





## **TEST REPORT**

Test report no.: 1-1049/20-01-06

BNetzA-CAB-02/21-102

## **Testing laboratory**

#### CTC advanced GmbH

Untertuerkheimer Strasse 6 – 10 66117 Saarbruecken / Germany Phone: + 49 681 5 98 - 0 Fax: + 49 681 5 98 - 9075

Internet: <a href="https://www.ctcadvanced.com">https://www.ctcadvanced.com</a>
e-mail: <a href="mail@ctcadvanced.com">mail@ctcadvanced.com</a>

## 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 starting with the registration number: D-PL-12076-01.

## **Applicant**

#### SBO Hearing A/S

Kongebakken 9

2765 Smørum / DENMARK
Phone: +45 39 17 71 00
Contact: Per Klaus Nielsen
e-mail: pkni@sbohearing.com

#### Manufacturer

### SBO Hearing A/S

Kongebakken 9

2765 Smørum / DENMARK

#### Test standard/s

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

5 frequency devices

RSS - 210 Issue 10 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: Hearing aid amplifier module

Model name: Aurora miniRITE 312 T Rc

FCC ID: 2ACAHSBMRTRC IC: 11936A-SBMRTRC

Frequency: 3.84 MHz

Technology tested: Inductive coupling

Antenna: Integrated ferrite coil antenna

Power supply: 3.3 V to 3.8 V DC by Li Ion battery

Temperature range: 0°C to +40°C

Radio Communications

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:	Test performed:
Christoph Schneider	Tobias Wittenmeier
Lab Manager	Testing Manager

Radio Communications



## Table of contents

1	Table	of contents	2
2	Gene	ral information	3
	2.1 2.2 2.3	Notes and disclaimer	3
3	Test s	standard/s, references and accreditations	4
4	Repo	rting statements of conformity – decision rule	5
5	Test e	environment	6
6	Test i	tem	6
	6.1 6.2	General descriptionAdditional information	
7	Descr	ription of the test setup	7
	7.1 7.2 7.3	Shielded semi anechoic chamberShielded fully anechoic chamber	10
8	Seque	ence of testing	12
	8.1 8.2	Sequence of testing radiated spurious 9 kHz to 30 MHzSequence of testing radiated spurious 30 MHz to 1 GHz	
9	Meas	urement uncertainty	14
10	Sur	nmary of measurement results	15
11	Add	ditional comments	15
12	Mea	asurement results	16
	12.1 12.2 12.3	Occupied bandwidthField strength of the fundamentalField strength of the harmonics and spurious	18
13	Obs	servations	22
14	Glo	ssary	23
15	Doo	cument history	24
16	Acc	creditation Certificate – D-PL-12076-01-04	24
17	Acc	creditation Certificate – D-PL-12076-01-05	25



### 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. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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

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

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

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

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

All rights and remedies regarding vendor's products and services for which CTC advanced GmbH has prepared this test report shall be provided by the party offering such products or services and not by CTC advanced GmbH. In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### 2.2 Application details

Date of receipt of order: 2021-01-19
Date of receipt of test item: 2021-02-01
Start of test:\* 2021-02-02
End of test:\* 2021-02-05

Person(s) present during the test: -/-

### 2.3 Test laboratories sub-contracted

None

© CTC advanced GmbH Page 3 of 25

<sup>\*</sup>Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.



## 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 10	December 2019	Spectrum Management and Telecommunications Radio Standards Specification - Licence-Exempt Radio Apparatus: Category I Equipment				
RSS - Gen Issue 5 incl. Amendment 1	March 2019	Spectrum Management and Telecommunications Radio Standards Specification - General Requirements for Compliance of Radio Apparatus				
Guidance	Version	Description				
ANSI C63.4-2014 ANSI C63.10-2013	-/-	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				
Accreditation	Descriptio	n				
D-PL-12076-01-04		unication and EMC Canada akks.de/as/ast/d/D-PL-12076-01-04e.pdf  DakkS  Deutsche Akkreditierungsstelle D-PL-12076-01-04				
D-PL-12076-01-05		unication FCC requirements akks.de/as/ast/d/D-PL-12076-01-05e.pdf  DAKS  Deutsche Akkreditierungsstelle D-PL-12076-01-05				

© CTC advanced GmbH Page 4 of 25

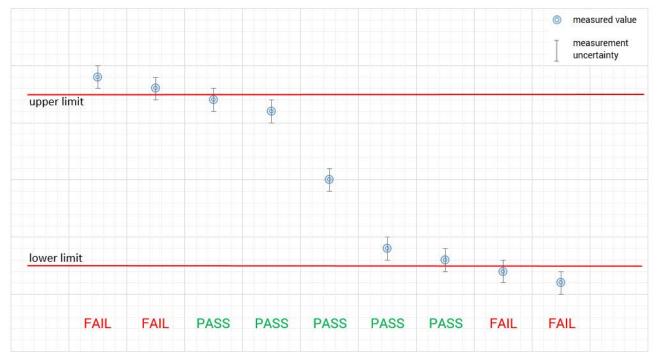


## 4 Reporting statements of conformity – decision rule

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



© CTC advanced GmbH Page 5 of 25



## 5 Test environment

Temperature :			+22 °C during room temperature tests No tests under extreme conditions required. No tests under extreme conditions required.
Relative humidity content	:		41 %
Barometric pressure	:		998 hpa
Power supply	:	$V_{max}$	3.7 V DC by Li Ion battery No tests under extreme conditions required. No tests under extreme conditions required.

## 6 Test item

## 6.1 General description

Kind of test item	:	Hearing aid amplifier module
Model name	:	Aurora miniRITE 312 T Rc
HMN	:	n/a
PMN	:	Aurora miniRITE 312 T Rc
HVIN	:	Aurora miniRITE 312 T Rc
FVIN	:	2.0
S/N serial number	:	201106
Hardware status	:	Enovia 171201 Rev. 7
Software status	:	SW rel. SR725_rel_2.1_17.0_b1
Firmware status	:	-/-
Frequency	:	3.84 MHz
Type of radio transmission Use of frequency spectrum	:	Modulated carrier
Type of modulation	:	GFSK
Number of channels		1
Antenna	:	Integrated ferrite coil antenna
Power supply	:	3.3 V to 3.8 V DC by Li Ion battery
Temperature range	:	0°C to +40°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: 1-1049/20-01-01\_AnnexA

1-1049/20-01-01\_AnnexB 1-1049/20-01-01\_AnnexD

© CTC advanced GmbH Page 6 of 25



## 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).

#### Agenda: Kind of Calibration

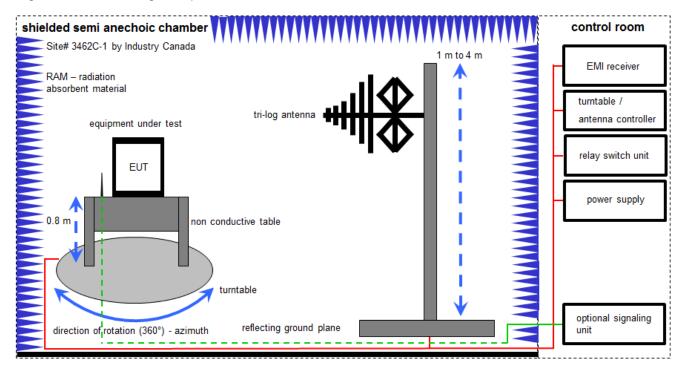
k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	ZW	cyclical maintenance (external cyclical
			maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

© CTC advanced GmbH Page 7 of 25



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

© CTC advanced GmbH Page 8 of 25



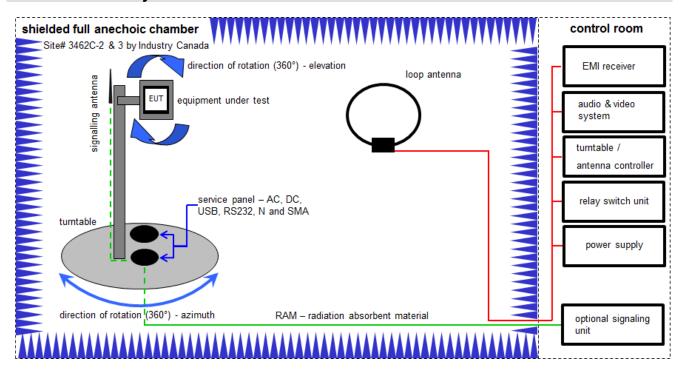
## **Equipment table:**

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	Α	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
2	A93	Semi anechoic chamber	3000023	MWB AG		300000551	ne	-/-	-/-
3	А	Analyzer-Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	vIKI!	17.01.2020	16.01.2022
4	Α	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw	-/-	-/-
5	А	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	-/-	-/-
6	А	Turntable Interface- Box	Model 105637	ETS-Lindgren	44583	300003747	izw	-/-	-/-
7	А	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	295	300003787	vIKI!	19.02.2019	18.02.2021
8	Α	Turntable	2089-4.0	EMCO		300004394	ne	-/-	-/-
9	Α	PC	TecLine	F+W		300004388	ne	-/-	-/-
10	Α	EMI Test Receiver	ESR3	Rohde & Schwarz	102587	300005771	k	10.12.2020	09.06.2022

© CTC advanced GmbH Page 9 of 25



## 7.2 Shielded fully anechoic chamber



Measurement distance: 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:

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

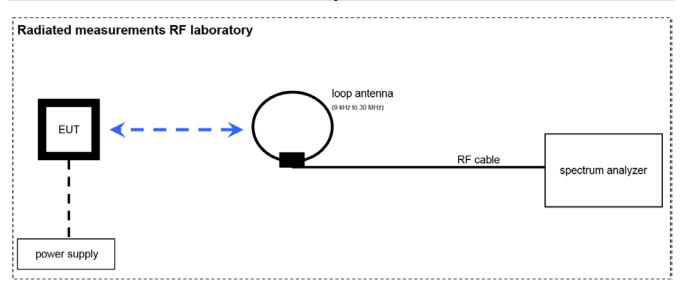
#### **Equipment table:**

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	Α	Active Loop Antenna 9 kHz to 30 MHz	6502	EMCO	2210	300001015	vIKI!	13.06.2019	12.06.2021
2	Α	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev	-/-	-/-
3	Α	Switch / Control Unit	3488A	HP	*	300000199	ne	-/-	-/-
4	Α	EMI Test Receiver 20Hz- 26,5GHz	ESU26	R&S	100037	300003555	k	11.12.2020	10.12.2021
5	Α	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne	-/-	-/-
6	А	NEXIO EMV- Software	BAT EMC V3.20.0.13	EMCO		300004682	ne	-/-	-/-
7	А	Open Switch and Control Unit and Power Sensors	OSP120 incl. B157	R&S	101274, 100877	300004825	vIKI!	16.12.2020	15.12.2022
8	Α	PC	ExOne	F+W		300004703	ne	-/-	-/-

© CTC advanced GmbH Page 10 of 25



## 7.3 Radiated measurements RF laboratory



## **Equipment table:**

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	Α	Loop Antenna		ZEG TS Steinfurt		400001208	ev	-/-	-/-
2	Α	RF Cable BNC	RG58	Huber & Suhner		400001209	ev	-/-	-/-
3	Α	Spectrum Analyzer	FSV30	Rohde & Schwarz	104365	300005923	k	16.12.2020	15.03.2022

© CTC advanced GmbH Page 11 of 25



### 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.

© CTC advanced GmbH Page 12 of 25

<sup>\*)</sup>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 ± 45° 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.

© CTC advanced GmbH Page 13 of 25



## 9 Measurement uncertainty

Measurement uncertainty							
Test case Uncertainty							
Occupied bandwidth	± used RBW						
Field strength of the fundamental	± 3 dB						
Field strength of the harmonics and spurious	± 3 dB						
Receiver spurious emissions and cabinet radiations	± 3 dB						
Conducted limits	± 2.6 dB						

© CTC advanced GmbH Page 14 of 25



## 10 Summary of measurement results

$\boxtimes$	No deviations from the technical specifications were ascertained
	There were deviations from the technical specifications ascertained
	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210 Issue 10 RSS Gen Issue 5	See table!	2021-05-11	-/-

Test specification clause	Test case	Temperature conditions	Power source conditions	С	NC	NA	NP	Remark
RSS Gen Issue 5 (6.6)	Occupied bandwidth	Nominal	Nominal	$\boxtimes$				-/-
§ 15.209	Field strength of the fundamental	Nominal	Nominal	$\boxtimes$				-/-
§ 15.209 RSS Gen Issue 5 (6.13)	Field strength of the harmonics and spurious	Nominal	Nominal	$\boxtimes$				-/-
§ 15.109	Receiver spurious emissions and cabinet radiations	Nominal	Nominal			$\boxtimes$		-/-
§15.107 §15.207	Conducted limits	Nominal	Nominal			X		Battery powered only!

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

## 11 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

© CTC advanced GmbH Page 15 of 25



## 12 Measurement results

## 12.1 Occupied bandwidth

### **Measurement:**

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal.

Measurement parameters				
Detector:	Peak			
Resolution bandwidth:	1 % – 5 % of the occupied bandwidth			
Video bandwidth:	≥ 3x RBW			
Trace mode:	Max hold			
Analyser function:	99 % power function			
Used test setup:	See sub clause 7.3 – A			
Measurement uncertainty:	See sub clause 9			

#### Limit:

IC
for RSP-100 test report coversheet only

### Result:

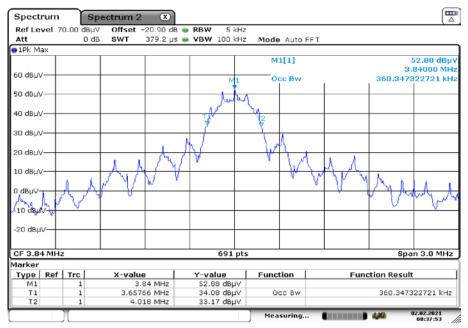
99% emission bandwidth
35 /6 emission bandwidth
360.347 kHz
360.347 KHZ

© CTC advanced GmbH Page 16 of 25



## Plot:

Plot 1: 99 % emission bandwidth



Date: 2.FEB.2021 08:37:53

© CTC advanced GmbH Page 17 of 25



## 12.2 Field strength of the fundamental

## **Measurement:**

The maximum detected field strength for the carrier signal.

Measurement parameters				
Detector:	average			
Resolution bandwidth:	10 kHz			
Video bandwidth:	≥ 3x RBW			
Trace mode:	Max hold			
Used test setup	See sub clause 7.2 – A			
Measurement uncertainty:	See sub clause 9			

## Limit:

FCC & IC						
Frequency	Field strength	Measurement distance				
(MHz)	(dBµV/m)	(m)				
1.705 – 30.0	30	30				

## **Recalculation:**

	According to ANSI C63.10						
Frequency	Frequency Formula						
3.84	$FS_{limit} = FS_{max} - 40 \log \left(\frac{d_{\textit{nearfield}}}{d_{\textit{measure}}}\right) - 20 \log \left(\frac{d_{\textit{limit}}}{d_{\textit{nearfield}}}\right)$ $FS_{limit} \qquad \text{is the calculation of field strength at the limit distance,} $ $\text{expressed in dB}_{\mu}V/m$ $FS_{max} \qquad \text{is the measured field strength, expressed in dB}_{\mu}V/m$ $\text{d}_{\textit{nearfield}} \qquad \text{is the } \lambda/2\pi \text{ distance}$	-51.4					
	d <sub>measure</sub> is the distance of the measurement point from EUT d <sub>limit</sub> is the reference limit distance						

## Result:

Field strength of the fundamental						
Frequency 3.84 MHz						
Distance	@ 1 m	@ 30 m				
Measured / calculated value	52.9 dBµV/m	1.5 dBµV/m				

© CTC advanced GmbH Page 18 of 25



## 12.3 Field strength of the harmonics and spurious

## **Measurement:**

The maximum detected field strength for the harmonics and spurious.

Measurement parameters				
Detector:	Quasi peak / average or			
Detector.	peak (worst case – pre-scan)			
	F < 150 kHz: 200 Hz			
Resolution bandwidth:	150 kHz < F < 30 MHz: 9 kHz			
	30 MHz < F < 1 GHz: 120 kHz			
	F < 150 kHz: 1 kHz			
Video bandwidth:	150 kHz < F < 30 MHz: 100 kHz			
	30 MHz < F < 1 GHz: 300 kHz			
Trace mode:	Max hold			
Lload tost setup:	9 kHz to 30 MHz: see sub clause 7.2 – A			
Used test setup:	30 MHz to 1 GHz: see sub clause 7.1 – A			
Measurement uncertainty:	See sub clause 9			

## Limit:

FCC & IC						
Frequency	Field strength	Measurement distance				
(MHz)	(dBµV/m)	(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				

## Result:

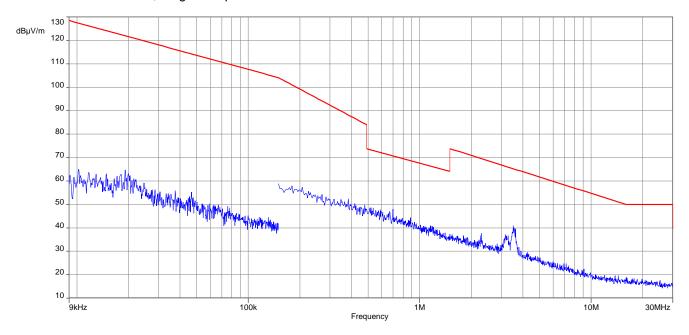
Detected emissions							
Frequency (MHz)	Detector	Resolution bandwidth (kHz)	Detected value				
All detected peak emissions below 30 MHz are more than 20 dB below the average limit.							
For emissions above 30 MHz, please look at the table below the 1 GHz plot.							

© CTC advanced GmbH Page 19 of 25



## Plots:

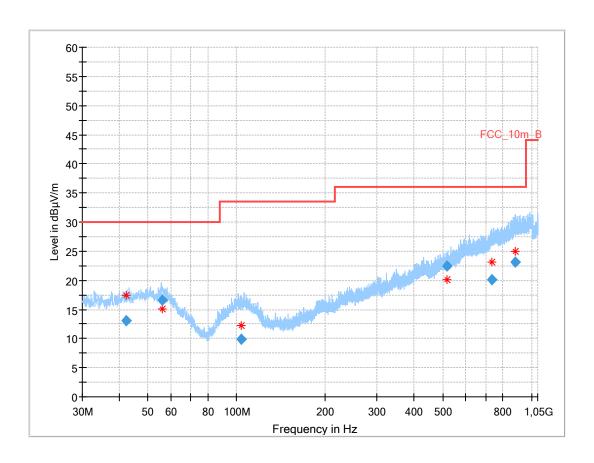
Plot 1: 9 kHz - 30 MHz, magnetic spurious emissions



© CTC advanced GmbH Page 20 of 25



Plot 2: 30 MHz – 1 GHz, vertical and horizontal polarization



Final\_Result

Frequency (MHz)	QuasiPea k (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.320	13.02	30.0	17.0	1000	120.0	116.0	Н	-7	14
55.988	16.60	30.0	13.4	1000	120.0	165.0	Н	67	15
103.419	9.86	33.5	23.6	1000	120.0	160.0	Н	67	13
515.452	22.38	36.0	13.6	1000	120.0	107.0	Н	71	19
734.679	20.19	36.0	15.8	1000	120.0	124.0	Н	-22	22
884.262	23.05	36.0	13.0	1000	120.0	151.0	V	247	23

© CTC advanced GmbH Page 21 of 25



## 13 Observations

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

© CTC advanced GmbH Page 22 of 25



## 14 Glossary

EUT	Equipment under test
DUT	Device under test
UUT	Unit under test
GUE	GNSS User Equipment
ETSI	European Telecommunications Standards Institute
EN	European Standard
FCC	Federal Communications Commission
FCC ID	Company Identifier at FCC
IC	Industry Canada
PMN	Product marketing name
HMN	Host marketing name
HVIN	Hardware version identification number
FVIN	Firmware version identification number
EMC	Electromagnetic Compatibility
HW	Hardware
SW	Software
Inv. No.	Inventory number
S/N or SN	Serial number
С	Compliant
NC	Not compliant
NA	Not applicable
NP	Not performed
PP	Positive peak
QP	Quasi peak
AVG	Average
ОС	Operating channel
OCW	Operating channel bandwidth
OBW	Occupied bandwidth
ООВ	Out of band
DFS	Dynamic frequency selection
CAC	Channel availability check
OP	Occupancy period
NOP	Non occupancy period
DC	Duty cycle
PER	Packet error rate
CW	Clean wave
MC	Modulated carrier
WLAN	Wireless local area network
RLAN	Radio local area network
DSSS	Dynamic sequence spread spectrum
OFDM	Orthogonal frequency division multiplexing
FHSS	Frequency hopping spread spectrum
GNSS	Global Navigation Satellite System
C/N₀	Carrier to noise-density ratio, expressed in dB-Hz

© CTC advanced GmbH Page 23 of 25



## 15 Document history

Version	Applied changes	Date of release
-/-	Initial release	2021-05-11

## 16 Accreditation Certificate - D-PL-12076-01-04

first page	last page
Deutsche Akkreditierungsstelle GmbH  Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition  Accreditation  The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory  CTC advanced GmbH Untertürkheimer Straße 6-10, 66117 Saarbrücken  is competent under the terms of DIN EN ISO/IEC 17025-2018 to carry out tests in the following fields:  Telecommunication (TC) and Electromagnetic Compatibility (EMC) for Canadian Standards	Deutsche Akkreditierungsstelle GmbH  Office Berlin Office Frankfurt am Main Office Braunschweig Spittelmarkt 10 Europa-Allee 32 Bunderallee 100 10117 Berlin 60327 Frankfurt am Main 38116 Braunschweig
The accreditation certificate shall only apply in connection with the notice of accreditation of 09.06.2020 with the accreditation number D-PL-12076-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 07 pages.  Registration number of the certificate: D-PL-12076-01-04  Frankfurt am Main, 09.06.2020  by order Duk Ing. (Fig. Ref. Egner-Head of Devision)  The certificate segether with its annex reflects the sistua of the line of the date of Issue. The current status of the scape of accreditation can be found at the distable of accreditation dates. The current status of the scape of accreditation can be found at the distable of accreditation dates. Altrapit/leven/dates. Africe/content/accreditate-bodies of Devisione Addressition-instable Grabbit.	The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.  No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkAS.  The accreditation was granted pursuant to the Act on the Accreditation Body (AkKstelleG) of 31July 2009 [rederal Lea Gazette Ja 2-250] and the Regulation IC (SA 0-25/2008 of the European Pelaiment and of the Council of 3 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Lincol. 123 of 5 July 2008, p. 301. DAkS is a signatory to the Nutbalkeral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Formul (RA) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.  The up-to-date state of membership can be retrieved from the following websites:  EA: www.uropean-accreditation.org ILAC: www.lac.org ILAC: www.lac.org

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkkS or may be received by CTC advanced GmbH on request

https://www.dakks.de/as/ast/d/D-PL-12076-01-04e.pdf

© CTC advanced GmbH Page 24 of 25



## 17 Accreditation Certificate – D-PL-12076-01-05

first page	last page
Deutsche Akkreditierungsstelle GmbH  Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition  Accreditation  The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory CTC advanced GmbH Untertürkheimer Straße 6-10, 66117 Saarbrücken is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields: Telecommunication (FCC Requirements)	Deutsche Akkreditierungsstelle GmbH  Office Berlin Office Frankfurt am Main Office Braunschweig Bundesallee 100 10117 Berlin 60327 Frankfurt am Main 38116 Braunschweig
The accreditation certificate shall only apply in connection with the notice of accreditation of 09.06.2020 with the accreditation number D-PL-12076-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 05 pages.  Registration number of the certificate: D-PL-12076-01-05  Frankfurt am Main, 09.06.2020 by orag Opel-ing. (PH) and Egner Head of Division  The cortificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the detailbate of accreditation can be found of the detailbate of accreditation can be found.	The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstele GmbH (DAKS), Exempted is the unchanged form of separate disseminations of the cover sheet by the conformally assessment body mentioned overleaf.  No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAKS.  The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gastett 1 p. 3633) and the Regulation (EC) No 765/2009 of the European Parliament and of the Council of 3 July 2008 stelling out the requirements for accreditation and markets reveillance relating to the marketing of products (Official Journal of the European Co-peration for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILC), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILC), The signatories to these agreements recognise each other's accreditations.  The U-to-date state of membership can be retrieved from the following websites:  EA: www.european-accreditation.org  ILAC: www.liac.org  IAF: www.liac.org

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkkS or may be received by CTC advanced GmbH on request

https://www.dakks.de/as/ast/d/D-PL-12076-01-05e.pdf

© CTC advanced GmbH Page 25 of 25