INTERGRUP

Informe de Prueba SGS

Unidad de Ventilación con termostato digital Modelo VAUD1U04NG

SGS-CSTC Standards Technical Services Co., Ltd.

No. 1 Workshop, M-10, Middle Section, Science & Technology Park,
District Shenzhen, China 518057

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: sgs_internet_operations@sgs.com

TEST REPORT

Application No.: SZEMO070802137IT

Applicant: TOTEN CO.

Equipment Under Test (EUT):

EUT Name: FAN UNIT/ FAN UNIT AND THERMOSTAT

Item No.: SA series 1U fan unit with 2fans/ 1U fan unit with 3fans/ 1U fan unit with 4fans/ 1U fan unit with 2fans and thermostat/ 1U fan unit with 3fans and thermostat/ 1U fan unit with 4fans and thermostat

Trade mark: TOTEN

Standards: EN 55022: 1998 + A1: 2000 + A2: 2003
EN 55024: 1998 + A1: 2001 + A2: 2003
EN 61000-3-2: 2006
EN 61000-3-3: 1995 + A1: 2001 + A2: 2005

Date of Receipt: 17 August 2007

Date of Test: 20 to 23 August 2007

Date of Issue: 30 August 2007

Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

CE

Robinson Lo
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission, 30MHz to 1GHz	EN 55022 : 1998 + A1:2000 + A2:2003	EN 55022 : 1998 + A1:2000 + A2:2003	Class B	PASS
Conducted Emission (150KHz to 30MHz)	EN 55022 : 1998 + A1:2000 + A2:2003	EN 55022 : 1998 + A1:2000 + A2:2003	Class B	PASS
Harmonic Emission on AC, 50Hz	EN 61000-3-2: 2006	EN 61000-3-2: 2006	Class A	PASS
Flicker Emission on AC	EN 61000-3-3 :1995 + A1: 2001 + A2: 2005	EN 61000-3-3 :1995 + A1: 2001 + A2: 2005	Clause 5 of EN 61000-3-11	PASS
ESD	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-2 :1995 +A1:1998+A2:2001	Contact ±4 kV Air ±8 kV	PASS
Radiated Immunity, 80MHz to 1 GHz	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-3 :2002 + A1:2002	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients (EFT) on AC	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-4 :1995 + A1:2001 + A2 :2001	AC ± 1.0kV	PASS
Surge Immunity on AC	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-5 :1995 + A1:2001	±1kV D.M.† ±2kV C.M. ‡	PASS
Injected Currents on AC, 150kHz to 80MHz	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-6 :1996 + A1:2001	3Vrms (emf), 80%, 1kHz Amp. Mod.	PASS
Voltage Dips and Interruptions on AC	EN 55024: 1998 + A1: 2001 + A2:2003	EN 61000-4-11 :1994 + A1:2001	0 % U_T* for 0.5per 0 % U_T* for 250per 70 % U_T* for 25per	PASS

* U_T is the nominal supply voltage

† D.M. – Differential Mode

‡ C.M. – Common Mode

3 Contents

4 General Information

4.1 Client Information

Applicant:	TOTEN CO.
Address of Applicant:	Changyuan industrial zone, xili town nanshan district, Shenzhen china

4.2 General Description of E.U.T.

EUT Name:	FAN UNIT/ FAN UNIT AND THERMOSTAT
Item No.:	SA series 1U fan unit with 2fans/ 1U fan unit with 3fans/ 1U fan unit with 4fans/ 1U fan unit with 2fans and thermostat/ 1U fan unit with 3fans and thermostat/ 1U fan unit with 4fans and thermostat
Serial No.:	Not supplied by client

4.3 Details of E.U.T.

Power Supply:	22-2400V AC

4.4 Description of Support Units

N/A

4.5 Standards Applicable for Testing

The customer requested EMC tests for FAN UNIT/ FAN UNIT AND THERMOSTAT.
The standards used were EN 55022, EN 61000-3-2, EN 61000-3-3 and EN 55024.

Table 1 : Tests Carried Out Under EN 55022 :1998 + A1:2000 + A2:2003

Standard		Status
EN 55022 :1998 + A1:2000 + A2:2003	Radiated Emissions	√
EN 55022 :1998 + A1:2000 + A2:2003	Conducted Emissions on AC	√
EN 55022 :1998 + A1:2000 + A2:2003	Conducted Emissions on Telecommunication Ports	×

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

Table 2: Tests Carried Out Under EN61000-3-2:2006 & EN61000-3-3:1995+A1:2001+A2:2005

Standard		Status
EN 61000-3-2: 2006	Harmonic Emissions on AC	√
EN 61000-3-3:1995+A1:2001+A2:2005	Flicker Emissions on AC	√

√ Indicates that the test is applicable

Table 3: Tests carried out under EN 55024 : 1998 + A1: 2001 + A2:2003

Standard		Status
EN 61000-4-2: 1995+A1:1998+A2 :2001	Electrostatic discharge immunity test	√
EN 61000-4-3: 2002+A1:2002	Radiated, radio-frequency electromagnetic field electromagnetic field immunity test	√
EN 61000-4-4: 1995+A1:2001+A2:2001	Electrical fast transients/burst immunity test	√
EN 61000-4-5: 1995+A1: 2001	Surge immunity test	√
EN 61000-4-6: 1996+A1:2001	Immunity to conducted disturbances, induced by radio-frequency fields	√
EN 61000-4-8: 1993+A1:2001	Power-frequency magnetic field immunity test	×
EN 61000-4-11: 1994+A1:2001	Voltage dips, short interruptions and voltage variations immunity tests	√

× Indicates that the test is not applicable
√ Indicates that the test is applicable
Note The EUT does not contain any component which is susceptable from the magnetic field.

4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory,

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

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

- **CNAS (No. CNAS L2929)**

  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing

- **VCCI**

  The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

  Date of Registration: September 29, 2005. Valid until September 28, 2008.

- **FCC – Registration No.: 556682**

  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 556682, Aug. 04, 2005.

- **Industry Canada (IC)**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has beer registered by Certification and Engineering Bureau of Industry Canada forradio equipment testing with Registration No.: 6002.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

5 Equipment Used during Test

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2007	15-06-2008
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	14-12-2006	13-12-2007
3	EMI Test software	AUDIX	E3	N/A	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	01-06-2007	31-05-2008
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	00042673	03-08-2007	02-08-2008
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	2944A10861	27-06-2007	26-06-2008
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	00035926	25-12-2006	24-12-2008
8	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	1091457	27-06-2007	26-06-2008

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	N/A	N/A
2	LISN	ETS-LINDGREN	3816/2	00033512	27-06-2007	26-06-2008
3	EMI Test Receiver	Rohde & Schwarz	ESCI	100119	27-06-2007	26-06-2008
4	Coaxial Cable	SGS	N/A	SEL0024	01-06-2007	31-05-2008

Harmonics / Flicker test						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	AC Power Source	California Instruments	5001ix	56644	27-06-2007	26-06-2008
2	Power Analyzer	California Instruments	PACS-1	72402	27-06-2007	26-06-2008
3	CTS 3.0 Software	California Instruments	N/A	N/A	N/A	N/A

ESD						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	ESD Simulator	SCHAFFNER	NSG 438	414	14-03-2007	13-03-2008
2	ESD Ground Plane	SGS(3m * 3m)	N/A	SEL0004	N/A	N/A

EFT, Surge, Voltage dips and Interruption, Power-frequency Magnetic Field						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	ProPLUS System	Thermo ELECTRON	N/A	0412194	09-03-2007	08-03-2008
2	ProPLUS Capacitive Clamp	Thermo ELECTRON	N/A	0501362	N/A	N/A
3	CM-HCOIL H-field loop	Thermo ELECTRON	N/A	0402600	09-03-2007	08-03-2008

Radiated Immunity						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	N/A	16-06-2007	15-06-2008
2	Signal Generator	Rohde & Schwarz	SML03	102319	27-06-2007	26-06-2008
3	Amplifier 30M-1GHz	Amplifier Research	250W1000A	312698	03-03-2006	02-03-2008
4	Amplifier 0.8-3.0GHz	Amplifier Research	60S1G3	312667	03-03-2006	02-03-2008
5	Power Meter	Rohde & Schwarz	NRVD	101287	27-06-2007	26-06-2008
6	Power Sensor	Rohde & Schwarz	URV5-Z2	100247	27-06-2007	26-06-2008
7	Power Sensor	Rohde & Schwarz	URV5-Z2	100248	27-06-2007	26-06-2008
8	Dual Directional Coupler	Amplifier Research	DC6180	80M-1GHz	15-01-2007	14-01-2008
9	Dual Directional Coupler	Amplifier Research	DC7144	0.8-4.2GHz	15-01-2007	14-01-2008
10	Software EMC32	Rohde & Schwarz	EMC32-S	SEL0082	N/A	N/A
11	Log-periodic Antenna	Amplifier Research	AT1080	311820	N/A	N/A
12	Antenna Tripod	Amplifier Research	TP1000A	312383	N/A	N/A

Conducted Immunity						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	RF-Generator	SCHAFFNER	NSG 2070	1114	16-03-2007	15-03-2008
2	Coupling/Decoupling Network	SCHAFFNER	CDN M016	21243	03-03-2006	02-03-2008
3	EM CLAMP	SCHAFFNER	KEMZ 801	21029	03-03-2006	02-03-2008

General used equipment						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	Thermo-/Hygrometer	N/A	TH01	SEL0032 to SEL0034	22-06-2006	21-06-2008
2	Barometer	ChangChun	DYM3	0026	22-06-2006	21-06-2008

6 Emission Test Results

6.1 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	EN 55022
Test Method:	EN 55022
Test Date:	20 August 2007
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

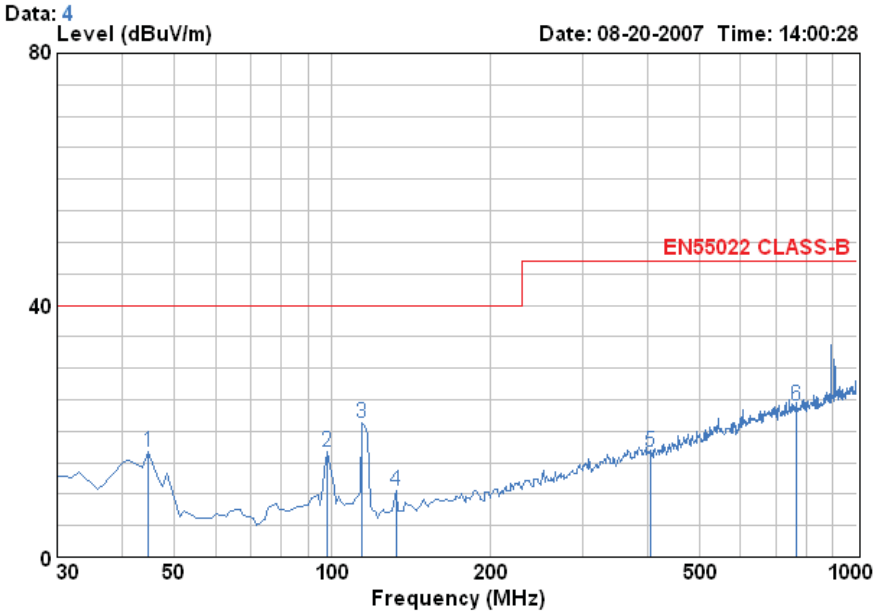
EUT Operation: Test the EUT in On Mode.

6.1.2 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurement data were performed on the EUT on 20 August 2007:

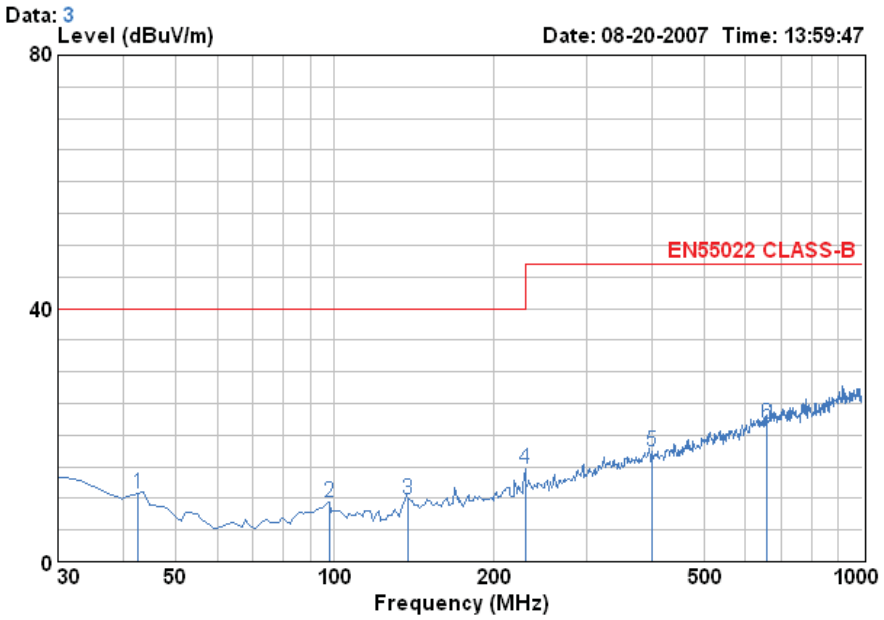
Vertical



Site : 3m-chamber site
Condition : EN55022 CLASS-B 3m 0042673 VERTICAL
EUT : FAN UNIT/FAN UNIT AND THERMOSTAT
Job No. : 2137IT

	Freq	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1 @	44.550	9.61	0.70	28.10	34.57	16.77	40.00	-23.23
2 @	97.900	9.02	1.18	27.89	34.36	16.66	40.00	-23.34
3 @	114.390	8.30	1.24	27.74	39.64	21.43	40.00	-18.57
4	132.820	7.82	1.28	27.58	29.08	10.60	40.00	-29.40
5	403.450	16.31	2.21	27.42	25.68	16.79	47.00	-30.21
6 @	767.200	21.90	3.11	27.05	26.19	24.15	47.00	-22.85

Horizontal



Site : 3m-chamber site
Condition : EN55022 CLASS-B 3m 0042673 HORIZONTAL
EUT : FAN UNIT/FAN UNIT AND THERMOSTAT
Job No. : 2137IT

	Freq	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	42.610	10.84	0.66	28.10	27.41	10.82	40.00	-29.18
2	97.900	9.02	1.18	27.89	27.09	9.39	40.00	-30.61
3	137.670	8.00	1.29	27.54	28.09	9.84	40.00	-30.16
4	229.820	11.64	1.57	27.00	28.39	14.61	40.00	-25.39
5	400.540	16.30	2.20	27.41	26.43	17.52	47.00	-29.48
6 @	657.590	20.84	2.82	27.42	25.56	21.81	47.00	-25.19

6.2 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement:	EN 55022
Test Method:	EN 55022
Test Date:	20 August 2007
Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 58 % RH Atmospheric Pressure: 1010 Mbar

EUT Operation: Test the EUT in On Mode.

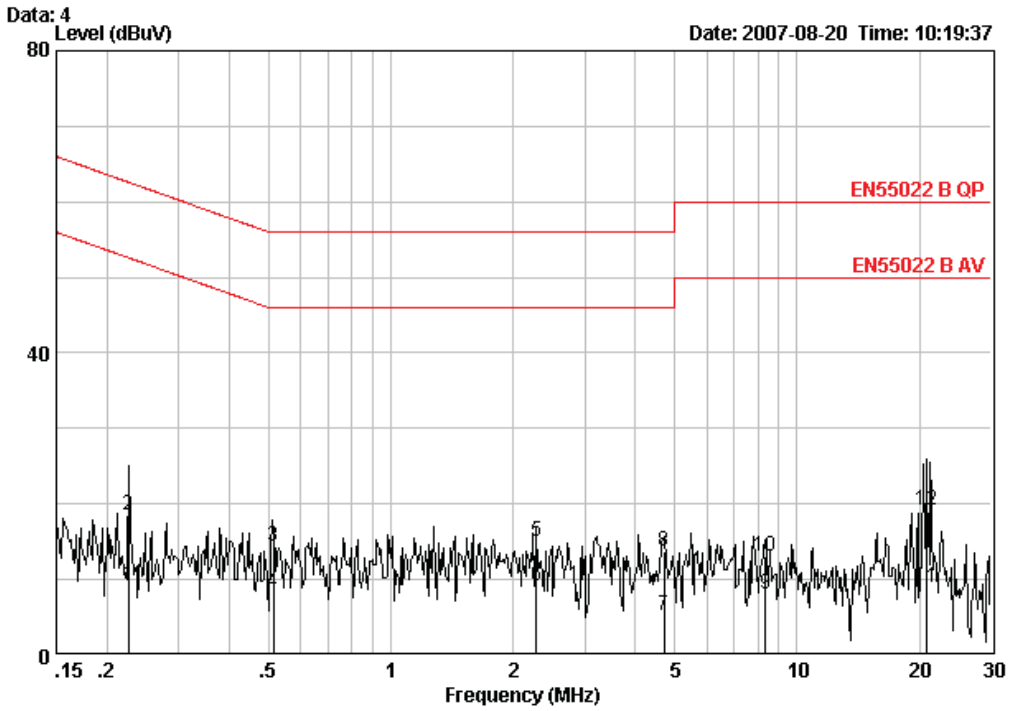
6.2.2 Measurement Data

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

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT on 20 August 2007:

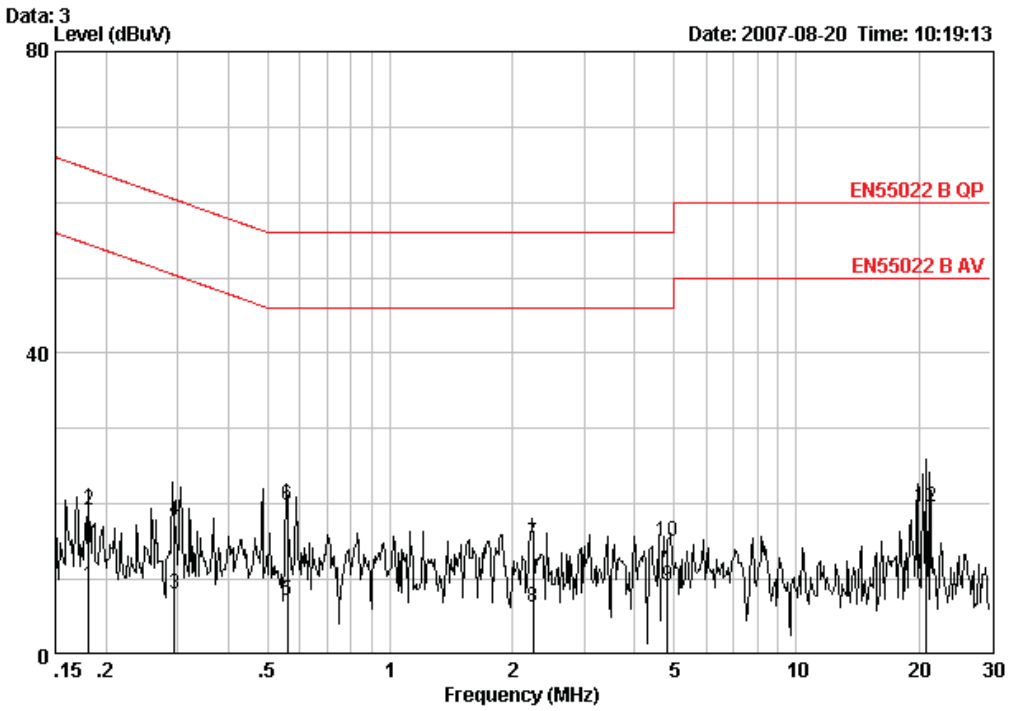
Live Line:



Site : Shielding Room
Condition : EN55022 B QP LISN OLD LINE
EUT : FAN UNIT/FAN UNIT AND THERMOSTAT
No. : 2137IT

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.22556	-0.07	-0.04	9.27	9.15	52.61	-43.46	Average
2		0.22556	-0.07	-0.04	18.74	18.62	62.61	-43.99	QP
3		0.51278	0.00	-0.04	14.45	14.41	56.00	-41.59	QP
4		0.51278	0.00	-0.04	8.33	8.28	46.00	-37.72	Average
5		2.285	0.10	-0.07	15.05	15.09	56.00	-40.91	QP
6	@	2.285	0.10	-0.07	9.15	9.19	46.00	-36.81	Average
7		4.696	0.10	-0.10	5.32	5.31	46.00	-40.69	Average
8		4.696	0.10	-0.10	13.81	13.80	56.00	-42.20	QP
9		8.367	0.17	-0.21	8.15	8.12	50.00	-41.88	Average
10		8.367	0.17	-0.21	13.11	13.07	60.00	-46.93	QP
11		20.924	0.33	-0.67	9.33	8.99	50.00	-41.01	Average
12		20.924	0.33	-0.67	19.54	19.20	60.00	-40.80	QP

Neutral Line:



Site : Shielding Room
Condition : EN55022 B QP LISN OLD NEUTRAL
EUT : FAN UNIT/FAN UNIT AND THERMOSTAT
No. : 2137IT

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.18152	-0.06	-0.04	9.26	9.15	54.42	-45.27	Average
2		0.18152	-0.06	-0.04	19.27	19.16	64.42	-45.26	QP
3		0.29398	-0.01	-0.04	8.16	8.11	50.41	-42.30	Average
4		0.29398	-0.01	-0.04	17.88	17.83	60.41	-42.58	QP
5		0.55814	0.00	-0.04	7.18	7.14	46.00	-38.86	Average
6	@	0.55814	0.00	-0.04	19.81	19.77	56.00	-36.23	QP
7		2.249	0.10	-0.07	14.84	14.87	56.00	-41.13	QP
8		2.249	0.10	-0.07	6.29	6.32	46.00	-39.68	Average
9		4.822	0.10	-0.12	9.19	9.17	46.00	-36.83	Average
10		4.822	0.10	-0.12	15.09	15.07	56.00	-40.93	QP
11		20.924	0.33	-0.78	11.02	10.58	50.00	-39.42	Average
12		20.924	0.33	-0.78	20.17	19.72	60.00	-40.28	QP

6.3 Harmonics Test Results

Test Requirement:	EN 61000-3-2
Test Method:	EN 61000-3-2
Test Date:	20 August 2007
Frequency Range	100Hz to 2kHz
Measurement Time:	3 mins
Class / Severity:	Class A

6.3.1 E.U.T. Operation

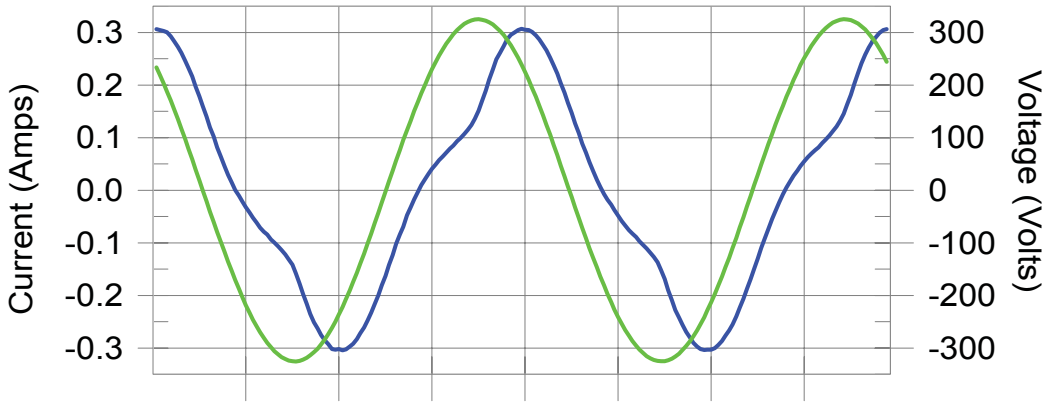
Operating Environment:

Temperature:	25.0 °C	Humidity:	56 % RH	Atmospheric Pressure:	1010 mbar

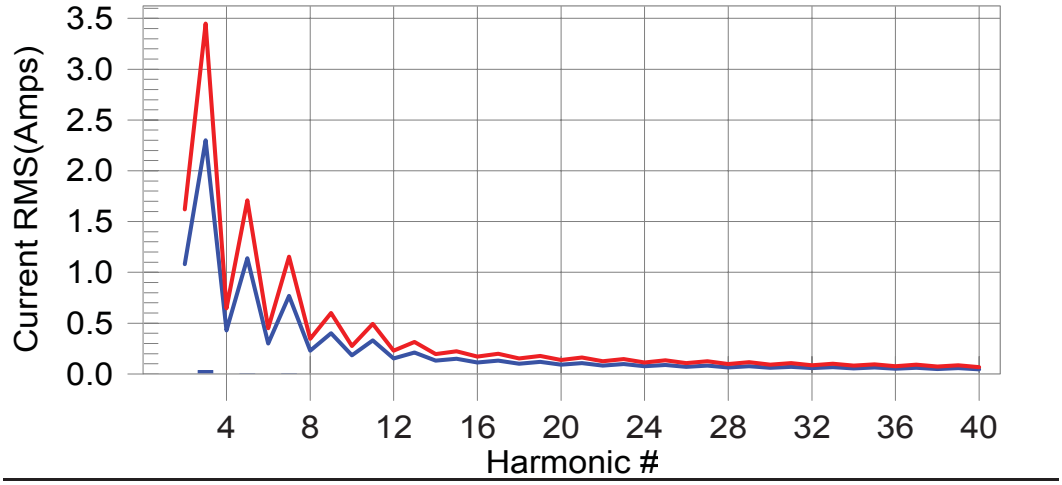
EUT Operation: Test the EUT in On Mode.

6.3.2 Measurement Data

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #3 with 0.94% of the limit.

Test Result: Pass Source qualification: Normal
THC(A): 0.03 I-THD(%): 16.81 POHC(A): 0.000 POHC Limit(A): 0.251
Highest parameter values during test:

V_RMS (Volts):	230.19	Frequency(Hz):	50.00
I_Peak (Amps):	0.309	I_RMS (Amps):	0.192
I_Fund (Amps):	0.190	Crest Factor:	1.621
Power (Watts):	32.7	Power Factor:	0.744

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.001	1.620	0.08	Pass
3	0.031	2.300	1.3	0.032	3.450	0.94	Pass
4	0.001	0.430	0.2	0.001	0.645	0.12	Pass
5	0.005	1.140	0.4	0.005	1.710	0.30	Pass
6	0.000	0.300	0.1	0.000	0.450	0.04	Pass
7	0.003	0.770	0.3	0.003	1.155	0.25	Pass
8	0.000	0.230	0.1	0.000	0.345	0.06	Pass
9	0.001	0.400	0.3	0.001	0.600	0.21	Pass
10	0.000	0.184	0.1	0.000	0.276	0.09	Pass
11	0.000	0.330	0.1	0.001	0.495	0.10	Pass
12	0.000	0.153	0.1	0.000	0.230	0.05	Pass
13	0.000	0.210	0.1	0.000	0.315	0.11	Pass
14	0.000	0.131	0.0	0.000	0.197	0.05	Pass
15	0.000	0.150	0.2	0.000	0.225	0.22	Pass
16	0.000	0.115	0.1	0.000	0.173	0.06	Pass
17	0.000	0.132	0.1	0.000	0.199	0.13	Pass
18	0.000	0.102	0.1	0.000	0.153	0.06	Pass
19	0.000	0.118	0.1	0.000	0.178	0.09	Pass
20	0.000	0.092	0.1	0.000	0.138	0.06	Pass
21	0.000	0.107	0.1	0.000	0.161	0.08	Pass
22	0.000	0.084	0.1	0.000	0.125	0.05	Pass
23	0.000	0.098	0.1	0.000	0.147	0.08	Pass
24	0.000	0.077	0.0	0.000	0.115	0.05	Pass
25	0.000	0.090	0.1	0.000	0.135	0.09	Pass
26	0.000	0.071	0.1	0.000	0.106	0.08	Pass
27	0.000	0.083	0.1	0.000	0.125	0.07	Pass
28	0.000	0.066	0.1	0.000	0.099	0.07	Pass
29	0.000	0.078	0.1	0.000	0.116	0.06	Pass
30	0.000	0.061	0.0	0.000	0.092	0.03	Pass
31	0.000	0.073	0.1	0.000	0.109	0.08	Pass
32	0.000	0.058	0.1	0.000	0.086	0.08	Pass
33	0.000	0.068	0.1	0.000	0.102	0.05	Pass
34	0.000	0.054	0.1	0.000	0.081	0.08	Pass
35	0.000	0.064	0.1	0.000	0.096	0.06	Pass
36	0.000	0.051	0.1	0.000	0.077	0.06	Pass
37	0.000	0.061	0.1	0.000	0.091	0.08	Pass
38	0.000	0.048	0.1	0.000	0.073	0.05	Pass
39	0.000	0.058	0.1	0.000	0.087	0.06	Pass
40	0.000	0.046	0.1	0.000	0.069	0.08	Pass

6.4 Flicker Test Result

Test Requirement:	EN 61000-3-3
Test Method:	EN 61000-3-3
Test Date:	20 August 2007
Measurement Time:	10 mins
Class / Severity:	Clause 5 of EN 61000-3-3

6.4.1 E.U.T. Operation

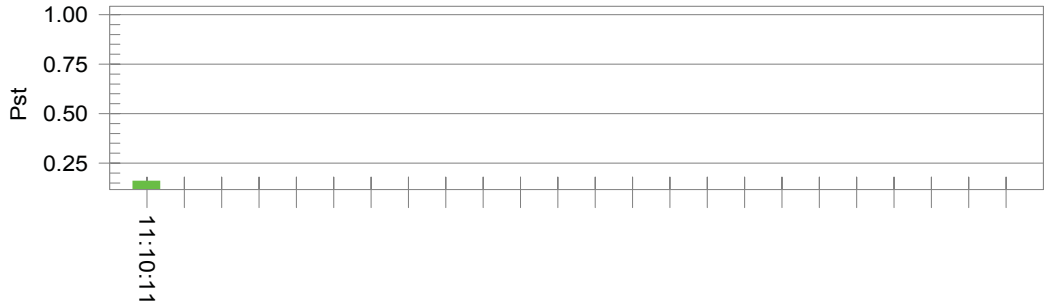
Operating Environment:

Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

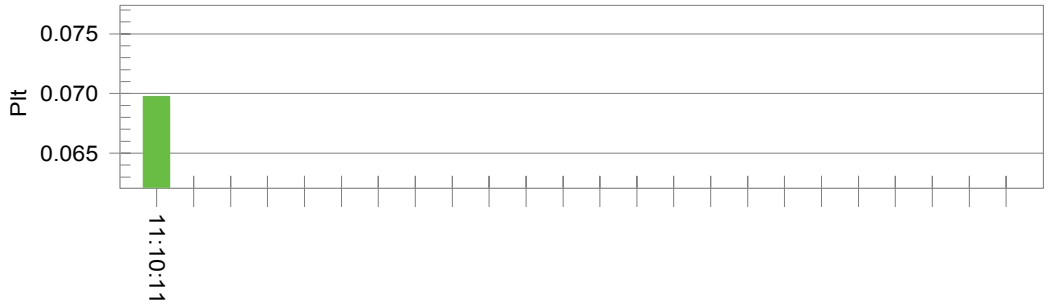
EUT Operation: Test the EUT in On Mode.

6.4.2 Measurement Data

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.09**			
Highest dt (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Time(mS) > dt:	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.160**	**Test limit:**	**1.000**	**Pass**

7 Immunity Test Results

7.1 Performance Criteria Description in Clause 7 of EN 55024

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

7.2 ESD

Test Requirement:	EN 55024	
Test Method:	EN 61000-4-2	
Performance Criterion:	B	
Test Date:	21 August 2007	
Discharge Impedance:	330 Ω / 150 pF	
Discharge Voltage:	Air Discharge:	2, 4, 8 kV
	VCP, HCP:	2, 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: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in On Mode.

7.2.2 Direct Application Test Results

Observations: Test Point: 1. All Enclosure and Seams;
2. All Screws.

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

Indirect Application Test Results

Observations: Test Point: 1. All sides.

Indirect Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
2,4	+/-	1	A	A

Results:

A: No degradation in the performance of the EUT was observed.

N/A: Not applicable (Not requested by Standard).

7.3 Radiated Immunity

Test Requirement: EN 55024
Test Method: EN 61000-4-3
Performance Criterion: A
Test Date: 20 August 2007
Frequency Range: 80MHz to 1GHz
Antenna Polarisation: Vertical and Horizontal
Severity: 3V/m 80%, 1kHz Amplitude Modulated

7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in On Mode.

7.3.2 Test Results

Frequency	Level	Modulation	EUT Face	Result / Observations
80MHz-1GHz	3V/m	1kHz, 80% Amp. Mod, 1% increment	Front/back	A
			Right/left	A
			Top/underside	A

Remarks:

Front: EUT as per photograph in section 8.5 of this report.

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

7.4 Electrical Fast Transients (EFT)

Test Requirement:	EN 55024
Test Method:	EN 61000-4-4
Performance Criterion:	B
Test Date:	23 August 2007
Test Level:	0.5kV, 1.0kV on AC
Polarity:	Positive & Negative
Repetition Frequency:	5kHz
Burst Duration:	300ms
Test Duration:	2 minute per level & polarity

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1008 mbar

EUT Operation: Test the EUT in On Mode with its load.

7.4.2 Test Results On AC Supply:

Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT operating mode	Observations (Performance Criterion)
Live	±0.5, 1.0	Direct	On mode	(A)
Neutral	±0.5, 1.0	Direct	On mode	(A)
Live, Neutral & Earth	±0.5, 1.0	Direct	On mode	(A)

A: No loss of function was observed.

7.5 Surge

Test Requirement:	EN 55024
Test Method:	EN 61000-4-5
Performance Criterion:	B
Test Date:	23 August 2007
Test Level:	±1kV Live to Neutral ±2kV Live to Earth or Neutral to Earth
Polarity:	Positive & Negative
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: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in On Mode.

7.5.2 Test Results:

Pulse No	Line-Line	Level (kV)	Surge Interval	Phase (deg)	Observation (Performance Criterion)
1–5	L-N	+1	60s	0°	(A)
6–10	L-N	-1	60s	0°	(A)
11–15	L-N	+1	60s	90°	(A)
16–20	L-N	-1	60s	90°	(A)
21–25	L-N	+1	60s	180°	(A)
26–30	L-N	-1	60s	180°	(A)
31–35	L-N	+1	60s	270°	(A)
36–40	L-N	-1	60s	270°	(A)
41–45	L-PE	+2	60s	0°	(A)
46–50	L-PE	-2	60s	0°	(A)
51–55	L-PE	+2	60s	90°	(A)
56–60	L-PE	-2	60s	90°	(A)
61–65	L-PE	+2	60s	180°	(A)
66–70	L-PE	-2	60s	180°	(A)
71–75	L-PE	+2	60s	270°	(A)
76–80	L-PE	-2	60s	270°	(A)
81–85	N-PE	+2	60s	0°	(A)
86–90	N-PE	-2	60s	0°	(A)
91–95	N-PE	+2	60s	90°	(A)
96–100	N-PE	-2	60s	90°	(A)
101–105	N-PE	+2	60s	180°	(A)
106–110	N-PE	-2	60s	180°	(A)
111–115	N-PE	+2	60s	270°	(A)
116–120	N-PE	-2	60s	270°	(A)
121-125	L-N-PE	+2	60s	0°	(A)
126-130	L-N-PE	-2	60s	0°	(A)
131-135	L-N-PE	+2	60s	90°	(A)
136-140	L-N-PE	-2	60s	90°	(A)
141-145	L-N-PE	+2	60s	180°	(A)
146-150	L-N-PE	-2	60s	180°	(A)
151-155	L-N-PE	+2	60s	270°	(A)
156-160	L-N-PE	-2	60s	270°	(A)

A: No loss of performance

7.6 Conducted Immunity 0.15MHz to 80MHz

Test Requirement:	EN 55024
Test Method:	EN 61000-4-6
Performance Criterion:	A
Test Date:	20 August 2007
Frequency Range:	0.15MHz to 80MHz
Test level:	3V rms on AC Ports (unmodulated emf into 150 Ω)
Modulation:	80%, 1kHz Amplitude Modulation

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in On Mode.

7.6.2 Test Results:

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150kHz to 80MHz	3 Wire AC Supply Cable	3Vrms	80%, 1kHz Amp. Mod.	1%	2S	No Loss of Function (A)

7.7 Voltage Dips and Interruptions

Test Requirement: EN 55024

Test Method: EN 61000-4-11

Performance Criterion: >95%VD,0.5period: B; >95%VD,250periods: C;
30%VD, 25periods: C

Test Date: 23 August 2007

Test Level: 0% of U_T (Supply Voltage) for 0.5 Periods
0% of U_T (Supply Voltage) for 250 Periods
70 % of U_T (Supply Voltage) for 25 Periods

No. of Dips / Interruptions: 3 per Level

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 56 % RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test the EUT in On Mode.

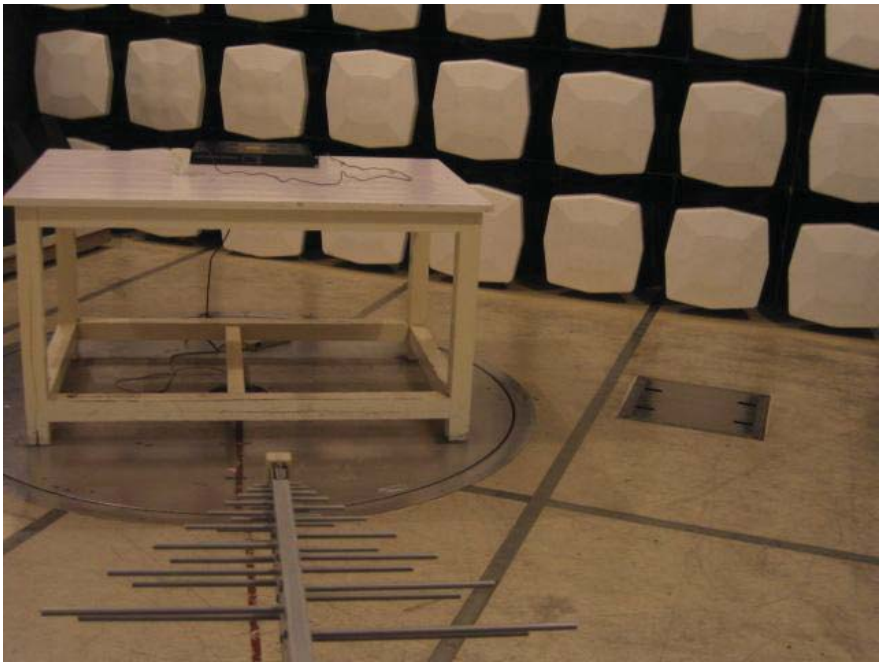
7.7.2 Test Results:

EUT operating mode	Test Level % U_T	Phase	Duration of dropout in Periods	No of dropout	Time between dropout	Observations (Performance Criterion)
On mode	0	0°&180°	0.5	3	10s	(A)
On mode	0	0°&180°	250	3	10s	(C)
On mode	70	0°&180°	25	3	10s	(A)

A: No Loss of Function
C: Power shut off during test, recovered by user.

8 Photographs

8.1 Radiated Emission Test Setup



8.2 Conducted Emission Test Setup

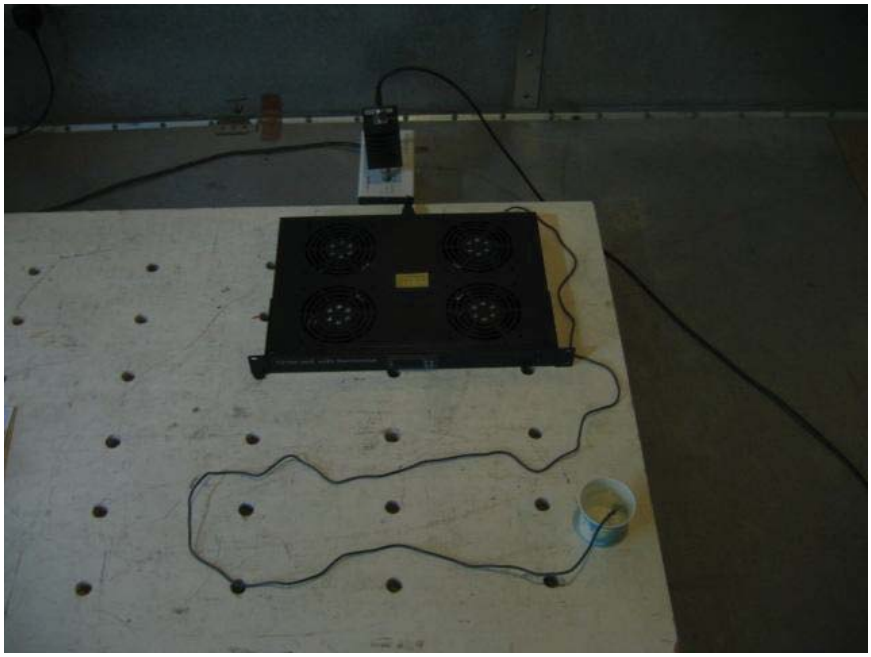
8.3 Harmonics & Flicker Test Setup

8.4 ESD Test Setup

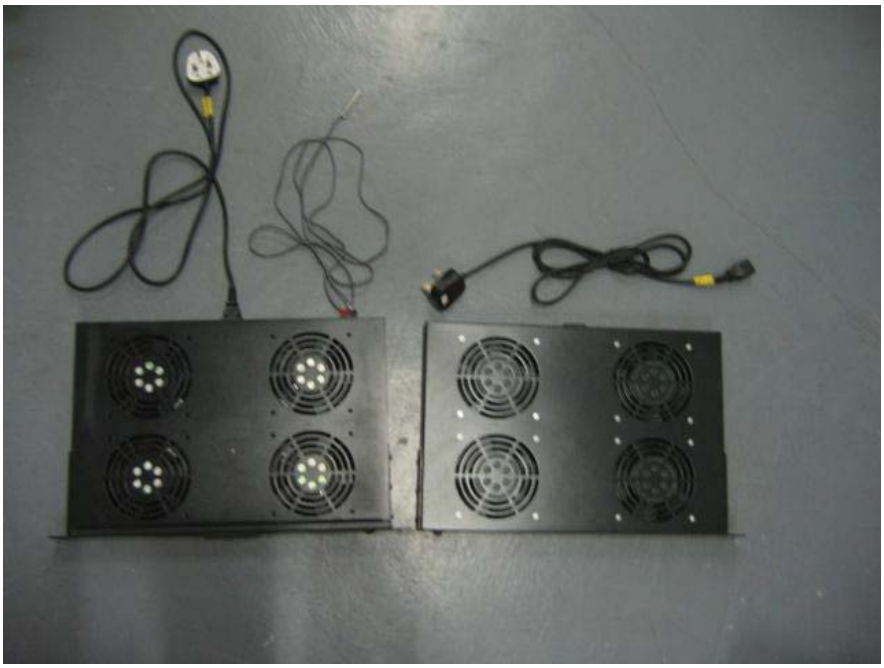
8.5 Radiated Immunity Test Setup

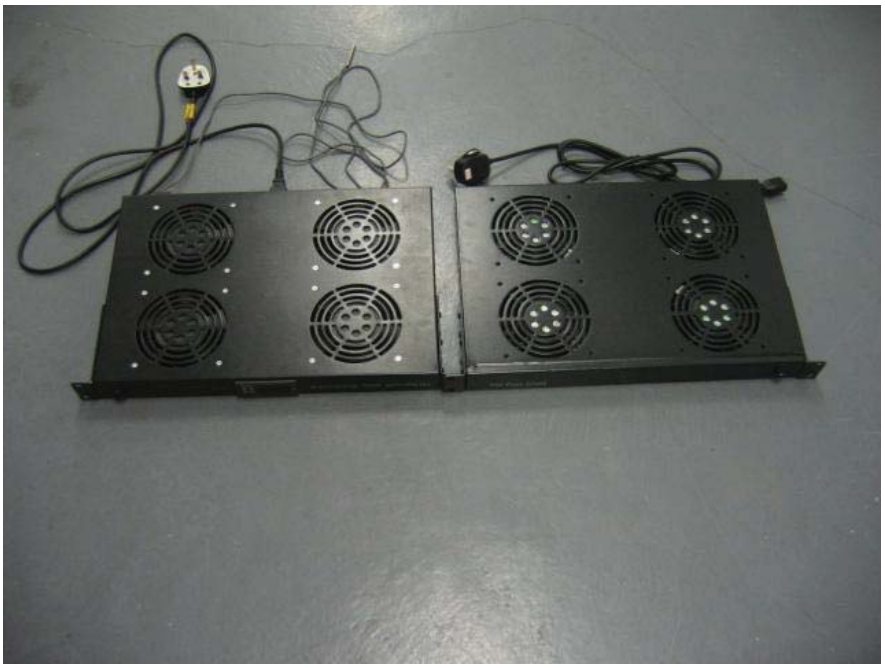
8.6 EFT, Surge and Voltage dips Test Setup

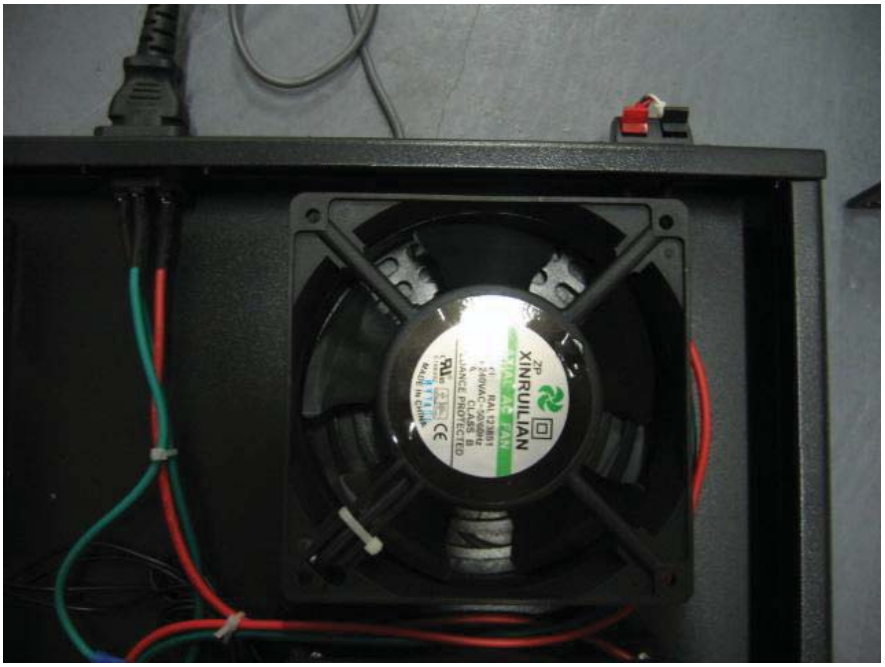
8.7 CI Test Setup



8.8 EUT Constructional Details



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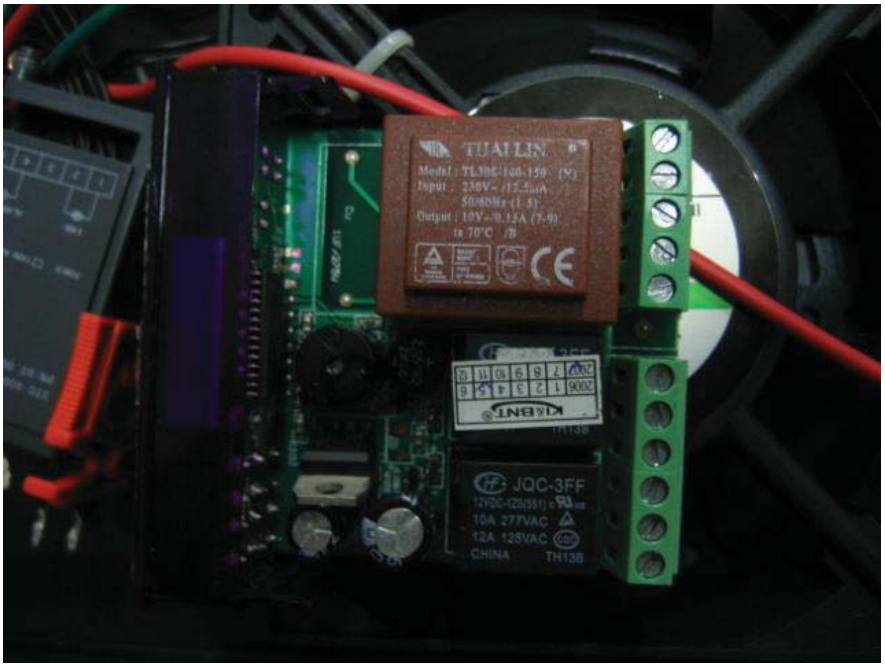
AXIAL AC FAN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12A 125VAC
CHINA
TH13B


JQC-3FF
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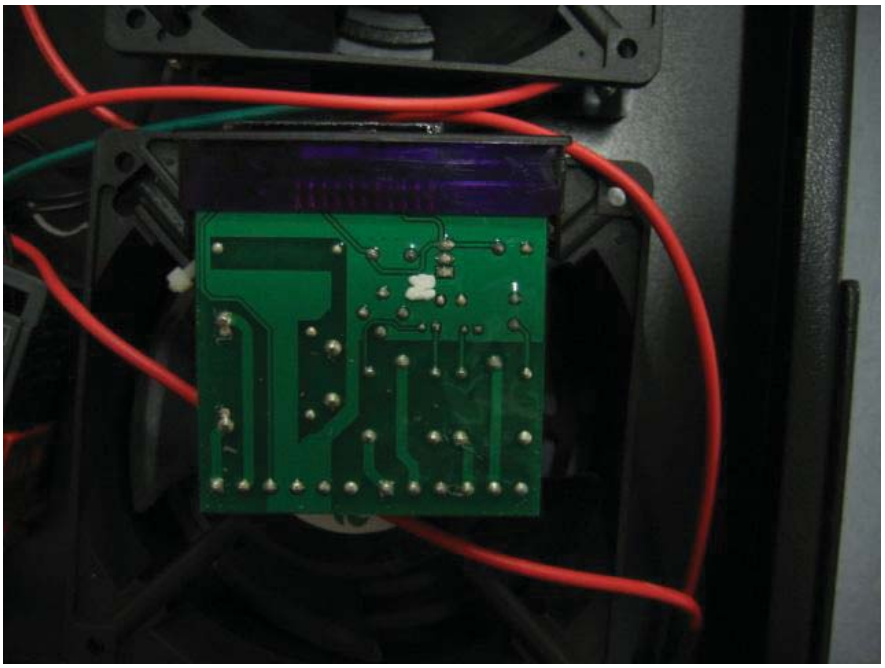
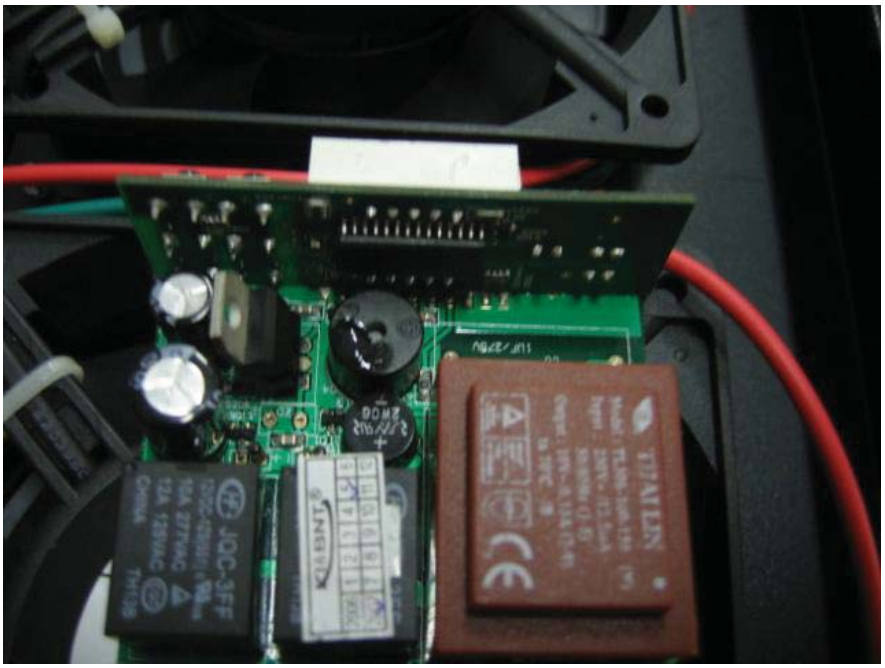
K&BNT
TAILIN

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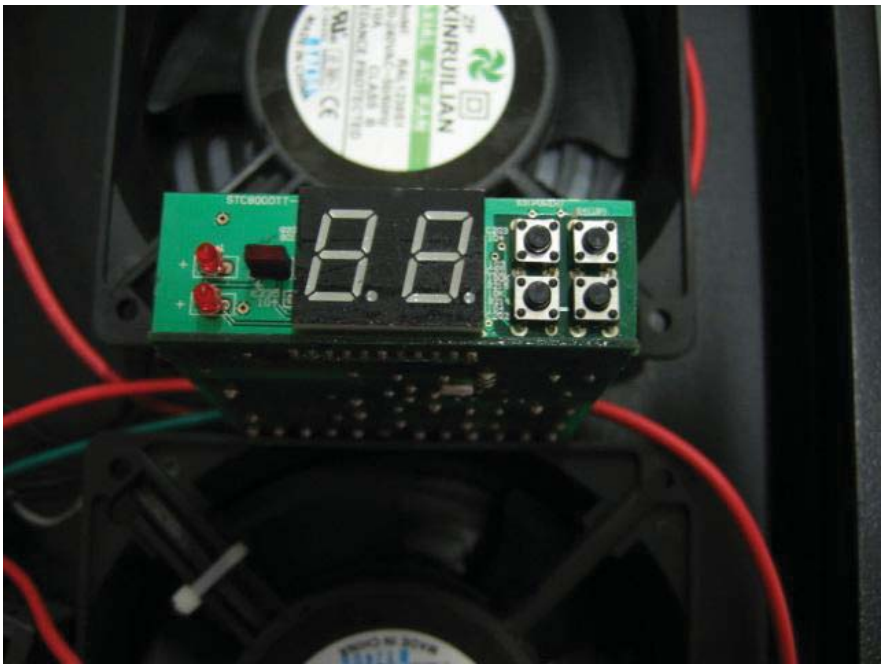
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