SENTON

■ EMV-Prüfzentrum ■ EMI/EMC-Testcenter ■

Straubing, October 16, 2000

T E S T - R E P O R T

No. 50118-00241-2

for

WIMAN II

FHSS RF Modem

Applicant:	Airdata WIMAN Systems Inc.
Purpose of testing:	To show compliance with FCC Code of Federal Regulations, Part 15 Subpart C, Section §15.247

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):	WIMAN II
Serial number(s):	0001
Type of equipment:	FHSS RF Modem
Parts/accessories:	
FCC-ID:	NB9-WIMAN II
Applicant: (full address)	Airdata WIMAN Systems Inc. 2180 Immokalee Road, Suite 201 Naples, FL 34110
Contract identification:	---
Contact person:	Mr. Andreas Brauer
Manufacturer:	Airdata WIMAN Systems Inc.
Receipt of EUT:	April 26, 2000
Date of test:	May 2000
Note:	---
Responsible for testing:	Johann Roidt
Responsible for test report:	Johann Roidt

2. Identification of Test Laboratory

Test Laboratory: (full address):	Senton GmbH EMI/EMC Test Center Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany	
Contact person:	Mr. Johann Roidt	
Communication:	Telephone Fax eMail:	(+49) 0 94 21 / 55 22-0 (+49) 0 94 21 / 55 22-99 Office@senton.de
FCC file number:	31040/SIT 1300F2	
Industry Canada file number:	IC 3050	

3. Summary of Test Results

The tested sample complies with the requirements set forth in the

Code of Regulations Part 15 Subpart C, Section §15.247 (intentional radiators) of the Federal Communication Commission (FCC).

Johann Roidt
Technical Manager

4. Operation Mode of EUT

The EUT features an onboard diagnostic software which allows access to either transmit or receive mode, individual RF channels and hopping or static mode. This software is accessible via RS 232 interface and a standard terminal program.

All tests were performed on the lowest, middle and highest RF channel while in transmit mode and on middle channel while in receive mode.

5. Configuration of EUT and Peripheral Devices

Configuration of cables of EUT

Every signal port of the EUT was loaded with a shielded cable. The EUT received power from an external AC adapter

Configuration of peripheral devices connected to EUT

A Notebook PC with Windows HyperTerminal loaded was used as RS 232 terminal.

6. Measuring Methods

6.1. Conducted RF Measurements at RF Output of EUT

All measurements were performed according to and with the test instruments settings of FCC Public Notice DA 00-705.

Test equipment used (see equipment list for details):
02, 18, 57, 67, 68

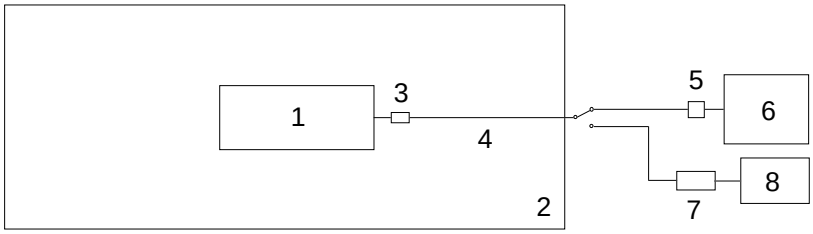


Figure 0: Measurement setup for testing on antenna connector

1 Transmitter (EUT)
2 Wooden table
3 DC-block
4 Test cable
5 Attenuator
6 Spectrum analyzer
7 Power sensor
8 Power meter

6.2. Conducted Power Line Emission 0.45 MHz - 30 MHz (§15.207)

Conducted emissions were measured in the frequency range 0.45 MHz to 30 MHz. The bandwidth of the EMI-Receiver was set to 9 kHz and the detector-function was set to CISPR quasi-peak.
The test setup was made in accordance with ANSI C63.4-1992.
Measurements were performed on phase and neutral lines of the power-cords of the tested system. Preliminary scans were taken with the detector-function of the EMI-receiver set to peak to determine the conducted EMI-profile of the EUT. At the final test the cables and equipment were placed and moved within the range of positions likely to find their maximum emissions.
See figure 1 for the measurement setup.

Test equipment used (see equipment list for details):
04, 22, 23, 60, 63

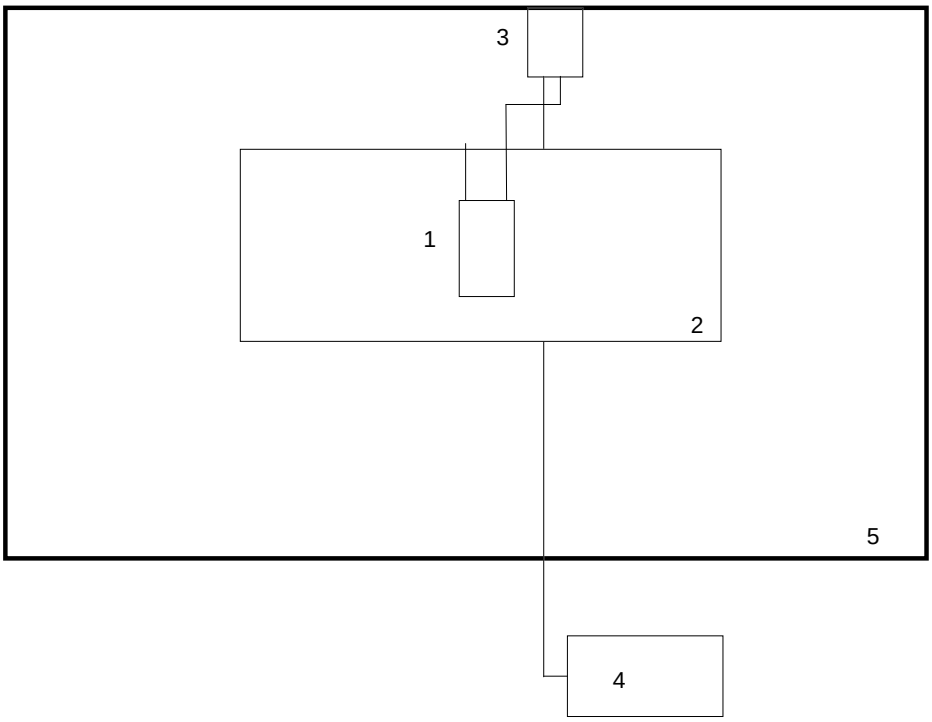


Figure 1: Measurement setup for conducted emission test

1 Computer (EUT)
2 RF-modem
3 Keyboard
4 Mouse
5 Monitor
6 FireWire Hard Drives
7 Printer
8 Microphone
9 Headphone
10 Headphone
11 Headphone
12 Telephone line
13 Wooden table
14 LISN for EUT
15 LISN for monitor
16 LISN for printer
17 Test receiver
18 Shielded room

6.3. Radiated Emission 30 MHz - 1 GHz (§15.209, §15.247.c, §15.205.a,b)

Radiated emissions were measured over the frequency range from 30 MHz to 1 GHz. The bandwidth of the EMI-receiver was set to 120 kHz and the detector-function was set to CISPR quasi-peak.
The test setup was made in accordance with ANSI C63.4-1992. Measurements were made in both the horizontal and vertical planes of polarization. Preliminary scans were taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak. All tests were performed at a test-distance of 3 meters. For final testing an open-area test-site was used. During the tests the EUT was rotated all around and the receiving-antenna was raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment were 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, 06, 12, 38, 39, 40, 41, 58, 61, 64, 66

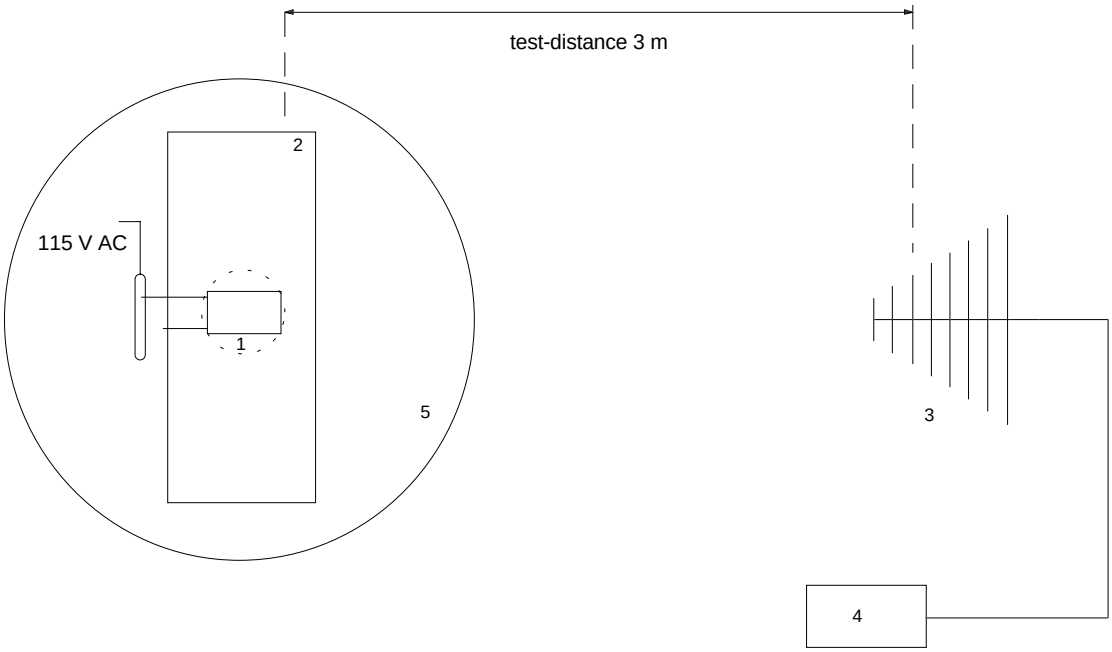


Figure 2: Measurement setup for radiated emission test below 1 GHz

1 Computer (EUT)
2 RF-modem
3 Keyboard
4 Mouse
5 Monitor
6 FireWire Hard Drives
7 Printer
8 Microphone
9 Headphone
10 Headphone
11 Headphone
12 Telephone line
13 Wooden table
14 Measurement antenna
15 Test receiver
16 Turn table

6.4. Radiated Emission 1 GHz - 25 GHz (§15.209, §15.247.c, §15.205.a,b)

Radiated emissions were measured in the frequency range 1 GHz to 25 GHz in transmit mode and 1 GHz to 12.5 GHz in receive mode. The resolution bandwidth of the spectrum analyzer was set to 1 MHz. Scans for the whole frequency range were taken with video bandwidth set to 1 MHz to check out the highest peak levels. In case of less margin to average limit additional prescans were made with video bandwidth reduced from 1 MHz to 100 kHz, 30 kHz or 10 kHz. Final measurements were performed at the critical frequencies with video bandwidth of the spectrum analyzer set to 100 Hz (average mode). EUT was rotated all around and receiving antenna was raised and lowered to find the maximum levels of emission. Cables and equipment were placed and moved within the range of position likely to find their maximum emissions.
All tests were performed in a semi-anechoic chamber with a test-distance of 3 meters (except for the frequency range 18 GHz - 25 GHz where test distance was reduced to 0.5 meter).
To avoid overload in transmit mode no preamplifier was used between 1 GHz and 3.95 GHz. Above 3.95 GHz tests were performed with appropriate preamplifiers (attenuation of operating frequency by horn antenna is sufficient to avoid overload of preamplifier).
For receive mode appropriate preamplifiers were used for the whole frequency range.
To eliminate variations in amplification of the preamplifiers a signal generator was used for substitution (however, during testing a correction according to the minimum amplification was added).

Substitution was performed in the following steps:

- antenna cable was disconnected from receiving antenna and connected to signal generator output
- level of signal generator was increased until the reading value of the analyzer was the same as caused by EUT
- level of signal generator was noted
- final value was calculated by converting the signal generator level to dBµV/m and adding the antenna correction factor.

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details):
02, 13, 14, 16, ,42, 43, 44, 45, 46, 47, 48, 49, 57, 64

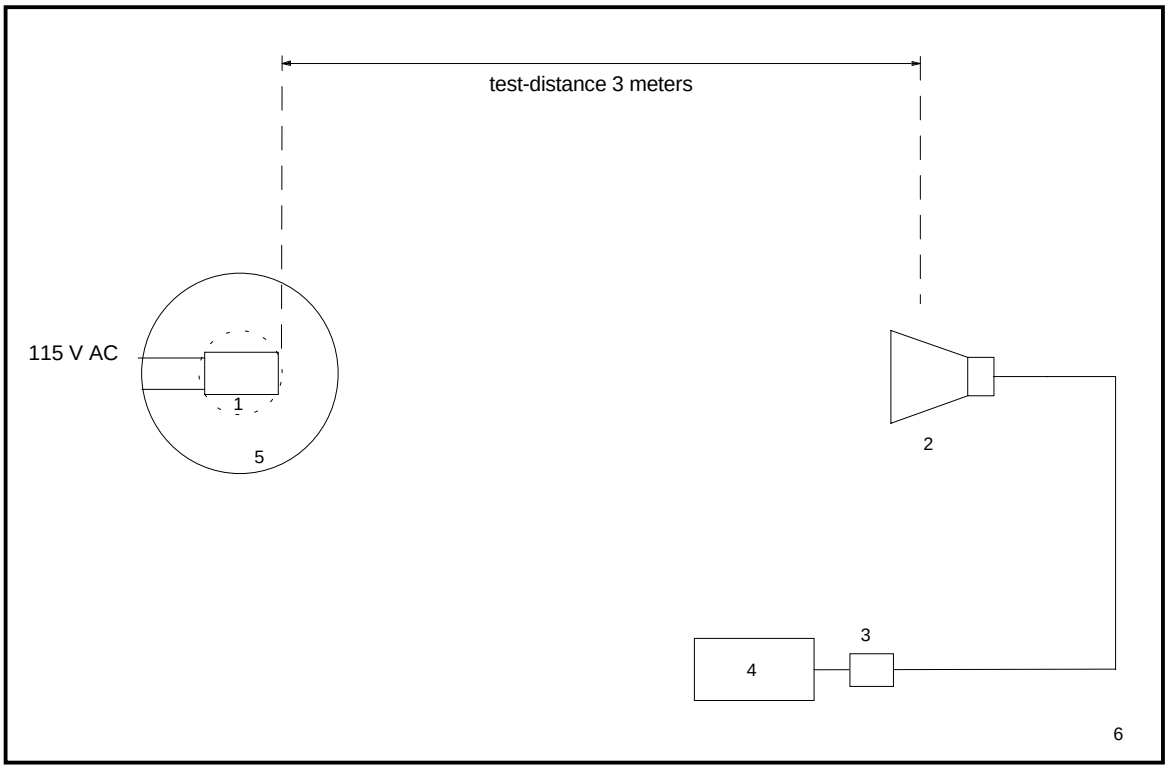


Figure 3: Measurement setup for radiated emission test above 1 GHz

1 Computer (EUT)
2 RF-modem
3 Keyboard
4 Mouse
5 Measurement antenna
6 Preamplifier (if applicable)
7 Spectrum analyzer
8 Signal generator
9 Turn table
10 Semi-anechoic room

7. Measuring Methods

7.1. 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

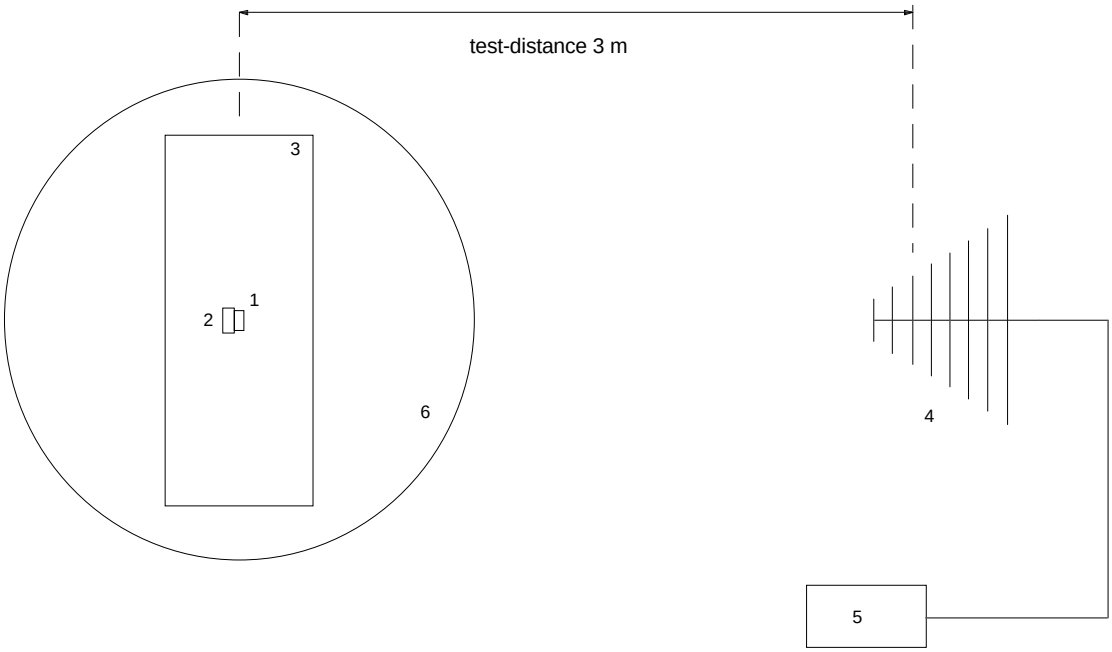


Figure 2: Measurement setup for radiated emission test below 1 GHz

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

7.2. Radiated Emission 1 GHz - 10 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 10 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

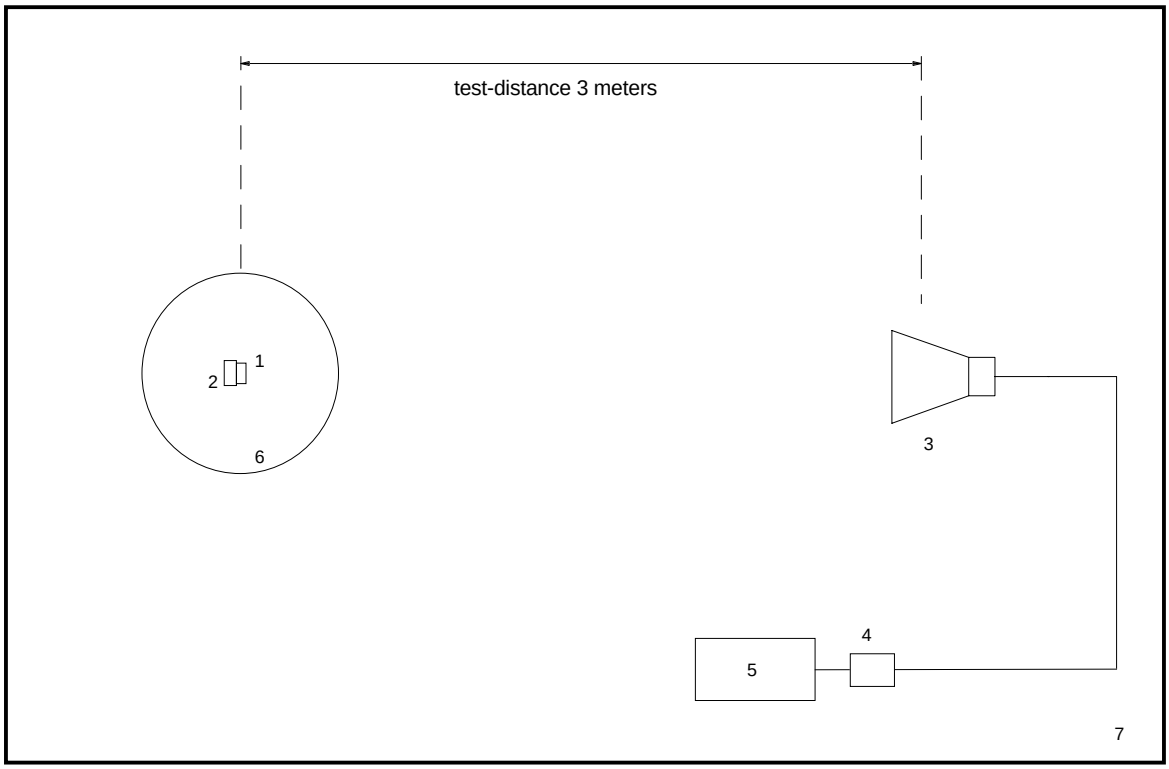


Figure 3: Measurement setup for radiated emission test above 1 GHz

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

8. 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.

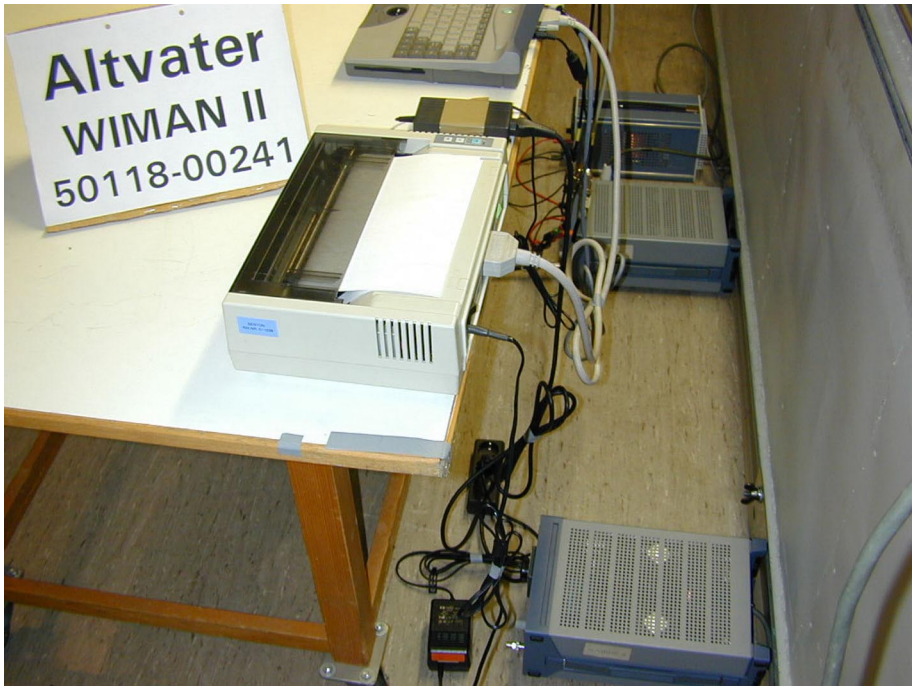
No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	R 3271	05050023	Advantest
02	EMI Test Receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
03	Test Receiver	ESH 3	880112/032	Rohde & Schwarz
04	Test Receiver	ESHS 10	860043/016	Rohde & Schwarz
05	Test Receiver	ESV	881414/009	Rohde & Schwarz
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

9. Photographs Taken During Testing

Photo No. 9.1 - 9.2

Test setup for conducted emission test 450 kHz - 30 MHz

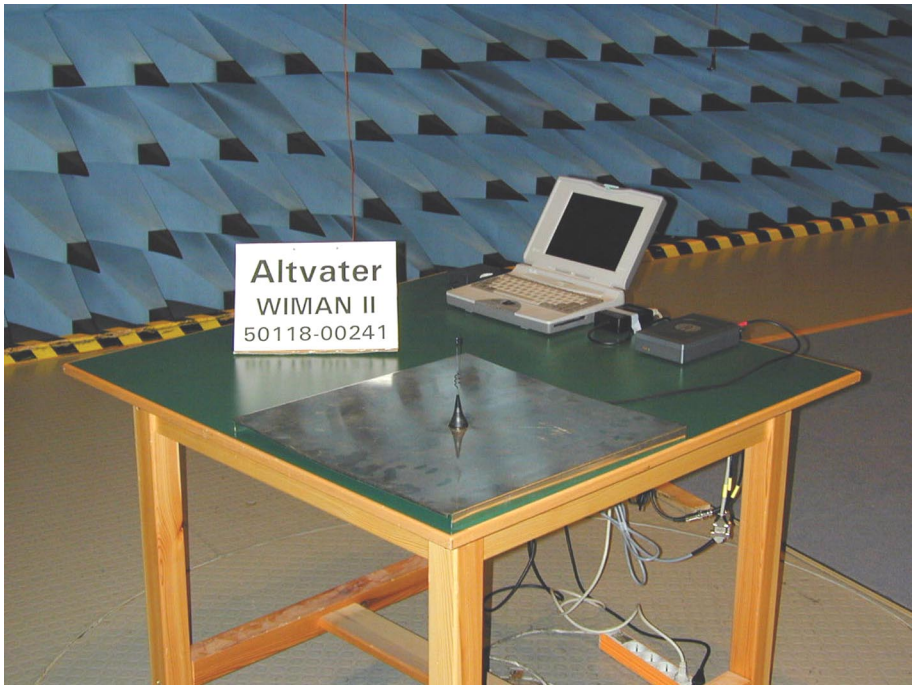


Photos No. 9.3

Test setup for conducted emission test 450 kHz - 30 MHz (continued)

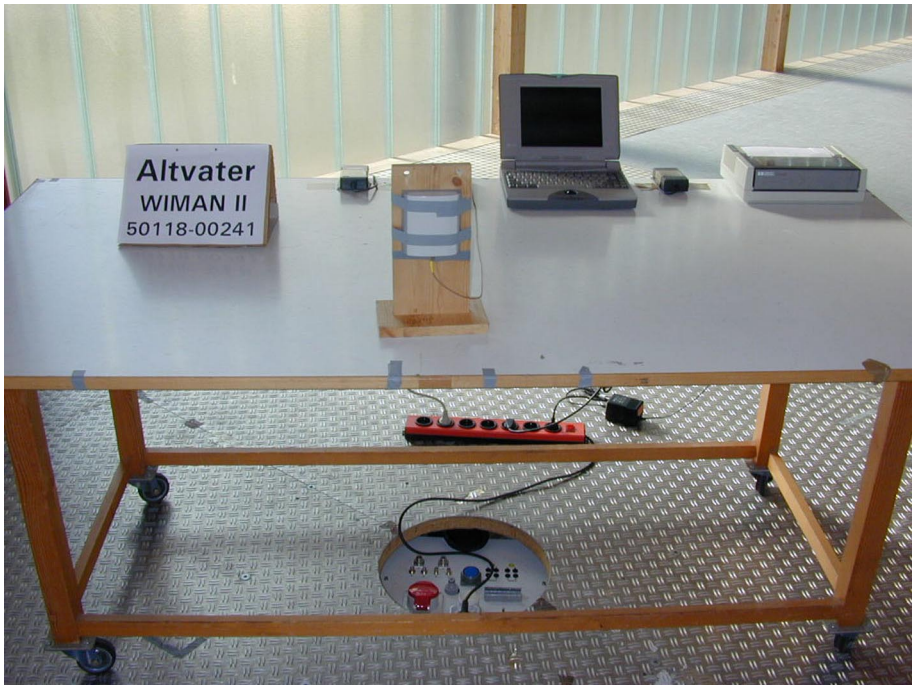
Photos No. 9.4 - 9.5

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



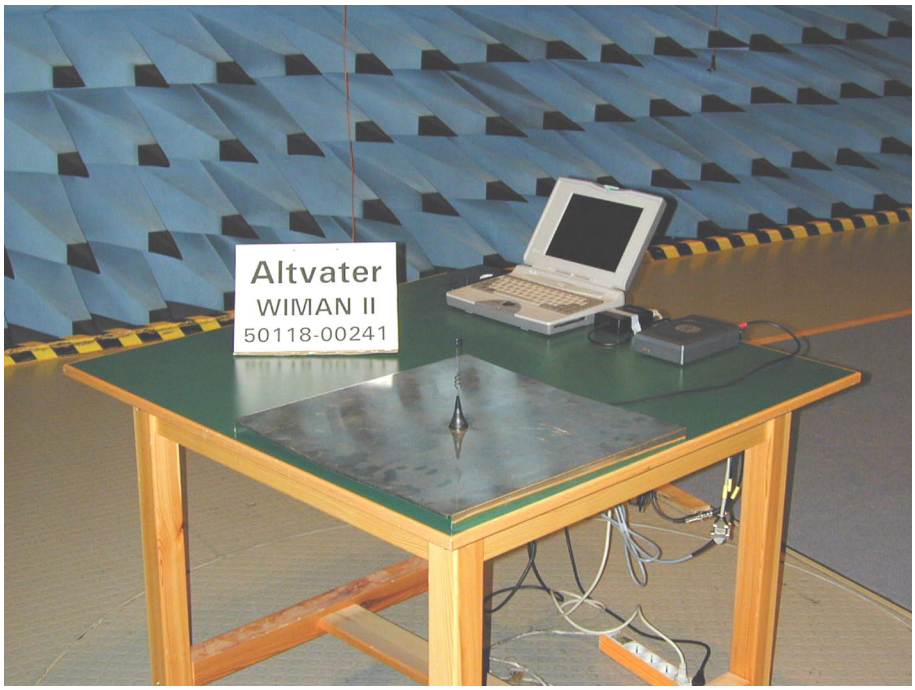
Photos No. 9.6

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



Photos No. 9.7

Test setup for radiated emission test above 1 GHz



10. List of Measurements

FCC Part 15 Subpart C			
Section(s):	**Test**	**Page(s)**	**Result**
15.31 (m)	Number of operating frequencies to be examined		Passed
15.203	Requirement that antenna is permanently attached or unique antenna connector		Passed
15.204	Information on antennae proposed for use with the EUT		Passed
15.207	Conducted emission test 450 kHz - 30 MHz		Passed
15.247 (a)	Description how the EUT meets the definition of a frequency hopping spread spectrum system		Passed
	Carrier Frequency separation		Passed
	Number of Hopping Frequencies		Passed
	Time of Occupancy		Passed
	20 dB Bandwidth		Passed
	Pseudorandom Frequency Hopping Sequence		See Supplement F
	Equal Hopping Frequency Use		See Supplement F
	System Receiver Input Bandwidth		See Supplement F
	System Receiver Hopping Capability		See Supplement F
15.247 (b)	Maximum peak output power		Passed
	De Facto EIRP Limit		Passed
	Point-to-Point Operation		See Supplement F
	RF Exposure Compliance Statement		See Supplement F
	Installation/Operation Manual Requirements		See Supplement F

§15.247 (c)	Band-edge Compliance of Conducted Emissions		Passed
	Spurios RF Conducted Emissions		Passed
15.247 (g)	Description how the EUT complies with the requirement of this section	---	Test performed by applicant
15.247 (h)	Requirement to avoid frequency coordination of multiple FHSS systems		Passed

	Receive mode (RX):		
§15.207	Conducted emission test 450 kHz - 30 MHz		Passed
§15.209	Radiated emission test	-	Passed

11. List of Measurements

Section(s):	Test	Page(s)	Result

Section 15.31 (m)	**Number of operating frequencies to be examined**	N/A	Passed

All transmitter related test were performed at the lowest, middle and highest RF channel of the device under test.

Receiver related tests were performed at the center frequency of the device under test.

Section 15.203	**Requirement that antenna is permanently attached or unique antenna connector**	N/A	Passed

A reverse SMA connector was used to meet the requirement for an uniqie antenna connector according to section 15.203 of the rules

Section 15.204	**Information on antennae proposed for use with the EUT**	N/A	N/A

The following antennas are proposed for use with the EUT and are covered by this report:

Model Name	Matchcode	Description
Colinear Mobile Whip Antenna	AN-24-2MN360-FMEM	Omni-Antenna, 2 dBi
MFB Omni-Directional Antenna	AN-24-8MN360-NM3	Omni-antenna, 8 dBi,
SPA 2400/75/9/0/V	AN-24-8PL76-SMAF	Planar Antenna, 8.5 dBi
Microceptor Antenna	AN-24-16PL24-NF	Planar Antenna, 16 dBi
SPA 2400/85/17/0/V	AN-24-16PL85-NF	Planar Antenna, 16.5 dBi, 85 Degree
Conifer 26T-2400F	AN-24-24PF8-NF	Paraflector Antenna, 24 dBi

15.207	Conducted emission test 450 kHz – 30 MHz		Passed

15.247 (a)	**Description how the EUT meets the definition of a frequency hopping spread spectrum system**		Passed

See Annex X for details

	Carrier Frequency separation		Passed

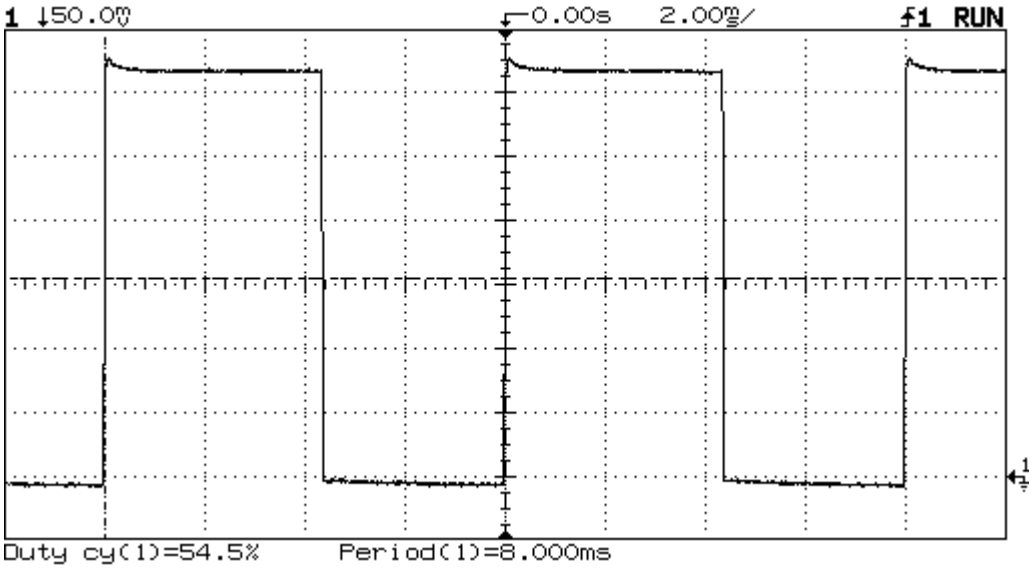
Carrier frequency separation is 1 MHz, see page x of the report for details

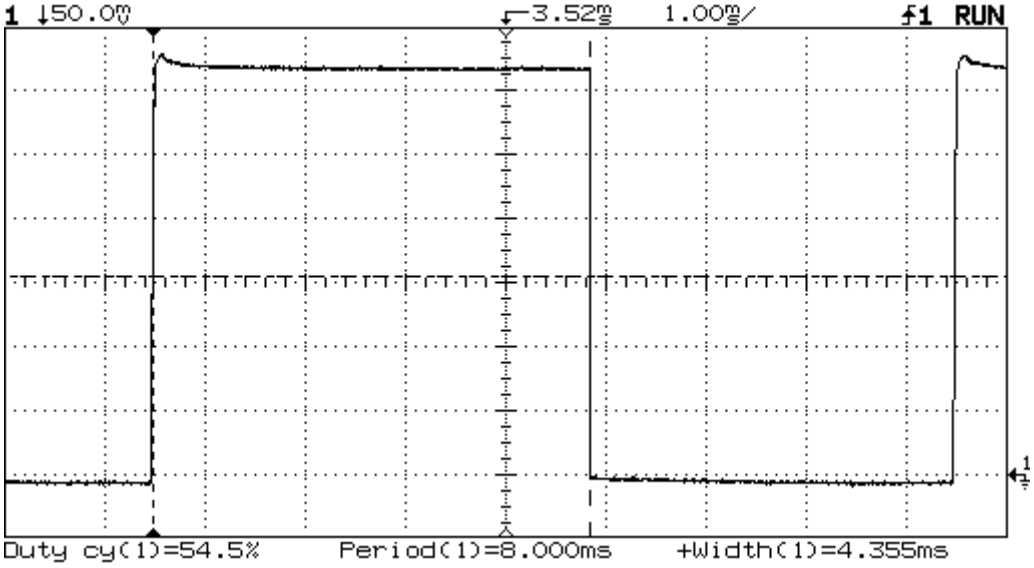
	Number of Hopping Frequencies		Passed

There are 80 hopping frequencies, see page x of the report for details

	Time of Occupancy		Passed

The dwell time per channel is **4.355 milliseconds**, see following test chart for details





	20 dB Bandwidth		Passed

The average 20 dB Bandwidth is 780 kHz, see test charts enclosed.

	Pseudorandom Frequency Hopping Sequence		

	Equal Hopping Frequency Use		

	System Receiver Input Bandwidth		

	System Receiver Hopping Capability		

15.247 (b)	**Maximum peak output power**		Passed

The maximum peak output power is 30 dBm, see test charts enclosed

	De Facto EIRP Limit		Passed

An individual TX power level has been given for every antenna covered by this report. This power level will be selected during installation of the unit.

Model Name	**Matchcode**	**Description**	**TX power setting**
Colinear Mobile Whip Antenna	AN-24-2MN360-FMEM	Omni-Antenna, 2 dBi	**28**
MFB Omni-Directional Antenna	AN-24-8MN360-NM3	Omni-antenna, 8 dBi,	**27**
SPA 2400/75/9/0/V	AN-24-8PL76-SMAF	Planar Antenna, 8.5 dBi	**26**
Microceptor Antenna	AN-24-16PL24-NF	Planar Antenna, 16 dBi	**20**
SPA 2400/85/17/0/V	AN-24-16PL85-NF	Planar Antenna, 16.5 dBi, 85 Degree	**19**
Conifer 26T-2400F	AN-24-24PF8-NF	Paraflector Antenna, 24 dBi	**12**

	Point-to-Point Operation		Not applicable

	RF Exposure Compliance Statement		Passed

	Installation/Operation Manual Requirements		Passed

§15.247 (c)	**Band-edge Compliance of Conducted Emissions**		Passed

See test charts enclosed

	Spurios RF Conducted Emissions		Passed

Spurious RF conducted Emissions according to FCC Rules, Part 15, Subpart C, Section 15.247

Model:	WIMAN II
Type:	FHSS RF Modem
Serial No.:	0001
Applicant:	Airdata WIMAN Systems Inc
Test Site:	Open Field Test Site (< 1GHz) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

Frequency (MHz)	Detector	Analyzer Reading (dBm)	Correction Factor (dB)	Power Level (dBm)
7225.0	Peak	-29.52	N/A	**-29.52**

	Spurios Radiated Emissions		Passed

Field Strength of Emissions according to FCC Rules, Part 15, Subpart C, Section 15.247

Model:	WIMAN II
Type:	FHSS RF Modem
Serial No.:	0001
Applicant:	Airdata WIMAN Systems Inc
Test Site:	Open Field Test Site (< 1GHz) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBµV)	Correction Factor (dB)	Field Strength (dBµV/m)
49.67	Quasi Peak	Horizontal	18.6	15.7	**34.3**
629.0	Quasi Peak	Horizontal	9.9	30.4	**40.3**
2406.6	Peak	Horizontal	15.37	31.0	**46.37**
4809.2	Peak	Vertical	15.02	28.2	**43.22**
7207.7	Peak	Vertical	19.91	31.0	**50.91**
9604.6	Peak	Horizontal	18.01	34.7	**52.8**
14416.0	Peak	Vertical	14.74	37.0	**51.4**

Sample calculation of field strength values:

Field Strength (dBµV/m) = Analyzer Reading (dBµV) + Correction Factor (dB)

Test instruments used: (see equipment list for details)
02, 13, 14, 16, 38, 40 ,42, 57, 64, 67

15.247 (g)	**Description how the EUT complies with the requirement of this section**	---	Test performed by applicant

15.247 (h)	**Requirement to avoid frequency coordination of multiple FHSS systems**		

	Receive mode (RX):		
Section 15.207	Conducted emission test 450 kHz - 30 MHz		Passed

Conducted Power Line Emissions according to FCC Rules, Part 15, Subpart C, Section 15.207 - Receive Mode -

Model:	WIMAN II
Type:	FHSS RF Modem
Serial No.:	0001
Applicant:	Airdata WIMAN Systems Inc.
Test Site:	Shielded Room No. 2
Date of test:	April 2000

Frequency (MHz)	Detector	Analyzer Reading (dBµV)	Limit (dBµV/m)	Margin (dB)
0.202	Quasipeak	43.4	48.0	**4.6**
19.56	Quasipeak	39.7	48.0	**8.3**
27.715	Quasipeak	40.1	48.0	**7.9**
28.041	Quasipeak	40.5	48.0	**7.5**

Test instruments used: (see equipment list for details)
02, 13, 14, 16, 38, 40 ,42, 57, 64, 67

§15.209	Radiated emission test	-	

Field Strength of Emissions according to FCC Rules, Part 15, Subpart C, Section 15.209 - Receive Mode -

Model:	WIMAN II
Type:	FHSS RF Modem
Serial No.:	0001
Applicant:	Airdata WIMAN Inc.
Test Site:	Open Field Test Site (< 1GHz) Semi-anechoic chamber (>1GHz)
Distance:	3 Meter
Date of test:	April 2000

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBµV)	Correction Factor (dB)	Field Strength (dBµV/m)
49.67	Quasi Peak	Horizontal	18.6	15.7	**34.3**
629.0	Quasi Peak	Horizontal	9.9	30.4	**40.3**

Sample calculation of field strength values:

Field Strength (dBµV/m) = Analyzer Reading (dBµV) + Correction Factor (dB)

Test instruments used: (see equipment list for details)
02, 13, 14, 16, 38, 40 ,42, 57, 64, 67

12. Referenced Regulations

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

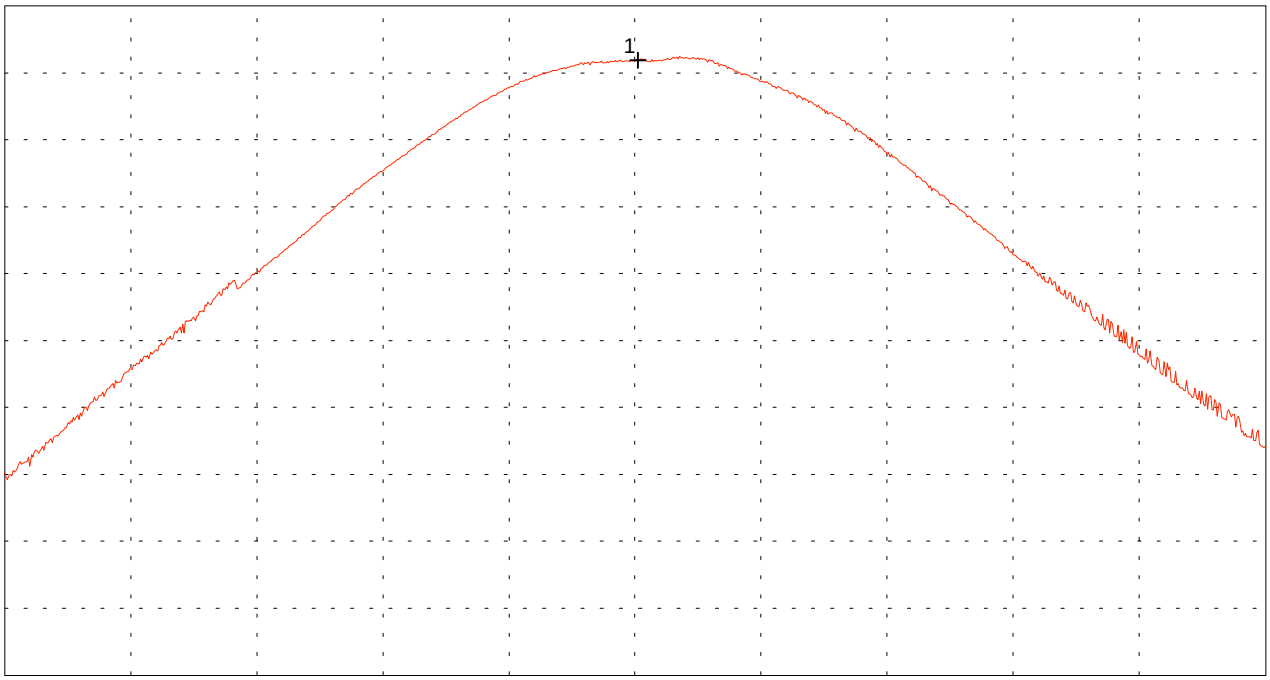
☐	FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	October 20, 1997
☐	FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication 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

13. Test Charts taken during Testing

Peak Output Power acc. to Section 15.247 (b)

Model: WIMAN II	Mode: - Static Mode, Channel 1 (lowest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 31 dBm ATT 40 dB Ref. Offset 21 dB
5 dB/Div.



Start 2.3995 GHz Stop 2.4045 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

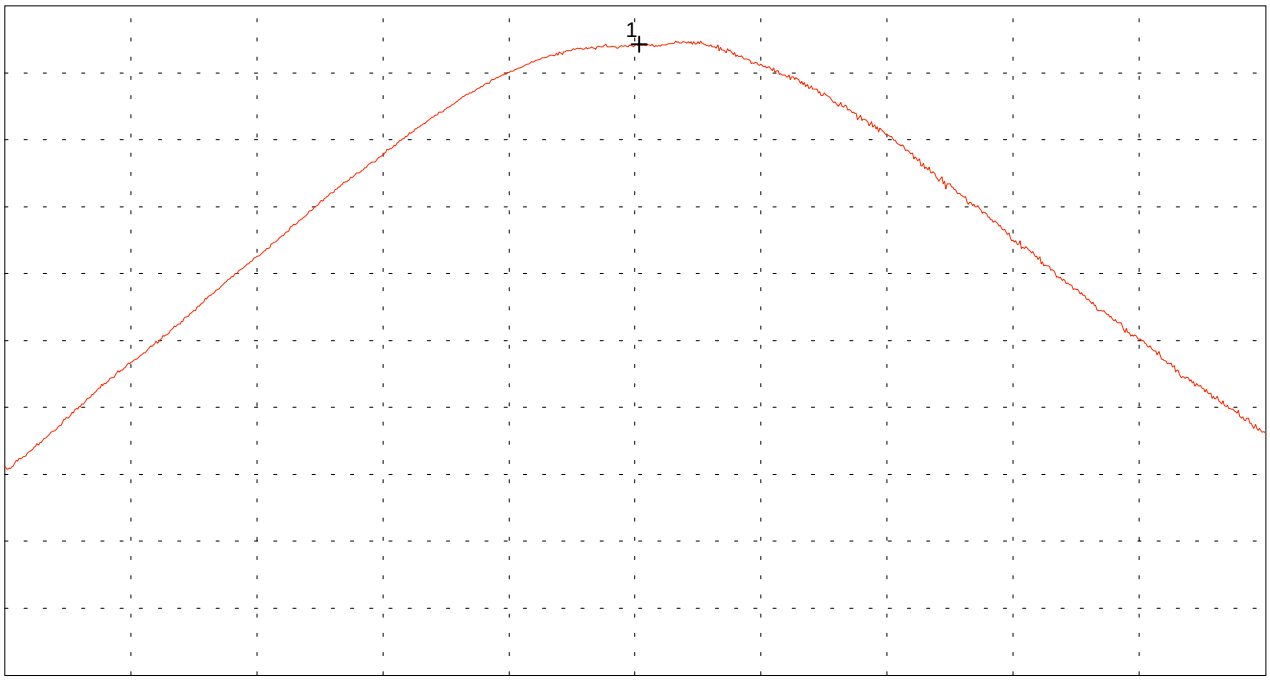
No. 1	2.402011 GHz	26.94 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 42 of 122 Pages

Peak Output Power acc. to Section 15.247 (b)

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 31 dBm ATT 40 dB Ref. Offset 21 dB
5 dB/Div.



Start 2.4385 GHz Stop 2.4435 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

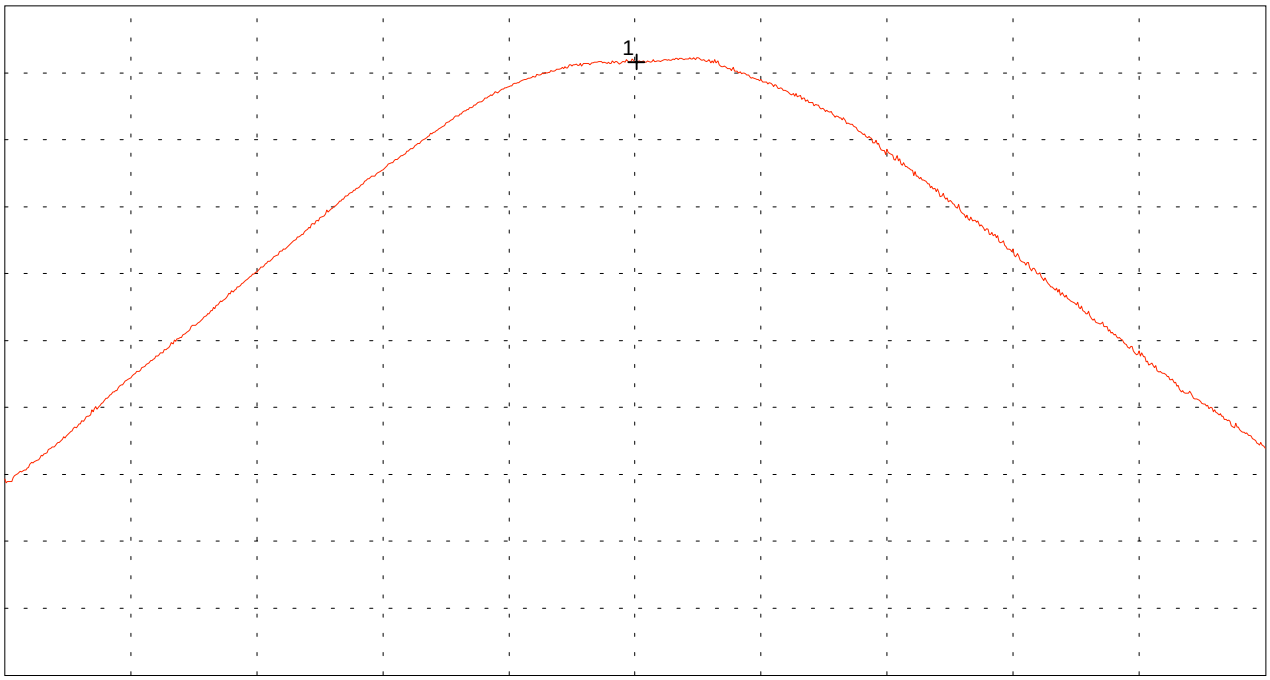
No. 1	2.441017 GHz	28.14 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 43 of 122 Pages

Peak Output Power acc. to Section 15.247 (b)

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 31 dBm ATT 40 dB Ref. Offset 21 dB
5 dB/Div.



Start 2.4785 GHz Stop 2.4835 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

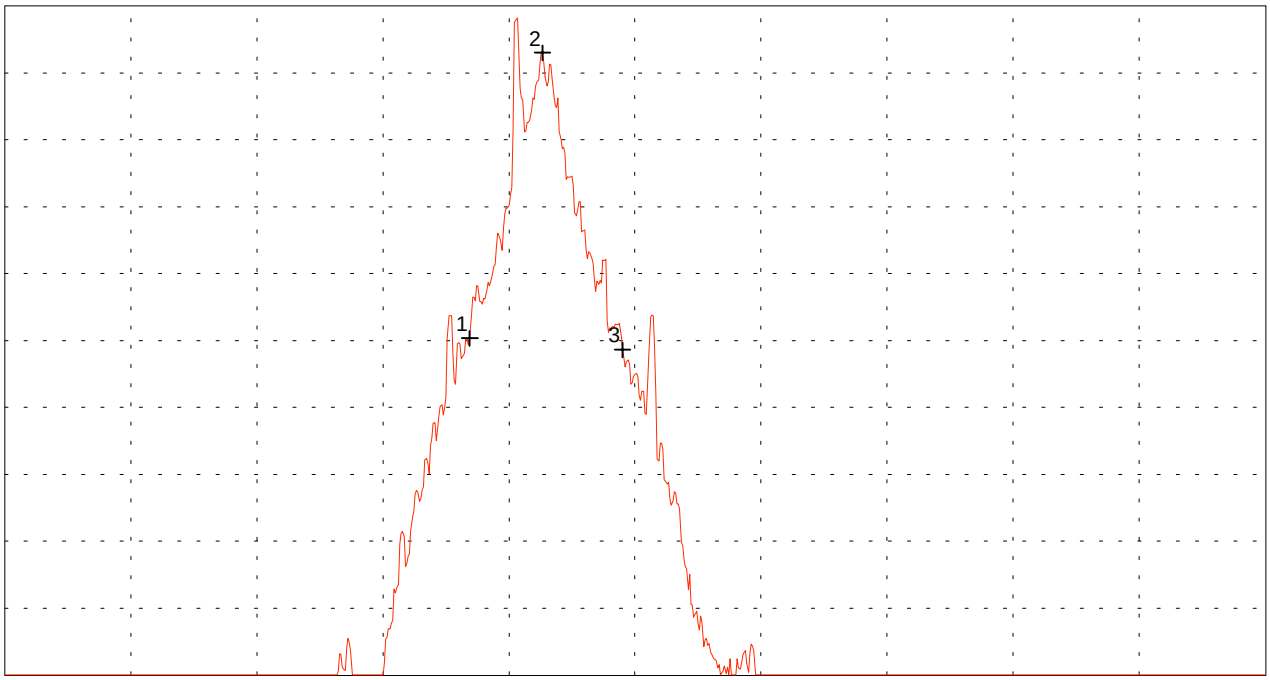
No. 1	2.481006 GHz	26.82 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 44 of 122 Pages

20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement - Lowest channel selected - TX power setting 28 (maximum) - 20 dB Bandwidth = 708.3 kHz
Serial No.: 0001	
Applicant: Altvater Airdata Systems GmbH	

Ref.Level 25 dBm ATT 35 dB Ref. Offset 20 dB
5 dB/Div.



Start 2.399319444 GHz Stop 2.405569444 GHz
RBW 10 kHz VBW 10 kHz SWP 200 ms

Multi Marker List

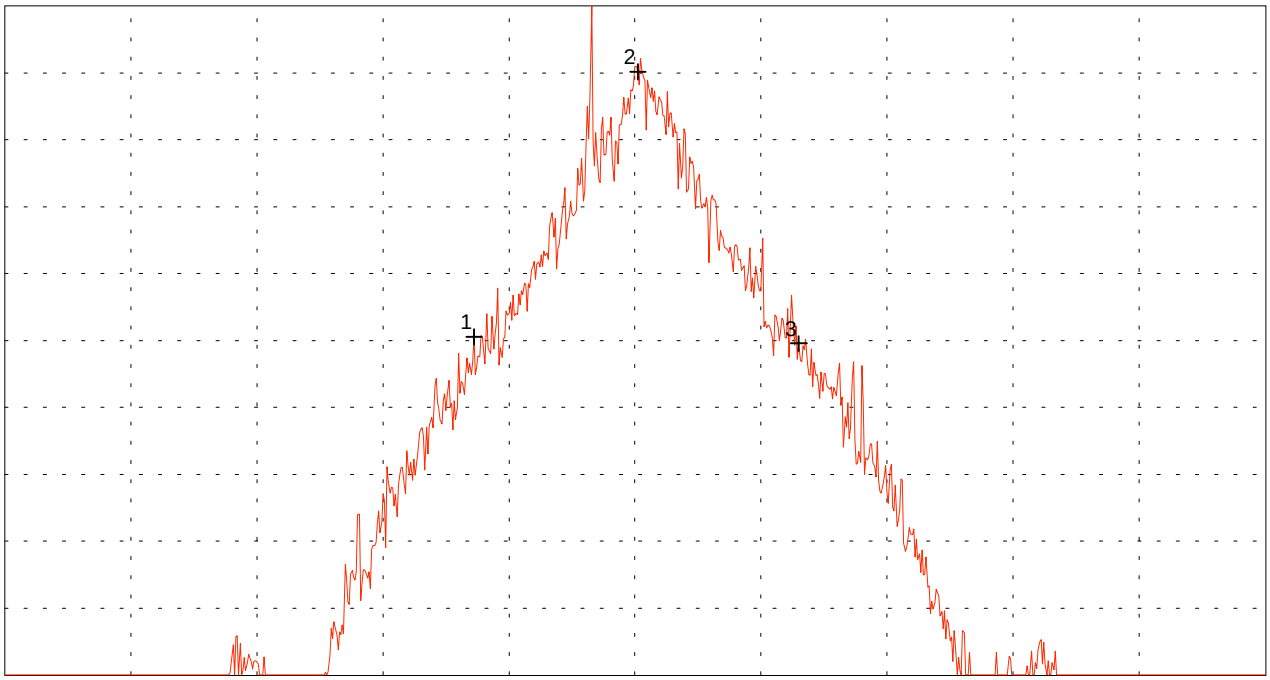
No. 1	2.401625 GHz	0.17 dBm
No. 2	2.401986 GHz	21.50 dBm
No. 3	2.402382 GHz	-0.69 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 22, 2000	Page 45 of 122 Pages

20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement - Middle channel selected - TX power setting 28 (maximum) - 20 dB Bandwidth = 784.7 kHz
Serial No.: 0001	
Applicant: Altvater Airdata Systems GmbH	

Ref.Level 25 dBm ATT 35 dB Ref. Offset 20 dB
5 dB/Div.



Start 2.439409722 GHz Stop 2.442534722 GHz
RBW 10 kHz VBW 10 kHz SWP 100 ms

Multi Marker List

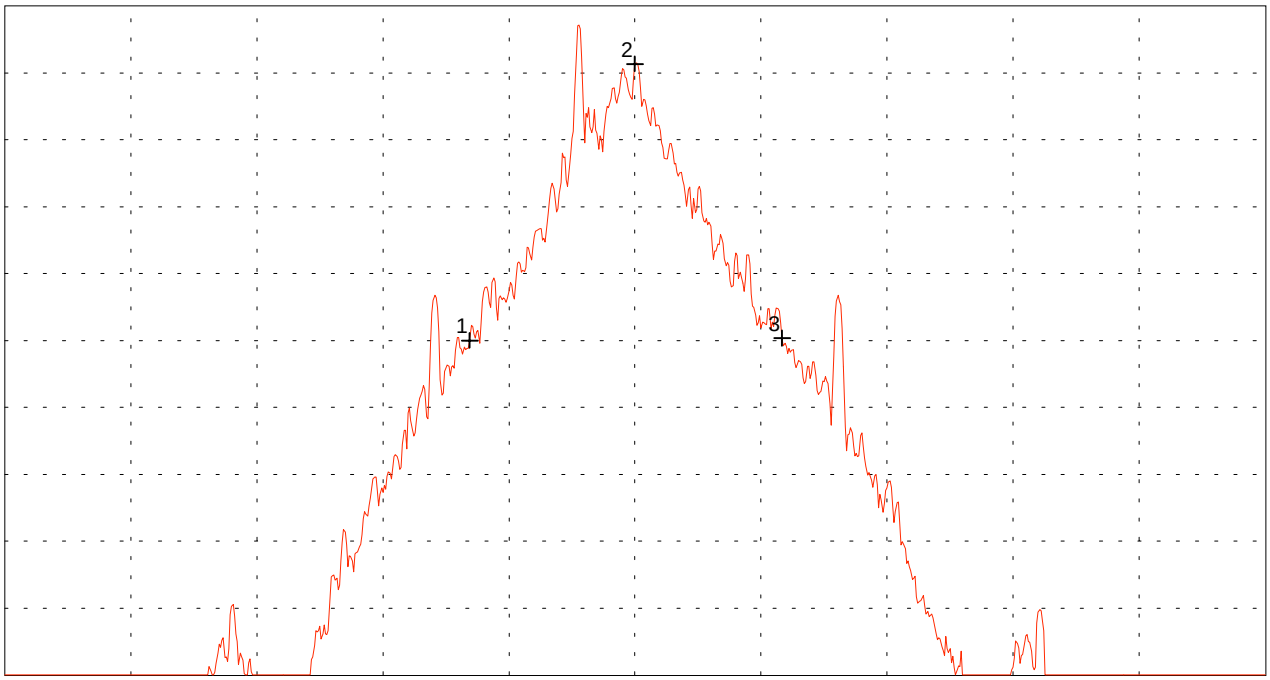
No. 1	2.440573 GHz	0.27 dBm
No. 2	2.440979 GHz	20.08 dBm
No. 3	2.441378 GHz	-0.22 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 22, 2000	Page 46 of 122 Pages

20 dB Bandwidth according to FCC Rules, Section 15.247

Model: WIMAN II	Mode: - Conducted Measurement - Highest channel selected - TX power setting 28 (maximum) - 20 dB Bandwidth = 774.3 kHz
Serial No.: 0001	
Applicant: Altvater Airdata Systems GmbH	

Ref.Level 25 dBm ATT 35 dB Ref. Offset 20 dB
5 dB/Div.



Start 2.479444444 GHz Stop 2.482569444 GHz
RBW 10 kHz VBW 10 kHz SWP 100 ms

Multi Marker List

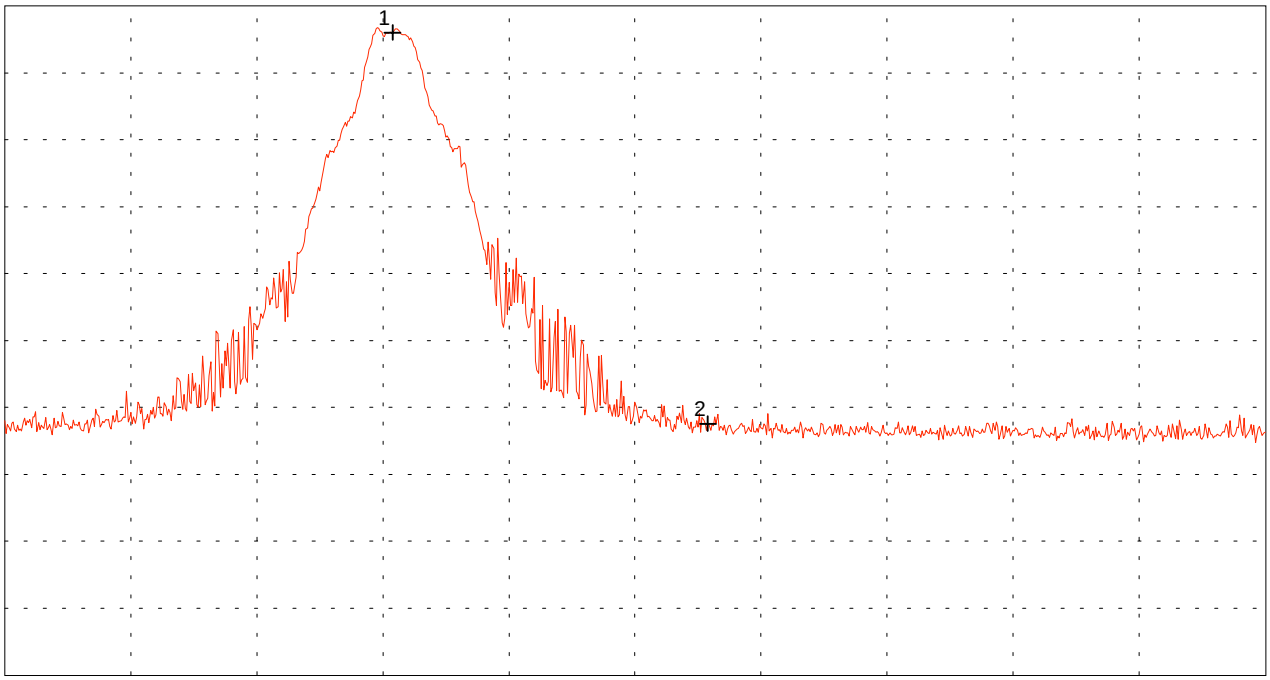
No. 1	2.480597 GHz	-0.01 dBm
No. 2	2.481007 GHz	20.68 dBm
No. 3	2.481372 GHz	0.18 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 22, 2000	Page 47 of 122 Pages

Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 40 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.477922105 GHz Stop 2.487922105 GHz
RBW 100 kHz VBW 100 kHz SWP 20 ms

Multi Marker List

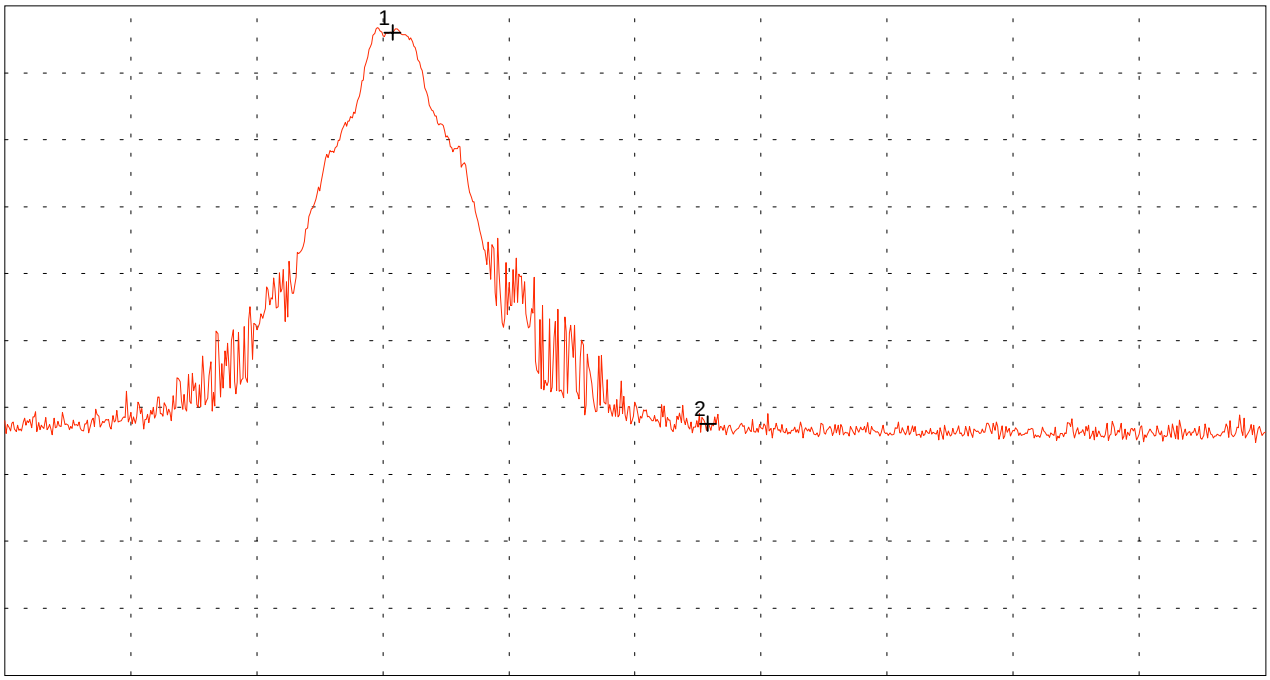
No. 1	2.480998 GHz	26.04 dBm
No. 2	2.483500 GHz	-32.46 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 48 of 122 Pages

Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 40 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.477922105 GHz Stop 2.487922105 GHz
RBW 100 kHz VBW 100 kHz SWP 20 ms

Multi Marker List

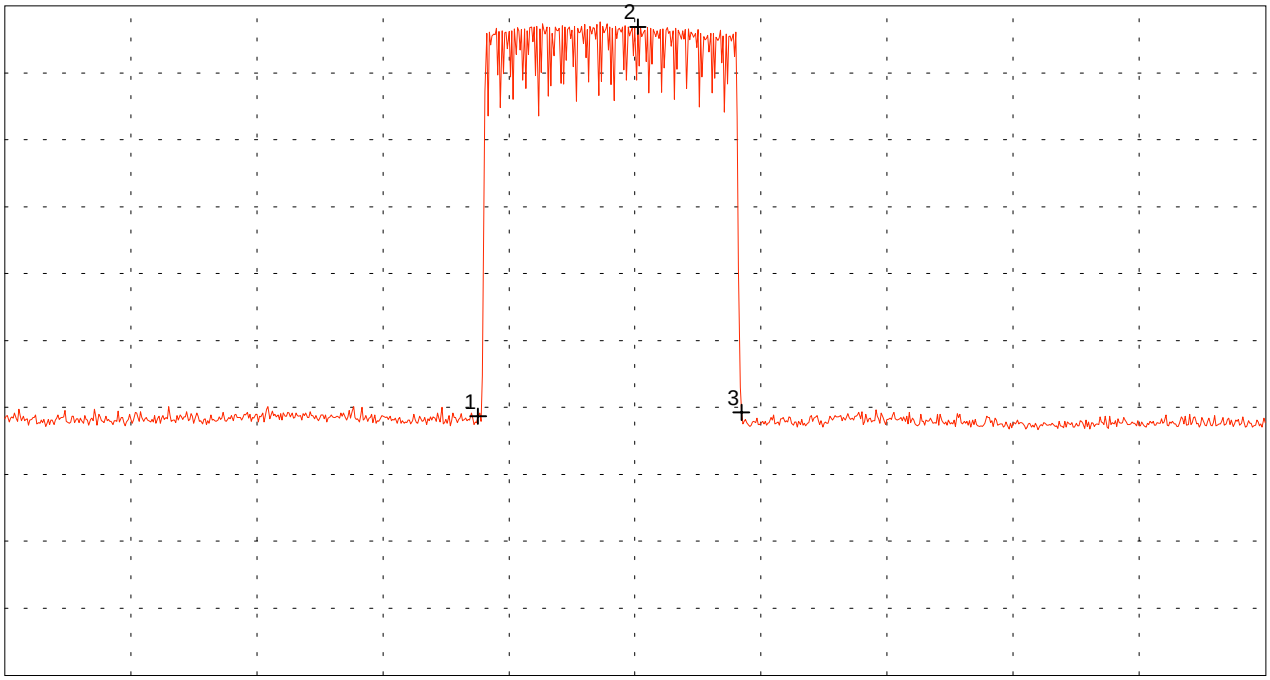
No. 1	2.480998 GHz	26.04 dBm
No. 2	2.483500 GHz	-32.46 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 49 of 122 Pages

Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, Full operating band - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 40 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.250 GHz Stop 2.650 GHz
RBW 100 kHz VBW 100 kHz SWP 120 ms

Multi Marker List

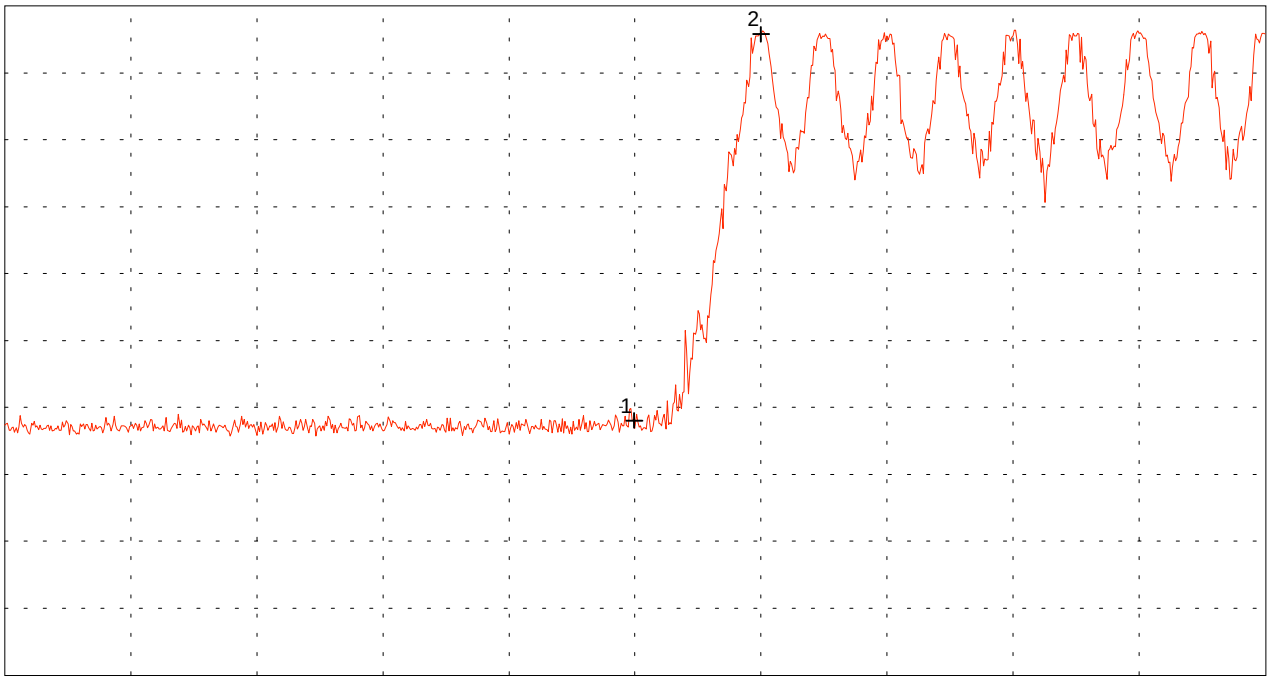
No. 1	2.400222 GHz	-31.32 dBm
No. 2	2.450889 GHz	26.88 dBm
No. 3	2.483778 GHz	-30.74 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 50 of 122 Pages

Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, Low end of operating band - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 40 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.390 GHz Stop 2.410 GHz
RBW 100 kHz VBW 100 kHz SWP 20 ms

Multi Marker List

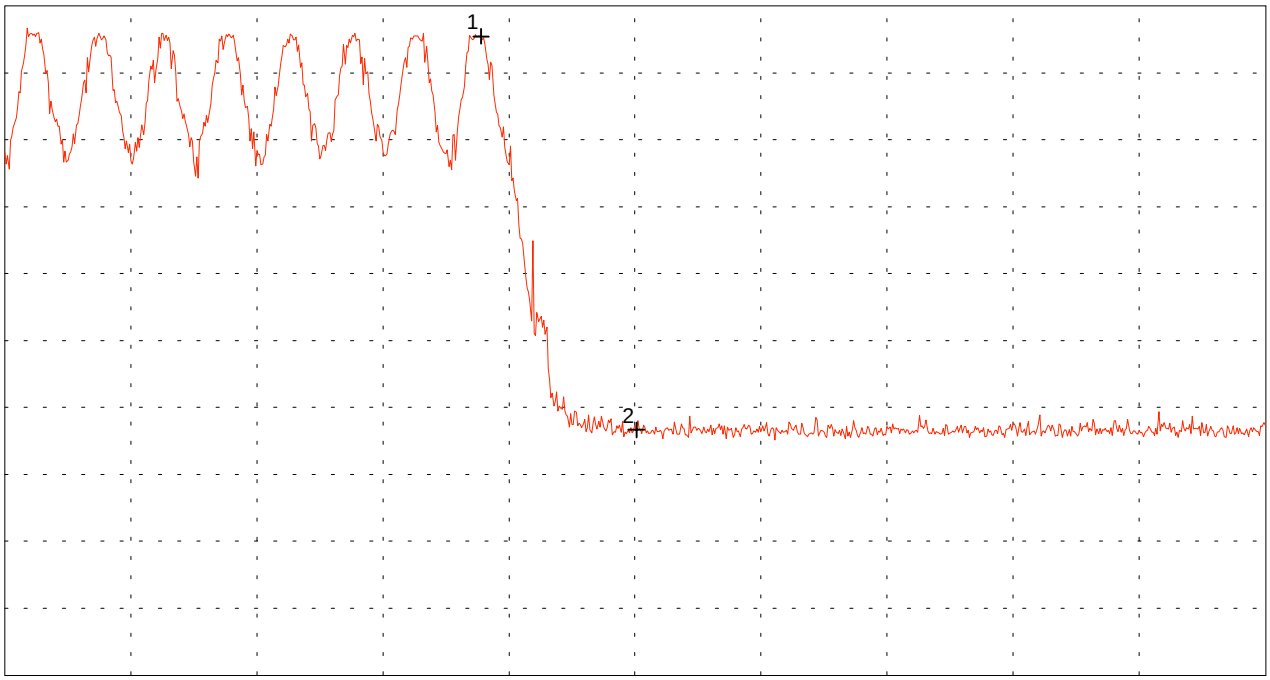
No. 1	2.399989 GHz	-31.96 dBm
No. 2	2.402000 GHz	25.79 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 51 of 122 Pages

Band-edge Compliance of conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Hopping Mode, High end of operating band - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 40 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.4735 GHz Stop 2.4935 GHz
RBW 100 kHz VBW 100 kHz SWP 20 ms

Multi Marker List

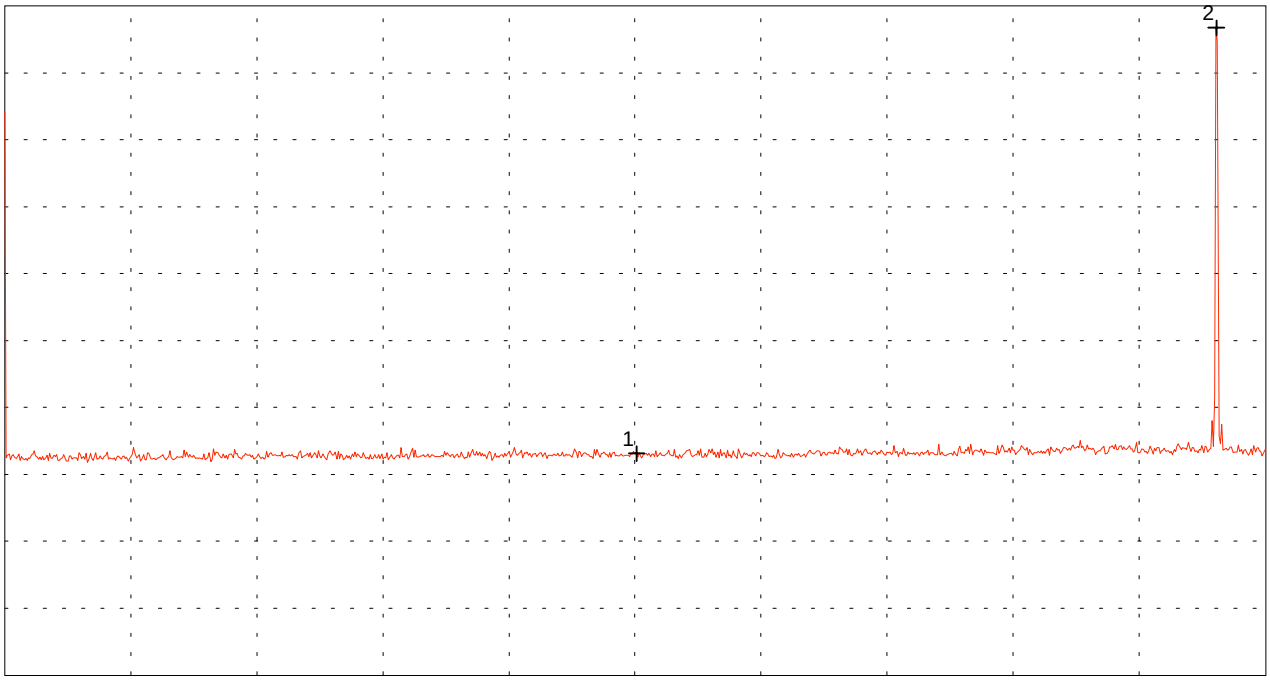
No. 1	2.481056 GHz	25.46 dBm
No. 2	2.483522 GHz	-33.35 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 52 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 100.000 kHz Stop 2.500 GHz
RBW 100 kHz VBW 100 kHz SWP 760 ms

Multi Marker List

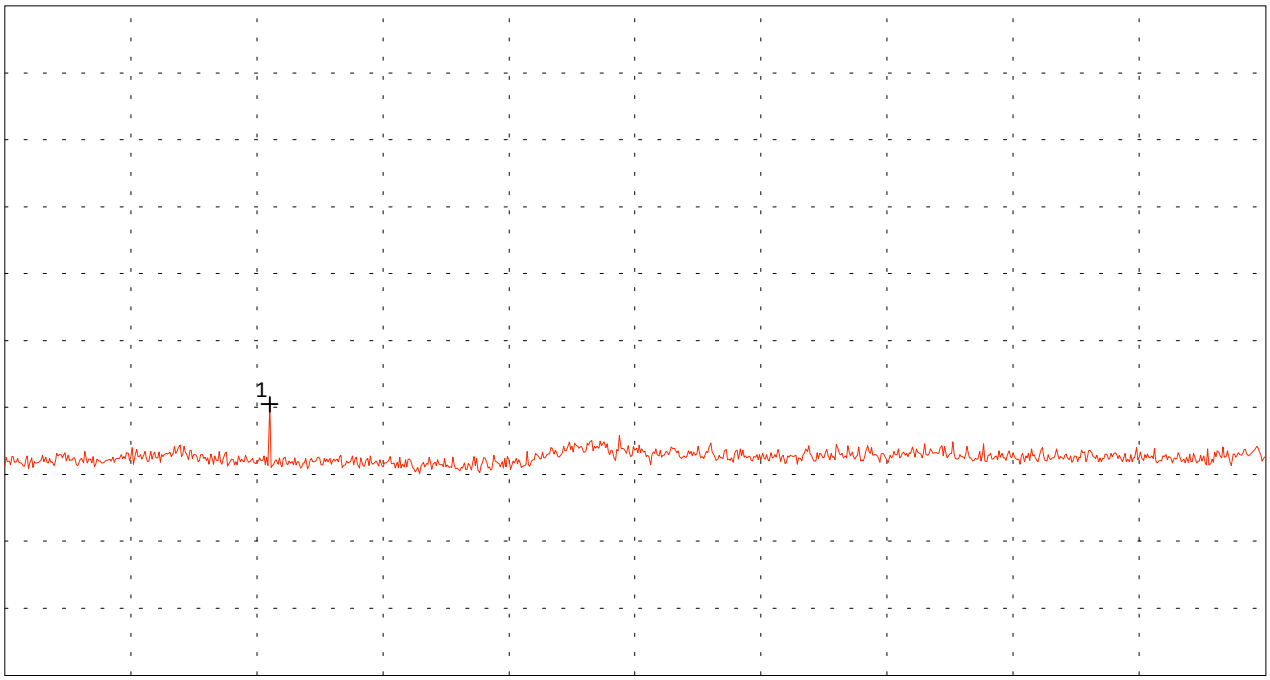
No. 1	1.253271 GHz	-36.93 dBm
No. 2	2.403225 GHz	26.75 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 53 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 01 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.500 GHz Stop 25.000 GHz
RBW 100 kHz VBW 100 kHz SWP 6.80 s

Multi Marker List

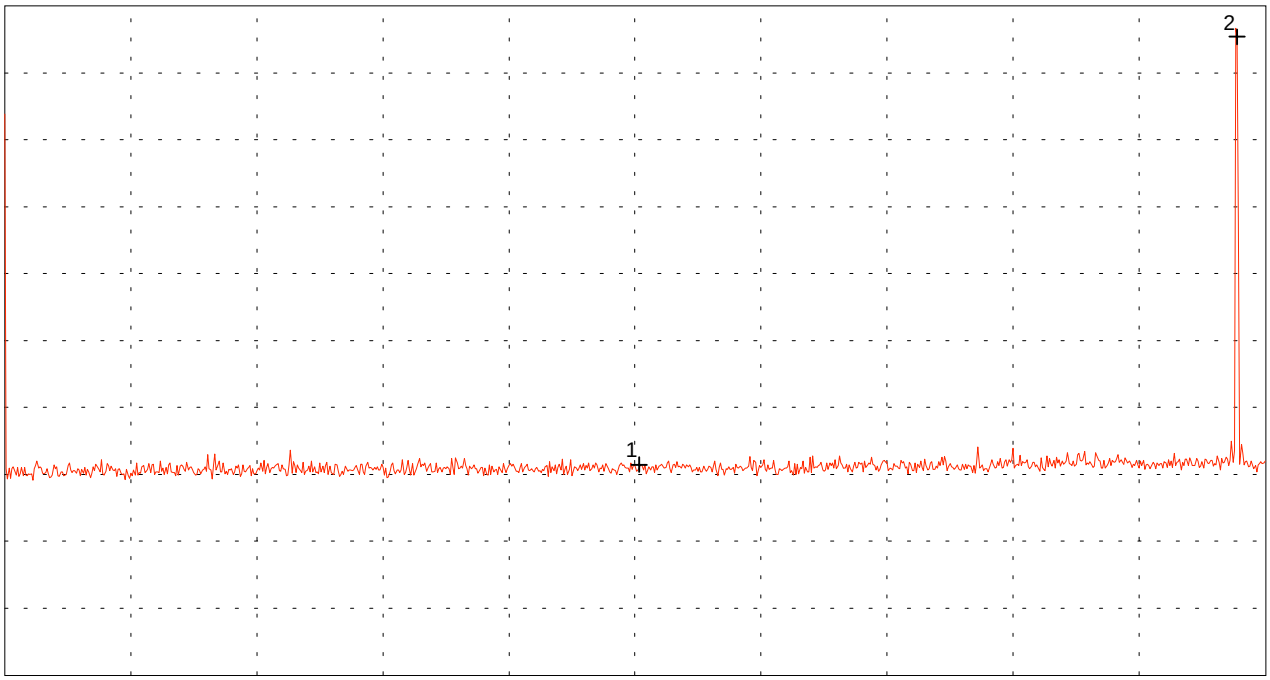
No. 1 7.225000 GHz -29.52 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 54 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 40 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 100.000 kHz Stop 2.500 GHz
RBW 100 kHz VBW 100 kHz SWP 760 ms

Multi Marker List

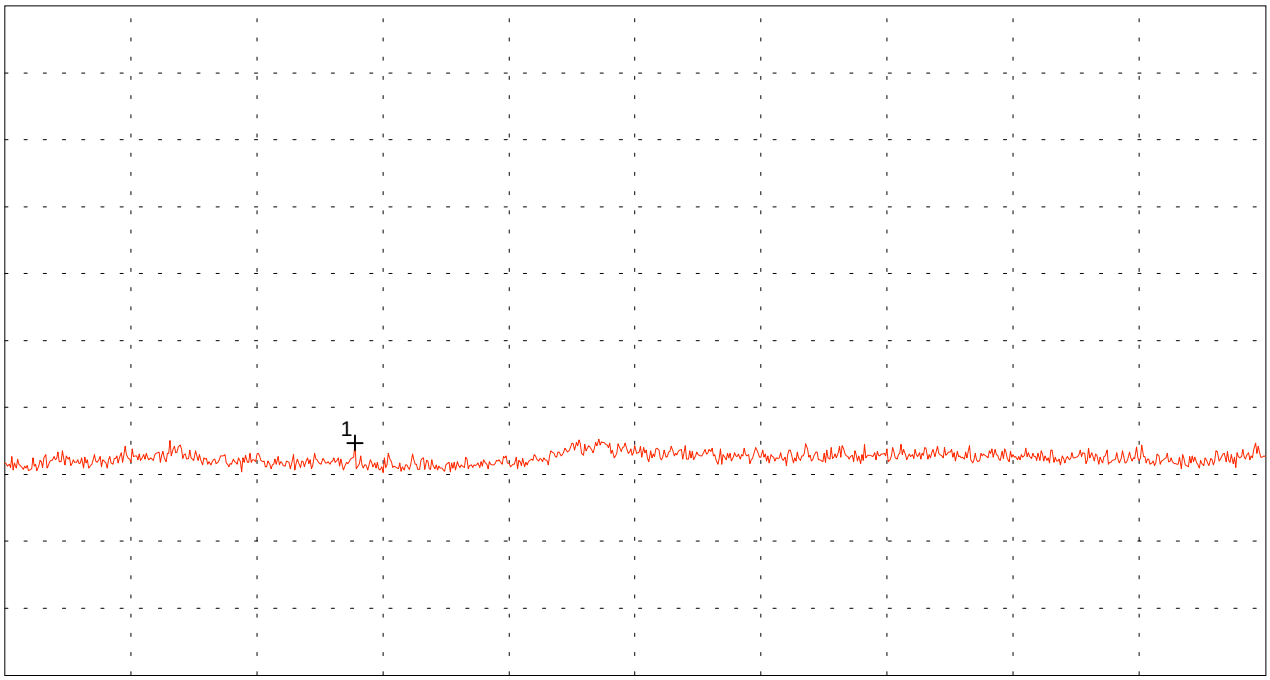
No. 1	1.258383 GHz	-38.56 dBm
No. 2	2.444447 GHz	25.38 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 55 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 40 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.500 GHz Stop 25.000 GHz
RBW 100 kHz VBW 100 kHz SWP 6.80 s

Multi Marker List

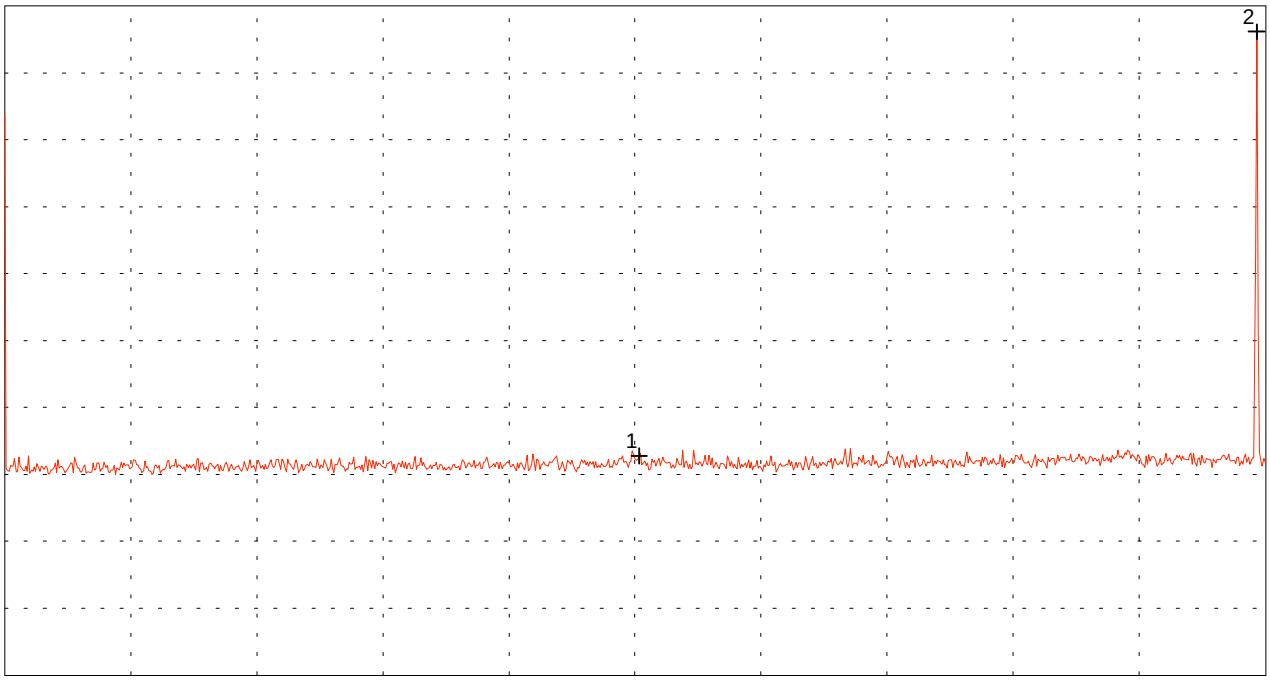
No. 1	8.750000 GHz	-35.33 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 56 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 80 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 100.000 kHz Stop 2.500 GHz
RBW 100 kHz VBW 100 kHz SWP 760 ms

Multi Marker List

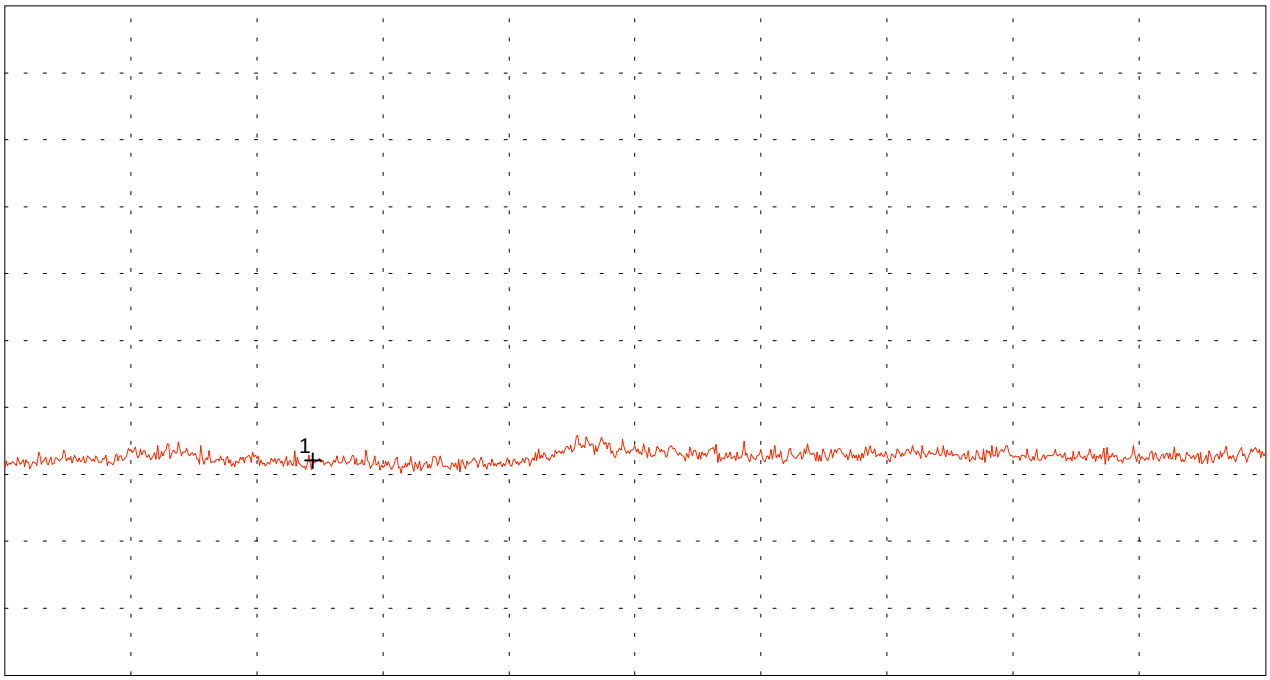
No. 1	1.258383 GHz	-37.26 dBm
No. 2	2.483334 GHz	26.17 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 57 of 122 Pages

Spurious RF Conducted Emissions acc. to Section 15.247 (c)

Model: WIMAN II	Mode: - Static Mode, Channel 80 selected - TX power setting 28 (maximum) - Modulation 4FSK, default data pattern - Conducted Measurement
Serial No.: ---	
Applicant: Altvater Airdata GmbH	

Ref.Level 30 dBm ATT 30 dB Ref. Offset 21 dB
10 dB/Div.



Start 2.500 GHz Stop 25.000 GHz
RBW 100 kHz VBW 100 kHz SWP 6.80 s

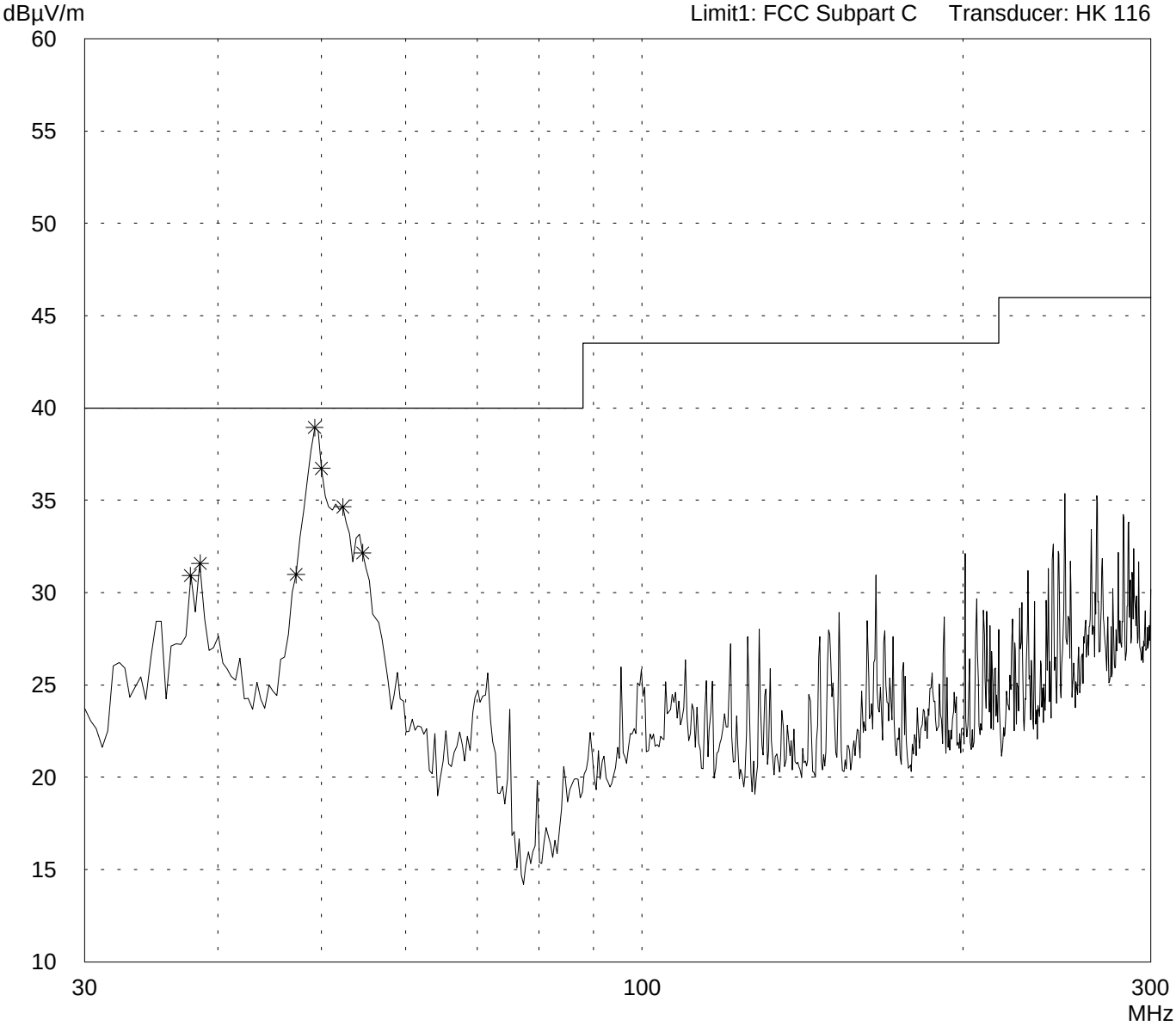
Multi Marker List

No. 1	8.000000 GHz	-37.95 dBm

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 58 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 01
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

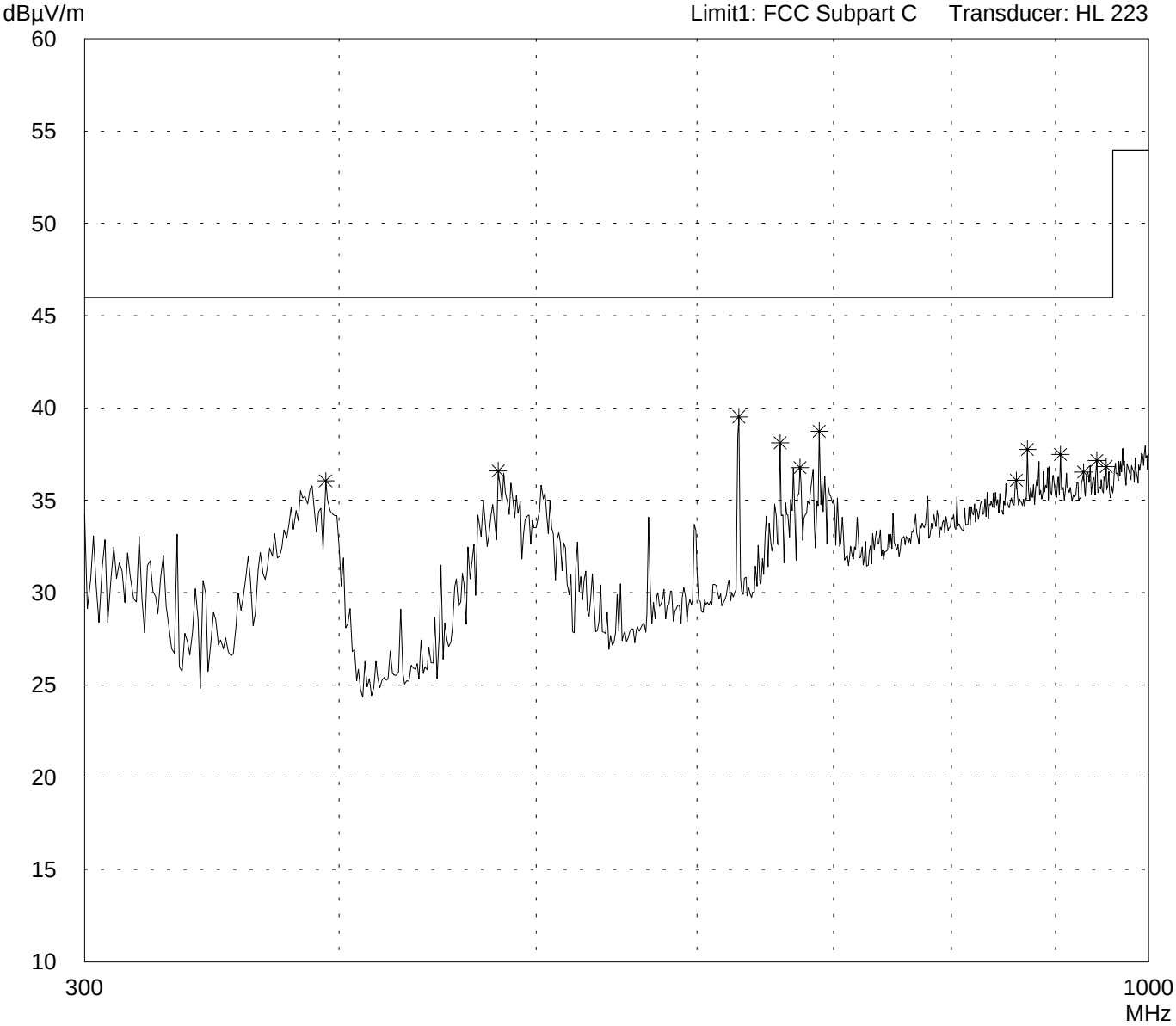


Result: Prescan	Project file: 50118-00241-2 — Page 59 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 01
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

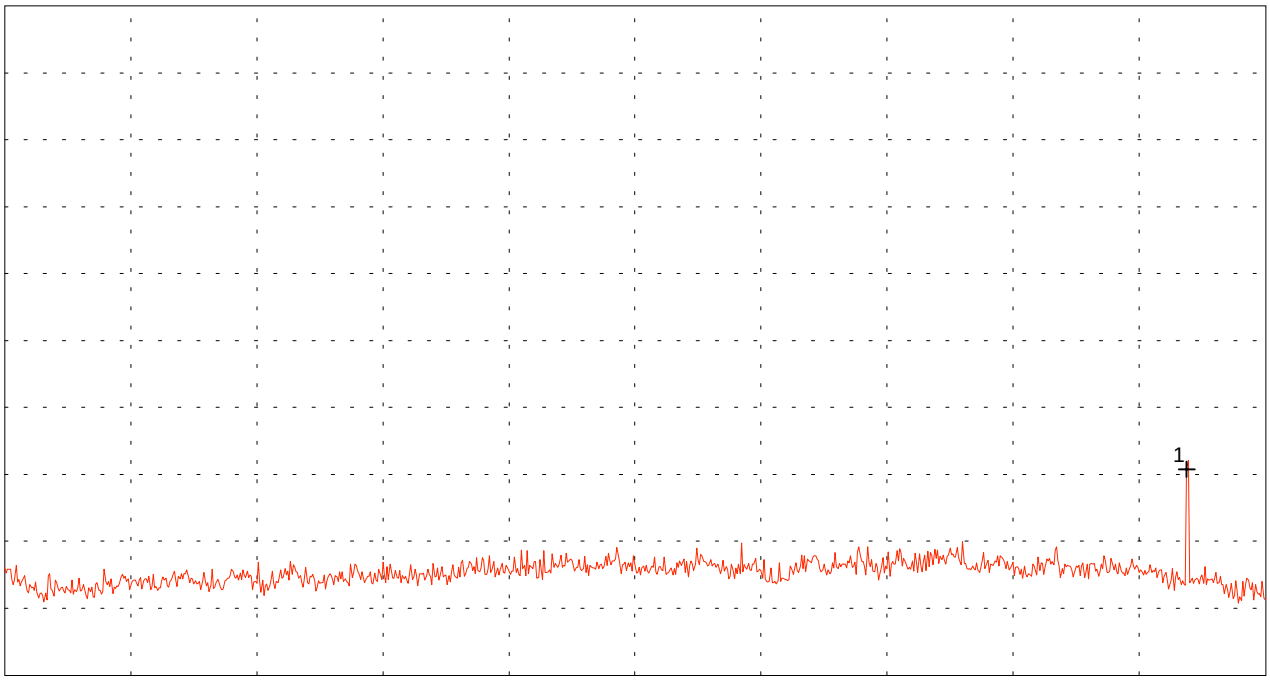


Result: Prescan	Project file: 50118-00241-2 — Page 60 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 50 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

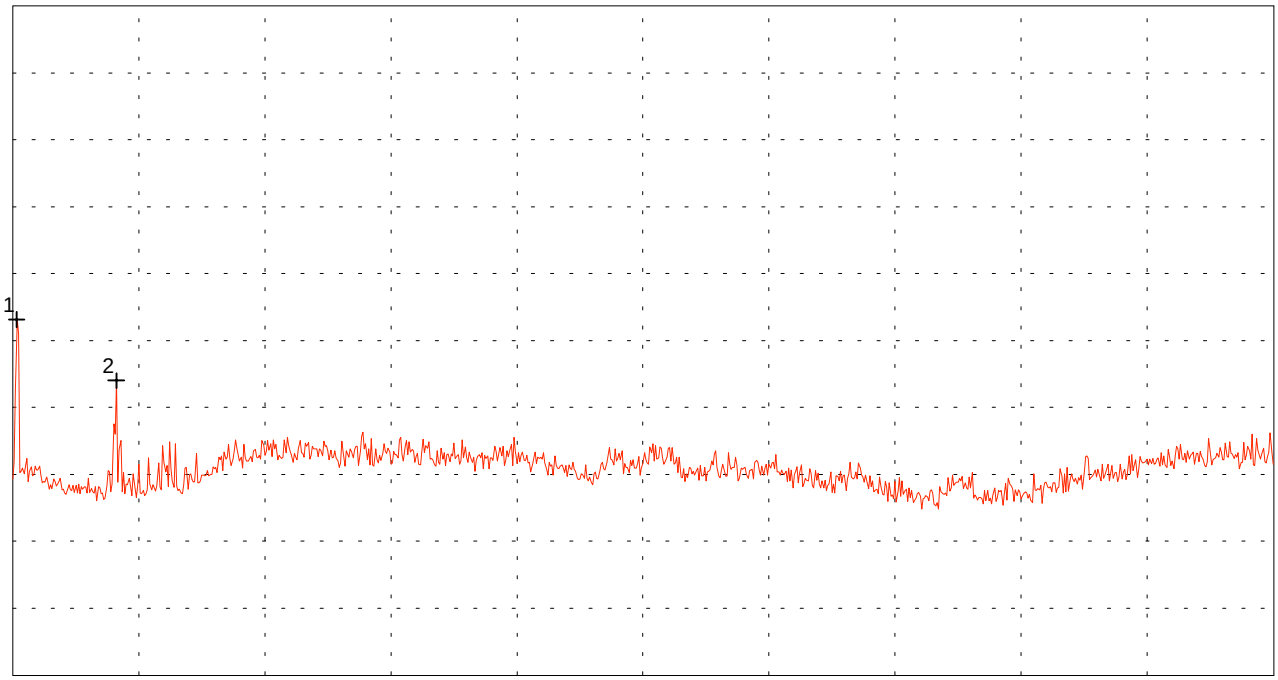
No. 1	2.406667 GHz	15.37 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 61 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

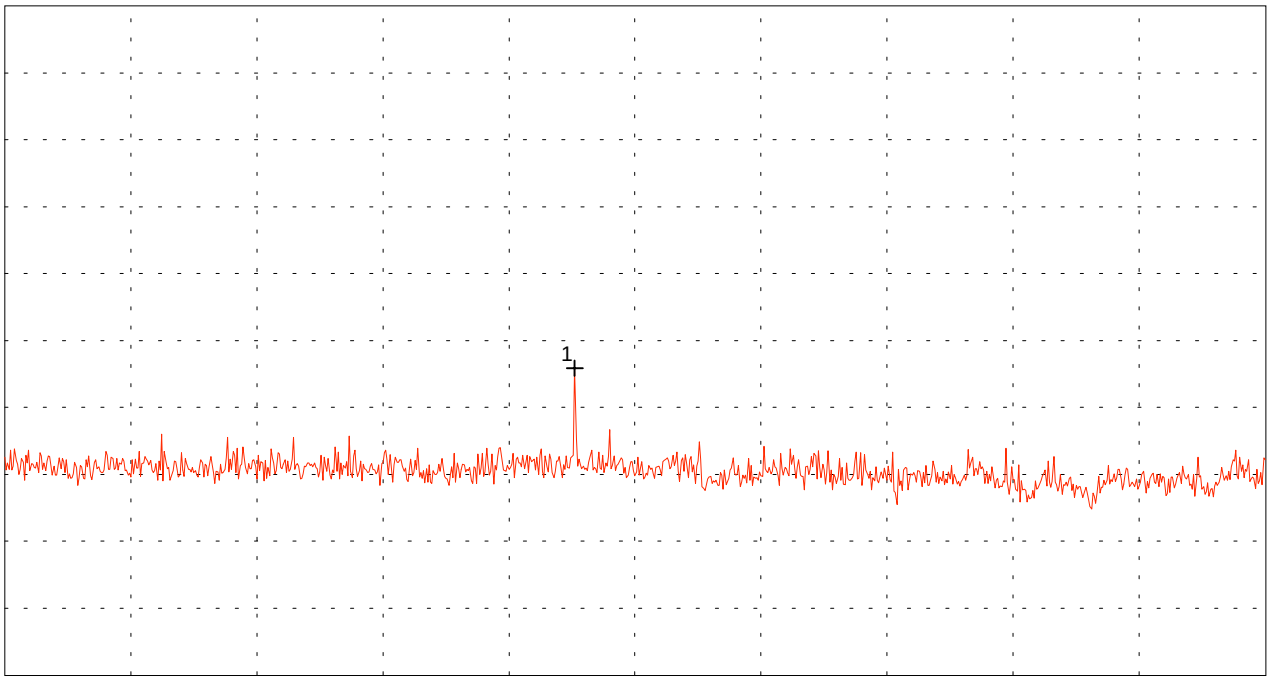
No. 1	2.404722 GHz	16.57 dBµV
No. 2	2.527000 GHz	12.01 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 62 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

No. 1	4.809222 GHz	12.92 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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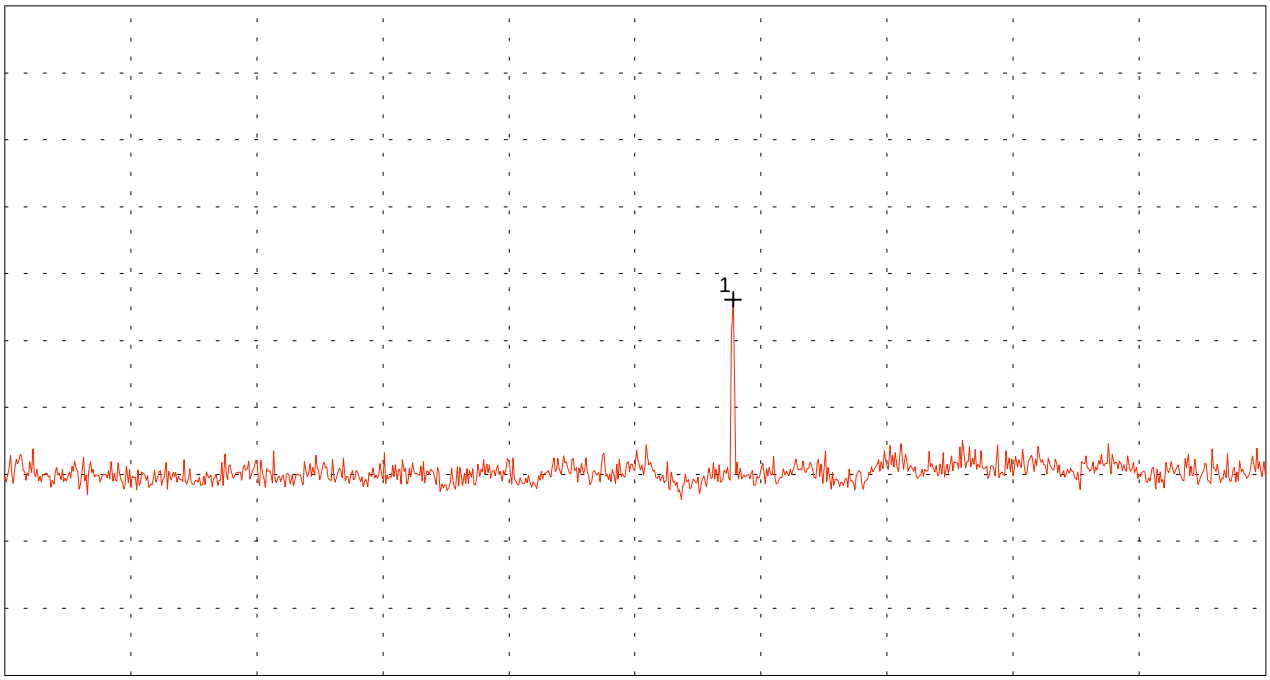
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

No. 1	7.207778 GHz	18.06 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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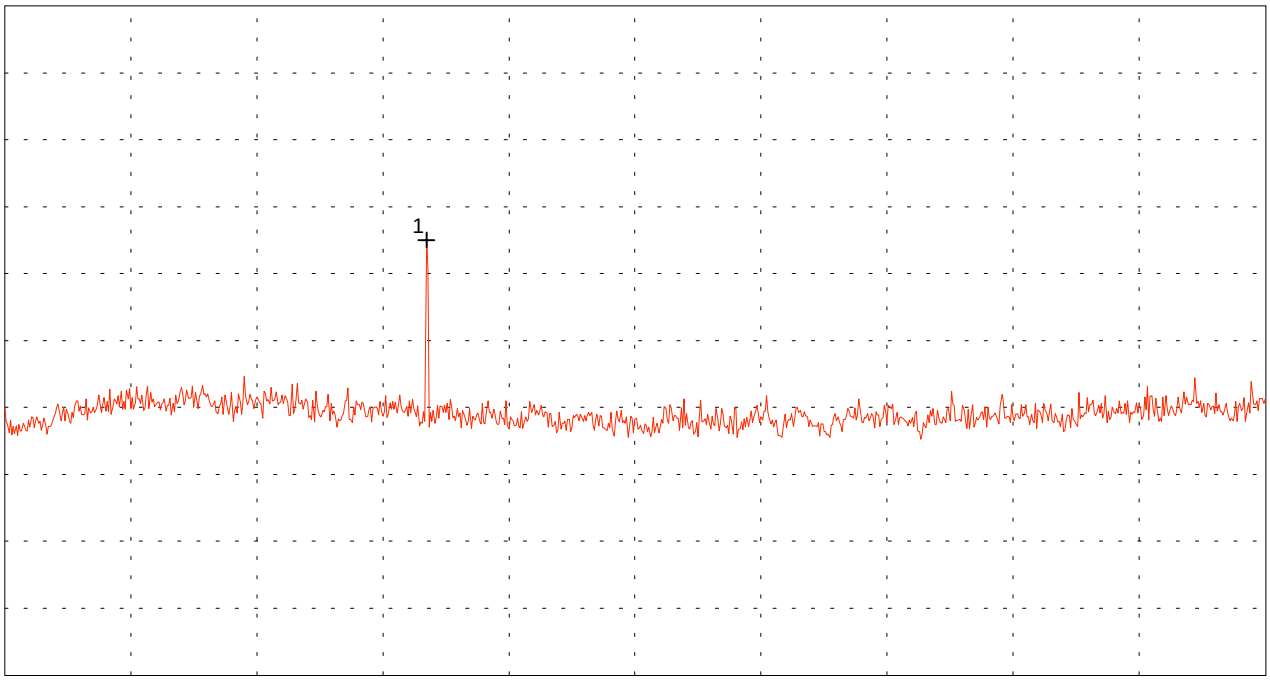
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

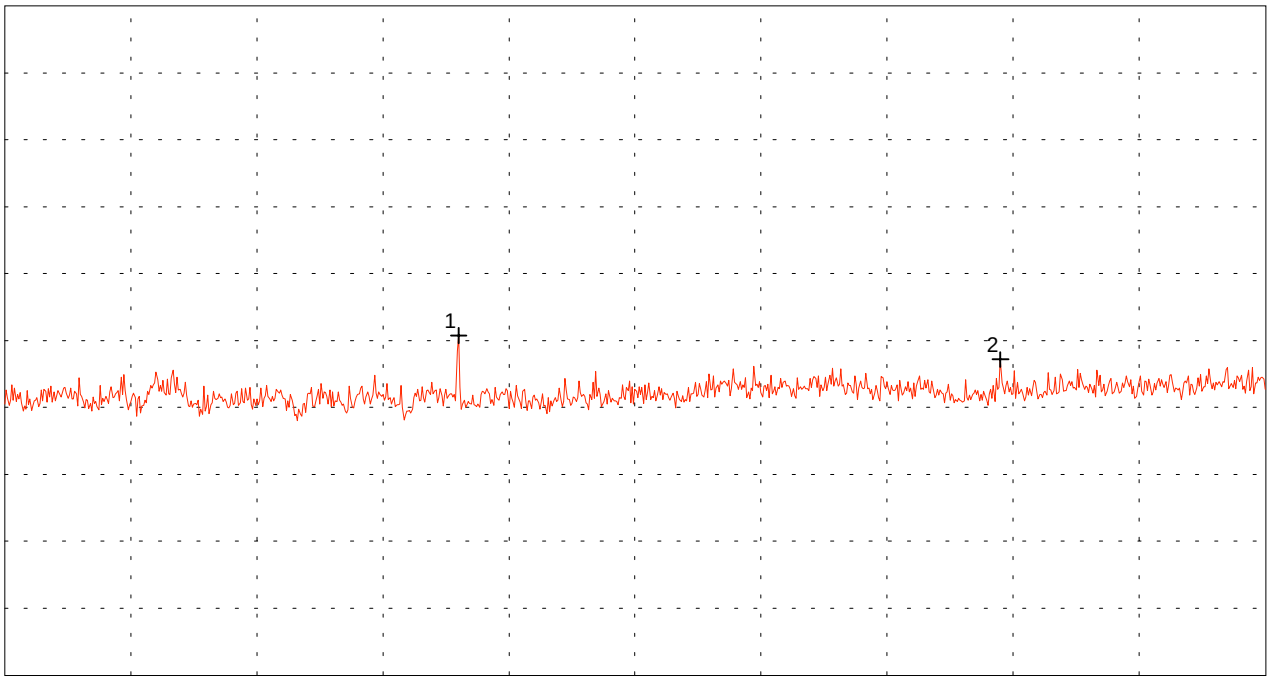
No. 1	9.604667 GHz	18.01 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 65 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

No. 1	14.416000 GHz	10.87 dBµV
No. 2	16.824000 GHz	9.08 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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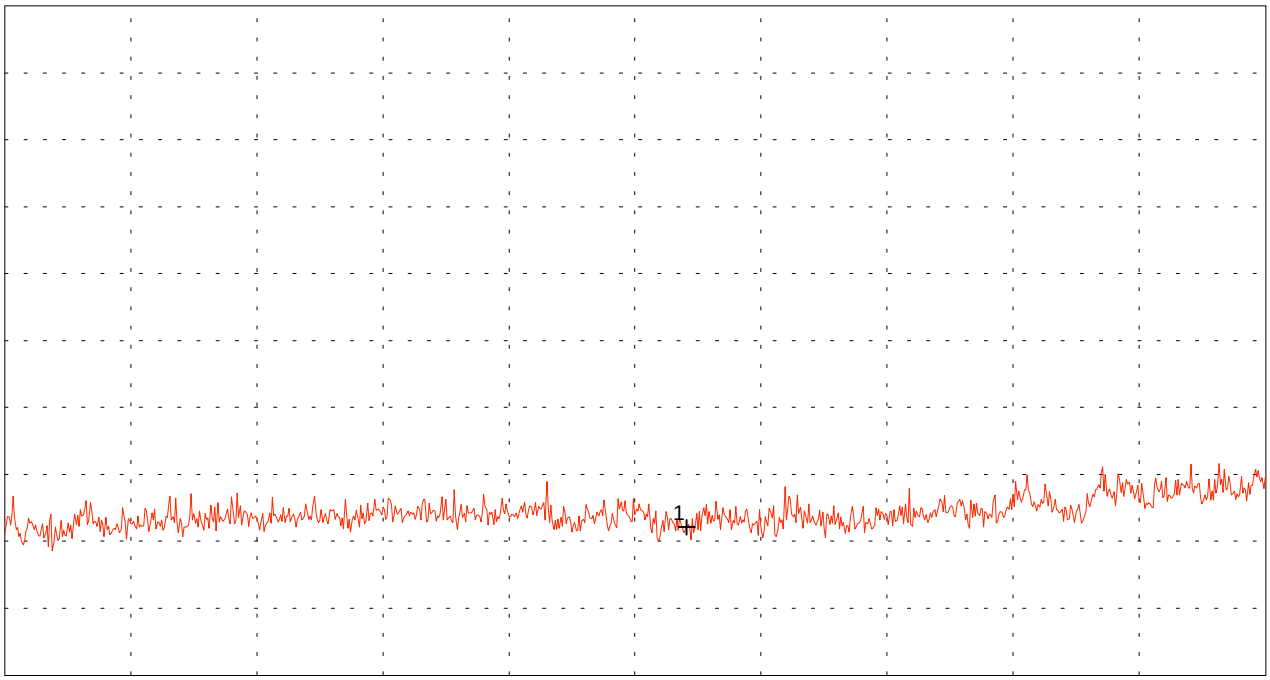
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

Multi Marker List

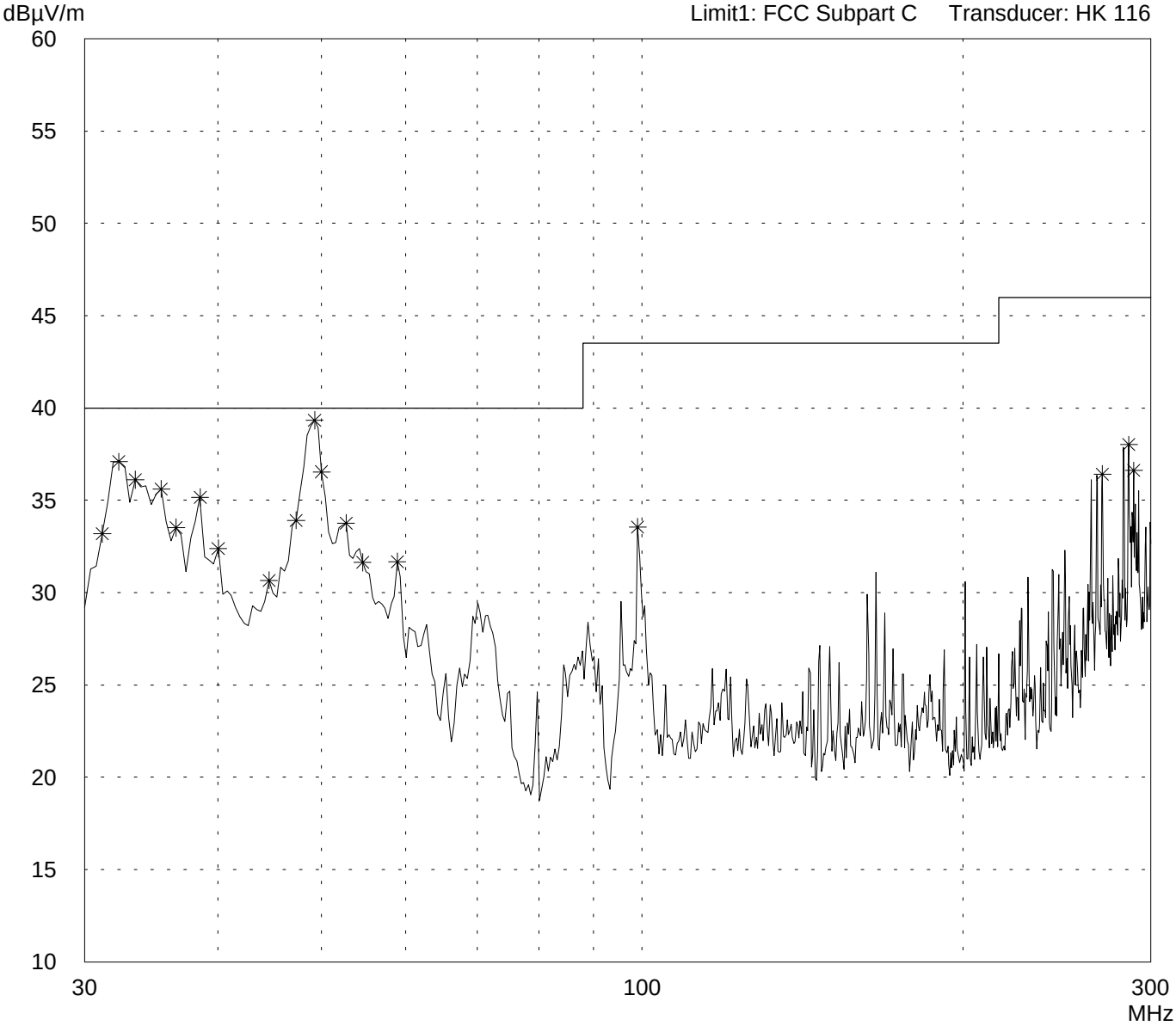
No. 1	21.787778 GHz	8.05 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 67 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 01
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

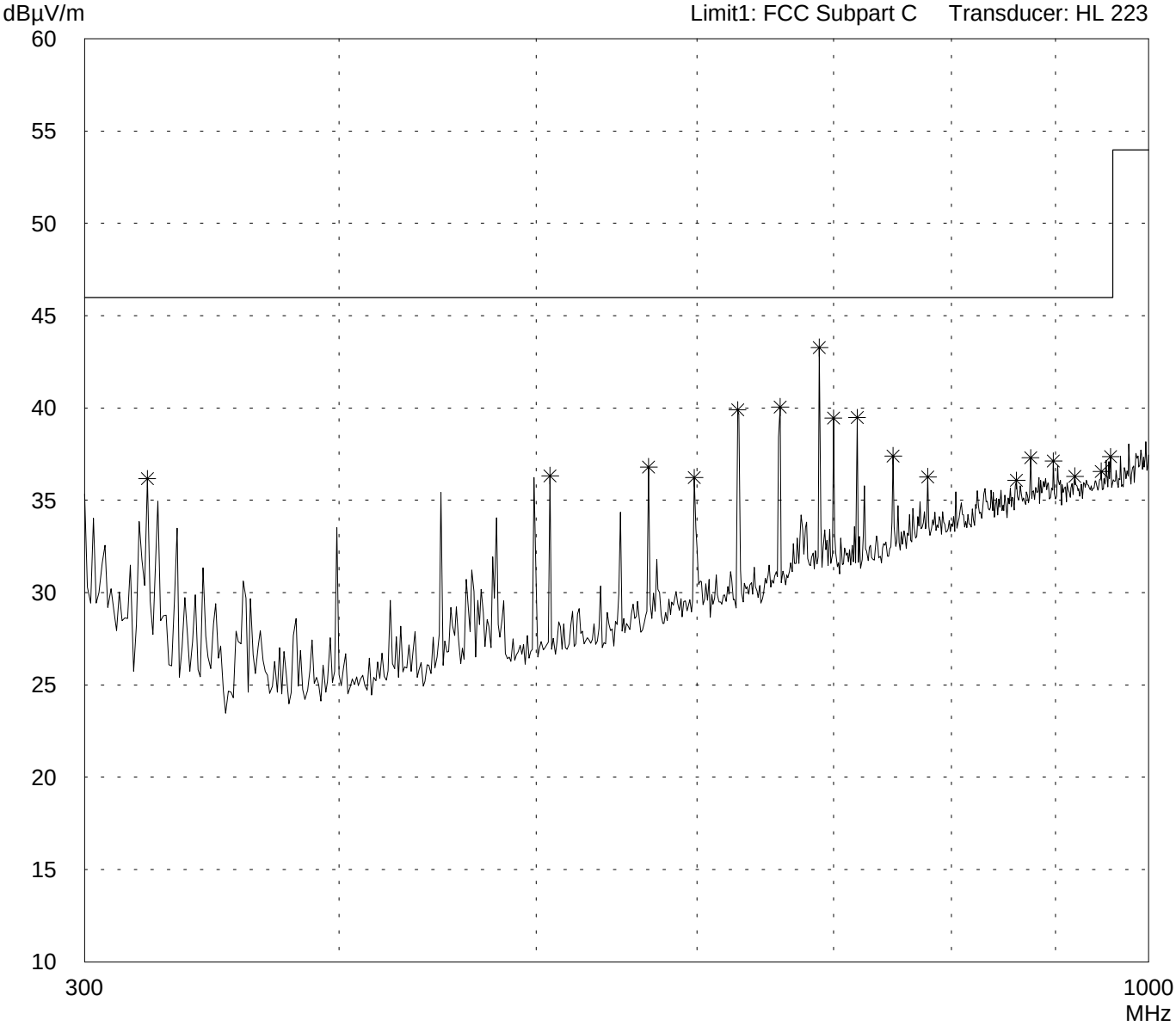


Result: Prescan	Project file: 50118-00241-2 — Page 68 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 01
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

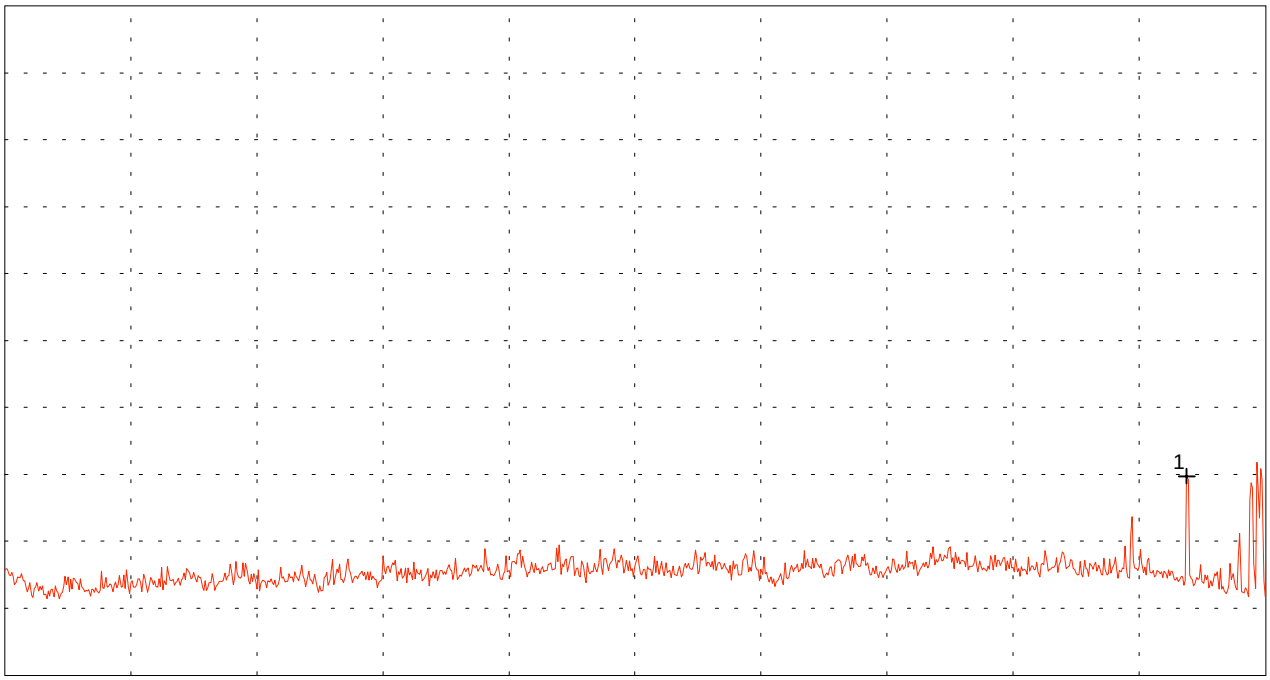


Result: Prescan	Project file: 50118-00241-2 — Page 69 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 50 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

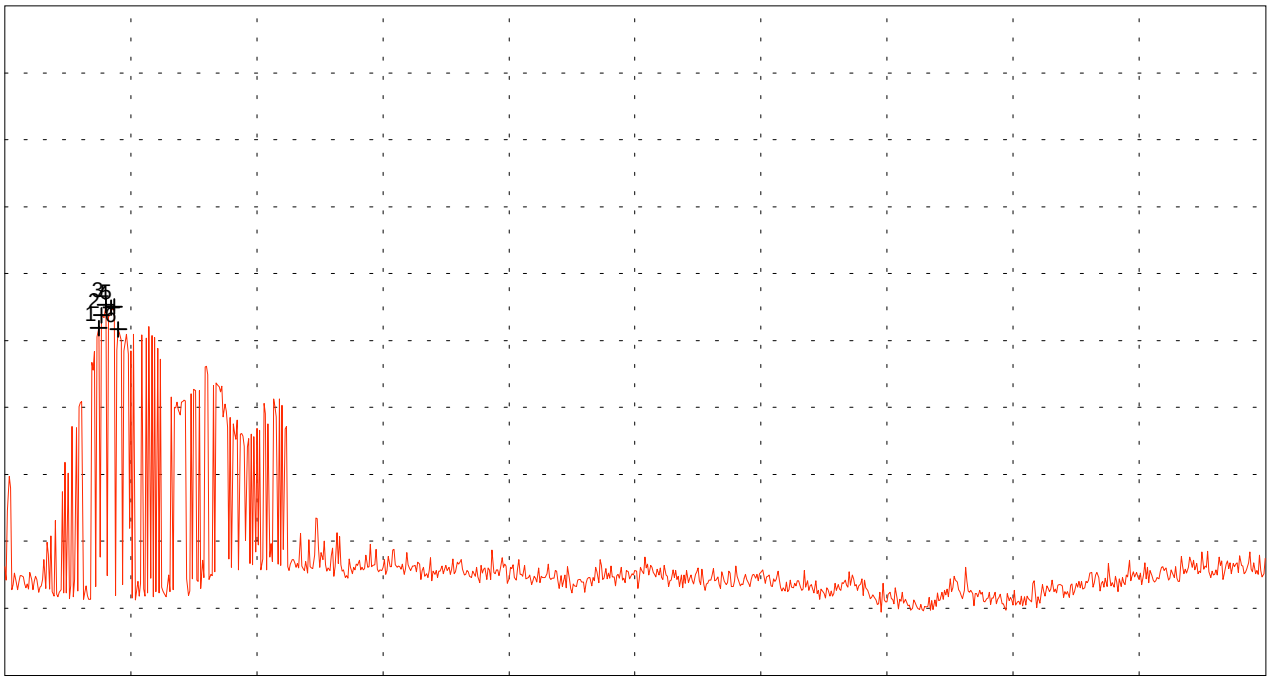
No. 1	2.406667 GHz	14.86 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 70 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 50 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

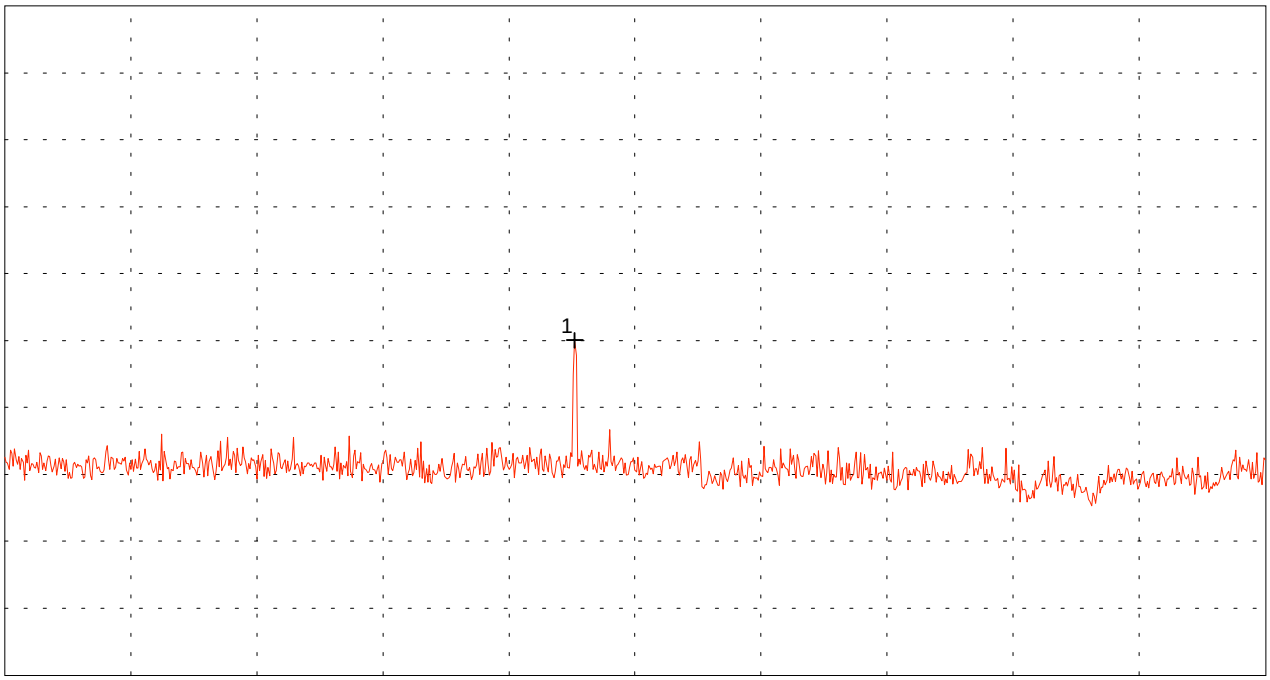
No. 1	2.515389 GHz	25.93 dBµV
No. 2	2.518833 GHz	26.88 dBµV
No. 3	2.524000 GHz	27.66 dBµV
No. 4	2.530889 GHz	27.46 dBµV
No. 5	2.534333 GHz	27.54 dBµV
No. 6	2.539500 GHz	25.83 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 71 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

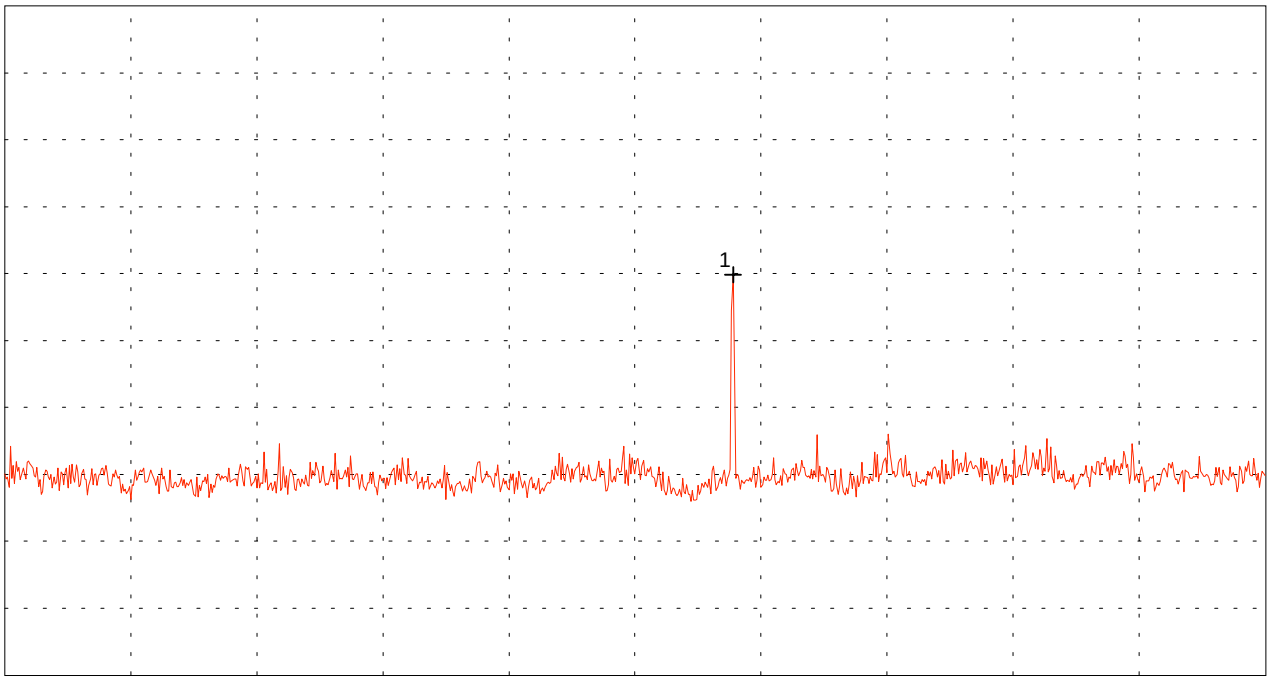
No. 1	4.809222 GHz	15.02 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 72 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

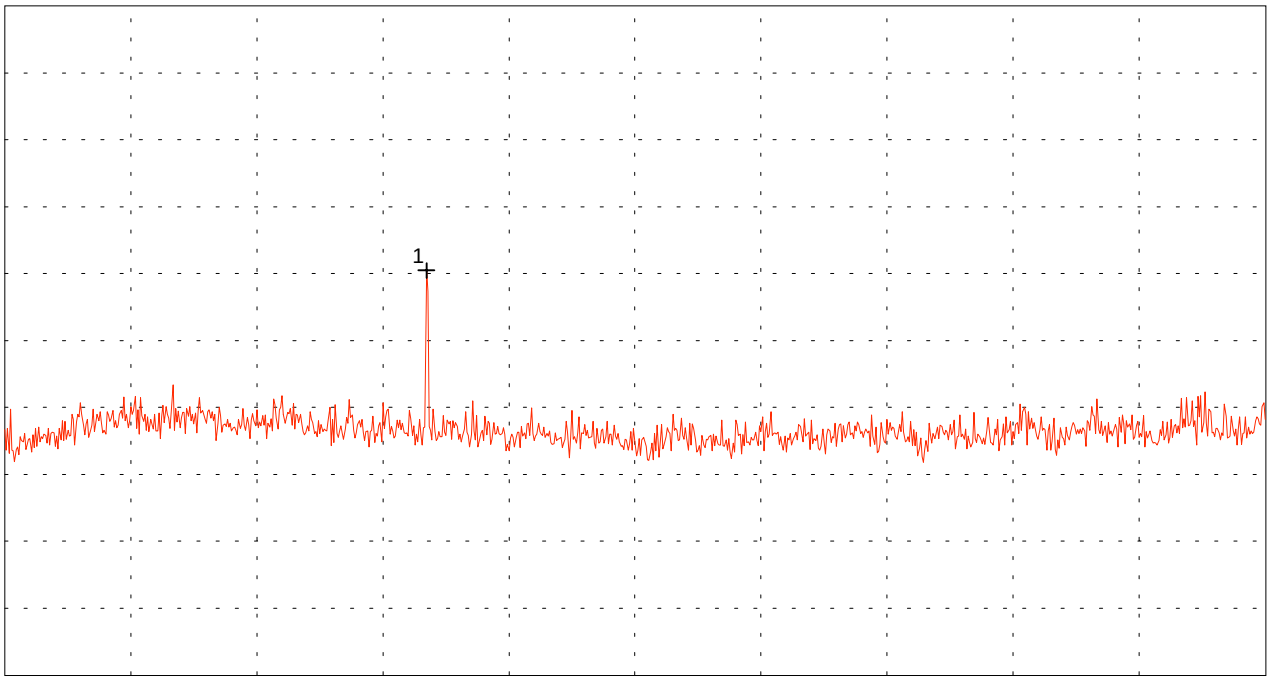
No. 1	7.207778 GHz	19.91 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 73 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

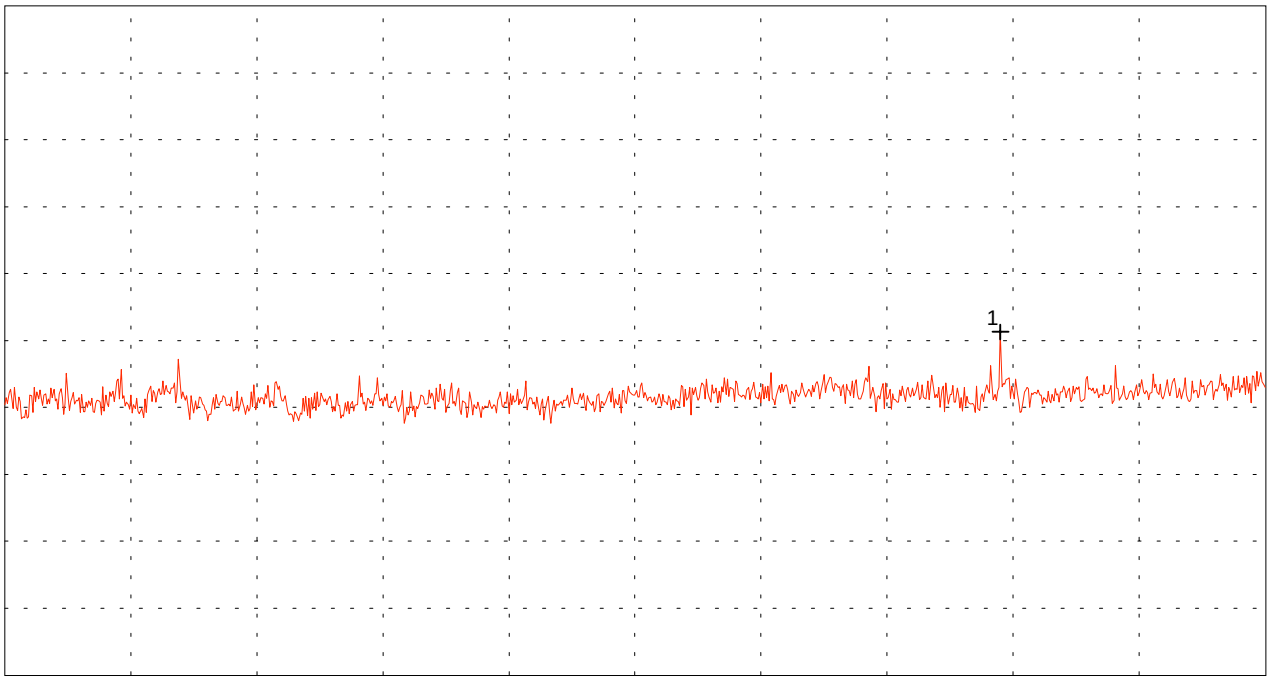
No. 1	9.604667 GHz	15.74 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 74 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

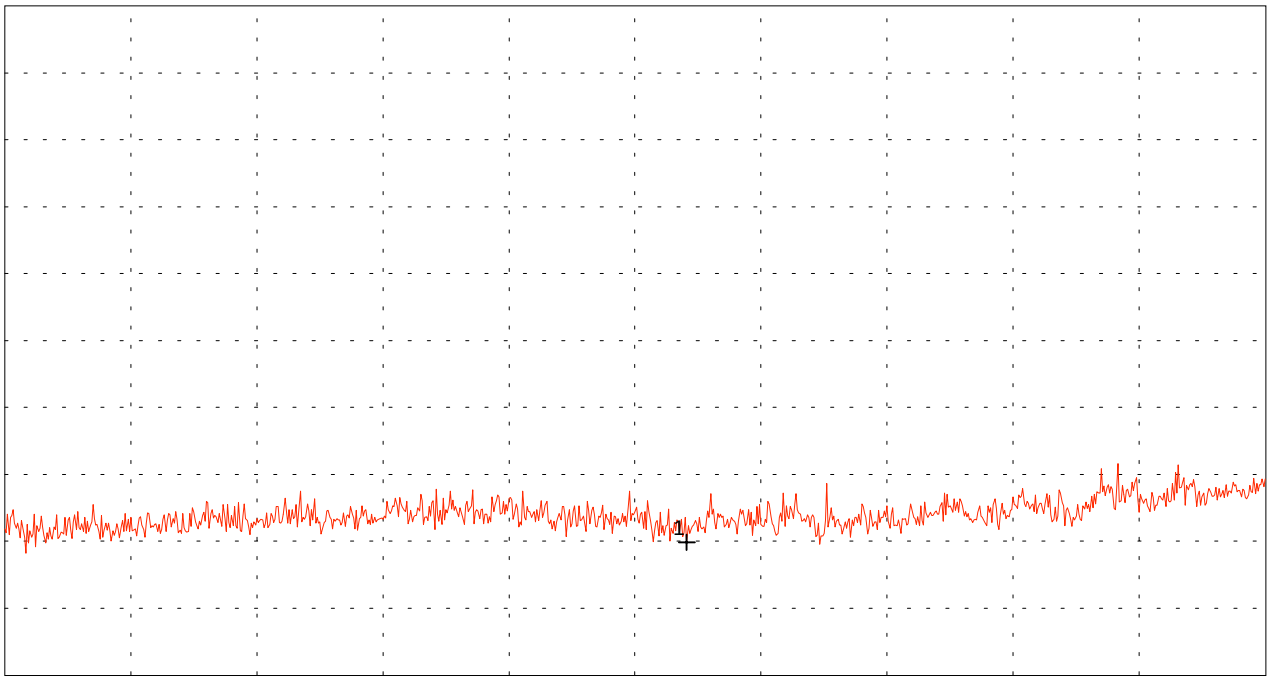
No. 1 16.824000 GHz 11.14 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 75 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 01 (lowest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

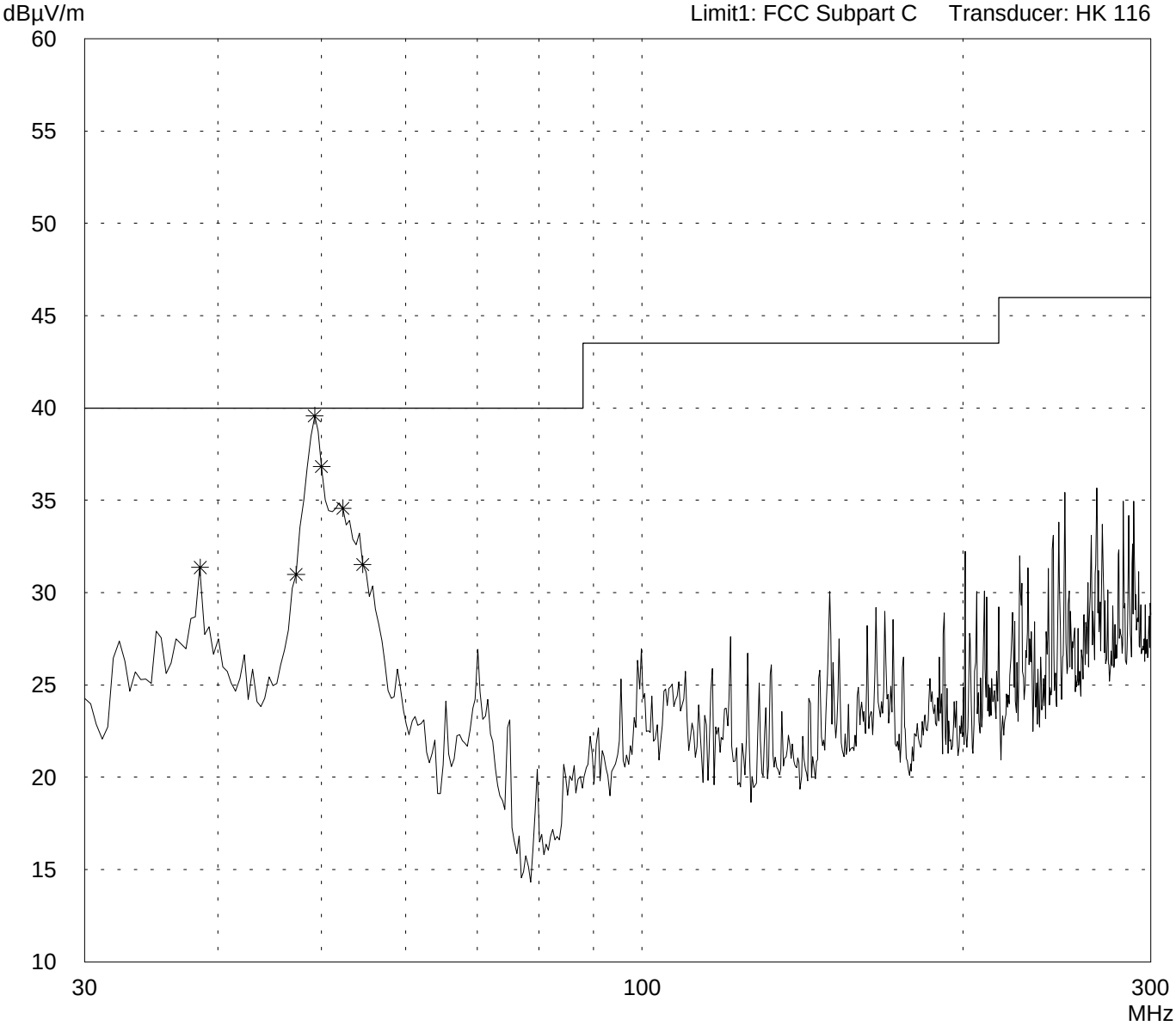
Multi Marker List

No. 1	21.787778 GHz	6.91 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 76 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

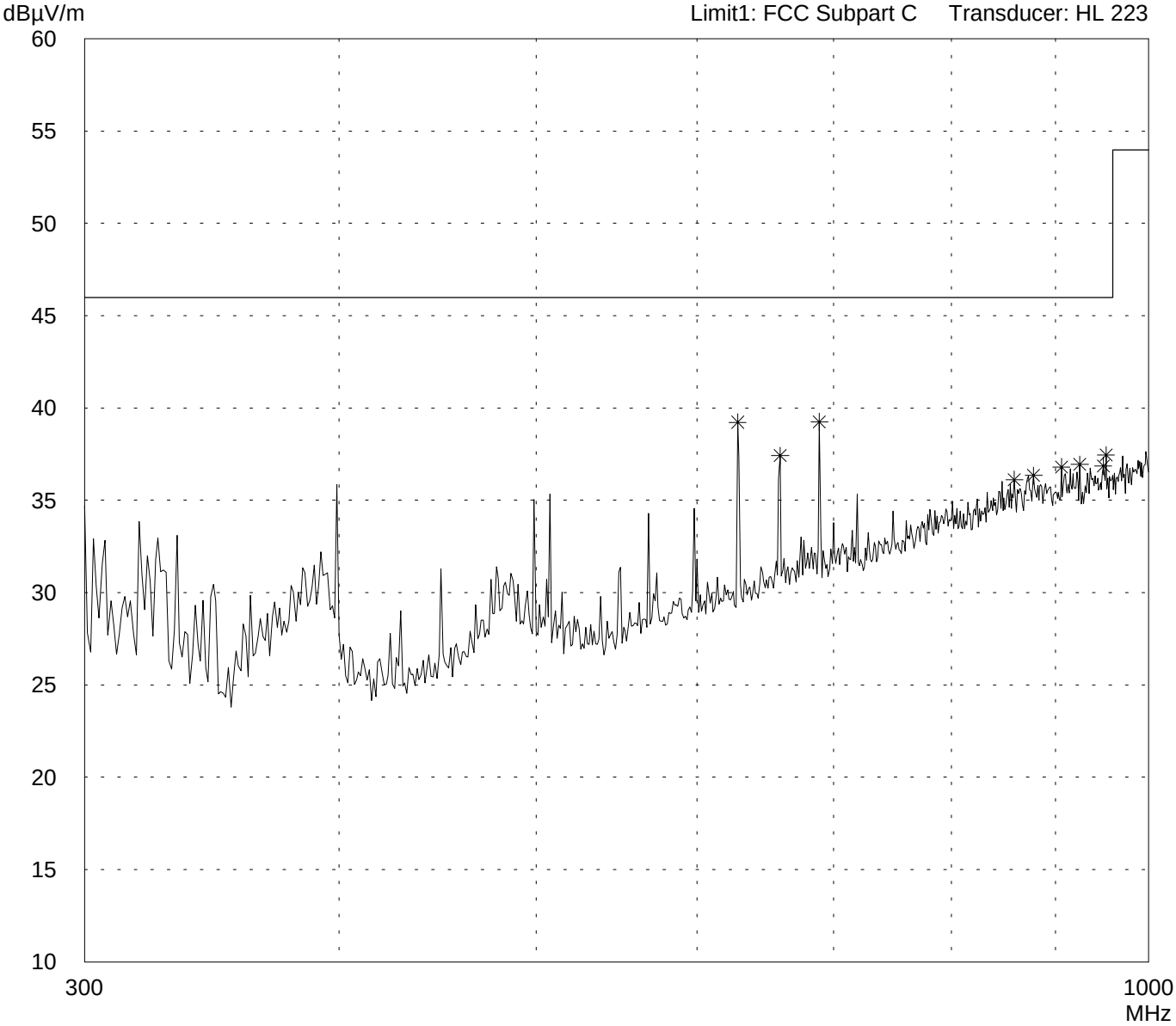


Result: Prescan	Project file: 50118-00241-2 — Page 77 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

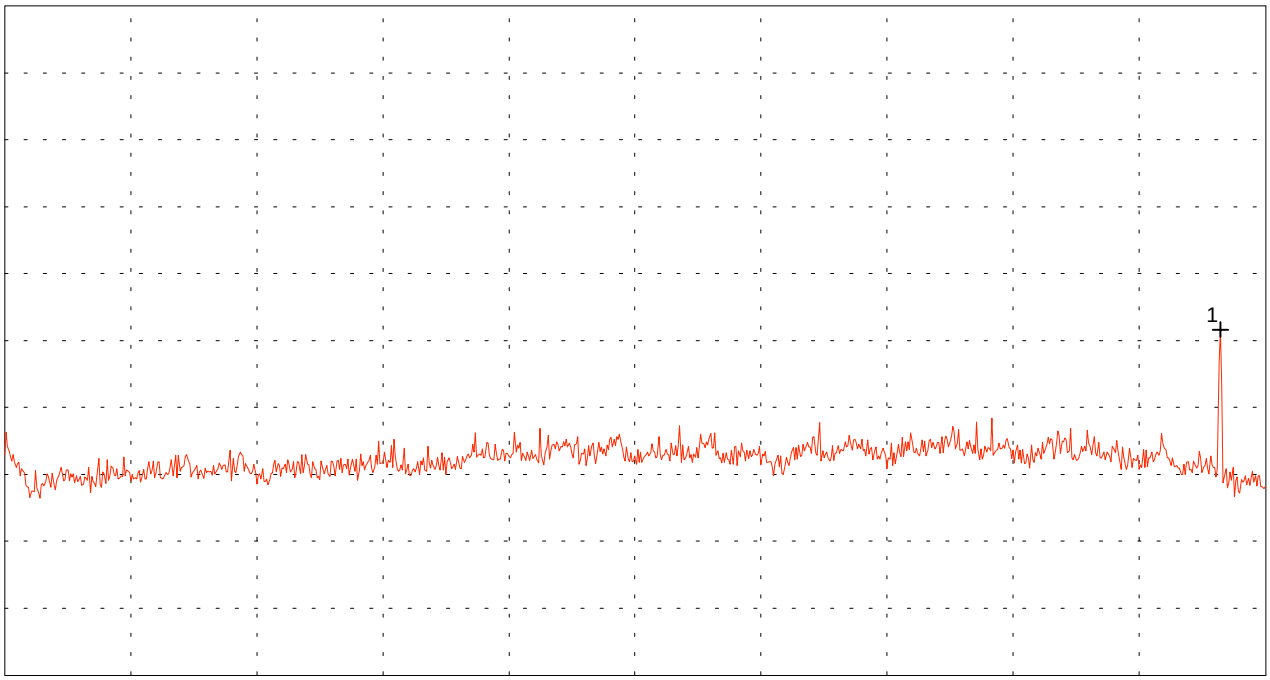


Result: Prescan	Project file: 50118-00241-2 — Page 78 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

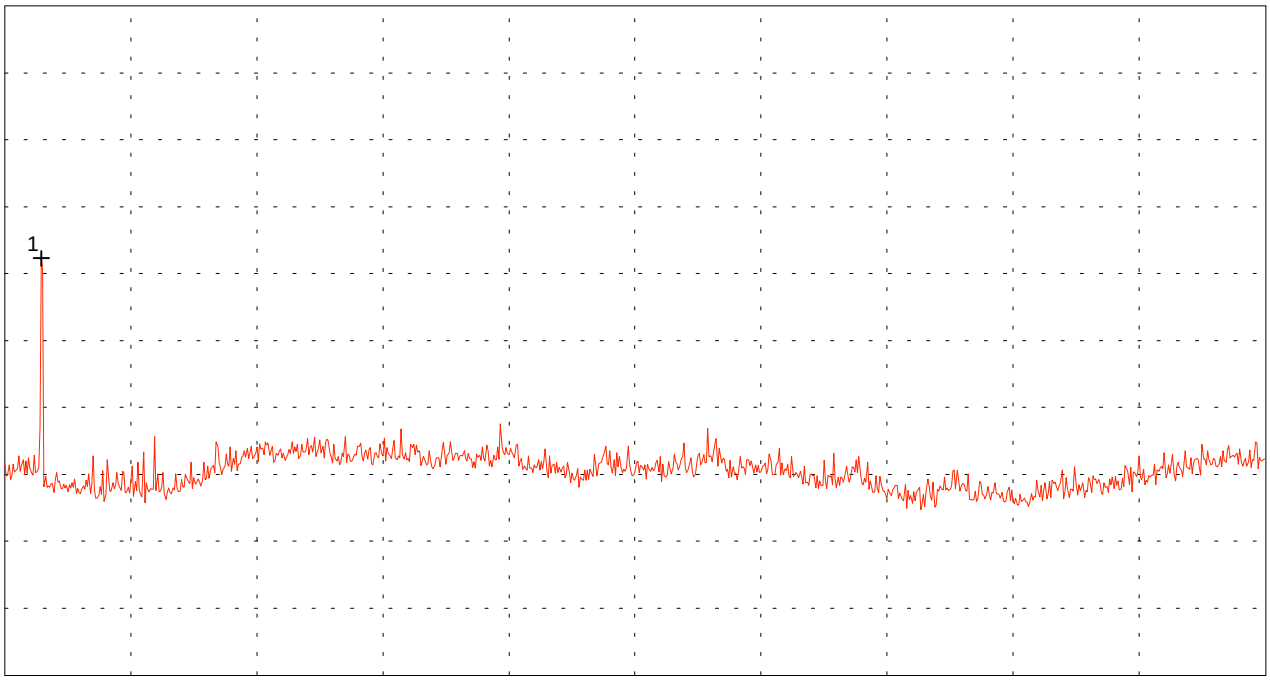
No. 1	2.446667 GHz	15.82 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 79 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

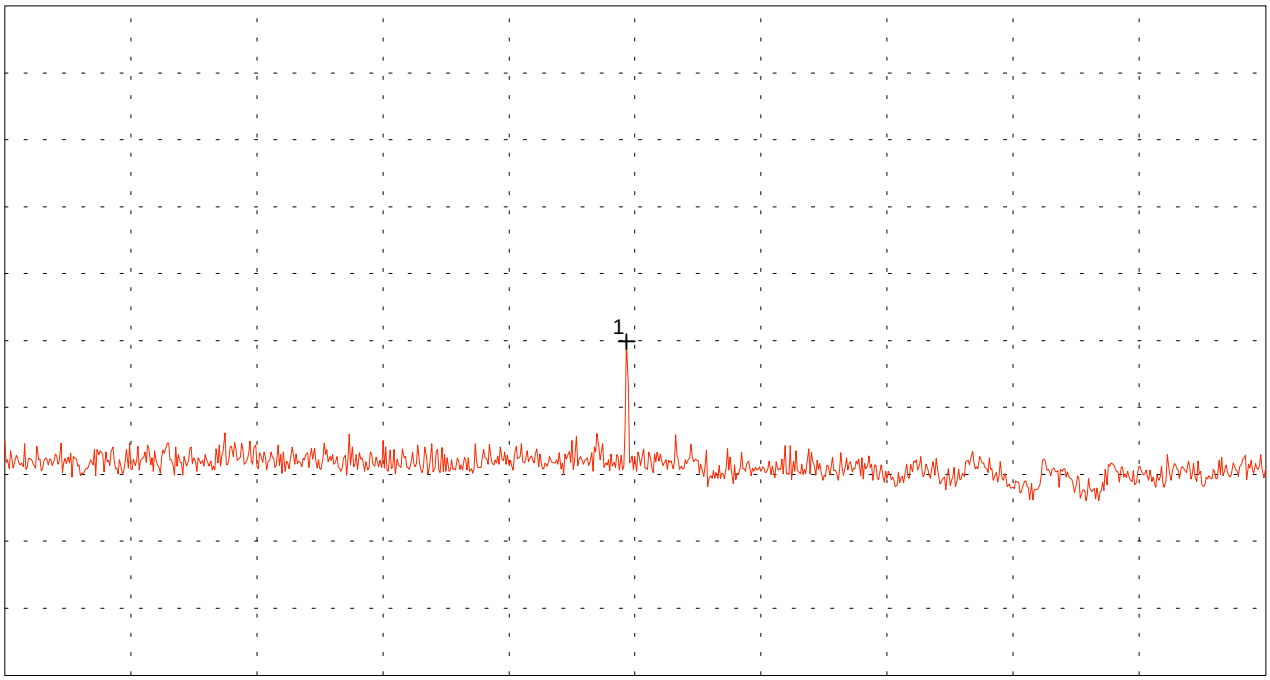
No. 1	2.444778 GHz	21.14 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 80 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

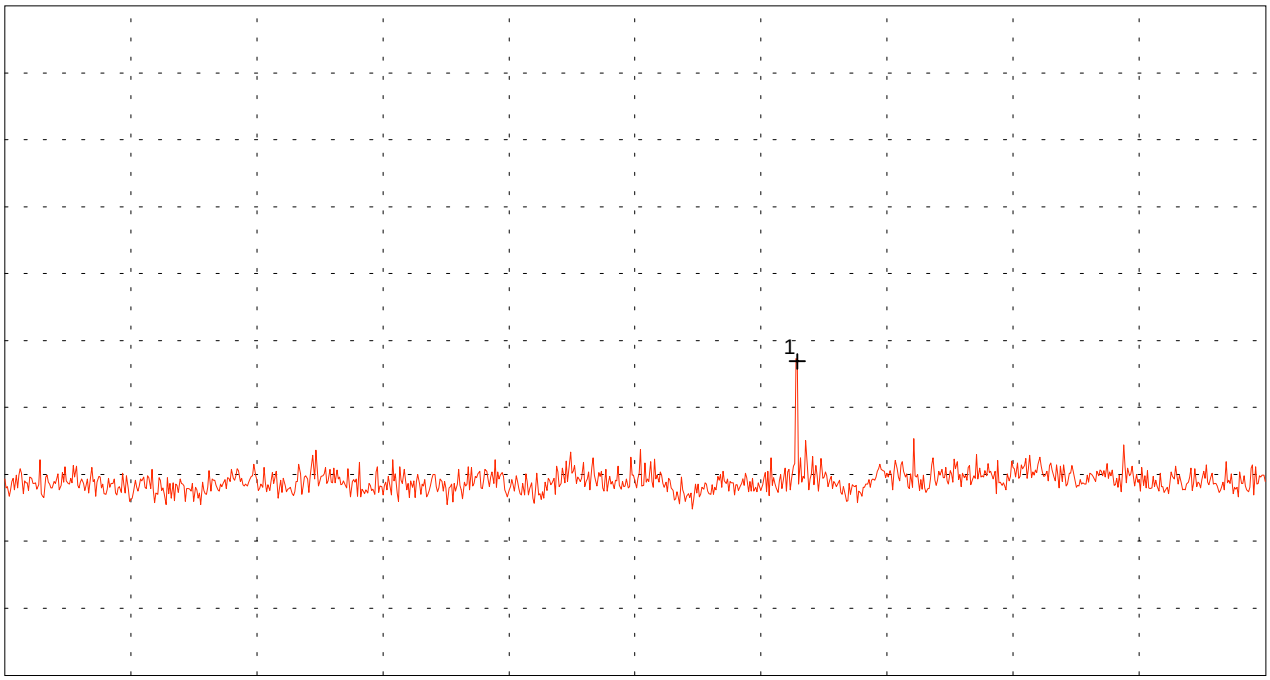
No. 1	4.887333 GHz	14.92 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 81 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

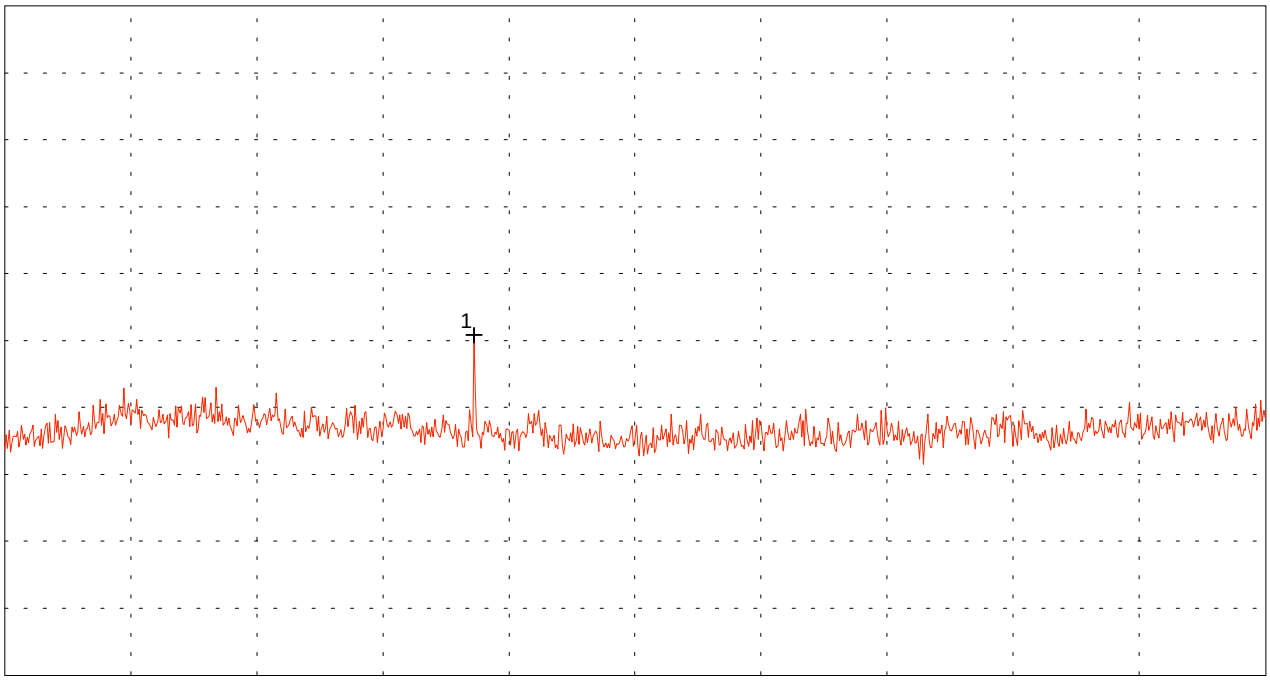
No. 1	7.327889 GHz	13.44 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 82 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

No. 1	9.763333 GHz	10.90 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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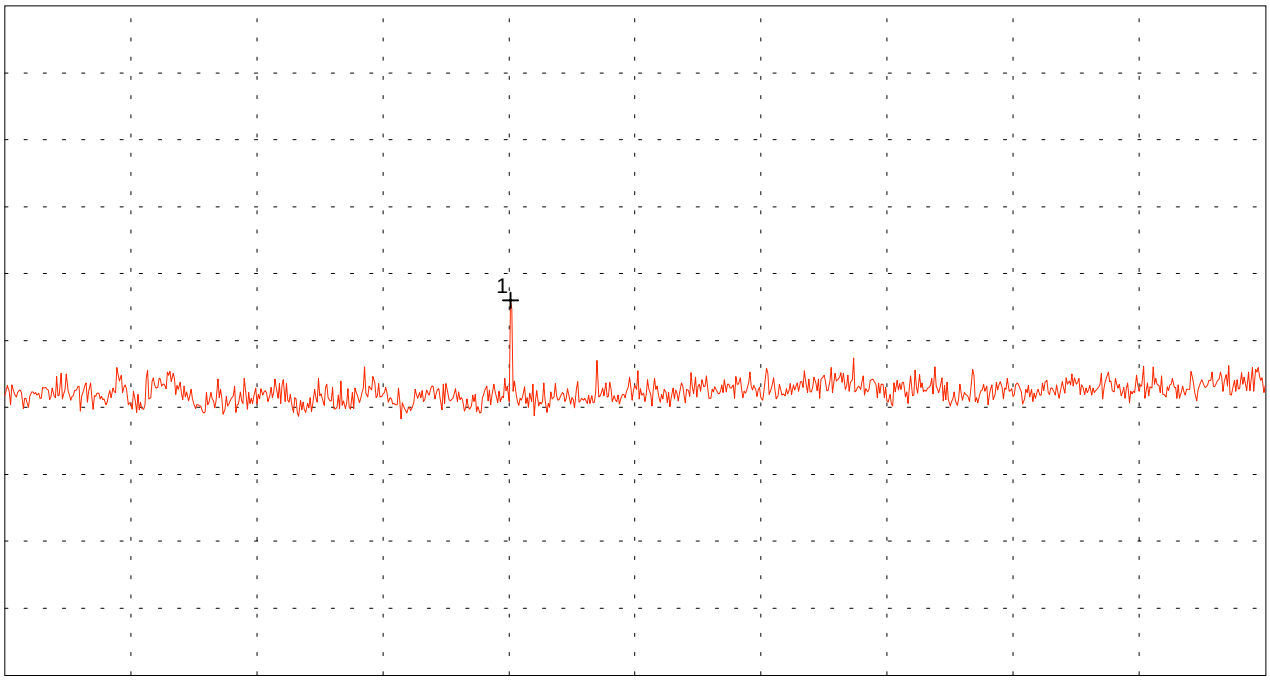
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

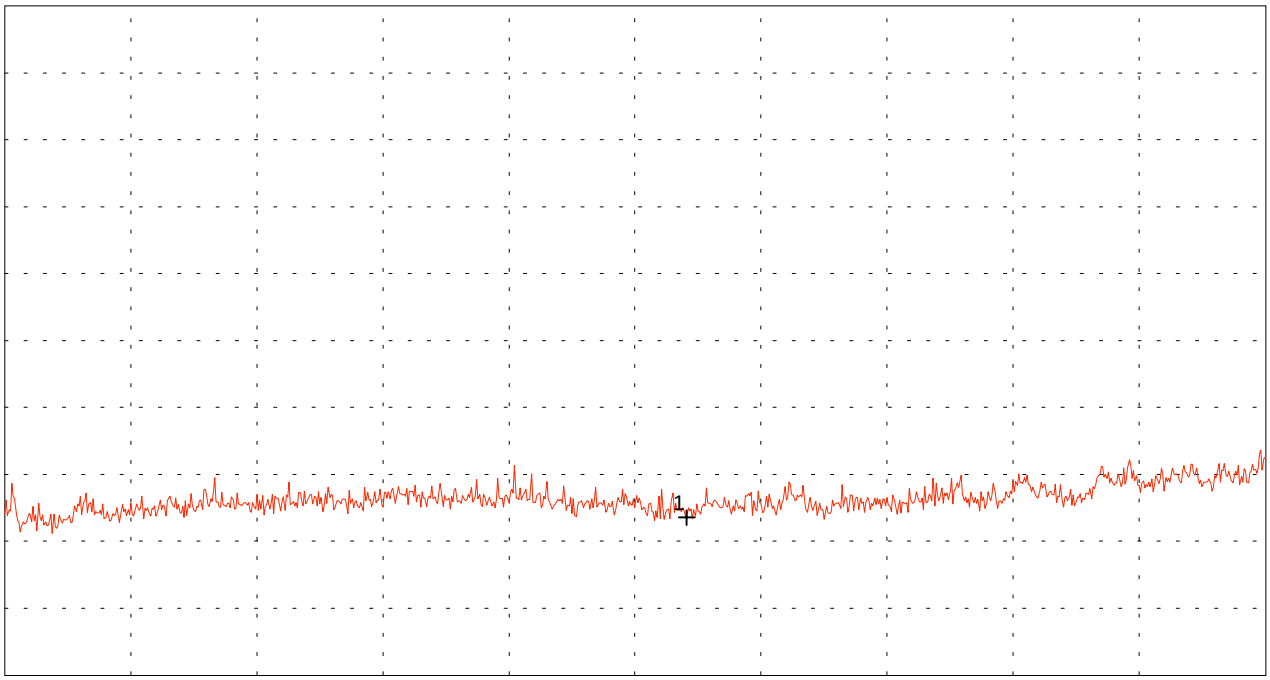
No. 1	14.646222 GHz	13.50 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 84 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

Multi Marker List

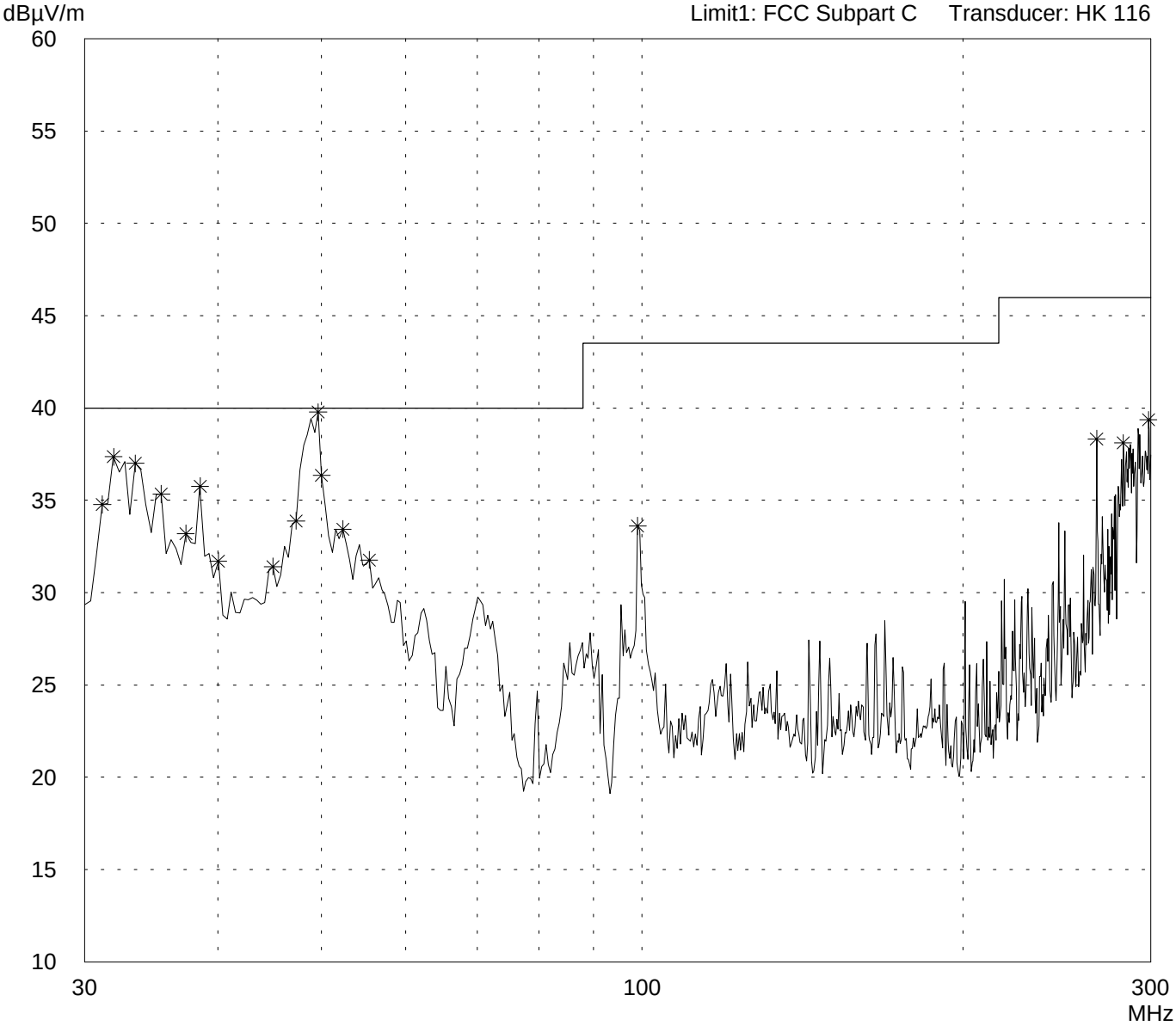
No. 1	21.787778 GHz	8.77 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 85 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

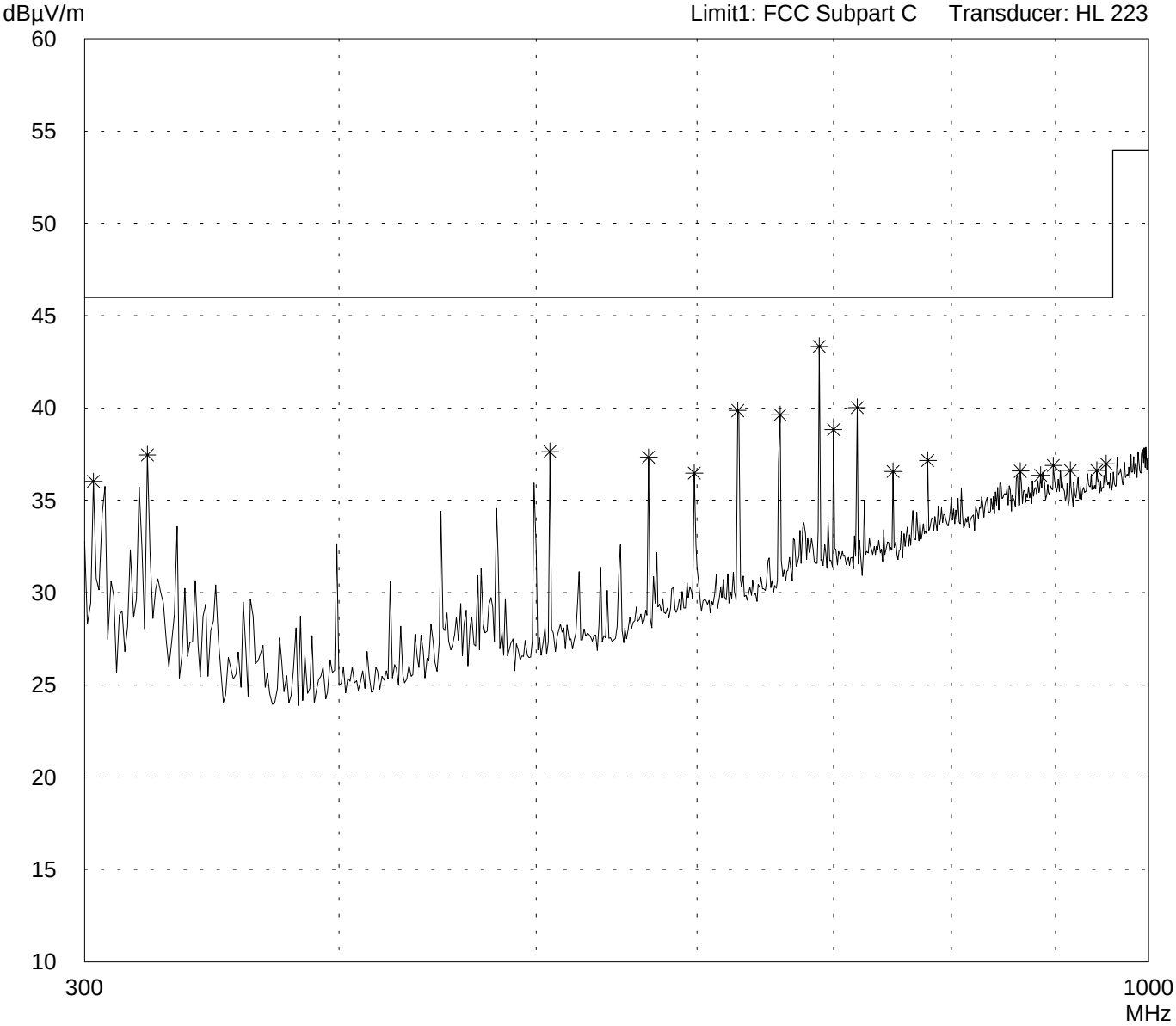


Result: Prescan	Project file: 50118-00241-2 — Page 86 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

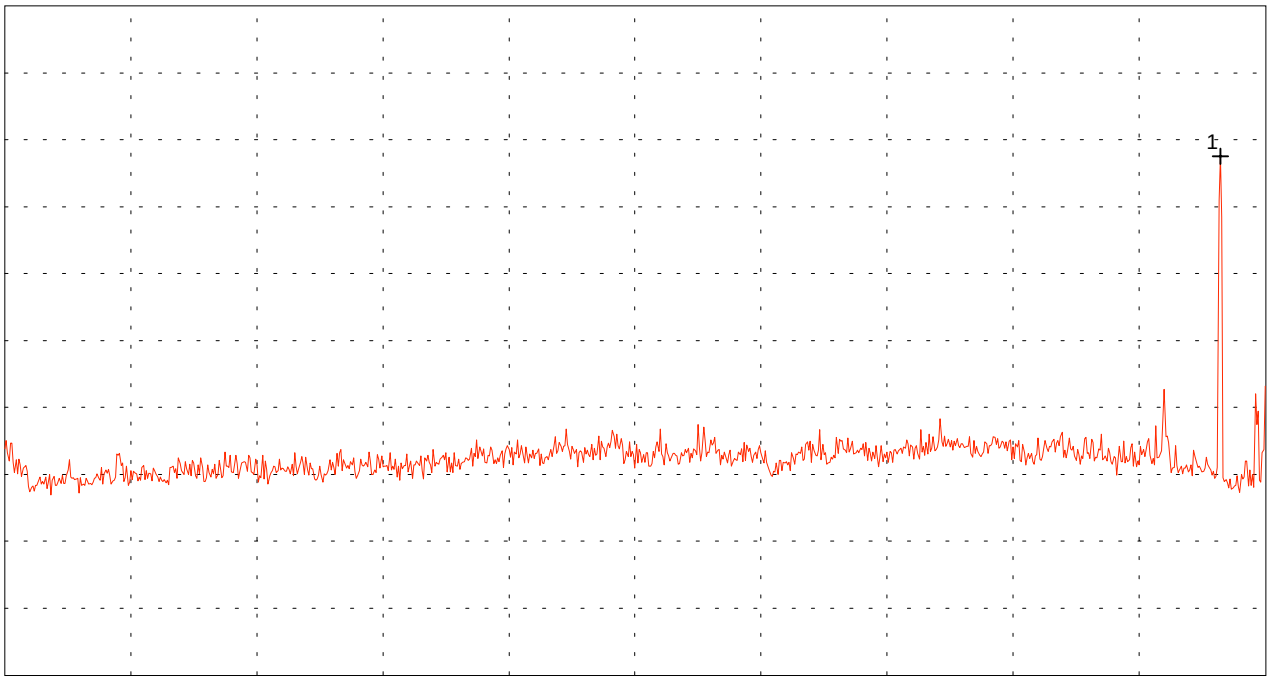


Result: Prescan	Project file: 50118-00241-2 — Page 87 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

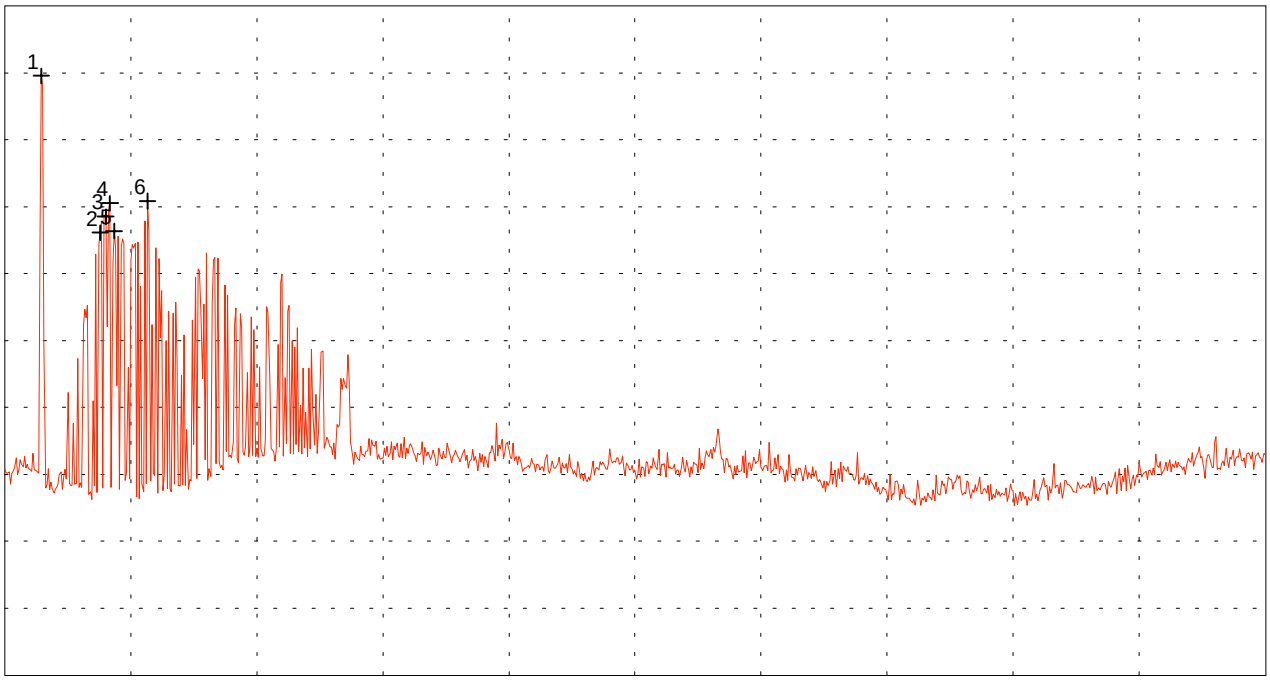
No. 1	2.446667 GHz	28.76 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 88 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Verticall Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

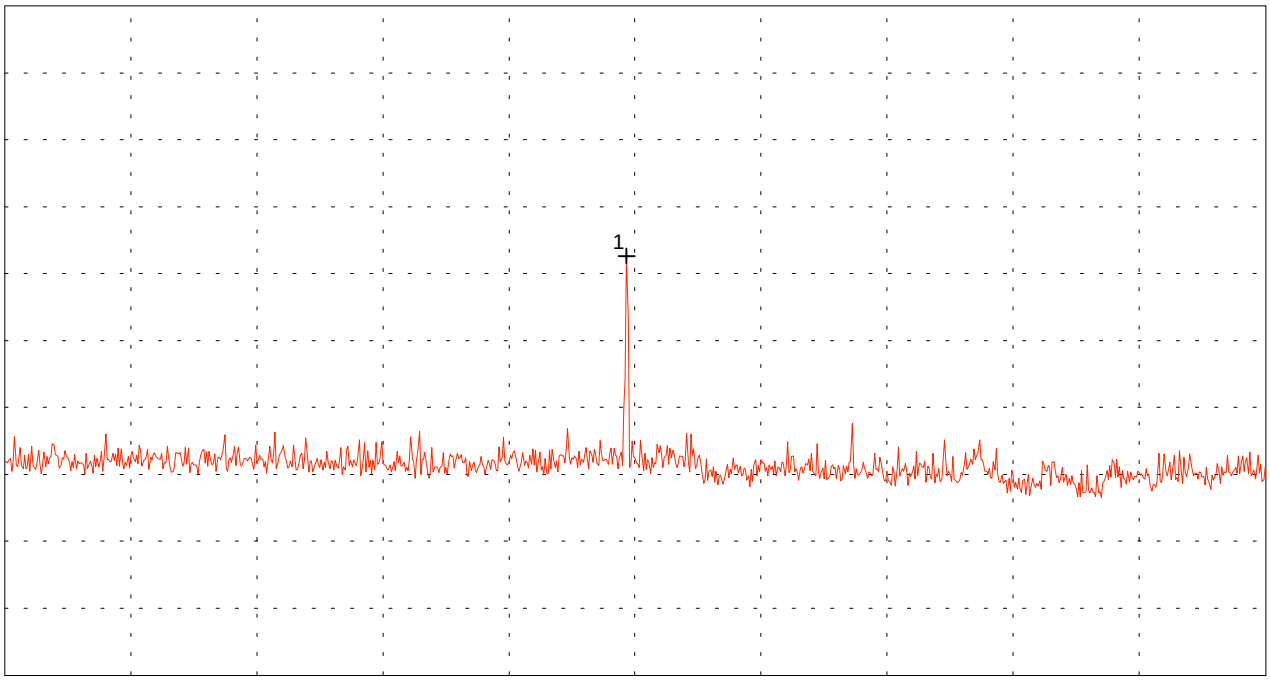
No. 1	2.444778 GHz	34.77 dBµV
No. 2	2.517111 GHz	23.05 dBµV
No. 3	2.524000 GHz	24.26 dBµV
No. 4	2.529167 GHz	25.26 dBµV
No. 5	2.534333 GHz	23.18 dBµV
No. 6	2.575667 GHz	25.42 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 89 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

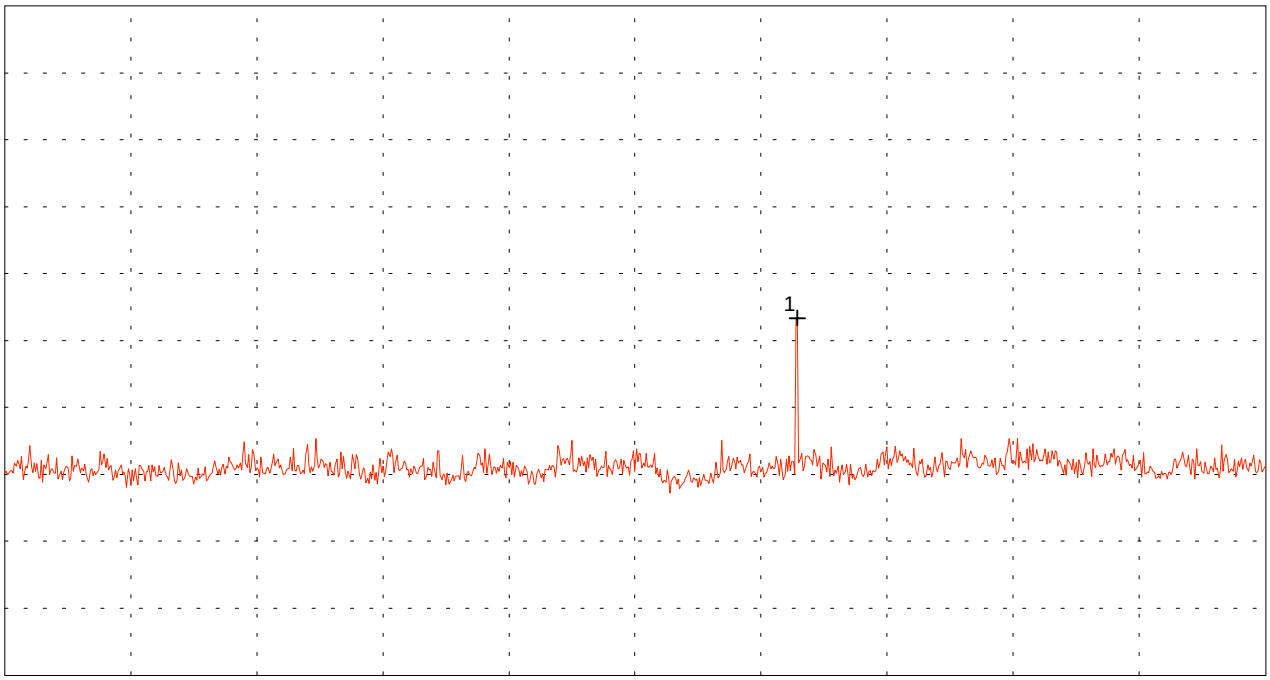
No. 1	4.887333 GHz	21.32 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 90 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

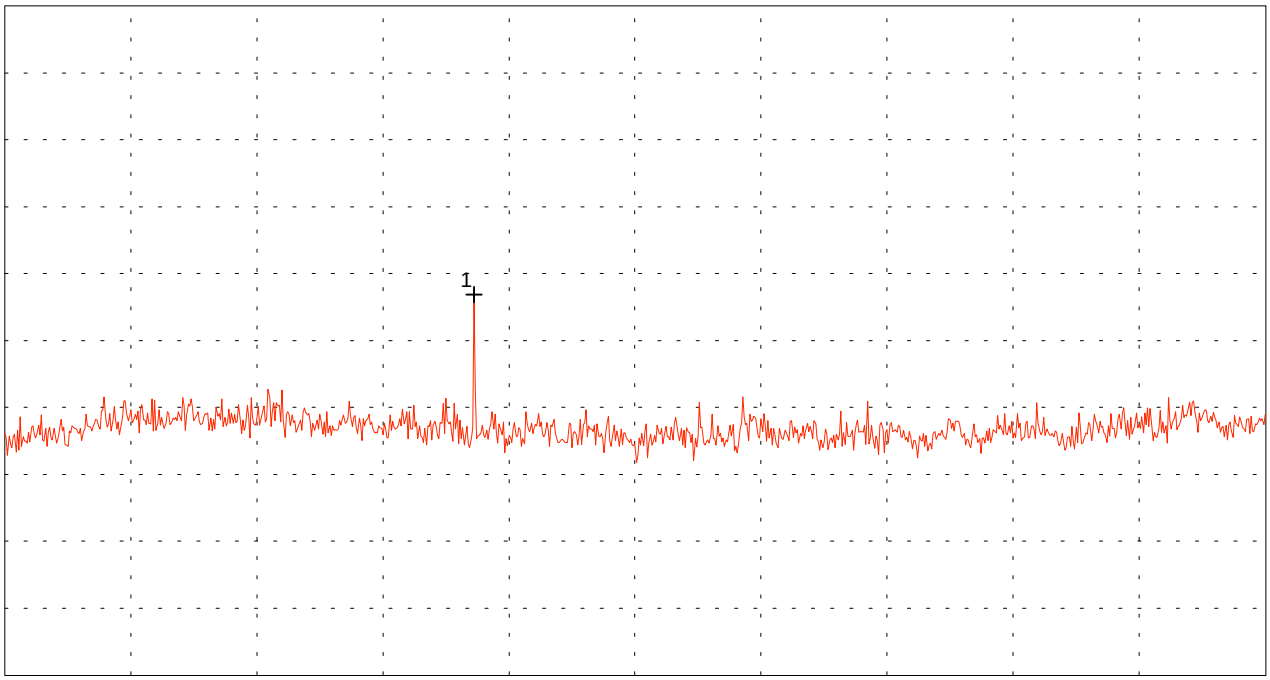
No. 1	7.327889 GHz	16.67 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 91 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

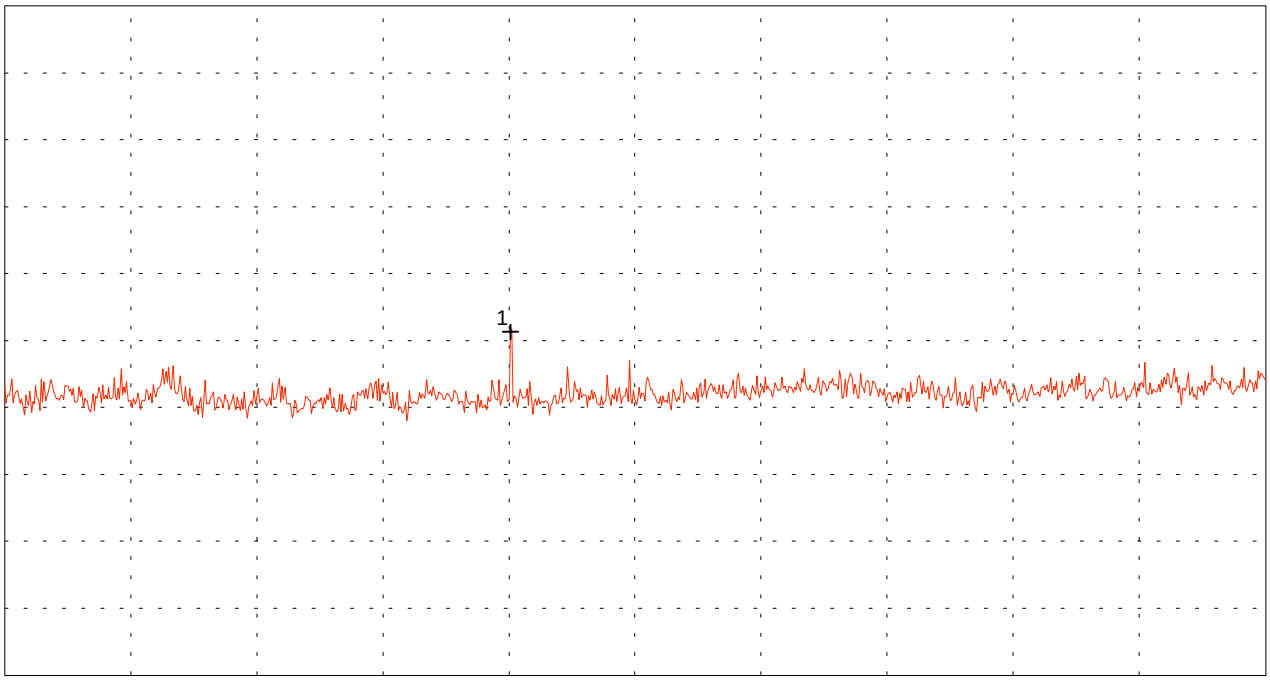
No. 1	9.763333 GHz	13.92 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 92 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

No. 1	14.646222 GHz	11.14 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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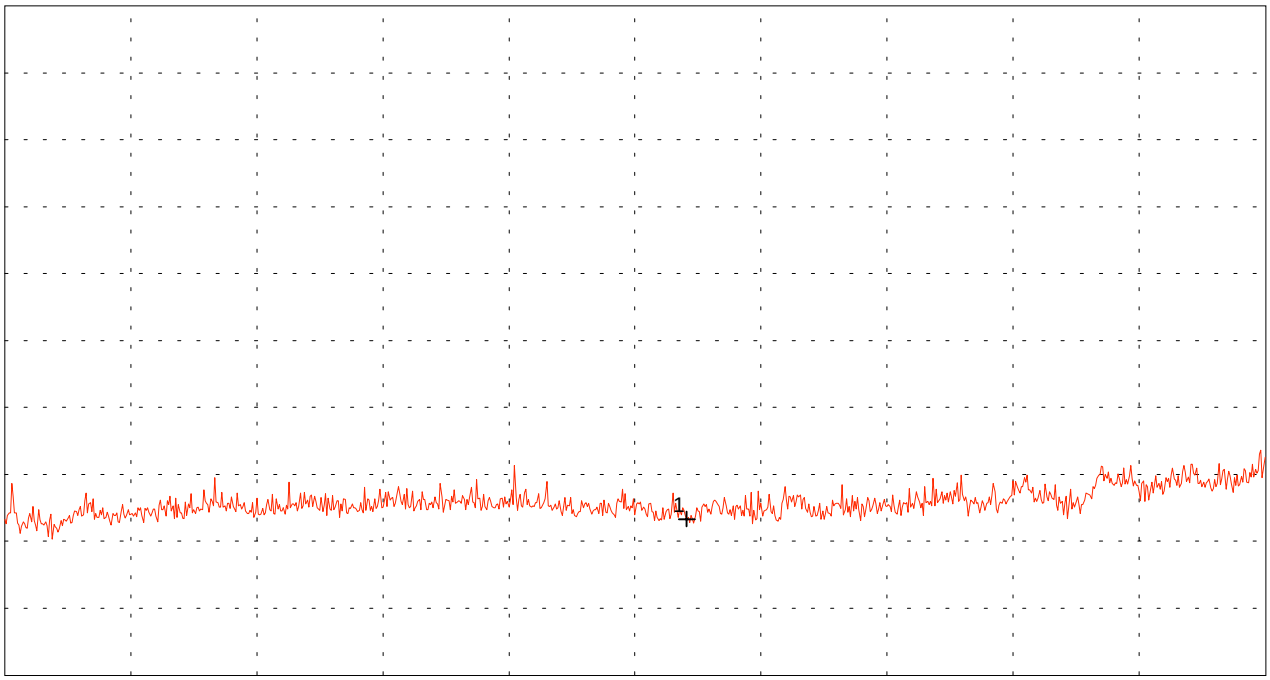
Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 40 (middle) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

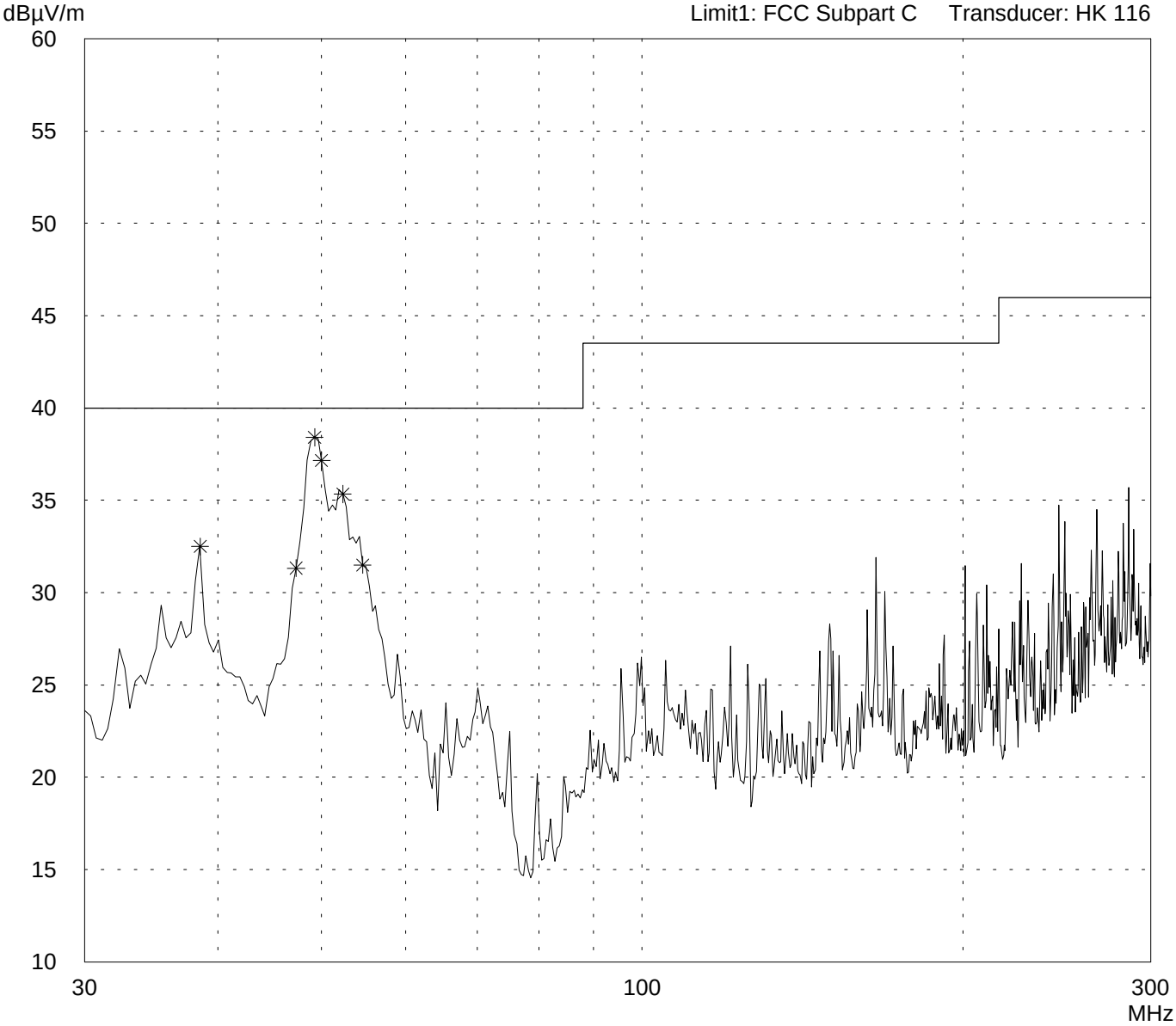
Multi Marker List

No. 1	21.787778 GHz	8.66 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 94 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

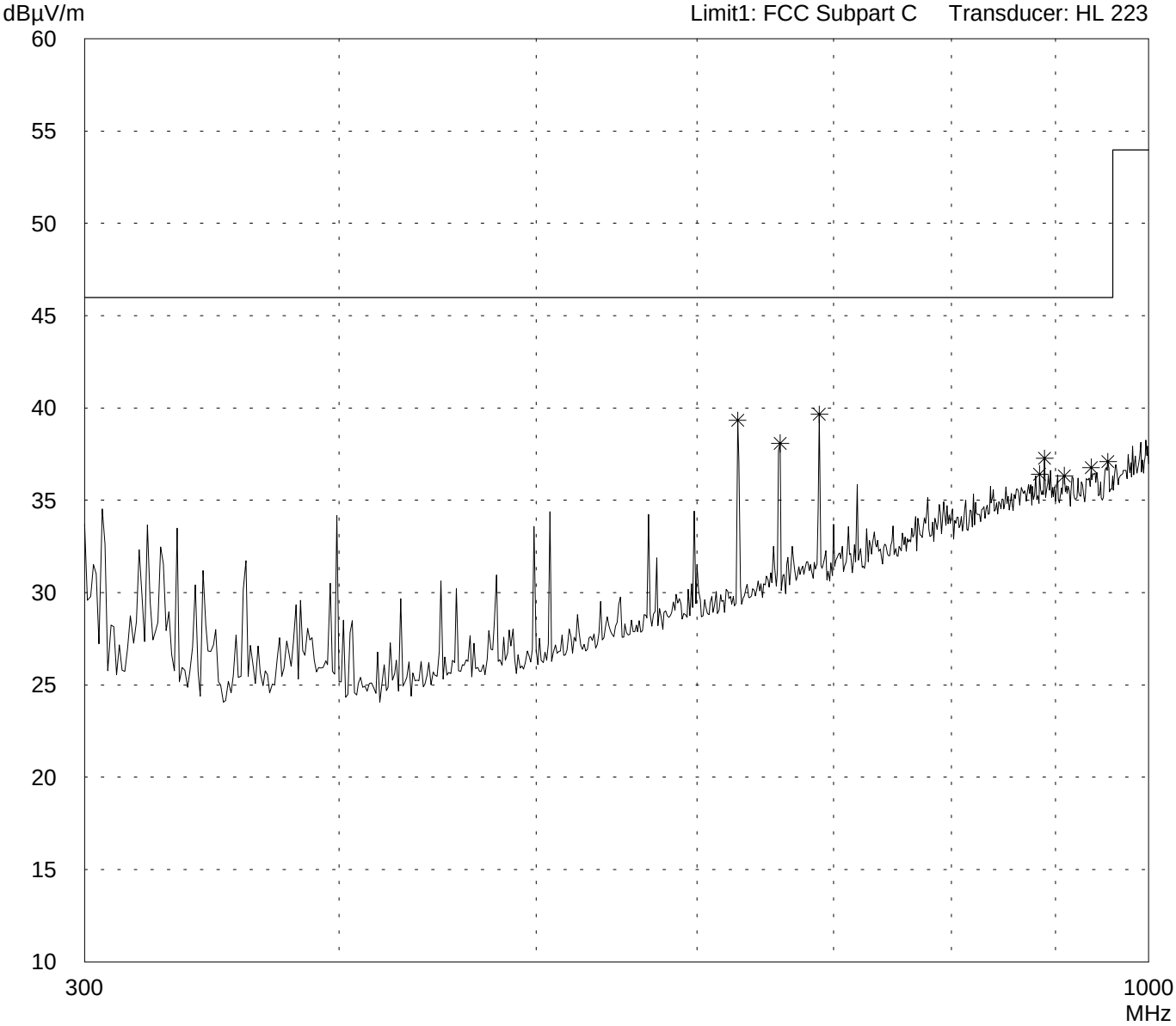


Result: Prescan	Project file: 50118-00241-2 — Page 95 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	

Detector: Peak	List of values: 10 dB Margin — 50 Subranges

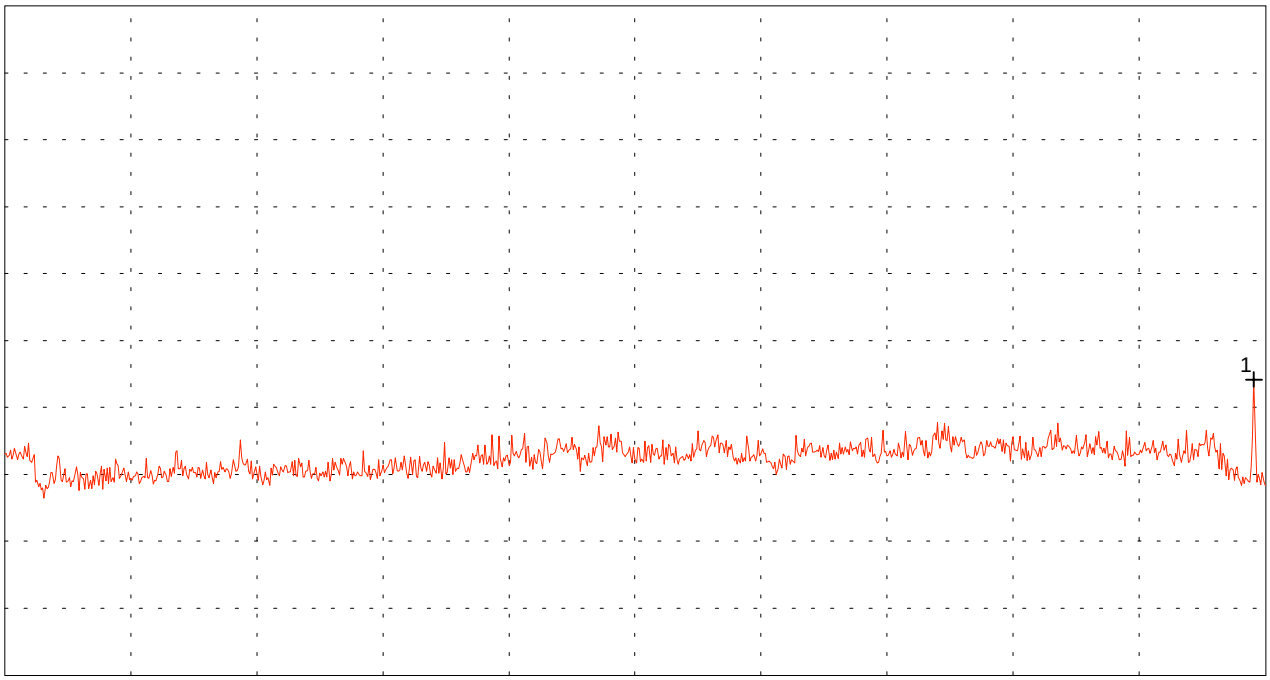


Result: Prescan	Project file: 50118-00241-2 — Page 96 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

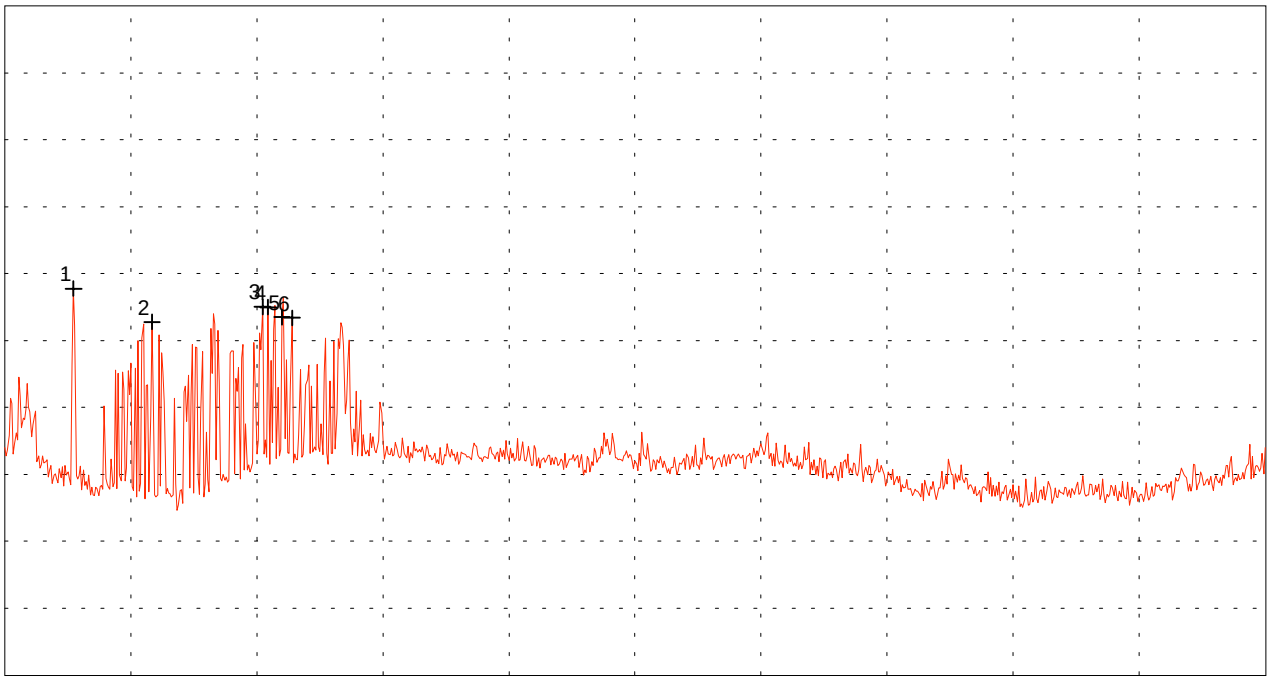
No. 1	2.486667 GHz	12.08 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 97 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

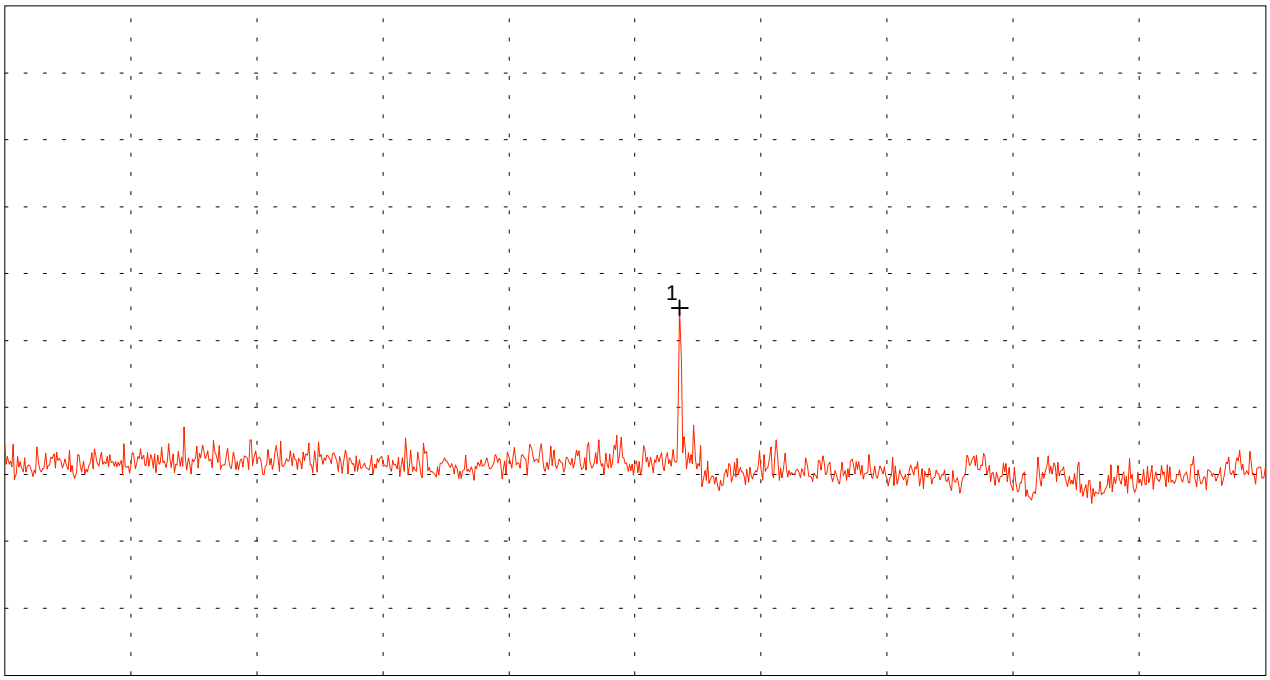
No. 1	2.484389 GHz	18.88 dBµV
No. 2	2.580833 GHz	16.39 dBµV
No. 3	2.716889 GHz	17.51 dBµV
No. 4	2.723778 GHz	17.49 dBµV
No. 5	2.741000 GHz	16.74 dBµV
No. 6	2.753056 GHz	16.69 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 98 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

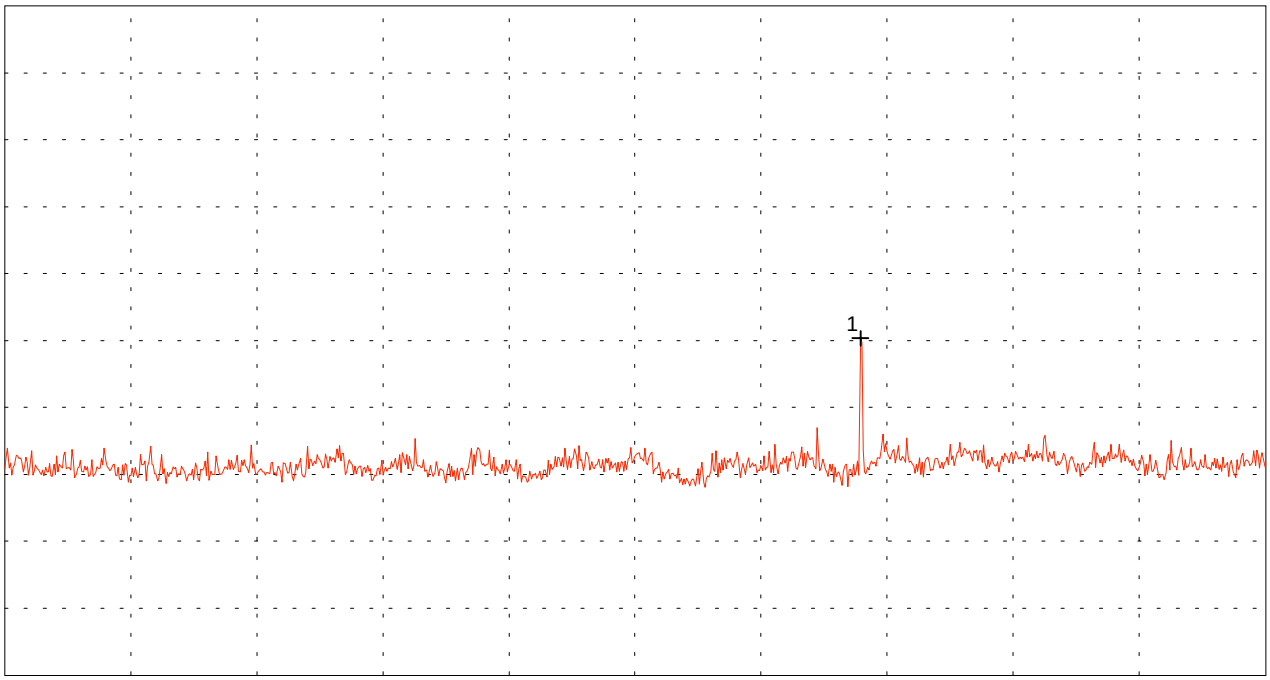
No. 1	4.967556 GHz	17.44 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 99 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

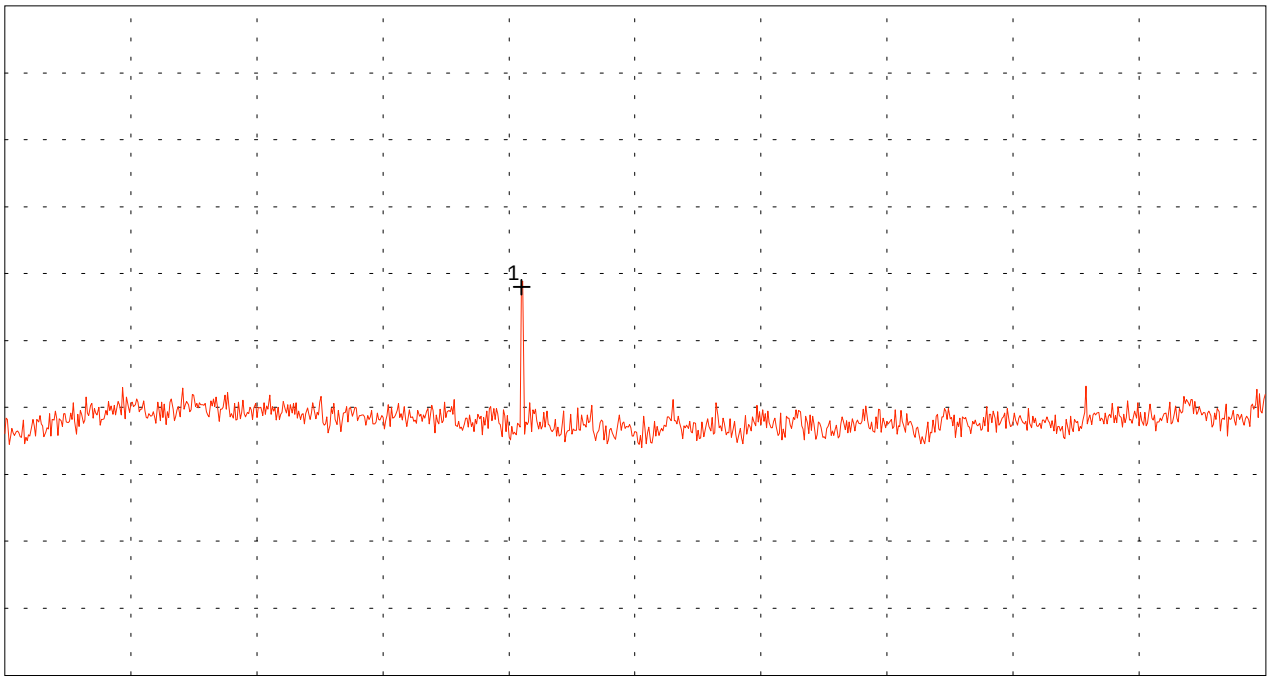
No. 1	7.445389 GHz	15.17 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 100 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

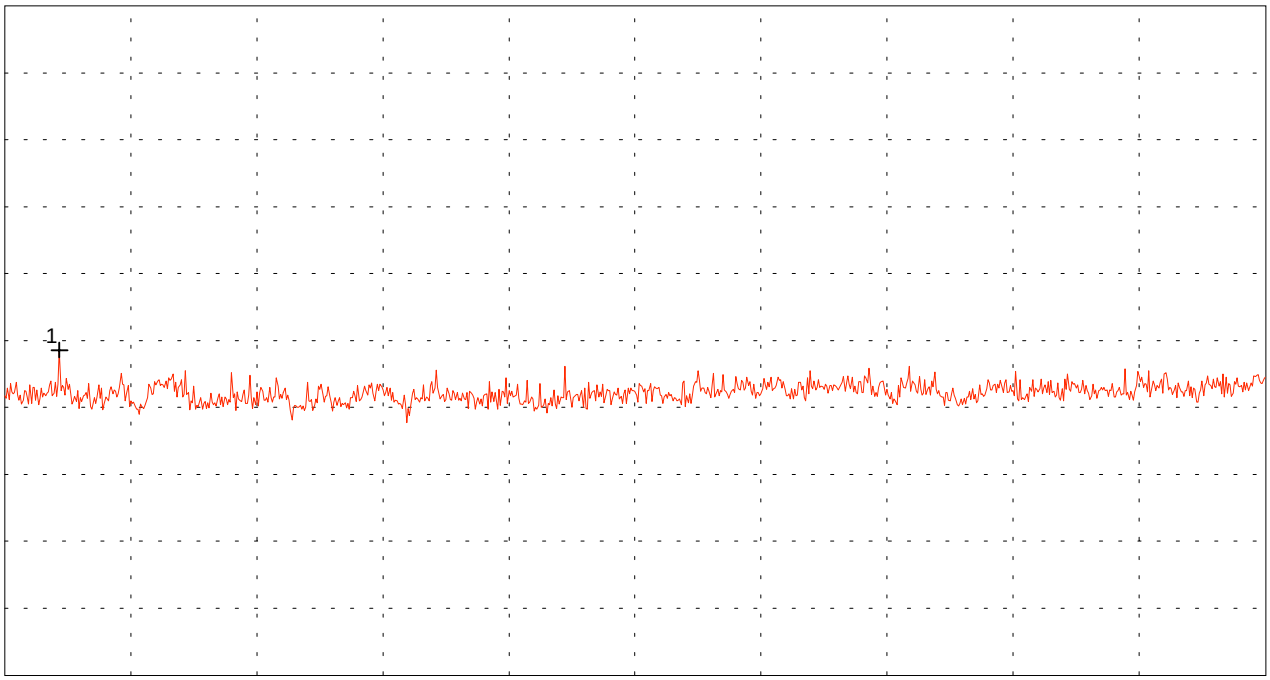
No. 1	9.922000 GHz	14.48 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 101 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

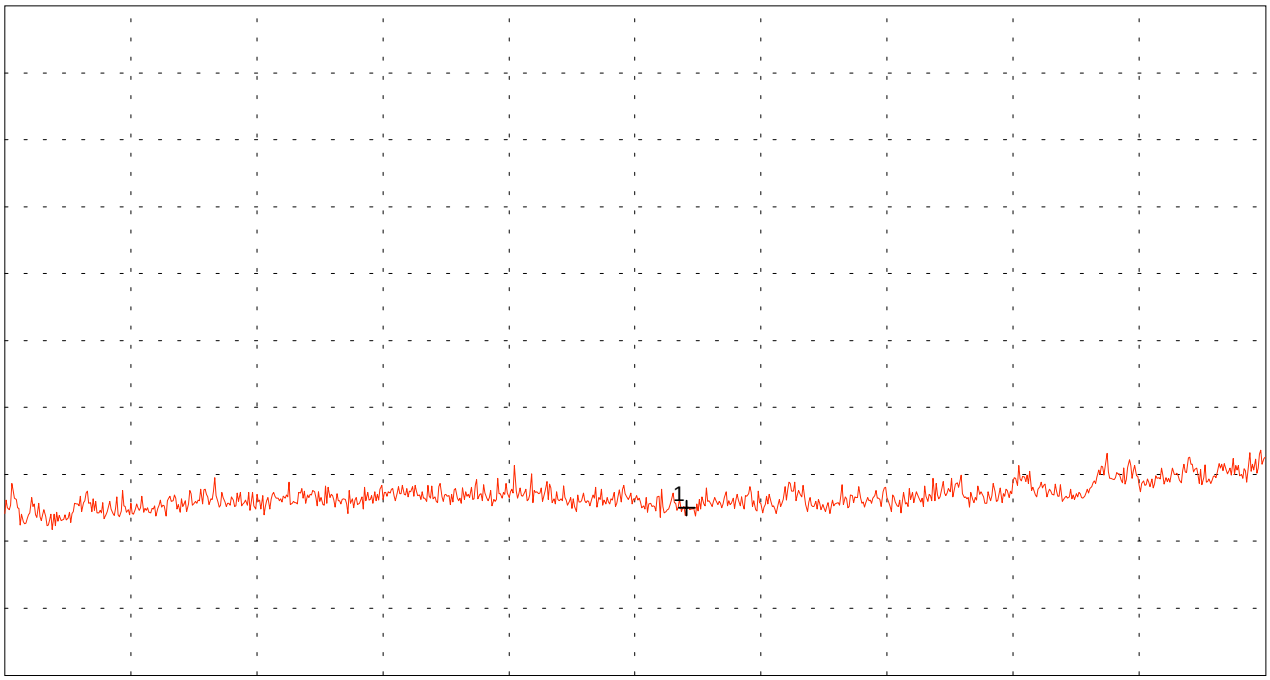
No. 1	12.642667 GHz	9.79 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 102 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

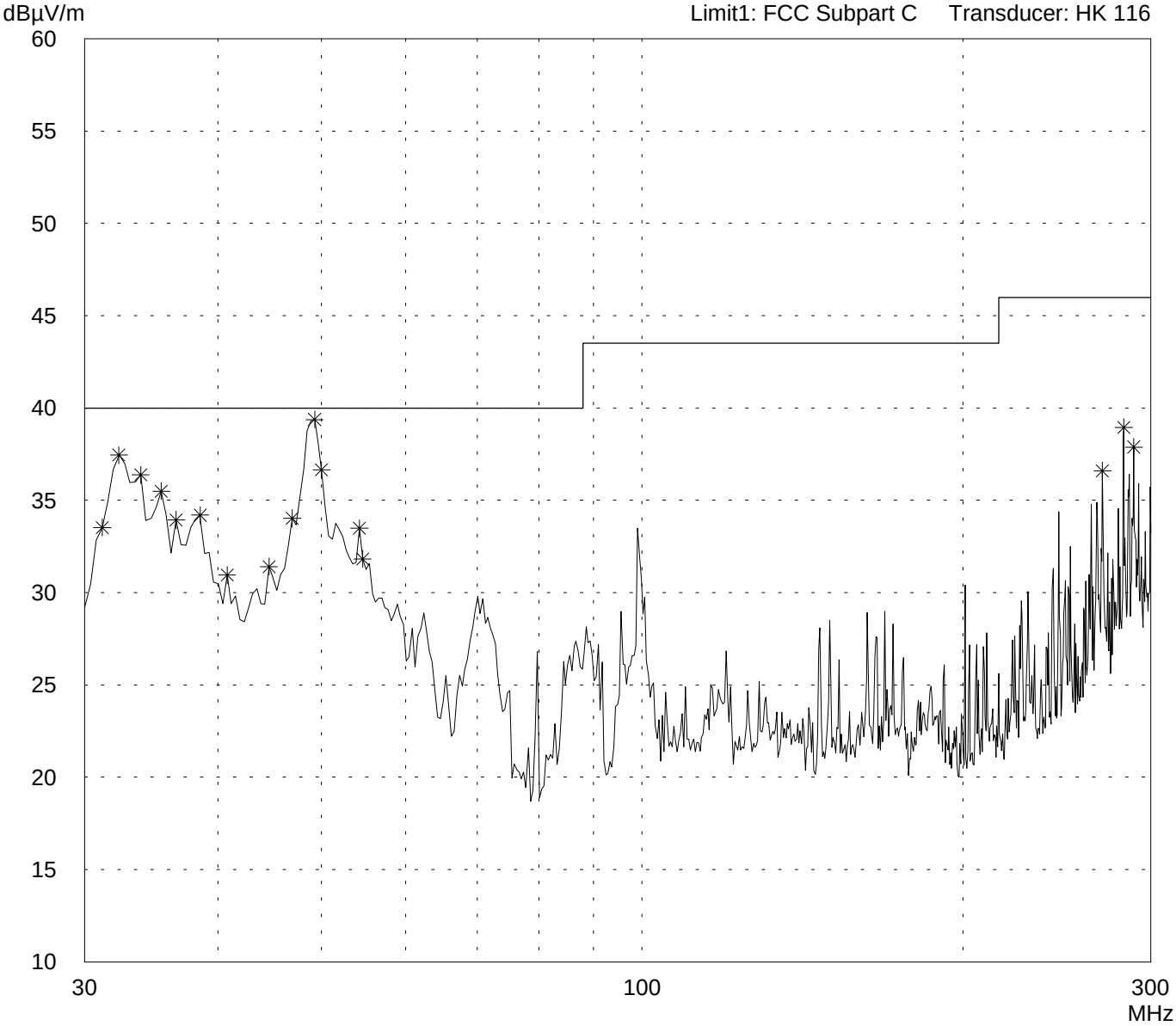
Multi Marker List

No. 1	21.787778 GHz	9.47 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 103 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

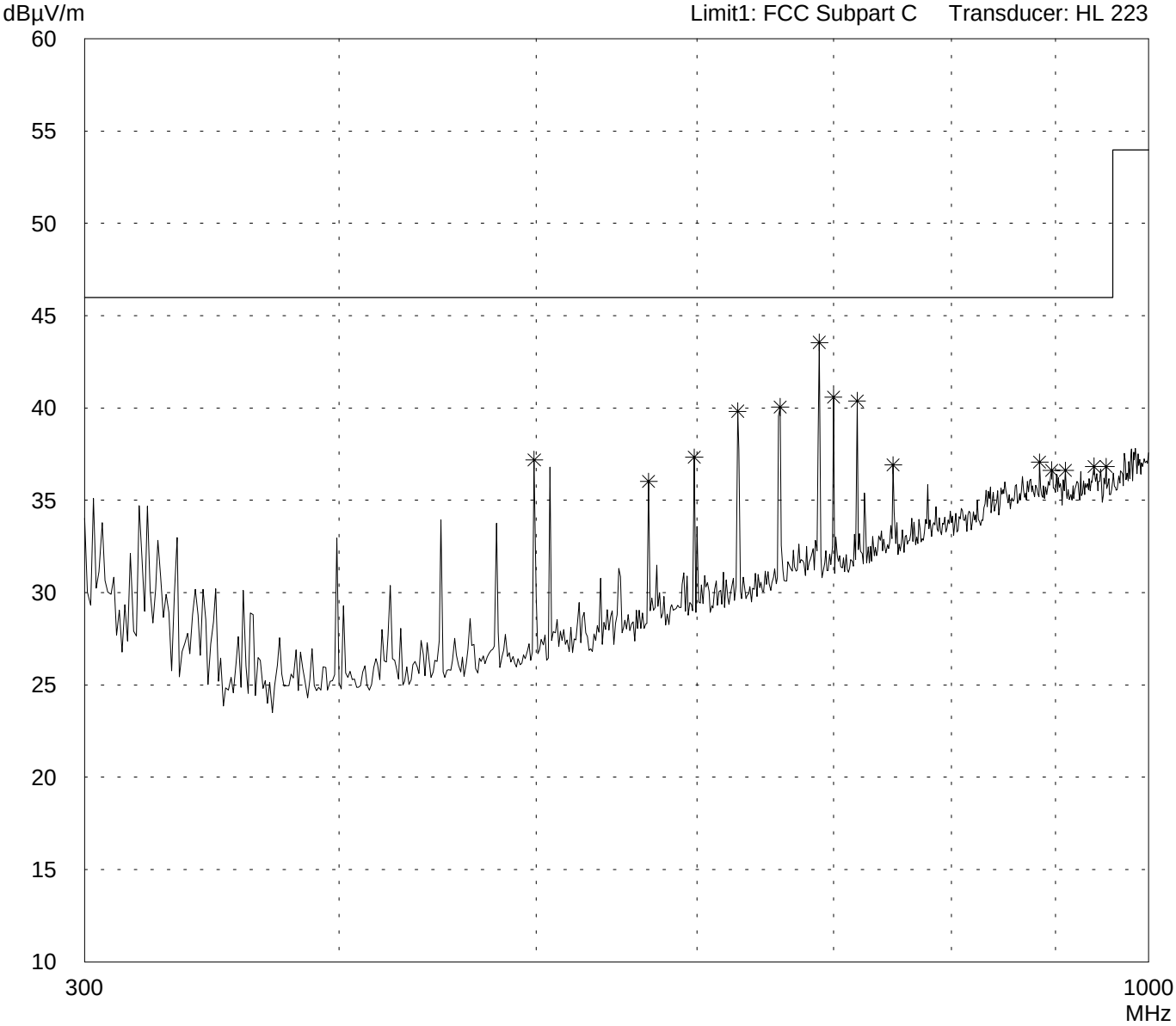
Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges



Result: Prescan	Project file: 50118-00241-2 — Page 104 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Transmit Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

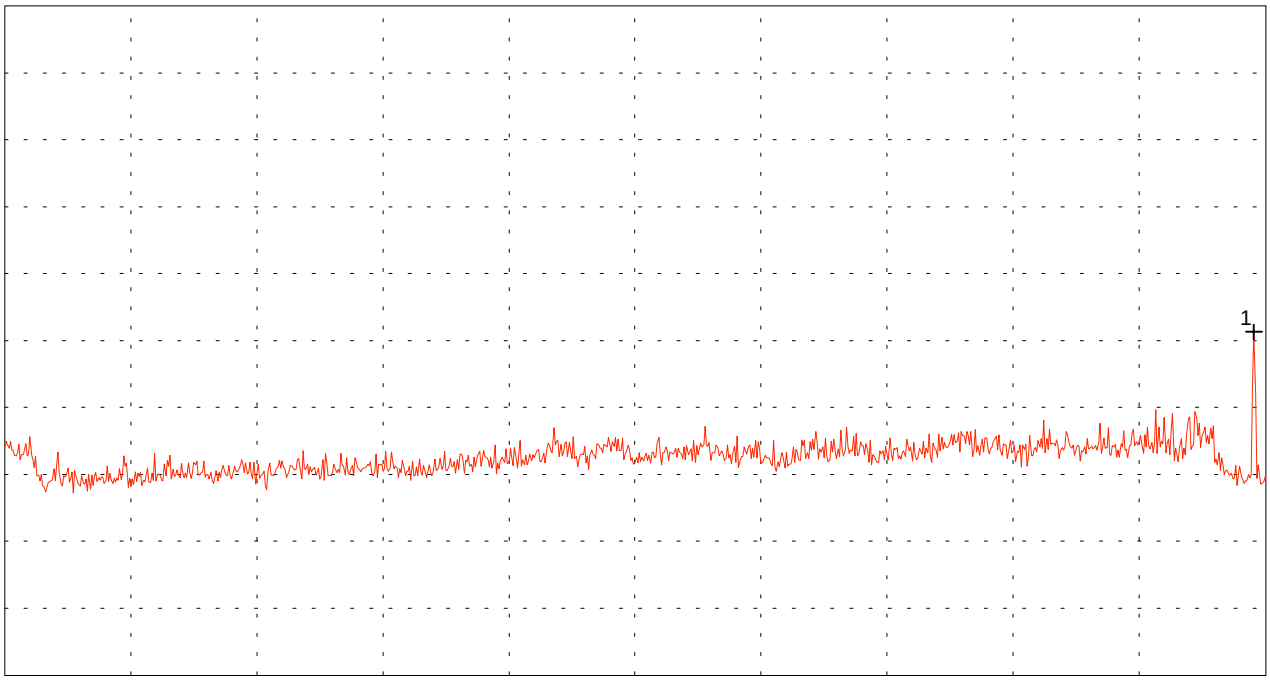


Result: Prescan	Project file: 50118-00241-2 — Page 105 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 2.500 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

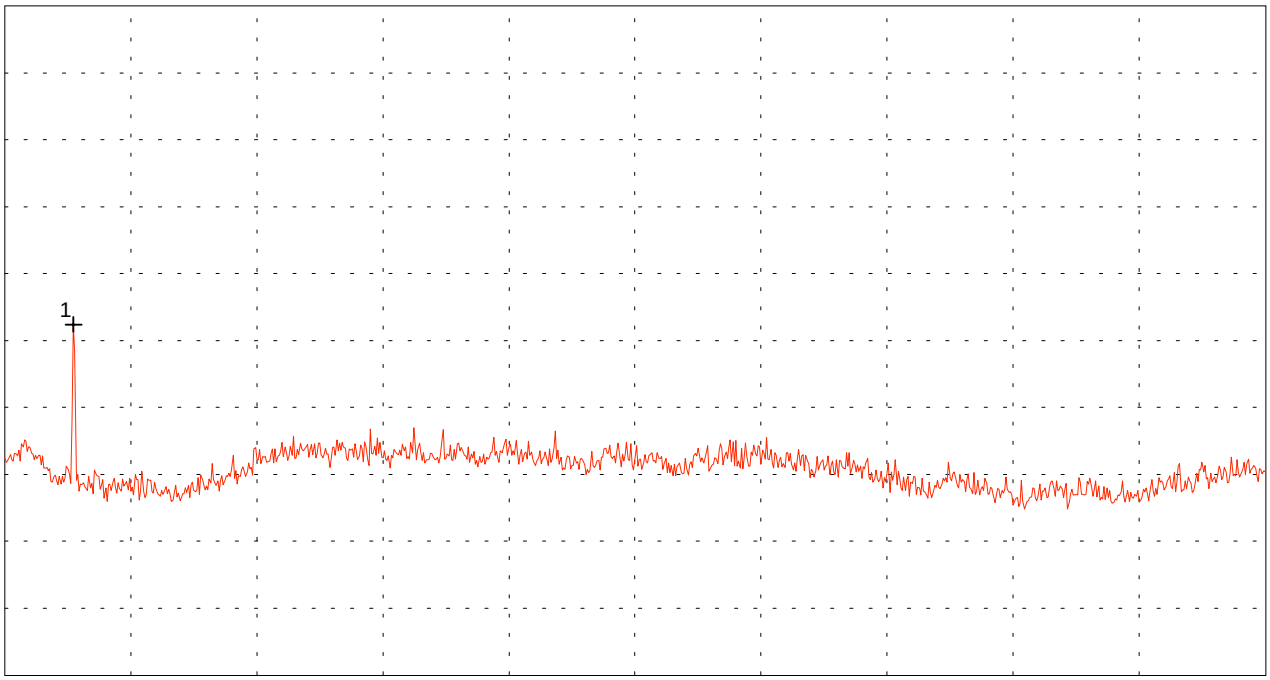
No. 1	2.486667 GHz	15.63 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 106 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Horizontal Polarisation, Peak Detector - Notch Filter for fundamental frequency
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 2.400 GHz Stop 3.950 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

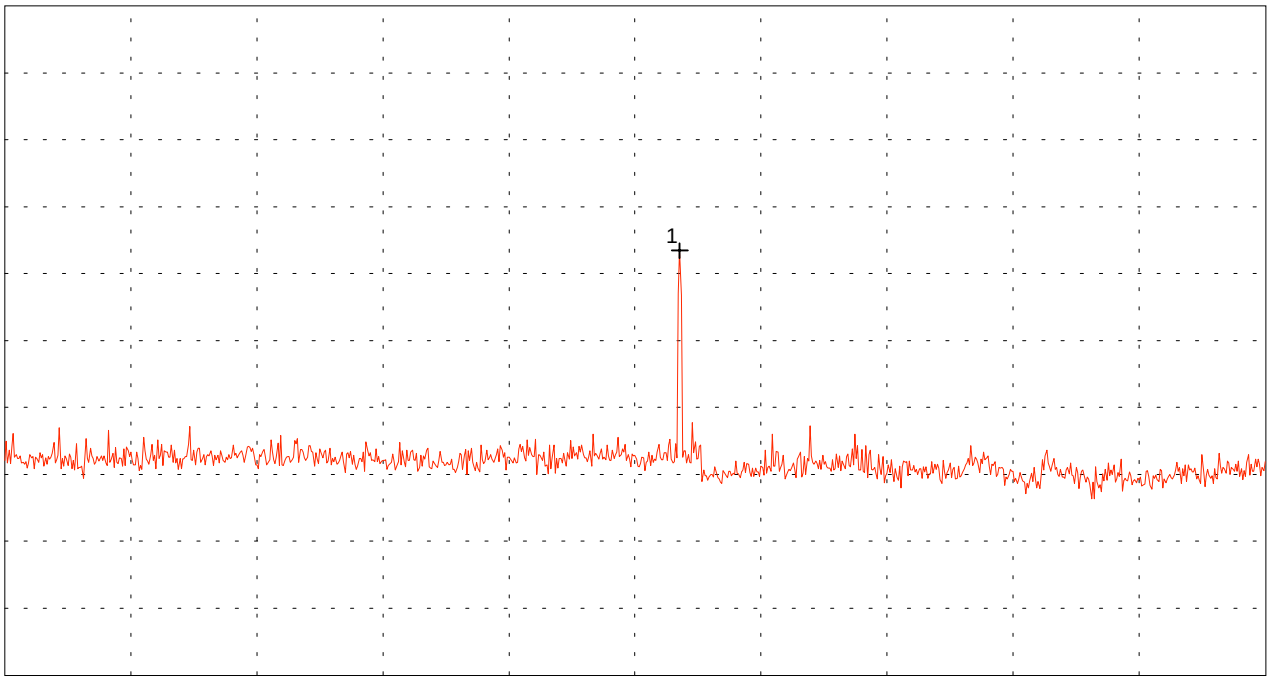
No. 1	2.484389 GHz	16.19 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 107 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 3.950 GHz Stop 5.850 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

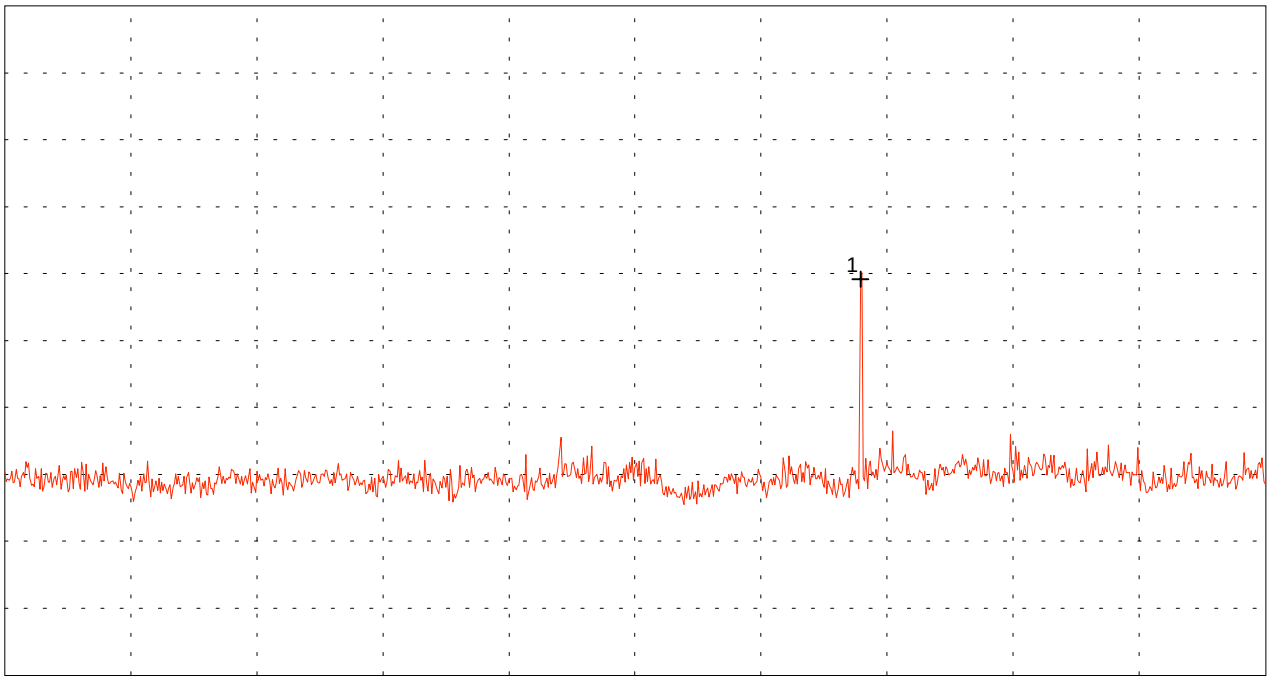
No. 1	4.967556 GHz	21.72 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 108 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 40 dBµV ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 5.850 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

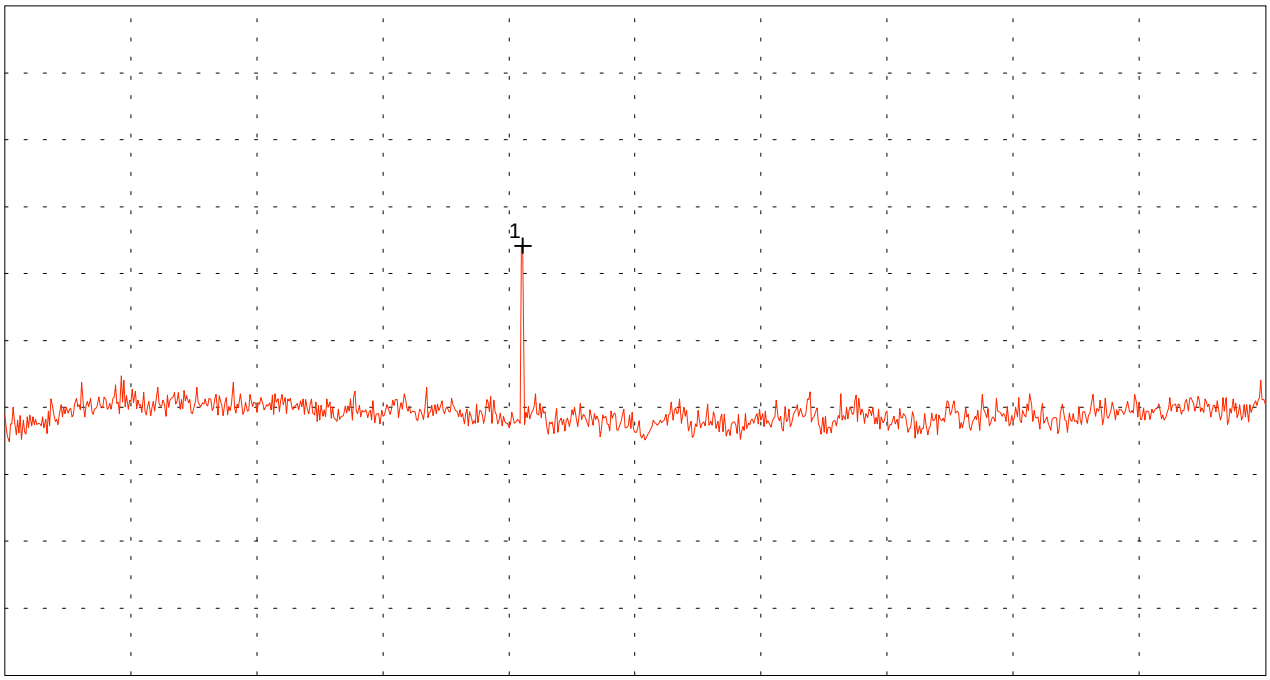
No. 1	7.445389 GHz	19.58 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 109 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

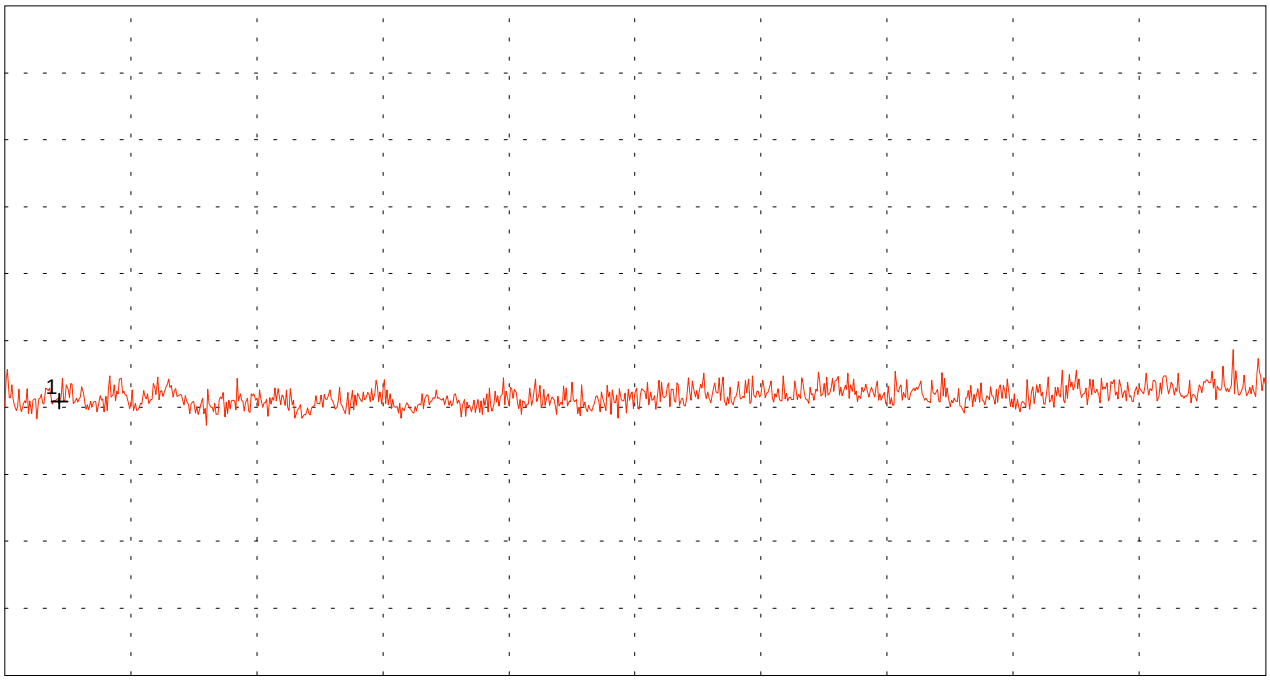
No. 1	9.926667 GHz	17.58 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 110 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation, Peak Detector
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 35.5 dBµV ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

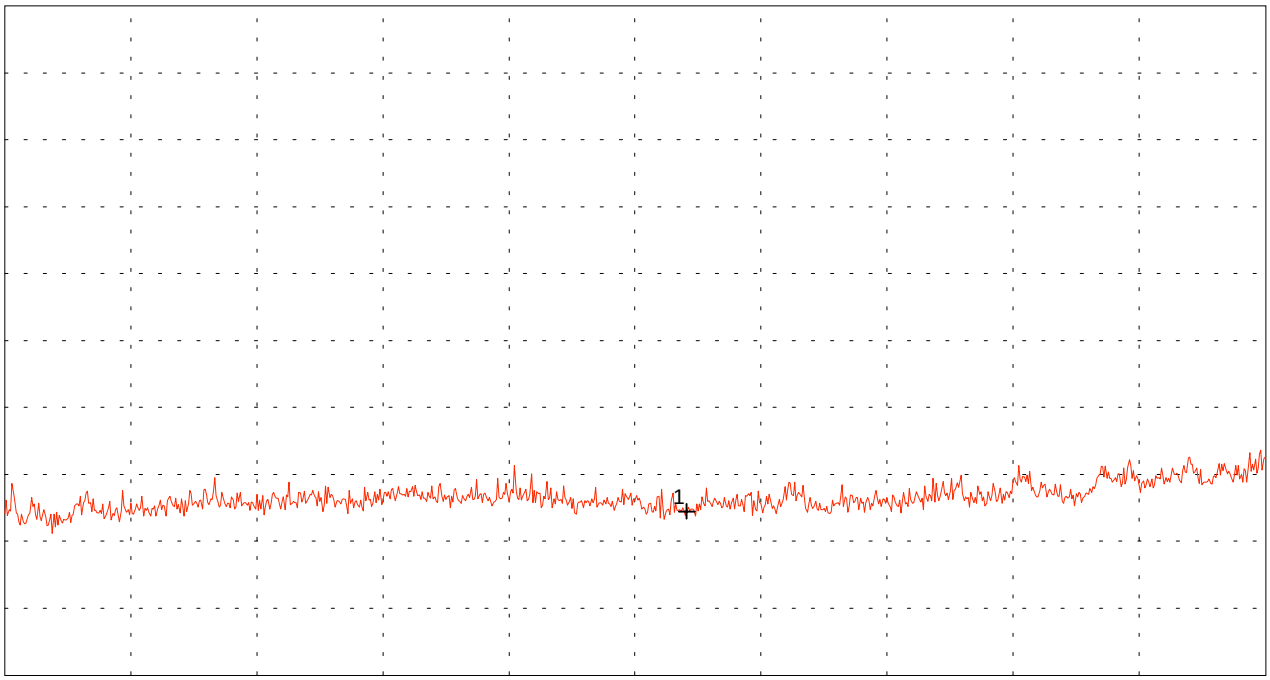
No. 1	12.642667 GHz	5.95 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 29, 2000	Page 111 of 122 Pages

Radiated Emission Measurement according to FCC Rules

Model: WIMAN II	Mode: - Static Mode, Channel 80 (highest) selected - TX power setting 28 (Procom Antenna, 2 dBi) - Modulation 4FSK, default data pattern - Vertical Polarisation - Test Distance : 1 meter
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 47 dBµV ATT 0 dB
5 dB/Div.



Start 18.000 GHz Stop 25.000 GHz
RBW 300 kHz VBW 300 kHz SWP 240 ms

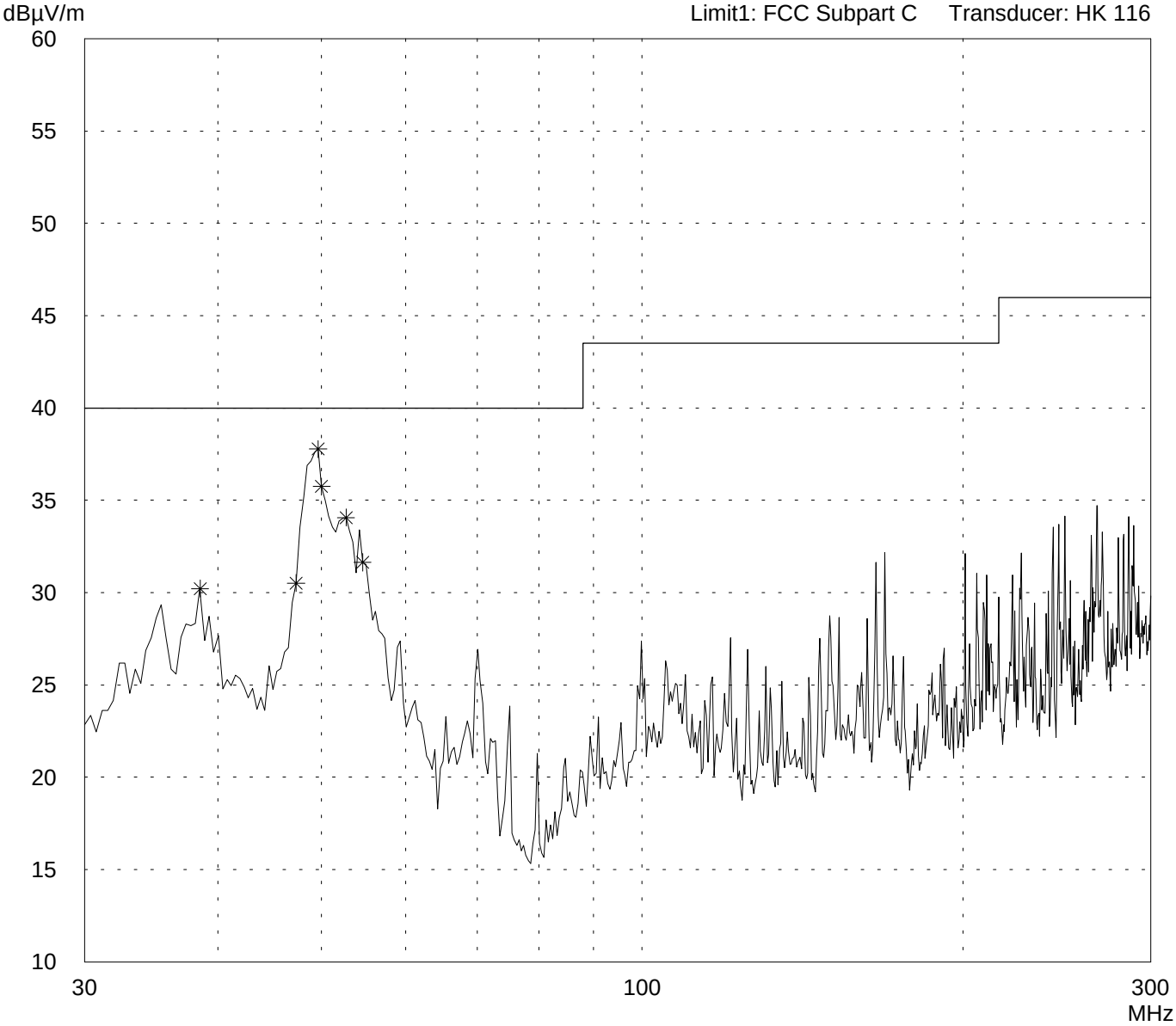
Multi Marker List

No. 1	21.787778 GHz	9.22 dBµV

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: May 30, 2000	Page 112 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

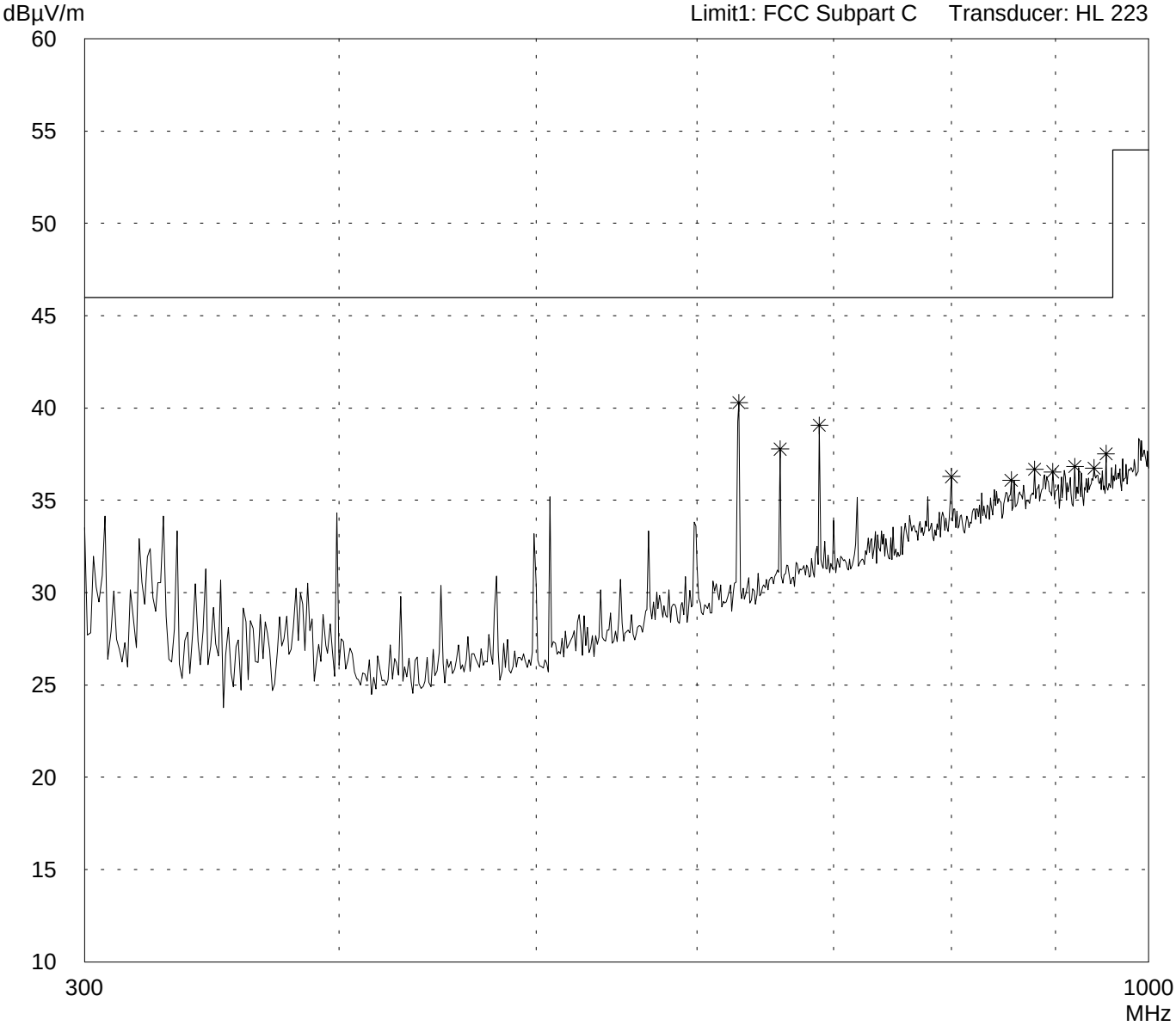
Model: WIMAN II	Mode: with Procom Antenna Receive Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges



Result: Prescan	Project file: 50118-00241-2 — Page 113 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Receive Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

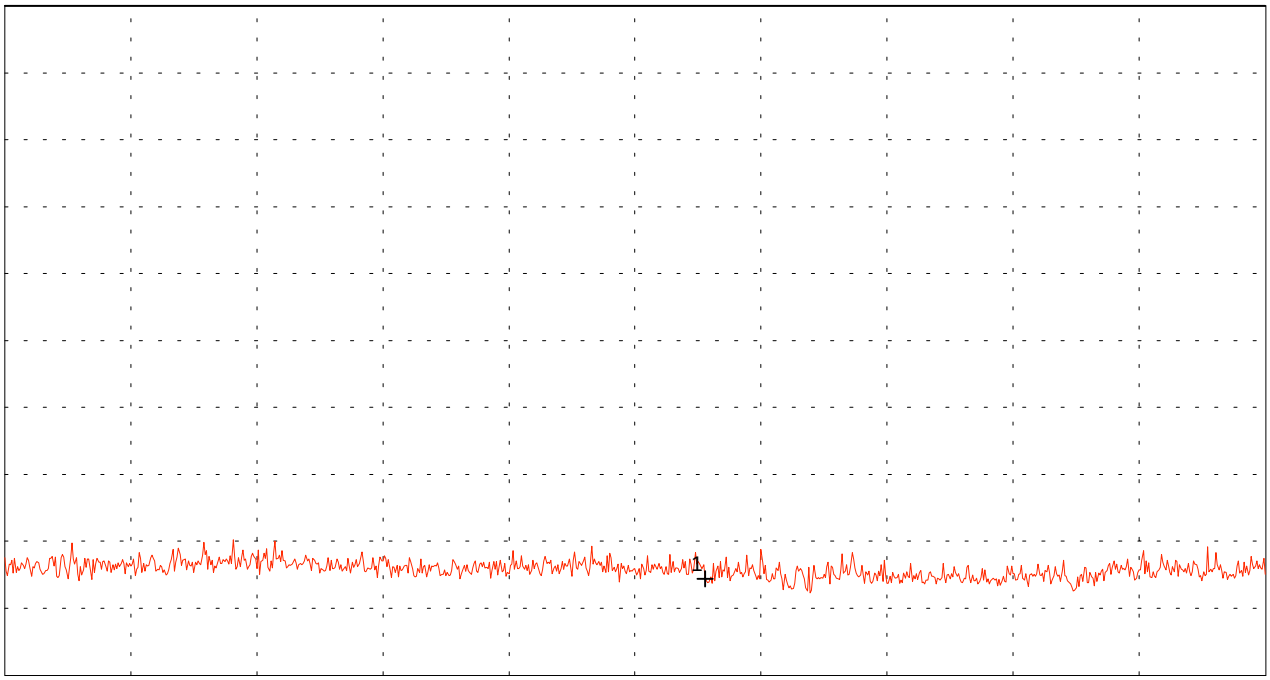


Result: Prescan	Project file: 50118-00241-2 — Page 114 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Horizontal Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 50 dBµV/m ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

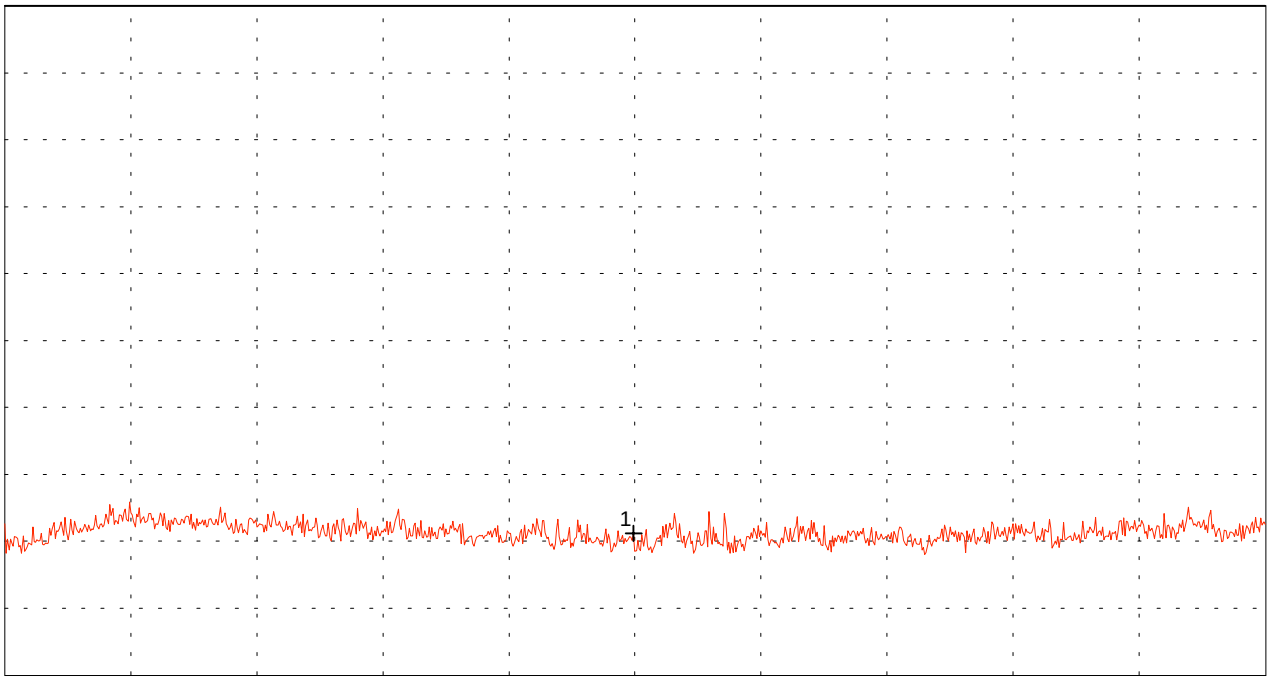
No. 1 5.000000 GHz 7.19 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: 05/29/2000	Page 115 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Horizontal Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 45.5 dBµV/m ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

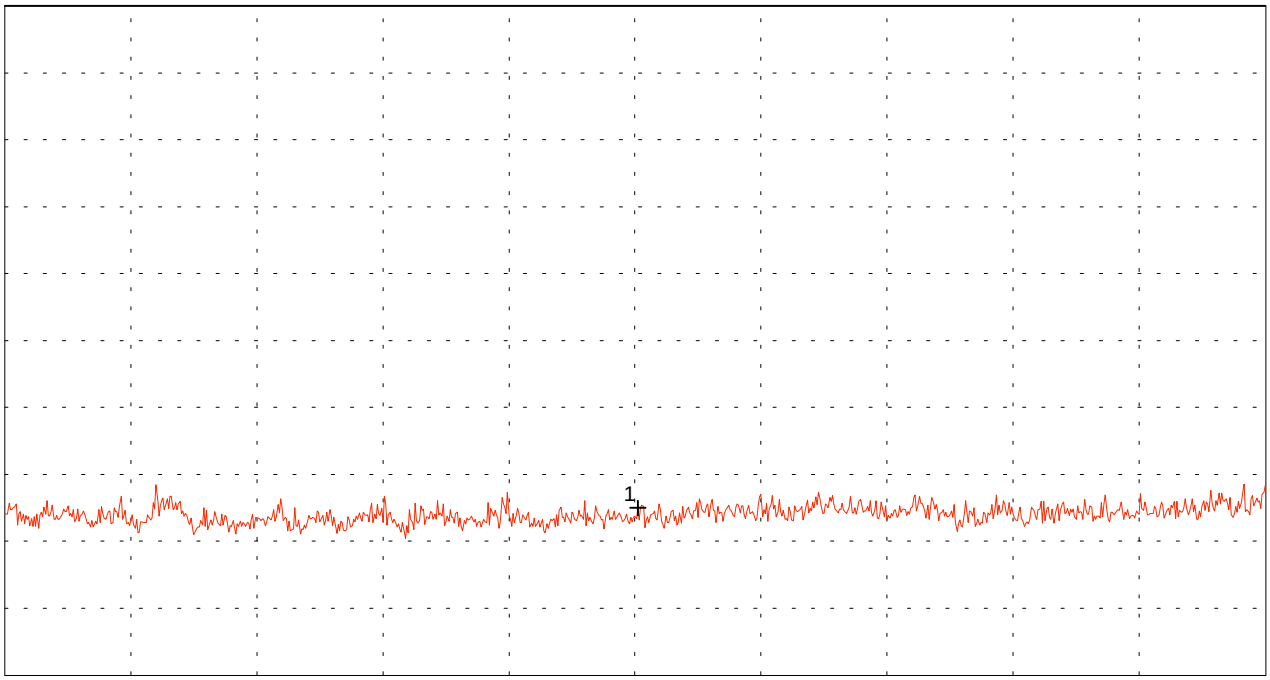
No. 1	10.295333 GHz	6.09 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: 05/29/2000	Page 116 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Horizontal Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 45.5 dBµV/m ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

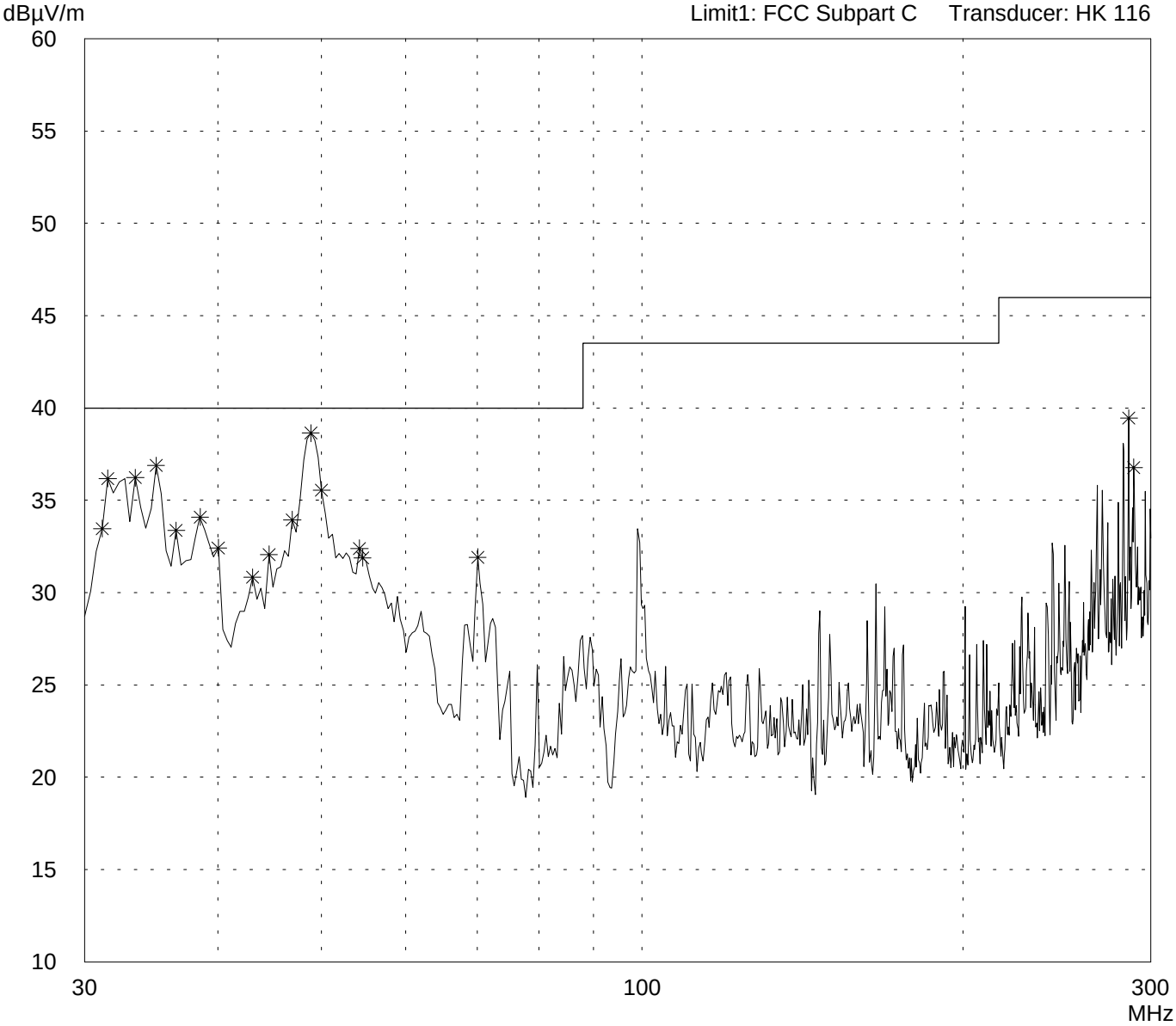
Multi Marker List

No. 1	15.212444 GHz	7.97 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: 05/29/2000	Page 117 of 122 Pages

Radiated Emission Test 30 MHz - 300 MHz
according to FCC Part 15 Subpart C

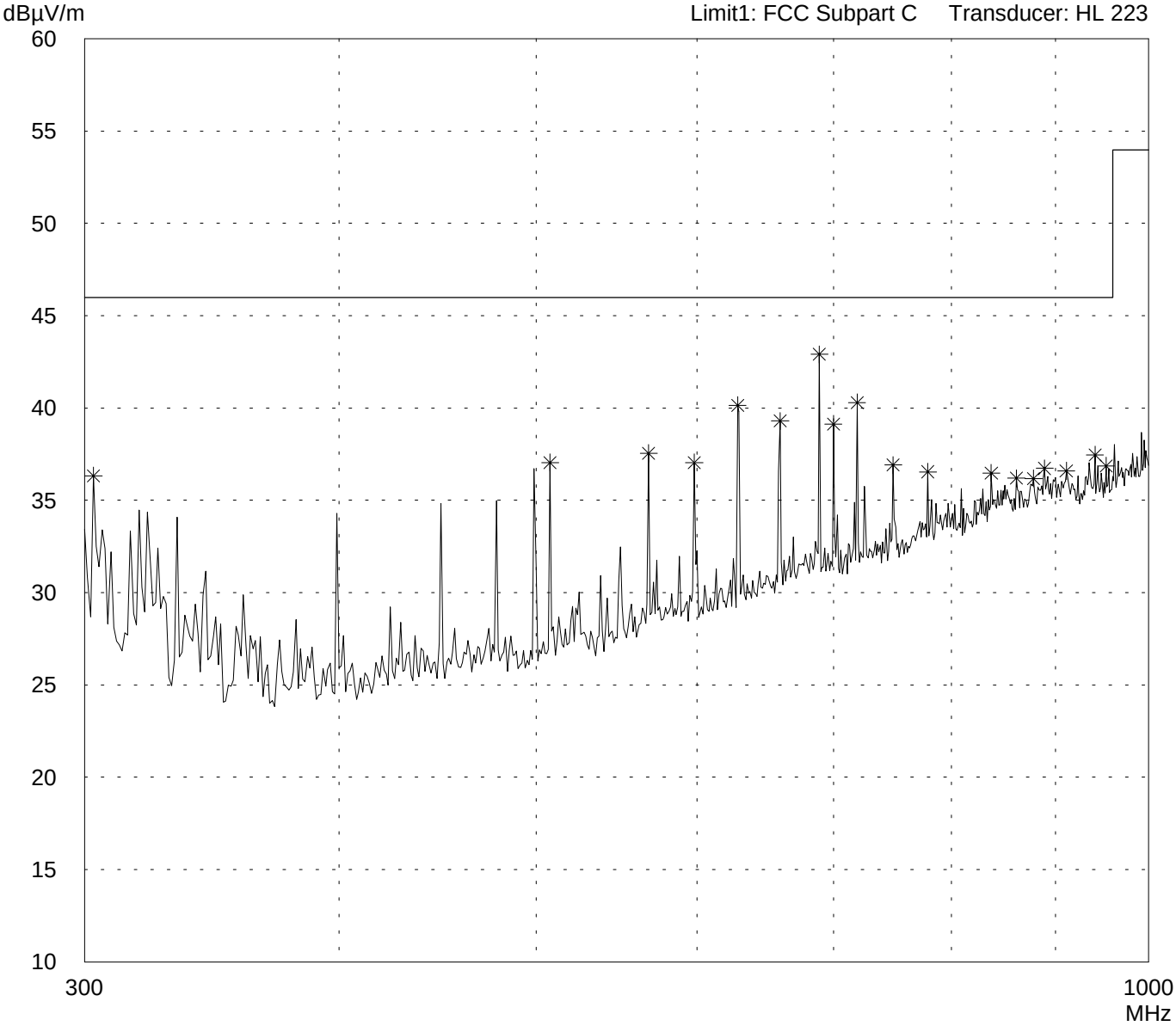
Model: WIMAN II	Mode: with Procom Antenna Receive Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges



Result: Prescan	Project file: 50118-00241-2 — Page 118 of 122 Pages

Radiated Emission Test 300 MHz - 1 GHz
according to FCC Part 15 Subpart C

Model: WIMAN II	Mode: with Procom Antenna Receive Mode at Channel 40
Serial no.: ---	
Applicant: Altvater Airdata Systems GmbH	
Test site: Semi anechoic room, cabin no. 3	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 05/17/2000 — Operator: J. Roidt	
Test performed: automatically — File name:	
Detector: Peak	List of values: 10 dB Margin — 50 Subranges

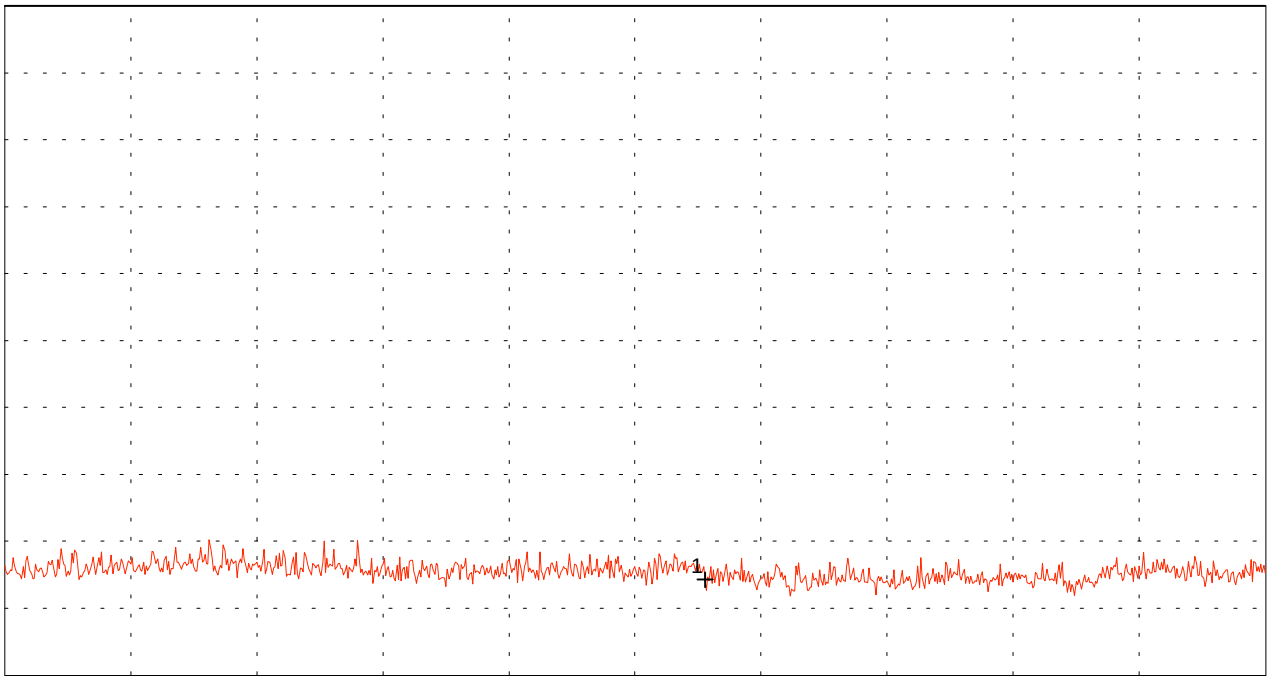


Result: Prescan	Project file: 50118-00241-2 — Page 119 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Vertical Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 50 dBµV/m ATT 0 dB Ref. Offset -30.5 dB
5 dB/Div.



Start 1.000 GHz Stop 8.200 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

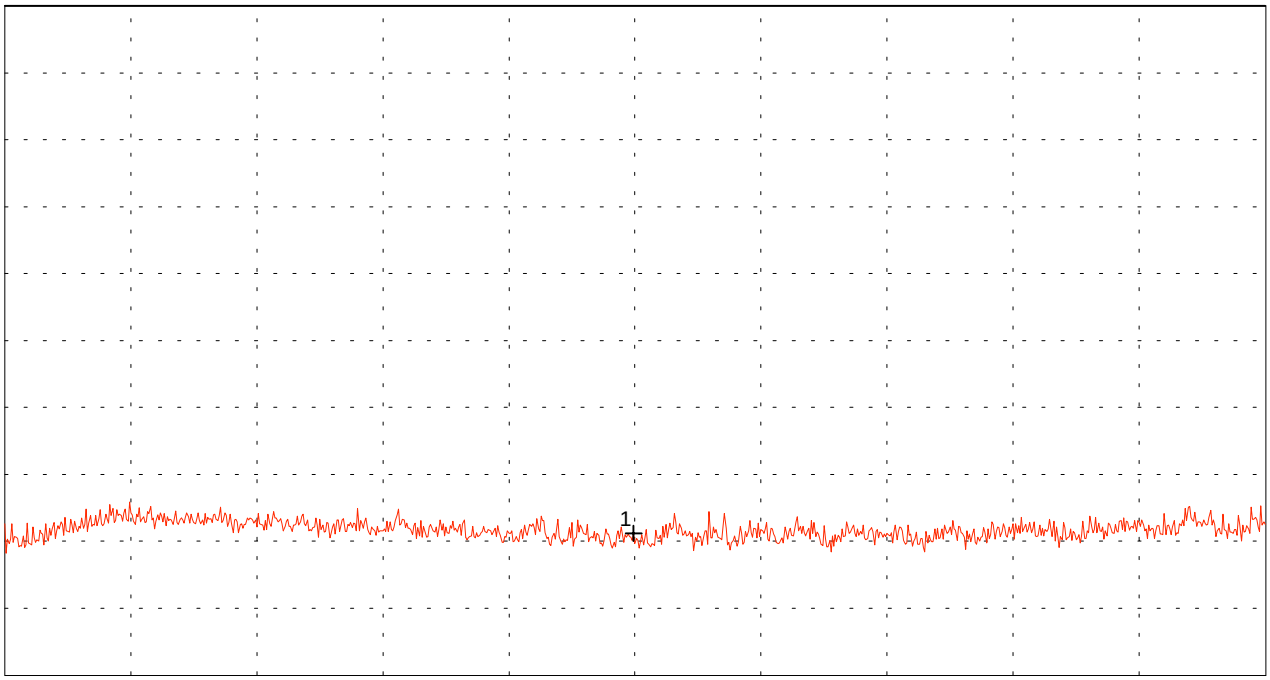
No. 1	5.000000 GHz	7.12 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: 05/29/2000	Page 120 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Vertical Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 45.5 dBµV/m ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 8.200 GHz Stop 12.400 GHz
RBW 1 MHz VBW 1 MHz SWP 20 ms

Multi Marker List

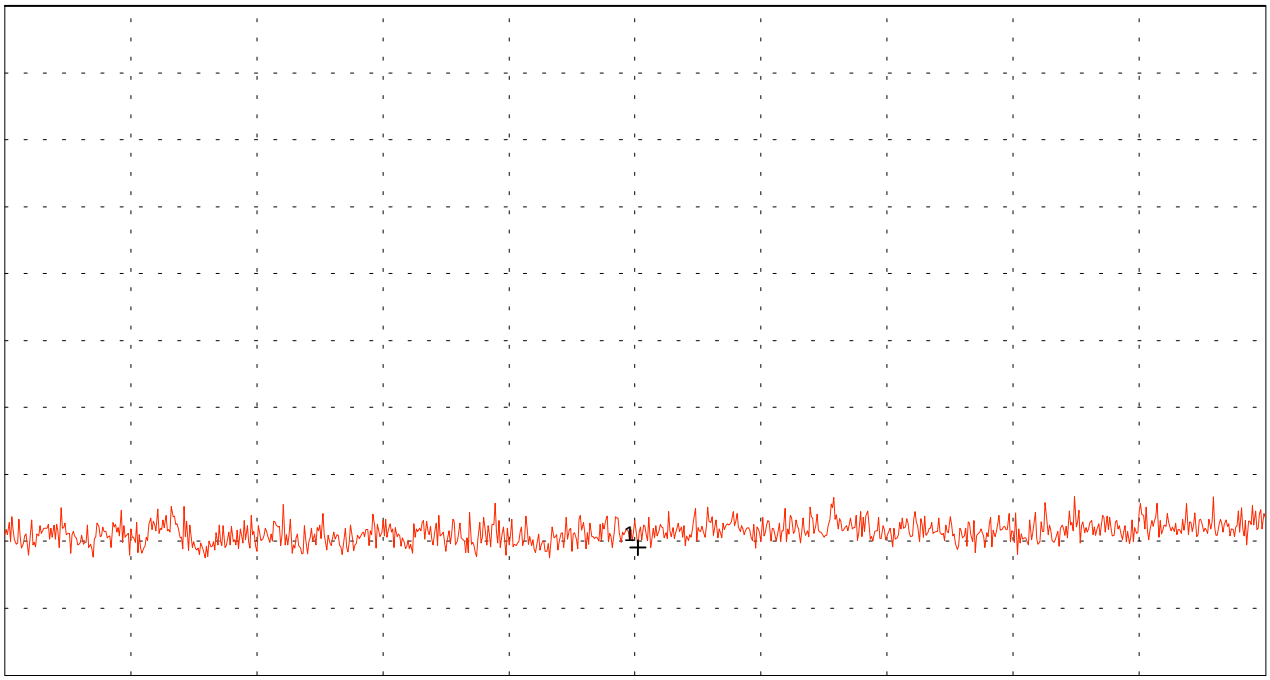
No. 1	10.295333 GHz	6.09 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
Date: 05/29/2000	Page 121 of 122 Pages

Radiated emission 1 GHz - 25 GHz acc. to FCC Part 15 Subpart C

Model: WIMAN II	Mode: - FCC test setup - with supply voltage 115 V AC - with external antenna Procom 2 dBi - RX mode with f = 2.450 GHz (Channel 40) - Test distance: 3 meters - Vertical Polarisation
Serial No.: ---	
Applicant: Altvater Airdata Systems GmbH & Co. KG	

Ref.Level 45.5 dBµV/m ATT 0 dB Ref. Offset -35 dB
5 dB/Div.



Start 12.400 GHz Stop 18.000 GHz
RBW 1 MHz VBW 1 MHz SWP 40 ms

Multi Marker List

No. 1	15.212444 GHz	5.01 dBµV/m

Tested by: Johann Roidt	Project-No.: 50118-00241-2
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