



# FCC TEST REPORT

## FCC ID:2A9Q9-M2259Q

**Report Number**..... : ZKT-24122519471E

**Date of Test**..... Dec. 25, 2024 to Jan. 03, 2025

**Date of issue**..... : Jan. 03, 2025

**Total number of pages**..... 29

**Test Result** ..... : PASS

**Testing Laboratory**..... : Shenzhen ZKT Technology Co., Ltd.

**Address** ..... 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

**Applicant's name** ..... : ShenZhen Zhongyi Technology CO., Ltd.

**Address** ..... Room 401, No.4 Road One, Shangxue Science and Technology City, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China

**Manufacturer's name** ..... : ShenZhen Zhongyi Technology CO., Ltd.

**Address** ..... Room 401, No.4 Road One, Shangxue Science and Technology City, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China

### Test specification:

**Standard**..... : FCC CFR Title 47 Part 15 Subpart C

**Test procedure**..... : /

**Non-standard test method** ..... : N/A

**Test Report Form No**..... : TRF-EL-107\_V0

**Test Report Form(s) Originator**..... : ZKT Testing

**Master TRF** ..... : Dated: 2020-01-06

This device described above has been tested by ZKT, 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.

This report shall not be reproduced except in full, without the written approval of ZKT, this document may be altered or revised by ZKT, personal only, and shall be noted in the revision of the document.

**Product name**..... : 5000mAh Magnetic Power Bank

**Trademark** ..... : N/A

**Model/Type reference**..... : M2259Q

**Ratings**..... : Type-C Input: 5V  $\text{---}$  3A, 9V  $\text{---}$  2A, 12V  $\text{---}$  1.5A, MAX 18.0W  
Type-C Output 5V  $\text{---}$  3A, 9V  $\text{---}$  2.22A, 12V  $\text{---}$  1.67A, MAX 20.0W  
Wireless Output: 5W/7.5W/10W/15W  
Battery Capacity: DC 3.85V, 5000mAh, 19.25W



Testing procedure and testing location:

Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.

Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Tested by (name + signature).....: Jim Liu

Reviewer (name + signature).....: Jackson Fang

Approved (name + signature).....: Lake Xie





## TABLE OF CONTENTS

|                                                         |           |
|---------------------------------------------------------|-----------|
| <b>1. VERSION .....</b>                                 | <b>4</b>  |
| <b>2. TEST SUMMARY .....</b>                            | <b>5</b>  |
| 2.1 TEST FACILITY .....                                 | 6         |
| 2.2 MEASUREMENT UNCERTAINTY .....                       | 6         |
| <b>3. GENERAL INFORMATION .....</b>                     | <b>7</b>  |
| 3.1 GENERAL DESCRIPTION OF EUT .....                    | 7         |
| 3.2 TEST MODE .....                                     | 8         |
| 3.3 BLOCK DIAGRAM OF EUT CONFIGURATION .....            | 9         |
| 3.4 TEST CONDITIONS .....                               | 10        |
| 3.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE) ..... | 10        |
| 3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS .....            | 11        |
| <b>4. CONDUCTED EMISSION TEST .....</b>                 | <b>13</b> |
| 4.1 CONDUCTED EMISSION MEASUREMENT .....                | 13        |
| 4.1.1 POWER LINE CONDUCTED EMISSION Limits .....        | 13        |
| 4.1.2 TEST PROCEDURE .....                              | 13        |
| 4.1.3 DEVIATION FROM TEST STANDARD .....                | 13        |
| 4.1.4 TEST SETUP .....                                  | 14        |
| 4.1.5 EUT OPERATING CONDITIONS .....                    | 14        |
| 4.1.6 TEST RESULT .....                                 | 15        |
| <b>5. RADIATED EMISSION MEASUREMENT .....</b>           | <b>17</b> |
| 5.1 RADIATED EMISSION LIMITS .....                      | 17        |
| 5.2 ANECHOIC CHAMBER TEST SETUP DIAGRAM .....           | 18        |
| 5.3 TEST PROCEDURE .....                                | 19        |
| 5.4 DEVIATION FROM TEST STANDARD .....                  | 19        |
| 5.5 TEST RESULT .....                                   | 19        |
| <b>6. 20DB BANDWIDTH TEST .....</b>                     | <b>26</b> |
| 6.1 TEST PROCEDURE .....                                | 26        |
| 6.2 LIMIT .....                                         | 26        |
| 6.3 TEST SETUP .....                                    | 26        |
| 6.4 DEVIATION FROM STANDARD .....                       | 26        |
| 6.5 TEST RESULT .....                                   | 27        |
| <b>7. ANTENNA REQUIREMENT .....</b>                     | <b>28</b> |
| <b>8. TEST SETUP PHOTO .....</b>                        | <b>29</b> |
| <b>9. EUT CONSTRUCTIONAL DETAILS .....</b>              | <b>29</b> |



1. VERSION

| Report No.       | Version | Description             | Approved      |
|------------------|---------|-------------------------|---------------|
| ZKT-24122519471E | Rev.01  | Initial issue of report | Jan. 03, 2025 |
|                  |         |                         |               |



## 2. TEST SUMMARY

| Test Item                        | Section in CFR 47 | Result |
|----------------------------------|-------------------|--------|
| Antenna requirement              | 15.203            | Pass   |
| AC Power Line Conducted Emission | 15.207            | Pass   |
| Spurious Emission                | 15.209(a)(f)      | Pass   |
| 20dB Bandwidth                   | 15.215            | Pass   |

NOTE:

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



## 2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225

Designation Number: CN1299

IC Registered No.: 27033

CAB identifier: CN0110

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                                              | Uncertainty |
|-----|---------------------------------------------------|-------------|
| 1   | 3m chamber Radiated spurious emission(9KHz-30MHz) | U=4.5dB     |
| 2   | 3m chamber Radiated spurious emission(30MHz-1GHz) | U=4.8dB     |
| 3   | 3m chamber Radiated spurious emission(1GHz-6GHz)  | U=4.9dB     |
| 4   | 3m chamber Radiated spurious emission(6GHz-40GHz) | U=5.0dB     |
| 5   | Conducted disturbance                             | U=3.2dB     |
| 6   | RF conducted Spurious Emission                    | U=2.2dB     |
| 7   | RF Occupied Bandwidth                             | U=1.8MHz    |
| 8   | humidity uncertainty                              | U=5.3%      |
| 9   | Temperature uncertainty                           | U=0.59℃     |



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                      |                                                                                                                                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:        | 5000mAh Magnetic Power Bank                                                                                                                                                          |
| Model No.:           | M2259Q                                                                                                                                                                               |
| Serial No.:          | N/A                                                                                                                                                                                  |
| Model Difference:    | N/A                                                                                                                                                                                  |
| Hardware Version:    | H 1.0                                                                                                                                                                                |
| Software Version:    | V 1.1                                                                                                                                                                                |
| Operation Frequency: | 110kHz-205kHz                                                                                                                                                                        |
| Modulation Type:     | ASK                                                                                                                                                                                  |
| Antenna Type:        | Loop Coil Antenna                                                                                                                                                                    |
| Antenna Gain:        | 0dBi                                                                                                                                                                                 |
| Ratings:             | Type-C Input: 5V $\leq$ 3A, 9V $\leq$ 2A, 12V $\leq$ 1.5A, MAX 18.0W<br>Type-C Output 5V $\leq$ 3A, 9V $\leq$ 2.22A, 12V $\leq$ 1.67A, MAX 20.0W<br>Wireless Output: 5W/7.5W/10W/15W |
| Battery Capacity:    | DC 3.85V, 5000mAh, 19.25W                                                                                                                                                            |
| Transmitting Mode:   | Keep the EUT in continuously wireless charging mode                                                                                                                                  |



### 3.2 TEST MODE

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

#### a. EUT mode of adapter input + wireless charge output:

| Test Modes: | Test Coil | Description:                                       |
|-------------|-----------|----------------------------------------------------|
| Mode 1      | ANT 1     | AC/DC Adapter + EUT + Phone (Battery Status: <1%)  |
| Mode 2      |           | AC/DC Adapter + EUT + Phone (Battery Status: 50%)  |
| Mode 3      |           | AC/DC Adapter + EUT + Phone (Battery Status: >98%) |

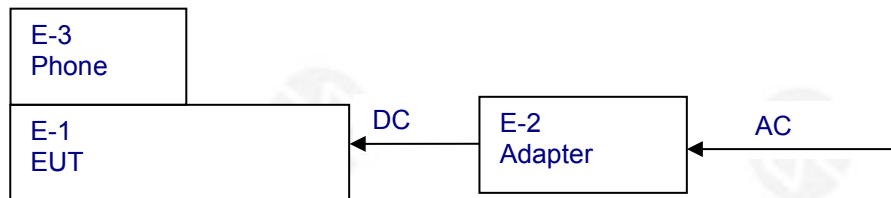
#### b. EUT mode of wireless charge output:

| Test Modes: | Test Coil | Description:                       |
|-------------|-----------|------------------------------------|
| Mode 1a     | ANT 1     | EUT + Phone (Battery Status: <1%)  |
| Mode 2a     |           | EUT + Phone (Battery Status: 50%)  |
| Mode 3a     |           | EUT + Phone (Battery Status: >98%) |



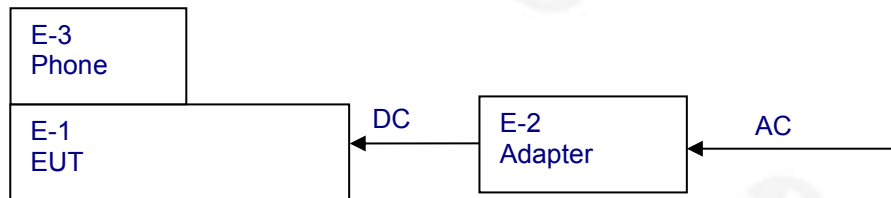
### 3.3 BLOCK DIAGRAM OF EUT CONFIGURATION

#### Conducted Emission

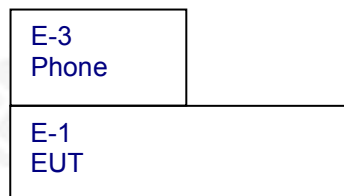


#### Radiated Emission

A:



B:





### 3.4 TEST CONDITIONS

Temperature: 23~26℃

Relative Humidity: 54~63 %

### 3.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment                   | Mfr/Brand | Model/Type No. | Series No. | Note      |
|------|-----------------------------|-----------|----------------|------------|-----------|
| E-1  | 5000mAh Magnetic Power Bank | N/A       | M2259Q         | N/A        | EUT       |
| E-2  | AC/DC Adapter               | HUAWEI    | HW-200200CP1   | N/A        | Auxiliary |
| E-3  | Phone                       | Apple     | iPhone 12      | N/A        | Auxiliary |

| Item | Shielded Type | Ferite Core | Length | Note                |
|------|---------------|-------------|--------|---------------------|
| C1   | NO            | NO          | 0.8M   | DC cable unshielded |
|      |               |             |        |                     |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



### 3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Conduction Emissions Test

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No.        | Firmware Version | Last calibration | Calibrated until |
|------|-------------------|--------------|----------|-------------------|------------------|------------------|------------------|
| 1    | LISN              | R&S          | ENV216   | 101471            | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 2    | LISN              | CYBERTEK     | EM5040A  | E1850400149       | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 3    | Test Cable        | N/A          | C-01     | N/A               | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 4    | EMI Test Receiver | R&S          | ESCI3    | 101393            | 4.42 SP3         | Sep. 29, 2024    | Sep. 28, 2025    |
| 5    | EMC Software      | Frad         | EZ-EMC   | Ver.EMC-CON 3A1.1 | N/A              | \                | \                |

#### Radiation Emissions & Radiation Spurious Emissions Test

| Item | Equipment                         | Manufacturer   | Type No.        | Serial No.         | Firmware Version | Last calibration | Calibrated until |
|------|-----------------------------------|----------------|-----------------|--------------------|------------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz)  | KEYSIGHT       | N9020A          | MY55370835         | A.17.05          | Sep. 29, 2024    | Sep. 28, 2025    |
| 2    | Spectrum Analyzer (10kHz-39.9GHz) | R&S            | FSV40-N         | 100363             | 1.71 SP2         | Sep. 30, 2024    | Sep. 29, 2025    |
| 3    | EMI Test Receiver (9kHz-7GHz)     | R&S            | ESCI7           | 100969             | 4.32             | Sep. 29, 2024    | Sep. 28, 2025    |
| 4    | Bilog Antenna (30MHz-1500MHz)     | Schwarzbeck    | VULB9168        | 00877              | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 5    | Horn Antenna (1GHz-18GHz)         | Agilent        | AH-118          | 071145             | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 6    | Horn Antenna (15GHz-40GHz)        | A.H.System     | SAS-574         | 588                | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 7    | Loop Antenna                      | TESEQ          | HLA6121         | 58357              | N/A              | Oct. 11, 2024    | Oct. 10, 2025    |
| 8    | Amplifier (30-1000MHz)            | EM Electronics | EM330 Amplifier | 60747              | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 9    | Amplifier (1GHz-26.5GHz)          | HuiPu          | 8449B           | 3008A00315         | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 10   | Amplifier (500MHz-40GHz)          | QuanJuDa       | DLE-161         | 097                | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 11   | Test Cable                        | N/A            | R-01            | N/A                | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 12   | Test Cable                        | N/A            | R-02            | N/A                | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 13   | Test Cable                        | N/A            | R-03            | N/A                | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 14   | D.C. Power Supply                 | LongWei        | TPR-6405D       | GQ7516             | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 15   | EMC Software                      | Frad           | EZ-EMC          | Ver.EMC-CO N 3A1.1 | N/A              | \                | \                |
| 16   | Turntable                         | MF             | MF-7802BS       | N/A                | N/A              | \                | \                |
| 17   | Antenna tower                     | MF             | MF-7802BS       | N/A                | N/A              | \                | \                |



RF Conducted Test

| Item | Equipment                         | Manufacturer                | Type No.    | Serial No.     | Firmware Version | Last calibration | Calibrated until |
|------|-----------------------------------|-----------------------------|-------------|----------------|------------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz)  | KEYSIGHT                    | N9020A      | MY55370835     | A.17.05          | Sep. 29, 2024    | Sep. 28, 2025    |
| 2    | Spectrum Analyzer (10kHz-39.9GHz) | R&S                         | FSV40-N     | 100363         | 1.71 SP2         | Sep. 30, 2024    | Sep. 29, 2025    |
| 3    | Test Cable                        | N/A                         | RF-01       | N/A            | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 4    | Test Cable                        | N/A                         | RF-02       | N/A            | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 5    | Test Cable                        | N/A                         | RF-03       | N/A            | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 6    | ESG Signal Generator              | Agilent                     | E4421B      | GB40051203     | B.03.84          | Sep. 29, 2024    | Sep. 28, 2025    |
| 7    | Signal Generator                  | Agilent                     | N5182A      | MY47420215     | A.01.87          | Sep. 29, 2024    | Sep. 28, 2025    |
| 8    | Magnetic Field Probe Tester       | Narda                       | ELT-400     | 0-0344/M-17 52 | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 9    | Van der Hoofden measuring head    | Schwarzbeck Mess-elektronik | VDHH 9502   | 9502-039       | N/A              | Sep. 30, 2024    | Sep. 29, 2025    |
| 10   | Wideband Radio Communication Test | R&S                         | CMW500      | 106504         | V 3.7.22         | Sep. 30, 2024    | Sep. 29, 2025    |
| 11   | MWRF Power Meter Test system      | MW                          | MW100-RF CB | 10371          | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 12   | D.C. Power Supply                 | LongWei                     | TPR-6405D   | GQ7516         | N/A              | Sep. 29, 2024    | Sep. 28, 2025    |
| 13   | RF Software                       | MW                          | MTS8310     | V2.0.0.0       | N/A              | \                | \                |



#### 4. CONDUCTED EMISSION TEST

##### 4.1 CONDUCTED EMISSION MEASUREMENT

|                       |                                      |
|-----------------------|--------------------------------------|
| Test Requirement:     | FCC Part15 C Section 15.207          |
| Test Method:          | ANSI C63.10:2013                     |
| Test Frequency Range: | 150KHz to 30MHz                      |
| Receiver setup:       | RBW=9KHz, VBW=30KHz, Sweep time=auto |

##### 4.1.1 POWER LINE CONDUCTED EMISSION Limits

| FREQUENCY (MHz) | Limit (dBuV) |           | Standard |
|-----------------|--------------|-----------|----------|
|                 | Quas-peak    | Average   |          |
| 0.15 -0.5       | 66 - 56 *    | 56 - 46 * | FCC      |
| 0.50 -5.0       | 56.00        | 46.00     | FCC      |
| 5.0 -30.0       | 60.00        | 50.00     | FCC      |

Note:

(1) \*Decreases with the logarithm of the frequency.

##### 4.1.2 TEST PROCEDURE

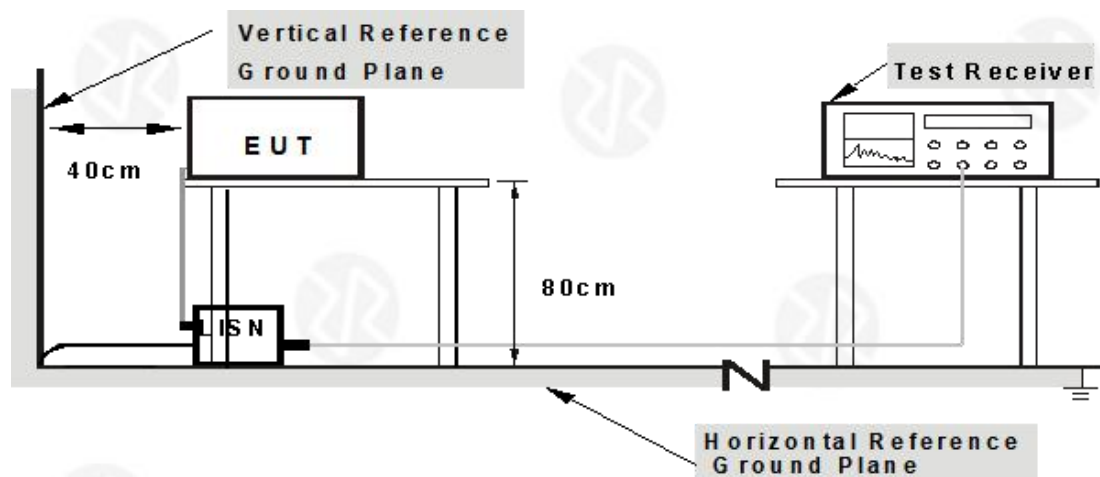
- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

##### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.1.4 TEST SETUP



- Note:**
- 1.Support units were connected to second LISN.
  - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

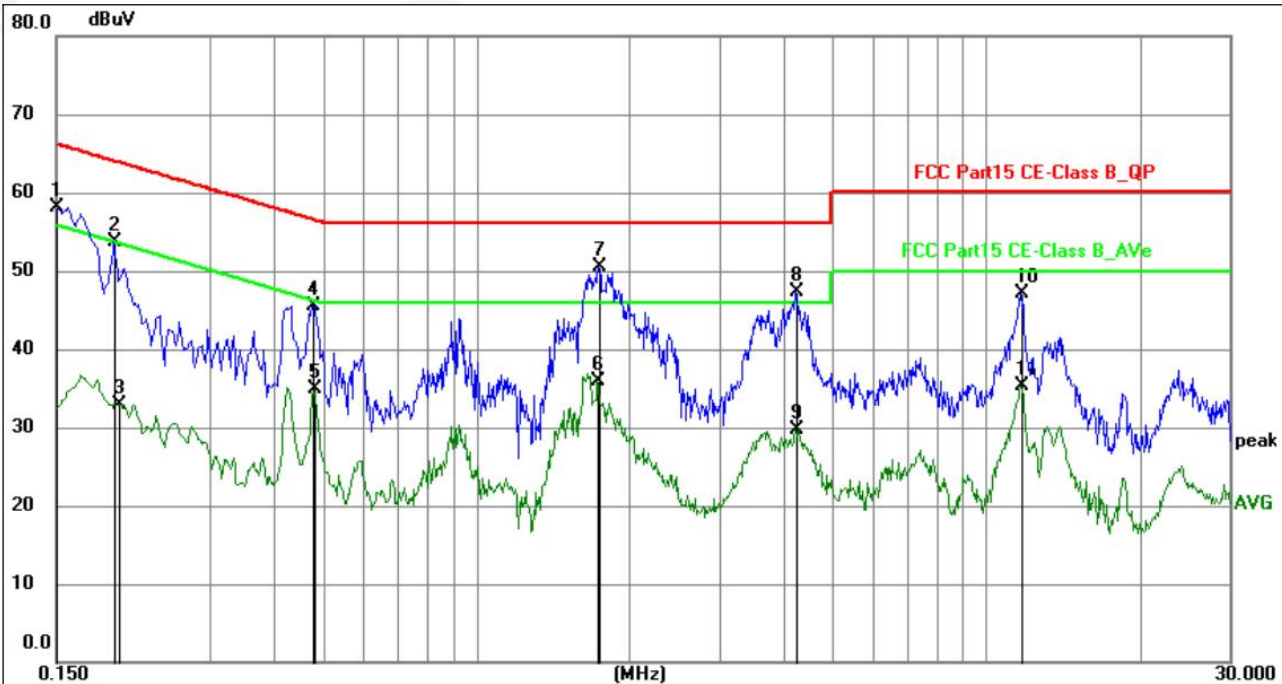
#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



#### 4.1.6 TEST RESULT

|                |              |                     |        |
|----------------|--------------|---------------------|--------|
| Temperature :  | 26°C         | Relative Humidity : | 54%    |
| Pressure :     | 101kPa       | Phase :             | L      |
| Test Voltage : | AC 120V/60Hz | Test Mode :         | Mode 1 |



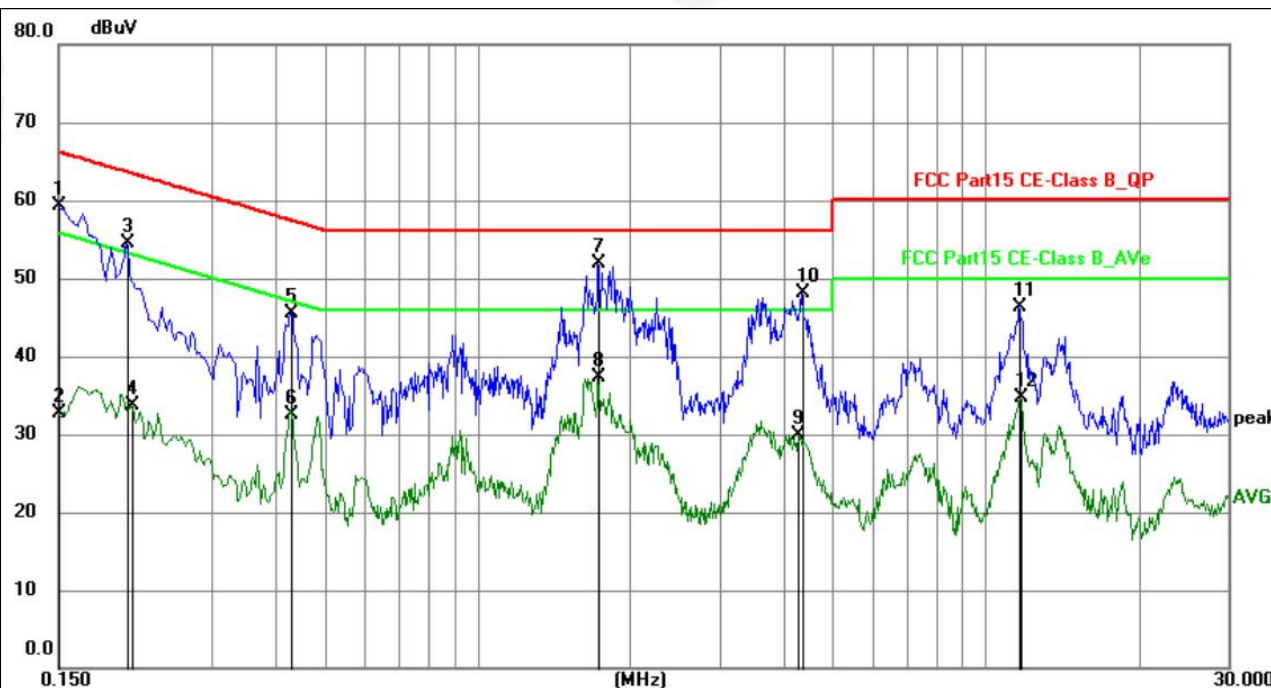
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1500          | 37.95          | 20.18       | 58.13        | 66.00        | -7.87       | QP       | P   |        |
| 2   | 0.1949          | 33.25          | 20.36       | 53.61        | 63.83        | -10.22      | QP       | P   |        |
| 3   | 0.1995          | 12.51          | 20.38       | 32.89        | 53.63        | -20.74      | AVG      | P   |        |
| 4   | 0.4785          | 25.15          | 20.31       | 45.46        | 56.37        | -10.91      | QP       | P   |        |
| 5   | 0.4830          | 14.54          | 20.30       | 34.84        | 46.29        | -11.45      | AVG      | P   |        |
| 6   | 1.7294          | 15.65          | 20.30       | 35.95        | 46.00        | -10.05      | AVG      | P   |        |
| 7   | 1.7384          | 30.20          | 20.30       | 50.50        | 56.00        | -5.50       | QP       | P   |        |
| 8   | 4.2360          | 26.96          | 20.35       | 47.31        | 56.00        | -8.69       | QP       | P   |        |
| 9   | 4.2360          | 9.40           | 20.35       | 29.75        | 46.00        | -16.25      | AVG      | P   |        |
| 10  | 11.7285         | 26.72          | 20.47       | 47.19        | 60.00        | -12.81      | QP       | P   |        |
| 11  | 11.7285         | 14.81          | 20.47       | 35.28        | 50.00        | -14.72      | AVG      | P   |        |

#### Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Reading level + Correct Factor.
4. Correct Factor = Lisen factor+ Cable loss factor + limiter factor.
5. Margin = Measurement Level-Limit.
6. All test modes were tested, with only the worst Mode 1 recorded.



|                |              |                     |        |
|----------------|--------------|---------------------|--------|
| Temperature :  | 26℃          | Relative Humidity : | 54%    |
| Pressure :     | 101kPa       | Phase :             | N      |
| Test Voltage : | AC 120V/60Hz | Test Mode :         | Mode 1 |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1507          | 39.20          | 20.17       | 59.37        | 65.96        | -6.59       | QP       | P   |        |
| 2   | 0.1507          | 12.46          | 20.17       | 32.63        | 55.96        | -23.33      | AVG      | P   |        |
| 3   | 0.2040          | 34.09          | 20.37       | 54.46        | 63.45        | -8.99       | QP       | P   |        |
| 4   | 0.2085          | 13.38          | 20.37       | 33.75        | 53.26        | -19.51      | AVG      | P   |        |
| 5   | 0.4290          | 25.20          | 20.32       | 45.52        | 57.27        | -11.75      | QP       | P   |        |
| 6   | 0.4305          | 12.24          | 20.32       | 32.56        | 47.24        | -14.68      | AVG      | P   |        |
| 7   | 1.7294          | 31.57          | 20.30       | 51.87        | 56.00        | -4.13       | QP       | P   |        |
| 8   | 1.7294          | 16.94          | 20.30       | 37.24        | 46.00        | -8.76       | AVG      | P   |        |
| 9   | 4.2855          | 9.58           | 20.34       | 29.92        | 46.00        | -16.08      | AVG      | P   |        |
| 10  | 4.3439          | 27.77          | 20.34       | 48.11        | 56.00        | -7.89       | QP       | P   |        |
| 11  | 11.6655         | 25.92          | 20.48       | 46.40        | 60.00        | -13.60      | QP       | P   |        |
| 12  | 11.7330         | 14.28          | 20.48       | 34.76        | 50.00        | -15.24      | AVG      | P   |        |

Notes:

- 1.An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Lisen factor+ Cable loss factor + limiter factor.
- 5.Margin = Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1 recorded.



## 5. RADIATED EMISSION MEASUREMENT

|                       |                             |            |        |        |            |
|-----------------------|-----------------------------|------------|--------|--------|------------|
| Test Requirement:     | FCC Part15 C Section 15.209 |            |        |        |            |
| Test Method:          | ANSI C63.10:2013            |            |        |        |            |
| Test Frequency Range: | 9kHz to 1GHz                |            |        |        |            |
| Test site:            | Measurement Distance: 3m    |            |        |        |            |
| Receiver setup:       | Frequency                   | Detector   | RBW    | VBW    | Value      |
|                       | 9KHz-150KHz                 | Quasi-peak | 200Hz  | 600Hz  | Quasi-peak |
|                       | 150KHz-30MHz                | Quasi-peak | 9KHz   | 30KHz  | Quasi-peak |
|                       | 30MHz-1GHz                  | Quasi-peak | 100KHz | 300KHz | Quasi-peak |
|                       | Above 1GHz                  | Peak       | 1MHz   | 3MHz   | Peak       |
|                       |                             | Peak       | 1MHz   | 10Hz   | Average    |

### 5.1 RADIATED EMISSION LIMITS

#### Limits for frequency below 30MHz

| Frequency   | Limit (uV/m) | Measurement Distance(m) | Remark           |
|-------------|--------------|-------------------------|------------------|
| 0.009-0.490 | 2400/F(kHz)  | 300                     | Quasi-peak Value |
| 0.490-1.705 | 24000/F(kHz) | 30                      | Quasi-peak Value |
| 1.705-30    | 30           | 30                      | Quasi-peak Value |

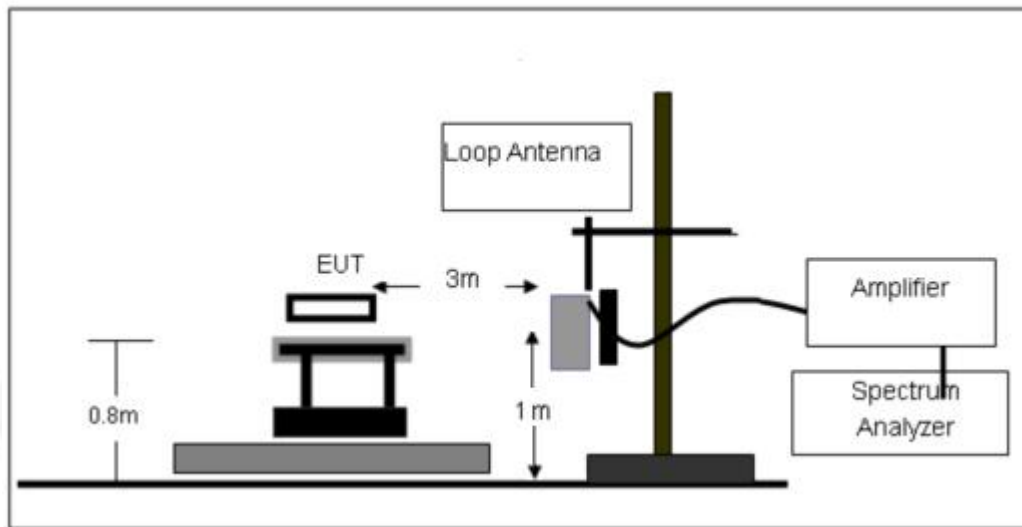
#### Limits for frequency Above 30MHz

| Frequency     | Limit (dBuV/m @3m) | Remark           |
|---------------|--------------------|------------------|
| 30MHz-88MHz   | 40.00              | Quasi-peak Value |
| 88MHz-216MHz  | 43.50              | Quasi-peak Value |
| 216MHz-960MHz | 46.00              | Quasi-peak Value |
| 960MHz-1GHz   | 54.00              | Quasi-peak Value |
| Above 1GHz    | 54.00              | Average Value    |
|               | 74.00              | Peak Value       |

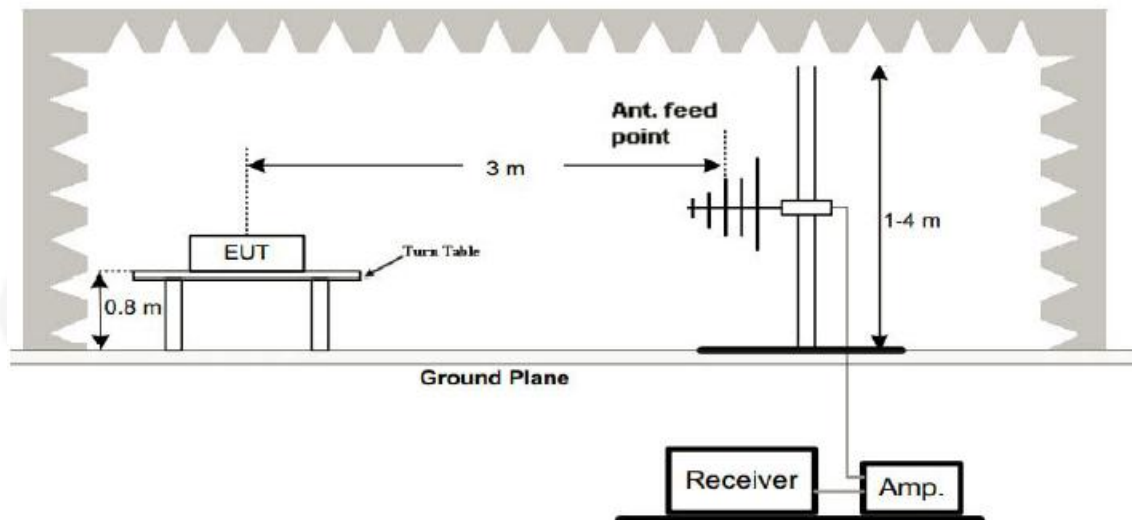


## 5.2 ANECHOIC CHAMBER TEST SETUP DIAGRAM

### (A) Radiated Emission Test-Up Frequency Below 30MHz



### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.



### 5.3 TEST PROCEDURE

#### Below 30MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving loop antenna and in the center of a loop antenna, which was mounted on the top of a variable-height antenna tower.
- For each suspected emission, the EUT was arranged to its worst case, the height of interference-receiving loop antenna centre is 1 meter above the ground, and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- Both coaxial (loop plane perpendicular to the ground plane and to the measurement axis) and coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis) polarizations of the antenna are set to make the measurement.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

#### 30MHz-1GHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

### 5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5 TEST RESULT

#### Measurement data:

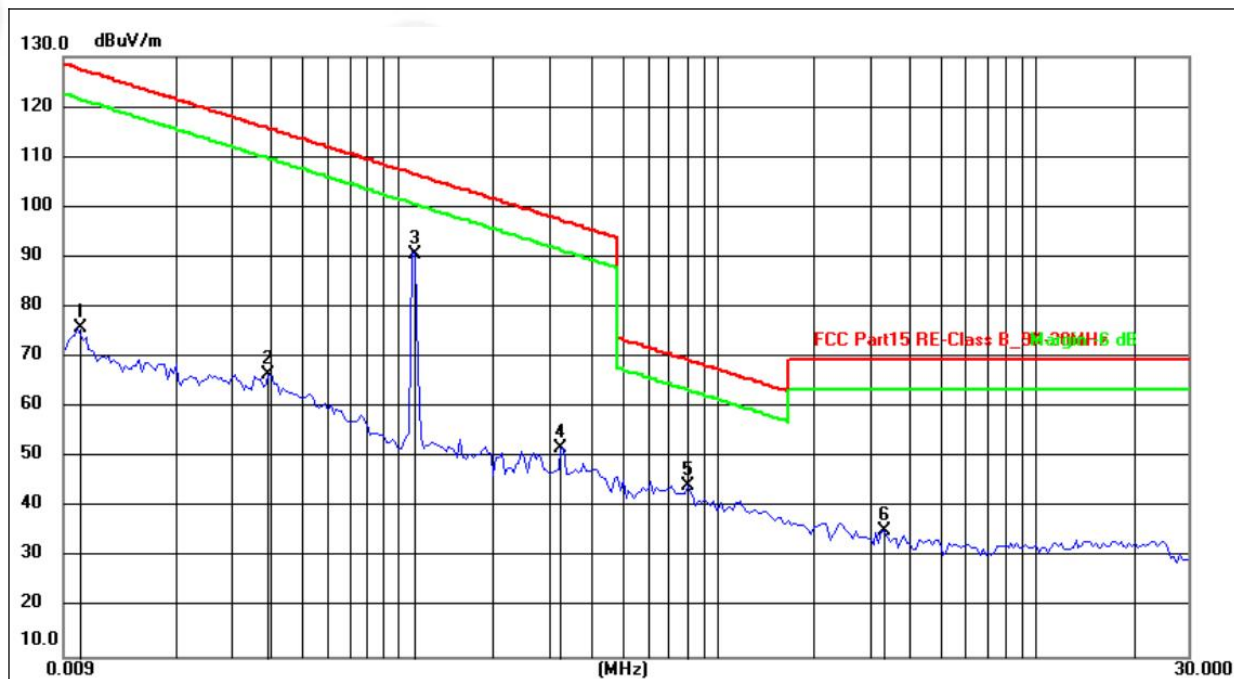
Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40



A: 9 kHz~30 MHz

|                |         |                     |         |
|----------------|---------|---------------------|---------|
| Temperature :  | 26℃     | Relative Humidity : | 54%     |
| Pressure :     | 101 kPa | Polarization :      | coaxial |
| Test Voltage : | DC 12V  | Test Mode :         | Mode 1  |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 0.0100          | 55.31          | 20.55         | 75.86          | 127.60         | -51.74      | peak     |
| 2   | 0.0395          | 46.65          | 19.99         | 66.64          | 115.67         | -49.03      | peak     |
| 3   | 0.1130          | 70.81          | 19.84         | 90.65          | 106.54         | -15.89      | peak     |
| 4   | 0.3259          | 31.62          | 20.13         | 51.75          | 97.34          | -45.59      | peak     |
| 5   | 0.8114          | 24.13          | 20.31         | 44.44          | 69.42          | -24.98      | peak     |
| 6   | 3.3567          | 15.83          | 19.62         | 35.45          | 69.54          | -34.09      | peak     |

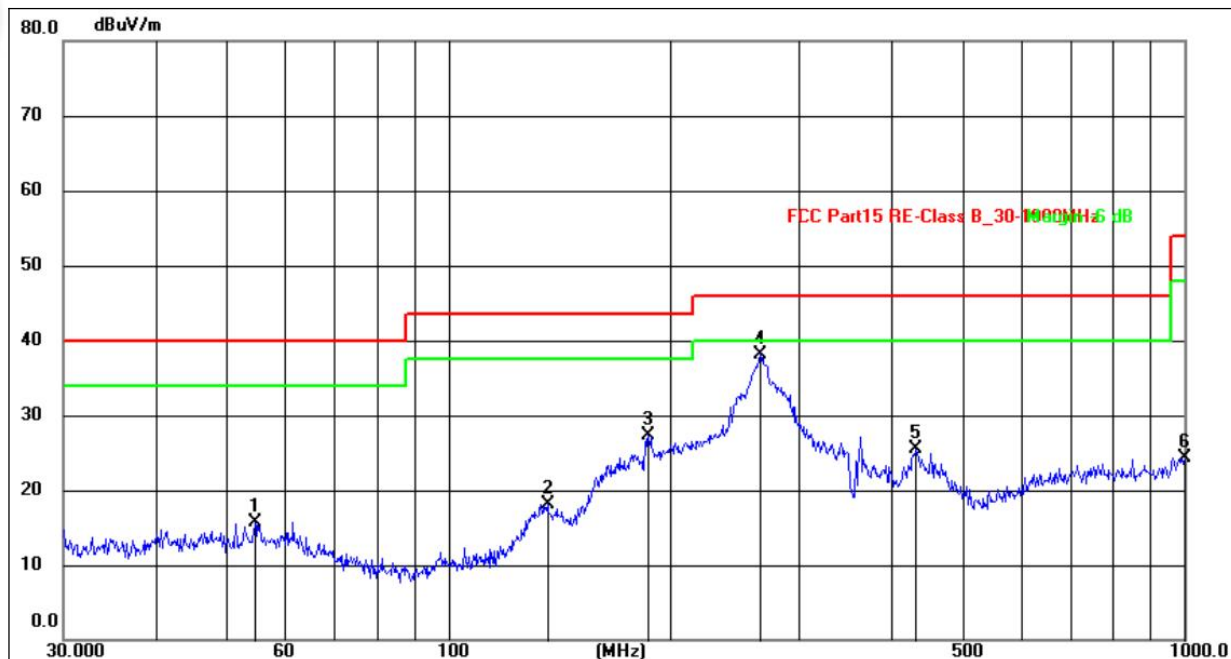
Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1 recorded.



30MHz-1GHz

|               |         |                    |            |
|---------------|---------|--------------------|------------|
| Temperature:  | 26℃     | Relative Humidity: | 54%        |
| Pressure:     | 101 kPa | Polarization:      | Horizontal |
| Test Voltage: | DC 12V  | Test Mode:         | Mode 1     |



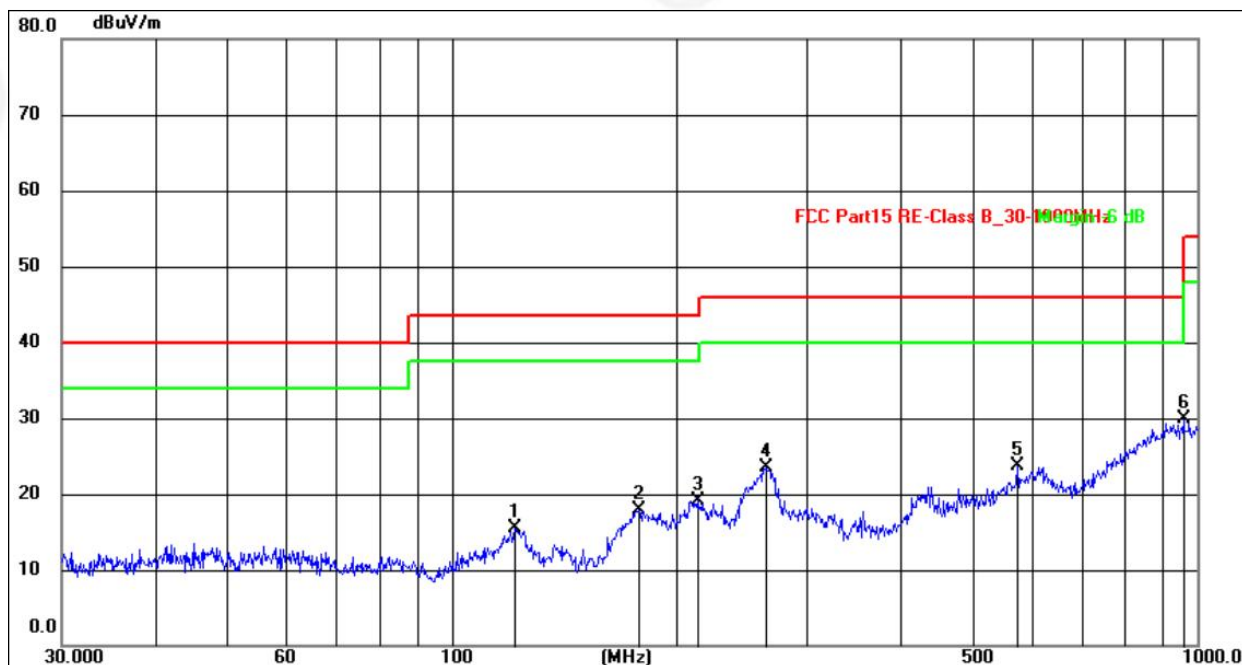
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 54.6428         | 29.78          | -14.03        | 15.75          | 40.00          | -24.25      | QP       |
| 2   | 136.4598        | 35.18          | -17.04        | 18.14          | 43.50          | -25.36      | QP       |
| 3   | 187.0956        | 45.12          | -17.91        | 27.21          | 43.50          | -16.29      | QP       |
| 4   | 265.6757        | 53.02          | -14.82        | 38.20          | 46.00          | -7.80       | QP       |
| 5   | 432.5456        | 39.89          | -14.43        | 25.46          | 46.00          | -20.54      | QP       |
| 6   | 1000.0000       | 28.84          | -4.56         | 24.28          | 54.00          | -29.72      | QP       |

Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1 recorded.



|               |        |                    |          |
|---------------|--------|--------------------|----------|
| Temperature:  | 26℃    | Relative Humidity: | 54%      |
| Pressure:     | 101kPa | Polarization:      | Vertical |
| Test Voltage: | DC 12V | Test Mode:         | Mode 1   |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 121.5485        | 36.72          | -21.19        | 15.53          | 43.50          | -27.97      | QP       |
| 2   | 178.1327        | 37.51          | -19.62        | 17.89          | 43.50          | -25.61      | QP       |
| 3   | 213.7634        | 39.37          | -20.17        | 19.20          | 43.50          | -24.30      | QP       |
| 4   | 263.8190        | 42.60          | -19.14        | 23.46          | 46.00          | -22.54      | QP       |
| 5   | 574.6258        | 31.96          | -8.27         | 23.69          | 46.00          | -22.31      | QP       |
| 6   | 958.7943        | 29.99          | -0.12         | 29.87          | 46.00          | -16.13      | QP       |

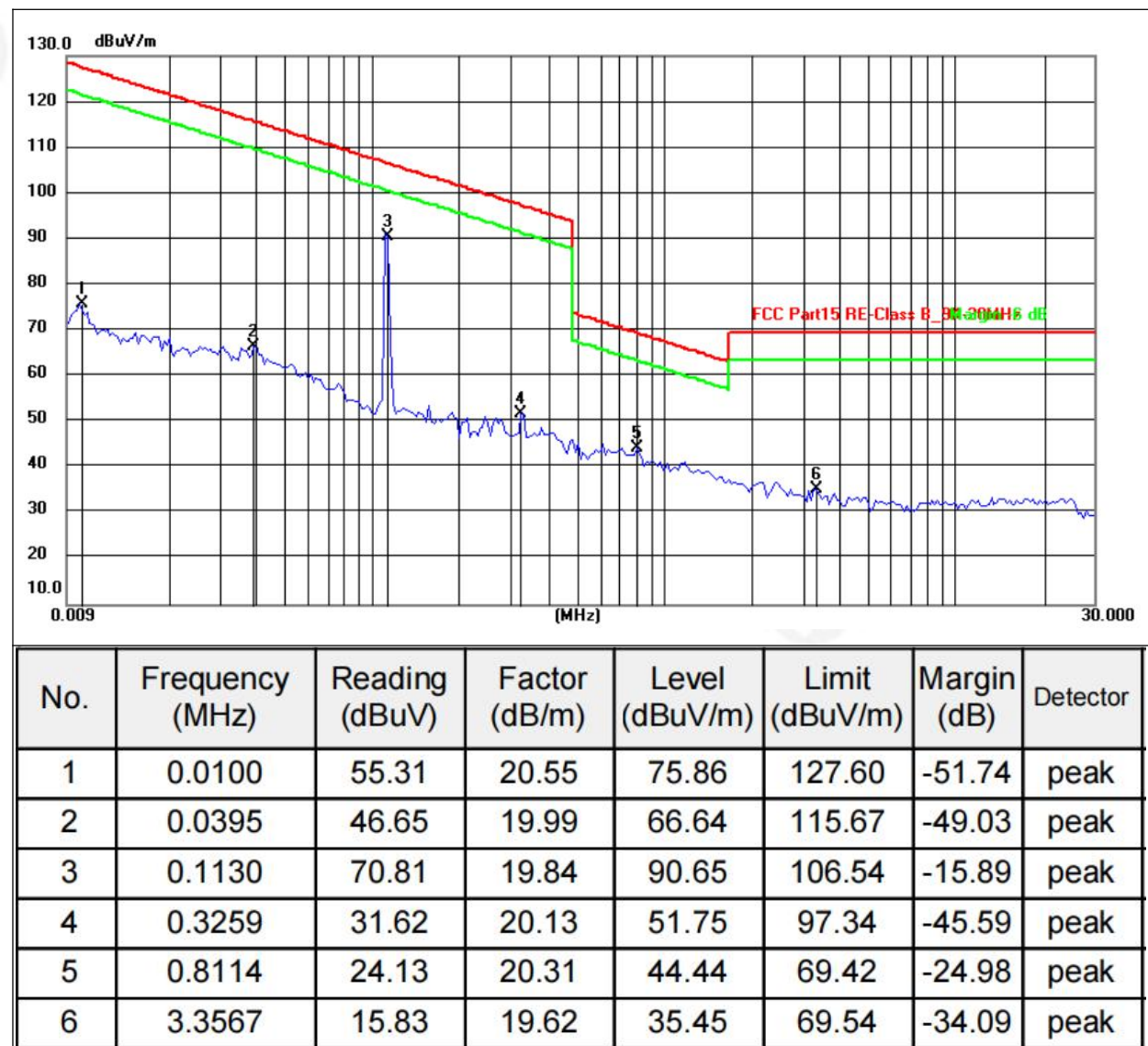
Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1 recorded.



B: 9 kHz~30 MHz

|               |          |                    |         |
|---------------|----------|--------------------|---------|
| Temperature:  | 26℃      | Relative Humidity: | 54%     |
| Pressure:     | 101 kPa  | Polarization:      | coaxial |
| Test Voltage: | DC 3.85V | Test Mode:         | Mode 1a |



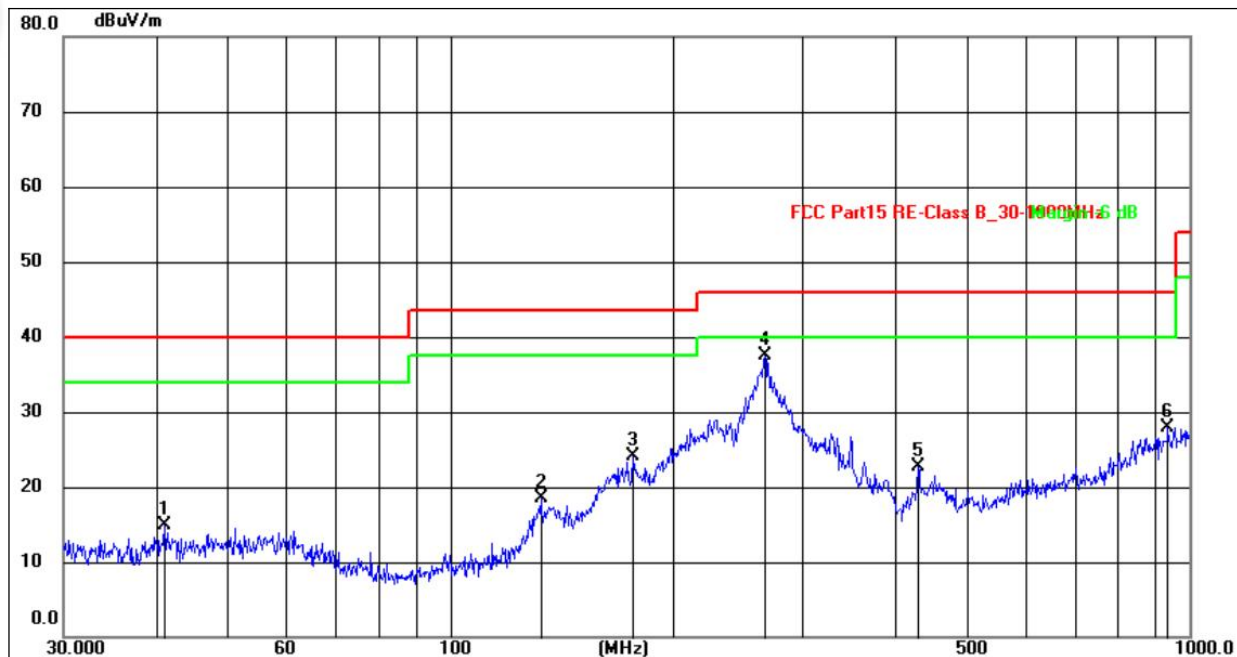
Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1a recorded.



30MHz-1GHz

|               |          |                    |            |
|---------------|----------|--------------------|------------|
| Temperature:  | 26℃      | Relative Humidity: | 54%        |
| Pressure:     | 101 kPa  | Polarization:      | Horizontal |
| Test Voltage: | DC 3.85V | Test Mode:         | Mode 1a    |



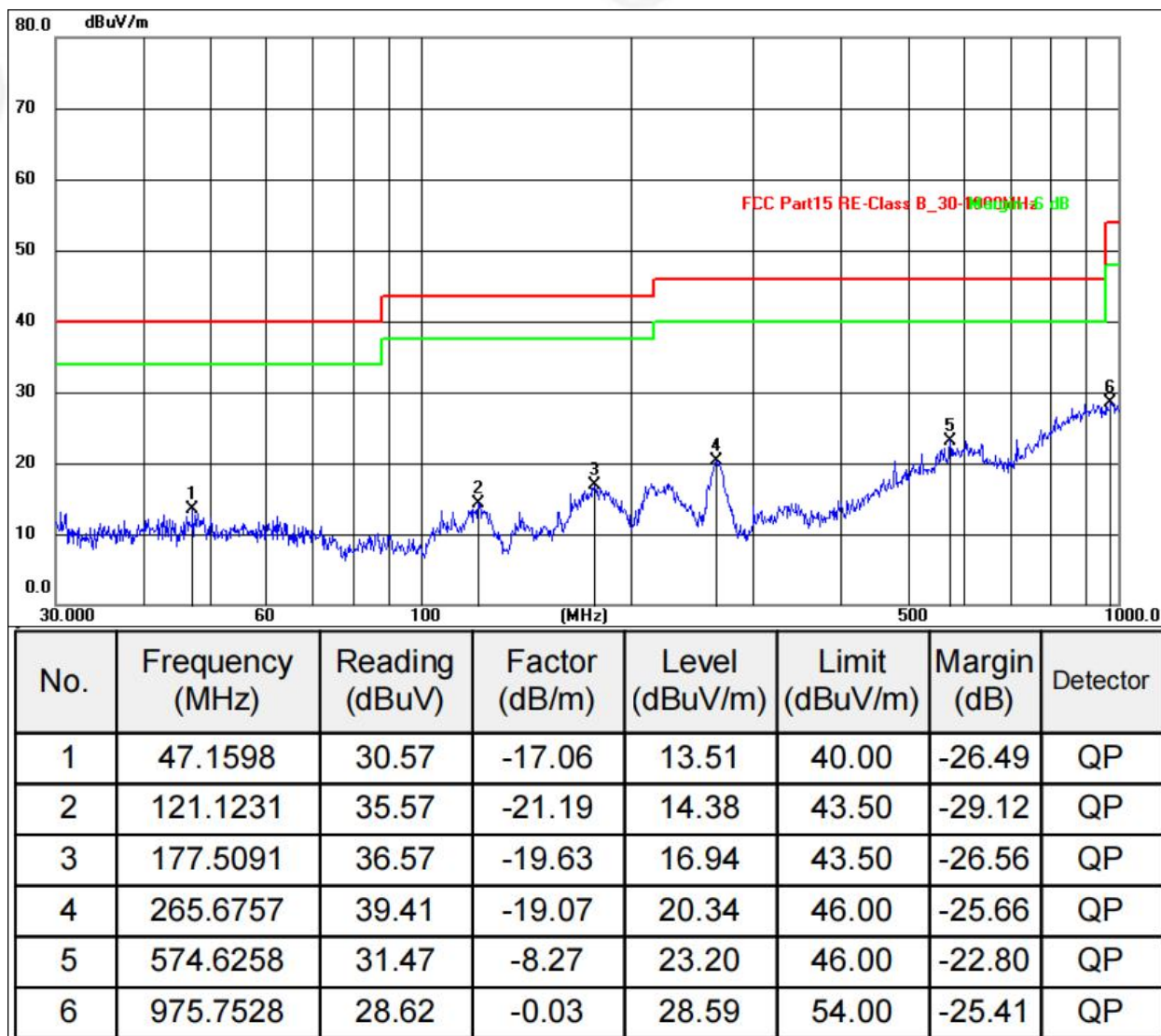
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 41.1320         | 28.94          | -14.02        | 14.92          | 40.00          | -25.08      | QP       |
| 2   | 132.6850        | 35.88          | -17.36        | 18.52          | 43.50          | -24.98      | QP       |
| 3   | 176.8878        | 41.45          | -17.33        | 24.12          | 43.50          | -19.38      | QP       |
| 4   | 266.6089        | 52.30          | -14.76        | 37.54          | 46.00          | -8.46       | QP       |
| 5   | 429.5228        | 37.33          | -14.58        | 22.75          | 46.00          | -23.25      | QP       |
| 6   | 935.5463        | 33.82          | -5.93         | 27.89          | 46.00          | -18.11      | QP       |

Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1a recorded.



|               |          |                    |          |
|---------------|----------|--------------------|----------|
| Temperature:  | 26℃      | Relative Humidity: | 54%      |
| Pressure:     | 101kPa   | Polarization:      | Vertical |
| Test Voltage: | DC 3.85V | Test Mode:         | Mode 1a  |



Remarks:

- 1.An initial pre-scan was performed on the peak detector.
- 2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
- 3.Final Level = Reading level + Correct Factor.
- 4.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
- 5.Margin= Measurement Level-Limit.
- 6.All test modes were tested, with only the worst Mode 1a recorded.



## 6. 20DB BANDWIDTH TEST

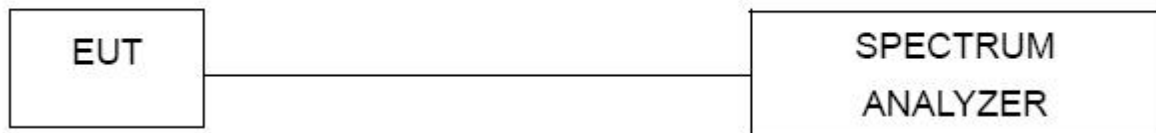
### 6.1 TEST PROCEDURE

1. Se span = 1.5 ~ 5 times OBW.
2. Set RBW = 1%~5% OBW.
3. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
4. Detector = peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

### 6.2 LIMIT

N/A

### 6.3 TEST SETUP



### 6.4 DEVIATION FROM STANDARD

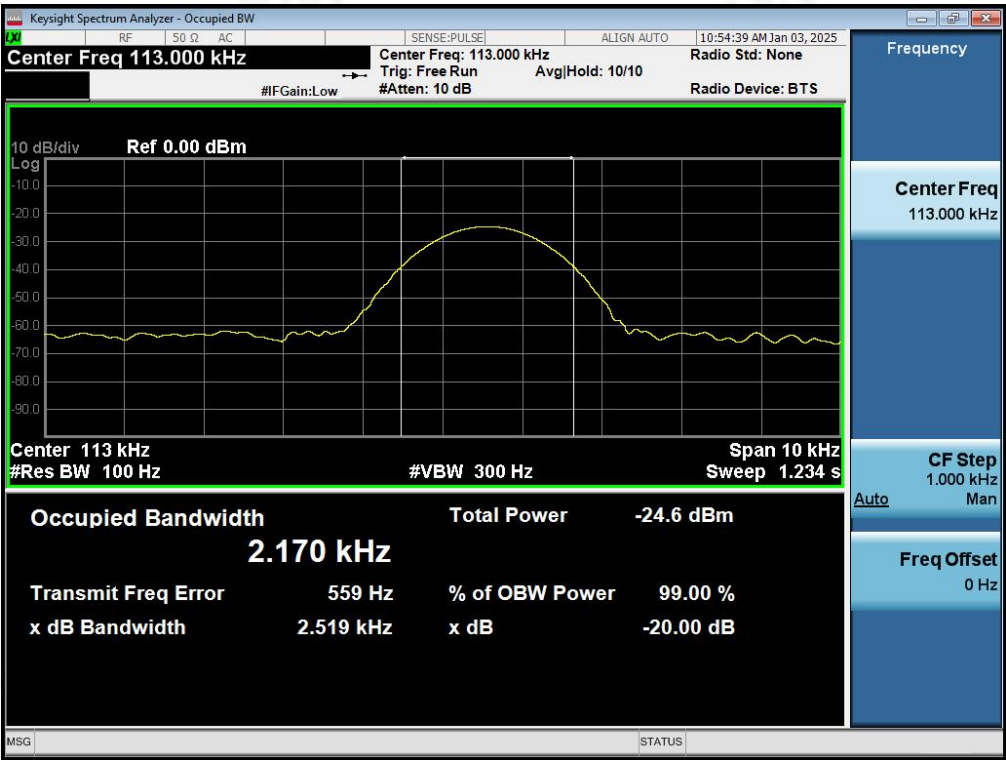
No deviation.



6.5 TEST RESULT

|              |        |                    |          |
|--------------|--------|--------------------|----------|
| Temperature: | 26 °C  | Relative Humidity: | 54%      |
| Pressure:    | 101kPa | Test Voltage:      | DC 3.85V |

| Test Coil | Frequency (kHz) | 20dB Bandwidth (kHz) | Result |
|-----------|-----------------|----------------------|--------|
| ANT 1     | 113.00          | 2.519                | Pass   |





## 7. ANTENNA REQUIREMENT

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Standard requirement:                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FCC Part15 C Section 15.203 |
| 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. |                             |
| EUT Antenna:                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |
| The antenna is Loop Coil antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details                                                                                                                                                                                                                                                                                                                                                    |                             |



## 8. TEST SETUP PHOTO

Reference to the appendix I for details.

## 9. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

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