Test report

EMC test report

265.132

Avery Dennison

Printer

AP5.4

prototype

Applicant:

Avery Dennison
Deutschland GmbH
Ohmstrasse 3
D-85386 Eching
Tel.: +49 (0) 8165 / 925 –0
Fax.: +49 (0) 8165 / 3143

EMV TESTHAUS

The test result refer exclusively
to the model tested.

This report must not be copied without
the written authorization by the lab.

Deutscher
Akkreditierungs
Rat

TTI-P-G 101/95-20 / RegTP-CAB-02/21-02

EMV Testhaus GmbH

Gustav-Hertz-Strasse 35
94315 Straubing
Tel.: +49 9421 / 923033
Fax: +49 9421 / 923035
Email: company@emv-testhaus.com

Accreditation:

Deutscher Akkreditierungs Rat

Registration number: TTI-P-G 101/95-20
Valid until 08.06.2006

CAB (EMC) registration number: RegTP-CAB-02/21-02
Valid until 27.11.2005

FCC facility registration number: 221458
Valid until 23.07.2005

Place of Inspection:

EMV Testhaus GmbH
Gustav-Hertz-Strasse 35
94315 Straubing

The technical accuracy is guaranteed through the quality management of the EMV Testhaus GmbH.

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1. Test regulation

Regulation:	**United States Code of Federal Regulations 47, Part 15 – Digital Devices, Subpart B – Unintentional Radiators, Class B (9 / 21 / 04).**
Standard:	**ANSI C63.4-2003 Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical Equipment in the Range of 9 kHz to 40 GHz.**
Limit:	**DIN EN 55022:1999-05 Information Technology Equipment Radio Disturbance Characteristics - Limits and Methods of Measurement**

Including:

- ☑ Measurement of the conducted emission in the frequency range from 150 kHz to 30 MHz (generated frequency more than 9 kHz)
- ☑ Measurement of the radiated emission in the frequency range from 30 MHz to 1GHz. (generated frequency: 1.705 – 108.0 MHz)
- ☐ Measurement of the radiated emission in the frequency range from 30 MHz to 2GHz. (generated frequency: 108.0 – 500.0 MHz)

Deviation of Regulations and Standards: No

2. Equipment under test

Responsible Party:	Avery Dennison Deutschland GmbH
(Manufacturer)	Ohmstrasse 3 D-85386 Eching Germany
Device name:	Printer
Tested Model Number:	AP5.4
Other Model (Option):	AP4.4
Serial Number:	prototype
Remark:	The EUT is an industrial printer with integrated RFID radio module

Photo documentation of EUT

picture 2.1: equipment under test

3. Product labeling

FCC Label and Location

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Information to the user:

Class B Statement:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

4. Equipment modifications

To achieve compliance with the regulations, modifications were made by a responsible employee of the manufacturer:

This modifications will be implemented in all production models of this equipment.

Applicant Signature _____ Date_____

Typed / Printed Name _____ Position _____

5. Test configuration and mode of operation

Test configuration devices

Numbers:	Description: (type / name / remarks)	Serial No.:
1	EUT: printer AP5.4	prototype
1	Test PC	
1	Test Monitor (for ems tests only)	
1	PS/2 Keyboard	
1	USB Mouse	
1	Foot switch	

Mode of operation

The EUT was tested in the following mode of operation:

Settings:

The EUT was permanently printing in endless mode.

6. Measurement of conducted emission

according to CFR 47 Part 15 Subpart B Class B

Location of measurement

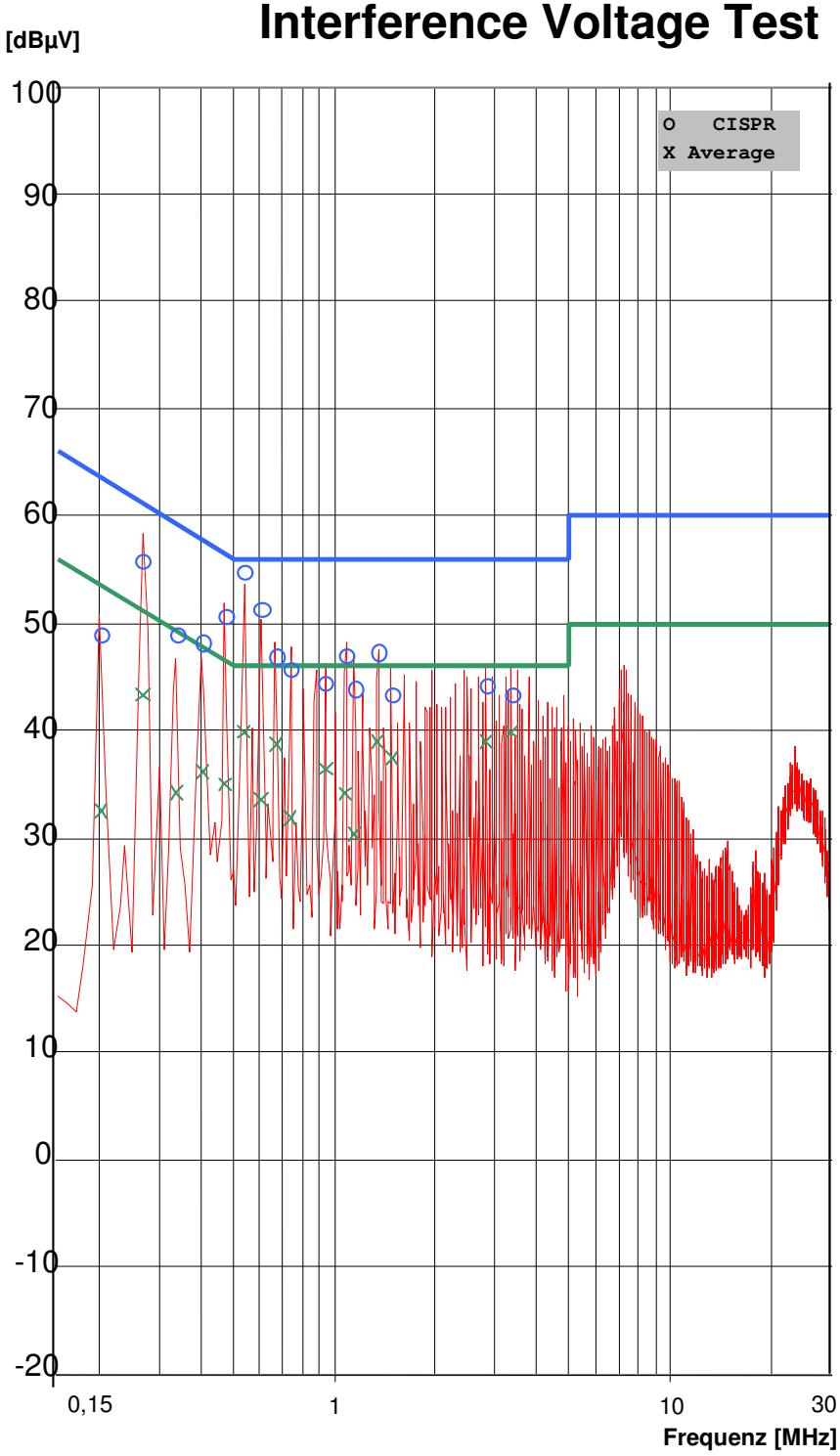
Description	Manufacturer	Inventory Nr.
Shielded chamber	Siemens - Matsushita	200016

Measurement equipment

	Description	Manufacturer	Inventory Nr.
☑	ESH 3	Rohde & Schwarz	100002
☐	ESCS 30	Rohde & Schwarz	100072
☐	EZ – 10	Rohde & Schwarz	100006
☐	TK 9430	Rohde & Schwarz	300089
☑	ESH3 Z2	Rohde & Schwarz	200051
☑	ESH 2-Z5	Rohde & Schwarz	100040
☑	ESH 2-Z5	Rohde & Schwarz	100041
☐	ENY 41	Rohde & Schwarz	100084
☐	ENY 22	Rohde & Schwarz	100086
☐	ISN LAN	EMV Testhaus	100087

Test related measurement inaccuracies have to be taken into consideration when evaluation the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.

Interference Voltage Test



REGULATION
DIN EN 55022 Klasse B
PEAK / CISPR / AV

TEST
R&S ESH3 (100002)
R&S ESH2-Z5 (100040)
R&S Pulse Limiter (200051)

ORDER
265.132

EUT:
AVERY DENNISON
Printer
AP5.4
Prototype

OPERATION
EUT is printing

Mains 230V AC /50Hz
Phase

TEST
EMV TESTHAUS GmbH
Gustav-Hertz-Straße 35
94315 Straubing

DATE /
16.03.2005
22,9 °C 27 %H

TEST
Biberger Markus

132 ss L1.E10

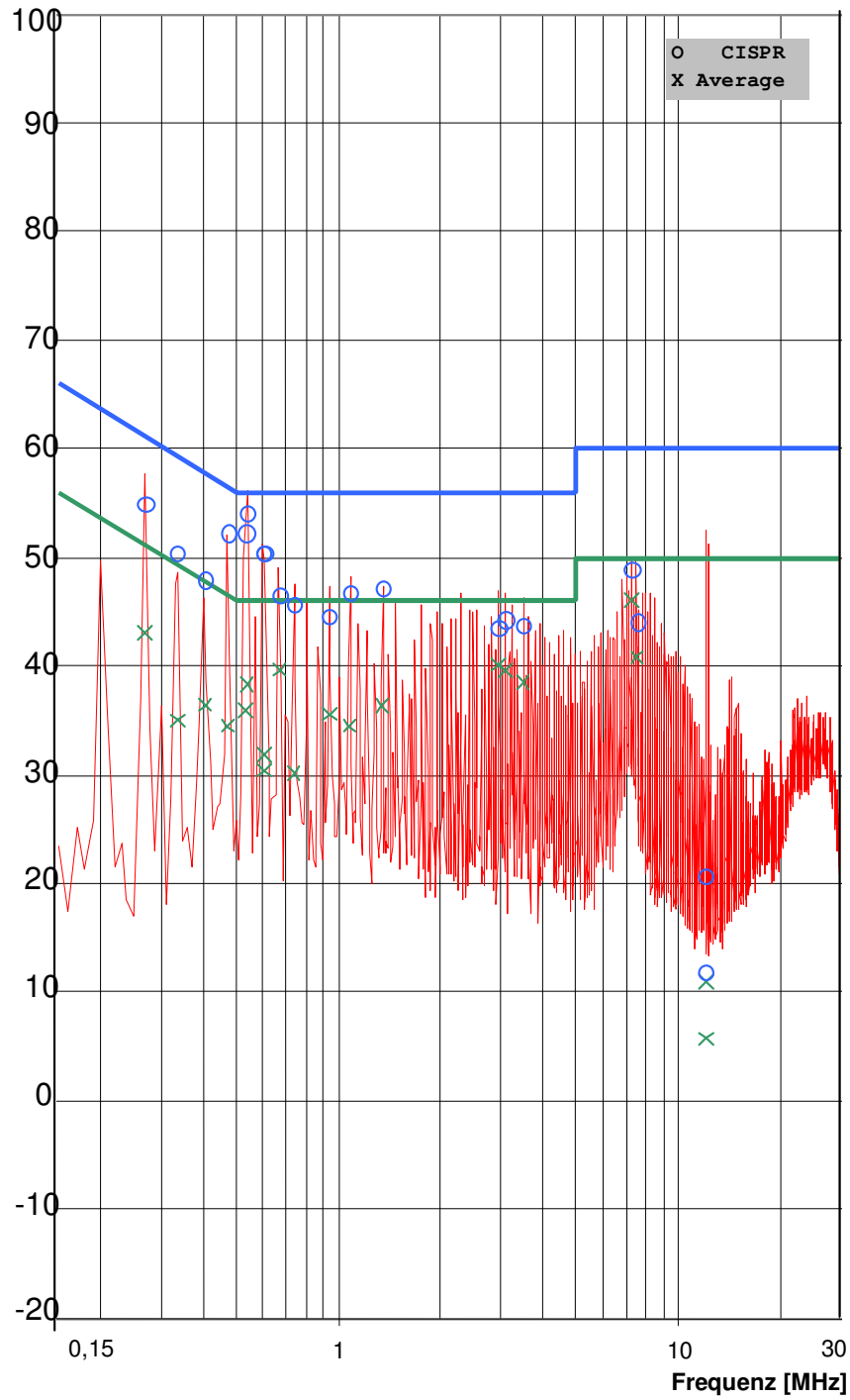
graph 4.1: conducted emission at line 1

Interference Voltage Test

Freq. [MHz]	U_CISPR [dBµV]	Limit [dBµV]	delta_U [dB]	U_AV [dBµV]	Limit [dBµV]	delta_U [dB]	Corr. [dB]	Remark 132 ss L1.E10
0,54	54,8	56,0	1,2	39,9	46,0	6,1	0,0	
0,61	51,3	56,0	4,7	33,6	46,0	12,4	0,0	
0,27	55,8	61,1	5,3	43,3	51,1	7,8	0,0	
0,47	50,7	56,5	5,8	35,0	46,5	11,5	0,0	
1,35	47,3	56,0	8,7	39,0	46,0	7,0	0,0	
1,08	47,0	56,0	9,0	34,1	46,0	11,9	0,0	
0,67	46,9	56,0	9,1	38,8	46,0	7,2	0,0	
0,41	48,2	57,8	9,6	36,2	47,8	11,6	0,0	
0,74	45,8	56,0	10,2	31,9	46,0	14,1	0,0	
0,34	48,9	59,2	10,3	34,2	49,2	15,0	0,0	
0,94	44,5	56,0	11,5	36,5	46,0	9,5	0,0	
2,83	44,2	56,0	11,8	39,0	46,0	7,0	0,0	
1,15	43,9	56,0	12,1	30,3	46,0	15,7	0,0	
1,48	43,4	56,0	12,6	37,4	46,0	8,6	0,0	
3,37	43,4	56,0	12,6	39,9	46,0	6,1	0,0	
0,20	48,9	63,5	14,6	32,5	53,5	21,0	0,0	

chart 4.1: conducted emission at line 1

Interference Voltage Test



REGULATION
DIN EN 55022 Klasse B
PEAK / CISPR / AV

TEST
R&S ESH3 (100002)
R&S ESH2-Z5 (100040)
R&S Pulse Limiter (200051)

ORDER
265.132

EUT:
AVERY DENNISON
Printer
AP5.4
Prototype

OPERATION
EUT is printing

Mains 230V AC /50Hz
Neutral

TEST
EMV TESTHAUS GmbH
Gustav-Hertz-Straße 35
94315 Straubing

DATE /
16.03.2005
22,9 °C 27 %H

TEST
Biberger Markus

132 ss N.E10

graph 4.2: conducted emission at line 2

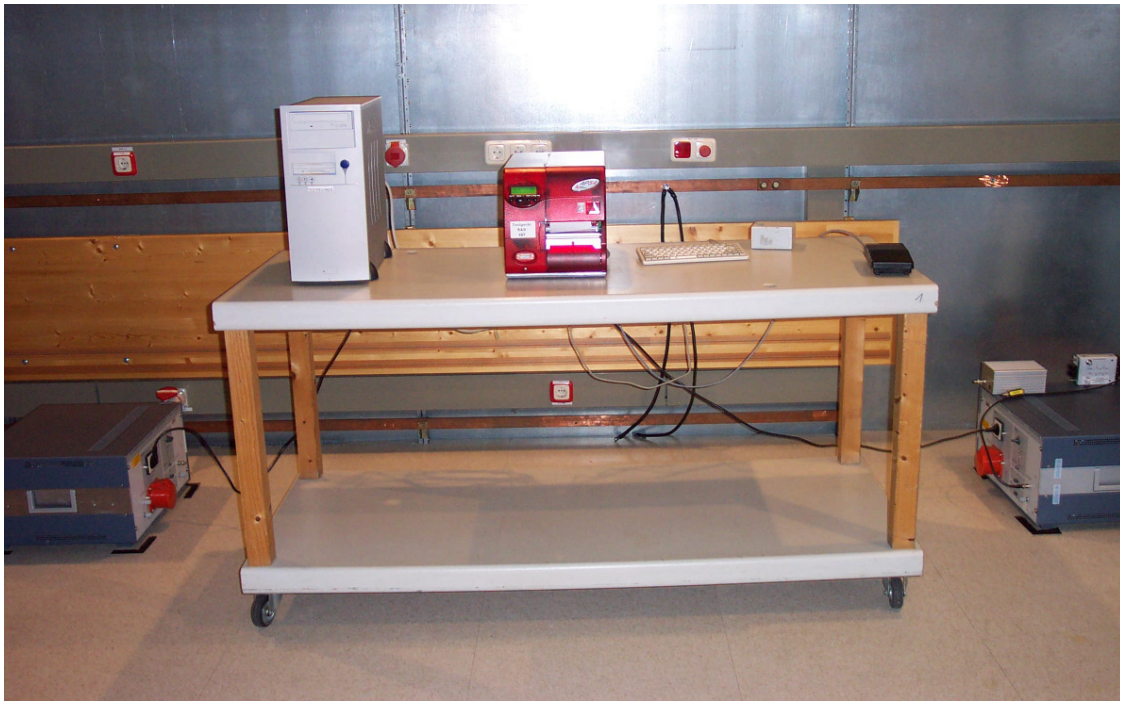
Interference Voltage Test

132 ss N.E10

Freq. [MHz]	U_CISPR [dBµV]	Limit [dBµV]	delta_U [dB]	U_AV [dBµV]	Limit [dBµV]	delta_U [dB]	Corr. [dB]	Remark
0,54	54,1	56,0	1,9	38,3	46,0	7,7	0,0	
0,54	52,3	56,0	3,7	36,0	46,0	10,0	0,0	
0,47	52,3	56,5	4,2	34,5	46,5	12,0	0,0	
0,61	50,5	56,0	5,5	30,4	46,0	15,6	0,0	
0,61	50,5	56,0	5,5	31,8	46,0	14,2	0,0	
0,27	55,0	61,1	6,1	43,1	51,1	8,0	0,0	
1,35	47,2	56,0	8,8	36,4	46,0	9,6	0,0	
0,34	50,4	59,3	8,9	35,0	49,3	14,3	0,0	
1,08	46,7	56,0	9,3	34,5	46,0	11,5	0,0	
0,67	46,6	56,0	9,4	39,7	46,0	6,3	0,0	
0,41	48,0	57,8	9,8	36,5	47,8	11,3	0,0	
0,74	45,8	56,0	10,2	30,2	46,0	15,8	0,0	
7,28	48,9	60,0	11,1	46,1	50,0	3,9	0,0	
0,94	44,7	56,0	11,3	35,6	46,0	10,4	0,0	
3,10	44,3	56,0	11,7	39,6	46,0	6,4	0,0	
3,50	43,7	56,0	12,3	38,5	46,0	7,5	0,0	
2,96	43,6	56,0	12,4	40,1	46,0	5,9	0,0	
7,55	44,1	60,0	15,9	40,8	50,0	9,2	0,0	
12,07	20,7	60,0	39,3	10,9	50,0	39,1	0,0	
12,07	11,9	60,0	48,1	5,7	50,0	44,3	0,0	

chart 4.2: conducted emission at line 2

Photo documentation



picture 4.1: setup of conducted emission

Test result

The requirements according to CFR 47 Part 15 Subpart B Class B are

☑ **Kept**

Kept with the closest margin of 1.2 dB at 0.540 MHz.

Test Personnel:

Signature: _____ test date: 16.03.2005

Printed Name: Markus Biberger

Expanded Uncertainty (9kHz to 150kHz):
$U_{(y)}$ = (y ± 4,3) dBµV; k=2,00
y = Indicated value

Expanded Uncertainty (150kHz to 30MHz):
$U_{(y)}$ = (y ± 3,9) dBµV; k=2,00
y = Indicated value

Comments: All peripheral devices were additionally decoupled by means of a line stabilization network.

7. Measurement of radiated emission

according to CFR 47 Part 15 Subpart B Class B

Procedure of radiated emission measurement:

☑ Scan with peak detector in 3 m CDC

☑ Final CISPR measurement with quasi peak detector on open site area.

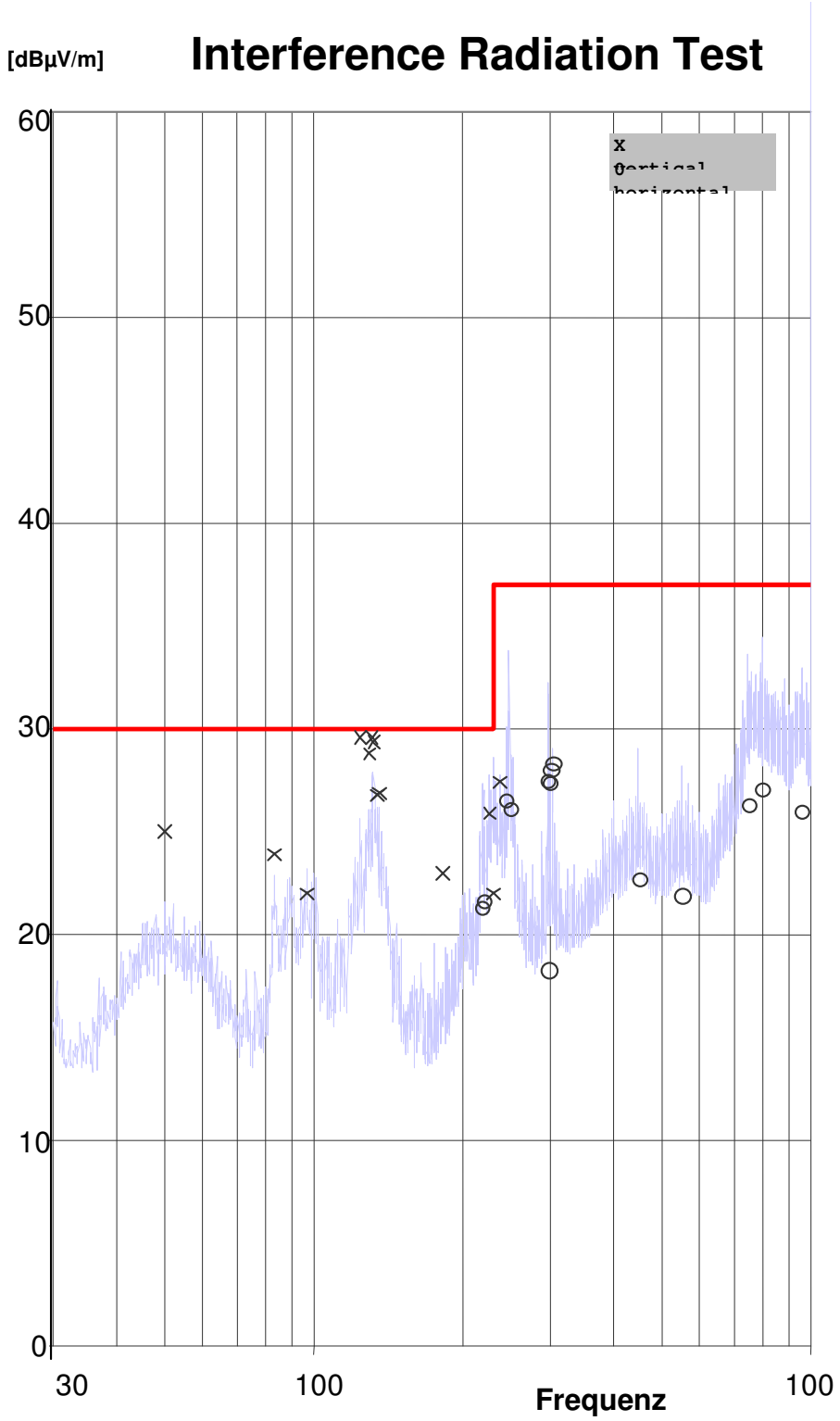
Location of measurement

Description	Manufacturer	Inventory Nr.
CDC	Albatross Projects	100089
Open site area	EMV Testhaus	200017

Measurement equipment

	Description	Manufacturer	Inventory Nr.
☑	ESCS 30 (CDC)	Rohde & Schwarz	100072
☑	ESVP (FF)	Rohde & Schwarz	100001
☑	VULB 9163 (CDC)	Rohde & Schwarz	100077
☑	VULB 9160 (FF)	Rohde & Schwarz	100064

Test related measurement inaccuracies have to be taken into consideration when evaluation the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.



REGULATION
DIN EN 55022 Class B
PEAK / CISPR

TEST
R & S ESVP (10 001)
VULB 9160 (10 0 064)
Suhner (20 0 024)

ORDER
265.132

EUT:
AVERY DENNISON
Printer
AP5.4
Prototype

OPERATION
EUT is printing
LAN was active
connected all
Data cable connect at PC

TEST
EMV TESTHAUS GmbH
Gustav-Hertz-Straße 35
94315 Straubing

DATE /
16.03.2005
22,2 °C 27 %H

TEST
Biberger Markus

132 cdc 03.E10

graph 5.1: radiated emission

Interference Radiation Test

132 cdc 03.E10

Freq. [MHz]	U_Rec [dBµV/m]	Limit [dBµV/m]	Corr. [dB]	U_Ant. [dBµV]	delta_U [dB]	Turn-table	Antenna	Pol.	Remark
50,10	25,0	30,0	12,2	12,8	5,0	334°	110 cm	V	
83,50	23,9	30,0	8,9	15,0	6,1	124°	110 cm	V	
97,00	22,0	30,0	10,8	11,2	8,0	198°	110 cm	V	
124,30	29,6	30,0	13,4	16,2	0,4	111°	110 cm	V	
129,50	28,8	30,0	13,7	15,1	1,2	58°	110 cm	V	
131,30	29,6	30,0	13,7	15,9	0,4	26°	111 cm	V	
132,30	29,4	30,0	13,8	15,6	0,6	56°	110 cm	V	
134,00	26,8	30,0	13,8	13,0	3,2	26°	110 cm	V	
135,80	26,9	30,0	13,9	13,0	3,1	55°	110 cm	V	
182,40	23,0	30,0	0,0	23,0	7,0	240°	110 cm	V	
218,00	21,3	30,0	12,0	9,3	8,7	88°	250 cm	H	
219,80	21,6	30,0	12,1	9,5	8,4	79°	250 cm	H	
226,10	25,9	30,0	12,5	13,4	4,1	150°	110 cm	V	
229,60	22,0	30,0	12,7	9,3	8,0	293°	110 cm	V	Fremdstörer
237,50	27,4	37,0	13,0	14,4	9,6	96°	110 cm	V	
244,00	26,5	37,0	13,3	13,2	10,5	121°	250 cm	H	
247,90	26,1	37,0	13,4	12,7	10,9	74°	250 cm	H	
295,30	27,5	37,0	15,2	12,3	9,5	334°	250 cm	H	
296,80	18,3	37,0	15,3	3,0	18,7	8°	250 cm	H	
297,60	27,4	37,0	15,3	12,1	9,6	6°	250 cm	H	
300,00	28,0	37,0	15,4	12,6	9,0	146°	250 cm	H	
302,50	28,3	37,0	15,5	12,8	8,7	171°	250 cm	H	
450,00	22,7	37,0	19,8	2,9	14,3	353°	250 cm	H	
550,00	21,9	37,0	21,8	0,1	15,1	69°	250 cm	H	
750,00	26,3	37,0	25,4	0,9	10,7	306°	250 cm	H	
800,00	27,1	37,0	26,2	0,9	9,9	4°	250 cm	H	
960,00	26,0	37,0	28,2	-2,2	11,0	1°	250 cm	H	

chart 5.1: radiated emission

Photo documentation

picture 5.1: setup of radiated emission

Test result

The requirements according to CFR 47 Part 15 Subpart B Class B are

☑ **Kept**

Kept with the closest margin of 0.4 dB at 131.30 MHz.

Test Personnel:

Signature: _____ test date: 16.03.2005

Printed Name: Markus Biberger

Expanded uncertainty (30MHz to 300MHz):
$U_{(y)}$ = (y ± 5,4) dBµV/m; k=2,00
y = Indicated value

Expanded uncertainty (300MHz to 1000MHz):
$U_{(y)}$ = (y ± 4,7) dBµV/m; k=2,00
y = Indicated value

Comments: : A modification was necessary.

8. Summary

The measurements of the equipment under test show compliance with the above mentioned test regulation.

Place and date of issuance of this test report:

Straubing, July 18th, 2005

EMI/EMC Test Engineer

EMV Testhaus GmbH Coordinator

The equipment shall be retested to demonstrate continued compliance with the applicable requirements if any modifications or changes that could adversely affect the emanation characteristics of the equipment are made.
The responsible party bears responsibility for the continued compliance of subsequently produced equipment.

Official of responsible party