

TEST REPORT

Test report no.: 1-1132-25-01-05_TR1-R01



Deutsche
Akkreditierungsstelle
D-PL-12047-01-00

Testing laboratory

cetecom advanced GmbH

Untertuerkheimer Strasse 6 – 10

66117 Saarbruecken / Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

Internet: <https://cetecomadvanced.com>

e-mail: mail@cetecomadvanced.com

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

AUMOVIO Engineering Solutions

Osterhofener Strasse 15

93055 Regensburg / GERMANY

Phone: +40 256 25 1314

Contact: Gordana Barb

e-mail: gordana-raluca.barb@aumovio.com

Manufacturer

AUMOVIO Engineering Solutions

Osterhofener Strasse 15

93055 Regensburg / GERMANY

Test standard/s

FCC - Title 47 CFR Part 15

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

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

Test Item

Kind of test item:

Telematics Control Unit

Model name:

Nebula TCU Max

FCC ID:

2BDLN-NEBULATCU

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 external antennas

Power supply:

11.8 V to 13 V DC by vehicle battery

Temperature range:

-40°C to 60°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:

cn=Michael Dorongovski, o=cetecom
advanced GmbH, ou=DOR-230601,
email=michael.dorongovski@cetecomadvan
ced.com, c=DE
2026.02.23 07:43:39 +01'00'

Michael Dorongovski
Lab Manager
Radio Labs

Test performed:

cn=Andreas Kurzkurt, o=cetecom advanced
GmbH, ou=KZK-230606,
email=andreas.kurzkurt@cetecomadvanced.c
om, c=DE
2026.02.23 08:20:18 +01'00'

Andreas Kurzkurt
Testing Manager
Radio Labs

1 Table of contents

1	Table of contents.....	2
2	General information.....	3
2.1	Notes and disclaimer.....	3
2.2	Application details.....	3
2.3	Test laboratories sub-contracted.....	3
3	Test standard/s, references and accreditations.....	4
4	Reporting statements of conformity – decision rule	5
5	Test environment.....	6
6	Test item.....	6
6.1	General description	6
6.2	Additional information.....	6
7	Description of the test setup	7
7.1	Shielded semi anechoic chamber.....	8
7.2	Shielded fully anechoic chamber	9
7.3	Radiated measurements > 18 GHz	11
7.4	Conducted measurements.....	12
8	Sequence of testing.....	13
8.1	Sequence of testing radiated spurious 9 kHz to 30 MHz.....	13
8.2	Sequence of testing radiated spurious 30 MHz to 1 GHz	14
8.3	Sequence of testing radiated spurious 1 GHz to 18 GHz	15
8.4	Sequence of testing radiated spurious above 18 GHz	16
9	Measurement uncertainty	17
10	Summary of measurement results.....	18
11	Additional comments	19
12	Measurement results	22
12.1	Identify worst case data rate	22
12.2	Antenna gain.....	23
12.3	Duty cycle.....	23
12.4	Maximum output power.....	24
12.5	Power spectral density.....	26
12.6	Power spectral density with different RU tones.....	28
12.7	Minimum emission bandwidth for the band 5.725-5.85 GHz	30
12.8	Spectrum bandwidth / 26 dB bandwidth.....	32
12.9	Occupied bandwidth / 99% emission bandwidth.....	34
12.10	Undesirable emissions for transmitters operating in the 5725 MHz to 5850 MHz band (conducted).....	36
12.11	Band edge compliance radiated.....	37
12.12	Spurious emissions radiated below 30 MHz.....	57
12.13	Spurious emissions radiated 30 MHz to 1 GHz	72
12.14	Spurious emissions radiated 1 GHz to 40 GHz	77
13	Observations	96
14	Glossary	96
15	Document history.....	97

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.

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of cetecom advanced GmbH.

The testing service provided by cetecom advanced GmbH has been rendered under the current "General Terms and Conditions for cetecom advanced GmbH".

cetecom advanced GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

Under no circumstances does the cetecom advanced GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.

Under no circumstances does the cetecom advanced GmbH test report include or imply any product or service warranties from cetecom advanced GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by cetecom advanced GmbH.

All rights and remedies regarding vendor's products and services for which cetecom advanced GmbH has prepared this test report shall be provided by the party offering such products or services and not by cetecom advanced GmbH.

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:	2025-09-19
Date of receipt of test item:	2025-11-13
Start of test:*	2025-11-19
End of test:*	2026-01-26
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

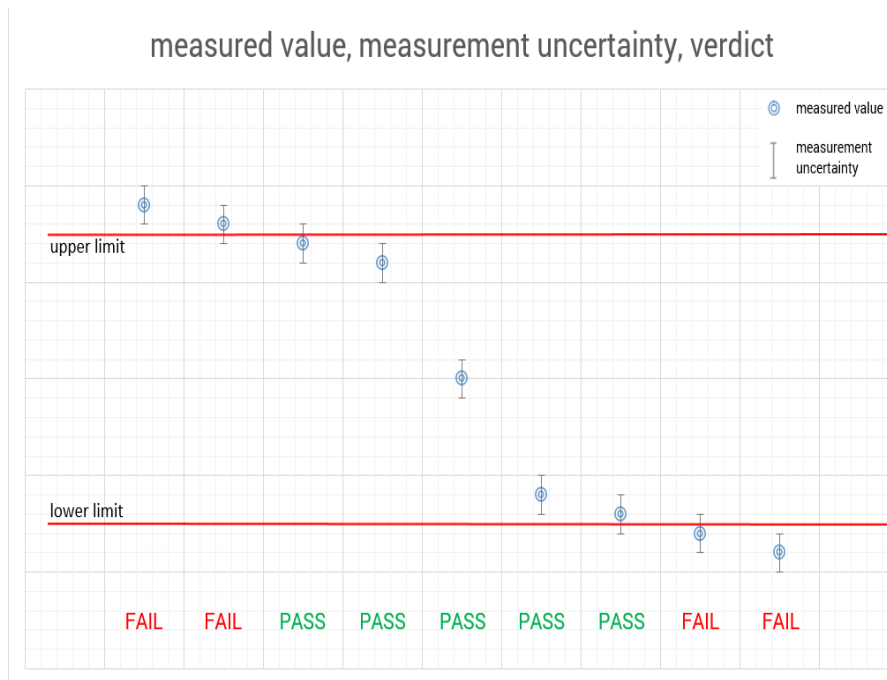
Test standard	Date	Description
FCC - Title 47 CFR Part 15	-/-	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

Guidance	Version	Description
KDB 789033 D02	v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E
ANSI C63.4a-2017	-/-	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2020	-/-	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 662911 D01	v02r01	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."



5 Test environment

Temperature	:	T_{nom} 21 °C during room temperature tests T_{max} No testing under extreme temperature condition required T_{min} No testing under extreme temperature condition required
Relative humidity content	:	45 %
Barometric pressure	:	Not relevant for this kind of testing
Power supply	:	V_{nom} 12 V DC external power supply V_{max} No testing under extreme voltage conditions required V_{min} No testing under extreme voltage conditions required

6 Test item

6.1 General description

Kind of test item	:	Telematics Control Unit
Model name	:	Nebula TCU Max
S/N serial number	:	Rad. 450003044 Cond. 450003051
Hardware status	:	02.00
Software status	:	SWD06.00_290725
Firmware status	:	SWD06.00_290725
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, OFDMA
Use of frequency spectrum	:	
Type of modulation	:	(D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM, 256 – QAM, 1024 – QAM
Number of channels	:	25 with 20 MHz channel bandwidth 12 with 40 MHz channel bandwidth 6 with 80 MHz channel bandwidth
Antenna	:	Two external antennas
Power supply	:	11.8 V to 13 V DC by vehicle battery
Temperature range	:	-40°C to 60°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:

1-1132-25-01-01_TR1-A101-R01
 1-1132-25-01-01_TR1-A102-R01
 1-1132-25-01-01_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).

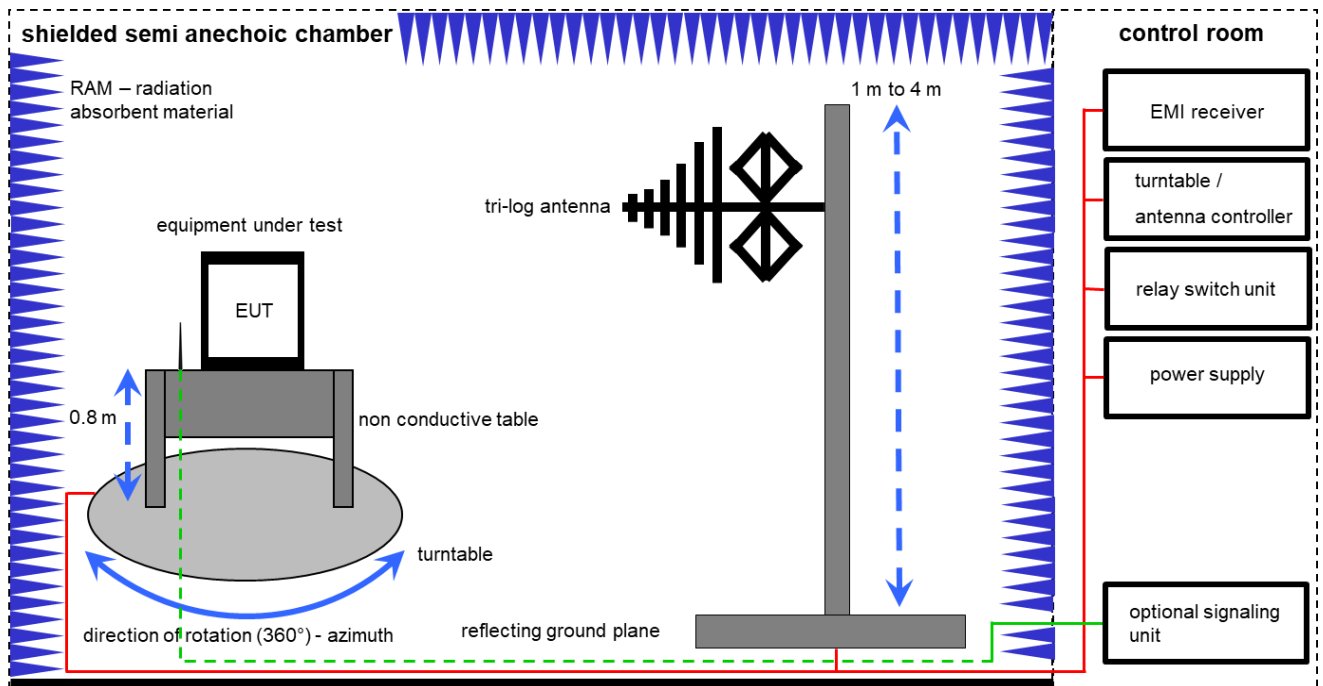
Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

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

$$FS = UR + CL + AF$$

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

Example calculation:

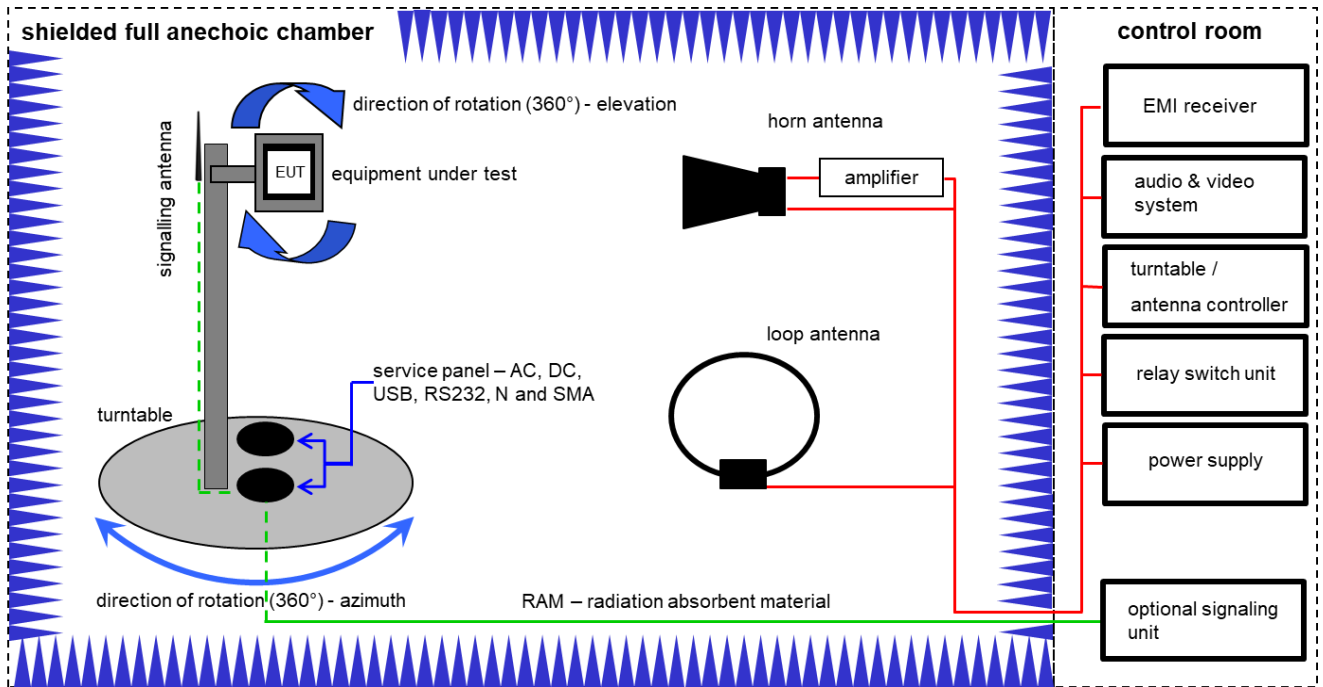
$$FS [dB\mu V/m] = 12.35 [dB\mu V/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dB\mu V/m] \quad (35.69 \mu V/m)$$

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Semi anechoic chamber	Semi anechoic chamber 3000023	MEC Import: MWB AG	-/-	40797	cnn	-/-	-/-
2	A	TRILOG Broadband Antenna	TRILOG Broadband Antenna VULB9163	Schwarzbeck Mess-Elektronik OHG Schönaun	371	40798	cal	11.07.2024	11.07.2026
3	A	Turntable	Turntable 2089-4.0	EMCO Elektronik GmbH Gilching	-/-	40799	cnn	-/-	-/-
4	A	Switch-Unit	Switch-Unit 3488A	Hewlett Packard	2719A14505	50160	cpu	-/-	-/-
5	A	Power Supply	Power Supply 6032A	Hewlett Packard	2920A04466	50161	cnn	-/-	-/-
6	A	Antenna Tower	Antenna Tower 2175	ETS-Lindgren GmbH Taufkirchen	64762	50279	cnn	-/-	-/-
7	A	Positioning Controller	Positioning Controller 2090	ETS-Lindgren GmbH Taufkirchen	64672	50280	cnn	-/-	-/-
8	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

NOTE: Tests have been performed after 08.12.2025

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:

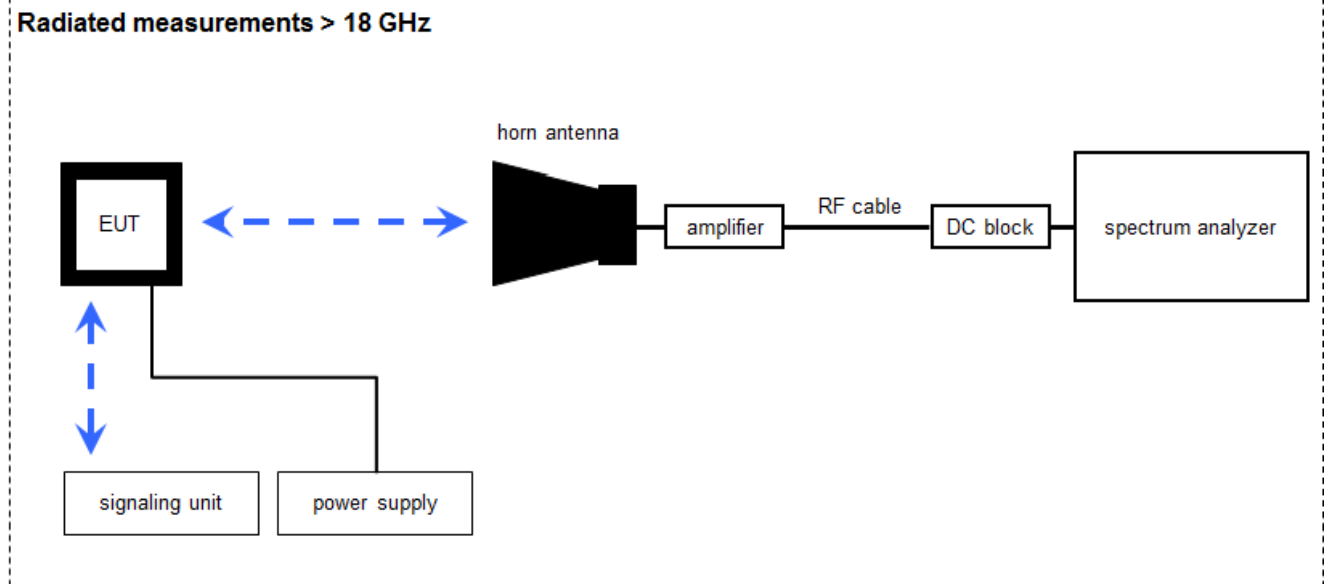
FS [dB μ V/m] = 40.0 [dB μ V/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dB μ V/m] (71.61 μ V/m)

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A, B, C	Signal- and Spectrum Analyzer	Signal- and Spectrum Analyzer FSW26	Rohde & Schwarz Messgerätebau GmbH Memmingen	101455	40114	cal	08.12.2025	31.12.2026
2	A, B	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115	EMCO Elektronik GmbH Gilching	8812-3089	40344	cal	09.07.2024	09.07.2026
3	B	Highpass Filter	Highpass Filter WHK1.1/15G-10SS	Wainwright Instruments GmbH Andechs	37	40362	cnn	-/-	-/-
4	B	Highpass Filter	Highpass Filter WHKX7.0/18G-8SS	Wainwright Instruments GmbH Andechs	18	40364	cpu	-/-	-/-
5	B	Band Reject Filter	Band Reject Filter WRCJV12-5120-5150-5350-5380-40SS	Wainwright Instruments GmbH Andechs	5	40395	cpu	-/-	-/-
6	B	Band Reject Filter	Band Reject Filter WRCJV12-5695-5725-5850-5880-40SS	Wainwright Instruments GmbH Andechs	5	40396	cpu	-/-	-/-
7	B	Band Reject Filter	Band Reject Filter WRCJV16-5440-5470-5725-5755-40SS	Wainwright Instruments GmbH Andechs	9	40397	cpu	-/-	-/-
8	A, B	Broadband Amplifier 0.5-18 GHz	Broadband Amplifier 0.5-18 GHz CBLU5184540	MEC Import: CERNEX	22050	40374	cpu	-/-	-/-
9	A, B, C	4U RF Switch Platform	4U RF Switch Platform L4491A	Agilent Technologies Deutschland GmbH Böblingen	MY50000032	40376	cnn	-/-	-/-

10	B	Highpass Filter	Highpass Filter WHKX2.6/18G-10SS	Wainwright Instruments GmbH Andechs	12	40377	cnn	-/-	-/-
11	A, B, C	NEXIO EMV- Software	NEXIO EMV- Software BAT EMC V2022.0.32.0	MEC Import: Nexio	-/-	40383	cnn	-/-	-/-
12	A, B, C	Anechoic chamber	Anechoic chamber	MEC Import: TDK	-/-	40385	cnn	-/-	-/-
13	A, B, C	Power Supply	Power Supply HMP2020	Rohde & Schwarz Messgerätebau GmbH Memmingen	120626	40410	cal	04.12.2025	31.12.2027
14	C	Active Loop Antenna 9 kHz to 30 MHz	6502	EMCO	2210	3000010 15	vIKI!	07.07.2025	07.07.2027

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:

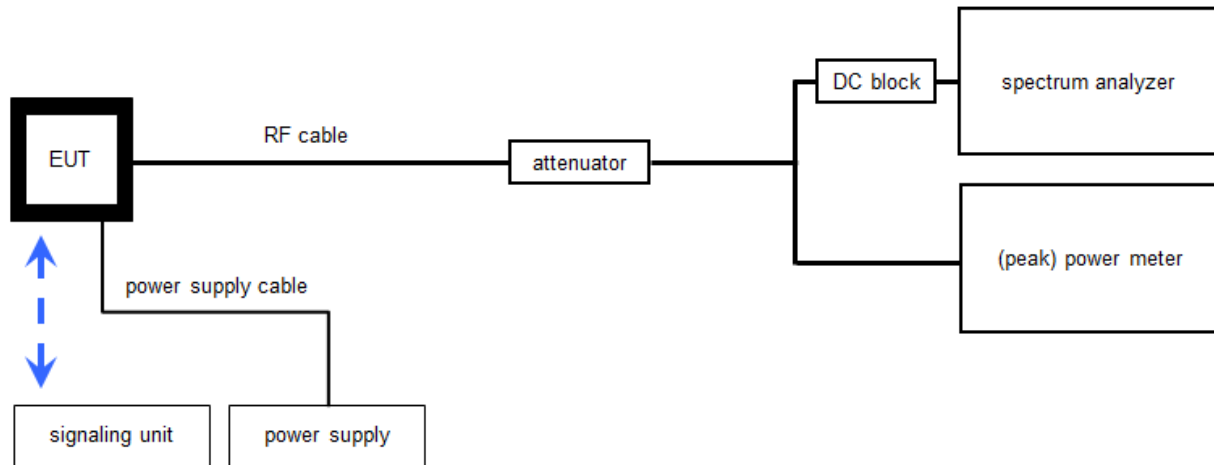
FS [dBμV/m] = 40.0 [dBμV/m] + (-60.1) [dB] + 36.74 [dB/m] = 16.64 [dBμV/m] (6.79 μV/m)

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Broadband LNA 18-50 GHz	Broadband LNA 18-50 GHz CBL18503070PN	MEC Import: CERNEX	25240	40073	chk	22.04.2024	22.04.2026
2	A	Std. Gain Horn Antenna 18.0-26.5 GHz	Std. Gain Horn Antenna 18.0-26.5 GHz 638	Narda Microwave	8205	40085	cal	24.01.2024	31.01.2026
3	A	Std. Gain Horn Antenna 26.5-40.0 GHz	Std. Gain Horn Antenna 26.5-40.0 GHz V637	MEC Import: Narda	82-16	40086	cal	24.01.2024	24.01.2026
4	A	Signal analyzer	Signal analyzer FSV40	Rohde & Schwarz Messgerätebau GmbH Memmingen	101042	40292	cal	08.01.2026	31.01.2027
5	A	RF-Cable	RF-Cable ST18/SMAm/SMAm /72	Huber & Suhner GmbH Unterhaching	Batch no. 699714	40389	cpu	-/-	-/-
6	A	DC-Blocker 0.1-40 GHz	DC-Blocker 0.1-40 GHz 8141A	MEC Import: Inmet	-/-	40390	cpu	-/-	-/-
7	A	DC Power Supply	DC Power Supply HMP2020	Rohde & Schwarz Messgerätebau GmbH Memmingen	102850 / 101699	40306	cal	02.12.2025	31.12.2027

7.4 Conducted measurements

Conducted measurements normal conditions



OP = AV + CA
(OP-output power; AV-analyzer value; CA-loss signal path)

Example calculation:

OP [dBm] = 6.0 [dBm] + 11.7 [dB] = 17.7 [dBm] (58.88 mW)

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Signal analyzer	Signal analyzer FSV40	Rohde & Schwarz Messgerätebau GmbH Memmingen	101042	40292	cal	08.01.2026	31.01.2027
2	A	RF-Cable	RF-Cable ST18/SMAM/SMAM /72	Huber & Suhner GmbH Unterhaching	Batch no. 699714	40389	cpu	-/-	-/-
3	A	DC-Blocker 0.1-40 GHz	DC-Blocker 0.1-40 GHz 8141A	MEC Import: Inmet		40390	cpu	-/-	-/-
4	A	DC Power Supply	DC Power Supply HMP2020	Rohde & Schwarz Messgerätebau GmbH Memmingen	102850 / 101699	40306	cal	02.12.2025	31.12.2027
5	A	Switch Matrix	Switch Matrix USM	cetecom advanced GmbH Saarbrücken	C001	40340	cnn	-/-	-/-
6	A	RF-Cable	RF-Cable ST18/SMAM/SMAM /60	Huber & Suhner GmbH Unterhaching	Batch no. 606844	40386	cpu	-/-	-/-
7	A	RF-Cable	RF-Cable ST18/SMAM/SMAM /48	Huber & Suhner GmbH Unterhaching	Batch no. 600918	40387	cpu	-/-	-/-
8	A	Coax Attenuator 10 dB 2W 0-40 GHz	Coax Attenuator 10 dB 2W 0-40 GHz MCL BW-K10-2W44+	Mini-Circuits Brooklyn		40391	cpu	-/-	-/-

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 63.4.
- 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 63.4) – 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 63.4).
- 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 63.4.
- 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 63.4) – 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 63.4).
- 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 63.4.
- 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 63.4) – 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 63.4).
- 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 63.4.
- 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 63.4).
- 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	± 3 dB	
Power spectral density	± 1.56 dB	
DTS bandwidth	± 100 kHz (depends on the used RBW)	
Occupied bandwidth	± 100 kHz (depends on the used RBW)	
Maximum output power conducted	± 1.56 dB	
Detailed spurious emissions @ the band edge - conducted	± 1.56 dB	
Band edge compliance radiated	± 3 dB	
Spurious emissions conducted	> 3.6 GHz	± 1.56 dB
	> 7 GHz	± 1.56 dB
	> 18 GHz	± 2.31 dB
	≥ 40 GHz	± 2.97 dB
Spurious emissions radiated below 30 MHz	± 3 dB	
Spurious emissions radiated 30 MHz to 1 GHz	± 4.1 dB	
Spurious emissions radiated 1 GHz to 12.75 GHz	± 3.7 dB	
Spurious emissions radiated above 12.75 GHz	± 4.5 dB	
Spurious emissions conducted below 30 MHz (AC conducted)	± 2.6 dB	

10 Summary of measurement results

☒	No deviations from the technical specifications were ascertained
☐	There were deviations from the technical specifications ascertained
☐	This test report is only a partial test report. 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	See table	2026-02-23	-/-

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)	Maximum output power (conducted & radiated)	☒	☐	☐	☐	-/-
§15.407(a)	Power spectral density	☒	☐	☐	☐	-/-
§15.407(e)	Spectrum bandwidth 6dB bandwidth	☒	☐	☐	☐	-/-
§15.407(a)	Spectrum bandwidth 26dB bandwidth	☒	☐	☐	☐	-/-
§15.407(a)	Spectrum bandwidth 99% bandwidth	-/-				-/-
§15.205	Band edge compliance radiated	☒	☐	☐	☐	-/-
§15.407(b)	TX spurious emissions radiated	☒	☐	☐	☐	-/-
§15.209(a)	Spurious emissions radiated < 30 MHz	☒	☐	☐	☐	-/-
§15.107(a) §15.207	Spurious emissions conducted emissions< 30 MHz	☐	☐	☒	☐	-/-
§15.407	DFS	-/-				See report 1-1132/25-02-02_TR1-R01

Notes:

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

11 Additional comments

Reference documents: AuroraTCUMax_Setup_Description.pdf
 QRCT_Settings.xlsx
 Aurora Innovation Self-Driving Trucks - ComboBox Antenna - Datasheet.pdf

Co-applicable documents: 1-1132-25-01-05_TR1-A201-R01 (all conducted results)
 1-1132-25-01-05_TR1-A202-R01 (PSD tests with different RU tones)

Special test descriptions: Power settings:

Channel	Power Setting
OFDM / a – mode	Default (TXPowerAuto)
OFDM / nHT20 – mode	Default (TXPowerAuto)
OFDM / nHT40 – mode	Default (TXPowerAuto)
OFDM / acVHT20 – mode	Default (TXPowerAuto)
OFDM / acVHT40 – mode	Default (TXPowerAuto)
OFDM / acVHT80 – mode	Default (TXPowerAuto)
OFDM / axHE20 – mode	Default (TXPowerAuto)
OFDM / axHE40 – mode	Default (TXPowerAuto)
OFDM / axHE80 – mode	Default (TXPowerAuto)

Configuration descriptions: All tests were performed with both ports/antenna transmitting simultaneously. a-mode only supports SISO. SISO on both chains is possible. All other modes support SISO and MIMO on both chains. It was verified that n-mode, ac-mode and ax-mode have the same output power in SISO and MIMO mode on each port. So the MIMO results of n-mode, ac-mode and ax-mode are also representative for SISO mode.

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) channel number & center frequency								
channel	36	40	44	48	52	56	60	64
f _c / MHz	5180	5200	5220	5240	5260	5280	5300	5320

U-NII-2C (5470 MHz to 5725 MHz) channel number & center frequency											
channel	100	104	108	112	116	120	124	128	132	136	140/144
f _c / MHz	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700/5720

U-NII-3 (5725 MHz to 5850 MHz) channel number & center frequency					
channel	149	153	157	161	165
f _c / MHz	5745	5765	5785	5805	5825

Channels with 40 MHz channel bandwidth:

U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz) channel number & center frequency				
channel	38	46	54	62
f _c / MHz	5190	5230	5270	5310

U-NII-2C (5470 MHz to 5725 MHz) channel number & center frequency					
channel	102	110	118	126	134/142
f _c / MHz	5510	5550	5590	5630	5670/5710

U-NII-3 (5725 MHz to 5850 MHz) channel number & center frequency		
channel	151	159
f _c / MHz	5755	5795

Channels with 80 MHz channel bandwidth:

U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz) channel number & center frequency		
channel	42	58
f _c / MHz	5210	5290

U-NII-2C (5470 MHz to 5725 MHz) channel number & center frequency			
channel	106	122	138
f _c / MHz	5530	5610	5690

U-NII-3 (5725 MHz to 5850 MHz) channel number & center frequency	
channel	155
f _c / MHz	5775

Test mode:

- ☐ No test mode available.
lperf 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 Identify worst case data rate

OFDM – mode	Modulation scheme / bandwidth					
	U-NII-1 & U-NII-2A		U-NII-2C		U-NII-3	
	lowest channel	highest channel	lowest channel	highest channel	lowest channel	highest channel
a – mode SISO1+SISO2	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s
n HT20 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ac VHT20 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ax HE20 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
n HT40 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ac VHT40 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ax HE40 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ac VHT80 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
ax HE80 – mode MIMO	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0

12.2 Antenna gain

Antenna gain declared by the customer (see referenced documents, section 11).

Peak antenna gain [dBi]	
SISO single antenna	5.8
MIMO combined gain	Not supported
MIMO beamforming gain	Not supported

12.3 Duty cycle

Measurement:

Measurement parameter	
According to: KDB789033 D02, B.	
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9

Results:

Duty cycle and correction factor: All tests were performed with >98% duty cycle.

12.4 Maximum output power

Measurement:

Measurement parameter	
According to: KDB789033 D02, E.2.e.	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 Max Output Power and PSD
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9
Standard parts:	FCC: § 15.407 (a)

Limits:

Limits	
Radiated output power	Conducted output power
Band 5150 MHz – 5250 MHz	
For an outdoor access point: Conducted power + 6 dBi antenna gain For an indoor access point: Conducted power + 6 dBi antenna gain For fixed point-to-point access points Conducted power + 23 dBi antenna gain For client devices Conducted power + 6 dBi antenna gain (If the Antenna gain is greater than the Limit: 1dB reduction in the max. conducted output power for each 1 dB of antenna gain in excess of the Limit)	For an outdoor access point: output power $\leq 1\text{W}/30\text{dBm}$ The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm) For an indoor access point output power $\leq 1\text{W}/30\text{dBm}$ For fixed point-to-point access points output power $\leq 1\text{W}/30\text{dBm}$ For client devices output power $\leq 250\text{ mW}/24\text{dBm}$
Band 5250MHz – 5350 MHz	
Conducted power + 6 dBi antenna gain (Antenna gain higher than the Limit: 1dB reduction in the max. conducted output power for each 1 dB of antenna gain in excess of the Limit)	Output power $\leq$ lesser of 250mW or $11\text{dBm} + 10\log B$ (B is the 26 dB emission bandwidth in megahertz)
Band 5470MHz – 5725 MHz	
Conducted power + 6 dBi antenna gain (Antenna gain higher than the Limit: 1dB reduction in the max. conducted output power for each 1 dB of antenna gain in excess of the Limit)	Output power $\leq$ lesser of 250mW or $11\text{dBm} + 10\log B$ (B is the 26 dB emission bandwidth in megahertz)
Band 5725MHz – 5850 MHz	
Conducted power + 6 dBi antenna gain (Antenna gain higher than the Limit: 1dB reduction in the max. conducted output power for each 1 dB of antenna gain in excess of the Limit Exception: fixed point-to-point U-NII devices, no corresponding reduction in transmitter conducted power)	output power $\leq 1\text{W}/30\text{dBm}$

Results:

Conducted power [dBm]	Ch36	Ch40	Ch48	Ch52	Ch56	Ch64	Ch100	Ch120	Ch140	Ch149	Ch157	Ch165
a-mode Power Chain 1	10.8	12.3	12.1	10.6	10.6	11.3	10.2	10.8	10.3	10.7	10.6	11.4
a-mode Power Chain 2	9.9	10.9	10.8	9.7	8.8	9.7	9.7	8.7	8.4	10.2	10.3	9.9
nHT20-mode Power Chain 1	10.5	11.8	11.7	11.7	11.3	11.8	10.6	11.1	11.2	10.3	10.3	11.0
nHT20-mode Power Chain 2	9.4	10.4	10.5	10.3	9.5	10.1	10.4	9.6	9.4	9.9	10.0	9.7
acVHT20-mode Power Chain 1	10.5	11.7	11.7	11.7	11.3	11.7	10.6	11.1	11.2	10.3	10.3	11.1
acVHT20-mode Power Chain 2	9.4	10.4	10.4	10.4	9.5	10.1	10.4	9.6	9.3	9.9	9.9	9.7
axHE20-mode Power Chain 1	10.6	11.9	11.9	11.6	11.4	11.8	10.7	11.2	11.3	10.5	10.5	11.3
axHE20-mode Power Chain 2	9.4	10.5	10.5	10.5	9.6	10.3	10.4	9.7	9.5	10.0	10.0	9.8
nHT20-mode Power Chain 1+2	13.4	14.7	14.5	13.2	12.8	13.6	13.0	12.9	12.5	13.5	13.5	13.7
acVHT20-mode Power Chain 1+2	13.2	14.4	14.3	13.8	13.2	13.9	13.2	13.1	13.0	13.3	13.3	13.5
axHE20-mode Power Chain 1+2	13.0	14.2	14.2	14.1	13.5	14.0	13.5	13.4	13.4	13.1	13.2	13.4

Conducted power [dBm]	Ch38		Ch46	Ch54		Ch62	Ch102	Ch118	Ch134/142	Ch151		Ch159
nHT40-mode Power Chain 1	11.6		12.1	11.7		11.9	11.6	11.8	11.2	10.5		10.8
nHT40-mode Power Chain 2	10.5		9.9	10.2		10.9	11.2	10.7	10.2	10.0		10.2
acVHT40-mode Power Chain 1	10.8		11.0	10.9		10.9	10.3	10.4	10.0	9.6		9.8
acVHT40-mode Power Chain 2	9.8		8.9	9.4		10.4	9.5	9.2	9.0	9.3		9.7
axHE40-mode Power Chain 1	10.5		11.0	10.7		10.8	10.3	10.2	9.9	9.4		9.7
axHE40-mode Power Chain 2	9.4		8.6	9.3		10.3	9.5	9.2	8.9	9.0		9.5
nHT40-mode Power Chain 1+2	14.1		14.1	14.0		14.4	14.4	14.3	13.7	13.3		13.5
acVHT40-mode Power Chain 1+2	13.7		13.5	13.6		13.9	13.8	13.6	13.1	12.8		13.0
axHE40-mode Power Chain 1+2	13.3		13.1	13.2		13.7	12.9	12.9	12.5	12.5		12.8

Conducted power [dBm]		Ch42			Ch58		Ch106	Ch122	Ch138		Ch155	
acVHT80-mode Power Chain 1		10.9			10.7		9.8	10.5	10.5		9.3	
acVHT80-mode Power Chain 2		8.8			9.6		9.5	9.1	8.8		8.7	
axHE80-mode Power Chain 1		10.8			10.8		9.9	10.5	10.4		9.3	
axHE80-mode Power Chain 2		8.8			9.6		9.5	9.0	8.8		8.7	
acVHT80-mode Power Chain 1+2		13.0			13.2		12.7	12.9	12.7		12.0	
axHE80-mode Power Chain 1+2		12.9			13.3		12.7	12.9	12.7		12.0	

12.5 Power spectral density

Measurement:

Measurement parameter	
According to: KDB789033 D02, F.	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 Max Output Power and PSD
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9
Standard parts:	FCC: § 15.407 (a)

Limits:

Power Spectral Density
Band 5150 MHz – 5250 MHz
For an outdoor access point power spectral density conducted ≤ 17 dBm in any 1 MHz band* For an indoor access point power spectral density conducted ≤ 17 dBm in any 1 MHz band* For fixed point-to-point access points power spectral density conducted ≤ 17 dBm in any 1 MHz band** For client devices point power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi **Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
Band 5250MHz – 5350 MHz
power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi
Band 5470MHz – 5725 MHz
power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi
Band 5725MHz – 5850 MHz
power spectral density conducted ≤ 30 dBm in any 500 kHz band If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Results:

Power Spectral Density [dBm/MHz]	Ch36	Ch40	Ch48	Ch52	Ch56	Ch64	Ch100	Ch120	Ch140	Ch149	Ch157	Ch165
a-mode Power Chain 1	-0.7	1.0	0.9	-0.7	-0.8	0.1	-0.8	-0.2	-0.6	-3.2	-3.3	-2.7
a-mode Power Chain 2	-1.0	-0.2	-0.3	-1.3	-2.4	-1.4	-1.3	-2.1	-2.7	-3.6	-3.7	-4.1
nHT20-mode Power Chain 1	-0.9	0.5	0.3	0.3	0.0	0.6	-0.4	0.1	-0.1	-3.9	-3.8	-3.1
nHT20-mode Power Chain 2	-2.0	-1.1	-1.1	-1.0	-2.2	-1.2	-1.3	-1.7	-2.0	-4.6	-4.5	-4.9
acVHT20-mode Power Chain 1	-1.0	0.4	0.3	0.3	0.0	0.6	-0.4	0.2	-0.1	-3.9	-3.7	-3.1
acVHT20-mode Power Chain 2	-2.0	-1.2	-1.2	-0.9	-2.2	-1.3	-1.3	-1.7	-2.0	-4.6	-4.6	-4.9
axHE20-mode Power Chain 1	-1.1	0.3	0.1	-0.1	-0.3	0.4	-0.7	-0.1	-0.3	-4.0	-3.9	-3.2
axHE20-mode Power Chain 2	-2.1	-1.2	-1.3	-1.1	-2.3	-1.3	-1.4	-1.7	-2.0	-4.6	-4.7	-5.1
nHT20-mode Power Chain 1+2	2.2	3.5	3.4	2.0	1.5	2.4	2.0	2.0	1.5	-0.4	-0.5	-0.3
acVHT20-mode Power Chain 1+2	2.1	3.2	3.0	2.6	2.0	2.7	2.2	2.1	1.8	-0.7	-0.7	-0.6
axHE20-mode Power Chain 1+2	1.6	2.8	2.7	2.7	2.0	2.8	2.2	2.3	2.1	-1.2	-1.1	-0.9

Power Spectral Density [dBm/MHz]	Ch38		Ch46	Ch54		Ch62	Ch102	Ch118	Ch134/142	Ch151		Ch159
nHT40-mode Power Chain 1	-2.6		-2.5	-2.6		-2.3	-2.5	-2.3	-2.8	-7.0		-6.4
nHT40-mode Power Chain 2	-3.5		-4.4	-3.9		-3.0	-3.1	-3.2	-3.8	-7.3		-7.0
acVHT40-mode Power Chain 1	-3.5		-3.5	-3.3		-3.3	-3.7	-3.7	-4.0	-7.9		-7.4
acVHT40-mode Power Chain 2	-4.3		-5.4	-4.7		-3.6	-4.7	-4.7	-5.1	-8.0		-7.6
axHE40-mode Power Chain 1	-4.0		-3.8	-3.7		-3.5	-3.8	-4.0	-4.3	-8.3		-7.7
axHE40-mode Power Chain 2	-4.8		-5.8	-5.0		-3.8	-4.9	-4.9	-5.3	-8.5		-8.0
nHT40-mode Power Chain 1+2	0.0		-0.3	-0.2		0.4	0.2	0.3	-0.3	-4.1		-3.7
acVHT40-mode Power Chain 1+2	-0.5		-0.9	-0.6		-0.1	-0.4	-0.4	-0.9	-4.6		-4.2
axHE40-mode Power Chain 1+2	-0.9		-1.3	-0.9		-0.4	-1.2	-1.2	-1.5	-4.9		-4.5

Power Spectral Density [dBm/MHz]		Ch42			Ch58		Ch106	Ch122	Ch138		Ch155	
acVHT80-mode Power Chain 1		-6.6			-6.8		-7.4	-6.7	-6.6		-10.9	
acVHT80-mode Power Chain 2		-8.7			-7.6		-7.7	-8.3	-8.1		-11.6	
axHE80-mode Power Chain 1		-6.7			-6.8		-7.4	-6.9	-6.8		-10.9	
axHE80-mode Power Chain 2		-8.8			-7.7		-7.8	-8.5	-8.3		-11.7	
acVHT80-mode Power Chain 1+2		-4.5			-4.2		-4.5	-4.4	-4.3		-8.2	
axHE80-mode Power Chain 1+2		-4.6			-4.2		-4.5	-4.5	-4.4		-8.2	

12.6 Power spectral density with different RU tones

Measurement:

Measurement parameter	
According to: KDB789033 D02, F.	
External result file(s)	1-1132-25-01-05_TR1-A202-R01.pdf FCC Part 15.407 Max Output Power and PSD
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9
Standard parts:	FCC: § 15.407 (a)

Limits:

Power Spectral Density
Band 5150 MHz – 5250 MHz
For an outdoor access point power spectral density conducted ≤ 17 dBm in any 1 MHz band* For an indoor access point power spectral density conducted ≤ 17 dBm in any 1 MHz band* For fixed point-to-point access points power spectral density conducted ≤ 17 dBm in any 1 MHz band** For client devices point power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi **Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
Band 5250MHz – 5350 MHz
power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi
Band 5470MHz – 5725 MHz
power spectral density conducted ≤ 11 dBm in any 1 MHz band* *If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi
Band 5725MHz – 5850 MHz
power spectral density conducted ≤ 30 dBm in any 500 kHz band If transmitting antennas of directional gain greater than 6 dBi are used the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Results:

20 MHz PSD [dBm/MHz]	Ch36	Ch40	Ch48	Ch52	Ch56	Ch64	Ch100	Ch120	140	Ch149	Ch157	Ch165
FULL RU	3.1	2.9	3.8	3.9	4.0	3.6	3.0	3.4	3.1	-0.2	-0.1	-0.5
RU26 Tone plan 10-S	-1.4	-1.2	-0.7	-0.5	-0.1	-0.1	-0.2	0.1	-0.1	-3.3	-3.1	-0.5
RU26 Tone plan 10-L	0.2	0.4	0.9	-0.6	-0.1	-0.1	-0.2	0.1	-0.1	-3.4	-3.2	-0.6
RU26 Tone plan 20-L	-2.2	-2.1	-1.3	-1.2	-0.7	-1.0	-1.0	-0.8	-1.0	-3.5	-3.3	-3.4
RU26 Tone plan 30-L	-0.8	-1.1	-0.2	-0.1	0.5	0.0	-0.2	0.4	0.2	-3.2	-3.2	-3.0
RU52 Tone plan 50-L	2.5	2.5	2.7	2.7	3.3	3.1	2.0	2.3	2.4	-1.2	-1.1	-1.6
RU52 Tone plan 60-L	2.2	2.1	2.4	2.4	3.0	2.7	1.7	1.9	2.1	-1.6	-1.6	-2.0
RU52 Tone plan 70-S	0.8	0.5	0.9	1.0	1.6	1.1	0.1	0.7	0.6	-3.0	-3.1	-3.1
RU52 Tone plan 70-L	1.3	1.0	1.4	1.5	2.1	1.5	0.5	0.9	0.9	-2.7	-2.7	-2.7
RU106 Tone plan 80-L	1.4	1.3	2.1	2.1	2.5	2.1	1.1	1.3	1.8	-1.7	-1.9	-2.3
RU106 Tone plan 90-L	1.9	1.5	2.5	2.5	2.9	2.4	1.4	1.8	2.1	-1.5	-1.7	-1.7
RU242 Tone plan 95-L	1.8	1.6	2.5	2.6	3.0	2.5	1.4	1.8	2.1	-1.4	-1.6	-1.7
40 MHz PSD [dBm/MHz]	Ch38		Ch46	Ch54		Ch62	Ch102	Ch118	Ch134	Ch151		Ch159
FULL RU	3.1		3.8	4.0		3.8	3.2	3.5	3.4	0.0		0.4
RU26 Tone plan 100-L	-0.9		-0.3	0.2		0.3	-0.2	0.4	0.1	-2.9		-2.9
RU26 Tone plan 105-L	-0.8		-0.3	0.2		0.3	-0.2	0.3	0.0	-3.0		-2.9
RU52 Tone plan 110-S	2.5		2.7	3.0		3.2	1.7	2.1	2.3	-1.1		-1.3
RU52 Tone plan 110-L	2.6		2.8	3.1		3.3	1.8	2.3	2.5	-1.0		-1.2
RU106 Tone plan 120-L	1.3		1.8	2.3		1.8	0.7	1.2	1.1	-2.1		-2.2
RU106 Tone plan 125-L	1.2		1.3	1.4		1.8	1.2	0.0	1.1	-2.2		-2.5
RU242 Tone plan 130-L	-4.5		-4.4	-3.9		-4.2	-4.7	-4.8	-4.8	-7.7		-8.0
RU242 Tone plan 135-L	-4.3		-4.1	-3.6		-4.0	-4.9	-4.7	-4.4	-7.7		-7.9
RU484 Tone plan 150-L	-4.5		-4.1	-3.8		-4.3	-4.9	-4.7	-5.0	-7.8		-7.9
80 MHz PSD [dBm/MHz]		Ch42			Ch58		Ch106	Ch122	Ch138		Ch155	
RU996 Tone plan 160-L		-4.9			-3.9		-4.9	-5.0	-4.6		-8.0	

Conclusion: The PSD for FULL RU configuration is the highest. Therefore no additional testing for different RU tone configurations are required.

12.7 Minimum emission bandwidth for the band 5.725-5.85 GHz

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
According to: KDB789033 D02, C.2.	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 & ISSED Minimum Emission BW
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9

Limits:

FCC	ISED
The minimum 6 dB bandwidth shall be at least 500 kHz.	

Results:

6 dB bandwidth [MHz]	Ch149	Ch157	Ch165
a-mode Power Chain 1	15.9	15.7	15.4
a-mode Power Chain 2	16.3	16.3	16.3
nHT20-mode Power Chain 1	17.2	16.9	17.3
nHT20-mode Power Chain 2	16.3	16.7	16.9
acVHT20-mode Power Chain 1	17.2	16.3	17.3
acVHT20-mode Power Chain 2	16.6	16.6	16.6
axHE20-mode Power Chain 1	18.7	18.4	18.5
axHE20-mode Power Chain 2	17.7	18.4	18.0

6 dB bandwidth [MHz]	Ch151		Ch159
nHT40-mode Power Chain 1	35.4		35.7
nHT40-mode Power Chain 2	35.2		35.2
acVHT40-mode Power Chain 1	35.6		35.4
acVHT40-mode Power Chain 2	35.1		35.0
axHE40-mode Power Chain 1	37.6		36.8
axHE40-mode Power Chain 2	35.1		35.9

6 dB bandwidth [MHz]		Ch155	
acVHT80-mode Power Chain 1		74.0	
acVHT80-mode Power Chain 2		75.2	
axHE80-mode Power Chain 1		76.4	
axHE80-mode Power Chain 2		75.2	

12.8 Spectrum bandwidth / 26 dB bandwidth

Description:

Measurement of the 26 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
According to: KDB789033 D02, C.1.	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 & ISSED Bandwidths
Used test setup:	See chapter 7.4 – A
Measurement uncertainty:	See chapter 9

Limits:

Spectrum Bandwidth – 26 dB Bandwidth
IC: Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band. FCC: Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

Results:

26 dB bandwidth [MHz]	Ch36	Ch40	Ch48	Ch52	Ch56	Ch64	Ch100	Ch120	Ch140	Ch149	Ch157	Ch165
a-mode Power Chain 1	19.2	19.0	16.1	19.0	19.2	19.0	19.2	19.0	19.0	17.8	17.8	17.8
a-mode Power Chain 2	18.7	19.0	18.9	19.0	19.0	19.0	18.9	19.0	19.1	17.7	17.7	17.7
nHT20-mode Power Chain 1	20.3	20.2	20.1	20.2	20.2	20.2	20.5	20.1	20.2	18.9	18.8	19.0
nHT20-mode Power Chain 2	20.1	20.2	19.8	20.0	20.2	20.3	20.2	20.1	20.1	18.8	18.8	19.0
acVHT20-mode Power Chain 1	20.4	20.3	20.3	20.1	20.2	20.0	20.1	20.0	19.9	18.9	18.8	19.1
acVHT20-mode Power Chain 2	20.2	20.0	20.1	20.0	20.2	20.0	20.0	20.3	20.1	18.9	18.9	18.8
axHE20-mode Power Chain 1	20.9	20.7	21.0	21.0	20.8	20.9	20.8	20.8	21.0	20.2	20.1	20.1
axHE20-mode Power Chain 2	20.8	20.8	20.8	20.9	20.7	20.7	20.8	20.9	20.9	20.0	20.0	20.0

26 dB bandwidth [MHz]	Ch38		Ch46	Ch54		Ch62	Ch102	Ch118	Ch134/142	Ch151		Ch159
nHT40-mode Power Chain 1	39.5		39.7	39.5		39.5	39.4	39.5	39.8	38.3		38.3
nHT40-mode Power Chain 2	39.2		39.5	39.6		39.4	39.6	39.3	39.4	38.1		38.2
acVHT40-mode Power Chain 1	39.5		39.7	39.6		39.6	39.5	39.6	39.8	38.5		38.3
acVHT40-mode Power Chain 2	39.3		39.2	39.5		39.2	39.4	39.2	39.5	38.1		38.1
axHE40-mode Power Chain 1	40.4		40.5	40.2		40.3	40.2	40.5	40.4	39.6		39.6
axHE40-mode Power Chain 2	40.3		40.5	40.3		40.1	40.2	40.3	40.6	39.4		39.4

26 dB bandwidth [MHz]		Ch42			Ch58		Ch106	Ch122	Ch138		Ch155	
acVHT80-mode Power Chain 1		82.4			81.6		81.8	82.0	81.8		80.0	
acVHT80-mode Power Chain 2		81.8			81.2		81.6	81.6	81.6		79.4	
axHE80-mode Power Chain 1		82.2			82.2		82.2	82.6	82.0		80.6	
axHE80-mode Power Chain 2		82.6			82.4		82.0	82.2	82.4		80.8	

12.9 Occupied bandwidth / 99% emission bandwidth

Measurement:

Measurement parameter	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 & ISSED Bandwidths
Test setup:	See sub clause 7.4 – A
Measurement uncertainty:	See chapter 9

Usage:

FCC
The occupied bandwidth has to be within the frequency band. Otherwise additional DFS testing on the affected channel might be required.

Results:

99% bandwidth [kHz]	Ch36	Ch40	Ch48	Ch52	Ch56	Ch64	Ch100	Ch120	Ch140	Ch149	Ch157	Ch165
a-mode Power Chain 1	16434	16334	16334	16334	16384	16334	16334	16334	16334	16384	16334	16384
a-mode Power Chain 2	16384	16384	16384	16334	16434	16384	16434	16384	16384	16384	16434	16434
nHT20-mode Power Chain 1	17532	17532	17532	17532	17532	17582	17532	17582	17582	17532	17532	17532
nHT20-mode Power Chain 2	17532	17532	17483	2E+05	17532	17483	17532	17183	17483	17433	17483	17483
acVHT20-mode Power Chain 1	17532	17532	17582	17532	17582	17532	17582	17582	17532	17532	17532	17582
acVHT20-mode Power Chain 2	17483	17483	17483	17483	17532	17532	17433	17483	17483	17433	17483	17483
axHE20-mode Power Chain 1	18931	18881	18881	18931	18931	18881	18931	18881	18931	18931	18881	18931
axHE20-mode Power Chain 2	18831	18831	18831	18831	18831	18831	18831	18831	18781	18831	18781	18831

99% bandwidth [kHz]	Ch38		Ch46	Ch54		Ch62	Ch102	Ch118	Ch134/142	Ch151		Ch159
nHT40-mode Power Chain 1	35964		36064	35964		35964	35864	35964	35964	36164		36064
nHT40-mode Power Chain 2	35864		35964	35864		35864	35964	35964	35964	35964		35864
acVHT40-mode Power Chain 1	35964		36064	36064		35964	35864	35964	35964	36064		35964
acVHT40-mode Power Chain 2	35964		35964	36064		35964	36064	35964	36064	35964		35864
axHE40-mode Power Chain 1	37662		37762	37662		37662	37662	37762	37662	37762		37762
axHE40-mode Power Chain 2	37562		37562	37662		37463	37662	37662	37662	37463		37463

99% bandwidth [kHz]		Ch42			Ch58		Ch106	Ch122	Ch138		Ch155	
acVHT80-mode Power Chain 1		75325			75125		75125	75125	75325		75325	
acVHT80-mode Power Chain 2		75325			75235		75325	75524	75325		75325	
axHE80-mode Power Chain 1		77123			76723		76923	77123	77323		77123	
axHE80-mode Power Chain 2		77123			77123		76923	76923	77123		76923	

12.10 Undesirable emissions for transmitters operating in the 5725 MHz to 5850 MHz band (conducted)

Description:

Measurement of the spectrum mask as per FCC Part 15.407 (b)(4) and KDB 789033 II.G.2 (c) (ii).
The measurement is repeated at the lowest, middle and highest channel and performed in a conducted way as defined in KDB 789033 II.G.3 (b).

The highest antenna gain is considered and was added to the Reference Level Offset.
Emission levels are further adjusted to consider the number of antenna outputs (2).

Measurement:

Measurement parameter	
External result file(s)	1-1132-25-01-05_TR1-A201-R01.pdf FCC Part 15.407 & ISED Bandwidths
Test setup:	See sub clause 7.4 – A
Measurement uncertainty:	See chapter 9

Limits:

FCC Part 15.407 (b)(4)
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Result: Compliant (See external result file)

12.11 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:	3 MHz
Trace mode:	Max Hold
Test setup:	See sub clause 7.2 – A
Measurement uncertainty:	See chapter 9

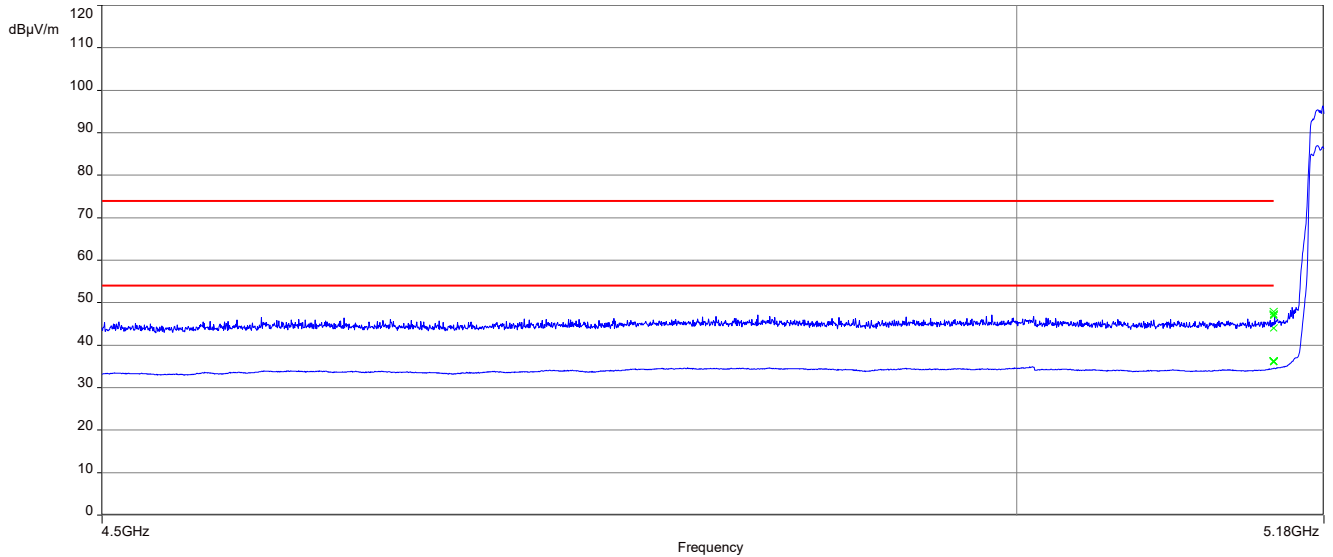
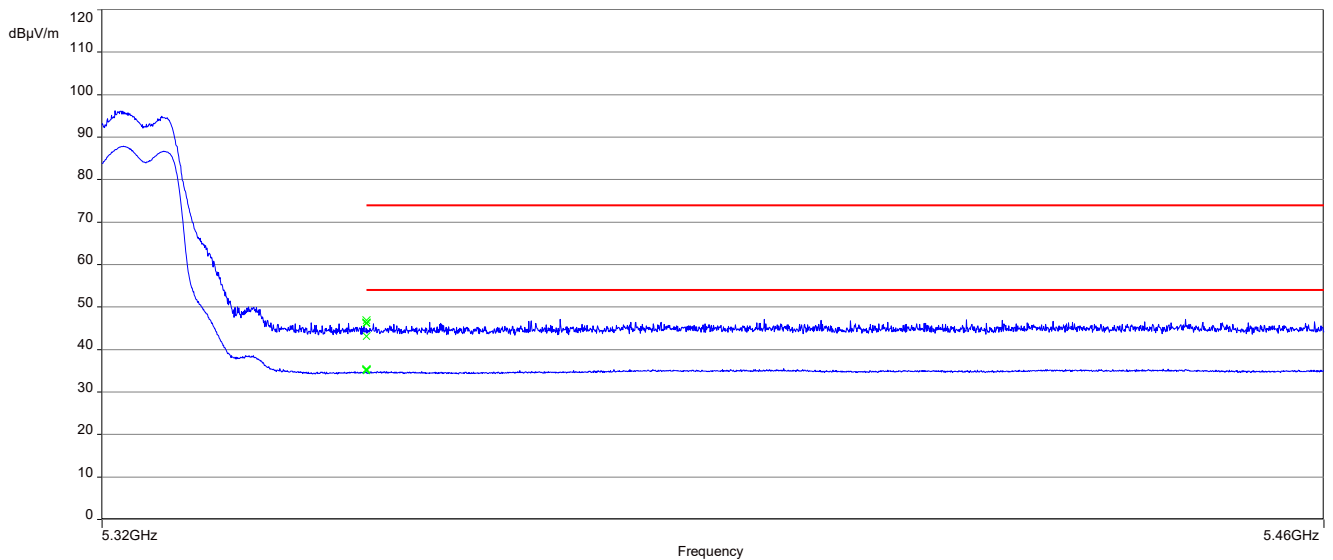
Limits:

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 μ V/m (peak) 54 dB μ V/m (average)

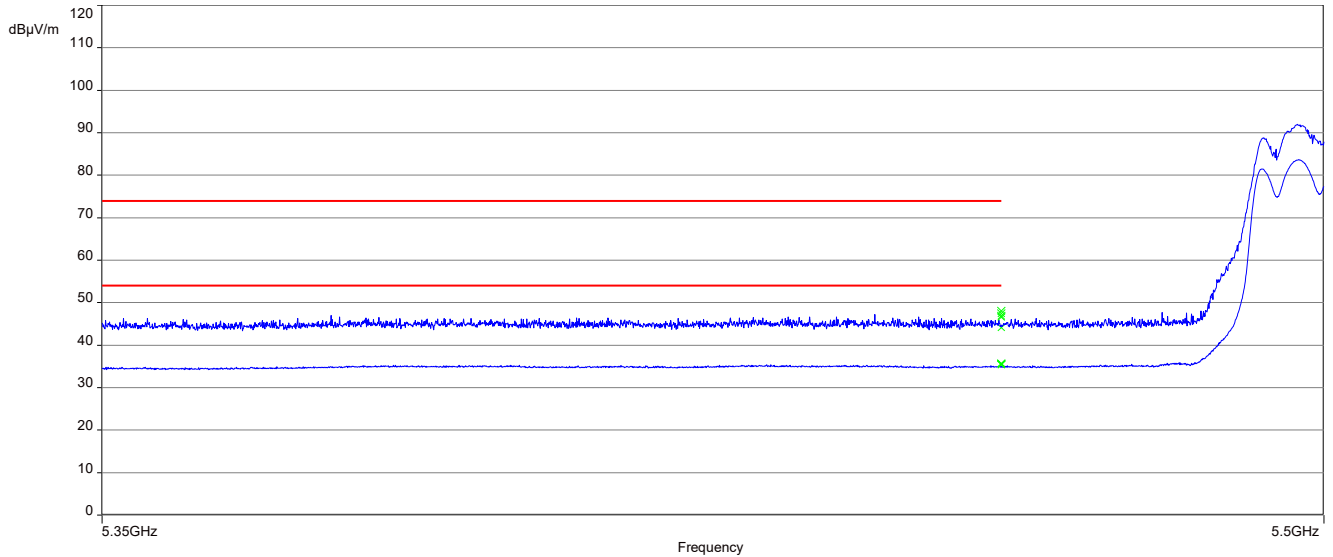
Result:

Scenario	Band Edge Compliance Radiated [dBµV/m]
a-mode Channel 36	47.9 dBµV/m (peak) 36.2 dBµV/m (average)
a-mode Channel 64	46.9 dBµV/m (peak) 35.3 dBµV/m (average)
a-mode Channel 100	48.1 dBµV/m (peak) 35.7 dBµV/m (average)
nHT20-mode Channel 36	47.9 dBµV/m (peak) 36.2 dBµV/m (average)
nHT20-mode Channel 64	45.7 dBµV/m (peak) 34.2 dBµV/m (average)
nHT20-mode Channel 100	46.3 dBµV/m (peak) 34.6 dBµV/m (average)
acVHT20-mode Channel 36	47.5 dBµV/m (peak) 36.2 dBµV/m (average)
acVHT20-mode Channel 64	46.6 dBµV/m (peak) 35.2 dBµV/m (average)
acVHT20-mode Channel 100	47.0 dBµV/m (peak) 35.4 dBµV/m (average)
axHE20-mode Channel 36	48.1 dBµV/m (peak) 36.1 dBµV/m (average)
axHE20-mode Channel 64	46.7 dBµV/m (peak) 35.1 dBµV/m (average)
axHE20-mode Channel 100	47.2 dBµV/m (peak) 35.5 dBµV/m (average)
nHT40-mode Channel 38	51.3 dBµV/m (peak) 38.4 dBµV/m (average)
nHT40-mode Channel 62	46.9 dBµV/m (peak) 35.3 dBµV/m (average)
nHT40-mode Channel 102	46.1 dBµV/m (peak) 34.6 dBµV/m (average)
acVHT40-mode Channel 38	48.0 dBµV/m (peak) 36.7 dBµV/m (average)
acVHT40-mode Channel 62	48.1 dBµV/m (peak) 36.1 dBµV/m (average)
acVHT40-mode Channel 102	47.1 dBµV/m (peak) 35.6 dBµV/m (average)
axHE40-mode Channel 38	48.0 dBµV/m (peak) 36.6 dBµV/m (average)
axHE40-mode Channel 62	48.4 dBµV/m (peak) 36.1 dBµV/m (average)
axHE40-mode Channel 102	47.2 dBµV/m (peak) 35.4 dBµV/m (average)
acVHT80-mode Channel 42	48.7 dBµV/m (peak) 37.0 dBµV/m (average)
acVHT80-mode Channel 58	48.3 dBµV/m (peak) 36.7 dBµV/m (average)
acVHT80-mode Channel 106	47.5 dBµV/m (peak) 36.1 dBµV/m (average)
axHE80-mode Channel 42	49.8 dBµV/m (peak) 38.2 dBµV/m (average)

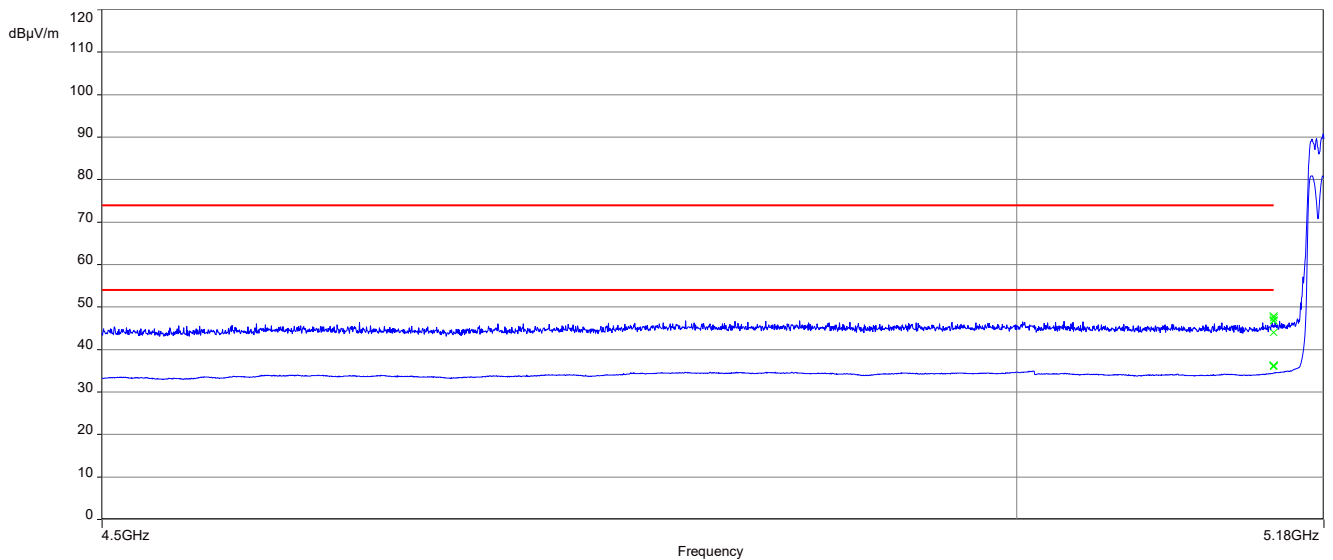
axHE80-mode Channel 58	51.9 dB μ V/m (peak) 38.0 dB μ V/m (average)
axHE80-mode Channel 106	47.4 dB μ V/m (peak) 36.2 dB μ V/m (average)
axHE20-mode Channel 36 Tone plan 10-L	48.0 dB μ V/m (peak) 36.0 dB μ V/m (average)
axHE20-mode Channel 36 Tone plan 50-L	47.6 dB μ V/m (peak) 36.0 dB μ V/m (average)
axHE20-mode Channel 64 Tone plan 30-L	46.6 dB μ V/m (peak) 35.1 dB μ V/m (average)
axHE20-mode Channel 64 Tone plan 90-L	46.7 dB μ V/m (peak) 35.1 dB μ V/m (average)
axHE20-mode Channel 100 Tone plan 10-L	47.4 dB μ V/m (peak) 35.5 dB μ V/m (average)
axHE20-mode Channel 100 Tone plan 50-L	46.8 dB μ V/m (peak) 35.7 dB μ V/m (average)

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

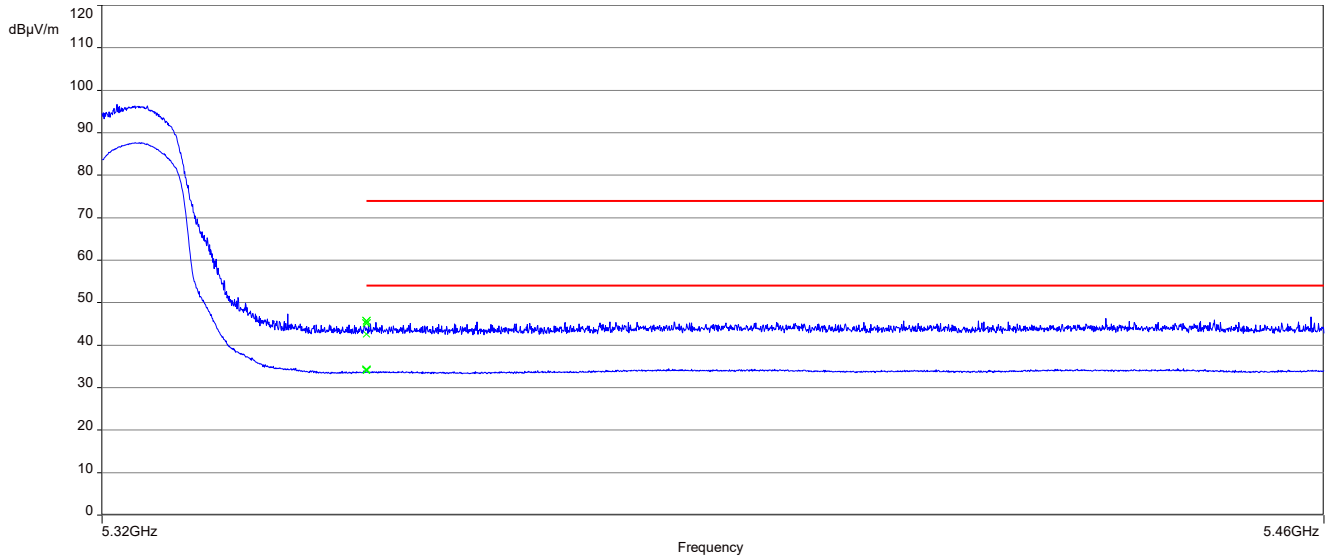
Plot 3: lower band edge; U-NII-2C; lowest channel; a-mode SISO 1+2



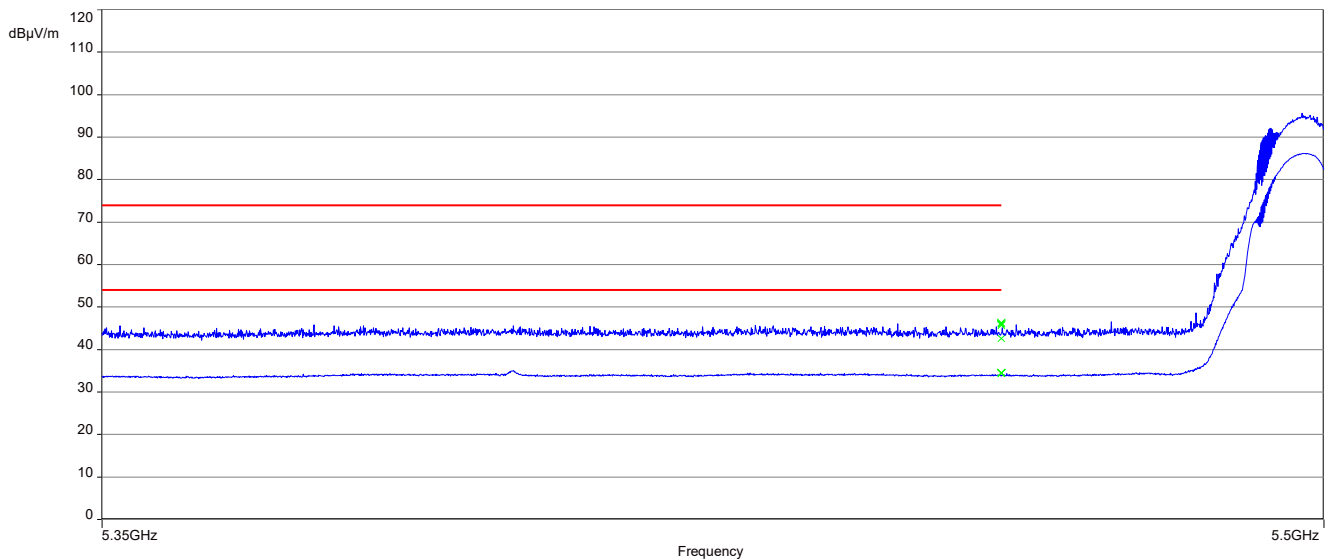
Plot 4: lower band edge; U-NII-1; lowest channel; n20-mode MIMO



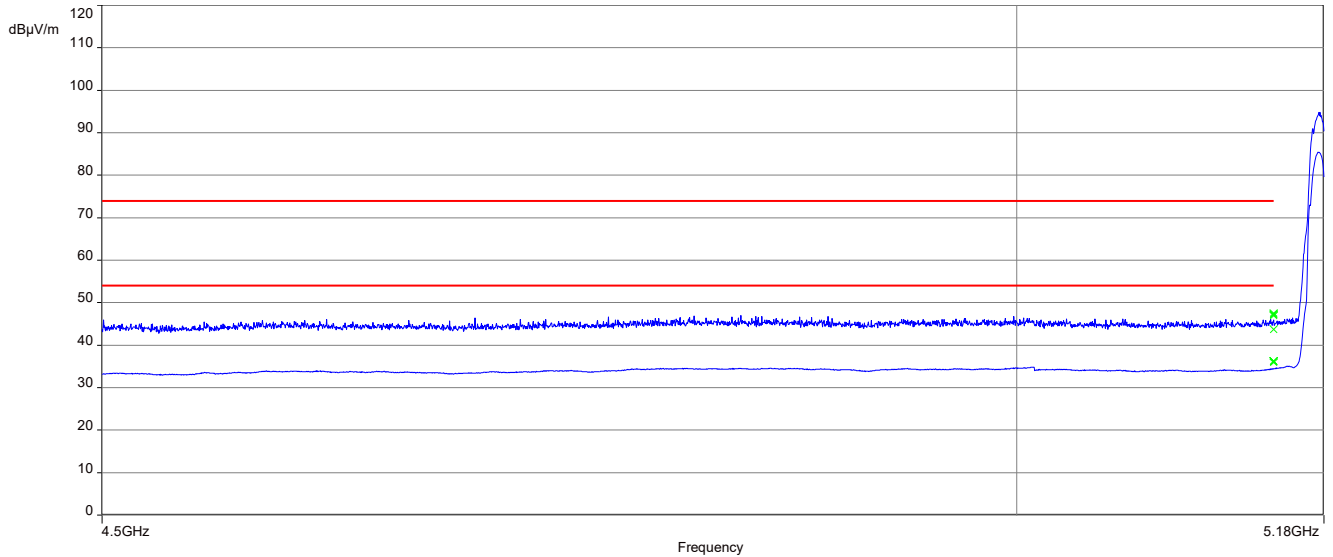
Plot 5: upper band edge; U-NII-2A; highest channel; n20-mode MIMO



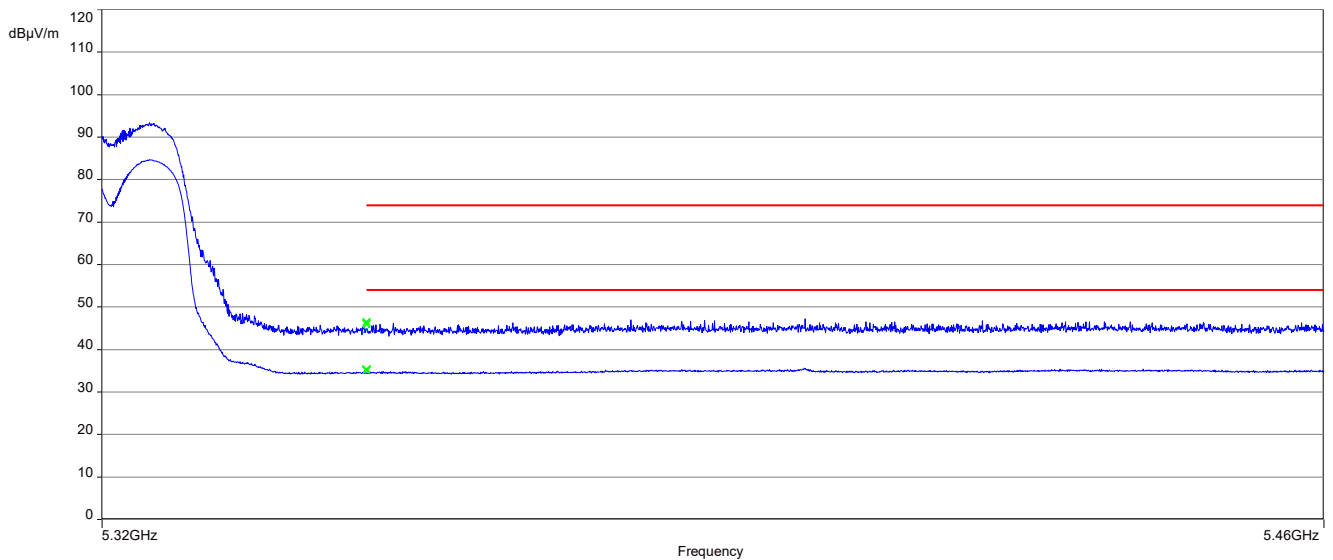
Plot 6: lower band edge; U-NII-2C; lowest channel; n20-mode MIMO



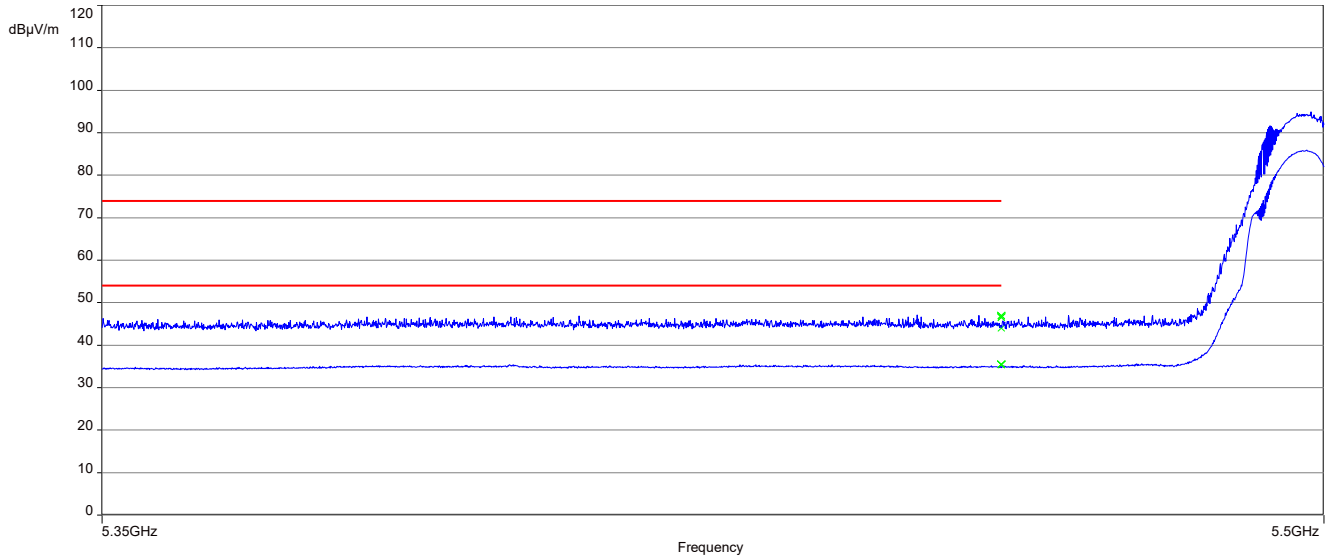
Plot 7: lower band edge; U-NII-1; lowest channel; ac20-mode MIMO



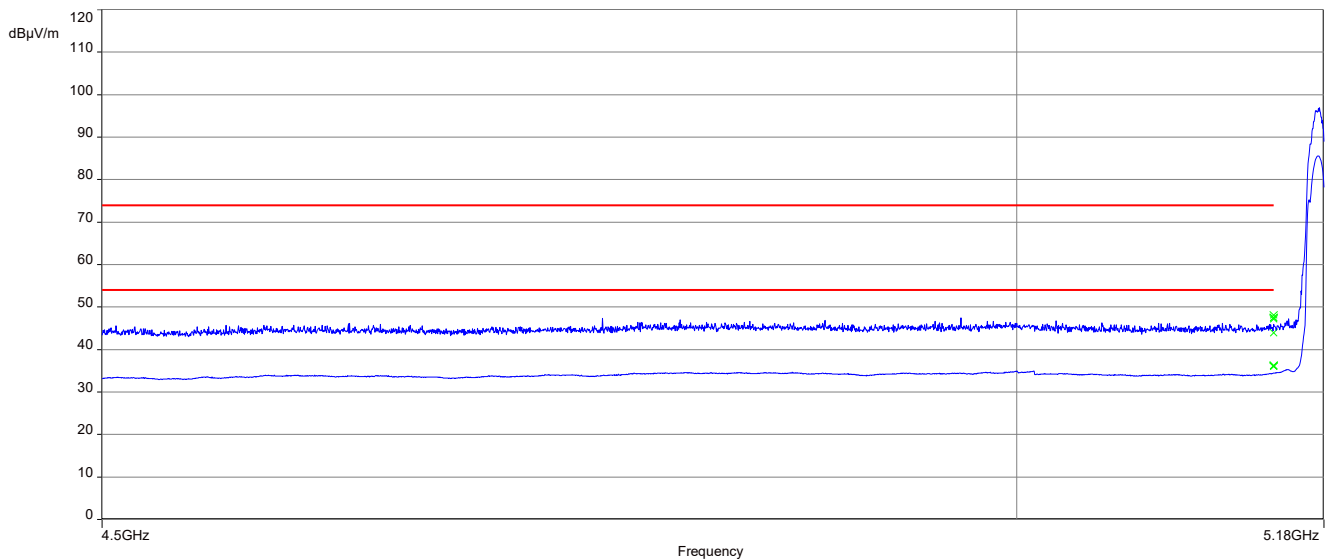
Plot 8: upper band edge; U-NII-2A; highest channel; ac20-mode MIMO



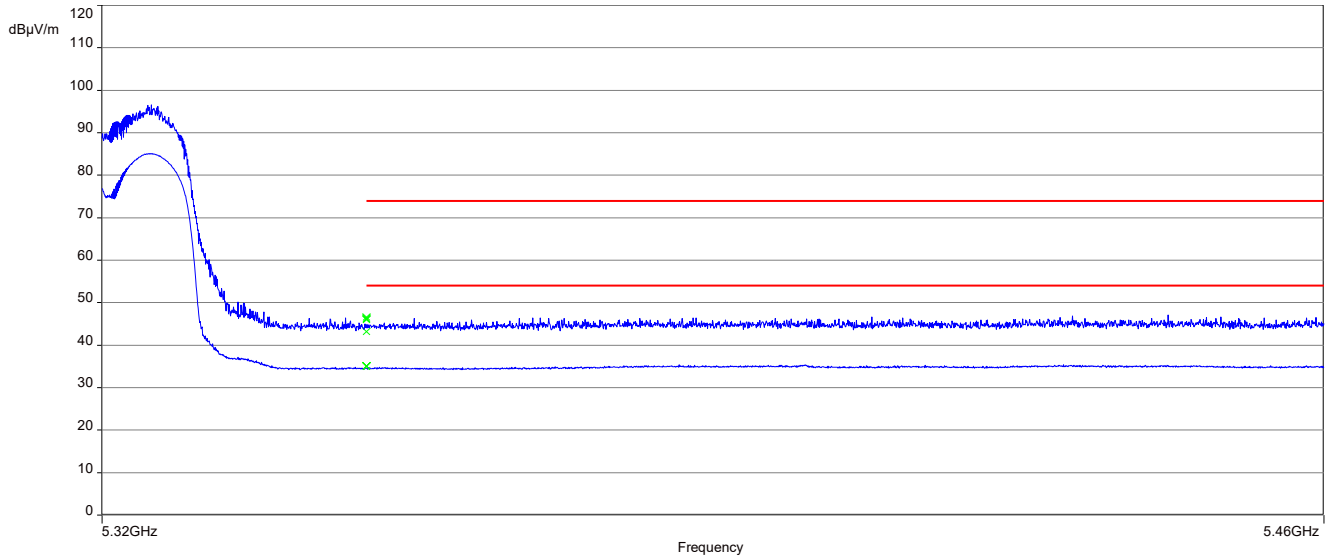
Plot 9: lower band edge; U-NII-2C; lowest channel; ac20-mode MIMO



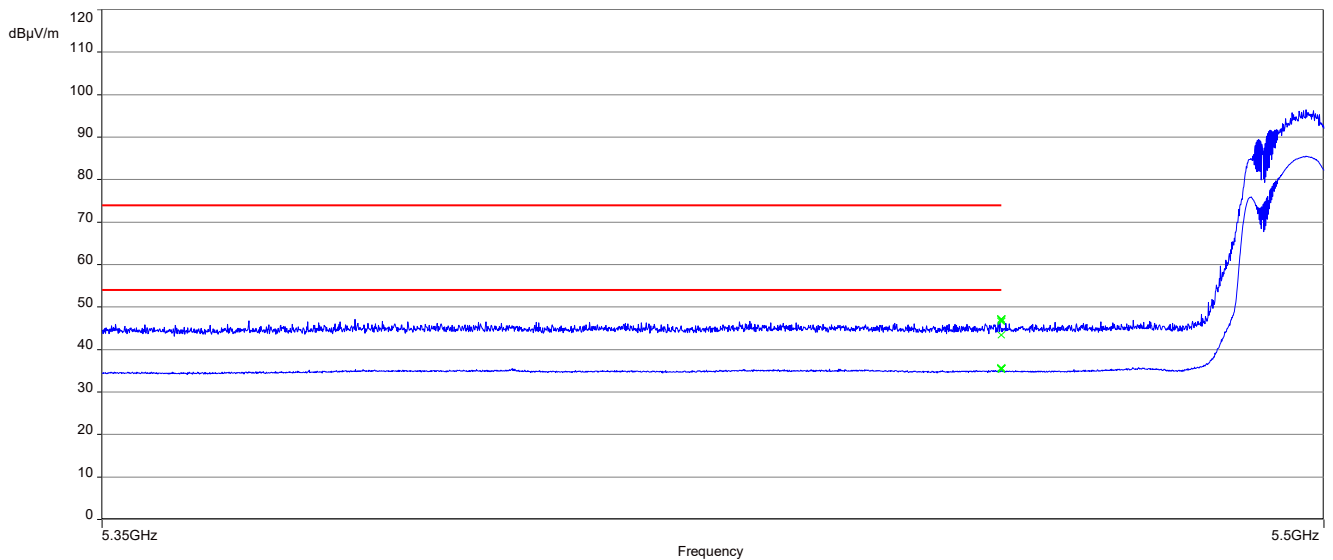
Plot 10: lower band edge; U-NII-1; lowest channel; ax20-mode MIMO

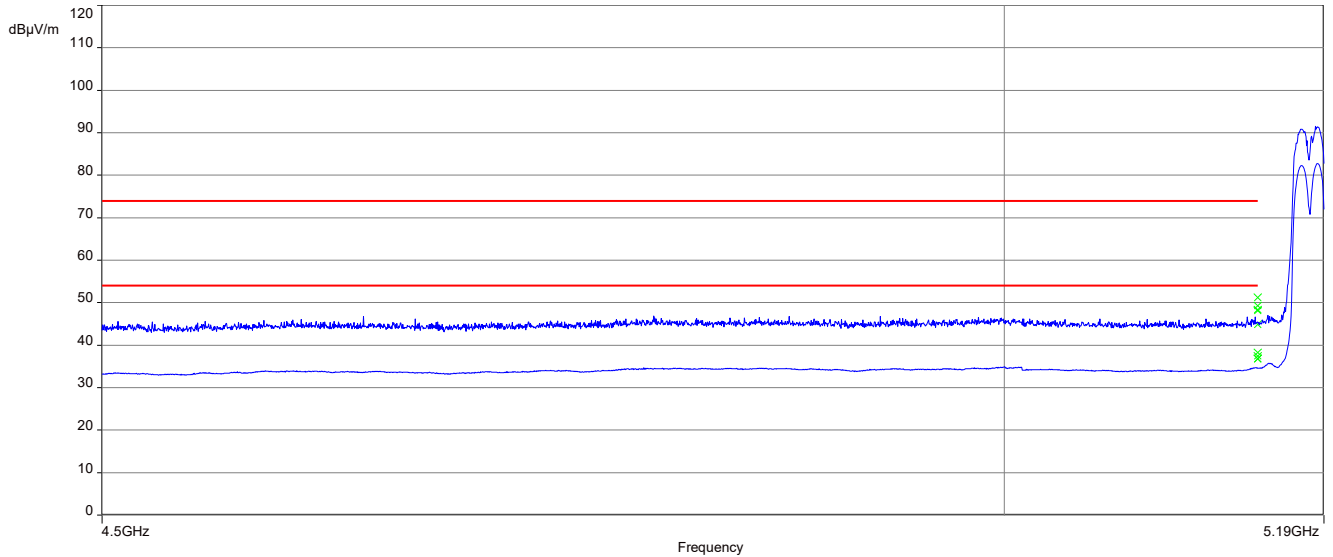
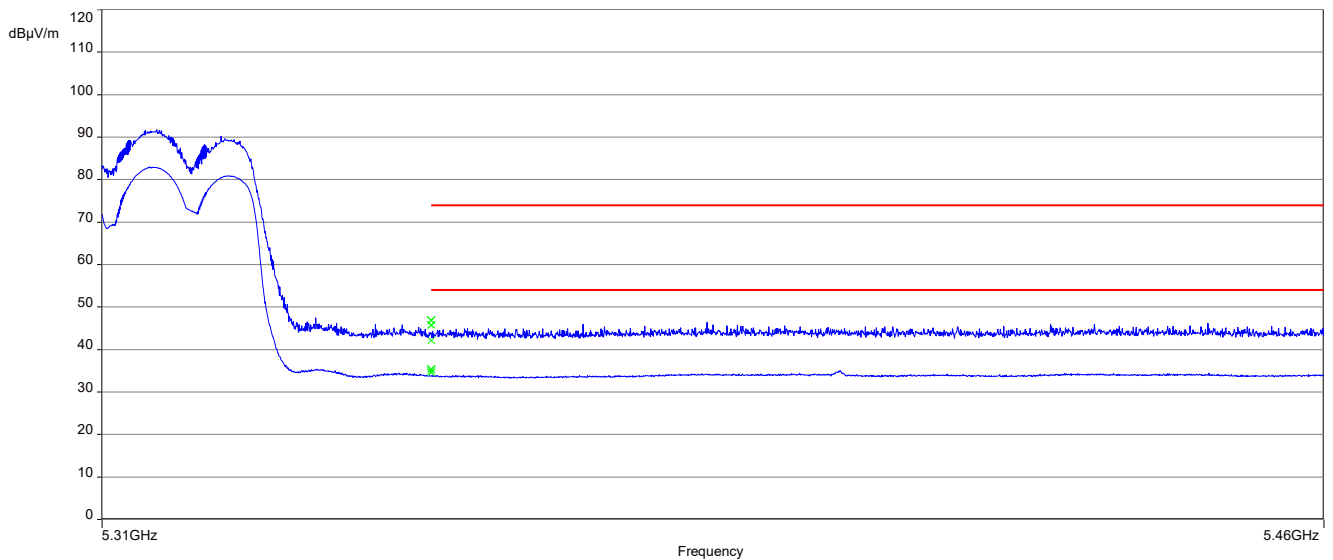


Plot 11: upper band edge; U-NII-2A; highest channel; ax20-mode MIMO

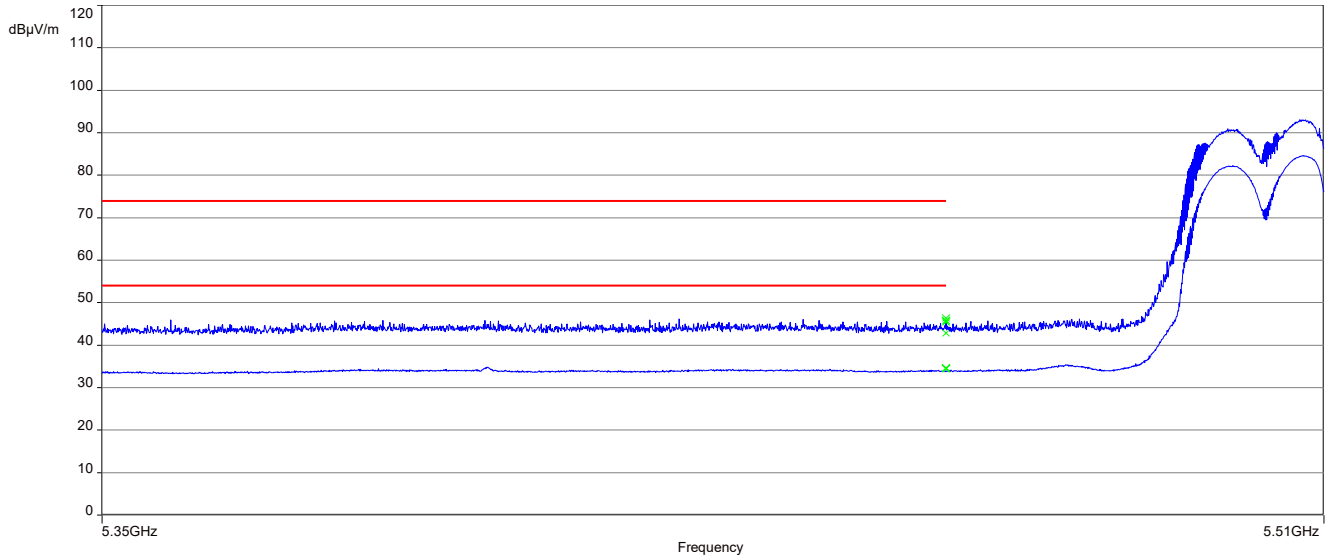


Plot 12: lower band edge; U-NII-2C; lowest channel; ax20-mode MIMO

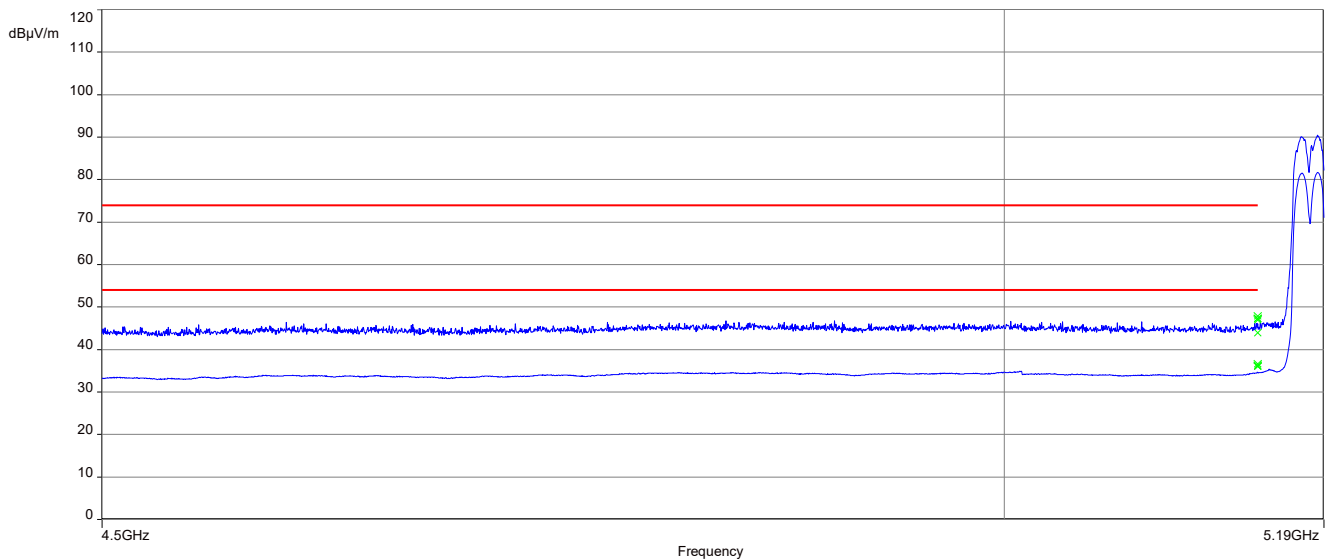


Plot 13: lower band edge; U-NII-1; lowest channel; n40-mode MIMO**Plot 14:** upper band edge; U-NII-2A; highest channel; n40-mode MIMO

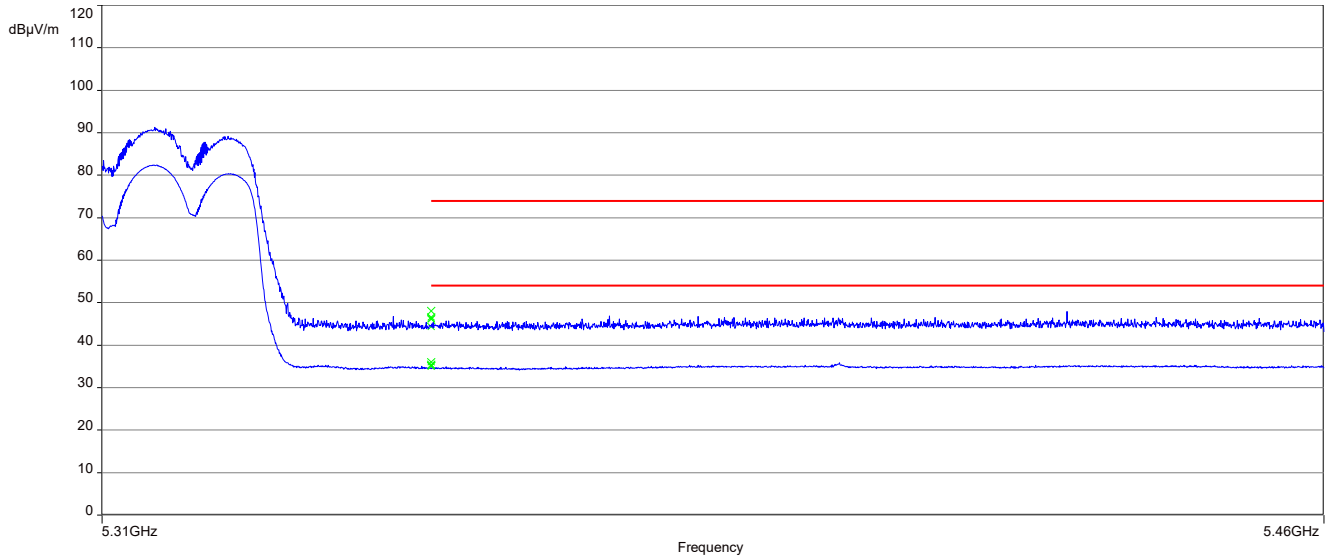
Plot 15: lower band edge; U-NII-2C; lowest channel; n40-mode MIMO



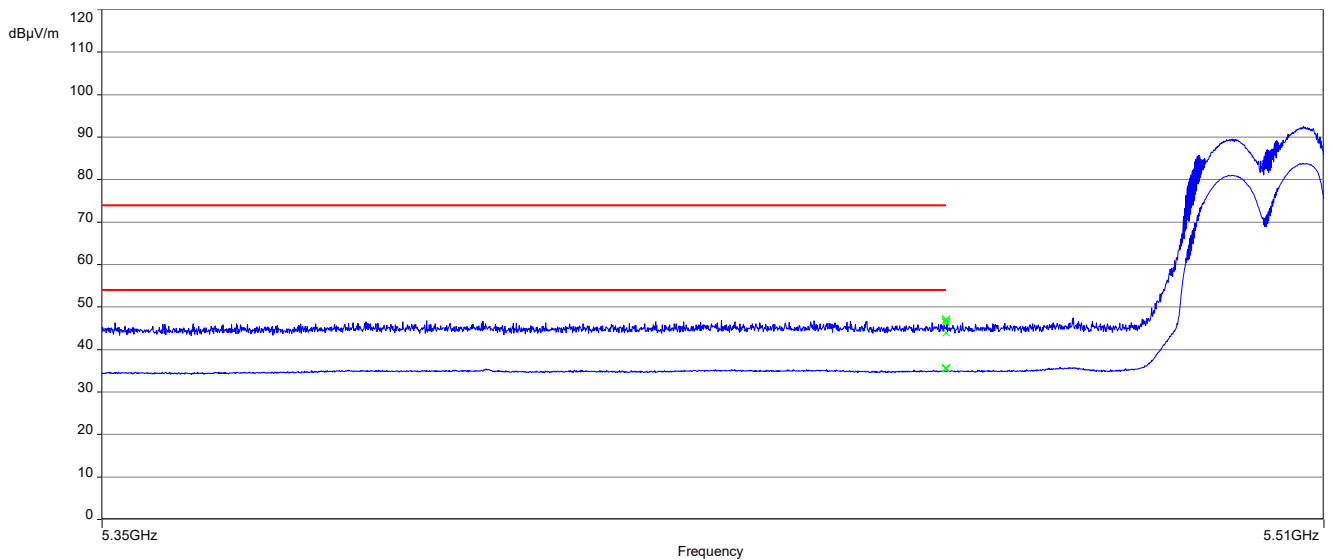
Plot 16: lower band edge; U-NII-1; lowest channel; ac40-mode MIMO



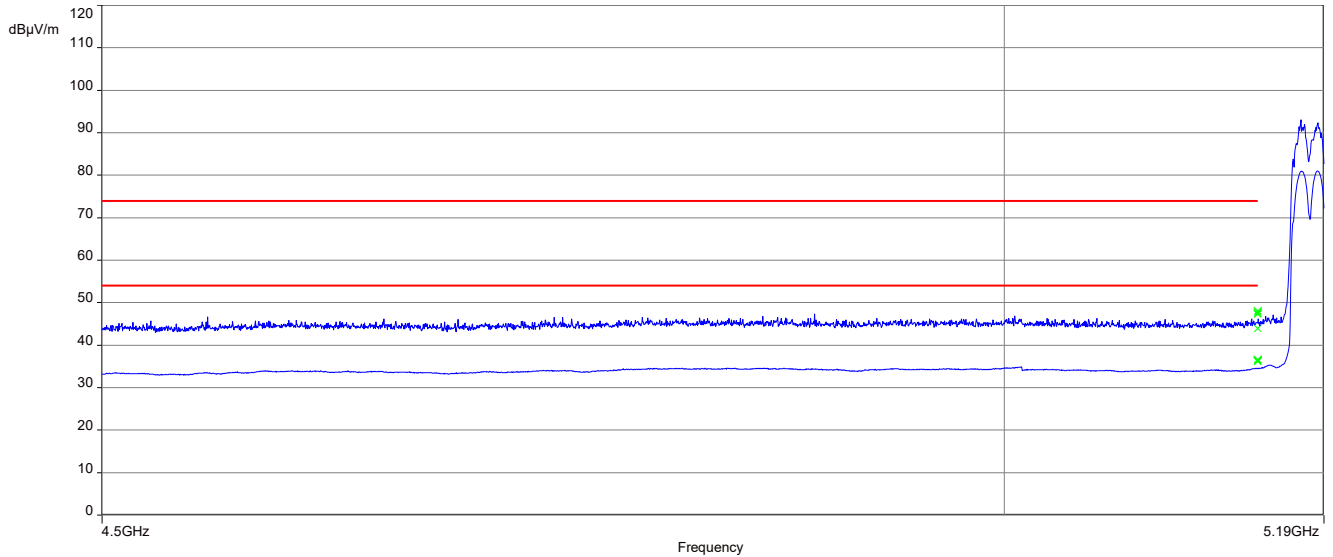
Plot 17: upper band edge; U-NII-2A; highest channel; ac40-mode MIMO



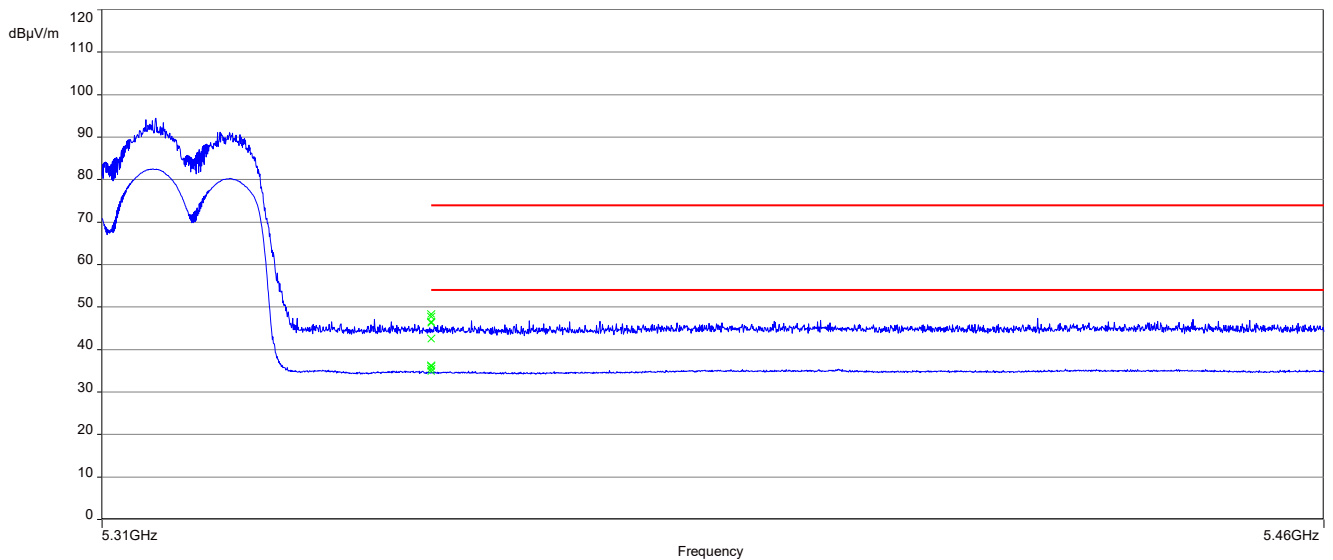
Plot 18: lower band edge; U-NII-2C; lowest channel; ac40-mode MIMO



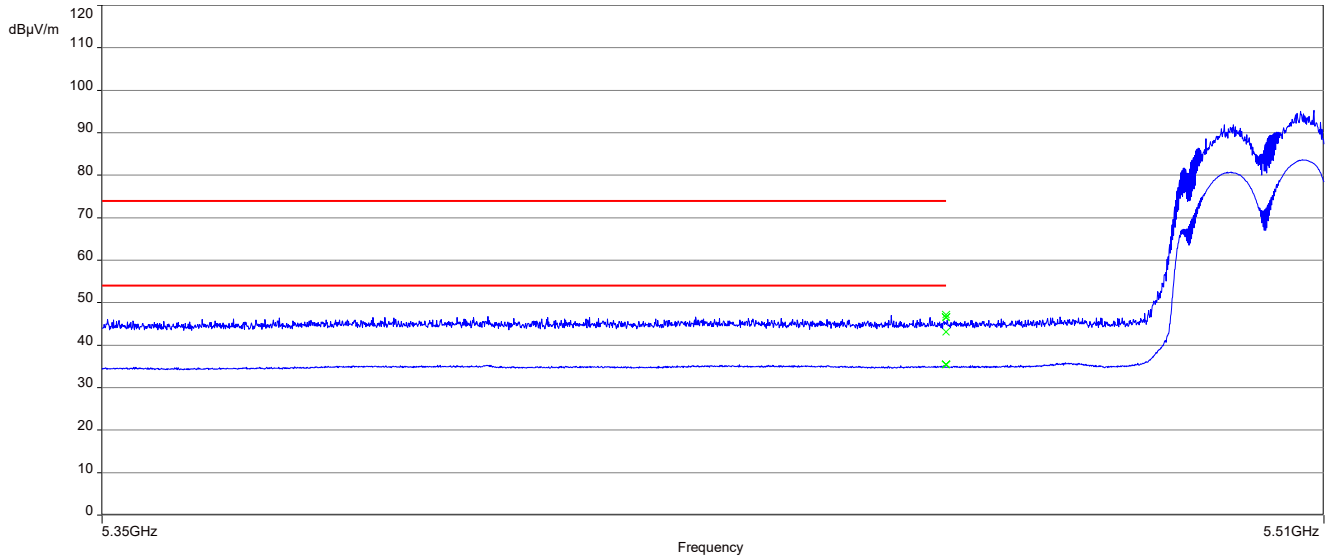
Plot 19: lower band edge; U-NII-1; lowest channel; ax40-mode MIMO



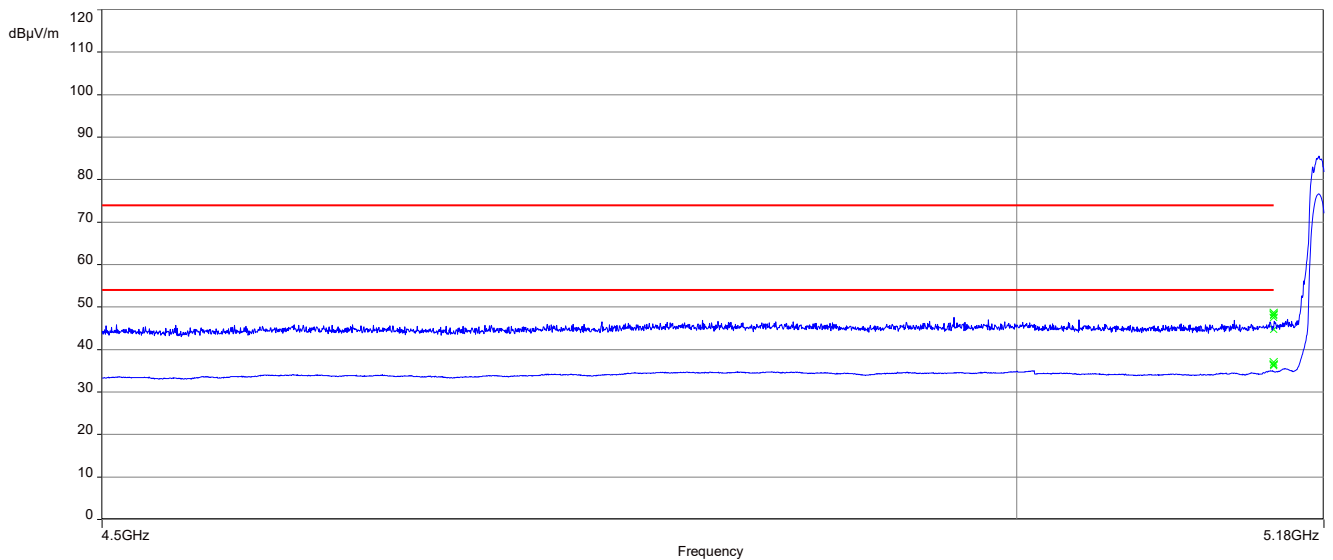
Plot 20: upper band edge; U-NII-2A; highest channel; ax40-mode MIMO



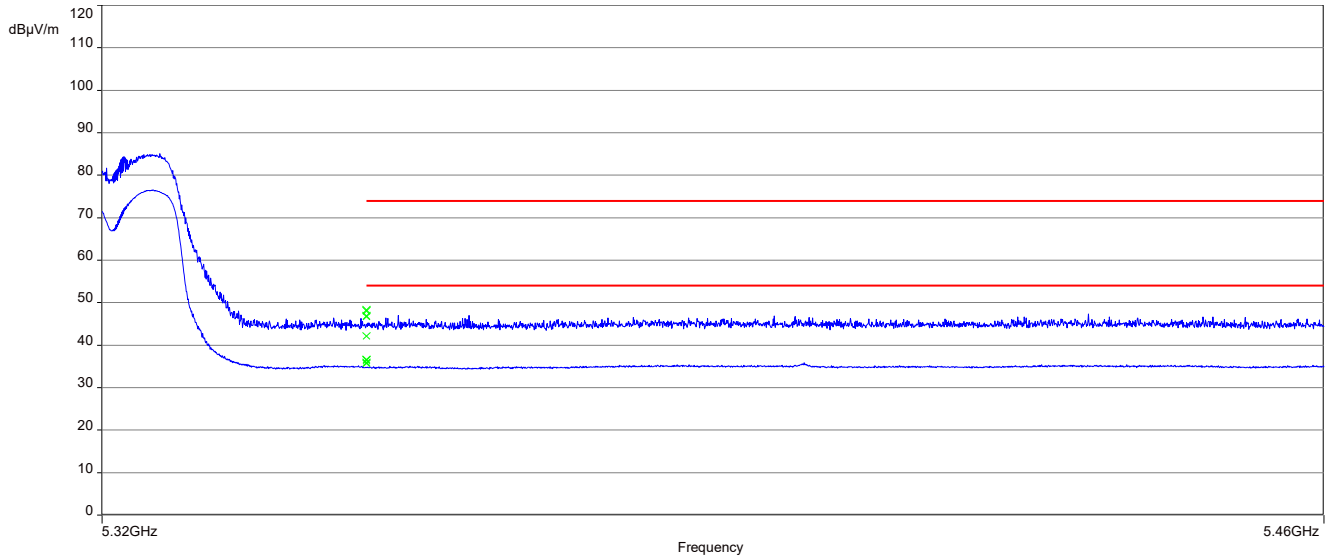
Plot 21: lower band edge; U-NII-2C; lowest channel; ax40-mode MIMO



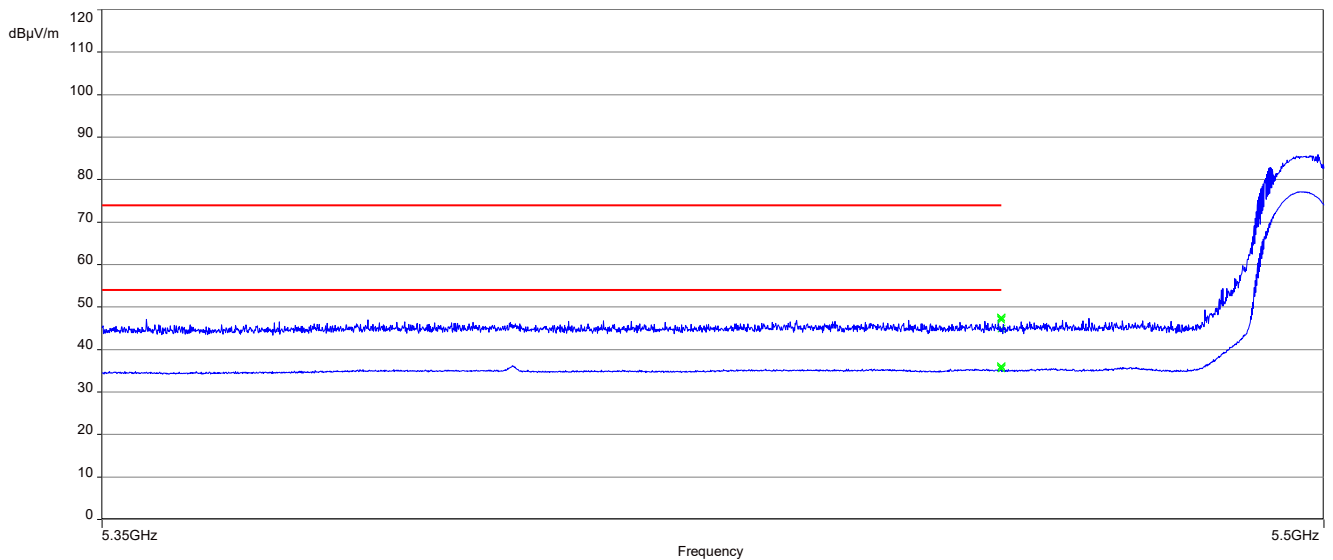
Plot 22: lower band edge; U-NII-1; middle channel; ac80-mode MIMO



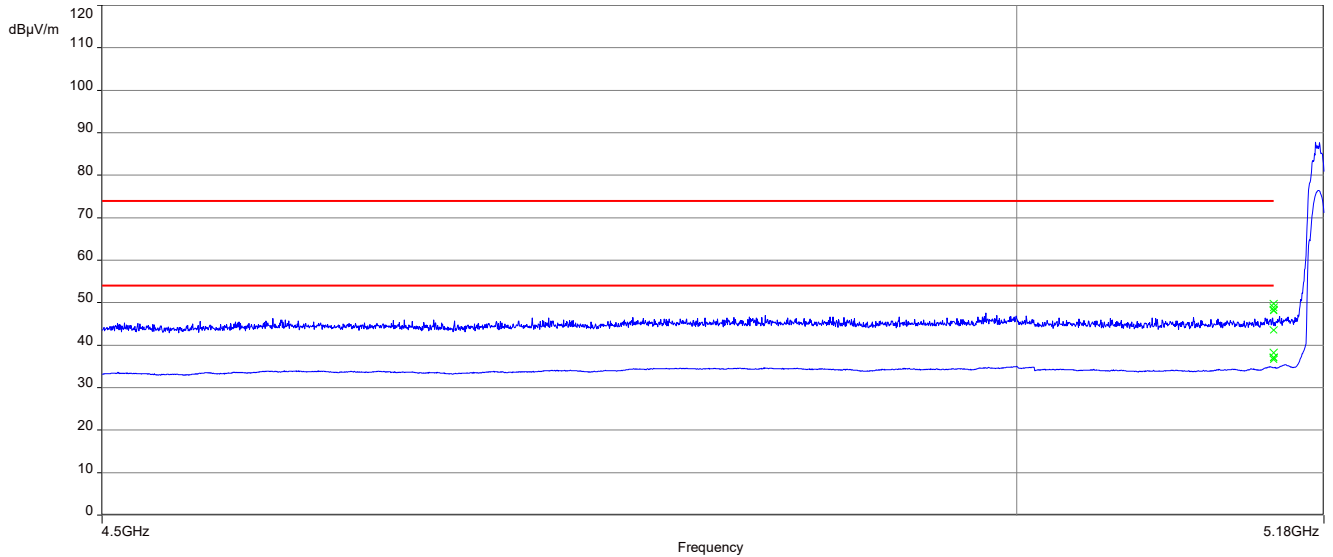
Plot 23: upper band edge; U-NII-2A; middle channel; ac80-mode MIMO



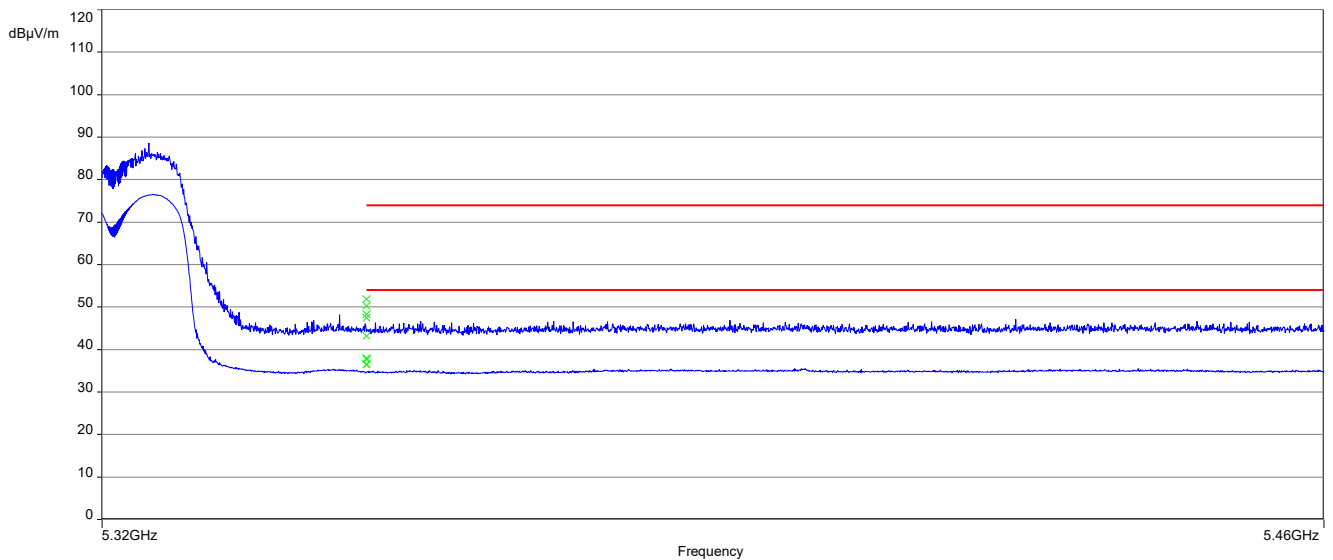
Plot 24: lower band edge; U-NII-2C; lowest channel; ac80-mode MIMO



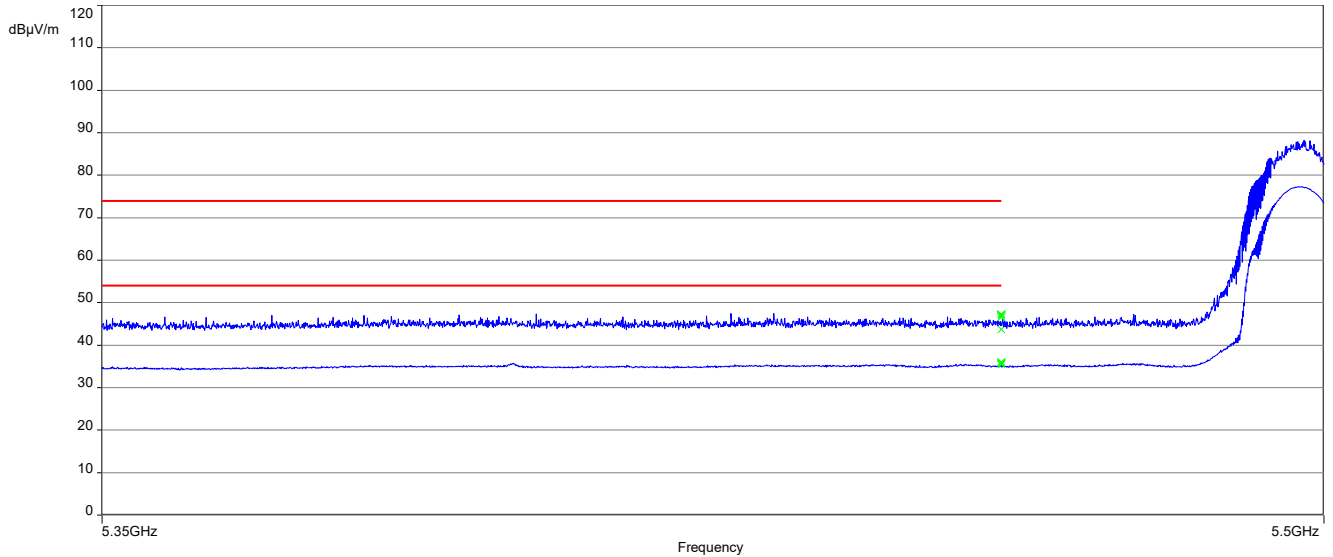
Plot 25: lower band edge; U-NII-1; middle channel; ax80-mode MIMO



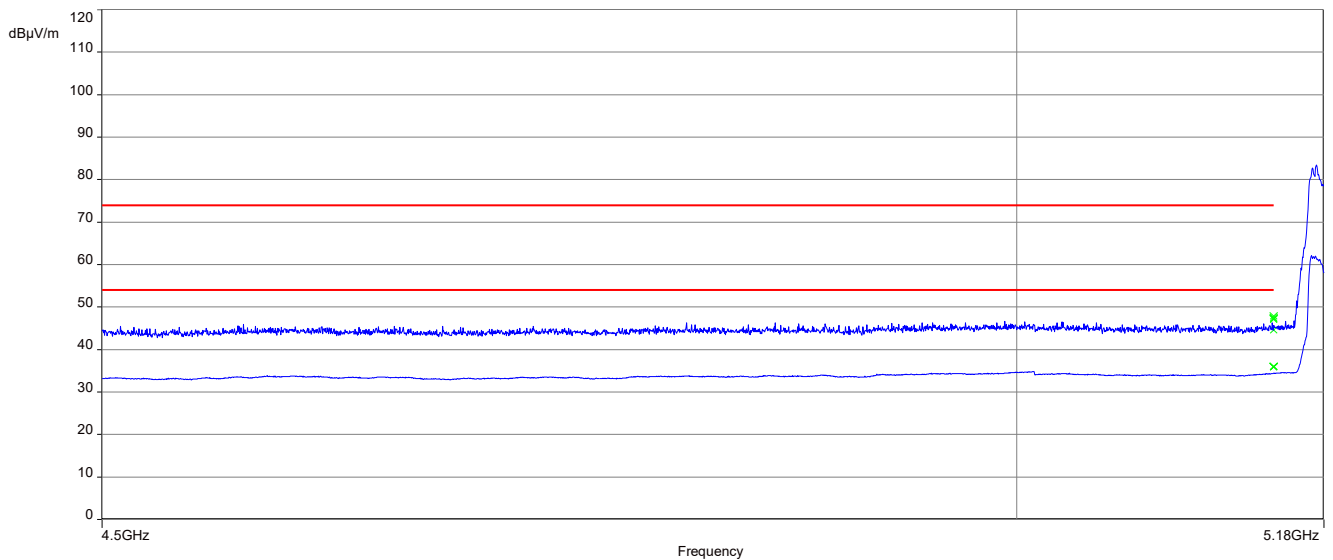
Plot 26: upper band edge; U-NII-2A; middle channel; ax80-mode MIMO



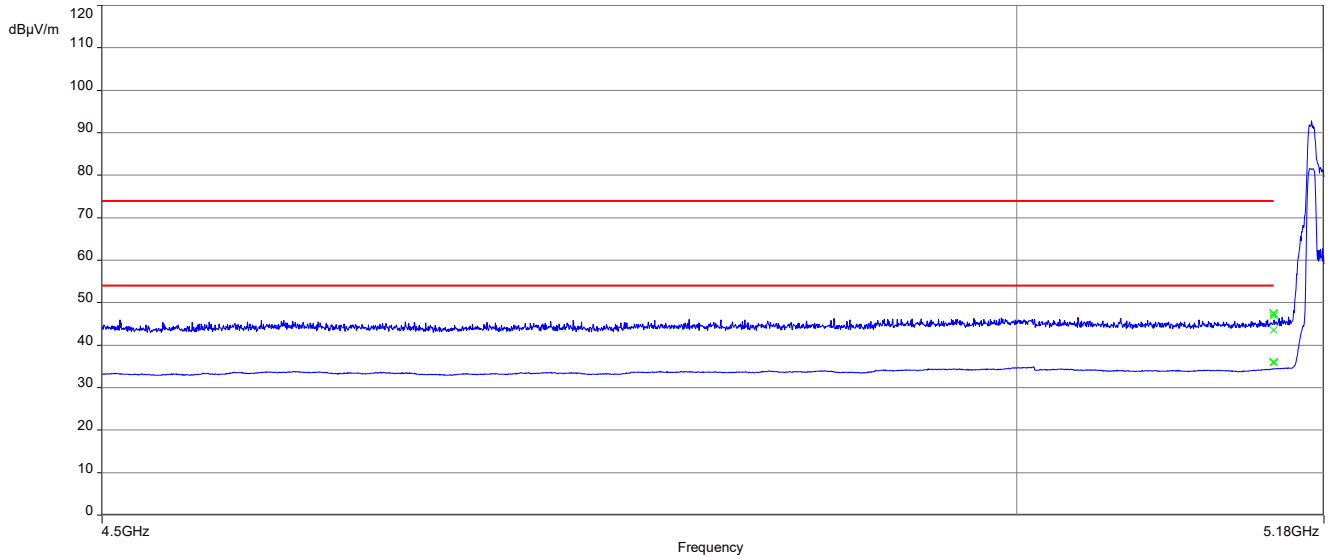
Plot 27: lower band edge; U-NII-2C; lowest channel; ax80-mode MIMO



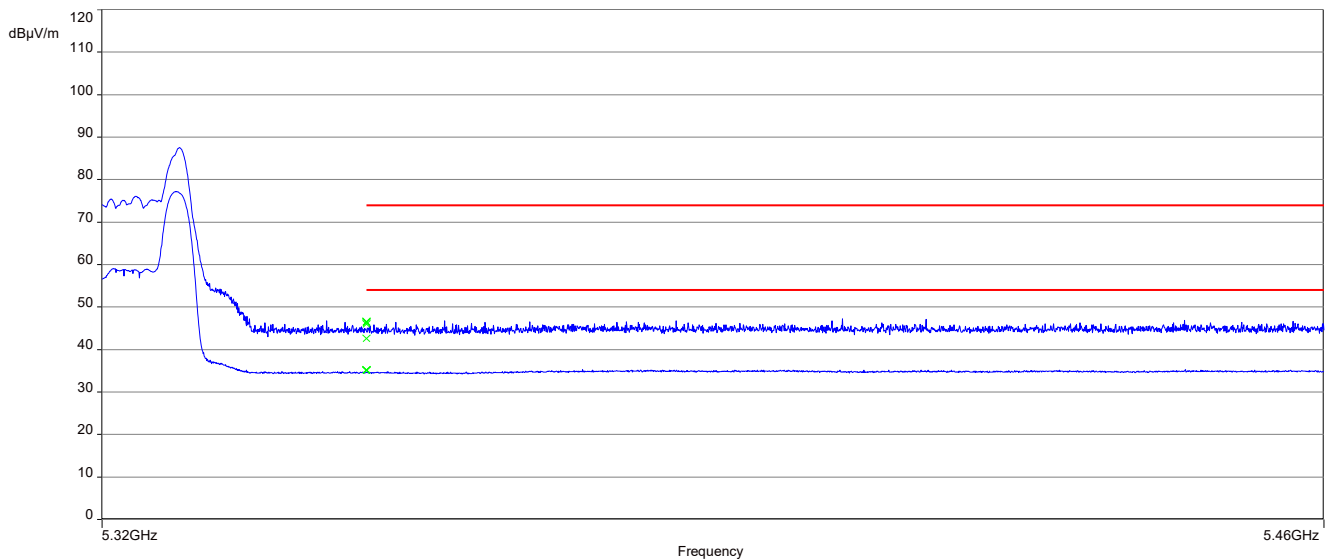
Plot 28: lower band edge; U-NII-1; lowest channel; ax20-mode MIMO, tone plan 10-L



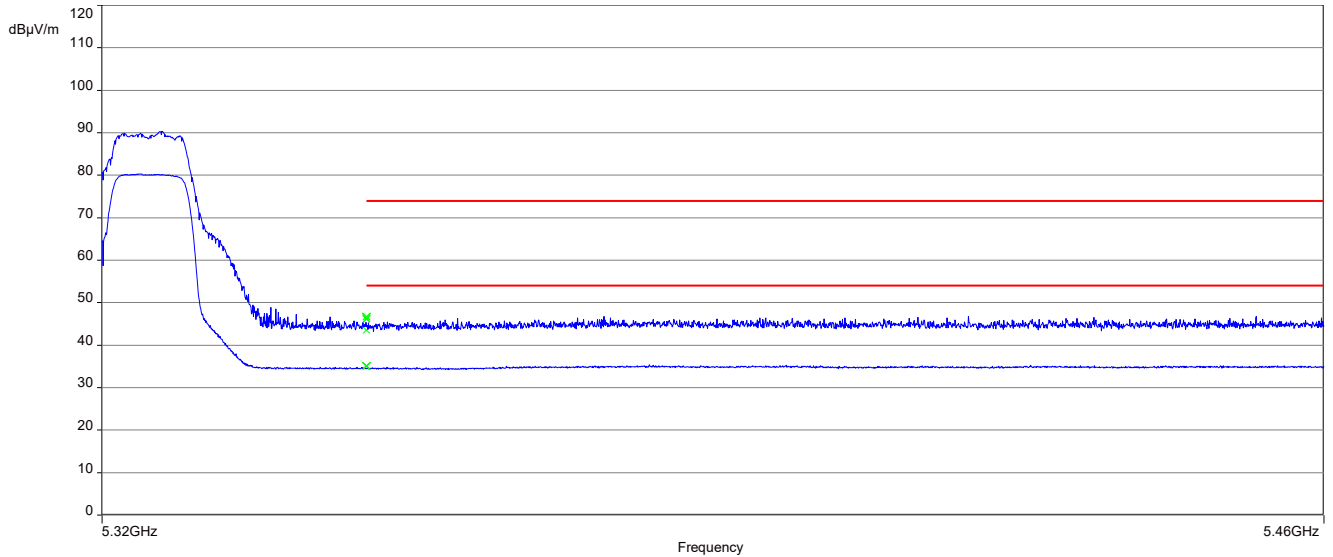
Plot 29: lower band edge; U-NII-1; lowest channel; ax20-mode MIMO, tone plan 50-L



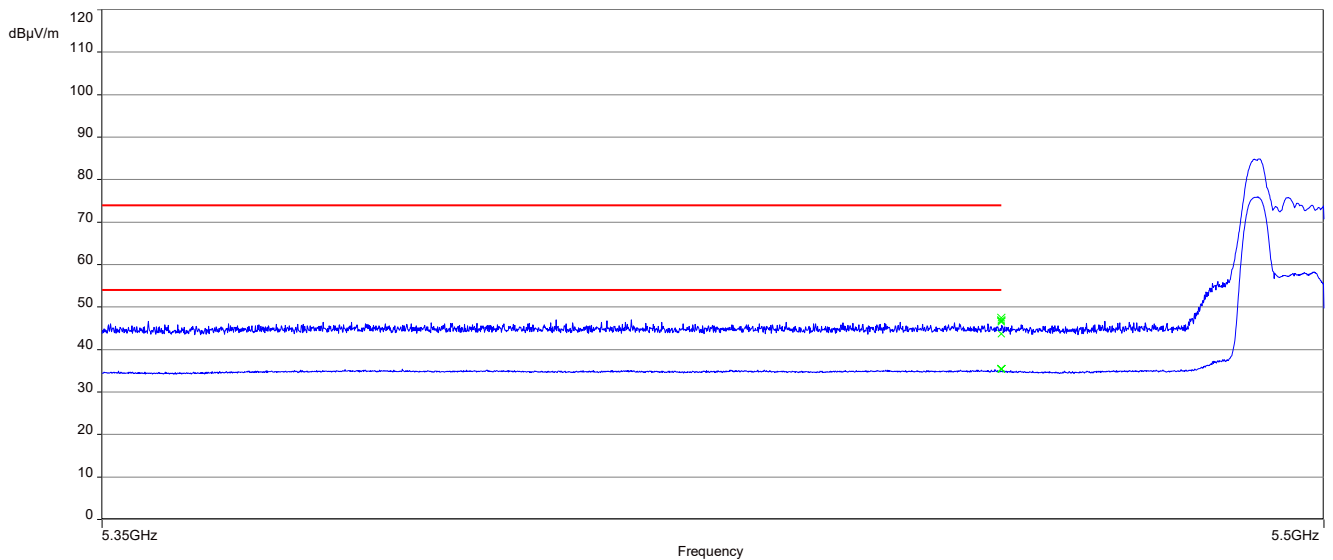
Plot 30: upper band edge; U-NII-2A; lowest channel; ax20-mode MIMO, tone plan 30-L



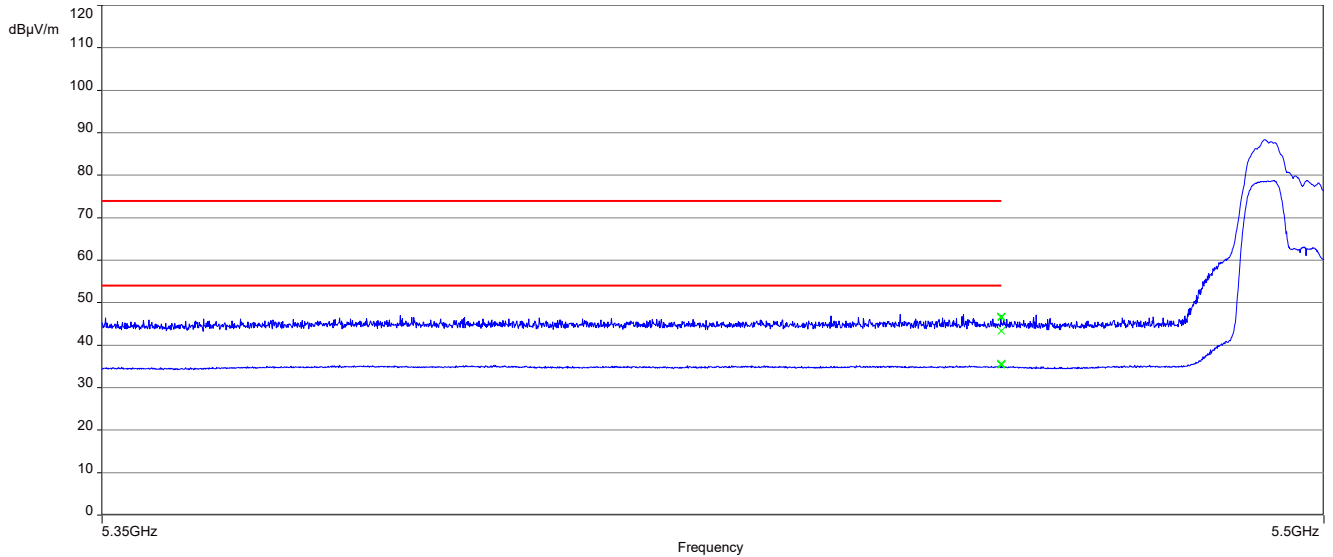
Plot 31: upper band edge; U-NII-2A; lowest channel; ax20-mode MIMO, tone plan 90-L



Plot 32: lower band edge; U-NII-2C; lowest channel; ax20-mode MIMO, tone plan 10-L



Plot 33: lower band edge; U-NII-2C; lowest channel; ax20-mode MIMO, tone plan 30-L



12.12 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 F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace mode:	Max Hold
Test setup:	See sub clause 7.2 – C
Measurement uncertainty:	See chapter 9

Limits:

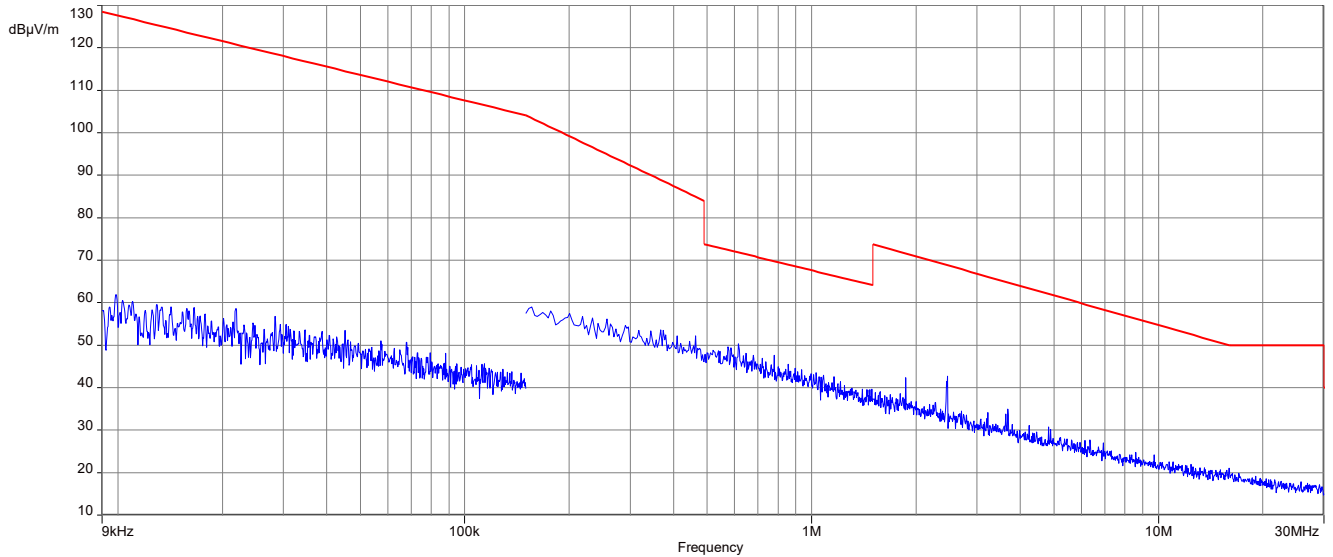
Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (μV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Results:

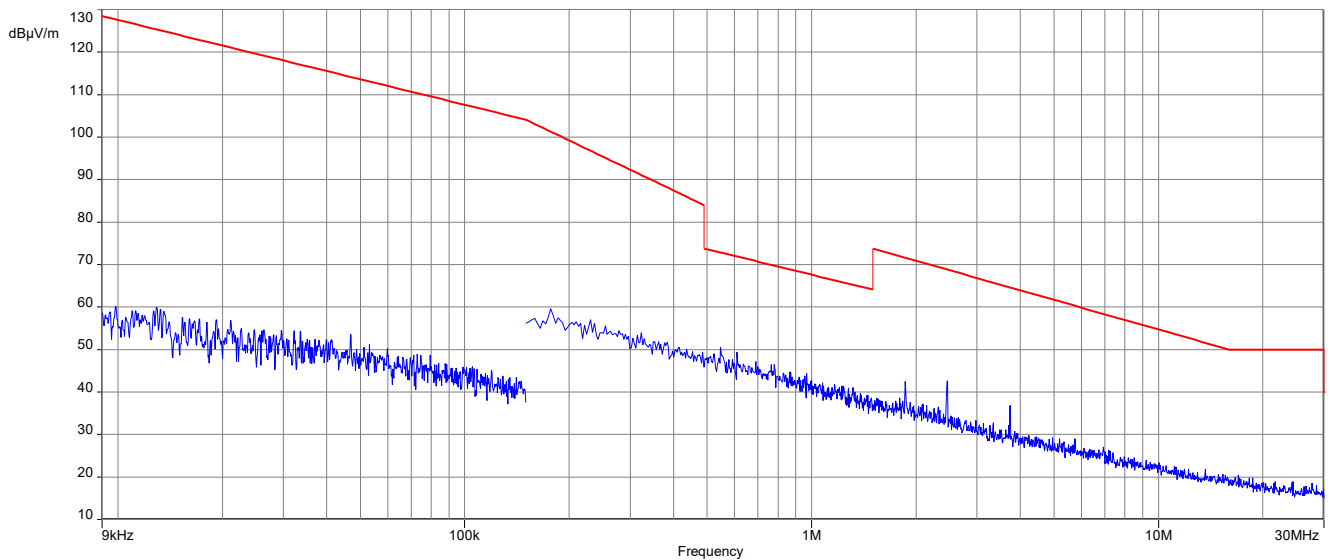
Spurious Emissions Radiated < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
All detected emissions are more than 20 dB below the limit.		

Plots: 20 MHz channel bandwidth

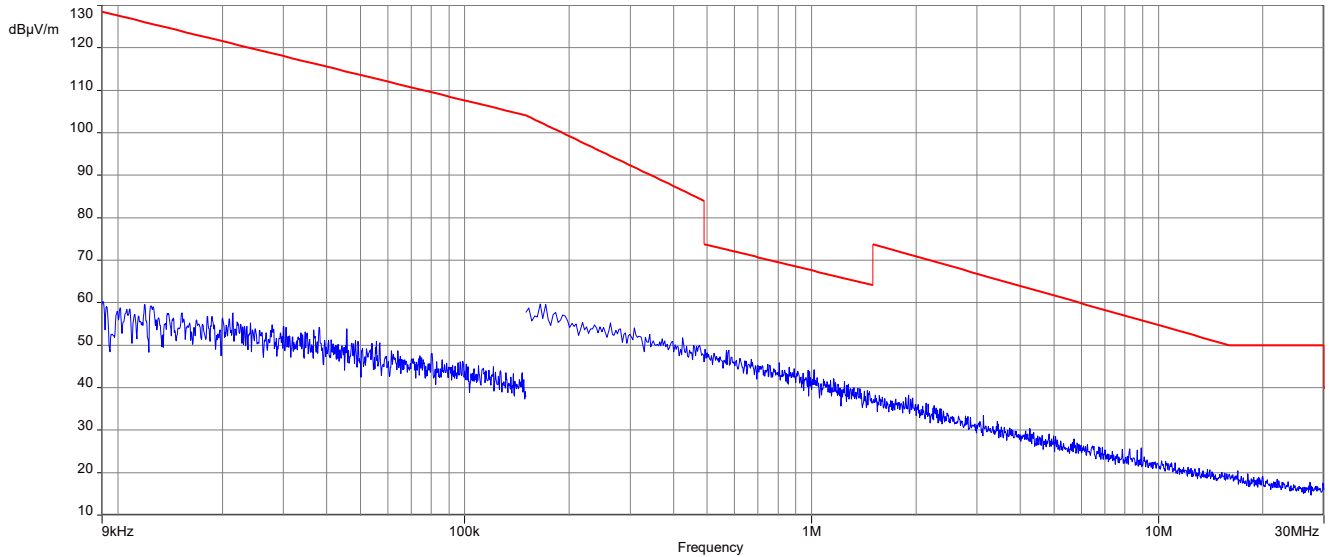
Plot 1: 9 kHz to 30 MHz, U-NII-1; lowest channel



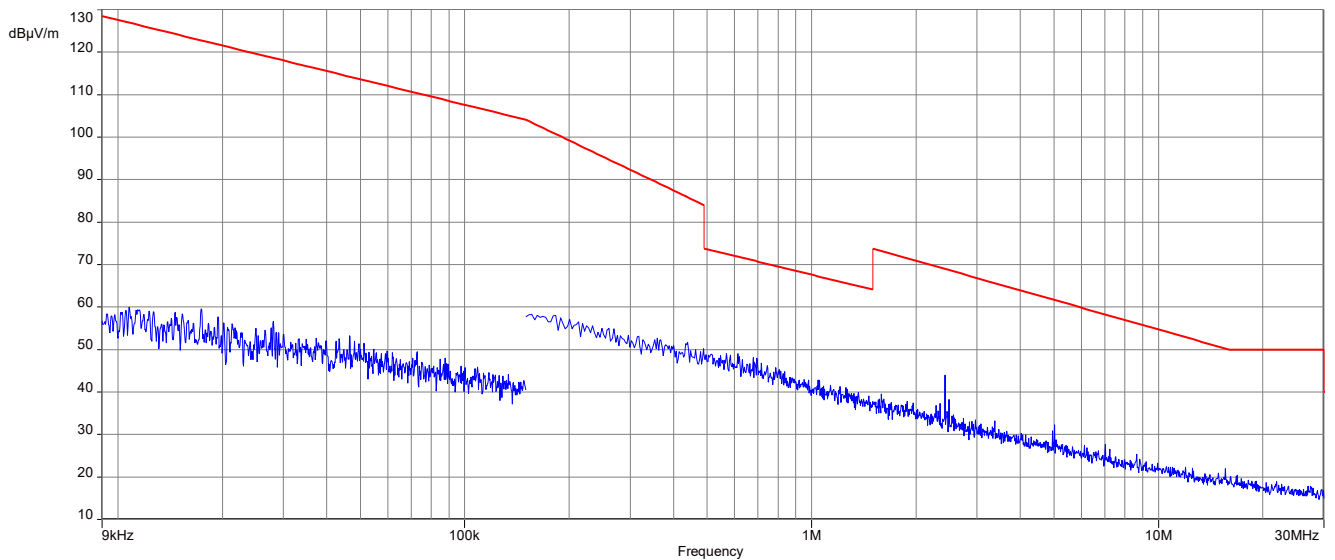
Plot 2: 9 kHz to 30 MHz, U-NII-1; middle channel



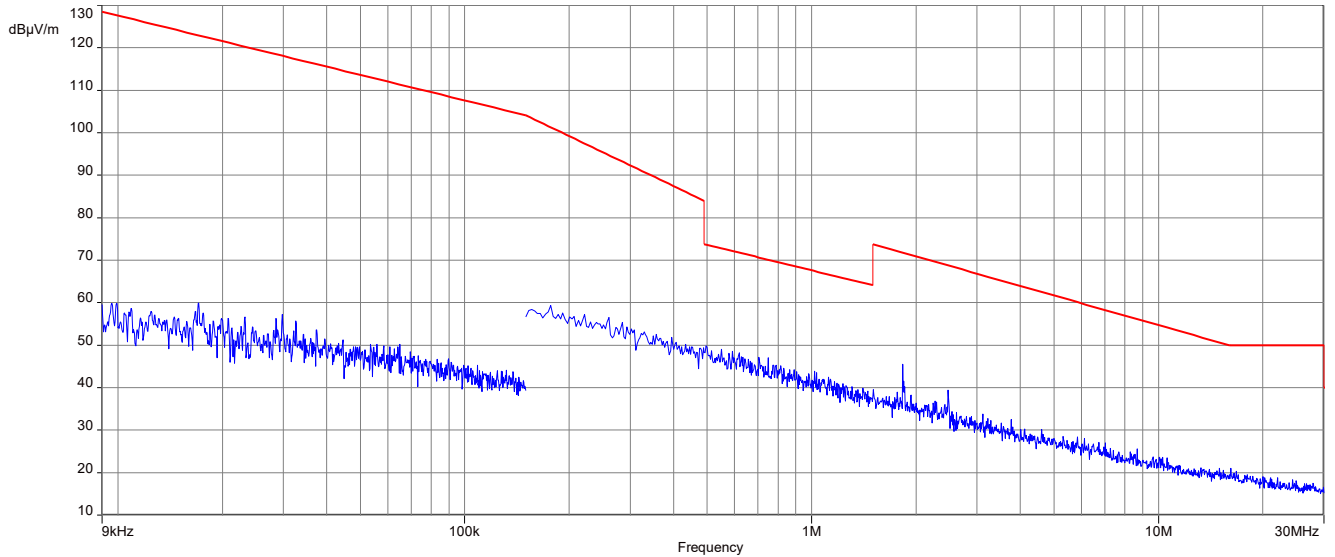
Plot 3: 9 kHz to 30 MHz, U-NII-1; highest channel



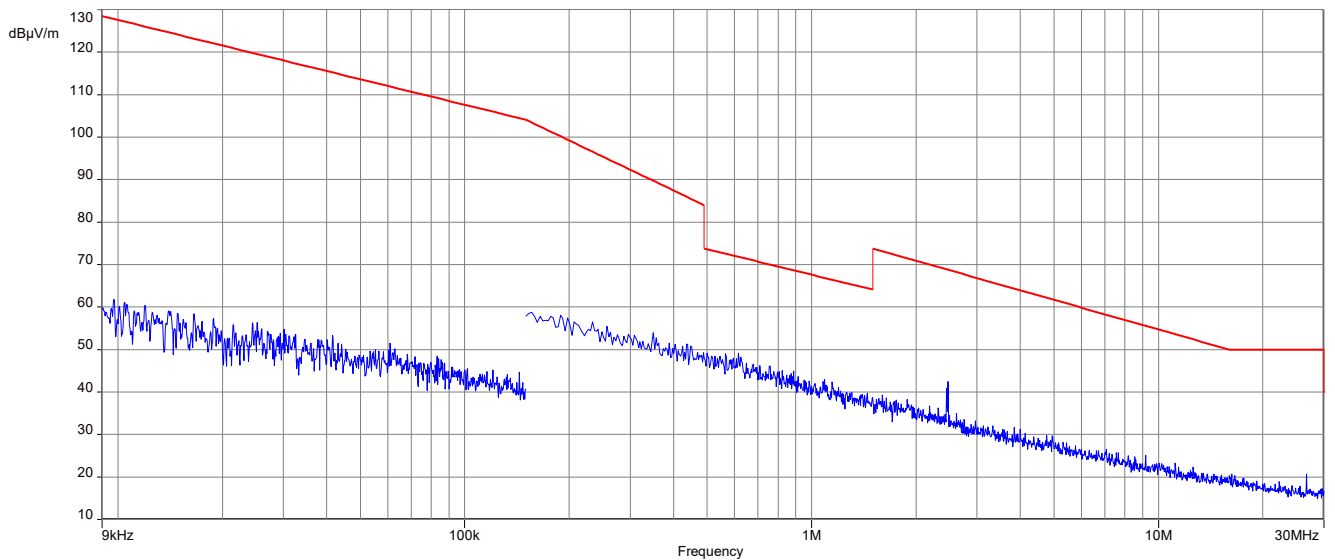
Plot 4: 9 kHz to 30 MHz, U-NII-2A; lowest channel



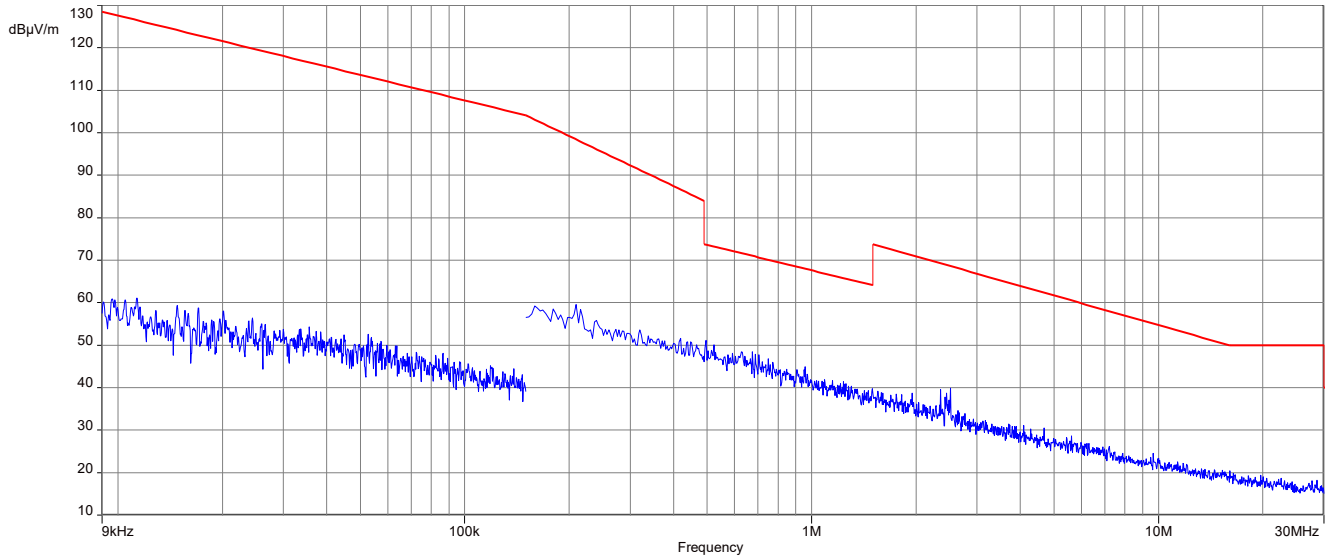
Plot 5: 9 kHz to 30 MHz, U-NII-2A; middle channel



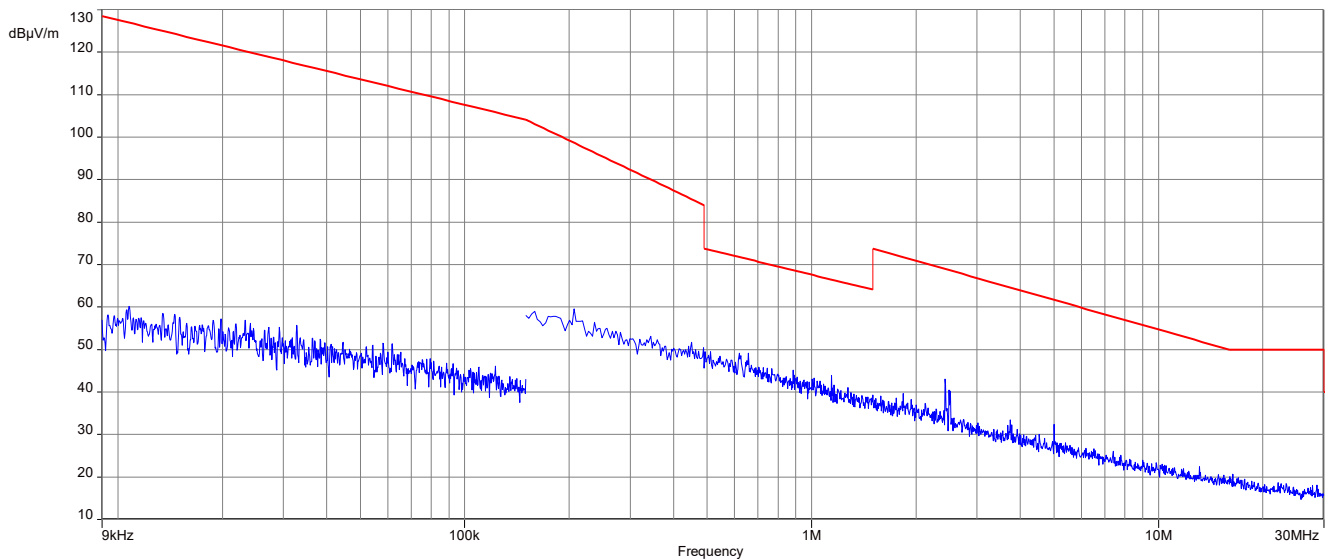
Plot 6: 9 kHz to 30 MHz, U-NII-2A; highest channel



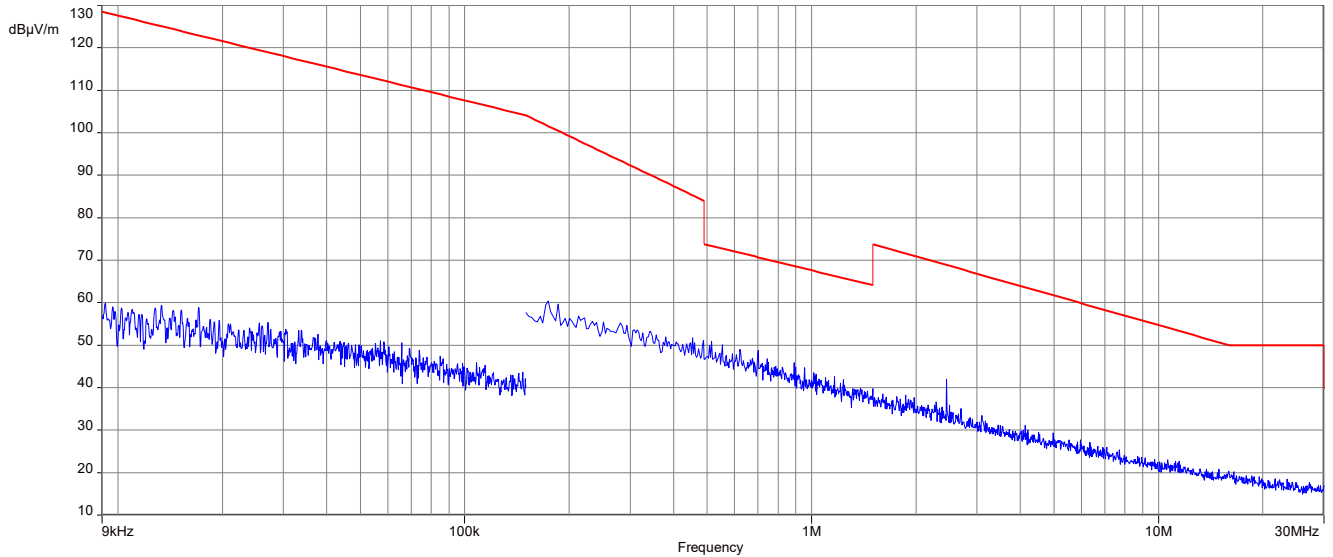
Plot 7: 9 kHz to 30 MHz, U-NII-2C; lowest channel



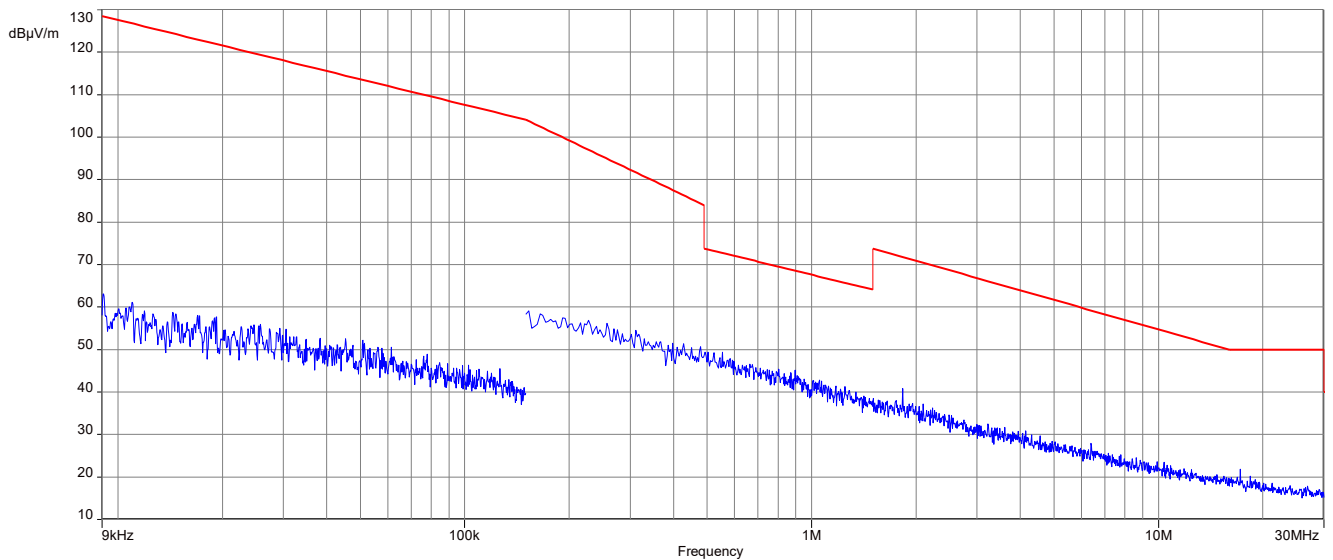
Plot 8: 9 kHz to 30 MHz, U-NII-2C; middle channel



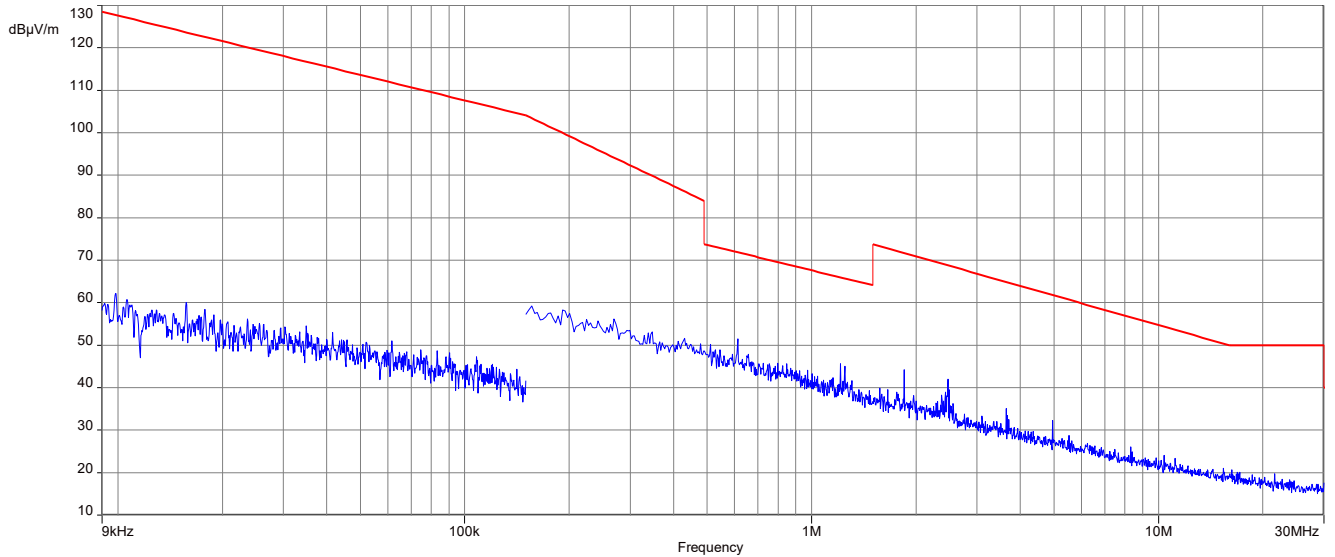
Plot 9: 9 kHz to 30 MHz, U-NII-2C; highest channel



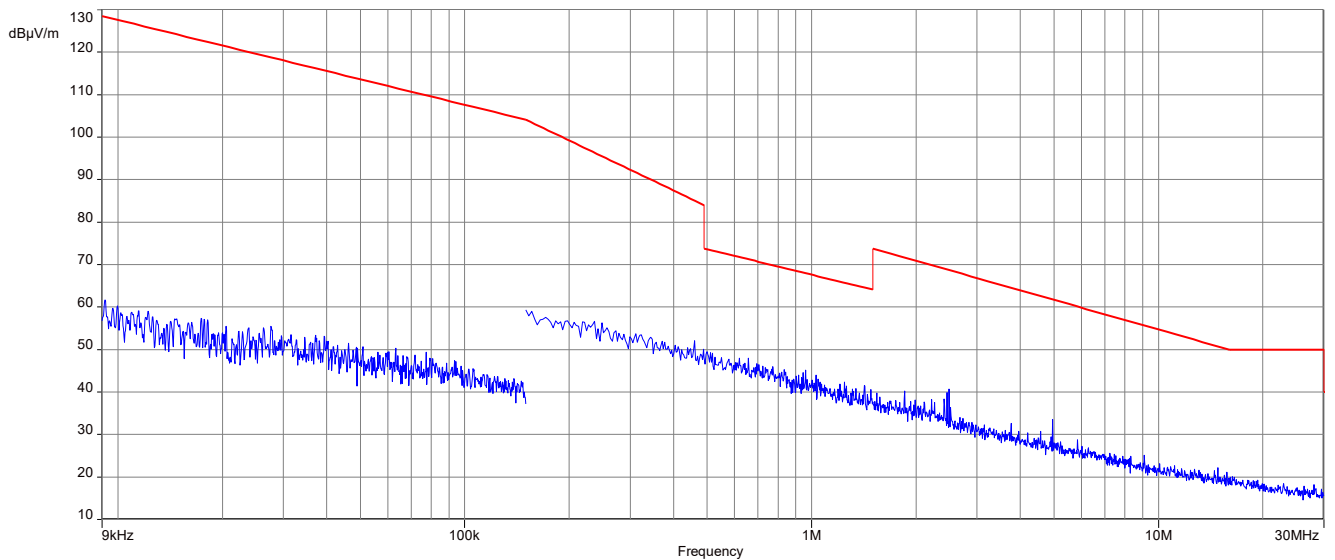
Plot 10: 9 kHz to 30 MHz, U-NII-3; lowest channel



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

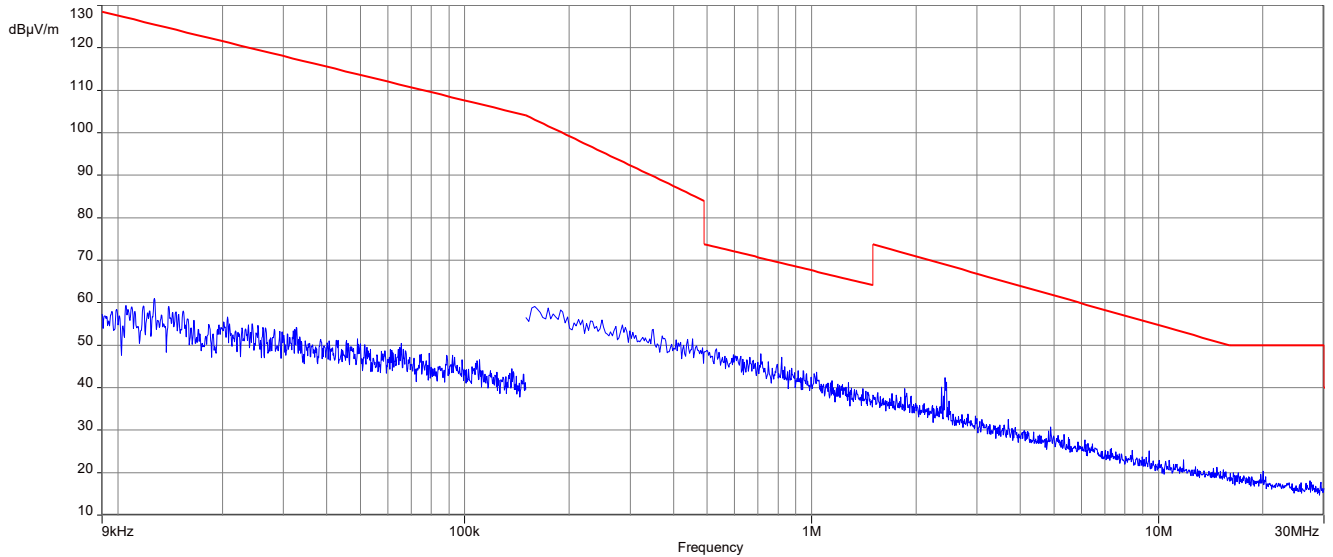


Plot 12: 9 kHz to 30 MHz, U-NII-3; highest channel

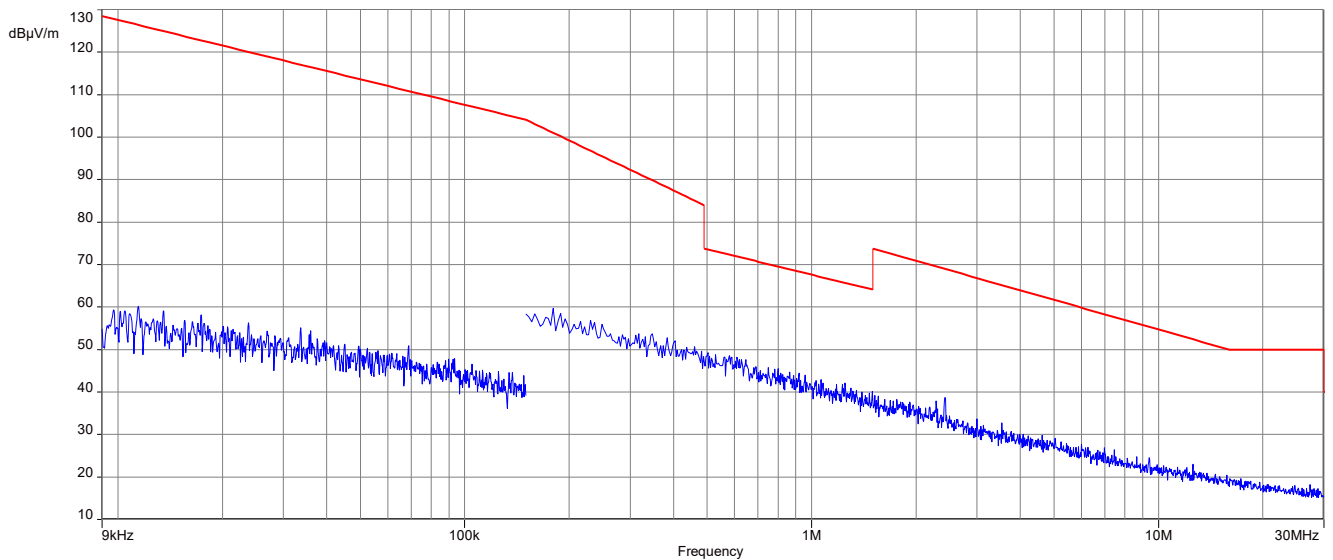


Plots: 40 MHz channel bandwidth

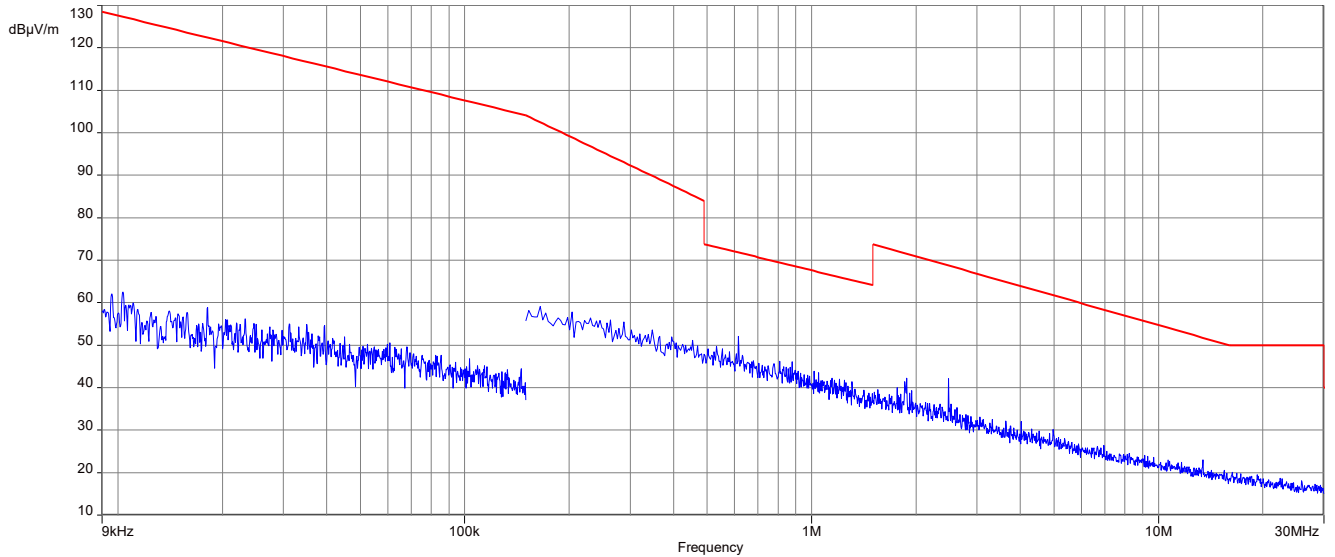
Plot 1: 9 kHz to 30 MHz, U-NII-1; lowest channel



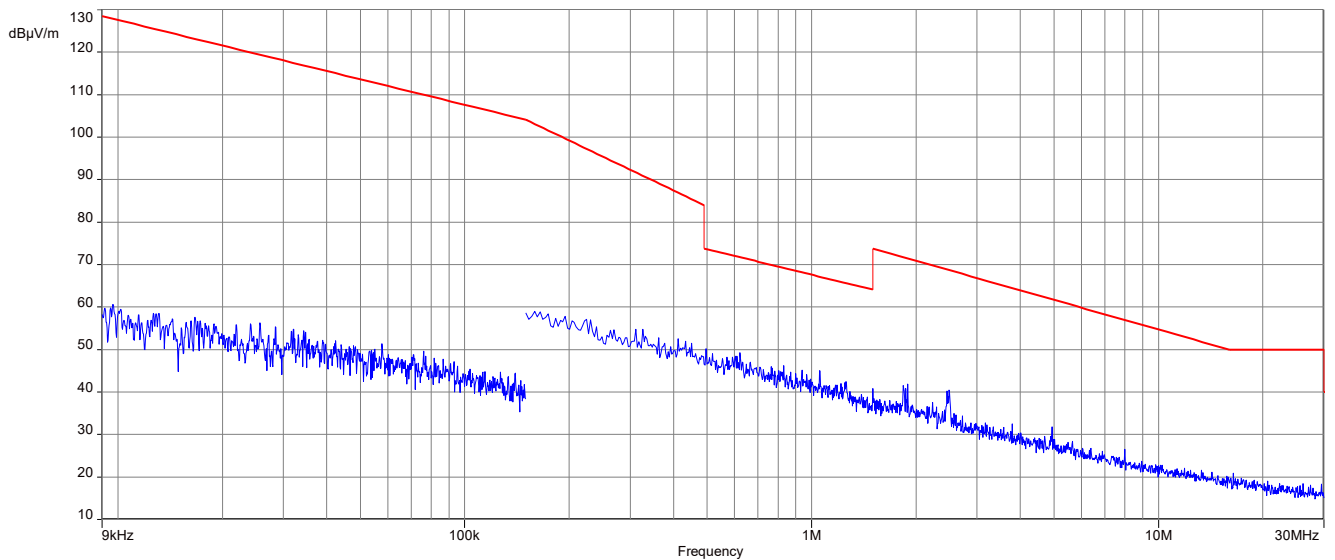
Plot 2: 9 kHz to 30 MHz, U-NII-1; highest channel



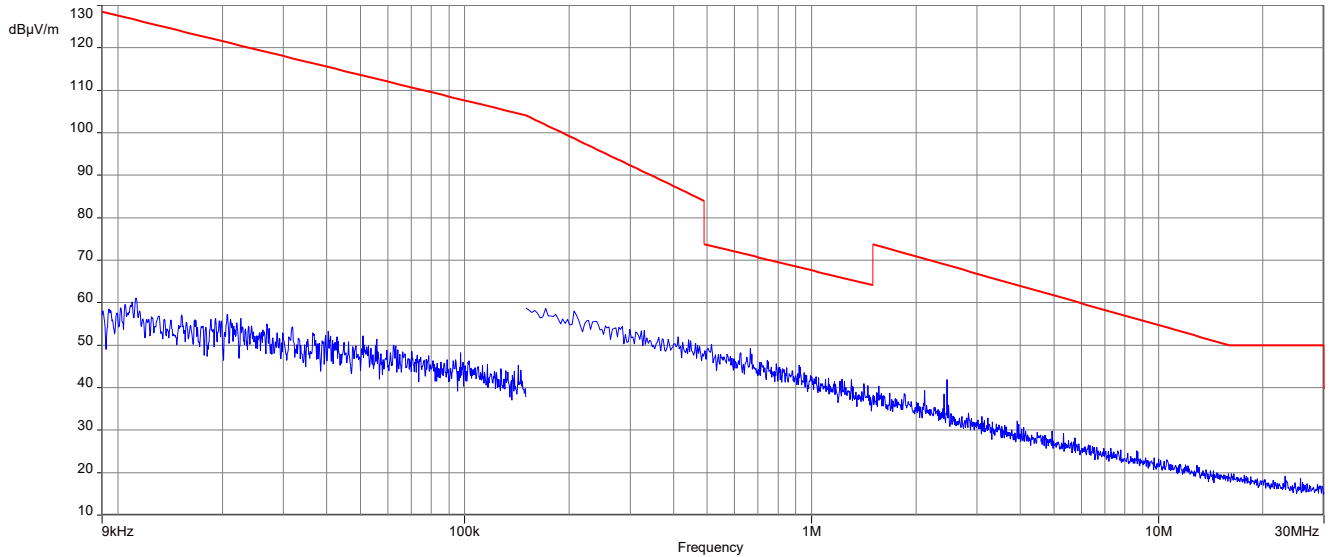
Plot 3: 9 kHz to 30 MHz, U-NII-2A; lowest channel



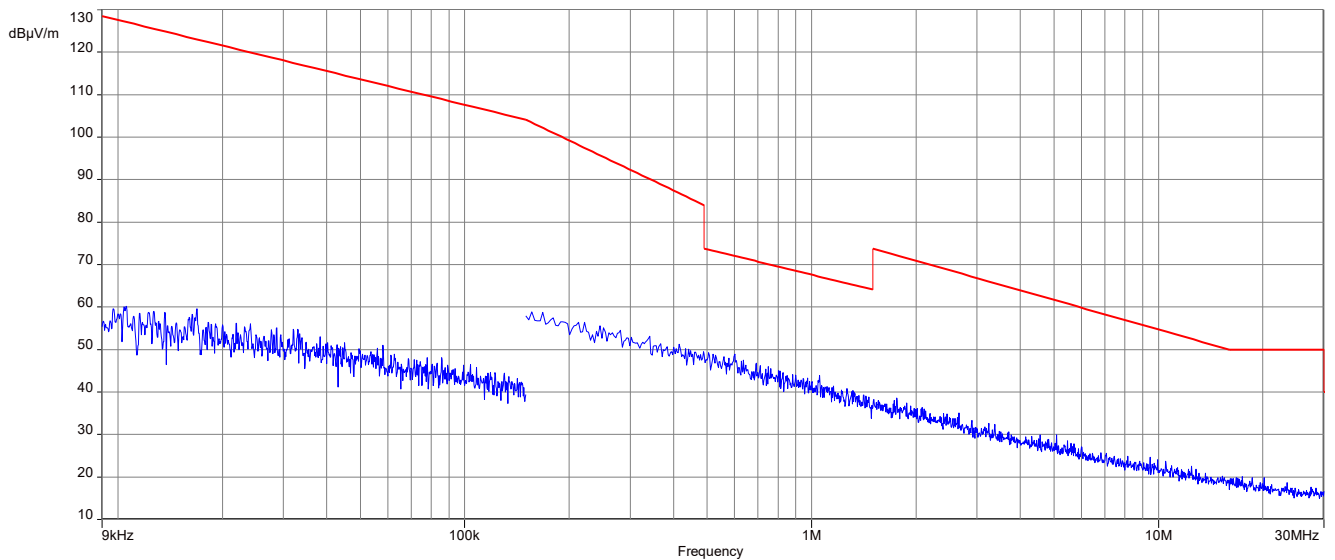
Plot 4: 9 kHz to 30 MHz, U-NII-2A; highest channel



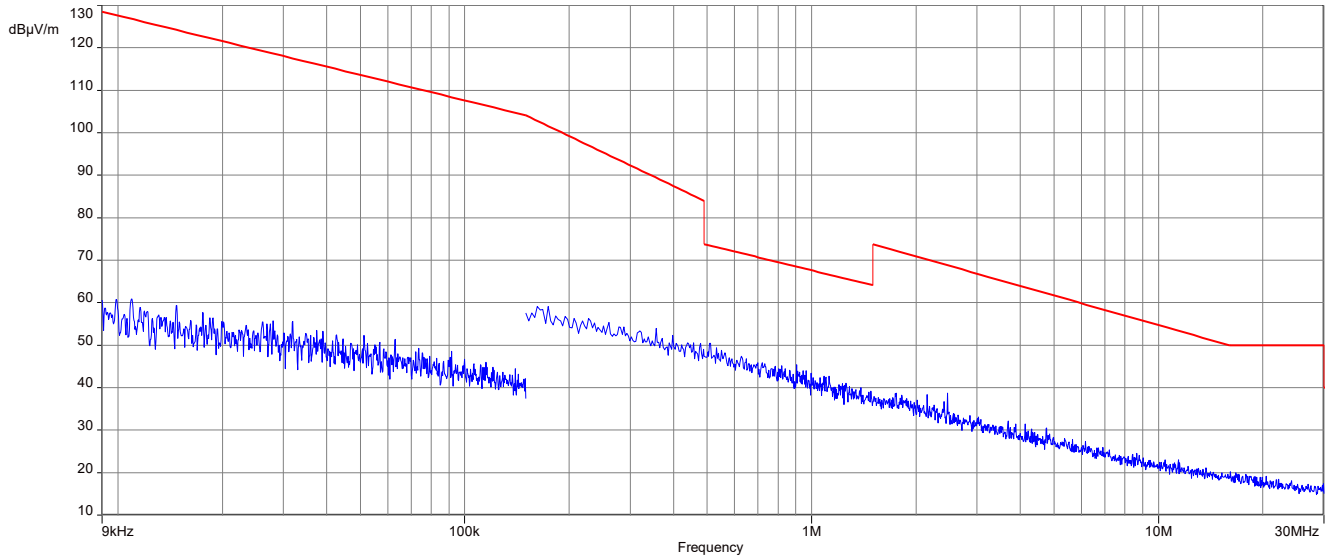
Plot 5: 9 kHz to 30 MHz, U-NII-2C; lowest channel



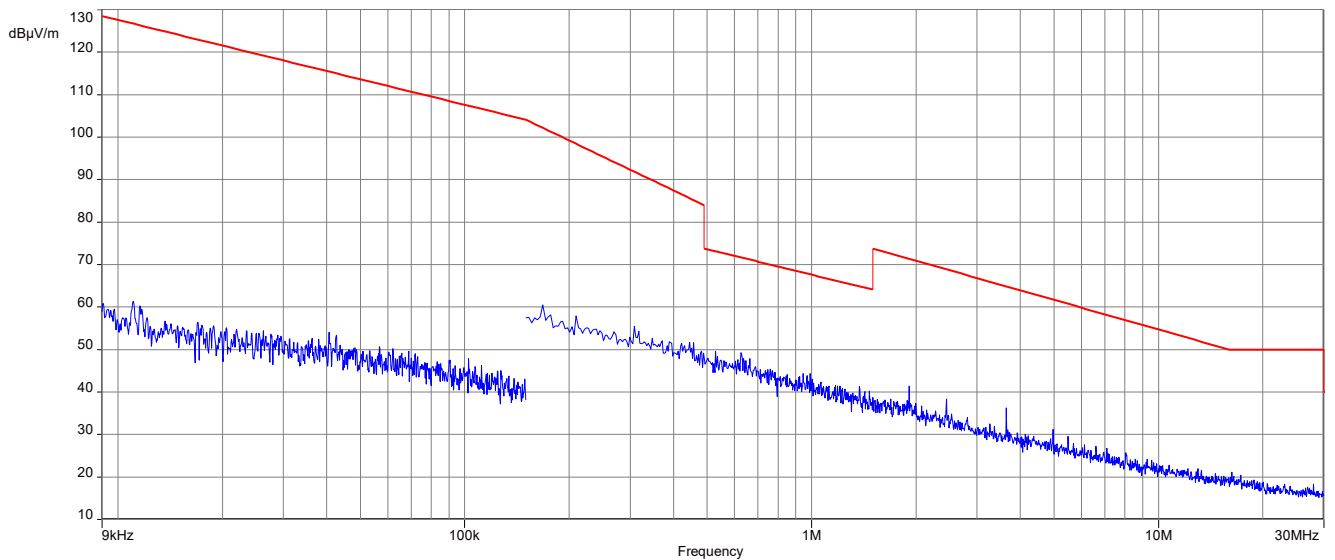
Plot 6: 9 kHz to 30 MHz, U-NII-2C; middle channel



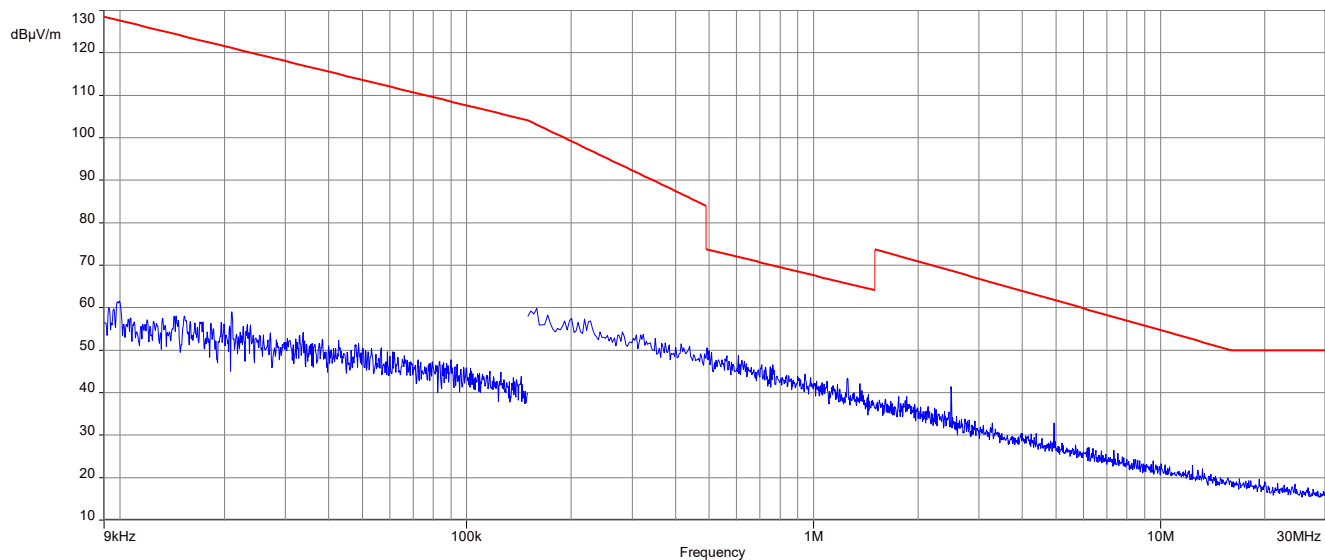
Plot 7: 9 kHz to 30 MHz, U-NII-2C; highest channel



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

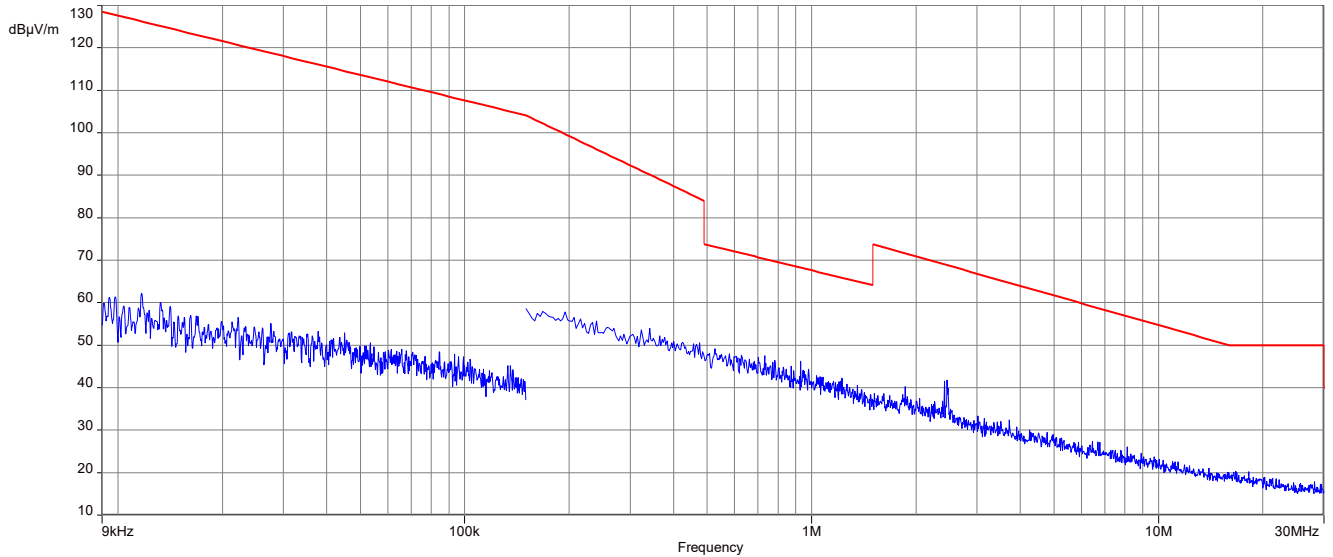


Plot 9: 9 kHz to 30 MHz, U-NII-3; highest channel

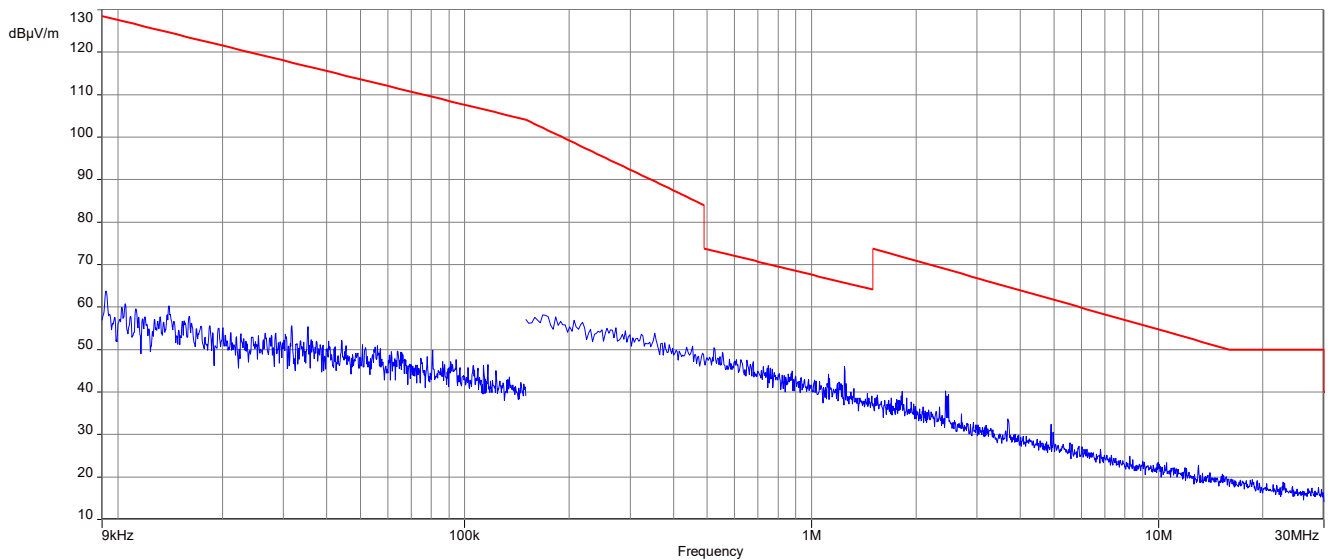


Plots: 80 MHz channel bandwidth

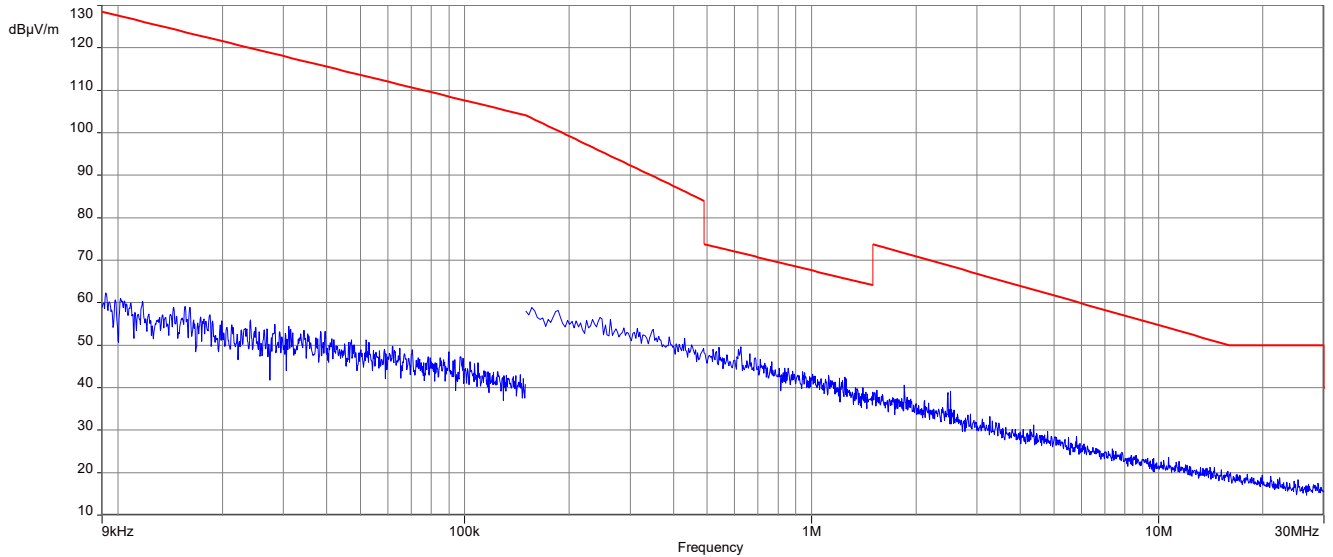
Plot 1: 9 kHz to 30 MHz, U-NII-1; middle channel



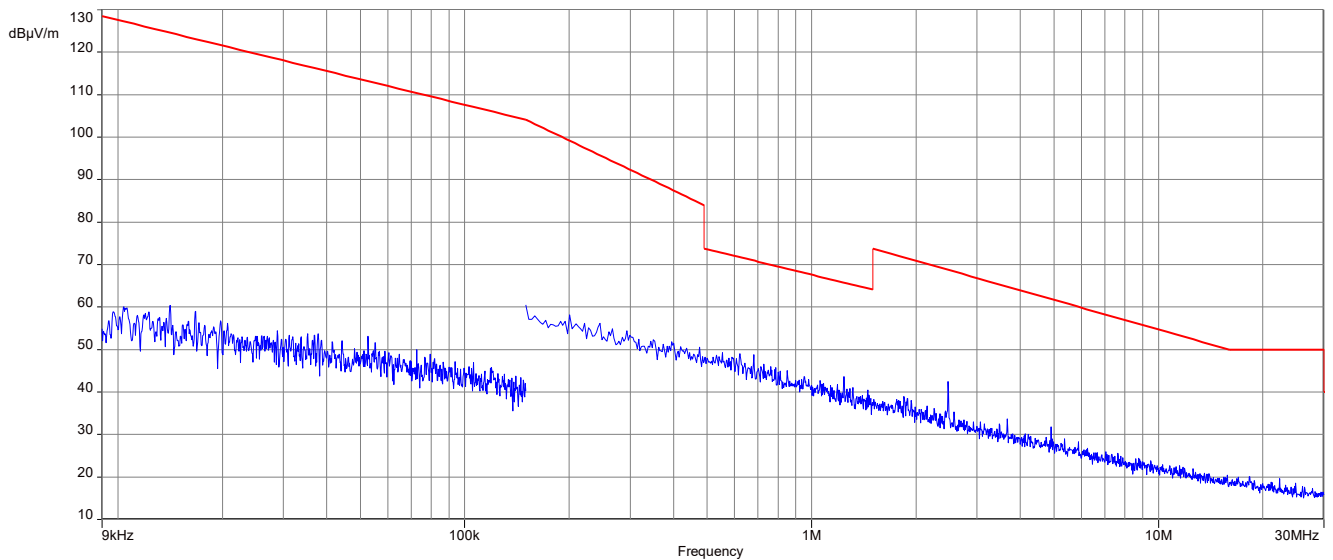
Plot 2: 9 kHz to 30 MHz, U-NII-2A; middle channel



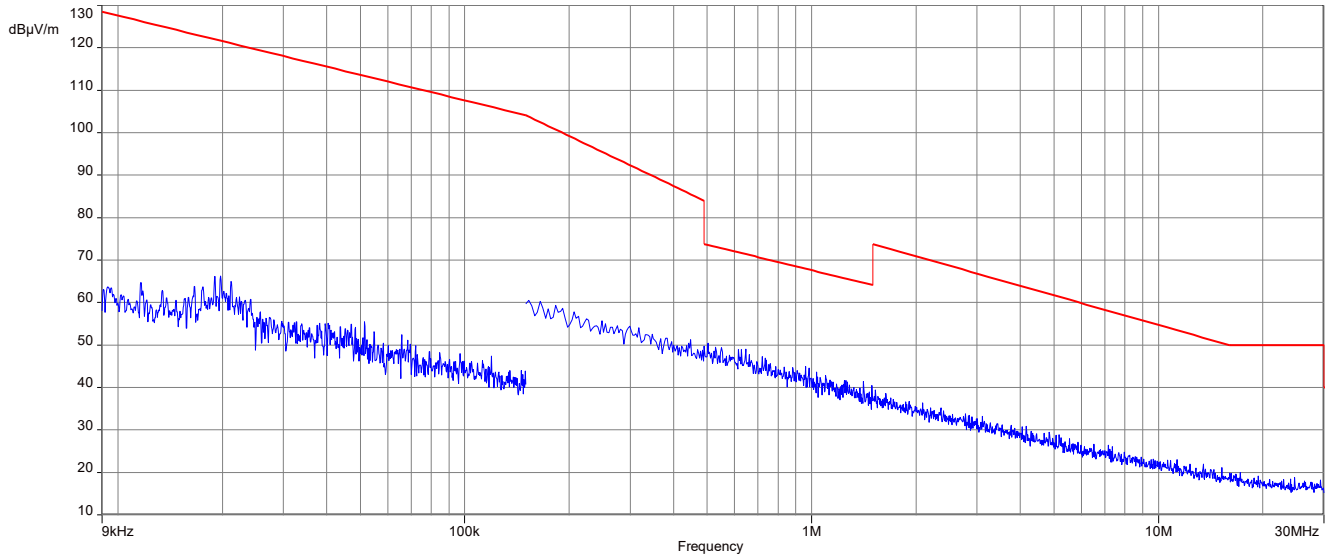
Plot 3: 9 kHz to 30 MHz, U-NII-2C; lowest channel



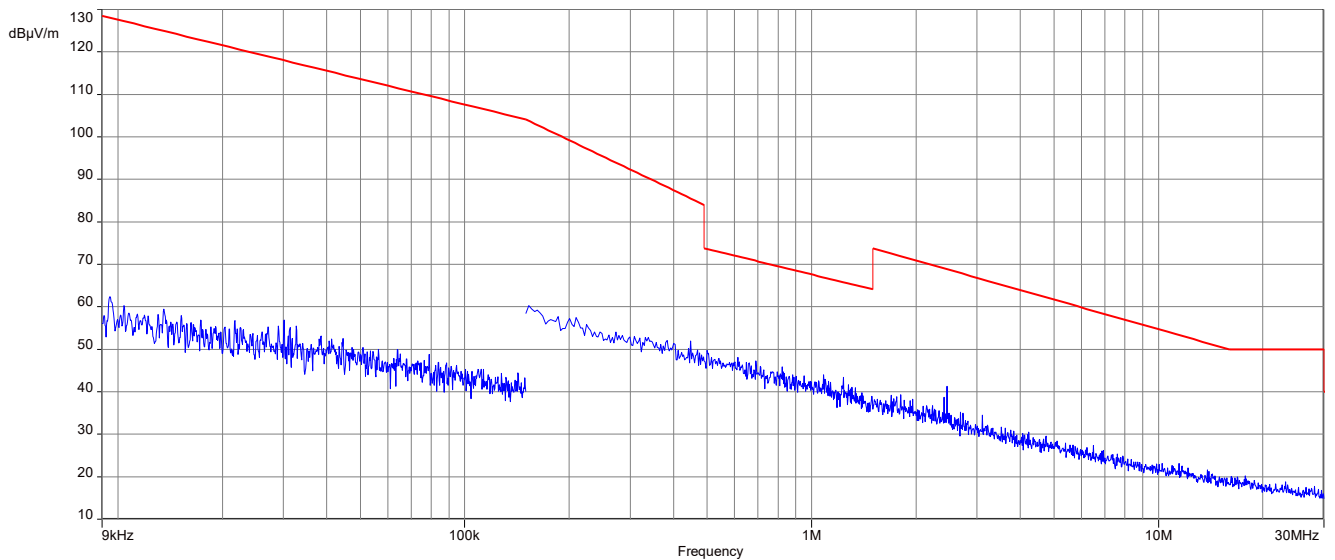
Plot 4: 9 kHz to 30 MHz, U-NII-2C; middle channel



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



Plot 6: 9 kHz to 30 MHz, U-NII-3; middle channel



12.13 Spurious emissions radiated 30 MHz to 1 GHz

Description:

Measurement of the radiated spurious emissions and cabinet radiations below 1 GHz.

Measurement:

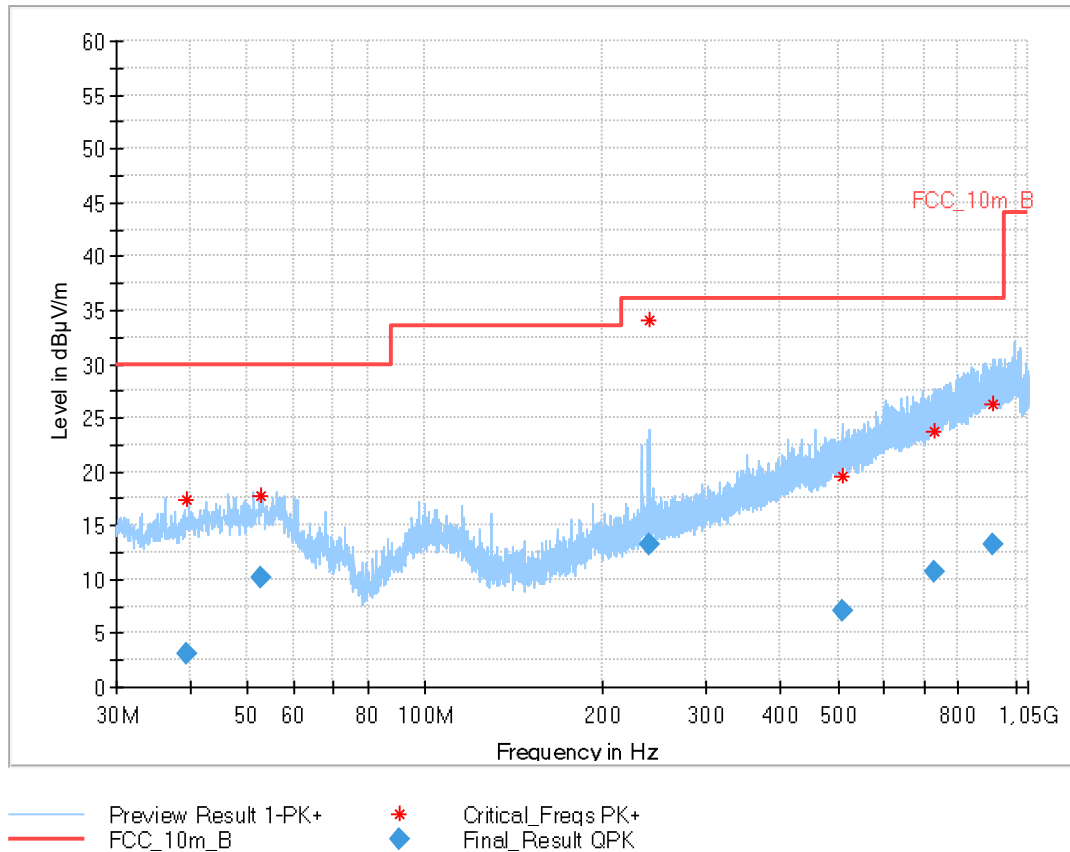
Measurement parameter	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	120 kHz
Video bandwidth:	500 kHz
Span:	30 MHz to 1 GHz
Test setup:	See sub clause 6.1 – A
Measurement uncertainty:	See chapter 9

Limits:

TX Spurious Emissions Radiated		
§15.209 / RSS-247		
Frequency (MHz)	Field Strength (dB μ 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	

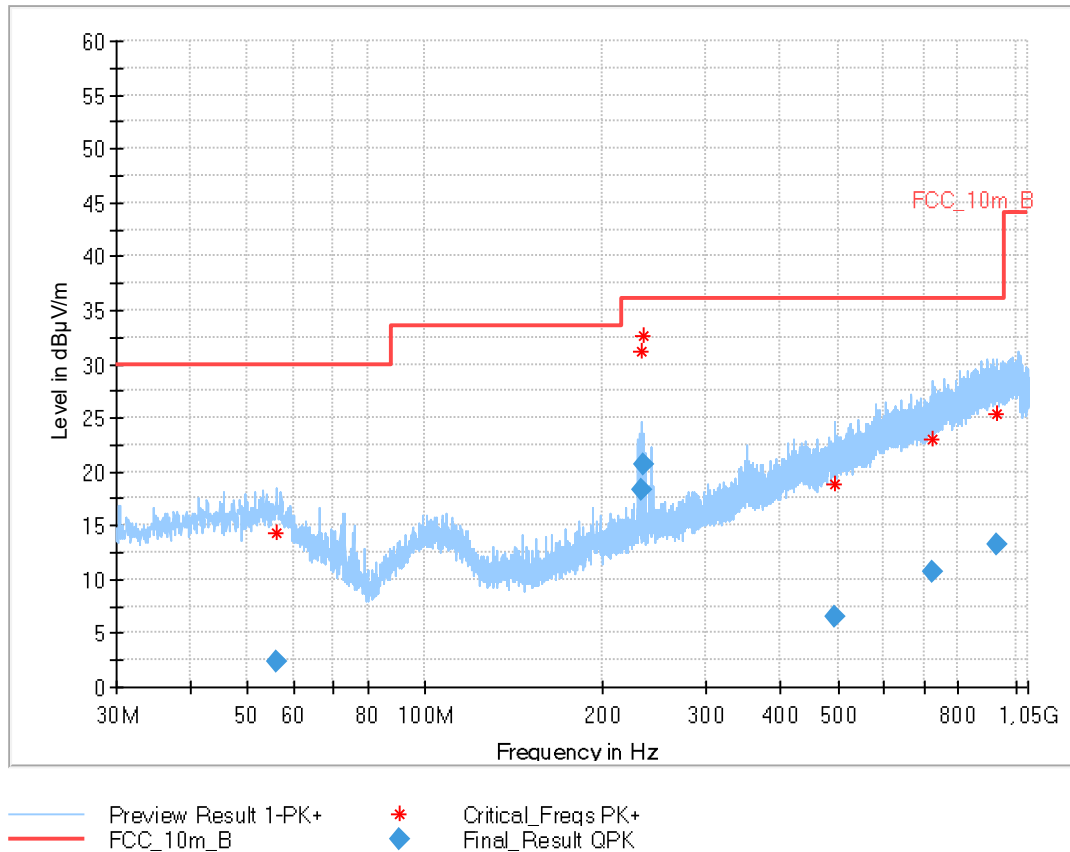
Plots:

Plot 1: 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-1; valid for all bandwidths, 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)
39.311	3.12	30.0	26.9	1000	120.0	151.0	V	190	14
52.584	10.19	30.0	19.8	1000	120.0	154.0	V	341	15
239.709	13.32	36.0	22.7	1000	120.0	148.0	V	188	14
511.079	7.01	36.0	29.0	1000	120.0	204.0	H	22	20
728.724	10.78	36.0	25.2	1000	120.0	326.0	V	236	23
919.022	13.27	36.0	22.7	1000	120.0	200.0	H	-42	25

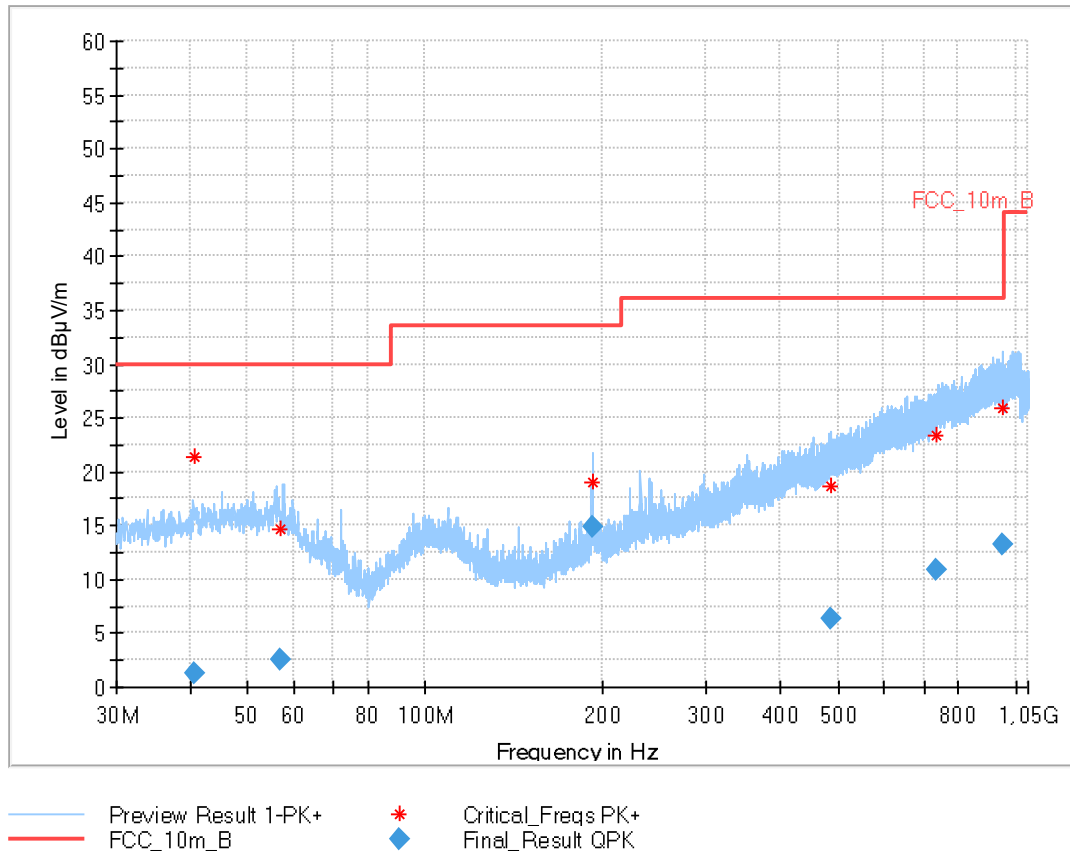
Plot 2: 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-2A; valid for all bandwidths, modes and channels



Results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
55.797	2.39	30.0	27.6	1000	120.0	400.0	H	1	16
233.125	18.27	36.0	17.7	1000	120.0	143.0	V	81	14
234.621	20.67	36.0	15.3	1000	120.0	117.0	V	80	14
492.606	6.51	36.0	29.5	1000	120.0	400.0	V	230	19
725.052	10.61	36.0	25.4	1000	120.0	308.0	V	170	23
930.804	13.17	36.0	22.8	1000	120.0	200.0	V	270	25

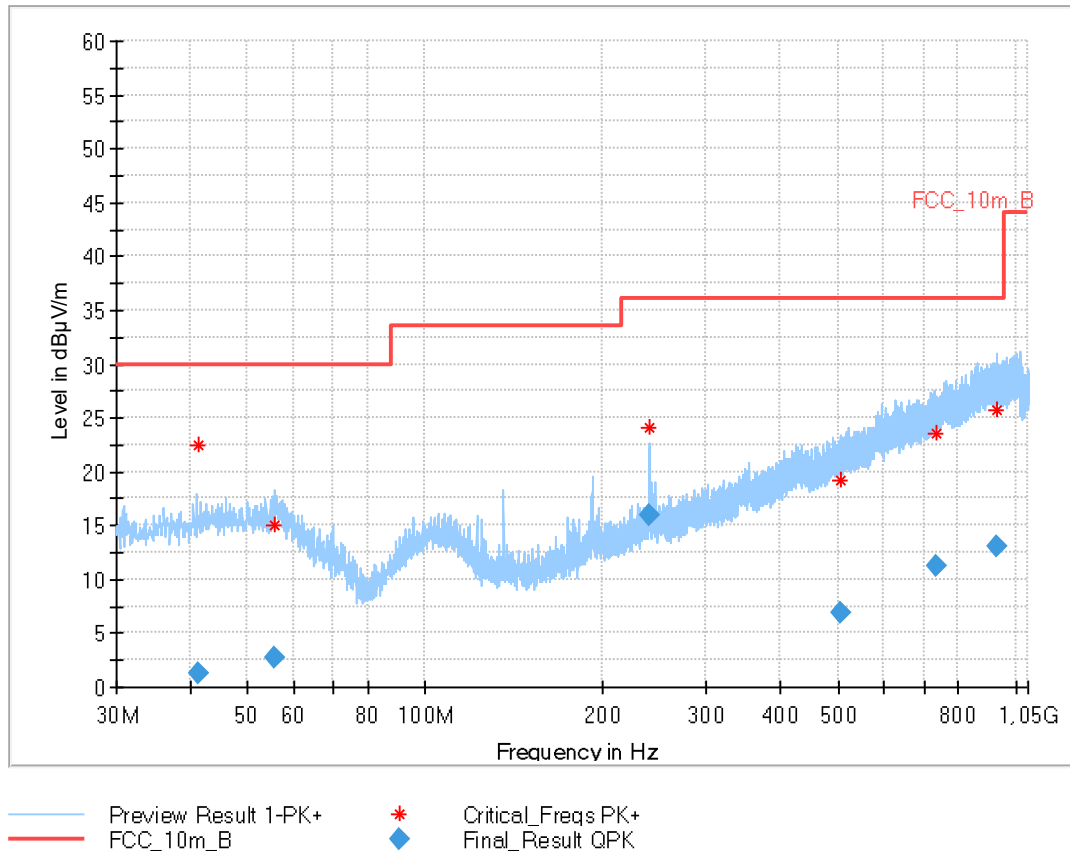
Plot 3: 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-2C; valid for all bandwidths, modes and channels



Results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
40.669	1.34	30.0	28.7	1000	120.0	154.0	H	187	14
56.968	2.57	30.0	27.4	1000	120.0	106.0	V	248	16
191.687	14.93	33.5	18.6	1000	120.0	103.0	V	253	12
486.952	6.34	36.0	29.7	1000	120.0	200.0	H	226	19
731.743	10.79	36.0	25.2	1000	120.0	250.0	H	120	23
952.705	13.19	36.0	22.8	1000	120.0	208.0	H	262	25

Plot 4: 30 MHz to 1 GHz; vertical & horizontal polarization; U-NII-3; valid for all bandwidths, 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)
41.164	1.35	30.0	28.7	1000	120.0	117.0	H	186	14
55.693	2.78	30.0	27.2	1000	120.0	200.0	V	136	16
239.868	16.04	36.0	20.0	1000	120.0	183.0	V	-3	14
506.476	6.90	36.0	29.1	1000	120.0	262.0	V	300	20
731.481	11.28	36.0	24.7	1000	120.0	298.0	V	-18	23
930.637	13.14	36.0	22.9	1000	120.0	389.0	V	217	25

12.14 Spurious emissions radiated 1 GHz to 40 GHz

Description:

Measurement of the radiated spurious emissions from 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 – B 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 μ 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]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

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]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

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]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

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]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

Results: 40 MHz channel bandwidth

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
U-NII-1 (5150 MHz to 5250 MHz)								
Lowest channel			Middle channel			Highest channel		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
U-NII-2A (5250 MHz to 5350 MHz)								
Lowest channel			Middle channel			Highest channel		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
U-NII-2C (5470 MHz to 5725 MHz)								
Lowest channel			Middle channel			Highest channel		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
U-NII-3 (5725 MHz to 5850 MHz)								
Lowest channel			Middle channel			Highest channel		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

Results: 80 MHz channel bandwidth

TX Spurious Emissions Radiated [dB μ V/m] / dBm		
U-NII-1 (5150 MHz to 5250 MHz)		
Middle channel		
F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-
	AVG	-/-

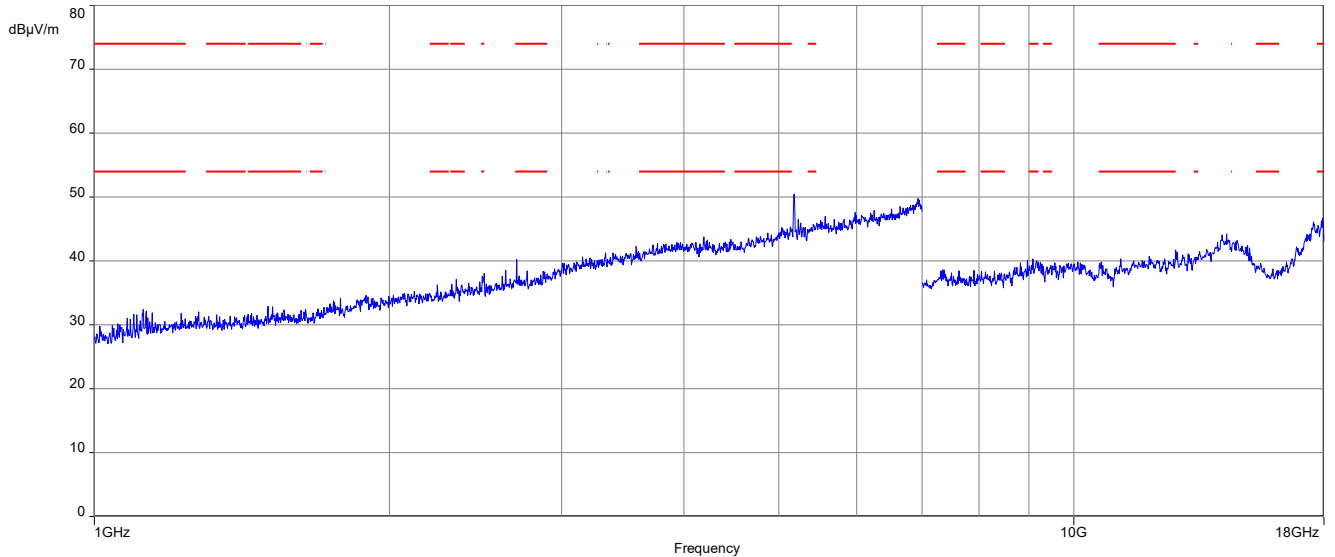
TX Spurious Emissions Radiated [dB μ V/m] / dBm		
U-NII-2A (5250 MHz to 5350 MHz)		
Middle channel		
F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-
	AVG	-/-

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
U-NII-2C (5470 MHz to 5725 MHz)								
Lowest channel			Middle channel			Highest channel		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

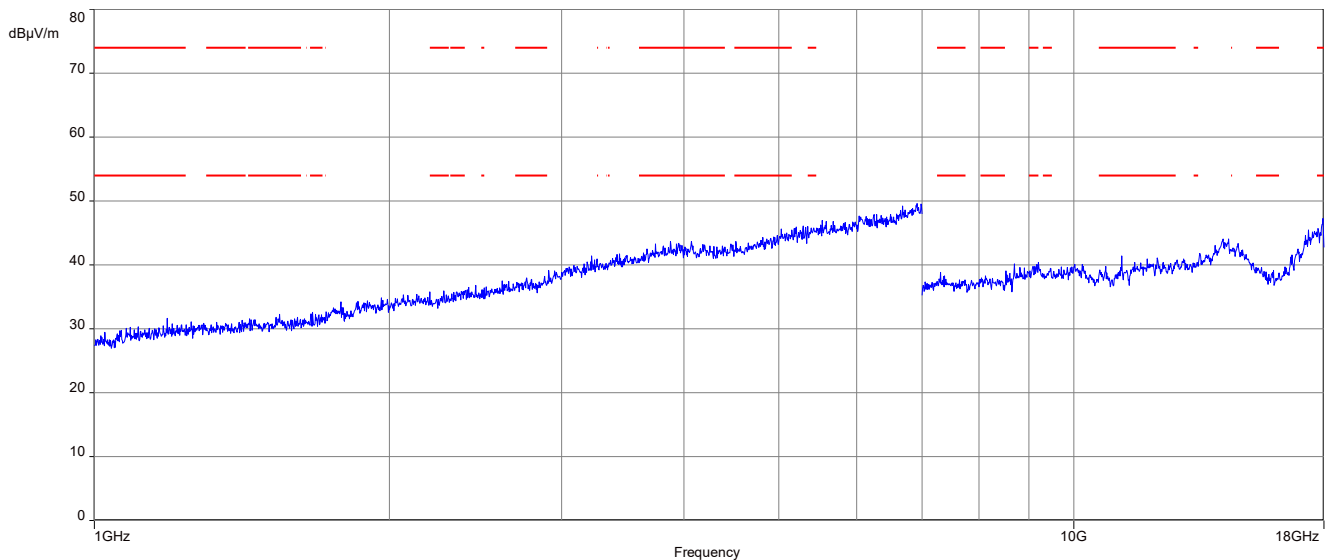
TX Spurious Emissions Radiated [dB μ V/m] / dBm		
U-NII-3 (5725 MHz to 5850 MHz)		
Middle channel		
F [MHz]	Detector	Level [dB μ V/m]
-/-	Peak	-/-
	AVG	-/-

Plots: 20 MHz channel bandwidth

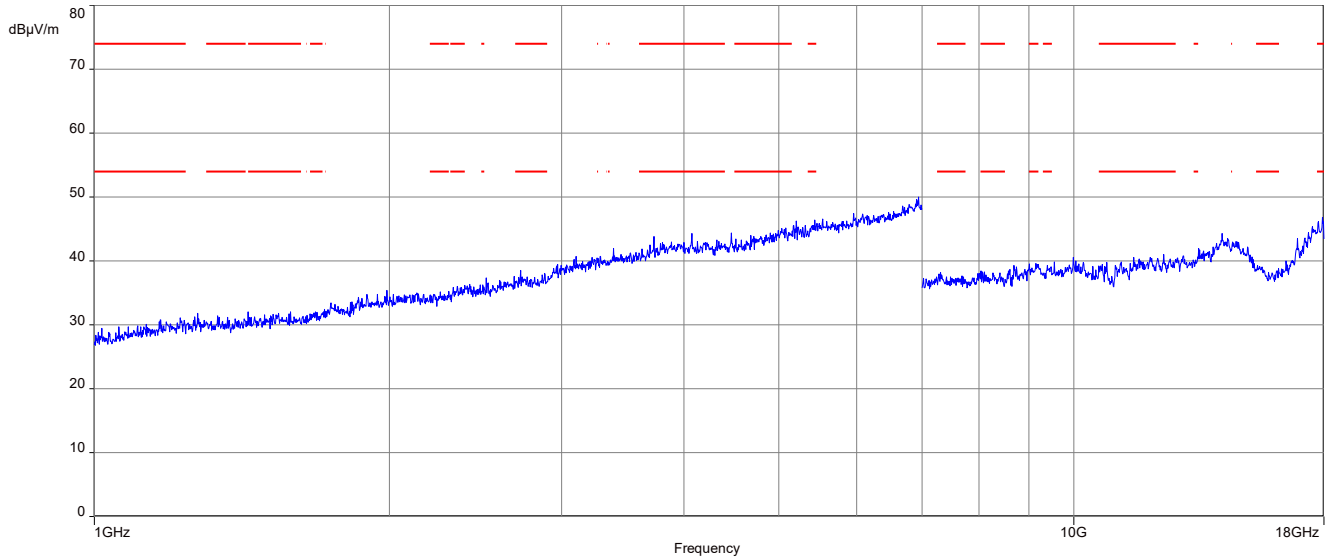
Plot 1: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; lowest channel



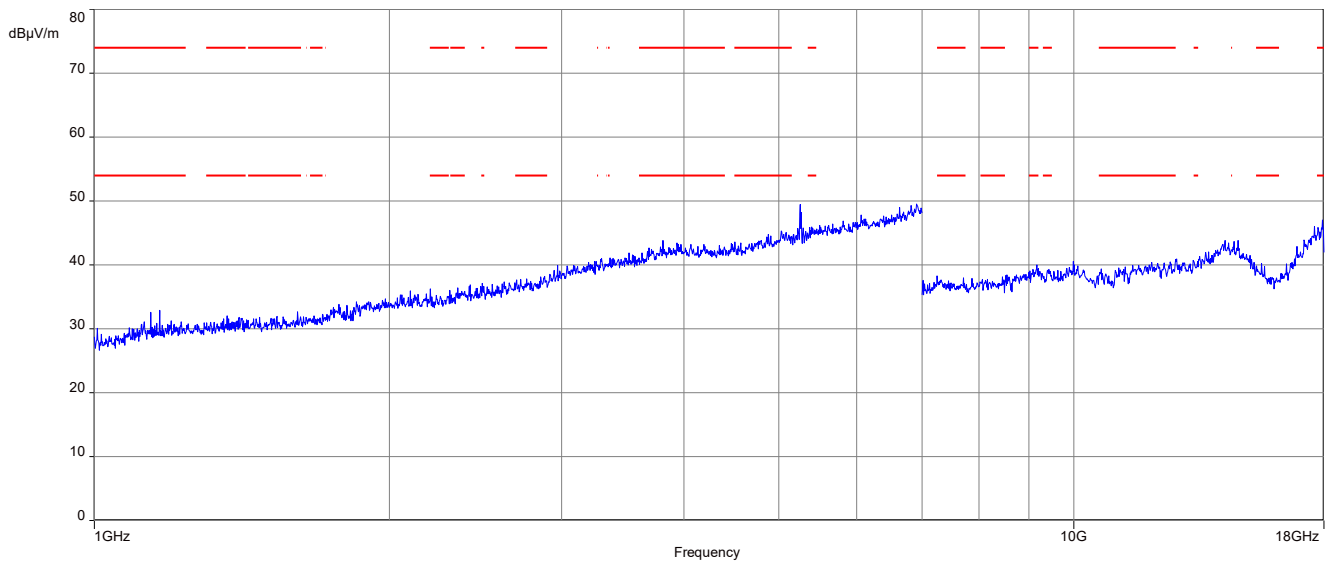
Plot 2: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; middle channel



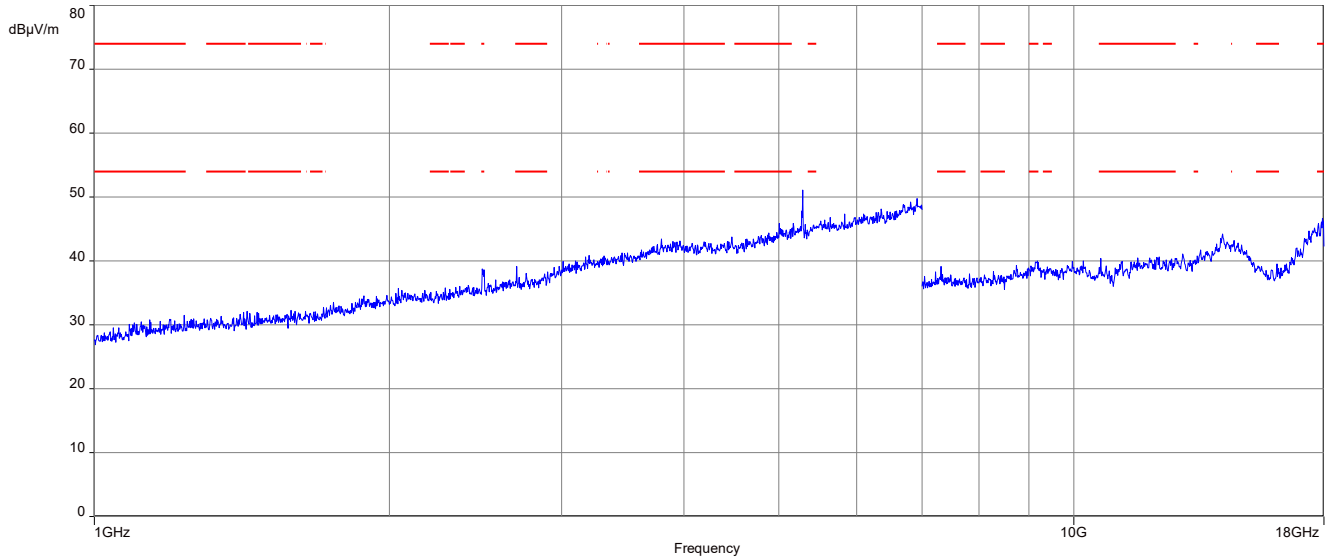
Plot 3: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; highest channel



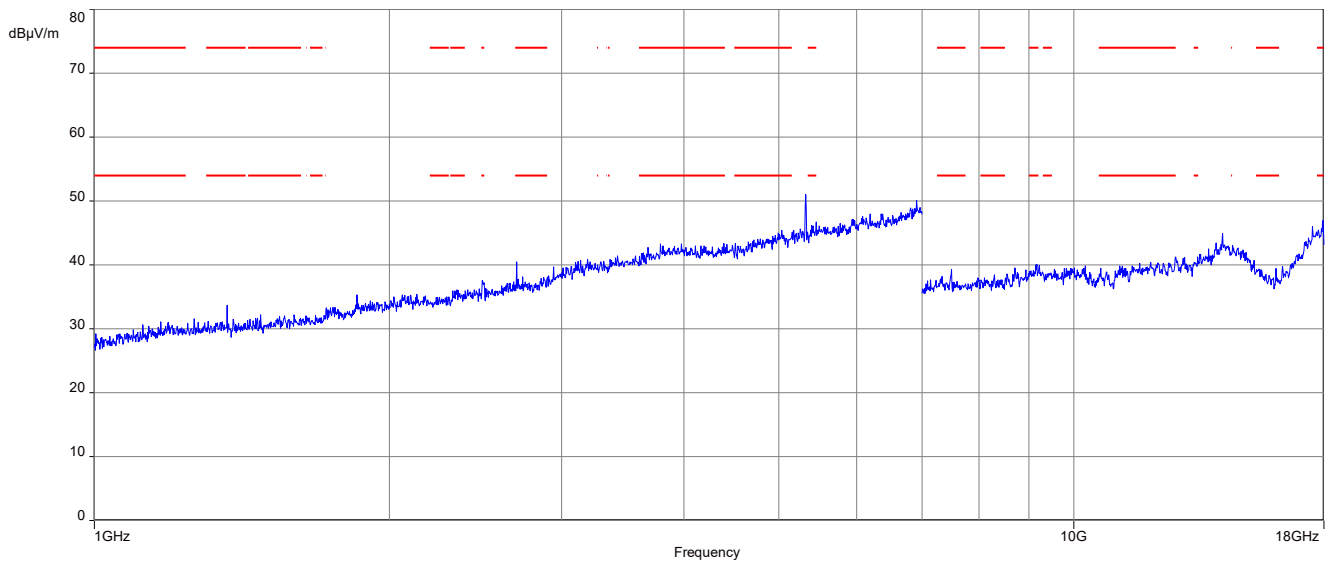
Plot 4: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; lowest channel



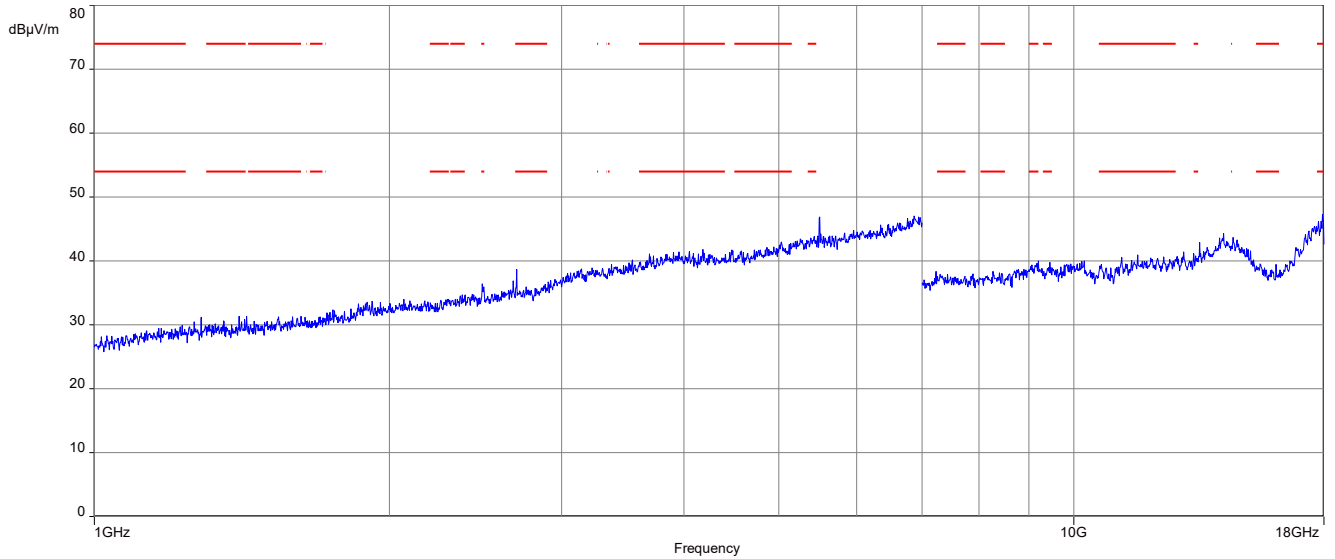
Plot 5: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; middle channel



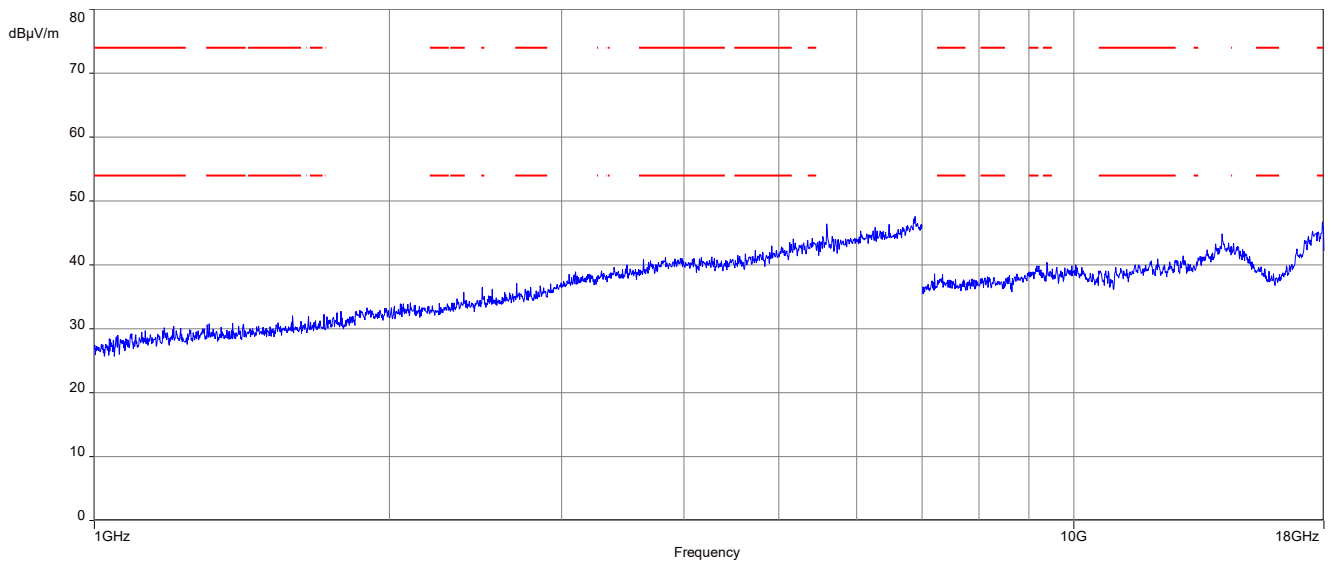
Plot 6: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; highest channel



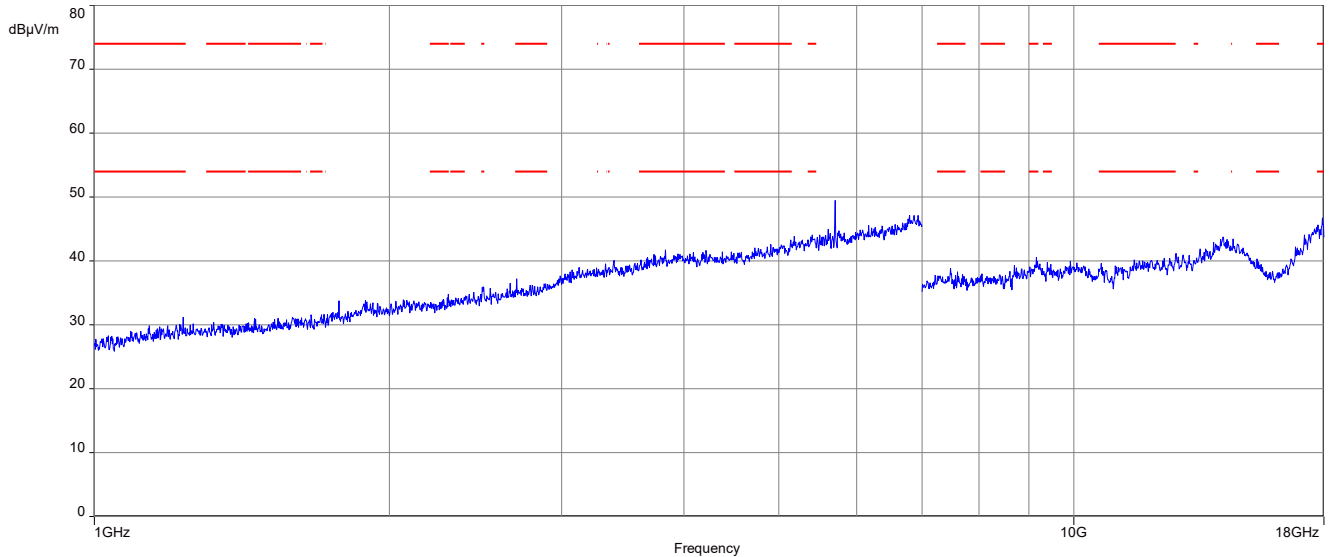
Plot 7: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel



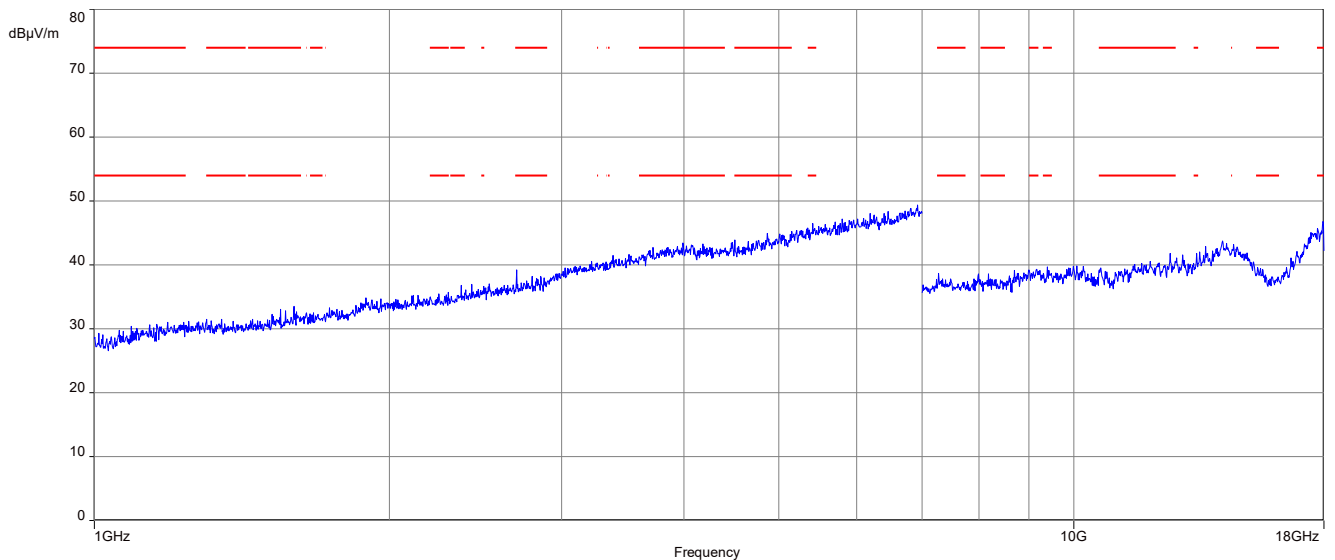
Plot 8: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; middle channel



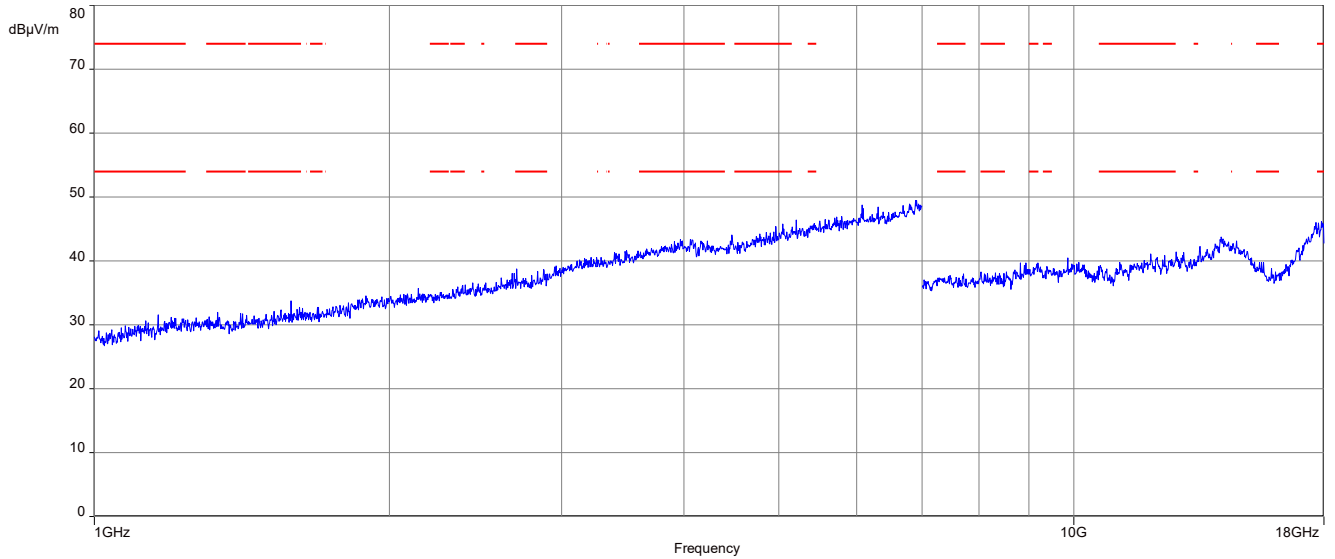
Plot 9: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



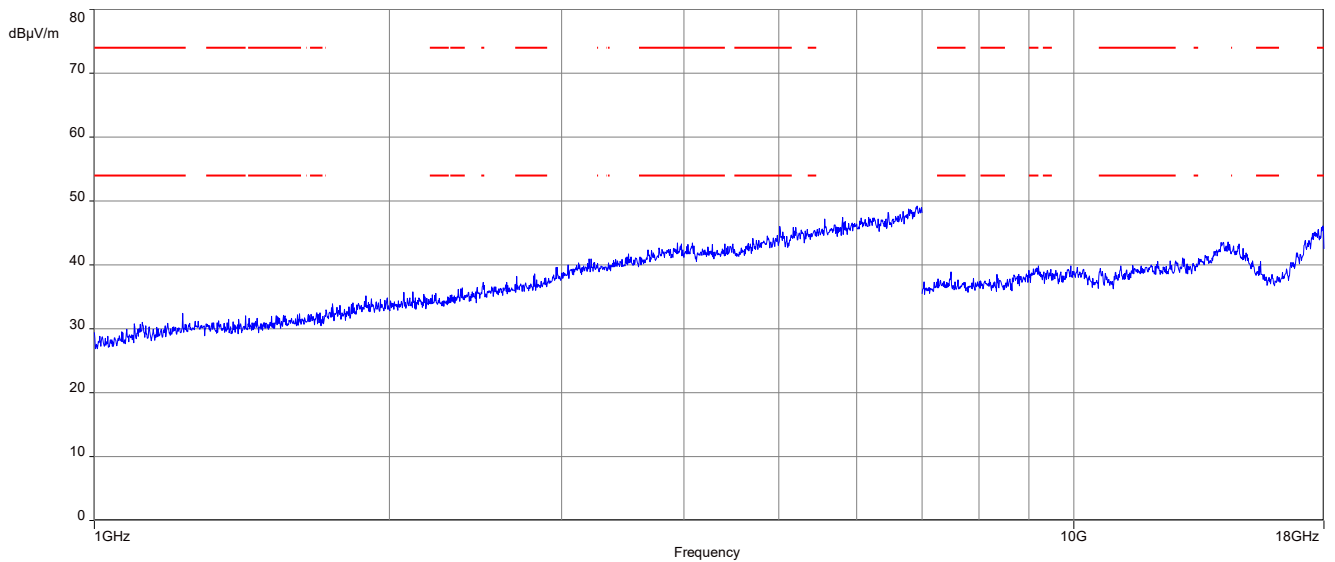
Plot 10: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; lowest channel



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

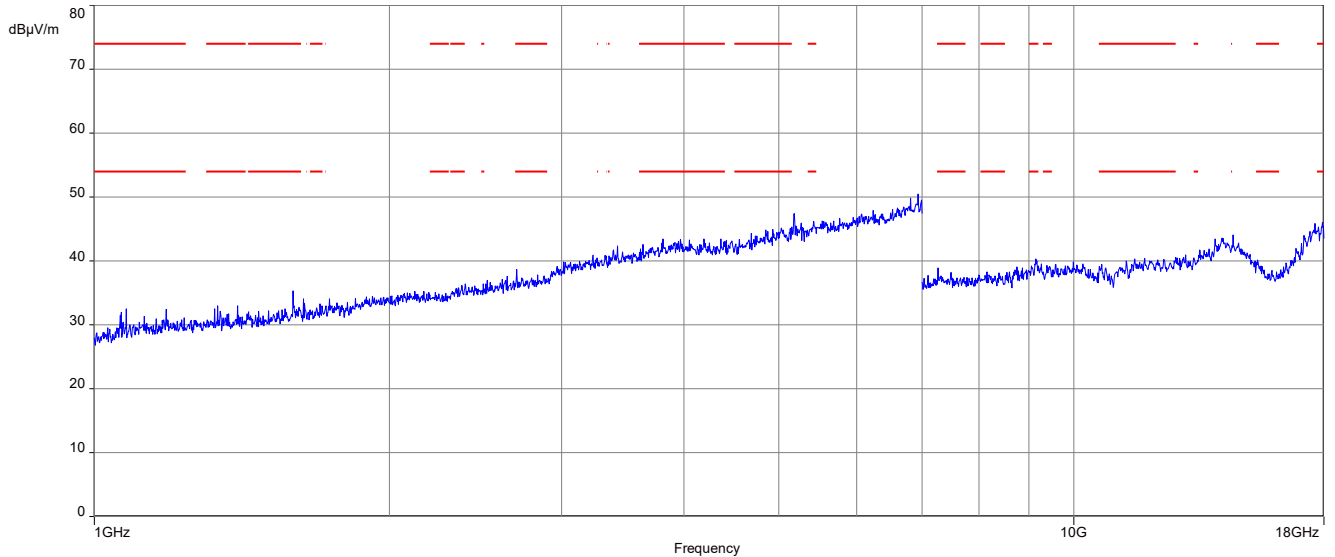


Plot 12: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; highest channel

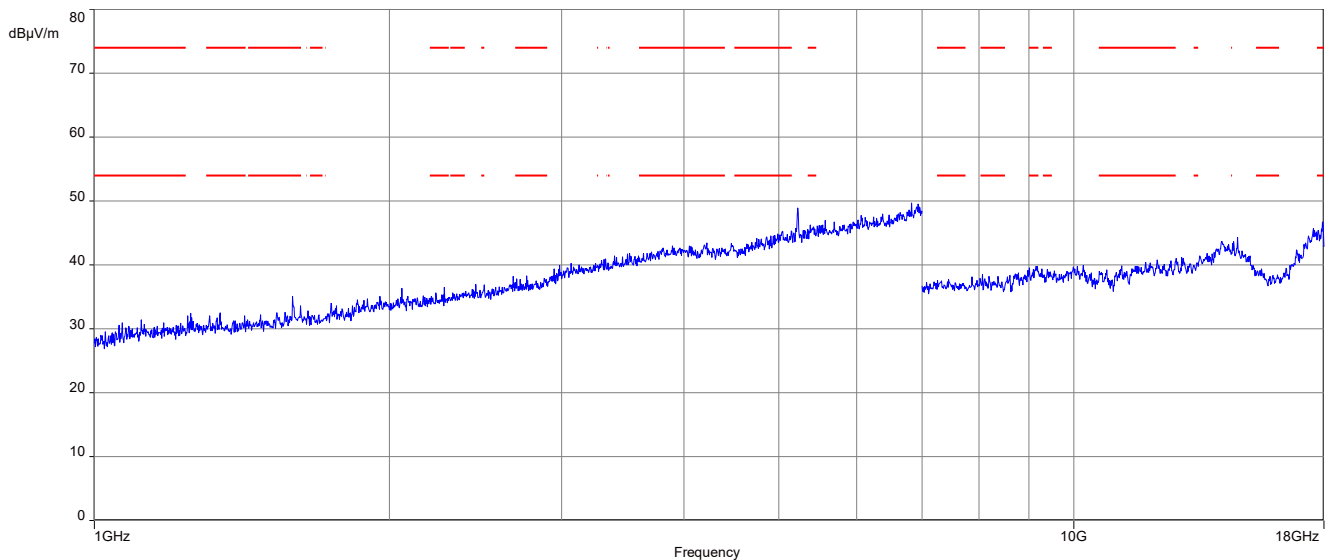


Plots: 40 MHz channel bandwidth

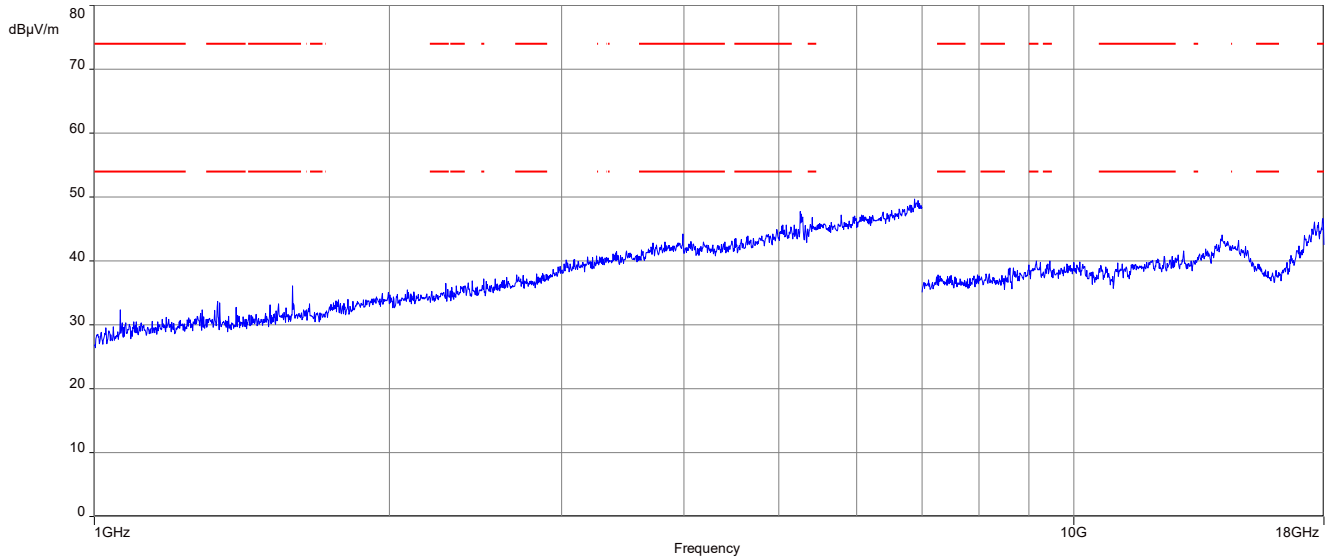
Plot 1: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; lowest channel



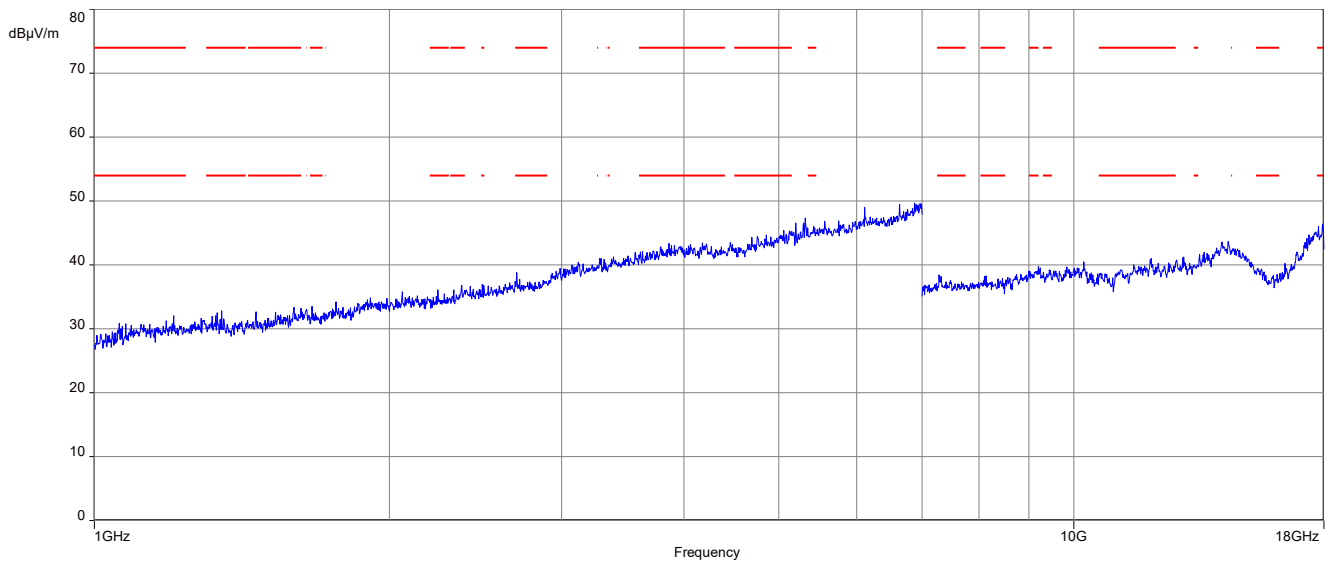
Plot 2: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; highest channel



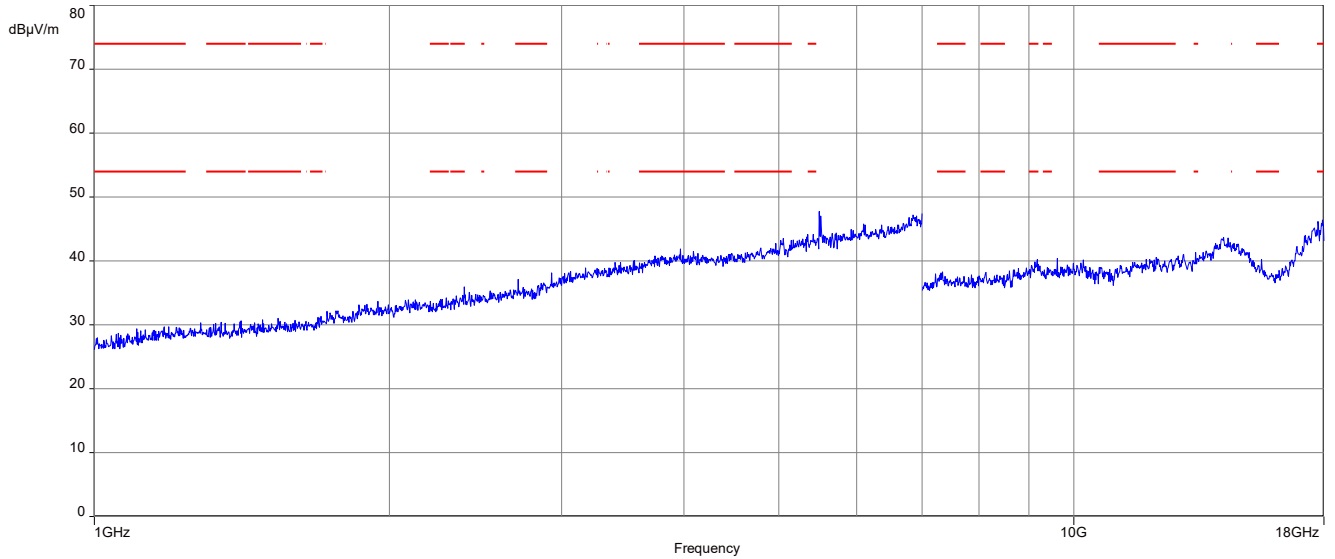
Plot 3: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; lowest channel



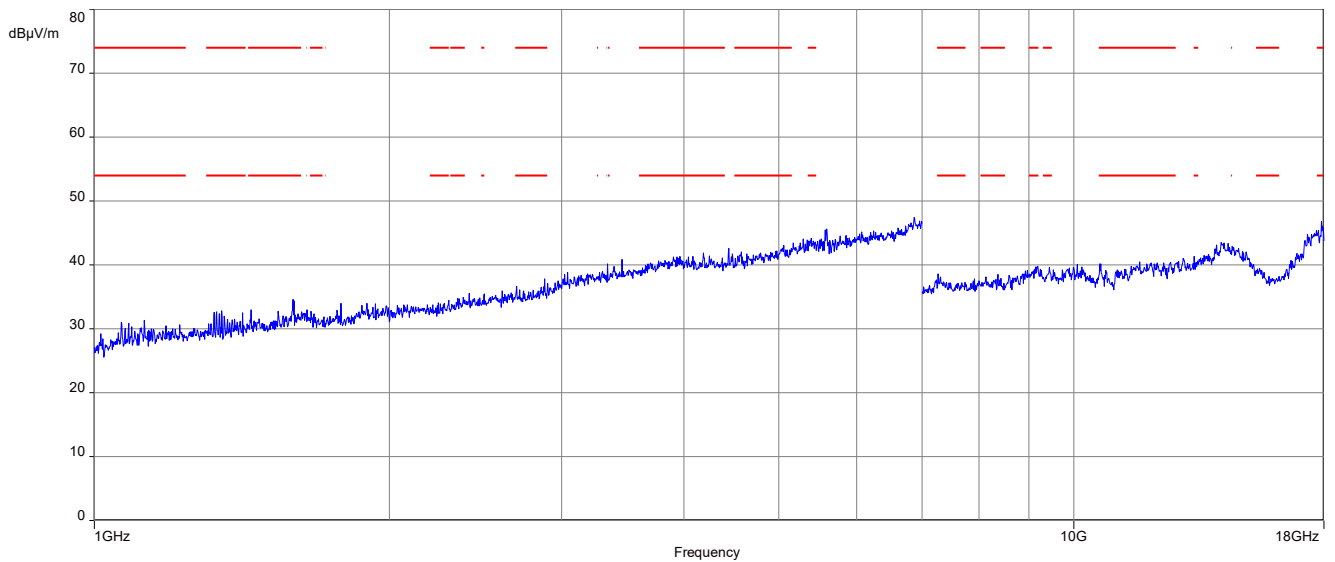
Plot 4: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; highest channel



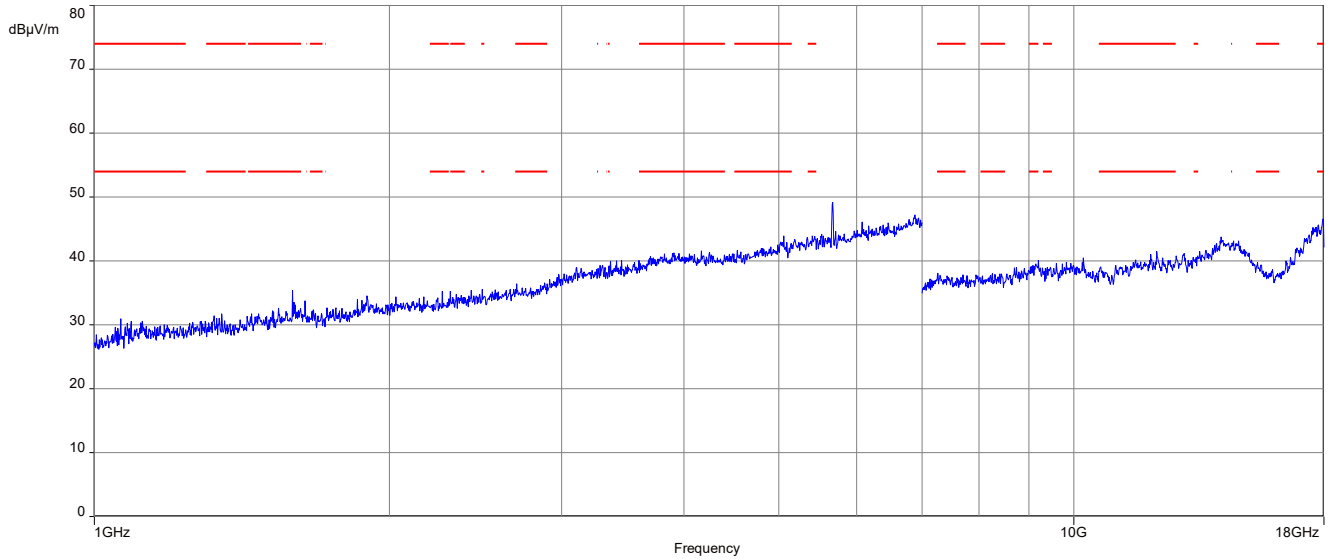
Plot 5: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel



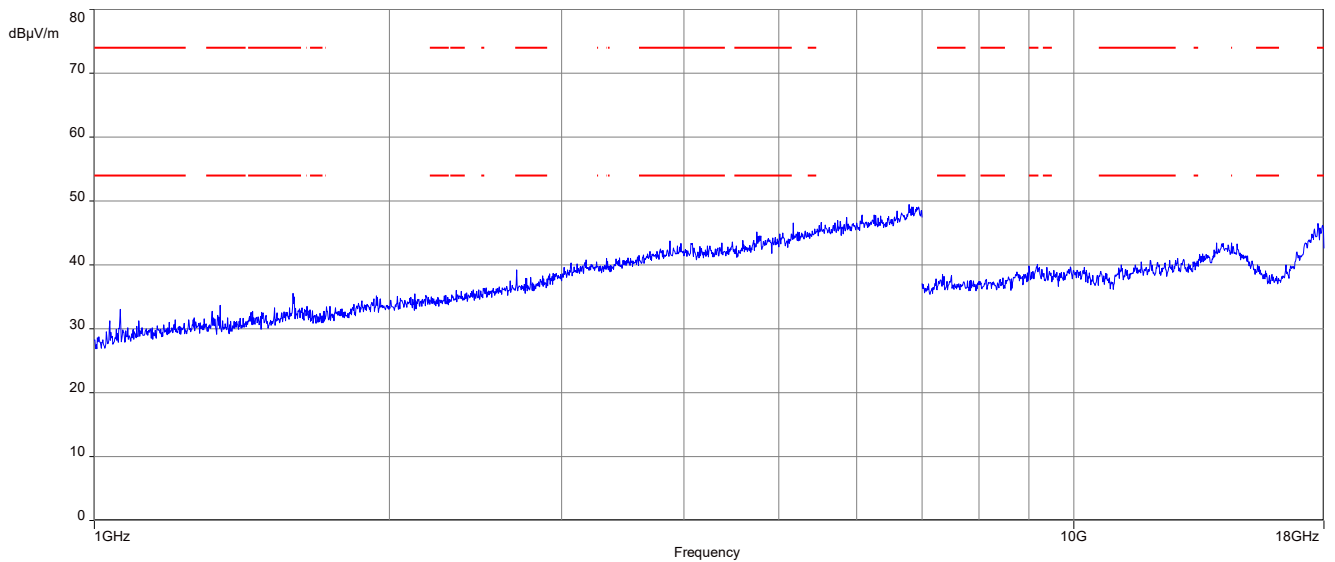
Plot 6: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; middle channel



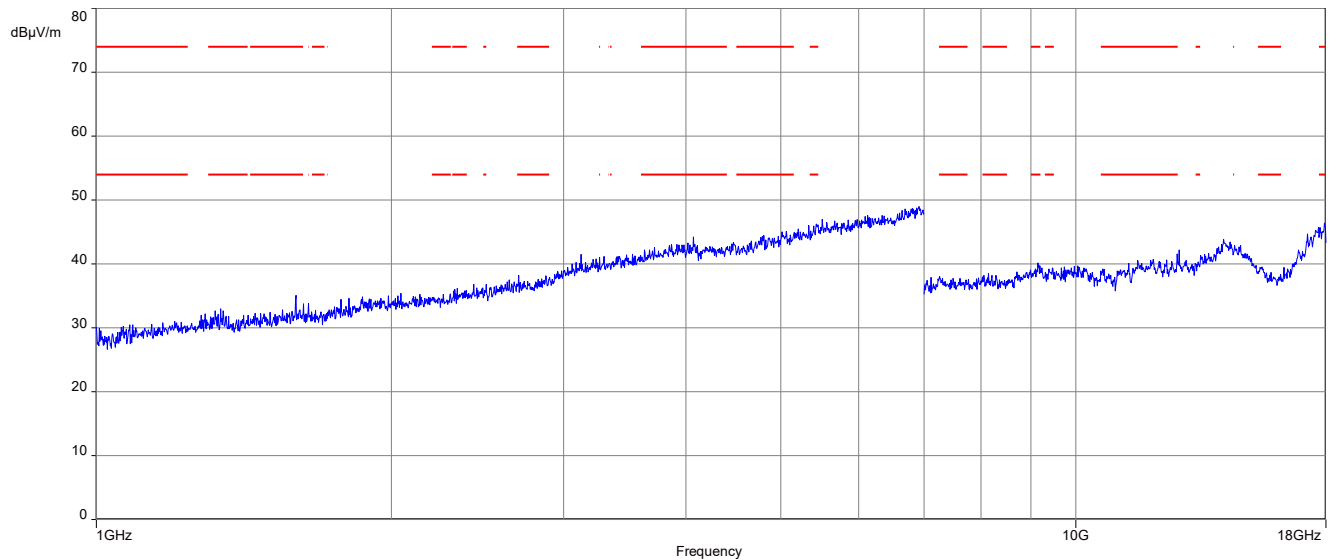
Plot 7: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



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

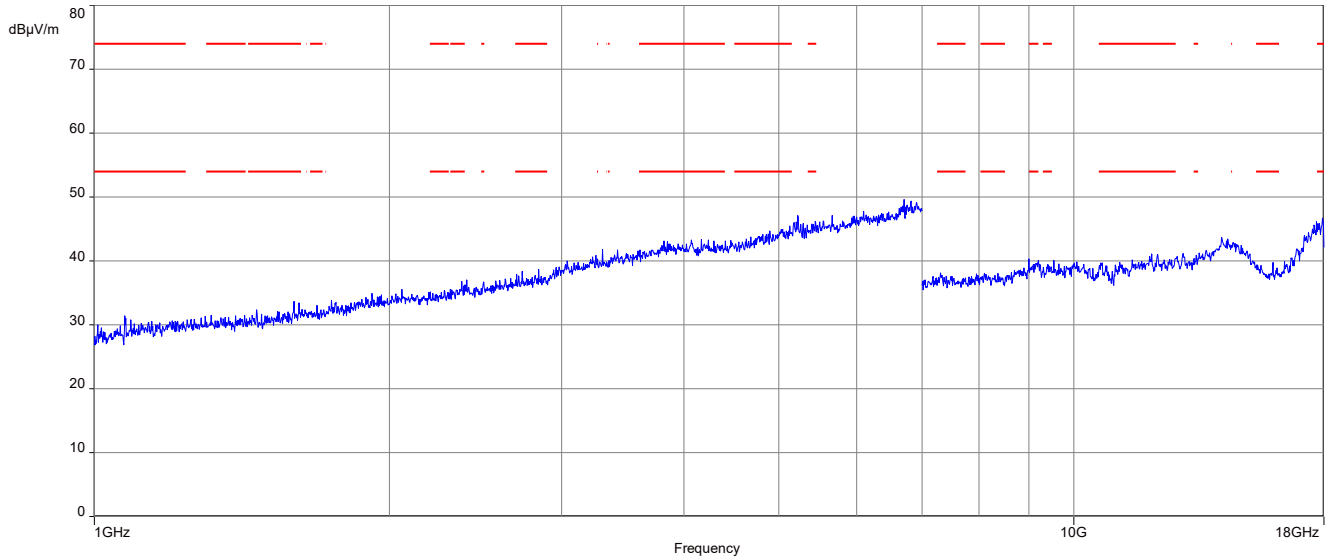


Plot 9: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-3; highest channel

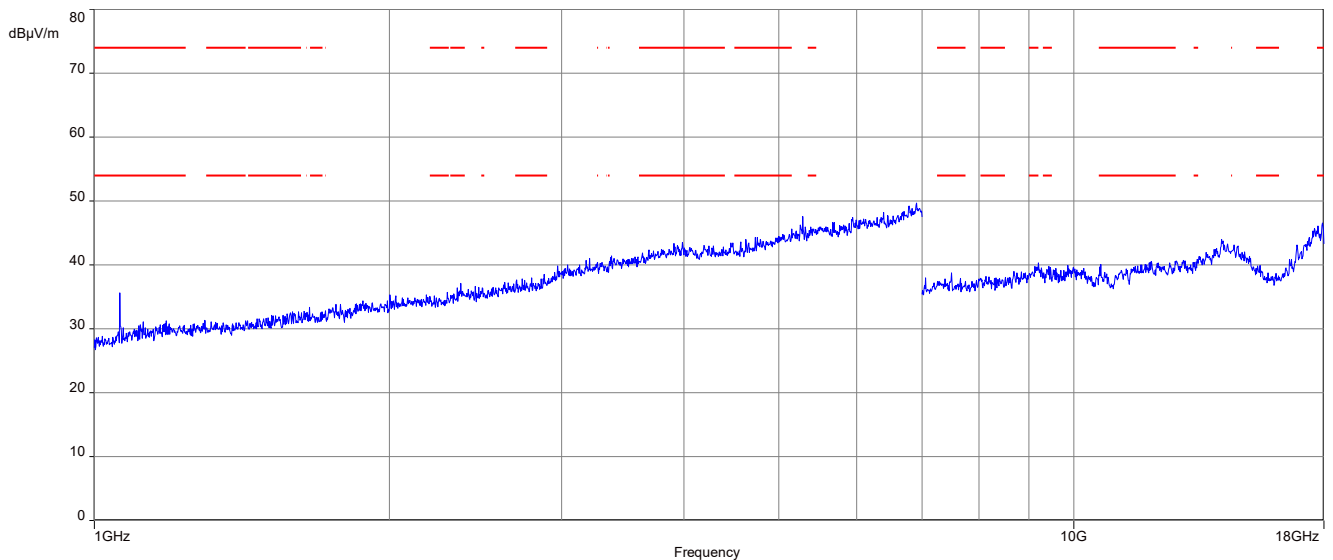


Plots: 80 MHz channel bandwidth

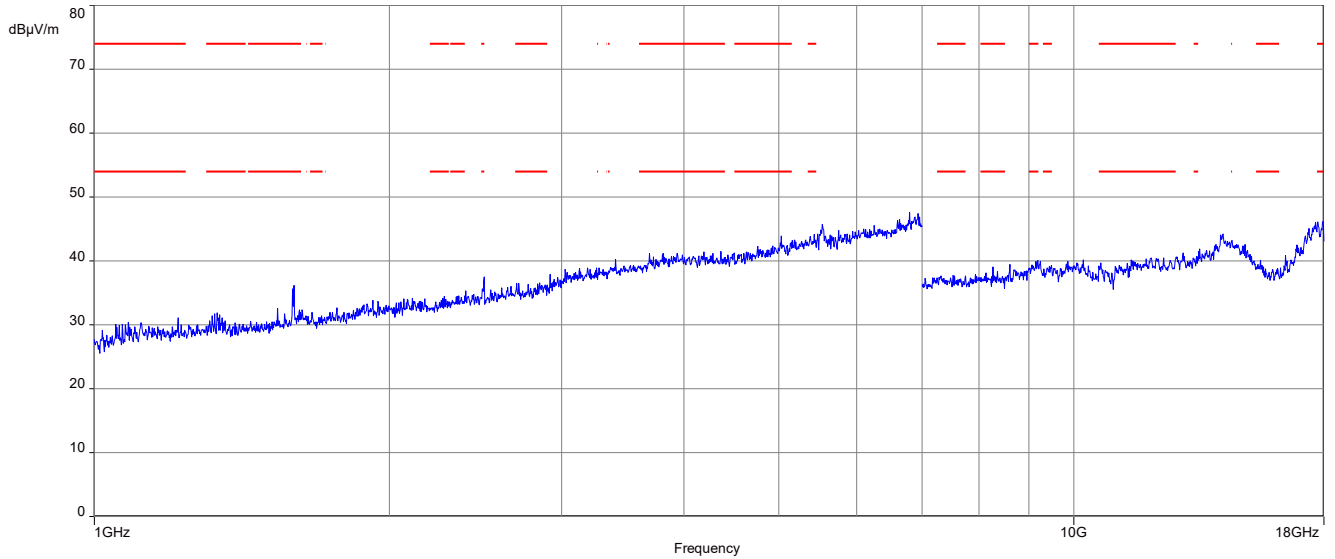
Plot 1: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-1; middle channel



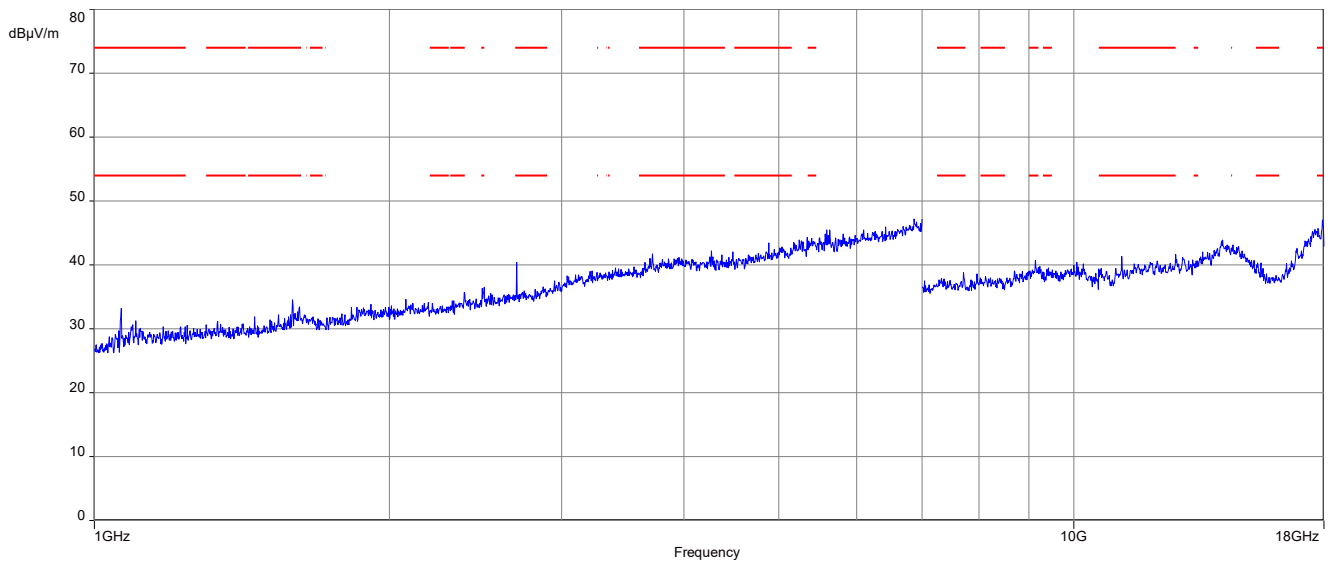
Plot 2: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2A; middle channel



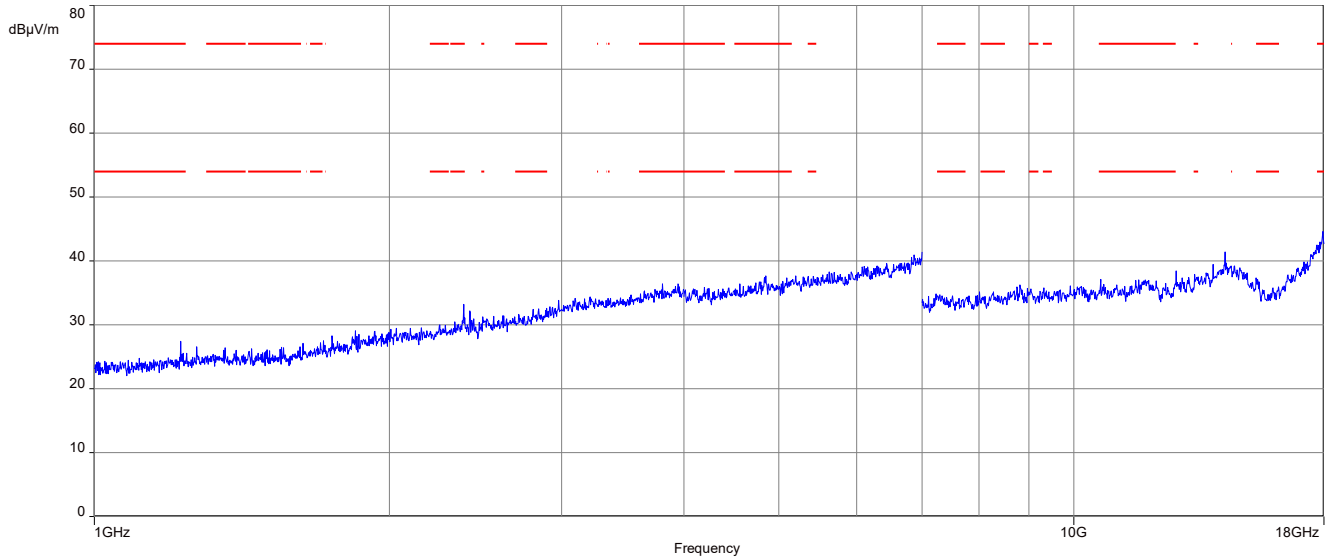
Plot 3: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; lowest channel



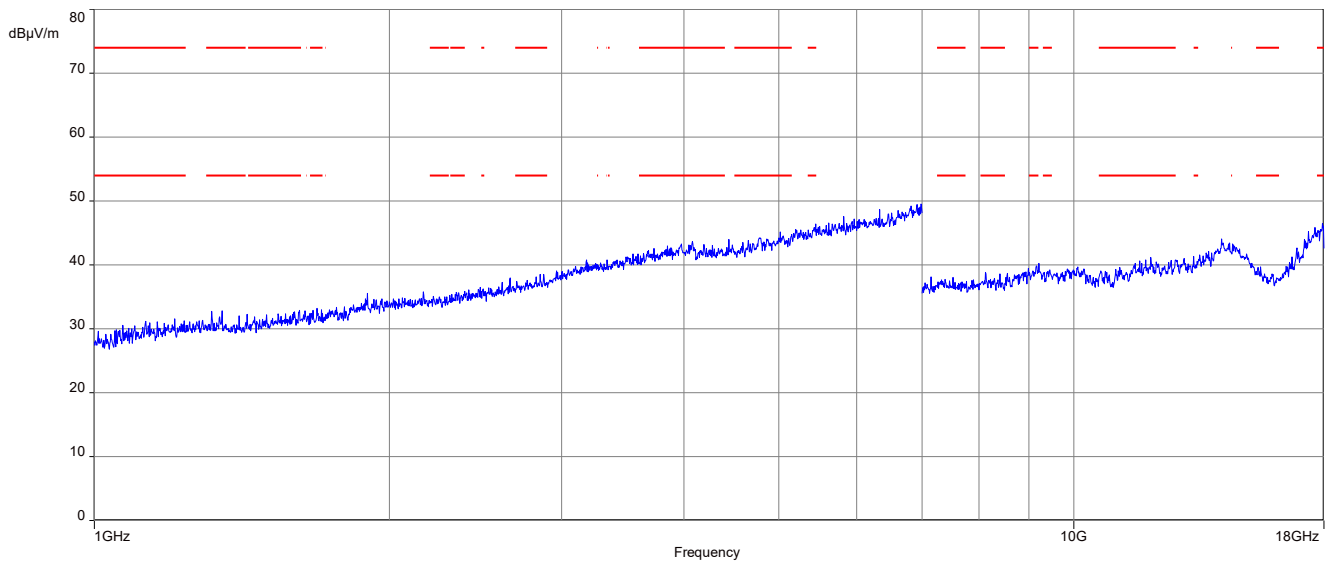
Plot 4: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; middle channel

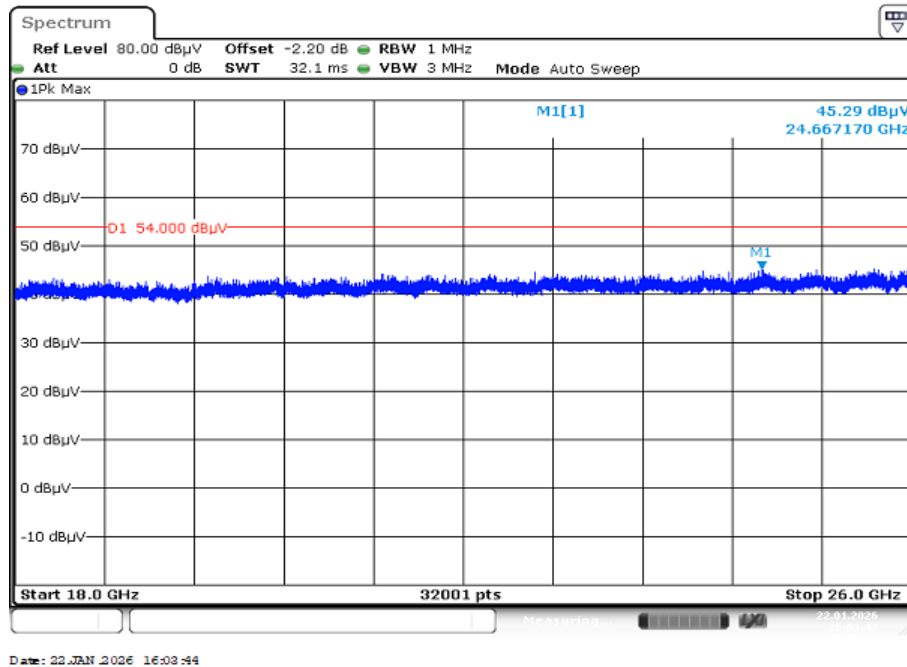
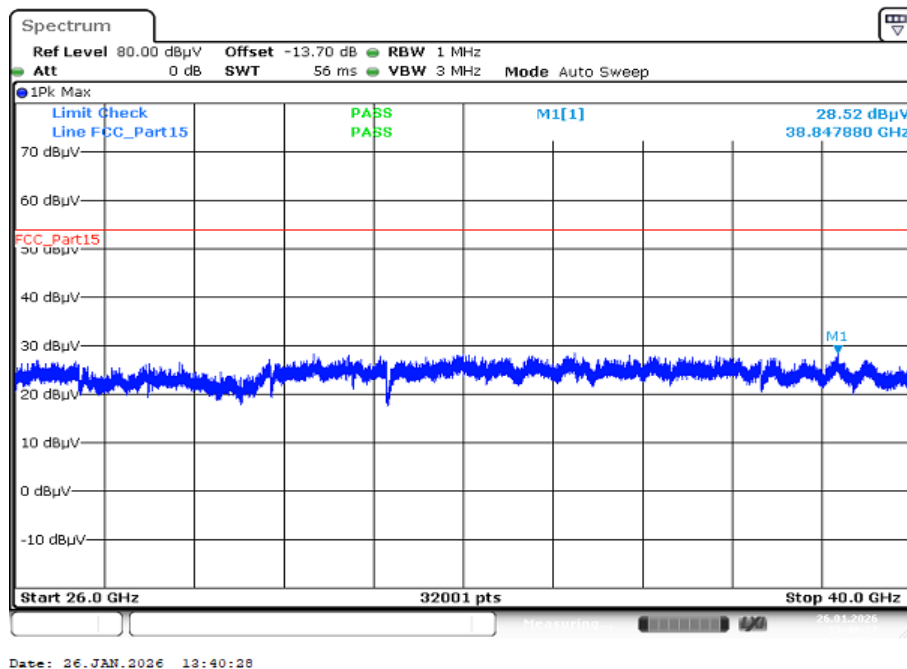


Plot 5: 1 GHz to 18 GHz; vertical & horizontal polarization; U-NII-2C; highest channel



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



Plot 7: 18 GHz to 26 GHz; vertical & horizontal polarization; valid for all bands, channels and modes**Plot 8:** 26 GHz to 40 GHz; vertical & horizontal polarization; valid for all bands, channels and modes

13 Observations

No observations except those reported with the single test cases have been made.

14 Glossary

AVG	Average
C	Compliant
C/N₀	Carrier to noise-density ratio, expressed in dB-Hz
CAC	Channel availability check
CW	Clean wave
DC	Duty cycle
DFS	Dynamic frequency selection
DSSS	Dynamic sequence spread spectrum
DUT	Device under test
EUT	Equipment under test
FCC	Federal Communications Commission
FCC ID	Combination of Grantee Code and Equipment Product Code
FHSS	Frequency hopping spread spectrum
FVIN	Firmware version identification number
HMN	Host marketing name
HVIN	Hardware version identification number
HW	Hardware
ISED	Innovation, Science and Economic Development Canada
Inv. No.	Inventory number
MC	Modulated carrier
NA	Not applicable
NC	Not compliant
NOP	Non occupancy period
NP	Not performed
OBW	Occupied bandwidth
OC	Operating channel
OCW	Operating channel bandwidth
OFDM	Orthogonal frequency division multiplexing
OOB	Out of band
OP	Occupancy period
PER	Packet error rate
PMN	Product marketing name
PP	Positive peak
QP	Quasi peak
RLAN	Radio local area network
S/N or SN	Serial number
SW	Software
UUT	Unit under test
WLAN	Wireless local area network

15 Document history

Version	Applied changes	Date of release
R01	Initial release	2026-02-23

END OF TEST REPORT