SENTON

EMV-Prüfzentrum EMI/EMC-Testcenter

Straubing, February 25, 1999

T E S T - R E P O R T

No. 56502-90126

for

Sesam 599

Variant covered by this report:
Sesam 512

Remote control transmitter (433.92 MHz)

Applicant:	Akerströms Björbo AB
Purpose of testing:	To show compliance with
	FCC Code of Federal Regulations, Part 15 Subpart C, Section §15.231
	Industry Canada Radio Standards Specification RSS-210 Issue 2, Section 6.1 (Category I Equipment)

Note:
The test data of this report relate only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.

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1. Administrative Data

Equipment Under Test (EUT):	Sesam 599
Serial number:	92 1865-000
Type of equipment:	Remote control transmitter (433.92 MHz)
Parts/accessories:	---
FCC-ID:	NKPD231

Applicant:	Akerströms Björbo AB
(full address)	S-780 45 Björbo Sweden
Contract identification:	---
Contact person:	Mr. Bernt Eriksson
Manufacturer:	Akerströms Björbo AB

Receipt of EUT:	February 15, 1999
Date of test:	February 16 to February 18, 1999
Note:	

Test Laboratory:	Senton GmbH EMI/EMC Test Center
(full address):	Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany
Contact person:	Mr. Johann Roidt
FCC file number:	31040/SIT 1300F2
Industry Canada file number:	IC 3050

Responsible for testing:	Thomas Eberl
Responsible for test report:	Thomas Eberl

2. Summary of Test Results

The tested sample complies with the requirements set forth in the

Code of Regulations Part 15 Subpart C, Section §15.231 (intentional radiators) of the Federal Communication Commission (FCC)

and the

Radio Standards Specification RSS-210 Issue 2, Section 6.1 for Low Power Licence-Exempt Radiocommuniction Devices of Industry Canada.

Johann Roidt
Technical Manager

Thomas Eberl
Test Engineer

3. Operation Mode of EUT

EUT is transmitting continuously with modulation, supplied by battery (9 V DC)

4. Configuration of EUT and Peripheral Devices

Configuration of EUT

EUT is configured as stand-alone device

Configuration of cables of EUT

Not applicable

Configuration of peripheral devices connected to EUT

Not applicable

5. Measuring Methods

5.1. Bandwidth of Emission(FCC §15.231.c / RSS-210 Section 6.1.1.c)

The Bandwidth of Emission is measured with a spectrum analyzer connected to measuring antenna (radiated measurement) or test fixture while EUT is operating in transmit mode with modulation at the appropriate center frequency. To increase received signal level distance to EUT is reduced (appropriate level offset is included).
The spectrum analyzer was set to:
RBW = 10 kHz, VBW = 10 kHz, span = 1 MHz, sweep = 40 ms
See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):
02, 55, 67

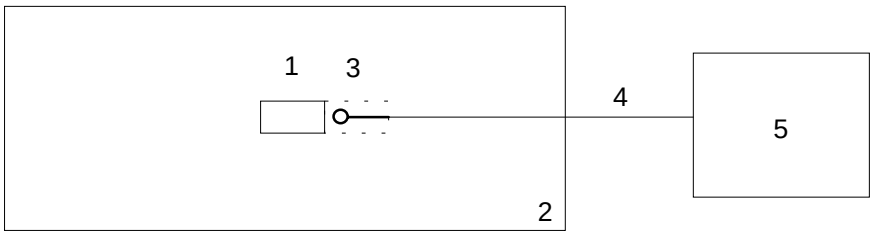


Figure 1: Measurement setup for bandwidth of emission test

1 Transmitter (EUT)
2 Wooden table
3 Test fixture
4 Test cable
5 Spectrum analyzer

5.2. Radiated Emission 30 MHz - 1 GHz (FCC §15.205.a,b, §15.209, §15.231.b / RSS-210 Sections 6.1.1.b, 6.3)

Radiated emissions are measured over the frequency range from 30 MHz to 1 GHz. The bandwidth of the EMI-receiver is set to 120 kHz and the detector-function is set to CISPR quasi-peak.
The test setup is made in accordance with ANSI C63.4-1992.
Measurements are made in both the horizontal and vertical planes of polarization.
Preliminary scans are taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.
All tests are performed at a test-distance of 3 meters.
For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details):
01, 02, 05, 12, 38, 39, 40, 41, 58, 61, 64, 66

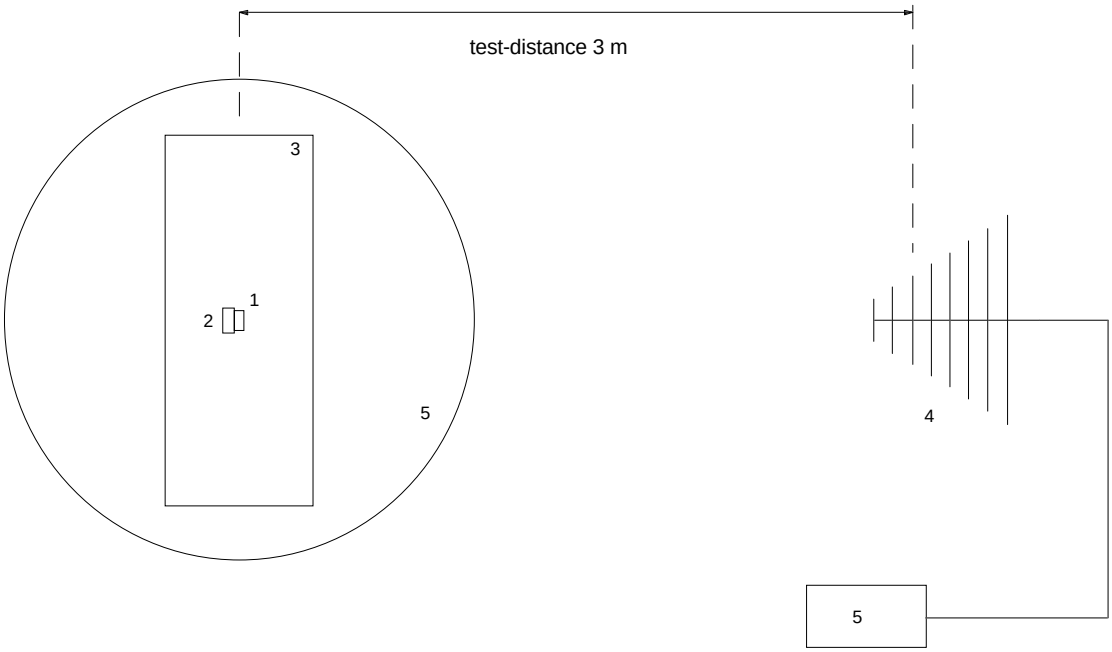


Figure 2: Measurement setup for radiated emission test below 1 GHz

1 Transmitter (EUT)
2 Wooden pedestal (if necessary)
3 Wooden table
4 Measurement antenna
5 Test receiver
6 Turn table

5.3. Radiated Emission 1 GHz - 5 GHz (FCC §15.205.a,b, §15.209, §15.231.b / RSS-210 Sections 6.1.1.b, 6.3)

Radiated emissions are measured in the frequency range 1 GHz to 5 GHz. Resolution and video bandwidth of the spectrum analyzer are set to 1 MHz. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.
Additional measurements are performed at critical frequencies with reduced span. EUT is rotated all around and receiving antenna is raised and lowered to find the maximum levels of emission. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions.
All tests are performed in a semi-anechoic chamber with a test-distance of 3 meters.
If possible preamplifiers are used for the whole frequency range. Special care is taken to avoid overload in transmit mode (using appropriate attenuators if necessary).

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details):
02, 13, 14, 16, ,42, 44, 45, 57, 64

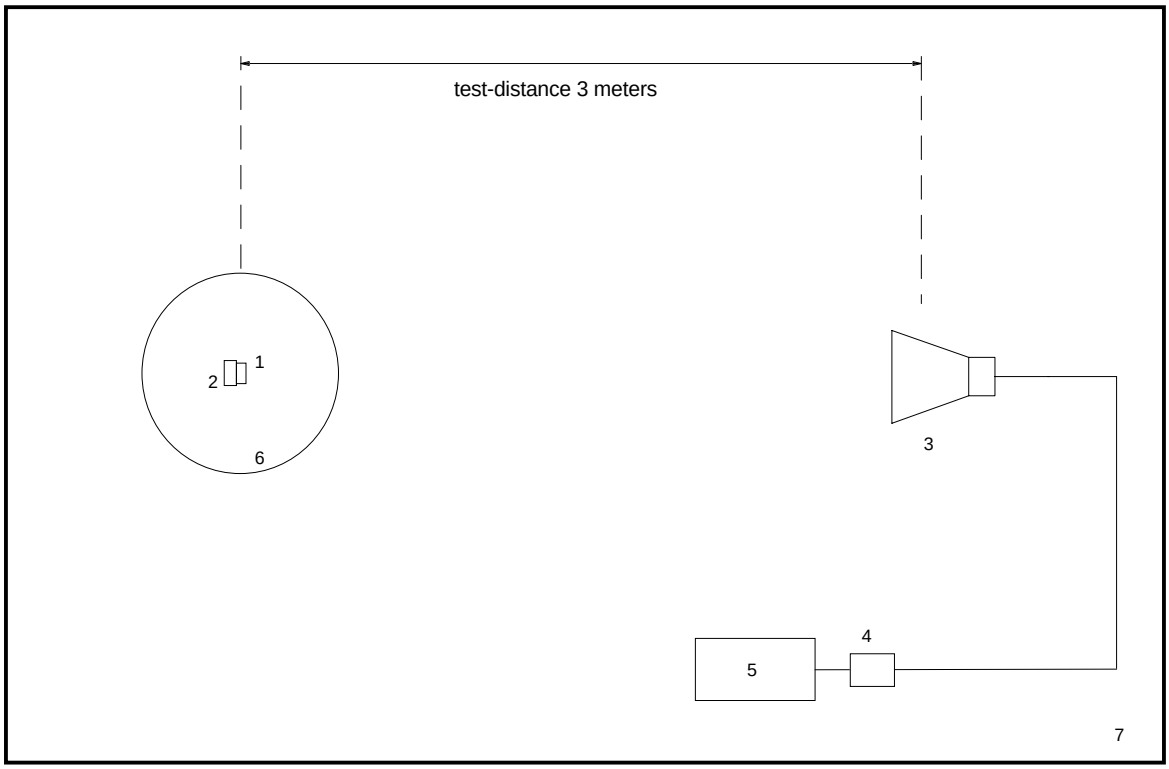


Figure 3: Measurement setup for radiated emission test above 1 GHz

1 Transmitter (EUT)
2 Wooden pedestal (if necessary)
3 Measurement antenna
4 Preamplifier (if applicable)
5 Spectrum analyzer
6 Turn table
7 Semi anechoic room

6. Equipment List

To facilitate reference to test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

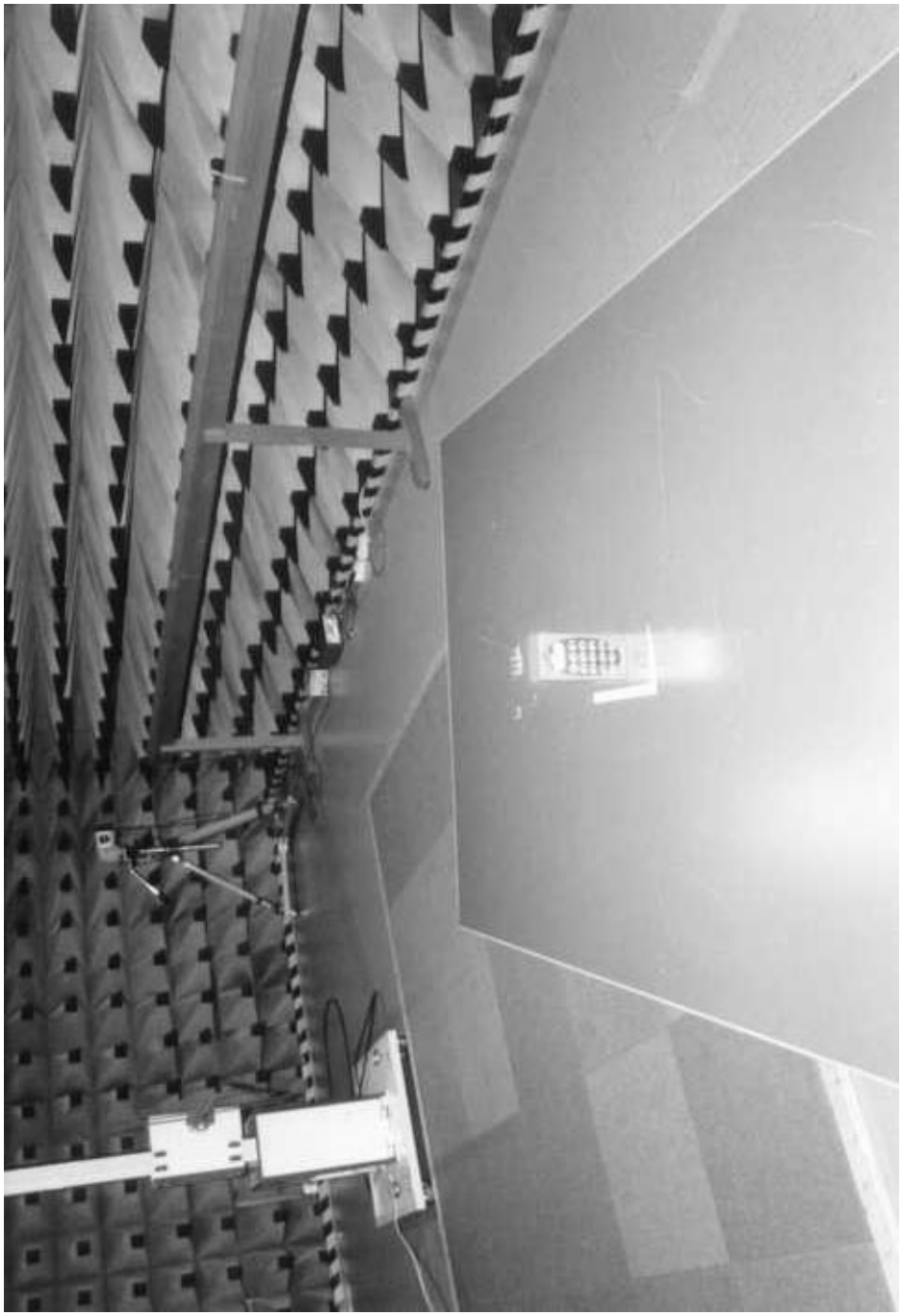
No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	R 3271	05050023	Advantest
02	EMI Test Receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
03	Test Receiver	ESH 3	880112/032	Rohde & Schwarz
04	Test Receiver	ESHS 10	860043/016	Rohde & Schwarz
05	Test Receiver	ESV	881414/009	Rohde & Schwarz
06	Test Receiver	ESVP	881120/024	Rohde & Schwarz
07	Audio Analyzer	UPA	862954	Rohde & Schwarz
08	Power Meter	NRVS	836856/015	Rohde & Schwarz
09	Power Sensor	NRV-Z52	837901/030	Rohde & Schwarz
10	Power Sensor	NRV-Z4	863828/015	Rohde & Schwarz
11	Preamplifier	ESV-Z3	860907/004	Rohde & Schwarz
12	Preamplifier	R14601		Advantest
13	Preamplifier	ACX/080-3030	32640	CTT
14	Preamplifier	ACO/180-3530	32641	CTT
15	Signal Generator	SMS	872166/039	Rohde & Schwarz
16	Signal Generator	HP 8673 D	2930A00966	Hewlett Packard
17	Waveform Generator	HP 33120 A	US34005375	Hewlett Packard
18	Attenuator 20 dB	4776-20	9503	Narda
19	Attenuator 10 dB	4776-10	9412	Narda
20	Pulse Limiter	ESH 3-Z2	1144	Rohde & Schwarz
21	Pulse Limiter	11947 A	3107A00566	Hewlett Packard
22	V-Network	ESH 3-Z5	862770/018	Rohde & Schwarz
23	V-Network	ESH 3-Z5	894785/005	Rohde & Schwarz
24	V-Network	ESH 3-Z5	830952/025	Rohde & Schwarz
25	V-Network	ESH 3-Z6	830722/010	Rohde & Schwarz
26	V-Network	NSLK 8127	8127152	Schwarzbeck
27	V-Network	NNLA 8119	8119148	Schwarzbeck
28	V-Network	SE 01	01	Senton
29	T-Network	ESH 3-Z4	890602/011	Rohde & Schwarz
30	T-Network	ESH 3-Z4	890602/012	Rohde & Schwarz
31	High Impedance Probe	TK 9416	01	Schwarzbeck
32	High Impedance Probe	TK 9416	02	Schwarzbeck
33	Current Probe	ESH 2-Z1	863366/18	Rohde & Schwarz
34	Current Probe	ESV-Z1	862553/3	Rohde & Schwarz

No.	Type	Model	Serial Number	Manufacturer
35	Absorbing Clamp	MDS 21	80911	Lüthi
36	Absorbing Clamp	MDS 21	79690	Lüthi
37	Loop Antenna	HFH2-Z2	882964/1	Rohde & Schwarz
38	Biconical Antenna	HK 116	842204/001	Rohde & Schwarz
39	Biconical Antenna	HK 116	836239/02	Rohde & Schwarz
40	Log. Periodic Antenna	HL 223	841516/023	Rohde & Schwarz
41	Log. Periodic Antenna	HL 223	834408/12	Rohde & Schwarz
42	Horn Antenna	3115	9508-4553	Emco
43	Horn Antenna	3160-03	9112-1003	Emco
44	Horn Antenna	3160-04	9112-1001	Emco
45	Horn Antenna	3160-05	9112-1001	Emco
46	Horn Antenna	3160-06	9112-1001	Emco
47	Horn Antenna	3160-07	9112-1008	Emco
48	Horn Antenna	3160-08	9112-1002	Emco
49	Horn Antenna	3160-09	9403-1025	Emco
50	Digital multimeter	199	463386	Keithley
51	DC Power Supply	NGSM 32/10	203	Rohde & Schwarz
52	DC Power Supply	NGB	2455	Rohde & Schwarz
53	DC Power Supply	NGA	386	Rohde & Schwarz
54	Temperature Test Chamber	HT4010	07065550	Heraeus
55	Cable	RG214	1309	Senton
56	Cable	200CM_001	1357	Rosenberger
57	Cable	150CM_001	1479	Rosenberger
58	Cable Set EG1	RG214	1189 - 1191	Senton
59	Cable Set Cabine 1	RG214		Senton
60	Cable Set Cabine 2	RG214		Senton
61	Cable Set Cabine 3	RG214		Senton
62	Shielded Room	No. 1	1451	Senton
63	Shielded Room	No. 2	1452	Senton
64	Semi-anechoic Chamber	No. 3	1453	Siemens
65	Shielded Room	No. 4	1454	Euroshield
66	Open Area Test Site	EG 1		Senton
67	Test fixture			Senton

7. Photographs Taken During Testing

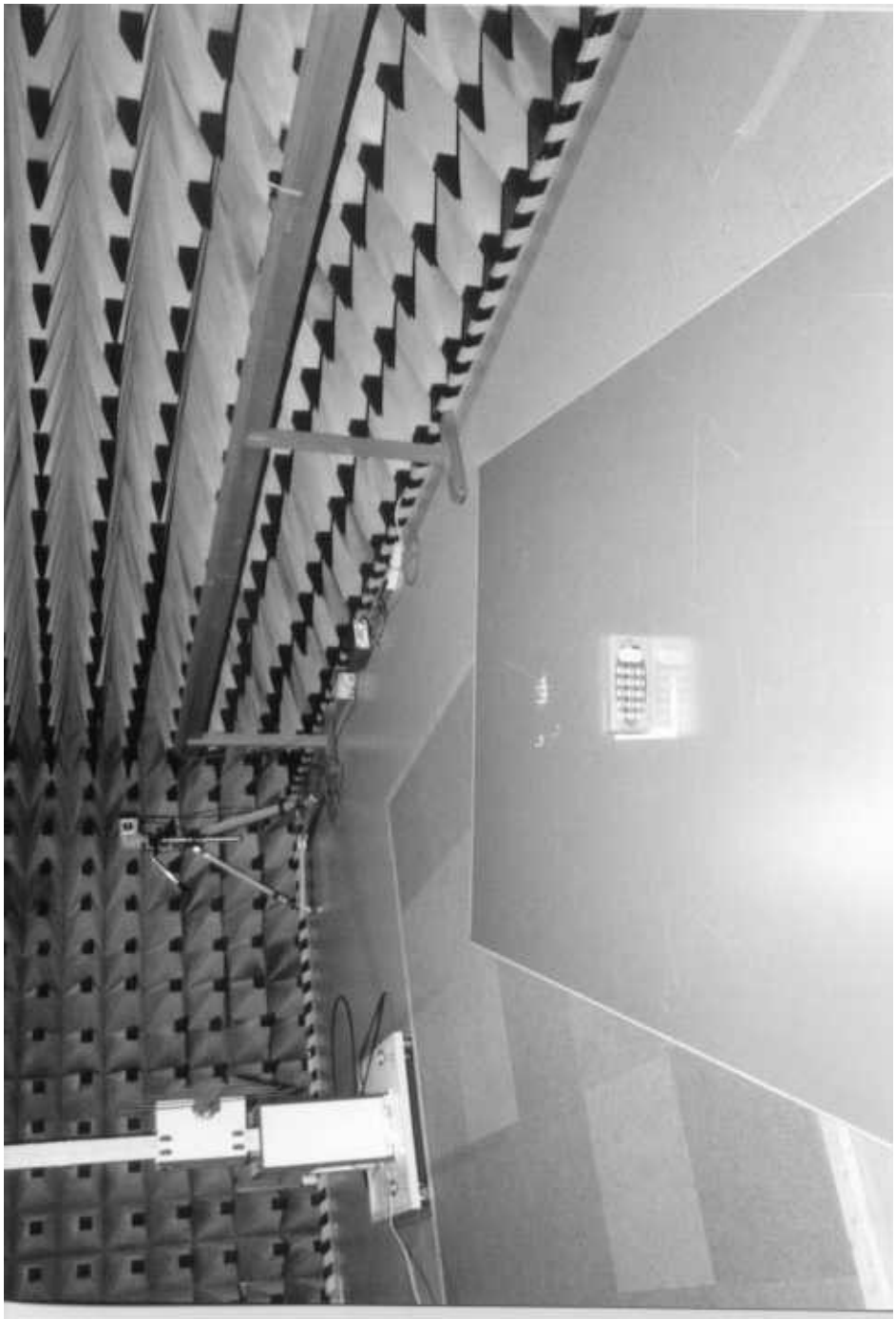
Photos No. 7.1

Test setup for radiated emission pre-test 30 MHz - 1 GHz (semi anechoic room)



Photos No. 7.2

Test setup for radiated emission pre-test 30 MHz - 1 GHz (semi anechoic room) - continued



Photos No. 7.3

Test setup for radiated emission pre-test 30 MHz - 1 GHz (semi anechoic room) - continued

Photos No. 7.4

Test setup for radiated emission final test 30 MHz - 1 GHz (open area test site)

Photos No. 7.5

Test setup for radiated emission test above 1 GHz

Photos No. 7.6

Test setup for radiated emission test above 1 GHz - continued

Photos No. 7.7

Test setup for radiated emission test above 1 GHz - continued

8. List of Measurements

8.1. List of Measurements According To FCC Part 15 Subpart C

FCC Part 15 Subpart C			
Section(s):	**Test**	**Page(s)**	**Result**
§15.231.c	Bandwidth of emission	27 - 28	passed
§15.207	Conducted emission test 450 kHz - 30 MHz		not applicable (battery supply)
§15.231.b **§15.209** **§15.205.a,b**	Radiated emission test 9 kHz - 30 MHz		not applicable (acc. to §15.33)
§15.231.b **§15.209** **§15.205.a,b**	Radiated emission test 30 MHz - 1 GHz	29 - 42	passed
§15.231.b **§15.209** **§15.205.a,b**	Radiated emission test 1 GHz - 5 GHz	43 - 51	passed

8.2. List of Measurements According To Industry Canada RSS-210

Industry Canada RSS-210 Issue 2			
Section(s):	**Test**	**Page(s)**	**Result**
6.1.1.c	Bandwidth	27 -28	passed
6.6	Conducted emission test 450 kHz - 30 MHz	---	not applicable (battery supply)
6.1.1.b **6.3**	Radiated emission test 9 kHz - 30 MHz	---	not applicable (acc. to 6.3.e)
6.1.1.b **6.3**	Radiated emission test 30 MHz - 1 GHz	29 - 42	passed
6.1.1.b **6.3**	Radiated emission test 1 GHz - 5 GHz	43 - 51	passed

9. Referenced Regulations

All tests were performed with reference to the following regulations and standards:

☑	FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	October 20, 1997
☐	FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
☑	FCC Part 15 Subpart C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
☑	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz	October, 1992
☑	RSS-210	Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommuniction Devices of Industry Canada	February 24, 1996

10. Test Results

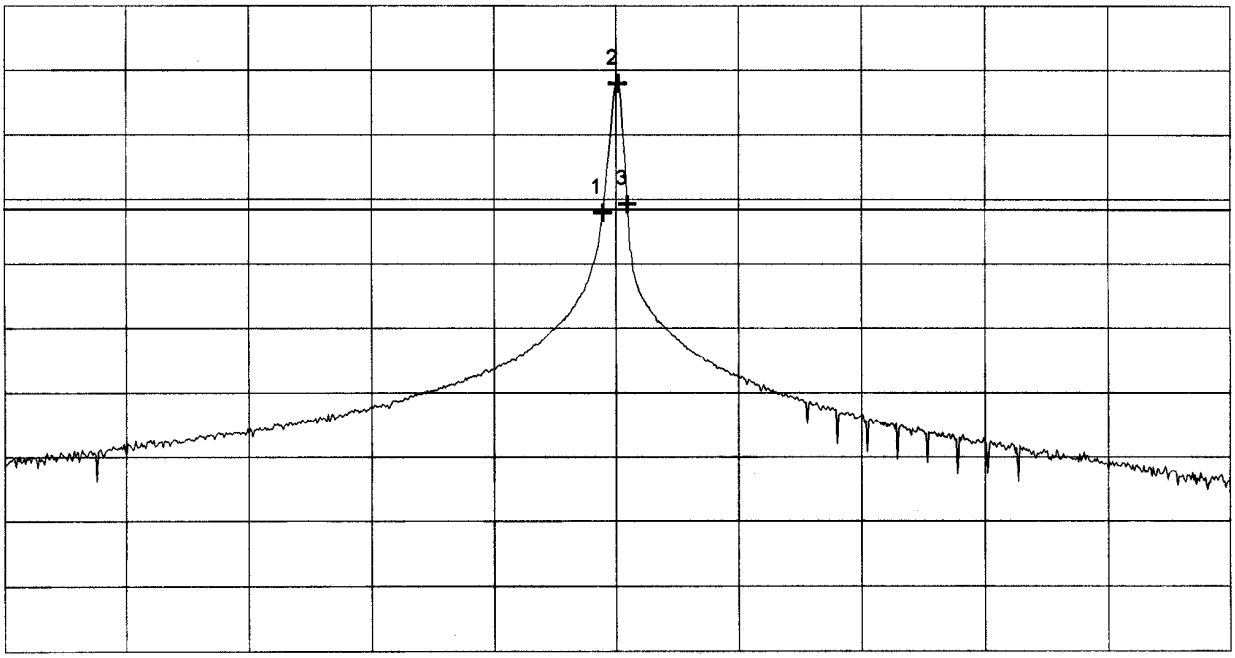
Bandwidth of emission acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode:
Serial No.: #1	- TX mode
Applicant: Akerströms Björbo AB	- with modulation
	- Unom.: 9.0 V DC Battery

Ref.Level 85.2 dBµV/m
10 dB dB/Div.

ATT 0 dB

Ref. Offset 1.8 dB



Start 432.925134 MHz
RBW 10 kHz

VBW 10 kHz

Stop 434.925134 MHz
SWP 60 ms

**** Multi Marker ****

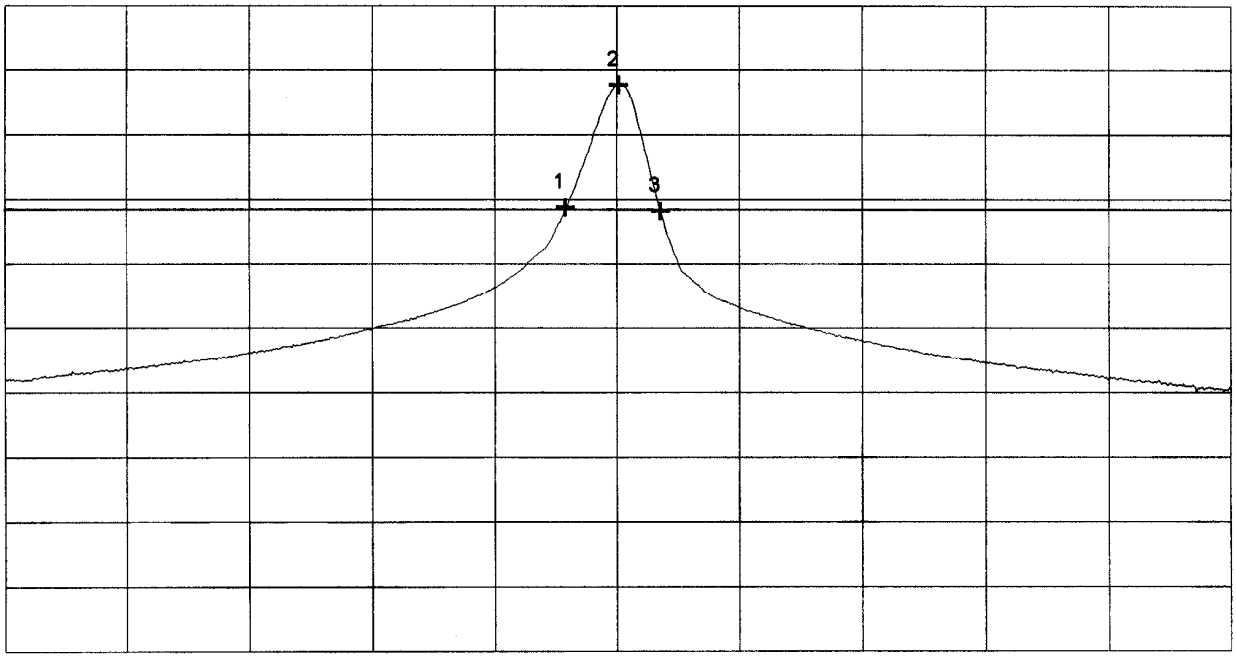
Nr.1	433.902912 MHz	53.18 dBµV/m
Nr.2	433.927356 MHz	73.19 dBµV/m
Nr.3	433.942912 MHz	54.48 dBµV/m
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502-90126
Date: 02/17/1999	

Bandwidth of emission acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode:
Serial No.: #1	- TX mode
Applicant: Akerströms Björbo AB	- with modulation
	- Unom.: 9.0 V DC Battery

Ref.Level 85.2 dBµV/m ATT 0 dB Ref. Offset 1.8 dB
10 dB dB/Div.



Start 433.675134 MHz Stop 434.175134 MHz
RBW 10 kHz VBW 10 kHz SWP 20 ms

**** Multi Marker ****

Nr.1	433.904023 MHz	54.02 dBµV/m
Nr.2	433.925690 MHz	72.91 dBµV/m
Nr.3	433.942912 MHz	53.41 dBµV/m
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

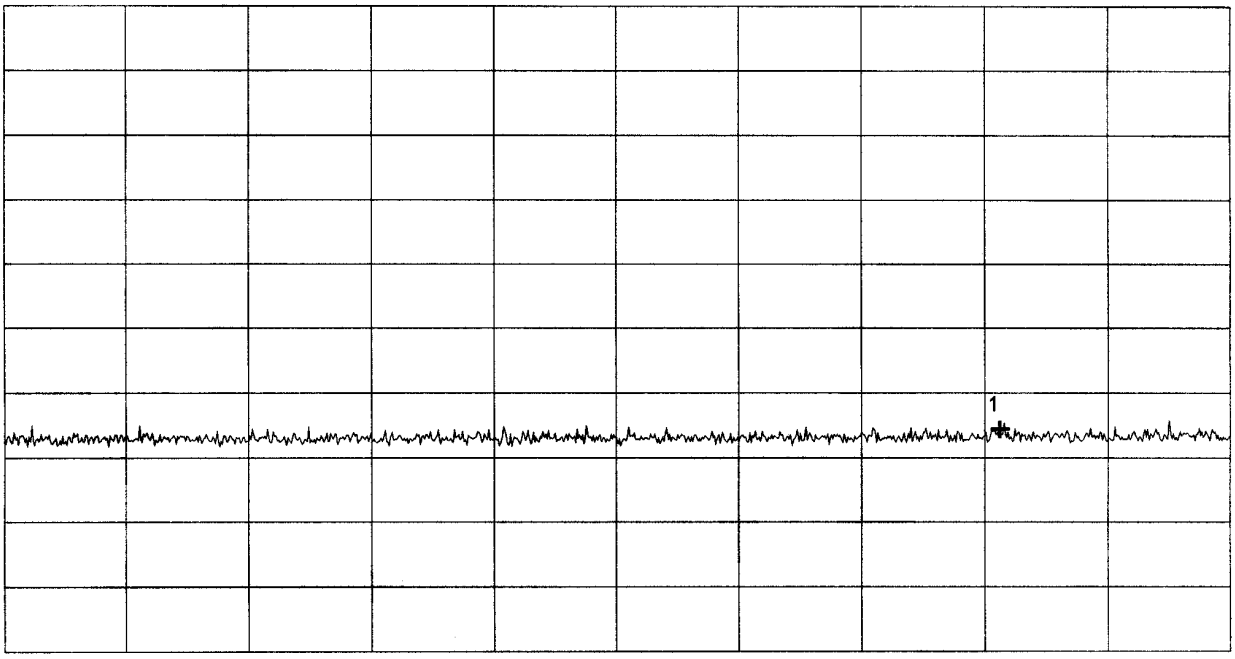
Tested by: Thomas Eberl	Project-No.: 56502-90126
Date: 02/17/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - rear on table - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	14.34 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

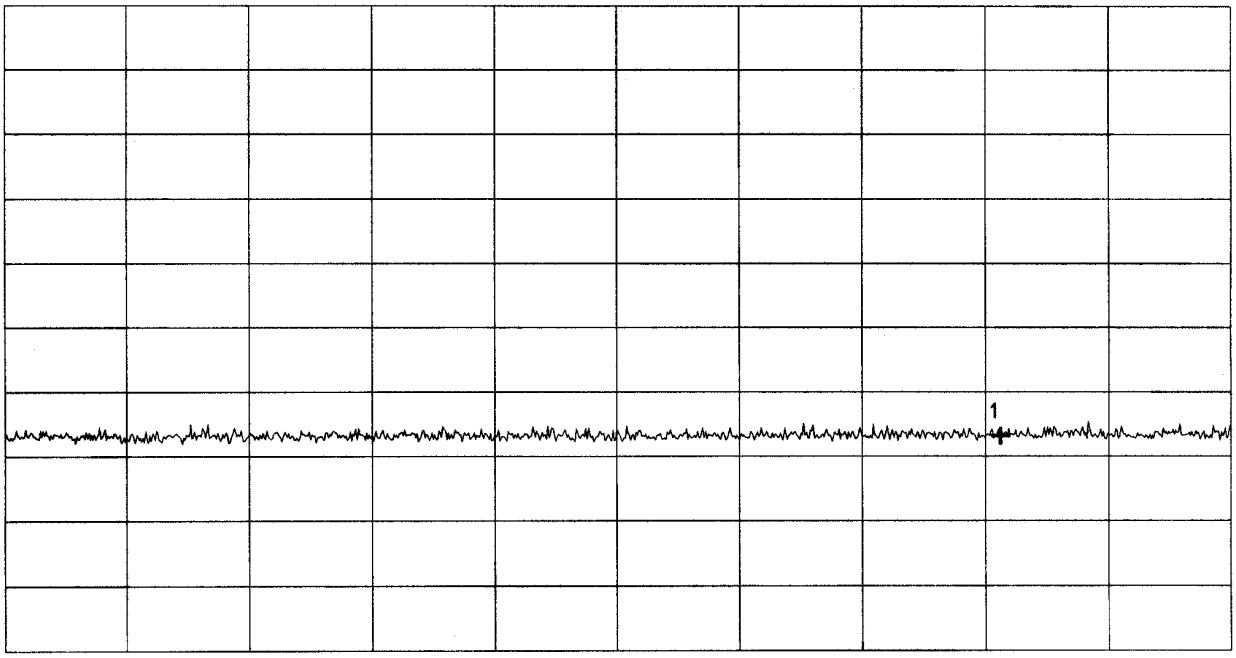
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - rear on table - Test distance : 3m - Antenna polarization : horizontal PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	13.07 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

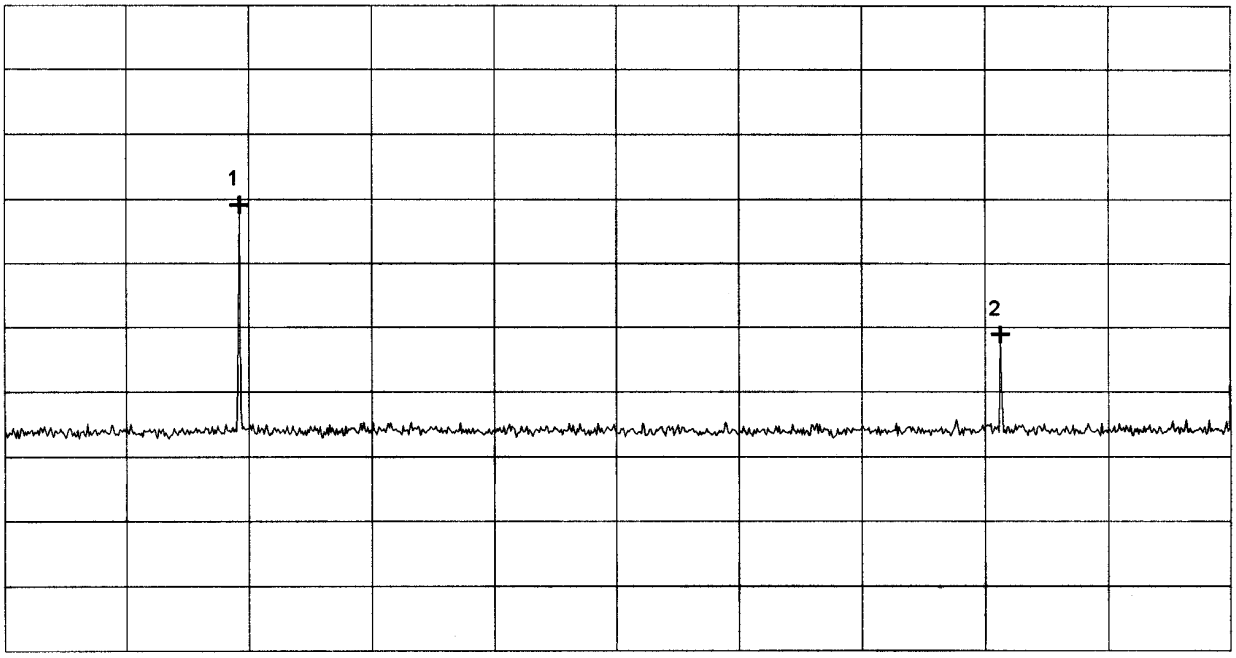
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in horizontal position - rear on table - Test distance : 3m - Antenna polarization : horizontal PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	49.15 dBµV
Nr.2	868.555556 MHz	28.91 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

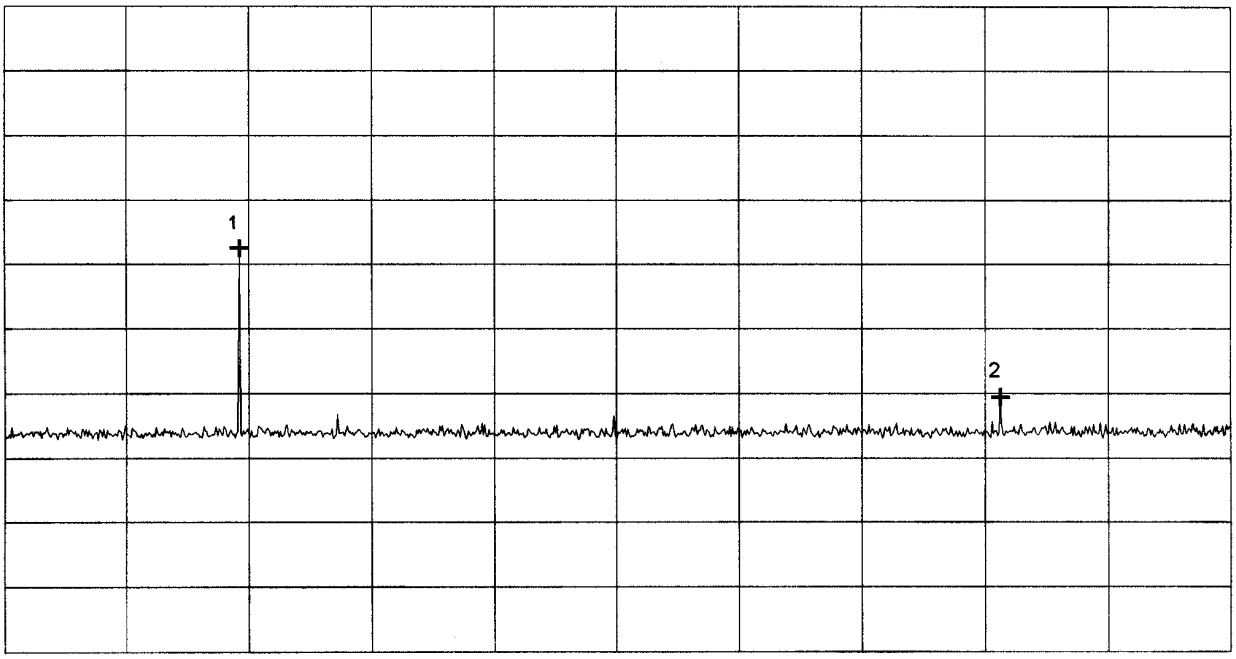
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in horizontal position - rear on table - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	42.42 dBµV
Nr.2	868.555556 MHz	19.44 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

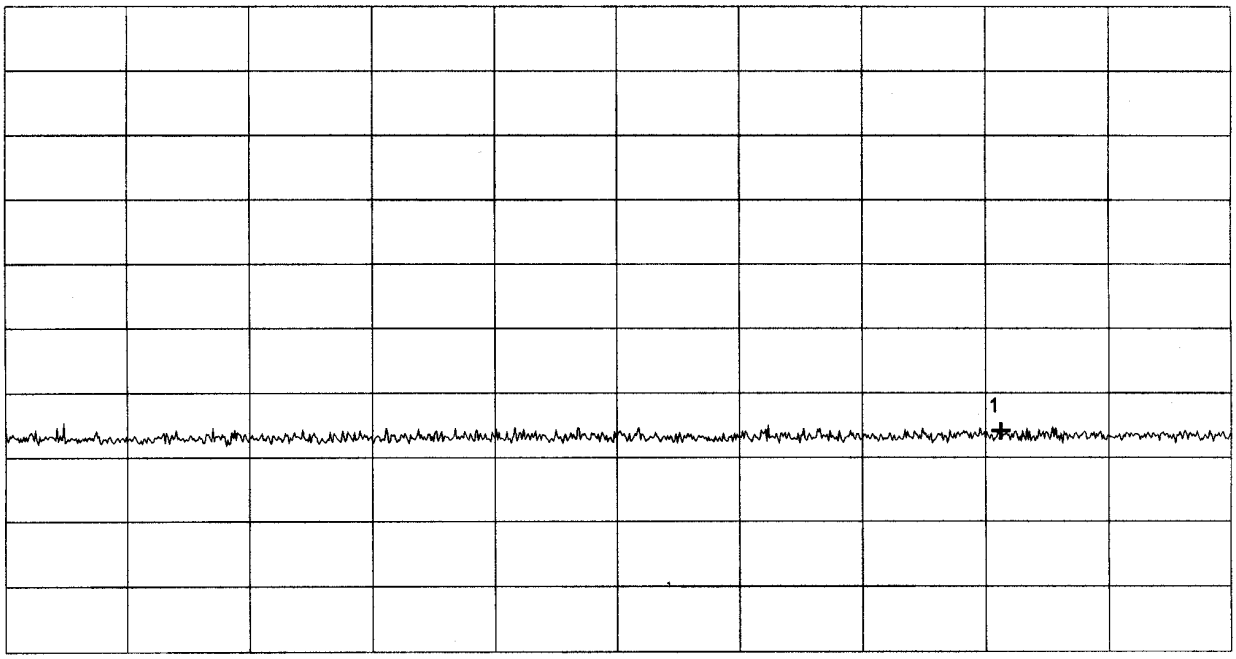
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - right side on table - Test distance : 3m - Antenna polarization : horizontal PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	14.06 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

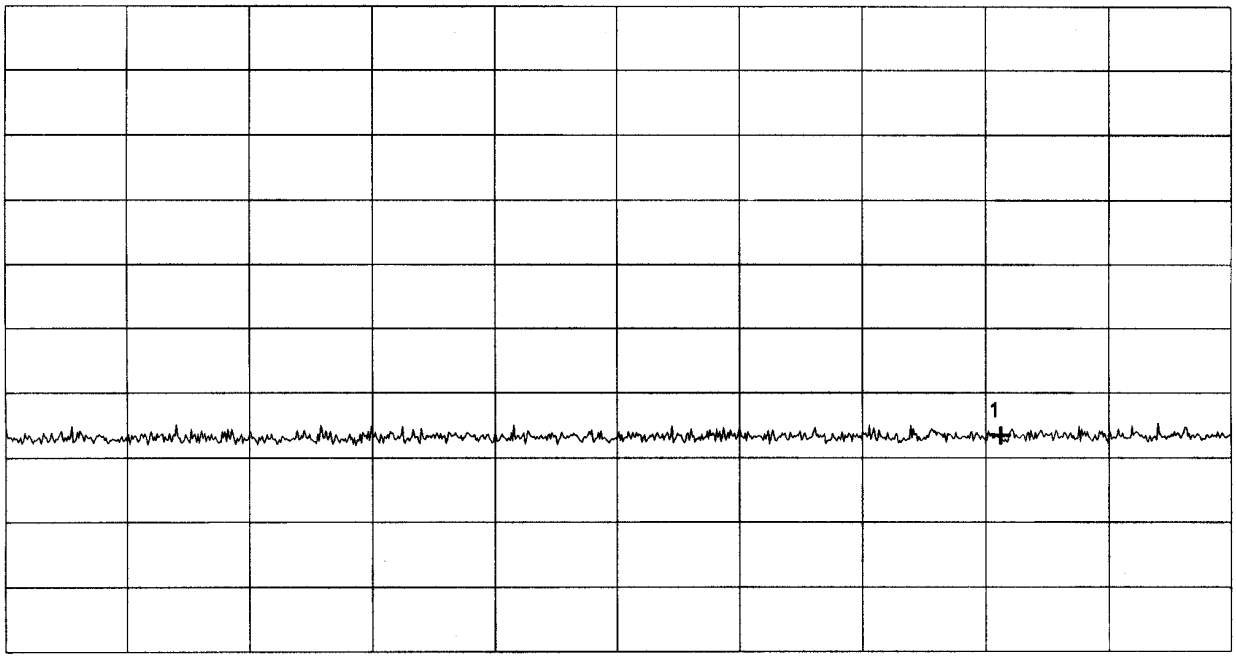
Senton GmbH / EMV-Prüfzentrum / Äußere Frühlingstraße 45 / 94315 Straubing / Tel. 09421 55220

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - right side on table - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	13.37 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

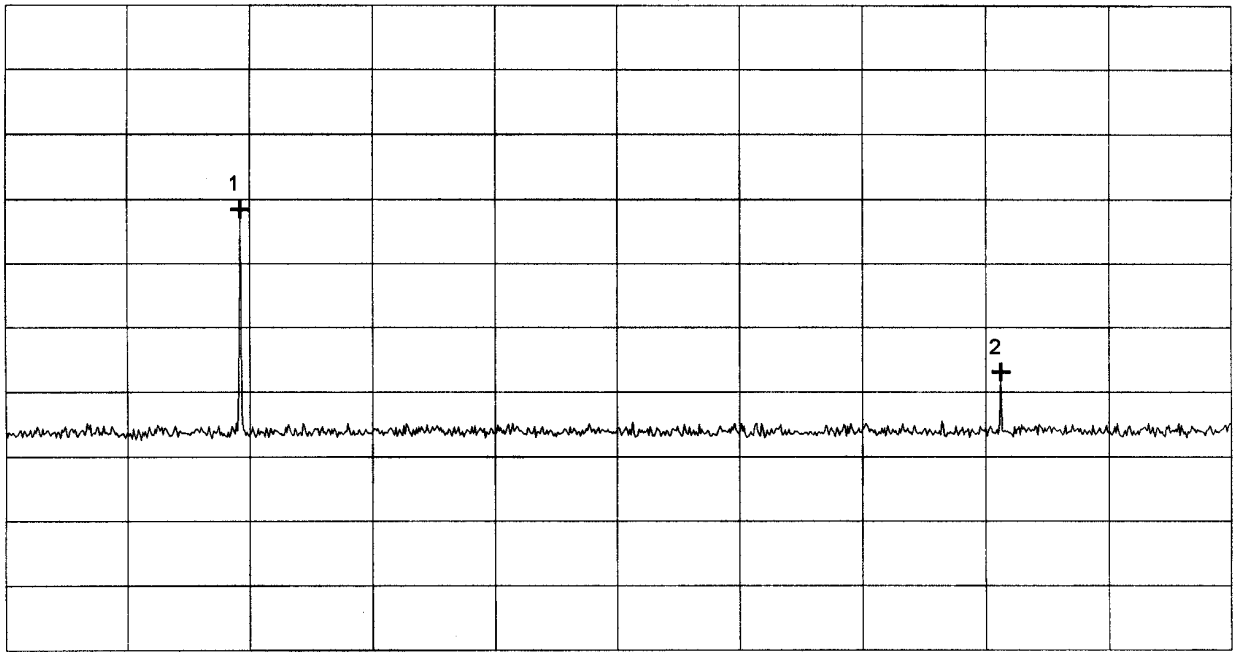
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in horizontal position - right side on table - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	48.42 dBµV
Nr.2	868.555556 MHz	23.00 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

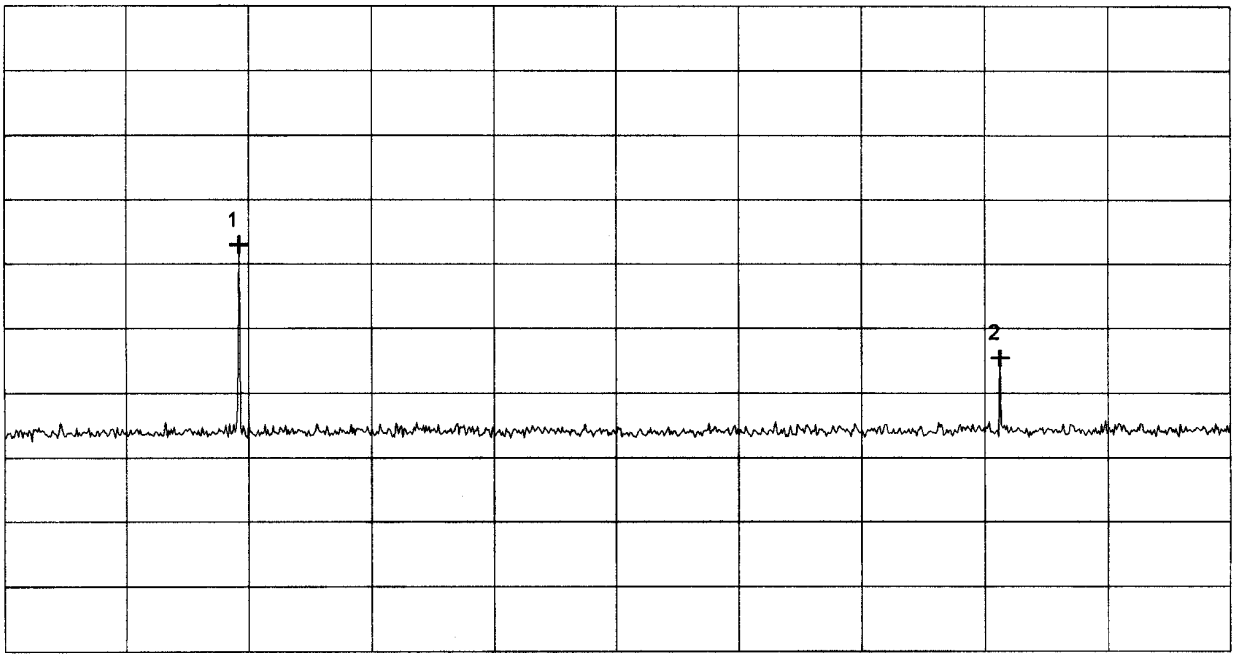
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode:
Serial No.: --	- transmitting continuously
Applicant: Akerströms Björbo AB	- with battery supply 9.0 V
	- EUT in horizontal position - right side on table
	- Test distance : 3m
	- Antenna polarization : horizontal
	PRESCAN WITHOUT CORRECTIONS !!

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	42.93 dBµV
Nr.2	868.555556 MHz	25.36 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

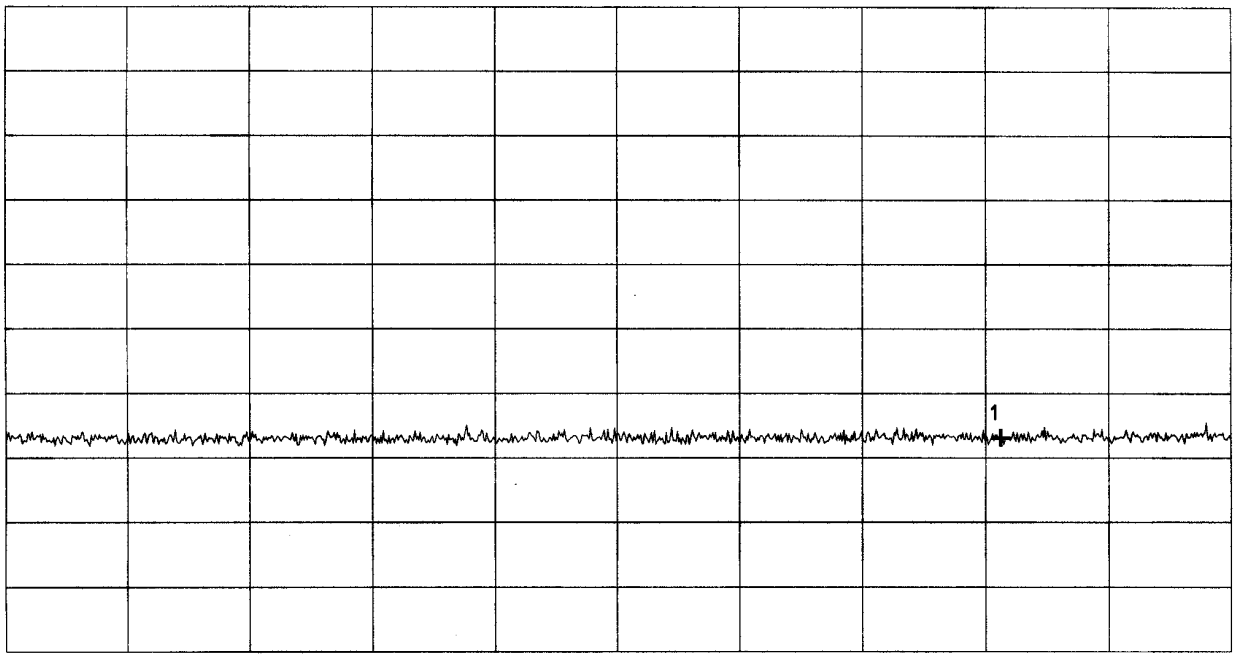
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - antenna to the top - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	13.04 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

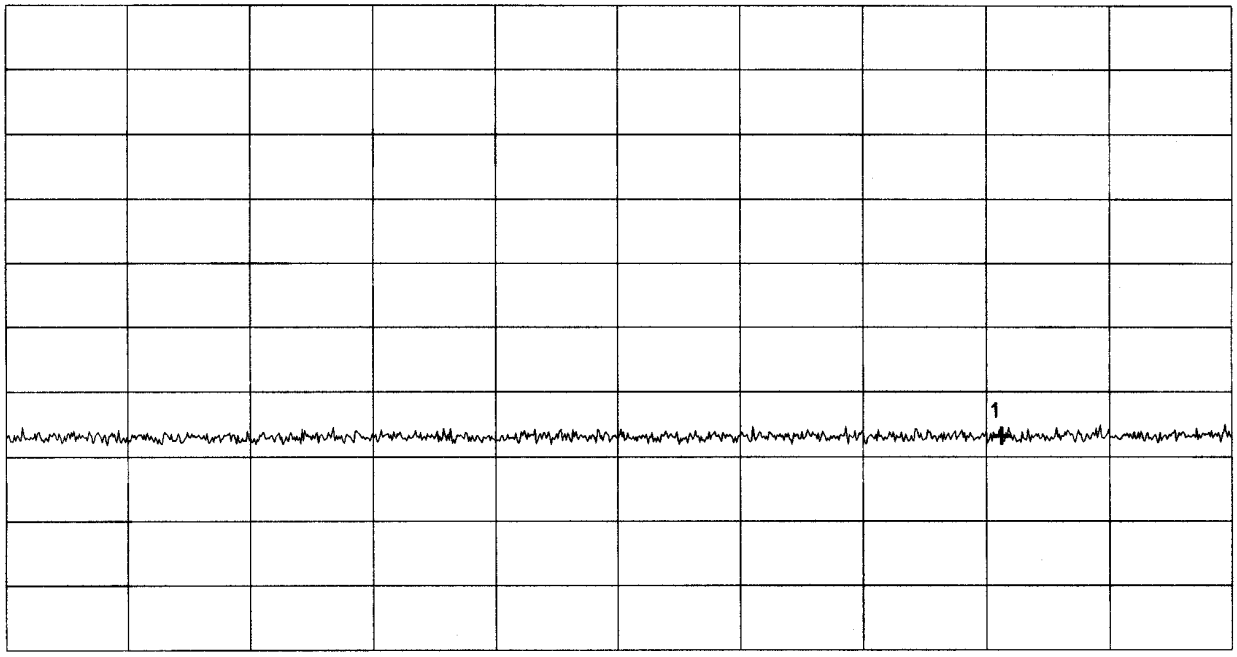
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - antenna to the top - Test distance : 3m - Antenna polarization : horizontal PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 30.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 300.000 MHz
SWP 100 ms

**** Multi Marker ****

Nr.1	249.300000 MHz	13.14 dBµV
Nr.2		
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

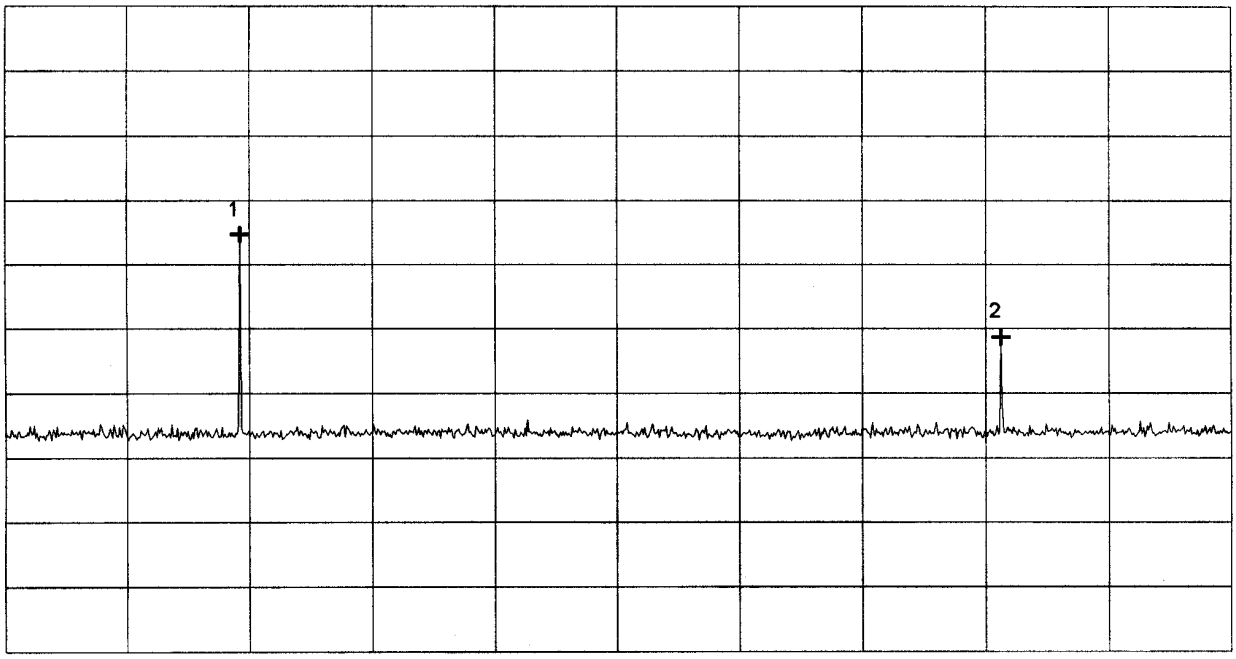
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - antenna to the top - Test distance : 3m - Antenna polarization : vertical PRESCAN WITHOUT CORRECTIONS !!
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	44.68 dBµV
Nr.2	868.555556 MHz	28.66 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

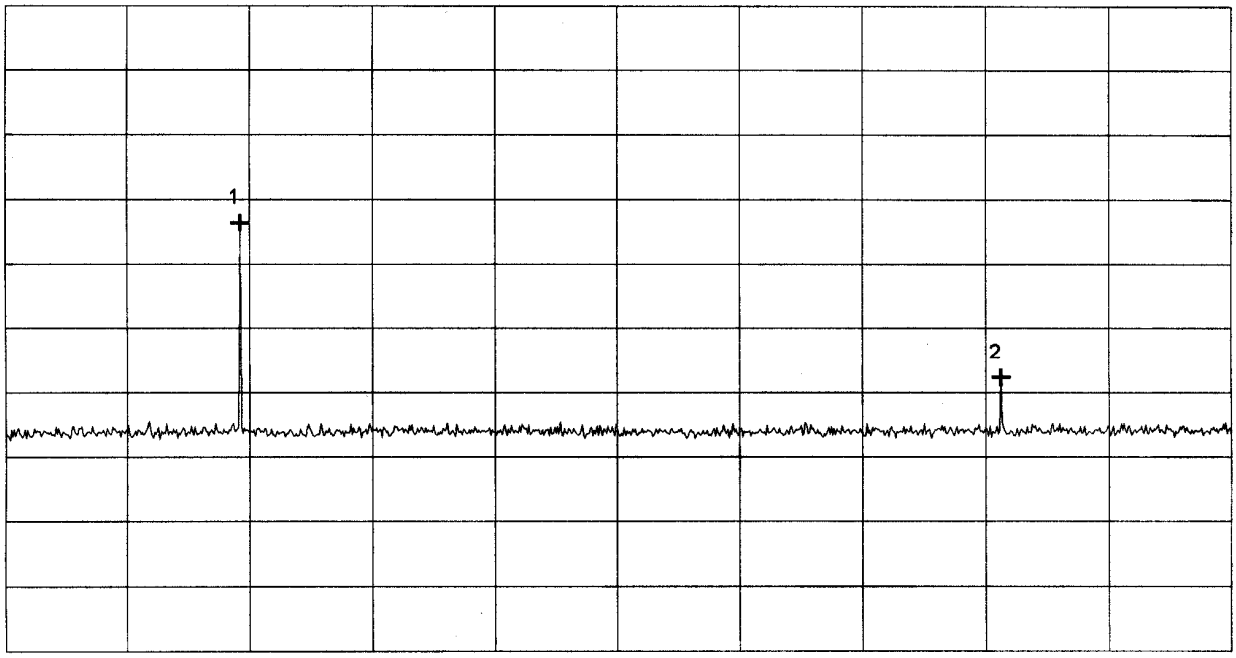
Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated emission 30 MHz - 1 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode:
Serial No.: --	- transmitting continuously
Applicant: Akerströms Björbo AB	- with battery supply 9.0 V
	- EUT in vertical position - antenna to the top
	- Test distance : 3m
	- Antenna polarization : horizontal
	PRESCAN WITHOUT CORRECTIONS !!

Ref.Level 80 dBµV
10 dB dB/Div.

ATT 0 dB



Start 300.000 MHz
RBW 100 kHz

VBW 100 kHz

Stop 1.000 GHz
SWP 220 ms

**** Multi Marker ****

Nr.1	434.555556 MHz	46.43 dBµV
Nr.2	868.555556 MHz	22.31 dBµV
Nr.3		
Nr.4		
Nr.5		
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date: 02/16/1999	

Radiated Emission 30 MHz - 1 GHz (Final Test)
according to FCC Part 15 Subpart C, §15.231.b

Model: Sesam 599
Type: Remote control transmitter
Serial No.: 92 1865-000
Applicant: Akerströms Björbo AB
Test-site: Open area test-site I
Test distance: 3 meters
Date of test: 02/18/1999
Operator: T. Eberl
Mode: - transmitting continuously
- with battery supply 9 V

EUT in horizontal position - rear to table

Detector: Peak

Polarization: horizontal

Frequency [MHz]	Receiver reading [dBµV]	Correction factor [dB]	Fieldstrength Peak [dBµV/m]	Limit Peak [dBµV/m]	Duty cycle correction [dB]	Fieldstrength Average [dBµV/m]	Limit Average [dBµV/m]	Limit exceeded
433.92	52.4	21.3	73.7	100.8			80.8	
867.86	27.7	29.9	57.6	80.8			60.8	

Note : No additional average testing, because peak fieldstrength is below average limit

Result: The limits are kept.

Radiated Emission 30 MHz - 1 GHz (Final Test)
according to FCC Part 15 Subpart C, §15.231.b

Model: Sesam 599
Type: Remote control transmitter
Serial No.: 92 1865-000
Applicant: Akerströms Björbo AB
Test-site: Open area test-site I
Test distance: 3 meters
Date of test: 02/18/1999
Operator: T. Eberl
Mode: - transmitting continuously
- with battery supply 9 V

EUT in horizontal position - rear to table

Detector: Peak

Polarization: vertical

Frequency [MHz]	Receiver reading [dBµV]	Correction factor [dB]	Fieldstrength Peak [dBµV/m]	Limit Peak [dBµV/m]	Duty cycle correction [dB]	Fieldstrength Average [dBµV/m]	Limit Average [dBµV/m]	Limit exceeded
433.92	39.5	21.3	60.8	100.8			80.8	
867.86	19.5	29.9	49.4	80.8			60.8	

Note : No additional average testing, because peak fieldstrength is below average limit

Result: The limits are kept.

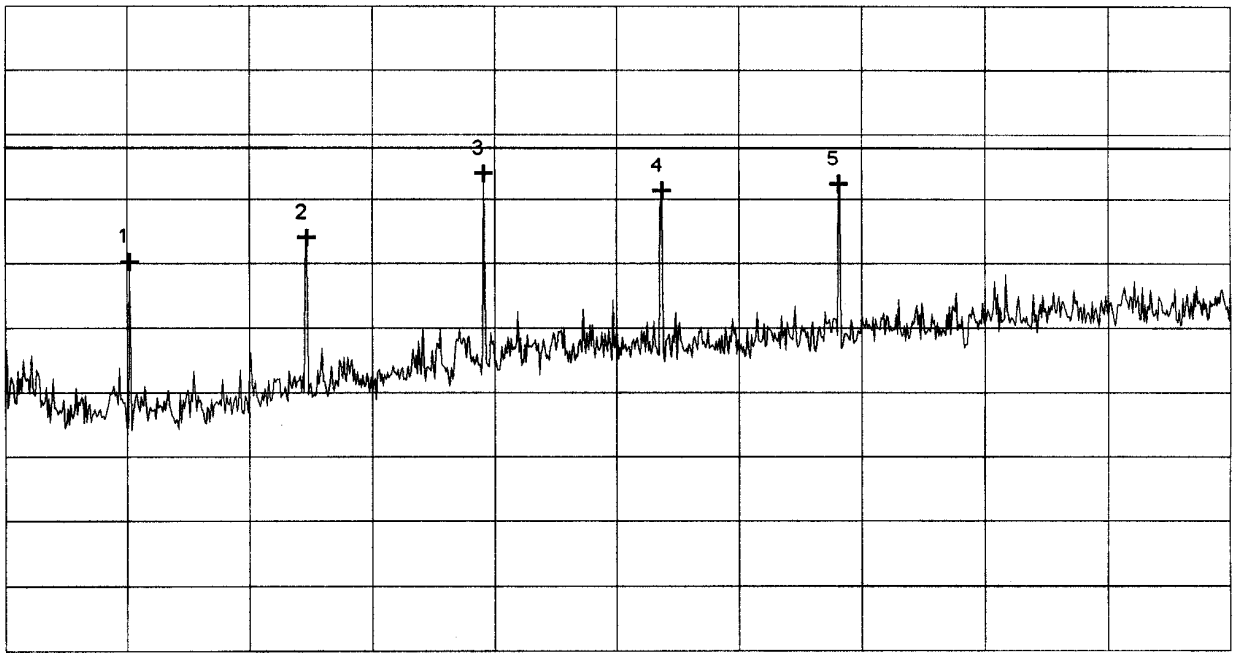
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - antenna to the top - Testdistance : 3m - Antenna polarisation : vertical
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	45.10 dBµV/m
Nr.2	1.740000 GHz	47.00 dBµV/m
Nr.3	2.173333 GHz	51.98 dBµV/m
Nr.4	2.610000 GHz	50.66 dBµV/m
Nr.5	3.043333 GHz	51.17 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

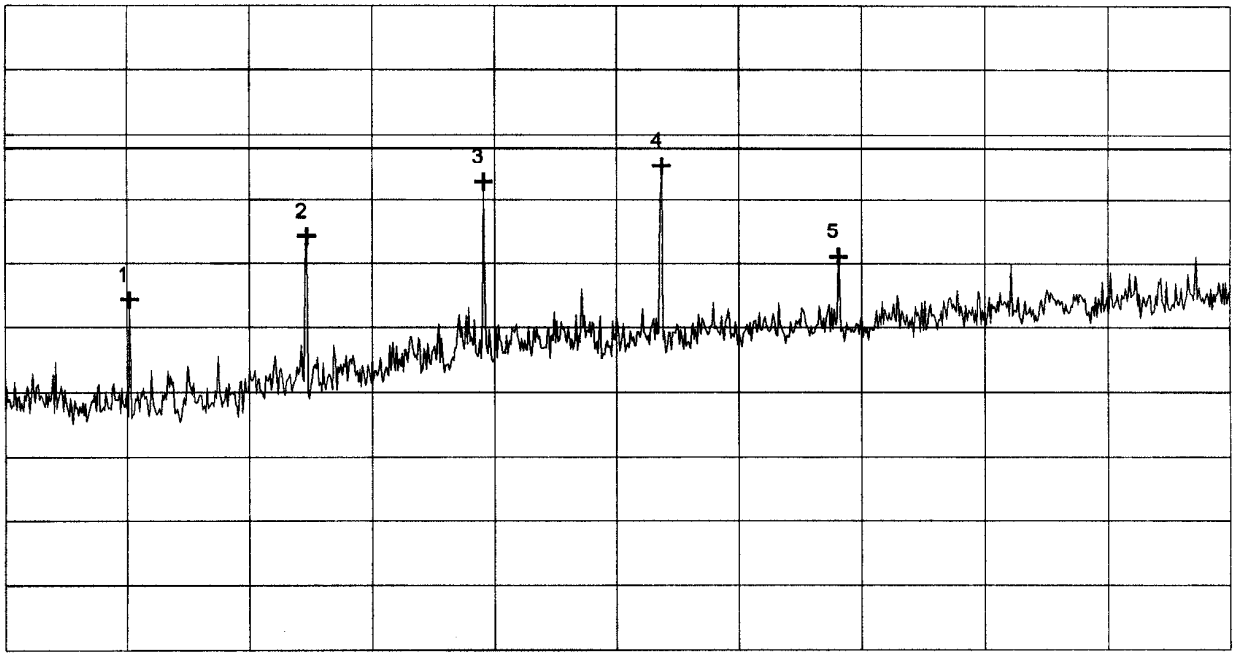
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - antenna to the top - Testdistance : 3m - Antenna polarisation : horizontal
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	42.13 dBµV/m
Nr.2	1.740000 GHz	47.13 dBµV/m
Nr.3	2.173333 GHz	51.37 dBµV/m
Nr.4	2.610000 GHz	52.61 dBµV/m
Nr.5	3.043333 GHz	45.53 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

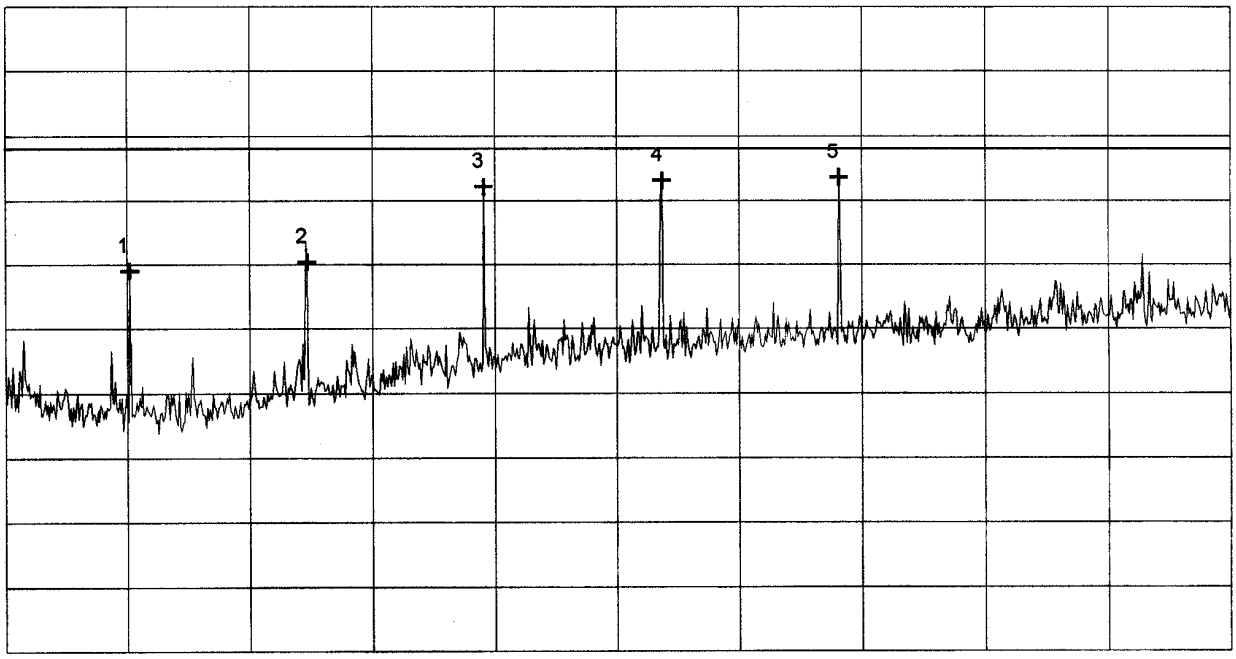
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - rear on table - Testdistance : 3m - Antenna polarisation : vertical
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	44.49 dBµV/m
Nr.2	1.740000 GHz	45.20 dBµV/m
Nr.3	2.173333 GHz	51.06 dBµV/m
Nr.4	2.610000 GHz	51.55 dBµV/m
Nr.5	3.043333 GHz	51.80 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

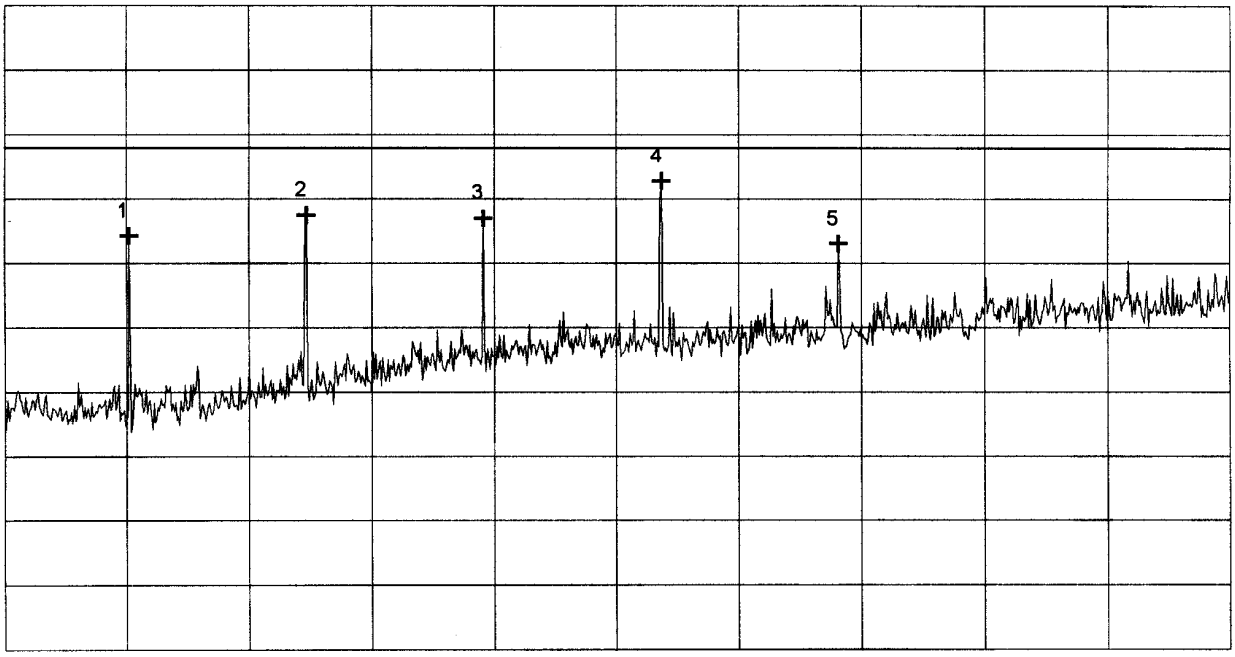
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - rear on table - Testdistance : 3m - Antenna polarisation : horizontal
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	47.10 dBµV/m
Nr.2	1.740000 GHz	48.75 dBµV/m
Nr.3	2.173333 GHz	48.50 dBµV/m
Nr.4	2.610000 GHz	51.39 dBµV/m
Nr.5	3.043333 GHz	46.49 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

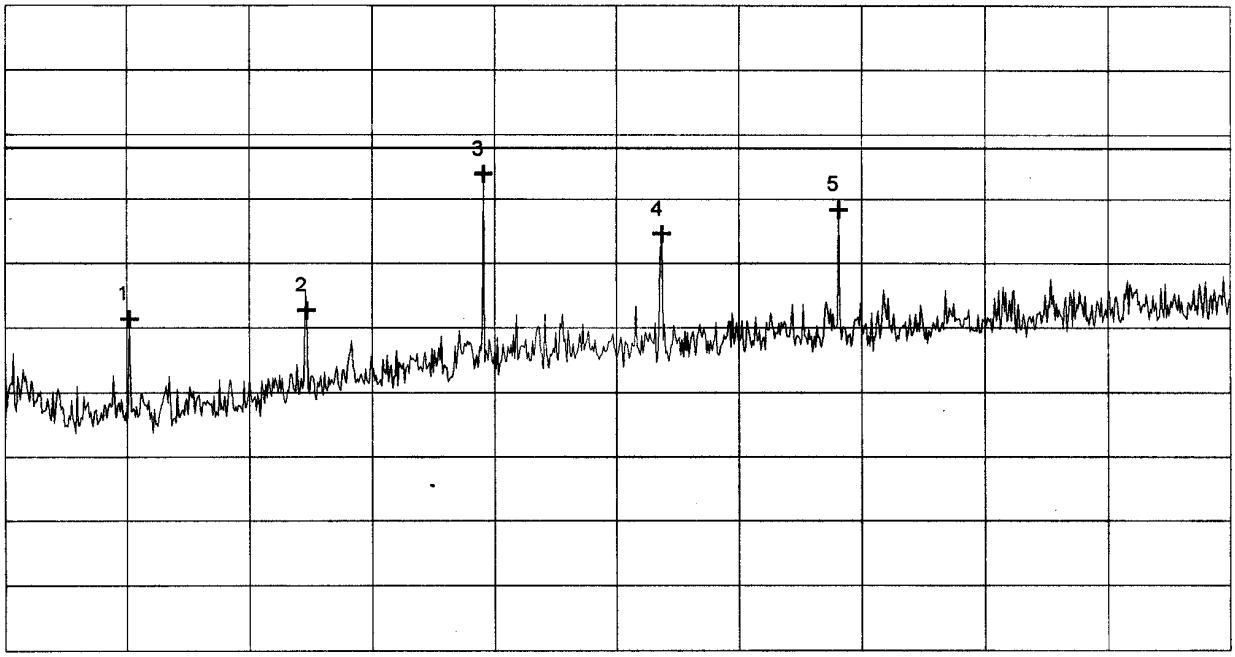
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - right side on table - Testdistance : 3m - Antenna polarisation : vertical
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	40.65 dBµV/m
Nr.2	1.740000 GHz	41.31 dBµV/m
Nr.3	2.173333 GHz	51.93 dBµV/m
Nr.4	2.610000 GHz	47.25 dBµV/m
Nr.5	3.043333 GHz	49.18 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

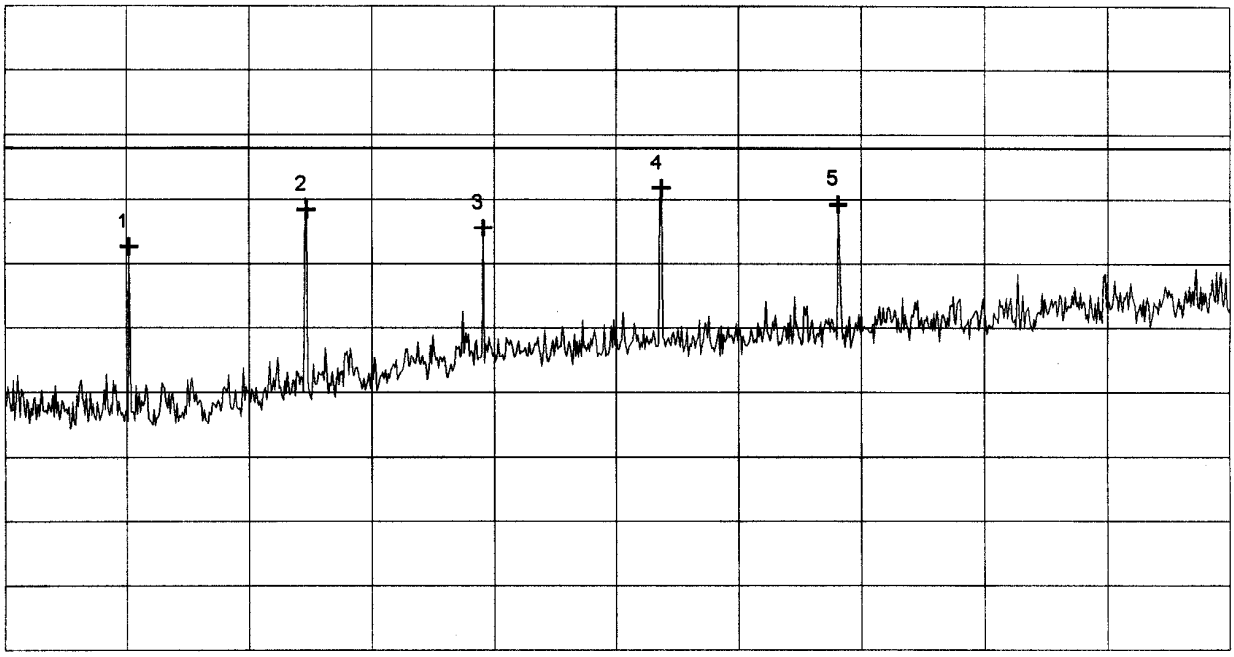
Radiated emission 1GHz - 4.5 GHz acc. FCC Part 15 Subpart C

Model: SESAM 599	Mode: - transmitting continuously - with battery supply 9.0 V - EUT in vertical position - right side on table - Testdistance : 3m - Antenna polarisation : horizontal
Serial No.: --	
Applicant: Akerströms Björbo AB	

Ref.Level 65 dBµV/m
5 dB dB/Div.

ATT 0 dB

Ref. Offset -30.5 dB



Start 1.000 GHz
RBW 1 MHz

VBW 1 MHz

Stop 4.000 GHz
SWP 20 ms

**** Multi Marker ****

Nr.1	1.306667 GHz	46.32 dBµV/m
Nr.2	1.740000 GHz	49.21 dBµV/m
Nr.3	2.173333 GHz	47.79 dBµV/m
Nr.4	2.610000 GHz	50.89 dBµV/m
Nr.5	3.043333 GHz	49.62 dBµV/m
Nr.6		
Nr.7		
Nr.8		

Tested by: Thomas Eberl	Project-No.: 56502
Date:	

Radiated Emission 1 GHz - 5 GHz
according to FCC Part 15 Subpart C, §15.231.b

Model: Sesam 599
Type: Remote control transmitter
Serial No.: 921865-000
Applicant: Akerströms Björbo AB
Test-site: Semi anechoic room
Test distance: 3 meters
Date of test: 02.16.1999
Operator: T. Eberl
Mode: - transmitting continuously
- with battery supply 9 V DC
-rear on table

Detector: Peak

Frequency [GHz]	Polarization	Analyzer-reading [dBµV]	Antenna-correction [dB]	Cable-correction [dB]	Fieldstrength Peak [dBµV/m]	Limit Peak [dBµV/m]	Duty cycle correction [dB]	Fieldstrength Average [dBµV/m]	Limit Average [dBµV/m]	Limit exceeded
1.3066	horizontal	20.2	26.5	0.5	47.1	74.0			54.0	
1.7400	horizontal	20.3	27.9	0.5	48.7	80.8			60.8	
2.1740	vertical	21.4	29.6	0.6	51.6	80.8			60.8	
2.6100	horizontal	28.3	23.7	0.6	52.6	80.8			60.8	
3.0433	vertical	27.4	23.7	0.7	51.8	80.8			60.8	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values are calculated as harmonics of fundamental frequency.

Result: The limits are kept.

Radiated Emission 1 GHz - 5 GHz
according to FCC Part 15 Subpart C, §15.231.b

Model: Sesam 599
Type: Remote control transmitter
Serial No.: 921865-000
Applicant: Akerströms Björbo AB
Test-site: Semi anechoic room
Test distance: 3 meters
Date of test: 02.16.1999
Operator: T. Eberl
Mode: - transmitting continuously
- with battery supply 9 V DC
- EUT in horizontal position with right hand side on table

Detector: Peak

Frequency [GHz]	Polarization	Analyzer-reading [dBµV]	Antenna-correction [dB]	Cable-correction [dB]	Fieldstrength Peak [dBµV/m]	Limit Peak [dBµV/m]	Duty cycle correction [dB]	Fieldstrength Average [dBµV/m]	Limit Average [dBµV/m]	Limit exceeded
1.3066	horizontal	19.4	26.5	0.5	46.3	74.0			54.0	
1.7400	horizontal	20.8	27.9	0.5	49.2	80.8			60.8	
2.1740	vertical	21.7	29.6	0.6	51.9	80.8			60.8	
2.6100	horizontal	26.6	23.7	0.6	50.9	80.8			60.8	
3.0433	horizontal	25.2	23.7	0.7	49.6	80.8			60.8	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values are calculated as harmonics of fundamental frequency.

Result: The limits are kept.

Radiated Emission 1 GHz - 5 GHz
according to FCC Part 15 Subpart C, §15.231.b

Model: Sesam 599
Type: Remote control transmitter
Serial No.: 921865-000
Applicant: Akerströms Björbo AB
Test-site: Semi anechoic room
Test distance: 3 meters
Date of test: 02.16.1999
Operator: T. Eberl
Mode: - transmitting continuously
- with battery supply 9 V DC
- EUT in vertical position with antenna to the top

Detector: Peak

Frequency [GHz]	Polarization	Analyzer-reading [dBµV]	Antenna-correction [dB]	Cable-correction [dB]	Fieldstrength Peak [dBµV/m]	Limit Peak [dBµV/m]	Duty cycle correction [dB]	Fieldstrength Average [dBµV/m]	Limit Average [dBµV/m]	Limit exceeded
1.3066	vertical	18.2	26.5	0.5	45.1	74.0			54.0	
1.7400	horizontal	18.7	27.9	0.5	47.1	80.8			60.8	
2.1740	vertical	21.7	29.6	0.6	51.9	80.8			60.8	
2.6100	horizontal	28.3	23.7	0.6	52.6	80.8			60.8	
3.0433	vertical	26.7	23.7	0.7	51.1	80.8			60.8	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values are calculated as harmonics of fundamental frequency.

Result: The limits are kept.