

Appendix A

Test Data Sheets

and

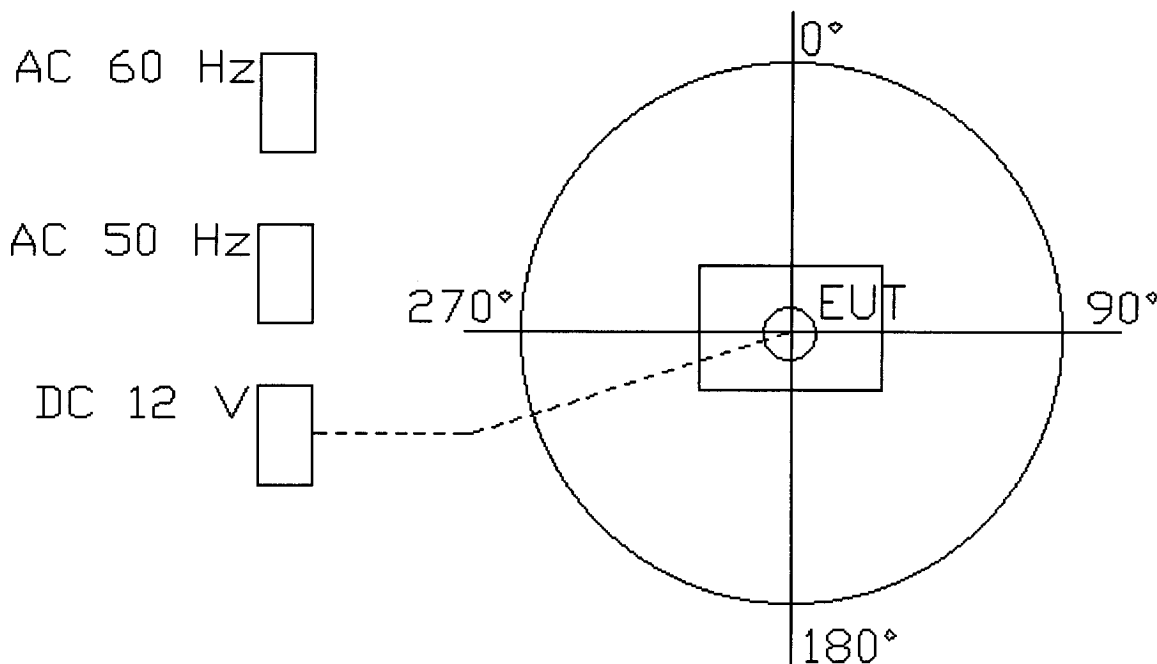
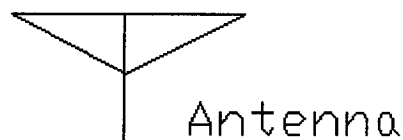
Test Setup Drawing(s)

TEST SETUP FOR EMISSIONS TESTING

Mikes Product Service
Open Test Site 1

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is about 15 meters vertically from the ground floor to the test area.
2. 50 Hz and 60 Hz are power panels for alternating current. There is also a power panel for direct current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 5 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



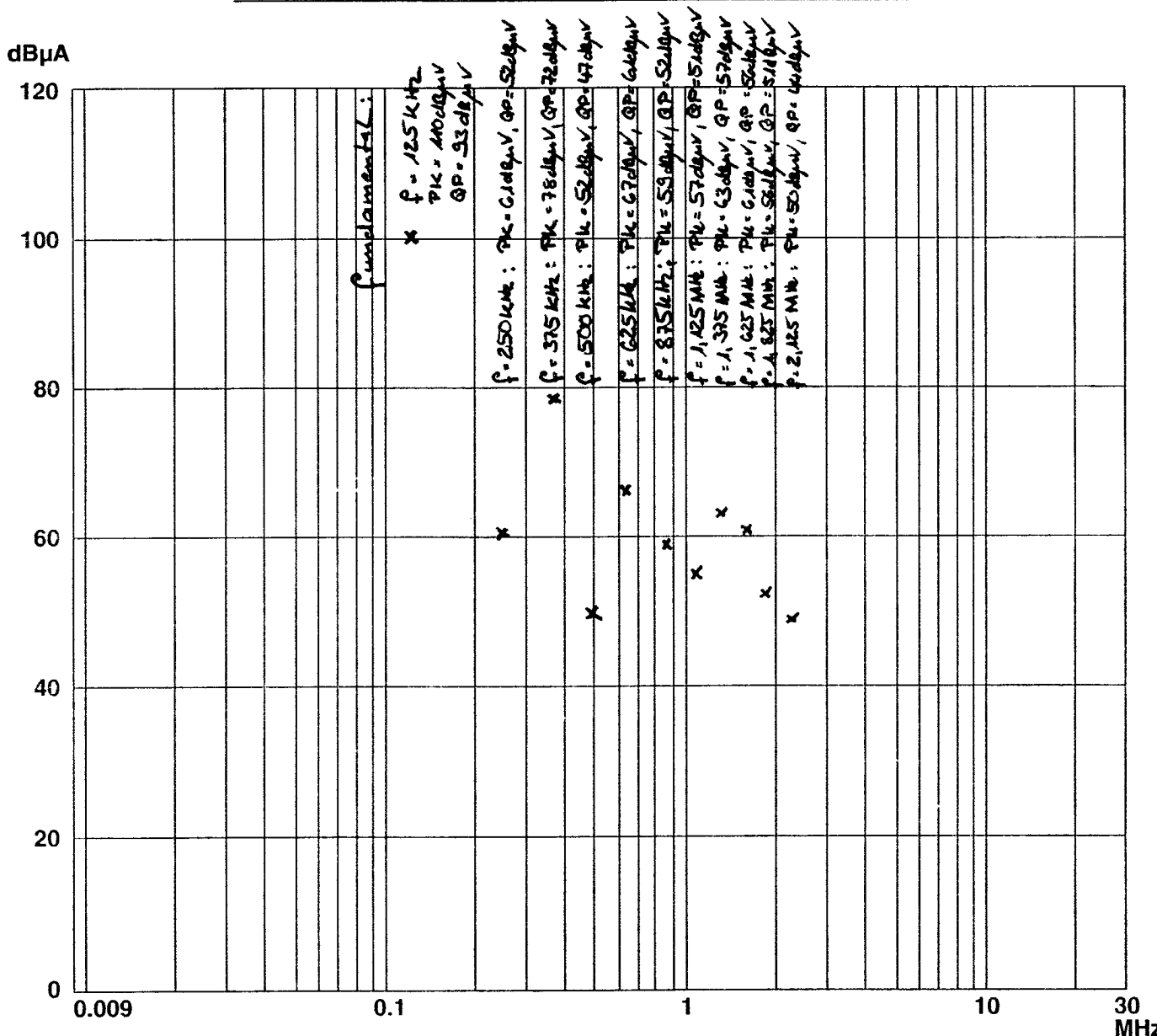
RADIATION-TEST 9 kHz – 30 MHz

Magnetic Field

Type/Model: VENUS
 Ser. No. : _____
 Client : Siemens AG
 Test mode : permanent transmit
 Test point : Door Antennas
 Test spec. : FCC Part 15.209

Detection Mode: ☒ P
☒ QP
☐ AV
 Test result: ☒ ok
☐ n. ok

Remarks Fundamental and spurious emissions
3m test distance



RADIATION-TEST 9 kHz – 30 MHz

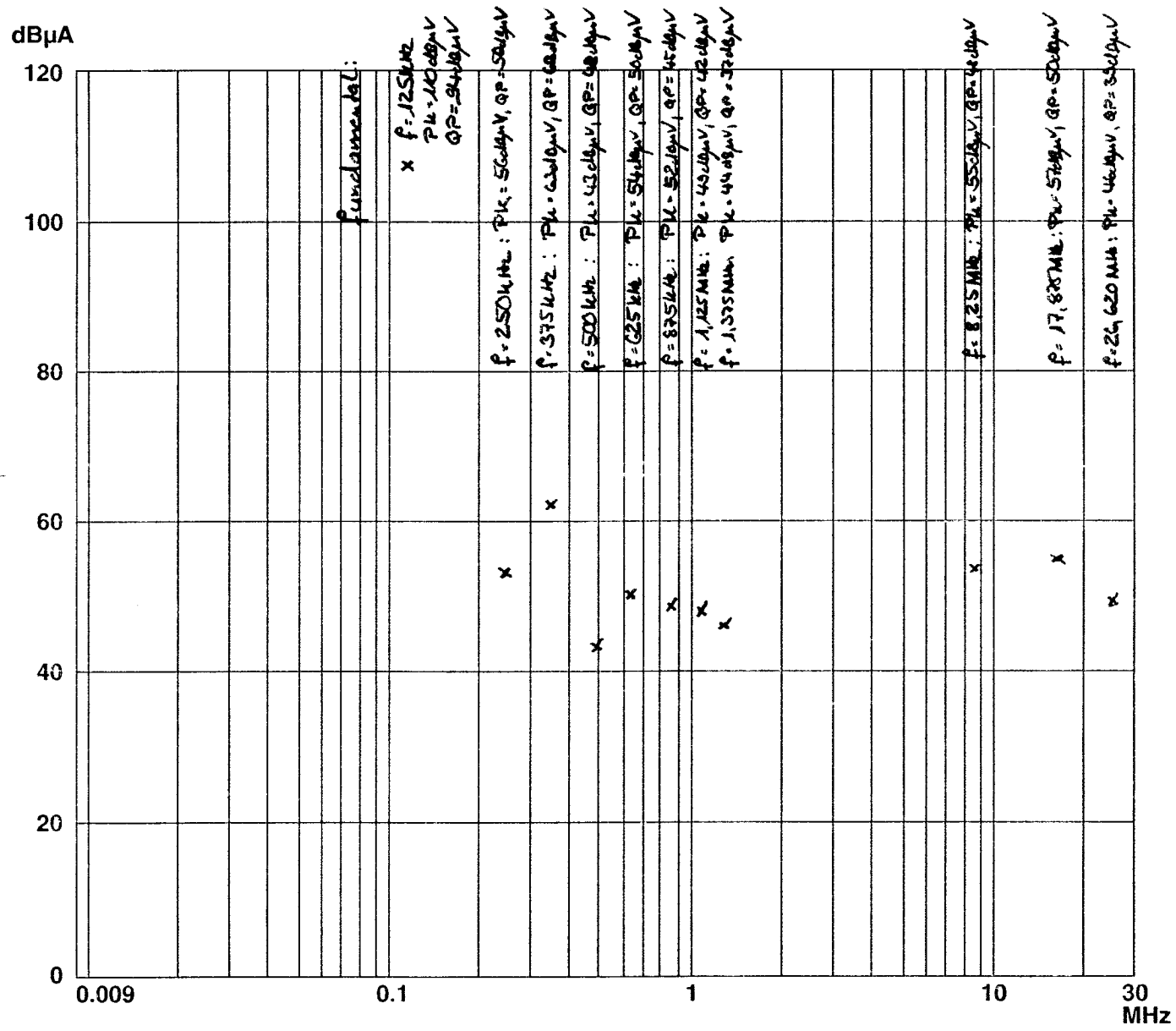
Magnetic Field

Type/Model: VENUS
 Ser. No. : _____
 Client : Siemens AG
 Test mode : Transmit
 Test point : Bumper Antenna
 Test spec. : FCC Part 15.209

Detection Mode: ☒ P
☒ QP
☐ AV

 Test result: ☒ ok
☐ n. ok

Remarks Fundamental and spurious emissions
3m test distance



FUNDAMENTAL AND SPURIOUS EMISSION (MAGNETIC FIELD) 10 kHz - 30 MHz

• - Test not applicable

- - in a shielded room
- - at a non - reflecting open-site
- and
- - in a testdistance of 3 meters.
- - in a testdistance of 30 meters.

Description of Measurement

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the EMI receiver (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Test results Door antennas:

Frequency (MHz)	Level (PK) dbuV	Level (QP) dBuV	Factor dB	Level (Pk) dBuV/m	Level (QP) dBuV/m	Limit dBuV/m	Delta dB
0.125	90	73	20	110	93	145.7	35.7
0.250	41	32	20	61	52	139.6	78.6
0.375	58	52	20	78	72	136.1	58.1
0.500	32	27	20	52	47	133.6	81.6
0.625	47	41	20	67	61	91.7	24.9
0.875	39	32	20	59	52	88.8	36.8
1.125	37	31	20	57	51	86.6	29.6
1.375	43	37	20	63	57	84.8	31.9
1.625	41	36	20	61	56	83.4	23.4
1.825	36	31	20	56	51	89.5	33.5
2.125	30	20	20	50	40	89.5	39.5

Test results Bumper antenna:

Frequency (MHz)	Level (PK) dbuV	Level (QP) dBuV	Factor dB	Level (Pk) dBuV/m	Level (QP) dBuV/m	Limit dBuV/m	Delta dB
0.125	90	74	20	110	94	145.7	35.7
0.250	36	30	20	56	50	139.6	83.5
0.375	43	40	20	63	60	136.1	73.1
0.500	23	20	20	43	40	133.6	90.6
0.625	34	30	20	54	50	91.7	37.9
0.875	32	25	20	52	45	88.8	36.9
1.125	29	22	20	49	42	86.6	37.6
1.375	24	17	20	44	37	84.8	40.8
8.250	35	28	20	55	48	89.5	34.5
17.875	37	30	20	57	50	89.5	32.5
26.620	26	19	20	46	39	89.5	43.5

File No. T13826-1-10KG , Appendix E



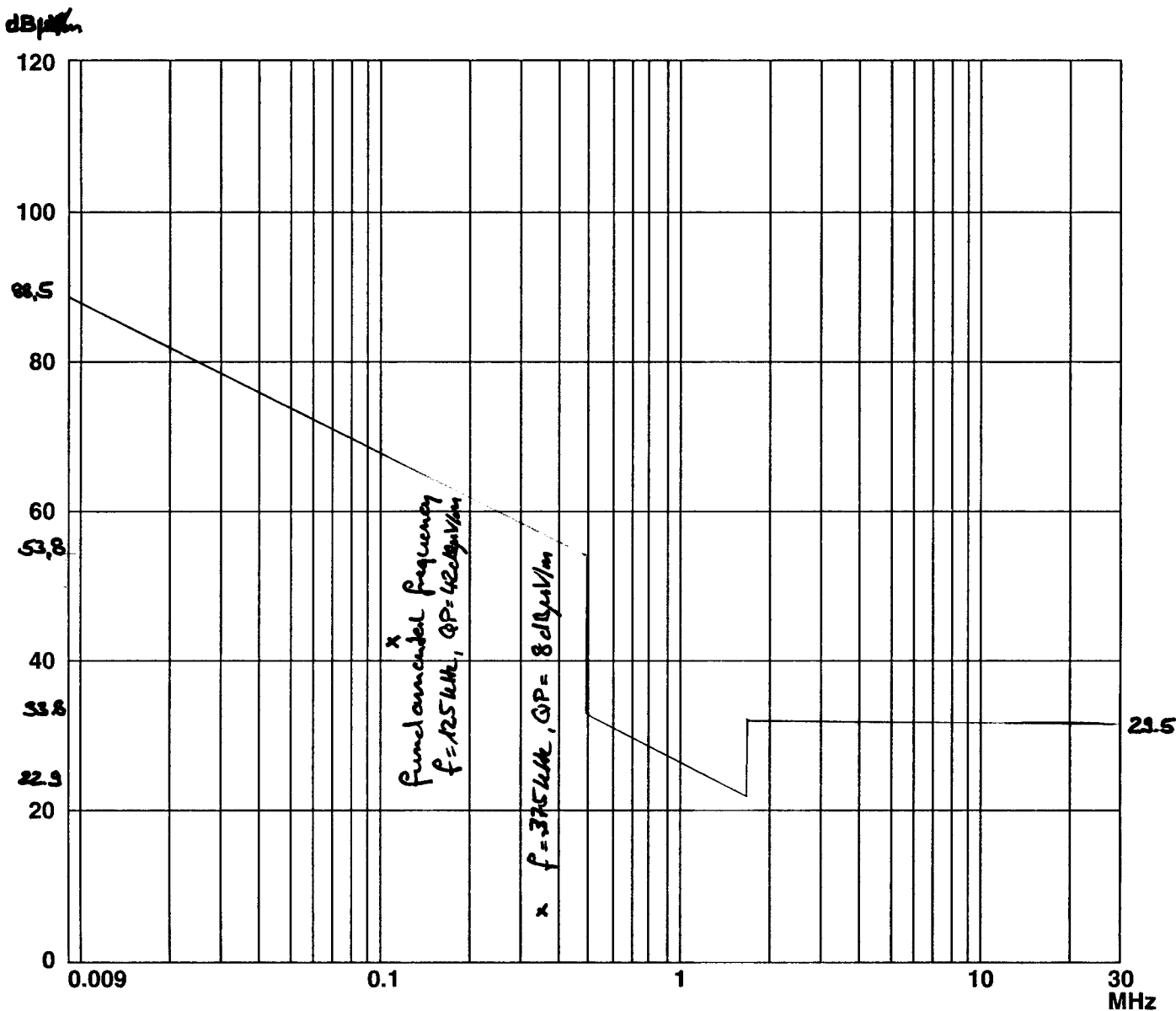
RADIATION-TEST 9 kHz – 30 MHz
Magnetic Field

Type/Model: VENUS
Ser. No. : _____
Client : Siemens AG
Test mode : Permanent Transmit
Test point : Door Antennas
Test spec. : FEC Part 15.209

Detection Mode: ☒ P
☒ QP
☐ AV

Test result: ☒ ok
☐ n. ok

Remarks Fundamental and spurious emissions
30m test distance



	name	date	page of pages
tested by	<u>Geyer</u>	<u>7. 4. 93</u>	<u>15</u> of <u>121</u>

RADIATION-TEST 9 kHz – 30 MHz

Magnetic Field

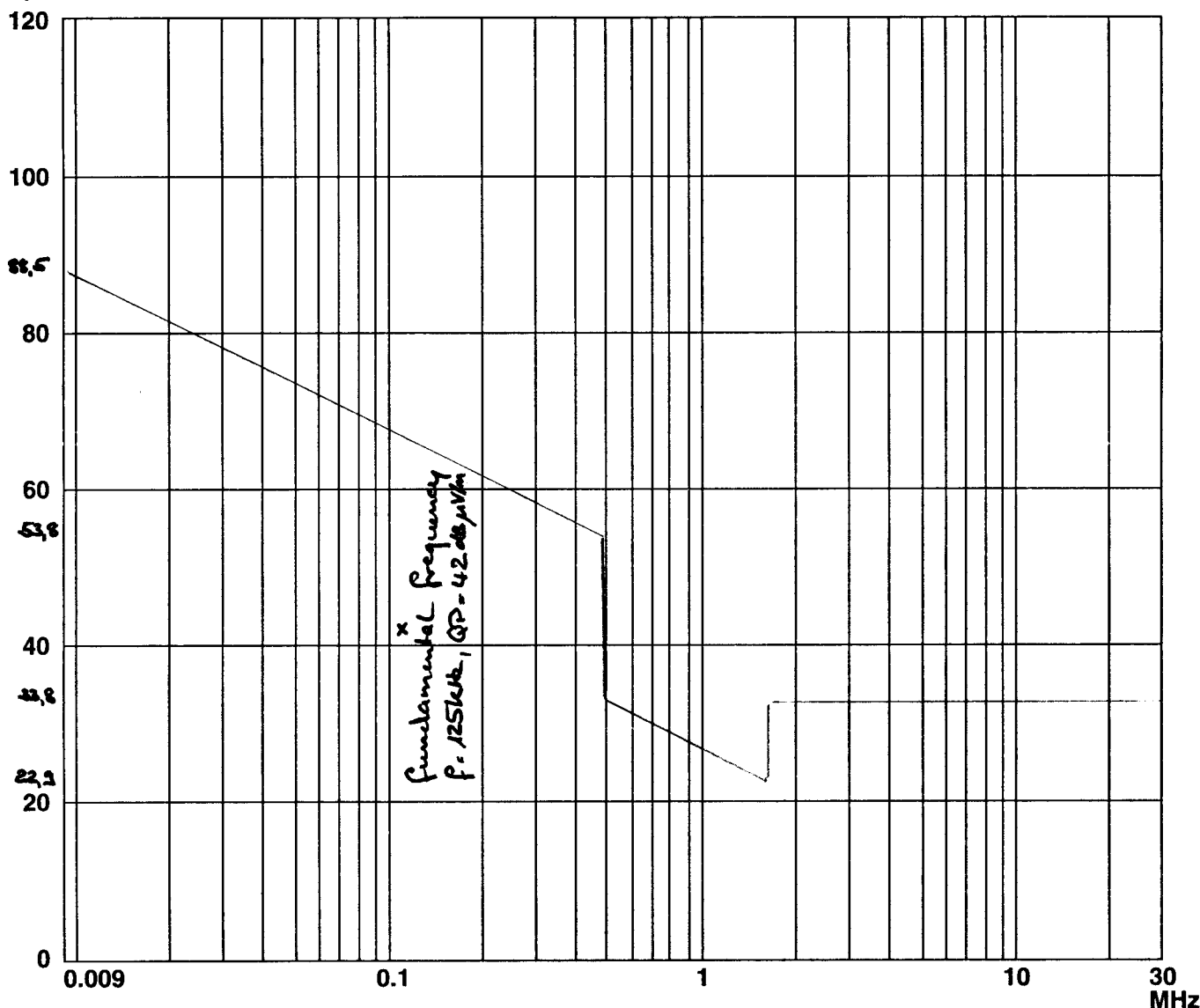
Type/Model: VENUS
Ser. No. : _____
Client : Siemens AG
Test mode : Permanent transmit
Test point : Bumper Antenna
Test spec. : FCC Part 15.209

Detection Mode: ☒ P
☒ QP
☐ AV

Test result: ☒ ok
☐ n. ok

Remarks Fundamental and spurious emissions
30m test distance

dBμV/m

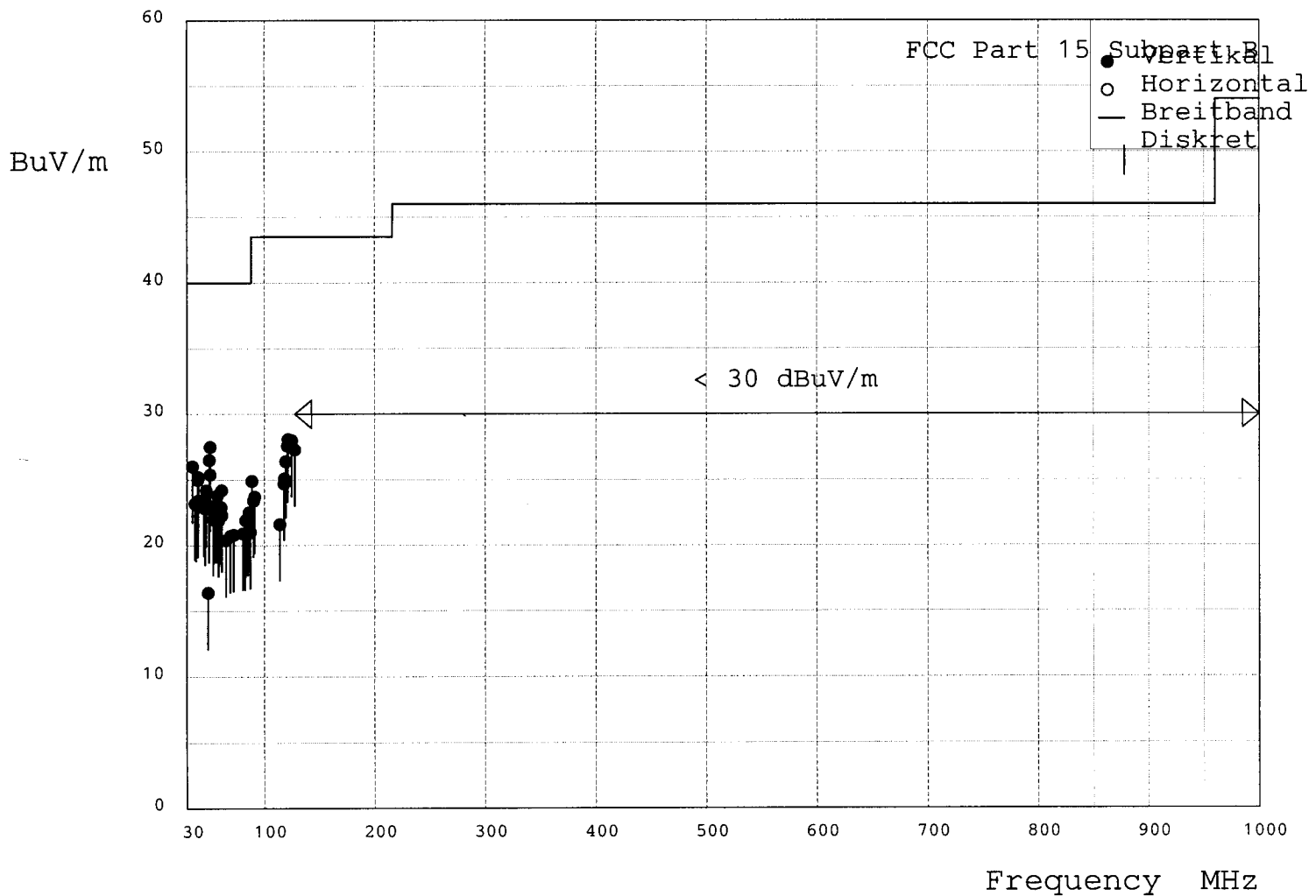


	name	date	page of pages
tested by	<u>Geyde</u>	<u>7.4.93</u>	<u>AG of A21</u>

Radiation-Test

accdg.FCC Part 15

Typ: VENUS	Testdistance: 3m
Manufacturer: Siemens AG	Testreceiver: ESVP
Client: Siemens AG	Antenna: BBA - UHALP
Regulation: FCC PART 15.209	Testengineer: K. Gegenfurtner
Order No.: T13826-1-10 KG	Date: 05-05-1999
Operation Mode: Transmit	
Remarks: Door Antennas (left side)	



Radiation-Test

accdg.FCC Part 15

Typ: VENUS
 Manufacturer: Siemens AG
 Client: Siemens AG
 Regulation: FCC PART 15.209
 Order No.: T13826-1-10 KG
 eration Mode: Transmit
 Remarks: Door Antennas (left side)

Testdistance: 3m
 Testreceiver: ESVP
 Antenna: BBA - UHALP
 Testengineer: K. Gegenfurtner
 Date: 05-05-1999

Result	Frequency [MHz]	Level [dBuV/m]	Limit [dBuV/m]	DLimit [dBuV]	Polarisation	Noise
	34.70	26.0	40.0	14.0	Vertikal	Diskret
	37.10	23.2	40.0	16.8	Vertikal	Diskret
	38.10	23.1	40.0	16.9	Vertikal	Diskret
	39.60	25.0	40.0	15.0	Vertikal	Diskret
	39.90	23.4	40.0	16.6	Vertikal	Diskret
	40.10	25.2	40.0	14.8	Vertikal	Diskret
	45.20	23.5	40.0	16.5	Vertikal	Diskret
	46.20	22.8	40.0	17.2	Vertikal	Diskret
	47.10	24.2	40.0	15.8	Vertikal	Diskret
	49.10	16.4	40.0	23.6	Vertikal	Diskret
	49.70	23.0	40.0	17.0	Vertikal	Diskret
	50.10	26.5	40.0	13.5	Vertikal	Diskret
	50.60	27.5	40.0	12.5	Vertikal	Diskret
	50.90	25.4	40.0	14.6	Vertikal	Diskret
	53.60	22.0	40.0	18.0	Vertikal	Diskret
	54.10	22.9	40.0	17.1	Vertikal	Diskret
	54.90	23.0	40.0	17.0	Vertikal	Diskret
	56.50	23.0	40.0	17.0	Vertikal	Diskret
	57.40	23.8	40.0	16.2	Vertikal	Diskret
	58.40	21.9	40.0	18.1	Vertikal	Diskret
	58.90	22.7	40.0	17.3	Vertikal	Diskret
	60.70	22.9	40.0	17.1	Vertikal	Diskret
	61.10	24.2	40.0	15.8	Vertikal	Diskret
	61.40	22.3	40.0	17.7	Vertikal	Diskret

Result	Frequency [MHz]	Level [dBuV/m]	Limit [dBuV/m]	DLimit [dBuV]	Polarisation	Noise
	65.40	20.4	40.0	19.6	Vertikal	Diskret
	69.00	20.7	40.0	19.3	Vertikal	Diskret
	72.00	20.8	40.0	19.2	Vertikal	Diskret
	80.50	20.9	40.0	19.1	Vertikal	Diskret
	82.60	20.9	40.0	19.1	Vertikal	Diskret
	82.90	21.9	40.0	18.1	Vertikal	Diskret
	85.00	22.0	40.0	18.0	Vertikal	Diskret
	86.00	22.5	40.0	17.5	Vertikal	Diskret
	87.40	21.0	40.0	19.0	Vertikal	Diskret
	88.60	24.9	43.5	18.6	Vertikal	Diskret
	90.10	23.4	43.5	20.1	Vertikal	Diskret
	91.20	23.7	43.5	19.8	Vertikal	Diskret
	114.00	21.6	43.5	21.9	Vertikal	Diskret
	117.80	24.7	43.5	18.8	Vertikal	Diskret
	118.10	25.1	43.5	18.4	Vertikal	Diskret
	119.40	26.4	43.5	17.1	Vertikal	Diskret
	120.90	27.6	43.5	15.9	Vertikal	Diskret
	121.40	28.1	43.5	15.4	Vertikal	Diskret
	124.70	28.0	43.5	15.5	Vertikal	Diskret
	127.70	27.3	43.5	16.2	Vertikal	Diskret

127.70 MHz - 1000 MHz < 30 dBuV/m

Radiation-Test

accdg.FCC Part 15

Typ: VENUS
 Manufacturer: Siemens AG
 Client: Siemens AG
 Regulation: FCC PART 15.209
 Order No.: T13826-1-10 KG
 eration Mode: Transmit
 Remarks: Bumper Antenna

Testdistance: 3m
 Testreceiver: ESVP
 Antenna: BBA - UHALP
 Testengineer: K. Gegenfurtner
 Date: 07-05-1999

Result	Frequency [MHz]	Level [dBuV/m]	Limit [dBuV/m]	DLimit [dBuV]	Polarisation	Noise
	30.00	34.2	40.0	5.8	Vertikal	Diskret
	59.50	17.1	40.0	22.9	Vertikal	Diskret
	60.50	18.8	40.0	21.2	Vertikal	Diskret
	60.90	19.7	40.0	20.3	Vertikal	Diskret
	62.90	19.8	40.0	20.2	Vertikal	Diskret
	63.40	20.1	40.0	19.9	Vertikal	Diskret
	63.70	21.0	40.0	19.0	Vertikal	Diskret
	64.90	22.4	40.0	17.6	Vertikal	Diskret
	65.40	22.3	40.0	17.7	Vertikal	Diskret
	65.90	23.8	40.0	16.2	Vertikal	Diskret
	66.60	22.4	40.0	17.6	Vertikal	Diskret
	67.10	21.5	40.0	18.5	Vertikal	Diskret
	69.10	18.5	40.0	21.5	Vertikal	Diskret

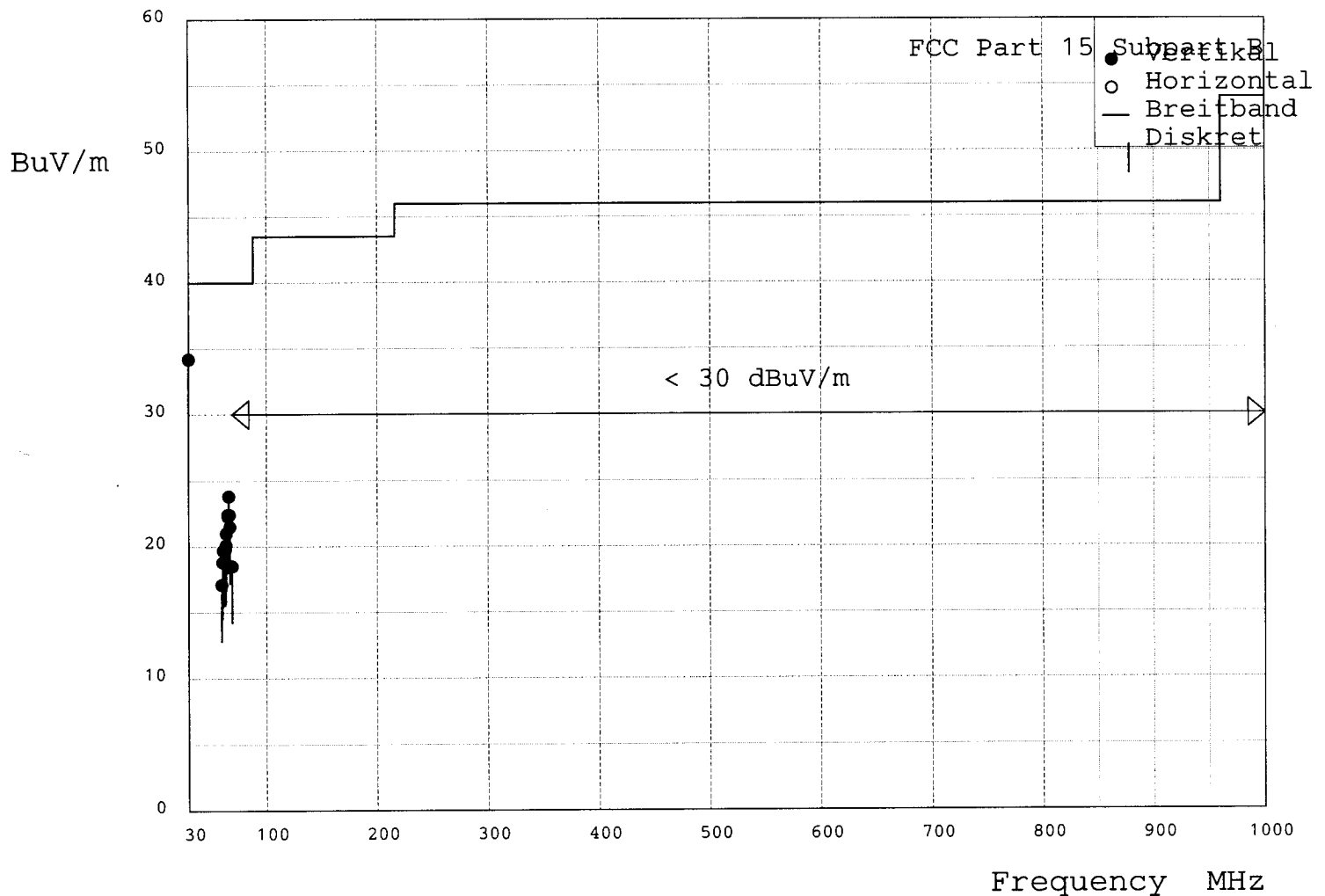
69.10 MHz - 1000 MHz < 30 dBuV/m

Radiation-Test

accdg.FCC Part 15

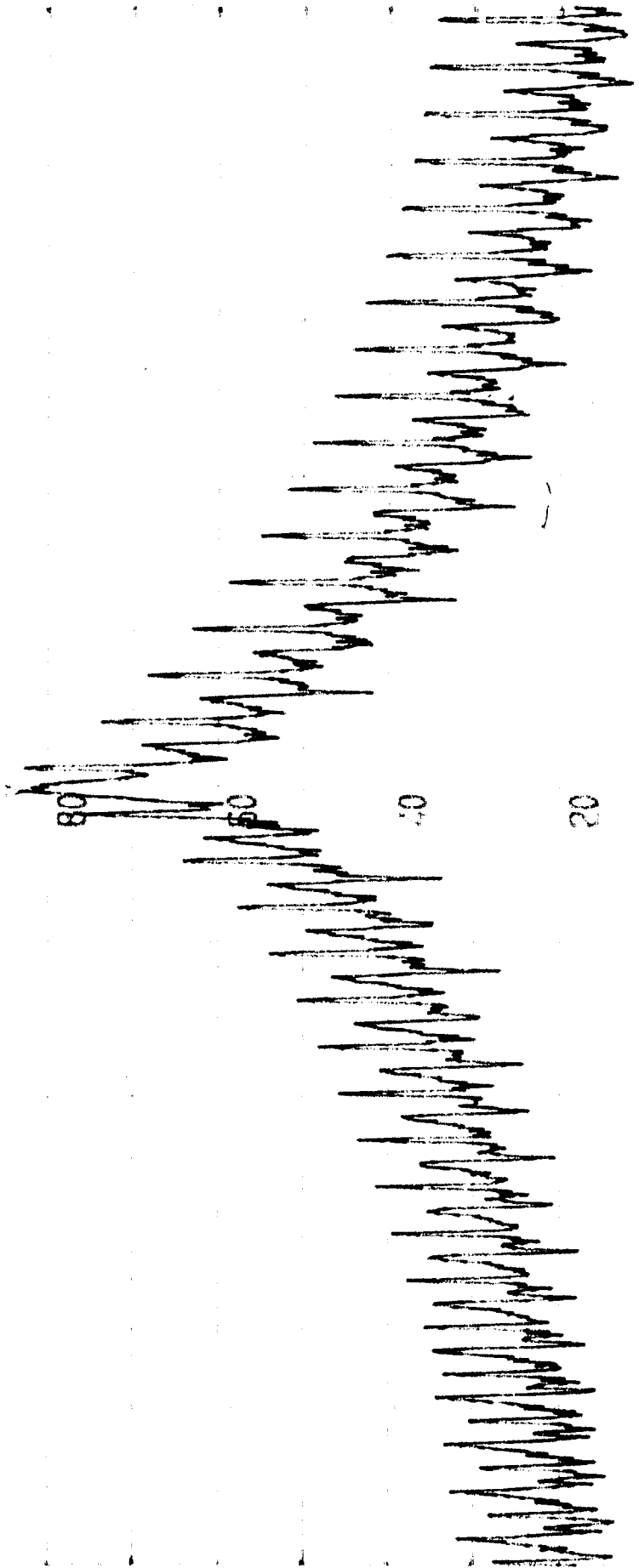
Typ: VENUS
Manufacturer: Siemens AG
Client: Siemens AG
Regulation: FCC PART 15.209
Order No.: T13826-1-10 KG
Operation Mode: Transmit
Remarks: Bumper Antenna

Testdistance: 3m
Testreceiver: ESVP
Antenna: BBA - UHALP
Testengineer: K. Gegenfurtner
Date: 07-05-1999



Bandwidth Plot
Door - Antenna

0.224700MHz 83.00dBu Ref 100.00dBu
100



0.2250 MHz +50 dBu

50 kHz
Date 07.APR.'99 Time 11:20:25

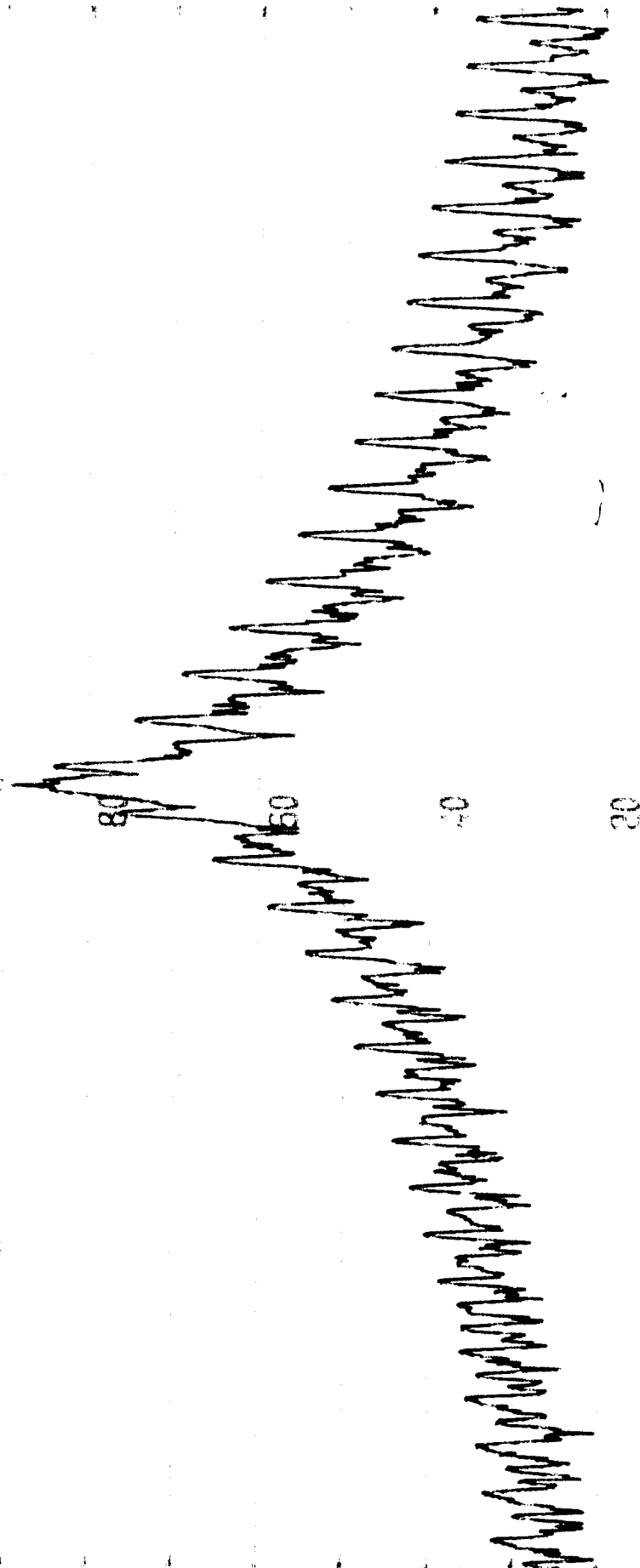
Resolution Bandwidth: 100 Hz

Bandwidth Plot
Door - Antenna



FCC ID: KPSVENUS

Start: 0.425000MHz Ref: 100.00030MHz
100



0.425000MHz

+50 kHz

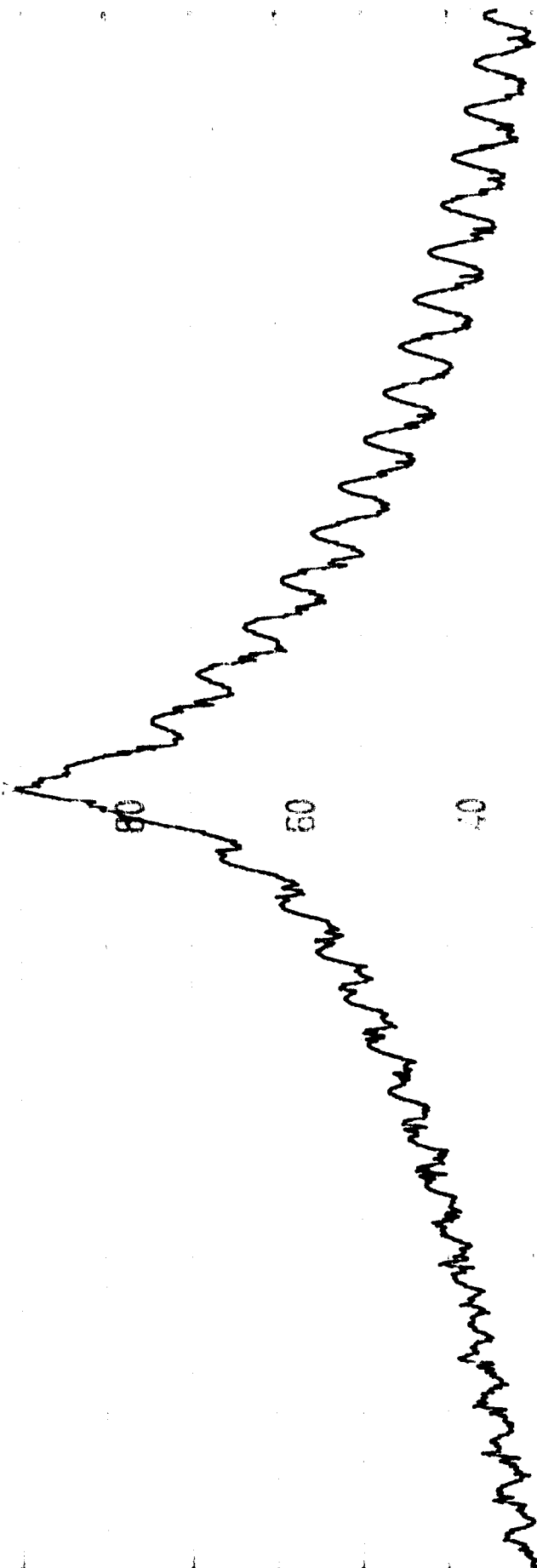
Date: 07 APR '99 Time: 11:06:16

Resolution Bandwidth: 300 Hz

A13/A21

Bandwidth Plot
Door - Antenna

0.125300MHz 90.25dBu Ref 100.00dBu
100



0.1250 MHz

0.1250 MHz

0.1250 MHz

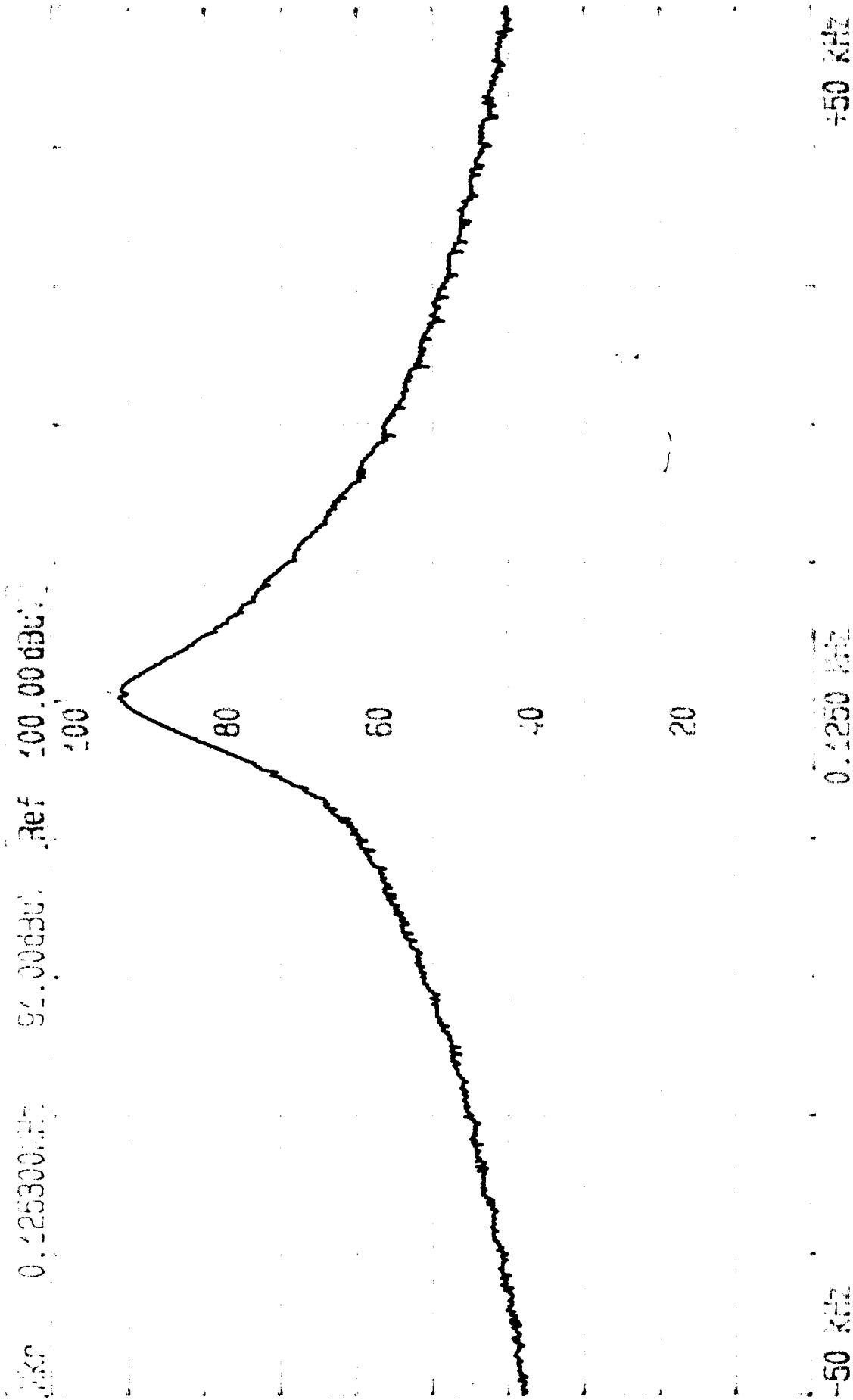
Date 07.APR.'99 Time 12:00:56

Resolution Bandwidth: 1 kHz

Bandwidth Plot
Door - Antenna



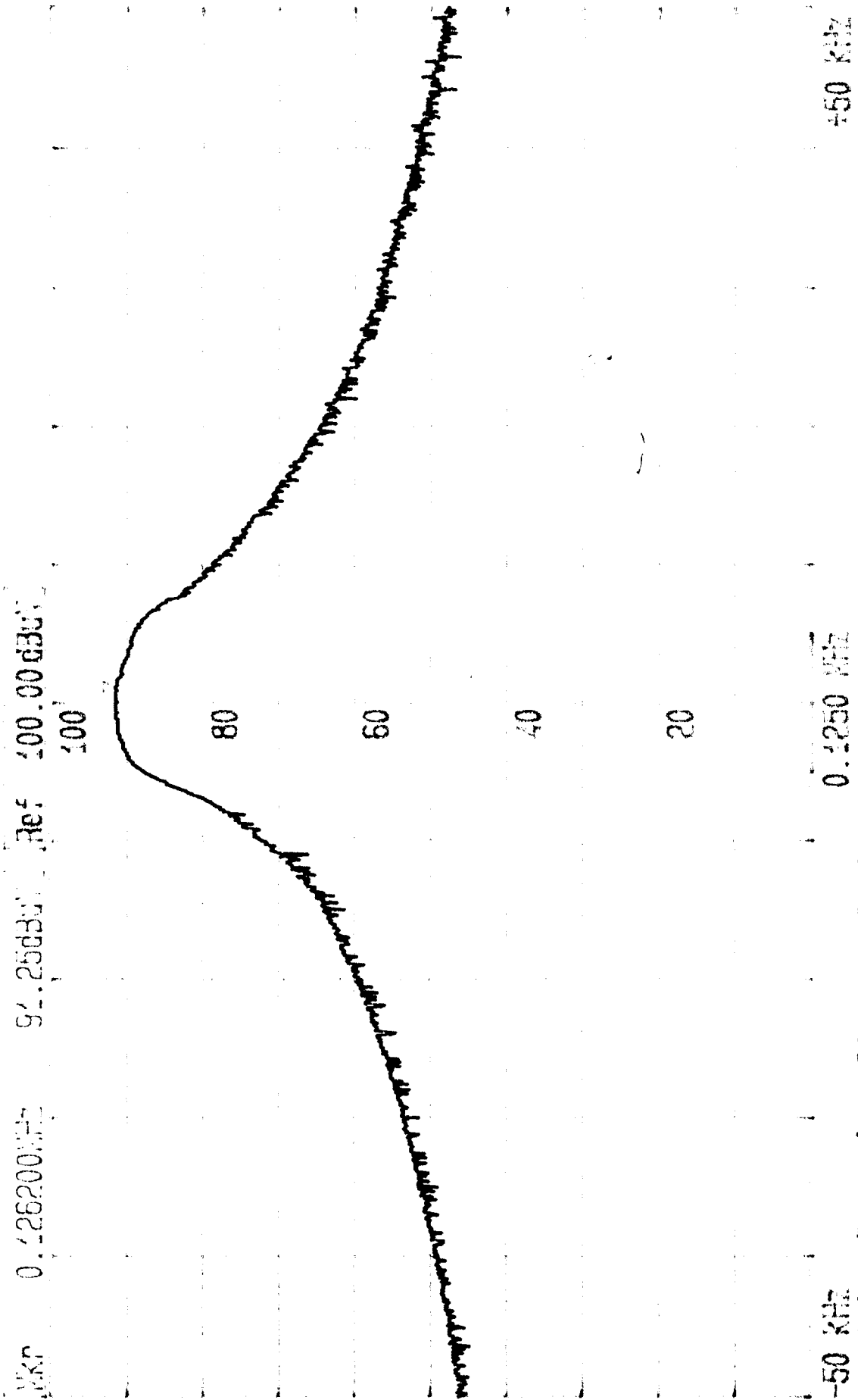
FCC ID KR5VENUS



-50 kHz
Date 07.APR.'99 Time 10:54:56
Resolution Bandwidth: 3kHz

A15/A21

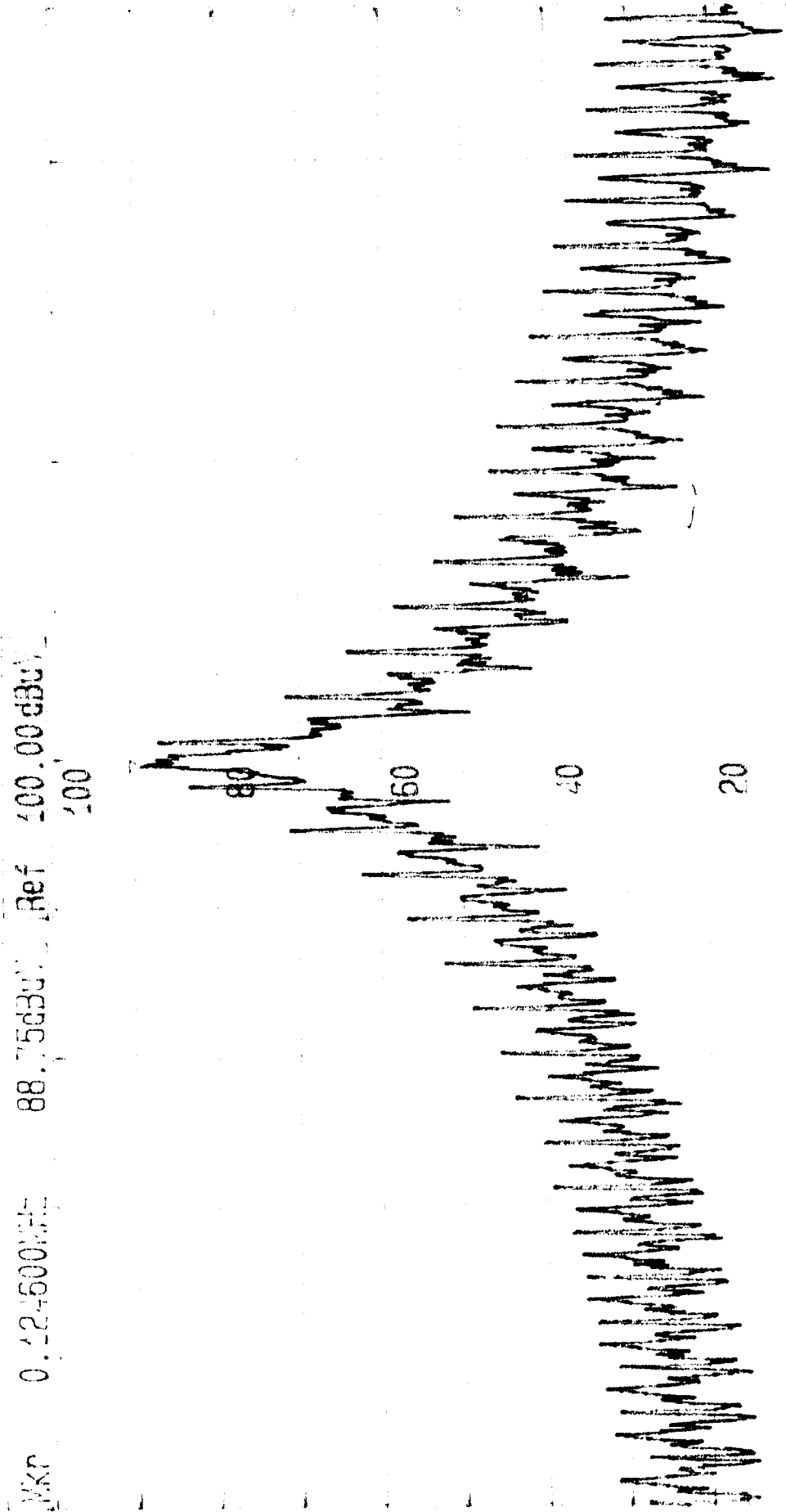
Bandwidth Plot
Door - Antenna



Date 07.APR.'99 Time 10:52:43

Resolution Bandwidth: 10 kHz

Bandwidth Plot
Bumper Antenna



+50 kHz

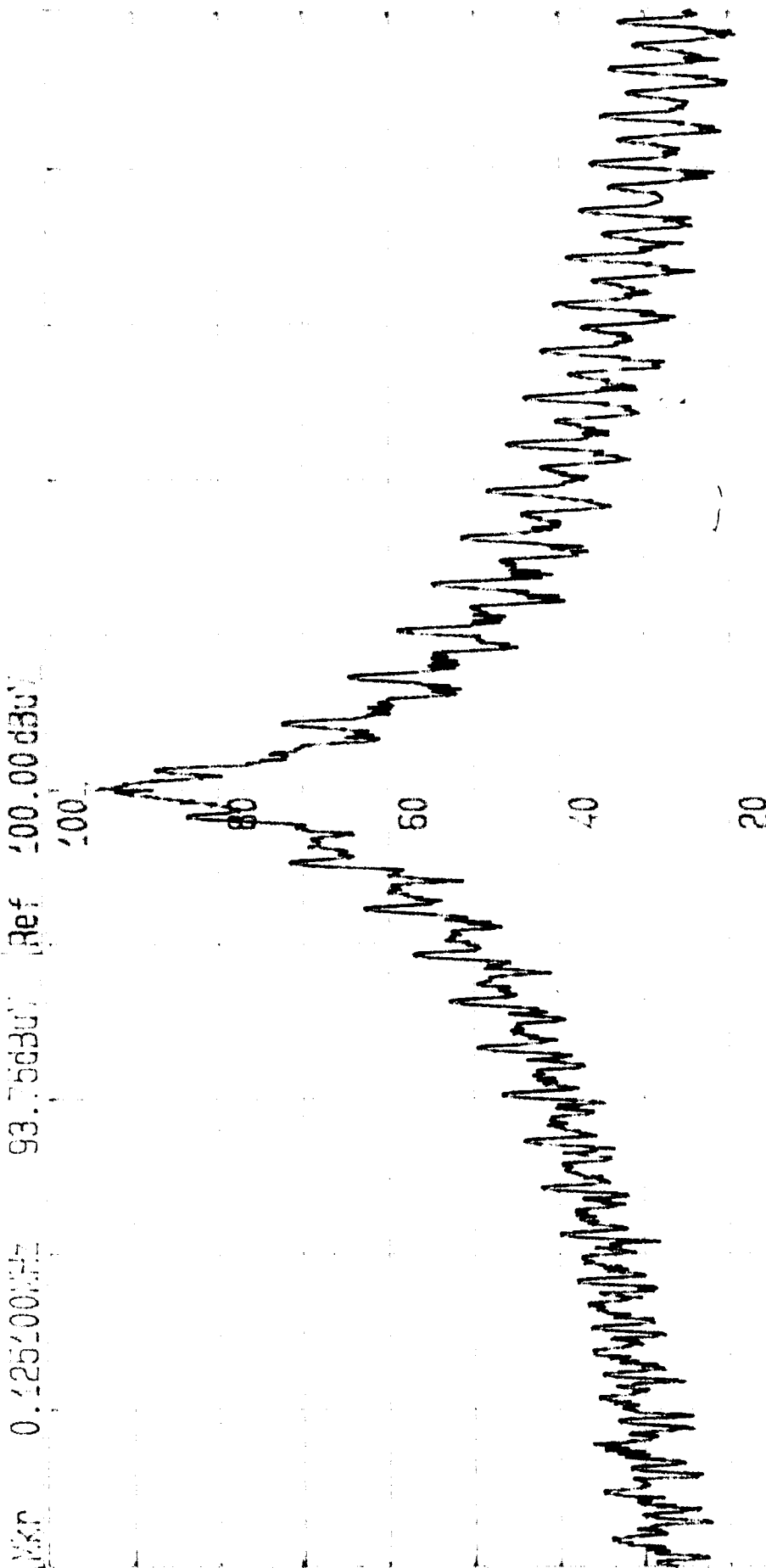
0.1250 kHz

-50 kHz

Date 07.APR.'99 Time 10:29:20

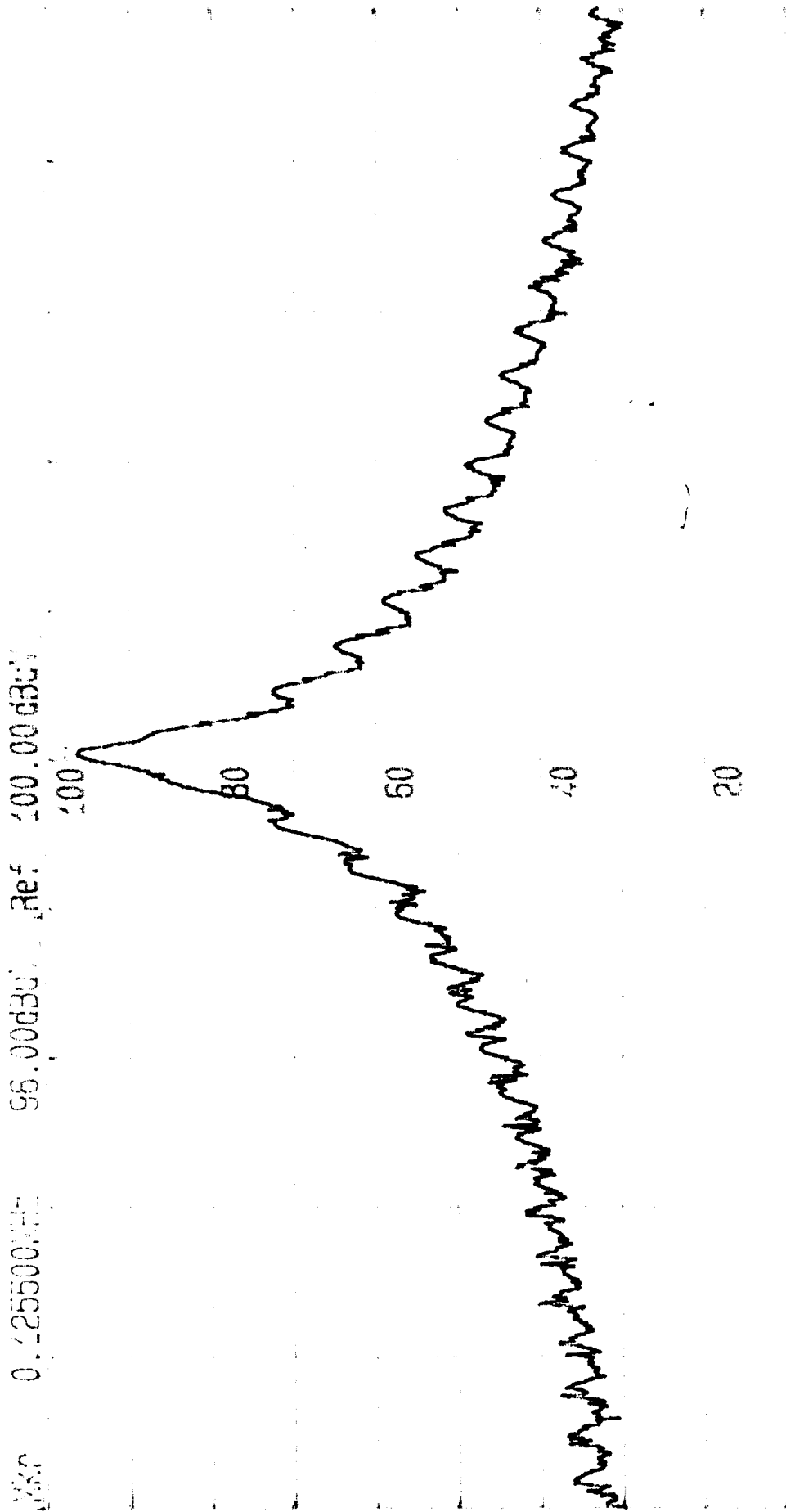
Resolution Bandwidth: 100Hz

Bandwidth Plot
Bumper Antenna



Bandwidth Plot

Bumper Antenna



7/19/21

-50 kHz

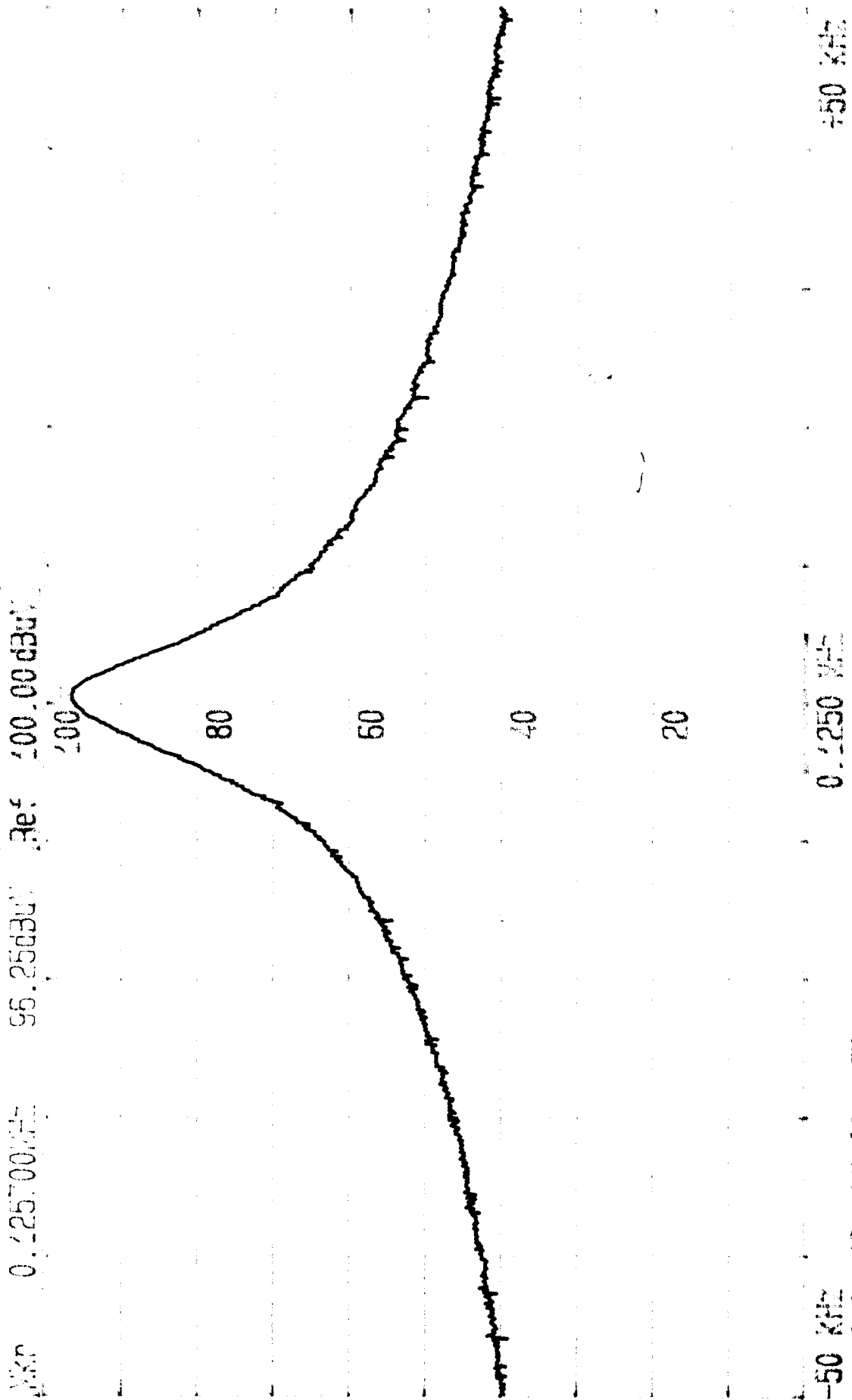
Date 07.APR.'99 Time 10:38:52

Resolution Bandwidth: 1 kHz

0.1250 kHz

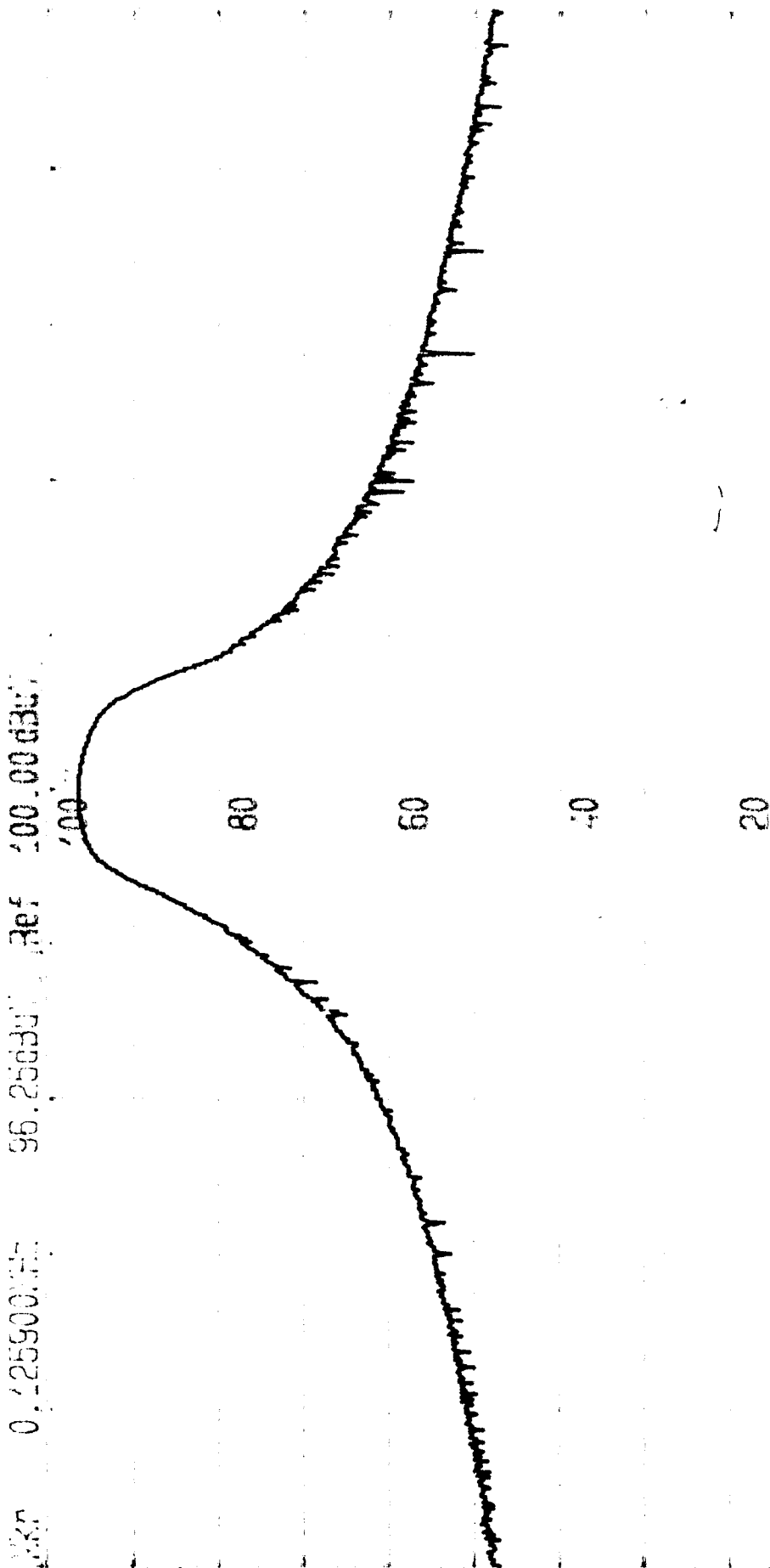
+50 kHz

Bandwidth Plot
Bumper - Antenna



Bandwidth Plot

Bumper - Antenna



-50 kHz

Date 07.APR.'99 Time 10:44:50

Resolution Bandwidth: 10 kHz

17211921

Appendix B

Constructional Data Form

CONSTRUCTIONAL DATAFORM FOR TESTING OF RADIO EQUIPMENT

Licence holder: Siemens AG
 Address: Wernerwerkstraße 2, D-93049 Regensburg
 Manufacturer: Siemens AG
 Address: Wernerwerkstraße 2, D-93049 Regensburg
 Type: Immobilizer system
 Model: VENUS
 Serial-No.: _____ Protection class: 1

Application for getting

- ☒ national approval in the following countries: USA, Canada
☐ EC-type examination

Additional informations to the above named model:**Antenna:****transmitter:**

Type:

Length/size: 0.1165 m² (door, back), 0.0985 m² (door, front), 0.008 m² (bumper)**receiver:**

Type:

Length/size:

Power supply of the transmitter:

Type:

Car battery

nominal voltage:

12.0 V

lowest voltage:

9.0 V

highest voltage:

15.0 V**Power supply of the receiver:**

Type:

Car battery

nominal voltage:

12.0 V**Ancillary equipment:**

Description:

Type:

Serial-no.:

Description: _____

Type: _____

Serial-no.: _____

Description: _____

Type: _____

Serial-no.: _____

Extreme temperature range in which the approval test should be performed:

- ☒ Category I: General (-20°C to +55°C) ☐ Category II: Portable (-10°C to +55°C)
☐ Category III: Equipment for normal indoor use (0°C to +55°C)

Connectable cables:

Name of the cable	Digital	Length/m	shielded
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no

O If applicable, if necessary complete overleaf**Page B2**

Type designation: VENUS			
Name and type designation of individual units comprising the radio equipment: 5WK4 830 (control unit), 5WK4 832 (Door antenna, driver side, front door) 5WK4 833 (Door antenna, front passenger), 5WK4 834 (Door antenna, driver side, back door) 5WK4 835 (Door antenna, passenger side, back side), 5WK4 836 (Bumper antenna)			
Type of equipment:			
☐ Radiotelephone equipment	☐ Remote-control equipment	☐ Radiomaritime equipment	☐ LPD
☐ One-way radiotelephone equipment	☒ Inductive loop system	☐ Inland waterways equipment	☐ RLAN
☐ Personal paging system	☐ Radio-relay system	☐ Radionavigation equipm.	☐
☐ Satellite earth station	☐ CB radiotelephone equipment	☐ Antenna	☐
☐ Data transmission equipment	☐ Movement detector	☐ Aeronautical equipment	☐
Technical characteristics:			
	Transmitter-receiver	Transmitter	Receiver
Frequency range	124.906 kHz $\pm$ 30 Hz		
Maximum no. of channels	1		
Channel spacing	--		
Class of emission (type of modulation)	K1D		
Maximum RF output power			
Maximum effective radiated power (ERP)	30 dBuA/m at 10 m		
Output power variable	no		
Channel switching frequency range	--		
Method of frequency generation	☐ Synthesizer ☒ Crystal ☐ Other		
Frequency generation TX			
Frequency generation RX			
IF	1st IF	2nd IF	3rd IF
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	☐ Duplex mode ☐ Semi-duplex mode ☒ Simplex mode		
Power source	☐ Mains ☒ Vehicle-regulated ☐ Integral		
Antenna socket	☐ BNC ☐ TNC ☐ N ☐ M ☐ UHF ☐ Adapter ☒ None ☐		
Type approval specifications: FCC part 15.209 RSS 210			

Declarations:

- x We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

Regensburg ,date 26.3.99
place of issue

SIEMENS Aktiengesellschaft
Bereich Automobiltechnik
Postfach 10 00 55
93009 Regensburg

Seal and signature of applicant

FCC ID: KR5VENUS

Appendix C

MEASUREMENT PROTOCOL FOR FCC, VCCI
AND AUSTELGENERAL INFORMATIONTest Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the CISPR 22 Limits.

Measurement Error

The test system for conducted emissions is defined as the LISN, tuned receive and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the tuned receiver and the coaxial cable. These test systems have an expected error of ± 3 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the EMI receiver (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factor are stored. This result then has the FCC limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Appendix B. The amplifier gain is automatically accounted for by using an analyzer offset.

Example:

Frequency (MHz)	Level (dB μ V)	+ Factor (dB)	= Final (dB μ V/m)	Limit - (dB μ V/m)	FCC B Final (dB μ V/m)	= Delta FCC B (dB)
37.19	10.2	+ 12.0	= 22.2	39.5	- 22.2	= 17.3

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasipeak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasipeak and average detection and recorded on the data sheets.

Radiated Emissions

Intentional radiated emissions from the EUT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EUT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated 360 degrees to locate the maximum of the emissions.

Unintentional radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasipeak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and average detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.