



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

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053-T - ISO17025

TEST REPORT

LDN number : 476
serial number: E0501016
edition number: 01
date of edition: 04/02/2005

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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 5302 (type 5365/100)+ RF tag reader SN: 1016 FCC ID : HPL5366

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) [designation number BE0002]date of validation 15.01.2002 (refer to p29)

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.

Field Strength Calculation.

The field strength is calculated in the receiver , for conducted emission TDF7 is selected , for spurious radiated emission (range 30-1000MHz).

The TDF21 is selected and for spurious radiated emission (range 1-2GHz) TDF20 is selected.

TDF7 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) .

TDF20 is the Transducer factor for the bilog antenna (combination of the AF of the Chase antenna , pre-amplifier and cables in the range 1GHz-2GHz) .

Deviations from the test methods :
none

History of the tests	
identification number of the receipt:	EMC05015
Date of receipt of the sample or equipment under test:	17/01/2005
Date(s) of test:	17 and 18/01/2005

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	
AC power generator(Spitzenberger +Spies)	EMV E2000/Pas	SN: A2780 00/0 0501	*
Vierdraht-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 : LÜTHI	CDN M2/3	930	
CDN 801-M5 : LÜTHI	CDN M5	932	
LISN single phase : EMCO	3816/2	9805-1086	*
parallel probe	LDN	LDNLP2	
preamp : 9kHz-1GHz Chase	CPA9231	SN :3078	*
HP Power supply	HP6247B		
HP spectrum – EMI 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	

De Vos Jan
Test Engineer

Prof. dr. ir. Dirk Van Troyen
Technical Director

1. Description of the EUT.

1.1. General.

The EUT is composed out one unit

1.2 Technical specifications of the EUT's.

rated power supply	100-127 and 220-240Vac (50/60Hz)
maximum internal clock freq.	70MHz
Cabling:	1 power cable (L , N , PE) l=2m LAN cable CAT5 : l=3m + l=10m
Test equipment (no part EUT) A.E.	Laptop : Dell Latitude software + version : asgard1.4.0a13
modification	none

Photographs of the EUT's.

Photo 1 :Complete Model .



Photo 2 : Class A Sign

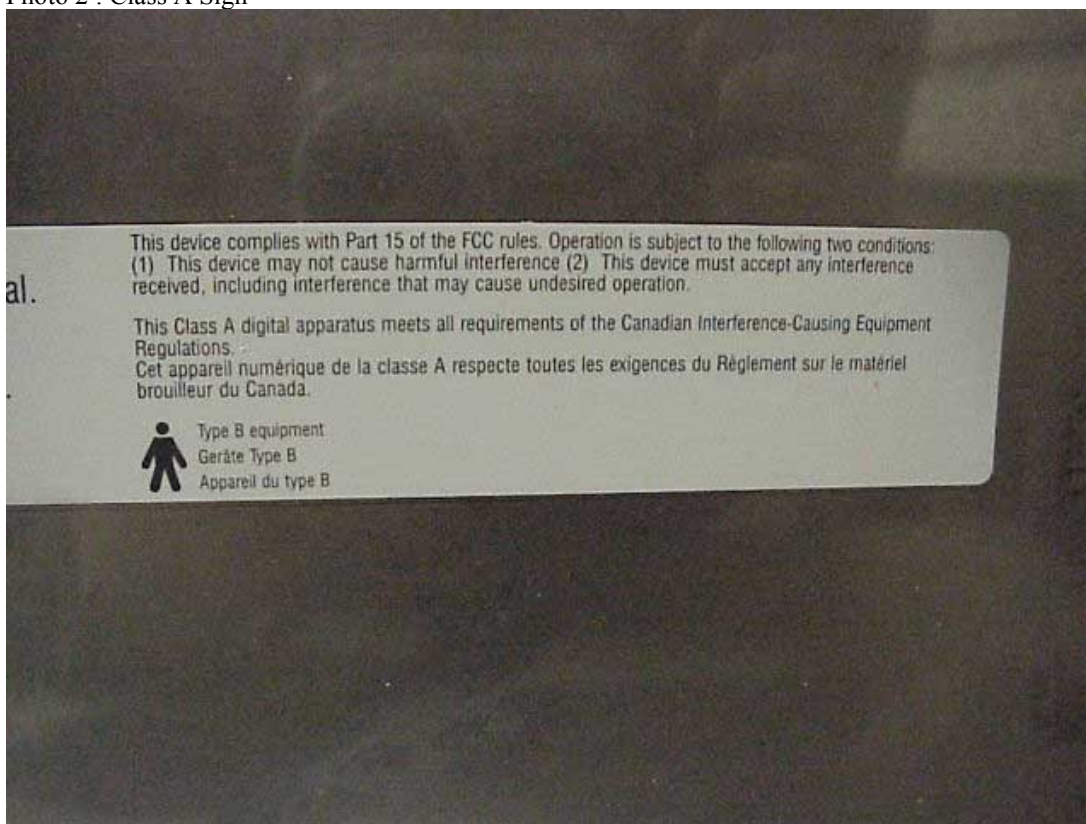


photo3 : RF ID tag reader



photo4 : AE



2. Test conditions and climatic conditions.

2.1 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.

2.2. Climatic conditions.

The climatic conditions during these tests were: ambient temperature :19.2/20.3 °C
relative humidity: 51/54%
atmospheric pressure:1020/1017 mBar

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

The applicant prepared the EUT and witnessed the test.

4. Tests.

4.1. Emission tests.

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

4.1.1. Conducted emission .

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

4.1.2 conducted emission on EUT(mains).(17/01/05)

The equipment was placed at ± 80 cm above the floor as table top equipment .

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).

Test voltage : 115VAC /60Hz

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

Conducted emission L1-PE

table1 : EUT

Freq (MHz)	QP (dB μ V)	AV (dB μ V)
0.165	43.4	40.5
0.21	45.3	40.8
0.28	46.5	43.0
0.35	38.5	33.6
0.42	40.1	34.5
0.49	36.2	31.6
0.565	34.9	26.5
0.915	29.2	22.3
5.04	43.7	34.6
9.4	38.8	31.5
24.29	33.7	25.1

fig1 : plot results L1- PE, peak detector , normal mode.

Conducted emission L2-PE

table2 : EUT

Freq (MHz)	QP (dB μ V)	AV (dB μ V)
0.165	42.8	39.7
0.21	42.5	37.2
0.28	37.4	32.2
0.35	38.3	31.3
0.42	45.1	38.5
0.49	40.3	34.2
0.56	41.1	28.5
1.23	24.9	17.9
5.04	47.8	40.5
9.33	52.8	45.2
24.56	36.5	28.2

fig2 : plot results L2- PE, peak detector , normal mode.

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

4.1.3 radiated emission (30-1000MHz) (17.01.2005).

The equipment was placed as a table top in a semi anechoic room (10x6x6) with metal groundplane on 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) .

Test voltage : 115VAC /50Hz

Specification reference :C.F.R.47 part 15.109

The limit line 1 is the quasi-peak limit line(purple) for class A equipments.

Measurement results Radiated emission : Horizontal polarization operation mode

table3

Freq (MHz)	QP (dB μ V/m)	height(m)	side
36.13	8.0	1.25	1
70.0	20.0	1.25	1
82.0	30.3	1.25	1
200.0	38.8	1.25	1
220.56	29.7	1	1
240.0	35.0	1	1
104.3	30.0	1.25	2
171.62	22.7	1.25	2
200.0	35.8	1.25	2
700.18	42.5	1.25	2
210.33	31.6	1	3
607.8	20.5	1	3
198.18	34.4	1	4
210.56	32.0	1	4
577.0	20.6	1	4

The final measurements with the quasi-peak detector remain everywhere below the limits for the class A limits.

fig3=hor/1 ; fig5=hor/2 ; fig7= hor/3; fig9= hor/4

table4

range 1-2GHz , BW=1MHz

Freq (GHz)	AV (dB μ V/m)	height(m)	side
1.295	32.0	1.06	1
1.708	28.1	1.06	1

The final measurements with the average detector remain everywhere below the limits for the class A limits.

fig11=hor/1

Vertical polarization operation mode**table5**

Freq (MHz)	QP (dB μ V/m)	height(m)	side
36.3	39.1	1	1
82.4	28.4	1	1
89.7	29.4	1	1
173.3	21.2	1	1
900.3	34.5	1	1
200	32.2	1	2
232.2	20.2	1	2
240	37.7	1	2
500.2	42.5	1	2
700.2	44.0	1	2
900.3	38.9	1	2
42.9	30.4	1	3
82.0	30.2	1	3
89.5	29.7	1	3
200	27.8	1	3
700	38.5	1	3
36.3	31.8	1	4
200	34.5	1	4
650.2	33.7	1	4
940.9	27.9	1	4

The final measurements with the quasi-peak detector remain everywhere below the limits for the class A limits.

fig4=ver/1 ; fig6=ver/2 ; fig8= ver/3 ; fig10= ver/4

table6

range 1-2GHz , BW=1MHz

Freq (GHz)	AV (dB μ V/m)	height(m)	side
1.10	36.5	1	1
1.499	30.2	1	1
1.90	35.6	1	1

The final measurements with the average detector remain everywhere below the limits for the class A limits.

fig12=ver/1

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

4.1.4 Tables limit lines

table 7: conducted emission limit (class A device)

Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15-0.5	79	66
0.5-30	73	60

table8 : radiated emission limit @ 3m distance (class A device)

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

5. Summary of the test results.

5.1 Test results of the emission tests.

Conducted and Radiated emission measurement according to FCC part15 Subpart B.		
Test	The EUT complies class A limits	remark
conducted emissions (0.15 MHz – 30 MHz)	yes	
spurious emissions (30 MHz – 1000 MHz)	yes	
spurious emissions (1GHz – 2GHz)	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.

6. Plotted graphs of the emission measurements.

6.1 fig1 Conducted emission L1-PE (115V/60Hz)

Agfa Gevaert
L1 115V/60Hz

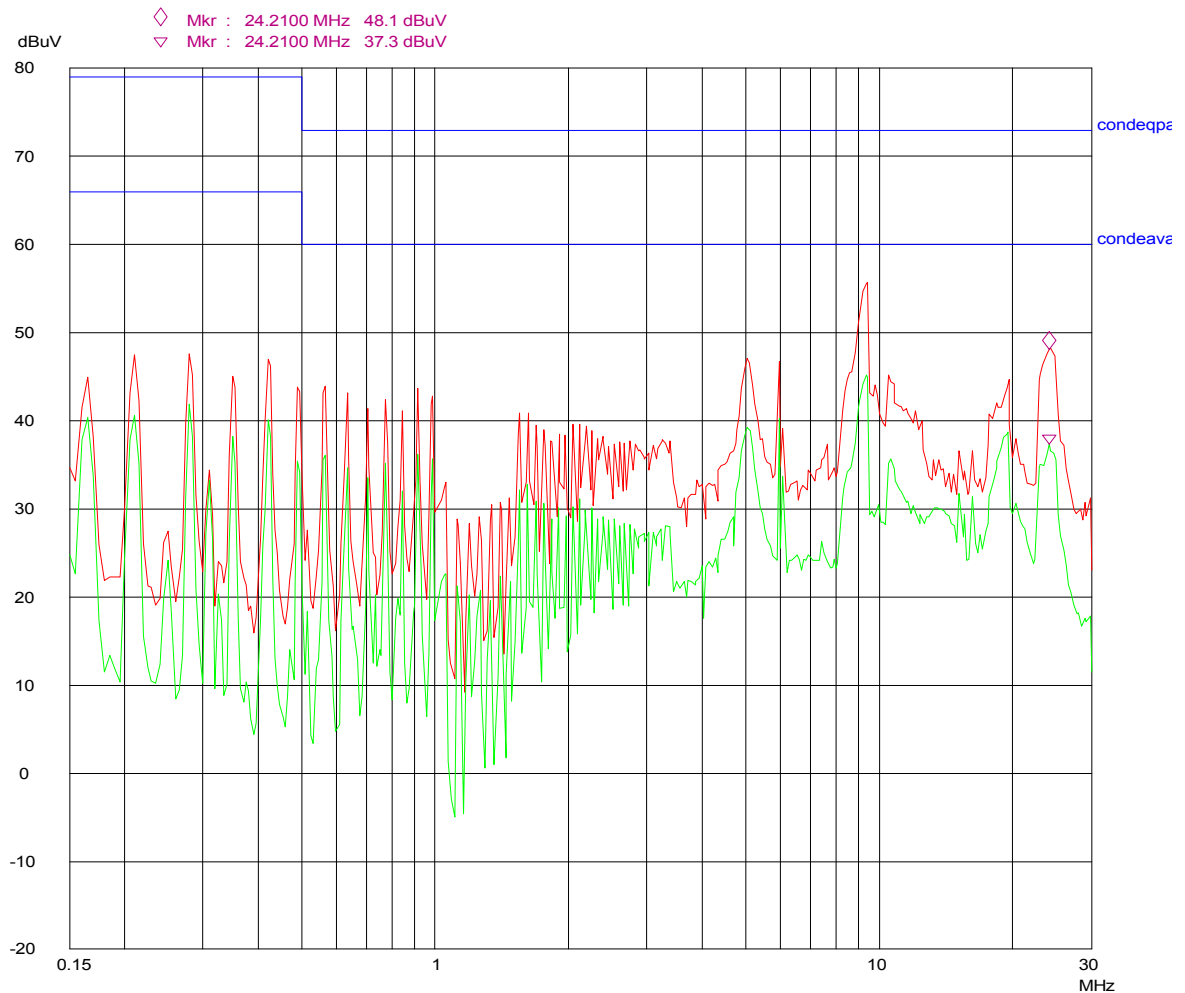
17. Jan 05 13:51

EUT: Drystar 5302

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
7	9k	30M	lisnemco



6.2 fig2 Conducted emission L2-PE (115V/60Hz)

Agfa Gevaert
L2 115V/60Hz

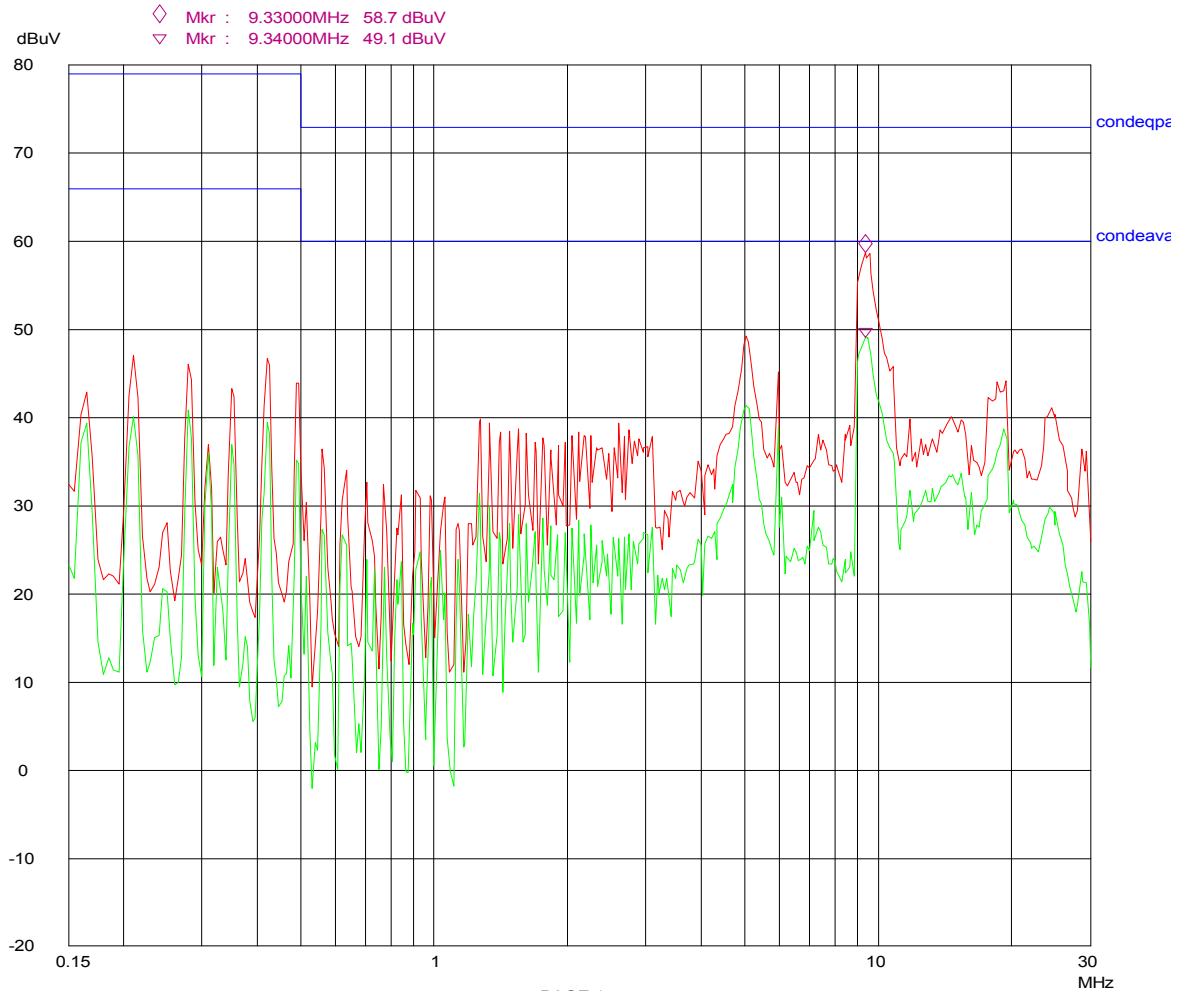
17. Jan 05 14:07

EUT: Drystar 5302

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
7	9k	30M	lisnemco



6.3 fig3 Radiated emission (30...1000MHz) hor. pol , side1

Agfa Gevaert

17 Jan 05 16:50

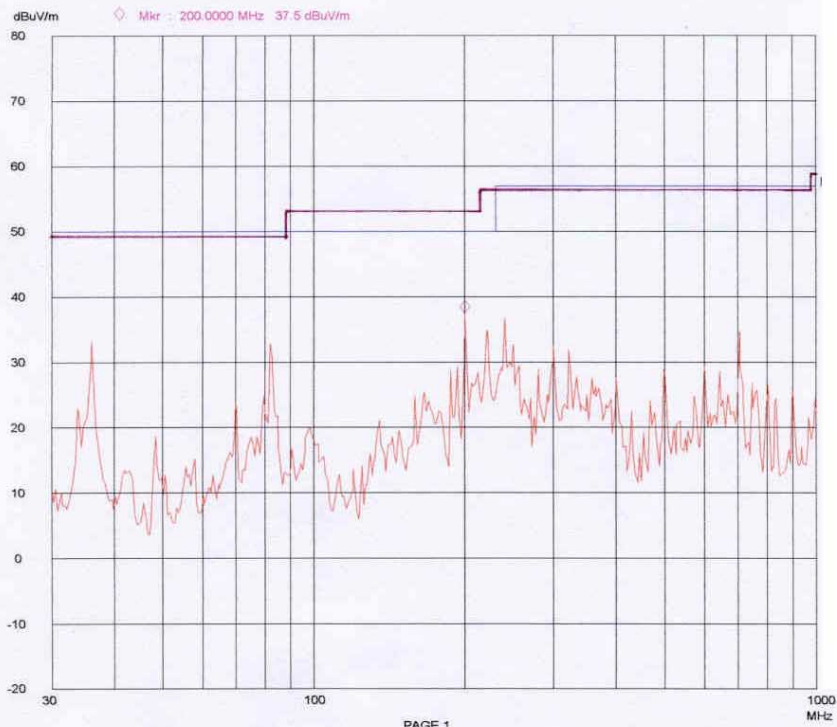
1h

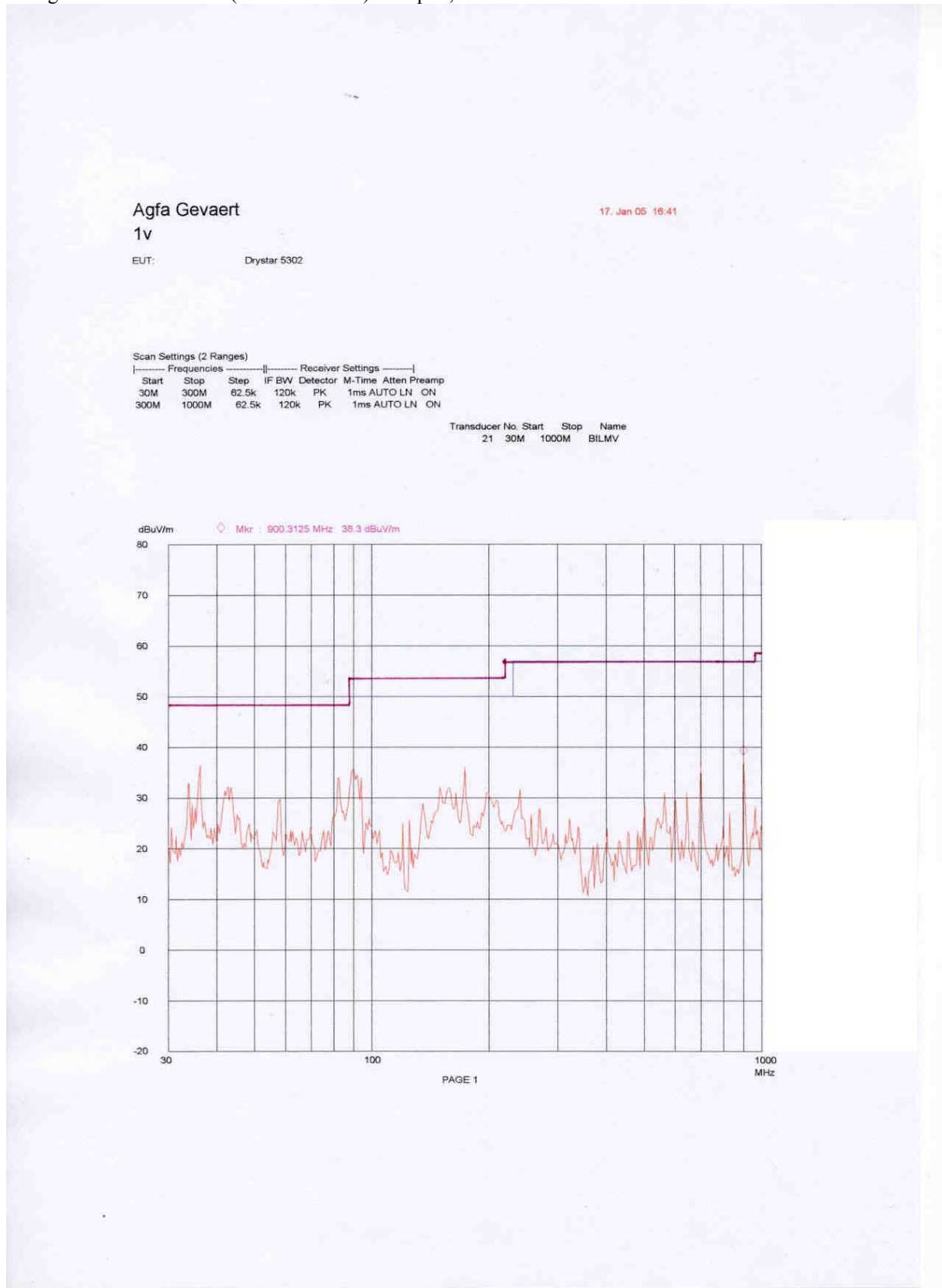
EUT: Drystar 5302

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





6.5 fig5 Radiated emission (30...1000MHz) hor. pol , side2

Agfa Gevaert
2h

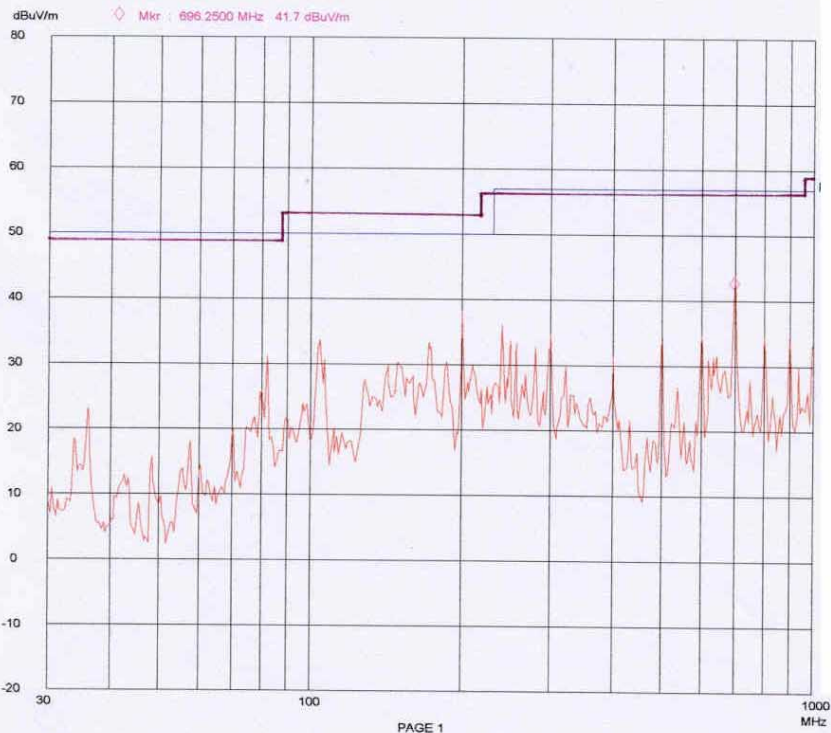
18. Jan 05 08:58

EUT: Drystar 5302

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



6.6 fig6 Radiated emission (30...1000MHz) ver. pol side2

Agfa Gevaert

18 Jan 05 09:05

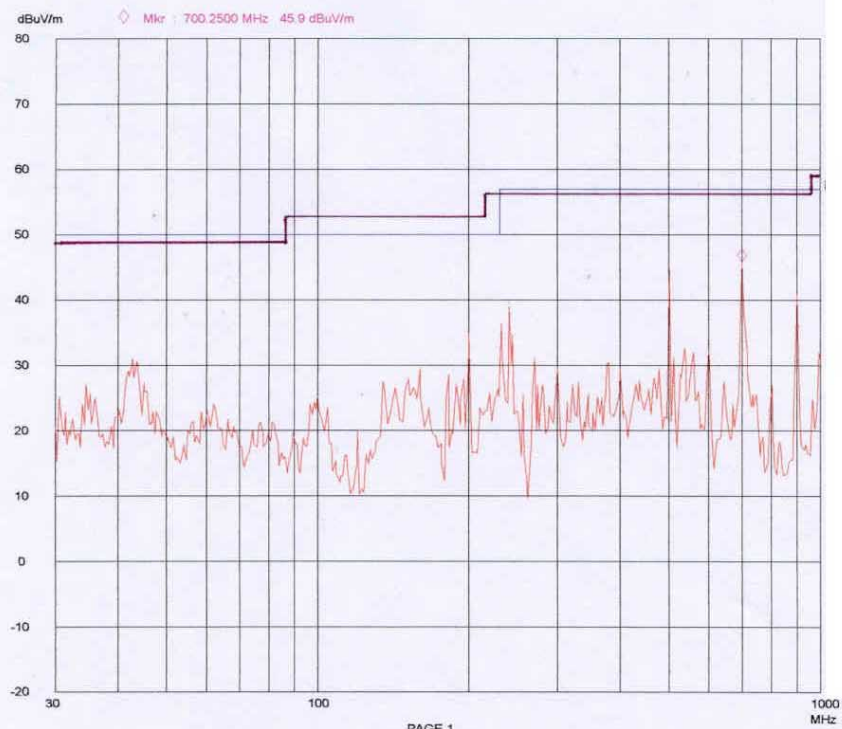
2v

EUT: Drystar 5302

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



6.7 fig7 Radiated emission (30...1000MHz) hor. pol side3

Agfa Gevaert

3h

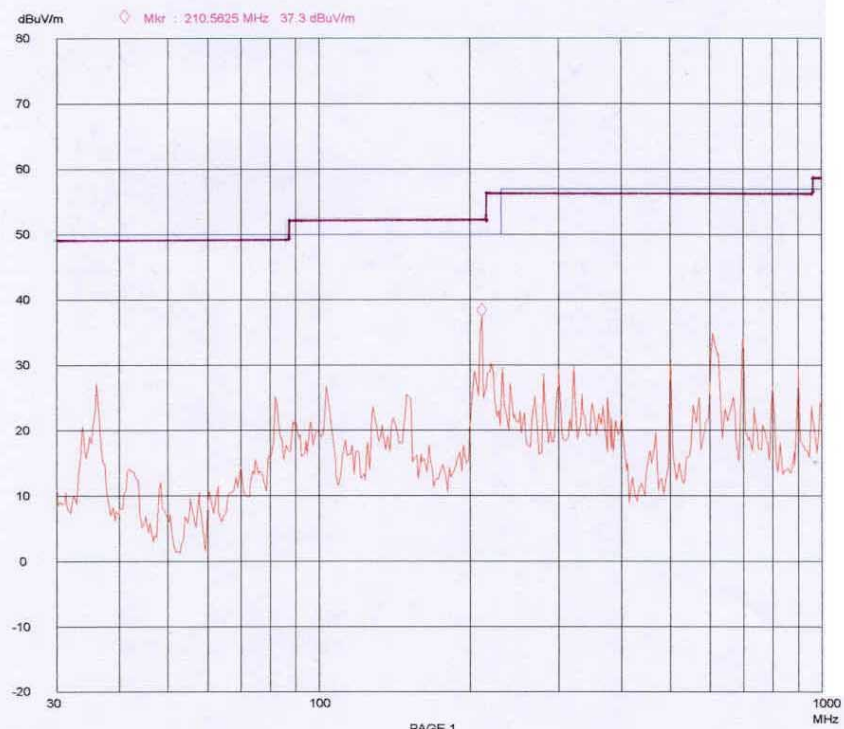
18 Jan 05 09:23

EUT: Drystar 5302

Scan Settings (2 Ranges)

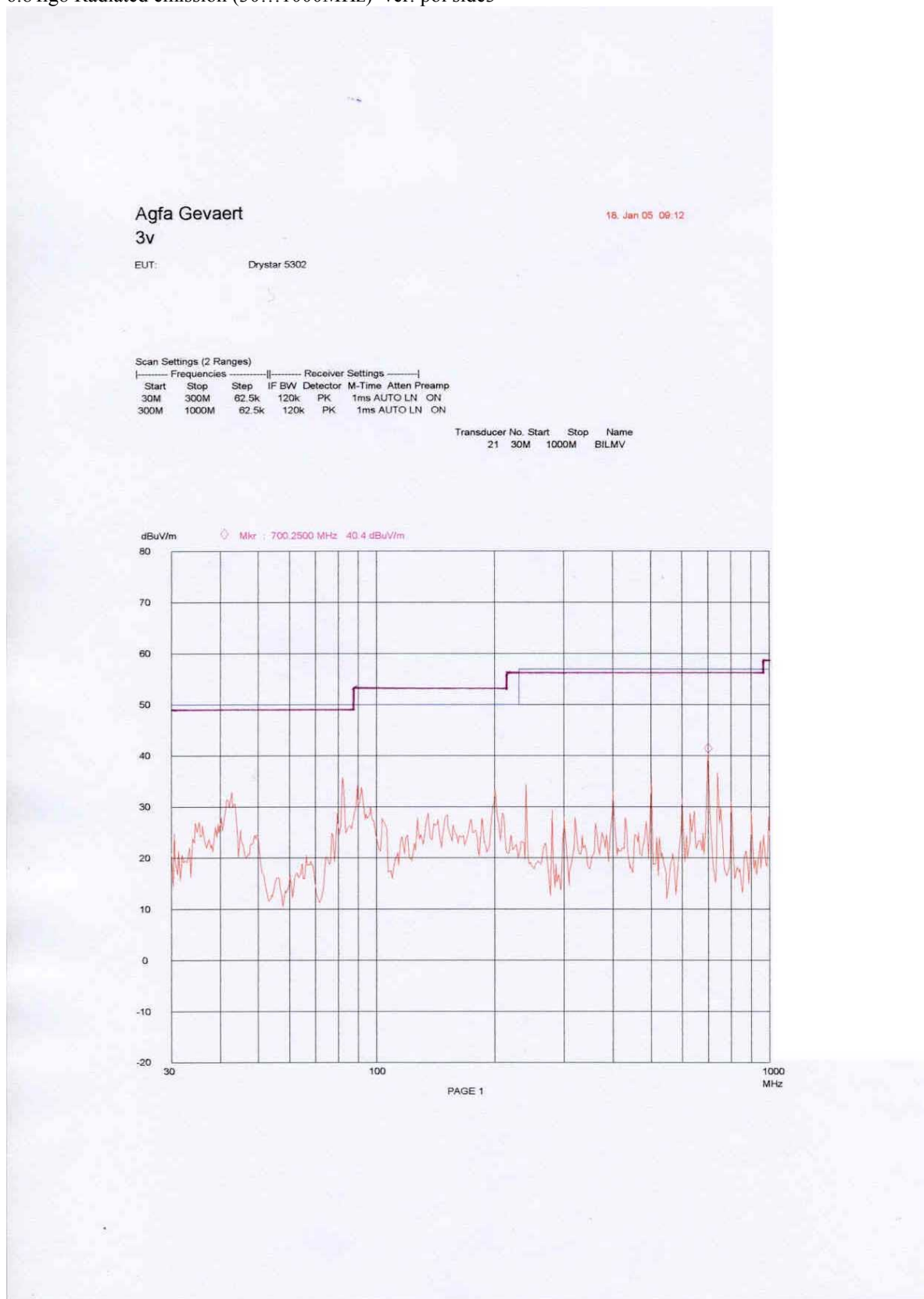
Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
30M	300M	62.5k	120k	PK	1ms AUTO	LN	ON
300M	1000M	62.5k	120k	PK	1ms AUTO	LN	ON

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

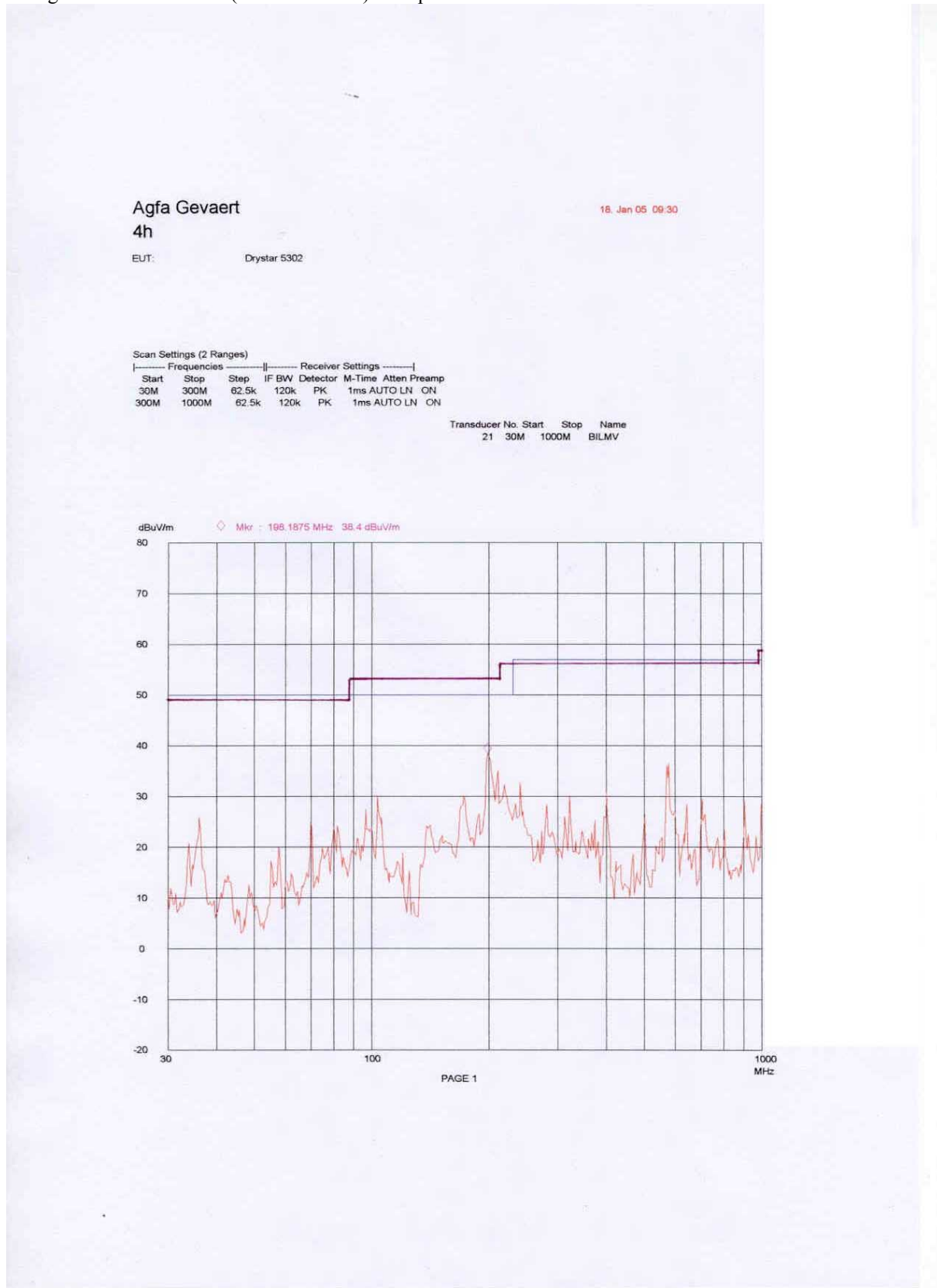


PAGE 1

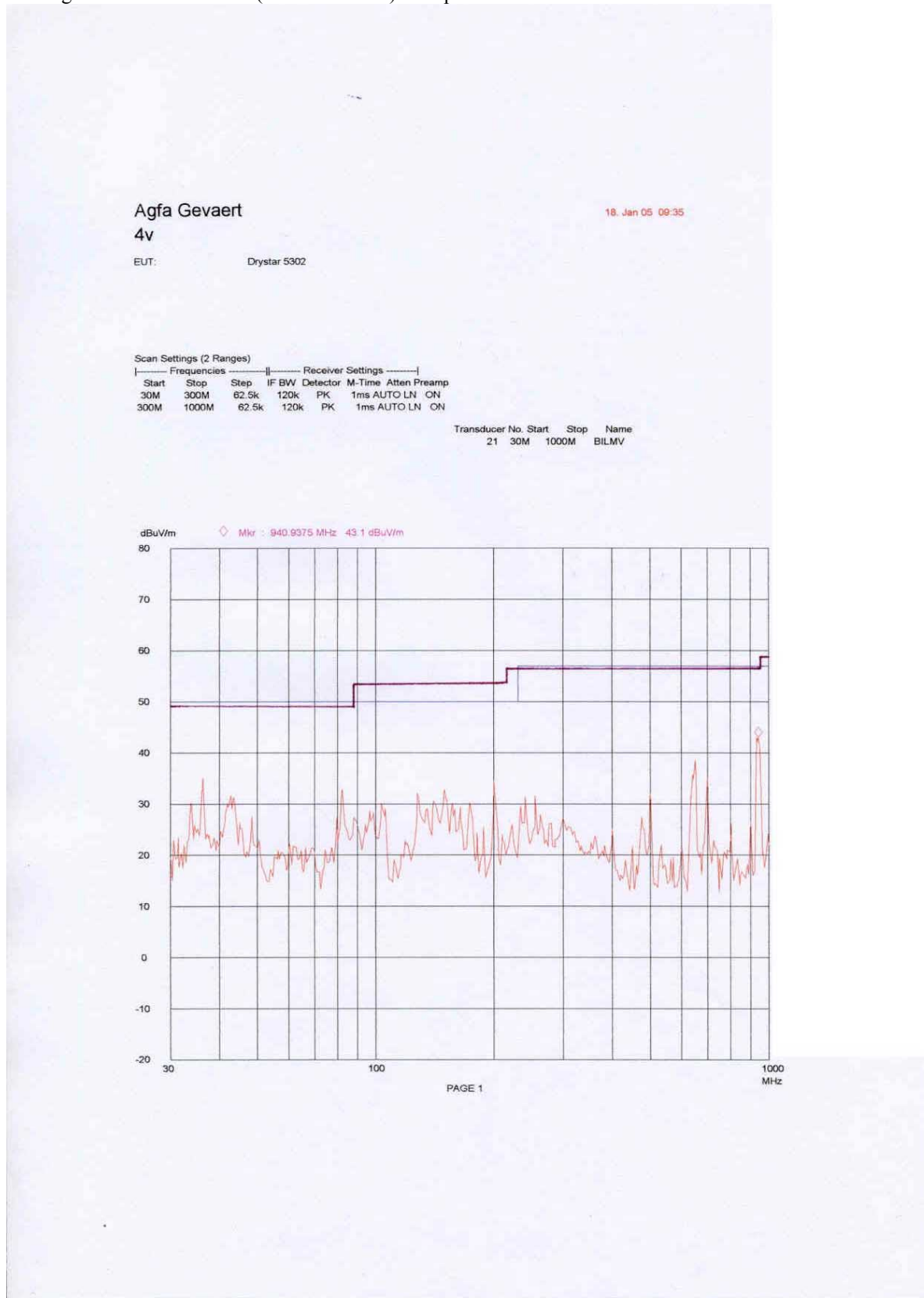
6.8 fig8 Radiated emission (30...1000MHz) ver. pol side3



6.9 fig9 Radiated emission (30...1000MHz) hor. pol side4



6.10 fig10 Radiated emission (30...1000MHz) ver. pol side4



Agfa Gevaert
2h FCC

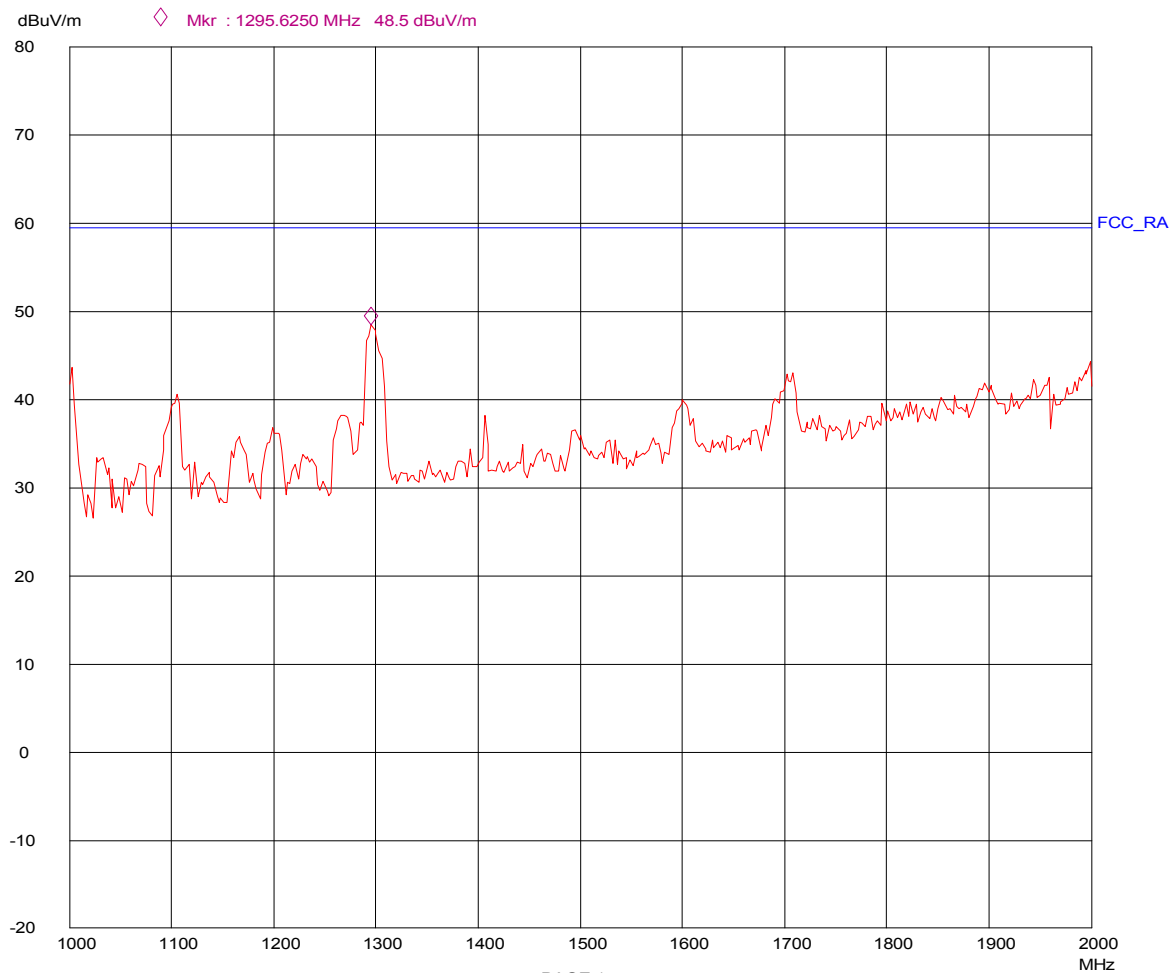
18. Jan 05 10:13

EUT: Drystar 5302

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
1000M	2000M	62.5k	1M	PK	1ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
20	1000M	2000M	af_2gmv



Agfa Gevaert 2v FCC

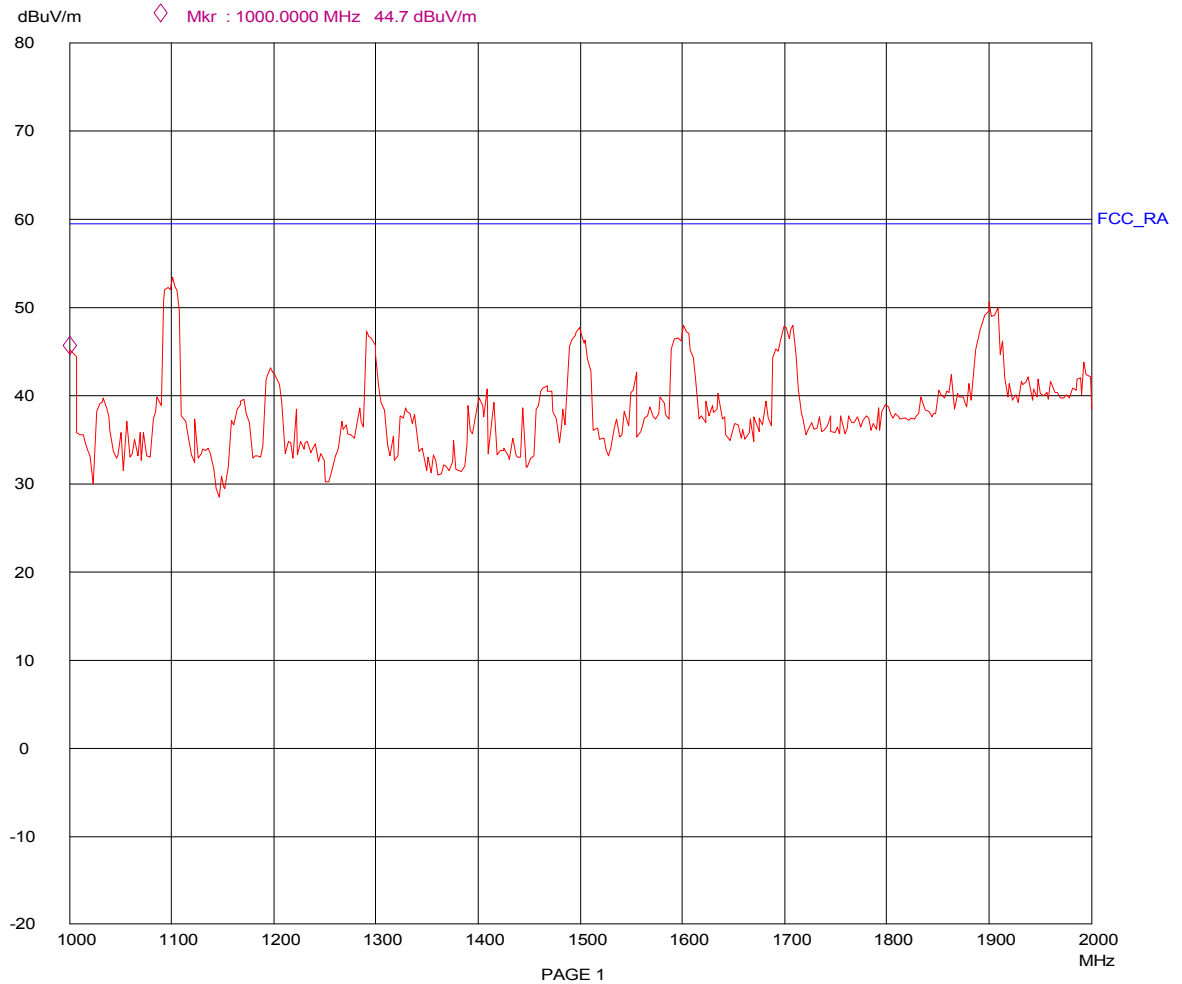
18. Jan 05 10:07

EUT: Drystar 5302

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
1000M	2000M	62.5k	1M	PK	1ms	AUTO	LN ON

Transducer No.	Start	Stop	Name
20	1000M	2000M	af_2gmv



7. Photo test setup

Photo 5: radiated emission set-up (30-2000MHz)

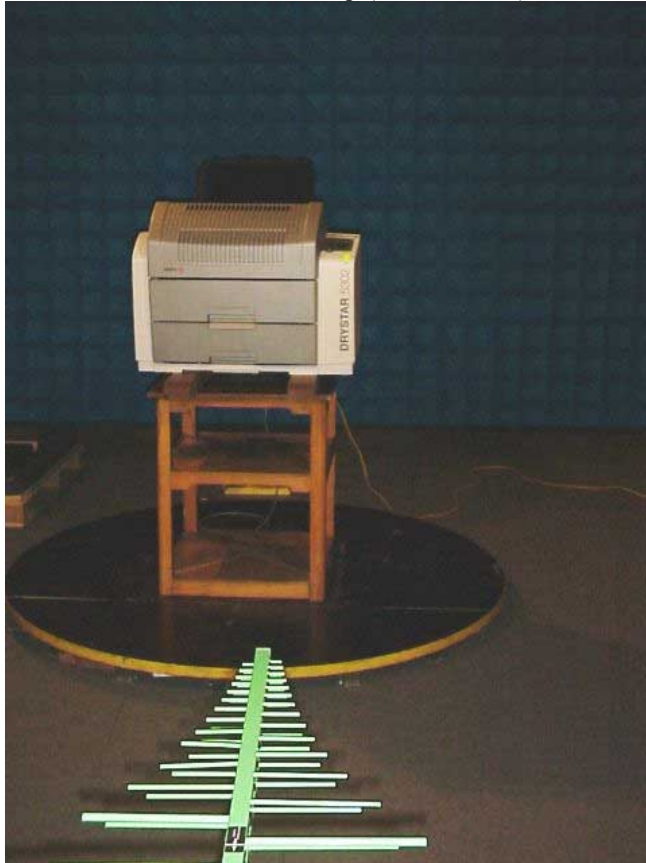
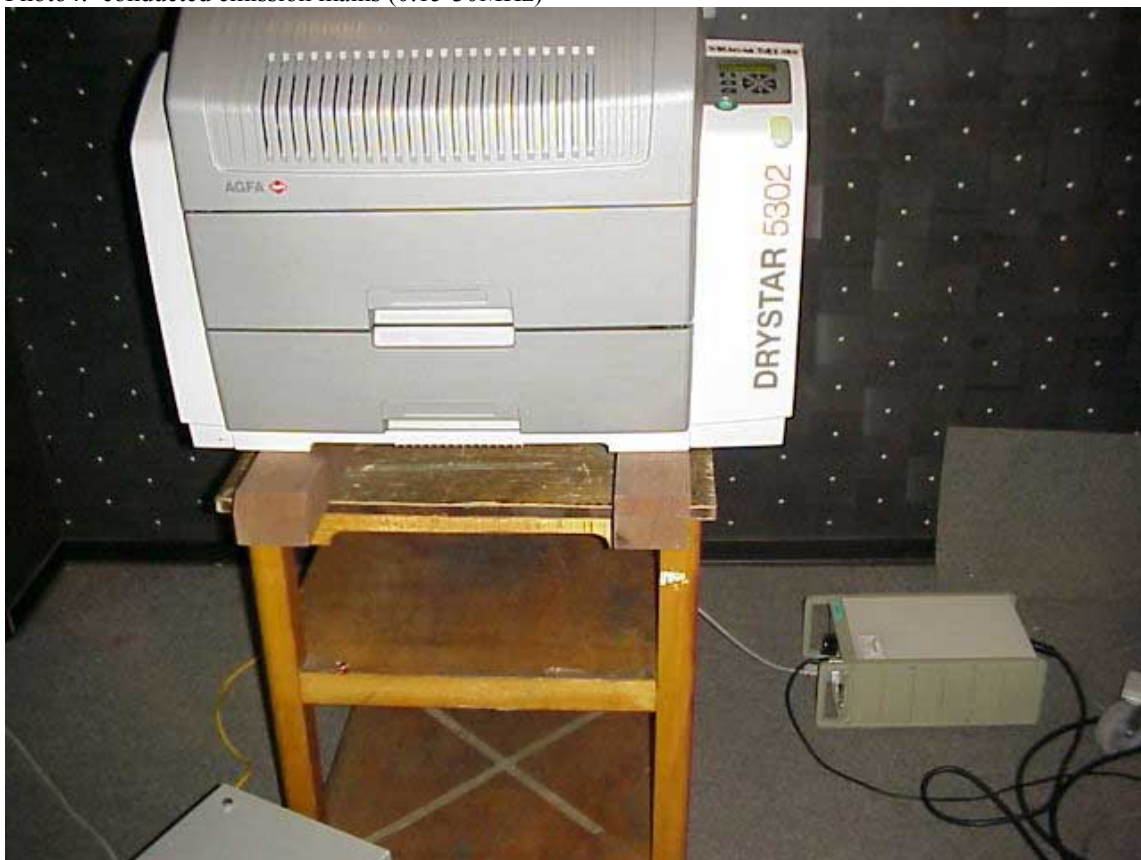


Photo4: conducted emission mains (0.15-30MHz)



8. Modification

no modification

9. Uncertainty.

measurement	uncertainty	remark
CE with LISN	$\pm 2.42\text{dB}$	
RE 30-2000MHz	$\pm 3.9\text{dB}$	

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.
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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,*

The Minister of Economy,

Nicole MEURÉE-VANLAETHEM

Fientje MOERMAN

Original version of this certificate is in Dutch.

EB-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