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Recognized by the Federal Communications Commission

Anechoic chamber registration no.: 90462 (FCC) Anechoic chamber registration no.: IC 3462C-1

TCB ID: DE 0001



Accredited by the German Accreditation Council DAR–Registration Number DAT-P-176/94-D1



Accredited Bluetooth® Test Facility (BQTF)

Test report no. : 1-1732-01-02B/09

Applicant : Oticon A/S
Type : Mini RITE
Test Standard : 47 CFR Part15

RSS-210 Issue 7

FCC ID : U28FUNRI03 Certification No. IC : 1350B-FUNRI03

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1. Administrative data

1.1. Administrative data of the test facility

1.1.1 Identification of the testing laboratory

Company name: Cetecom ICT Services GmbH

Address: Untertürkheimerstr. 6-10

D-66117 Saarbruecken

Germany

Laboratory accreditation: DAR-Registration No. DAT-P-176/94-D1

Bluetooth Qualification Test Facility (BQTF)

Responsible for testing laboratory: Dipl.-Ing. (FH) Stefan Bös

Phone: +49 681 598 0 Fax: +49 681 598 9075 email: info@ict.cetecom.de

Responsible for testing laboratory (Dipl.-Ing. (FH) Stefan Bös)

1.1.2 Organizational items

Reference No.: 1-1732-01-02B/09

Order No.: -/-

Receipt of EUT: 2009-10-19

Date(s) of test: 2009-10-27 - 2009-10-28

Date of report: 2009-12-21

Number of report pages: 25
Number of pages (annex): 7

Version of template: 1.8

Responsible for testing (Andreas Keller)

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Note:

The test results of this test report relate exclusively to the item tested as specified in this report. The 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.

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During the test no hardware and software changes are allowed to be performed at the EUT.

1.1.3 Applicant's details

Manufacturer's name:

Applicant's name:

Address:

Kongebakken 9

2765 Smørum

Denmark

Tel: +45 39 17 71 00

Fax: +45 39 27 79 00

Email: http://www.oticon.com

Contact person:

Mr. Jørgen Peter Hanuscheck

Tel: +45 39 13 85 38

Fax: -/
Email: jnp@oticon.dk

Oticon A/S

1.2 Administrative data of manufacturer / member

Kongebakken 9
2765 Smørum
Denmark
Tel: +45 39 17 71 00
Fax: +45 39 27 79 00
Email: http://www.oticon.com
Mr. Jørgen Peter Hanuscheck
Tel: +45 39 13 85 38
Fax: -/-
Email: jnp@oticon.dk

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1.3 Description of the Equipment under test (EUT)

1.3.1 EUT: Type, S/N etc.

Type of equipment : Hearing Aid

Mini RITE

Model name : TX (test mode duty cycle 22%):# 000364, 000362, 000359

RX: # 000361

Syndreas Heller

Manufacturer Oticon A/S Address Kongebakken 9 City 2765 Smørum Country Denmark 210 Issue 7 Tested to Radio Standards Specification(RSS) No. : Open Area Test Site Industry Canada Number IC 3462C Frequency Range (or fixed frequency) TX: 3.8 MHz Field Strength $-2dB\mu V/m @ 30m$

Occupied Bandwidth (99% BW) : 365kHz
Type of Modulation : A1D

Antenna Information : Integrated coil antenna

Emission Designator : 365KA1D

Transmitter Spurious (worst case) : $23dB\mu V/m$ @ 10m (noise floor) Receiver Spurious (worst case) : $23dB\mu V/m$ @ 10m (noise floor)

IC no. : 1350B-FUNRI03 FCC ID : U28FUNRI03

ATTESTATION:

DECLARATION OF COMPLIANCE:

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory Manager:

2009-12-21 Andreas Keller

Date Name

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1.3.2 RF Technical Brief Cover Sheet acc. To RSS-102

All Fields must be completed with the requested information or the following codes: N/A for Not Applicable, N/P for Not Performed or N/V for Not Available. Where applicable, check appropriate box.

1. COMPANY NUMBER:	1350B
2. MODEL NUMBER:	Mini RITE
3. MANUFACTURER:	Oticon A/S
4. TYPE OF EVALUATION:	N/A
 Duty cycle used in evaluation: Standard used for evaluation: R Measurement distance: 0.20 m 	SS-102 Issue 2 (2005-11) A/m

Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in this test report is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Name:

Company: Cetecom ICT Services GmbH

Andreas Heller

2009-12-21

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1.4 Test Setup

Hardware : 2 Software : 040

Flex PCB # 14-290 R02

1.5 Test Specifications

FCC:	CFR Part 15.209, CFR Part 15.223
IC:	RSS 210, Issue 7

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2 Statement of Compliance

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

2.1 Summary of Measurement Results

2.1.1 CFR 47 Part 15 Radio frequency devices

Section in this Report	Test Name / Section FCC Part 15	Test Name / Section RSS 210 Issue 7	applicable	Verdict
4.1	§ 15.35 (c) Timing of the transmitter	-/-	YES	Passed
4.2	§ 15.209 (a) FIELDSTRENGTH OF FUNDAMENTAL	2.6	YES	Passed
4.3	§ 15.209 (a) FIELDSTRENGTH OF HARMONICS and SPURIOUS	2.6	YES	Passed
4.4	§ 15.109 Receiver spurious emissions (radiated)	2.6	YES	Passed
4.5	§ 15.107 / 15.207 Conducted Limits	-/-	NO	-/-

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3 Measurements and results

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 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 with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. 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 set-ups 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 C63.4-2003 clause 4.2. Antennas are conform with ANSI C63.2-1996 item 15.

9 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna. 30 MHz - 200 MHz: Quasi Peak measurement, 120kHz Bandwidth, trilog antenna 200MHz - 1GHz: Quasi Peak measurement, 120kHz Bandwidth, trilog antenna >1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.209 and 15.207

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4 FCC Part 15 Subpart C

4.1 Timing of the transmitter

Reference

FCC:	CFR Part SUBCLAUSE § 15.35 (c)
IC:	-/-

Duty cycle of the samples with test mode: 22% (declared by the manufacturer).

In normal use the duty cycle is approximately 2.5% (declared by the manufacturer).

Limits: § 15.35 (c)

(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

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4.2 Field strength of the fundamental / bandwidth

§ 15.209 (a)

Reference

FCC:	CFR Part SUBCLAUSE § 15.223
IC:	RSS 210, Issue 7, 2.3

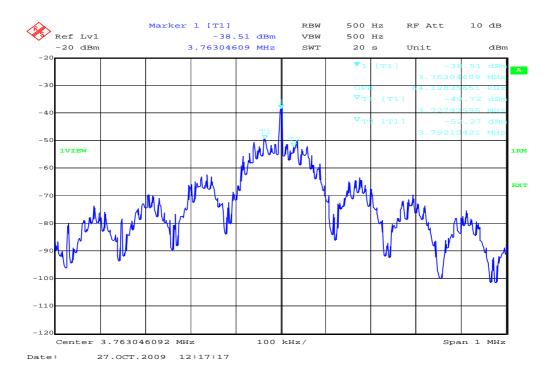
Sample #000362

Results:

	Occupied Bandwidth (kHz)		
6 dB (75%)	64		
20 dB (99%)	365		

Measured with the integrated OBW-function of the spectrum analyser Rohde&Schwarz FSIQ26 (measurement criteria is the integrated power in %).

Plot 1: 6 dB (75%) – bandwidth

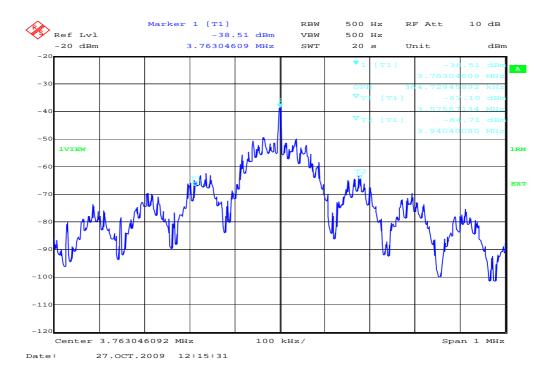


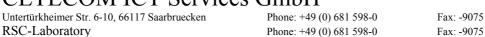
Untertürkheimer Str. 6-10, 66117 Saarbruecken Ph. RSC-Laboratory Ph.

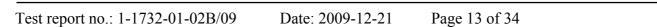
Phone: +49 (0) 681 598-0 Phone: +49 (0) 681 598-0 Fax: -9075 Fax: -9075

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Plot 2: 20 dB (99%) – bandwidth







4.3 Maximum output power (quasi peak) – (radiated)

Reference

FCC: CFR Part SUBCLAUSE § 15.223
IC: RSS 210, Issue 7, 2.3

Sample #000362

Power measured

TEST CONDITIONS		Maximum field	strength (dBµV/m)
Frequency		3.8 MHz	
Distance		1 m	30 m*
T_{nom} V_{nom}		58	-2
Measurement uncertainty		±	3dB

Noise floor: 26dBµV/m

*Calculation:

Measured maximum field strength @ 1 m: 58dBμV/m

Correction factor from 1m to 10m: -40 dB (40 dB/decade)

 $58dB\mu V/m$ @ 1 meters - 40 dB = $18dB\mu V/m$ @ 10 meters

Correction factor from 1m to 30m: -60 dB (40 dB/decade)

 $58dB\mu V/m$ @ 1 meters - $60 dB = -2.0dB\mu V/m$ @ 30 meters

Limits

SUBCLAUSE § 15.223

Fundamental Frequency (MHz)	Field strength of Fundamental (µV/m)	Measurement Distance (meters)	
1.705 – 10.0	[15] or [6dB-BW(kHz)/F(MHz)] whichever is higher	30	

For measuring equipment calibrated in $dB\mu V/m$, the reading should be reduced by 51,5dB to be converted to $dB\mu A/m$.



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4.4 Field strength of the harmonics and the spurious

Reference

FCC:	CFR Part SUBCLAUSE § 15.209 (a)
IC:	RSS Gen 4.9, RSS 210, Issue 7, 2.2

Sample #000362

	EMISSION LIMITATIONS				
f (MHz)		amplitude of emission (dBµV/m) Average/QP	limit max. allowed emission power at 30m	actual attenuation below frequency of operation (dB)	results
			No peaks detected.		
Measurement uncertainty		nt uncertainty		± 3dB	

RBW/VBW: 200 Hz up to 150 kHz, 9 kHz up to 30 MHz, 120 kHz up to 1 GHz

Limits

SUBCLAUSE § 15.209 (a)

Fundamental Frequency	Field strength of	Measurement Distance		
(MHz)	Fundamental (µV/m)	(meters)		
0.009 - 0.490	2400 / F (kHz)	300		
0.490 - 1.705	24000 / F (kHz)	30		
1.705 - 30.0	30	30		
30.0 - 88.0	100	3		
88 - 216	150	3		
216 – 960	200	3		
Above 960	500	3		

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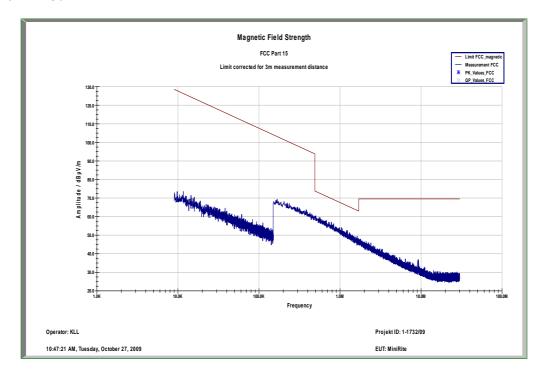
Phone: +49 (0) 681 598-0 Phone: +49 (0) 681 598-0 Fax: -9075 Fax: -9075



4.4.1 Plots of measurements

Sample #000362

Plot 1: TX 9kHz - 30MHz



(To convert the measuring distance from 10m to 30m and 30 to 300m a correction factor from 40 dB/decade was used. Here we use 80 dB to recalculate from 3m to 300m)

Measurement distance 3 m

This measurement was done in 3 planes; the plot shows the worst case.

The values may have some errors because of the small distance between measuring antenna and sample. Therefore we re-measured all found peaks at 10m.





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Plot 2: TX (30 MHz to 1 GHz)

EUT: mini rite Serial Number: 000364

Test Description: FFC Part 15 C @ 10m **Operating Conditions:** TX (22% duty cycle)

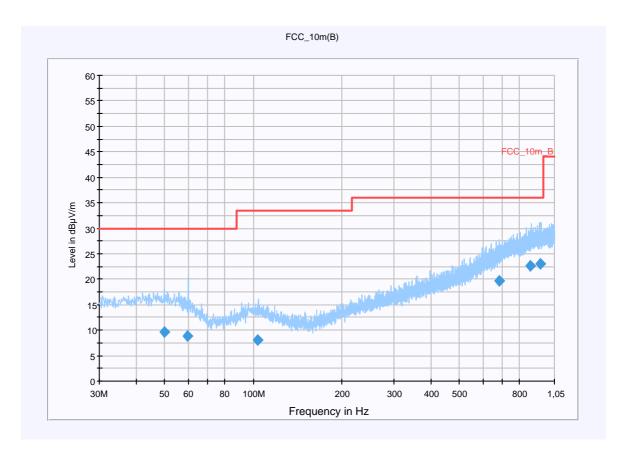
Operator Name: **LANGER** Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Level Unit: dBµV/m

Subrange **Detectors** IF Bandwidth Meas. Time Receiver 30 MHz - 1,05 GHz QuasiPeak 120 kHz 15 s Receiver



Final Result 1

i iiiai ittos	indi Nesalt i											
Frequency	QuasiPeak	Meas.	Bandwidth	Antenna	Polarity	Turntable	Corr.	Margin	Limit	Comment		
(MHz)	(dBµV/m)	Time	(kHz)	height		position	(dB)	(dB)	(dBµV/m)			
` '	,	(ms)		(cm)		(deg)		, ,				
49.998000	9.6	15000.000	120.000	371.0	Н	167.0	13.5	20.4	30.0			
59.591250	8.9	15000.000	120.000	318.0	٧	242.0	11.9	21.1	30.0			
103.765800	8.0	15000.000	120.000	200.0	V	159.0	11.9	25.5	33.5			
683.624100	19.7	15000.000	120.000	200.0	Н	50.0	22.6	16.3	36.0			
873.480150	22.6	15000.000	120.000	400.0	٧	118.0	25.4	13.4	36.0			
940.815150	23.0	15000.000	120.000	400.0	Н	-3.0	25.8	13.0	36.0			

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Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]

@ GPIB0 (ADR 20), SN 100083/003, FW 4.32

Signal Path: without Notch

FW 1.0

Antenna: VULB 9163

SN 9163-295, FW ---

Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]

@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]

@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00



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4.5 Receiver spurious emission (radiated)

Reference

FCC: CFR Part SUBCLAUSE § 15.109
IC: RSS Gen 4.10/6, RSS 210, Issue 7, Section 2.6

Sample #000361

		S	PURIOUS E	MISSIONS L	EVEL (μV/n	1)		
F	Receiver mode							
F [MHz]	Detector	Level [μV/m]	F [MHz]	Detector	Level [μV/m]	F [MHz]	Detector	Level [μV/m]
No cri	No critical peaks detected.							
Measuremen	Measurement uncertainty							

f < 1 GHz: RBW/VBW: 100 kHz $f \ge 1 \text{GHz}$: RBW/VBW: 1 MHz

Limits

SUBCLAUSE § 15.109

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)		
30 - 88	100	3		
88 - 216	150	3		
216 - 960	200	3		
above 960	500	3		

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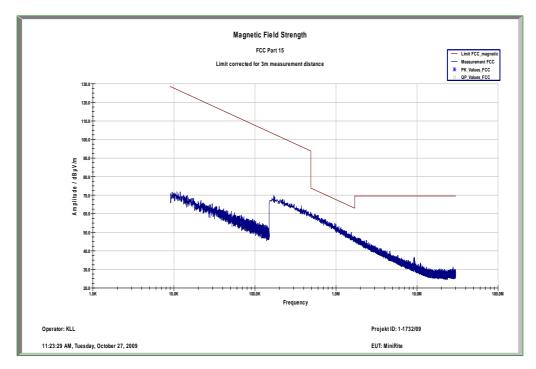
Phone: +49 (0) 681 598-0 Phone: +49 (0) 681 598-0 Fax: -9075 Fax: -9075



4.5.1 Plots of measurements

Sample #000361

Plot 1: RX 9kHz - 30MHz



(To convert the measuring distance from 10m to 30m and 30 to 300m a correction factor from 40 dB/decade was used. Here we use 80 dB to recalculate from 3m to 300m)

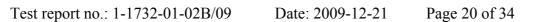
Measurement distance 3 m

This measurement was done in 3 planes; the plot shows the worst case.

The values may have some errors because of the small distance between measuring antenna and sample. Therefore we re-measured all found peaks at 10m.







Plot 2: RX (30 MHz to 1 GHz)

EUT: mini RITE Serial Number: SNr.:000361

Test Description: FCC Part 15 C @ 10m <1 GHz

Operating Conditions: RX
Operator Name: Langer

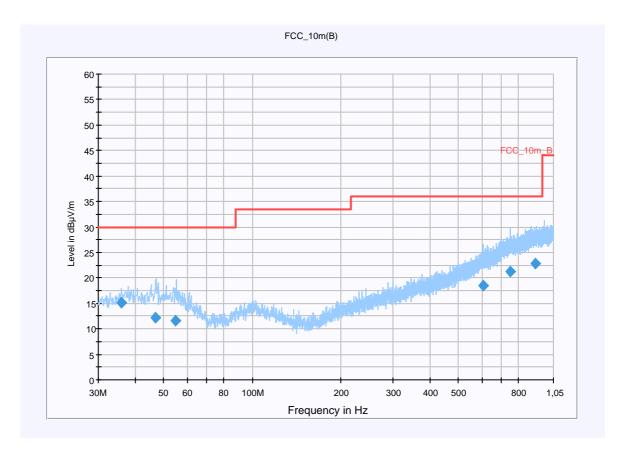
Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Level Unit: dBµV/m

SubrangeDetectorsIF BandwidthMeas. TimeReceiver30 MHz - 1,05 GHzQuasiPeak120 kHz15 sReceiver



Final Result 1

Liliai Ke2	Final Result I												
Frequency	QuasiPeak	Meas.	Bandwidth	Antenna	Polarity	Turntable	Corr.	Margin	Limit	Comment			
(MHz)	(dBµV/m)	Time	(kHz)	height		position	(dB)	(dB)	(dBµV/m)				
		(ms)		(cm)		(deg)							
35.976900	15.2	15000.000	120.000	112.0	V	5.0	13.2	14.8	30.0				
46.771500	12.2	15000.000	120.000	98.0	٧	325.0	13.5	17.8	30.0				
54.724200	11.6	15000.000	120.000	287.0	٧	47.0	13.1	18.4	30.0				
608.225700	18.6	15000.000	120.000	128.0	V	104.0	21.4	17.4	36.0				
749.978700	21.2	15000.000	120.000	105.0	V	293.0	24.2	14.8	36.0				
915.306750	22.9	15000.000	120.000	347.0	٧	146.0	25.7	13.1	36.0				

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Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]

@ GPIB0 (ADR 20), SN 100083/003, FW 4.32

Signal Path: without Notch

FW 1.0

Antenna: VULB 9163

SN 9163-295, FW ---

Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]

@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]

@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00



Untertürkheimer Str. 6-10, 66117 Saarbruecken RSC-Laboratory

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4.6 Conducted Limits

Reference

FCC:	CFR Part 15.207, 15.107
IC:	-/-

Not applicable!

Limits: § 15.107 / 15.207

Frequency of Emission (MHz)	Conducted Limit (dBµV)					
	Quasi-peak	Average				
0.15 - 0.5	66 to 56 *	56 to 46 *				
0.5 - 5	56	46				
5 - 30	60	50				

^{*} Decreases with the logarithm of the frequency

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5 Used Test equipment

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

All reported calibration intervals are calibrations according to the EN/ISO/IEC 17025 standard. These calibrations were performed from an accredited external calibration laboratory.

Additional to these calibrations the laboratory performed comparison measurements with other calibrated systems and performed a weekly chamber inspection.

All used devices are connected with a 10 MHz external reference.

According to the manufacturers' instruction is it possible to establish a calibration interval for the FSP unit of 24 month, if the device has an external 10 MHz reference.

Anechoic chamber F:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna VULB 9163	Schwarzbeck	295	300003787	01.04.2008	24	01.04.2010
3	Amplifier - 0518C-138	Veritech Micro- wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	01.06.2009	24	01.06.2011
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	EMCO	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-

SRD Laboratory Room 002:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	System Controller PSM 12	R&S	835259/007	300002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	300002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	300002681	n.a.		
4	19" Monitor		22759020-ED	300002681	n.a.		
5	Mouse		LZE 0095/6639	300002681	n.a.		
6	Keyboard		G00013834L461	300002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	300002681-0005	10.01.2008	24	10.01.2010
8	Tracking Generator FSIQ-B10	R&S	835107/015	300002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	300002681-0002	26.08.2008	36	26.08.2011
11	Modulation Coder SMIQ-B20	R&S	To 10	300002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	300002681	s.No.10		
13	RF Rear Connection SMIQ- B19	R&S	To 10	300002681	s.No.10		
14	Broadband horn antenna (1-18 GHz)	EMCO	9107-3696	300001604	16.04.2008	24	16.04.2010
15	Broadband horn antenna (1-18 GHz)	EMCO	9107-3697	300001605	21.08.2008	24	21.08.2010
16	Std gain horn antenna (18-26.5 GHz)	Narda	Model no. 638	300000486	n.a.		
17	Std gain horn antenna (18- 26.5 GHz)	Narda	Model no. 638	300000487	n.a.		
18	Sleeve dipole antenna Model 3126-880	ETS- Lindgren	00040887	3000000	n.a.		
19	Fast CPU SM-B50	R&S	To 10	300002681	s.No.10		
20	FM Modulator SM-B5	R&S	835676/033	300002681	s.No.10		







ETECON

Note: 3000002681-00xx inventoried as a system

SRD Laboratory Room 005:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last	Frequency	Next
					Calibration	(months)	Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	18.01.2008	24	18.01.2010
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	23.01.2008	24	23.01.2010
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	23.01.2008	24	23.01.2010
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

SRD Laboratory Room 011:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom		Frequency (months)	Next Calibration
1	NRP Power Meter	R&S	100212	300003780	27.02.2008	24	27.02.2010

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Field strength measurement equipment:

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No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last	Frequency	Next
					Calibration	(months)	Calibration
1	Test Receiver ESH2	R&S	871921/095	300002505	23.05.2007	36	23.05.2010
2	Loop Antenna HFH2-Z2	R&S	872096/61	300001824	18.11.2009	24	18.11.2011

