Laboratoria De Nayer v.z.w.
Department of Electronics
Section E.M.C.

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053-T - ISO17025

TEST REPORT

order number : 380
serial number: E0406004
edition number: 01
date of edition: 28/01/2005

Customer's references	
Customer :	Agfa Gevaert NV
Address :	Septestraat 27 , 2640 Mortsel
Contact person :	Mr. Jan Vercammen

EUT's identification
Description and identification of the sample or equipment under test (marks, type number):
Drystar 5300 tabel top model SN : IPT1030 type : 5365/100 FCC ID : HPL5365

Applied Tests or Technical Standards	
Emission:	
Test or Technical Standard	**Title**
FCC CFR47 part 15	**Code of Federal Regulations , part 15 , Subpart B , Unintentional Radiators**

MRA : **between E.C. and USA : CAB (EMC) date of validation 15.01.2002 (refer to p30)**

Equipment Classifications
Class A digital device : A digital device that is marketed for use in a commercial , industrial or business environment , exclusive of a device which is marketed for use by the general public or is intended to be used in the home.

Class B digital device : A digital device that is marketed for use in a residential environment , notwithstanding use in commercial , industrial or business environments. Examples of such a devices include , but are not limited to , personal computer , calculators and similar electronic devices that are marketed for use by the general public.

The field strength is calculated in the receiver , for conducted emission TDF11 is selected , for spurious radiated emission the TDF21 is selected .
TDF11 is the Transducer Factor for the LISN (combination of the attenuation of the LISN and cable in the range 150kHz-30MHz)
TDF21 is the Transducer factor for the bilog antenna (combination of the AF of the Chase antenna , pre-amplifier and cables in the range 30MHz-1GHz) .

Deviations from the test methods :
no

History of the tests	
identification number of the receipt:	EMC04022
Date of receipt of the sample or equipment under test:	03/06/2004
Date(s) of test:	03 and 17/06/2004 , 28/07/2004

De Vos Jan
Test Engineer

Prof. dr. ir. Dirk Van Troyen
Technical Director

List of measurement equipment used during the tests

Item	model	serial number	
Rohde & Schwarz EMI receiver	ESCS30	SN:826547/027	*
Chase Bilog antenna	CBL6112A	SN:2182	*
Antenne mast + controller	RSM 010 / RSC 02	/	*
Anechoic room	EAC52282	/	*
Rohde & Schwarz signal generator	SMX	SN: 825026/026	*
WaveTek signal generator	182A	M6660836	*
Amplifier Research amplifier 25-1000 MHz	25W1000M7	SN:12126	*
Amplifier Research amplifier 10 kHz – 220 MHz	50A220	SN: 12143	*
EM clamp	EM101	SN: 35400	*
ESD generator EM-TEST	ESD30	SN:0295-31	
ESD gun	P 18	SN:0295-31	
Compact generator	UCS 500	SN: 0596-42	*
Magnetic field source	MFS 100/P	SN: A1888 04/0 0297	
Magnetic loop antenna		SN: A18811/00297	
Magnetic field probe	/	SN: A1888 11/S 0297	
harm + flicker test system (Spitzenberger+Spies)	EMV E2000/Pas	SN: A2780 00/0 0501	*
Vierddraht-T-Netznachbildung	EZ-10	SN: 843074/018	
100 Ohm resistor	CR 100A	/	
R&S ISN 4wire network	ENY41	837032/012	*
R&S ISN 2wire network	ENY22	837497/017	
R&S clamp	MDS21	84003/017	
R&S T-network 2wire network	ESH3-Z4	SN: 844390/004	
R&S T-network 4wire network	EZ-10	SN: 843074/018	
CDN 801-M2/3 : LÜTHL	CDN M2/3	930	*
CDN 801-M5 : LÜTHL	CDN M5	932	
LISN single phase	LDN	LDNLI1	*
parallel probe	LDN	LDNLP2	
preamp : 9kHz-1GHz Chase	CPA9231	SN :3078	*
HP Power supply	HP6247B		
HP spectrum Analyzer	HP8546A	SN: 3549A00300	
R&S horn antenna 1-18GHz	HF906	SN: 100008	
R&S horn antenna 1-18GHz	HF906	SN: 100007	
R&S power meter	NRVD	SN : 857.8008.02	
R&S power sensor	URV5-Z4	SN : 095 161955	
Marconi signal generator	2024	SN : 112246/063	
R&S loop antenna 9k-30MHz	HFH2 Z2	SN : 878604/007	
R&S bilog antenna 30-3000MHz	HL562	SN : 361324/017	
R&S bilog antenna 30-3000MHz	HL562	SN : 361324/018	
HP dynamic signal analyzer	HP3562A	SN : 3005A05241	
Fluke Scopemeter	192B	SN : DM8380360	
Fluke current probe	i200s	SN : 1040036ZBS	
Fluke DVM	73III	SN: 74140243	

Description of the EUT.

l.1. General.

The EUT is composed out one unit

1.2. Technical specifications of the EUT's.

rated power supply	115V/230Vac
Inrush current	/
Cabling:	LAN cable UTP l=13m
Test equipment (AE) (no part EUT)	PC Laptop
1 power supply cable	power cable , 3wires l= 2m
Modifications	power supply : Magnetek : 3E-19-50 SN008 common mode choke on L and N Shield on booster choke.

1.3. Photographs of the EUT's.

Photo 1 :Complete Model . EUT

photo 2 : rear view

1. Test conditions and climatic conditions.

1.1. Test conditions.

The equipment under test(EUT's) has been tested as a table top equipment.
For the radiated emission test the distance between antenna and EUT was 3 meter.
All tests have been performed in an anechoic chamber.

2 Climatic conditions.

The climatic conditions during these tests were:
date : 03,17/06/2004 and 28/07/2004
ambient temperature : 22.1/22.8/24°C
relative humidity: 62/64/52%
atmospheric pressure: 1021/1018/1021mBar

3. The manufacturers'/applicants' role during the tests.

The applicant prepared the EUT and witnessed the test.

3. Tests.

3.1. Emission tests.

The test has been performed according to the standard: CFR 47 part15 Subpart B .

3.1.1. Conducted emission .

The test has been performed according to the standard: CFR 47 part15 Subpart B section 15.107.

3.1.2. Conducted emission on EUT. (test date : 17/06/2004)

The equipment was placed at ± 80 cm above the floor .
The test has been performed in a shielded room.
The conducted emission level was measured with a LISN according to CISPR16 /ANSI C63.4 (0.15 MHz - 30 MHz).

The upper limit line is the quasi-peak limit line for class A equipments.
The lower limit line is the average limit line for class A equipments.

Measurement results for EUT : 230Vac @50Hz

Conducted emission L1-PE : EUT

table1 : EUT

Freq (MHz)	QP (dBµV)	AV (dBµV)
0.171	46.2	40.3
0.210	54.3	49.2
0.280	53.0	48.4
0.350	46.1	42.5
5.845	52.4	43.2
9.535	48.2	36.6
25.625	48.6	40.2

fig1 : Measurement results L1- PE, peak + average detector, normal mode.

Conducted emission L2-PE : EUT

table2 : EUT

Freq (MHz)	QP (dBµV)	AV (dBµV)
0.170	44.9	40.0
0.485	49.1	43.5
0.55	49.2	44.5
9.10	44.8	28.7
13.06	36.4	31.5
25.80	41.2	31.6

fig2 : Measurement results L2- PE, peak + average detector, normal mode.

conclusion :The EUT satisfies the class A limits for conducted emission according to part15 Subpart B

3.1.3. Conducted emission on EUT. (test date : 28/07/2004)

The equipment was placed at ± 80 cm above the floor .
The test has been performed in a shielded room.
The conducted emission level was measured with a LISN according to CISPR16 (0.15 MHz - 30 MHz).

The upper limit line is the quasi-peak limit line for class A equipments.
The lower limit line is the average limit line for class A equipments.

Measurement results for EUT : 115Vac @60Hz
Conducted emission L1-PE : EUT

table3 : EUT

Freq (MHz)	QP (dBµV)	AV (dBµV)
0.205	59.7	54.2
0.275	52.5	48.8
0.345	50.7	44.2
0.415	48.2	42.5
0.485	43.5	39.1
0.555	44.8	40.5
9.39	31.4	22.6
13.48	37.8	28.2

fig3 : Measurement results L1- PE, peak + average detector, normal mode.

Conducted emission L2-PE : EUT

table4 : EUT

Freq (MHz)	QP (dBµV)	AV (dBµV)
0.205	59.9	54.8
0.28	55.7	51.8
0.35	52.6	46.4
0.415	56.0	51.2
0.485	52.1	45.3
0.555	53.3	47.5
9.84	47.0	40.5
13.21	47.4	33.2

fig4 : Measurement results L1- PE, peak + average detector, normal mode.

conclusion :The EUT satisfies the class A limits for conducted emission according to part15 Subpart B.

3.1.4. Radiated emission . (test date : 03/06/2003)

The test has been performed according to the standard: CFR 47 part15 Subpart B section 15.109.

The equipment was placed in a semi anechoic room (10x6x6) with metal groundplane at ± 80cm of the floor. The chamber complies with the ANSI C63.4/5 and CISPR 16.
The radiated emission level was measured with a bilog antenna (30-1000MHz) .
The measuring uncertainty is +/- 3.9 dB.
The limit line 1 is the quasi-peak limit line for class equipments.

Measurement results Radiated emission :
Horizontal polarization operation mode :

table5 : EUT (115Vac/50Hz)

Freq (MHz)	QP (dBµV/m)	height(m)	side
150.062	33.5	1.75	1
244.06	36.3	1.0	1
325.4	39.0	1.0	1
379.687	37.3	1.0	1
134.18	32.8	1.5	2
189.81	29.3	1.5	2
325.43	36.1	1.0	2
128.625	25.7	1.5	3
216.93	31.6	1.5	3
379.68	32.6	1.0	3
130.50	30.9	1.5	4
300.81	32.2	1.0	4
610.125	31.6	1.0	4

fig5=hor/1 ; fig7=hor/2 ; fig9= hor/3; fig11= hor/4

Vertical polarization operation mode
table6 : EUT

Freq (MHz)	QP (dBµV/m)	height(m)	side
42.87	31.3	1	1
50.75	34.4	1	1
134.75	33.9	1	1
156.87	32.7	1	1
297.37	34.1	1	1
610.18	38.1	1	1
42.56	33.8	1	2
50.56	35.3	1	2
134.81	36.7	1	2
150.06	35.7	1	2
42.43	31.3	1	3
50.75	33.5	1	3
68.12	28.6	1	3
1343.68	36.2	1	3
149.62	35.7	1	3
43.0	32.4	1	4
135.0	38.7	1	4
142.0	34.8	1	4

fig6= ver/1 ; fig8= ver/2 ; fig10= ver/3 ; fig12= ver/4

conclusion: The EUT satisfies the class B limits for radiated emission according to part15 Subpart B.

3.1.4 Tables limit lines

table6 : CE on mains (class A)

frequency (MHz)	QP (dBµV)	AV (dBµV)
0.15-0.50	79	66
0.50-5.0	73	60
5.0-30	73	60

table7 : RE @ 3m (class B)

frequency (MHz)	QP (dBµV/m)
30-88	40.0
88-216	43.5
216-960	46.0
above 960	54.0

table8 : RE @ 3m (class A)

frequency (MHz)	QP (dBµV/m)
30-88	49
88-216	53.5
216-960	56.5
above 960	59.5

4. Summary of the test results.

4.1Test results of the emission tests.EUT1.

Conducted and Radiated emission measurement according to FCC part15 Subpart B.		
Test	The EUT complies class A limits	remarks
conducted emissions (0.15 MHz – 30 MHz)	yes	
radiated emissions (30 MHz – 1000 MHz)	yes	

remark : for class A devices

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

5. Plotted graphs of the emission measurements.

5.1fig1 Conducted emission L1-PE (230V / 50Hz)

Agfa Gevaert

17. Jun 04 12:11

L1

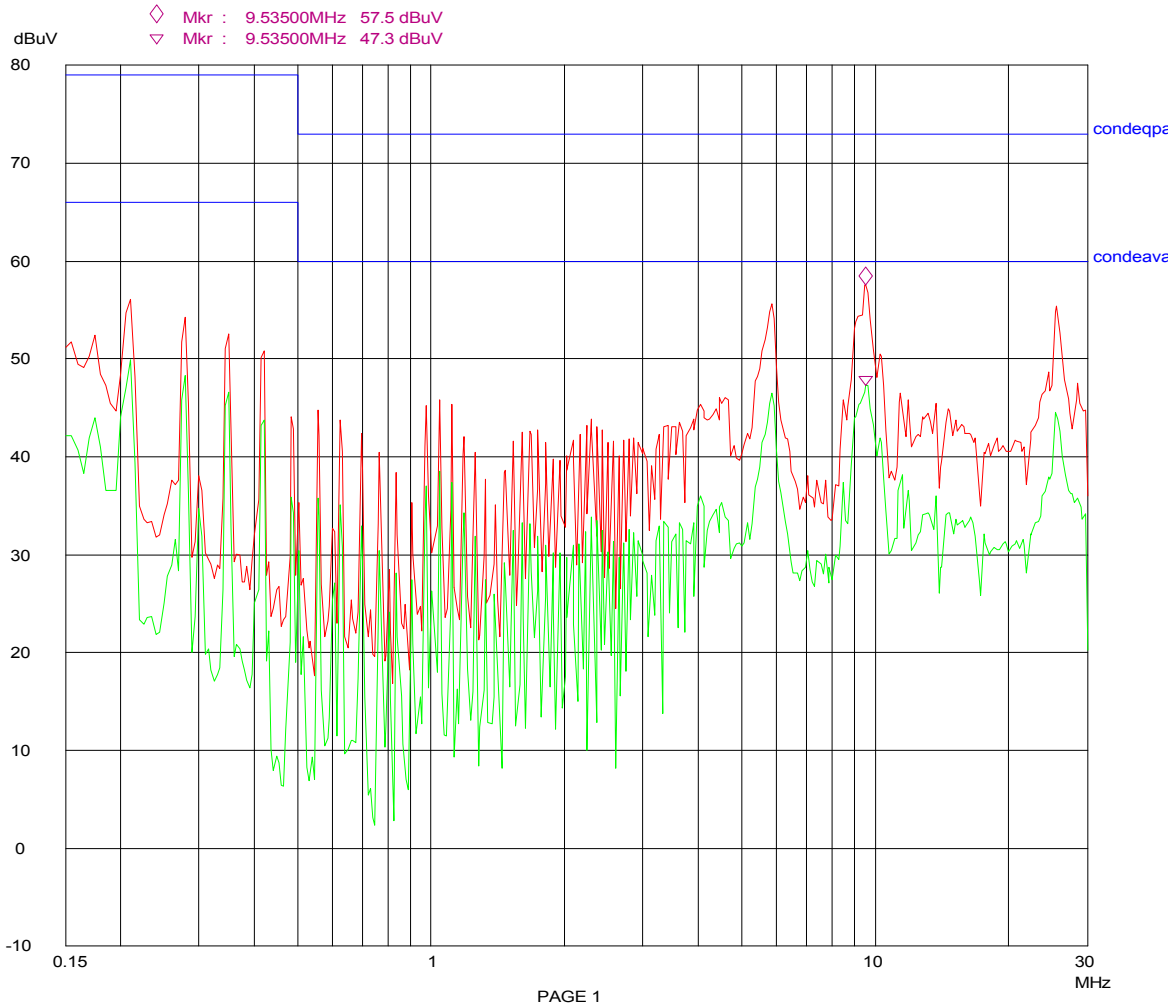
EUT: Drystar 5300

Scan Settings (1 Range)

|-------- Frequencies ----------||-------- Receiver Settings --------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
11	9k	30M	lisn



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5.2 fig2 Conducted emission L2-PE (230V / 50Hz)

Agfa Gevaert

17. Jun 04 11:53

L2

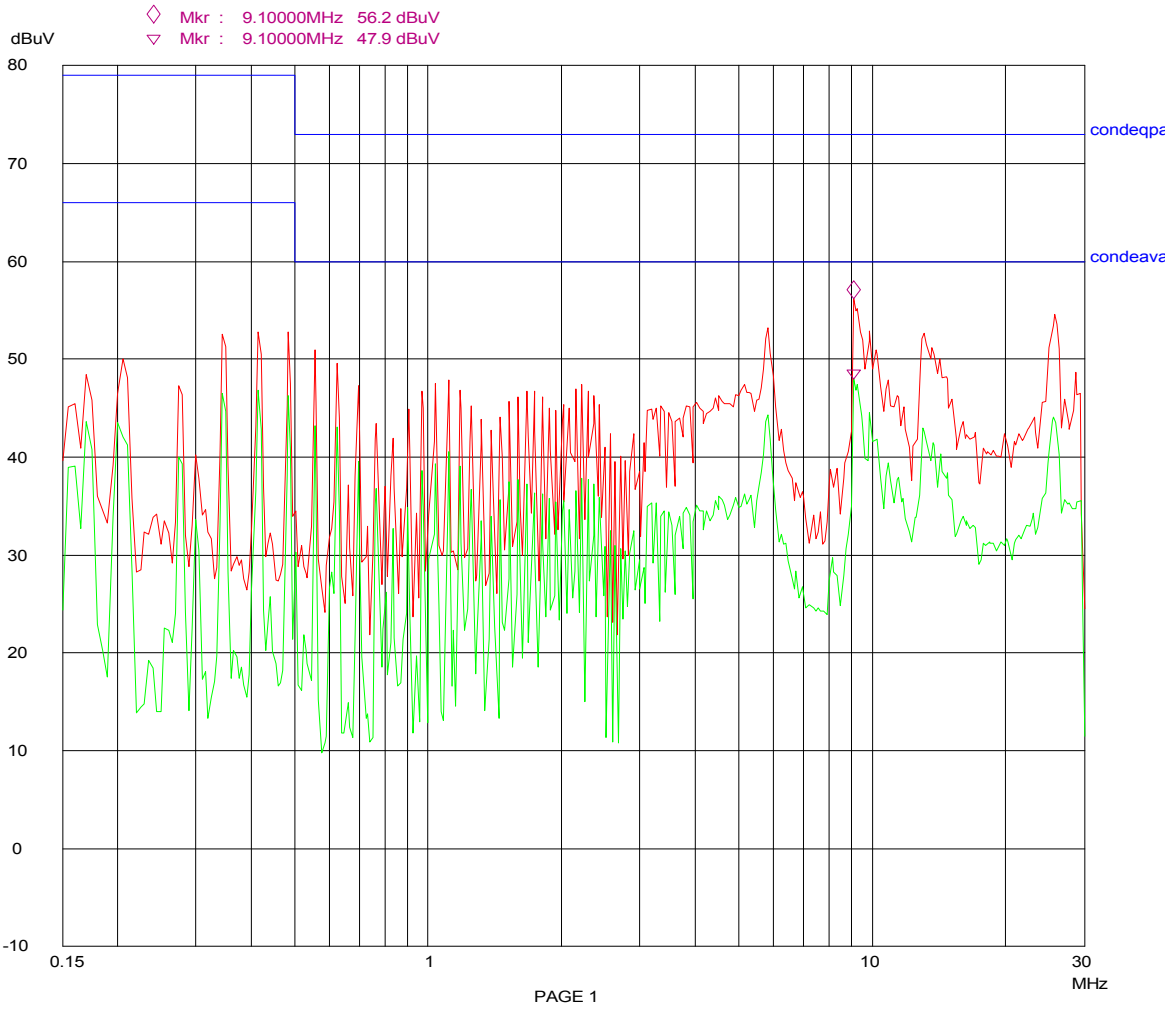
EUT: Drystar 5300

Scan Settings (1 Range)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
11	9k	30M	lisn



PAGE 1

5.3 fig3 Conducted emission L1-PE (115V / 60Hz)

Agfa Gevaert

28. Jul 04 14:25

L1 115V

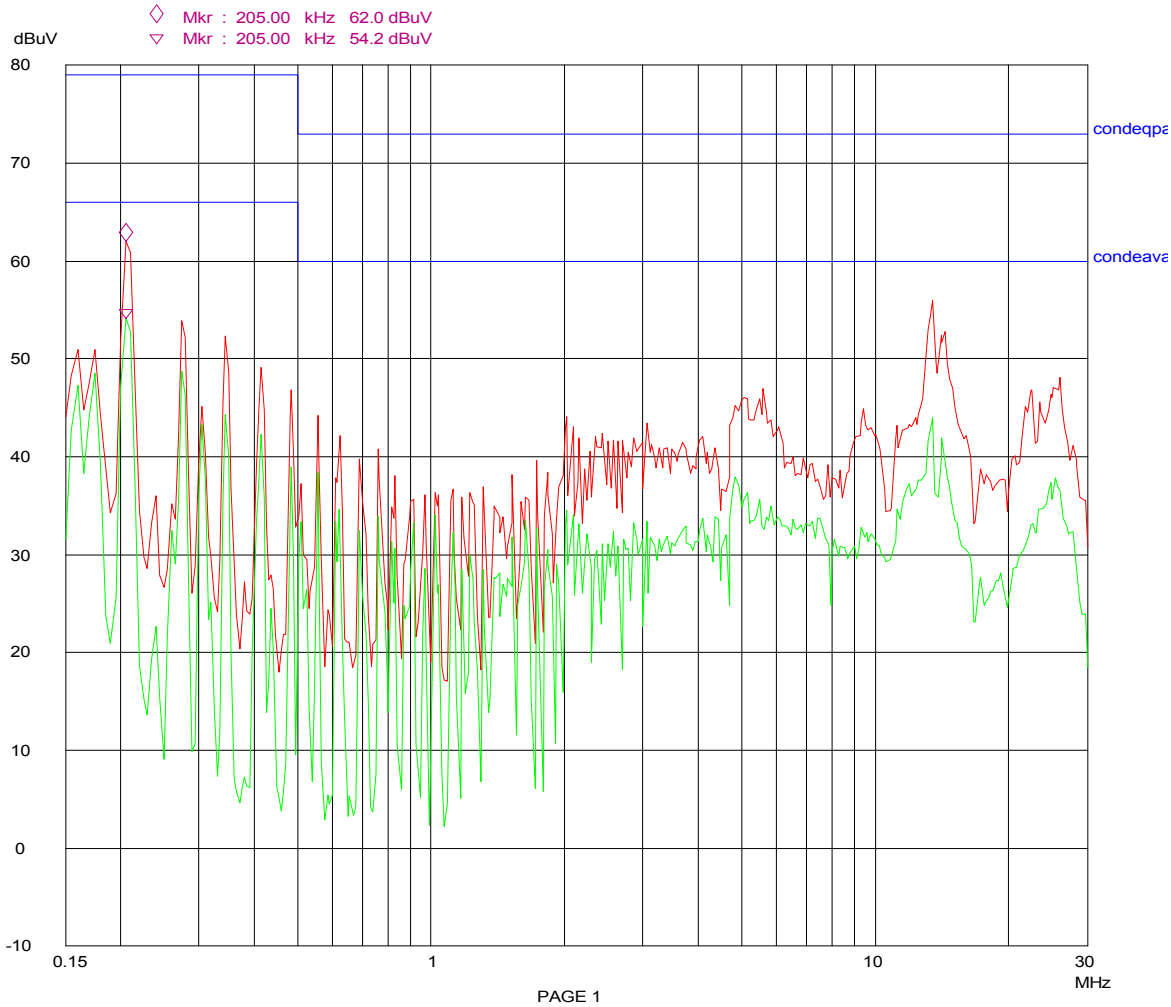
EUT: printing

Scan Settings (1 Range)

|-------- Frequencies ----------||-------- Receiver Settings --------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
11	9k	30M	lisn



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5.4 fig4 Conducted emission L2-PE (115V / 60Hz)

Agfa Gevaert

28. Jul 04 14:10

L2 115V

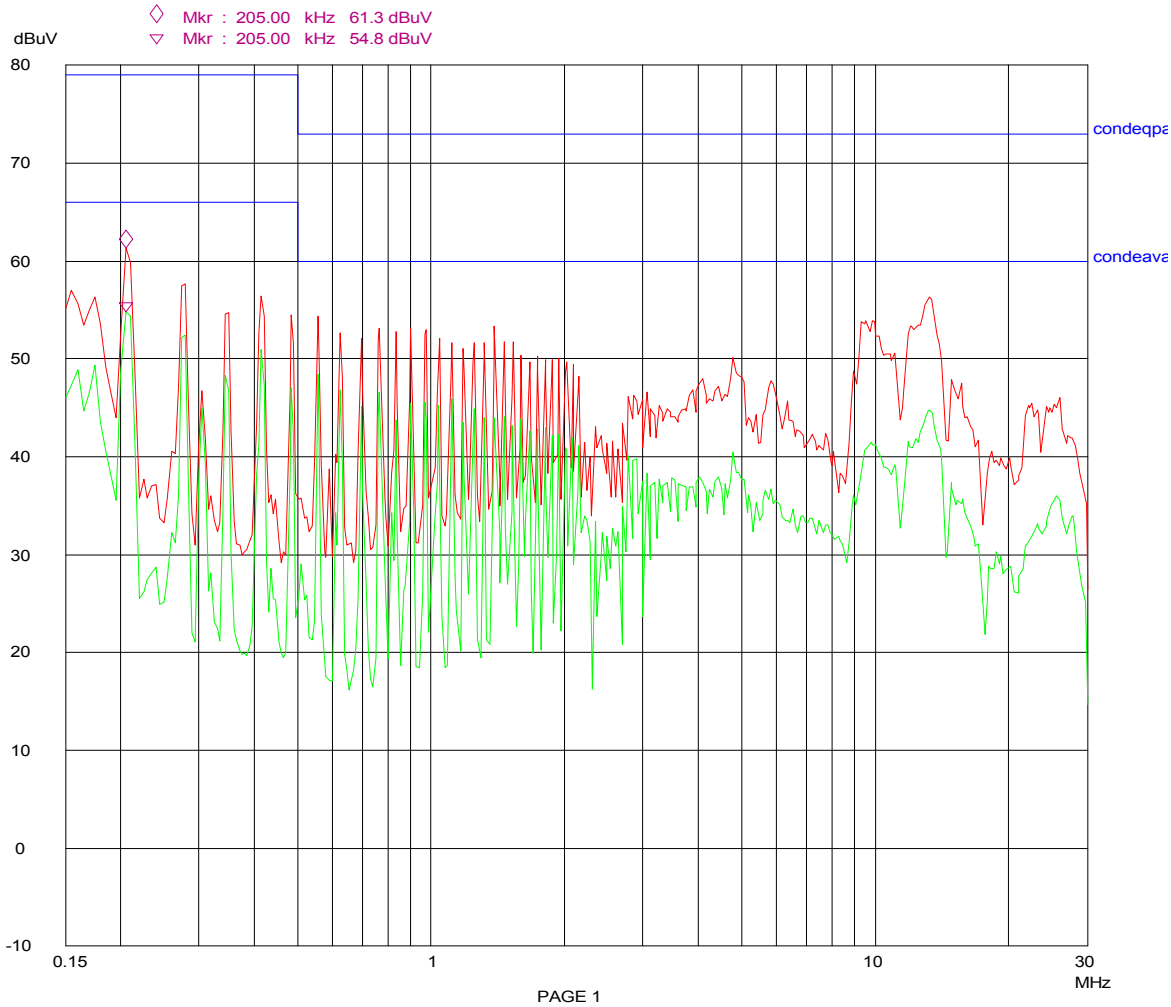
EUT: printing

Scan Settings (1 Range)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
11	9k	30M	lisn



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5.5 fig5 Radiated emission (30...1000MHz) hor. pol , side1

Agfa Gevaert

03. Jun 04 12:46

1h

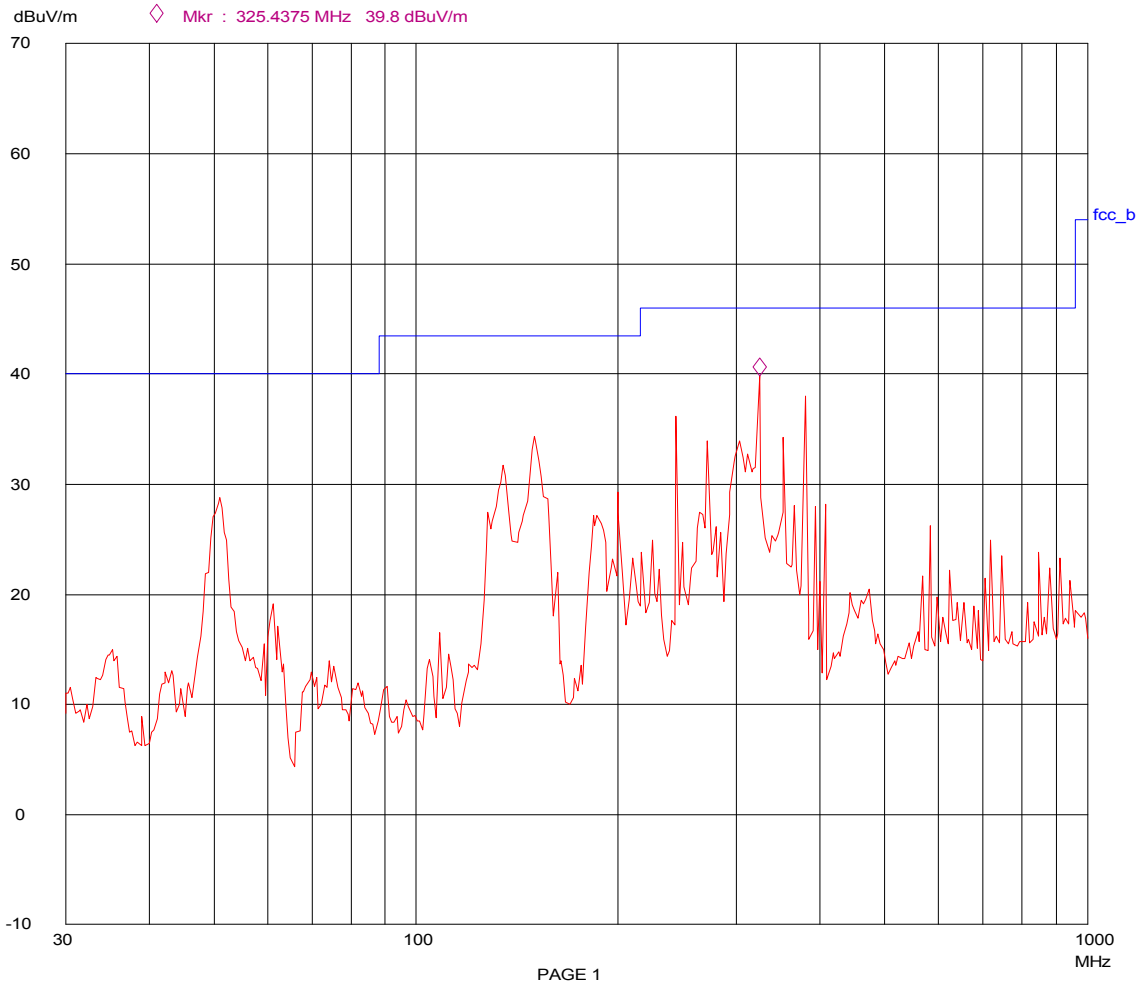
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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Agfa Gevaert

03. Jun 04 12:54

1v

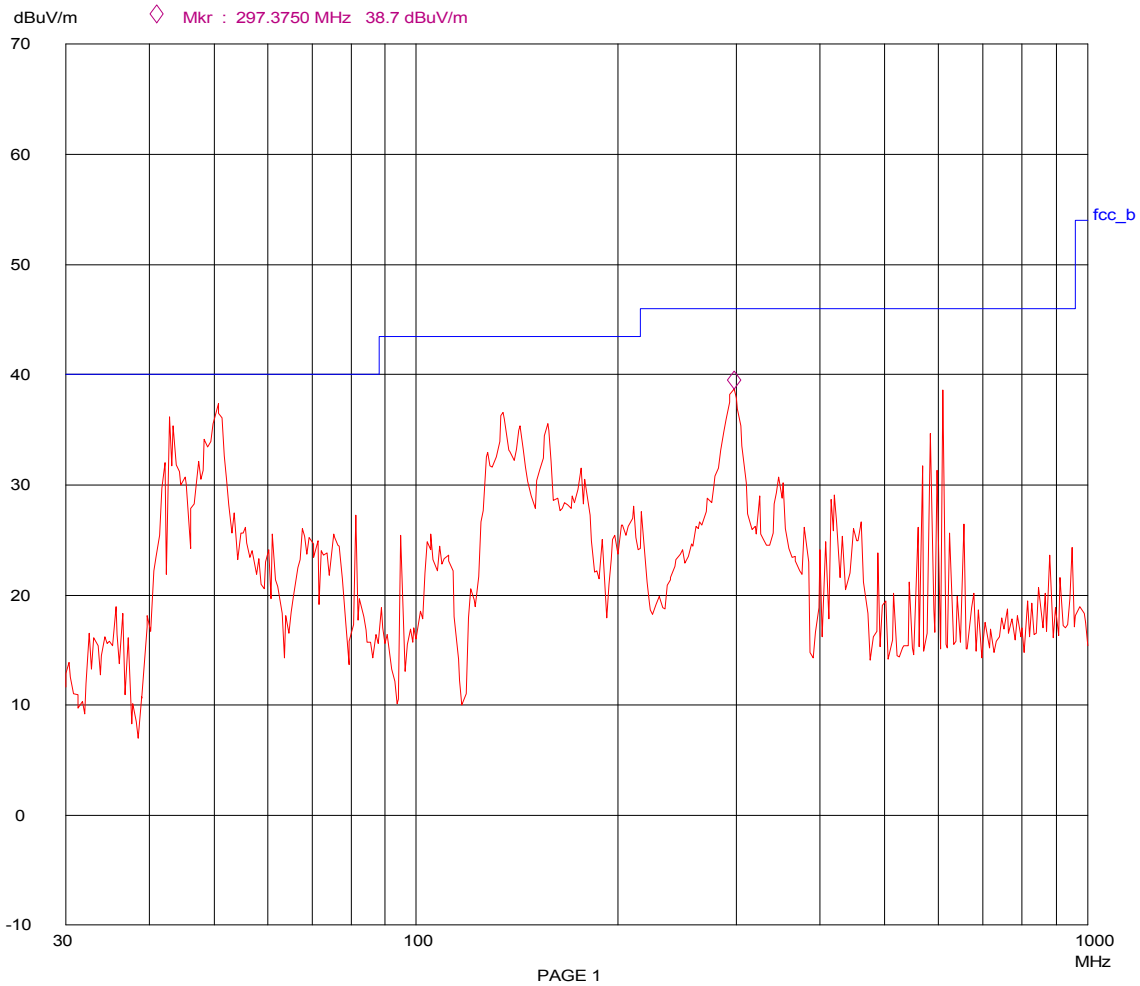
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



PAGE 1

5.7 fig7 Radiated emission (30...1000MHz) hor. pol , side2

Agfa Gevaert

03. Jun 04 13:09

2h

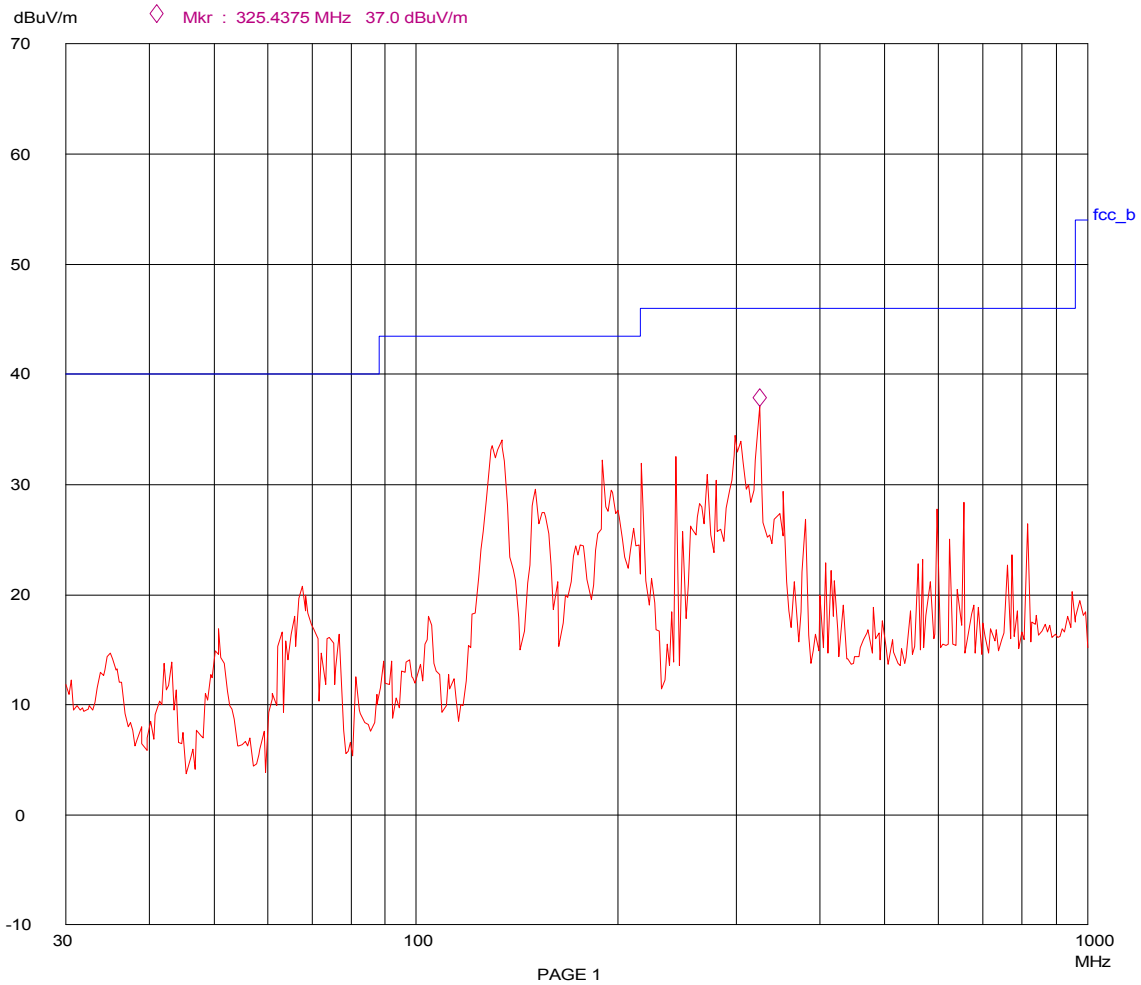
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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Agfa Gevaert

2v

03. Jun 04 13:03

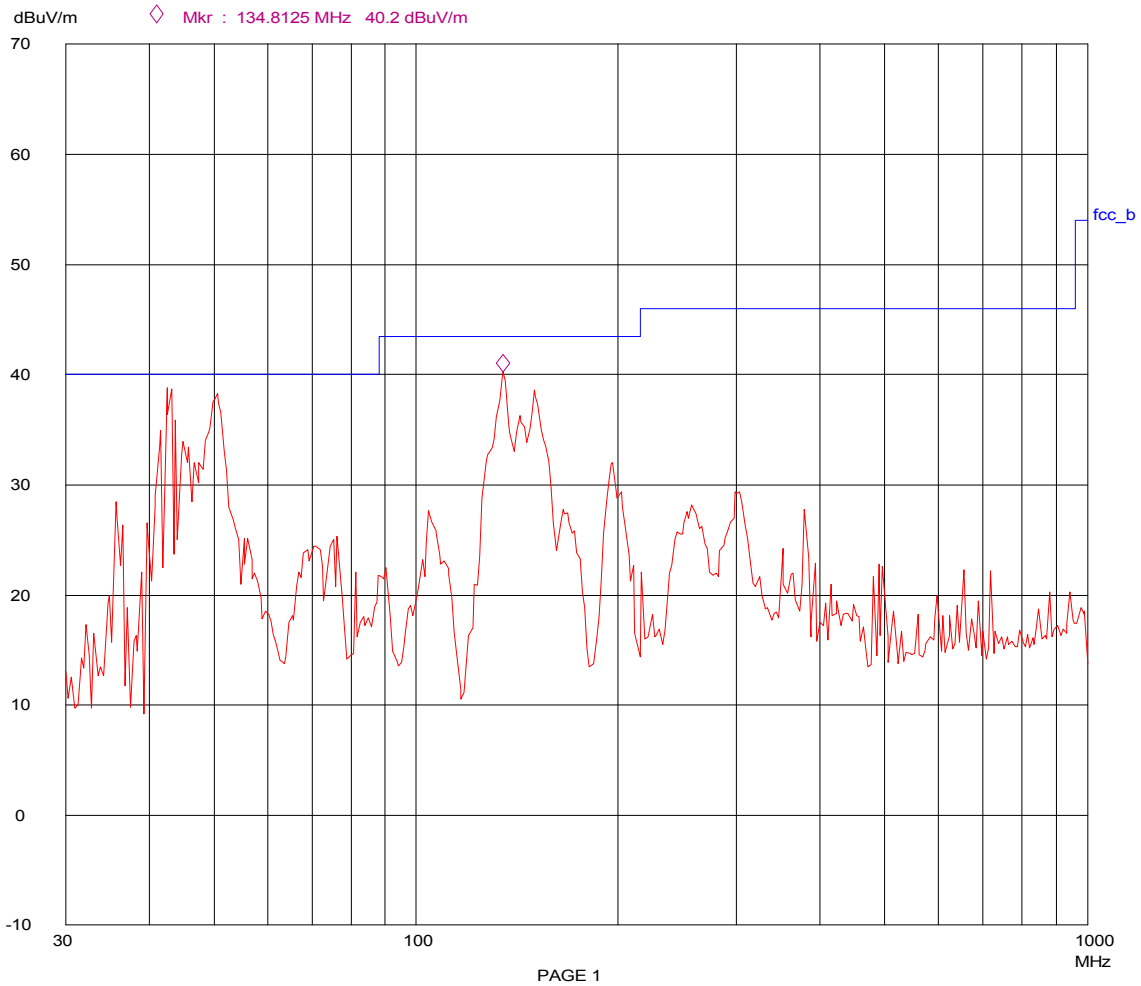
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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Agfa Gevaert

3h

03. Jun 04 13:17

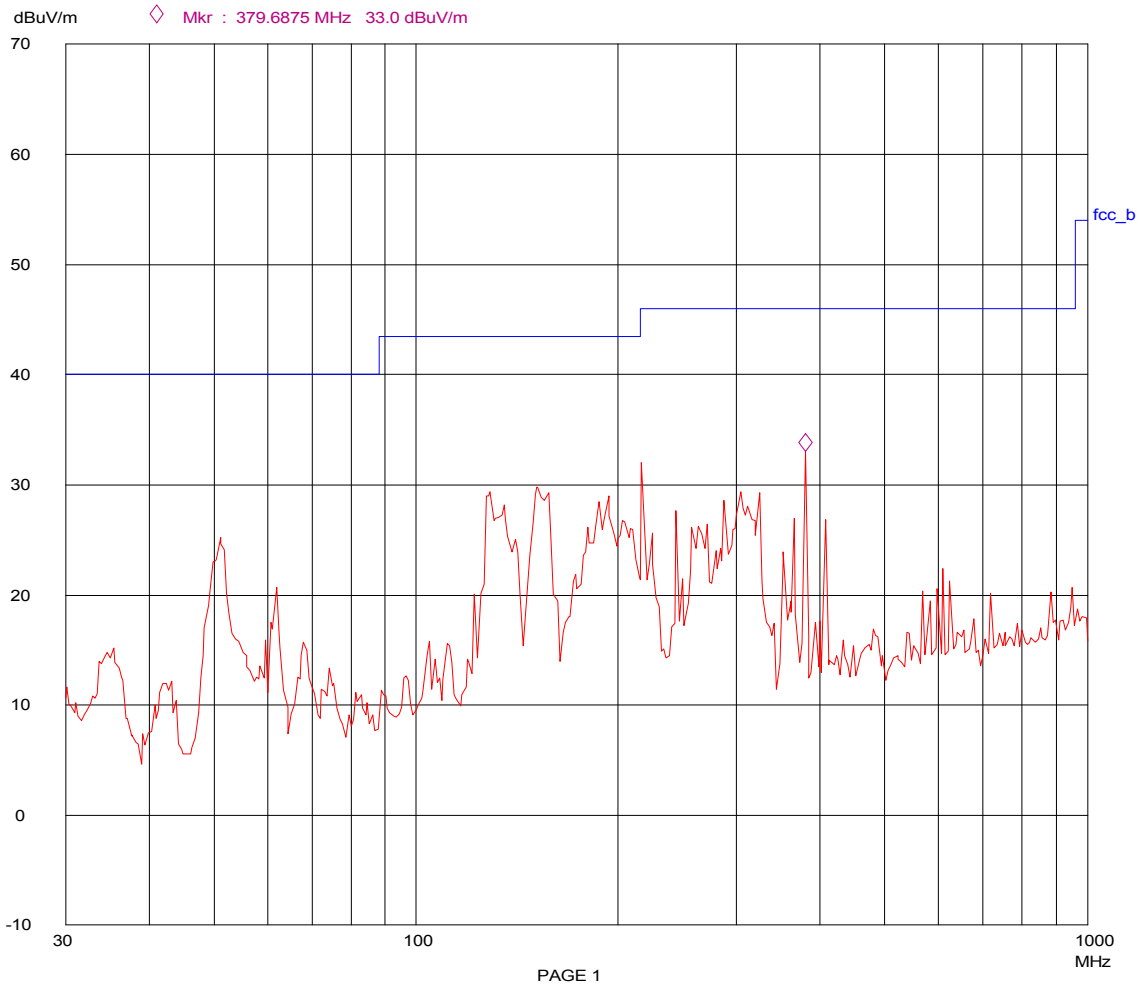
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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Agfa Gevaert

3v

03. Jun 04 13:26

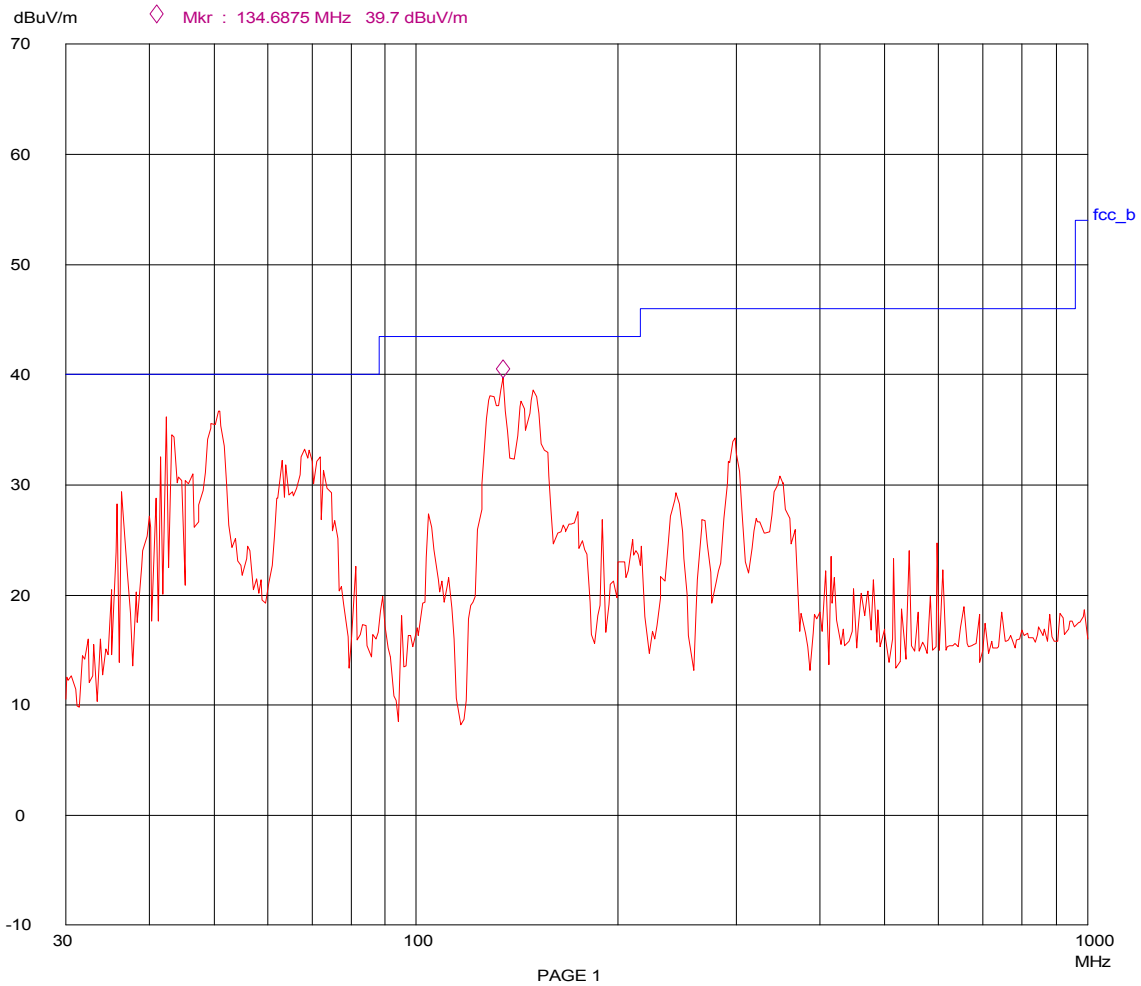
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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Agfa Gevaert

4h

03. Jun 04 13:40

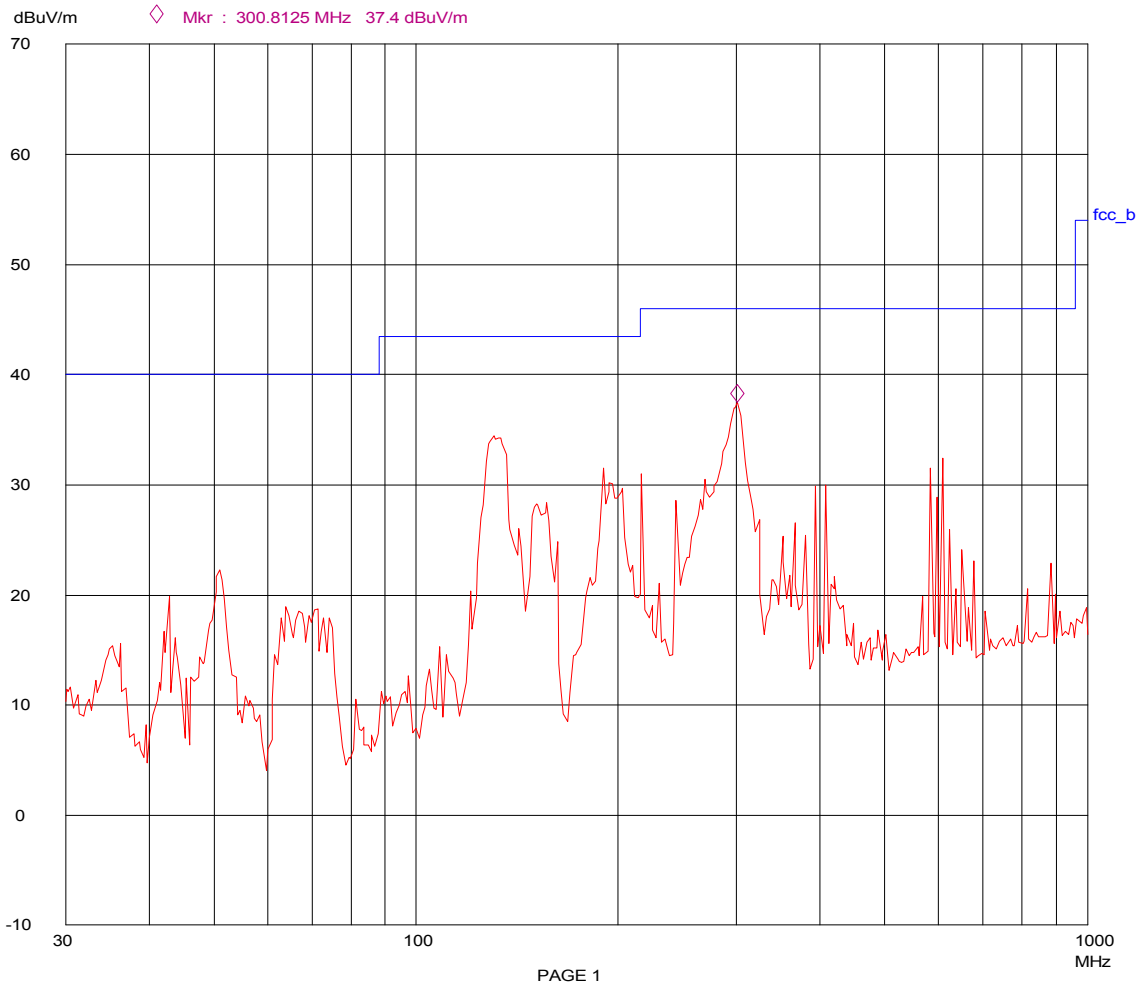
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO LN	ON
300M	1000M	62.5k	120k	PK	1ms	AUTO LN	ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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5.12fig12 Radiated emission (30...1000MHz) ver. pol side4

Agfa Gevaert

4v

03. Jun 04 13:33

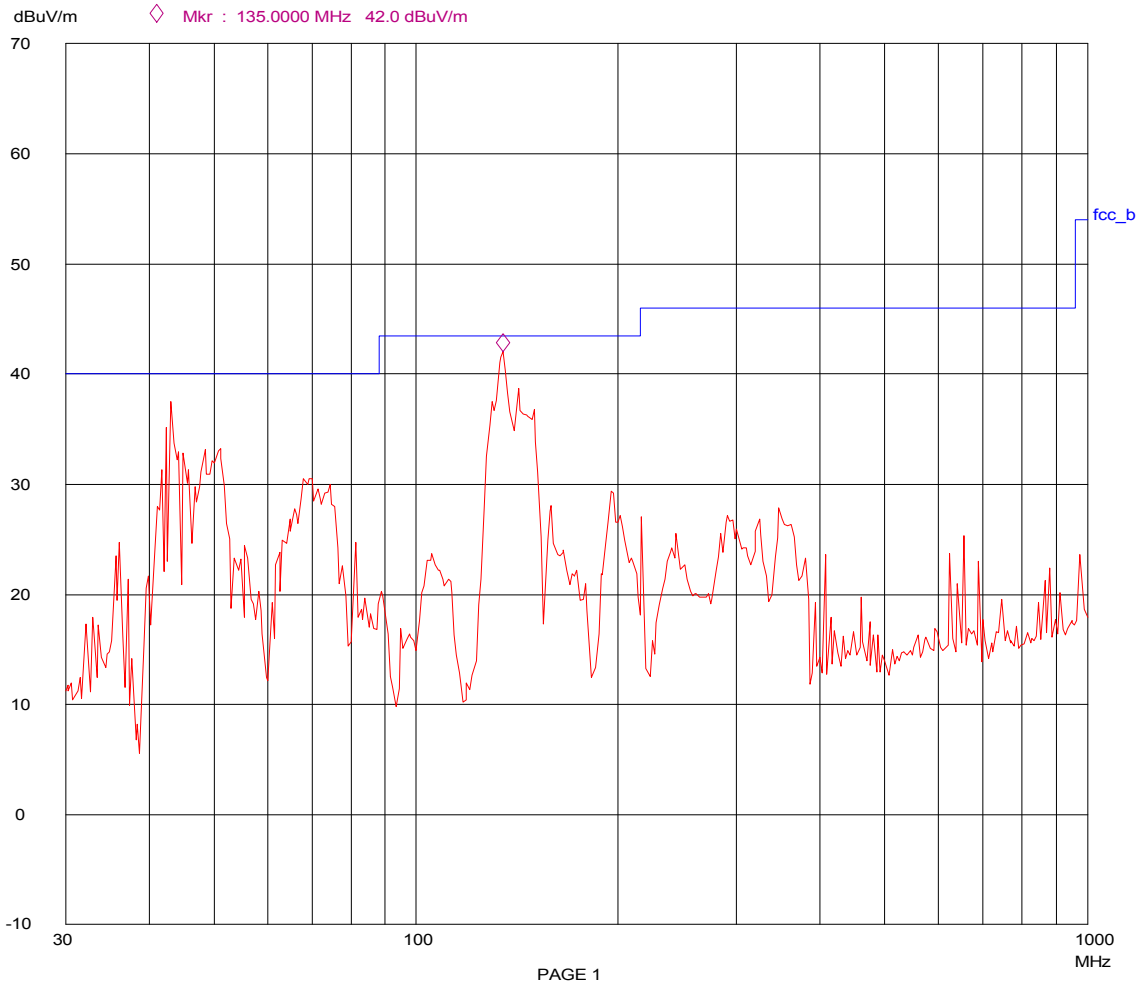
EUT: RFID in printer

Scan Settings (2 Ranges)

|--------- Frequencies ----------||--------- Receiver Settings ---------|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms	AUTO	LN ON
300M	1000M	62.5k	120k	PK	1ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
21	30M	1000M	BILMV



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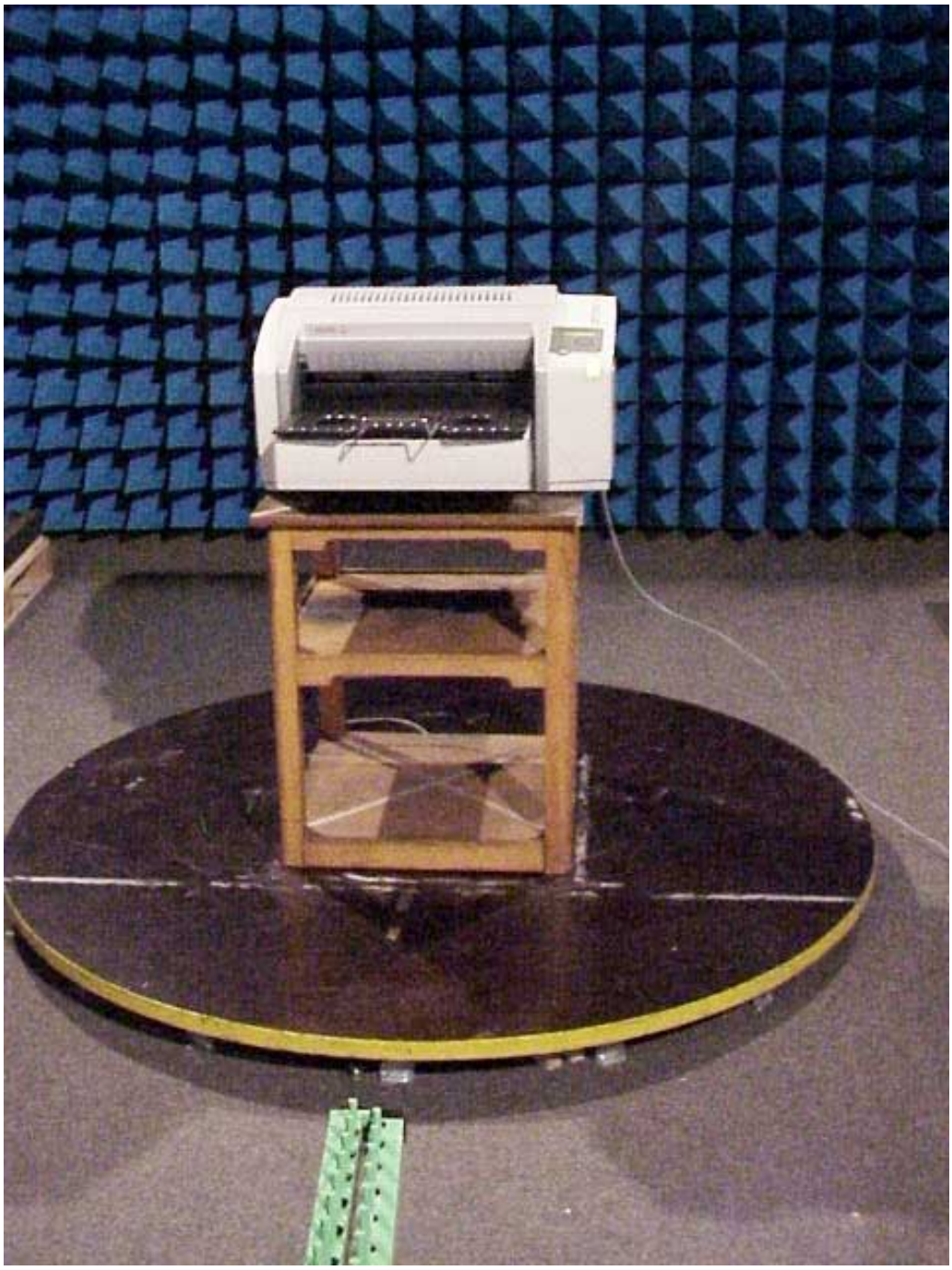
6. Photo Documentation (test setups and modifications)

Photo 3: conducted emission set-up mains

Photo5: radiated emission



7.Modifications

photo11: shielding choke (*)

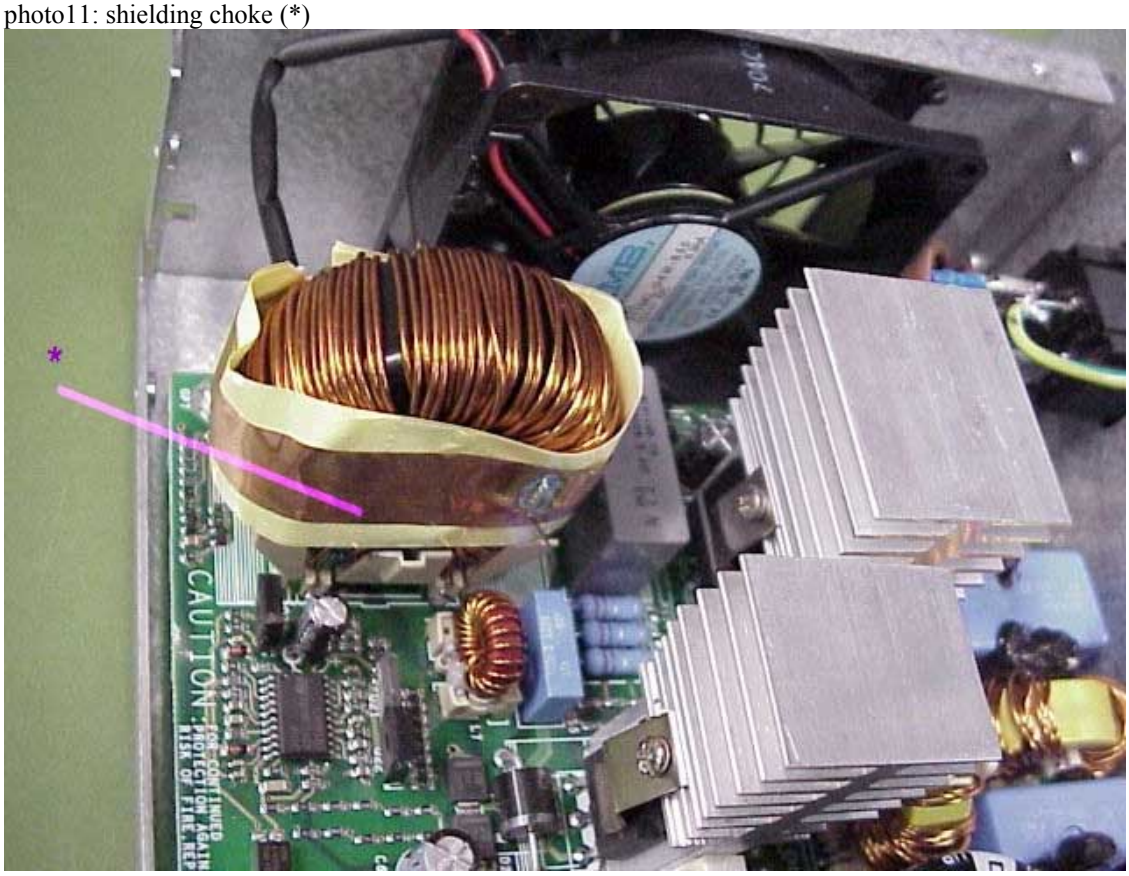
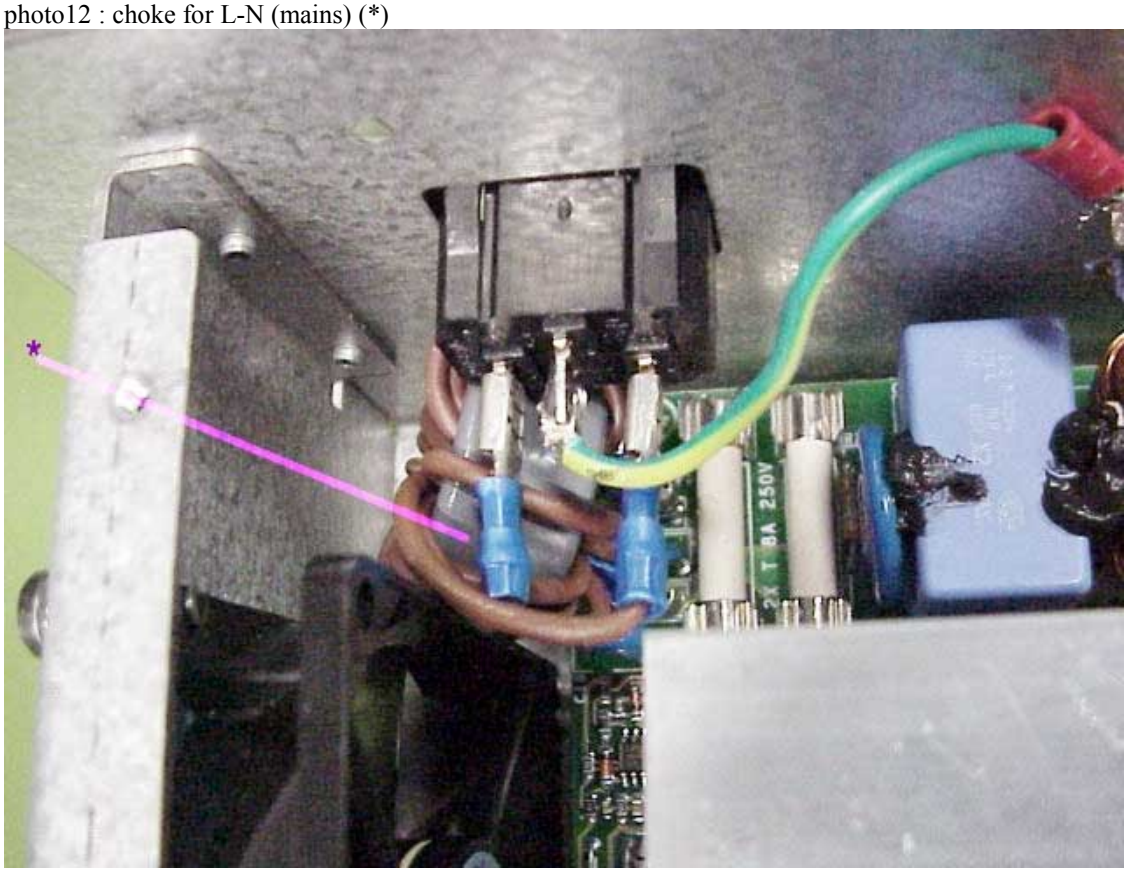


photo12 : choke for L-N (mains) (*)



8.0 Uncertainty table

measurement	uncertainty	remark
CE with LISN	±2.42dB	
RE 30-1000MHz	±3.9dB	

Système Belge d'Accréditation
Essais et Inspection

Belgisch Accreditatiesysteem
Testen en Keuring

Member of EA and the EA-MLA (testing)
Member of ILAC

ACCREDITATION CERTIFICATE

Nr. 053-T

In compliance with the provisions of the Royal Decree of December 22nd 1992 concerning the setting up of BELTEST, the Minister of Economy, hereby confirms, on advice of the Accreditation Bureau, that the test laboratory

LABORATORIA DE NAYER v.z.w.
Jan De Nayerlaan, 3
2860 SINT-KATELIJNE-WAVER

has the competence to perform the tests, mentioned in the attached enclosure, in accordance with the requirements of the standard NBN EN ISO 17025. The present accreditation certificate is granted for a period of 3 years starting from ***08.01.2004*** *and is submitted to an intermediate surveillance.*

The chair of the Accreditation Bureau,

Nicole MEURÉE-VANLAETHEM

The Minister of Economy,

Fientje MOERMAN

Original version of this certificate is in Dutch.

E6-0147

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

November 29, 2004

Laboratoria DE NAYER
Jan De Nayerlaan 3
B-2860 Sint-Katelijne-Waver
Belgium

Attention: Dirk Van Troyen

Re: Accreditation of Laboratoria DE NAYER

Dear Sir or Madam:

We have been notified by the European Commission that Laboratoria DE NAYER has been accredited as a Conformity Assessment Body (CAB).

At this time your organization is hereby designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Parts 15 and 18 of the Commission's Rules.

This designation will expire upon expiration of the accreditation or notification of withdrawal of designation.

Sincerely,

Thomas W. Phillips
Electronics Engineer