EMC TEST REPORT

Reference No. : WT05060416

Applicant : Gembird Electronics Ltd.

Equipment Under Test (EUT) :

Product Name : Multi-socket with surge protection

Model No. : SPG3-B-10, SPG3-B-15, SPG3-B-5, SPG3-B-6

Standards : EN55022:1998+A2:2003
EN55024:1998+A2:2003
EN61000-3-2:2000
EN61000-3-3:1995+A1:2001

Date of Test : June 6, 2005

Test Engineer : Tiger Su

Reviewed By :

Test Result :	**PASS ***

* The sample detailed above has been tested to the requirements of Council Directives 89/336/EEC (as amended by Directives 92/31/EEC and 93/68/EEC). The test results have been reviewed against the Directives above and found to meet their essential requirement

1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	EN55022:1998+A2-2003	EN55022:1998+A2-2003	Class B	PASS
Radiation Emission, 30MHz to 1000MHz	EN55022:1998+A2-2003	EN55022:1998+A2-2003	Class B	PASS
Harmonic Emission on AC, 100Hz to 2kHz	EN 61000-3-2 : 2000	EN 61000-3-2 : 2000	Clause 7 of EN61000-3-2	PASS
Flicker Emission on AC	EN 61000-3-3 :1995 +A1:2001	EN 61000-3-3 :1995 +A1:2001	Clause 5 of EN61000-3-3	PASS
ESD	EN55024 : 1998+A2:2003	EN61000-4-2 :1995 + A2:2001	±4 kV Contact ±8 kV Air	PASS
Radiated Immunity (80MHz to 1GHz)	EN55024 : 1998+A2:2003	EN61000-4-3 : 2002 + A1:2002	3V/m, 80%, 1kHz, Amp. Mod.	PASS♦
Electrical Fast Transients (EFT) on AC and DC	EN55024 : 1998+A2:2003	EN61000-4-4 :2004	AC ±1.0kV DC ±0.5kV	PASS
Surge Immunity on AC	EN55024 : 1998+A2:2003	EN 61000-4-5 :1995 +A1:2001	±1kV D.M.† ±2kV C.M.‡	PASS
Injected Currents on AC & DC, 150kHz to 80MHz	EN55024 : 1998+A2:2003	EN 61000-4-6 :1996 +A1:2001	3Vrms(emf), 80%, 1kHz Amp. Mod.	PASS♦
Power-frequency magnetic field	EN55024 : 1998+A2:2003	EN 61000-4-8 :1993 +A1:2001	3A/m	N/A
Voltage Dips and Interruptions on AC	EN55024 : 1998+A2:2003	EN61000-4-11:1994 +A1:2001	>95 % U_T* for 0.5per >95 % U_T* for 250per 70 % U_T* for 25per	PASS

Remark:

♦ The EUT was within the minimum performance (e.g., the EUT made disturbance sound) level set by the applicant.

A.M. Amplitude Modulation.

P.M. Pulse Modulation.

† D.M. – Differential Mode

* U_T is the nominal supply voltage

2 Contents

3 General Information

3.1 Client Information

Applicant:	Gembird Electronics Ltd.
Address of Applicant:	Room 1709, News Building, #2 Shennan Zhong Lu, Shenzhen, China

3.2 General Description of E.U.T.

Product Name:	Multi-socket with surge protection
Model No.:	SPG3-B-10, SPG3-B-15, SPG3-B-5, SPG3-B-6

3.3 Details of E.U.T.

Power Supply:	220-250 V AC 50Hz

3.4 Description of Support Units

The EUT has been tested as an independent unit.

3.5 Standards Applicable for Testing

The customer requested EMC tests for a Multi-socket with surge protection. The standards used were EN55022 Class B for emissions & EN55024 for immunity.

Table 1 : Tests Carried Out Under EN55022:1998

Standard		Status
EN55022: 1998+A2:2003	Radiation Emission, 30MHz to 1000MHz	√
EN55022: 1998+A2:2003	Mains Terminal Disturbance Voltage,150KHz to 30MHz	√

Table 2 : Tests Carried Out Under EN 61000-3-2: 2000 & EN61000-3-3: 1995 + A1: 2001

EN61000-3-2: 2000	Harmonic Emissions on AC	×
EN61000-3-3: 1995 + A1: 2001	Flicker Emissions on AC	×

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 3 : Tests Carried Out Under EN55024:1998+A1: 2001

Standard		**Status**
EN61000-4-2:1995 + A2:2001	Electro-static discharge	√
EN61000-4-3:2002	Radio frequency EM fields (80MHz to 1GHz)	√
EN61000-4-4:2004	Fast transients	√
EN61000-4-5:1995 +A1:2001	Surges	√
EN61000-4-6:1996+A1:2001	Radio frequency continuous conducted (150kHz to 80MHz)	√
EN61000-4-8:1993+A1:2001	Power-frequency magnetic field (50Hz)	×
EN61000-4-11:1994+A1:2001	Voltage dips & interruptions	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

3.6 Test Facility

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

- **FCC – Registration No.:662850**

  Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 662850, November 17, 2003.

3.7 Test Location

All Emissions testswere performed at:-Shenzhen Huatongwei International Inspection Co., Ltd. at Keji S,12th,Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China.

3.8 Equipment Used during Test

	Conducted Emission Test					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Due date**
1	CE Variac	GZ Debao Factory	TS/DGC$_2$-5	N/A	N/A	N/A
2	LISN	SCHAFFNER CHASE	MNZ050D11	1421	11-11-2004	10-11-2005
3	Shielding Room	Frankonia	12 x 4 x 4 m^3	N/A	N/A	N/A
4	EMI Receiver	ROHDE & SCHWARZ	ESCS30	100086	11-11-2004	10-11-2005
5	Coaxial Cable	HTW	2m	N/A	11-11-2004	10-11-2005
	Radiated Emission Test					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Due date**
1	3m Semi- Anechoic Chamber	Frankonia	N/A	N/A	11-11-2004	10-11-2005
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100085	11-11-2004	10-11-2005
3	EMI Test Software	ROHDE & SCHWARZ	ES-K1	N/A	N/A	N/A
4	Coaxial cable	HTW	N/A	N/A	11-11-2004	10-11-2005
5	Bilog Attenna	SCHAFFNER CHASE	CBL6143	N/A	11-11-2004	10-11-2005
	Radiated Power					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Series No.**	**Cal. Date**	**Due date**
1.	Shielding Room	Frankonia	12 x 4 x 4 m^3	EMC0103	N/A	N/A
1.	Absorbing Clamp	Schwarzbeck	MDS 20	901997	11-11-2004	10-11-2005
2.	EMI Test Receiver	Rohde & Schwarz	ESCS30	100086	11-11-2004	10-11-2005
3.	7m Coaxial Cable	HTW	7m	EMC0303	11-11-2004	10-11-2005
	ESD					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Series No.**	**Cal. Date**	**Due date**
1	ESD Tester	EM Test	N/A	302105	11-11-2004	10-11-2005
	Radiated Immunity					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Series No.**	**Cal. Date**	**Due date**
•	GTEM	Lindgreen-Rayproof	1750	EMC0401	11-11-2004	10-11-2005
1.	Signal Generator	Rohde & Schwarz	SMY01	825675/018	11-11-2004	10-11-2005
2.	Function Generator	Philips	PM5134	LO-263813	11-11-2004	10-11-2005
3.	Amplifier 0.08-1GHz	SCHAFFNER	CBA9413A	4004	11-11-2004	10-11-2005
4.	Power Meter	Rohde & Schwarz	NRVS	825770/074	11-11-2004	10-11-2005
5.	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	11-11-2004	10-11-2005
•	Dual Directional Coupler	WERLATONE INC.	C1795	6634	11-11-2004	10-11-2005

6.	Electric Field Probe	Wandel & Goltermann	EMC-20	M-0063	11-11-2004	10-11-2005
	Conducted Immunity Test					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Series No.**	**Cal. Date**	**Due date**
1	Signal Generator	ROHDE & SCHWARZ	SMY01	825675/016	11-11-2004	10-11-2005
2	Amplifier 0.15-230MHz	OPHIRRF	GRF5048	1003	11-11-2004	10-11-2005
3	Power Meter	ROHDE & SCHWARZ	NRVS	825770/079	11-11-2004	10-11-2005
4	Power Sensor	ROHDE & SCHWARZ	NRV-Z5	825802/012	11-11-2004	10-11-2005
5	Dual Directional Coupler	WERLATONE INC.	C1795	6635	11-11-2004	10-11-2005
6	Oscilloscope Type 485	TEKTRONIX	485	B144408	N/A	N/A
7	CDN M2	SCHAFFNER CHASE	CDN-M2-16	9863	11-11-2004	10-11-2005
8	Immunity S/W Ver 4.31	SCHAFFNER CHASE	CIS9942	WHHPKB	N/A	N/A
	Common Used Equipment					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Series No.**	**Cal. Date**	**Due date**
1	Temperature, Humidity & Barometer	OREGON SCIENTIFIC	BA-888	EMC0001 to EMC0004	11-11-2004	10-11-2005
2	DMM	FLUKE	73	70681569 or 70671122	11-11-2004	10-11-2005

4 Emission Test Results

4.1 Mains Terminals Disturbance Voltage, 150kHz to 30MHz

Test Requirement:	EN 55022 Class B
Test Method:	EN 55022 Class B
Test Date:	June 6, 2005
Frequency Range:	150kHz to 30MHz
Class/Severity:	Table 1 of EN55022
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

4.2 E.U.T. Operation

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1012 mbar

EUT Operation :

Compliance test was performed test in on mode connected with a lamp.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

4.3 Measurement Data

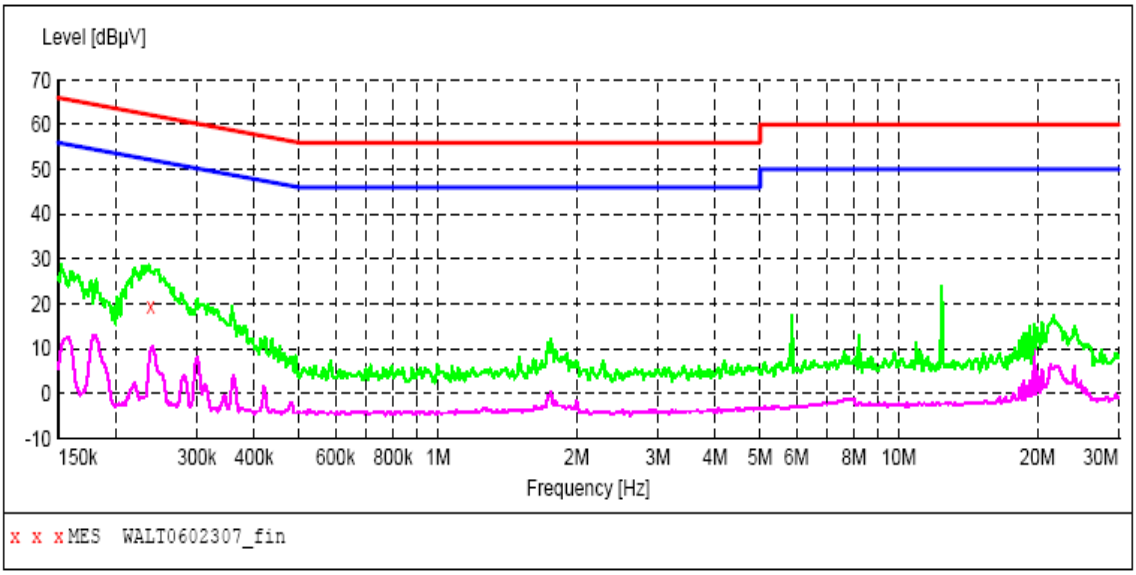
An initial pre-scan was performed on the live and neutral lines.

No futher quasi-peak or average measurements were performed since no peak emissions were detected within 10dB line below the average limit.

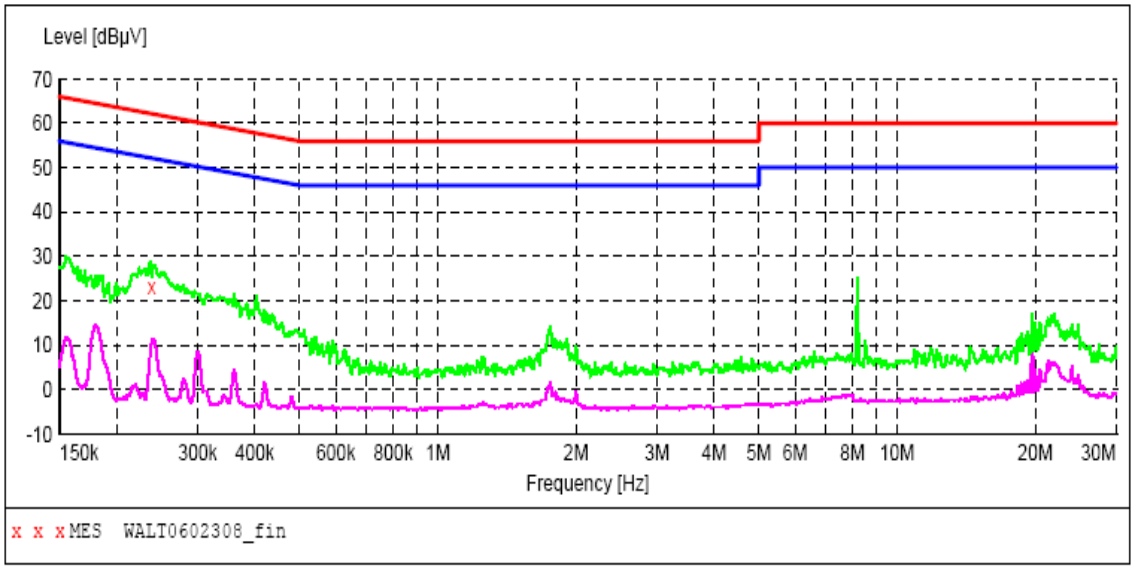
Please refer to the following peak scan graph for reference.

4.4 Conducted Emissions Test Data

Live Line:



Neutral Line:



4.5 Conductied Emissions Test Data

Freq. MHz	Line	QP Reading dBuV	Limit dBuV	Margin dB	AV Reading dBuV	Limit dBuV	Margin dB
0.238115	Live	19.6	62.0	42.4	/	/	/
0.241940	Neutral	23.1	61.8	38.7	/	/	/

4.6 Photographs – Mains Terminal Disturbance Voltage on AC Test Setup

4.7 Radiation Emission Data

Test Requirement:	EN 55022 Class B
Test Method:	EN 55022 Class B
Test Date:	June 6, 2005
Frequency Range:	30MHz to 1000MHz
Class/Severity:	Table 1 of EN55022
Detector:	Peak for pre-scan (120kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

4.8 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at SZHTW is $\pm$4.0 dB.

4.9 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR16-1, The specification used in this report was the EN55022 Class B limits.

The EUT was placed on the test table in on mode connected with a lamp.

The spacing between the peripherals was 10 cm.

4.10 Spectrum Analyzer Setup

According to EN55022 Class B Rules, the system was tested to 1000 MHz.

Start Frequency.....30 MHz
Stop Frequency .....1000 MHz
Sweep Speed Auto
IF Bandwidth .....1 MHz
Video Bandwidth.....1 MHz
Quasi-Peak Adapter Bandwidth .....120 kHz
Quasi-Peak Adapter Mode.....Normal
Resolution Bandwidth 1MHz

4.11 Test procedure

For the radiated emissions test, since the EUT does have a power source, there was connection to AC outlets.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.
The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

4.12 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Class B Limit

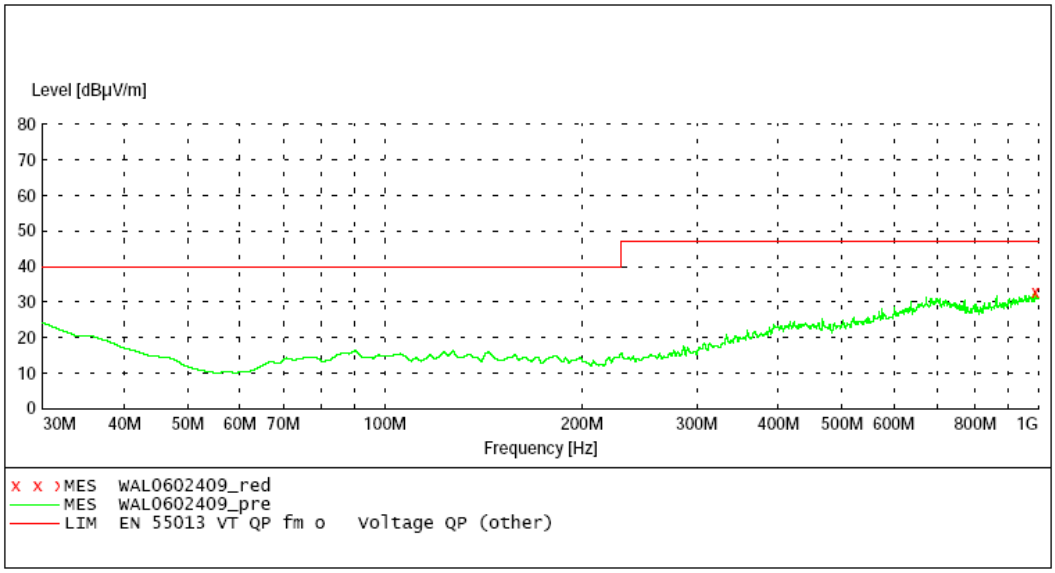
4.13 Summary of Test Results

According to the data in section 5.2.7, the EUT complied with the EN55022 Class B standards, and had the worst margin of:

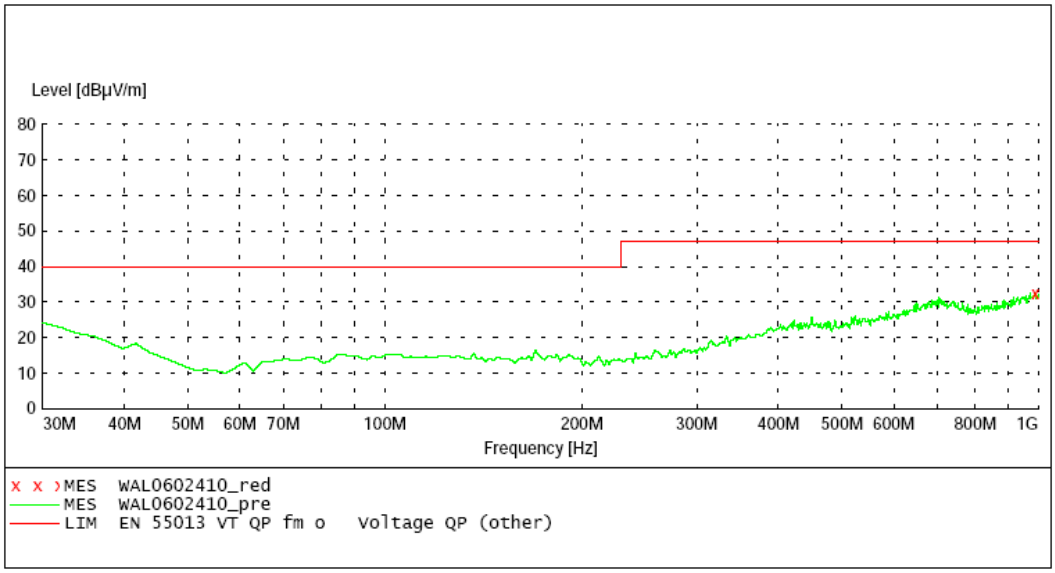
Remarks:No significant emissions above the equipment noise floor were detected.

4.14 Radiated Emissions Test Data

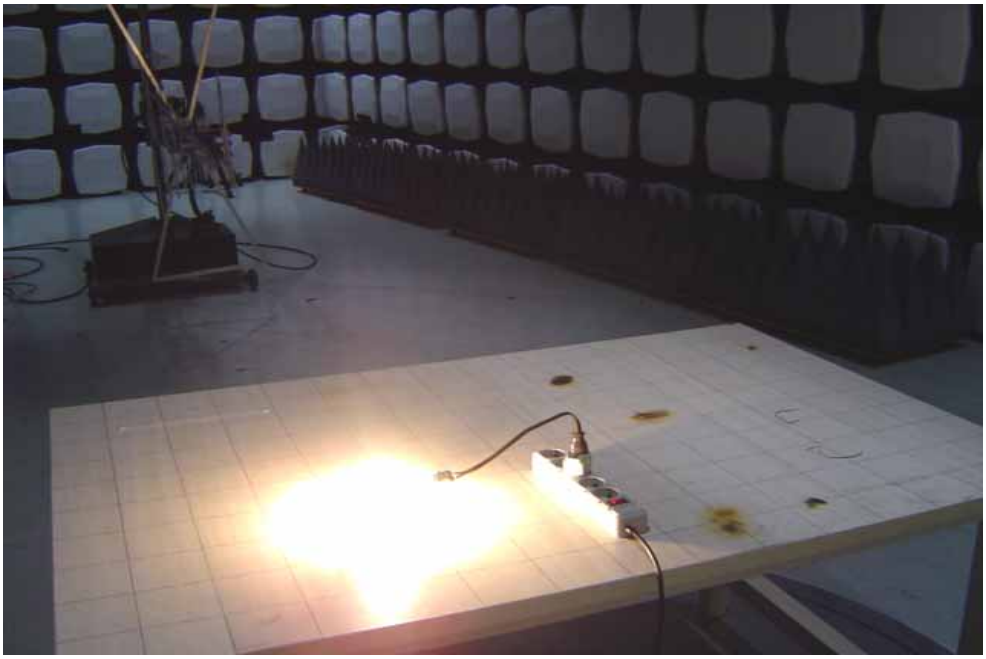
Vertical:



Horizontal:



4.15 Photographs – Radiation Emission Test Setup



5 Harmonics Test Results

Test Requirement: EN61000-3-2
Test Method: EN61000-3-2
Frequency Range: 100Hz to 2kHz
Test Result: PASS

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN61000-3-2 (1995 + A12:1996 + A1:1998 +A2:1998 + A14:2000).

For further details, please refer to Clause 7, Note 1 of EN61000-3-2 which states:-

"For the following categories of equipment limits are not specified in this edition of the standard.

Note 1: Equipment with a rated power of 75W or less, other than lighting equipment."

Report title:	0606103
Company Name:	HUATONGWEI
Date of test:	18:26 6. June 2005
Measurement file name:	d:\report~1\w\walt\0606101.rsd
Tester:	JACKY
Standard used:	EN/IEC 61000-3-2 A14 (2000) Quasi-stationary - Equipment class A
Observation time:	150s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2000)
Customer:	Gembird Electronics Ltd.
E. U. T.:	Advanced surge protection
	AC 230V/50Hz

Test Result	
E. U. T.:	PASS
Power Source:	PASS

E. U. T. Result

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

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

Check odd harmonics 21..39:

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

Power Source Result

First dataset out of limit:
DS (time): None
Harmonic(s) out of limit:
Order (n): None

Average harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	4.840	100.000		
2	50.153E-3	1.036	1.08	PASS
3	29.498E-3	0.609	2.30	PASS
4	1.794E-3	0.037	430.00E-3	PASS
5	7.072E-3	0.146	1.14	PASS
6	5.851E-3	0.121	300.00E-3	PASS
7	2.145E-3	0.044	770.00E-3	PASS
8	4.183E-3	0.086	230.00E-3	PASS
9	3.757E-3	0.078	400.00E-3	PASS
10	1.573E-3	0.033	184.00E-3	PASS
11	2.641E-3	0.055	330.00E-3	PASS
12	3.046E-3	0.063	153.33E-3	PASS
13	1.039E-3	0.021	210.00E-3	PASS
14	2.363E-3	0.049	131.43E-3	PASS
15	1.984E-3	0.041	150.00E-3	PASS
16	1.652E-3	0.034	115.00E-3	PASS
17	1.444E-3	0.030	132.35E-3	PASS
18	2.184E-3	0.045	102.22E-3	PASS
19	1.016E-3	0.021	118.42E-3	PASS
20	1.406E-3	0.029	92.00E-3	PASS
21	1.569E-3	0.032	160.71E-3	PASS
22	1.237E-3	0.026	83.64E-3	PASS
23	1.098E-3	0.023	146.74E-3	PASS
24	1.475E-3	0.030	76.66E-3	PASS
25	754.061E-6	0.016	135.00E-3	PASS
26	1.137E-3	0.023	70.77E-3	PASS
27	1.500E-3	0.031	124.99E-3	PASS
28	873.291E-6	0.018	65.71E-3	PASS
29	749.724E-6	0.015	116.39E-3	PASS
30	1.626E-3	0.034	61.33E-3	PASS
31	924.599E-6	0.019	108.87E-3	PASS

32	963.384E-6	0.020	57.50E-3	PASS
33	689.941E-6	0.014	102.27E-3	PASS
34	1.198E-3	0.025	54.12E-3	PASS
35	972.195E-6	0.020	96.44E-3	PASS
36	1.124E-3	0.023	51.11E-3	PASS
37	716.190E-6	0.015	91.21E-3	PASS
38	816.155E-6	0.017	48.42E-3	PASS
39	863.533E-6	0.018	86.53E-3	PASS
40	738.987E-6	0.015	46.00E-3	PASS

Maximum harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	4.842	100.000		
2	52.223E-3	1.079	1.62	PASS
3	30.200E-3	0.624	3.45	PASS
4	2.344E-3	0.048	645.00E-3	PASS
5	7.378E-3	0.152	1.71	PASS
6	6.667E-3	0.138	450.00E-3	PASS
7	2.490E-3	0.051	1.15	PASS
8	4.520E-3	0.093	345.00E-3	PASS
9	4.335E-3	0.090	600.00E-3	PASS
10	1.991E-3	0.041	276.00E-3	PASS
11	3.093E-3	0.064	495.00E-3	PASS
12	3.512E-3	0.073	229.99E-3	PASS
13	1.392E-3	0.029	315.00E-3	PASS
14	2.602E-3	0.054	197.15E-3	PASS
15	2.169E-3	0.045	225.00E-3	PASS
16	1.951E-3	0.040	172.50E-3	PASS
17	1.584E-3	0.033	198.52E-3	PASS
18	2.409E-3	0.050	153.33E-3	PASS
19	1.222E-3	0.025	177.63E-3	PASS
20	1.653E-3	0.034	138.00E-3	PASS
21	1.825E-3	0.038	160.71E-3	PASS
22	1.409E-3	0.029	125.46E-3	PASS
23	1.376E-3	0.028	146.74E-3	PASS
24	1.681E-3	0.035	114.99E-3	PASS
25	1.230E-3	0.025	135.00E-3	PASS
26	1.406E-3	0.029	106.16E-3	PASS
27	1.883E-3	0.039	124.99E-3	PASS
28	1.120E-3	0.023	98.57E-3	PASS
29	1.037E-3	0.021	116.39E-3	PASS
30	1.933E-3	0.040	92.00E-3	PASS
31	1.275E-3	0.026	108.87E-3	PASS
32	1.221E-3	0.025	86.25E-3	PASS

33	1.197E-3	0.025	102.27E-3	PASS
34	1.825E-3	0.038	81.18E-3	PASS
35	1.427E-3	0.029	96.44E-3	PASS
36	1.447E-3	0.030	76.66E-3	PASS
37	975.254E-6	0.020	91.21E-3	PASS
38	1.250E-3	0.026	72.63E-3	PASS
39	1.299E-3	0.027	86.53E-3	PASS
40	976.486E-6	0.020	69.00E-3	PASS

Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.21	100.092		
2	151.96E-3	0.066	0.2	PASS
3	456.37E-3	0.198	0.9	PASS
4	55.95E-3	0.024	0.2	PASS
5	51.16E-3	0.022	0.4	PASS
6	44.59E-3	0.019	0.2	PASS
7	29.71E-3	0.013	0.3	PASS
8	21.96E-3	0.010	0.2	PASS
9	10.40E-3	0.005	0.2	PASS
10	28.41E-3	0.012	0.2	PASS
11	19.44E-3	0.008	0.1	PASS
12	13.33E-3	0.006	0.1	PASS
13	20.59E-3	0.009	0.1	PASS
14	14.96E-3	0.007	0.1	PASS
15	17.84E-3	0.008	0.1	PASS
16	23.78E-3	0.010	0.1	PASS
17	17.52E-3	0.008	0.1	PASS
18	24.20E-3	0.011	0.1	PASS
19	17.05E-3	0.007	0.1	PASS
20	18.71E-3	0.008	0.1	PASS
21	11.37E-3	0.005	0.1	PASS
22	11.86E-3	0.005	0.1	PASS
23	11.17E-3	0.005	0.1	PASS
24	13.70E-3	0.006	0.1	PASS
25	14.11E-3	0.006	0.1	PASS
26	13.14E-3	0.006	0.1	PASS
27	13.56E-3	0.006	0.1	PASS
28	17.56E-3	0.008	0.1	PASS
29	9.51E-3	0.004	0.1	PASS
30	14.86E-3	0.006	0.1	PASS
31	10.52E-3	0.005	0.1	PASS
32	14.75E-3	0.006	0.1	PASS

33	11.35E-3	0.005	0.1	PASS
34	10.01E-3	0.004	0.1	PASS
35	9.75E-3	0.004	0.1	PASS
36	10.26E-3	0.004	0.1	PASS
37	10.01E-3	0.004	0.1	PASS
38	9.54E-3	0.004	0.1	PASS
39	9.84E-3	0.004	0.1	PASS
40	13.99E-3	0.006	0.1	PASS

6 Flicker Test Results

Test Requirement: EN61000-3-3

Test Method: EN61000-3-3

Test Result PASS

Compliance test was performed in ON mode and 'on/off' once during the test.

Report title:	0613104
Company Name:	HUATONGWEI
Date of test:	18:56 06.Jun 2005
Tester:	JACKY
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	230V / 50Hz
Customer:	Gembird Electronics Ltd.
E. U. T.:	Multi-socket with surge protection

Test Result	PASS

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.214	4.00	PASS
dt [s]	0.000	0.50	PASS

Photographs – Harmonics and Flicker Test Setup

7 Immunity Test Results

7.1 Performance Criteria Description

Criterion A: The apparatus shall continue to operate as intended .No degradation of performan-ce or loss of function is allowed below a performance level specified by the manu-facturer, when the apparatus is used as intended.

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

Criterion C: Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

For further details, please refer to of EN55024.

7.2 ESD

Test Requirement:	EN55024	
Test Method:	EN61000-4-2	
Test Date:	June 6, 2005	
Discharge Impedance:	330 Ω / 150 pF	
Discharge Voltage:	Air Discharge:	8 kV
	Contact Discharge:	4 kV
	HCP & VCP:	4 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

7.2.1 E.U.T. Operation

Operating Environment:

Temperature :	24.0 °C
Humidity :	52 % RH
Barometric Pressure :	1012 mbar

EUT Operation:

Compliance test was performed test in on mode connected with a lamp.

7.2.2 Direct Application Test Results

Observations : Test points : 1. All Exposed Surface & Seams;
2. All matellic part

Direct Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Contact Discharge**	**Air Discharge**
8	+/-	1	N/A	A
4	+/-	2	A	N/A

Results

A: No degradation in the performance of the E.U.T. was observed.
N/A: Not applicable.

7.2.3 Indirect Application Test Results

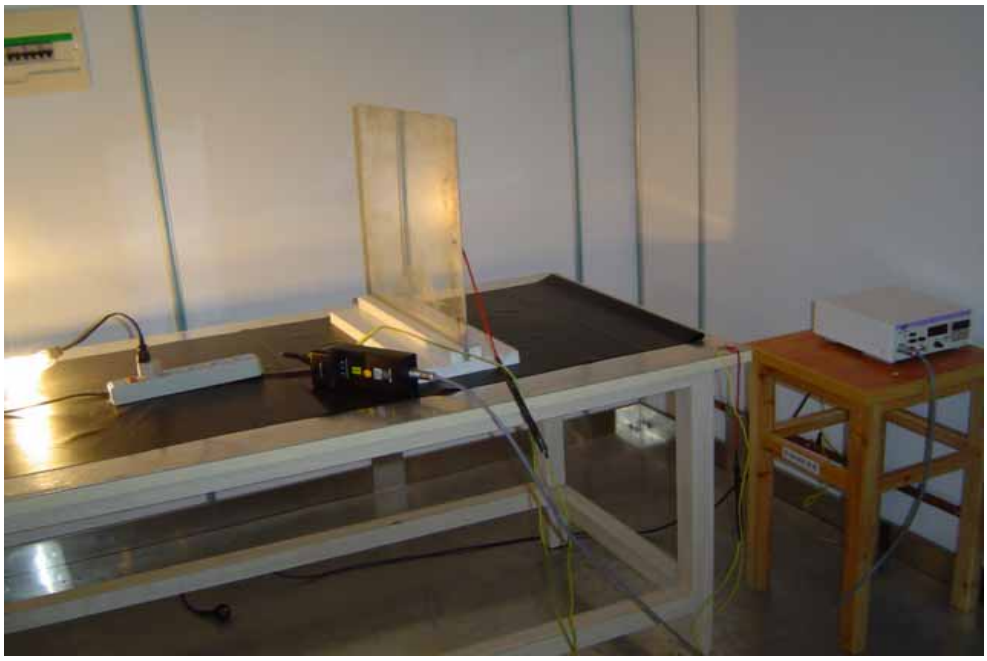
Observations : Test points : 1. All sides.

Indirect Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
4	+/-	1	A	A

Results

A: No degradation in the performance of the E.U.T. was observed.

7.2.4 Photographs - ESD Test Setup



7.3 Radiated Immunity

Test Requirement: EN55024
Test Method: EN61000-4-3
Frequency Range: 80MHz–1GHz
Face Under Test: Three Mutually Orthogonal Faces
Severity: 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 1GHz
Test Date: June 6, 2005

7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 24.0 °C
Humidity: 52 % RH
Barometric Pressure: 1012 mbar

EUT Operation:

Compliance test was performed test in on mode connected with a lamp.

7.3.2 Test Results

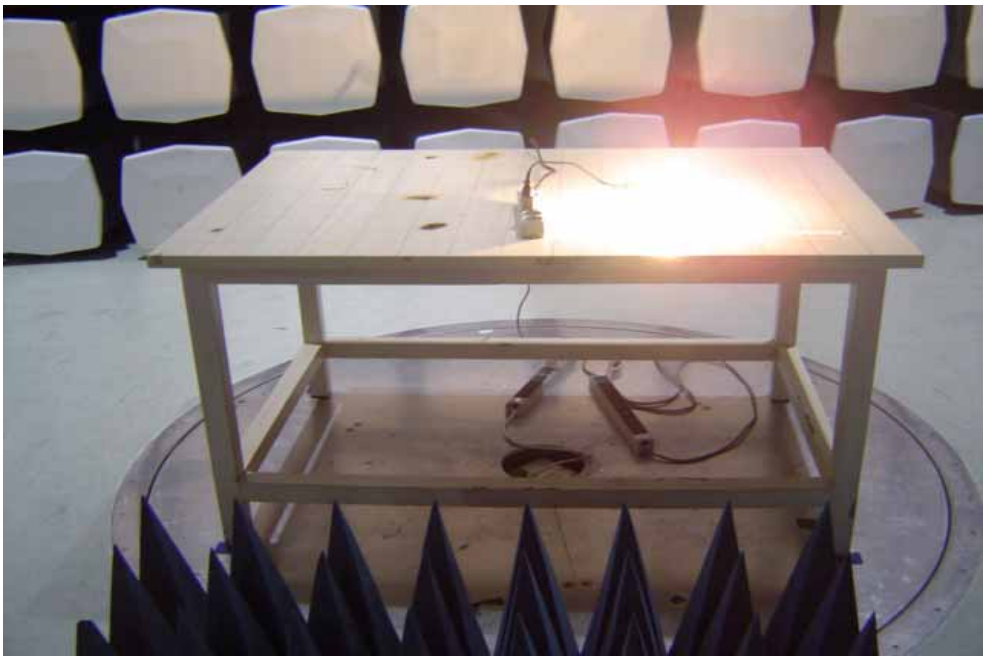
Frequency	Level	Modulation	EUT Face	Result / Observations
80MHz-1GHz	3V/m	1kHz, 80%, Amp. Mod.	X Y Z	During test, noise can be heard. After test EUT recovers to normal (A).

Remarks:
AM : Amplitude Modulation.
PM : Pulse Modulation.
X : EUT as per photograph in section 7.3.3of this report.
Y : As X, but rotate EUT by 90° clockwise.
Z : As Y, but rotate EUT by 90° vertically.

Results

A: No degradation in the performance of the E.U.T. was observed.

7.3.3 Photographs - Radiated Immunity Test Setup For X-Direction



7.4 Electrical Fast Transients (EFT)

Test Requirement:	EN55024
Test Method:	EN61000-4-4
Test Date:	June 6, 2005
Test Level:	1.0kV on AC
Polarity:	Positive & Negative& PE
Repetition Frequency:	5kHz
Burst Duration:	300ms
Test Duration:	2 minutes per level & polarity

7.4.1 E.U.T. Operation

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Barometric Pressure:	1012 mbar

EUT Operation:

Compliance test was performed test in on mode connected with a lamp.

7.4.2 Test Results On AC Cable

Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT operating mode	Observations (Performance Criterion)
Live	±1.0	Direct	ON	No loss of function(A)
Neutral	±1.0	Direct	ditto	ditto
L-N-PE	±1.0	Direct	ditto	ditto

Results

A: No degradation in the performance of the E.U.T. was observed.

7.4.3 Photographs : EFT Test Setup For EUT On AC Cable

WALTEK
Reference I

7.5 Surge

Test Requirement:	EN55024
Test Method:	EN61000-4-5
Test Date:	June 6, 2005
Test level:	±1kV Live to Neutral, ± 2kV L&N-PE
Interval:	60s between each surge
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.

7.5.1 E.U.T. Operation

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Barometric Pressure:	1012 mbar

EUT Operation:

Compliance test was performed test in on mode connected with a lamp.

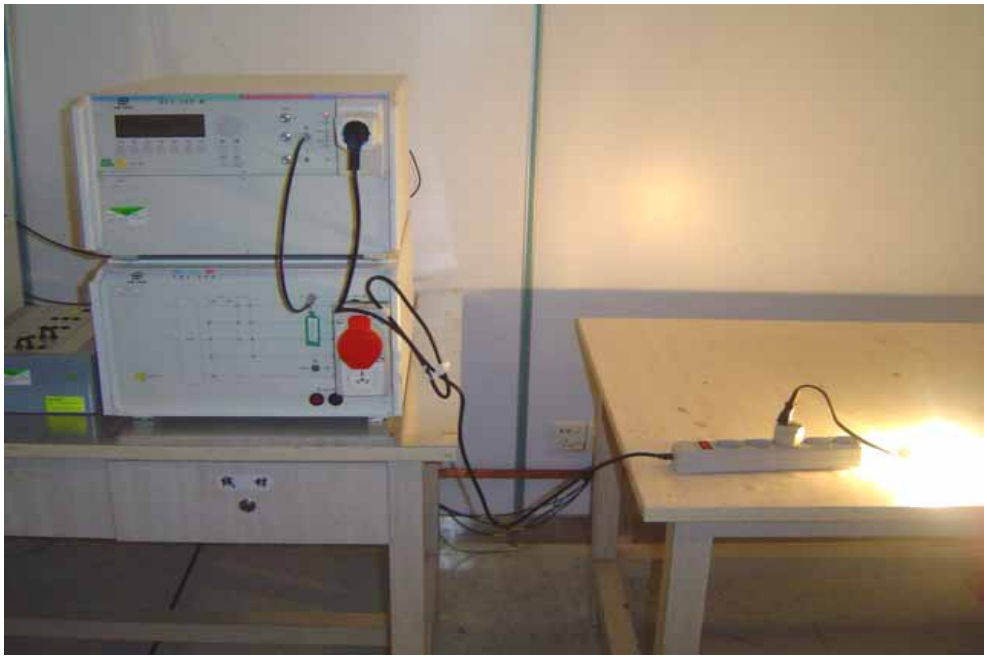
7.5.2 Test Results

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	/	/
2	1kV	±	L-N	A	/
3	2kV	±	L-PE, N-PE	A	/
4	4kV	±	L-N	/	/

Results

A: No degradation in the performance of the E.U.T. was observed.

7.5.3 Photographs : Surge Test Setup



7.6 Conducted Immunity 0.15MHz to 80MHz

Test Requirement: EN55024
Test Method: EN61000-4-6
Test Date: June 6, 2005
Frequency Range: 0.15MHz to 80MHz
Test level: 3V rms (unmodulated emf into 150 Ω)
Modulation: 80%, 1kHz Amplitude Modulation.

7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 24.0 °C
Humidity: 52 % RH
Barometric Pressure: 1012 mbar

EUT Operation:
Compliance test was performed test on mode connected with a lamp.

7.6.2 Test Results

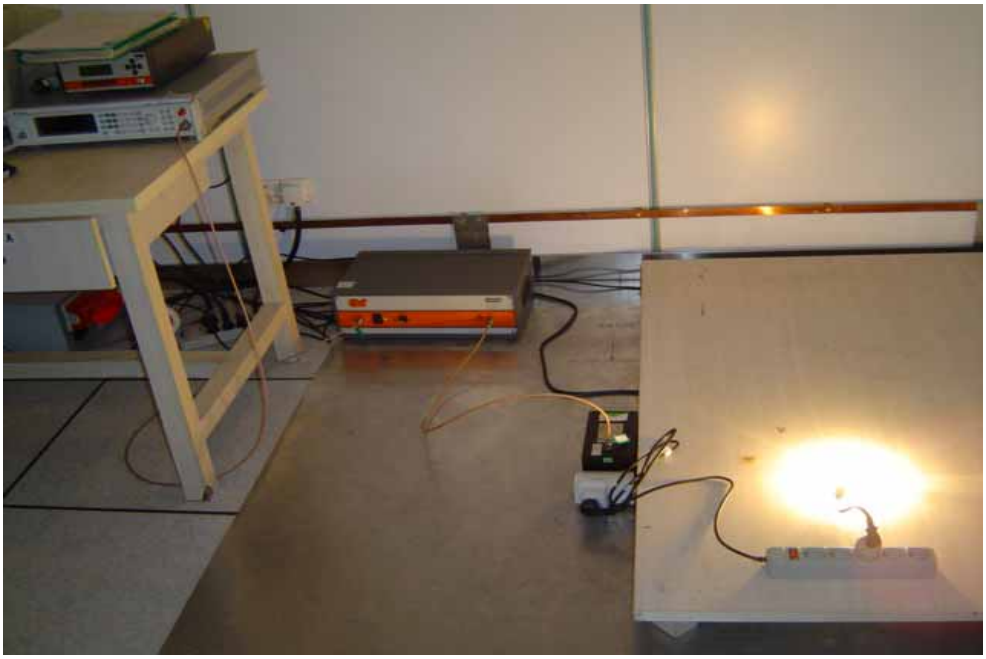
AC mains of AC Cable

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150kHz to 80MHz	2 Wire AC Supply Cable	3Vrms	80%, 1kHz Amp. Mod.	1%	1s	During test, noise can be heard. After test EUT recovers to normal (A).

Results

A: No degradation in the performance of the E.U.T. was observed.

7.6.3 Photographs : Conducted Immunity Test Setup On AC Cable



7.7 Voltage Dips and Interruptions

Test Requirement:	EN55024
Test Method:	EN61000-4-11
Test Date:	June 6, 2005
Test Level:	0% & 0% & 70 % of U_T (Supply Voltage)
No. of Dips / Interruptions:	1 per Level at 20ms intervals

7.7.1 E.U.T. Operation

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Barometric Pressure:	1012 mbar

EUT Operation:

Compliance test was performed test in on mode connected with a lamp.

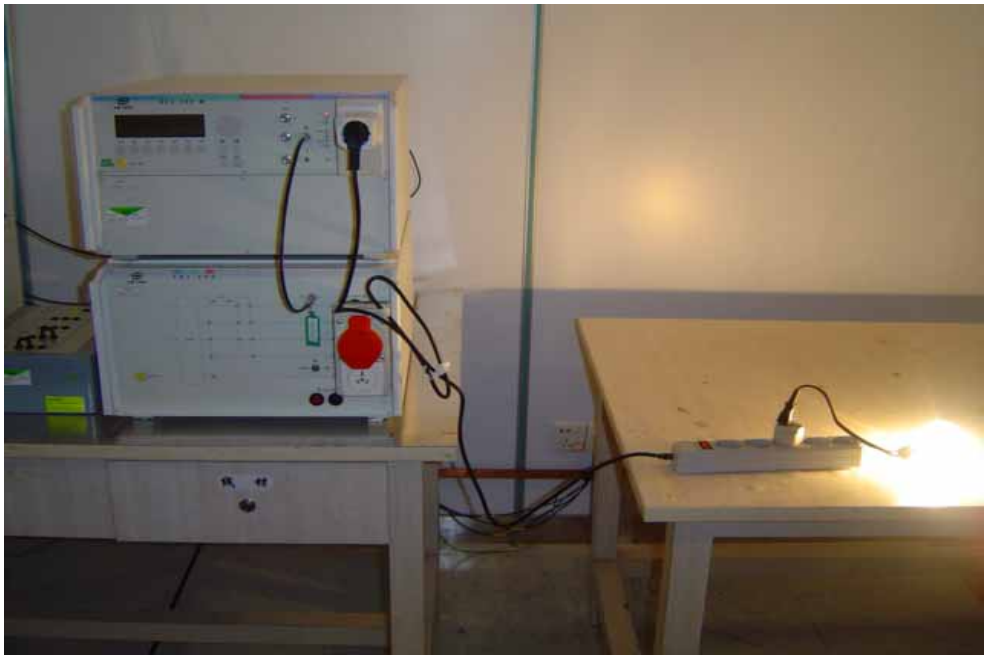
7.7.2 Measurement Data

EUT operating mode	Test specification	Phase	Duration of dropout in Periods	No of dropout	Time between dropout	Observations (Performance Criterion)
On mode	>95	0°	250	3	5000ms	C
ditto	>95	0°	0.5	3	10ms	B
ditto	30	180°	25	3	500ms	C

Results

B & C: During test, This was within the minimum performance criteria set by the applicant. Please refer to section 7.1 of this report for further details.

7.7.3 Photographs : Voltage Dips and Interruptions Test Setup



8 Photographs - Constructional Details

8.1 EUT - Front View

8.2 EUT - Back View

8.3 EUT - Open View