



**CTS (NINGBO) TESTING SERVICE TECHNOLOGY
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

EMC TEST REPORT

TEST REPORT NUMBER : CGZ3130905-00824-E-D



CTS (Ningbo) Testing Service Technology Co., Ltd.
2/F., South Tower, Huoju Building, No.181, Canghai Road,
Jiangdong Science and Technology Park, Ningbo, Zhejiang, China



TEST REPORT EN 61000-6-3:2007+A1:2011 Electromagnetic compatibility (EMC) —Part 6-3: GenLeo standards — Emission standard for residential, commercial and light-industrial environments EN 61000-6-1:2007 Electromagnetic compatibility (EMC) —Part 6-1: GenLeo standards — Immunity for residential, commercial and light-industrial environments	
Report Reference No.	CGZ3130905-00824-E-D
Date of issue	10 September 2013
Testing Laboratory Name	CTS (Ningbo) Testing Service Technology Co., Ltd.
Address	GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China
Testing location/ procedure	Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
Applicant's name	Processing Point, Inc
Address	2796 Loker Avenue West, Suite 111, Carlsbad, CA 92010
Test specification:	
Standard	EN 61000-6-3:2007+A1:2011, EN 61000-6-1:2007 EN 61000-3-2: 2006+A2:2009 ,EN 61000-3-3: 2008
Test Report Form No.	CTSEMC-1.0
TRF Originator	CTS (Ningbo) Testing Service Technology Co., Ltd.
Master TRF	Dated 2009-01
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Test item description.	ELECTRONIC TIME RECORDER
Trade Mark	uPunch
Manufacturer	Processing Point, Inc
Model/Type reference	HN1000
Ratings	13V by adapter; Adapter Input AC 100~240V, 50/60Hz, Output:13V
Result	PASSED

Compiled by:

Kate

Kate zhang /File administrators

Supervised by:

Duke

Duke yang / Technique principal

Approved by:

Vincent Yao

Vincent yao / Manager

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EMC -- TEST REPORT

Test Report No. : CGZ3130905-00824-E-D	<u>10 September 2013</u> Date of issue
---	---

Type / Model.....	HN1000
EUT.....	ELECTRONIC TIME RECORDER
Applicant.....	Processing Point, Inc
Address.....	2796 Loker Avenue West, Suite 111, Carlsbad, CA 92010
Telephone.....	+(760) 846-3524
Fax.....	+(800)357-0298
Contact.....	Andrew
Manufacturer.....	Processing Point, Inc
Address.....	2796 Loker Avenue West, Suite 111, Carlsbad, CA 92010
Telephone.....	+(760) 846-3524
Fax.....	+(800)357-0298
Contact.....	Andrew
Factory.....	Processing Point, Inc
Address.....	2796 Loker Avenue West, Suite 111, Carlsbad, CA 92010
Telephone.....	+(760) 846-3524
Fax.....	+(800)357-0298
Contact.....	Andrew

Special description:
 This is an additional test report which is based on the original report **CGZ3130905-00822-E**. There are no any difference among the models except for the applicant, product name and product models and displace following identical model(s). After review, no additional test should be carried out.

The test report merely corresponds to the test sample.
 It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

EN 61000-6-3:2007+A1:2011 Electromagnetic compatibility (EMC) —Part 6-3: GenLeo standards — Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1:2007 Electromagnetic compatibility (EMC) —Part 6-1: GenLeo standards — Immunity for residential, commercial and light-industrial environments

EN 61000-3-2: 2006+A2:2009 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3: 2008 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current \leq 16 A per phase and not subject to conditional connection.

2 SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	05 September 2013
Testing commenced on	05~06 September 2013
Testing concluded on	10 September 2013

2.2 FINAL ASSESSMENT

The EMC requirements pertaining to the technical standards and tested operation modes are

- fulfilled.

- **not** fulfilled.

The equipment under test

- fulfils the EMC requirements cited on page 1.

- **does not** fulfil the EMC requirements cited on page 1.



3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage: AC 230V/50Hz
 Others

3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: 1
Serial number: Prototype

3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

- Normal

Operating Mode: Normal

Emissions tests.....: According to EN 61000-6-3, searching for the highest disturbance.

Immunity tests: According to EN 61000-6-1, searching for the highest susceptibility.

Harmonic current..... : According to EN 61000-3-2, searching for the highest disturbance.

Voltage fluctuation.....: According to EN 61000-3-3, searching for the highest disturbance.

3.4 EUT configuration

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement:

Not Applicable

3.5 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

3.6 Definition related to the performance level

- based on the used product standard
- based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

Criterion C:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

Criterion D:

Definition: loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data:

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China

Tel: +86-20-85543113 (32 lines)

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4.2 Test facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L3394

CTS (Ningbo) Testing Service Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01: 2006 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

IC-Registration No.: 8374A

The 3m Alternate Test Site of CTS (Ningbo) Testing Service Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374A on June 06, 2011 .

FCC-Registration No.: 971995

CTS (Ningbo) Testing Service Technology Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration No.971995, July 13, 2012.

4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 ° C
Humidity:	25~75 %
AtmosphLeo pressure:	86~106 kPa

4.4 Definitions of symbols used in this test report

- - The black square indicates that the listed condition, standard or equipment is applicable for this report.
- - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the CTS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±1.22dB	(1)
Power disturbance	30MHz~300MHz	±1.38dB	(1)
Radiation emission (3m)	30MHz~300MHz	±3.14dB	(1)
	300MHz~1000MHz	±3.18dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.7 Test Description

4.7.1 Description of Standards and Results

EMISSION (EN 61000-6-3:2007+A1:2011)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 61000-6-3:2007+A1:2011	Class B	PASS
Conducted disturbance at telecommunication port	EN 61000-6-3:2007+A1:2011	Class B	N/A
Radiated disturbance	EN 61000-6-3:2007+A1:2011	Class B	PASS
Harmonic current emissions	EN 61000-3-2:2006+A2:2009	Class A	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2008	-----	PASS
IMMUNITY (EN 61000-6-1:2007)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	IEC 61000-4-2: 2008	B	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006 +A1:2007+A2:2010	A	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2012	B	PASS
Surge (Input a.c. power ports)	IEC 61000-4-5: 2005	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6: 2008	A	PASS
Power frequency magnetic field	IEC 61000-4-8: 2009	A	PASS
Voltage dips, >95% reduction	IEC 61000-4-11: 2004	B	PASS
Voltage dips, 30% reduction		B	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

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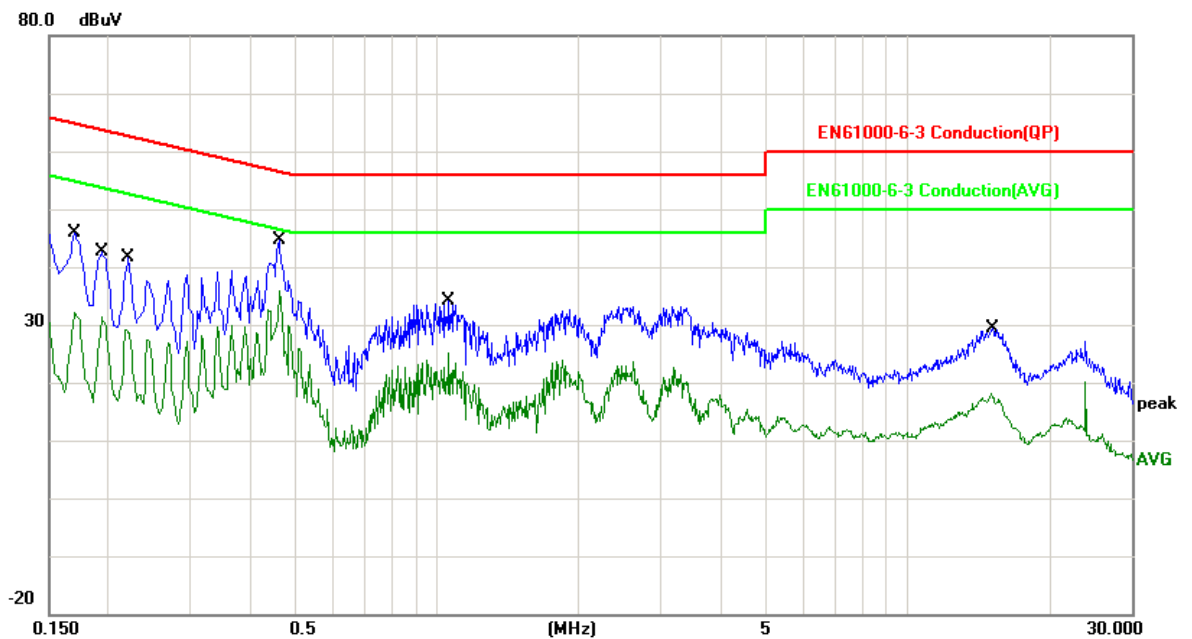
5.1.4 Test result

The requirements are	Fulfilled
Band width	9kHz
Frequency range	0.15 MHz - 30 MHz
Min. limit margin	>10.03 dB at 0.15 - 30 MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.1.5 Test protocol

Test point	L	Result:	■ - passed
Operation mode	Normal		□ - not passed
Remarks:			
EUT	ELECTRONIC TIME RECORDER		
MODEL NO.	HN1000		
Operating Condition	AC 230V/50Hz		
Test Condition	Ambient Temperature: 24°C Humidity: 56%		
Operator	Leo		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	9.78	34.65	44.43	64.96	-20.53	QP
2	0.1700	9.78	23.08	32.86	54.96	-22.10	AVG
3	0.1940	9.78	31.18	40.96	63.86	-22.90	QP
4	0.1940	9.78	21.53	31.31	53.86	-22.55	AVG
5	0.2220	9.78	26.84	36.62	62.74	-26.12	QP
6	0.2220	9.78	18.18	27.96	52.74	-24.78	AVG
7	0.4620	9.83	32.67	42.50	56.66	-14.16	QP
8	0.4620	9.83	26.21	36.04	46.66	-10.62	AVG
9	1.0620	9.83	21.84	31.67	56.00	-24.33	QP
10	1.0620	9.83	12.59	22.42	46.00	-23.58	AVG
11	15.1780	9.94	13.38	23.32	60.00	-36.68	QP
12	15.1780	9.94	6.78	16.72	50.00	-33.28	AVG

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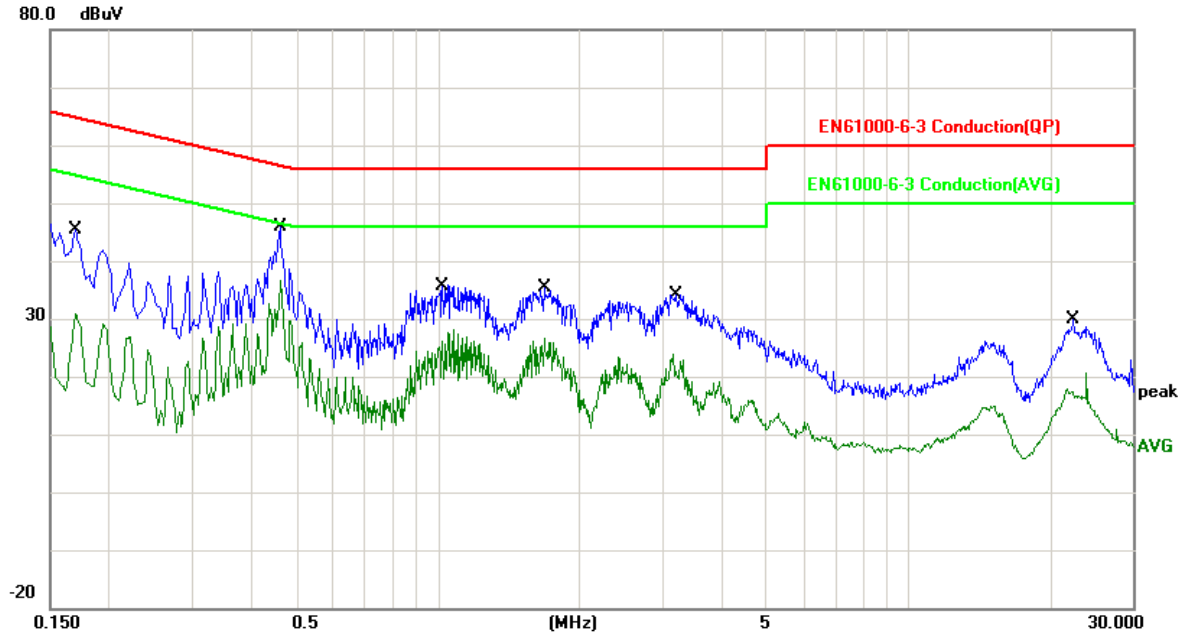
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Test point:	N	Result:	■ - passed
Operation mode:	Normal		□ - not passed
Remarks:			



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	9.78	33.78	43.56	64.96	-21.40	QP
2	0.1700	9.78	21.17	30.95	54.96	-24.01	AVG
3	0.4620	9.83	32.97	42.80	56.66	-13.86	QP
4	0.4620	9.83	26.80	36.63	46.66	-10.03	AVG
5	1.0260	9.83	22.04	31.87	56.00	-24.13	QP
6	1.0260	9.83	13.20	23.03	46.00	-22.97	AVG
7	1.6820	9.85	22.84	32.69	56.00	-23.31	QP
8	1.6820	9.85	14.01	23.86	46.00	-22.14	AVG
9	3.2220	9.89	18.24	28.13	56.00	-27.87	QP
10	3.2220	9.89	8.26	18.15	46.00	-27.85	AVG
11	22.4540	10.03	12.85	22.88	60.00	-37.12	QP
12	22.4540	10.03	6.03	16.06	50.00	-33.94	AVG

Note: Level=Reading+Factor. Margin= Limit-Level

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5.2 Radiated disturbance (electric field)

For test instruments and accessories used see section 6 part 6.1.

5.2.1 Description of the test location

Test location : Semi-Anechoic chamber

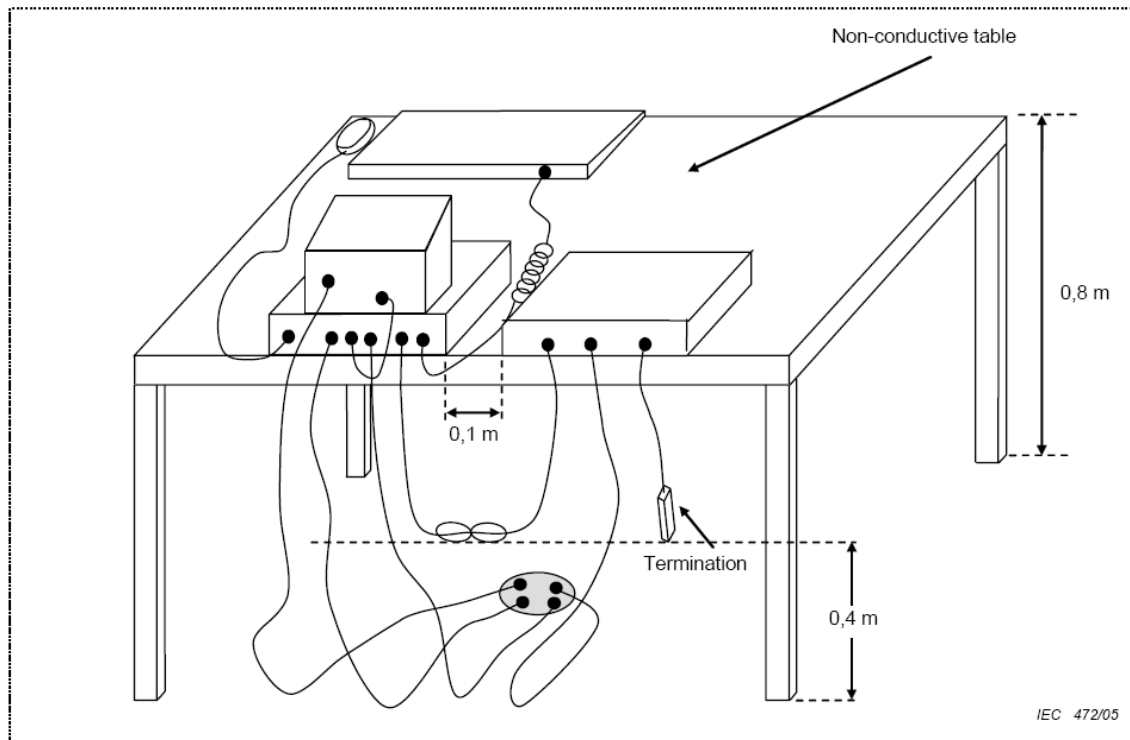
Test disturbance: 3 Meter

5.2.2 Description of the test set-up

5.2.2.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.2.2.2 Block Diagram of Test Setup



5.2.3 Limits of disturbance (Class B)

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
 (2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

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5.2.4 Test result

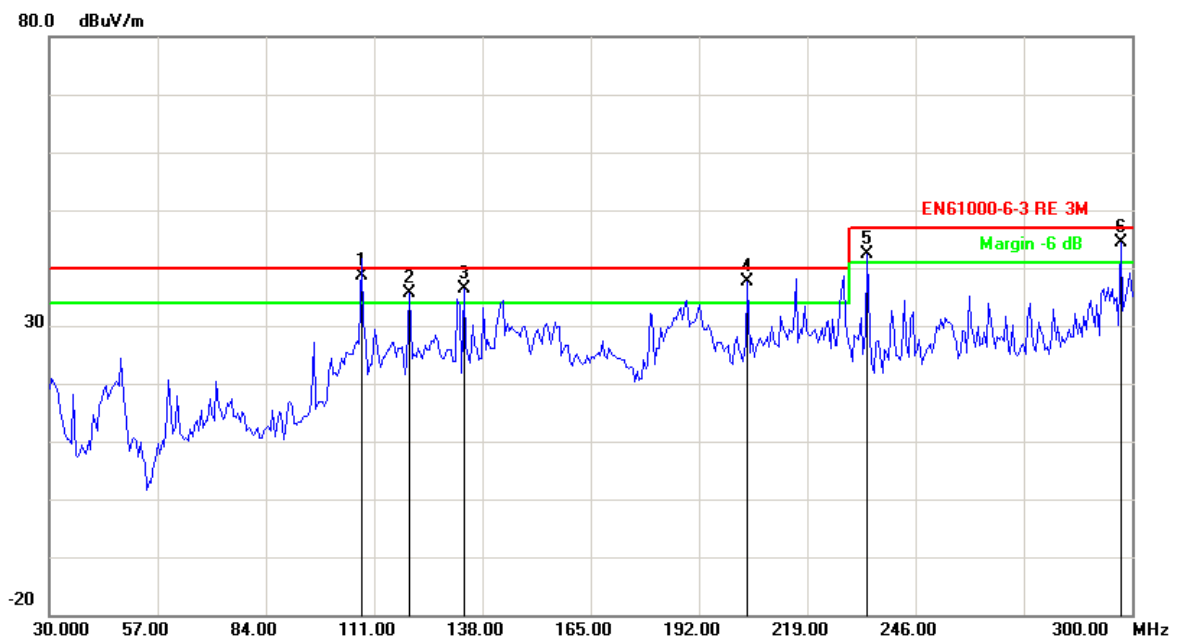
The requirements are	Fulfilled
Band width	120kHz
Frequency range	30 MHz - 1000 MHz
Min. limit margin	>1.02 dB at 30 - 1000 MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.2.5 Test protocol

Test point:	Horizontal	Result:	<input checked="" type="checkbox"/> - passed
Operation mode	Normal		<input type="checkbox"/> - not passed
Remarks:			

EUT	ELECTRONIC TIME RECORDER
MODEL NO.	HN1000
Operating Condition	AC 230V/50Hz
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Leo



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	107.9158	-21.09	59.82	38.73	40.00	-1.27	QP
2	119.8196	-18.17	53.85	35.68	40.00	-4.32	QP
3	133.3467	-16.83	53.28	36.45	40.00	-3.55	QP
4	204.2285	-12.41	49.99	37.58	40.00	-2.42	QP
5	233.9880	-12.66	55.12	42.46	47.00	-4.54	QP
6	297.2946	-5.97	50.32	44.35	47.00	-2.65	QP

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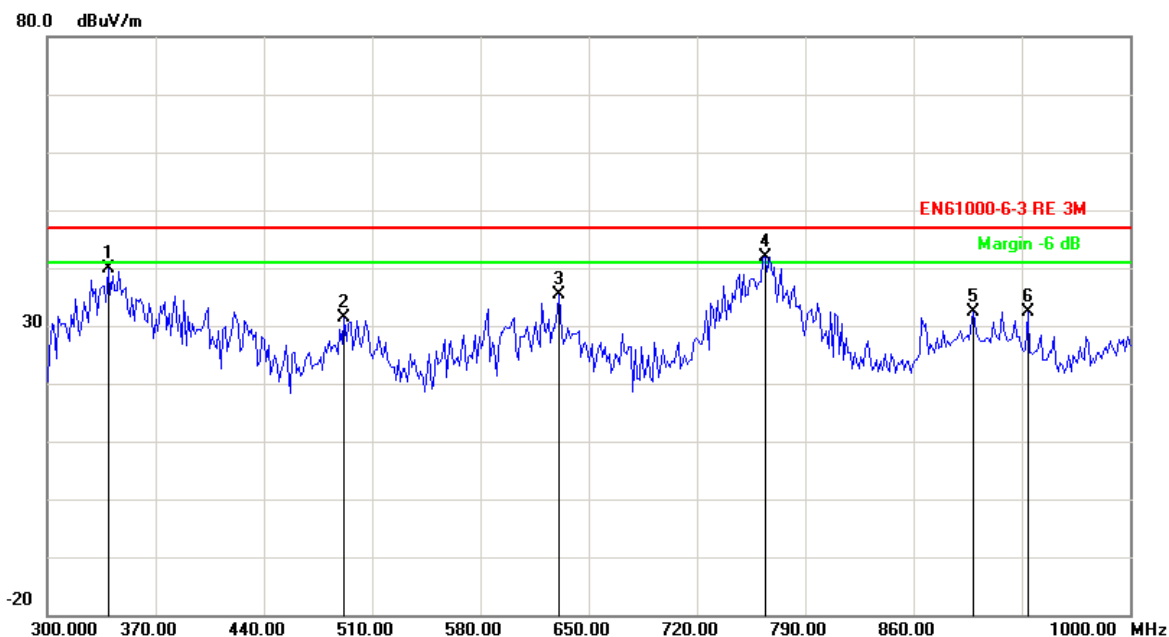
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	339.2785	-13.29	53.18	39.89	47.00	-7.11	QP
2	492.1843	-9.98	41.38	31.40	47.00	-15.60	QP
3	631.0621	-7.37	42.67	35.30	47.00	-11.70	QP
4	764.3286	-5.59	47.56	41.97	47.00	-5.03	QP
5	898.9979	-3.96	36.39	32.43	47.00	-14.57	QP
6	934.0681	-6.26	38.76	32.50	47.00	-14.50	QP

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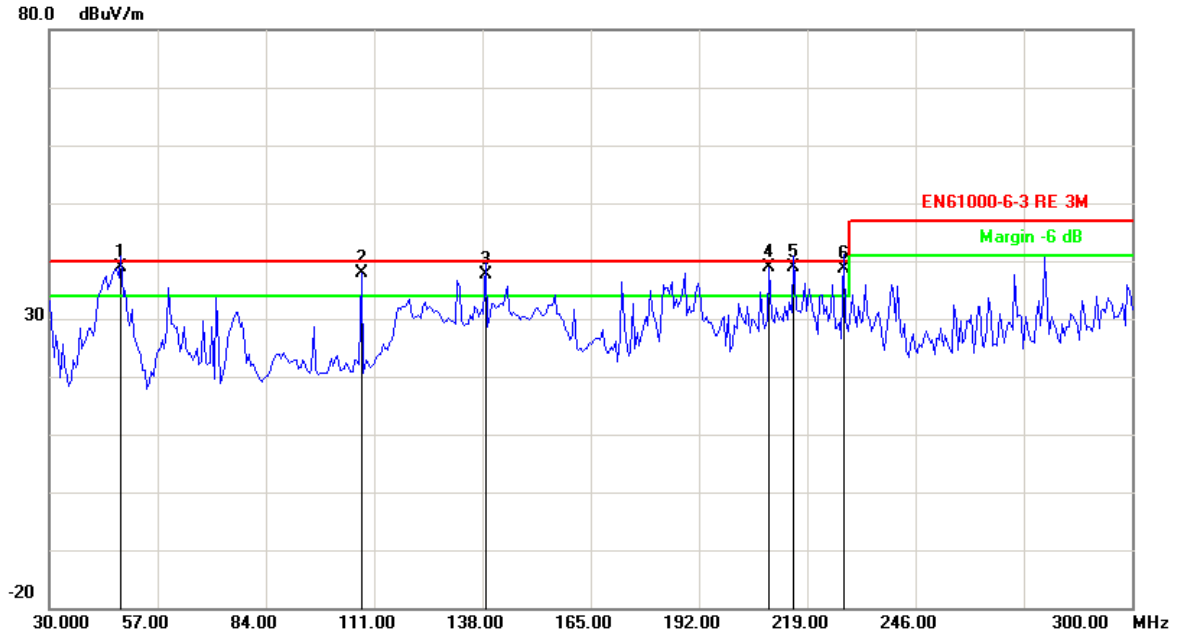
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Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

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Test point:	Vertical	Result:	<input checked="" type="checkbox"/> - passed
Operation mode:	Normal		<input type="checkbox"/> - not passed
Remarks:			



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	47.8557	-30.38	69.25	38.87	40.00	-1.13	QP
2	107.9158	-21.09	58.89	37.80	40.00	-2.20	QP
3	138.7575	-16.46	54.01	37.55	40.00	-2.45	QP
4	209.6393	-12.08	50.96	38.88	40.00	-1.12	QP
5	215.5911	-12.27	51.25	38.98	40.00	-1.02	QP
6	228.0361	-12.36	51.05	38.69	40.00	-1.31	QP

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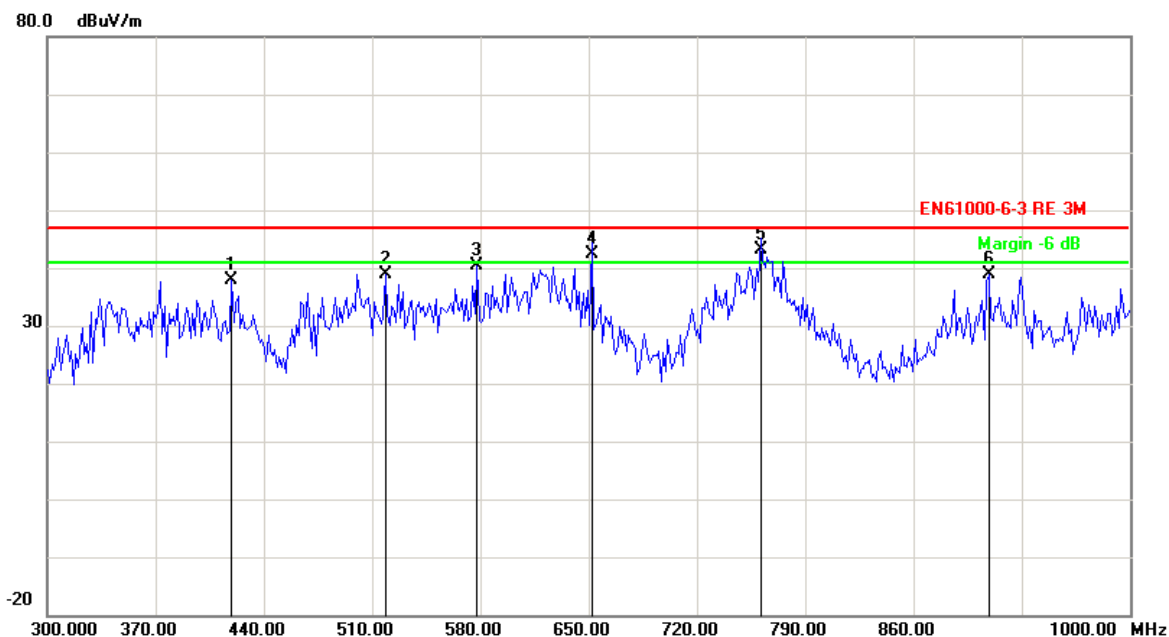
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No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	419.2384	-14.78	52.76	37.98	47.00	-9.02	QP
2	518.8376	-12.99	51.97	38.98	47.00	-8.02	QP
3	577.7555	-14.90	55.33	40.43	47.00	-6.57	QP
4	652.1042	-9.57	51.84	42.27	47.00	-4.73	QP
5	761.5230	-5.53	48.78	43.25	47.00	-3.75	QP
6	908.8176	-4.18	43.12	38.94	47.00	-8.06	QP

Note: Level=Reading+Factor. Margin= Limit-Level

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5.3 Harmonic current

For test instruments and accessories used see section 6 part 6.3.

5.3.1 Description of the test location

Test location : Test location no. 1

5.3.2 Limits of harmonic current

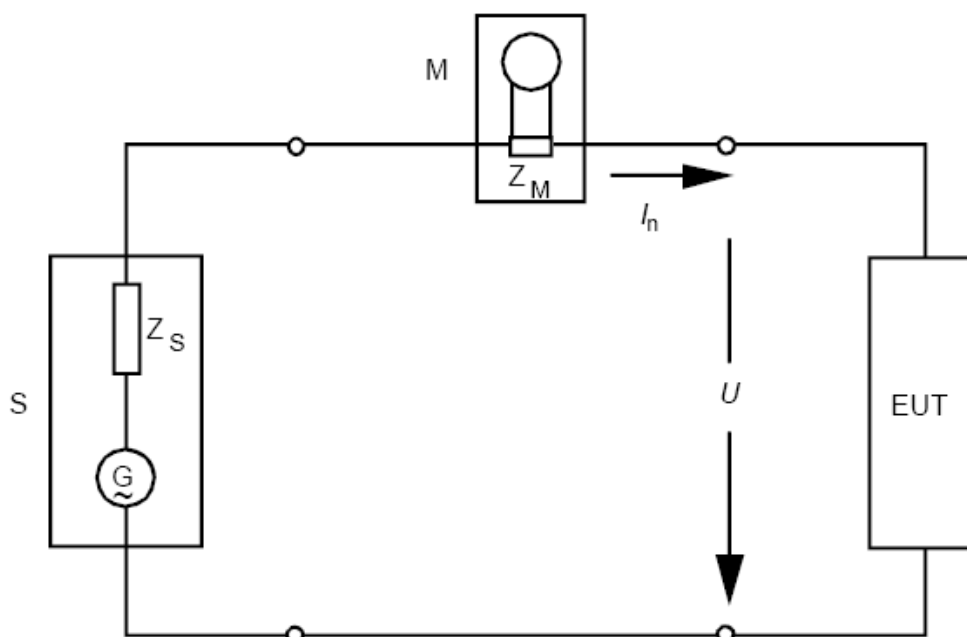
Test configuration and procedure see clause 7.1 of standard EN 61000-3-2: 2006+A2:2009.

5.3.3 Description of the test set-up

5.3.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.3.3.2 Block Diagram of Test Setup



5.3.4 Test result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.3.5 Test protocol

Operation mode	Normal	Result:	<input checked="" type="checkbox"/> - passed <input type="checkbox"/> - not passed
Remarks:			
Standard used:	EN 61000-3-2 Quasi-Stationary – Equipment class A		
Observation time:	5 min		
Windows width:	10 periods – (EN/IEC 61000-4-7 Edition 2002)		
Mains supply voltage:	AC 230V/50Hz		
Ambient Temperature:	24°C		
Humidity:	56%		
Barometric Pressure:	86~106KPa		
E. U. T.:	ELECTRONIC TIME RECORDER		
M/N:	HN1000		
Date of test:	05 September 2013		
Tester:	Leo		
Test result			
E. U. T.:	PASS		
Power Source:	PASS		

Check harmonics 2..40 [exception odd 21..39]:

Harmonic(s) > 150%:	
Order (n):	None
Harmonic(s) with average > 100%:	
Order (n):	None

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.
Harmonic(s) > 150%: Order (n): None
Harmonic(s) with average > 150%: Order (n): None

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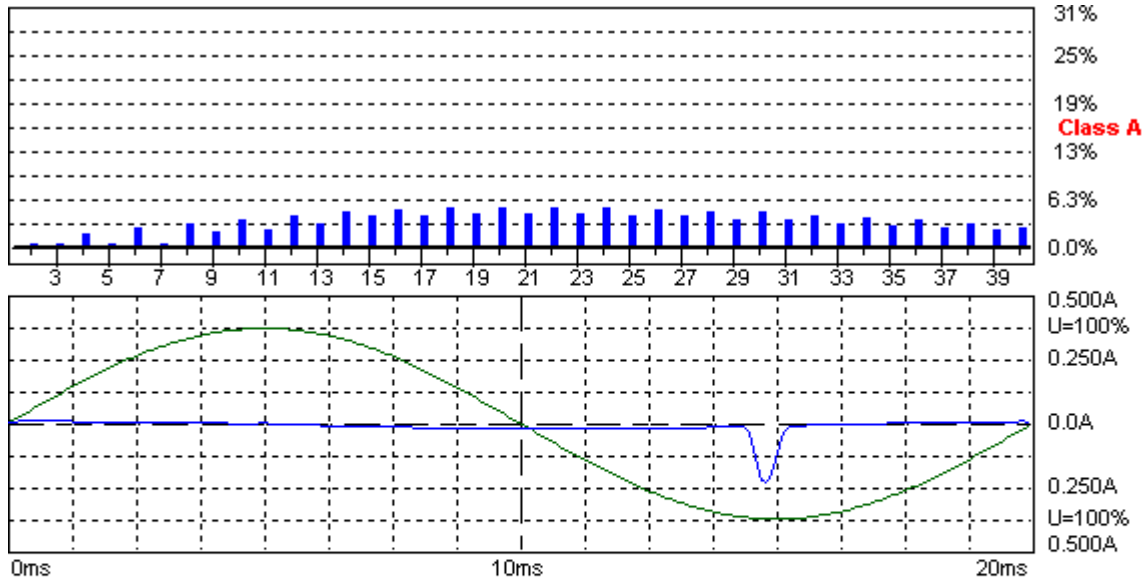
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Harmonic Emission - IEC 61000-3-2, EN 61000-3-2, (EN60555-2)

2013-9-5 15:14:47

Urms = 229.7 V P = 2.123 W THD(I) = 204 % Range: 0.5 A
 Irms = 0.032 A pf = 0.287 H1 (I) = 0.014 A V-nom: 230 V
 TestTime: 10 min (100%)

LEO

Test completed, Result: PASSED

HAR-1000 EMC-Parber

Order	Freq. [Hz]	Irms [A]	Imax [A]	Limit [A]	Status	Remark
1	50	0.0140	0.0140			
2	100	0.0067	0.0067	1.0800		
3	150	0.0069	0.0069	2.3000		
4	200	0.0066	0.0066	0.4300		
5	250	0.0067	0.0068	1.1400		
6	300	0.0065	0.0065	0.3000		
7	350	0.0066	0.0067	0.7700		
8	400	0.0063	0.0063	0.2300		
9	450	0.0064	0.0064	0.4000		
10	500	0.0061	0.0061	0.1840		
11	550	0.0062	0.0062	0.3300		
12	600	0.0058	0.0059	0.1533		
13	650	0.0058	0.0058	0.2100		
14	700	0.0055	0.0056	0.1314		
15	750	0.0055	0.0055	0.1500		
16	800	0.0052	0.0052	0.1150		
17	850	0.0051	0.0051	0.1324		
18	900	0.0048	0.0049	0.1022		
19	950	0.0047	0.0048	0.1184		
20	1000	0.0045	0.0045	0.0920		

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21	1050	0.0042	0.0043	0.1071		
22	1100	0.0041	0.0041	0.0836		
23	1150	0.0039	0.0039	0.0978		
24	1200	0.0037	0.0037	0.0767		
25	1250	0.0034	0.0034	0.0900		
26	1300	0.0033	0.0033	0.0708		
27	1350	0.0030	0.0031	0.0833		
28	1400	0.0029	0.0029	0.0657		
29	1450	0.0026	0.0026	0.0776		
30	1500	0.0025	0.0026	0.0613		
31	1550	0.0022	0.0023	0.0726		
32	1600	0.0022	0.0022	0.0575		
33	1650	0.0018	0.0019	0.0682		
34	1700	0.0018	0.0019	0.0541		
35	1750	0.0015	0.0016	0.0643		
36	1800	0.0015	0.0016	0.0511		
37	1850	0.0012	0.0013	0.0608		
38	1900	0.0013	0.0013	0.0484		
39	1950	0.0010	0.0010	0.0577		
40	2000	0.0010	0.0011	0.0460		

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5.4 Voltage fluctuations and flicker

For test instruments and accessories used see section 6 part 6.4.

5.4.1 Description of the test location

Test location : Test location no. 1

5.4.2 Limits of voltage fluctuation and flicker

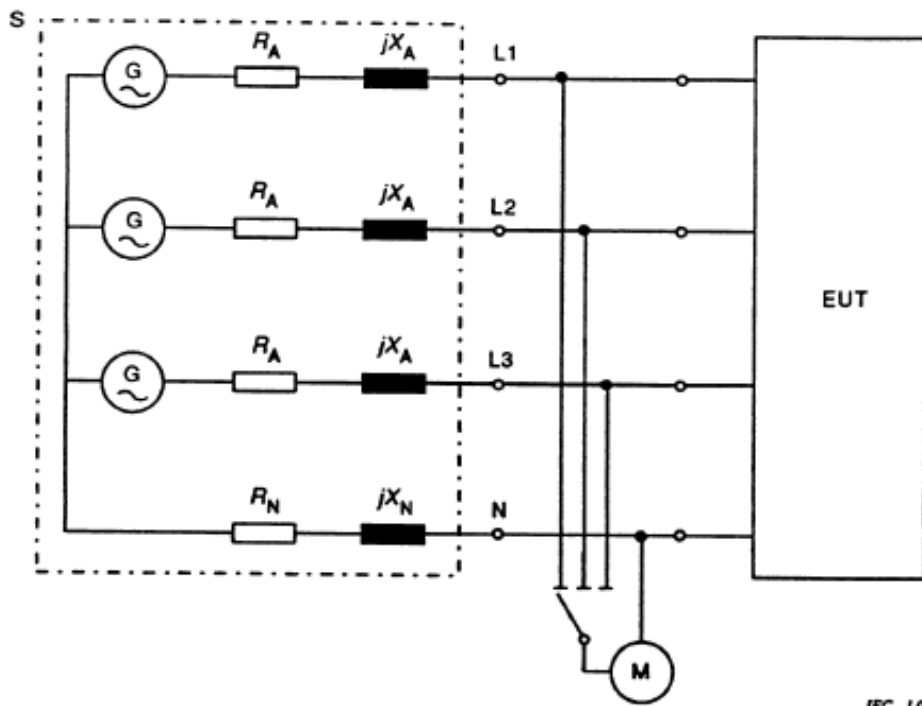
Test configuration and procedure see clause 5 of standard EN 61000-3-3: 2008.

5.4.3 Description of the test set-up

5.4.3.1 Operating Condition

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5.4.3.2 Block Diagram of Test Setup



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5.4.4 Test result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.4.5 Test protocol

Operation mode	Normal	Result:	<input checked="" type="checkbox"/> - passed
Remarks:			<input type="checkbox"/> - not passed

Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	1 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	AC 230V/50Hz
Ambient Temperature:	24°C
Humidity:	56%
Barometric Pressure:	86~106KPa
E. U. T.:	ELECTRONIC TIME RECORDER
M/N:	HN1000
Date of test:	05 September 2013
Tester:	Leo

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.07	1.00	PASS
dc [%]	0.00	3.30	PASS
dmax [%]	0.00	4.00	PASS
dt [s]	0.00	0.50	PASS

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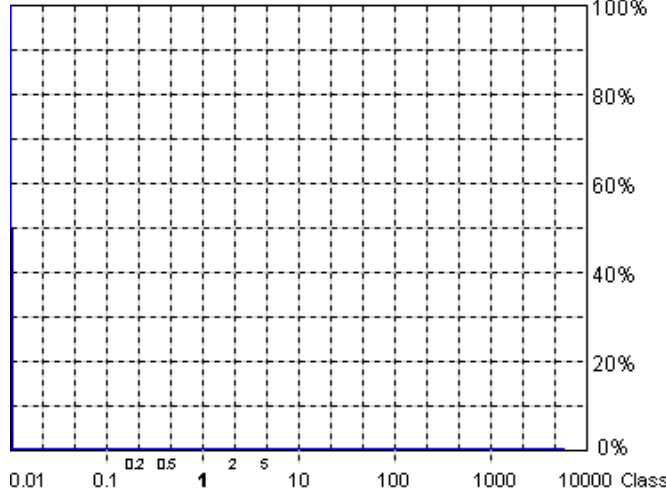
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Flickermeter 1000-4-15 for 230V/50Hz



Actual Flicker (Fli):	0.00
Short-term Flicker (Pst):	0.07
Limit (Pst):	1.00
Long-term Flicker (Plt):	0.07
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	0.00%
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	0.00%
Limit (dc):	3.30%
Maximum Interval exceeding 3.30% (dt):	0.00ms
Limit (dt>Lim):	200ms

Flicker Emission - IEC 61000-3-3, EN 61000-3-3, (EN60555-3)

Urms = 229.7 V P = 2.123 W
 Irms = 0.032 A pf = 0.287

2013-9-5 15:03:05

Range: 0.5 A
 V-nom: 230 V
 TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Parber

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5.5 Electrostatic discharge

For test instruments and accessories used see section 6 part 6.5.

5.5.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.5.2 Severity of levels electrostatic discharge

5.5.2.1 Severity level: Contact discharge at $\pm 4KV$ air discharge at $\pm 8KV$

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

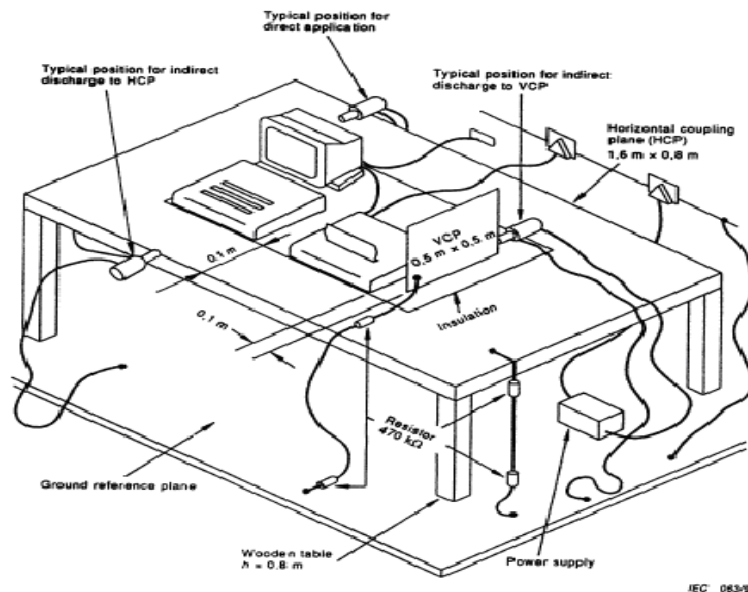
5.5.2.2 Performance criterion: B

5.5.3 Description of the test set-up

5.5.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.5.3.2 Block Diagram of Test Setup



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5.5.4 Test specification:

Contact discharge voltage:	<input checked="" type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 4 kV	
Air discharge voltage:	<input checked="" type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 8 kV
Discharge impedance:	<input checked="" type="checkbox"/> 330 Ω / 150 pF		
Discharge factor:	<input checked="" type="checkbox"/> ≥ 1 sec.		
Number of discharges:	<input checked="" type="checkbox"/> ≥ 10		
Type of discharge:	Direct discharge	<input checked="" type="checkbox"/> Air discharge	
		<input checked="" type="checkbox"/> Contact discharge	
	Indirect discharge	<input checked="" type="checkbox"/> Contact discharge	
Polarity:	<input checked="" type="checkbox"/> Positive	<input checked="" type="checkbox"/> Negative	
Discharge location:	<input checked="" type="checkbox"/> see photo documentation of the test set-up		
	<input checked="" type="checkbox"/> all external locations accessible by hand		
	<input checked="" type="checkbox"/> horizontal plate (HCP)		
	<input checked="" type="checkbox"/> vertical coupling plate (VCP)		

5.5.5 Test result

The requirements are **Fulfilled**Performance Criterion: **B****Remarks:** During the test no deviation was detected to the selected operation mode(s).

5.6 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 6 part 6.6.

5.6.1 Description of the test location

Test location :	GTEM chamber
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.6.2 Severity levels of radiated, Radio-frequency, electromagnetic field

5.6.2.1 Severity level: 3V/m

Level	Field strenght(V/m)
1	1
2	3
3	10
X	Special

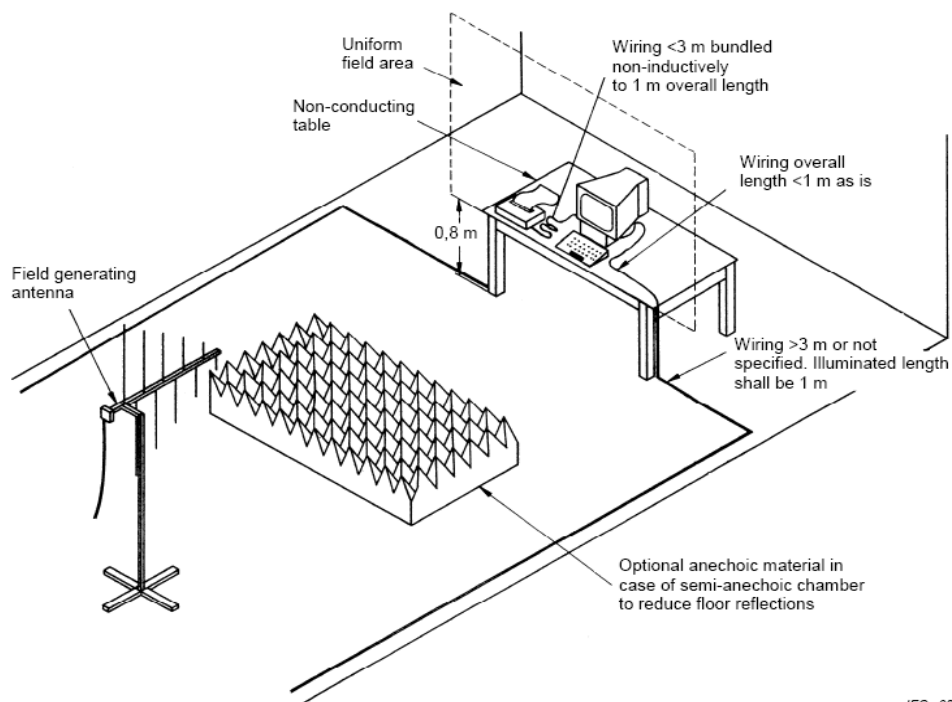
5.6.2.2 Performance criterion: A

5.6.3 Description of the test set-up

5.6.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.6.3.2 Block Diagram of Test Setup



IEC 034/06

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5.6.4 Test specification:

Frequency range:	■ 80 MHz to 1000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical

5.6.5 Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.7 Electrical fast transients / Burst

For test instruments and accessories used see section 6 part 6.7.

5.7.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.7.2 Severity levels of electrical fast transients / Burst

5.7.2.1 Severity level: ±1000V for AC power supply lines

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O signal, data and control ports	
	V peak (KV)	Repetition rate (KHz)	Voltage peak	Repetition rate (KHz)
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X	Special	Special	Special	Special

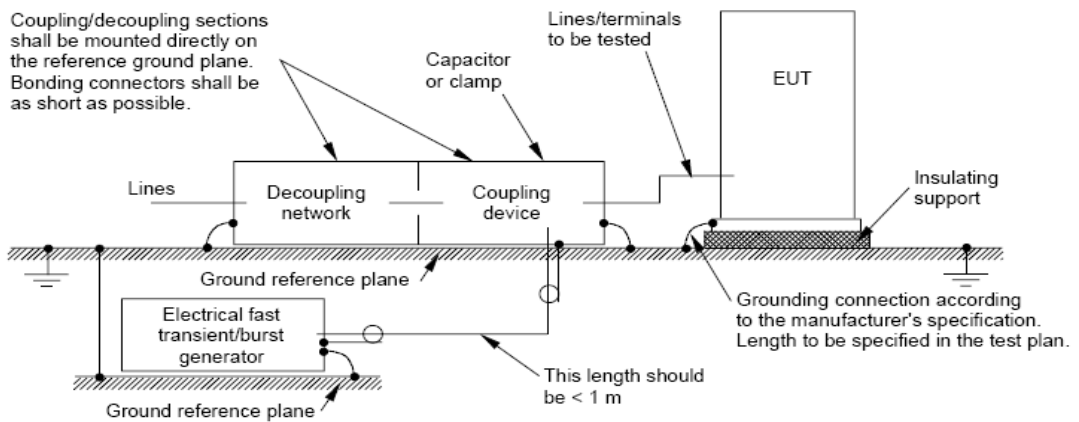
5.7.2.2 Performance criterion: B

5.7.3 Description of the test set-up

5.7.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.7.3.2 Block Diagram of Test Setup



IEC 900/04

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5.8 Surge

For test instruments and accessories used see section 6 part 6.8.

5.8.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.8.2 Severity levels of surge

5.8.2.1 Severity level: Line to line: ±1KV Line to earth: ±2KV

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
X	Special

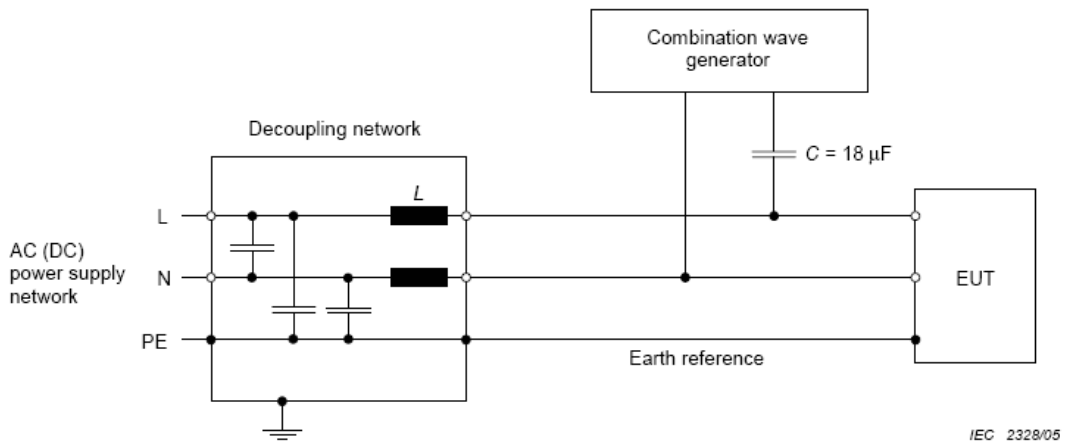
5.8.2.2 Performance Criterion: B

5.8.3 Description of the test set-up

5.8.3.1 Operating Condition

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5.8.3.2 Block Diagram of Test Setup



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5.8.4 Test specification:

Pulse amplitude-Power line sym.: Source impedance: 2 Ω + 18 μ F	<input checked="" type="checkbox"/> 0.5 kV <input checked="" type="checkbox"/> 1 kV <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV
Pulse amplitude-Power line unsym.: Source impedance: 12 Ω + 9 μ F	<input type="checkbox"/> 0.5 kV <input type="checkbox"/> 1 kV <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV
Number of surges:	<input checked="" type="checkbox"/> 5 Surges/Phase angle
Phase angle:	<input checked="" type="checkbox"/> 0 ° <input checked="" type="checkbox"/> 90 ° <input checked="" type="checkbox"/> 180 ° <input checked="" type="checkbox"/> 270 °
Repetition rate:	<input checked="" type="checkbox"/> 60 s
Polarity:	<input checked="" type="checkbox"/> positive <input checked="" type="checkbox"/> negative

5.8.5 Coupling points

Cable description:	AC power line: L+N
Screening:	<input type="checkbox"/> screened <input checked="" type="checkbox"/> unscreened
Status:	<input type="checkbox"/> passive <input checked="" type="checkbox"/> active
Signal transmission:	<input checked="" type="checkbox"/> analogue <input type="checkbox"/> digital
Length:	<input checked="" type="checkbox"/> 1.5 m

5.8.6 Test result

The requirements are **Fulfilled**

Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.9 Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 6 part 6.9

5.9.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.9.2 Severity levels of conducted disturbances induced by radio-frequency fields discharge

5.9.2.1 Severity Level: 3V

Level	Field Strength (V)
1	1
2	3
3	10
X	Special

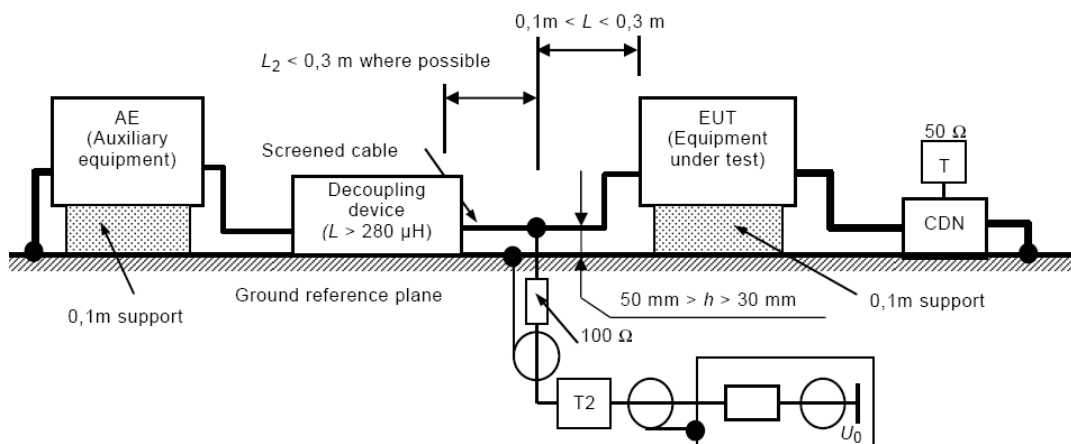
5.9.2.2 Performance Criterion: A

5.9.3 Description of the test set-up

5.9.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.9.3.2 Block Diagram of Test Setup



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5.9.4 Test specification:

Frequency range:	■ 0.15 MHz to 80 MHz
Test voltage:	■ 3 V
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time

5.9.5 Coupling points

Cable description (Port1):	AC power line: L+N
Screening:	<input type="checkbox"/> screened <input checked="" type="checkbox"/> unshielded
Status:	<input type="checkbox"/> passive <input checked="" type="checkbox"/> active
Signal transmission:	<input checked="" type="checkbox"/> analogue <input type="checkbox"/> digital
Length:	■ 0.3 m

5.9.6 Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.10 Power frequency magnetic field

For test instruments and accessories used see section 6 part 6.10.

5.10.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.10.2 Severity levels of magnetic field immunity

5.10.2.1 Severity Level: 3A/m

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X	Special

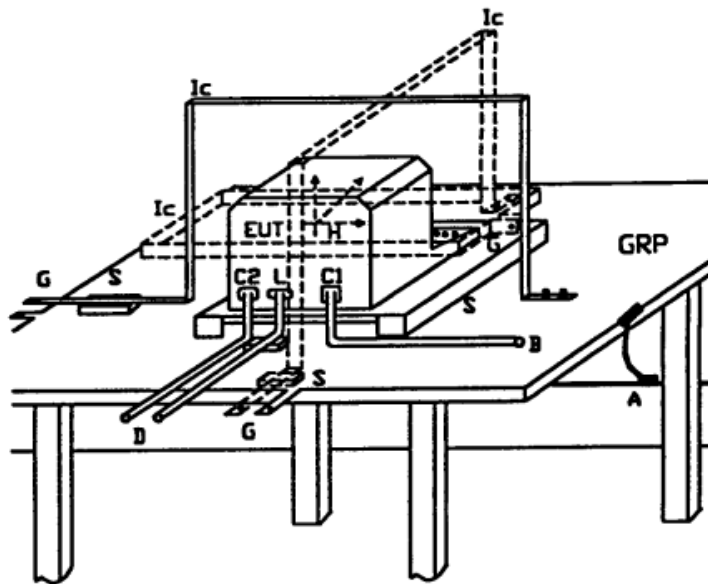
5.10.2.2 Performance Criterion: A

5.10.3 Description of the test set-up

5.10.3.1 Operating Condition

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5.10.3.2 Block Diagram of Test Setup



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5.10.4 Test specification:

Test frequency:	■ 50 Hz		
Continuous field:	■ 3 A/m		
Duration (Continuous field):	■ 60 s each Axis		
Short duration (1-3s):	■ 3s		
Axis:	■ x-axis	■ y-axis	■ z-axis

5.10.5 Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.11 Voltage dips

For test instruments and accessories used see section 6 part 6.11.

5.11.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.11.2 Severity levels of voltage dips

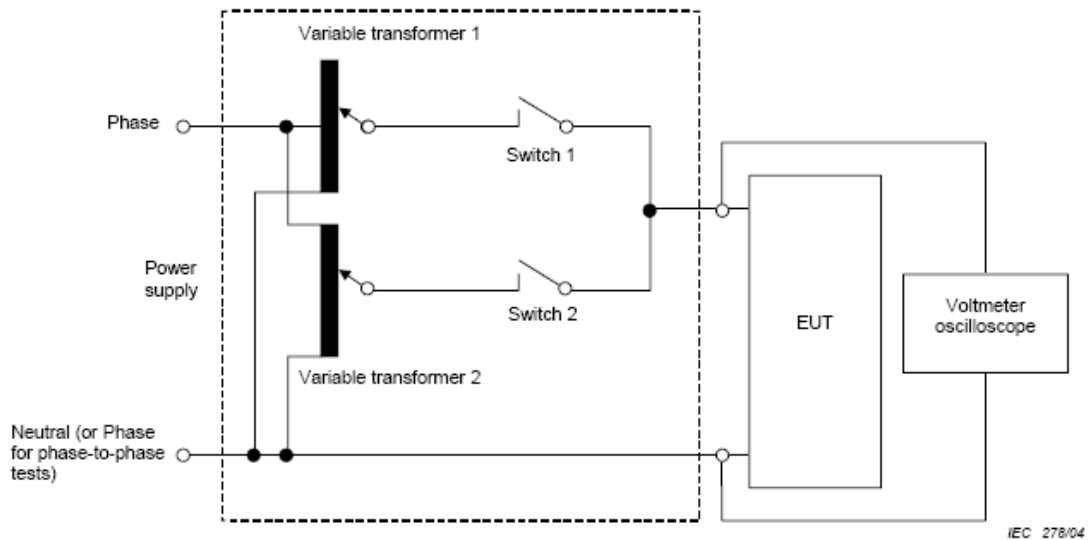
Test Level (%Ut)	Voltage Dips (%Ut)	Performance Criterion	Duration (in period)
0	100	B	0.5
0	100	B	1
70	30	B	25

5.11.3 Description of the test set-up

5.11.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.11.3.2 Block Diagram of Test Setup



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5.11.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 30 % / 1000ms

5.11.5 Test resultThe requirements are **Fulfilled**Performance Criterion: **B****Remarks:** During the test no deviation was detected to the selected operation mode(s).

5.12 Voltage Short interruptions

For test instruments and accessories used see section 6 part 6.12.

5.12.1 Description of the test location

Test location :	Test location no. 2
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	05~06 September 2013
Operator :	Leo

5.12.2 Severity levels of voltage short interruptions

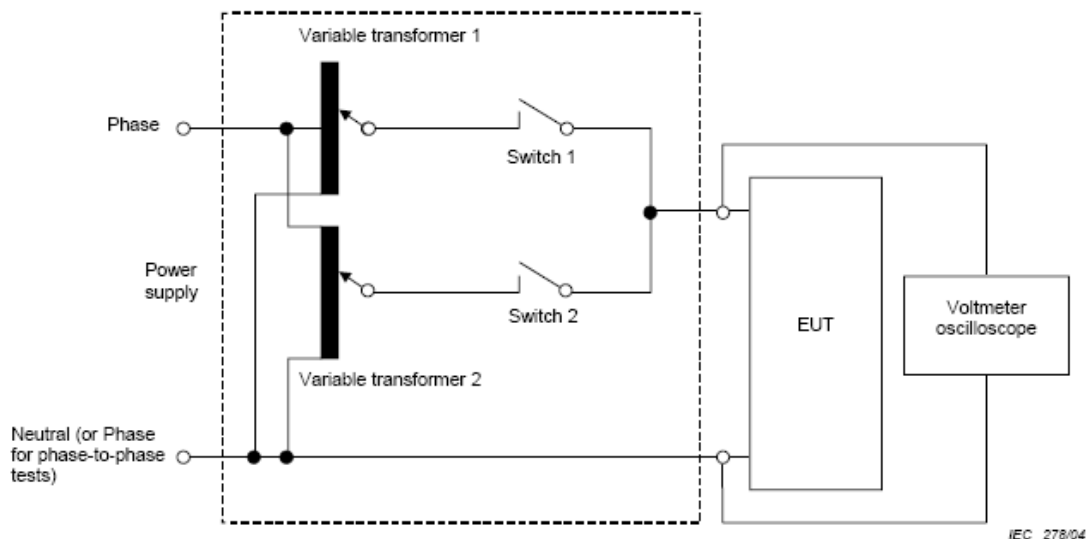
Test Level (%Ut)	Voltage Short Interruptions (%Ut)	Performance Criterion	Duration (in period)
0	100	C	250

5.12.3 Description of the test set-up

5.12.3.1 Operating Condition

The EUT is engraving during the test, and the results of the maximum emanation are recorded

5.12.3.2 Block Diagram of Test Setup



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5.12.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230 V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 100 ms

5.12.5 Test resultThe requirements are **Fulfilled**Performance Criterion: **C****Remarks:** During the test no deviation was detected to the selected operation mode(s).

6 USED TEST EQUIPMENT

6.1					
Radiated disturbance (Electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2013/03/28
2	EMI Test Receiver	ROHDE & SCHWARZ	ESVS 10	842885/001	2012/11/06
3	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2013/03/29
4	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2013/03/29
5	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2013/03/29
6	Pre-Amplifier	EMC	EMC330	980113	2013/03/28
7	Pre-Amplifier	EMC	EMC012645	980114	2013/03/28
8	EMI Test Software	Farad	EZ-EMC	N/A	N/A

6.2					
Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2012/11/06
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2012/11/06
3	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z6	100140	2012/11/06
4	Pulse Limiter	ROHDE & SCHWARZ	ESHS-Z2	100301	2012/11/06
5	EMI Test Software	Farad	EZ-EMC	N/A	N/A

6.3					
Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2012/11/20
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A

6.4					
Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2012/11/20
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A

6.5					
Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	Schlöder	SESD 200	0302016	2013/03/29

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6.6					
RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	ROHDE & SCHWARZ	SMY 01	843215/014	2012/11/06
2	Signal Generator	ROHDE & SCHWARZ	SML03	102986	2012/11/06
3	Amplifier	KALMUS	713FC	7385-1	2012/11/06
4	Power Meter	ROHDE & SCHWARZ	NRVS	842856/049	2012/11/06
5	Field Probe	ETS	HI-6005	00075047	2012/11/14
6	RS Test Software	Farad	EZ-RS	N/A	N/A

6.7					
Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2012/11/06
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2012/11/06
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2012/11/06
4	Genecs Software	EMC Partner	N/A	N/A	N/A

6.8					
Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2012/11/06
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2012/11/06
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2012/11/06
4	Genecs Software	EMC Partner	N/A	N/A	N/A

6.9					
Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	RF generator / amplifier	Schlöder	CDG 6000	HU906007	2012/11/06
2	CDN	Schlöder	CDN M3	A3003008	2012/11/06
3	CDN	Schlöde	CDN T2	A3010005	2012/11/06
4	Attenuator	Abschwächer	DC-500MHz	N/A	2012/11/06
5	EM injection clamp	Liithi	EM101	35670	2012/11/09
6	CDG-6000 Software	Schlöder	N/A	N/A	N/A

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6.10					
Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EM TEST	EMS61000-8K	409001	2012/11/20

6.11					
Voltage Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2012/11/06
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2012/11/06
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2012/11/06
4	GenecsSoftware	EMC Partner	N/A	N/A	N/A

6.12					
Voltage Short Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2012/11/06
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2012/11/06
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2012/11/06
4	GenecsSoftware	EMC Partner	N/A	N/A	N/A

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7 TEST PHOTOGRAPHS

7.1. Photo of power line conducted emission measurement (C.E.)



7.2. Photo of radiated emission measurement (R.E. Electric field)



7.3. Photo of harmonic current and flicker emission measurement (H.&F.)



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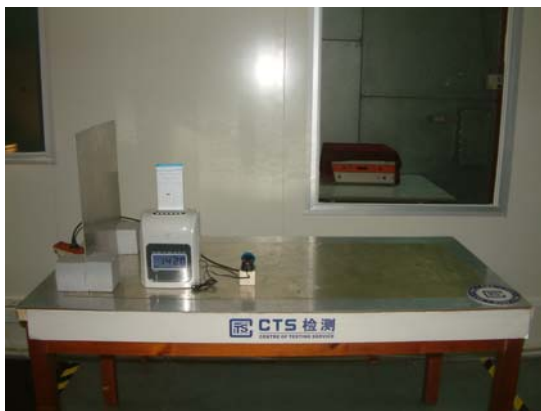
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7.4. Photo of electrostatic discharge Immunity measurement (E.S.D.)



7.5. Photo of RF field strength Immunity measurement (R.S.)



7.6. Photo of EFT/surge/Dips immunity measurement (E.F.T./Surge./Dips.)



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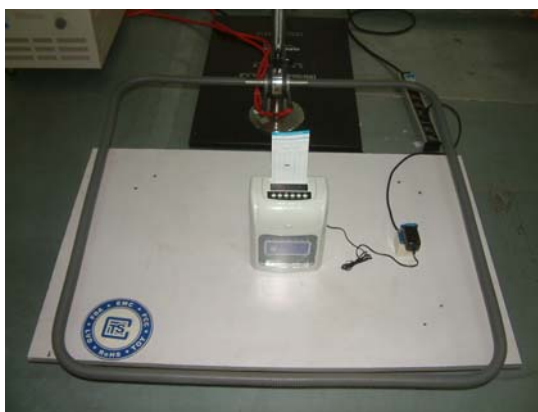
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7.7. Photo of conducted disturbance Immunity measurement (C.S.)



7.8. Photo of PFM field immunity measurement (P.F.M.F.)



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8 External and Internal Photos of the EUT



External view



External view 1



External view 2

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External view 4



External view 5

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External view 6



label



Internal view

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PCB 1 side 1



PCB 1 side 2



PCB 2 side 1

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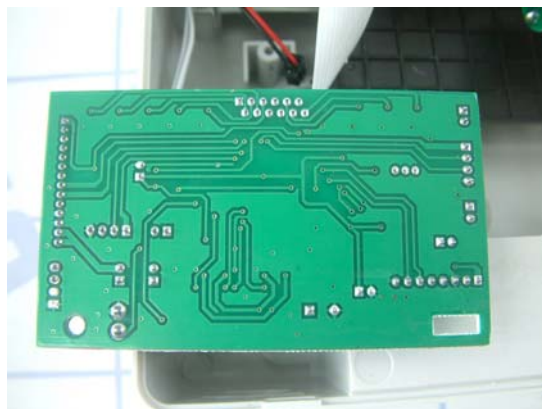
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PCB 2 side 2



Oscillator

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9 Manufacturer/ Approval holder Declaration

The following identical model(s):

HN2000, HN3000, HN4000, HN5000

Belong to the tested device:

Product description: **ELECTRONIC TIME RECORDER**
Model name: **HN1000**

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