

TEST REPORT

Test report no.: 1-1630-25-01-02_TR1-R02



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

E. Dold & Söhne GmbH & Co.KG

Bregstr. 18

78120 Furtwangen / GERMANY

Phone: +49 7723 654 331

Contact: M. Colpi

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Manufacturer

E. Dold & Söhne GmbH & Co.KG

Bregstr. 18

78120 Furtwangen / 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
RSS - Gen Issue 5 incl. Amendment 1 & 2	Spectrum Management and Telecommunications Radio Standards Specification - General Requirements for Compliance of Radio Apparatus
RSS - 210 Issue 11	Spectrum Management and Telecommunications Radio Standards Specification - Licence-Exempt Radio Apparatus: Category I Equipment

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

Test Item

Kind of test item:	SAFEMASTER W
Model name:	RE6900 with ZB6900/200
FCC ID:	2A3XQRE6900
Frequency:	911.79 MHz to 918.16 MHz
Technology tested:	proprietary
Antenna:	internal antenna
Power supply:	3.2 V to 3.8 V DC, by internal Li-Io battery
Temperature range:	-25°C to +55°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:

On behalf of

Christoph Schneider
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On behalf of

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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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This test report replaces the test report with the number 1-1630-25-01-02_TR1-R01 and dated 2026-04-28.

2.2 Application details

Date of receipt of order:	2025-11-12
Date of receipt of test item:	2026-03-03
Start of test:*	2026-03-03
End of test:*	2026-03-04
Person(s) present during the test:	Mr. Schätzle Mr. Jayanti

*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

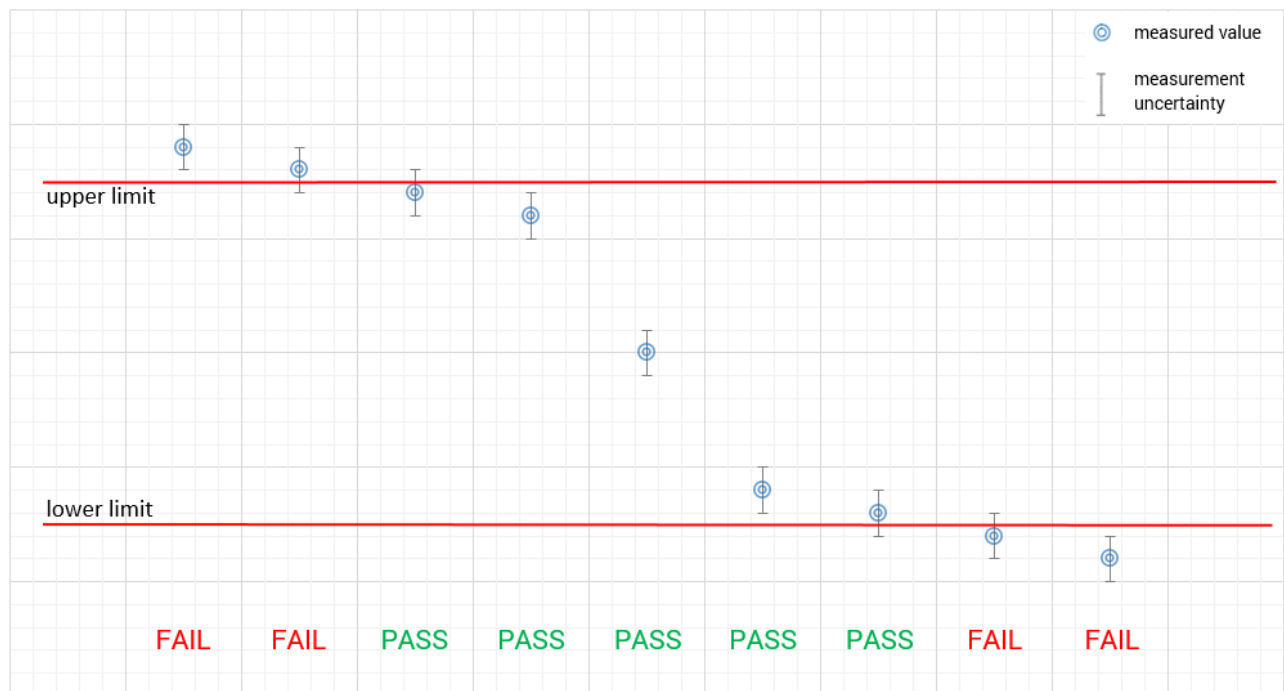
Test standard	Date	Description
FCC - Title 47 CFR Part 15		FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 11	25.06.2024	Spectrum Management and Telecommunications Radio Standards Specification - Licence-Exempt Radio Apparatus: Category I Equipment
RSS - Gen Issue 5 incl. Amendment 1 & 2	February 2021	Spectrum Management and Telecommunications Radio Standards Specification - General Requirements for Compliance of Radio Apparatus
Guidance	Version	Description
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 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Including
ANSI C63.10-2020	2020	- ANSI/USEMCSC C63.10-2020/Cor 1-2023 - ANSI/USEMCSC C63.10a-2024 - ANSI/USEMCSC C63.10a-2024 Amendment 1 / 2024-08-08 - ANSI/USEMCSC C63.10a-2024 Amendment 1 Errata / 2024-11-18

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 +55 °C during high temperature tests* -25 °C during low temperature tests* *all tests performed with room temperature
Relative humidity content :		55 %
Barometric pressure :		1021 hpa
Power supply :	V_{nom} V_{max} V_{min}	4.0 V DC, by internal Li-Io battery 3.8 V* 3.2 V* *all tests performed with nominal voltage

6 Test item

6.1 General description

Kind of test item :	SAFEMASTER W
Model name :	RE6900 with ZB6900/200
HMN :	N/A
PMN :	N/A
HVIN :	N/A
FVIN :	N/A
S/N serial number :	enabling switch model: prototype emergency stop model: prototype
Hardware status :	-/-
Software status :	-/-
Firmware status :	Firmware uC1: PN6900_3_00_00_01_01_02.hex Firmware uC2: PN6900_4_00_00_01_01_02.hex
Frequency band :	911.79 MHz to 918.16 MHz
Type of radio transmission :	modulated carrier
Use of frequency spectrum :	
Type of modulation :	2-GFSK
Number of channels :	128
Antenna :	internal antenna
Power supply :	3.2 V to 3.8 V DC, by internal Li-Io battery
Temperature range :	-25°C to +55°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:

1-1630-25-01-01_TR1-A101-R01
1-1630-25-01-01_TR1-A102-R01
1-1630-25-01-01_TR1-A103-R01

7 Description of the test setup

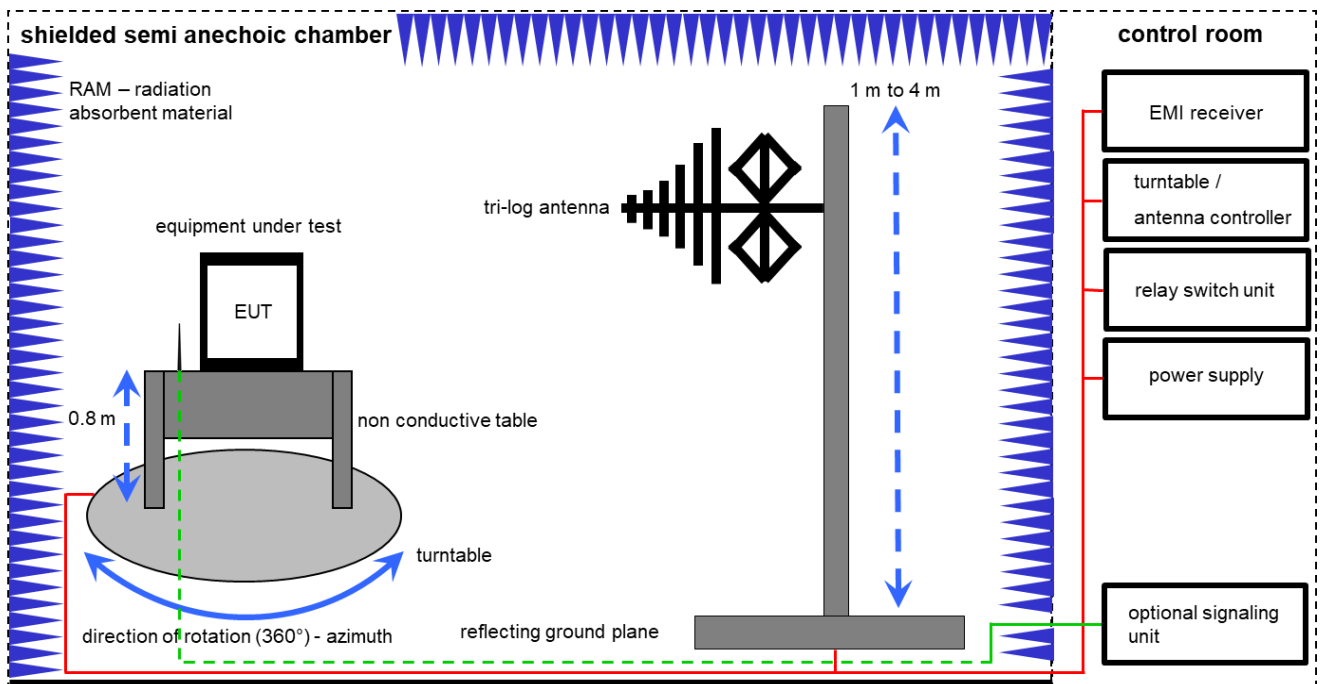
Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements 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.

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)

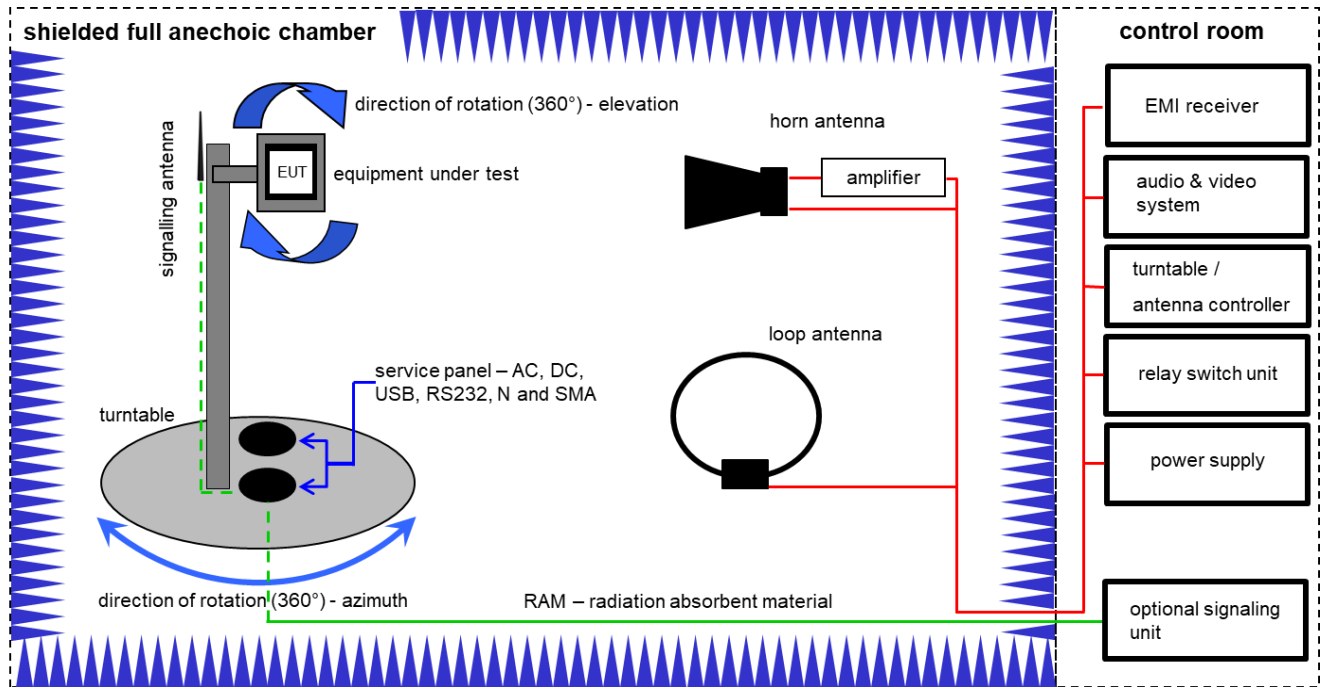
Example calculation:

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

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115	EMCO Elektronik GmbH / Gilching	8812-3088	300001032	cal	30.10.2025	31.10.2027
2	A	Anechoic chamber	Anechoic chamber FAC 3/5m	MEC Import: MWB / TDK	87400/02	300000996-0000	cpu	-/-	-/-
3	A	Switch / Control Unit	Switch / Control Unit 3488A	Hewlett Packard	*	300000199-0000	cnn	-/-	-/-
4	A	Variable isolating transformer	Variable isolating transformer MPL IEC625 Bus Variable isolating transformer	MEC Import: Erfi	91350	300001155-0000	cnn	-/-	-/-
5	A	Broadband Amplifier 0.5-18 GHz	Broadband Amplifier 0.5-18 GHz CBLU5184540	MEC Import: CERNEX	22049	300004481-0000	cpu	-/-	-/-
6	A	4U RF Switch Platform	4U RF Switch Platform L4491A	Agilent Technologies Deutschland GmbH / Böblingen	MY50000037	300004509-0000	cnn	-/-	-/-
7	A	NEXIO EMV-Software	NEXIO EMV-Software BAT EMC V2022.0.32.0	MEC Import: Nexio		300004682-0000	cnn	-/-	-/-
8	A	Active Loop Antenna	Active Loop Antenna 6502	EMCO Elektronik GmbH / Gilching	8905-2342	300000256-0000	cal	16.07.2025	31.07.2027
9	A	EMI Test Receiver	EMI Test Receiver ESU26	Rohde & Schwarz Messgerätebau GmbH / Memmingen	100037	300003555-0000	cal	11.12.2025	31.12.2026
10	A	TRILOG Broadband Antenna	TRILOG Broadband Antenna VULB9163	Schwarzbeck MESS-ELEKTRONIK OHG / Schönaun	318	300003696	cal	09.02.2026	29.02.2028

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:

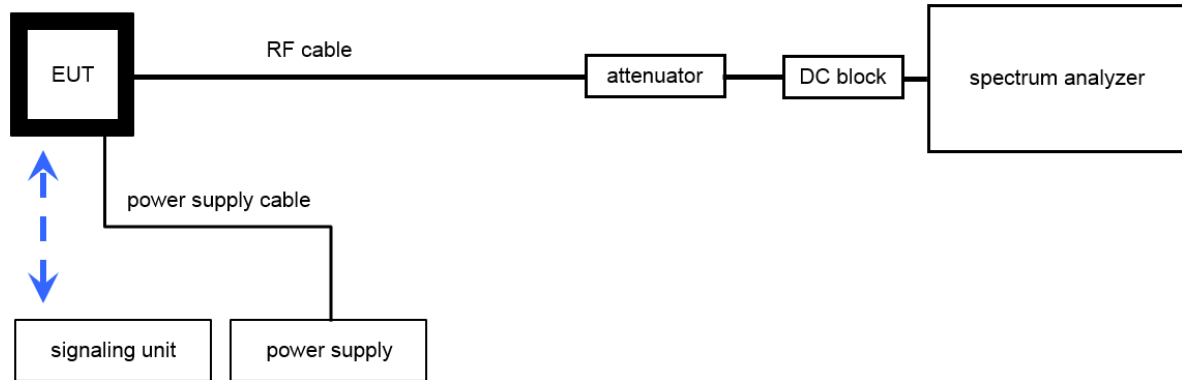
FS [dB μ V/m] = 40.0 [dB μ V] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dB μ V/m] (71.61 μ V/m) @ distance

Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	B	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115	EMCO Elektronik GmbH / Gilching	8812-3088	300001032	cal	30.10.2025	31.10.2027
2	A,B	Anechoic chamber	Anechoic chamber FAC 3/5m	MEC Import: MWB / TDK	87400/02	300000996-0000	cpu	-/-	-/-
3	A,B	Switch / Control Unit	Switch / Control Unit 3488A	Hewlett Packard	*	300000199-0000	cnn	-/-	-/-
4	B	Broadband Amplifier 0.5-18 GHz	Broadband Amplifier 0.5-18 GHz CBLU5184540	MEC Import: CERNEX	22049	300004481-0000	cpu	-/-	-/-
5	A,B	4U RF Switch Platform	4U RF Switch Platform L4491A	Agilent Technologies Deutschland GmbH / Böblingen	MY50000037	300004509-0000	cnn	-/-	-/-
6	A,B	NEXIO EMV-Software	NEXIO EMV-Software BAT EMC V2022.0.32.0	MEC Import: Nexio		300004682-0000	cnn	-/-	-/-
7	A	Active Loop Antenna	Active Loop Antenna 6502	EMCO Elektronik GmbH / Gilching	8905-2342	300000256-0000	cal	16.07.2025	31.07.2027
8	A,B	EMI Test Receiver	EMI Test Receiver ESU26	Rohde & Schwarz Messgerätebau GmbH / Memmingen	100037	300003555-0000	cal	11.12.2025	31.12.2026

7.3 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	FSW26	Rohde & Schwarz	101455	300004528	k	08.12.2025	31.12.2026

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 63.4.
- 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 10 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.

9 Measurement uncertainty

Measurement uncertainty	
Test case	Uncertainty
Occupied bandwidth	± 100 kHz (depends on the used RBW)
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

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	47 CFR Part 15 RSS 210 Issue 11 RSS Gen Issue 5	See table!	2026-07-31	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	C	NC	NA	NP	Remark
§15.249(a) RSS 210 B.10	Field strength of emissions (wanted signal)	Nominal	Nominal	☒	☐	☐	☐	-/-
RSS Gen	Occupied bandwidth (99% bandwidth)	Nominal	Nominal	☒	☐	☐	☐	-/-
§15.209(a) / §15.249(b)(1)(2)(3) RSS Gen RSS 210 B.10	Field strength of emissions (spurious)	Nominal	Nominal	☒	☐	☐	☐	-/-
§15.207(a) RSS Gen	Conducted emissions < 30 MHz	Nominal	Nominal	☐	☐	☒	☐	powered by build in rechargeable battery

Note: C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

11 Additional comments

Reference documents: None

Special test descriptions: Tested frequencies

Channel low	911.80 MHz
Channel high	918.15 MHz

All conversions due to different measurement distances have been calculated according ANSI C63.10:

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

→ Example: 10.46 dB from 10 m to 3 m

Configuration descriptions: there are two housings for this device, radiated measurements have been performed on both variants (see photo annex):

1. with enabling switch
2. with emergency stop

Power level sw setting: level -3dBm, offset value 0

Test mode:

- ☐ No test mode available.
Iperf was used to ping another device with the largest support packet size
- ☒ 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)

12 Measurement results

12.1 Field strength of emissions (wanted signal)

Description:

Measurement of the maximum radiated field strength of the wanted signal.
Measurement performed according to ANSI C63.10, chapter 6.5

Measurement:

Measurement parameter	
Detector:	Peak / Quasi peak
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Trace mode:	Max. hold

Limits:

FCC / ISCED			
The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:			
Frequency	Field Strength of fundamental		Measurement distance
	peak	quasi peak	
902 MHz – 928 MHz	500 mV/m (114 dB μ V/m)	50 mV/m (94 dB μ V/m)	3 m

Result: enabling switch model

Test condition	Frequency	Maximum field strength	
		field strength peak	field strength quasi peak
T_{nom} / V_{nom}	911.80 MHz	93.77 dB μ V/m@3 m* 83.31 dB μ V/m@10 m	93.33 dB μ V/m@3 m* 82.87 dB μ V/m@10 m
	918.15 MHz	91.80 dB μ V/m@3 m* 81.34 dB μ V/m@10 m	91.34 dB μ V/m@3 m* 80.88 dB μ V/m@10 m

* 3 m values recalculated

Result: emergency stop model

Test condition	Frequency	Maximum field strength	
		field strength peak	field strength quasi peak
T_{nom} / V_{nom}	911.80 MHz	92.83 dB μ V/m@3 m* 82.37 dB μ V/m@10 m	92.33 dB μ V/m@3 m* 81.87 dB μ V/m@10 m
	918.15 MHz	93.65 dB μ V/m@3 m* 83.19 dB μ V/m@10 m	92.83 dB μ V/m@3 m* 82.37 dB μ V/m@10 m

* 3 m values recalculated

12.2 Occupied bandwidth (99% bandwidth)

Description:

Measurement of the 99% bandwidth of the wanted signal.
Measurement performed according to ANSI C63.10, chapter 6.9

Measurement:

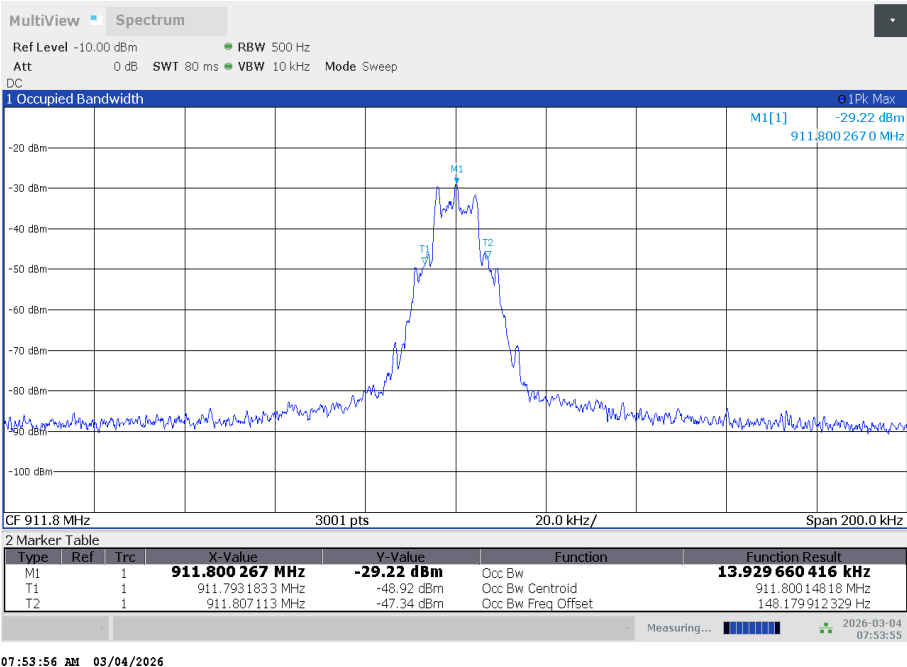
Measurement parameters	
Detector:	Peak
Resolution bandwidth:	1 % – 5 % of the occupied bandwidth
Video bandwidth:	$\geq 3 \times \text{RBW}$
Trace mode:	Max hold
Analyzer function:	99 % power function
Used equipment:	See chapter 7.3A
Measurement uncertainty:	See chapter 9

Results:

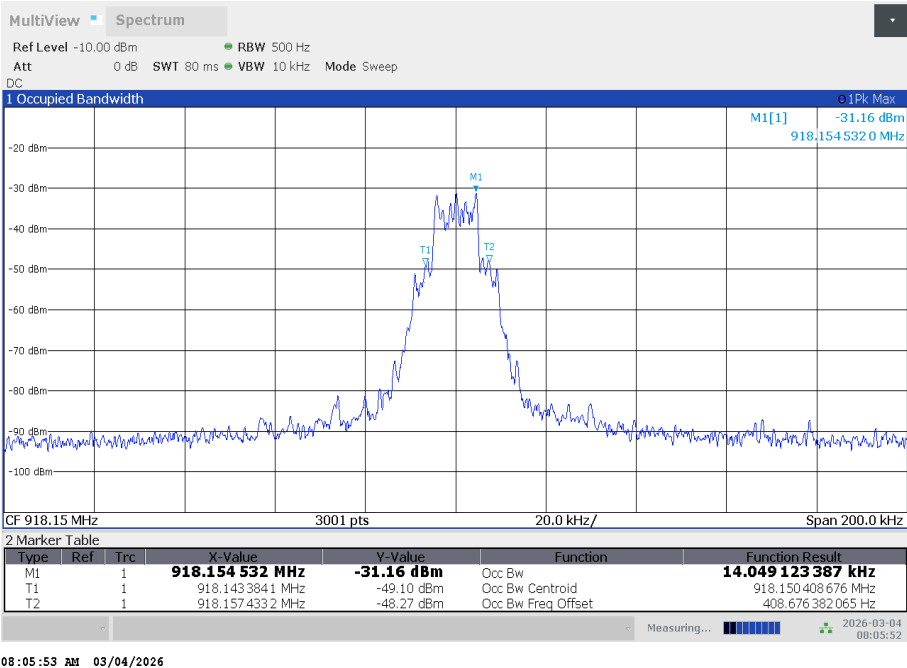
Occupied bandwidth	
Frequency	Occupied bandwidth
911.80 MHz	13.929 kHz
918.15 MHz	14.049 kHz

Plots:

Plot 1: 911.80 MHz



Plot 2: 918.15 MHz



12.3 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 performed according to ANSI C63.10, chapter 6.4

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 7.2A
Measurement uncertainty	See chapter 9

Limit:

FCC		
Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009 – 0.490	2400/(F/kHz)	300
0.490 – 1.705	24000/(F/kHz)	30
1.705 – 30	30 (29.5 dBμV/m)	30
30 – 88	100 (40 dBμV/m)	3
88 – 216	150 (43.5 dBμV/m)	3
216 – 960	200 (46 dBμV/m)	3

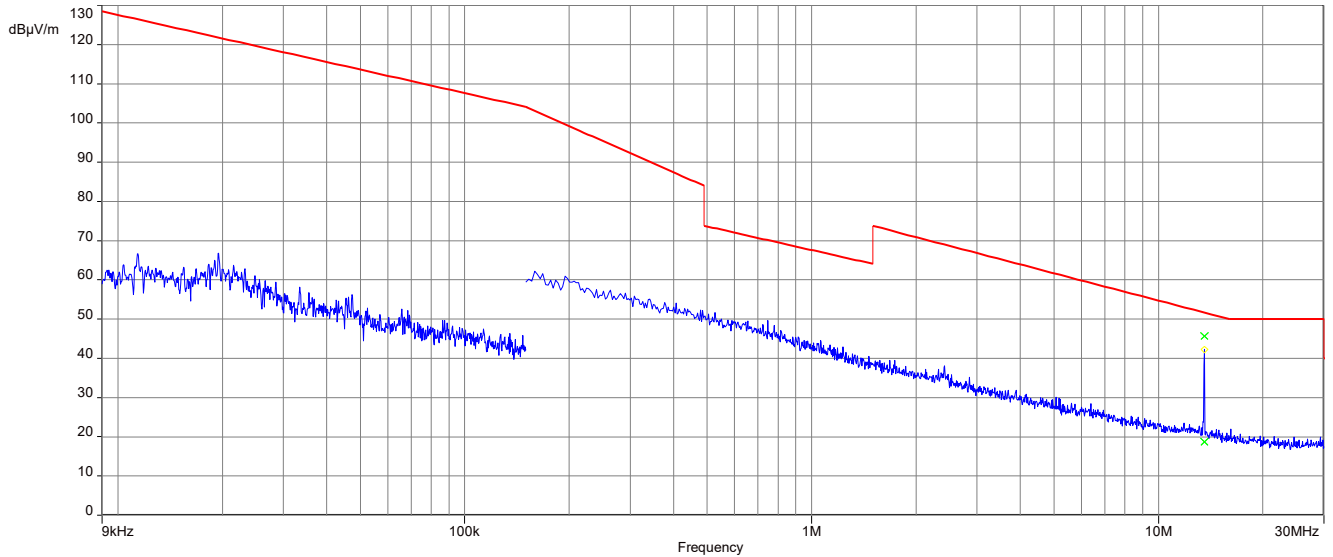
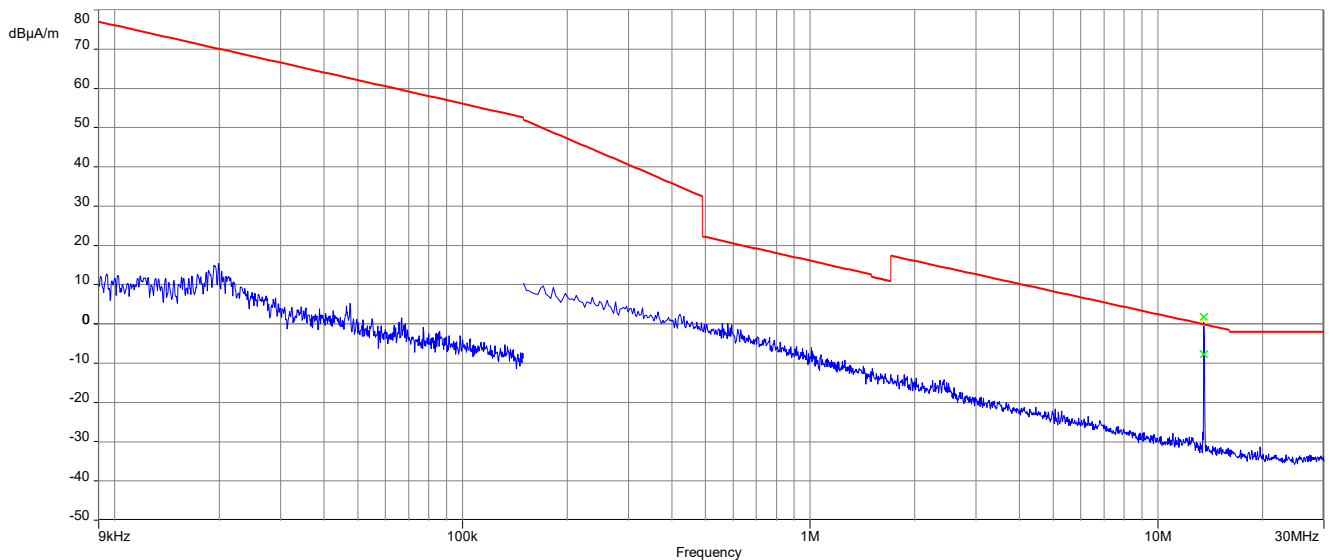
ISED		
Frequency (MHz)	Field strength (μA/m)	Measurement distance (m)
0.009 – 0.490	6.37/F (F in kHz)	300
0.490 – 1.705	63.7/F (F in kHz)	30
1.705 – 30	0.08 (-22 dBμA/m)	30

Results: enabling switch model

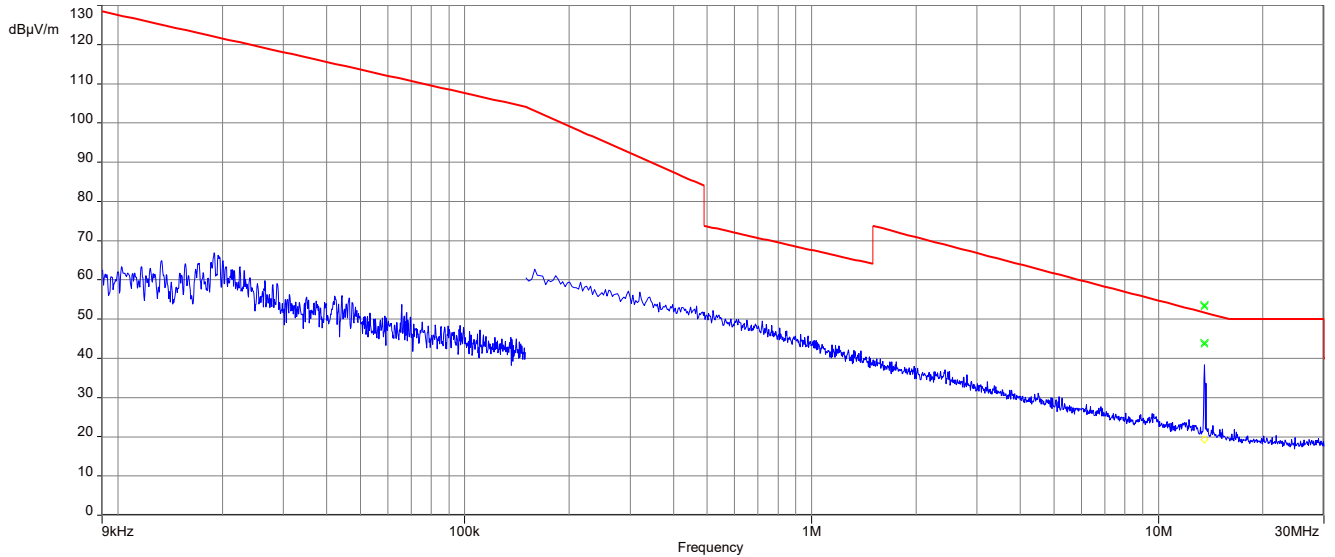
tx Frequency	Detected emissions			
	Frequency	Detector	Resolution bandwidth	Detected value (@ 3m)
911.80 MHz	13.549 MHz	QP	10 kHz	18.82 dB μ V/m
	13.561 MHz	QP	10 kHz	-7.61 dB μ A/m
918.15 MHz	13.561 MHz	QP	10 kHz	44.02 dB μ V/m
	13.561 MHz	QP	10 kHz	-7.71 dB μ A/m

Results: emergency stop model

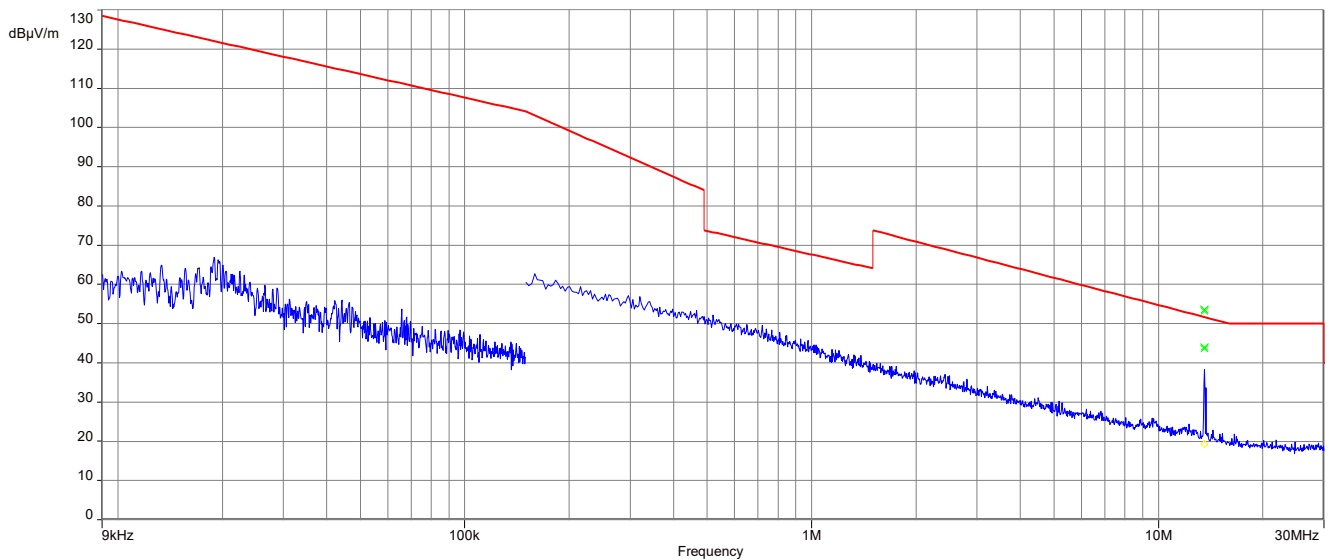
tx Frequency	Detected emissions			
	Frequency	Detector	Resolution bandwidth	Detected value (@ 3m)
911.80 MHz	13.537 MHz	QP	10 kHz	16.30 dB μ V/m
	13.573 MHz	QP	10 kHz	-33.94 dB μ A/m
918.15 MHz	13.556 MHz	QP	10 kHz	45.43 dB μ V/m
	13.561 MHz	QP	10 kHz	-6.49 dB μ A/m

Plots:**Plot 1:** 9 kHz to 30 MHz, 911.80 MHz, FCC, enabling switch model**Plot 2:** 9 kHz to 30 MHz, 911.80 MHz, ISED, enabling switch model

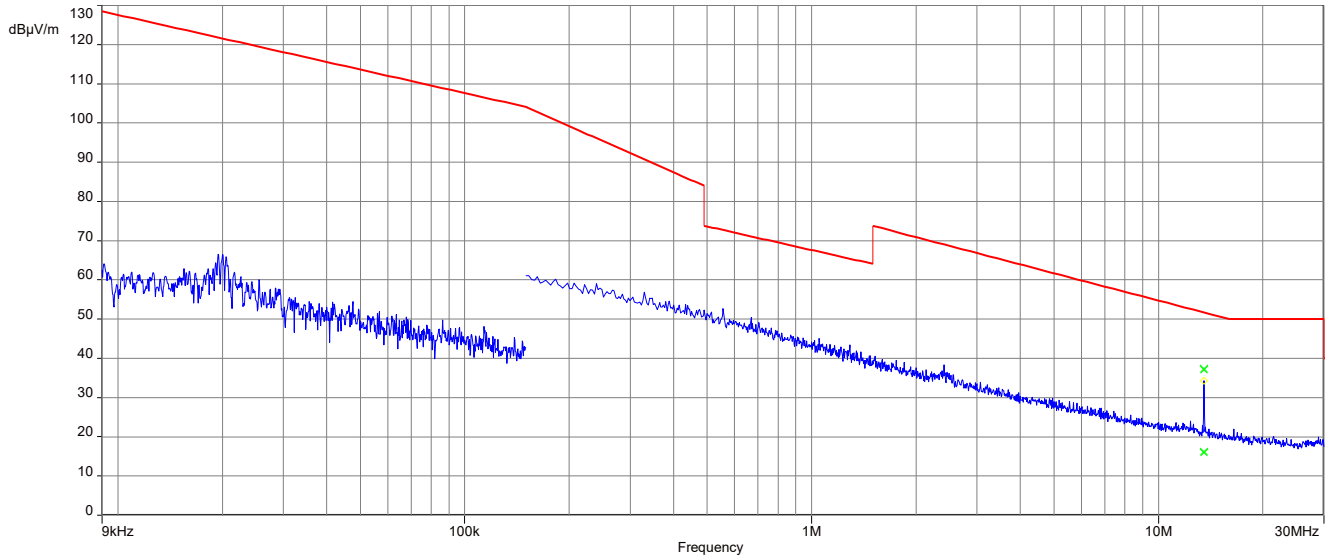
Plot 3: 9 kHz to 30 MHz, 918.15 MHz, FCC, enabling switch model



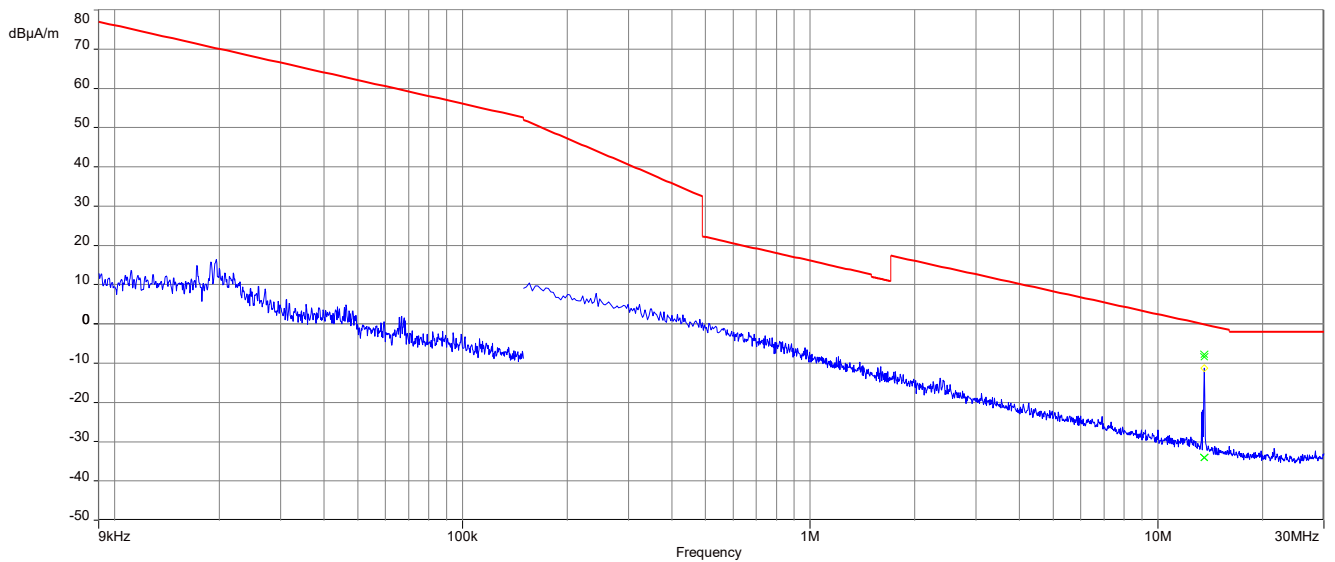
Plot 4: 9 kHz to 30 MHz, 918.15 MHz, ISED, enabling switch model



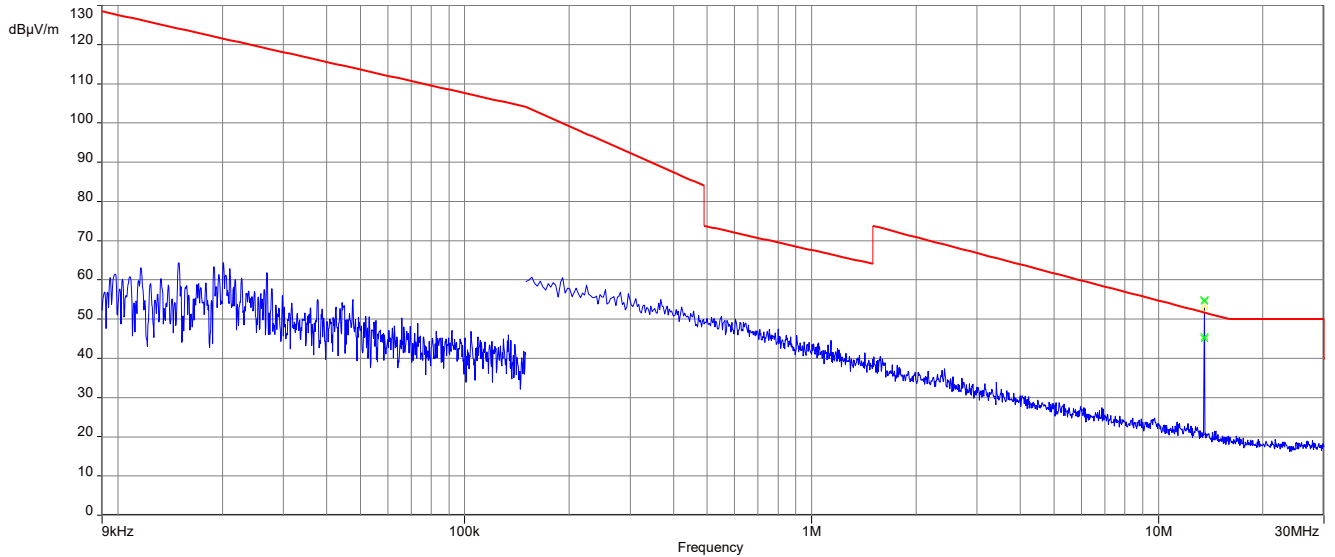
Plot 5: 9 kHz to 30 MHz, 911.80 MHz, FCC, emergency stop model



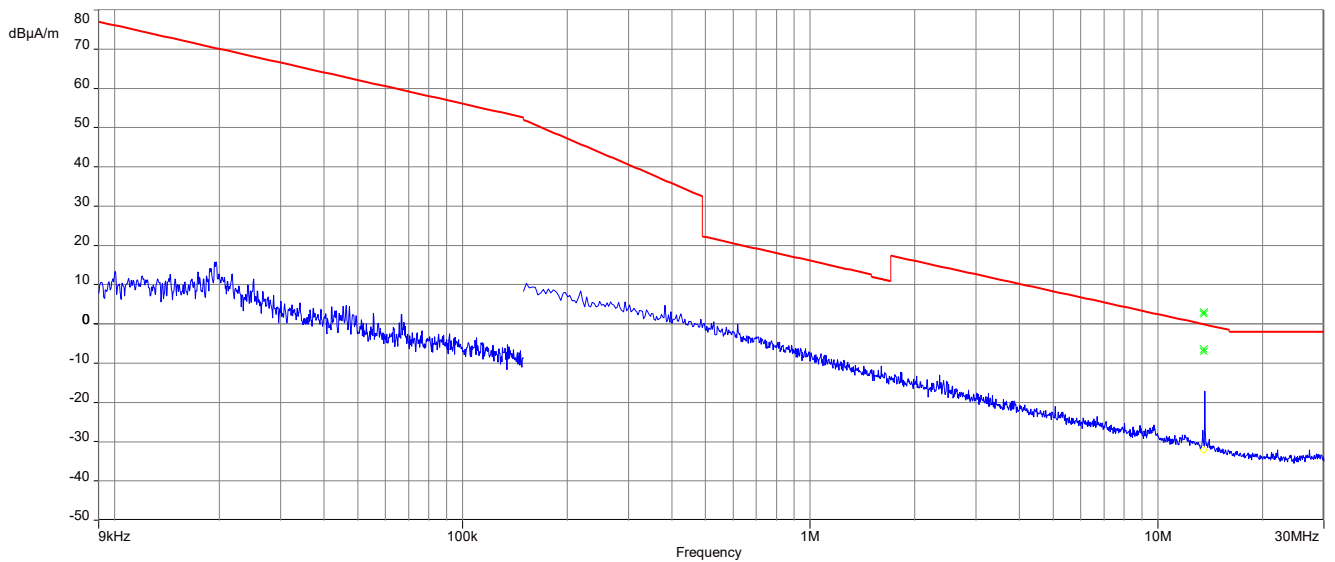
Plot 6: 9 kHz to 30 MHz, 911.80 MHz, ISED, emergency stop model



Plot 7: 9 kHz to 30 MHz, 918.15 MHz, FCC, emergency stop model



Plot8: 9 kHz to 30 MHz, 918.15 MHz, ISED, emergency stop model



12.4 Spurious emissions radiated 30 MHz to 1 GHz

Description:

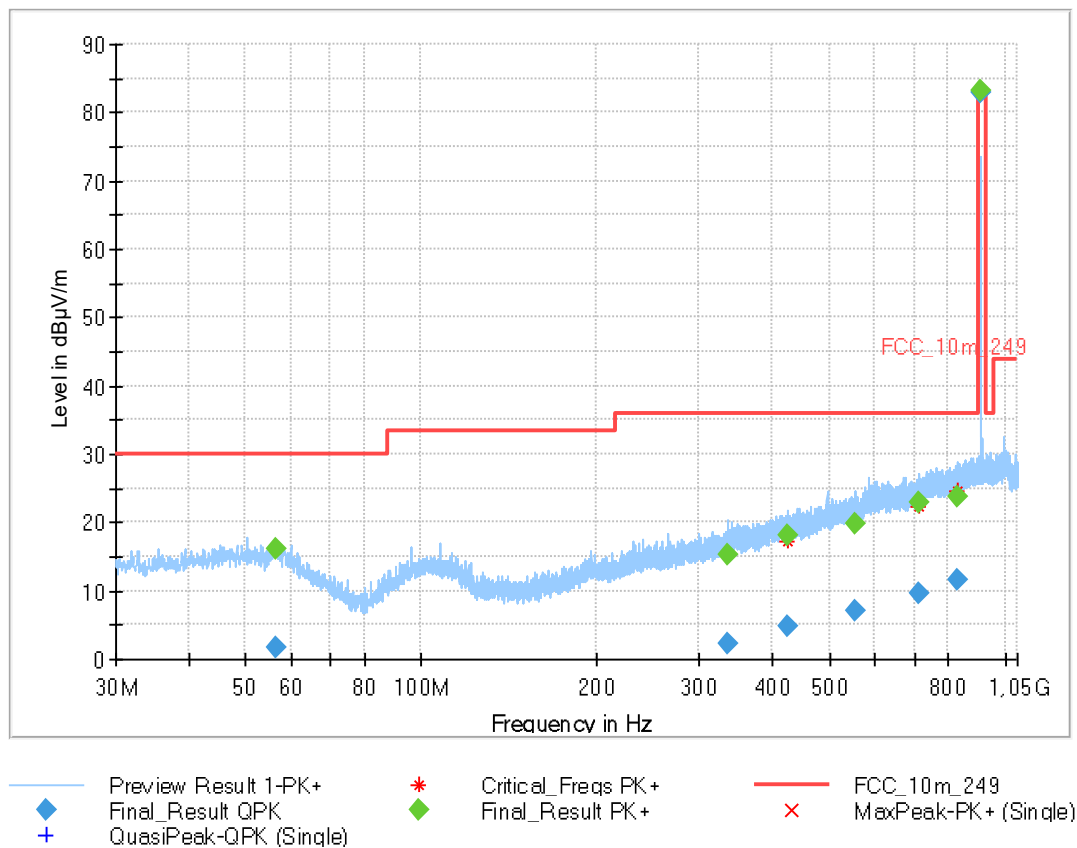
Measurement of the radiated spurious emissions and cabinet radiations below 1 GHz.
Measurement performed according to ANSI C63.10, chapter 6.5

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 7.1A
Measurement uncertainty	See chapter 9

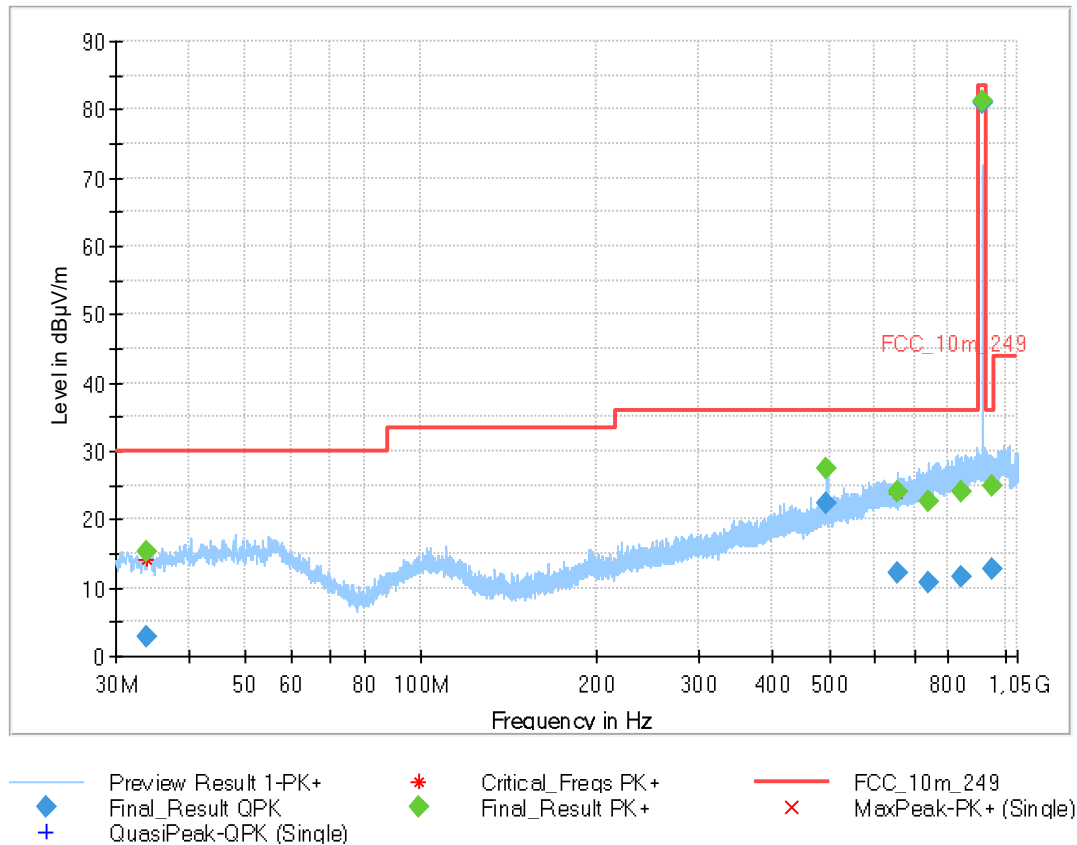
Limits:

FCC		ISED	
Part 15.249 (a): field strength of harmonics			
902 MHz – 928 MHz	Quasi Peak		500 μV/m @ 3 m (54 dBμV/m)
	Peak		5 mV/m @ 3 m (74 dBμV/m)
Part 15.249 (d): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.			
Limit according Part 15.209 (a):			
Frequency /MHz	Field Strength / (dBμV/m)		Measurement distance
	Peak	Quasi Peak	
30 - 88	50.0	30.0	10 m
88 – 216	54.5	33.5	10 m
216 – 960	56.0	36.0	10 m
enabling switch model: Limit calculation according Part 15.249 (d):			
Frequency of the fundamental	Detector	Level of the fundamental	Emission limit (50 dBc)
911.80 MHz	Peak	83.31 dBμV/m	33.31 dBμV/m
	Quasi Peak	82.87 dBμV/m	32.87 dBμV/m
918.15 MHz	Peak	81.34 dBμV/m	31.34 dBμV/m
	Quasi Peak	80.88 dBμV/m	30.88 dBμV/m
emergency stop model: Limit calculation according Part 15.249 (d):			
Frequency of the fundamental	Detector	Level of the fundamental	Emission limit (50 dBc)
911.80 MHz	Peak	82.37 dBμV/m	32.37 dBμV/m
	Quasi Peak	81.87 dBμV/m	31.87 dBμV/m
918.15 MHz	Peak	83.19 dBμV/m	33.19 dBμV/m
	Quasi Peak	82.37 dBμV/m	32.37 dBμV/m

Plot:**Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization, 911.80 MHz, enabling switch model**Final_Result**

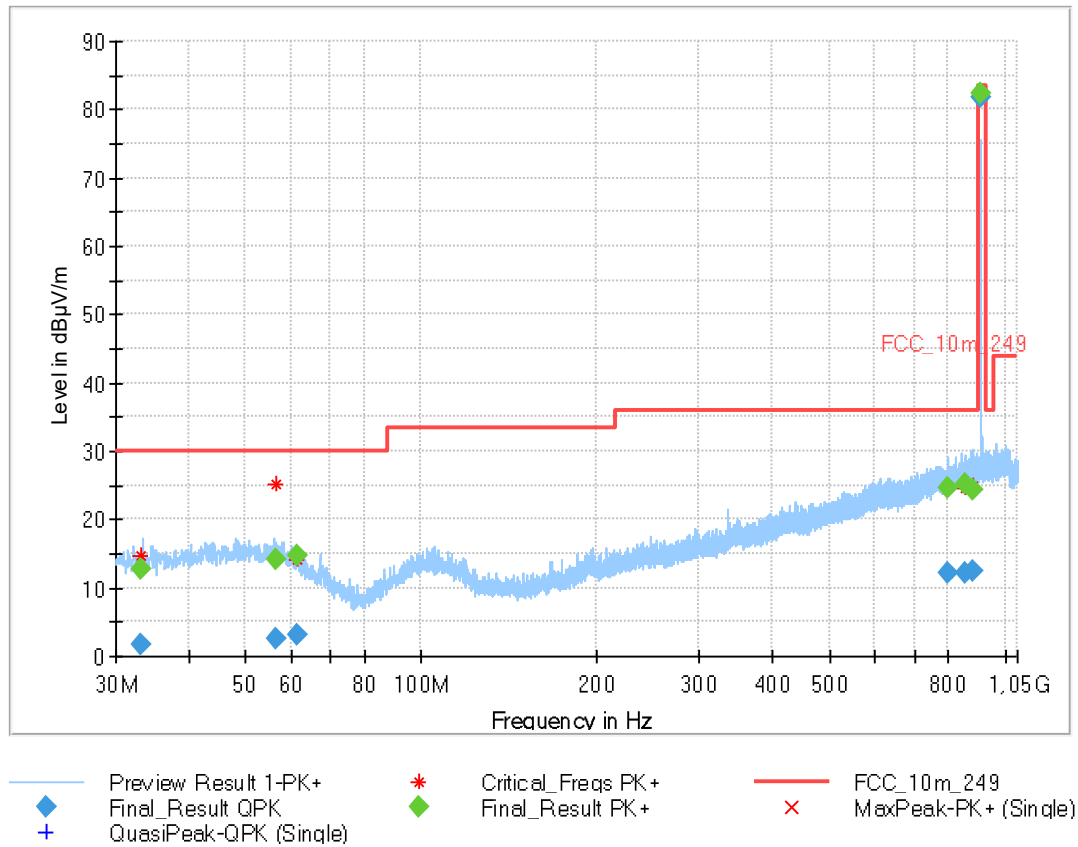
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
56.320	1.67	30.0	28.3	1000	120.0	310.0	V	230	15
334.954	2.23	36.0	33.8	1000	120.0	200.0	H	298	16
425.374	4.93	36.0	31.1	1000	120.0	200.0	H	240	18
554.694	7.05	36.0	29.0	1000	120.0	176.0	H	204	20
714.522	9.66	36.0	26.3	1000	120.0	324.0	V	28	22
830.333	11.53	36.0	24.5	1000	120.0	200.0	V	-37	24

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
911.800	82.87	83.50	0.6	1000	120.0	203.0	V	22	25

Plot 2: 30 MHz to 1 GHz, vertical & horizontal polarization, 918.15 MHz enabling switch**Final_Result**

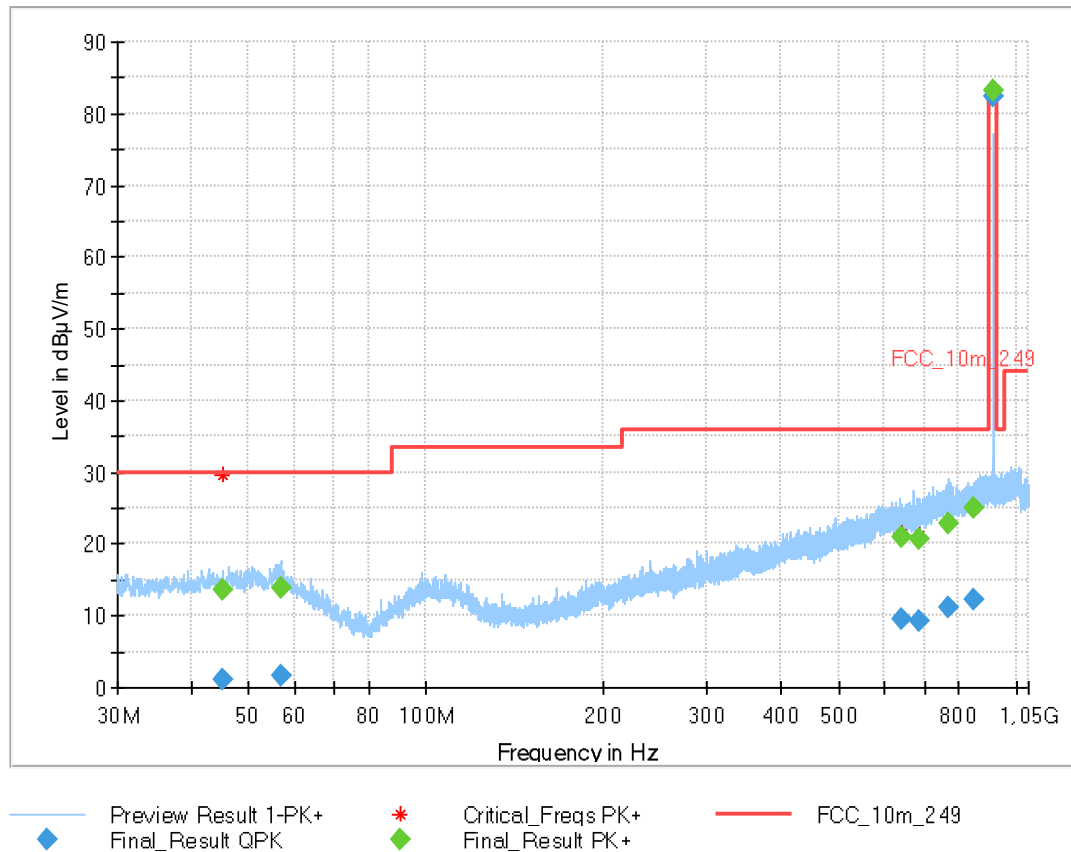
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.800	2.73	30.0	37.3	1000	120.0	115.0	V	155	12
495.987	22.33	36.0	13.7	1000	120.0	103.0	V	173	19
656.028	12.30	36.0	23.7	1000	120.0	108.0	H	264	22
740.209	10.64	36.0	25.4	1000	120.0	155.0	H	272	23
841.131	11.70	36.0	24.3	1000	120.0	108.0	V	155	24
951.091	12.60	36.0	23.4	1000	120.0	227.0	V	344	25

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
918.151	80.88	83.5	2.6	1000	120.0	200.0	V	22	25

Plot 3: 30 MHz to 1 GHz, vertical & horizontal polarization, 911.80 MHz, emergency stop**Final_Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.238	1.67	30.0	28.3	1000	120.0	200.0	V	119	12
56.576	2.48	30.0	27.5	1000	120.0	363.0	V	205	15
61.480	3.20	30.0	26.8	1000	120.0	225.0	H	168	13
797.456	12.10	36.0	23.9	1000	120.0	228.0	V	346	23
853.556	12.18	36.0	23.8	1000	120.0	248.0	V	79	24
882.233	12.38	36.0	23.6	1000	120.0	259.0	H	257	25

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
911.815	81.87	83.5	1.6	1000	120.0	257.0	V	180	25

Plot 4: 30 MHz to 1 GHz, vertical & horizontal polarization, 918.15 MHz emergency stop**Final_Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.362	1.18	30.0	28.8	200	120.0	400.0	V	299	14
56.978	1.70	30.0	28.3	200	120.0	200.0	H	180	15
641.684	9.39	36.0	26.6	200	120.0	200.0	H	28	21
683.016	9.21	36.0	26.8	200	120.0	112.0	V	-42	22
769.984	11.07	36.0	24.9	200	120.0	200.0	H	290	23
850.086	12.20	36.0	23.8	200	120.0	200.0	V	306	24

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
918.154	82.37	83.5	1.1	1000	120.0	200.0	V	173	25

12.5 Spurious emissions radiated above 1 GHz

Description:

Measurement of the radiated spurious emissions above 1 GHz in transmit mode
Measurement performed according to ANSI C63.10, chapter 6.6

Measurement:

Measurement parameter	
Detector:	Peak / AVG
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	1 GHz to 10 GHz
Trace mode:	Max Hold
Test setup:	See chapter 7.2B
Measurement uncertainty	See chapter 9

Limits:

FCC		ISED	
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.			
Frequency	Field Strength		Measurement distance
	Peak	AVG	
Above 960 MHz	74 dBµV/m	54 dBµV/m	3 m

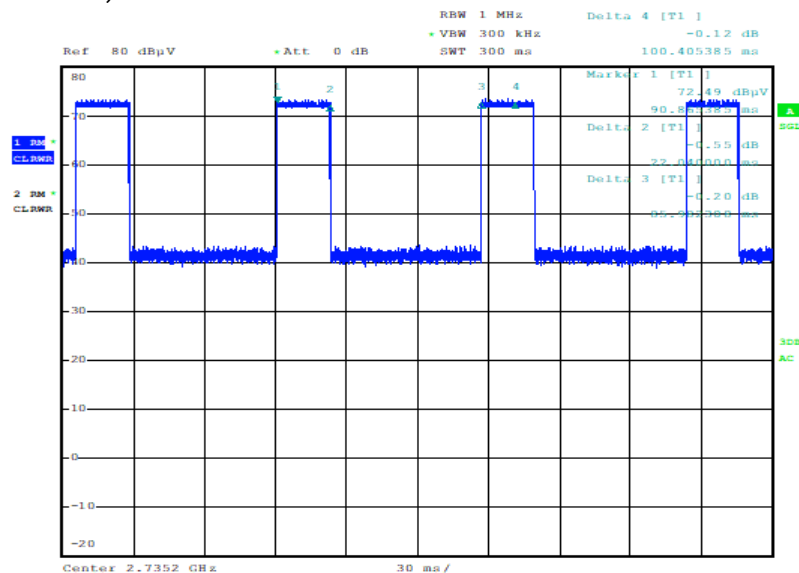
Results: enabling switch model

TX Spurious Emissions Radiated								
911.80 MHz			-/-			918.15 MHz		
F / MHz	Detector	Level / dBµV/m	F / MHz	Detector	Level / dBµV/m	F / MHz	Detector	Level / dBµV/m
2735.2	Peak	58.03	-/-	Peak	-/-	2754.4	Peak	54.71
	AVG	49.16*		AVG	-/-		AVG	53.32
-/-	Peak	-/-	-/-	Peak	-/-	3672.4	Peak	54.03
	AVG	-/-		AVG	-/-		AVG	51.19

*peak to average correction by 8.87 dB

$$DC = 20 \log \frac{22 \text{ ms} + 14 \text{ ms}}{100 \text{ ms}} = -8.87 \text{ dB}$$

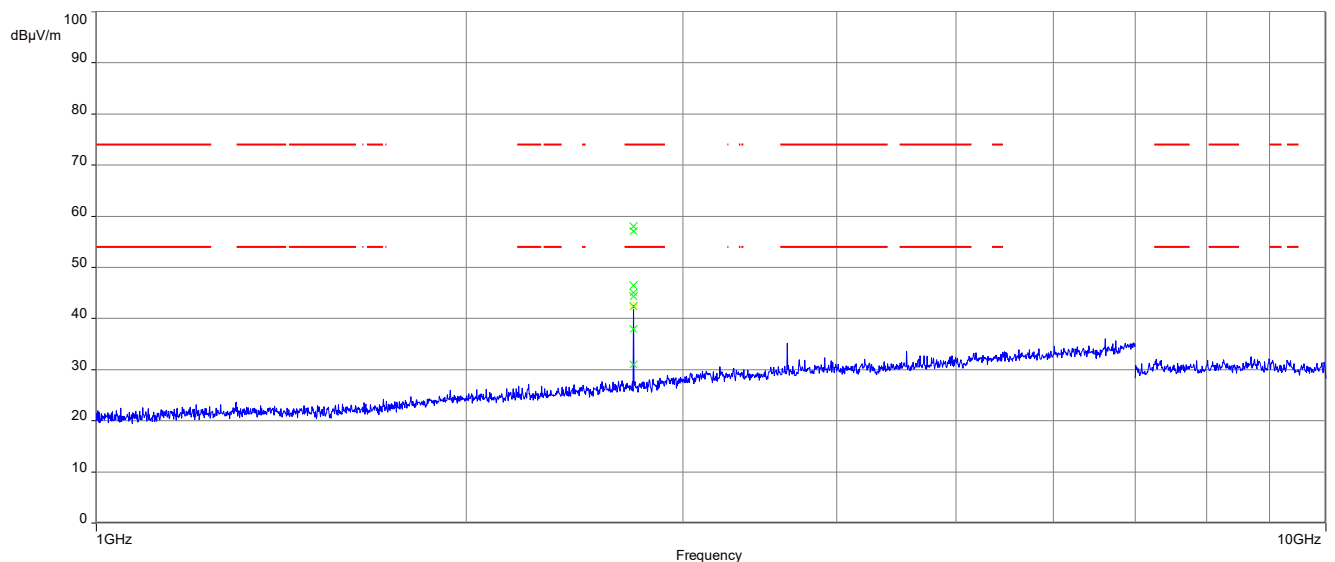
Plot (timing within 100ms):

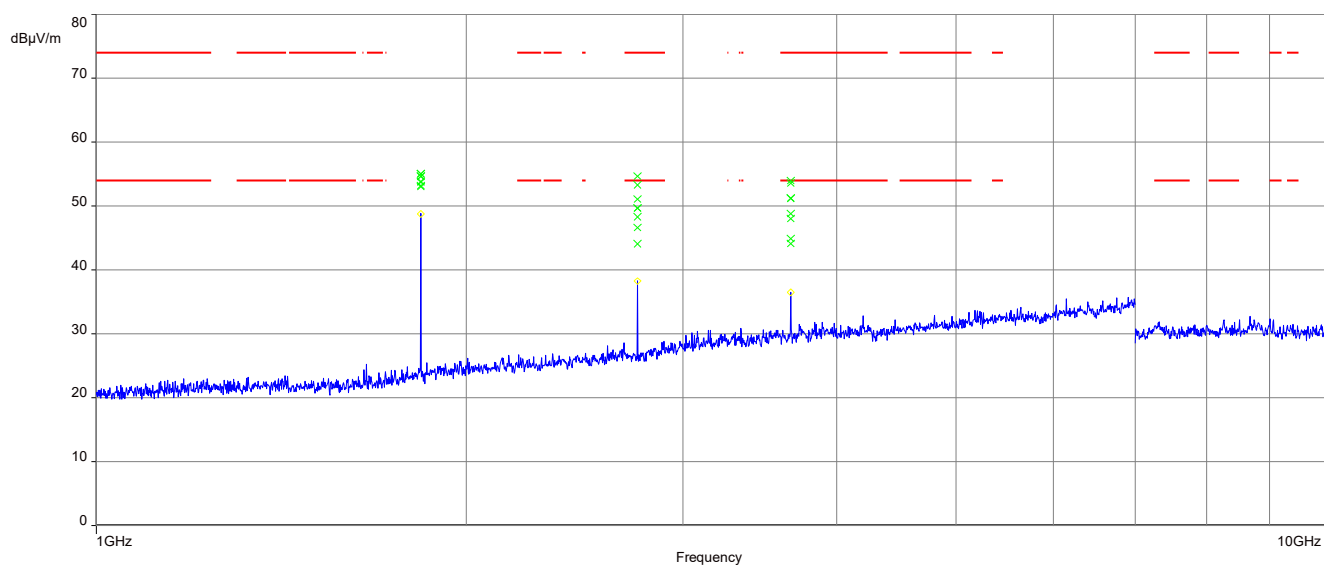


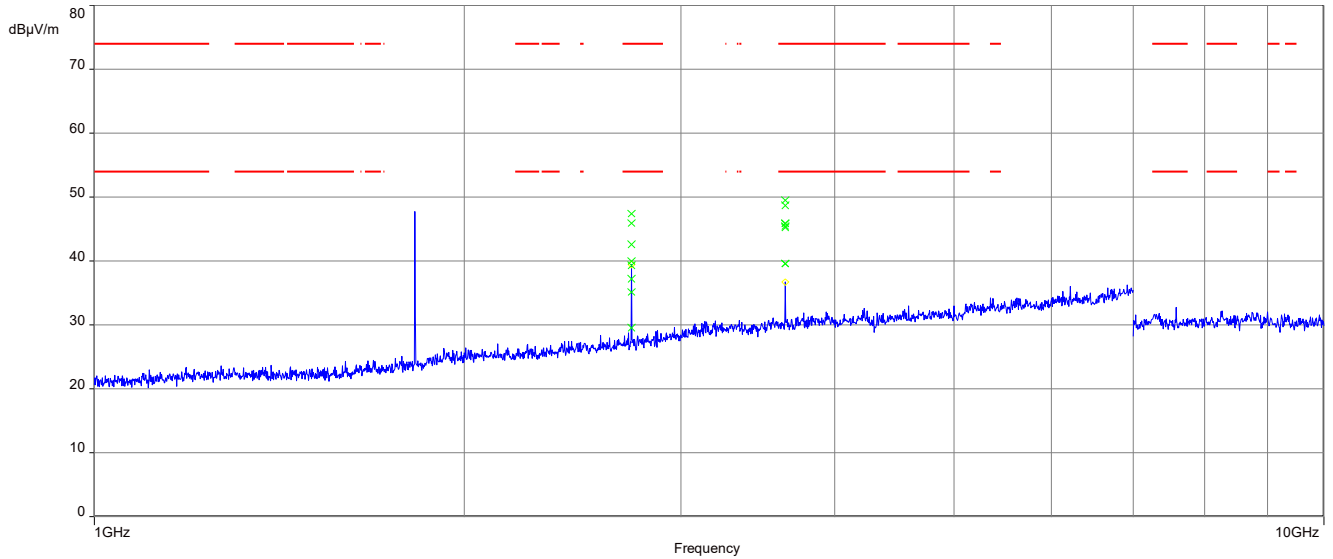
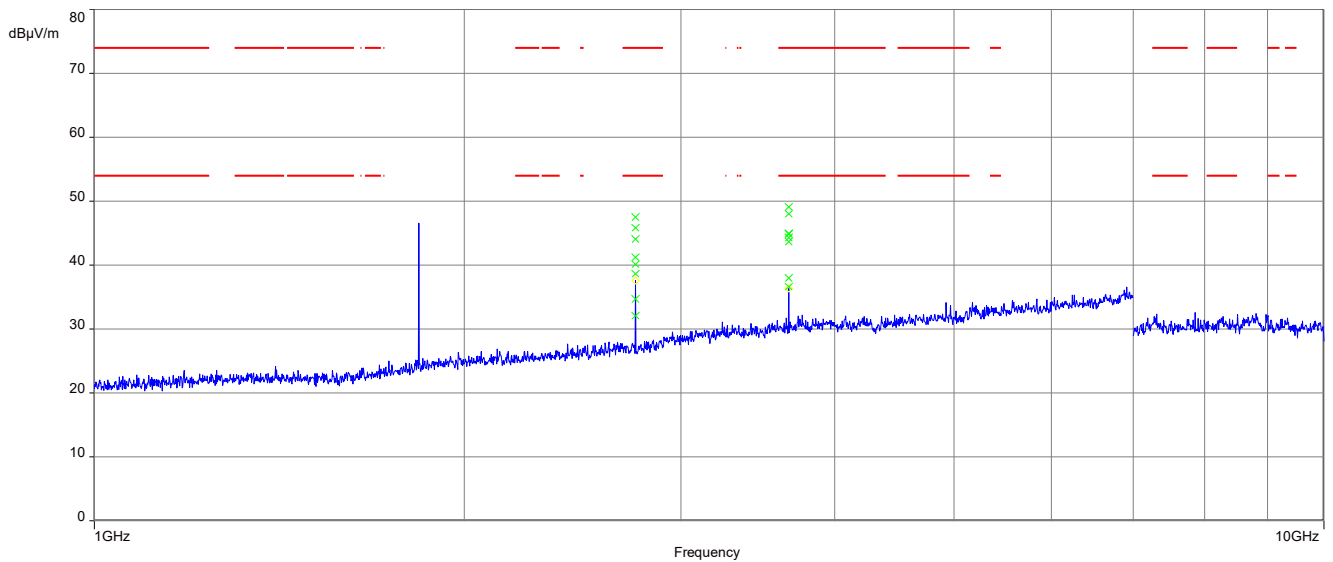
Date: 3.MAR.2026 12:45:10

Results: emergency stop model

TX Spurious Emissions Radiated								
911.80 MHz			-/-			918.15 MHz		
F / MHz	Detector	Level / dB μ V/m	F / MHz	Detector	Level / dB μ V/m	F / MHz	Detector	Level / dB μ V/m
2735.2	Peak	47.41	-/-	Peak	-/-	2754.4	Peak	47.52
	AVG	45.92		AVG	-/-		AVG	45.89
3647.2	Peak	49.53	-/-	Peak	-/-	3672.4	Peak	49.16
	AVG	45.93		AVG	-/-		AVG	44.87

Plots: enabling switch model**Plot 1:** 1 GHz to 10 GHz, vertical & horizontal polarization, 911.80 MHz, enabling switch model**Plot 2:** 1 GHz to 10 GHz, vertical & horizontal polarization, 918.15 MHz, enabling switch model



Plots: emergency stop model**Plot 1:** 1 GHz to 10 GHz, vertical & horizontal polarization, 911.80 MHz, emergency stop**Plot 2:** 1 GHz to 10 GHz, vertical & horizontal polarization, 918.15 MHz, emergency stop

13 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

14 Document history

Version	Applied changes	Date of release
R01	Initial release	2026-04-28
R02	FCC ID changed	2026-07-31

END OF TEST REPORT