CE

SPORTON LAB.

Certificate No: EC791706

CERTIFICATE

- **EQUIPMENT : Power Supply**
  MODEL NO. : PWS-702A-1R, PWS-801-1R,
  PWS-902-1R, PWS-981-1S
  APPLICANT : Ablecom Technology Inc.
  5F, No. 228, Liancheng Rd.,
  Chung-Ho City, Taipei County 235, Taiwan

SPORTON LAB.

I HEREBY CERTIFY THAT:

THE MEASUREMENTS SHOWN IN THIS TEST REPORT WERE MADE IN ACCORDANCE WITH THE PROCEDURES GIVEN IN **EUROPEAN COUNCIL DIRECTIVE 2004/108/EC.** THE EQUIPMENT WAS **PASSED** THE TEST PERFORMED ACCORDING TO **EUROPEAN STANDARD EN 55022:2006 Class A, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001/A2:2003 (IEC 61000-4-2:1995/A2:2000, IEC 61000-4-3:2002, IEC 61000-4-4:1995/A2:2001, IEC 61000-4-5:1995/A1:2000, IEC 61000-4-6:1996/A1:2000, IEC 61000-4-8:1993/A1:2000, IEC 61000-4-11:1994/A1:2000).** THE TEST WAS CARRIED OUT ON **Sep. 27, 2007** AT **SPORTON INTERNATIONAL INC.** LAB.

Castries Huang Sep. 28, 2007

Castries Huang
Supervisor

EMC TEST REPORT

according to

**EUROPEAN STANDARD EN 55022:2006 Class A,
EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and
EN 55024:1998/A1:2001/A2:2003 (IEC 61000-4-2:1995/A2:2000,
IEC 61000-4-3:2002, IEC 61000-4-4:1995/A2:2001,
IEC 61000-4-5:1995/A1:2000, IEC 61000-4-6:1996/A1:2000,
IEC 61000-4-8:1993/A1:2000, IEC 61000-4-11:1994/A1:2000)**

Equipment	:	Power Supply
Model No.	:	PWS-702A-1R, PWS-801-1R, PWS-902-1R, PWS-981-1S
Applicant	:	**Ablecom Technology Inc.** 5F, No. 228, Liancheng Rd., Chung-Ho City, Taipei County 235, Taiwan

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- This test report is only applicable to European Community.

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Sep. 28, 2007

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : EC791706

CERTIFICATE OF COMPLIANCE

according to

EUROPEAN STANDARD EN 55022:2006 Class A, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001/A2:2003 (IEC 61000-4-2:1995/A2:2000, IEC 61000-4-3:2002, IEC 61000-4-4:1995/A2:2001, IEC 61000-4-5:1995/A1:2000, IEC 61000-4-6:1996/A1:2000, IEC 61000-4-8:1993/A1:2000, IEC 61000-4-11:1994/A1:2000)

Equipment : Power Supply

Model No. : PWS-702A-1R, PWS-801-1R, PWS-902-1R, PWS-981-1S

Applicant : **Ablecom Technology Inc.**
5F, No. 228, Liancheng Rd.,
Chung-Ho City, Taipei County 235, Taiwan

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 2004/108/EC.** The equipment was ***passed*** the test performed according to **EUROPEAN STANDARD EN 55022:2006 Class A, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001/A2:2003 (IEC 61000-4-2:1995/A2:2000, IEC 61000-4-3:2002, IEC 61000-4-4:1995/A2:2001, IEC 61000-4-5:1995/A1:2000, IEC 61000-4-6:1996/A1:2000, IEC 61000-4-8:1993/A1:2000, IEC 61000-4-11:1994/A1:2000).**
The test was carried out on Sep. 27, 2007 at **SPORTON International Inc.** LAB.

Castries Huang Sep. 28, 2007
Castries Huang
Supervisor

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

Ablecom Technology Inc.
5F, No. 228, Liancheng Rd.,
Chung-Ho City, Taipei County 235, Taiwan

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: Power Supply
Model No.	: PWS-702A-1R, PWS-801-1R, PWS-902-1R, PWS-981-1S
Trade Name	: Ablecom
Power Supply Type	: Switching
AC Power Cord	: Non-Shielded, 1.8 m, 3 pin

1.4. Feature of Equipment under Test

Model : PWS-702A-1R

- INPUT : 100-240V, 50-60Hz, 10-4A
- OUTPUT : +12V / 57A, +5Vsb / 4A
- 700W

Model : PWS-801-1R

- INPUT : 100-240V, 50-60Hz, 10-4A
- OUTPUT : +12V / 66A, +5Vsb / 4A
- 800W

Model : PWS-902-1R

- INPUT : 100-240V, 50-60Hz, 13-4A
- OUTPUT : +12V / 75A, +5Vsb / 4A
- 900W

Model : PWS-981-1S

- INPUT : 100-240V, 50-60Hz, 14-6A
- OUTPUT : +12V / 81A, +5Vsb / 4A
- 980W

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. During testing, the interface cables and equipment positions were varied according to European Standard EN 55022.
b. The complete test system included SPORTNO Dummy Load and EUT for EMI test.
c. For EMI test, the following modes were pretested :
   Mode 1. Model : PWS-702A-1R
   Mode 2. Model : PWS-801-1R
   Mode 3. Model : PWS-902-1R
   Mode 4. Model : PWS-981-1S
   cause “mode 4” generated the worst test result, it was reported as final data.
d. The complete test system included SPORTNO Dummy Load, Pro’s Kit Multi-meter and EUT for EMS test.
e. The EUT and dummy load were placed in a metal enclosure.
f. The following test modes were performed for EMS test:
   Mode 1. Model : PWS-702A-1R
   Mode 2. Model : PWS-801-1R
   Mode 3. Model : PWS-902-1R
   Mode 4. Model : PWS-981-1S
g. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000 MHz.

2.2. Description of Test System

< EMI >

Support Unit 1. -- Dummy Load (SPORTON)
Spec. : Full Load

< EMS >

Support Unit 1. -- Multi-meter (Pro’s Kit)
Model No. : MT-2007
Serial No. : SP1077

Support Unit 2. -- Dummy Load (SPORTON)
Spec. : Full Load

3. Test Software

No test software was used during testing.

4. General Information of Test

4.1. Test Facility

<EMI>

Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District,
Taipei 11424, Taiwan, R.O.C.
TEL : 886-2-2631-4739
FAX : 886-2-2631-9740

Test Site No : CO01-NH, OS03-NH

<EMS>

Test Site Location : 3F, No.587, Tanmeu St., Neihu District,Taipei, Taiwan, R.O.C.
TEL : 886-2-2793-1705

4.2. Test Voltage

230VAC / 50Hz

4.3. Standard for Methods of Measurement

EMI Test (conduction and radiation) : European Standard EN 55022 Class A
Harmonics Test : European Standard EN 61000-3-2
Voltage Fluctuations Test : European Standard EN 61000-3-3
EMS Test : European Standard EN 55024
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

4.4. Test in Compliance with

EMI Test (conduction and radiation) : European Standard EN 55022 Class A
Harmonics Test : European Standard EN 61000-3-2
Voltage Fluctuations Test : European Standard EN 61000-3-3
EMS Test : European Standard EN 55024
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

4.5. Frequency Range Investigated

a. Conducted emission test: from 150 kHz to 30 MHz
b. Radiated emission test: from 30 MHz to 1,000 MHz
c. Radio frequency electromagnetic field immunity test: 80-1000 MHz.

4.6. Test Distance

a. The test distance of radiated emission test from antenna to EUT is 10 M.
b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55022 Clause 9. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

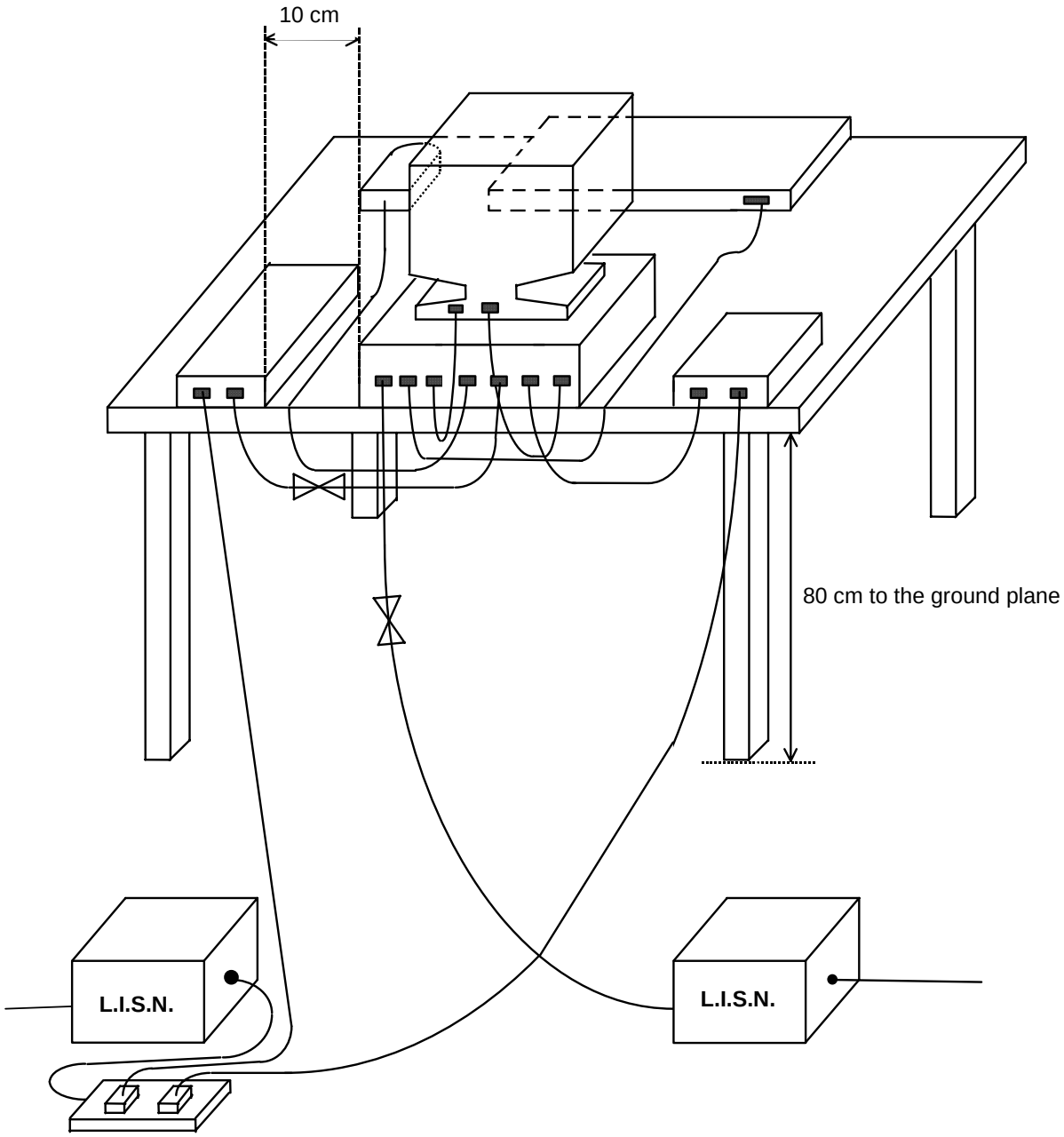
5.1. Description of Major Test Instruments

● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The CISPR states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3. Typical Test Setup Layout of Conducted Powerline

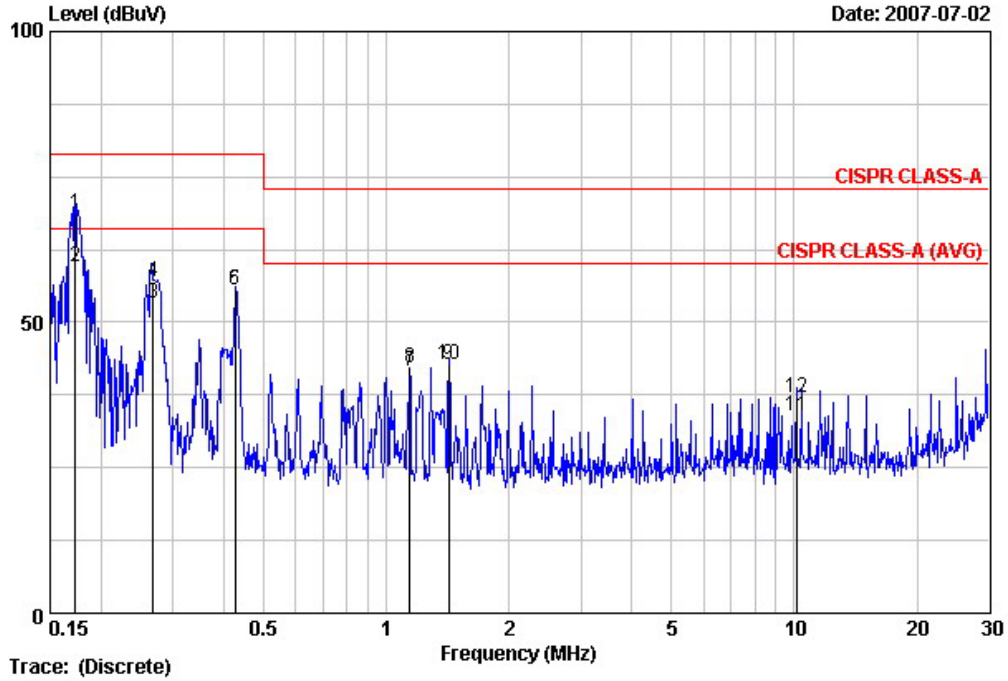


5.4. Test Result of AC Powerline Conducted Emission

5.4.1. Test Mode: Mode 4

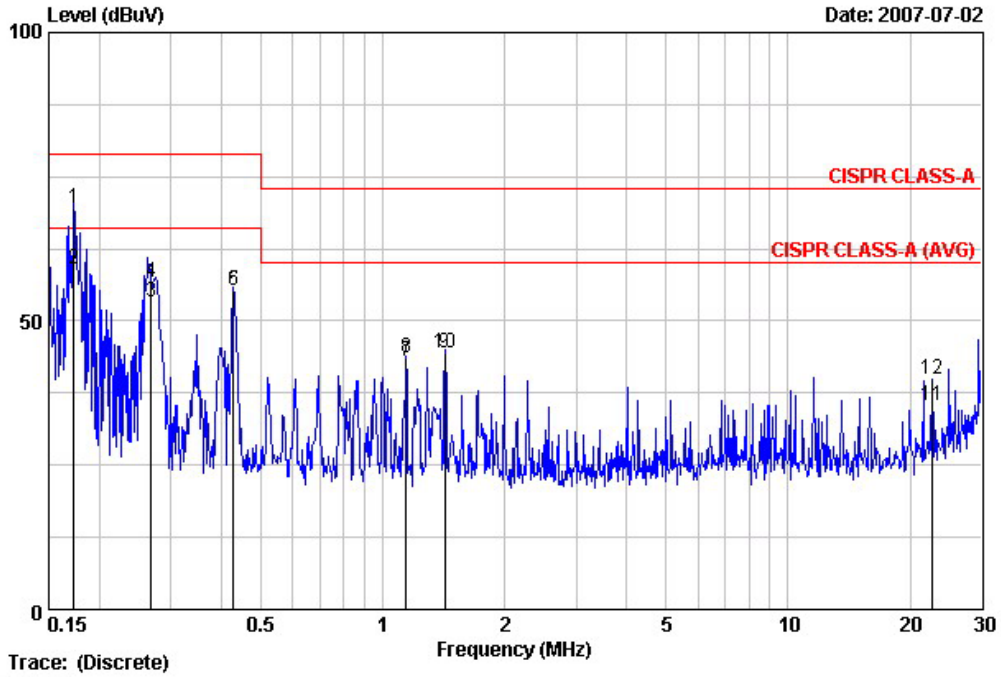
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 25 ℃
- Relative Humidity: 51 %
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked by the frame in the following table.



Site : CO01-NH
Condition : CISPR CLASS-A LISN-NNB41-20070308 LINE
eut : PPWER(980W)
power : AC 230V
memo : MODE 4
memo :
memo :
memo :

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.173	68.69	-10.31	79.00	58.59	10.10	0.00	QP
2 @	0.173	59.45	-6.55	66.00	49.35	10.10	0.00	AVERAGE
3	0.268	53.40	-12.60	66.00	43.30	10.10	0.00	AVERAGE
4	0.268	56.84	-22.16	79.00	46.74	10.10	0.00	QP
5	0.427	55.59	-23.41	79.00	45.48	10.10	0.01	QP
6	0.427	55.49	-10.51	66.00	45.38	10.10	0.01	AVERAGE
7	1.140	41.55	-18.45	60.00	31.35	10.10	0.10	AVERAGE
8	1.140	42.07	-30.93	73.00	31.87	10.10	0.10	QP
9	1.426	42.82	-30.18	73.00	32.62	10.10	0.10	QP
10	1.426	42.71	-17.29	60.00	32.51	10.10	0.10	AVERAGE
11	10.119	34.03	-25.97	60.00	23.73	10.10	0.20	AVERAGE
12	10.119	37.00	-36.00	73.00	26.70	10.10	0.20	QP



Trace: (Discrete)

Site : CO01-NH
Condition : CISPR CLASS-A LISN-NNB41-20070308 NEUTRAL
eut : PPWER(980W)
power : AC 230V
memo : MODE 4
memo :
memo :
memo :

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.173	69.41	-9.59	79.00	59.39	10.02	0.00	QP
2	0.173	58.92	-7.08	66.00	48.90	10.02	0.00	AVERAGE
3	0.268	53.24	-12.76	66.00	43.24	10.00	0.00	AVERAGE
4	0.268	56.74	-22.26	79.00	46.74	10.00	0.00	QP
5	0.428	55.39	-23.61	79.00	45.38	10.01	0.01	QP
6	0.428	55.19	-10.81	66.00	45.18	10.01	0.01	AVERAGE
7	1.140	43.06	-16.94	60.00	32.86	10.10	0.10	AVERAGE
8	1.140	43.57	-29.43	73.00	33.37	10.10	0.10	QP
9	1.426	44.40	-28.60	73.00	34.20	10.10	0.10	QP
10	1.426	44.35	-15.65	60.00	34.15	10.10	0.10	AVERAGE
11	22.663	35.43	-24.57	60.00	24.92	10.21	0.30	AVERAGE
12	22.663	40.02	-32.98	73.00	29.51	10.21	0.30	QP

Test Engineer : Eddie

Eddie Lee

5.5. Photographs of Conducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in European Standard EN 55022, Clause 10. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Description of Major Test Instruments

● Amplifier	(HP 8447D)
RF Gain	25 dB
Signal Input	0.1 MHz - 1.3 GHz
● Spectrum Analyzer	(ADVANTEST R3261C)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 kHz
Signal Input	9 kHz - 2.6 GHz
● Test Receiver	(R&S ESCS 30)
Resolution Bandwidth	120 kHz
Frequency Band	9 kHz - 2.75 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode
	OFF for Peak Mode

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

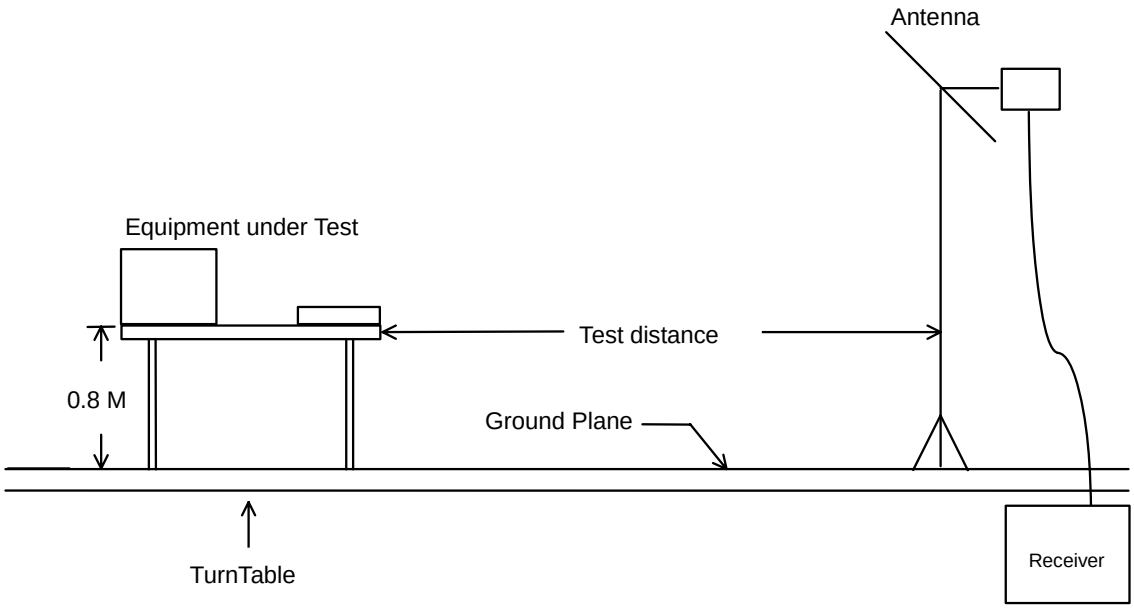
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission

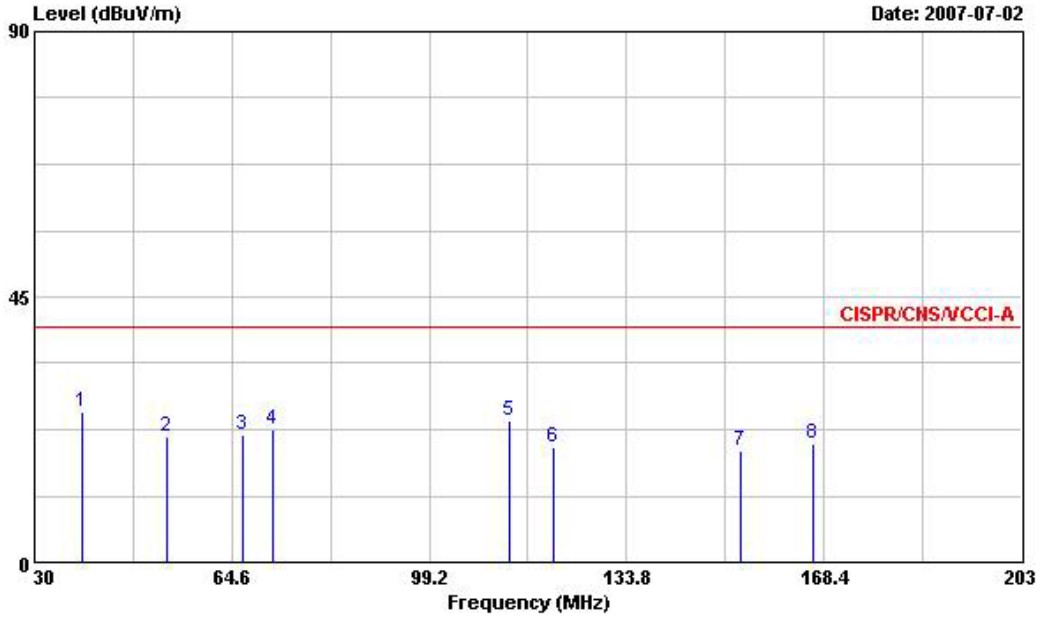


6.4. Test Result of Radiated Emission

6.4.1. Test Mode: Mode 4

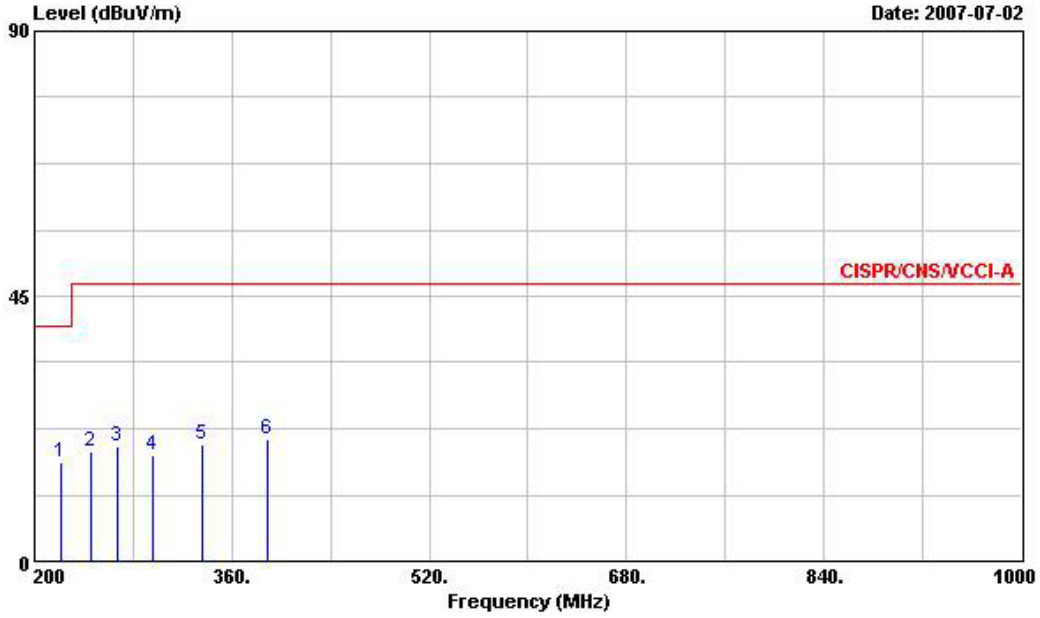
- Frequency Range of Test: from 30 MHz to 1,000 MHz
- Temperature: 24 ℃
- Relative Humidity: 53 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following test record



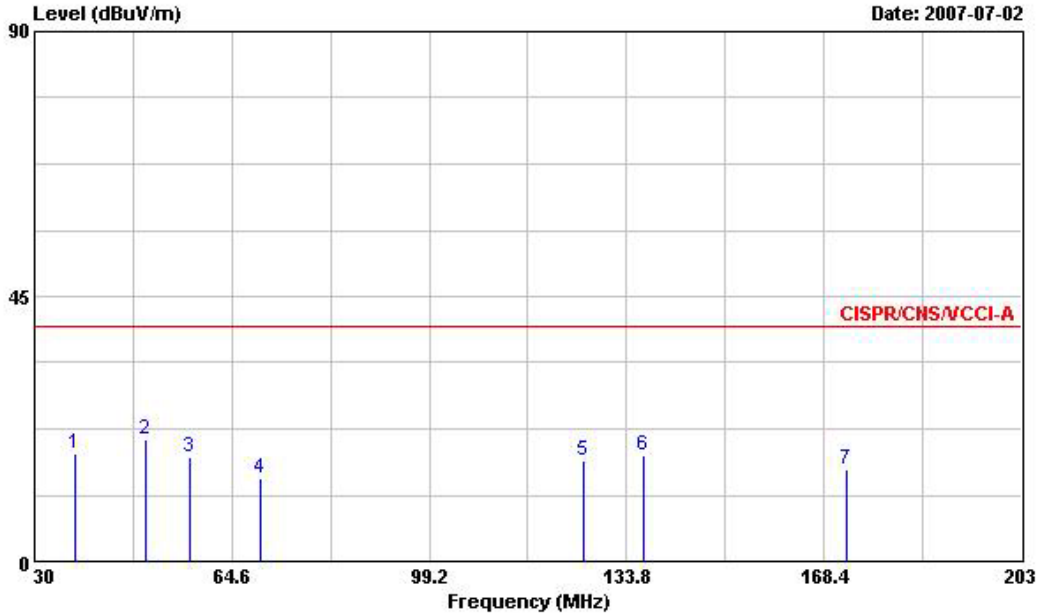
Site : OS03-NH
Condition : CISPR/CNS/VCCI-A 10m OS03-ANT-06-20-2007 VERTICAL
EUT : POWER SUPPLY
POWER : 230VAC
MEMO : 980W

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	38.300	25.46	-14.54	40.00	38.00	14.43	1.43	28.40	QP	100	180
2	53.180	21.45	-18.55	40.00	37.83	10.37	1.65	28.40	Peak	---	---
3	66.500	21.52	-18.48	40.00	41.60	6.56	1.76	28.40	Peak	---	---
4	71.870	22.49	-17.51	40.00	42.46	6.66	1.77	28.40	QP	---	---
5	113.210	24.06	-15.94	40.00	38.82	11.64	1.90	28.30	QP	---	---
6	121.000	19.41	-20.59	40.00	33.51	12.20	1.99	28.29	Peak	---	---
7	153.870	18.96	-21.04	40.00	33.99	10.88	2.15	28.06	Peak	---	---
8	166.500	20.00	-20.00	40.00	35.69	10.00	2.31	28.00	Peak	---	---



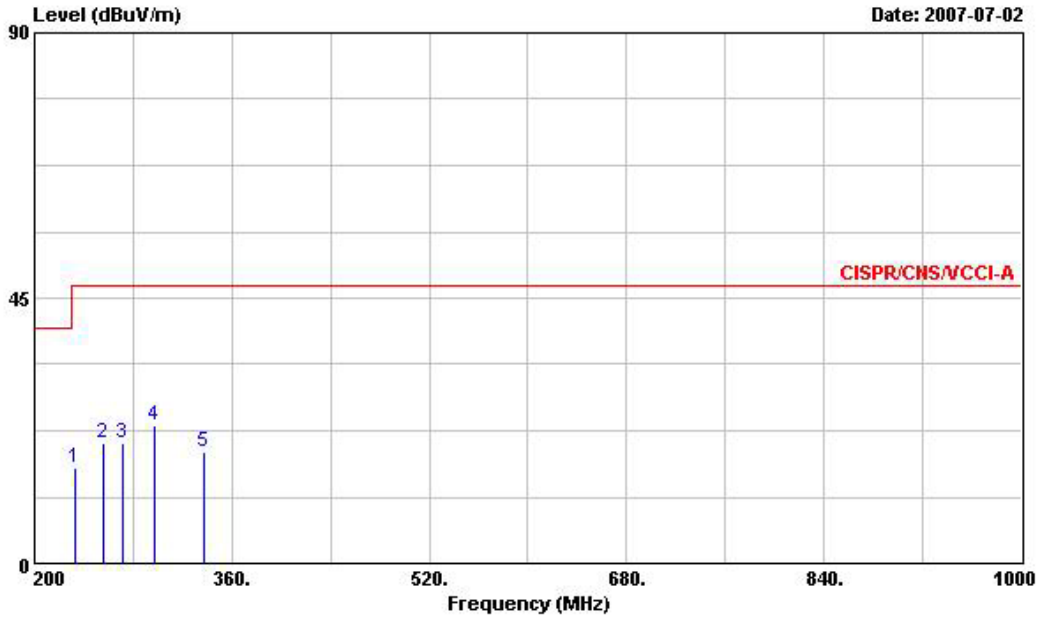
Site : OS03-NH
Condition : CISPR/CNS/VCCI-A 10m OS03-ANT-06-20-2007 VERTICAL
EUT : POWER SUPPLY
POWER : 230VAC
MEMO : 980W

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	221.600	16.68	-23.32	40.00	30.80	10.90	2.78	27.80	Peak	---	---
2	245.600	18.67	-28.33	47.00	31.00	12.49	2.88	27.70	Peak	---	---
3	267.200	19.47	-27.53	47.00	31.00	13.11	2.98	27.62	Peak	---	---
4	296.000	17.92	-29.08	47.00	28.80	13.58	3.14	27.60	Peak	---	---
5	336.000	19.71	-27.29	47.00	29.62	14.54	3.43	27.88	Peak	---	---
6	388.800	20.77	-26.23	47.00	29.39	15.87	3.85	28.34	Peak	---	---



Site : OS03-NH
Condition : CISPR/CNS/VCCI-A 10m OS03-ANT-06-20-2007 HORIZONTAL
EUT : POWER SUPPLY
POWER : 230VAC
MEMO : 980W

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	37.090	18.40	-21.60	40.00	30.73	14.68	1.39	28.40	QP	---	---
2	49.550	20.77	-19.23	40.00	35.48	12.10	1.59	28.40	QP	---	---
3	57.160	17.64	-22.36	40.00	36.00	8.33	1.71	28.40	QP	---	---
4	69.620	14.25	-25.75	40.00	34.42	6.46	1.77	28.40	Peak	---	---
5	126.190	17.09	-22.91	40.00	31.18	12.18	1.97	28.24	Peak	---	---
6	136.740	17.98	-22.02	40.00	32.39	11.69	2.03	28.13	Peak	---	---
7	172.380	15.69	-24.31	40.00	31.59	9.72	2.38	28.00	Peak	---	---



Site : OS03-NH
Condition : CISPR/CNS/VCCI-A 10m OS03-ANT-06-20-2007 HORIZONTAL
EUT : POWER SUPPLY
POWER : 230VAC
MEMO : 980W

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	232.800	16.29	-30.71	47.00	29.60	11.63	2.83	27.77	Peak	---	---
2	256.000	20.51	-26.49	47.00	32.40	12.92	2.89	27.70	Peak	---	---
3	271.200	20.39	-26.61	47.00	31.80	13.18	3.01	27.60	Peak	---	---
4	297.600	23.36	-23.64	47.00	34.20	13.62	3.14	27.60	Peak	---	---
5	337.600	19.05	-27.95	47.00	28.90	14.59	3.45	27.89	Peak	---	---

Test Engineer: Chay Yeh

6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW

7. Harmonics Test

7.1. Standard

- Standard : EN 61000-3-2:2000

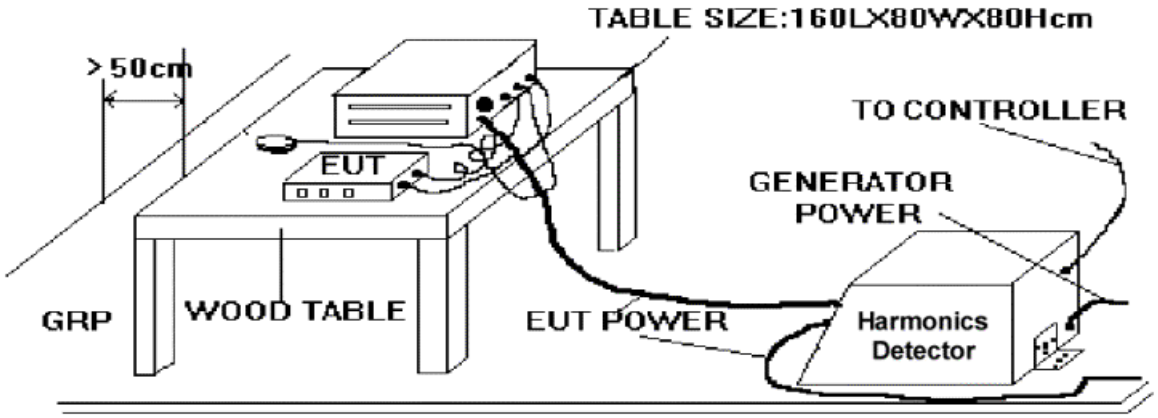
7.2. Test Procedure

The measured values of the harmonics components of the input current, including line current and neutral current, shall be compared with the limits given in Clause 7 of EN 61000-3-2.

7.3. Test Equipment Settings

- Line Voltage : 230 V
- Line Frequency : 50 Hz
- Device Class : A
- Current Measurement Range : High
- Measurement Delay : 10.0 seconds
- Test Duration : 2.00 minutes
- Class determination Pre-test Duration : 10.00 seconds

7.4. Test Setup



7.5. Current Harmonics Test

7.5.1. Test Data Of Current Harmonics

- FINAL TEST RESULT : ***PASS***
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 1

Urms =	230.1V	Freq =	49.987	Range:	10 A
Irms =	2.935A	Ipk =	4.551A	cf =	1.551
P =	668.3W	Pap =	675.3VA	pf =	0.990
THDi =	8.80 %	THDu =	0.10 %	Class A	

Test - Time : 10min (100 %)
Test completed, Result: PASSED

Order	Freq.	Iavg	Iavg%	Irms	Irms%	Imax	Imax%	Limit
1	50	3.0212	102.95	2.9230	99.605	4.0173	136.90	
2	100	0.0238	0.8111	0.0220	0.7488	0.0238	0.8111	1.0800
3	150	0.2661	9.0682	0.2545	8.6730	0.2679	9.1306	2.3000
4	200	0.0000	0.0000	0.0024	0.0832	0.0024	0.0832	0.4300
5	250	0.0000	0.0000	0.0055	0.1872	0.0073	0.2496	1.1400
6	300	0.0000	0.0000	0.0006	0.0208	0.0006	0.0208	0.3000
7	350	0.0000	0.0000	0.0061	0.2080	0.0061	0.2080	0.7700
8	400	0.0000	0.0000	0.0006	0.0208	0.0006	0.0208	0.2300
9	450	0.0000	0.0000	0.0128	0.4368	0.0128	0.4368	0.4000
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1840
11	550	0.0000	0.0000	0.0171	0.5824	0.0171	0.5824	0.3300
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1533
13	650	0.0000	0.0000	0.0171	0.5824	0.0177	0.6032	0.2100
14	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1314
15	750	0.0000	0.0000	0.0153	0.5200	0.0159	0.5408	0.1500
16	800	0.0000	0.0000	0.0000	0.0000	0.0006	0.0208	0.1150
17	850	0.0000	0.0000	0.0092	0.3120	0.0128	0.4368	0.1324
18	900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1022
19	950	0.0000	0.0000	0.0049	0.1664	0.0098	0.3328	0.1184
20	1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0920
21	1050	0.0000	0.0000	0.0061	0.2080	0.0079	0.2704	0.1071
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0836
23	1150	0.0000	0.0000	0.0073	0.2496	0.0079	0.2704	0.0978
24	1200	0.0000	0.0000	0.0000	0.0000	0.0006	0.0208	0.0767
25	1250	0.0000	0.0000	0.0085	0.2912	0.0085	0.2912	0.0900
26	1300	0.0000	0.0000	0.0006	0.0208	0.0006	0.0208	0.0708
27	1350	0.0000	0.0000	0.0085	0.2912	0.0085	0.2912	0.0833
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657
29	1450	0.0000	0.0000	0.0079	0.2704	0.0079	0.2704	0.0776
30	1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0613
31	1550	0.0000	0.0000	0.0073	0.2496	0.0073	0.2496	0.0726
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575
33	1650	0.0000	0.0000	0.0061	0.2080	0.0061	0.2080	0.0682
34	1700	0.0000	0.0000	0.0006	0.0208	0.0006	0.0208	0.0541
35	1750	0.0000	0.0000	0.0049	0.1664	0.0049	0.1664	0.0643
36	1800	0.0000	0.0000	0.0000	0.0000	0.0006	0.0208	0.0511
37	1850	0.0000	0.0000	0.0031	0.1040	0.0037	0.1248	0.0608
38	1900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484
39	1950	0.0000	0.0000	0.0018	0.0624	0.0018	0.0624	0.0577
40	2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460

Test Engineer: Tony Y

Tony Hsu

7.5.2. Test Data Of Current Harmonics

- FINAL TEST RESULT : ***PASS***
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 2

Urms =	230.1V	Freq =	50.000	Range:	10 A
Irms =	3.491A	Ipk =	5.322A	cf =	1.524
P =	794.7W	Pap =	803.4VA	pf =	0.989
THDi =	8.40 %	THDu =	0.10 %	Class A	

Test - Time : 10min (100 %)

Test completed, Result: PASSED

Order	Freq.	Iavg	Iavg%	Irms	Irms%	Imax	Imax%	Limit
1	50	3.4943	100.09	3.4766	99.580	3.4967	100.16	
2	100	0.0000	0.0000	0.0031	0.0874	0.0037	0.1049	1.0800
3	150	0.2936	8.4091	0.2917	8.3566	0.2936	8.4091	2.3000
4	200	0.0000	0.0000	0.0012	0.0350	0.0012	0.0350	0.4300
5	250	0.0000	0.0000	0.0189	0.5420	0.0189	0.5420	1.1400
6	300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3000
7	350	0.0000	0.0000	0.0189	0.5420	0.0195	0.5594	0.7700
8	400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2300
9	450	0.0000	0.0000	0.0165	0.4720	0.0165	0.4720	0.4000
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1840
11	550	0.0000	0.0000	0.0140	0.4021	0.0146	0.4196	0.3300
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1533
13	650	0.0000	0.0000	0.0116	0.3322	0.0116	0.3322	0.2100
14	700	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.1314
15	750	0.0000	0.0000	0.0104	0.2972	0.0104	0.2972	0.1500
16	800	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.1150
17	850	0.0000	0.0000	0.0079	0.2273	0.0079	0.2273	0.1324
18	900	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.1022
19	950	0.0000	0.0000	0.0061	0.1748	0.0061	0.1748	0.1184
20	1000	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.0920
21	1050	0.0000	0.0000	0.0043	0.1224	0.0043	0.1224	0.1071
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0836
23	1150	0.0000	0.0000	0.0024	0.0699	0.0024	0.0699	0.0978
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767
25	1250	0.0000	0.0000	0.0012	0.0350	0.0012	0.0350	0.0900
26	1300	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.0708
27	1350	0.0000	0.0000	0.0012	0.0350	0.0018	0.0524	0.0833
28	1400	0.0000	0.0000	0.0000	0.0000	0.0006	0.0175	0.0657
29	1450	0.0000	0.0000	0.0018	0.0524	0.0018	0.0524	0.0776
30	1500	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.0613
31	1550	0.0000	0.0000	0.0024	0.0699	0.0024	0.0699	0.0726
32	1600	0.0000	0.0000	0.0006	0.0175	0.0006	0.0175	0.0575
33	1650	0.0000	0.0000	0.0031	0.0874	0.0037	0.1049	0.0682
34	1700	0.0000	0.0000	0.0000	0.0000	0.0006	0.0175	0.0541
35	1750	0.0000	0.0000	0.0037	0.1049	0.0043	0.1224	0.0643
36	1800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0511
37	1850	0.0000	0.0000	0.0043	0.1224	0.0043	0.1224	0.0608
38	1900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484
39	1950	0.0000	0.0000	0.0043	0.1224	0.0043	0.1224	0.0577
40	2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460

Test Engineer: Tony Y

Tony Hsu

7.5.3. Test Data Of Current Harmonics

- FINAL TEST RESULT : ***PASS***
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 3

Urms =	230.1V	Freq =	49.987	Range:	10 A
Irms =	3.789A	Ipk =	5.786A	cf =	1.527
P =	863.4W	Pap =	871.9VA	pf =	0.990
THDi =	9.00 %	THDu =	0.10 %	Class A	

Test - Time : 10min (100 %)

Test completed, Result: PASSED

Order	Freq.	Iavg	Iavg%	Irms	Irms%	Imax	Imax%	Limit
1	50	3.7915	100.06	3.7726	99.565	4.0948	108.07	
2	100	0.0000	0.0000	0.0098	0.2577	0.0104	0.2738	1.0800
3	150	0.3314	8.7468	0.3308	8.7307	0.3320	8.7629	2.3000
4	200	0.0000	0.0000	0.0018	0.0483	0.0018	0.0483	0.4300
5	250	0.0439	1.1598	0.0439	1.1598	0.0439	1.1598	1.1400
6	300	0.0000	0.0000	0.0006	0.0161	0.0012	0.0322	0.3000
7	350	0.0342	0.9021	0.0342	0.9021	0.0342	0.9021	0.7700
8	400	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.2300
9	450	0.0275	0.7249	0.0275	0.7249	0.0275	0.7249	0.4000
10	500	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.1840
11	550	0.0238	0.6282	0.0238	0.6282	0.0244	0.6443	0.3300
12	600	0.0000	0.0000	0.0006	0.0161	0.0012	0.0322	0.1533
13	650	0.0000	0.0000	0.0189	0.4994	0.0189	0.4994	0.2100
14	700	0.0000	0.0000	0.0006	0.0161	0.0012	0.0322	0.1314
15	750	0.0000	0.0000	0.0159	0.4188	0.0159	0.4188	0.1500
16	800	0.0000	0.0000	0.0006	0.0161	0.0012	0.0322	0.1150
17	850	0.0000	0.0000	0.0128	0.3383	0.0134	0.3544	0.1324
18	900	0.0000	0.0000	0.0006	0.0161	0.0006	0.0161	0.1022
19	950	0.0000	0.0000	0.0098	0.2577	0.0104	0.2738	0.1184
20	1000	0.0000	0.0000	0.0006	0.0161	0.0006	0.0161	0.0920
21	1050	0.0000	0.0000	0.0079	0.2094	0.0085	0.2255	0.1071
22	1100	0.0000	0.0000	0.0006	0.0161	0.0006	0.0161	0.0836
23	1150	0.0000	0.0000	0.0061	0.1611	0.0067	0.1772	0.0978
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767
25	1250	0.0000	0.0000	0.0049	0.1289	0.0055	0.1450	0.0900
26	1300	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.0708
27	1350	0.0000	0.0000	0.0043	0.1128	0.0049	0.1289	0.0833
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657
29	1450	0.0000	0.0000	0.0049	0.1289	0.0055	0.1450	0.0776
30	1500	0.0000	0.0000	0.0006	0.0161	0.0006	0.0161	0.0613
31	1550	0.0000	0.0000	0.0055	0.1450	0.0055	0.1450	0.0726
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575
33	1650	0.0000	0.0000	0.0049	0.1289	0.0055	0.1450	0.0682
34	1700	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.0541
35	1750	0.0000	0.0000	0.0061	0.1611	0.0061	0.1611	0.0643
36	1800	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.0511
37	1850	0.0000	0.0000	0.0055	0.1450	0.0055	0.1450	0.0608
38	1900	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.0484
39	1950	0.0000	0.0000	0.0061	0.1611	0.0061	0.1611	0.0577
40	2000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0161	0.0460

Test Engineer: Tony Y

Tony Hsu

7.5.4. Test Data Of Current Harmonics

- FINAL TEST RESULT : ***PASS***
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 26, 2007
- Test Mode : Mode 4

Urms =	230.1V	Freq =	49.987	Range:	10 A
Irms =	4.224A	Ipk =	6.553A	cf =	1.551
P =	958.4W	Pap =	971.9VA	pf =	0.986
THDi =	10.3 %	THDu =	0.10 %	Class A	

Test - Time : 10min (100 %)

Test completed, Result: PASSED

Order	Freq.	Iavg	Iavg%	Irms	Irms%	Imax	Imax%	Limit
1	50	4.1821	99.017	4.2010	99.465	6.0889	144.16	
2	100	0.0140	0.3324	0.0232	0.5491	0.0269	0.6358	1.0800
3	150	0.4346	10.289	0.4211	9.9711	0.4346	10.289	2.3000
4	200	0.0000	0.0000	0.0018	0.0434	0.0018	0.0434	0.4300
5	250	0.0604	1.4306	0.0568	1.3439	0.0604	1.4306	1.1400
6	300	0.0000	0.0000	0.0006	0.0145	0.0006	0.0145	0.3000
7	350	0.0470	1.1127	0.0433	1.0260	0.0470	1.1127	0.7700
8	400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2300
9	450	0.0372	0.8815	0.0348	0.8237	0.0372	0.8815	0.4000
10	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1840
11	550	0.0330	0.7803	0.0305	0.7225	0.0330	0.7803	0.3300
12	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1533
13	650	0.0269	0.6358	0.0250	0.5925	0.0269	0.6358	0.2100
14	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1314
15	750	0.0000	0.0000	0.0226	0.5347	0.0238	0.5636	0.1500
16	800	0.0000	0.0000	0.0000	0.0000	0.0006	0.0145	0.1150
17	850	0.0000	0.0000	0.0183	0.4335	0.0189	0.4480	0.1324
18	900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1022
19	950	0.0000	0.0000	0.0134	0.3179	0.0140	0.3324	0.1184
20	1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0920
21	1050	0.0000	0.0000	0.0098	0.2312	0.0104	0.2457	0.1071
22	1100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0836
23	1150	0.0000	0.0000	0.0079	0.1879	0.0085	0.2023	0.0978
24	1200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0767
25	1250	0.0000	0.0000	0.0067	0.1590	0.0073	0.1734	0.0900
26	1300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0708
27	1350	0.0000	0.0000	0.0061	0.1445	0.0067	0.1590	0.0833
28	1400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0657
29	1450	0.0000	0.0000	0.0067	0.1590	0.0073	0.1734	0.0776
30	1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0613
31	1550	0.0000	0.0000	0.0061	0.1445	0.0067	0.1590	0.0726
32	1600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0575
33	1650	0.0000	0.0000	0.0067	0.1590	0.0067	0.1590	0.0682
34	1700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0541
35	1750	0.0000	0.0000	0.0067	0.1590	0.0079	0.1879	0.0643
36	1800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0511
37	1850	0.0000	0.0000	0.0079	0.1879	0.0085	0.2023	0.0608
38	1900	0.0000	0.0000	0.0000	0.0000	0.0006	0.0145	0.0484
39	1950	0.0000	0.0000	0.0079	0.1879	0.0085	0.2023	0.0577
40	2000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0145	0.0460

Test Engineer: Tony Y

Tony Hsu

8. Voltage Fluctuations Test

8.1. Standard

- Product Standard : EN 61000-3-3:1995/A1:2001

8.2. Test Procedure

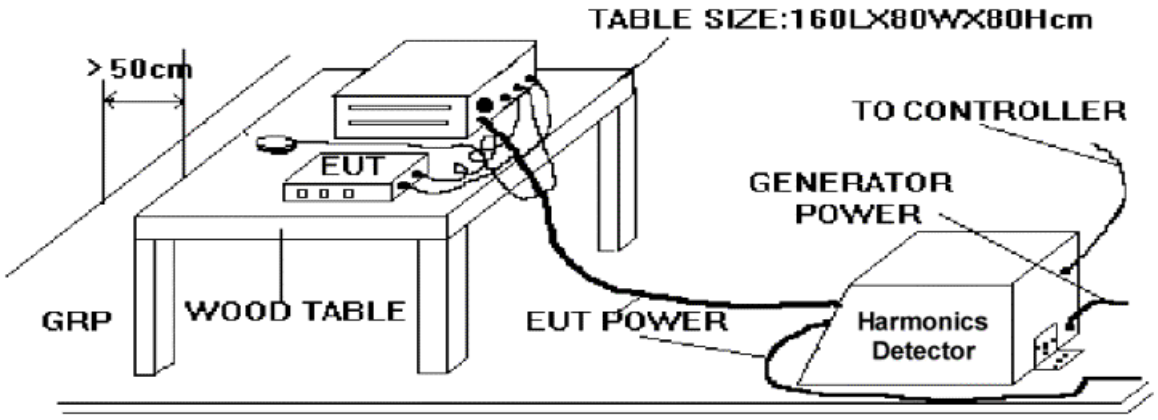
The equipment shall be tested under the conditions of **Clause 5.**

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

8.3. Test Equipment Settings

- Line Voltage: 230 V
- Line Frequency: 50 Hz
- Measurement Delay: 10.0 seconds
- Pst Integration Time: 10 minutes
- Pst Integration Periods: 1
- Test Duration: 00:10:00 minutes

8.4. Test Setup



8.5. Test Result of Voltage Fluctuation and Flicker Test

8.5.1. Test Data of Voltage Fluctuation and Flicker

- Final Test Result : **PASS**
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 1

Urms =	230.1V	Freq =	49.987	Range:	10 A
Irms =	2.925A	Ipk =	4.541A	cf =	1.553
P =	666.3W	Pap =	673.0VA	pf =	0.990

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits :	Plt :	0.65	Pst :	1.00
	dmax :	6.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.030	0.000

Test Engineer: Tony Hsu

8.5.2. Test Data of Voltage Fluctuation and Flicker

- Final Test Result : **PASS**
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 2

Urms =	230.1V	Freq =	49.987	Range:	10A
Irms =	3.486A	Ipk =	5.322A	cf =	1.527
P =	794.4W	Pap =	802.2VA	pf =	0.990

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits :	Plt :	0.65	Pst :	1.00
	dmax :	6.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.030	0.000

Test Engineer: Tony Hsu

8.5.3. Test Data of Voltage Fluctuation and Flicker

- Final Test Result : **PASS**
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 27, 2007
- Test Mode : Mode 3

Urms =	230.1V	Freq =	50.000	Range:	1 0A
Irms =	3.789A	Ipk =	5.796A	cf =	1.530
P =	863.2W	Pap =	871.9VA	pf =	0.990

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits :	Plt :	0.65	Pst :	1.00
	dmax :	6.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.020	0.000

Test Engineer: Tony Hsu

8.5.4. Test Data of Voltage Fluctuation and Flicker

- Final Test Result : **PASS**
- Temperature : 24 ℃
- Relative Humidity : 51 % RH
- Test Date : Sep. 26, 2007
- Test Mode : Mode 4

Urms =	230.1V	Freq =	50.000	Range:	10 A
Irms =	4.097A	Ipk =	6.362A	cf =	1.553
P =	929.4W	Pap =	942.7VA	pf =	0.986

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits :	Plt :	0.65	Pst :	1.00
	dmax :	6.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.080	0.000

Test Engineer: Tony Y
Tony Hsu

8.6. Photographs of Harmonics Test, Voltage Fluctuation and Flicker Test

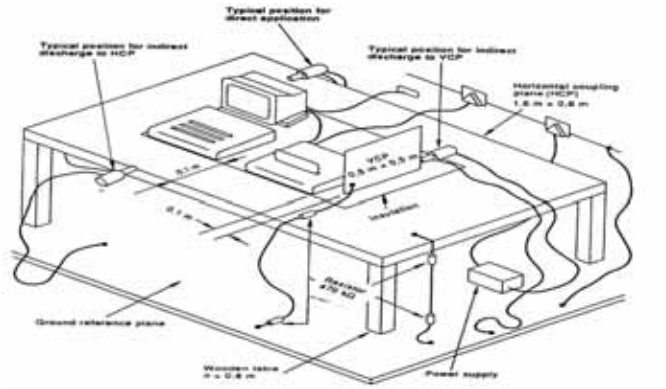
FRONT VIEW

REAR VIEW

9. Electrostatic Discharge Immunity Test (ESD)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-2:1995/A2:2000
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Level : 2 for contact discharge
- Test Voltage : ±2 / ±4 KV for contact discharge
- Temperature : 21 ℃
- Relative Humidity : 46 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal.
- Remark : The EUT has no on slots, apertures, or insulating surfaces. So, the air discharge test is not applicable.

9.1. Test Setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner:

a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;

b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

9.2. Test Setup for Tests Performed in Laboratory

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

9.3. ESD Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
   - ambient temperature: 15°C to 35°C;
   - relative humidity : 30% to 60%;
   - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT.

   The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. The test shall be performed with both air discharge and contact discharge. On preselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On preselected points at least 25 single discharges (in the most sensitive polarity) shall be applied on contact discharge.

e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharg e switch is operated.

g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted:
   - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
   - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
   - The contact discharge test shall not be applied to such surfaces.

h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

9.4. Test Severity Levels

9.4.1. Contact Discharge

Level	Test Voltage (kV) of Contact discharge
1	±2
2	±4
3	±6
4	±8
X	Specified

Remark : “X” is an open level.

9.4.2. Air Discharge

Level	Test Voltage (kV) of Air Discharge
1	±2
2	±4
3	±8
4	±15
X	Specified

Remark : “X” is an open level.

9.5. Test Points

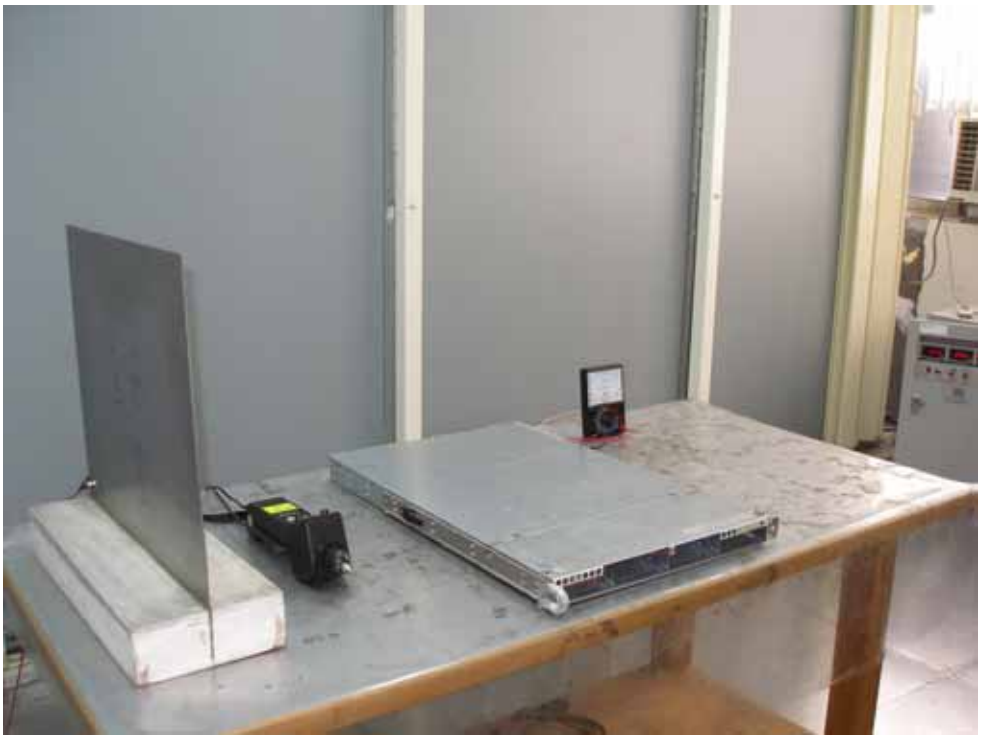
9.5.1. Test Result of Contact Discharge

Test Point	Voltage	Tested No.
HCP (At Front)	±2 / ±4 kV	BY 25
HCP (At Left)	±2 / ±4 kV	BY 25
HCP (At Right)	±2 / ±4 kV	BY 25
HCP (At Rear)	±2 / ±4 kV	BY 25
VCP (At Front)	±2 / ±4 kV	BY 25
VCP (At Left)	±2 / ±4 kV	BY 25
VCP (At Right)	±2 / ±4 kV	BY 25
VCP (At Rear)	±2 / ±4 kV	BY 25
VGA PORT	±2 / ±4 kV	BY 25
CASE	±2 / ±4 kV	BY 25

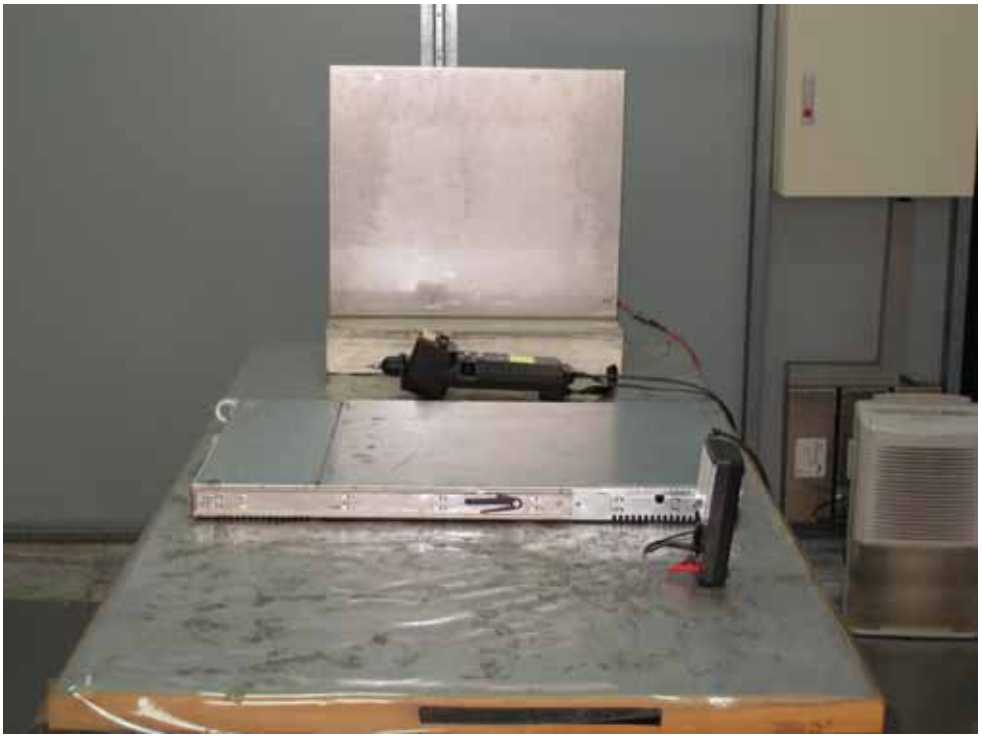
Test Engineer: Tony Hsu

9.6. Photographs of Electrostatic Discharge Immunity Test

FRONT VIEW



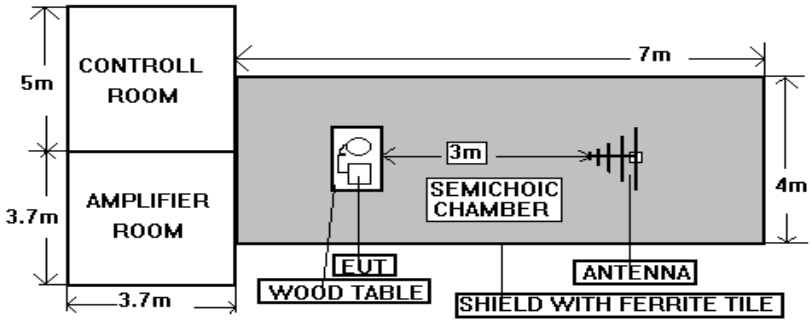
REAR VIEW



10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-3:2002
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80% AM at 1KHz)
- Temperature : 23 ℃
- Relative Humidity : 49 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal

10.1. Test Setup



NOTE : The SPORTON 7m x 4m x 4m semichoic chamber is compliance with the sixteen points uniform field requirement as stated in IEC 1000-4-3 Section 6.2.

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semichoic chamber.

10.2. Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.

b. The bilog antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.

c. The test is normally performed with the generating antenna facing each of four sides of the EUT. The polarization of the field generated by the broadband (bilog) antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

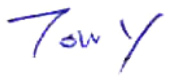
d. At each of the above conditions, the frequency range is swept 80-1000 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5*10-3 decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.3. Test Severity Levels

Frequency Band : 80-1000 MHz

Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified

Remark : “X” is an open class.

Test Engineer: 
Tony Hsu

10.4. Photographs of Radio Frequency Electromagnetic Field Immunity Test

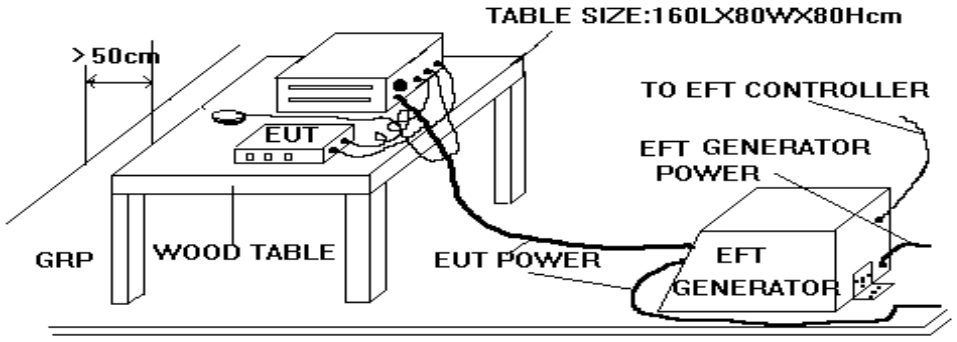
FRONT VIEW

REAR VIEW

11. Electrical Fast Transient/Burst Immunity Test (EFT/BURST)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-4:1995/A2:2001
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Level : on Power Supply -- 2
- Test Voltage : on Power Supply -- ±0.5 / ±1.0 kV
- Temperature : 24 ℃
- Relative Humidity : 51 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal.

11.1. Test Setup



The EUT was placed on a ground reference plane and was insulated from it by an insulating support about 0.1m thick. If the EUT is table-top equipment, it was located approximately 0.8m above the GRP.. The GRP. Was a metallic sheet (copper or aluminum) of 0.25 mm ,minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. It shall project beyond the EUT by at least 0.1m on all sides and connected to the protective earth. In the SPORTON EMC LAB. We provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system. The EUT was arranged and connected according to its functional requirements. The minimum distance between the EUT and other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. Using the coupling clamp, the minimum distance between the coupling plates and all other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. The length of the signal and power lines between the coupling device and the EUT was 1m or less.

11.2. Test on Power Line

a. The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT as not exceed 1 m.

b. The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

11.3. Test on Communication Lines

a. The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP..

b. The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

11.4. Test Procedure

a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
   - ambient temperature: 15°C to 35°C;
   - relative humidity : 45% to 75%;
   - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).

b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.

c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.

d. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
   - Normal performance within the specification limits.
   - Temporary degradation or loss of function or performance which is self-recoverable.
   - Temporary degradation or loss of function or performance which requires operator intervention or system reset.
   - Degradation or loss of function which is not recoverable due to damage of equipment (components).

11.5. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

Open circuit output test voltage ± 10%		
Level	On Power Supply	On I/O signal, data and control line
1	0.5 kV	0.25 kV
2	1.0 kV	0.50 kV
3	2.0 kV	1.00 kV
4	4.0 kV	2.00 kV
X	Specified	Specified

Remark : " X " is an open level. The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.

Test Engineer: Tony Hsu

11.6. Photographs of Electrical Fast Transient/Burst Immunity Test

FRONT VIEW

REAR VIEW

12. Surge Immunity Test

- Final Test Result : **PASS**
- Pass performance Criteria : A
- Required Performance Criteria : B
- Basic Standard : IEC 61000-4-5:1995/A1:2000
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Surge Wave Form (Tr/Th) : 1, 2/50（8/20）μs
- Level : on Input AC Power Port – 3
- Test Voltage : on Input AC Power Port -- ±0.5/1.0/2.0 kV
- Temperature : 24 ℃
- Relative Humidity : 51 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal

12.1. Test Record

Voltage (kV)	Test Location	Polarity	Phase Angle				Test Result
			0°	90°	180°	270°	
1 kV	L - N	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***PASS***
2 kV	L - PE	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***PASS***
	N - PE	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***PASS***

Remark : PE = Earth reference

12.2. Test Level

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

12.3. Test Procedure

a. Climatic conditions

The climatic conditions shall comply with the following requirements :

-- ambient temperature : 15 °C to 35 °C

-- relative humidity : 10 % to 75 %

-- atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)

b. Electromagnetic conditions

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

c. The test shall be performed according the test plan that shall specify the test set-up with

-- generator and other equipment utilized;

-- test level (voltage/current);

-- generator source impedance;

-- internal or external generator trigger;

-- number of tests : at least five positive and five negative at the selected points;

-- repetition rate : maximum 1/min.

-- inputs and outputs to be tested;

-- representative operating conditions of the EUT;

-- sequence of application of the surge to the circuit;

-- phase angle in the case of a.c. power supply;

-- actual installation conditions, for example :

AC : neutral earthed,

DC : (+) or (-) earthed to simulated the actual earthing conditions.

d. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).

e. The surges have to be applied line to line and line(s) and earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.

f. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan.

g. All lower levels including the selected test level shall be satisfied. For testing the secondary protection, the output voltage of the generator shall be increased up to the worstcase voltage breakdown level (let-through level) of the primary protection.

h. If the actual operating signal sources are not available, the may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according the a test plan.

i. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied. For acceptance test a previously unstressed equipment shall be used to the protection devices shall be replaced.

j.

12.4. Operating Condition

Full system

Test Engineer: Tony Hsu

12.5. Photographs of Surge Immunity Test

FRONT VIEW

REAR VIEW

13. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (CS)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-6:1996/A1:2000
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Level : 2
- Test Voltage : 3 V rms (Modulated, 1KHz, 80%, AM)
- Frequency Range : 0.15 MHz to 80 MHz
- Dwell Time : 2.9 seconds
- Frequency Step Size : 1 %
- Coupling mode : CDN-SW M3
- Temperature : 24 ℃
- Relative Humidity : 51 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal

13.1. Test Level

Level	Voltage Level (EMF)
1	1 V
2	3 V
3	10 V
x	Specified
NOTE - x is an open class. This level can be specified in the product specification.	

13.2. Operating Condition

Full system

13.3. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.

b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.

c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.

d. The frequency range is swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sinewave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.

e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency(ies) and harmonics or frequencies of dominant interest shall be analyzed separately.

f. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.

g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.

h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

i. The use of special exercising programs is recommended.

j. Testing shall be performed according to a Test Plan, which shall be included in the test report.

k. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

Test Engineer: Tony Y
Tony Hsu

13.4. Photographs of CS Tests

FRONT VIEW

REAR VIEW

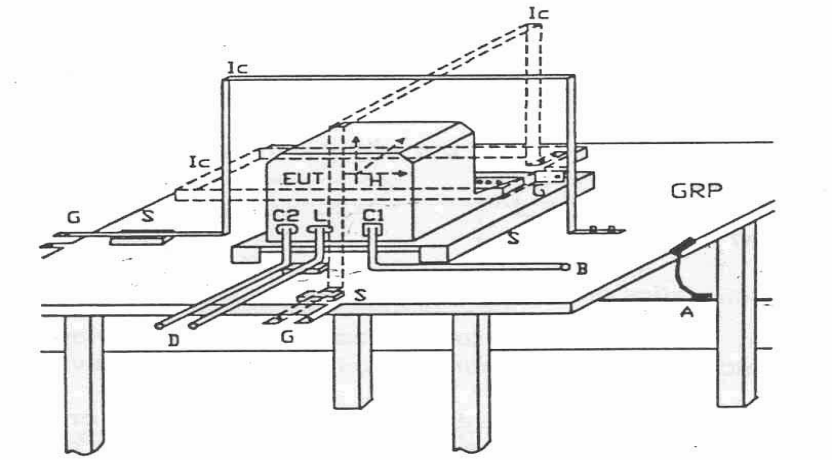
14. Power Frequency Magnetic Field Immunity Tests

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Basic Standard : IEC 61000-4-8:1993/A1:2000
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Temperature : 24 ℃
- Relative Humidity : 51 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal

14.1. Test Record

Power Frequency Magnetic Field	Testing duration	Coil Orientation	Results
50Hz, 1A/m	1.0 Min	X-axis	Pass
50Hz, 1A/m	1.0 Min	Y-axis	Pass
50Hz, 1A/m	1.0 Min	Z-axis	Pass

14.2. Test Setup



GRP:	Ground plane	C1:	Power supply circuit
A:	Safety earth	C2:	Signal circuit
S:	Insulating support	L:	Communication line
EUT:	Equipment under test	B:	To power supply source
Lc:	Induction coil	D:	To signal source, simulator
E:	Earth terminal	G:	To the test generator

Test Engineer: Tony Hsu

14.3. Photographs of Power Frequency Magnetic Field Immunity Tests

FRONT VIEW

REAR VIEW

15. Voltage Dips and Voltage Interruptions Immunity Tests

- Final Test Result : **PASS**
- Pass Performance Criteria : C for voltage interruption, B for voltage dips
- Required Performance Criteria : C for voltage interruption, B/C for voltage dips
- Basic Standard : IEC 61000-4-11:1994/A1:2000
- Product Standard : EN 55024:1998/A1:2001/A2:2003
- Temperature : 24 ℃
- Relative Humidity : 51 %
- Atmospheric Pressure : 103 kPa
- Test Date : Sep. 27, 2007
- Observation : Normal

15.1. Test Record of Voltage Interruption

Voltage (V)	Phase Angle		% Reduction	Duration (Periods)	Observation
	0 °	180 °			
100/240	C	C	>95%	250	After the interruption, the power of EUT reset automatically.

15.2. Test Record of Voltage Dips

Voltage (V)	Phase Angle		% Reduction	Duration (Periods)	Observation
	0 °	180 °			
100/240	B	B	30	25	Normal
100/240	B	B	>95 %	0.5	Normal

15.3. Testing Requirement and Procedure

The test was based on IEC 61000-4-11:1994/A1:2000

15.4. Test Conditions

1. Source voltage and frequency: 100/240V / 50Hz, Single phase.
2. Test of interval: 10 sec.
3. Level and duration: Sequency of 3 dips/interrupts.
4. Voltage rise (and fall) time: 1 ~ 5 μs.

15.5. Operating Condition

Full system

Test Engineer: Tony Y
Tony Hsu

15.6. Photographs of Voltage Dips and Voltage Interruptions Immunity Tests

FRONT VIEW

REAR VIEW

16. List of Measuring Equipment Used

<EMI>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	100358	9 kHz - 2.75 GHz	Oct. 26, 2006	Conduction (CO01-NH)
LISN	AFJ	NNB-2/16Z	99079	9kHz – 30MHz	Dec. 27, 2006	Conduction (CO01-NH)
LISN	KYORITSU	KNW-407	8-1010-15	9kHz – 30MHz	Dec. 07, 2006	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz – 30MHz	Dec. 15, 2006	Conduction (CO01-NH)
Open Area Test Site	SPORTON	OATS-10	OS03-NH	30 MHz - 1 GHz 10m, 3m	Apr. 07, 2007	Radiation (OS03-NH)
Amplifier	HP	8447D	2944A08292	0.1MHz – 1.3 GHz	Jan. 11, 2007	Radiation (OS03-NH)
Spectrum	Advantest	RS3261C	81720147	9 kHz - 2.6 GHz	Jul. 06, 2006	Radiation (OS03-NH)
Receiver	R&S	ESCS 30	838251/002	9 kHz - 2.75 GHz	Feb. 13, 2007	Radiation (OS03-NH)
Bilog Antenna	CHASE	CBL6112B	2444	30 MHz - 2 GHz	Jun. 20, 2007	Radiation (OS03-NH)
Turn Table	EMCO	2080	9805-2065	0 - 360 degree	N/A	Radiation (OS03-NH)
Antenna Mast	EMCO	2075	9804-2151	1 m - 4 m	N/A	Radiation (OS03-NH)
RF Cable-R10m	MIYAZAKI	5DFB	CB003	30 MHz - 1 GHz	Aug. 22, 2006	Radiation (OS03-NH)

※ Calibration Interval of instruments listed above is one year.

<EMS>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0302197	Air: 0 KV - 15 KV Contact: 0 KV -8KV	Mar. 12, 2007	ESD
Amplifier	AMPLIFIER& RESEARCH	150W1000	312366	80M~1GHz	Sep. 10, 2007	RS
Amplifier	AMPLIFIER& RESEARCH	30S1G3	312505	80M~3GHz	Sep. 10, 2007	RS
Antenna	AMPLIFIER& RESEARCH	AT1080A	312637	80M~1GHz	Sep. 14, 2007	RS
Antenna	AMPLIFIER& RESEARCH	AT4002A	312601	80M~5GHz	Sep. 14, 2007	RS
INTEGRATED MEASUREMENT SYSTEM	ROHDE& SCHWARZ	IMS	100007	9kHz~3GHz	Sep. 12, 2007	RS
NRP-Z91 POWER SENSOR 6GHZ	ROHDE& SCHWARZ	1168.8004.02	100095	9kHz~3GHz	Sep. 12, 2007	RS
EFT Generator	KEYTEK	EMCPRO	0609221	0 KV - 4.4 KV	Sep. 05, 2007	EFT
SURGE Generator Bi-Wave	KEYTEK	EMCPRO	0609221	0 KV -6 KV/2Ω 0KV-500V/12Ω	Sep. 05, 2007	SURGE
SURGE/CDN	KEYTEK	EMCPRO	0609221	0 KV -4 KV/2Ω 0KV-500V/12Ω	Sep. 05, 2007	SURGE
SURGE Generator Ring-Wave	KEYTEK	EMCPRO	0609221	0 KV -6 KV/2Ω 0KV-500V/12Ω	Sep. 05, 2007	SURGE
CS	FRANKONIA	CIT-10	102C3115	100 kHz - 266 MHz	Sep. 05, 2007	CS
Attenuator	EM TEST	75W-DC-250 MHz 06	0004166A	150 kHz - 230 MHz	May 25, 2007	CS
Koppel-Eutkoppelnetzwerk	FRANKONIA	CDN M3	A3003012	150k~230MHz	May 13, 2007	CS
Magnetic Field Antenna	FCC	F-1000-4-8/9/10-L-1M	9830	0~125A	Apr. 02, 2007	PFMF
Magnetic Generator	FCC	F-1000-4-8-G-125A	05004	0~125A	Apr. 02, 2007	PFMF
PQF Generator	KEYTEK	EMCPRO	0609221	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%0.10S 70%/0.01S	Sep. 05, 2007	DIP
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	088	4000VA 16A PEAK	Sep. 05, 2007	Harmonics, Flicker

※ Calibration Interval of instruments listed above is one year.

17. Notice for Class A Product

This Notice is for class A product only. If the Equipment under Test is a class B product, this notice should be disregarded.

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

18. Declaration of Conformity and the CE Mark

There are three possible procedures pertaining to the declaration of conformity:

18.1. Conformity Testing and Declaration of Conformity by the Manufacturer or His Authorized Representative Established within the Community or by an Importer.

- Article 10 (1) of the EMC Directive,
- § 3 (1) no. 2a of the EMC Act.

18.2. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing of the Product and Issued of an EC certificate of conformity by a competent body.

- Article 10 (2) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act.

18.3. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing and Certification of the Product by a Notified Body.

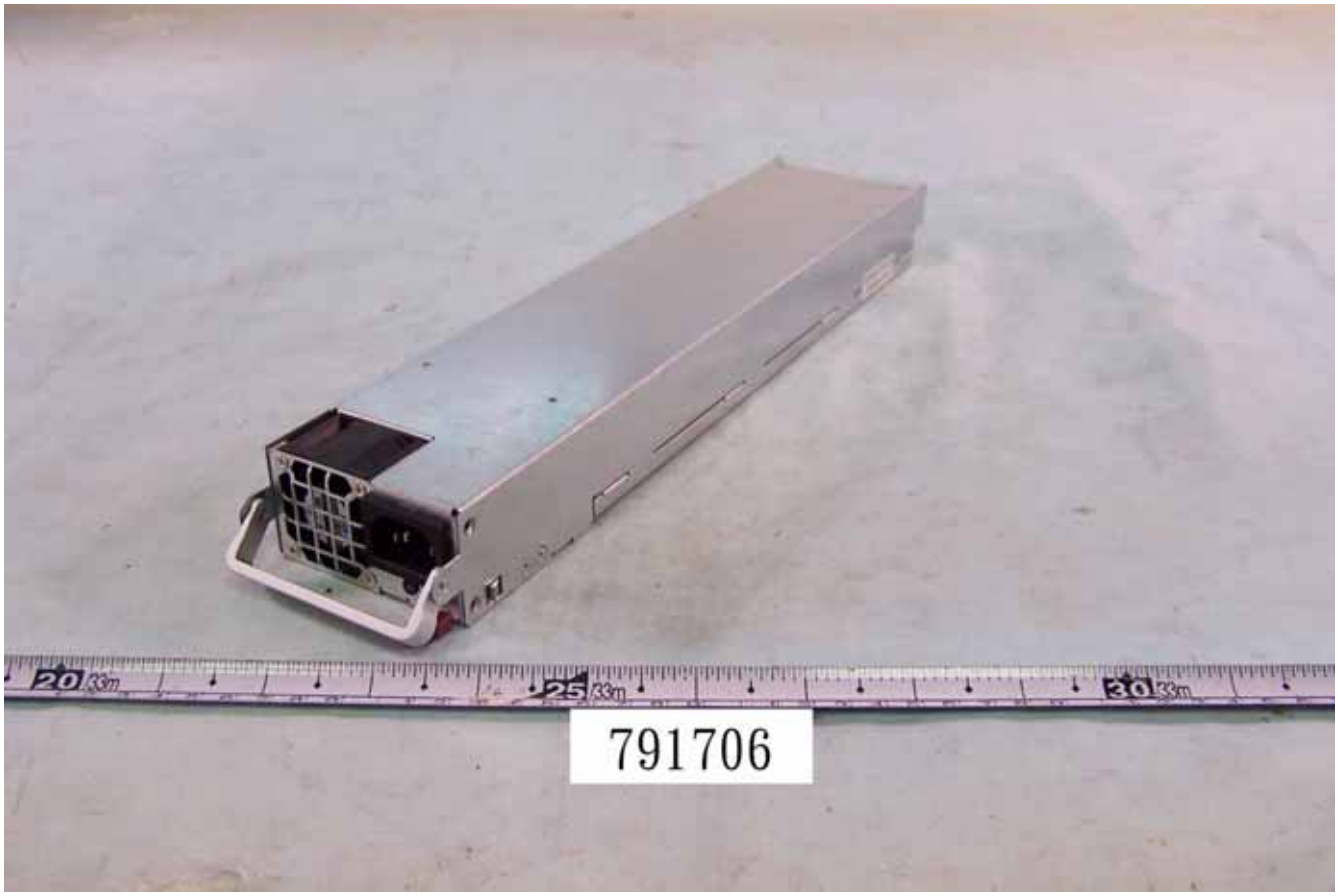
- Article 10 (5) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act (radio transmitting installations).

18.4. Specimen For The CE Marking Of Electrical / Electronical Equipment

The components of the CE marking shall have substantially the same vertical dimension, which may not be less than 5 mm.

APPENDIX A. Photographs of EUT

761601-700w-01.JPG



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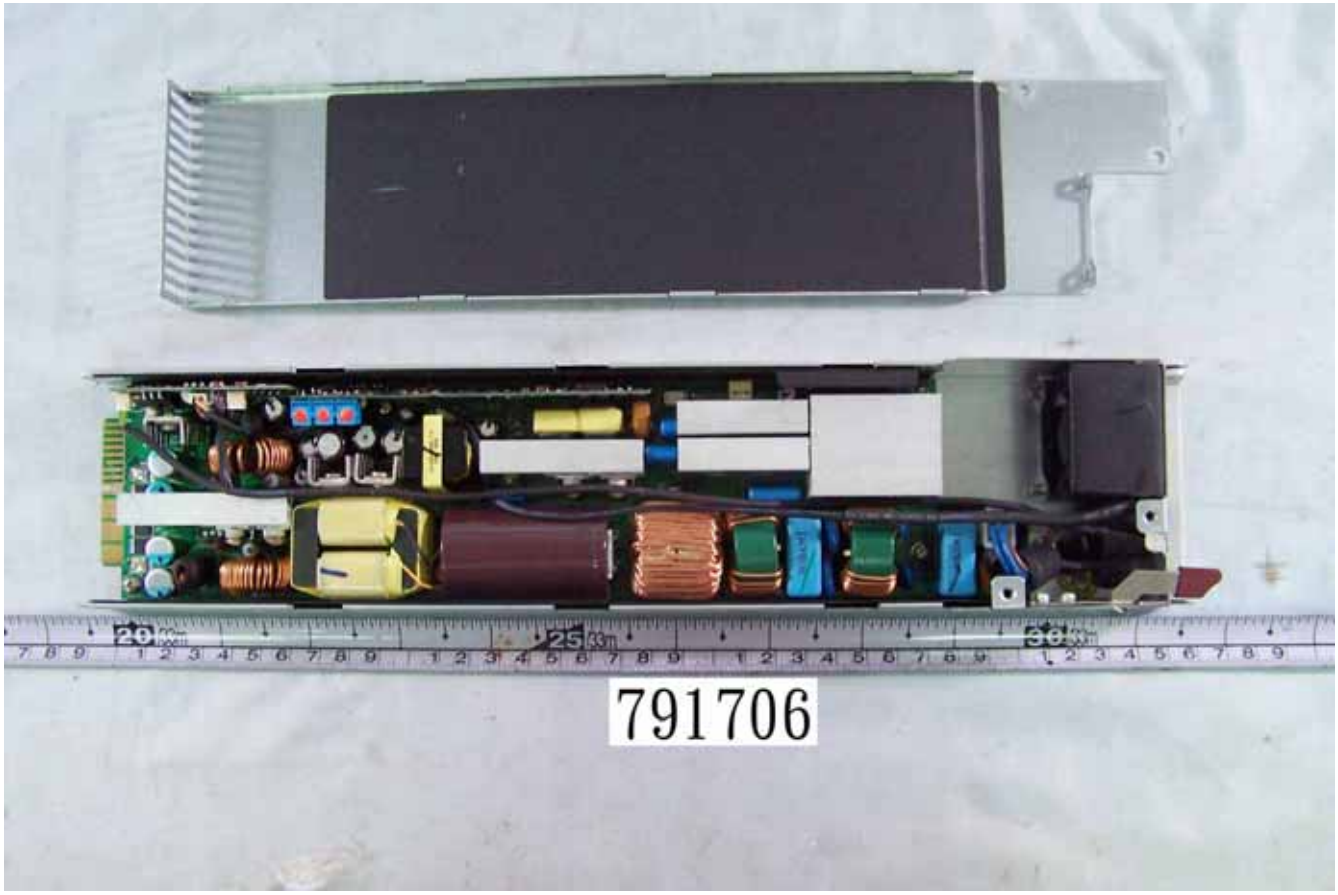

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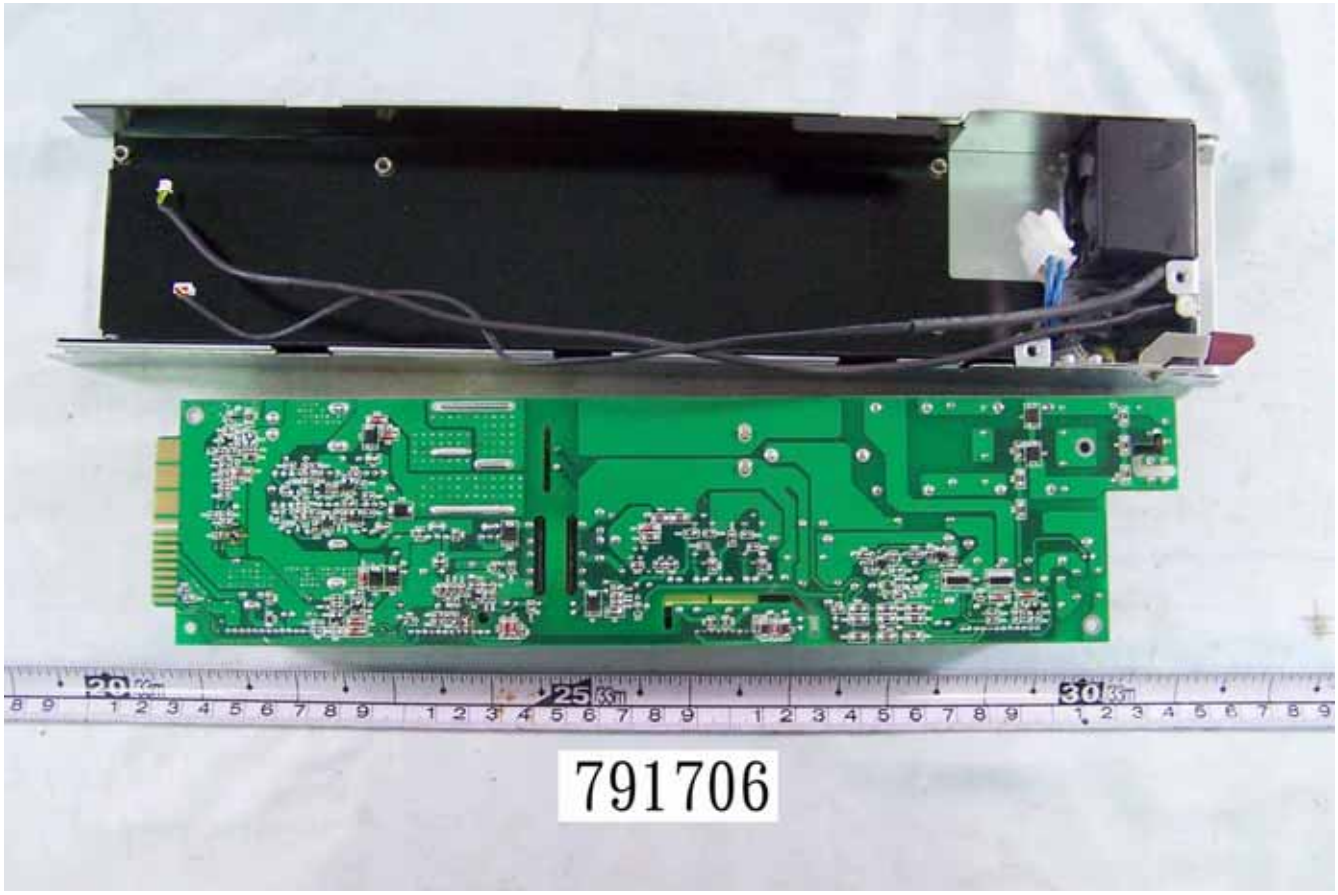

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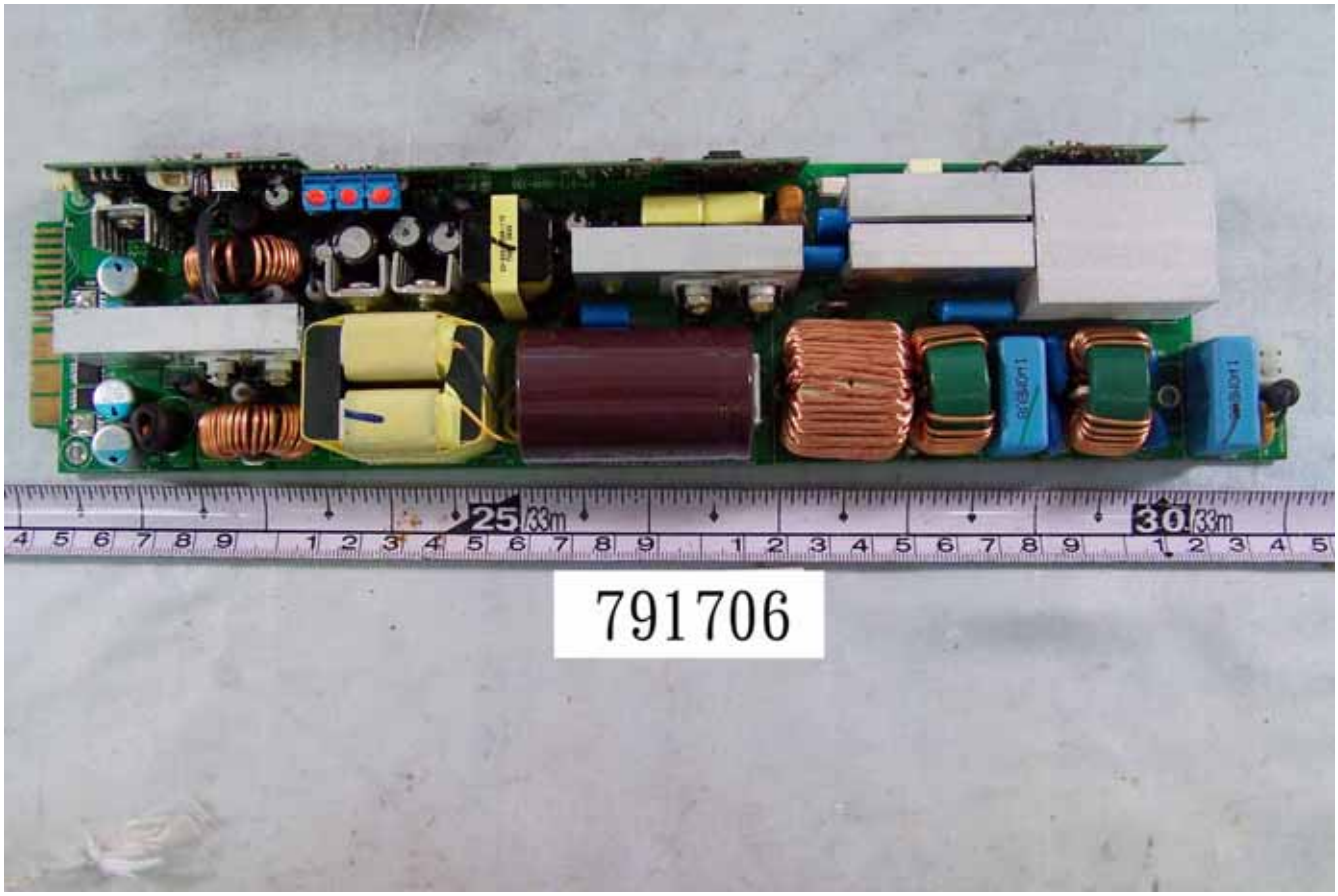

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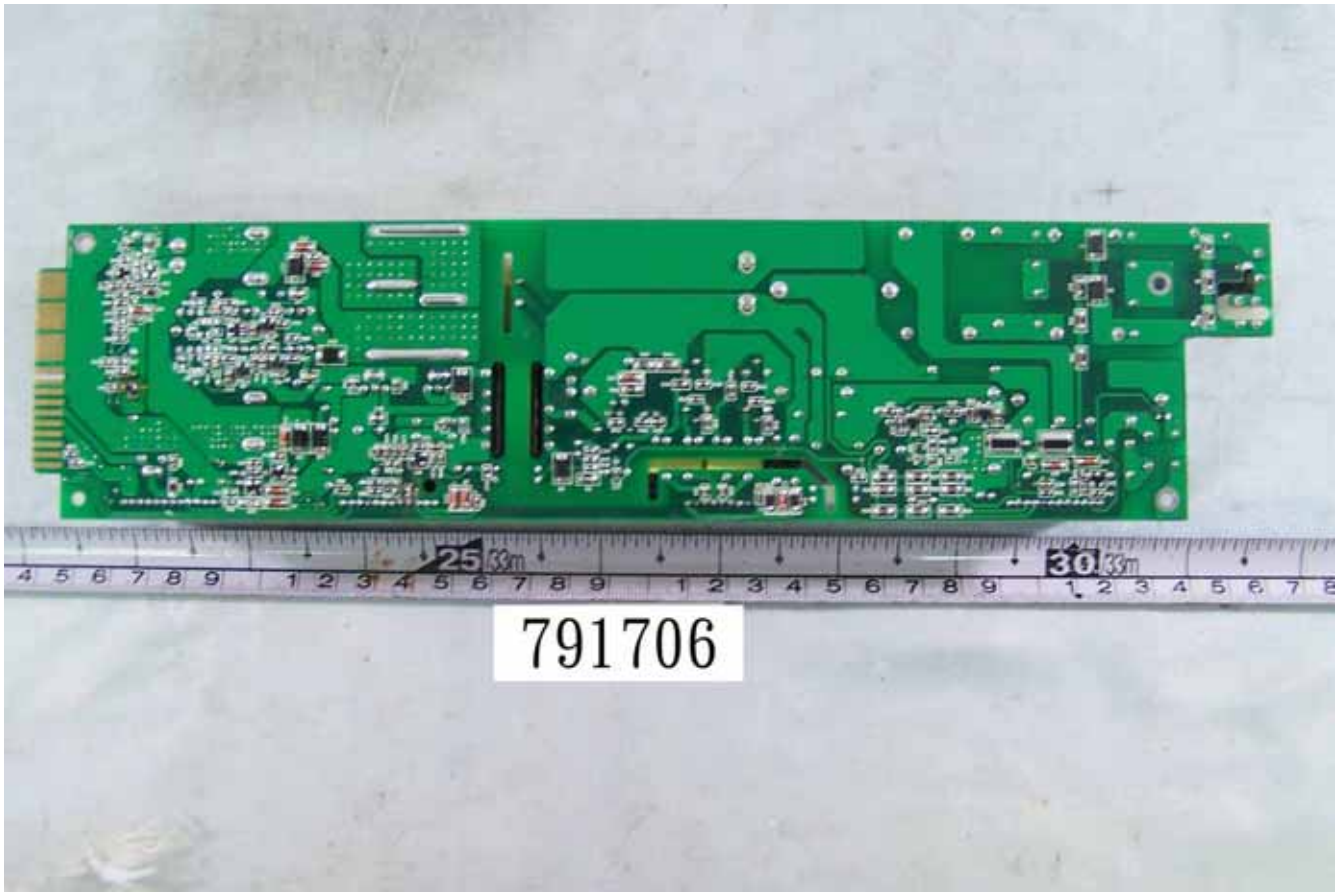

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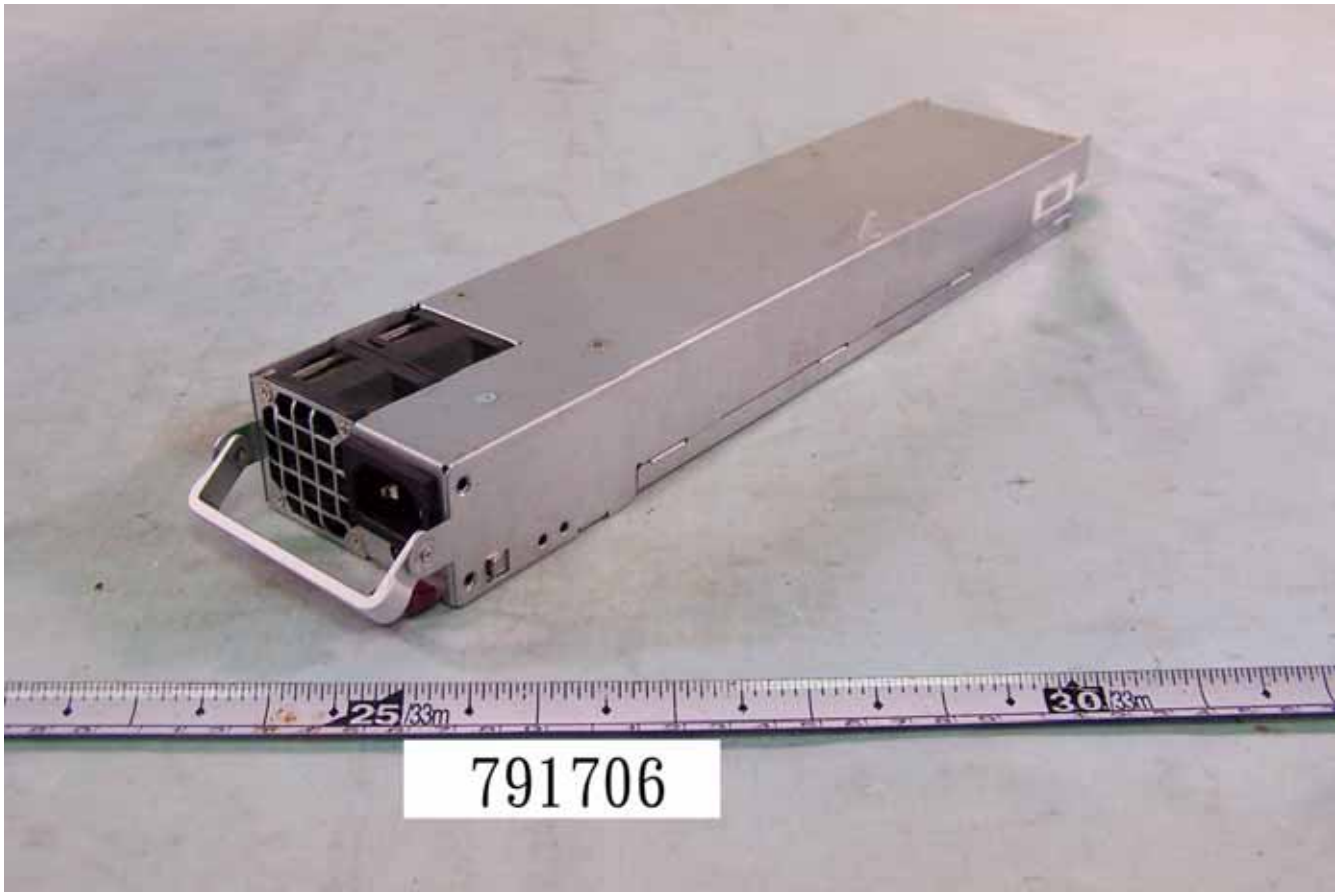

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761601-800w-11.JPG

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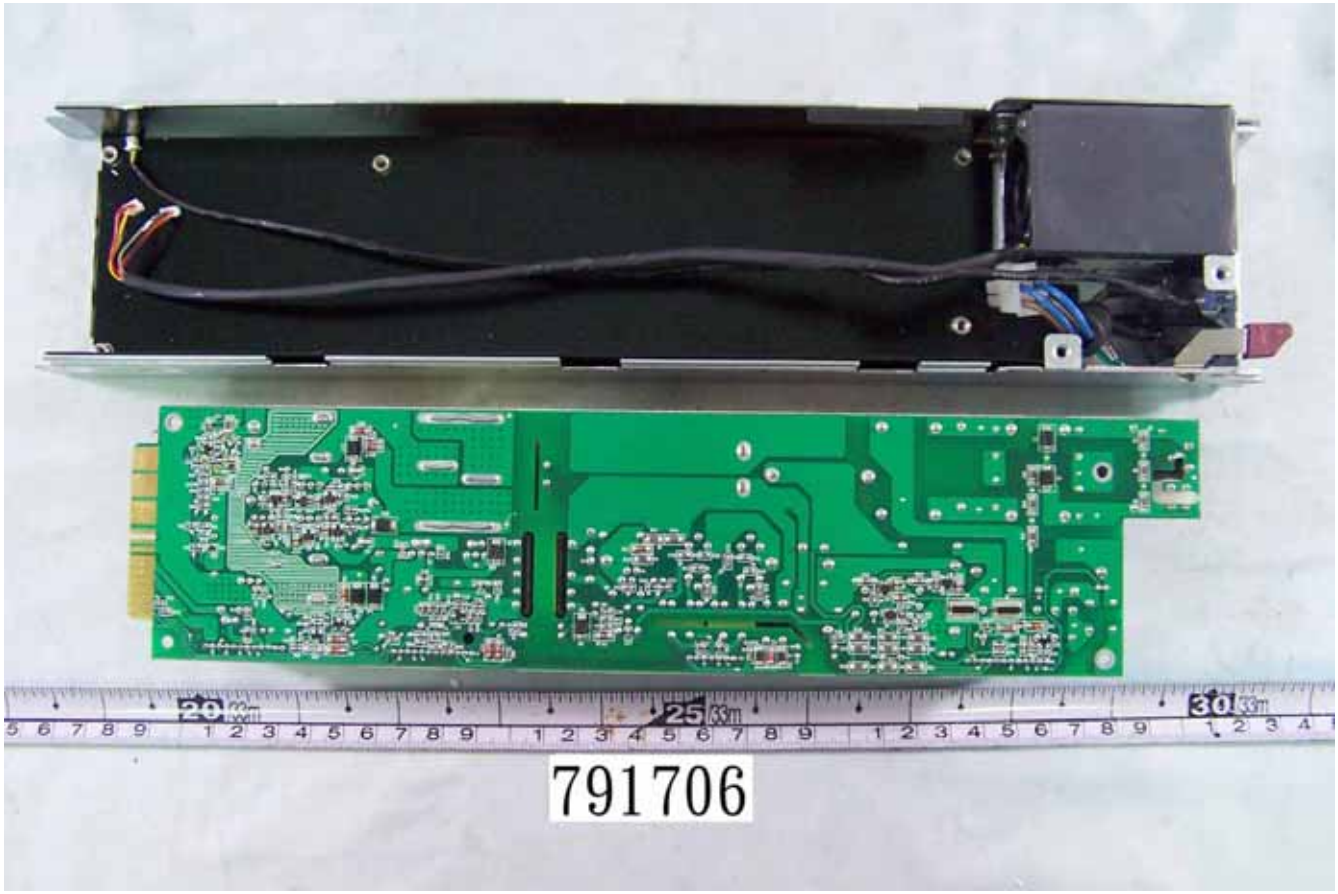

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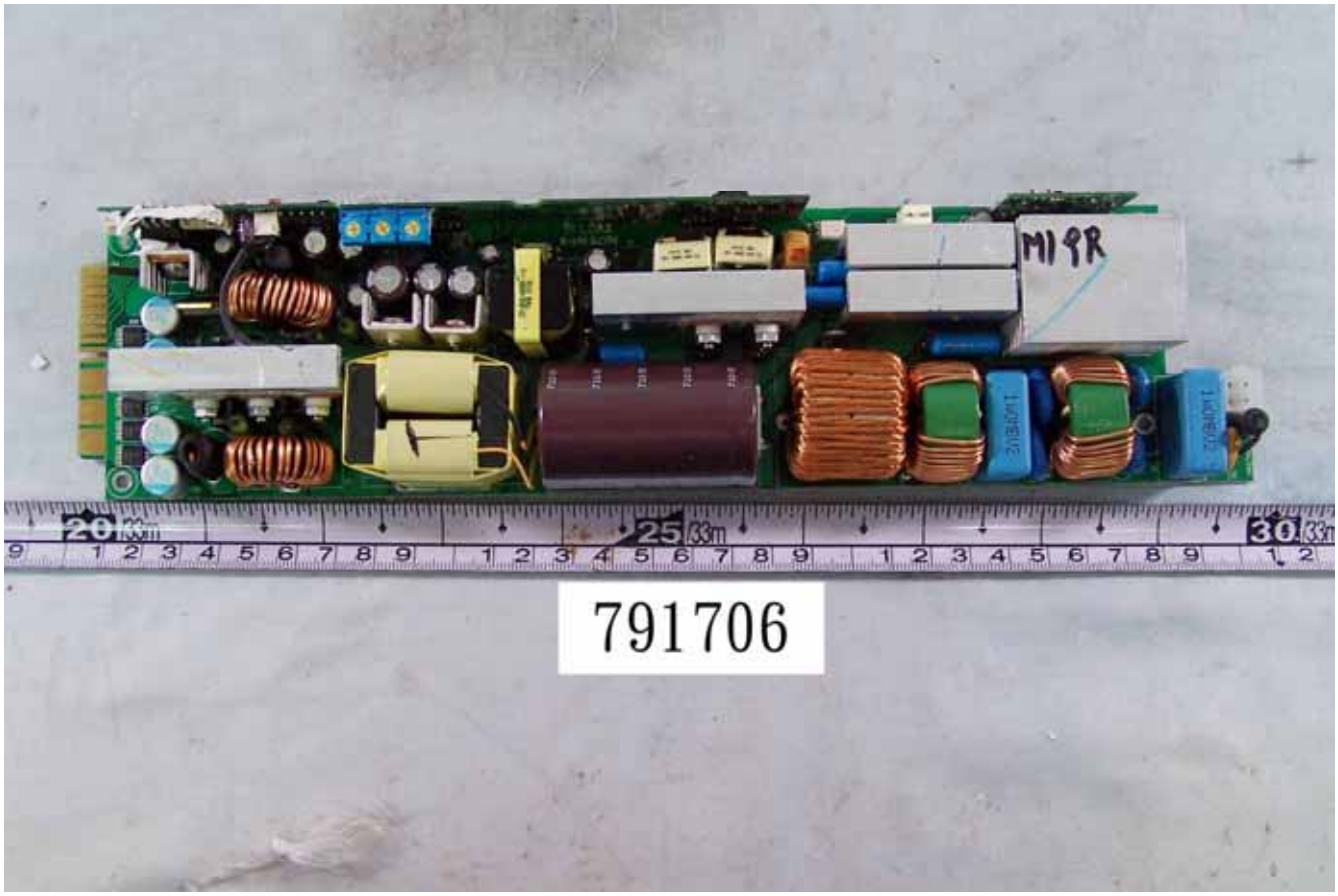

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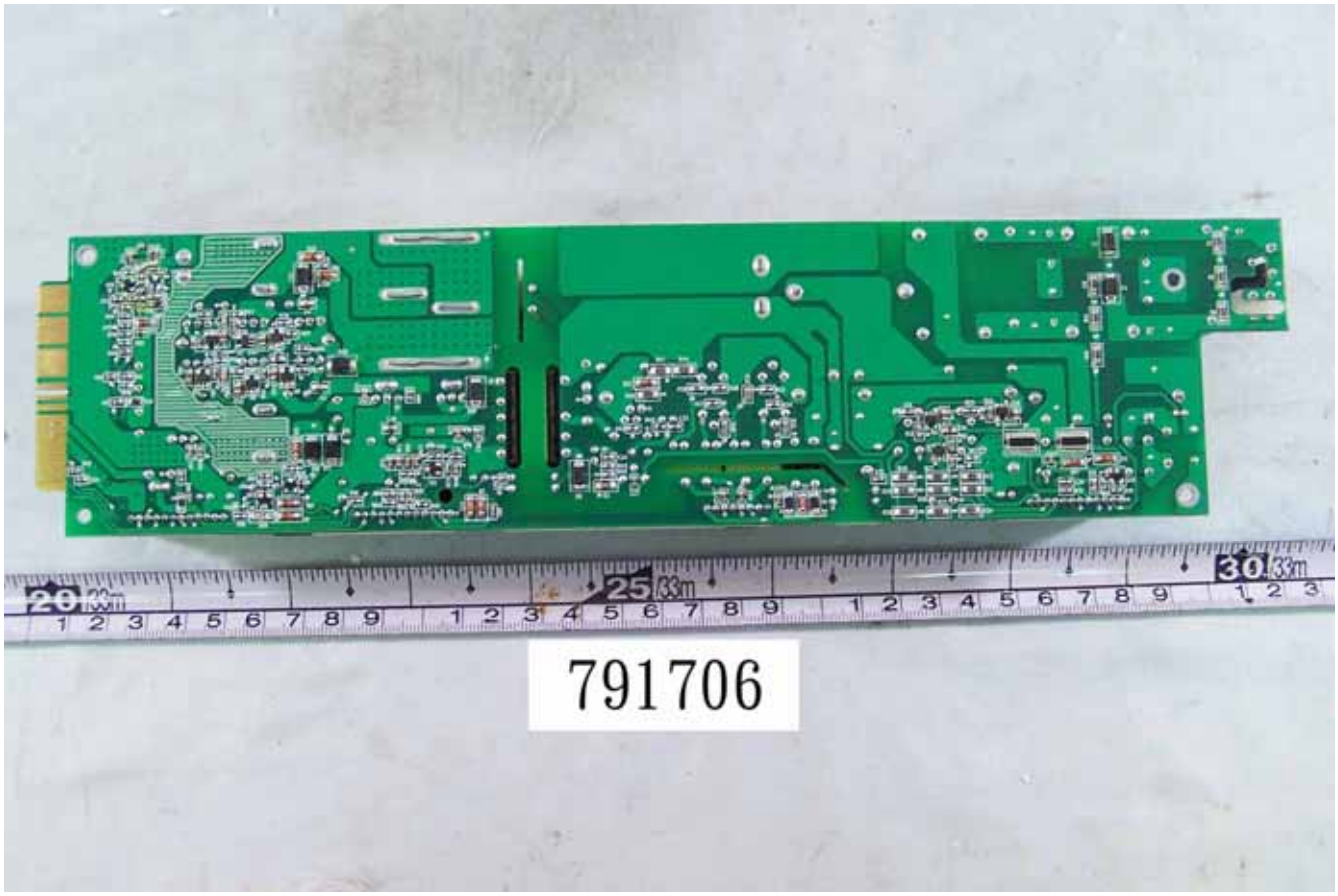

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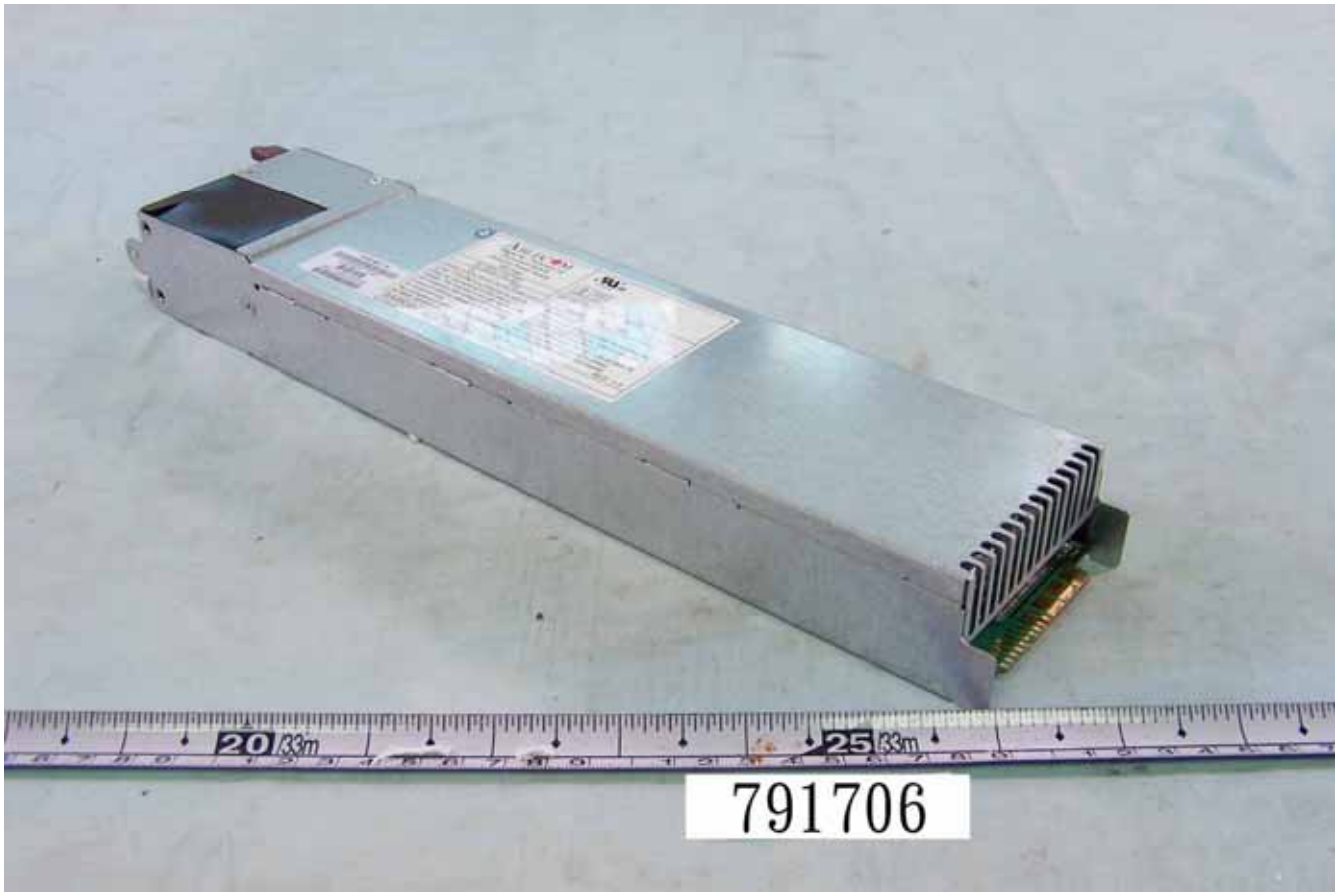

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761601-900w-18.JPG

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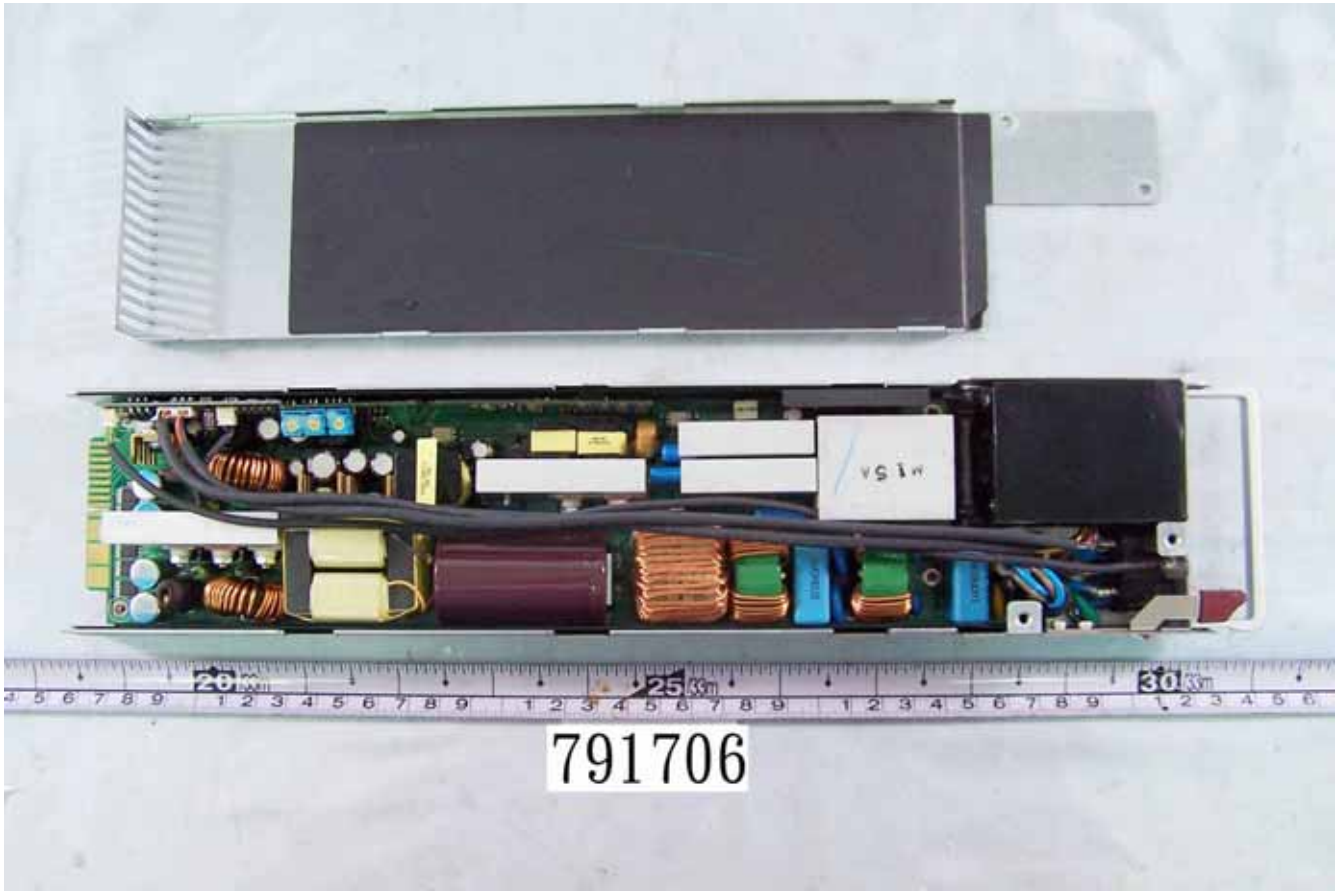

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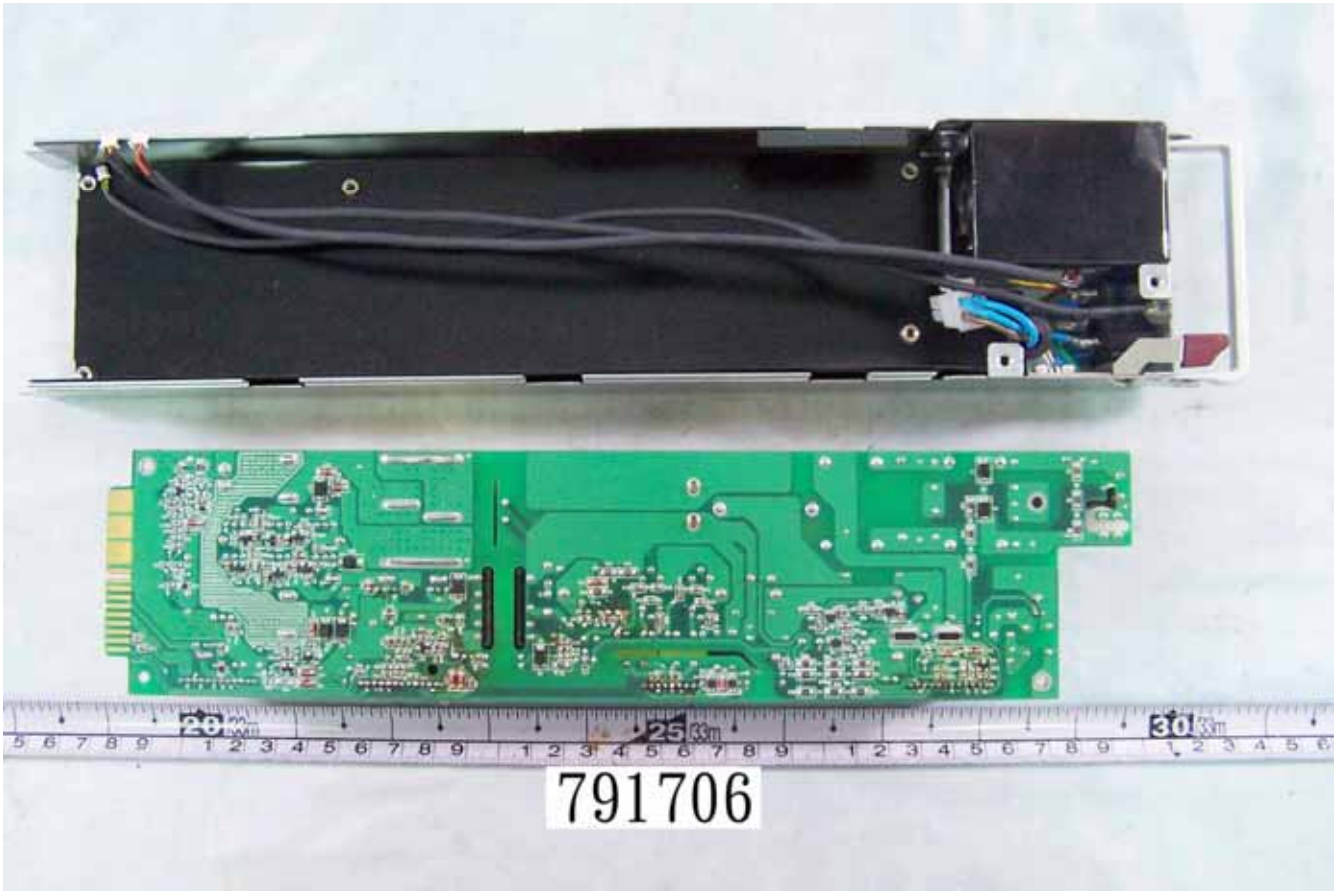

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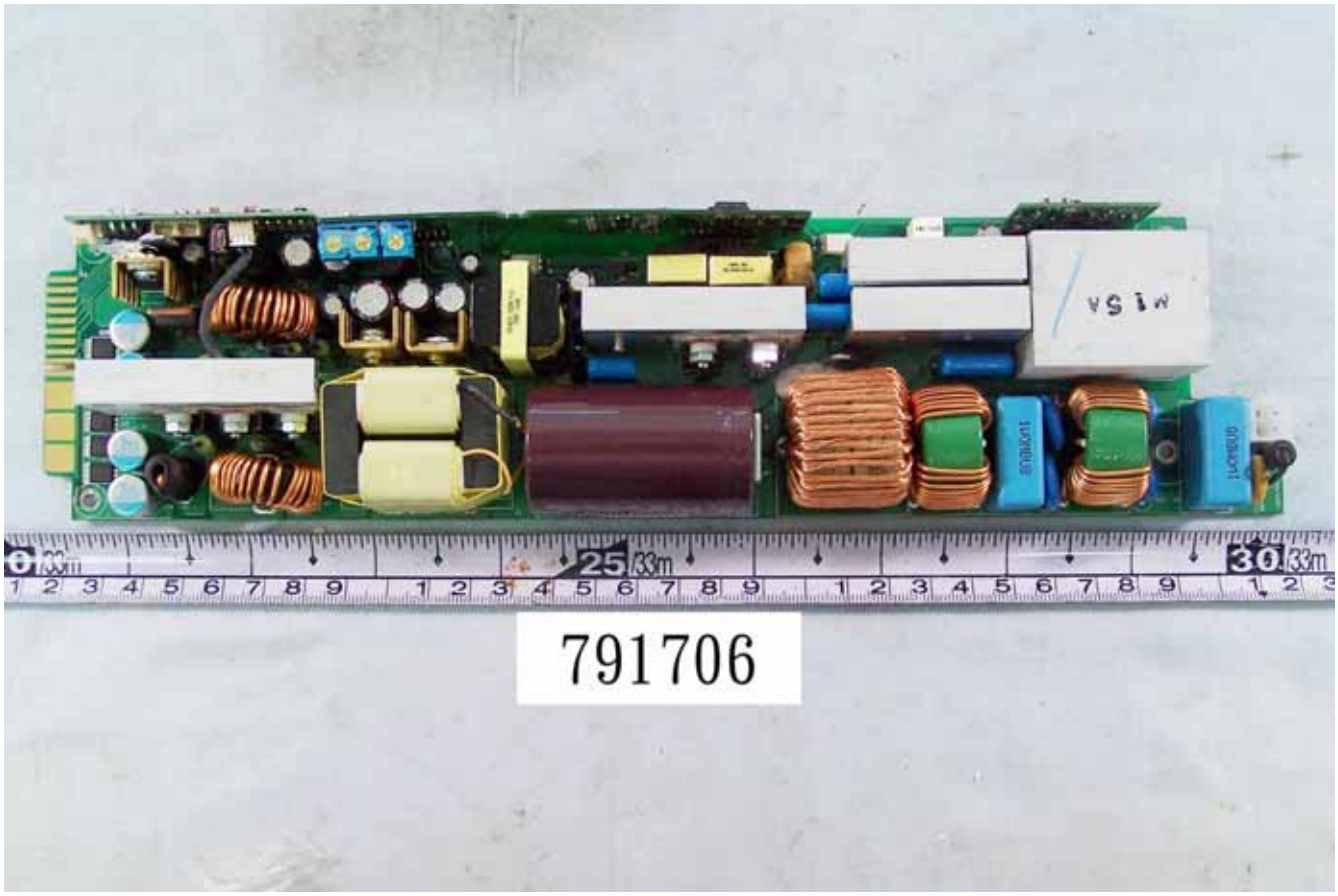

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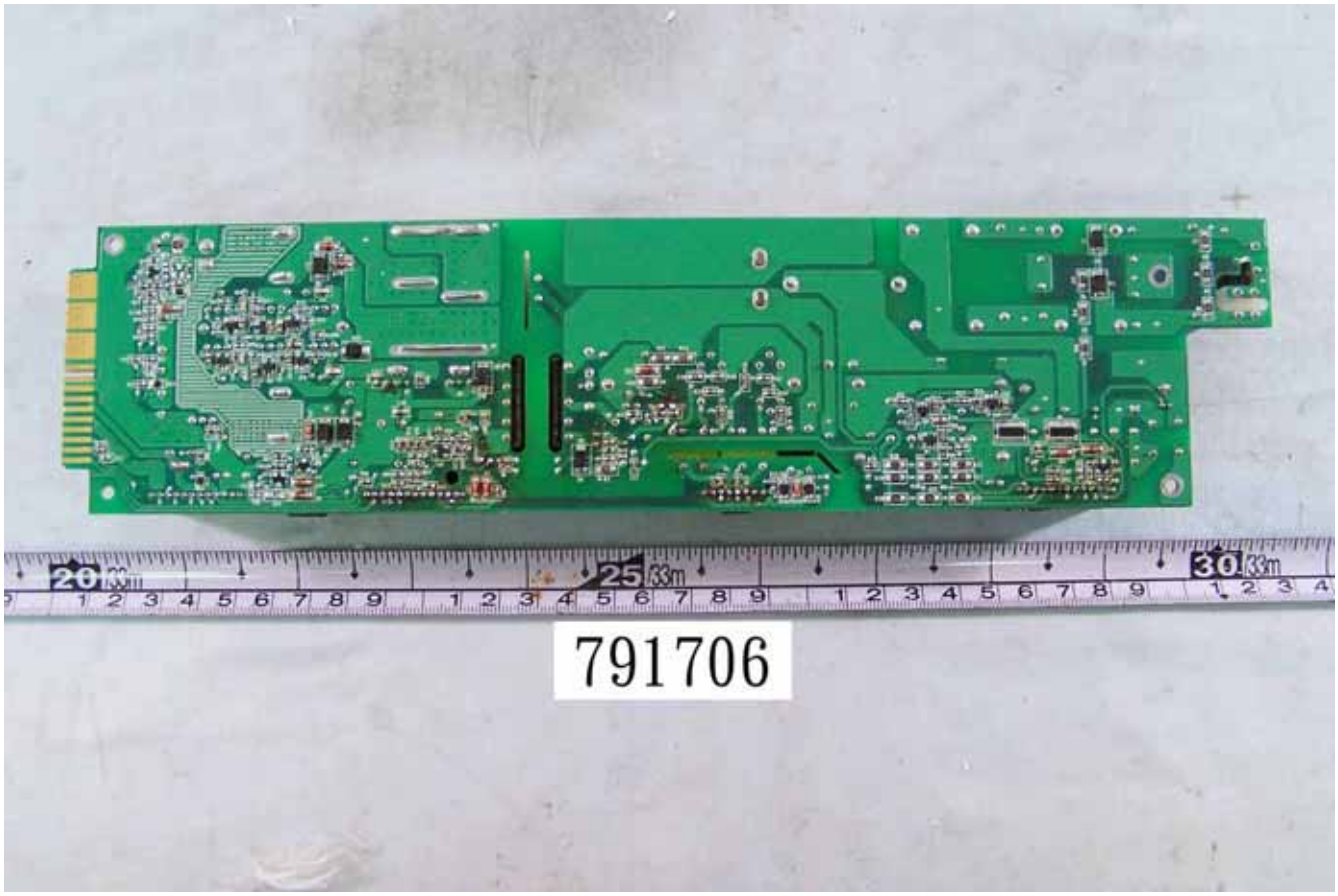

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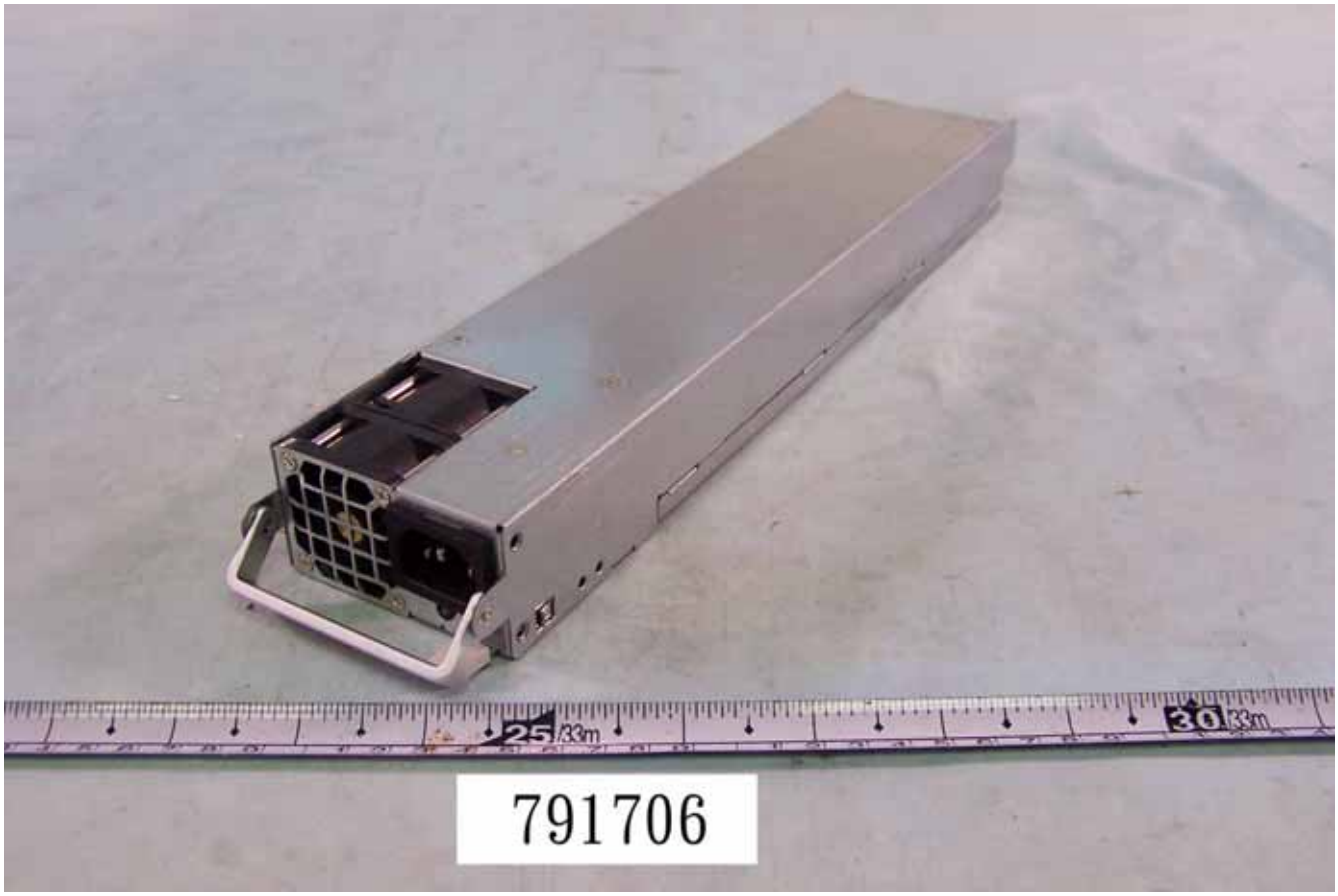

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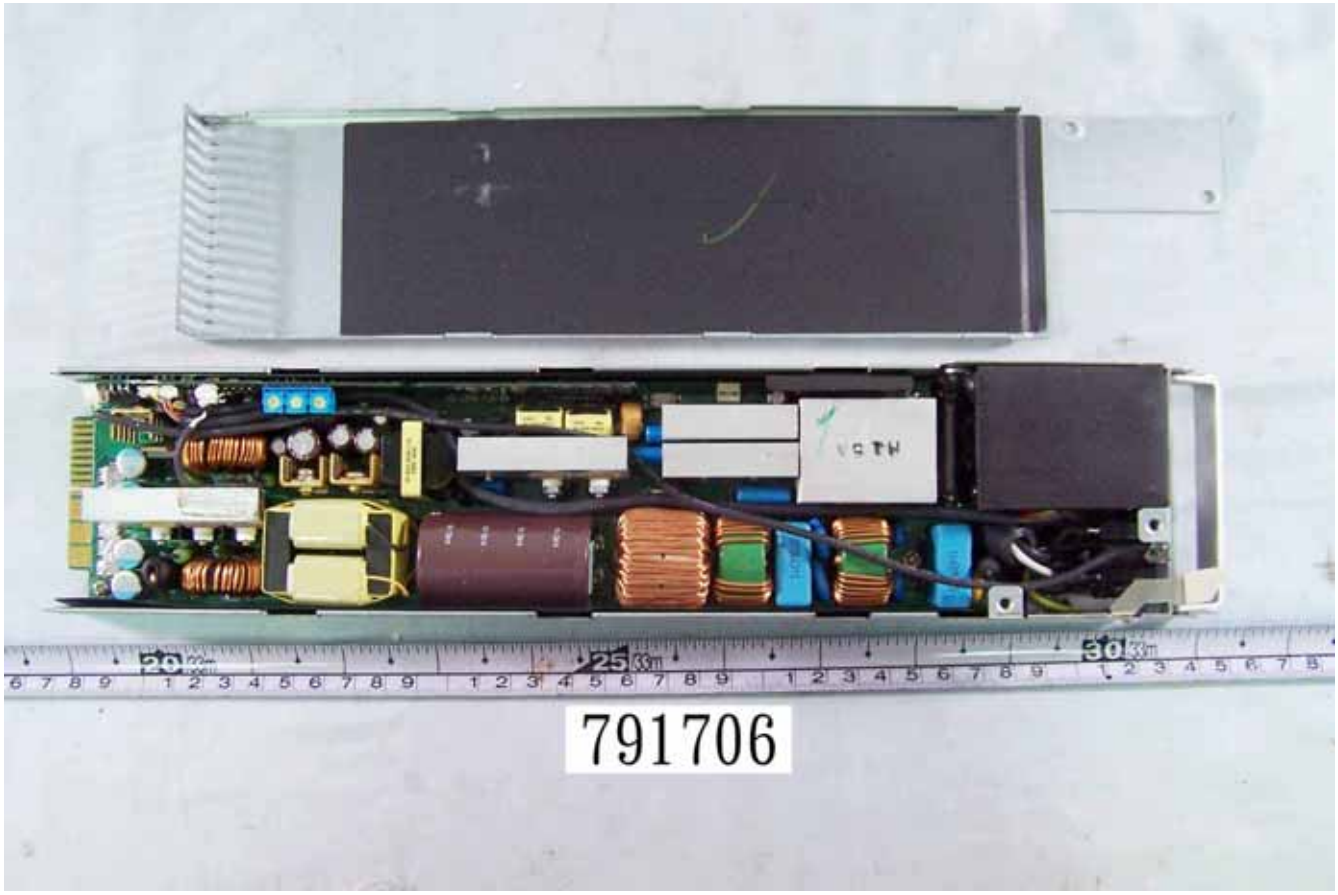

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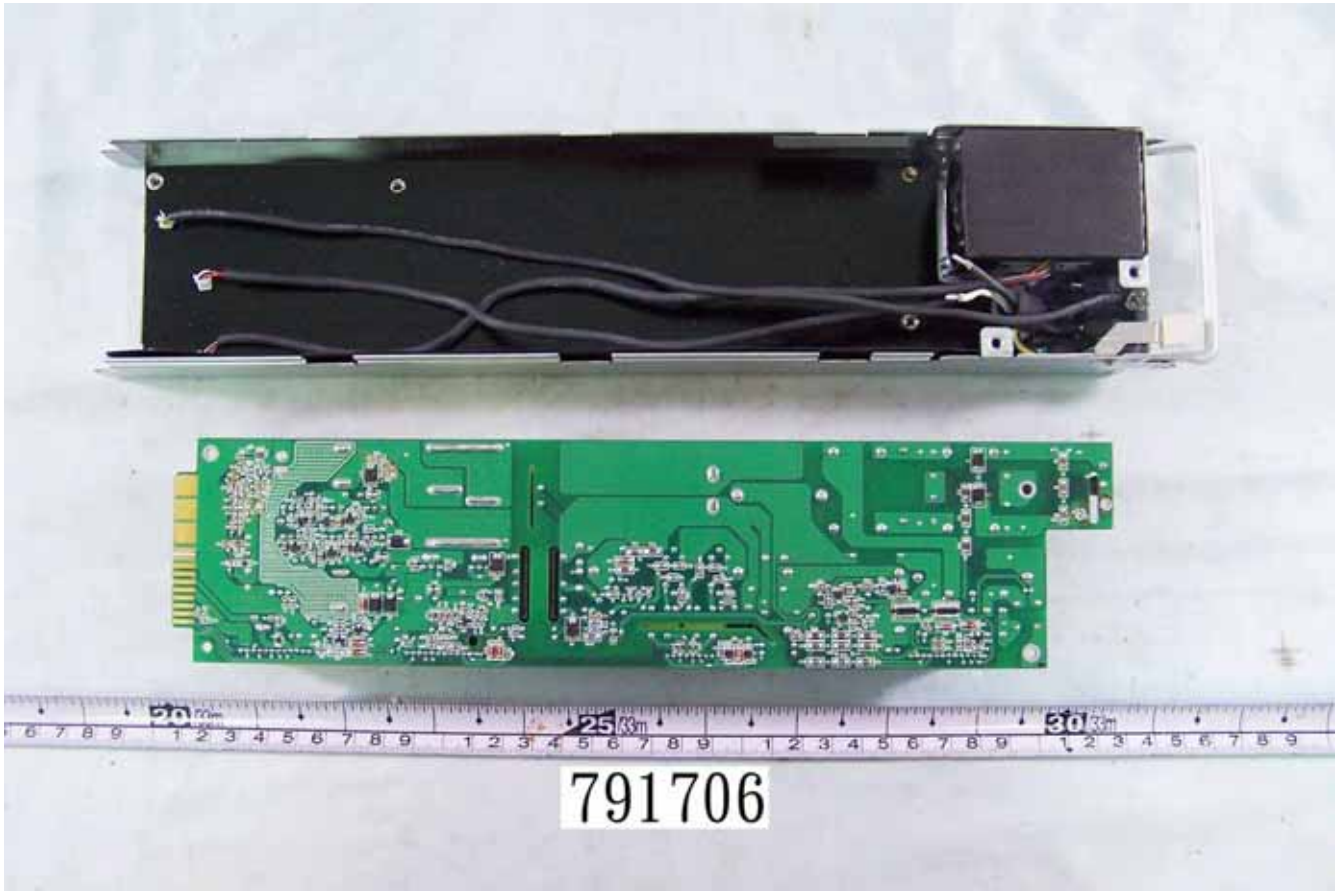

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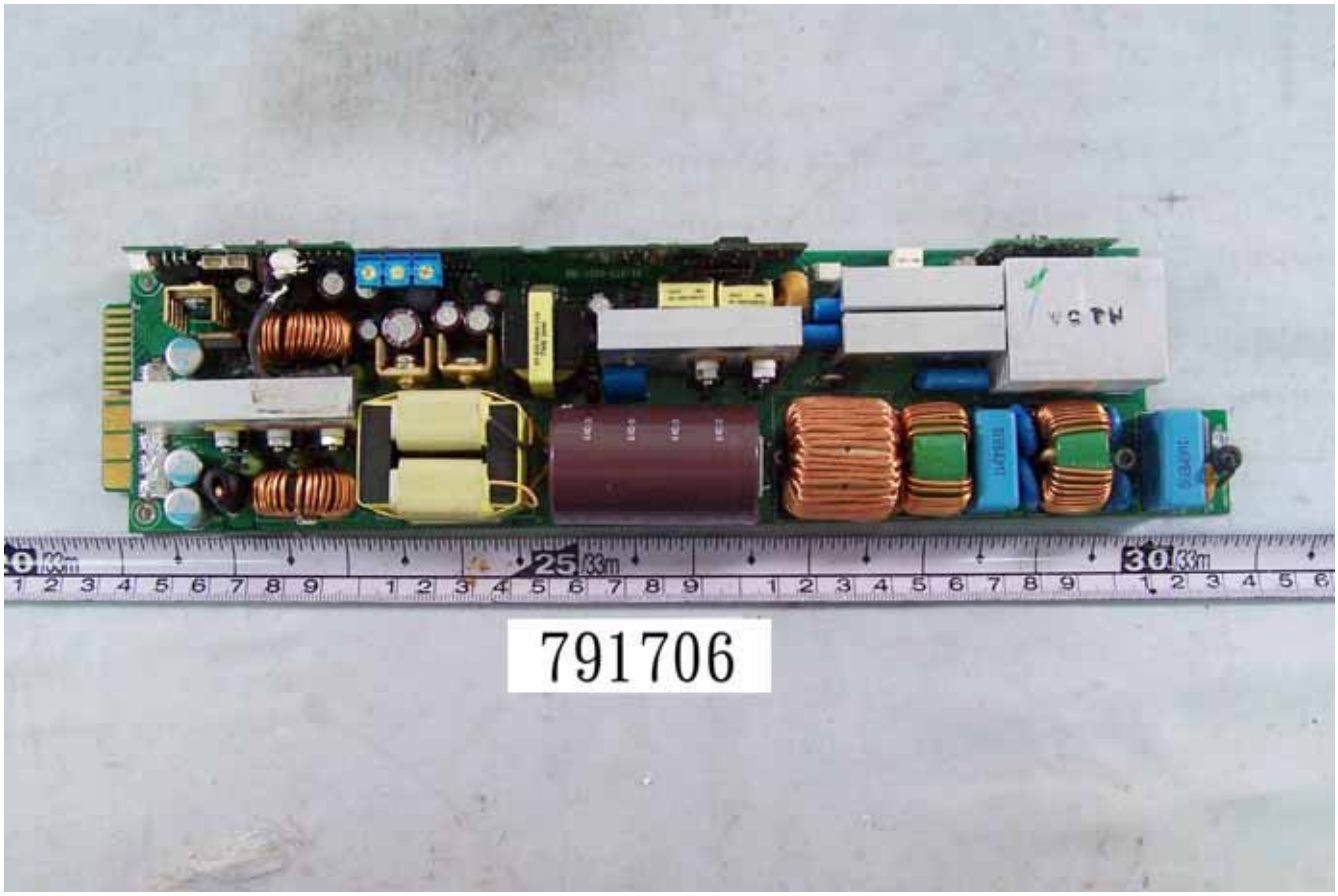

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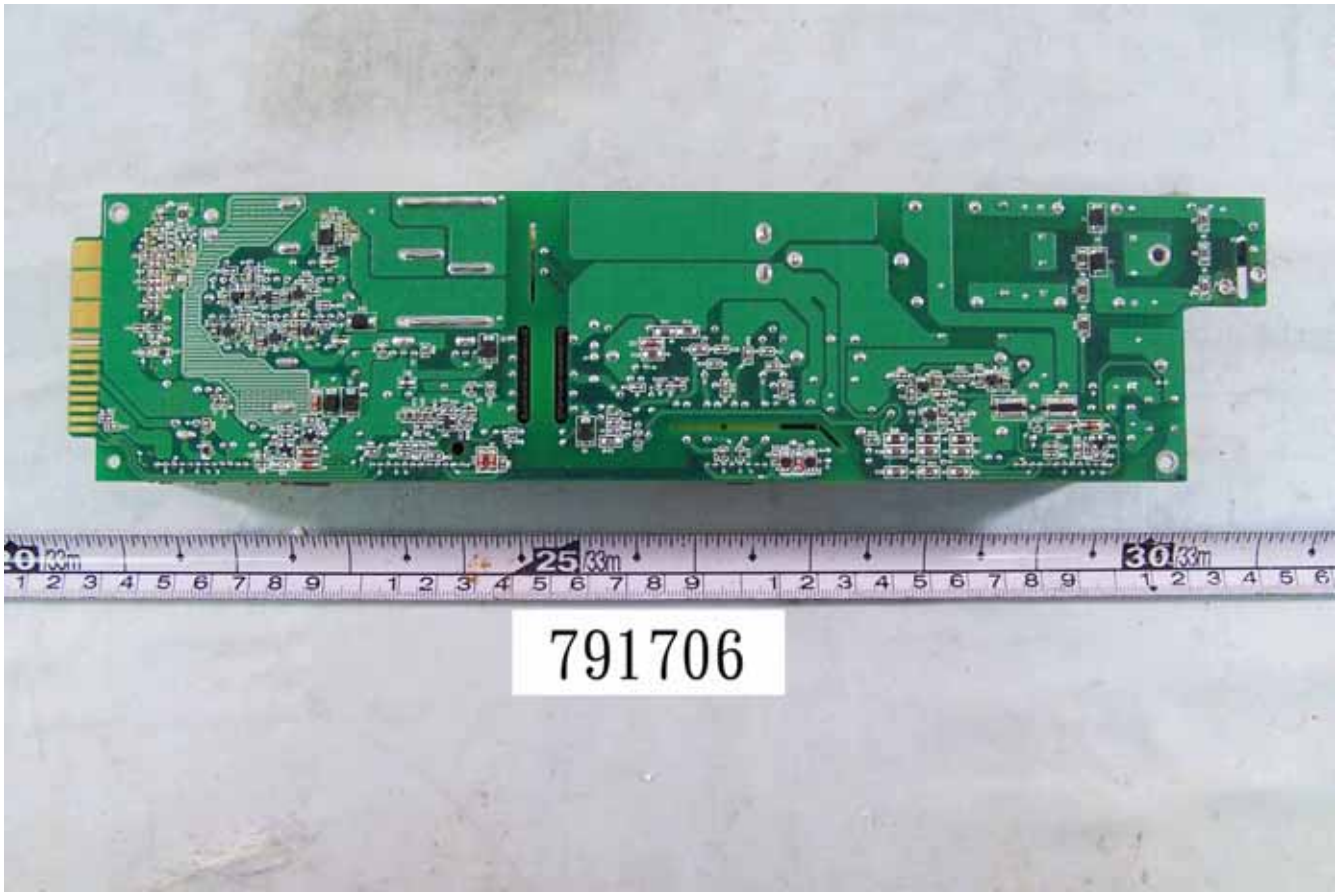

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