

Test report

IF343_02.DOC

EUT: Short range device family

Trade name: P60/W01, P60/W02

Tested type: P60/W01, P60/W02

Equipment Class: DXX

FCC Identifier: Pending

Production level: Prototype

S/N: xx

Responsible party: Interflex Datensysteme GmbH
Großwiesenstr. 24
D-78591 Durchhausen
Germany

Measurement procedure: FCC Rules CFR 47 Part 15
– Subpart C Section 15.209
The regulations were kept
 not kept

Applicant: Interflex Datensysteme GmbH
Großwiesenstr. 24
D-78591 Durchhausen
Germany

Contact person: Mr. Kiemele

Arrival of EUT: 10/14/2003

ID of EUT: PR342_05, PR342_04

Date(s) of test of EUT: 10/14/2003

Remarks:

The test results effects only to the relate items tested. The test report shall not be reproduced except in full without the written approval of the testing laboratory

Test laboratory:

EMCE GmbH Ingenieurbüro für EMV-Prüfungen
und Schaltungsentwicklung
Laupheimer Str. 25d
88483 Burgrieden / Germany
Conformity Assessment Body / FCC Registration Nr. 90568
DAR-Registration Nr: TTI-P-G164/98

Test engineer:

Mr. Chr. Vogelmann
EMCE GmbH Ingenieurbüro für EMV-Prüfungen
und Schaltungsentwicklung

EUT description:

Reader for an access control system.

The product offers following features:

- Wiegand interface: Data 1, Data 0 signal return
- Beeper
- External power supply with 5VDC \pm 5%

Antenna P60W01:

- Type: Loop
- Size: 58,5x35,5mm

Antenna P60W02:

- Type: Loop
- Size: 71x67mm

Operating frequency:

125kHz \pm 1kHz / Fundamental frequency of the magnetic field
8MHz / Ceramic resonator / Clock for the controller

EUT size: P60/W01 80x41x15 (LxWxH)
 P60/W02 120x761x25 (LxWxH)

EUT configuration: The reader was supplied via an external power supply. A door manager monitored the reader information. Usually the reader is separate mounted and the door manager is not necessarily in the neighborhood. Therefore the reader was tested without peripheral components.

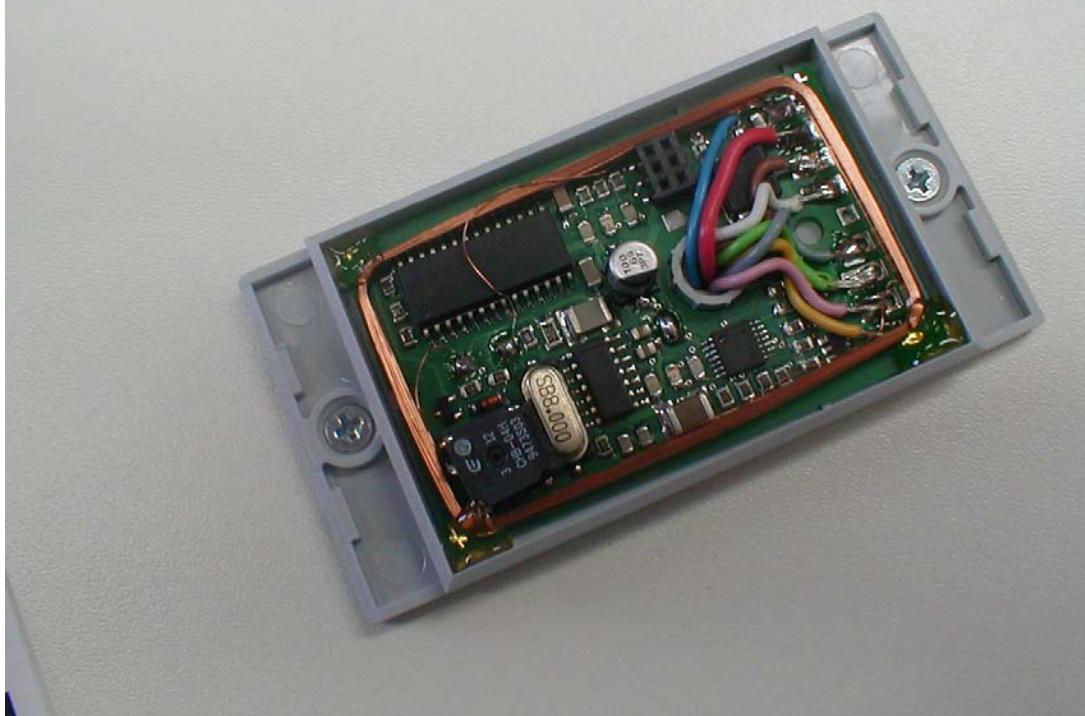
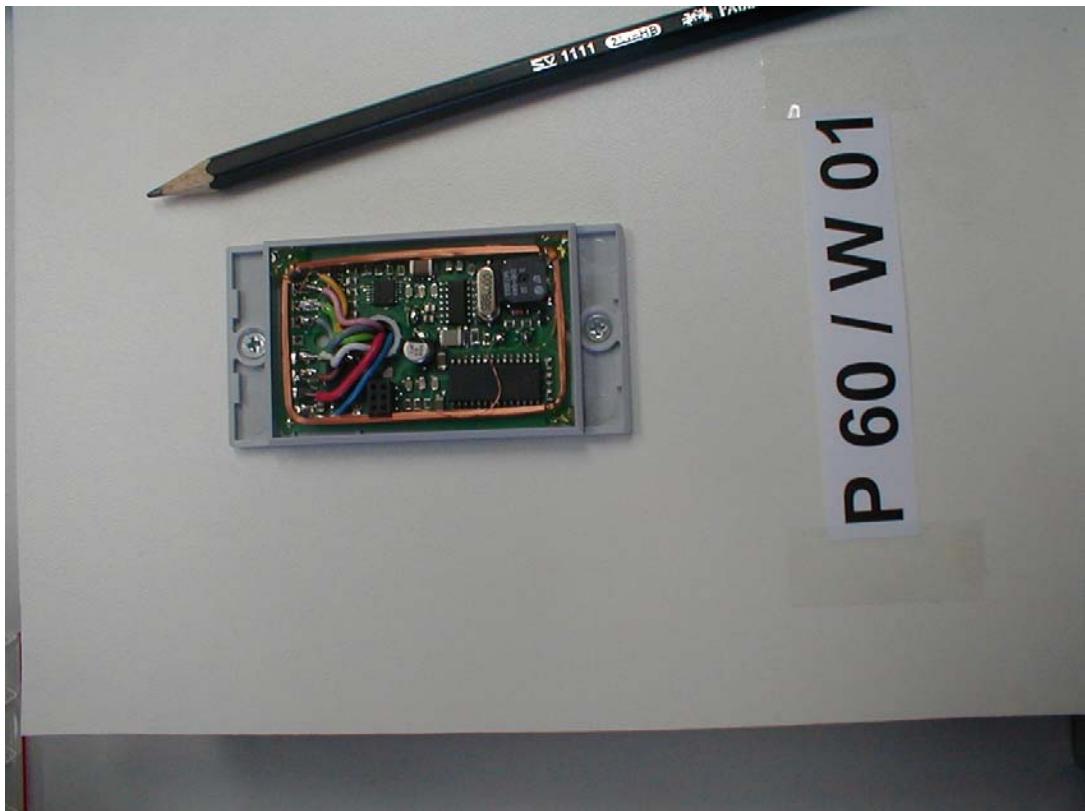
Harness	Type	Length	Remarks
Connecting attachment	Common cable 8 wires	> 3m	No special accessories

Used accessories:

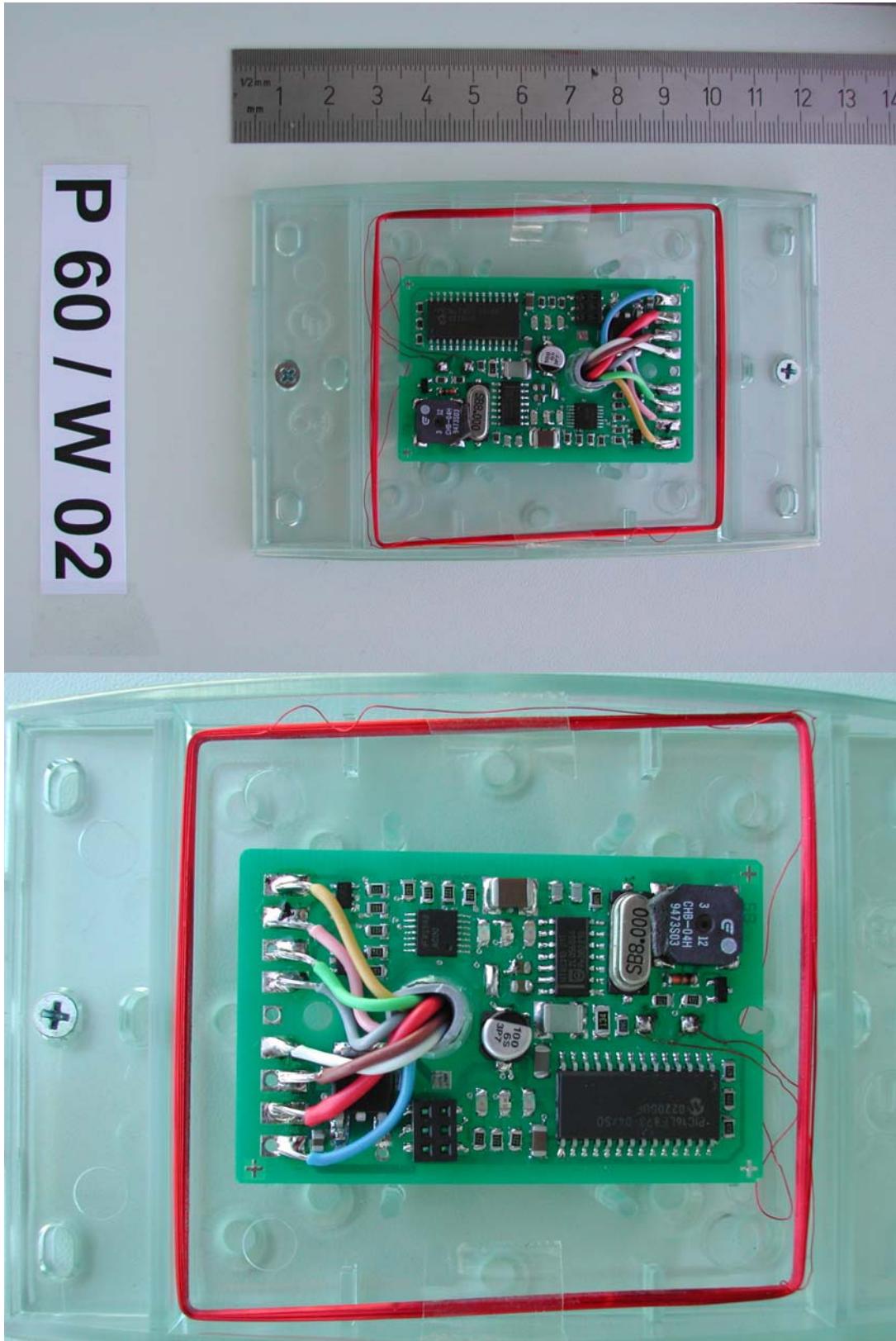
Designation	S/N	FCC-ID	Manufacturer
Door manager IF0610	167019		Interflex Datensysteme GmbH
ID-Card with transponder	0030	xx	Interflex Datensysteme GmbH
Power supply	4005	xx	Voltcraft

Additional information: This report is an application for Certification of a transmitter operating pursuant to 47 CFR 15.209. The models covered by this report are P60/W01 and P60/W02. All of these devices contain the same reader module type Philips, HTRC 110 .

EUT: P60/W01 – without cover



EUT: P60/W02 – without cover



ID Card



List of valid equipment

<input checked="" type="checkbox"/>	Inv-Nr.	Designation	Type	Manufacturer	S/N
<input checked="" type="checkbox"/>	001	Test receiver	ESS 5Hz - 1000 MHz	Rohde & Schwarz	833776/008
	002	Probe	ESH2-Z3	Rohde & Schwarz	-
	003	LISN 1	ESH3-Z5	Rohde & Schwarz	835268/007
	004	LISN 2	ESH3-Z5	Rohde & Schwarz	835268/003
	005	LISN 3	NNB 4/32T	Rolf Heine HF-Technik	4/32T-96015
	006	LISN	NNBM 8125	Schwarzbeck	8125371
	007	Absorbing clamp	MDS 21	Schwarzbeck	942436
<input checked="" type="checkbox"/>	008	Antenna 9kHz - 30MHz	HFH2-Z2	Rohde & Schwarz	835776/0002
<input checked="" type="checkbox"/>	009	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	435
	010	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	108
	011	Antenna 30 - 300MHz	VHBA9123 / BBA9106	Schwarzbeck	0408/94
<input checked="" type="checkbox"/>	012	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	166
	013	Antenna 9kHz - 30MHz	Loop antenna 1.5m	EMCE GmbH	-
<input checked="" type="checkbox"/>	014	Open area test site	3m	EMCE GmbH	-
	015	Open area test site	10m	EMCE GmbH	-
	019	Burst generator	PEFT / PHV 41.2	Haefely	082948-50
	020	Coupling clamp	IP4A	Haefely	082672-13
	022	ESD-Gun	NSG 435	Schaffner	577
	024	HF-Generator	SMY01	Rohde & Schwarz	844146/046
	025	Current clamp BCI	F-120-2	FCC	47
	026	Coupling device network	CDN 801-M3-25	FCC	92
	027	Surge Generator	Transient 1000	EMC-Partner AG	TRA1000-85
	029	HF Amplifier	10W1000	Amplifier Research	10576
	030	Coupling device network	CDN 801-S1/9pol.DSUB	EMCE GmbH	-
	031	Coupling device network	CDN 801-S1/9pol.DSUB	EMCE GmbH	-

<input checked="" type="checkbox"/>	Inv-Nr.	Designation	Type	Manufacturer	S/N
	032	HF Amplifier	75A250	Amplifier Research	22789
	033	Coupling device network	CDN AF2	EMCE GmbH	
	034	Coupling device network	CDN AF2	EMCE GmbH	
	035	3-Phase Coupling network	CDN-1000	EMC-Partner AG	CDN-1000-45
	036	Coupling device network	CDN 801-M5-25	EMCE GmbH	
	037	Coupling device network	CDN 801-T1	EMCE GmbH	
	038	Helmholtz coil	1x1m	EMCE GmbH	
	039	Helmholtz coil	1x1m	EMCE GmbH	
	040	Current transformer		EMCE GmbH	
	041	HZ-10	Shielded coil	Rohde & Schwarz	849788/020
	042	AC-Source / Analyser / Normimpedance	EMV D5000/PAS	Spitzenberger + Spies	A274700/00501
	xx	Susceptibility test equipment according DIN EN 61000-4-3	Full anechoic chamber 3m test site	Siemens	xx

Scope:

1	EMC - Test(s)	10
1.1	EMI Report FCC Rules CFR 47 Part 15 – Subpart C (15.209)	10
1.1.1	Terminal voltage	10
1.1.2	Radiated emissions	11
1.1.2.1	Test set up	11
1.1.2.2	Test – Intentional / unwanted emissions	15
1.1.2.3	Test – Unintentional radiation	21
2	Summary	31

1 EMC - Test(s)

1.1 EMI Report FCC Rules CFR 47 Part 15 – Subpart C Section 15.209

1.1.1 Terminal voltage

The product is DC powered and not designed to be connected to the public utility (AC) power line.

1.1.2 Radiated emissions

1.1.2.1 Test set up

According ANSI C63.4-1992

Test location:

Precompliance

Shielded room

Laboratory

Full compliance

Anechoic chamber

OATS 3m

OATS 10m

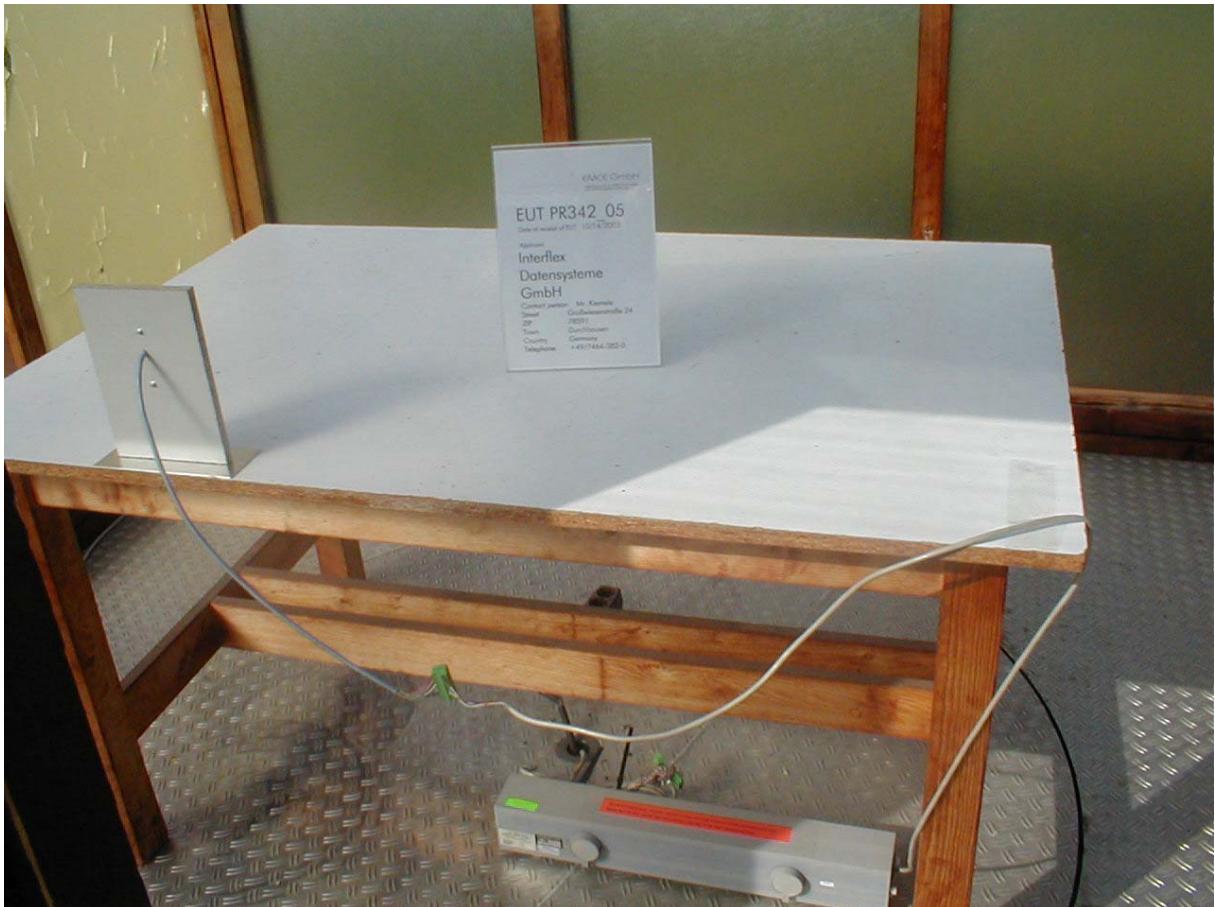
The test equipment was checked and met the requirements.



EUT: P60/W01 – without cover



EUT: P60/W01 – without cover



EUT: P60/W02 – without cover



EUT: P60/W02 – without cover



1.1.2.2 Test – Intentional / unwanted emissions

Regulation:

FCC Rules CFR 47 Part 15 – Subpart C

Range:	<input checked="" type="checkbox"/>	9kHz - 30MHz	<input type="checkbox"/>	30MHz - 1000MHz
Limits:	<input checked="" type="checkbox"/>	Section 15.209	<input type="checkbox"/>	—

Operation mode:

EUT arrangement: Tabletop Floor standing

Continuous operation with ID-Card outside of the reading range. This application shows the worst case. The EUT was powered by $5\text{VDC} \pm 5\%$ power supply according the specification. Since the device is installed in one orientation, the emissions were maximized around the vertical axis and the maximum reading was recorded. The integrated antenna cannot be maximized separately.

Fundamental frequency of the magnetic field: $125\text{kHz} \pm 1\text{kHz}$

Environmental conditions:

Temperature: $15 - 35^\circ\text{C}$

Humidity: $30 - 60\%$

Air pressure: $860 - 1060\text{hPa}$

The environmental conditions during the test: were kept
 were not kept

Test results:

The testing was performed at an antenna to EUT distance of 3m. Measurements are made with a CISPR receiver with quasi-peak. The average detector is used in the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. For pulse modulated devices with a pulse repetition frequency of 20Hz or less, peak detector is used (15.35a Note). The frequency, the measured value, antenna information and the limit will be printed out.

Summary:

Limits for continuous disturbances:

kept
 not kept

The level of any unwanted emissions from an intentional radiator shall not exceed the level of the fundamental wave:

kept
 not kept

Remarks: All other measured emanations, 10dB or more below the limit lines, were not listed.
The voltage supply of the reader was varied between the specified range 5VDC $\pm 5\%$ - there was no impact to the used center frequency or the field strength of the fundamental wave.

Protocol scope P60/W01:

Readings - Antenna horizontal polarized.
 Diagram - Antenna horizontal polarized.
 Readings - Antenna vertical polarized.
 Diagram - Antenna vertical polarized.
 Precompliance measurement(s).

Protocol scope P60/W02:

Readings - Antenna horizontal polarized.
 Diagram - Antenna horizontal polarized.
 Readings - Antenna vertical polarized.
 Diagram - Antenna vertical polarized.
 Precompliance measurement(s).

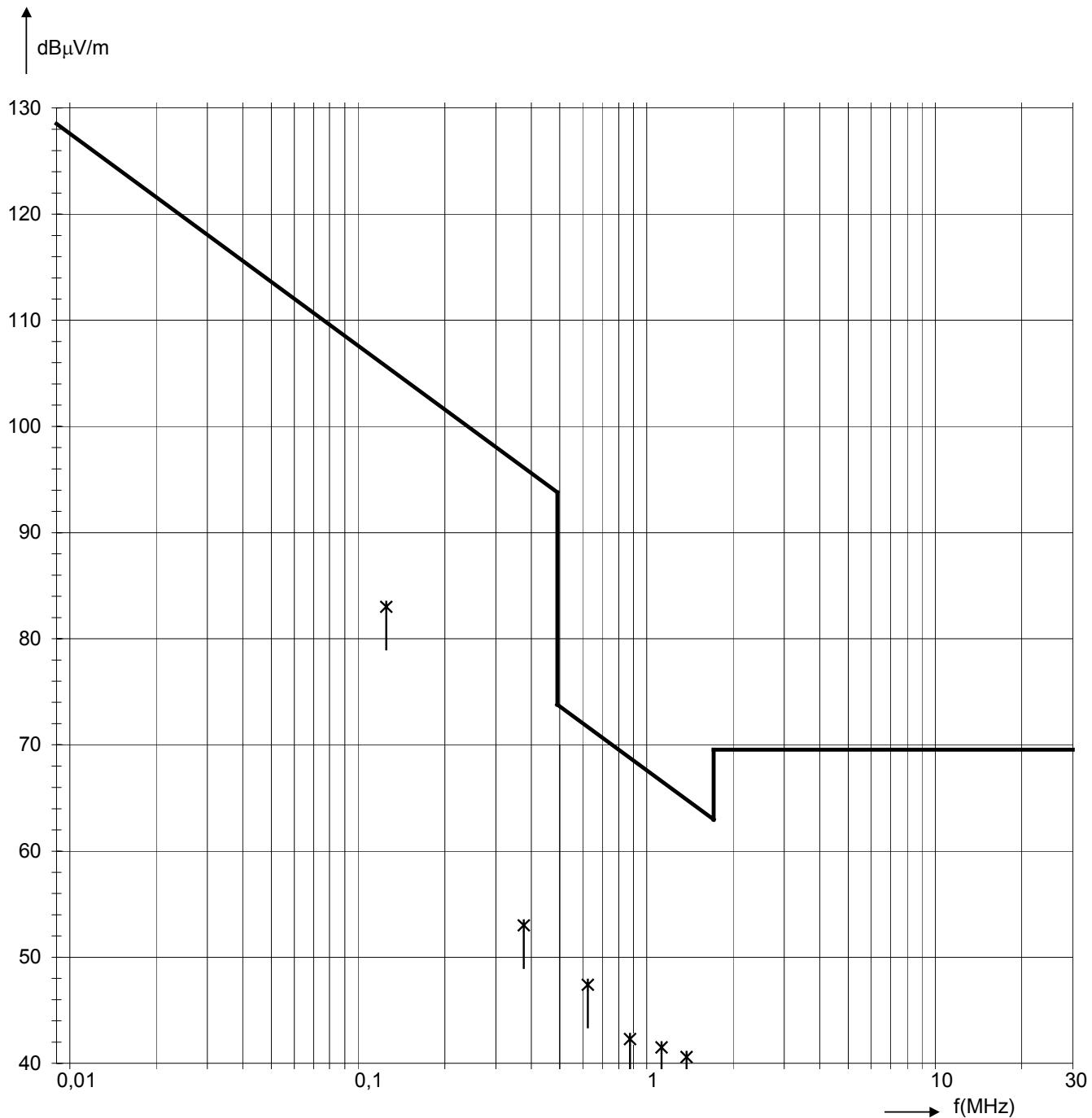
Readings P60/W01 - Antenna vertical polarized

Frequency MHz	Reading U dB μ V	Antenna + AF dB/m	Cable + KF dB	Emission Σ dB μ V/m	Limit dB μ V/m	Margin dB μ V	Ant.- Distance m	Ant.- Polar. H/V	Detector Peak / QP / AV	Receiver 6dB BW kHz
0.12489	63.0	20.0	0.0	83.0	105.7	22.7	3.0	V	Peak	0.2
0.24978	<20	20.0	0.0	<40	99.7	59.7	3.0	V	Peak	10
0.37467	33.0	20.0	0.0	53.0	96.1	43.1	3.0	V	Peak	10
0.49956	<20	20.0	0.0	<40	73.6	33.6	3.0	V	Peak	10
0.62494	27.4	20.0	0.0	47.4	71.7	24.3	3.0	V	Peak	10
0.74934	<20	20.0	0.0	<40	70.1	30.1	3.0	V	Peak	10
0.87515	22.3	20.0	0.0	42.3	68.8	26.5	3.0	V	Peak	10
0.99912	<20	20.0	0.0	<40	67.6	27.6	3.0	V	Peak	10
1.12504	21.5	20.0	0.0	41.5	66.6	25.1	3.0	V	Peak	10
1.24890	<20	20.0	0.0	<40	65.7	25.7	3.0	V	Peak	10
1.37509	20.6	20.0	0.0	40.6	64.8	24.2	3.0	V	Peak	10

Diagram P60/W01 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209



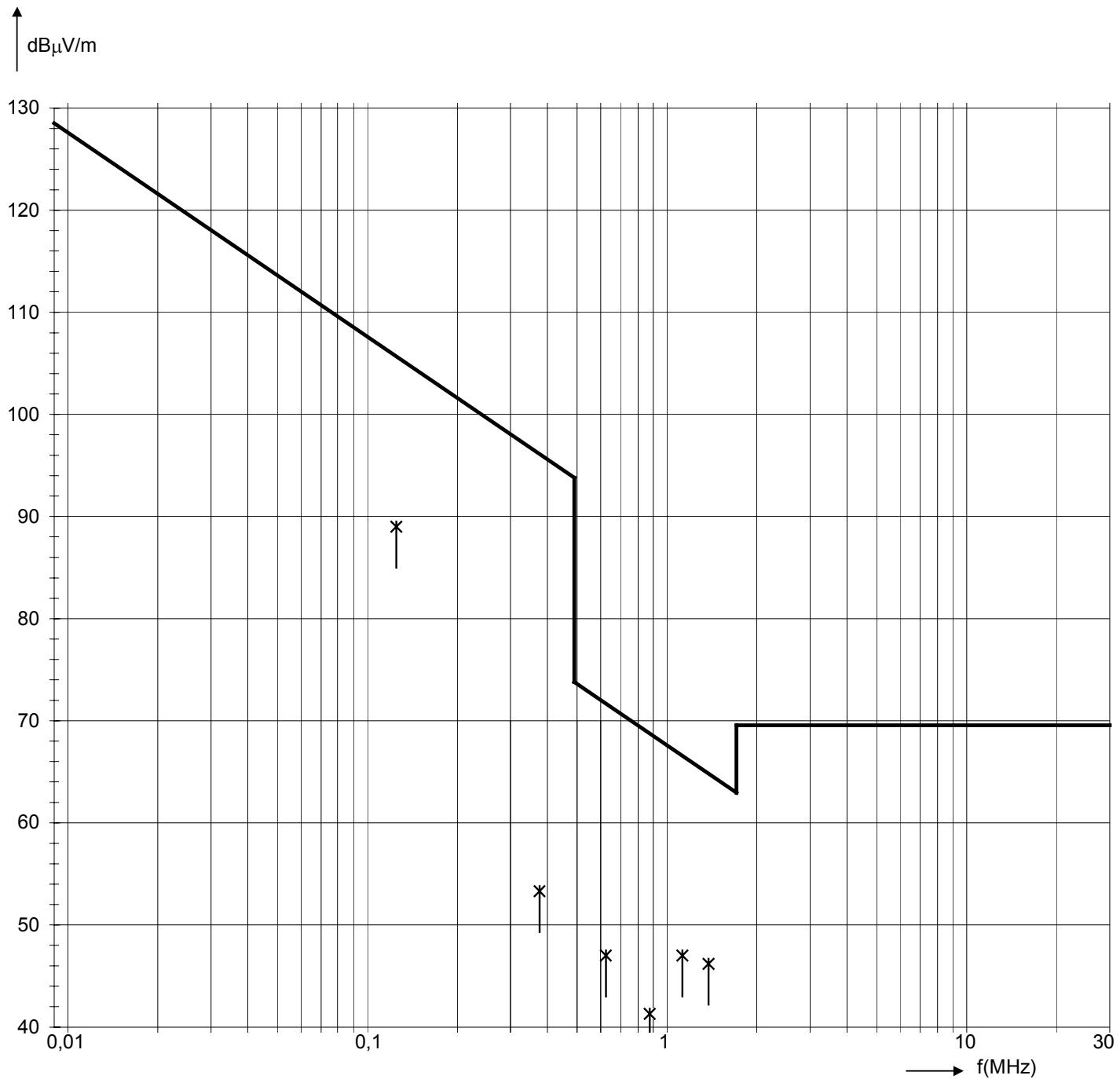
Readings P60/W02 - Antenna vertical polarized

Frequency MHz	Reading U dB μ V	Antenna + AF dB/m	Cable + KF dB	Emission Σ dB μ V/m	Limit dB μ V/m	Margin dB μ V	Ant.- Distance m	Ant.- Polar. H/V	Detector Peak / QP / AV	Receiver 6dB BW kHz
0.12476	69.0	20.0	0.0	89.0	105.7	16.7	3.0	V	Peak	0.2
0.24952	<20	20.0	0.0	<40	99.7	59.7	3.0	V	Peak	10
0.37480	33.3	20.0	0.0	53.3	96.1	42.8	3.0	V	Peak	10
0.49904	<20	20.0	0.0	<40	73.6	33.6	3.0	V	Peak	10
0.62492	27.0	20.0	0.0	47.0	71.7	24.7	3.0	V	Peak	10
0.74856	<20	20.0	0.0	<40	70.1	30.1	3.0	V	Peak	10
0.87515	21.3	20.0	0.0	41.3	68.8	27.5	3.0	V	Peak	10
0.99808	<20	20.0	0.0	<40	67.6	27.6	3.0	V	Peak	10
1.12480	27.0	20.0	0.0	47.0	66.6	19.6	3.0	V	Peak	10
1.24760	<20	20.0	0.0	<40	65.7	25.7	3.0	V	Peak	10
1.37515	26.2	20.0	0.0	46.2	64.8	18.6	3.0	V	Peak	10

Diagram P60/W02 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209



1.1.2.3 Test – Unintentional radiation

Regulation:

FCC Rules CFR 47 Part 15 – Subpart C

Range: 9kHz - 30MHz 30MHz - 1000MHz
Limits: Section 15.209 —

Operation mode:

EUT arrangement: Tabletop Floor standing

Continuous operation with ID-Card in the reading range. This application shows the worst case. The EUT was powered by $5\text{VDC}\pm5\%$ power supply according the specification. Since the device is installed in one orientation, the emissions were maximized around the vertical axis and the maximum reading was recorded. The integrated antenna cannot be maximized separately.

Environmental conditions:

Temperature: 15 - 35°C
Humidity: 30 - 60%
Air pressure: 860 – 1060hPa

The environmental conditions during the test: were kept were not kept

Test results:

The testing was performed at an antenna to EUT distance of 3m. Measurements are made with a CISPR receiver with quasi-peak detector. The frequency, the measured value, antenna information and the limit will be printed out.

Summary:

Limits for continuous disturbances: kept not kept



Remarks: All other measured emanations. 10dB or more below the limit lines.
were not listed.

Protocol scope P60/W01:

- Readings - Antenna horizontal polarized.
- Diagram - Antenna horizontal polarized.
- Readings - Antenna vertical polarized.
- Diagram - Antenna vertical polarized.
- Precompliance measurement(s).

Protocol scope P60/W02:

- Readings - Antenna horizontal polarized.
- Diagram - Antenna horizontal polarized.
- Readings - Antenna vertical polarized.
- Diagram - Antenna vertical polarized.
- Precompliance measurement(s).



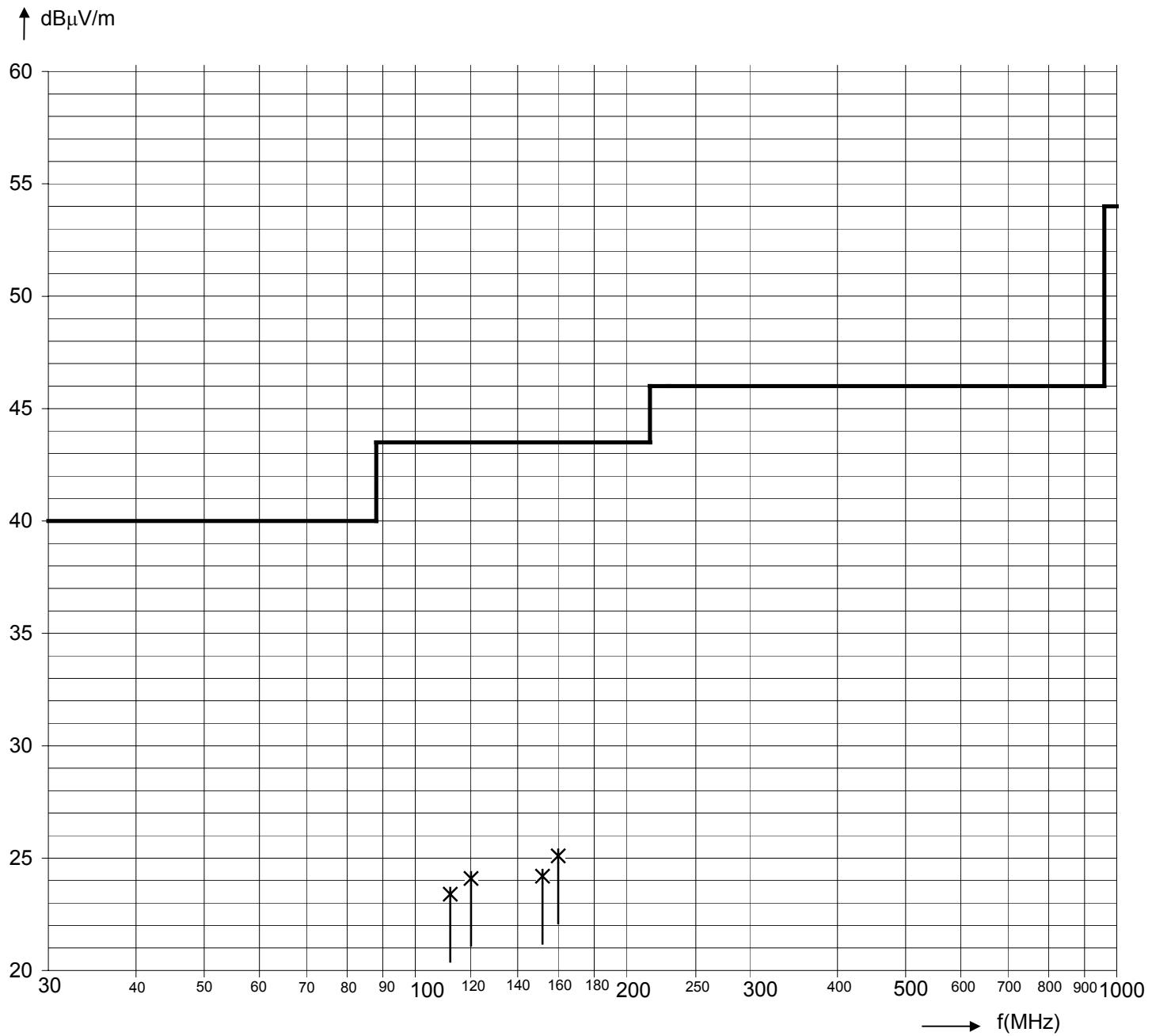
Readings P60/W01 - Antenna horizontal polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dB μ V	dB/m	dB	dB μ V/m	dB μ V/m	dB μ V	/m	H/V
112.142	10.7	10.6	2.2	23.4	43.5	20.1	2.0	H
120.140	10.9	11.0	2.3	24.1	43.5	19.4	1.5	H
151.898	9.1	12.6	2.6	24.2	43.5	19.3	1.5	H
159.899	9.5	13.0	2.7	25.1	43.5	18.4	1.5	H

Diagram P60/W01 - Antenna horizontal polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209
 —





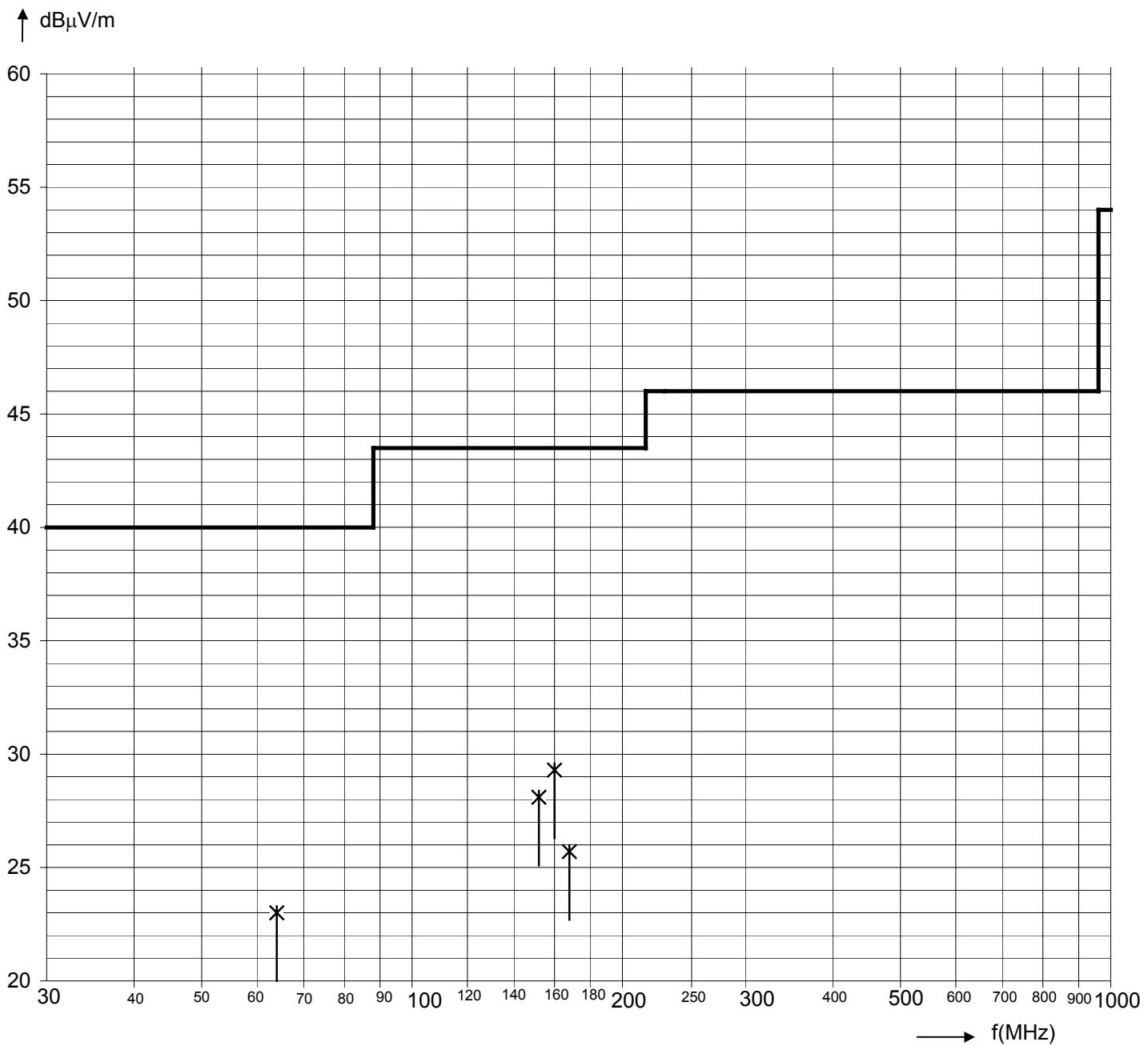
Readings P60/W01 - Antenna vertical polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dB μ V	dB/m	dB	dB μ V/m	dB μ V/m	dB μ V	meter	H/V
64.001	13.1	8.4	1.6	23.0	40.0	17.0	1.0	V
151.898	13.0	12.6	2.6	28.1	43.5	15.4	1.0	V
159.899	13.7	13.0	2.7	29.3	43.5	14.2	1.0	V
167.900	9.6	13.4	2.7	25.7	43.5	17.8	1.0	V

Diagram P60/W01 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209





Readings P60/W02 - Antenna horizontal polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dB μ V	dB/m	dB	dB μ V/m	dB μ V/m	dB μ V	meter	H/V
104.140	18.1	10.2	2.1	30.4	43.5	13.1	2.0	H
119.890	10.3	10.9	2.3	23.5	43.5	20.0	2.0	H
120.140	12.9	11.0	2.3	26.1	43.5	17.4	2.0	H
192.030	8.6	14.6	2.9	26.1	43.5	17.4	1.5	H

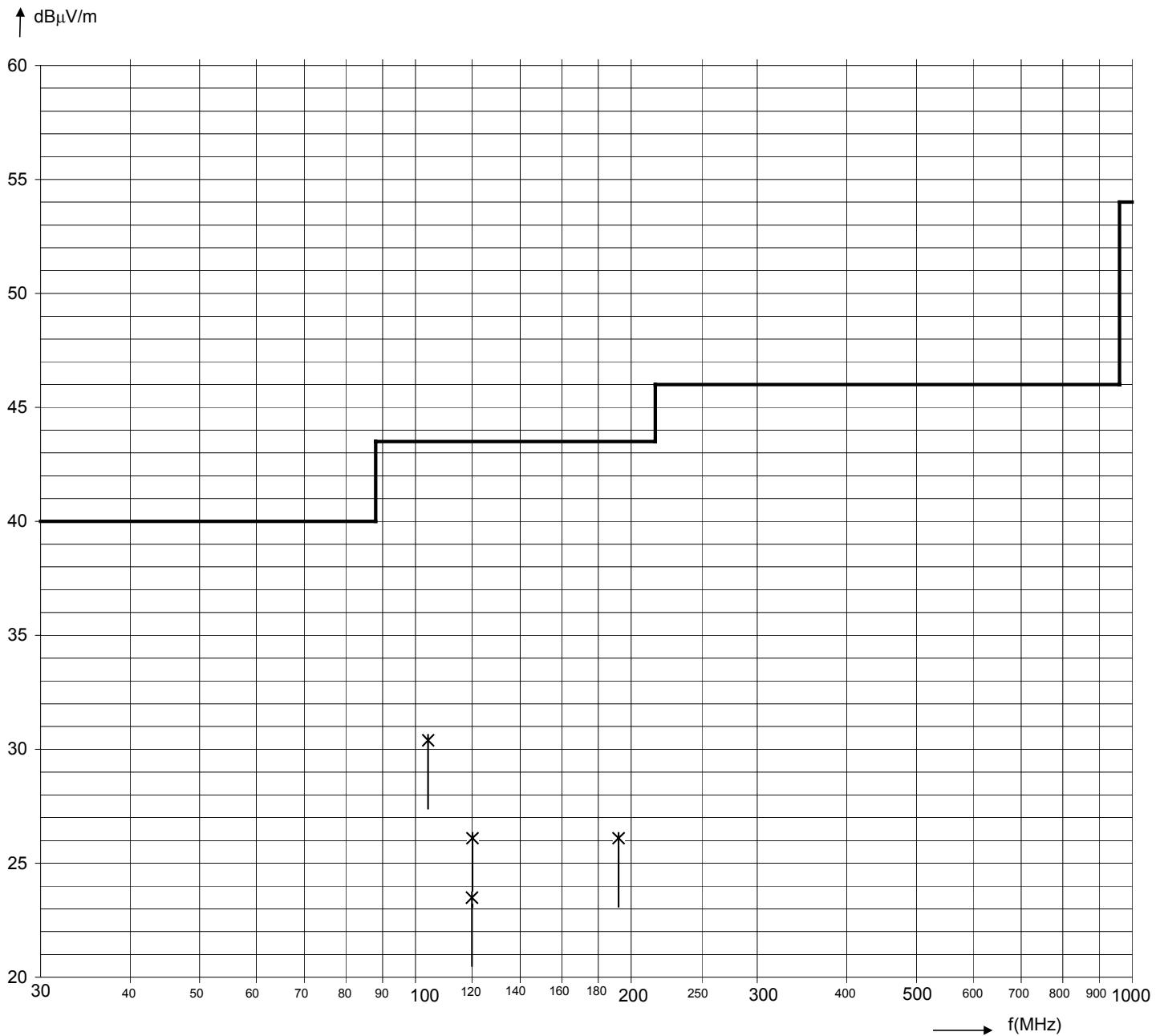
Diagram P60/W02 - Antenna horizontal polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209



—



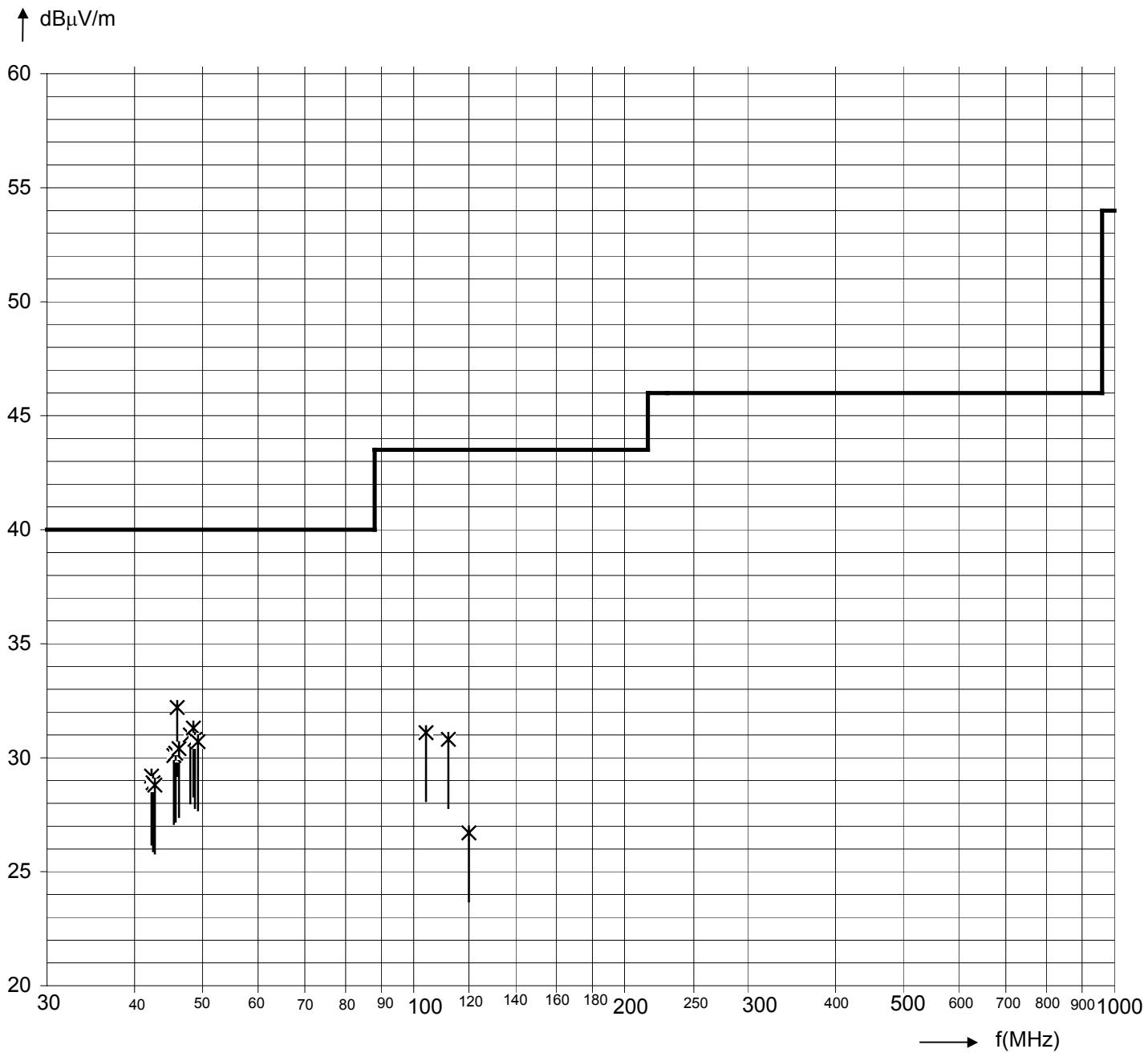
Readings P60/W02 - Antenna vertical polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dB μ V	dB/m	dB	dB μ V/m	dB μ V/m	dB μ V	meter	H/V
42.260	19.4	8.6	1.2	29.2	40.0	10.8	1.0	V
42.506	19.1	8.6	1.2	28.9	40.0	11.1	1.0	V
42.757	19.0	8.6	1.2	28.8	40.0	11.2	1.0	V
45.507	20.5	8.3	1.3	30.1	40.0	9.9	1.0	V
45.757	20.7	8.3	1.3	30.2	40.0	9.8	1.0	V
46.007	22.7	8.3	1.3	32.2	40.0	7.8	1.0	V
46.257	20.9	8.3	1.3	30.4	40.0	9.6	1.0	V
48.007	21.5	8.2	1.3	31.0	40.0	9.0	1.0	V
48.507	21.8	8.2	1.3	31.3	40.0	8.7	1.0	V
48.757	21.3	8.2	1.3	30.8	40.0	9.2	1.0	V
49.257	21.2	8.2	1.3	30.7	40.0	9.3	1.0	V
104.140	18.8	10.2	2.1	31.1	43.5	12.4	1.5	V
112.143	18.1	10.6	2.2	30.8	43.5	12.7	1.5	V
119.893	13.5	10.9	2.3	26.7	43.5	16.8	1.0	V

Diagram P60/W02 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C

Section 15.209
 —



2 Summary

Regulation	Class / Test level	Result	Remark(s)
FCC Rules CFR 47 Part 15 Subpart C			
Terminal voltage 0.15-30MHz	Section 15.209	n.r.	5VDC supplied
Radiated emissions 0.009-30MHz	Section 15.209	Limits kept.	Intentional / unwanted emissions
Radiated emissions 30-1000MHz	Section 15.209	Limits kept.	Unintentional emissions

n.r. – not relevant

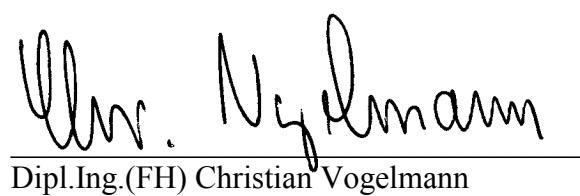
Statement of Conformity

The Interflex P60/W01 and P60/W02 has been found to conform with the following parts of the 47 CFR 15 as detailed below:

Part 2	Part 15	Comment
	15.15(b)	There are no for the user accessible controls that increase transmission power above allowable levels.
	15.27	No special accessories are required for compliance.
	15.31(e)	Readings were taken at the fundamental frequency with the supply voltage varied with a $\pm 5\%$ range from the nominal voltage 5VDC. as specified by the product.
	15.203	The loop antenna is permanently attached to the transmitter.
	15.205	The used fundamental frequency is not in a restricted band. All spurious emissions in the restricted bands comply with the radiated emission limits of 15.209.
	15.207	The product is DC powered and not designed to be connected to the public utility (AC) power line.
	15.209	The radiated emission limits. general requirements of section 15.209 are kept.

Last page

Burgrieden, 10/22/2003



Dipl.Ing.(FH) Christian Vogelmann



Dipl.Ing.(FH) Erik Felser