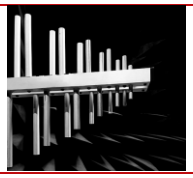
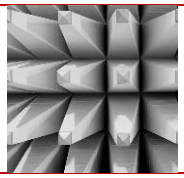




CETECOM™

CETECOM ICT Services

consulting - testing - certification ➤➤➤

TEST REPORT

Test report no.: 1-8940/14-01-07-A

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-00

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-00

Applicant

UNITRON HEARING LTD
20 Beasley Drive
N2G 4X1 Kitchener, Ontario / CANADA
Phone: +1 519 895 0100
Fax: -/-
Contact: Brian Matcheski
e-mail: Brian.Matcheski@unitron.com
Phone: +1 51 98 95 01 00 21 10

Manufacturer

UNITRON HEARING LTD
20 Beasley Drive
N2G 4X1 Kitchener, Ontario / CANADA

Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

Test Item

Kind of test item:	**Air Conduction Hearing Aid**
Model name:	**N Moxi Dura 800**
FCC ID:	**VMY-UWNB1**
IC:	**2756A-UWNB1**
Frequency:	10.6 MHz
Technology tested:	Modulated carrier
Antenna:	Integrated ferrite coil antenna (inductive)
Power supply:	1.30 V DC by Zinc Air battery
Temperature range:	0°C to +35°C

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

Test report authorised:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2015.03.30 06:50:40 +02'00'

Marco Bertolino
Radio Communications & EMC

Test performed:

cn=Christoph Schneider, o=CETECOM ICT Services GmbH, ou=SND-120402, email=christoph.schneider@cetecom.com, c=DE
2015.03.27 13:04:03 +01'00'

Christoph Schneider
Radio Communications & EMC

1 Table of contents

1 Table of contents 2
2 General information 3
2.1 Notes and disclaimer 3
2.2 Application details 3
3 Test standard/s 3
4 Test environment 4
5 Test item 4
5.1 Additional information 4
6 Test laboratories sub-contracted 4
7 Description of the test setup 5
7.1 Radiated measurements chamber F 5
7.2 Radiated measurements chamber C 6
7.3 Conducted measurements 7
8 Summary of measurement results 8
9 Additional comments 8
10 Measurement results 9
10.1 Occupied bandwidth 9
10.2 Field strength of the fundamental 11
10.3 Field strength of the harmonics and spurious 12
10.4 Receiver spurious emissions and cabinet radiations 15
11 Test equipment and ancillaries used for tests 17
12 Observations 17
Annex A Document history 18
Annex B Further information 18
Annex C Accreditation Certificate 19

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services 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 CETECOM ICT Services GmbH.
The testing service provided by CETECOM ICT Services GmbH has been rendered under the current "General Terms and Conditions for CETECOM ICT Services GmbH".
CETECOM ICT Services 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 CETECOM ICT Services 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 CETECOM ICT Services GmbH test report include or imply any product or service warranties from CETECOM ICT Services GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CETECOM ICT Services GmbH.
All rights and remedies regarding vendor's products and services for which CETECOM ICT Services GmbH has prepared this test report shall be provided by the party offering such products or services and not by CETECOM ICT Services 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.

This test report replaces the test report with the number 1-8940/14-01-07 and dated 2015-02-20

2.2 Application details

Date of receipt of order:	2014-12-10
Date of receipt of test item:	2015-01-29
Start of test:	2015-02-12
End of test:	2015-02-17
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	-/-	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8	01.12.2010	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS - Gen Issue 4	01.11.2014	Spectrum Management and Telecommunications Radio Standards Specifications - General Requirements and Information for the Certification of Radio Apparatus

4 Test environment

Temperature:	T_{nom}	+22 °C	during room temperature tests
	T_{max}	+35 °C	during high temperature tests
	T_{min}	0 °C	during low temperature tests
Relative humidity content:		38 %	
Barometric pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	1.30 V	DC by Zinc Air battery
	V_{max}	1.45 V	
	V_{min}	1.10 V	

5 Test item

Kind of test item	**:**	**Air Conduction Hearing Aid**
Type identification	**:**	**N Moxi Dura 800**
S/N serial number	**:**	**TX 1504K000F** **RX 1504K000G**
HW hardware status	**:**	**050-5673-xx** **equivalent variants: 050-5670-xx; 050-5671-xx; 050-5672-xx; 050-5674-xx; 050-5675-xx44; 050-5676-xx44;**
SW software status	**:**	**067-6348** **equivalent varients: 067-6345; 067-6346; 067-6347; 067-6349**
Frequency band [MHz]	**:**	**10.6 MHz**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**Base band modulation**
Type of modulation	**:**	**8-DPSK**
Number of channels	**:**	**1**
Antenna	**:**	**Integrated ferrite coil antenna (inductive)**
Power supply	**:**	**1.30 V DC by Zinc Air battery**
Temperature range	**:**	**0°C to +35 °C**

5.1 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: 1-8940/14-01-19_AnnexA
1-8940/14-01-19_AnnexB
1-8940/14-01-19_AnnexC

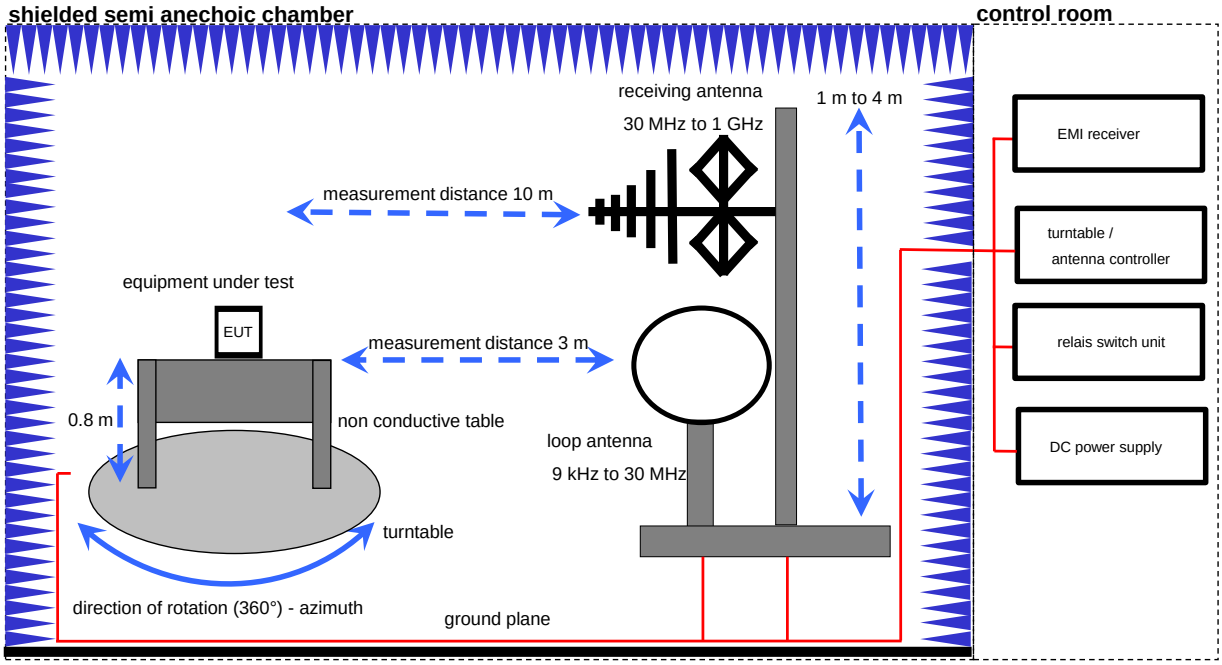
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

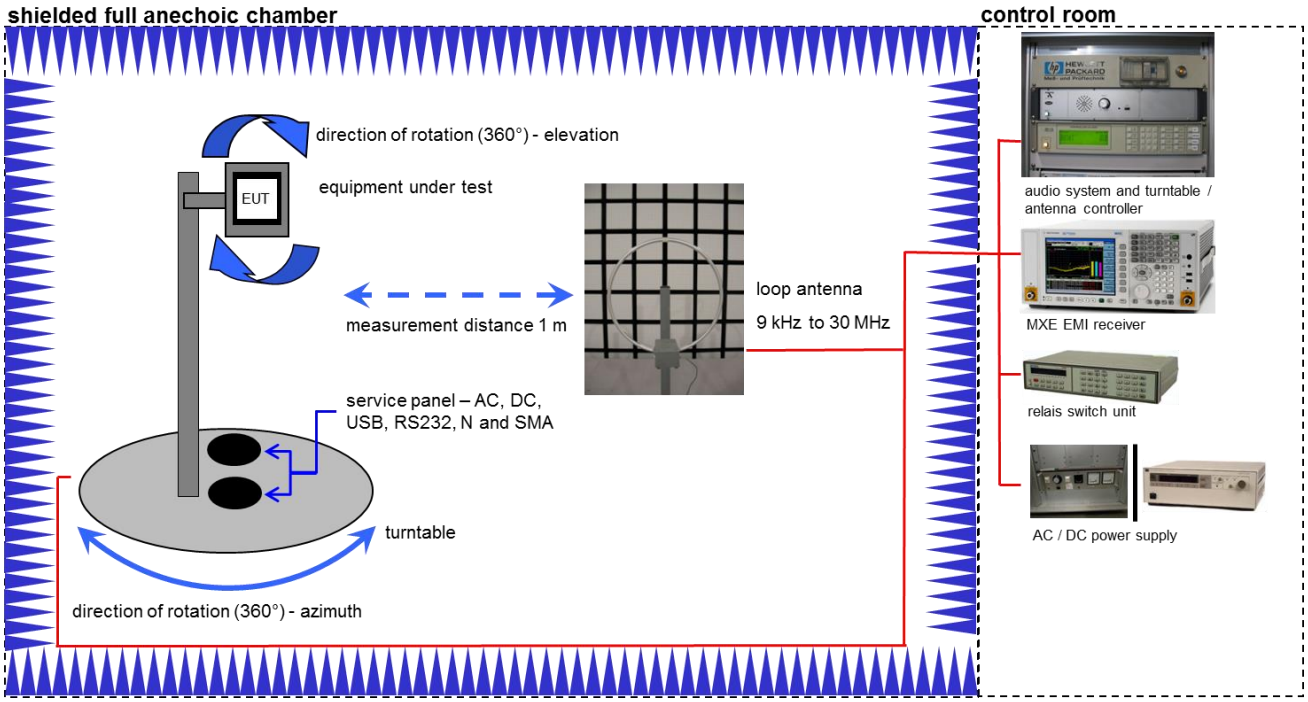
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with 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 analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Software	EMC32 V.| 9.12.05	R&S	-/-	-/-
Switch-Unit	3488A	HP	2719A14505	300000368
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745
Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746
Turntable Interface-Box	Model 105637	ETS-Lindgren	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787

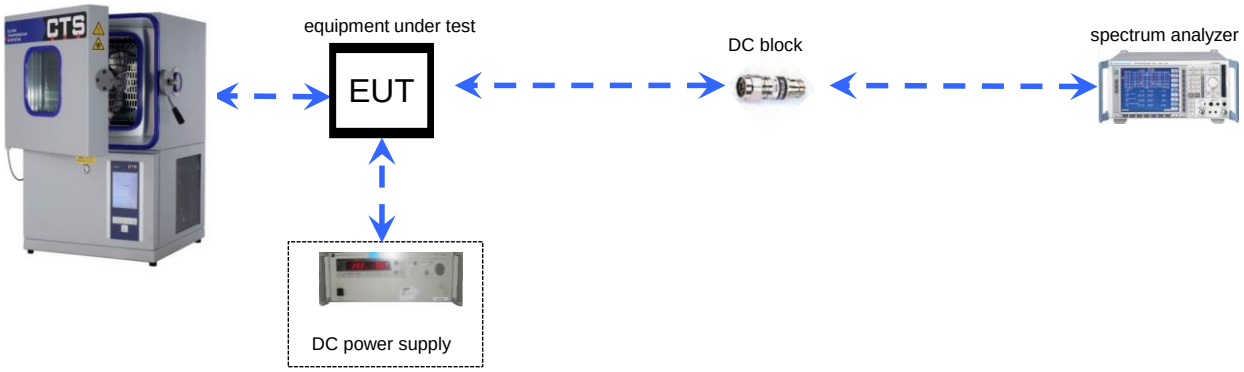
7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP	*	300000199
Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256
MXE EMI Receiver 20 Hz to 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405

7.3 Conducted measurements



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059

8 Summary of measurement results

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210 Issue 8 RSS Gen Issue 4	See tests	2015-03-27	-/-

Test specification clause	Test case	Temperature conditions	Power source conditions	Pass	Fail	NA	NP	Remark
RSS Gen Issue 4 (6.6)	Occupied bandwidth	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria
§ 15.209	Field strength of the fundamental	Nominal	Nominal	☒	☐	☐	☐	Pass
§ 15.209	Field strength of the harmonics and spurious	Nominal	Nominal	☒	☐	☐	☐	Pass
§ 15.109	Receiver spurious emissions and cabinet radiations	Nominal	Nominal	☒	☐	☐	☐	Pass
§15.107 §15.207	Conducted limits	Nominal	Nominal	☐	☐	☒	☐	Battery powered only

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

10 Measurement results

10.1 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

Limit:

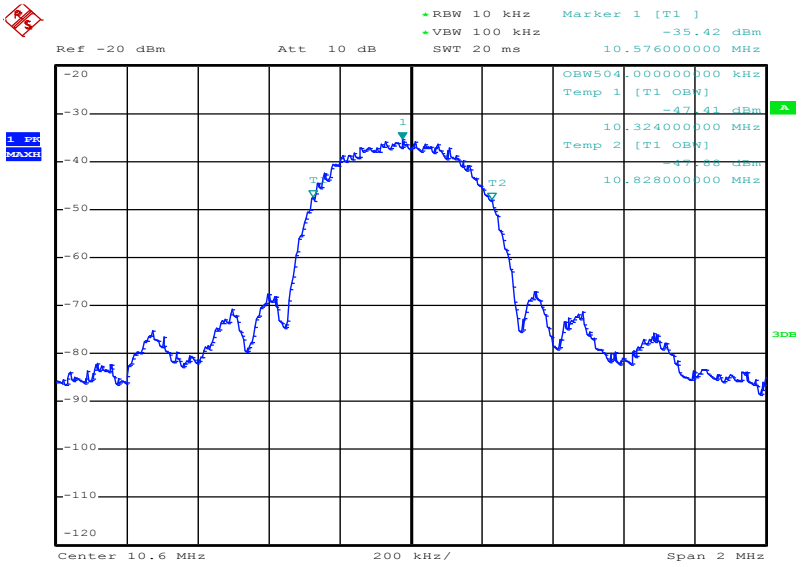
IC
for RSP-100 test report coversheet only

Result:

99% emission bandwidth	
504 kHz	
Measurement uncertainty	± RBW

Plot:

Plot 1: 99 % emission bandwidth



Date: 17.FEB.2015 10:52:59

10.2 Field strength of the fundamental

Measurement:

The maximum detected field strength for the carrier signal.

Measurement parameters	
Detector:	Quasi peak / peak (worst case)
Resolution bandwidth:	120 kHz
Video bandwidth:	≥ 3x RBW
Trace mode:	Max hold

Limit:

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

Recalculation:

According to ANSI C63.10		
Frequency	Formula	Correction value
10.6 MHz	$FS_{limit} = FS_{max} - 40\log\left(\frac{d_{nearfield}}{d_{measure}}\right) - 20\log\left(\frac{d_{limit}}{d_{nearfield}}\right)$	-42.62

Result:

Field strength of the fundamental		
Frequency	10.6 MHz	
Distance	@ 1 m	@ 30 m
Measured / calculated value	53.07 dBµV/m	10.45 dBµV/m
Measurement uncertainty	±3 dB	

10.3 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 peak (worst case – pre-scan)
Resolution bandwidth:	F < 150 kHz: 200 Hz 150 kHz < F < 30 MHz: 9 kHz 30 MHz < F < 1 GHz: 120 kHz
Video bandwidth:	F < 150 kHz: 1 kHz 150 kHz < F < 30 MHz: 100 kHz 30 MHz < F < 1 GHz: 300 kHz
Trace mode:	Max hold

Limit:

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

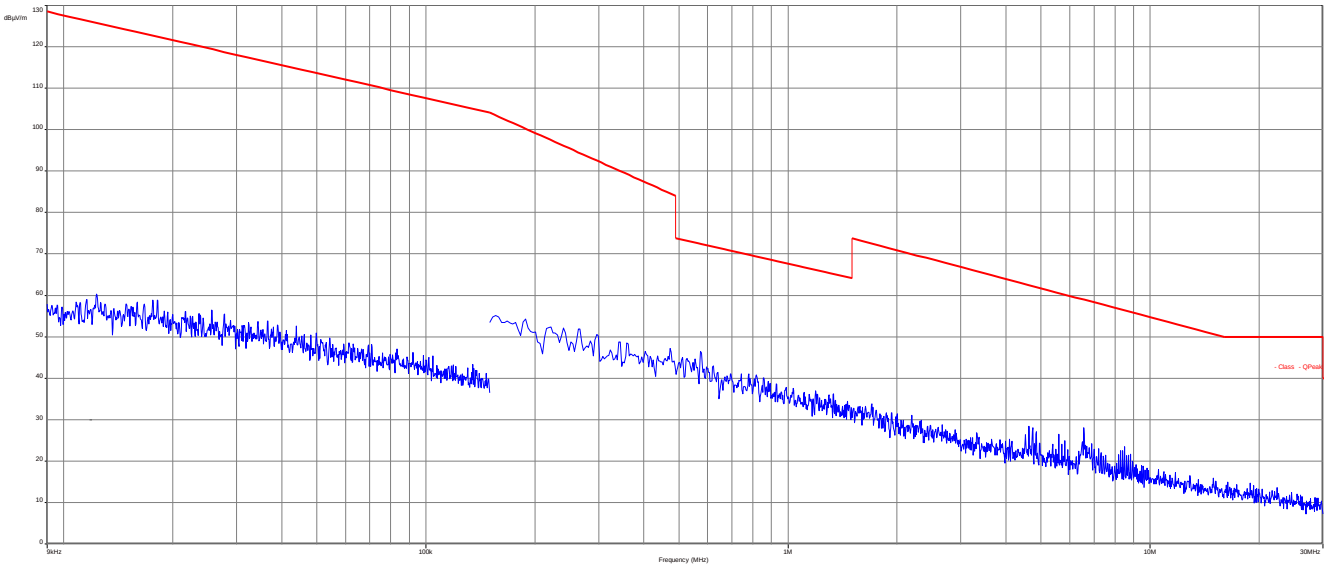
Note: For a reduced measurement distance, please take a look at the limit line and the ANSI C63.10-2013 sub clause 6.4 radiated emissions from unlicensed wireless devices below 30 MHz.

Result:

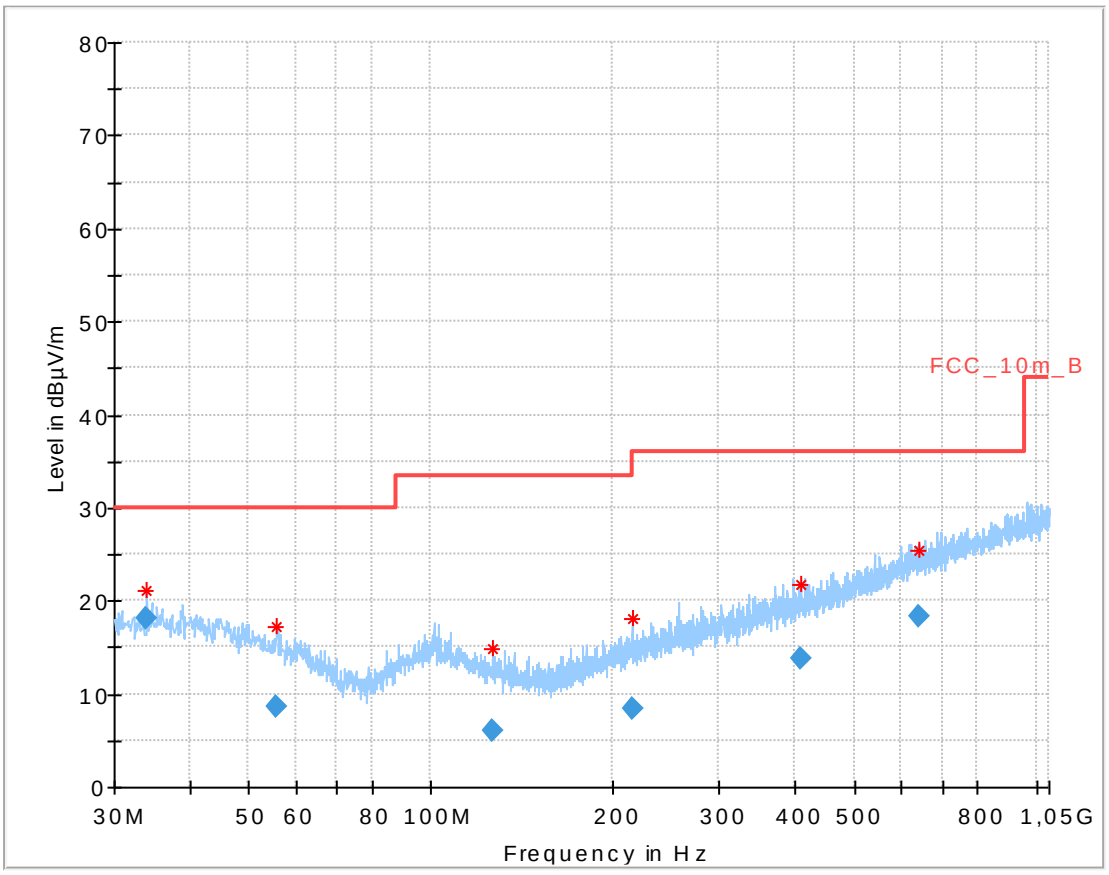
Detected emissions			
Frequency (MHz)	Detector	Resolution bandwidth (kHz)	Detected value
Please take a look at the table below the 1 GHz plot.			
Measurement uncertainty		±3 dB	

Plots:

Plot 1: 9 kHz – 30 MHz, magnetic emissions



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



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
33.981300	18.12	30.00	11.88	1000.0	120.000	101.0	V	287	13.7
55.528050	8.72	30.00	21.28	1000.0	120.000	101.0	V	263	11.7
126.511650	6.11	33.50	27.39	1000.0	120.000	101.0	H	25	9.7
215.107950	8.31	33.50	25.19	1000.0	120.000	170.0	V	25	12.2
409.526250	13.76	36.00	22.24	1000.0	120.000	98.0	V	83	17.0
638.832900	18.36	36.00	17.64	1000.0	120.000	170.0	H	155	21.0

10.4 Receiver spurious emissions and cabinet radiations

Measurement:

The maximum detected field strength for the spurious.

Measurement parameters	
Detector:	Quasi peak / average or peak (worst case – pre-scan)
Resolution bandwidth:	F < 150 kHz: 200 Hz 150 kHz < F < 30 MHz: 9 kHz 30 MHz < F < 1 GHz: 120 kHz
Video bandwidth:	F < 150 kHz: 1 kHz 150 kHz < F < 30 MHz: 100 kHz 30 MHz < F < 1 GHz: 300 kHz
Trace mode:	Max hold

Limit:

FCC & IC		
Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 – 88	100 (40 dBµV/m)	3
88 – 216	150 (43.5 dBµV/m)	3
216 – 960	200 (46 dBµV/m)	3

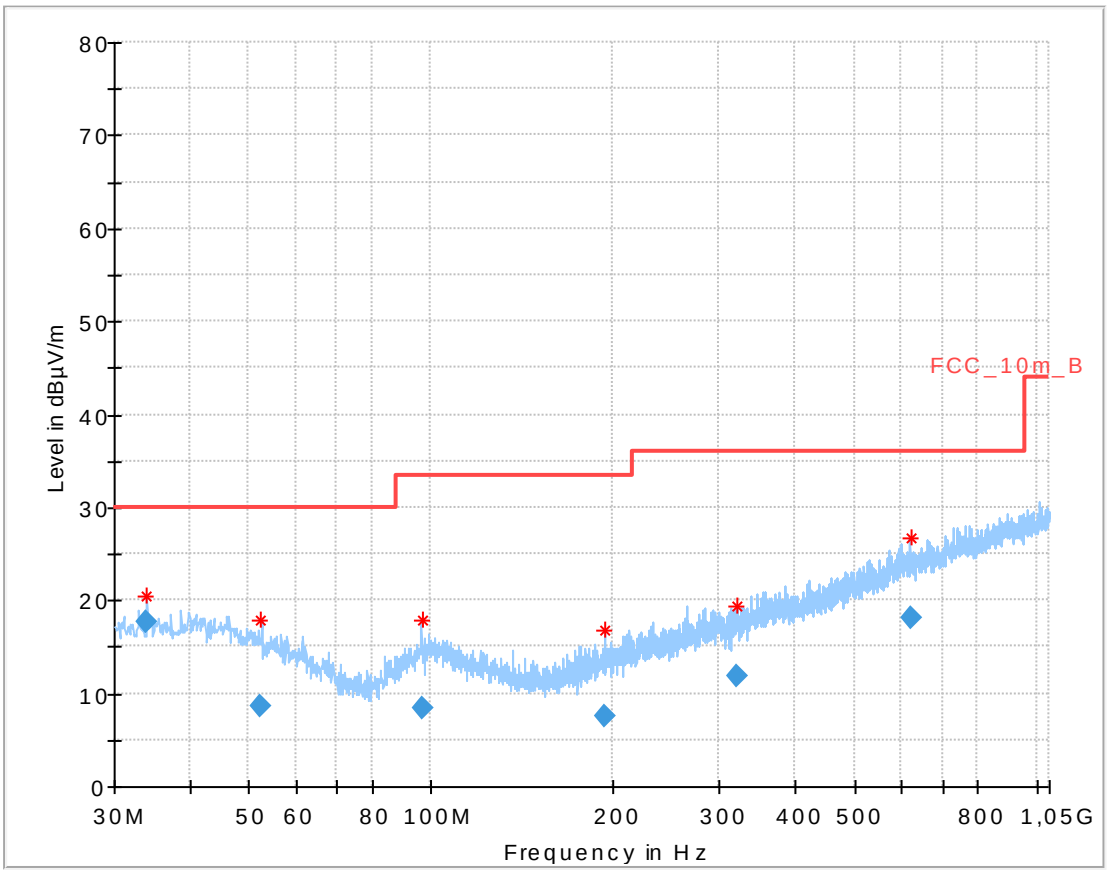
Note: For a reduced measurement distance, please take a look at the limit line and the ANSI C63.10-2013 sub clause 6.4 radiated emissions from unlicensed wireless devices below 30 MHz.

Result:

Detected emissions			
Frequency (MHz)	Detector	Resolution bandwidth (kHz)	Detected value
Please take a look at the table below the 1 GHz plot.			
Measurement uncertainty		±3 dB	

Plots:

Plot 1: 30 MHz – 1 GHz, vertical and horizontal polarisation



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
33.975300	17.73	30.00	12.27	1000.0	120.000	101.0	V	174	13.7
52.190400	8.69	30.00	21.31	1000.0	120.000	101.0	H	84	12.3
96.992550	8.39	33.50	25.11	1000.0	120.000	101.0	V	173	11.7
193.518450	7.46	33.50	26.04	1000.0	120.000	101.0	V	245	11.3
321.277650	11.80	36.00	24.20	1000.0	120.000	101.0	V	25	15.1
618.836850	18.02	36.00	17.98	1000.0	120.000	170.0	H	263	20.9

11 Test equipment and ancillaries used for tests

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 signalling 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).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP	2719A14505	300000368	g		
2	45	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	22.01.2015	22.01.2017
3	45	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw		
4	45	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw		
5	45	Turntable Interface-Box	Model 105637	ETS-Lindgren	44583	300003747	izw		
6	45	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016
7	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
8	n. a.	Switch / Control Unit	3488A	HP	*	300000199	ne		
9	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
10	90	MXE EMI Receiver 20 Hz to 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	13.03.2014	13.03.2015
11	n. a.	EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059	k	23.01.2015	22.01.2016

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

12 Observations

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

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2015-02-20
-A	Updated FCC ID	2015-03-27

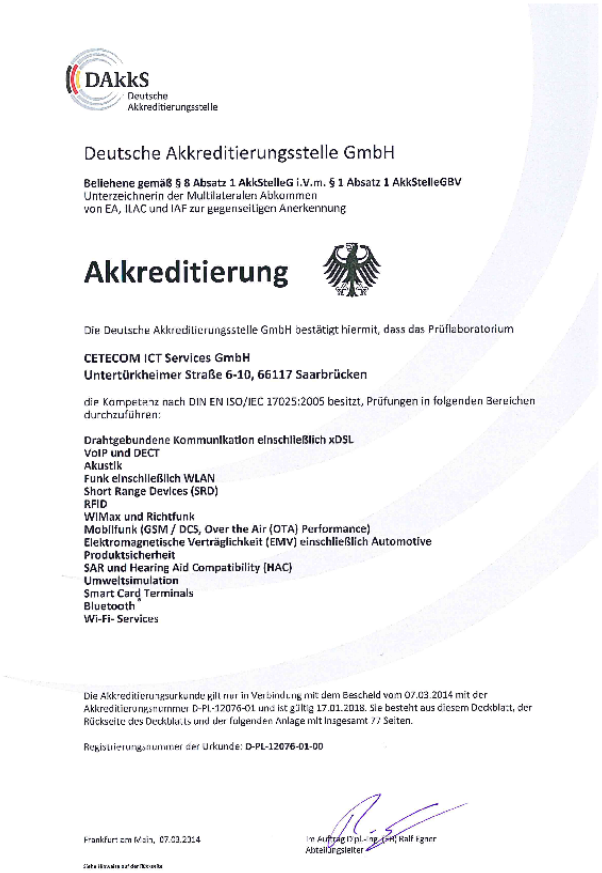
Annex B Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

Annex C Accreditation Certificate

Front side of certificate



DAkkS
Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Beliehene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL
VoIP und DECT
Akustik
Funk einschließlich WLAN
Short Range Devices (SRD)
RFID
WiMax und Richtfunk
Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR und Hearing Aid Compatibility (HAC)
Umweltsimulation
Smart Card Terminals
Bluetooth
Wi-Fi- Services

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 07.03.2014 mit der Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 77 Seiten.

Registrierungsnummer der Urkunde: **D-PL-12076-01-00**

Frankfurt am Main, 07.03.2014

Im Auftrag Dipl.-Ing. (FH) Rolf Egner
Abteilungsleiter

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

Standort Berlin
Spittelmarkt 10
10117 Berlin

Standort Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Standort Braunschweig
Bundesallee 100
38116 Braunschweig

Die auszugsweise Veröffentlichung der Akkreditierungsurkunde bedarf der vorherigen schriftlichen Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAkkS). Ausgenommen davon ist die separate Weiterverbreitung des Deckblattes durch die umseitig genannte Konformitätsbewertungsstelle in unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt, die über den durch die DAkkS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).
Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Note:

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html