

## FCC AND ISCED CERTIFICATION TEST REPORT

|                             |   |                                                                                             |                                       |                                          |
|-----------------------------|---|---------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------------|
| <b>Applicant</b>            | : | Ninebot (Changzhou) Tech Co., Ltd.                                                          |                                       |                                          |
| <b>Address</b>              | : | 16F-17F, Block A, Building 3, No.18, Changwu Mid Rd,Wujin Dist., Changzhou, Jiangsu, China. |                                       |                                          |
| <b>Equipment under Test</b> | : | Segway eKickScooter<br>Ninebot E3                                                           | Segway eKickScooter<br>Ninebot E3 Pro | Segway eKickScooter<br>Ninebot E3 Pro SE |
| <b>Model No.</b>            | : | 051901U                                                                                     | 051902U                               | 051902USE                                |
| <b>Trade Mark</b>           | : |           |                                       |                                          |
| <b>FCC ID</b>               | : | 2ALS8-KS0021                                                                                |                                       |                                          |
| <b>IC</b>                   | : | 22636-KS0021                                                                                |                                       |                                          |
| <b>Manufacturer</b>         | : | Ninebot (Changzhou) Tech Co., Ltd.                                                          |                                       |                                          |
| <b>Address</b>              | : | 16F-17F, Block A, Building 3, No.18, Changwu Mid Rd,Wujin Dist., Changzhou, Jiangsu, China. |                                       |                                          |

**Issued By:** Suzhou Dongdian Testing Service Co.,Ltd.

**Address:** Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou,  
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# REPORT

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## Test Report Declare

|                             |   |                                                                                                |                                       |                                          |
|-----------------------------|---|------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------------|
| <b>Applicant</b>            | : | Ninebot (Changzhou) Tech Co., Ltd.                                                             |                                       |                                          |
| <b>Address</b>              | : | 16F-17F, Block A, Building 3, No.18, Changwu Mid Rd,Wujin Dist.,<br>Changzhou, Jiangsu, China. |                                       |                                          |
| <b>Equipment under Test</b> | : | Segway eKickScooter<br>Ninebot E3                                                              | Segway eKickScooter<br>Ninebot E3 Pro | Segway eKickScooter<br>Ninebot E3 Pro SE |
| <b>Model No.</b>            | : | 051901U                                                                                        | 051902U                               | 051902USE                                |
| <b>Trade Mark</b>           | : |               |                                       |                                          |
| <b>Manufacturer</b>         | : | Ninebot (Changzhou) Tech Co., Ltd.                                                             |                                       |                                          |
| <b>Address</b>              | : | 16F-17F, Block A, Building 3, No.18, Changwu Mid Rd,Wujin Dist.,<br>Changzhou, Jiangsu, China. |                                       |                                          |

### Test Standard Used:

47 CFR FCC Part 15 Subpart C (Section 15.247), RSS-247 Issue 3 August. 2023.

### Test Procedure Used:

ANSI C63.10:2020+Corr.1:2023, RSS-Gen Issue 5 Apr. 2018+Amendment 1 March. 2019

### We Declare:

The equipment described above is tested by Suzhou Dongdian Testing Service Co.,Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Suzhou Dongdian Testing Service Co.,Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.**

|                         |                    |                      |                              |
|-------------------------|--------------------|----------------------|------------------------------|
| <b>Report No:</b>       | DDT-B24103106-3E01 |                      |                              |
| <b>Sample No:</b>       | Y24103106-02       |                      |                              |
| <b>Date of Receipt:</b> | Jan. 07, 2025      | <b>Date of Test:</b> | Feb. 14, 2025~ Mar. 03, 2025 |

Prepared By:

*Bacon Dong*

Bacon Dong/Engineer

Reviewed By:

*Leon Wu*

Leon Wu/Director

Authorized By:

*Chris Zhong*

Chris Zhong/EMC  
Manager

### Note:

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Suzhou Dongdian Testing Service Co., Ltd.

The results reported herein have been performed in accordance with the laboratory's terms of accreditation.

This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

Revision History

| Rev. | Revisions     | Issue Date    | Revised By |
|------|---------------|---------------|------------|
| ---  | Initial issue | Mar. 03, 2025 |            |
|      |               |               |            |

## 1. Summary of Test Results

| The EUT have been tested according to the applicable standards as referenced below.                                                                                                                   |                                                                                        |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------|
| Description of Test Item                                                                                                                                                                              | Standard                                                                               | Verdict |
| 6 dB Bandwidth and 99% Bandwidth                                                                                                                                                                      | FCC 15.247 (a) (2)<br>RSS-247 Clause 5.2 (a)                                           | Pass    |
| Peak Output Power                                                                                                                                                                                     | FCC 15.247 (b) (3)<br>RSS-247 Clause 5.4 (e)                                           | Pass    |
| Power Spectral Density                                                                                                                                                                                | FCC 15.247 (e)<br>RSS-247 Clause 5.2 (b)                                               | Pass    |
| Band Edge Compliance<br>(conducted method)                                                                                                                                                            | FCC 15.247 (d)<br>RSS-247 Clause 5.5                                                   | Pass    |
| Radiation Emission                                                                                                                                                                                    | FCC 15.247 (d)<br>FCC 15.209<br>FCC 15.205<br>RSS-247 Clause 5.5<br>RSS-GEN Clause 8.9 | Pass    |
| RF Conducted Spurious Emissions                                                                                                                                                                       | FCC 15.247 (d)<br>FCC 15.209<br>FCC 15.205<br>RSS-247 Clause 5.5<br>RSS-GEN Clause 8.9 | Pass    |
| Emission in Restricted Frequency Bands                                                                                                                                                                | FCC 15.205<br>RSS-GEN Clause 8.9                                                       | Pass    |
| Power Line Conducted Emission                                                                                                                                                                         | FCC 15.207<br>RSS-GEN Clause 8.8                                                       | Pass    |
| Antenna Requirement                                                                                                                                                                                   | FCC 15.247 (a) (2)<br>RSS-247 Clause 6.8                                               | Pass    |
| Note: The measurement result for the sample received is <Pass> according to < ANSI C63.10:2020+CORR.1:2023, FCC CFR 47 Part 2, FCC CFR 47 Part 15C > when <Accuracy Method> decision rule is applied. |                                                                                        |         |

## 2. General Test Information

### 2.1. Description of EUT

|                            |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                    |                                       |
|----------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------|
| EUT* Name/PMN              | : | Segway eKickScooter Ninebot E3                                                                                                                                                                                                                                                                                                                                                                                                                                       | Segway eKickScooter Ninebot E3 Pro | Segway eKickScooter Ninebot E3 Pro SE |
| Model Number/HVIN          | : | 051901U                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 051902U                            | 051902USE                             |
| Hardware Version           | : | E3 PRO_ESU                                                                                                                                                                                                                                                                                                                                                                                                                                                           | E3 PRO_ESU                         | E3 PRO_ESU                            |
| Software Version           | : | V1.2.4                                                                                                                                                                                                                                                                                                                                                                                                                                                               | V1.2.4                             | V1.2.4                                |
| Test Model                 | : | 051902U                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    |                                       |
| Difference of model number | : | All the models are electrical identical including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location, components on PCB, etc.), same mechanical structure and design (including product enclosure, materials, etc.), the only difference is the product name, model name, and add a mobile phone holder & a coded lock inside the scooter box, and sell in different market. |                                    |                                       |
| EUT function description   | : | Please reference user manual of this device                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |                                       |
| Power Supply               | : | DC 47V 1.7A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |                                       |
| Operation Frequency        | : | 2402MHz-2480MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                    |                                       |
| Modulation                 | : | GFSK                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |                                       |
| Data Rate                  | : | 1Mbps                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                    |                                       |
| Antenna Type               | : | PCB Antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |                                       |
| Antenna Gain               | : | -1.26dBi<br>(Declare by customer and the lab isn't responsible for the value)                                                                                                                                                                                                                                                                                                                                                                                        |                                    |                                       |
| Serial Number              | : | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                    |                                       |

Note1: The lab isn't responsible for the value provide by customer(Such as RF cable loss, antenna gain etc..)

| Channel information |                 |         |                 |         |                 |
|---------------------|-----------------|---------|-----------------|---------|-----------------|
| Channel             | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 0                   | 2402            | 14      | 2430            | 28      | 2458            |
| 1                   | 2404            | 15      | 2432            | 29      | 2460            |
| 2                   | 2406            | 16      | 2434            | 30      | 2462            |
| 3                   | 2408            | 17      | 2436            | 31      | 2464            |
| 4                   | 2410            | 18      | 2438            | 32      | 2466            |
| 5                   | 2412            | 19      | 2440            | 33      | 2468            |
| 6                   | 2414            | 20      | 2442            | 34      | 2470            |
| 7                   | 2416            | 21      | 2444            | 35      | 2472            |
| 8                   | 2418            | 22      | 2446            | 36      | 2474            |
| 9                   | 2420            | 23      | 2448            | 37      | 2476            |
| 10                  | 2422            | 24      | 2450            | 38      | 2478            |
| 11                  | 2424            | 25      | 2452            | 39      | 2480            |
| 12                  | 2426            | 26      | 2454            |         |                 |
| 13                  | 2428            | 27      | 2456            |         |                 |

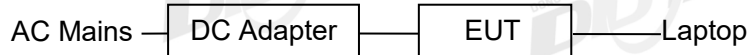
## 2.2. Accessories of EUT

| Description of Accessories       | Manufacturer                       | Model number | Description                                                          | Remark |
|----------------------------------|------------------------------------|--------------|----------------------------------------------------------------------|--------|
| Battery Charger/<br>Power Supply | Weihai Hitai Electronics Co., Ltd. | NBW41D001D7D | Input AC 100-240V<br>50-60Hz 2.0A MAX<br>Rated Output<br>DC 41V 1.7A | 1#     |
| Battery Charger/<br>Power Supply | FSP-Powerland Technology Inc.      | NBW41D001D7D | AC 100-240V<br>50-60Hz 2.0 A MAX<br>Rated Output<br>DC 41V 1.7A      | 2#     |

## 2.3. Assistant equipment used for test

| Assistant equipment | Manufacturer | Model number             | EMC Compliance | SN               |
|---------------------|--------------|--------------------------|----------------|------------------|
| Laptop              | ASUS         | FX506LI10750-0DABXHA4X10 | FCC/CE         | LANRCX04 696543F |

## 2.4. Block diagram of EUT configuration for test



software: GRDirect Test Mode Tool

Test software version: 1.0.0.0

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table:

| Tested mode, channel, information |                  |         |                 |
|-----------------------------------|------------------|---------|-----------------|
| Mode                              | Setting Tx Power | Channel | Frequency (MHz) |
| GFSK                              | 0                | CH0     | 2402            |
|                                   | 0                | CH19    | 2440            |
|                                   | 0                | CH39    | 2480            |

## 2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

| Environment Parameter | Selected Values During Tests |
|-----------------------|------------------------------|
| Relative Humidity     | 40-75%                       |
| Atmospheric Pressure: | 86-106 kPa                   |
| Temperature           | 21-25 °C                     |
| Voltage:              | AC 120V 60Hz                 |

## 2.6. Deviations of test standard

No deviation.

## 2.7. Test laboratory

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lab Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Company Name: Suzhou Dongdian Testing Service Co.,Ltd.</p> <p>Address: Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou, People's Republic of China.</p> <p>Tel: +86-0512-62531270, E-mail: ddt@dgddt.com, <a href="http://www.ddttest.com">http://www.ddttest.com</a></p>                                                                                                                                                                                                                                                                                                                                                                |
| Accreditation Certificate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>A2LA (Certificate No.: 7346.01)</p> <p>Suzhou Dongdian Testing Service Co.,Ltd. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1397)</p> <p>Suzhou Dongdian Testing Service Co.,Ltd. has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</p> <p>IC (IC Designation No.: 32952; CAB No.:CN0182)</p> <p>Suzhou Dongdian Testing Service Co.,Ltd. has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.</p> |
| <p>Note 1: All tests measurement facilities use to collect the measurement data are located at Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou, China.</p> <p>Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.</p> <p>Note 3: The test anechoic chamber in Suzhou Dongdian Testing Service Co.,Ltd had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 2.8. Measurement uncertainty

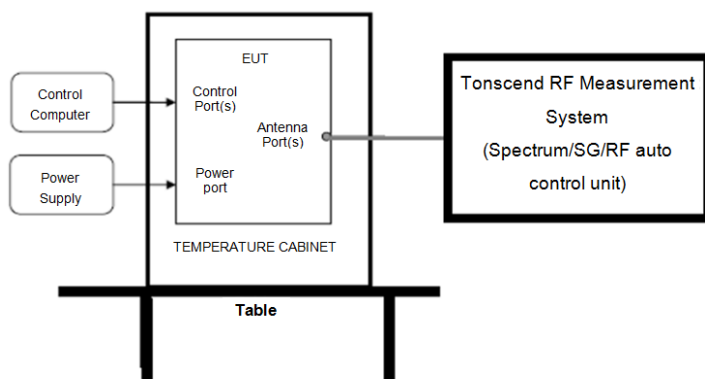
| Test Item                                                                                                                                     | Uncertainty                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| DTS Bandwidth                                                                                                                                 | $\pm 1.9\%$                          |
| Maximum Conducted Output Power                                                                                                                | $\pm 0.69\text{dB}$                  |
| Maximum Power Spectral Density Level                                                                                                          | $\pm 1.5\text{ dB}$                  |
| Band-edge Compliance                                                                                                                          | $\pm 1.9\%$                          |
| Conducted Spurious Emissions                                                                                                                  | 30MHz-1GHz: $\pm 1.5\text{ dB}$      |
|                                                                                                                                               | 1GHz-12.75GHz: $\pm 1.9\text{dB}$    |
|                                                                                                                                               | 12.75GHz-26.5GHz: $\pm 2.1\text{dB}$ |
| Uncertainty for Radiation Emission Test (9kHz - 1 GHz)                                                                                        | 9kHz-30MHz: $0.9\text{ dB}$          |
|                                                                                                                                               | 30MHz-1000MHz: $1.5\text{dB}$        |
| Uncertainty for Radiation Emission Test (1 GHz - 40 GHz)                                                                                      | 1GHz - 12.75GHz: $1.9\text{ dB}$     |
|                                                                                                                                               | 12.75GHz - 26.5GHz: $2.1\text{ dB}$  |
|                                                                                                                                               | 26.5GHz - 40GHz: $2.5\text{ dB}$     |
| Uncertainty for Power Line Conduction Emission Test                                                                                           | $3.4\text{ dB}$ (150 kHz - 30 MHz)   |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                                      |

### 3. Equipment Used During Test

| Equipment                                        | Manufacturer    | Model No.            | Serial No.   | Last Cal.  | Cal. Interval |
|--------------------------------------------------|-----------------|----------------------|--------------|------------|---------------|
| <b>RF Conducted Test</b>                         |                 |                      |              |            |               |
| MXG Vector Signal Generator(100kHz-6GHz)         | Agilent         | N5182A               | MY50144775   | 2025/01/23 | 1 Year        |
| Spectrum Analyzer(9kHz-40GHz)                    | R&S             | FSV40-N              | 101642       | 2025/01/23 | 1 Year        |
| Vector Signal Generator(4kHz-7.125GHz)           | R&S             | SMCV100B             | 103781       | 2025/01/23 | 1 Year        |
| WIDBAND RADIO COMMUNICATION TESTER               | R&S             | CMW 500              | 167141       | 2025/01/23 | 1 Year        |
| Signal Analyzer(10Hz-26.5GHz)                    | Keysight        | N9020B               | MY56080159   | 2025/01/23 | 1 Year        |
| RF Control Unit                                  | Tonscend        | JS0806-3             | 24A80620795  | 2025/01/23 | 1 Year        |
| Signal Generator                                 | R&S             | SMF 100A             | 101396       | 2025/01/23 | 1 Year        |
| Programmable Temperature Humidity Chamber        | Zhi Xiang       | ZXGDJS-225L          | ZX20171127A  | 2025/01/23 | 1 Year        |
| Temperature, humidity and pressure recorder      | Huahanwei       | TH10R                | c00286000Ebc | 2025/01/23 | 1 Year        |
| Test Software                                    | TONSCEND        | JS1120-3             | 3.5.39       | N/A        | N/A           |
| <b>Radiated Spurious Emission 3m EMI Chamber</b> |                 |                      |              |            |               |
| Equipment                                        | Manufacturer    | Model No.            | Serial No.   | Last Cal.  | Cal. Interval |
| EMI Test Receiver                                | R&S             | ESC17                | 101138       | 2025/01/23 | 1 Year        |
| Signal Analyzer                                  | R&S             | FSV40                | 101730       | 2025/01/23 | 1 Year        |
| Hybrid antenna                                   | TESEQ           | CBL6141B             | 27421        | 2024/01/10 | 3 Year        |
| Horn Antenna                                     | ETS             | ETS 3117             | 157735       | 2024/01/19 | 3 Year        |
| Pre-Amplifier_HF                                 | COM-MW          | DPA8-1000-18000-1012 | 9BH231242575 | 2025/01/23 | 1 Year        |
| Temperature, humidity and pressure recorder      | Huahanwei       | TH10R                | c0222020002F | 2025/01/23 | 1 Year        |
| 3m Anechoic Chamber                              | CeRuiTong       | 3m-SAC               | N/A          | 2024/05/10 | 3 Year        |
| Test Software                                    | TONSCEND        | JS32-RE              | 5.0.0        | N/A        | N/A           |
| <b>Power Line Conducted Emissions Test</b>       |                 |                      |              |            |               |
| Equipment                                        | Manufacturer    | Model No.            | Serial No.   | Last Cal.  | Cal. Interval |
| EMI Test Receiver                                | Rohde & Schwarz | ESC13                | 101705       | 2025/01/23 | 1 Year        |
| Two-Line V-Network                               | Rohde & Schwarz | ENV216               | 101063       | 2025/01/23 | 1 Year        |
| Test software                                    | TONSCEND        | JS32-CE              | 5.0.0        | N/A        | N/A           |

## 4. 6 dB Bandwidth and 99% Bandwidth

### 4.1. Block diagram of test setup



### 4.2. Limits

| FCC Part15 (15.247), Subpart C, RSS 247         |                         |                             |                       |
|-------------------------------------------------|-------------------------|-----------------------------|-----------------------|
| Section                                         | Test Item               | Limit                       | Frequency Range (MHz) |
| CFR 47 FCC 15.247(a)(2)<br>ISED RSS-247 5.2 (a) | 6dB Bandwidth           | $\geq 500\text{kHz}$        | 2400-2483.5           |
| ISED RSS-Gen Clause 6.7                         | 99 % Occupied Bandwidth | For reporting purposes only | 2400-2483.5           |

### 4.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) 99% Bandwidth set the spectrum analyzer as follows:

RBW: RBW, prefer 1% to 5% of OBW,  
or a minimum of 1 MHz if this is not possible due to a large OBW

VBW: VBW approximately  $3 \times \text{RBW}$

Detector Mode: Peak

Sweep time: auto

Trace mode: Max hold

- (3) 6 dB Bandwidth set the spectrum analyzer as follows:

RBW: 100 kHz

VBW: 300 kHz

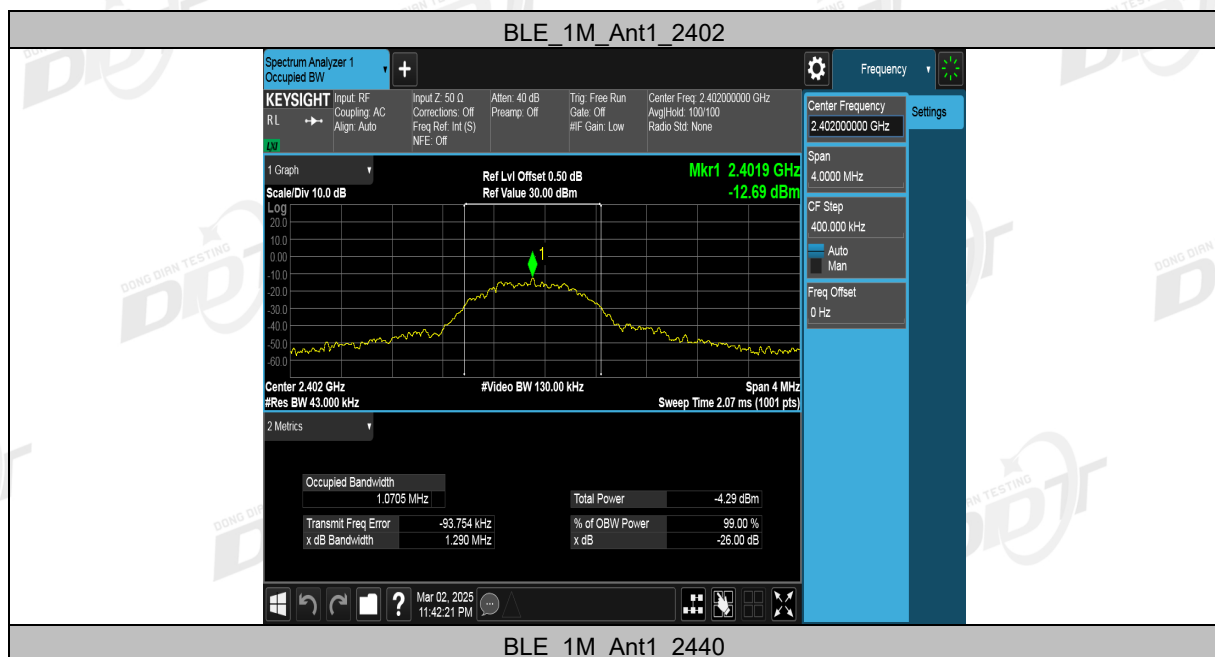
Detector Mode: Peak  
 Sweep time: auto  
 Trace mode: Max hold

(4) Allow the trace to stabilize, measure the 6 dB and 99% bandwidth of signal.

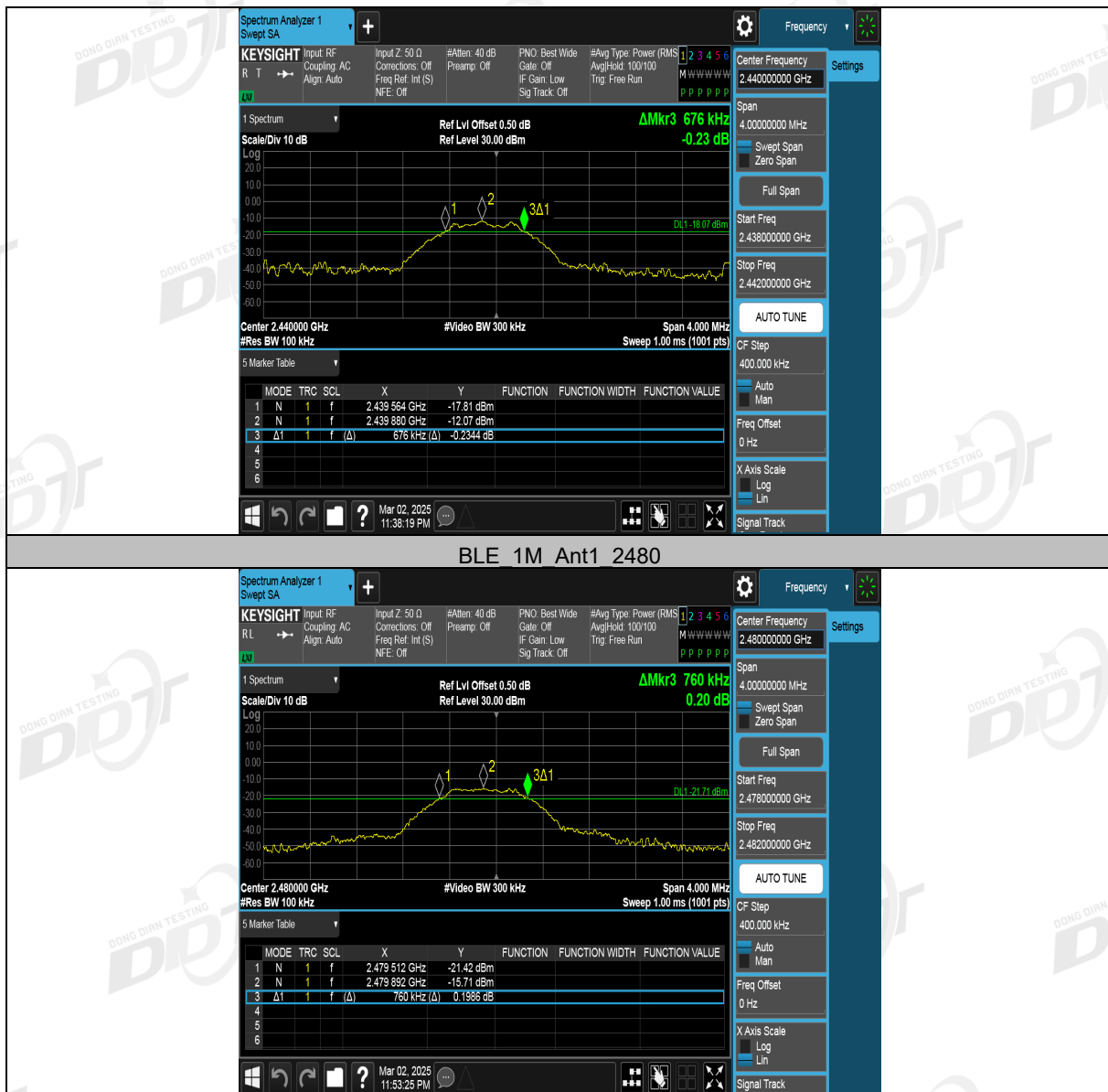
#### 4.4. Test result

| Mode | Channel | 99% bandwidth Result (MHz) | 6 dB bandwidth Result (MHz) | 6 dB width Limit (MHz) | Verdict |
|------|---------|----------------------------|-----------------------------|------------------------|---------|
| GFSK | CH0     | 1.0705                     | 0.684                       | >0.5                   | Pass    |
|      | CH19    | 1.0980                     | 0.676                       | >0.5                   | Pass    |
|      | CH39    | 1.0771                     | 0.760                       | >0.5                   | Pass    |

#### 4.5. Original test data







## 5. Maximum Peak Output Power

### 5.1. Block diagram of test setup

Same with 4.1

### 5.2. Limits

| FCC Part15 (15.247) Subpart C, RSS 247      |              |                           |                       |
|---------------------------------------------|--------------|---------------------------|-----------------------|
| Section                                     | Test Item    | Limit                     | Frequency Range (MHz) |
| FCC 15.247(b)(3)<br>ISED RSS-247<br>5.4 (d) | Output Power | 1 watt or<br>30dBm        | 2400-2483.5           |
| RSS-Gen Clause<br>6.12                      |              | 4 watt or<br>36dBm (EIRP) |                       |

If transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 5.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

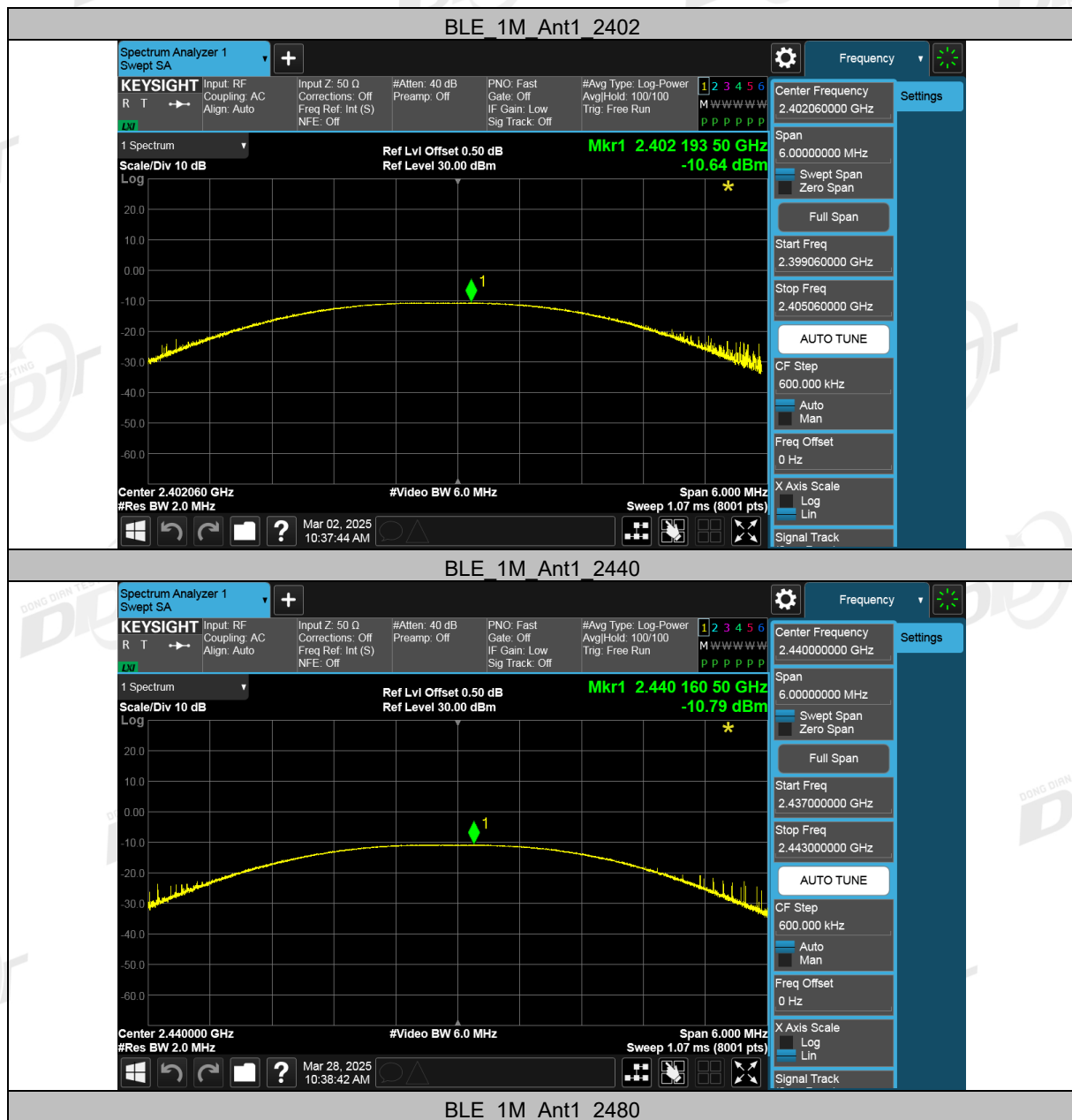
|                |                |
|----------------|----------------|
| RBW:           | ≥DTS bandwidth |
| VBW:           | ≥3 x RBW       |
| Span           | ≥3 x RBW       |
| Detector Mode: | Peak           |
| Sweep time:    | auto           |
| Trace mode     | Max hold       |

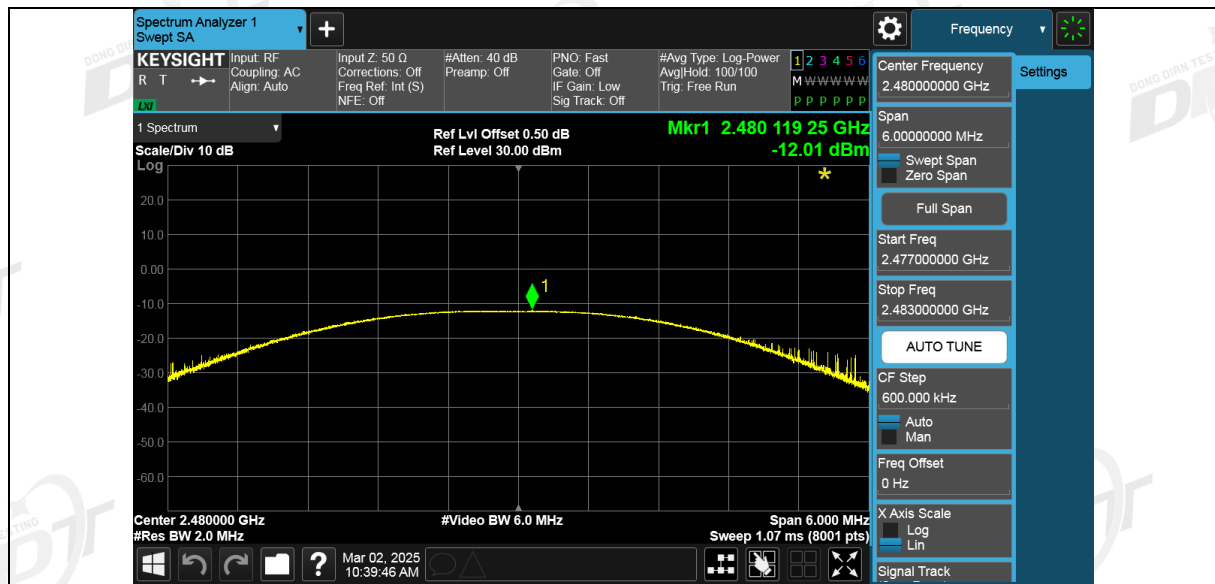
(3) Allow the trace to stabilize, Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges measure out the PK output power.

### 5.4. Test result

| Mode | Freq. (MHz) | Conducted Peak Power[dBm] | Conducted Limit[dBm] | EIRP[dBm] | EIRP Limit[dBm] | Verdict |
|------|-------------|---------------------------|----------------------|-----------|-----------------|---------|
| GFSK | 2402        | -10.64                    | ≤30                  | -11.90    | ≤36             | PASS    |
|      | 2440        | -10.79                    | ≤30                  | -12.05    | ≤36             | PASS    |
|      | 2480        | -12.01                    | ≤30                  | -13.27    | ≤36             | PASS    |

## 5.5. Original test data





## 6. Power Spectral Density

### 6.1. Block diagram of test setup

Same with 4.1

### 6.2. Limits

| FCC Part15 (15.247), Subpart C          |                        |             |                       |
|-----------------------------------------|------------------------|-------------|-----------------------|
| Section                                 | Test Item              | Limit       | Frequency Range (MHz) |
| FCC §15.247 (e)<br>ISED RSS-247 5.2 (b) | Power Spectral Density | 8 dBm/3 kHz | 2400-2483.5           |

### 6.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

|                  |                                                      |
|------------------|------------------------------------------------------|
| Center frequency | DTS Channel center frequency                         |
| RBW:             | $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ |
| VBW:             | $\geq 3\text{RBW}$                                   |
| Span             | 1.5 times the DTS bandwidth                          |
| Detector Mode:   | Peak                                                 |
| Sweep time:      | auto                                                 |
| Trace mode       | Max hold                                             |

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.

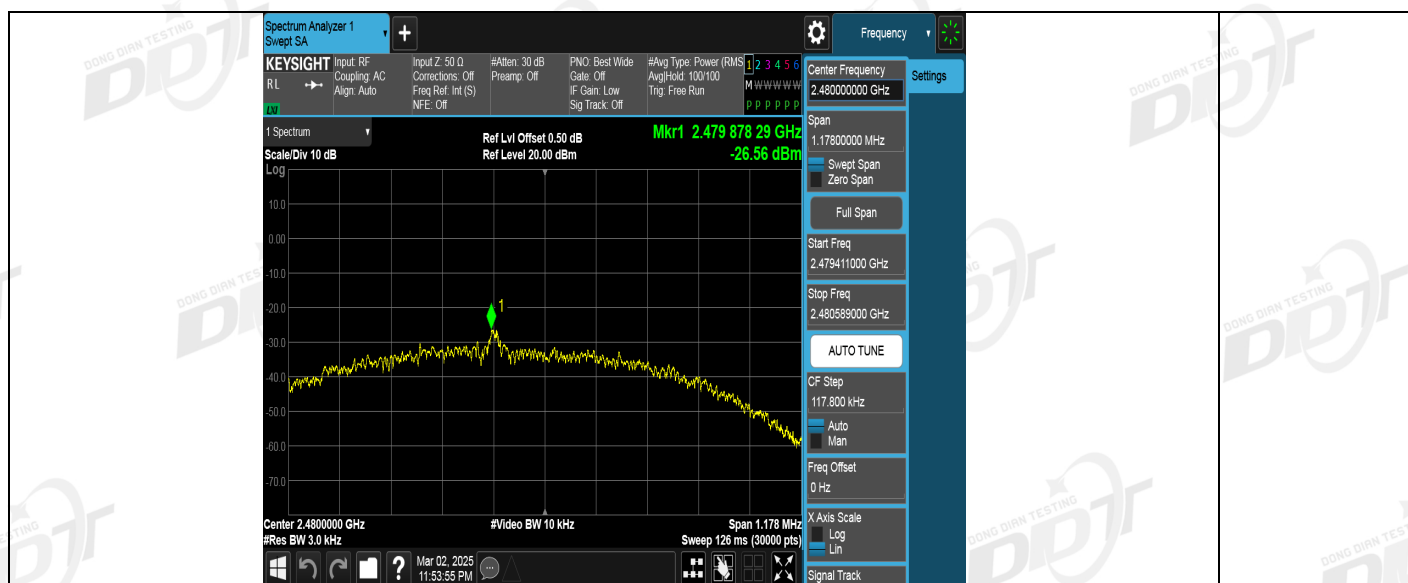
(4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.4. Test result

| EUT Set Mode        | Antenna | Channel | Result (dBm/3 kHz) |
|---------------------|---------|---------|--------------------|
| GFSK                | ANT1    | CH0     | -23.03             |
|                     | ANT1    | CH19    | -24.42             |
|                     | ANT1    | CH39    | -26.56             |
| Limit: <8 dBm/3 kHz |         |         | Verdict: Pass      |

## 6.5. Original test data





## 7. Band Edge Compliance (Conducted Method)

### 7.1. Block diagram of test setup

Same with 4.1

### 7.2. Limits

| FCC Part15 (15.247), Subpart C                               |                    |                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section                                                      | Test Item          | Limit                                                                                                                                                                                                                                                                                                                         |
| FCC §15.247 (d)<br>RSS-247 Clause 5.5<br>RSS-GEN Clause 6.13 | Conducted Bandedge | 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. |

### 7.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

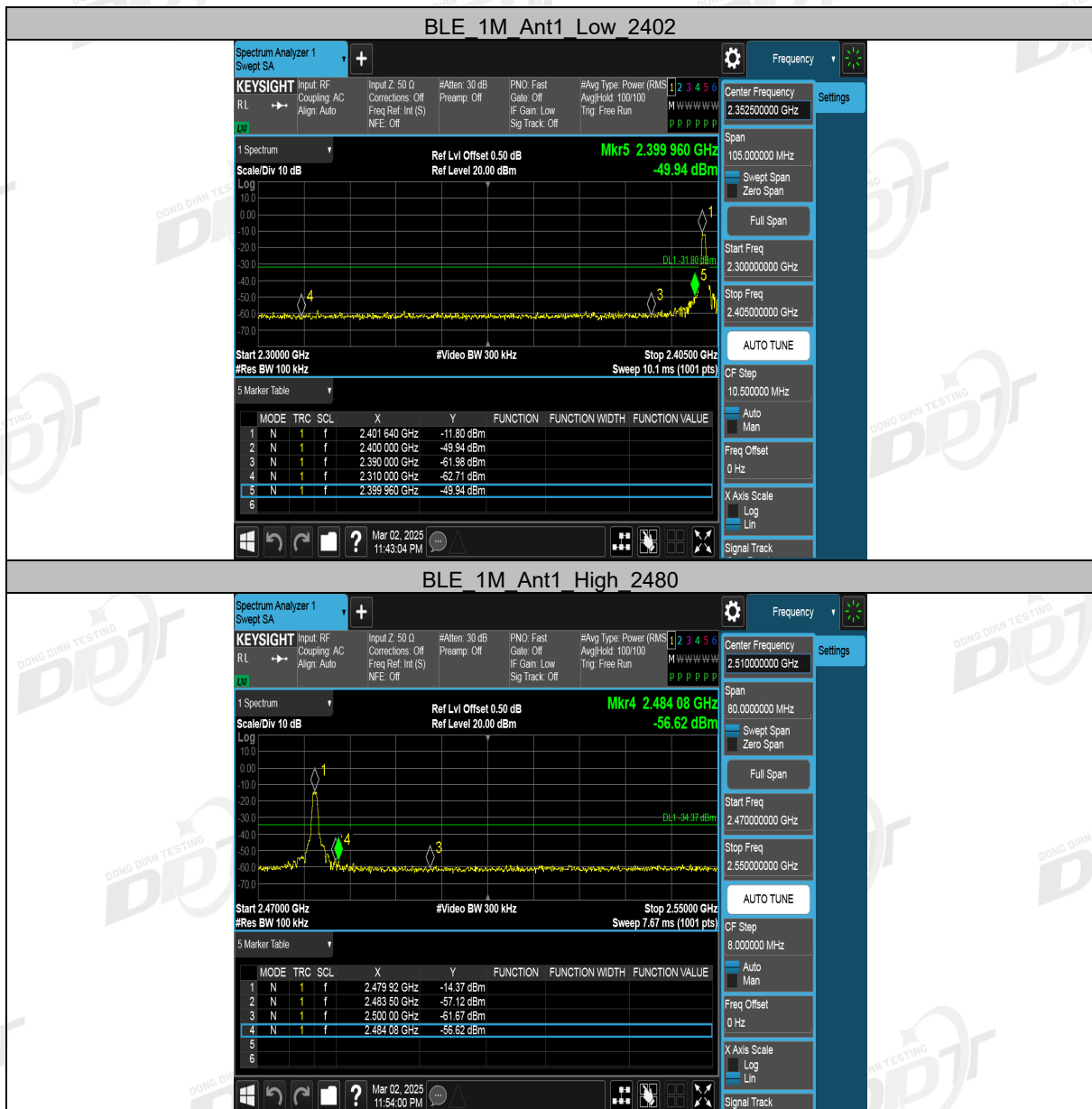
|                              |                                          |
|------------------------------|------------------------------------------|
| RBW:                         | 100 kHz                                  |
| VBW:                         | 300 kHz                                  |
| Span                         | Encompass frequency range to be measured |
| Number of measurement points | $\geq \text{span}/\text{RBW}$            |
| Detector Mode:               | Peak                                     |
| Sweep time:                  | auto                                     |
| Trace mode                   | Max hold                                 |

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

### 7.4. Test result

| EUT Set Mode | CH or Frequency | Measured Range        | Verdict |
|--------------|-----------------|-----------------------|---------|
| GFSK         | CH0             | 2.300 GHz - 2.405 GHz | Pass    |
|              | CH39            | 2.470 GHz - 2.550 GHz | Pass    |

## 7.5. Original test data



## 8. RF Conducted Spurious Emissions

### 8.1. Block diagram of test setup

Same as section 4.1

### 8.2. Limits

| FCC Part15 (15.247), Subpart C                               |                              |                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section                                                      | Test Item                    | Limit                                                                                                                                                                                                                                                                                                                         |
| FCC §15.247 (d)<br>RSS-247 Clause 5.5<br>RSS-GEN Clause 6.13 | Conducted Spurious Emissions | 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. |

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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

### 8.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| Center frequency | Test frequency                                                |
| RBW:             | 100 kHz                                                       |
| VBW:             | 300 kHz                                                       |
| Span             | Wide enough to capture the peak level of the in-band emission |
| Detector Mode:   | Peak                                                          |
| Sweep time:      | auto                                                          |
| Trace mode       | Max hold                                                      |

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

|      |         |
|------|---------|
| RBW: | 100 kHz |
|------|---------|

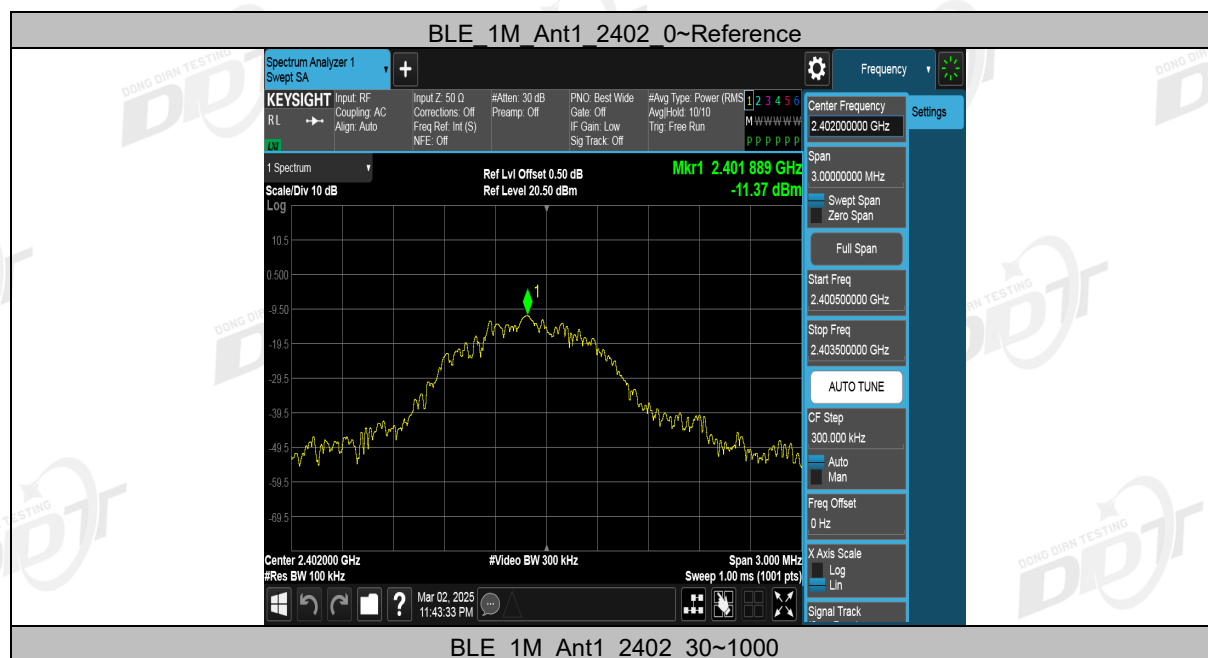
VBW: 300 kHz  
 Span: Encompass frequency range to be measured  
 Number of measurement points:  $\geq \text{span/RBW}$   
 Detector Mode: Peak  
 Sweep time: auto  
 Trace mode: Max hold

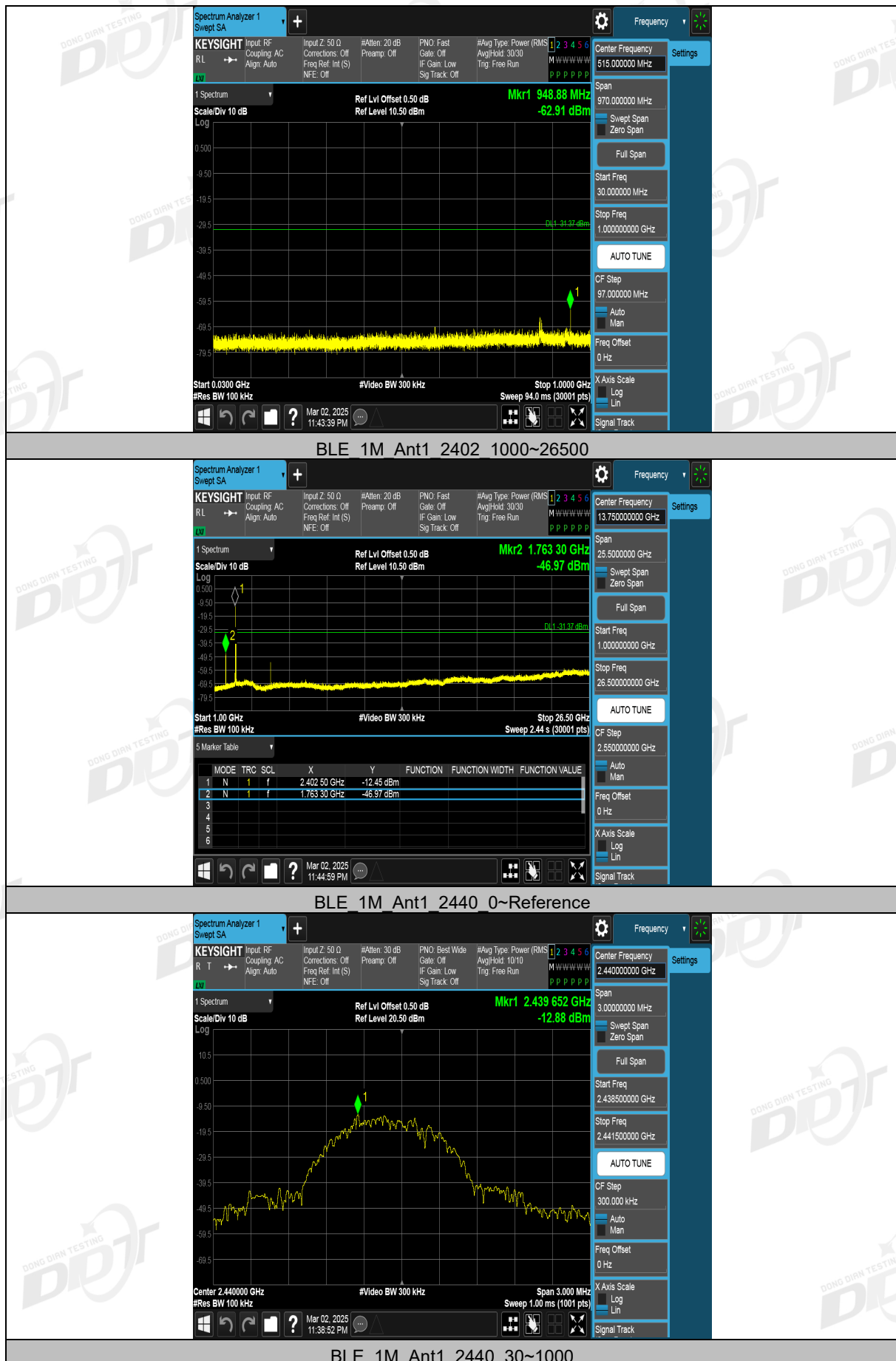
- (5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

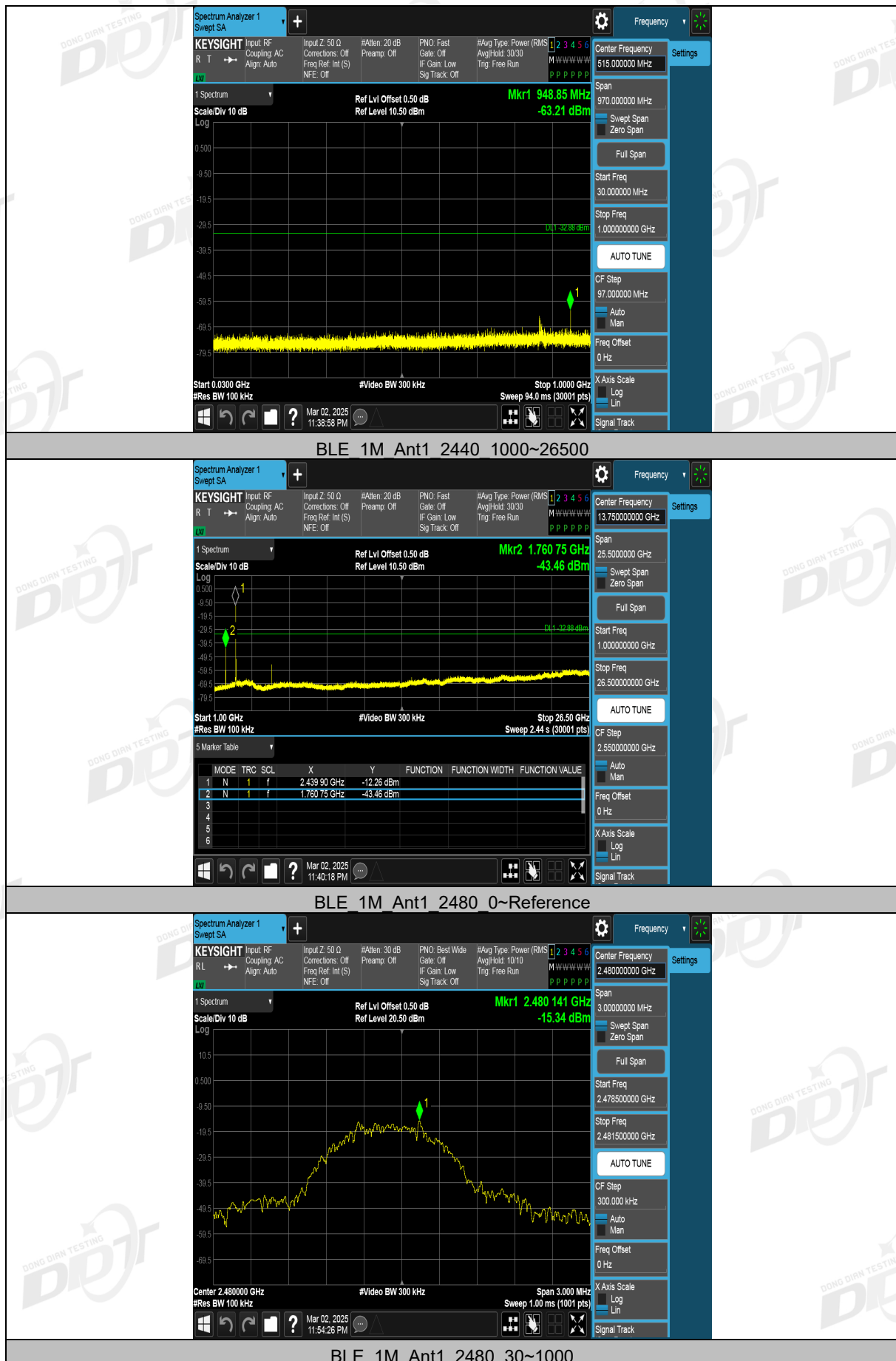
#### 8.4. Test result

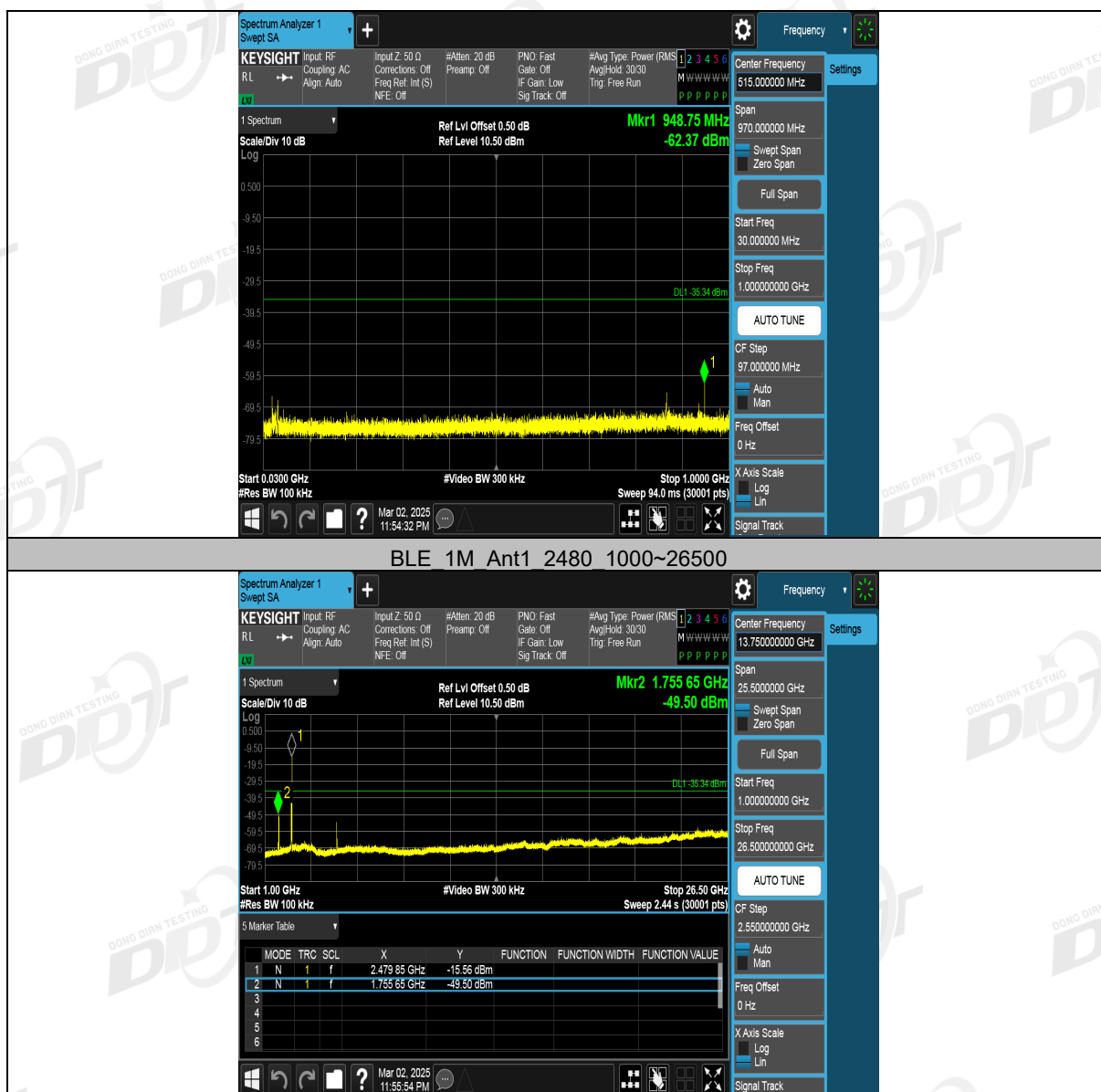
| Mode | Freq. (MHz) | Verdict |
|------|-------------|---------|
| GFSK | 2402        | Pass    |
|      | 2440        | Pass    |
|      | 2480        | Pass    |

#### 8.5. Original test data





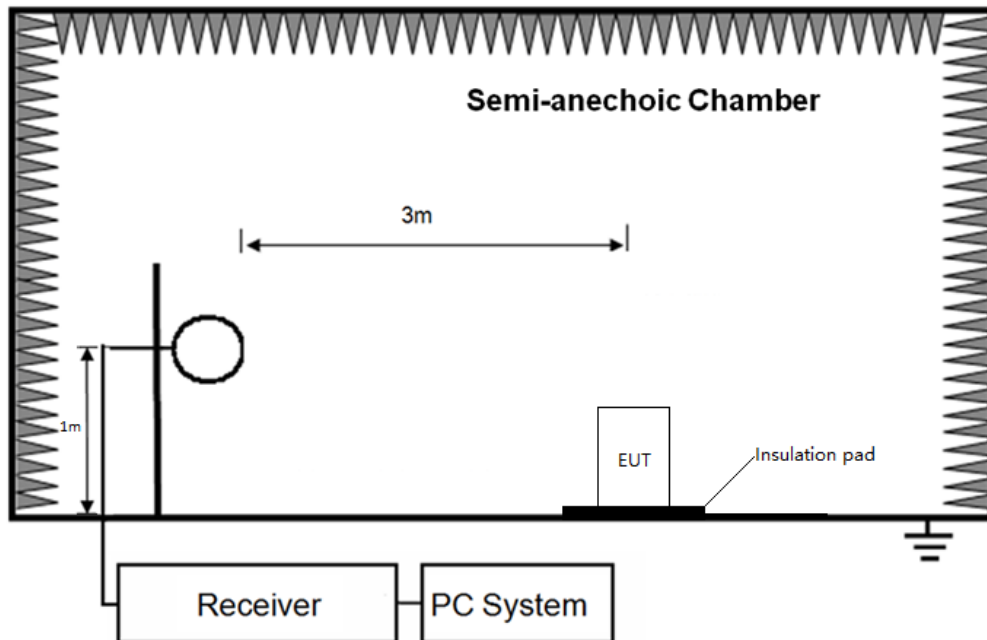




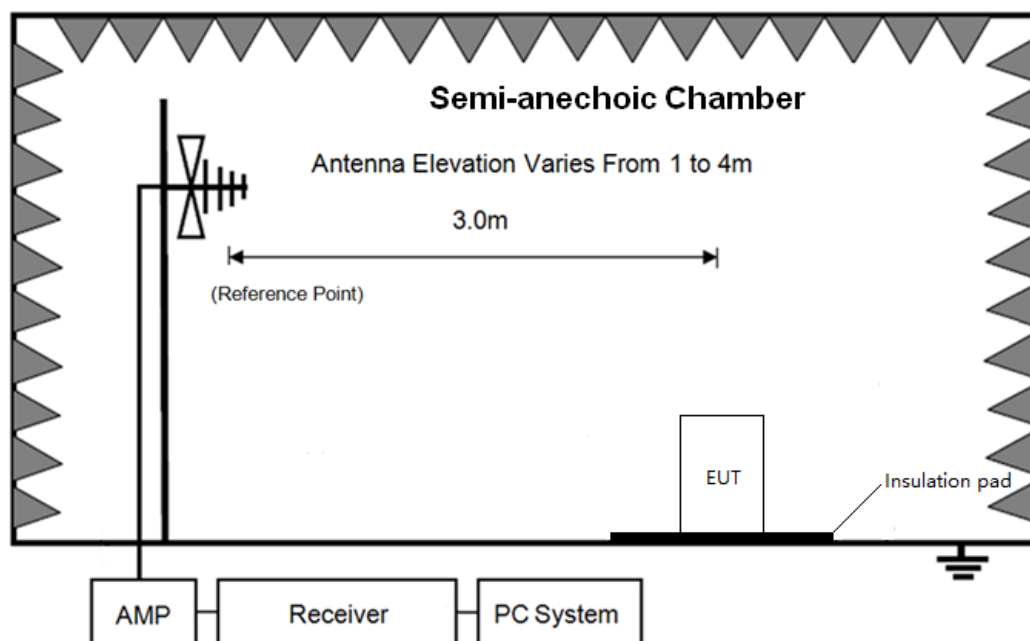
## 9. Radiated Emission

### 9.1. Block diagram of test setup

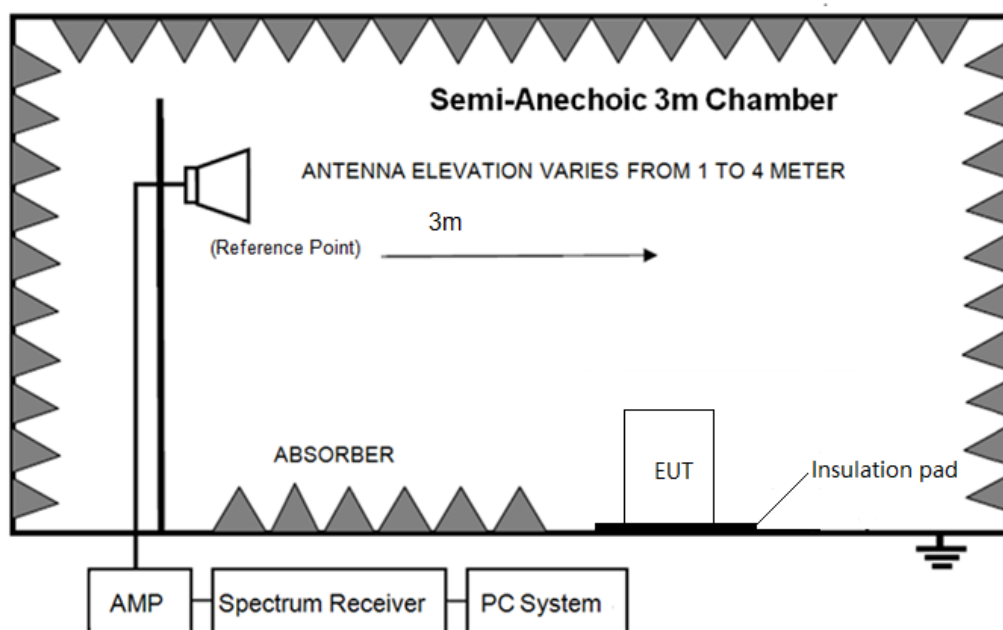
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

## 9.2. Limit

### 8.2.1 FCC 15.205 Restricted frequency band

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.1772&4.17775           | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.2072&4.20775           | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup>Above 38.6

### 8.2.2 FCC 15.209 Limit.

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT                                                     |                                   |
|------------------|--------------------|---------------------------------------------------------------------------|-----------------------------------|
|                  |                    | $\mu\text{V/m}$                                                           | $\text{dB}(\mu\text{V})/\text{m}$ |
| 0.009 ~ 0.490    | 300                | 2400/F(kHz)                                                               | 67.6-20log(F)                     |
| 0.490 ~ 1.705    | 30                 | 24000/F(kHz)                                                              | 87.6-20log(F)                     |
| 1.705 ~ 30.0     | 30                 | 30                                                                        | 29.54                             |
| 30 ~ 88          | 3                  | 100                                                                       | 40.0                              |
| 88 ~ 216         | 3                  | 150                                                                       | 43.5                              |
| 216 ~ 960        | 3                  | 200                                                                       | 46.0                              |
| 960 ~ 1000       | 3                  | 500                                                                       | 54.0                              |
| Above 1000       | 3                  | 74.0 dB( $\mu\text{V}$ )/m (Peak)<br>54.0 dB( $\mu\text{V}$ )/m (Average) |                                   |

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V/m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V/m}) + 40\text{Log}(30\text{m}/3\text{m})$$

### 8.2.3 Limit for this EUT

All the emissions appearing within 15.205 & RSS-GEN restricted frequency bands shall not exceed the limits shown in 15.209 & RSS-GEN, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 & RSS-GEN limits.

## 9.3. Test Procedure

- (1) EUT was placed on a non-metallic table, 10 mm above the ground plane inside a semi-anechoic chamber for below 1 GHz and 150 cm above the ground plane inside a semi-anechoic chamber for above 1 GHz.
- (2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

| Test frequency range | Test antenna used                              | Test antenna distance |
|----------------------|------------------------------------------------|-----------------------|
| 9 kHz - 30 MHz       | Active Loop antenna                            | 3 m                   |
| 30 MHz - 1 GHz       | Trilog Broadband Antenna                       | 3 m                   |
| 1 GHz - 18 GHz       | Double Ridged Horn Antenna<br>(1 GHz - 18 GHz) | 3 m                   |
| 18 GHz - 40 GHz      | Horn Antenna<br>(18 GHz - 40 GHz)              | 3 m                   |

According ANSI C63.10:2020+CORR.1:2023 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also is positioned with its plane horizontal at the specified distance from the EUT. The

center of the loop is 1 m above the ground. For measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 25 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so below final test was performed with frequency range from 30 MHz to 18 GHz.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2020+CORR.1:2023 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

| Frequency band   | RBW     |
|------------------|---------|
| 9 kHz - 150 kHz  | 200 Hz  |
| 150 kHz - 30 MHz | 9 kHz   |
| 30 MHz - 1 GHz   | 120 kHz |

(7) For emissions above 1 GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2020+CORR.1:2023 clause 4.1.4.2.2 procedure for average measure.

(8) X axis, Y axis, Z axis are tested, and worse setup X axis is reported.

#### 9.4. Test result

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 25 GHz were comply with 15.209 limit.

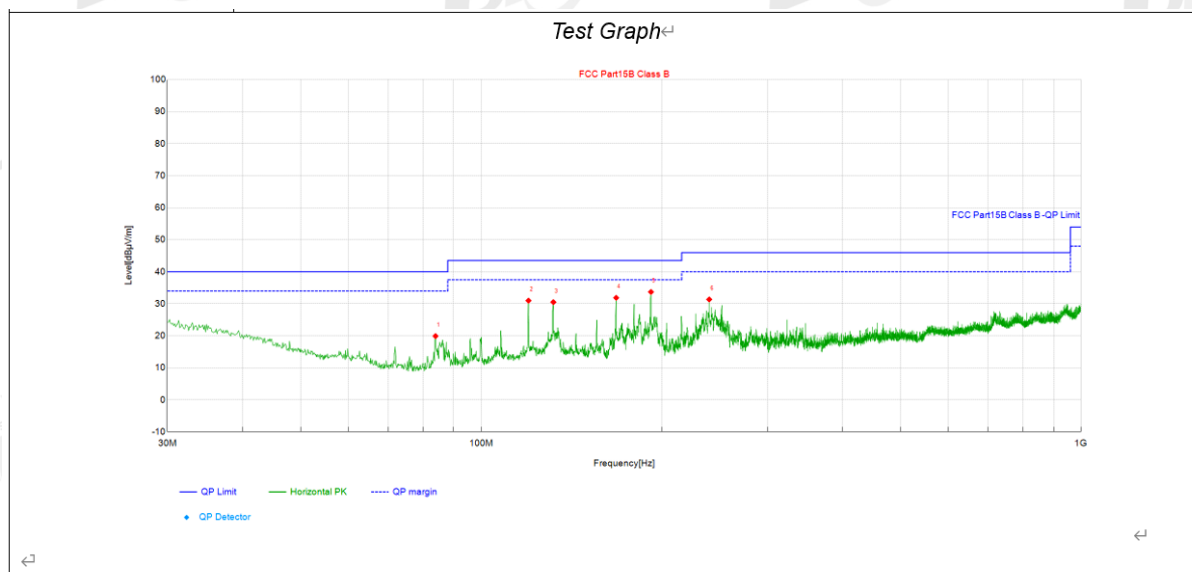
Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 25 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in GFSK, Tx 2402 MHz mode.

Note3: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

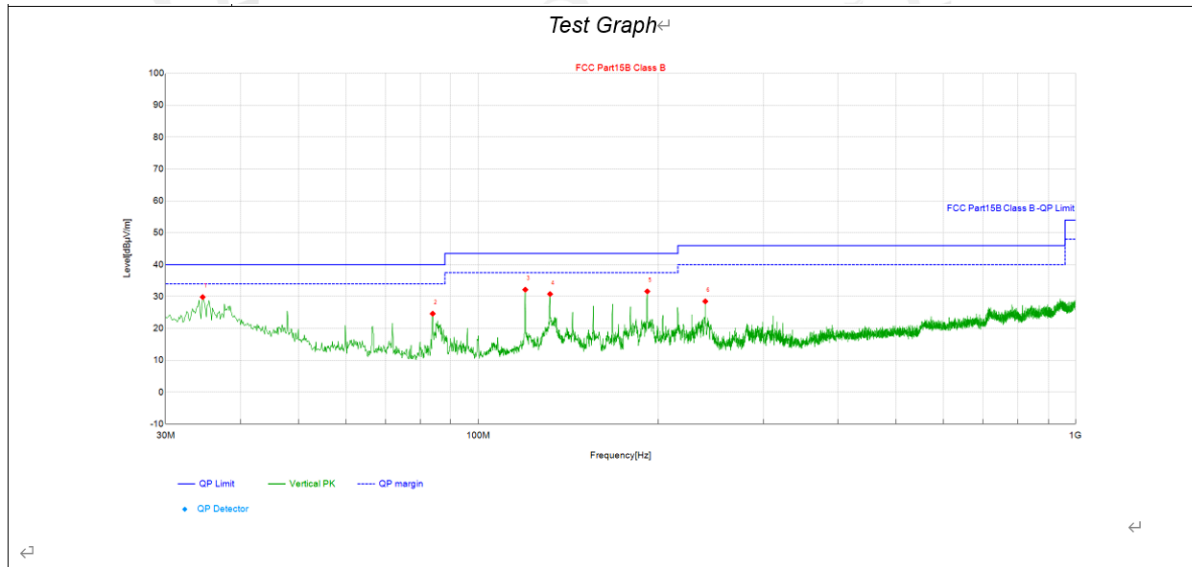
**Radiated Emission test (30MHz-1GHz)**

Powered by 1# adapter

**Suspected Data List**

| NO. | Frequency [MHz] | Reading [dBuV] | Level [dBuV/m] | Factor [dB/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [°] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|-----|------|---------|
| 1   | 83.96           | 41.49          | 19.93          | -21.56        | 40.00          | 20.07       | 200         | 216       | PK  | Hori | PASS    |
| 2   | 119.97          | 48.20          | 31.01          | -17.19        | 43.50          | 12.49       | 200         | 189       | PK  | Hori | PASS    |
| 3   | 131.97          | 46.81          | 30.53          | -16.28        | 43.50          | 12.97       | 100         | 233       | PK  | Hori | PASS    |
| 4   | 167.98          | 49.69          | 31.89          | -17.80        | 43.50          | 11.61       | 200         | 334       | PK  | Hori | PASS    |
| 5   | 191.99          | 51.87          | 33.71          | -18.16        | 43.50          | 9.79        | 100         | 191       | PK  | Hori | PASS    |
| 6   | 240.01          | 47.94          | 31.38          | -16.56        | 46.00          | 14.62       | 100         | 12        | PK  | Hori | PASS    |

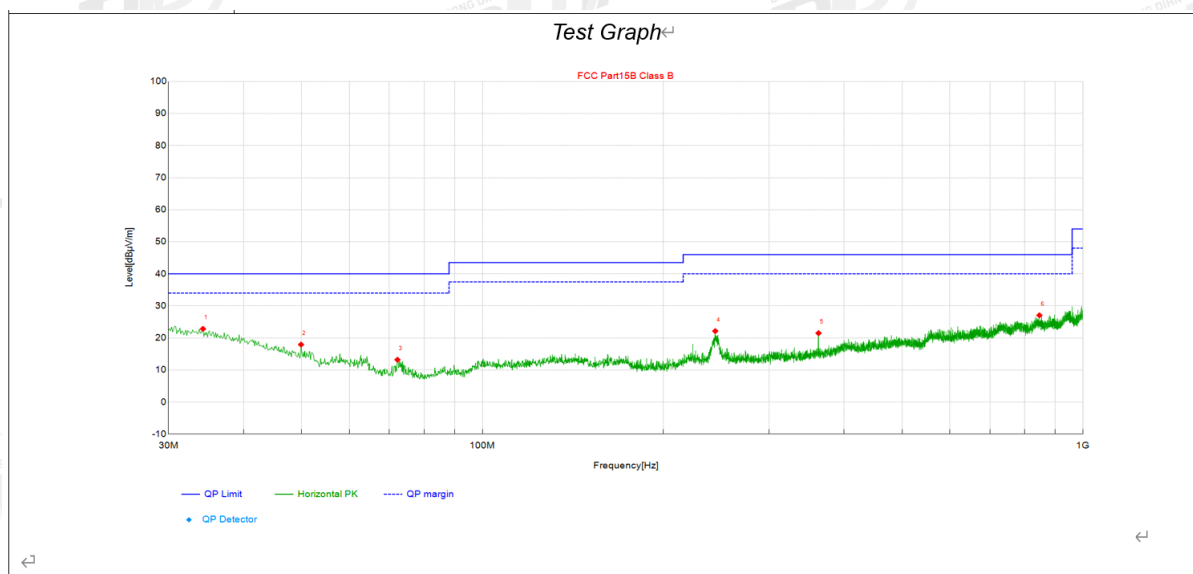
Note: if the PK value is less than QP limit, it deems meet the requirements of QP limits.

**Suspected Data List**

| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|-----|------|---------|
| 1   | 34.61           | 38.41          | 29.85          | -8.56         | 40.00          | 10.15       | 200         | 230       | PK  | Vert | PASS    |
| 2   | 83.96           | 46.20          | 24.64          | -21.56        | 40.00          | 15.36       | 100         | 320       | PK  | Vert | PASS    |
| 3   | 119.97          | 49.37          | 32.18          | -17.19        | 43.50          | 11.32       | 200         | 272       | PK  | Vert | PASS    |
| 4   | 131.97          | 47.08          | 30.80          | -16.28        | 43.50          | 12.70       | 200         | 195       | PK  | Vert | PASS    |
| 5   | 191.99          | 49.79          | 31.63          | -18.16        | 43.50          | 11.87       | 100         | 161       | PK  | Vert | PASS    |
| 6   | 240.01          | 45.07          | 28.51          | -16.56        | 46.00          | 17.49       | 200         | 140       | PK  | Vert | PASS    |

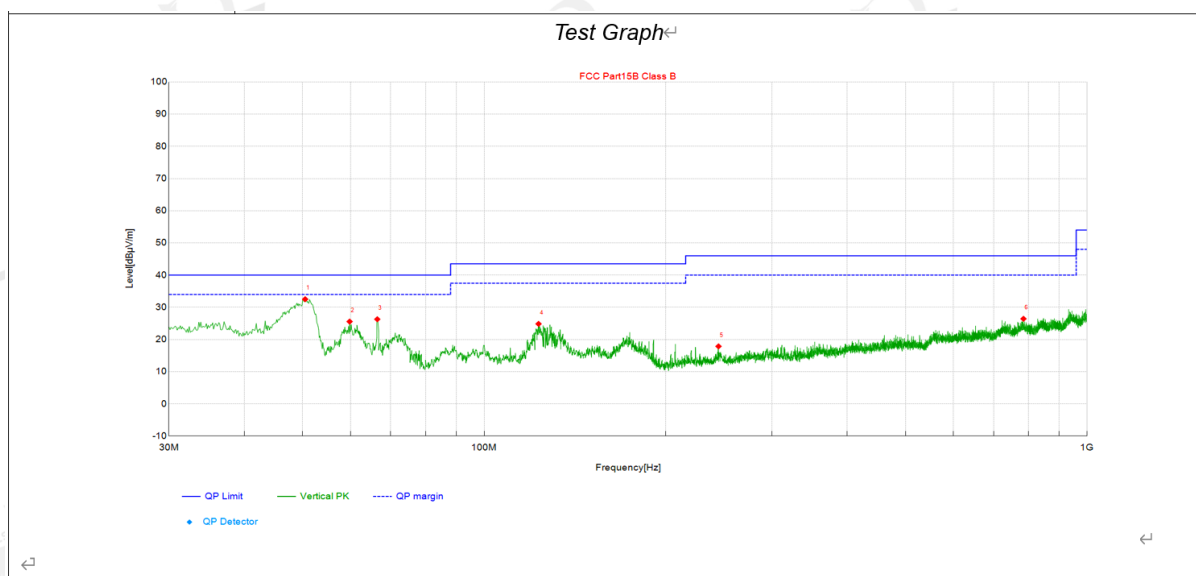
Note: if the PK value is less than QP limit, it deems meet the requirements of QP limits.

Powered by 2# adapter



| Suspected Data List |                 |                |                |               |                |             |             |           |     |      |         |
|---------------------|-----------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|-----|------|---------|
| NO.                 | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Det | Pol  | Verdict |
| 1                   | 34.24           | 31.22          | 22.84          | -8.38         | 40.00          | 17.16       | 100         | 236       | PK  | Hori | PASS    |
| 2                   | 49.89           | 33.83          | 17.94          | -15.89        | 40.00          | 22.06       | 100         | 241       | PK  | Hori | PASS    |
| 3                   | 72.20           | 34.82          | 13.22          | -21.60        | 40.00          | 26.78       | 100         | 176       | PK  | Hori | PASS    |
| 4                   | 244.25          | 38.35          | 22.15          | -16.20        | 46.00          | 23.85       | 100         | 274       | PK  | Hori | PASS    |
| 5                   | 362.95          | 35.09          | 21.51          | -13.58        | 46.00          | 24.49       | 100         | 280       | PK  | Hori | PASS    |
| 6                   | 846.74          | 31.04          | 27.07          | -3.97         | 46.00          | 18.93       | 100         | 99        | PK  | Hori | PASS    |

Note: if the PK value is less than QP limit, it deems meet the requirements of QP limits.

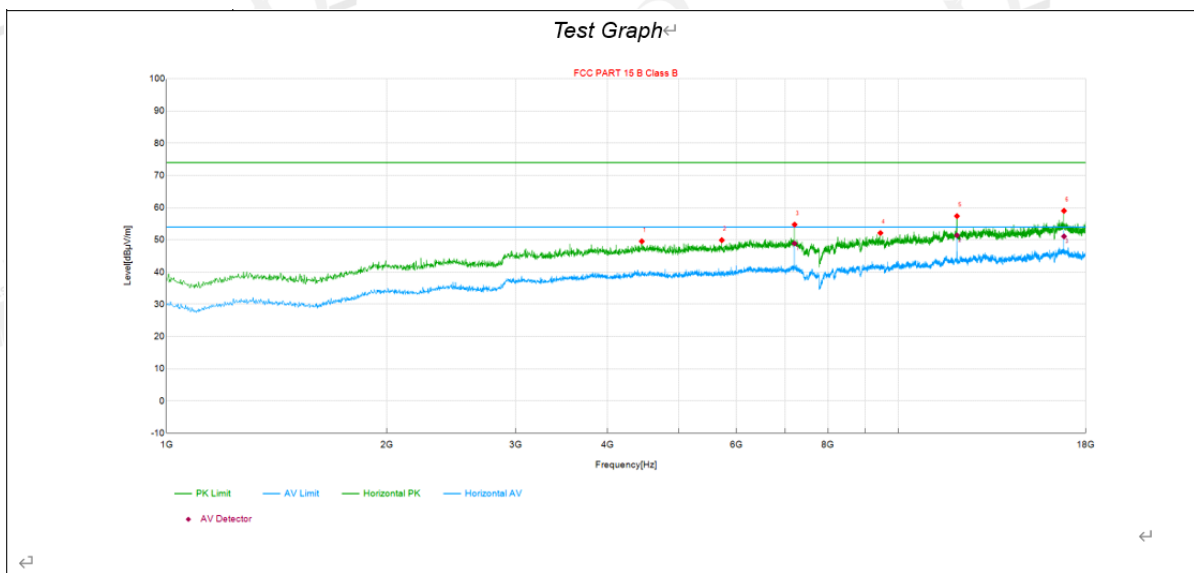


| Suspected Data List |                 |                |                |               |                |             |             |           |     |      |         |
|---------------------|-----------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|-----|------|---------|
| NO.                 | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Det | Pol  | Verdict |
| 1                   | 50.49           | 48.66          | 32.52          | -16.14        | 40.00          | 7.48        | 100         | 48        | PK  | Vert | PASS    |
| 2                   | 59.83           | 45.40          | 25.58          | -19.82        | 40.00          | 14.42       | 100         | 99        | PK  | Vert | PASS    |
| 3                   | 66.50           | 47.34          | 26.30          | -21.04        | 40.00          | 13.70       | 100         | 48        | PK  | Vert | PASS    |
| 4                   | 123.12          | 41.75          | 24.86          | -16.89        | 43.50          | 18.64       | 100         | 3         | PK  | Vert | PASS    |
| 5                   | 244.86          | 34.03          | 17.88          | -16.15        | 46.00          | 28.12       | 100         | 22        | PK  | Vert | PASS    |
| 6                   | 784.90          | 31.44          | 26.44          | -5.00         | 46.00          | 19.56       | 100         | 357       | PK  | Vert | PASS    |

Note: if the PK value is less than QP limit, it deems meet the requirements of QP limits.

## Radiated Emission test (above 1 GHz)

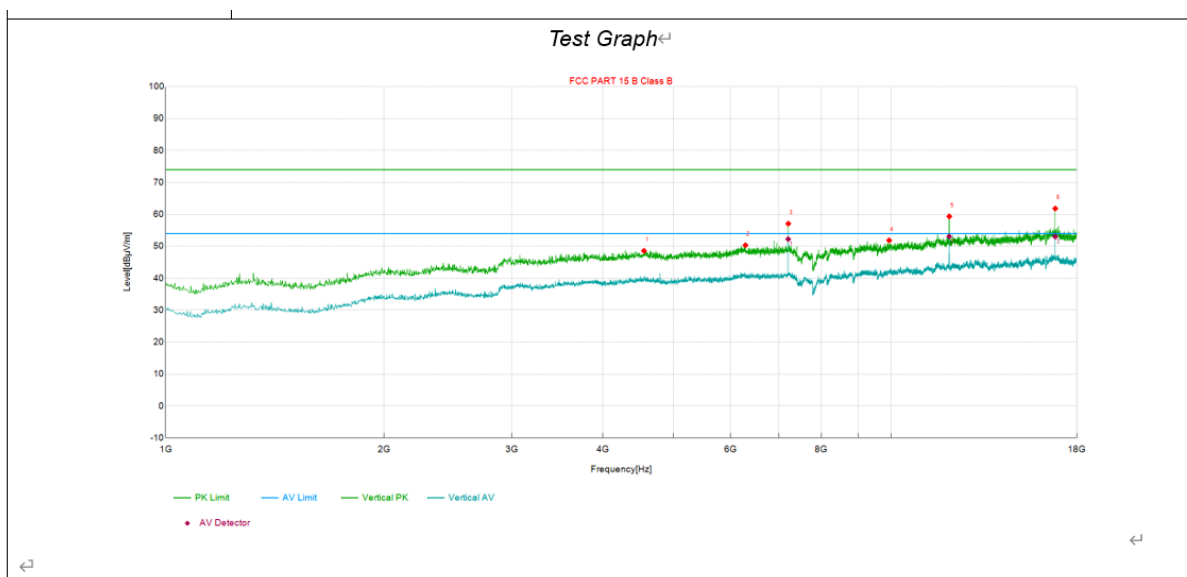
| Mode | Test channel | Ant. Pol.  |
|------|--------------|------------|
| BLE  | 2402MHz      | Horizontal |



| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 4457.38         | 56.09          | 49.57          | -6.52         | 74             | 24.43       | PK  | Hori | PASS    |
| 2   | 5732.38         | 54.4           | 49.93          | -4.47         | 74             | 24.07       | PK  | Hori | PASS    |
| 3   | 7207.13         | 57.26          | 54.75          | -2.51         | 74             | 19.25       | PK  | Hori | PASS    |
| 4   | 7204.94         | 51.4           | 48.89          | -2.51         | 54             | 5.11        | AV  | Hori | PASS    |
| 5   | 9438.38         | 52.69          | 52.14          | -0.55         | 74             | 21.86       | PK  | Hori | PASS    |
| 6   | 12007.5         | 54.04          | 57.39          | 3.35          | 74             | 16.61       | PK  | Hori | PASS    |
| 7   | 12008.37        | 48.08          | 51.43          | 3.35          | 54             | 2.57        | AV  | Hori | PASS    |
| 8   | 16812.13        | 50.72          | 59.03          | 8.31          | 74             | 14.97       | PK  | Hori | PASS    |
| 9   | 16815.04        | 42.78          | 51.09          | 8.31          | 54             | 2.91        | AV  | Hori | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

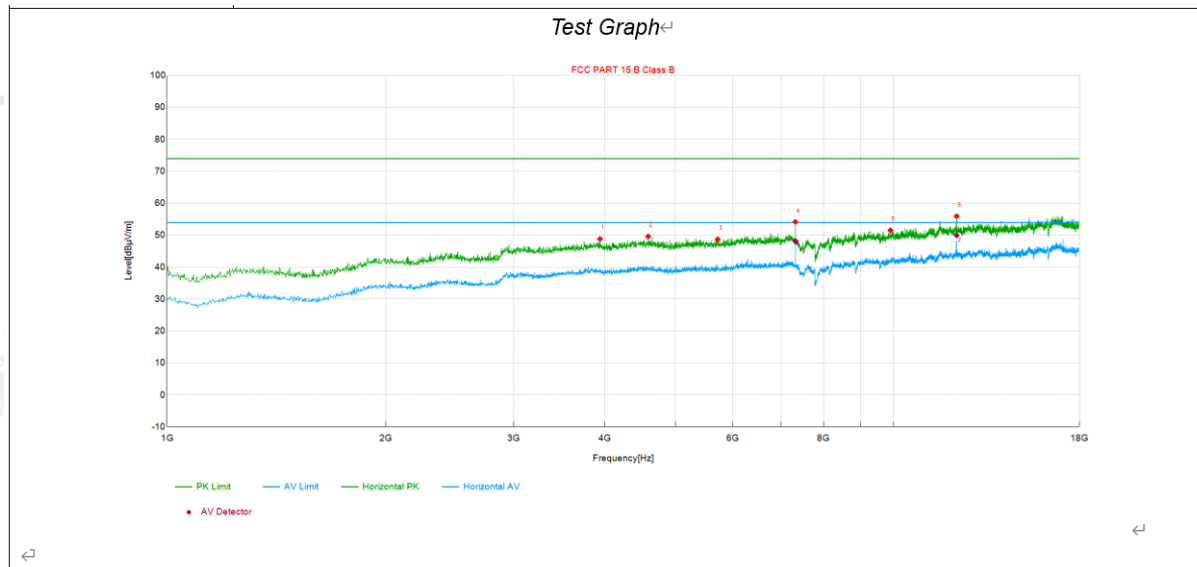
|      |              |           |
|------|--------------|-----------|
| Mode | Test channel | Ant. Pol. |
| BLE  | 2402MHz      | Vertical  |



| NO. | Frequency [MHz] | Reading [dBuV] | Level [dBuV/m] | Factor [dB/m] | Limit [dBuV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 4559.38         | 54.91          | 48.59          | -6.32         | 74             | 25.41       | PK  | Vert | PASS    |
| 2   | 6291.25         | 53.66          | 50.35          | -3.31         | 74             | 23.65       | PK  | Vert | PASS    |
| 3   | 7207.13         | 59.61          | 57.1           | -2.51         | 74             | 16.9        | PK  | Vert | PASS    |
| 4   | 7204.94         | 54.78          | 52.27          | -2.51         | 54             | 1.73        | AV  | Vert | PASS    |
| 5   | 9925            | 51.52          | 51.87          | 0.35          | 74             | 22.13       | PK  | Vert | PASS    |
| 6   | 12011.75        | 56.03          | 59.37          | 3.34          | 74             | 14.63       | PK  | Vert | PASS    |
| 7   | 12008.27        | 49.75          | 53.09          | 3.34          | 54             | 0.91        | AV  | Vert | PASS    |
| 8   | 16812.13        | 53.54          | 61.85          | 8.31          | 74             | 12.15       | PK  | Vert | PASS    |
| 9   | 16811.15        | 44.72          | 53.03          | 8.31          | 54             | 0.97        | AV  | Vert | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

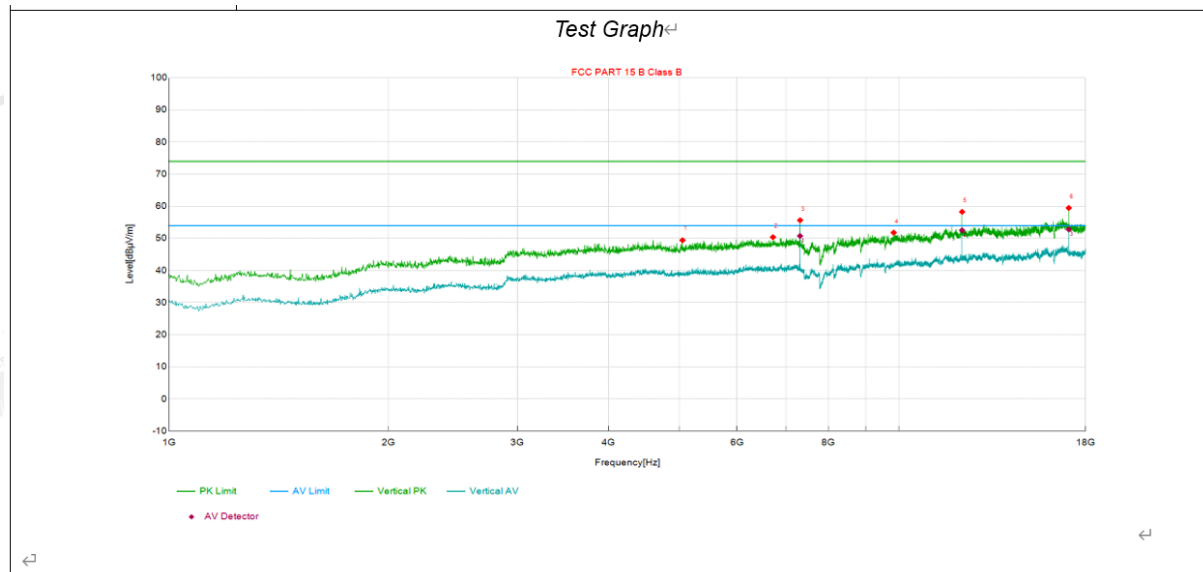
|      |              |            |
|------|--------------|------------|
| Mode | Test channel | Ant. Pol.  |
| BLE  | 2440MHz      | Horizontal |



| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 3941            | 56.76          | 48.83          | -7.93         | 74             | 25.17       | PK  | Hori | PASS    |
| 2   | 4591.25         | 55.88          | 49.63          | -6.25         | 74             | 24.37       | PK  | Hori | PASS    |
| 3   | 5721.75         | 53.21          | 48.72          | -4.49         | 74             | 25.28       | PK  | Hori | PASS    |
| 4   | 7319.75         | 56.73          | 54.18          | -2.55         | 74             | 19.82       | PK  | Hori | PASS    |
| 5   | 7319.11         | 50.71          | 48.16          | -2.55         | 54             | 5.84        | AV  | Hori | PASS    |
| 6   | 9893.13         | 51.24          | 51.55          | 0.31          | 74             | 22.45       | PK  | Hori | PASS    |
| 7   | 12198.75        | 52.38          | 55.97          | 3.59          | 74             | 18.03       | PK  | Hori | PASS    |
| 8   | 12198.4         | 46.38          | 49.97          | 3.59          | 54             | 4.03        | AV  | Hori | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

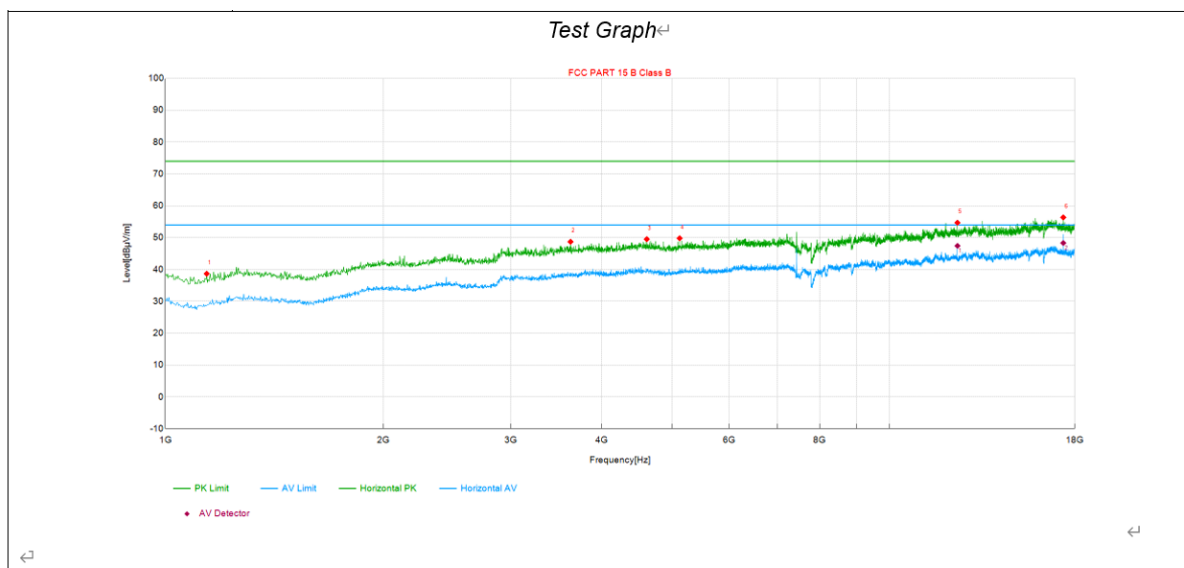
|      |              |           |
|------|--------------|-----------|
| Mode | Test channel | Ant. Pol. |
| BLE  | 2440MHz      | Vertical  |



| NO. | Frequency [MHz] | Reading [dBuV] | Level [dBuV/m] | Factor [dB/m] | Limit [dBuV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 5052.38         | 55.21          | 49.43          | -5.78         | 74.00          | 24.57       | PK  | Vert | PASS    |
| 2   | 6720.50         | 52.98          | 50.38          | -2.60         | 74.00          | 23.62       | PK  | Vert | PASS    |
| 3   | 7319.75         | 58.20          | 55.65          | -2.55         | 74.00          | 18.35       | PK  | Vert | PASS    |
| 4   | 7318.90         | 53.32          | 50.77          | -2.55         | 54.00          | 3.23        | AV  | Vert | PASS    |
| 5   | 9833.63         | 51.59          | 51.80          | 0.21          | 74.00          | 22.20       | PK  | Vert | PASS    |
| 6   | 12200.88        | 54.67          | 58.26          | 3.59          | 74.00          | 15.74       | PK  | Vert | PASS    |
| 7   | 12198.23        | 48.94          | 52.53          | 3.59          | 54.00          | 1.47        | AV  | Vert | PASS    |
| 8   | 17077.75        | 50.90          | 59.47          | 8.57          | 74.00          | 14.53       | PK  | Vert | PASS    |
| 9   | 17077.50        | 44.24          | 52.81          | 8.57          | 54.00          | 1.19        | AV  | Vert | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

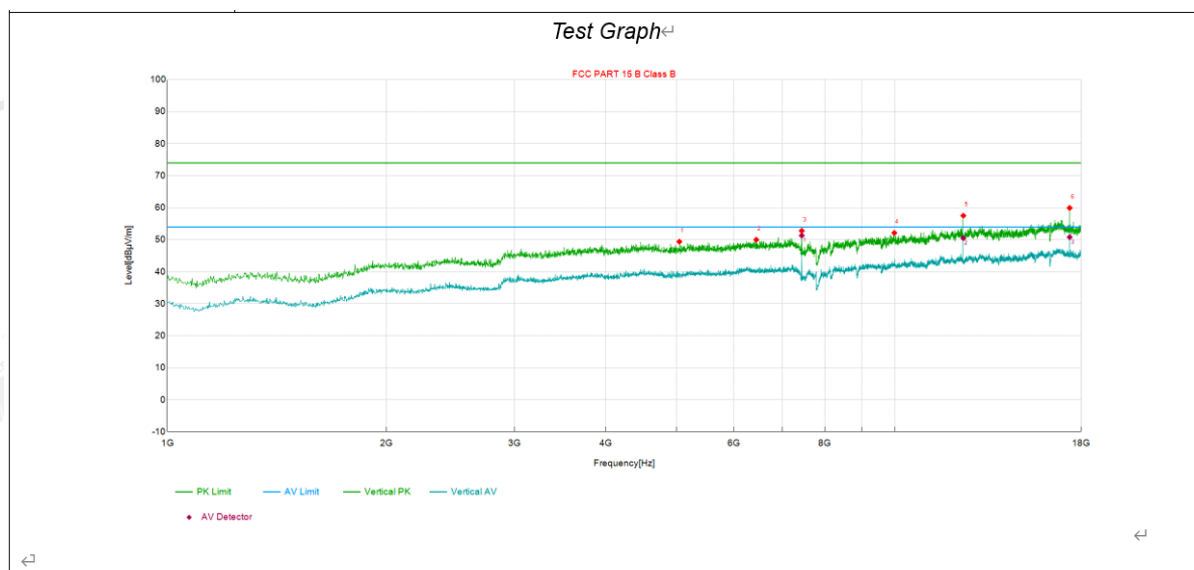
|      |              |            |
|------|--------------|------------|
| Mode | Test channel | Ant. Pol.  |
| BLE  | 2480MHz      | Horizontal |



| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 1140.25         | 55.49          | 38.66          | -16.83        | 74.00          | 35.34       | PK  | Hori | PASS    |
| 2   | 3624.38         | 57.42          | 48.71          | -8.71         | 74.00          | 25.29       | PK  | Hori | PASS    |
| 3   | 4618.88         | 55.74          | 49.53          | -6.21         | 74.00          | 24.47       | PK  | Hori | PASS    |
| 4   | 5126.75         | 55.36          | 49.82          | -5.54         | 74.00          | 24.18       | PK  | Hori | PASS    |
| 5   | 12398.50        | 51.07          | 54.69          | 3.62          | 74.00          | 19.31       | PK  | Hori | PASS    |
| 6   | 12398.32        | 43.81          | 47.43          | 3.62          | 54.00          | 6.57        | AV  | Hori | PASS    |
| 7   | 17358.25        | 47.77          | 56.37          | 8.60          | 74.00          | 17.63       | PK  | Hori | PASS    |
| 8   | 17357.25        | 39.72          | 48.32          | 8.60          | 54.00          | 5.68        | AV  | Hori | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

|      |              |           |
|------|--------------|-----------|
| Mode | Test channel | Ant. Pol. |
| BLE  | 2480MHz      | Vertical  |

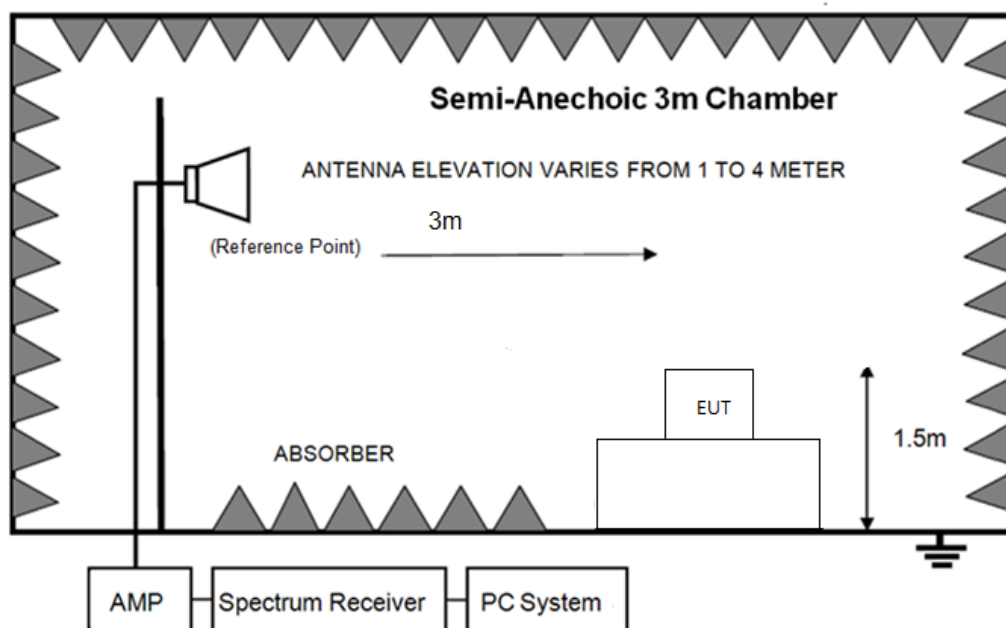


| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Det | Pol  | Verdict |
|-----|-----------------|----------------|----------------|---------------|----------------|-------------|-----|------|---------|
| 1   | 5050.25         | 55.19          | 49.41          | -5.78         | 74.00          | 24.59       | PK  | Vert | PASS    |
| 2   | 6442.13         | 53.13          | 50.01          | -3.12         | 74.00          | 23.99       | PK  | Vert | PASS    |
| 3   | 7438.75         | 55.40          | 52.81          | -2.59         | 74.00          | 21.19       | PK  | Vert | PASS    |
| 4   | 7439.08         | 53.91          | 51.32          | -2.59         | 54.00          | 2.68        | AV  | Vert | PASS    |
| 5   | 9971.75         | 51.73          | 52.14          | 0.41          | 74.00          | 21.86       | PK  | Vert | PASS    |
| 6   | 12400.63        | 53.90          | 57.52          | 3.62          | 74.00          | 16.48       | PK  | Vert | PASS    |
| 7   | 12398.47        | 46.89          | 50.51          | 3.62          | 54.00          | 3.49        | AV  | Vert | PASS    |
| 8   | 17358.25        | 51.33          | 59.93          | 8.60          | 74.00          | 14.07       | PK  | Vert | PASS    |
| 9   | 17361.52        | 42.23          | 50.83          | 8.60          | 54.00          | 3.17        | AV  | Vert | PASS    |

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

## 10. Emissions in Restricted Frequency Bands

### 10.1. Block diagram of test setup



### 10.2. Limit

All restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400 MHz to 2483.5 MHz shall be at least 20dB below the fundamental emissions or comply with RSS-Gen Issue 3 clause 7.2.5 (Same as FCC 15.209) limits.

### 10.3. Test Procedure

Same with clause 8.3 except change investigated frequency range from 2310 MHz to 2410 MHz and 2475 MHz to 2500 MHz.

Remark: All restriction band have been tested, and only the worst case is shown in report.

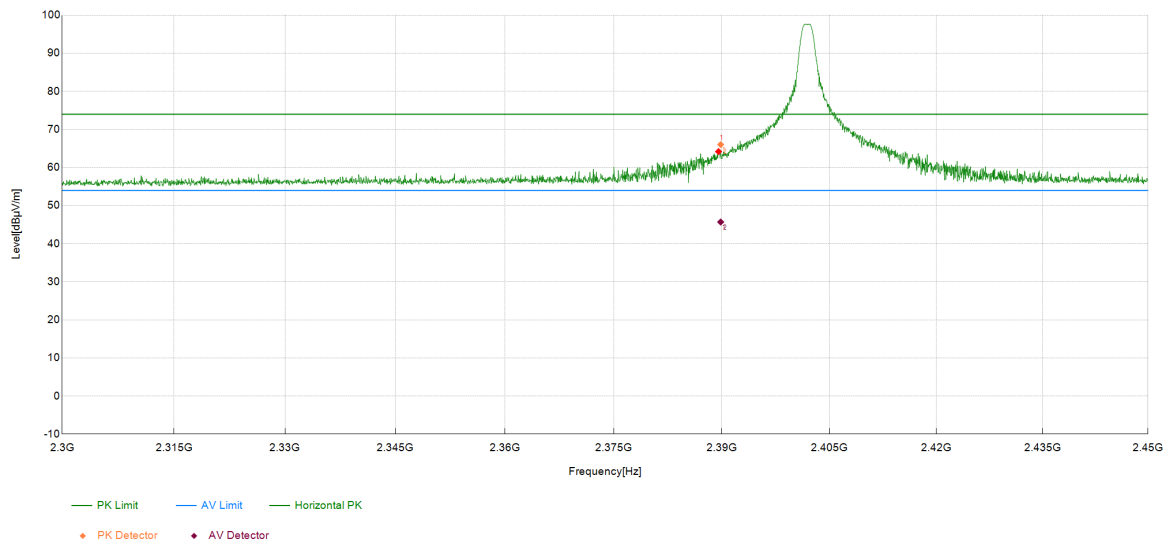
### 10.4. Test result

Pass. (See below detailed test result)

## Radiated Emission Test Result

|      |              |            |
|------|--------------|------------|
| Mode | Test channel | Ant. Pol.  |
| BLE  | 2402MHz      | Horizontal |

Test Graph



| NO. | Frequency [MHz] | Factor [dB/m] | Reading [dBμV] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Dec | Pol | Verdict |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|-----|-----|---------|
| 1   | 2389.83         | -0.57         | 66.6           | 66.03          | 74             | 7.97        | PK  | H   | PASS    |
| 2   | 2389.83         | -0.57         | 46.27          | 45.7           | 54             | 8.3         | AV  | H   | PASS    |
| 3   | 2390.00         | -0.57         | 66.24          | 65.67          | 74             | 8.33        | PK  | H   | PASS    |
| 4   | 2390.00         | -0.57         | 46.25          | 45.68          | 54             | 8.32        | AV  | H   | PASS    |

Note: 1. Result Level = Read Level + Factor.

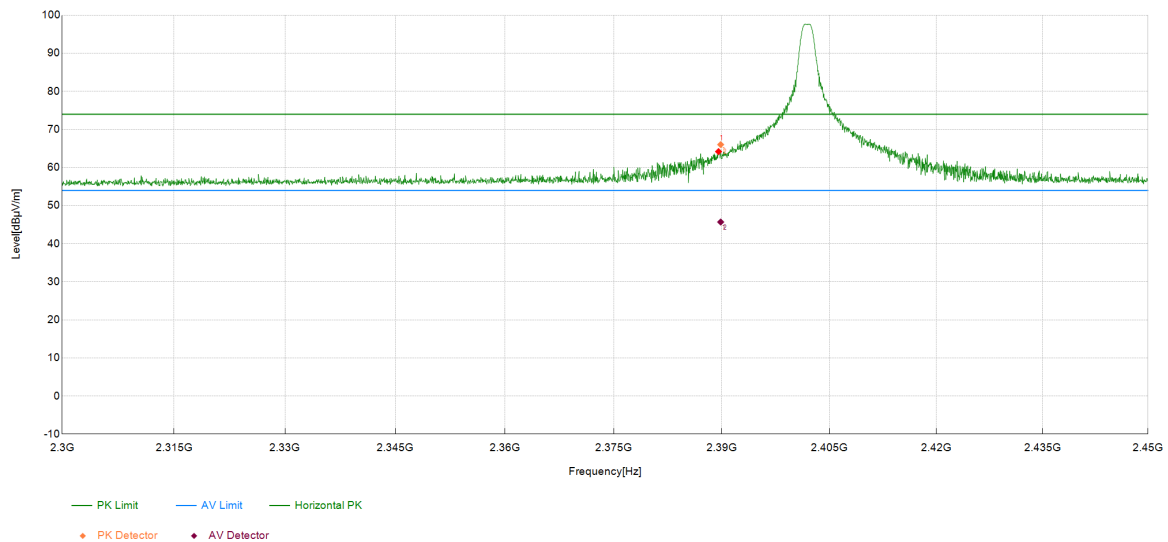
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## Radiated Emission Test Result

| Mode | Test channel | Ant. Pol. |
|------|--------------|-----------|
| BLE  | 2402MHz      | Vertical  |

Test Graph



| NO. | Frequency [MHz] | Factor [dB/m] | Reading [dBμV] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Dec | Pol | Verdict |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|-----|-----|---------|
| 1   | 2382.78         | -0.62         | 58.49          | 57.87          | 74             | 16.13       | PK  | V   | PASS    |
| 2   | 2382.78         | -0.62         | 46.47          | 45.85          | 54             | 8.15        | AV  | V   | PASS    |
| 3   | 2390.00         | -0.57         | 57.48          | 56.91          | 74             | 17.09       | PK  | V   | PASS    |
| 4   | 2390.00         | -0.57         | 46.69          | 46.12          | 54             | 7.88        | AV  | V   | PASS    |

Note: 1. Result Level = Read Level + Factor.

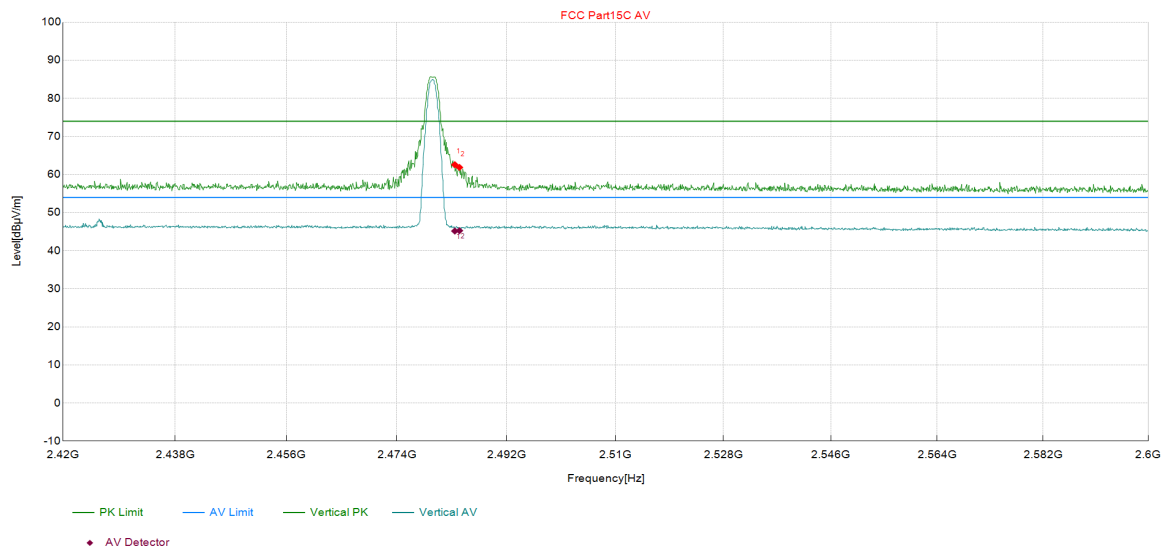
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## Radiated Emission Test Result

| Mode | Test channel | Ant. Pol.  |
|------|--------------|------------|
| BLE  | 2480MHz      | Horizontal |

Test Graph



| NO. | Frequency [MHz] | Factor [dB/m] | Reading [dBμV] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Dec | Pol | Verdict |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|-----|-----|---------|
| 1   | 2483.50         | -0.65         | 73.10          | 72.45          | 74.00          | 1.55        | PK  | H   | PASS    |
| 2   | 2483.50         | -0.65         | 45.94          | 45.29          | 54.00          | 8.71        | AV  | H   | PASS    |
| 3   | 2484.08         | -0.65         | 72.39          | 71.74          | 74.00          | 2.26        | PK  | H   | PASS    |
| 4   | 2484.08         | -0.65         | 44.94          | 44.29          | 54.00          | 9.71        | AV  | H   | PASS    |

Note: 1. Result Level = Read Level + Factor.

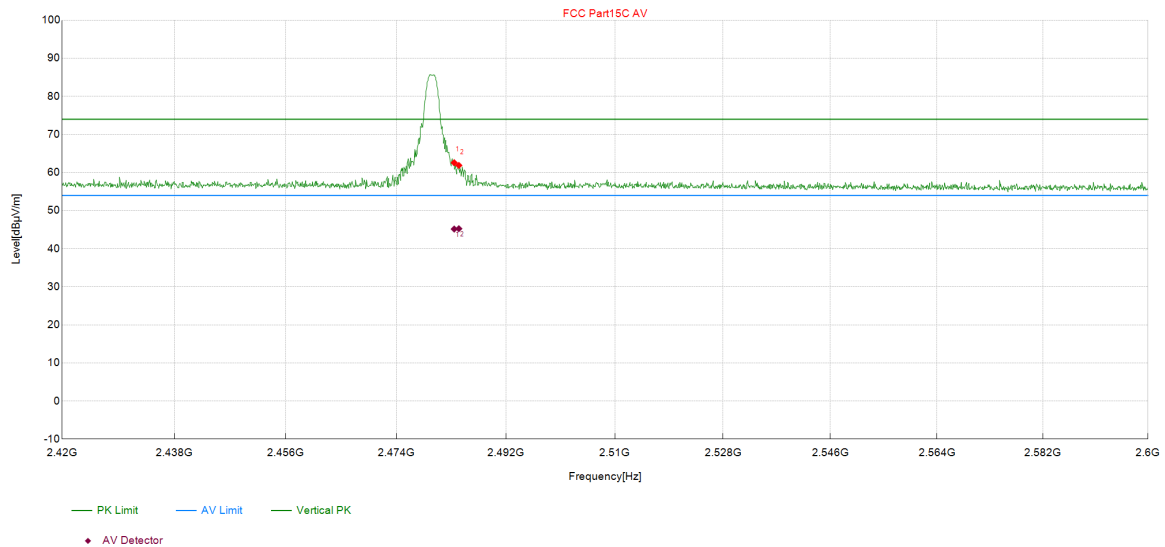
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## Radiated Emission Test Result

|      |              |           |
|------|--------------|-----------|
| Mode | Test channel | Ant. Pol. |
| BLE  | 2480MHz      | Vertical  |

Test Graph



| NO. | Frequency [MHz] | Factor [dB/m] | Reading [dBμV] | Value [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Dec | Pol | Verdict |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|-----|-----|---------|
| 1   | 2483.50         | -0.65         | 63.24          | 62.59          | 74.00          | 11.41       | PK  | V   | PASS    |
| 2   | 2484.26         | -0.65         | 45.82          | 45.17          | 54.00          | 8.83        | AV  | V   | PASS    |
| 3   | 2390.00         | -0.65         | 62.53          | 61.88          | 74.00          | 12.12       | PK  | V   | PASS    |
| 4   | 2484.26         | -0.65         | 45.91          | 45.26          | 54.00          | 8.74        | AV  | V   | PASS    |

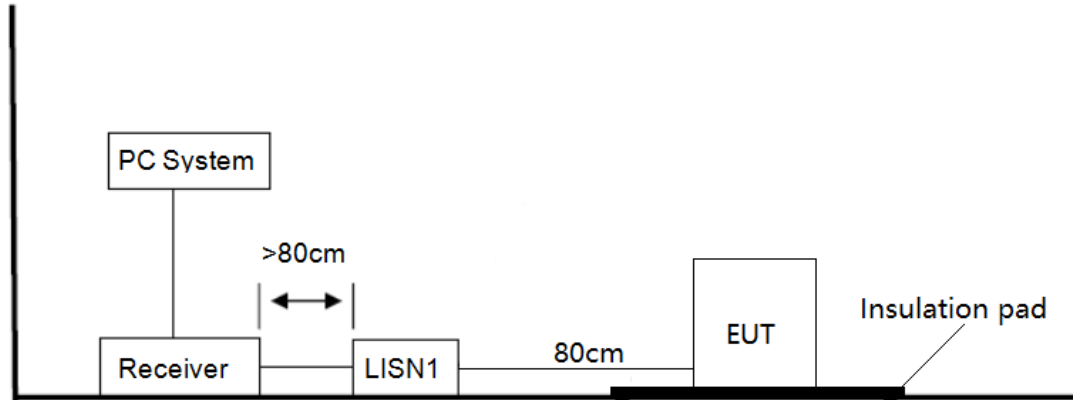
Note: 1. Result Level = Read Level + Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## 11. Power Line Conducted Emission

### 11.1. Block diagram of test setup



### 11.2. Power line conducted emission limits

| Frequency         | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
|-------------------|----------------------------------|-------------------------------|
| 150 kHz ~ 500 kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500 kHz ~ 5 MHz   | 56                               | 46                            |
| 5 MHz ~ 30 MHz    | 60                               | 50                            |

Note 1: \* Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

### 11.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 10 mm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest

emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

#### **11.4. Test result**

**PASS. (See below detailed test result)**

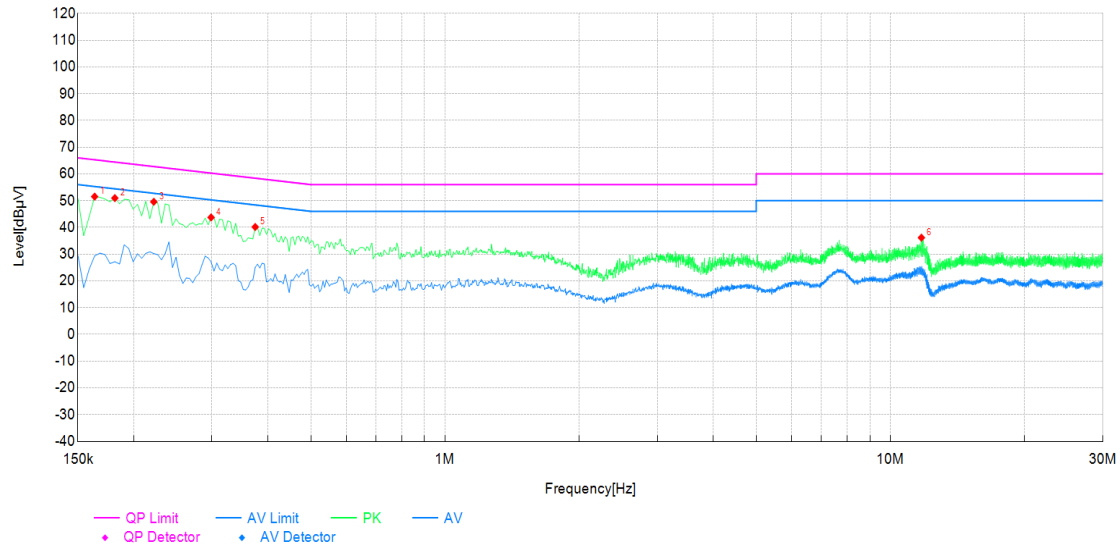
Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” means Average detection.

Note3: Pre-test AC conducted emission at both 1# adapter and 2# adapter, recorded worse case.

Powered by adapter 1#

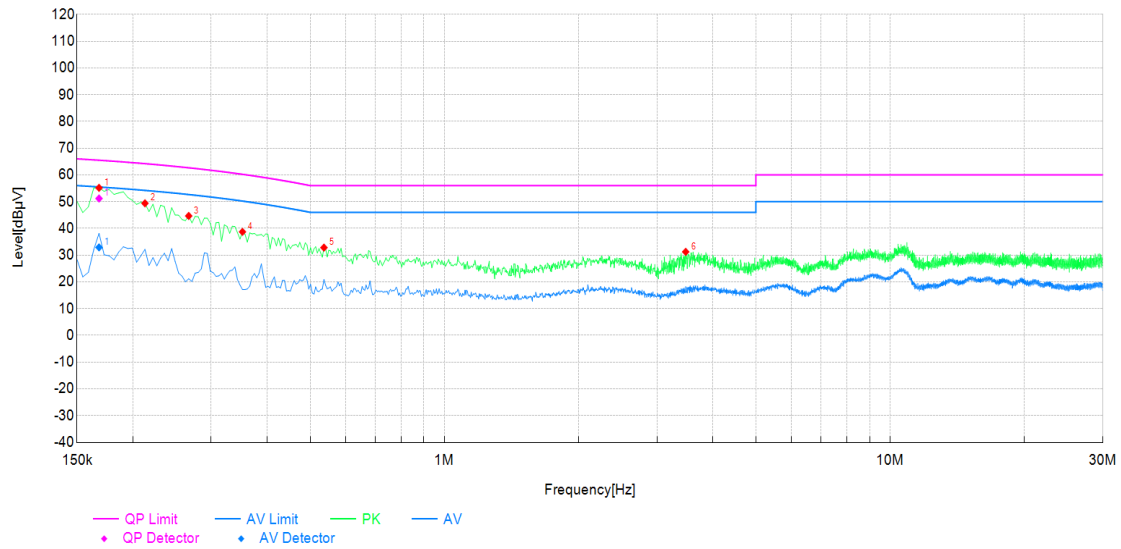
## Conducted Emission Test Result



| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV] | Factor [dB] | Limit [dBμV] | Margin [dB] | Phase | Detector | Verdict |
|-----|-----------------|----------------|--------------|-------------|--------------|-------------|-------|----------|---------|
| 1   | 0.1635          | 32.51          | 51.51        | 19.00       | 65.28        | 13.77       | L     | PK       | PASS    |
| 2   | 0.1815          | 31.96          | 50.95        | 18.99       | 64.42        | 13.47       | L     | PK       | PASS    |
| 3   | 0.222           | 30.59          | 49.57        | 18.98       | 62.74        | 13.17       | L     | PK       | PASS    |
| 4   | 0.2985          | 24.77          | 43.73        | 18.96       | 60.28        | 16.55       | L     | PK       | PASS    |
| 5   | 0.375           | 21.21          | 40.15        | 18.94       | 58.39        | 18.24       | L     | PK       | PASS    |
| 6   | 11.7465         | 16.71          | 36.15        | 19.44       | 60.00        | 23.85       | L     | PK       | PASS    |

Note: 1. Result Level = Read Level + LISN Factor

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.



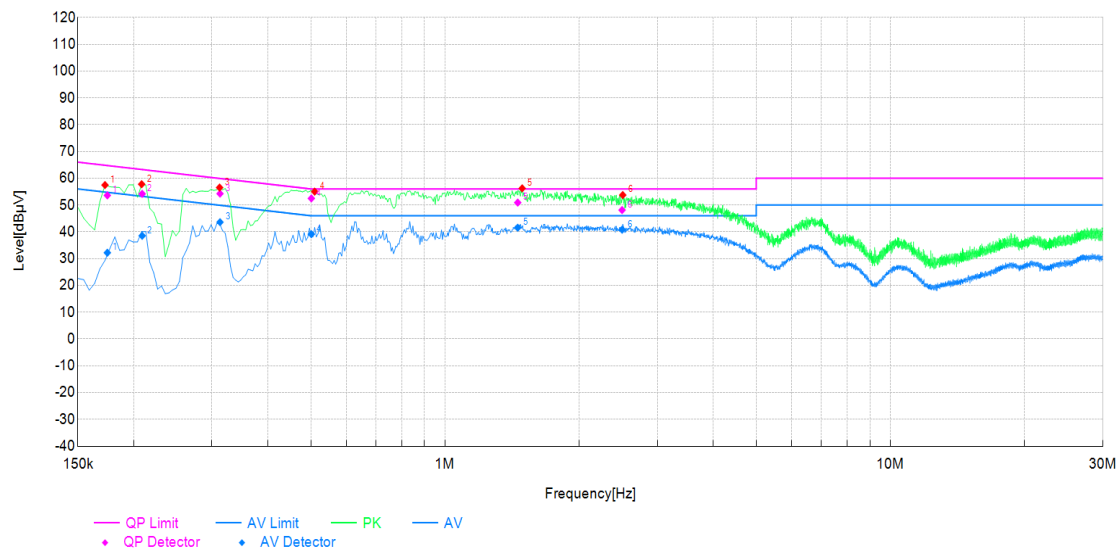
| NO. | Frequency [MHz] | Reading [dBμV] | Level [dBμV] | Factor [dB] | Limit [dBμV] | Margin [dB] | Phase | Detector | Verdict |
|-----|-----------------|----------------|--------------|-------------|--------------|-------------|-------|----------|---------|
| 1   | 0.168           | 32             | 51.19        | 19.19       | 65.06        | 13.87       | N     | QP       | PASS    |
| 2   | 0.168           | 13.7           | 32.89        | 19.19       | 55.06        | 22.17       | N     | AV       | PASS    |
| 3   | 0.213           | 30.20          | 49.38        | 19.18       | 63.09        | 13.71       | N     | PK       | PASS    |
| 4   | 0.267           | 25.49          | 44.66        | 19.17       | 61.21        | 16.55       | N     | PK       | PASS    |
| 5   | 0.3525          | 19.56          | 38.70        | 19.14       | 58.90        | 20.20       | N     | PK       | PASS    |
| 6   | 0.537           | 13.72          | 32.82        | 19.10       | 56.00        | 23.18       | N     | PK       | PASS    |
| 7   | 3.48            | 12.07          | 31.23        | 19.16       | 56.00        | 24.77       | N     | PK       | PASS    |

Note: 1. Result Level = Read Level + LISN Factor

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

Powered by adapter 2#

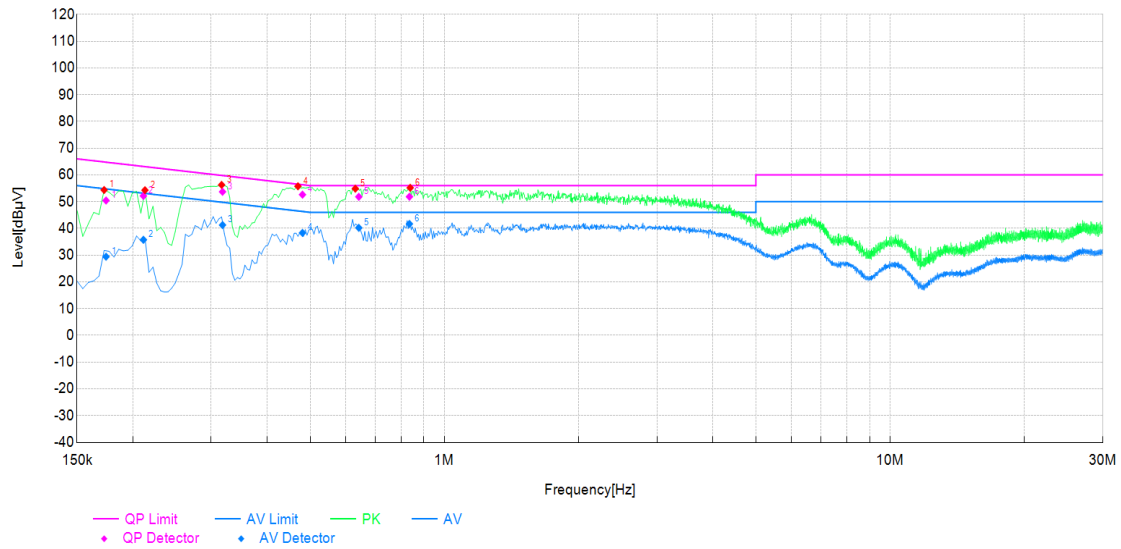
## Conducted Emission Test Result



| NO. | Frequency [MHz] | Factor [dB] | QP Reading [dBμV] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Reading [dBμV] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Phase | Verdict |
|-----|-----------------|-------------|-------------------|-----------------|-----------------|----------------|-------------------|-----------------|-----------------|----------------|-------|---------|
| 1   | 0.1746          | 18.99       | 34.60             | 53.59           | 64.74           | 11.15          | 13.20             | 32.19           | 54.74           | 22.55          | L     | PASS    |
| 2   | 0.2090          | 18.98       | 35.20             | 54.18           | 63.25           | 9.07           | 19.55             | 38.53           | 53.25           | 14.72          | L     | PASS    |
| 3   | 0.3126          | 18.95       | 35.29             | 54.24           | 59.90           | 5.66           | 24.65             | 43.60           | 49.90           | 6.30           | L     | PASS    |
| 4   | 0.5013          | 18.90       | 33.57             | 52.47           | 56.00           | 3.53           | 20.21             | 39.11           | 46.00           | 6.89           | L     | PASS    |
| 5   | 1.4571          | 18.91       | 31.99             | 50.90           | 56.00           | 5.10           | 22.61             | 41.52           | 46.00           | 4.48           | L     | PASS    |
| 6   | 2.4995          | 18.94       | 29.18             | 48.12           | 56.00           | 7.88           | 21.87             | 40.81           | 46.00           | 5.19           | L     | PASS    |

Note: 1. Result Level = Read Level + LISN Factor

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.



| NO. | Frequency [MHz] | Factor[dB] | QP Reading [dBμV] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Reading [dBμV] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Phase | Verdict |
|-----|-----------------|------------|-------------------|-----------------|-----------------|----------------|-------------------|-----------------|-----------------|----------------|-------|---------|
| 1   | 0.1742          | 19.19      | 31.24             | 50.43           | 64.76           | 14.33          | 10.22             | 29.41           | 54.76           | 25.35          | N     | PASS    |
| 2   | 0.2113          | 19.18      | 32.96             | 52.14           | 63.15           | 11.01          | 16.55             | 35.73           | 53.15           | 17.42          | N     | PASS    |
| 3   | 0.3180          | 19.15      | 34.54             | 53.69           | 59.76           | 6.07           | 22.10             | 41.25           | 49.76           | 8.51           | N     | PASS    |
| 4   | 0.4806          | 19.11      | 33.50             | 52.61           | 56.33           | 3.72           | 19.20             | 38.31           | 46.33           | 8.02           | N     | PASS    |
| 5   | 0.6430          | 19.10      | 32.71             | 51.81           | 56.00           | 4.19           | 21.11             | 40.21           | 46.00           | 5.79           | N     | PASS    |
| 6   | 0.8352          | 19.10      | 32.74             | 51.84           | 56.00           | 4.16           | 22.58             | 41.68           | 46.00           | 4.32           | N     | PASS    |

Note: 1. Result Level = Read Level + LISN Factor

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

## 12. Antenna Requirements

### 12.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 12.2. Result

The antennas used for this product are integrated antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only -1.26 dBi.

### 13. Test Setup Photograph

Please find the Test Setup photos of EUT in APPENDIXES.

### 14. Photos of the EUT

Please refer to the appendix file.

**END OF REPORT**