58 dBi                                                                                      |
| Type of Modulation                                                                                                                                                                                             | : | GFSK, $\pi/4$ -DQPSK                                                                           |
| Power supply                                                                                                                                                                                                   | : | DC 3.7V from battery; charging input: DC 5V                                                    |
| Hardware Version                                                                                                                                                                                               | : | /                                                                                              |
| Software Version                                                                                                                                                                                               | : | /                                                                                              |
| Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant. |   |                                                                                                |



## 4.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHZ to the 10th harmonics of the highest fundamental frequency or to 40 GHz, whichever is lower).

The EUT has been tested under TX operating condition.

This EUT is a FHSS system, were conducted to determine the final configuration from all possible combinations. We use software control the EUT, Let EUT hopping on and transmit with highest power, all the modes GFSK,  $\pi/4$ -DQPSK have been tested. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Channel List:

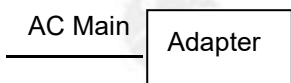
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 0       | 2402            | 1       | 2403            | 2       | 2404            | 3       | 2405            |
| 4       | 2406            | 5       | 2407            | 6       | 2408            | 7       | 2409            |
| 8       | 2410            | 9       | 2411            | 10      | 2412            | 11      | 2413            |
| 12      | 2414            | 13      | 2415            | 14      | 2416            | 15      | 2417            |
| 16      | 2418            | 17      | 2419            | 18      | 2420            | 19      | 2421            |
| 20      | 2422            | 21      | 2423            | 22      | 2424            | 23      | 2425            |
| 24      | 2426            | 25      | 2427            | 26      | 2428            | 27      | 2429            |
| 28      | 2430            | 29      | 2431            | 30      | 2432            | 31      | 2433            |
| 32      | 2434            | 33      | 2435            | 34      | 2436            | 35      | 2437            |
| 36      | 2438            | 37      | 2439            | 38      | 2440            | 39      | 2441            |
| 40      | 2442            | 41      | 2443            | 42      | 2444            | 43      | 2445            |
| 44      | 2446            | 45      | 2447            | 46      | 2448            | 47      | 2449            |
| 48      | 2450            | 49      | 2451            | 50      | 2452            | 51      | 2453            |
| 52      | 2454            | 53      | 2455            | 54      | 2456            | 55      | 2457            |
| 56      | 2458            | 57      | 2459            | 58      | 2460            | 59      | 2461            |
| 60      | 2462            | 61      | 2463            | 62      | 2464            | 63      | 2465            |
| 64      | 2466            | 65      | 2467            | 66      | 2468            | 67      | 2469            |
| 68      | 2470            | 69      | 2471            | 70      | 2472            | 71      | 2473            |
| 72      | 2474            | 73      | 2475            | 74      | 2476            | 75      | 2477            |
| 76      | 2478            | 77      | 2479            | 78      | 2480            | -       | -               |

| Channel | Frequency(MHz) |
|---------|----------------|
| 0       | 2402           |
| 39      | 2441           |
| 78      | 2480           |

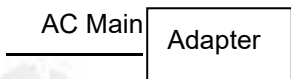


### 4.3 Test Setup Configuration

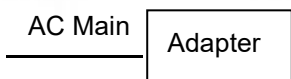
Conducted Emission



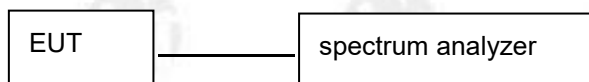
Radiated Emission



Radiated Spurious



RF Conducted Test



### 4.4 Test configuration

|                                                                                                                                                                                                                                       |                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                     | Keep the EUT in continuously transmitting mode. |
| Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. |                                                 |

|                   |                    |
|-------------------|--------------------|
| Test Software     | FCC_assist_1.0.2.2 |
| Power level setup | Default            |



## 5 Equipment During Test

### 5.1 Equipments List

#### Conducted emission Test Equipment

| Name              | Model No.     | Serial No. | Manufacturer | Date of Cal. | Due Date  |
|-------------------|---------------|------------|--------------|--------------|-----------|
| 944 Shielded Room | HSRCE944      | /          | HTEC         | 2025/4/30    | 2028/4/29 |
| EMI Test Receiver | ESCI          | /          | RS           | 2025/9/8     | 2026/9/7  |
| LISN              | NNLK 8129     | 00603      | Schwarzbeck  | 2025/9/8     | 2026/9/7  |
| LISN              | NNHV 8123-400 | 00694      | Schwarzbeck  | 2025/9/8     | 2026/9/7  |
| LISN              | NNHV 8123-400 | 00680      | Schwarzbeck  | 2025/9/8     | 2026/9/7  |
| Cable             | RG223-1500MM  | NA         | RG           | 2025/9/8     | 2026/9/7  |

#### Radiated emission & Radio Frequency Test Equipment

| Name                                          | Model No.   | Serial No. | Manufacturer    | Date of Cal. | Due Date  |
|-----------------------------------------------|-------------|------------|-----------------|--------------|-----------|
| 966 Shielded Room                             | 966 Room    | /          | EMToni          | 2025/7/24    | 2028/7/23 |
| EMI Test Receiver                             | ESCI        | 101018     | RS              | 2025/9/8     | 2026/9/7  |
| Amplifier (30MHz-1GHz)                        | BBV 9718D   | 00042      | SCHWARZBECK     | 2025/9/8     | 2026/9/7  |
| Bilog Antenna (30MHz-1GHz)                    | VULB9168    | 1858       | SCHWARZBECK     | 2025/9/9     | 2026/9/8  |
| Horn antenna (1GHz-18GHz)                     | BBHA 9120 D | 02622      | SCHWARZBECK     | 2025/9/9     | 2026/9/8  |
| Preamplifier (1GHz-18GHz)                     | BBV 9718D   | 0024       | SCHWARZBECK     | 2025/9/8     | 2026/9/7  |
| Spectrum Analyzer (10Hz-40GHz)                | FSV 40      | 100952     | Rohde & Schwarz | 2025/9/8     | 2026/9/7  |
| Preamplifier (18GHz-40GHz)                    | BBV 9721    | 0056       | SCHWARZBECK     | 2025/9/8     | 2026/9/7  |
| Double Ridge Guide Horn Antenna (18GHz-40GHz) | SAS-574     | 588        | A.H.System      | 2025/9/8     | 2026/9/7  |
| Loop Antenna (9KHz-30MHz)                     | FMZB1519B   | 014        | SCHWARZBECK     | 2025/9/8     | 2026/9/7  |
| Amplifier (9KHz-30MHz)                        | CVP 9222 C  | 00109      | SCHWARZBECK     | 2025/9/8     | 2026/9/7  |
| MXG Signal Analyzer                           | N9020A      | MY50510202 | Agilent         | 2025/9/8     | 2026/9/7  |



|                             |               |            |         |          |          |
|-----------------------------|---------------|------------|---------|----------|----------|
| MXG Vector Signal Generator | N5182A        | MY50140020 | Agilent | 2025/9/8 | 2026/9/7 |
| MXG Analog Signal Generator | N5181A        | MY47420919 | Agilent | 2025/9/8 | 2026/9/7 |
| Power Sensor                | TR1029-2      | 512364     | Techoy  | 2025/9/8 | 2026/9/7 |
| RF Swith                    | TR1029-1      | 512364     | Techoy  | 2025/9/8 | 2026/9/7 |
| Cable                       | DA800-4000MM  | NA         | DA      | 2025/9/8 | 2026/9/7 |
| Cable                       | DA800-11000MM | NA         | DA      | 2025/9/8 | 2026/9/7 |

Other

| Item | Name                         | Manufacturer | Model  | Software version   |
|------|------------------------------|--------------|--------|--------------------|
| 1    | EMC Conduction Test System   | FALA         | EZ-EMC | Ver.EMC-CON 3A1.1+ |
| 2    | EMC radiation test system    | FALA         | EZ-EMC | Ver.FA-03A2 RE+    |
| 3    | RF test system               | TACHOY       | RFTest | V1.0.0             |
| 4    | RF communication test system | TACHOY       | RFTest | V1.0.0             |



## 5.2 Measurement Uncertainty

| Parameter                                                                                                                                                                                                                                                 | Uncertainty              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| RF output power, conducted                                                                                                                                                                                                                                | $\pm 1.0\text{dB}$       |
| Power Spectral Density, conducted                                                                                                                                                                                                                         | $\pm 2.2\text{dB}$       |
| Radio Frequency                                                                                                                                                                                                                                           | $\pm 1 \times 10^{-6}$   |
| Bandwidth                                                                                                                                                                                                                                                 | $\pm 1.5 \times 10^{-6}$ |
| Time                                                                                                                                                                                                                                                      | $\pm 2\%$                |
| Duty Cycle                                                                                                                                                                                                                                                | $\pm 2\%$                |
| Temperature                                                                                                                                                                                                                                               | $\pm 1^{\circ}\text{C}$  |
| Humidity                                                                                                                                                                                                                                                  | $\pm 5\%$                |
| DC and low frequency voltages                                                                                                                                                                                                                             | $\pm 3\%$                |
| Conducted Emissions (150kHz~30MHz)                                                                                                                                                                                                                        | $\pm 3.64\text{dB}$      |
| Radiated Emission(9KHz~30MHz)                                                                                                                                                                                                                             | $\pm 4.51\text{dB}$      |
| Radiated Emission(30MHz~1GHz)                                                                                                                                                                                                                             | $\pm 5.03\text{dB}$      |
| Radiated Emission(1GHz~25GHz)                                                                                                                                                                                                                             | $\pm 4.74\text{dB}$      |
| Remark:When making a conformity declaration based on test results for regulations/standards or specifications,the default is to use Clause 4.2.1of ILAC-G8:09/2019 and the guidelines on decision rules and conformity declaration in IEC Guide 115:2023. |                          |

## 5.3 Description of Support Units

The EUT has been tested as an independent unit .

## 6 Conducted Emission

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| Test Requirement: | : FCC CFR 47 Part 15 Section 15.207                                    |
| Test Method:      | : ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 |
| Test Result:      | : PASS                                                                 |
| Frequency Range:  | : 150kHz to 30MHz                                                      |
| Class/Severity:   | : Class B                                                              |
| Detector:         | : Peak for pre-scan (9kHz Resolution Bandwidth)                        |

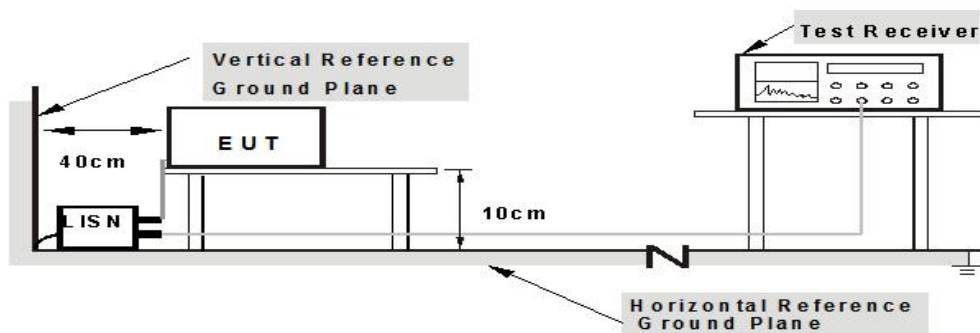
### 6.1 E.U.T. Operation

Operating Environment :

|                       |                |
|-----------------------|----------------|
| Temperature:          | : 25°C         |
| Humidity:             | : 54% RH       |
| Atmospheric Pressure: | : 1010hPa      |
| Test Voltage          | : AC 120V/60Hz |

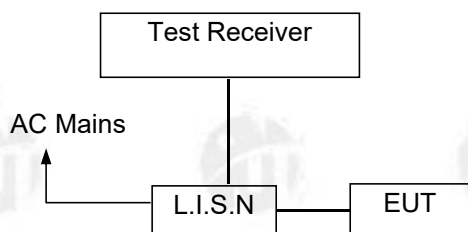
### 6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020+Cor.1-2023



Note: 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 10 cm from EUT and at least 10 from other units and other metal planes

### 6.3 Test SET-UP (Block Diagram of Configuration)



## 6.4 Measurement Procedure:

1. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN at least 80 cm from nearest part of EUT chassis.
5. For the actual test configuration, please refer to the related Item - EUT Test Photos.

## 6.5 Conducted Emission Limit

### Conducted Emission

| Frequency(MHz) | 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.

## 6.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

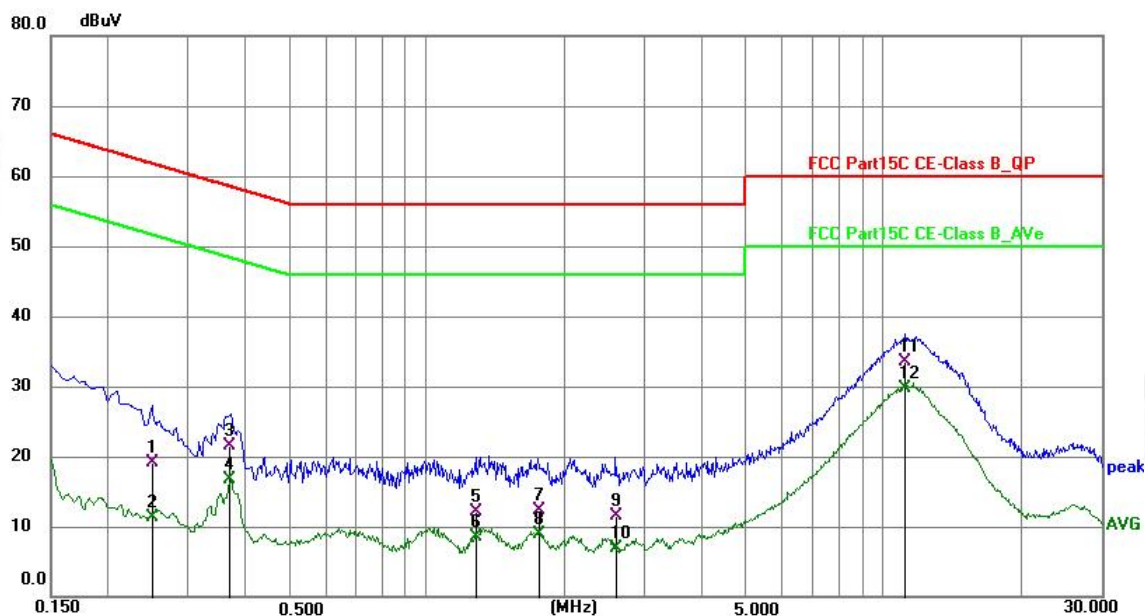
## 6.7 Conducted Emission Test Result

Pass.

Conducted emission at all mode, only the worst mode is recorded in the following pages.



|                |                                       |                    |              |
|----------------|---------------------------------------|--------------------|--------------|
| Temperature:   | 25 °C                                 | Relative Humidity: | 54%          |
| Pressure:      | 1010hPa                               | Phase :            | L            |
| Test Voltage : | DC 5V from Adapter input AC 120V/60Hz | Mode:              | GFSK-2402MHz |



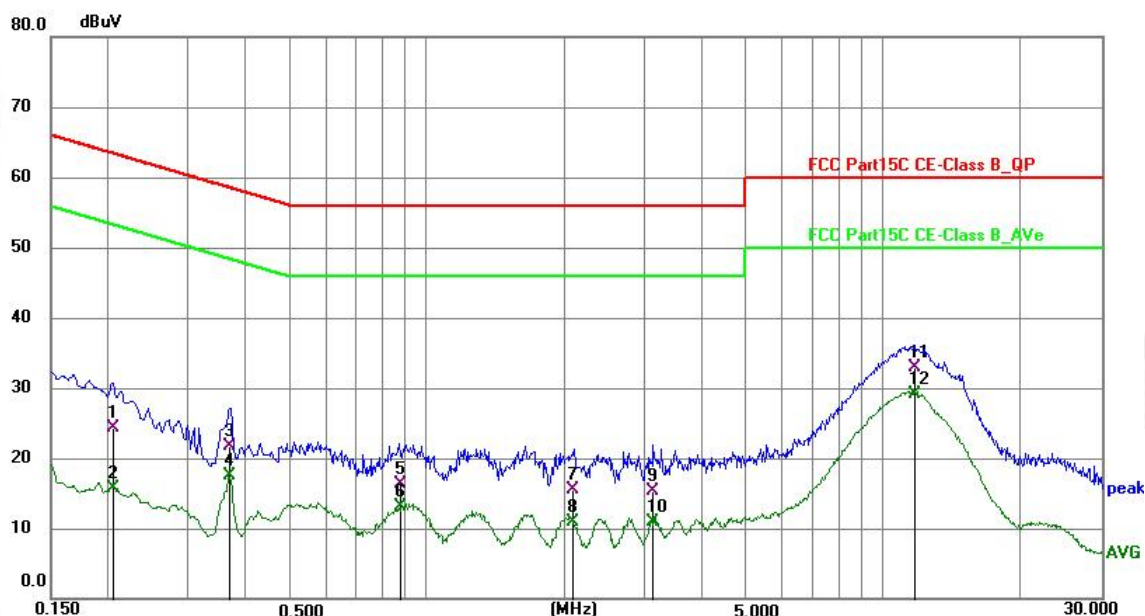
| No.  | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|------|-----------------|----------------|-------------|--------------|--------------|-------------|----------|
| 1    | 0.2490          | 9.00           | 10.15       | 19.15        | 61.79        | -42.64      | QP       |
| 2    | 0.2490          | 1.15           | 10.15       | 11.30        | 51.79        | -40.49      | AVG      |
| 3    | 0.3693          | 11.35          | 10.13       | 21.48        | 58.52        | -37.04      | QP       |
| 4    | 0.3693          | 6.49           | 10.13       | 16.62        | 48.52        | -31.90      | AVG      |
| 5    | 1.2851          | 2.02           | 10.14       | 12.16        | 56.00        | -43.84      | QP       |
| 6    | 1.2851          | -1.61          | 10.14       | 8.53         | 46.00        | -37.47      | AVG      |
| 7    | 1.7615          | 2.13           | 10.16       | 12.29        | 56.00        | -43.71      | QP       |
| 8    | 1.7615          | -1.25          | 10.16       | 8.91         | 46.00        | -37.09      | AVG      |
| 9    | 2.6056          | 1.40           | 10.17       | 11.57        | 56.00        | -44.43      | QP       |
| 10   | 2.6056          | -3.27          | 10.17       | 6.90         | 46.00        | -39.10      | AVG      |
| 11   | 11.1348         | 23.08          | 10.38       | 33.46        | 60.00        | -26.54      | QP       |
| 12 * | 11.1348         | 19.24          | 10.38       | 29.62        | 50.00        | -20.38      | AVG      |

Note:

1. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
2. An initial pre-scan was performed on the line and neutral lines with peak detector.
3. Correct Factor = Insertion loss of LISN + Cable loss.
4. Margin = Reading level + Correct Factor - Limit.



|                |                                       |                    |              |
|----------------|---------------------------------------|--------------------|--------------|
| Temperature:   | 25 °C                                 | Relative Humidity: | 54%          |
| Pressure:      | 1010hPa                               | Phase :            | N            |
| Test Voltage : | DC 5V from Adapter input AC 120V/60Hz | Mode:              | GFSK-2402MHz |



| No.  | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|------|-----------------|----------------|-------------|--------------|--------------|-------------|----------|
| 1    | 0.2046          | 14.09          | 10.15       | 24.24        | 63.42        | -39.18      | QP       |
| 2    | 0.2046          | 5.46           | 10.15       | 15.61        | 53.42        | -37.81      | AVG      |
| 3    | 0.3699          | 11.51          | 10.12       | 21.63        | 58.50        | -36.87      | QP       |
| 4    | 0.3699          | 7.35           | 10.12       | 17.47        | 48.50        | -31.03      | AVG      |
| 5    | 0.8756          | 6.20           | 10.13       | 16.33        | 56.00        | -39.67      | QP       |
| 6    | 0.8756          | 2.99           | 10.13       | 13.12        | 46.00        | -32.88      | AVG      |
| 7    | 2.0912          | 5.26           | 10.15       | 15.41        | 56.00        | -40.59      | QP       |
| 8    | 2.0912          | 0.74           | 10.15       | 10.89        | 46.00        | -35.11      | AVG      |
| 9    | 3.1371          | 5.02           | 10.19       | 15.21        | 56.00        | -40.79      | QP       |
| 10   | 3.1371          | 0.81           | 10.19       | 11.00        | 46.00        | -35.00      | AVG      |
| 11   | 11.6932         | 22.41          | 10.40       | 32.81        | 60.00        | -27.19      | QP       |
| 12 * | 11.6932         | 18.74          | 10.40       | 29.14        | 50.00        | -20.86      | AVG      |

Note:

1. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
2. An initial pre-scan was performed on the line and neutral lines with peak detector.
3. Correct Factor = Insertion loss of LISN + Cable loss.
4. Margin = Reading level + Correct Factor - Limit.



## 7 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247  
Test Method : ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024  
Test Result : PASS  
Measurement Distance : 3m  
Limit : See the follow table

| Frequency (MHz) | Field Strength        |              | Field Strength Limit at 3m Measurement Dist |                                       |
|-----------------|-----------------------|--------------|---------------------------------------------|---------------------------------------|
|                 | uV/m                  | Distance (m) | uV/m                                        | dBuV/m                                |
| 0.009 ~ 0.490   | $2400/F(\text{kHz})$  | 300          | $10000 * 2400/F(\text{kHz})$                | $20\log^{(2400/F(\text{kHz}))} + 80$  |
| 0.490 ~ 1.705   | $24000/F(\text{kHz})$ | 30           | $100 * 24000/F(\text{kHz})$                 | $20\log^{(24000/F(\text{kHz}))} + 40$ |
| 1.705 ~ 30      | 30                    | 30           | $100 * 30$                                  | $20\log^{(30)} + 40$                  |
| 30 ~ 88         | 100                   | 3            | 100                                         | $20\log^{(100)}$                      |
| 88 ~ 216        | 150                   | 3            | 150                                         | $20\log^{(150)}$                      |
| 216 ~ 960       | 200                   | 3            | 200                                         | $20\log^{(200)}$                      |
| Above 960       | 500                   | 3            | 500                                         | $20\log^{(500)}$                      |

### 7.1 EUT Operation

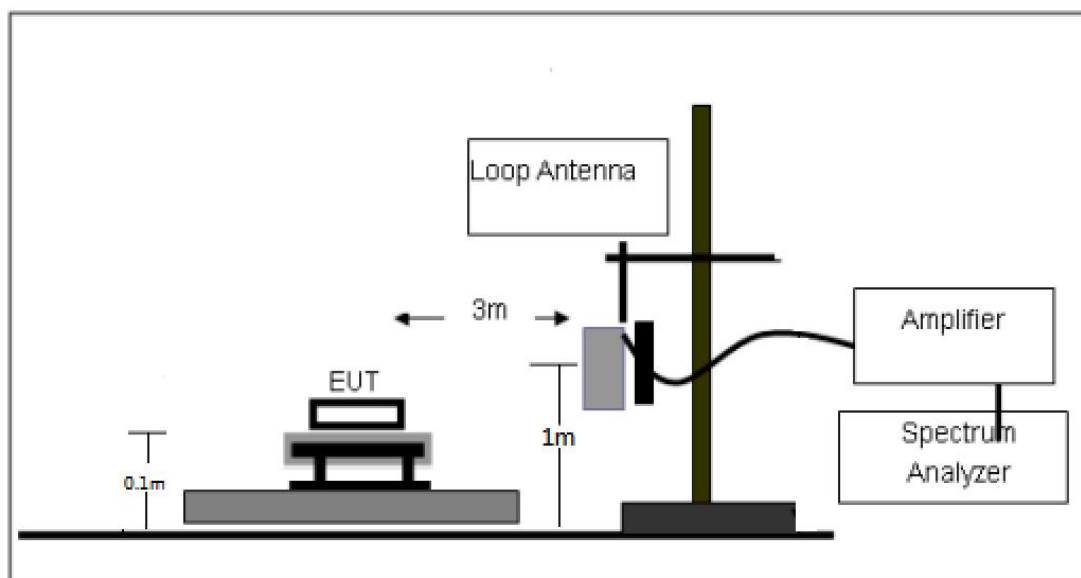
Operating Environment :

Temperature : 25 °C  
Humidity : 54% RH  
Atmospheric Pressure : 1010hPa  
Test Voltage : AC 120V/60Hz

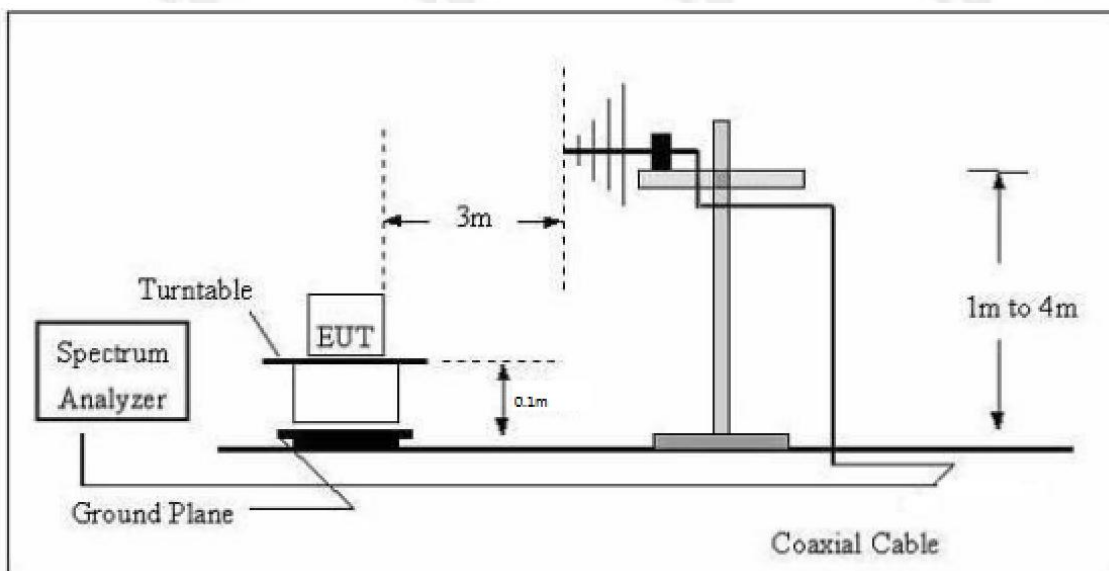
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi-Anechoic Chamber test site

The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



### 7.3 Spectrum Analyzer Setup

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 1000 MHz                                         |
| Stop Frequency                        | 10th carrier harmonic                            |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020+Cor.1-2023.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.1m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 0.1m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
  - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
  - 2) Change the antenna polarization and repeat 1) with vertical polarization.
  - 3) Make a hardcopy of the spectrum.
  - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
  - 5) Change the analyzer mode to Clear/ Write and found the cone of emission.
  - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
  - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
  - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.



8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

## 7.5 Summary of Test Results

### Test Frequency: 9KHz-30MHz

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV/m) | Limit 3m<br>(dBuV/m) | Over<br>(dB) |
|----------------|-----------------|----------------------------|----------------------|--------------|
| --             | --              | --                         | --                   | >20          |

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

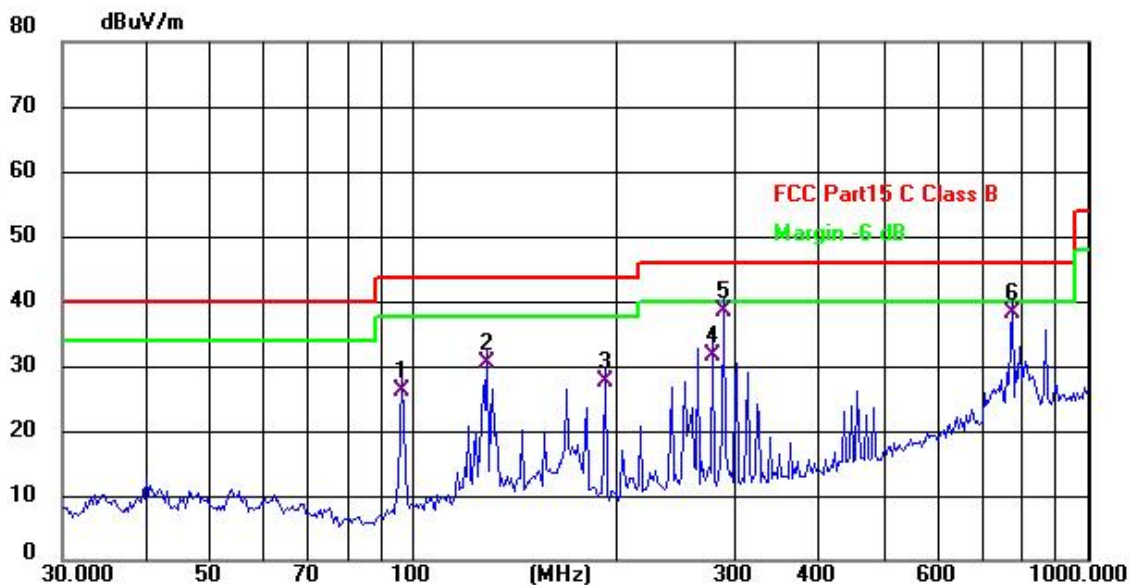
Limit line = Specific limits(dBuV) + distance extrapolation factor.

### Test Frequency: 30MHz ~ 1GHz

Please refer to the following test plots, we had tested the EUT at different modulation modes, then recorded the worst mode : GFSK, the Low Channel (2402MHz) :



|                |         |                    |              |
|----------------|---------|--------------------|--------------|
| Temperature:   | 25 °C   | Relative Humidity: | 54%          |
| Pressure:      | 1010hPa | Phase :            | Horizontal   |
| Test Voltage : | DC 3.7V | Mode:              | GFSK-2402MHz |

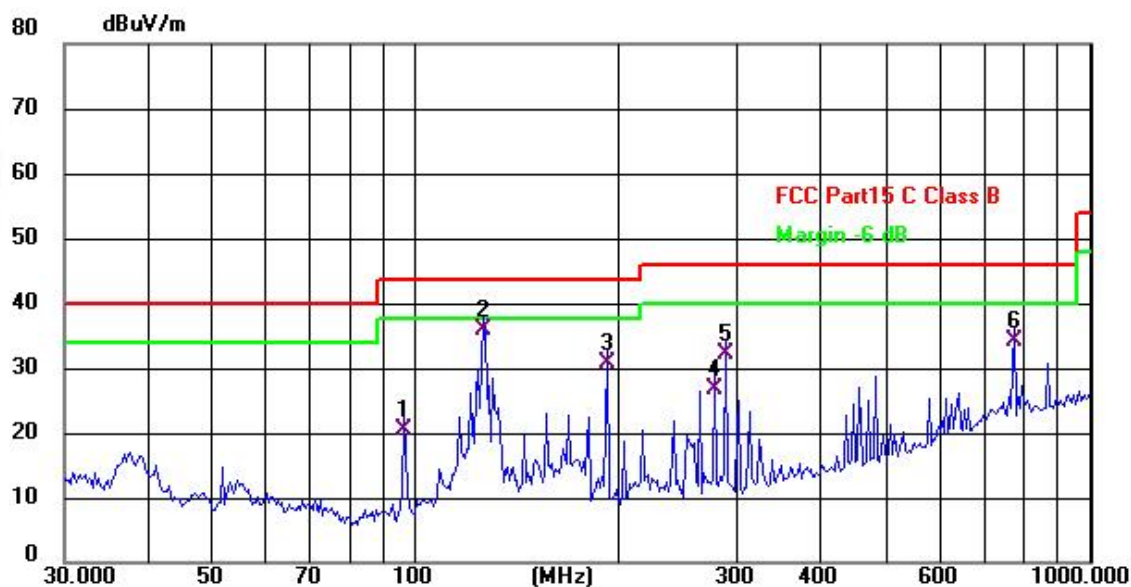


| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 96.0985         | 46.35          | -20.25        | 26.10          | 43.50          | -17.40      | QP       |
| 2   | 128.1130        | 47.68          | -17.38        | 30.30          | 43.50          | -13.20      | QP       |
| 3   | 192.4185        | 46.68          | -19.18        | 27.50          | 43.50          | -16.00      | QP       |
| 4   | 277.0935        | 48.75          | -17.05        | 31.70          | 46.00          | -14.30      | QP       |
| 5 * | 289.0020        | 55.01          | -16.71        | 38.30          | 46.00          | -7.70       | QP       |
| 6   | 771.4485        | 43.70          | -5.60         | 38.10          | 46.00          | -7.90       | QP       |

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor



|                |         |                    |              |
|----------------|---------|--------------------|--------------|
| Temperature:   | 25 °C   | Relative Humidity: | 54%          |
| Pressure:      | 1010hPa | Phase :            | Vertical     |
| Test Voltage : | DC 3.7V | Mode:              | GFSK-2402MHz |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 96.0985         | 40.55          | -20.25        | 20.30          | 43.50          | -23.20      | QP       |
| 2 * | 125.4457        | 53.42          | -17.52        | 35.90          | 43.50          | -7.60       | QP       |
| 3   | 192.4185        | 49.78          | -19.18        | 30.60          | 43.50          | -12.90      | QP       |
| 4   | 277.0935        | 43.85          | -17.05        | 26.80          | 46.00          | -19.20      | QP       |
| 5   | 289.0020        | 48.81          | -16.71        | 32.10          | 46.00          | -13.90      | QP       |
| 6   | 771.4485        | 39.80          | -5.60         | 34.20          | 46.00          | -11.80      | QP       |

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor



## Test Frequency 1GHz-25GHz

All the modes have tested and recorded the worst mode(GFSK) in the report

| Polar<br>(H/V)      | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampli<br>fier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|---------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|--------------------|----------------|------------------|
| Low Channel:2402MHz |                    |                            |                           |                       |                           |                               |                    |                |                  |
| V                   | 4804.00            | 46.82                      | 34.12                     | 5.03                  | 32.39                     | 50.12                         | 74.00              | -23.88         | Pk               |
| V                   | 4804.00            | 37.14                      | 34.12                     | 5.03                  | 32.39                     | 40.44                         | 54.00              | -13.56         | AV               |
| V                   | 7206.00            | 48.32                      | 32.54                     | 6.29                  | 35.86                     | 57.93                         | 74.00              | -16.07         | Pk               |
| V                   | 7206.00            | 37.96                      | 32.54                     | 6.29                  | 35.86                     | 47.57                         | 54.00              | -6.43          | AV               |
| V                   | 9608.00            | 45.06                      | 32.98                     | 7.55                  | 38.40                     | 58.03                         | 74.00              | -15.97         | Pk               |
| V                   | 9608.00            | 32.44                      | 32.98                     | 7.55                  | 38.40                     | 45.41                         | 54.00              | -8.59          | AV               |
| V                   | 12010.00           | 44.83                      | 32.09                     | 8.93                  | 39.00                     | 60.67                         | 74.00              | -13.33         | Pk               |
| V                   | 12010.00           | 28.61                      | 32.09                     | 8.93                  | 39.00                     | 44.45                         | 54.00              | -9.55          | AV               |
| H                   | 4804.00            | 49.34                      | 34.12                     | 5.03                  | 32.39                     | 52.64                         | 74.00              | -21.36         | Pk               |
| H                   | 4804.00            | 36.00                      | 34.12                     | 5.03                  | 32.39                     | 39.30                         | 54.00              | -14.70         | AV               |
| H                   | 7206.00            | 44.17                      | 32.54                     | 6.29                  | 35.86                     | 53.78                         | 74.00              | -20.22         | Pk               |
| H                   | 7206.00            | 35.70                      | 32.54                     | 6.29                  | 35.86                     | 45.31                         | 54.00              | -8.69          | AV               |
| H                   | 9608.00            | 42.97                      | 32.98                     | 7.55                  | 38.40                     | 55.94                         | 74.00              | -18.06         | Pk               |
| H                   | 9608.00            | 31.92                      | 32.98                     | 7.55                  | 38.40                     | 44.89                         | 54.00              | -9.11          | AV               |
| H                   | 12010.00           | 38.02                      | 32.09                     | 8.93                  | 39.00                     | 53.86                         | 74.00              | -20.14         | Pk               |
| H                   | 12010.00           | 30.58                      | 32.09                     | 8.93                  | 39.00                     | 46.42                         | 54.00              | -7.58          | AV               |



| Polar<br>(H/V)         | Frequency | Meter<br>Reading | Pre-ampli<br>fier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits   | Margin | Detector<br>Type |
|------------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|----------|--------|------------------|
|                        | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/m) | (dB)   |                  |
| Middle Channel:2441MHz |           |                  |                   |               |                   |                   |          |        |                  |
| V                      | 4882.00   | 48.86            | 34.07             | 5.09          | 32.59             | 52.47             | 74.00    | -21.53 | Pk               |
| V                      | 4882.00   | 38.29            | 34.07             | 5.09          | 32.59             | 41.90             | 54.00    | -12.10 | AV               |
| V                      | 7323.00   | 43.60            | 32.63             | 6.34          | 35.96             | 53.27             | 74.00    | -20.73 | Pk               |
| V                      | 7323.00   | 32.17            | 32.63             | 6.34          | 35.96             | 41.84             | 54.00    | -12.16 | AV               |
| V                      | 9764.00   | 40.17            | 32.92             | 7.59          | 38.40             | 53.24             | 74.00    | -20.76 | Pk               |
| V                      | 9764.00   | 28.82            | 32.92             | 7.59          | 38.40             | 41.89             | 54.00    | -12.11 | AV               |
| V                      | 12205.00  | 39.88            | 31.96             | 8.88          | 39.04             | 55.84             | 74.00    | -18.16 | Pk               |
| V                      | 12205.00  | 26.63            | 31.96             | 8.88          | 39.04             | 42.59             | 54.00    | -11.41 | AV               |
| H                      | 4882.00   | 46.46            | 34.07             | 5.09          | 32.59             | 50.07             | 74.00    | -23.93 | Pk               |
| H                      | 4882.00   | 38.56            | 34.07             | 5.09          | 32.59             | 42.17             | 54.00    | -11.83 | AV               |
| H                      | 7323.00   | 43.81            | 32.63             | 6.34          | 35.96             | 53.48             | 74.00    | -20.52 | Pk               |
| H                      | 7323.00   | 33.77            | 32.63             | 6.34          | 35.96             | 43.44             | 54.00    | -10.56 | AV               |
| H                      | 9764.00   | 37.78            | 32.92             | 7.59          | 38.40             | 50.85             | 74.00    | -23.15 | Pk               |
| H                      | 9764.00   | 29.30            | 32.92             | 7.59          | 38.40             | 42.37             | 54.00    | -11.63 | AV               |
| H                      | 12205.00  | 38.31            | 31.96             | 8.88          | 39.04             | 54.27             | 74.00    | -19.73 | Pk               |
| H                      | 12205.00  | 27.10            | 31.96             | 8.88          | 39.04             | 43.06             | 54.00    | -10.94 | AV               |



| Polar<br>(H/V)       | Frequency | Meter<br>Reading | Pre-ampli<br>fier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits   | Margin | Detector<br>Type |
|----------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|----------|--------|------------------|
|                      | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/m) | (dB)   |                  |
| High Channel:2480MHz |           |                  |                   |               |                   |                   |          |        |                  |
| V                    | 4960.00   | 47.78            | 34.02             | 5.15          | 32.80             | 51.71             | 74.00    | -22.29 | Pk               |
| V                    | 4960.00   | 35.33            | 34.02             | 5.15          | 32.80             | 39.26             | 54.00    | -14.74 | AV               |
| V                    | 7440.00   | 42.25            | 32.71             | 6.40          | 36.05             | 51.99             | 74.00    | -22.01 | Pk               |
| V                    | 7440.00   | 33.53            | 32.71             | 6.40          | 36.05             | 43.27             | 54.00    | -10.73 | AV               |
| V                    | 9920.00   | 43.34            | 32.86             | 7.62          | 38.40             | 56.50             | 74.00    | -17.50 | Pk               |
| V                    | 9920.00   | 31.11            | 32.86             | 7.62          | 38.40             | 44.27             | 54.00    | -9.73  | AV               |
| V                    | 12400.00  | 42.11            | 31.82             | 8.84          | 39.08             | 58.21             | 74.00    | -15.79 | Pk               |
| V                    | 12400.00  | 30.09            | 31.82             | 8.84          | 39.08             | 46.19             | 54.00    | -7.81  | AV               |
| H                    | 4960.00   | 47.31            | 34.02             | 5.15          | 32.80             | 51.24             | 74.00    | -22.76 | Pk               |
| H                    | 4960.00   | 39.98            | 34.02             | 5.15          | 32.80             | 43.91             | 54.00    | -10.09 | AV               |
| H                    | 7440.00   | 46.68            | 32.71             | 6.40          | 36.05             | 56.42             | 74.00    | -17.58 | Pk               |
| H                    | 7440.00   | 31.60            | 32.71             | 6.40          | 36.05             | 41.34             | 54.00    | -12.66 | AV               |
| H                    | 9920.00   | 39.68            | 32.86             | 7.62          | 38.40             | 52.84             | 74.00    | -21.16 | Pk               |
| H                    | 9920.00   | 32.52            | 32.86             | 7.62          | 38.40             | 45.68             | 54.00    | -8.32  | AV               |
| H                    | 12400.00  | 37.71            | 31.82             | 8.84          | 39.08             | 53.81             | 74.00    | -20.19 | Pk               |
| H                    | 12400.00  | 27.87            | 31.82             | 8.84          | 39.08             | 43.97             | 54.00    | -10.03 | AV               |

Note: 1. The testing has been conformed to 10\*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

Margin=Emission Level-Limit

The 1-25GHz range has been tested, and the report only records the worst performance of the 1-18G range.



## Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

|           | Polar<br>(H/V)        | Frequenc<br>y<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-am<br>plifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Emission<br>level<br>(dBuV/m) | Limit<br>(dBuV<br>/m) | Margi<br>n<br>(dB) | Detect<br>or Type |
|-----------|-----------------------|------------------------|----------------------------|---------------------------|-----------------------|-----------------------------|-------------------------------|-----------------------|--------------------|-------------------|
| GFSK      | Low Channel: 2402MHz  |                        |                            |                           |                       |                             |                               |                       |                    |                   |
|           | H                     | 2390                   | 58.22                      | 35.17                     | 3.48                  | 27.49                       | 54.02                         | 74.00                 | -19.98             | PK                |
|           | H                     | 2390                   | 49.97                      | 35.17                     | 3.48                  | 27.49                       | 45.77                         | 54.00                 | -8.23              | AV                |
|           | H                     | 2400                   | 59.36                      | 35.16                     | 3.49                  | 27.52                       | 55.21                         | 74.00                 | -18.79             | PK                |
|           | H                     | 2400                   | 49.38                      | 35.16                     | 3.49                  | 27.52                       | 45.23                         | 54.00                 | -8.77              | AV                |
|           | V                     | 2390                   | 57.90                      | 35.17                     | 3.48                  | 27.49                       | 53.70                         | 74.00                 | -20.3              | PK                |
|           | V                     | 2390                   | 50.06                      | 35.17                     | 3.48                  | 27.49                       | 45.86                         | 54.00                 | -8.14              | AV                |
|           | V                     | 2400                   | 59.65                      | 35.16                     | 3.49                  | 27.52                       | 55.50                         | 74.00                 | -18.5              | PK                |
|           | V                     | 2400                   | 49.94                      | 35.16                     | 3.49                  | 27.52                       | 45.79                         | 54.00                 | -8.21              | AV                |
|           | High Channel: 2480MHz |                        |                            |                           |                       |                             |                               |                       |                    |                   |
|           | H                     | 2483.5                 | 57.45                      | 35.11                     | 3.56                  | 27.75                       | 53.65                         | 74.00                 | -20.35             | PK                |
|           | H                     | 2483.5                 | 49.13                      | 35.11                     | 3.56                  | 27.75                       | 45.33                         | 54.00                 | -8.67              | AV                |
|           | H                     | 2500                   | 59.45                      | 35.10                     | 3.57                  | 27.80                       | 55.72                         | 74.00                 | -18.28             | PK                |
|           | H                     | 2500                   | 49.43                      | 35.10                     | 3.57                  | 27.80                       | 45.70                         | 54.00                 | -8.3               | AV                |
|           | V                     | 2483.5                 | 58.61                      | 35.11                     | 3.56                  | 27.75                       | 54.81                         | 74.00                 | -19.19             | PK                |
|           | V                     | 2483.5                 | 50.28                      | 35.11                     | 3.56                  | 27.75                       | 46.48                         | 54.00                 | -7.52              | AV                |
|           | V                     | 2500                   | 58.92                      | 35.10                     | 3.57                  | 27.80                       | 55.19                         | 74.00                 | -18.81             | PK                |
|           | V                     | 2500                   | 49.43                      | 35.10                     | 3.57                  | 27.80                       | 45.70                         | 54.00                 | -8.3               | AV                |
| π/4-DQPSK | Low Channel: 2402MHz  |                        |                            |                           |                       |                             |                               |                       |                    |                   |
|           | H                     | 2390                   | 58.39                      | 35.17                     | 3.48                  | 27.49                       | 54.19                         | 74.00                 | -19.81             | PK                |
|           | H                     | 2390                   | 49.76                      | 35.17                     | 3.48                  | 27.49                       | 45.56                         | 54.00                 | -8.44              | AV                |
|           | H                     | 2400                   | 59.67                      | 35.16                     | 3.49                  | 27.52                       | 55.52                         | 74.00                 | -18.48             | PK                |
|           | H                     | 2400                   | 50.10                      | 35.16                     | 3.49                  | 27.52                       | 45.95                         | 54.00                 | -8.05              | AV                |
|           | V                     | 2390                   | 57.64                      | 35.17                     | 3.48                  | 27.49                       | 53.44                         | 74.00                 | -20.56             | PK                |
|           | V                     | 2390                   | 49.87                      | 35.17                     | 3.48                  | 27.49                       | 45.67                         | 54.00                 | -8.33              | AV                |
|           | V                     | 2400                   | 59.23                      | 35.16                     | 3.49                  | 27.52                       | 55.08                         | 74.00                 | -18.92             | PK                |
|           | V                     | 2400                   | 49.38                      | 35.16                     | 3.49                  | 27.52                       | 45.23                         | 54.00                 | -8.77              | AV                |
|           | High Channel: 2480MHz |                        |                            |                           |                       |                             |                               |                       |                    |                   |
|           | H                     | 2483.5                 | 57.97                      | 35.11                     | 3.56                  | 27.75                       | 54.17                         | 74.00                 | -19.83             | PK                |
|           | H                     | 2483.5                 | 48.81                      | 35.11                     | 3.56                  | 27.75                       | 45.01                         | 54.00                 | -8.99              | AV                |
|           | H                     | 2500                   | 58.73                      | 35.10                     | 3.57                  | 27.80                       | 55.00                         | 74.00                 | -19                | PK                |
|           | H                     | 2500                   | 50.06                      | 35.10                     | 3.57                  | 27.80                       | 46.33                         | 54.00                 | -7.67              | AV                |
|           | V                     | 2483.5                 | 58.78                      | 35.11                     | 3.56                  | 27.75                       | 54.98                         | 74.00                 | -19.02             | PK                |
|           | V                     | 2483.5                 | 50.18                      | 35.11                     | 3.56                  | 27.75                       | 46.38                         | 54.00                 | -7.62              | AV                |
|           | V                     | 2500                   | 59.16                      | 35.10                     | 3.57                  | 27.80                       | 55.43                         | 74.00                 | -18.57             | PK                |
|           | V                     | 2500                   | 49.45                      | 35.10                     | 3.57                  | 27.80                       | 45.72                         | 54.00                 | -8.28              | AV                |

### Remark:

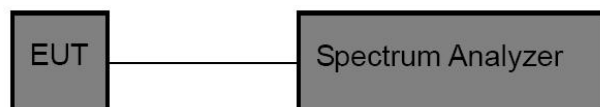
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

## 8 Maximum Peak Output Power Test

### 8.1 Test Standard and Limit

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (b)(1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Test Limit    | <p>For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.</p> <p>For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W.</p> |

### 8.2 Test Setup



### 8.3 Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,
2. Spectrum Setting:

RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

### 8.4 Test Data

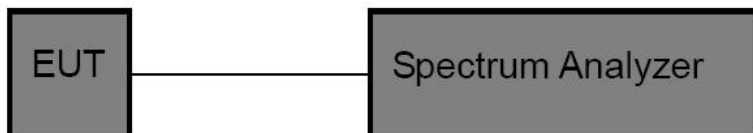
Please see the attachment for data.

## 9 20DB Occupy Bandwidth Test

### 9.1 Test Standard

|               |                                    |
|---------------|------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (a)(1) |
|---------------|------------------------------------|

### 9.2 Test Setup



### 9.3 Test Procedure

Using the following spectrum analyzer settings:

For 20dB Bandwidth Measurement:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 30 kHz.
3. Set the VBW = 91 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

For 99% Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW  $\geq$  3RBW

### 9.4 Test Data

Please see the attachment for data.



## 10 Carrier Frequency Separation Test

### 10.1 Test Standard and Limit

|               |                                              |
|---------------|----------------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (a)(1)           |
| Test Limit    | >25KHz or >two-thirds of the 20 dB bandwidth |

### 10.2 Test Setup



### 10.3 Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 300 kHz.
3. Set the VBW = 1000 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

### 10.4 Test Data

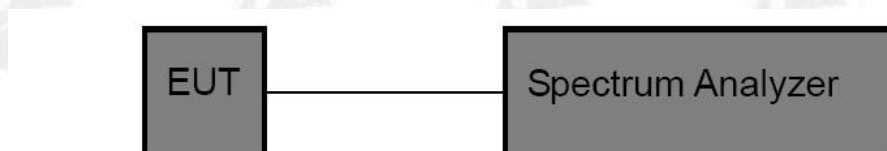
Please see the attachment for data.

## 11 Number of Hopping Channel Test

### 11.1 Test Standard and Limit

|               |                                    |
|---------------|------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (a)(1) |
| Test Limit    | >15 channels                       |

### 11.2 Test Setup



### 11.3 Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = 100kHz.
3. Set the VBW = 300kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

### 11.4 Test Data

Please see the attachment for data.



## 12 Dwell Time Test

### 12.1 Test Standard and Limit

|               |                                    |
|---------------|------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (a)(1) |
| Test Limit    | 0.4 sec                            |

### 12.2 Test Setup



### 12.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = clear write.
7. Allow trace to fully stabilize.

### 12.4 Test Data

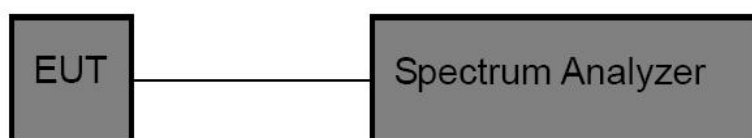
Please see the attachment for data.

## 13 100kHz Bandwidth of Frequency Band Edge Requirement

### 13.1 Test Standard and Limit

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Standard | FCC Part15 C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Test Limit    | in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, 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). |

### 13.2 Test Setup



### 13.3 Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

### 13.4 Test Data

Please see the attachment for data.



## 14 Antenna Requirement

### 14.1 Test Standard and Requirement

| Test Standard | FCC Part15 Section 15.203 /247(b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Requirement   | <p>1) 15.203 requirement:<br/>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, 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>2) 15.247(b) (4) requirement:<br/>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> |

### 14.2 Antenna Connected Construction

The antenna is chip Antenna which permanently attached, and the best case gain of the antenna is -0.58 dBi. It complies with the standard requirement.



## 15 TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

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