




**LABORATORIUM VOOR OMGEVINGSMETINGEN  
LABORATOIRE D'ESSAIS D'ENVIRONNEMENT  
ENVIRONMENTAL TEST LABORATORIA**

COMPETENT BODY UNDER CEC-DIRECTIVE 2004/108/CE NOTIFIED BODY UNDER CEC-DIRECTIVE 2006/95/CE	 041-T - ISO17025
ACCREDITED FOR NBN EN ISO 17025 BY BELAC 041-T - ISO17025	
RECOGNISED TESTING AUTHORITY FOR AUSTRALIA	
CONFORMITY ASSESSMENT BODY MRA US-EU SECTORAL ANNEX EMC (FCC)	

## **EMC TESTREPORT**

<b>Product</b>	DS5503
<b>Standard</b>	FCC part 15 subpart C
<b>Test Report</b>	ETC2741
<b>LDN Number</b>	LDN1537
<b>Date of issue</b>	2009-11-23
<b>Edition</b>	02



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**This Test Report contains 34 pages**

## SECTION 1: IDENTIFICATION OF THE TEST LABORATORIA

<b>LABORATORIA DE NAYER</b> <b>Product Certification Centre (PCC)</b>	
J.De Nayerlaan 9 B-2860 St.-Katelijne-Waver Belgium Tel: +32 (0) 15 30 54 00 Fax: +32 (0) 15 32 1212	Direct phone numbers and e-mail address: (Test engineer)  J. De Vos +32(0)15 30 54 04 <a href="mailto:j.de.vos@labodenayer.be">j.de.vos@labodenayer.be</a>

TEST LABORATORY RESPONSIBILITIES			
Function	Name(s)	Date	Signature
Test Operator	Jan De Vos	2009-09-07	
Author Report	Jan De Vos	2009-11-23	
Technical Expert	dr.ir. Dirk Van Troyen	2009-09-09	



**041-T - ISO17025**

The test report may not be reproduced, unless as a complete packet, without written agreement of Laboratoria De Nayer v.z.w.

The results refer to the described sample or equipment under test only.

Neither the accredited status of Laboratoria De Nayer v.z.w., nor this test report implies that the sample or equipment under test is approved by BELAC or any other establishment.

In case the customer wants to refer to his appeal to our accredited laboratories, he will use the following equivalent sentence: "Tested by Laboratoria De Nayer, E.M.C.department, accredited by BELAC for EMC-immunity and EMC-emission under registration number 041-T".

## SECTION 2: CUSTOMER INFORMATION AND DATES

### CUSTOMER INFORMATION

Company name: Agfa HealthCare  
Address: Septestraat 27  
2640 Mortsel Belgium  
Contact person: Mr. Jan Vercammen  
Telephone nr: +32.3.444.62.33  
E-mail: jan.vercammen1@agfa.com

### DATES

Receipt of the EUT: 2009-08-24  
Start of tests: 2009-08-24  
End of tests: 2009-08-24

### SECTION 3: EQUIPMENT UNDER TEST (E.U.T.)

**The correctness of the description and identification of the equipment under test, its operating conditions, possible modifications and monitoring of its behaviour during and/ or after the test conditions generated by the De Nayer Environmental Test Laboratory are under the responsibility of the customer.**

#### IDENTIFICATION OF THE E.U.T.

Intended use:	Medical thermal printer
Manufacturer:	Agfa Healthcare
Marketing name:	Drystar 5503 (three-cassette) and 5500 (two-cassette - production stopped)
Model / Type:	5364/XXX
Software Version:	Drystar 5503: R6.1.0C1build03
Maximum internal frequency	Maximum internal frequency digital part: 500MHz Maximum internal frequency radio part: 16MHz
Serial Number:	ftp9
FCC-ID number:	HPL5364A

Remark : Drystar 5503 is shown to comply with subpart C of CFR47 part 15 using 15.31(k). This implies that the radio part is working but that the digital parts are not functioning (thermal head, Crius central processing unit PCB) OR are removed (Themis central processing unit PCB). All parts relevant for the radio part are in place. The digital part of Drystar 5503 and Drystar 5500 has been tested and shown to comply with CFR47 part 15 subpart B. Drystar 5500 is an older two cassette printer for which production stopped end of 2006.

Illustrations: (Equipment under test)

Photo 1 : EUT front



Photo 2 : rear



## SECTION 4: TEST SPECIFICATIONS AND TEST METHODS

Applied Tests or Technical Standards	
Emission:	
Test or Technical Standard	Title
FCC CFR47 part 15	Code of Federal Regulations , part 15 , Subpart C , Intentional Radiators part 15.225 Operation within the band 13.110-14.010MHz



(\*) if the log  is mentioned, the measurement is under accreditation : 041-T – ISO17025

MRA : between E.C. and USA : CAB (EMC) [ designation number BE0002] date of validation 15.01.2002

### 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 LISNEMCO is selected , for spurious radiated emission the HI562hp (30-1000MHz) and EMCOROD(0.009-30MHz) and fundamental the HFHZ2 is selected .

LISNEMCO is the Transducer Factor for the LISN (combination of the attenuation of the LISN and cable in the range 150kHz-30MHz)

EMCO is the Transducer factor for the rod antenna (combination of the AF of the EMCO active antenna and cables in the range 9kHz-30MHz ) .

HI562hp is the Transducer factor for the bilog antenna (combination of the AF of the R&S antenna , pre-amplifier and cables in the range 30MHz-1GHz ) .

HFHZ2 is the Transducer factor for the magnetic loop antenna (combination of the AF of the R&S loop antenna and cables in the range 9k-30MHz ) .

## **SECTION 5: OPERATION OF EUT DURING TESTING**

**The following performance criteria are described in the standard .**

### **Operating modes during emission testing**

Continuous read of three cassettes simultaneous (2x I-CODE and 1x ISO label)



**SECTION 6: SUMMARY OF TEST RESULTS**

6.1 Test results of the emission tests.

Emission measurement according to : FCC part 15		
Test	The EUT complies limits	remarks
conducted emissions (0.15 MHz – 30 MHz) 15.207	Yes	1
Spurious emissions (0.009-30 MHz) 15.209	Yes	
Spurious emissions (30-1000 MHz) 15.209	Yes	1
radiated field strength of fundamental emissions 15.225	Yes	
Frequency tolerance 15.225	Yes	

Remark 1 : class B

Section 15.19 Labelling requirements.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules.  
 Operation is subject to the following two conditions:  
 9805.□. this device may not cause harmful interference,  
 and (2) this device must accept any interference received, including  
 interference that may cause undesired operation.

(b) Products subject to authorization under a Declaration of Conformity shall be □abelled as follows:

9805.□. The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:

(i) If the product is authorized based on testing of the product or system; or



## **SECTION 7: DETAILED TEST RESULTS**

### **7.1. EMISSION TEST**

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

### 7.1.1 CONDUCTED EMISSION TEST : power

#### CONDITIONS

The equipment was placed as floorstanding equipment.  
 The test has been performed in a shielded room.  
 The conducted emission level was measured with a LISN according to CISPR16/ANSI C36.4 (0.15 MHz – 30 MHz).  
 Test voltage : 115V /60Hz  
 Specification reference :C.F.R.47 part 15.207  
 The upper limit line is the quasi-peak limit line .  
 The lower limit line is the average limit line.  
 Remark : 2 x I-code reader and 1 x ISO code reader in EUT  
 Test date : 2009-08-24

#### Conducted emission L1-PE

**table1** (quasi peak + average detector)

Freq (MHz)	QP (dB $\mu$ V)	AV (dB $\mu$ V)
0.305	44.4	34.6
2.20	31.9	28.6

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

#### Conducted emission L2-PE

**table2** (quasi peak + average detector)

Freq (MHz)	QP (dB $\mu$ V)	AV (dB $\mu$ V)
0.312	46.1	42.5
2.45	32.8	29.1

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

Test result	Pass Class B
-------------	--------------

fig1 Conducted emission L1-PE

Agfa H  
L1 FCC

24. Aug 09 10:10

EUT: DS5503

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 LD OFF

Transducer No.	Start	Stop	Name
1	9k	30M	lisnemco

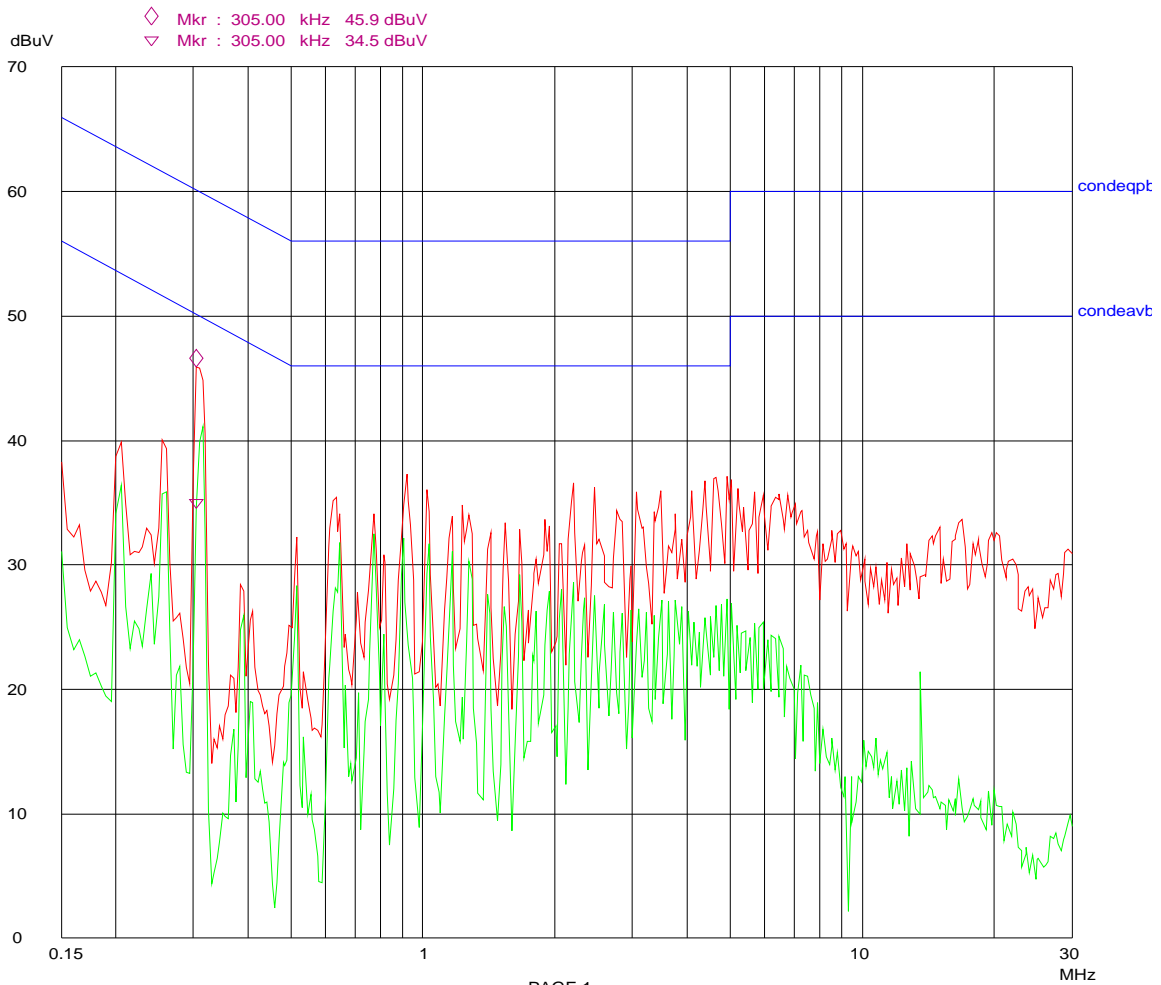


fig2 Conducted emission L2-PE

Agfa H  
L2 FCC

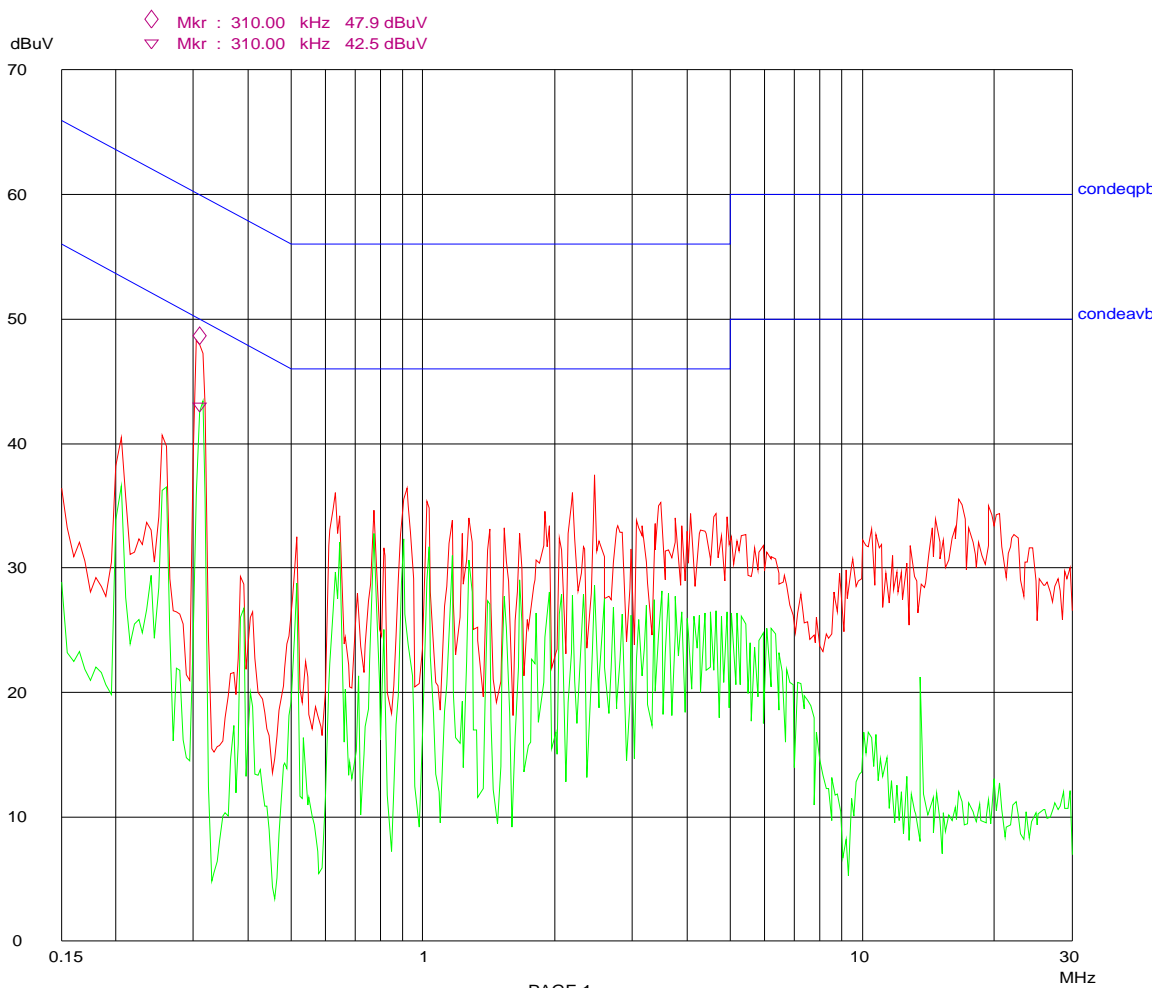
24. Aug 09 10:23

EUT: DS5503

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 LD OFF

Transducer No.	Start	Stop	Name
1	9k	30M	lisnemco



## 7.1.2 RADIATED EMISSION TEST

### CONDITIONS

The equipment was placed as floorstanding equipment.  
 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/60Hz  
 Specification reference :C.F.R.47 part 15.209  
 The limit line 1 is the quasi-peak limit line .  
 Remark : maximum radio part frequency : 16MHz , only measurement till 1GHz .  
 Remark : 2 x I-code reader and 1 x ISO code reader in EUT  
 Test date : 2009-07-28

#### Measurement results Radiated emission : Horizontal polarization operation mode

**Table3** : (quasi-peak detector)

Freq (MHz)	QP (dB $\mu$ V/m)	height(m)	Angle °
403.87	29.5	1.5	150

The final measurements with the quasi-peak detector remain everywhere below the limits .  
 Fig3= 0-345°

#### Vertical polarization operation mode

**Table4** (quasi-peak detector)

Freq (MHz)	QP (dB $\mu$ V/m)	height(m)	Angle °
404.0	28.8	1	225
42.18	31.8	1	180

The final measurements with the quasi-peak detector remain everywhere below the limits .  
 Fig4= 0-345°

Test result	Pass Class B : 15.209 (c) and 15.209 (f) .
-------------	--

Fig 3 : Radiated emission (30-1000MHz) hor pol

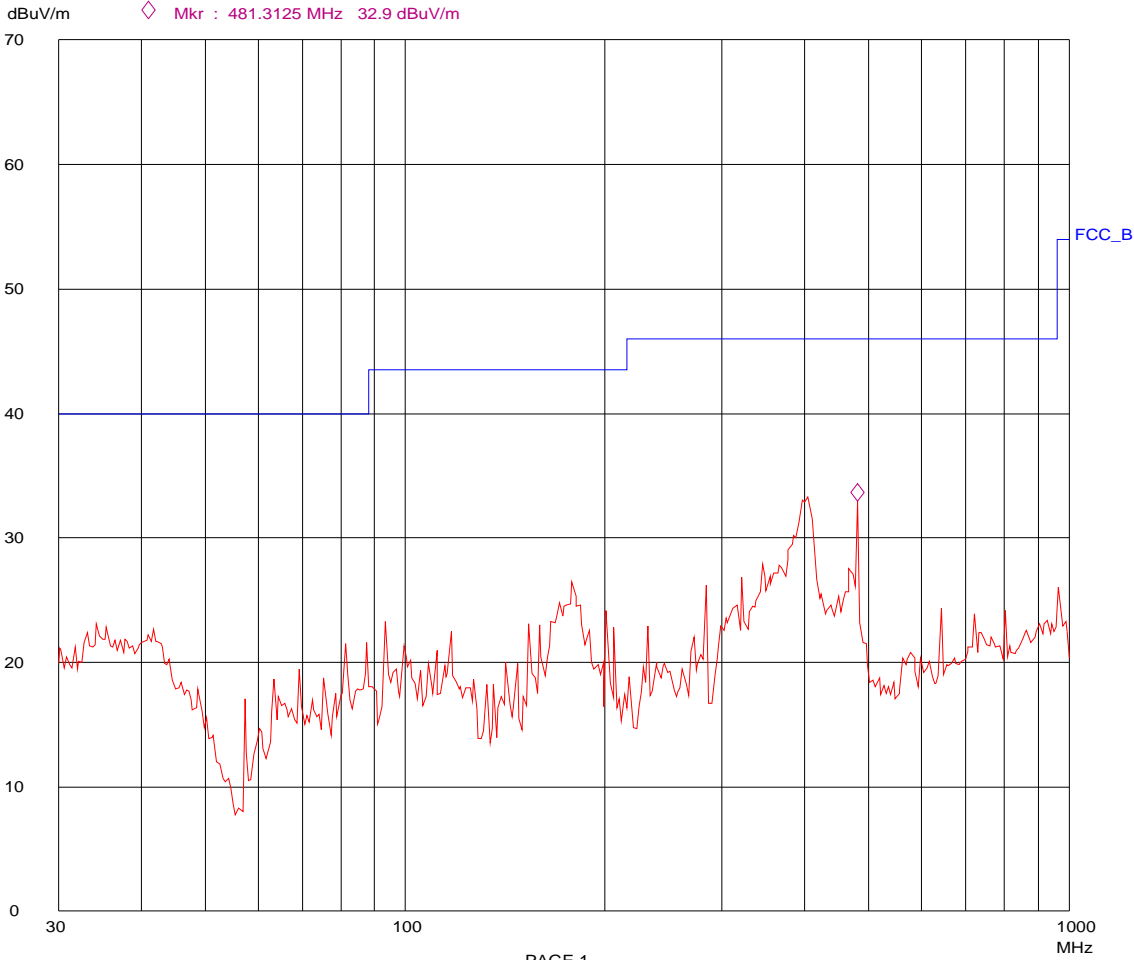
Agfa H  
hor FCC

24. Aug 09 11:29

EUT: DS5503

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 LD ON  
 300M 1000M 62.5k 120k PK 1ms AUTO LD ON

Transducer No. Start Stop Name  
 22 30M 1000M HL562hp



PAGE 1

Fig 4 : Radiated emission (30-1000MHz) ver pol

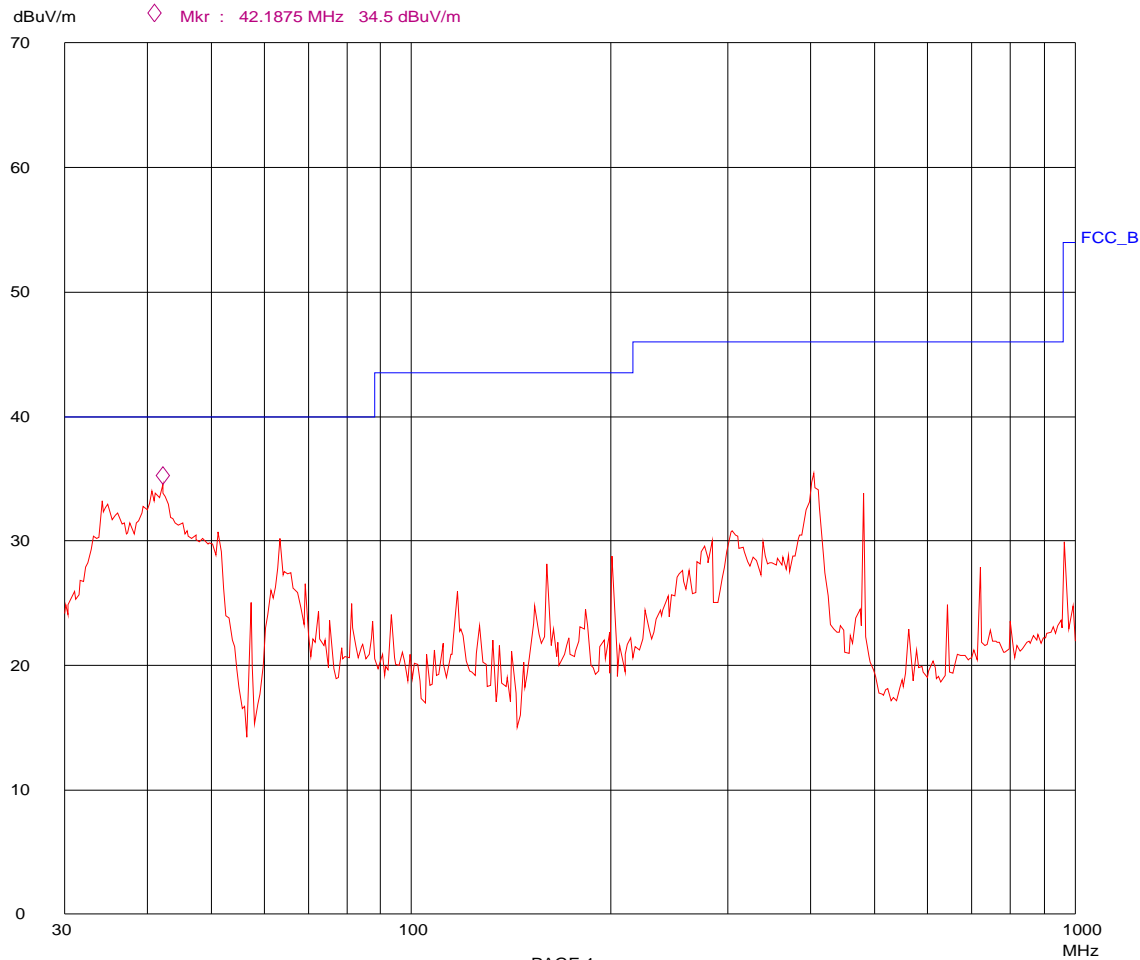
Agfa H  
ver FCC

24. Aug 09 10:45

EUT: DS5503

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 LD ON  
 300M 1000M 62.5k 120k PK 1ms AUTO LD ON

Transducer No. Start Stop Name  
 22 30M 1000M HL562hp





### 7.1.3 RADIATED EMISSION TEST

#### CONDITIONS

The equipment was placed as floorstanding equipment.  
The chamber complies with the ANSI C63.4/5 and CISPR 16.  
The radiated emission level was measured with a rod antenna (0.01-30MHz).  
Test voltage : 115Vac/60Hz  
Specification reference :C.F.R.47 part 15.209  
The limit line 1 is the quasi-peak limit line .  
Remark : 2 x I-code reader and 1 x ISO code reader in EUT  
Test date : 2009-08-24

#### Measurement results Radiated emission : vertical polarization operation mode

ISO label

**Table5** : (quasi-peak detector)

Freq (kHz)	QP (dB $\mu$ V/m)	height(m)	Angle °
12.0	30.0	1	0
5035	29.8	1	0

The final measurements with the quasi-peak detector remain everywhere below the limits .  
Fig5= 0-345°

Test result	Pass
-------------	------

Fig 5 : Radiated emission (0.01-30MHz)

Agfa H  
15209 LF

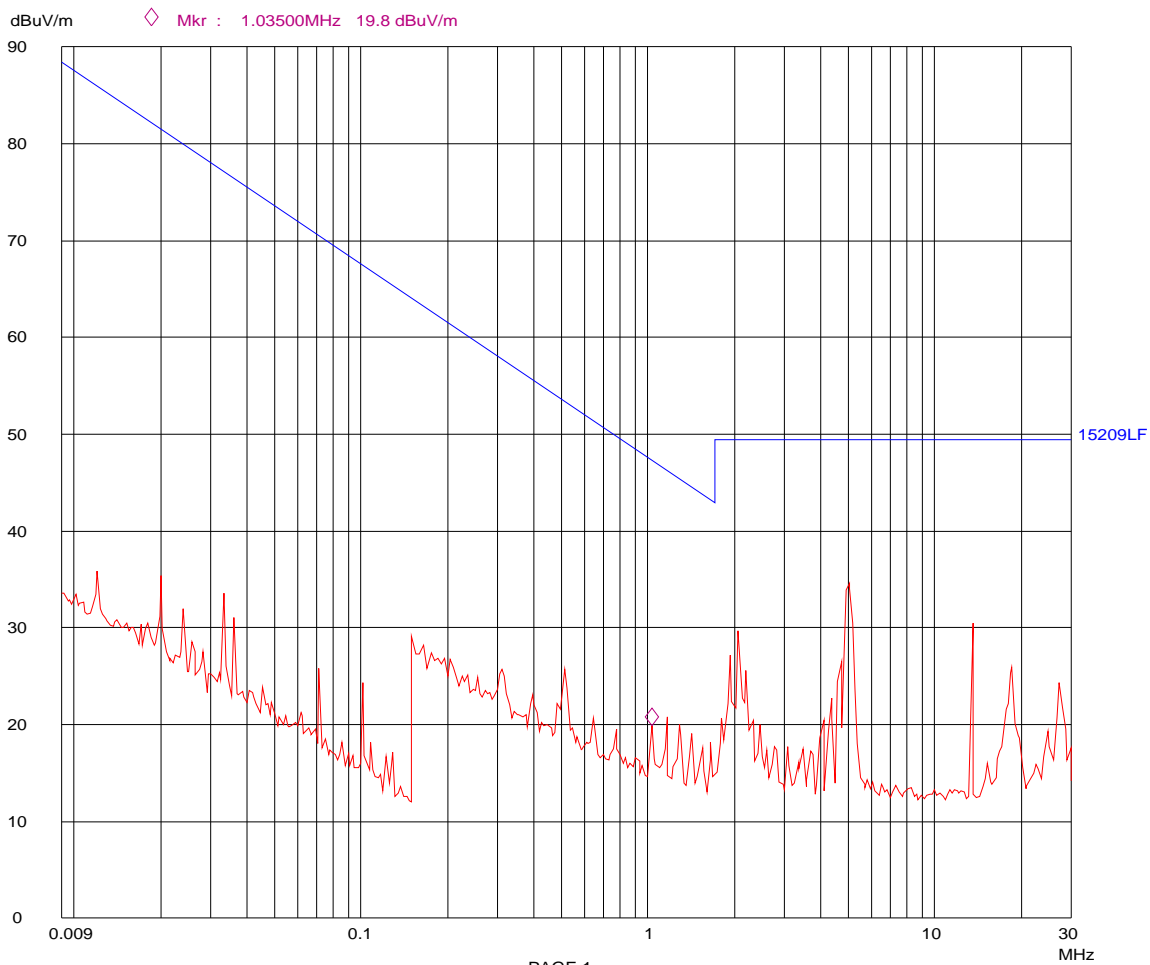
24. Aug 09 13:23

EUT: DS5503

Scan Settings (2 Ranges)

Frequencies			Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten Preamp
9k	150k	100Hz	200Hz	PK	100ms	AUTO LD ON
150k	30M	5k	9k	PK	20ms	10dBLD ON

Transducer No.	Start	Stop	Name
21	9k	30M	EMCOROD



PAGE 1

### 7.1.4 . Fundamental Radiated emission

#### CONDITIONS

The equipment was placed as floorstanding equipment.  
 The chamber complies with the ANSI C63.4/5 and CISPR 16.  
 The radiated emission level was measured with a magnetic loop antenna .  
 Test voltage : 115Vac/60Hz  
 Specification reference :C.F.R.47 part 15.225  
 The limit line 1 is the quasi-peak limit line .  
 Remark : The test was done at 1m distance , the limit was calculated using the square of an inverse linear distance extrapolation factor of 40dB/dec. (40 log 30/1). Section 15.31(f)(2)  
 Test date : 2009-08-24

#### Measurement results Radiated emission :

**Table6 :** (quasi-peak detector) : range 13.553-13.567MHz

Freq (MHz)	QP (dB $\mu$ V/m)	limit (dB $\mu$ V/m) @1m
13.5605	49.6	143

Fig6: RFID tag : peak value

**Table7 :** (quasi-peak detector) : 15.225 (b) range

QP (dB $\mu$ V/m)	limit (dB $\mu$ V/m) @1m	Range (MHz)
29.7	109.5	13.410-13.553
32.1	109.5	13.567-13.710

**Table8 :** (quasi-peak detector) : 15.225 (c) range

QP (dB $\mu$ V/m)	limit (dB $\mu$ V/m) @1m	range
18.4	99.5	13.110-13.410
14.5	99.5	13.710-14.010

Remark : plots in dB $\mu$ A/m : add 51.5db for dB $\mu$ V/m

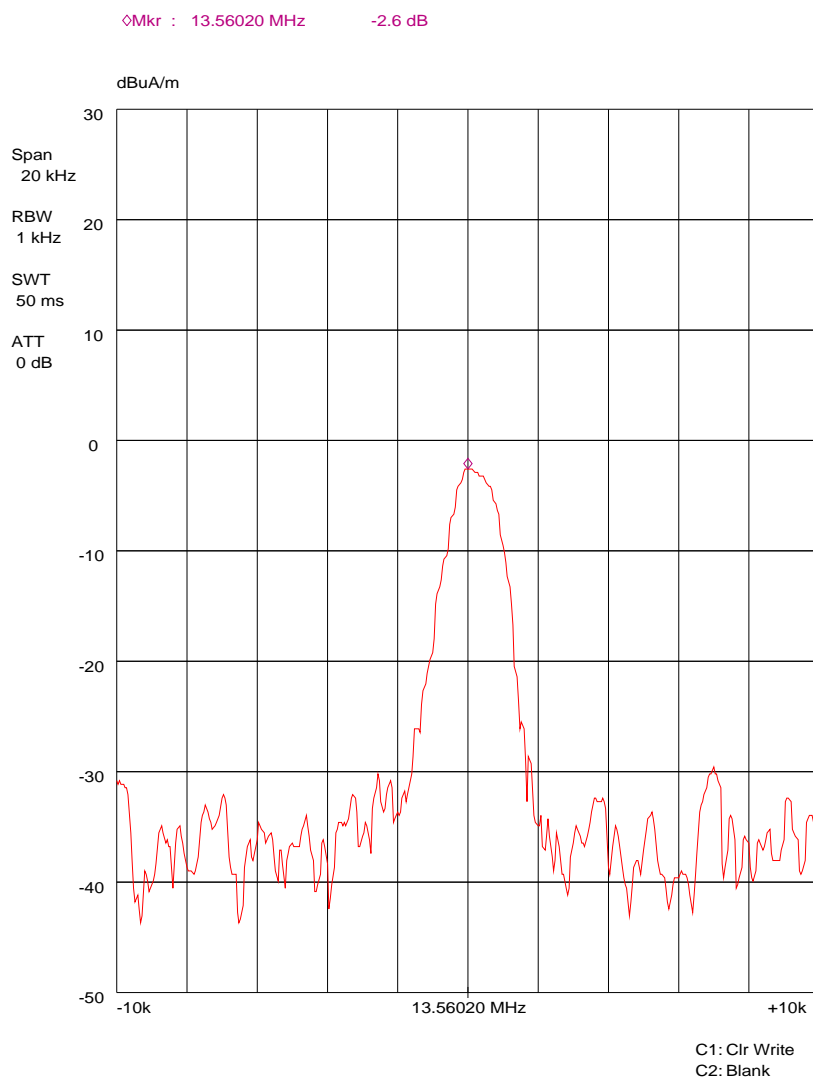
Test result	Pass
-------------	------

Fig 6 : ISM band (13.56MHz)

# Agfa H ISM

24. Aug 09 13:23

EUT: DS5503





## 7.2. Frequency tolerance

### CONDITIONS

The equipment was placed in a climate chamber .  
 The frequency level was measured with spectrum analyzer .  
 Test voltage : 5Vdc  
 Temperature range -20° to +50°C  
 Specification reference :C.F.R.47 part 15.225  
 Test date : 2009-07-31

Table9 : frequency-temp

Maximum frequency (kHz) / temp °c	Minimum frequency (kHz) / temp °c	Δf (Hz)	Δ ppm
13560.548 / +20	13560.488 / -20	60	4.4

Maximum allowed frequency tolerance : ±0.01% or 100ppm .

### CONDITIONS

The equipment was placed in a climate chamber .  
 The frequency level was measured with spectrum analyzer .  
 Test voltage range : 85-115% of 5Vdc (4.25-5.75V)  
 Specification reference :C.F.R.47 part 15.225  
 Test date : 2009-08-27

Table10 : frequency-voltage

Maximum frequency (kHz) / voltage	Minimum frequency (kHz) / voltage	Δf (Hz)	Δ ppm
13560.566 / 5.75V	13560.537 / 4.75V	29	2.1

Maximum allowed frequency tolerance : ±0.01% or 100ppm .

Remark : range 4.25-4.75V : EUT output level dropped below -80dBm ( normal level > -7dBm ) , therefore only the results in range 4.75-5.75V were used .

Fig 8 : frequency deviation temp .

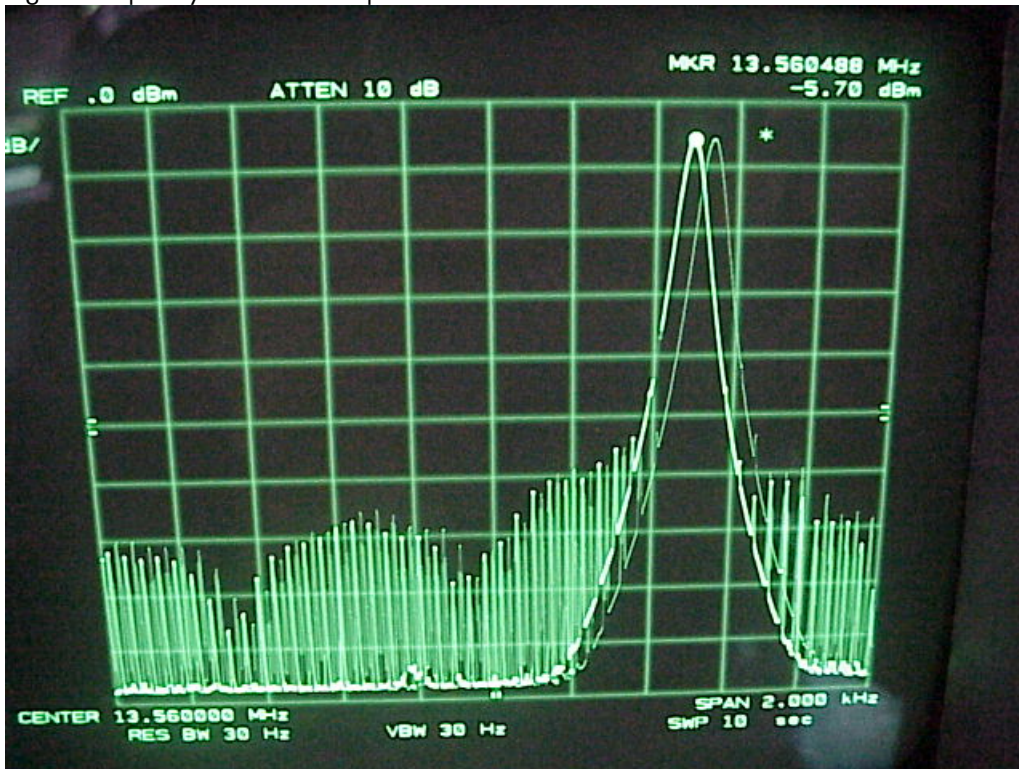


Fig 9 : frequency deviation voltage .

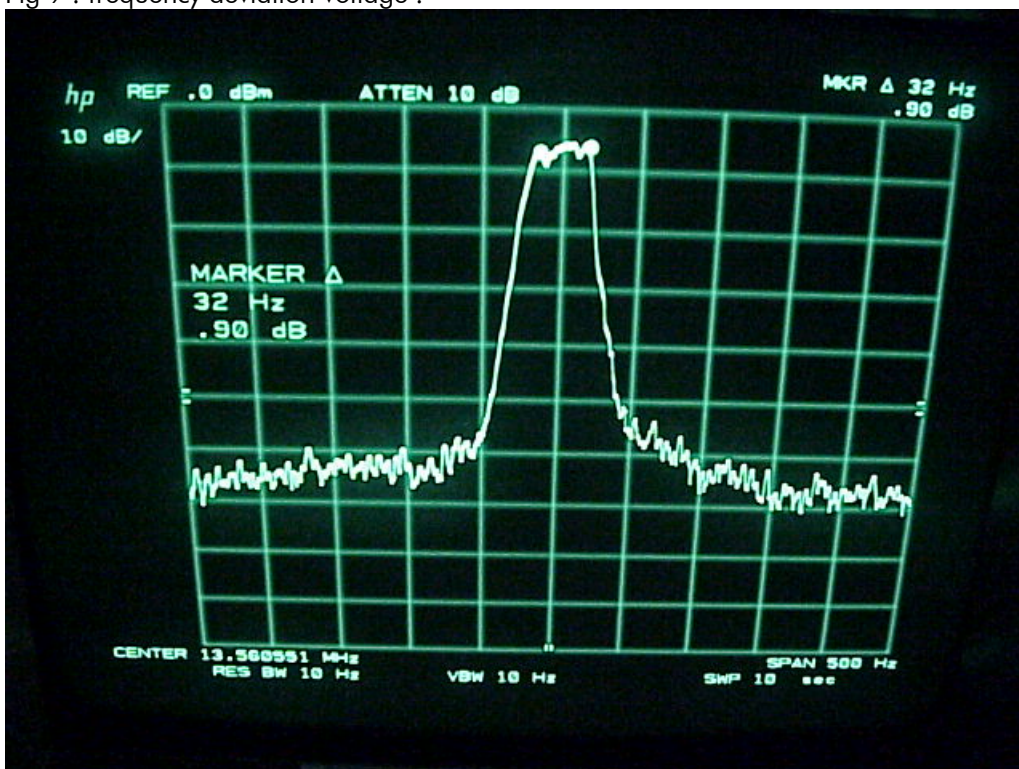
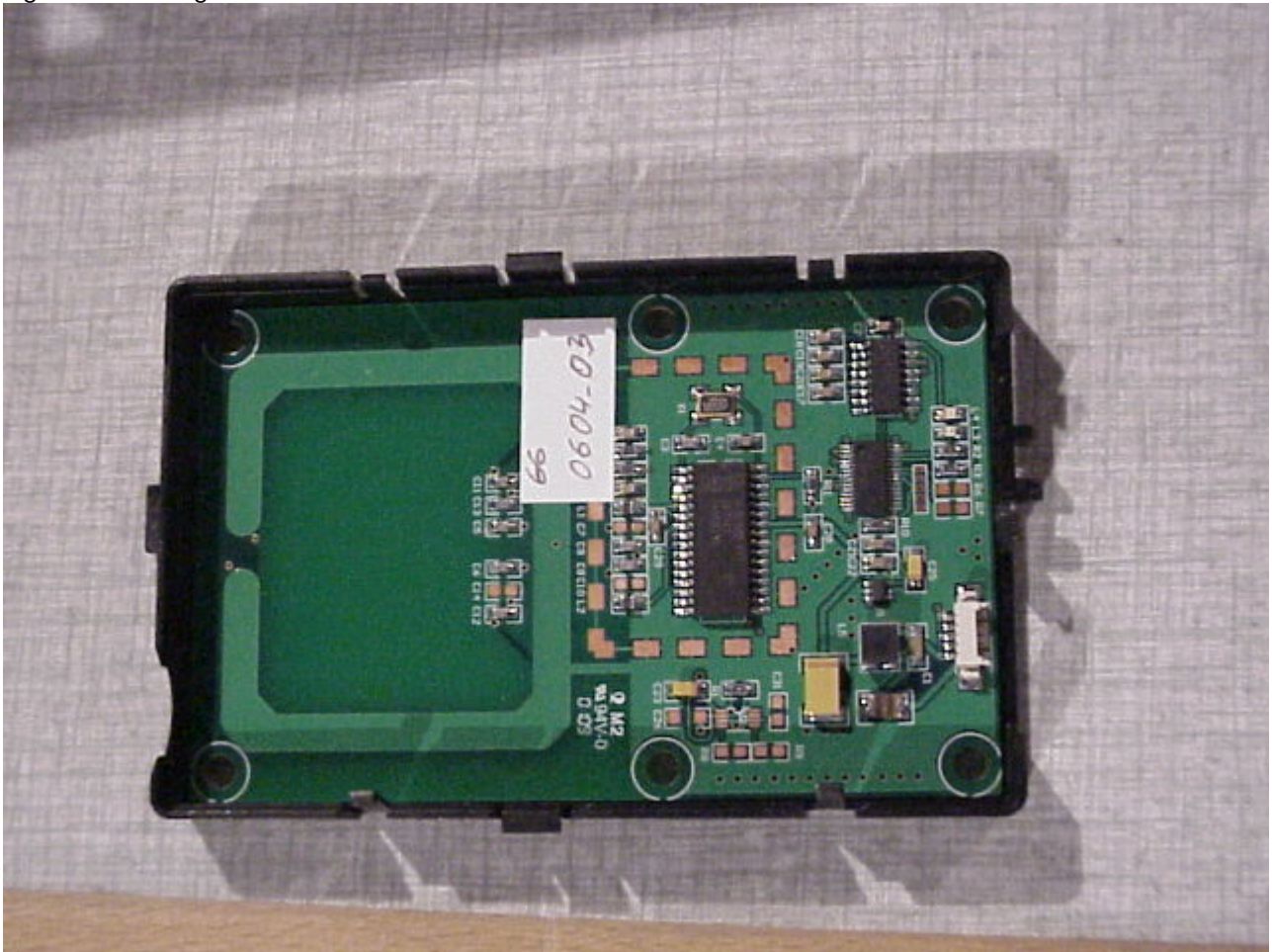




Fig 10 : RF-ID tag reader





### 7.3. limits

Table11 : CE on mains (class B)

frequency (MHz)	QP (dB $\mu$ V)	AV (dB $\mu$ V)
0.15-0.50	66 to 56	56 to 46
0.50-5.0	56	46
5.0-30	60	50

Table12 : RE range 0.01-30MHz @ 3m

frequency (MHz)	QP (dB $\mu$ V)
0.009-0.490	88.5 to 53.8
0.49-1.705	53.8 to 43.0
1.705-30.0	49.5

Table13 : RE @ 3m range 30-1000MHz (class B)

frequency (MHz)	QP (dB $\mu$ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
above 960	54.0

Table14 : RE @ 1m ISM band 13.56MHz

frequency (MHz)	QP (dB $\mu$ V/m)
13.110-13.410	99.5
13.410-13.553	109.5
13.553-13.567	143
13.567-13.710	109.5
13.710-14.010	99.5

#### 7.4. Test dates and Climate conditions .

<b>date</b>	2009-08-24
<b>ambient temperature</b>	24°C
<b>relative humidity</b>	55%
<b>atmospheric pressure</b>	1013hPa

## SECTION 8: MEASUREMENT UNCERTAINTIES

measurement	uncertainty	remark
CE with LISN	$\pm 2.42\text{dB}$	
CE with ISN	$\pm 1.5\text{dB}$	
CE with current probe	$\pm 3.6\text{dB}$	
DPE with clamp (30-300M)	$\pm 3.9\text{dB}$	
RE 30-1000MHz	$\pm 3.9\text{dB}$	
Harmonic	1%	current
Flicker	5%	
ESD	$\pm 12\%$	current
RI 80-1000MHz GTEM	$\pm 0.656\text{V/m}$	3V/m
RI 80-1000MHz GTEM	$\pm 1.72\text{V/m}$	10V/m
RI 80-1000MHz AR	$\pm 0.85\text{V/m}$	3V/m
RI 80-1000MHz AR	$\pm 1.77\text{V/m}$	10V/m
RI 895-905MHz GTEM	$\pm 0.656\text{V/m}$	3V/m
RI 895-905MHz GTEM	$\pm 1.72\text{V/m}$	10V/m
RI 895-905MHz AR	$\pm 0.85\text{V/m}$	3V/m
RI 895-905MHz AR	$\pm 1.77\text{V/m}$	10V/m
EFT	$\pm 12\%$	
Surge	$\pm 12\%$	
CI CDN	$\pm 0.54\text{dB}$	
CI injection clamp	$\pm 3.5\text{dB}$	
Magnetic immunity	$\pm 0.12\text{A/m}$ $\pm 0.23\text{A/m}$	3A/m 30A/m
Voltage dips	$\pm 1.5\%$	
Temperature climate chamber	$\pm 2^\circ\text{C}$	

## SECTION 9: PHOTOGRAPHS OF EQUIPMENT AND TEST SET-UP

Photo 3 : conducted emission



Photo 5 : radiates emission (0.009-30.0MHz)

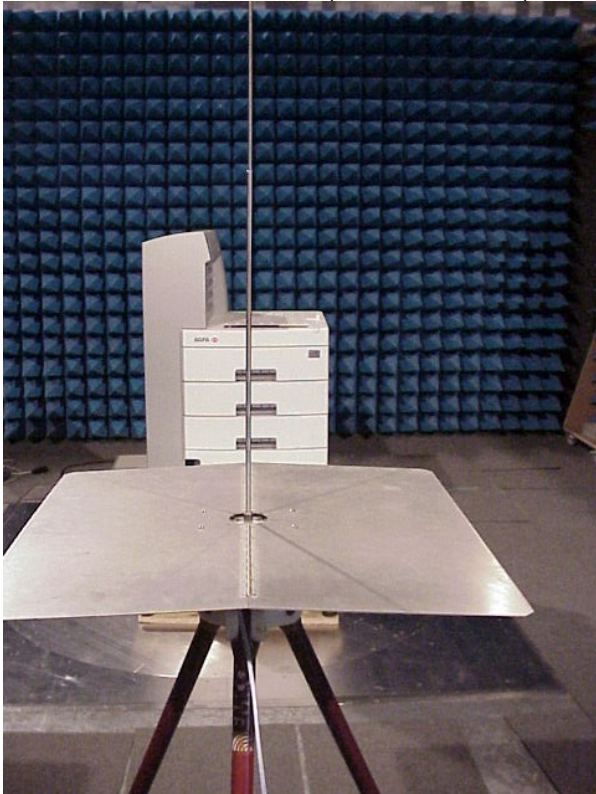
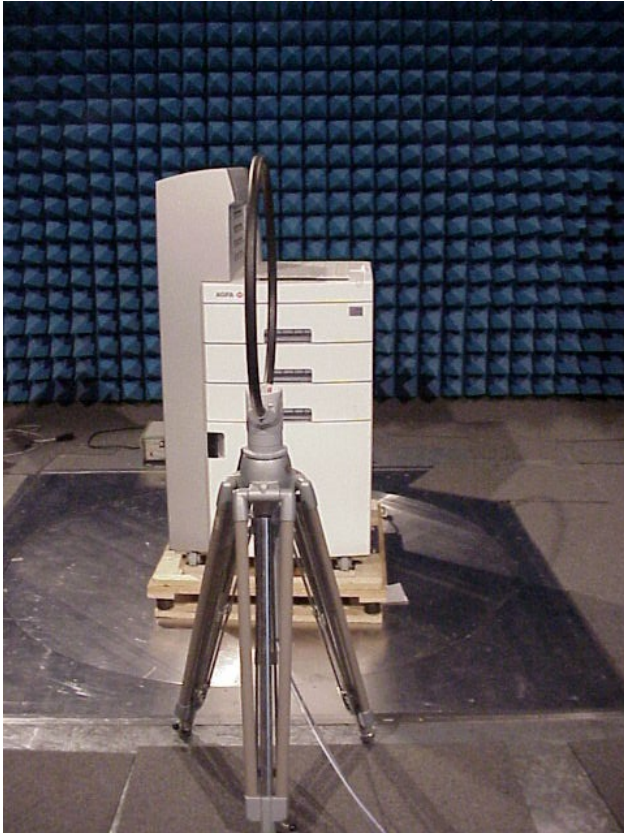


Photo 6 : radiates emission (30-1000MHz)



Photo 7 : fundamental radiated emission (ISM 13.65MHz)





## SECTION 10: LIST OF MEASUREMENT EQUIPMENT USED DURING THE TEST

Item	model	serial number	
Rohde & Schwarz EMI receiver	ESCS30	826547/027	*
Chase Bilog antenna	CBL6112A	2182	
Chase bicon antenna	CBL6111B	1948	
R&S bilog antenna	HL562	361324/17	*
R&S horn antenna	HF906	100007	
R&S magnetic loop antenna	HFH2 Z2	879604/007	*
EMCO rod antenna	3301B	8908-2811	*
Antenne mast + controller	RSM 010 / RSC 02	/	*
Anechoic room	EAC52282	/	*
harm + flicker test system (Spitzenberger + Spies)	EMV E2000/Pas	A2780 00/0 0501	*
LISN single phase : EMCO	3816/2	9805-1086	*
HP spectrum Analyzer	HP8546A	3549A00300	
HP spectrum Analyzer	HP8568B	2517A09581	*
preamp : 9kHz-1GHz Chase	CPA9231	3078	
Preamp : 10kHz-50MHz HP	HP8447A	2349A07622	
Preamp : 10kHz-1.3GHz HP	HP8447F	2430A01601	*
Low noise preamp 0.1-8.0GHz	AFS4-00100800-25-10P-4	1581127	
Climate chamber Weiß	SB2-1000	222/20474	*
Delta power supply	E030-3	04251	*
Delta power supply	E030-3	03159	*
Fluke DVM	85III	396180	*

## SECTION 11: ADDITIONAL INFORMATION GIVEN BY THE CUSTOMER

### Applicant's role during testing

Connecting and brings the EUT in operating mode.  
Witness testing

### EUT information given by the customer

#### Auxiliary equipment connected during testing

none

#### Cables

Power cable : 3wire , l = 1.75m



## **SECTION 12: MODIFICATIONS OF EUT**

MODIFICATIONS OF EUT : none

## SECTION 13: HISTORY OF THE TEST REPORT

### HISTORY OF THE TEST REPORT (EDITION)

<b>Edition</b>	<b>Adjustment (reason for up-grade)</b>
ETC27241_ed.1	Original
ETC27241_ed.2	Change in table 12 and 14 : data for LSB en USB in ISM band Add extra info in 7.1.2 ; separate data of the 152.225 of the a , b and c band , correcting the values of the spurious ISM emission

## SECTION 14: ACCREDITATION CERTIFICATE



Organisme belge d'Accréditation  
Belgische Accreditatieinstelling  
Belgische Akkreditierungsstelle  
Belgian Accreditation Body

Signatory to EA, ILAC and IAF  
Multilateral Agreements

### Accreditation Certificate No. 041-TEST

In compliance with the provisions of the Royal Decree of 31 January 2006 setting up BELAC, the Accreditation Board hereby declares, that the test laboratory

**LABORATORIA DE NAYER VZW**  
**Jan De Nayerlaan, 3**  
**2860 SINT-KATELIJNE-WAVER - Belgium**

has the competence to perform the tests as described in the annex which is an integral part of the present certificate, in accordance with the requirements of the standard NBN EN ISO/IEC 17025:2005. The present accreditation is the subject of regular surveillance in order to confirm the compliance with the accreditation conditions.

The Chair of the Accreditation Board BELAC,



Nicole MEURÉE-VANLAETHEM

Issue date : 2009-05-12

Validity date : 2014-01-07

Original version of this certificate is in Dutch.



FCC :

**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

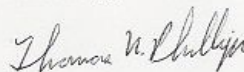
Dear Sir or Madam:

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