

Test report

2006-1589-2587-REN



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Equipment under test: Name: **Streaming Client**
 Model: **repeated inspection to test 2006-1520-2483**
 Manufacturer: IZY Development GmbH

Date of tests: 09/14/2006

Test specifications:
 Emission: EN 55022:1998-09+A1:2000-10+A2:2003+01 (Limit class: B)
 Immunity: EN 55024:1998-09+A1:2001-10+A2:2003-10

Test summary:

Emission	Tested port	Limit class	Result
Conducted emissions at AC mains terminals 150 kHz - 30 MHz	230 VAC	B	Passed
Conducted emissions at signal & telecommunication lines 150 kHz - 30 MHz	LAN	B	Passed
Radiated emissions - electromagnetic fields 30 MHz - 1000 MHz	Enclosure	B	Passed

Immunity to ...	Tested port	Test level	Crit.	Result
Electrical fast transients (Burst)	230 VAC Other	2 kV 1 kV	A A	Passed
Surge	230 VAC	1 kV	A	Passed
Conducted RF disturbances 150 kHz - 80 MHz (AM)	See inside test report	3 V	A	Passed

Testing location: **ELMAC GmbH**
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Reg.-Nr.: DAT-P-206/05-00

Tested by: Schmidt October 24, 2006

 U. Schmidt Date

Verified by: Bühne October 24, 2006

 J. Bühne Date

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ELMAC GmbH informs the client that testing is done in accordance with the standard procedures stated under paragraph 2. All deviations will be listed separately. The test results of this report exclusively refer to the specific sample tested under stated test conditions. ELMAC GmbH shall have no liability for any deductions, inferences or generalisations drawn from the test results. This report must only be reproduced in full. Publications or reproductions in the form of extracts have to be approved in written form by ELMAC GmbH.

2. Test specifications

Emission

Document No.	Title	Limit class
EN 55022:1998-09+A1:2000-10+A2:2003+01 IEC/CISPR 22:1997+A1:2000+A2:2002 DIN EN 55022:2003-09	Information technology equipment; Radio disturbance characteristics; Limits and methods of measurement	B

Immunity

Document No.	Title	Severity level
EN 55024:1998-09+A1:2001-10+A2:2003-10 IEC/CISPR 24:1997, modifiziert+A1:2001+A2:2002 DIN EN 55024:2003-10	Information technology equipment - Immunity characteristics - Limits and methods of measurement	

3. Equipment Under Test (EUT)

Name	Streaming Client	
Model	repeated inspection to test 2006-1520-2483	
S/N	without	
Manufacturer	IZY Development GmbH	
Kind/Type of EUT	Streaming Client	
Day of receipt	09/14/2006	
Kind of EUT handling	Plug-in	During the tests: As table top equipment
Base unit covering the EUT	-	
Accessories (Part of the EUT)	Technics AC Adaptor Model: TEAD-41-120500V	
Support equipment (Not part of the EUT)	-	
Connected cables and lines	1x Ethernet CAT5 3.0 m 1x RS232 D-Sub 9-pole shielded 1.5 m Audiocable RCA Jack Stereo 1.0 m power supply unshielded 1.0 m Head Phone output 1.5 m shielded	
Power supply	230 VAC +10% -15%; 50 Hz	
Class of protection against electrical shock	II (protective insulation)	
Remarks	4-layer carrier PCB new power supply	

eutID: 2587

Tested operation modes

Emission	Immunity	Test criteria
streaming	streaming	criterion A: Unwanted changes of selected operation mode: - max. -30 dB SNR - Reset
Remarks:		

4. General Test Conditions

4.1. Environment conditions

If not stated otherwise in this test report the tests have been carried out under the following environment conditions:

Temperature:	15 ... 35 °C
Relative Humidity:	30 ... 60 %
Atmospheric pressure:	860 ... 1060 hPa

4.2. Calibration of test equipment

All test equipment having an important influence on the certainty of the test results is incorporated into a system of regular calibration and maintenance. The calibration system is a part of ELMAC's quality management system.

4.3. Measurement uncertainty

All EMC tests have a measurement uncertainty. The measurement uncertainty is a parameter related to a quantitative testing characterizing the range of values that with a certain probability still can be assigned to the result. Commonly the measurement uncertainty is given so, that the named probability is 95 %.

The emission limits and immunity severity levels (test levels) given in common EMC generic and product standards are related to the requirements for EMC test equipment defined by the EMC basic standards (like CISPR 16-x, IEC 61000-4-x).

That means: Under the condition that the EMC test equipment used for tests is compliant with the parameters defined by the EMC basic standards it can be assumed ...

- for emission tests: The equipment under test (EUT) passed the test, if the measurement value is lower or equal to the limit;
- for immunity tests: The EUT passed the test, if the EUT complies with the required performance criterion at the stated or higher test level. (See prEN 50222:1995.)

ELMAC's quality management system including calibration system guarantees that the above condition is given.

4.4. Performance criteria

If no other performance criteria specified in the standards listed in section 2. The performance criteria of EN 61326:1997 + A1:1998+A2:2001 section 6.5 are applied.

5. Test Results

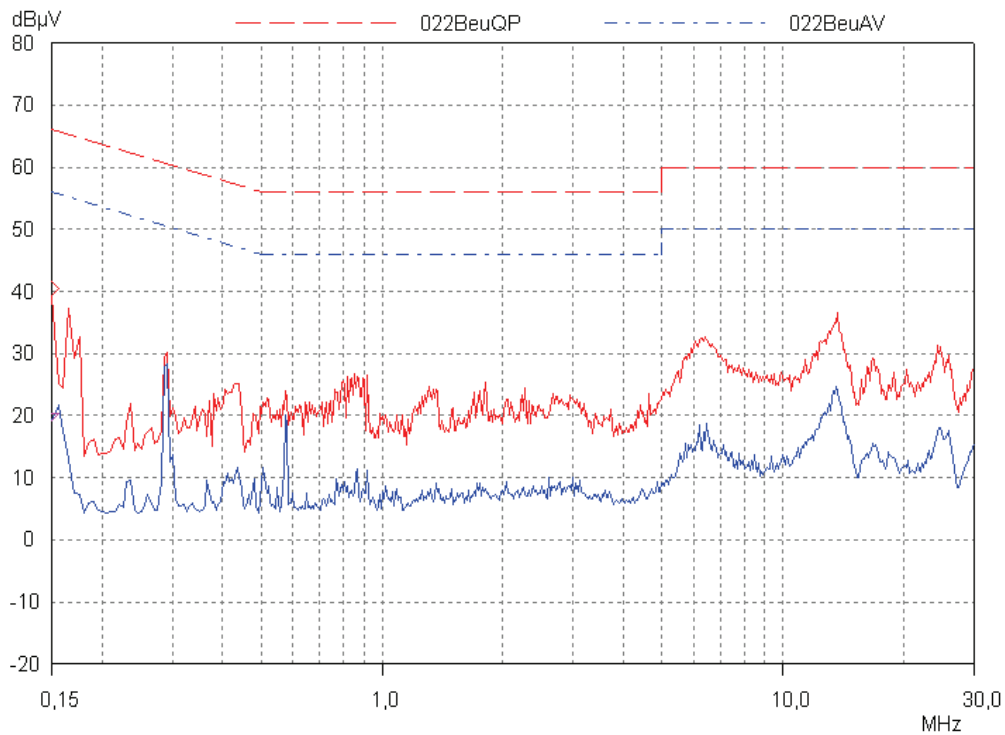
See next pages.

5.1. Conducted emissions at AC mains terminals 150 kHz - 30 MHz

eunID: 2359

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Emission
		Generic standard:	EN 55011:1998 + A1:1999 + A2:2002
Operation mode:	streaming		
Port:	230 VAC		
Date of test:	09/14/2006		
Tested by:	Sc	EUT modified:	No
Limit class:	B	Result:	Passed
Remarks:			

PEAK Detection



Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
V-LISN	MN2050D	Schaffner	1403	251	
EMI Receiver	ESHS 10	R&S	862970/012	35	

**ad 5.1. Conducted emissions at AC mains terminals
150 kHz - 30 MHz****- Continuation -**

eunID: 2359

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		
Operation mode:	streaming		

QUASI-PEAK Detection

Frequency MHz	QP Level dB μ V	QP Limit dB μ V	QP Delta dB
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No results above acceptance margin under limit.

AVERAGE Detection

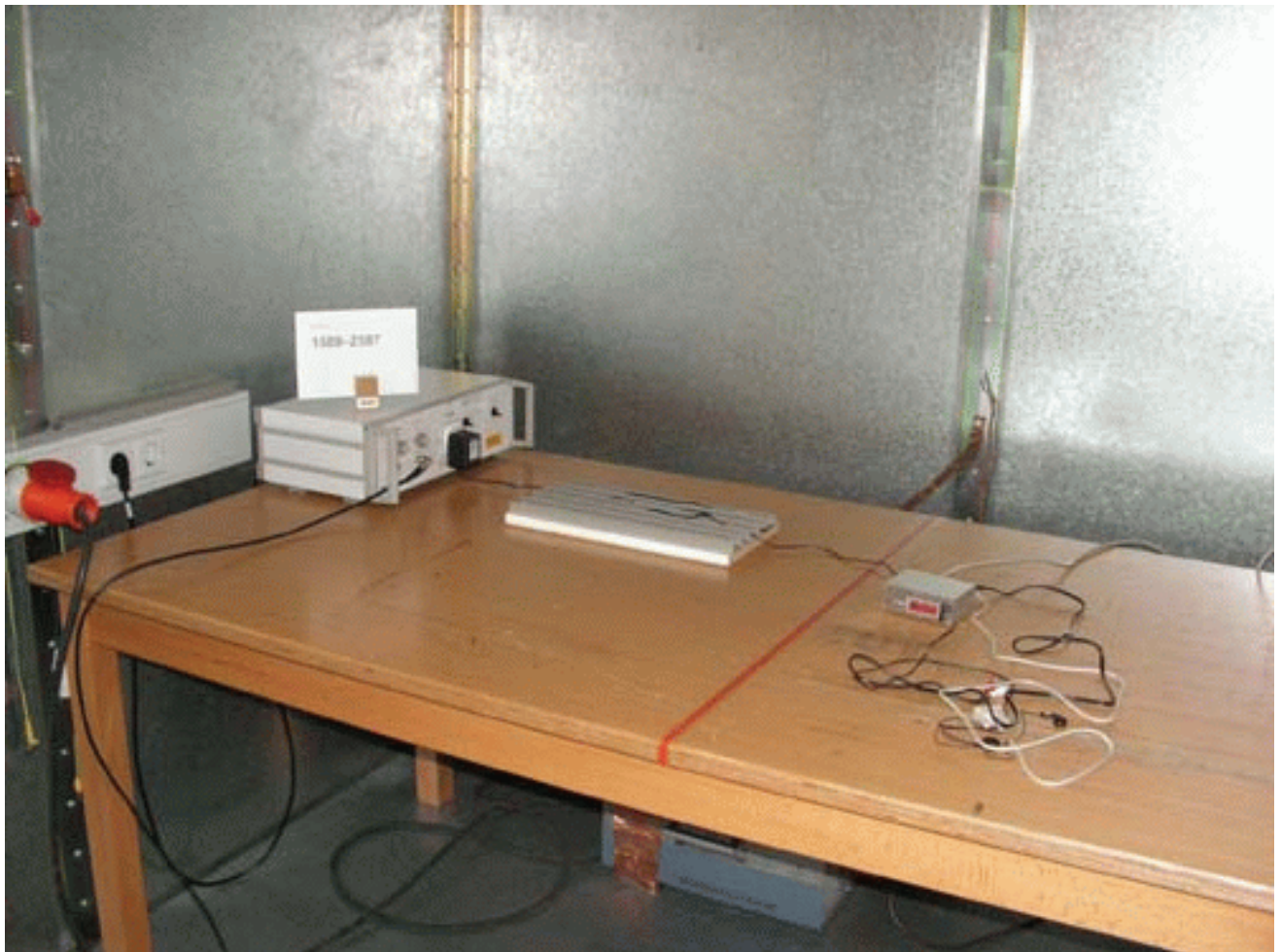
Frequency MHz	AV Level dB μ V	AV Limit dB μ V	AV Delta dB
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No results above acceptance margin under limit.

**ad 5.1. Conducted emissions at AC mains terminals
150 kHz - 30 MHz**

eunID: 2359

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		

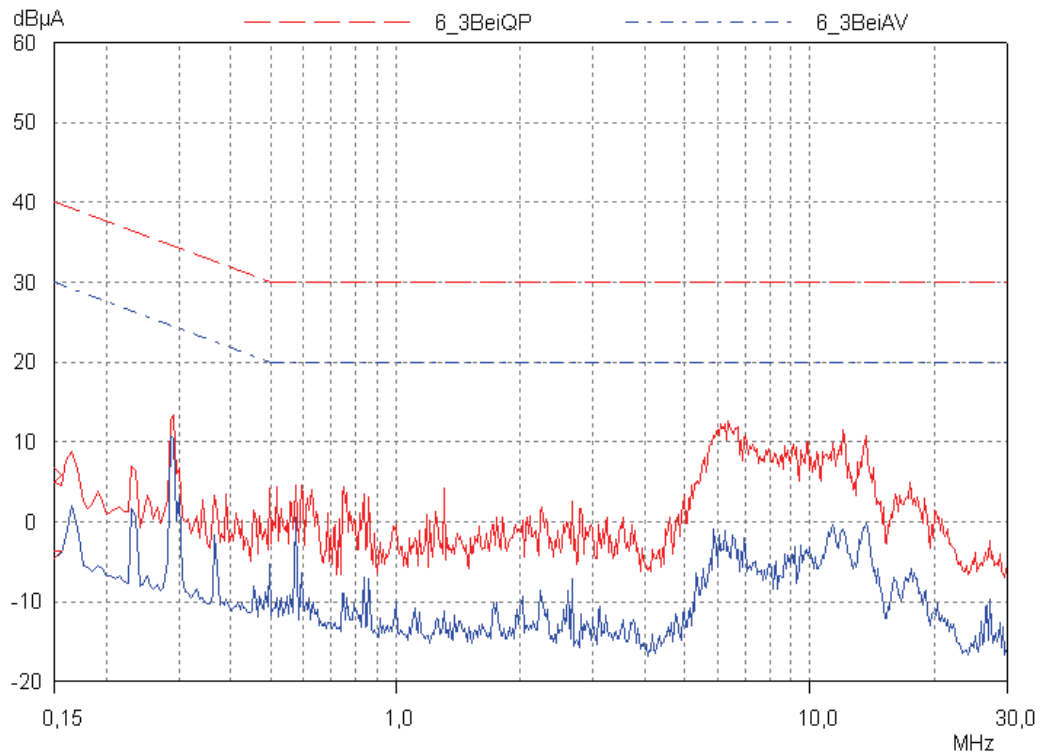


5.2. Conducted emissions at signal & telecommunication lines 150 kHz - 30 MHz

euSigID: 220

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Emission
Operation mode:	streaming	Basic standard:	
Port:	LAN		
Date of test:	09/14/2006		
Tested by:	Sc	EUT modified:	No
Measured quantity:	Interference current	Result:	Passed
Limit class:	B		
Remarks:			

PEAK Detection - Interference current



Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
Current Clamp	PCL-25	Fairchild	215	310	
EMI Receiver	ESHS 10	R&S	862970/012	35	

**ad 5.2. Conducted emissions at signal & telecommunication lines
150 kHz - 30 MHz****- Continuation -**

euSigID: 220

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		
Operation mode:	streaming		

QUASI-PEAK Detection - Interference current

Frequency MHz	QP Level dB μ V	QP Limit dB μ V	QP Delta dB
------------------	------------------------	------------------------	----------------

No results above acceptance margin under limit.

AVERAGE Detection - Interference current

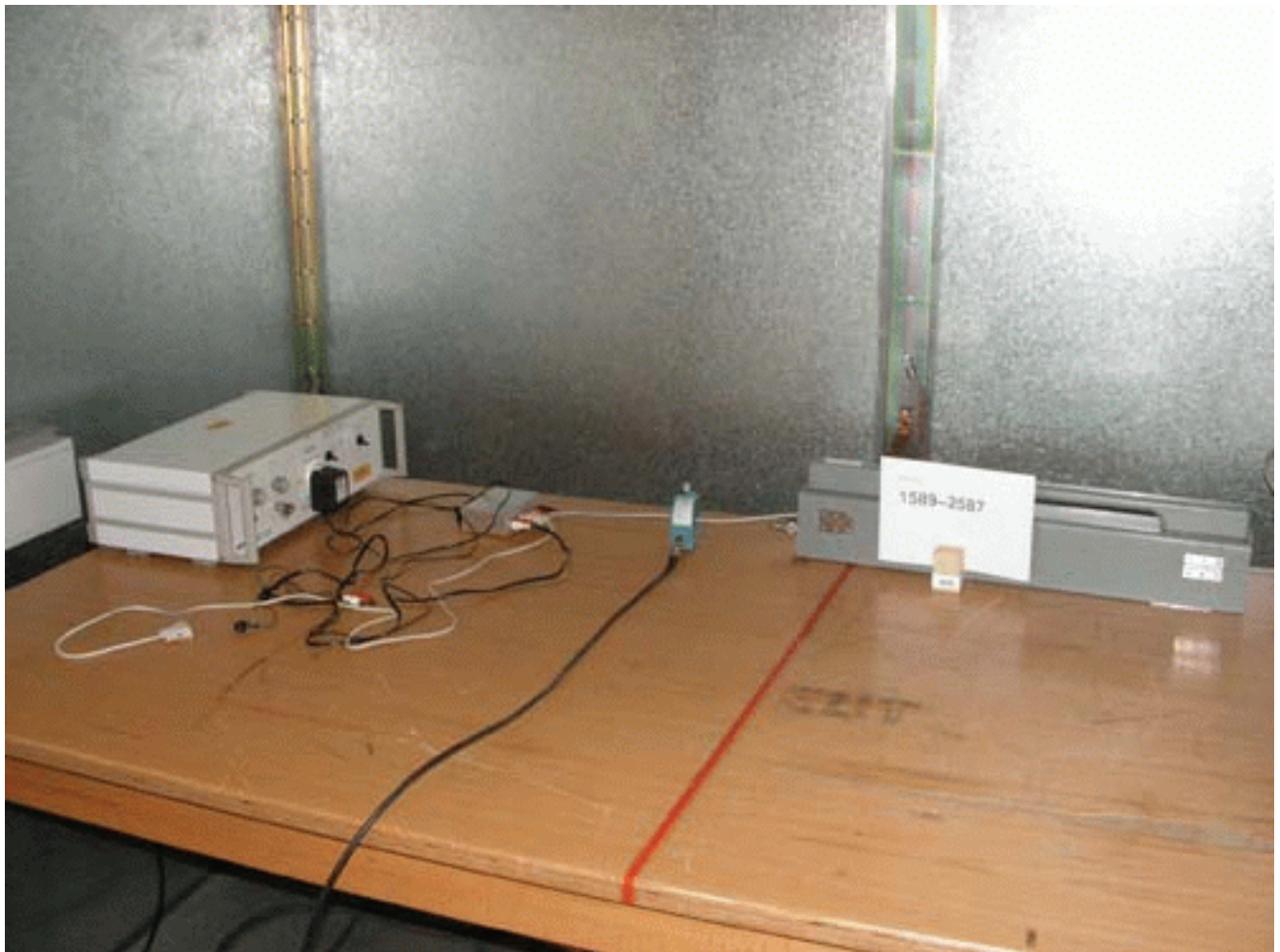
Frequency MHz	QP Level dB μ V	QP Limit dB μ V	QP Delta dB
------------------	------------------------	------------------------	----------------

No results above acceptance margin under limit.

**ad 5.2. Conducted emissions at signal & telecommunication lines
150 kHz - 30 MHz**

euSigID: 220

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		

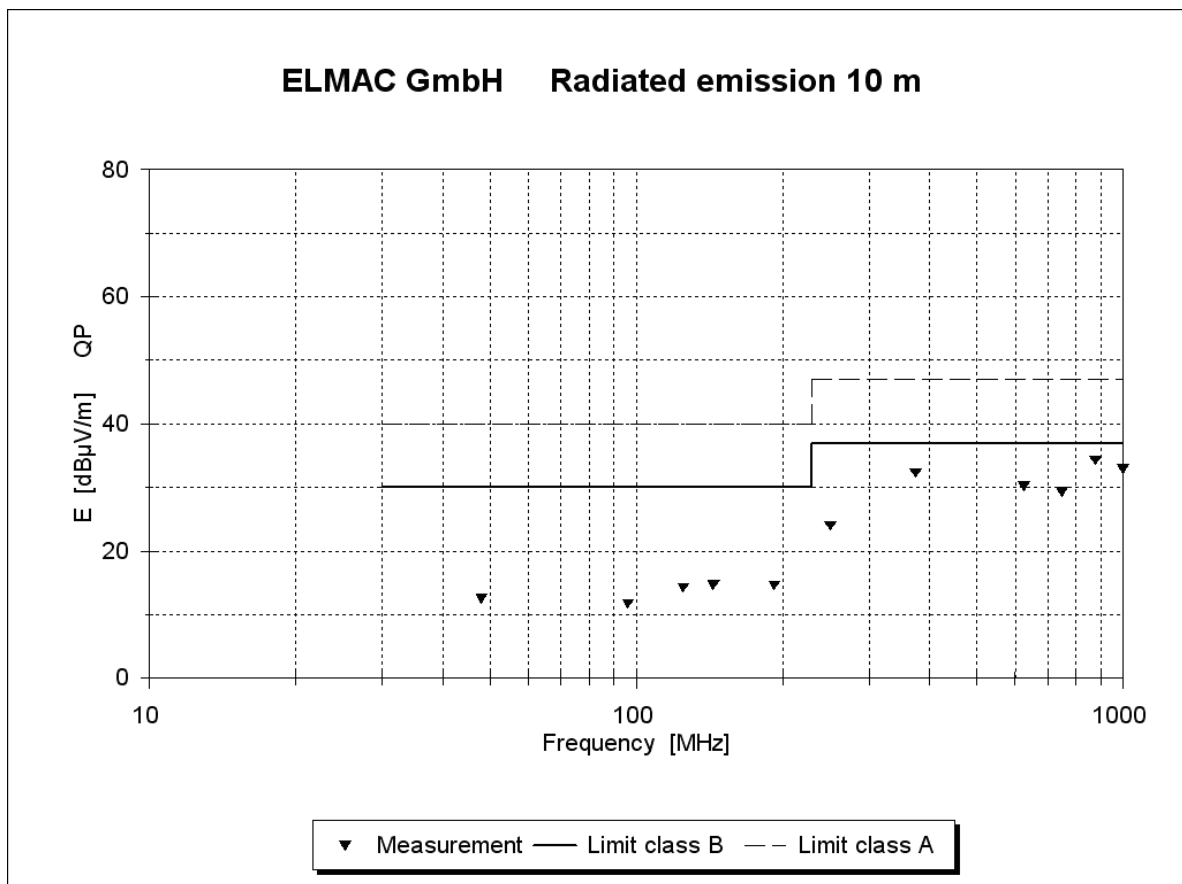


5.3. Radiated emissions - electromagn. fields 30 MHz - 1000 MHz

eeID: 2953

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Emission
		Generic standard:	EN 55011:1998 + A1:1999 + A2:2002
Operation mode:	streaming		
Port:	Enclosure		
Date of test:	09/14/2006		
Tested by:	Sc		
Prescan:	Done		
Final test:	Done		
Test site (final):	Open Area Test Site (OATS)	EUT modified:	No
Antenna distance:	10 m	Result:	Passed
Limit class:	B		
Remarks:			

QUASI-PEAK Detection



Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
Biconilog Antenna	3142	EMCO	9705-1153	282	
Spectrum Analyzer	HP 8566B	HP	2311A02223	32	

**ad 5.3. Radiated emissions - electromagn. fields
30 MHz - 1000 MHz**

- Continuation -

eeID: 2953

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		
Operation mode:	streaming		

QUASI-PEAK Detection

Frequency MHz	Field Strength Level at 10 m dB μ V/m	Limit (B) dB μ V/m	DELTA dB	Remarks
48	12.58	30.00	-17.42	
96	11.73	30.00	-18.27	
125.016	14.24	30.00	-15.76	
144	14.73	30.00	-15.27	
192	14.69	30.00	-15.31	
250.036	24.05	37.00	-12.95	
374.978	32.33	37.00	-4.67	
624.993	30.29	37.00	-6.71	
749.995	29.37	37.00	-7.63	
874.993	34.29	37.00	-2.71	
999.991	33.02	37.00	-3.98	

**ad 5.3. Radiated emissions - electromagn. fields
30 MHz - 1000 MHz**

eeID: 2953

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		



**ad 5.3. Radiated emissions - electromagn. fields
30 MHz - 1000 MHz**

eeID: 2953

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		



5.4. Electrical fast transients (Burst)

ibID: 1408

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Immunity
Operation mode:	streaming	Basic standard:	EN 61000-4-4:2004
Date of test:	09/14/2006	EUT modified:	No
Tested by:	Sc	Result:	Passed
Required performance criterion:	B		
Remarks:			

Coupling devices and Kind of coupling	Tested cables/lines	Test voltage (kV)	Passed Performance criterion	Remarks
Coupling device network (in each case un-symmetrically and asymmetrically)	230 VAC	2	A	
Capacitive coupling clamp (asymmetrically)	Ethernet RS232 Audiocable Head Phone output	1	A	

Notes:

Tested polarization: Positive + Negative (at each kind of coupling)
Duration of test: 60 s at each polarity and kind of coupling
Test puls: 5/50 ns; $Z_1 = 50 \text{ Ohm}$
Repetition frequency: 5 kHz; at test level $\geq 4 \text{ kV}$: 2.5 kHz

Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
Burst Generator	NSG 2025	Schaffner	1188	237	
Capacitive Coupling Clamp	CDN 125	Schaffner	647	239	

ad 5.4. Electrical fast transients (Burst)

ibID: 1408

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		



5.5. Surge

isID: 1258

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Immunity
		Basic standard:	EN 61000-4-5:1995+ A1:2001
Operation mode:	streaming		
Date of test:	09/14/2006		
Tested by:	Sc	EUT modified:	No
Required performance criterion:	B	Result:	Passed
Remarks:			

Tested port	Lines	Kind of coupling	Coupling impedance	Max. test voltage (kV)	Passed Performance criterion	Remarks
230 VAC	L1 - N	s	18 μ F	1	A	

Notes:

Kind of coupling:

s = symmetrically
u = unsymmetrically

Test puls:

1.2/50 μ s; $Z_i = 2$ Ohm

Polarity:

positive and negative at each test voltage

Number of test pulses:

 ≥ 6 at each test voltage

Time interval between pulses:

 ≥ 10 s

Tested voltage steps:

0,5 / 1 kV, if max. test voltage = 1 kV

0,5 / 1 / 1,5 / 2 kV, if max. test voltage = 2 kV

1 / 2 / 3 / 4 kV, if max. test voltage = 4 kV

Tested phase angles (at AC):

90°/180°/270°

Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
Surge Wave Generator	NSG 623/600	Schaffner	1212	272	

5.6. Conducted disturbances, induced by radio-frequency fields 150 kHz - 80 MHz

icsID: 1438

EUT:	Streaming Client repeated inspection to test 2006-1520-2483	Kind of test:	Immunity
		Basic standard:	EN 61000-4-6:1996 + A1:2001
Operation mode:	streaming		
Date of test:	09/14/2006		
Tested by:	Sc	EUT modified:	No
Required performance criterion:	A	Result:	Passed
Remarks:	Basic noise: approx. -80 dB		

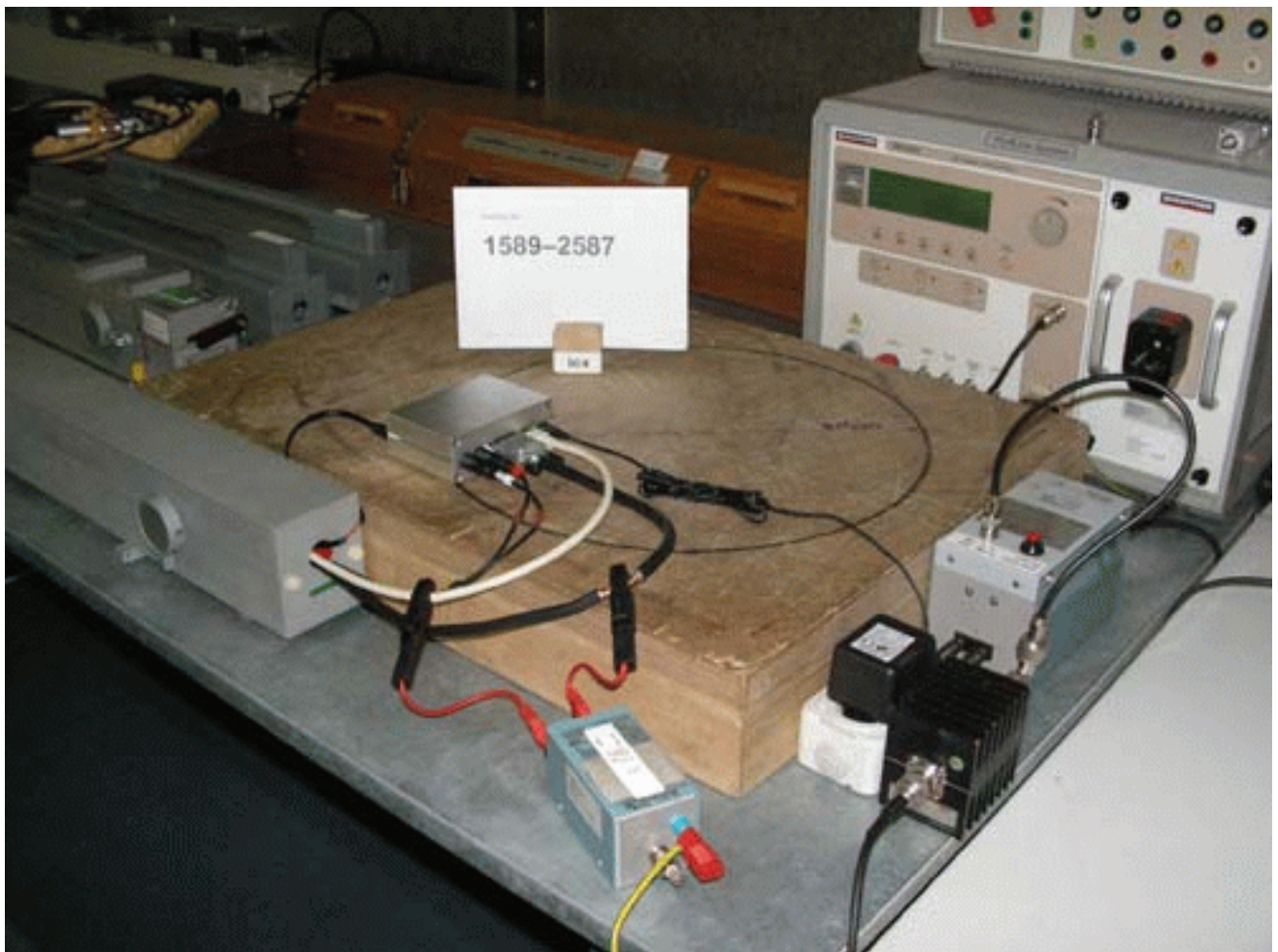
Test parameter	Settings
Frequency range	150 kHz - 80 MHz
Frequency step	1 %
Dwell time	1 s
Modulation	1 kHz/AM 80%
Test voltage	3 V
Tested cables/lines	Cable/line/port of the EUT
	230 VAC
	LAN; RS232
	Line R/L; Headphone
Result	Coupling device used
Passed Performance criterion	CDN 801 M2/M3 INV 307
	CDN 801 S INV 198
	CDN 801 S INV 198
Remarks	mains -60dB 26,0 MHz LAN... -41dB 8,1 MHz Line... -42dB 2,5 MHz

Test equipment used					
Name	Model	Manufacturer	S/N	INV	Remarks
RF Generator	NSG 2070-1	Schaffner	135	222	
Coupling Network	CDN 801 M2/M3	Lüthi	935064	307	
Coupling Network	CDN 801 S	ELMAC		198	
Coupling Network	CDN 801 S	ELMAC		198	

**ad 5.6. Conducted disturbances, induced by radio-frequency fields
150 kHz - 80 MHz**

icsID: 1438

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		



**ad 5.6. Conducted disturbances, induced by radio-frequency fields
150 kHz - 80 MHz**

icsID: 1438

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		



**ad 5.6. Conducted disturbances, induced by radio-frequency fields
150 kHz - 80 MHz**

icsID: 1438

EUT:	Streaming Client repeated inspection to test 2006-1520-2483		

