



# FCC PART 15.247 TEST REPORT

On Behalf of  
**Suzhou Etag-Technology Corporation**

Room 236, 2/F Ming De Building, No.166 Ren ai Road, Suzhou Industrial Park,  
Suzhou, China

**FCC ID: 2ARJ5-AP05-D1**

**Model: ETAP05-D1**

August 5, 2026

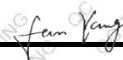
**This Report Concerns:**

☒ Original Report

**Equipment Type:**

Gateway

**Test Engineer:**

Fan Yang / 

**Report Number:**

**QCT26GR-1827E-01**

**Test Date:**

July 24-28, 2026

**Test Result:**

Pass

**Reviewed By:**

Vincent Yang / 

**Approved By:**

Kendy Wang / 

**Prepared By:**

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## Revision History of This Test Report

[illegible]



## 1. GENERAL INFORMATION

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

|                      |                                                                                           |
|----------------------|-------------------------------------------------------------------------------------------|
| EUT Description:     | Gateway                                                                                   |
| Model No.:           | ETAP05-D1                                                                                 |
| Tested Model:        | ETAP05-D1                                                                                 |
| Sample(s) Status:    | Engineer sample                                                                           |
| Packet Type:         | Bluetooth LE(1Mbps)                                                                       |
| Operation Frequency: | 2402MHz~2480MHz                                                                           |
| Channel numbers:     | 40                                                                                        |
| Channel separation:  | 2MHz                                                                                      |
| Modulation type:     | GFSK                                                                                      |
| Antenna Type:        | FPC Antenna                                                                               |
| Antenna gain*1:      | 5.97dBi                                                                                   |
| Power supply:        | 12V DC (Powered by Adapter)                                                               |
| Adapter Information: | Model: TEKA-AB1C120100TW<br>Input: 100-240V~ 50/60Hz 0.35A Max<br>Output: 12.0V --- 1.0A  |
| Trade Mark:          | ETGtag                                                                                    |
| Applicant:           | Suzhou Etag-Technology Corporation                                                        |
| Address:             | Room 236, 2/F Ming De Building, No.166 Ren ai Road, Suzhou Industrial Park, Suzhou, China |
| Manufacturer:        | Suzhou Etag-Technology Corporation                                                        |
| Address:             | Room 236, 2/F Ming De Building, No.166 Ren ai Road, Suzhou Industrial Park, Suzhou, China |
| Sample No.:          | Y26F1827E01YN                                                                             |

Note: \*1This information provided by Manufacturer, SZ QC Lab is not responsible for the accuracy of this information.

## 1.2 System Test Configuration

### 1.2.1 Channel List

| Operation Frequency each of channel |           |         |           |         |           |         |           |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel                             | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1                                   | 2402 MHz  | 11      | 2422 MHz  | 21      | 2442 MHz  | 31      | 2462 MHz  |
| 2                                   | 2404 MHz  | 12      | 2424 MHz  | 22      | 2444 MHz  | 32      | 2464 MHz  |
| 3                                   | 2406 MHz  | 13      | 2426 MHz  | 23      | 2446 MHz  | 33      | 2466 MHz  |
| 4                                   | 2408 MHz  | 14      | 2428 MHz  | 24      | 2448 MHz  | 34      | 2468 MHz  |
| 5                                   | 2410 MHz  | 15      | 2430 MHz  | 25      | 2450 MHz  | 35      | 2470 MHz  |
| 6                                   | 2412 MHz  | 16      | 2432 MHz  | 26      | 2452 MHz  | 36      | 2472 MHz  |
| 7                                   | 2414 MHz  | 17      | 2434 MHz  | 27      | 2454 MHz  | 37      | 2474 MHz  |
| 8                                   | 2416 MHz  | 18      | 2436 MHz  | 28      | 2456 MHz  | 38      | 2476 MHz  |
| 9                                   | 2418 MHz  | 19      | 2438 MHz  | 29      | 2458 MHz  | 39      | 2478 MHz  |
| 10                                  | 2420 MHz  | 20      | 2440 MHz  | 30      | 2460 MHz  | 40      | 2480 MHz  |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel             | Frequency |
|---------------------|-----------|
| The lowest channel  | 2402MHz   |
| The middle channel  | 2440MHz   |
| The Highest channel | 2480MHz   |

### 1.2.2 EUT Exercise Software

"PhyPlusKit\_v2.5.2a" exercise software was used to test. The power level is 5. The software and power level was provided by the applicant.

Note: This EUT has three identical modules and antennas, and their software and power index are also the same. Therefore, we chose Module 1 for the test by the conduction method, and selected three modules to simultaneously emit to measure the radiation, and recorded the results in the report.

### 1.2.3 Support Equipment

| Manufacturer | Description                   | Model            | Remark      |
|--------------|-------------------------------|------------------|-------------|
| Dell         | Notebook PC                   | Inspiron 15 3511 | 13764488907 |
| Dell         | Notebook PC<br>65W-AC ADAPTER | HA65NS5-00       | A065R073L   |

### 1.2.4 Test mode and test voltage

Transmitting mode: Keep the EUT in continuously transmitting.

Test voltage: 12V DC (Powered by Adapter)



### 1.3 Test Facility

Test Firm : Shenzhen QC Testing Laboratory Co., Ltd.

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS – Registration No.: L8464

The EMC Laboratory has been accredited by CNAS, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

A2LA Certificate Number: 6759.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 561109

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 29628

CAB identifier: CN0141

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

### 1.4 Measurement Uncertainty

| Parameter                                          | Uncertainty |
|----------------------------------------------------|-------------|
| Occupied Channel Bandwidth                         | 3.43%       |
| RF output power, conducted                         | 0.63dB      |
| Power Spectral Density, conducted                  | 0.69dB      |
| Unwanted Emissions, conducted                      | 0.90dB      |
| AC Power Line Conducted Emission                   | 1.80dB      |
| Radiated Spurious Emission test (9kHz-30MHz)       | 2.68dB      |
| Radiated Spurious Emission test (30MHz-1000MHz)    | 4.10dB      |
| Radiated Spurious Emission test (1000MHz-18000MHz) | 4.70dB      |
| Radiated Spurious Emission test (18GHz-40GHz)      | 4.80dB      |
| Temperature                                        | 0.375°C     |
| Humidity                                           | 1.2679%     |
| DC and low frequency voltages                      | 0.18%       |
| Time                                               | 0.133%      |
| Duty cycle                                         | 0.133%      |

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2



## 2. Summary of Test Results

| Test Item                                  | Section                    | Result |
|--------------------------------------------|----------------------------|--------|
| Antenna Requirement                        | FCC part 15.203/15.247 (c) | Pass   |
| AC Power Line Conducted Emission           | FCC part 15.207            | Pass   |
| Conducted Peak Output Power                | FCC part 15.247 (b)(3)     | Pass   |
| Channel Bandwidth & 99% Occupied Bandwidth | FCC part 15.247 (a)(2)     | Pass   |
| Power Spectral Density                     | FCC part 15.247 (e)        | Pass   |
| Band Edge                                  | FCC part 15.247(d)         | Pass   |
| Spurious Emissions                         | FCC part 15.205/15.209     | Pass   |

Note: 1. "N/A" means "not applicable".

2. Test according to ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.

3. In the configuration tested, the EUT complied with the standards specified above.

4. All indications of Pass/Fail in this report are opinions expressed by Shenzhen QC Testing Laboratory Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.



### 3. List of Test and Measurement Instruments

#### 3.1 Conducted Emission Test

| Item | Equipment                | Manufacturer  | Model No. | Serial No. | Last Cal.  | Cal.Due    |
|------|--------------------------|---------------|-----------|------------|------------|------------|
| 1    | EMI Test Receiver        | Rohde&Schwarz | ESIB 7    | 2277573376 | 2026.03.12 | 2027.03.11 |
| 2    | EMI Test Receiver        | Rohde&Schwarz | ESCI3     | 101820     | 2025.08.11 | 2026.08.10 |
| 3    | Artificial Mains Network | SCHWARZBECK   | NSLK8126  | 8126200    | 2025.08.11 | 2026.08.10 |
| 4    | PULSE LIMITER            | Rohde&Schwarz | ESH3-Z2   | 100058     | 2026.03.13 | 2027.03.12 |

Conducted Emission Measurement Software: TS+ JS32-CE Ver 5.0.0

#### 3.2 Radiated Emission Test

| Item | Equipment                     | Manufacturer  | Model No.              | Serial No.   | Last Cal.  | Cal.Due    |
|------|-------------------------------|---------------|------------------------|--------------|------------|------------|
| 1    | EMI Test Receiver             | R&S           | ESIB 7                 | 2277573376   | 2026.03.12 | 2027.03.11 |
| 2    | EMI Test Receiver             | ESPI3         | ESPI3                  | 101131       | 2026.03.12 | 2027.03.11 |
| 3    | Spectrum Analyzer             | Rohde&Schwarz | FSV 40                 | 101458       | 2026.03.13 | 2027.03.12 |
| 4    | TRILOG Broadband Test-Antenna | SCHWARZBECK   | VULB9168               | VULB9168-588 | 2026.03.14 | 2028.03.13 |
| 5    | Loop Antenna                  | EMCO          | 6502                   | 2133         | 2026.03.14 | 2028.03.13 |
| 6    | horn antenna                  | SCHWARZBECK   | BBHA9120D              | 2069         | 2026.03.14 | 2028.03.13 |
| 7    | Horn Antenna                  | COM-MW        | ZLB7-18-40G-950        | 12221225     | 2025.08.19 | 2027.08.18 |
| 8    | Pre-amplifier                 | MITEQ         | TTA0001-18             | 2063645      | 2026.03.12 | 2027.03.11 |
| 9    | Pre-amplifier                 | MITEQ         | TTA1800-30-HG          | 2063644      | 2026.03.12 | 2027.03.11 |
| 10   | Pre-amplifier                 | COM-MW        | DLAN-18000-40000-02    | 10229104     | 2026.03.12 | 2027.03.11 |
| 11   | 966 Camber                    | ZhongYU       | 9*6*6                  | /            | 2025.08.12 | 2028.08.11 |
| 12   | Test Software                 | Farad         | EZ-EMC Ver QCT03A2 RE+ | N/A          | N/A        | N/A        |



### 3.3 RF Conducted test

| Item                                                    | Equipment                           | Manufacturer    | Model No.                | Serial No. | Last Cal.  | Cal.Due    |
|---------------------------------------------------------|-------------------------------------|-----------------|--------------------------|------------|------------|------------|
| 1.                                                      | Wideband Radio Communication Tester | Rohde & Schwarz | CW500                    | 151583     | 2026.03.12 | 2027.03.11 |
| 2.                                                      | Spectrum Analyzer                   | ROHDE & SCHWARZ | FSV 40                   | 101458     | 2026.03.13 | 2027.03.12 |
| 3.                                                      | Signal Generator                    | Agilent         | N5182A                   | MY50141563 | 2026.03.12 | 2027.03.11 |
| 4.                                                      | RF Automatic Test System            | MW              | MW100-RFCB/<br>MW100-PSB | MW2007004  | 2026.03.13 | 2027.03.12 |
| RF Conducted Measurement Software: MTS 8310 Ver 2.0.0.0 |                                     |                 |                          |            |            |            |



## 4. Antenna requirement

**Standard requirement:** FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

**EUT Antenna:** The Ant is FPC Antenna, the best case gain of the antenna is 5.97dBi, reference to the Internal photo for details.

## 5. Conducted Emissions

### 5.1 Applicable Standard

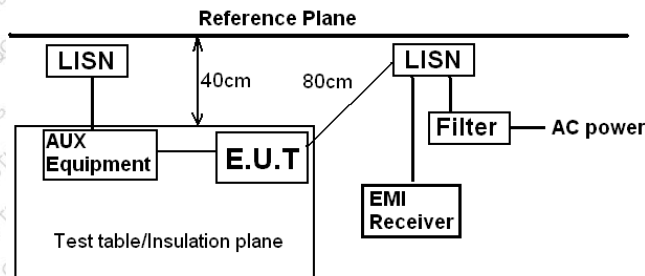
FCC Part15 C Section 15.207

### 5.2 Limit

| Frequency range (MHz) | Limit (dBμV) |           |
|-----------------------|--------------|-----------|
|                       | Quasi-peak   | Average   |
| 0.15-0.5              | 66 to 56*    | 56 to 46* |
| 0.5-5                 | 56           | 46        |
| 5-30                  | 60           | 50        |

Note \*: The level decreases linearly with the logarithm of the frequency.

### 5.3 Test setup



Remark:  
E.U.T: Equipment Under Test  
LISN: Line Impedance Stabilization Network  
Test table height=0.8m

### 5.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.  
RBW=9 kHz, VBW=30 kHz, Sweep time=auto

### 5.5 Test procedure

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 on conducted measurement.

### 5.6 Test Data

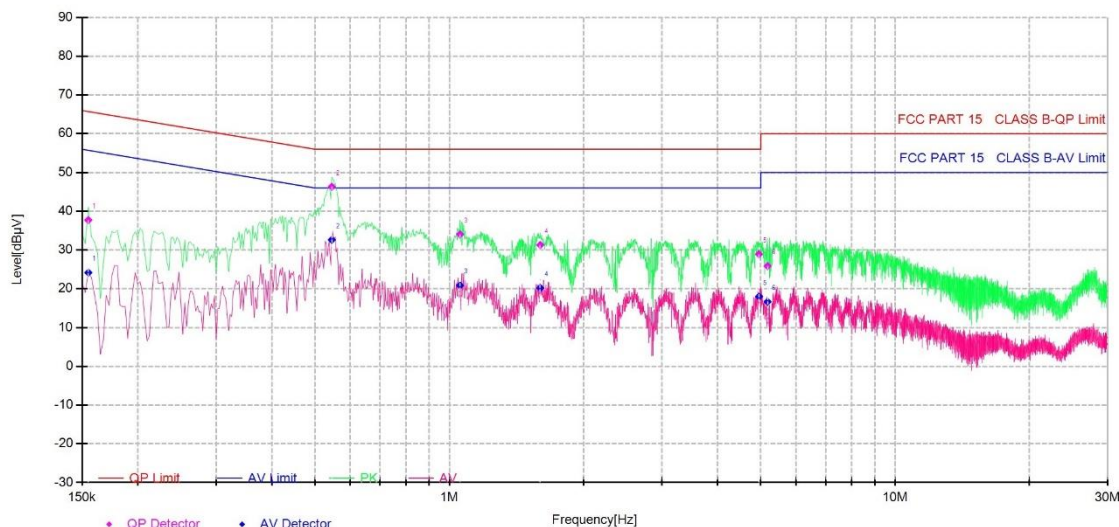
|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 22°C     | Humidity     | 52%     |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |



### Measurement data:

Pre-scan all test modes, found worst case at BLE 2402MHz TX, and so only show the test result of BLE 2402MHz TX.

Line:

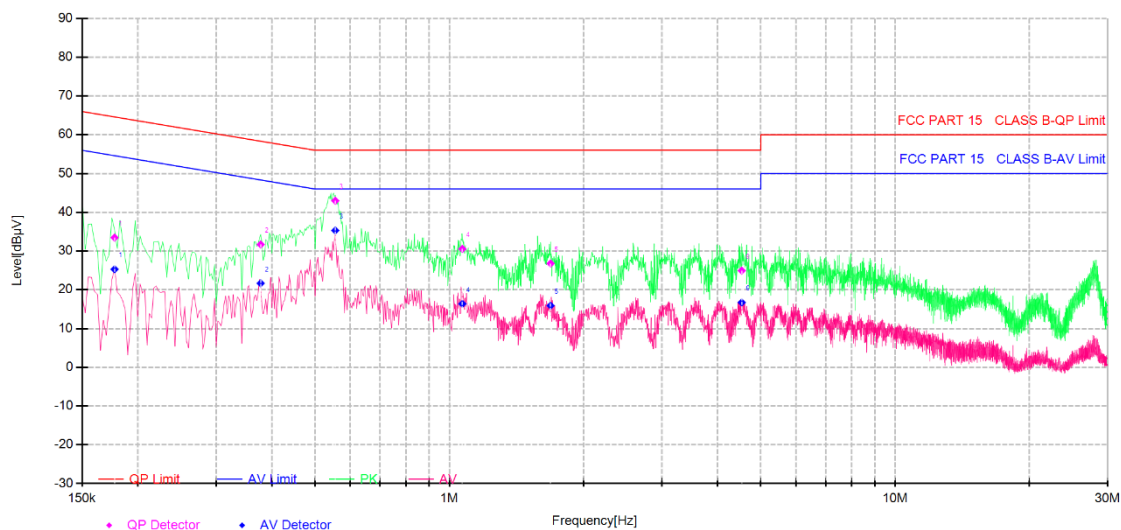


### Final Data List

| NO. | Freq.<br>[MHz] | Factor[dB] | QP<br>Value<br>[dBμV] | QP<br>Limit<br>[dBμV] | QP<br>Margin<br>[dB] | AV<br>Value<br>[dBμV] | AV<br>Limit<br>[dBμV] | AV<br>Margin<br>[dB] | Phase | Verdict |
|-----|----------------|------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|-------|---------|
| 1   | 0.1550         | 10.58      | 37.73                 | 65.73                 | 28.00                | 24.18                 | 55.73                 | 31.55                | L     | PASS    |
| 2   | 0.5450         | 10.73      | 46.33                 | 56.00                 | 9.67                 | 32.64                 | 46.00                 | 13.36                | L     | PASS    |
| 3   | 1.0575         | 10.64      | 34.05                 | 56.00                 | 21.95                | 20.86                 | 46.00                 | 25.14                | L     | PASS    |
| 4   | 1.6000         | 10.67      | 31.31                 | 56.00                 | 24.69                | 20.19                 | 46.00                 | 25.81                | L     | PASS    |
| 5   | 4.9520         | 10.73      | 28.93                 | 56.00                 | 27.07                | 17.99                 | 46.00                 | 28.01                | L     | PASS    |
| 6   | 5.1770         | 10.73      | 25.86                 | 60.00                 | 34.14                | 16.66                 | 50.00                 | 33.34                | L     | PASS    |



Neutral:



## Final Data List

| NO. | Freq.<br>[MHz] | Factor[dB] | QP<br>Value<br>[dBμV] | QP<br>Limit<br>[dBμV] | QP<br>Margin<br>[dB] | AV<br>Value<br>[dBμV] | AV<br>Limit<br>[dBμV] | AV<br>Margin<br>[dB] | Phase | Verdict |
|-----|----------------|------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|-------|---------|
| 1   | 0.1775         | 10.48      | 33.47                 | 64.60                 | 31.13                | 25.30                 | 54.60                 | 29.30                | N     | PASS    |
| 2   | 0.3775         | 10.65      | 31.69                 | 58.33                 | 26.64                | 21.67                 | 48.33                 | 26.66                | N     | PASS    |
| 3   | 0.5550         | 10.64      | 42.97                 | 56.00                 | 13.03                | 35.30                 | 46.00                 | 10.70                | N     | PASS    |
| 4   | 1.0700         | 10.61      | 30.55                 | 56.00                 | 25.45                | 16.38                 | 46.00                 | 29.62                | N     | PASS    |
| 5   | 1.6875         | 10.65      | 26.78                 | 56.00                 | 29.22                | 15.91                 | 46.00                 | 30.09                | N     | PASS    |
| 6   | 4.5290         | 10.61      | 24.95                 | 56.00                 | 31.05                | 16.73                 | 46.00                 | 29.27                | N     | PASS    |

## 6. Conducted Peak Output Power

### 6.1 Applicable Standard

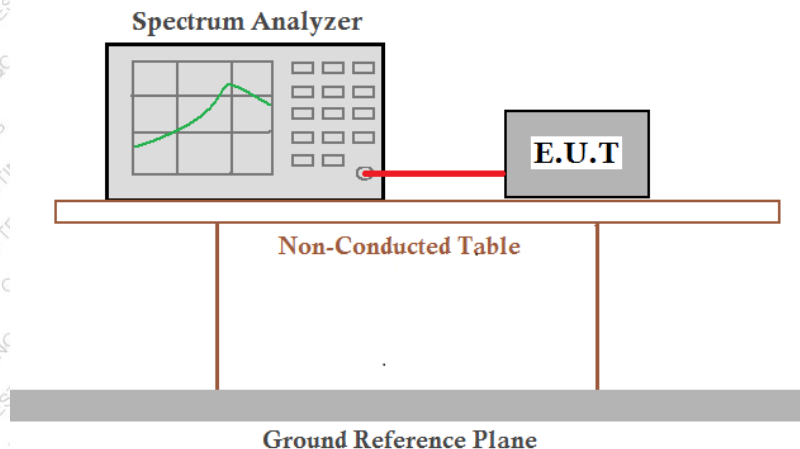
FCC Part15 C Section 15.247 (b)(3)

### 6.2 Limit

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

### 6.3 Test setup





## 6.4 Test Procedure

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- Set the  $RBW \geq DTS$  bandwidth.
- Set  $VBW \geq [3 \times RBW]$ .
- Set  $span \geq [3 \times RBW]$ .
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

## 6.5 Test Data

|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 24.7 °C  | Humidity     | 43%     |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |

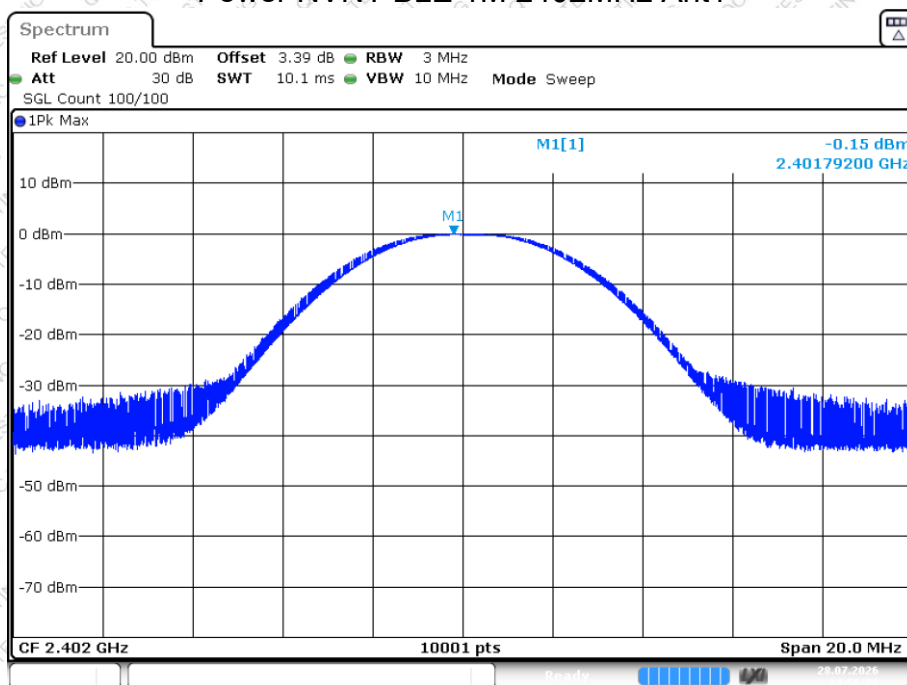
Please refer to following table and plots.

### Output Power:

| Modulation | CH No.  | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Verdict |
|------------|---------|-----------------|--------------------|-------------|---------|
| BLE 1Mbps  | Lowest  | 2402            | -0.15              | $\leq 30$   | PASS    |
|            | Middle  | 2440            | -0.67              | $\leq 30$   | PASS    |
|            | Highest | 2480            | -1.08              | $\leq 30$   | PASS    |

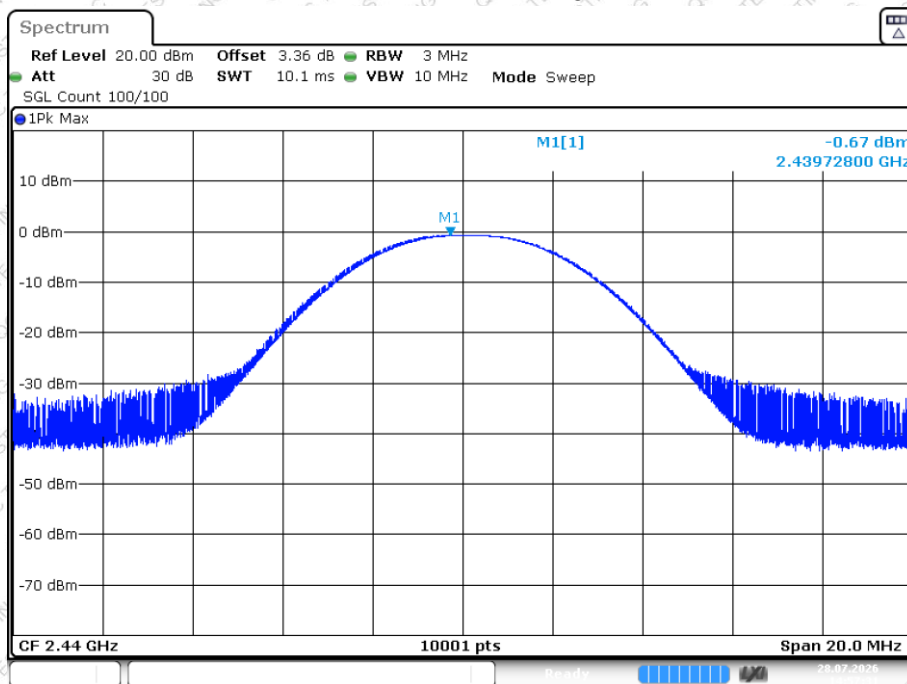


## Power NVNT BLE 1M 2402MHz Ant1



Date: 28. JUL. 2026 14:56:28

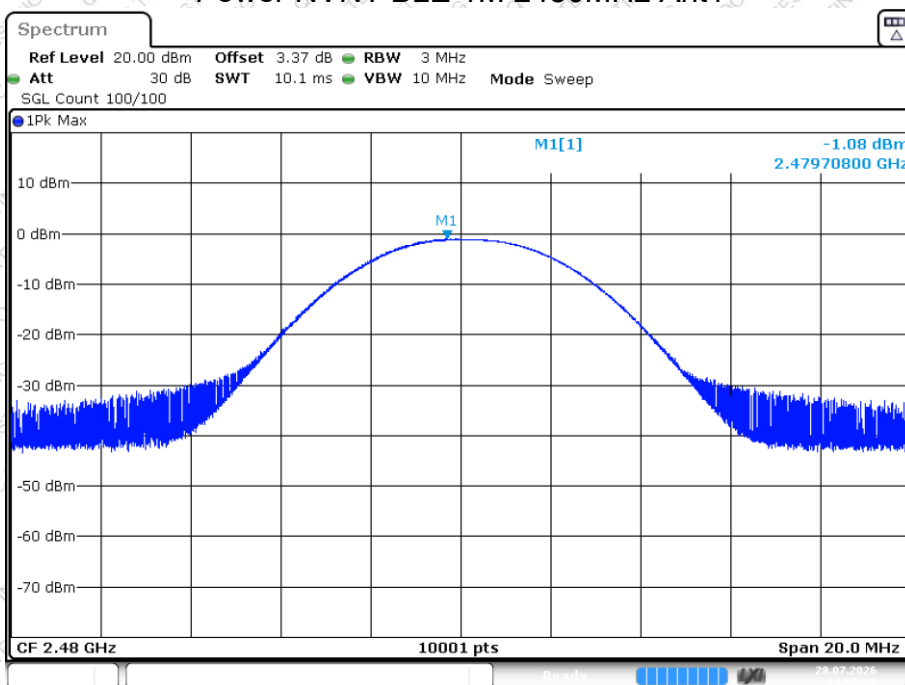
## Power NVNT BLE 1M 2440MHz Ant1



Date: 28. JUL. 2026 14:57:31



## Power NVNT BLE 1M 2480MHz Ant1



Date: 28. JUL. 2026 14:58:28

## 7. Channel Bandwidth & 99% Occupied Bandwidth

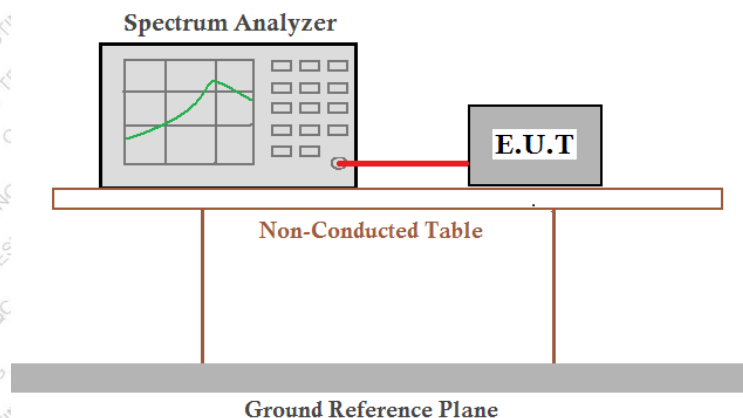
### 7.1 Applicable Standard

FCC Part15 C Section 15.247 (a)(2)

### 7.2 Limit

The minimum 6 dB bandwidth shall be 500 kHz.

### 7.3 Test setup



### 7.4 Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

#### •DTS bandwidth

The steps for the first option are as follows:

- a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- b) Set the  $VBW \geq 3 \times RBW$ .
- c) Detector = peak.
- d) Trace mode = max hold.
- e) Sweep = No faster than coupled (auto) time.



- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value.

## 7.5 Test Data

|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 24.7 °C  | Humidity     | 43%     |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |

Please refer to following table and plots.

### DTS Bandwidth:

| Modulation | CH No.  | Frequency (MHz) | DTS Bandwidth (MHz) | Limit (MHz) | Verdict |
|------------|---------|-----------------|---------------------|-------------|---------|
| BLE 1Mbps  | Lowest  | 2402            | 0.779               | 0.5         | PASS    |
|            | Middle  | 2440            | 0.704               | 0.5         | PASS    |
|            | Highest | 2480            | 0.717               | 0.5         | PASS    |

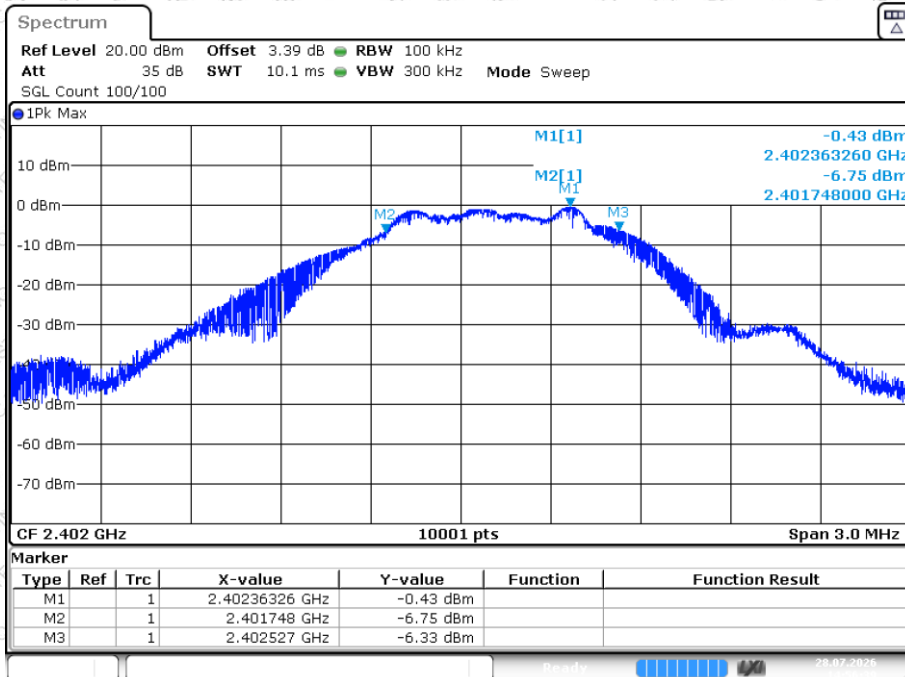
### 99% Occupied Bandwidth:

| Modulation | CH No.  | Frequency (MHz) | 99% Bandwidth (MHz) | Limit (MHz) | Verdict |
|------------|---------|-----------------|---------------------|-------------|---------|
| BLE 1Mbps  | Lowest  | 2402            | 1.083               | ---         | PASS    |
|            | Middle  | 2440            | 1.041               | ---         | PASS    |
|            | Highest | 2480            | 1.046               | ---         | PASS    |

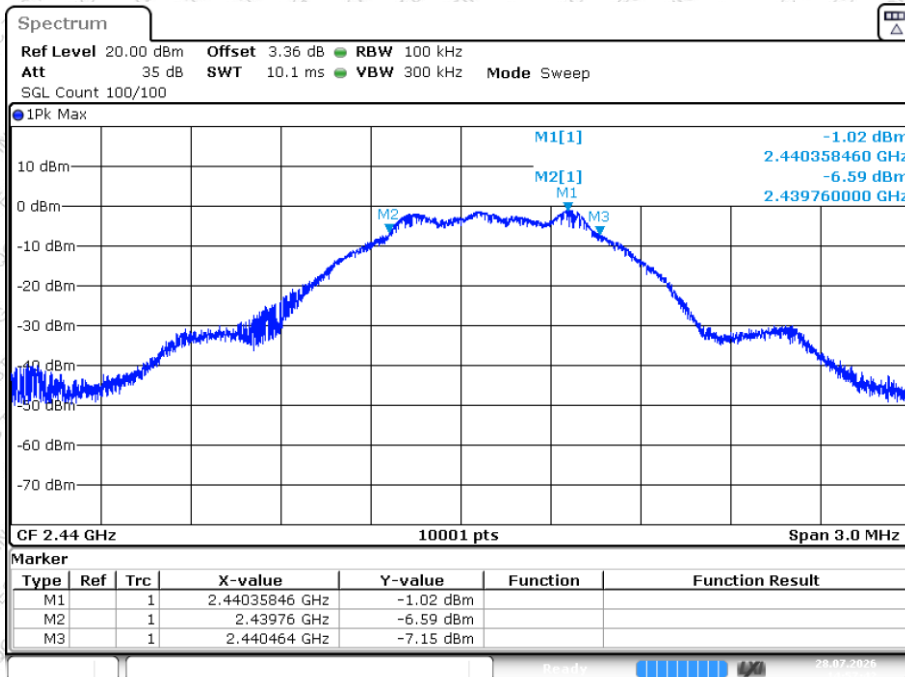


DTS Bandwidth:

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1

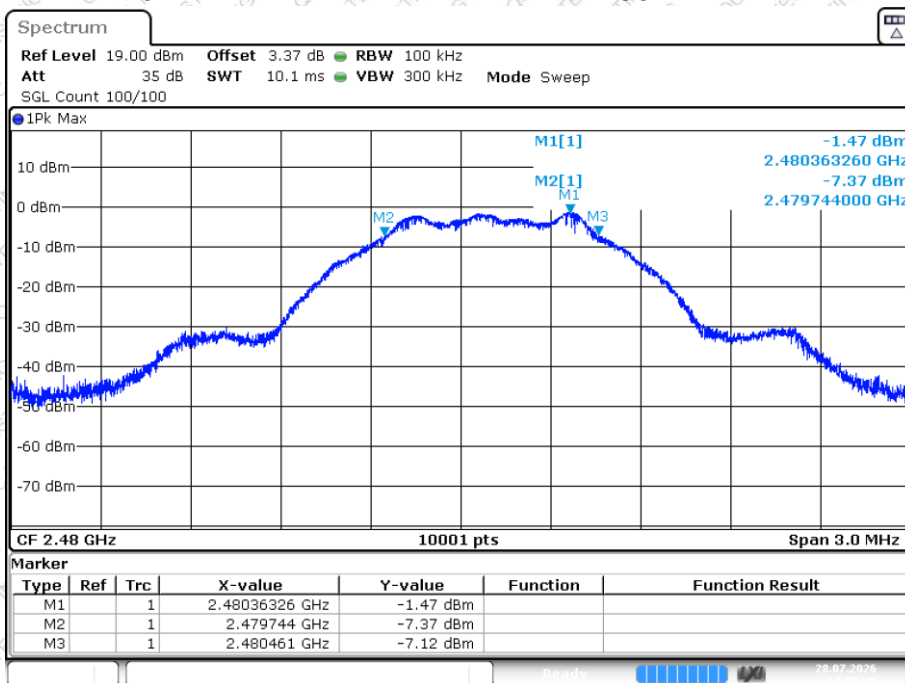


-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1





-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1

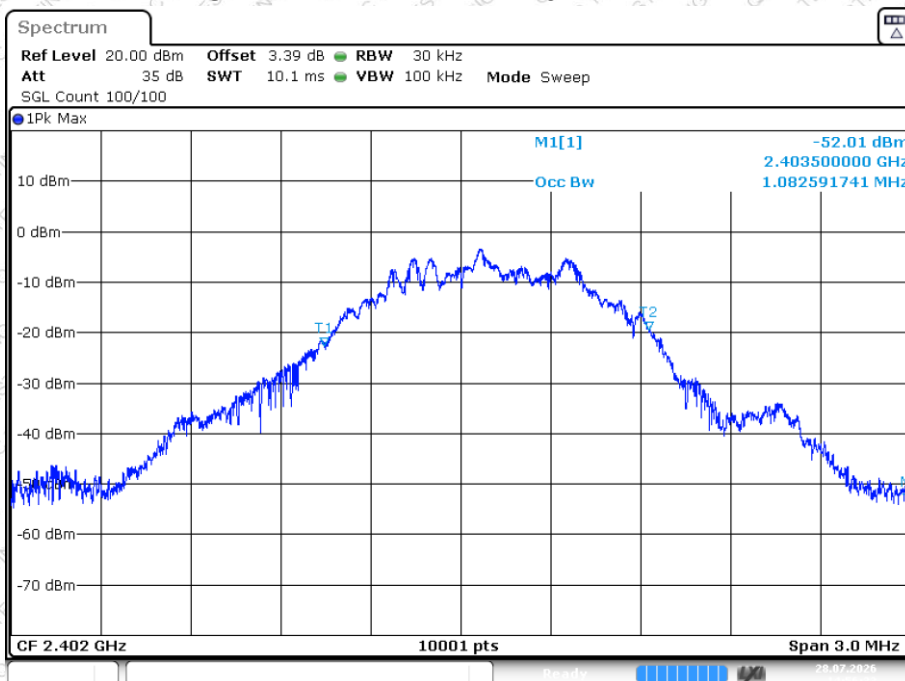


Date: 28 JUL 2026 14:58:40



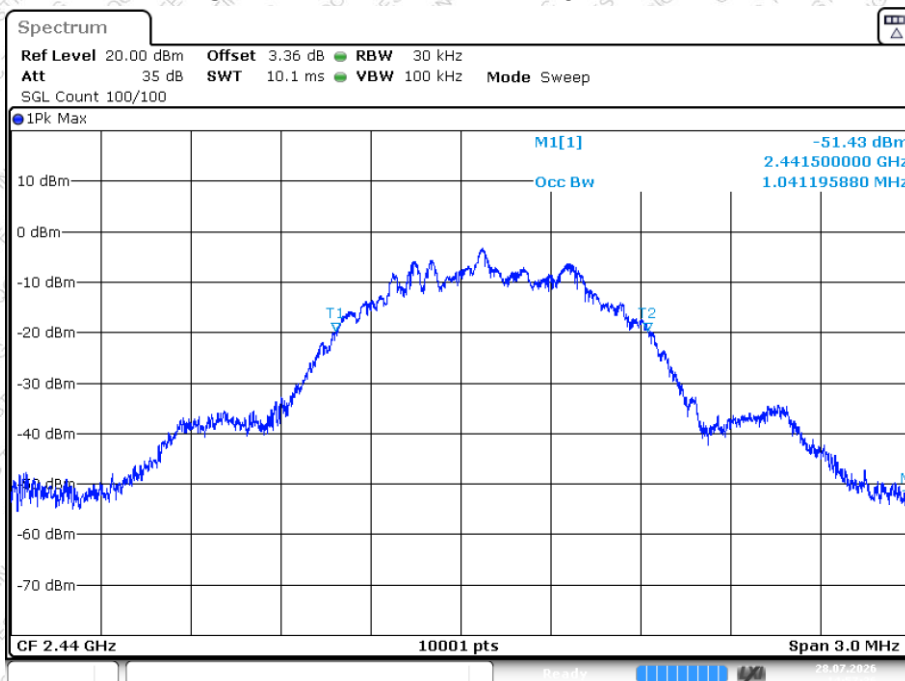
99% Occupied Bandwidth:

### OBW NVNT BLE 1M 2402MHz Ant1



Date: 28.JUL.2026 14:56:33

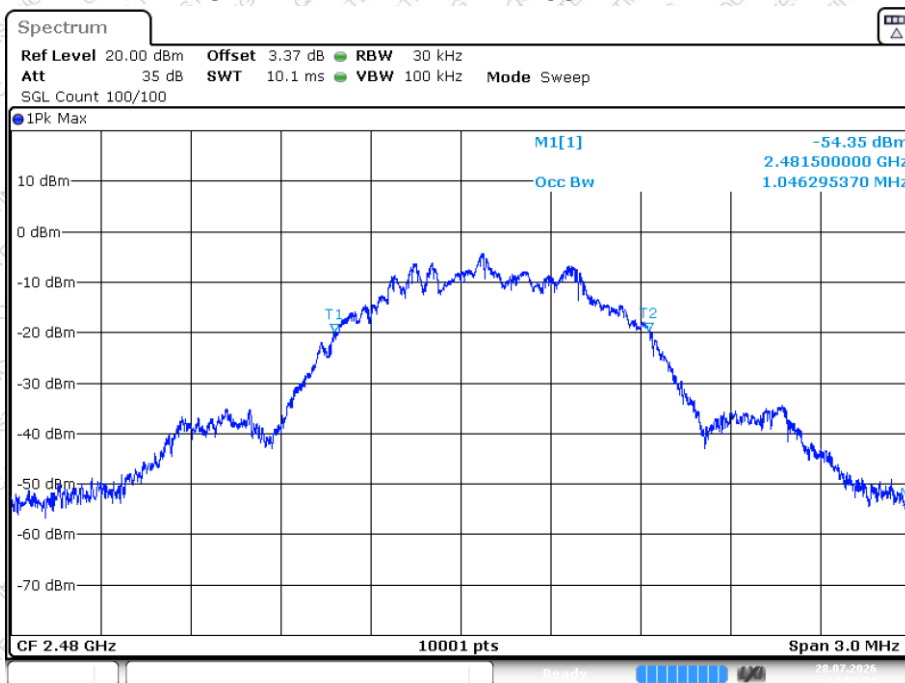
### OBW NVNT BLE 1M 2440MHz Ant1



Date: 28.JUL.2026 14:57:36



## OBW NVNT BLE 1M 2480MHz Ant1



Date: 28.JUL.2026 14:58:34

## 8. Power Spectral Density

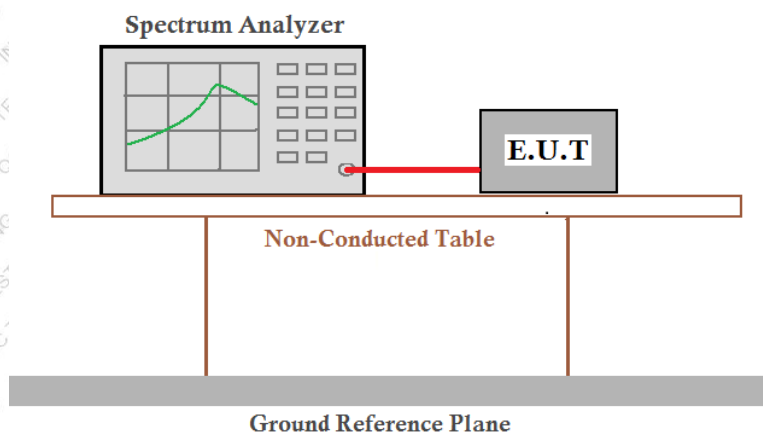
### 8.1 Applicable Standard

FCC Part15 C Section 15.247 (e)

### 8.2 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### 8.3 Test setup



### 8.4 Test Procedure

Refer to KDB558074 D01 15.247 Meas Guidance v05r02

### 8.5 Test Data

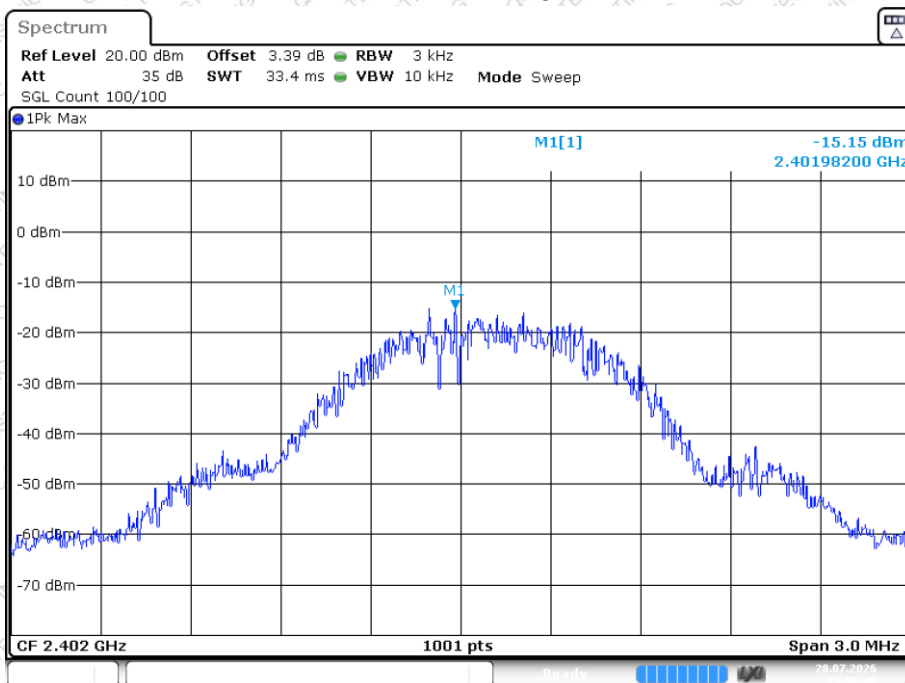
|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 24.7 °C  | Humidity     | 43%     |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |

Please refer to following table and plots.

| Modulation | Test channel | Power Spectral Density (dBm/3kHz) | Limit(dBm/3kHz) | Result |
|------------|--------------|-----------------------------------|-----------------|--------|
| BLE 1Mbps  | Lowest       | -15.15                            | 8.00            | Pass   |
|            | Middle       | -15.13                            |                 |        |
|            | Highest      | -15.83                            |                 |        |

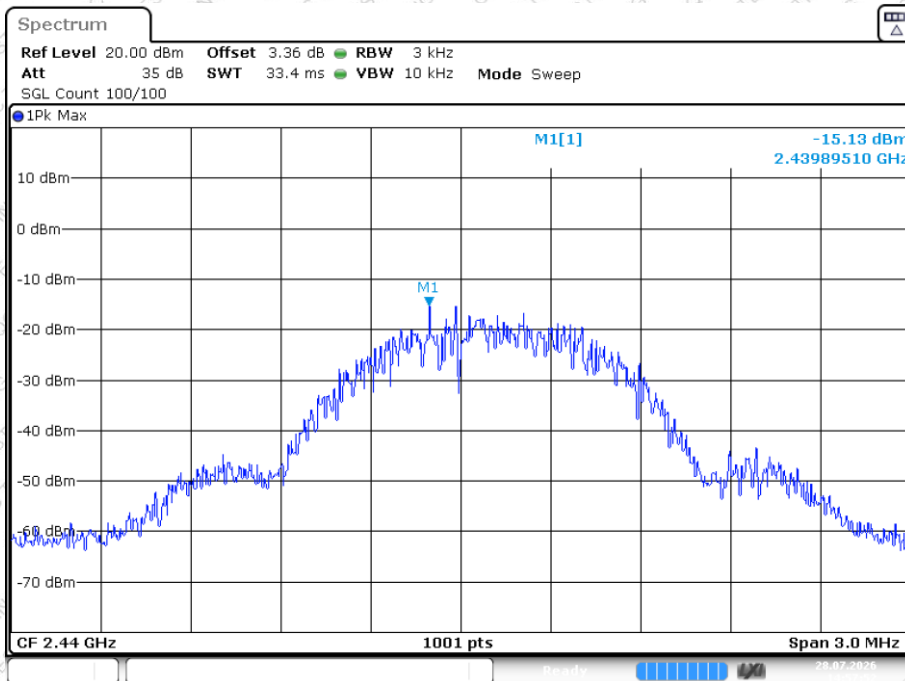


## PSD NVNT BLE 1M 2402MHz Ant1



Date: 28.JUL.2026 14:56:49

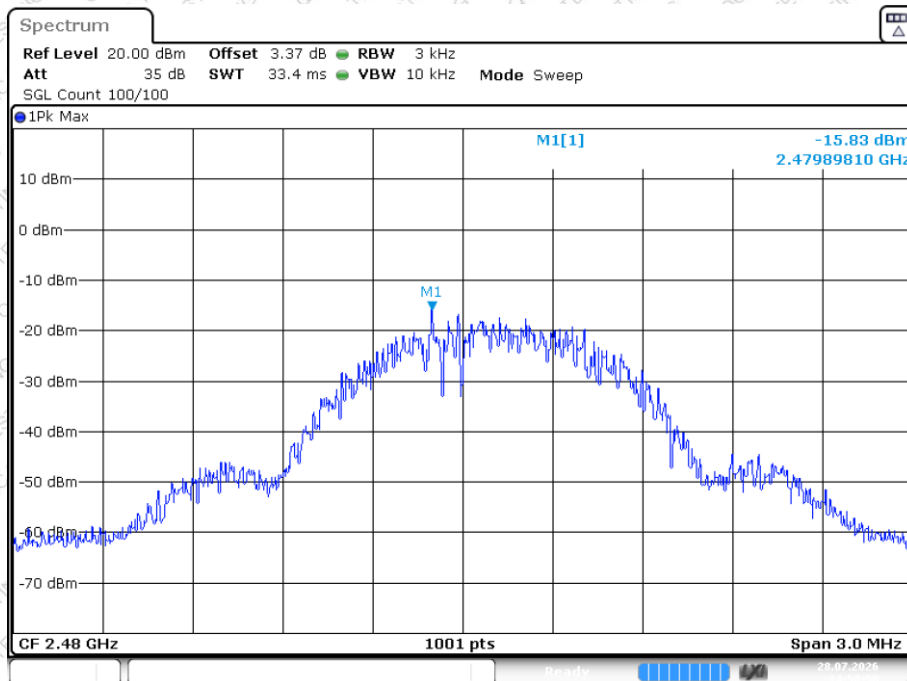
## PSD NVNT BLE 1M 2440MHz Ant1



Date: 28.JUL.2026 14:57:52



## PSD NVNT BLE 1M 2480MHz Ant1



Date: 28.JUL.2026 14:58:50

## 9. Spurious Emission in Non-restricted & restricted Bands

### 9.1 Conducted Emission Method

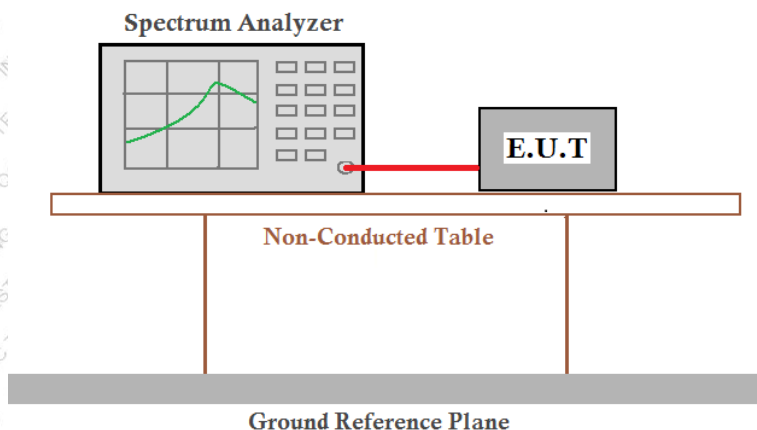
#### 9.1.1 Applicable Standard

FCC Part15 C Section 15.247 (d)

#### 9.1.2 Limit

In any 100 kHz bandwidth outside the frequency band 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, based on either an RF conducted or a radiated measurement.

#### 9.1.3 Test setup



#### 9.1.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- Repeat above procedures until all measured frequencies were complete.

#### 9.1.5 Test Data

|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 24.7 °C  | Humidity     | 43%     |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |

Please refer to following plots.

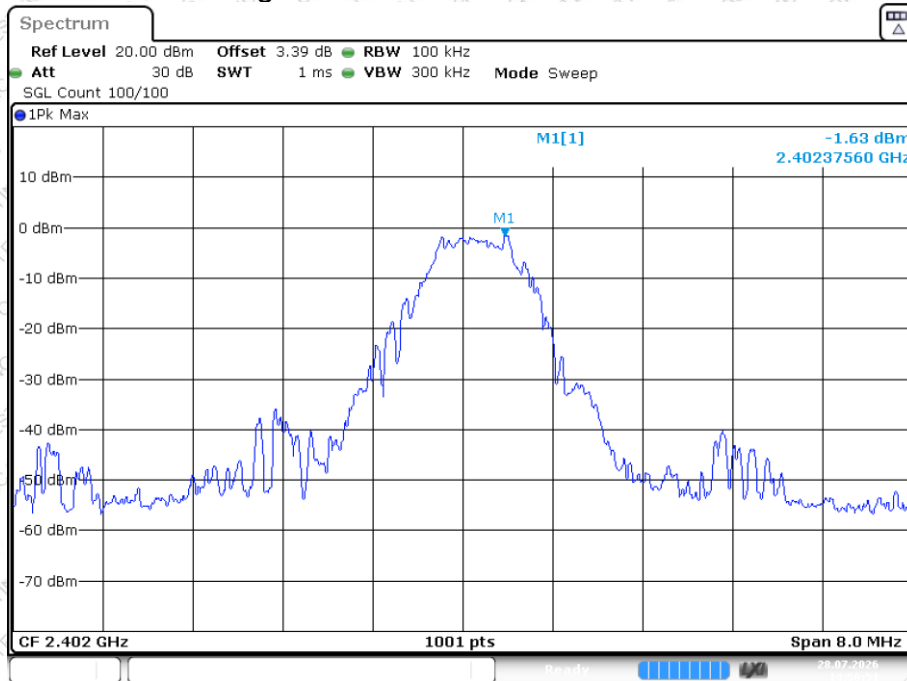


**Band Edge:**

| Modulation | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|------------|-----------------|---------|-----------------|-------------|---------|
| BLE 1Mbps  | Lowest          | 2402    | -47.37          | -20         | Pass    |
|            | Highest         | 2480    | -42.68          | -20         | Pass    |

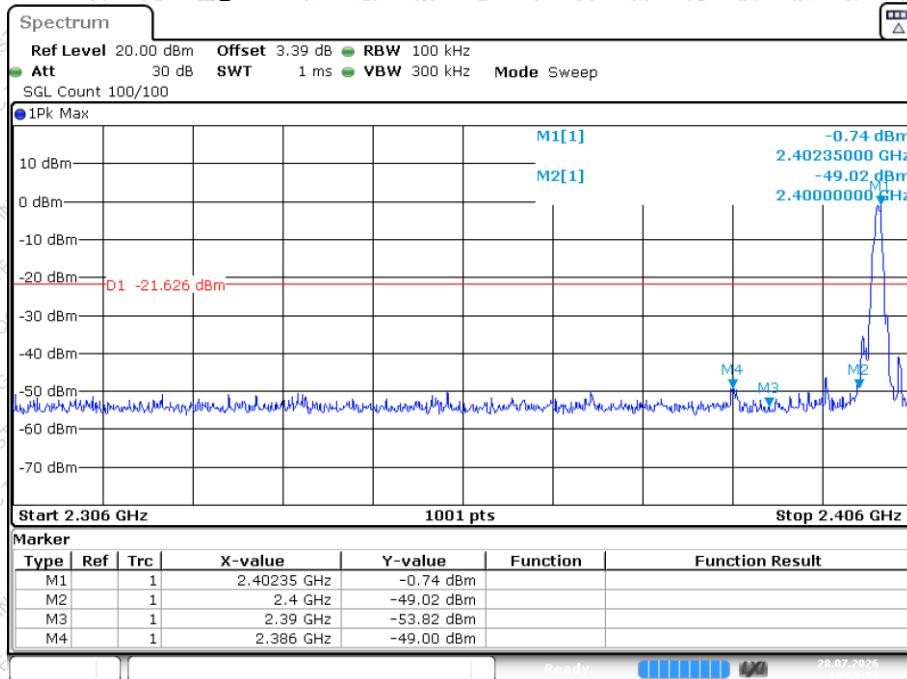


### Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Date: 28.JUL.2026 14:56:52

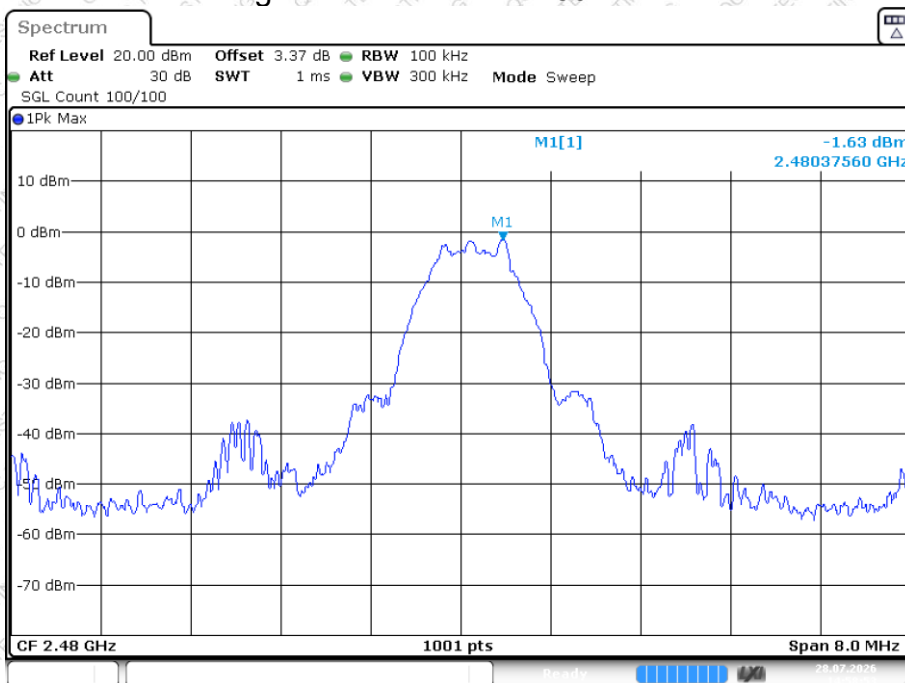
### Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Date: 28.JUL.2026 14:56:54

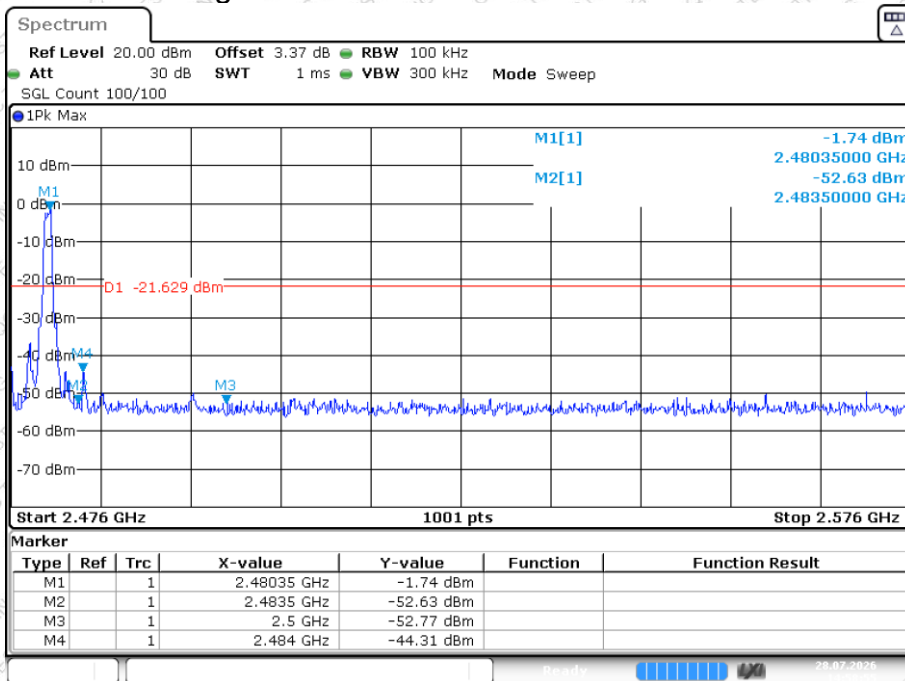


### Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Date: 28.JUL.2026 14:58:53

### Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



Date: 28.JUL.2026 14:58:55

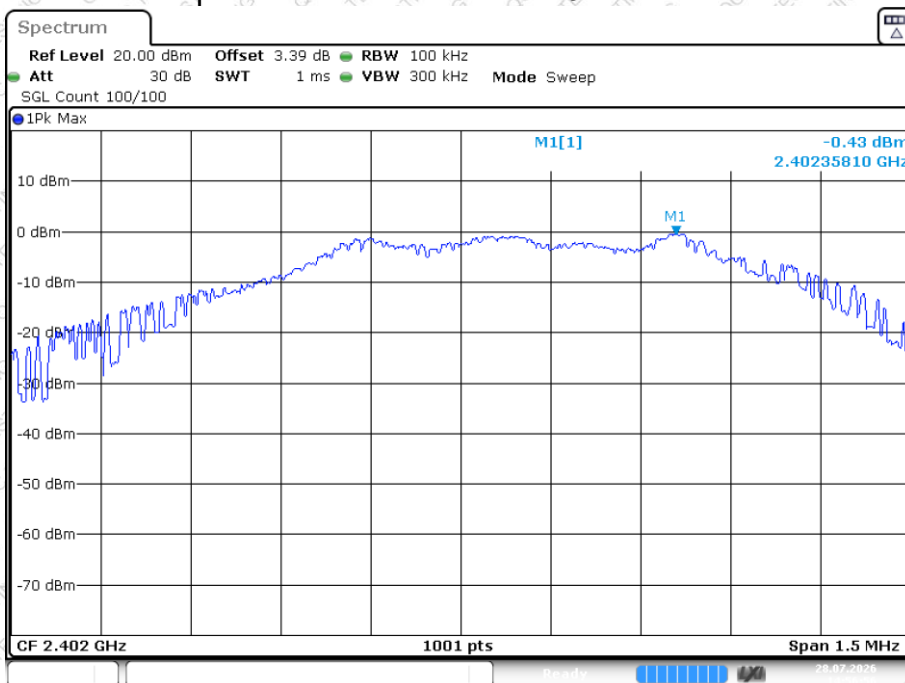


**Conducted RF Spurious Emission:**

| Modulation | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|------------|-----------------|---------|-----------------|-------------|---------|
| BLE 1Mbps  | Lowest          | 2402    | -38.39          | -20         | Pass    |
|            | Middle          | 2440    | -38.02          | -20         | Pass    |
|            | Highest         | 2480    | -41.37          | -20         | Pass    |

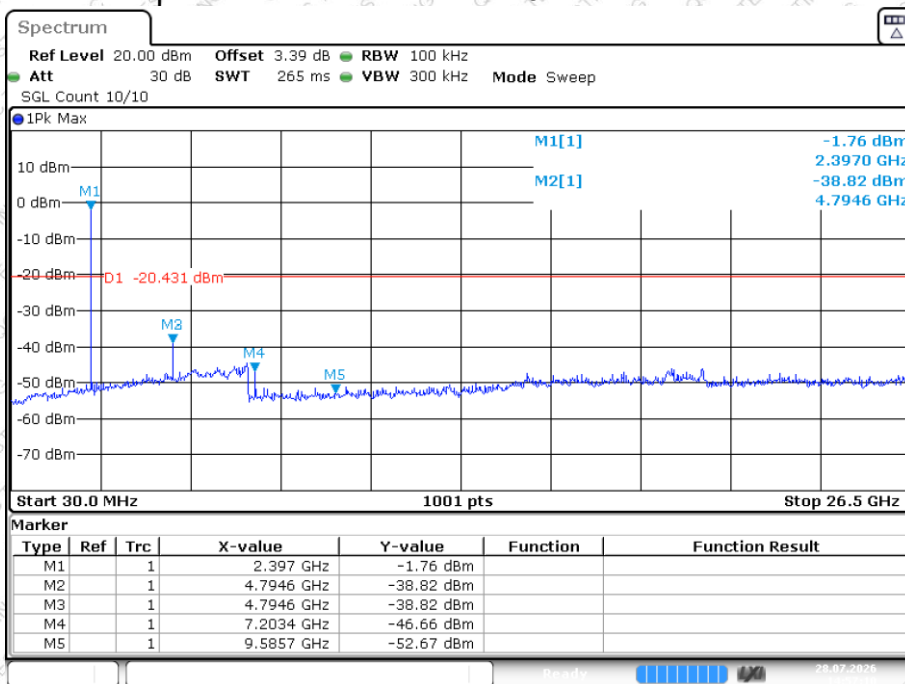


### Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



Date: 28.JUL.2026 14:56:57

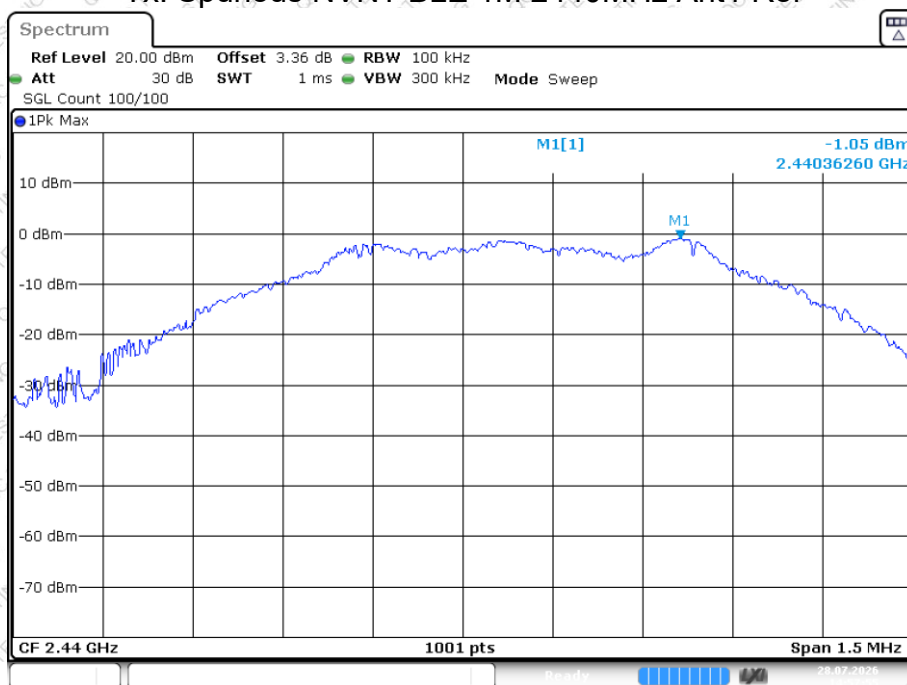
### Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



Date: 28.JUL.2026 14:57:09

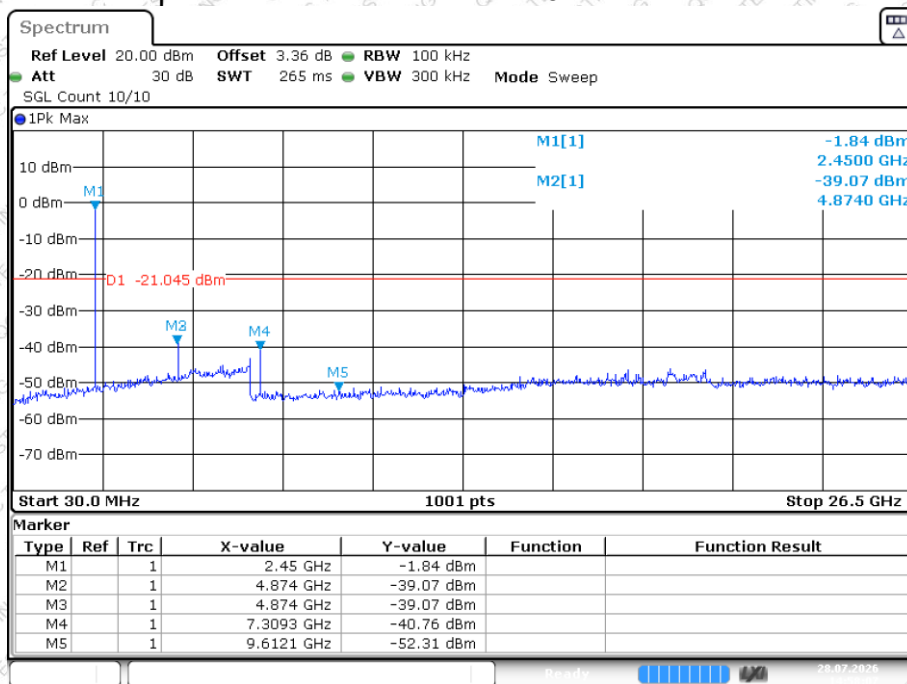


### Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Date: 28.JUL.2026 14:57:55

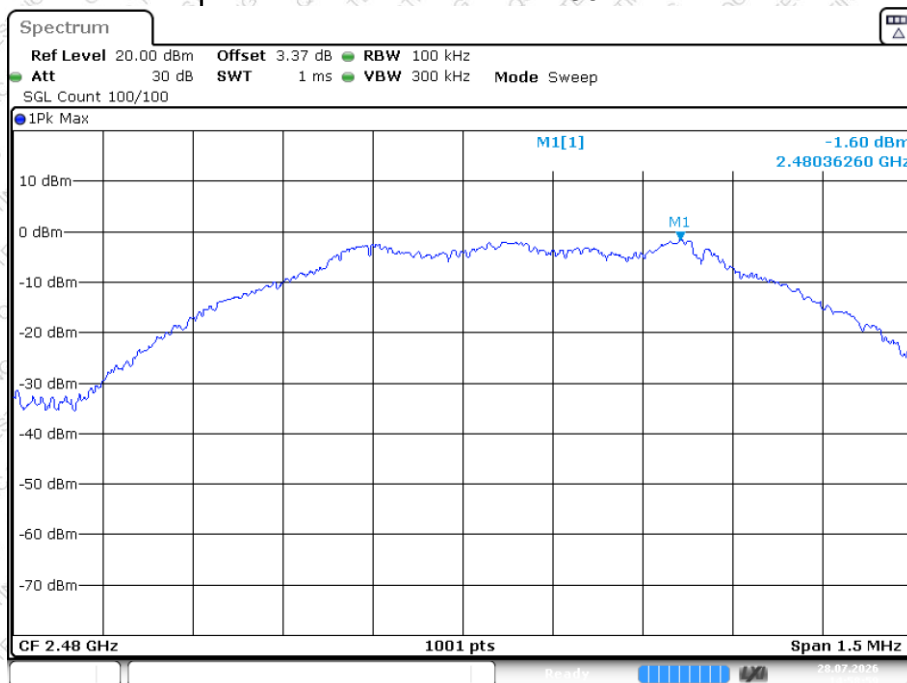
### Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



Date: 28.JUL.2026 14:58:08

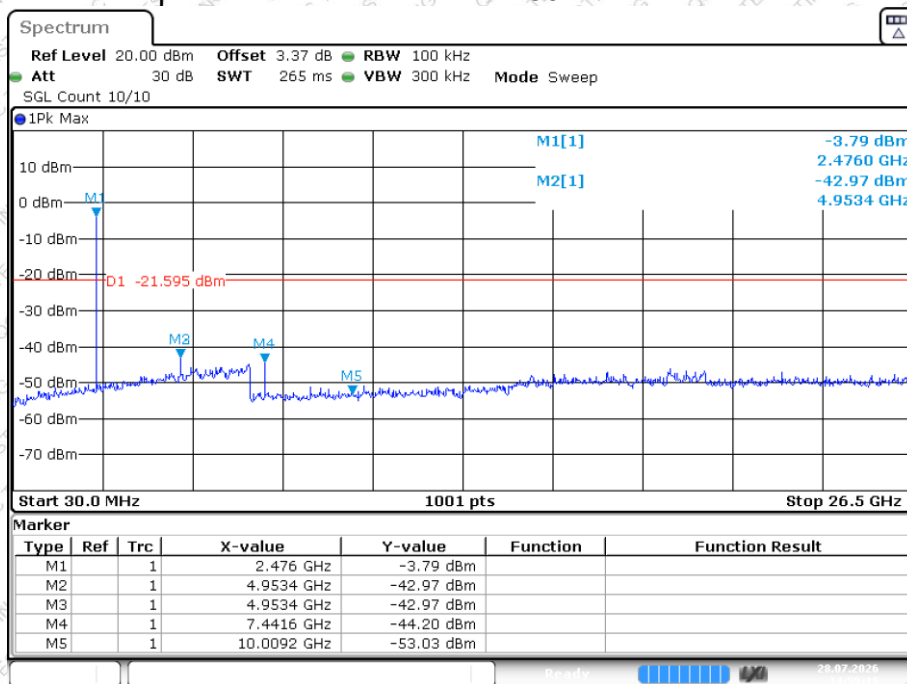


### Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Date: 28.JUL.2026 14:58:59

### Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



Date: 28.JUL.2026 14:59:11

## 9.2 Radiated Emission Method

### 9.2.1 Applicable Standard

FCC Part15 C Section 15.209 and 15.205

### 9.2.2 Limit

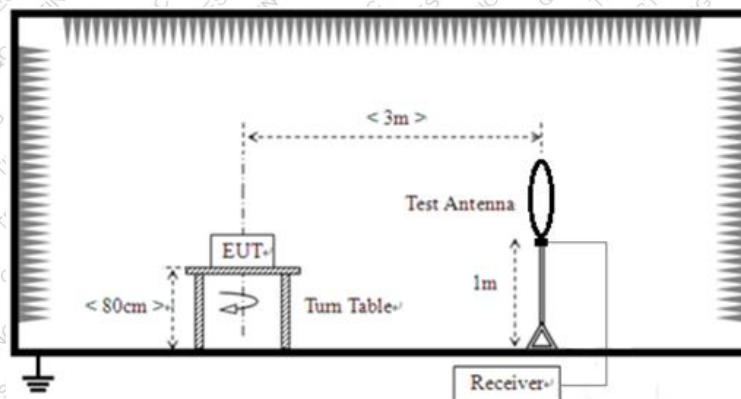
| Frequency         | Limit (uV/m) | Value | Measurement Distance |
|-------------------|--------------|-------|----------------------|
| 0.009MHz-0.490MHz | 2400/F(KHz)  | QP    | 300m                 |
| 0.490MHz-1.705MHz | 24000/F(KHz) | QP    | 30m                  |
| 1.705MHz-30MHz    | 30           | QP    | 30m                  |

| Frequency  | Field Strengths Limits (uV/m at 3 m) | Field Strengths Limits (dBuV/m at 3 m) | Remark     |
|------------|--------------------------------------|----------------------------------------|------------|
| 30 – 88    | 100                                  | 40.0                                   | Quasi-peak |
| 88 – 216   | 150                                  | 43.5                                   | Quasi-peak |
| 216 – 960  | 200                                  | 46.0                                   | Quasi-peak |
| Above 960  | 500                                  | 54.0                                   | Quasi-peak |
| Above 1GHz | /                                    | 74.0                                   | Peak       |
|            |                                      | 54.0                                   | Average    |

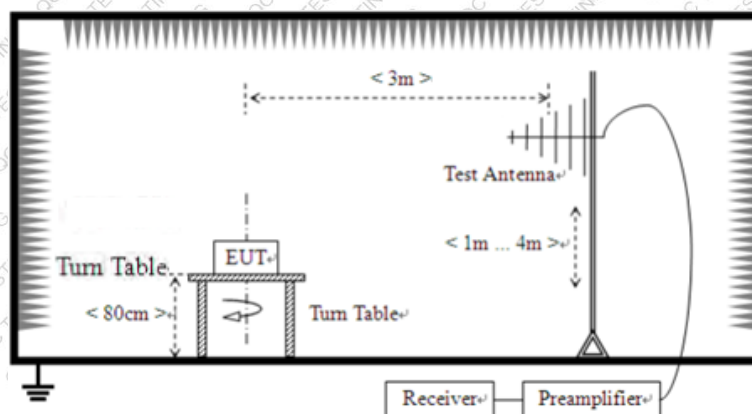
Note:  $\text{dBuV/m} = 20\log(\mu\text{V/m})$

### 9.2.3 Test setup

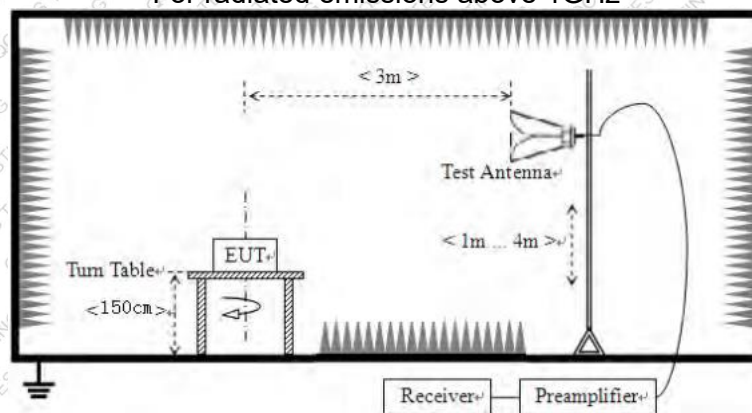
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



#### 9.2.4 EMI Test Receiver Setup

| Frequency         | RBW     | VBW     | IF B/W  | Measurement |
|-------------------|---------|---------|---------|-------------|
| 9KHz-150KHz       | 200Hz   | 600Hz   | /       | QP          |
| 150KHz-30MHz      | 9KHz    | 30KHz   | /       | QP          |
| 30 MHz – 1000 MHz | 100 kHz | 300 kHz | 120 kHz | QP          |
| Above 1 GHz       | 1 MHz   | 3 MHz   | /       | Peak        |
|                   | 1 MHz   | 10 Hz   | /       | Average     |

Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.

#### 9.2.5 Test procedure

- The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.



- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

## 9.2.6 Test Data

|              |          |              |         |
|--------------|----------|--------------|---------|
| Temperature  | 22-26 °C | Humidity     | 54 °C   |
| ATM Pressure | 101.1kPa | Antenna Gain | 5.97dBi |
| Test by      | Fan Yang | Test result  | PASS    |

### Remarks:

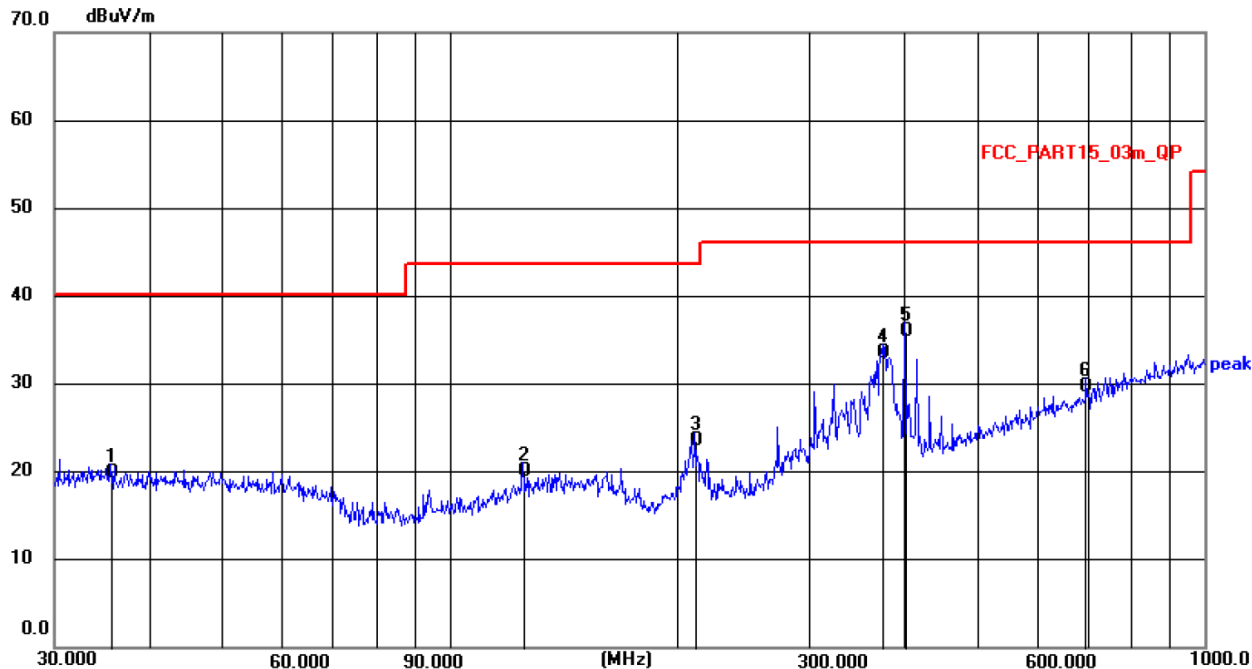
1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
2. Data of measurement within frequency range 9kHz-30MHz, 18-26GHz are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so test data does not present in this report.
3. The data recorded when three antennas were transmitting simultaneously is included in the report.



### Below 1GHz

Pre-scan all test modes, found worst case at BLE 1Mbps:2402MHz, and so only show the test result of BLE 1Mbps:2402MHz.

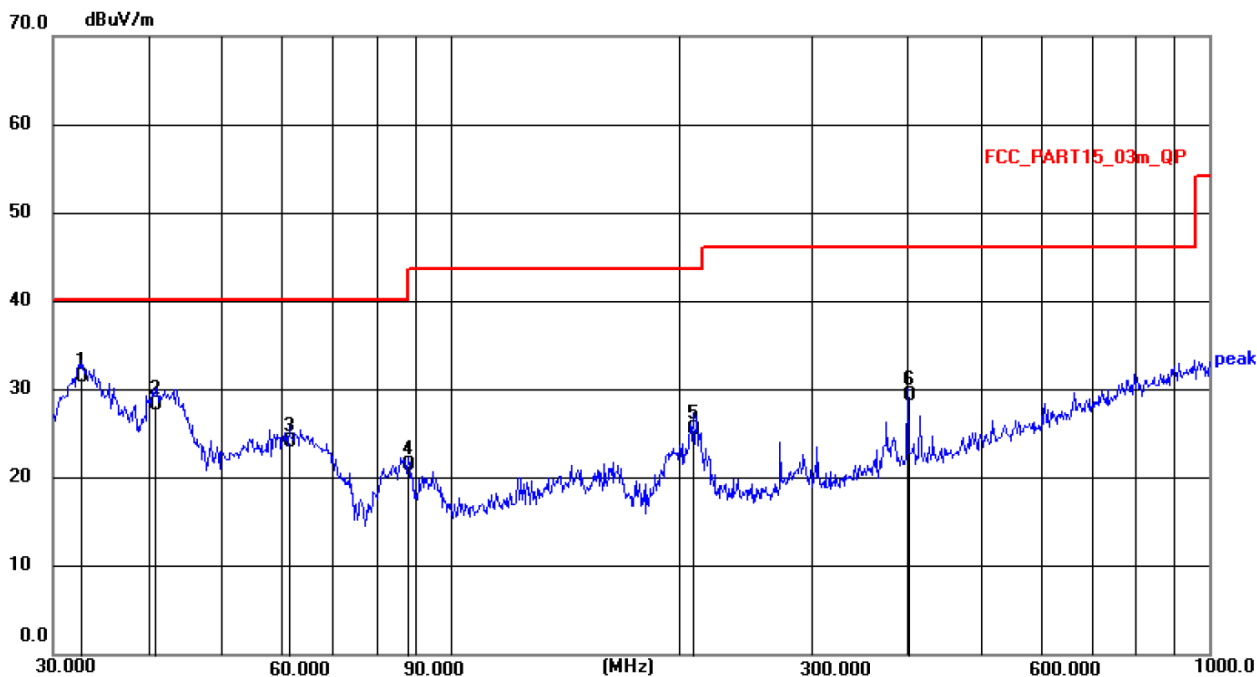
### Horizontal:



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1   | 35.6240         | 4.55           | 15.31         | 19.86          | 40.00          | 20.14       | QP       |
| 2   | 125.0066        | 6.59           | 13.41         | 20.00          | 43.50          | 23.50       | QP       |
| 3   | 211.5265        | 11.80          | 11.66         | 23.46          | 43.50          | 20.04       | QP       |
| 4   | 374.6225        | 16.84          | 16.75         | 33.59          | 46.00          | 12.41       | QP       |
| 5 * | 400.4319        | 18.42          | 17.62         | 36.04          | 46.00          | 9.96        | QP       |
| 6   | 696.8567        | 6.98           | 22.75         | 29.73          | 46.00          | 16.27       | QP       |



Vertical:



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|
| 1 * | 32.7486         | 15.94          | 15.42         | 31.36          | 40.00          | 8.64        | QP       |
| 2   | 40.8446         | 13.68          | 14.57         | 28.25          | 40.00          | 11.75       | QP       |
| 3   | 61.3463         | 10.74          | 13.35         | 24.09          | 40.00          | 15.91       | QP       |
| 4   | 88.0329         | 11.34          | 10.02         | 21.36          | 43.50          | 22.14       | QP       |
| 5   | 209.3129        | 13.91          | 11.54         | 25.45          | 43.50          | 18.05       | QP       |
| 6   | 400.4319        | 11.62          | 17.62         | 29.24          | 46.00          | 16.76       | QP       |



**Above 1GHz**

Test channel: Lowest channel

| Frequency (MHz) | Read Level (dBμV) | polarization | Factor (dB/m) | Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector |
|-----------------|-------------------|--------------|---------------|----------------|---------------------|-------------|----------|
| 2310            | 56.66             | H            | -22.55        | 34.11          | 74                  | 39.89       | peak     |
| 2310            | 55.11             | V            | -22.52        | 32.59          | 74                  | 41.41       | peak     |
| 2322.5          | 68.81             | H            | -22.52        | 46.29          | 74                  | 27.71       | peak     |
| 2338.4          | 71.67             | H            | -22.49        | 49.18          | 74                  | 24.82       | peak     |
| 2354.5          | 72.41             | H            | -22.45        | 49.96          | 74                  | 24.04       | peak     |
| 2353.9          | 62.28             | V            | -22.45        | 39.83          | 74                  | 34.17       | peak     |
| 2362.5          | 64.43             | V            | -22.45        | 41.98          | 74                  | 32.02       | peak     |
| 2370.6          | 74.05             | H            | -22.43        | 51.62          | 74                  | 22.38       | peak     |
| 2370.4          | 60.88             | V            | -22.43        | 38.45          | 74                  | 35.55       | peak     |
| 2386.8          | 74.12             | H            | -22.4         | 51.72          | 74                  | 22.28       | peak     |
| 2386.1          | 63.7              | V            | -22.4         | 41.3           | 74                  | 32.7        | peak     |
| 2390            | 70.13             | H            | -22.39        | 47.74          | 74                  | 26.26       | peak     |
| 2390            | 55.69             | V            | -22.39        | 33.3           | 74                  | 40.7        | peak     |
| 4804            | 52.58             | H            | -18.87        | 33.71          | 74                  | 40.29       | peak     |
| 4804            | 52.98             | V            | -18.87        | 34.11          | 74                  | 39.89       | peak     |

Test channel: Middle channel

| Frequency (MHz) | Read Level (dBμV) | polarization | Factor (dB/m) | Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector |
|-----------------|-------------------|--------------|---------------|----------------|---------------------|-------------|----------|
| 4880            | 54.17             | H            | -18.62        | 35.55          | 74                  | 38.45       | peak     |
| 4880            | 53.57             | V            | -18.62        | 34.95          | 74                  | 39.05       | peak     |



Test channel: Highest channel

| Frequency (MHz) | Read Level (dBμV) | polarization | Factor (dB/m) | Level (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) | Detector |
|-----------------|-------------------|--------------|---------------|----------------|---------------------|-------------|----------|
| 2483.5          | 73.48             | H            | -22.2         | 51.28          | 74                  | 22.72       | peak     |
| 2483.5          | 59.53             | V            | -22.2         | 37.33          | 74                  | 36.67       | peak     |
| 2484.28         | 75.81             | H            | -22.2         | 53.61          | 74                  | 20.39       | peak     |
| 2484.14         | 66.32             | V            | -22.2         | 44.12          | 74                  | 29.88       | peak     |
| 2486.08         | 74.37             | H            | -22.19        | 52.18          | 74                  | 21.82       | peak     |
| 2488.88         | 62.73             | V            | -22.19        | 40.54          | 74                  | 33.46       | peak     |
| 2490.24         | 68.96             | H            | -22.18        | 46.78          | 74                  | 27.22       | peak     |
| 2495.96         | 61.78             | V            | -22.18        | 39.6           | 74                  | 34.4        | peak     |
| 2496.32         | 69.11             | H            | -22.18        | 46.93          | 74                  | 27.07       | peak     |
| 2500            | 59.3              | H            | -22.17        | 37.13          | 74                  | 36.87       | peak     |
| 2500            | 58.41             | V            | -22.17        | 36.24          | 74                  | 37.76       | peak     |
| 4960            | 55.4              | H            | -18.38        | 37.02          | 74                  | 36.98       | peak     |
| 4960            | 54.77             | V            | -18.38        | 36.39          | 74                  | 37.61       | peak     |

Remarks:

1. Level = Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. If the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in above table if the peak value complies with average limit.

----- THE END OF TEST REPORT -----