

EMC TEST REPORT

According to

EN 61204-3 : 2000

EN 55022: 1998+A1: 2000+A2: 2003

EN 61000-3-2: 2000+A2: 2005

EN 61000-3-3: 1995+A1: 2001+A2: 2005

EN 61000-4-2: 1995+A1: 1998+A2: 2001 / EN 61000-4-3: 2002+A1: 2002

EN 61000-4-4: 2004 / EN 61000-4-5: 1995+A1: 2001

EN 61000-4-6: 1996+A1: 2001 / EN 61000-4-11: 2004

EUT Name : Power Supply

Model No. : TC-500R8A, TC-400R8A, TC-300R8A, TC-400R8,
TC-300R8

Applicant : I-STAR COMPUTER CO., LTD.

2F, NO. 33, LANE 42, CHUNG SHIN NORTH ST., SAN
CHUNG CITY, TAIPEI, TAIWAN, R. O. C.

Reviewed by : JASON KUNG

Issued Date: : JULY 27, 2007

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- The report can't be used by the client to claim product endorsement by PEP Testing Laboratory.
- This report is only for the equipment which described in page 7.

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1. General

1.1 General Information :

Applicant : I-STAR COMPUTER CO., LTD.
2F, NO. 33, LANE 42, CHUNG SHIN NORTH ST., SAN
CHUNG CITY, TAIPEI, TAIWAN, R.O.C.

Manufacturer : I-STAR COMPUTER CO., LTD.
2F, NO. 33, LANE 42, CHUNG SHIN NORTH ST., SAN
CHUNG CITY, TAIPEI, TAIWAN, R.O.C.

Measurement Procedure : EN55022

Measurement Uncertainty :

The uncertainty of the testing result is given as below. The method of uncertainty Calculation is provided in PEP Testing Lab document No. QP-T-28-B & QP-T-27-B

Frequency (MHz)	0.15 ~ 30	30 ~ 1000
Expanded Uncertainty μ_c	1.4 (dB)	2.84 (dB)

※ 95% Confidence Level; K=2

1.2 Place of Measurement

※ PEP TESTING LABORATORY ※

NO. 9-6, Huzi, Hubei Village, Linkou Shiang, Taipei Hsien, Taiwan 244, R. O. C.

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FAX : 886-2-26021045

Accreditation ---

NVLAP LAB CODE 200097-0

(U. S. A.) (AUSTRALIA)

FCC Registration No. : 90868

(U. S. A.)

NEMKO Aut. No. : ELA133

(Europe)

BSMI Aut. No. : SL2-IN-E-11

(Taiwan)

VCCI Registration No. : C-493/R-477

(Japan)

1.3 Test Standards

Tested for compliance with:

EN 61204-3: 2000	- Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)
EN 55022:1998 +A1: 2003	- Information Technology Equipment – Radio disturbance characteristics – Limits and methods of measurement
EN 61000-3-2: 2005	- Electromagnetic compatibility (EMC) Part 3-2: Limits –Limits for harmonic current emissions (equipment input Current up to and including 16A per phase
EN 61000-3-3: 1995 +A1: 2005	- Electromagnetic compatibility (EMC) Part 3-2: Limits – Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to 16A
EN 61000-4-2: 1995 +A2: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 2: Electrostatic discharge immunity test Basic EMC Publication
EN 61000-4-3: 2002+ A1: 2002	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 3: Radiated, radio-Frequency, electromagnetic field immunity test
EN 61000-4-4: 1995 +A2: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 4: Electrical fast transient / Burst immunity test Basic EMC publication
EN 61000-4-5: 1995 +A1: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 5: Surge immunity test (includes corrigendum: 1995)
EN 61000-4-6: 1996 +A1: 2001	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 6: Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11: 2004	- Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques, Section 11: Voltage dips, short interruptions and voltage variations immunity tests

2. Product Information

- a. **EUT Name:** Power Supply
- b. **Model No. :** TC-500R8A
- c. **Chassis Used :** Metal
- d. **Port/Connector(s) :** DC Output Port * 1
- e. **Power Rating :** Input : AC100-240V 50 ~ 60 Hz
Output : DC +5V, +12V, -12V
42A, 28A, 0.8A
- f. **Condition of the EUT :** Prototype Sample Engineering Sample
 Production Sample
- g. **Test Item Receipt Date :** MAY 21, 2007
- h. **Date(s) of performance of test:** MAY 21, 2007 – JULY 16, 2007

2a. Product Technical Judgement

N/A

3. EUT Description and Test Conclusion

EUT Name:	Power Supply		
Representative Model:	TC-500R8A		
Serial Model:	TC-400R8A, TC-300R8A, TC-400R8, TC-300R8		
Power Rating:	Input: AC 100-240V Output: DC +5V/+12V/-12A		
Model Difference Description :	The difference between R8A series and R8 series is that R8A series have a internal side board.		
EUT'S I/O Port(s):	I/O Port	Number	Connector Equipment
	DC Output Port	1	Resistance Load
Operation Mode(s) of EUT for Preliminary test(s):	(1) DC FULL LOAD		
	(2) DC HALF LOAD		
Worst-case operation mode(s) of EUT:	(1) DC FULL LOAD		
	(2) DC HALF LOAD		

Software used to Operate EUT Function(s) :	N/A
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Modification(s):	N/A
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4. Support Equipment Used

RESISTANCE LOAD

5. EN 55022 Conducted Disturbance Test

Test Standard	Model No.	Criterion
EN 55022	TC-500R8A	Class A

5.1 Limits of mains terminal disturbance voltage (a.c. input port)

Frequency MHz	Class B Limits		Class A Limits	
	Quasi-peak dB(μV)	Average dB(μV)	Quasi-peak dB(μV)	Average dB(μV)
0.15 to 0.5	66 to 56 ¹⁾	56 to 46 ¹⁾	79	66
0.5 to 5	56	46	73	60
5 to 30	60	50	73	60

¹⁾ Limit decreasing linearly with logarithm of frequency.

5.2 Conducted Disturbance Test Setup Photos

< FRONT VIEW >



< REAR VIEW >



5.3 Conducted Disturbance Test Data

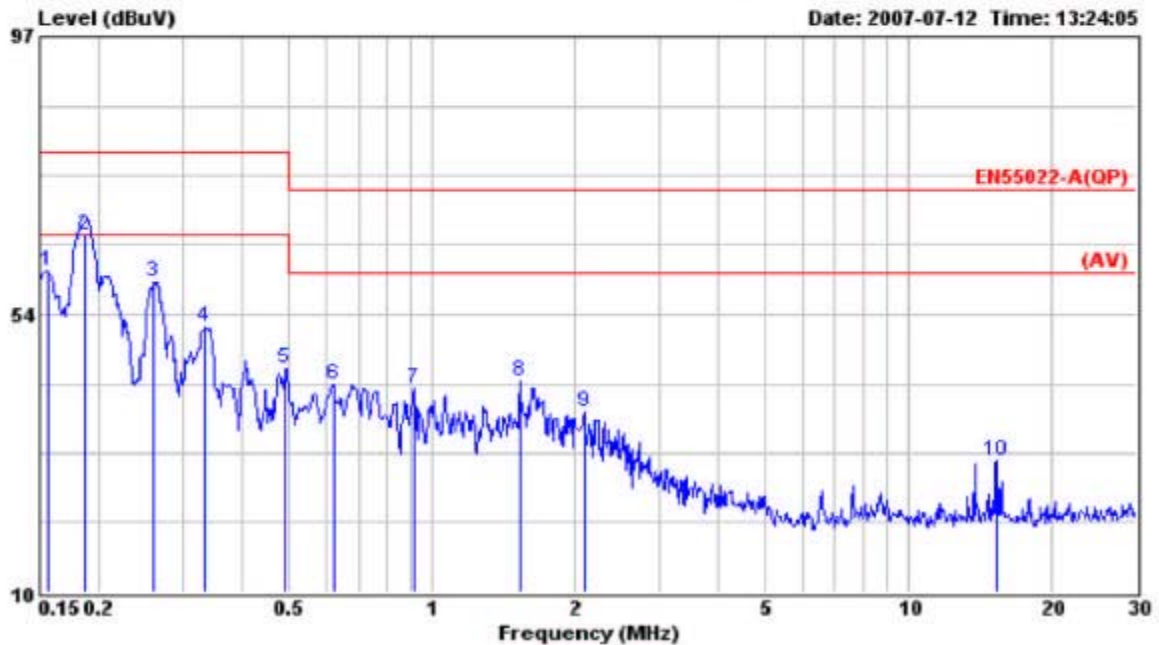
Model No. : TC-500R8A
Frequency range : 150KHz to 30MHz
Detector : Peak Value
Temperature : 30 °C
Humidity : 51 %
Memo : DC FULL LOAD MODE

Test Data : # 217 < LINE >
 # 218 < NEUTRAL >

- Note 1. Level = Read Level + Probe (LISN) Factor + Cable Loss
2. Over Limit = Level – Limit Line = Margin



Data#: 217

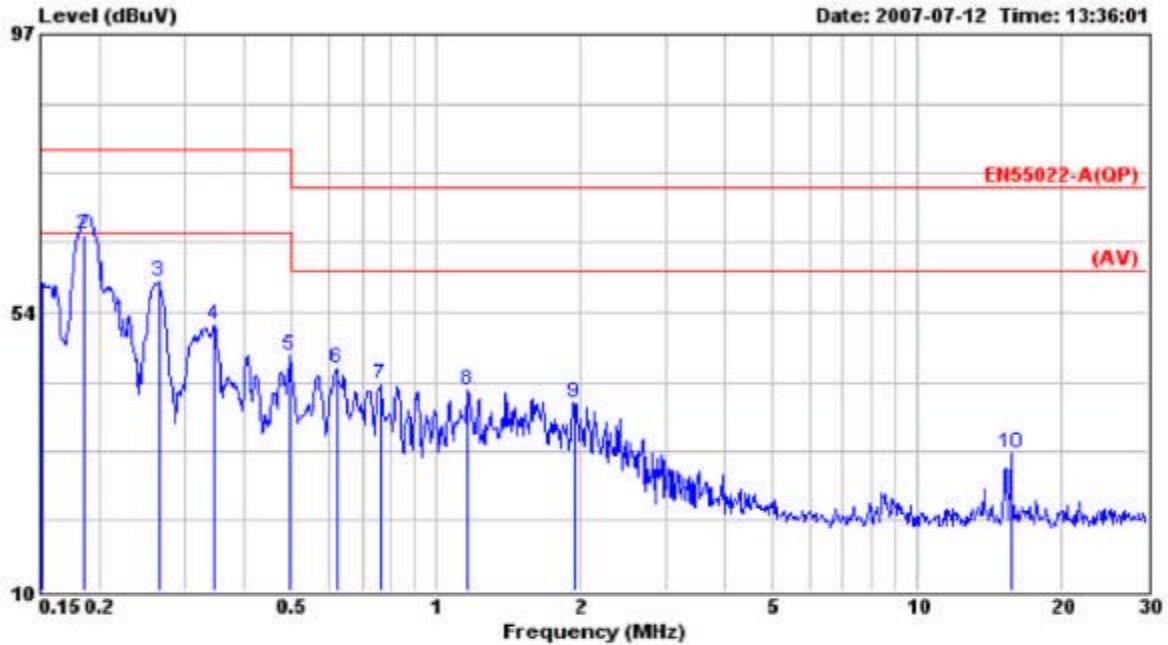


Site : Linko: Conduction No.2 (David)
 Condition : EN55022-A(QP) LISN.L(32A) LINE
 Form : E960164
 Power : AC 230V 50Hz
 Memo : Full Load
 Memo : Peak Value Curve
 Detect : Quasi Peak Value

	Freq	Level	Over	Limit	Read	Probe	Cable	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.156	60.41	-18.59	79.00	60.29	0.10	0.02	
2	0.186	65.85	-13.15	79.00	65.70	0.10	0.05	QP
3	0.260	58.60	-20.40	79.00	58.38	0.10	0.12	
4	0.334	51.40	-27.60	79.00	51.15	0.10	0.15	
5	0.491	45.03	-33.97	79.00	44.76	0.10	0.17	
6	0.621	42.55	-30.45	73.00	42.25	0.10	0.20	
7	0.914	41.95	-31.05	73.00	41.62	0.10	0.23	
8	1.530	43.04	-29.96	73.00	42.60	0.16	0.28	
9	2.090	38.34	-34.66	73.00	37.82	0.20	0.32	
10	15.310	30.73	-42.27	73.00	29.62	0.42	0.69	



Data#: 218



Site : Linko: Conduction No.2 (David)
 Condition : EN55022-A(QP) LISN.N(32A) NEUTRAL
 Form : E960164
 Power : AC 230V 50Hz
 Memo : Full Load
 Memo : Peak Value Curve
 Detect : Quasi Peak Value

	Freq	Level	Over	Limit	Read	Probe	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.151	58.09	-20.91	79.00	57.98	0.10	0.01	
2	0.185	65.55	-13.45	79.00	65.40	0.10	0.05	QP
3	0.264	58.25	-20.75	79.00	58.02	0.10	0.13	
4	0.345	51.45	-27.55	79.00	51.20	0.10	0.15	
5	0.497	46.72	-32.28	79.00	46.45	0.10	0.17	
6	0.621	44.61	-28.39	73.00	44.31	0.10	0.20	
7	0.767	42.07	-30.93	73.00	41.76	0.10	0.21	
8	1.160	41.25	-31.75	73.00	40.88	0.12	0.25	
9	1.930	39.48	-33.52	73.00	38.97	0.20	0.31	
10	15.720	31.54	-41.46	73.00	30.53	0.31	0.70	

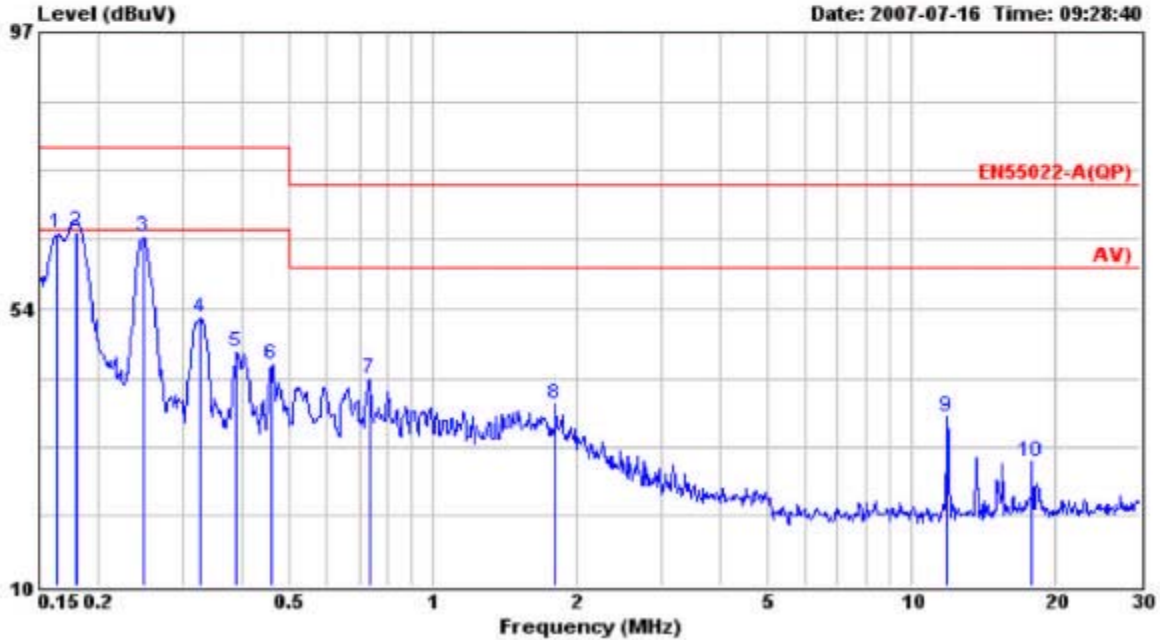
Model No. : TC-500R8A
Frequency range : 150KHz to 30MHz
Detector : Peak Value
Temperature : 30 °C
Humidity : 51 %
Memo : DC HALF LOAD MODE

Test Data : # 225 < LINE >
226 < NEUTRAL >

- Note
1. Level = Read Level + Probe (LISN) Factor + Cable Loss
 2. Over Limit = Level – Limit Line = Margin



Data#: 225

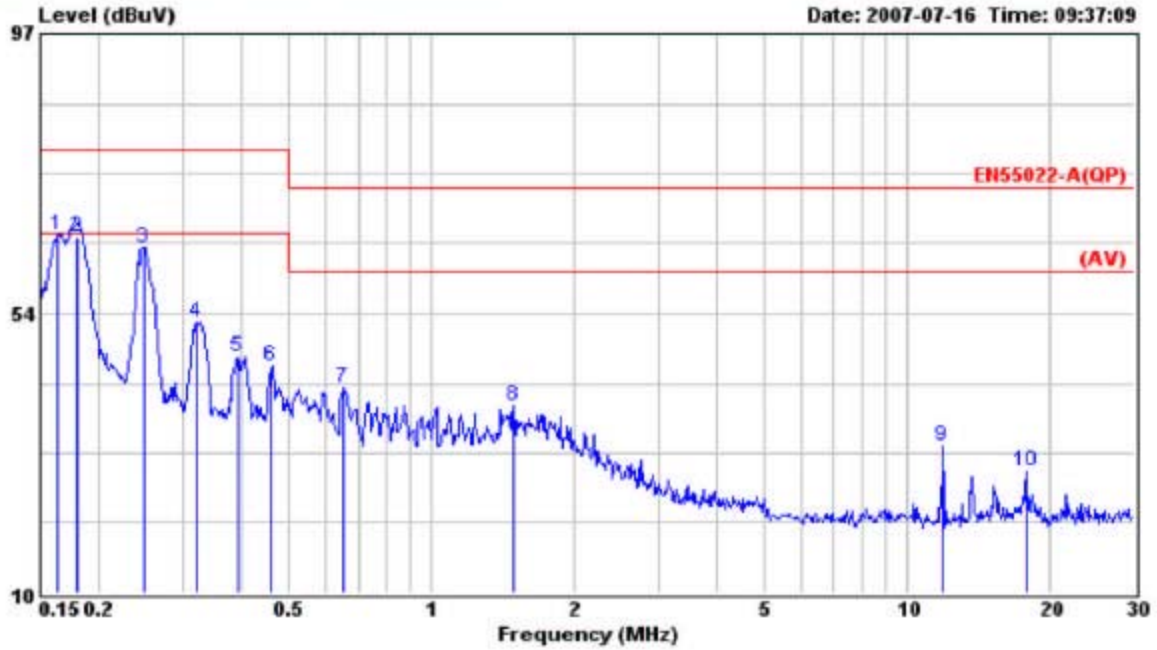


Site : Linko: Conduction No.2 (David)
 Condition : EN55022-A(QP) LISN.L(32A) LINE
 Form : E960164
 Power : AC 230V 50Hz
 Memo : Peak Value Curve
 Detect : Quasi Peak Value
 Memo : Half Load

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.164	65.23	-13.77	79.00	65.10	0.10	0.03	
2	0.180	65.55	-13.45	79.00	65.40	0.10	0.05	QP
3	0.247	64.90	-14.10	79.00	64.69	0.10	0.11	
4	0.327	52.09	-26.91	79.00	51.84	0.10	0.15	
5	0.387	46.58	-32.42	79.00	46.33	0.10	0.15	
6	0.461	44.65	-34.35	79.00	44.39	0.10	0.16	
7	0.735	42.44	-30.56	73.00	42.13	0.10	0.21	
8	1.800	38.47	-34.53	73.00	37.99	0.18	0.30	
9	11.870	36.47	-36.53	73.00	35.52	0.34	0.61	
10	17.850	29.37	-43.63	73.00	28.05	0.58	0.74	



Data#: 226



Site : Linko: Conduction No.2 (David)
 Condition : EN55022-A(QP) LISN.N(32A) NEUTRAL
 Form : E960164
 Power : AC 230V 50Hz
 Memo : Peak Value Curve
 Detect : Quasi Peak Value
 Memo : Half Load

	Freq	Level	Over	Limit	Read	Probe	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.164	65.73	-13.27	79.00	65.60	0.10	0.03	
2	0.179	65.48	-13.52	79.00	65.33	0.10	0.05	QP
3	0.248	63.78	-15.22	79.00	63.57	0.10	0.11	
4	0.320	51.99	-27.01	79.00	51.74	0.10	0.15	
5	0.391	46.77	-32.23	79.00	46.52	0.10	0.15	
6	0.461	45.22	-33.78	79.00	44.96	0.10	0.16	
7	0.654	41.92	-31.08	73.00	41.62	0.10	0.20	
8	1.490	39.17	-33.83	73.00	38.73	0.16	0.28	
9	11.870	32.81	-40.19	73.00	31.96	0.24	0.61	
10	17.750	28.86	-44.14	73.00	27.76	0.36	0.74	

6. EN 55022 Radiated Disturbance Test

Test Standard	Model No.	Criterion
EN 55022	TC-500R8A	Class A

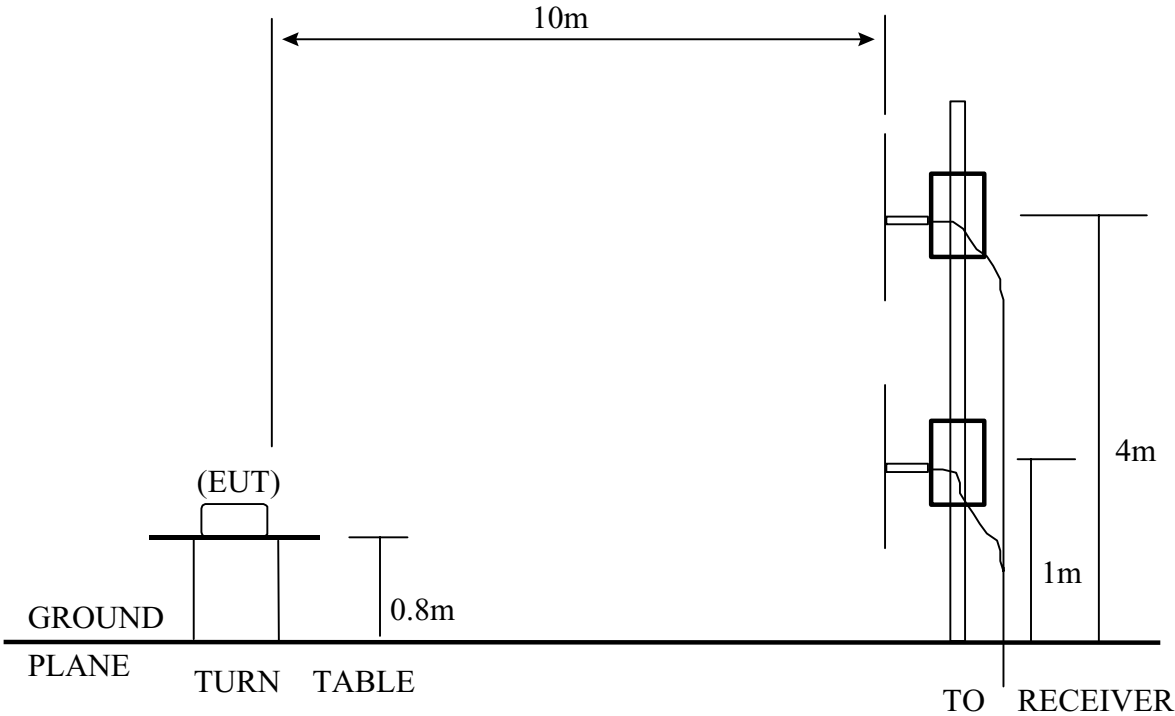
6.1 Radiated Disturbance Test Description

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna were used.

Final measurements were made outdoors at 10-meter test range using biconical, dipole antenna or horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.

6.2 Radiated Disturbance Test Setup



EUT = Equipment Under Test

6.3 Radiated Disturbance Test Limits

Limits for electromagnetic radiation/interference power disturbance
(all field strength limits refer to quasi-peak measurements)

Frequency band MHz	Class B Limits		Class A Limits	
	Quasi-peak dB($\mu\text{V}/\text{m}$) ¹⁾	Distance m	Quasi-peak dB($\mu\text{V}/\text{m}$) ¹⁾	Distance m
30 to 230	30	10	40	10
230 to 1000	37		47	

¹⁾ dB(pW) if interference power is measured instead of field strength.

6.4 Radiated Disturbance Test Setup Photos

< FRONT VIEW >



< REAR VIEW >



6.5 Radiated Disturbance Test Data

Model No. : TC-500R8A
Frequency range : 30MHz to 1GHz **Detector** : Quasi-Peak Value
Frequency range : above 1GHz **Detector** : Quasi-Peak/Average Value
Temperature : 29 ° C **Humidity** : 52 %
Memo : DC FULL LOAD MODE

Antenna polarization : HORIZONTAL ; **Test distance** : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
60.070	20.54	-19.46	40.00	27.77	12.46	1.01	20.70	76.0	4.0
114.390	21.33	-18.67	40.00	29.82	10.81	1.40	20.70	78.0	4.0
131.850	21.93	-18.07	40.00	28.45	12.56	1.50	20.58	70.0	4.0
156.100	21.23	-18.77	40.00	23.29	16.84	1.60	20.50	81.0	4.0
385.990	22.18	-24.82	47.00	24.96	14.72	2.65	20.15	83.0	4.0
498.510	23.34	-23.66	47.00	23.43	16.74	2.99	19.82	80.0	4.0

Antenna polarization : VERTICAL ; **Test distance** : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
56.190	24.22	-15.78	40.00	33.67	10.32	1.00	20.77	267.0	1.0
115.360	27.21	-12.79	40.00	35.66	10.83	1.42	20.70	262.0	1.0
159.010	23.64	-16.36	40.00	24.86	17.68	1.60	20.50	270.0	1.0
193.930	22.54	-17.46	40.00	29.66	11.44	1.80	20.36	275.0	1.0
258.920	21.45	-25.55	47.00	28.36	11.10	2.09	20.10	266.0	1.0
524.700	23.28	-23.72	47.00	22.62	17.16	3.30	19.80	268.0	1.0

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : TC-500R8A
Frequency range : 30MHz to 1GHz **Detector** : Quasi-Peak Value
Frequency range : above 1GHz **Detector** : Quasi-Peak/Average Value
Temperature : 29 ° C **Humidity** : 52 %
Memo : DC HALF LOAD MODE

Antenna polarization : HORIZONTAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
60.070	20.77	-19.23	40.00	28.00	12.46	1.01	20.70	36.0	4.0
115.360	21.76	-18.24	40.00	30.21	10.83	1.42	20.70	33.0	4.0
133.790	22.81	-17.19	40.00	28.79	13.08	1.50	20.56	30.0	4.0
155.130	23.46	-16.54	40.00	25.66	16.70	1.60	20.50	33.0	4.0
224.970	23.16	-16.84	40.00	30.89	10.61	1.90	20.24	32.0	4.0
408.300	22.49	-24.51	47.00	24.77	15.18	2.74	20.20	35.0	4.0

Antenna polarization : VERTICAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
129.910	23.55	-16.45	40.00	30.61	12.04	1.50	20.60	277.0	1.0
159.980	24.03	-15.97	40.00	25.11	17.82	1.60	20.50	274.0	1.0
193.930	23.66	-16.34	40.00	30.78	11.44	1.80	20.36	270.0	1.0
258.920	24.20	-22.80	47.00	31.11	11.10	2.09	20.10	268.0	1.0
327.790	23.77	-23.23	47.00	28.12	13.25	2.40	20.00	269.0	1.0
524.700	22.82	-24.18	47.00	22.16	17.16	3.30	19.80	271.0	1.0

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

7. EN 61000-3-2 Harmonic Current Test

Test Standard	Model No.	Device Class
EN 61000-3-2	TC-500R8A	A

The test was requested by customer to test under the class A and the listing of power in the below -----

+5V, +12V, +3.3V, 5VSB, -5V, -12V
6A, 2A, 1A, 0.1A, 0.1A, 0.1A

7.1 Harmonic Current Test Description

The equipment under test is supplied in series with shunt(s) R_m or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment under test. Whether the equipment operates with automatic, mixed or manual control, the measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions.

User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn.

For the purpose of harmonic current limitation, equipment is classified as follows:

Class A:

- Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Equipment not specified in one of the three other classes shall be considered as Class A equipment.

NOTE 1 Equipment that can be shown to have a significant effect on the supply system may be reclassified in a future edition of the standard. Factors to be taken into account include:

- number in use;
- duration of use;
- simultaneity of use;
- power consumption;
- harmonic spectrum, including phase.

Class B: Portable tools.

- Portable tools;
- Arc welding equipment which is not professional equipment.

Class C:

- Lighting equipment.

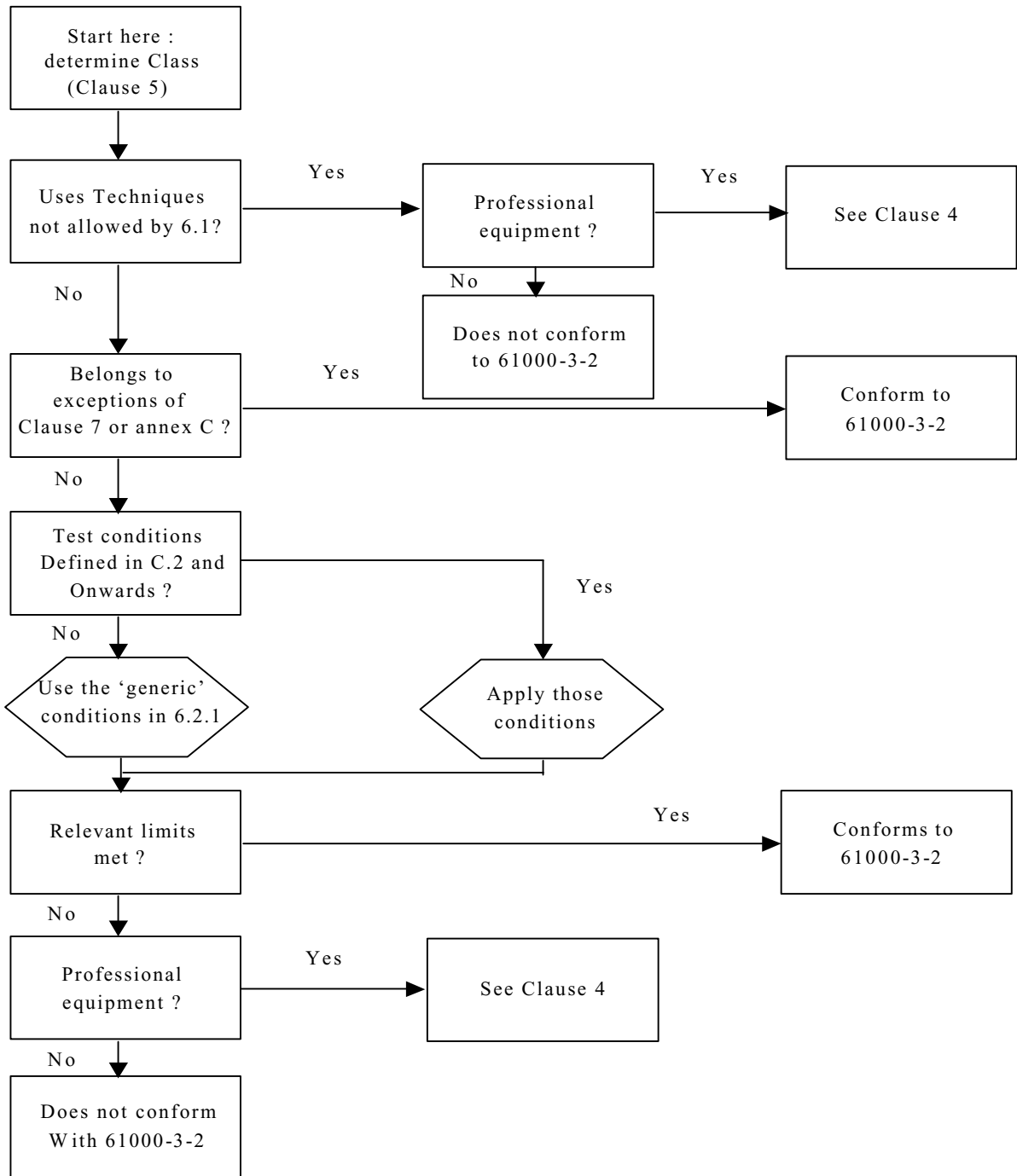
Class D:

Equipment having a specified power according to 6.2.2 less than or equal to 600W, of the following types:

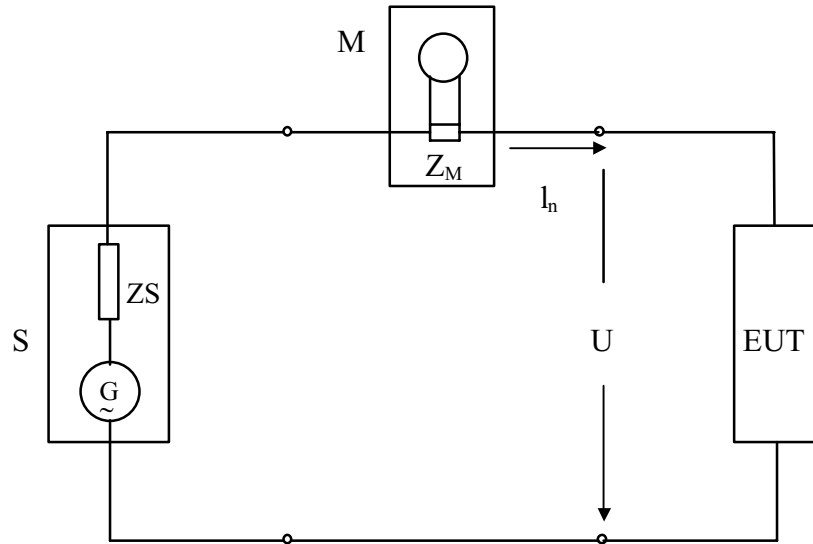
- Personal computers and personal computer monitors;
- Television receivers.

NOTE 2 Class D limits are reserved for equipment that, by virtue of the factors listed in note 1, can be shown to have a pronounced effect on the public electricity supply system.

7.2 Flow-chart for determining Conformity



7.3 Harmonic Current Test Setup



- | | | | |
|-----|-----------------------|----------------|---|
| S | power supply source | Z _M | input impedance of measurement equipment |
| M | measurement equipment | Z _S | internal impedance of the supply source |
| EUT | equipment under test | I _n | harmonic component of order n of the line current |
| U | test voltage | G | open-loop voltage of the supply source |

7.4 Harmonic Current Test Limits

Table 1 Limits for Class A equipment

Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	$0.15 \frac{15}{n}$
Even harmonics	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	$0.23 \frac{8}{n}$

Note :

1. For Class A equipment, the harmonics of the input current shall not exceed the absolute values given in table 1.
2. For Class B equipment, the harmonics of the input current shall not exceed the values given in table 1 multiplied by a factor of 1,5.

Table 2 Limits for Class C equipment

Harmonic order n	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	$30 \cdot \lambda^*$
5	10
7	7
9	5
$11 \leq n \leq 39$ (odd harmonics only)	3

* λ is the circuit power factor

Note :

The harmonic current limits of lighting equipment shall not exceed the relative limits given in table 2.

Table 3 Limits for Class D equipment

Harmonic n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
$13 \leq n \leq 39$ (odd harmonics only)	$\frac{3.85}{n}$	See table 1

Note :

The harmonics of the input current shall not exceed the values that can be derived from table 3.

7.5 Harmonic Current Test Setup Photos

< FRONT VIEW >



7.6 Harmonic Current Test Data

Model : TC-500R8A
 Line Voltage : 227.0 Vrms
 RMS Current : 1.001 A
 Real Power : 111.7 W
 Fundamental Amp : 590.5 mArms
 Line Frequency : 50 Hz
 Device Class : A

Harm. Order	Indicated Values	Max. Permits Harm. Current Ampere	Harm. Order	Indicated Values	Max. Permits Harm. Current Ampere
---	---	---	2	0.006	1.08
3	0.460	2.30	4	0.003	0.43
5	0.413	1.14	6	0.004	0.30
7	0.358	0.77	8	0.004	0.23
9	0.306	0.40	10	0.006	0.18
11	0.253	0.33	12	0.006	0.15
13	0.193	0.21	14	0.004	0.13
15	0.135	0.15	16	0.004	0.12
17	0.083	0.13	18	0.003	0.10
19	0.045	0.12	20	0.003	0.09
21	0.022	0.11	22	0.001	0.08
23	0.021	0.10	24	0.001	0.08
25	0.024	0.09	26	0.000	0.07
27	0.025	0.06	28	0.000	0.07
29	0.021	0.08	30	0.000	0.06
31	0.015	0.07	32	0.000	0.06
33	0.007	0.07	34	0.000	0.05
35	0.004	0.06	36	0.000	0.05
37	0.004	0.06	38	0.000	0.05
39	0.004	0.06	40	0.000	0.05

8. EN 61000-3-3 Voltage Fluctuations Test

Test Standard	Model No.	Criterion
EN 61000-3-3	TC-500R8A	Class A

8.1 Voltage Fluctuations Test Description

EN 61000-3-3 standards define the measurement requirements, ac power source requirements, line impedance requirements, and voltage fluctuation and flicker limits for assessing electronic and electrical equipment's propensity to cause voltage disturbances on the ac mains. Compliance with these standards ensures that voltage fluctuations do not interfere with other equipment connected to the ac mains or cause incandescent lights to visibly flicker in a way that causes an annoyance or health risk to a human observer.

When automatic controls cycle on and off, they cause frequent changes of toehold to the supply. When the fluctuating load is in a branch circuit with other loads, these changes cause rms voltage fluctuations that affect all of the loads in the branch. In particular, variations in voltage amplitude cause changes in the light output of any filament lamps in the branch circuit. Because the output of a filament lamp is proportional to the square of the applied voltage, changes in light intensities can be significant even for small changes in voltage.

8.2 Voltage Fluctuations Test Limits

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test.

The following limits apply:

- the value of P_{st} shall not be greater than 1.0;
- the value of P_{it} shall not be greater than 0.65;
- the value of $d(t)$ during a voltage change shall not exceed 3.3% for more than 500 ms;
- the relative steady-state voltage change, d_c , shall not exceed 3.3%;
- the maximum relative voltage change d_{max} , shall not exceed
 - a) 4% without additional conditions;
 - b) 6% for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

NOTE The cycling frequency will be frequency will be further limited by the P_{st} and P_{it} limit. For example: a d_{max} of 6% producing a rectangular voltage change characteristic twice per hour will give a P_{it} of about 0.65.

- c) 7% for equipment which is
 - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - switched on automatically, or is intended to be switched on manually, no mote than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

8.3 Voltage Fluctuations Test Setup Photos

< FRONT VIEW >



8.4 Voltage Fluctuations Test Data

Model No : TC-500R8A

RMS Voltage : 228.5 V RMS Current : 5.322 A
 Real Power : 662.6 W Peak Current : 19.45 A
 Apparent Power : 1216 VA Frequency : 50.0 Hz

	Indicated Values	Pass(P) or Fail (F)
Pst	0.07	P
Plt	0.07	P
Dc	0.00%	P
Dmax	0.00%	P
D(t)	0.00%	P

Pst : Short-term flicker indicator

Plt : Long-term flicker indicator

Dc : Relative steady state voltage change

Dmax : Maximum relative voltage change

D (t) : Voltage change

9. EN 61000-4-2 Electrostatic Discharge Test

Test Standard	Model No.	Criterion
EN 61000-4-2	TC-500R8A	B

Criteria to prove the performance of a PSU against EM disturbances

	Performance criteria		
	A	B	C
Basic specifications	No loss of function or performance during the test	Temporary loss of function or performance during the test Self-recoverable	Loss of function or performance Not self-recoverable Not damaged
Remarks	Operating as intended within Specified tolerance	Degradation of performance shall be specified by the manufacturer PSU shall continue to operate as intended after the test	Any resettable condition allowed including shut-down

9.1 Electrostatic Discharge Test Description

This standard relates to equipment, systems, sub-systems and peripherals which may be involved in static electricity discharges owing to environmental and installation conditions. such as low relative humidity, use of low-conductivity (artificial-fibre) carpets, vinyl garments, etc., which may exist in allocations classified in standards relevant to electrical and electronic equipment.

The test set-up shall consist of a wooden table, 0.8 m high standing on the ground reference plane. A horizontal coupling plane(HCP), 1.6 m x 0.8 m, shall be placed on the table. The EUT and cables shall be isolated from the coupling plane by an insulating support 0.5 mm thick .

A ground reference plane shall be provided on floor of the laboratory. It shall be metallic sheet of 0.25 mm minimum thickness. The minimum size of the reference plane is 1 m, the exact size depending on the dimensions of the EUT .

It shall project beyond the EUT or coupling plane by at least 0.5 m on all sides. and shall be connected to the protective grounding system.

In order to minimize the impact of environmental parameters on test results, the tests shall be carried out in climatic and electromagnetic reference conditions.

Climatic conditions

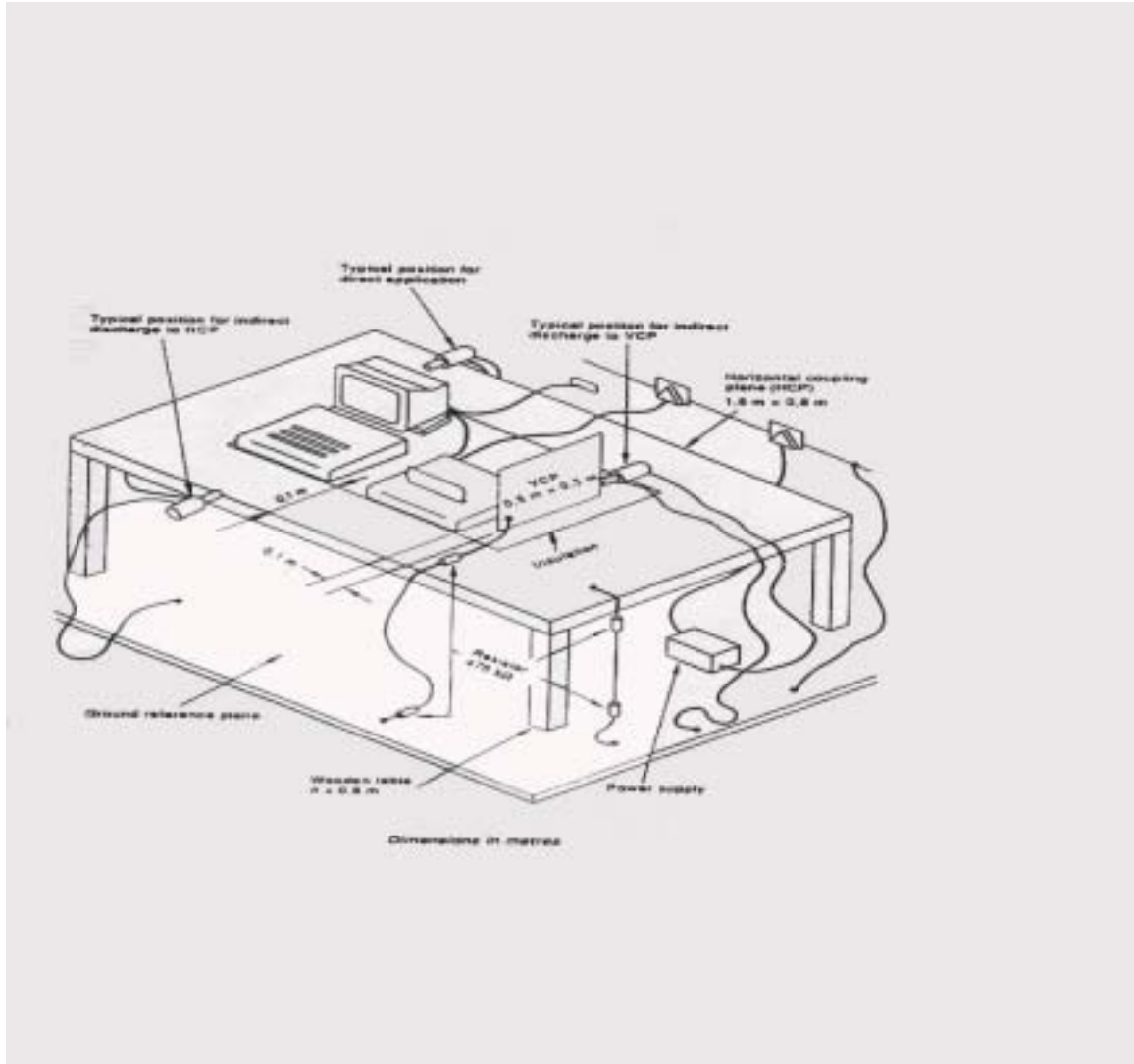
- ambient temperature: 15 °C to 35°C;
- relative humidity: 30 % to 60%
- atmospheric pressure: 86 KPa (860 mbar) to 106 KPa (1 060 mbar).

NOTE – Any other values are specified in the product specification.

Electromagnetic conditions

The electromagnetic environment of the laboratory shall not influence the test results.

9.2 Electrostatic Discharge Test Setup



- Example of test set-up for table-top equipment, laboratory tests

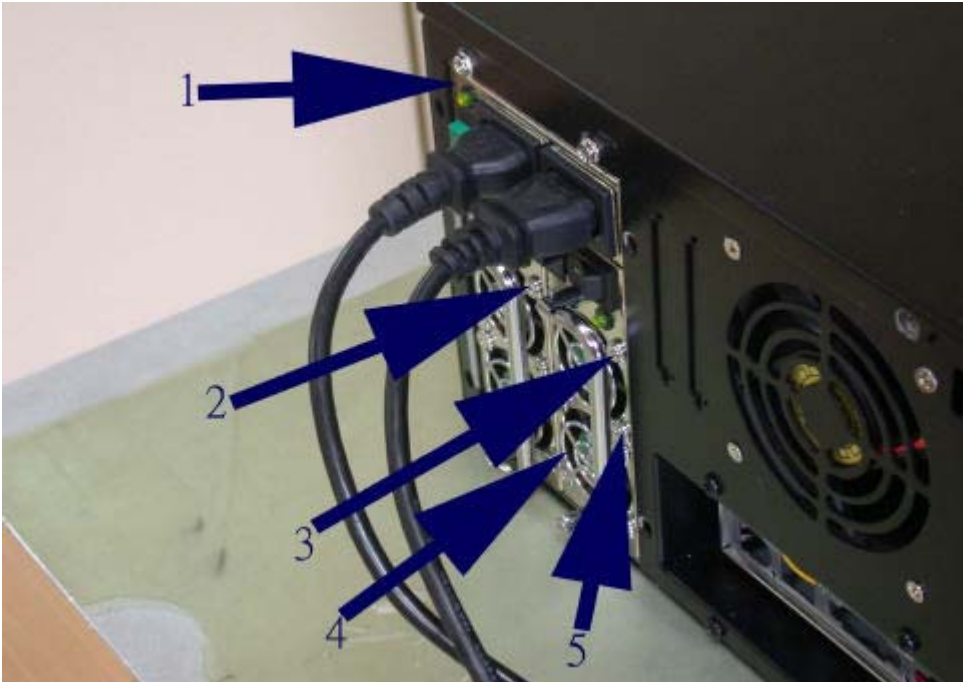
9.3 Electrostatic Discharge Test Limits

Test levels

Contact discharge		Air discharge	
Level	Test voltage kv	Level	Test voltage
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
x ¹⁾	Special	x ¹⁾	Special

¹⁾ "x" is an open level . The level has to be specified in the dedicated equipment specification .
If higher voltages than those shown are specified , special test equipment may be needed .

9.4 Direct Discharge Test Drawing



Indirect Discharge Test Drawing



9.5 Electrostatic Discharge Test Data

Model No. : _____ TC-500R8A _____

Test Item : Direct Discharge								Instrument :							
Temperature : <u>29</u> °C								Relative Humidity : <u>52</u> %RH							
Storage Capacitor : 150 pf								Discharge Resistor : 330 Ohm							
Discharge Rate : < 1 / Sec															
Contact Discharge								Air Discharge							
2KV		4KV		KV		KV		2 KV		4KV		6KV		8KV	
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
P	P	P	P	/	/	/	/	P	P	P	P	P	P	P	P

Test Item : Indirect Discharge								Instrument :							
Temperature : <u>30</u> °C								Relative Humidity : <u>51</u> %RH							
Storage Capacitor : 150 pf								Discharge Resistor : 330 Ohm							
Discharge Rate : < 1 / Sec															
Contact Discharge															
2 KV		4KV		KV		KV									
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1	P	P	P	P	P	/	/	/	/	/	/	/	/	/	/

1. " P " - - - - means the EUT function is correct during the test.
2. " / " - - - - no test.

10. EN 61000-4-3 Radio-Frequency Electromagnetic Field Test

Test Standard	Model No.	Criterion
EN 61000-4-3	TC-500R8A	A

Field Strength : 3 V/M , Level 2 .

Modulation : AM 80 % , 1KHz . ON (YES) . OFF (___)

Start : 80 MHz , Stop : 1000 MHz . AC Power : 230 Vac

DC Power : N/A Vdc

Criteria to prove the performance of a PSU against EM disturbances

	Performance criteria		
	A	B	C
Basic specifications	No loss of function or performance during the test	Temporary loss of function or performance during the test Self-recoverable	Loss of function or performance Not self-recoverable Not damaged
Remarks	Operating as intended within Specified tolerance	Degradation of performance shall be specified by the manufacturer PSU shall continue to operate as intended after the test	Any resettable condition allowed including shut-down

10.1 Radio-Frequency Electromagnetic Field Test Description

Most electronic equipment is, in some manner, affected by electromagnetic radiation.

This radiation is frequently generated by such sources as the small hand-held radio transceivers that are used by operating, maintenance and security personnel, fixed-station radio and television transmitters, vehicle radio transmitters, and various industrial electromagnetic sources.

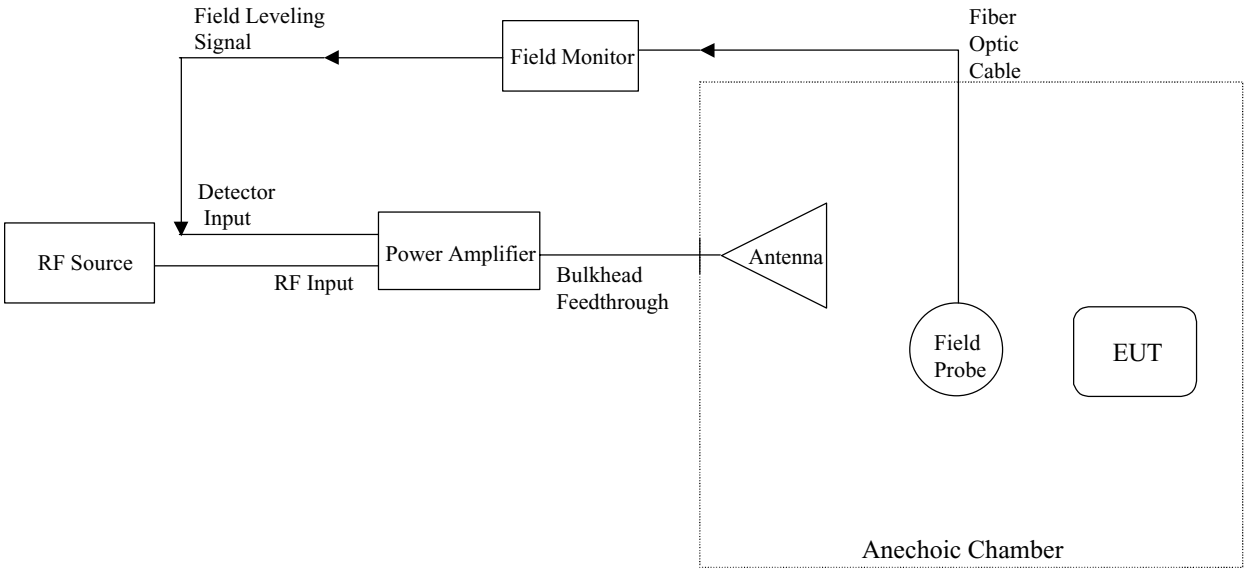
In addition to electromagnetic energy deliberately generated, there is also spurious radiation caused by devices such as welders, thyristors, fluorescent lights, switches operating inductive loads, etc. For the most part, this interference manifests itself as conducted electrical interference and, as such, is dealt with in other parts of this standard. Methods employed to prevent effects from electromagnetic fields will normally also reduce the effects from these sources.

The electromagnetic environment is determined by the strength of the electromagnetic field (field strength in volts per metre). The field strength is not easily measured without sophisticated instrumentation nor is it easily calculated by classical equations and formulae because of the effect of surrounding structures or the proximity of other equipment that will distort and/or reflect the electromagnetic waves.

All testing of equipment shall be performed in a configuration as close as possible to the installed case. Wiring shall be consistent with the manufacturer's recommended procedures, and the equipment shall be in its housing with all covers and access panels in place, unless otherwise stated.

If the equipment is designed to be mounted in a panel, rack or cabinet, it shall be tested in this configuration.

10.2 Radio-Frequency Electromagnetic Field Test Block Diagram



10.3 Radio-Frequency Electromagnetic Field Test Limits

Table 1 - Test levels

Level	Test field strength V/m
1	1
2	3
3	10
x	Special

NOTE – x is an open test level. This level may be given in the Product specification.

Table 1 gives details of the field strength of the unmodulated signal. For testing of equipment, this signal is 80 % amplitude modulate with a 1 KHz sinewave to simulate actual threats.

10.4 Radio-Frequency Electromagnetic Field Test Setup Photos

< FRONT VIEW >



11. EN 61000-4-4 Fast Transient Burst Test

Test Standard	Model No.	Criterion
EN 61000-4-4	TC-500R8A	B

Criteria to prove the performance of a PSU against EM disturbances

	Performance criteria		
	A	B	C
Basic specifications	No loss of function or performance during the test	Temporary loss of function or performance during the test Self-recoverable	Loss of function or performance Not self-recoverable Not damaged
Remarks	Operating as intended within Specified tolerance	Degradation of performance shall be specified by the manufacturer PSU shall continue to operate as intended after the test	Any resettable condition allowed including shut-down

11.1 Fast Transient Bursts Test Description

The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled into power supply, control and signal ports of electrical and electronic equipment. Significant for the test are the short rise time, the repetition rate and the low energy of the transients.

The test shall be carried out on the basis of a test plan including verification of the performances of the EUT as defined in the technical specification.

Climatic conditions

The tests shall be carried out in standard climatic conditions in accordance with IEC 68-1:

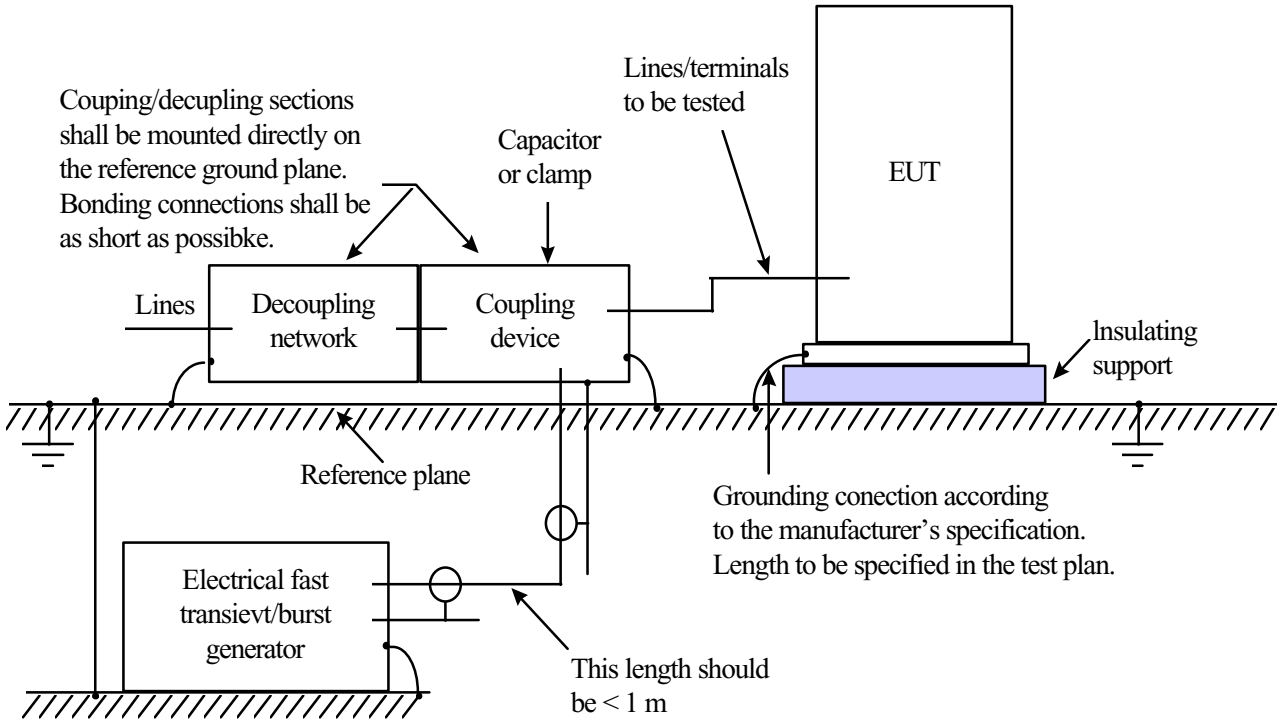
- ambient temperature: 15°C to 35°C
- relative humidity: 25% to 75%
- atmospheric pressure: 86kPa (860 mbar) to 106Kpa (1 060 mbar)

NOTE – Any other values are specified in the product specification.

Electromagnetic conditions

The electromagnetic conditions of the laboratory shall be such to guarantee the correct operation of the EUT in order not to influence the test results.

11.2 Fast Transient Burst Test Setup



Block-diagram for electrical fast transient/burst immunity test

11.3 Fast Transient Burst Test Limits

Test levels

Open-circuit output test voltage ($\pm 10\%$) and repetition rate of the impulses ($\pm 20\%$)				
Level	On power supply port, PE		On I/O (Input/Output) signal, data and control ports	
	Voltage peak	Repetition rate	Voltage peak	Repetition rate
	kV	kHz	kV	kHz
1	0.5	5	0.25	5
2	1	5	0.5	5
3	2	5	1	5
4	4	2.5	2	5
x ¹⁾	Special	Special	Special	Special

¹⁾ "x" is an open level. The level has to be specified in the dedicated equipment specification.

11.4 Fast Transient Burst Test Setup Photos

< FRONT VIEW >



11.5 Fast Transient Burst Test Data

MODEL NO. : TC-500R8A

REGULATION : **According to EN 61000-4-4 (2004) Spec.**

TEST RESULT

Temperature : <u>29 degree.</u>	Duration of tests : <u>1 min.</u>
Relative Humidity : <u>52 % RH.</u>	Time between test : <u>60 second.</u>
Pulse : <u>5 / 50 ns.</u>	AC Power : <u>230 Vac.</u>
Burst : <u>15 ms / 300 ms.</u>	DC Power : <u>N/A Vdc.</u>

Voltage \ Polarity \ Test Point \ Mode \ Result		0.5 KV		1 KV		2 KV	
		+	-	+	-	+	-
Power Line	L	/	/	P	P	/	/
	N	/	/	P	P	/	/
	G	/	/	P	P	/	/
Signal Line Clamp Test		/	/	/	/	/	/

- Note :
1. "P" mean the EUT function is correct during the test .
 2. "F" ---- Fail
 3. "/" ---- no test

12. EN 61000-4-5 Surge Immunity Test

Test Standard	Model No.	Criterion
EN 61000-4-5	TC-500R8A	B

Criteria to prove the performance of a PSU against EM disturbances

	Performance criteria		
	A	B	C
Basic specifications	No loss of function or performance during the test	Temporary loss of function or performance during the test Self-recoverable	Loss of function or performance Not self-recoverable Not damaged
Remarks	Operating as intended within Specified tolerance	Degradation of performance shall be specified by the manufacturer PSU shall continue to operate as intended after the test	Any resettable condition allowed including shut-down

12.1 Surge Immunity Test Description

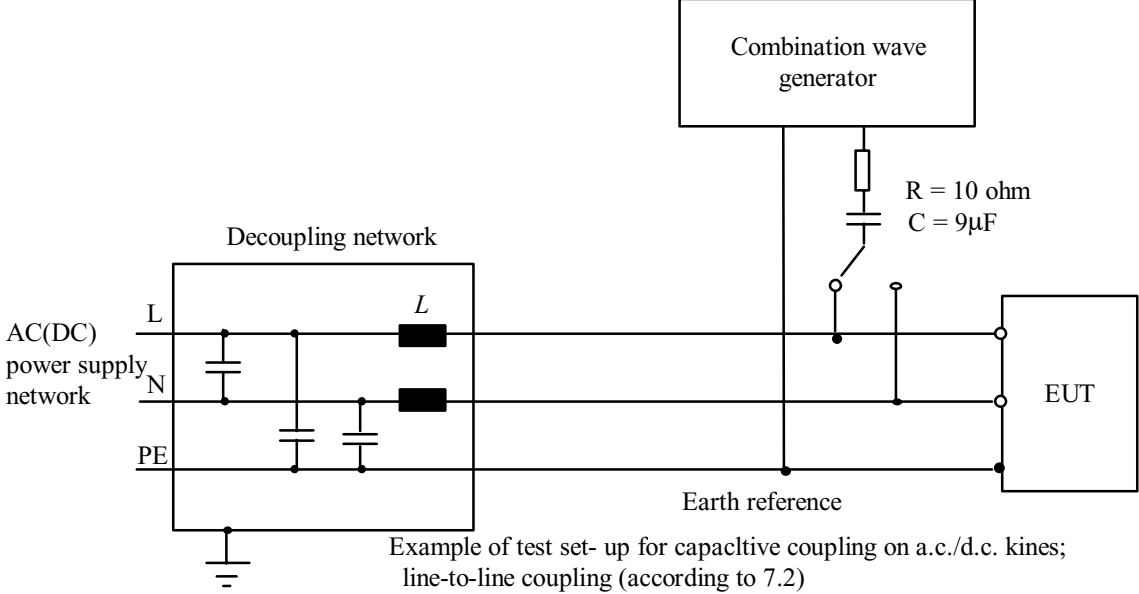
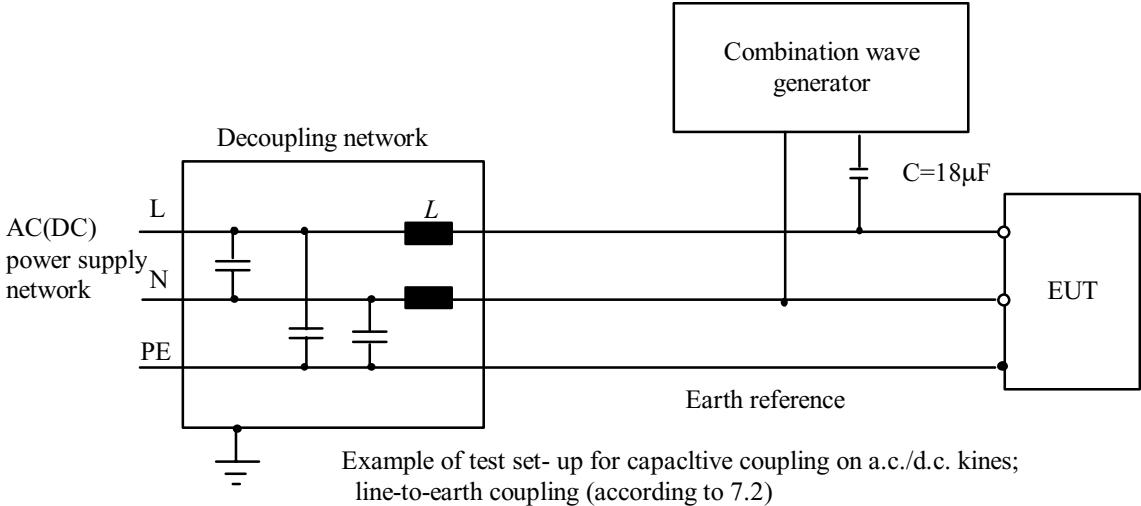
The task of the described laboratory test is to find the reaction of the EUT under specified operational conditions caused by surge voltages from switching and lightning effects at certain threat levels.

The following equipment is part of the test set-up :

- equipment under test (EUT);
- auxiliary equipment (AE);
- cables (of specified type and length);
- coupling device (capacitive or arrestors);
- test generator (combination wave generator, 1.2/50 μ s generator);
- decoupling network/protection devices;
- additional resistors, 10 ohm and 40 ohm

The surge is to be applied to the EUT Power Supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be developed on the lines under test .

12.2 Surge Immunity Test Setup



12.3 Surge Immunity Test Limits

The preferential range of test levels is given in table 1.

Table 1-Test levels

Level	Open-circuit test voltage +10 % - kV
1	0.5
2	1.0
3	2.0
4	4.0
x	Special
NOTE - x is an open class . The level can be specified in the product specification .	

12.4 Surge Immunity Test Setup Photos

< FRONT VIEW >



12.5 Surge Immunity Test Data

MODEL NO : TC-500R8A

TEST SETUP : According to EN 61000-4-5 (1995+A1: 2001)

TEST RESULT

Temperature : <u>30</u> °C		Relative Humidity <u>51</u> %RH				
Waveform : <u>1,2 x 50 μs</u>		Test rate : <u>60</u> sec				
Times <u>5</u> times / each condition		AC power <u>230</u> VAC				
\Phase		0	90	180	270	
\Voltage\Mode\Polarity\Result						
1KV	Line	+	P	P	P	P
	Neutral	-	P	P	P	P
2KV	Line	+	/	/	/	/
	Neutral	-	/	/	/	/
2KV	Line	+	P	P	P	P
	Ground	-	P	P	P	P
	Neutral	+	P	P	P	P
	Ground	-	P	P	P	P

- Note : 1. " P " means the EUT function is correct during the test
 2. " / " no test

13. EN 61000-4-6 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields

Test Standard	Model No.	Criterion
EN 61000-4-6	TC-500R8A	A

Criteria to prove the performance of a PSU against EM disturbances

	Performance criteria		
	A	B	C
Basic specifications	No loss of function or performance during the test	Temporary loss of function or performance during the test Self-recoverable	Loss of function or performance Not self-recoverable Not damaged
Remarks	Operating as intended within Specified tolerance	Degradation of performance shall be specified by the manufacturer PSU shall continue to operate as intended after the test	Any resettable condition allowed including shut-down

13.1 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields Description

The EUT shall be placed on an insulating support, 0.1 m above the ground reference plane. For table-top equipment, the ground reference plane may be placed on a table (see figure) .

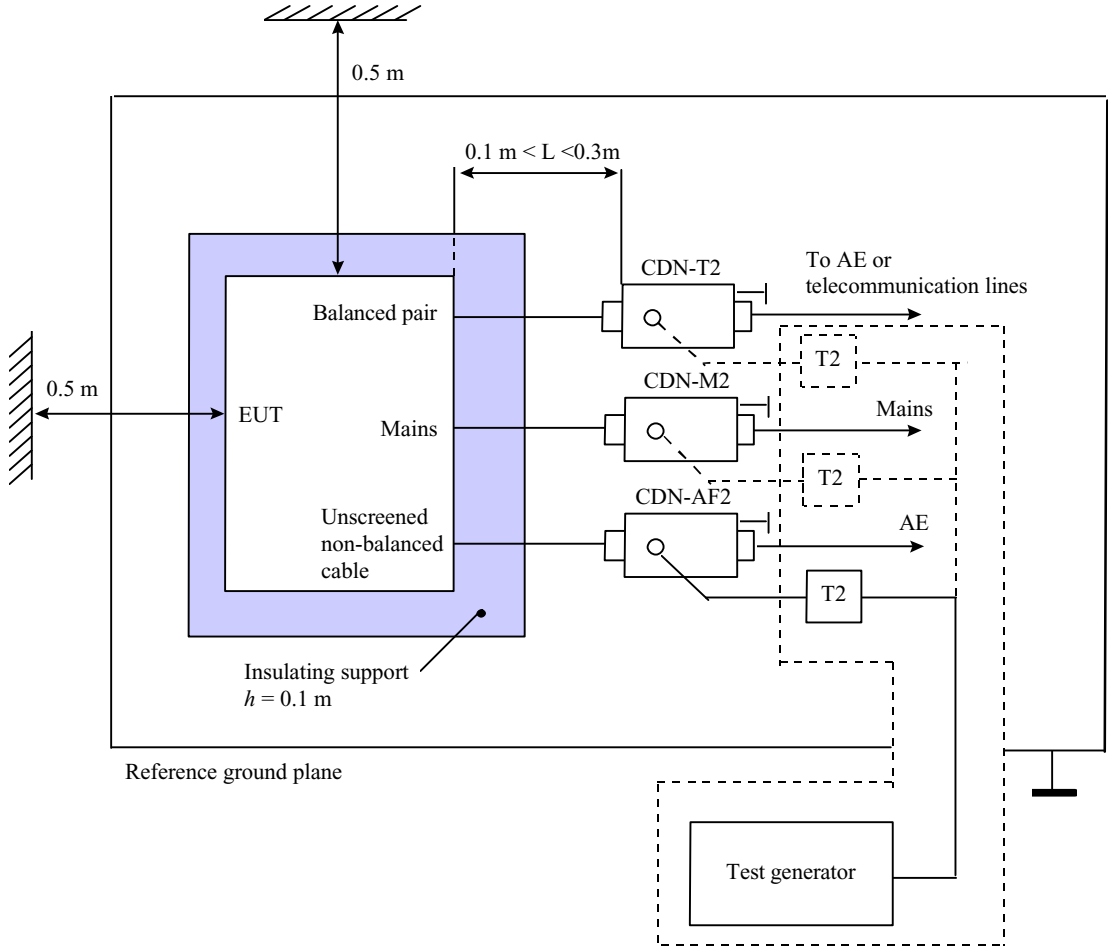
On all cables to be tested, coupling and decoupling devices shall be inserted. The coupling and decoupling devices shall be placed on the ground reference plane, making direct contact with it at about 0.1 m to 0.3 m from the EUT. The cables between the coupling and decoupling devices and the EUT shall be as short as possible and shall not be bundled nor wrapped. height above the ground reference plane shall be between 30 mm and 50 mm.

If the EUT is provided with other earth terminals, they shall, when allowed, be connected to the ground reference plane through the coupling and decoupling network CDN-M1, (i.e. the AE port of the CDN-M1 is then connected to the ground reference).

If the EUT is provided with a keyboard or hand-held accessory, then the artificial hand shall be placed on this keyboard or wrapped around the accessory and connected to the ground reference plane.

Auxiliary equipment (AE) required for the defined operation of the EUT according to the specifications of the product committee, e.g. communication equipment, modem, printer, sensor, etc., as well as auxiliary equipment necessary for ensuring any data transfer and assessment of the functions, shall be connected to the EUT through coupling and decoupling devices. However, as far as possible the number of cables to be tested should be limited by restricting attention to the representative functions.

13.2 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields Setup



NOTE - The EUT clearance from any metallic obstacles shall be at least 0.5 m .
All non-excited input ports of the CDNs shall be terminated by 50 ohm loads .

Example of test set-up with a single-unit system
for class II safety equipment (see IEC 536)

13.3 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields Test Limits

No tests are required for induced disturbances caused by electromagnetic fields coming from intentional RF transmitters in the frequency range 9 kHz to 150 kHz,

The open-circuit test levels (e.m.f.) of the unmodulated disturbing signal, expressed in r.m.s., are given in table 1. The test levels are set at the EUT port of the coupling and decoupling devices. For testing of equipment, this signal is 80% amplitude modulated with a 1 kHz sine wave to simulate actual threats.

Table1 – Test levels

Frequency range 150 kHz – 80MHz		
Level	Voltage level (e.m.t.)	
	Uo [dB(μ V)]	Uo[V]
1	120	1
2	130	3
X ¹⁾	140	10
	special	
¹⁾ X is an open level.		

13.4 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields Test Setup Photos

< FRONT VIEW >



13.5 Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields Test Data

MODEL NO. : TC-500R8A

REGULATION : EN 61000-4-6 (1996+A1: 2001)

TEST RESULT

Temperature : <u>29 degree</u> , Relative Humidity : <u>52 % RH</u>				
Start : <u>0.15 MHz</u> , Stop : <u>80 MHz</u> , Power : <u>AC 230V</u>				
Modulation : AM 80 % , 1kHz. ON (<u>YES</u>) , OFF (<u> </u>)				
Output impedance : 50 ohm , Source impedance : 150 ohm				
Performance criterion : A				
Test Ports	Frequency(MHz) Range	EUT Condition	1V(rms) Field strength	3V(rms) Field strength
Input / Output a. c. power	0.15 - - - - - 80	NORMAL	/	P
Input / Output d. c.	0.15 - - - - - 80	NORMAL	/	/
Signal lines Control lines	0.15 - - - - - 80	NORMAL	/	/

Note : 1. " P " mean the EUT function is correct during the test.

2. " / " no test.

14. EN 61000-4-11 Voltage Dips, Short Interruptions And Voltage Variations Immunity Tests

14.1 Voltage Dips,short Interruptions And Voltage Variations Immunity Tests Description

Electrical and electronic equipment may be affected by voltage dips, short interruptions or voltage variations of Power Supply.

Voltage dips and short interruptions are caused by faults in the network, in installations or by a sudden large change of load. In certain cases, two or more consecutive dips or interruptions may occur. Voltage variations are caused by the continuously varying loads connected to the network. Before starting the test of a given equipment, a test plan shall be prepared.

It is recommended that the test plan shall comprise the following items :

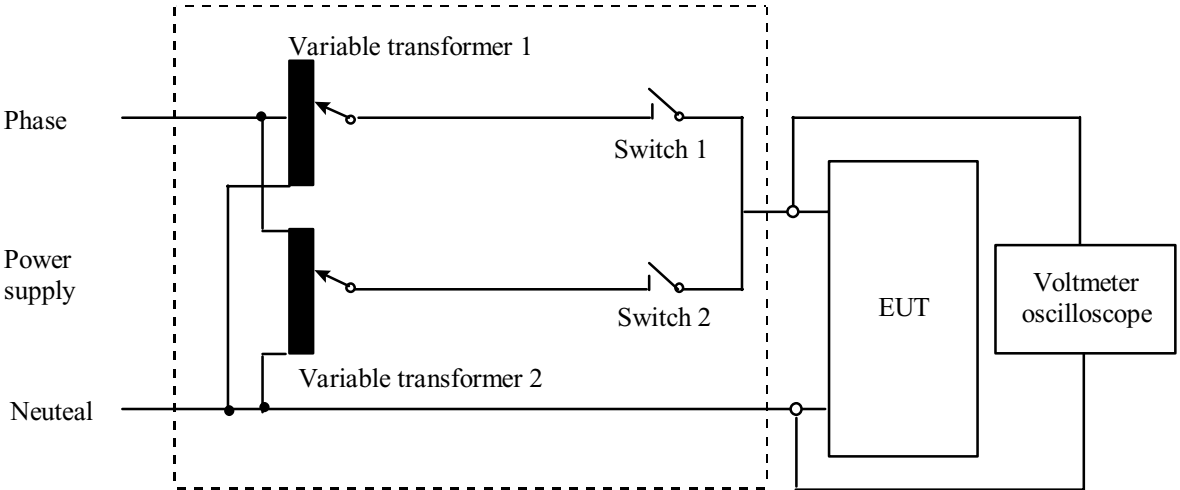
- the type designation of the EUT;
- information on possible connections (plugs, terminals, etc.) and cables, and peripherals;
- input power port of equipment to be tested;
- representative operational modes of the EUT for the test;
- performance criteria used and defined in the technical specifications;
- operational mode(s) of equipment;
- description of the test set-up.

If the actual operating signal sources are not available to the EUT, they may be simulated.

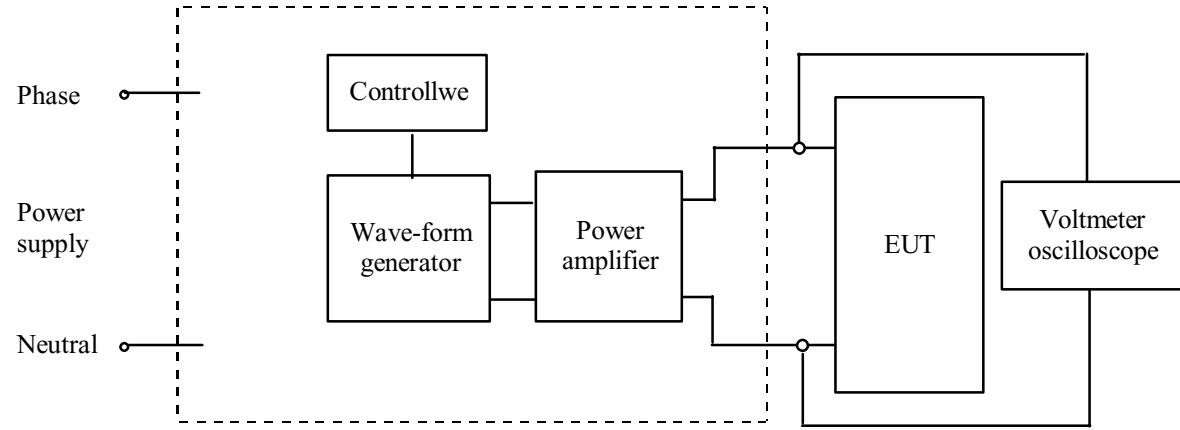
For each test any degradation of performance shall be recorded.

The monitoring equipment should be capable of displaying the status of the operational mode of the EUT during and after the tests. After each group of tests a full functional check shall be performed.

14.2 Voltage Dips, short Interruptions And Voltage Variations Immunity Tests Setup



Schematic of test instrumentation for voltage dips and short interruptions using variable transformers and seitches



Schematic of test instrumentation for voltage dips, short interruptions and variations using power amplifier

14.3 Voltage Dips, short Interruptions And Voltage Variations Immunity Tests Limits

Preferred test levels and durations for
voltage dips and short interruptions

Test level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Duration (in period)
0	100	0.5*
40	60	1
70	30	5
		10
		25
		50
		x

* For 0.5 period, the test shall be made in positive and negative polarity, i.e. starting at 0° and 180° , respectively .

NOTES

- 1 One or more of the above test levels and durations may be chosen .
- 2 If the EUT is tested for voltage dips of 100%, it is generally unnecessary to test for other levels for the same durations. However, for some cases (safeguard systems or electromechanical devices) it is not true. The product specification or product committee shall give an indication of the applicability of this note .
- 3 "x" is an open duration. This duration can be given in the product specification. Utilities in Europe have measured dips and short interruptions of duration between 1/2 a period and 3 000 periods, but duration less than 50 periods are most common.
- 4 Any duration may apply to any test level .

14.4 Voltage Dips, short Interruptions And Voltage Variations Test Setup Photos

< FRONT VIEW >



14.5 Voltage Dips, short Interruptions And Voltage Variations Immunity Tests Data

MODEL NO. : TC-500R8A

REGULAR : EN 61000-4-11 (1994+A1: 2001)

TEST RESULT : Test Voltage **230Vac**

	Test Level %U _T	Duration (ms)	Performance Criterion
Voltage dips	30	10	A
	60	100	B
Voltage interruptions	>95	5000	C

U_T is the rated voltage for the equipment.

15. Labelling Requirement, Warning



1. The vertical size is 5mm.
2. The mark will be placed in a visible spot on the outside of the equipment, but in cases where that is impractical, it may be included on the packaging and/or documentation.

Class A equipment shall carry the following remark in its documentation:

Warning: This is a class A product. In a residential, commercial or light industrial environment it may cause radio interference. This product is not intended to be installed in a residential environment; in a commercial and light industrial environment with connection to the public mains supply, the user may be required to take adequate measures to reduce interference.

16. The List of Test Instruments

Test Site	Instrument	Model No.	S/N	Next Cal. Date	Cal. Interval
Conduction (No.2)	R & S Spectrum	FSP 3	833387/010	Aug. 23, 2007	1Year
	R & S Receiver	ESHS10	830223/008	Sep. 10, 2007	1Year
	R & S LISN(EUT)	ESH2-Z5	831886/004	Apr. 17, 2008	1Year
	Kyoritsu LISN(2nd)	KNW-242	8-837-7	N/A	N/A
	RF Cable	No.4	N/A	Jan. 02, 2008	1Year
Radiation (OP No.3)	R & S Receiver	ESVS 30	863342/012	Aug. 14, 2007	1Year
	Schaffner Pre-Amp.	CPA-9232	1012	Jan. 02, 2008	1Year
	SCHWARZBECK Antenna	9161	9161-4077	July 23, 2007	1Year
	RF Cable	No.3	N/A	Jan. 02, 2008	1Year
	R & S Signal Generator	SMY02	829846/038	May 01, 2008	2Year

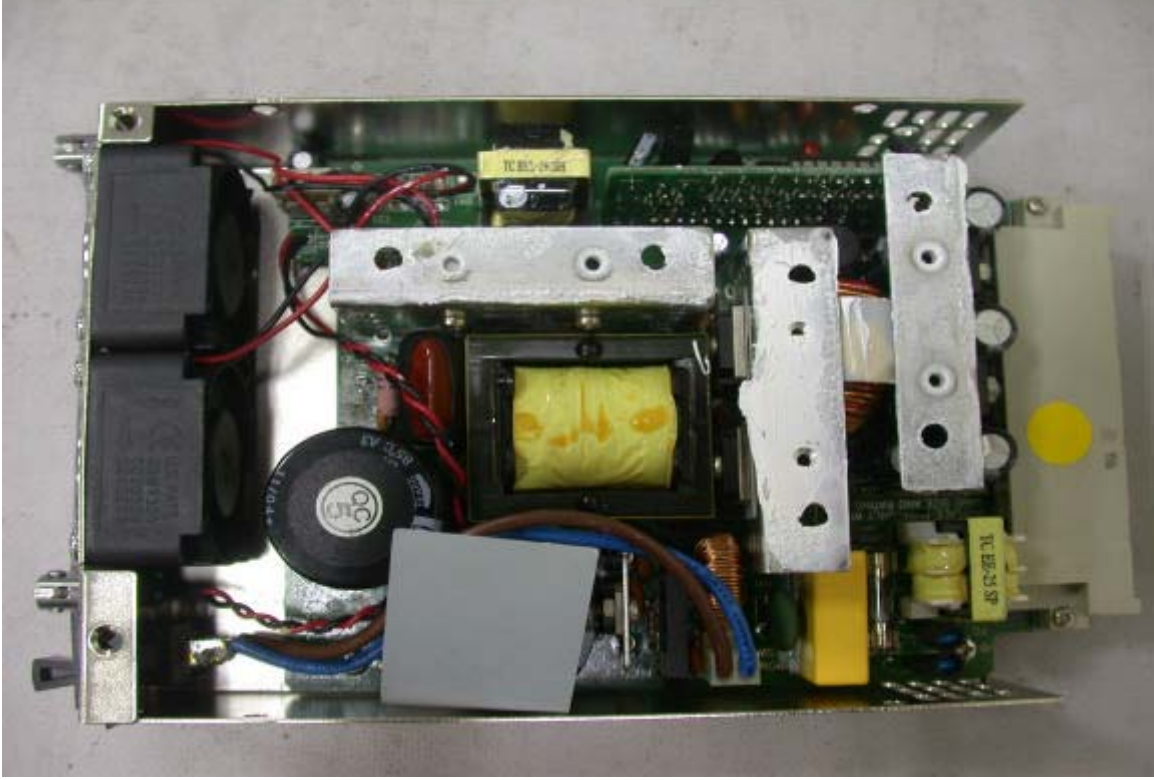
Test Site	Instrument	Model No.	S/N	Next Cal. Date	Cal. Interval
EMS (NO.2)	(EMC-PARTNER) Transient Tester	TRA-2000/N6	456	July 03 , 2009	2 Year
	ESD Simulator	MZ-15/EC	9505340	Aug. 15 , 2007	1 Year
	(EMC-PARTNER) EFT/B Clamp	TRA1Z03B	CNEFT 1000-268	July 03 , 2009	2 Year
	(EMC-PARTNER) Magnetic Field Loop antenna	MF-1000	MF 1000-169	July 03 , 2009	2 Year
	CONDUCTED IMMUNITY	CIT-10 /102C3117	102C3117	Dec. 06 , 2008	2Years
	(EMC-PARTNER) Harmonic/ Flicker	HAR-1000	66	June 13 , 2008	2Years
	(Amplifier & Research) Power Amplifier	100W1000M11	25616	N/A	2Years
	(Amplifier & Research) Power Amplifier	80S1G3	313546	N/A	2Years
	(Amplifier & Research) Power Meter	PM2002	N/A	June 13 , 2008	2Years
	(Amplifier & Research) Field Probe	FP5000	25339	June 13 , 2008	2Years
	(Amplifier & Research) Field Probe	FP6001	D445,050	June 13 , 2008	2Years
	(Amplifier & Research) Direct Coupler	DC6080	N/A	N/A	2Years
	(Amplifier & Research) Direct Coupler	DC7144A	N/A	N/A	2Years
	(Boonton) Power Sensor	51011-EMC	31094	N/A	2Years
	(Boonton) Power Sensor	31011-EMC	31078	N/A	2Years
R & S Signal Generator	SMY02	829846/038	May 01, 2008	2Year	

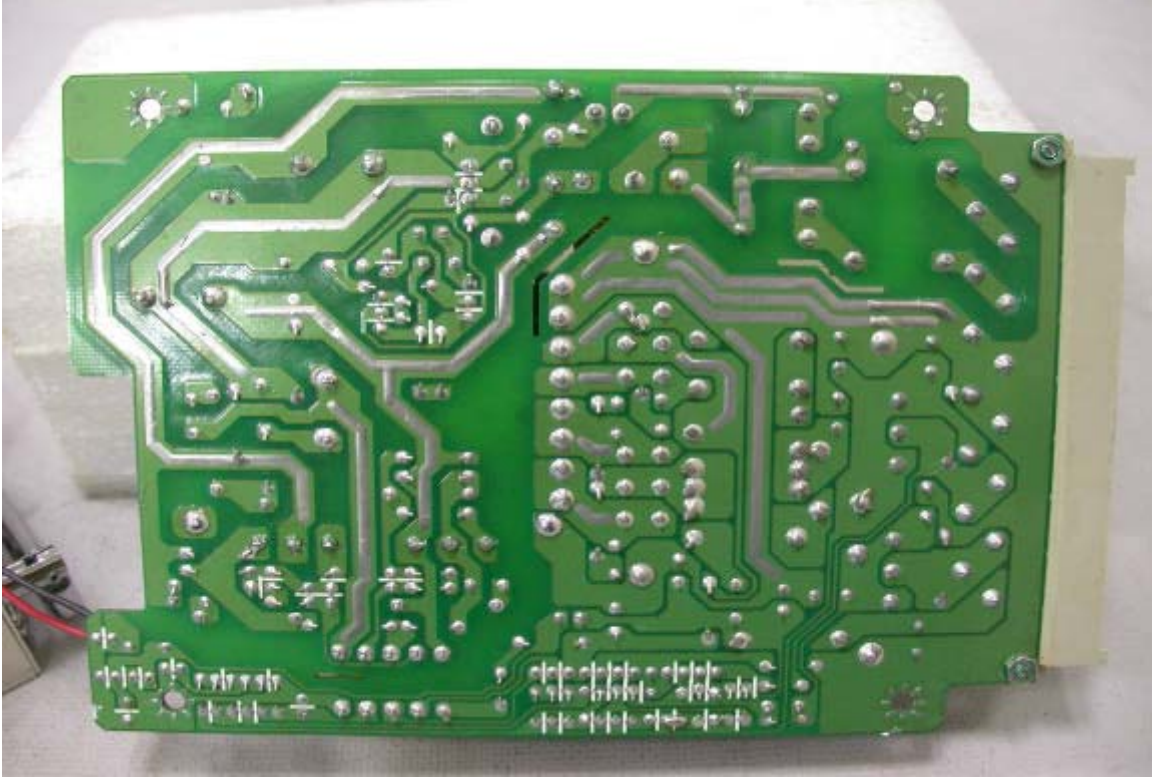
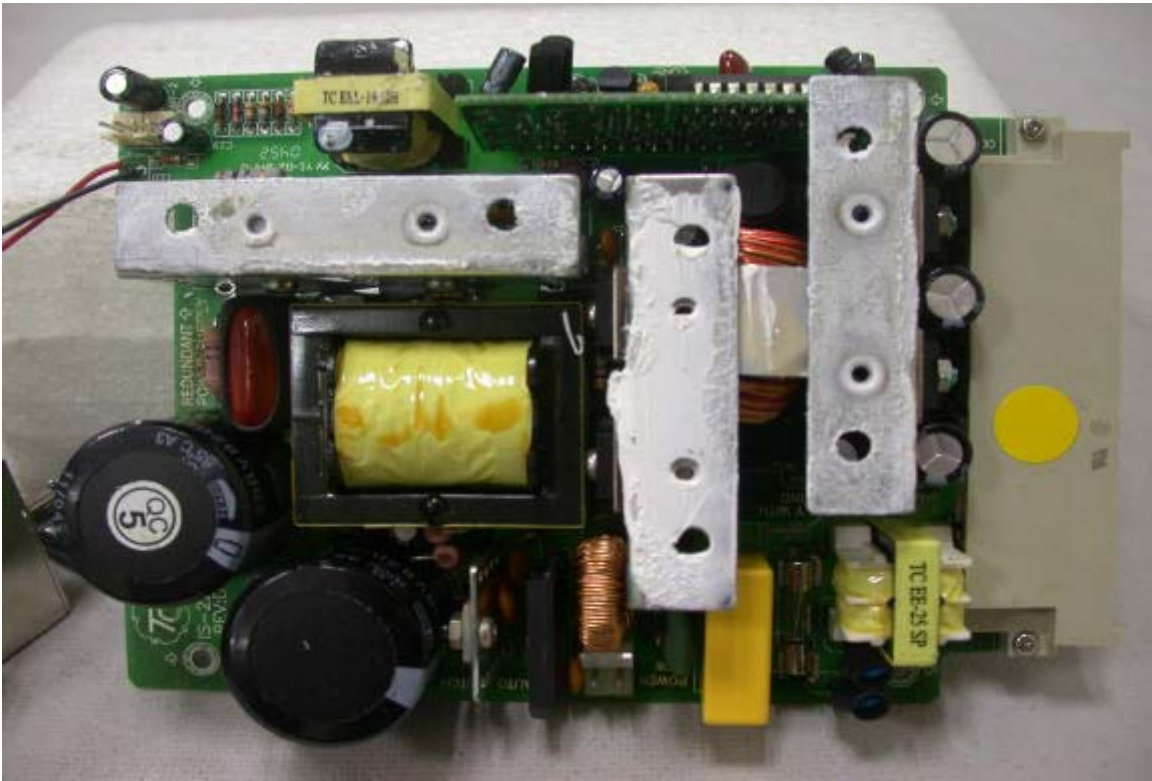
17. EUT Photos

MODEL NO.: TC-500R8A









VERIFICATION

of conformity with European EMC Directive

No. E960164

Document holder:

I-STAR COMPUTER CO., LTD.

Type of equipment:

Power Supply

Type designation:

TC-500R8A, TC-400R8A, TC-300R8A, TC-400R8, TC-300R8

A sample of the equipment has been tested for CE-marking according to the EMC Directive, 2004/108/EC. *Standard(s) used for showing compliance with the essential requirements of the directive:*

Standard(s):

EN 61204-3: 2000	EN 55022: 1998+A1: 2000+A2: 2003	CLASS A
	EN 61000-3-2: 2000+A2: 2005	
	EN 61000-3-3: 1995+A1: 2001+A2: 2005	
	EN 61000-4-2: 1995+A1: 1998+A2: 2001	<i>Performance Criterion</i> B
	EN 61000-4-3: 2002+A1: 2002	A
	EN 61000-4-4: 2004	B
	EN 61000-4-5: 1995+A1: 2001	B
	EN 61000-4-6: 1996+A1: 2001	A
	EN 61000-4-11: 2004	

The referred test report(s) show that the product fulfills the requirements in the EMC Directive for CE marking. On this basis, together with the manufacturer's own documented production control, the manufacturer (or his European authorized representative) can in his EC Declaration of Conformity verify compliance with the EMC Directive.

Signed for and on behalf of
PEP Testing Laboratory



M. Y. Tsui

Date: JULY 26, 2007

M. Y. Tsui / President

Declaration of Conformity

The following

Applicant : I-STAR COMPUTER CO., LTD.
Equipment : Power Supply
Model No. : TC-500R8A, TC-400R8A, TC-300R8A, TC-400R8,
TC-300R8
Report No. : E960164

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility(2004/108/EC)

For the evaluation of above mentioned Directives, the following standards were applied:

EN 61204-3: 2000
EN 55022: 1998+A1: 2000+A2: 2003
EN 61000-3-2: 2000+A2: 2005
EN 61000-3-3: 1995+A1: 2001+A2: 2005
EN 61000-4-2: 1995+A1: 1998+A2: 2001
EN 61000-4-3: 2002+A1: 2002
EN 61000-4-4 : 2004
EN 61000-4-5 : 1995+A1: 2001
EN 61000-4-6 : 1996+A1: 2001
EN 61000-4-11 : 2004

The following manufacturer is responsible for this declaration:

I-STAR COMPUTER CO., LTD

2F, NO. 33, LANE 42, CHUNG SHIN NORTH ST., SAN CHUNG CITY,
TAIPEI, TAIWAN R.O.C.

Taiwan / JULY 26, 2007

Place and Date

Signature of responsible Person