



# FCC TEST REPORT

## FCC ID:2BFSQ-WL310

Report Number.....: ZKT-240415L3773-1

Date of Test..... Mar. 23, 2024 to Apr. 19, 2024

Date of issue.....: Apr. 19, 2024

Total number of pages..... 112

Test Result .....: PASS

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

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

**Applicant's name .....: Shenzhen Weizhi Internet Technology Co.,Ltd**

Address .....: 607B, Building B, Jiading Industrial Zone, Langkou Community, Dalang Street, Longhua District, Shenzhen City, China

**Manufacturer's name .....: Shenzhen Weizhi Internet Technology Co.,Ltd**

Address .....: 607B, Building B, Jiading Industrial Zone, Langkou Community, Dalang Street, Longhua District, Shenzhen City, China

Test specification:

Standard.....: FCC CFR Title 47 Part 15 Subpart C Section 15.247  
ANSI C63.10:2013

Test procedure.....: /

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

**Test Report Form No.....: TRF-EL-111\_V0**

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

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

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

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**Product name.....: wifi router**

Trademark .....: N/A

Model/Type reference.....: Refer to Section 3.1

Ratings.....: DC 12V from adapter



**Testing procedure and testing location:**

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

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

**Tested by (name + signature).....: Alen He**

**Reviewer (name + signature).....: Joe Liu**

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



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1. VERSION

| ReportNo.         | Version | Description             | Approved      |
|-------------------|---------|-------------------------|---------------|
| ZKT-240415L3773-1 | Rev.01  | Initial issue of report | Apr. 19, 2024 |
|                   |         |                         |               |
|                   |         |                         |               |



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.247) , Subpart C<br>KDB 558074 D01 |                                  |        |        |
|---------------------------------------------------|----------------------------------|--------|--------|
| Standard Section                                  | Test Item                        | Result | Remark |
| FCC part 15.203/15.247 (c)                        | Antenna requirement              | PASS   |        |
| FCC part 15.207                                   | AC Power Line Conducted Emission | PASS   |        |
| FCC part 15.247 (b)(3)                            | Conducted Peak Output Power      | PASS   |        |
| FCC part 15.247 (a)(2)                            | Channel Bandwidth&               | PASS   |        |
| FCC part 15.247 (e)                               | Power Spectral Density           | PASS   |        |
| FCC part 15.247(d)                                | Band Edge                        | PASS   |        |
| FCC part 15.247(d)                                | Conducted Spurious Emission      | PASS   |        |
| FCC part 15.205/15.209                            | Spurious Emission                | PASS   |        |

NOTE:

- (1) " N/A" denotes test is not applicable in this Test Report
- (2) KDB 662911 D01 Multiple Transmitter Output v02r01



## 2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

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

FCC Test Firm Registration Number: 692225

Designation Number: CN1299

IC Registered No.: 27033

## 2.2 MEASUREMENT UNCERTAINTY

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

| No. | Item                                              | Uncertainty |
|-----|---------------------------------------------------|-------------|
| 1   | 3m camber Radiated spurious emission(9KHz-30MHz)  | U=4.5dB     |
| 2   | 3m camber Radiated spurious emission(30MHz-1GHz)  | U=4.8dB     |
| 3   | 3m chamber Radiated spurious emission(1GHz-6GHz)  | U=4.9dB     |
| 4   | 3m chamber Radiated spurious emission(6GHz-40GHz) | U=5.0dB     |
| 5   | Conducted disturbance                             | U=3.2dB     |
| 6   | RF Band Edge                                      | U=1.68dB    |
| 7   | RF power conducted                                | U=1.86dB    |
| 8   | RF conducted Spurious Emission                    | U=2.2dB     |
| 9   | RF Occupied Bandwidth                             | U=1.8dB     |
| 10  | RF Power Spectral Density                         | U=1.75dB    |
| 11  | humidity uncertainty                              | U=5.3%      |
| 12  | Temperature uncertainty                           | U=0.59°C    |



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                        |                                                                                                                                                                                                                                                                                                                                                            |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:          | wifi router                                                                                                                                                                                                                                                                                                                                                |
| Model No.:             | WL211, WL212, WL213, WL214, WL215, WL216, WL217, WL218, WL219, WL231, WL281, WL282, WL283, WL284, WL285, WL286, WL287, WL288, WL289, WL300, WL301, WL302, WL303, WL304, WL305, WL306, WL307, WL308, WL309, WL310, WL316, WL317, WL318, WL319, WR1200S, WR1800K, WR3000K, WR200, ZW100, XD1800K(M), MS1200K(M), MS1800K(M), 5G-CPE1801K, PW100, X40, U9, M9 |
| Model Different.:      | Only the model names are different.(Main test model: WL310)                                                                                                                                                                                                                                                                                                |
| Serial No.:            | N/A                                                                                                                                                                                                                                                                                                                                                        |
| Hardware Version:      | V1.0                                                                                                                                                                                                                                                                                                                                                       |
| Software Version:      | V1.0                                                                                                                                                                                                                                                                                                                                                       |
| Sample(s) Status:      | Engineer sample                                                                                                                                                                                                                                                                                                                                            |
| Channel numbers:       | 802.11b/802.11g /802.11n(HT20):11<br>802.11n(HT40):9                                                                                                                                                                                                                                                                                                       |
| Channel separation:    | 5MHz                                                                                                                                                                                                                                                                                                                                                       |
| Modulation technology: | 802.11b: Direct Sequence Spread Spectrum(DSSS)<br>802.11g/802.11n(H20)/802.11n(H40)<br>Orthogonal Frequency Division Multiplexing(OFDM)                                                                                                                                                                                                                    |
| Antenna Type:          | External detachable antenna                                                                                                                                                                                                                                                                                                                                |
| Antenna gain:          | ANT 0: 5.28dBi<br>ANT 1: 5.28dBi                                                                                                                                                                                                                                                                                                                           |
| Power supply:          | DC 12V from adapter                                                                                                                                                                                                                                                                                                                                        |
| Adapter:               | Input:100-240V~ 50/60Hz 0.8A max<br>Output:12V---2.0A                                                                                                                                                                                                                                                                                                      |

| Operation Frequency each of channel |           |             |           |             |           |             |           |
|-------------------------------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| Channel                             | Frequency | Chann<br>el | Frequency | Chann<br>el | Frequency | Chann<br>el | Frequency |
| 1                                   | 2412MHz   | 4           | 2427MHz   | 7           | 2442MHz   | 10          | 2457MHz   |
| 2                                   | 2417MHz   | 5           | 2432MHz   | 8           | 2447MHz   | 11          | 2462MHz   |
| 3                                   | 2422MHz   | 6           | 2437MHz   | 9           | 2452MHz   |             |           |

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:





| Test channel    | Frequency (MHz)               |               |
|-----------------|-------------------------------|---------------|
|                 | 802.11b/802.11g/802.11n(HT20) | 802.11n(HT40) |
| Lowest channel  | 2412MHz                       | 2422MHz       |
| Middle channel  | 2437MHz                       | 2437MHz       |
| Highest channel | 2462MHz                       | 2452MHz       |

### 3.2 DESCRIPTION OF TEST MODES

|                                                                                                                                                                                                                                                          |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                                        | Keep the EUT in continuously transmitting mode |
| Remark: During the test,the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. |                                                |

|                                                                                                                                                                                                              |         |         |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------------|---------------|
| We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows: |         |         |               |               |
| Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.                                                                                                         |         |         |               |               |
| Mode                                                                                                                                                                                                         | 802.11b | 802.11g | 802.11n(HT20) | 802.11n(HT40) |
| Data rate                                                                                                                                                                                                    | 1Mbps   | 6Mbps   | 6.5Mbps       | 13.5Mbps      |

|                   |                |
|-------------------|----------------|
| Test Software     | WIFI Test tool |
| Power level setup | <13dBm         |

### 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Conducted Emission



#### Radiated Emission



#### Conducted Spurious



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

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

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------|-----------|----------------|------------|------|
| /    | /         | /         | /              | /          | /    |
|      |           |           |                |            |      |
|      |           |           |                |            |      |



| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



### 3.5EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Radiation Test equipment

| Item | Equipment                         | Manufacturer   | Type No.        | Serial No.         | Firmware Version | Last calibration | Calibrated until |
|------|-----------------------------------|----------------|-----------------|--------------------|------------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz)  | KEYSIGHT       | 9020A           | MY55370835         | A.17.05          | Nov. 02, 2023    | Nov. 01, 2024    |
| 2    | Spectrum Analyzer (10kHz-39.9GHz) | R&S            | FSV40-N         | 100363             | 1.71 SP2         | Nov. 02, 2023    | Nov. 01, 2024    |
| 3    | EMI Test Receiver (9kHz-7GHz)     | R&S            | ESCI7           | 100969             | 4.32             | Nov. 02, 2023    | Nov. 01, 2024    |
| 4    | Bilog Antenna (30MHz-1500MHz)     | Schwarzbeck    | VULB9168        | N/A                | N/A              | Nov. 13, 2023    | Nov. 12, 2024    |
| 5    | Horn Antenna (1GHz-18GHz)         | Agilent        | AH-118          | 071145             | N/A              | Nov. 13, 2023    | Nov. 12, 2024    |
| 6    | Horn Antenna (15GHz-40GHz)        | A.H.System     | SAS-574         | 588                | N/A              | Nov. 13, 2023    | Nov. 12, 2024    |
| 7    | Loop Antenna                      | TESEQ          | HLA6121         | 58357              | N/A              | Nov. 16, 2023    | Nov. 15, 2024    |
| 8    | Amplifier (30-1000MHz)            | EM Electronics | EM330 Amplifier | 60747              | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 9    | Amplifier (1GHz-26.5GHz)          | HuiPu          | 8449B           | 3008A00315         | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 10   | Amplifier (500MHz-40GHz)          | QuanJuDa       | DLE-161         | 097                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 11   | Test Cable                        | N/A            | R-01            | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 12   | Test Cable                        | N/A            | R-02            | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 13   | Test Cable                        | N/A            | R-03            | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 14   | Test Cable                        | N/A            | RF-01           | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 15   | Test Cable                        | N/A            | RF-02           | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 16   | Test Cable                        | N/A            | RF-03           | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 17   | ESG Signal Generator              | Agilent        | E4421B          | N/A                | B.03.84          | Nov. 02, 2023    | Nov. 01, 2024    |
| 18   | Signal Generator                  | Agilent        | N5182A          | N/A                | A.01.87          | Nov. 02, 2023    | Nov. 01, 2024    |
| 19   | Magnetic Field Probe Tester       | Narda          | ELT-400         | 0-0344             | N/A              | Nov. 16, 2023    | Nov. 15, 2024    |
| 20   | Wideband Radio Communication Test | R&S            | CMW500          | 106504             | V 3.7.22         | Nov. 02, 2023    | Nov. 01, 2024    |
| 21   | MWRF Power Meter Test system      | MW             | MW100-RF CB     | N/A                | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 22   | D.C. Power Supply                 | LongWei        | TPR-6405D       | N/A                | N/A              | \                | \                |
| 23   | EMC Software                      | Frad           | EZ-EMC          | Ver.EMC-CO N 3A1.1 | N/A              | \                | \                |
| 24   | RF Software                       | MW             | MTS8310         | V2.0.0.0           | N/A              | \                | \                |
| 25   | Turntable                         | MF             | MF-7802BS       | N/A                | N/A              | \                | \                |
| 26   | Antenna tower                     | MF             | MF-7802BS       | N/A                | N/A              | \                | \                |



Conducted emissions Test

| Item | Kind of Equipment   | Manufacturer | Type No. | Serial No.        | Firmware Version | Last calibration | Calibrated until |
|------|---------------------|--------------|----------|-------------------|------------------|------------------|------------------|
| 1    | LISN                | R&S          | ENV216   | 101471            | N/A              | Nov. 14, 2023    | Nov. 13, 2024    |
| 2    | LISN                | CYBERTEK     | EM5040A  | E1850400149       | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 3    | Test Cable          | N/A          | C-01     | N/A               | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 4    | Test Cable          | N/A          | C-02     | N/A               | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 5    | Test Cable          | N/A          | C-03     | N/A               | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 6    | EMI Test Receiver   | R&S          | ESCI3    | 101393            | 4.42 SP3         | Nov. 02, 2023    | Nov. 01, 2024    |
| 7    | Triple-Loop Antenna | N/A          | RF300    | N/A               | N/A              | Nov. 02, 2023    | Nov. 01, 2024    |
| 8    | Absorbing Clamp     | DZ           | ZN23201  | 15034             | N/A              | Nov. 07, 2023    | Nov. 06, 2024    |
| 9    | EMC Software        | Frad         | EZ-EMC   | Ver.EMC-CON 3A1.1 | N/A              | \                | \                |



#### 4. EMC EMISSION TEST

##### 4.1 CONDUCTED EMISSION MEASUREMENT

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

##### 4.1.1 POWER LINE CONDUCTED EMISSION Limits

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

Note:

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

##### 4.1.2 TEST PROCEDURE

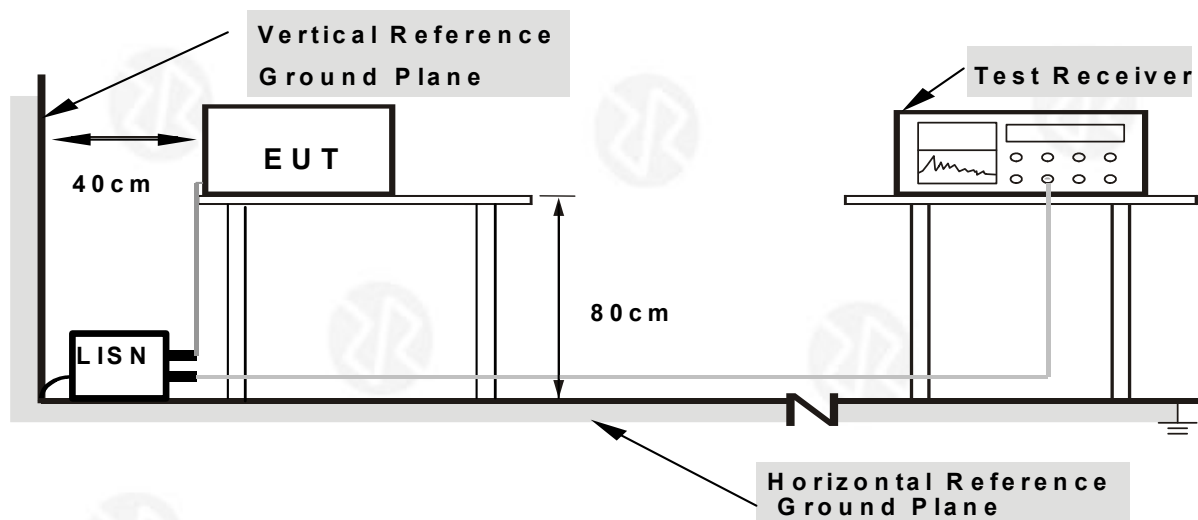
- The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.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

##### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.1.4 TEST SETUP



**Note: 1. Support units were connected to second LISN.**

**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

#### 4.1.5 EUT OPERATING CONDITIONS

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

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

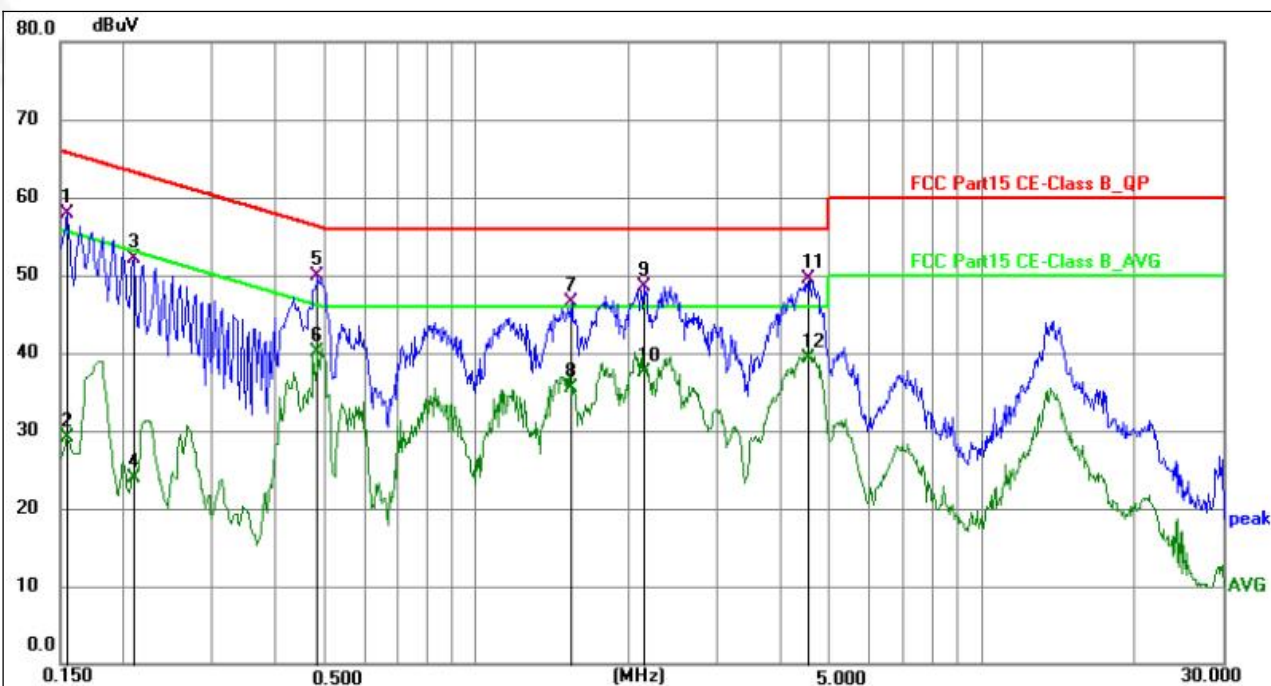
#### 4.1.6 TEST RESULTS PASS





#### 4.1.6 Test Result

|                |              |                    |                                          |
|----------------|--------------|--------------------|------------------------------------------|
| Temperature :  | 26℃          | Relative Humidity: | 54%                                      |
| Pressure :     | 101kPa       | Phase :            | L                                        |
| Test Voltage : | AC 120V/60Hz |                    | 802.11b 2412MHz TX<br>(Worst case ant 0) |



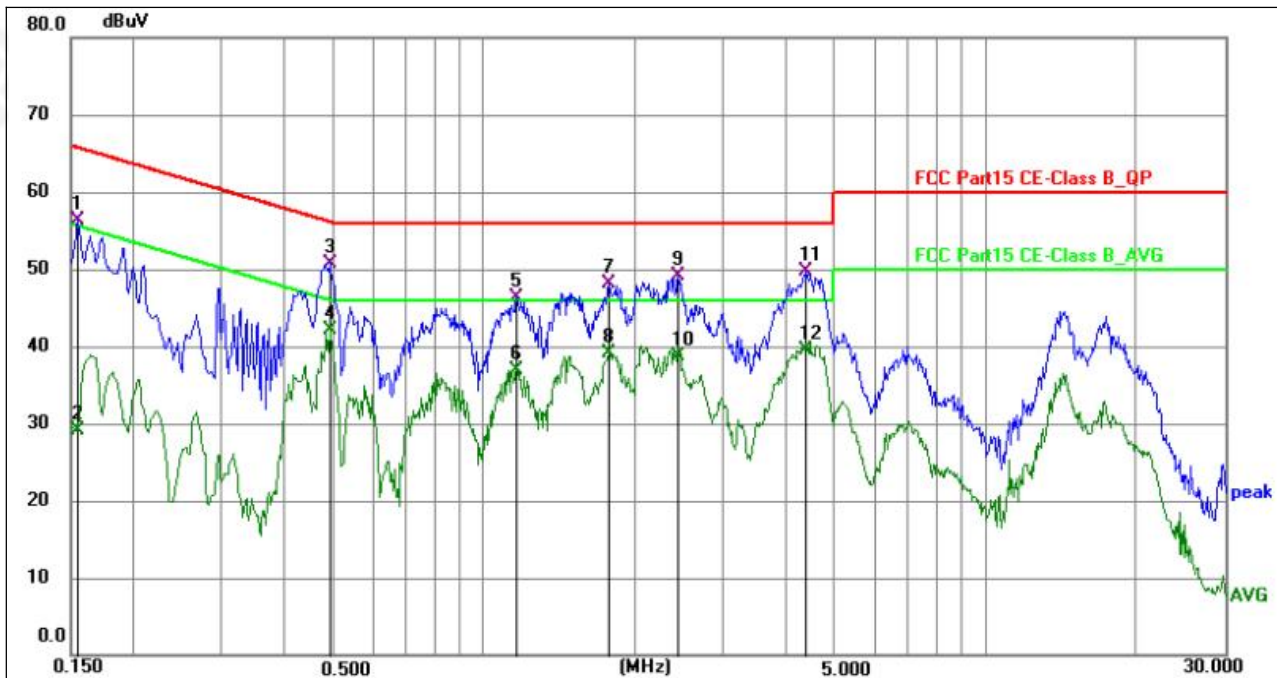
| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1544          | 48.33          | 9.53        | 57.86        | 65.76        | -7.90       | QP       | P   |        |
| 2   | 0.1544          | 19.61          | 9.53        | 29.14        | 55.76        | -26.62      | AVG      | P   |        |
| 3   | 0.2084          | 42.42          | 9.71        | 52.13        | 63.27        | -11.14      | QP       | P   |        |
| 4   | 0.2084          | 14.29          | 9.71        | 24.00        | 53.27        | -29.27      | AVG      | P   |        |
| 5   | 0.4828          | 40.23          | 9.62        | 49.85        | 56.29        | -6.44       | QP       | P   |        |
| 6 * | 0.4828          | 30.39          | 9.62        | 40.01        | 46.29        | -6.28       | AVG      | P   |        |
| 7   | 1.5494          | 36.81          | 9.63        | 46.44        | 56.00        | -9.56       | QP       | P   |        |
| 8   | 1.5494          | 25.93          | 9.63        | 35.56        | 46.00        | -10.44      | AVG      | P   |        |
| 9   | 2.1524          | 38.86          | 9.70        | 48.56        | 56.00        | -7.44       | QP       | P   |        |
| 10  | 2.1524          | 27.88          | 9.70        | 37.58        | 46.00        | -8.42       | AVG      | P   |        |
| 11  | 4.5734          | 39.97          | 9.53        | 49.50        | 56.00        | -6.50       | QP       | P   |        |
| 12  | 4.5734          | 29.79          | 9.53        | 39.32        | 46.00        | -6.68       | AVG      | P   |        |

#### Notes:

- 1.An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3.Measurement Level = Reading level + Correct Factor



|                |              |                    |                                          |
|----------------|--------------|--------------------|------------------------------------------|
| Temperature :  | 26°C         | Relative Humidity: | 54%                                      |
| Pressure :     | 101kPa       | Phase :            | N                                        |
| Test Voltage : | AC 120V/60Hz |                    | 802.11b 2412MHz TX<br>(Worst case ant 0) |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|-------------|--------------|--------------|-------------|----------|-----|--------|
| 1   | 0.1544          | 46.68          | 9.53        | 56.21        | 65.76        | -9.55       | QP       | P   |        |
| 2   | 0.1544          | 19.54          | 9.53        | 29.07        | 55.76        | -26.69      | AVG      | P   |        |
| 3   | 0.4919          | 41.06          | 9.61        | 50.67        | 56.14        | -5.47       | QP       | P   |        |
| 4 * | 0.4919          | 32.42          | 9.61        | 42.03        | 46.14        | -4.11       | AVG      | P   |        |
| 5   | 1.1625          | 36.72          | 9.55        | 46.27        | 56.00        | -9.73       | QP       | P   |        |
| 6   | 1.1625          | 27.29          | 9.55        | 36.84        | 46.00        | -9.16       | AVG      | P   |        |
| 7   | 1.7744          | 38.47          | 9.67        | 48.14        | 56.00        | -7.86       | QP       | P   |        |
| 8   | 1.7744          | 29.50          | 9.67        | 39.17        | 46.00        | -6.83       | AVG      | P   |        |
| 9   | 2.4359          | 39.50          | 9.68        | 49.18        | 56.00        | -6.82       | QP       | P   |        |
| 10  | 2.4359          | 28.94          | 9.68        | 38.62        | 46.00        | -7.38       | AVG      | P   |        |
| 11  | 4.4069          | 40.26          | 9.53        | 49.79        | 56.00        | -6.21       | QP       | P   |        |
| 12  | 4.4069          | 30.07          | 9.53        | 39.60        | 46.00        | -6.40       | AVG      | P   |        |

Notes:

- 1.An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3.Measurement Level = Reading level + Correct Factor





#### 4.2 RADIATED EMISSION MEASUREMENT

|                       |                             |            |        |        |            |
|-----------------------|-----------------------------|------------|--------|--------|------------|
| Test Requirement:     | FCC Part15 C Section 15.209 |            |        |        |            |
| Test Method:          | ANSI C63.10:2013            |            |        |        |            |
| Test Frequency Range: | 9kHz to 25GHz               |            |        |        |            |
| Test site:            | Measurement Distance: 3m    |            |        |        |            |
| Receiver setup:       | Frequency                   | Detector   | RBW    | VBW    | Value      |
|                       | 9KHz-150KHz                 | Quasi-peak | 200Hz  | 600Hz  | Quasi-peak |
|                       | 150KHz-30MHz                | Quasi-peak | 9KHz   | 30KHz  | Quasi-peak |
|                       | 30MHz-1GHz                  | Quasi-peak | 100KHz | 300KHz | Quasi-peak |
|                       | Above 1GHz                  | Peak       | 1MHz   | 3MHz   | Peak       |
|                       |                             | Peak       | 1MHz   | 10Hz   | Average    |

##### 4.2.1 RADIATED EMISSION LIMITS

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009~0.490          | 2400/F(KHz)                          | 300                              |
| 0.490~1.705          | 24000/F(KHz)                         | 30                               |
| 1.705~30.0           | 30                                   | 30                               |
| 30~88                | 100                                  | 3                                |
| 88~216               | 150                                  | 3                                |
| 216~960              | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

##### LIMITS OF RADIATED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

##### 4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of variable-height antenna tower.



- c. 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.

Above 1GHz test procedure as below:

- g. Different from above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change from table 0.8 meter to 1.5 meter (Above 18GHz the distance is 1 meter and table is 1.5 meter).
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

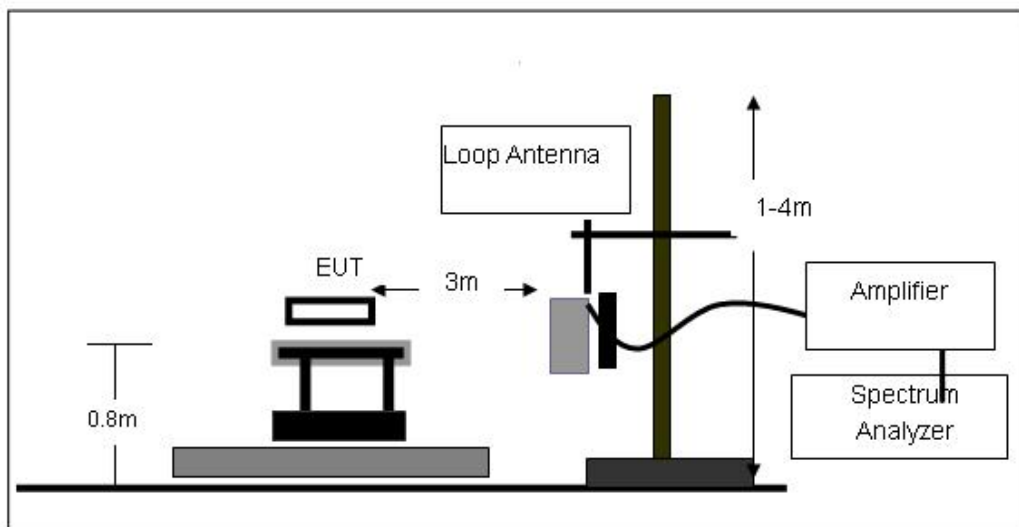
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 4.2.3 DEVIATION FROM TEST STANDARD

No deviation

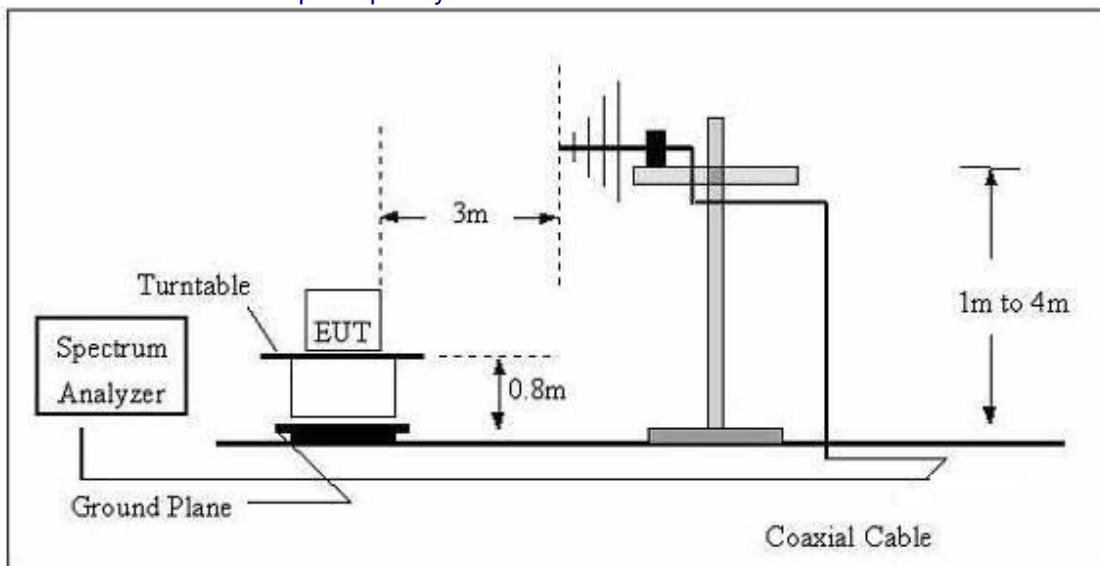
#### 4.2.4 TEST SETUP

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

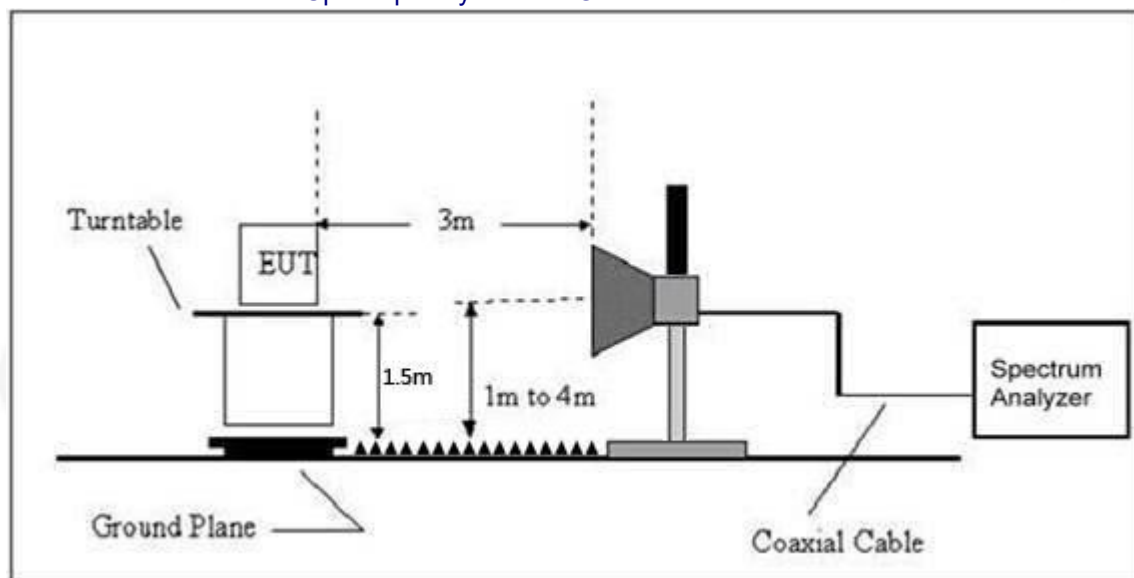




(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.2.6 TEST RESULTS

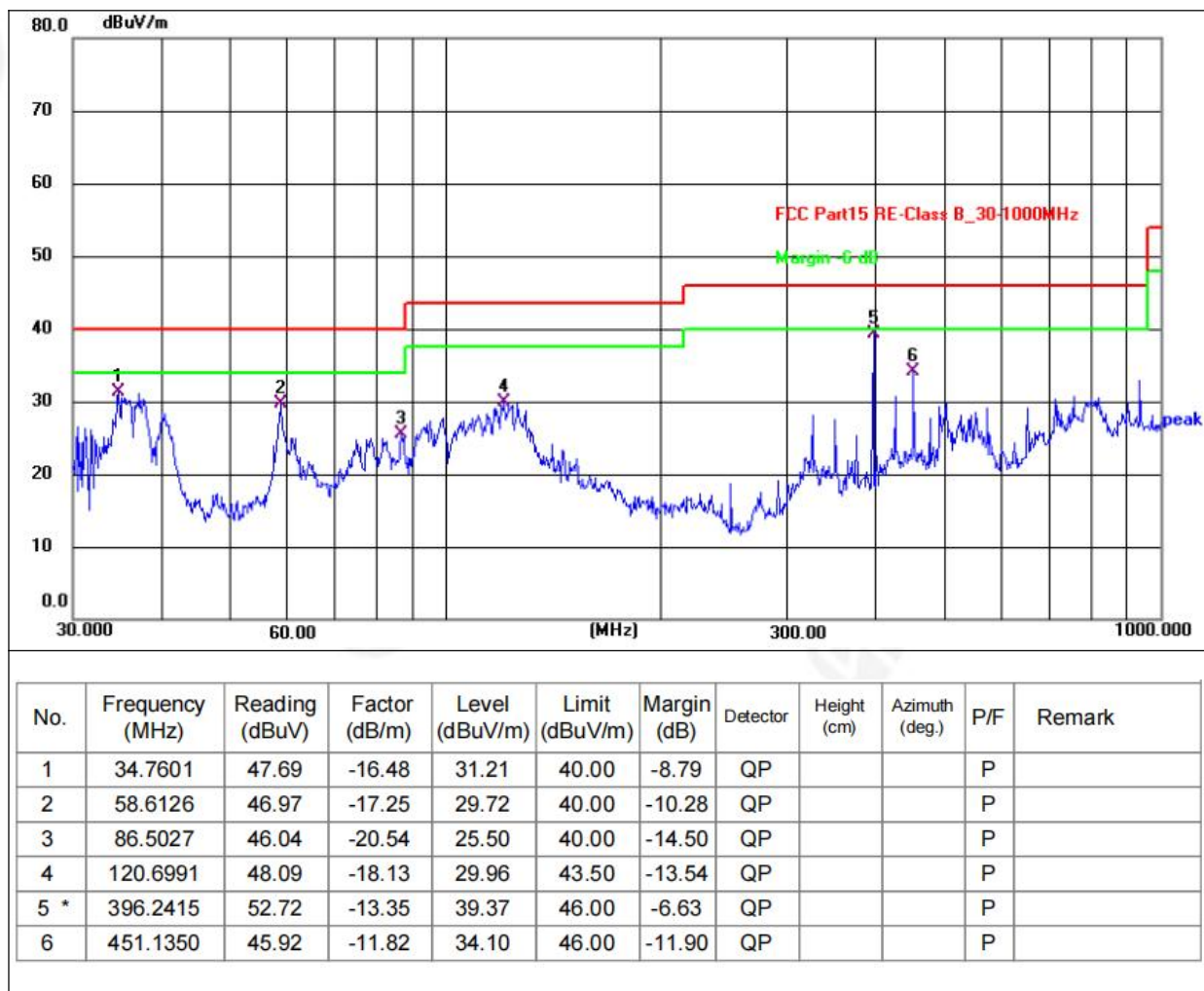
Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.



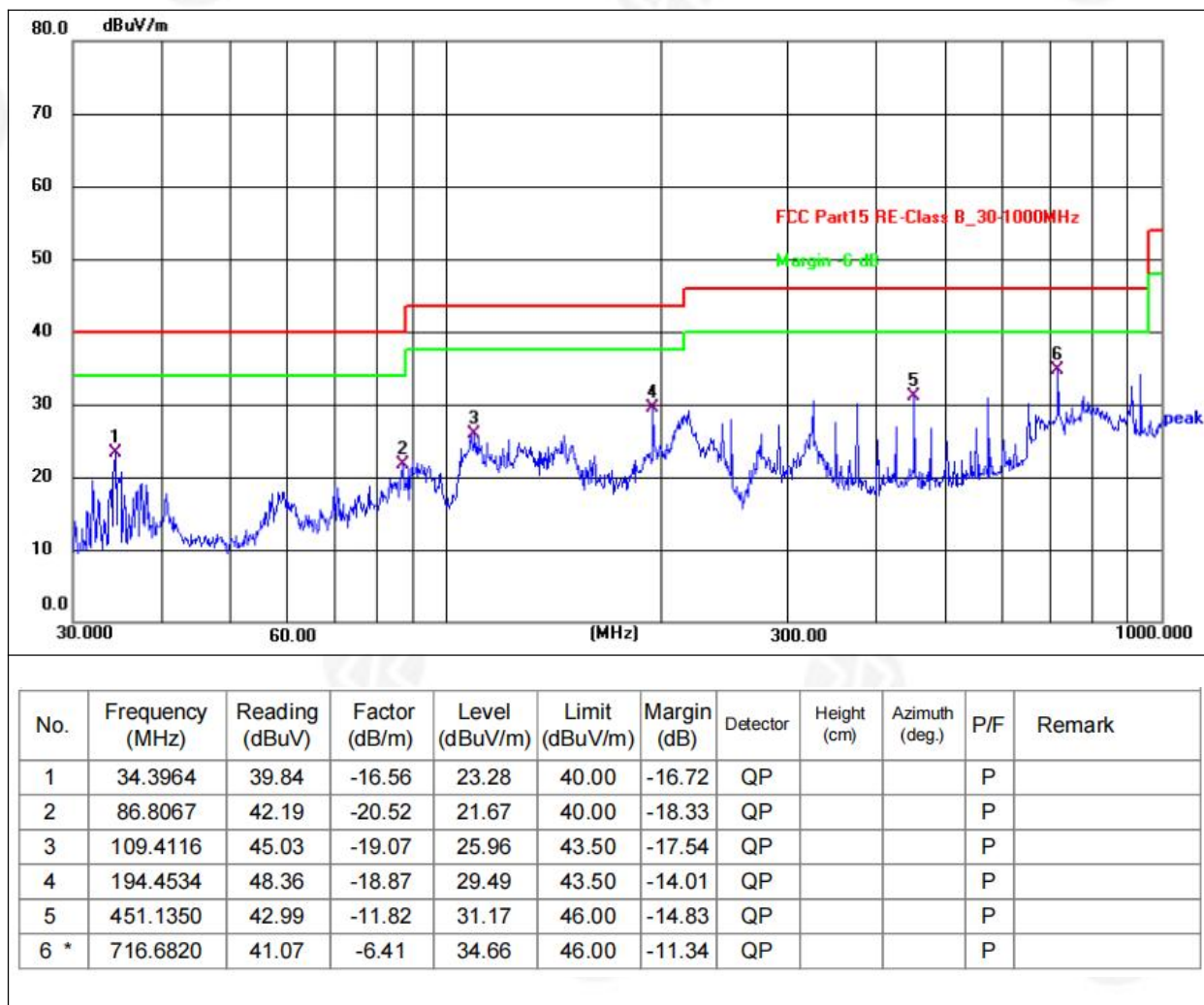
Between 30MHz – 1GHz

|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26℃          | Relative Humidity: | 54%                                     |
| Pressure:     | 101 kPa      | Polarization:      | Horizontal                              |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |





|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26℃          | Relative Humidity: | 54%                                     |
| Pressure:     | 101kPa       | Polarization:      | Vertical                                |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |



Remarks:

- 1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
  - 2.The emission levels of other frequencies are very lower than the limit and not show in test report.
  - 3.The test data shows only the worst case 802.11b mode
- Note:The 802.11b/g ANT0 / 1 is tested, and only the worst mode is reflected in the report





1GHz~25GHz

802.11b ANT 0

| Polar<br>(H/V)      | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|---------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                     | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Low Channel:2412MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                   | 4824.00   | 50.68            | 30.55             | 5.77          | 24.66             | 52.01             | 74.00        | -21.99 | Pk                   |
| V                   | 4824.00   | 43.59            | 30.55             | 5.77          | 24.66             | 43.47             | 54.00        | -10.53 | AV                   |
| V                   | 7236.00   | 53.35            | 30.33             | 6.32          | 24.55             | 53.89             | 74.00        | -20.11 | Pk                   |
| V                   | 7236.00   | 43.06            | 30.33             | 6.32          | 24.55             | 43.60             | 54.00        | -10.40 | AV                   |
| V                   | 9648.00   | 50.68            | 30.85             | 7.45          | 24.69             | 51.97             | 74.00        | -22.03 | Pk                   |
| V                   | 9648.00   | 43.28            | 30.85             | 7.45          | 24.69             | 44.57             | 54.00        | -9.43  | AV                   |
| V                   | 12060.00  | 54.12            | 31.02             | 8.99          | 25.57             | 57.66             | 74.00        | -16.34 | Pk                   |
| V                   | 12060.00  | 43.47            | 31.02             | 8.99          | 25.57             | 47.01             | 54.00        | -6.99  | AV                   |
| H                   | 4824.00   | 53.18            | 30.55             | 5.77          | 24.66             | 53.06             | 74.00        | -20.94 | Pk                   |
| H                   | 4824.00   | 43.70            | 30.55             | 5.77          | 24.66             | 43.58             | 54.00        | -10.42 | AV                   |
| H                   | 7236.00   | 51.94            | 30.33             | 6.32          | 24.55             | 52.48             | 74.00        | -21.52 | Pk                   |
| H                   | 7236.00   | 43.29            | 30.33             | 6.32          | 24.55             | 43.83             | 54.00        | -10.17 | AV                   |
| H                   | 9648.00   | 52.21            | 30.85             | 7.45          | 24.69             | 53.50             | 74.00        | -20.50 | Pk                   |
| H                   | 9648.00   | 43.05            | 30.85             | 7.45          | 24.69             | 44.34             | 54.00        | -9.66  | AV                   |
| H                   | 12060.00  | 54.85            | 31.02             | 8.99          | 25.57             | 58.39             | 74.00        | -15.61 | Pk                   |
| H                   | 12060.00  | 43.89            | 31.02             | 8.99          | 25.57             | 47.43             | 54.00        | -6.57  | AV                   |

| Polar<br>(H/V)         | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|------------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                        | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Middle Channel:2437MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                      | 4874.00   | 52.56            | 30.55             | 5.77          | 24.66             | 52.44             | 74.00        | -21.56 | Pk                   |
| V                      | 4874.00   | 43.12            | 30.55             | 5.77          | 24.66             | 43.00             | 54.00        | -11.00 | AV                   |
| V                      | 7311.00   | 52.27            | 30.33             | 6.32          | 24.55             | 52.81             | 74.00        | -21.19 | Pk                   |
| V                      | 7311.00   | 43.60            | 30.33             | 6.32          | 24.55             | 44.14             | 54.00        | -9.86  | AV                   |
| V                      | 9748.00   | 50.48            | 30.85             | 7.45          | 24.69             | 51.77             | 74.00        | -22.23 | Pk                   |
| V                      | 9748.00   | 43.65            | 30.85             | 7.45          | 24.69             | 44.94             | 54.00        | -9.06  | AV                   |
| V                      | 12185.00  | 53.10            | 31.02             | 8.99          | 25.57             | 56.64             | 74.00        | -17.36 | Pk                   |
| V                      | 12185.00  | 43.73            | 31.02             | 8.99          | 25.57             | 47.27             | 54.00        | -6.73  | AV                   |
| H                      | 4874.00   | 53.03            | 30.55             | 5.77          | 24.66             | 52.91             | 74.00        | -21.09 | Pk                   |
| H                      | 4874.00   | 43.02            | 30.55             | 5.77          | 24.66             | 42.90             | 54.00        | -11.10 | AV                   |
| H                      | 7311.00   | 53.40            | 30.33             | 6.32          | 24.55             | 53.94             | 74.00        | -20.06 | Pk                   |
| H                      | 7311.00   | 43.94            | 30.33             | 6.32          | 24.55             | 44.48             | 54.00        | -9.52  | AV                   |
| H                      | 9748.00   | 50.77            | 30.85             | 7.45          | 24.69             | 52.06             | 74.00        | -21.94 | Pk                   |
| H                      | 9748.00   | 43.54            | 30.85             | 7.45          | 24.69             | 44.83             | 54.00        | -9.17  | AV                   |
| H                      | 12185.00  | 50.77            | 31.02             | 8.99          | 25.57             | 54.31             | 74.00        | -19.69 | Pk                   |
| H                      | 12185.00  | 43.26            | 31.02             | 8.99          | 25.57             | 46.80             | 54.00        | -7.20  | AV                   |





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| Polar<br>(H/V)       | Frequency | Meter<br>Reading | Pre-ampli<br>fier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|----------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                      | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| High Channel:2462MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                    | 4924.00   | 51.74            | 30.55             | 5.77          | 24.66             | 51.62             | 74.00        | -22.38 | Pk                   |
| V                    | 4924.00   | 43.50            | 30.55             | 5.77          | 24.66             | 43.38             | 54.00        | -10.62 | AV                   |
| V                    | 7386.00   | 51.71            | 30.33             | 6.32          | 24.55             | 52.25             | 74.00        | -21.75 | Pk                   |
| V                    | 7386.00   | 43.32            | 30.33             | 6.32          | 24.55             | 43.86             | 54.00        | -10.14 | AV                   |
| V                    | 9848.00   | 53.27            | 30.85             | 7.45          | 24.69             | 54.56             | 74.00        | -19.44 | Pk                   |
| V                    | 9848.00   | 43.88            | 30.85             | 7.45          | 24.69             | 45.17             | 54.00        | -8.83  | AV                   |
| V                    | 12310.00  | 54.62            | 31.02             | 8.99          | 25.57             | 58.16             | 74.00        | -15.84 | Pk                   |
| V                    | 12310.00  | 43.99            | 31.02             | 8.99          | 25.57             | 47.53             | 54.00        | -6.47  | AV                   |
| H                    | 4924.00   | 50.75            | 30.55             | 5.77          | 24.66             | 50.63             | 74.00        | -23.37 | Pk                   |
| H                    | 4924.00   | 43.94            | 30.55             | 5.77          | 24.66             | 43.82             | 54.00        | -10.18 | AV                   |
| H                    | 7386.00   | 50.55            | 30.33             | 6.32          | 24.55             | 51.09             | 74.00        | -22.91 | Pk                   |
| H                    | 7386.00   | 43.88            | 30.33             | 6.32          | 24.55             | 44.42             | 54.00        | -9.58  | AV                   |
| H                    | 9848.00   | 51.88            | 30.85             | 7.45          | 24.69             | 53.17             | 74.00        | -20.83 | Pk                   |
| H                    | 9848.00   | 43.73            | 30.85             | 7.45          | 24.69             | 45.02             | 54.00        | -8.98  | AV                   |
| H                    | 12310.00  | 54.42            | 31.02             | 8.99          | 25.57             | 57.96             | 74.00        | -16.04 | Pk                   |
| H                    | 12310.00  | 43.85            | 31.02             | 8.99          | 25.57             | 47.39             | 54.00        | -6.61  | AV                   |

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11g ANT 0

| Polar<br>(H/V)      | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|---------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                     | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Low Channel:2412MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                   | 4824.00   | 51.55            | 30.55             | 5.77          | 24.66             | 51.43             | 74.00        | -22.57 | Pk                   |
| V                   | 4824.00   | 43.02            | 30.55             | 5.77          | 24.66             | 42.90             | 54.00        | -11.10 | AV                   |
| V                   | 7236.00   | 50.78            | 30.33             | 6.32          | 24.55             | 51.32             | 74.00        | -22.68 | Pk                   |
| V                   | 7236.00   | 43.96            | 30.33             | 6.32          | 24.55             | 44.50             | 54.00        | -9.50  | AV                   |
| V                   | 9648.00   | 51.63            | 30.85             | 7.45          | 24.69             | 52.92             | 74.00        | -21.08 | Pk                   |
| V                   | 9648.00   | 43.66            | 30.85             | 7.45          | 24.69             | 44.95             | 54.00        | -9.05  | AV                   |
| V                   | 12060.00  | 50.26            | 31.02             | 8.99          | 25.57             | 53.80             | 74.00        | -20.20 | Pk                   |
| V                   | 12060.00  | 43.21            | 31.02             | 8.99          | 25.57             | 46.75             | 54.00        | -7.25  | AV                   |
| H                   | 4824.00   | 52.04            | 30.55             | 5.77          | 24.66             | 51.92             | 74.00        | -22.08 | Pk                   |
| H                   | 4824.00   | 43.36            | 30.55             | 5.77          | 24.66             | 43.24             | 54.00        | -10.76 | AV                   |
| H                   | 7236.00   | 54.21            | 30.33             | 6.32          | 24.55             | 54.75             | 74.00        | -19.25 | Pk                   |
| H                   | 7236.00   | 43.99            | 30.33             | 6.32          | 24.55             | 44.53             | 54.00        | -9.47  | AV                   |
| H                   | 9648.00   | 50.60            | 30.85             | 7.45          | 24.69             | 51.89             | 74.00        | -22.11 | Pk                   |
| H                   | 9648.00   | 43.08            | 30.85             | 7.45          | 24.69             | 44.37             | 54.00        | -9.63  | AV                   |
| H                   | 12060.00  | 50.03            | 31.02             | 8.99          | 25.57             | 53.57             | 74.00        | -20.43 | Pk                   |
| H                   | 12060.00  | 43.56            | 31.02             | 8.99          | 25.57             | 47.10             | 54.00        | -6.90  | AV                   |

| Polar<br>(H/V)         | Frequency | Meter<br>Reading | Pre-amp<br>lifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|------------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                        | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Middle Channel:2437MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                      | 4874.00   | 50.56            | 30.55             | 5.77          | 24.66             | 50.44             | 74.00        | -23.56 | Pk                   |
| V                      | 4874.00   | 43.38            | 30.55             | 5.77          | 24.66             | 43.26             | 54.00        | -10.74 | AV                   |
| V                      | 7311.00   | 53.75            | 30.33             | 6.32          | 24.55             | 54.29             | 74.00        | -19.71 | Pk                   |
| V                      | 7311.00   | 43.13            | 30.33             | 6.32          | 24.55             | 43.67             | 54.00        | -10.33 | AV                   |
| V                      | 9748.00   | 52.16            | 30.85             | 7.45          | 24.69             | 53.45             | 74.00        | -20.55 | Pk                   |
| V                      | 9748.00   | 43.85            | 30.85             | 7.45          | 24.69             | 45.14             | 54.00        | -8.86  | AV                   |
| V                      | 12185.00  | 51.14            | 31.02             | 8.99          | 25.57             | 54.68             | 74.00        | -19.32 | Pk                   |
| V                      | 12185.00  | 43.13            | 31.02             | 8.99          | 25.57             | 46.67             | 54.00        | -7.33  | AV                   |
| H                      | 4874.00   | 52.87            | 30.55             | 5.77          | 24.66             | 52.75             | 74.00        | -21.25 | Pk                   |
| H                      | 4874.00   | 43.56            | 30.55             | 5.77          | 24.66             | 43.44             | 54.00        | -10.56 | AV                   |
| H                      | 7311.00   | 53.22            | 30.33             | 6.32          | 24.55             | 53.76             | 74.00        | -20.24 | Pk                   |
| H                      | 7311.00   | 43.35            | 30.33             | 6.32          | 24.55             | 43.89             | 54.00        | -10.11 | AV                   |
| H                      | 9748.00   | 51.00            | 30.85             | 7.45          | 24.69             | 52.29             | 74.00        | -21.71 | Pk                   |
| H                      | 9748.00   | 43.87            | 30.85             | 7.45          | 24.69             | 45.16             | 54.00        | -8.84  | AV                   |
| H                      | 12185.00  | 54.44            | 31.02             | 8.99          | 25.57             | 57.98             | 74.00        | -16.02 | Pk                   |
| H                      | 12185.00  | 43.70            | 31.02             | 8.99          | 25.57             | 47.24             | 54.00        | -6.76  | AV                   |



| Polar<br>(H/V)       | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|----------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                      | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| High Channel:2462MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                    | 4924.00   | 52.10            | 30.55             | 5.77          | 24.66             | 51.98             | 74.00        | -22.02 | Pk                   |
| V                    | 4924.00   | 43.83            | 30.55             | 5.77          | 24.66             | 43.71             | 54.00        | -10.29 | AV                   |
| V                    | 7386.00   | 50.18            | 30.33             | 6.32          | 24.55             | 50.72             | 74.00        | -23.28 | Pk                   |
| V                    | 7386.00   | 43.80            | 30.33             | 6.32          | 24.55             | 44.34             | 54.00        | -9.66  | AV                   |
| V                    | 9848.00   | 53.30            | 30.85             | 7.45          | 24.69             | 54.59             | 74.00        | -19.41 | Pk                   |
| V                    | 9848.00   | 43.57            | 30.85             | 7.45          | 24.69             | 44.86             | 54.00        | -9.14  | AV                   |
| V                    | 12310.00  | 50.95            | 31.02             | 8.99          | 25.57             | 54.49             | 74.00        | -19.51 | Pk                   |
| V                    | 12310.00  | 43.89            | 31.02             | 8.99          | 25.57             | 47.43             | 54.00        | -6.57  | AV                   |
| H                    | 4924.00   | 50.95            | 30.55             | 5.77          | 24.66             | 50.83             | 74.00        | -23.17 | Pk                   |
| H                    | 4924.00   | 43.27            | 30.55             | 5.77          | 24.66             | 43.15             | 54.00        | -10.85 | AV                   |
| H                    | 7386.00   | 53.84            | 30.33             | 6.32          | 24.55             | 54.38             | 74.00        | -19.62 | Pk                   |
| H                    | 7386.00   | 43.30            | 30.33             | 6.32          | 24.55             | 43.84             | 54.00        | -10.16 | AV                   |
| H                    | 9848.00   | 50.81            | 30.85             | 7.45          | 24.69             | 52.10             | 74.00        | -21.90 | Pk                   |
| H                    | 9848.00   | 43.96            | 30.85             | 7.45          | 24.69             | 45.25             | 54.00        | -8.75  | AV                   |
| H                    | 12310.00  | 52.74            | 31.02             | 8.99          | 25.57             | 56.28             | 74.00        | -17.72 | Pk                   |
| H                    | 12310.00  | 43.05            | 31.02             | 8.99          | 25.57             | 46.59             | 54.00        | -7.41  | AV                   |

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n20 MIMO

| Polar<br>(H/V)      | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|---------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                     | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Low Channel:2412MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                   | 4824.00   | 54.81            | 30.55             | 5.77          | 24.66             | 54.69             | 74.00        | -19.31 | Pk                   |
| V                   | 4824.00   | 43.72            | 30.55             | 5.77          | 24.66             | 43.60             | 54.00        | -10.40 | AV                   |
| V                   | 7236.00   | 51.99            | 30.33             | 6.32          | 24.55             | 52.53             | 74.00        | -21.47 | Pk                   |
| V                   | 7236.00   | 43.00            | 30.33             | 6.32          | 24.55             | 43.54             | 54.00        | -10.46 | AV                   |
| V                   | 9648.00   | 53.87            | 30.85             | 7.45          | 24.69             | 55.16             | 74.00        | -18.84 | Pk                   |
| V                   | 9648.00   | 43.73            | 30.85             | 7.45          | 24.69             | 45.02             | 54.00        | -8.98  | AV                   |
| V                   | 12060.00  | 53.44            | 31.02             | 8.99          | 25.57             | 56.98             | 74.00        | -17.02 | Pk                   |
| V                   | 12060.00  | 43.06            | 31.02             | 8.99          | 25.57             | 46.60             | 54.00        | -7.40  | AV                   |
| H                   | 4824.00   | 50.96            | 30.55             | 5.77          | 24.66             | 50.84             | 74.00        | -23.16 | Pk                   |
| H                   | 4824.00   | 43.27            | 30.55             | 5.77          | 24.66             | 43.15             | 54.00        | -10.85 | AV                   |
| H                   | 7236.00   | 52.18            | 30.33             | 6.32          | 24.55             | 52.72             | 74.00        | -21.28 | Pk                   |
| H                   | 7236.00   | 43.77            | 30.33             | 6.32          | 24.55             | 44.31             | 54.00        | -9.69  | AV                   |
| H                   | 9648.00   | 50.51            | 30.85             | 7.45          | 24.69             | 51.80             | 74.00        | -22.20 | Pk                   |
| H                   | 9648.00   | 43.12            | 30.85             | 7.45          | 24.69             | 44.41             | 54.00        | -9.59  | AV                   |
| H                   | 12060.00  | 52.89            | 31.02             | 8.99          | 25.57             | 56.43             | 74.00        | -17.57 | Pk                   |
| H                   | 12060.00  | 43.41            | 31.02             | 8.99          | 25.57             | 46.95             | 54.00        | -7.05  | AV                   |

| Polar<br>(H/V)         | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|------------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                        | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Middle Channel:2437MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                      | 4874.00   | 53.08            | 30.55             | 5.77          | 24.66             | 52.96             | 74.00        | -21.04 | Pk                   |
| V                      | 4874.00   | 43.04            | 30.55             | 5.77          | 24.66             | 42.92             | 54.00        | -11.08 | AV                   |
| V                      | 7311.00   | 54.15            | 30.33             | 6.32          | 24.55             | 54.69             | 74.00        | -19.31 | Pk                   |
| V                      | 7311.00   | 43.46            | 30.33             | 6.32          | 24.55             | 44.00             | 54.00        | -10.00 | AV                   |
| V                      | 9748.00   | 50.24            | 30.85             | 7.45          | 24.69             | 51.53             | 74.00        | -22.47 | Pk                   |
| V                      | 9748.00   | 43.68            | 30.85             | 7.45          | 24.69             | 44.97             | 54.00        | -9.03  | AV                   |
| V                      | 12185.00  | 54.86            | 31.02             | 8.99          | 25.57             | 58.40             | 74.00        | -15.60 | Pk                   |
| V                      | 12185.00  | 43.24            | 31.02             | 8.99          | 25.57             | 46.78             | 54.00        | -7.22  | AV                   |
| H                      | 4874.00   | 54.87            | 30.55             | 5.77          | 24.66             | 54.75             | 74.00        | -19.25 | Pk                   |
| H                      | 4874.00   | 43.09            | 30.55             | 5.77          | 24.66             | 42.97             | 54.00        | -11.03 | AV                   |
| H                      | 7311.00   | 50.95            | 30.33             | 6.32          | 24.55             | 51.49             | 74.00        | -22.51 | Pk                   |
| H                      | 7311.00   | 43.42            | 30.33             | 6.32          | 24.55             | 43.96             | 54.00        | -10.04 | AV                   |
| H                      | 9748.00   | 53.29            | 30.85             | 7.45          | 24.69             | 54.58             | 74.00        | -19.42 | Pk                   |
| H                      | 9748.00   | 43.66            | 30.85             | 7.45          | 24.69             | 44.95             | 54.00        | -9.05  | AV                   |
| H                      | 12185.00  | 52.85            | 31.02             | 8.99          | 25.57             | 56.39             | 74.00        | -17.61 | Pk                   |
| H                      | 12185.00  | 43.83            | 31.02             | 8.99          | 25.57             | 47.37             | 54.00        | -6.63  | AV                   |



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| Polar<br>(H/V)       | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|----------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                      | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| High Channel:2462MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                    | 4924.00   | 50.79            | 30.55             | 5.77          | 24.66             | 50.67             | 74.00        | -23.33 | Pk                   |
| V                    | 4924.00   | 43.83            | 30.55             | 5.77          | 24.66             | 43.71             | 54.00        | -10.29 | AV                   |
| V                    | 7386.00   | 52.39            | 30.33             | 6.32          | 24.55             | 52.93             | 74.00        | -21.07 | Pk                   |
| V                    | 7386.00   | 43.04            | 30.33             | 6.32          | 24.55             | 43.58             | 54.00        | -10.42 | AV                   |
| V                    | 9848.00   | 53.07            | 30.85             | 7.45          | 24.69             | 54.36             | 74.00        | -19.64 | Pk                   |
| V                    | 9848.00   | 43.94            | 30.85             | 7.45          | 24.69             | 45.23             | 54.00        | -8.77  | AV                   |
| V                    | 12310.00  | 54.15            | 31.02             | 8.99          | 25.57             | 57.69             | 74.00        | -16.31 | Pk                   |
| V                    | 12310.00  | 43.95            | 31.02             | 8.99          | 25.57             | 47.49             | 54.00        | -6.51  | AV                   |
| H                    | 4924.00   | 50.31            | 30.55             | 5.77          | 24.66             | 50.19             | 74.00        | -23.81 | Pk                   |
| H                    | 4924.00   | 43.40            | 30.55             | 5.77          | 24.66             | 43.28             | 54.00        | -10.72 | AV                   |
| H                    | 7386.00   | 52.65            | 30.33             | 6.32          | 24.55             | 53.19             | 74.00        | -20.81 | Pk                   |
| H                    | 7386.00   | 43.50            | 30.33             | 6.32          | 24.55             | 44.04             | 54.00        | -9.96  | AV                   |
| H                    | 9848.00   | 51.46            | 30.85             | 7.45          | 24.69             | 52.75             | 74.00        | -21.25 | Pk                   |
| H                    | 9848.00   | 43.36            | 30.85             | 7.45          | 24.69             | 44.65             | 54.00        | -9.35  | AV                   |
| H                    | 12310.00  | 51.03            | 31.02             | 8.99          | 25.57             | 54.57             | 74.00        | -19.43 | Pk                   |
| H                    | 12310.00  | 43.33            | 31.02             | 8.99          | 25.57             | 46.87             | 54.00        | -7.13  | AV                   |





802.11n40 MIMO

| Polar<br>(H/V)      | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|---------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                     | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Low Channel:2422MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                   | 4844.00   | 50.71            | 30.55             | 5.77          | 24.66             | 50.59             | 74.00        | -23.41 | Pk                   |
| V                   | 4844.00   | 43.79            | 30.55             | 5.77          | 24.66             | 43.67             | 54.00        | -10.33 | AV                   |
| V                   | 7266.00   | 51.54            | 30.33             | 6.32          | 24.55             | 52.08             | 74.00        | -21.92 | Pk                   |
| V                   | 7266.00   | 43.90            | 30.33             | 6.32          | 24.55             | 44.44             | 54.00        | -9.56  | AV                   |
| V                   | 9688.00   | 51.73            | 30.85             | 7.45          | 24.69             | 53.02             | 74.00        | -20.98 | Pk                   |
| V                   | 9688.00   | 43.08            | 30.85             | 7.45          | 24.69             | 44.37             | 54.00        | -9.63  | AV                   |
| V                   | 12110.00  | 53.90            | 31.02             | 8.99          | 25.57             | 57.44             | 74.00        | -16.56 | Pk                   |
| V                   | 12110.00  | 43.89            | 31.02             | 8.99          | 25.57             | 47.43             | 54.00        | -6.57  | AV                   |
| H                   | 4844.00   | 50.98            | 30.55             | 5.77          | 24.66             | 50.86             | 74.00        | -23.14 | Pk                   |
| H                   | 4844.00   | 43.10            | 30.55             | 5.77          | 24.66             | 42.98             | 54.00        | -11.02 | AV                   |
| H                   | 7266.00   | 51.70            | 30.33             | 6.32          | 24.55             | 52.24             | 74.00        | -21.76 | Pk                   |
| H                   | 7266.00   | 43.39            | 30.33             | 6.32          | 24.55             | 43.93             | 54.00        | -10.07 | AV                   |
| H                   | 9688.00   | 50.58            | 30.85             | 7.45          | 24.69             | 51.87             | 74.00        | -22.13 | Pk                   |
| H                   | 9688.00   | 43.20            | 30.85             | 7.45          | 24.69             | 44.49             | 54.00        | -9.51  | AV                   |
| H                   | 12110.00  | 52.43            | 31.02             | 8.99          | 25.57             | 55.97             | 74.00        | -18.03 | Pk                   |
| H                   | 12110.00  | 43.07            | 31.02             | 8.99          | 25.57             | 46.61             | 54.00        | -7.39  | AV                   |

| Polar<br>(H/V)         | Frequency | Meter<br>Reading | Pre-ampl<br>ifier | Cable<br>Loss | Antenna<br>Factor | Emission<br>Level | Limits       | Margin | Detect<br>or<br>Type |
|------------------------|-----------|------------------|-------------------|---------------|-------------------|-------------------|--------------|--------|----------------------|
|                        | (MHz)     | (dBuV)           | (dB)              | (dB)          | (dB)              | (dBuV/m)          | (dBuV/<br>m) | (dB)   |                      |
| Middle Channel:2437MHz |           |                  |                   |               |                   |                   |              |        |                      |
| V                      | 4874.00   | 50.30            | 30.55             | 5.77          | 24.66             | 52.23             | 74.00        | -21.77 | Pk                   |
| V                      | 4874.00   | 43.28            | 30.55             | 5.77          | 24.66             | 43.48             | 54.00        | -10.52 | AV                   |
| V                      | 7311.00   | 51.89            | 30.33             | 6.32          | 24.55             | 54.16             | 74.00        | -19.84 | Pk                   |
| V                      | 7311.00   | 43.52            | 30.33             | 6.32          | 24.55             | 43.66             | 54.00        | -10.34 | AV                   |
| V                      | 9748.00   | 53.41            | 30.85             | 7.45          | 24.69             | 53.63             | 74.00        | -20.37 | Pk                   |
| V                      | 9748.00   | 43.77            | 30.85             | 7.45          | 24.69             | 44.52             | 54.00        | -9.48  | AV                   |
| V                      | 12185.00  | 53.83            | 31.02             | 8.99          | 25.57             | 56.82             | 74.00        | -17.18 | Pk                   |
| V                      | 12185.00  | 43.67            | 31.02             | 8.99          | 25.57             | 47.86             | 54.00        | -6.14  | AV                   |
| H                      | 4874.00   | 54.82            | 30.55             | 5.77          | 24.66             | 53.14             | 74.00        | -20.86 | Pk                   |
| H                      | 4874.00   | 43.14            | 30.55             | 5.77          | 24.66             | 43.13             | 54.00        | -10.87 | AV                   |
| H                      | 7311.00   | 50.62            | 30.33             | 6.32          | 24.55             | 52.82             | 74.00        | -21.18 | Pk                   |
| H                      | 7311.00   | 43.99            | 30.33             | 6.32          | 24.55             | 43.19             | 54.00        | -10.81 | AV                   |
| H                      | 9748.00   | 53.98            | 30.85             | 7.45          | 24.69             | 54.46             | 74.00        | -19.54 | Pk                   |
| H                      | 9748.00   | 43.17            | 30.85             | 7.45          | 24.69             | 44.82             | 54.00        | -9.18  | AV                   |
| H                      | 12185.00  | 52.84            | 31.02             | 8.99          | 25.57             | 54.88             | 74.00        | -19.12 | Pk                   |
| H                      | 12185.00  | 43.51            | 31.02             | 8.99          | 25.57             | 45.75             | 54.00        | -8.25  | AV                   |





| Polar<br>(H/V)       | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-ampl<br>ifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/<br>m) | Margin<br>(dB) | Detect<br>or<br>Type |
|----------------------|--------------------|----------------------------|---------------------------|-----------------------|---------------------------|-------------------------------|------------------------|----------------|----------------------|
| High Channel:2452MHz |                    |                            |                           |                       |                           |                               |                        |                |                      |
| V                    | 4904.00            | 52.45                      | 30.55                     | 5.77                  | 24.66                     | 52.23                         | 74.00                  | -21.77         | Pk                   |
| V                    | 4904.00            | 43.55                      | 30.55                     | 5.77                  | 24.66                     | 43.48                         | 54.00                  | -10.52         | AV                   |
| V                    | 7356.00            | 54.84                      | 30.33                     | 6.32                  | 24.55                     | 54.16                         | 74.00                  | -19.84         | Pk                   |
| V                    | 7356.00            | 43.02                      | 30.33                     | 6.32                  | 24.55                     | 43.66                         | 54.00                  | -10.34         | AV                   |
| V                    | 9808.00            | 53.23                      | 30.85                     | 7.45                  | 24.69                     | 53.63                         | 74.00                  | -20.37         | Pk                   |
| V                    | 9808.00            | 43.93                      | 30.85                     | 7.45                  | 24.69                     | 44.52                         | 54.00                  | -9.48          | AV                   |
| V                    | 12260.00           | 53.64                      | 31.02                     | 8.99                  | 25.57                     | 56.82                         | 74.00                  | -17.18         | Pk                   |
| V                    | 12260.00           | 43.18                      | 31.02                     | 8.99                  | 25.57                     | 47.86                         | 54.00                  | -6.14          | AV                   |
| H                    | 4904.00            | 50.94                      | 30.55                     | 5.77                  | 24.66                     | 53.14                         | 74.00                  | -20.86         | Pk                   |
| H                    | 4904.00            | 43.34                      | 30.55                     | 5.77                  | 24.66                     | 43.13                         | 54.00                  | -10.87         | AV                   |
| H                    | 7356.00            | 52.50                      | 30.33                     | 6.32                  | 24.55                     | 52.82                         | 74.00                  | -21.18         | Pk                   |
| H                    | 7356.00            | 43.16                      | 30.33                     | 6.32                  | 24.55                     | 43.19                         | 54.00                  | -10.81         | AV                   |
| H                    | 9808.00            | 50.16                      | 30.85                     | 7.45                  | 24.69                     | 54.46                         | 74.00                  | -19.54         | Pk                   |
| H                    | 9808.00            | 43.75                      | 30.85                     | 7.45                  | 24.69                     | 44.82                         | 54.00                  | -9.18          | AV                   |
| H                    | 12260.00           | 53.65                      | 31.02                     | 8.99                  | 25.57                     | 54.88                         | 74.00                  | -19.12         | Pk                   |
| H                    | 12260.00           | 43.48                      | 31.02                     | 8.99                  | 25.57                     | 45.75                         | 54.00                  | -8.25          | AV                   |

## Remark:

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

Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Note:The 802.11b/g ANT0 / 1 is tested, and only the worst mode is reflected in the report



## 5. RADIATED BAND EMISSION MEASUREMENT

### 5.1 TEST REQUIREMENT:

|                       |                                                                                                    |          |      |      |         |
|-----------------------|----------------------------------------------------------------------------------------------------|----------|------|------|---------|
| Test Requirement:     | FCC Part 15 C Section 15.209 and 15.205                                                            |          |      |      |         |
| Test Method:          | ANSI C63.10: 2013                                                                                  |          |      |      |         |
| Test Frequency Range: | All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed. |          |      |      |         |
| Test site:            | Measurement Distance: 3m                                                                           |          |      |      |         |
| Receiver setup:       | Frequency                                                                                          | Detector | RBW  | VBW  | Value   |
|                       | Above                                                                                              | Peak     | 1MHz | 3MHz | Peak    |
|                       | 1GHz                                                                                               | Peak     | 1MHz | 10Hz | Average |

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Class B (dBuV/m) (at 3M) |         |
|-----------------|--------------------------|---------|
|                 | PEAK                     | AVERAGE |
| Above 1000      | 74                       | 54      |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).

### 5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 1.5 meters 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.
- Test the EUT in the lowest channel, the Highest channel

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

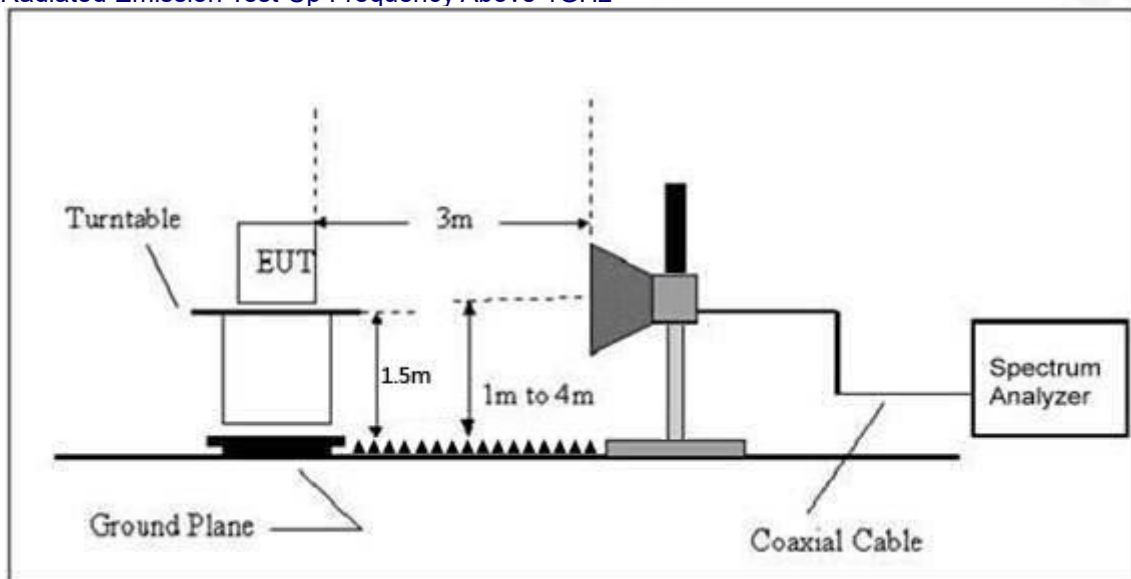
### 5.3 DEVIATION FROM TEST STANDARD

No deviation



## 5.4 TEST SETUP

### Radiated Emission Test-Up Frequency Above 1GHz



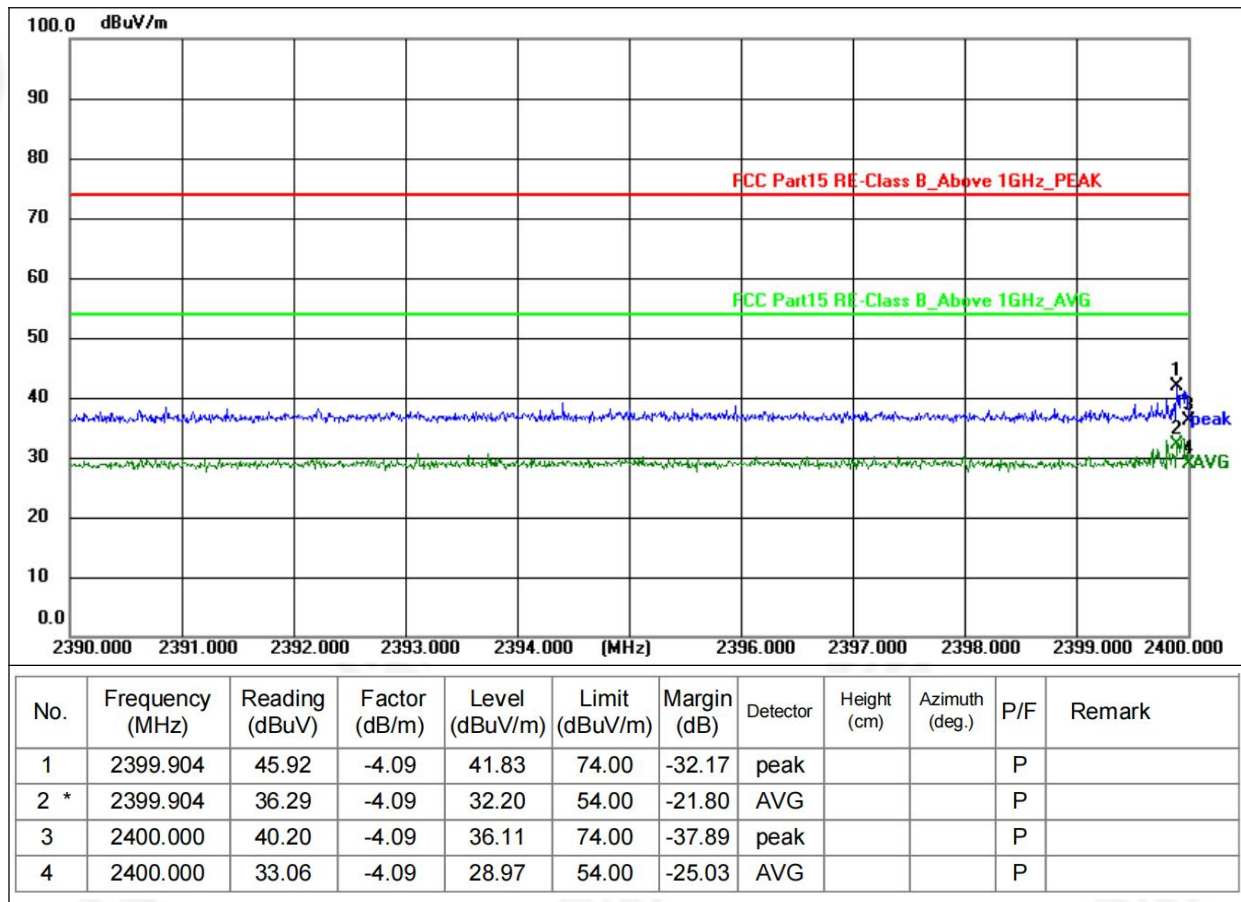
## 5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



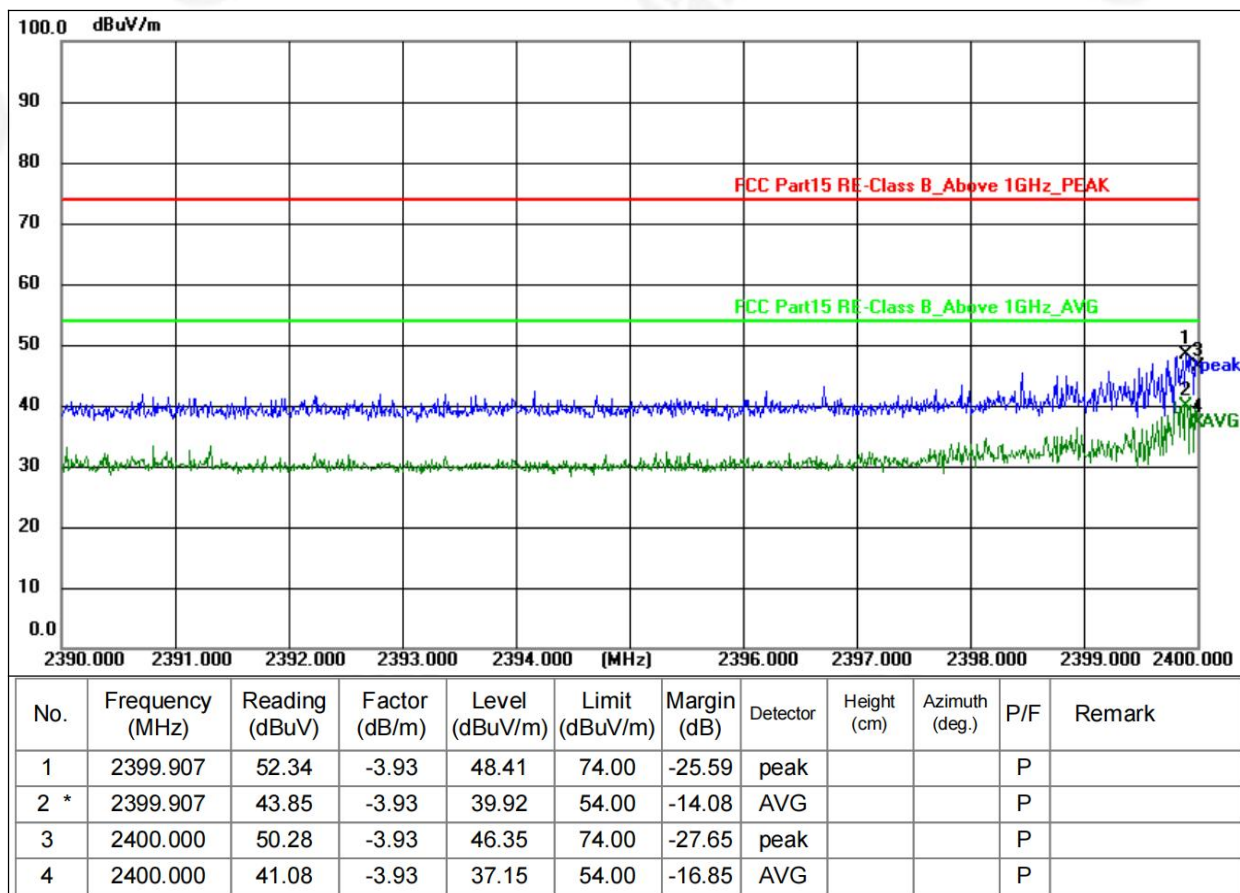
## 5.6 TEST RESULT

|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                     |
| Pressure:     | 101 kPa      | Polarization:      | Horizontal                              |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |





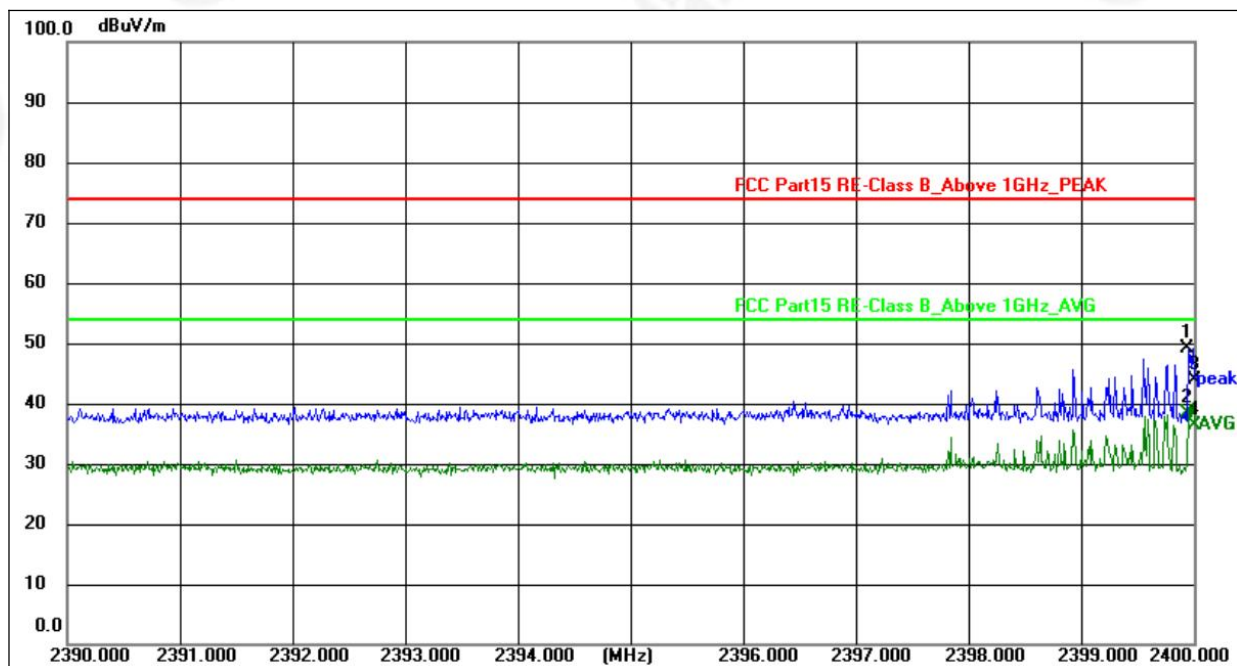
|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26℃          | Relative Humidity: | 54%                                     |
| Pressure:     | 101kPa       | Polarization:      | Vertical                                |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |







|               |              |                    |                                           |
|---------------|--------------|--------------------|-------------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                       |
| Pressure:     | 101 kPa      | Polarization:      | Horizontal                                |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11n40 2422MHz TX<br>(Worst case MIMO) |

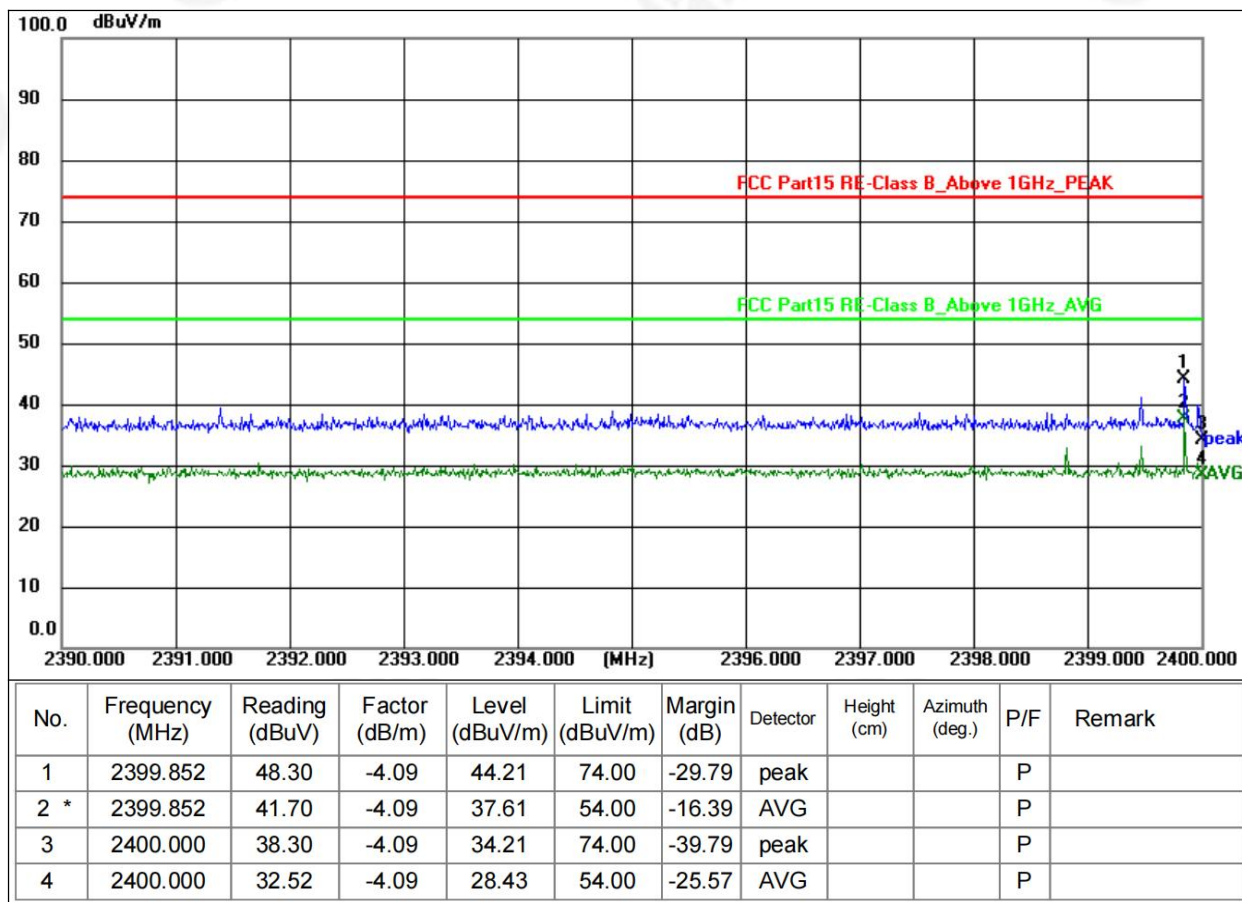


| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 2399.952        | 53.15          | -3.93         | 49.22          | 74.00          | -24.78      | peak     |             |                | P   |        |
| 2 * | 2399.952        | 42.41          | -3.93         | 38.48          | 54.00          | -15.52      | AVG      |             |                | P   |        |
| 3   | 2400.000        | 47.80          | -3.93         | 43.87          | 74.00          | -30.13      | peak     |             |                | P   |        |
| 4   | 2400.000        | 40.32          | -3.93         | 36.39          | 54.00          | -17.61      | AVG      |             |                | P   |        |



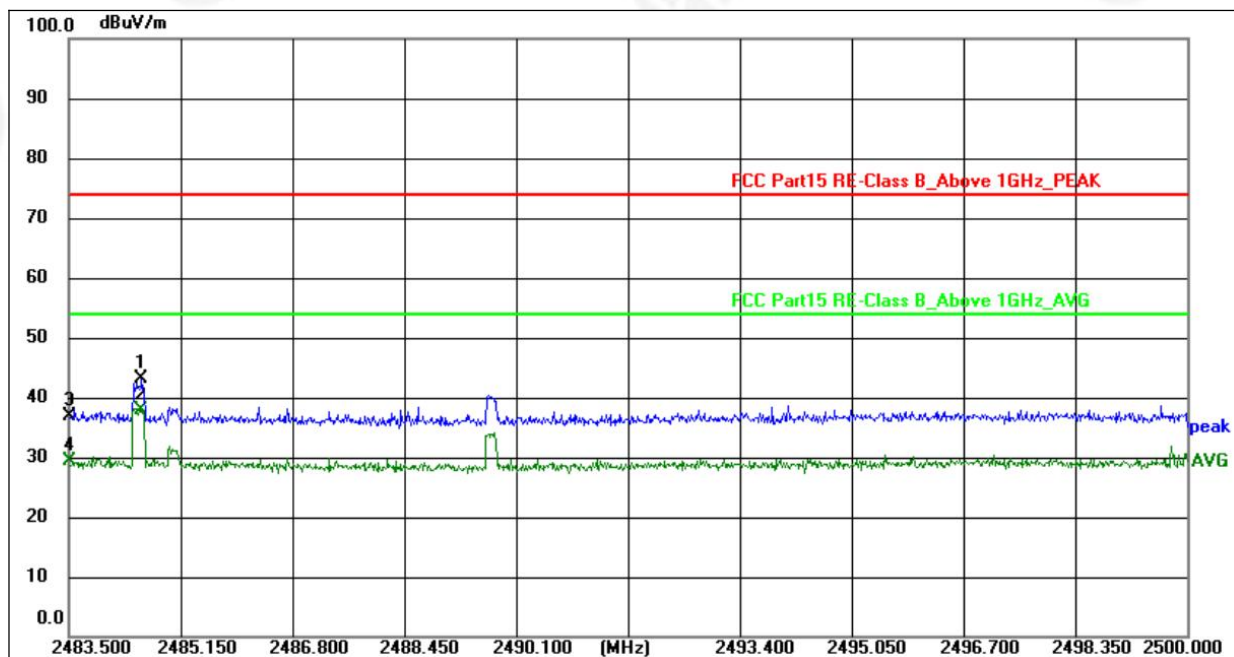


|               |              |                    |                                           |
|---------------|--------------|--------------------|-------------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                       |
| Pressure:     | 101kPa       | Polarization:      | Vertical                                  |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11n40 2422MHz TX<br>(Worst case MIMO) |





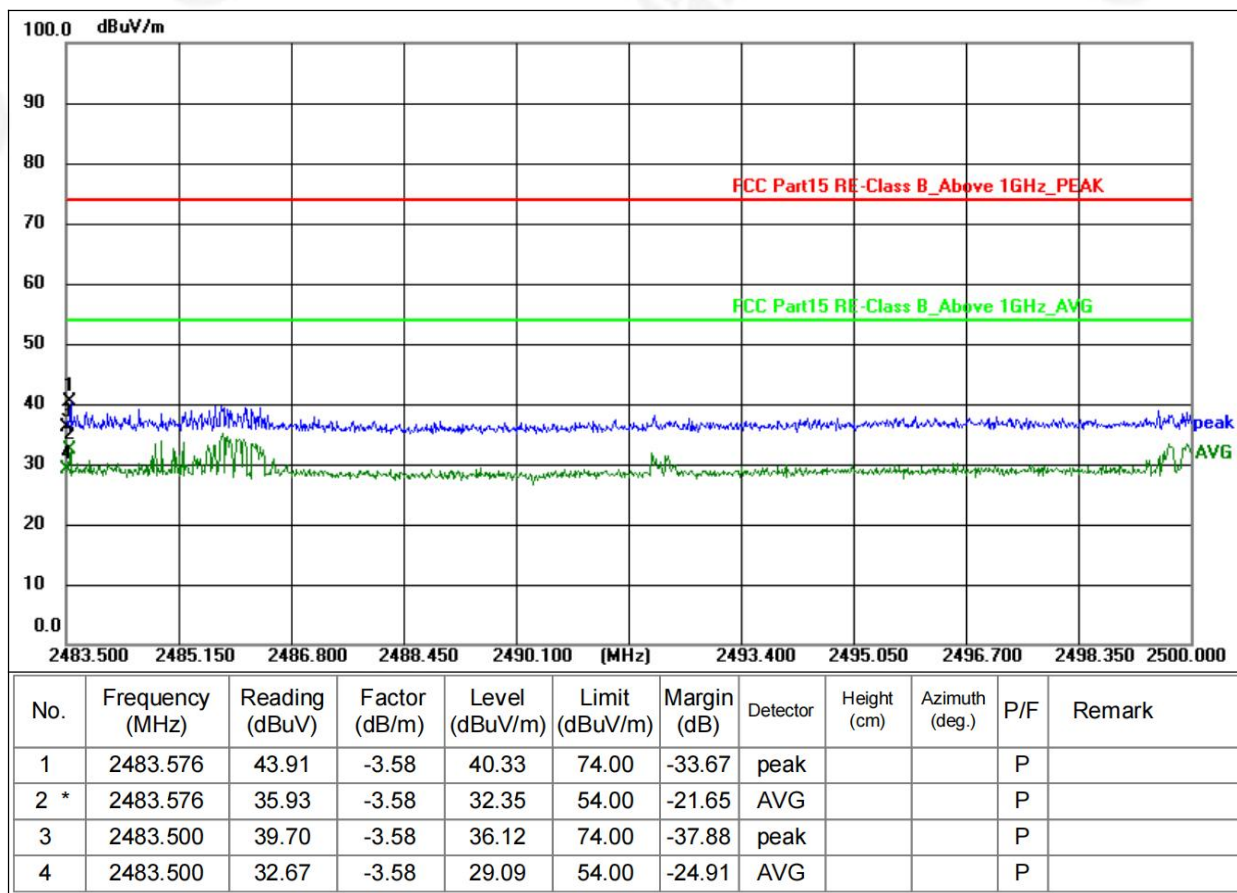
|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                     |
| Pressure:     | 101 kPa      | Polarization:      | Horizontal                              |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 2484.592        | 47.01          | -3.85         | 43.16          | 74.00          | -30.84      | peak     |             |                | P   |        |
| 2 * | 2484.592        | 41.75          | -3.85         | 37.90          | 54.00          | -16.10      | AVG      |             |                | P   |        |
| 3   | 2483.500        | 40.78          | -3.85         | 36.93          | 74.00          | -37.07      | peak     |             |                | P   |        |
| 4   | 2483.500        | 33.20          | -3.85         | 29.35          | 54.00          | -24.65      | AVG      |             |                | P   |        |

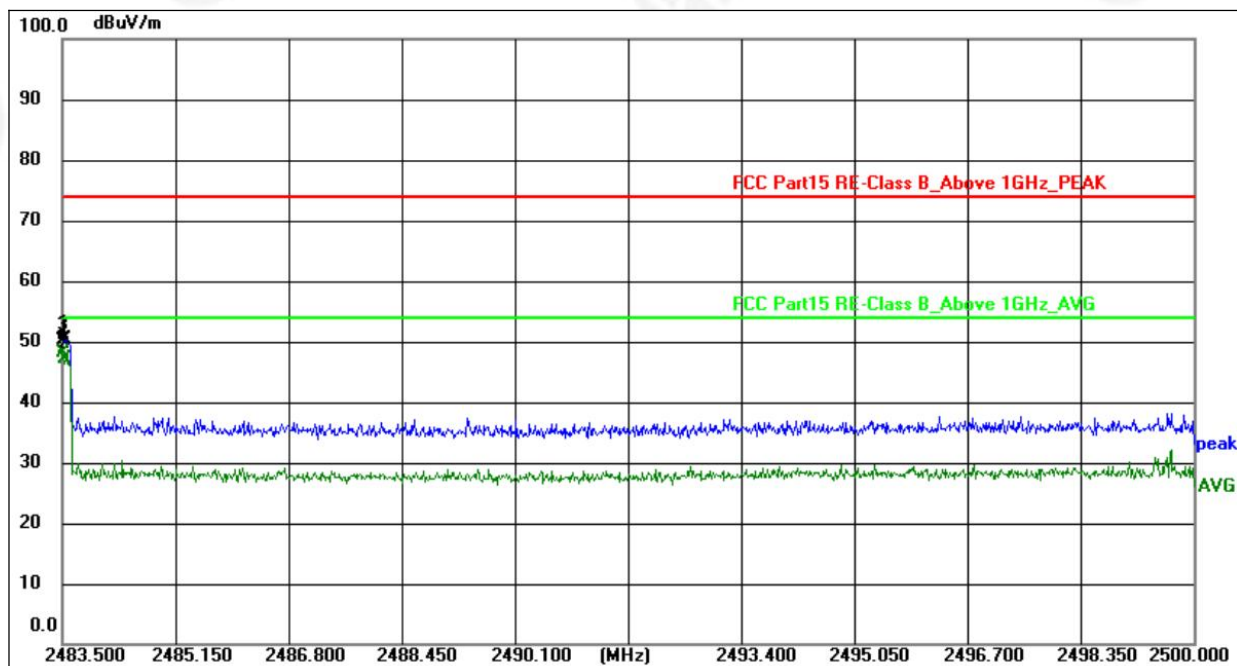


|               |              |                    |                                         |
|---------------|--------------|--------------------|-----------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                     |
| Pressure:     | 101kPa       | Polarization:      | Vertical                                |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11b 2412MHz TX<br>(Worst case ant0) |





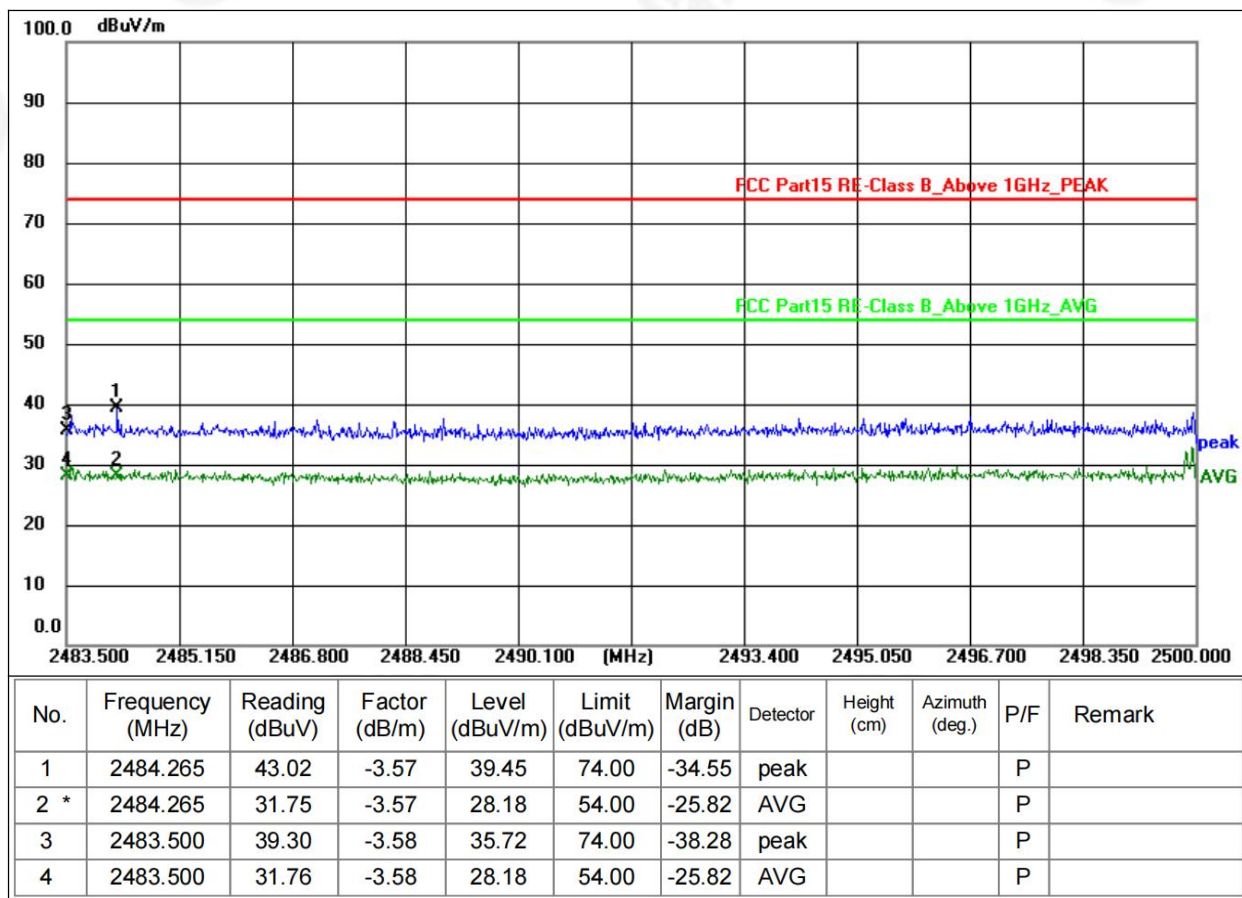
|               |              |                    |                                           |
|---------------|--------------|--------------------|-------------------------------------------|
| Temperature:  | 26°C         | Relative Humidity: | 54%                                       |
| Pressure:     | 101 kPa      | Polarization:      | Horizontal                                |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11n40 2422MHz TX<br>(Worst case MIMO) |



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-------------|----------------|-----|--------|
| 1   | 2483.555        | 53.91          | -3.58         | 50.33          | 74.00          | -23.67      | peak     |             |                | P   |        |
| 2   | 2483.555        | 50.63          | -3.58         | 47.05          | 54.00          | -6.95       | AVG      |             |                | P   |        |
| 3   | 2483.500        | 53.79          | -3.58         | 50.21          | 74.00          | -23.79      | peak     |             |                | P   |        |
| 4 * | 2483.500        | 51.64          | -3.58         | 48.06          | 54.00          | -5.94       | AVG      |             |                | P   |        |



|               |              |                    |                                           |
|---------------|--------------|--------------------|-------------------------------------------|
| Temperature:  | 26℃          | Relative Humidity: | 54%                                       |
| Pressure:     | 101kPa       | Polarization:      | Vertical                                  |
| Test Voltage: | AC 120V/60Hz | Test Mode          | 802.11n40 2422MHz TX<br>(Worst case MIMO) |



Remarks:

- 1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
  - 2.The emission levels of other frequencies are very lower than the limit and not show in test report.
  - 3.The test data shows only the worst case 802.11b mode
- Note:The 802.11b/g ANT0 / 1 is tested, and only the worst mode is reflected in the report





## 6. POWER SPECTRAL DENSITY TEST

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part15 C Section 15.247 (e)         |
| Test Method:      | KDB558074 D0115.247 Meas Guidancev05r02 |

### 6.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |                        |           |                       |        |
|---------------------------------|------------------------|-----------|-----------------------|--------|
| Section                         | Test Item              | Limit     | Frequency Range (MHz) | Result |
| 15.247                          | Power Spectral Density | 8dBm/3kHz | 2400-2483.5           | PASS   |

### 6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to:  $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.3 DEVIATION FROM STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.





## 6.6 TEST RESULT

| Mode | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Duty Factor (dB) | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|------|-----------------|---------|--------------------------|------------------|----------------------|------------------|---------|
| b    | 2412            | Ant0    | -17.14                   | 0                | -17.14               | 8                | Pass    |
| b    | 2437            | Ant0    | -17.37                   | 0                | -17.37               | 8                | Pass    |
| b    | 2462            | Ant0    | -17.67                   | 0                | -17.67               | 8                | Pass    |
| g    | 2412            | Ant0    | -14.47                   | 0                | -14.47               | 8                | Pass    |
| g    | 2437            | Ant0    | -15.2                    | 0                | -15.2                | 8                | Pass    |
| g    | 2462            | Ant0    | -15.32                   | 0                | -15.32               | 8                | Pass    |
| n20  | 2412            | Ant0    | -16.23                   | 0                | -16.23               | 8                | Pass    |
| n20  | 2437            | Ant0    | -14.47                   | 0                | -14.47               | 8                | Pass    |
| n20  | 2462            | Ant0    | -15.14                   | 0                | -15.14               | 8                | Pass    |
| n40  | 2422            | Ant0    | -17.47                   | 0                | -17.47               | 8                | Pass    |
| n40  | 2437            | Ant0    | -16.25                   | 0                | -16.25               | 8                | Pass    |
| n40  | 2452            | Ant0    | -19.22                   | 0                | -19.22               | 8                | Pass    |

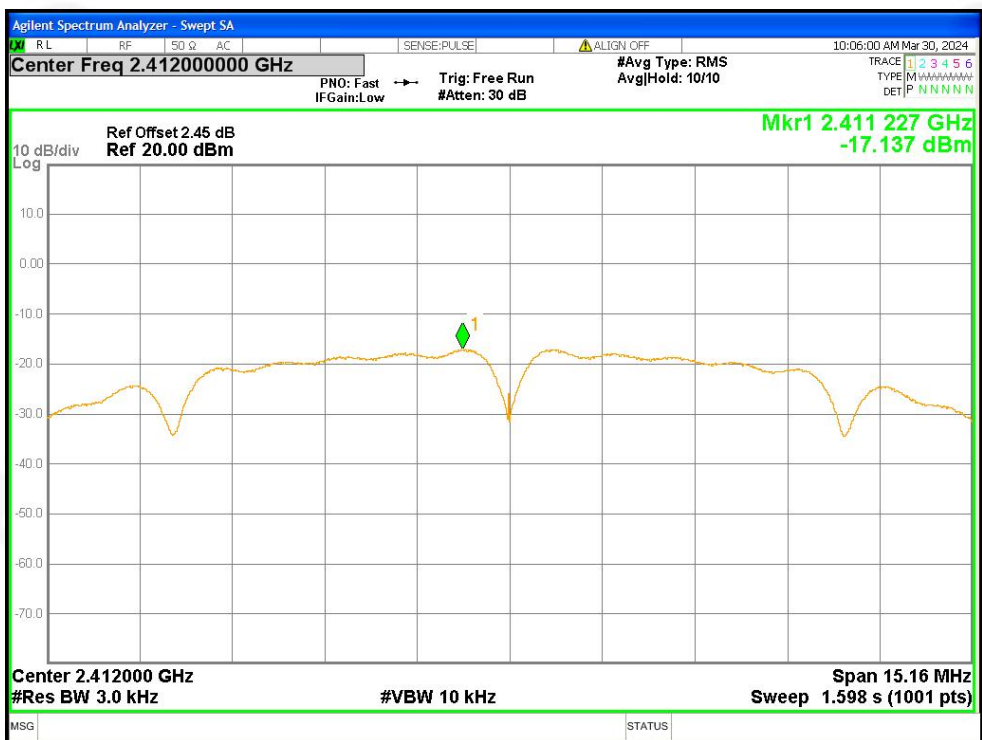
| Mode | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Duty Factor (dB) | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|------|-----------------|---------|--------------------------|------------------|----------------------|------------------|---------|
| b    | 2412            | Ant1    | -16.81                   | 0                | -16.81               | 8                | Pass    |
| b    | 2437            | Ant1    | -17.42                   | 0                | -17.42               | 8                | Pass    |
| b    | 2462            | Ant1    | -17.47                   | 0                | -17.47               | 8                | Pass    |
| g    | 2412            | Ant1    | -15.05                   | 0                | -15.05               | 8                | Pass    |
| g    | 2437            | Ant1    | -15.2                    | 0                | -15.2                | 8                | Pass    |
| g    | 2462            | Ant1    | -15.57                   | 0                | -15.57               | 8                | Pass    |
| n20  | 2412            | Ant1    | -16.25                   | 0                | -16.25               | 8                | Pass    |
| n20  | 2437            | Ant1    | -14.1                    | 0                | -14.1                | 8                | Pass    |
| n20  | 2462            | Ant1    | -15.09                   | 0                | -15.09               | 8                | Pass    |
| n40  | 2422            | Ant1    | -17.49                   | 0                | -17.49               | 8                | Pass    |
| n40  | 2437            | Ant1    | -17.62                   | 0                | -17.62               | 8                | Pass    |
| n40  | 2452            | Ant1    | -15.84                   | 0                | -15.84               | 8                | Pass    |

### ANT0+ANT1

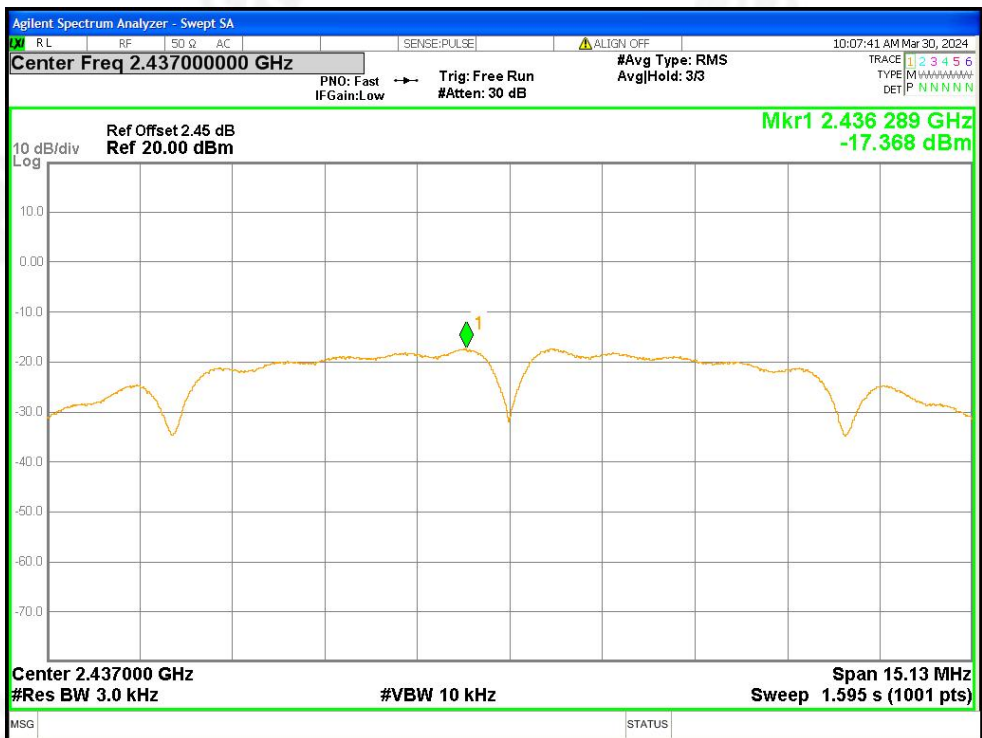
| Mode | Frequency (MHz) | Conducted PSD ant 0 (dBm/3kHz) | Conducted PSD ant 1 (dBm/3kHz) | MIMO Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) <= | Verdict |
|------|-----------------|--------------------------------|--------------------------------|-------------------------------|---------------------|---------|
| n20  | 2412            | -16.23                         | -16.25                         | -13.23                        | 5.71                | Pass    |
| n20  | 2437            | -14.47                         | -14.1                          | -11.27                        | 5.71                | Pass    |
| n20  | 2462            | -15.14                         | -15.09                         | -12.10                        | 5.71                | Pass    |
| N40  | 2422            | -17.47                         | -17.49                         | -14.47                        | 5.71                | Pass    |
| N40  | 2437            | -16.25                         | -17.62                         | -13.87                        | 5.71                | Pass    |
| N40  | 2452            | -19.22                         | -15.84                         | -14.20                        | 5.71                | Pass    |

EUT supports MIMO mode for 802.11n mode, Direction Gain=antenna gain+10\*log(X)=5.28+3.01=8.29(X is the number of antennas, it should be 2)

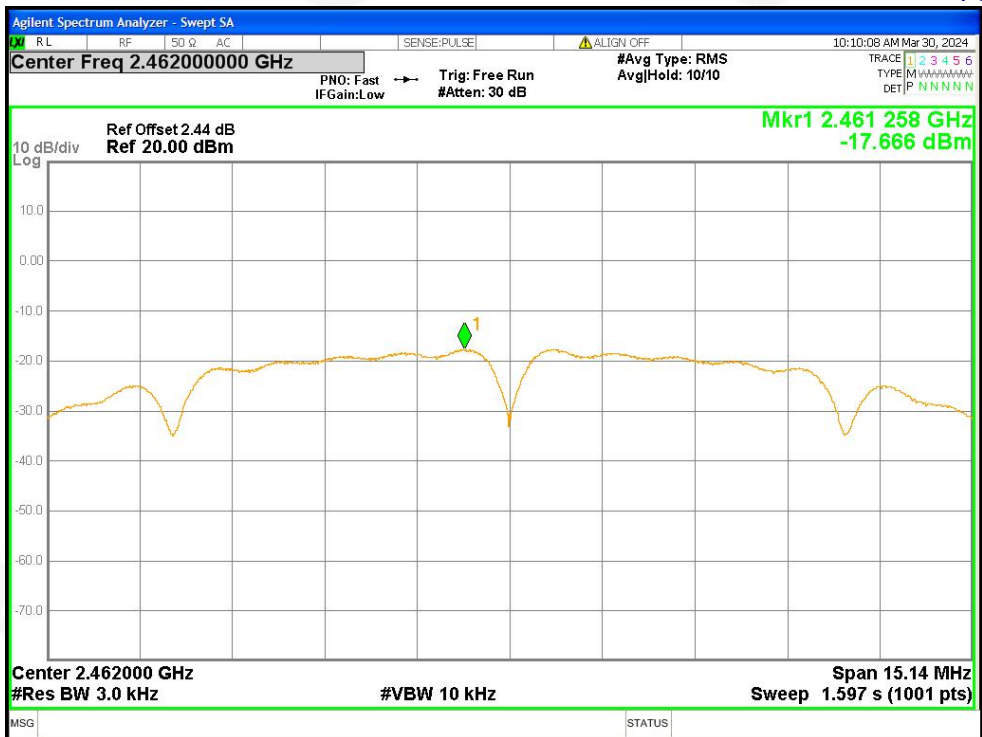
For MIMO mode, as the antenna gain is larger than 6 dBi, then the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



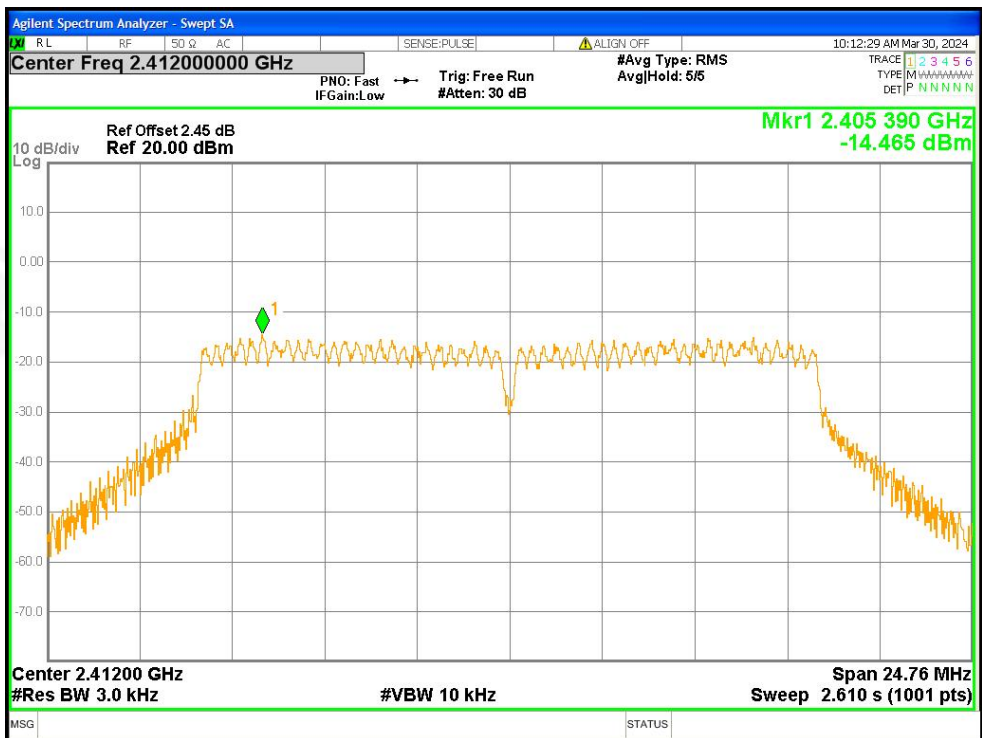
PSD NVNT b 2412MHz Ant0



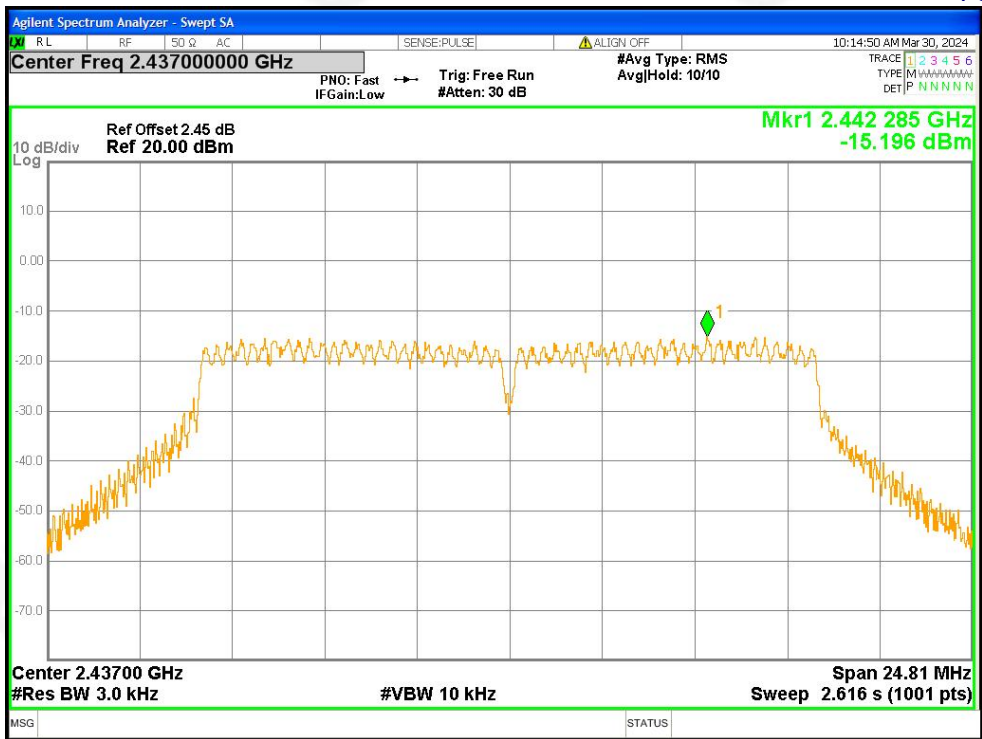
PSD NVNT b 2437MHz Ant0



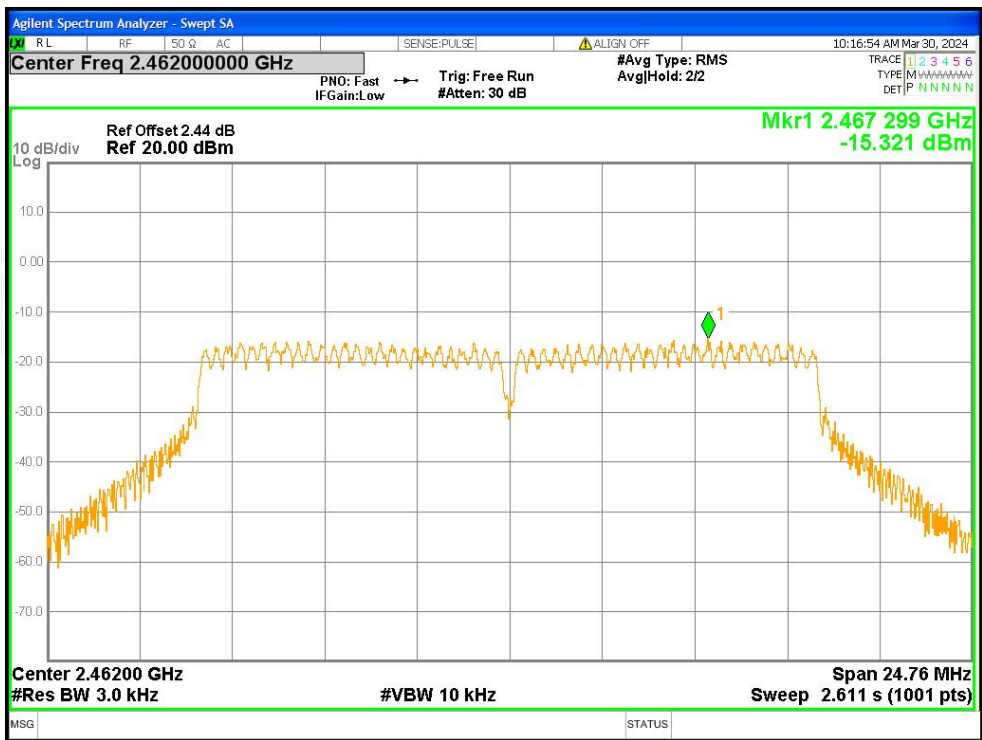
PSD NVNT b 2462MHz Ant0



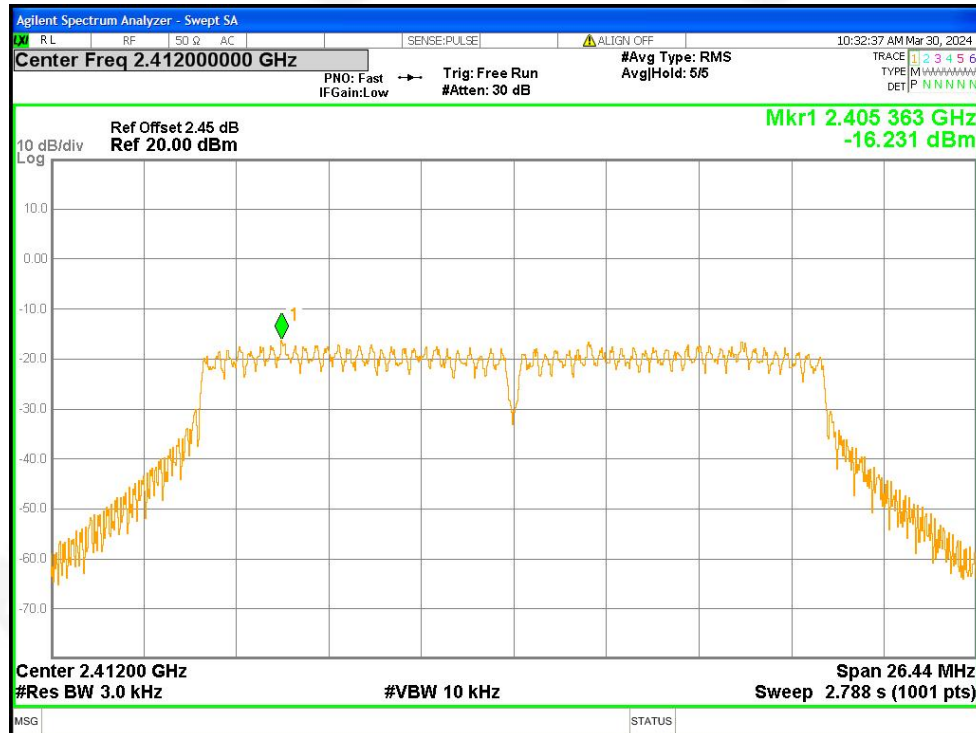
PSD NVNT g 2412MHz Ant0



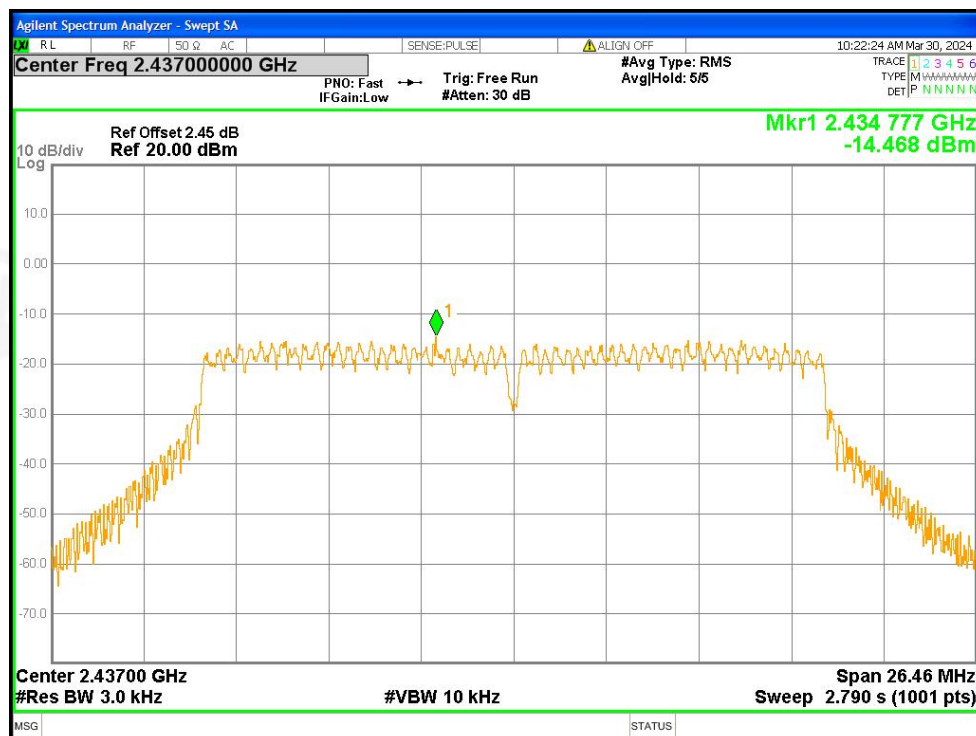
PSD NVNT g 2437MHz Ant0



PSD NVNT g 2462MHz Ant0

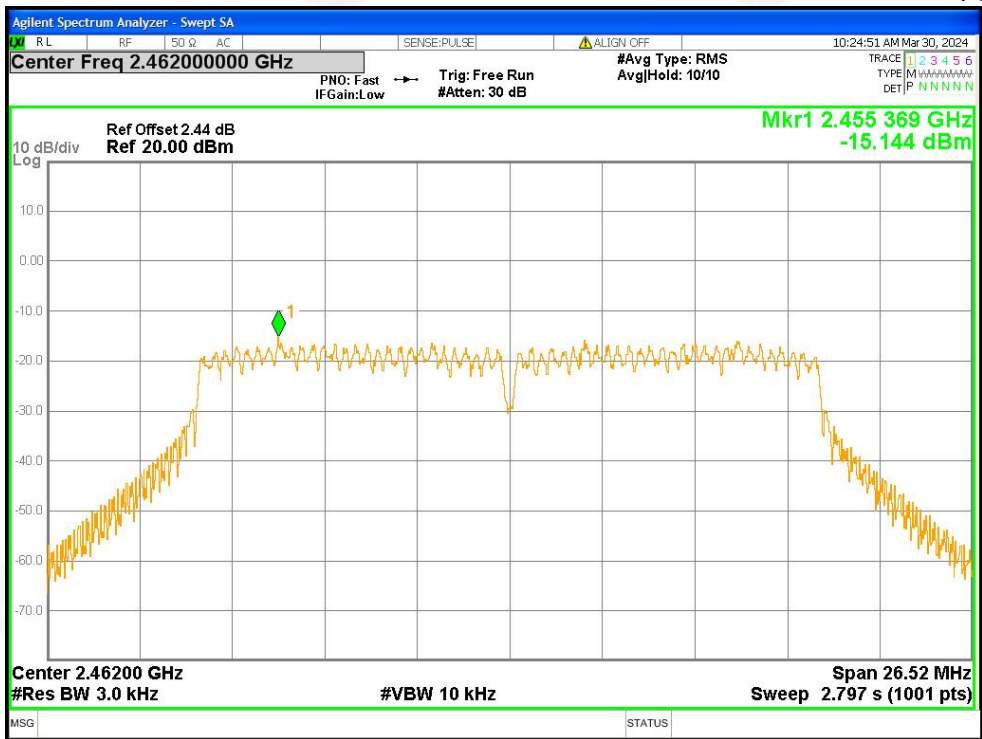


PSD NVNT n20 2412MHz Ant0

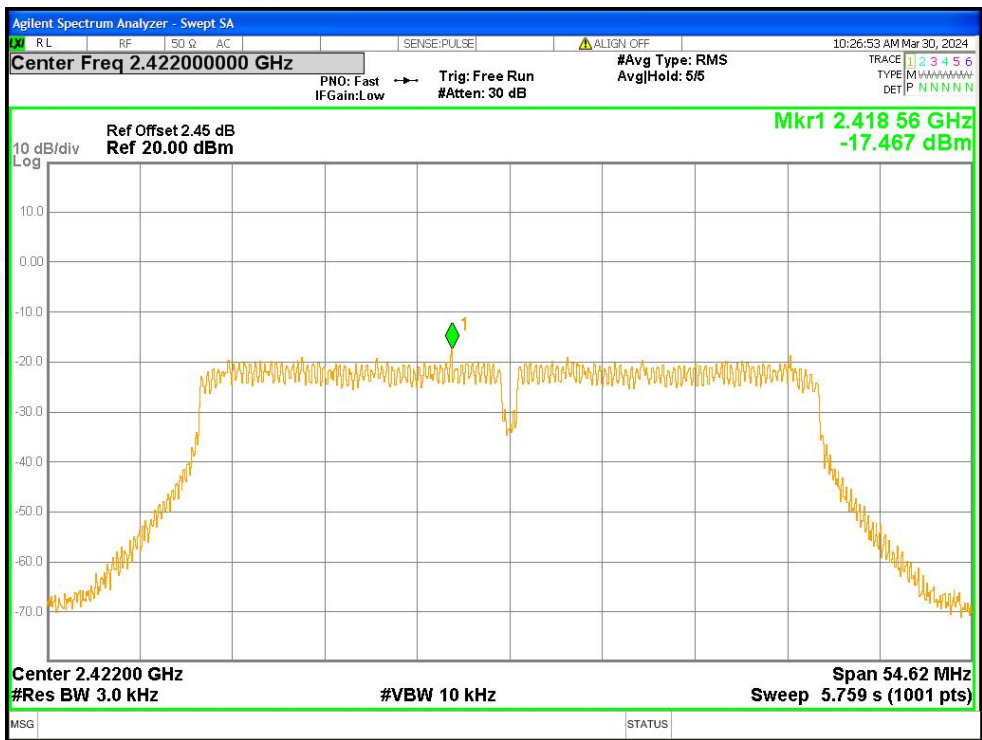


PSD NVNT n20 2437MHz Ant0



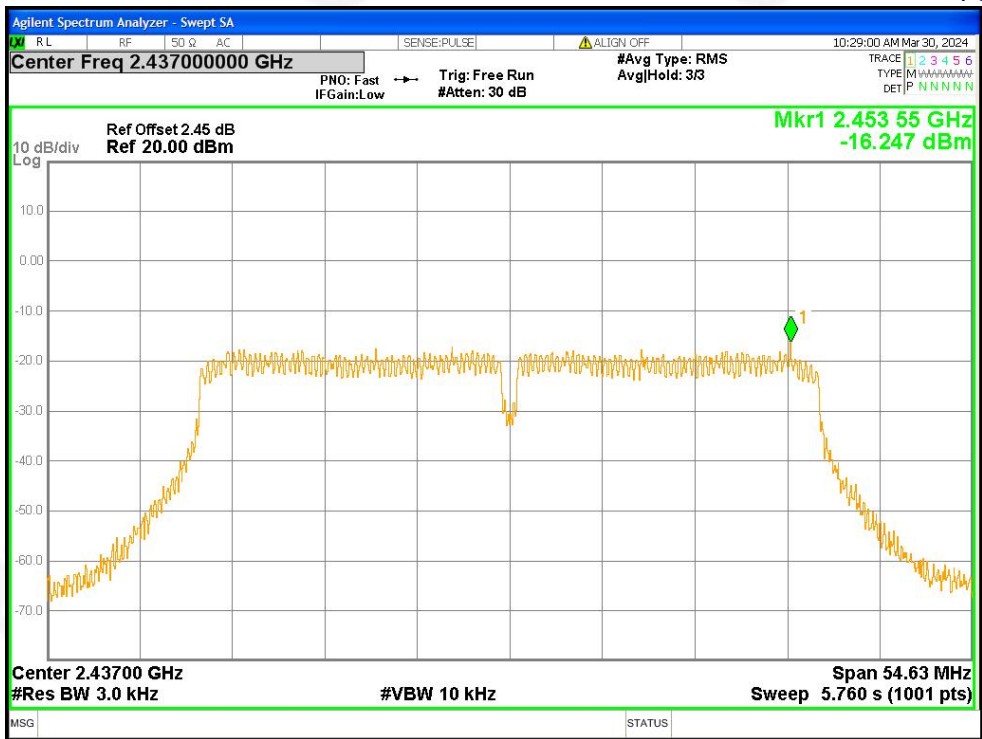


PSD NVNT n20 2462MHz Ant0

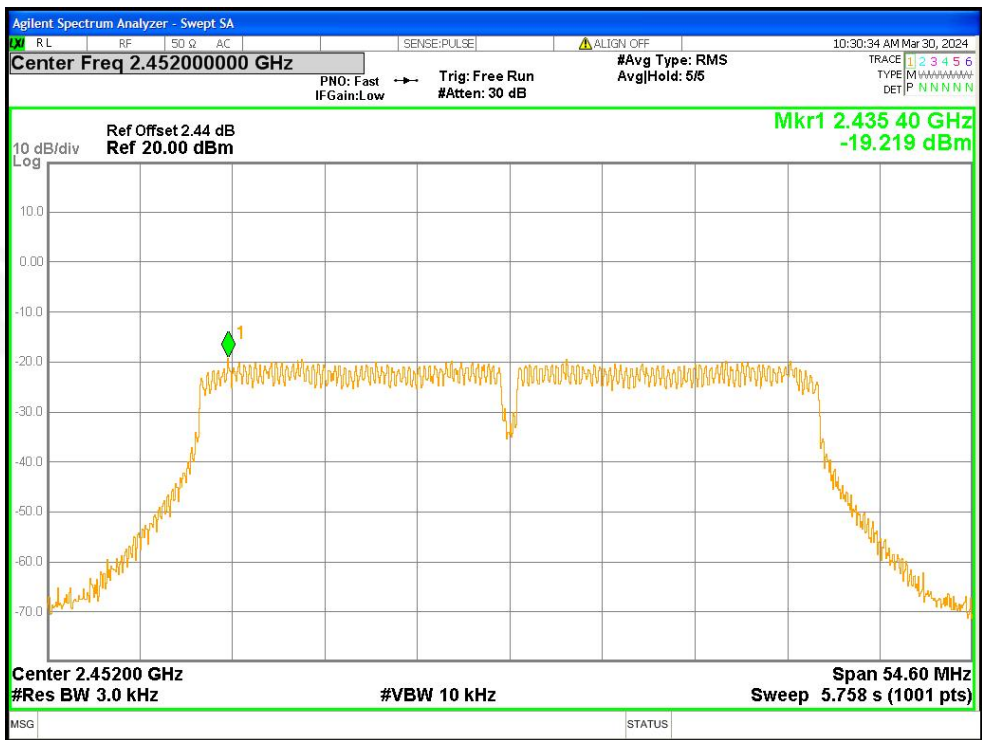


PSD NVNT n40 2422MHz Ant0

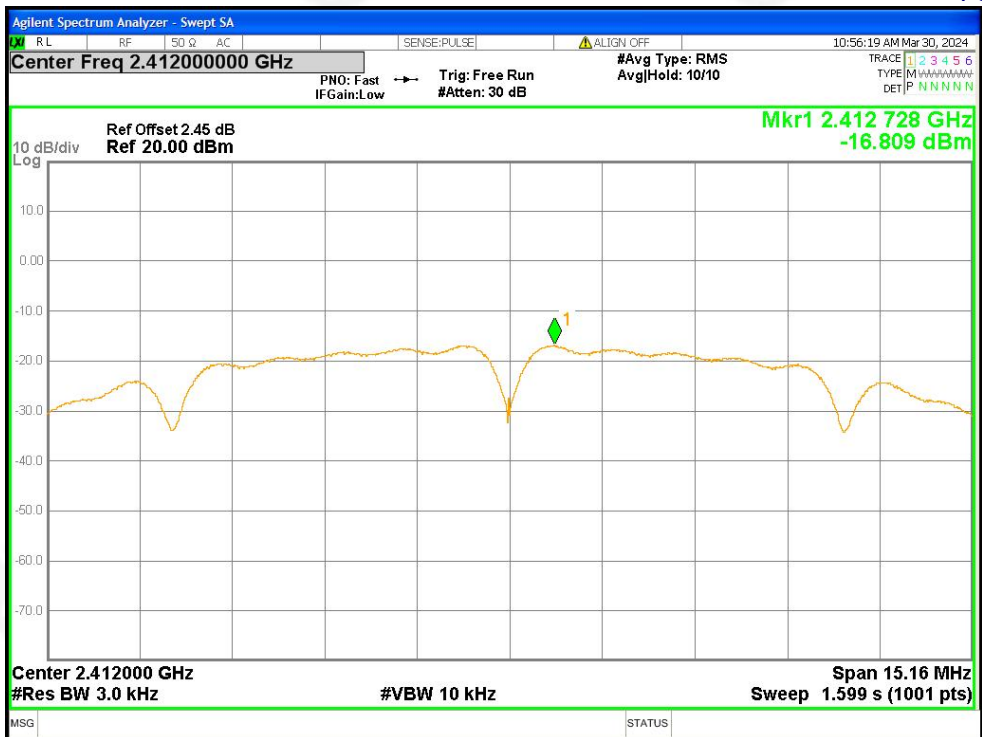




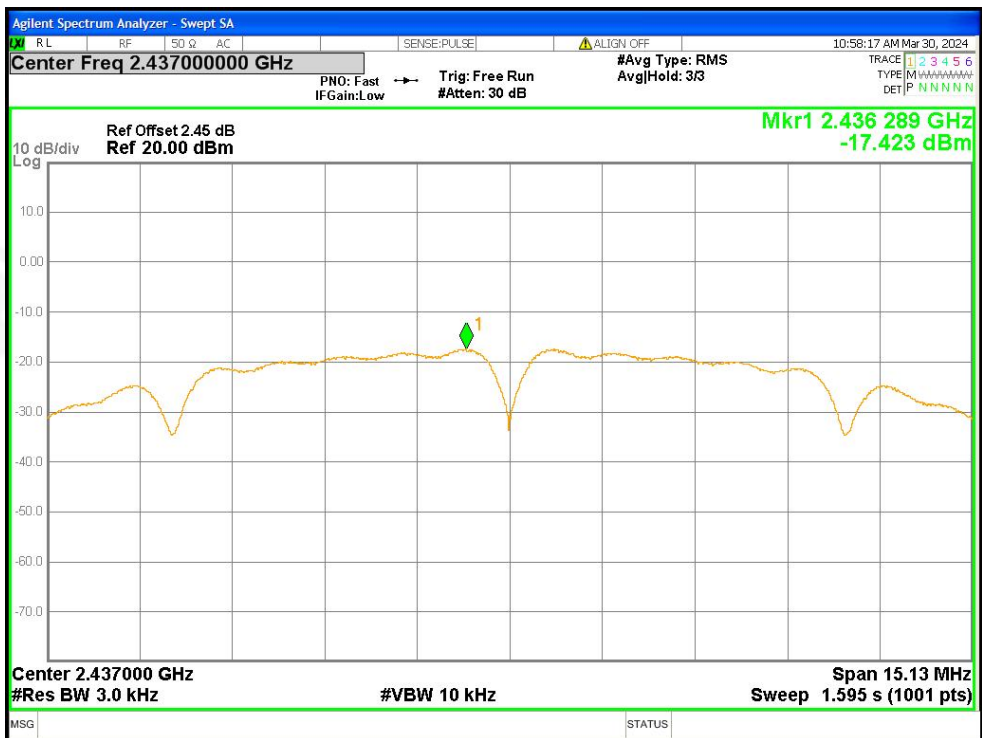
PSD NVNT n40 2437MHz Ant0



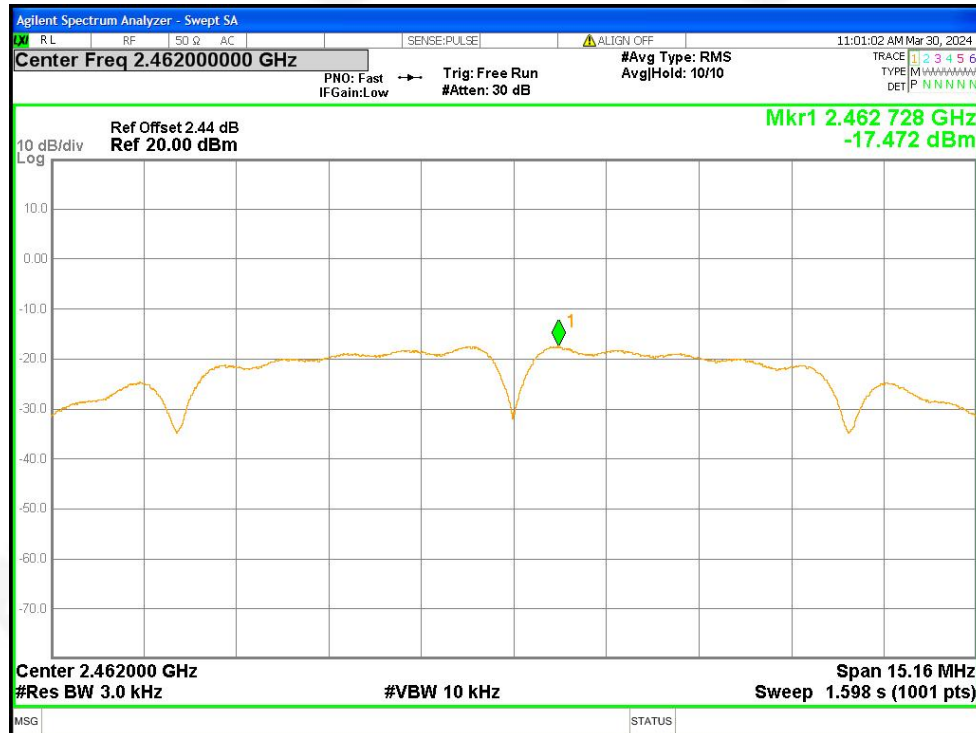
PSD NVNT n40 2452MHz Ant0



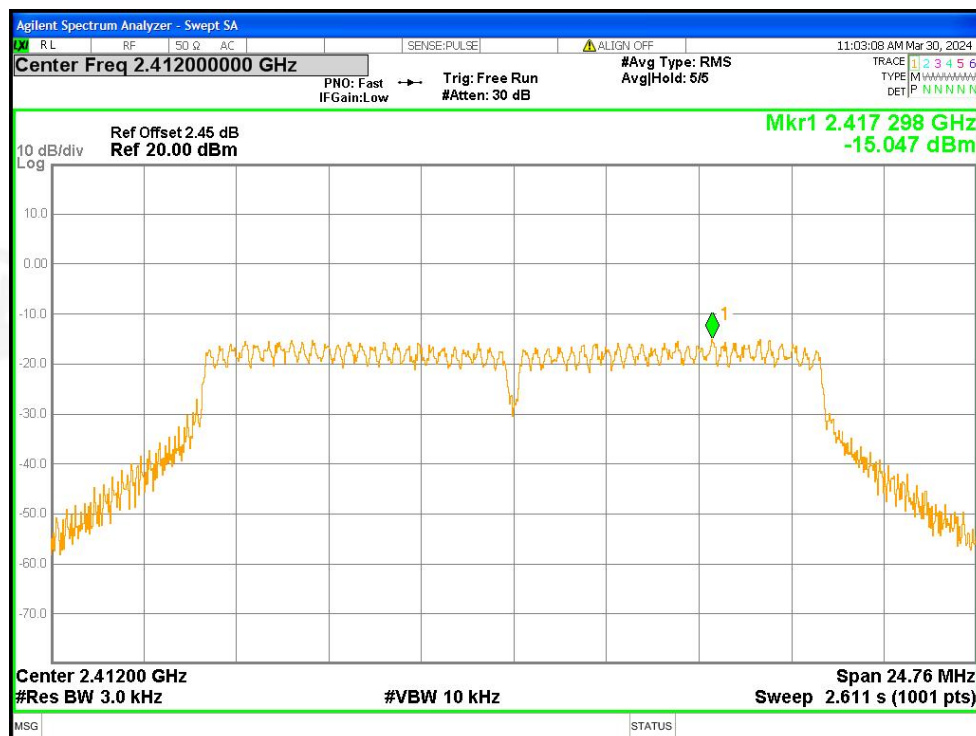
PSD NVNT b 2412MHz Ant1



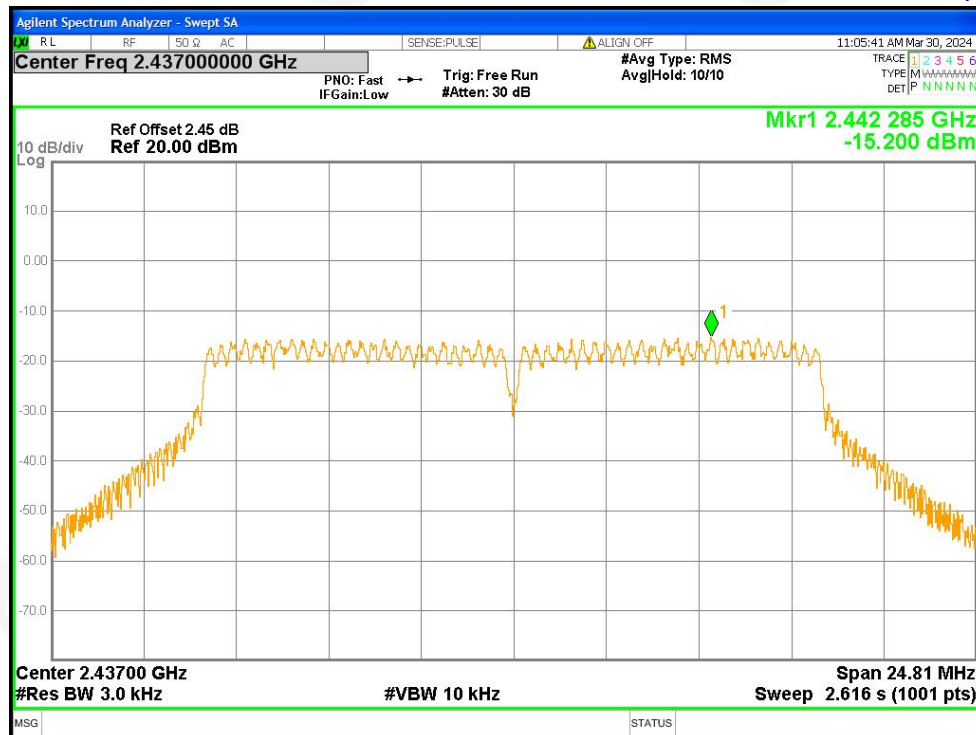
PSD NVNT b 2437MHz Ant1



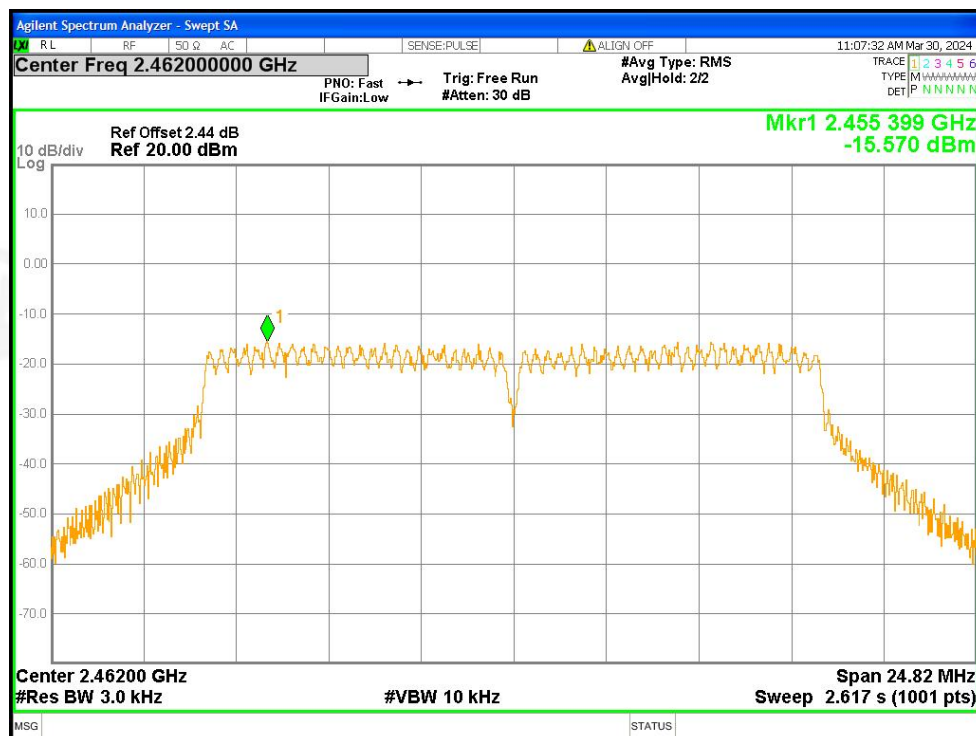
PSD NVNT b 2462MHz Ant1



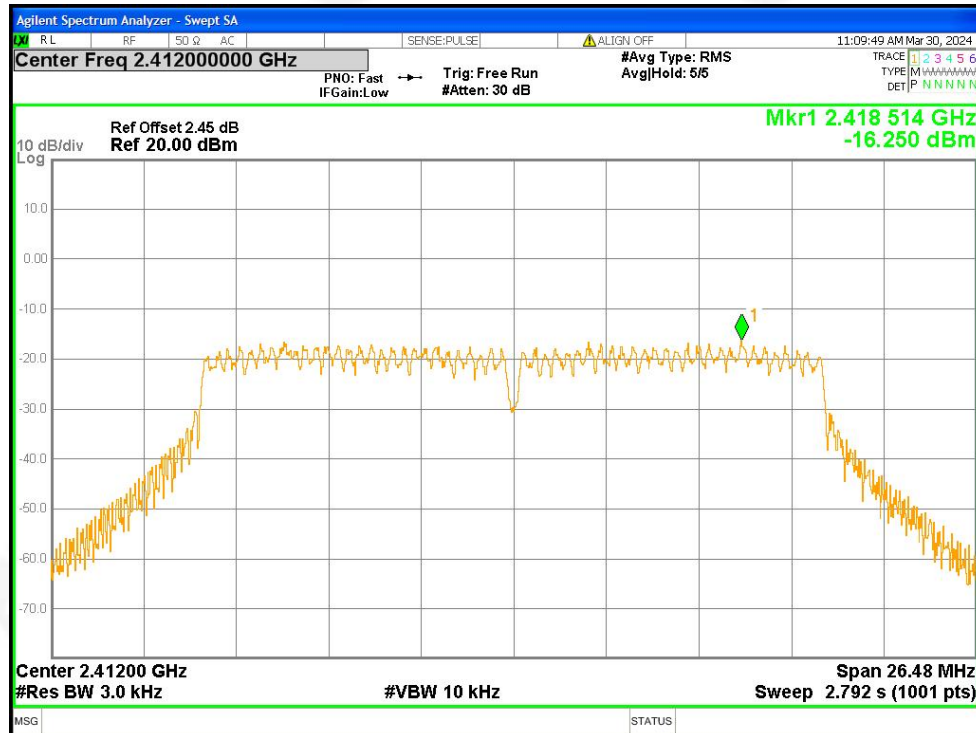
PSD NVNT g 2412MHz Ant1



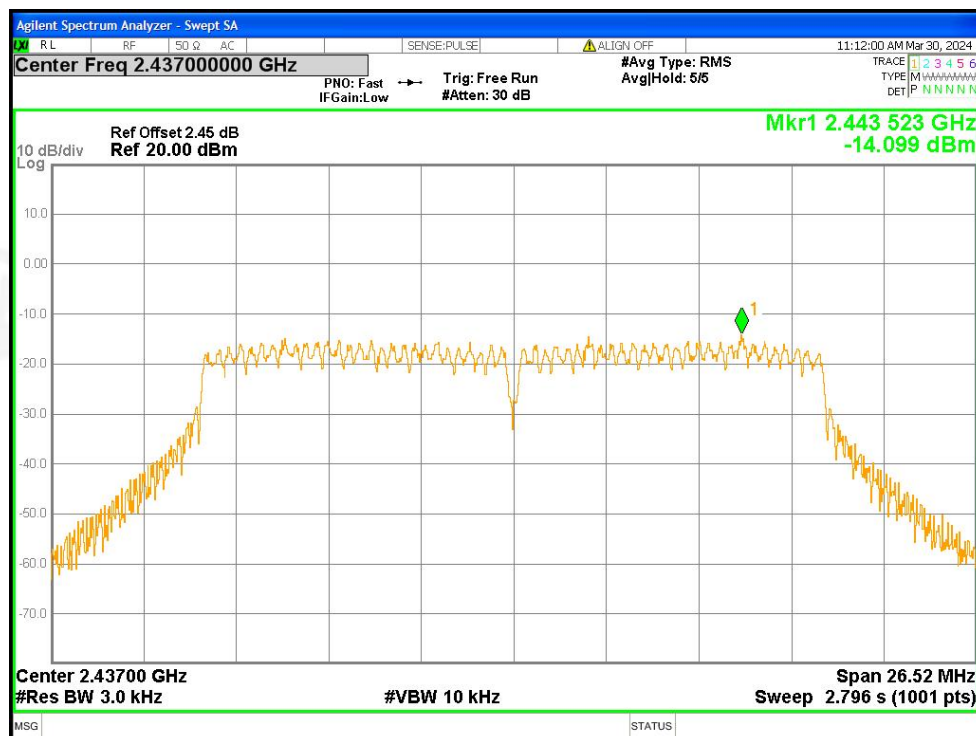
PSD NVNT g 2437MHz Ant1



PSD NVNT g 2462MHz Ant1

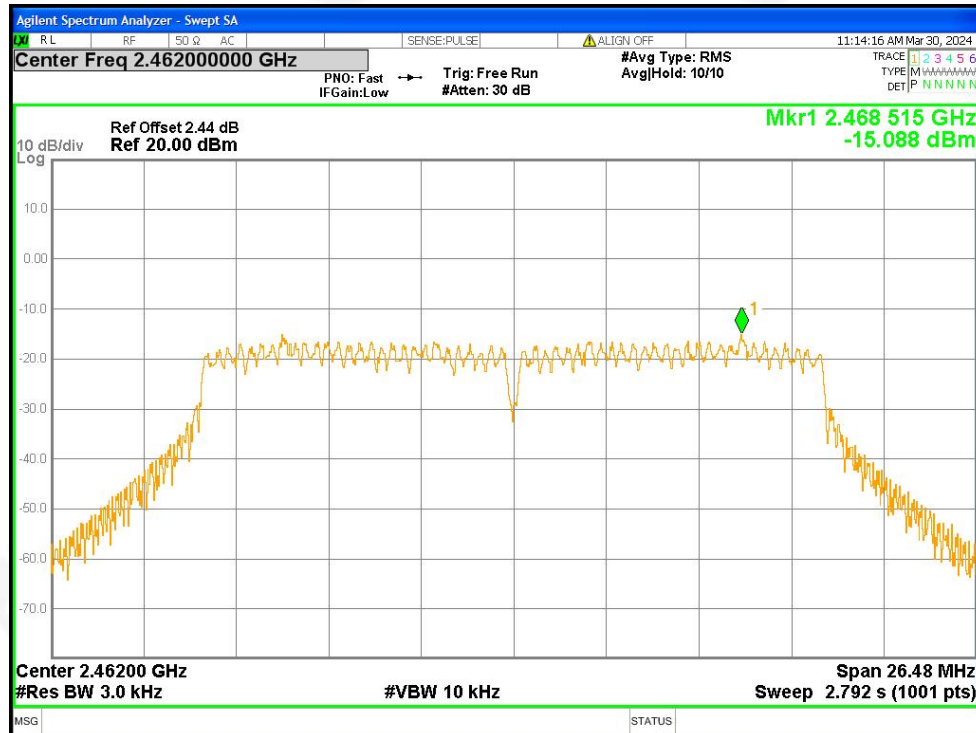


PSD NVNT n20 2412MHz Ant1

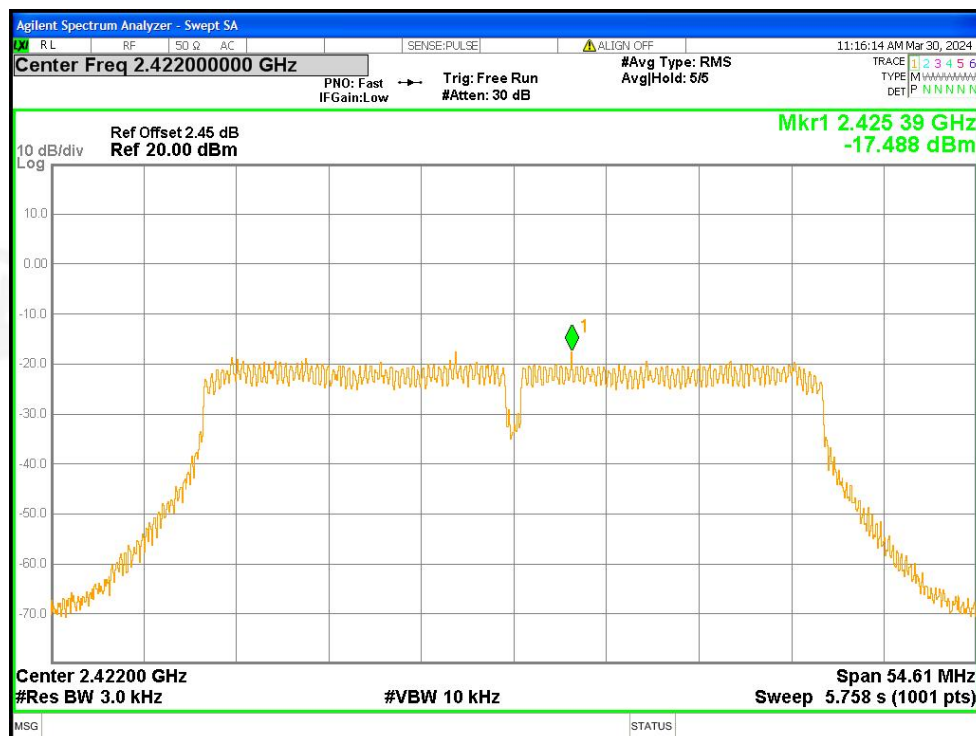


PSD NVNT n20 2437MHz Ant1



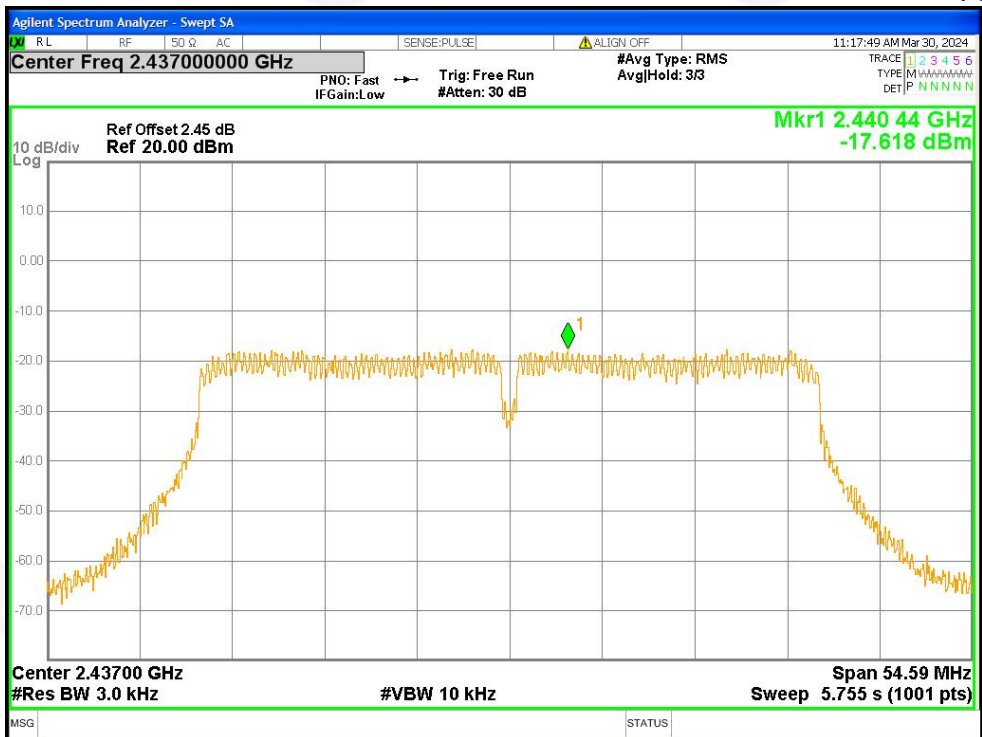


PSD NVNT n20 2462MHz Ant1

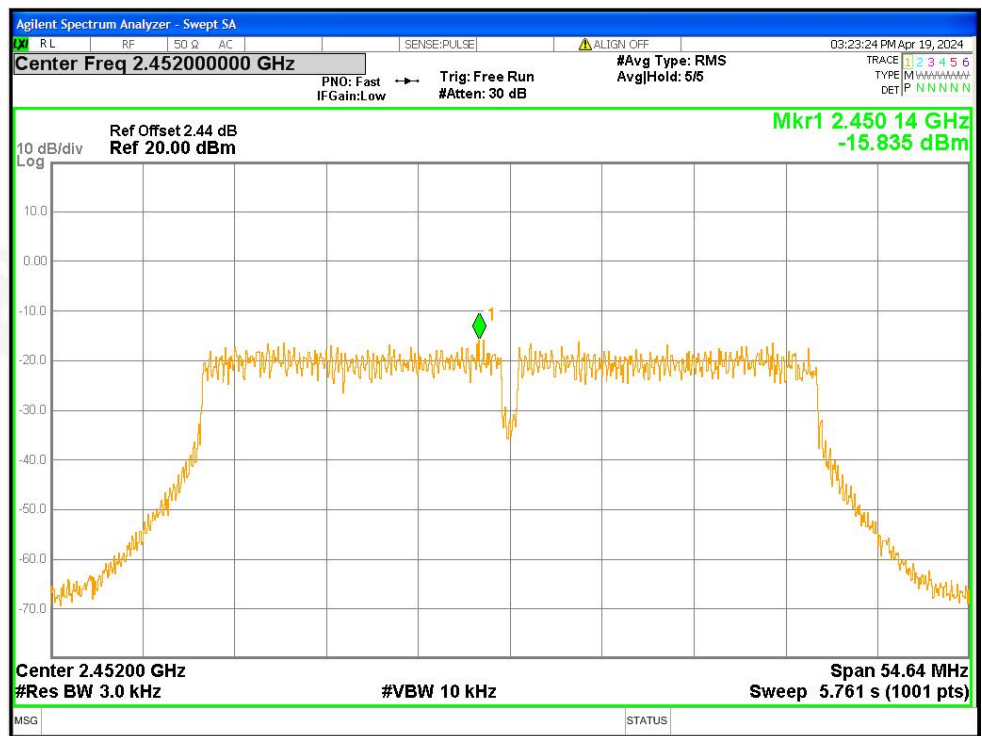


PSD NVNT n40 2422MHz Ant1





PSD NVNT n40 2437MHz Ant1



PSD NVNT n40 2452MHz Ant1



## 7. CHANNEL BANDWIDTH&

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(2)      |
| Test Method:      | KDB558074 D0115.247 Meas Guidancev05r02 |

### 7.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |           |                                         |                       |        |
|---------------------------------|-----------|-----------------------------------------|-----------------------|--------|
| Section                         | Test Item | Limit                                   | Frequency Range (MHz) | Result |
| 15.247(a)(2)                    | Bandwidth | $\geq 500\text{KHz}$<br>(6dB bandwidth) | 2400-2483.5           | PASS   |

### 7.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 7.3 DEVIATION FROM STANDARD

No deviation.

### 7.4 TEST SETUP



### 7.5 EUT OPERATION CONDITIONS

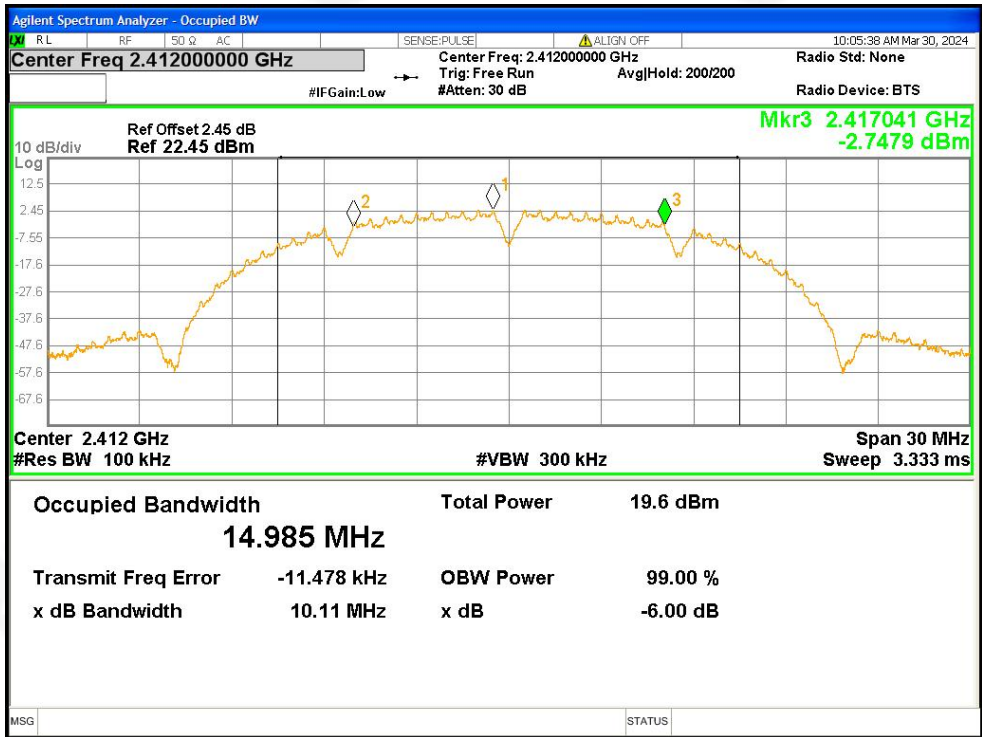
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



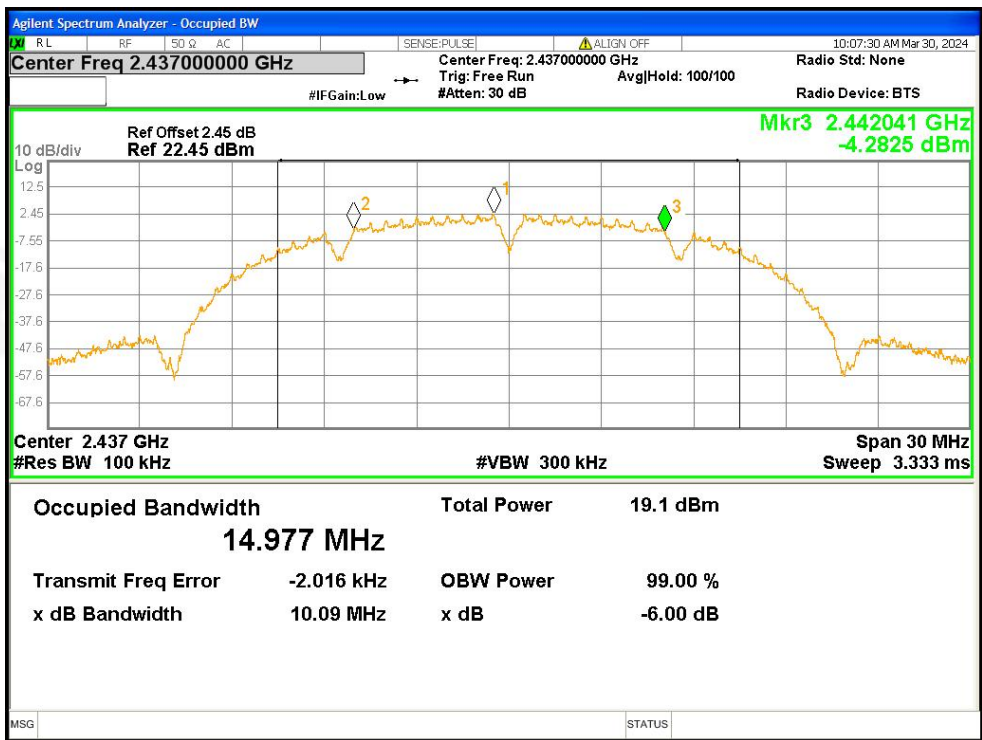
## 7.6 TEST RESULT

| Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|------|-----------------|---------|-----------------------|-----------------------------|---------|
| b    | 2412            | Ant0    | 10.106                | 0.5                         | Pass    |
| b    | 2437            | Ant0    | 10.086                | 0.5                         | Pass    |
| b    | 2462            | Ant0    | 10.096                | 0.5                         | Pass    |
| g    | 2412            | Ant0    | 16.505                | 0.5                         | Pass    |
| g    | 2437            | Ant0    | 16.542                | 0.5                         | Pass    |
| g    | 2462            | Ant0    | 16.507                | 0.5                         | Pass    |
| n20  | 2412            | Ant0    | 17.627                | 0.5                         | Pass    |
| n20  | 2437            | Ant0    | 17.642                | 0.5                         | Pass    |
| n20  | 2462            | Ant0    | 17.683                | 0.5                         | Pass    |
| n40  | 2422            | Ant0    | 36.415                | 0.5                         | Pass    |
| n40  | 2437            | Ant0    | 36.419                | 0.5                         | Pass    |
| n40  | 2452            | Ant0    | 36.403                | 0.5                         | Pass    |

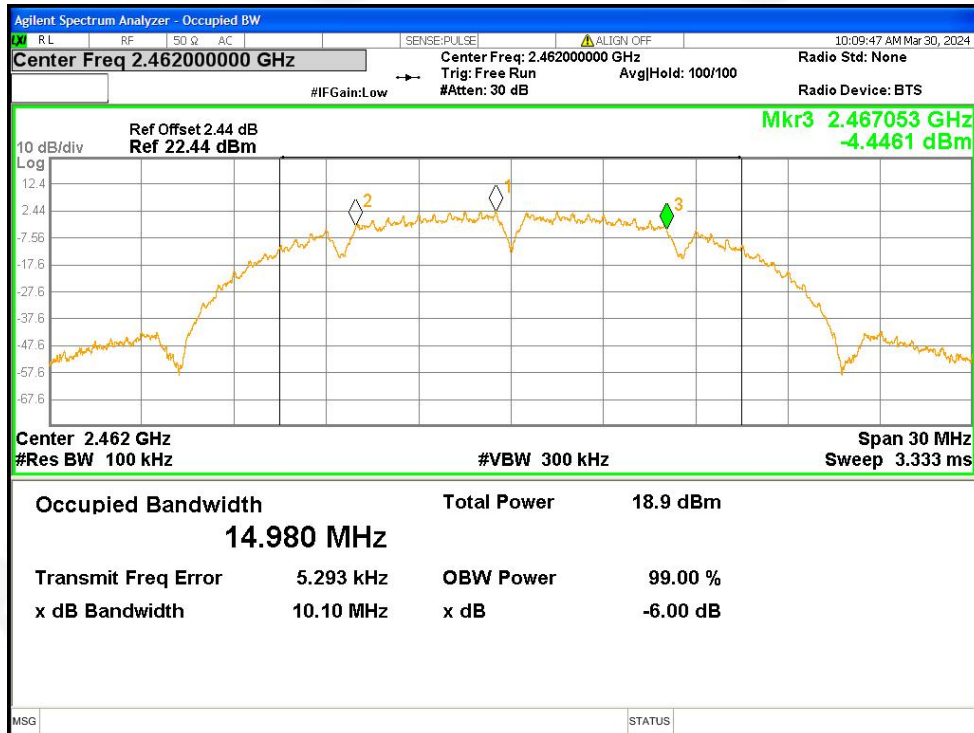
| Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|------|-----------------|---------|-----------------------|-----------------------------|---------|
| b    | 2412            | Ant1    | 10.107                | 0.5                         | Pass    |
| b    | 2437            | Ant1    | 10.086                | 0.5                         | Pass    |
| b    | 2462            | Ant1    | 10.106                | 0.5                         | Pass    |
| g    | 2412            | Ant1    | 16.506                | 0.5                         | Pass    |
| g    | 2437            | Ant1    | 16.542                | 0.5                         | Pass    |
| g    | 2462            | Ant1    | 16.545                | 0.5                         | Pass    |
| n20  | 2412            | Ant1    | 17.654                | 0.5                         | Pass    |
| n20  | 2437            | Ant1    | 17.678                | 0.5                         | Pass    |
| n20  | 2462            | Ant1    | 17.656                | 0.5                         | Pass    |
| n40  | 2422            | Ant1    | 36.408                | 0.5                         | Pass    |
| n40  | 2437            | Ant1    | 36.39                 | 0.5                         | Pass    |
| n40  | 2452            | Ant1    | 36.426                | 0.5                         | Pass    |



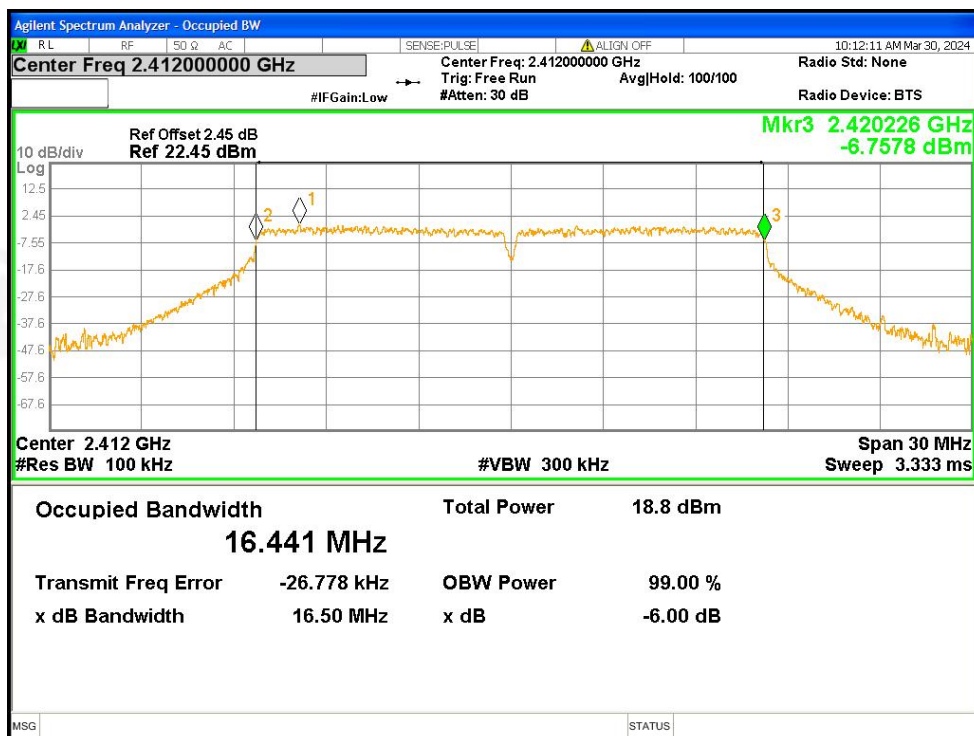
-6dB Bandwidth NVNT b 2412MHz Ant0



-6dB Bandwidth NVNT b 2437MHz Ant0

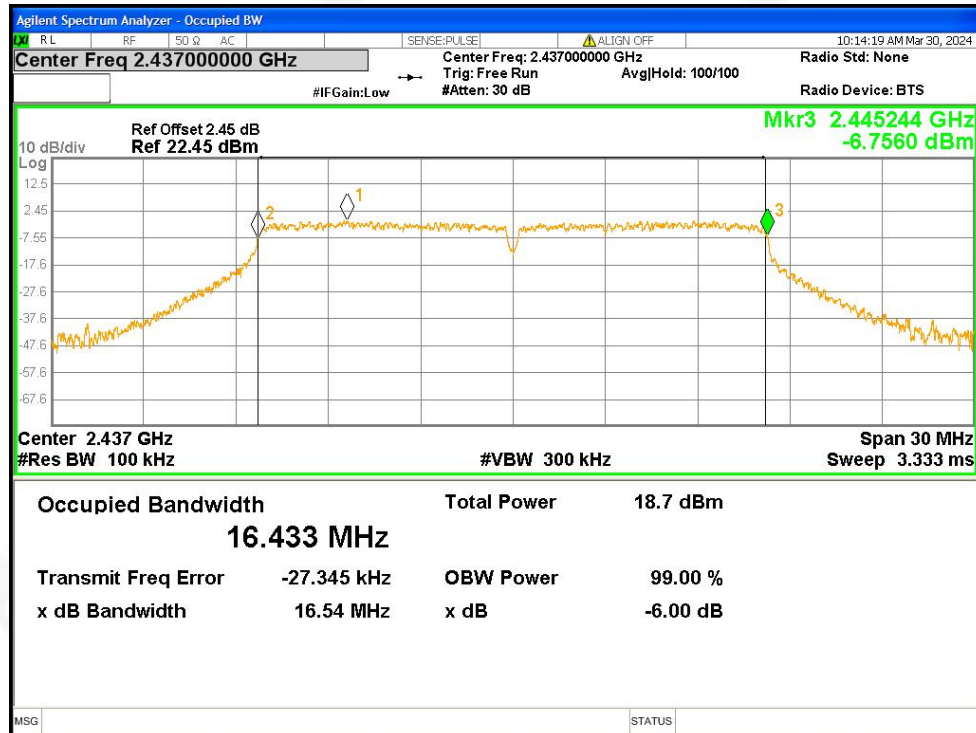


-6dB Bandwidth NVNT b 2462MHz Ant0

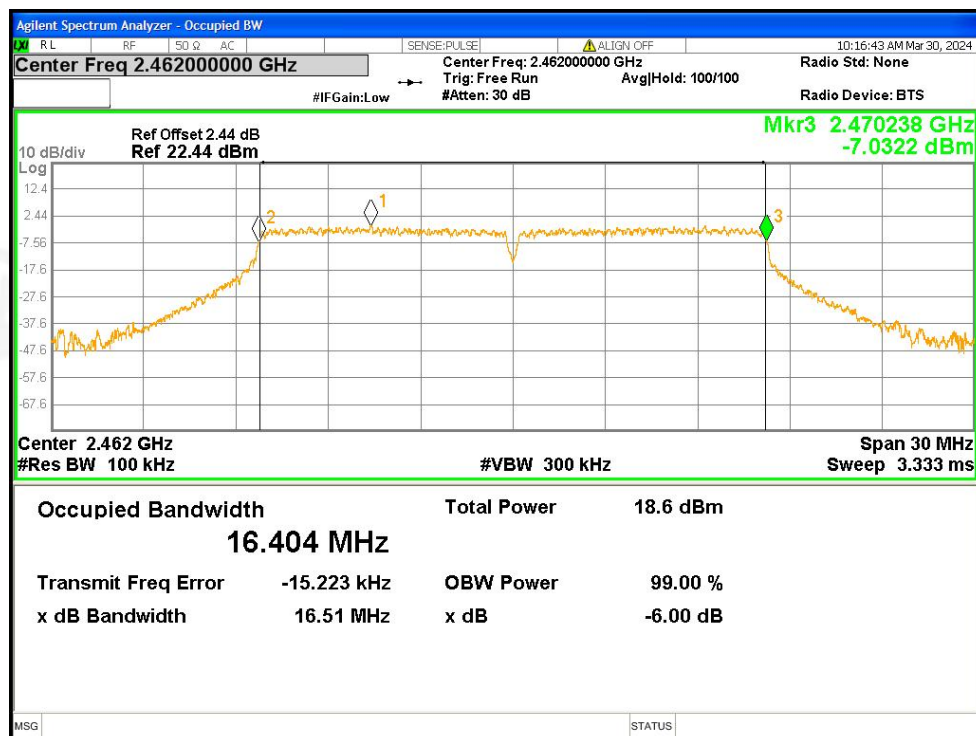


-6dB Bandwidth NVNT g 2412MHz Ant0

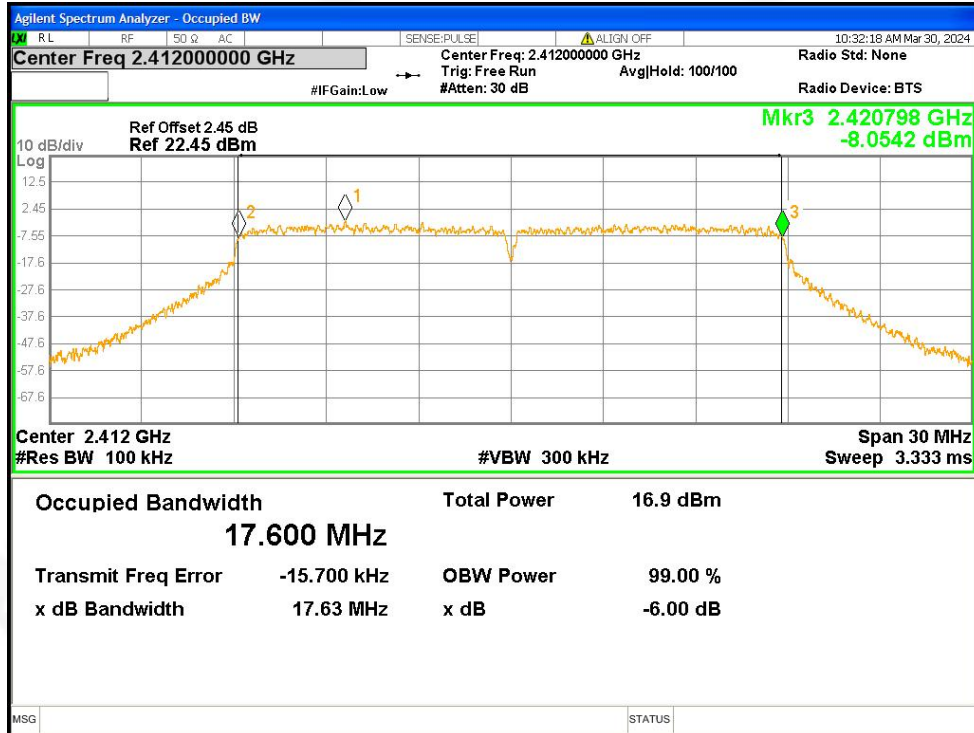




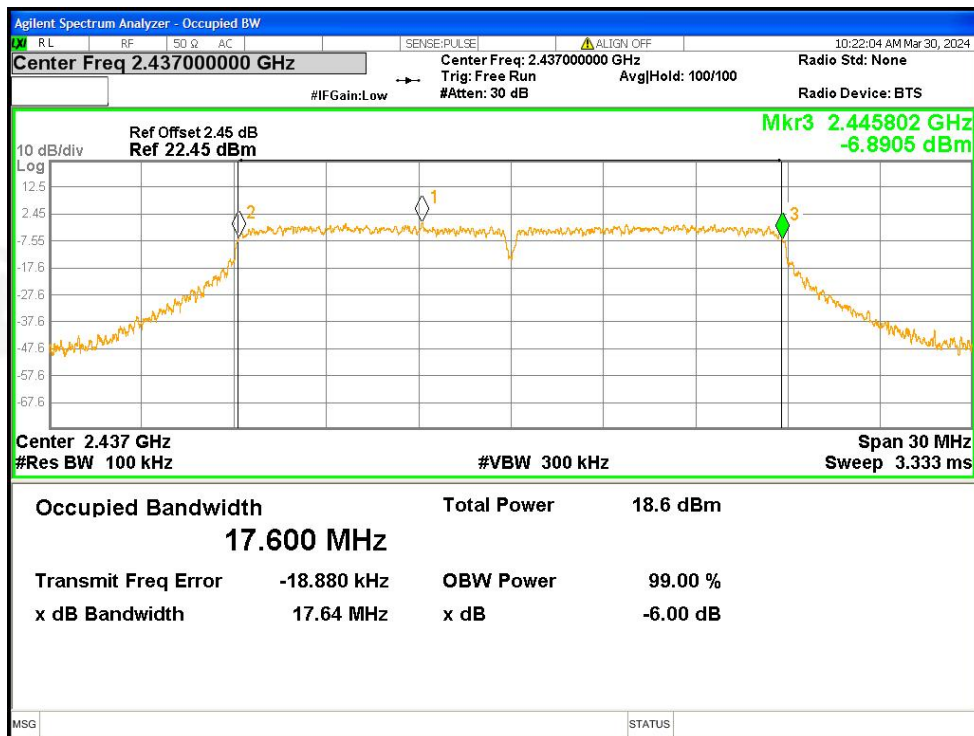
-6dB Bandwidth NVNT g 2437MHz Ant0



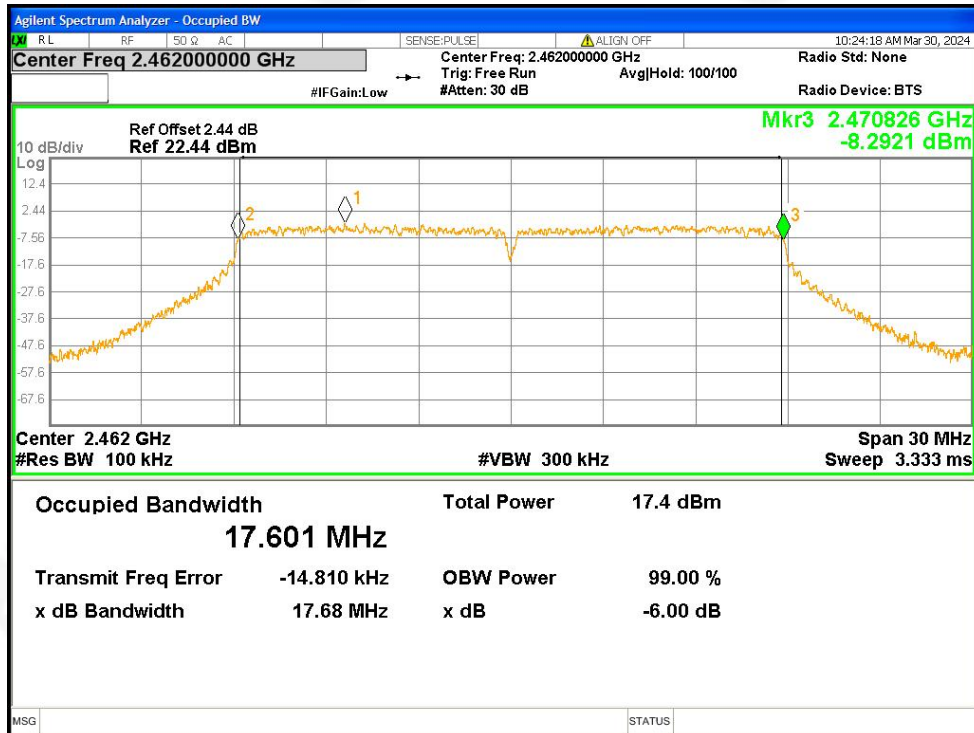
-6dB Bandwidth NVNT g 2462MHz Ant0



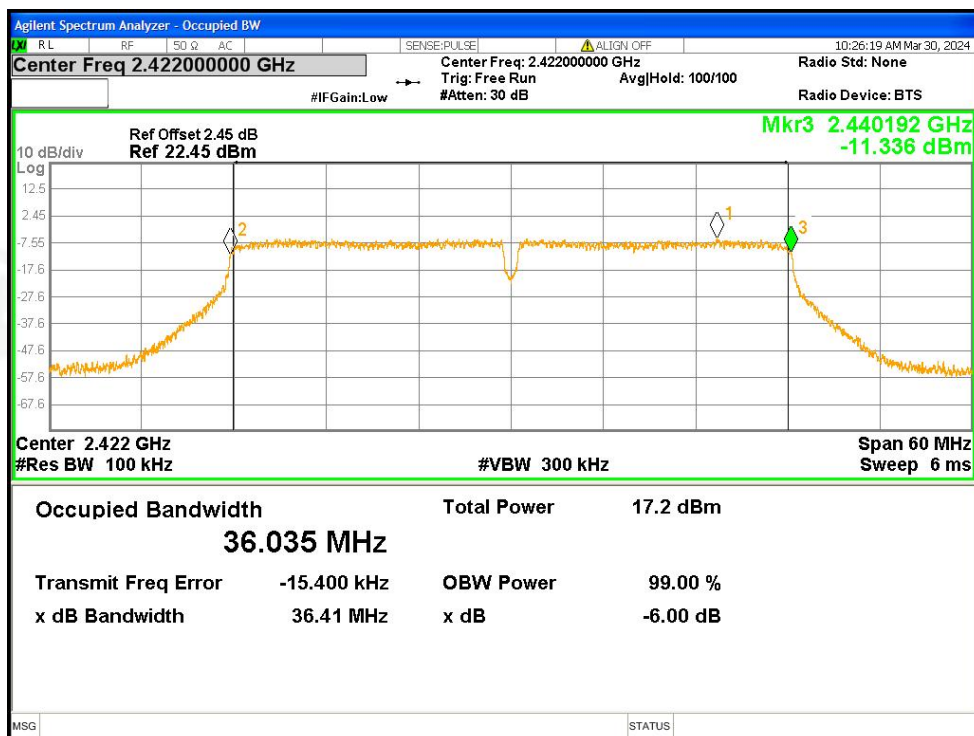
-6dB Bandwidth NVNT n20 2412MHz Ant0



-6dB Bandwidth NVNT n20 2437MHz Ant0



-6dB Bandwidth NVNT n20 2462MHz Ant0



-6dB Bandwidth NVNT n40 2422MHz Ant0