

FCC, ISED Test Report (Part 15C, RSS-Gen, RSS-210) NFC

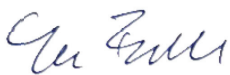
Test report no.:	LAB-1050B (v4.0)	Date of report:	14-Aug-2025
Number of pages:	38	Lab project responsible:	Oliver Flecke
Test period:	07-Apr-2025 to 25-Apr-2025		

Applicant:	Molex Technologies GmbH, Mizarstrasse 3, 12529 Schönefeld, Germany, Mr. Dominik Liedmann		
Manufacturer:	Molex Technologies GmbH, Mizarstrasse 3, 12529 Schönefeld, Germany		
EUT identification:	Molex, WCH-PF30 (WCH-307b, WCH-307c, WCH-307d)		
FCC ID:	RK7WCH-PF30	ISED ID:	4774A-WCHPF30

Testing laboratory:	Molex CVS Lab, Molex CVS Bochum GmbH, Meesmannstr.103, 44807 Bochum, Germany		
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e-mail:	Product.Validation.Bochum@molex.com		
FCC designation no.:	DE0017	ISED recognition no.:	DE0015
Laboratory manager:	Robert Müller		

Test result:	The EUT complies with the requirements made in the referred test documents.
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Approver:	Ines Baufeld	Technical review:	Frank Wittmann
Title:	Laboratory Quality Manager	Title:	Senior Test Engineer EMC

Signature:  Signature: 

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Lab project responsible: Oliver Flecke
Date of issue: 14-Aug-2025
Report no.: LAB-1050B (v4.0)

FCC, ISED Test Report (RK7WCH-PF30, 4774A-WCHPF30)
Template Version 8.0
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Version History

Report Number	Date	Comment
LAB-1050B (v1.0)	11-Jul-2025	1 st approved version
LAB-1050B (v2.0)	11-Jul-2025	2 nd approved version, SW version corrected
LAB-1050B (v3.0)	12-Aug-2025	3 rd approved version, added ISED measurement results below 30 MHz in dBμA/m
LAB-1050B (v4.0)	14-Aug-2025	4 th approved version, updated EUT information as declared by manufacturer

Former issued versions of this report are declared as invalid.

1. Summary for FCC Part 15C Test Report

Date of receipt	07-Apr-2025
Testing completed	25-Apr-2025
The customer's contact person	Mr. Dominik Liedmann
Test samples, setup pictures	LAB-1050D_FCC_EUT_&_NFC_Test_Setup_Photo_Report
HW change, difference document	1.3_WCH-PF30_Difference_document_1.0
Notes	none

1.1. EUT and accessory information

The EUT is an inductive wireless power transfer device (wireless charger) with RFID system (NFC) operating at 13.56 MHz. The EUT is tested without mobile phone in a continuous NFC transmission mode with active modulation, configured via UART interface (Duty cycle of 100 %).

The following test samples provided by the customer were tested.

ID	Description	Manufacturer	Type	S/N	HW Version	SW Version
250394	WPT Device	Molex	WCH-PF30	PA-01250690021	01	01
250395	WPT Device	Molex	WCH-PF30	PA-01250690019	01	01

The following accessories have been provided by the customer and belong to the equipment under test (EUT).

ID	Description	Manufacturer	Type	S/N	HW Version	SW Version
230571	System power cable	Molex	-	-	-	-
230577	System power cable	Molex	-	-	-	-
230802	Rubber mat	Molex	-	-	-	-
230805	Rubber mat	Molex	-	-	-	-

1.2. Technical characteristics

Power Supply	Lead-acid battery (vehicle regulated) – 12 V DC		
Voltage Range	$U_{nom} = 13.2 \text{ V}$	$U_{min} = 11.1 \text{ V}$	$U_{max} = 15.2 \text{ V}$
NFC communication cut-off Voltage	$U_{cut-off} = 9.0 \text{ V}$ (NFC communication is stopped for $U < U_{cut-off}$)		
Temperatures Range	$-20 \text{ }^{\circ}\text{C}$ to $+85 \text{ }^{\circ}\text{C}$		
Radio Type	NFC transceiver		
Operating Frequency	13.56 MHz		
Operating Channels	Not channelized		
Antenna Type	Integral		
Antenna gain [dBi]	n.a.		
Product Category	RFID		
Modulation Type	ASK		
RFID Classification	Wideband (ISO14443, NFC...)		

The above technical information was provided by the applicant. For more details, please refer to the User's manual of the EUT.

1.3. Applied standards

Standard / Rule Part	Version	Year
CFR 47, FCC Part 15C	-	Jul-2025
ANSI C63.10	-	Sep-2020 (+COR1 2023)
ANSI C63.10a	-	Aug-2024
ISED RSS-Gen	Issue 5 +AMD1 +AMD2	Feb-2021
ISED RSS-210	Issue 11	Jun-2024

Deviations or clarifications to these standards are noted in the related test result under "test method and limit".

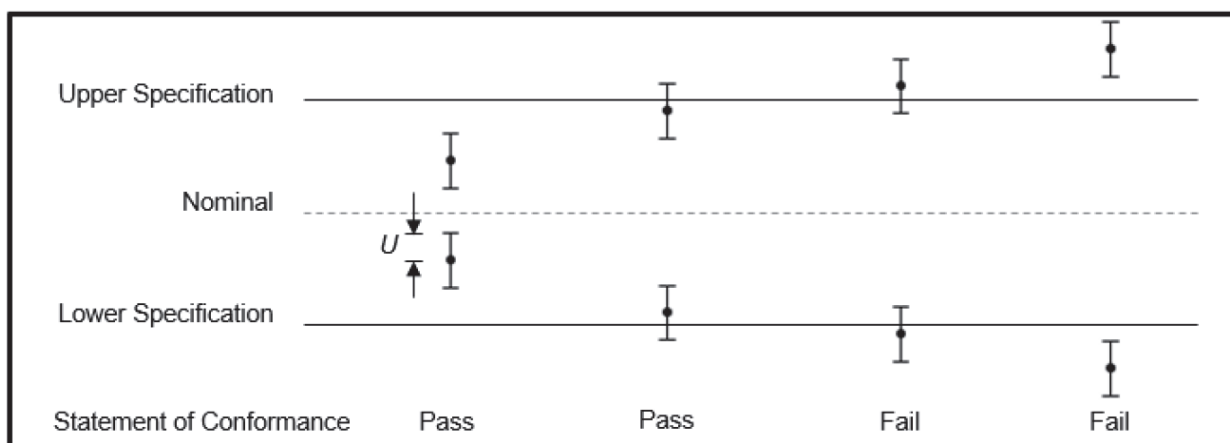
1.4. Measurement uncertainties

Parameter	Measurement Uncertainty	Maximum Uncertainty
Radio Frequency	$\pm 3.6 \times 10^{-7}$	$\pm 1 \times 10^{-5}$
Total RF Power, conducted	± 0.79 dB	± 1.5 dB
RF Power density, conducted	± 0.79 dB	± 3.0 dB
Spurious emissions, conducted	± 1.67 dB	± 3.0 dB
All emissions, radiated	± 5.38 dB	± 6.0 dB
Temperature	± 1.0 °C	± 3.0 °C
Humidity	± 2.0 %	± 5.0 %

These uncertainties represent an expanded uncertainty expressed approximately at the 95% confidence level using a coverage factor of $k=2$

1.5. Decision rule

Unless it is inherent in the requested customer specification or test standard, the “Binary Statement for Simple Acceptance” as defined in ILAC G8:2019 clause 4.2.1 is applied as decision rule for the conformity statement, see the following picture. Therefore, the measured values are compared directly with the limit values without taking the measurement uncertainty into account.



U = 95% expanded measurement uncertainty

1.6. Risk Assessment

Following the guidance of ILAC G8:2019 clause 5.2, the level of specific risk of False Accept or False Reject considering different decision rules and respectively expanded measurement uncertainties can be expressed as follows.

Decision Rule	Distance of Measurement Value to Limit	Probability of wrong Conformity Statement
6 Sigma	3 x Measurement Uncertainty	< 1 ppm
3 Sigma	1.5 x Measurement Uncertainty	< 0.16 %
ILAC G8:2009 Rule	1 x Measurement Uncertainty	< 2.5 %
ISO 14253.1:2017	0.83 x Measurement Uncertainty	< 5 %
Simple Acceptance, ILAC G8:2009 4.2.1	Measurement Value on Limit Line	50 % "worst case" scenario

1.7. Summary of test results

Section	Section in CFR 47	Section in RSS-Gen	Section in RSS-210	Name of the test	Result
3	15.225 (a)(b)(c)	-	B.6 (a)	Field strength in the 13.56 MHz band	PASSED
4	15.225 (d), 15.209	8.9	-	Radiated emissions below 30 MHz	PASSED
4.2	15.225 (d), 15.209	8.9	-	Radiated emissions above 30 MHz	PASSED
6	15.225 (e)	8.11	B.6 (b)	Frequency stability, temperature variation	PASSED
7	15.225 (e)	8.11	B.6 (b)	Frequency stability, voltage variation	PASSED
-	15.207	8.8	-	AC powerline conducted emissions	NA
8	15.215 (c)	6.7	-	Occupied bandwidth	PASSED

PASSED: The EUT complies with the essential requirements in the standard.

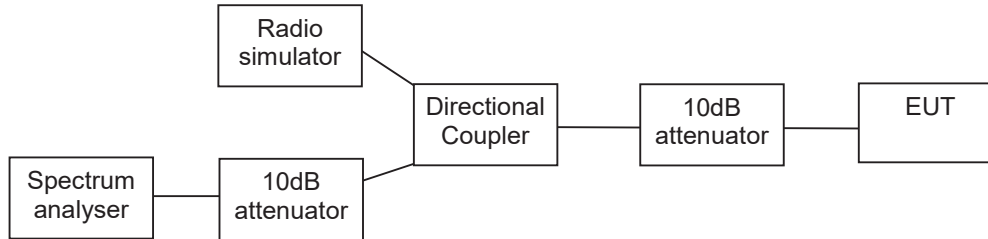
FAILED: The EUT does not comply with the essential requirements in the standard.

NP: The test was not performed.

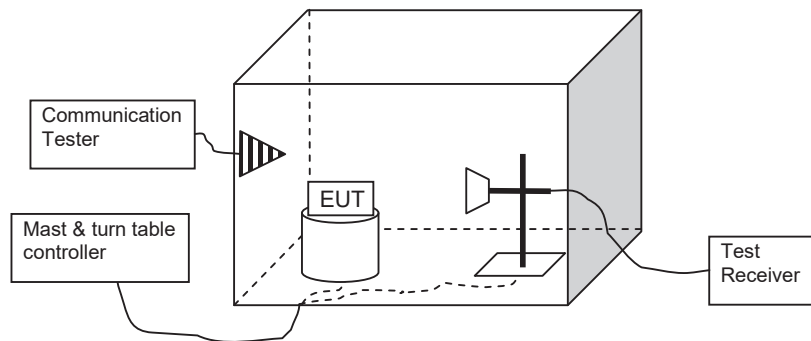
NA: The test was not applicable.

2. Test setups

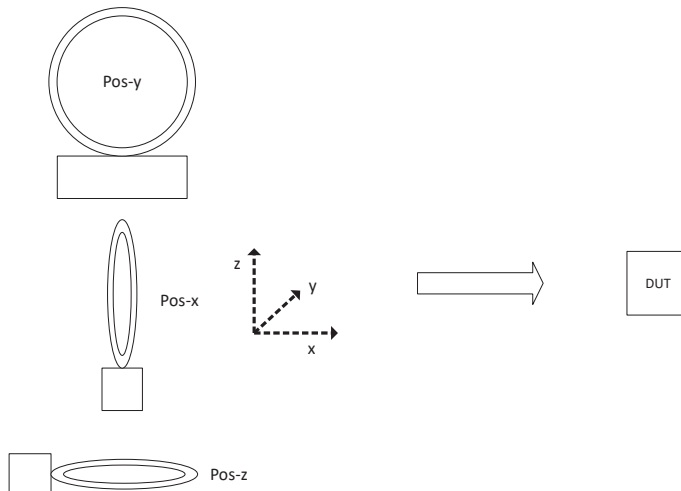
2.1. Conducted radio test setup (Setup 1)



2.2. Radiated emission test setup (Setup 2)



Loop Antenna orientation:



3. Field strength in the 13.56 MHz band

EUT with DUT number	250394
Accessories with DUT numbers	230577, 230805
Operation voltage	13.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	22-Apr-2025 to 25-Apr-2025
Test responsible	Frank Wittmann
Test system SW / version / configuration	Rohde & Schwarz EMC32 / 11.70.00 / v2.2

3.1. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-210 as follows:

- ⇒ The measurement distance is 3 m with a shielded loop antenna. The magnetic field to electric field conversion factor is 51.5 dB (dBμA/m = dBμV/m – 51.5 dB).
- ⇒ The Limit has been adjusted with the distance correction factor according to 15.31(f)(2). (+40 dB for 30 m distance and +80 dB for 300 m distance)
- ⇒ The measurement is divided into the Preliminary Measurement and the Final Measurement.
The Preliminary Measurement and the Final Measurement are performed with the measuring antenna at 1m height. The equipment under test (EUT) is located on an 80 cm table, which is rotated by 360 degrees. The DUT is positioned in horizontal position on the test table.
- ⇒ During the Preliminary Measurement, the suspected frequencies are searched by using the PK detector and the measuring antenna is turned in 3 orthogonal positions (x-, y-, z-pos) to find out worst case position.
In the Final Measurement the exact frequency and amplitude of these emissions are re-measured by using the applicable QP and AV detector.
- ⇒ The Final Measurement is performed if the Preliminary Measurement results are closer than 20 dB to the permissible limit.
- ⇒ The measurement results are obtained as described in the following formula: $E \text{ [dB}\mu\text{V/m]} = U_{RX} + A_{CF}$
Where U_{RX} is receiver reading and A_{CF} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{CF} = L_{CABLES} + AF - G_{PREAMP}$).
- ⇒ Example values for calculation of one final QP measurement frequency at 13.56 MHz, see result in 3.2:
 $E \text{ [dB}\mu\text{V/m]} = 39.05 + 22.8 = 61.85$

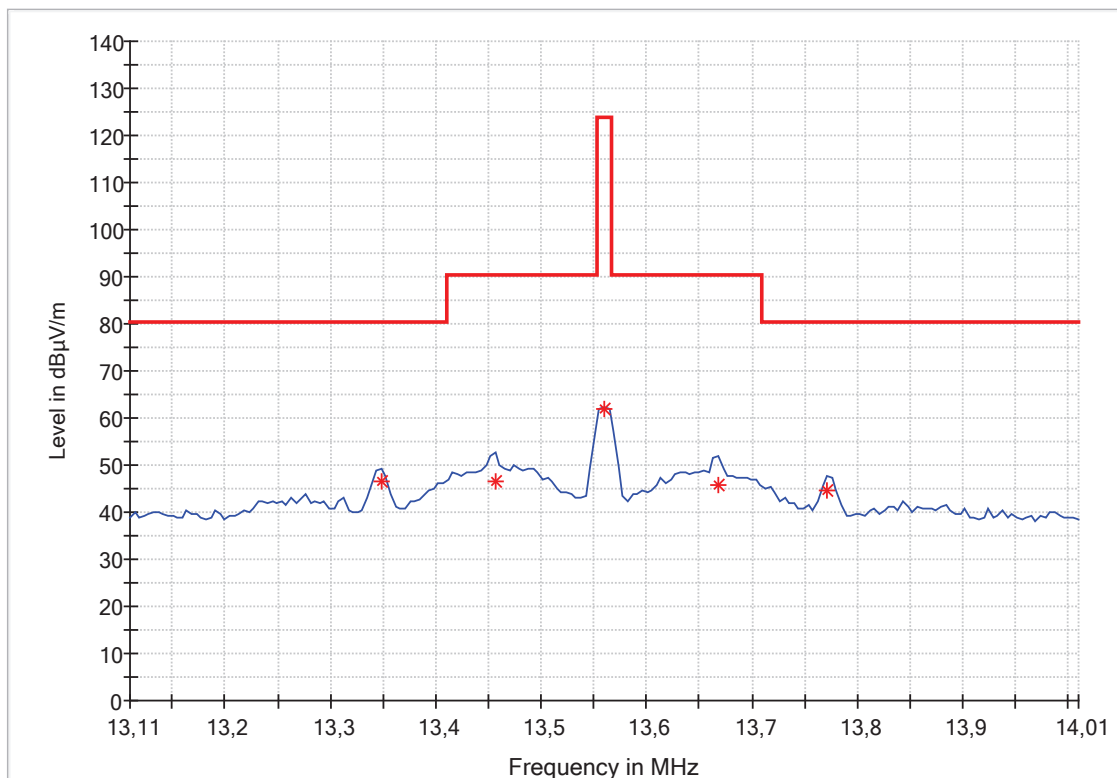
FCC and ISSED limits for field strength (13.56 MHz band) measurements at 3 m measurement distance.

Frequency range [MHz]	Limit [μV/m]	Limit [dBμV/m]	Detector
13.553 - 13.567	15.848 (* 100)	84 (+40 dB)	QP
13.410 - 13.553	334 (* 100)	50.5 (+40 dB)	QP
13.567 - 13.710			QP
13.110 - 13.410	106 (* 100)	40.5 (+40 dB)	QP
13.710 - 14.010			QP

3.2. Test results (FCC, ISCED)

DUT horizontal, Antenna x-position

Peak detector (RBW 10 kHz)



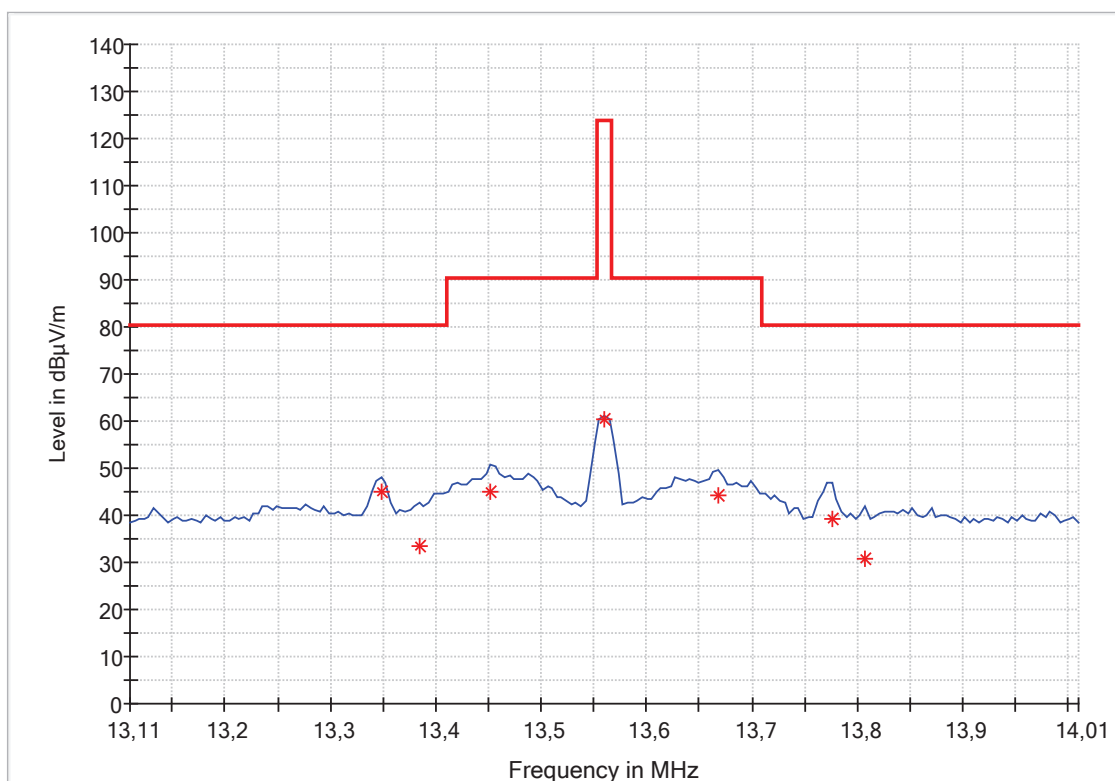
Quasi-Peak detector (RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
13.348500	46.65	80.50	33.85	15000.0	9.000	100.0	X-Pos	270.0	22.8	PASSED
13.456500	46.60	90.50	43.90	15000.0	9.000	100.0	X-Pos	270.0	22.8	PASSED
13.560000	61.85	124.00	62.15	15000.0	9.000	100.0	X-Pos	264.0	22.8	PASSED
13.668000	45.80	90.50	44.70	15000.0	9.000	100.0	X-Pos	275.0	22.8	PASSED
13.771500	44.51	80.50	36.00	15000.0	9.000	100.0	X-Pos	285.0	22.8	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna y-position

Peak detector (RBW 10 kHz)



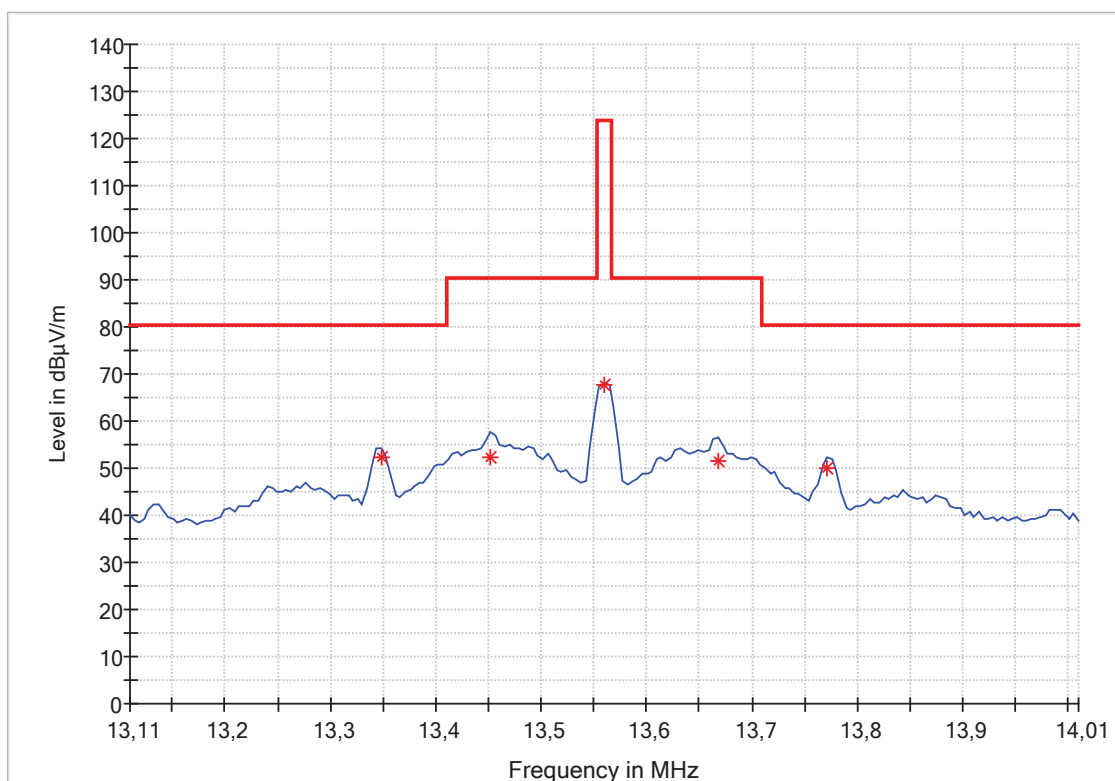
Quasi-Peak detector (RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
13.348500	44.93	80.50	35.57	15000.0	9.000	100.0	Y-Pos	9.0	22.8	PASSED
13.384500	33.27	80.50	47.23	15000.0	9.000	100.0	Y-Pos	310.0	22.8	PASSED
13.452000	44.93	90.50	45.57	15000.0	9.000	100.0	Y-Pos	15.0	22.8	PASSED
13.560000	60.34	124.00	63.66	15000.0	9.000	100.0	Y-Pos	6.0	22.8	PASSED
13.668000	44.37	90.50	46.13	15000.0	9.000	100.0	Y-Pos	330.0	22.8	PASSED
13.776000	39.17	80.50	41.33	15000.0	9.000	100.0	Y-Pos	15.0	22.8	PASSED
13.807500	30.77	80.50	49.73	15000.0	9.000	100.0	Y-Pos	345.0	22.8	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna z-position

Peak detector (RBW 10 kHz)



Quasi-Peak detector (RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
13.348500	52.33	80.50	28.17	15000.0	9.000	100.0	Z-Pos	316.0	22.8	PASSED
13.452000	52.49	90.50	38.01	15000.0	9.000	100.0	Z-Pos	341.0	22.8	PASSED
13.560000	67.54	124.00	56.46	15000.0	9.000	100.0	Z-Pos	302.0	22.8	PASSED
13.668000	51.61	90.50	38.89	15000.0	9.000	100.0	Z-Pos	311.0	22.8	PASSED
13.771500	50.15	80.50	30.35	15000.0	9.000	100.0	Z-Pos	311.0	22.8	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

4. Radiated emissions below 30 MHz

EUT with DUT number	250394
Accessories with DUT numbers	230577, 230805
Operation voltage	13.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	22-Apr-2025 to 25-Apr-2025
Test responsible	Frank Wittmann
Test system SW / version / configuration	Rohde & Schwarz EMC32 / 11.70.00 / v2.2

4.1. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-Gen as follows:

- ⇒ The measurement distance is 3 m with a shielded loop antenna. The magnetic field to electric field conversion factor is 51.5 dB ($\text{dB}\mu\text{A}/\text{m} = \text{dB}\mu\text{V}/\text{m} - 51.5 \text{ dB}$).
- ⇒ The Limit has been adjusted with the distance correction factor according to 15.31(f)(2). (+40 dB for 30 m distance and +80 dB for 300 m distance)
- ⇒ The measurement is divided into the Preliminary Measurement and the Final Measurement.
The Preliminary Measurement and the Final Measurement are performed with the measuring antenna at 1m height. The equipment under test (EUT) is located on an 80 cm table, which is rotated by 360 degrees. The DUT is positioned in horizontal position on the test table.
- ⇒ During the Preliminary Measurement, the suspected frequencies are searched by using the PK detector and the measuring antenna is turned in 3 orthogonal positions (x-, y-, z-pos) to find out worst case position.
In the Final Measurement the exact frequency and amplitude of these emissions are re-measured by using the applicable QP and AV detector.
- ⇒ The Final Measurement is performed if the Preliminary Measurement results are closer than 20 dB to the permissible limit.
- ⇒ The measurement results are obtained as described in the following formula: $E [\text{dB}\mu\text{V}/\text{m}] = U_{\text{RX}} + A_{\text{CF}}$
Where U_{RX} is receiver reading and A_{CF} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{\text{CF}} = L_{\text{CABLES}} + \text{AF} - G_{\text{PREAMP}}$).
- ⇒ Example values for calculation of one final QP measurement frequency at 1.022 MHz, see result in 4.2:
 $E [\text{dB}\mu\text{V}/\text{m}] = 8.54 + 22.2 = 30.74$

FCC limits for radiated emission measurements at 3 m measurement distance.

Frequency range [MHz]	Limit [$\mu\text{V}/\text{m}$]	Limit [$\text{dB}\mu\text{V}/\text{m}$]	Detector
0.009 - 0.090	2400 / F[kHz] (* 10000)	48.5 to 13.8 (+80 dB)	AV
0.090 - 0.110			QP
0.110 - 0.490			AV
0.490 - 1.705	24000 / F[kHz] (* 100)	33.8 to 23.0 (+40 dB)	QP
1.705 - 30.00	30 (* 100)	29.5 (+40 dB)	QP

ISED limits for radiated emission measurements at 3 m measurement distance.

Frequency range [MHz]	Limit [$\mu\text{A}/\text{m}$]	Limit [$\text{dB}\mu\text{A}/\text{m}$]	Detector
0.009 - 0.090	6.37 / F[kHz] (* 10000)	-3.0 to -37.72 (+80 dB)	AV
0.090 - 0.110			QP
0.110 - 0.490			AV
0.490 - 1.705	63.7 / F[kHz] (* 100)	-17.72 to -28.55 (+40 dB)	QP
1.705 - 30.00	0.08 (* 100)	-21.93 (+40 dB)	QP

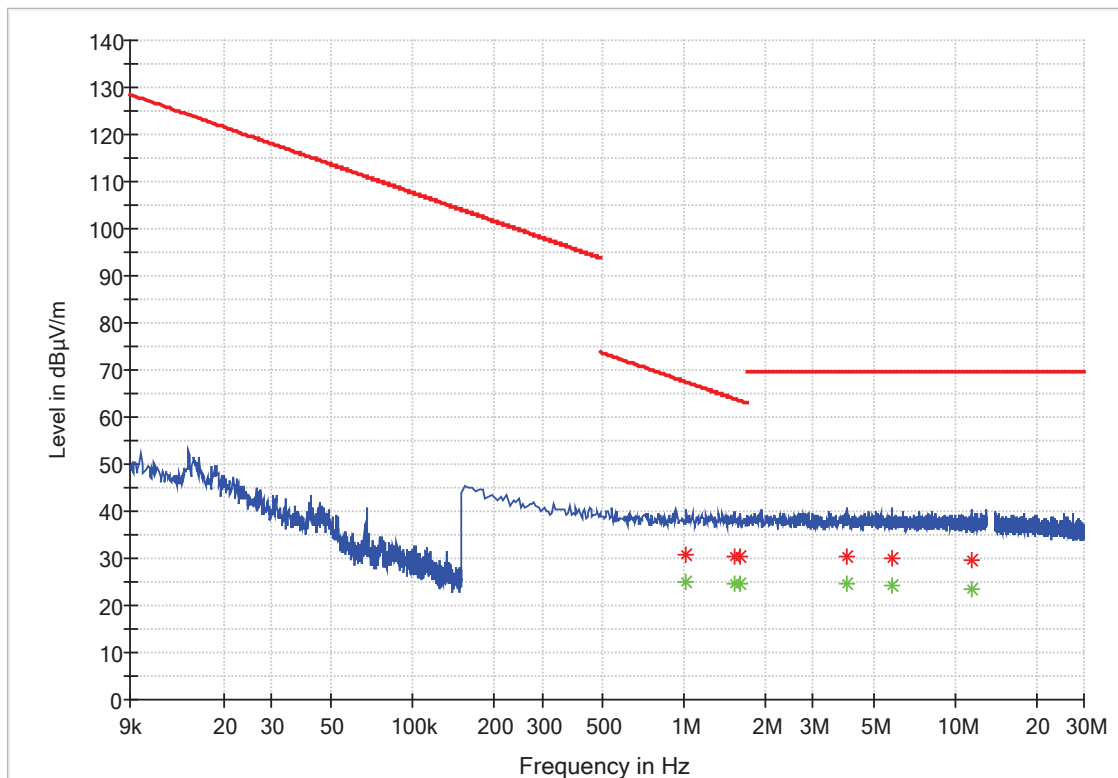
Lab project responsible: Oliver Flecke
Date of issue: 14-Aug-2025
Report no.: LAB-1050B (v4.0)

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Template Version 8.0
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4.2. Test results (FCC)

DUT horizontal, Antenna x-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.022308	30.74	67.41	36.68	15000.0	9.000	100.0	X-Pos	165.0	22.2	PASSED
1.535723	30.51	63.88	33.37	15000.0	9.000	100.0	X-Pos	60.0	22.2	PASSED
1.620462	30.43	63.41	32.98	15000.0	9.000	100.0	X-Pos	341.0	22.2	PASSED
4.023046	30.31	69.54	39.23	15000.0	9.000	100.0	X-Pos	139.0	22.3	PASSED
5.907231	29.97	69.54	39.57	15000.0	9.000	100.0	X-Pos	188.0	22.4	PASSED
11.559785	29.71	69.54	39.83	15000.0	9.000	100.0	X-Pos	251.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

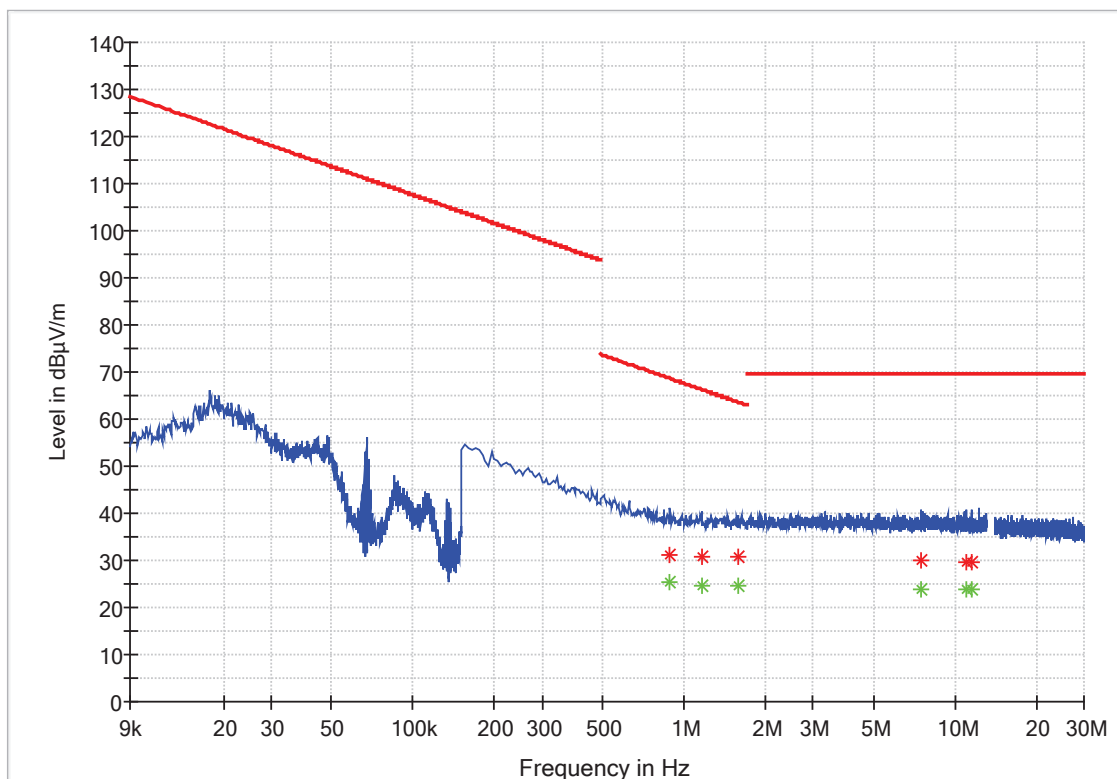
Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.022308	24.91	67.41	42.50	15000.0	9.000	100.0	X-Pos	165.0	22.2	PASSED
1.535723	24.64	63.88	39.24	15000.0	9.000	100.0	X-Pos	60.0	22.2	PASSED
1.620462	24.57	63.41	38.84	15000.0	9.000	100.0	X-Pos	341.0	22.2	PASSED
4.023046	24.49	69.54	45.05	15000.0	9.000	100.0	X-Pos	139.0	22.3	PASSED
5.907231	24.04	69.54	45.50	15000.0	9.000	100.0	X-Pos	188.0	22.4	PASSED
11.559785	23.64	69.54	45.90	15000.0	9.000	100.0	X-Pos	251.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna y-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.887723	31.19	68.64	37.45	15000.0	9.000	100.0	Y-Pos	195.0	22.2	PASSED
1.166862	30.72	66.26	35.54	15000.0	9.000	100.0	Y-Pos	285.0	22.2	PASSED
1.590554	30.61	63.57	32.96	15000.0	9.000	100.0	Y-Pos	111.0	22.2	PASSED
7.512277	29.88	69.54	39.66	15000.0	9.000	100.0	Y-Pos	223.0	22.5	PASSED
10.966615	29.65	69.54	39.89	15000.0	9.000	100.0	Y-Pos	114.0	22.7	PASSED
11.480031	29.69	69.54	39.85	15000.0	9.000	100.0	Y-Pos	225.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

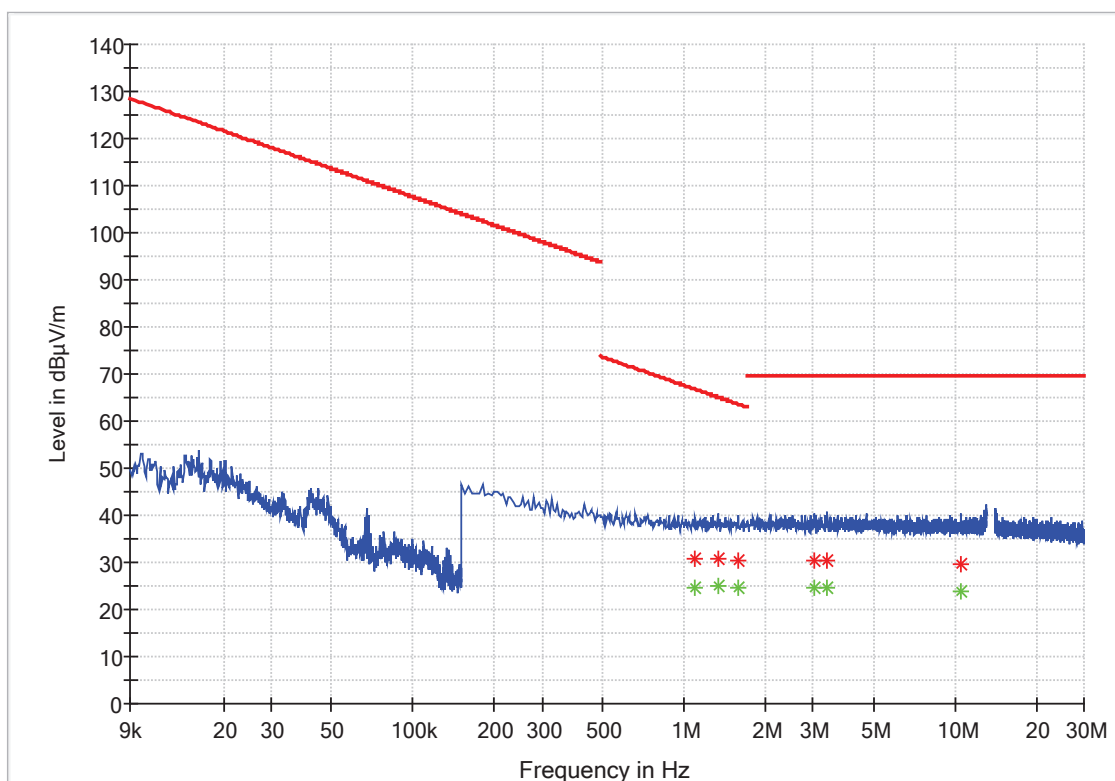
Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.887723	25.32	68.64	43.32	15000.0	9.000	100.0	Y-Pos	195.0	22.2	PASSED
1.166862	24.78	66.26	41.48	15000.0	9.000	100.0	Y-Pos	285.0	22.2	PASSED
1.590554	24.76	63.57	38.82	15000.0	9.000	100.0	Y-Pos	111.0	22.2	PASSED
7.512277	24.01	69.54	45.53	15000.0	9.000	100.0	Y-Pos	223.0	22.5	PASSED
10.966615	23.89	69.54	45.65	15000.0	9.000	100.0	Y-Pos	114.0	22.7	PASSED
11.480031	23.75	69.54	45.79	15000.0	9.000	100.0	Y-Pos	225.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna z-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.102062	30.74	66.76	36.02	15000.0	9.000	100.0	Z-Pos	205.0	22.2	PASSED
1.331354	30.73	65.12	34.39	15000.0	9.000	100.0	Z-Pos	169.0	22.2	PASSED
1.590554	30.56	63.57	33.01	15000.0	9.000	100.0	Z-Pos	300.0	22.2	PASSED
3.046062	30.30	69.54	39.24	15000.0	9.000	100.0	Z-Pos	294.0	22.3	PASSED
3.385015	30.34	69.54	39.20	15000.0	9.000	100.0	Z-Pos	195.0	22.3	PASSED
10.567846	29.74	69.54	39.80	15000.0	9.000	100.0	Z-Pos	315.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

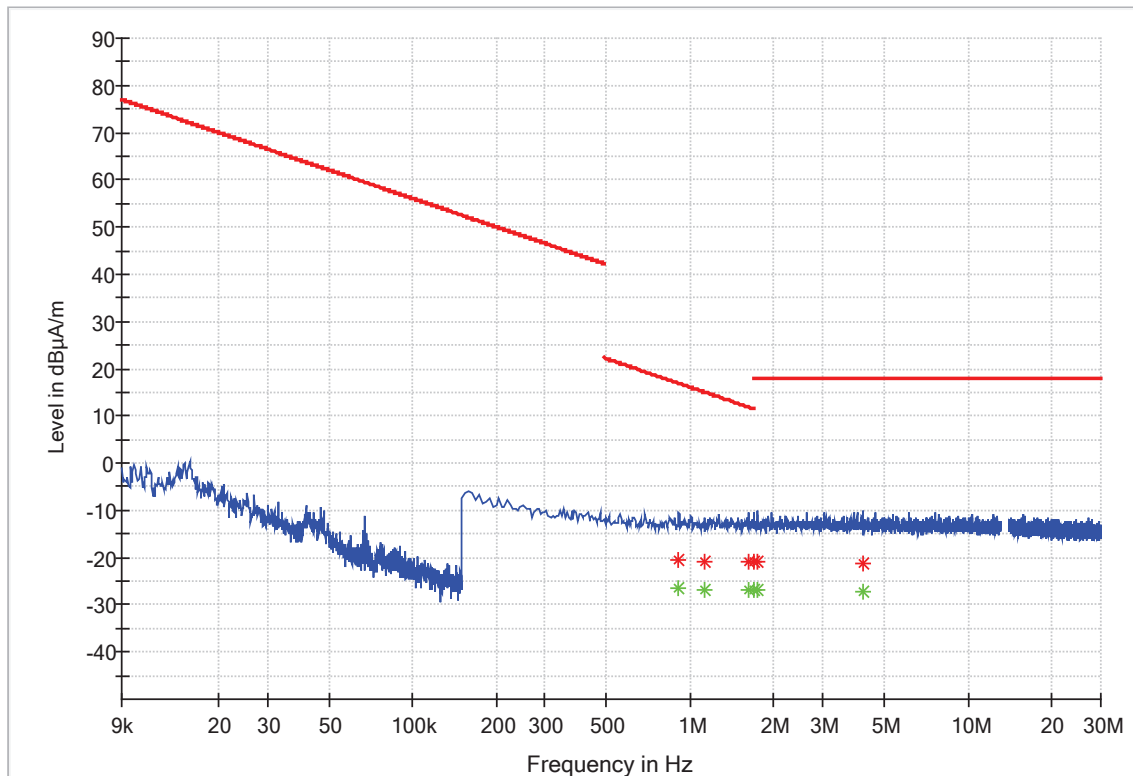
Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.102062	24.79	66.76	41.97	15000.0	9.000	100.0	Z-Pos	205.0	22.2	PASSED
1.331354	24.82	65.12	40.30	15000.0	9.000	100.0	Z-Pos	169.0	22.2	PASSED
1.590554	24.63	63.57	38.94	15000.0	9.000	100.0	Z-Pos	300.0	22.2	PASSED
3.046062	24.47	69.54	45.07	15000.0	9.000	100.0	Z-Pos	294.0	22.3	PASSED
3.385015	24.45	69.54	45.09	15000.0	9.000	100.0	Z-Pos	195.0	22.3	PASSED
10.567846	23.85	69.54	45.69	15000.0	9.000	100.0	Z-Pos	315.0	22.7	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

4.3. Test results (ISED)

DUT horizontal, Antenna x-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.907662	-20.51	16.95	43.45	15000.0	9.000	100.0	X-Pos	15.0	-29.30	PASSED
1.126985	-20.92	15.07	41.80	15000.0	9.000	100.0	X-Pos	32.0	-29.30	PASSED
1.615477	-21.02	11.94	38.78	15000.0	9.000	100.0	X-Pos	60.0	-29.30	PASSED
1.695231	-21.04	11.52	38.35	15000.0	9.000	100.0	X-Pos	68.0	-29.30	PASSED
1.745077	-21.00	18.04	44.81	15000.0	9.000	100.0	X-Pos	319.0	-29.30	PASSED
4.167600	-21.18	18.04	45.11	15000.0	9.000	100.0	X-Pos	225.0	-29.20	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

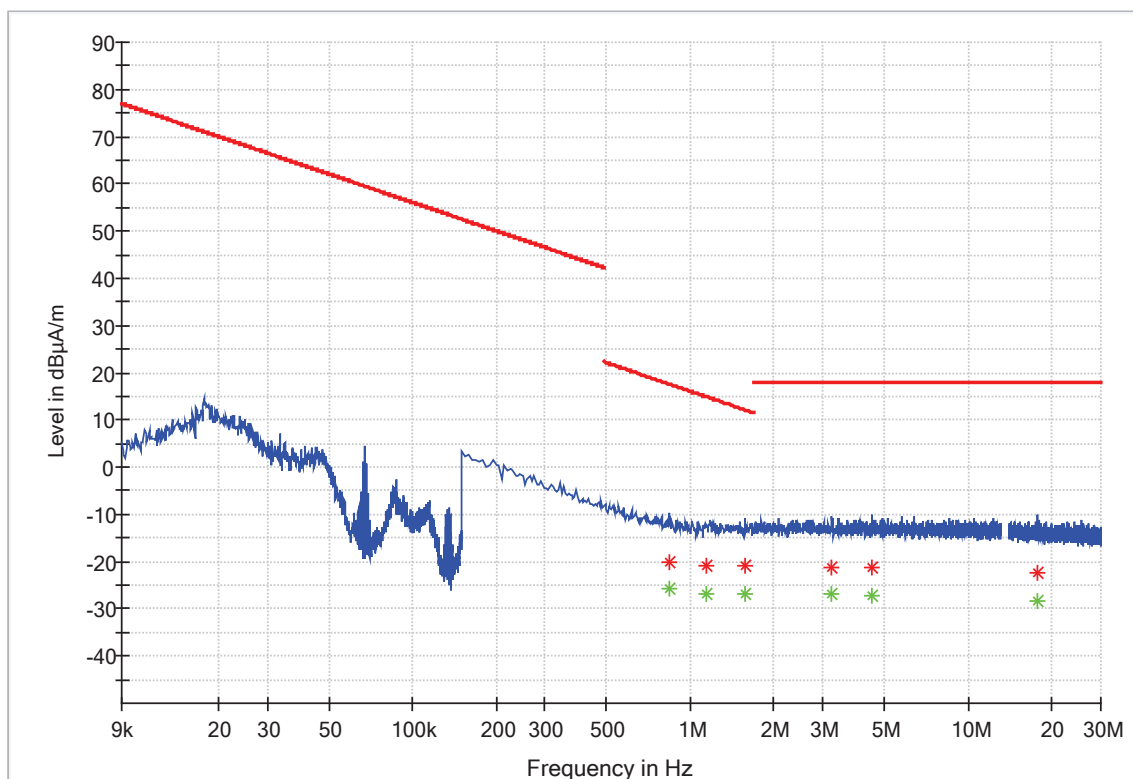
Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.907662	-26.51	16.95	43.45	15000.0	9.000	100.0	X-Pos	15.0	-29.30	PASSED
1.126985	-26.73	15.07	41.80	15000.0	9.000	100.0	X-Pos	32.0	-29.30	PASSED
1.615477	-26.84	11.94	38.78	15000.0	9.000	100.0	X-Pos	60.0	-29.30	PASSED
1.695231	-26.83	11.52	38.35	15000.0	9.000	100.0	X-Pos	68.0	-29.30	PASSED
1.745077	-26.77	18.04	44.81	15000.0	9.000	100.0	X-Pos	319.0	-29.30	PASSED
4.167600	-27.07	18.04	45.11	15000.0	9.000	100.0	X-Pos	225.0	-29.20	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna y-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.837877	-20.01	17.64	37.65	15000.0	9.000	100.0	Y-Pos	267.0	-29.30	PASSED
1.146923	-20.77	14.91	35.69	15000.0	9.000	100.0	Y-Pos	315.0	-29.30	PASSED
1.575600	-20.87	12.16	33.03	15000.0	9.000	100.0	Y-Pos	255.0	-29.30	PASSED
3.240462	-21.11	18.04	39.15	15000.0	9.000	100.0	Y-Pos	289.0	-29.20	PASSED
4.486615	-21.27	18.04	39.31	15000.0	9.000	100.0	Y-Pos	165.0	-29.20	PASSED
17.702691	-22.36	18.04	40.40	15000.0	9.000	100.0	Y-Pos	286.0	-28.50	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

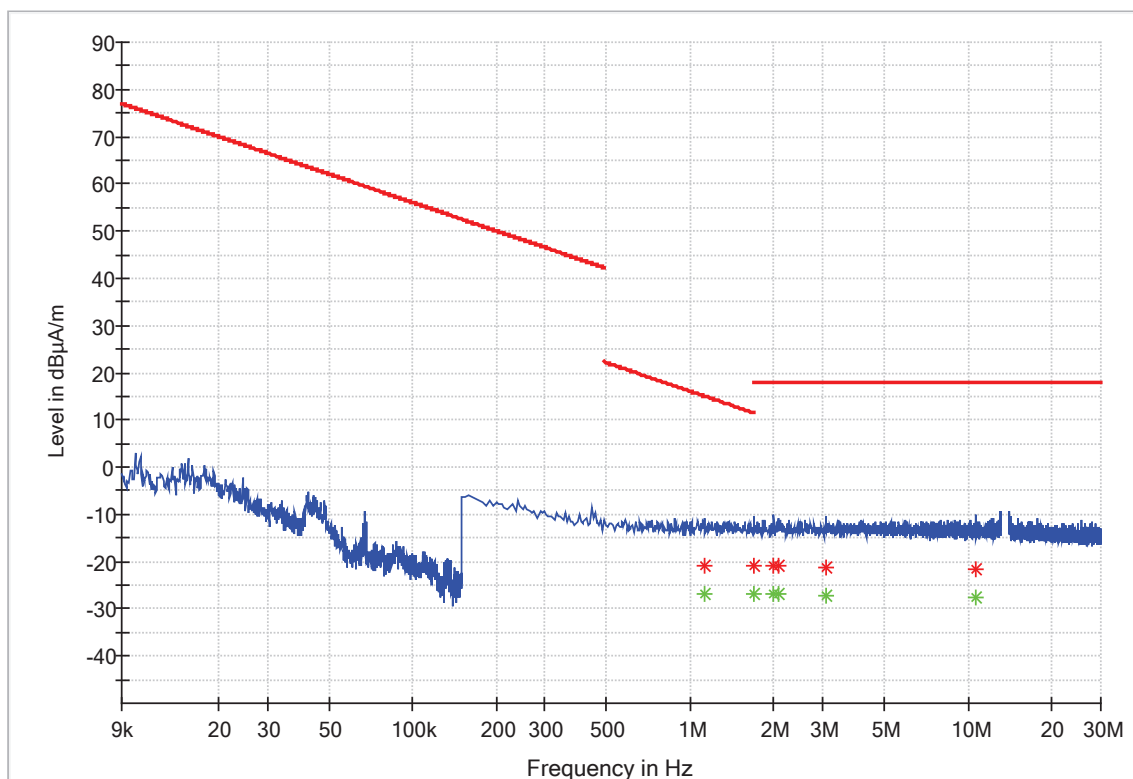
Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
0.837877	-25.84	17.64	43.48	15000.0	9.000	100.0	Y-Pos	267.0	-29.30	PASSED
1.146923	-26.71	14.91	41.63	15000.0	9.000	100.0	Y-Pos	315.0	-29.30	PASSED
1.575600	-26.73	12.16	38.88	15000.0	9.000	100.0	Y-Pos	255.0	-29.30	PASSED
3.240462	-26.98	18.04	45.02	15000.0	9.000	100.0	Y-Pos	289.0	-29.20	PASSED
4.486615	-27.04	18.04	45.09	15000.0	9.000	100.0	Y-Pos	165.0	-29.20	PASSED
17.702691	-28.28	18.04	46.32	15000.0	9.000	100.0	Y-Pos	286.0	-28.50	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

DUT horizontal, Antenna z-position

Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 10 kHz)



Quasi-Peak detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.126985	-20.76	15.07	35.83	15000.0	9.000	100.0	Z-Pos	105.0	-29.30	PASSED
1.690246	-20.96	11.55	32.51	15000.0	9.000	100.0	Z-Pos	278.0	-29.30	PASSED
1.999292	-20.82	18.04	38.86	15000.0	9.000	100.0	Z-Pos	207.0	-29.30	PASSED
2.064092	-20.80	18.04	38.84	15000.0	9.000	100.0	Z-Pos	169.0	-29.30	PASSED
3.095908	-21.08	18.04	39.12	15000.0	9.000	100.0	Z-Pos	239.0	-29.20	PASSED
10.667538	-21.76	18.04	39.80	15000.0	9.000	100.0	Z-Pos	165.0	-28.80	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

Average detector (< 150 kHz: RBW 200 Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμA/m]	Limit [dBμA/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Orientation	Azimuth [deg]	Transducer [dB]	Result
1.126985	-26.73	15.07	41.80	15000.0	9.000	100.0	Z-Pos	105.0	-29.30	PASSED
1.690246	-26.80	11.55	38.35	15000.0	9.000	100.0	Z-Pos	278.0	-29.30	PASSED
1.999292	-26.73	18.04	44.77	15000.0	9.000	100.0	Z-Pos	207.0	-29.30	PASSED
2.064092	-26.76	18.04	44.80	15000.0	9.000	100.0	Z-Pos	169.0	-29.30	PASSED
3.095908	-27.08	18.04	45.12	15000.0	9.000	100.0	Z-Pos	239.0	-29.20	PASSED
10.667538	-27.63	18.04	45.67	15000.0	9.000	100.0	Z-Pos	165.0	-28.80	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

5. Radiated emissions above 30 MHz

EUT with DUT number	250394
Accessories with DUT numbers	230577, 230805
Operation voltage	13.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	22-Apr-2025 to 25-Apr-2025
Test responsible	Frank Wittmann
Test system SW / version / configuration	Rohde & Schwarz EMC32 / 11.70.00 / v2.2

5.1. Test method and limit

The measurement is made according to ANSI C63.10 and RSS-Gen as follows:

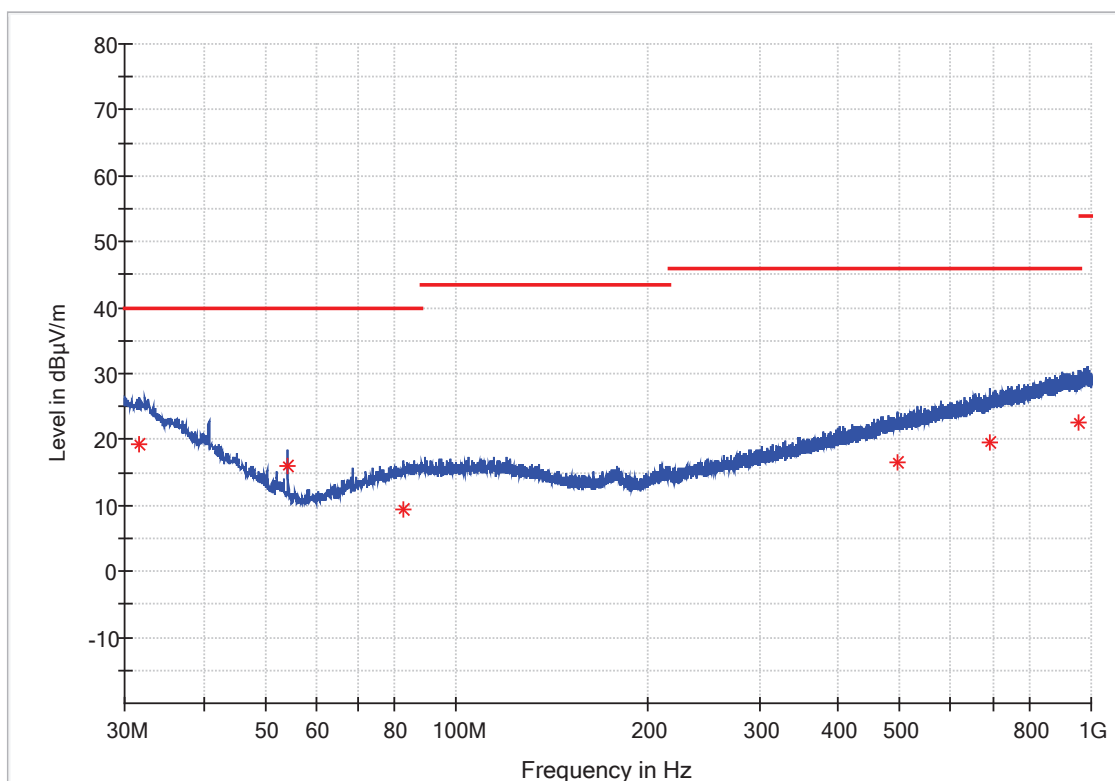
- ⇒ The equipment under test (EUT) is located on an 80 cm table, which is rotated by 360 degrees. The DUT is positioned in horizontal position on the test table.
- ⇒ The measurement is divided into the Preliminary Measurement and the Final Measurement.
The Preliminary Measurement and the Final Measurement is performed in 3 m distance without floor absorbers by rotating the turntable of 360 degrees and moving the antenna height between 1-4 m.
- ⇒ During the Preliminary Measurement the suspected frequencies are searched by using the PK detector.
In the Final Measurement the exact frequency and amplitude of these emissions are re-measured by using the applicable QP detector.
- ⇒ The Final Measurement is performed if the Preliminary Measurement results are closer than 20 dB to the permissible limit.
- ⇒ The measurement results are obtained as described in the following formula: $E \text{ [dB}\mu\text{V/m]} = U_{RX} + A_{CF}$
Where U_{RX} is receiver reading and A_{CF} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{CF} = L_{CABLES} + AF - G_{PREAMP}$).
- ⇒ Example values for calculation of one final QP measurement frequency at 54.25 MHz, see result in 5.2:
 $E \text{ [dB}\mu\text{V/m]} = 45.52 - 29.4 = 16.12$

FCC and ISED limits for radiated emission measurements at 3 m measurement distance.

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 – 88	100	40	QP
88 – 216	150	43.5	QP
216 – 960	200	46	QP
960 – 1000	500	54	QP

5.2. Test results (FCC, ISED)

Peak detector (< 300 MHz: RBW 300 kHz, > 300 MHz: RBW 1 MHz)



Quasi-Peak detector (RBW 120 kHz)

Frequency [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Height [cm]	Antenna Polarization	Azimuth [deg]	Transducer [dB]	Result
31.552000	19.17	40.00	20.83	15000.0	120.000	176.0	H	52.0	-16.0	PASSED
54.250000	16.12	40.00	23.88	15000.0	120.000	115.0	V	195.0	-29.4	PASSED
82.477000	9.28	40.00	30.72	15000.0	120.000	384.0	V	213.0	-25.0	PASSED
495.406000	16.52	46.02	29.50	15000.0	120.000	205.0	H	195.0	-15.8	PASSED
694.304500	19.69	46.02	26.33	15000.0	120.000	127.0	H	327.0	-12.4	PASSED
956.350000	22.55	46.02	23.47	15000.0	120.000	265.0	H	7.0	-9.4	PASSED

No further emissions found less than 20 dB to the regulatory limit and no emission found in the restricted bands of operation.

6. Frequency stability, temperature variation

EUT with DUT number	250395
Accessories with DUT numbers	230571, 230802
Operation voltage	13.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	07-Apr-2025 to 17-Apr-2025
Test responsible	Sebastian Kattinger
Test system SW / version	Emissions_Radio_CE/FCC / v1.98

6.1. Test reference and limit

The measurement is made according to ANSI C63.10 and RSS-210 as follows:

- ⇒ The EUT is placed in the chamber.
- ⇒ The climate chamber temperature is set to the maximum value and allowed to stabilize.
- ⇒ The transmit frequency is measured.
- ⇒ Temperature is lowered to the next temperature value and allowed to stabilize.
- ⇒ The steps 3-4 are repeated for each temperature.

FCC and ISSED limit for frequency stability, temperature variation measurements.

Frequency Deviation [%]
+/- 0.01

6.2. Test results (FCC, ISED)

Temperature [°C]	Time [min]	Frequency [MHz]	Deviation [%]	Result
+50	0	13.55967	0.0024	PASSED
	2	13.56010	0.0007	PASSED
	5	13.56012	0.0009	PASSED
	10	13.56055	0.0040	PASSED
+40	0	13.56014	0.0011	PASSED
	2	13.56031	0.0022	PASSED
	5	13.56024	0.0018	PASSED
	10	13.56004	0.0003	PASSED
+30	0	13.55986	0.0011	PASSED
	2	13.56022	0.0017	PASSED
	5	13.55972	0.0021	PASSED
	0	13.56037	0.0027	PASSED
+20	0	13.55996	0.0003	PASSED
	2	13.55976	0.0018	PASSED
	5	13.56031	0.0022	PASSED
	10	13.56014	0.0011	PASSED
+10	0	13.56051	0.0037	PASSED
	2	13.56031	0.0022	PASSED
	5	13.56049	0.0036	PASSED
	10	13.56018	0.0014	PASSED
0	0	13.56047	0.0035	PASSED
	2	13.56037	0.0027	PASSED
	5	13.56010	0.0007	PASSED
	10	13.56028	0.0021	PASSED
-10	0	13.56004	0.0003	PASSED
	2	13.56033	0.0024	PASSED
	5	13.56022	0.0017	PASSED
	10	13.56049	0.0036	PASSED
-20	0	13.55990	0.0007	PASSED
	2	13.56022	0.0017	PASSED
	5	13.56022	0.0017	PASSED
	10	13.56033	0.0024	PASSED
-30	0	13.56024	0.0018	PASSED
	2	13.56055	0.0040	PASSED
	5	13.56057	0.0042	PASSED
	10	13.56000	0.0000	PASSED

7. Frequency stability, voltage variation

EUT with DUT number	250395
Accessories with DUT numbers	230571, 230802
Operation voltage	11.2 V to 15.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	07-Apr-2025 to 17-Apr-2025
Test responsible	Sebastian Kattinger
Test system SW / version	Emissions_Radio_CE/FCC / v1.98

7.1. Test reference and limit

The measurement is made according to ANSI C63.10 and RSS-210 as follows:

- ⇒ The EUT is placed in the chamber.
- ⇒ The climate chamber temperature is set to 20 °C allowed to stabilize.
- ⇒ The EUT is connected to an adjustable power supply.
- ⇒ The frequency stability was measured at nominal voltage and at 85 % and 115 %.

FCC and ISSED limit for frequency stability, voltage variation measurements.

Frequency Deviation [%]
+/- 0.01

7.2. Test results (FCC, ISSED)

Voltage [V]	Frequency [MHz]	Deviation [%]	Result
Nominal (13.2)	13.56033	0.0024	PASSED
Minimum (11.2)	13.55994	0.0004	PASSED
Maximum (15.2)	13.55974	0.0019	PASSED

8. Occupied bandwidth

EUT with DUT number	250395
Accessories with DUT numbers	230571, 230802
Operation voltage	13.2 V / DC
Result	PASSED
Remarks	none
Temperature / humidity	+15 °C to +35 °C / 20 % to 75 %
Date of measurement	07-Apr-2025 to 17-Apr-2025
Test responsible	Sebastian Kattinger
Test system SW / version	Emissions_Radio_CE/FCC / v1.98

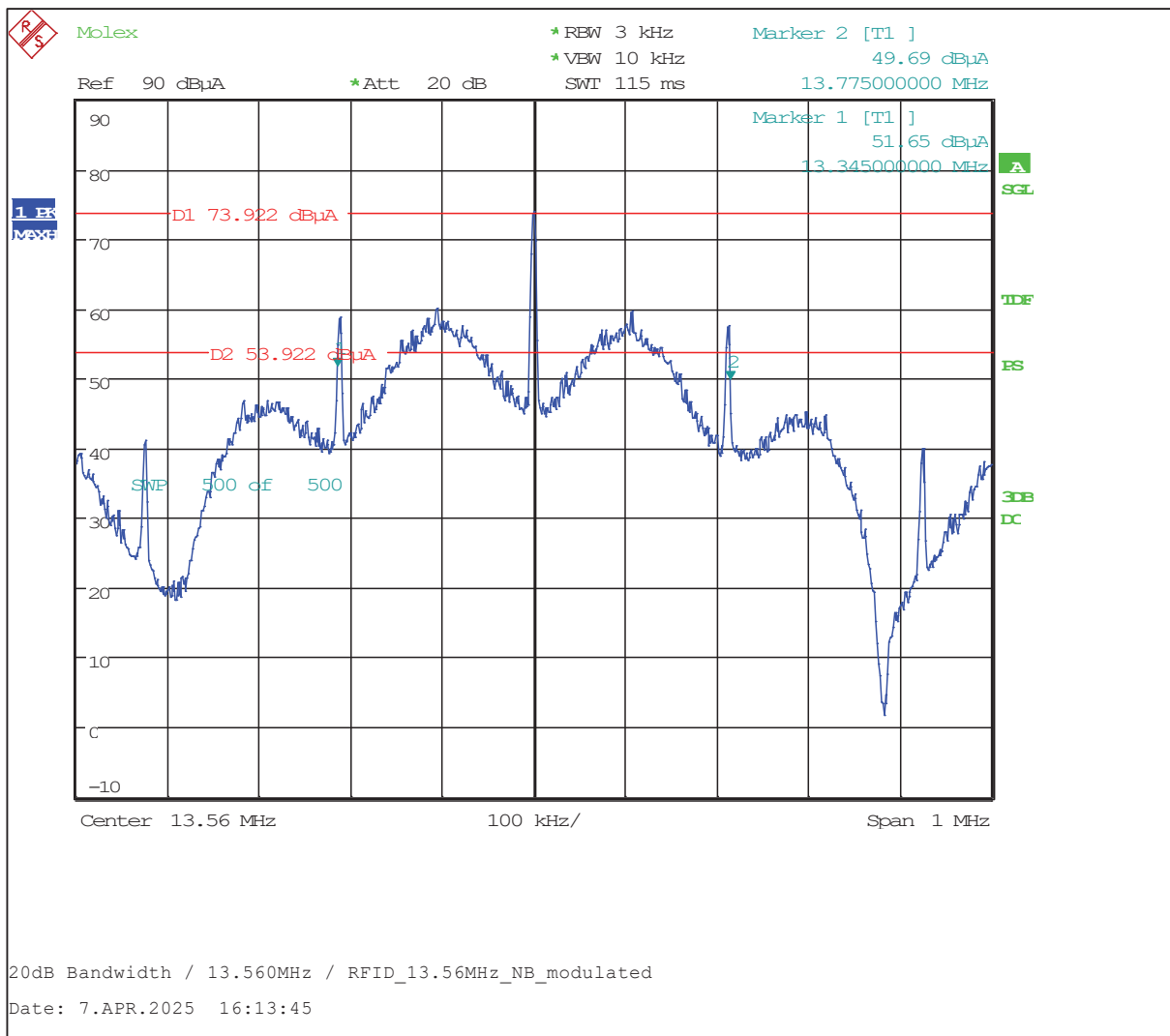
8.1. Test method and limit

The measurement is made according to FCC 15.215(c) and RSS-Gen.

FCC and ISSED limits for occupied bandwidth measurements.

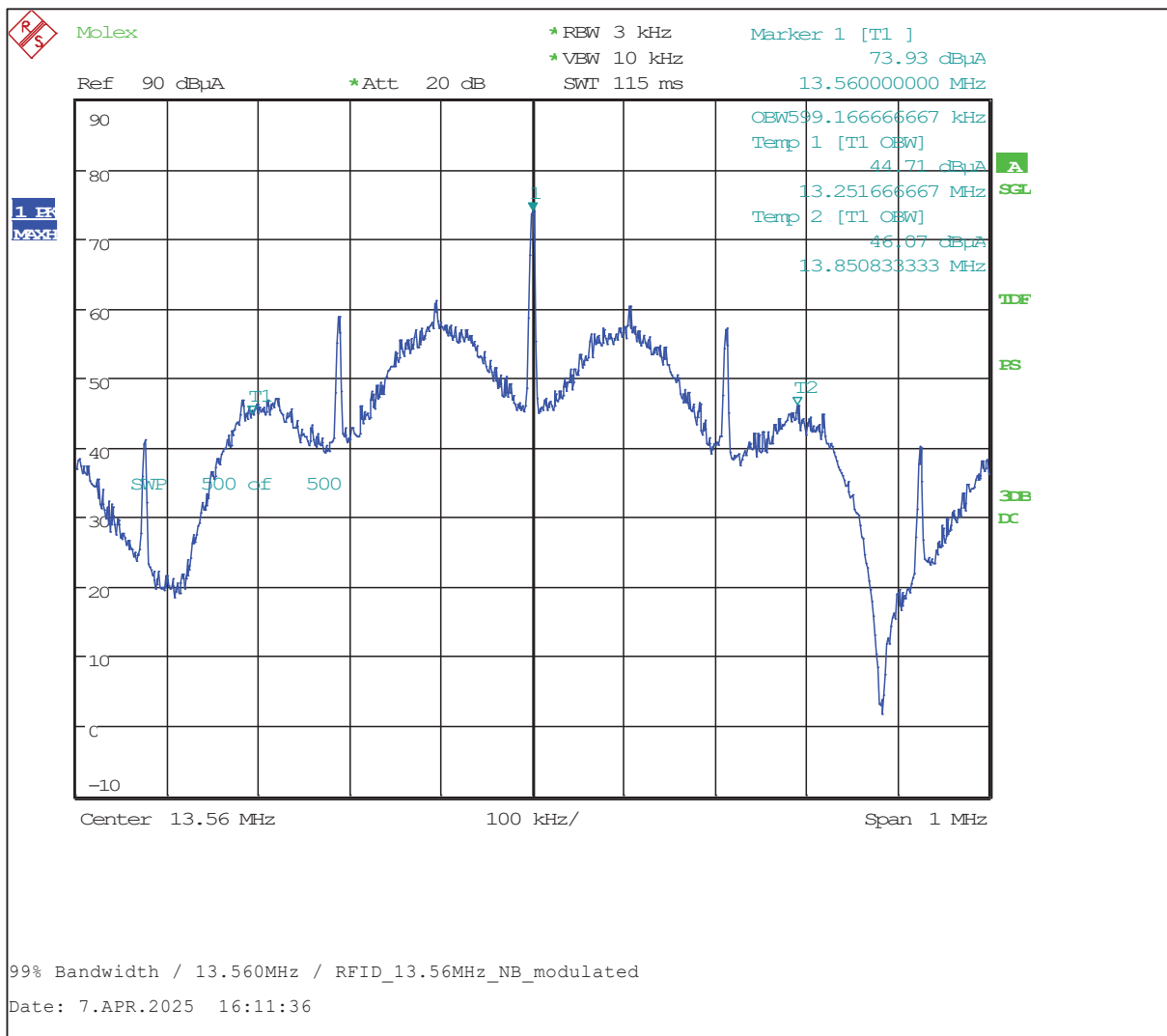
20 dB Bandwidth Limit [MHz]	99 % Bandwidth Limit [MHz]
N.A.	N.A.

8.2. Test results 20 dB OBW (FCC)



Frequency [MHz]	20 dB Bandwidth [kHz]
13.56	430.00

8.3. Test results 99 % OBW (ISED)



Frequency [MHz]	99 % Bandwidth [kHz]
13.56	599.17

9. Test Equipment

9.1. Conducted emission

Equipment	Manufacturer	Type	SERIAL-NO.	Actual Calibration	Next Calibration
Signal Generator	ROHDE & SCHWARZ	SMB100A	181275	07.05.2025	07.05.2026
Vector Signal Generator	ROHDE & SCHWARZ	SMBV100A	263158	30.04.2025	30.04.2026
EMI Test Receiver	ROHDE & SCHWARZ	ESU26	100077	06.05.2025	06.05.2026
Power Supply	Hewlett Packard - Agilent	E3632A	MY40011318	31.05.2023	31.05.2026
Climatic Chamber	Vötsch	VT4002	521/85094	14.12.2022	14.12.2025

9.1.1 Passive devices

Equipment*	Manufacturer	Type	SERIAL-NO.
Loop antenna 6 cm	ETS-Lindgreen	7405-901B	Radio 0001
10 dB attenuator	Pasternack	PE7001-10	Radio 0002
RF-cable 2m	Huber & Suhner	Sucoflex 104	563441/4
RF-cable 20 cm	Huber & Suhner	Sucoflex 104	199784/4
Directional coupler	Tyco electronics	M/A-COM 0.5 – 18 GHz	96341

*Passive components included in used signal path.

9.2. Radiated Emission

Equipment	Manufacturer	Type	SERIAL-NO.	Actual Calibration	Next Calibration
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB-1519	1519-056	03.04.2023	03.04.2026
Bilog Antenna	ROHDE & SCHWARZ	HL562E	100191	21.02.2023	21.02.2026
Horn Antenna	Schwarzbeck	BBHA-9120-D	01617	22.01.2025	22.01.2028
MW Antenna	Schwarzbeck	BBHA-9170	01617	25.01.2023	25.02.2026
Antenna	Schwarzbeck Mess-Elektronik	VAMP-9243	9243-486	02.05.2024	02.05.2027
Signal Generator	ROHDE & SCHWARZ	SML01	100652	26.04.2024	26.04.2027
Signal Generator	ROHDE & SCHWARZ	SMB100A	181275	07.05.2025	07.05.2026
Vector Signal Generator	ROHDE & SCHWARZ	SMBV100A	263158	30.04.2025	30.04.2026
Power Supply	Hewlett Packard - Agilent	E3632A	KR75303301	31.05.2023	31.05.2026
EMI Test Receiver	ROHDE & SCHWARZ	ESU26	100077	06.05.2025	06.05.2026
EMI Test Receiver	ROHDE & SCHWARZ	ESW44	101733	05.05.2025	05.05.2026
Temp. / Humidity Logger	Lufft	Opus 10	13262	10.01.2023	10.01.2026
Antenna	ROHDE & SCHWARZ	HK-116: 20-300MHz	825177/0017	08.01.2025	08.01.2028
Antenna	ROHDE & SCHWARZ	HK-116: 20-300MHz	100401	05.10.2023	05.10.2026
Antenna	ROHDE & SCHWARZ	HL223	832369/006	08.01.2025	08.01.2028
Antenna	ROHDE & SCHWARZ	HL223	100731	08.01.2025	08.01.2028
Antenna	Schwarzbeck	UBA 9116	9116-396	30.06.2023	30.06.2026
Antenna	Emco	3115	9810-5588	07.03.2024	07.03.2027

9.2.1 Passive devices

Equipment*	Manufacturer	Type	SERIAL-NO.
OSP Switch Unit	ROHDE & SCHWARZ	OSP-320	103089
OSP Switch Unit	ROHDE & SCHWARZ	OSP-230	101023
Low Noise Amplifier	Miteq	LNA-40-00100800-15-10P	15383
RF Attenuator	Huber & Suhner	3dB DC-18GHz	751933 No.1
RF Attenuator	Huber & Suhner	3dB DC-18GHz	751933 No.2
RF Cable	Huber & Suhner	Sucoflex 104	506968
RF Cable	Huber & Suhner	Sucoflex 104	506967
RF Cable	Huber & Suhner	Sucoflex 126EA	517430
RF Cable	Huber & Suhner	Sucoflex 126PEA	0815

*Passive components included in used signal paths.

END OF REPORT