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L C I E

Rapport d'essai / Test report

JDE : 60055461 N° 200701-3532C-R2-E

DELIVRE A / ISSUED TO : SmarDTV (M. HOOPER)
ZE Athelia II
531 avenue du Serpolet
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Objet / Subject : Essais de compatibilité électromagnétique conformément aux normes :
Electromagnetic compatibility tests according to the standards:
FCC part 15 Subpart B, ANSI C63.4-2003

Matériel testé / Apparatus under test :

- Produit / Product : Module DVB CAM / DVB CAM Module
- Marque / Trade mark : SmarDTV
- Constructeur / Manufacturer : SmarDTV
- Type / Model : SMARCAM (World CAM2 Sim CAM)
- N° de série / serial number : Proto 00.80.00.00.00.00.32

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

Date des essais / Test date : Du 19 au 21 Février 2007 / From February 19th to 21st, 2007

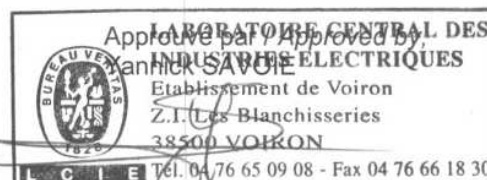
Lieu d'essai / Test location : LCIE
ZI des Blanchisseries
38500 VOIRON - France

Test réalisé par / Test performed by : Jacques LORQUIN

Ce document comporte / Composition of document : 19 pages.

VOIRON, LE 23 FEVRIER 2007 / FEBRUARY 23ND, 2007

Ecrit par / Written by
Jacques LORQUIN



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**SUMMARY**

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1. TEST PROGRAM

1.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it). All functions available on the equipment under test are activated during the measurement test.

1.2. REQUIREMENTS FOR DISTURBANCE EMISSIONS

Standard:

- FCC 47 CFR Part 15 Subpart B
- ANSI C63.4 (2003)

Requirements for Information Technology Equipment (ITE), class B:

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz 230V/50Hz & 110V/60Hz	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	COMPLY
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Limits for conducted disturbance at telecommunication ports – Current limits 150kHz-30MHz	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	NA
	150-500kHz	40 to 30	30 to 20	
	0.5-30MHz	30	20	
Limits for conducted disturbance at telecommunication ports – Voltage limits 150kHz-30MHz	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	NA
	150-500kHz	84 to 74	74 to 64	
	0.5-30MHz	74	64	
Radiated emissions 30MHz-1GHz	Measure at 10m (Quasi-peak) 30MHz-230MHz : 30 dBµV/m 230MHz-1GHz : 37 dBµV/m			COMPLY

NA: Not Applicable

NP: Not Performed

**2. APPARATUS UNDER TEST: CONFIGURATION****2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):**

- **Equipment under test (EUT):**

SMARCAM (WORLD CAM2 SIM CAM)

Numéro de série : Proto 00.80.00.00.00.00.32

- **Inputs/outputs:**

- PCMCIA Port

- **Cables:**

- Power supply cable, unshielded, length: 1.5m
- Scart cable, shielded, length: 0.8m
- RCA cable, unshielded, length: 1m (video, audio L&R)

- **Auxiliaries equipment used during test:**

- Digital satellite receiver CI, Kathrein, UFD 515/S20210016
- IF UPCONVERTER B75, Global Communication
- Monitor F14C7N, Daewoo
- Laptop latitude D620, model PP18L
- DVB modulator NTC/2077/Fx, Newtec, Thomson

Sn: none

Sn: none

Sn: none

Sn: 274-747-711-15 Fcc id: D.O.C.

Sn: 00110292

2.2. RUNNING MODE

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

Running mode n°1:

Laptop with DVB modulator send in loop a video MPEG2 flow rate to the Digital satellite receiver. The SMARCAM (World CAM2 Sim CAM) descramble (reading key on smart card) this flow rate.

2.3. EQUIPMENT MODIFICATIONS

No equipment modification has been necessary during testing to achieve compliance to class B levels. The test unit is representative from a product unit.

2.4. SPECIAL ACCESSORIES

None

2.5. SYNOPTIC

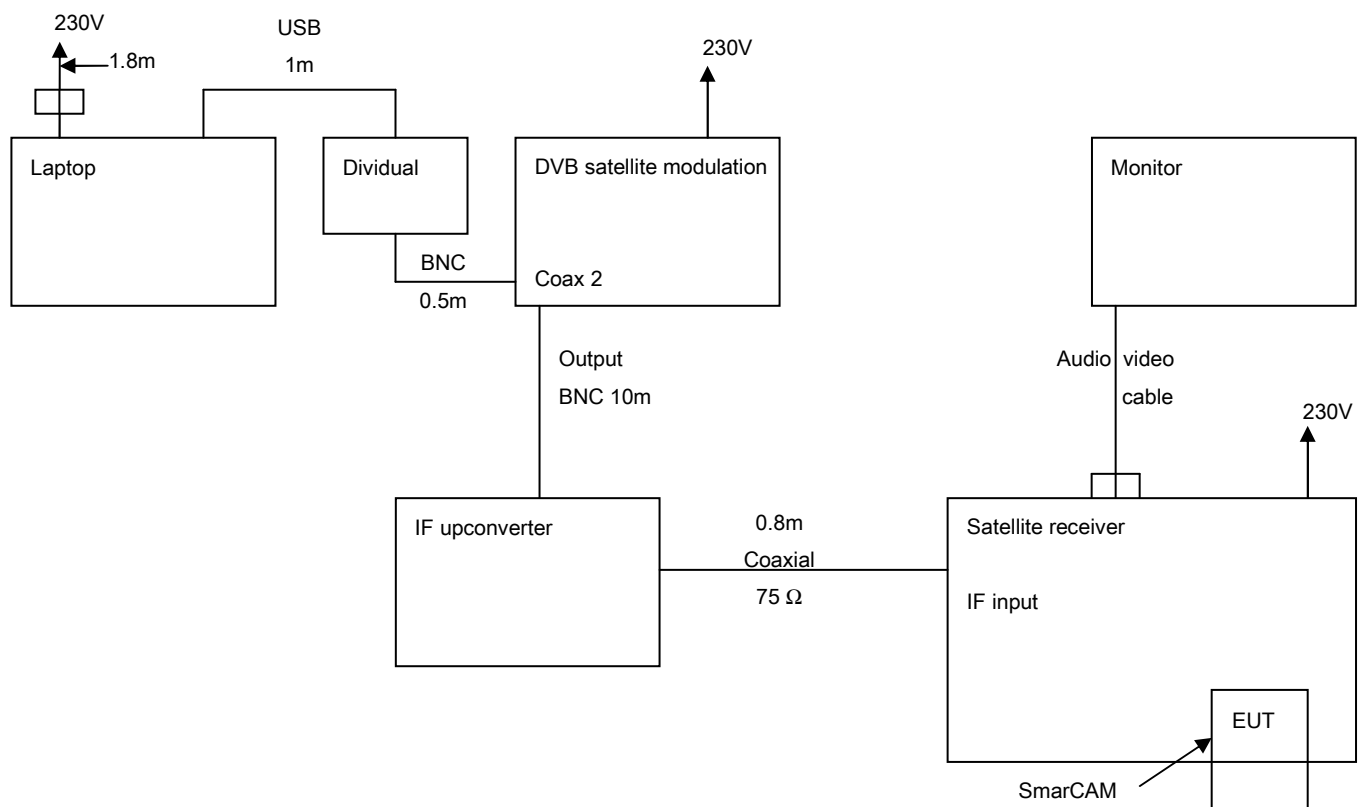


Figure - 1

As show in figure 1, all interfaces cables used for compliance testing are shielded as normally supplied. All these cables are normally recommended to be used with the product.

3. MEASUREMENT OF RADIATED EMISSION

3.1. CLIMATIC CONDITIONS

Date of test : February 19th, 2007
Test performed by : Jacques LORQUIN
Atmospheric pressure : 962mb
Relative humidity : 35%
Ambient temperature : 21°C

3.2. SETUP FOR RADIATED EMISSIONS MEASUREMENT

The product has been tested according to ANSI C63.4 (2003) and FCC 47 CFR Part 15 Subpart B.

The product has been tested with 230/50Hz power line voltage, at a distance of 10meters from the antenna and compared to the Class B limits. Measurement bandwidth was 120kHz from 30MHz to 1GHz.

Antenna height search was performed from 1m to 4m for both horizontal and vertical polarization. Continuous linear turntable azimuth search was performed with 360 degrees range.
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.

Pre-characterisation measurement:

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.
The pre-characterization graphs are obtained in PEAK detection.

Setup:

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.

The EUT and auxiliaries are set on the non-conducting table of 80 cm height (Table-top equipment)

The laptop and DVB modulator are set outside of the anechoic chamber.

Characterization on 10 meters open site from 30MHz to 1GHz:



3.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

none



3.4. MEASUREMENTS RESULTS

Pre-characterisation measurement: pre-scan measurement at 3m (PEAK detection, graph examples)

Running mode n°1:

Azimuth 0° Polarisation H: graph **pol#h** (see annex 1)
Polarisation V: graph **pol#v** (see annex 1)

QUALIFICATION: 10 meters measurement on the Open Area Test Site.

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

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)	Comments
1	119.984	30.0	25.2	-4.8	130	V	360	16.3	Keyboard Entry
2	152.420	30.0	26.0	-4.0	60	V	210	17.2	Keyboard Entry
3	220.132	30.0	26.8	-3.2	30	V	120	14.1	Keyboard Entry
4	303.750	37.0	31.1	-5.9	25	V	120	17.5	Keyboard Entry
5	323.997	37.0	29.4	-7.6	325	V	100	17.8	Keyboard Entry
6	364.203	37.0	33.0	-4.0	130	H	270	18.3	Keyboard Entry
7	374.803	37.0	33.4	-3.6	135	H	240	18.5	Keyboard Entry
8	607.520	37.0	28.8	-8.2	205	V	250	23.2	Keyboard Entry
9	665.141	37.0	29.3	-7.7	20	H	150	24.9	Keyboard Entry
10	739.011	37.0	28.7	-8.3	170	H	120	26.2	Keyboard Entry
11	812.900	37.0	31.9	-5.1	85	H	140	26.8	Keyboard Entry

Note – In conformity with the Section 15.109 (g) the radiated measurement is performed in accordance with the standard CISPR 22 (Third Edition).

3.5. 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.

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

3.6. CONCLUSION



The sample of the equipment SMARCAM (WORLD CAM2 SIM CAM), Sn : Proto 00.80.00.00.00.00.32, tested in the configuration presented in this test report **satisfies** to requirements of class **B** limits of the FCC part 15 subpart B standard, for radiated emissions.

4. MEASUREMENT OF CONDUCTED EMISSION

4.1. CLIMATIC CONDITIONS

Date of test : February 19th, 2007
Test performed by : Jacques LORQUIN
Atmospheric pressure : 962mb
Relative humidity : 35%
Ambient temperature : 21°C

4.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

The product has been tested according to ANSI C63.4 (2003) and FCC 47 CFR Part 15 Subpart B.

Measurement was initially made with a Rohde&Schwarz ESH3 receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement with the 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 peak data are shown on the following plots. Quasi-Peak and Average measurements are detailed in the 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.

Setup:

The EUT with its auxiliaries are set on a non-conducting 80cm above the ground reference plane. (Table-top equipment)

The distance between the EUT and the LISN is 80cm. The EUT is 40cm away for the vertical ground plane.

The EUT is powered through a LISN (measure). Auxiliaries are powered by another LISN.

The product has been tested with 110V/60Hz and 230V/50Hz power line voltage and compared to the Class B limits.

Measurement bandwidth was 9kHz from 150kHz to 30MHz.





4.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

4.4. MEASUREMENTS RESULTS

4.4.1. Mains terminals:

Measurements are performed on the phase (L1) and neutral (N) of the power line (230V/50Hz).

Results: (PEAK detection)

Measure on L1: graph **Phase 230V** (see annex 1)

Measure on N : graph **Neutre 230V** (see annex 1)

4.4.2. Mains terminals:

Measurements are performed on the phase (L1) and neutral (N) of the power supply (110V/60Hz).

Results: (PEAK detection)

Measure on L1: graph **Phase 110V** (see annex 1)

Measure on N : graph **Neutre 110V** (see annex 1)

4.5. CONCLUSION

The sample of the equipment SMARCAM (WORLD CAM2 SIM CAM), Sn : Proto 00.80.00.00.00.00.32, tested in the configuration presented in this test report **satisfies** to requirements of class **B** limits of the FCC part 15 subpart B standard, for conducted emissions.

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5. TEST EQUIPMENT LIST

	N° LCIE	TYPE	COMPANY	REF	SN
RADIATED EMISSION MEASUREMENT					
	C2040057VO	Antenna monopole	AH SYSTEM	SAS-551	181
	A7102026VO	Amplifier 8-26GHz	ALDETEC	ALS01452	1
	C4040009VO	Air Compressor	ATLAS COPCO	LX111	0615-038
X	A3169050VO	Radiated emission comb generator	BARDET		PR17B
X	C2040051VO	Antenna Bi-log	CHASE	CBL6111A	1628
	C2040052VO	Antenna Loop	ELECTRO-METRICS	EM-6879	690234
X	C2042027VO	Antenna horn	EMCO	3115	6382
X	C2040050VO	Antenna biconic	EMCO	3104C	9401-4636
X	C2040056VO	Antenna log-periodic	EMCO	3146	2178
X	F2000286VO	Turntable controller	EMCO	1060-10	1217
X	F2000287VO	Antenna mast controller	EMCO	1050	8811-1295
X	F2000288VO	Antenna mast	EMCO	1050	
X	F2000289VO	Turntable	EMCO	1060	
X	F2000371VO	Turntable chamber	ETS Lingren	Model 2065	F2000371VO
X	F2000372VO	Turntable controller chamber	ETS Lingren	Model 2066	F2000372VO
X	D3044009VO	Anechoic chamber	EUROSHIELD	RDF-F-60-060	1213
	A7102024VO	Amplifier 8 GHz	HEROTEK	A1080304A	222033
X	A4060016VO	Spectrum analyzer 9kHz –1.8GHz	HEWLETT PACKARD	8591E	3536A00384
	A7102019VO	Amplifier 9 KHz – 1300 MHz	HEWLETT PACKARD	8447F Opt 64	3113A06394
	A4060018VO	Spectrum Analyzer 9KHz – 26.5GHz	HEWLETT PACKARD	8593E	3409u00537
	A4049060VO	Adapter quasi-peak	HEWLETT PACKARD	HP85650A	2811A01134
	A4060028VO	Spectrum analyzer display	HEWLETT PACKARD	HP85662A	2816A16603
	A4060029VO	Spectrum analyzer	HEWLETT PACKARD	HP8568B	2732A04155
	A4060030VO	Pre-selector RF	HEWLETT PACKARD	HP85685A	2837A00784
	A5329032VO	Absorption clamp	LUTHI	MDS21	2826
	A5329044VO	Absorption clamp	RHODE ET SCHWARZ	85024A	194.0100.50
	A2640011VO	Measurement receiver 9kHz–30MHz	ROHDE ET SCHWARZ	ESH3	972079/117
	C2042028VO	Antenna horn 26GHz	SCHWARZBECK	BBHA 9170	BBHA9170232
X	A5329045VO	Cable IMR&EMR (Anechoic chamber)	SMEE	KX13	
	A5329048VO	Cable EMR OATS	SUCOFLEX	106G	553
	A5329038VO	Cable coaxial 3.5 m (Blue)	SUHNER	SUCOFLEX 106	26732/6
X	A5329056VO	Cable Radiat EMI (Pre-amp/Analyzer)			
X	A5329057VO	Cable Radiat. EMI (Pre-amp/cage)			
X	A5329059VO	Cable OATS (Mast at 10m)			
	A5329058VO	Cable OATS (Mast at 3m)			
CONDUCTED MEASUREMENT EMISSION					
X	A3169049VO	Conducted emission comb generator	BARDET		CGPR12
X	A2320059VO	LISN	EMCO	3810/2SH	9511/1182
X	C2320068VO	LISN	EMCO	3825/2	9309/2122
X	A4049061VO	Transient limiter	HEWLETT PACKARD	11947A	3107A01596
	A2120003VO	Programmable PSU, HAR/FLK	HEWLETT PACKARD	6842A	3531A00109
	A4060016VO	Spectrum analyzer 9kHz –1.8GHz	HEWLETT PACKARD	8591E	3536A00384
	A5329036VO	Direct Injection Module 100 Ohms	LCIE	MID01-100 ohms	
	A5329042VO	Ferrite Tube	LUTHI	FTC 101	4485
	A1092042VO	Ferrite Tube	LUTHI	FTC101	4763
X	D3044010VO	Faraday Cage	RAY PROOF		4854
	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
	C2320066VO	RSI 4 wires	RHODE ET SCHWARZ	ENY41	838119/023
	C2320067VO	RSI 2 x 2 wires	RHODE ET SCHWARZ	ENY22	836727/015
X	A2640011VO	Measurement receiver 9kHz–30MHz	ROHDE ET SCHWARZ	ESH3	972079/117
	A1290017VO	Current probe	SCHAFFNER	CSP9160	1097
	A5329034VO	Current injection probe	SCHAFFNER	CIP8213	52
	A4089117VO	Voltage probe	SMEE		
	C2320061VO	LISN	TELEMETER ELECTRONIC	NNB-2/16Z	98010
X	A5329061VO	Cable Conduct. EMI (Analyzer/cage)			
X	A5329060VO	Cable Conduct. EMI (LISN/cage)			
CURRENT HARMONICS MEASUREMENT					
X	A7043026	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043026
X	A7043027	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043027
X	A7043028	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043028
X	A2089002	HAR + Imped. Net + Output switch	CALIFORNIA INSTRUM.		A2089002



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	N°LCIE	TYPE	COMPANY	REF	SN
VOLTAGE FLUCTUATIONS AND FLICKER TEST					
X	A7043026	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043026
X	A7043027	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043027
X	A7043028	CALIFORNIA System: 5kVA PSU	SCHAFFNER	NSG 1007	A7043028
X	A2089002	HAR + Imped. Net + Output switch	CALIFORNIA INSTRUM.		A2089002
RADIO MEASUREMENTS					
	A7102026VO	Amplifier 8-26GHz	ALDETEC	ALS01452	1
	C4040009VO	Air Compressor	ATLAS COPCO	LX111	0615-038
	A3169050VO	Radiated emission comb generator	Bardet		PR17B
	D1022117VO	Climatic chamber	BIA CLIMATIC	CL 6-25	200 105 6
	C2040051VO	Antenna Bi-log	Chase	CBL6111A	1628
	C2040052VO	Antenna Loop	Electro-metrics	EM-6879	690234
	C2042027VO	Antenna horn	EMCO	3115	6382
	C2040050VO	Antenna biconic	EMCO	3104C	9401-4636
	C2040056VO	Antenna log-periodic	EMCO	3146	2178
	F2000286VO	Turntable controller	EMCO	1060-10	1217
	F2000287VO	Antenna mast controller	EMCO	1050	8811-1295
	F2000288VO	Antenna mast	EMCO	1050	
	F2000289VO	Turntable	EMCO	1060	
	D3044009VO	Anechoic chamber	EUROSHIELD	RDF-F-60-060	1213
	A7102024VO	Amplifier 8 GHz	HEROTEK	A1080304A	222033
	A5442021VO	Frequency generator 3.2GHz	Hewlett Packard	8648C	3443U00509
	A4060016VO	Spectrum analyzer 9kHz – 1.8GHz	Hewlett Packard	8591E	3536A00384
	A7102019VO	Amplifier 9 KHz – 1300 MHz	Hewlett Packard	8447F Opt 64	3113A06394
	A4060018VO	Spectrum Analyzer 9KHz – 26.5GHz	Hewlett Packard	8593E	3409u00537
	A4049060VO	Adapter quasi-peak	Hewlett Packard	HP85650A	2811A01134
	A4060028VO	Spectrum analyzer display	Hewlett Packard	HP85662A	2816A16603
	A4060029VO	Spectrum analyzer	Hewlett Packard	HP8568B	2732A04155
	A4060030VO	Pre-selector RF	Hewlett Packard	HP85685A	2837A00784
	A5442022VO	Frequency generator 2GHz – 18GHz	Hewlett Packard	8672A	2104A01703
	B2163022VO	Frequency generator 1GHz	Marconi	2023	112158027
	A2640011VO	Measurement receiver 9kHz–30MHz	Rohde et Schwarz	ESH3	972079/117
	C1207122VO	Dipole precision	Schwarzbeck	VHAP	211
	C1207123VO	Dipole precision	Schwarzbeck	UHAP	205
	C2042028VO	Antenna horn 26GHz	Schwarzbeck	BBHA 9170	BBHA9170232
	A5329045VO	Cable IMR&EMR (Anechoic chamber)	SMEER	KX13	
	A5329048VO	Cable EMR OATS	SUCOFLEX	106G	553
	A5329038VO	Cable coaxial 3.5 m (Blue)	SUHNER	SUCOFLEX 106	26732/6
	A5329056VO	Cable Radiat. EMI (Pre-amp/Analyz)			
	A5329057VO	Cable Radiat. EMI (Pre-amp/cage)			
	A5329059VO	Cable OATS (Mast at 10m)			
	A5329058VO	Cable OATS (Mast at 3m)			
MISCELLANEOUS (CONTROL EQUIPMENT)					
	A6440068VO	Data Logger	AGILENT	34970A	US37043935
	A6440068VO	Data Logger Board	AGILENT	34901A	MY41037442
	D1022117VO	Climatic chamber	BIA CLIMATIC	CL 6-25	200 105 6
	A7043037VO	Power supply DC 30V 10A	ELC	AL924	95/00600
	A1240170VO	Multimeter	Fluke	87	75250745
	A1240171VO	Multimeter	FLUKE	189	89770115
	A4024018VO	Oscilloscope 500 MHz	Hewlett Packard	54542C	US36040602
	A4024019VO	Oscilloscope	Hewlett Packard	54720A	7426600
	B4204052VO	Thermo-hygrometer	HUGER		
	A7043036VO	Power supply DC 300W / 150V-6A	SODILEC	7SDLIN/GB AUTO 300	493711
	A4083040VO	Oscilloscope 100 MHz 500Ms/s	Tektronix	TDS30-25	H712103



6. UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) ± x	Incertitude limite du CISPR / CISPR uncertainty limit ± y
Mesure des perturbations conduites en tension sur le réseau d'énergie <i>Measurement of conducted disturbances in voltage on the power port</i>	3.57 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i>	3.28 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension <i>Measurement of discontinuous conducted disturbances in voltage</i>	3.47 dB	3.6 dB
Mesure des perturbations conduites en courant <i>Measurement of conducted disturbances in current</i>	2.90 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Voiron <i>Measurement of radiated electric field on the Voiron open area test site</i>	5.07 dB	5.2 dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz <i>IN SITU measurement of radiated electric field from 30 to 1000MHz</i>	A l'étude / Under consideration	5.2 dB
Mesure de la puissance perturbatrice / <i>Measurement of disturbance power</i>	3.37 dB	4.5 dB
Mesure des harmoniques de courant / <i>Measurement of current harmonics</i>	11.11%	/
Mesure du flicker / <i>Flicker measurement</i>	9.26%	/
Immunité aux perturbations conduites, induites par les champs électromagnétiques / <i>Immunity to conducted disturbance, induced by radio-frequency fields.</i>	2.36dB	/
Immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques / <i>Immunity to radiated, radio-frequency, electromagnetic field (26MHz-2.5GHz)</i>	2.64dB	/
Immunité aux ondes de choc / <i>Surge immunity</i>		
Tension crête / <i>Peak voltage</i>	<±10 %	/
Durée du front (circuit ouvert) / <i>Front time (open circuit)</i>	<±30 %	/
Durée jusqu'à la mi-valeur (circuit ouvert) / <i>Time to half-value (open circuit)</i>	<±20 %	/
Courant crête / <i>Peak current</i>	<±10 %	/
Durée du front (court-circuit) / <i>Front time (short-circuit)</i>	<±20 %	/
Durée jusqu'à la mi-valeur (court-circuit) / <i>Time to half-value (short-circuit)</i>	<±20 %	/
Immunité aux transitoires électriques rapides en salves / <i>Immunity to electrical fast transient/burst</i>		
Incertitude sous 50 ohms / <i>Uncertainty under 50ohms</i>		
Tension crête / <i>peak voltage</i>	<±10 %	/
Temps de montée t_r / <i>rise time t_r</i>	<±30 %	/
Durée t_d à 50% / <i>Duration t_d to 50%</i>	<±30 %	/
Durée de la salve / <i>Burst duration</i>	<±20 %	/
Période de la salve / <i>Burst periode</i>	<±20 %	/
Fréquence de répétition / <i>Repetition frequency</i>	<±20 %	/
Incertitude sous 1000 ohms / <i>Uncertainty under 1000ohms</i>		
Tension crête / <i>peak voltage</i>	<±10 % - 15 %	/
Temps de montée t_r / <i>rise time t_r</i>	<±30 %	/
Durée t_d à 50% / <i>Duration t_d to 50%</i>	+200 % -30 %	/
Durée de la salve / <i>Burst duration</i>	<±20 %	/
Période de la salve / <i>Burst periode</i>	<±20 %	/
Fréquence de répétition / <i>Repetition frequency</i>	<±20 %	/
Immunité aux décharges électrostatiques / <i>Immunity to electrostatic discharge immunity</i>		
Tension de sortie / <i>Output voltage</i>	<±5 %	/
Crête de courant / <i>Peak current</i>	<±10 %	/
Temps de montée t_r / <i>Rise time t_r</i>	0.7 – 1ns	/
Intensité à 30ns / <i>Current at 30ns</i>	<±30 %	/
Intensité à 60ns / <i>Current at 60ns</i>	<±30 %	/

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.



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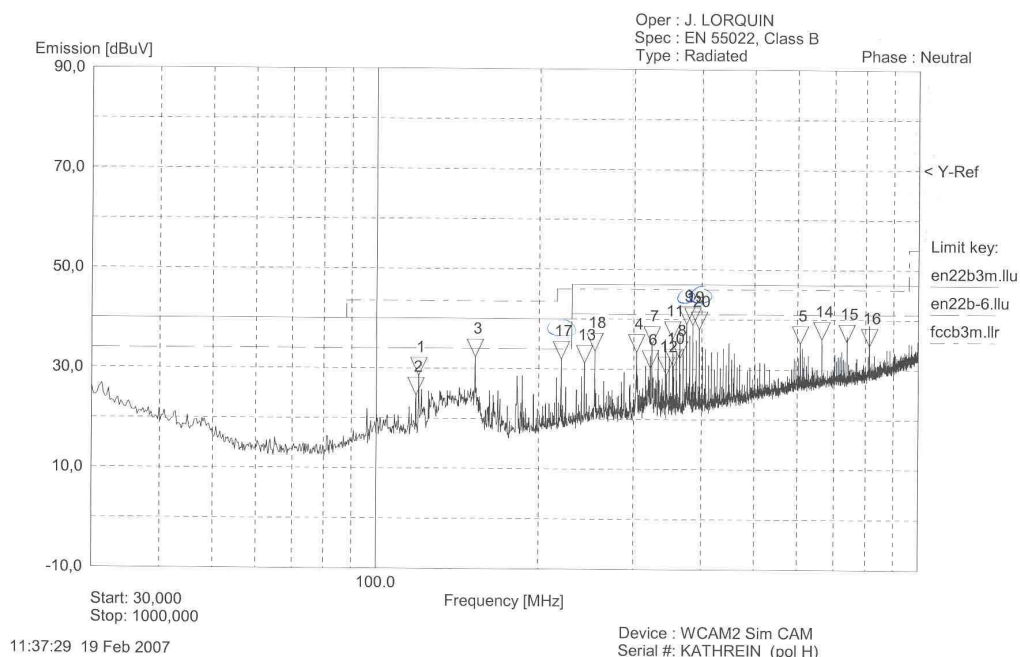
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7. ANNEX 1 (GRAPHS)

RADIATED EMISSIONS		Test configuration:
Graph name:	Pol#h	
Antenna polarisation	Horizontal	
Azimuth:	0°	
RBW / VBW :	120kHz / 300kHz	

RADIATED EMISSIONS - SMARDTV



Marker ▽	Frequency [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	119,7	28,57	-	-	40,00
2	118,4	24,62	-	-	40,00
3	152,6	32,32	-	-	40,00
4	303,6	33,43	-	-	47,00
5	607,6	35,22	-	-	47,00
6	322,1	30,24	-	-	47,00
7	324,1	35,04	-	-	47,00
8	364,6	32,15	-	-	47,00
9	375,0	39,04	-	-	47,00
10	354,9	30,56	-	-	47,00
11	353,8	36,05	-	-	47,00
12	344,6	28,90	-	-	47,00
13	243,2	31,19	-	-	47,00
14	665,1	36,09	-	-	47,00
15	739,2	35,59	-	-	47,00
16	813,1	34,76	-	-	47,00
17	220,0	31,96	-	-	47,00
18	254,2	33,64	-	-	40,00
19	385,2	38,86	-	-	47,00
20	396,0	37,99	-	-	47,00

Marker	Comments
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15	

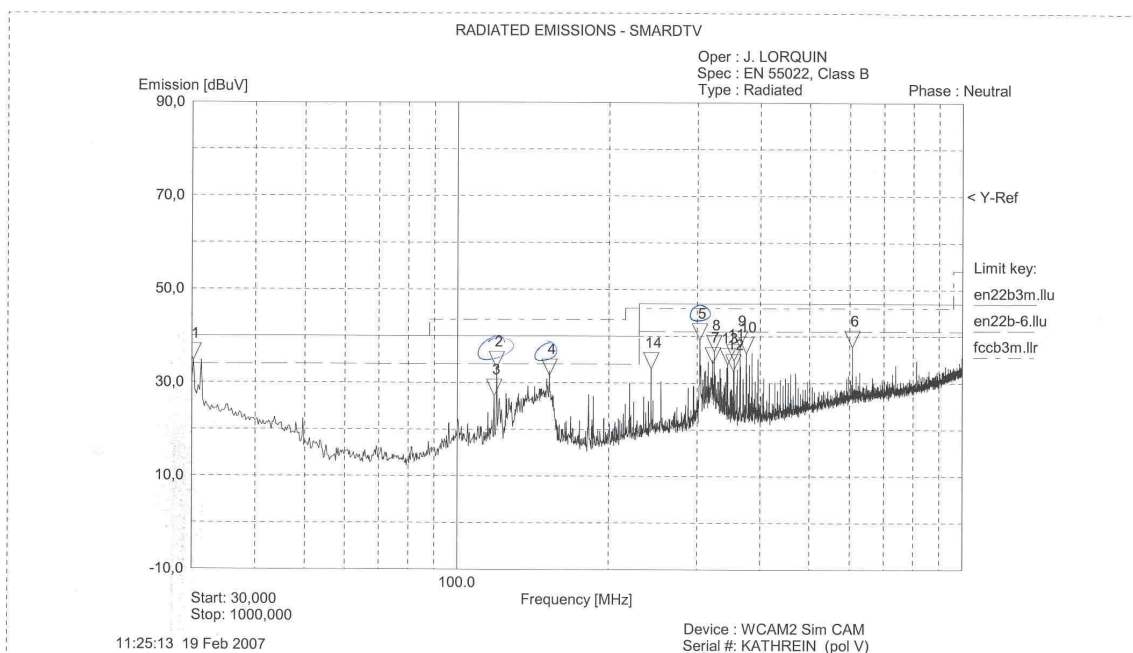


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RADIATED EMISSIONS		Test configuration:
Graph name:	Pol#V	
Antenna polarisation	Vertical	
Azimuth:	0°	
RBW / VBW :	120kHz / 300kHz	



Marker ▽	Frequency [MHz]	Peak [dBuV]	Q-Peak [dBuV]	Average [dBuV]	Limit [dBuV]
1	30,21	33,09	24,23	-	40,00
2	119,7	33,10	-	-	40,00
3	118,4	27,13	-	-	40,00
4	152,6	31,53	-	-	40,00
5	303,6	39,25	-	-	47,00
6	607,6	37,73	-	-	47,00
7	322,1	34,12	-	-	47,00
8	324,1	36,75	-	-	47,00
9	364,6	37,69	-	-	47,00
10	375,0	36,34	-	-	47,00
11	354,9	34,79	-	-	47,00
12	353,8	32,57	-	-	47,00
13	344,6	33,97	-	-	47,00
14	243,2	33,00	-	-	47,00

Marker	Comments
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* - Fail [Limit = en22b3m.llu]

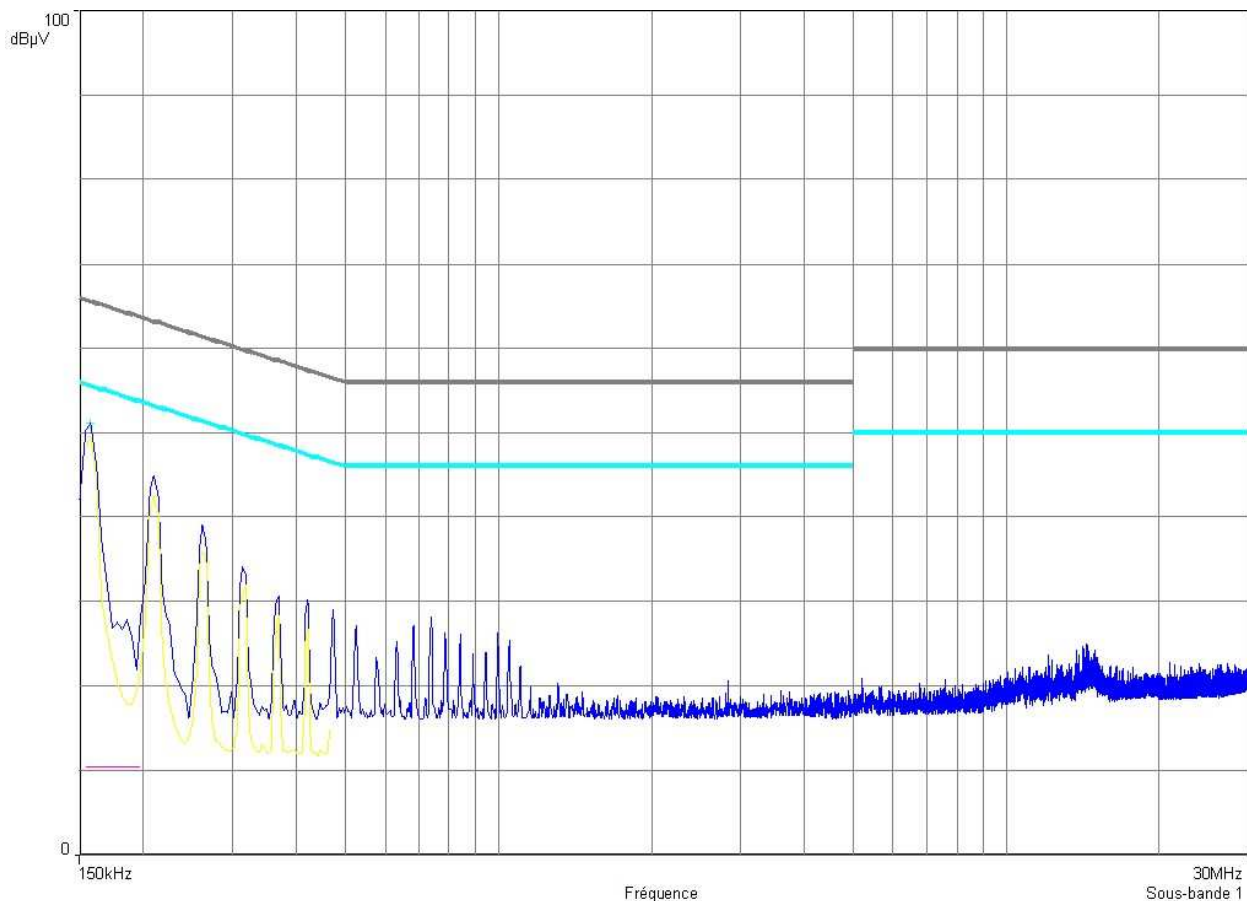


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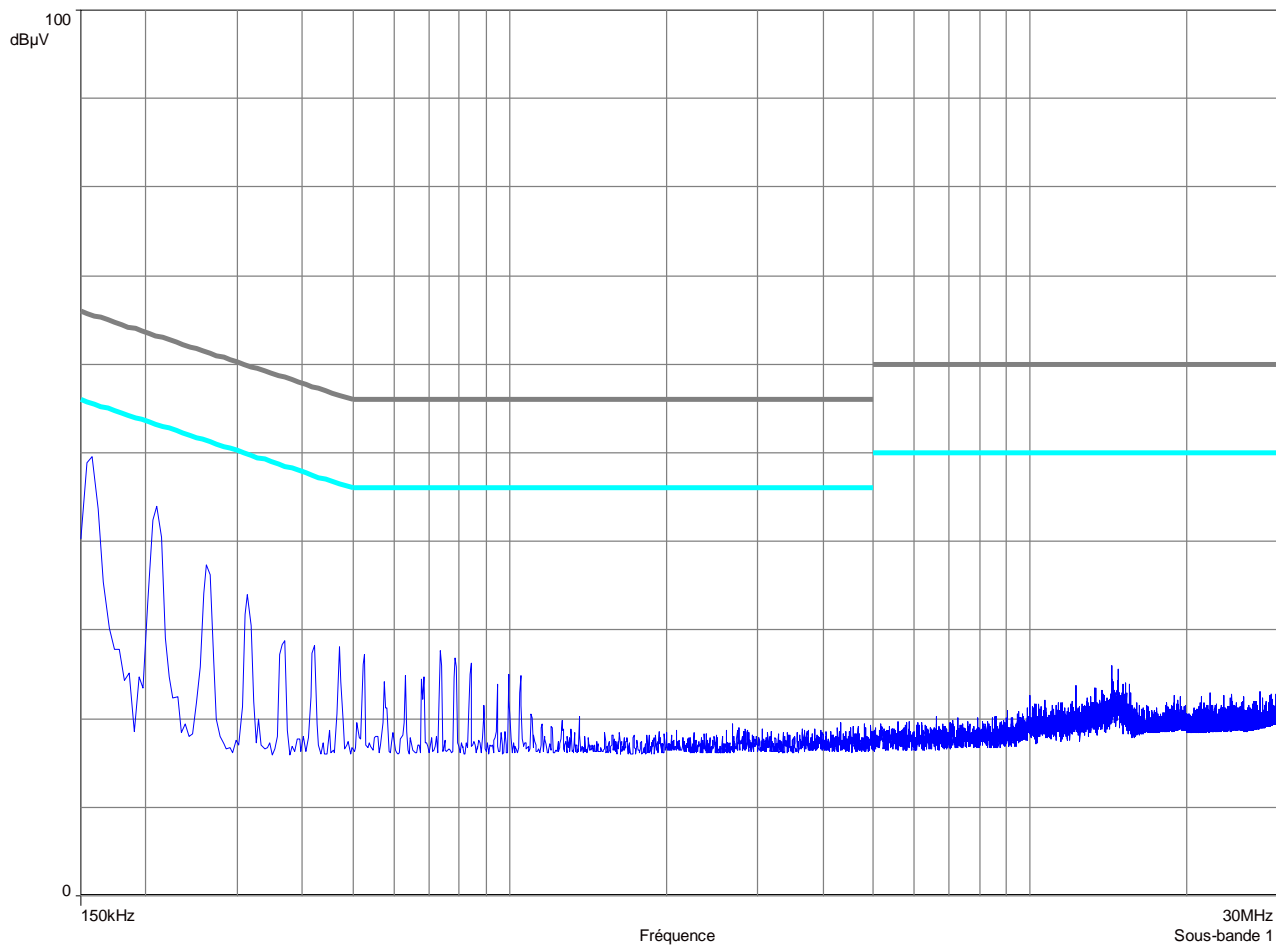
CONDUCTED EMISSIONS		Test configuration:
Graph name:	Emc#1	
Voltage / Frequency	230Vac/50Hz	
Line/Port	Phase L1	
RBW / VBW :	9kHz / 30kHz	





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CONDUCTED EMISSIONS		Test configuration:
Graph name:	Emc#2	
Voltage / Frequency	230Vac/50Hz	
Line/Port	Neutral (N)	
RBW / VBW :	9kHz / 30kHz	



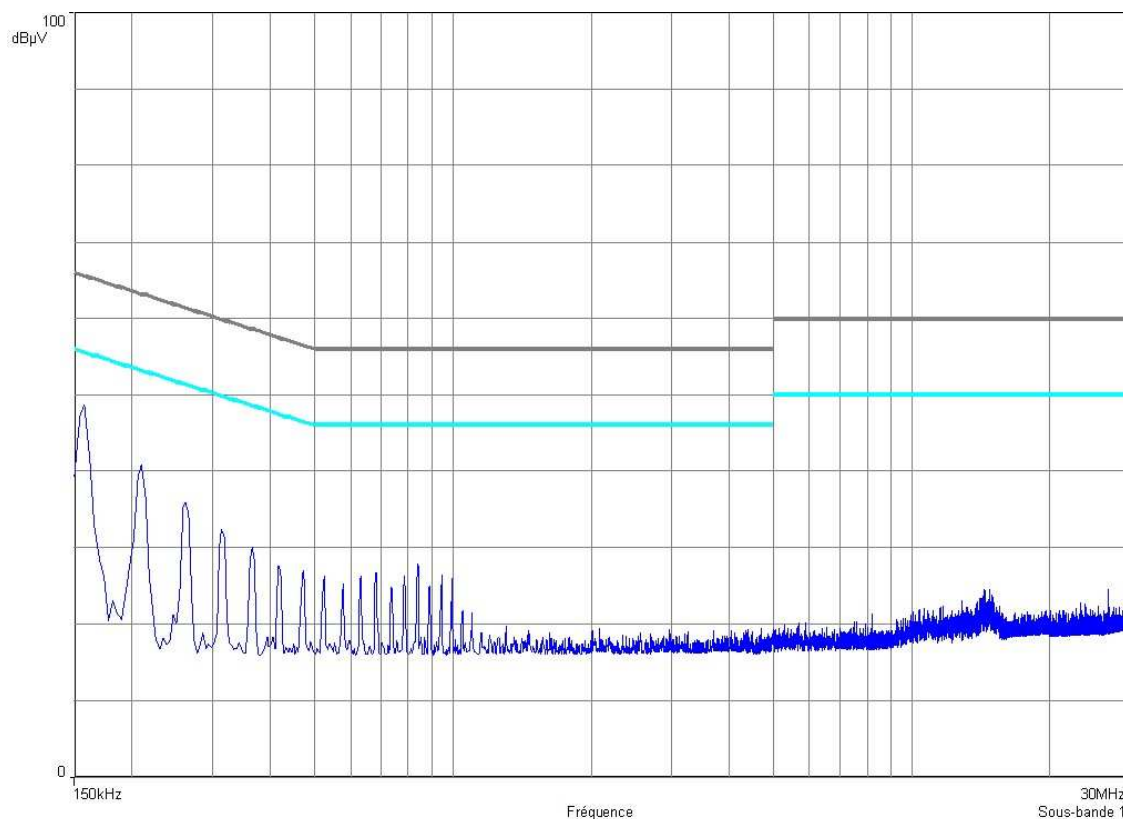


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CONDUCTED EMISSIONS – TELECOMMUNICATION PORT		Test configuration:
Graph name:	Emc#3	
Voltage / Frequency:	110Vac/60Hz	
Line/Port:	Line	
RBW / VBW:	9kHz / 30kHz	





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CONDUCTED EMISSIONS – TELECOMMUNICATION PORT		Test configuration:
Graph name:	Emc#4	
Voltage / Frequency:	110Vac/60Hz	
Line/Port:	Line	
RBW / VBW:	9kHz / 30kHz	

