

TEST REPORT

Test report no.: 1-2152-25-01-08_TR1-R01



Deutsche
Akkreditierungsstelle
D-PL-12047-01-00

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

Haivision Systems Inc.

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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:	Video Transmitters
Model name:	Falkon X2
FCC ID:	2BTDD-AX210NG
ISED certification number:	31632-AX210NG
Frequency:	2400 MHz to 2483.5 MHz
Technology tested:	WLAN
Antenna:	Two integrated PCB antennas
Power supply:	10.8 V DC by battery pack
Temperature range:	-5°C to +45°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.

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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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2.2 Application details

Date of receipt of order:	2026-02-02
Date of receipt of test item:	2020-00-00
Start of test:*	2026-04-01
End of test:*	2026-07-22
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) + Amendment 1 (2019-03) + Amendment 2 (2021-02)	2021-02-01	General Requirements for Compliance of Radio Apparatus

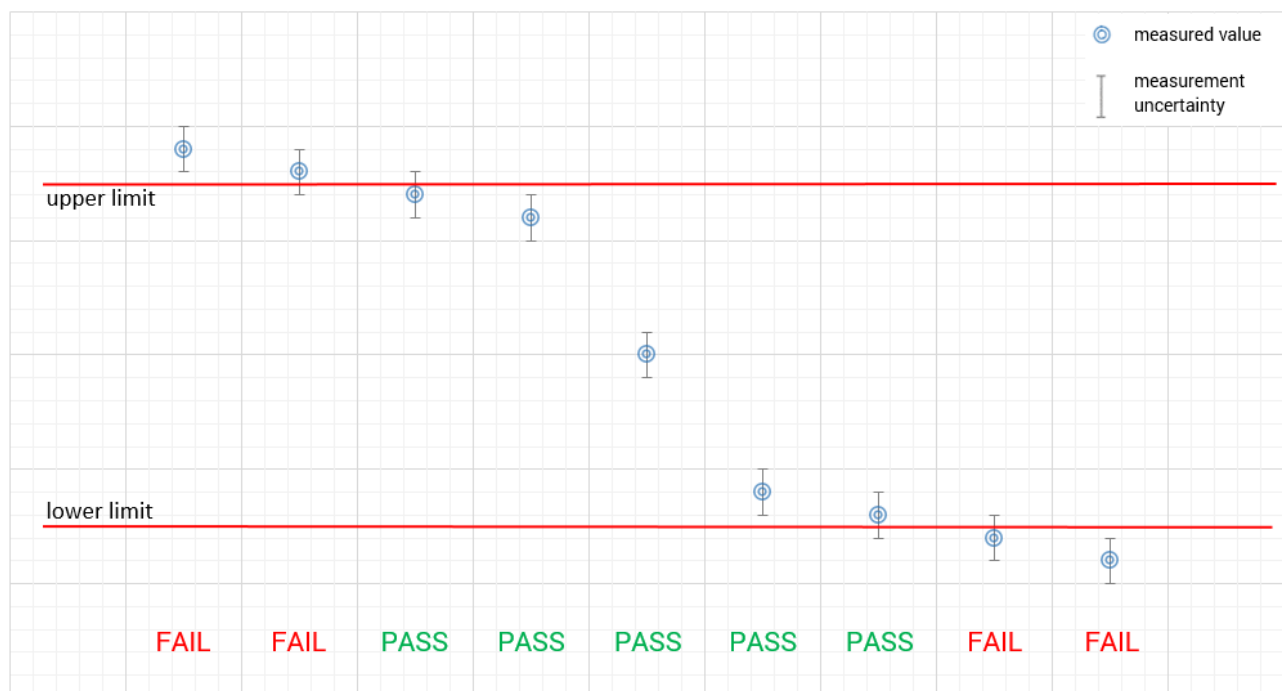
Guidance	Version	Description
KDB 558074 D01	v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
ANSI C63.10-2020	-/-	American National Standard of Procedures for 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 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} T_{max} T_{min}	+22 °C during room temperature tests No tests under extreme temperature conditions required. No tests under extreme temperature conditions required.
Relative humidity content	:		42 %
Barometric pressure	:		1018 hpa
Power supply	:	V_{nom} V_{max} V_{min}	10.8 V DC by battery pack No tests under extreme voltage conditions required. No tests under extreme voltage conditions required.

6 Test item

6.1 General description

Kind of test item	:	Video Transmitters
Model name	:	Falkon X2
HMN	:	-/-
PMN	:	Intel Wi-Fi 6E AX210
HVIN	:	AX210NGW
FVIN	:	-/-
S/N serial number	:	Rad. Sample 4 Cond. HAIFKX20126011730
Hardware status	:	2.0.0-2
Software status	:	DRTU_08119_23.130.0
Firmware status	:	-/-
Frequency band	:	2400 MHz to 2483.5 MHz
Type of radio transmission	:	DSSS, OFDM
Use of frequency spectrum	:	
Type of modulation	:	CCK, (D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM to 1024 - QAM
Number of channels	:	11 (20 MHz), 7 (40 MHz)
Antenna	:	Two integrated PCB antennas
Power supply	:	10.8 V DC by battery pack
Temperature range	:	-5°C to +45°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:

1-2152-25-01-01_TR1-A101-R01
1-2152-25-01-01_TR1-A102-R01
1-2152-25-01-01_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).

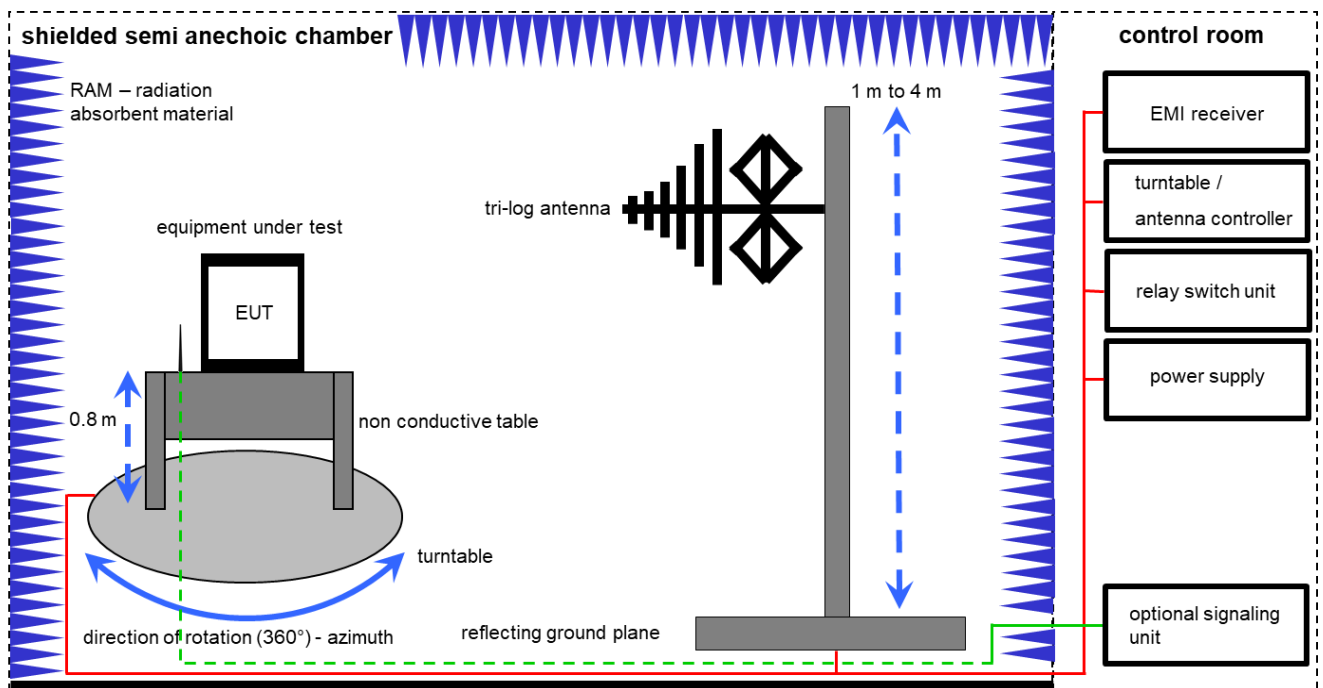
Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

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
vlkl!	Attention: extended calibration interval	*)	next calibration ordered / currently in progress
NK!	Attention: not calibrated		
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)

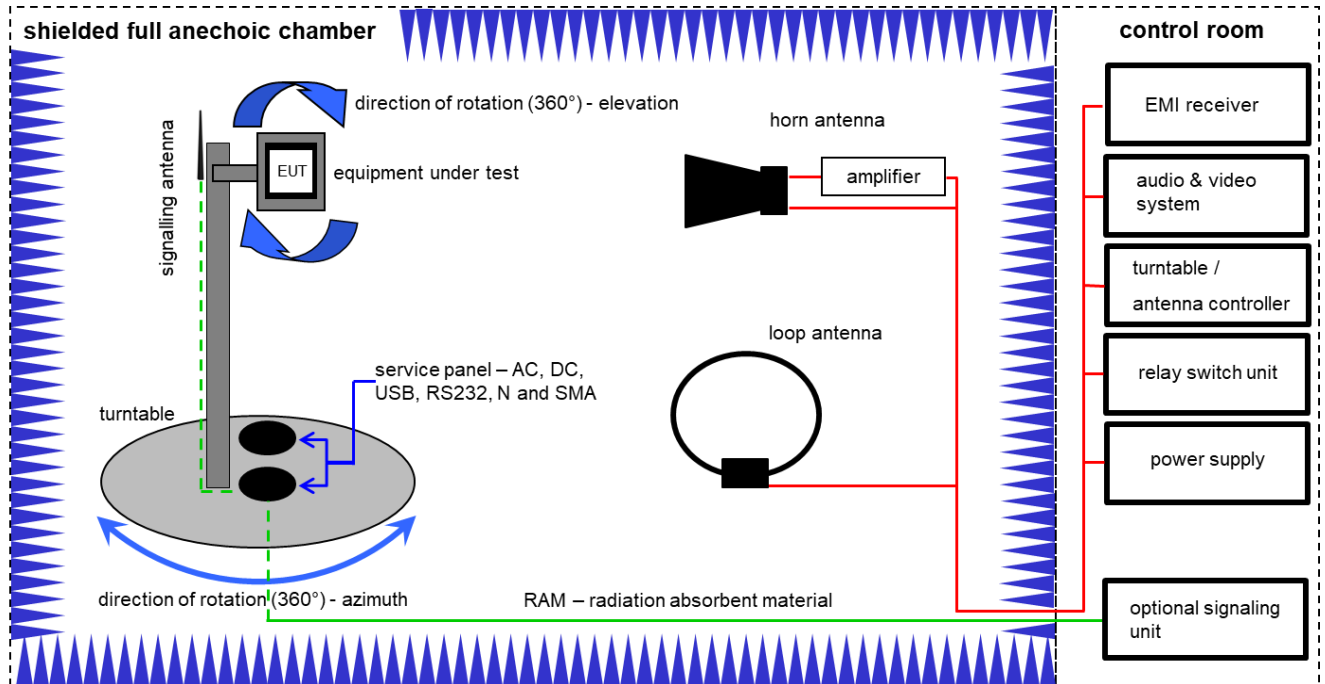
Example calculation:

FS [dB μ V/m] = 12.35 [dB μ V] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dB μ V/m] (35.69 μ V/m) @ distance

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	Antenna Tower	Antenna Tower 2175	ETS-Lindgren GmbH Taufkirchen	64762	50279	cnn	-/-	-/-
3	A	Positioning Controller	Positioning Controller 2090	ETS-Lindgren GmbH Taufkirchen	64672	50280	cnn	-/-	-/-
4	A	TRILOG Broadband Antenna	TRILOG Broadband Antenna VULB9163	Schwarzbeck Mess-Elektronik OHG Schönaun	1029	50403	cal	07.11.2025	30.11.2027
5	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:

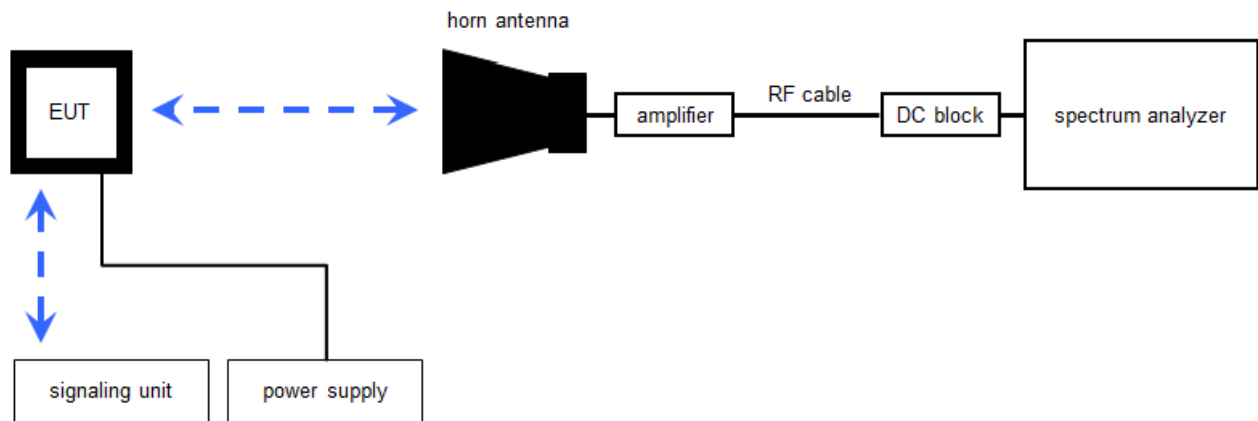
FS [dBμV/m] = 40.0 [dBμV] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBμV/m] (71.61 μV/m) @ distance

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A, B, C	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115	EMCO Elektronik GmbH Gilching	8812-3089	40344	cal	09.07.2024	31.07.2026
2	A, B	Highpass Filter	Highpass Filter WHK1.1/15G-10SS	Wainwright Instruments GmbH Andechs	37	40362	cnn	-/-	-/-
3	A, B	Highpass Filter	Highpass Filter WHKX7.0/18G-8SS	Wainwright Instruments GmbH Andechs	18	40364	cpu	-/-	-/-
4	B	Band Reject Filter	Band Reject Filter WRCG2400/2483-2375/2505-50/10SS	Wainwright Instruments GmbH Andechs	26	40367	cpu	-/-	-/-
5	A, B	Broadband Amplifier 0.5-18 GHz	Broadband Amplifier 0.5-18 GHz CBLU5184540	MEC Import: CERNEX	22050	40374	cpu	-/-	-/-
6	A, B, C	4U RF Switch Platform	4U RF Switch Platform L4491A	Agilent Technologies Deutschland GmbH Böblingen	MY50000032	40376	cnn	-/-	-/-
7	A, B, C	NEXIO EMV-Software	NEXIO EMV-Software BAT EMC V2022.0.32.0	MEC Import: Nexio	-/-	40383	cnn	-/-	-/-
8	A, B, C	Anechoic chamber	Anechoic chamber	MEC Import: TDK	-/-	40385	cnn	-/-	-/-
9	A, B, C	Signal- and Spectrum Analyzer	Signal- and Spectrum Analyzer FSW26	Rohde & Schwarz Messgerätebau GmbH Memmingen	104533	41044	cal	30.12.2025	30.12.2026
10	C	Active Loop Antenna	Active Loop Antenna 6502	EMCO Elektronik GmbH Gilching	2210	50044	cal	07.07.2025	31.07.2027

7.3 Radiated measurements > 18 GHz

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)

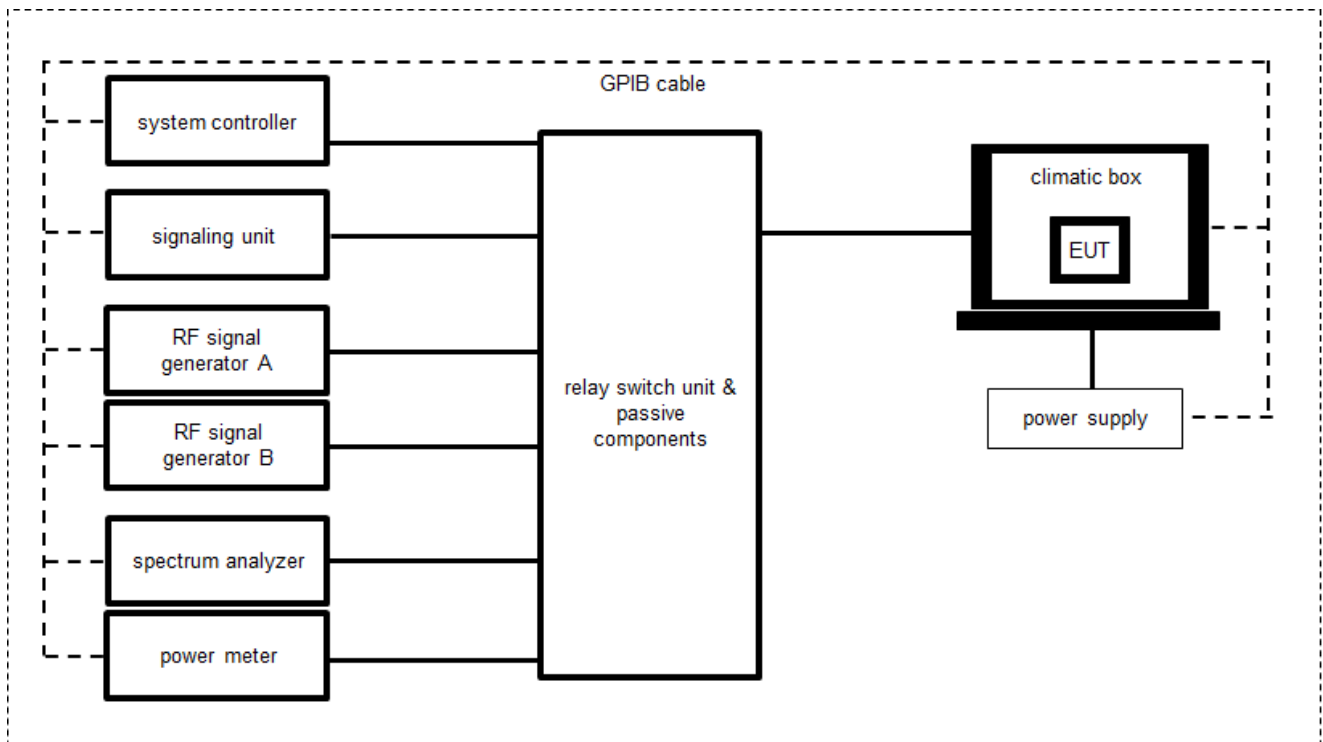
Example calculation:

$$FS [dB\mu V/m] = 40.0 [dB\mu V] + (-60.1) [dB] + 36.74 [dB/m] = 16.64 [dB\mu V/m] (6.79 \mu V/m) @ distance$$

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Microwave System Amplifier, 0.5-26.5 GHz	Microwave System Amplifier, 0.5-26.5 GHz 83017A	Hewlett Packard	00419	40014	cpu	-/-	-/-
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	16.01.2026	31.01.2028
3	A	Signal analyzer	Signal analyzer FSV30	Rohde & Schwarz Messgerätebau GmbH Memmingen	1321.3008K30/103170	18373	cal	15.01.2025	15.01.2027
4	A	Switch Matrix	USM/RSM	cetecom advanced GmbH Saarbrücken	A001	40338	chk	13.08.2025	13.08.2026

7.4 Conducted tests



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

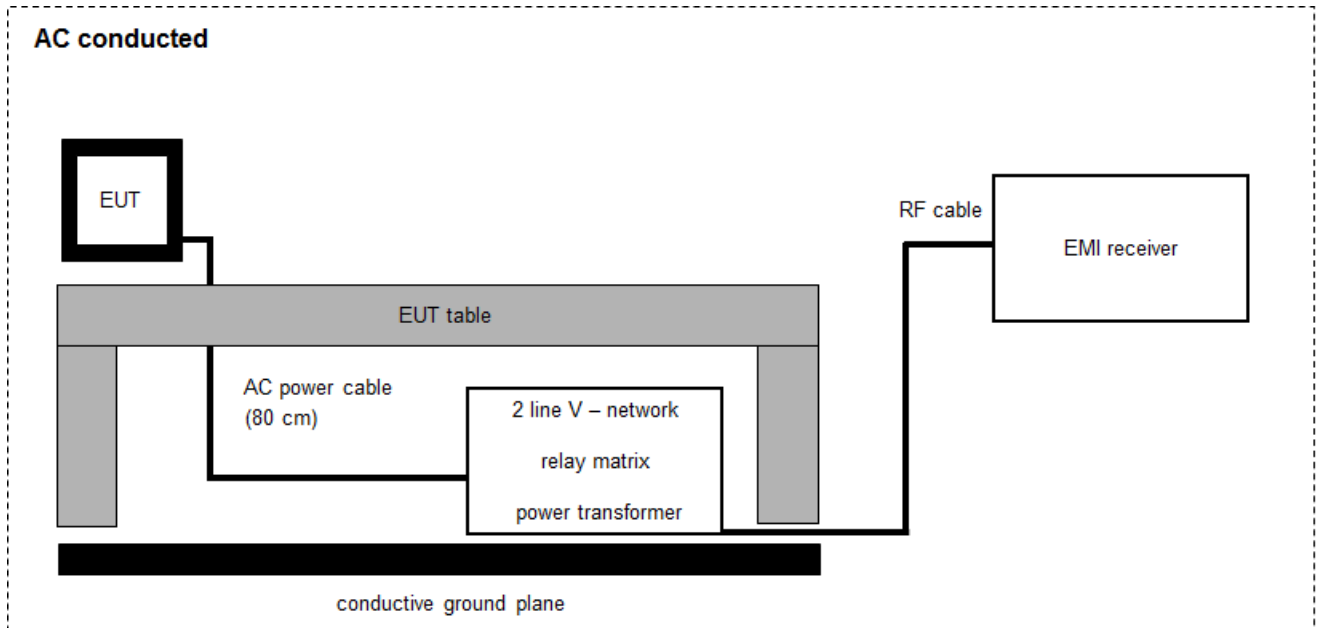
Example calculation:

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 FSV30	Rohde & Schwarz Messgerätebau GmbH Memmingen	1321.3008K30/103170	18373	cal	15.01.2025	15.01.2027
2	A, B	Switch Matrix	USM/RSM	cetecom advanced GmbH Saarbrücken	A001	40338	chk	13.08.2025	13.08.2026
3	B	Peak And Average Power Sensor	Peak And Average Power Sensor U2042XA	Keysight Technologies Deutschland GmbH Böblingen	MY58020014	40308	cal	08.12.2025	31.12.2026
4	A, B	Hygro-Thermometer	Hygro-Thermometer -/-, 5-45°C, 20-100%rF	Adolf Thies GmbH & Co. KG, Meteorologie - Umweltmesstechnik Göttingen	without	40353	chk	25.09.2024	25.09.2026
5	A, B	Test software RadioStar (C.BER2 for BT LE RFPHY)	Test software RadioStar (C.BER2 for BT LE RFPHY)	cetecom advanced GmbH Saarbrücken	1	40407	cnn	-/-	-/-

7.5 AC conducted



Result = UR + CF + VC

(UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

Example calculation:

Result [dBμV] = 37.62 [dBμV] + 9.90 [dB] + 0.23 [dB] = 47.75 [dBμV] (244.06 μV)

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	EMI Test Receiver	EMI Test Receiver ESR3 9kHz-3.6GHz	Rohde & Schwarz Messgerätebau GmbH Memmingen	102981	40332	cal	05.12.2025	31.12.2026
2	A	Two-Line V-Network (LISN)	Two-Line V-Network (LISN) ESH3-Z5	Rohde & Schwarz Messgerätebau GmbH Memmingen	892475/017	50005	cal	09.12.2025	31.12.2027
3	A	Artificial Mains Network	Artificial Mains Network ESH2-Z5	Rohde & Schwarz Messgerätebau GmbH Memmingen	892602/0024	50147	cal	11.12.2024	31.12.2026
4	A	Impedance Stabilization Network	Impedance Stabilization Network ISN ST08C	Schaffner Deutschland GmbH Karlsruhe	22583	50239	cal	20.09.2024	30.09.2026

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	± 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 Part 15 RSS - 247, Issue 4	See table	2026-07-30	Reduced tests due to pre-certified module

Test specification clause	Test case	Guideline	Temperature & voltage conditions	C	NC	NA	NP	Remark
§15.247(b)(4) RSS - 247 / 5.4 (f)(ii)	Antenna gain	-/-	Nominal	-/-				-/-
§15.35	Duty cycle	-/-	Nominal	-/-				-/-
§15.247(e) RSS - 247 / 5.2 (b)	Power spectral density	KDB 558074 DTS clause: 8.4	Nominal	☐	☐	☐	☒	-/-
§15.247(a)(2) RSS - 247 / 5.2 (a)	DTS bandwidth	KDB 558074 DTS clause: 8.2	Nominal	☐	☐	☐	☒	-/-
RSS Gen clause 4.6.1	Occupied bandwidth	-/-	Nominal	☐	☐	☐	☒	-/-
§15.247(b)(3) RSS - 247 / 5.4 (d)	Maximum output power	KDB 558074 DTS clause: 8.3.1.3	Nominal	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5	Detailed spurious emissions @ the band edge – cond.	-/-	Nominal	☐	☐	☐	☒	-/-
§15.205 RSS - 247 / 5.5 RSS - Gen	Band edge compliance rad.	KDB 558074 DTS clause: 8.7.3	Nominal	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5	TX spurious emissions cond.	KDB 558074 DTS clause: 8.5	Nominal	☐	☐	☐	☒	-/-
§15.209(a) RSS-Gen	TX spurious emissions rad. below 30 MHz	-/-	Nominal	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5 RSS-Gen	TX spurious emissions rad. 30 MHz to 1 GHz	-/-	Nominal	☒	☐	☐	☐	-/-
§15.247(d) RSS - 247 / 5.5 RSS-Gen	TX spurious emissions rad. above 1 GHz	-/-	Nominal	☒	☐	☐	☐	-/-
§15.107(a) §15.207	Conducted emissions < 30 MHz	-/-	Nominal	☒	☐	☐	☐	-/-

Notes:

C	Compliant	NC	Not compliant	NA	Not applicable	NP	Not performed
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11 Additional information and comments

Reference documents: Gain antenne WiFi Falkon X2.xlsx
 1-2152-25-01-08_TR1-A201-R01.pdf (SISO power results)
 1-2152-25-01-08_TR1-A202-R01.pdf (MIMO power results)

Special test descriptions: Power settings:

Channel	All channels
DSSS / b – mode, SISO	Default (Set by Intel module test GUI)
OFDM / g – mode, SISO	Default (Set by Intel module test GUI)
OFDM / n HT20 – mode, SISO/MIMO	Default (Set by Intel module test GUI)
OFDM / n HT40 – mode, SISO/MIMO	Default (Set by Intel module test GUI)
OFDM / ax HE20 – mode, SISO/MIMO	Default (Set by Intel module test GUI)
OFDM / ax HE40 – mode, SISO/MIMO	Default (Set by Intel module test GUI)

Configuration descriptions: The device has two Chains A and B and supports SISO and MIMO for all modes. Based on the module reports and the power settings from the module reports, testing was done in worst case modes, where the modes are spectrally identical and the power settings are the same.

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:

channel number & center frequency													
channel	1	2	3	4	5	6	7	8	9	10	11	12	13
f _c / MHz	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472

Channels with 40 MHz channel bandwidth:

channel number & center frequency													
channel	-/-	-/-	3	4	5	6	7	8	9	10	11	-/-	-/-
f _c / MHz	-/-	-/-	2422	2427	2432	2437	2442	2447	2452	2457	2462	-/-	-/-

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

12 Additional EUT parameter

- Test mode:
- ☐ No test mode available
lperf was used to ping another device with the largest support packet size
- ☒ Test mode available
Special software is used.
EUT is transmitting pseudo random data by itself
- Modulation types:
- ☒ Wide Band Modulation (None Hopping – e.g. DSSS, OFDM)
- ☐ Frequency Hopping Spread Spectrum (FHSS)
- 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.

13 Measurement results

13.1 Antenna gain

Limits:

FCC	ISED
6 dBi / > 6 dBi output power and power density reduction required	

Results:

Antenna 1	lowest channel	middle channel	highest channel
Gain [dBi] / Declared Extracted from Gain antenne WiFi Falkon X2.xlsx	1.3		

Results:

Antenna 2	lowest channel	middle channel	highest channel
Gain [dBi] / Declared Extracted from Gain antenne WiFi Falkon X2.xlsx	1.9		

13.2 Identify worst case data rate

Results:

Modulation scheme / bandwidth Extracted from the module test reports	
DSSS / b – mode SISO	1 Mbit/s
OFDM / g – mode SISO	6 Mbit/s
OFDM / n HT20 – mode SISO	HT0
OFDM / n HT40 – mode SISO	HT0
OFDM / ax HE20 – mode SISO	HE0
OFDM / ax HE40 – mode SISO	HE0

13.3 Maximum output power

Description:

Measurement of the maximum conducted peak output power. The measurements are performed using the data rate identified in the previous chapter.

Measurement:

Measurement parameter	
According to DTS clause: 8.3.1.3	
Peak power meter	
External result file(s)	1-2152-25-01-08_TR1-A201-R01.pdf 1-2152-25-01-08_TR1-A202-R01.pdf
Test setup	See chapter 7.4 setup B
Measurement uncertainty	See chapter 9

Limits:

FCC	ISED
Conducted 1.0 W / 30 dBm with an antenna gain of max. 6 dBi	

Results:

antenna port 1 SISO measured	maximum output power / dBm		
	lowest channel	middle channel	highest channel
Output power conducted DSSS / b – mode	21.0	21.4	19.7
Output power conducted OFDM / g – mode	19.7	21.4	18.2
Output power conducted OFDM / n HT20 – mode	19.5	21.4	18.1
Output power conducted OFDM / n HT40 – mode	19.0	19.1	18.8
Output power conducted OFDM / ac HT20 – mode	19.8	21.6	18.4
Output power conducted OFDM / ax HE20 – mode	19.1	18.8	18.7

antenna port 2 SISO measured	maximum output power / dBm		
	lowest channel	middle channel	highest channel
Output power conducted DSSS / b – mode	20.7	21.7	19.7
Output power conducted OFDM / g – mode	19.1	21.4	17.1
Output power conducted OFDM / n HT20 – mode	19.0	21.3	17.1
Output power conducted OFDM / n HT40 – mode	18.6	19.2	17.8
Output power conducted OFDM / ac HT20 – mode	19.2	21.4	17.2
Output power conducted OFDM / ax HE20 – mode	18.9	19.0	17.8

antenna port 1 + 2 MIMO measured	maximum output power / dBm		
	lowest channel	middle channel	highest channel
Output power conducted OFDM / n HT20 – mode	21.5	24.5	19.9
Output power conducted OFDM / n HT40 – mode	21.3	21.7	20.4
Output power conducted OFDM / ac HT20 – mode	21.6	14.8	20.1
Output power conducted OFDM / ax HE20 – mode	20.9	21.5	20.1

13.4 Duty cycle

Description:

Measurement of the timing behavior.

Measurement:

Measurement parameter	
Detector	Peak
Sweep time	Depends on the signal see plot
Resolution bandwidth	10 MHz
Video bandwidth	10 MHz
Trace mode	Max hold
Test setup	See chapter 7.4 setup A
Measurement uncertainty	See chapter 9

Limits:

FCC	ISED
No limitation!	

Results: Set by GUI to > 99%

T _{nom}	V _{nom}	lowest channel	middle channel	highest channel
DSSS / b – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB
OFDM / g – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB
OFDM / n HT20 – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB
OFDM / n HT40 – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB
OFDM / ac HT20 – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB
OFDM / ax HE20 – mode		>99 % / 0.0 dB	>99 % / 0.0 dB	>99 % / 0.0 dB

13.5 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 3 meter.

Measurement:

	Measurement parameter for peak measurements	Measurement parameter for average measurements
		According to DTS clause: 8.7.3
Detector	Peak	RMS
Sweep time	Auto	Auto
Resolution bandwidth	1 MHz	100 kHz
Video bandwidth	3 MHz	300 kHz
Span	See plot	2 MHz
Trace mode	Max. hold	RMS Average over 101 sweeps
Analyzer function	-/-	Band power function (Compute the power by integrating the spectrum over 1 MHz)
Test setup	See chapter 7.2 setup A	
Measurement uncertainty	See chapter 9	

Limits:

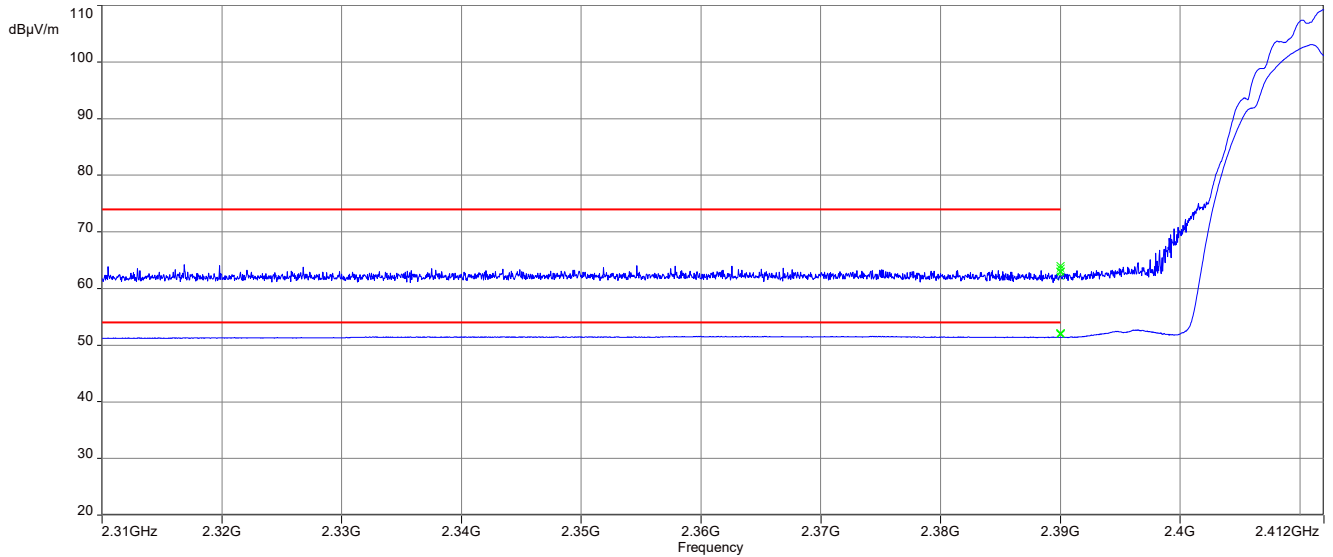
FCC	ISED
74 dB μ V/m @ 3 m (Peak) 54 dB μ V/m @ 3 m (AVG)	

Results: SISO Chain A

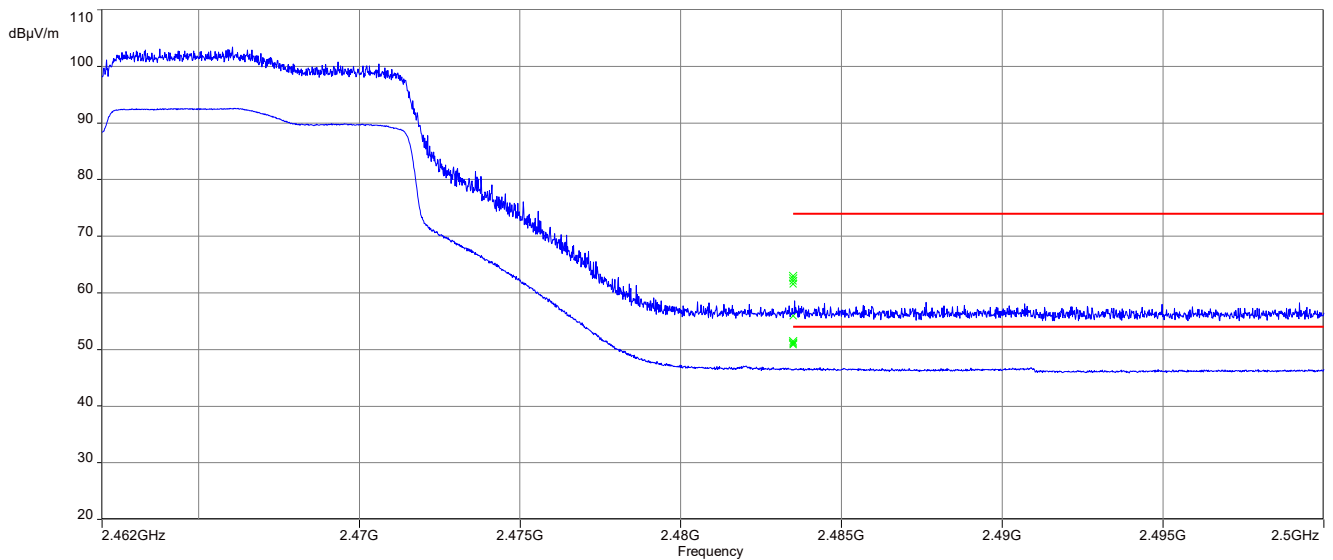
Scenario	Band edge compliance radiated [dB μ V/m]
Mode	802.11b
Lower restricted band	52.1 dB μ V/m AVG 64.1 dB μ V/m Peak
Upper restricted band	51.5 dB μ V/m AVG 63.0 dB μ V/m Peak
Mode	802.11n HT20
Lower restricted band	52.2 dB μ V/m AVG 63.4 dB μ V/m Peak
Upper restricted band	51.3 dB μ V/m AVG 63.1 dB μ V/m Peak
Mode	802.11n HT40
Lower restricted band	53.0 dB μ V/m AVG 64.9 dB μ V/m Peak
Upper restricted band	50.9 dB μ V/m AVG 61.7 dB μ V/m Peak
Mode	802.11ax HE20
Lower restricted band	51.9 dB μ V/m AVG 63.8 dB μ V/m Peak
Upper restricted band	51.5 dB μ V/m AVG 63.0 dB μ V/m Peak
Mode	802.11ax HE40
Lower restricted band	51.5 dB μ V/m AVG 62.4 dB μ V/m Peak
Upper restricted band	50.9 dB μ V/m AVG 62.3 dB μ V/m Peak

Plots: SISO Chain A

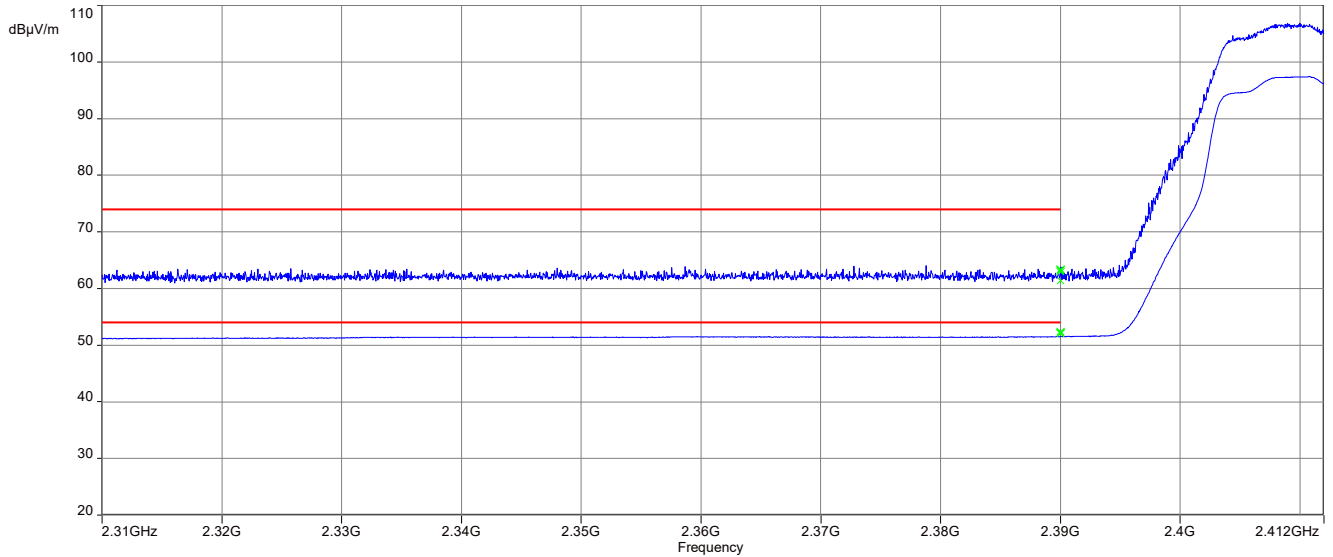
Plot 1: TX mode, lower band edge, vertical & horizontal polarization, 802.11b



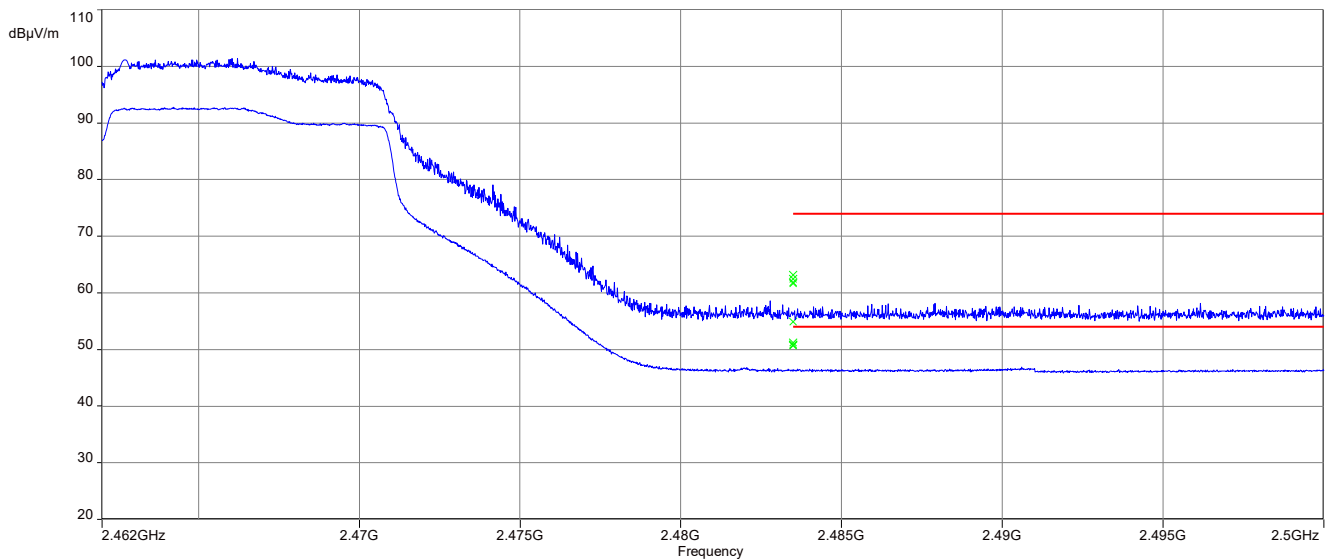
Plot 2: TX mode, upper band edge, vertical & horizontal polarization, 802.11b



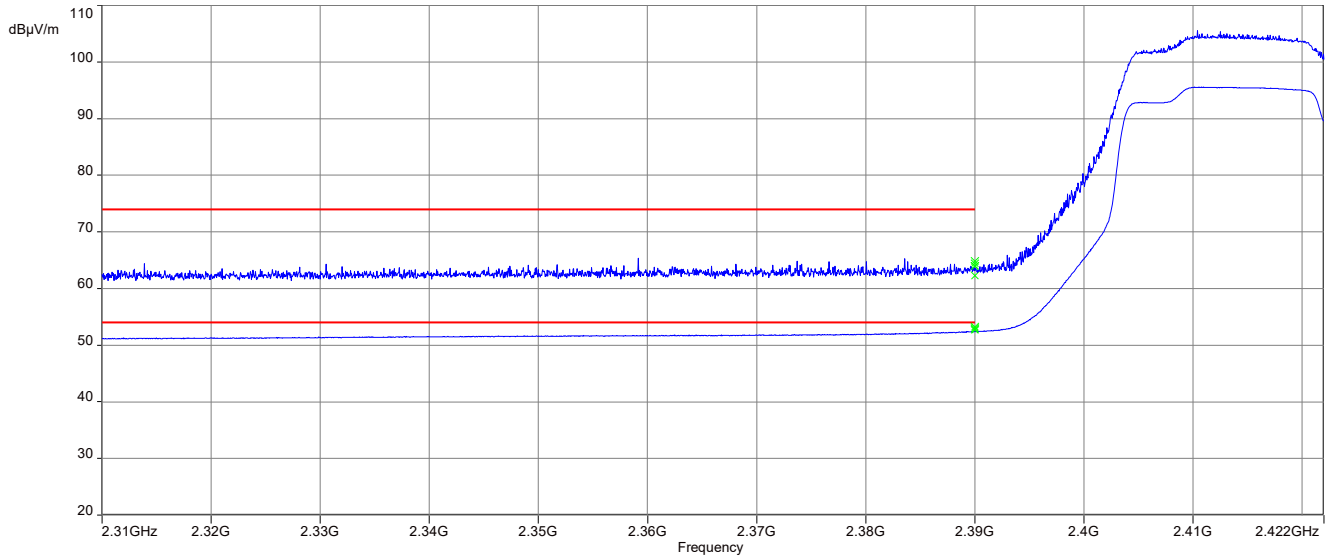
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT20



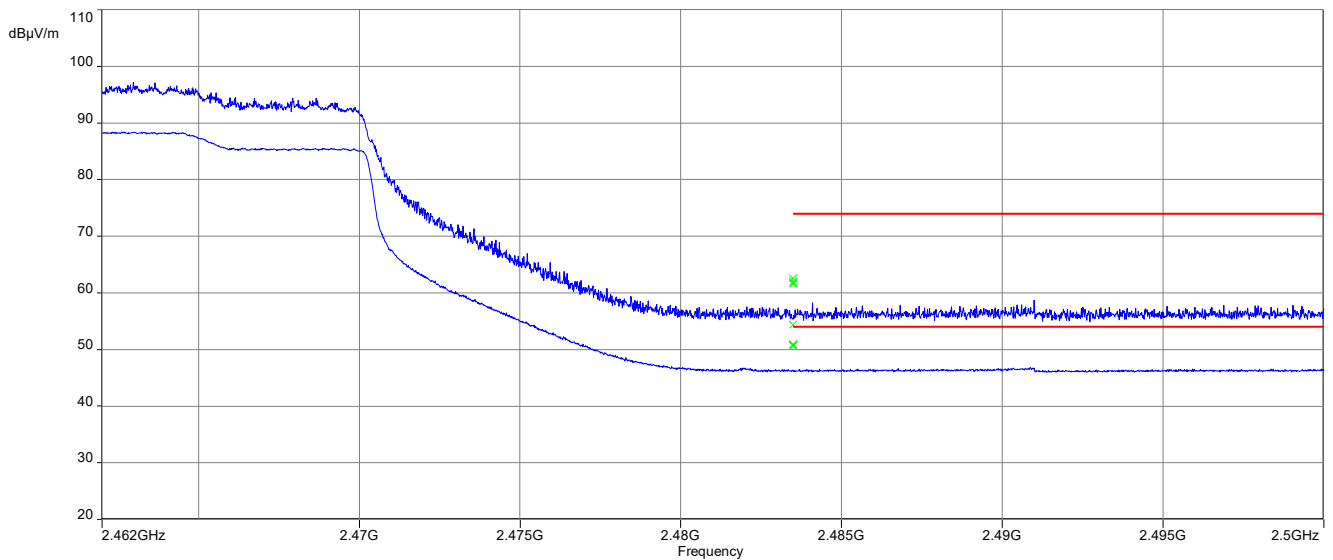
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT20



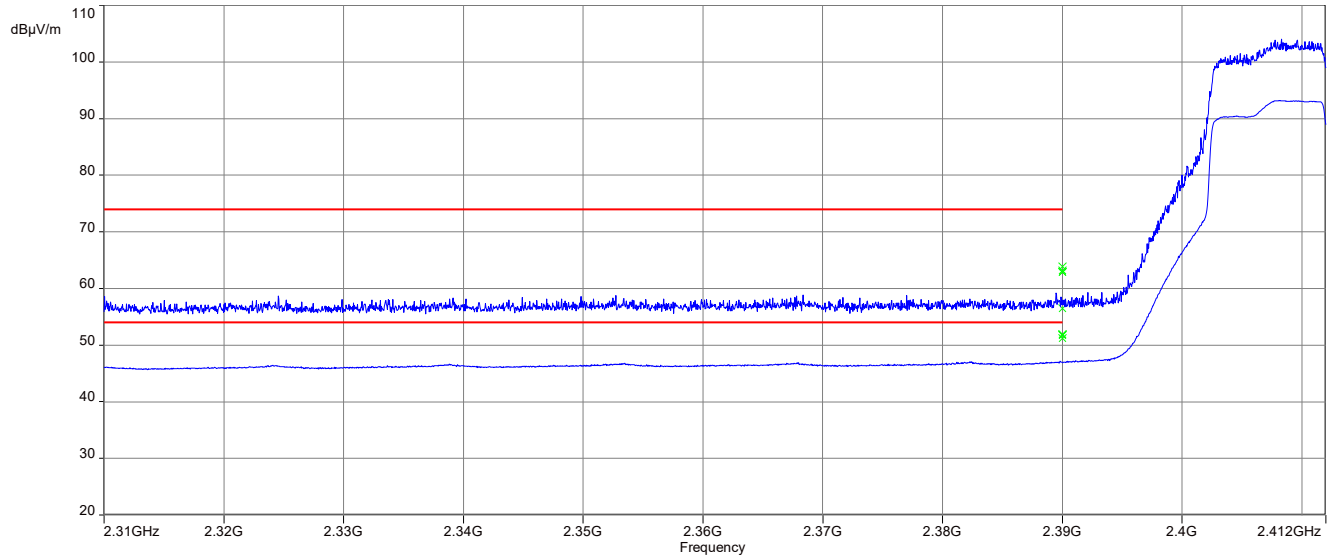
Plot 5: TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT40



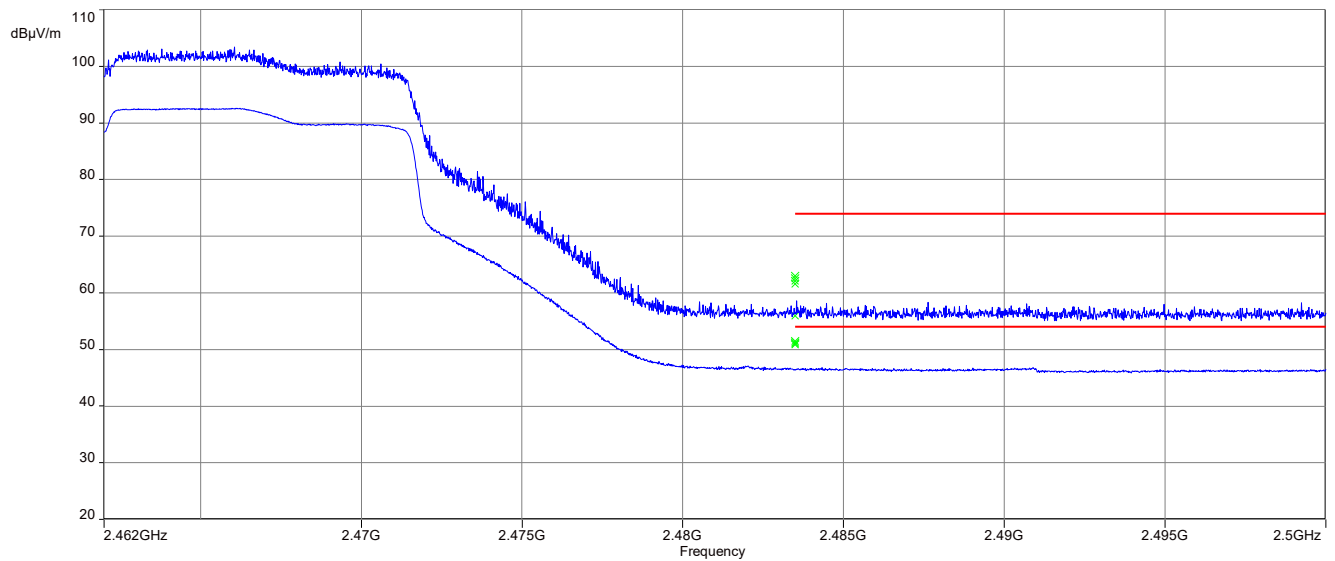
Plot 6: TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT40

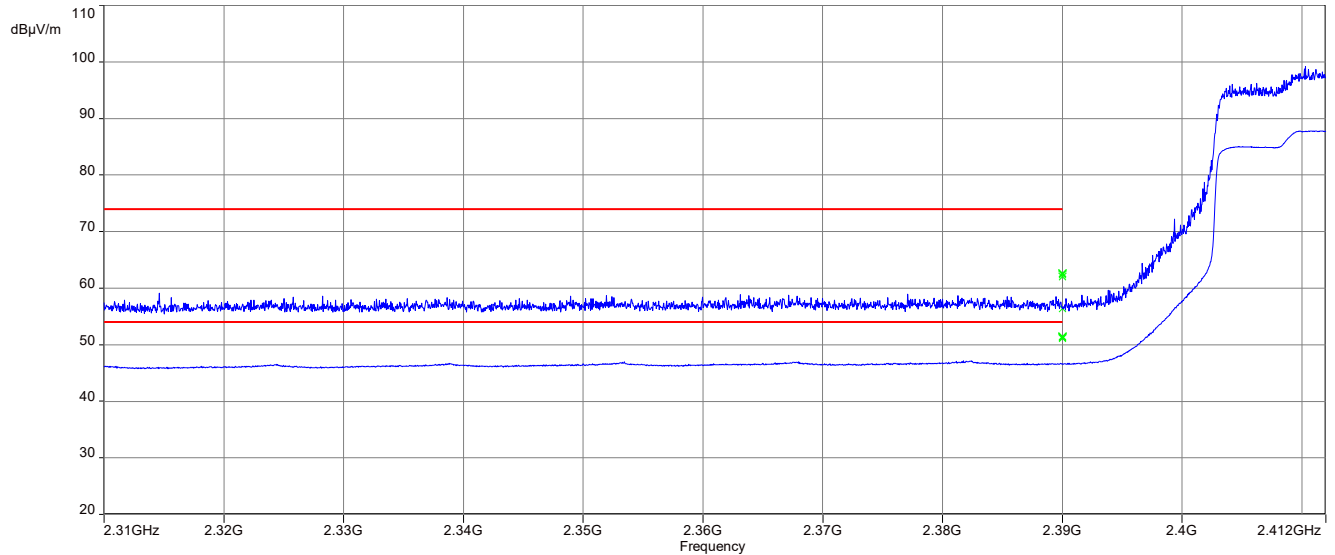
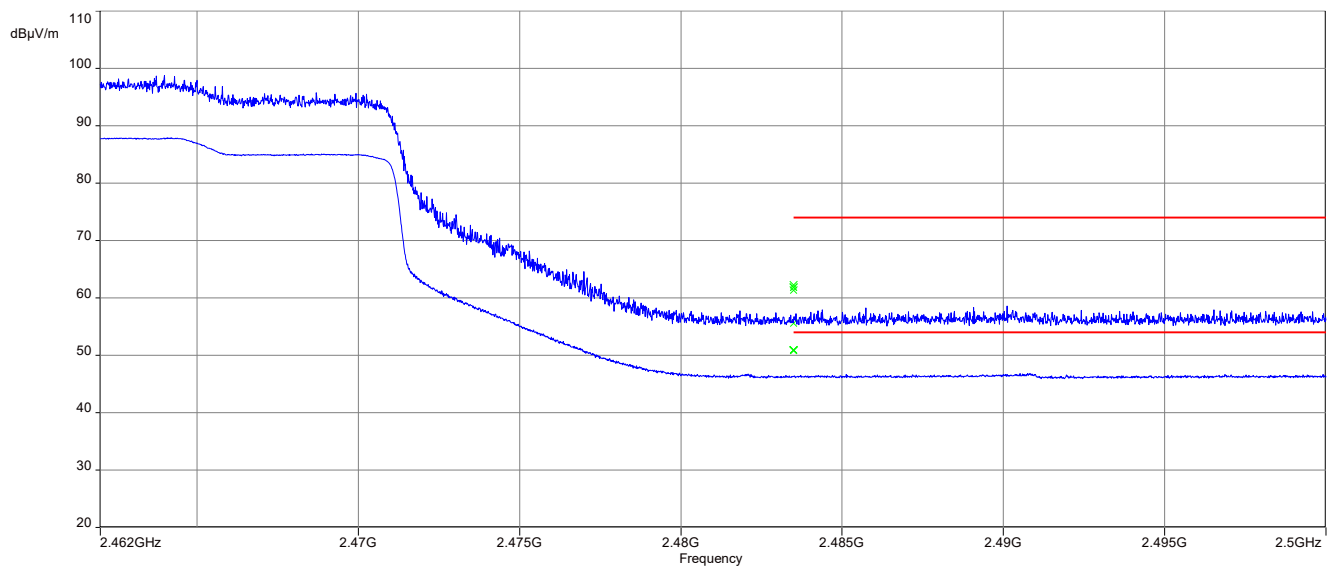


Plot 7: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE20



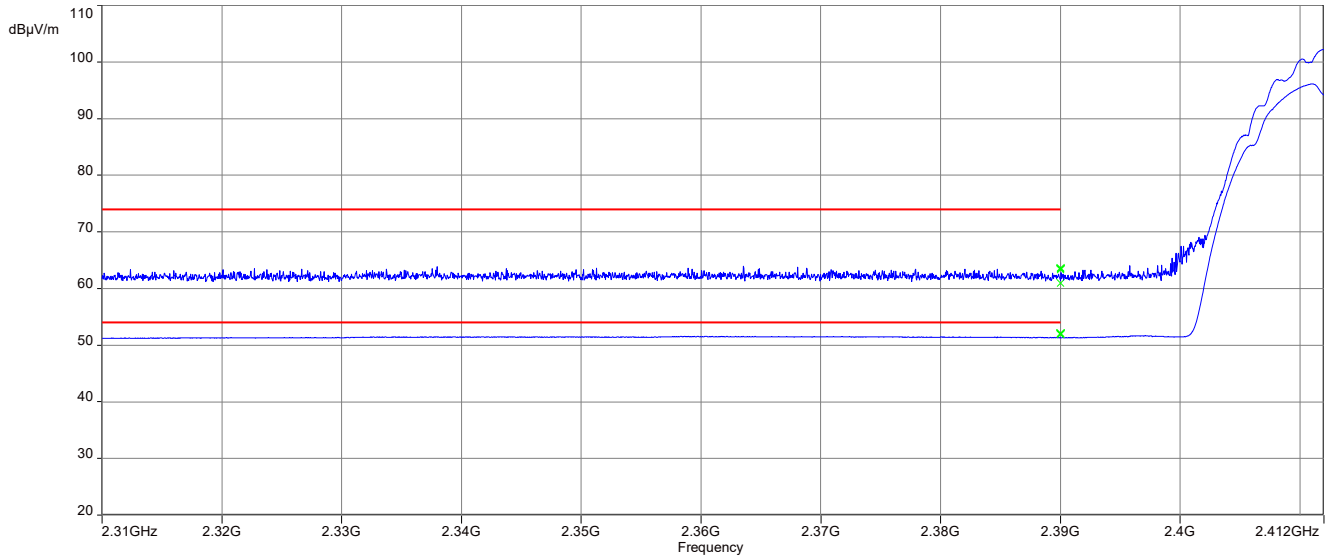
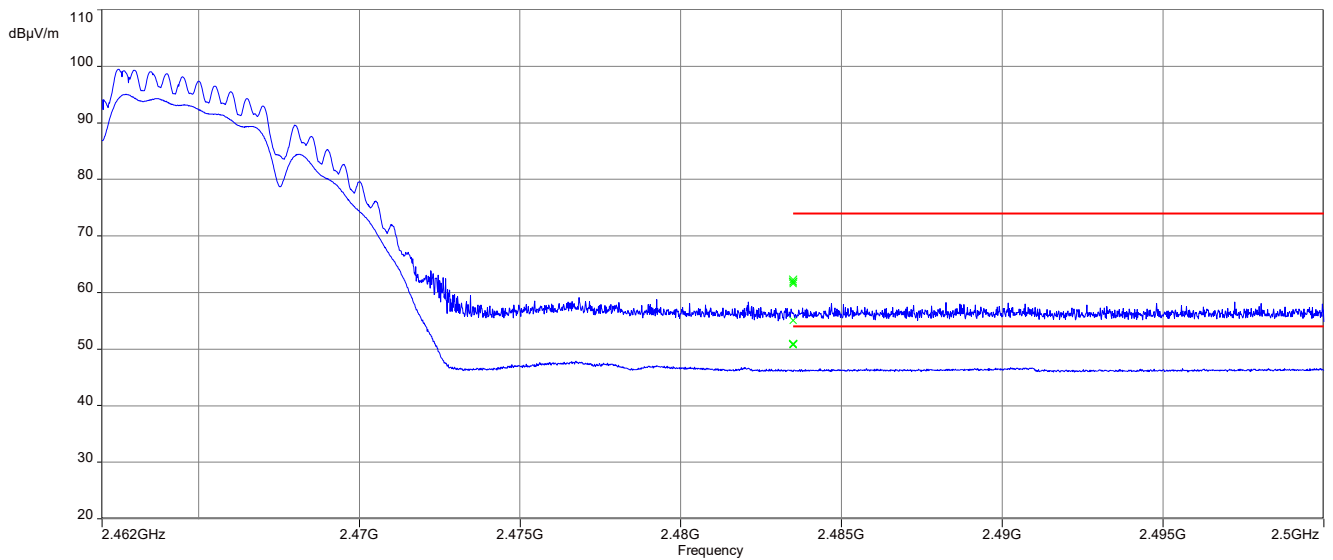
Plot 8: TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE20



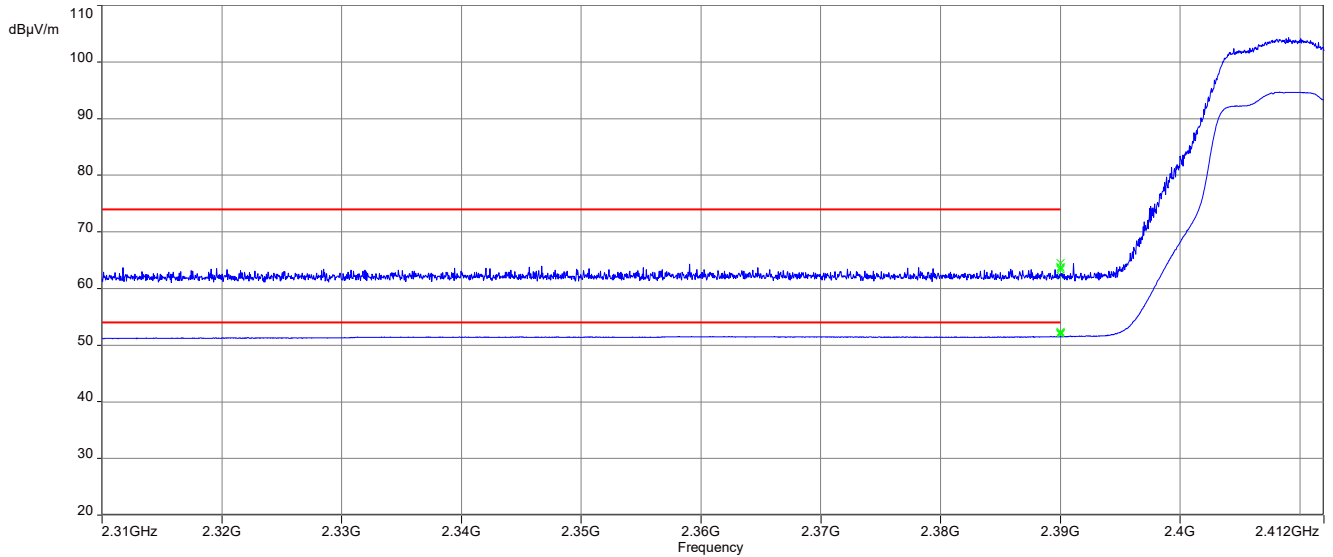
Plot 9: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE40**Plot 10:** TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE40

Results: SISO Chain B

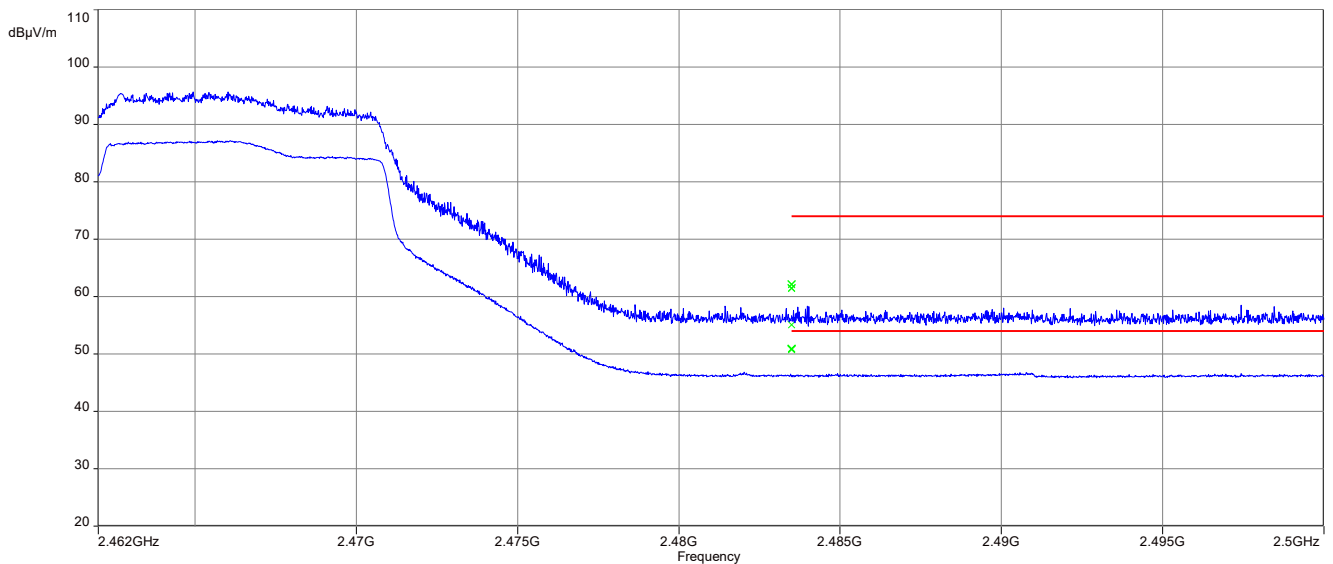
Scenario	Band edge compliance radiated [dB μ V/m]
Mode	802.11b
Lower restricted band	52.0 dB μ V/m AVG 53.7 dB μ V/m Peak
Upper restricted band	50.9 dB μ V/m AVG 61.8 dB μ V/m Peak
Mode	802.11n HT20
Lower restricted band	52.1 dB μ V/m AVG 64.5 dB μ V/m Peak
Upper restricted band	51.0 dB μ V/m AVG 62.2 dB μ V/m Peak
Mode	802.11n HT40
Lower restricted band	52.8 dB μ V/m AVG 64.3 dB μ V/m Peak
Upper restricted band	51.0 dB μ V/m AVG 62.1 dB μ V/m Peak
Mode	802.11ax HE20
Lower restricted band	53.1 dB μ V/m AVG 64.4 dB μ V/m Peak
Upper restricted band	51.2 dB μ V/m AVG 62.7 dB μ V/m Peak
Mode	802.11ax HE40
Lower restricted band	52.8 dB μ V/m AVG 64.3 dB μ V/m Peak
Upper restricted band	51.2 dB μ V/m AVG 62.1 dB μ V/m Peak

Plots: SISO Chain B**Plot 1:** TX mode, lower band edge, vertical & horizontal polarization, 802.11b**Plot 2:** TX mode, upper band edge, vertical & horizontal polarization, 802.11b

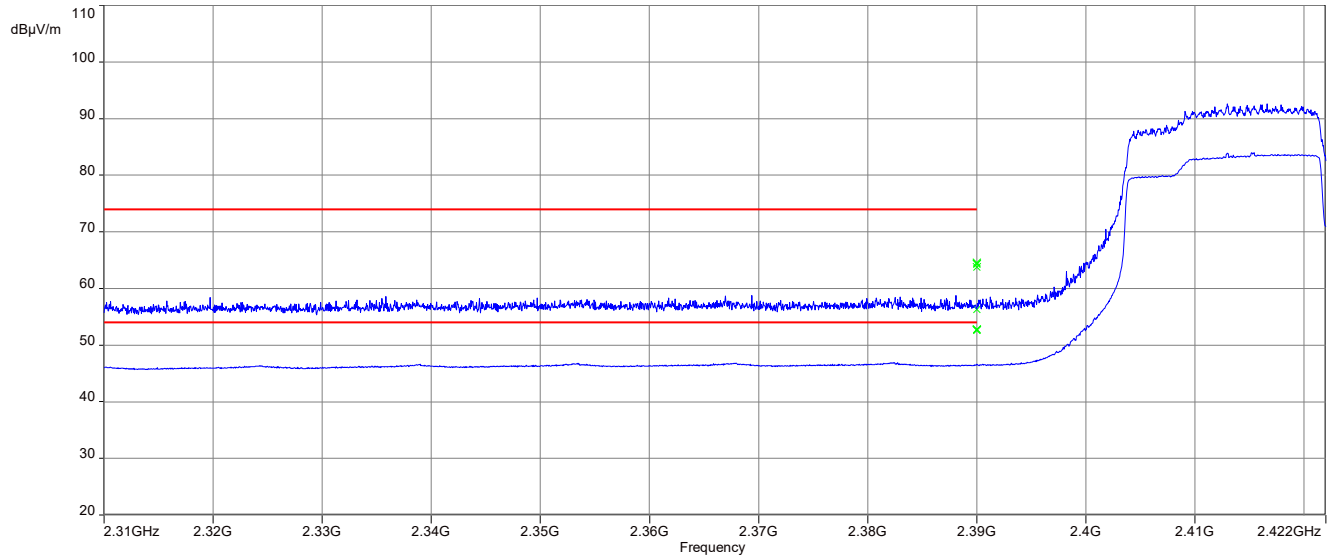
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT20



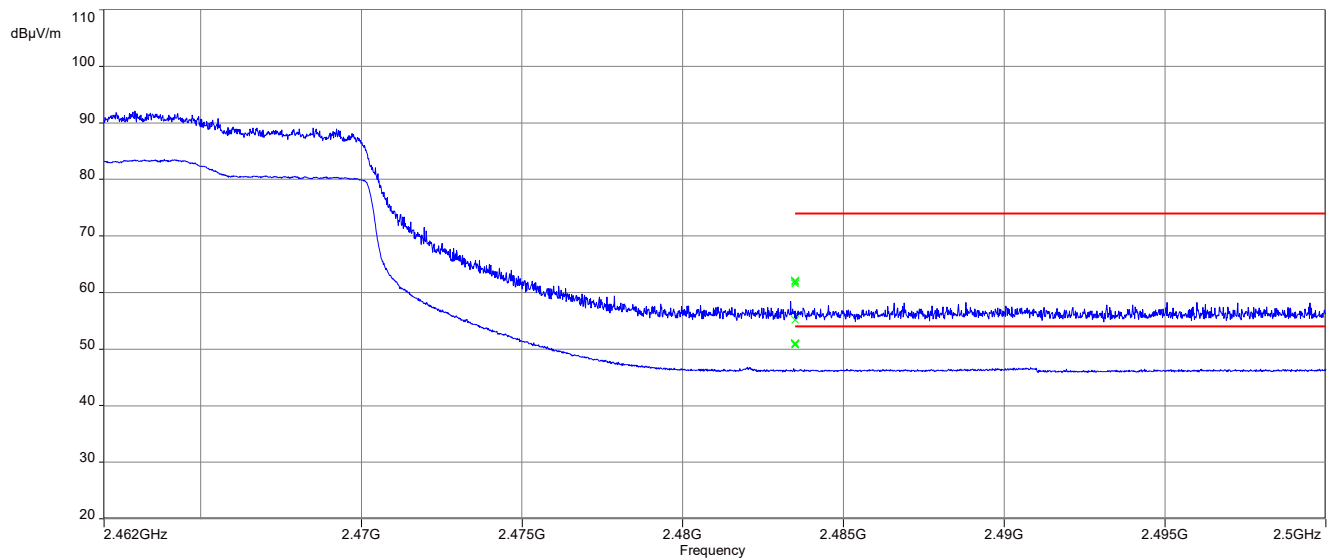
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT20



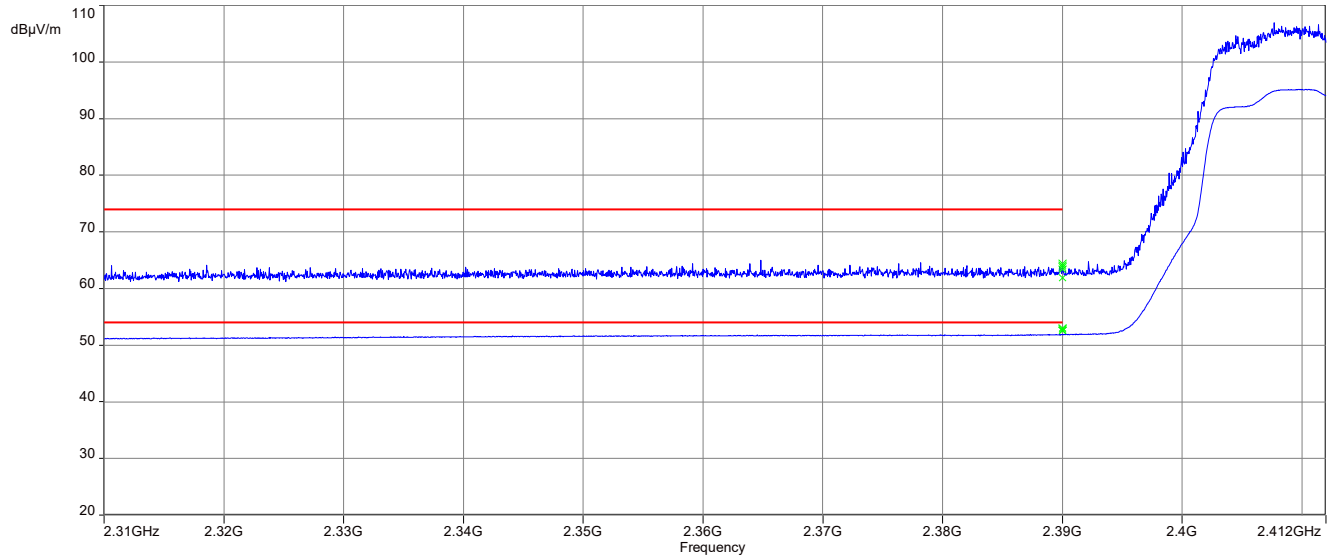
Plot 5: TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT40



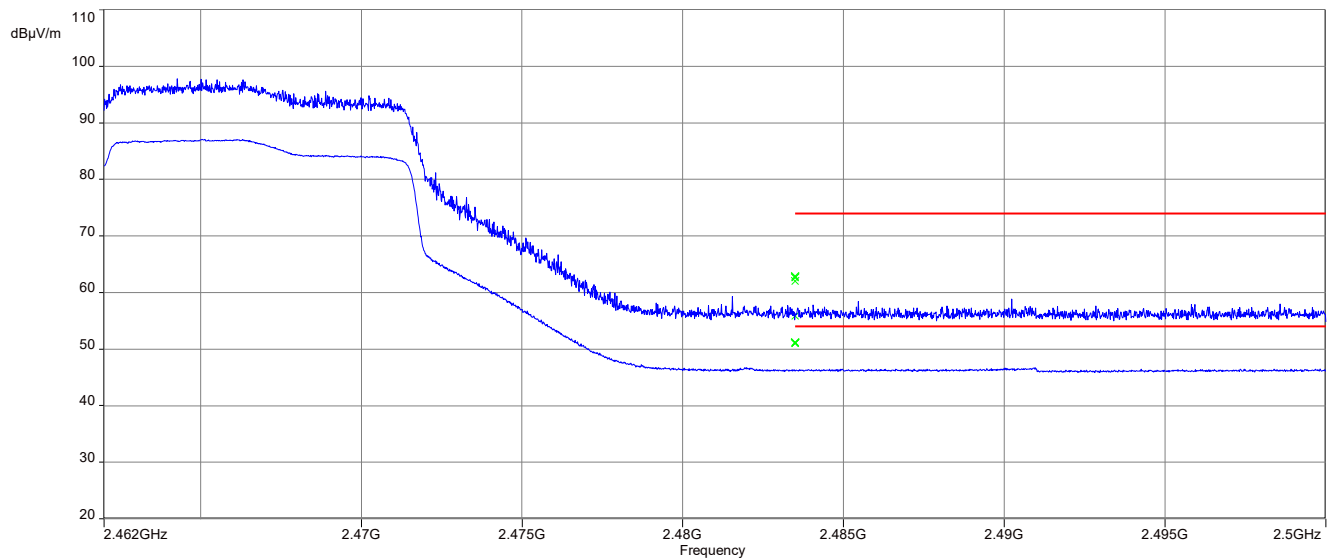
Plot 6: TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT40



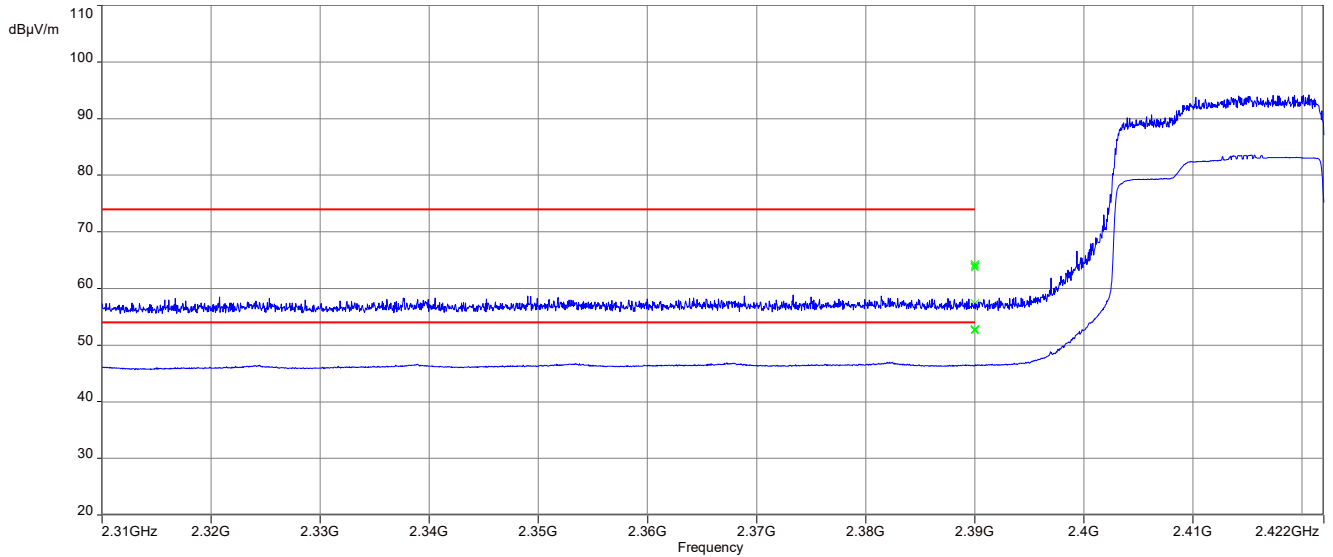
Plot 7: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE20



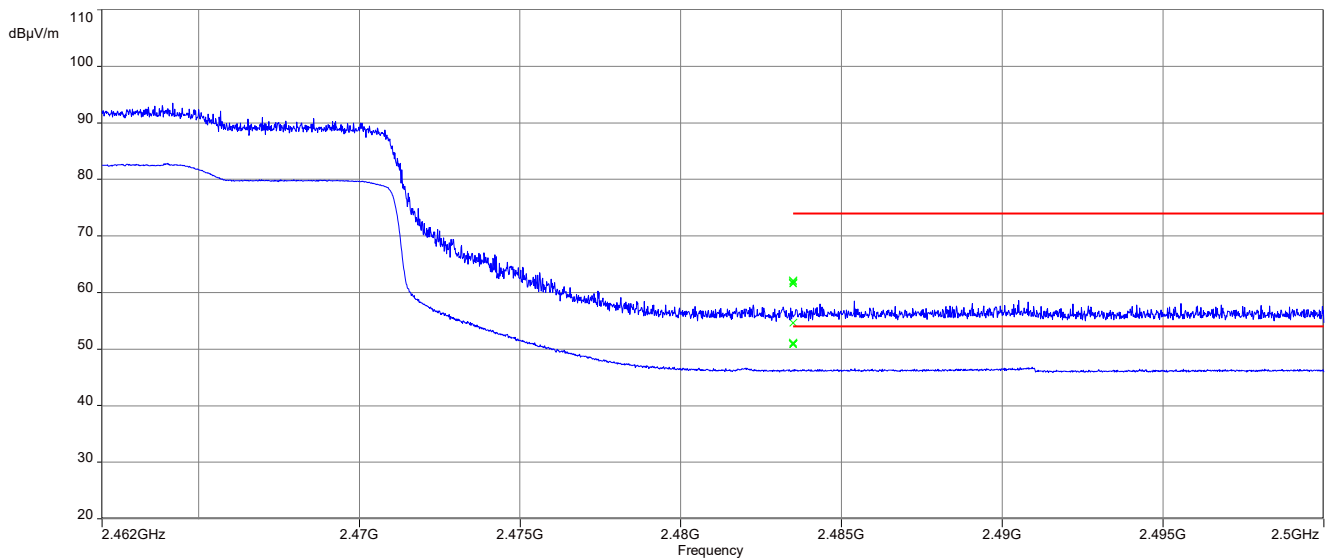
Plot 8: TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE20



Plot 9: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE40

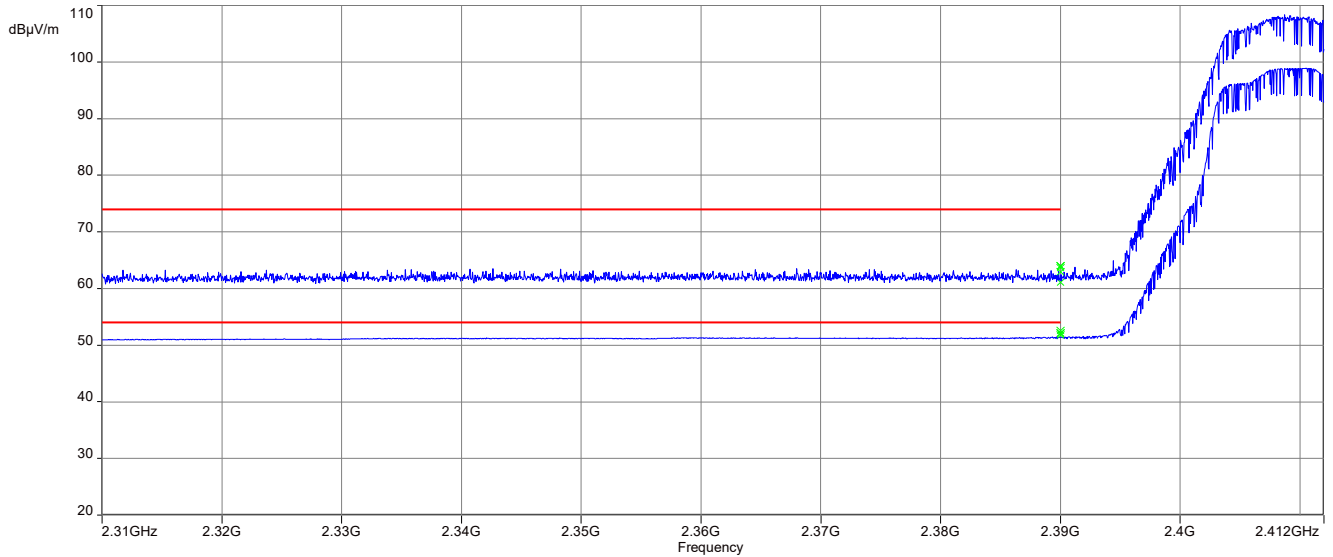
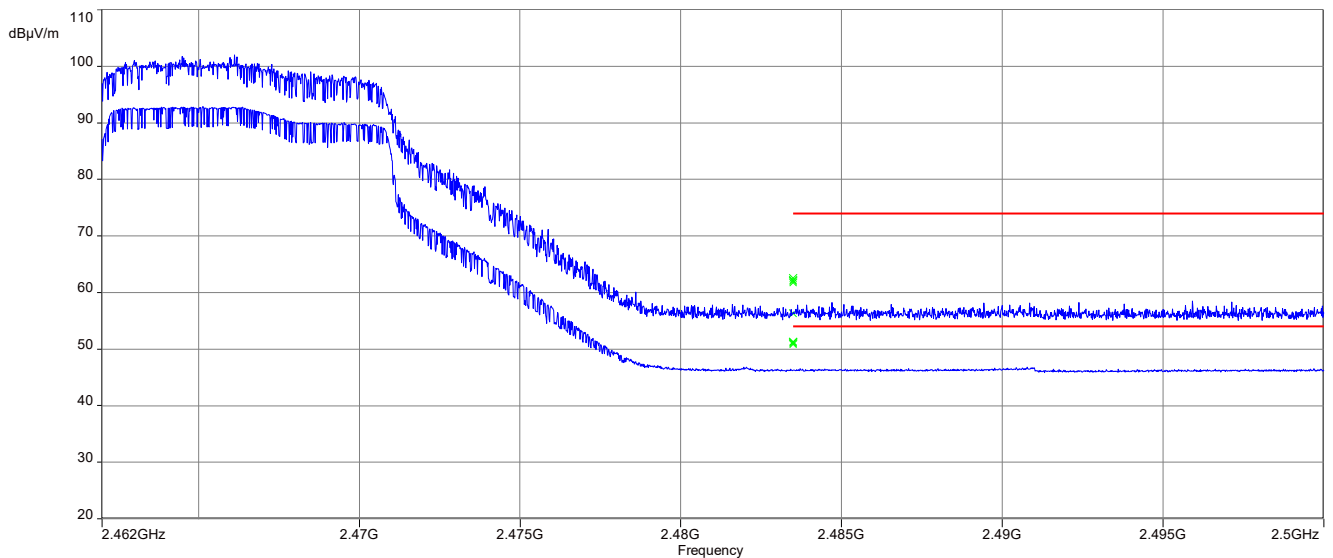


Plot 10: TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE40

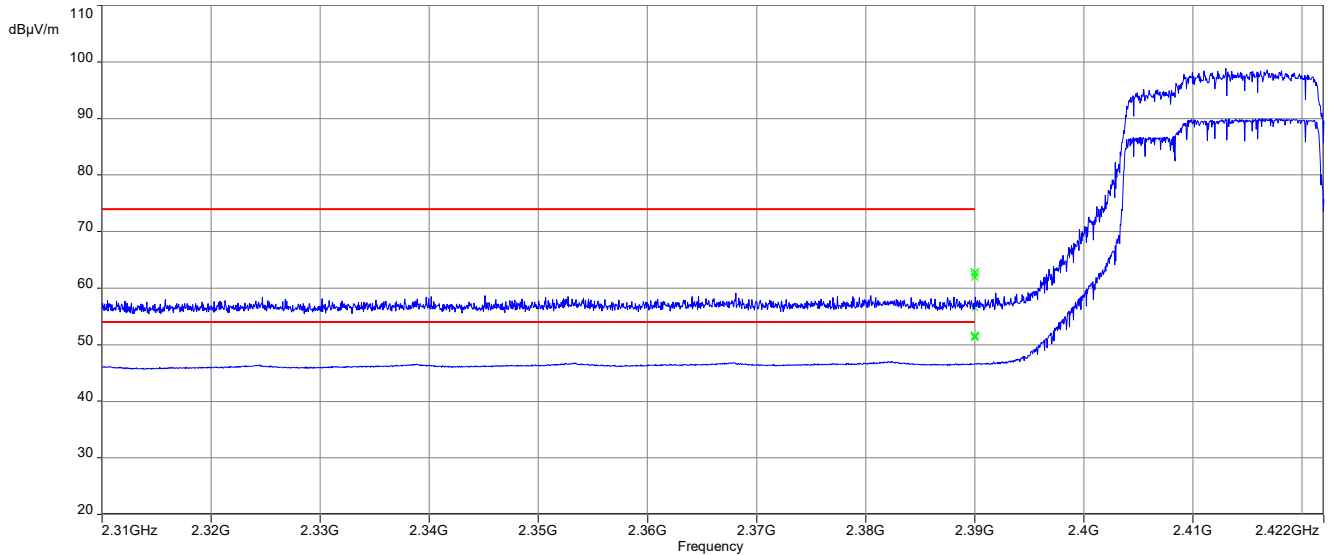


Results: MIMO Chain A+B

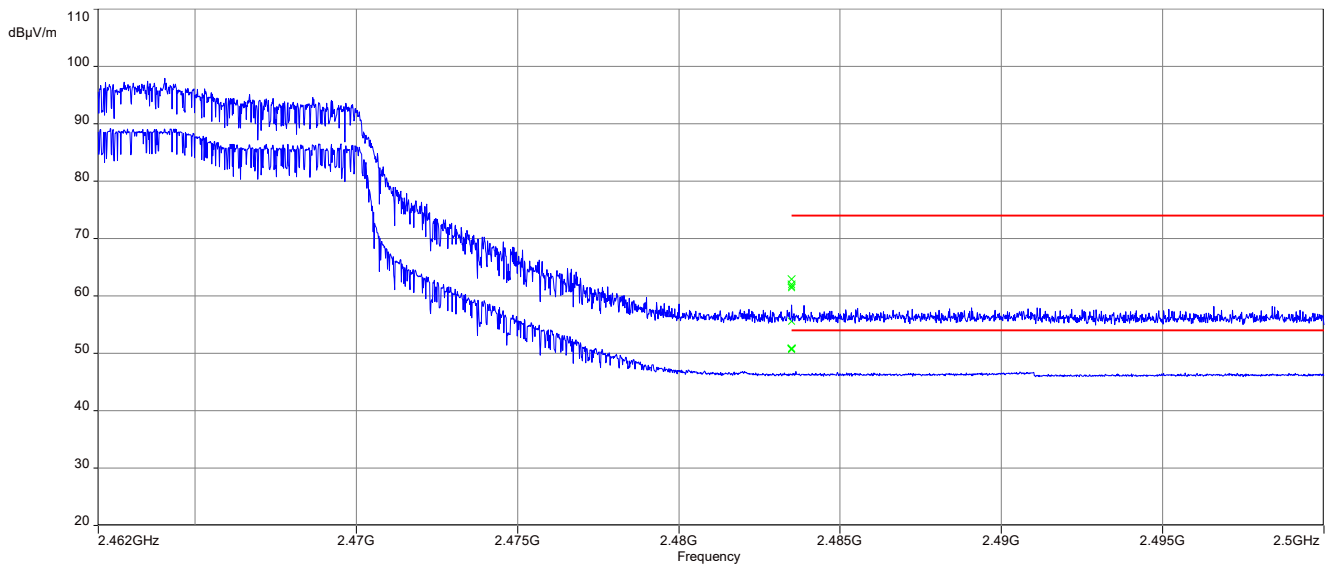
Scenario	Band edge compliance radiated [dB μ V/m]
Mode	802.11n HT20
Lower restricted band	52.6 dB μ V/m AVG 64.1 dB μ V/m Peak
Upper restricted band	51.3 dB μ V/m AVG 62.6 dB μ V/m Peak
Mode	802.11n HT40
Lower restricted band	51.6 dB μ V/m AVG 62.9 dB μ V/m Peak
Upper restricted band	50.9 dB μ V/m AVG 61.7 dB μ V/m Peak
Mode	802.11ax HE20
Lower restricted band	52.2 dB μ V/m AVG 64.6 dB μ V/m Peak
Upper restricted band	51.4 dB μ V/m AVG 62.4 dB μ V/m Peak
Mode	802.11ax HE40
Lower restricted band	51.3 dB μ V/m AVG 62.0 dB μ V/m Peak
Upper restricted band	51.0 dB μ V/m AVG 62.5 dB μ V/m Peak

Plots: MIMO Chain A+B**Plot 1:** TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT20**Plot 2:** TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT20

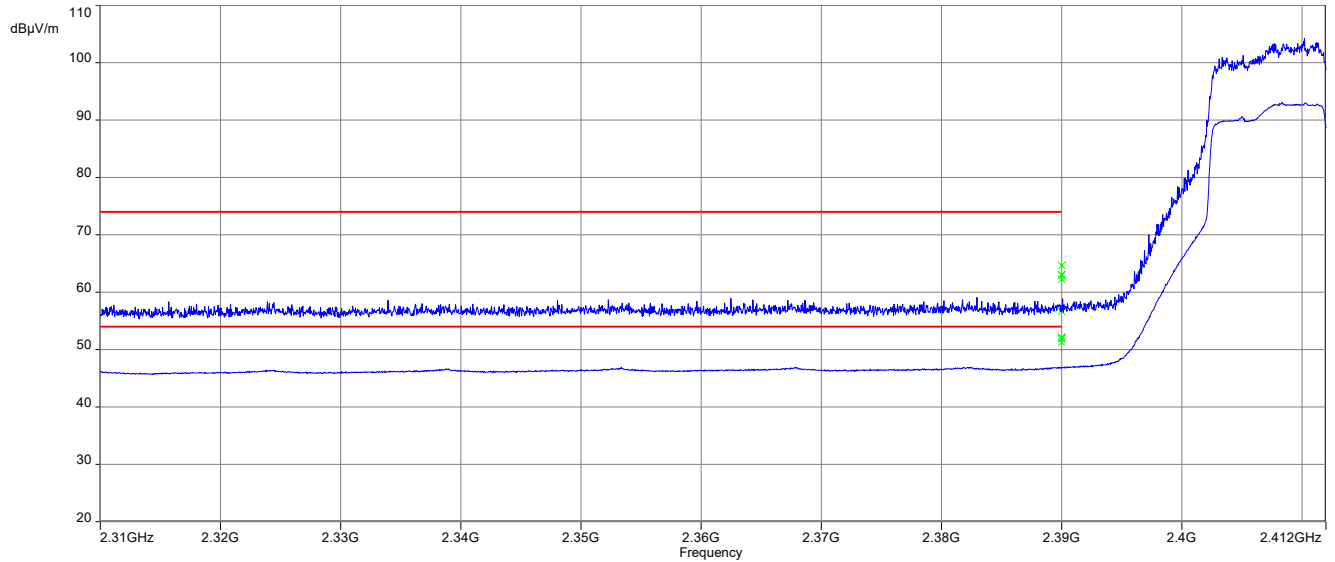
Plot 3: TX mode, lower band edge, vertical & horizontal polarization, 802.11n HT40



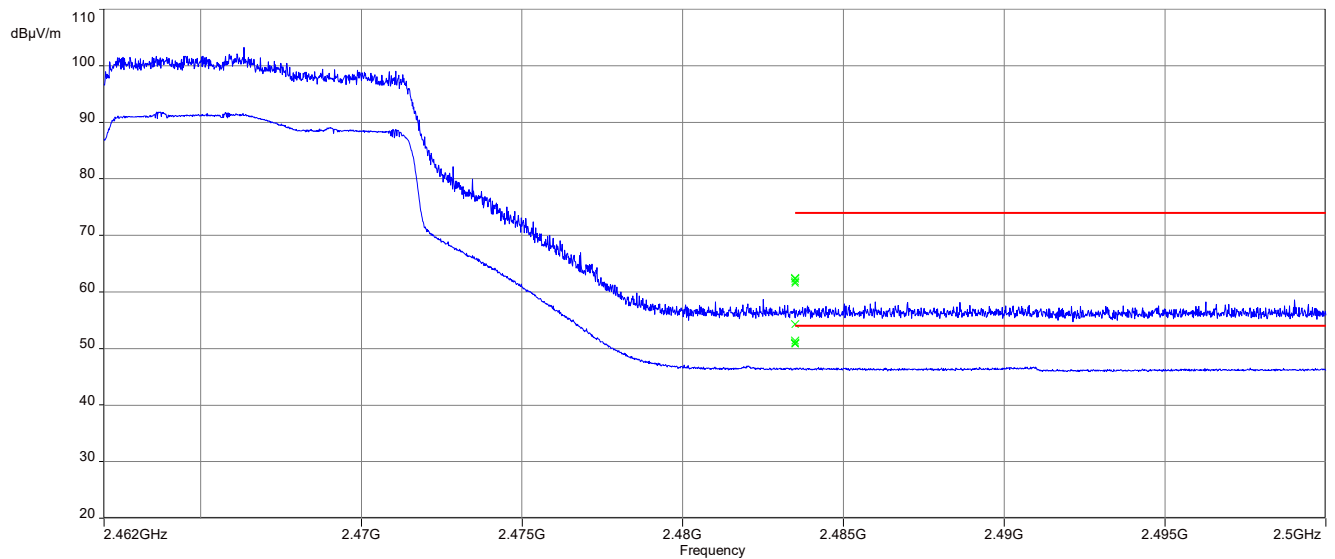
Plot 4: TX mode, upper band edge, vertical & horizontal polarization, 802.11n HT40



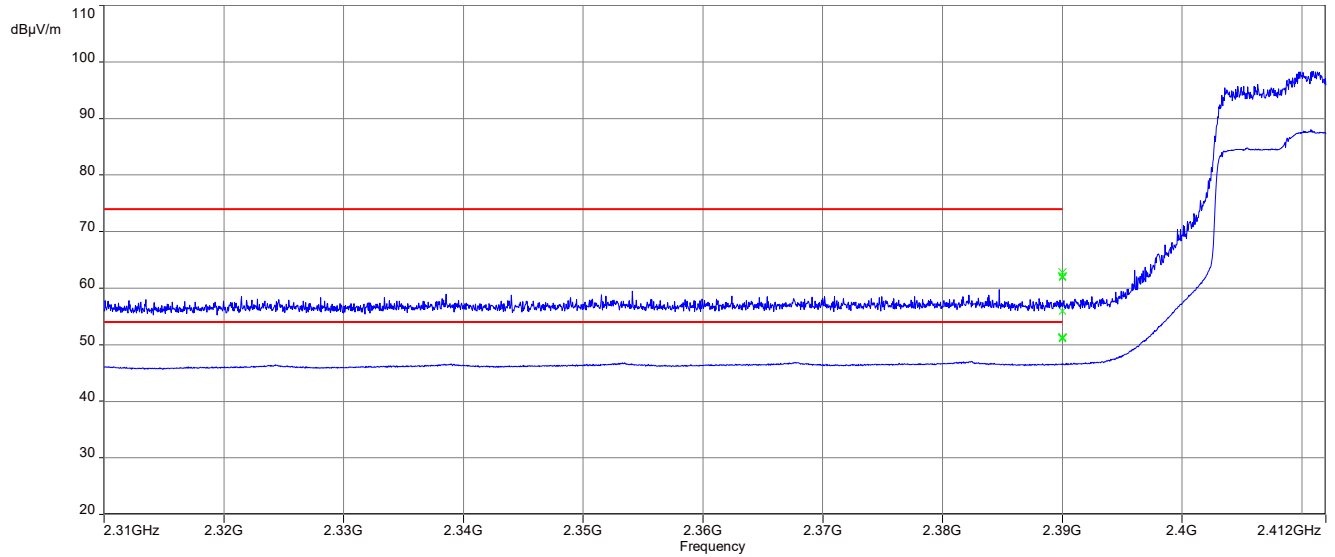
Plot 5: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE20



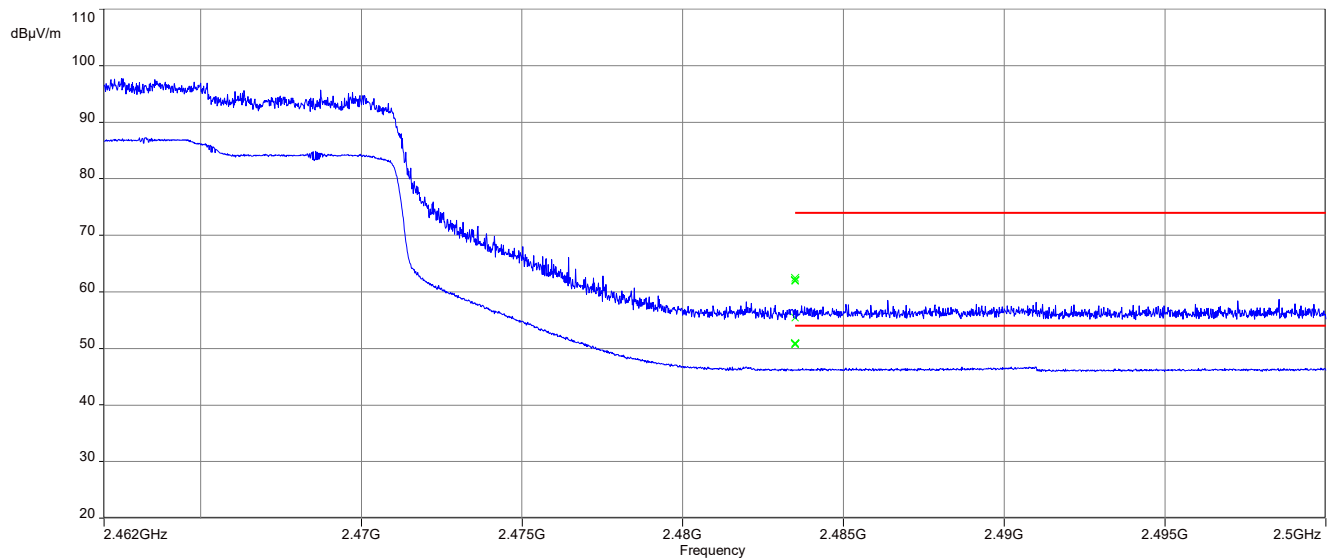
Plot 6: TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE20



Plot 7: TX mode, lower band edge, vertical & horizontal polarization, 802.11ax HE40



Plot 8: TX mode, upper band edge, vertical & horizontal polarization, 802.11ax HE40



13.6 Spurious emissions radiated below 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The limits are recalculated 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
Resolution bandwidth	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Video bandwidth	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span	9 kHz to 30 MHz
Trace mode	Max Hold
Test setup	See chapter 7.2 setup C
Measurement uncertainty	See chapter 9

Limits:

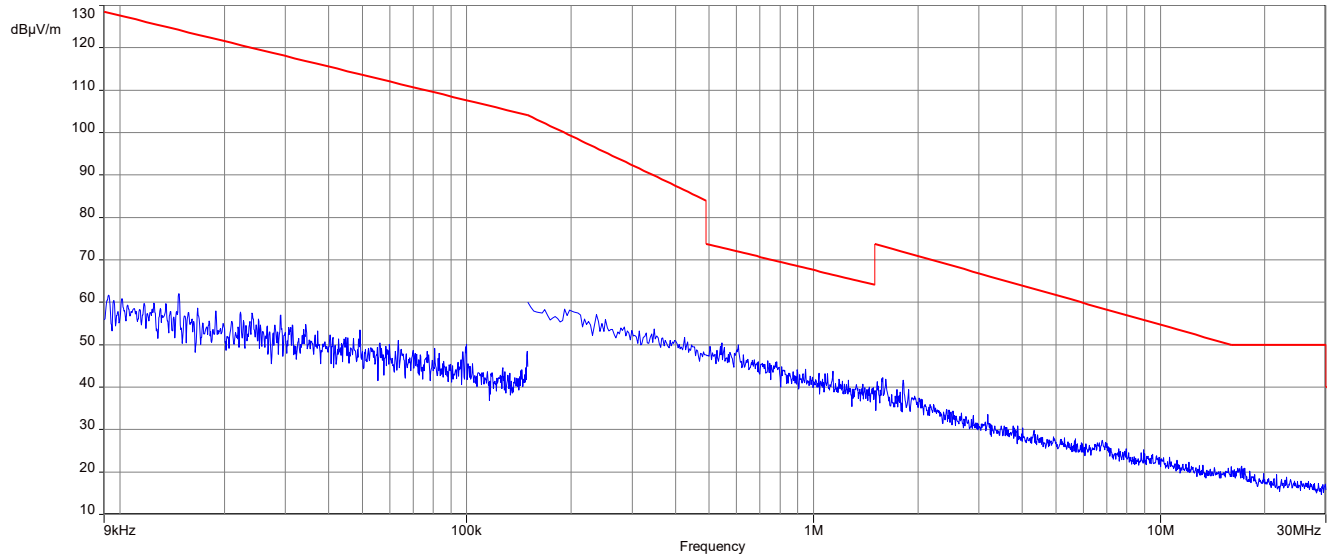
FCC		ISED
Frequency / MHz	Field Strength / ($\mu\text{V} / \text{m}$)	Measurement distance / m
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30.0	30	30

Results:

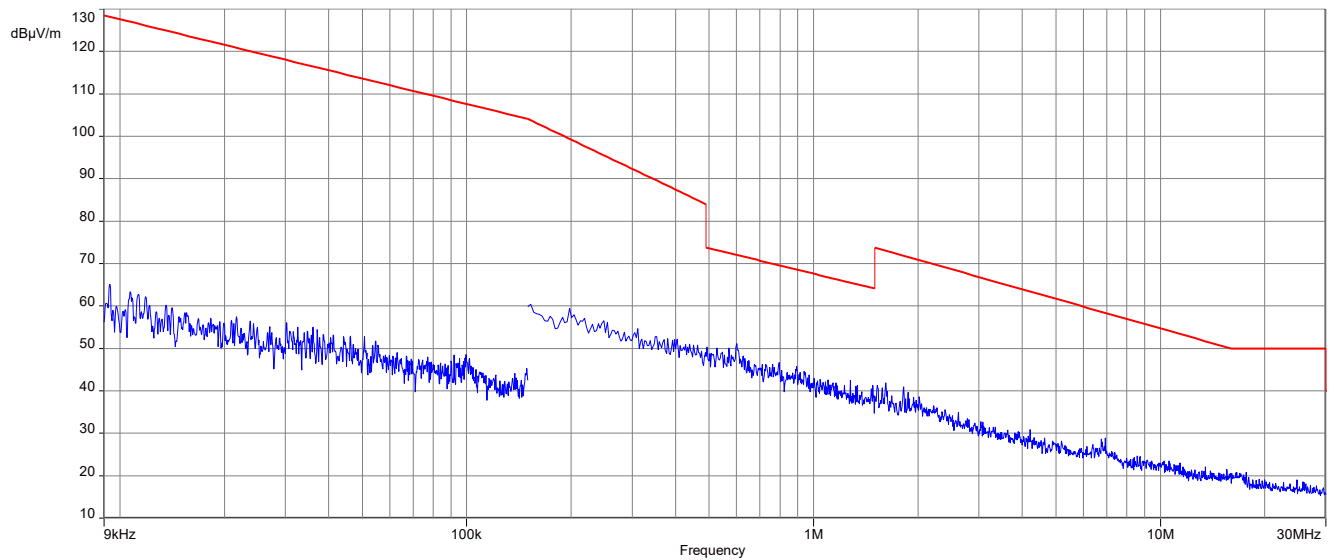
TX spurious emissions radiated < 30 MHz / (dB $\mu\text{V} / \text{m}$) @ 3 m		
Frequency / MHz	Detector	Level / (dB $\mu\text{V} / \text{m}$)
All detected peaks are more than 20 dB below the limit.		

Plots: DSSS

Plot 1: 9 kHz to 30 MHz, SISO A, valid for all channels

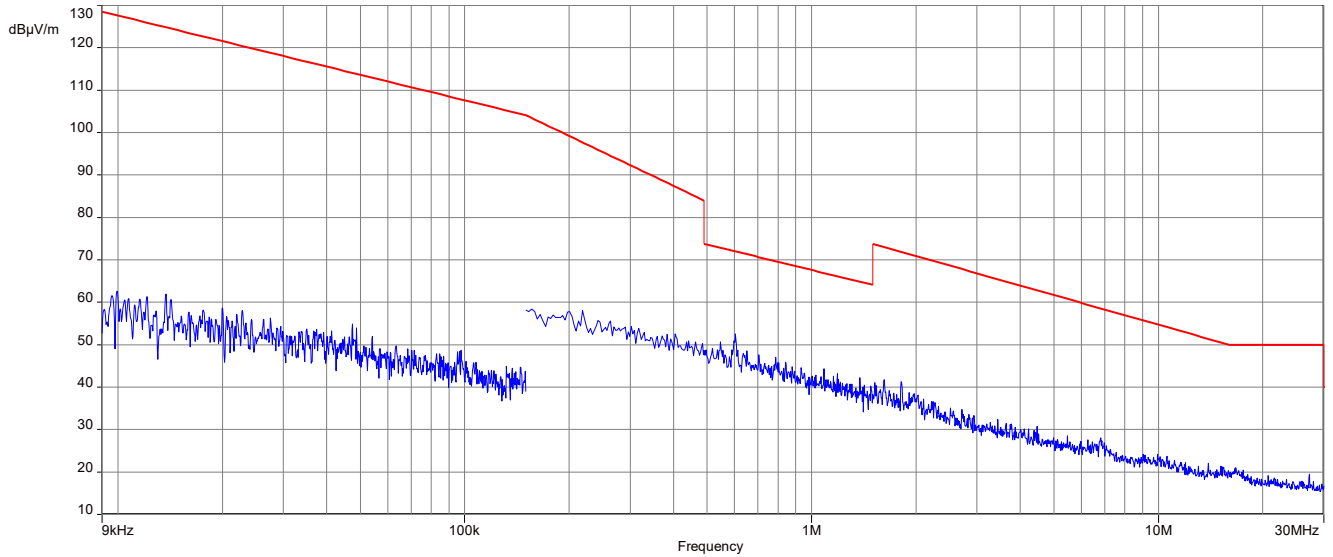


Plot 2: 9 kHz to 30 MHz, SISO B, valid for all channels

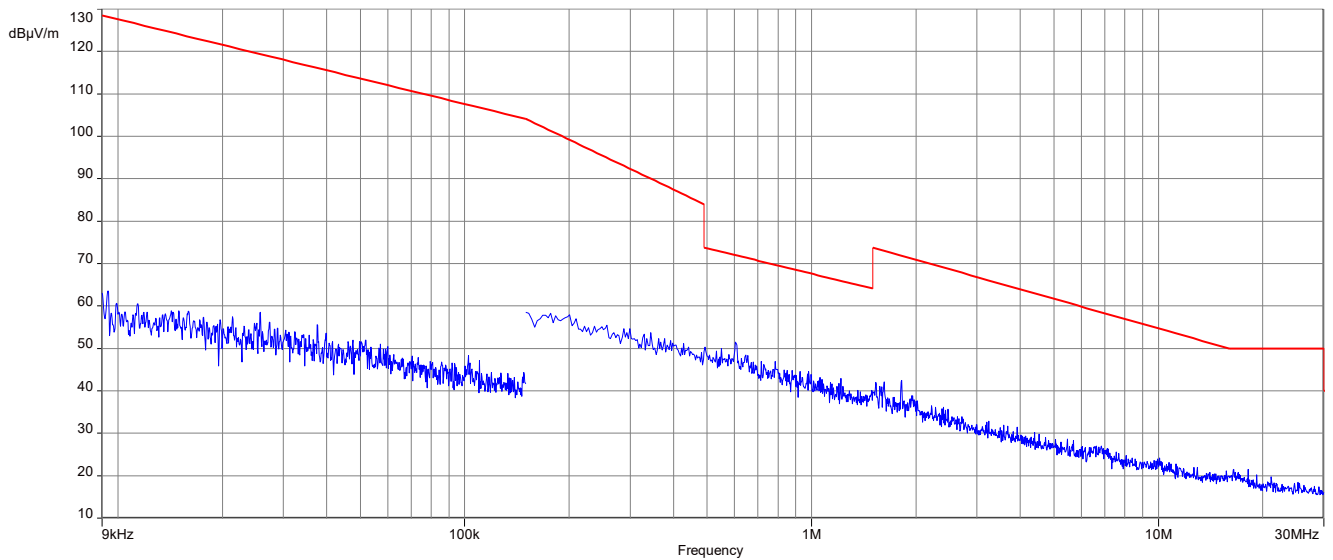


Plots: OFDM(A) (20 MHz nominal channel bandwidth)

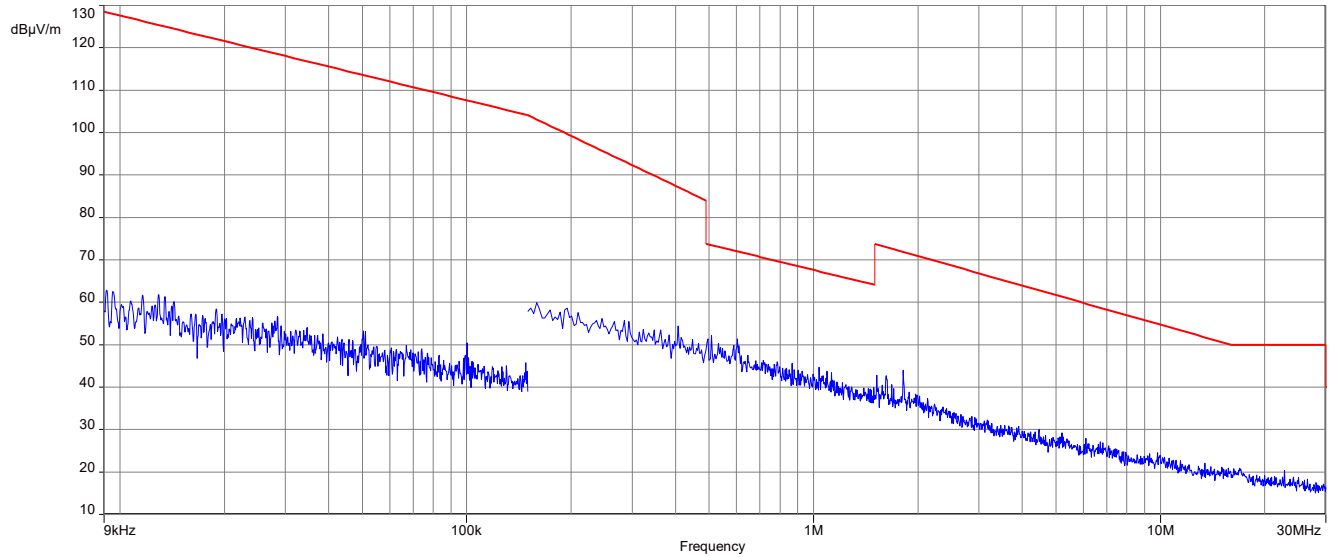
Plot 1: 9 kHz to 30 MHz, SISO A, valid for all channels



Plot 2: 9 kHz to 30 MHz, SISO B, valid for all channels

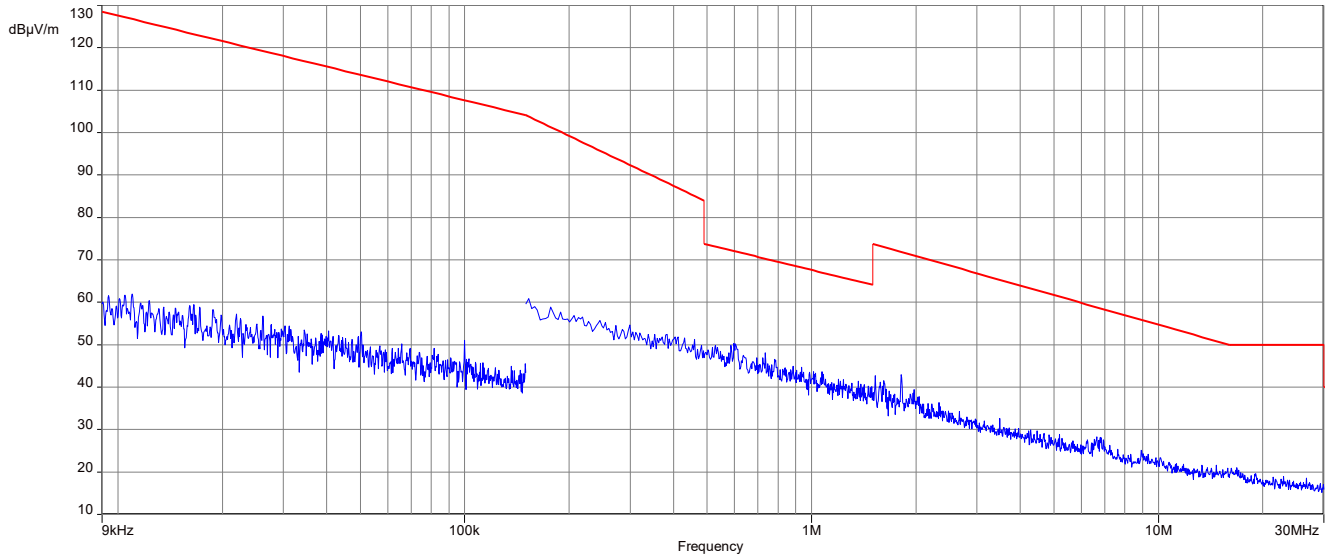


Plot 3: 9 kHz to 30 MHz, MIMO A+B, valid for all channels

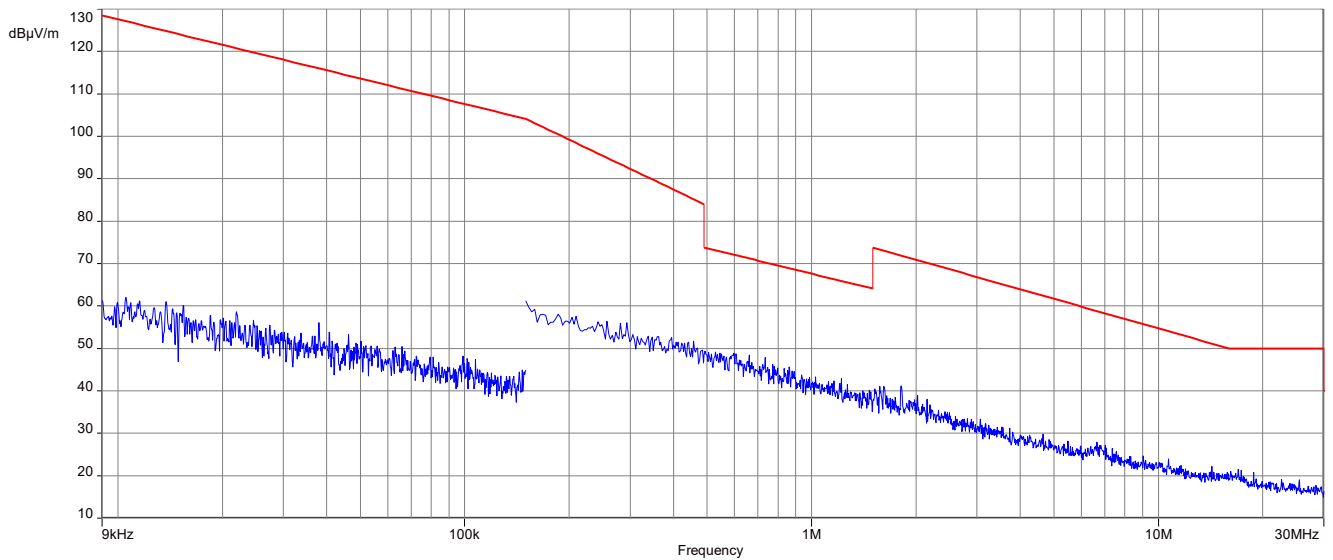


Plots: OFDM(A) (40 MHz nominal channel bandwidth)

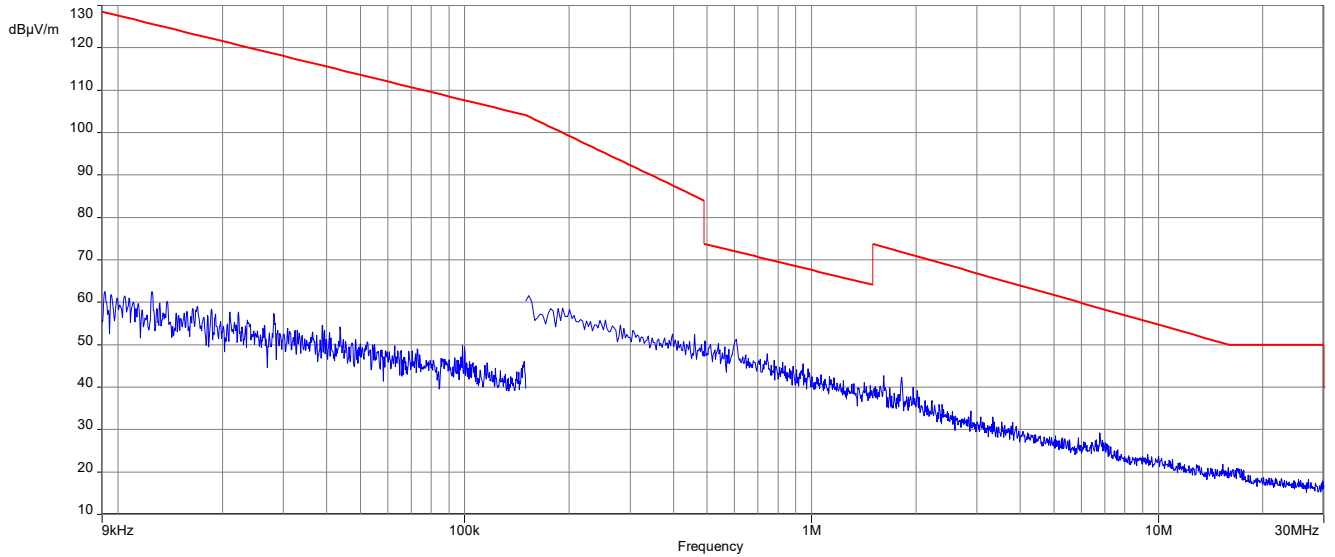
Plot 1: 9 kHz to 30 MHz, SISO A, valid for all channels



Plot 2: 9 kHz to 30 MHz, SISO B, valid for all channels



Plot 3: 9 kHz to 30 MHz, MIMO A+B, valid for all channels



13.7 Spurious emissions radiated 30 MHz to 1 GHz

Measurement:

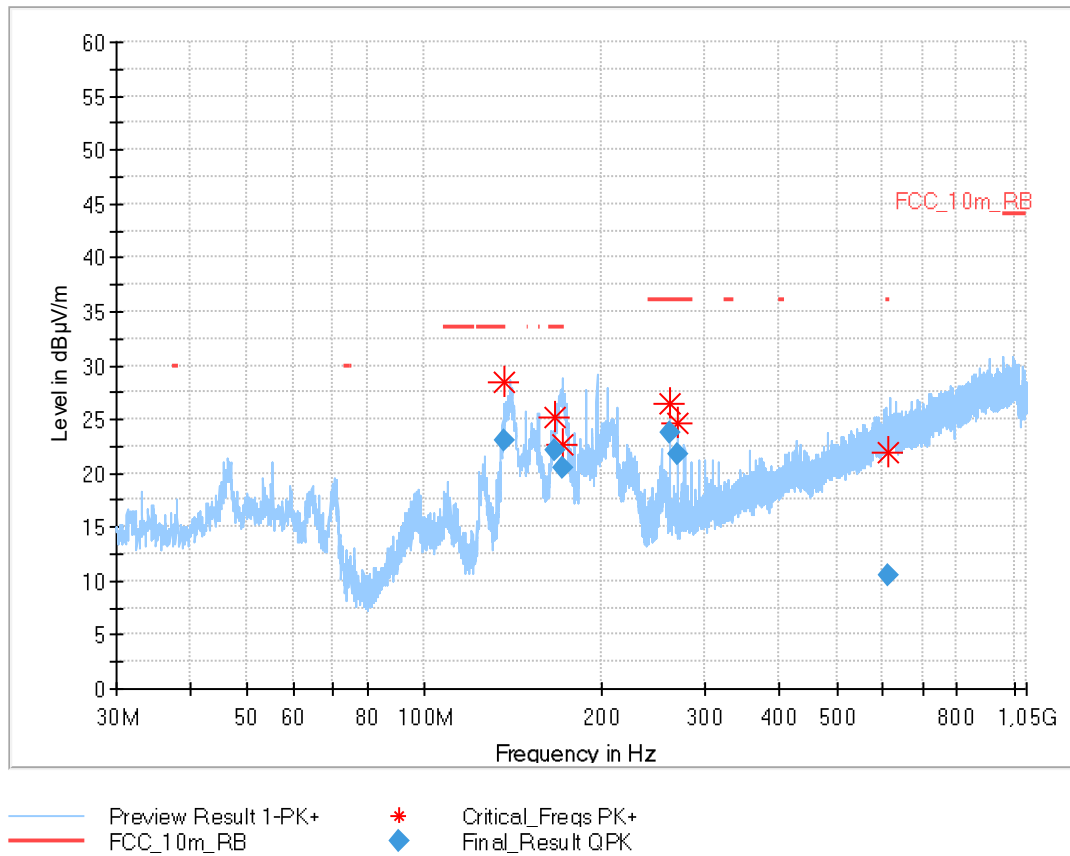
Measurement parameter	
Detector	Peak / Quasi Peak
Sweep time	Auto
Resolution bandwidth	120 kHz
Video bandwidth	3 x RBW
Span	30 MHz to 1 GHz
Trace mode	Max Hold
Test setup	See chapter 7.1 setup A
Measurement uncertainty	See chapter 9

Limits:

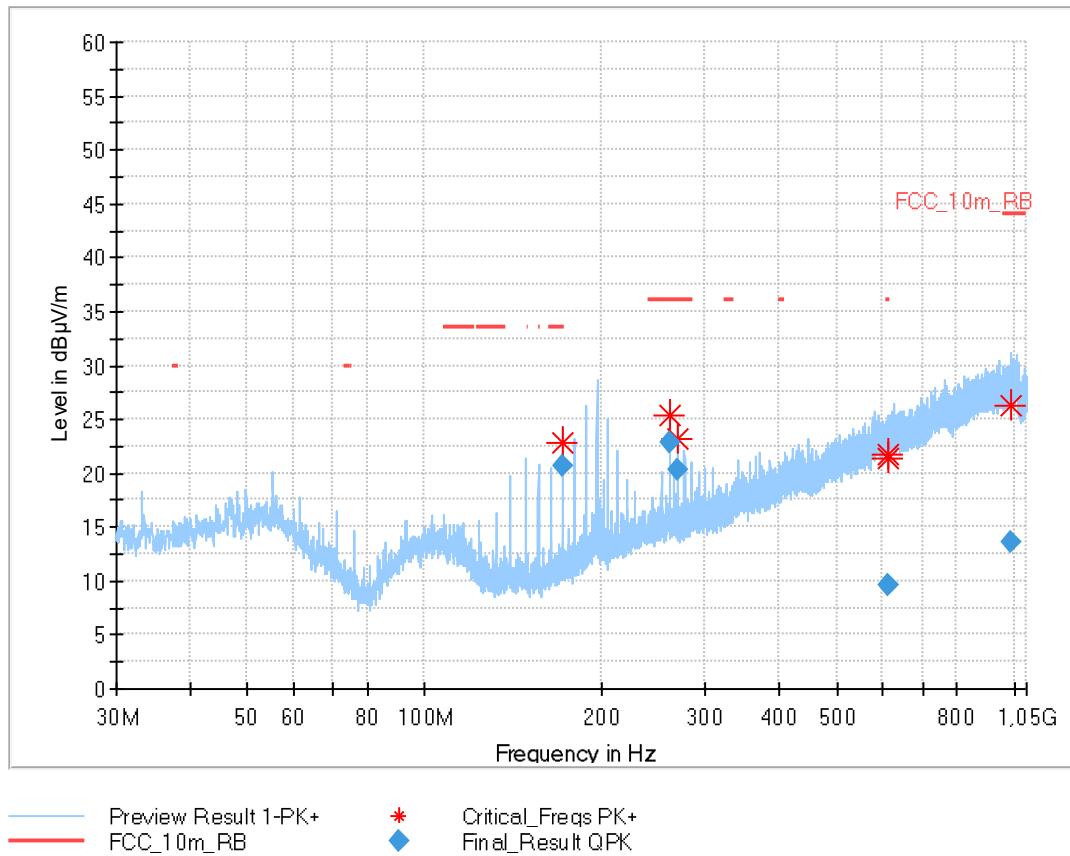
FCC		ISED
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that 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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency / MHz	Field Strength / (dB μ V / m)	Measurement distance / m
30 – 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10

Plot:

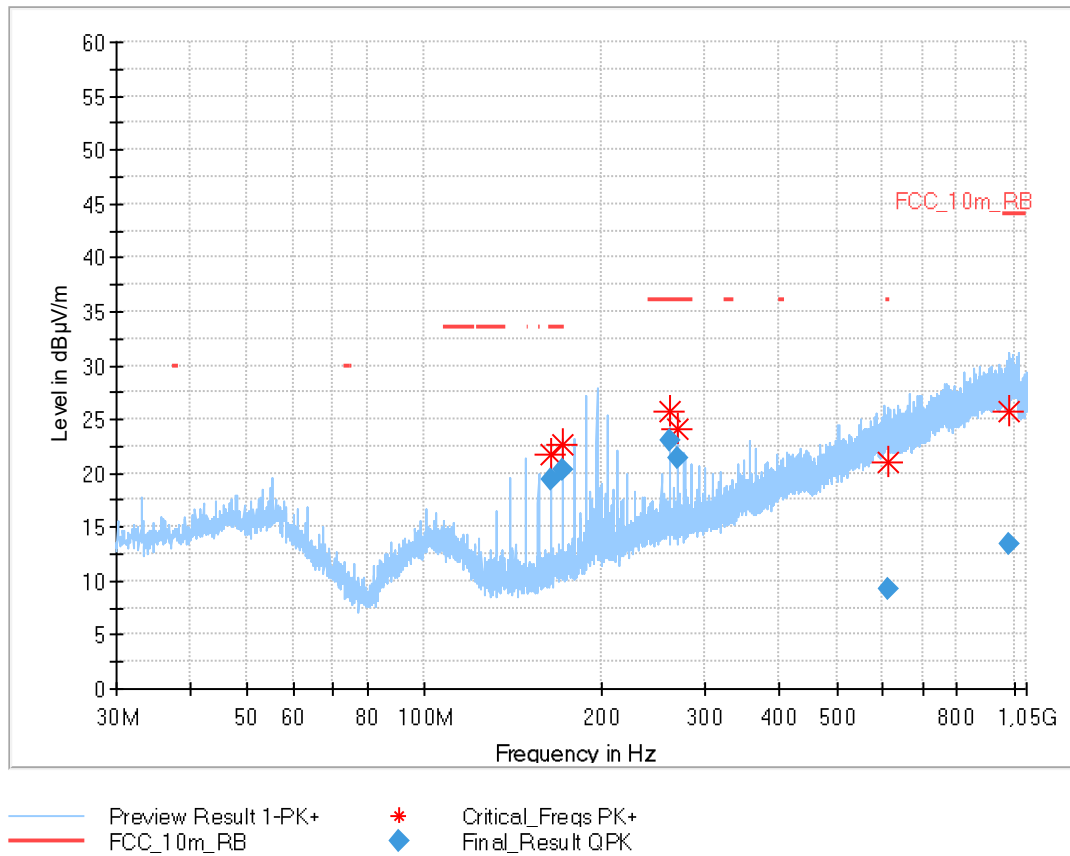
Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization, valid for all modes and channels of Chain A

**Final results:**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
136.884	22.99	33.5	10.5	1000	120.0	195.0	V	90	9
166.291	22.14	33.5	11.4	1000	120.0	104.0	V	285	10
171.997	20.55	33.5	13.0	1000	120.0	107.0	V	32	10
260.009	23.73	36.0	12.3	1000	120.0	100.0	V	292	14
268.002	21.79	36.0	14.2	1000	120.0	105.0	V	227	14
612.486	10.52	36.0	25.5	1000	120.0	177.0	H	307	22

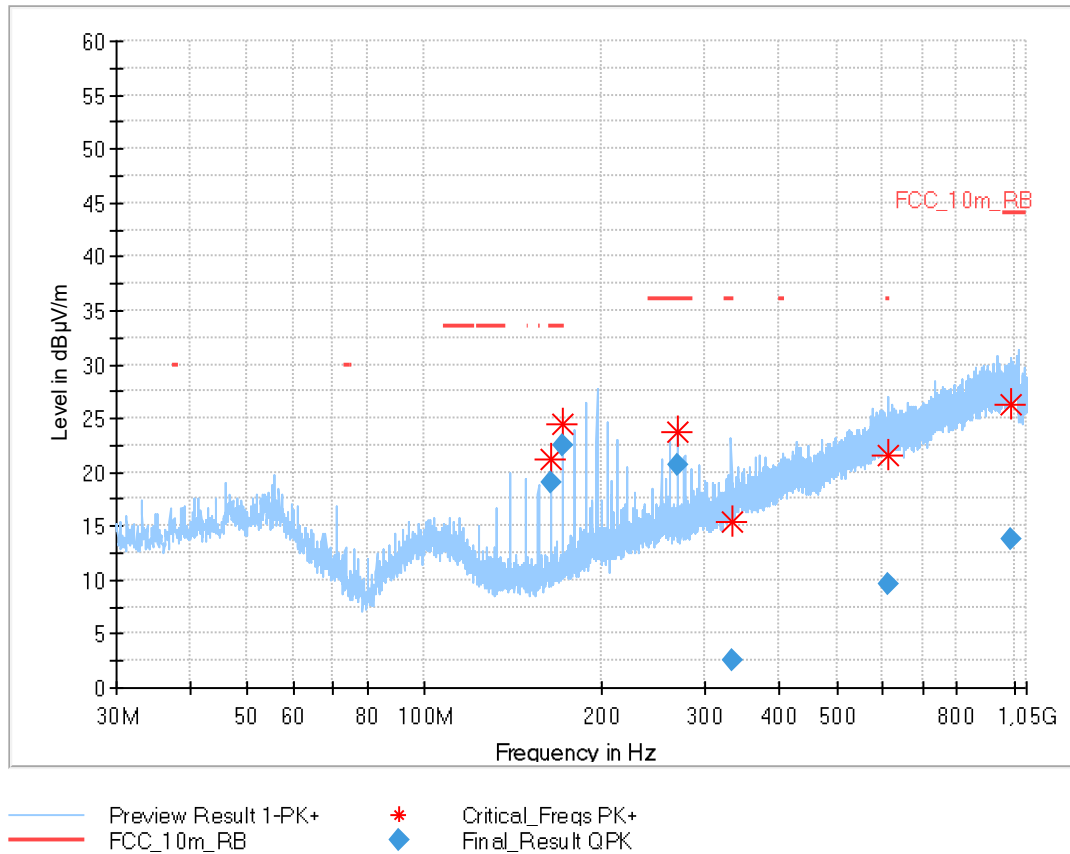
Plot 2: 30 MHz to 1 GHz, vertical & horizontal polarization, valid for all modes and channels of Chain B**Final results:**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
171.999	20.67	33.5	12.8	1000	120.0	100.0	V	34	10
259.993	22.93	36.0	13.1	1000	120.0	100.0	V	289	14
267.995	20.37	36.0	15.6	1000	120.0	103.0	V	280	14
611.277	9.52	36.0	26.5	1000	120.0	200.0	H	211	22
612.732	9.62	36.0	26.4	1000	120.0	200.0	H	235	22
988.154	13.65	44.0	30.4	1000	120.0	314.0	H	285	25

Plot 3: 30 MHz to 1 GHz, vertical & horizontal polarization, valid for all channels of DSSS modes for Chain A+B**Final results:**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
163.998	19.36	33.5	14.1	1000	120.0	117.0	V	153	10
172.004	20.28	33.5	13.2	1000	120.0	100.0	V	45	10
260.008	23.08	36.0	12.9	1000	120.0	382.0	H	272	14
268.014	21.39	36.0	14.6	1000	120.0	103.0	V	268	14
610.657	9.18	36.0	26.8	1000	120.0	400.0	V	59	22
978.919	13.37	44.0	30.6	1000	120.0	121.0	V	321	25

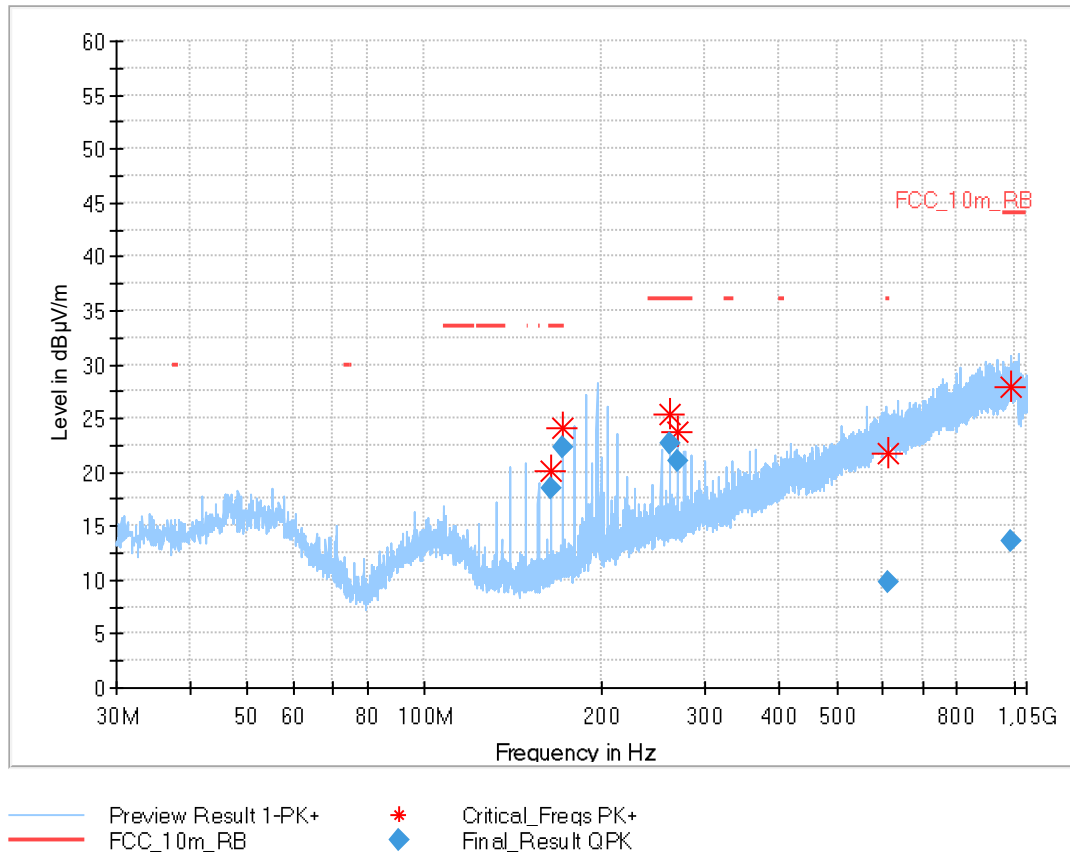
Plot 4: 30 MHz to 1 GHz, vertical & horizontal polarization, valid for all channels of OFDM 20 MHz modes for Chain A+B



Final results:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
163.998	19.02	33.5	14.5	1000	120.0	110.0	V	157	10
171.996	22.42	33.5	11.1	1000	120.0	100.0	V	28	10
267.993	20.62	36.0	15.4	1000	120.0	319.0	H	257	14
331.792	2.60	36.0	33.4	1000	120.0	171.0	V	294	16
611.324	9.68	36.0	26.3	1000	120.0	205.0	H	71	22
988.782	13.71	44.0	30.3	1000	120.0	159.0	V	152	25

Plot 5: 30 MHz to 1 GHz, vertical & horizontal polarization, valid for all channels of OFDM 40 MHz modes for Chain A+B



Final results:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
164.007	18.52	33.5	15.0	1000	120.0	100.0	V	143	10
172.002	22.21	33.5	11.3	1000	120.0	100.0	V	19	10
260.001	22.64	36.0	13.4	1000	120.0	392.0	H	272	14
267.998	21.00	36.0	15.0	1000	120.0	103.0	V	239	14
613.441	9.75	36.0	26.3	1000	120.0	100.0	H	199	22
988.892	13.64	44.0	30.4	1000	120.0	234.0	H	225	25

13.8 Spurious emissions radiated above 1 GHz

Measurement:

Measurement parameter	
Detector	Peak / RMS
Sweep time	Auto
Resolution bandwidth	1 MHz
Video bandwidth	3 x RBW
Span	1 GHz to 26 GHz
Trace mode	Max Hold
Test setup	See chapter 7.2 setup B & 7.3 setup A
Measurement uncertainty	See chapter 9

Limits:

FCC		ISED
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 30 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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency / MHz	Field Strength / (dB μ V / m)	Measurement distance / m
Above 960	54.0 (AVG)	3
	74.0 (peak)	

Results: b-mode, Chain A

TX spurious emissions radiated / dB μ V/m @ 3 m								
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
4824	Peak	48.5	4874	Peak	49.2	4924	Peak	45.1
	AVG	44.3		AVG	44.2		AVG	39.0

Results: b-mode, Chain B

TX spurious emissions radiated / dB μ V/m @ 3 m								
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
4824	Peak	49.7	4874	Peak	53.2	4924	Peak	47.3
	AVG	45.9		AVG	49.7		AVG	42.4

Results: g-mode, Chain A

TX spurious emissions radiated / dB μ V/m @ 3 m								
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: g-mode, Chain B

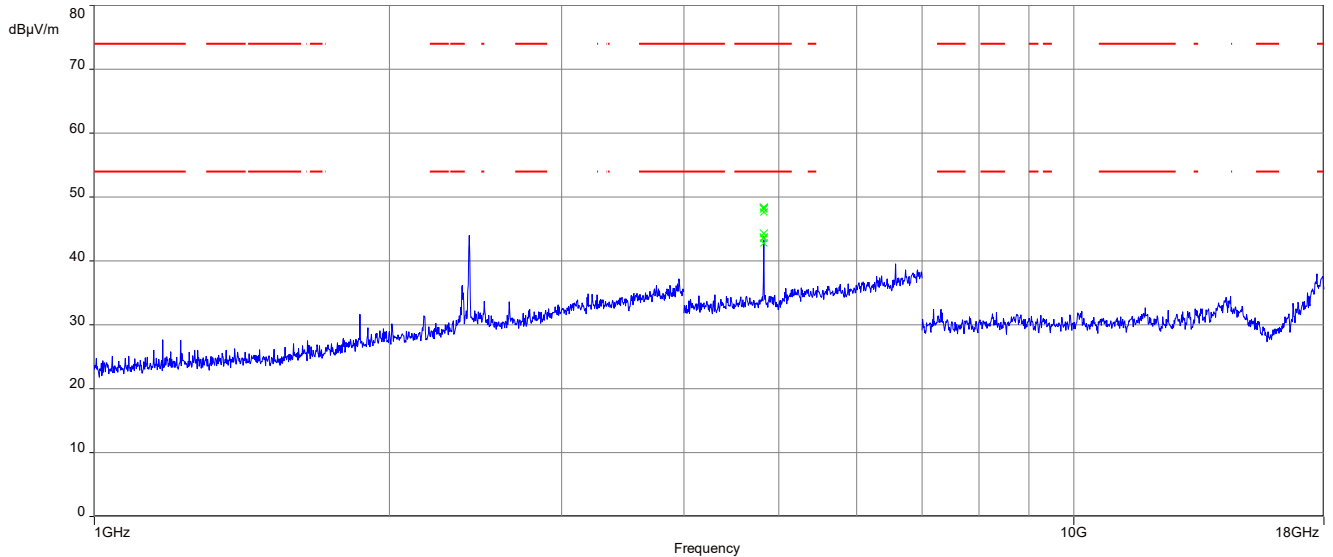
TX spurious emissions radiated / dB μ V/m @ 3 m								
lowest channel			middle channel			highest channel		
f / MHz	Detector	Level / dB μ V/m	f / MHz	Detector	Level / dB μ V/m	f / MHz	Detector	Level / dB μ V/m
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

Results: axHE20-mode, MIMO Chain A+B

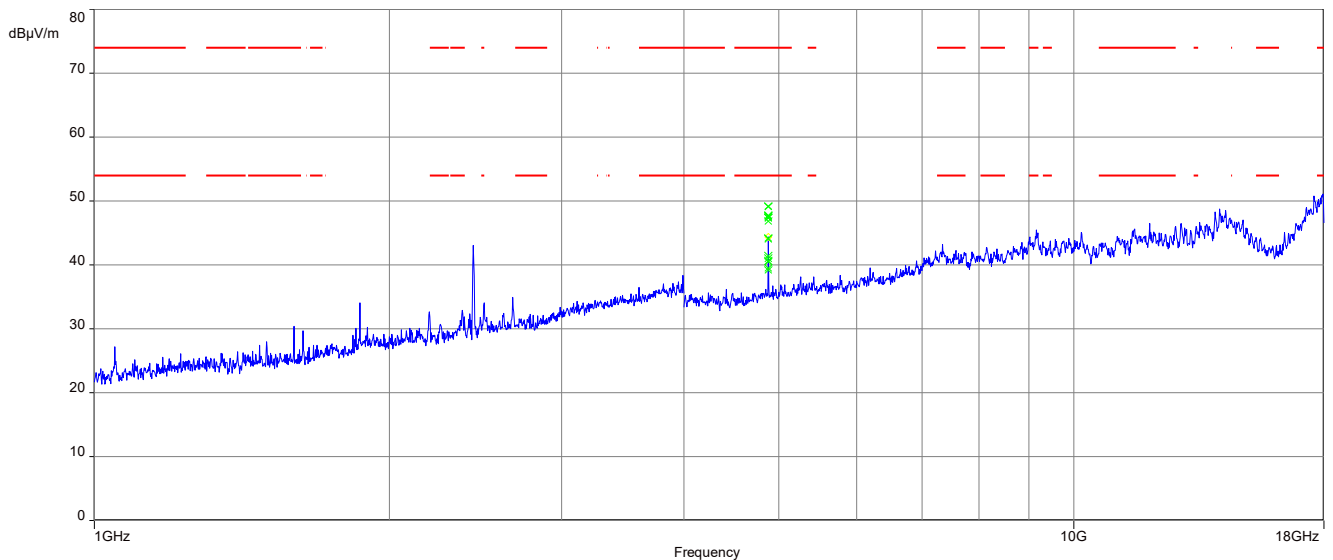
TX spurious emissions radiated / dB μ V/m @ 3 m								
lowest channel			middle channel			highest channel		
f / MHz	Detector	Level / dB μ V/m	f / MHz	Detector	Level / dB μ V/m	f / MHz	Detector	Level / dB μ V/m
-/-	Peak	-/-	-/-	Peak	-/-	-/-	Peak	-/-
	AVG	-/-		AVG	-/-		AVG	-/-

Results: axHE40-mode, MIMO Chain A+B

TX spurious emissions radiated / dB μ V/m @ 3 m								
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	-/-

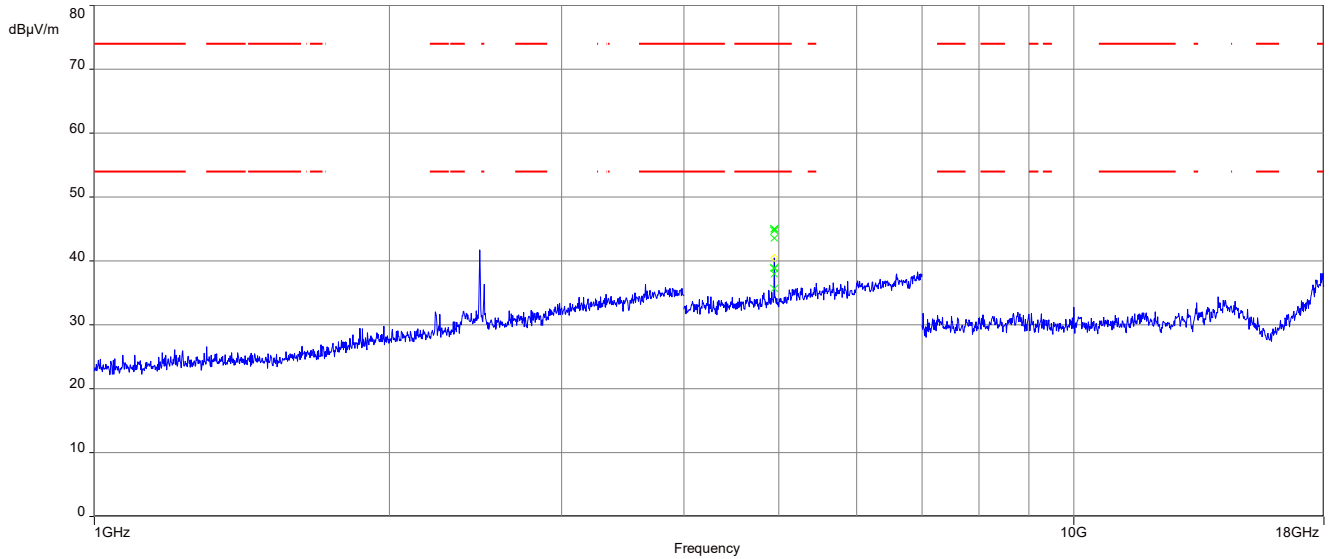
Plots: b-mode, Chain A**Plot 1:** Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

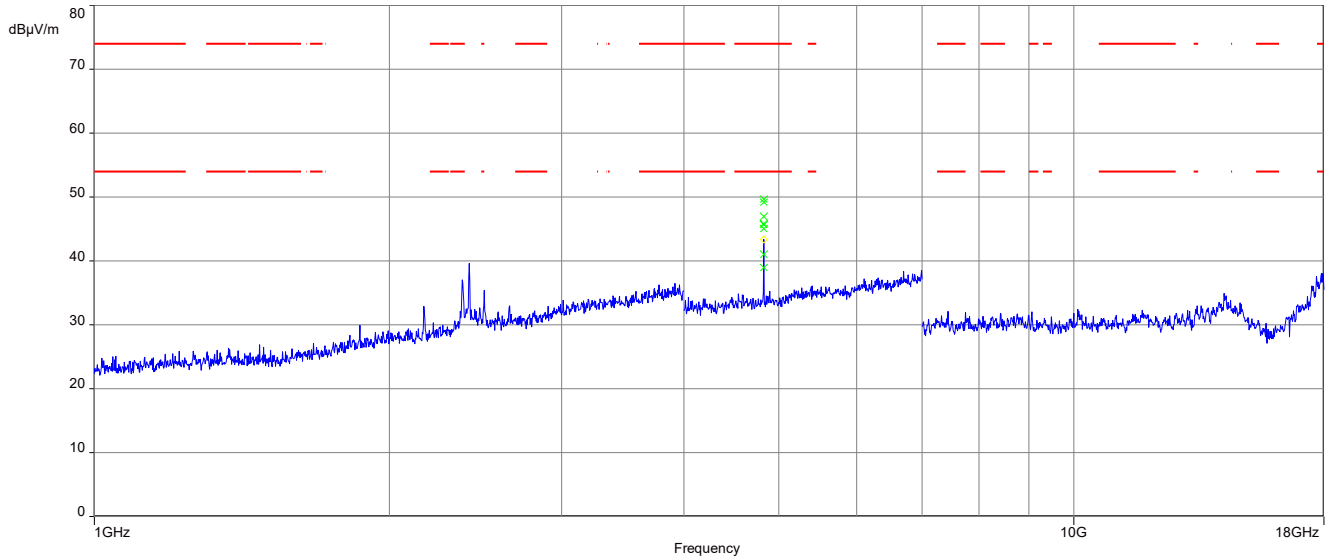
Plot 2: Middle channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

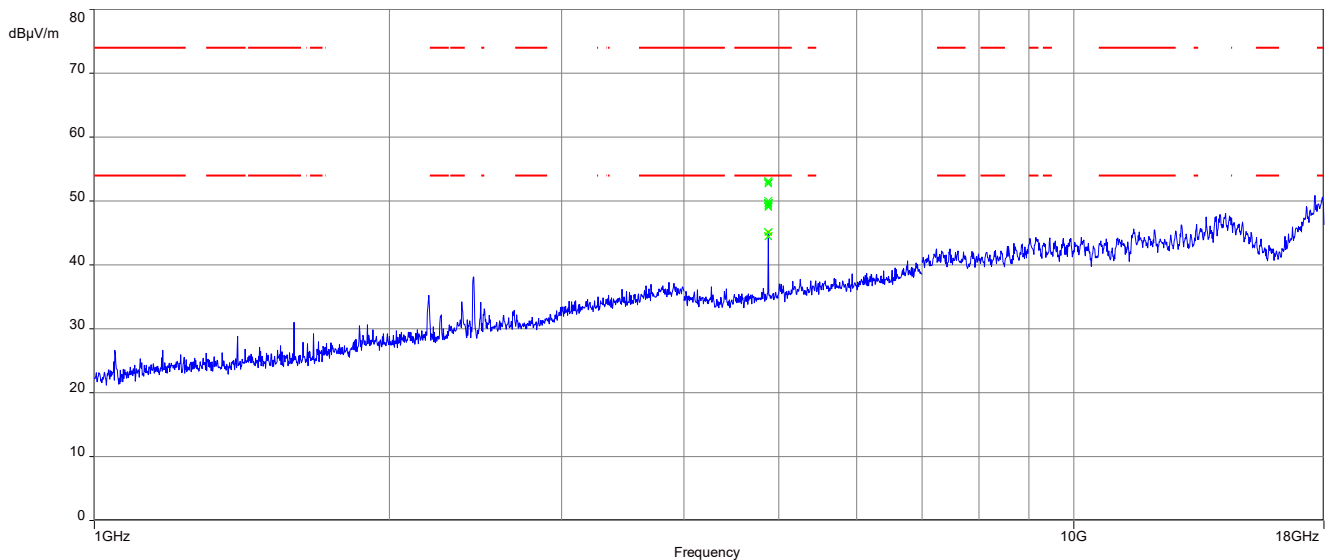
Plot 3: Highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

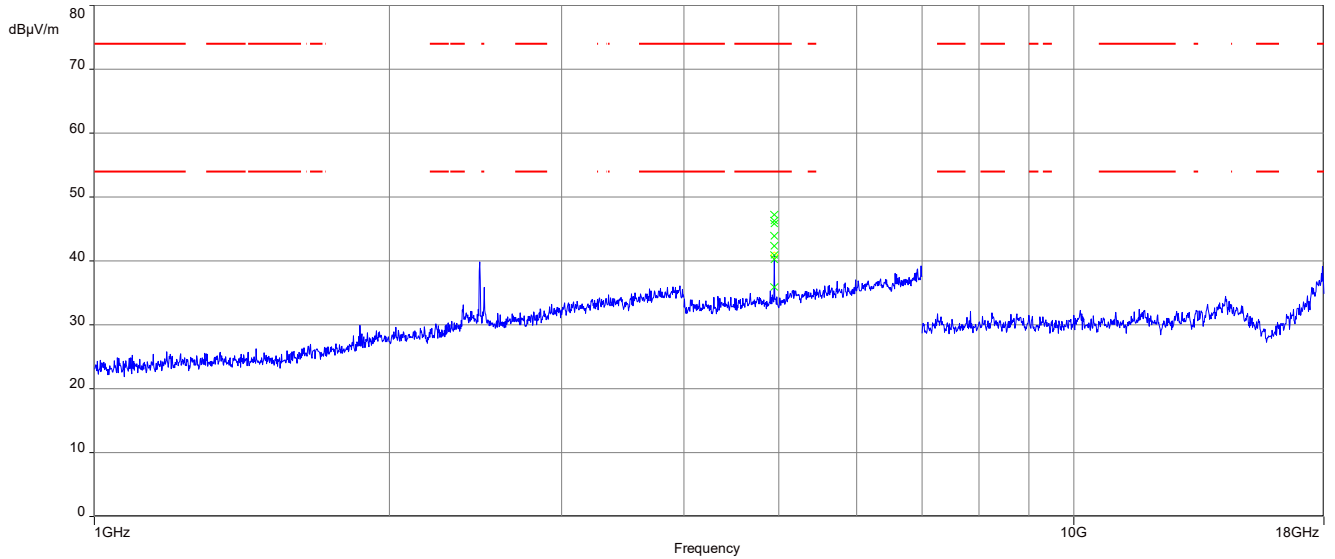
Plots: b-mode, Chain B**Plot 1:** Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

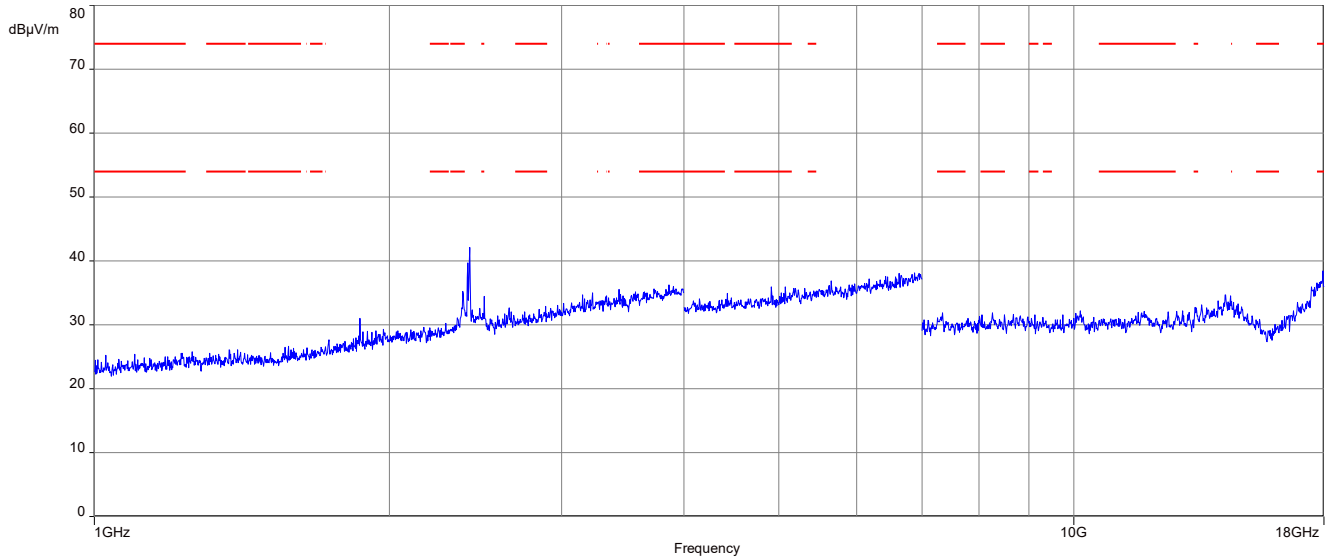
Plot 2: Middle channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

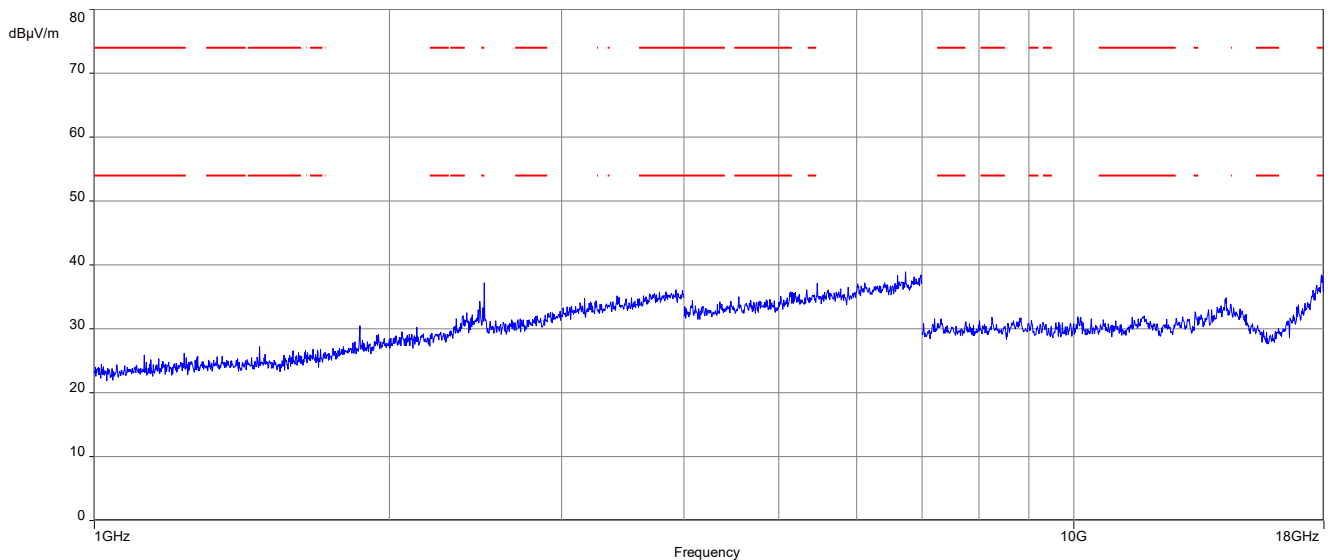
Plot 3: Highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



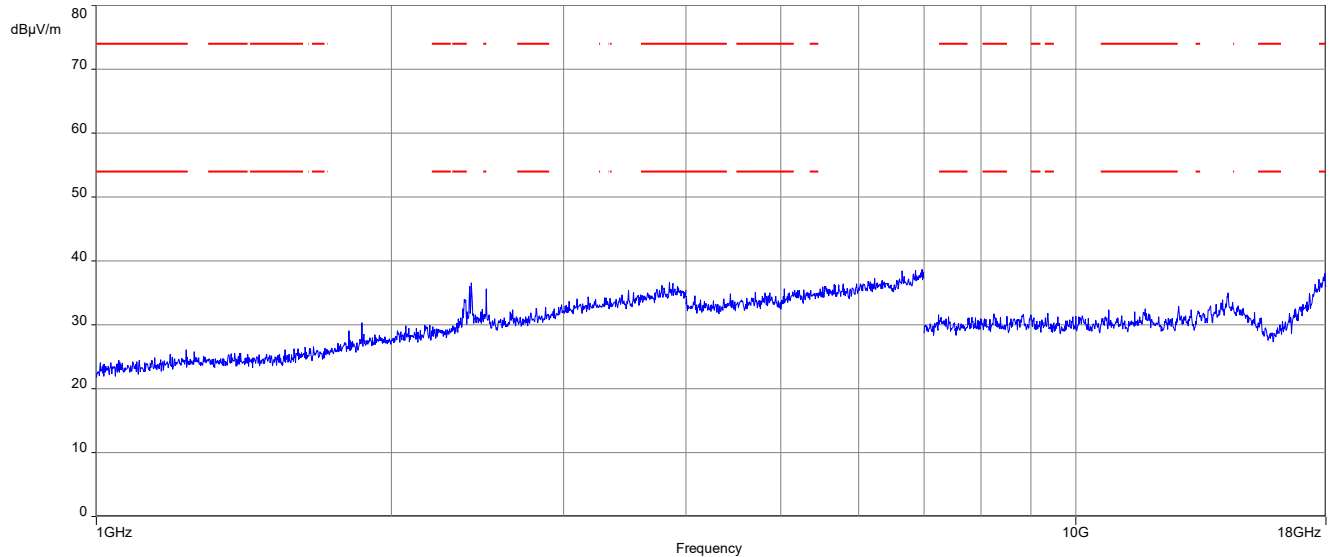
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plots: g-mode, Chain A**Plot 1:** Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

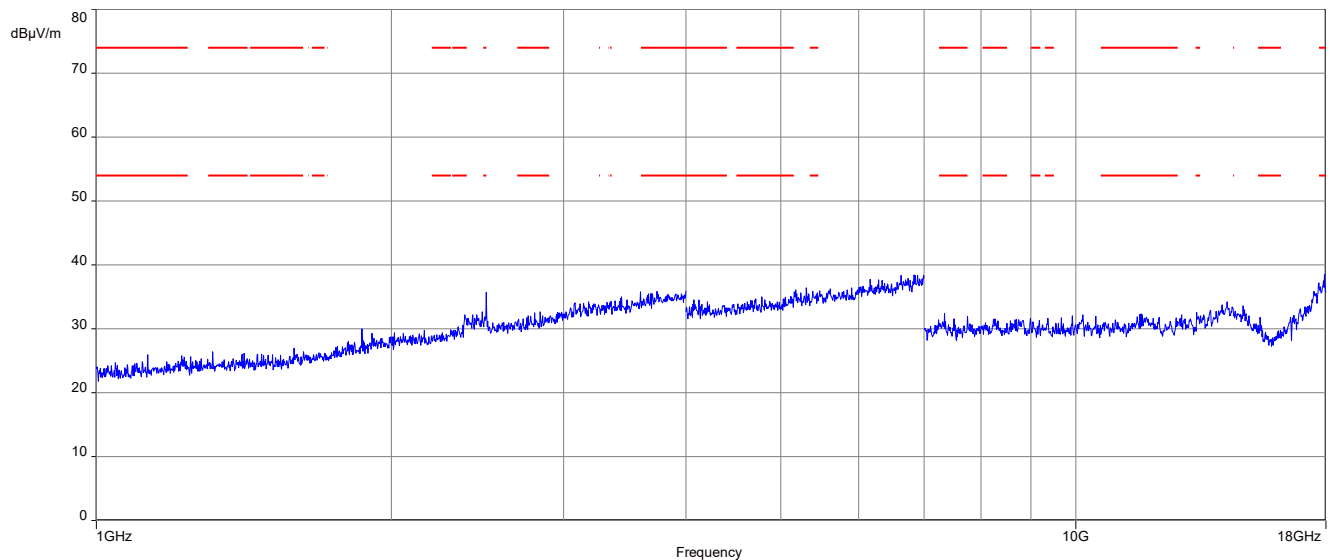
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

Plots: g-mode, Chain B**Plot 1:** Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

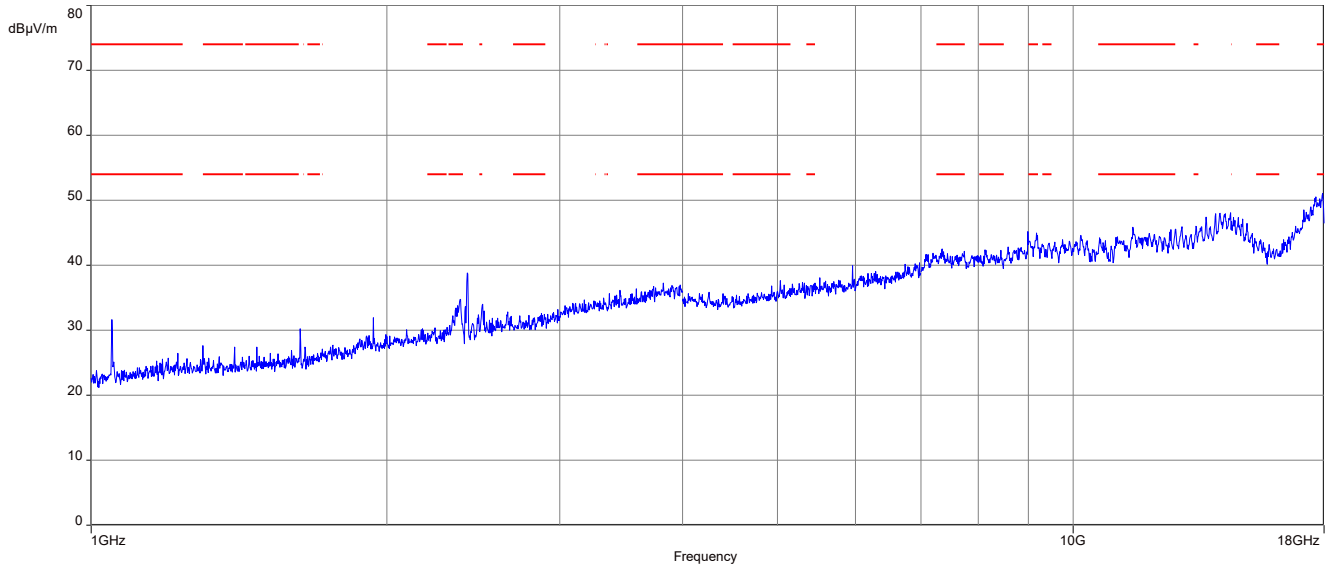
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

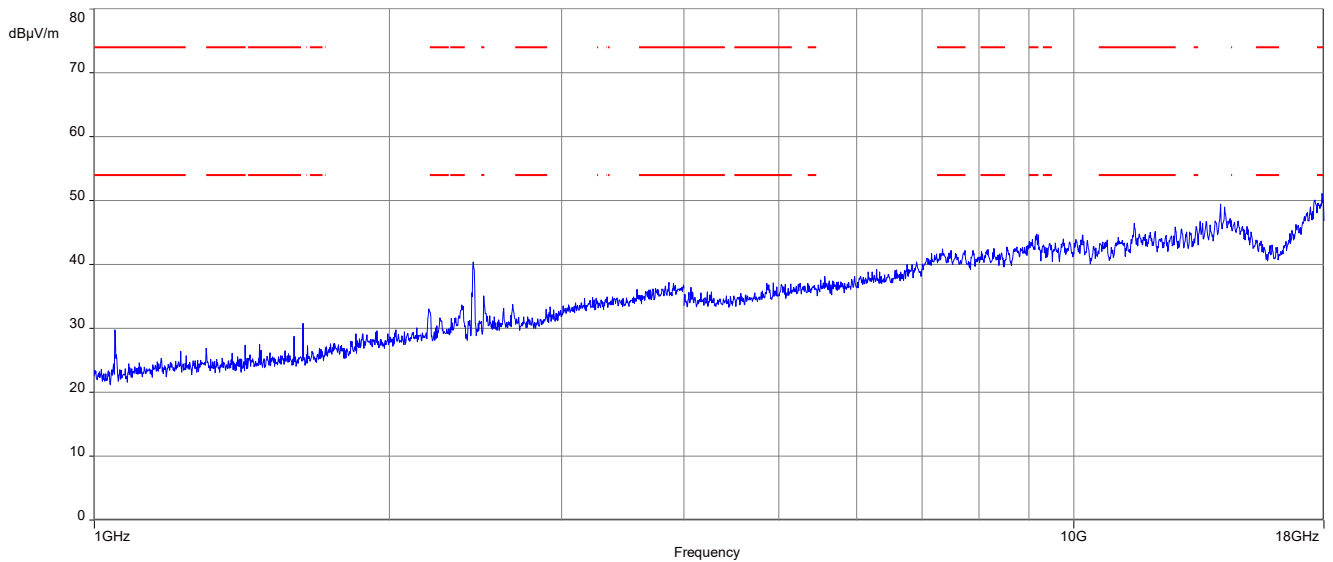
Plots: axHE20-mode, MIMO Chain A+B

Plot 1: Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



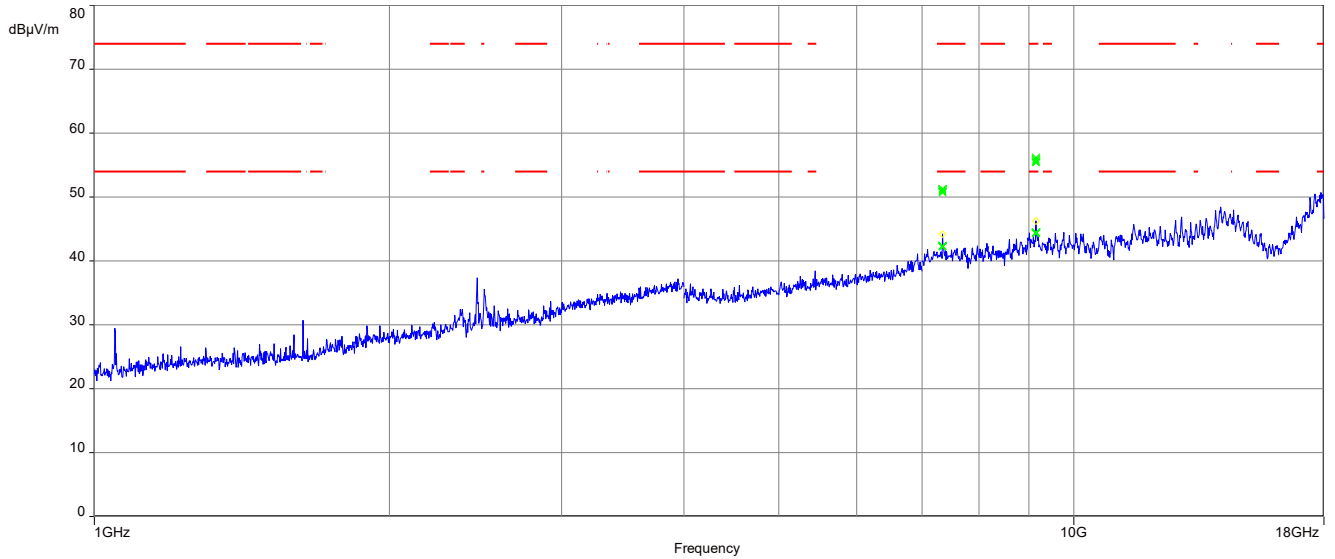
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Middle channel, 1 GHz to 18 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

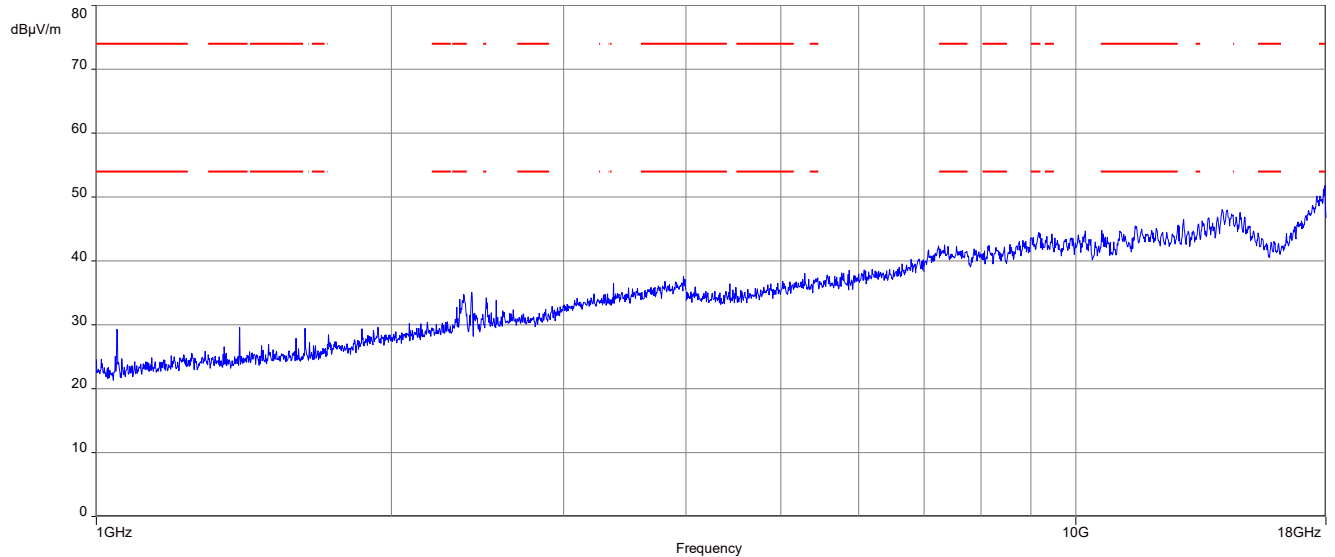
Plot 3: Highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

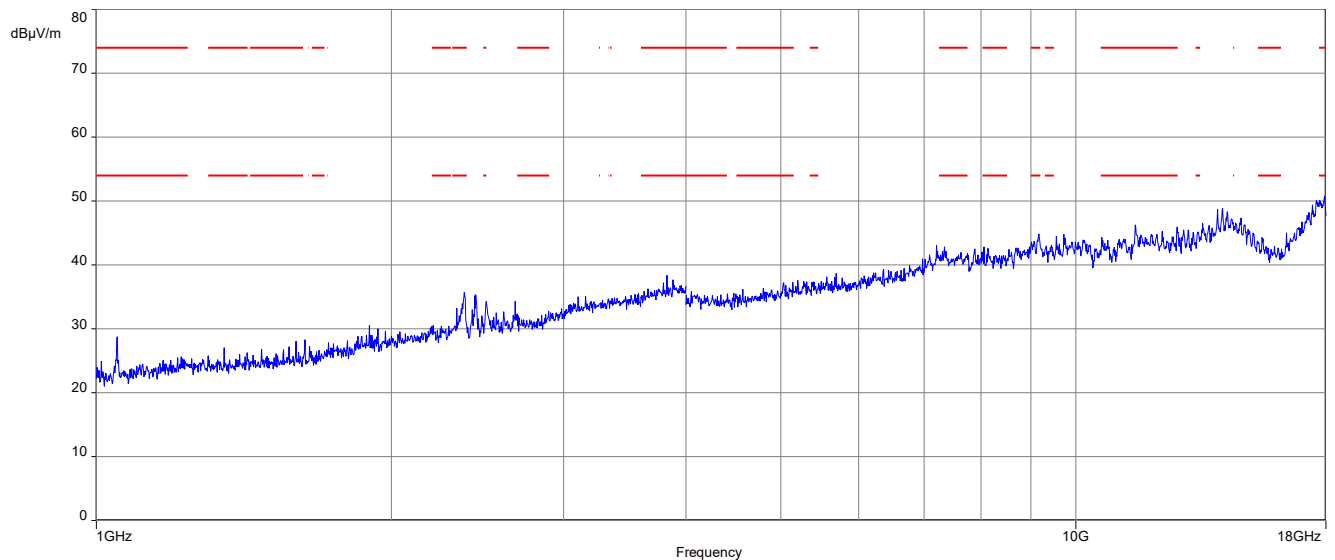
Plots: axHE40-mode, MIMO Chain A+B

Plot 1: Lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



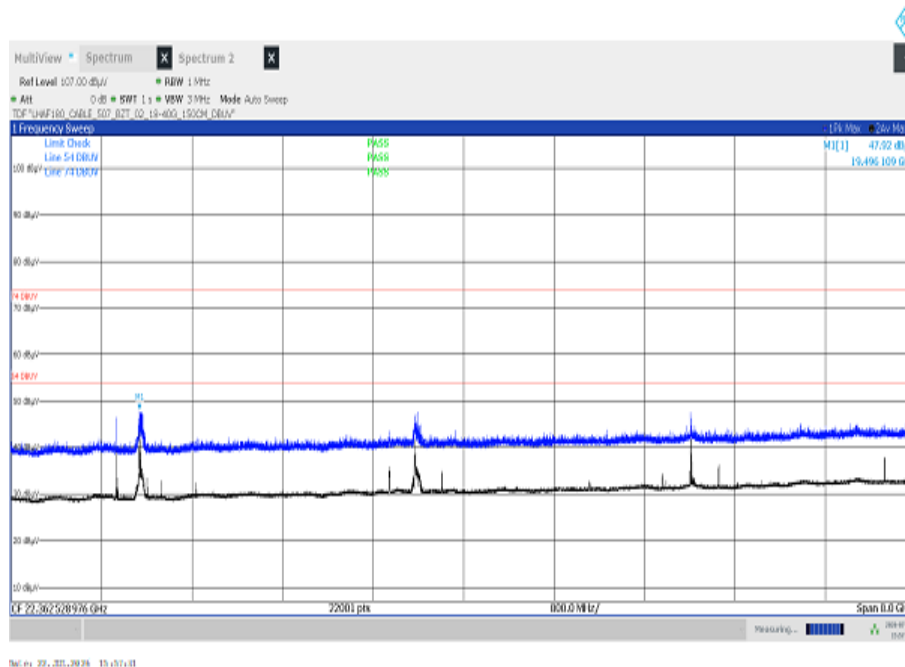
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 2: Middle channel, 1 GHz to 18 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization, valid for all channels and modes



13.9 Spurious emissions conducted below 30 MHz (AC conducted)

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

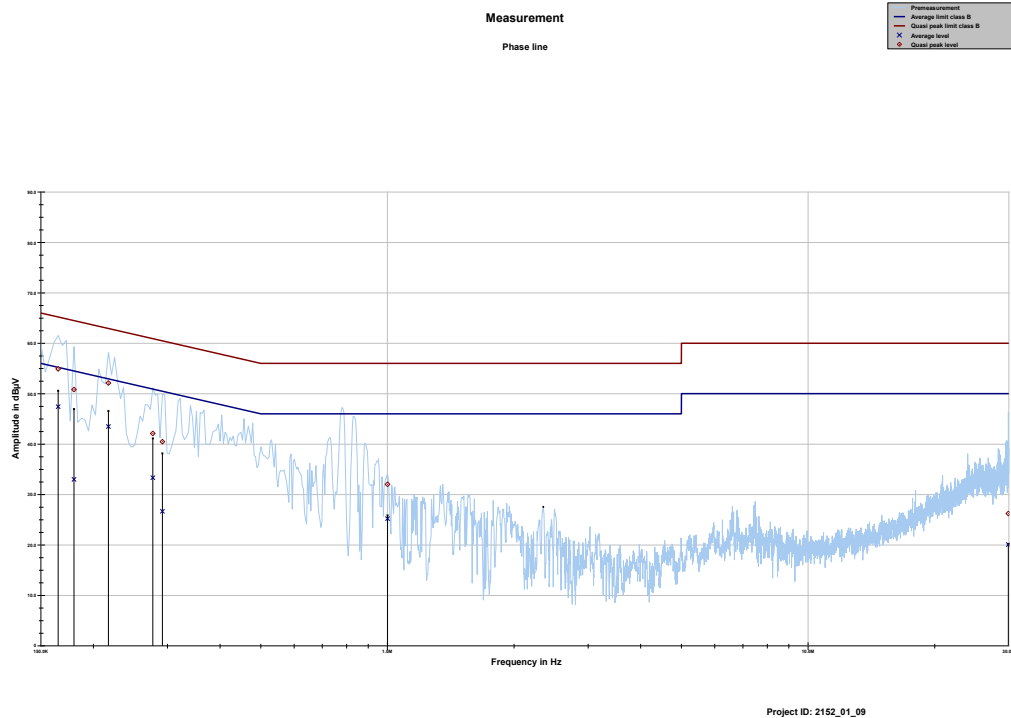
Measurement:

Measurement parameter	
Detector	Peak - Quasi Peak / Average
Sweep time	Auto
Resolution bandwidth	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Video bandwidth	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span	9 kHz to 30 MHz
Trace mode	Max. hold
Test setup	See chapter 7.5 setup A
Measurement uncertainty	See chapter 9

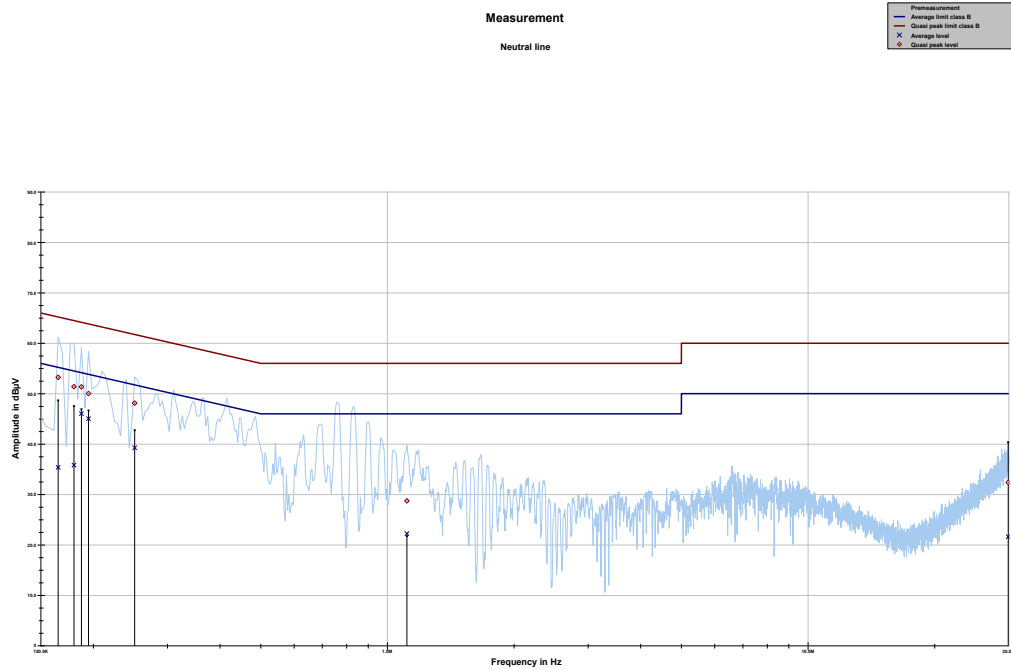
Limits:

FCC		ISED
Frequency / MHz	Quasi-Peak / (dB μ V / m)	Average / (dB μ V / m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

*Decreases with the logarithm of the frequency

Plots:**Plot 1:** 150 kHz to 30 MHz, phase line (240 VAC)**Final results:**

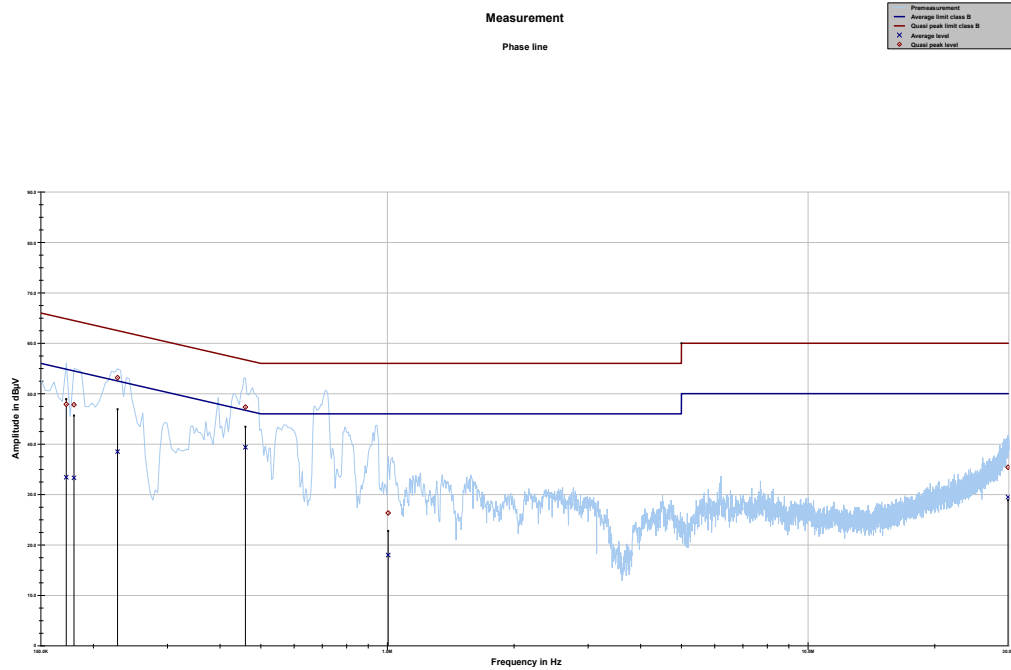
Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin average	Limit AV
MHz	dBμV	dB	dBμV	dBμV	dB	dBμV
0.164925	54.91	10.30	65.212	47.41	8.16	55.574
0.179850	50.82	13.67	64.493	33.00	22.14	55.147
0.217163	52.11	10.82	62.927	43.50	10.59	54.081
0.276863	42.10	18.81	60.909	33.33	19.05	52.375
0.291787	40.48	19.99	60.473	26.68	25.27	51.949
1.000725	32.03	23.97	56.000	25.21	20.79	46.000
29.932838	26.22	33.78	60.000	20.08	29.92	50.000

Plot 2: 150 kHz to 30 MHz, neutral line (240 VAC)

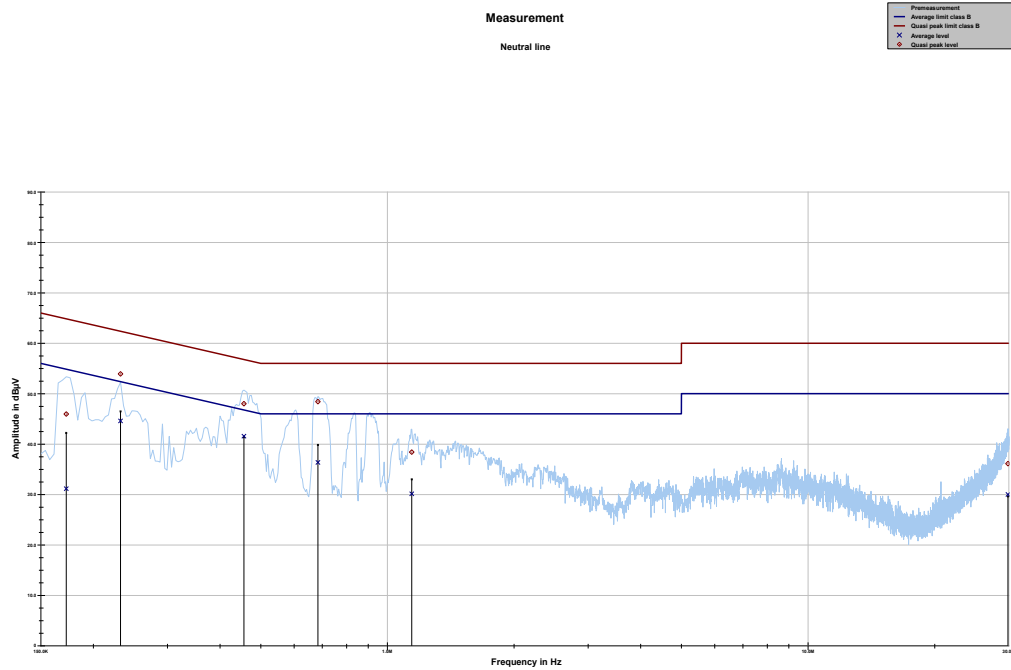
Project ID: 2152_01_09

Final results:

Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin Average	Limit AV
MHz	dBμV	dB	dBμV	dBμV	dB	dBμV
0.164925	53.24	11.97	65.212	35.39	20.18	55.574
0.179850	51.39	13.10	64.493	35.83	19.32	55.147
0.187312	51.35	12.81	64.155	46.04	8.89	54.934
0.194775	50.02	13.81	63.830	45.04	9.68	54.721
0.250744	48.12	13.62	61.732	39.26	13.86	53.122
1.112663	28.74	27.26	56.000	22.25	23.75	46.000
29.910450	32.38	27.62	60.000	21.60	28.40	50.000

Plot 3: 150 kHz to 30 MHz, phase line (120 VAC)**Final results:**

Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin average	Limit AV
MHz	dBμV	dB	dBμV	dBμV	dB	dBμV
0.172387	47.90	16.94	64.845	33.43	21.93	55.360
0.179850	47.81	16.68	64.493	33.31	21.84	55.147
0.228356	53.18	9.33	62.509	38.50	15.26	53.761
0.459694	47.34	9.36	56.698	39.36	7.79	47.152
1.004456	26.34	29.66	56.000	17.99	28.01	46.000
29.888063	35.41	24.59	60.000	29.50	20.50	50.000

Plot 4: 150 kHz to 30 MHz, neutral line (120 VAC)

Project ID: 2152_01_11

Final results:

Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin average	Limit AV
MHz	dBμV	dB	dBμV	dBμV	dB	dBμV
0.172387	45.96	18.89	64.845	31.16	24.20	55.360
0.232088	53.92	8.46	62.375	44.59	9.06	53.655
0.455962	48.02	8.75	56.766	41.57	5.69	47.258
0.683569	48.41	7.59	56.000	36.36	9.64	46.000
1.142513	38.41	17.59	56.000	30.13	15.87	46.000
29.876869	36.13	23.87	60.000	30.01	19.99	50.000

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
EN	European Standard
ETSI	European Telecommunications Standards Institute
EMC	Electromagnetic Compatibility
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
GNSS	Global Navigation Satellite System
GUE	GNSS User Equipment
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	2026-07-30

END OF TEST REPORT