Test report

IF343_01.DOC

EUT:	Short range device family
Trade name:	HDP60/W01, HDP60/W02
Tested type:	HDP60/W01, HDP60/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_02, PR342_03
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:

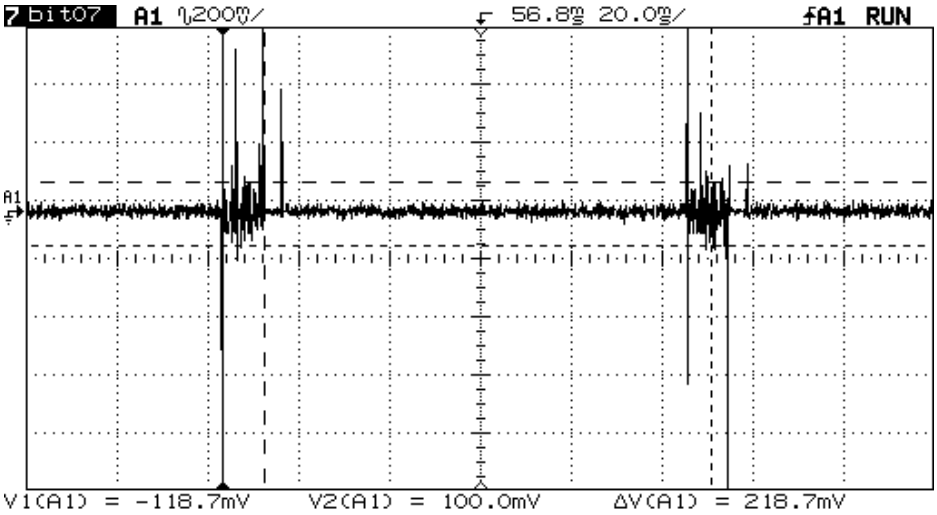
Reader for an access control system.
The product offers following features:
- Wiegand interface: Data 1, Data 0 signal return
- Beeper
- External power supply with 5VDC±5%

Antenna HDP60W01:
- Type: Loop
- Size: 58,5x35,5mm

Antenna HDP60W02:
- Type: Loop
- Size: 71x67mm

Operating frequency:

125kHz ± 1kHz / Fundamental frequency of the magnetic field
Note: The exciter is being enable with approximately 10% duty so the receiver is only on for about 8.8ms then off for 93ms.



8MHz / Ceramic resonator / Clock for the controller

EUT size: HDP60/W01 80x41x15 (LxWxH)
HDP60/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	01696	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 HDP60/W01 and HDP60/W02. All of these devices contain the same reader module type 4025-501-05 / HID Corporation / USA.

EUT: HDP60/W01 – without cover

EUT: HDP60/W02 – without cover

ID Card

List of valid equipment

☒	Inv-Nr.	Designation	Type	Manufacturer	S/N
☒	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
☒	008	Antenna 9kHz - 30MHz	HFH2-Z2	Rohde & Schwarz	835776/0002
☒	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
☒	012	Antenna 250 -1200MHz	UHALP 9108A	Schwarzbeck	166
	013	Antenna 9kHz - 30MHz	Loop antenna 1.5m	EMCE GmbH	-
☒	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	-

☒	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	A274700/0 0501
	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: HDP60/W01 – without cover

EUT: HDP60/W01 – without cover

EUT: HDP60/W02 – without cover

EUT: HDP60/W02 – without cover

1.1.2.2 Test – Intentional / unwanted emissions

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 outside of the reading range. This application shows the worst case. The EUT was powered by 5VDC±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:	125kHz ± 1kHz
Pulse repetition rate:	93ms

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. 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 ±5% - there was no impact to the used center frequency or the field strength of the fundamental wave.

Protocol scope HDP60/W01:

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

Protocol scope HDP60/W02:

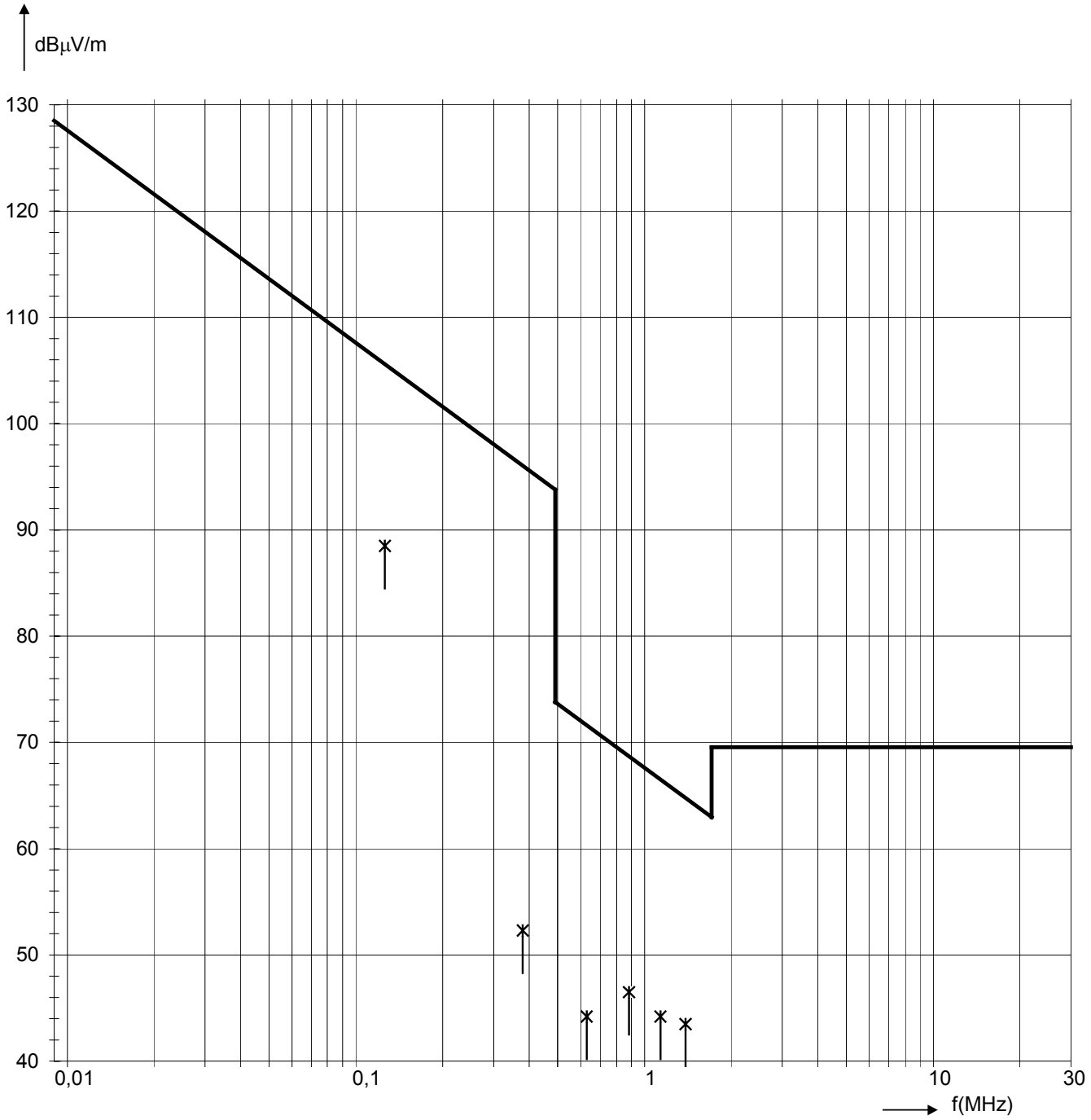
☐ Readings - Antenna horizontal polarized.
☐ Diagram - Antenna horizontal polarized.
☒ Readings - Antenna vertical polarized.
☒ Diagram - Antenna vertical polarized.
☐ Precompliance measurement(s).

Readings HDP60/W01 - Antenna vertical polarized

Frequency MHz	Reading U dBµV	Antenna + AF dB/m	Cable + KF dB	Emission Σ dBµV/m	Limit dBµV/m	Margin dBµV	Ant.-Distance m	Ant.-Polar. H/V	Detector Peak / QP / AV	Receiver 6dB BW kHz
0.12598	68.5	20.0	0.0	88.5	105.6	17.1	3.0	V	Peak	0.2
0.25196	<20	20.0	0.0	<40	99.6	≥59.6	3.0	V	Peak	10
0.37793	32.3	20.0	0.0	52.3	96.1	43.8	3.0	V	Peak	10
0.50392	<20	20.0	0.0	<40	73.6	≥33.6	3.0	V	Peak	10
0.62988	24.2	20.0	0.0	44.2	71.6	27.4	3.0	V	Peak	10
0.75588	<20	20.0	0.0	<40	70.0	≥30.0	3.0	V	Peak	10
0.88184	26.5	20.0	0.0	46.5	68.7	22.2	3.0	V	Peak	10
1.00784	<20	20.0	0.0	<40	67.5	≥27.5	3.0	V	Peak	10
1.13380	24.2	20.0	0.0	44.2	66.5	22.3	3.0	V	Peak	10
1.25980	<20	20.0	0.0	<40	65.6	≥25.6	3.0	V	Peak	10
1.38573	23.5	20.0	0.0	43.5	64.8	21.3	3.0	V	Peak	10

Diagram HDP60/W01 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C ☒ Section 15.209

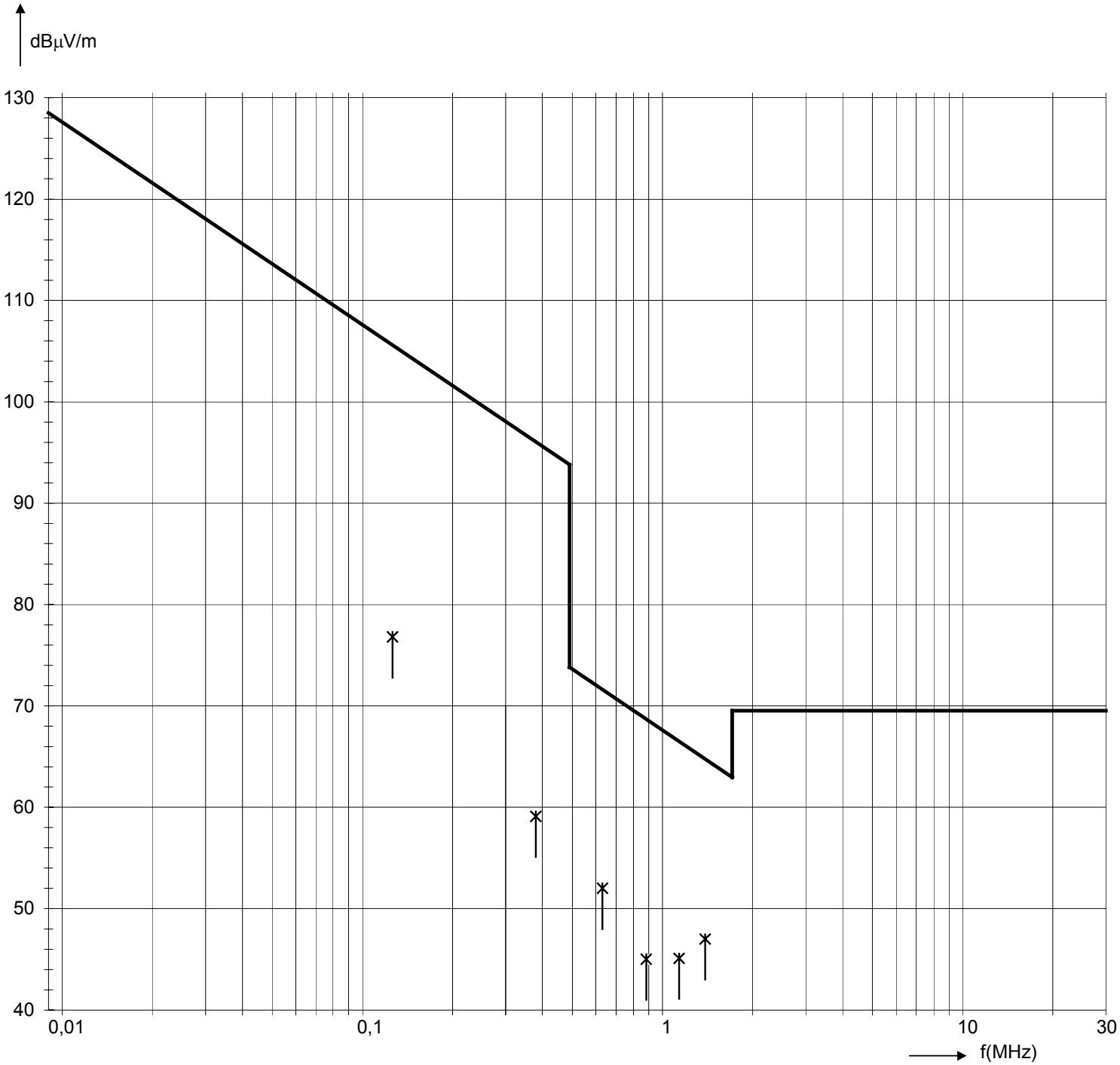


Readings HDP60/W02 - Antenna vertical polarized

Frequency MHz	Reading U dBµV	Antenna + AF dB/m	Cable + KF dB	Emission Σ dBµV/m	Limit dBµV/m	Margin dBµV	Ant.-Distance m	Ant.-Polar. H/V	Detector Peak / QP / AV	Receiver 6dB BW kHz
0.12588	56.8	20.0	0.0	76.8	105.6	28.8	3.0	V	Peak	0.2
0.25176	<20	20.0	0.0	<40	99.6	≥59.6	3.0	V	Peak	10
0.37806	39.1	20.0	0.0	59.1	96.1	37.0	3.0	V	Peak	10
0.50352	<20	20.0	0.0	<40	73.6	≥33.6	3.0	V	Peak	10
0.63055	32.0	20.0	0.0	52.0	71.6	19.6	3.0	V	Peak	10
0.75528	<20	20.0	0.0	<40	70.0	≥30.0	3.0	V	Peak	10
0.88231	25.0	20.0	0.0	45.0	68.7	23.7	3.0	V	Peak	10
1.00704	<20	20.0	0.0	<40	67.5	≥27.5	3.0	V	Peak	10
1.13500	25.1	20.0	0.0	45.1	66.5	21.4	3.0	V	Peak	10
1.25880	<20	20.0	0.0	<40	65.6	≥25.6	3.0	V	Peak	10
1.38670	27.0	20.0	0.0	47.0	64.8	17.8	3.0	V	Peak	10

Diagram HDP60/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 5VDC±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.

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 HDP60/W01:

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

Protocol scope HDP60/W02:

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

Readings HDP60/W01 - Antenna horizontal polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dBµV	dB/m	dB	dBµV/m	dBµV/m	dBµV	/m	H/V
151.736	7.3	12.6	2.6	22.4	43.5	21.1	2.0	H
159.801	6.3	13.0	2.7	21.9	43.5	21.6	2.0	H

Diagram HDP60/W01 - Antenna horizontal polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C ☒ Section 15.209
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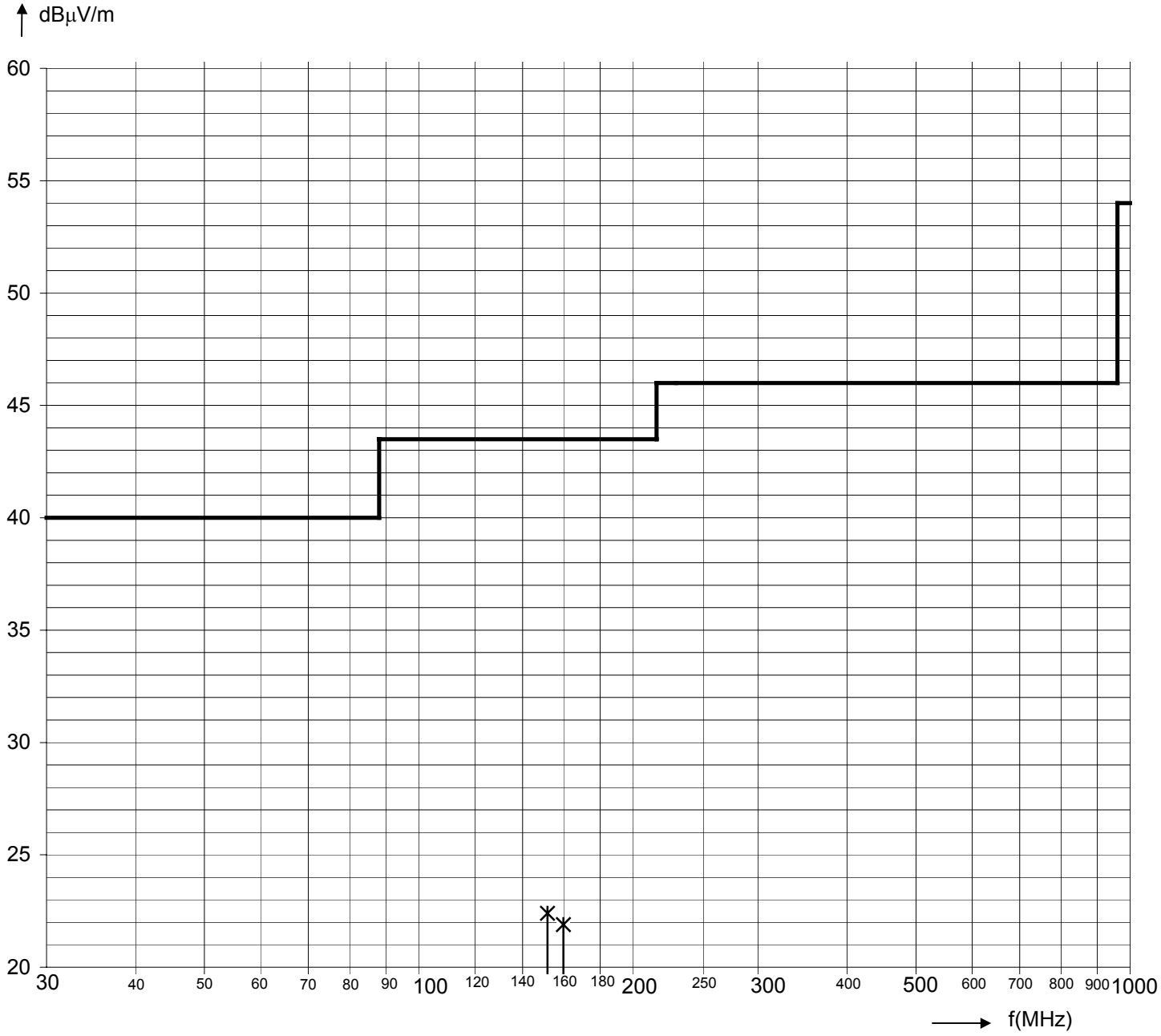

Readings HDP60/W01 - Antenna vertical polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dBµV	dB/m	dB	dBµV/m	dBµV/m	dBµV	meter	H/V
42.070	11.2	8.6	1.2	21.1	40.0	18.9	1.0	V
42.570	10.8	8.6	1.2	20.6	40.0	19.4	1.0	V

Diagram HDP60/W01 - Antenna vertical polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C ☒ Section 15.209
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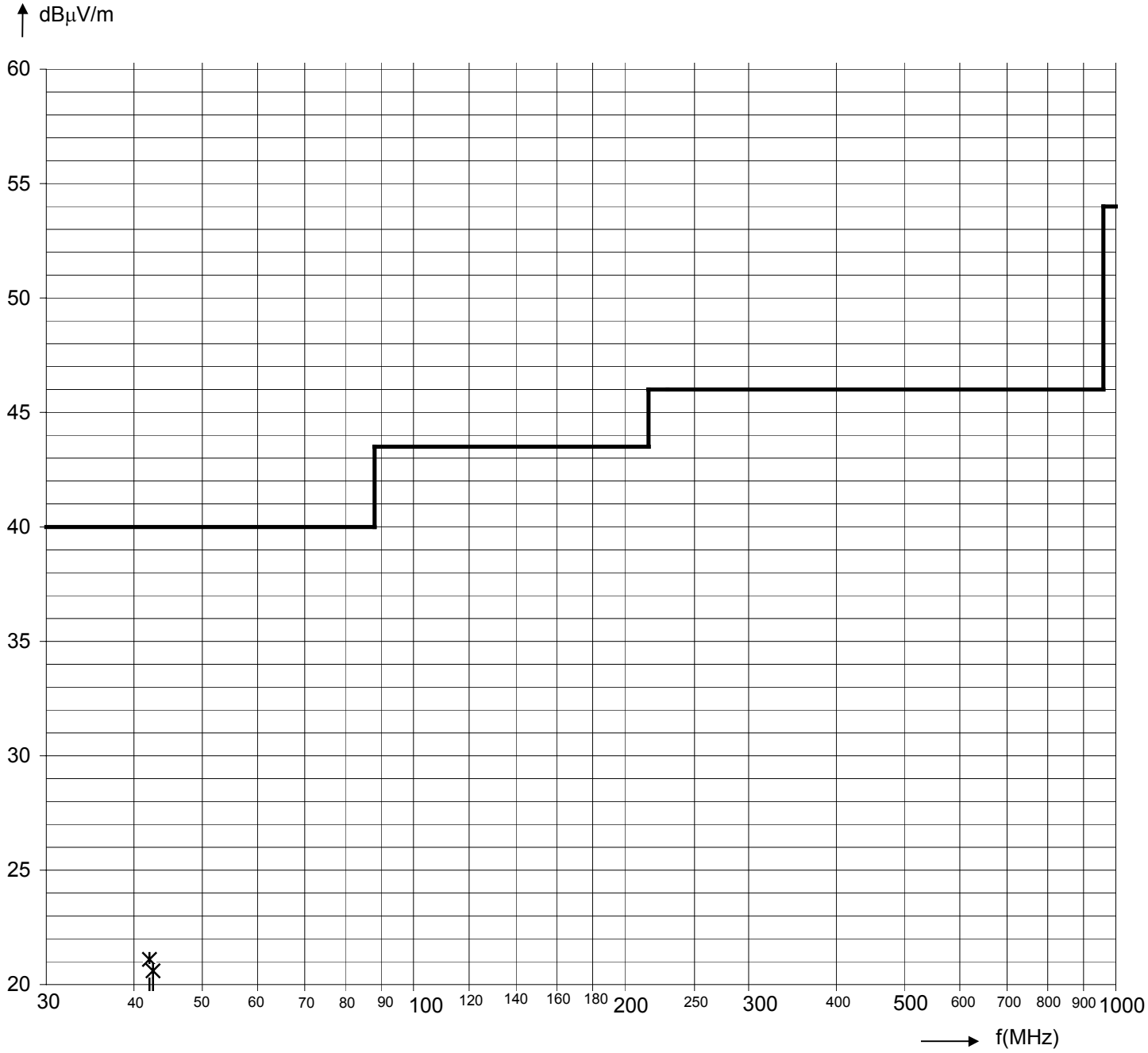

Readings HDP60/W02 - Antenna horizontal polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dBµV	dB/m	dB	dBµV/m	dBµV/m	dBµV	meter	H/V
38.718	19.2	9.3	1.2	29.6	40.0	10.4	2.5	H
38.970	19.3	9.2	1.2	29.7	40.0	10.3	2.5	H
40.230	19.6	9.0	1.2	29.7	40.0	10.3	2.5	H
40.480	19.9	8.9	1.2	30.0	40.0	10.0	2.5	H
40.730	21.5	8.9	1.2	31.5	40.0	8.5	2.5	H
40.988	21.0	8.8	1.2	31.0	40.0	9.0	2.5	H
41.240	21.1	8.8	1.2	31.1	40.0	8.9	2.5	H
41.490	21.6	8.7	1.2	31.5	40.0	8.5	2.5	H
41.740	22.0	8.7	1.2	31.9	40.0	8.1	2.5	H
42.248	22.5	8.6	1.2	32.3	40.0	7.7	2.5	H
42.750	22.1	8.6	1.2	31.9	40.0	8.1	2.5	H
43.510	21.0	8.5	1.2	30.7	40.0	9.3	2.5	H
44.010	20.6	8.4	1.2	30.3	40.0	9.7	2.5	H
44.260	20.5	8.4	1.2	30.1	40.0	9.9	2.5	H
45.020	20.8	8.3	1.3	30.4	40.0	9.6	2.5	H
45.530	20.9	8.3	1.3	30.5	40.0	9.5	2.5	H
46.030	21.6	8.3	1.3	31.1	40.0	8.9	2.5	H
47.040	20.2	8.2	1.3	29.7	40.0	10.3	2.5	H

Diagram HDP60/W02 - Antenna horizontal polarized

Limits according FCC Rules CFR 47 Part 15 – Subpart C ☒ Section 15.209
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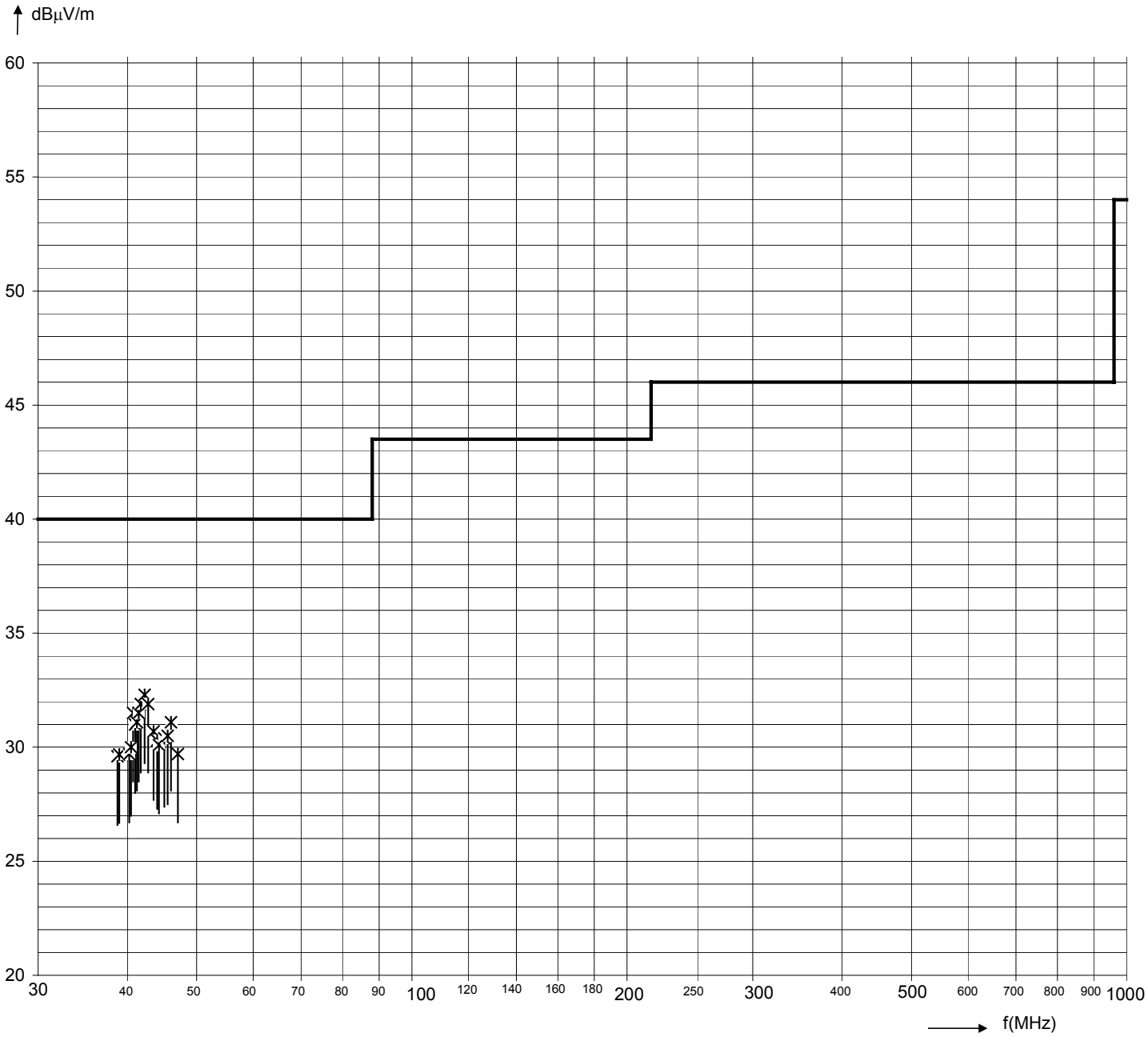
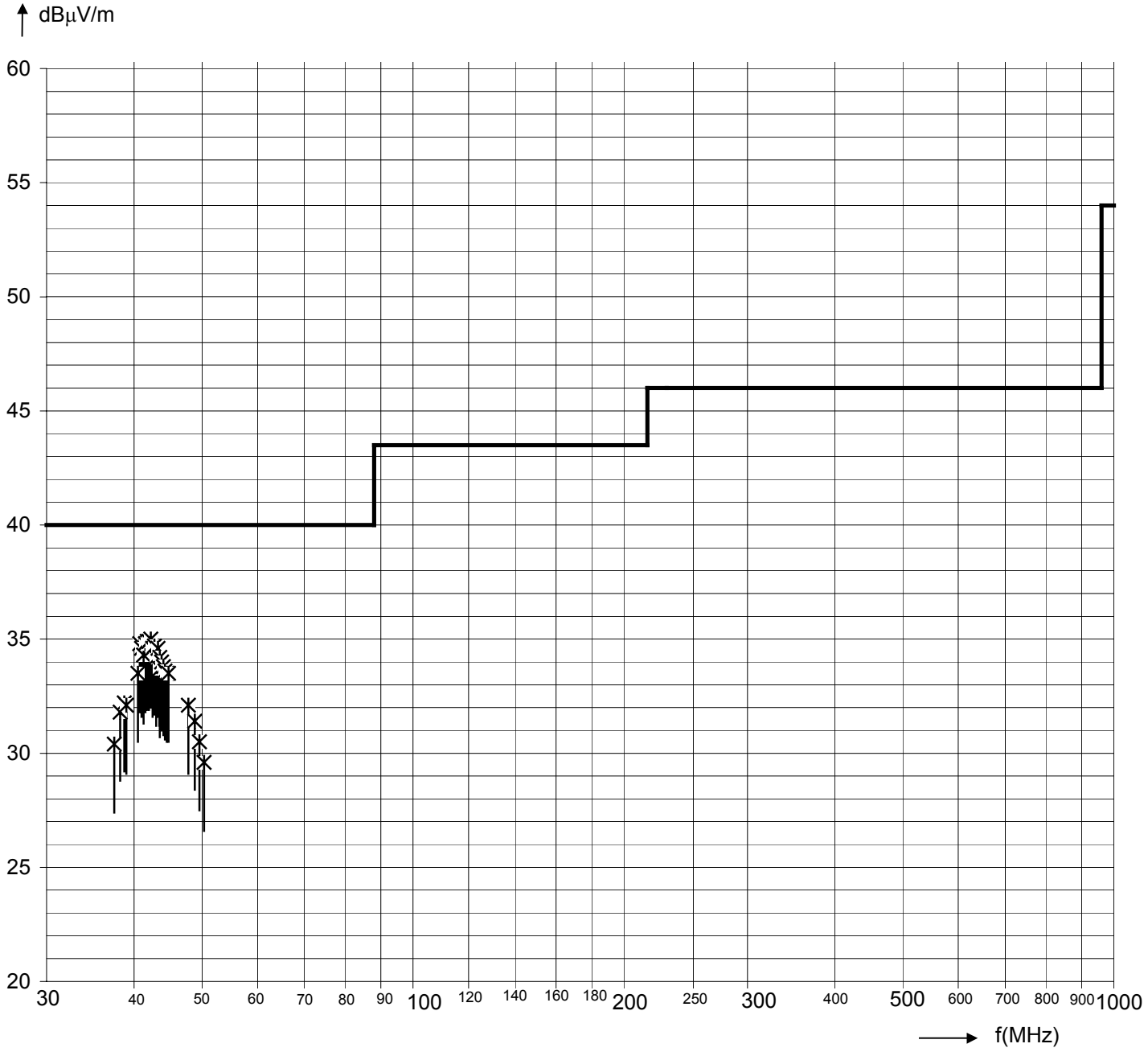


Readings HDP60/W02 - Antenna vertical polarized

Frequency	Reading	Antenna	Cable	Emission	Limit	Margin	Ant.-	Ant.-
	U	+ AF	+ KF	Σ			Height	Polar.
MHz	dBµV	dB/m	dB	dBµV/m	dBµV/m	dBµV	meter	H/V
37.450	19.6	9.6	1.1	30.4	40.0	9.6	1.0	V
38.210	21.2	9.4	1.1	31.8	40.0	8.2	1.0	V
38.710	21.8	9.3	1.2	32.2	40.0	7.8	1.0	V
38.970	21.7	9.2	1.2	32.1	40.0	7.9	1.0	V
40.480	23.4	8.9	1.2	33.5	40.0	6.5	1.0	V
40.730	24.8	8.9	1.2	34.8	40.0	5.2	1.0	V
40.980	24.6	8.8	1.2	34.6	40.0	5.4	1.0	V
41.240	24.3	8.8	1.2	34.3	40.0	5.7	1.0	V
41.490	24.9	8.7	1.2	34.8	40.0	5.2	1.0	V
41.740	25.0	8.7	1.2	34.9	40.0	5.1	1.0	V
41.990	25.0	8.7	1.2	34.9	40.0	5.1	1.0	V
42.240	25.2	8.6	1.2	35.0	40.0	5.0	1.5	V
42.500	24.8	8.6	1.2	34.6	40.0	5.4	1.5	V
42.755	24.9	8.6	1.2	34.7	40.0	5.3	1.0	V
43.000	24.5	8.5	1.2	34.2	40.0	5.8	1.5	V
43.250	24.9	8.5	1.2	34.6	40.0	5.4	1.5	V
43.510	24.5	8.5	1.2	34.2	40.0	5.8	1.5	V
43.511	24.0	8.5	1.2	33.7	40.0	6.3	1.0	V
43.760	24.3	8.4	1.2	34.0	40.0	6.0	1.5	V
44.010	24.1	8.4	1.2	33.8	40.0	6.2	1.5	V
44.260	24.0	8.4	1.2	33.6	40.0	6.4	1.5	V
44.510	23.9	8.4	1.3	33.5	40.0	6.5	1.5	V
44.770	23.9	8.3	1.3	33.5	40.0	6.5	1.0	V
47.790	22.6	8.2	1.3	32.1	40.0	7.9	1.0	V
48.800	21.9	8.2	1.3	31.4	40.0	8.6	1.0	V
49.560	21.0	8.2	1.3	30.5	40.0	9.5	1.5	V

Diagram HDP60/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 HDP60/W01 and HDP60/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 ±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