Test Report

Manufacturer:	**DK-Technologies A/S**
Product:	**PT5211 & PT5300**
Standards:	**EN 55103-1** **EN 55103-2**
Report No:	**B2013028**
Date and Signature:	**07-05-2013**

Bolls Rådgivning

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Test object:	PT5211 ChangeOver & PT5300 Sync Generator	
Manufacturer:	DK-Technologies A/S Marielundvej 37D 2730 Herlev.	
Test dates:	15 – 17-04-2013, 02-05-2013 & 06-05-2013	
Standards:	Emission:	Product family standards EN 55103-1:2009 Product family standards EN 61000-3-2:2006 +A1:2009 and A2:2009 and EN 61000-3-3:2008
	Immunity:	Product family standards EN 50103-2:2009
Test engineer:	Søren Carlsen & Michael Jørgensen	
Test laboratory:	All tests are made in the test laboratories of Bolls Rådgivning, Stenløse, Denmark.	
Conclusion:	The product has been tested according to the above mentioned standards and has been found to fulfil the requirements. This gives presumption of compliance for the protection requirements given in annex 1 of the EMC directive 2004/108/EEC and the unit can be CE-marked according to that directive.	

Table of contents

1. Introduction

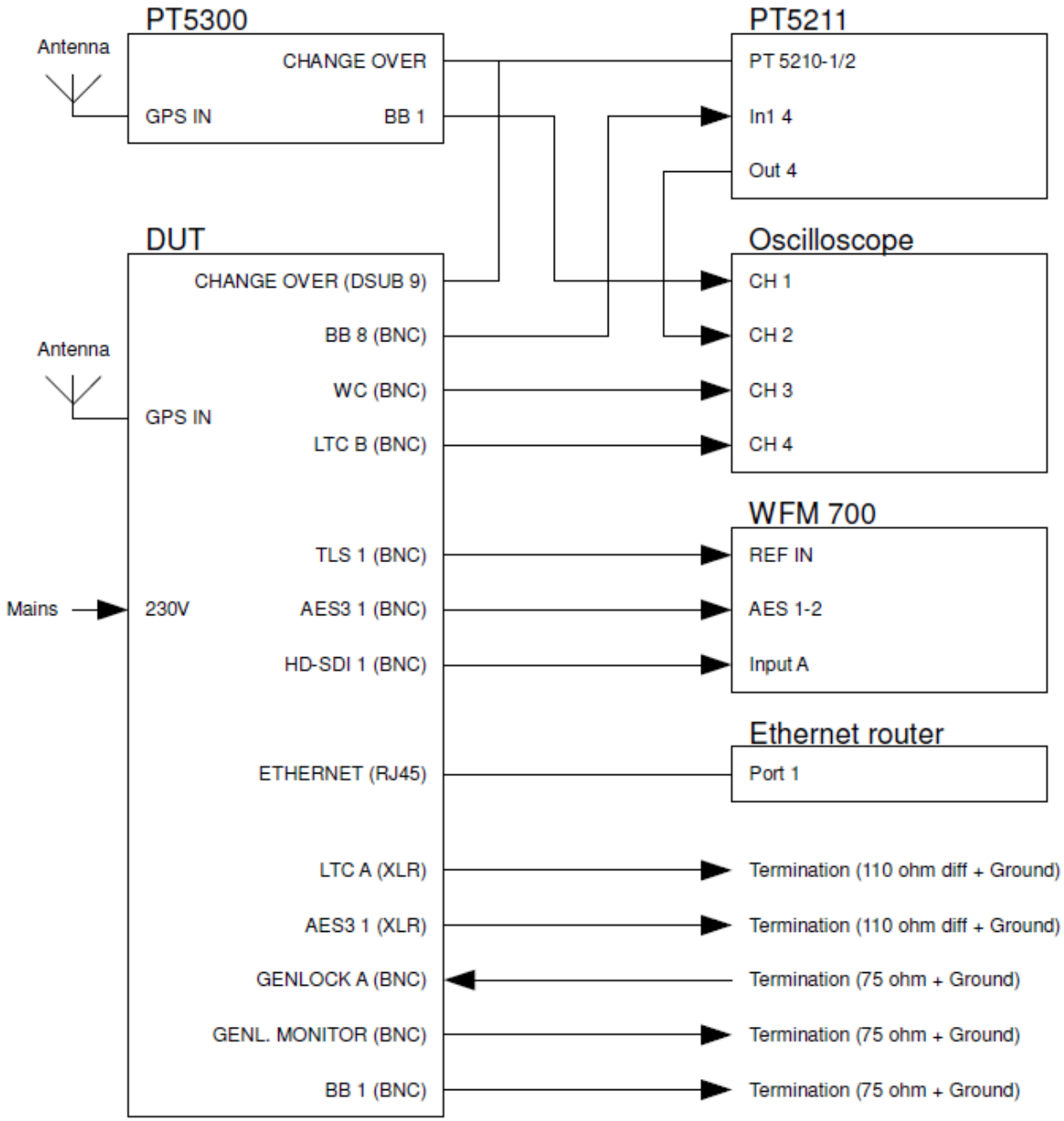
1.1 General

The purpose of this report is to describe the tests that this product has been submitted to. These tests have been performed to verify that EMC requirements for the product are met.

1.2 Summery of tests

Phenomenon	Used Basic standard	Test on	Result
Radiated emission	EN 55022:2006 + A1:2007	Enclosure port	Requirements fulfilled
Discontinuous disturbance	EN 55014-1:2006	Enclosure port	NA
Radiated magnetic fields	EN 55103-1:2009	Enclosure port	Requirements fulfilled
Conducted emission	EN 55022:2006 + A1:2007	Input AC power port +signal and dc ports + Telecommunication and network ports	Requirements fulfilled
Harmonic current emission	EN 61000-3-2: 2006 + A1:2009, A2:2009 EN 61000-3-12: 2005	Input AC power port	Requirements fulfilled
Voltage fluctuation and flicker emission	EN 61000-3-3:2008 or EN 61000-3-11:2000	Input AC power port	NA
Inrush current	EN 55103:2009	Input AC power port	Requirements fulfilled
Conducted emission	EN 55013:2001	on Antenna ports of broadcast receivers	requirements fulfilled
Radiated RF immunity	EN 61000-4-3:2006 +A1:2008	Enclosure port	Requirements fulfilled
Conducted RF immunity	EN 61000-4-6:2009	Input AC power port Signal ports	Requirements fulfilled
Conducted RF immunity	EN 55103-2:2009 Annex B	Earth point	Requirements fulfilled
Conducted fast transient immunity	EN 61000-4-4:2004 +A1:2010	Input AC power port Signal ports	Requirements fulfilled
Conducted surge transient immunity	EN 61000-4-5:2006	Input AC power port	Requirements fulfilled
ESD immunity	EN 61000-4-2:2009	Enclosure port	Requirements fulfilled
Power frequency magnetic field immunity	EN 55103-2:2009 Annex A	Enclosure port	Requirements fulfilled
Voltage dips and interruptions immunity	EN 61000-4-2:2009	Input AC power port	Requirements fulfilled

1.3 Test set-up



1.4 Definition of performance criteria for immunity testing :

Performance criterion A :
The apparatus shall continue to operate as intended. No degradation of performance or loss of functions is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Performance criterion B:
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of functions is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Performance criterion C :
Temporary loss of functions is allowed provided that normal function is automatically restored when the test stimulus is removed, or can be restored by operation of the controls.

See further details in the standard.

1.5 Electromagnetic environment for immunity testing

Environment	E1	E2	E3	E4	E5
Applicable				X	

1.6 Test notes:

- The test setup consists of a PT5300 Sync generator working as a master unit, plus another one working as a spare unit. Beside these two generators there is a PT5211 Changeover box that automatically switches between the master and spare unit in case of a failure on the master generator.
- All tests have been performed on the master sync generator and on the ChangeOver.
- During radiated emission, conducted emission, radiated immunity tests the full setup has been activated and all cables has been mounted.
- During all the conducted immunity tests (RF on cables, Burst, Surge Voltage dip and the magnetic immunity tests all the terminated BNC cables has been dismounted.
- In the standard EN55103-2 test note 8, regarding RF on cables, it is stated that Screened-cable ports as defined in 3.8 are deemed to comply with the requirements for this phenomenon without testing.
  3.8 screened-cable port
  A signal, control or DC power port on a metal-cased apparatus intended for the termination of a braid-screened cable where provision is made for direct, low impedance connection between the cable screen and the case of the apparatus. Where a connector is used it shall provide either a 360° continuous connection between the screen and the case, or at least four points of connection distributed around the connector aperture.

2. Emission test: EN 55022 / EN 55016-2-3 / EN 55014-1

Test applicable [X] Not applicable [ ]. Comment:

Measurements (shortform) :
Test setup shall be normal use with max. load according to standards.
In the TEM-cell, the product shall be measured from three different sides and each measurement is indicated on the test sheets. The corrected limits shall be indicated on the sheets.

Conducted emission can be measured in a shielded room or outside, just remember to use a HF-ground plane according to the standard.
Test sheets shall always be attached to this test.

E1, E2, E3 limit B shall apply
E4, E5 limit A shall apply

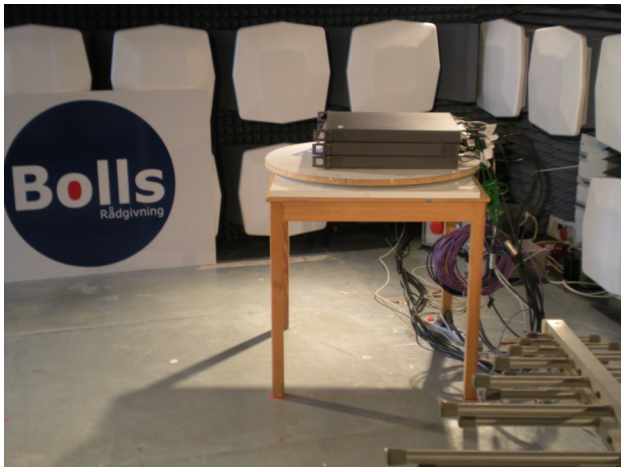
Test :	OK / not OK	Comments :
Shielded room	OK	
Conducted mains:	OK	

Comments: **Test passed.**

On the measurement printouts in the attachment, all measurements over limit were verified to be background by turning the EUT off.

Tested by : Michael Jørgensen
Date : 15-04-2013

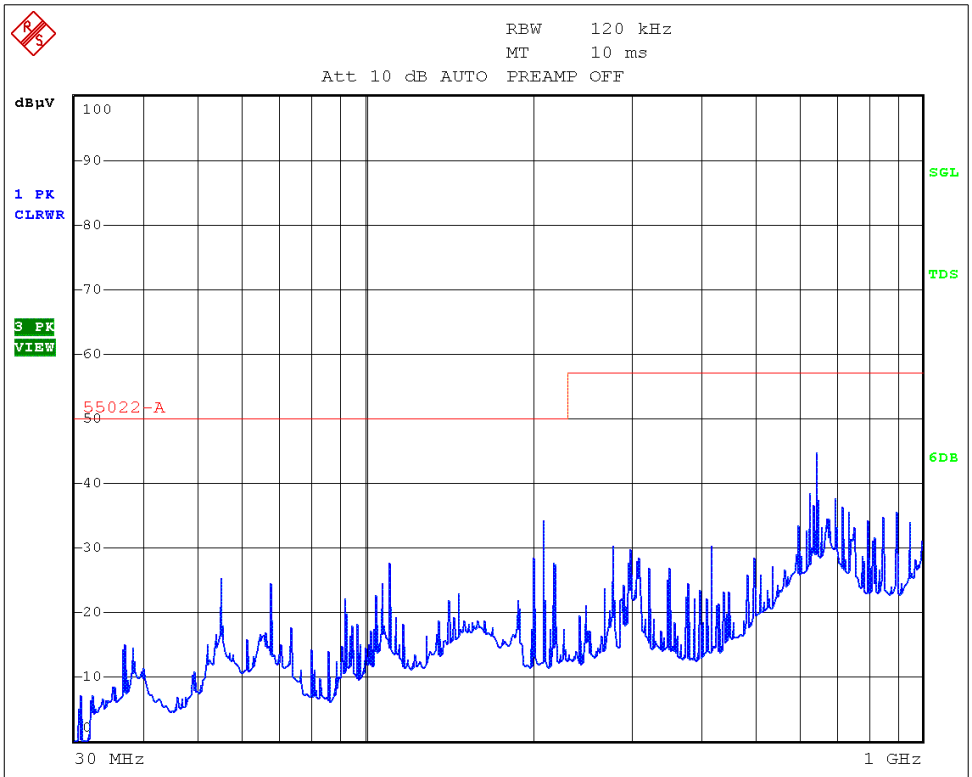
Pictures from the Emission tests.



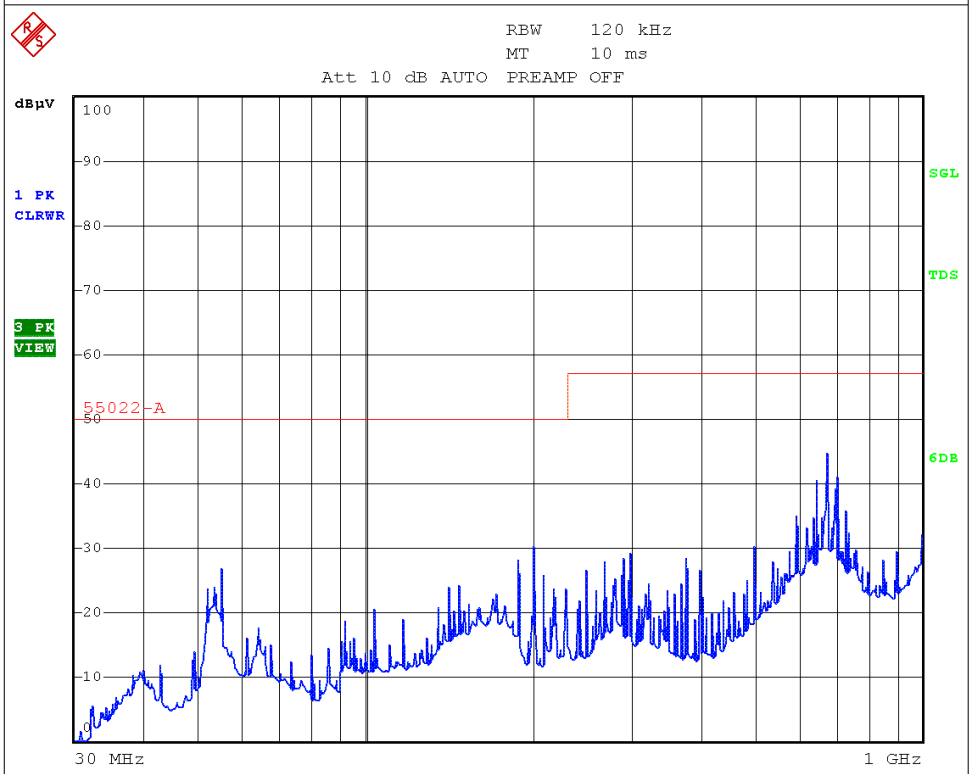
Radiated emission.


Conducted emission.

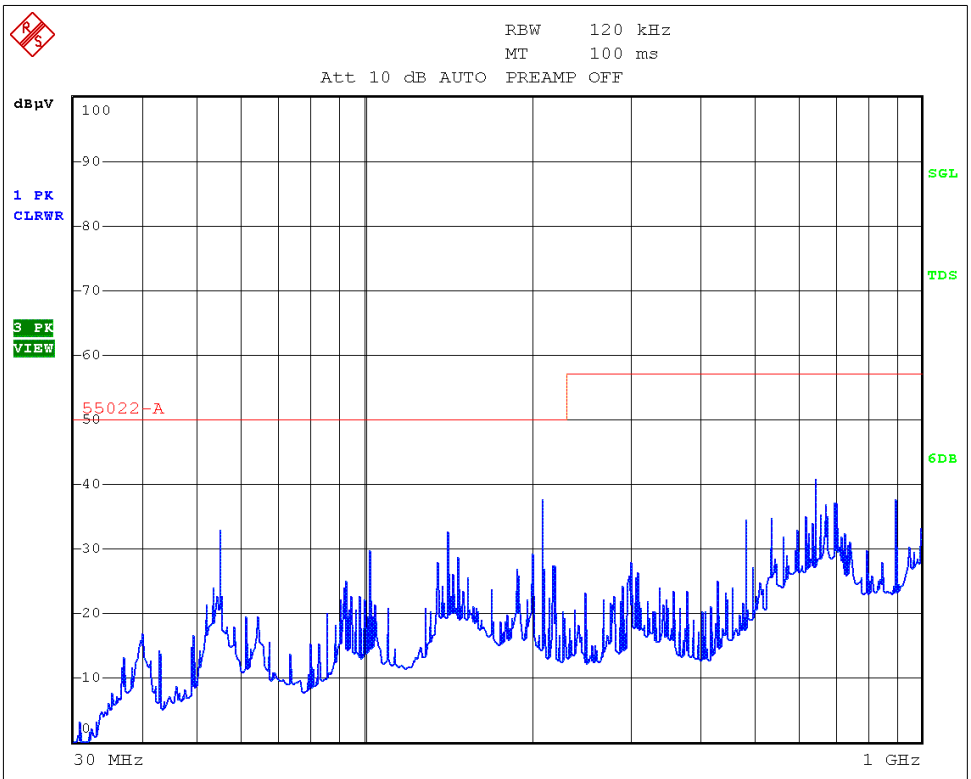
- Results from the radiated emission with horizontal antenna.



Backside of EUT pointing towards the antenna.

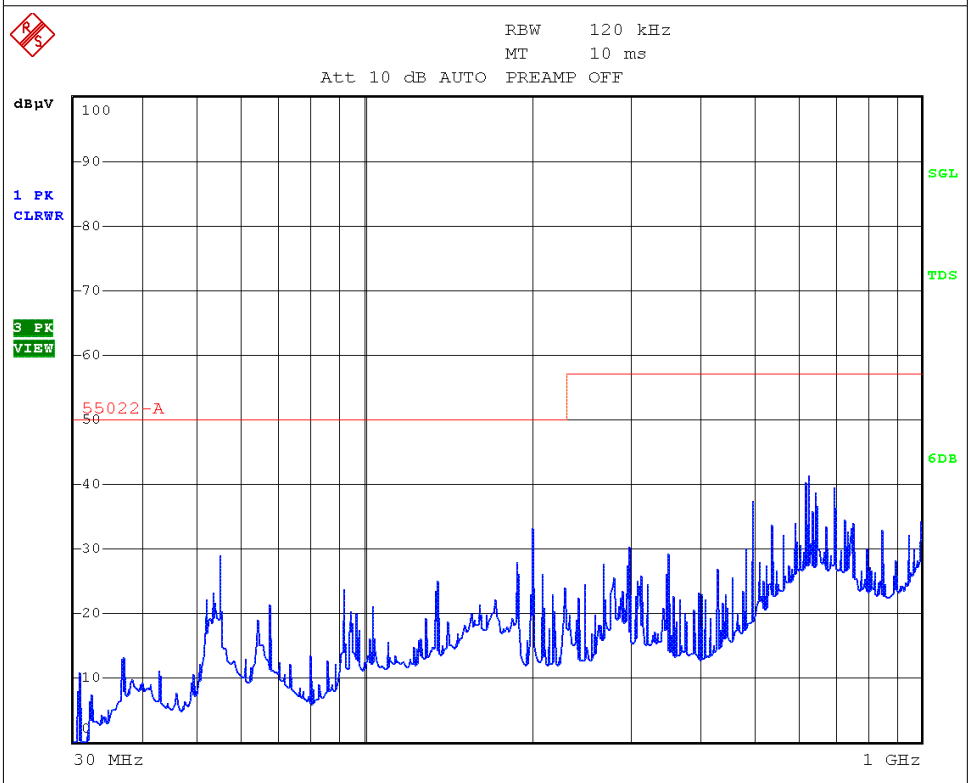


Front side of EUT pointing towards the antenna.



Date: 1.JAN.2000 00:12:43

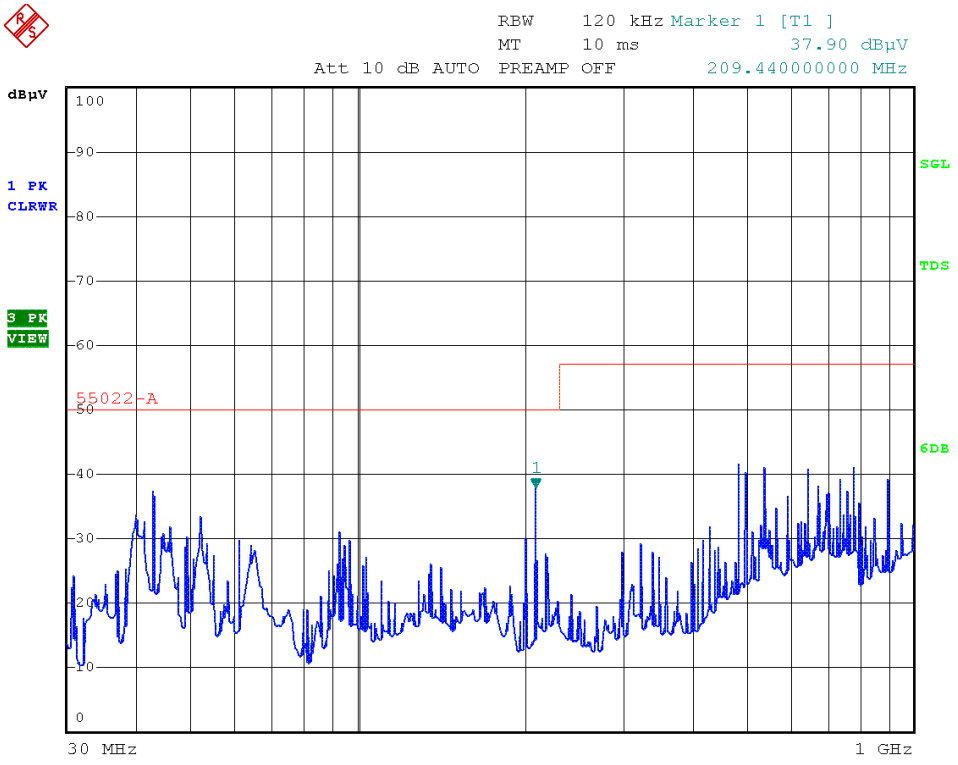
Right side of EUT pointing towards the antenna.



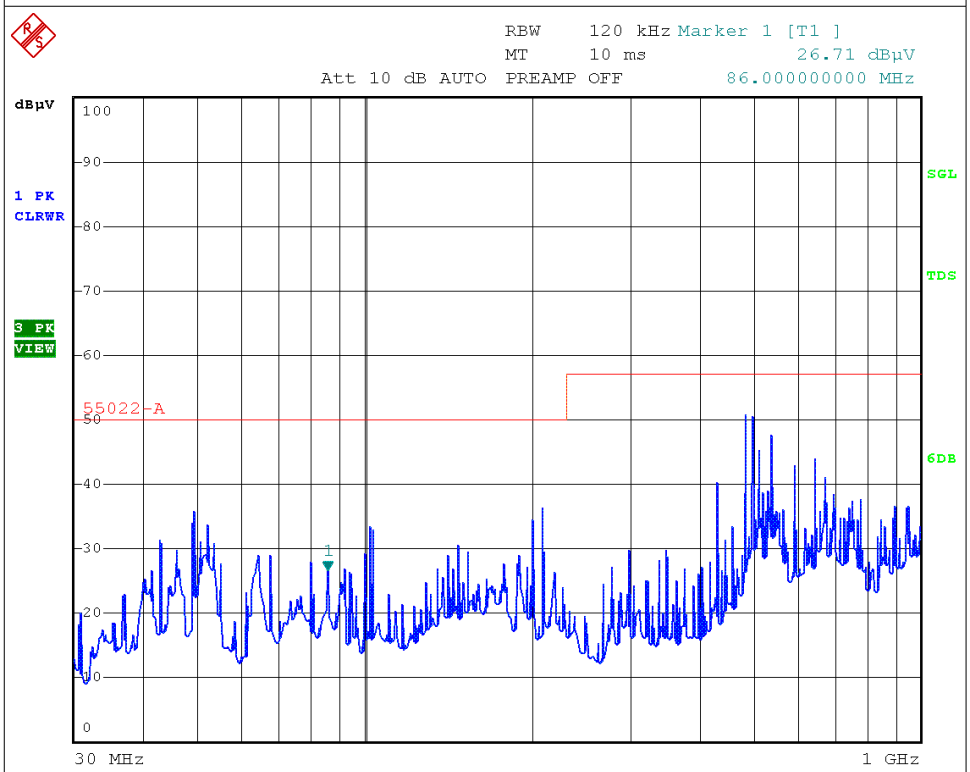
Date: 1.JAN.2000 00:27:51

Left side of EUT pointing towards the antenna.

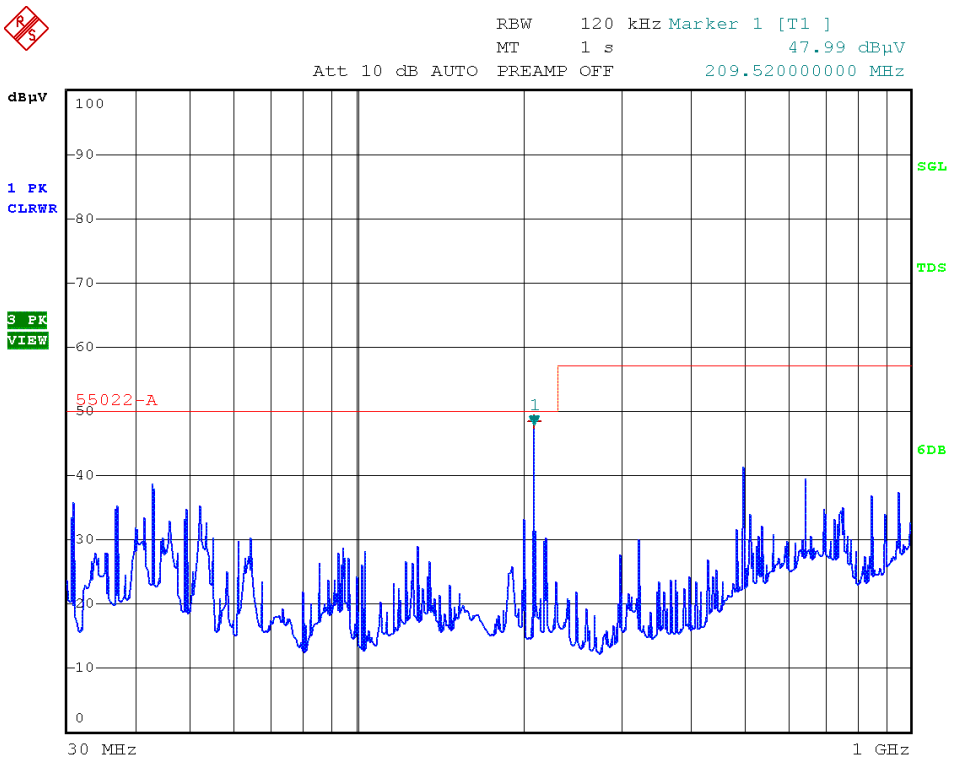
- Results from the radiated emission with vertical antenna.



Back side of EUT pointing towards the antenna.



Front side of EUT pointing towards the antenna.



Date: 1.JAN.2000 06:36:52

Left side of EUT pointing towards the antenna

EDIT PEAK LIST (Final Measurement Results)

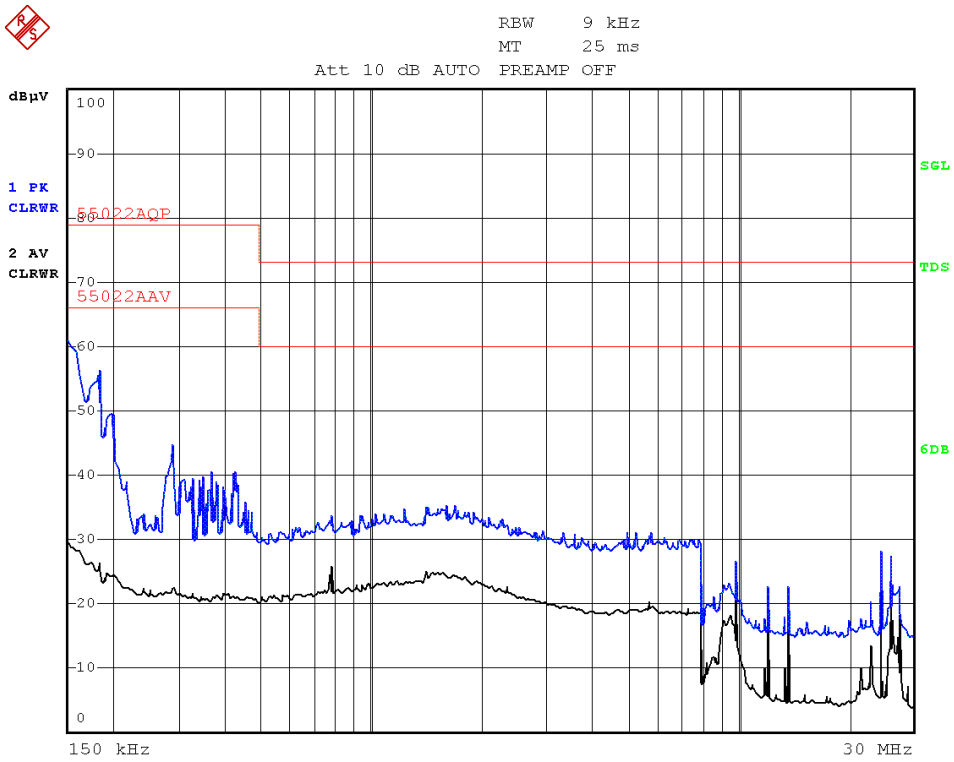
Trace1:	55022-A
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	209.52 MHz	48.31	-1.68

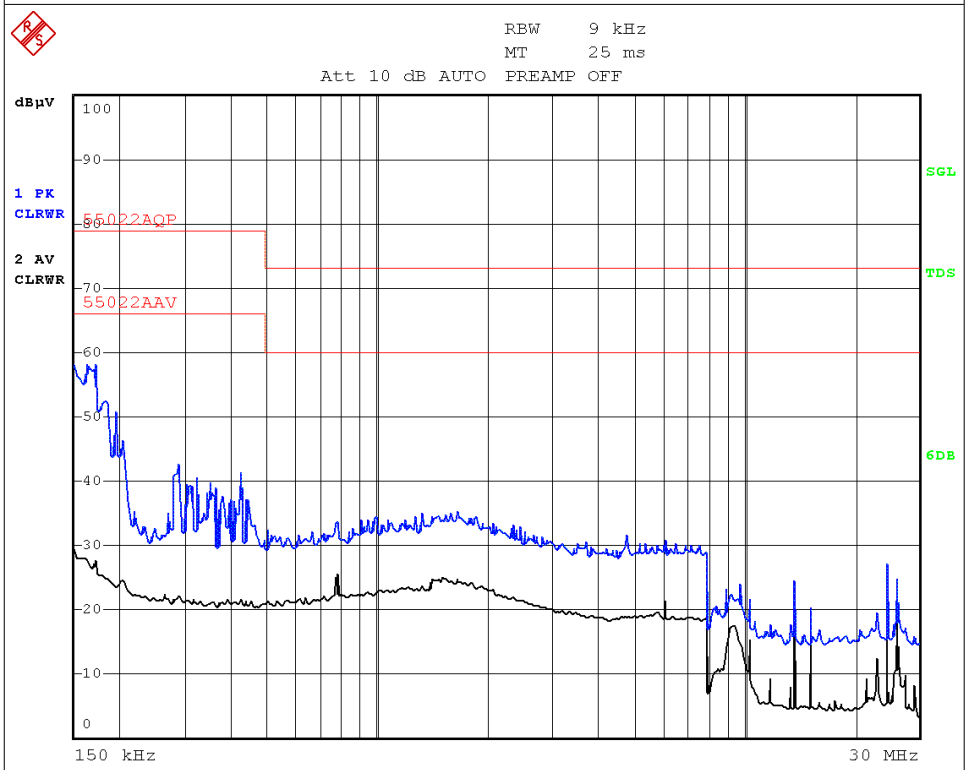
Date: 1.JAN.2000 06:36:46

The peak list.

- Results from the conducted emission.



Test on the 'Line' wire.



Test on the 'Neutral' wire.

3. Radiated magnetic fields

Test applicable [X] Not applicable [ ]. Comment:

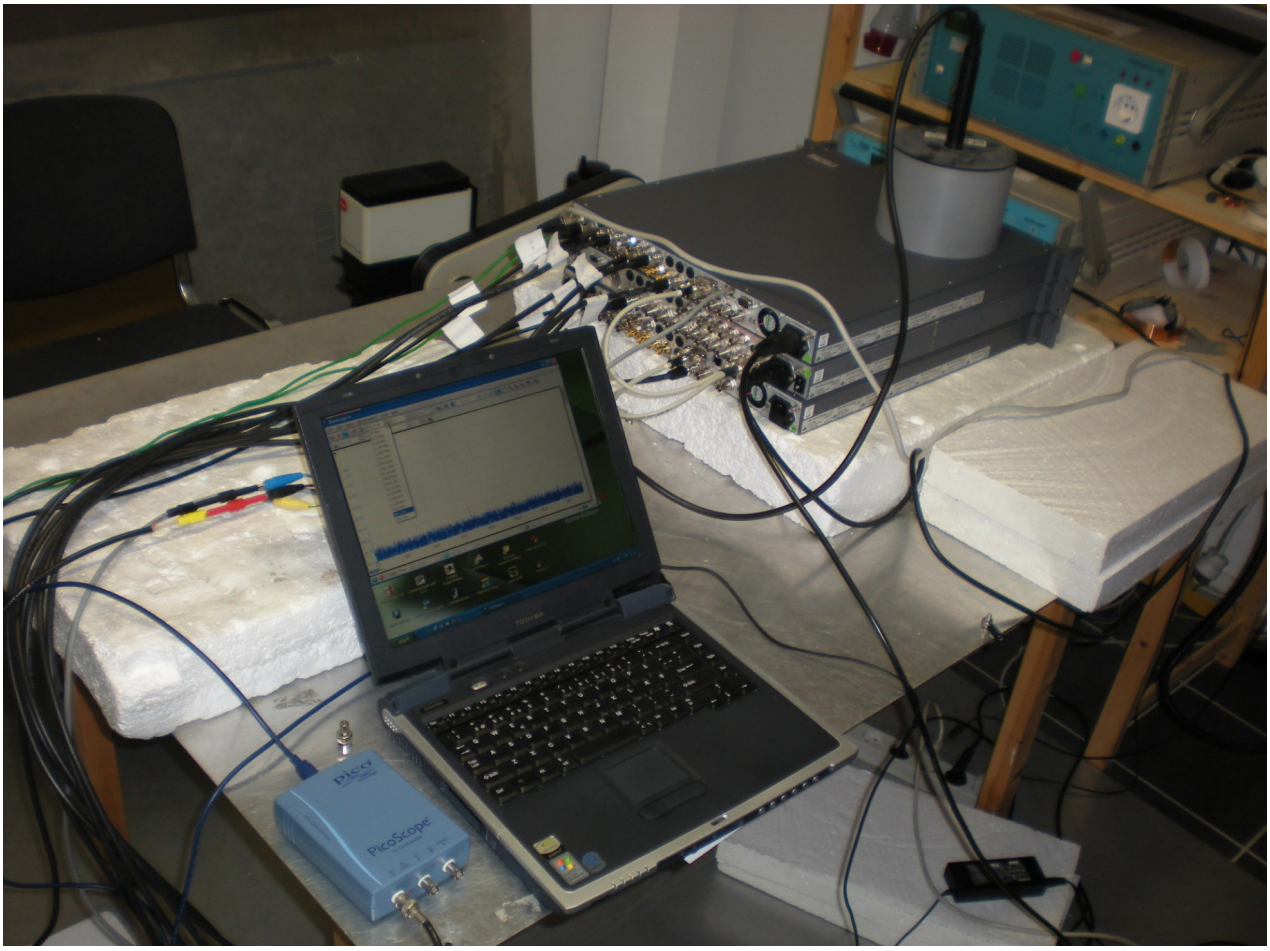
For E 5 no measurements required

Frequency	Limit for rack mounted equipment (distance 10 cm)	Limit for all other equipment (distance 1 m)	Measurements
50 – 500 Hz	4 – 0.4 A/m*	1 – 0.01 A/m*	OK
500 – 50,000 Hz	0.4 A/m	0.01 A/m	OK

** decreasing linearly with the logarithm of the frequency*

Comments: **Test passed.**

Tested by : Søren Carlsen / Michael Jørgensen.
Date : 17-04-2013



4. Harmonic Current: EN 61000-3-2

Test applicable [X] Not applicable [ ].
Comment: Test has been performed with One PT5300 and PT5211 connected simultaniously.

Scope
Applicable to mains operated equipment (>= 220Vac) with input current <= 16A per phase.
Class A, B and C; Not applicable if max. power < 75W
Class D; Not applicable if max. power < 50W

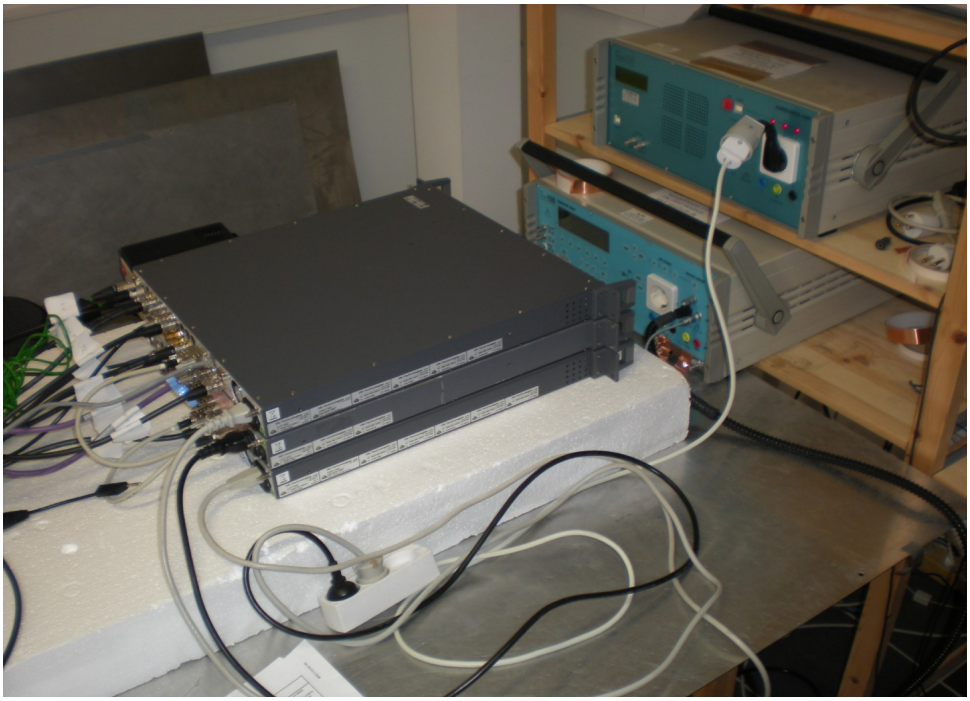
Measurements (shortform) :
Test setup shall be normal use with max. load according to standards.
Input Voltage shall a sin. Voltage with minimum distortion.

Class:	A	B	C	D
Equipment Class:	X			
Pass Class:	X			

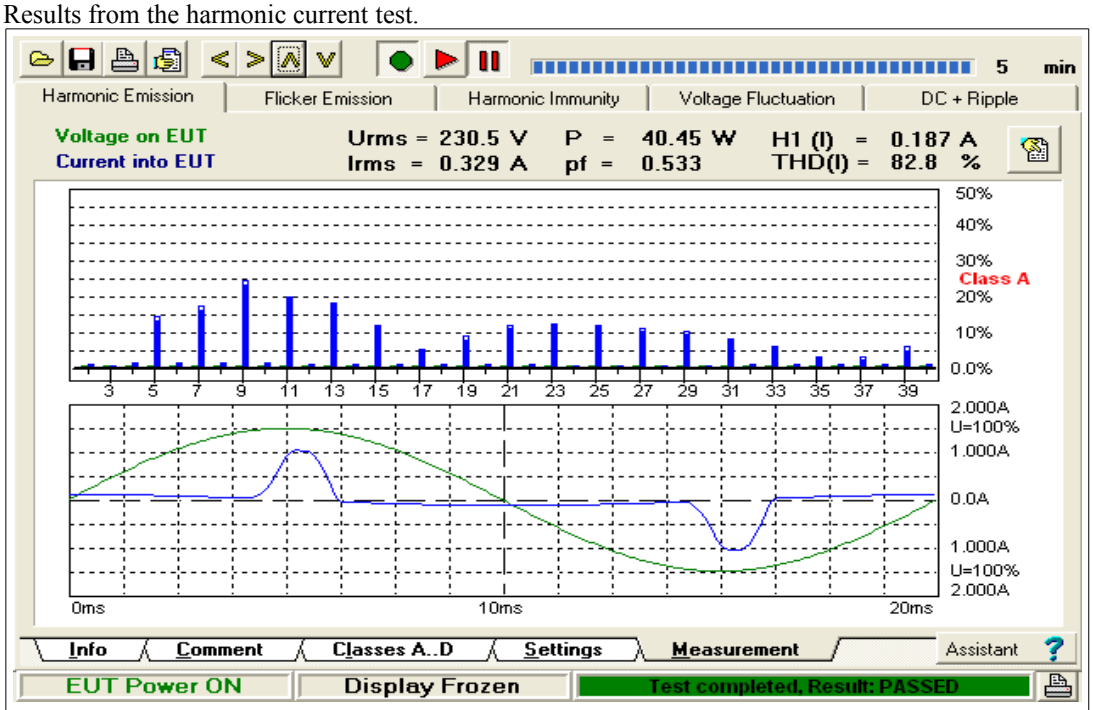
Comments: **Test passed.**

Tested by : Michael Jørgensen
Date : 16-04-2013

- Picture from the harmonic current test.



- Results from the harmonic current test.



Bolls ApS Date : 16-04-2013 15:33:27 V4.18

PT5300 og PT5211

Test - Time : 5min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Irms [A]	Irms% [%]	Imax [A]	Imax% [%]	Limit [A]	Status	Vrms [V]	Vrms% [%]	Vmax [V]	Vmax% [%]	Limit [V]
1	50	0.1871	56.862	0.2003	60.868			230.45	99.979	230.45	99.979	0.0000
2	100	0.0027	0.8160	0.0034	1.0386	1.0800		0.1227	0.0532	0.1227	0.0532	0.4663
3	150	0.1635	49.666	0.1768	53.709	2.3000		0.0245	0.0106	0.0245	0.0106	2.0615
4	200	0.0024	0.7418	0.0031	0.9273	0.4300		0.0000	0.0000	0.0000	0.0000	0.4663
5	250	0.1449	44.028	0.1559	47.366	1.1400		0.0245	0.0106	0.0245	0.0106	0.9081
6	300	0.0020	0.5935	0.0024	0.7418	0.3000		0.0000	0.0000	0.0000	0.0000	0.4663
7	350	0.1193	36.239	0.1273	38.687	0.7700		0.0245	0.0106	0.0245	0.0106	0.6872
8	400	0.0016	0.4822	0.0018	0.5564	0.2300		0.0000	0.0000	0.0000	0.0000	0.4663
9	450	0.0906	27.522	0.0956	29.043	0.4000		0.0245	0.0106	0.0245	0.0106	0.4663
10	500	0.0011	0.3338	0.0012	0.3709	0.1840		0.0000	0.0000	0.0000	0.0000	0.4663
11	550	0.0619	18.806	0.0641	19.473	0.3300		0.0245	0.0106	0.0245	0.0106	0.2209
12	600	0.0007	0.2226	0.0009	0.2596	0.1533		0.0000	0.0000	0.0000	0.0000	0.2209
13	650	0.0365	11.091	0.0367	11.165	0.2100		0.0000	0.0000	0.0245	0.0106	0.2209
14	700	0.0005	0.1484	0.0006	0.1855	0.1314		0.0000	0.0000	0.0000	0.0000	0.2209
15	750	0.0166	5.0445	0.0171	5.1929	0.1500		0.0000	0.0000	0.0000	0.0000	0.2209
16	800	0.0004	0.1113	0.0005	0.1484	0.1150		0.0000	0.0000	0.0000	0.0000	0.2209
17	850	0.0056	1.7062	0.0062	1.8917	0.1324		0.0000	0.0000	0.0000	0.0000	0.2209
18	900	0.0004	0.1113	0.0004	0.1113	0.1022		0.0000	0.0000	0.0000	0.0000	0.2209
19	950	0.0085	2.5964	0.0099	3.0045	0.1184		0.0000	0.0000	0.0000	0.0000	0.2209
20	1000	0.0002	0.0742	0.0004	0.1113	0.0920		0.0000	0.0000	0.0000	0.0000	0.2209
21	1050	0.0111	3.3754	0.0121	3.6721	0.1071		0.0000	0.0000	0.0000	0.0000	0.2209
22	1100	0.0001	0.0371	0.0002	0.0742	0.0836		0.0000	0.0000	0.0000	0.0000	0.2209
23	1150	0.0112	3.4125	0.0116	3.5237	0.0978		0.0000	0.0000	0.0000	0.0000	0.2209
24	1200	0.0001	0.0371	0.0001	0.0371	0.0767		0.0000	0.0000	0.0000	0.0000	0.2209
25	1250	0.0098	2.9674	0.0101	3.0786	0.0900		0.0000	0.0000	0.0000	0.0000	0.2209
26	1300	0.0000	0.0000	0.0001	0.0371	0.0708		0.0000	0.0000	0.0000	0.0000	0.2209
27	1350	0.0082	2.4852	0.0087	2.6335	0.0833		0.0000	0.0000	0.0000	0.0000	0.2209
28	1400	0.0001	0.0371	0.0001	0.0371	0.0657		0.0000	0.0000	0.0000	0.0000	0.2209
29	1450	0.0068	2.0772	0.0073	2.2255	0.0776		0.0000	0.0000	0.0000	0.0000	0.2209
30	1500	0.0001	0.0371	0.0001	0.0371	0.0613		0.0000	0.0000	0.0000	0.0000	0.2209
31	1550	0.0052	1.5950	0.0056	1.7062	0.0726		0.0000	0.0000	0.0000	0.0000	0.2209
32	1600	0.0002	0.0742	0.0002	0.0742	0.0575		0.0000	0.0000	0.0000	0.0000	0.2209
33	1650	0.0034	1.0386	0.0037	1.1128	0.0682		0.0000	0.0000	0.0000	0.0000	0.2209
34	1700	0.0001	0.0371	0.0002	0.0742	0.0541		0.0000	0.0000	0.0000	0.0000	0.2209
35	1750	0.0013	0.4080	0.0016	0.4822	0.0643		0.0000	0.0000	0.0000	0.0000	0.2209
36	1800	0.0002	0.0742	0.0002	0.0742	0.0511		0.0000	0.0000	0.0000	0.0000	0.2209
37	1850	0.0010	0.2967	0.0016	0.4822	0.0608		0.0000	0.0000	0.0000	0.0000	0.2209
38	1900	0.0001	0.0371	0.0001	0.0371	0.0484		0.0000	0.0000	0.0000	0.0000	0.2209
39	1950	0.0023	0.7047	0.0032	0.9644	0.0577		0.0000	0.0000	0.0000	0.0000	0.2209
40	2000	0.0001	0.0371	0.0001	0.0371	0.0460		0.0000	0.0000	0.0000	0.0000	0.2209

5. Voltage fluctuations and flicker: EN 61000-3-3

Test applicable [ ] Not applicable [X]. Comment: EUT is not suspected to make any voltage fluctuations or flicker.

Scope
Applicable to mains operated equipment (>= 220Vac) with input current <= 16A per phase.

According to § 6.1 of this standard, test shall not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker.

Measurements (shortform) :
Test setup shall be normal use with max. load according to standards.

Value	Limit	Measured value
*Pst	1.0	
*Pit	0,65	
Dc steady-state	≤ 3%	
Dmax	≤ 4% (6% or 7%**)	
Dc during voltage change	> 3,3% in less than 500 ms	

*If voltage changes are caused by manual switching or occurs less than once per hour this requirements do not apply
** see standard § 5

Comments

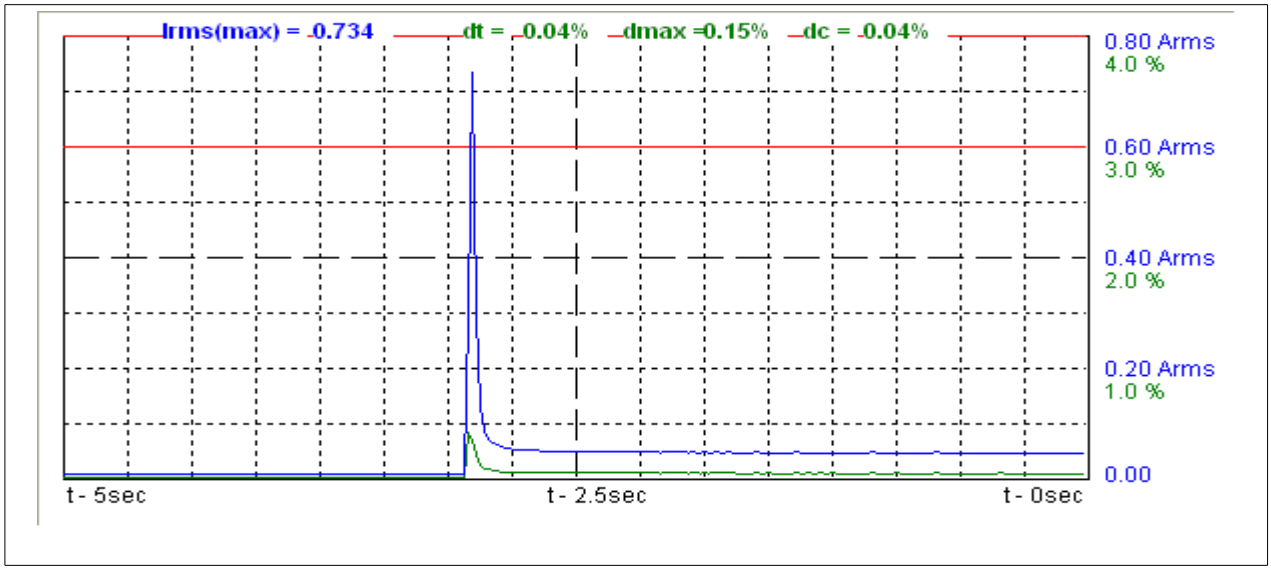
Tested by : Michael Jørgensen
Date : 16-04-2013

6. Inrush current

Test applicable [X] Not applicable [ ]. Comment: PT5211.

I_{ref}	Limit; 10 x I_{ref}	Measured inrush current	Pass
1,6A	16A	0,74A	OK

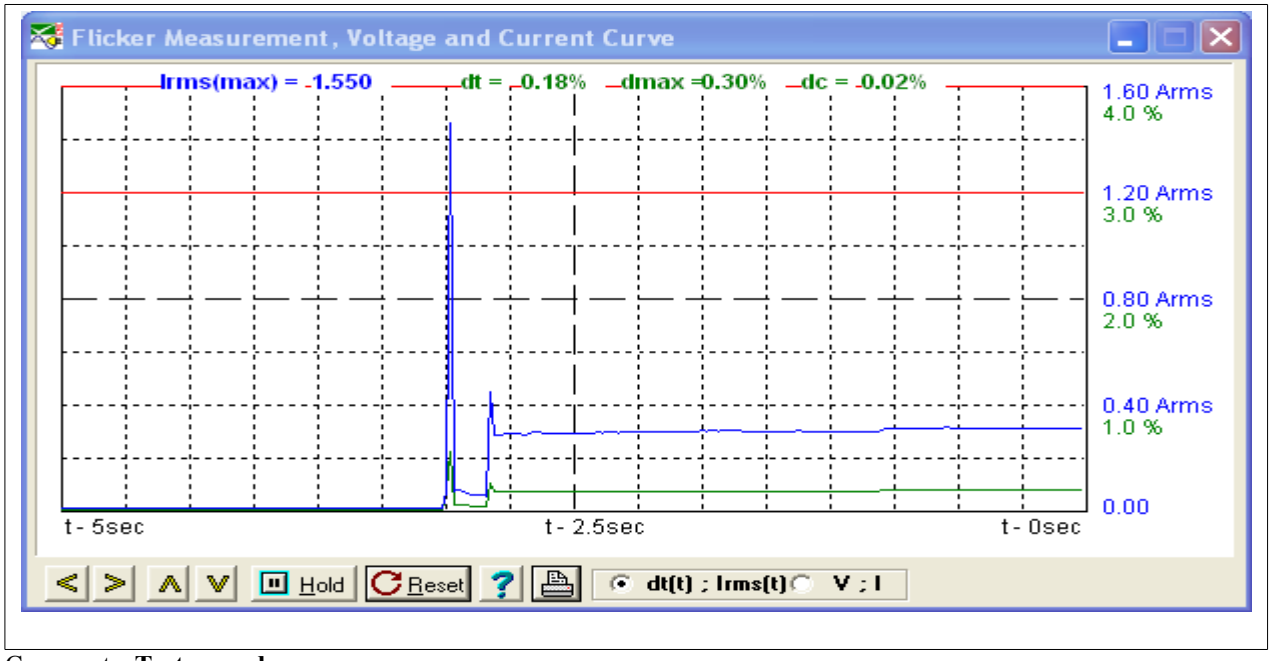
I_{ref} = I fuse rating



Test applicable [X] Not applicable [ ]. Comment: PT5300.

I_{ref}	Limit; 10 x I_{ref}	Measured inrush current	Pass
1,6A	16A	1,44A	OK

I_{ref} = I fuse rating



Comments: **Test passed.**

Tested by : Michael Jørgensen
Date : 06-05-2013

7. ESD-Test: EN 61000-4-2

Test applicable [X] Not applicable [ ]. Comment:

Test 1 (shortform) :
Discharge on product on typical operator accessible points.
Contact: 10 discharges pr. points, min. 1 sec. interval (per polarity) min. different 4 points. If no test points available, 200 discharges at VCP (see Test 2).
Air discharges: at slots, apertures and insulating surfaces. 10 discharges pr. Points
No discharge to open connectors.
E1, E2, E3 and E5; 4 kV contact and 8 kV air discharge
E4; 2 kV contact and 4 kV air discharge

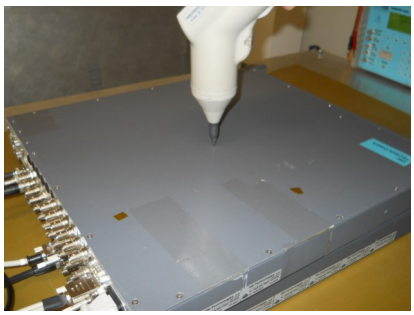
Test is performed with increasing voltages 2, 4, 8 kV

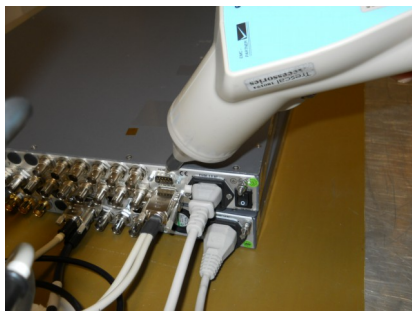
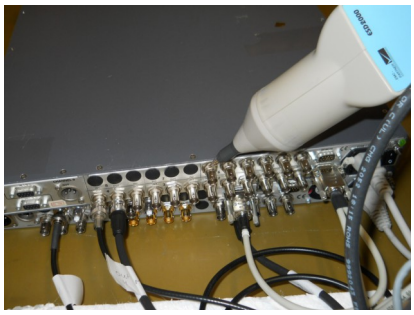
Performance criterion B

No	Discharge point PT5211	Number of discharges	Voltage Polarity	Air 8 kV	Contact 4 kV
1	Top side of cabinet	20	+/-		OK
2	Sides of cabinet	20	+/-		OK
3	Bottom side of cabinet	20	+/-		OK
4	Front side of cabinet	20	+/-	OK	
5	Front side around buttons	20	+/-	OK	
6	Left DSUB conn. On back side	20	+/-		OK
7	BNC conn. On back side	20	+/-		OK
8	XLR conn. On back side	20	+/-		OK

Comments: **Test passed.**

- Pictures from the ESD on the PT5211 ChangeOver.

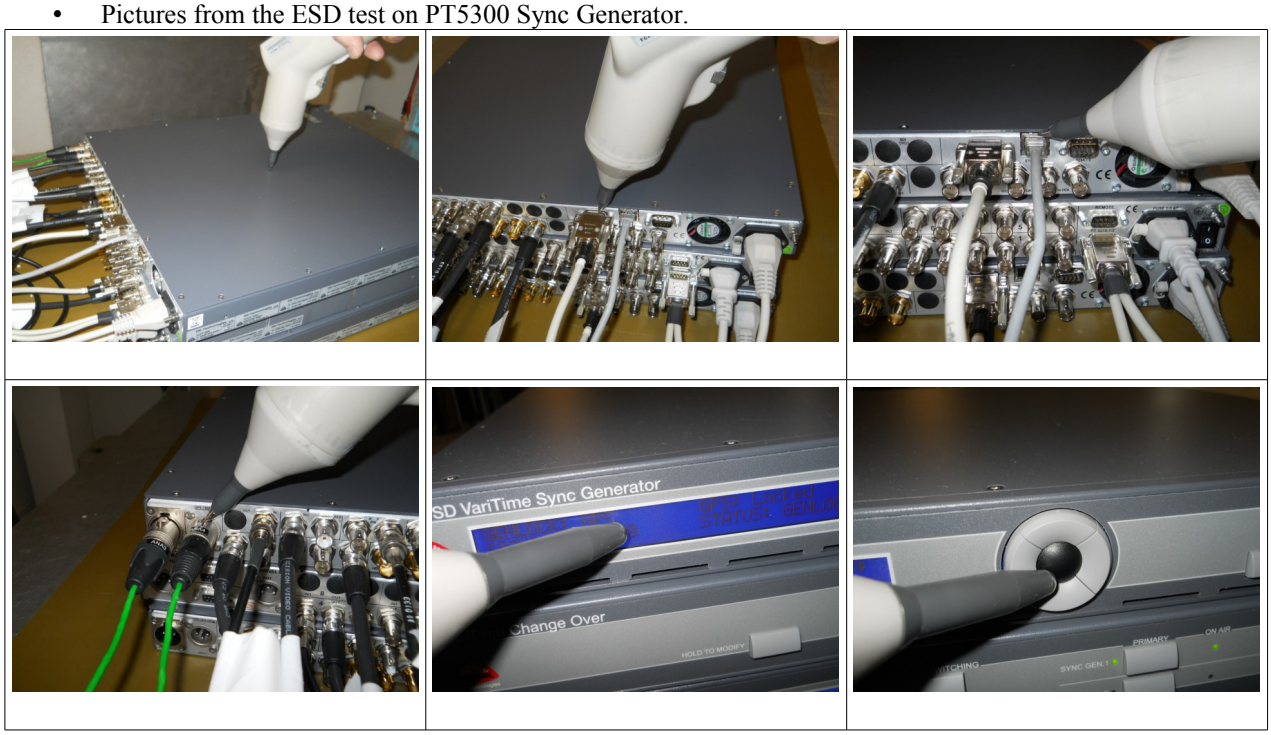


No	Discharge point PT5300	Number of discharges	Voltage Polarity	Air 8 kV	Contact 4 kV
1	Top side of cabinet	20	+/-		OK
2	Sides of cabinet	20	+/-		OK
3	Bottom side of cabinet	20	+/-		OK
4	Front side of cabinet	20	+/-	OK	
5	Front side around buttons	20	+/-	OK	
	Front side over display area	20	+/-	OK	
6	Left DSUB conn. On back side	20	+/-		OK
7	BNC conn. On back side	20	+/-		OK

Comments: **Test passed.**

- Pictures from the ESD test on PT5300 Sync Generator.



Test 2 (shortform) :
Discharges on the horizontal coupling plane (HPC) (ground plane) and vertical coupling plane (VPC) according to standard.
10 discharges on each position min. 1 sec. interval applied to the edge of the plans.

Contact discharge (4 kV).

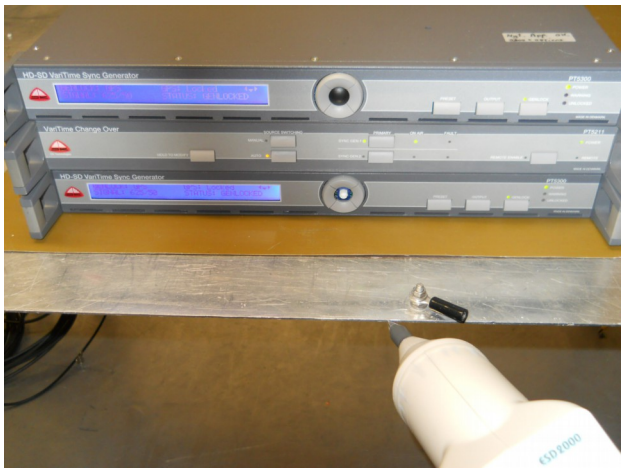
Performance criterion B

No	Positions	Number of discharges	Voltage Polarity	Contact 4 kV
1	In front of product at HPC	20	+/-	OK
2	In front of product at VPC	20	+/-	OK
3	Behind product at VPC	20	+/-	OK
4	Left side of product at VPC	20	+/-	OK
5	Right side of product at VPC	20	+/-	OK

Comments: **Test passed.**

Tested by : Michael Jørgensen
Date : 06-05-2013

- Pictures from the ESD to the coupling planes.


ESD to the horizontal coupling plane.


ESD to the vertical coupling plane.

8.EM Field immunity; EN 61000-4-3

Test applicable [X] Not applicable [ ]. Comment:

Measurements (shortform) :
Test setup shall be normal use with max. load according to standards.
80 to 1000 MHz 80% AM (1kHz),
E1, E2, E3; 3 V/m
E4; 1 V/m
E5; 10 V/m
The product shall be observed during the test and be operating. After test, the product should be tested to be sure that no errors or changes in mode have occurred.

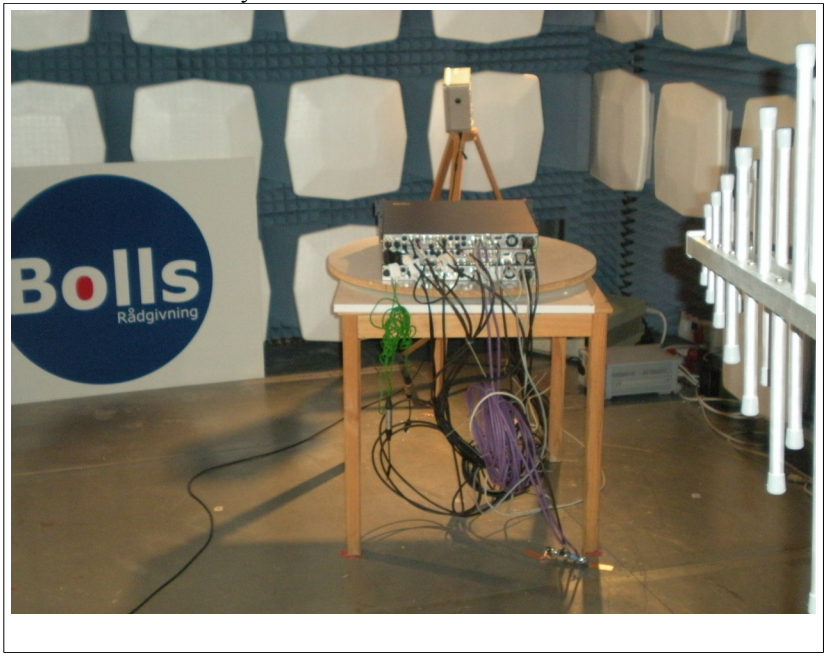
Performance criterion A.

Antenna & product position :	**80M–1GHz OK/not OK**	**Comments:**
Vertical & front :	OK	
Vertical & back :	OK	
Vertical & right side :	OK	
Vertical & left side :	OK	
Horizontal & front :	OK	
Horizontal & back :	OK	
Horizontal & right side :	OK	
Horizontal & left side :	OK	

Comments: **Test passed.**

Tested by : Michael Jørgensen
Date : 16-04-2013

- Picture from the radiated immunity test.



9. Burst Test: EN 61000-4-4

Test applicable [X] Not applicable [ ]. Comment:

Test 1 - immunities on ac input/output powerport:
Product is in normal operating mode.
E1, E2, E3; 1kV
E4; 0.5 kV
E5; 2 kV
Test is performed as 1 min. positive and 1 min. negative pulses.

Performance criterion B
Test applicable [X] Not applicable [ ]. Comment:

Port :	0,5 kV +	0,5 kV -	1 kV +	1 kV -	2 kV +	2 kV -	Comments:
AC-port :	OK	OK					

Test 2 - immunities on signal- and controlport:
(Test is only performed if connection cable is over 3 meter.)
Product is in normal operating mode. Test set-up according to IEC 61000-4-4. Signal or control cables shall be placed in the capacitive coupling clamp.
E1, E2, E3, E4; 0.5kV
E5; 1 kV
Test is performed as 1 min. positive and 1 min. negative pulses.

Performance criterion B
Test applicable [X] Not applicable [ ]. Comment:

Port :	0,25 kV +	0,25 kV -	0,5 kV +	0,5 kV -	1 kV +	1 kV -	Comments:
BB 8 (BNC)	OK	OK	OK	OK			
WC (BNC)	OK	OK	OK	OK			
LTC B (BNC)	OK	OK	OK	OK			
TLS 1 (BNC)	OK	OK	OK	OK			
AES 3 (BNC)	OK	OK	OK	OK			
HD-SDI (BNC)	OK	OK	OK	OK			
Ethernet (BNC)	OK	OK	OK	OK			
LTC A (XLR)	OK	OK	OK	OK			
AES3 1 (XLR)	OK	OK	OK	OK			

Test 3 - immunities on dc input/output powerport:
(Test is only performed if connection cable is over 3 meter.)
Product is in normal operating mode. Test set-up according to IEC 61000-4-4. Cables shall be placed in the capacitive coupling clamp.
E1, E2, E3, E4; 0.5kV
E5; 2 kV
Test is performed as 1 min. positive and 1 min. negative pulses.

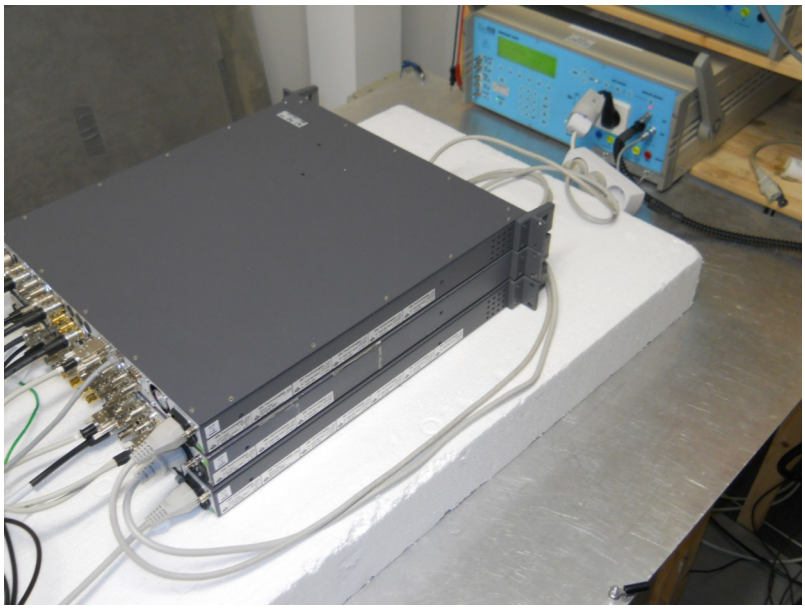
Performance criterion B
Test applicable [ ] Not applicable [X]. Comment: No DC input / output power ports.

Port :	0,25 kV +	0,25 kV -	0,5 kV +	0,5 kV -	2 kV +	2 kV -	Comments:

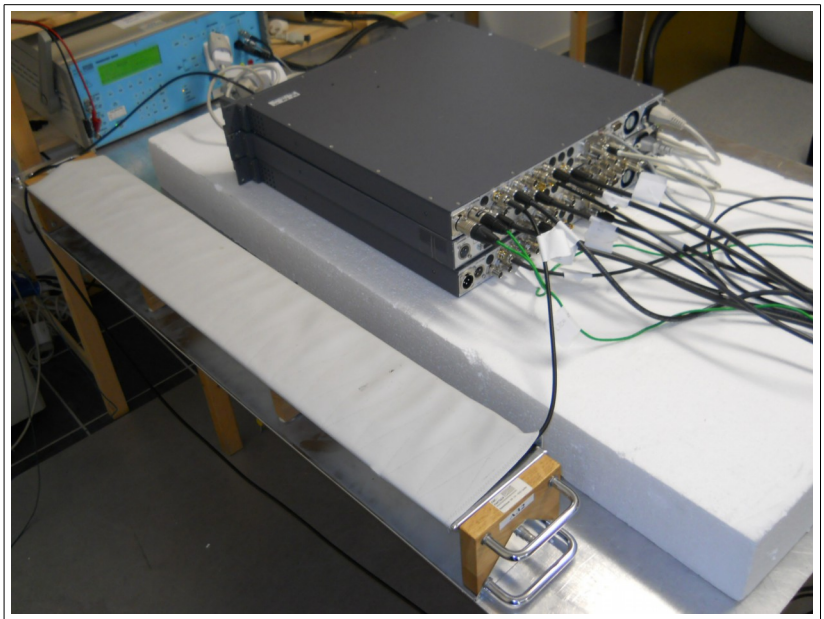
Comments

Tested by : Michael Jørgensen
Date : 17-05-2013

- Pictures from the burst, surge and voltage dip tests on the power port.



- Picture from the burst on cables test.



10. Surge: EN 61000-4-5

Test applicable [X] Not applicable [ ]. Comment:

Immunities on AC powerport :
E1, E2, E3; 0,5 kVolt Line to Line and 1 kVolt Line to ground .
E4; 0,5 kVolt Line to ground
E5; 2 kVolt Line to ground
Couplings network is used, and both positive and negative pulses are used, minimum 5 sec. between pulses and at least 5 pulses of each.

Performance criterion B
Test applicable [X] Not applicable [ ]. Comment:

Port :	0,5 kVolt +	0,5 kVolt -	1 kVolt +	1 kVolt -	2 kVolt +	2 kVolt -	Comments
L - PE	OK	OK					
N - PE	OK	OK					

Comments: **Test passed.**

Tested by : Søren Carlsen / Michael Jørgensen
Date : 17-04-2013

Nbr.	Nominal	Syncro	V-peak	I-peak
1. Coupling SURGE to: L-PE				
1	+ 500V	90	+ 819V	+ 9A
2	+ 500V	90	+ 814V	+ 9A
3	+ 500V	90	+ 816V	+ 9A
4	+ 500V	90	+ 818V	+ 9A
5	+ 500V	90	+ 814V	+ 9A
6	- 500V	270	- 821V	- 10A
7	- 500V	270	- 822V	- 9A
8	- 500V	270	- 820V	- 9A
9	- 500V	270	- 817V	- 9A
10	- 500V	270	- 820V	- 9A
2. Coupling SURGE to: N-PE				
1	+ 500V	90	+ 482V	+ 9A
2	+ 500V	90	+ 484V	+ 8A
3	+ 500V	90	+ 483V	+ 8A
4	+ 500V	90	+ 485V	+ 8A
5	+ 500V	90	+ 481V	+ 8A
6	- 500V	270	- 487V	- 9A
7	- 500V	270	- 488V	- 9A
8	- 500V	270	- 488V	- 9A
9	- 500V	270	- 485V	- 9A
10	- 500V	270	- 485V	- 9A

Test Result : Test completed

11. RF immunity on cables: EN 61000-4-6

Test applicable [X] Not applicable [ ]. Comment:

Scope
Test applies to signal and control ports if cable is or can be longer than 1 m.

Test1 signal / control ports and ac power ports
0,15 – 80MHz minimum 80% AM.
E1, E2, E3; 3 V/m
E4; 1V/m
E5; 10 V/m

Test setup as pr. standard. Product in normal operating mode.

Performance criterion A

Cable:	**0,15 – 80MHz 1 V/m**	**Comments:**
AC power port PT5211 & PT5300	OK *)	
GPS in	OK *)	
LTC A	OK *)	
AES3 1	OK *)	

*) Has been tested with 3Vrms.

Test2 dc power ports
0,15 – 80MHz minimum 80% AM.
E1, E2, E3, E4; 3 V/m
E5; 10 V/m

Test setup as pr. standard. Product in normal operating mode.

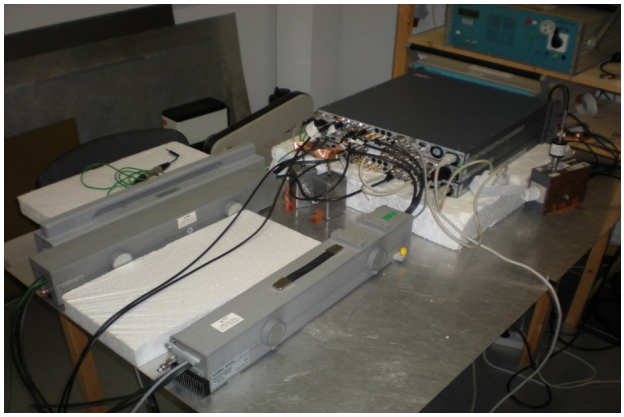
Performance criterion A

Cable:	**0,15 – 80MHz 1 V/m**	**Comments:**

Comments: **Test passed.**

Tested by : Michael Jørgensen
Date : 16-04-2013.

- Pictures from the RF on cables test.


Equipment under test.


Ancillary equipment.

12. Power freq. magnetic field: EN55103-2 Annex A

Test applicable [X] Not applicable [ ]. Comment:

Scope
Test applies to enclosure (including cables)

Test
Test setup as pr. standard (Annex A). Product in normal operating mode.
Test is performed in three directions.

E1

Frequency	A/m
50 Hz – 5kHz	1 – 0,01*
5 kHz – 10 kHz	0,01

E2 and E3

Frequency	A/m
50 Hz – 5kHz	3 – 0,03*
5 kHz – 10 kHz	0,03

E4

Frequency	A/m
50 Hz – 5kHz	0,8 – 0,008*
5 kHz – 10 kHz	0,008

E5

Frequency	A/m
50 Hz – 5kHz	10 – 0,1*
5 kHz – 10 kHz	0,1

** decreasing linearly with the logarithm of the frequency*

Performance criterion A

H-field direction	OK / Not OK	Comments:
Vertical 1	OK	
Vertical 2	OK	
Horizontal	OK	

Comments: **Test passed.**

Tested by : Søren Carlsen
Date : 17-04-2013

- Picture from the magnetic fields test.

13. AF Common mode: EN 55103-2 Annex B

Test applicable [X] Not applicable [ ].
Comment:

Scope
Test applies to balanced ports to which may be attached cables whose total length according to the manufacturer's functinoal specification may exceed 10 m.

Test frequency range 50 Hz – 10 kHz

Test is performed to 'LTC A'.and 'AES3 1' outputs on PT5300.
Both output ports are considered a BP 3 port according to EN 55103-2 Annex B, and test method and configuration B.3.3 option 1 is used.

Test performed with an equaliser circuit consisting of R1 = 470 Ω, L = 3x100 µH, R2 = 1 Ω, Current transformer 1:2, and Vin = 47 VAC.

Test frequencies are chosen as 50, 70, 100, 200, 500, 700, 1000, 2000, 5000, 7000 and 10000Hz.

Compliance level: according to EN 55103-2 Annex B

Performance criterion A

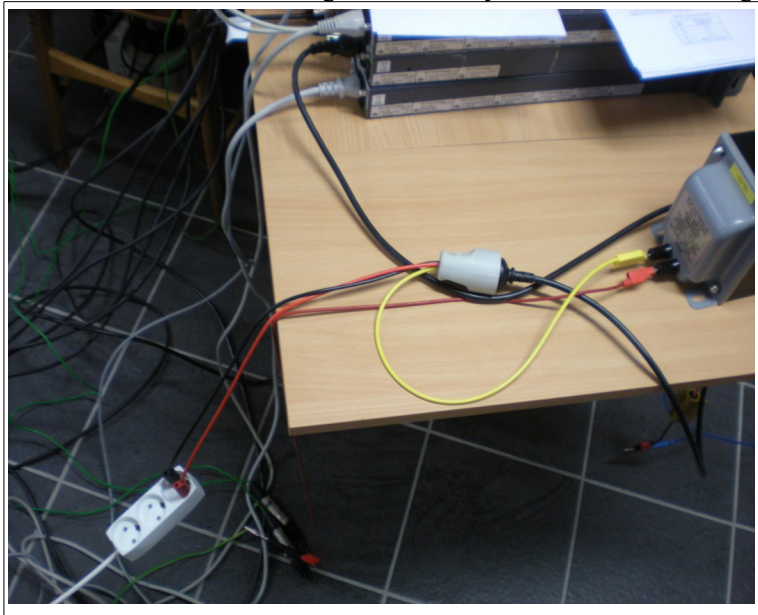
Cable:	50 Hz – 10 kHz	Comments:
LTC A	OK	
AES3 1	OK	

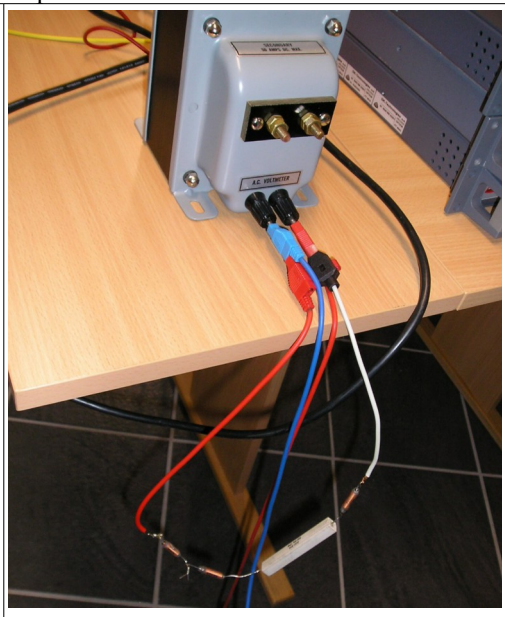
Comments: Test passed.

Requirements according to EN 55103-2 EMC environments E1 - E5 fulfilled

Tested by : Michael Jørgensen
Date : 02-05-2013

- Pictures from the magnetic immunity of balanced I/O and signal ports.





14.Voltage dips/interruptions: EN 61000-4-11

Test applicable [X] Not applicable [ ]. Comment:

The voltage is adjusted to 230 Vac and the following dips/interruptions are introduced (3 dips in a period > 10 sec.):

Reduction in %	Voltage	Time	OK / not OK	Performance criteria	Comment
95%	11 Vac	5 s	OK	C	
60%	92 Vac	100 ms	OK	C	
100%	0 Vac	20 ms	OK	B	

Comments: **Test passed.**

Tested by : Søren Carlsen / Michael Jørgensen
Date : 16-04-2013

15. Conclusion and Remarks

- EUT has passed all tests.

16. List of instruments:

Radiated emission:

Instrument	Manufacturer	Type	Serial number
Shielded room	Euroshield	RFD-F/A-100	1758
Test receiver	R&S	ESPI 7	100107
Antenna	Schwarzbeck	9161/4007	4007
Antenna preamplifier	BI	20 MHz-3 GHz	A94
LISN	R & S	ENV216	3560.6550.02

Conducted emission mains 150kHz – 30 MHz:

Instrument	Manufacturer	Type	Serial number
Shielded room	Euroshield	RFD-F/A-100	1758
Test receiver	R&S	ESPI 7	100107
LISN	R & S	ENV216	3560.6550.02

Magnetic field emission: EN55103-1

Instrument	Manufacturer	Type	Serial number
Coil	Schwarzbeck	FESP 5133	9767
Scope	Pico	PicoScope 2205	AS292/394
PC w. picoscope software	Toshiba	Laptop	43774161G

Radiated RF immunity:

Instrument	Manufacturer	Type	Serial number
Shielded room	Euroshield	RFD-F/A-100	1758
Generator	R&S	SMC 100A	101162
Antenna	Schwarzbeck	BBHA9120	-
Antenna	Schwarzbeck	VULB9161/4007	4007
Amplifier	BI	1 – 3 GHz / 8W	
Amplifier	BI	20-1000MHz / 100W	
Field strength meter	Holaday	HI3004	39126
Field strength meter sensor	Holaday	HSE-04	169

Harmonic current and flicker:

Instrument	Manufacturer	Type	Serial number
Power Analyzer Software	EMC Partner	HARC 1000 Ver. 4.16	
Power Analyzer	EMC Partner	HARMONIC 1000	028

Magnetic field immunity: EN55103-2 Annex A

Instrument	Manufacturer	Type	Serial number
Power amplifier	Pascal Audio	-	-
Meter	Fluke	189	-
Helmholt	TDC	-	-

Conducted AF immunity: EN55103-2 Annex B

Instrument	Manufacturer	Type	Serial number
Power amplifier	Pascal Audio	-	-
Meter	Fluke	189	-
Audio isolation transformer	Solar Electronics	6220-1A	-

Conducted RF immunity:

Instrument	Manufacturer	Type	Serial number
Generator	R&S	SMC 100A	101162
Amplifier	Amplifier Research	75A250	19163
CDN	BI	CDN –S1	A22
CDN	BI	CDN –S1	A23
CDN	BI	CDN –S1	A71
CDN	TDC	CDN –AF3	19187
Clamp	LÛTHI	EM101	35962
Clamp	FCC	F-203I-23MM	487

ESD, Surge, Burst and Voltage dips and variation immunity

Instrument	Manufacturer	Type	Serial number
Generator	EMC Partner	Transient 2000	990
Clamp	EMC partner	CNEFT 1000-194	-