



L C I E

Rapport d'essai / Test report

JDE : 60046457 N° 200605-3100-R1-E

DELIVRE A / ISSUED TO : DIGIGRAM (M. HAUSER)
430, rue Aristide Bergès
38330 MONTBONNOT SAINT MARTIN - FRANCE

Objet / Subject : Essais de compatibilité électromagnétique conformément aux normes EN55022 (1998 + A1/2000 + A2/2003), CISPR 22 (2005 + A1/2005) et FCC part 15, Subpart B.
Electromagnetic compatibility tests according to the standards EN55022 (1998 + A1/2000 + A2/2003), CISPR 22 (2005 + A1/2005) and FCC Part 15, subpart B.

Matériel testé / Apparatus under test :

- Produit / Product : Carte Son USB / USB Sound Card
- Marque / Trade mark : DIGIGRAM
- Constructeur / Manufacturer : DIGIGRAM
- Type / Model : UAX220-MIC / UAX220-v2
- N° de série / serial number : 2595.000000001 (PCB proto #1)*
- FCC ID : IGTUAX220MIC

* : information donnée par le client / information given by the customer

Date des essais / Test date : 22 mai et 28 juillet 2006 / May 22nd and July 28th, 2006

Lieu d'essai / Test location : LCIE
ZI des Blanchisseries
38500 VOIRON - France

Test réalisé par / Test performed by : Laurent CHAPUS / Jacques LORQUIN

Ce document comporte / Composition of document : 16 pages.

VOIRON, LE 10 AOÛT 2006 / AUGUST 10TH, 2006

Ecrit par / Written by
Laurent CHAPUS

Approuvé par / Approved by,
Jacques LORQUIN

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1. TEST PROGRAM

Standard:

- EN 55022 (1998 + A1/2000 + A2/2003)
- CISPR 22 (2005 + A1/2005)
- FCC Part 15, Subpart B

Requirements for Information Technology Equipment and digital devices:

- Radiated emissions, Class B level Test result : **PASS**
- Conducted emissions, Class B level Test result : **PASS**

2. TEST SETUP

2.1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it).

The tested apparatus could come in two different versions:

- UAX220-MIC
- UAX200v2

The UAX220-MIC sound card is the complete version and it will be used for the evaluation.

2.2. Hardware identification:

- * Equipment under test (EUT) :

UAX220-MIC

Sn: 2595.00000001 (PCB proto #1)

- Input/output:

- USB (*)
- 2 x Audio Lines IN
- 2 x Audio Lines OUT
- 1 x Headset Line

(*): cable connected to these Input/Output are considered to be lower than 3m, as declared by the applicant.

- Auxiliaries:

Trade Mark – Model Number (Serial number)	FCC ID	Description	Cable description
UAX220-MIC * (sn : 2595.00000001)	IGTUAX220MIC	Professional USB Audio Interface	I/O cable Ref: SC171900201-03 (USB and audio lines)
DELL, Model: SMM01 (sn: CNBX11J)	DoC	Personal computer	Power cord unshielded. All other cable shielded.
Hewlett Packard pn:D2846 (sn: JP74001000)	DoC	Monitor	Power cord unshielded. Video cable shielded with ferrites
Hewlett Packard pn:C3751B (sn: LZA62831217)	DZL211029	Mouse	PS2 cable (1.5m)
Hewlett Packard pn:C4734-60111 (sn: M990814763)	GYUR38K	Keyboard	PS2 cable (1.2m)
Hewlett Packard DESKJET 895cxi (sn: MY9761915S)	none	Parallel printer	Power cord unshielded. All other cable shielded.
Hewlett Packard HP48GX (sn: ID83802369)	none	Serial calculator	Serial cable shielded
DIGIGRAM - Audio Load Box (sn: none)	none	Load box	Earth wire (1.5m)
SENNHEISER - HD 433 (sn: none)	none	Headset	Audio cable (2m)

*: Equipment under test.



- **I/O cables:**

The cable attached on EUT (Ref: SC171900201-03) consists of:

- USB cable (1.8m with ferrite on PC side)
- 4x XLR Audio IN and OUT cables (1m) + extension cords (1.2m)
- 1x Headset cable (1m) + Headset cable (2m)

Other cables used for the test are:

- 2x Standard power cords (1.5m) for PC and Monitor
- Video cable (1.5m)
- Parallel printer cable (1.5m)
- Serial calculator cable (1.5m)

2.3. Running mode

The EUT is connected to a USB port of the PC. A media player is playing in loop a sound file.

IN and OUT audio lines are connected to the load box.

PC is running under WINDOWS XP.

2.4. Equipment modifications

No equipment modification has been necessary during testing. The unit tested was representative to a production unit.

2.5. Special accessories

No special accessory used during testing. I/O cable is attached on EUT with a ferrite tube on the USB cable on PC side.

3. RADIATED EMISSION DATA

3.1. Setup

Power supply: 230Vac/50Hz

The EUT is set on the non-conductive table of 80 cm height.

The installation of EUT is identical for pre-characterization measures in a 3 meters full anechoic chamber and for measures on the 10 meters Open site.

Note: Measures are performed without ferrite absorption clamps on mains power cords according to CISPR22 (2005) requirements.



Radiated test setup at 10m

Equipment configuration and running mode:

- EUT is connected to the USB port of the PC
- Audio lines are loaded by typical impedance
- Software (Media player) is running in loop

3.2. Test sequence and results, EN 55022 / CISPR22, Class B level.

3.2.1. Pre-characterization at 3 meters

A pre-scan of all the setup has been performed in a 3 meters full anechoic chamber. The distance between EUT and antenna is 3 meters. Test is performed in horizontal (H) and vertical (V) polarization, on 4 faces of the EUT. The pre-characterization graphs are obtained in PEAK detection.

Graph examples:

Polarization H: graph: m#1
Polarization V: graph: m#2

(see page 8/16)

(see page 9/16)

**3.2.2. Characterization on 10 meters open site from 30MHz to 1GHz**

Frequency list has been created with anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

No	Frequencies (MHz)	QPeak Limit (dBμV/m)	QPeak (dBμV/m)	Margin (dB)	Angle (deg)	Pol	Hgt (cm)	Corr Factor (dB)	Comments
1	66.039	30.0	17.7	-12.3	125	V	120	9.8	
2	77.567	30.0	25.6	-4.4	115	V	170	8.8	
3	84.015	30.0	26.2	-3.8	305	V	160	9.4	
4	113.987	30.0	22.1	-7.9	205	V	210	15.5	
5	239.998	37.0	17.3	-19.7	235	H	180	14.9	
6	250.738	37.0	20.4	-16.6	335	V	120	14.8	

RESULT: **PASS**

3.3. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow :

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength
- RA = Receiver Amplitude
- AF = Antenna Factor
- CF = Cable Factor
- AG = Amplifier Gain

Assume a receiver reading of 52.5dBμV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 is added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dBμV/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dBμV/m value can be mathematically converted to its corresponding level in μV/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$

4. CONDUCTED EMISSION DATA

The product has been tested according to EN55022 and CISPR22 requirements.

The product has been tested with 110V/60Hz and 230Vac/50Hz power line voltage and compared to the CISPR 22 class B limits. Measurement bandwidth was 9kHz from 150 kHz to 30 MHz.

Measurement was initially made with an HP-8591EM Spectrum Analyzer in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement with the Rohde & Schwarz ESH3 receiver for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure) is 50Ω / $50\mu\text{H}$.

The Peak data are shown on the plots. Quasi-Peak and Average measurements are detailed in a table with frequencies and levels measured.

Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page.

4.1. TEST SETUP

The EUT is placed on a table at 0.8m height. The cable of the PC has been shorted to 1meter length. The EUT is powered through the LISN (measure). Auxiliaries (monitor and printer) are connected to a separate LISN.



Conducted test setup

Equipment configuration and running mode:

- EUT is connected to the USB port of the PC
- Audio lines are loaded by typical impedance
- Software (Media player) is running in loop

4.2. TEST SEQUENCE AND RESULTS

Measurements are performed on the phase (L1) and neutral (N) of power lines of the PC (110Vac/60Hz and 230Vac/50Hz).

Graphs are obtained in PEAK detection.

Measures are also performed in Quasi-Peak and Average for any strong signal.



Power voltage 110Vac/60Hz

Measure on L1: graph c#1

(see page 10/16)

Measure on N: graph c#2

(see page 11/16)

Power voltage 230Vac/50Hz

Measure on L1: graph c#3

(see page 12/16)

Measure on N: graph c#4

(see page 13/16)

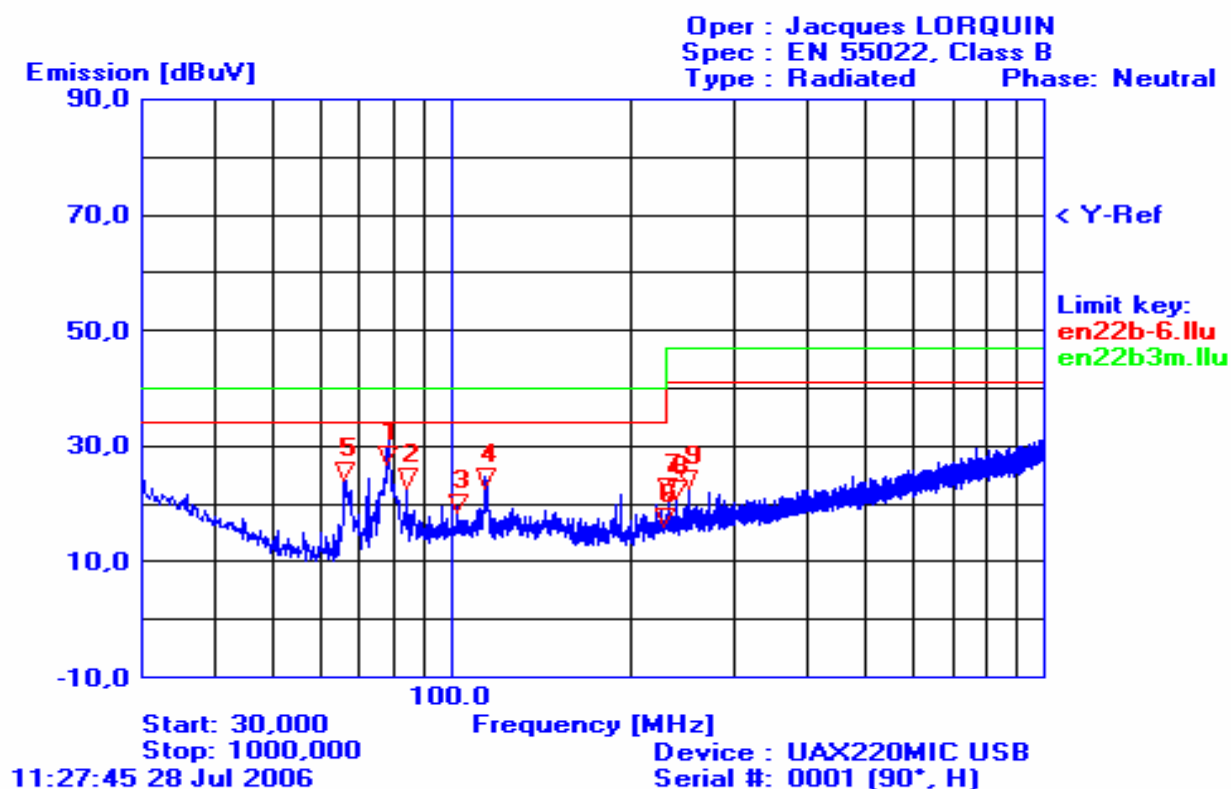
5. CONCLUSION

Measures performed on the sample of the UAX220-MIC (sn: 2595.00000001), tested in configuration and description presented in this test report, show levels below the EN 55022 / CISPR 22, class B in radiated and conducted emissions.



RADIATED EMISSION		Test configuration:
Graph name:	m#1	
Antenna position:	Horizontal	
Azimuth:	90°	

EMISSIONS RAYONNEES - DIGIGRAM



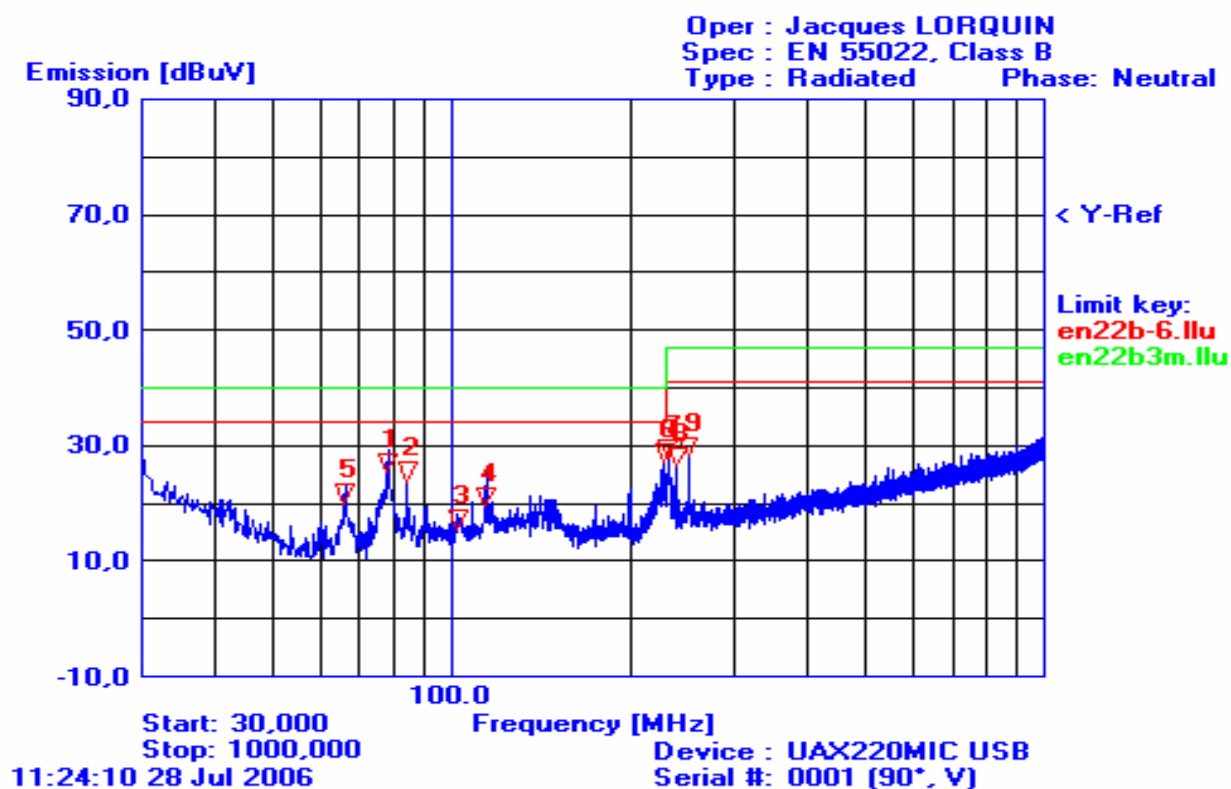
(RBW = 120kHz, VBW = 300kHz)

Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	77,86	26,71	-	-	34,00
2	84,23	22,75	-	-	34,00
3	102,5	18,34	-	-	34,00
4	114,0	22,81	-	-	34,00
5	65,93	23,91	-	-	34,00
6	228,6	16,06	-	-	34,00
7	232,2	20,96	-	-	41,00
8	240,1	20,83	-	-	41,00
9	250,9	22,64	-	-	41,00



RADIATED EMISSION		Test configuration:
Graph name:	m#2	
Antenna position:	vertical	
Azimuth:	0°	

EMISSIONS RAYONNEES - DIGIGRAM



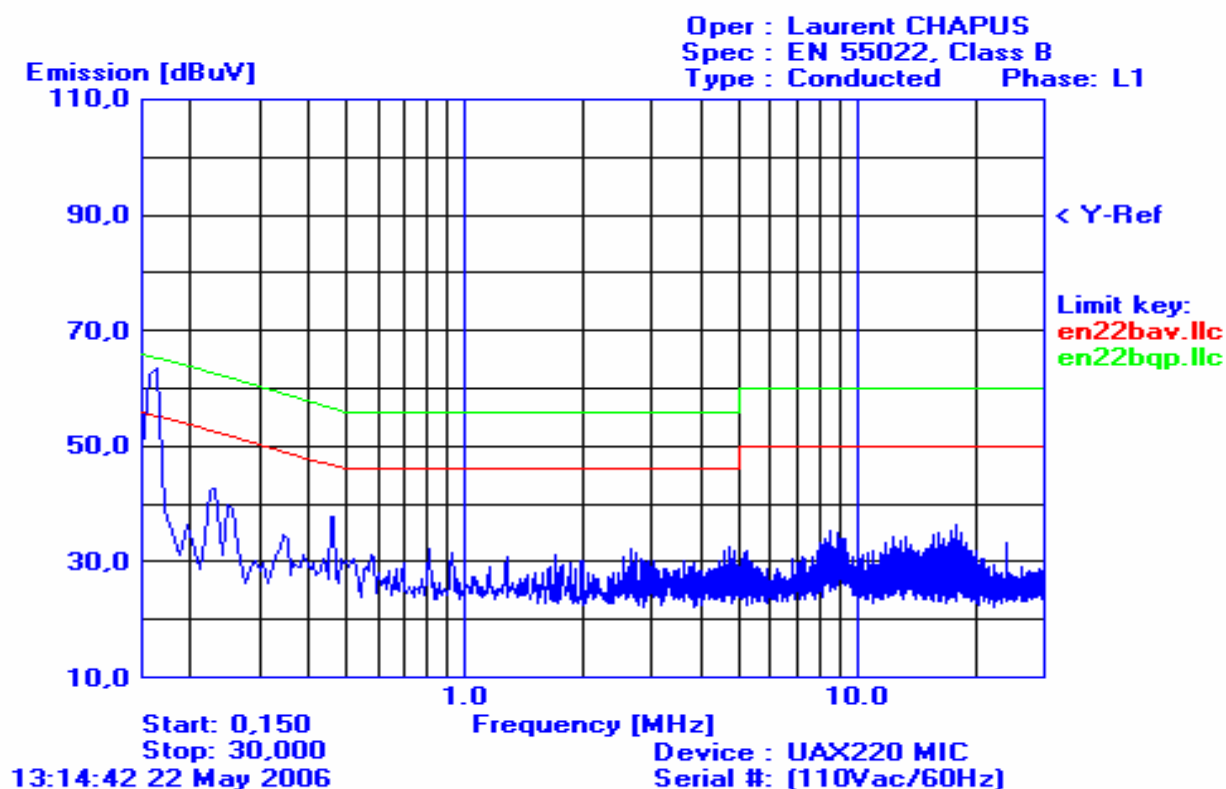
(RBW = 120kHz, VBW = 300kHz)

Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	77,86	25,32	-	-	34,00
2	84,23	23,75	-	-	34,00
3	102,5	15,45	-	-	34,00
4	114,0	19,48	-	-	34,00
5	65,93	19,95	-	-	34,00
6	228,6	27,11	-	-	34,00
7	232,2	27,77	-	-	41,00
8	240,1	26,39	-	-	41,00
9	250,9	28,15	-	-	41,00



CONDUCTED EMISSION		Test configuration:
Graph name:	c#1	
Voltage/Frequency:	110V/60Hz	
Phase	L1	

CONDUCTED EMISSIONS - DIGIGRAM



(RBW = 9kHz, VBW = 30kHz)

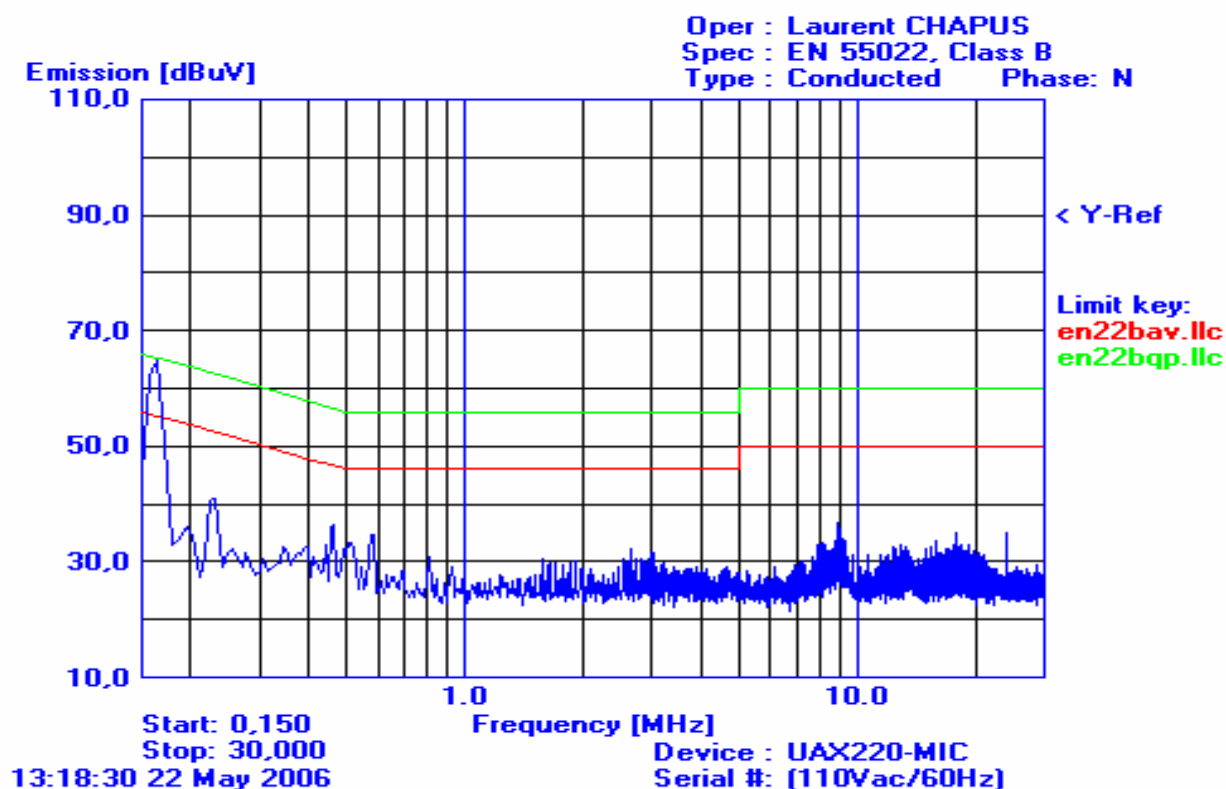
Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit AV [dBuV]
1	0,1656	66,40	61,10 *	48,00*	54,00
2	0,230	46,99	39,04	34,02	52,00
3	0,250	47,60	43,40	25,82	50,00
4	0,460	38,90	35,22	33,29	46,00

*: ESH3 measurement



CONDUCTED EMISSION		Test configuration:
Graph name:	c#2	
Voltage/Frequency:	110V/60Hz	
Phase	N	

CONDUCTED EMISSIONS - DIGIGRAM



(RBW = 9kHz, VBW = 30kHz)

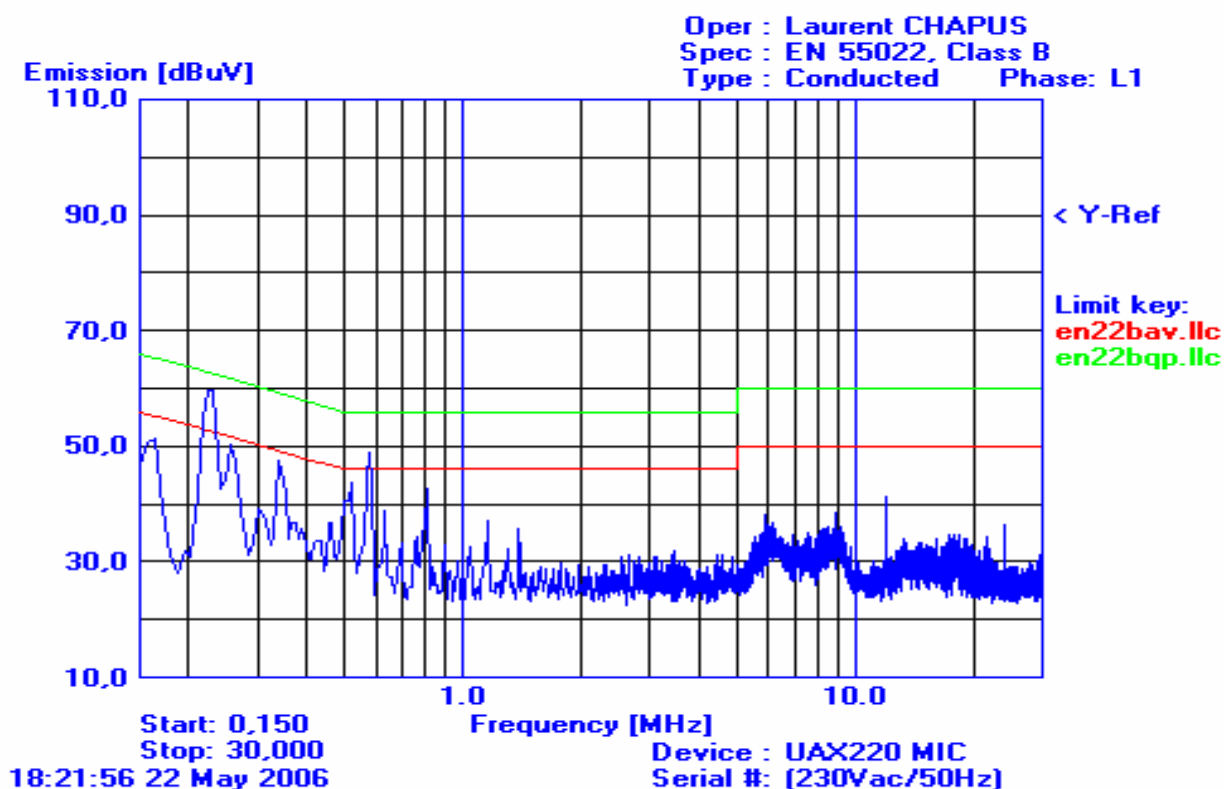
Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	0,1656	65,25	61,10*	47,60*	54,00
2	0,230	42,56	39,31	37,92	52,00
3	0,250	47,93	43,60	27,19	50,00
4	0,460	40,90	35,75	34,00	46,00
5	0,570	34,30	30,63	26,98	46,00

*: ESH3 measurement



CONDUCTED EMISSION		Test configuration:
Graph name:	c#3	
Voltage/Frequency:	230V/50Hz	
Phase	L1	

CONDUCTED EMISSIONS - DIGIGRAM



(RBW = 9kHz, VBW = 30kHz)

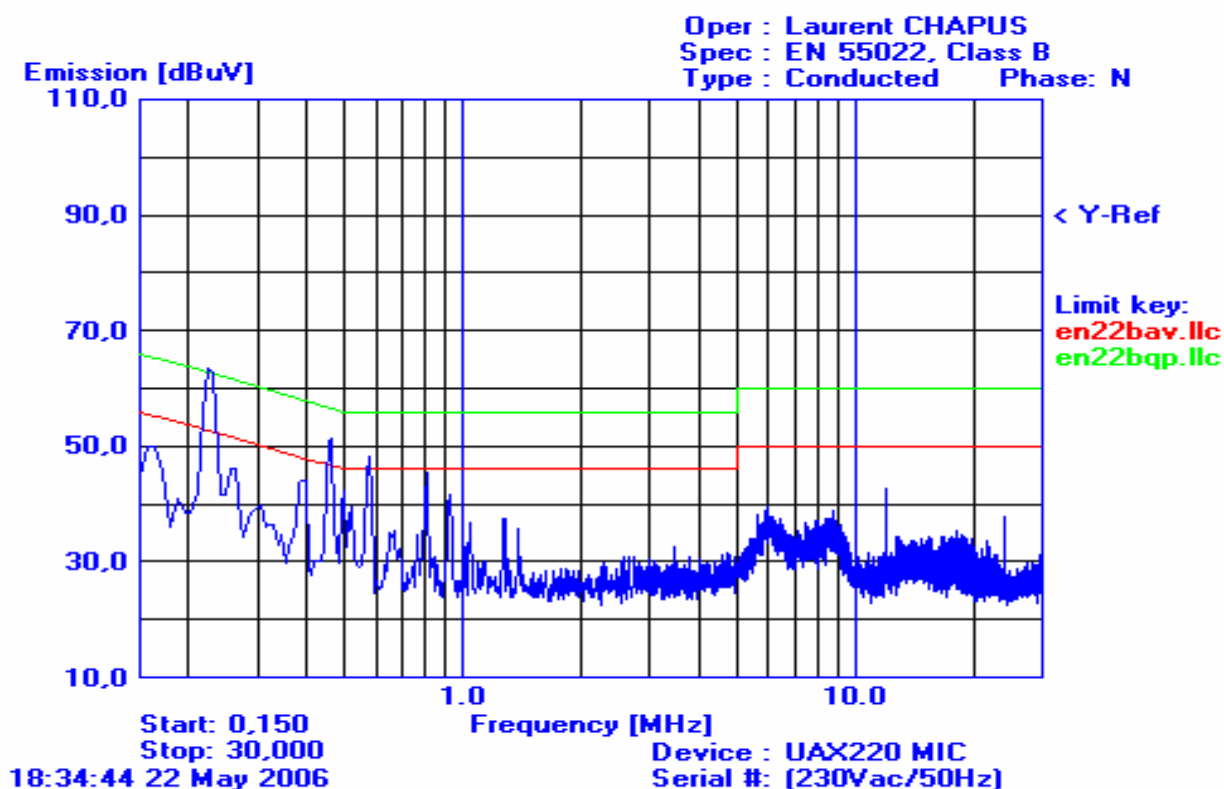
Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	0,160	64,90*	47,40*	44,60*	54,00
2	0,230	64,35	60,90*	38,10*	52,00
3	0,250	53,32	46,71	28,12	50,00
4	0,340	50,56	47,79	32,46	48,00
5	0,460	53,36	51,74	36,87	46,00
6	0,520	43,26	36,45	19,17	46,00
7	0,570	50,03	47,33	33,90*	46,00
8	0,810	45,20	42,45	29,11	46,00

*: ESH3 measurement



CONDUCTED EMISSION		Test configuration:
Graph name:	c#4	
Voltage/Frequency:	230V/50Hz	
Phase	N	

CONDUCTED EMISSIONS - DIGIGRAM



(RBW = 9kHz, VBW = 30kHz)

Marker	Freq. [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	0,160	51,42	47,60*	43,40*	54,00
2	0,230	63,31	60,40*	45,50*	52,00
3	0,250	50,78	46,80	28,56	50,00
4	0,340	50,12	47,41	31,66	48,00
5	0,460	54,47	51,14	37,14	46,00
6	0,520	44,54	38,04	20,64	46,00
7	0,570	48,54	46,90	30,86	46,00
8	0,810	46,07	43,68	30,87	46,00

*: ESH3 measurement



LISTE DE MATERIEL / LIST OF EQUIPMENT

	N°LCIE	GENRE	MARQUE	TYPE	SERIE
	A1481006VO	RF Voltmeter	BOOTON	9200C	339301AA
	A1240169VO	Multimeter	WAVETEK	DM15XL	40417876
	C2320056VO	Coupling Decoupling Network	FCC	FCC 801 M1 25	28
	C2320057VO	Coupling Decoupling Network	FCC	FCC 801 M2 25	38
	C2320058VO	Coupling Decoupling Network	FCC	FCC 801 M3 25	96
	A4083040VO	Oscilloscope 100 MHz 500Ms/s	TEKTRONIX	TDS30-25	H712103
EMC	A2640011VO	Measurement receiver 9kHz–30MHz	ROHDE ET SCHWARZ	ESH3	972079/117
EMC	A4049061VO	Transient limiter	HEWLETT PACKARD	11947A	3107A01596
EMR	A7102019VO	Amplifier 9 KHz – 1300 MHz	HEWLETT PACKARD	8447F Opt 64	3113A06394
EMC	A3169049VO	Conducted emission comb generator	BARDET		CGPR12
	A2320059VO	LISN	EMCO	3810/2SH	9511/1182
EMR	A3169050VO	Radiated emission comb generator	BARDET		PR17B
EMR	A4060016VO	Spectrum analyzer 9kHz –1.8MHz	HEWLETT PACKARD	8591E	3536A00384
EMR	C2040051VO	Bi-log antenna	CHASE	CBL6111A	1628
	A5160028VO	Burst generator	SCHAFFNER	NSG2025-1	1109
	C1127003VO	Surge generator	SCHAFFNER	NSG650	269
	A2249072VO	Coupling clamp	SCHAFFNER	CDN 126	194
	A7130044VO	Surge Coupler	SCHAFFNER	CDN 110	294
	C2320060VO	Surge coupling network	SCHAFFNER	CDN116	166
	A2249019VO	Field probe 30-1000 MHz	HEWLETT PACKARD	11940A	2650A05962
	A2249023VO	Field probe 9kHz – 30 MHz	HEWLETT PACKARD	11941A	2807A04302
	A5322008VO	Pistol DES 15 KV	SCHAFFNER	NSG 435	1354
	A5322009VO	Pistol DES 25 KV	SCHAFFNER	NSG 432	1226
EMC	A2120003VO	Harmonic/Flickermeter, power supply	HEWLETT PACKARD	6842A	3531A00109
	A7156005VO	Adaptor 50-150 ohms	FCC	FCC-150-50	378
	A7156006VO	Adaptor 50-150 ohms	FCC	FCC-150-50	379
	B2163022VO	Frequency generator	MARCONI	2023	112158027
	A2249021VO	Field probe	KALMUS	HI-4422	90264
	A7102020VO	Amplifier 0.01-1000 MHz	KALMUS	757LC	122297-7
	A7132005VO	Coupler bi-directional 40 dB	KALMUS	DC100RHH	7330A-1
	A7122008VO	Attenuator 6 dB	BIRD	8343-060	2038
	B4204052VO	Thermo-hygrometer	HUGER		
EMR	D3044009VO	Anechoic chamber	EUROSHIELD	RDF-F-60-060	1213
EMC	D3044010VO	Faraday Cage	RAY PROOF		4854
	A5329032VO	Absorption clamp	LUTHI	MDS21	2826
	A5329033VO	Injection EM clamp	LUTHI	EM101	35430
	A5329042VO	Ferrite Tube	LUTHI	FTC 101	4485
	A5322010VO	Test station ESD			
	A5329043VO	Shielded cable « IMR&EMR »	AIRCOM		
	A7122009VO	Attenuator 10 dB	HEWLETT PACKARD	8491A	2708A53166
	A5329034VO	Shielded cable injection IMC			
	A5329035VO	Shielded cable calibration IMC	AIRCOM		
	A5329036VO	Direct Injection Module 100 Ohms		MID01-100 ohms	
EMR	C2040050VO	Antenna biconic	EMCO	3104C	9401-4636
EMR	C2040056VO	Antenna log-periodic	EMCO	3146	2178
EMR	F2000286VO	Controller table	EMCO	1060-10	1217
EMR	F2000287VO	Controller antenna mast	EMCO	1050	8811-1295
	A4049059VO	Adaptor quasi-peak	HEWLETT PACKARD	HP85650	2811A01136
	A4060017VO	Spectrum analyzer	HEWLETT PACKARD	HP8568B	2732A04140
	A4060019VO	Spectrum analyzer display	HEWLETT PACKARD	HP85662A	2816A16561
	A4060027VO	RF pre-selector	HEWLETT PACKARD	HP85685A	2833A00773
EMR	F2000288VO	Antenna mast	EMCO	1050	
EMR	F2000289VO	Turntable	EMCO	1060	
EMR	C4040009VO	Air Compressor	ATLAS COPCO	LX111	0615-038
	C1207122VO	Dipole precision	SCHWARZBECK	VHAP	211
	C1207123VO	Dipole precision	SCHWARZBECK	UHAP	205
	C2040054VO	Antenna log-periodic	SCHWARZBECK	UHALP 9107	910
	C2040047VO	Antenna biconic	SCHWARZBECK	VHA 910	911
	C2040048VO	Antenna biconic	EMCO	3104	3767
	C2040049VO	Antenna biconic	EMCO	3110	1245
	C2040055VO	Antenna log-periodic	EMCO	3146A	9011-1151
EMC	C2320061VO	LISN	TELEMETER ELECTRONIC	NNB-2/16Z	98010
	C2320062VO	LISN tri-phase ESH2-Z5	RHODE ET SCHWARZ	33852.19.53	841223/008
	C2320063VO	LISN tri-phase ESH2-Z5	RHODE ET SCHWARZ	33852.19.53	841223/007



	N°LCIE	GENRE	MARQUE	TYPE	SERIE
	A1240170VO	Multimeter	FLUKE	87	75250745
	C2320064VO	Coupling Decoupling Network	EM TEST	CDN-M3	6219C
	C2320065VO	Coupling Decoupling Network	EM TEST	CDN-T8/RJ45	9011C
	C2040057VO	Antenna monopole	AH SYSTEM	SAS-551	181
	A1290017VO	Current probe	SCHAFFNER	CSP9160	1097
	C2320066VO	RSI 4 wires	RHODE ET SCHWARZ	ENY41	838119/023
	C2320067VO	RSI 2 x 2 wires	RHODE ET SCHWARZ	ENY22	836727/015
	A5329034VO	Current injection probe	SCHAFFNER	CIP8213	52
	C2042027VO	Antenna horn	EMCO	3115	6382
	A4060018VO	Spectrum Analyzer 9KHz – 26.5GHz	HEWLETT PACKARD	8593E	3409u00537
	A4024018VO	Oscilloscope 500 MHz	HEWLETT PACKARD	54542C	US36040602
	A5442021VO	Generator HF 100 KHz – 3200 MHz	HEWLETT PACKARD	8648C	3443U00509
	A4024019VO	Oscilloscope	HEWLETT PACKARD	54720A	0007426600
	A4089115VO	Active probe 2.5 GHz	HEWLETT PACKARD	54701A	3220A 00325
	A4089116VO	Active probe 2.5 GHz	HEWLETT PACKARD	54701A	3220A 00329
	C2040058VO	Close field probe 30 MHz – 1 GHz	HEWLETT PACKARD	HP11940A	
	C2040059VO	Close field probe 9 KHz – 30 MHz	HEWLETT PACKARD	HP11941A	
	A4069007VO	High frequency probe	HEWLETT PACKARD	85024A	280 1A 04205
	A5329044VO	Absorption clamp	RHODE ET SCHWARZ	85024A	194.0100.50
	A3169048VO	Field site source	EMCO	4610	9012-1161
	A7102022VO	Amplifier 0.5-1000 MHz	KALMUS	706FC	7359-1
	A7122010VO	Attenuator 70 dB	HEWLETT PACKARD	8495B	3308A17069
	A7122011VO	Attenuator 20 dB - 0.1 GHz	ROLS ESH	ESH 2Z11	349.7518.52
	A1290018VO	Current probe	HF STROMWANDLER	ESH2-Z1	872 545/24
	A2240015VO	Field probe	EMCO	7405	9301-2355
	A7132006VO	Coupler bi-directional	HEWLETT PACKARD	778D	1144A07705
	A7102023VO	Amplifier 2.5 GHz	MINI-CIRCUITS	ZFL-2500VH AS	
	A7102024VO	Amplifier 8 GHz	HEROTEK	A1080304A	222033
	D1022117VO	Climatic chamber	BIA CLIMATIC	CL 6-25	200 105 6
EMR	A5329045VO	Cable IMR&EMR	SMEE	KX13	
	A5329046VO	Cable EMR FCC	RADIALL	9542 gd câb. vert	
	A5329047VO	Cable EMR FCC	RADIALL	960603 pt câb. vert	
	C2040052VO	Loop Antenna	ELECTRO-METRICS	EM-6879	690234
	C2040053VO	Loop Antenna	TELEC	CT2A	140
	A2322003VO	Leakage current tool	SMEE	61010A3&A4	
EMR	A5329048VO	Cable EMR OATS	SUCOFLEX	106G	553
	A1500016VO	Wattmeter RF	ANRITSU	ML1437A	03050003
	A7132007VO	Coupler bi-directional 20 dB	MCLI	C36-20	0D2LS 0148
	A5329038VO	Cable coaxial 3.5 m	SUHNER	SUCOFLEX 106	26732/6
	A2249024VO	Field E probe 5GHz	HOLADAY	HI-6005	107884
	A7102025VO	Amplifier 0.8-3GHz	PRANA	AP32 SV125A	0310-0573
EMR	A4049060VO	Adapter quasi-peak	HEWLETT PACKARD	HP85650A	2811A01134
EMR	A4060028VO	Spectrum analyzer display	HEWLETT PACKARD	HP85662A	2816A16603
EMR	A4060029VO	Spectrum analyzer	HEWLETT PACKARD	HP8568B	2732A04155
EMR	A4060030VO	Pre-selector RF	HEWLETT PACKARD	HP85685A	2837A00784
	C2042028VO	Antenna horn	SCHWARZBECK	BBHA 9170	BBHA9170232
	A7043036VO	Power supply DC 300W / 150V-6A	SODILEC	7SDLIN/GB AUTO 300	493711
	A5320017VO	BEST EMC	SCHAFFNER		200040-023SC
	A5322011VO	Pistol de DES	SCHAFFNER	BEST ESD	1033
	C2320073VO	Coupling clamp TRS	SCHAFFNER	CDN8014	074
EMC	C2320068VO	Line impedance stabilization network	EMCO	3825/2	9309/2122
	C2320069VO	Coupling Decoupling Network	LUTHI	CDN L-801 M2	2076
	C2320070VO	Coupling Decoupling Network	LUTHI	CDN L-801 M2	2075
	A7102026VO	Amplifier	ALDETEC	ALS01452	001
	A5442022VO	Frequency generator 2GHz – 18GHz	HEWLETT PACKARD	8672A	2104A01703
	A7122013VO	Burst verification coupler	SCHAFFNER	INA 265 A	20935/1
	A7122014VO	Burst verification coupler	SCHAFFNER	INA 266	20935/2
	A5329040VO	Cable coaxial		RG58	
	A2249022VO	HV PROBE (E6N CVH1-100/1)	SCHAFFNER	MD200	037005
	A1092039VO	Amperemeter clamp	CHAUVIN ARNOUX	P01120040A	100044CAV
	A1091249VO	Shunt coaxial	LEM	ISM 5P/5	4502
	A5329041VO	Cable coaxial 45cm			
	A7043037VO	Power supply DC 30V 10A	ELC	AL924	95/00600
	A4089117VO	Voltage probe	SMEE		
	A7156004VO	Adaptation 100ohms	LUTHI	CR100A	221
	A1240171VO	Multimeter	FLUKE	189	89770115



	N°LCIE	GENRE	MARQUE	TYPE	SERIE
	C2320071VO	Coupling Decoupling Network	LUTHI	L 801 M4 PE	2088
	A7122012VO	Attenuator	WEINSCHEL	48-40-43	BT2126
	A1092041VO	Electromagnetic Injection Clamp	LUTHI	EM101	35758
	A1092042VO	Ferrite tube	LUTHI	FTC101	4763

EMR: Emission rayonnée / Radiated emission

EMC: Emission conduite / Conducted Emission

TABLE DES INCERTITUDES / UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) $\pm x$ (dB)	Incertitude limite du CISPR / CISPR uncertainty limit $\pm y$ (dB)
Emission Rayonnée / Radiated emission		
Loop antenna (9kHz - 30MHz)	± 4.70 dB	-
Double ridged waveguide horn antenna (1GHz - 18GHz)	± 5.20 dB	-
Biconic antenna (30MHz - 200MHz) – Horizontal polarization	± 4.46 dB	± 5.2
Biconic antenna (30MHz - 200MHz) - Vertical polarization	± 5.15 dB	± 5.2
Log-périodique antenna (200MHz - 1GHz) - Horizontal polarization	± 4.48 dB	± 5.2
Log-périodique antenna (200MHz - 1GHz) - Vertical polarization	± 5.04 dB	± 5.2
Emission conduite RSIL / Conducted emission LISN		
Estimation of uncertainties for measurement from 150kHz to 30MHz	± 3.40 dB	± 3.6
Emission conduite RSI / Conducted emission ISN		
Estimation of uncertainties for measurement from 150kHz to 30MHz	± 3.20 dB	± 3.6
Emission conduite sonde de courant / Conducted emission current probe		
Estimation of uncertainties for measurement from 150kHz to 30MHz	± 2.68 dB	± 3.6

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values.