# FCC Radio Test Report

## FCC ID: 2AXJ4C420

**This report concerns: Class II Permissive Change**

| | | |
|---|---|---|
| **Report No.** | : | BTL-FCCP-1-2307G106 |
| **Equipment** | : | Smart Wire-Free Security Camera |
| **Model Name** | : | Tapo C420 |
| **Brand Name** | : | tp-link, tapo |
| **Applicant** | : | TP-Link Corporation Limited |
| **Address** | : | Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong |
| **Manufacturer** | : | TP-Link Corporation Limited |
| **Address** | : | Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong |
| **Radio Function** | : | WLAN 2.4 GHz |
| **FCC Rule Part(s)** | : | FCC CFR Title 47, Part 15, Subpart C (15.247) |
| **Measurement Procedure(s)** | : | ANSI C63.10-2013 |
| **Date of Receipt** | : | 2023/3/1<br>2023/7/18 |
| **Date of Test** | : | 2023/3/30 ~ 2023/4/10<br>2023/8/22 |
| **Issued Date** | : | 2023/9/6 |

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

**Prepared by** : Eddie Lee, Engineer

**Approved by** : Jerry Chuang, Supervisor

Testing Laboratory 0659

**BTL Inc.**

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan

Tel: +886-2-2657-3299 Fax: +886-2-2657-3331 Web: www.newbtl.com Service mail: btl_qa@newbtl.com

**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

**CONTENTS**


| | | |
|---|---|---|
| REVISION HISTORY | | 5 |
| 1 | SUMMARY OF TEST RESULTS | 6 |
| 1.1 | REFERENCE TEST GUIDANCE | 7 |
| 1.2 | TEST FACILITY | 7 |
| 1.3 | MEASUREMENT UNCERTAINTY | 7 |
| 1.4 | TEST ENVIRONMENT CONDITIONS | 7 |
| 1.5 | TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING | 8 |
| 1.6 | DUTY CYCLE | 9 |
| 2 | GENERAL INFORMATION | 10 |
| 2.1 | DESCRIPTION OF EUT | 10 |
| 2.2 | TEST MODES | 12 |
| 2.3 | BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 13 |
| 2.4 | SUPPORT UNITS | 14 |
| 3 | RADIATED EMISSIONS TEST | 15 |
| 3.1 | LIMIT | 15 |
| 3.2 | TEST PROCEDURE | 16 |
| 3.3 | DEVIATION FROM TEST STANDARD | 16 |
| 3.4 | TEST SETUP | 16 |
| 3.5 | EUT OPERATING CONDITIONS | 17 |
| 3.6 | TEST RESULT – BELOW 30 MHZ | 18 |
| 3.7 | TEST RESULT – 30 MHZ TO 1 GHZ | 18 |
| 3.8 | TEST RESULT – ABOVE 1 GHZ | 18 |
| 4 | BANDWIDTH TEST | 19 |
| 4.1 | LIMIT | 19 |
| 4.2 | TEST PROCEDURE | 19 |
| 4.3 | DEVIATION FROM TEST STANDARD | 19 |
| 4.4 | TEST SETUP | 19 |
| 4.5 | EUT OPERATING CONDITIONS | 19 |
| 4.6 | TEST RESULT | 19 |
| 5 | OUTPUT POWER TEST | 20 |
| 5.1 | LIMIT | 20 |
| 5.2 | TEST PROCEDURE | 20 |
| 5.3 | DEVIATION FROM TEST STANDARD | 20 |
| 5.4 | TEST SETUP | 20 |
| 5.5 | EUT OPERATING CONDITIONS | 20 |
| 5.6 | TEST RESULT | 20 |
| 6 | POWER SPECTRAL DENSITY | 21 |
| 6.1 | LIMIT | 21 |
| 6.2 | TEST PROCEDURE | 21 |
| 6.3 | DEVIATION FROM TEST STANDARD | 21 |
| 6.4 | TEST SETUP | 21 |
| 6.5 | EUT OPERATING CONDITIONS | 21 |
| 6.6 | TEST RESULT | 21 |
| 7 | ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST | 22 |
| 7.1 | LIMIT | 22 |
| 7.2 | TEST PROCEDURE | 22 |
| 7.3 | DEVIATION FROM TEST STANDARD | 22 |

| | | |
|---|---|---|
| 7.4 | TEST SETUP | 22 |
| 7.5 | EUT OPERATING CONDITIONS | 22 |
| 7.6 | TEST RESULT | 22 |
| 8 | LIST OF MEASURING EQUIPMENTS | 23 |
| 9 | EUT TEST PHOTO | 25 |
| 10 | EUT PHOTOS | 25 |

| | | |
|---|---|---|
| APPENDIX A | RADIATED EMISSIONS - 30 MHZ TO 1 GHZ | 26 |
| APPENDIX B | RADIATED EMISSIONS - ABOVE 1 GHZ | 29 |
| APPENDIX C | BANDWIDTH | 48 |
| APPENDIX D | OUTPUT POWER | 52 |
| APPENDIX E | POWER SPECTRAL DENSITY | 54 |
| APPENDIX F | ANTENNA CONDUCTED SPURIOUS EMISSIONS | 58 |

## REVISION HISTORY

| Report No. | Version | Description | Issued Date | Note |
|---|---|---|---|---|
| BTL-FCCP-1-2302G024 | R00 | Original Report. | 2023/4/28 | Invalid |
| BTL-FCCP-1-2302G024 | R01 | Revised report to address TCB's comments. | 2023/4/28 | Invalid |
| BTL-FCCP-1-2302G024 | R02 | Revised report to address TCB's comments. | 2023/5/23 | Valid |
| BTL-FCCP-1-2307G106 | R00 | Changed battery. | 2023/9/6 | Valid |

# 1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

| Standard(s) Section | Description | Test Result | Judgement | Remark |
|---|---|---|---|---|
| 15.207 | AC Power Line Conducted Emissions | NOTE (1) | N/A | ------ |
| 15.205<br>15.209<br>15.247(d) | Radiated Emissions | APPENDIX A<br>APPENDIX B | Pass | ------ |
| 15.247(a) | Bandwidth | APPENDIX C | Pass | ------ |
| 15.247(b) | Output Power | APPENDIX D | Pass | ------ |
| 15.247(e) | Power Spectral Density | APPENDIX E | Pass | ------ |
| 15.247(d) | Antenna conducted Spurious Emission | APPENDIX F | Pass | ------ |
| 15.203 | Antenna Requirement | ------ | Pass | ------ |

NOTE:
(1) ”N/A” denotes test is not applicable in this Test Report.
(2) The report format version is TP.1.1.1.
(3) This a support report for FCC ID: 2AXJ4C420 enables WLAN channel 12 and 13. Only test results of WLAN channel 12 and 13 are recorded in this report.

### 1.1 REFERENCE TEST GUIDANCE

KDB 662911 D01 Multiple Transmitter Output v02r01

### 1.2 TEST FACILITY

The test locations stated below are under the TAF Accreditation Number 0659.
The test location(s) used to collect the test data in this report are:
No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
(FCC DN: TW0659)
☐ C05 ☐ CB08 ☐ CB11 ☒ SR10 ☐ SR11
No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
(FCC DN: TW0659)
☐ C06 ☒ CB21 ☐ CB22

### 1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k = 2**, providing a level of confidence of approximately **95 %**. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 $U_{cispr}$ requirement.

A. Radiated emissions test :

| Test Site | Measurement Frequency Range | U (dB) |
|---|---|---|
| CB21 | 0.03 GHz ~ 0.2 GHz | 4.17 |
| | 0.2 GHz ~ 1 GHz | 4.72 |
| | 1 GHz ~ 6 GHz | 5.21 |
| | 6 GHz ~ 18 GHz | 5.51 |
| | 18 GHz ~ 26 GHz | 3.69 |
| | 26 GHz ~ 40 GHz | 4.23 |

B. Conducted test :

| Test Item | U (dB) |
|---|---|
| Occupied Bandwidth | 0.5334 |
| Output power | 0.3669 |
| Power Spectral Density | 0.6591 |
| Conducted Spurious emissions | 0.5416 |
| Conducted Band edges | 0.5348 |

NOTE:
Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 1.4 TEST ENVIRONMENT CONDITIONS

| Test Item | Environment Condition | Test Voltage | Tested by |
|---|---|---|---|
| Radiated emissions below 1 GHz | Refer to data | AC 120V | Mark Wang |
| Radiated emissions above 1 GHz | Refer to data | AC 120V | Mark Wang |
| Bandwidth | 22 °C, 49 % | AC 120V | Jay Tien |
| Output Power | 21 °C, 61 % | AC 120V | Jay Tien |
| Power Spectral Density | 21 °C, 61 % | AC 120V | Jay Tien |
| Antenna conducted Spurious Emission | 22 °C, 49 % | AC 120V | Jay Tien |

### 1.5 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

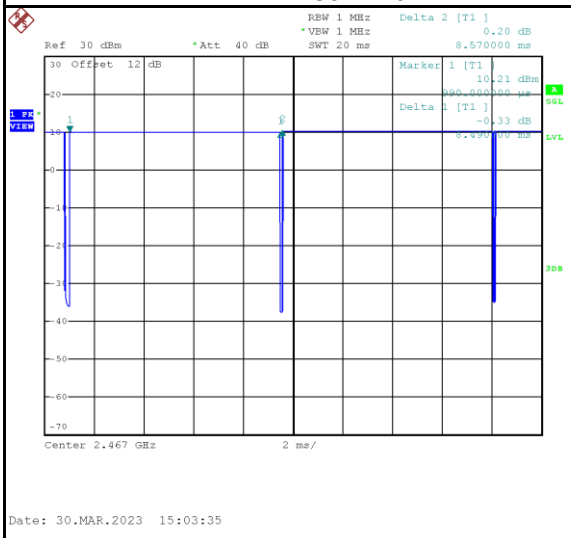
| Test Software | MT7682 QA 0.3.0.8 | | |
|---|---|---|---|
| Mode | 2467 MHz | 2472 MHz | Data Rate |
| IEEE 802.11b | 1D | 19 | 1 Mbps |
| IEEE 802.11g | 18 | 18 | 6 Mbps |
| IEEE 802.11n (HT20) | 1A | 1A | HT 0 |

## 1.6 DUTY CYCLE

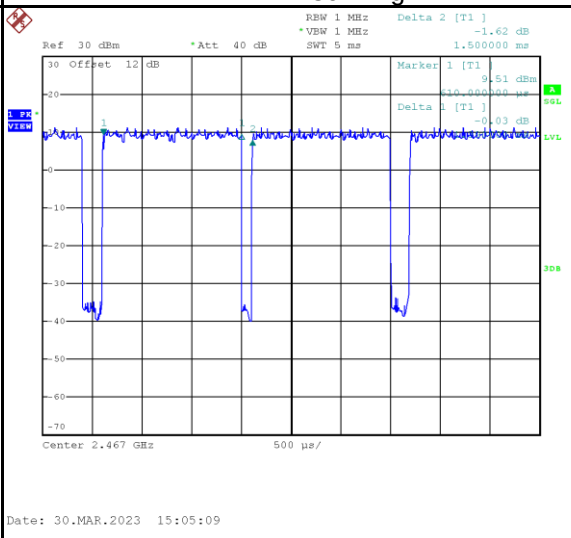
If duty cycle is ≥ 98 %, duty factor is not required.
If duty cycle is < 98 %, duty factor shall be considered.

| Remark | Delta 1 | | | Delta 2 | On Time/Period | 10 log(1/Duty Cycle) |
|---|---|---|---|---|---|---|
| Mode | ON (ms) | Numbers (ON) | On Time (B) (ms) | Period (ON+OFF) (ms) | Duty Cycle (%) | Duty Factor (dB) |
| IEEE 802.11b | 8.490 | 1 | 8.490 | 8.570 | 99.07% | 0.04 |
| IEEE 802.11g | 1.390 | 1 | 1.390 | 1.500 | 92.67% | 0.33 |
| IEEE 802.11n (HT20) | 1.310 | 1 | 1.310 | 1.460 | 89.73% | 0.47 |

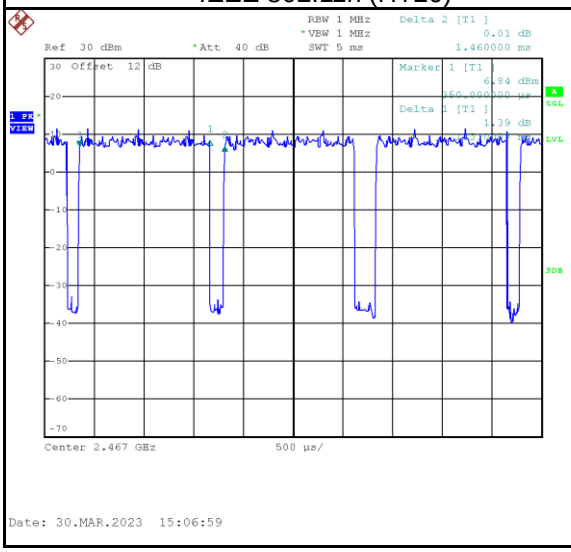
IEEE 802.11b




IEEE 802.11g




IEEE 802.11n (HT20)




-

-

# 2 GENERAL INFORMATION

## 2.1 DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Smart Wire-Free Security Camera |
| Model Name | Tapo C420 |
| Brand Name | tp-link, tapo |
| Model Difference | N/A |
| Power Source | #1 DC voltage supplied from AC Adapter.<br>#2 Supplied from battery. |
| Power Rating | #1 I/P: 100-240V~ 50/60Hz 0.2A Max. O/P: 5V⎓1A<br>#2 DC3.6V, 6700mAh, 24.12Wh |
| Products Covered | 1 * Adapter: A8-501000<br>1 * Battery: Tapo A100<br>1 * USB Cable<br>1 * Bracket |
| Operation Band | 2400 MHz ~ 2483.5 MHz |
| Operation Frequency | 2412 MHz ~ 2472 MHz |
| Modulation Technology | IEEE 802.11b: DSSS<br>IEEE 802.11g: OFDM<br>IEEE 802.11n: OFDM |
| Transfer Rate | IEEE 802.11b: 11/5.5/2/1 Mbps<br>IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps<br>IEEE 802.11n: up to 72.2 Mbps |
| Output Average Power Max. (Channel 1~11) NOTE (5) | IEEE 802.11b: 18.06 dBm (0.0640 W)<br>IEEE 802.11g: 18.59 dBm (0.0723 W)<br>IEEE 802.11n (HT20): 17.26 dBm (0.0532 W) |
| Output Average Power Max. (Channel 12~13) | IEEE 802.11b: 15.23 dBm (0.0333 W)<br>IEEE 802.11g: 12.66 dBm (0.0185 W)<br>IEEE 802.11n (HT20): 12.44 dBm (0.0175 W) |
| Test Model | Tapo C420 |
| Sample Status | Engineering Sample |
| EUT Modification(s) | N/A |

NOTE:

(1) The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

(2) Channel List:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 01 | 2412 | 06 | 2437 | 11 | 2462 |
| 02 | 2417 | 07 | 2442 | 12 | 2467 |
| 03 | 2422 | 08 | 2447 | 13 | 2472 |
| 04 | 2427 | 09 | 2452 | | |
| 05 | 2432 | 10 | 2457 | | |

(3) Table for Filed Antenna:

| Ant. | Brand | Model Name | Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 2 | TP-LINK® | Tapo C420(US)1.0 | IFA | N/A | -0.21 |

(4) The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

(5) The values are adopted from test report: BTL-FCCP-1-2204C109A.

(6) This is a supplement report of BTL-FCCP-1-2302G024 report. The differences compared with original report is changed battery.
After evaluated, the changes with respect to the original one, only radiated emissions below 1 GHz tests need to be verified.

## 2.2 TEST MODES

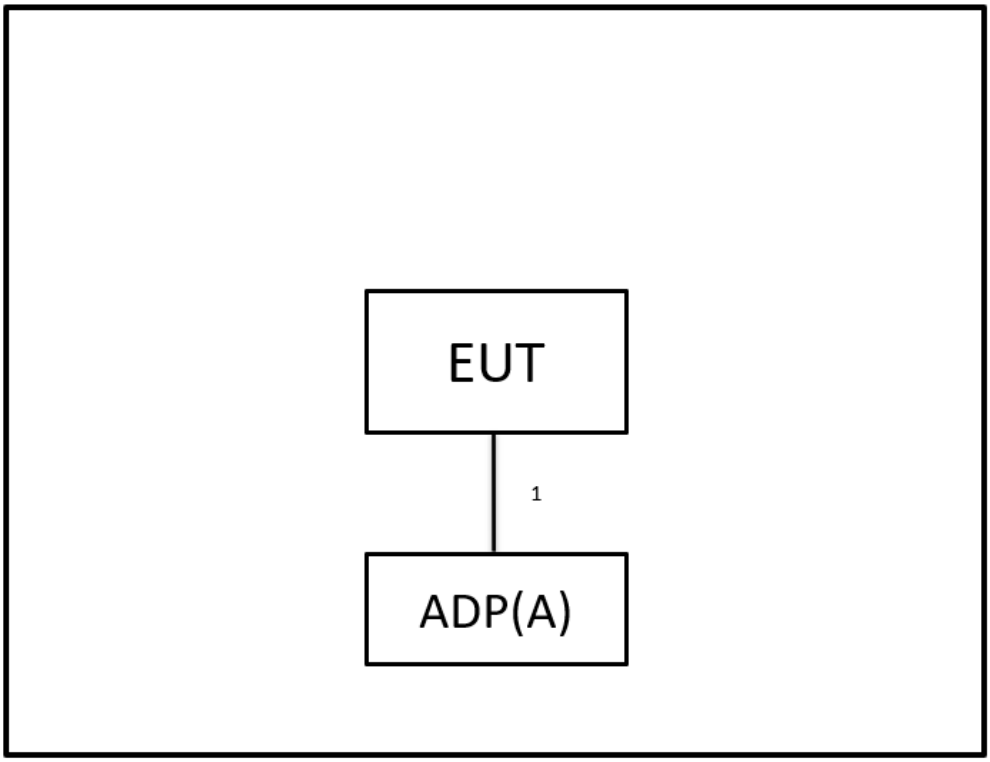
| Test Items | Test mode | Channel | Note |
|---|---|---|---|
| Transmitter Radiated Emissions (below 1GHz) | TX Mode_IEEE 802.11b | 12 | - |
| Transmitter Radiated Emissions (above 1GHz) | TX Mode_IEEE 802.11b | | Bandedge |
| | TX Mode_IEEE 802.11g | | |
| | TX Mode_IEEE 802.11n (HT20) | | |
| Transmitter Radiated Emissions (above 1GHz) | TX Mode_IEEE 802.11b | 12/13 | Harmonic |
| | TX Mode_IEEE 802.11g | | |
| | TX Mode_IEEE 802.11n (HT20) | | |
| Bandwidth & Output Power & Power Spectral Density & Antenna conducted Spurious Emission | TX Mode_IEEE 802.11b | 12/13 | - |
| | TX Mode_IEEE 802.11g | | |
| | TX Mode_IEEE 802.11n (HT20) | | |

NOTE:
(1) For radiated emission band edge test, both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.
(2) All X, Y and Z axes are evaluated, but only the worst case (Y axis) is recorded.

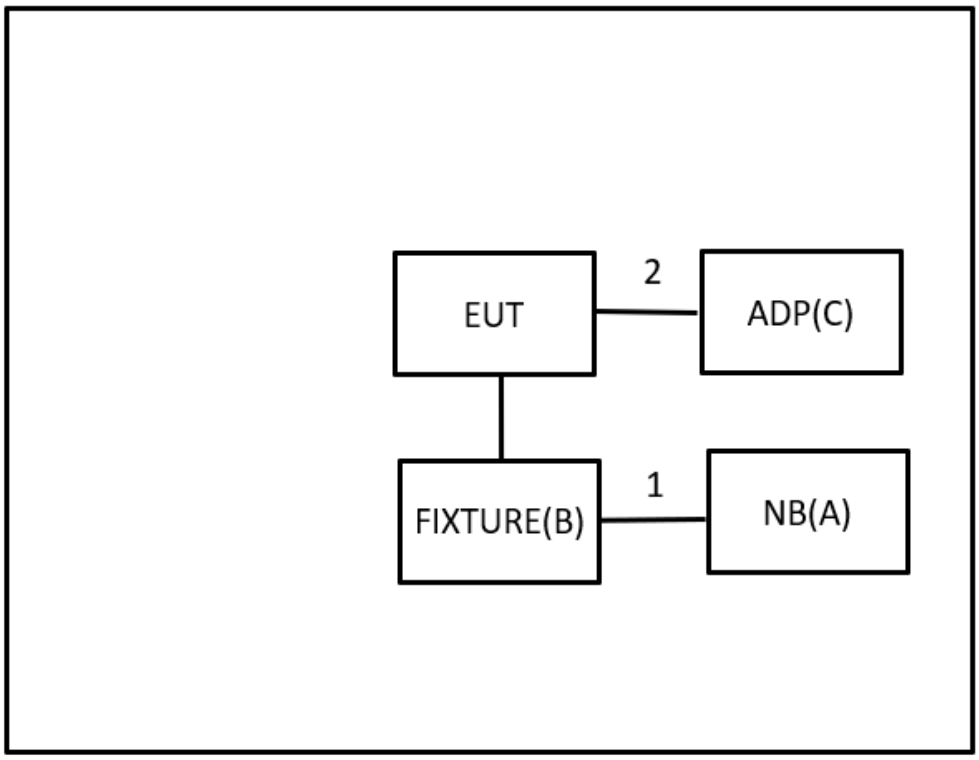
## 2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.

**For Radiated Emissions (below 1GHz)**




**For Radiated Emissions (above 1GHz)**



## 2.4 SUPPORT UNITS

**For Radiated Emissions (below 1GHz)**

| Item | Equipment | Brand | Model No. | Series No. | Remarks |
|---|---|---|---|---|---|
| A | ADP | LISTED | A8-501000 | N/A | Supplied by test requester |

| Item | Shielded | Ferrite Core | Length | Cable Type | Remarks |
|---|---|---|---|---|---|
| 1 | No | No | 1m | USB To Mico USB Cable | Supplied by test requester |

**For Radiated Emissions (above 1GHz)**

| Item | Equipment | Brand | Model No. | Series No. | Remarks |
|---|---|---|---|---|---|
| A | NB | HP | TPN-C125 | N/A | Furnished by test lab. |
| B | FIXTURE | N/A | N/A | N/A | Supplied by test requester |
| C | ADP | LISTED | A8-501000 | N/A | Supplied by test requester |

| Item | Shielded | Ferrite Core | Length | Cable Type | Remarks |
|---|---|---|---|---|---|
| 1 | No | No | 1m | USB extension Cable | Furnished by test lab. |
| 2 | No | No | 0.5m | USB Cable | Supplied by test requester |

# 3 RADIATED EMISSIONS TEST

## 3.1 LIMIT

In case the emission fall within the restricted band specified on 15.205, then the 15.209 limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (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 |
| 960~1000 | 500 | 3 |

LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

| Frequency (MHz) | Radiated Emissions (dBuV/m) | | Measurement Distance (meters) |
|---|---|---|---|
| | Peak | Average | |
| Above 1000 | 74 | 54 | 3 |

NOTE:
(1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value
Calculation example:

| Reading Level | | Correct Factor | | Measurement Value |
|---|---|---|---|---|
| 19.11 | + | 2.11 | = | 21.22 |

| Measurement Value | | Limit Value | | Margin Level |
|---|---|---|---|---|
| 21.22 | - | 54 | = | -32.78 |

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RBW / VBW (Emission in restricted band) | 1MHz / 3MHz for Peak, 1MHz / 1/T for Average |

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9KHz~90KHz for PK/AVG detector |
| Start ~ Stop Frequency | 90KHz~110KHz for QP detector |
| Start ~ Stop Frequency | 110KHz~490KHz for PK/AVG detector |
| Start ~ Stop Frequency | 490KHz~30MHz for QP detector |
| Start ~ Stop Frequency | 30MHz~1000MHz for QP detector |

### 3.2 TEST PROCEDURE

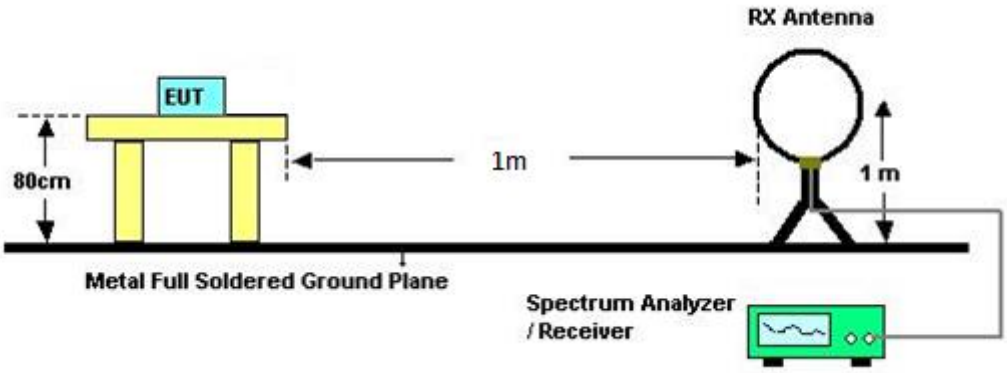
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)
i. For the actual test configuration, please refer to the related Item – EUT TEST PHOTO.

### 3.3 DEVIATION FROM TEST STANDARD

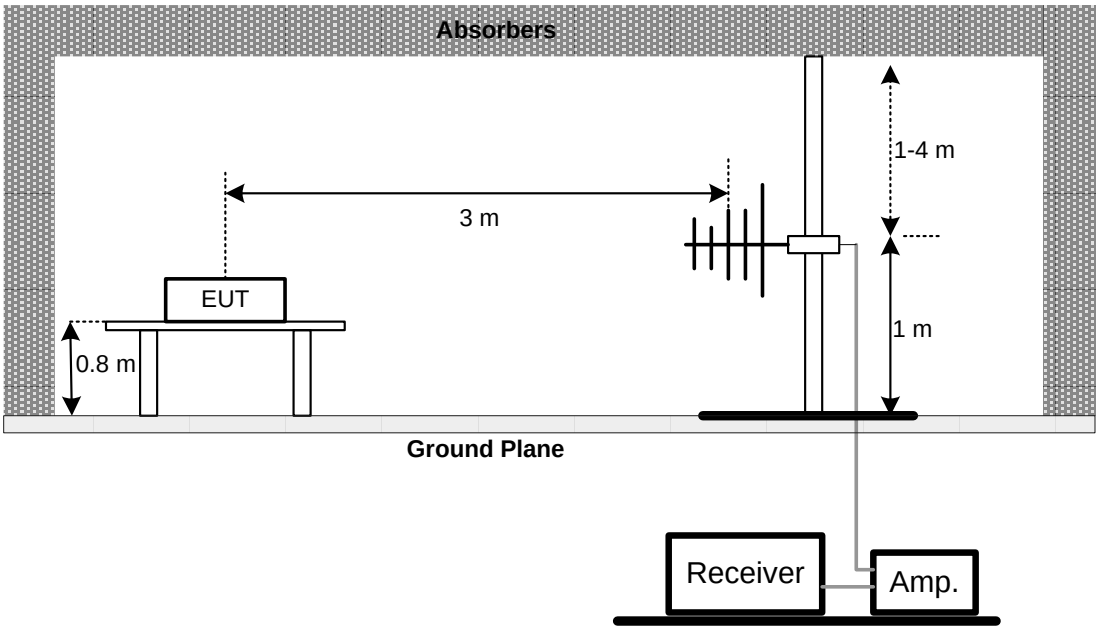
No deviation.

### 3.4 TEST SETUP

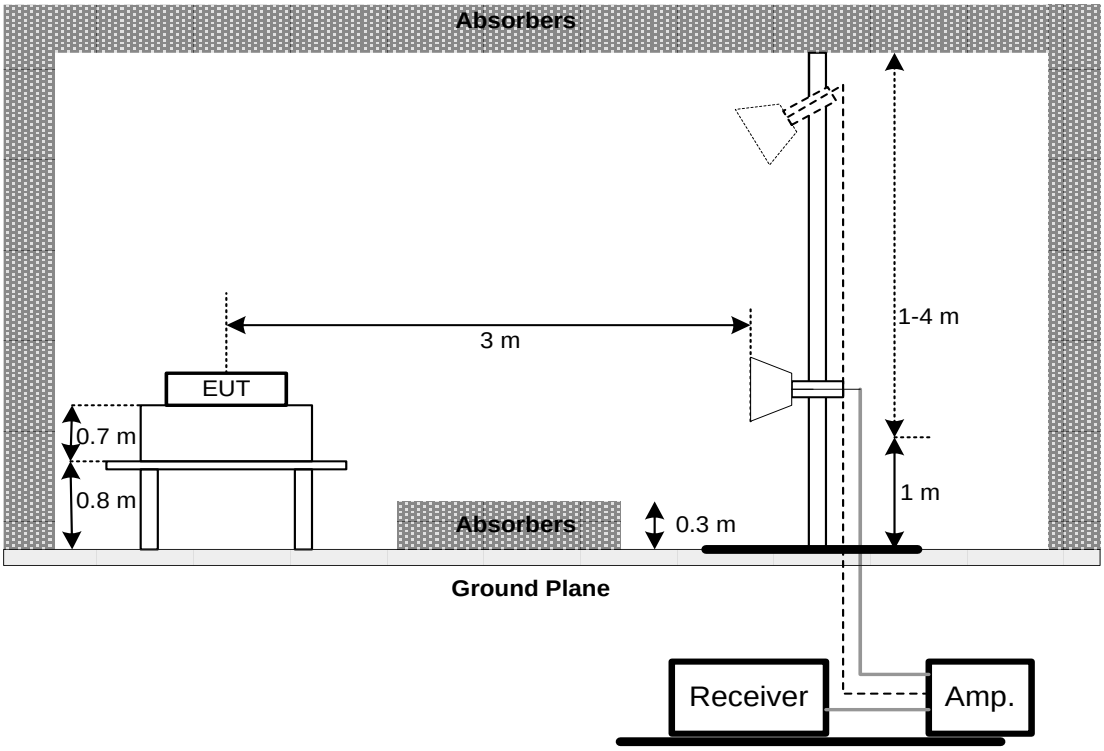
**9 kHz to 30 MHz**



**30 MHz to 1 GHz**




**Above 1 GHz**




### 3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 3.6 TEST RESULT – BELOW 30 MHZ

There were no emissions found below 30 MHz within 20 dB of the limit.

### 3.7 TEST RESULT – 30 MHZ TO 1 GHZ

Please refer to the APPENDIX A.

### 3.8 TEST RESULT – ABOVE 1 GHZ

Please refer to the APPENDIX B.

NOTE:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

# 4 BANDWIDTH TEST

## 4.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| 15.247(a) | 6 dB Bandwidth | 500 kHz |

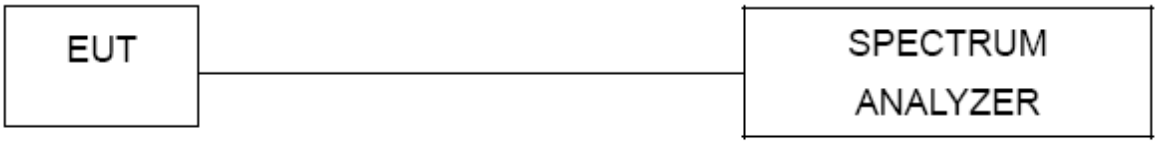
## 4.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

## 4.3 DEVIATION FROM TEST STANDARD

No deviation.

## 4.4 TEST SETUP




## 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 4.6 TEST RESULT

Please refer to the APPENDIX C.

# 5 OUTPUT POWER TEST

## 5.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| 15.247(b) | Maximum Output Power | 1 Watt or 30dBm |

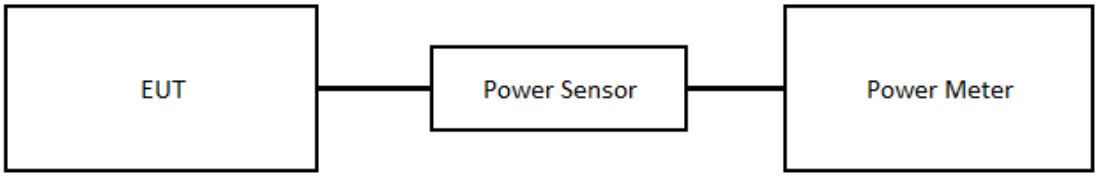
## 5.2 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
b. The maximum peak conducted output power was performed in accordance with FCC KDB 558074 D01 15.247 Meas Guidance.
c. Subclause 11.9.1.1 of ANSI C63.10 is applied. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

## 5.3 DEVIATION FROM TEST STANDARD

No deviation.

## 5.4 TEST SETUP




## 5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 5.6 TEST RESULT

Please refer to the APPENDIX D.

# 6 POWER SPECTRAL DENSITY

## 6.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| 15.247(e) | Power Spectral Density | 8 dBm<br>(in any 3 kHz) |

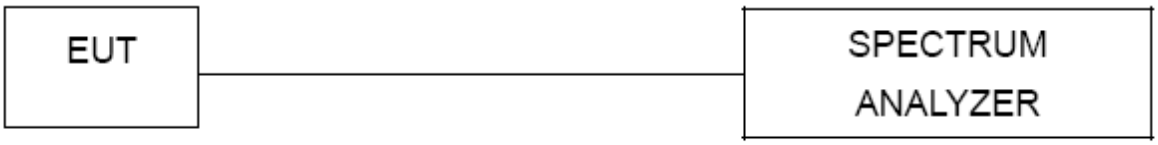
## 6.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW = 3 kHz, VBW = 10 kHz, Sweep time = Auto.

## 6.3 DEVIATION FROM TEST STANDARD

No deviation.

## 6.4 TEST SETUP




## 6.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 6.6 TEST RESULT

Please refer to the APPENDIX E.

# 7 ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST

## 7.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

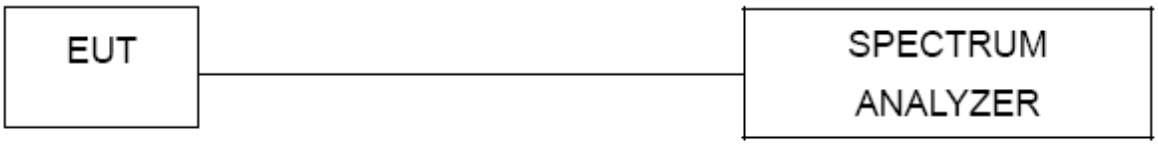
## 7.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW = 100 kHz, VBW=300 kHz, Sweep time = Auto.
c. Offset = antenna gain + cable loss.

## 7.3 DEVIATION FROM TEST STANDARD

No deviation.

## 7.4 TEST SETUP




## 7.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 7.6 TEST RESULT

Please refer to the APPENDIX F.

# 8 LIST OF MEASURING EQUIPMENTS

| Radiated Emissions (below 1GHz) | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Preamplifier | EMCI | EMC330N | 980850 | 2022/9/19 | 2023/9/18 |
| 2 | Test Cable | EMCI | EMC104-SM-1000 | 180809 | 2023/7/10 | 2024/7/9 |
| 3 | Test Cable | EMCI | EMC104-SM-SM-3000 | 220322 | 2023/3/14 | 2024/3/13 |
| 4 | Test Cable | EMCI | EMC104-SM-SM-7000 | 220324 | 2023/3/14 | 2024/3/13 |
| 5 | EXA Signal Analyzer | keysight | N9020B | MY57120120 | 2023/2/24 | 2024/2/23 |
| 6 | Log-bicon Antenna | Schwarzbeck | VULB9168 | 1369 | 2023/5/9 | 2024/5/8 |
| 7 | 6dB Attenuator | EMCI | EMCI-N-6-06 | AT-06001 | 2023/5/9 | 2024/5/8 |
| 8 | Measurement Software | EZ | EZ_EMC (Version NB-03A1-01) | N/A | N/A | N/A |

| Radiated Emissions (above 1GHz) | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Preamplifier | EMCI | EMC118A45SE | 980819 | 2023/3/7 | 2024/3/6 |
| 2 | Pre-Amplifier | EMCI | EMC184045SE | 980907 | 2022/9/28 | 2023/9/27 |
| 3 | Test Cable | EMCI | EMC104-SM-SM-1000 | 220319 | 2023/3/14 | 2024/3/13 |
| 4 | Test Cable | EMCI | EMC104-SM-SM-3000 | 220322 | 2023/3/14 | 2024/3/13 |
| 5 | Test Cable | EMCI | EMC104-SM-SM-7000 | 220324 | 2023/3/14 | 2024/3/13 |
| 6 | EXA Signal Analyzer | keysight | N9020B | MY57120120 | 2023/2/24 | 2024/2/23 |
| 7 | Horn Antenna | RFSPIN | DRH18-E | 211202A18EN | 2022/5/18 | 2023/5/17 |
| 8 | Horn Ant | Schwarzbeck | BBHA 9170D | 1136 | 2022/5/18 | 2023/5/17 |
| 9 | Test Cable | EMCI | EMC101G-KM-KM-3000 | 220329 | 2023/3/14 | 2024/3/13 |
| 10 | Test Cable | EMCI | EMC102-KM-KM-1000 | 220327 | 2023/3/14 | 2024/3/13 |
| 11 | Measurement Software | EZ | EZ_EMC (Version NB-03A1-01) | N/A | N/A | N/A |

| Bandwidth | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100129 | 2022/10/7 | 2023/10/6 |

| Output Power | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Power Meter | Anritsu | ML2495A | 1128008 | 2022/6/1 | 2023/5/31 |
| 2 | Power Sensor | Anritsu | MA2411B | 1126001 | 2022/6/1 | 2023/5/31 |

| Power Spectral Density | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100129 | 2022/10/7 | 2023/10/6 |

| Antenna conducted Spurious Emission | | | | | | |
|---|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated Date | Calibrated Until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100129 | 2022/10/7 | 2023/10/6 |

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

## 9 EUT TEST PHOTO

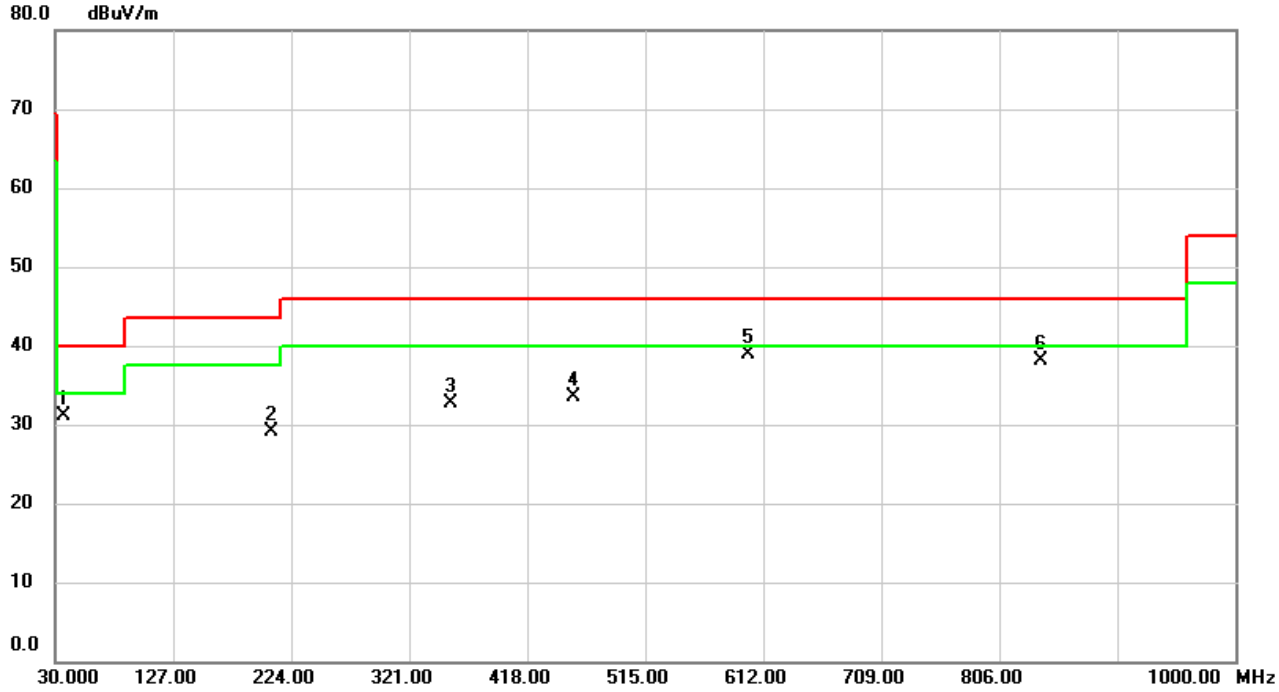
Please refer to document Appendix No.: TP-2307G106-FCCP-1 (APPENDIX-TEST PHOTOS).

## 10 EUT PHOTOS

Please refer to document Appendix No.: EP-2307G106-1 (APPENDIX-EUT PHOTOS).

# APPENDIX A RADIATED EMISSIONS - 30 MHZ TO 1 GHZ

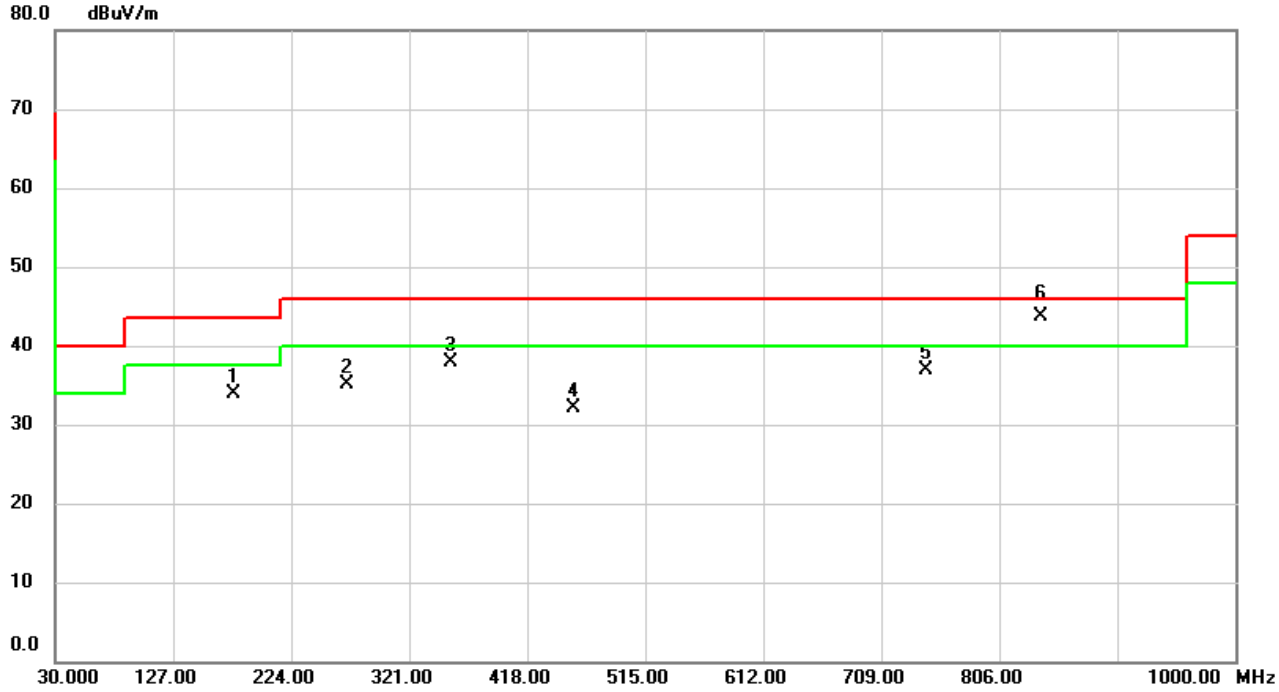
| Test Mode | IEEE 802.11b | Test Date | 2023/8/22 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Vertical |
| Temp | 25°C | Hum. | 56% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 36.7576 | 43.27 | -12.14 | 31.13 | 40.00 | -8.87 | peak | |
| 2 | | 207.2513 | 44.29 | -15.15 | 29.14 | 43.50 | -14.36 | peak | |
| 3 | | 355.7260 | 42.55 | -9.94 | 32.61 | 46.00 | -13.39 | peak | |
| 4 | | 455.9917 | 40.45 | -6.98 | 33.47 | 46.00 | -12.53 | peak | |
| 5 | * | 600.0043 | 42.69 | -3.86 | 38.83 | 46.00 | -7.17 | peak | |
| 6 | | 840.0147 | 38.26 | -0.10 | 38.16 | 46.00 | -7.84 | peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | IEEE 802.11b | Test Date | 2023/8/22 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 25°C | Hum. | 56% |

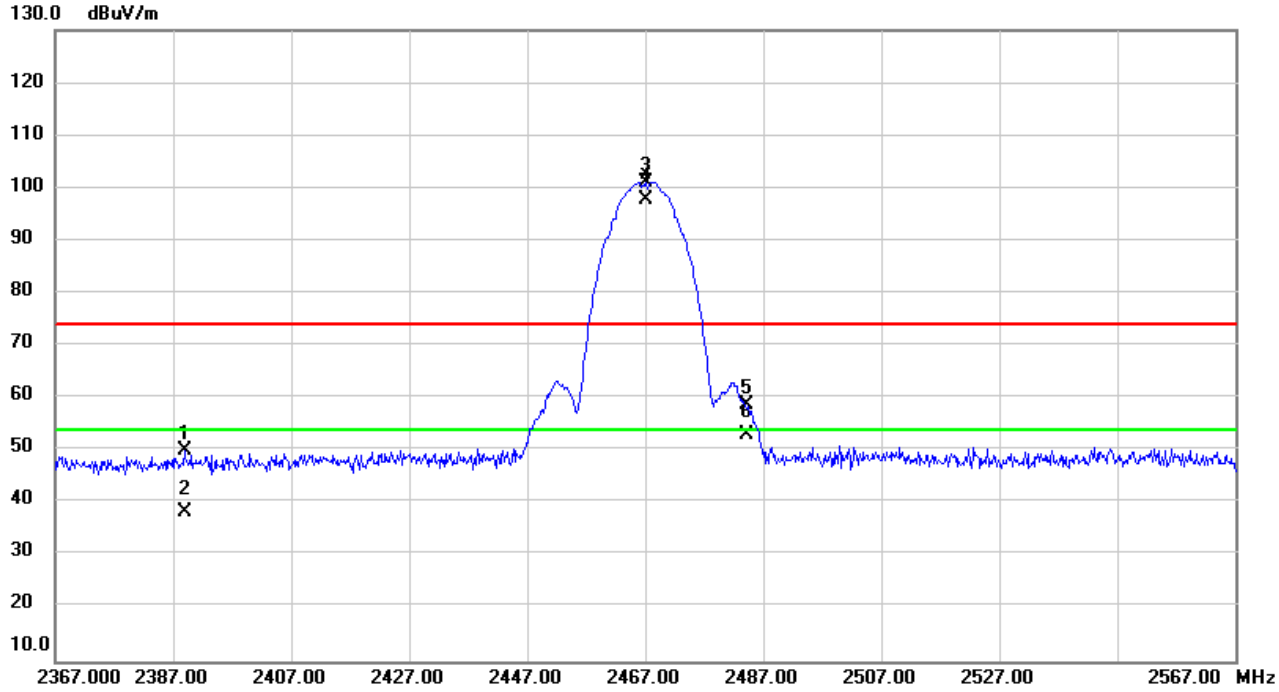



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 177.3107 | 46.81 | -12.92 | 33.89 | 43.50 | -9.61 | peak | |
| 2 | | 269.8810 | 47.30 | -12.11 | 35.19 | 46.00 | -10.81 | peak | |
| 3 | | 355.3380 | 47.79 | -9.95 | 37.84 | 46.00 | -8.16 | peak | |
| 4 | | 455.9917 | 39.10 | -6.98 | 32.12 | 46.00 | -13.88 | peak | |
| 5 | | 745.3103 | 38.34 | -1.46 | 36.88 | 46.00 | -9.12 | peak | |
| 6 | * | 840.0147 | 43.88 | -0.10 | 43.78 | 46.00 | -2.22 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX B RADIATED EMISSIONS - ABOVE 1 GHZ

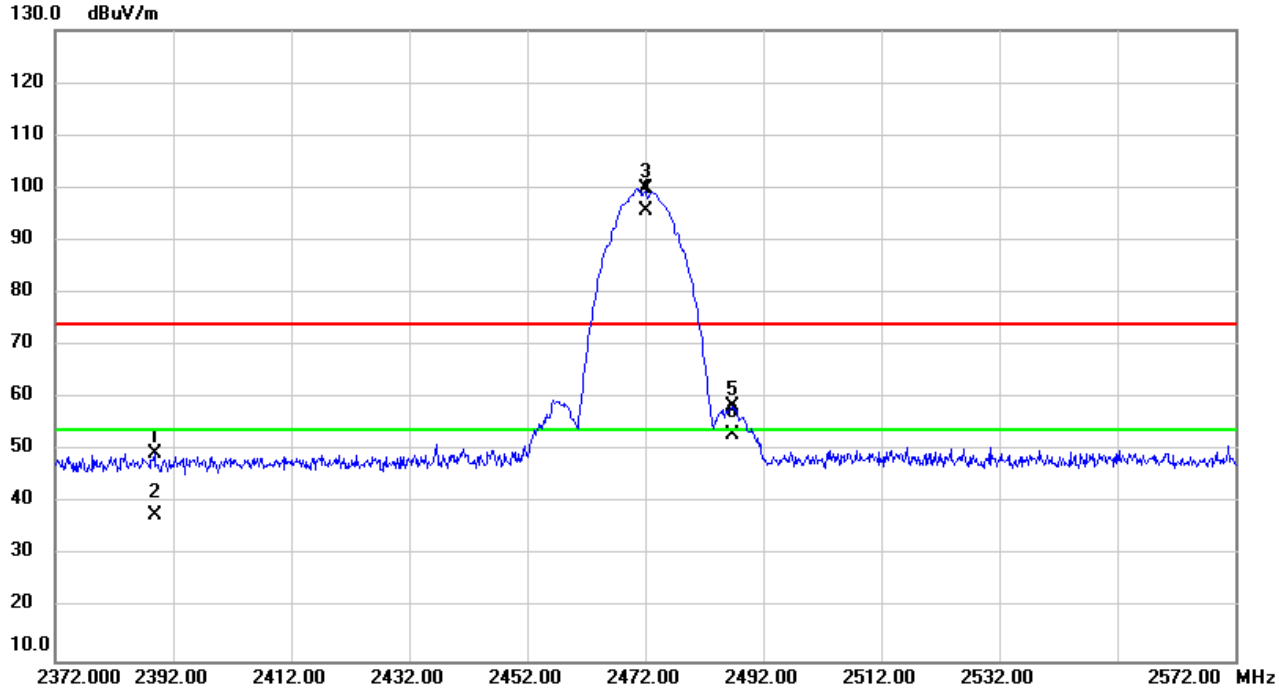
| Test Mode | IEEE 802.11b | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2388.947 | 55.47 | -5.42 | 50.05 | 74.00 | -23.95 | peak | |
| 2 | | 2388.947 | 43.77 | -5.42 | 38.35 | 54.00 | -15.65 | AVG | |
| 3 | X | 2467.000 | 106.43 | -5.32 | 101.11 | 74.00 | 27.11 | peak | NoLimit |
| 4 | * | 2467.000 | 103.03 | -5.32 | 97.71 | 54.00 | 43.71 | AVG | NoLimit |
| 5 | | 2484.226 | 63.98 | -5.32 | 58.66 | 74.00 | -15.34 | peak | |
| 6 | | 2484.226 | 58.26 | -5.32 | 52.94 | 54.00 | -1.06 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

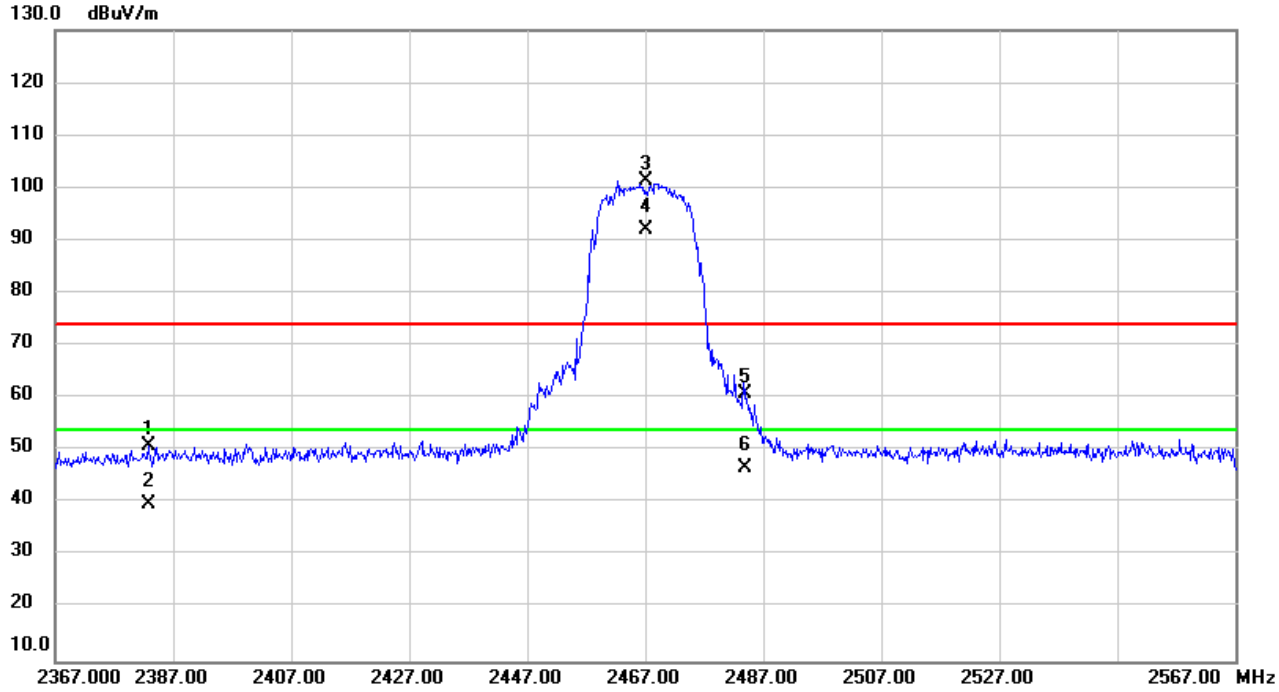
| Test Mode | IEEE 802.11b | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2388.913 | 54.89 | -5.42 | 49.47 | 74.00 | -24.53 | peak | |
| 2 | | 2388.913 | 43.30 | -5.42 | 37.88 | 54.00 | -16.12 | AVG | |
| 3 | X | 2472.000 | 105.09 | -5.33 | 99.76 | 74.00 | 25.76 | peak | NoLimit |
| 4 | * | 2472.000 | 101.01 | -5.33 | 95.68 | 54.00 | 41.68 | AVG | NoLimit |
| 5 | | 2486.880 | 63.82 | -5.30 | 58.52 | 74.00 | -15.48 | peak | |
| 6 | | 2486.880 | 58.48 | -5.30 | 53.18 | 54.00 | -0.82 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

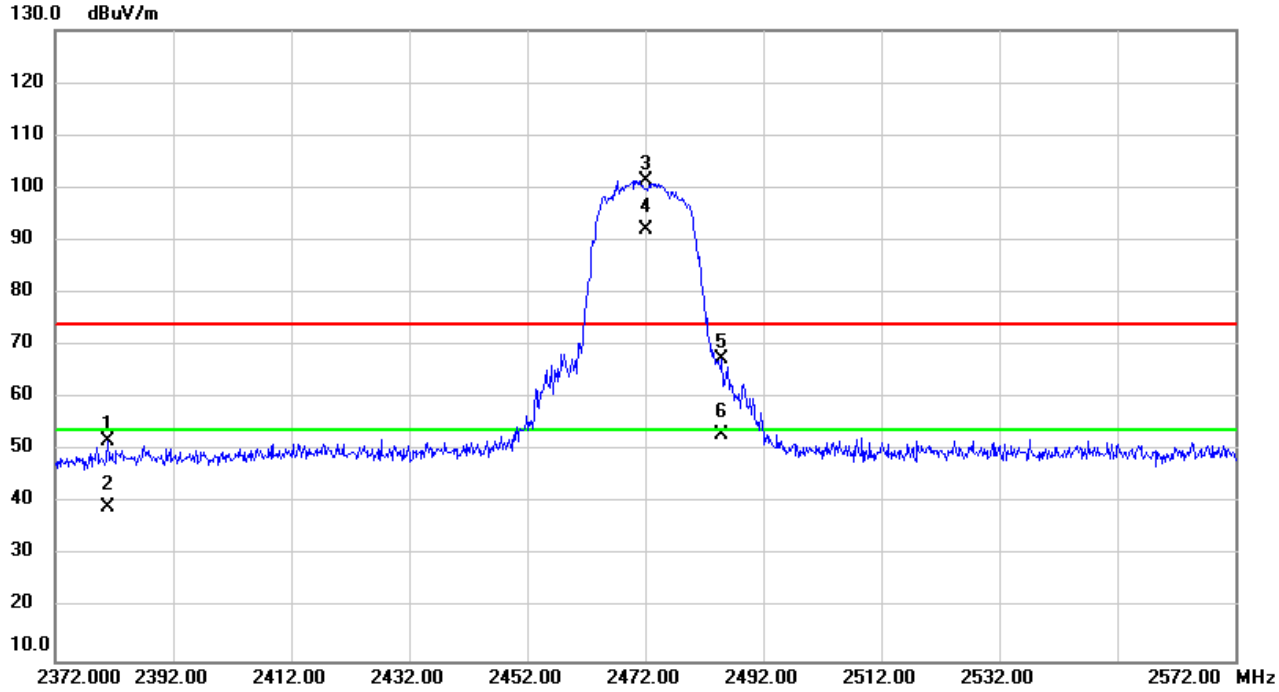
| Test Mode | IEEE 802.11g | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2382.780 | 56.26 | -5.42 | 50.84 | 74.00 | -23.16 | peak | |
| 2 | | 2382.780 | 45.16 | -5.42 | 39.74 | 54.00 | -14.26 | AVG | |
| 3 | X | 2467.000 | 106.80 | -5.32 | 101.48 | 74.00 | 27.48 | peak | NoLimit |
| 4 | * | 2467.000 | 97.29 | -5.32 | 91.97 | 54.00 | 37.97 | AVG | NoLimit |
| 5 | | 2483.800 | 66.13 | -5.32 | 60.81 | 74.00 | -13.19 | peak | |
| 6 | | 2483.800 | 52.18 | -5.32 | 46.86 | 54.00 | -7.14 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

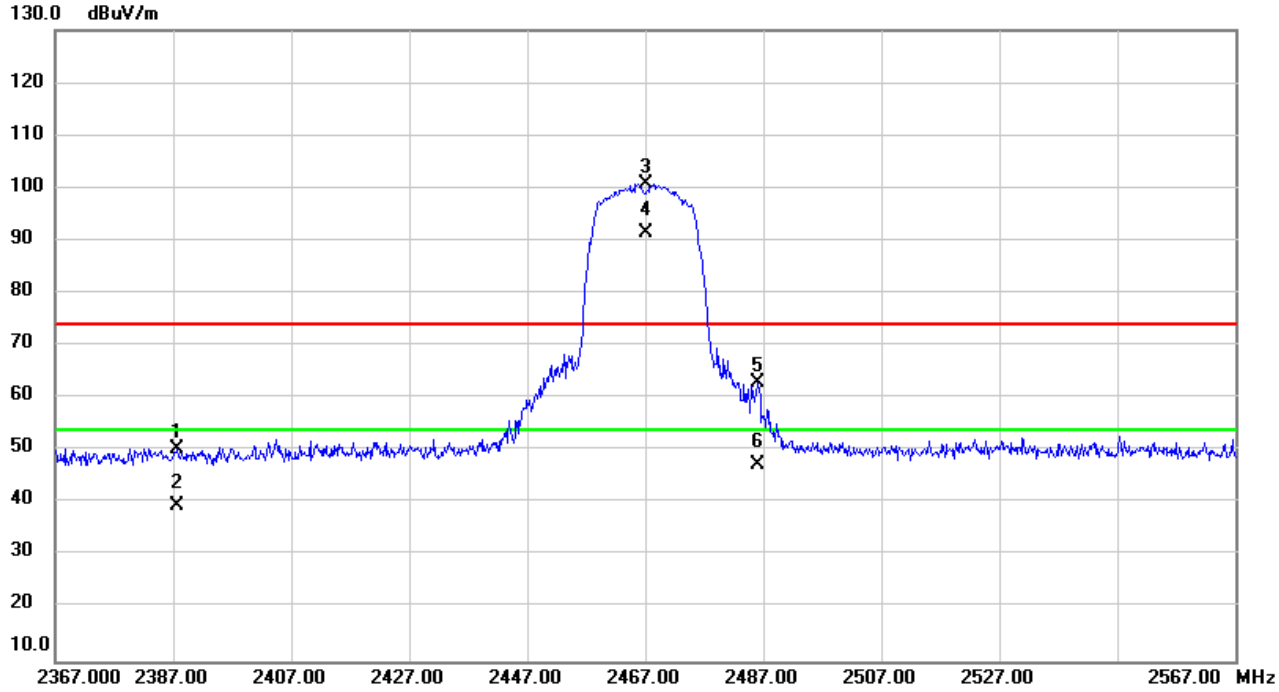
| Test Mode | IEEE 802.11g | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2380.873 | 57.41 | -5.42 | 51.99 | 74.00 | -22.01 | peak | |
| 2 | | 2380.873 | 44.76 | -5.42 | 39.34 | 54.00 | -14.66 | AVG | |
| 3 | X | 2472.000 | 106.80 | -5.33 | 101.47 | 74.00 | 27.47 | peak | NoLimit |
| 4 | * | 2472.000 | 97.50 | -5.33 | 92.17 | 54.00 | 38.17 | AVG | NoLimit |
| 5 | | 2485.007 | 72.68 | -5.30 | 67.38 | 74.00 | -6.62 | peak | |
| 6 | | 2485.007 | 58.24 | -5.30 | 52.94 | 54.00 | -1.06 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

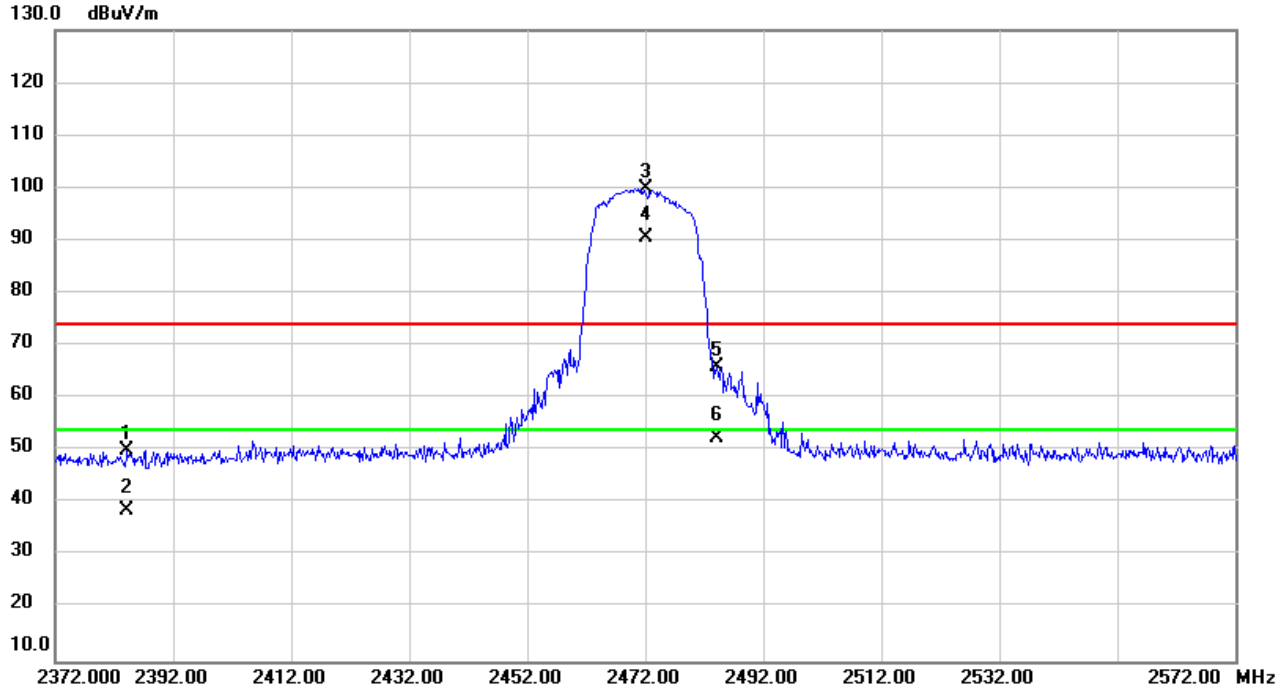
| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2387.767 | 55.88 | -5.42 | 50.46 | 74.00 | -23.54 | peak | |
| 2 | | 2387.767 | 44.90 | -5.42 | 39.48 | 54.00 | -14.52 | AVG | |
| 3 | X | 2467.000 | 106.10 | -5.32 | 100.78 | 74.00 | 26.78 | peak | NoLimit |
| 4 | * | 2467.000 | 96.76 | -5.32 | 91.44 | 54.00 | 37.44 | AVG | NoLimit |
| 5 | | 2486.193 | 68.23 | -5.30 | 62.93 | 74.00 | -11.07 | peak | |
| 6 | | 2486.193 | 52.60 | -5.30 | 47.30 | 54.00 | -6.70 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

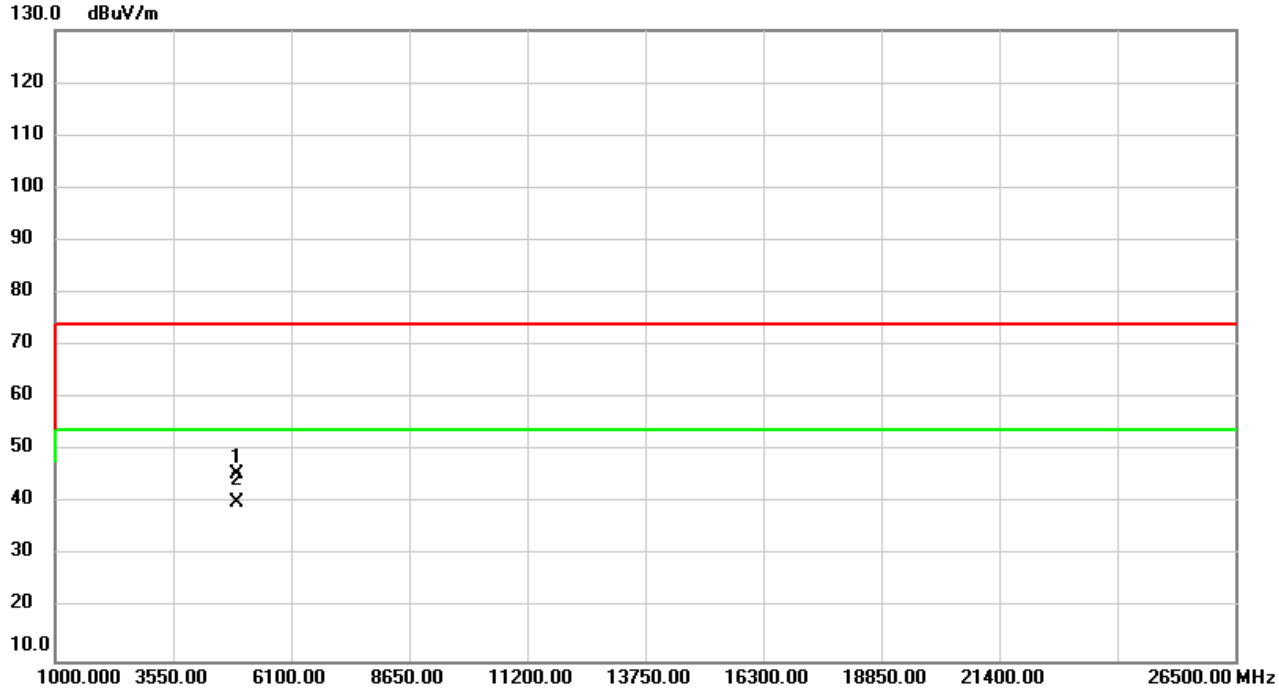
| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/4/6 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 2384.240 | 55.56 | -5.43 | 50.13 | 74.00 | -23.87 | peak | |
| 2 | | 2384.240 | 44.10 | -5.43 | 38.67 | 54.00 | -15.33 | AVG | |
| 3 | X | 2472.000 | 105.23 | -5.33 | 99.90 | 74.00 | 25.90 | peak | NoLimit |
| 4 | * | 2472.000 | 95.86 | -5.33 | 90.53 | 54.00 | 36.53 | AVG | NoLimit |
| 5 | | 2484.253 | 71.42 | -5.32 | 66.10 | 74.00 | -7.90 | peak | |
| 6 | | 2484.253 | 57.78 | -5.32 | 52.46 | 54.00 | -1.54 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

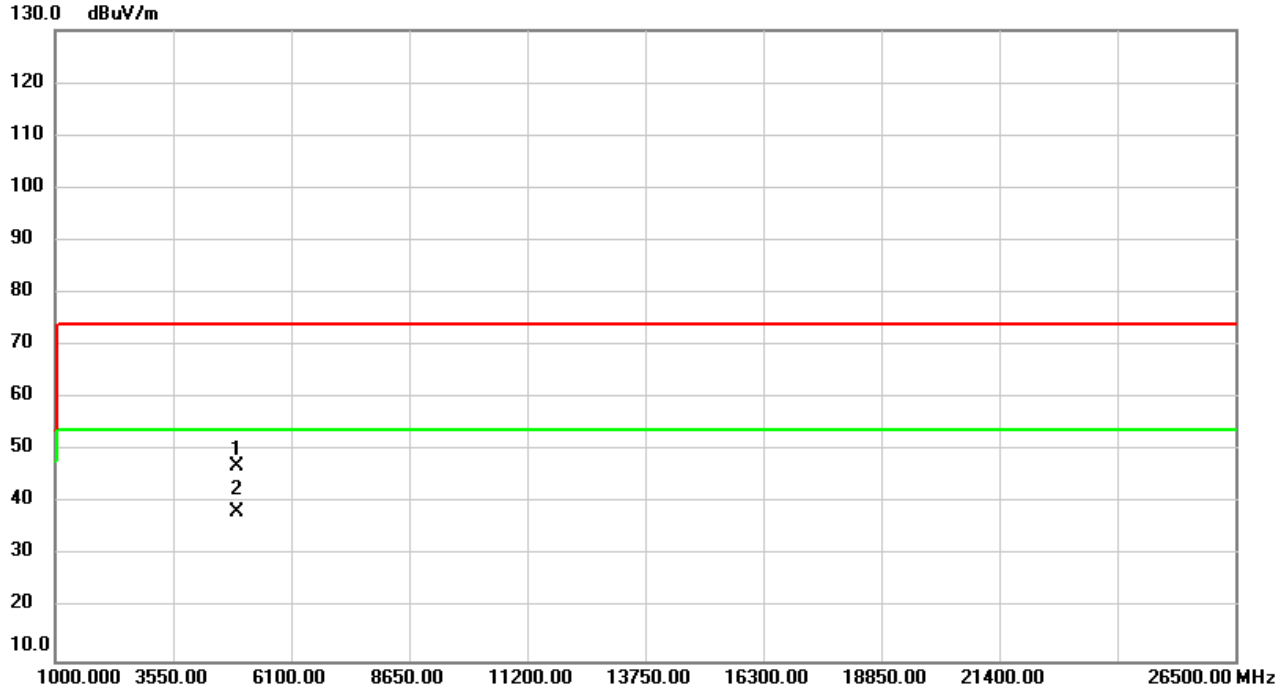
| Test Mode | IEEE 802.11b | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 44.24 | 1.20 | 45.44 | 74.00 | -28.56 | peak | |
| 2 | * | 4934.000 | 39.05 | 1.20 | 40.25 | 54.00 | -13.75 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

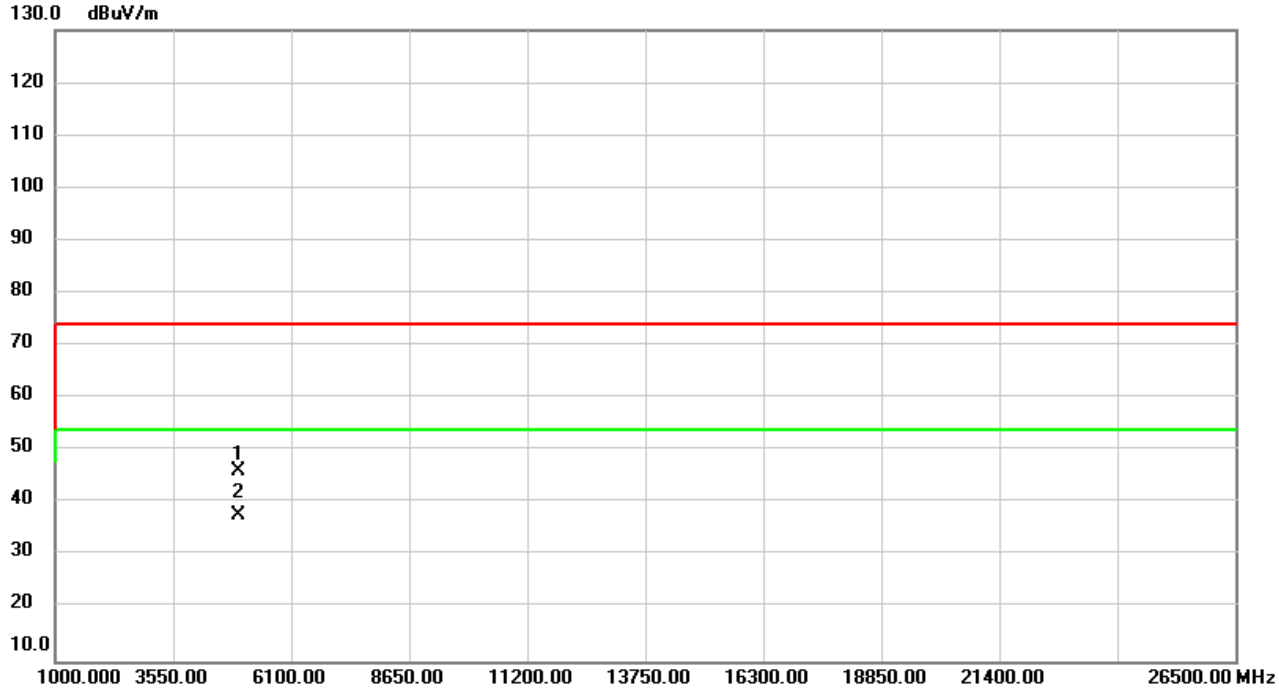
| Test Mode | IEEE 802.11b | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 45.85 | 1.20 | 47.05 | 74.00 | -26.95 | peak | |
| 2 | * | 4934.000 | 37.08 | 1.20 | 38.28 | 54.00 | -15.72 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

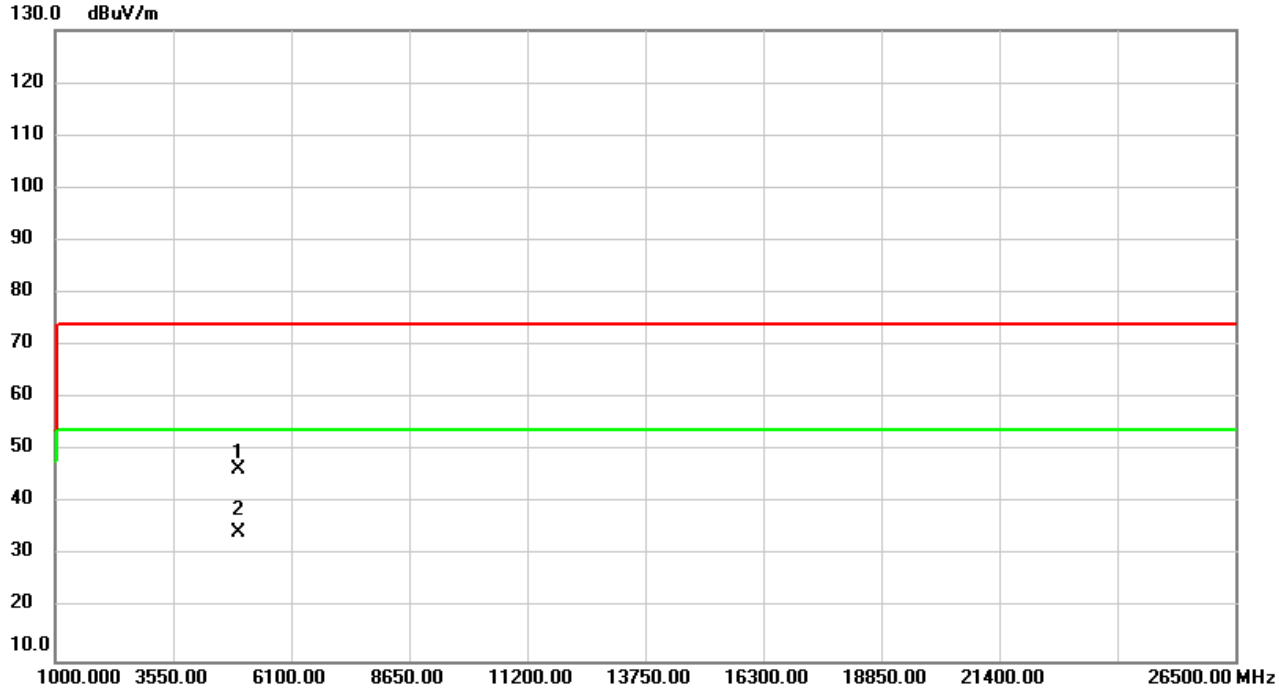
| Test Mode | IEEE 802.11b | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 44.82 | 1.22 | 46.04 | 74.00 | -27.96 | peak | |
| 2 | * | 4944.000 | 36.49 | 1.22 | 37.71 | 54.00 | -16.29 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

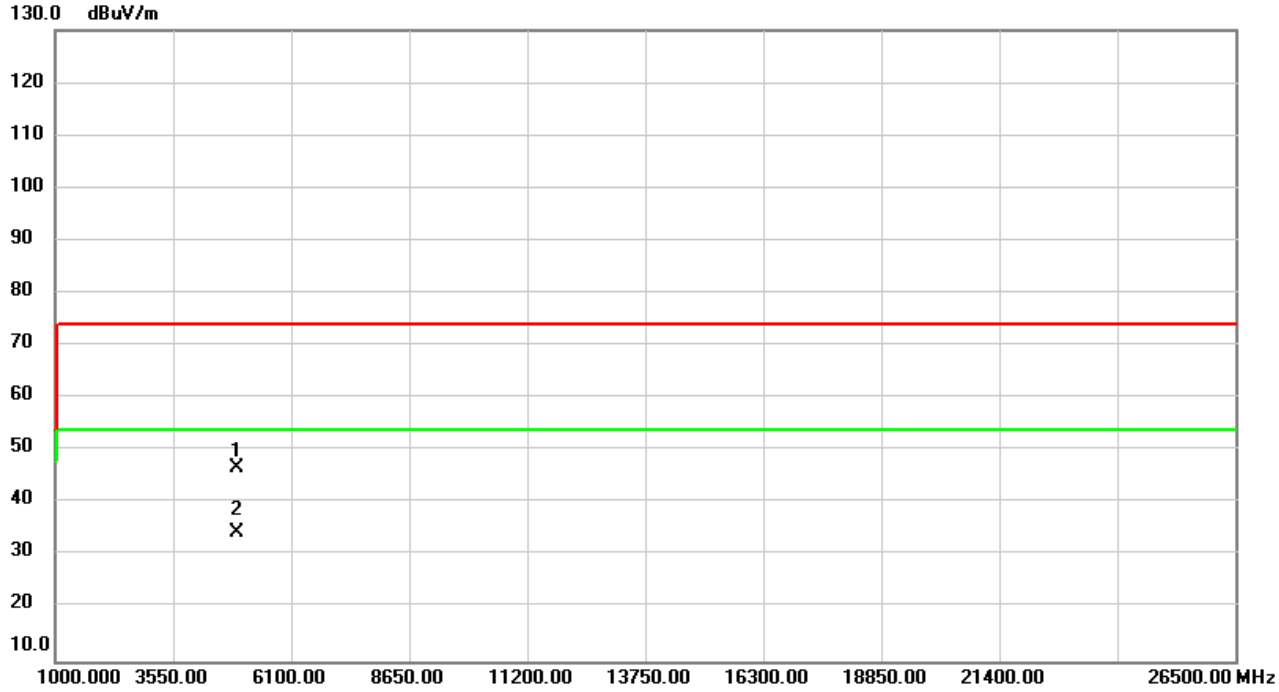
| Test Mode | IEEE 802.11b | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 45.13 | 1.22 | 46.35 | 74.00 | -27.65 | peak | |
| 2 | * | 4944.000 | 33.30 | 1.22 | 34.52 | 54.00 | -19.48 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

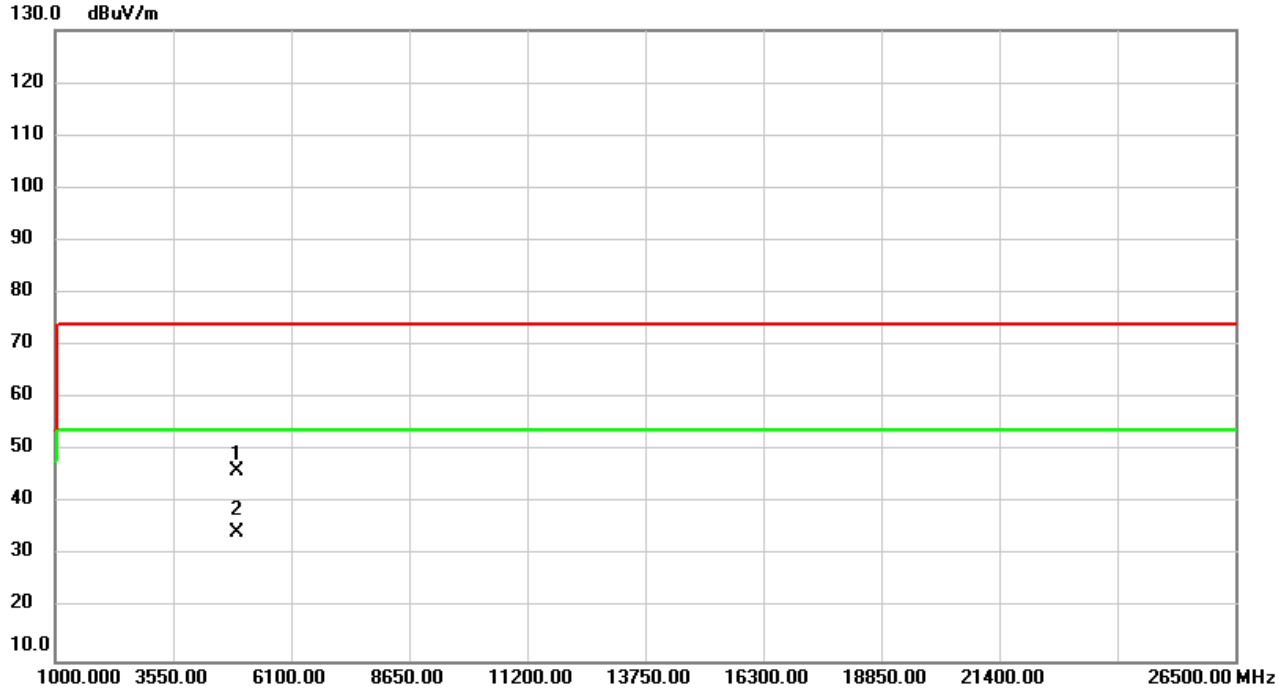
| Test Mode | IEEE 802.11g | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 45.56 | 1.20 | 46.76 | 74.00 | -27.24 | peak | |
| 2 | * | 4934.000 | 33.26 | 1.20 | 34.46 | 54.00 | -19.54 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

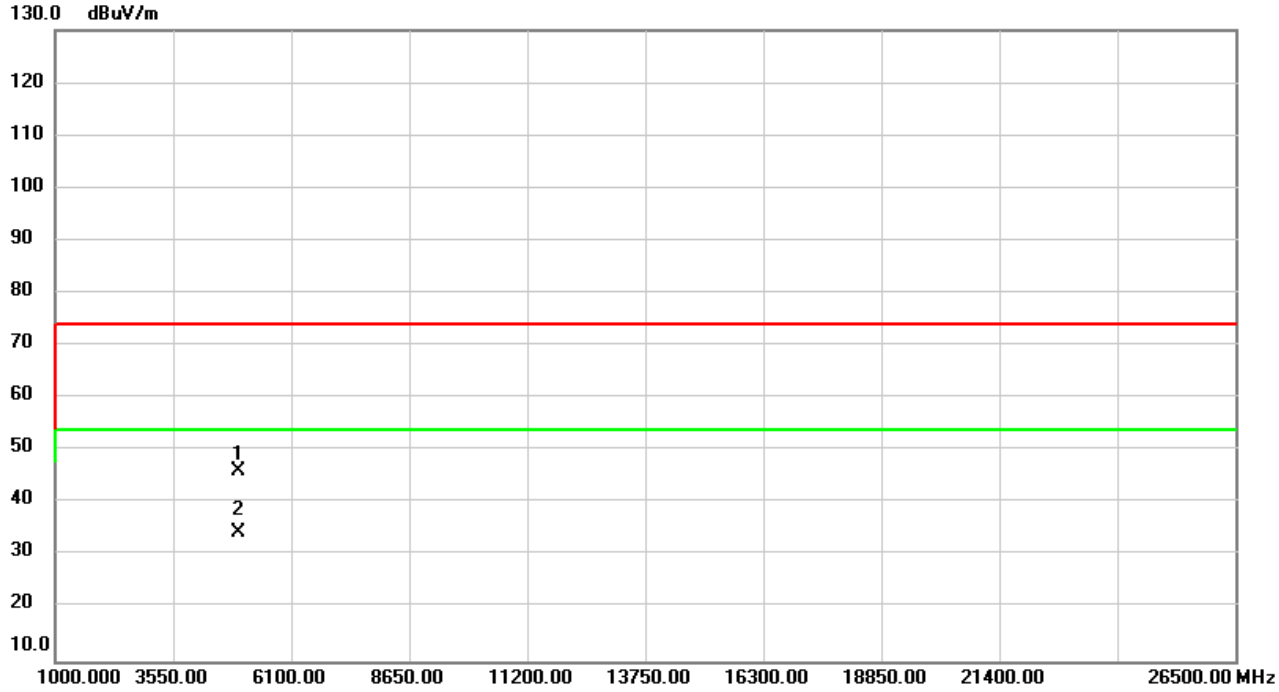
| Test Mode | IEEE 802.11g | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 44.85 | 1.20 | 46.05 | 74.00 | -27.95 | peak | |
| 2 | * | 4934.000 | 33.20 | 1.20 | 34.40 | 54.00 | -19.60 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

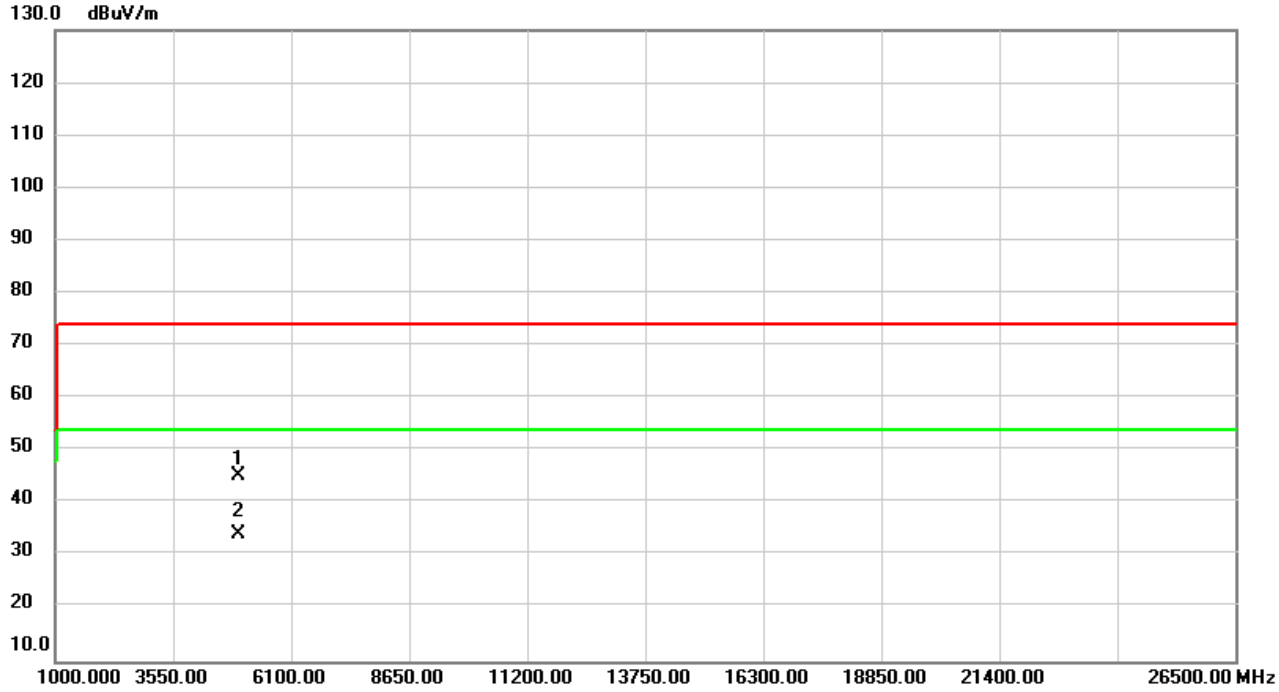
| Test Mode | IEEE 802.11g | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 45.01 | 1.22 | 46.23 | 74.00 | -27.77 | peak | |
| 2 | * | 4944.000 | 33.19 | 1.22 | 34.41 | 54.00 | -19.59 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

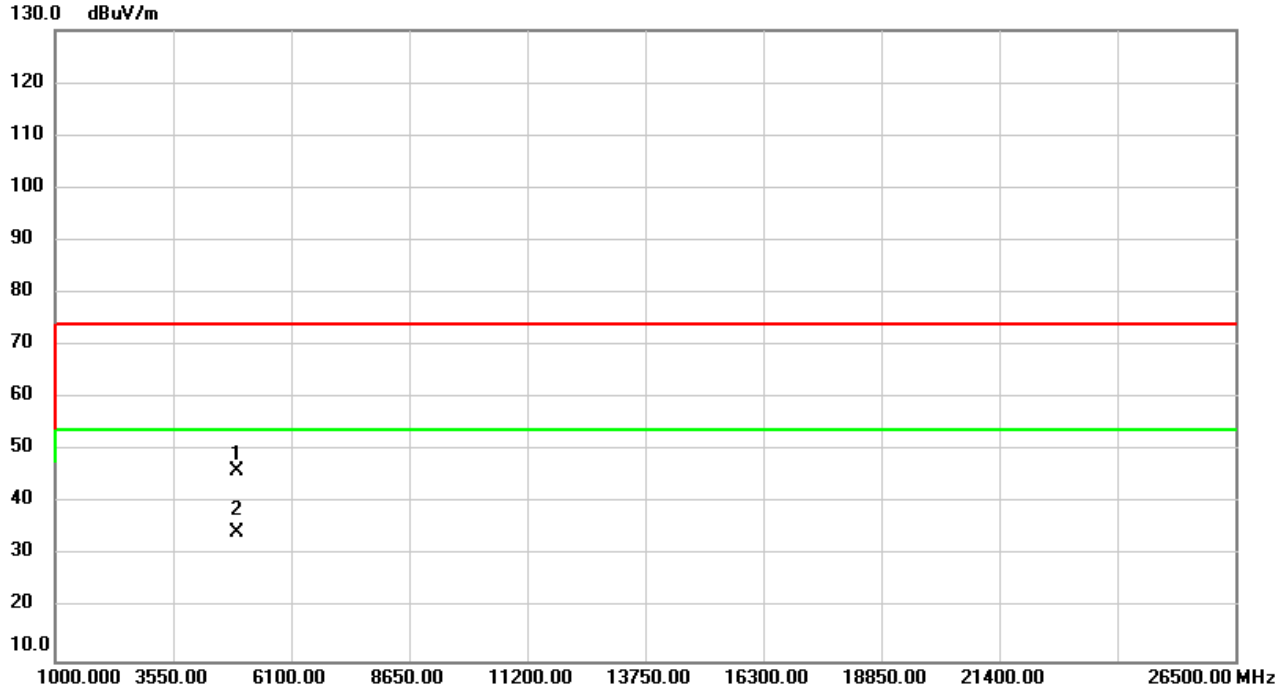
| Test Mode | IEEE 802.11g | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 44.08 | 1.22 | 45.30 | 74.00 | -28.70 | peak | |
| 2 | * | 4944.000 | 33.08 | 1.22 | 34.30 | 54.00 | -19.70 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

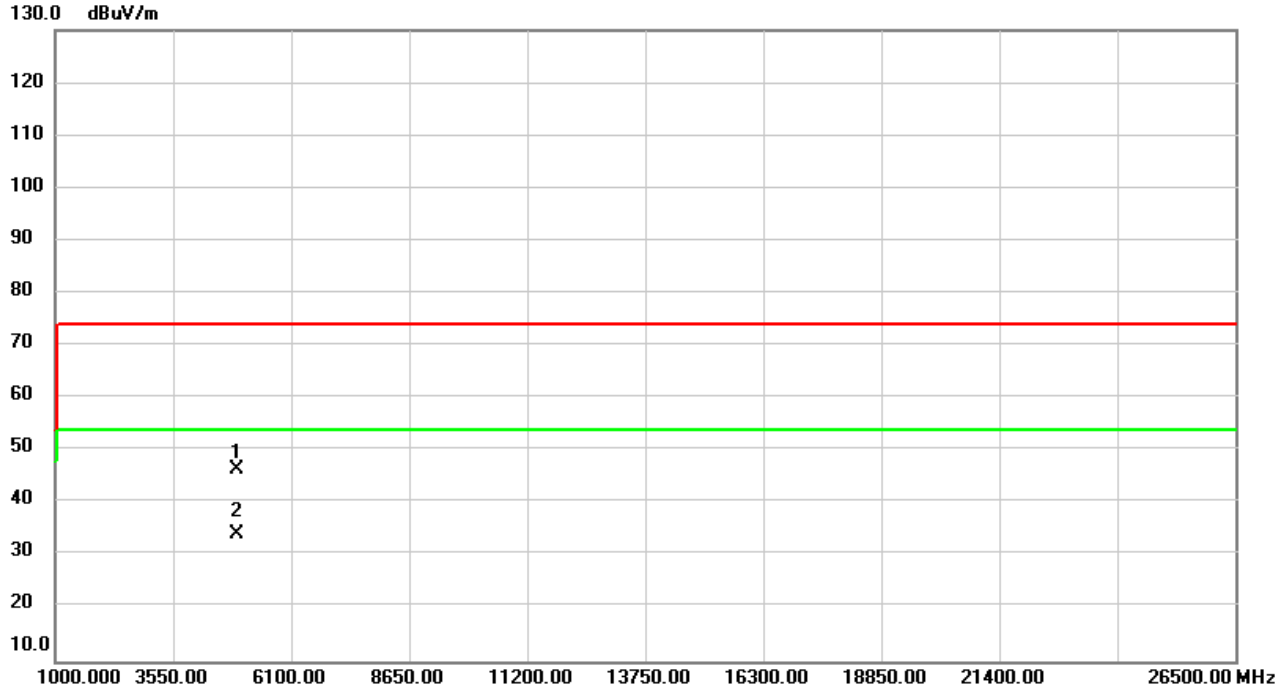
| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 44.81 | 1.20 | 46.01 | 74.00 | -27.99 | peak | |
| 2 | * | 4934.000 | 33.21 | 1.20 | 34.41 | 54.00 | -19.59 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

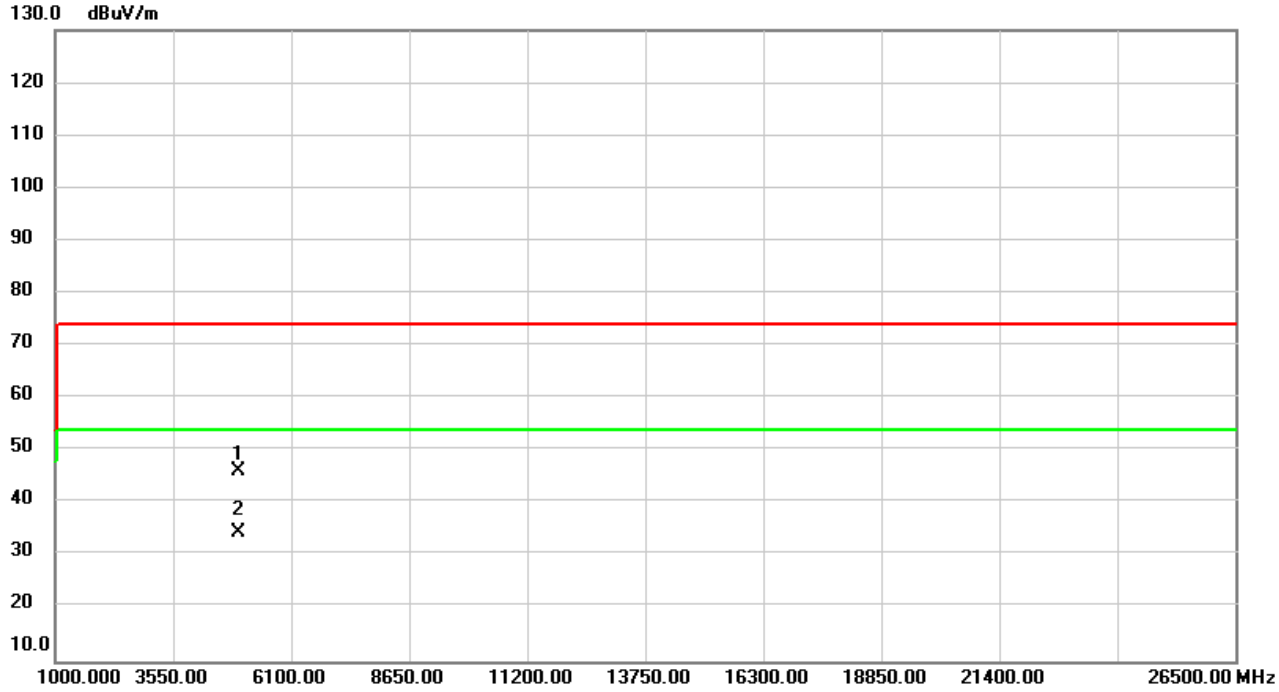
| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2467MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4934.000 | 45.14 | 1.20 | 46.34 | 74.00 | -27.66 | peak | |
| 2 | * | 4934.000 | 33.10 | 1.20 | 34.30 | 54.00 | -19.70 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

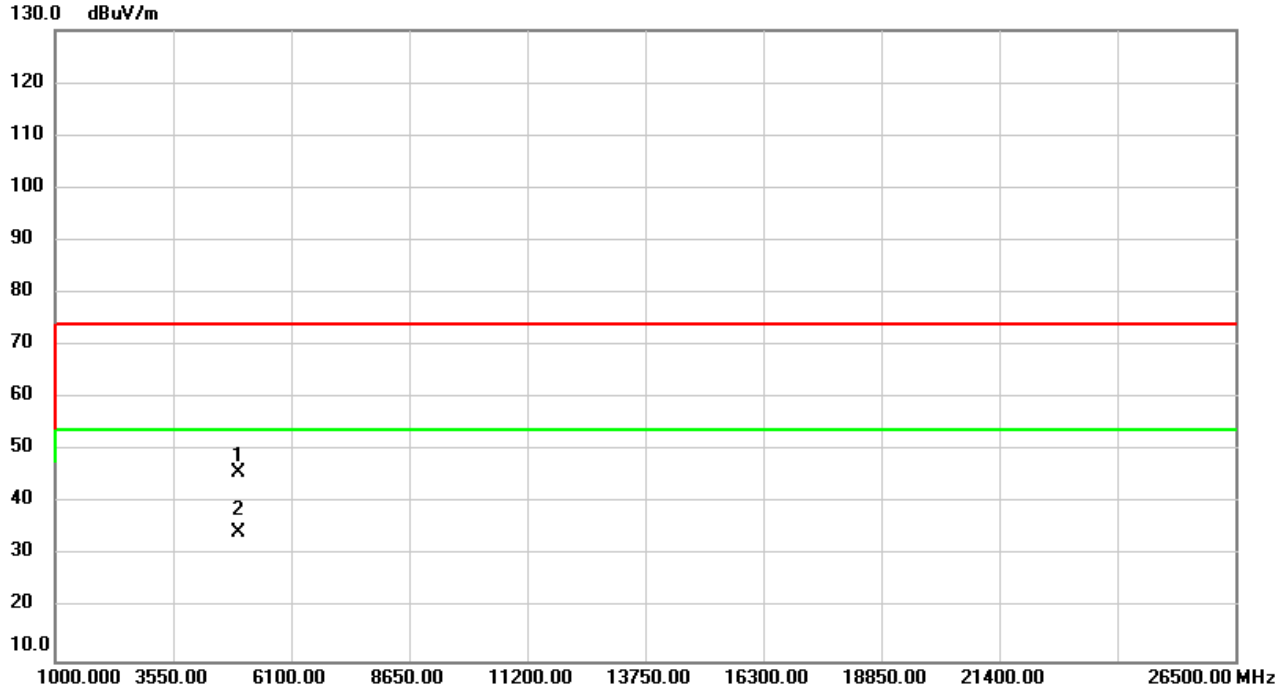
| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Vertical |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 44.89 | 1.22 | 46.11 | 74.00 | -27.89 | peak | |
| 2 | * | 4944.000 | 33.26 | 1.22 | 34.48 | 54.00 | -19.52 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | IEEE 802.11n (HT20) | Test Date | 2023/3/31 |
|---|---|---|---|
| Test Frequency | 2472MHz | Polarization | Horizontal |
| Temp | 22°C | Hum. | 67% |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 4944.000 | 44.49 | 1.22 | 45.71 | 74.00 | -28.29 | peak | |
| 2 | * | 4944.000 | 33.30 | 1.22 | 34.52 | 54.00 | -19.48 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

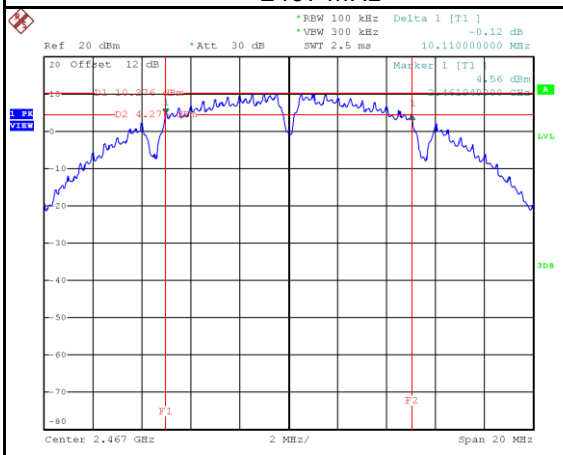
# APPENDIX C BANDWIDTH

| Test Mode | IEEE 802.11b |
|---|---|

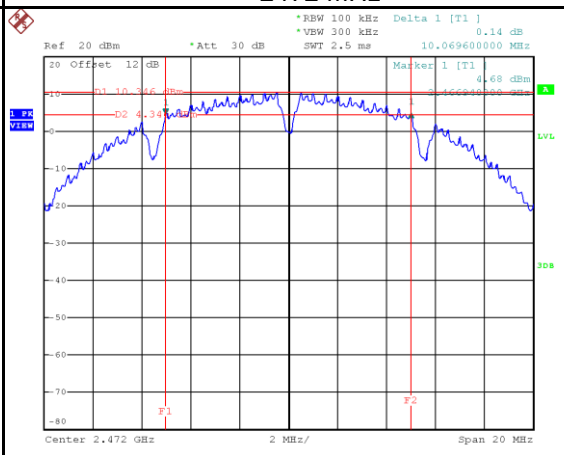
| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | Minimum 6 dB Bandwidth Limit (kHz) | Result |
|---|---|---|---|---|
| 2467 | 10.11 | 15.04 | ≥ 500 | Pass |
| 2472 | 10.07 | 15.04 | ≥ 500 | Pass |

6dB Bandwidth

2467 MHz

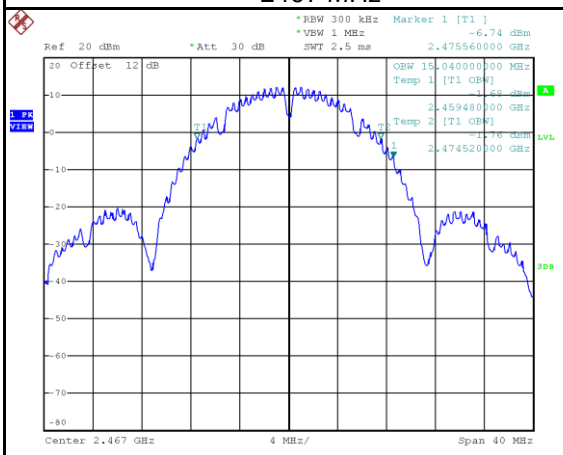



2472 MHz

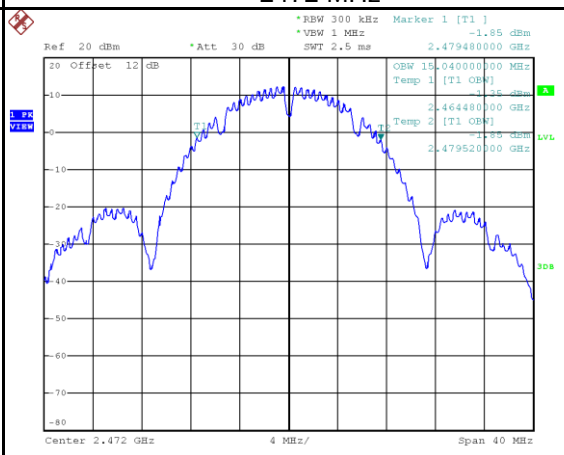



99% Occupied BW

2467 MHz




2472 MHz

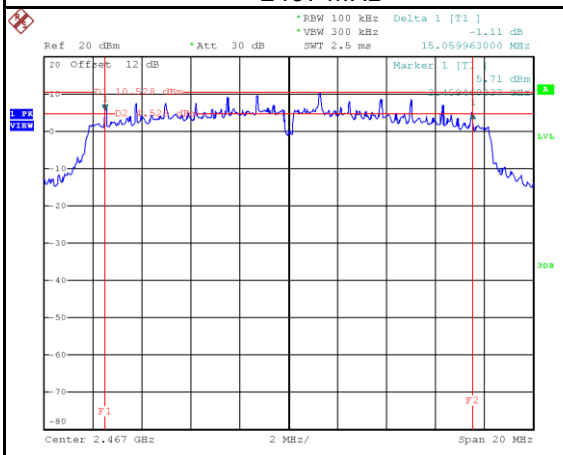


| Test Mode | IEEE 802.11g |
|---|---|

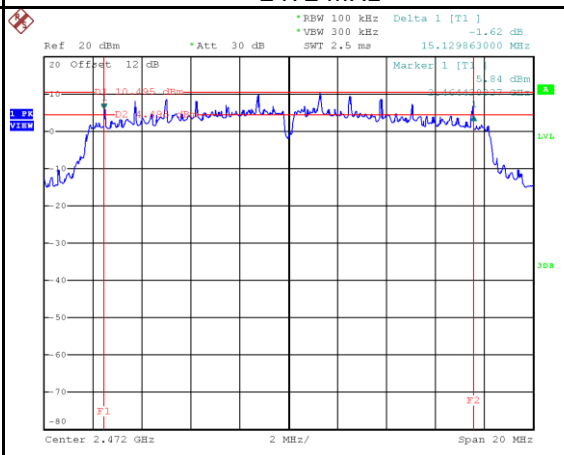
| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | Minimum 6 dB Bandwidth Limit (kHz) | Result |
|---|---|---|---|---|
| 2467 | 15.06 | 18.24 | ≥ 500 | Pass |
| 2472 | 15.13 | 18.24 | ≥ 500 | Pass |

6dB Bandwidth

2467 MHz

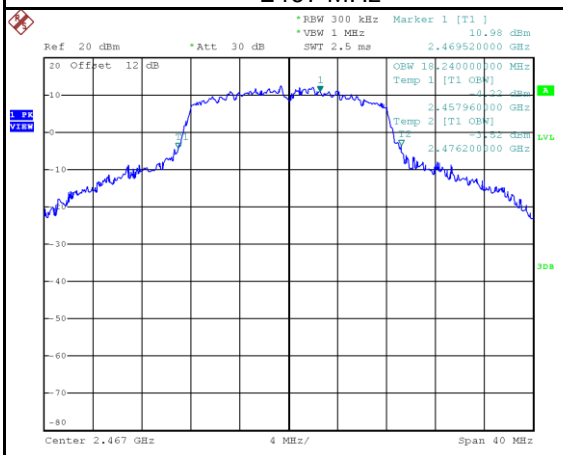



2472 MHz

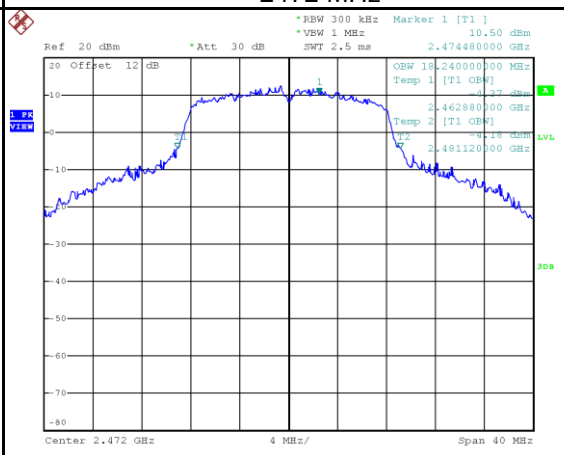



99% Occupied BW

2467 MHz




2472 MHz

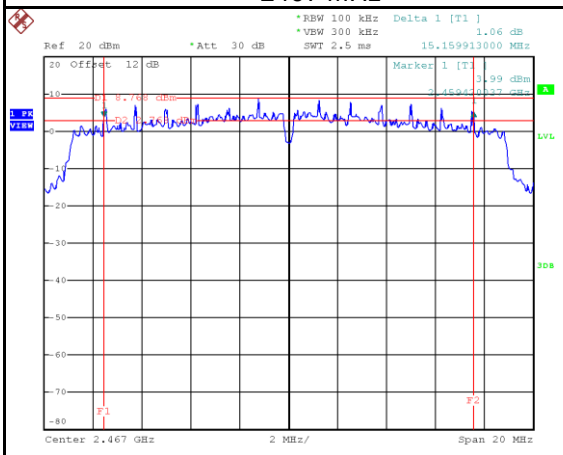


| Test Mode | IEEE 802.11n (HT20) |
|---|---|

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | Minimum 6 dB Bandwidth Limit (kHz) | Result |
|---|---|---|---|---|
| 2467 | 15.16 | 18.40 | ≥ 500 | Pass |
| 2472 | 15.04 | 18.40 | ≥ 500 | Pass |

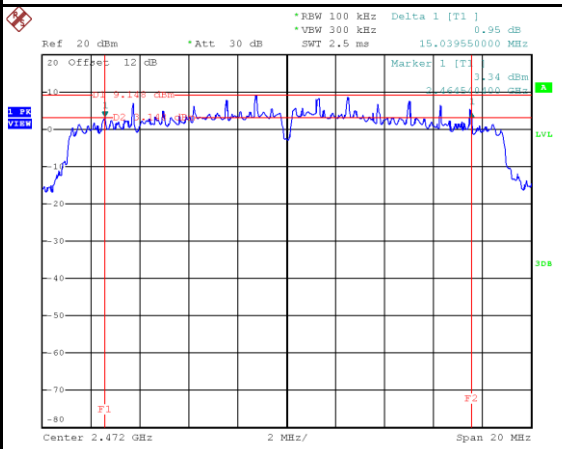
6dB Bandwidth

2467 MHz




Date: 30.MAR.2023 15:24:37

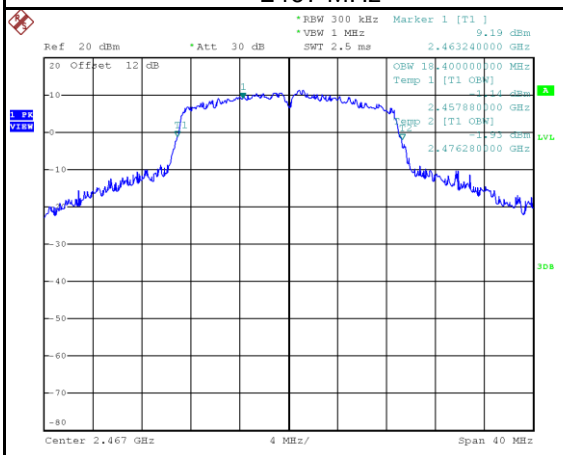
2472 MHz




Date: 30.MAR.2023 15:25:59

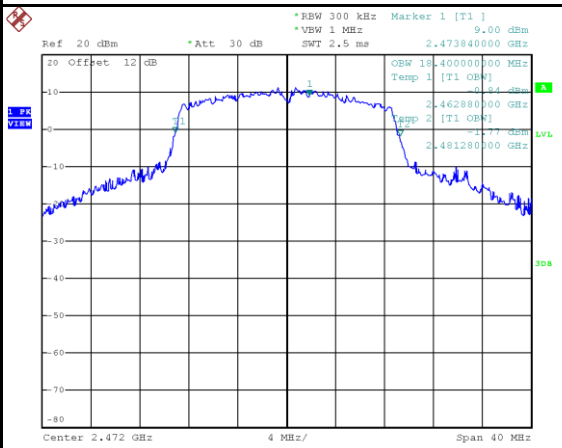
99% Occupied BW

2467 MHz




Date: 30.MAR.2023 15:24:43

2472 MHz




Date: 30.MAR.2023 15:26:06

# APPENDIX D OUTPUT POWER

| Test Mode | IEEE 802.11b | Tested Date | 2023/4/10 |
|---|---|---|---|

| Frequency (MHz) | Conducted Peak Power (dBm) | Conducted Average Power (dBm) | Conducted Average Power (W) | Limit (dBm) | Limit (W) | Result |
|---|---|---|---|---|---|---|
| 2467 | 17.15 | 15.23 | 0.0333 | 30.00 | 1.0000 | Complies |
| 2472 | 15.30 | 13.39 | 0.0218 | 30.00 | 1.0000 | Complies |

| Test Mode | IEEE 802.11g | Tested Date | 2023/4/10 |
|---|---|---|---|

| Frequency (MHz) | Conducted Peak Power (dBm) | Conducted Average Power (dBm) | Conducted Average Power (W) | Limit (dBm) | Limit (W) | Result |
|---|---|---|---|---|---|---|
| 2467 | 21.32 | 12.59 | 0.0182 | 30.00 | 1.0000 | Complies |
| 2472 | 21.58 | 12.66 | 0.0185 | 30.00 | 1.0000 | Complies |

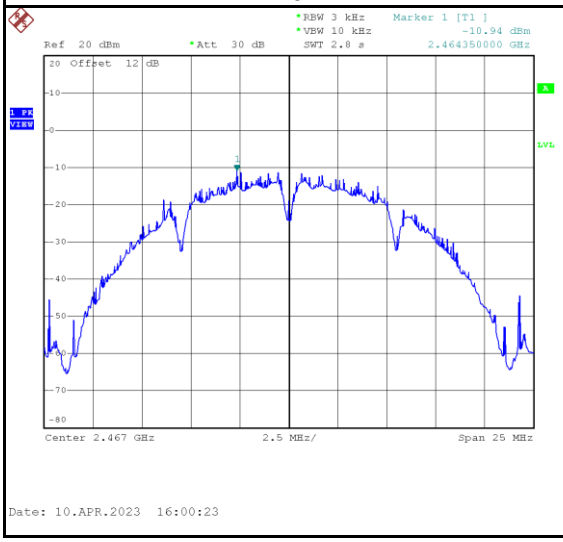
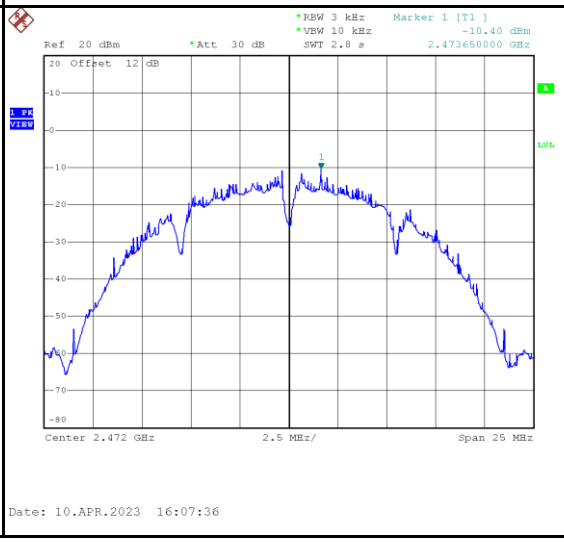
| Test Mode | IEEE 802.11n (HT20) | Tested Date | 2023/4/10 |
|---|---|---|---|

| Frequency (MHz) | Conducted Peak Power (dBm) | Conducted Average Power (dBm) | Conducted Average Power (W) | Limit (dBm) | Limit (W) | Result |
|---|---|---|---|---|---|---|
| 2467 | 21.51 | 12.40 | 0.0174 | 30.00 | 1.0000 | Complies |
| 2472 | 21.05 | 12.44 | 0.0175 | 30.00 | 1.0000 | Complies |

# APPENDIX E POWER SPECTRAL DENSITY

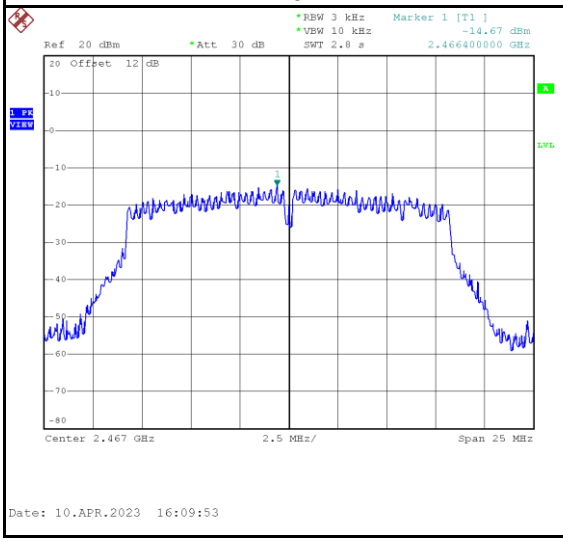
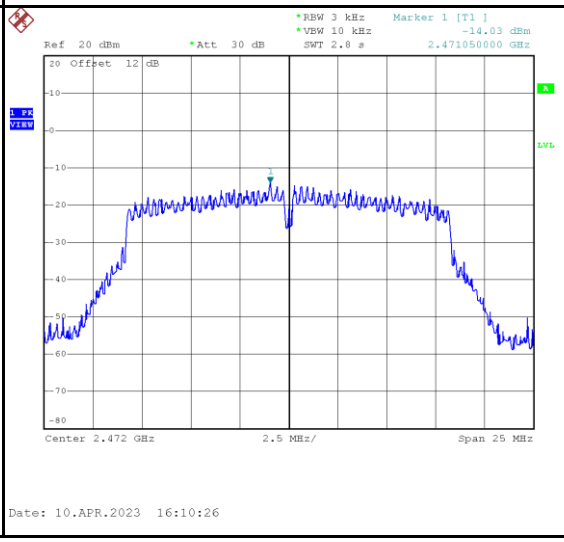
| Test Mode | IEEE 802.11b |
|---|---|

| Test Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Maximum Limit (dBm/3kHz) | Result |
|---|---|---|---|
| 2467 | -10.94 | 8.00 | Pass |
| 2472 | -10.40 | 8.00 | Pass |

| 2467 MHz | 2472 MHz |
|---|---|
|  |  |
| Date: 10.APR.2023 16:00:23 | Date: 10.APR.2023 16:07:36 |

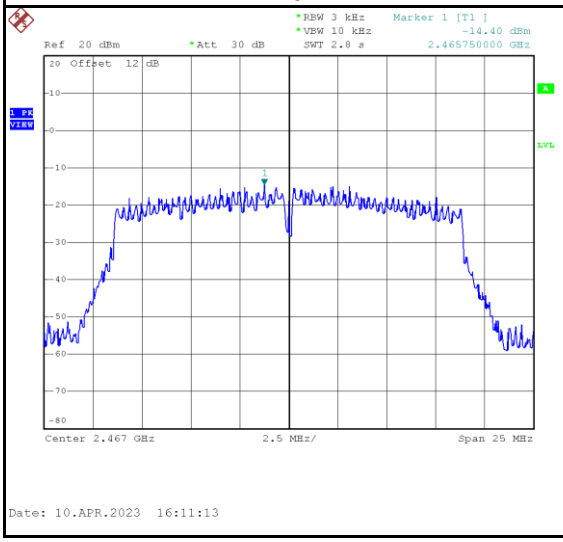
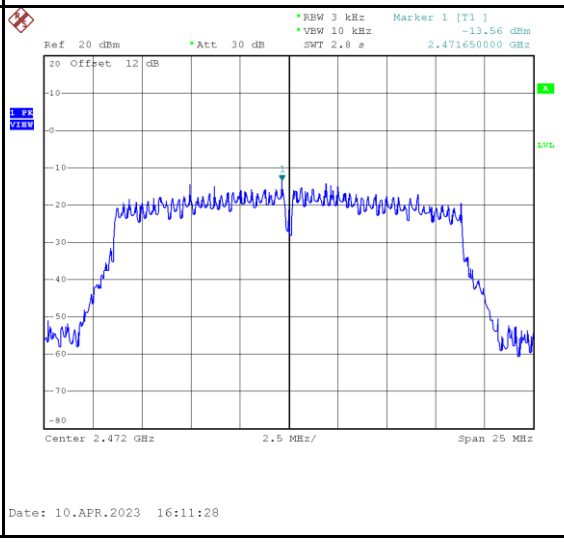
| Test Mode | IEEE 802.11g |
|---|---|

| Test Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Maximum Limit (dBm/3kHz) | Result |
|---|---|---|---|
| 2467 | -14.67 | 8.00 | Pass |
| 2472 | -14.03 | 8.00 | Pass |

| 2467 MHz | 2472 MHz |
|---|---|
|  |  |
| Date: 10.APR.2023 16:09:53 | Date: 10.APR.2023 16:10:26 |

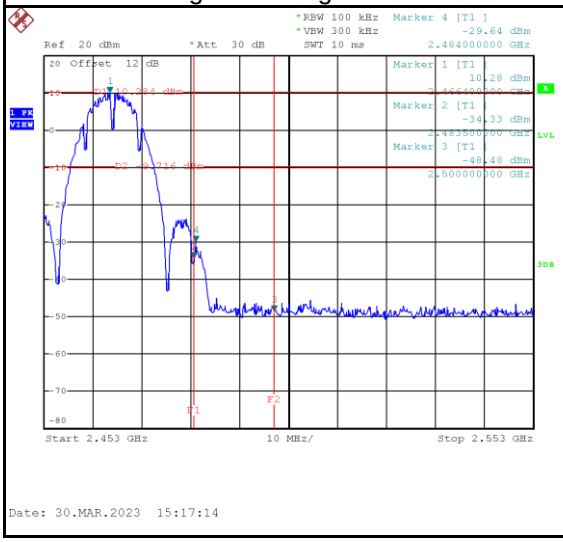
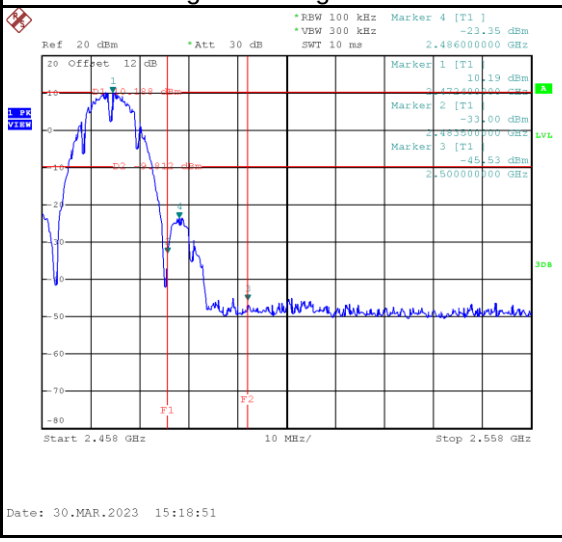
| Test Mode | IEEE 802.11n (HT20) |
|---|---|

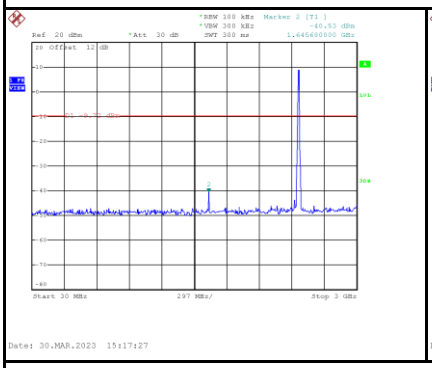
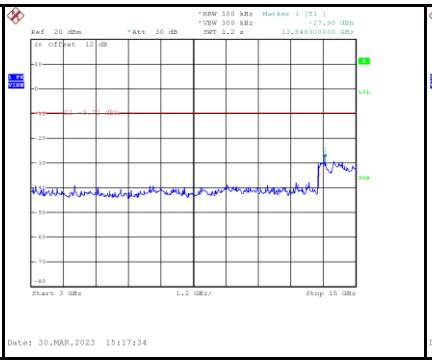
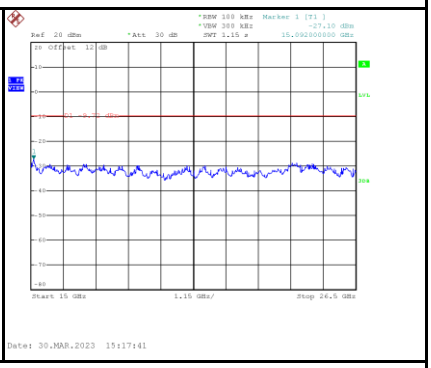
| Test Frequency (MHz) | Power Spectral Density (dBm/3kHz) | Maximum Limit (dBm/3kHz) | Result |
|---|---|---|---|
| 2467 | -14.40 | 8.00 | Pass |
| 2472 | -13.56 | 8.00 | Pass |

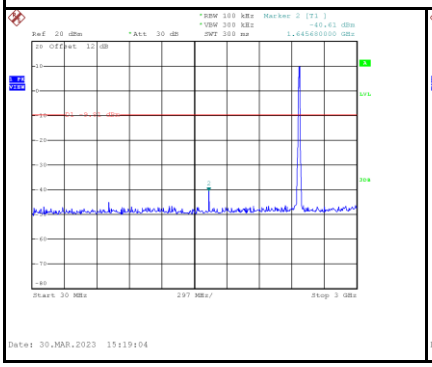
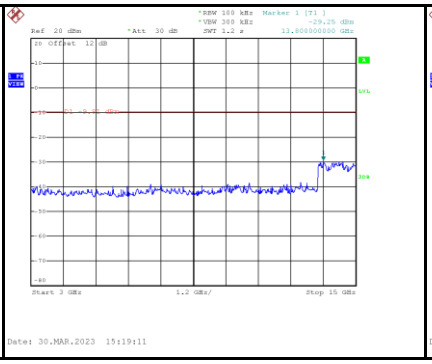
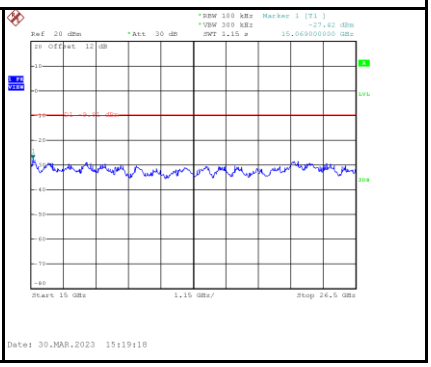
| 2467 MHz | 2472 MHz |
|---|---|
|  |  |

# APPENDIX F ANTENNA CONDUCTED SPURIOUS EMISSIONS

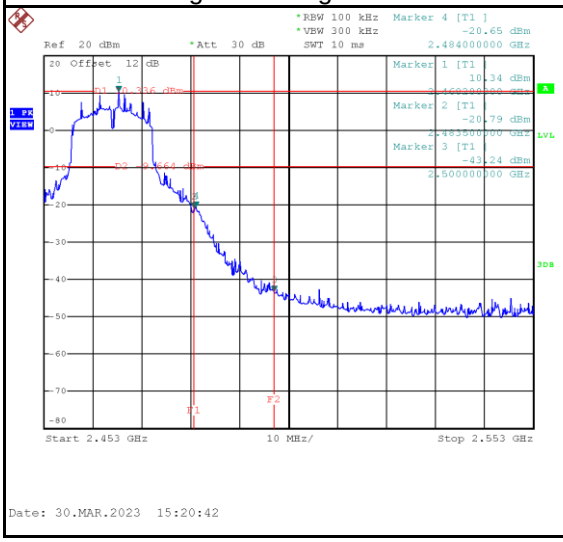
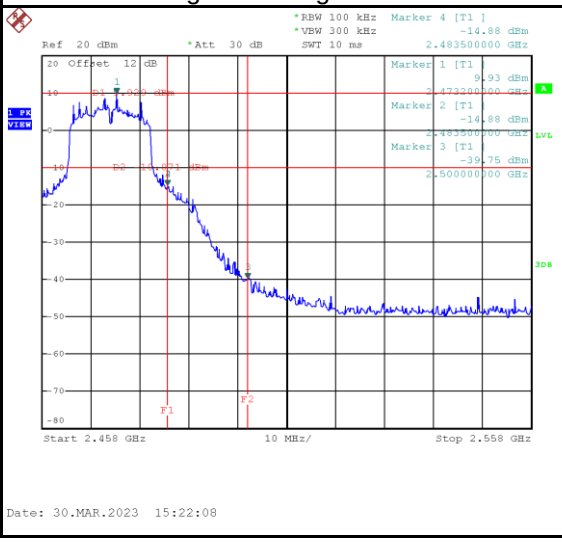
| Test Mode | IEEE 802.11b |
|---|---|

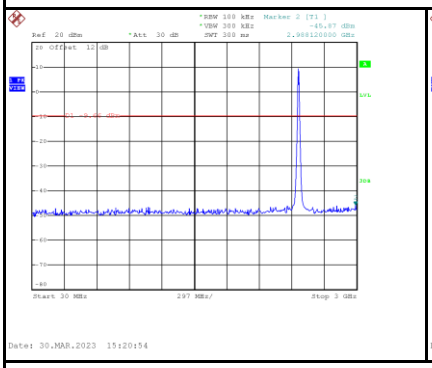
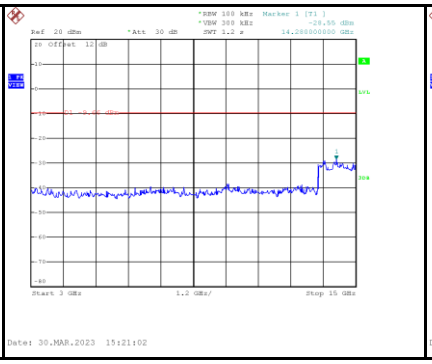
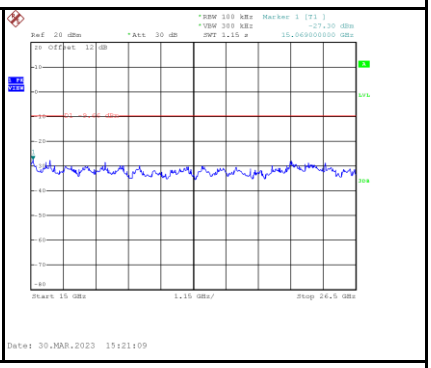
| High Bandedge-2467 MHz | High Bandedge-2472 MHz |
|---|---|
|  |  |

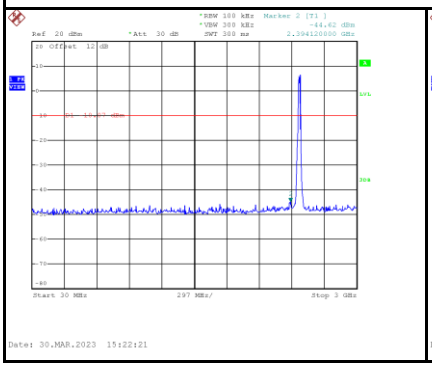
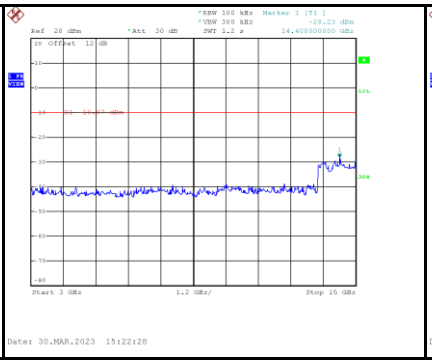
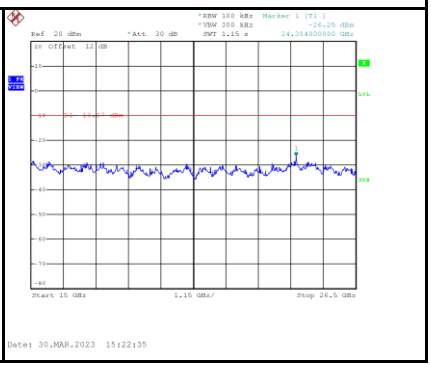
| 2467 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

| 2472 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

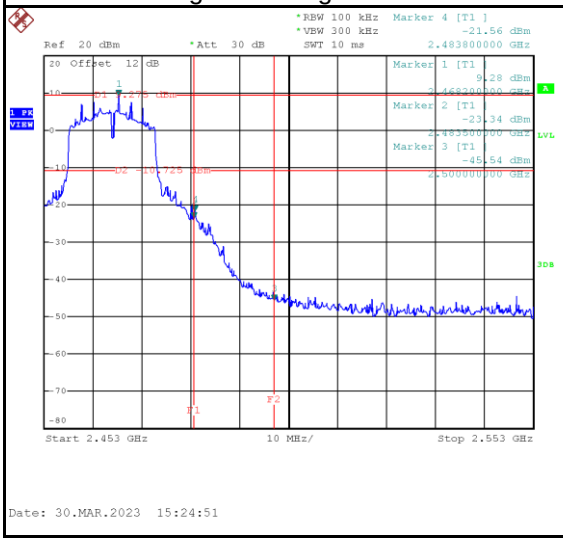
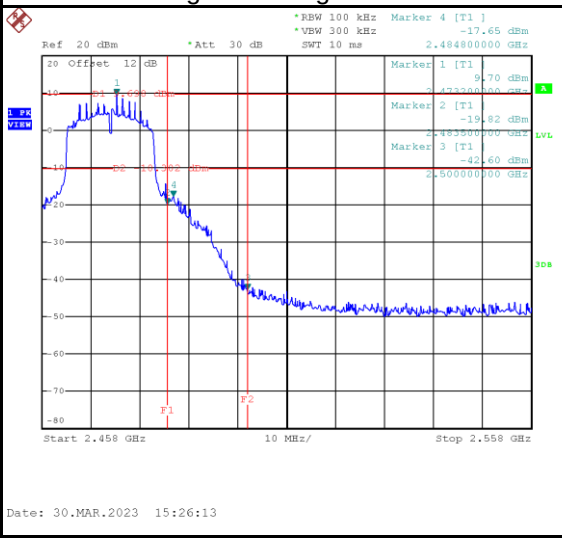
| Test Mode | IEEE 802.11g |
|---|---|

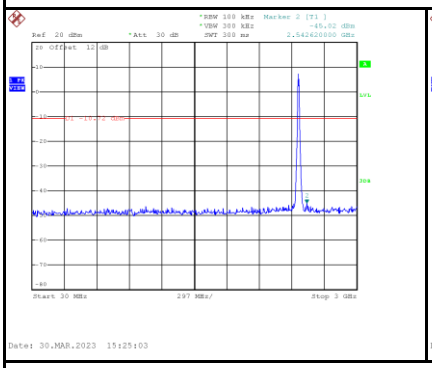
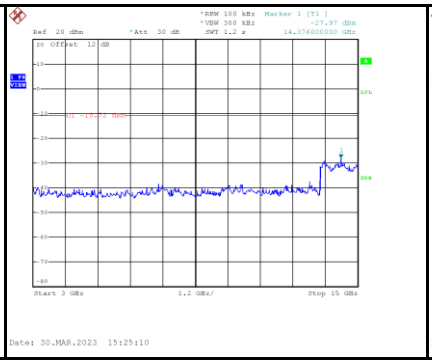
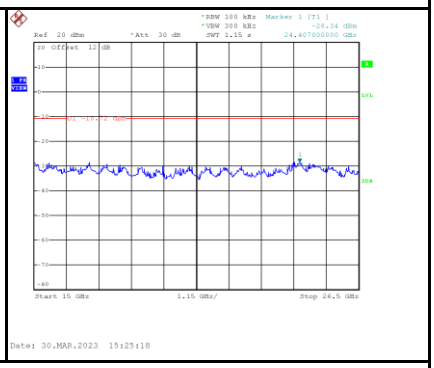
| High Bandedge-2467 MHz | High Bandedge-2472 MHz |
|---|---|
|  |  |

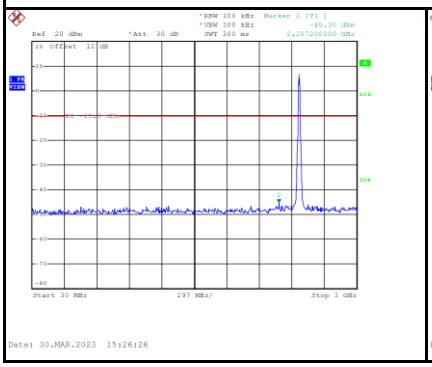
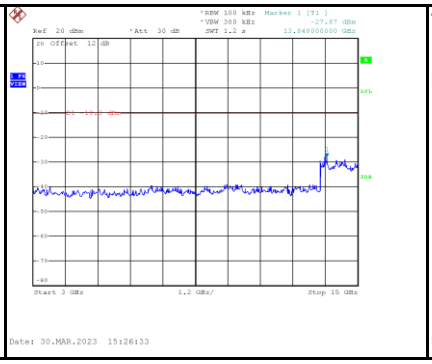
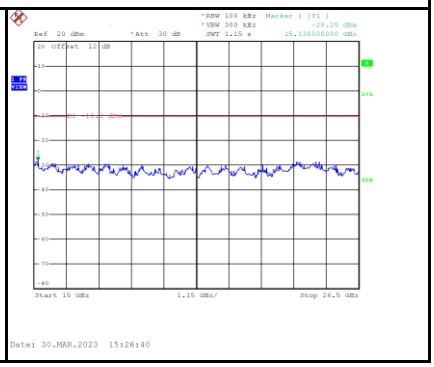
| 2467 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

| 2472 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

| Test Mode | IEEE 802.11n (HT20) |
|---|---|

| High Bandedge-2467 MHz | High Bandedge-2472 MHz |
|---|---|
|  |  |

| 2467 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

| 2472 MHz-10th Harmonics | | |
|---|---|---|
|  |  |  |

**End of Test Report**