# FCC TEST REPORT

FCC ID: PADWF150

On Behalf of

Wahoo Fitness LLC

KICKR RUN

Model No.: WF150

| | | |
|---|---|---|
| Prepared for | : | Wahoo Fitness LLC |
| Address | : | 90 W. Wieuca Road #110 Atlanta, Georgia 30342, United States |

| | | |
|---|---|---|
| Prepared By | : | Shenzhen Alpha Product Testing Co., Ltd. |
| Address | : | Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China |

| | | |
|---|---|---|
| Report Number | : | A2404166-C01-R03 |
| Date of Receipt | : | April 19, 2024 |
| Date of Test | : | April 19, 2024 - June 13, 2024 |
| Date of Report | : | June 13, 2024 |
| Version Number | : | V0 |
| **Result** | | **Pass** |

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# TEST REPORT DECLARATION

| | | |
|---|---|---|
| Applicant | : | Wahoo Fitness LLC |
| Address | : | 90 W. Wieuca Road #110 Atlanta, Georgia 30342, United States |
| Manufacturer | : | Wahoo Fitness LLC |
| Address | : | 90 W. Wieuca Road #110 Atlanta, Georgia 30342, United States |
| EUT Description | : | KICKR RUN |
| | | (A) Model No. : WF150 |
| | | (B) Trademark : N/A |

Measurement Standard Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247,**

**ANSI C63.10:2013, CISPR 16-1-4:2010**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

| | | |
|---|---|---|
| Tested by (name + signature).....…..: | Yannis Wen<br>Project Engineer | Yannis Wen |
| Approved by (name + signature)…....: | Jack Xu<br>Project Manager | Jack Xu |
| Date of issue……..: | June 13, 2024 | |

## Revision History

| Revision | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V0 | June 13, 2024 | Initial released Issue | Yannis Wen |

# 1. SUMMARY OF STANDARDS AND RESULTS

## 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

| Test Item | Standards Paragraph | Result |
|---|---|---|
| Conducted Emission | FCC Part 15: 15.207<br>ANSI C63.10 :2013 | P |
| 6dB Bandwidth | FCC PART 15:15.247(a)(2)<br>ANSI C63.10 :2013 | P |
| Output Power | FCC Part 15: 15.247(b)(3)<br>ANSI C63.10 :2013 | P |
| Radiated Spurious Emission | FCC Part 15: 15.209<br>FCC Part 15: 15.247(d)<br>ANSI C63.10 :2013 | P |
| Conducted Spurious & Band Edge Emission | FCC Part 15: 15.247(d)<br>ANSI C63.10 :2013 | P |
| Power Spectral Density | FCC PART 15:15.247(e)<br>ANSI C63.10 :2013 | P |
| Radiated Band Edge Emission | FCC Part 15: 15.247(d)<br>ANSI C63.10 :2013 | P |
| Antenna Requirement | FCC Part 15: 15.203 | P |

Note:
1. P is an abbreviation for Pass.
2. F is an abbreviation for Fail.
3. N/A is an abbreviation for Not Applicable.
4. Decision rules for the conclusion of this test report: decision by actual test data without considering measurement uncertainty.

# 2. GENERAL INFORMATION

## 2.1. Description of Device (EUT)

| | | |
|---|---|---|
| Description/PMN | : | KICKR RUN |
| Model Number | : | WF150 |
| Diff. | : | N/A |
| Test Voltage | : | AC 120V/60Hz |
| Radio Technology | : | 2.4G WIFI |
| Operation frequency | : | 2412MHz-2462MHz for IEEE 802.11 b, g. n/HT20,<br>2422MHz~2452MHz for IEEE802.11n/HT40 |
| Channel No. | : | 802.11b/802.11g /802.11n(HT20): 11<br>802.11(HT40): 7 |
| Modulation type | : | IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n :OFDM(64QAM, 16QAM, QPSK, BPSK) |
| Antenna Type | : | Internal antenna, Maximum Gain is 5.12dBi.<br>(Antenna information is provided by applicant.) |
| Software Version | : | V1.0 |
| Hardware version/FVIN | : | V1.0 |

## 2.2. Accessories of Device (EUT)

Accessories : /

Manufacturer : /

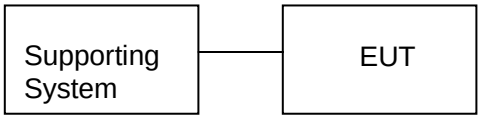
Model : /

Ratings : /

## 2.3. Tested Supporting System Details

| No. | Description | Manufacturer | Model | Serial Number | Certification or SDOC |
|---|---|---|---|---|---|
| 1 | Notebook PC | Lenovo | Thinkpad E14 | N/A | N/A |

## 2.4. Block Diagram of connection between EUT and simulators



## 2.5. Test Mode Description

| Duty cycle :100%Keeping TX | | | |
|---|---|---|---|
| **Mode** | **Data rate (Mbps)** | **Channel** | **Frequency (MHz)** |
| IEEE 802.11b | 1 | Low :CH1 | 2412 |
| | 1 | Middle: CH6 | 2437 |
| | 1 | High: CH11 | 2462 |
| IEEE 802.11g | 6 | Low :CH1 | 2412 |
| | 6 | Middle: CH6 | 2437 |
| | 6 | High: CH11 | 2462 |
| IEEE 802.11 n/HT20 | 6.5 | Low :CH1 | 2412 |
| | 6.5 | Middle: CH6 | 2437 |
| | 6.5 | High: CH11 | 2462 |
| IEEE 802.11 n/HT40 | 13 | Low :CH3 | 2422 |
| | 13 | Middle: CH6 | 2437 |
| | 13 | High: CH9 | 2452 |
| Note: According exploratory test, EUT will have maximum output power in those data rate. So those data rate were used for all test. | | | |

| Channel list: | | | | | |
|---|---|---|---|---|---|
| For IEEE 802.11b, g, n/HT20, n/HT40 | | | | | |
| **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** | **Channel** | **Frequency (MHz)** |
| CH1 | 2412 | CH5 | 2432 | CH9 | 2452 |
| CH2 | 2417 | CH6 | 2437 | CH10 | 2457 |
| CH3 | 2422 | CH7 | 2442 | CH11 | 2462 |
| CH4 | 2427 | CH8 | 2447 | | |

## 2.6. Test Conditions

| Items | Required | Actual |
|---|---|---|
| Temperature range: | 15-35℃ | 24℃ |
| Humidity range: | 25-75% | 56% |
| Pressure range: | 86-106kPa | 98kPa |

## 2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961
Designation Number: CN1236

July 15, 2019 Certificated by IC
Registration Number: 12135A

## 2.8. Measurement Uncertainty

(95% confidence levels, k=2)

| Item | Uncertainty |
|---|---|
| Uncertainty for Power point Conducted Emissions Test | 1.63dB |
| Uncertainty for Radiation Emission test in 3m chamber (below 30MHz) | 3.5dB |
| Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz) | 3.74dB(Polarize: V) |
| | 3.76dB(Polarize: H) |
| Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz) | 3.77dB(Polarize: V) |
| | 3.80dB(Polarize: H) |
| Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz) | 4.31 dB(Polarize: V) |
| | 4.30 dB(Polarize: H) |
| Uncertainty for radio frequency | $5.06\times10^{-8}$GHz |
| Uncertainty for conducted RF Power | 0.40dB |
| Uncertainty for temperature | 0.2℃ |
| Uncertainty for humidity | 1% |
| Uncertainty for DC and low frequency voltages | 0.06% |

## 2.9. Test Equipment List

| Equipment | Manufacture | Model No. | Firmware version | Serial No. | Last cal. | Cal Interval |
|---|---|---|---|---|---|---|
| 9*6*6 anechoic chamber | CHENYU | 9*6*6 | / | N/A | 2022.05.17 | 3Year |
| Spectrum analyzer | ROHDE&SCHWARZ | FSV40-N | 2.3 | 102137 | 2023.08.16 | 1Year |
| Spectrum analyzer | Agilent | N9020A | A.14.16 | MY499100060 | 2023.08.16 | 1Year |
| Receiver | ROHDE&SCHWARZ | ESR | 2.28 SP1 | 1316.3003K03-102082-Wa | 2023.08.16 | 1Year |
| Receiver | R&S | ESCI | 4.42 SP1 | 101165 | 2023.08.16 | 1Year |
| Bilog Antenna | Schwarzbeck | VULB 9168 | / | VULB 9168#627 | 2023.08.28 | 1Year |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | / | 2106 | 2023.08.19 | 1Year |
| Loop Antenna | SCHWARZBECK | FMZB 1519B | / | 00128 | 2023.08.19 | 1Year |
| RF Cable | Resenberger | Cable 1 | / | RE1 | 2023.08.16 | 1Year |
| RF Cable | Resenberger | Cable 2 | / | RE2 | 2023.08.16 | 1Year |
| RF Cable | Resenberger | Cable 3 | / | CE1 | 2023.08.16 | 1Year |
| Pre-amplifier | HP | HP8347A | / | 2834A00455 | 2023.08.16 | 1Year |
| Pre-amplifier | Agilent | 8449B | / | 3008A02664 | 2023.08.16 | 1Year |
| L.I.S.N.#1 | Schwarzbeck | NSLK8126 | / | 8126-466 | 2023.08.16 | 1Year |
| L.I.S.N.#2 | ROHDE&SCHWARZ | ENV216 | / | 101043 | 2023.08.16 | 1Year |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | / | 00946 | 2023.08.19 | 1Year |
| Preamplifier | SKET | LNPA_1840-50 | / | SK2018101801 | 2023.08.16 | 1 Year |
| Power Meter | Agilent | E9300A | / | MY41496628 | 2023.08.16 | 1 Year |
| Power Sensor | DARE | RPR3006W | / | 15100041SNO91 | 2023.08.16 | 1 Year |
| Temp. & Humid. Chamber | Teelong | TL-HW408S | / | TL-20191205-01 | 2023.07.25 | 1 Year |
| Switching Mode Power Supply | JUNKE | JK12010S | / | 20140927-6 | 2023.08.16 | 1 Year |
| Adjustable attenuator | MWRFtest | N/A | / | N/A | N/A | N/A |
| 10dB Attenuator | Mini-Circuits | DC-6G | / | N/A | N/A | N/A |

| **Software Information** | | | |
|---|---|---|---|
| Test Item | Software Name | Manufacturer | Version |
| RE | EZ-EMC | Farad | Alpha-3A1 |
| CE | EZ-EMC | Farad | Alpha-3A1 |
| RF-CE | MTS 8310 | MW | V2.0.0.0 |

# 3. SPURIOUS EMISSION

## 3.1. Test Limits

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

15.205 Restricted frequency band

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| [1]0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | ([2]) |

15.209 Limit

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMIT | |
|---|---|---|---|
| | | μV/m | dB(μV)/m |
| 0.009-0.490 | 300 | 2400/F(KHz) | / |
| 0.490-1.705 | 30 | 24000/F(KHz) | / |
| 1.705-30 | 30 | 30 | 29.5 |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |
| Above 1000 | 3 | 74.0 dB(μV)/m (Peak)<br>54.0 dB(μV)/m (Average) | |
| Note 1: The peak limit is 20 dB higher than the average limit | | | |
| Note 2: Peak limit applies (AVG limit + 20 dB) as well as RSS-247 Section 5.5 | | | |

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

| Table 5 – General field strength limits at frequencies above 30 MHz | |
|---|---|
| **Frequency (MHz)** | **Field strength (μV/m at 3 m)** |
| 30 – 88 | 100 |
| 88 – 216 | 150 |
| 216 – 960 | 200 |
| Above 960 | 500 |

| Table 6 – General field strength limits at frequencies below 30 MHz | | |
|---|---|---|
| **Frequency** | **Magnetic field strength (H-Field) (μA/m)** | **Measurement distance (m)** |
| 9 - 490 kHz[Note 1] | 6.37/F (F in kHz) | 300 |
| 490 - 1705 kHz | 63.7/F (F in kHz) | 30 |
| 1.705 - 30 MHz | 0.08 | 30 |

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

## 3.2. Test Procedure

The measuring distance of 3m shall be used for measurements at frequency up to 1GH and above 1GHz.

The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, the table was rotated 360 degrees to determine the position of the highest radiation

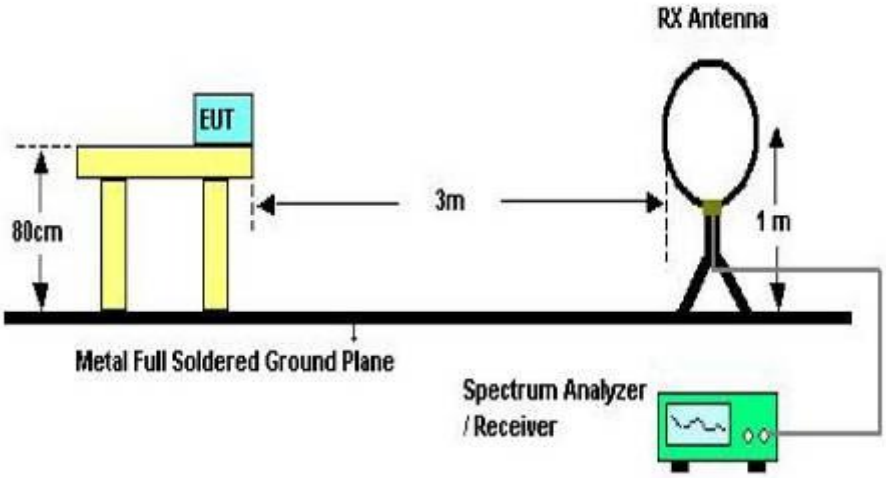
The Test antenna shall vary between 1m and 4m, both Horizontal and Vertical antenna are set of make measurement.

The initial step in collecting radiated emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Quasi Peak Detector mode premeasured

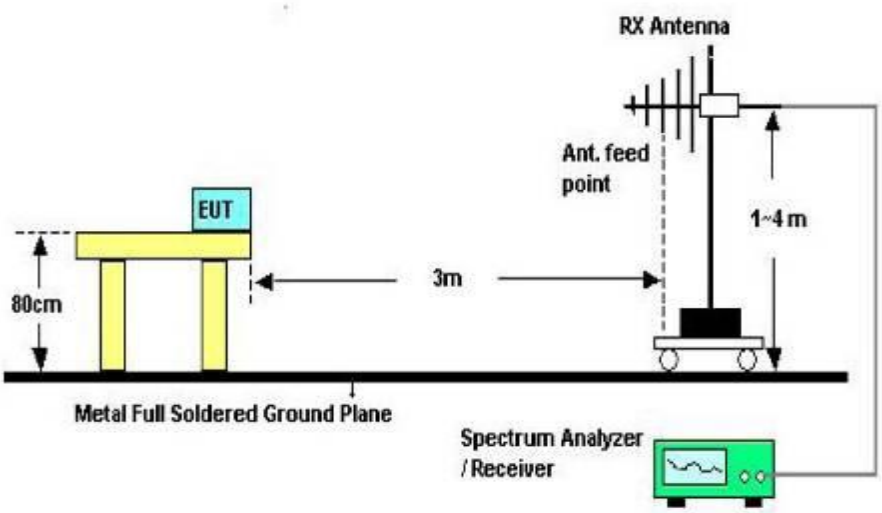
If Peak value comply with QP limit below 1GHz, the EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.

For the actual test configuration, please see the test setup photo.

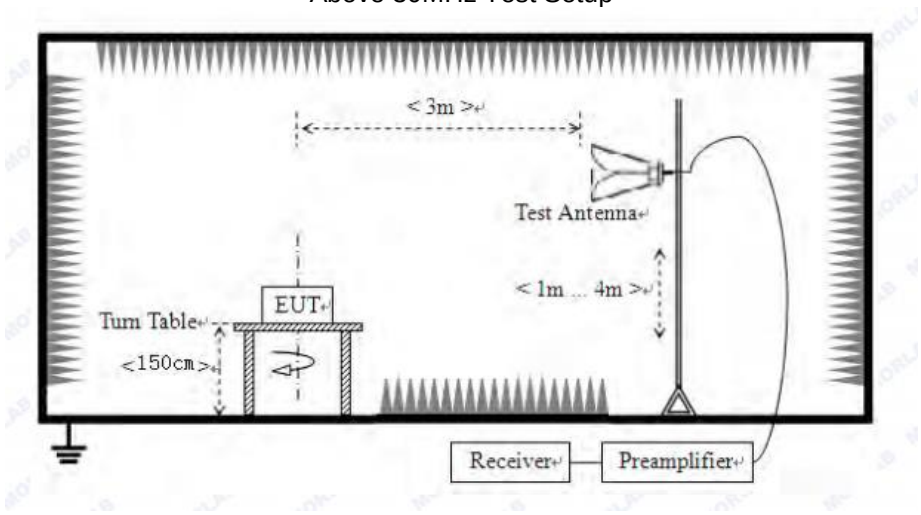
## 3.3. Test Setup




Below 30MHz Test Setup




Above 30MHz Test Setup




Above 1GHz Test Setup

## 3.4. Test Results

Test Condition
Continual Transmitting in maximum power.

| | | |
|---|---|---|
| 9KHz~150KHz | RBW200Hz | VBW1KHz |
| 150KHz~30MHz | RBW9KHz | VBW 30KHz |
| 30MHZ~1GHz | RBW120KHz | VBW 300KHz |
| Above1GHz | RBW1MHz | VBW 3MHz |

We have scanned the EUT from 9kHz up to the 10th harmonic of the fundamental.

Detailed information please see the following page.

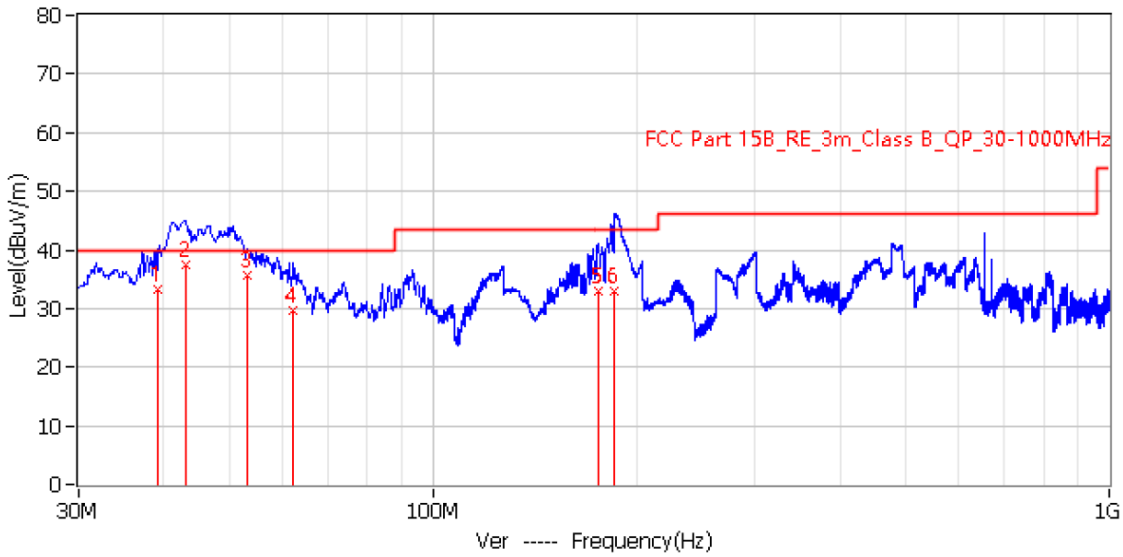
From 9KHz to 30MHz: Conclusion: PASS

Note: 1.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

2. All antennas have been tested, only the worst data of each pattern is reflected.

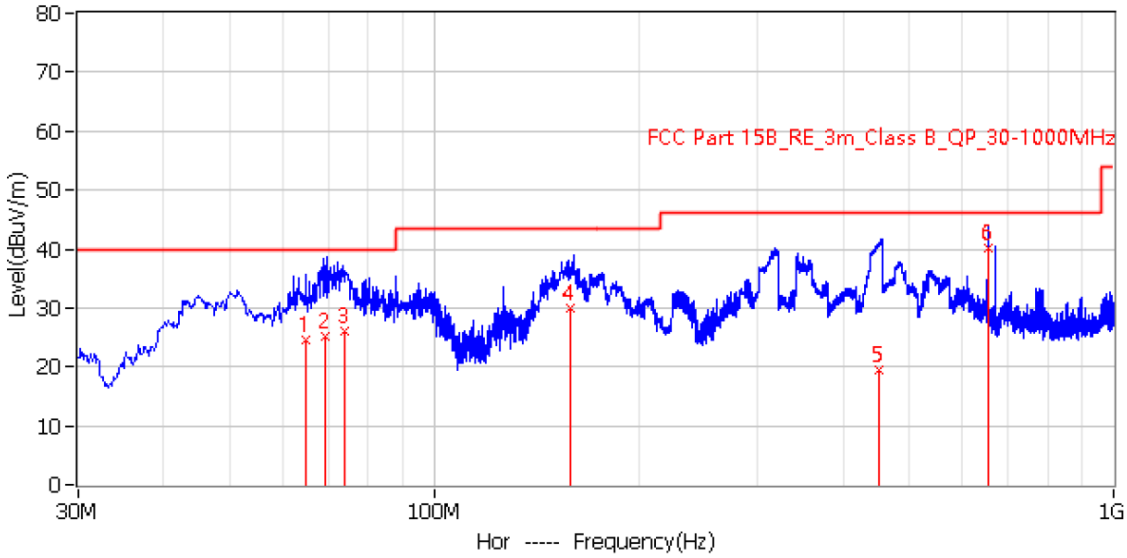
Test result for 802.11b (High Channel)

**Vertical:**




| No. | Frequency | Limit dBuV/m | Level dBuV/m | Margin dB | Factor dB/m | Detector | Height cm | Height cm | Angle deg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 39.161MHz | 40.0 | 33.3 | -6.7 | 16.3 | QP | Ver | 100.0 | 205.0 |
| 2 | 43.222MHz | 40.0 | 37.6 | -2.4 | 17.6 | QP | Ver | 100.0 | 145.0 |
| 3 | 53.272MHz | 40.0 | 35.6 | -4.4 | 18.1 | QP | Ver | 100.0 | 220.0 |
| 4 | 62.258MHz | 40.0 | 29.6 | -10.4 | 17.2 | QP | Ver | 100.0 | 220.0 |
| 5 | 176.288MHz | 43.5 | 32.9 | -10.6 | 14.7 | QP | Ver | 100.0 | 121.0 |
| 6 | 185.677MHz | 43.5 | 33.1 | -10.4 | 13.5 | QP | Ver | 100.0 | 121.0 |

**Horizontal:**




| No. | Frequency | Limit dBuV/m | Level dBuV/m | Margin dB | Factor dB/m | Detector | Height cm | Height cm | Angle deg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 64.921MHz | 40.0 | 24.6 | -15.4 | 16.8 | QP | Hor | 100.0 | 319.0 |
| 2 | 69.111MHz | 40.0 | 25.1 | -14.9 | 13.6 | QP | Hor | 100.0 | 299.0 |
| 3 | 74.139MHz | 40.0 | 26.2 | -13.8 | 13.6 | QP | Hor | 100.0 | 299.0 |
| 4 | 158.973MHz | 43.5 | 30.1 | -13.4 | 16.0 | QP | Hor | 100.0 | 0.0 |
| 5 | 451.473MHz | 46.0 | 19.4 | -26.6 | 19.3 | QP | Hor | 100.0 | 108.0 |
| 6 | 652.953MHz | 46.0 | 40.2 | -5.8 | 23.3 | QP | Hor | 100.0 | 186.0 |

Notes: Above is below 1GHz test data. This report only shall the worst case mode for b 2412MHz.

From 1G-25GHz

| Test Mode: IEEE 802.11b TX Low | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq (MHz) | Read Level (dBuV/m) | Polar (H/V) | Antenna Factor (dB/m) | Cable loss(dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 4824 | 45.49 | V | 33.95 | 10.18 | 34.26 | 55.36 | 74 | -18.64 | PK |
| 4824 | 36.65 | V | 33.95 | 10.18 | 34.26 | 46.52 | 54 | -7.48 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| 4824 | 50.66 | H | 33.95 | 10.18 | 34.26 | 60.53 | 74 | -13.47 | PK |
| 4824 | 34.63 | H | 33.95 | 10.18 | 34.26 | 44.50 | 54 | -9.50 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11b TX Mid | | | | | | | | | |
| 4874 | 43.34 | V | 33.93 | 10.2 | 34.29 | 53.18 | 74 | -20.82 | PK |
| 4874 | 33.07 | V | 33.93 | 10.2 | 34.29 | 42.91 | 54 | -11.09 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| 4874 | 48.09 | H | 33.93 | 10.2 | 34.29 | 57.93 | 74 | -16.07 | PK |
| 4874 | 32.91 | H | 33.93 | 10.2 | 34.29 | 42.75 | 54 | -11.25 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11b TX High | | | | | | | | | |
| 4924 | 48.07 | V | 33.98 | 10.22 | 34.25 | 58.02 | 74 | -15.98 | PK |
| 4924 | 36.26 | V | 33.98 | 10.22 | 34.25 | 46.21 | 54 | -7.79 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |
| 4924 | 49.48 | H | 33.98 | 10.22 | 34.25 | 59.43 | 74 | -14.57 | PK |
| 4924 | 32.90 | H | 33.98 | 10.22 | 34.25 | 42.85 | 54 | -11.15 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

| Test Mode: IEEE 802.11g TX Low | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq (MHz) | Read Level (dBuV/m) | Polar (H/V) | Antenna Factor (dB/m) | Cable loss(dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 4824 | 45.44 | V | 33.95 | 10.18 | 34.26 | 55.31 | 74 | -18.69 | PK |
| 4824 | 34.82 | V | 33.95 | 10.18 | 34.26 | 44.69 | 54 | -9.31 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| 4824 | 50.70 | H | 33.95 | 10.18 | 34.26 | 60.57 | 74 | -13.43 | PK |
| 4824 | 35.34 | H | 33.95 | 10.18 | 34.26 | 45.21 | 54 | -8.79 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11g TX Mid | | | | | | | | | |
| 4874 | 44.55 | V | 33.93 | 10.2 | 34.29 | 54.39 | 74 | -19.61 | PK |
| 4874 | 33.29 | V | 33.93 | 10.2 | 34.29 | 43.13 | 54 | -10.87 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| 4874 | 45.63 | H | 33.93 | 10.2 | 34.29 | 55.47 | 74 | -18.53 | PK |
| 4874 | 35.41 | H | 33.93 | 10.2 | 34.29 | 45.25 | 54 | -8.75 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11g TX High | | | | | | | | | |
| 4924 | 44.73 | V | 33.98 | 10.22 | 34.25 | 54.68 | 74 | -19.32 | PK |
| 4924 | 34.96 | V | 33.98 | 10.22 | 34.25 | 44.91 | 54 | -9.09 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |
| 4924 | 47.13 | H | 33.98 | 10.22 | 34.25 | 57.08 | 74 | -16.92 | PK |
| 4924 | 36.13 | H | 33.98 | 10.22 | 34.25 | 46.08 | 54 | -7.92 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

| Test Mode: IEEE 802.11n HT20 TX Low | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq (MHz) | Read Level (dBuV/m) | Polar (H/V) | Antenna Factor (dB/m) | Cable loss(dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 4824 | 45.13 | V | 33.95 | 10.18 | 34.26 | 55.00 | 74 | -19.00 | PK |
| 4824 | 37.16 | V | 33.95 | 10.18 | 34.26 | 47.03 | 54 | -6.97 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| 4824 | 49.71 | H | 33.95 | 10.18 | 34.26 | 59.58 | 74 | -14.42 | PK |
| 4824 | 35.12 | H | 33.95 | 10.18 | 34.26 | 44.99 | 54 | -9.01 | AV |
| 7236 | / | / | / | / | / | / | / | / | / |
| 9648 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11n HT20 TX Mid | | | | | | | | | |
| 4874 | 45.74 | V | 33.93 | 10.2 | 34.29 | 55.58 | 74 | -18.42 | PK |
| 4874 | 30.97 | V | 33.93 | 10.2 | 34.29 | 40.81 | 54 | -13.19 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| 4874 | 48.05 | H | 33.93 | 10.2 | 34.29 | 57.89 | 74 | -16.11 | PK |
| 4874 | 32.34 | H | 33.93 | 10.2 | 34.29 | 42.18 | 54 | -11.82 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11n HT20 TX High | | | | | | | | | |
| 4924 | 46.06 | V | 33.98 | 10.22 | 34.25 | 56.01 | 74 | -17.99 | PK |
| 4924 | 36.03 | V | 33.98 | 10.22 | 34.25 | 45.98 | 54 | -8.02 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |
| 4924 | 47.40 | H | 33.98 | 10.22 | 34.25 | 57.35 | 74 | -16.65 | PK |
| 4924 | 33.61 | H | 33.98 | 10.22 | 34.25 | 43.56 | 54 | -10.44 | AV |
| 7386 | / | / | / | / | / | / | / | / | / |
| 9848 | / | / | / | / | / | / | / | / | / |

Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

| Test Mode: IEEE 802.11n HT40 TX Low | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq (MHz) | Read Level (dBuV/m) | Polar (H/V) | Antenna Factor (dB/m) | Cable loss(dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 4844 | 46.85 | V | 33.95 | 10.18 | 34.26 | 56.72 | 74 | -17.28 | PK |
| 4844 | 38.24 | V | 33.95 | 10.18 | 34.26 | 48.11 | 54 | -5.89 | AV |
| 7266 | / | / | / | / | / | / | / | / | / |
| 9688 | / | / | / | / | / | / | / | / | / |
| 4844 | 47.60 | H | 33.95 | 10.18 | 34.26 | 57.47 | 74 | -16.53 | PK |
| 4844 | 36.97 | H | 33.95 | 10.18 | 34.26 | 46.84 | 54 | -7.16 | AV |
| 7266 | / | / | / | / | / | / | / | / | / |
| 9688 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11n HT40 TX Mid | | | | | | | | | |
| 4874 | 44.76 | V | 33.93 | 10.2 | 34.29 | 54.60 | 74 | -19.40 | PK |
| 4874 | 30.81 | V | 33.93 | 10.2 | 34.29 | 40.65 | 54 | -13.35 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| 4874 | 45.53 | H | 33.93 | 10.2 | 34.29 | 55.37 | 74 | -18.63 | PK |
| 4874 | 35.72 | H | 33.93 | 10.2 | 34.29 | 45.56 | 54 | -8.44 | AV |
| 7311 | / | / | / | / | / | / | / | / | / |
| 9748 | / | / | / | / | / | / | / | / | / |
| Test Mode: IEEE 802.11n HT40 TX High | | | | | | | | | |
| 4904 | 48.14 | V | 33.98 | 10.22 | 34.25 | 58.09 | 74 | -15.91 | PK |
| 4904 | 34.52 | V | 33.98 | 10.22 | 34.25 | 44.47 | 54 | -9.53 | AV |
| 7356 | / | / | / | / | / | / | / | / | / |
| 9808 | / | / | / | / | / | / | / | / | / |
| 4904 | 48.29 | H | 33.98 | 10.22 | 34.25 | 58.24 | 74 | -15.76 | PK |
| 4904 | 35.24 | H | 33.98 | 10.22 | 34.25 | 45.19 | 54 | -8.81 | AV |
| 7356 | / | / | / | / | / | / | / | / | / |
| 9808 | / | / | / | / | / | / | / | / | / |

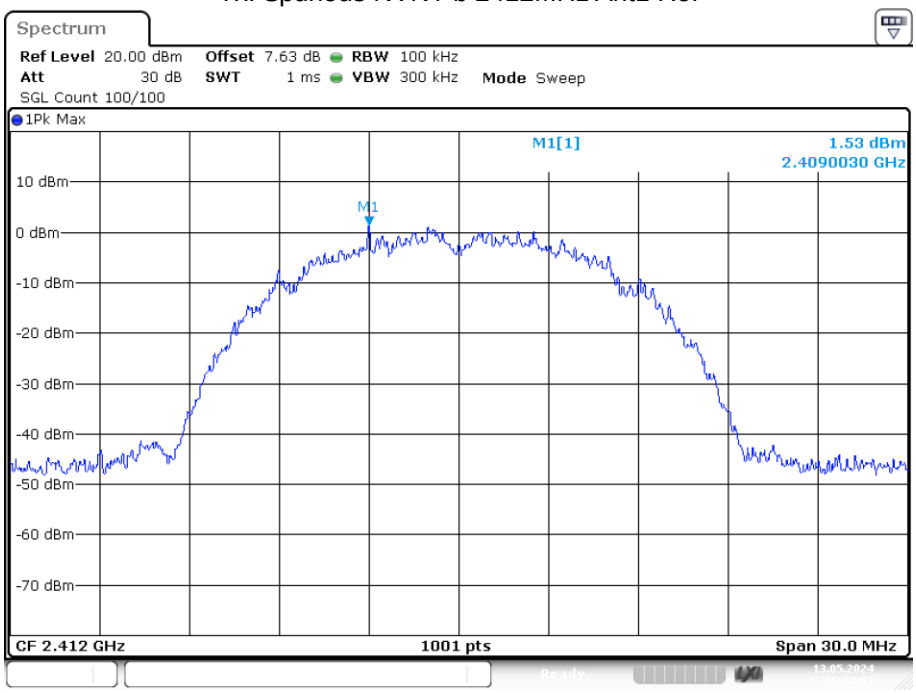
Note:

1, Result = Read level + Antenna factor + cable loss-Amp factor

2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

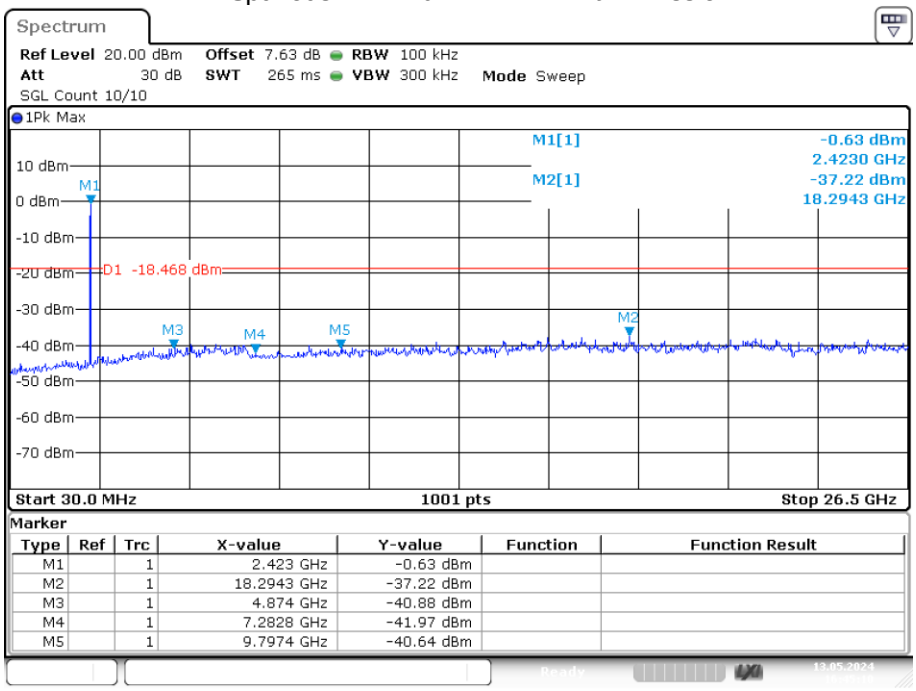
## Conducted RF Spurious Emission

Tx. Spurious NVNT b 2412MHz Ant1 Ref




Date: 13.MAY.2024 16:44:52

Tx. Spurious NVNT b 2412MHz Ant1 Emission

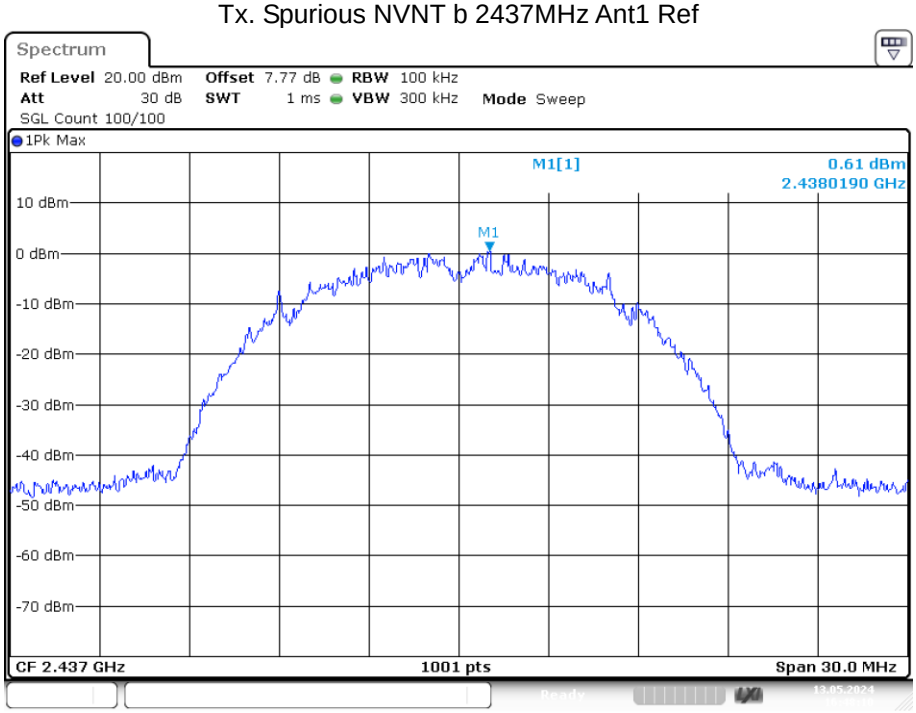



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.423 GHz | -0.63 dBm | | |
| M2 | | 1 | 18.2943 GHz | -37.22 dBm | | |
| M3 | | 1 | 4.874 GHz | -40.88 dBm | | |
| M4 | | 1 | 7.2828 GHz | -41.97 dBm | | |
| M5 | | 1 | 9.7974 GHz | -40.64 dBm | | |

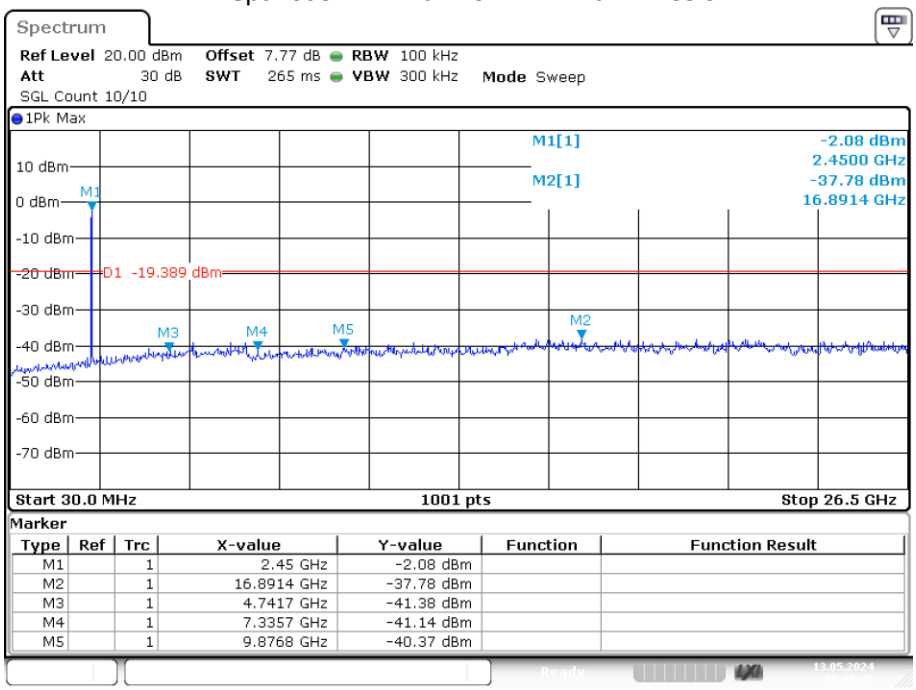
Date: 13.MAY.2024 16:45:10

Tx. Spurious NVNT b 2437MHz Ant1 Ref




Date: 13.MAY.2024 16:48:10

Tx. Spurious NVNT b 2437MHz Ant1 Emission

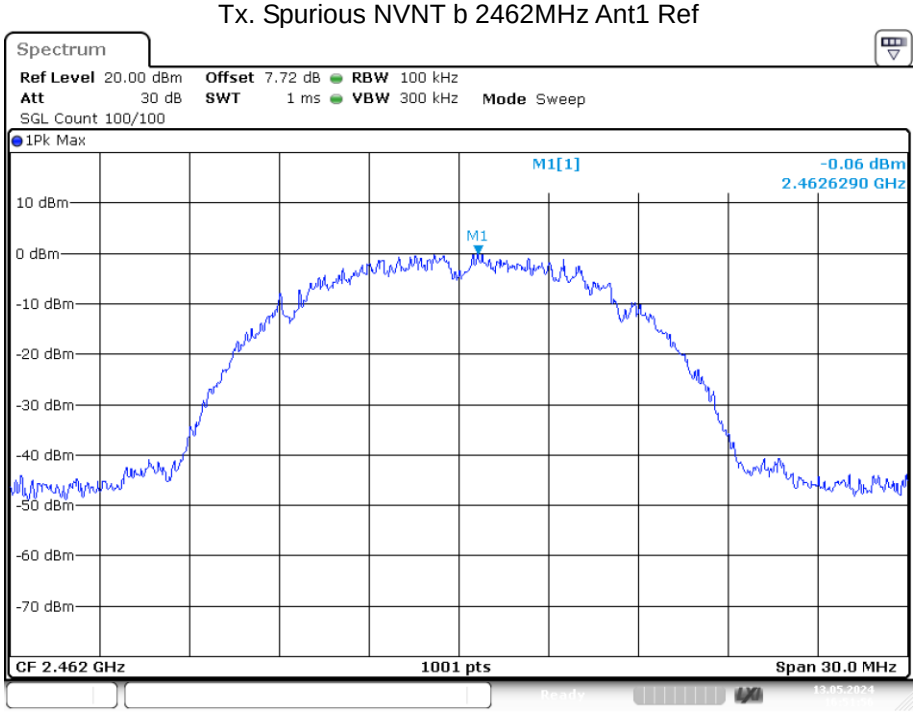



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -2.08 dBm | | |
| M2 | | 1 | 16.8914 GHz | -37.78 dBm | | |
| M3 | | 1 | 4.7417 GHz | -41.38 dBm | | |
| M4 | | 1 | 7.3357 GHz | -41.14 dBm | | |
| M5 | | 1 | 9.8768 GHz | -40.37 dBm | | |

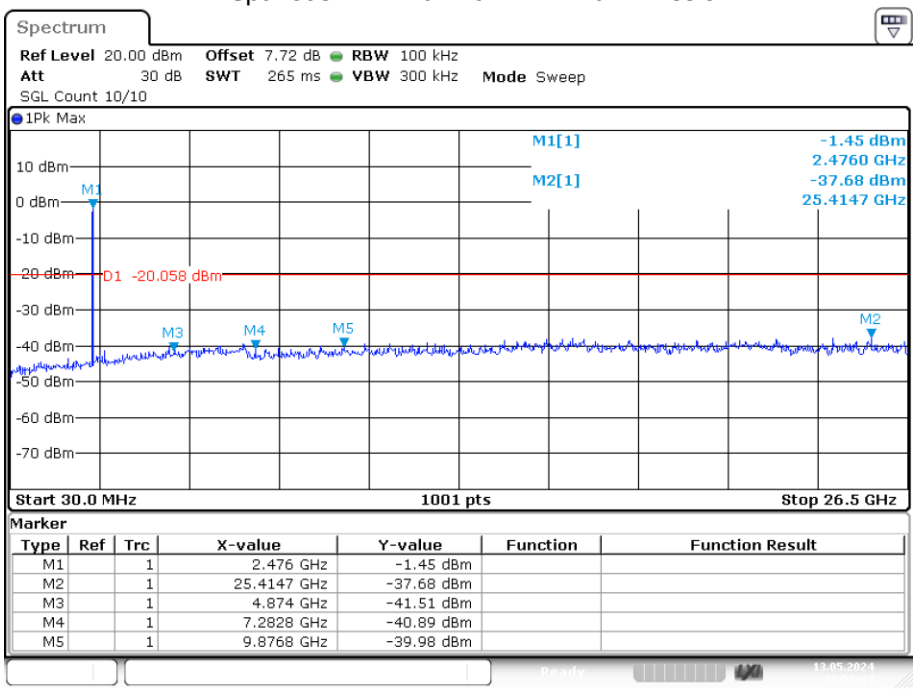
Date: 13.MAY.2024 16:48:28

Tx. Spurious NVNT b 2462MHz Ant1 Ref




Date: 13.MAY.2024 16:51:56

Tx. Spurious NVNT b 2462MHz Ant1 Emission

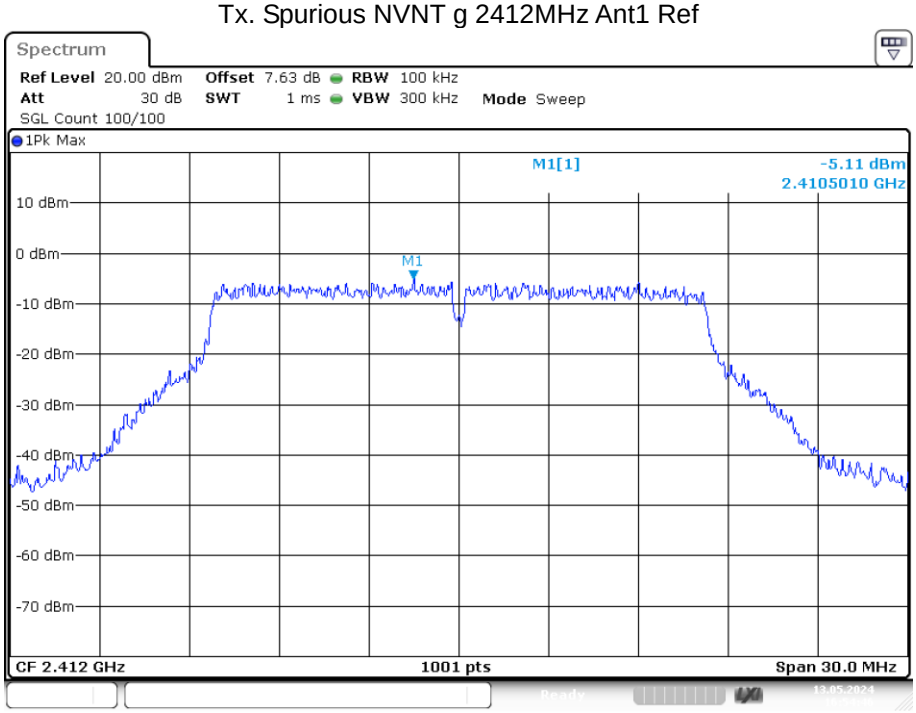



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.476 GHz | -1.45 dBm | | |
| M2 | | 1 | 25.4147 GHz | -37.68 dBm | | |
| M3 | | 1 | 4.874 GHz | -41.51 dBm | | |
| M4 | | 1 | 7.2828 GHz | -40.89 dBm | | |
| M5 | | 1 | 9.8768 GHz | -39.98 dBm | | |

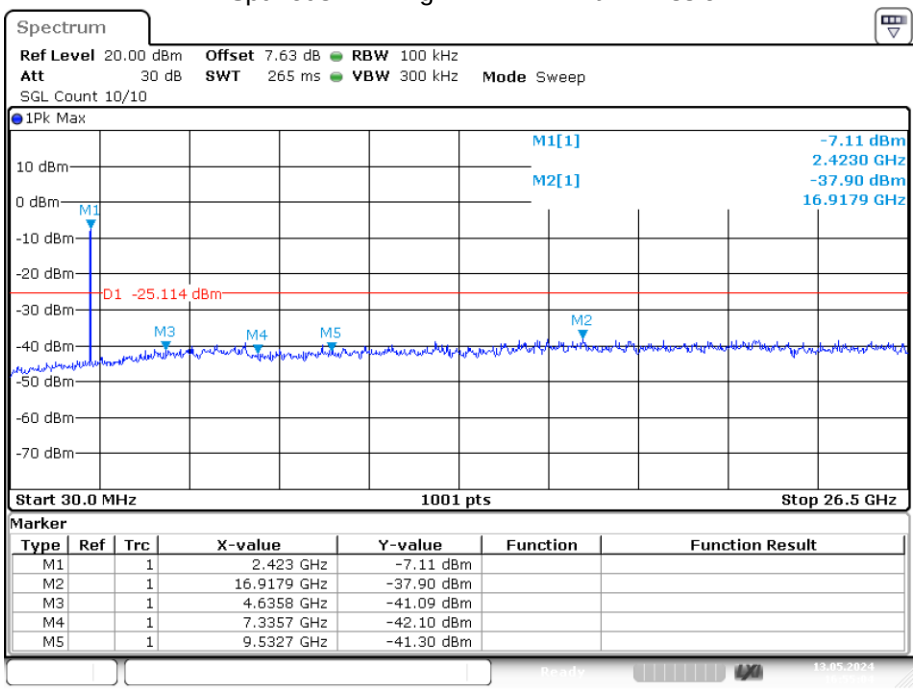
Date: 13.MAY.2024 16:52:14

Tx. Spurious NVNT g 2412MHz Ant1 Ref




Date: 13.MAY.2024 16:54:46

Tx. Spurious NVNT g 2412MHz Ant1 Emission

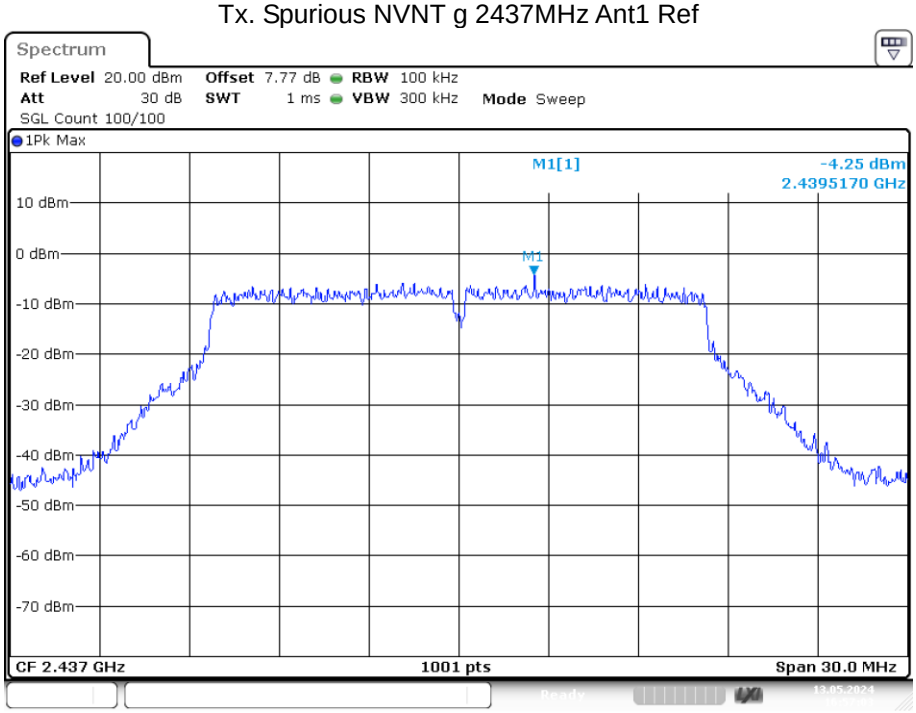



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.423 GHz | -7.11 dBm | | |
| M2 | | 1 | 16.9179 GHz | -37.90 dBm | | |
| M3 | | 1 | 4.6358 GHz | -41.09 dBm | | |
| M4 | | 1 | 7.3357 GHz | -42.10 dBm | | |
| M5 | | 1 | 9.5327 GHz | -41.30 dBm | | |

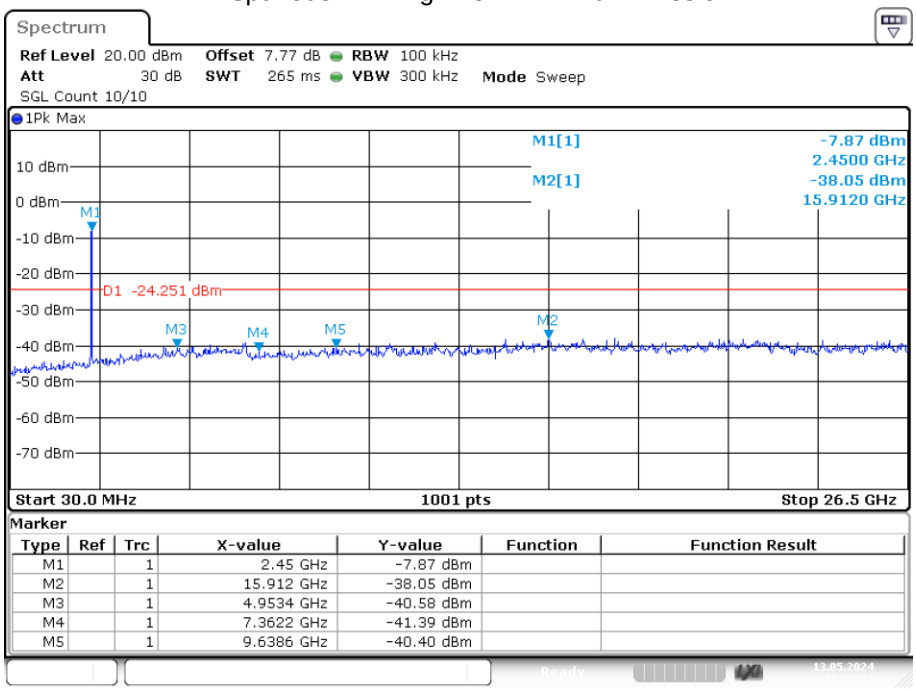
Date: 13.MAY.2024 16:55:04

Tx. Spurious NVNT g 2437MHz Ant1 Ref




Date: 13.MAY.2024 16:57:03

Tx. Spurious NVNT g 2437MHz Ant1 Emission

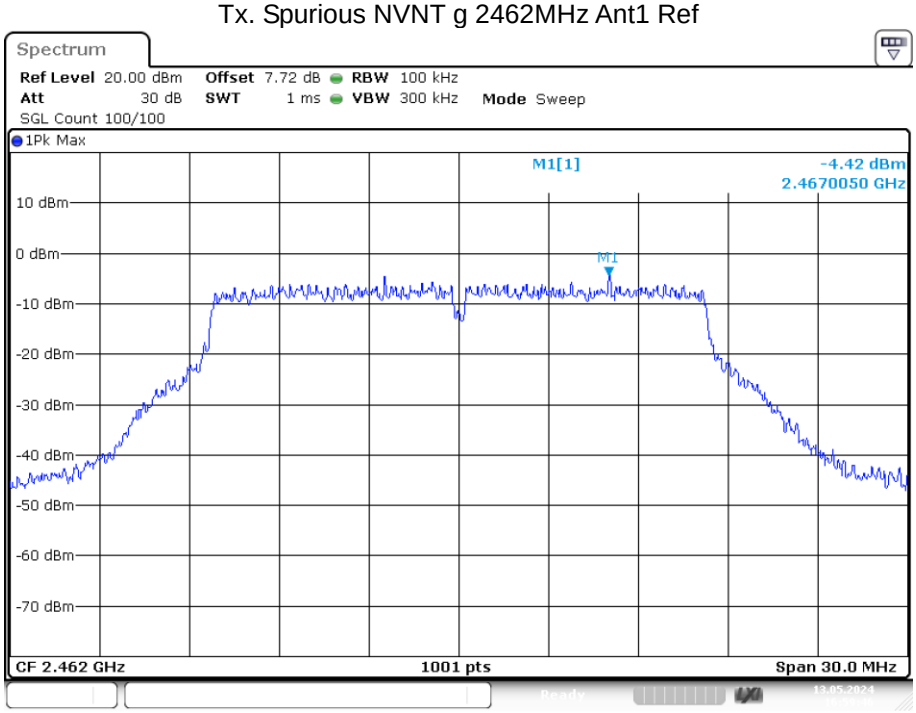



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -7.87 dBm | | |
| M2 | | 1 | 15.912 GHz | -38.05 dBm | | |
| M3 | | 1 | 4.9534 GHz | -40.58 dBm | | |
| M4 | | 1 | 7.3622 GHz | -41.39 dBm | | |
| M5 | | 1 | 9.6386 GHz | -40.40 dBm | | |

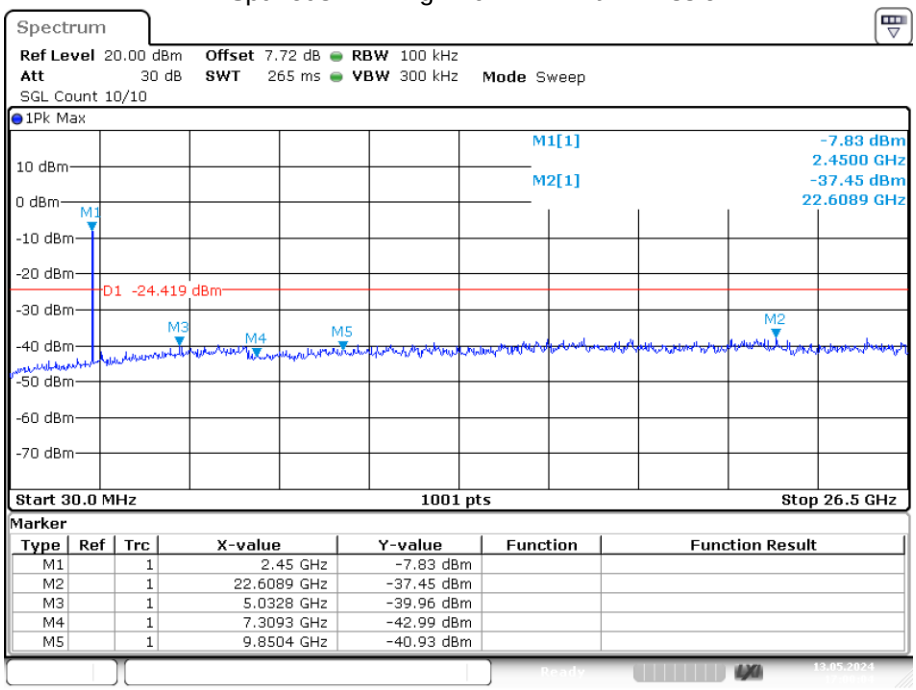
Date: 13.MAY.2024 16:57:21

Tx. Spurious NVNT g 2462MHz Ant1 Ref




Date: 13.MAY.2024 16:59:46

Tx. Spurious NVNT g 2462MHz Ant1 Emission

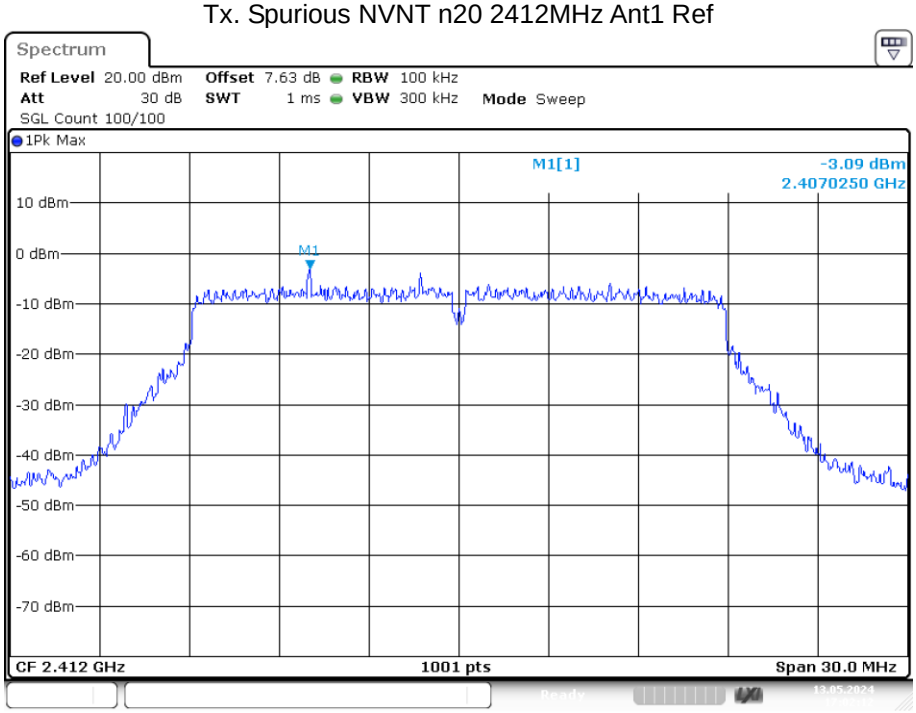



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -7.83 dBm | | |
| M2 | | 1 | 22.6089 GHz | -37.45 dBm | | |
| M3 | | 1 | 5.0328 GHz | -39.96 dBm | | |
| M4 | | 1 | 7.3093 GHz | -42.99 dBm | | |
| M5 | | 1 | 9.8504 GHz | -40.93 dBm | | |

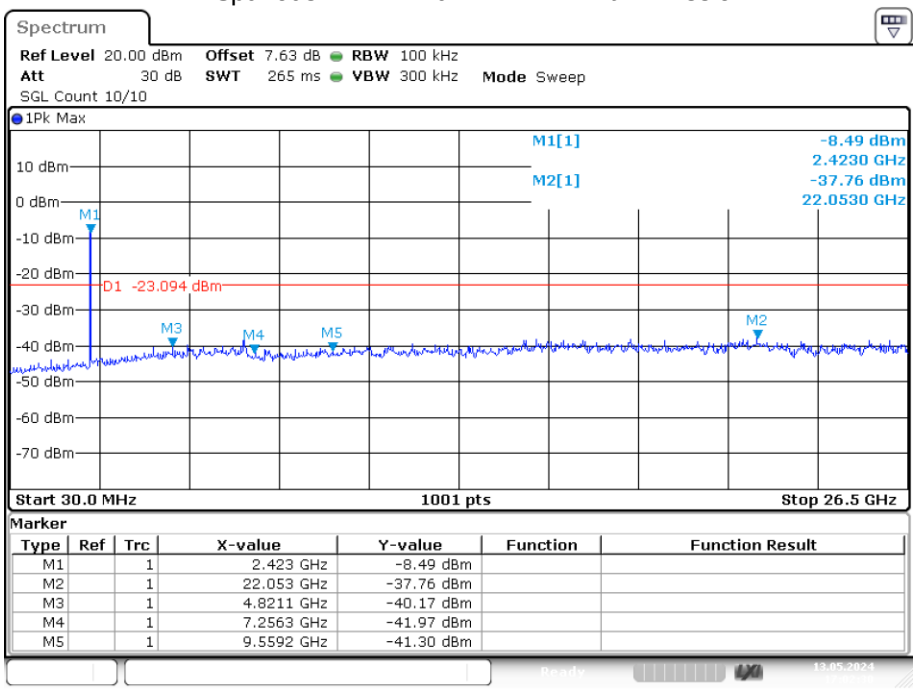
Date: 13.MAY.2024 17:00:03

Tx. Spurious NVNT n20 2412MHz Ant1 Ref




Date: 13.MAY.2024 17:02:12

Tx. Spurious NVNT n20 2412MHz Ant1 Emission

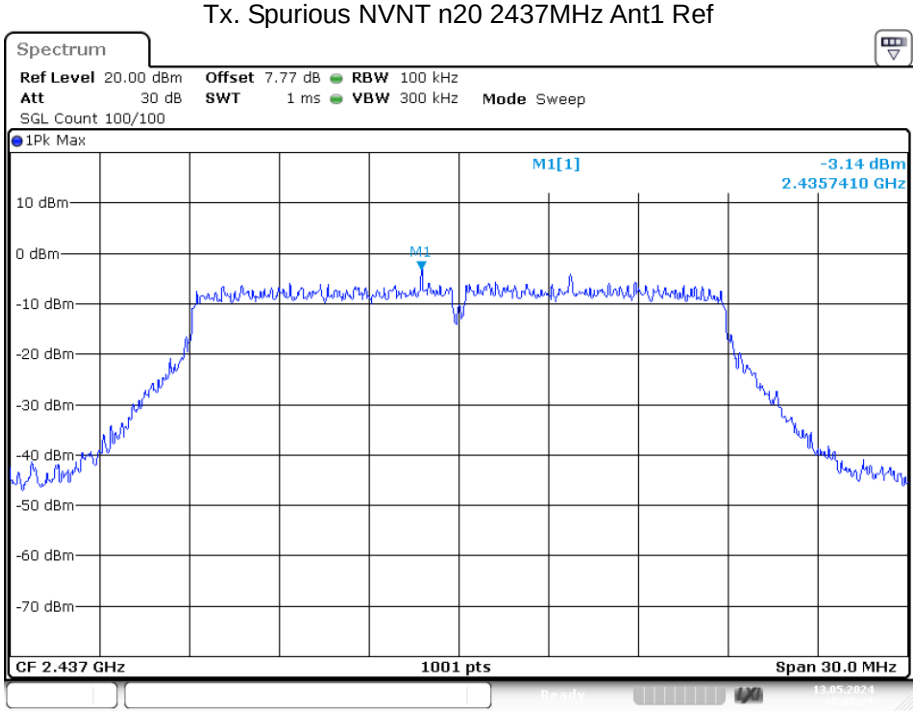



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.423 GHz | -8.49 dBm | | |
| M2 | | 1 | 22.053 GHz | -37.76 dBm | | |
| M3 | | 1 | 4.8211 GHz | -40.17 dBm | | |
| M4 | | 1 | 7.2563 GHz | -41.97 dBm | | |
| M5 | | 1 | 9.5592 GHz | -41.30 dBm | | |

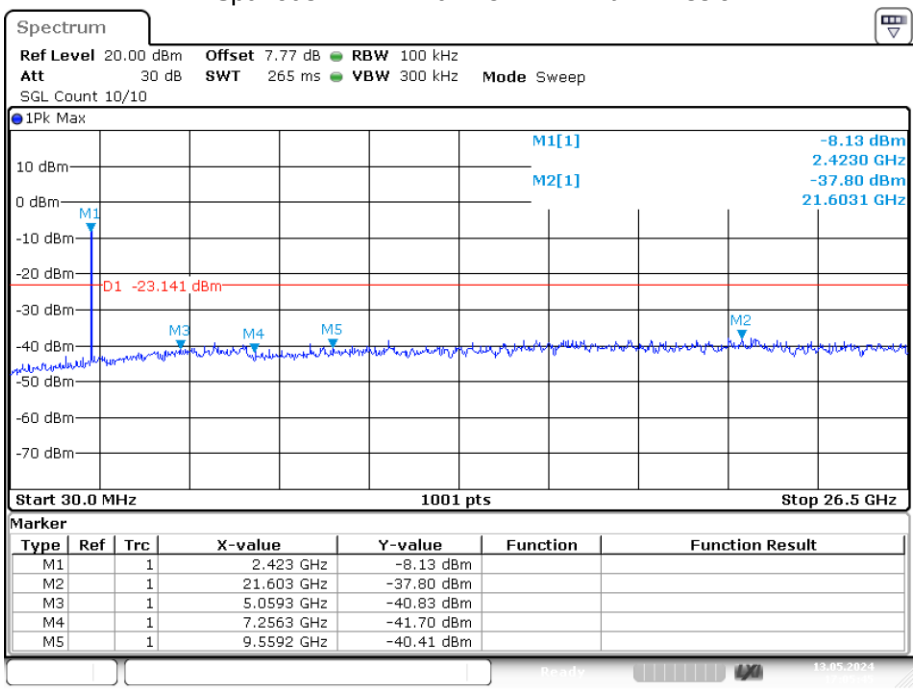
Date: 13.MAY.2024 17:02:30

Tx. Spurious NVNT n20 2437MHz Ant1 Ref




Date: 13.MAY.2024 17:05:27

Tx. Spurious NVNT n20 2437MHz Ant1 Emission

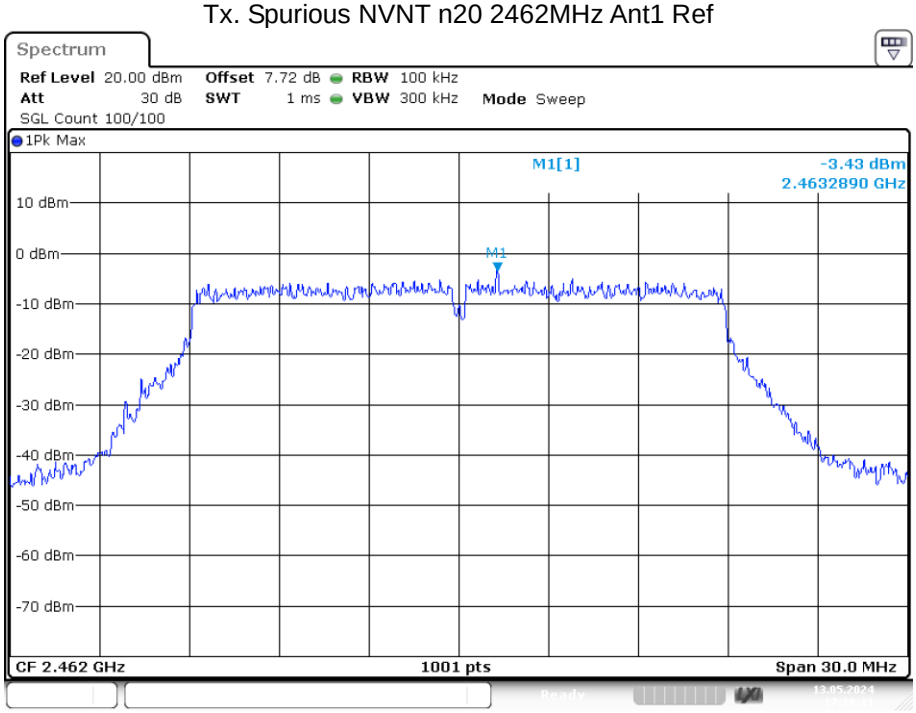



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.423 GHz | -8.13 dBm | | |
| M2 | | 1 | 21.603 GHz | -37.80 dBm | | |
| M3 | | 1 | 5.0593 GHz | -40.83 dBm | | |
| M4 | | 1 | 7.2563 GHz | -41.70 dBm | | |
| M5 | | 1 | 9.5592 GHz | -40.41 dBm | | |

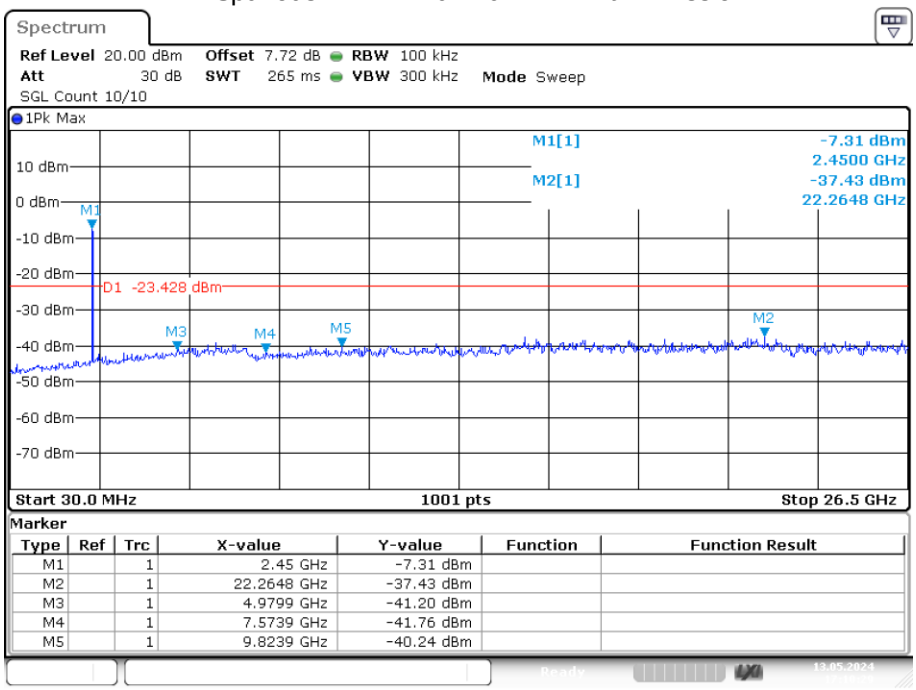
Date: 13.MAY.2024 17:05:44

Tx. Spurious NVNT n20 2462MHz Ant1 Ref




Date: 13.MAY.2024 17:10:12

Tx. Spurious NVNT n20 2462MHz Ant1 Emission

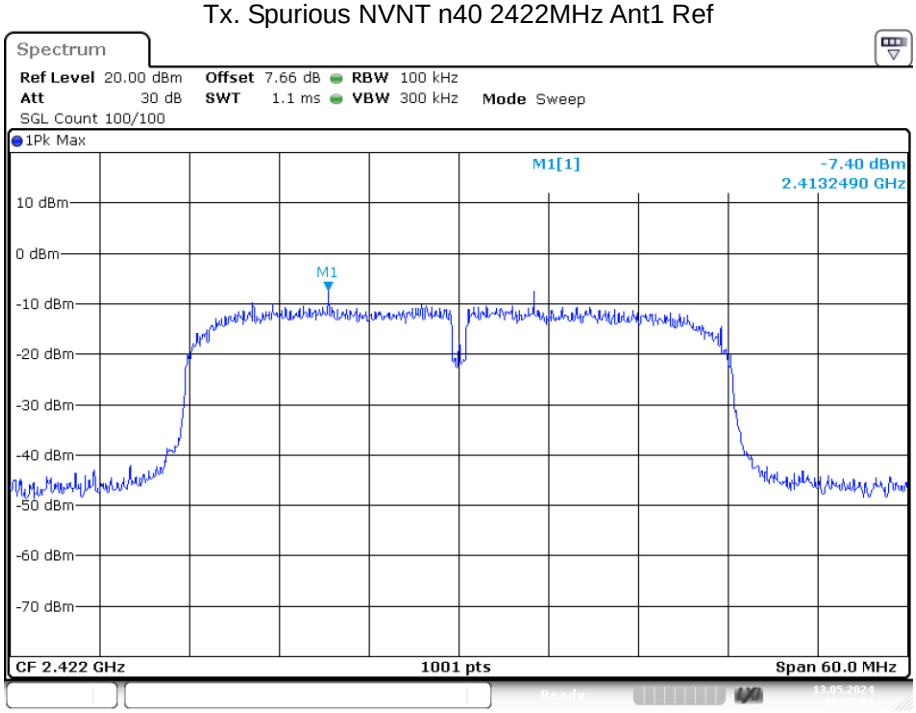



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -7.31 dBm | | |
| M2 | | 1 | 22.2648 GHz | -37.43 dBm | | |
| M3 | | 1 | 4.9799 GHz | -41.20 dBm | | |
| M4 | | 1 | 7.5739 GHz | -41.76 dBm | | |
| M5 | | 1 | 9.8239 GHz | -40.24 dBm | | |

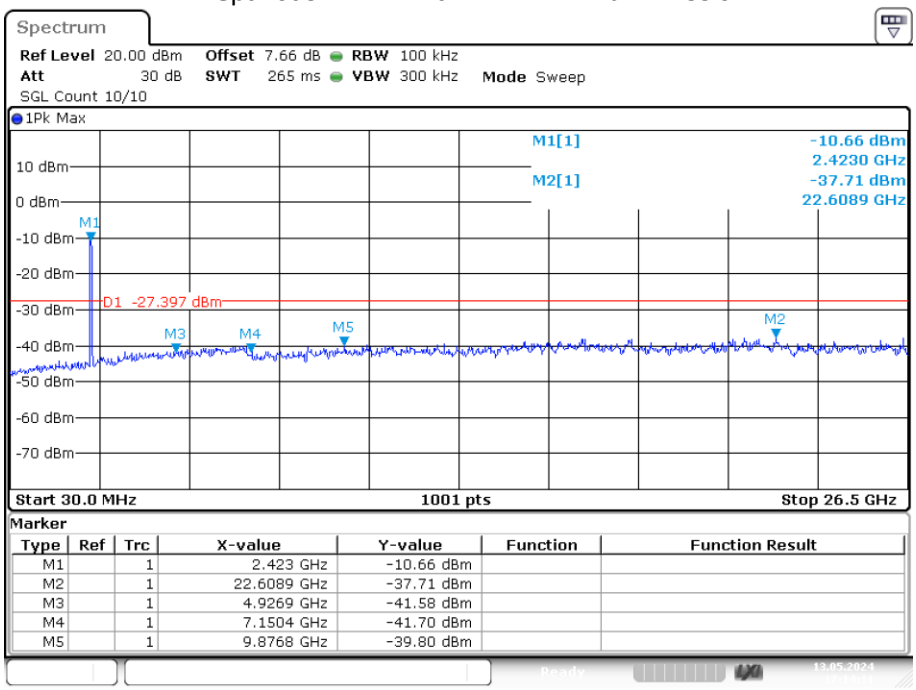
Date: 13.MAY.2024 17:10:30

Tx. Spurious NVNT n40 2422MHz Ant1 Ref




Date: 13.MAY.2024 17:13:53

Tx. Spurious NVNT n40 2422MHz Ant1 Emission

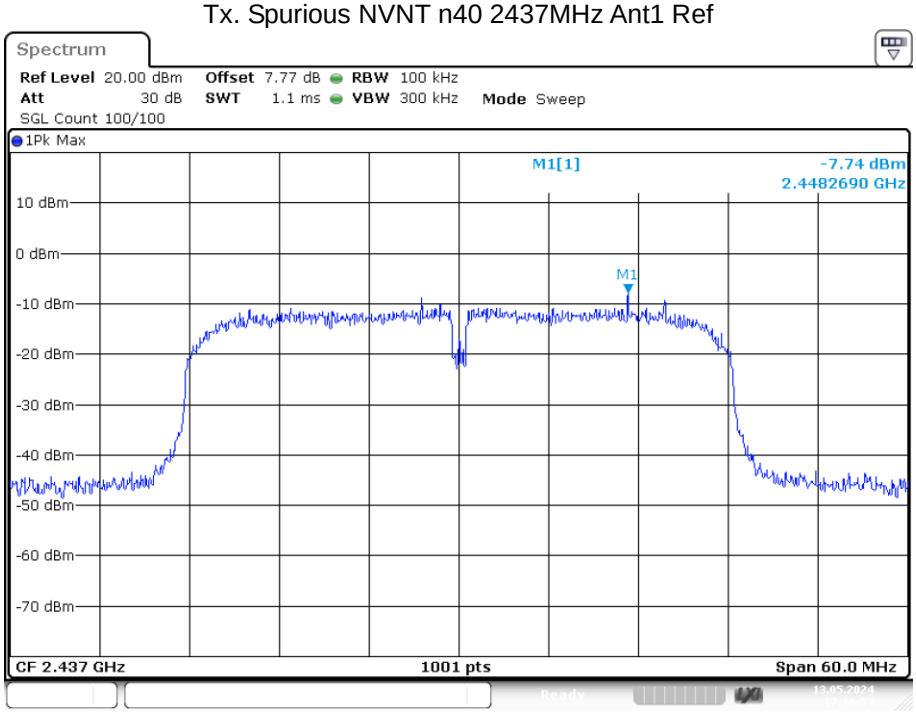



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.423 GHz | -10.66 dBm | | |
| M2 | | 1 | 22.6089 GHz | -37.71 dBm | | |
| M3 | | 1 | 4.9269 GHz | -41.58 dBm | | |
| M4 | | 1 | 7.1504 GHz | -41.70 dBm | | |
| M5 | | 1 | 9.8768 GHz | -39.80 dBm | | |

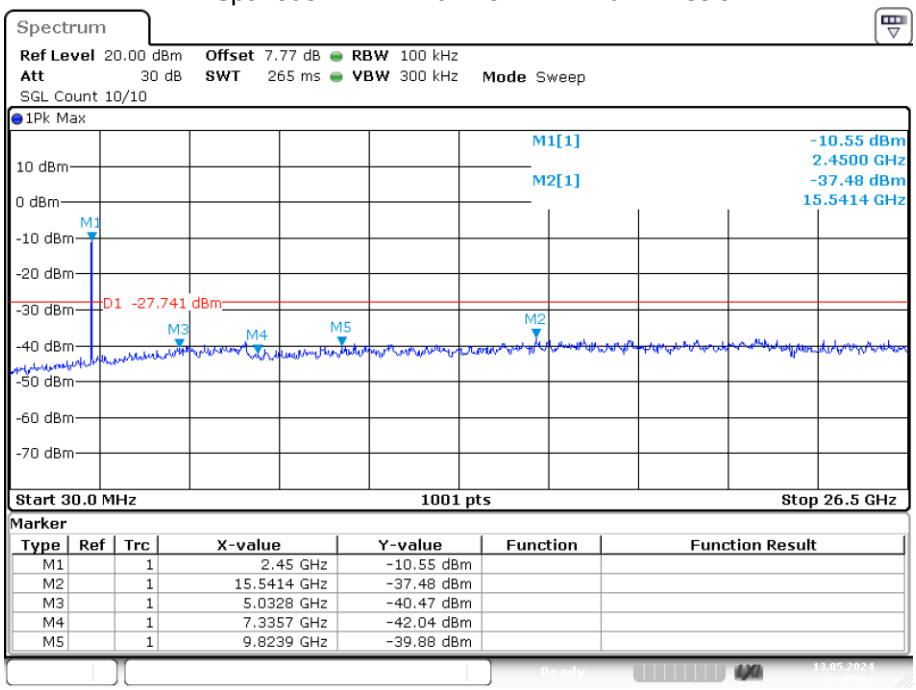
Date: 13.MAY.2024 17:14:10

Tx. Spurious NVNT n40 2437MHz Ant1 Ref




Date: 13.MAY.2024 17:16:52

Tx. Spurious NVNT n40 2437MHz Ant1 Emission

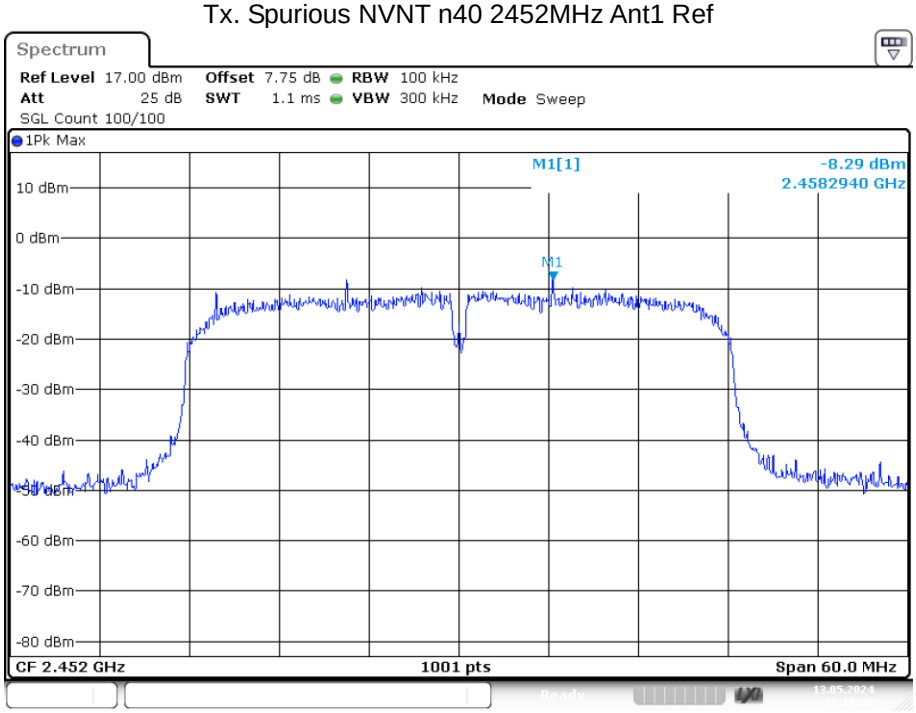



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -10.55 dBm | | |
| M2 | | 1 | 15.5414 GHz | -37.48 dBm | | |
| M3 | | 1 | 5.0328 GHz | -40.47 dBm | | |
| M4 | | 1 | 7.3357 GHz | -42.04 dBm | | |
| M5 | | 1 | 9.8239 GHz | -39.88 dBm | | |

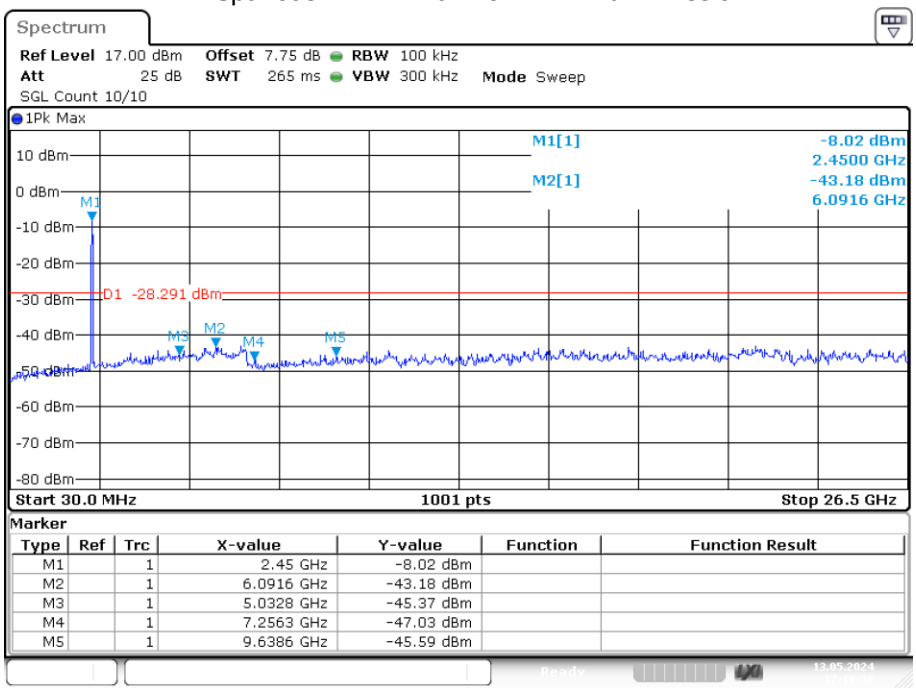
Date: 13.MAY.2024 17:17:10

Tx. Spurious NVNT n40 2452MHz Ant1 Ref




Date: 13.MAY.2024 17:19:20

Tx. Spurious NVNT n40 2452MHz Ant1 Emission




Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.45 GHz | -8.02 dBm | | |
| M2 | | 1 | 6.0916 GHz | -43.18 dBm | | |
| M3 | | 1 | 5.0328 GHz | -45.37 dBm | | |
| M4 | | 1 | 7.2563 GHz | -47.03 dBm | | |
| M5 | | 1 | 9.6386 GHz | -45.59 dBm | | |

Date: 13.MAY.2024 17:19:38

# 4. POWER LINE CONDUCTED EMISSION

## 4.1. Test Limits

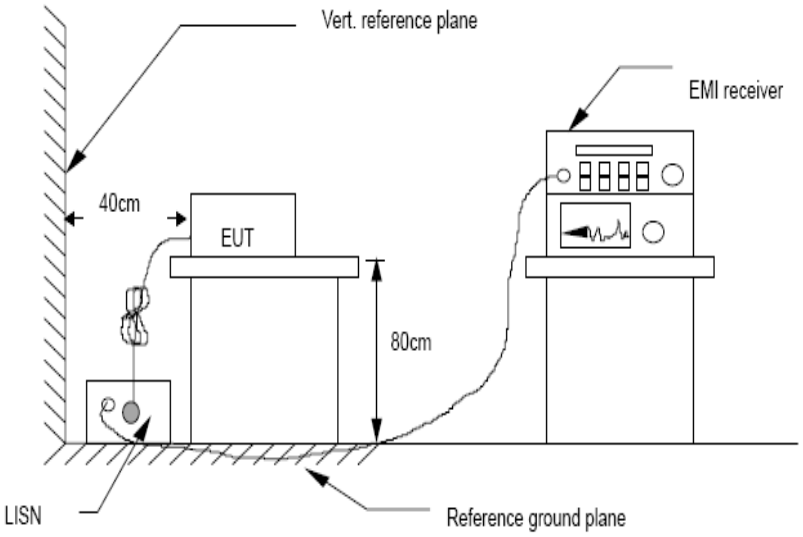
| Frequency | Limits dB(μV) | |
|---|---|---|
| MHz | Quasi-peak Level | Average Level |
| 0.15 -0.50 | 66 -56* | 56 - 46* |
| 0.50 -5.00 | 56 | 46 |
| 5.00 -30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.
3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

## 4.2. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.
The bandwidth of test receiver is set at 9 kHz.

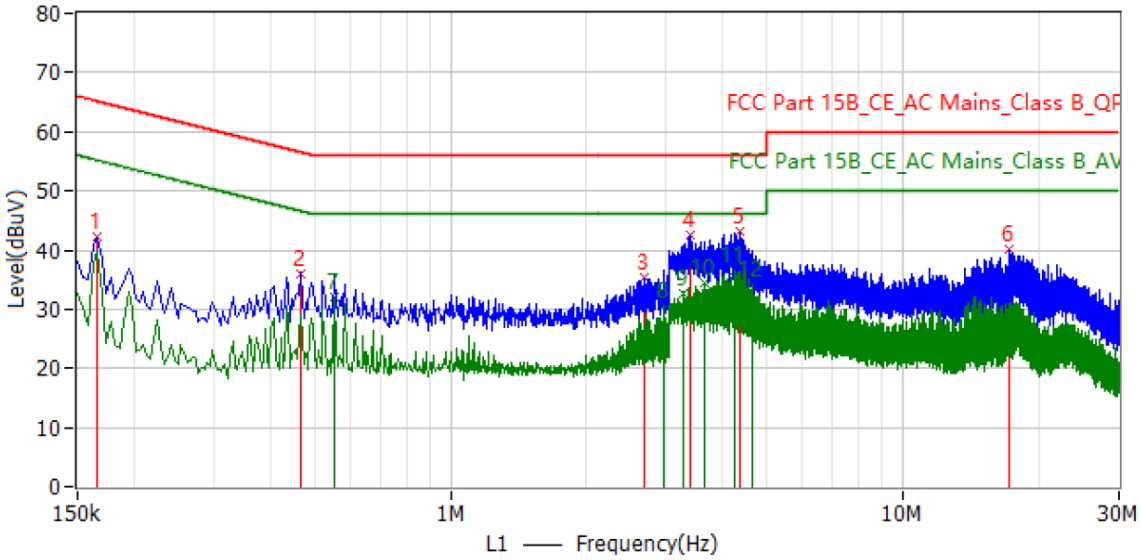
## 4.3. Test Setup



## 4.4. Test Results

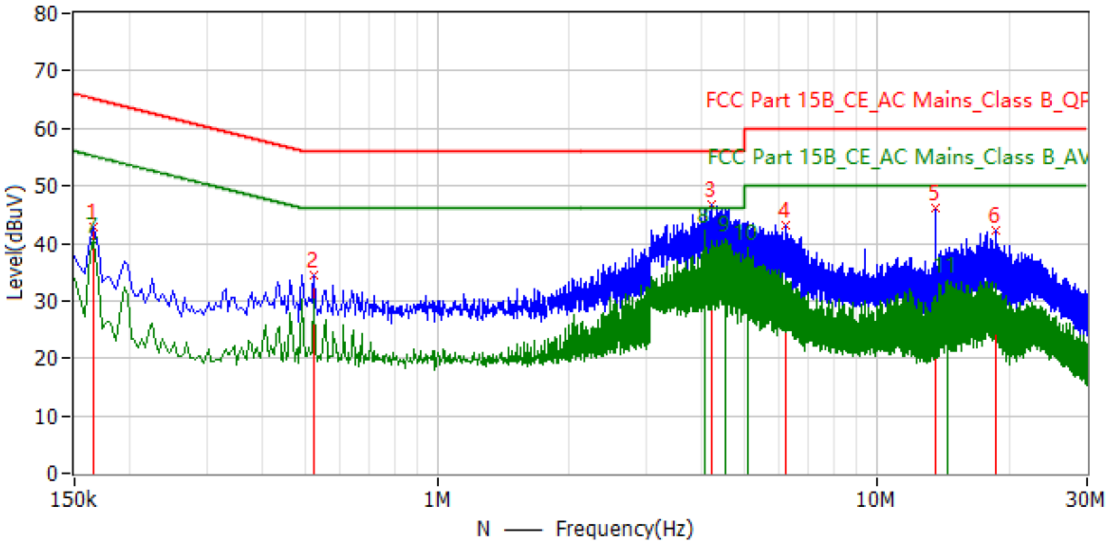
Test result for 802.11b (2412MHz), AC 120V/ 60Hz

Line:




| No. | Frequency | Limit dBuV | Level dBuV | Delta dB | Factor dB | Detector | Polar |
|---|---|---|---|---|---|---|---|
| 1* | 166.000 kHz | 65.2 | 42.1 | -23.0 | 15.5 | PK | L1 |
| 2* | 466.000 kHz | 56.6 | 36.1 | -20.5 | 13.8 | PK | L1 |
| 3* | 2.670 MHz | 56.0 | 35.4 | -20.6 | 13.9 | PK | L1 |
| 4* | 3.374 MHz | 56.0 | 42.6 | -13.4 | 13.9 | PK | L1 |
| 5* | 4.350 MHz | 56.0 | 43.1 | -12.9 | 13.9 | PK | L1 |
| 6* | 17.206 MHz | 60.0 | 40.1 | -19.9 | 14.1 | PK | L1 |
| 7* | 554.000 kHz | 46.0 | 32.0 | -14.0 | 13.8 | AV | L1 |
| 8* | 2.954 MHz | 46.0 | 30.7 | -15.3 | 13.9 | AV | L1 |
| 9* | 3.270 MHz | 46.0 | 32.8 | -13.2 | 13.9 | AV | L1 |
| 10* | 3.630 MHz | 46.0 | 34.5 | -11.5 | 13.9 | AV | L1 |
| 11* | 4.230 MHz | 46.0 | 36.5 | -9.5 | 13.9 | AV | L1 |
| 12* | 4.634 MHz | 46.0 | 34.1 | -11.9 | 13.9 | AV | L1 |

Neutral:




| No. | Frequency | Limit dBuV | Level dBuV | Delta dB | Factor dB | Detector | Polar |
|---|---|---|---|---|---|---|---|
| 1* | 166.000 kHz | 65.2 | 42.8 | -22.4 | 15.5 | PK | N |
| 2* | 526.000 kHz | 56.0 | 34.5 | -21.5 | 13.7 | PK | N |
| 3* | 4.214 MHz | 56.0 | 46.6 | -9.4 | 13.9 | PK | N |
| 4* | 6.194 MHz | 60.0 | 43.2 | -16.8 | 13.9 | PK | N |
| 5* | 13.554 MHz | 60.0 | 46.0 | -14.0 | 14.0 | PK | N |
| 6* | 18.630 MHz | 60.0 | 42.2 | -17.8 | 14.0 | PK | N |
| 7* | 166.000 kHz | 55.2 | 40.5 | -14.6 | 15.5 | AV | N |
| 8* | 4.050 MHz | 46.0 | 42.1 | -3.9 | 13.9 | AV | N |
| 9* | 4.530 MHz | 46.0 | 40.7 | -5.3 | 13.9 | AV | N |
| 10* | 5.070 MHz | 50.0 | 39.2 | -10.8 | 13.9 | AV | N |
| 11* | 14.506 MHz | 50.0 | 33.6 | -16.4 | 14.0 | AV | N |

Notes: This report only shall the worst case mode for b 2412MHz.

# 5. CONDUCTED MAXIMUM OUTPUT POWER

## 5.1. Test limits

Please refer FCC PART 15: 15.247.

Regulation 15.247(b) The limit of Maximum Peak Output Power Measurement is 1W(30dBm).

## 5.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02

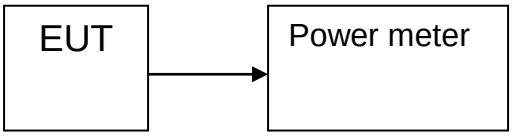
5.2.1 Place the EUT on the table and set it in transmitting mode.

5.2.2 Connected the EUT's antenna port to peak power meter by 20dB attenuator.

5.2.3 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

## 5.3. Test Setup



## 5.4. Test Results

| Condition | Mode | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | b | 2412 | Ant1 | 14.912 | 30 | Pass |
| NVNT | b | 2437 | Ant1 | 14.372 | 30 | Pass |
| NVNT | b | 2462 | Ant1 | 14.427 | 30 | Pass |
| NVNT | g | 2412 | Ant1 | 14.608 | 30 | Pass |
| NVNT | g | 2437 | Ant1 | 13.986 | 30 | Pass |
| NVNT | g | 2462 | Ant1 | 14.318 | 30 | Pass |
| NVNT | n20 | 2412 | Ant1 | 14.15 | 30 | Pass |
| NVNT | n20 | 2437 | Ant1 | 14.666 | 30 | Pass |
| NVNT | n20 | 2462 | Ant1 | 14.961 | 30 | Pass |
| NVNT | n40 | 2422 | Ant1 | 15.005 | 30 | Pass |
| NVNT | n40 | 2437 | Ant1 | 14.731 | 30 | Pass |
| NVNT | n40 | 2452 | Ant1 | 15 | 30 | Pass |

**Duty Cycle**

| Condition | Mode | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) |
|---|---|---|---|---|---|
| NVNT | b | 2412 | Ant1 | 99.97 | 0 |
| NVNT | b | 2437 | Ant1 | 99.97 | 0 |
| NVNT | b | 2462 | Ant1 | 99.98 | 0 |
| NVNT | g | 2412 | Ant1 | 99.46 | 0.02 |
| NVNT | g | 2437 | Ant1 | 99.64 | 0.02 |
| NVNT | g | 2462 | Ant1 | 99.46 | 0.02 |
| NVNT | n20 | 2412 | Ant1 | 99.54 | 0.02 |
| NVNT | n20 | 2437 | Ant1 | 99.52 | 0.02 |
| NVNT | n20 | 2462 | Ant1 | 99.64 | 0.02 |
| NVNT | n40 | 2422 | Ant1 | 97.89 | 0.09 |
| NVNT | n40 | 2437 | Ant1 | 97.54 | 0.11 |
| NVNT | n40 | 2452 | Ant1 | 98 | 0.09 |

# 6. PEAK POWER SPECTRAL DENSITY

## 6.1. Test limits

6.1.1 Please refer FCC PART 15: 15.247.

6.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

6.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

## 6.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02

6.2.1 Place the EUT on the table and set it in transmitting mode.

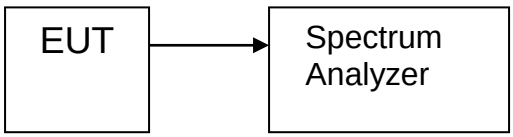
6.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.2.3 Set the spectrum analyzer as RBW = 3kHz(Set the RBW to: 3 kHz≤RBW≤100 kHz.), VBW = 10kHz(Set the VBW≥3×RBW), span≥1.5×DTS bandwidth., detail see the test plot.

6.2.4 Record the max reading.

6.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

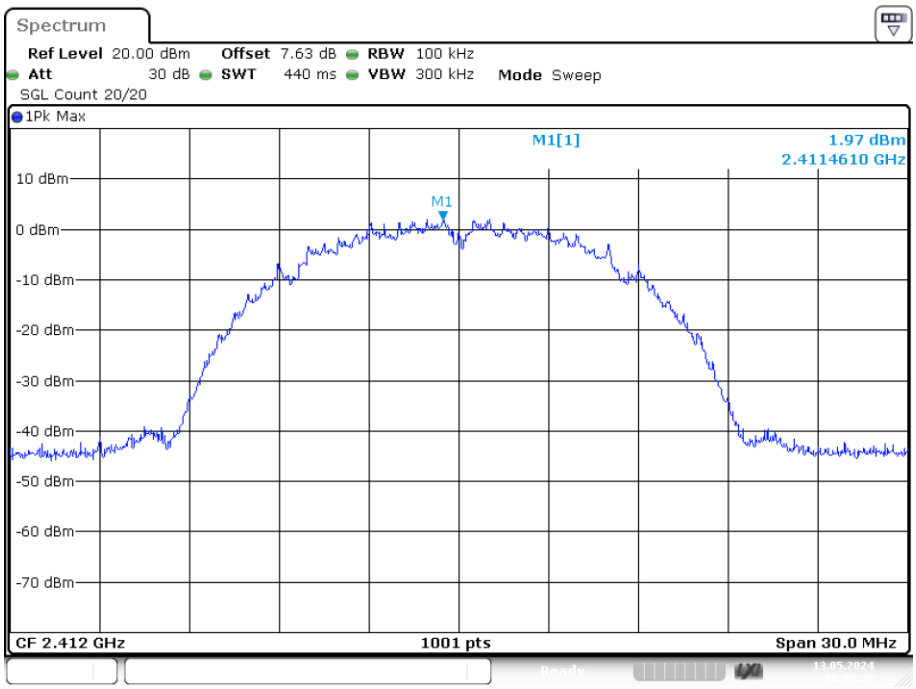
## 6.3. Test Setup




## 6.4. Test Results

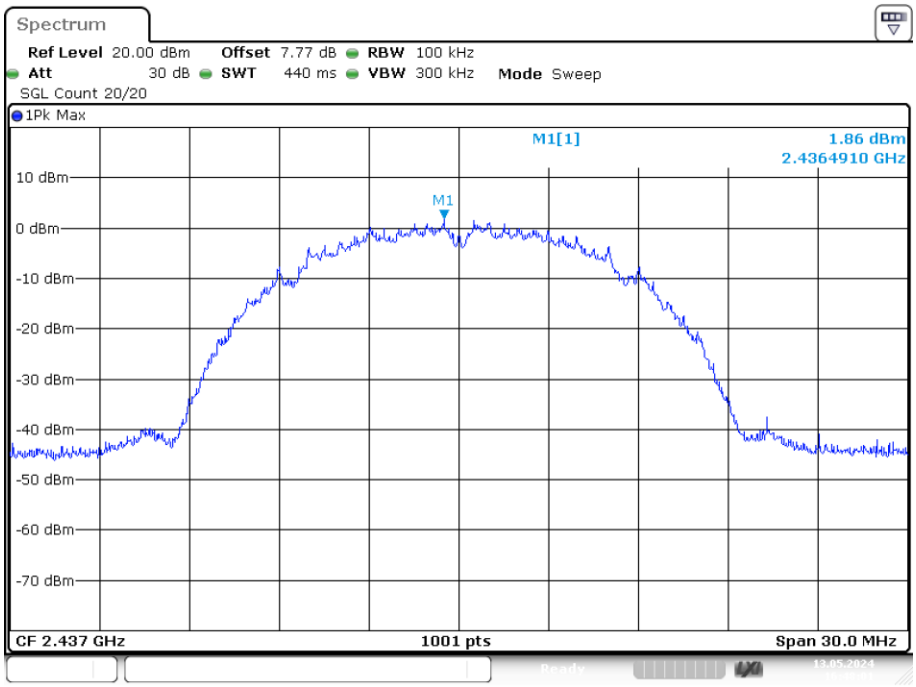
| Condition | Mode | Frequency (MHz) | Antenna | Max PSD (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | b | 2412 | Ant1 | 1.972 | 8 | Pass |
| NVNT | b | 2437 | Ant1 | 1.86 | 8 | Pass |
| NVNT | b | 2462 | Ant1 | 2.294 | 8 | Pass |
| NVNT | g | 2412 | Ant1 | -5.629 | 8 | Pass |
| NVNT | g | 2437 | Ant1 | -3.181 | 8 | Pass |
| NVNT | g | 2462 | Ant1 | -2.752 | 8 | Pass |
| NVNT | n20 | 2412 | Ant1 | -2.917 | 8 | Pass |
| NVNT | n20 | 2437 | Ant1 | -2.635 | 8 | Pass |
| NVNT | n20 | 2462 | Ant1 | -2.082 | 8 | Pass |
| NVNT | n40 | 2422 | Ant1 | -7.309 | 8 | Pass |
| NVNT | n40 | 2437 | Ant1 | -7.531 | 8 | Pass |
| NVNT | n40 | 2452 | Ant1 | -6.965 | 8 | Pass |

PSD NVNT b 2412MHz Ant1



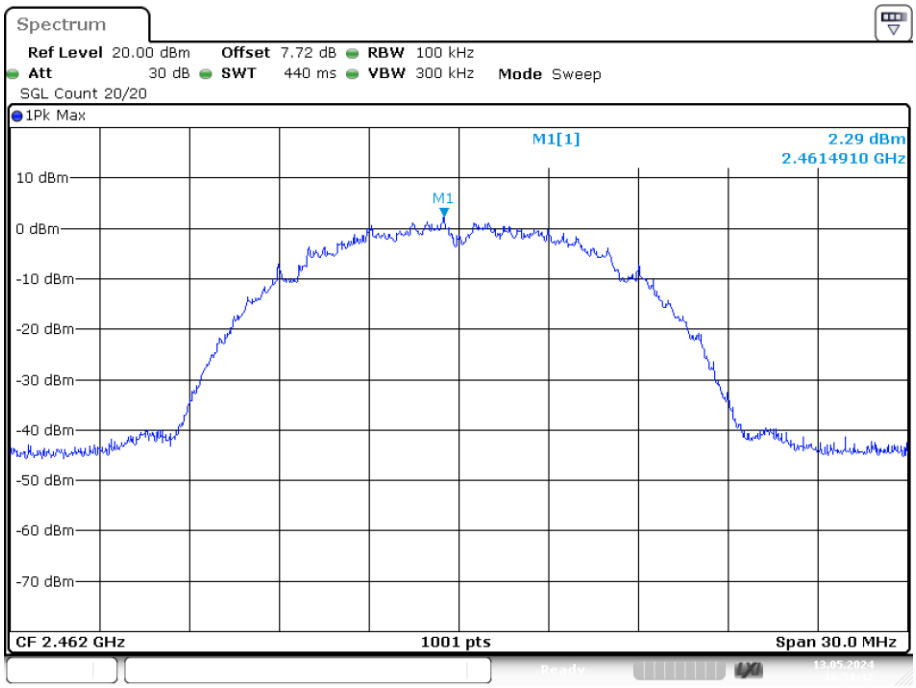

Date: 13.MAY.2024 16:44:29

PSD NVNT b 2437MHz Ant1



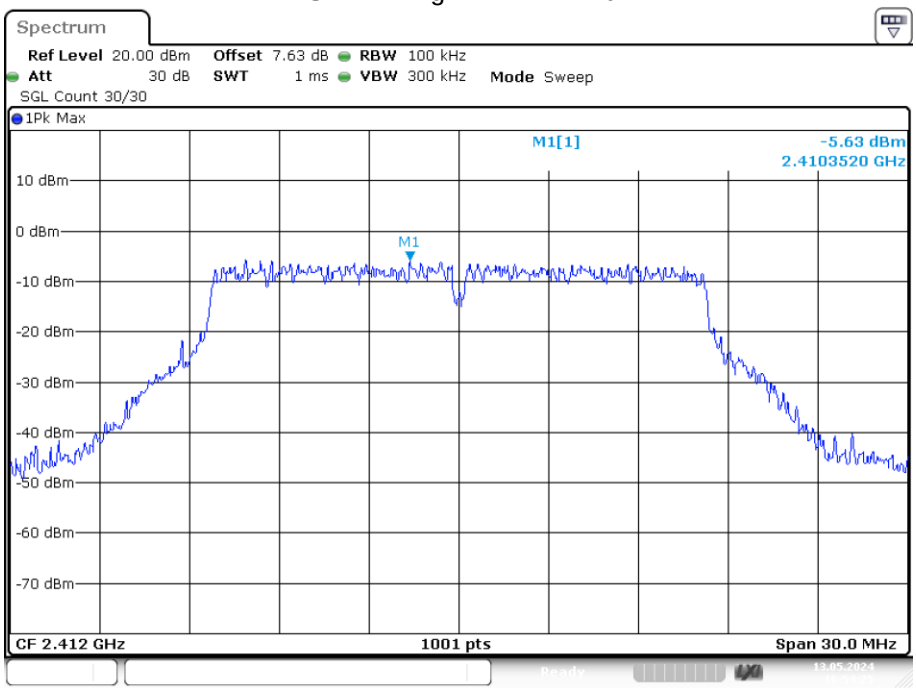

Date: 13.MAY.2024 16:48:01

PSD NVNT b 2462MHz Ant1



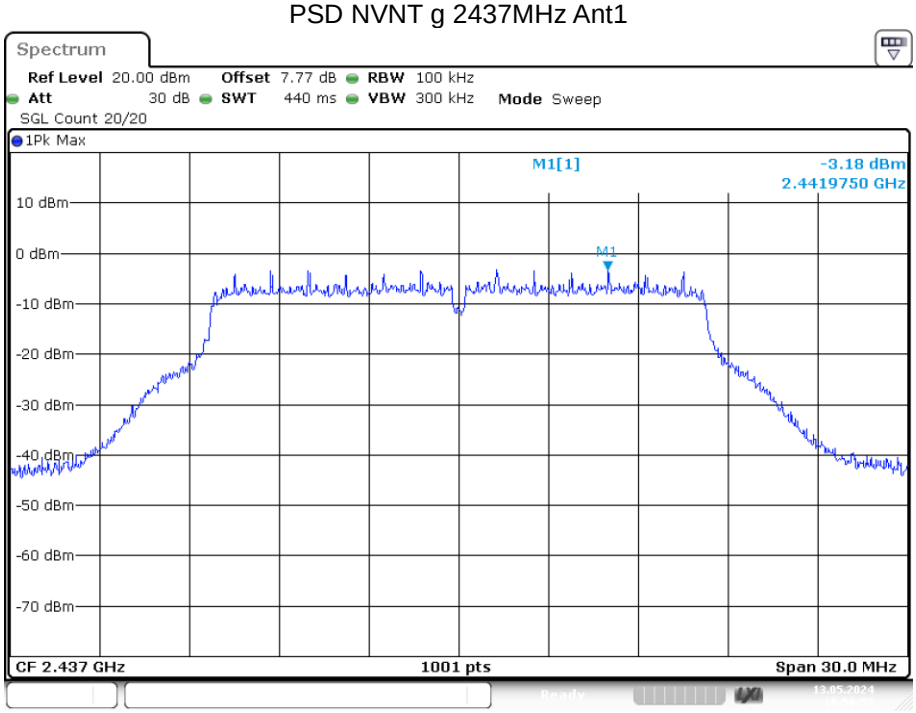

Date: 13.MAY.2024 16:51:32

PSD NVNT g 2412MHz Ant1



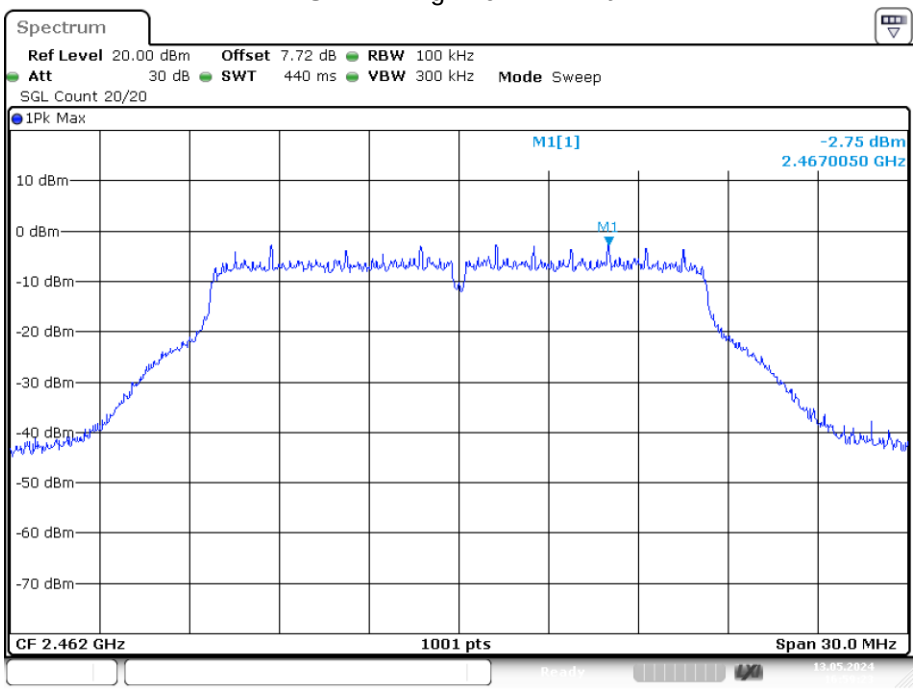

Date: 13.MAY.2024 16:54:25

PSD NVNT g 2437MHz Ant1



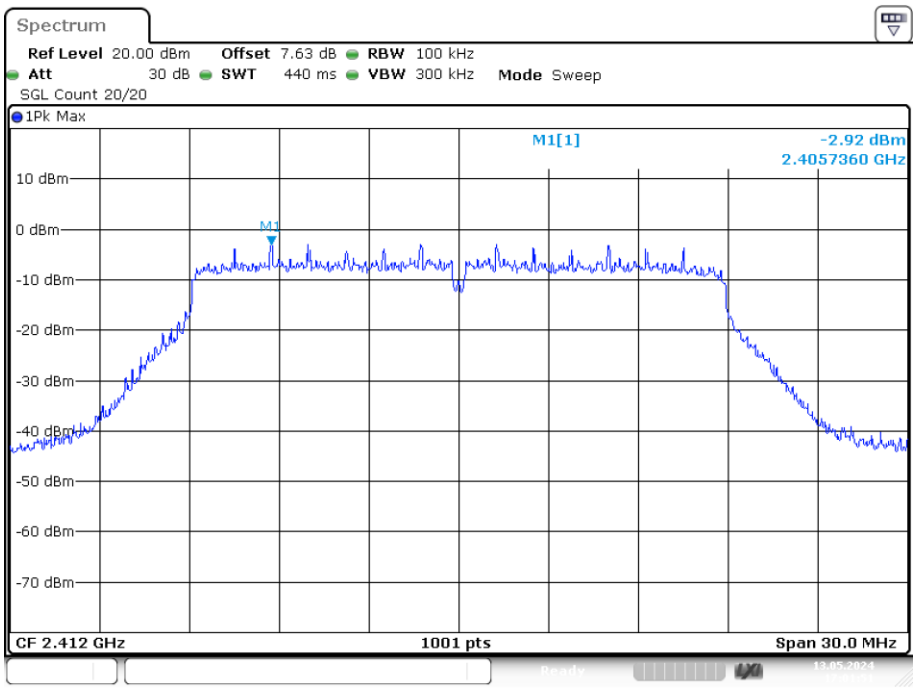

Date: 13.MAY.2024 16:56:55

PSD NVNT g 2462MHz Ant1



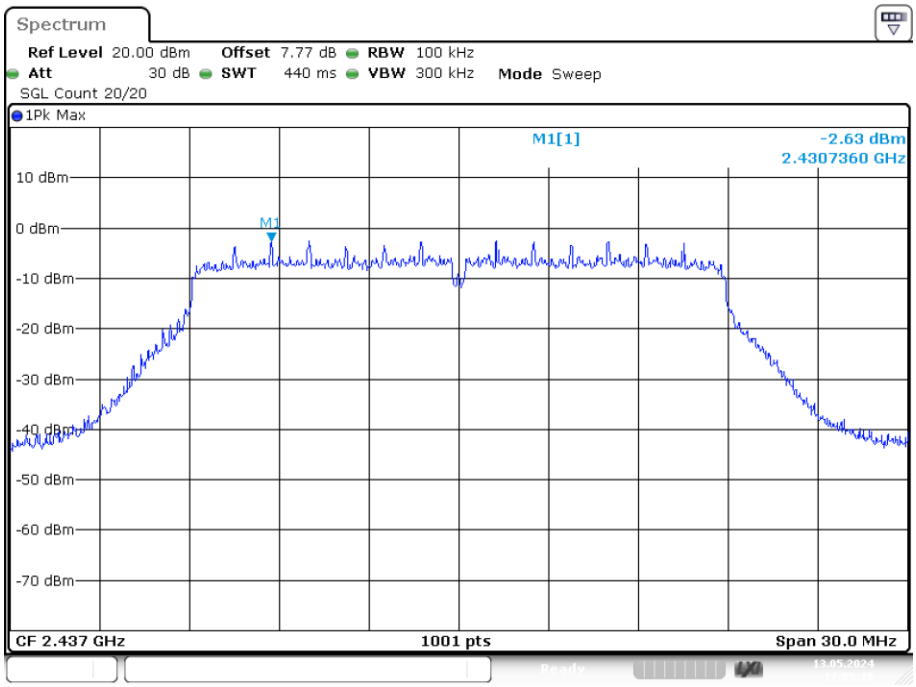

Date: 13.MAY.2024 16:59:23

PSD NVNT n20 2412MHz Ant1



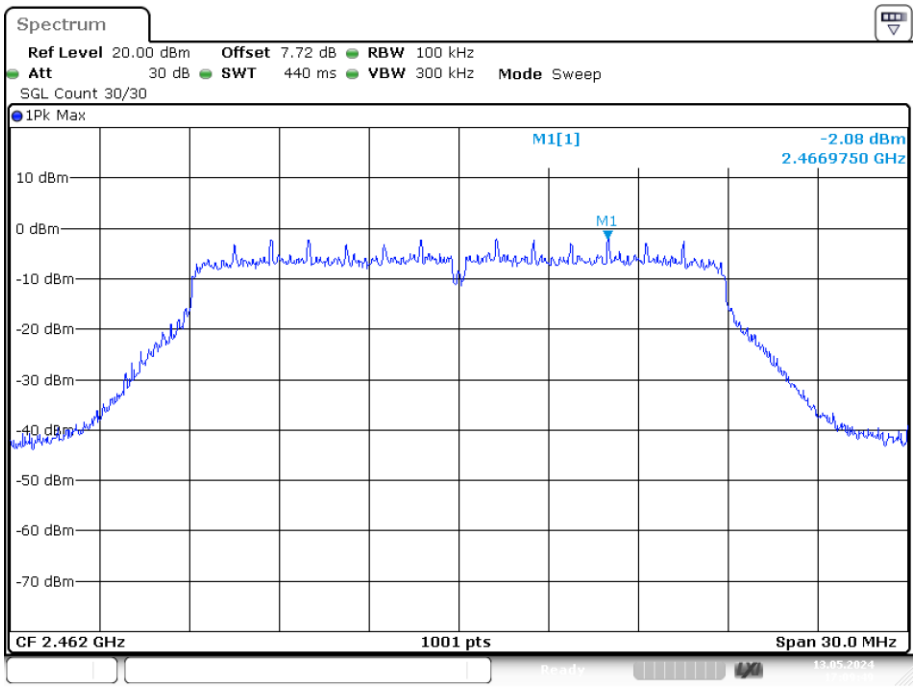

Date: 13.MAY.2024 17:01:51

PSD NVNT n20 2437MHz Ant1



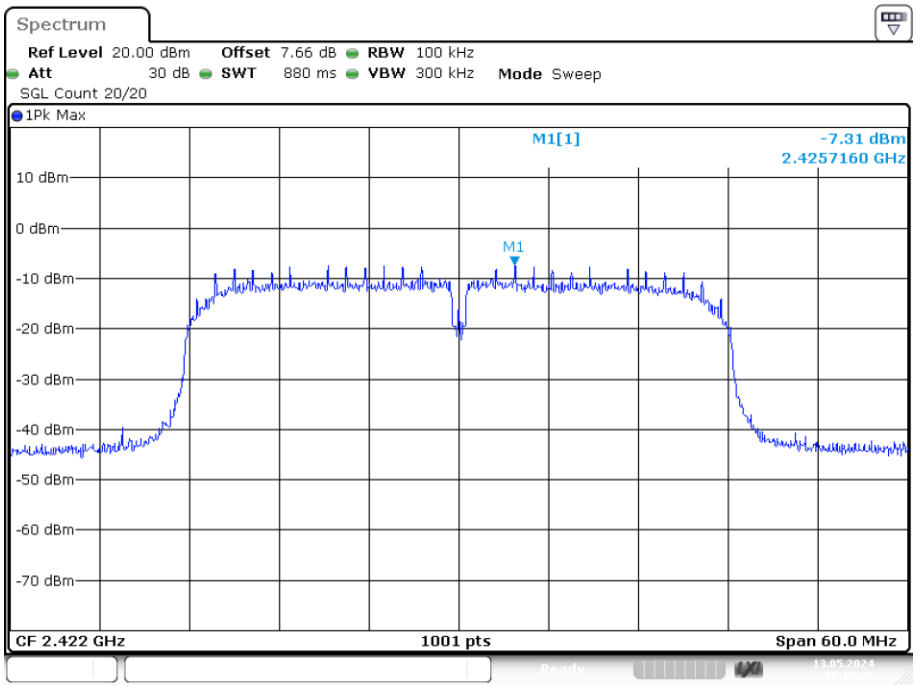

Date: 13.MAY.2024 17:05:18

PSD NVNT n20 2462MHz Ant1



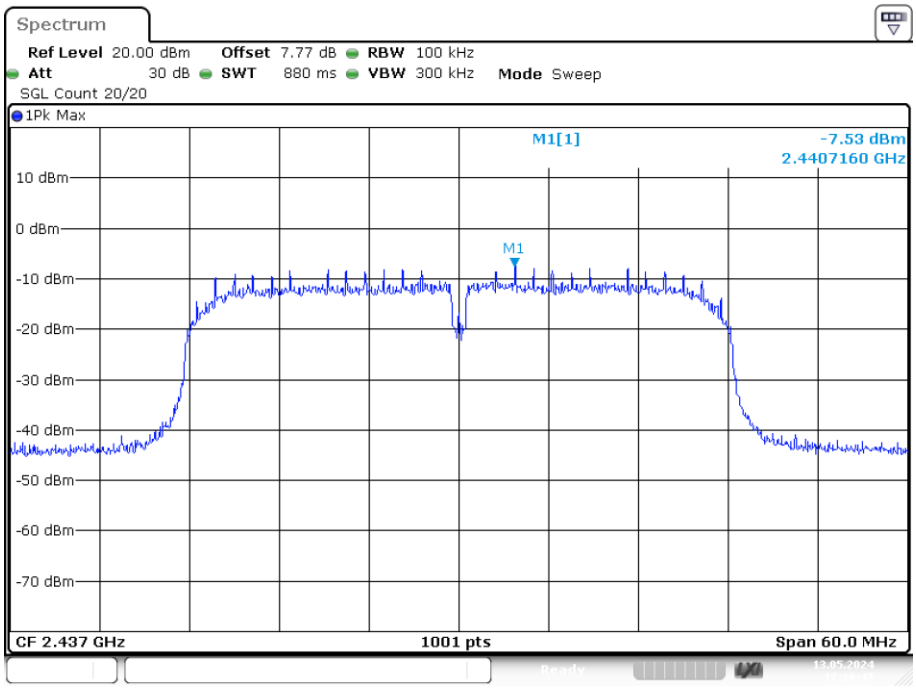

Date: 13.MAY.2024 17:09:49

PSD NVNT n40 2422MHz Ant1



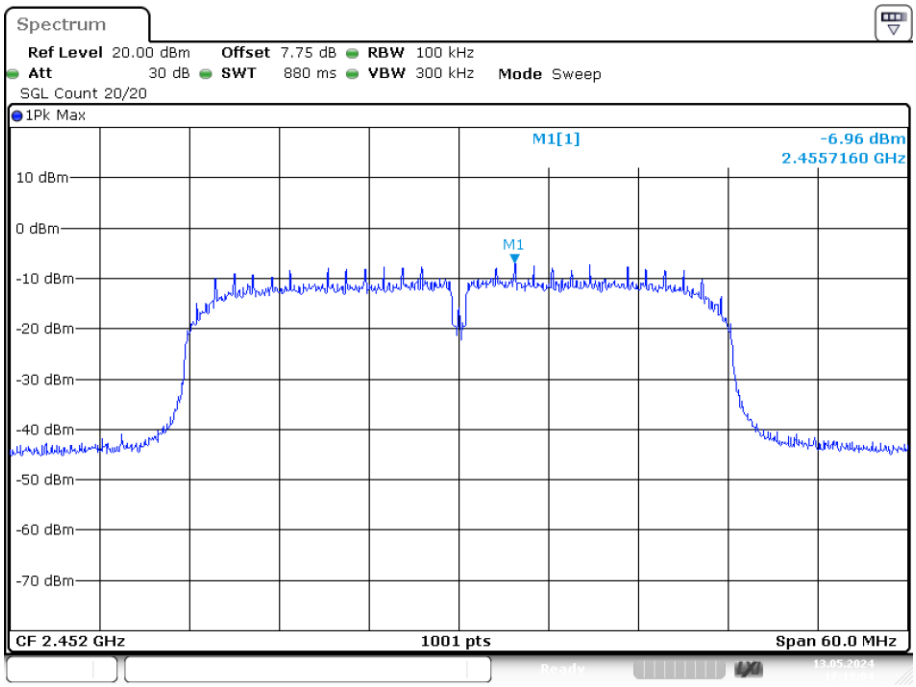

Date: 13.MAY.2024 17:13:35

PSD NVNT n40 2437MHz Ant1




Date: 13.MAY.2024 17:16:46

PSD NVNT n40 2452MHz Ant1




Date: 13.MAY.2024 17:19:03

# 7. BANDWIDTH

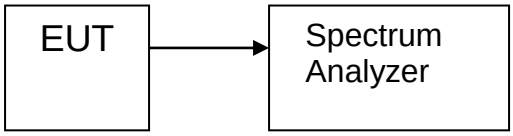
## 7.1. Test limits

Please refer FCC PART 15: 15.247
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

## 7.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02
a) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
b) The test receiver set RBW =1-5%BW, VBW≥3*RBW, Sweep time set auto, detail see the test plot for 99% Bandwidth.
c) The test receiver set RBW = 100kHz, VBW≥3*RBW =300kHz, Sweep time set auto, detail see the test plot for 6dB Bandwidth.

## 7.3. Test Setup

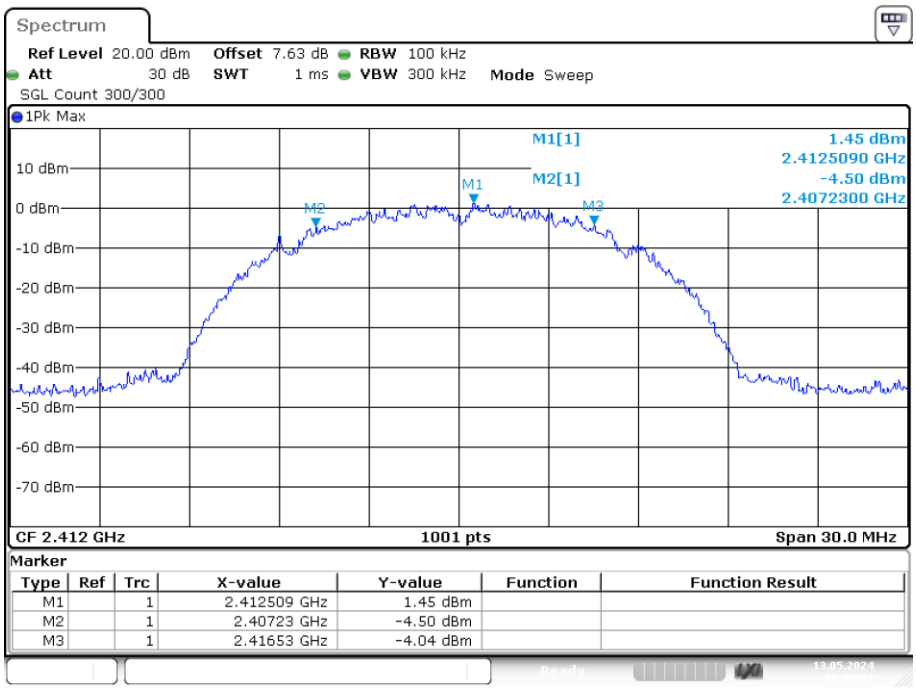



## 7.4. Test Results

**-6dB Bandwidth**

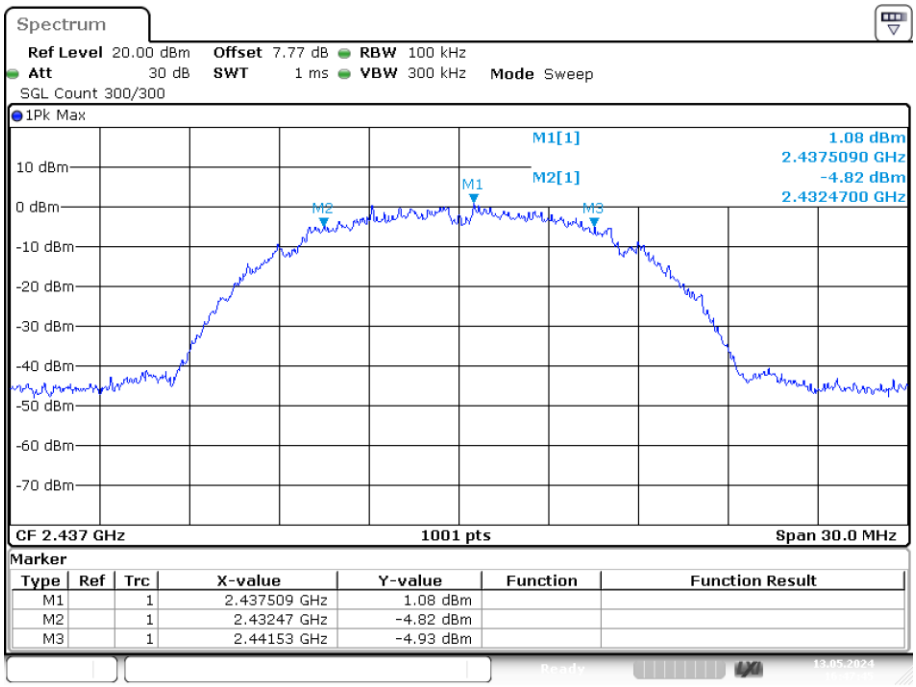
| Condition | Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | b | 2412 | Ant1 | 9.3 | 0.5 | Pass |
| NVNT | b | 2437 | Ant1 | 9.06 | 0.5 | Pass |
| NVNT | b | 2462 | Ant1 | 8.91 | 0.5 | Pass |
| NVNT | g | 2412 | Ant1 | 16.32 | 0.5 | Pass |
| NVNT | g | 2437 | Ant1 | 16.56 | 0.5 | Pass |
| NVNT | g | 2462 | Ant1 | 16.35 | 0.5 | Pass |
| NVNT | n20 | 2412 | Ant1 | 17.73 | 0.5 | Pass |
| NVNT | n20 | 2437 | Ant1 | 17.58 | 0.5 | Pass |
| NVNT | n20 | 2462 | Ant1 | 17.79 | 0.5 | Pass |
| NVNT | n40 | 2422 | Ant1 | 32.28 | 0.5 | Pass |
| NVNT | n40 | 2437 | Ant1 | 32.34 | 0.5 | Pass |
| NVNT | n40 | 2452 | Ant1 | 32.4 | 0.5 | Pass |

-6dB Bandwidth NVNT b 2412MHz Ant1



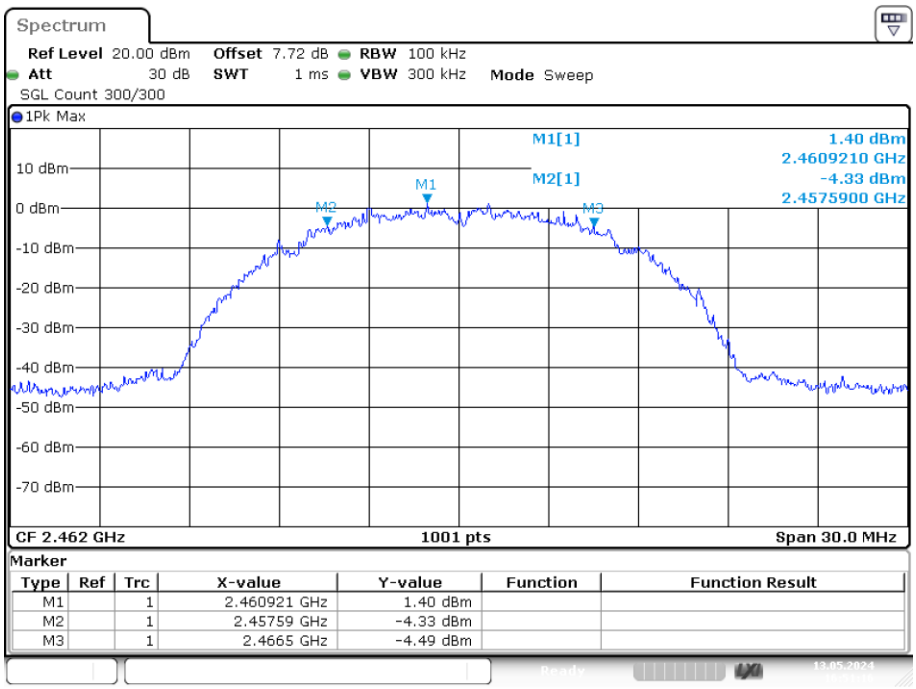

Date: 13.MAY.2024 16:44:12

-6dB Bandwidth NVNT b 2437MHz Ant1



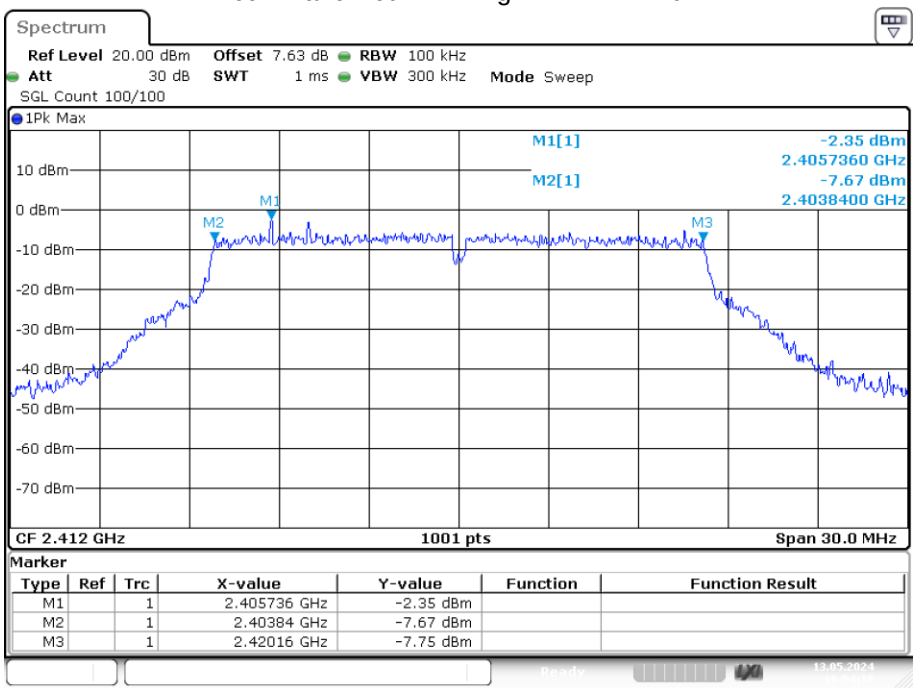

Date: 13.MAY.2024 16:47:45

-6dB Bandwidth NVNT b 2462MHz Ant1



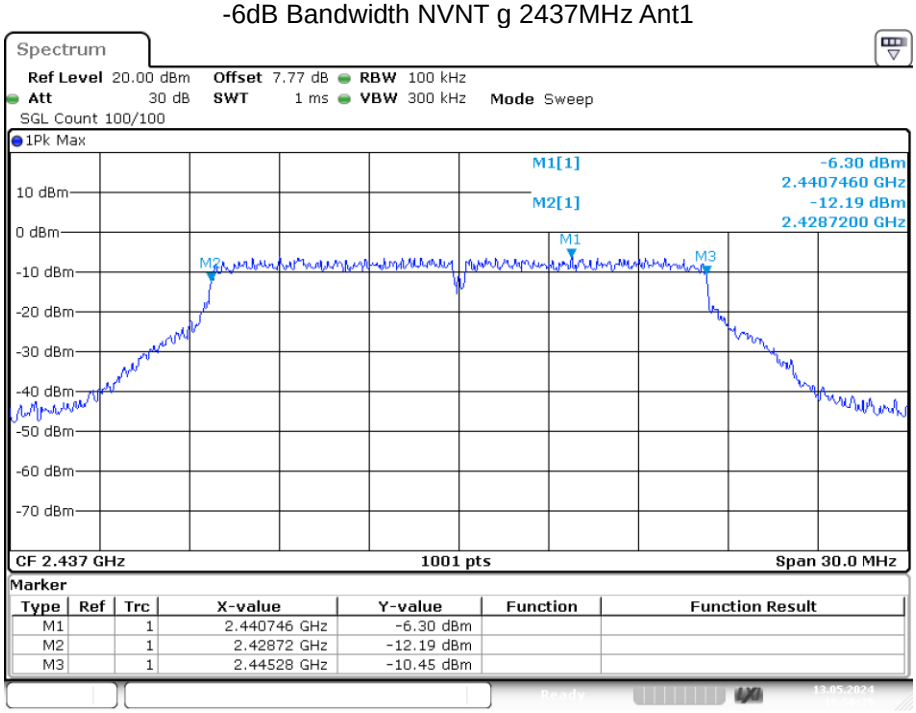

Date: 13.MAY.2024 16:51:16

-6dB Bandwidth NVNT g 2412MHz Ant1



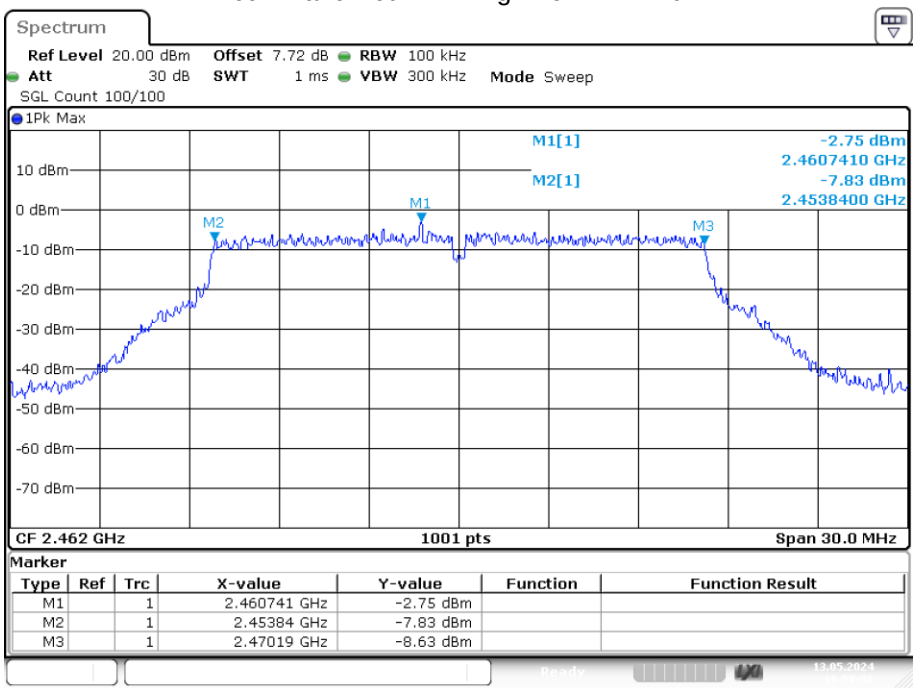

Date: 13.MAY.2024 16:54:18

-6dB Bandwidth NVNT g 2437MHz Ant1



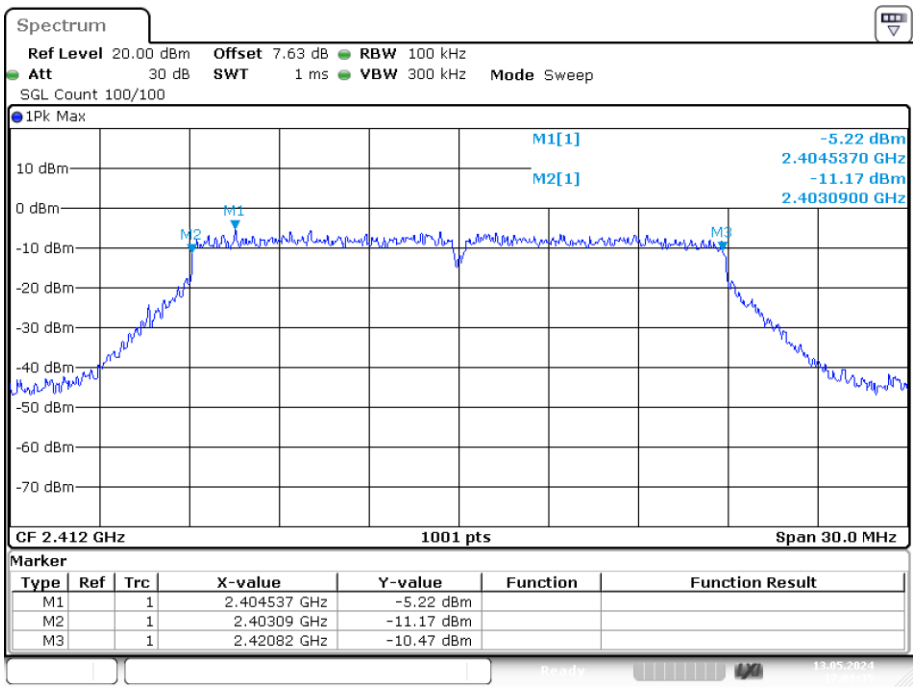

Date: 13.MAY.2024 16:56:38

-6dB Bandwidth NVNT g 2462MHz Ant1



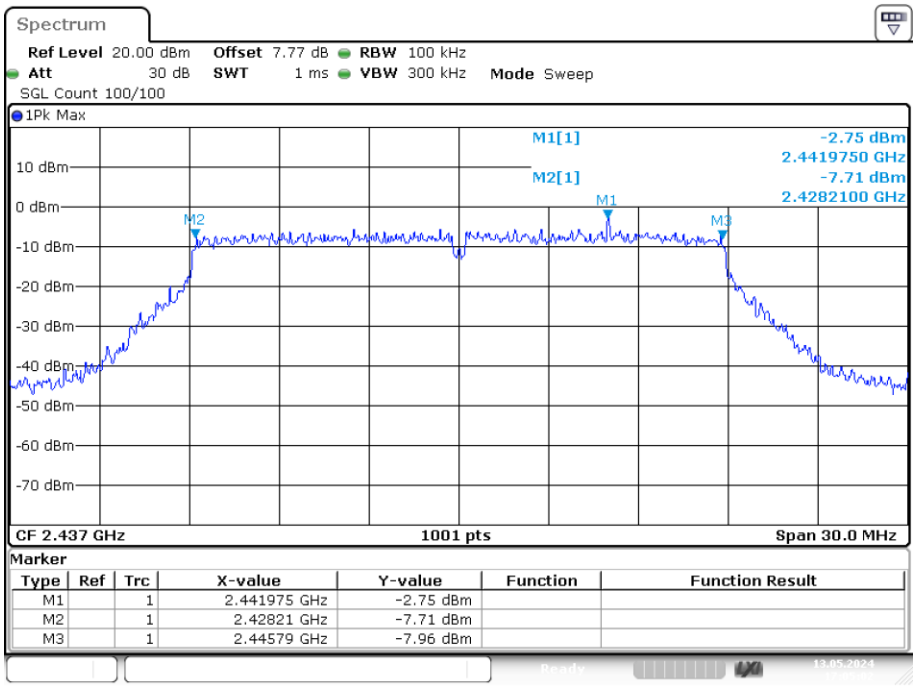

Date: 13.MAY.2024 16:59:06

-6dB Bandwidth NVNT n20 2412MHz Ant1



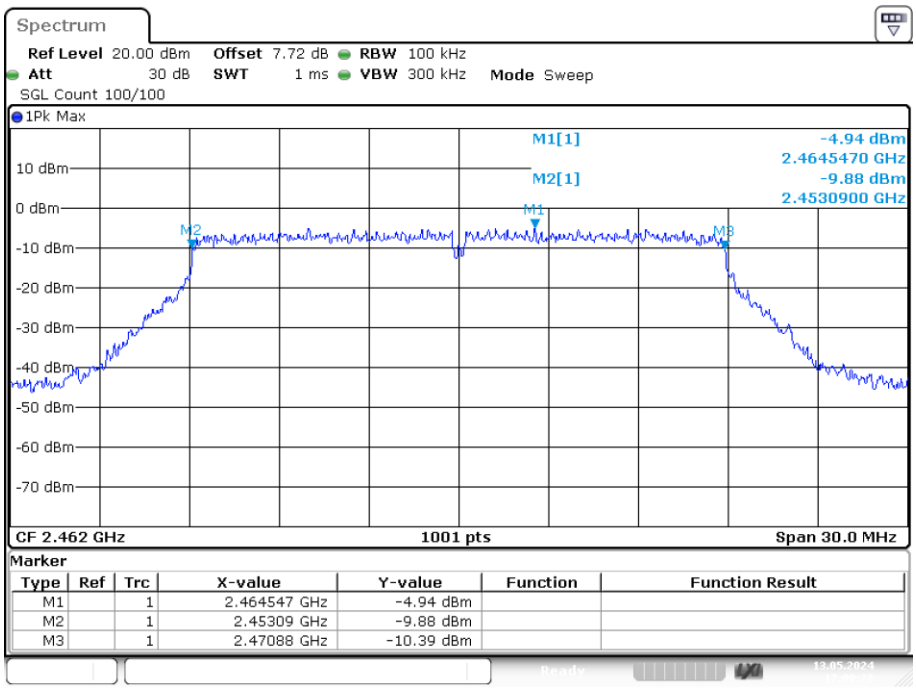

Date: 13.MAY.2024 17:01:35

-6dB Bandwidth NVNT n20 2437MHz Ant1



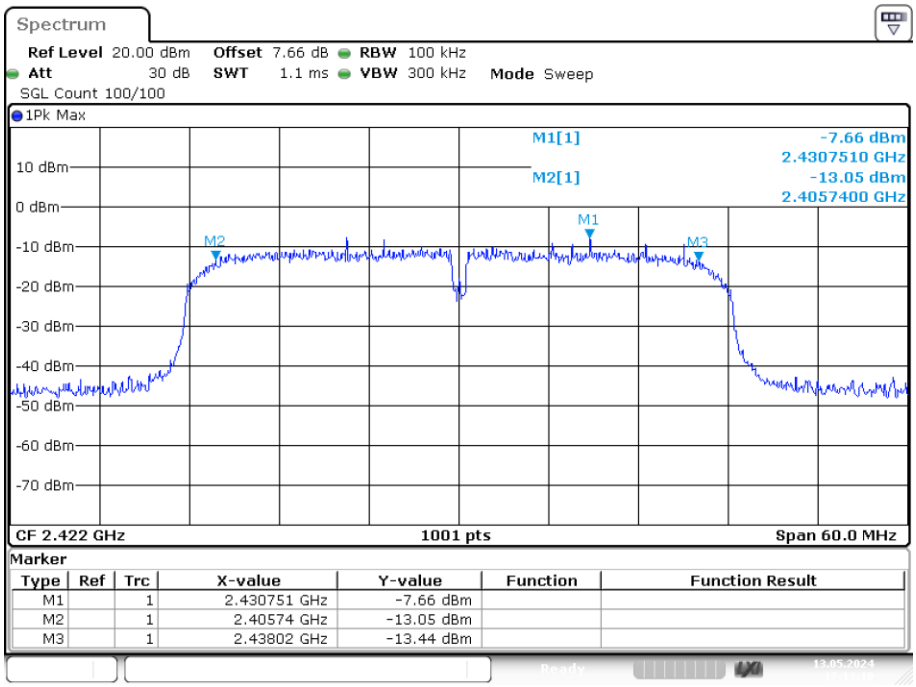

Date: 13.MAY.2024 17:05:02

-6dB Bandwidth NVNT n20 2462MHz Ant1



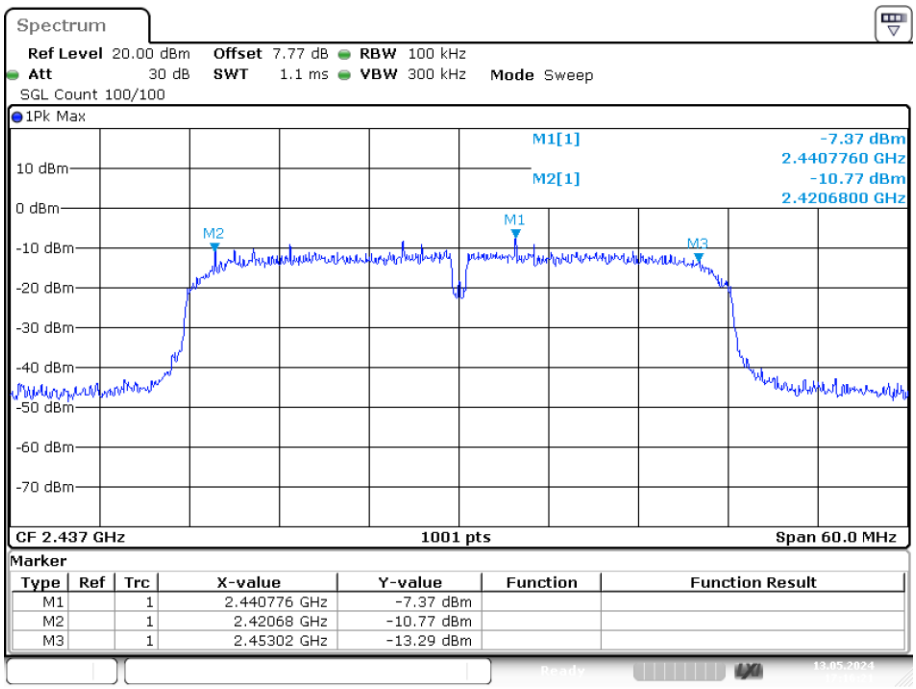

Date: 13.MAY.2024 17:09:27

-6dB Bandwidth NVNT n40 2422MHz Ant1



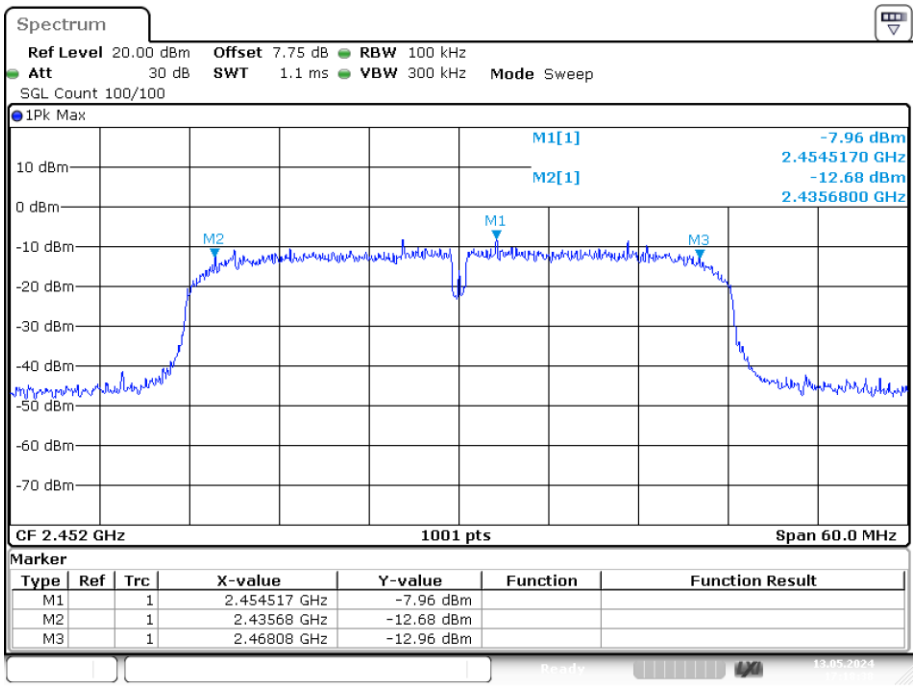

Date: 13.MAY.2024 17:13:10

-6dB Bandwidth NVNT n40 2437MHz Ant1




Date: 13.MAY.2024 17:16:21

-6dB Bandwidth NVNT n40 2452MHz Ant1

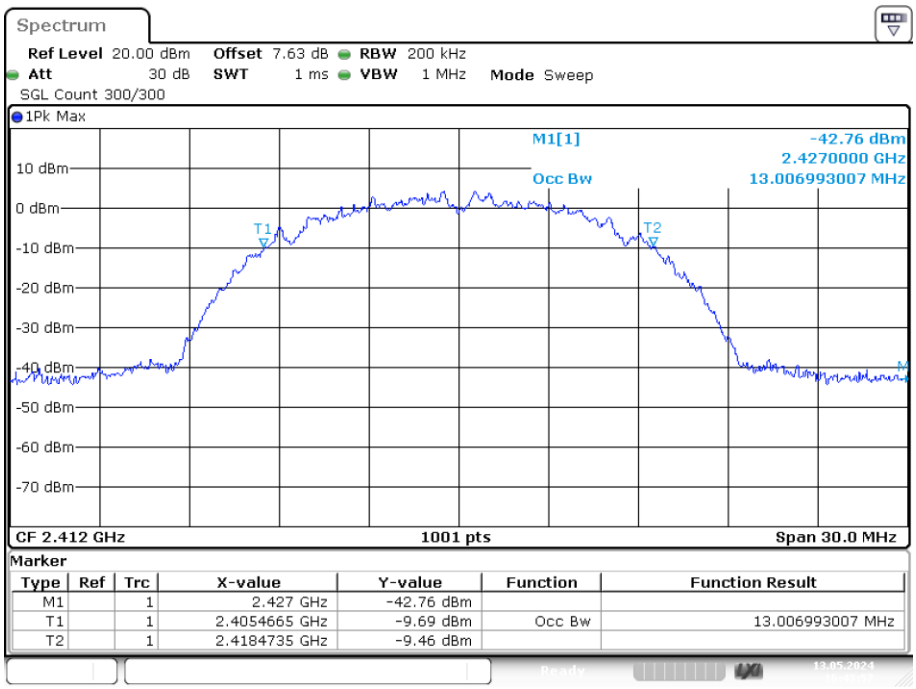



Date: 13.MAY.2024 17:18:38

**Occupied Channel Bandwidth**

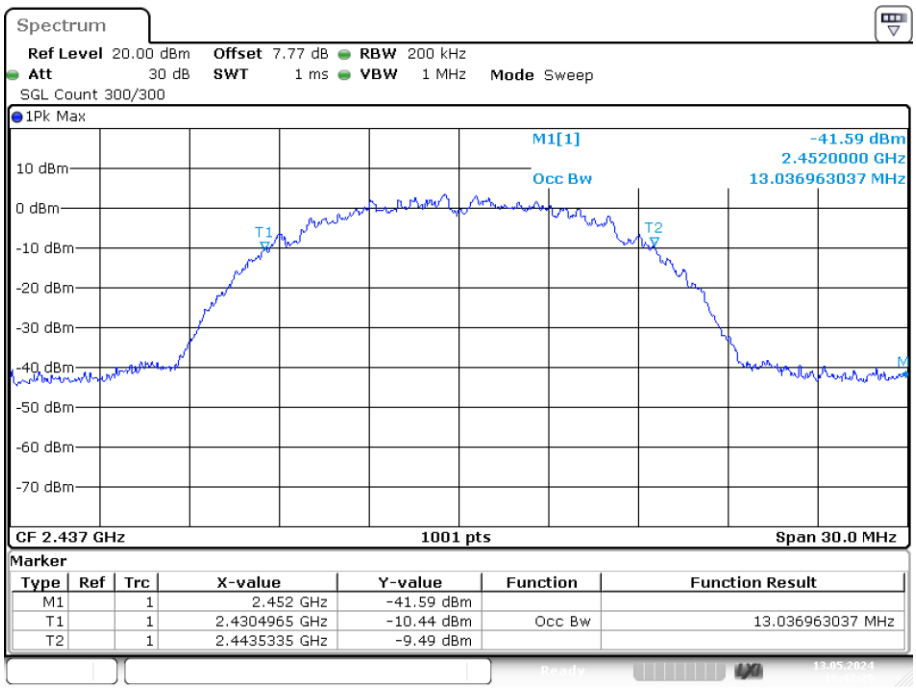
| Condition | Mode | Frequency (MHz) | Antenna | 99% OBW (MHz) |
|---|---|---|---|---|
| NVNT | b | 2412 | Ant1 | 13.007 |
| NVNT | b | 2437 | Ant1 | 13.037 |
| NVNT | b | 2462 | Ant1 | 13.037 |
| NVNT | g | 2412 | Ant1 | 16.753 |
| NVNT | g | 2437 | Ant1 | 16.843 |
| NVNT | g | 2462 | Ant1 | 16.813 |
| NVNT | n20 | 2412 | Ant1 | 17.862 |
| NVNT | n20 | 2437 | Ant1 | 17.922 |
| NVNT | n20 | 2462 | Ant1 | 17.892 |
| NVNT | n40 | 2422 | Ant1 | 35.065 |
| NVNT | n40 | 2437 | Ant1 | 35.005 |
| NVNT | n40 | 2452 | Ant1 | 34.885 |

OBW NVNT b 2412MHz Ant1



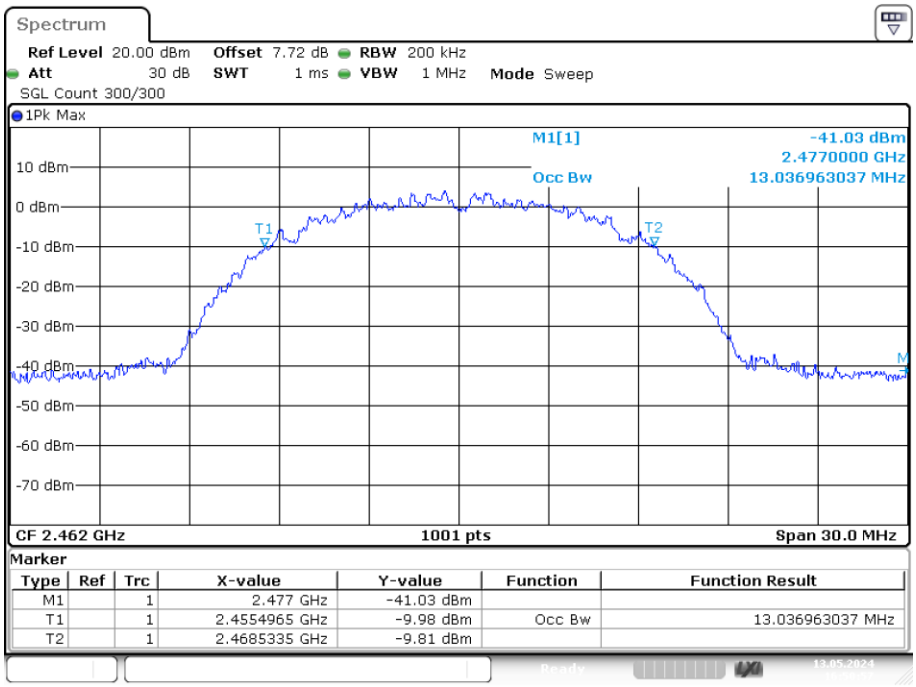

Date: 13.MAY.2024 16:43:57

OBW NVNT b 2437MHz Ant1



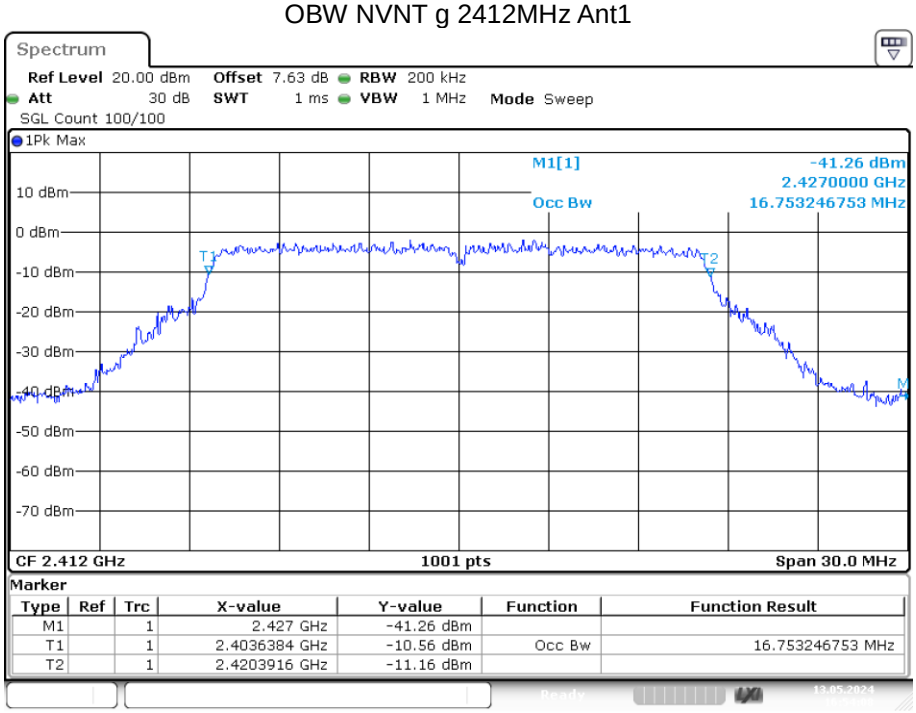

Date: 13.MAY.2024 16:47:29

OBW NVNT b 2462MHz Ant1




Date: 13.MAY.2024 16:50:57

OBW NVNT g 2412MHz Ant1

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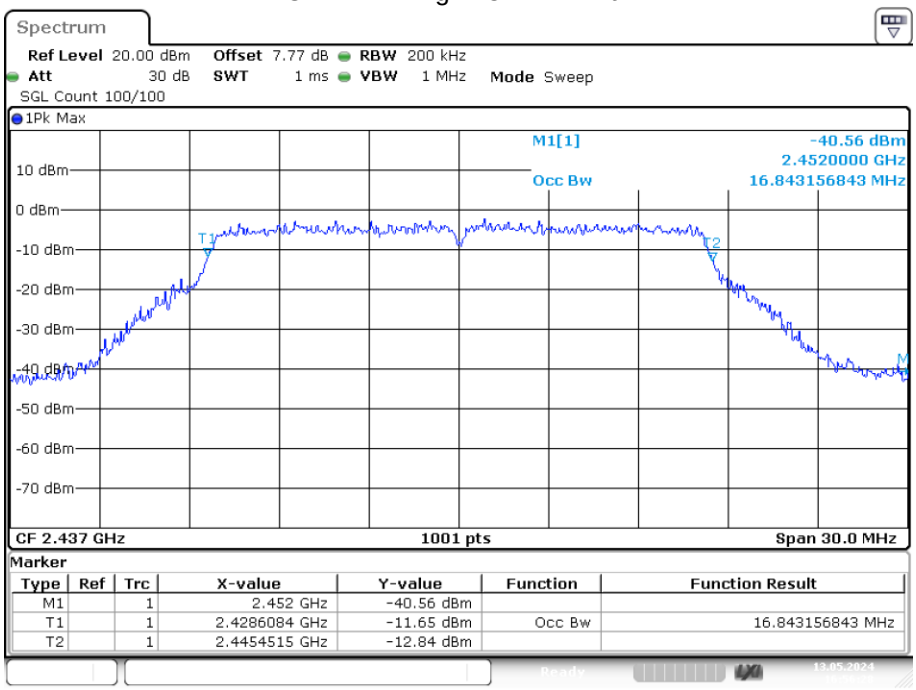
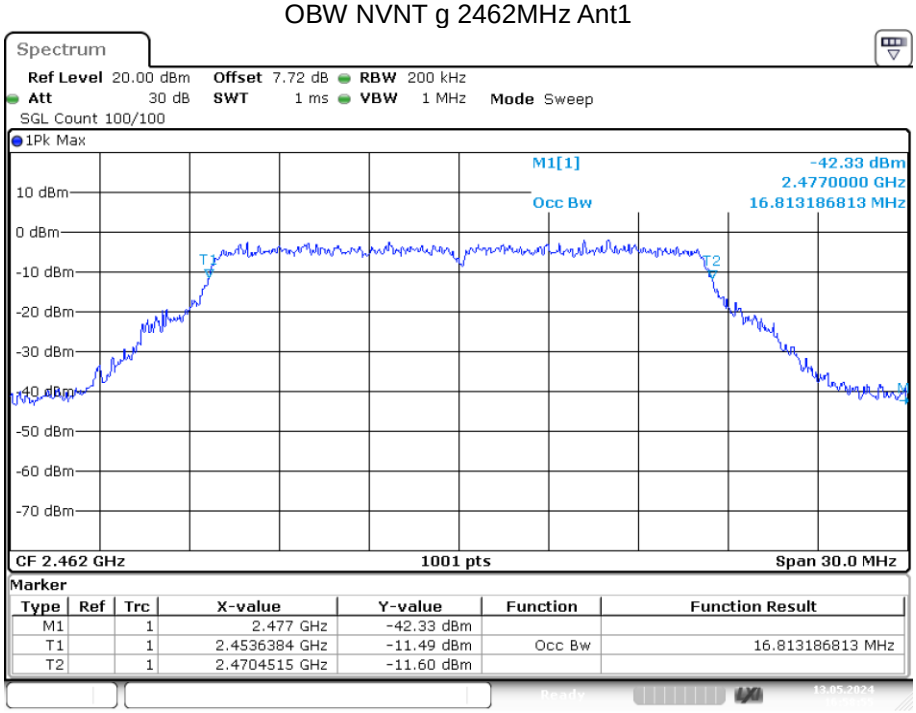
OBW NVNT g 2437MHz Ant1



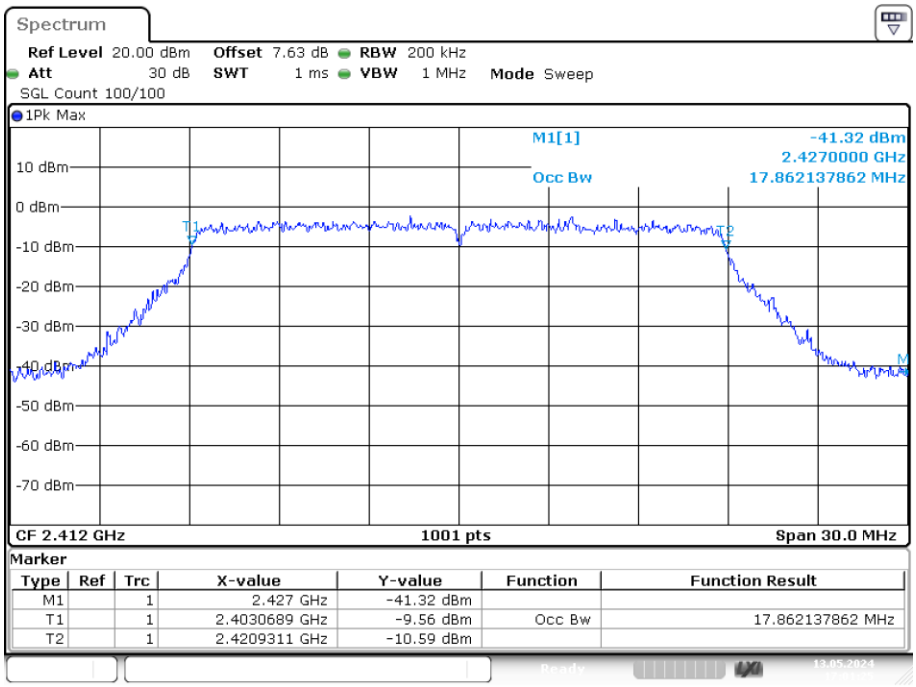

Date: 13.MAY.2024 16:56:28

OBW NVNT g 2462MHz Ant1



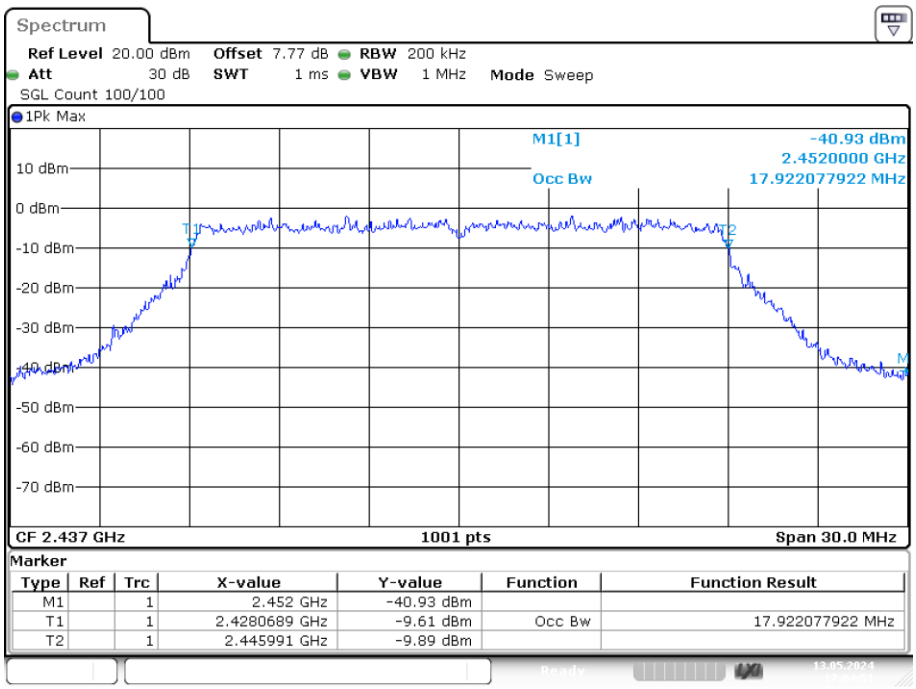

Date: 13.MAY.2024 16:58:55

OBW NVNT n20 2412MHz Ant1




Date: 13.MAY.2024 17:01:24

OBW NVNT n20 2437MHz Ant1

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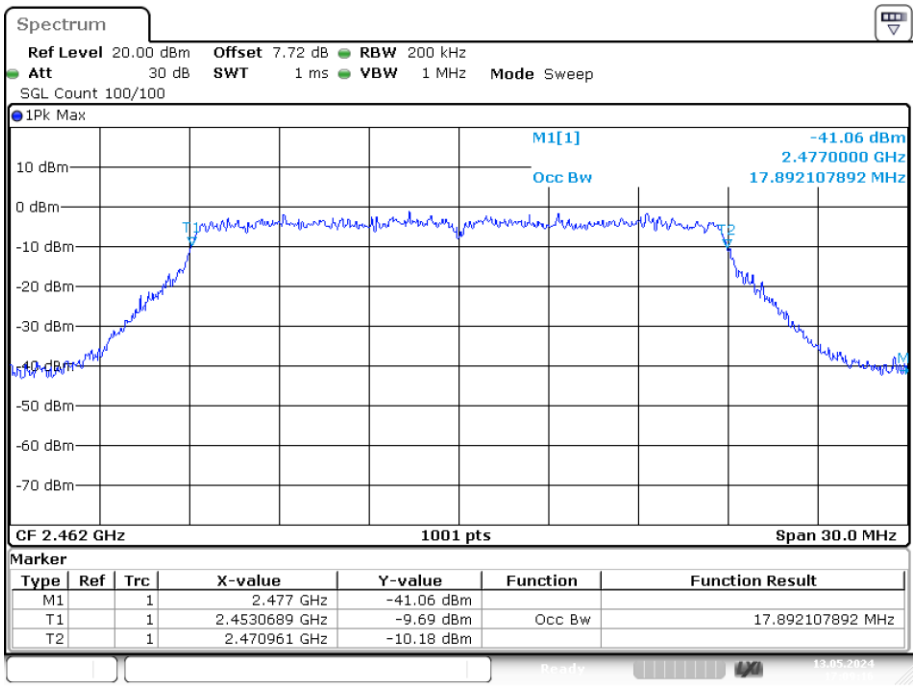
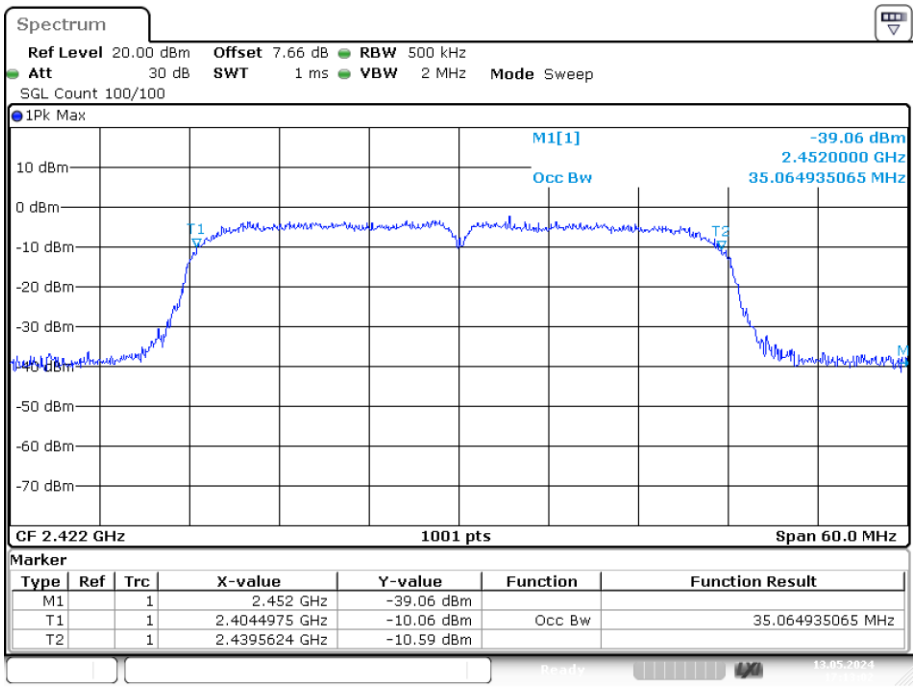
OBW NVNT n20 2462MHz Ant1



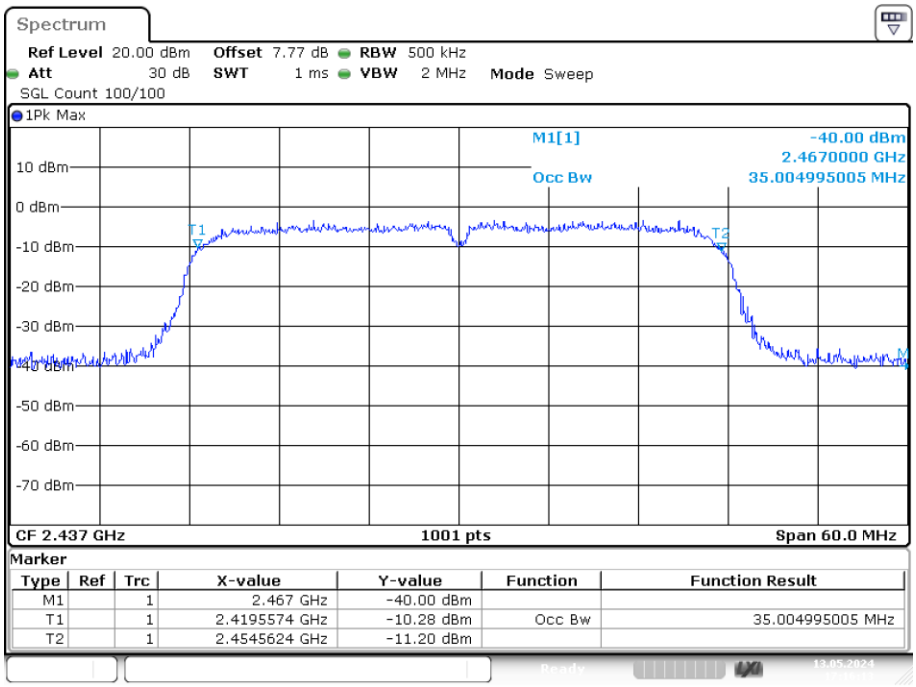

Date: 13.MAY.2024 17:09:17

OBW NVNT n40 2422MHz Ant1



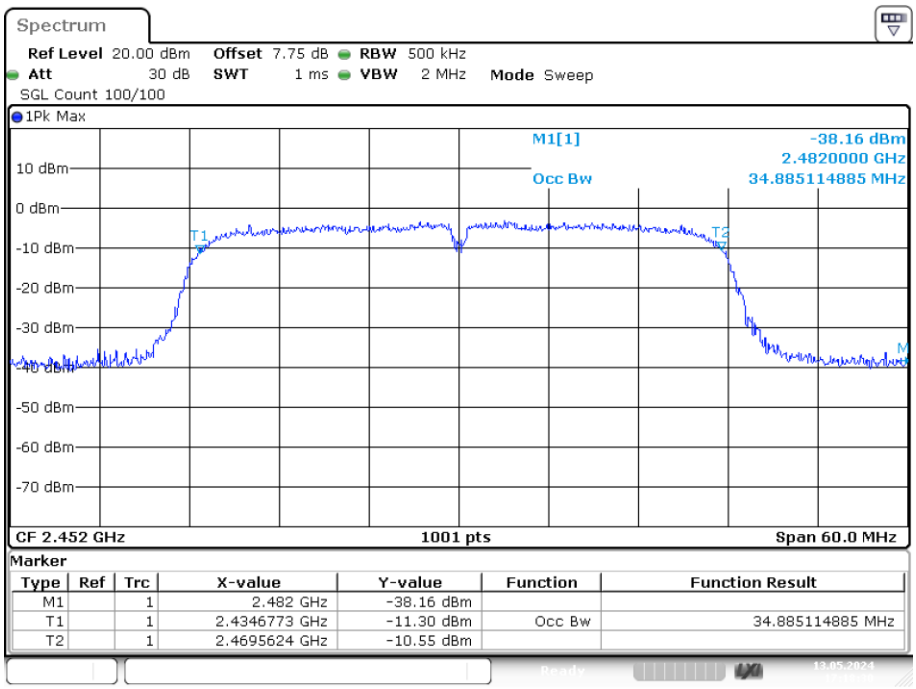

Date: 13.MAY.2024 17:13:02

OBW NVNT n40 2437MHz Ant1




Date: 13.MAY.2024 17:16:13

OBW NVNT n40 2452MHz Ant1




Date: 13.MAY.2024 17:18:30

# 8. BAND EDGE CHECK

## 8.1. Test limits

Please refer FCC PART 15: 15.247

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits and RSS-GEN limits.

## 8.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02

8.2.1 Put the EUT on a 1.5m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

8.2.2 Check the spurious emissions out of band.

8.2.3 RBW 1MHz, VBW 3MHz, peak detector for peak value, RBW 1MHz, VBW 10Hz, RMS detector for AV value.

## 8.3. Test Setup

Same as 5.2.2.

## 8.4. Test Results

PASS.

Detailed information please see the following page.