

Recognized by the
Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: IC 3463A-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. : 2-4839-01-05/07
Applicant : SIEMENS Audiologische
Technik GmbH
Type : Hearing Aid BTE
Test Standard : FCC Part 15.223
RSS-210 Issue 7
FCC ID : SGI-WL002BTE
Certification No. IC : 267AB-WL002

*The Bluetooth word mark and logos are owned by the Bluetooth SIG,
Inc. and any use of such marks by Cetecom ICT is under license*

Table of contents

1. ADMINISTRATIVE DATA	3
1.1. ADMINISTRATIVE DATA OF THE TEST FACILITY	3
1.1.1 Identification of the testing laboratory	3
1.1.2 Organizational items.....	3
1.1.3 Applicant's details	4
1.1.4 APPLICATION DETAILS	4
1.2 ADMINISTRATIVE DATA OF MANUFACTURER / MEMBER	4
1.3 DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)	5
1.3.1 EUT: Type, S/N etc.	5
1.4 TEST SETUP	5
1.5 TEST SPECIFICATIONS.....	5
2 STATEMENT OF COMPLIANCE	6
2.1 SUMMARY OF MEASUREMENT RESULTS.....	6
2.1.1 CFR 47 Part 15 Radio frequency devices.....	6
3 MEASUREMENTS AND RESULTS	7
4 FCC PART 15 SUBPART C.....	8
4.1 Timing of the transmitter	8
4.2 Field strength of the fundamental.....	9
4.3 Field strength of the harmonics and the spurious.....	10
4.4 Plots of measurements	11
4.5 Receiver spurious emission (radiated).....	15
4.6 Conducted Limits.....	16
5 USED TESTEQUIPMENT	17
6 ANNEX B: PHOTOGRAPHS OF TEST SITE	20
7 ANNEX C: EXTERNAL PHOTOGRAPHS OF THE EQUIPMENT	22

ANNEX 1: TECHNICAL PRODUCT DESCRIPTION

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



.....
Responsible for testing
(Harro Ames)

1.1.2 Organizational items

Reference No.:	2-4839-01-05/07
Order No.:	
Receipt of EUT:	2008-01-21
Date(s) of test:	2008-01-21 to 2008-01-22
Date of report:	2008-01-22
Number of report pages:	23
Number of diagram pages (annex):	

Version of template:	1.8



.....
Responsible for laboratory
(Michael Berg)

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.

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 the CETECOM ICT Services GmbH.

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

1.1.3 Applicant's details

Name : SIEMENS Audiologische Technik GmbH
Street : Gebbertstrasse 125
Town : 91058 Erlangen
Country : Germany
Telephone : +49 (0) 91 31 / 3 08 - 35 08 / 4369
Telefax : +49 (0) 91 31 / 3 08 - 35 02
Contact : Mr. Jürgen Reithinger
Telephone : +49 (0) 91 31 / 3 08 - 35 08 / 4369
Telefax : +49 (0) 91 31 / 3 08 - 35 02
Email : Juergen.Reithinger@siemens.com

1.1.4 Application Details

Date of receipt of application	:	2008-01-21
Date of receipt of test item	:	2008-01-21
Date(s) of test	:	2008-01-22
Person(s) who have been present during the test	:	-

1.2 Administrative data of manufacturer / member

Name : Same as applicant
Street :
Town :
Country :

1.3 Description of the Equipment under test (EUT)

1.3.1 EUT: Type, S/N etc.

Type of equipment : Hearing aid BTE
Model name : Pure 500, Pure 700, Explorer 500 P, Life 300, Life 500, Life 700
Manufacturer : SIEMENS Audiologische Technik GmbH
Address : Gebbertstrasse 125
City : 91058 Erlangen
Country : Germany
Tested to Radio Standards Specification(RSS) No. : 210 Issue 7
Open Area Test Site Industry Canada Number : IC 3463A-1
Frequency Range (or fixed frequency) : Tx/RX: 3.2839 MHz
R F: Power in Watts : -/
Field Strength (at what distance) : 73.8 dBµV/m in 0.3m, -6.2 dBµV/m calculated at 30m
Occupied Bandwidth (99% BW) : 67 kHz
Type of Modulation : F1D
Antenna Information : ferrite antenna
Emission Designator : 67K0F1D
Transmitter Spurious (worst case) : only noise floor
Receiver Spurious (worst case) : only noise floor
IC no. : 267AB-WL002
FCC ID : SGI-WL002BTE

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 :

2008-01-22

Harro Ames



Date

Name

Signature

1.4 Test Setup

Hardware :
Software :

1.5 Test Specifications

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

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 (Duty cycle correction factor)		NO	
4.2	§ 15.223 (a) FIELDSTRENGTH OF FUNDAMENTAL	2.6	YES	pass
4.3	§ 15.209 (a) FIELDSTRENGTH OF HARMONICS and SPURIOUS	2.6	YES	pass
4.4	§ 15.109 Receiver spurious emissions (radiated)	2.6	NO	
4.5	§ 15.107 / 15.207 Conducted Limits		NO	

2.2 Additional Informations

All models of the hearing aid family have the same RF part and have the same RF-behavior. Therefore this report is applicable for all models of this family.

3 Measurements and results

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 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 conform with ANSI C63.2-1996 item 15.

9 kHz – 150 kHz: Quasi Peak measurement, 200 Hz Bandwidth, magnetic shielded loop antenna.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, magnetic shielded loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

>1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.209 and 15.223

4 FCC Part 15 Subpart C

4.1 Timing of the transmitter

Not applicable

Reference

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

Measurement not applicable, transmitter is continuous modulated

Limits: § 15.35 (c)

<p>(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.</p>

4.2 Field strength of the fundamental

Reference

FCC:	CFR Part SUBCLAUSE § 15.223 (a)
IC:	RSS 210, Issue 7, 2.6

Maximum output power - (radiated)

TEST CONDITIONS		MAXIMUM POWER (dB μ V/m) Peak		
Frequency		3.2839 MHz	3.2839 MHz	
		at 30 cm	calculated to 30 m	
T _{nom} +21 °C	V _{nom} 1.4V DC	73.8 dB μ V/m	-6.2 dB μ V/m 0.49 μ V/m	
limit		<15 μ V/m		
Measurement uncertainty		±3dB		

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

Limits

SUBCLAUSE § 15.223 (a)

If the bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 μ V/m or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) μ V/m at a distance of 30m, whichever is the higher level.

4.3 Field strength of the harmonics and the spurious

Reference

FCC:	CFR Part SUBCLAUSE § 15.223 (a)
IC:	RSS 210, Issue 7, 2.6

EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBµV/m) Average/QP	limit max. allowed emmision power	actual attenuation below frequency of operation (dB)	results
no		peaks	found		
Measurement uncertainty			± 3dB		

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

Limits

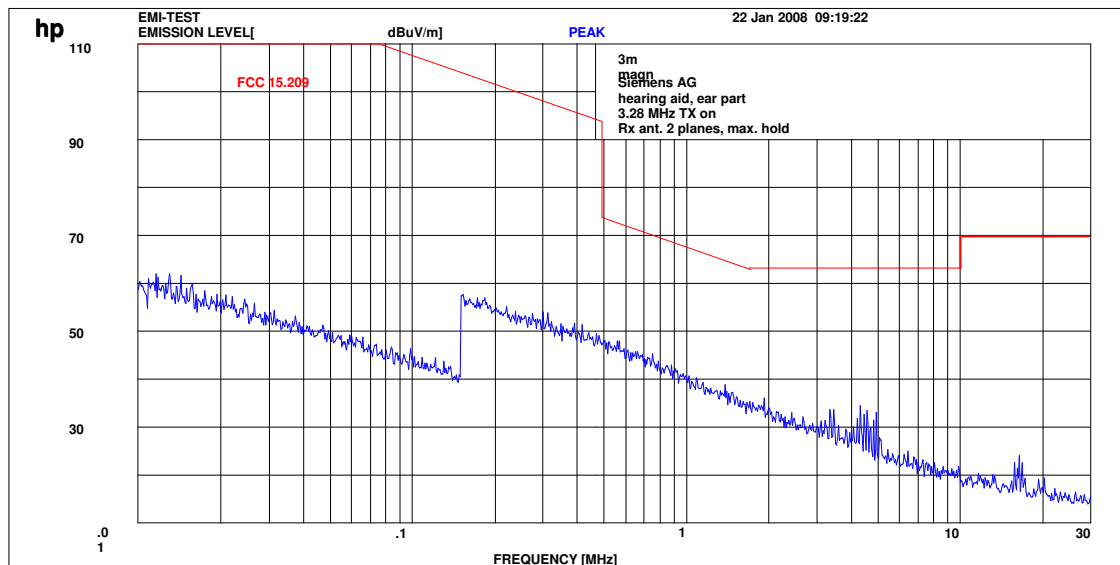
SUBCLAUSE § 15.223 (a)

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.0009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 - 10	23.5	30
10-30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

4.4 Plots of measurements

Plot 1:

Part 15.209 Magnetics TX



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

Performed in a fully anechoic chamber at 3m to get an overview about radiated emissions.
This values may have some errors because of the low signal.
Therefore we remeasured the signal at 30 cm to get a measurable signal.

(to convert the measuring distance from 0.3m to 3m and 3 to 30m a correction factor from 40 dB/decade was used.
Here we use 80 dB to recalculate from 0.3m to 30m)


This measurement was done in 3 planes, the plot shows the worst case use

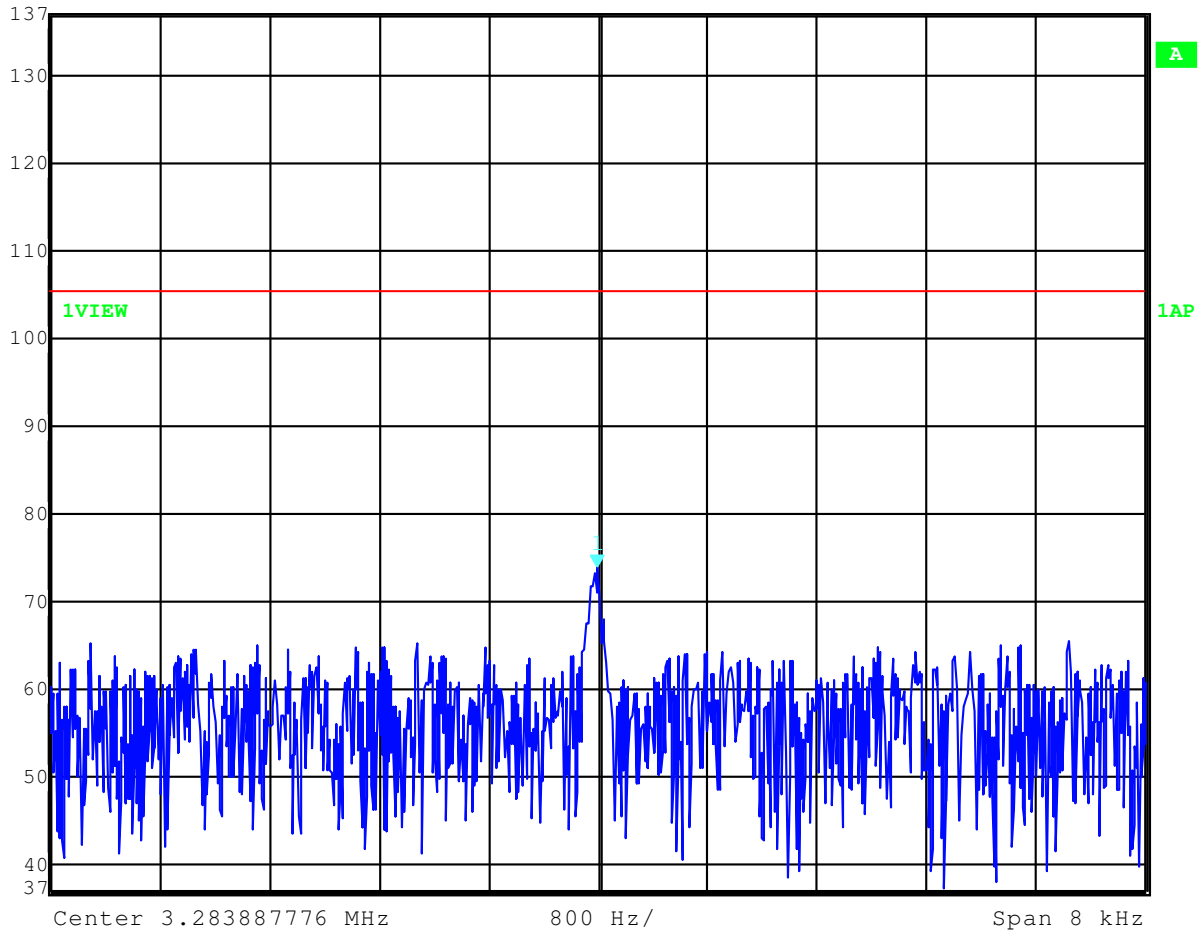
Limits

SUBCLAUSE § 15.209

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Measurement distance (m)
0.0009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 - 10	23.5	30
10-30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

Field strength at 30cm distance

	Marker 1 [T1]	RBW	100 Hz	RF Att	10 dB
	Ref Lvl	73.76 dB μ V/m	VBW	100 Hz	
	137 dB*	3.28387976 MHz	SWT	4 s	Unit dB μ V/m



Date: 23.JAN.2008 08:34:24

In this plot you see only one of the two peaks caused by the signal. We made it to determine the field strength.

Recalculation factor from 30 cm to 30m distance is 80 dB.


The calculated field strength at 30m distance is -6.2dB μ V/m.

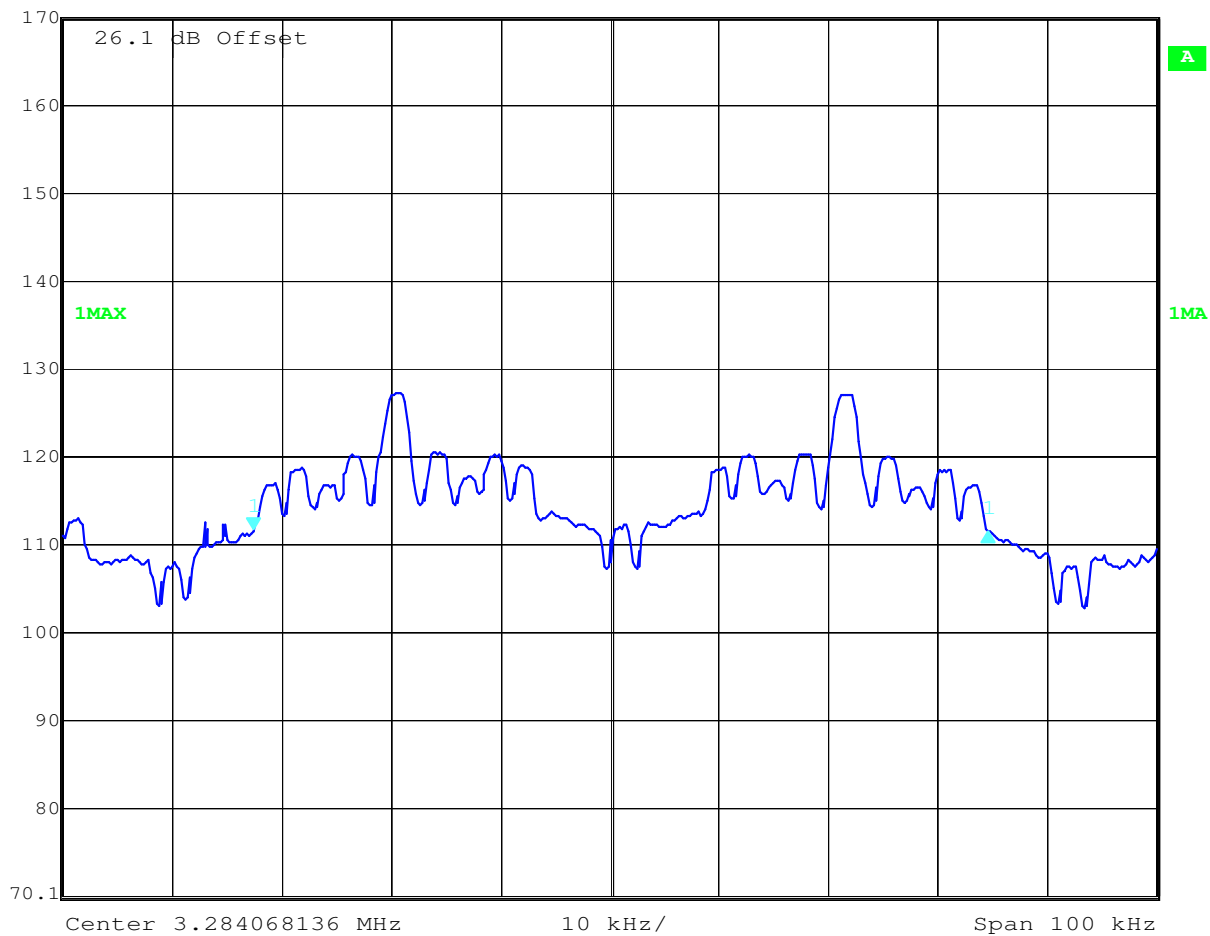
The 6dB-bandwidth was not measurable because of the very low signal level.

So we used the lowest limit line, here 23.5 dB μ V/m at 30m, recalculated to 30cm with 80 dB => 103.5 dB μ V/m@0.3m

Occupied BW:

Measured very close to the sample because of the very low field strength.

	Delta 1 [T1]	RBW	1 kHz	RF Att	0 dB
	Ref Lvl	-0.36 dB	VBW	1 kHz	
	170.1 dB*	67.03406814 kHz	SWT	250 ms	Unit

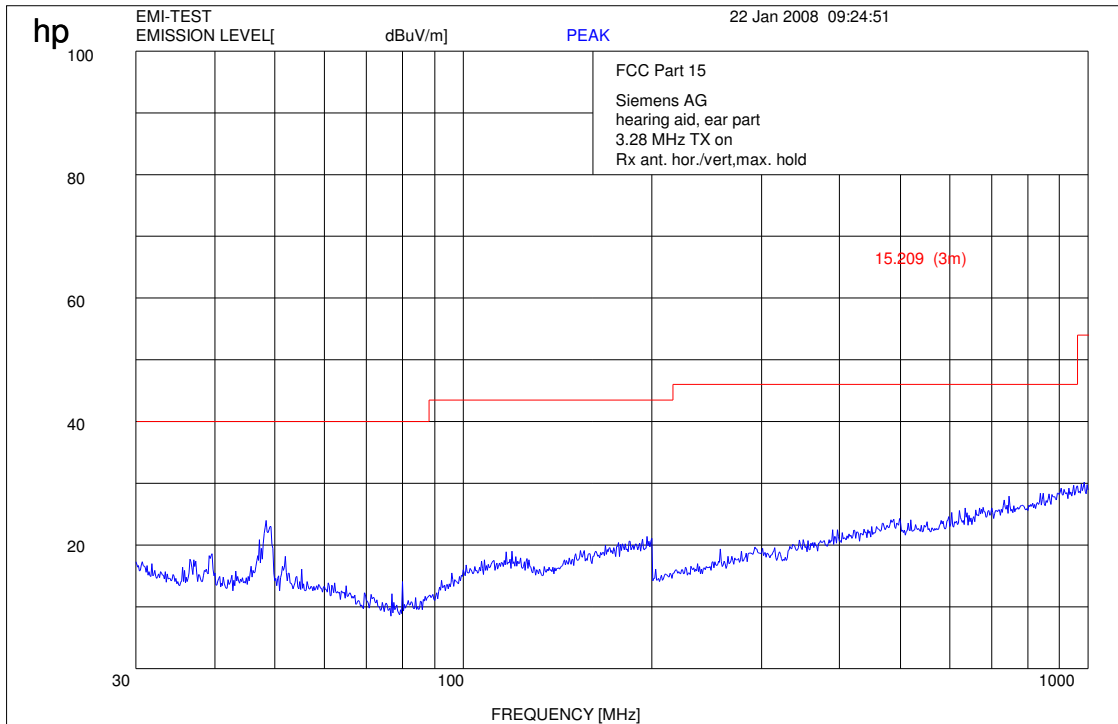


Date: 15.FEB.2008 09:44:13

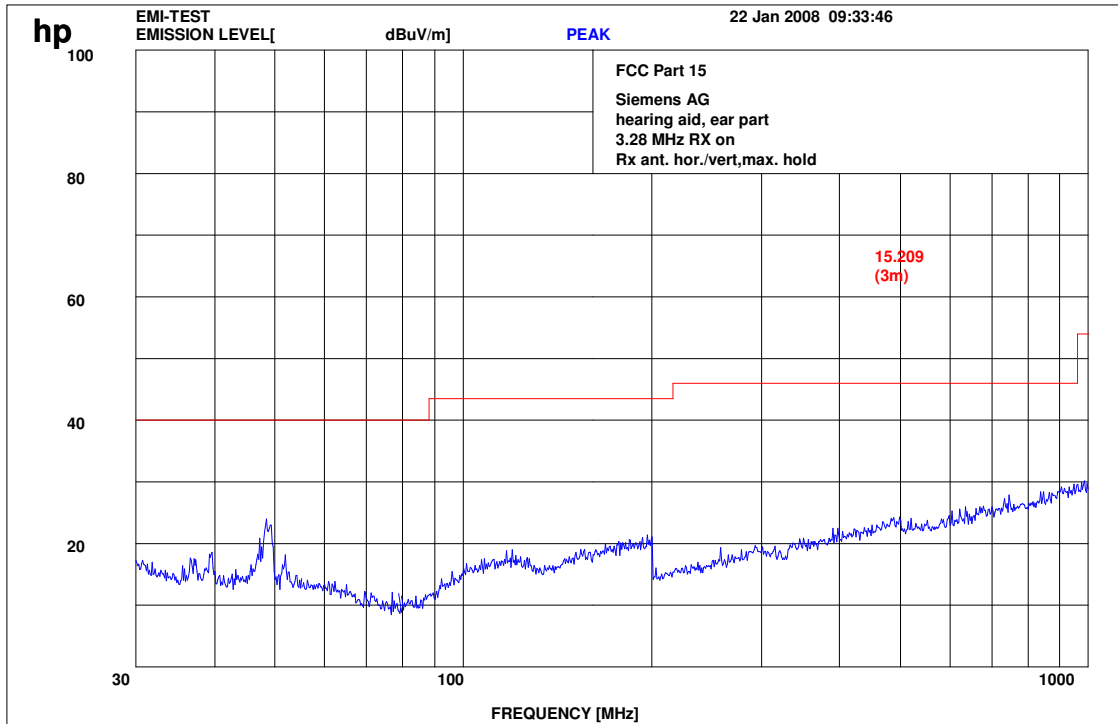
The OBW is ~ 67 kHz , very close to the noise level.

Plot 2:

TX (30 MHz to 1GHz)



4.5 Receiver spurious emission (radiated)



Reference

FCC: CFR Part SUBCLAUSE § 15.109/209
IC: RSS 210, Issue 7, Section 2.6

SPURIOUS EMISSIONS LEVEL ($\mu\text{V/m}$)								
Low Channel			Middle Channel			High Channel		
MHz			MHz			MHz		
F [MHz]	Detector	Level [$\mu\text{V/m}$]	F [MHz]	Detector	Level [$\mu\text{V/m}$]	F [MHz]	Detector	Level [$\mu\text{V/m}$]
no	peaks	found						
Measurement uncertainty			± 3 dB					

$f < 1$ GHz : RBW/VBW: 100 kHz

$f \geq 1$ GHz : RBW/VBW: 1 MHz

Limits

SUBCLAUSE § 15.109

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

4.6 Conducted Limits

not applicable, only battery powered

Reference

FCC:	CFR Part 15.207, 15.107
IC:	

EUT:
Manufacturer:
Operating Condition: Transmitting Mode
Test Site: CETECOM ICT Services Room 006
Operator:
Test Specification: EN 55022 / CISPR 22
Power Supply:
Start of Test:

Limits: § 15.107 / 15.207

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	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

5 Used Testequipment

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.

Anechoic chamber C:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	Spektrum Analyzer 8566B	HP	2747A05306	300001000	05.10.2006	24	05.10.2008
5	Spektrum Analyzer Display 85662A	HP	2816A16541	300002297	05.10.2006	24	05.10.2008
6	Quasi-Peak-Adapter 85650A	HP	2811A01131	300000999	05.10.2006	24	05.10.2008
7	RF-Preselector 85685A	HP	2837A00779	300000218	08.11.2006	24	08.11.2008
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100623	ICT 300003464	05.10.2007	24	15.10.2009
12	PC	F+W			n.a.		
13	TILE	TILE			n.a.		
14	Biconical antenna	EMCO	S/N: 860 942/003		Monthly verification (System cal.)		
15	Log. Period. Antenna 3146	EMCO	2130	300001603	Monthly verification (System cal.)		
16	Double Ridged Antenna HP 3115P	EMCO	3088	300001032	Monthly verification (System cal.)		
17	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
18	Power Supply 6032A	HP	2818A03450	300001040	12.05.2007	36	12.05.2010
19	Busisolator	Kontron		300001056	n.a.		
20	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
21	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
22	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
23	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		

Bluetooth Rack:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	FSP 30	R&S		300003575	02.04.2007	24	02.04.2009
2	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010

Signaling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
2	CBT	R&S	100185	300003416	21.02.2006	24	21.02.2008
3	CMU-200	R&S	103992	300003231	27.04.2007	12	27.04.2008
4	CMU-200	R&S	106240	300003321	02.05.2006	24	02.05.2008

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	3000002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	3000002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	3000002681	n.a.		
4	19" Monitor		22759020-ED	3000002681	n.a.		
5	Mouse		LZE 0095/6639	3000002681	n.a.		
6	Keyboard		G00013834L 461	3000002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	3000002681-0005	01.08.2006	24	01.08.2008
8	Tracking Generator FSIQ-B10	R&S	835107/015	3000002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	3000002681-0002	01.08.2006	36	01.08.2009
11	Modulation Coder SMIQ-B20	R&S	To 10	3000002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	3000002681	s.No.10		
13	RF Rear Connection SMIQ-B19	R&S	To 10	3000002681	s.No.10		
14	Fast CPU SM-B50	R&S	To 10	3000002681	s.No.10		
15	FM Modulator SM-B5	R&S	835676/033	3000002681	s.No.10		
16	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	3000002681-0001	01.08.2006	36	01.08.2009
17	Modulation Coder SMIQ-B20	R&S	To 16	3000002681	s.No.16		
18	Data Generator SMIQ-B11	R&S	To 16	3000002681	s.No.16		
19	RF Rear Connection SMIQ-B19	R&S	To 16	3000002681	s.No.16		
20	Fast CPU SM-B50	R&S	To 16	3000002681	s.No.16		
21	FM Modulator SM-B5	R&S	836061/022	3000002681	s.No.16		
22	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	3000002681-0003	01.08.2006	36	01.08.2009
23	Attenuator SMP-B15	R&S	835136/014	3000002681	S.No.22		
24	RF Rear Connection SMP-B19	R&S	834745/007	3000002681	S.No.22		
25	Power Meter NRVD	R&S	835430/044	3000002681-0004	01.08.2006	24	01.08.2008
26	Power Sensor NRVD-Z1	R&S	833894/012	3000002681-0013	01.08.2006	24	01.08.2008
27	Power Sensor NRVD-Z1	R&S	833894/011	3000002681-0010	01.08.2006	24	01.08.2008
28	Rubidium Standard RUB	R&S		3000002681-0009	01.08.2006	24	01.08.2008

29	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	3000002681-0006	01.08.2006	24	01.08.2008
30	Laser Printer HP Deskjet 2100	HP	N/A	3000002681-0011	n.a.		
31	19" Rack	R&S	11138363000004	3000002681	n.a.		
32	RF-cable set	R&S	N/A	3000002681	n.a.		
33	IEEE-cables	R&S	N/A	3000002681	n.a.		
34	Sampling System FSIQ-B70	R&S	835355/009	3000002681	s.No.7		
35	RSP programmable attenuator	R&S	834500/010	3000002681-0007	01.08.2006	24	01.08.2008
36	Signalling Unit	R&S	838312/011	3000002681	n.a.		
37	NGPE programmable Power Supply for EUT	R&S	192.033.41	3000002681			
38	Climatic box VT 4002	Heraeus Vötsch	58566046820010	300003019	11.05.2007	24	11.05.2009
39	Signaling Unit CMU200	R&S	832221/0055	300002862	12.01.2006	24	12.01.2008
40	Power Splitter 6005-3	Inmet Corp.	none	300002841	23.12.2006	24	23.12.2008
41	SMA Cables SPS-1151-985-SPS	Insulated Wire	different	different	n.a.		
42	CBT32 with EDR Signaling Unit	R&S					
43	Coupling unit	Narda	N/A	--	n.a.		
44	2xSwitch Matrix PSU	R&S	872584/021	300001329	n.a.		
45	RF-cable set	R&S	N/A	different	n.a.		
46	IEEE-cables	R&S	N/A	--	n.a.		

Anmerkung: 3000002681-00xx als Systeme inventarisiert

SRD Laboratory Room 005:

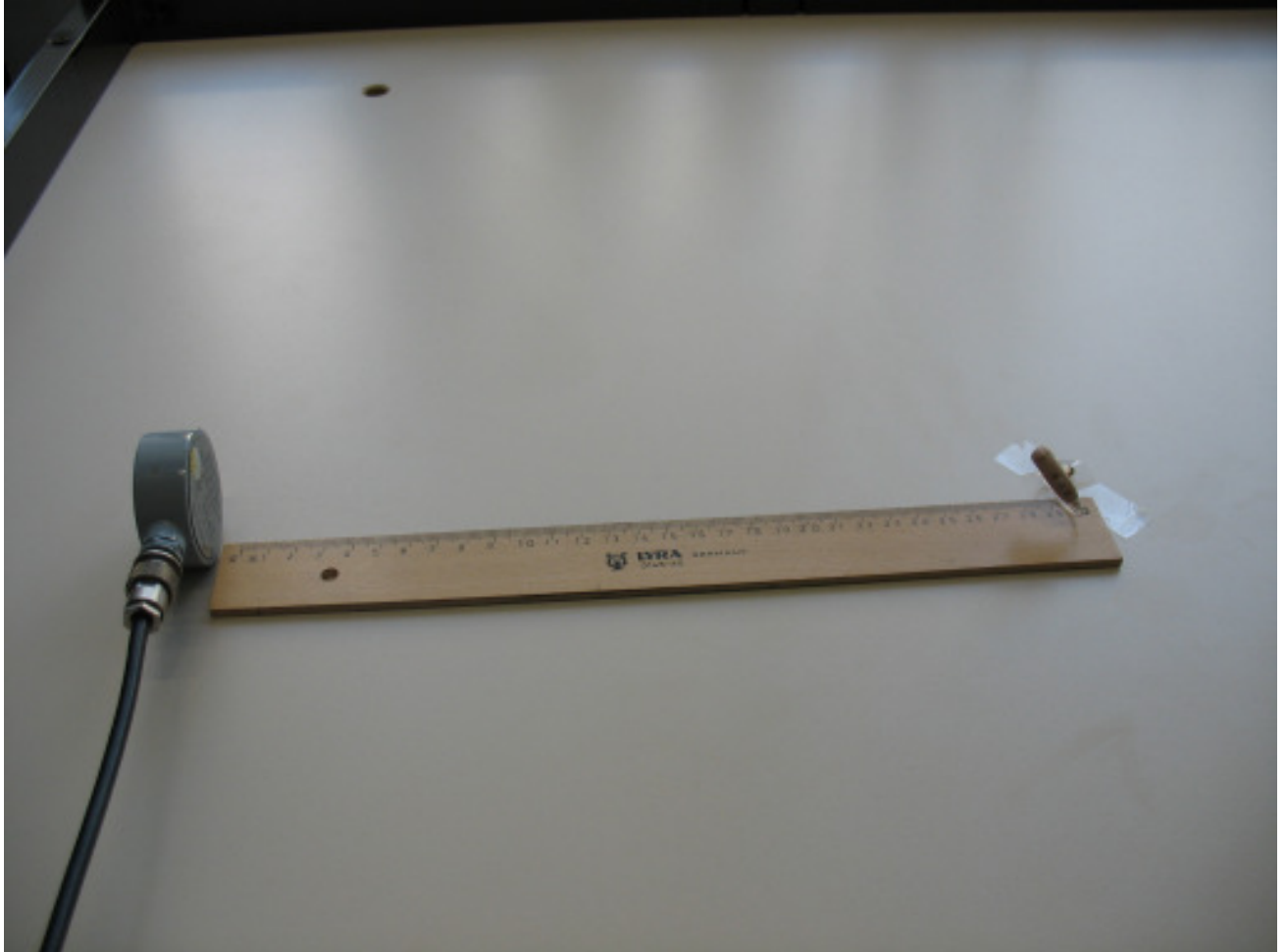
No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	08.11.2006	24	08.11.2008
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	08.11.2006	24	08.11.2008
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	08.11.2006	24	08.11.2008
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
6	Spektrum Analyzer FSU50	R&S	2000012	300003443	12.05.2007	24	12.05.2009

6 Annex B: Photographs of Test site

Photo 1 (Radiated Emissions):



Photo 2 (Radiated Emissions):



7 Annex C: External Photographs of the Equipment

Photo 1: general view



Photo 2: detailed view

