

## TEST REPORT

Test report no.: 1-1613-25-01-04\_TR1-R01



### Testing laboratory

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#### **Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

### Applicant

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### Manufacturer

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### Test standard/s

FCC 47 CFR Part 15

FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

RSS-247:Issue 4 (2025-07)

RSS-247 – Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:**

**Telematics Control Unit Generation 2**

**Model name:**

**TCU2 NA IP30 (Type: TCU2 NA IP30 C-Hub)**

**FCC ID:**

**2AUXS-TCU2NAIP30A**

**ISED certification number:**

**25847-TCU2NAIP30**

**Frequency:**

UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz; 5470 MHz to 5725 MHz; 5725 MHz to 5850 MHz

**Technology tested:**

WLAN

**Antenna:**

Two Integrated antennas with MIMO capability

**Power supply:**

12.0 V DC by vehicle battery

**Temperature range:**

-40°C to +65°C

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### Test report authorized:

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Supervisor Radio Lab  
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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2026-05-21 |
| Date of receipt of test item:      | 2026-07-06 |
| Start of test:*                    | 2026-07-06 |
| End of test:*                      | 2026-08-04 |
| Person(s) present during the test: | -/-        |

\*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

### 2.3 Test laboratories sub-contracted

None

### 3 Test standard/s, references and accreditations

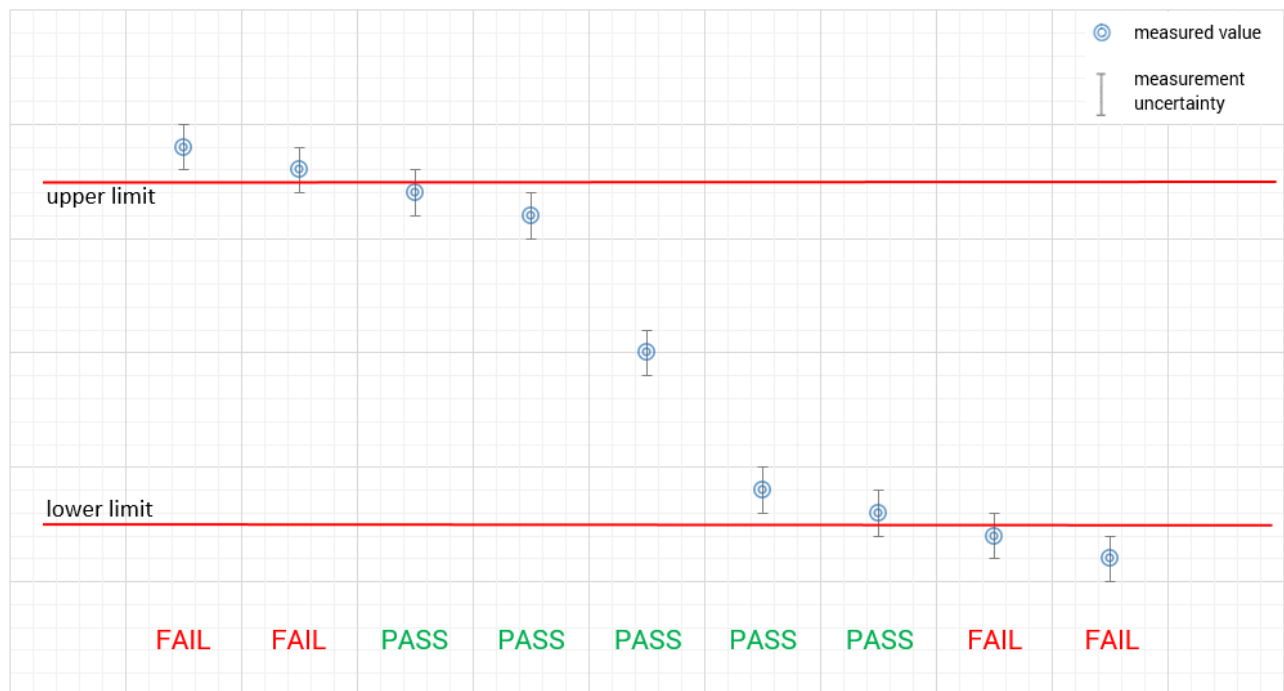
| Test standard                                                                   | Date       | Description                                                                                                                                                                             |
|---------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC 47 CFR Part 15                                                              | -/-        | FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices                                                                                         |
| RSS-247:Issue 4 (2025-07)                                                       | 2025-07-24 | RSS-247 – Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands |
| RSS-Gen:Issue 5 (2018-04)<br>+ Amendment 1 (2019-03)<br>+ Amendment 2 (2021-02) | 2021-02-01 | General Requirements for Compliance of Radio Apparatus                                                                                                                                  |
| Guidance                                                                        | Version    | Description                                                                                                                                                                             |
| KDB 789033 D02                                                                  | v02r01     | Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E                                                                |
| ANSI C63.10-2020                                                                | -/-        | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                                          |
| ANSI/USEMCSC C63.10a-2024 Amendment 1                                           | 2024-08-08 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1                                                                              |
| ANSI/USEMCSC C63.10a-2024 Amendment 1 Errata                                    | 2024-11-18 | Errata to American National Standard for Procedures for Compliance Testing of Unlicensed Wireless Devices Amendment 1                                                                   |
| KDB 662911 D01                                                                  | v02r01     | Correction Sheet<br>Emissions Testing of Transmitters with Multiple Outputs in the Same Band                                                                                            |

#### 4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."

measured value, measurement uncertainty, verdict



## 5 Test environment

|                           |   |                                     |                                                                                                                                                                |
|---------------------------|---|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature               | : | $T_{nom}$<br>$T_{max}$<br>$T_{min}$ | +22 °C during room temperature tests<br>No tests under extreme environmental conditions required.<br>No tests under extreme environmental conditions required. |
| Relative humidity content | : |                                     | 50 %                                                                                                                                                           |
| Barometric pressure       | : |                                     | 1024 hpa                                                                                                                                                       |
| Power supply              | : | $V_{nom}$<br>$V_{max}$<br>$V_{min}$ | 12.0 V DC by external power supply<br>No tests under extreme environmental conditions required.<br>No tests under extreme environmental conditions required.   |

## 6 Test item

### 6.1 General description

|                            |   |                                                                                                    |
|----------------------------|---|----------------------------------------------------------------------------------------------------|
| Kind of test item          | : | Telematics Control Unit Generation 2                                                               |
| Model name                 | : | TCU2 NA IP30 (Type: TCU2 NA IP30 C-Hub)                                                            |
| HMN                        | : | N/A                                                                                                |
| PMN                        | : | TCU2 NA IP30 C-Hub                                                                                 |
| HVIN                       | : | TCU2 NA IP30                                                                                       |
| FVIN                       | : | N/A                                                                                                |
| S/N serial number          | : | Rad. 09G0006003                                                                                    |
| Hardware status            | : | 1361H06                                                                                            |
| Software status            | : | CHUBTCU2.NA.R07.002.004                                                                            |
| Firmware status            | : | -/-                                                                                                |
| Frequency band             | : | UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz; 5470 MHz to 5725 MHz; 5725 MHz to 5850 MHz |
| Type of radio transmission | : | OFDM                                                                                               |
| Use of frequency spectrum  | : |                                                                                                    |
| Type of modulation         | : | (D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM                                                               |
| Number of channels         | : | 24 (20 MHz); 11 (40 MHz); 5 (80 MHz)                                                               |
| Antenna                    | : | Two Integrated antennas with MIMO capability                                                       |
| Power supply               | : | 12.0 V DC by vehicle battery                                                                       |
| Temperature range          | : | -40°C to +65°C                                                                                     |

### 6.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report: 1-1613-25-01-01\_TR1-A101-R01  
1-1613-25-01-01\_TR1-A103-R01

## 7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

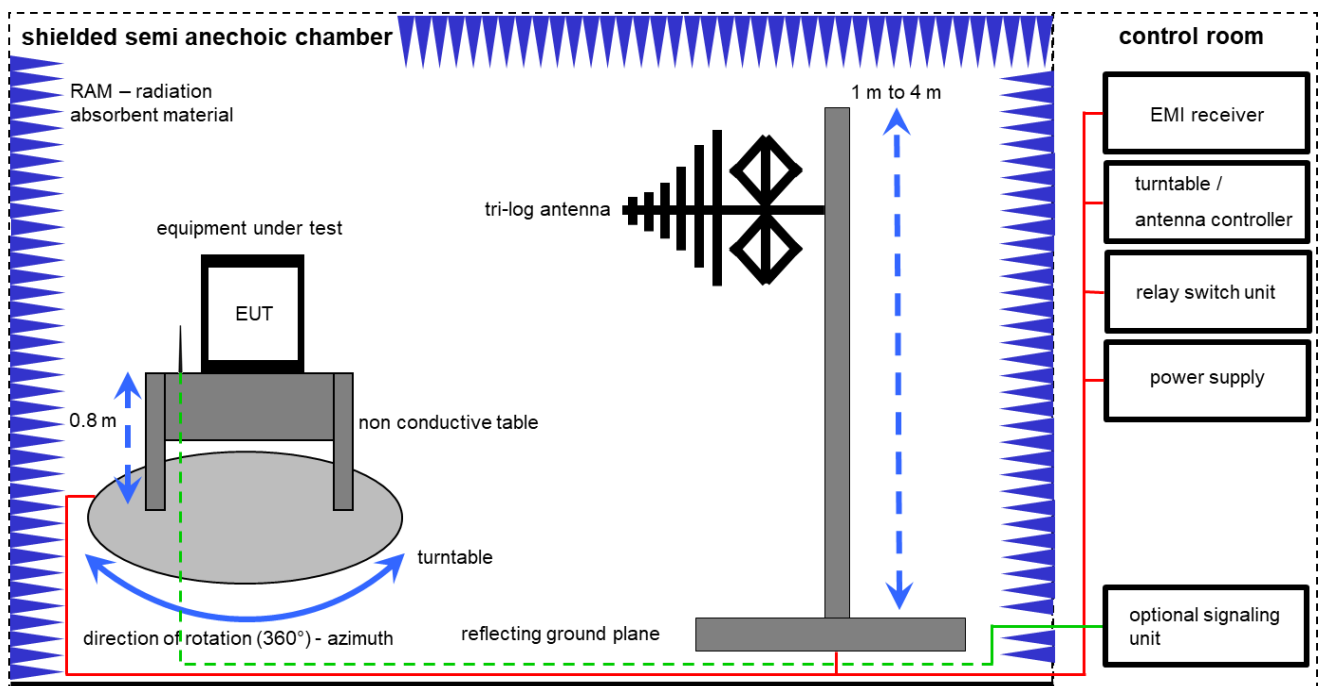
Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

### Agenda: Kind of Calibration

|        |                                            |     |                                                      |
|--------|--------------------------------------------|-----|------------------------------------------------------|
| k/cal  | calibration / calibrated                   | EK  | limited calibration                                  |
| Ne/cnn | not required (k, ev, izw, zw not required) | zw  | cyclical maintenance (external cyclical maintenance) |
| Ev/chk | periodic self verification                 | izw | internal cyclical maintenance                        |
| Ve     | long-term stability recognized             | g   | blocked for accredited testing                       |
| vlk!   | Attention: extended calibration interval   |     |                                                      |
| NK!    | Attention: not calibrated                  | *)  | next calibration ordered / currently in progress     |
| cpu    | check prior usage                          |     |                                                      |

## 7.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter; EMC32 software version: 10.59.00

$$FS = UR + CL + AF$$

(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

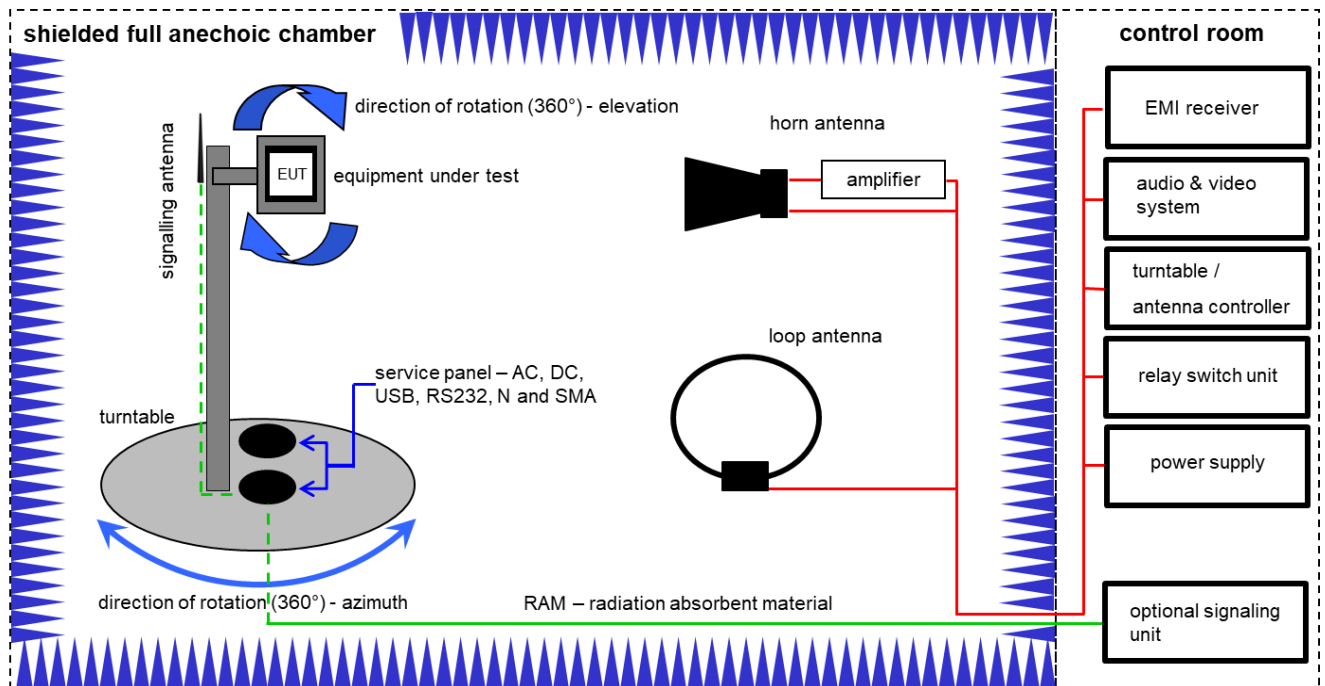
Example calculation:

$$FS \text{ [dB}\mu\text{V/m]} = 12.35 \text{ [dB}\mu\text{V/m]} + 1.90 \text{ [dB]} + 16.80 \text{ [dB/m]} = 31.05 \text{ [dB}\mu\text{V/m]} \text{ (35.69 } \mu\text{V/m)}$$

### Equipment table:

| No. | Setup | Equipment                | Type                               | Manufacturer                                 | Serial No. | INV. No. | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|--------------------------|------------------------------------|----------------------------------------------|------------|----------|---------------------|------------------|------------------|
| 1   | A     | Switch-Unit              | Switch-Unit 3488A                  | Hewlett Packard                              | 2719A14505 | 50160    | cpu                 | -/-              | -/-              |
| 2   | A     | Positioning Controller   | Positioning Controller 2090        | ETS-Lindgren GmbH Taufkirchen                | 64672      | 50280    | cnn                 | -/-              | -/-              |
| 3   | A     | TRILOG Broadband Antenna | TRILOG Broadband Antenna VULB9163  | Schwarzbeck MESS-ELEKTRONIK OHG Schönaun     | 1029       | 50403    | cal                 | 07.11.2025       | 30.11.2027       |
| 4   | A     | EMI Test Receiver        | EMI Test Receiver ESR3 9kHz-3.6GHz | Rohde & Schwarz Messgerätebau GmbH Memmingen | 102587     | 50417    | cal                 | 08.12.2025       | 31.12.2026       |

## 7.2 Shielded fully anechoic chamber



Measurement distance: horn antenna 3 meter; loop antenna 3 meter

FS = UR + CA + AF

(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation:

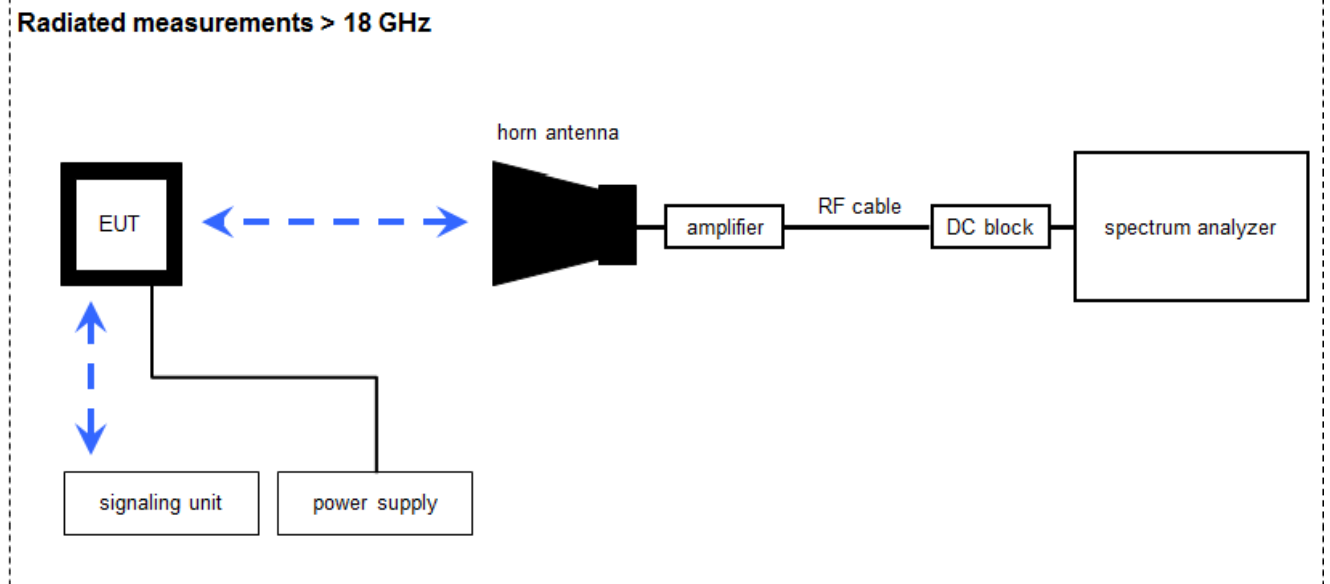
FS [dBμV/m] = 40.0 [dBμV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBμV/m] (71.61 μV/m)

### Equipment table:

| No. | Setup   | Equipment                            | Type                                       | Manufacturer                                    | Serial No. | INV. No. | Kind of Calibration | Last Calibration | Next Calibration |
|-----|---------|--------------------------------------|--------------------------------------------|-------------------------------------------------|------------|----------|---------------------|------------------|------------------|
| 1   | A, C    | Double-Ridged Waveguide Horn Antenna | Double-Ridged Waveguide Horn Antenna 3115  | EMCO Elektronik GmbH Gilching                   | 9107-3696  | 40342    | cal                 | 15.04.2025       | 30.04.2027       |
| 2   | A, B, C | Anechoic chamber                     | Anechoic chamber FAC 3/5m                  | MEC Import: MWB TDK                             | 87400/02   | 40349    | cpu                 | -/-              | -/-              |
| 3   | A, B, C | Switch / Control Unit                | Switch / Control Unit 3488A                | Hewlett Packard                                 | *          | 40350    | cnn                 | -/-              | -/-              |
| 4   | C       | Highpass Filter                      | Highpass Filter WHK1.1/15G-10SS            | Wainwright Instruments GmbH Andechs             | 3          | 40361    | cpu                 | -/-              | -/-              |
| 5   | C       | Highpass Filter                      | Highpass Filter WHKX7.0/18G-8SS            | Wainwright Instruments GmbH Andechs             | 19         | 40365    | cnn                 | -/-              | -/-              |
| 6   | C       | High Pass Filter                     | High Pass Filter VHF-3500+                 | Mini-Circuits Brooklyn                          | -/-        | 40369    | cnn                 | -/-              | -/-              |
| 7   | A, C    | Broadband Amplifier 0.5-18 GHz       | Broadband Amplifier 0.5-18 GHz CBLU5184540 | MEC Import: CERNEX                              | 22049      | 40373    | cpu                 | -/-              | -/-              |
| 8   | A, B, C | 4U RF Switch Platform                | 4U RF Switch Platform L4491A               | Agilent Technologies Deutschland GmbH Böblingen | MY50000037 | 40375    | cnn                 | -/-              | -/-              |
| 9   | A, B, C | NEXIO EMV-Software                   | NEXIO EMV-Software BAT EMC V2022.0.32.0    | MEC Import: Nexio                               | -/-        | 40383    | cnn                 | -/-              | -/-              |
| 10  | C       | RF-Amplifier                         | RF-Amplifier AMF-6F06001800-30-10P-R       | MEC Import: NARDA-MITEQ Inc                     | 2011572    | 40400    | cpu                 | -/-              | -/-              |

|    |         |                     |                                                   |                                                    |         |       |     |            |            |
|----|---------|---------------------|---------------------------------------------------|----------------------------------------------------|---------|-------|-----|------------|------------|
| 11 | B       | Active Loop Antenna | Active Loop Antenna<br>6502                       | EMCO Elektronik<br>GmbH Gilching                   | 2210    | 50044 | cal | 07.07.2025 | 31.07.2027 |
| 12 | A, B, C | EMI Test Receiver   | EMI Test Receiver<br>ESU26                        | Rohde & Schwarz<br>Messgerätebau<br>GmbH Memmingen | 100037  | 50254 | cal | 11.12.2025 | 31.12.2026 |
| 13 | C       | Low Noise Amplifier | Low Noise Amplifier<br>LNA-40-00100800-<br>15-10P | Miteq Inc.                                         | 2336093 | 50483 | cnn | -/-        | -/-        |

### 7.3 Radiated measurements > 18 GHz



Measurement distance: horn antenna 50 cm

FS = UR + CA + AF

(FS-field strength; UR-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

Example calculation:

FS [dBμV/m] = 40.0 [dBμV/m] + (-60.1) [dB] + 36.74 [dB/m] = 16.64 [dBμV/m] (6.79 μV/m)

#### Equipment table:

| No. | Setup | Equipment                                | Type                                                                   | Manufacturer                                 | Serial No.    | INV. No. | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|------------------------------------------|------------------------------------------------------------------------|----------------------------------------------|---------------|----------|---------------------|------------------|------------------|
| 1   | A     | Horn Antenna 18,0-40,0 GHz               | Horn Antenna 18,0-40,0 GHz LHAF180                                     | MEC Import: Microw.Devel                     | 39180-103-021 | 40170    | cal                 | 16.01.2026       | 31.01.2028       |
| 2   | A     | Low Noise Amplifier, Broadband 18-50 GHz | Low Noise Amplifier, Broadband 18-50 GHz BZT-18005000-550835-SL2525-SL | MEC Import: B&Z Technologies                 | 27887-27889   | 40789    | cpu                 | -/-              | -/-              |
| 3   | A     | Signal- and Spectrum Analyzer            | Signal- and Spectrum Analyzer FSW50                                    | Rohde & Schwarz Messgerätebau GmbH Memmingen | 101332        | 40010    | cal                 | 28.01.2026       | 31.01.2027       |

## 8 Sequence of testing

### 8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.10.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.10) – see test details.
- EUT is set into operation.

#### Premeasurement\*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

#### Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.10).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

\*)Note: The sequence will be repeated three times with different EUT orientations.

## 8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.10.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.10) – see test details.
- EUT is set into operation.

### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position  $\pm 45^\circ$  and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.10).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

### 8.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.10.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.10) – see test details.
- EUT is set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

#### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.10).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

## 8.4 Sequence of testing radiated spurious above 18 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.10.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

### Premeasurement

- The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

### Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.10).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

## 9 Measurement uncertainty

| Measurement uncertainty                                  |                                         |               |
|----------------------------------------------------------|-----------------------------------------|---------------|
| Test case                                                | Uncertainty                             |               |
| Antenna gain                                             | $\pm 3$ dB                              |               |
| Power spectral density                                   | $\pm 1.56$ dB                           |               |
| DTS bandwidth                                            | $\pm 100$ kHz (depends on the used RBW) |               |
| Occupied bandwidth                                       | $\pm 100$ kHz (depends on the used RBW) |               |
| Maximum output power conducted                           | $\pm 1.56$ dB                           |               |
| Detailed spurious emissions @ the band edge - conducted  | $\pm 1.56$ dB                           |               |
| Band edge compliance radiated                            | $\pm 3$ dB                              |               |
| Spurious emissions conducted                             | > 3.6 GHz                               | $\pm 1.56$ dB |
|                                                          | > 7 GHz                                 | $\pm 1.56$ dB |
|                                                          | > 18 GHz                                | $\pm 2.31$ dB |
|                                                          | $\geq 40$ GHz                           | $\pm 2.97$ dB |
| Spurious emissions radiated below 30 MHz                 | $\pm 3$ dB                              |               |
| Spurious emissions radiated 30 MHz to 1 GHz              | $\pm 4.1$ dB                            |               |
| Spurious emissions radiated 1 GHz to 12.75 GHz           | $\pm 3.7$ dB                            |               |
| Spurious emissions radiated above 12.75 GHz              | $\pm 4.5$ dB                            |               |
| Spurious emissions conducted below 30 MHz (AC conducted) | $\pm 2.6$ dB                            |               |

## 10 Summary of measurement results

|                                     |                                                                                                                          |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | No deviations from the technical specifications were ascertained                                                         |
| <input type="checkbox"/>            | There were deviations from the technical specifications ascertained                                                      |
| <input checked="" type="checkbox"/> | This test report is only a partial test report.<br>The content and verdict of the performed test cases are listed below. |

| TC Identifier | Description                              | Verdict   | Date       | Remark                          |
|---------------|------------------------------------------|-----------|------------|---------------------------------|
| RF-Testing    | CFR Title 47 Part 15<br>RSS 247, Issue 4 | See table | 2026-08-06 | Tests according customer demand |

| Test specification clause         | Test case                                         | C                                   | NC                       | NA                                  | NP                                  | Remark   |
|-----------------------------------|---------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|----------|
| -/-                               | Output power verification (cond.)                 | -/-                                 |                          |                                     |                                     | Declared |
| -/-                               | Antenna gain                                      | -/-                                 |                          |                                     |                                     | Declared |
| U-NII Part 15                     | Duty cycle                                        | -/-                                 |                          |                                     |                                     | -/-      |
| §15.407(a)<br>RSS - 247 (6.2.x.1) | Maximum output power<br>(conducted & radiated)    | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | -/-      |
| §15.407(a)<br>RSS - 247 (6.2.x.1) | Power spectral density                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | -/-      |
| RSS - 247 (6.2.4.1)               | Spectrum bandwidth<br>6dB bandwidth               | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | -/-      |
| §15.407(a)<br>RSS - 247 (6.2.x.2) | Spectrum bandwidth<br>26dB bandwidth              | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | -/-      |
| RSS Gen clause<br>6.6             | Spectrum bandwidth<br>99% bandwidth               | -/-                                 |                          |                                     |                                     | -/-      |
| §15.205<br>RSS - 247 (6.2.x.2)    | Band edge compliance radiated                     | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | -/-      |
| §15.407(b)<br>RSS - 247 (6.2.x.2) | TX spurious emissions radiated                    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | -/-      |
| §15.209(a)<br>RSS-Gen             | Spurious emissions radiated<br>< 30 MHz           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | -/-      |
| §15.107(a)<br>§15.207             | Spurious emissions conducted<br>emissions< 30 MHz | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | -/-      |
| §15.407<br>RSS - 247 (6.3)        | DFS                                               | -/-                                 |                          |                                     |                                     | -/-      |

Notes:

|    |           |     |               |     |                |     |               |
|----|-----------|-----|---------------|-----|----------------|-----|---------------|
| C: | Compliant | NC: | Not compliant | NA: | Not applicable | NP: | Not performed |
|----|-----------|-----|---------------|-----|----------------|-----|---------------|

## 11 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: Used power setting:  
a-mode: 9.5  
nHT20-mode: 8.5  
nHT40-mode: 7.5  
acVHT80-mode: 6.5

EUT selection:

☐ Only one device available

☐ Devices selected by the customer

☒ Devices selected by the laboratory (Randomly)

Provided channels:

Channels with 20 MHz channel bandwidth:

| U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz)<br>channel number & center frequency |             |             |      |             |             |             |      |             |
|-------------------------------------------------------------------------------------------------------|-------------|-------------|------|-------------|-------------|-------------|------|-------------|
| channel                                                                                               | <b>36</b>   | <b>40</b>   | 44   | <b>48</b>   | <b>52</b>   | <b>56</b>   | 60   | <b>64</b>   |
| f <sub>c</sub> / MHz                                                                                  | <b>5180</b> | <b>5200</b> | 5220 | <b>5240</b> | <b>5260</b> | <b>5280</b> | 5300 | <b>5320</b> |

| U-NII-2C (5470 MHz to 5725 MHz)<br>channel number & center frequency |             |      |      |      |      |             |      |      |      |      |             |
|----------------------------------------------------------------------|-------------|------|------|------|------|-------------|------|------|------|------|-------------|
| channel                                                              | <b>100</b>  | 104  | 108  | 112  | 116  | <b>120</b>  | 124  | 128  | 132  | 136  | <b>140</b>  |
| f <sub>c</sub> / MHz                                                 | <b>5500</b> | 5520 | 5540 | 5560 | 5580 | <b>5600</b> | 5620 | 5640 | 5660 | 5680 | <b>5700</b> |

| U-NII-3 (5725 MHz to 5850 MHz)<br>channel number & center frequency |             |      |             |      |             |
|---------------------------------------------------------------------|-------------|------|-------------|------|-------------|
| channel                                                             | <b>149</b>  | 153  | <b>157</b>  | 161  | <b>165</b>  |
| f <sub>c</sub> / MHz                                                | <b>5745</b> | 5765 | <b>5785</b> | 5805 | <b>5825</b> |

Channels with 40 MHz channel bandwidth:

| U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz)<br>channel number & center frequency |             |             |             |             |
|-------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|
| channel                                                                                               | <b>38</b>   | <b>46</b>   | <b>54</b>   | <b>62</b>   |
| f <sub>c</sub> / MHz                                                                                  | <b>5190</b> | <b>5230</b> | <b>5270</b> | <b>5310</b> |

| U-NII-2C (5470 MHz to 5725 MHz)<br>channel number & center frequency |             |      |             |      |
|----------------------------------------------------------------------|-------------|------|-------------|------|
| channel                                                              | <b>102</b>  | 110  | <b>118</b>  | 126  |
| f <sub>c</sub> / MHz                                                 | <b>5510</b> | 5550 | <b>5590</b> | 5630 |

| U-NII-3 (5725 MHz to 5850 MHz)<br>channel number & center frequency |             |             |  |
|---------------------------------------------------------------------|-------------|-------------|--|
| channel                                                             | <b>151</b>  | <b>159</b>  |  |
| f <sub>c</sub> / MHz                                                | <b>5755</b> | <b>5795</b> |  |

Channels with 80 MHz channel bandwidth:

| U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz)<br>channel number & center frequency |             |             |
|-------------------------------------------------------------------------------------------------------|-------------|-------------|
| channel                                                                                               | <b>42</b>   | <b>58</b>   |
| f <sub>c</sub> / MHz                                                                                  | <b>5210</b> | <b>5290</b> |

| U-NII-2C (5470 MHz to 5725 MHz)<br>channel number & center frequency |             |             |
|----------------------------------------------------------------------|-------------|-------------|
| channel                                                              | <b>106</b>  | <b>122</b>  |
| f <sub>c</sub> / MHz                                                 | <b>5530</b> | <b>5610</b> |

| U-NII-3 (5725 MHz to 5850 MHz)<br>channel number & center frequency |             |
|---------------------------------------------------------------------|-------------|
| channel                                                             | <b>155</b>  |
| f <sub>c</sub> / MHz                                                | <b>5775</b> |

Note: The channels used for the tests were marked in bold in the list.

Test mode:

- ☐ No test mode available.  
Iperf is used to transmit data to a companion device
- ☒ Special software is used.  
EUT is transmitting pseudo random data by itself

Antennas and transmit operating modes:

- ☐ Operating mode 1 (single antenna)
- Equipment with 1 antenna,
  - Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used,
  - Smart antenna system with 2 or more transmit/receive chains, but operating in a mode where only 1 transmit/receive chain is used)
- ☒ Operating mode 2 (multiple antennas, no beamforming)
- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously but without beamforming.
- ☐ Operating mode 3 (multiple antennas, with beamforming)
- Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously with beamforming.  
In addition to the antenna assembly gain (G), the beamforming gain (Y) may have to be taken into account when performing the measurements.

## 12 Measurement results

### 12.1 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to the lowest channel for the lower restricted band and to the highest channel for the upper restricted band. Measurement distance is 3m.

Measurement:

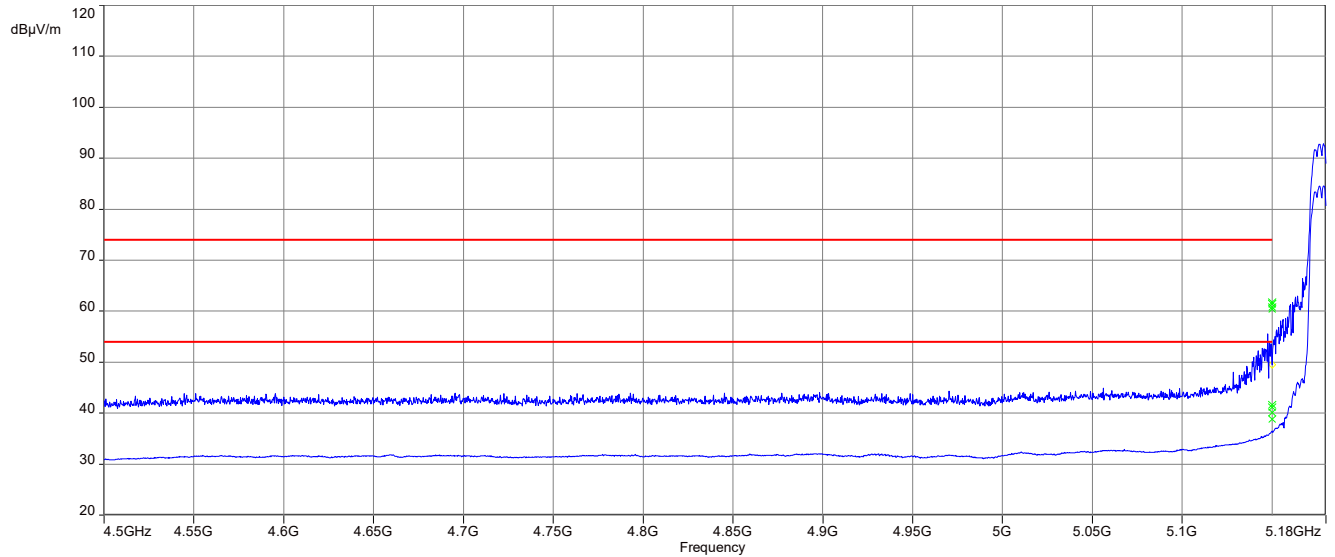
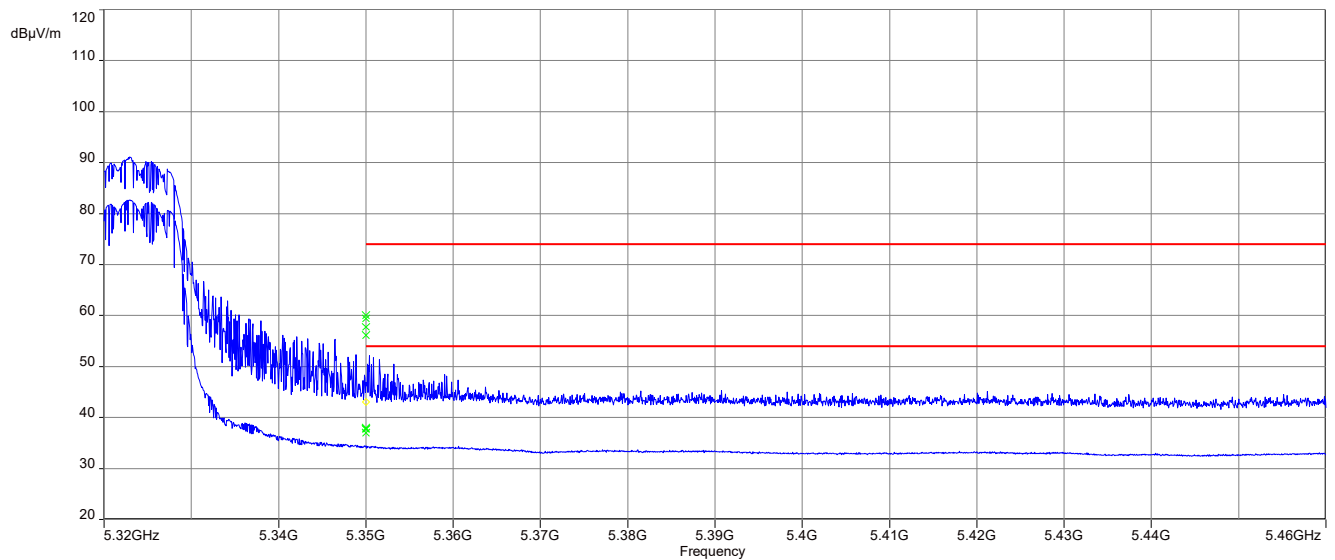
| Measurement parameter    |                            |
|--------------------------|----------------------------|
| Detector:                | Peak / RMS                 |
| Sweep time:              | Auto                       |
| Resolution bandwidth:    | 1 MHz                      |
| Video bandwidth:         | $\geq 3 \times \text{RBW}$ |
| Span:                    | See plots!                 |
| Trace mode:              | Max Hold                   |
| Test setup:              | See sub clause 7.2 – A     |
| Measurement uncertainty: | See chapter 9              |

Limits:

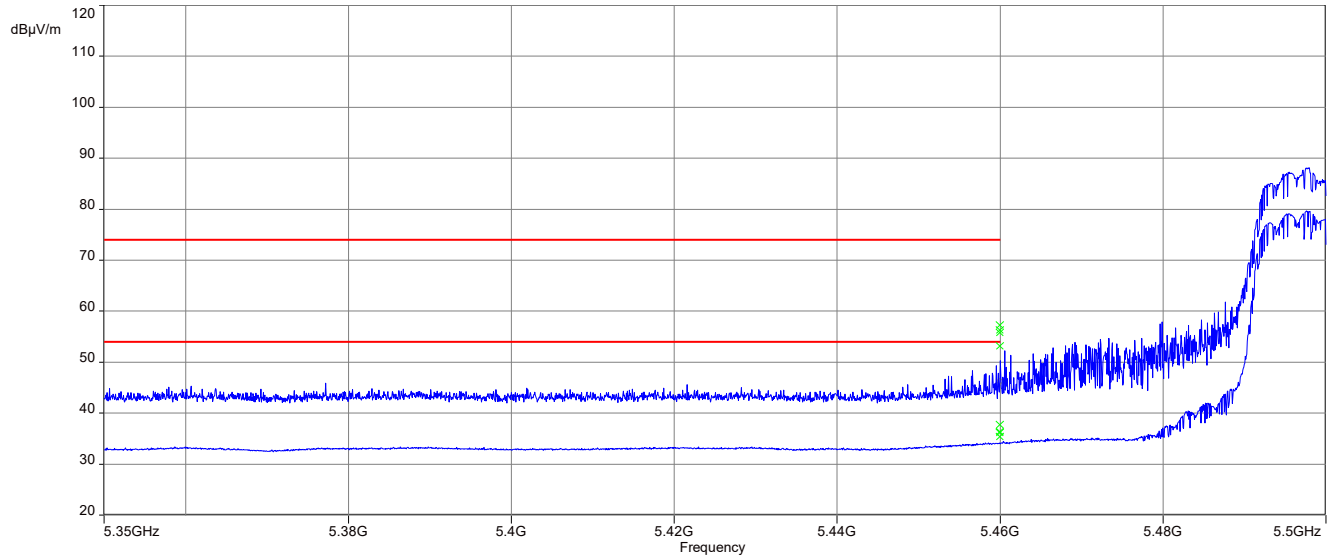
| Band Edge Compliance Radiated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)). |
| 74 dB $\mu$ V/m (peak)<br>54 dB $\mu$ V/m (average)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Result:

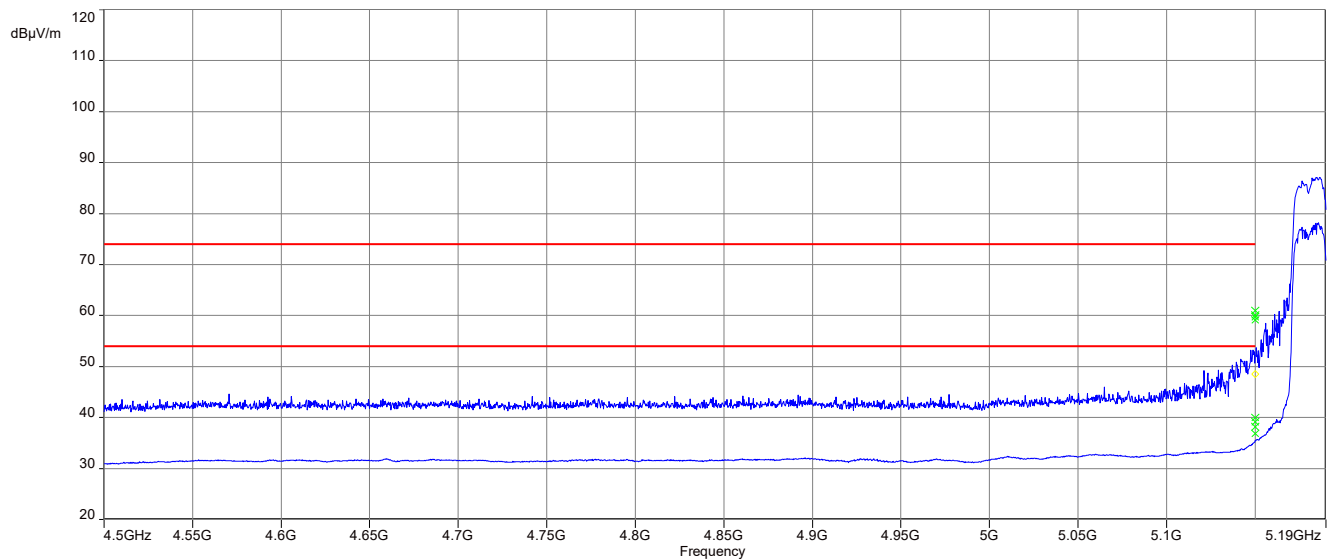
| Scenario                | Band Edge Compliance Radiated [dB $\mu$ V/m]            |
|-------------------------|---------------------------------------------------------|
| a-mode Channel 36       | 61.8 dB $\mu$ V/m (peak)<br>41.7 dB $\mu$ V/m (average) |
| a-mode Channel 64       | 60.0 dB $\mu$ V/m (peak)<br>37.8 dB $\mu$ V/m (average) |
| a-mode Channel 100      | 57.4 dB $\mu$ V/m (peak)<br>37.8 dB $\mu$ V/m (average) |
| nHT40-mode Channel 38   | 61.0 dB $\mu$ V/m (peak)<br>40.1 dB $\mu$ V/m (average) |
| nHT40-mode Channel 62   | 60.3 dB $\mu$ V/m (peak)<br>39.1 dB $\mu$ V/m (average) |
| nHT40-mode Channel 102  | 54.5 dB $\mu$ V/m (peak)<br>38.0 dB $\mu$ V/m (average) |
| acVHT80mode Channel 42  | 50.6 dB $\mu$ V/m (peak)<br>36.1 dB $\mu$ V/m (average) |
| acVHT80mode Channel 58  | 53.7 dB $\mu$ V/m (peak)<br>38.7 dB $\mu$ V/m (average) |
| acVHT80mode Channel 106 | 51.5 dB $\mu$ V/m (peak)<br>38.6 dB $\mu$ V/m (average) |

**Plots:****Plot 1:** lower band edge; U-NII-1; lowest channel; a-mode**Plot 2:** upper band edge; U-NII-2A; highest channel; a-mode

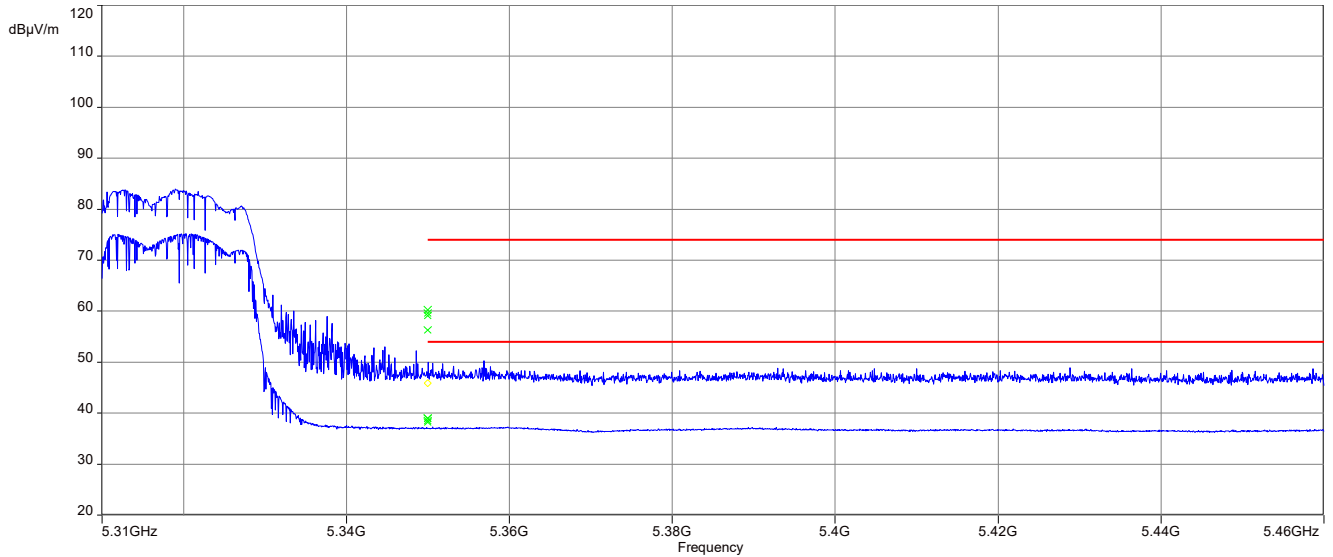
**Plot 3:** lower band edge; U-NII-2C; lowest channel; a-mode



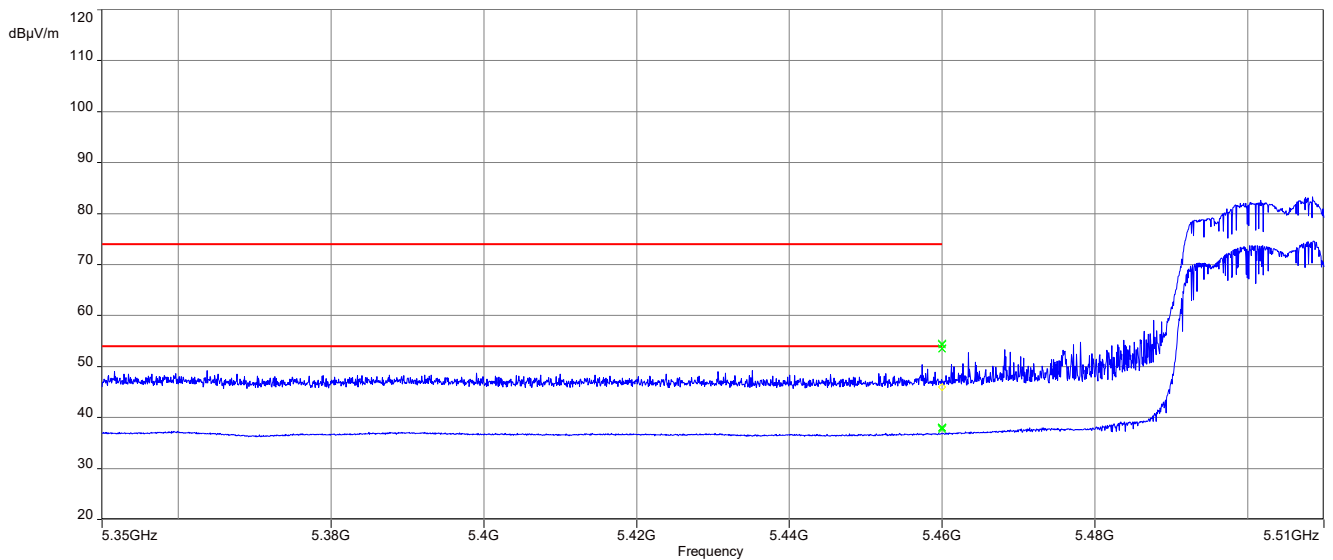
**Plot 4:** lower band edge; U-NII-1; lowest channel; n40-mode



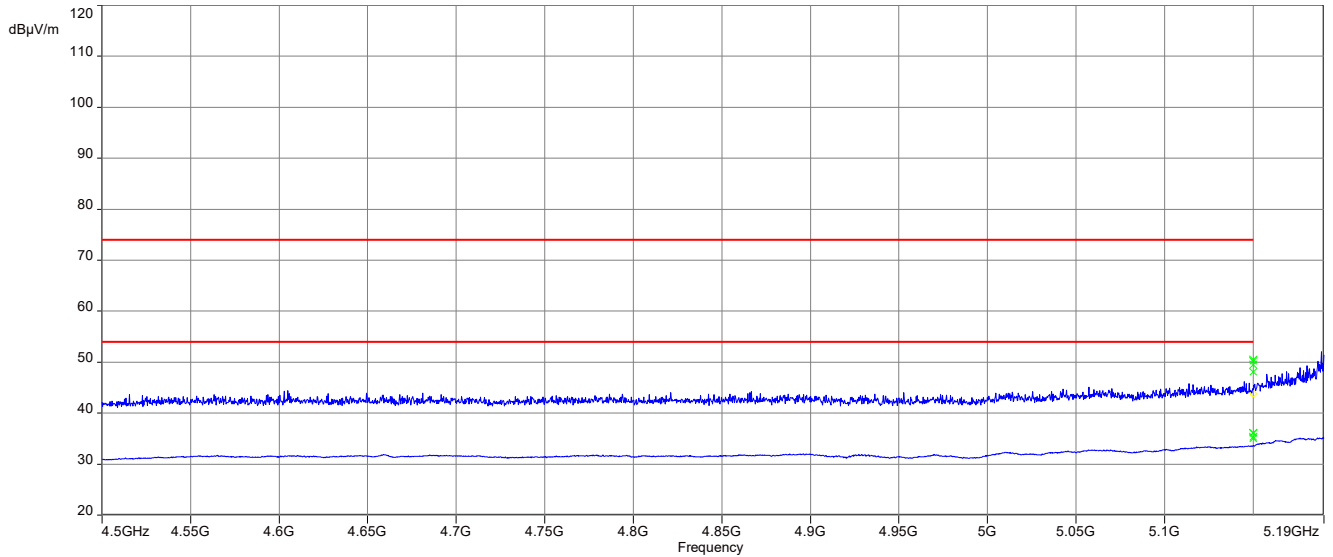
**Plot 5:** upper band edge; U-NII-2A; highest channel; n40-mode



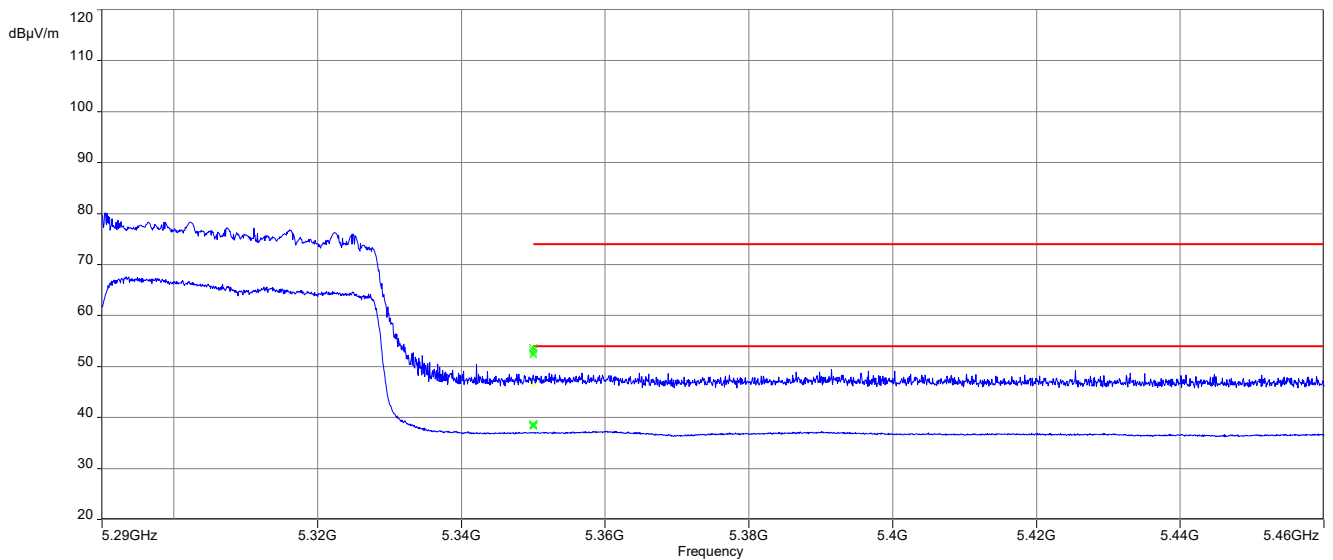
**Plot 6:** lower band edge; U-NII-2C; lowest channel; n40-mode



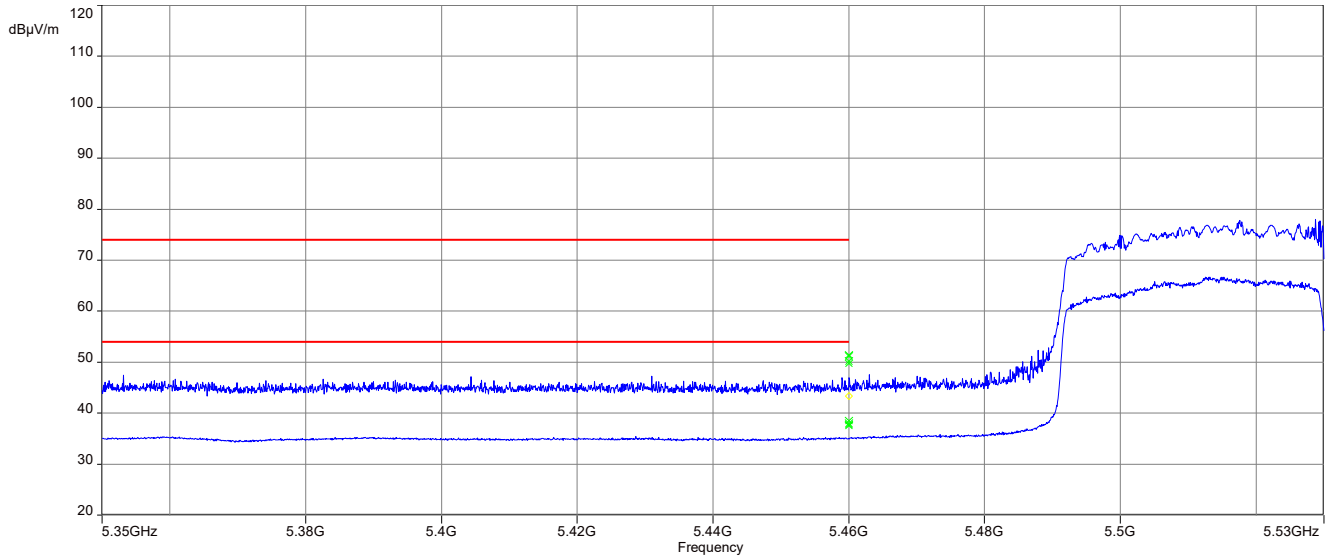
**Plot 7:** lower band edge; U-NII-1; middle channel; ac80-mode



**Plot 8:** upper band edge; U-NII-2A; middle channel; ac80-mode



**Plot 9:** lower band edge; U-NII-2C; lowest channel; ac80-mode



## 12.2 Spurious emissions radiated below 30 MHz

### Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The limits are re-calculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

### Measurement:

| Measurement parameter    |                                            |
|--------------------------|--------------------------------------------|
| Detector:                | Peak / Quasi Peak                          |
| Sweep time:              | Auto                                       |
| Video bandwidth:         | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz  |
| Resolution bandwidth:    | F < 150 kHz: 1 kHz<br>F > 150 kHz: 100 kHz |
| Span:                    | 9 kHz to 30 MHz                            |
| Trace mode:              | Max Hold                                   |
| Test setup:              | See sub clause 7.2 – B                     |
| Measurement uncertainty: | See chapter 9                              |

### Limits:

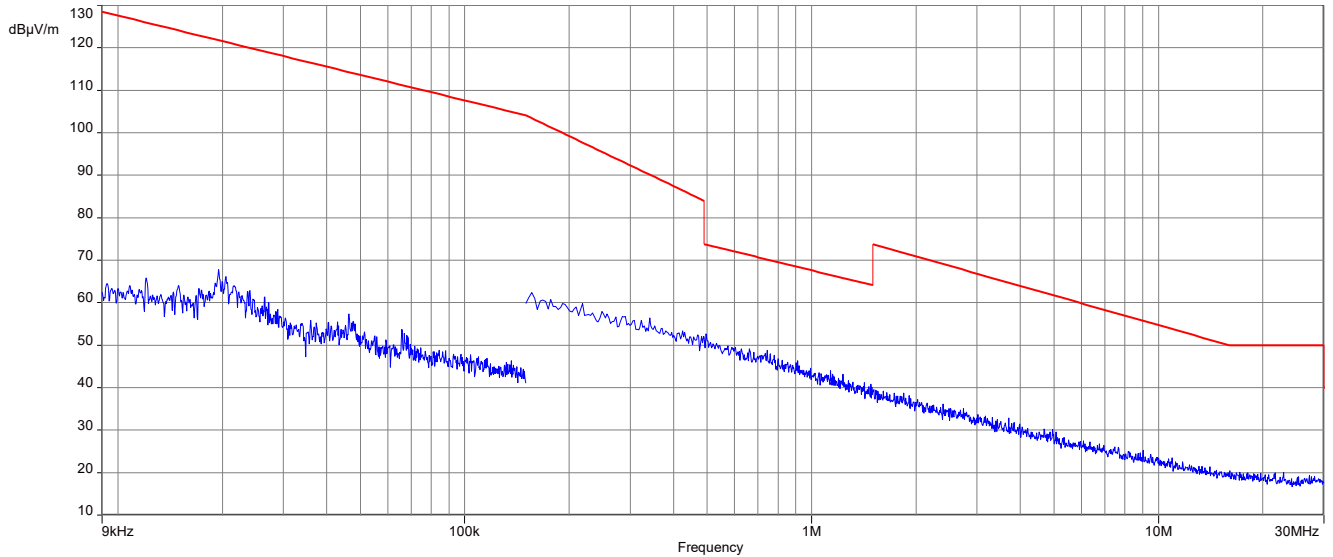
| Spurious Emissions Radiated < 30 MHz |                       |                      |
|--------------------------------------|-----------------------|----------------------|
| Frequency (MHz)                      | Field Strength (μV/m) | Measurement distance |
| 0.009 – 0.490                        | 2400/F(kHz)           | 300                  |
| 0.490 – 1.705                        | 24000/F(kHz)          | 30                   |
| 1.705 – 30.0                         | 30                    | 30                   |

### Results:

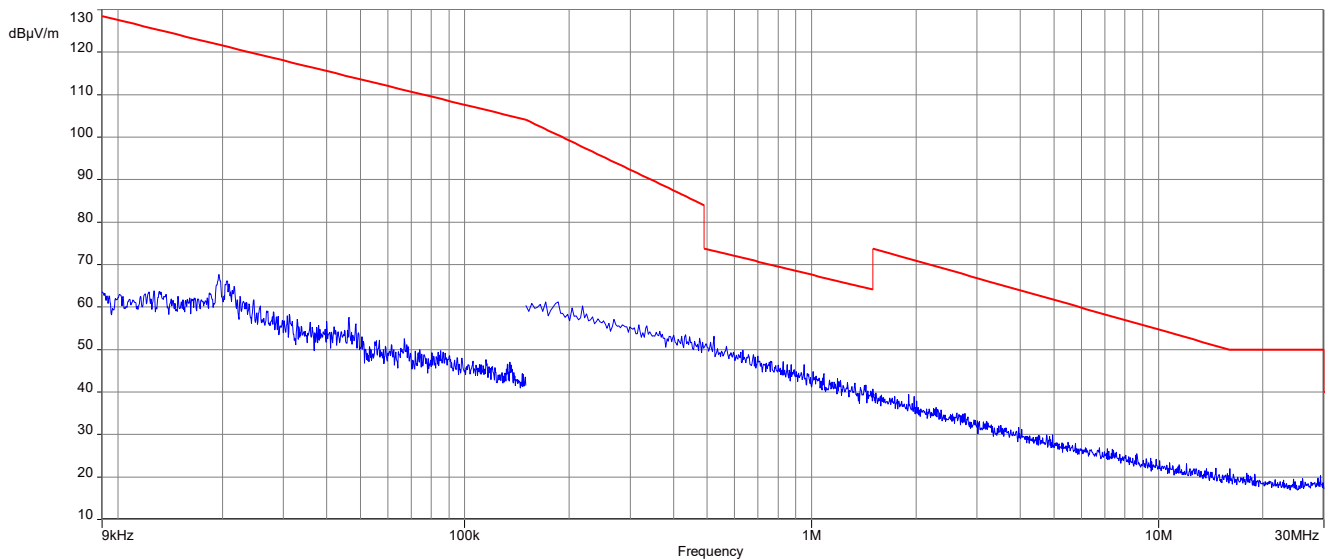
| Spurious Emissions Radiated < 30 MHz [dBμV/m]               |          |                |
|-------------------------------------------------------------|----------|----------------|
| F [MHz]                                                     | Detector | Level [dBμV/m] |
| All detected emissions are more than 20 dB below the limit. |          |                |
|                                                             |          |                |
|                                                             |          |                |

**Plots:** 20 MHz channel bandwidth

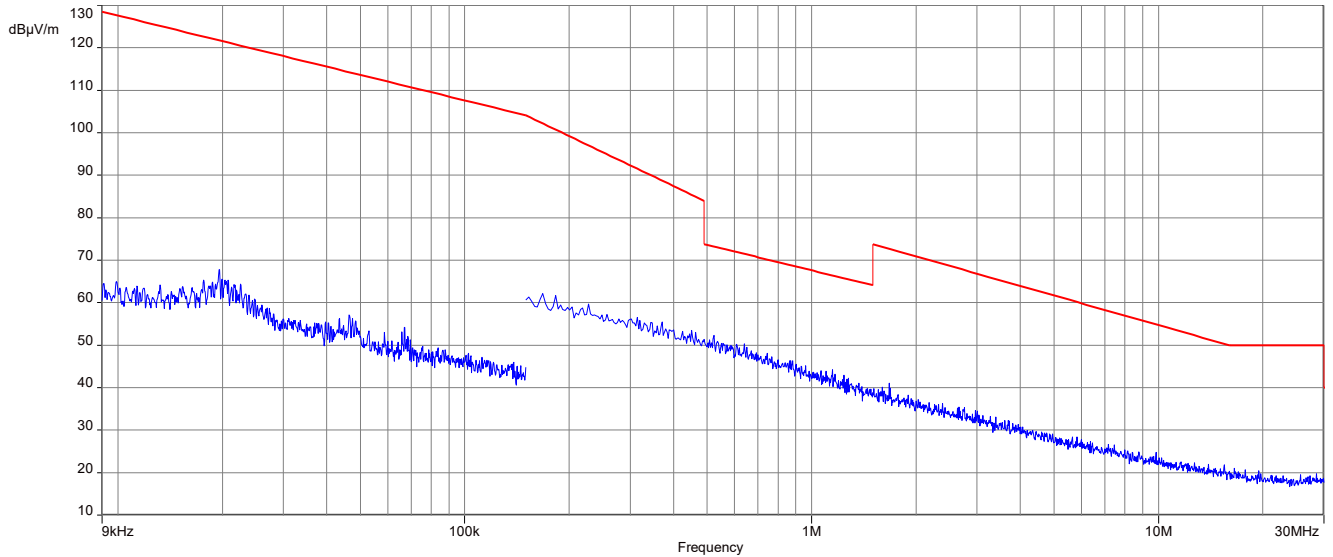
**Plot 1:** 9 kHz to 30 MHz, U-NII-1; lowest channel



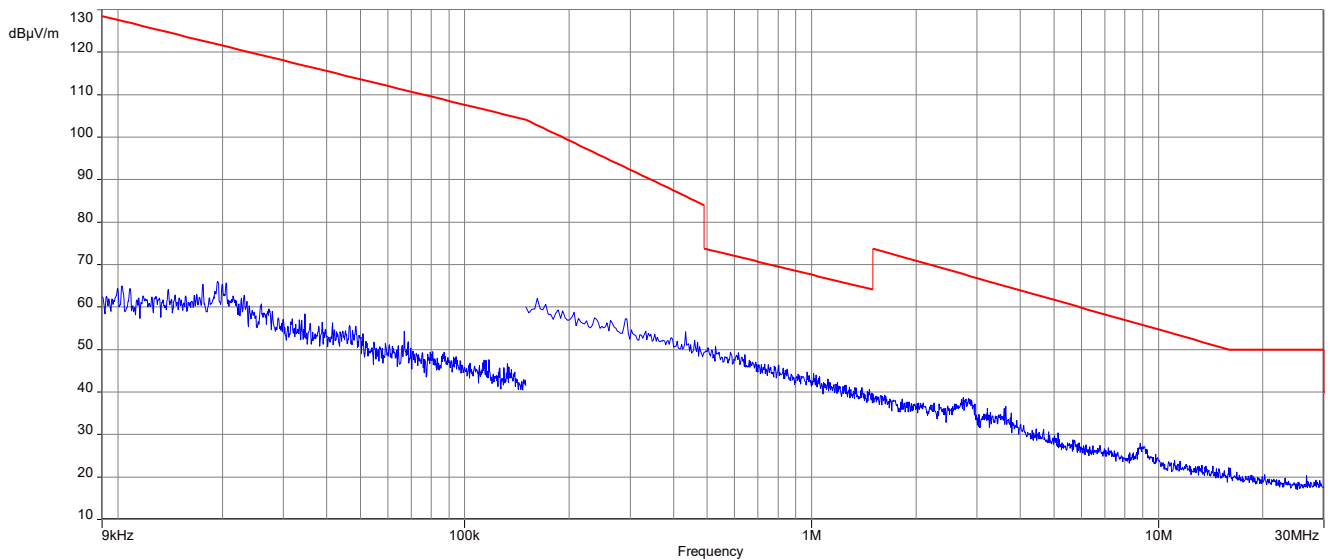
**Plot 2:** 9 kHz to 30 MHz, U-NII-1; middle channel



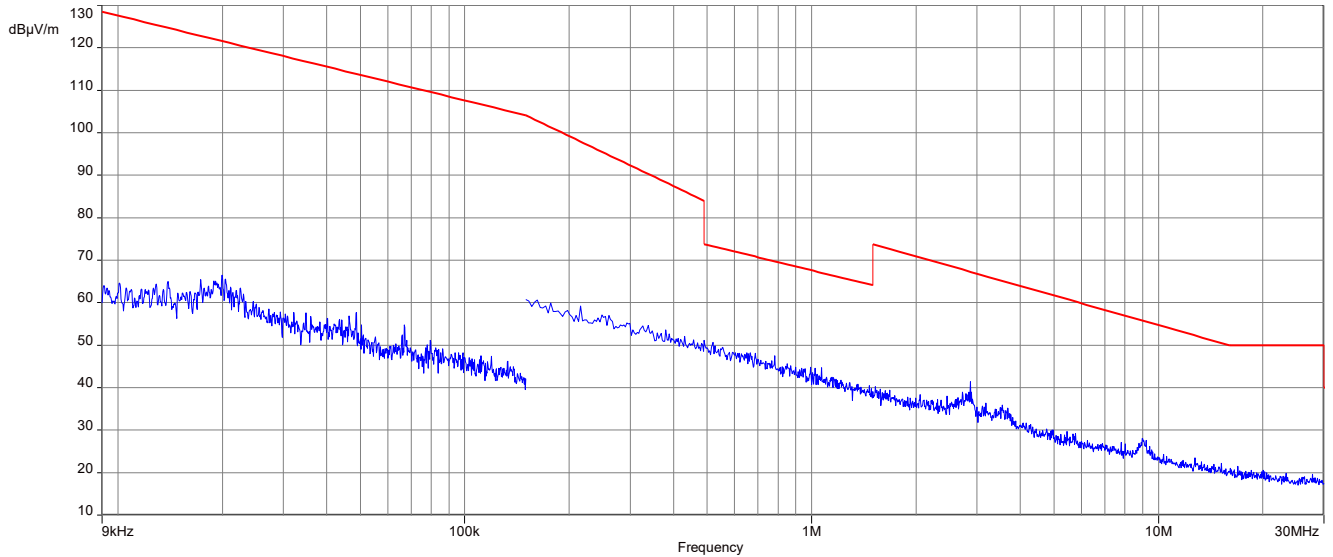
**Plot 3:** 9 kHz to 30 MHz, U-NII-1; highest channel



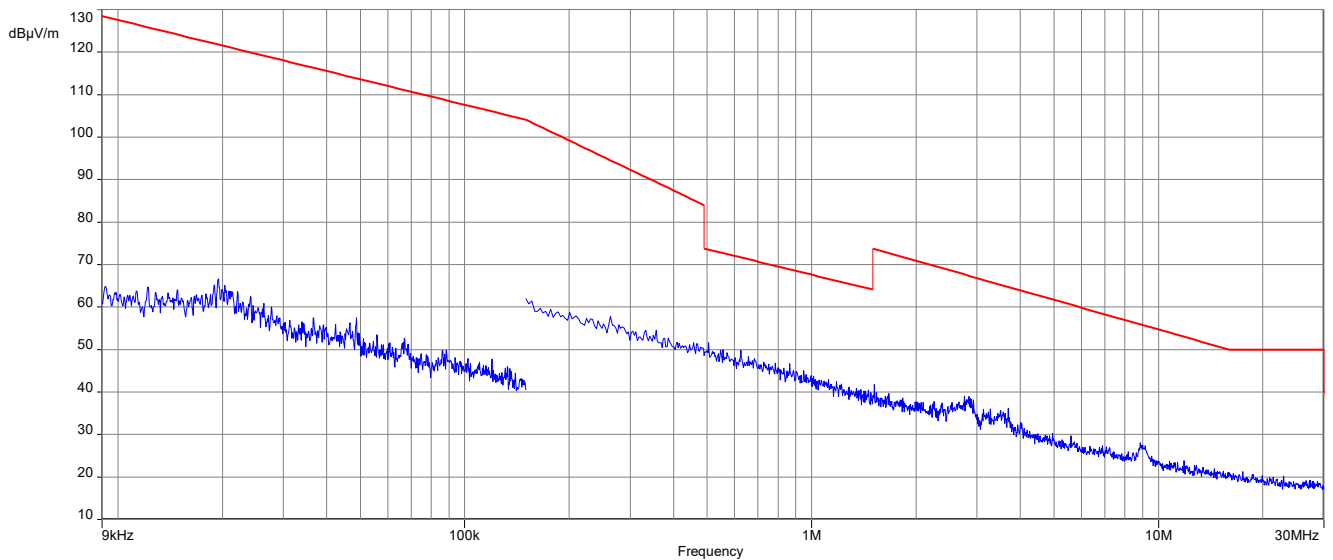
**Plot 4:** 9 kHz to 30 MHz, U-NII-2A; lowest channel



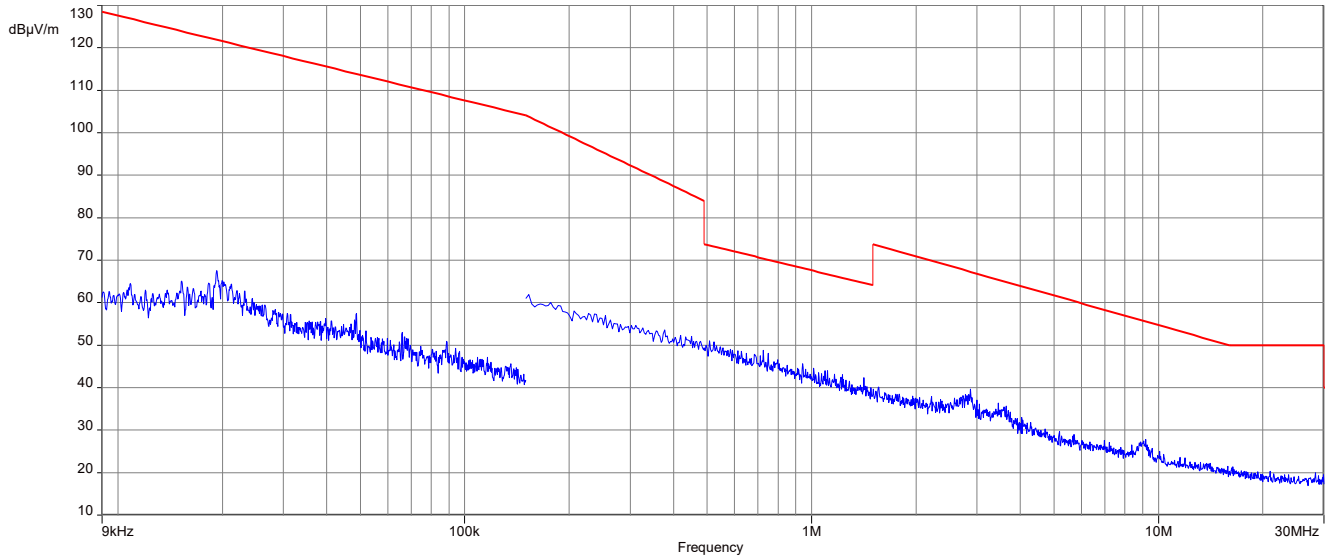
**Plot 5:** 9 kHz to 30 MHz, U-NII-2A; middle channel



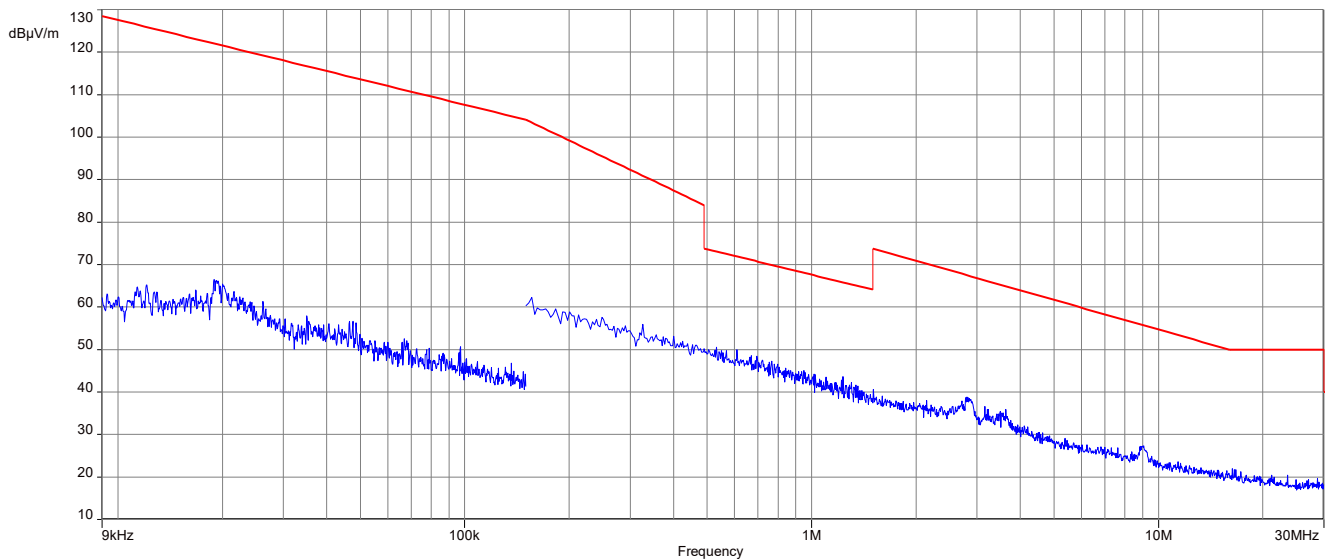
**Plot 6:** 9 kHz to 30 MHz, U-NII-2A; highest channel



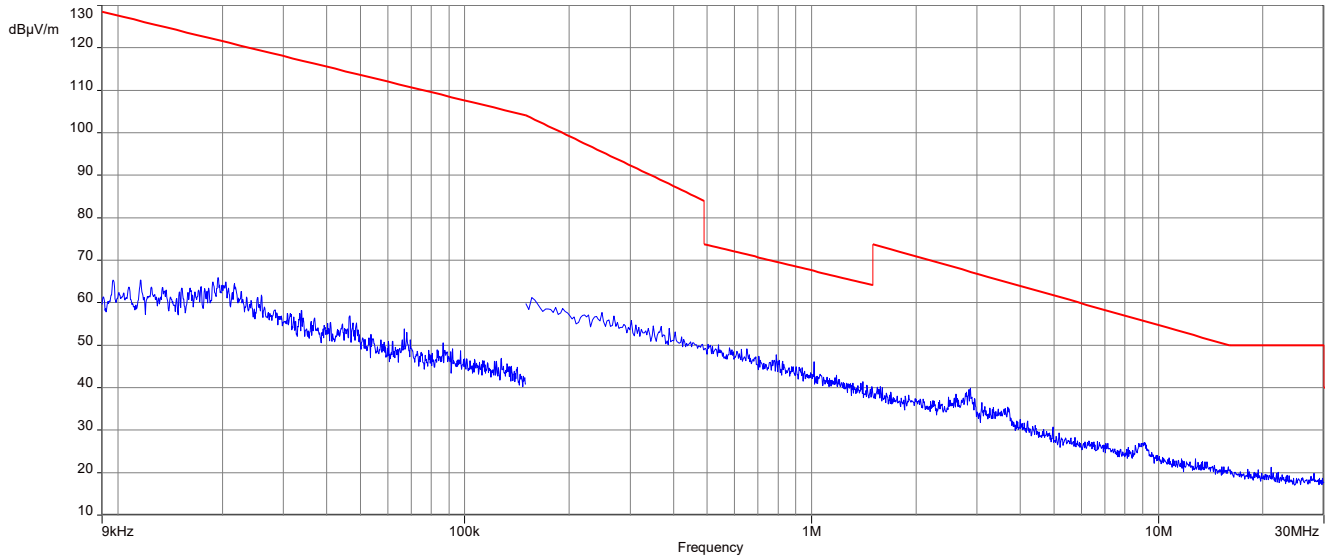
**Plot 7:** 9 kHz to 30 MHz, U-NII-2C; lowest channel



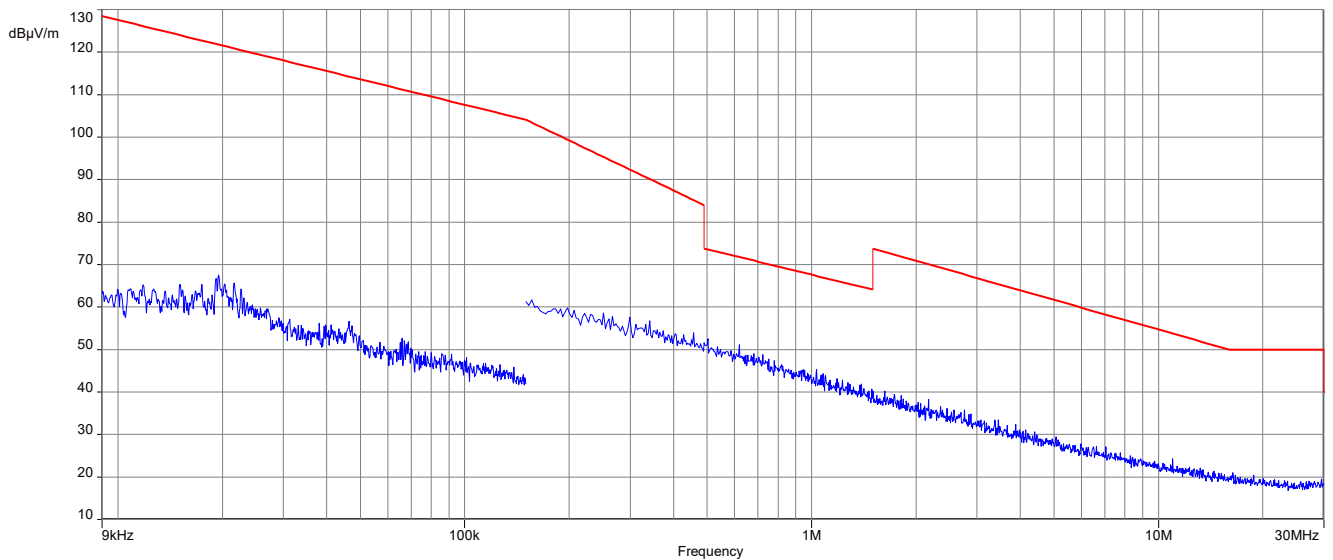
**Plot 8:** 9 kHz to 30 MHz, U-NII-2C; middle channel



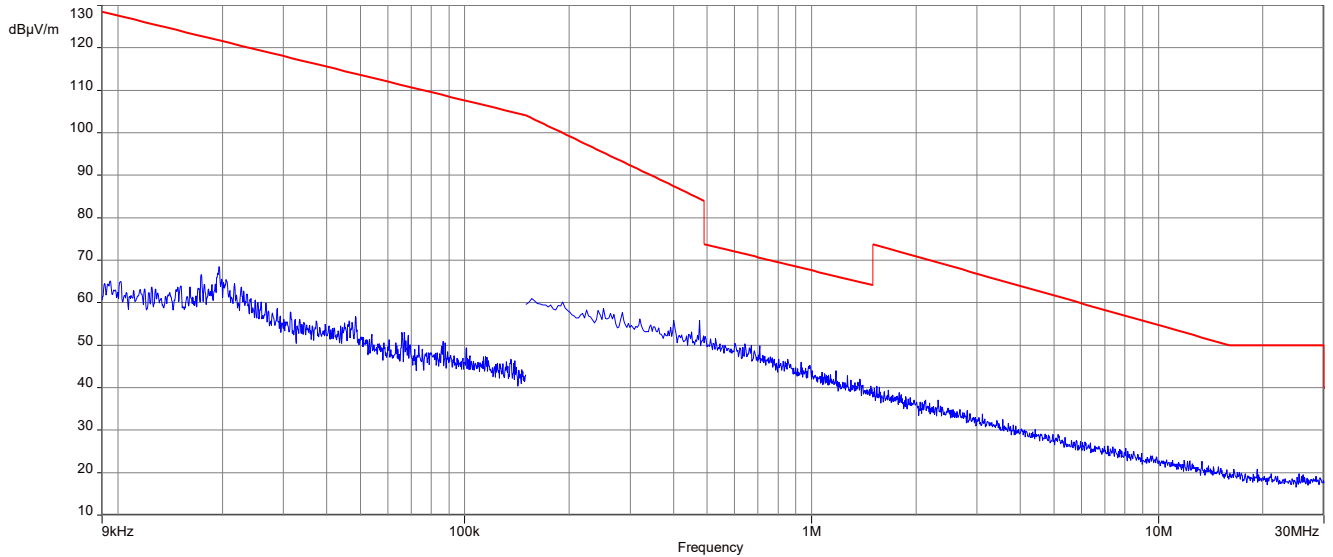
**Plot 9:** 9 kHz to 30 MHz, U-NII-2C; highest channel



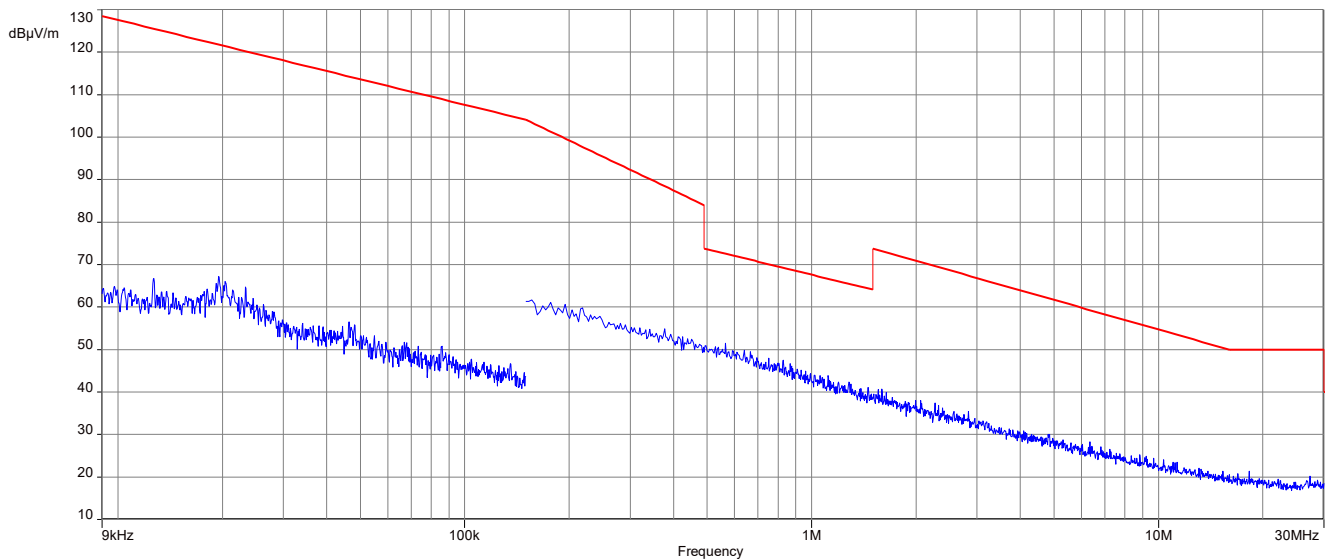
**Plot 10:** 9 kHz to 30 MHz, U-NII-3; lowest channel



**Plot 11:** 9 kHz to 30 MHz, U-NII-3; middle channel

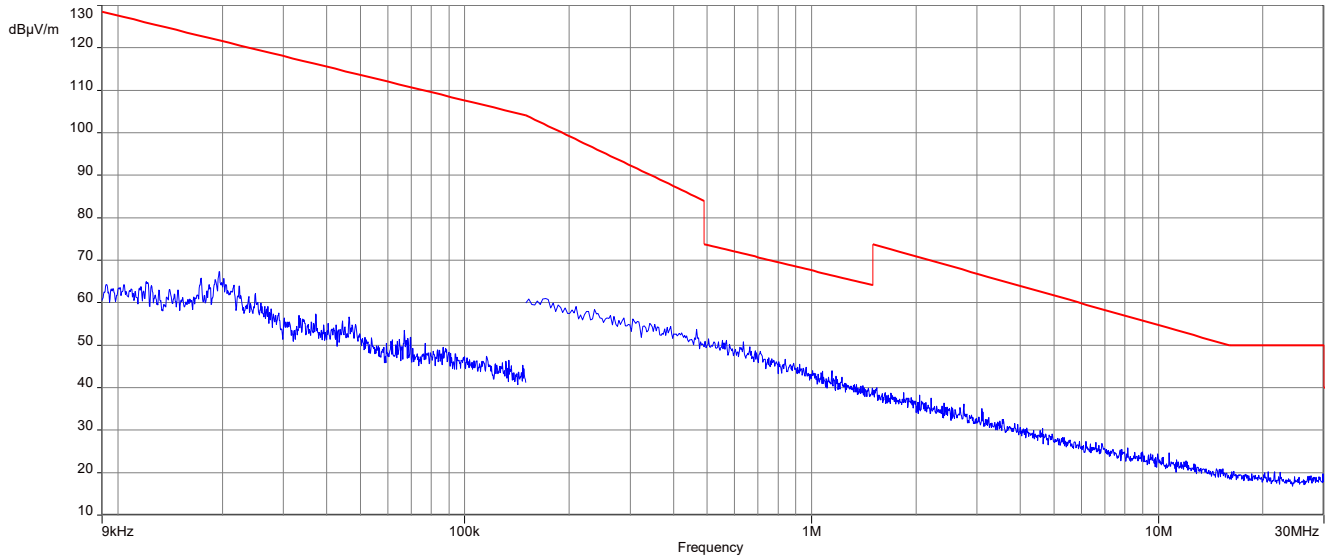


**Plot 12:** 9 kHz to 30 MHz, U-NII-3; highest channel

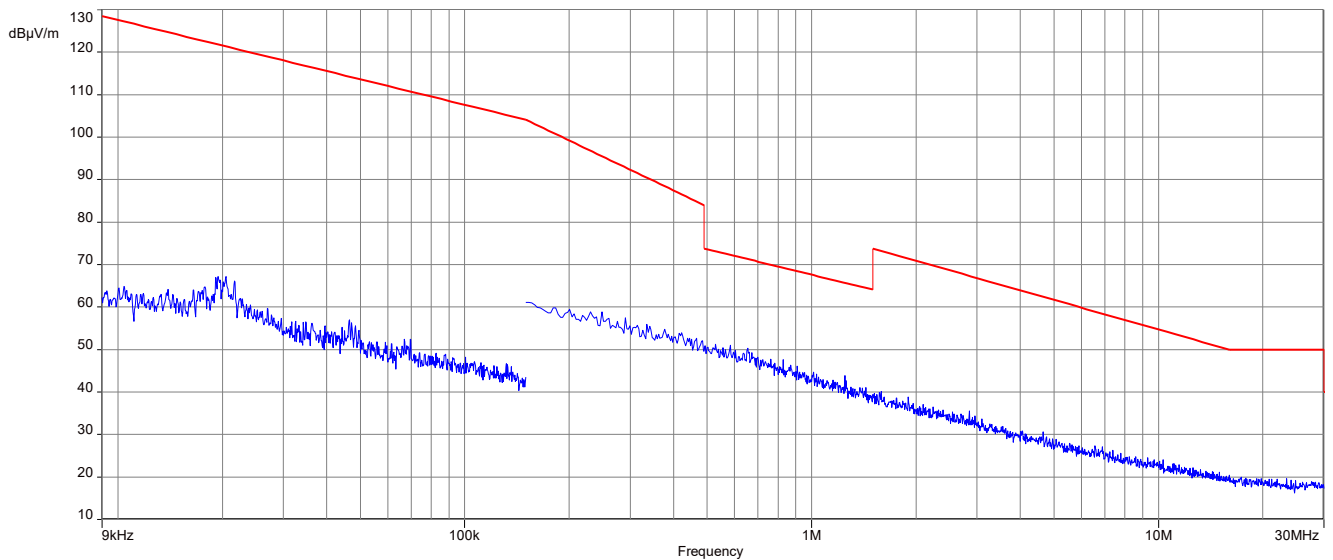


**Plots:** 40 MHz channel bandwidth

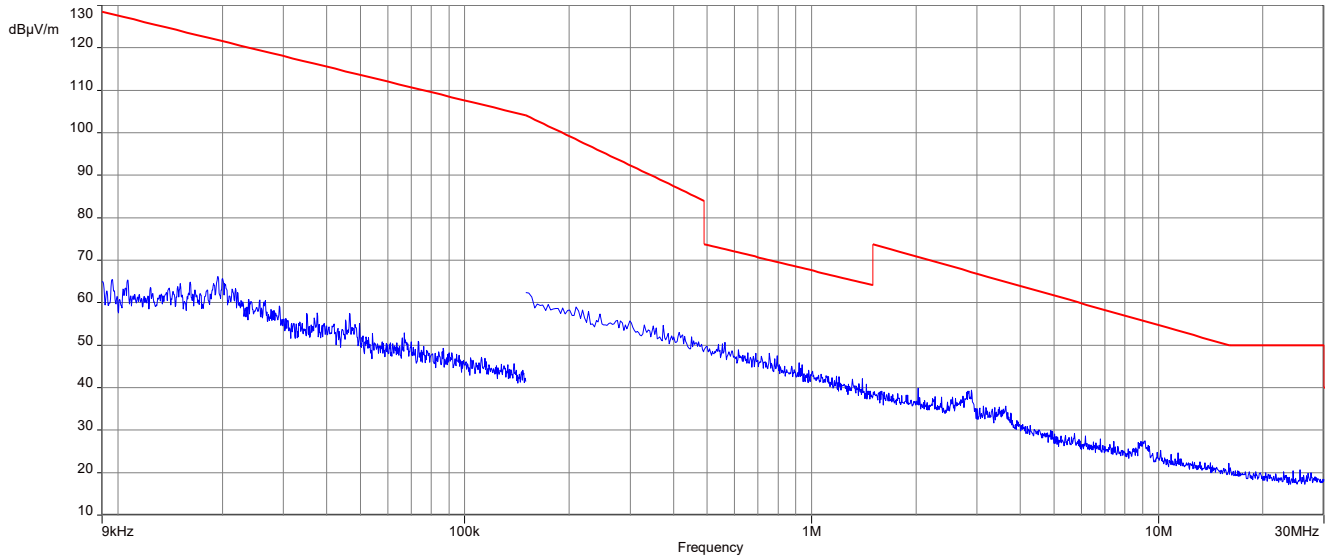
**Plot 1:** 9 kHz to 30 MHz, U-NII-1; lowest channel



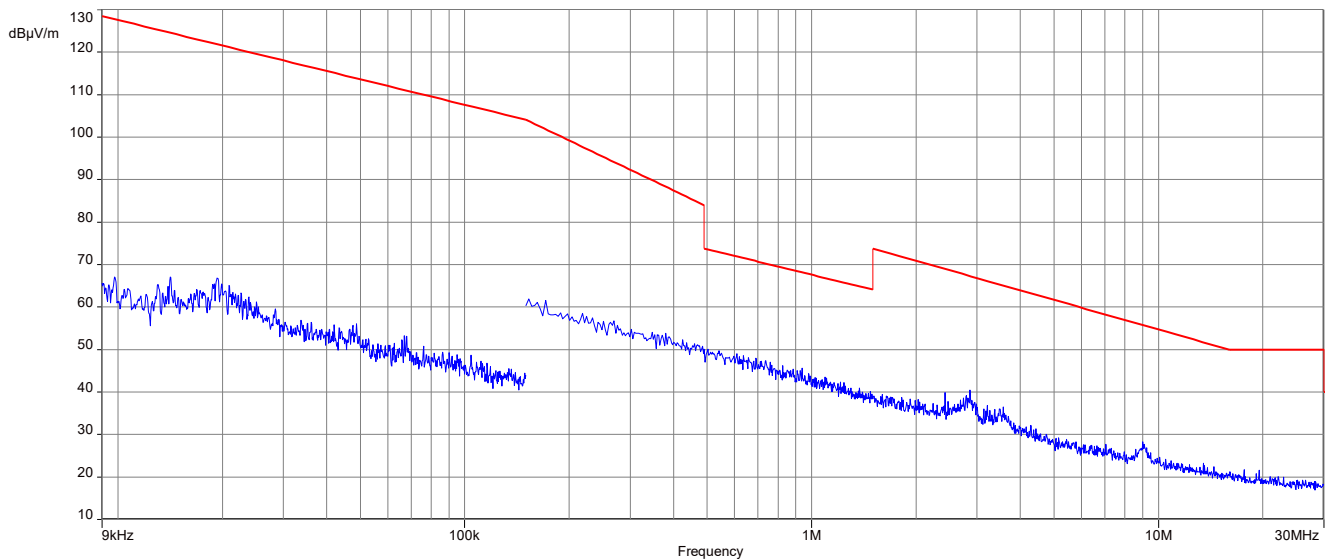
**Plot 2:** 9 kHz to 30 MHz, U-NII-1; highest channel



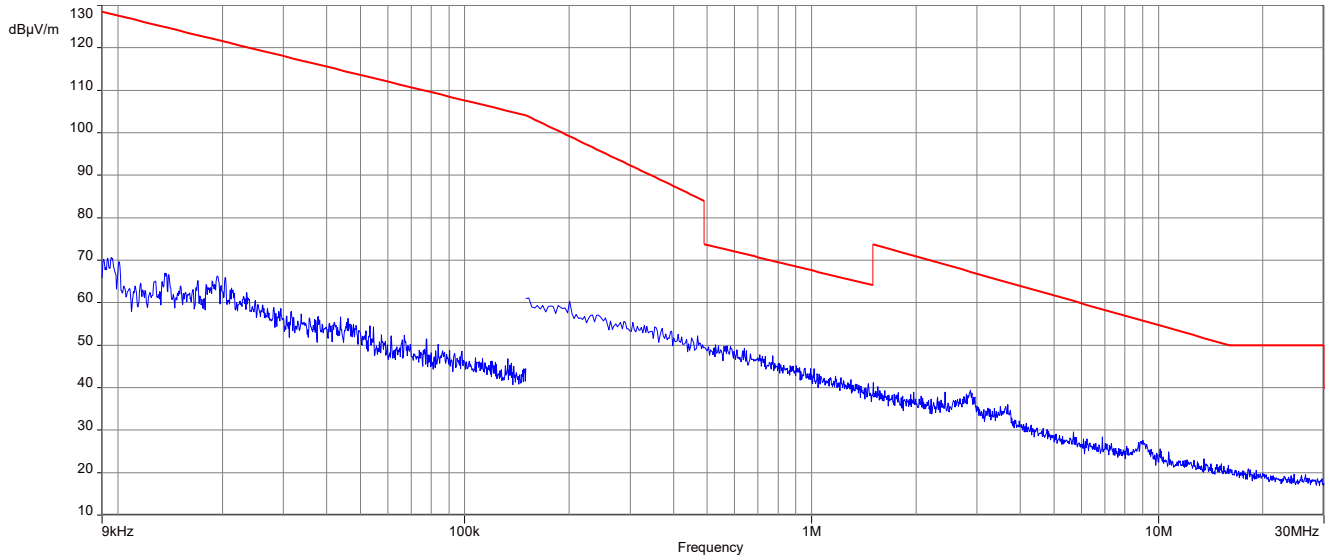
**Plot 3:** 9 kHz to 30 MHz, U-NII-2A; lowest channel



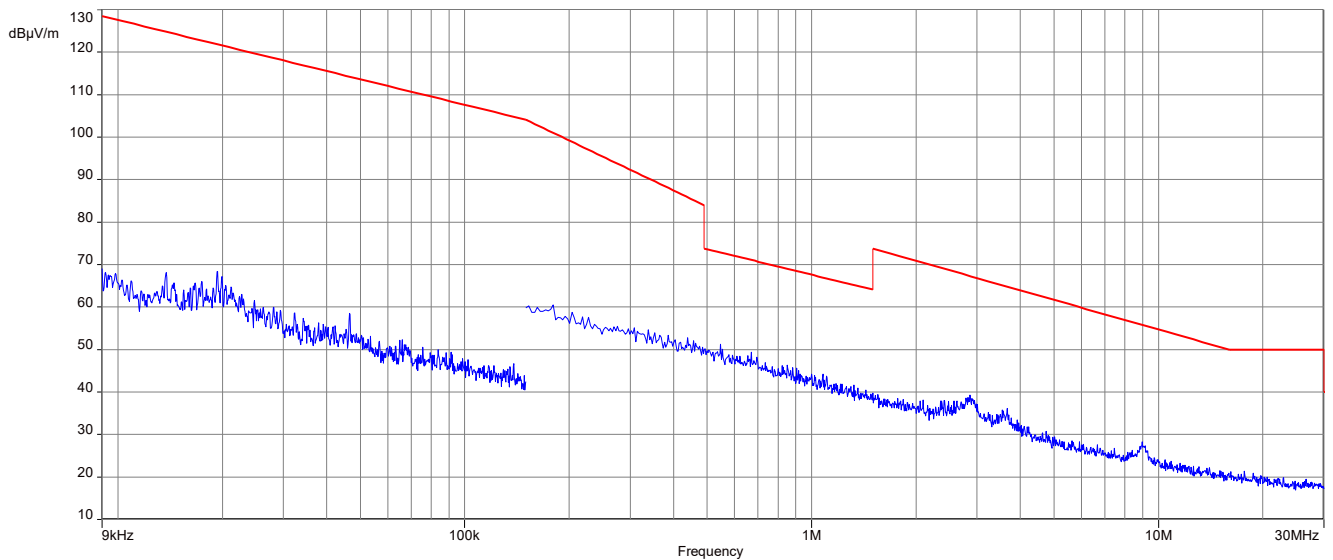
**Plot 4:** 9 kHz to 30 MHz, U-NII-2A; highest channel



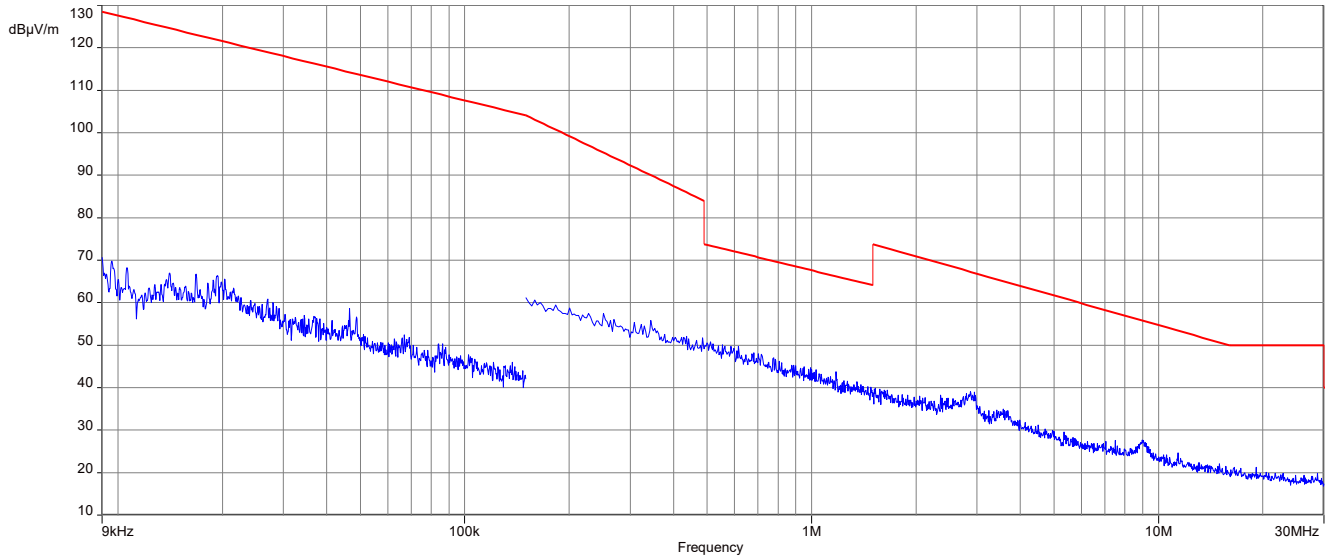
**Plot 5:** 9 kHz to 30 MHz, U-NII-2C; lowest channel



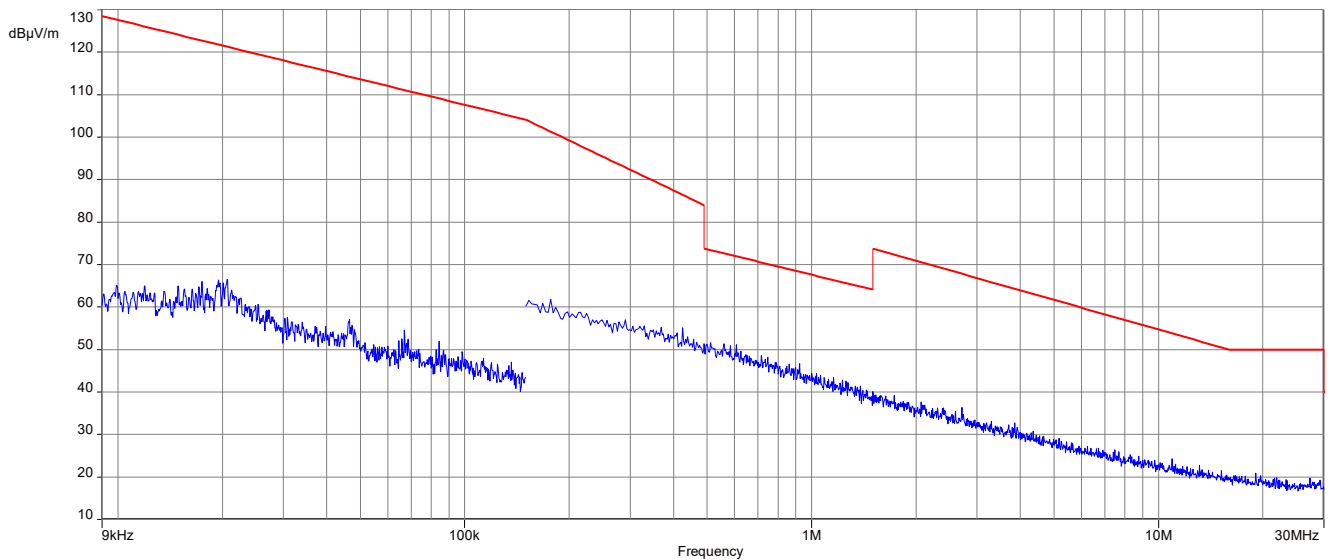
**Plot 6:** 9 kHz to 30 MHz, U-NII-2C; middle channel



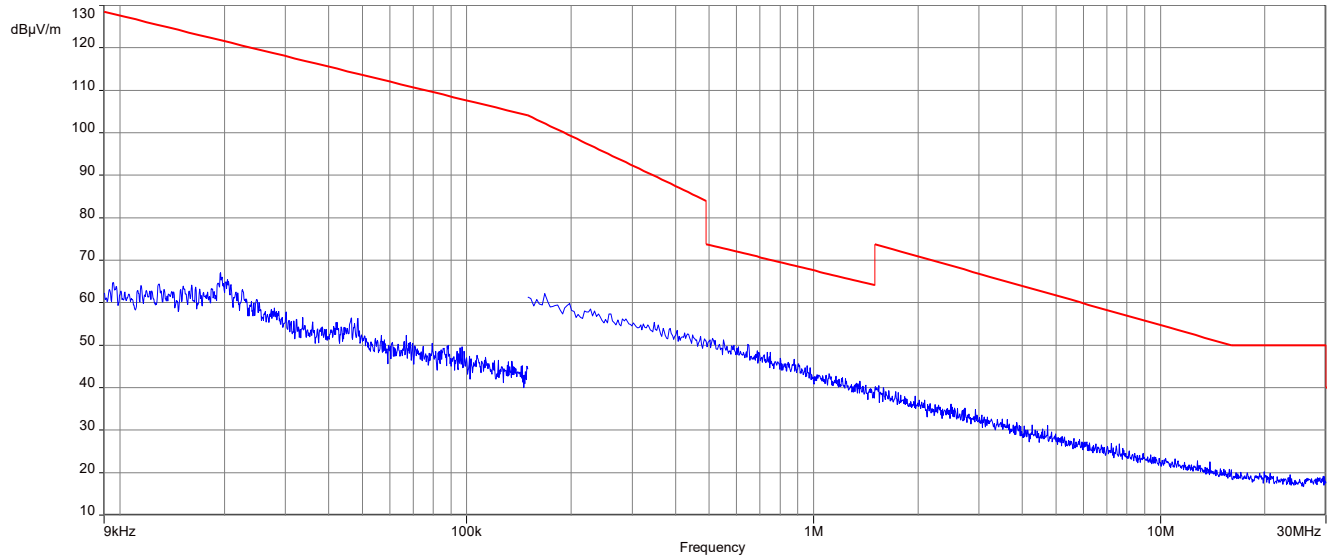
**Plot 7:** 9 kHz to 30 MHz, U-NII-2C; highest channel



**Plot 8:** 9 kHz to 30 MHz, U-NII-3; lowest channel

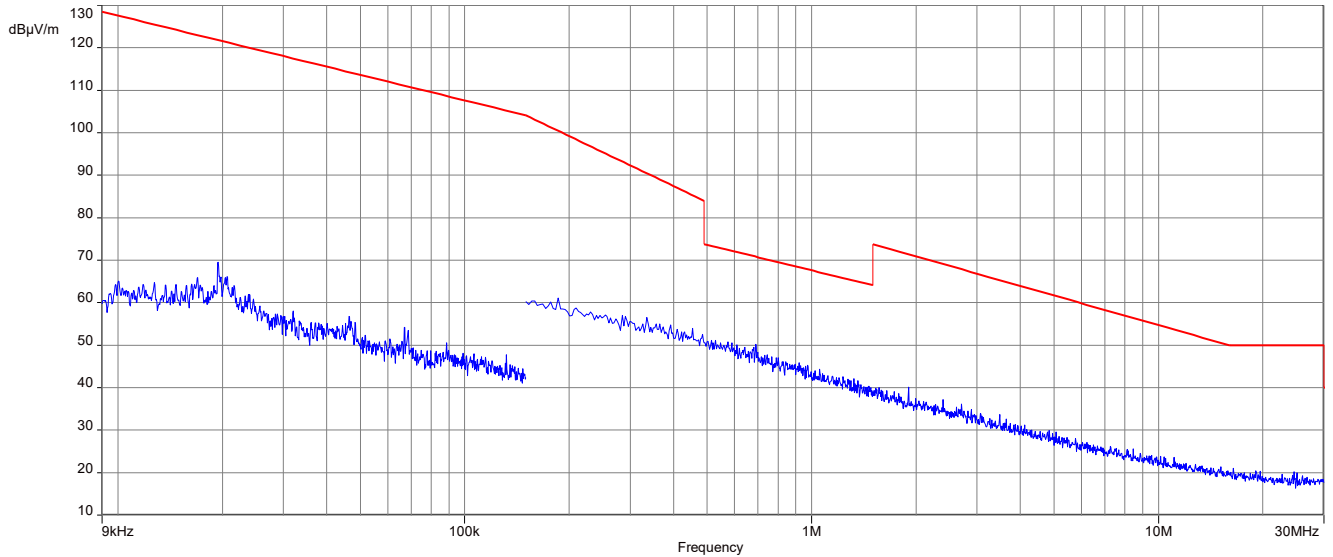


**Plot 9:** 9 kHz to 30 MHz, U-NII-3; highest channel

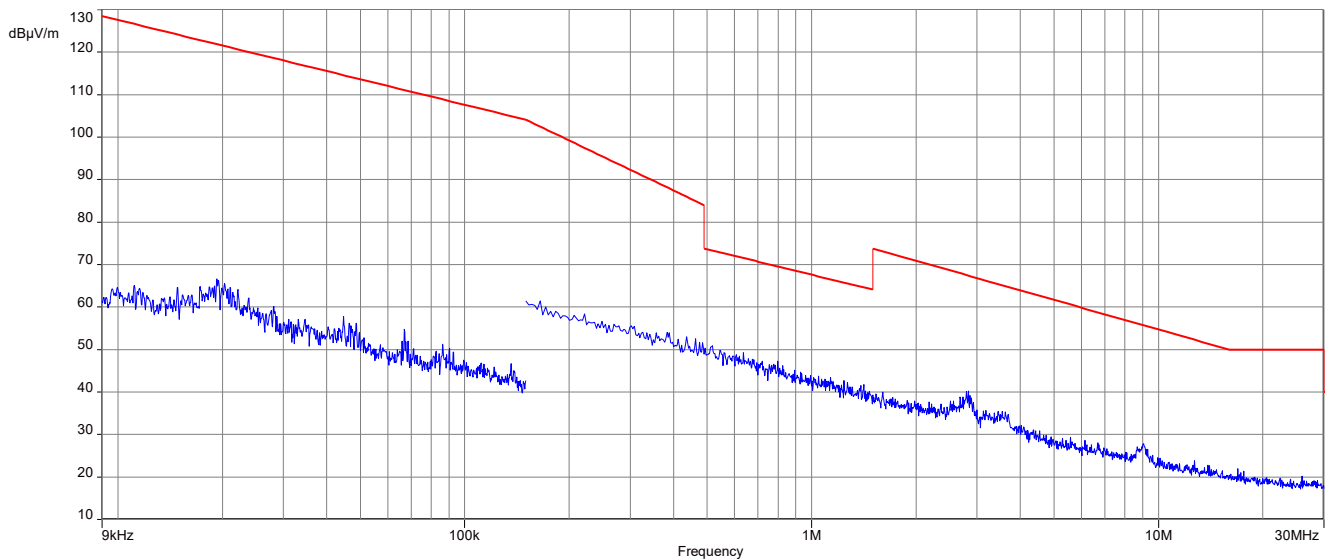


**Plots:** 80 MHz channel bandwidth

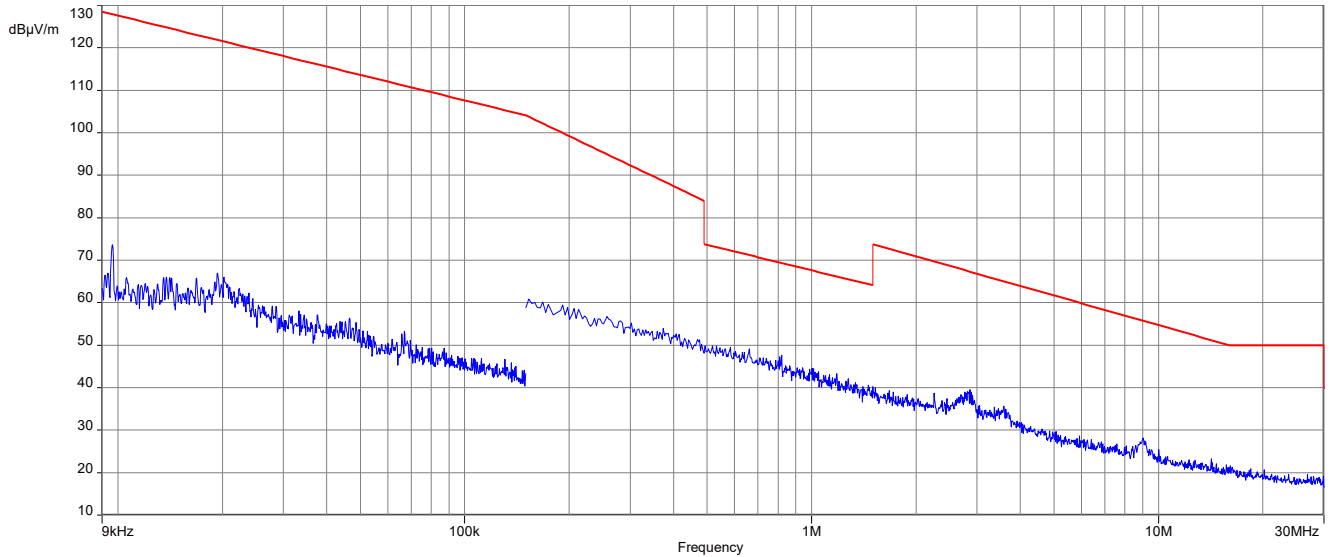
**Plot 1:** 9 kHz to 30 MHz, U-NII-1; middle channel



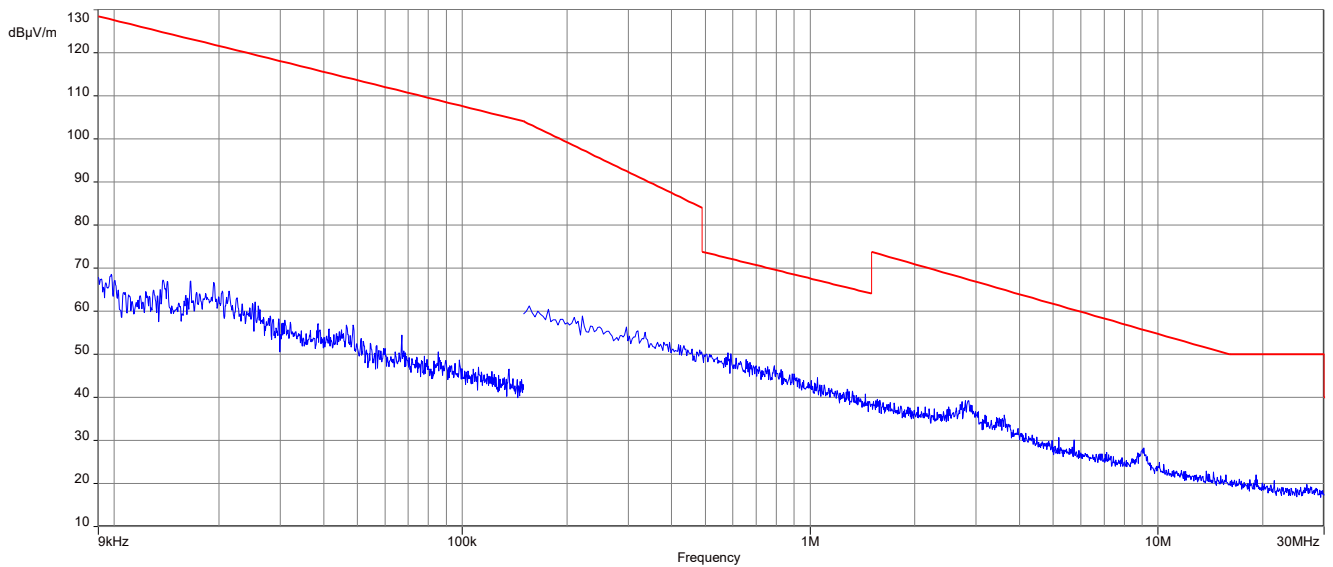
**Plot 2:** 9 kHz to 30 MHz, U-NII-2A; middle channel



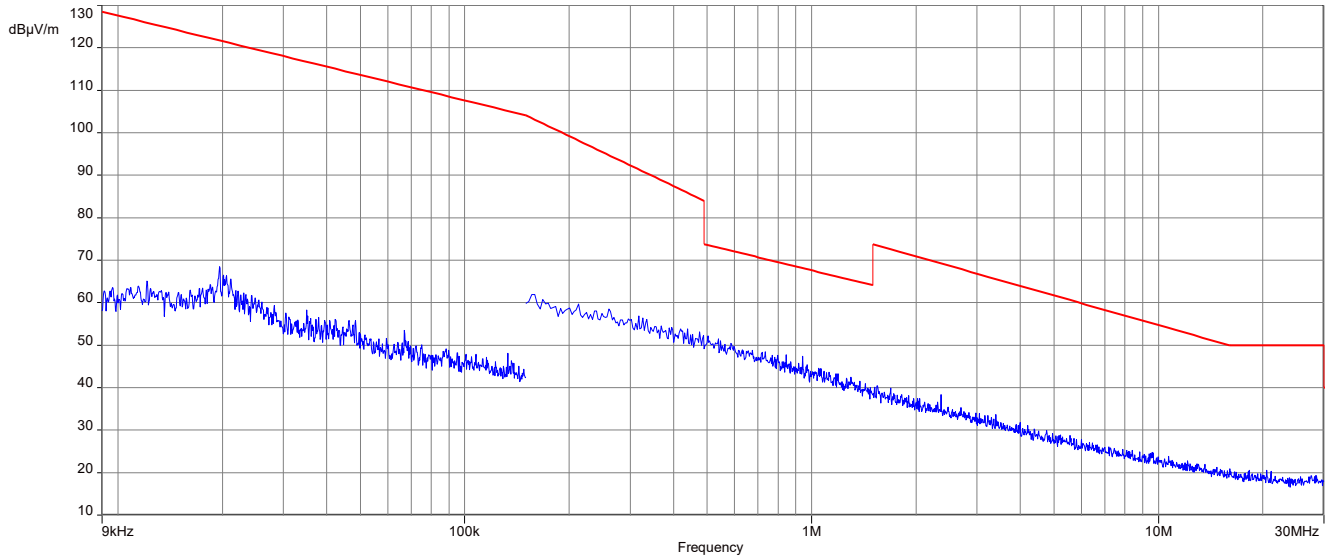
**Plot 3:** 9 kHz to 30 MHz, U-NII-2C; lowest channel



**Plot 4:** 9 kHz to 30 MHz, U-NII-2C; highest channel



**Plot 5:** 9 kHz to 30 MHz, U-NII-3; middle channel



### 12.3 Spurious emissions radiated 30 MHz to 1 GHz

Measurement:

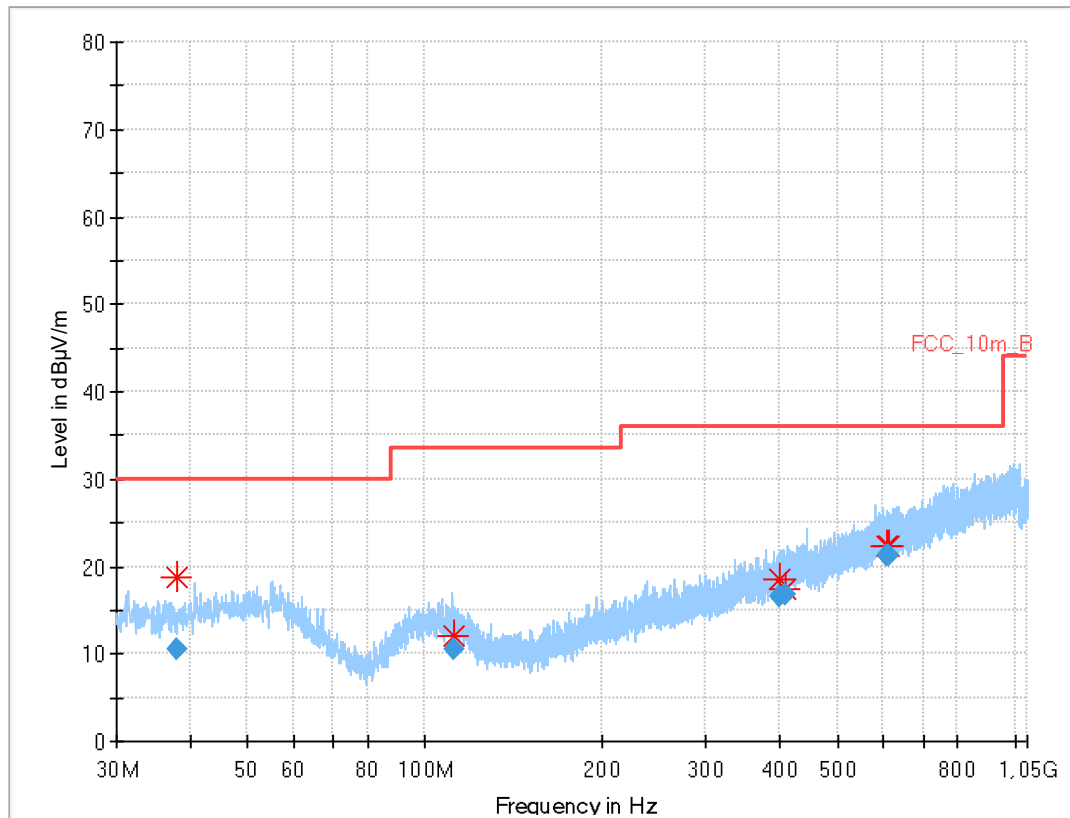
| Measurement parameter    |                        |
|--------------------------|------------------------|
| Detector:                | Quasi Peak             |
| Sweep time:              | Auto                   |
| Resolution bandwidth:    | 120 kHz                |
| Video bandwidth:         | 500 kHz                |
| Span:                    | 30 MHz to 1 GHz        |
| Test setup:              | See sub clause 7.1 – A |
| Measurement uncertainty: | See chapter 9          |

Limits:

| TX Spurious Emissions Radiated |                               |                      |
|--------------------------------|-------------------------------|----------------------|
| §15.209 / RSS-247              |                               |                      |
| Frequency (MHz)                | Field Strength (dB $\mu$ V/m) | Measurement distance |
| 30 - 88                        | 30.0                          | 10                   |
| 88 – 216                       | 33.5                          | 10                   |
| 216 – 960                      | 36.0                          | 10                   |
| Above 960                      | 54.0                          | 3                    |
| §15.407                        |                               |                      |
| Outside the restricted bands!  | -27 dBm / MHz                 |                      |

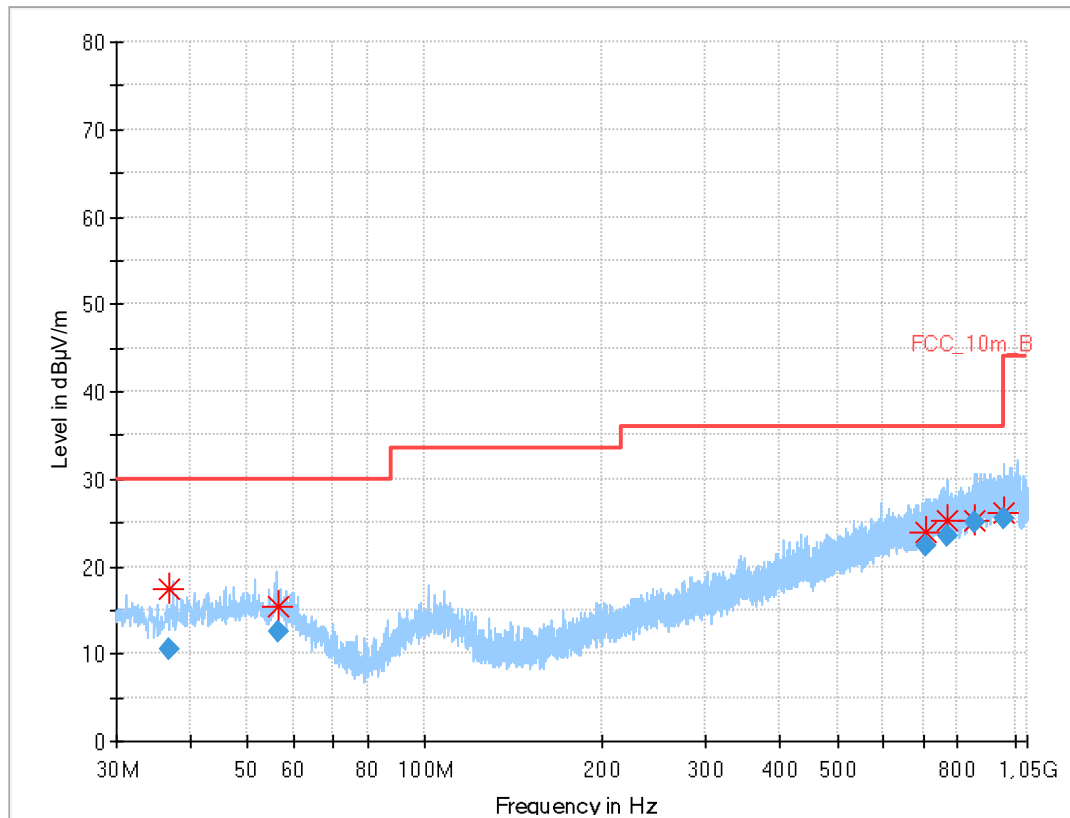
**Plots:**

**Plot 1:** 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-1; valid for all modes and channels

**Results:**

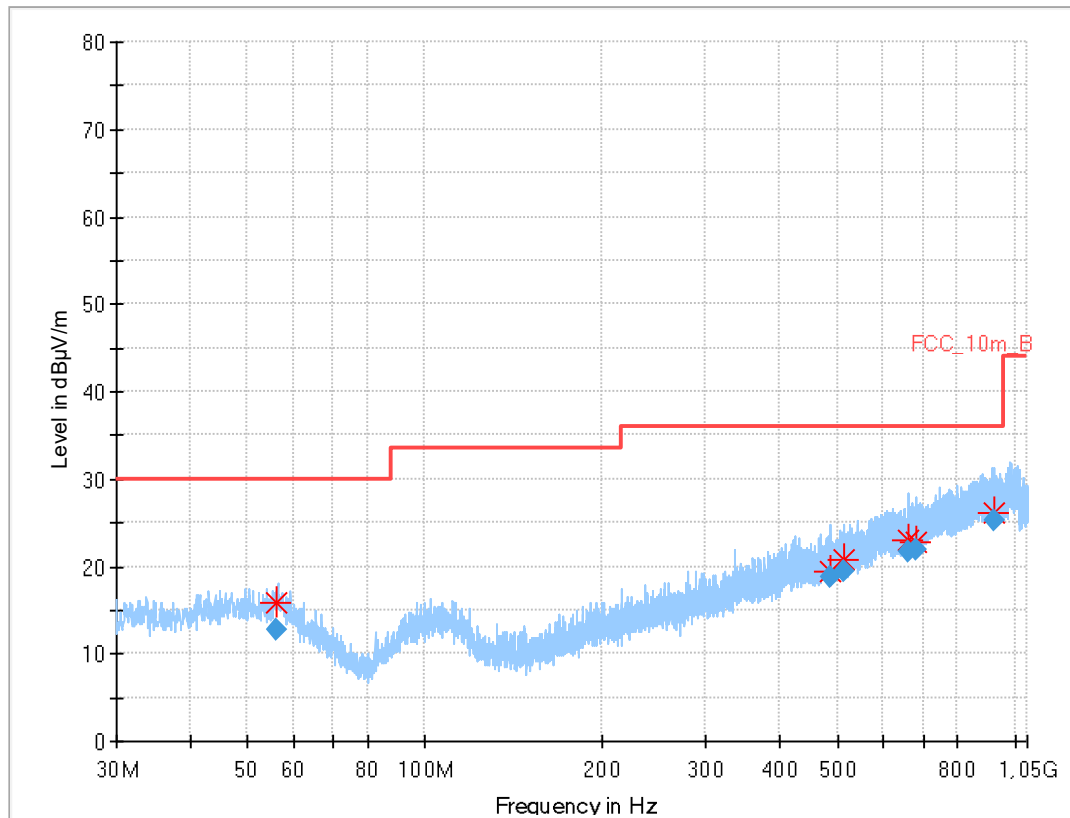
| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 38.029560       | 10.56              | 30.00          | 19.44       | 1000.0          | 120.000         | 164.0       | H   | 77.0          | 13.1       |
| 111.665280      | 10.58              | 33.50          | 22.92       | 1000.0          | 120.000         | 170.0       | V   | 292.0         | 12.5       |
| 400.397640      | 16.48              | 36.00          | 19.52       | 1000.0          | 120.000         | 170.0       | H   | 249.0         | 17.5       |
| 407.089440      | 16.70              | 36.00          | 19.30       | 1000.0          | 120.000         | 145.0       | H   | 292.0         | 17.7       |
| 608.464800      | 21.22              | 36.00          | 14.78       | 1000.0          | 120.000         | 170.0       | H   | 94.0          | 21.5       |
| 611.744160      | 21.33              | 36.00          | 14.67       | 1000.0          | 120.000         | 127.0       | H   | 251.0         | 21.6       |

**Plot 2:** 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-2A; valid for all modes and channels

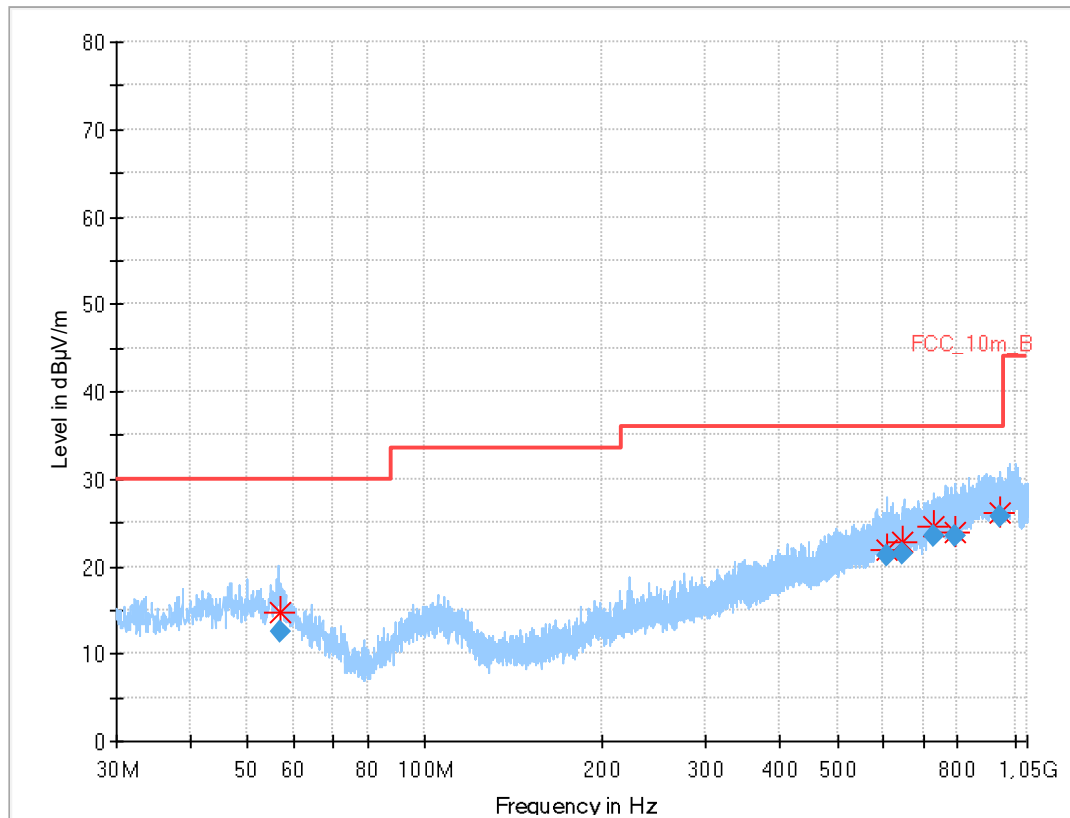


#### Results:

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 36.826200       | 10.48              | 30.00          | 19.52       | 1000.0          | 120.000         | 134.0       | H   | 250.0         | 12.9       |
| 56.409240       | 12.60              | 30.00          | 17.40       | 1000.0          | 120.000         | 170.0       | H   | 78.0          | 15.2       |
| 706.818240      | 22.43              | 36.00          | 13.57       | 1000.0          | 120.000         | 98.0        | H   | 202.0         | 21.8       |
| 766.517640      | 23.50              | 36.00          | 12.50       | 1000.0          | 120.000         | 170.0       | H   | 277.0         | 23.3       |
| 854.520000      | 24.93              | 36.00          | 11.07       | 1000.0          | 120.000         | 98.0        | V   | 257.0         | 24.3       |
| 956.595000      | 25.57              | 36.00          | 10.43       | 1000.0          | 120.000         | 170.0       | H   | 169.0         | 24.8       |

**Plot 3:** 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-2C; valid for all modes and channels**Results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 55.852320       | 12.74              | 30.00          | 17.26       | 1000.0          | 120.000         | 114.0       | V   | 101.0         | 15.3       |
| 487.502880      | 18.68              | 36.00          | 17.32       | 1000.0          | 120.000         | 148.0       | V   | 22.0          | 18.9       |
| 514.081680      | 19.42              | 36.00          | 16.58       | 1000.0          | 120.000         | 148.0       | H   | 2.0           | 19.4       |
| 662.116080      | 21.66              | 36.00          | 14.34       | 1000.0          | 120.000         | 170.0       | H   | 187.0         | 21.6       |
| 681.138840      | 21.93              | 36.00          | 14.07       | 1000.0          | 120.000         | 170.0       | H   | 22.0          | 21.7       |
| 923.474280      | 25.34              | 36.00          | 10.66       | 1000.0          | 120.000         | 170.0       | H   | 281.0         | 24.8       |

**Plot 4:** 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-3; valid for all modes and channels**Results:**

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 56.786640       | 12.48              | 30.00          | 17.52       | 1000.0          | 120.000         | 170.0       | H   | 68.0          | 15.1       |
| 609.003480      | 21.21              | 36.00          | 14.79       | 1000.0          | 120.000         | 165.0       | H   | 89.0          | 21.5       |
| 647.448240      | 21.53              | 36.00          | 14.47       | 1000.0          | 120.000         | 161.0       | V   | 276.0         | 21.5       |
| 726.961080      | 23.36              | 36.00          | 12.64       | 1000.0          | 120.000         | 114.0       | V   | 202.0         | 22.4       |
| 789.509880      | 23.39              | 36.00          | 12.61       | 1000.0          | 120.000         | 170.0       | H   | 157.0         | 23.2       |
| 942.137760      | 25.63              | 36.00          | 10.37       | 1000.0          | 120.000         | 170.0       | H   | 202.0         | 24.8       |

## 12.4 Spurious emissions radiated 1 GHz to 40 GHz

Measurement:

| Measurement parameter    |                                                  |
|--------------------------|--------------------------------------------------|
| Detector:                | Peak / AVG                                       |
| Sweep time:              | Auto                                             |
| Resolution bandwidth:    | 1 MHz                                            |
| Video bandwidth:         | 3 MHz                                            |
| Span:                    | 1 GHz to 40 GHz                                  |
| Test setup:              | See sub clause 7.2 – C<br>See sub clause 7.3 – A |
| Measurement uncertainty: | See chapter 9                                    |

Limits:

| TX Spurious Emissions Radiated |                               |                      |
|--------------------------------|-------------------------------|----------------------|
| §15.209 / RSS-247              |                               |                      |
| Frequency (MHz)                | Field Strength (dB $\mu$ V/m) | Measurement distance |
| Above 960                      | 54.0                          | 3                    |
| §15.407                        |                               |                      |
| Outside the restricted bands!  | -27 dBm / MHz                 |                      |

**Results:** 20 MHz channel bandwidth

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-1 (5150 MHz to 5250 MHz)                            |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-2A (5250 MHz to 5350 MHz)                           |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-2C (5470 MHz to 5725 MHz)                           |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-3 (5725 MHz to 5850 MHz)                            |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

**Results:** 40 MHz channel bandwidth

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-1 (5150 MHz to 5250 MHz)                            |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-2A (5250 MHz to 5350 MHz)                           |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-2C (5470 MHz to 5725 MHz)                           |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBµV/m] / dBm             |          |                |                                                           |          |                |                                                           |          |                |
|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|-----------------------------------------------------------|----------|----------------|
| U-NII-3 (5725 MHz to 5850 MHz)                            |          |                |                                                           |          |                |                                                           |          |                |
| Lowest channel                                            |          |                | Middle channel                                            |          |                | Highest channel                                           |          |                |
| F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] | F [MHz]                                                   | Detector | Level [dBµV/m] |
| All detected peak emissions are below the average limit.  |          |                |                                                           |          |                |                                                           |          |                |
|                                                           | Peak     |                |                                                           | Peak     |                |                                                           | Peak     |                |
|                                                           | AVG      |                |                                                           | AVG      |                |                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                | For emissions above 18 GHz please take look at the plots. |          |                |

**Results:** 80 MHz channel bandwidth

| TX Spurious Emissions Radiated [dBμV/m] / dBm             |          |                |
|-----------------------------------------------------------|----------|----------------|
| U-NII-1 (5150 MHz to 5250 MHz)                            |          |                |
| Middle channel                                            |          |                |
| F [MHz]                                                   | Detector | Level [dBμV/m] |
| All detected peak emissions are below the average limit.  |          |                |
|                                                           | Peak     |                |
|                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                |

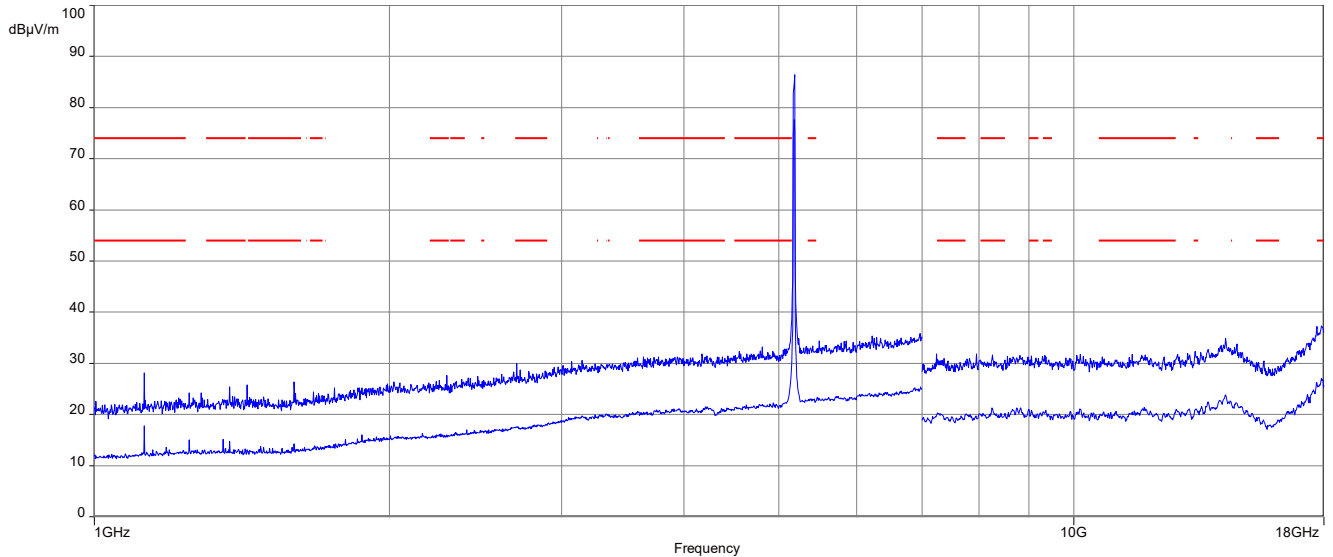
| TX Spurious Emissions Radiated [dBμV/m] / dBm             |          |                |
|-----------------------------------------------------------|----------|----------------|
| U-NII-2A (5250 MHz to 5350 MHz)                           |          |                |
| Middle channel                                            |          |                |
| F [MHz]                                                   | Detector | Level [dBμV/m] |
| All detected peak emissions are below the average limit.  |          |                |
|                                                           | Peak     |                |
|                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                |

| TX Spurious Emissions Radiated [dBμV/m] / dBm             |      |  |                                                           |      |  |
|-----------------------------------------------------------|------|--|-----------------------------------------------------------|------|--|
| U-NII-2C (5470 MHz to 5725 MHz)                           |      |  |                                                           |      |  |
| Lowest channel                                            |      |  | Highest channel                                           |      |  |
| All detected peak emissions are below the average limit.  |      |  |                                                           |      |  |
|                                                           | Peak |  |                                                           | Peak |  |
|                                                           | AVG  |  |                                                           | AVG  |  |
| For emissions above 18 GHz please take look at the plots. |      |  | For emissions above 18 GHz please take look at the plots. |      |  |

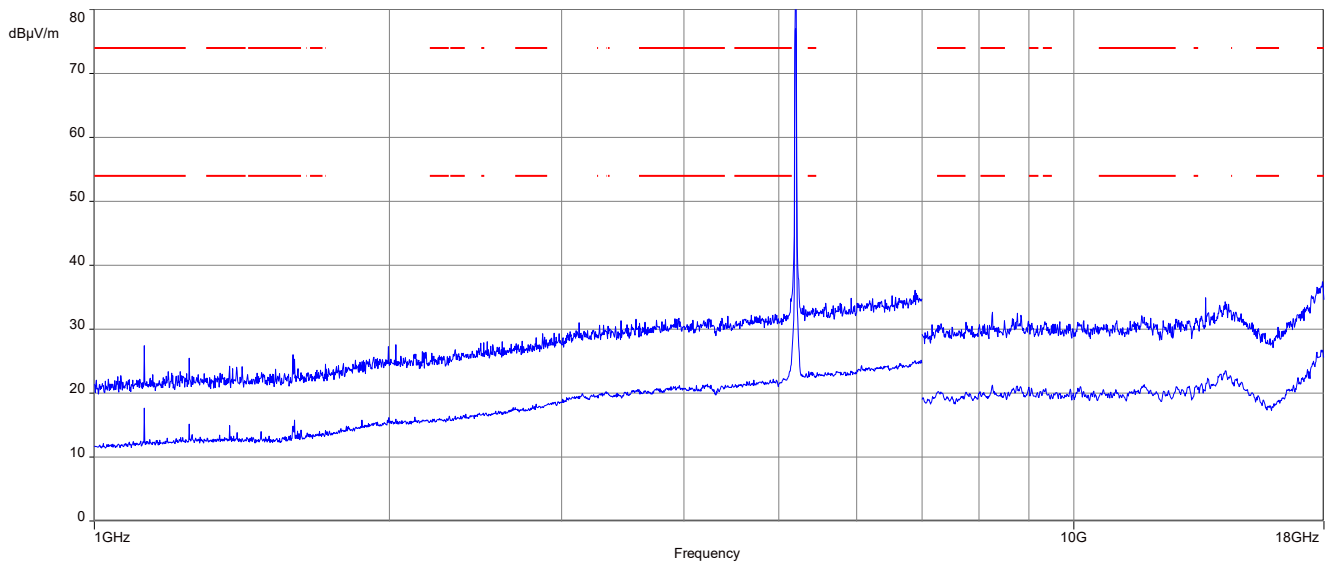
| TX Spurious Emissions Radiated [dBμV/m] / dBm             |          |                |
|-----------------------------------------------------------|----------|----------------|
| U-NII-3 (5725 MHz to 5850 MHz)                            |          |                |
| Middle channel                                            |          |                |
| F [MHz]                                                   | Detector | Level [dBμV/m] |
| All detected peak emissions are below the average limit.  |          |                |
|                                                           | Peak     |                |
|                                                           | AVG      |                |
| For emissions above 18 GHz please take look at the plots. |          |                |

**Plots:** 20 MHz channel bandwidth

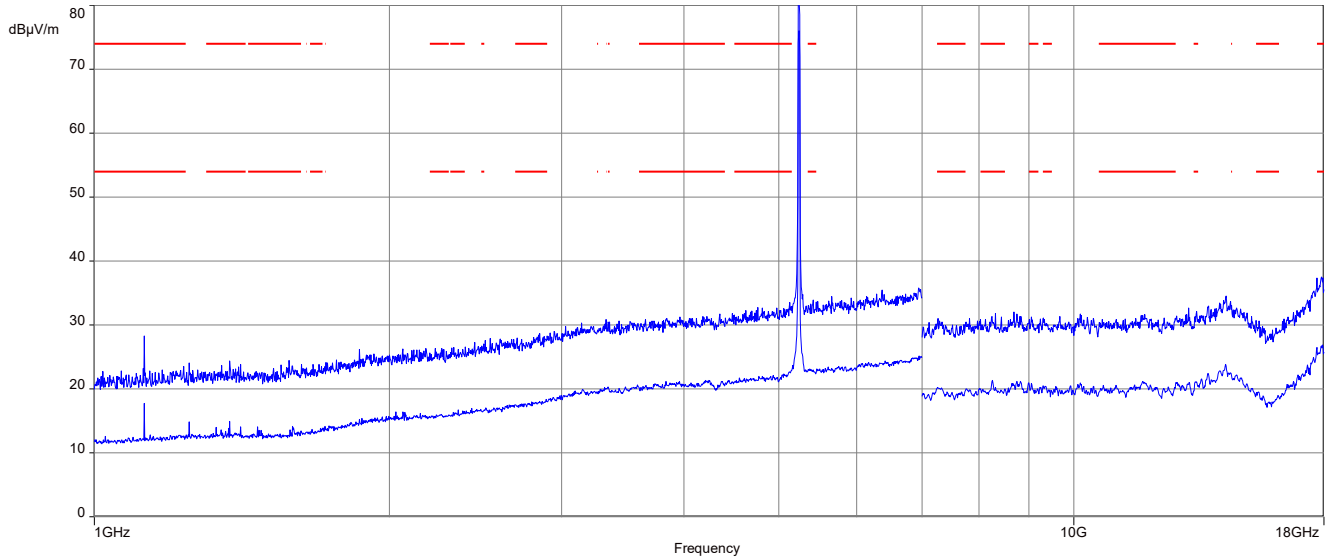
**Plot 1:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; lowest channel



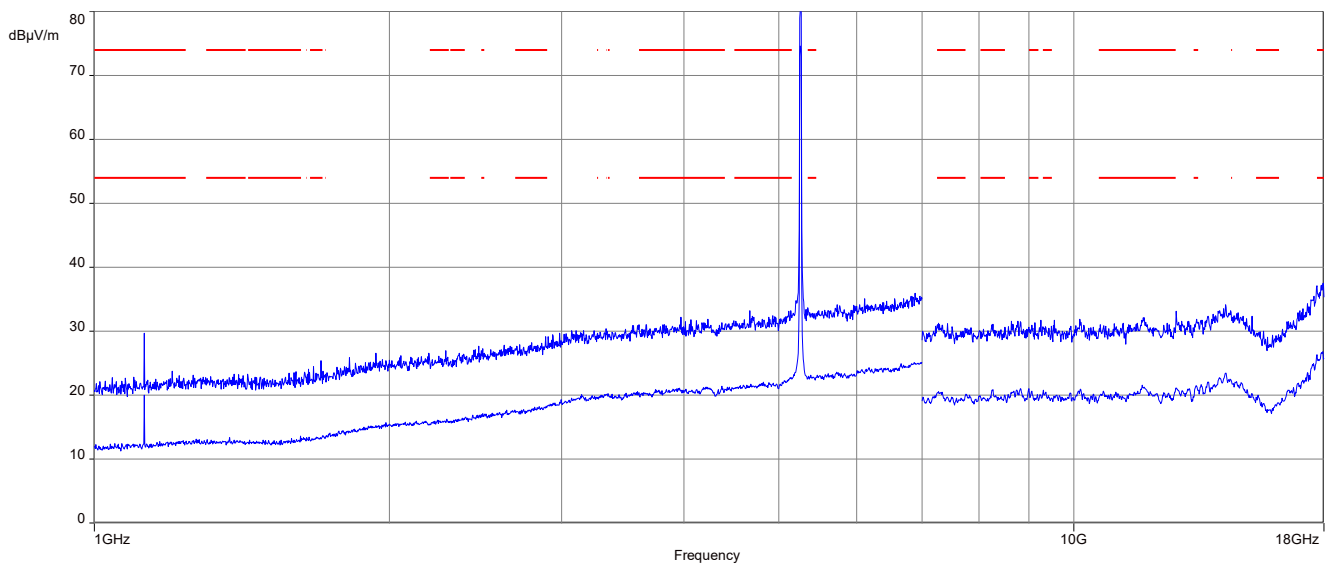
**Plot 2:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; middle channel



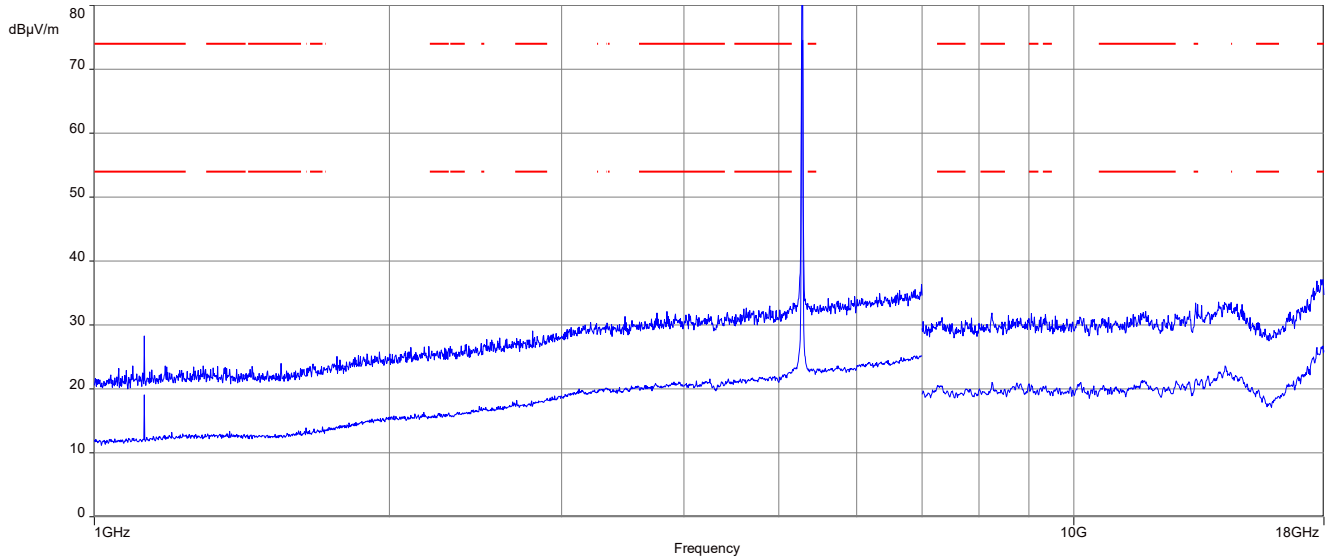
**Plot 3:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; highest channel



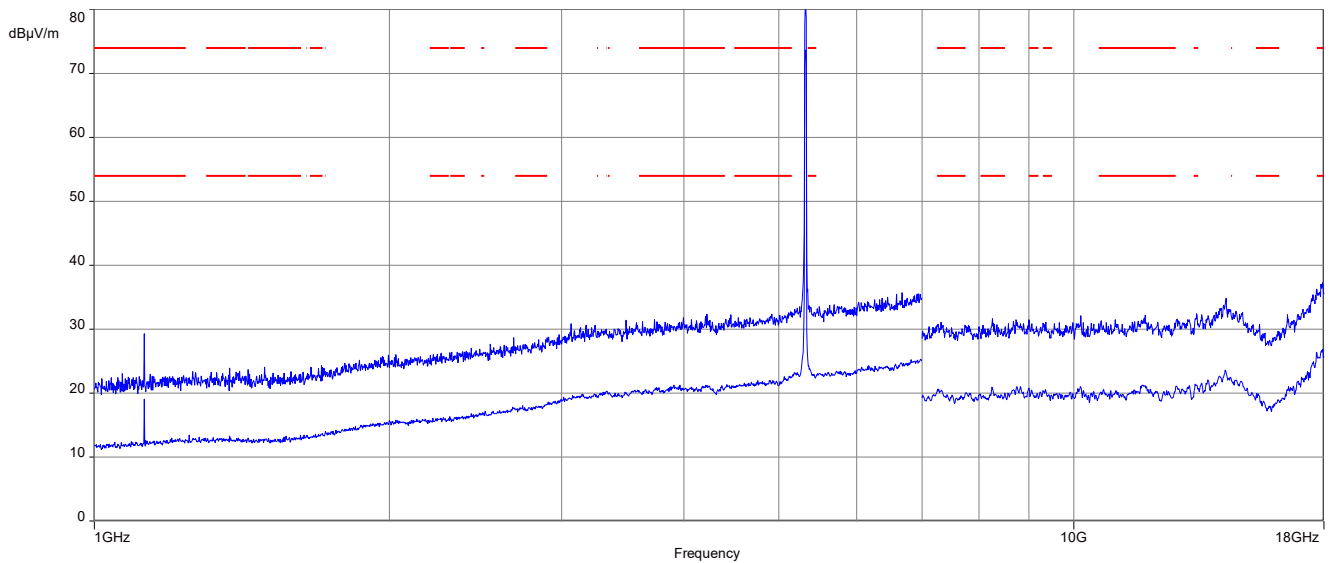
**Plot 4:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; lowest channel



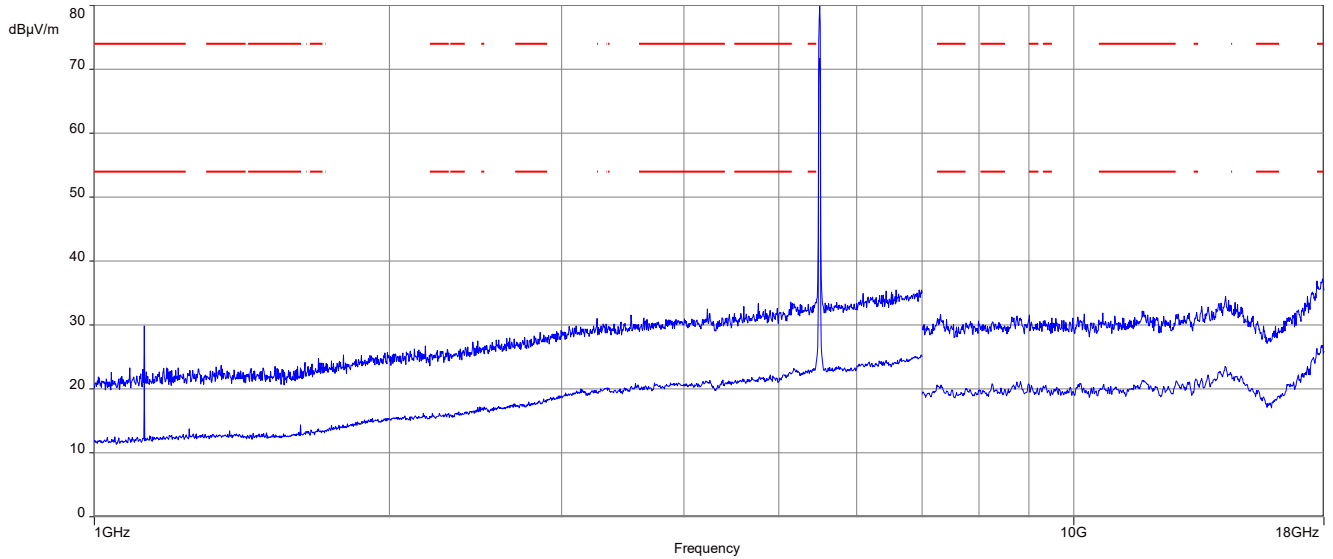
**Plot 5:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; middle channel



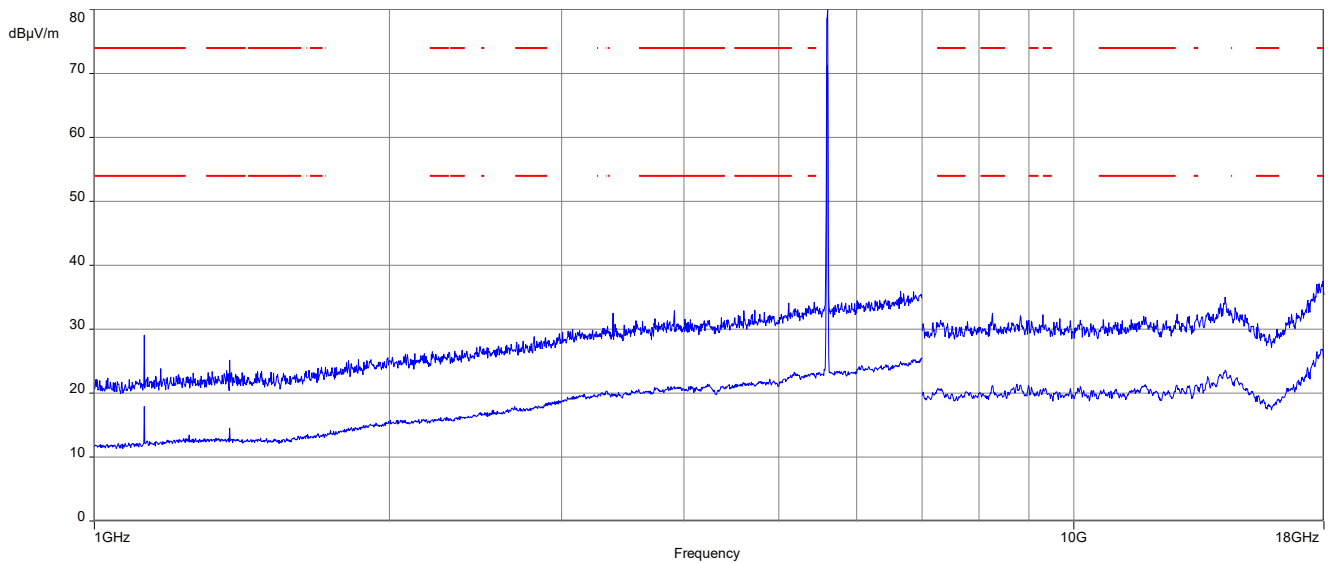
**Plot 6:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; highest channel



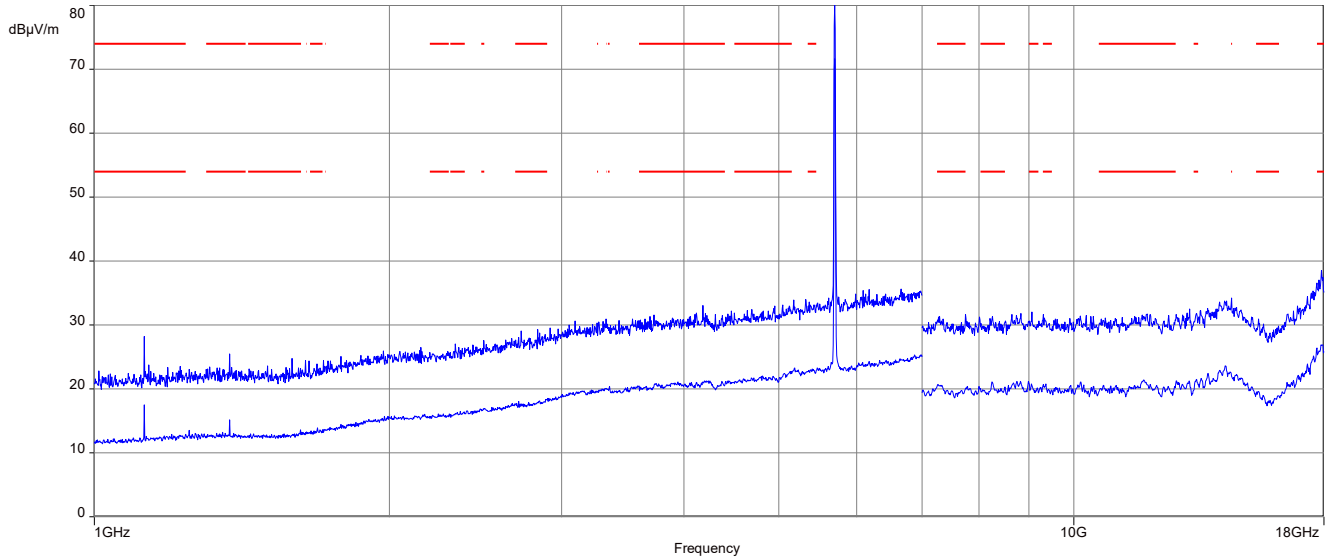
**Plot 7:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel



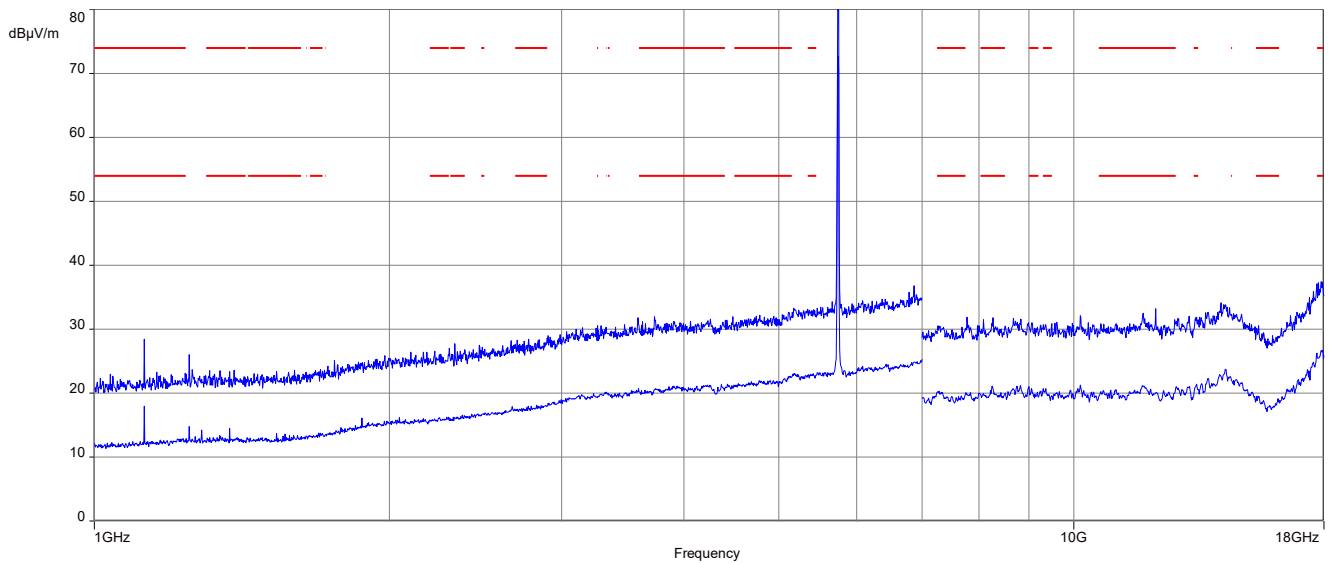
**Plot 8:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; middle channel



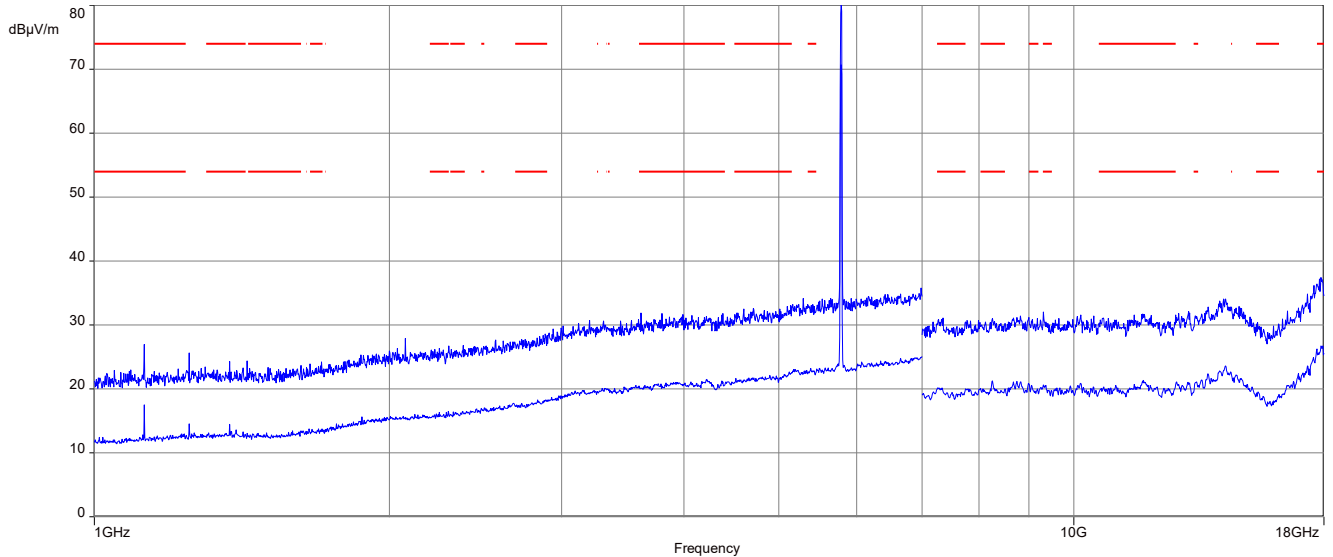
**Plot 9:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



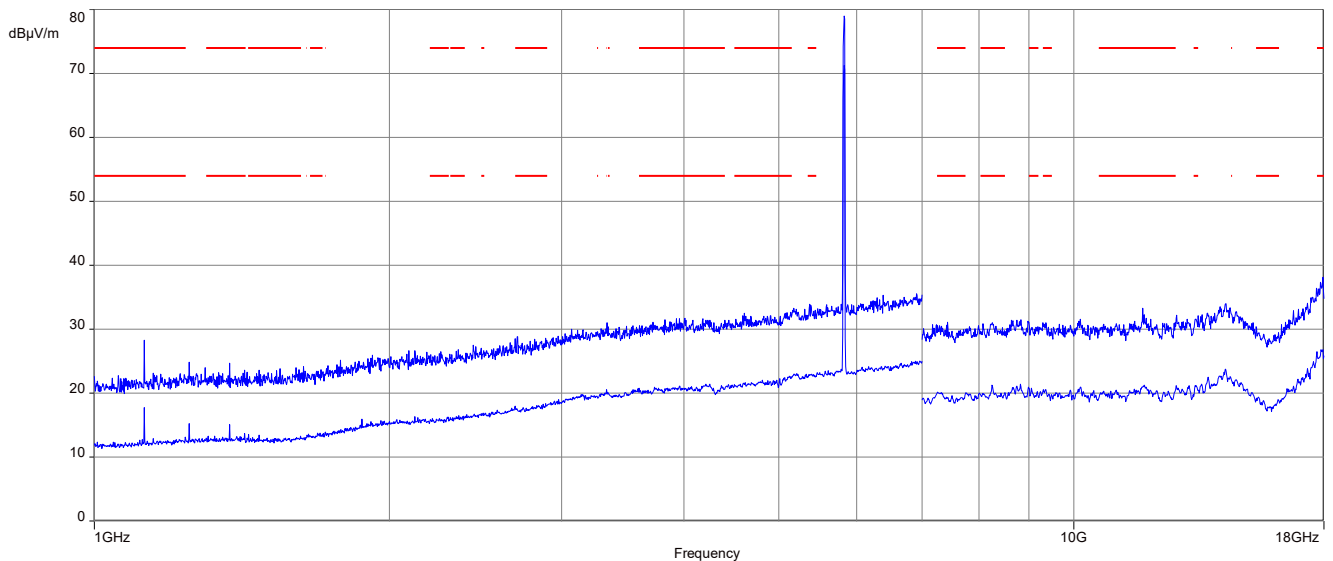
**Plot 10:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; lowest channel



**Plot 11:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; middle channel

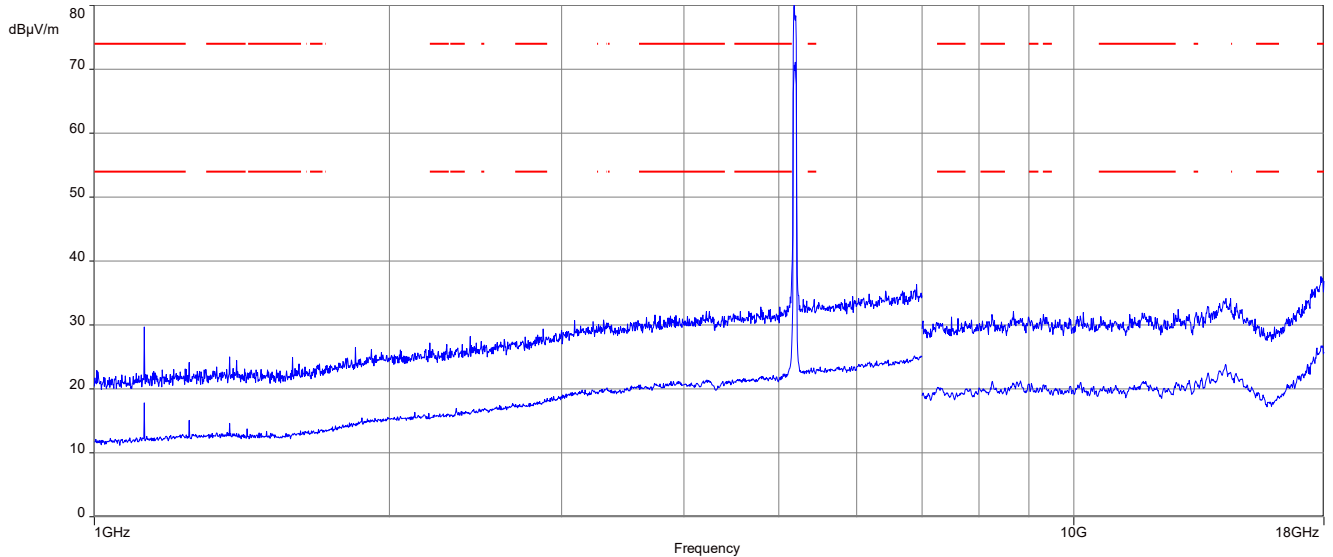


**Plot 12:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; highest channel

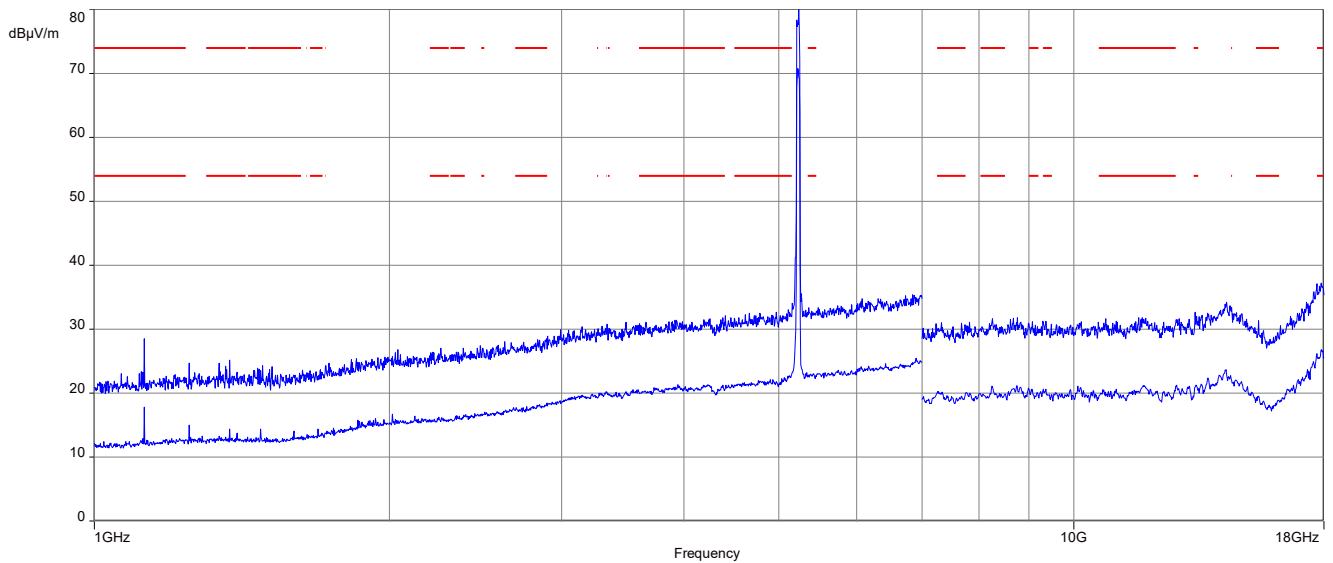


**Plots:** 40 MHz channel bandwidth

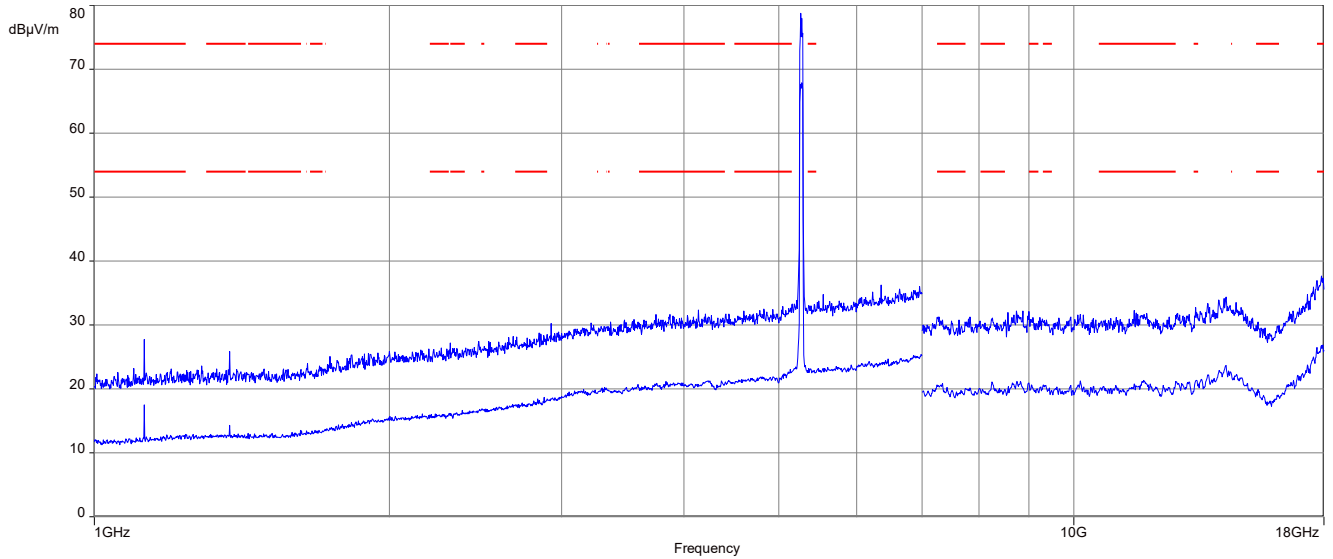
**Plot 1:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; lowest channel



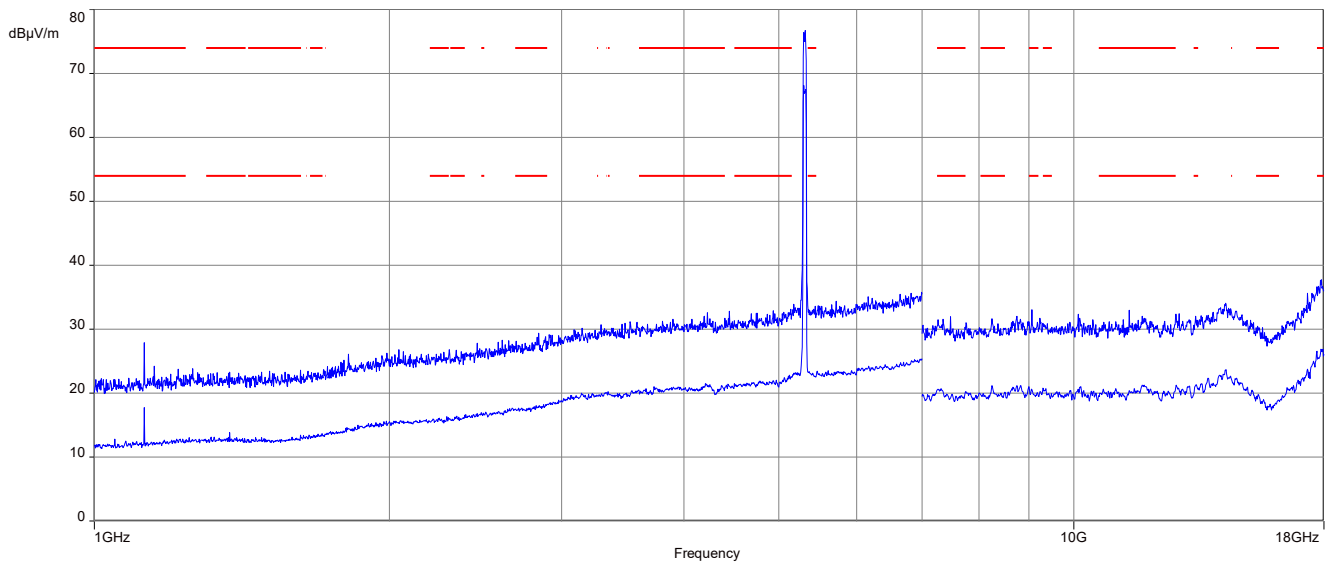
**Plot 2:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; highest channel



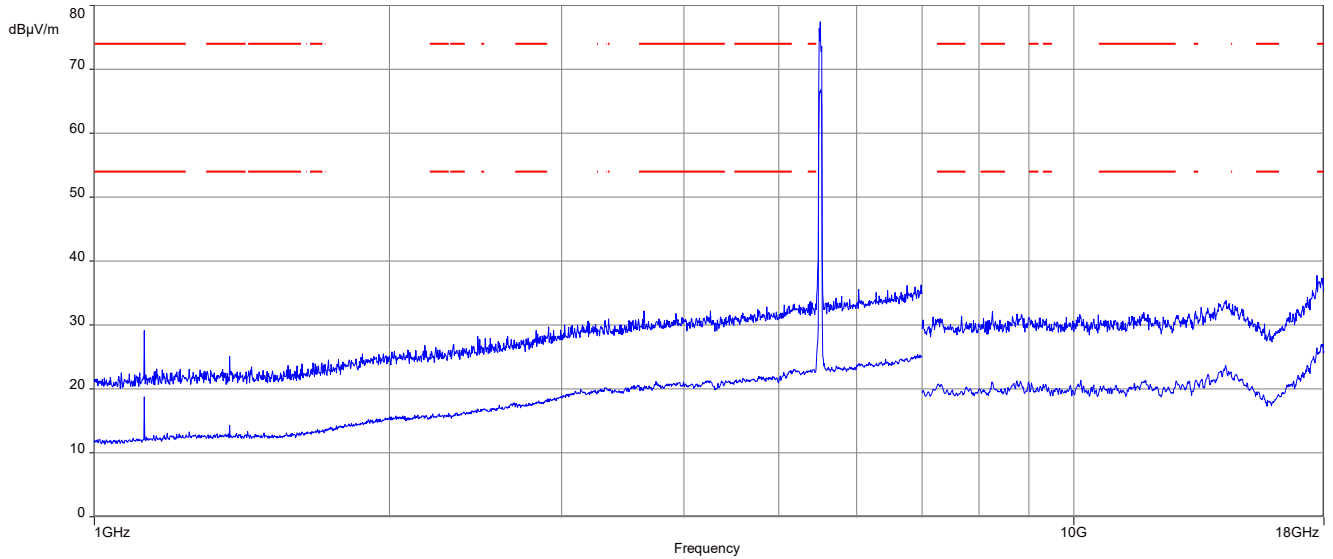
**Plot 3:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; lowest channel



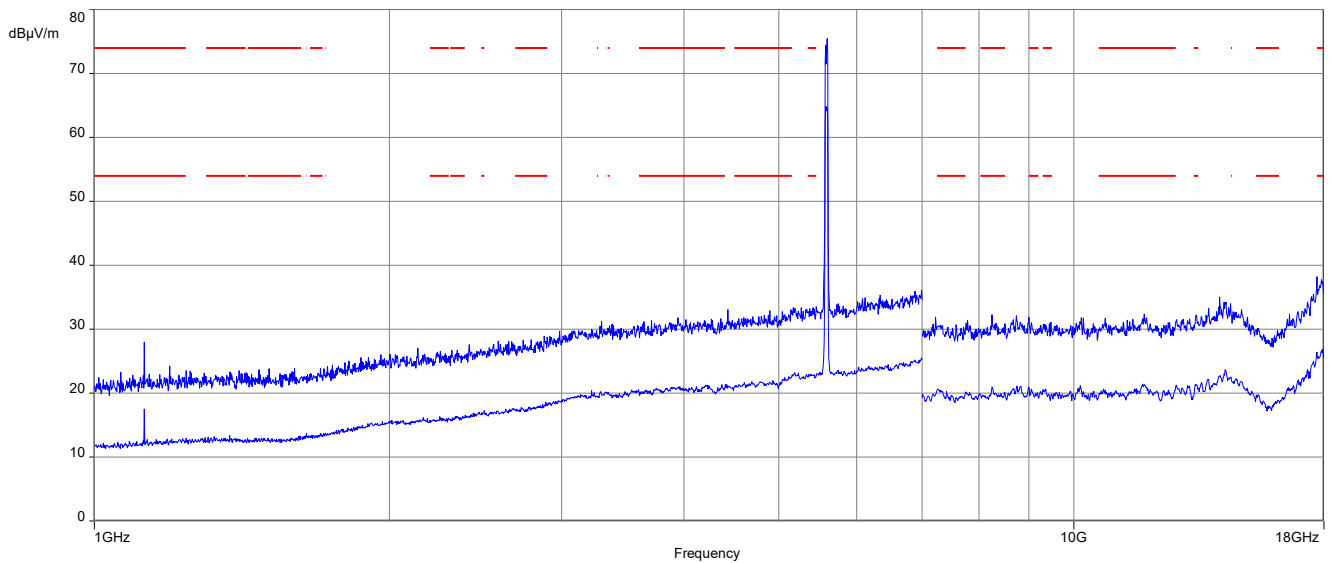
**Plot 4:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; highest channel



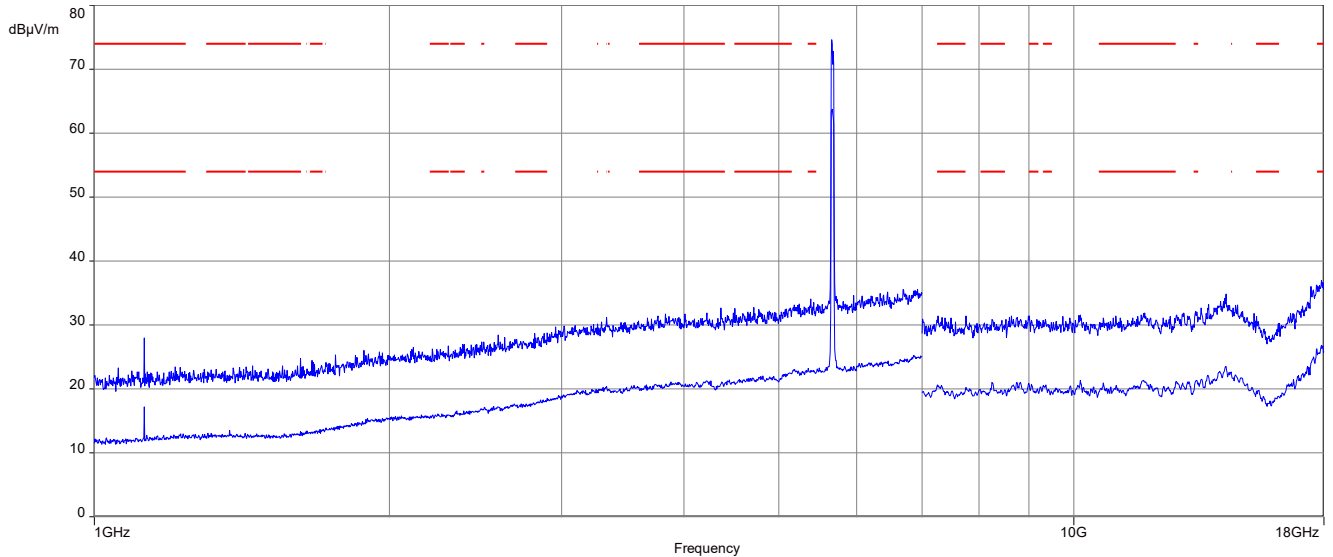
**Plot 5:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel



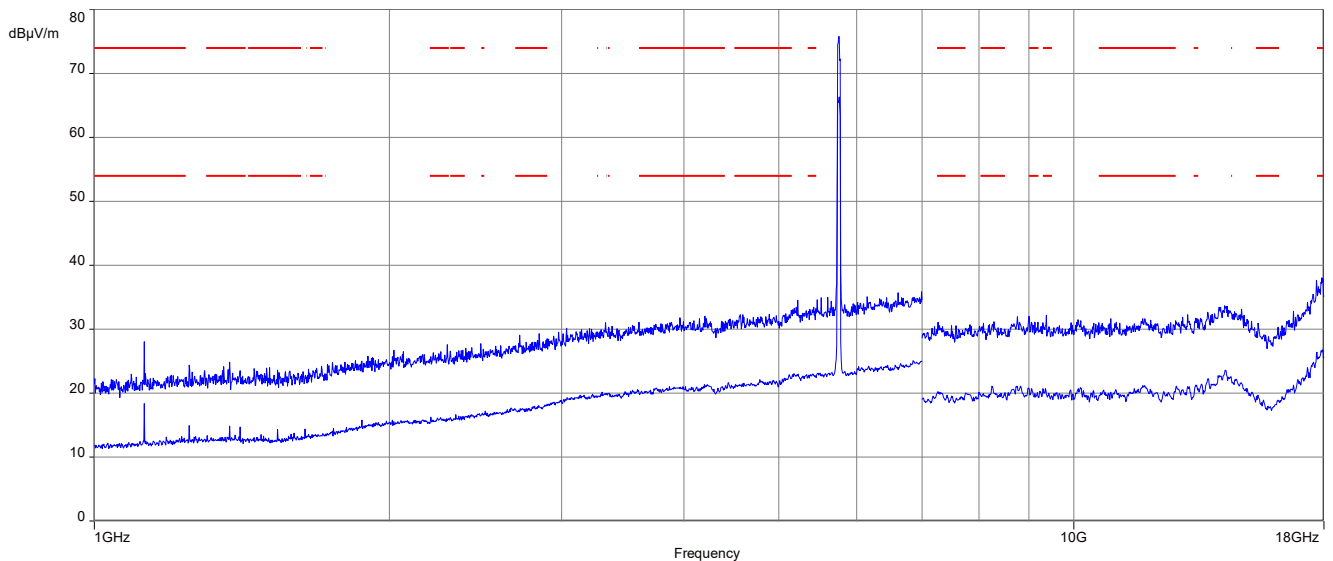
**Plot 6:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; middle channel



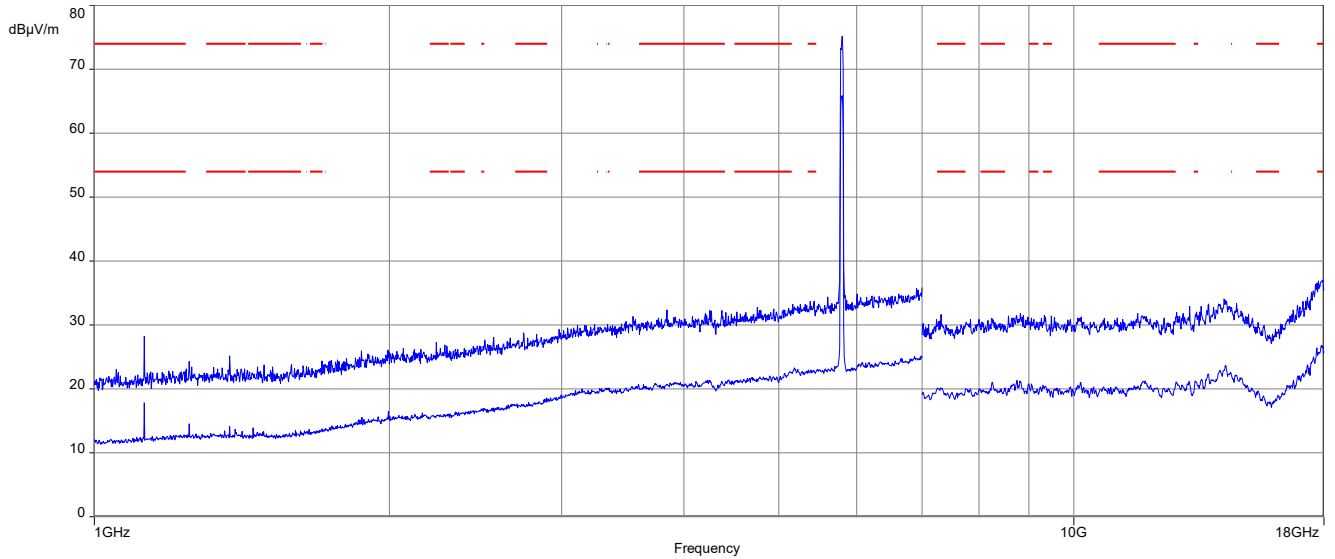
**Plot 7:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



**Plot 8:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; lowest channel

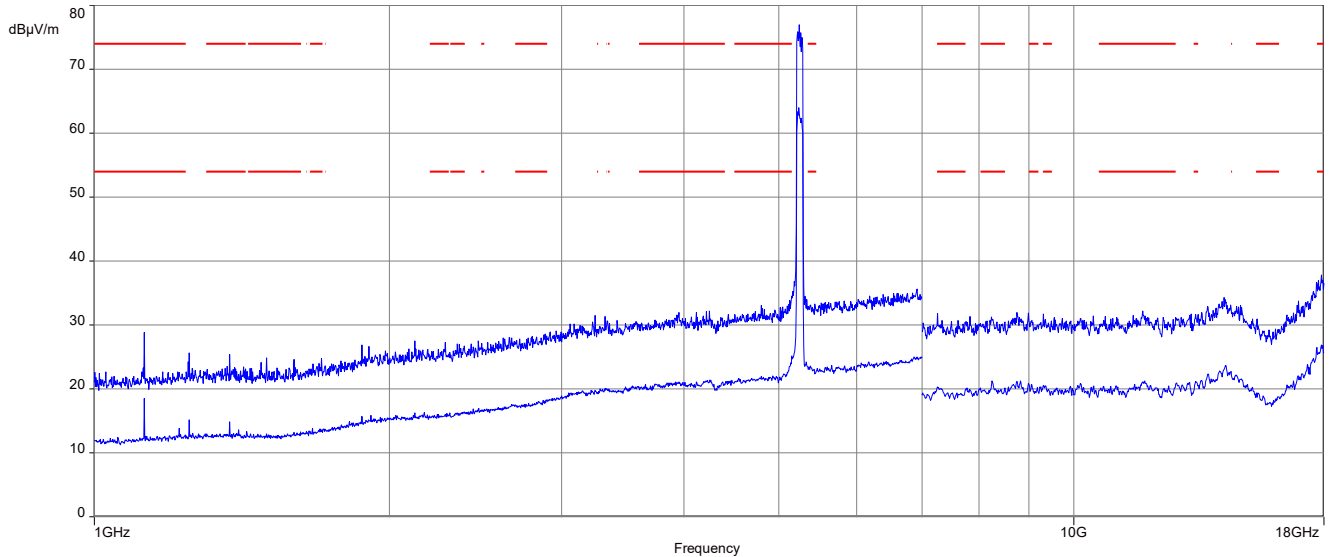


**Plot 9:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; highest channel

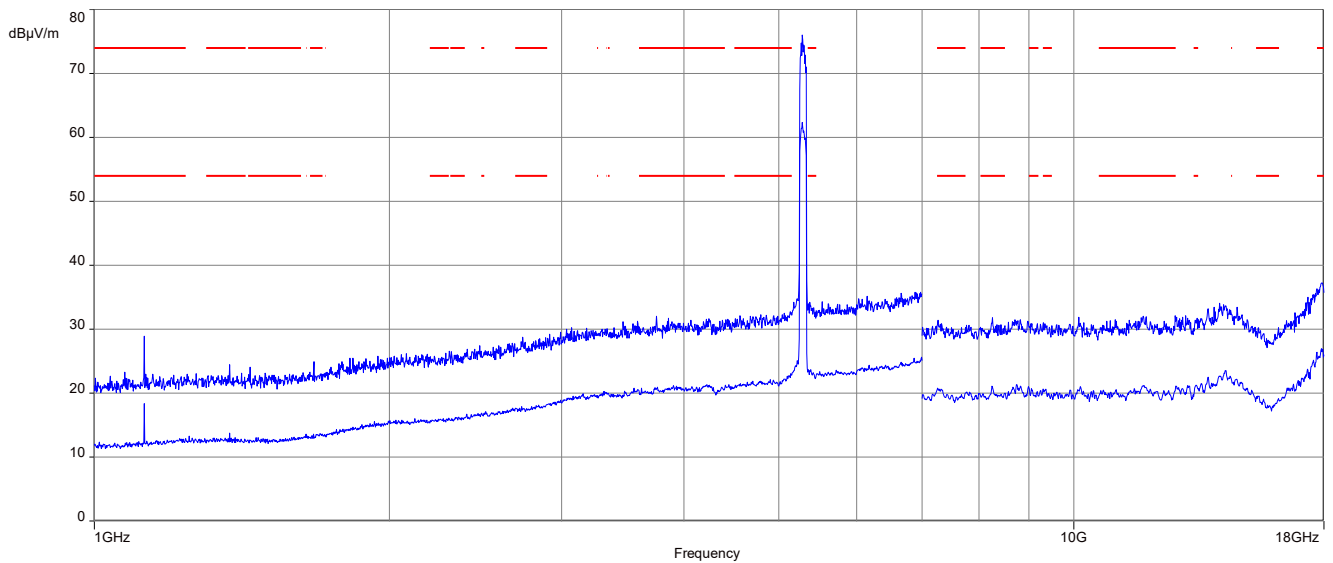


**Plots:** 80 MHz channel bandwidth

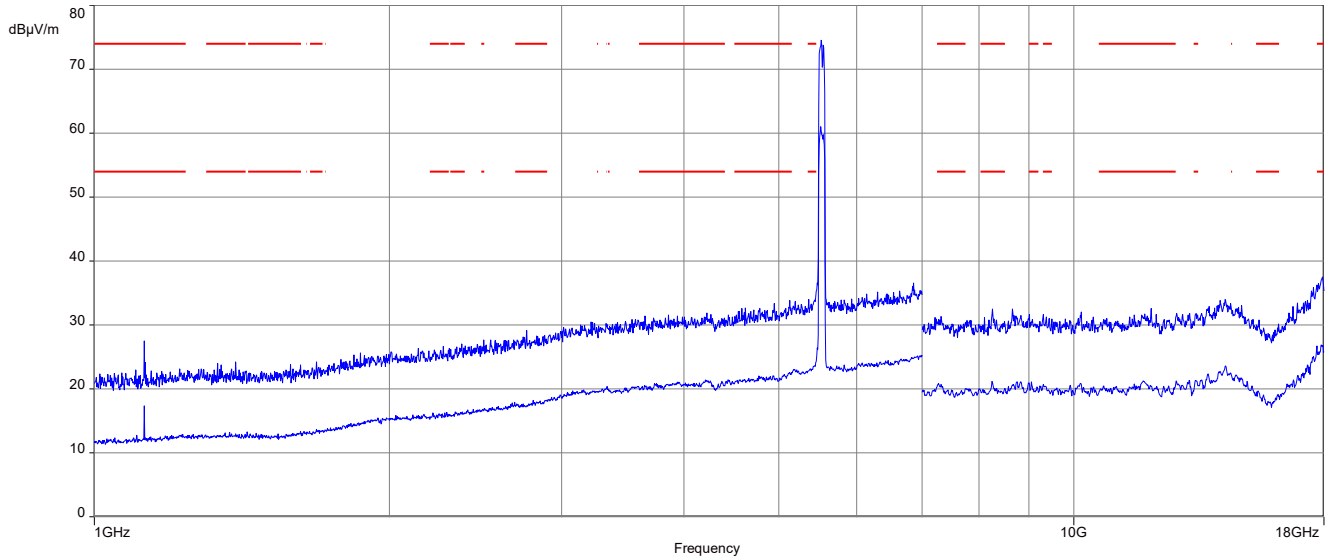
**Plot 1:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; middle channel



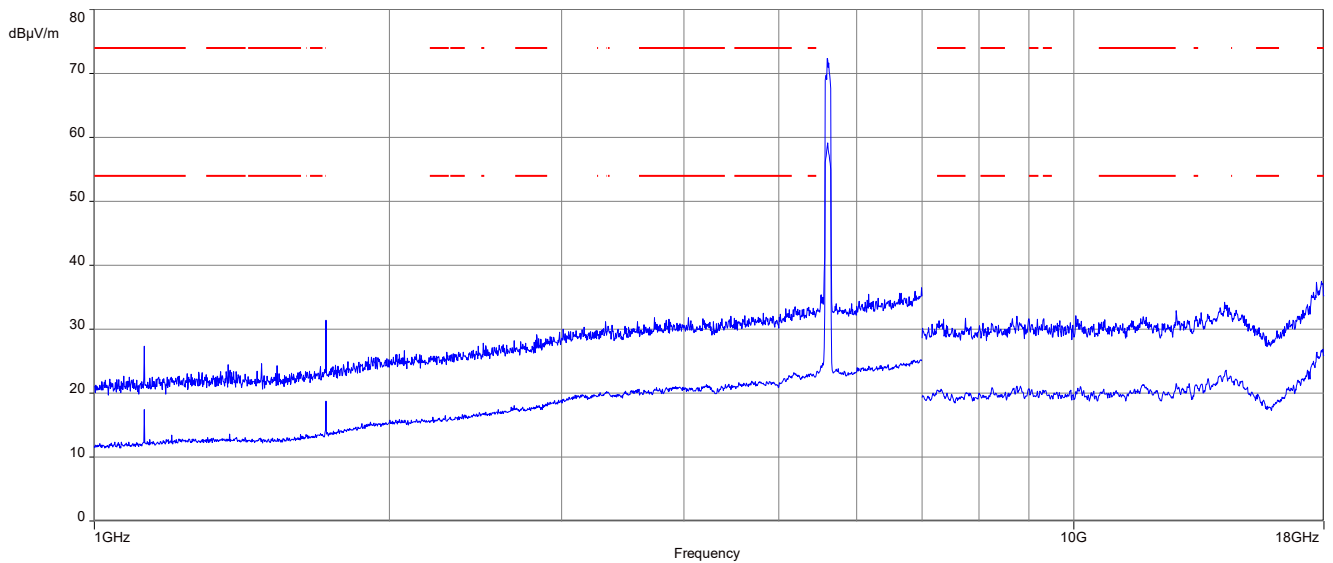
**Plot 2:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; middle channel

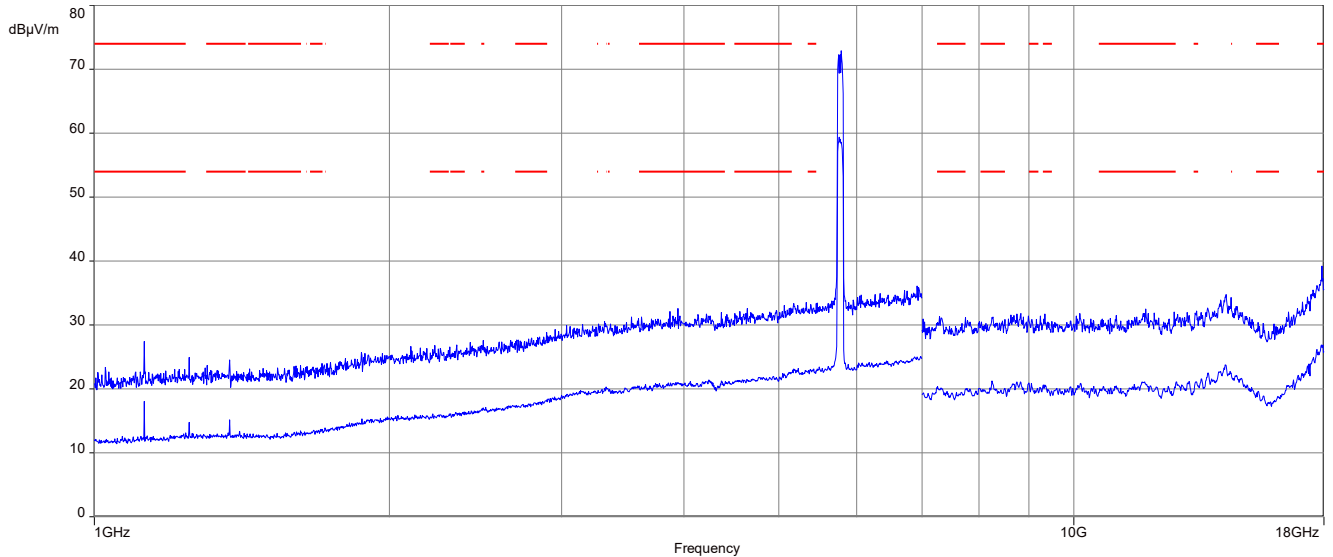
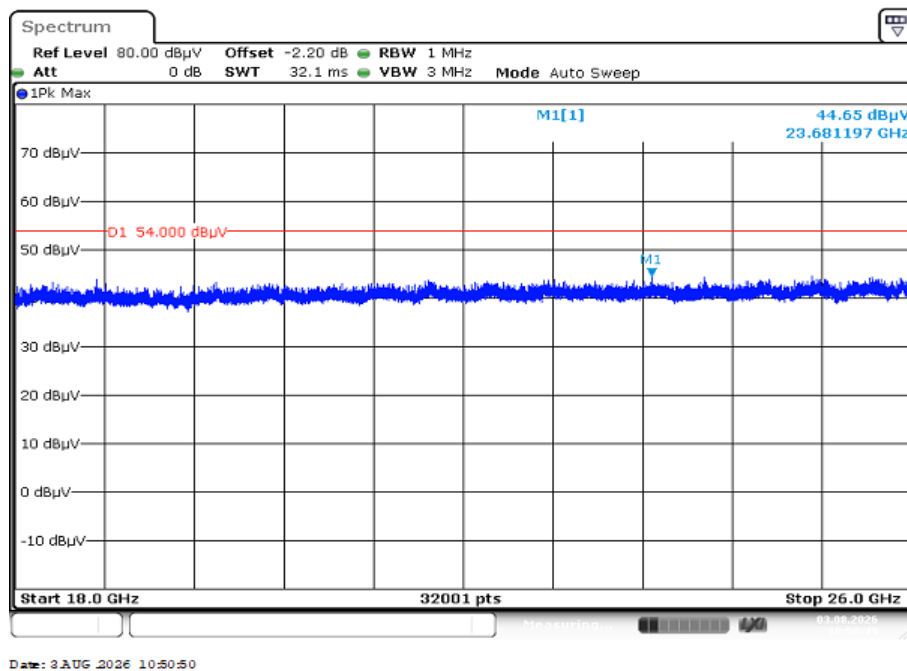


**Plot 3:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel

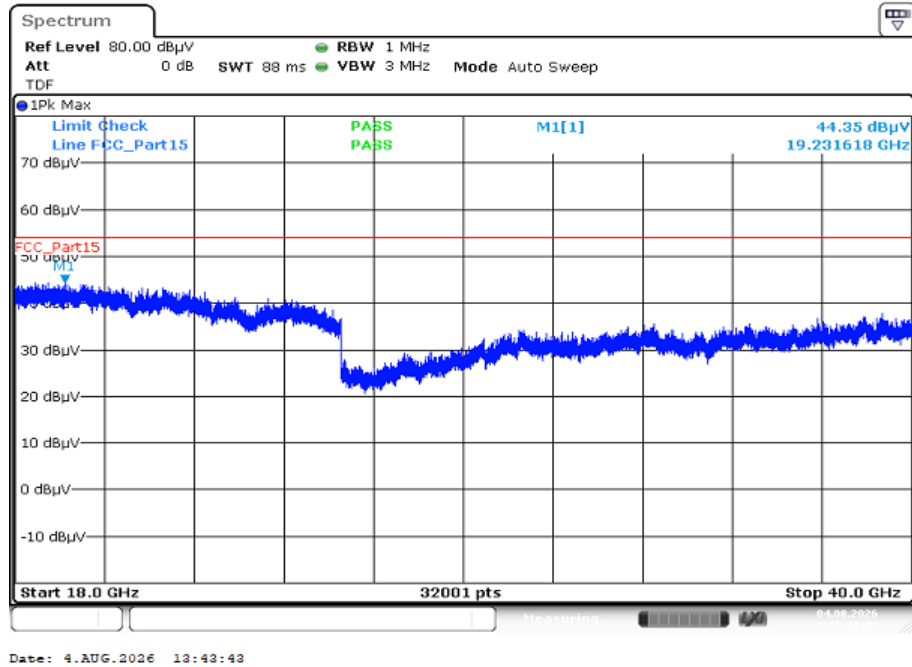


**Plot 4:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



**Plot 5:** 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; middle channel**Plot 6:** 18 GHz to 26 GHz; vertical & horizontal polarization; U-NII-3; middle channel

**Plot 7:** 26 GHz to 40 GHz; vertical & horizontal polarization; U-NII-3; middle channel



### 13 Glossary

|                        |                                                        |
|------------------------|--------------------------------------------------------|
| <b>AVG</b>             | Average                                                |
| <b>C</b>               | Compliant                                              |
| <b>C/N<sub>0</sub></b> | Carrier to noise-density ratio, expressed in dB-Hz     |
| <b>CAC</b>             | Channel availability check                             |
| <b>CW</b>              | Clean wave                                             |
| <b>DC</b>              | Duty cycle                                             |
| <b>DFS</b>             | Dynamic frequency selection                            |
| <b>DSSS</b>            | Dynamic sequence spread spectrum                       |
| <b>DUT</b>             | Device under test                                      |
| <b>EN</b>              | European Standard                                      |
| <b>ETSI</b>            | European Telecommunications Standards Institute        |
| <b>EMC</b>             | Electromagnetic Compatibility                          |
| <b>EUT</b>             | Equipment under test                                   |
| <b>FCC</b>             | Federal Communications Commission                      |
| <b>FCC ID</b>          | Combination of Grantee Code and Equipment Product Code |
| <b>FHSS</b>            | Frequency hopping spread spectrum                      |
| <b>FVIN</b>            | Firmware version identification number                 |
| <b>GNSS</b>            | Global Navigation Satellite System                     |
| <b>GUE</b>             | GNSS User Equipment                                    |
| <b>HMN</b>             | Host marketing name                                    |
| <b>HVIN</b>            | Hardware version identification number                 |
| <b>HW</b>              | Hardware                                               |
| <b>ISED</b>            | Innovation, Science and Economic Development Canada    |
| <b>Inv. No.</b>        | Inventory number                                       |
| <b>MC</b>              | Modulated carrier                                      |
| <b>NA</b>              | Not applicable                                         |
| <b>NC</b>              | Not compliant                                          |
| <b>NOP</b>             | Non occupancy period                                   |
| <b>NP</b>              | Not performed                                          |
| <b>OBW</b>             | Occupied bandwidth                                     |
| <b>OC</b>              | Operating channel                                      |
| <b>OCW</b>             | Operating channel bandwidth                            |
| <b>OFDM</b>            | Orthogonal frequency division multiplexing             |
| <b>OOB</b>             | Out of band                                            |
| <b>OP</b>              | Occupancy period                                       |
| <b>PER</b>             | Packet error rate                                      |
| <b>PMN</b>             | Product marketing name                                 |
| <b>PP</b>              | Positive peak                                          |
| <b>QP</b>              | Quasi peak                                             |
| <b>RLAN</b>            | Radio local area network                               |
| <b>S/N or SN</b>       | Serial number                                          |
| <b>SW</b>              | Software                                               |
| <b>UUT</b>             | Unit under test                                        |
| <b>WLAN</b>            | Wireless local area network                            |

14 Document history

| Version | Applied changes | Date of release |
|---------|-----------------|-----------------|
| R01     | Initial release | 2026-08-06      |

##### END OF TEST REPORT #####