

Test Verification of Conformity

On the basis of the referenced test report(s), the sample(s) of the below product has been found to comply with the relevant harmonized standard(s) to the directive(s) listed on this verification at the time the tests were carried out. The manufacturer may indicate compliance to only the said directives by signing a DoC himself and may affix the CE marking to products identical to the tested sample(s) if the product complies with all CE marking directives that has the product in their scope. In addition, the manufacturer shall file and keep the documentation according to the rules of the applicable directive(s) and shall consider changes of the standards as they may occur. Additional requirements, additional directives and local laws may be applicable.

Applicant Name & Address : GUANGZHOU PHNIX AIR CONDITIONER CO., LTD.
XingYe Road No. 4, Lizhiwan, Tanzhou, DaGang Town, PanYu,
GuangZhou, GuangDong, China

Product(s) Tested : VERTICAL FAN-COIL

Ratings and principal characteristics : 220-240V~; 50Hz; Class I; IP11;
16W for PFP-025V and PFP-025; 25W for PFP-040V and PFP-040;
34W for PFP-060V and PFP-060; 42W for PFP-080V and PFP-080;
43W for PFP-100V and PFP-100

Model(s) : PFP-025V; PFP-040V; PFP-060V; PFP-080V; PFP-100V; PFP-025;
PFP-040; PFP-060; PFP-080; PFP-100

Brand name : PHNIX

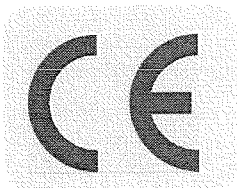
Relevant Standard(s) / Specification(s) / Directive(s) : EN 55014-1: 2006+A1:2009/ Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission
EN 61000-3-2: 2006+A1:2009+A2:2009/ Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3: 2008/ Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
EN 55014-2: 1997+A1: 2001+A2:2008/ Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity – Product family standard
EMC Directive 2004/108/EC

Verification Issuing Office Name & Address : Same as Legal Entity

Verification/Report Number(s) : GZ11081516-1/ GZ11081516-1

Note 1 : This verification is part of the full test report(s) and should be read in conjunction with it.

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Signature

Name: Carrie Chen
Position: Sr. Project Engineer
Date: 13 Oct., 2011

TEST REPORT

Applicant Name & Address : GUANGZHOU PHNIX AIR CONDITIONER CO., LTD.
XingYe Road No. 4, Lizhiwan, Tanzhou, DaGang Town, PanYu, GuangZhou,
GuangDong, China

Manufacturing Site : Same as applicant

Sample Description
Product : VERTICAL FAN-COIL
Model No. : PFP-025V; PFP-040V; PFP-060V; PFP-080V; PFP-100V; PFP-025; PFP-040;
PFP-060; PFP-080; PFP-100
Electrical Rating : 220-240V~; 50Hz; Class I; IP11;
16W for PFP-025V and PFP-025; 25W for PFP-040V and PFP-040; 34W for
PFP-060V and PFP-060; 42W for PFP-080V and PFP-080; 43W for PFP-100V
and PFP-100

Date Received : 26 Aug., 2011

Date Test Conducted : 26 Aug., 2011-10 Oct., 2011

Test standards : EN 55014-1: 2006+A1:2009
EN 61000-3-2: 2006+ A1:2009+ A2:2009
EN 61000-3-3: 2008
EN 55014-2: 1997+A1: 2001+A2: 2008

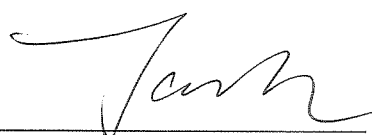
Test Result : Pass

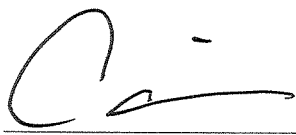
Conclusion : The submitted samples complied with the above EMC standards.

Remark : None.

*****End of Page*****

Prepared and Checked By:***Approved By:***


Jack Dai
Project Engineer
Intertek Guangzhou


Carrie Chen
Sr. Project Engineer
Intertek Guangzhou
13 Oct., 2011 ***Date***

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1

TEST RESULTS SUMMARY

Test Item	Standard	Result
Continuous conducted disturbance voltage	EN 55014-1: 2006+A1:2009	Pass
Discontinuous conducted disturbance voltage	EN 55014-1: 2006+A1:2009	N/A
Radiated disturbance power	EN 55014-1: 2006+A1:2009	Pass
Radiated disturbance	EN 55014-1: 2006+A1:2009 Reference: CISPR 16-2-3: 2006	N/A
Harmonic of current	EN 61000-3-2: 2006+ A1:2009+ A2:2009	Pass
Flicker	EN 61000-3-3: 2008	Pass
ESD immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-2:1995+A1:1998+A2:2001	N/A
Inject current immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-6:2007	N/A
Surge immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-5:2006	N/A
EFT immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-4:2004	N/A
Radiated EM field immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-3:2006+A1:2008	N/A
Voltage dips and interruption immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-11:2004	N/A

Remark: 1. The symbol “N/A” in above table means Not Applicable.

2. When determining the test results, measurement uncertainty of tests has been considered.

EMC Results Conclusion (with Justification)

RE: EMC Testing Pursuant to EMC Directive 2004/108/EC Performed on the VERTICAL FAN-COIL, Models: PFP-025V; PFP-040V; PFP-060V; PFP-080V; PFP-100V; PFP-025; PFP-040; PFP-060; PFP-080; PFP-100.

We tested the VERTICAL FAN-COIL, Model: PFP-100V to determine if it was in compliance with the relevant EN standards as marked on the Test Results Summary. We found that the unit met the requirements of EN 55014-1, EN 61000-3-2 and EN 61000-3-3 standards when tested as received. The worst case's test data was presented in this test report.

General product information:

These appliances are fan coils.

PFP-025V, PFP-040V, PFP-060V, PFP-080V and PFP-100V have the same construction except length of appliance.

The difference between suffix "V" series and none suffix "V" series is none suffix "V" series didn't equipped with the electric water valve.

Please see table below for details:

Model No.	Length of appliance (mm)	With electric water valve (Yes/No)	Rated water flow (m ³ /h)	Rated power (W)
PFP-025V	700	Yes	0,17	16
PFP-025	700	No	0,17	16
PFP-040V	900	Yes	0,33	25
PFP-040	900	No	0,33	25
PFP-060V	1100	Yes	0,43	34
PFP-060	1100	No	0,43	34
PFP-080V	1300	Yes	0,60	42
PFP-080	1300	No	0,60	42
PFP-100V	1500	Yes	0,75	43
PFP-100	1500	No	0,75	43

Model: PFP-100V can cover other models in EMC characteristics.

Standards against which no testing has been conducted of the captioned model and the engineering judgement is stated as follows:

EN55014-2: This product contains no electronic control circuitry. It is classified to Category I of the standard and is therefore deemed to fulfil the relevant immunity requirements without testing.

3

LABORATORY MEASUREMENTS**Configuration Information**

Equipment Under Test (EUT):	VERTICAL FAN-COIL	
Model:	PFP-100V	
Serial No.	Not Labelled	
Support Equipment:	N/A	
Rated Voltage:	220-240V~, 50Hz	
Condition of Environment:	Temperature	: 22~28°C
	Relative Humidity:	35~60%
	Atmosphere Pressure	86~106kPa

Notes:

1. The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications.

An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. The EMS measurements had been made in the frequency bands being investigated, with the EUT in the most susceptible operating mode consistent with normal applications. The configuration of the test sample had been varied to achieve maximum susceptibility.

4 EMI TEST

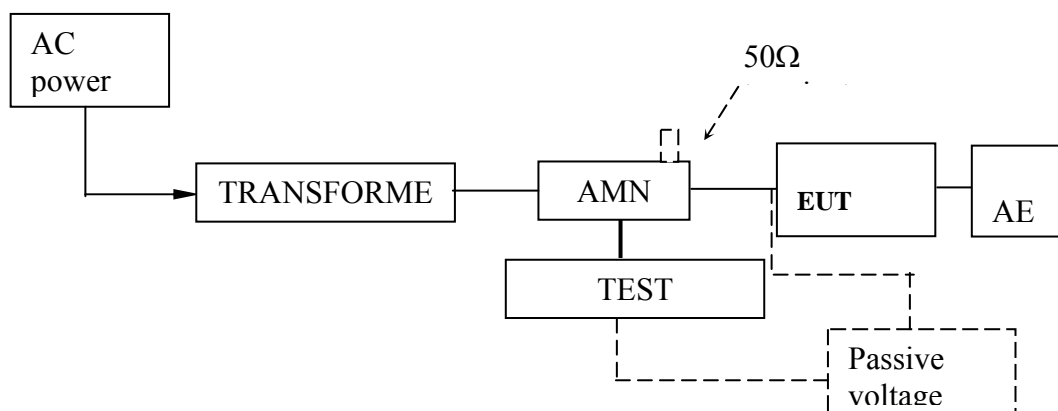
4.1 EN 55014-1 Continuous Conducted Disturbance Voltage Test

Test Result: Pass

4.1.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM006-05	LISN	ENV216	R&S
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.1.2 Block Diagram of Test Setup



4.1.3 Test Setup and Procedure

The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance. Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The table-top EUT was placed on a 0.4m high non-metallic table above earthed ground plane (Ground Reference Plane). And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The EUT keeps a distance of at least 0.8m from any other of the metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 9 kHz. The frequency range from 150 kHz to 30MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in clause 7.

4.1.4 Test Data

At main terminal: Pass

Tested Wire: Live

Operation Mode: EUT on.

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE14QP			
Trace2:	CE14AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	290 kHz	35.52	L1	-24.99
1 Quasi Peak	346 kHz	38.10	L1	-20.94
1 Quasi Peak	562 kHz	36.87	L1	-19.12
1 Quasi Peak	694 kHz	45.67	L1	-10.32
1 Quasi Peak	786 kHz	35.39	L1	-20.60

Tested Wire: Neutral

Operation Mode: EUT on.

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE14QP			
Trace2:	CE14AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	206 kHz	47.81	L1	-15.55
1 Quasi Peak	282 kHz	45.88	L1	-14.87
1 Quasi Peak	386 kHz	43.72	L1	-14.42
1 Quasi Peak	562 kHz	41.77	L1	-14.22
1 Quasi Peak	706 kHz	46.61	L1	-9.38
1 Quasi Peak	786 kHz	38.03	L1	-17.96

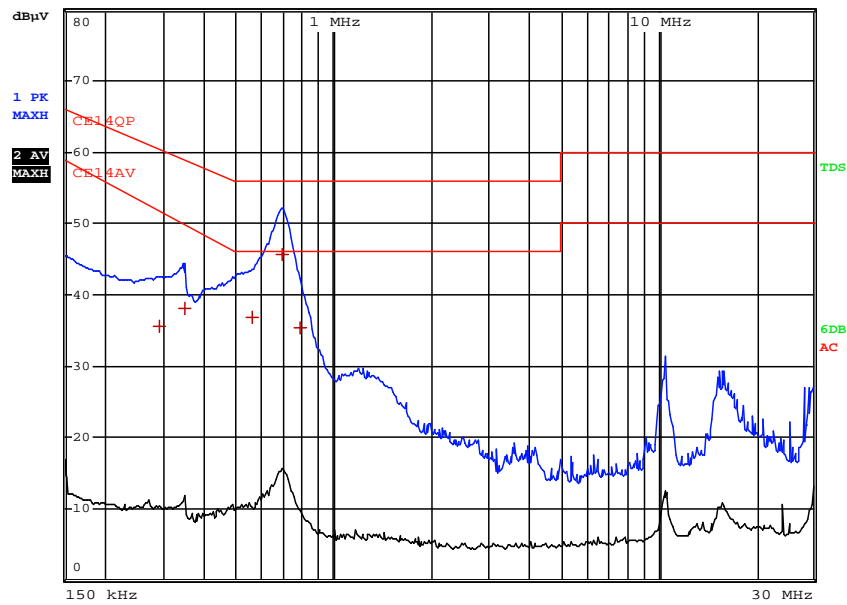
At load/control terminal: Not Applicable

Frequency [MHz]	Quasi-Peak		Average	
	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

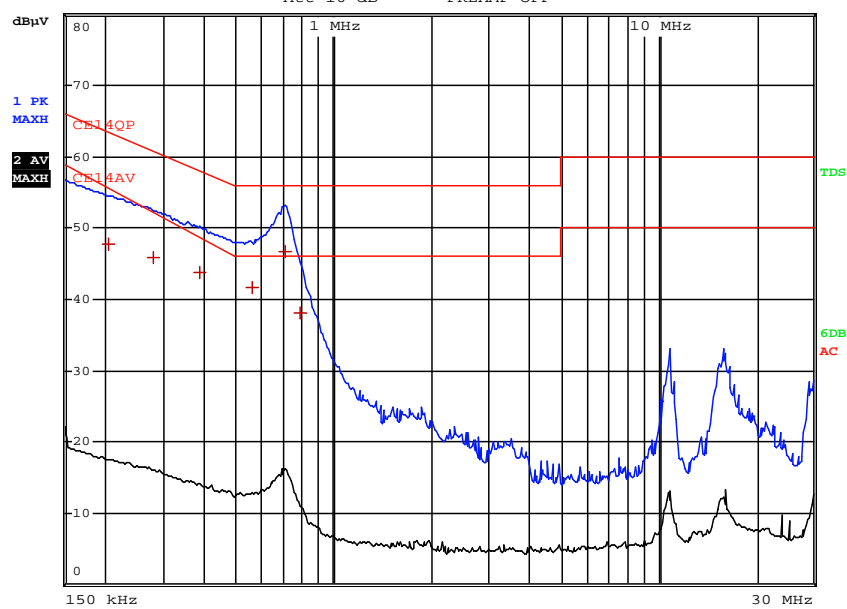
4.1.5 Emission Curve

At mains terminal:

Tested Wire: Live



Tested Wire: Neutral



At load/control terminal:

Not Applicable.

4.1.6 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2003.

Measurement uncertainty of mains terminal disturbance voltage in CISPR band B: 2.5dB.

The measurement uncertainty is given with a confidence of 95%, $k=2$.

4.2 EN 55014-1 Discontinuous Conducted Disturbance Voltage

Test Result: Not Applicable

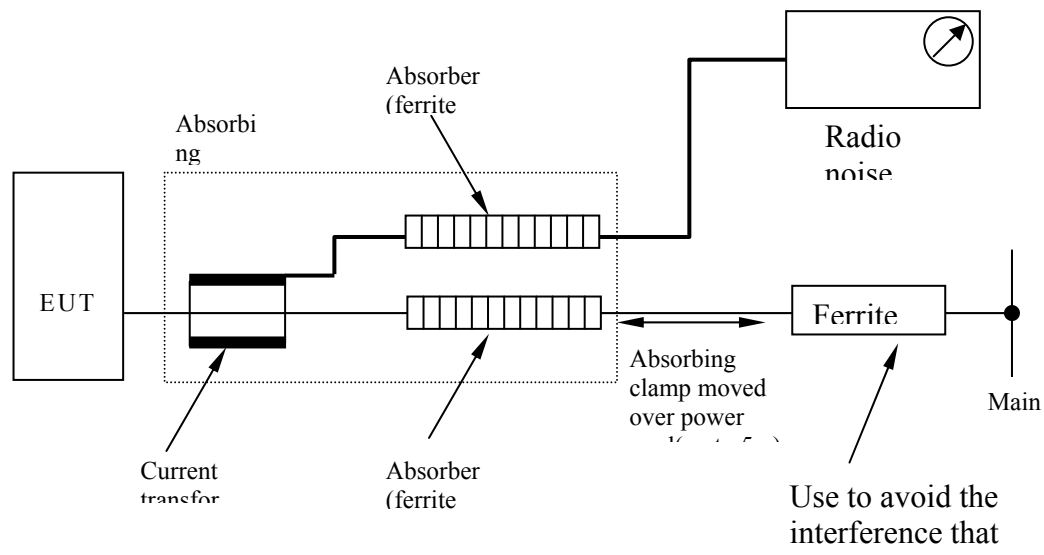
4.3 EN 55014-1 Radiated Disturbance Power

Test Result: Pass

4.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM081-04	Absorb Power Clamp	MDS-21	R&S
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.3.2 Block Diagram of Test Setup



4.3.3 Test Setup and Procedure

The disturbance power was measured with the EUT in a shielded room. The height of the table shall be $0,1 \text{ m} \pm 0,025 \text{ m}$ for appliances primarily intended to be positioned on the floor in normal use, and $0,8 \text{ m} \pm 0,05 \text{ m}$ for other appliances. The EUT was placed on a non-metallic table at least 0.8m from other metallic surface and the mains lead of EUT was extended to about 6m long. The auxiliary lead longer than 0.25m but shorter than twice length of absorbing clamp was extend to twice length of clamp and those longer than twice length was extend to 6 meters.

The absorbing clamp was moved along the lead to obtain maximum disturbance. The EUT was set to achieve the maximum emission level, and for each point which appears a relevant high emission level, the absorbing clamp was moved around the lead to get the maximum disturbance value.

The bandwidth of test receiver was set at 120 kHz. The frequency range from 30MHz to 300MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in clause 7.

4.3.4 Test Data

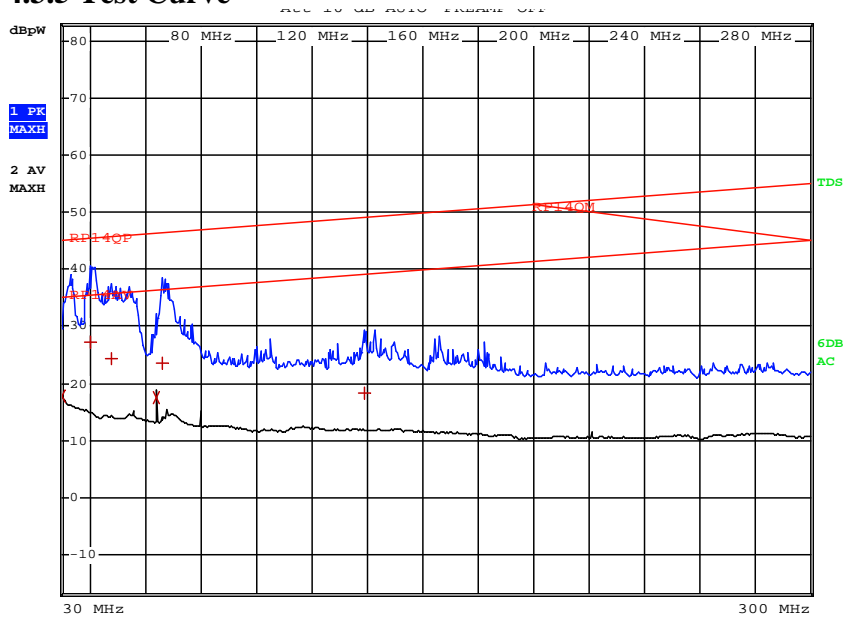
Tested Port: AC Main.

Operation mode: EUT ON.

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	RP14QP			
Trace2:	RP14AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBpW	DELTA LIMIT dB	
2 Average	30 MHz	17.76 L1	-17.23	
1 Quasi Peak	40.44 MHz	27.12 L1	-18.26	
2 Average	64.12 MHz	17.51 L1	-18.74	
1 Quasi Peak	47.6 MHz	24.35 L1	-21.29	
1 Quasi Peak	66.4 MHz	23.44 L1	-22.90	
1 Quasi Peak	139.2 MHz	18.29 L1	-30.75	

☒the measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz

4.3.5 Test Curve



4.3.6 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2003.

Measurement uncertainty of mains terminal disturbance power: 3.0dB

The measurement uncertainty is given with a confidence of 95%, $k=2$.

4.4 EN 55014-1 Radiated Disturbance

Test Result: Not Applicable

Remark:

☒ Radiated disturbance shall not be conducted, if the measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz,.

☐ Radiated disturbance (300-1000MHz) shall be conducted, if the measurement quasi-peak data of disturbance power is between the limit and limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz or the maximum clock frequency is not less than 30MHz,.

☐ Radiated disturbance(30-1000MHz) is applied to battery-operated appliance

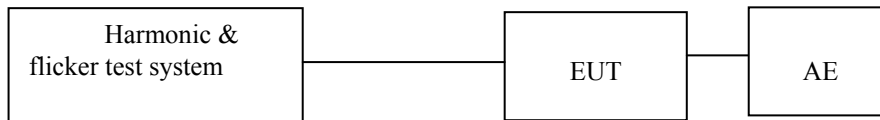
5 Harmonic of Current

Test Result: Pass

5.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM001-02	Harmonic & Flicker Test System	5001IX-CTS-400-413	California Instrument

5.2 Block Diagram of Test Setup



5.3 Test Setup and Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyser which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

☑ This product is not defined as lighting equipment, and rated power is less than 75W, therefore, no limit applies according to EN 61000-3-2.

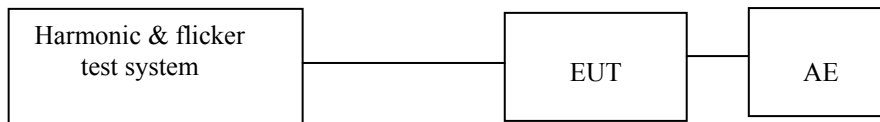
6 Flicker

Test Result: Pass

6.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM001-02	Harmonic & Flicker Test System	5001IX-CTS-400-413	California Instrument

6.2 Block Diagram of Test Setup



6.3 Test Setup and Procedure

6.3.1 Definition

Flicker: impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.

Pst: Short-term flicker indicator The flicker severity evaluated over a short period (in minutes); Pst=1 is the conventional threshold of irritability

Plt: long-term flicker indicator; the flicker severity evaluated over a long period (a few hours). Using successive Pst value.

dc: the relative steady-state voltage change

dmax: the maximum relative voltage change

d(t): the value during a voltage change

6.3.2 Test condition

The EUT was set to produce the most unfavourable sequence of voltage changes.

6.4 Test Data

Flicker Test Summary (Run time)

Test Result: Pass		Status: Test Completed		
Psti and limit line		European Limits		
Parameter values recorded during the test:				
Vrms at the end of test (Volt): 230.40				
Highest dt (%):	0.34	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 (%):	0.19	Test limit (%):	6.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

6.5 Measurement Uncertainty

Measurement uncertainty for voltage fluctuation and flicker is under consideration according to CISPR 16-4-2:2003.

7 EMS TEST

Performance Criteria:

- Criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permission loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if 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 (or permission loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. 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 from what the user may reasonably expect from the apparatus if 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, or by any operation specified in the instruction for use.

Measurement Uncertainty

According to CISPR 16-4-2:2003, measurement uncertainty to immunity test is under consideration.

7.1 EN 61000-4-2(Pursuant to EN 55014-2) Electrostatic Discharge Immunity

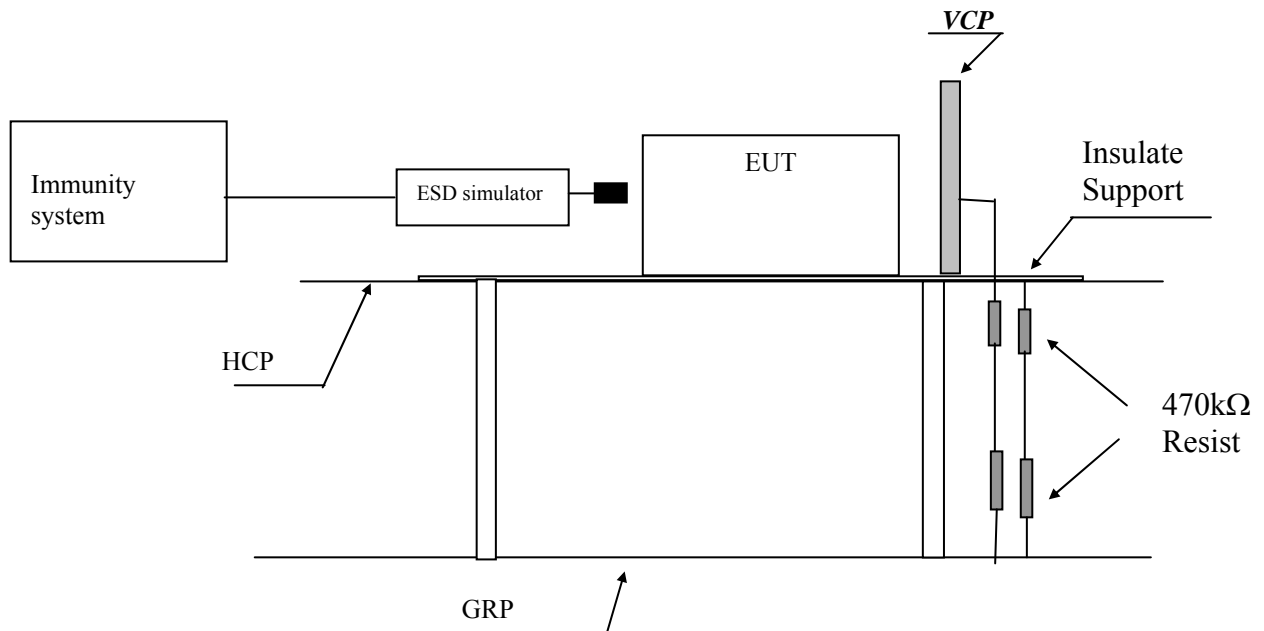
Performance criterion: B

Test Result: Pass

7.1.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM077-03	ESD Simulator	KES4021	KIKUSUI

7.1.2 Block Diagram of Test Setup



Note: HCP means Horizontal Coupling Plane,
VCP means Vertical Coupling Plane
GRP means Ground Reference Plane

7.1.3 Test Setup and Procedure

The EUT was put on a 0.8m high wooden tabel/0.1m high for floor standing equipment standing on the ground reference plane(GRP) 3m by 2m in size, made by iron 1.0 mm thick.

A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & thinkmess as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end.

The distance between EUT and any of the other metallic surface excepted the GRP, HCP & VCP was greater than 1m.

The EUT was arranged and connected according to its functional requirements.

Direct static electricity discharges was applied only to those points and surface which are accessible to personnel during normal usage.

On each preselected points 10 times of each polarity single discharge were applied The time interval between successive single discharges is at least 1s.

The ESD generator was held perpendicular to the surface to which the discharge is applied. The discharge return cable of the generator was kept at a distance of 0.2m whilst the discharge is being applied. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.

Indirect discharge was conducted to objects placed near the EUT, simulated by applying the discharges of the ESD generator to a coupling plane, in the contact discharge mode.

After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a grounded carbon fibre brush with bleeder resistors ($2 \times 470 \text{ k}\Omega$) in the grounding cable was used after each discharge to remove remnant electrostatic voltage.

10 times of each polarity single discharge were applied to HCP and VCP. The detail selected points are listed in the following table.

7.1.4 Test Result

Direct Application of ESD

Direct Contact Discharge

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN 55014-2, criterion B)	Discharged Points
4	20	Pass	All touchable screws of enclosure, accessible metal parts of the EUT

Direct Air Discharge

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN 55014-2, criterion B)	Discharged Points
8	20	Pass	Air gap of the switch, button, the air in-taking opening, slots around the EUT

Indirect Application of ESD

Horizontal Coupling Plane under the EUT

Applied Voltage (kV)	No. of Discharge for each point	Result (pursuant to EN 55014-2 criterion B)	Discharged Point
4	20	Pass	Edge of centre, corner on HCP

Vertical Coupling Plane beside the EUT

Applied Voltage (kV)	No. of Discharge for each point	Result (pursuant to EN 55014-2 criterion B)	Discharged Point
4	20	Pass	Edge of centre, corner on VCP

7.2 EN 61000-4-6(Pursuant to EN 55014-2) Injected Current (0.15 MHz to 230 MHz)

Performance criterion: A

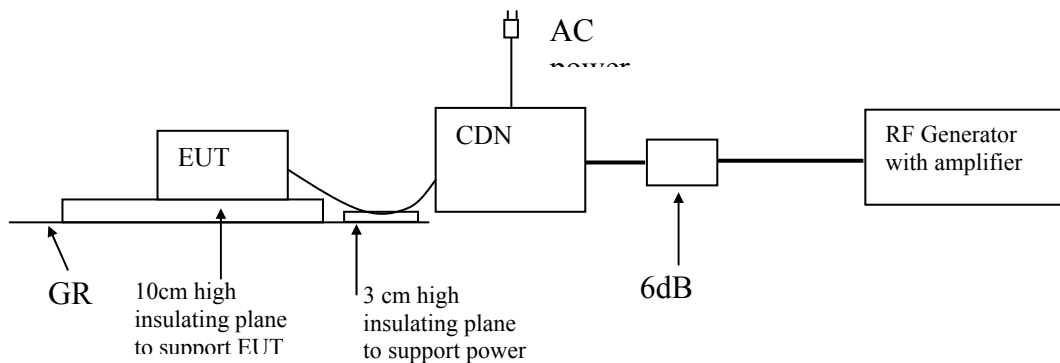
Test Result: Pass

7.2.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM003-01	Conducted Disturbance Generator	CDG_1020	Dr.Hubert GmbH
EM003-01-04	Coupling&Decoupling Network	CDN M2+M3	Dr.Hubert GmbH
EM003-01-05	Attenuator	6dB	Dr.Hubert GmbH

7.2.2 Block Diagram of Test Setup

7.2.3 Test Setup and Procedure



The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement.

All relevant cables were provided with the appropriate coupling and decoupling devices at a distance between 0.1m and 0.3m from the projected geometry of the EUT on an insulating support of 0.03m height above the ground reference plane.

Test voltage was verified before each testing though power meter combined in the RF generator with AMP.

Dwell time was set to 3s and step was set as 1% to keep sufficient response time for EUT.

The frequency from 0.15MHz to 230MHz was checked.

7.2.4 Test Result

Port:	Frequency (MHz)	Level (Pursuant to EN55014-2)	Result
A.C. Power Lines	0.15 to 230	3V (r.m.s.)	Pass
D.C. Power Lines	0.15 to 230	1V (r.m.s.)	N/A
Signal Lines	0.15 to 230	1V (r.m.s.)	N/A
Control Lines	0.15 to 230	1V (r.m.s.)	N/A

7.3 EN 61000-4-4(Pursuant to EN 55014-2) Electrical Fast Transient/Burst

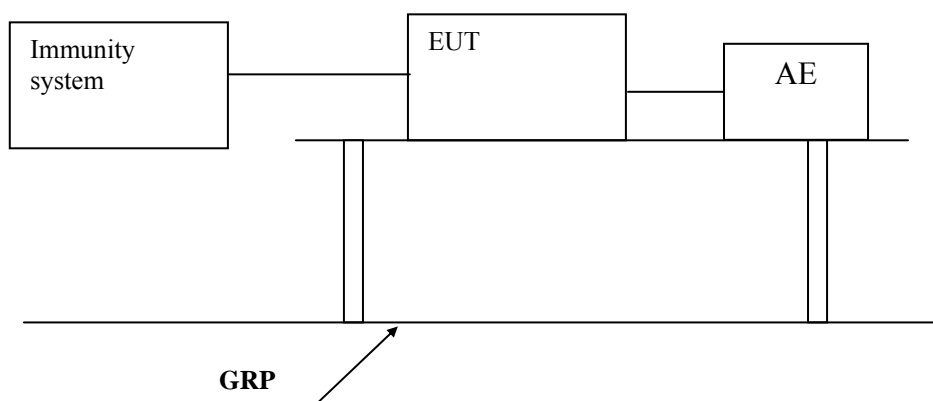
Performance criterion: B

Test Result: Pass

7.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-07	EMS test system	Ecompact 4	HAEFELY

7.3.2 Block Diagram of Test Setup



7.3.3 Test Setup and Procedure

The EUT was placed on a 0.1m high wooden table, standing on the ground reference plane 3m by 2m in size, made by steel 1mm thick.

The distance between the EUT and any other of the metallic surface except the GRP is greater than 0.5m.

The mains lead excess than 0.5m is folded to avoid a flat coil and situated at a distance of 0.1m above the ground reference plane to insure the distance between the coupling device and the EUT were 0.5m.

The EUT was arranged and connected to satisfy its functional requirement and supplied by the coupling-decoupling network.

7.3.4 Test Result

Level (Pursuant to EN55014-2)	Polarity	A.C. Power supply line and protective earth terminal	D.C. Power Lines, Signal Line & Control Line
0.5kV	+	N/A	N/A
0.5kV	-	N/A	N/A
1kV	+	Pass	N/A
1kV	-	Pass	N/A

7.4 EN 61000-4-5(Pursuant to EN 55014-2) Surge Immunity

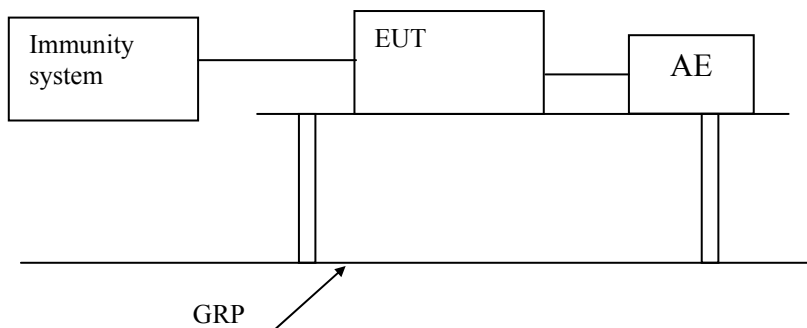
Performance criterion: B

Test Result: Pass

7.4.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-08	Surge Generator	NSG2050	SCHAFFNER

7.4.2 Block Diagram of Test Setup



7.4.3 Test Setup and Procedure

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network.

Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be developed on the lines under test.

The EUT was arranged and connected according to its functional requirements. The EUT was placed on a 0.1m high wooden support above the GRP, supplied by the coupling-decoupling network, and arranged and connected to satisfy its functional requirement and the power cord between the EUT and the coupling/decoupling network was less than 2 meters.

Surge is applied to the EUT power supply terminals.

7.4.4 Test Result

Level (Pursuant to EN 55014-2)		Result
Between Phase And Phase:	1kV	N/A
Between Phase And Neutral:	1kV	Pass
Between Phase And Earth:	2kV	Pass
Between Neutral And Earth:	2kV	Pass

7.5 EN 61000-4-11(Pursuant to EN 55014-2) Voltage Dips and Interruptions

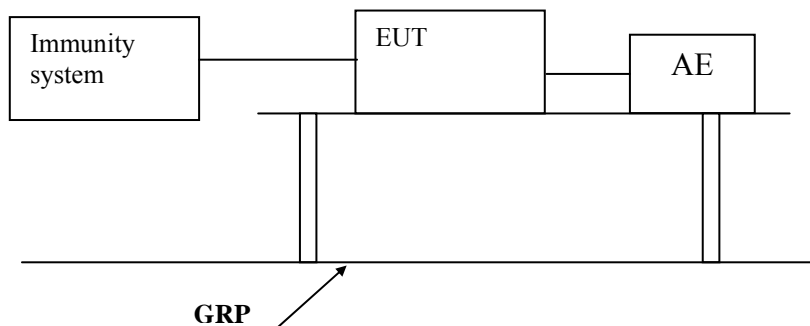
Performance criterion: C

Test Result: Pass

7.5.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-07	EMS test system	Ecompact 4	HAEFELY

7.5.2 Block Diagram of Test Setup



7.5.3 Test Setup and Procedure

The EUT was placed on an insulating support of 0.8m height, standing on a ground reference plane, and arranged and connected to satisfy its functional requirement

The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer.

The EUT was tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10 s minimum. Each representative mode of operation was tested.

7.5.4 Test Result

Test condition (Pursuant to EN 55014-2)				
Test Level in %U _T	50 Hz		60 Hz	
	Duration	Result	Duration	Result
0	0.5	Pass	0.5	N/A
40	10	Pass	12	N/A
70	25	Pass	30	N/A

Remark: U_T is the rated voltage for the equipment.

7.6 EN 61000-4-3(Pursuant to EN 55014-2) Radiated Electromagnetic Field Immunity

Performance criterion: A

Test Result: Not Applicable

Remark:

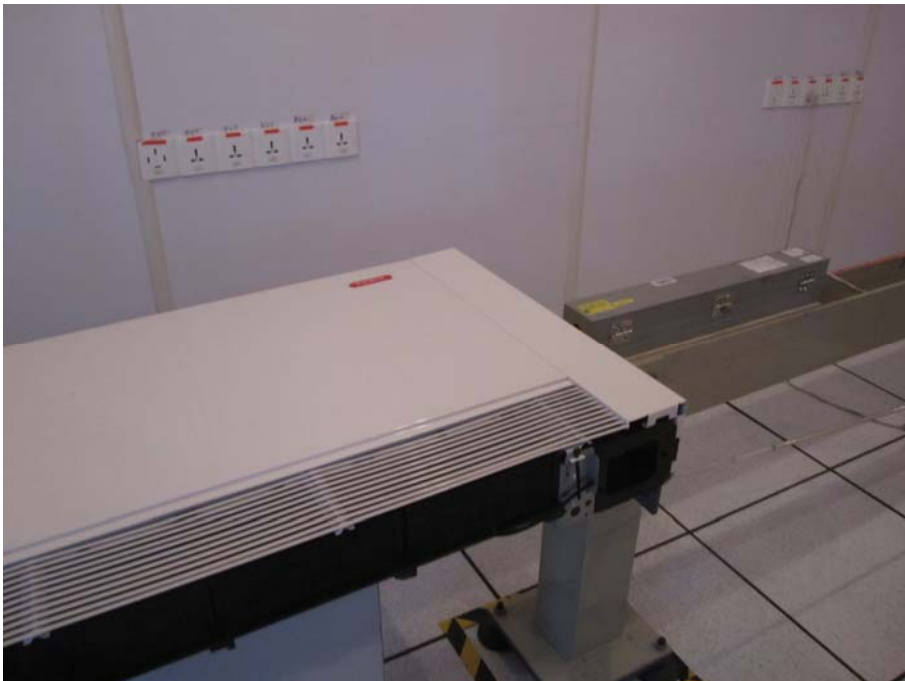
Containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

8 Appendix I - Photos of test setup

Conducted Emission



Radiated Power



Harmonic and Flicker



ESD Immunity



EFT/DIP Immunity



Conducted Immunity



Surge Immunity



9 Appendix II - Photos of EUT



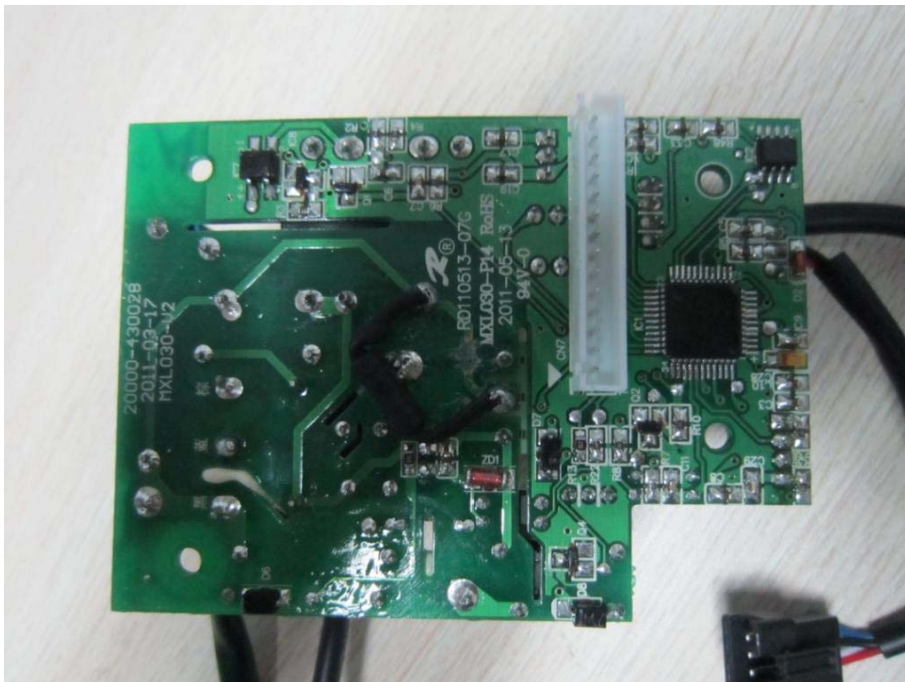
Outside



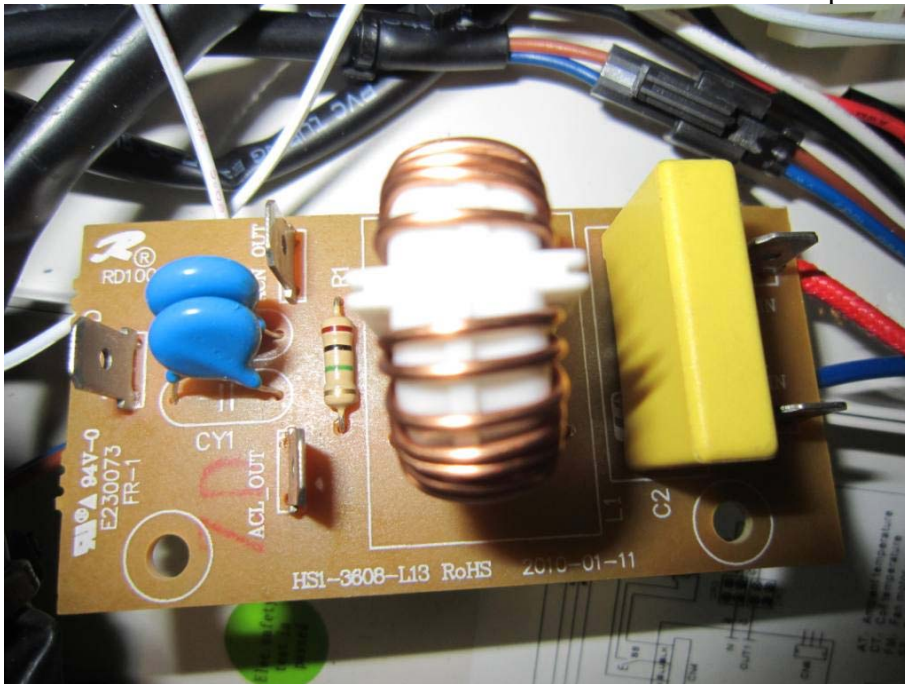
Fan motor



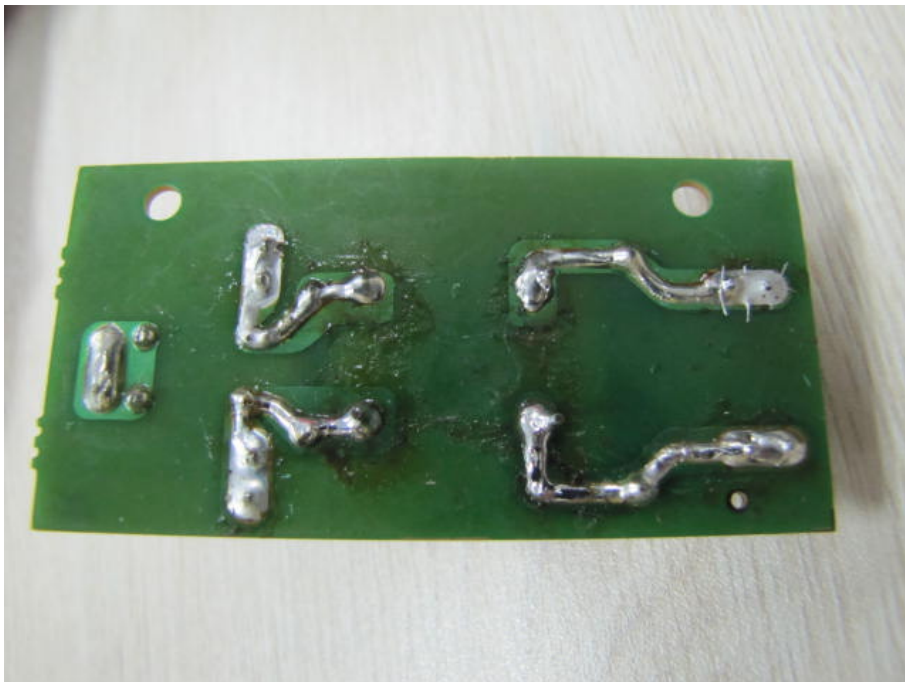
Front view of main PCB



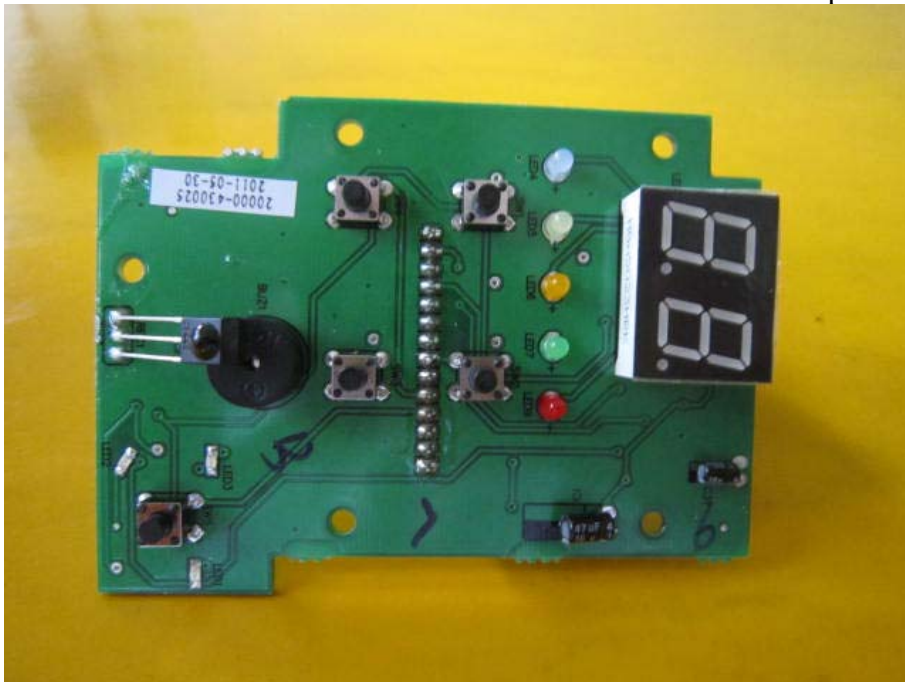
Back view of main PCB



Front view of EMI filter PCB



Back view of EMI filter PCB



Front view of display&control PCB



Back view of display&control PCB