

FCC Test Report (Part 15C)

WPT

Test report no.:	LAB-341E (v3.0)	Date of report:	02-Jun-2022
Number of pages:	28	Project support engineer:	Oliver Flecke
Test period:	09-Aug-2021 to 01-Apr-2022		

Applicant:	Molex CVS Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Germany, Mr. Michael Schmidt		
Manufacturer:	Molex CVS Dabendorf GmbH, Märkische Straße 72, 15806 Zossen, Germany		
EUT identification:	Molex, WCH-304 (WCH-304a)		
FCC ID:	RK7WCH-304	ISED ID:	4774A-WCH304

Testing laboratory:	Molex CVS Lab, Molex CVS Bochum GmbH, Meesmannstr.103, 44807 Bochum, Germany			
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	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:	Robert Müller
Title:	Laboratory Quality Manager	Title:	Laboratory Manager

Signature:		Signature:	
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Table of contents

1. VERSION HISTORY	3
2. SUMMARY FOR FCC PART 15C TEST REPORT	4
2.1. EUT AND ACCESSORY INFORMATION	4
2.2. TECHNICAL CHARACTERISTICS	5
2.3. APPLIED STANDARDS	6
2.4. MEASUREMENT UNCERTAINTIES	7
2.5. DECISION RULE	7
2.6. RISK ASSESSMENT	8
2.7. SUMMARY OF TEST RESULTS.....	9
3. TEST SETUPS	9
3.1. CONDUCTED RF TEST SETUP (SETUP 1)	9
3.2. CONDUCTED AC POWER LINE EMISSIONS TEST SETUP (SETUP 2).....	9
3.3. RADIATED EMISSIONS TEST SETUP (SETUP 3)	10
4. RADIATED EMISSIONS BELOW 30 MHZ	11
4.1. TEST METHOD AND LIMIT.....	11
4.2. TEST RESULTS (FCC).....	12
4.3. TEST RESULTS (ISED)	16
5. RADIATED EMISSIONS ABOVE 30 MHZ.....	19
5.1. TEST METHOD AND LIMIT.....	19
5.2. TEST RESULTS (FCC).....	20
5.3. TEST RESULTS (ISED)	21
6. OCCUPIED BANDWIDTH	22
6.1. TEST METHOD AND LIMIT.....	22
6.2. 99% OBW	22
6.3. 20DB OBW	24
7. TEST EQUIPMENT.....	26
7.1. CONDUCTED RADIO.....	26
7.2. RADIATED EMISSION	27

1. Version History

Report Number	Date	Comment
LAB-341E (v1.0)	08-Dec-2021	1 st approved version
LAB-341E (v2.0)	29-Apr-2022	Updated regarding TCB comments: - 5W mode added - Setup descriptions updated - Units changed for dBμV/m to dBμA/m
LAB-341E (v3.0)	02-Jun-2022	Update test setup description section 4.1

2. Summary for FCC Part 15C Test Report

Date of receipt	09-Aug-2021
Testing completed	01-Apr-2022
The customer's contact person	Michael Schmidt
Test samples / setup pictures	LAB-341E_RK7WCH-304_FCC_WPT_Test_Setup_Photos_v3.0.pdf
HW change / difference document	none
Notes	none

2.1. EUT and accessory Information

The EUT is an inductive wireless power transfer device (wireless charger) with transmitter and load modulation operating at 127.55 kHz. The EUT is tested with an artificial load, continuously charging at 5 W or respectively 15 W (duty cycle of 100 %).

The following test samples provided by the customer were tested.

ID	Description	Manufacturer	Type	S/N	HW Version	SW Version
DAB210990E	WPT Device	Molex	WCH-304a	0000030D0470	H10	T019
DAB210913E	WPT Device	Molex	WCH-304a	0000030D041C	H10	T019

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
DAB2210000	DC power cable long (15W)	Molex	-	-	-	-
DAB2210001	Cellular RF cable with Bias-T (50 Ω, 10 kΩ) (15W)	Molex	-	-	-	-
DAB200495E	Load Receiver (15 W)	Molex	R10	0000028A96F8	0.4	-
DAB201540E	AVID Qi Medium Power Receiver with 10 Ohm load	AVID Technologies	102-03	00002044	1.2	-
DAB210469E	DC power cable long (5W)	Molex	-	-	-	-
DAB200865E	Cellular RF cable with Bias-T (50 Ω, 10 kΩ) (5W)	Molex	-	-	-	-
DAB2220069	Load Receiver (5W)	Molex	TREC-EF	0000028C7FE	0.8	-

2.2. Technical characteristics

Power Supply [V]	Lead-acid battery (vehicle regulated) – 13.2 V DC		
Voltage Range [V]	$U_{nom} = 13.2$	$U_{min} = 11.1$	$U_{max} = 15.3$
Charging cut-off Voltage [V] @ 15W	$U_{cut-off} = 9.0$ (wireless power transfer is stopped for $U < U_{cut-off}$)		
Temperatures Range [°C]	-20 .. +80 (WPT +60)		
Radio Type	WPT transceiver		
Product Category	Category I radio apparatus (type 3)		
Operating Frequency Range [kHz]	127.55		
Communication Frequency [kHz]	Same as operating frequency range		
Operating Channels	Not channelized		
Antenna Type	Integral inductive loop coils (no customization allowed)		
Antenna Gain [dBi]	n.a.		
Modulation Type	5 W mode: H-field for charging is not modulated 15 W mode: H-field for charging is digital modulated		
Modulation Technique	5 W mode: H-field for charging is not modulated 15 W mode: H-field for charging is FSK modulated		

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

2.3. Applied standards

Standard / Rule Part	Version	Year
CFR 47, FCC Part 15C	-	Apr-2022
ANSI C63.10	-	Jun-2013
ISED RSS-Gen	Issue 5 + AMD1 + AMD2	Feb-2021
ISED RSS-216	Issue 2 + AMD1	Sep-2020
ISED ICES-001	Issue 5	Jul-2020

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

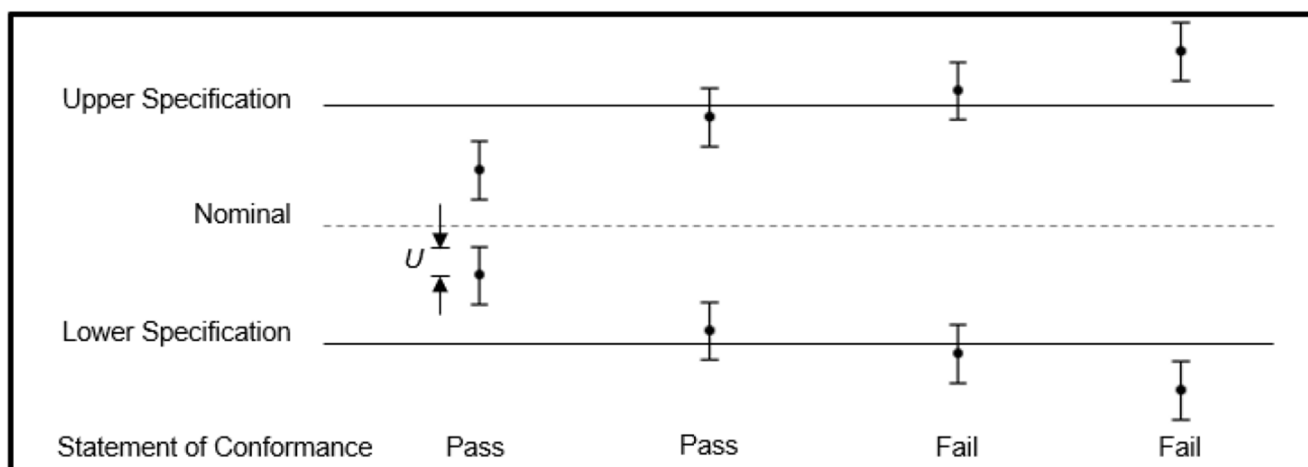
2.4. Measurement uncertainties

Parameter	Measurement Uncertainty	Maximum Uncertainty
Radio Frequency	$\pm 1.0 \times 10^{-7}$	$\pm 1 \times 10^{-5}$
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	± 5.21 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 $k=2$

2.5. 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

2.6. 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

2.7. Summary of test results

Section	Section in CFR 47	Section in RSS-Gen	Section in RSS-216	Name of the test	Result
4 & 5	15.205, 15.209	8.9, 8.10	6.2.2.2, 6.2.3 (Type 3 WPT devices)	Radiated emissions	PASSED
-	15.207	-	6.2.2.1	AC powerline conducted emissions	NA
6	15.215 (c)	6.7	-	Occupied bandwidth	PASSED

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

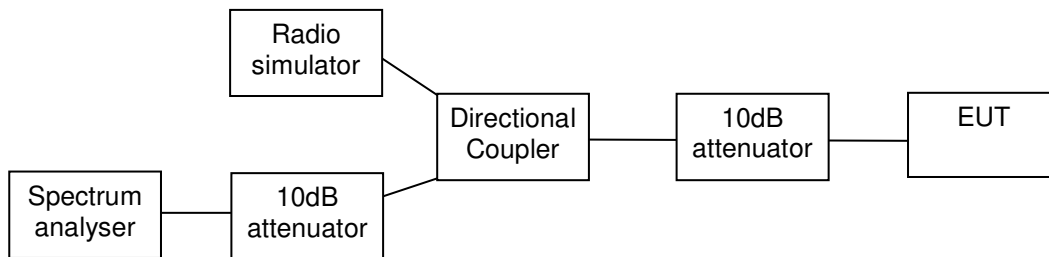
FAILED: The EUT does not comply with the essential requirements in the standard.

NP: The test was not performed.

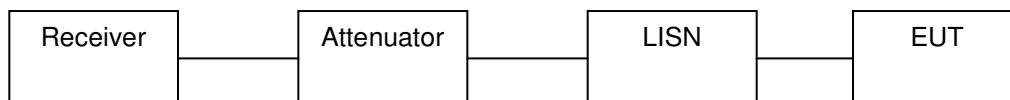
NA: The test was not applicable.

3. Test setups

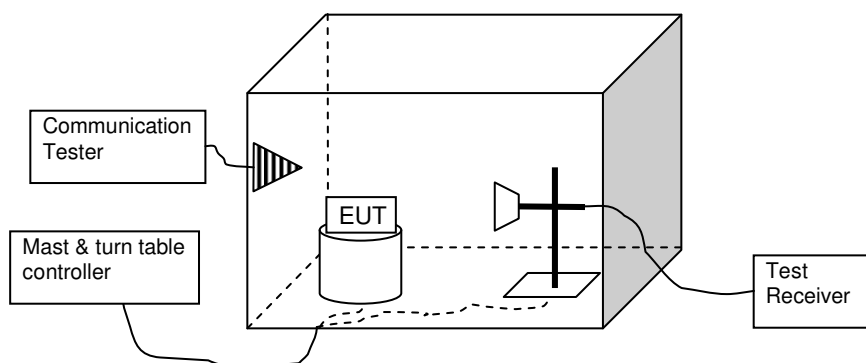
3.1. Conducted RF test setup (Setup 1)



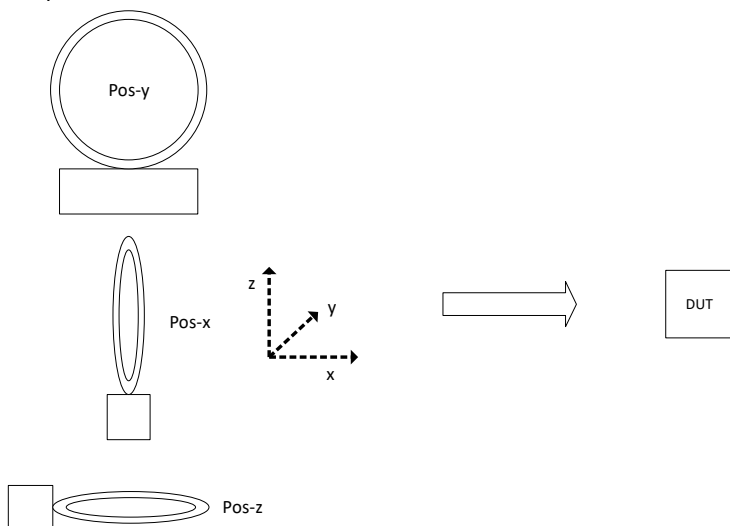
3.2. Conducted AC power line emissions test setup (Setup 2)



3.3. Radiated emissions test setup (Setup 3)



Loop Antenna orientation:



4. Radiated emissions below 30 MHz

EUT with DUT number	DAB210990E, DAB210913E
Accessories with DUT numbers	DAB2210000, DAB2210001, DAB200495E DAB210469E, DAB200865E, DAB2220069
Operation Voltage [V] / [Hz]	13.2 V / DC
Result	PASSED
Remarks	none
Temp [°C] / Humidity [%RH]	22.7 / 37.5
Date of measurement	03-Nov-2021 to 01-Apr-2022
Test Responsible	Jürgen Mitterer / Frank Wittmann
Test system SW / Version	Rohde & Schwarz EMC32 / 10.60.20

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 ($\text{dB}\mu\text{A/m} = \text{dB}\mu\text{V/m} - 51.5 \text{ dB}$).
- ⇒ 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 and vertical 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 2 vertical positions (x-, y-pos) to find out worst case position¹⁾.
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: $E [\text{dB}\mu\text{V/m}] = U_{\text{RX}} + A_{\text{CF}}$
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 and calculation for one final QP measurement frequency at 127.555 kHz, see result in 4.2.1.2:
 $E [\text{dB}\mu\text{V/m}] = 68.99 + 20.90 = 89.89$

- 1) Note: The position DUT vertical / Antenna vertical has been determined as worst-case position compared to position DUT horizontal / Antenna horizontal.

FCC limits for radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	Detector
0.009 - 0.09	$10000 * 2400 / f[\text{kHz}]$	128.5 - 93.8	AV
0.09 - 0.11			QP
0.11 - 0.19			AV
0.19 - 0.49			AV
0.490 - 1.705	$100 * 24000 / f[\text{kHz}]$	73.8 - 63.0	QP
1.705 - 30.0	$100 * 30$	69.5	QP

ICES-001 Induction cooking limits (3 m measurement distance)

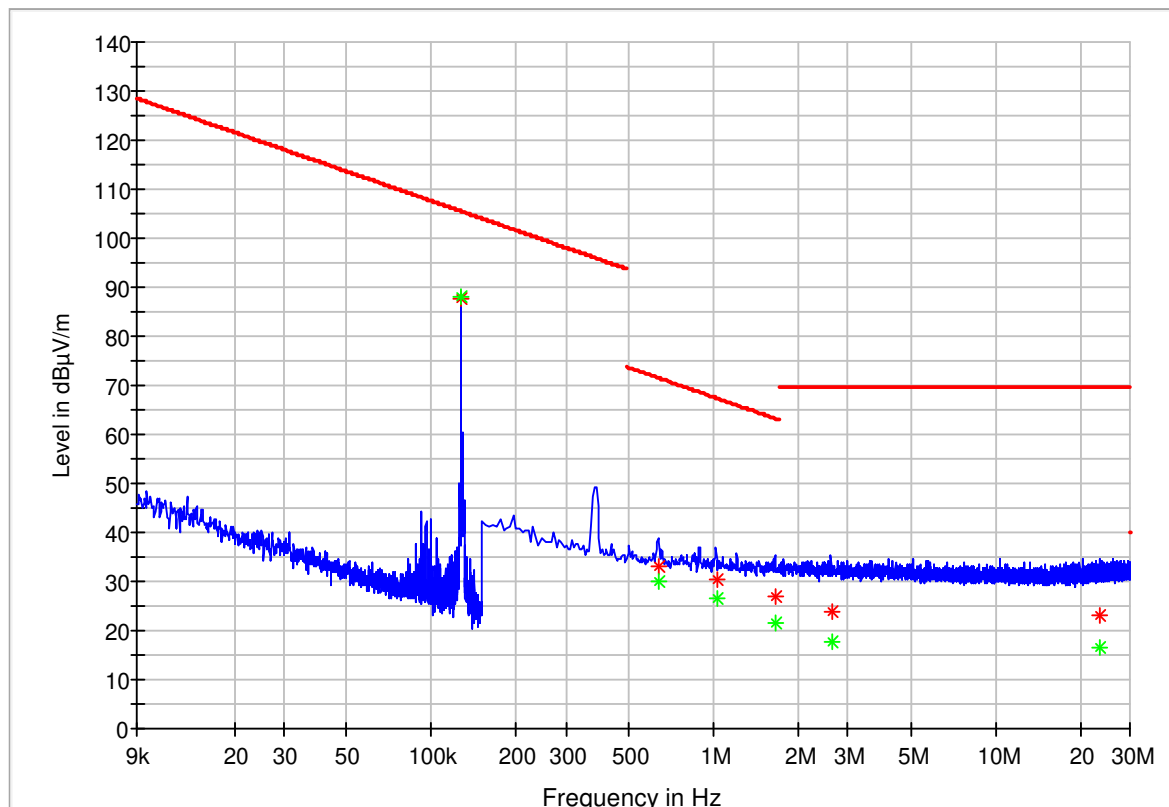
Frequency range [MHz]	Limit [$\text{dB}\mu\text{A/m}$]	Limit [$\text{dB}\mu\text{V/m}$]	Detector
0.009 - 0.070	69.0	120.5	QP
0.070 - 0.15	69 - 39	120.5 - 90.5	QP
0.15 - 30	39 - 7	90.5 - 58.5	QP

4.2. Test results (FCC)

4.2.1 WPT 127.55 kHz

4.2.1.1 5W not modulated

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]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127554	87.73	20.9	105.49	17.76	100.0	1.0	VERTICAL	x-pos	PASSED
0.638383	33.17	21.1	71.50	38.33	100.0	166.0	VERTICAL	x-pos	PASSED
1.023592	30.46	21.1	67.40	36.94	100.0	101.0	VERTICAL	x-pos	PASSED
1.659667	27.11	20.9	63.20	36.09	100.0	266.0	VERTICAL	x-pos	PASSED
2.623958	23.99	20.9	69.54	45.55	100.0	315.0	VERTICAL	x-pos	PASSED
23.341200	22.93	21.4	69.54	46.61	100.0	315.0	VERTICAL	x-pos	PASSED

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

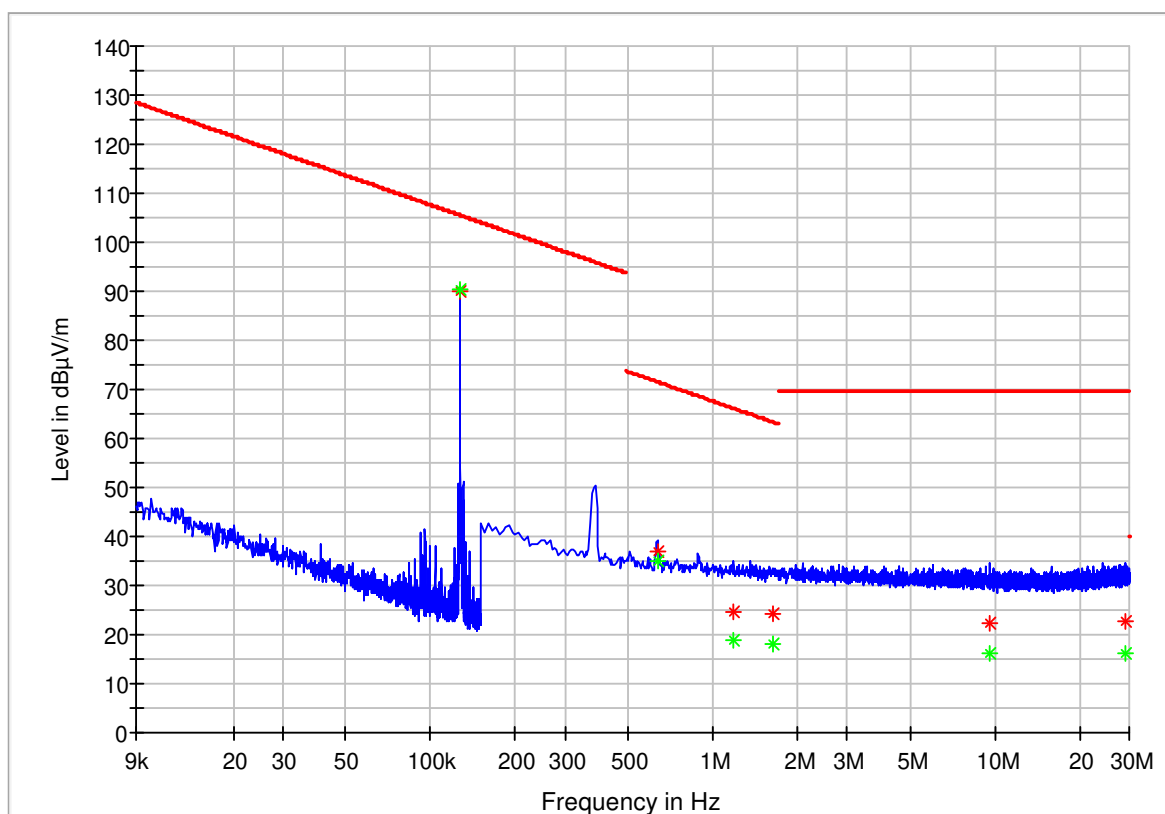
CISPR-Average detector (< 150 kHz: RBW 200Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127554	88.17	20.9	105.49	17.32	100.0	1.0	VERTICAL	x-pos	PASSED
0.638383	30.02	21.1	71.50	41.49	100.0	166.0	VERTICAL	x-pos	PASSED
1.023592	26.55	21.1	67.40	40.85	100.0	101.0	VERTICAL	x-pos	PASSED
1.659667	21.47	20.9	63.20	41.74	100.0	266.0	VERTICAL	x-pos	PASSED
2.623958	17.81	20.9	69.54	51.73	100.0	315.0	VERTICAL	x-pos	PASSED
23.341200	16.56	21.4	69.54	52.98	100.0	315.0	VERTICAL	x-pos	PASSED

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

4.2.1.2 15W modulated

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]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127555	89.89	20.9	105.49	15.60	100.0	-15.0	VERTICAL	x-pos	PASSED
0.636783	36.81	21.1	71.52	34.71	100.0	16.0	VERTICAL	x-pos	PASSED
1.183142	24.78	21.0	66.14	41.36	100.0	315.0	VERTICAL	x-pos	PASSED
1.647625	24.28	20.9	63.27	38.99	100.0	17.0	VERTICAL	x-pos	PASSED
9.592308	22.33	20.9	69.54	47.21	100.0	45.0	VERTICAL	x-pos	PASSED
28.942967	22.60	21.6	69.54	46.94	100.0	165.0	VERTICAL	x-pos	PASSED

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

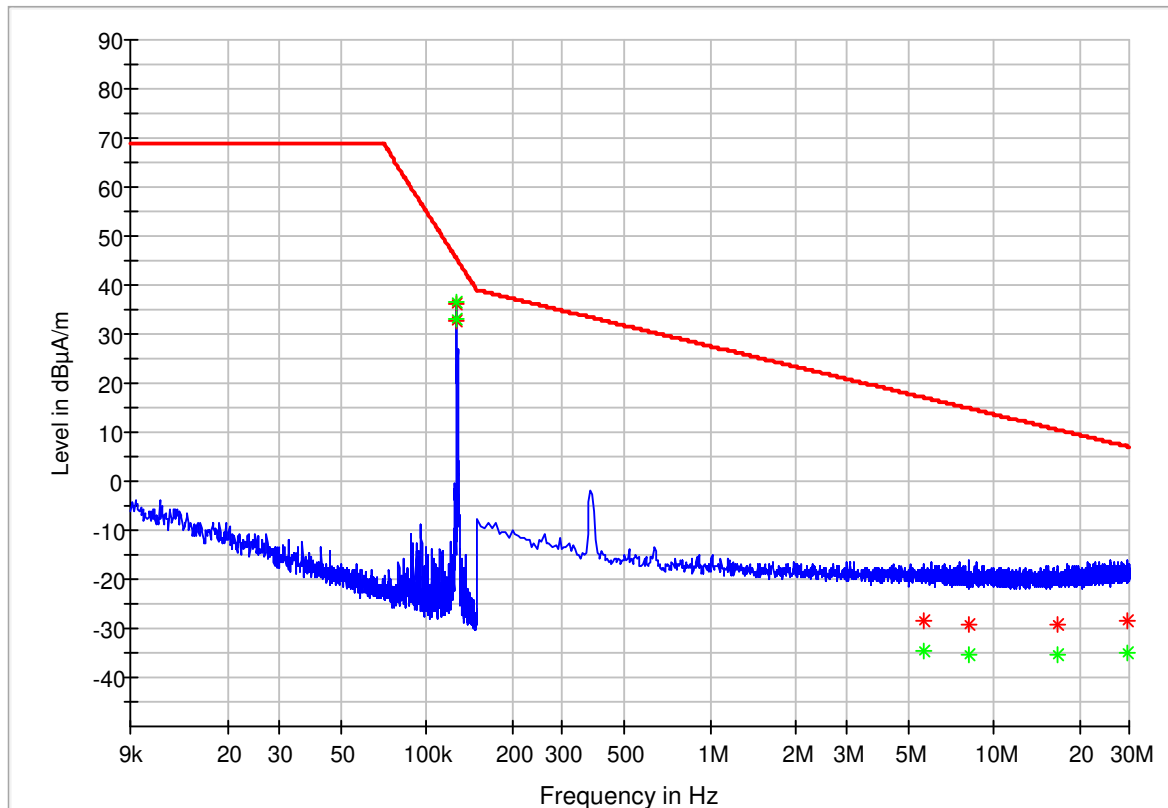
CISPR-Average detector (< 150 kHz: RBW 200Hz, > 150 kHz: RBW 9 kHz)

Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127555	90.30	20.9	105.49	15.19	100.0	-15.0	VERTICAL	x-pos	PASSED
0.636783	35.15	21.1	71.52	36.37	100.0	16.0	VERTICAL	x-pos	PASSED
1.183142	18.72	21.0	66.14	47.42	100.0	315.0	VERTICAL	x-pos	PASSED
1.647625	18.18	20.9	63.27	45.09	100.0	17.0	VERTICAL	x-pos	PASSED
9.592308	16.03	20.9	69.54	53.51	100.0	45.0	VERTICAL	x-pos	PASSED
28.942967	16.28	21.6	69.54	53.26	100.0	165.0	VERTICAL	x-pos	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)

4.3.1.1 5W not modulated



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

Frequency [MHz]	Level [dBμA/m]	Transducer [dB]	Limit [dBμA/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127550	32.64	-30.6	45.38	12.74	100.0	165.0	VERTICAL	x-pos	PASSED
0.127552	36.20	-30.6	45.38	9.18	100.0	1.0	VERTICAL	x-pos	PASSED
5.644083	-28.43	-30.5	17.09	45.52	100.0	223.0	VERTICAL	x-pos	PASSED
8.124825	-29.10	-30.4	14.89	43.99	100.0	311.0	VERTICAL	x-pos	PASSED
16.707558	-29.16	-30.4	10.54	39.69	100.0	161.0	VERTICAL	x-pos	PASSED
29.372125	-28.55	-29.7	7.13	35.68	100.0	15.0	VERTICAL	x-pos	PASSED

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

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

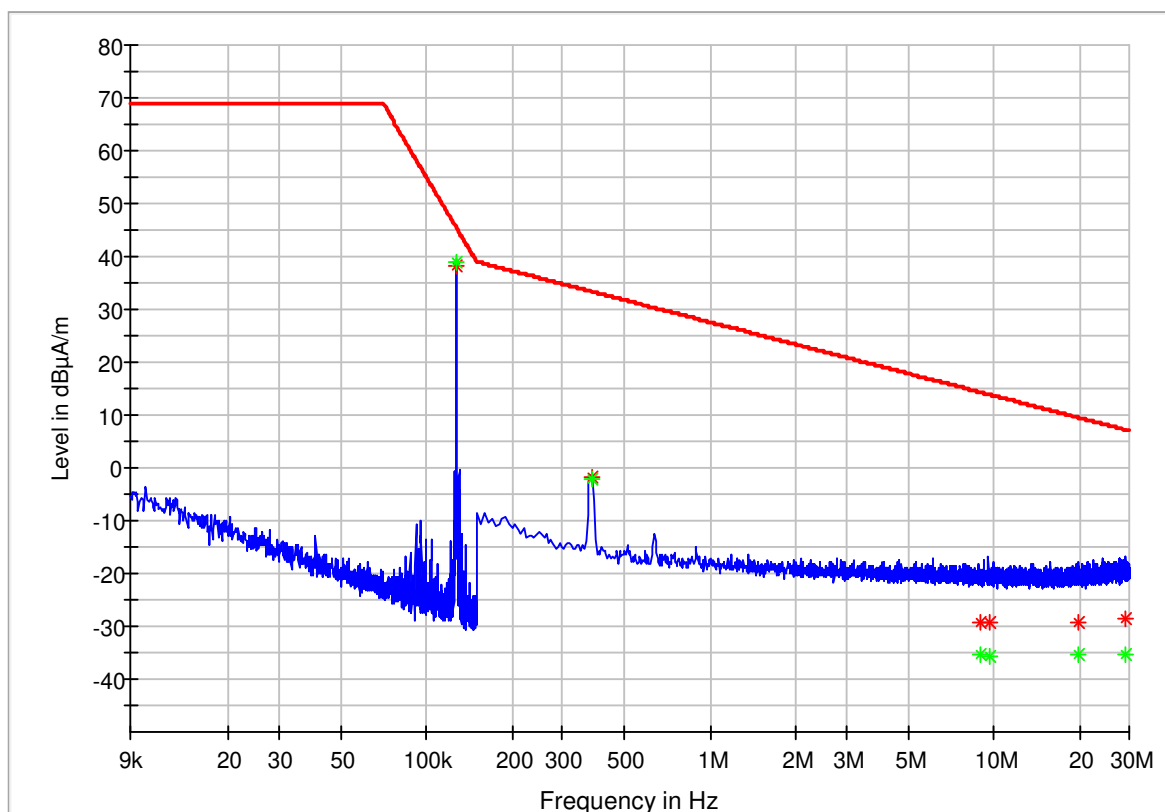
Frequency [MHz]	Level [dBμA/m]	Transducer [dB]	Limit [dBμA/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127550	33.09	-30.6	45.38	12.29	100.0	165.0	VERTICAL	x-pos	PASSED
0.127552	36.64	-30.6	45.38	8.75	100.0	1.0	VERTICAL	x-pos	PASSED
5.644083	-34.52	-30.5	17.09	51.61	100.0	223.0	VERTICAL	x-pos	PASSED
8.124825	-35.28	-30.4	14.89	50.17	100.0	311.0	VERTICAL	x-pos	PASSED
16.707558	-35.42	-30.4	10.54	45.95	100.0	161.0	VERTICAL	x-pos	PASSED
29.372125	-34.87	-29.7	7.13	42.00	100.0	15.0	VERTICAL	x-pos	PASSED

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

4.3.1.2 15W modulated

4.3.2 WPT 127.55 kHz

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]	Transducer [dB]	Limit [dBμA/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127556	38.37	20.9	45.38	7.01	100.0	-16.0	VERTICAL	x-pos	PASSED
0.382542	-1.80	21.0	33.35	35.14	100.0	-1.0	VERTICAL	x-pos	PASSED
8.895350	-29.21	20.9	14.34	43.55	100.0	197.0	VERTICAL	x-pos	PASSED
9.626792	-29.36	20.9	13.87	43.23	100.0	45.0	VERTICAL	x-pos	PASSED
19.934983	-29.34	21.1	9.47	38.81	100.0	107.0	VERTICAL	x-pos	PASSED
28.947583	-28.70	21.6	7.22	35.92	100.0	195.0	VERTICAL	x-pos	PASSED

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

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

Frequency [MHz]	Level [dBμA/m]	Transducer [dB]	Limit [dBμA/m]	Margin [dB]	Height [cm]	Azimuth [deg]	EUT Orientation	Antenna Position	Result
0.127556	38.79	20.9	45.38	6.59	100.0	-16.0	VERTICAL	x-pos	PASSED
0.382542	-2.19	21.0	33.35	35.54	100.0	-1.0	VERTICAL	x-pos	PASSED
8.895350	-35.35	20.9	14.34	49.69	100.0	197.0	VERTICAL	x-pos	PASSED
9.626792	-35.54	20.9	13.87	49.40	100.0	45.0	VERTICAL	x-pos	PASSED
19.934983	-35.48	21.1	9.47	44.95	100.0	107.0	VERTICAL	x-pos	PASSED
28.947583	-35.27	21.6	7.22	42.49	100.0	195.0	VERTICAL	x-pos	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	DAB210990E
Accessories with DUT numbers	DAB2210000, DAB2210001, DAB200495E
Operation Voltage [V] / [Hz]	13.2 V / DC
Result	PASSED
Remarks	none
Temp [°C] / Humidity [%RH]	23.3 / 54.0
Date of measurement	9. – 10. Nov-2021
Test Responsible	Jürgen Mitterer
Test system SW / Version	Rohde & Schwarz EMC32 / 10.60.20

5.1. Test method and limit

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

- ⇒ The EUT is placed on a nonconductive table in the centre of the turntable.
- ⇒ The DUT is positioned in horizontal and vertical 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 and calculation for one final QP measurement frequency at 370.55 MHz, see result in 5.2:
 $E \text{ [dB}\mu\text{V/m]} = 45.87 - 22.30 = 23.57$

FCC limits for radiated emissions measurements (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

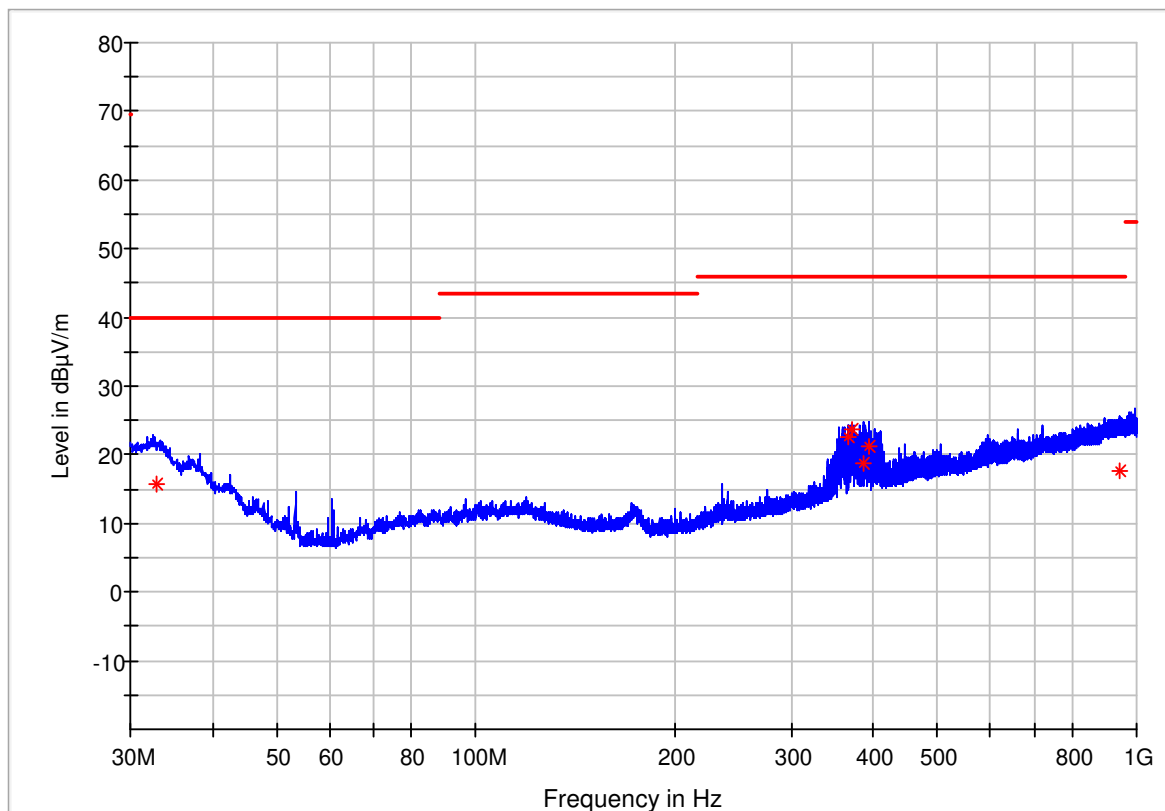
ICES-001 SAC limits (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 – 230	100	40	QP
230 - 1000	223.9	47	QP

5.2. Test results (FCC)

5.2.1 WPT 127.55 kHz

Peak detector (RBW 300 kHz)



Quasi-Peak detector (RBW 120 kHz)

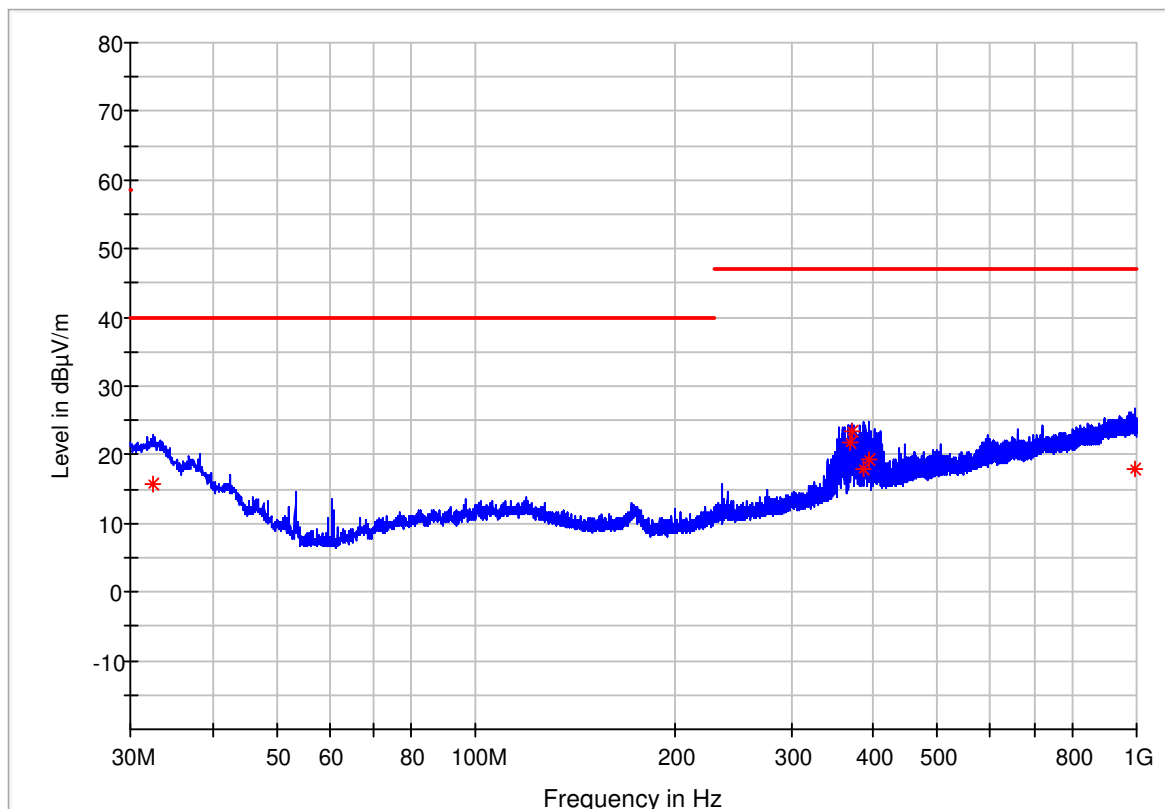
Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	Polarisation	Result
32.922450	15.80	-18.70	40.00	24.20	213.0	329.0	Vertical	PASSED
367.230650	22.57	-22.40	46.00	23.45	96.0	152.0	Horizontal	PASSED
370.552750	23.57	-22.30	46.00	22.45	96.0	165.0	Horizontal	PASSED
385.614650	18.73	-22.00	46.00	27.29	99.0	159.0	Horizontal	PASSED
393.765600	21.10	-21.70	46.00	24.92	97.0	136.0	Horizontal	PASSED
944.824950	17.58	-12.60	46.00	28.44	395.0	46.0	Vertical	PASSED

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

5.3. Test results (ISED)

5.3.1 WPT 127.55 kHz

Peak detector (RBW 300 kHz)



Quasi-Peak detector (RBW 120 kHz)

Frequency [MHz]	Level [dBμV/m]	Transducer [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Azimuth [deg]	Polarisation	Result
32.557050	15.75	-18.50	40.00	24.25	214.0	32.557050	Vertical	PASSED
367.477250	21.84	-22.40	47.00	25.16	96.0	367.477250	Horizontal	PASSED
370.524500	23.40	-22.30	47.00	23.60	96.0	370.524500	Horizontal	PASSED
385.607400	17.95	-22.00	47.00	29.05	99.0	385.607400	Horizontal	PASSED
393.719550	19.28	-21.70	47.00	27.72	97.0	393.719550	Horizontal	PASSED
994.479600	18.00	-12.30	47.00	29.00	236.0	994.479600	Horizontal	PASSED

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

6. Occupied bandwidth

EUT with DUT number	DAB210990E, DAB210913E
Accessories with DUT numbers	DAB2210000, DAB2210001, DAB201540E DAB210469E, DAB200865E, DAB2220069
Operation Voltage [V] / [Hz]	13.2 V / DC
Result	PASSED
Remarks	none
Temp [°C] / Humidity [%RH]	23.7 / 46.3
Date of measurement	08-Oct-2021 & 30-Mar-2022
Test Responsible	Jürgen Mitterer
Test system SW / Version	Emissions_Radio_CEFCC / 1.8

6.1. Test method and limit

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

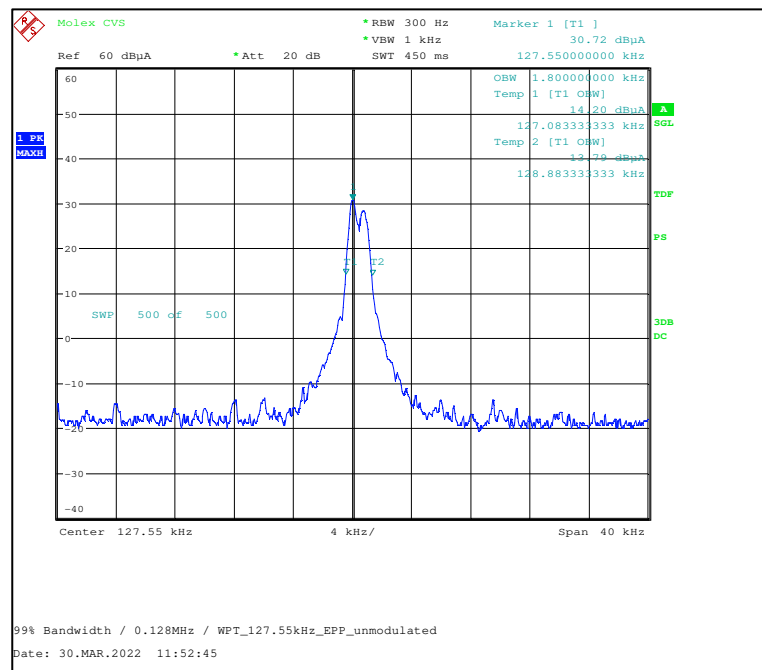
FCC and ISCED limits for occupied bandwidth measurements

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

6.2. 99% OBW

6.2.1 WPT 127.55 kHz

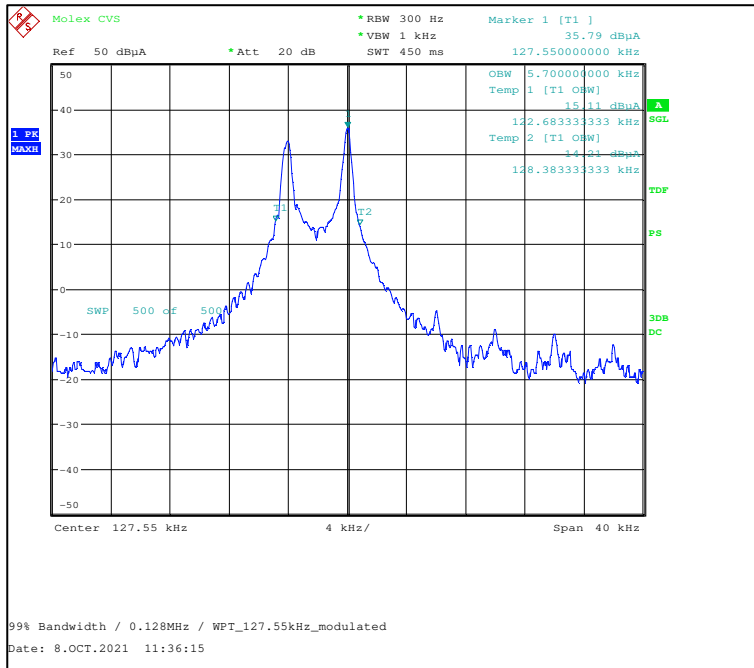
6.2.1.1 5W not modulated



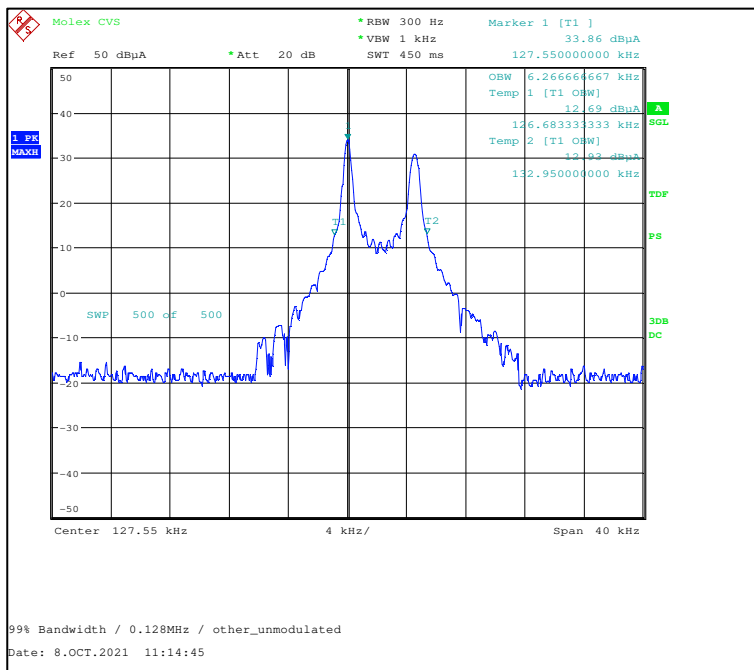
Frequency [kHz]	99% Bandwidth [kHz]
127.55	1.8

6.2.1.2 15W modulated

127.55kHz with negative FSK:



127.55kHz with positive FSK:

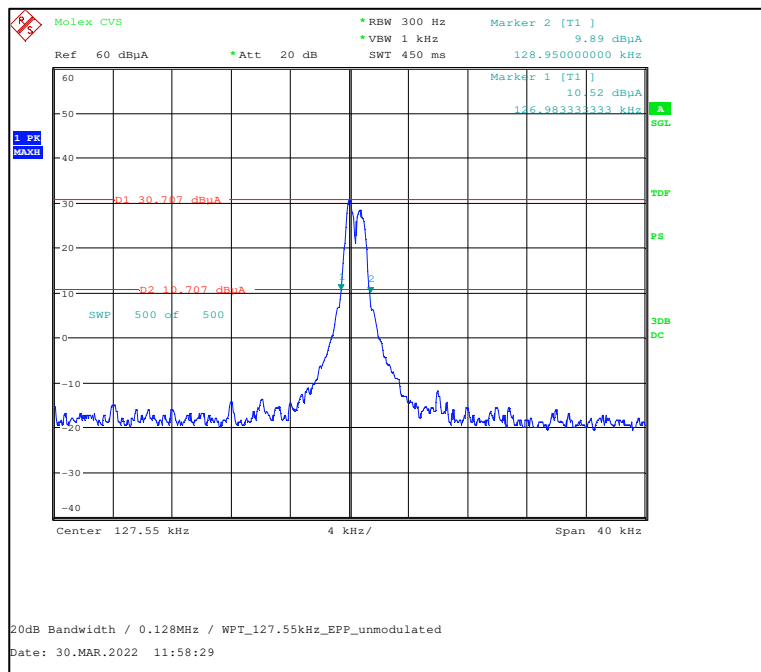


Frequency [kHz]	99% Bandwidth [kHz]
127.55 - FSK	5.70
127.55 + FSK	6.27

6.3. 20db OBW

6.3.1 WPT 127.55 kHz

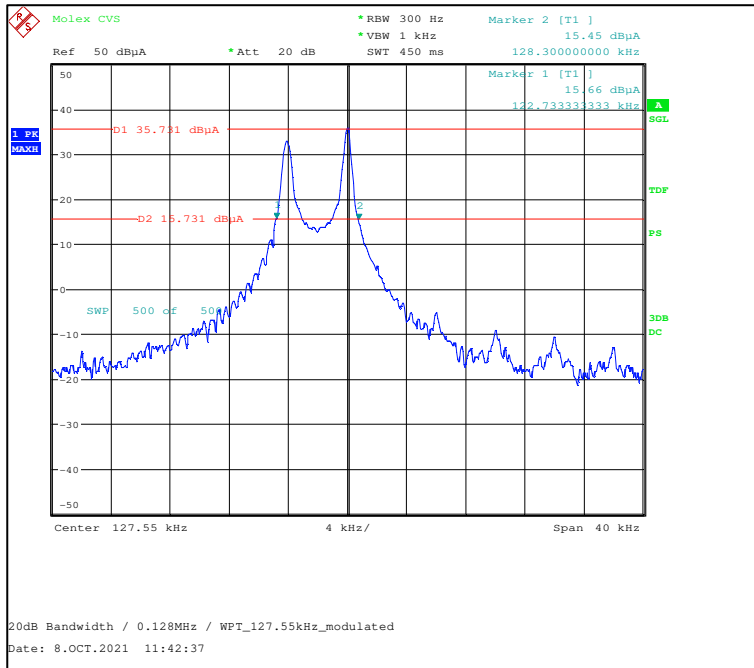
6.3.1.1 5W not modulated



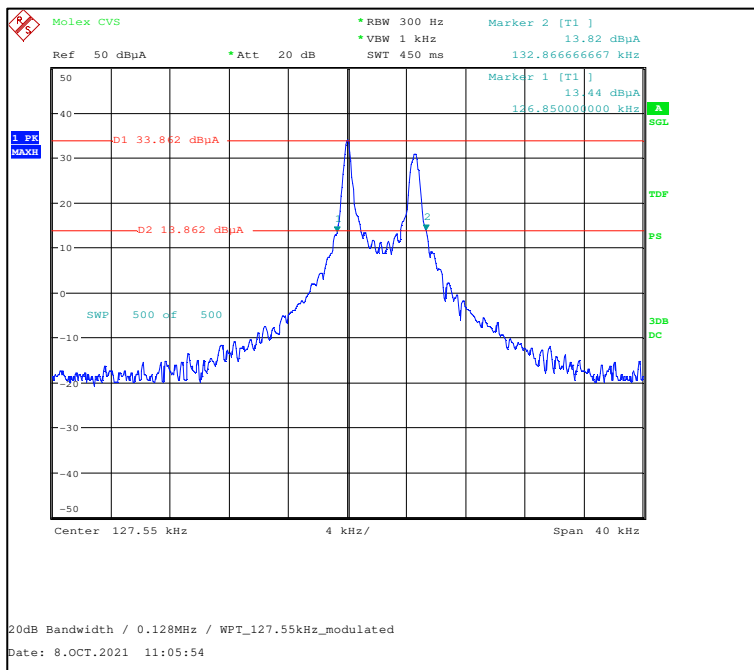
Frequency [kHz]	99% Bandwidth [kHz]
127.55	1.97

6.3.1.2 15W modulated

127.55kHz with negative FSK:



127.55kHz with positive FSK:



Frequency [kHz]	20dB OBW [kHz]
127.55 - FSK	5.57
127.55 + FSK	6.02

7. Test Equipment

7.1. Conducted Radio

Equipment	Manufacturer	Type	SERIAL-NO.	Actual Calibration	Next Calibration
Signal Generator	ROHDE & SCHWARZ	SMP02	828269/008	12.05.2020	12.05.2023
Signal Generator	ROHDE & SCHWARZ	SMB100A	181275	12.05.2021	12.05.2022
Vector Signal Generator	ROHDE & SCHWARZ	SMBV100A	263158	11.05.2021	11.05.2022
EMI Test Receiver	ROHDE & SCHWARZ	ESU26	100077	12.05.2021	12.05.2022
Vector Signal Generator	ROHDE & SCHWARZ	SMJ100A	100845	16.05.2020	16.05.2022
Power Supply	Hewlett Packard - Agilent	E3632A	MY40011318	11.05.2020	11.05.2023
Temp. / Humidity Logger	Lufft	Opus 10	13262	21.01.2020	21.01.2023
Climatic Chamber	Vötsch	VT4002	521/85094	06.10.2020	06.10.2022

7.2. Radiated Emission

Equipment	Manufacturer	Type	SERIAL-NO.	Actual Calibration	Next Calibration
Antenna	Schwarzbeck Mess-Elektronik	FMZB_1519	1519-056	22.07.2020	22.07.2023
Signal Generator	ROHDE & SCHWARZ	SMP02	828269/008	12.05.2020	12.05.2023
Signal Generator	ROHDE & SCHWARZ	SML01	100652	11.05.2021	11.05.2024
Power Supply	Hewlett Packard - Agilent	E3632A	KR75303301	11.05.2020	11.05.2022
Field Analyzer	Wandel & Goltermann	EMR20	P-0030	30.10.2020	30.10.2023
Antenna	ROHDE & SCHWARZ	HL025	359012/006		
Temp. / Humidity Logger	Lufft	Opus 10	13262	21.01.2020	21.01.2023
Antenna	ROHDE & SCHWARZ	HL562	100191	01.10.2021	01.10.2024
Antenna	ROHDE & SCHWARZ	HK-116: 20-300MHz	825177/0017	25.11.2021	25.11.2024
Antenna	ROHDE & SCHWARZ	HK-116: 20-300MHz	100401	21.08.2020	21.08.2023
Antenna	ROHDE & SCHWARZ	HL223	832369/006	26.04.2019	26.04.2022
Antenna	Schwarzbeck	UBA 9116	9116-396	27.07.2020	27.07.2023
Antenna	Emco	3115	9810-5588	24.03.2021	24.03.2024
Antenna	Schwarzbeck	BBHA-9120-D	01617	09.02.2022	09.02.2025
Antenna	ROHDE & SCHWARZ	HL223	100731	25.11.2021	25.11.2024
Antenna	Schwarzbeck Mess-Elektronik	VAMP 9243	9243-486	25.05.2021	25.05.2024
Isotropic Electric Field Probe	Wandel & Goltermann	Type 8	M-0082	30.10.2020	30.10.2023
Signal Generator	ROHDE & SCHWARZ	SMB100A	181275	12.05.2021	12.05.2022
EMI Test Receiver	ROHDE & SCHWARZ	ESW44	101733	28.05.2021	28.05.2022

End of Report