EMC TEST REPORT

Product Name	:	Window-type Air Conditioner
Product Model	:	GJH24AC-K3MNB8A, GJH24AC-K3RNB9A GJC24AC-E3MNC1A, GJC24AC-E3RNC2A
Serial No.	:	Pre-production model
Date of Receipt	:	2009.12.06
Test Period	:	2009.12.09
Applicant	:	Gree Electric Appliances, Inc. of Zhuhai
Testing Location	:	Gree EMC Testing Lab.

Applicable The Following Selected Harmonized Standards:

EN55014-1: 2006
EN55014-2: 1997+A1: 2001
EN61000-3-2: 2006
EN61000-3-3: 1995+A1: 2001+A2: 2005

Tested by	:	**HUANG Xue-li**		2009-12-08
		Printed Name	*Signature*	*Date((YY-MM-DD)*
Reviewed by	:	**LI Zhi-kun**		2009-12-08
		Printed Name	*Signature*	*Date((YY-MM-DD)*

EMC LABORATORY OF GREE ELETRIC APPLIANCES INC. OF ZHUHAI

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Contents

Remark:

Principle of Configuration Selection of test set-up and operation mode

Emission: The Equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

1. Test Summary

4. EMISSION TESTS:

4.1 Continuous Disturbance Voltage

Test Result: Pass

4.2 Discontinuous Interference on AC Mains

Test Result: Pass

4.3 Disturbance Power

Test Result: Pass

4.4 Harmonics on AC Mains

Test Result: Pass

4.5 Voltage Fluctuation on AC Mains

Test Result: Pass

5. IMMUNITY TESTS:

5.1 Electrostatic Discharge (ESD)

Test Result: Pass

5.2 Electrical Fast Transient/Burst (EFT)

Test Result: Pass

5.3 Surge

Test Result: Pass

5.4 Immunity to conducted Disturbances, induced by RF fields

Test Result: Pass

5.5 Voltage Dips and Short interruptions

Test Result: Pass

2. Products Description

Power Supply : 1P, AC 220-240V, 50Hz

Power Cord : Unshielded

Interconnection Line : None

Protection : Class Ⅰ

Operation Mode : Standby
Cool
Heat
Fan

General Description :

All of current models are Window-Type Are conditioner.The difference is not influence the product Electromagnetic Compatibility (EMC).So,the test data of model GJC24AC-E3RNC2A can represent the test data of other models.

About the particular information of the modes, please refer to Technical Construction Document, user manual, etc.

3. List of Test and Measurement Instruments

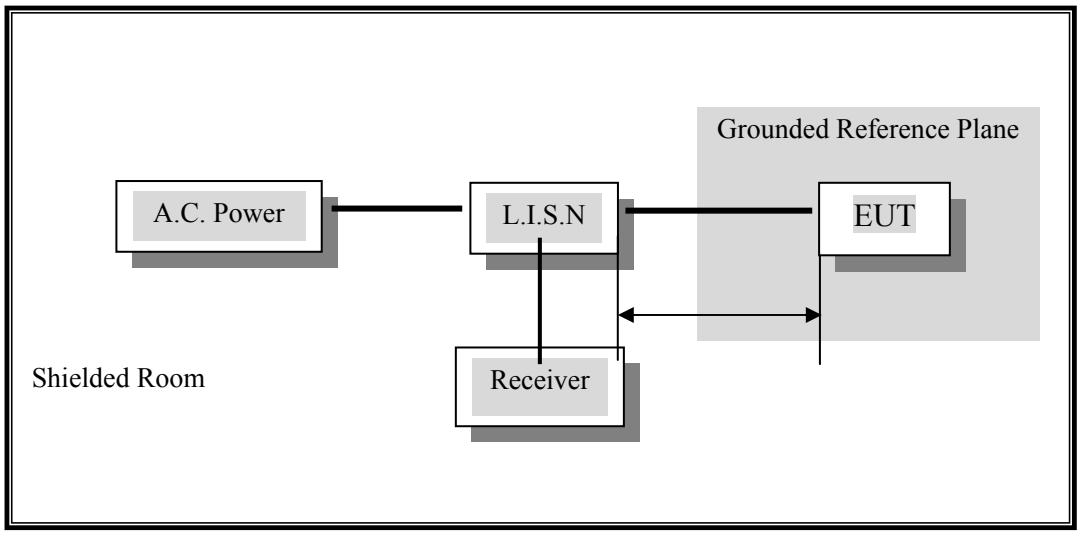
Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Test Receiver	R&S	ESCS30	100353	08/07/2010
L.I.S.N	R&S	ENV4200	100031	08/07/2010
Pulse limiter	R&S	ESH3-Z2	100066	08/07/2010
Absorbing Clamp	R&S	MDS-21	100194	08/07/2010
Clicks Analyzer	Schaffner	DIA1512D	21534	08/07/2010
Harmonic/Flicker Testing system	Schaffner	PROFLINE 2115-400	HK53890~53892	08/07/2010
ESD Simulator System	3CTest	ESD-30	EC0210605	08/07/2010
EFT/B Generator	Schaffner	NSG2025-4	1237	08/07/2010
RF-Generator	Schaffner	NSG2070	1022	08/07/2010
Coupling/Decoupling Network	Schaffner	CDN M316	15072	08/07/2010
Voltage Swell/DIP/Interrupt Source	KeyTek ECAT	EP62	0512181	10/27/2010
Surge Generator-Combination Wave	KeyTek ECAT	510A	0512182	10/27/2010
Coupling/Decoupling Network	KeyTek ECAT	E4554A	0512183	10/27/2010

4. Emission Test

4.1 Continuous Disturbance Voltage

Date of testing	**:**	2009.12.09
Temperature	**:**	28°C
Humidity	**:**	65%RH~67%RH
Test procedure	**:**	EN55014-1: 2006
Frequency range	**:**	0.15M - 30MHz
Kind of test site	**:**	Shielded room
Operational mode	**:**	Cool, High speed
Test result	**:**	Pass

1.Test Setup:



The EUT is on an insulating plane (height=80cm)
The distance between EUT and L.I.S.N is 80cm.
The distance between EUT and other metal conductors grounded is at least 80cm.

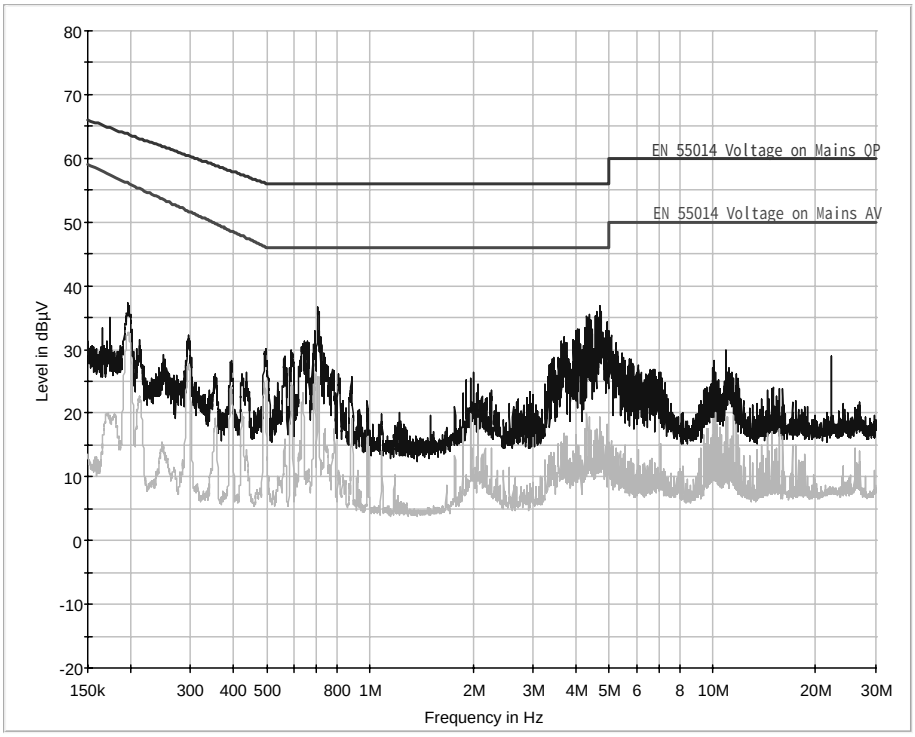
2.If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector has been omitted.
Disturbances other than those mentioned are small or not detectable.

Receiver setup:
Detector:Peak+Average; IF-BW: 9kHz; Step: 4.5kHz; M-Time: 20ms
The test data are as follows:

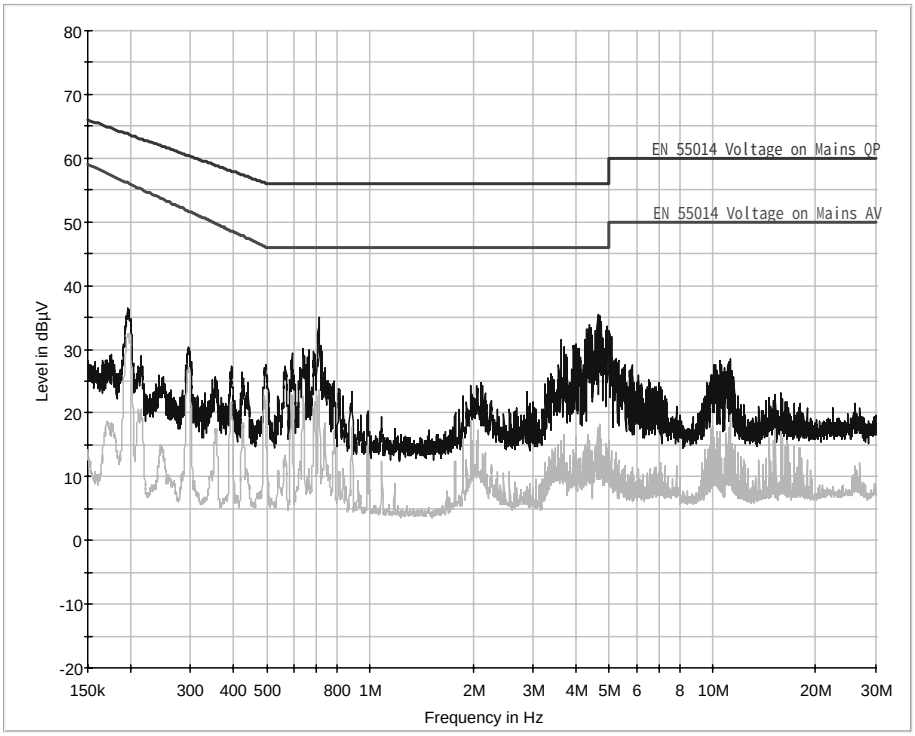
At main terminal:Pass

Model: GJC24AC-E3RNC2A

Cool mode **Port: Power Cord- L line**



Cool mode **Port: Power Cord- N line**



Remark: The all margin values>10dB.

4.2 Discontinuous Interference on AC Mains

Date of testing : 2009.12.09

Temperature : 28°C

Humidity : 66%RH~67%RH

Test procedure : EN55014-1: 2006

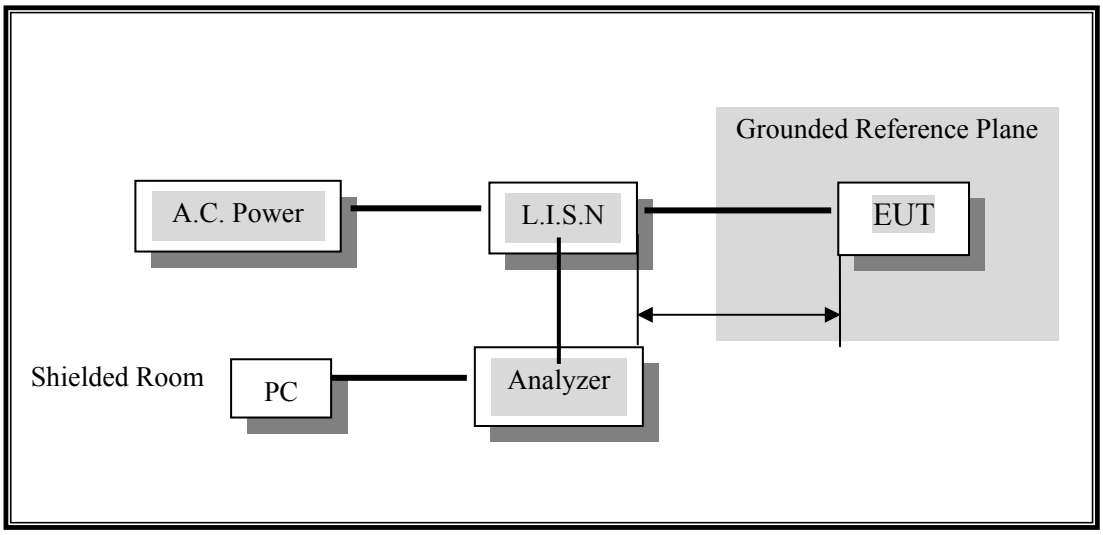
Frequency range : 0.15M – 30MHz

Kind of test site : Shielded room

Operational mode : Cool

Test result : Pass

1.Test Setup



The EUT is on an insulating plane (height=80cm)
The distance between EUT and L.I.S.N is 80cm.
The distance between EUT and other metal conductors grounded is at least 80cm.

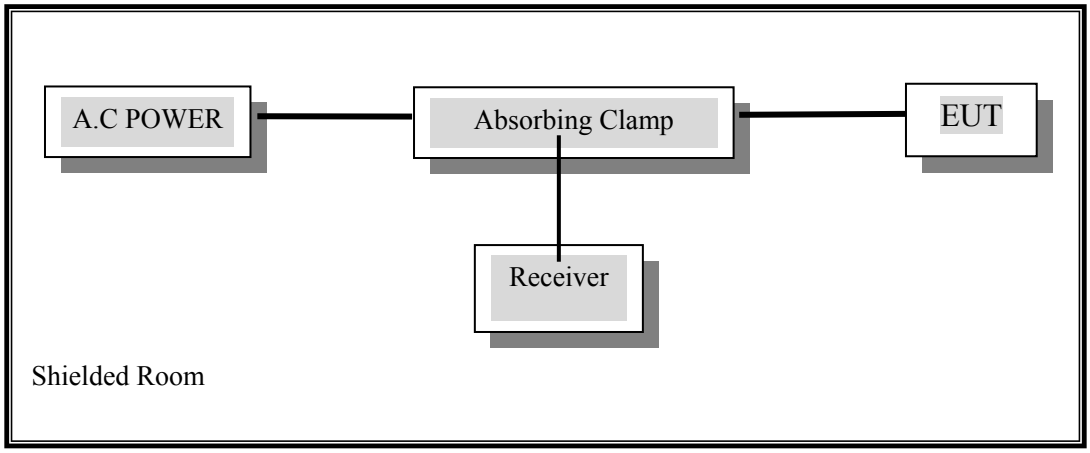
2. Test results.

Model: GJC24AC-E3RNC2A					
Run A (Observation time=120Mins0Sec)					
Frequency (MHz)		0.15	0.5	1.4	30
Limit value (L)(**dB**μV)		66	56	56	60
Amount of clicks >L	Short (n1)	24	24	24	0
	Long (n2)	0	0	0	0
Total (n=n1+n2)		24	24	24	0
Click Rate (N=n/T)		0.20	0.20	0.20	0.00
Continuous(s)		0	0	0	0
Switching operations		---			
f factor		N/A			
Result		PASS			

4.3 Disturbance Power

Date of testing	**:**	2009.12.09
Temperature	**:**	24°C~28°C
Humidity	**:**	65%RH~67%RH
Test procedure	**:**	EN55014-1: 2006
Frequency range	**:**	30M - 300MHz
Kind of test site	**:**	Shielded room
Test ports	**:**	AC Mains
Operational mode	**:**	Cool , High speed
Test result	**:**	Pass

1.Test Setup:



EUT and absorbing clamp are placed on an insulating plane (height=80cm). The distance between the absorbing clamp and other metal conductors grounded is 40cm above. EUT is connected to A.C power through an extended cord(≧6m). The absorbing clamp clamps the power line and moves along the power line to measure the maximum disturbance power emitted from the line. If EUT has an indoors unit and an outdoors unit, its interconnection lines and signal lines(or controlling lines) should be also measured ,too.

2.If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector has been omitted.

The power cord and interconnection line had been extended to a length of 6m and routed through an absorbing clamp. The clamp was moved along the cable to find the maximal emission.

Disturbances other than those mentioned are small or not detectable.

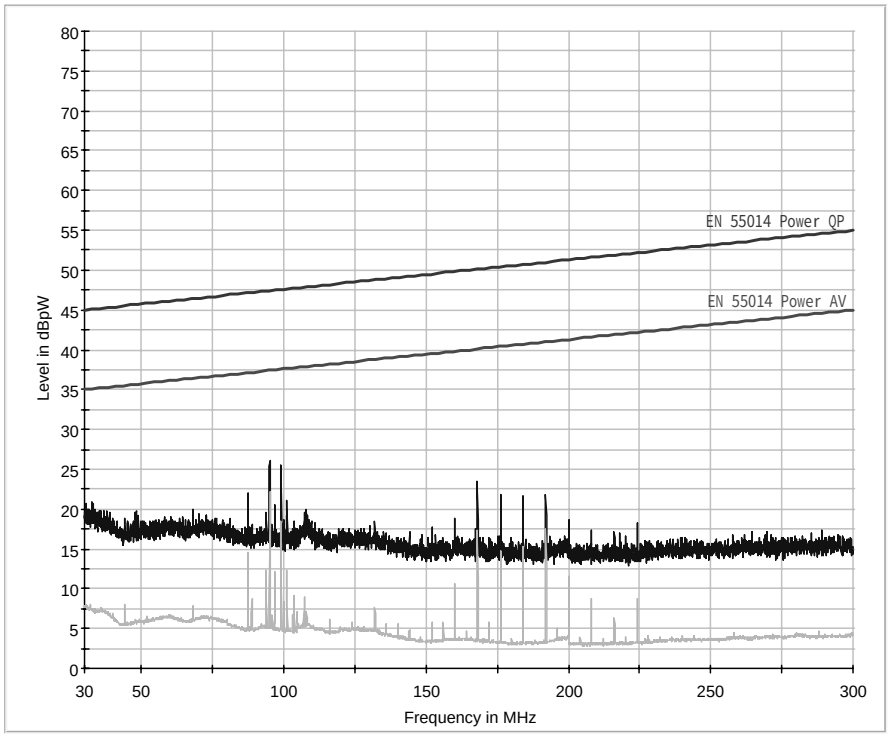
Receiver setup:

Detector:Peak+Average, IF-BW: 120kHz, Step: 60kHz, M-Time: 10ms.

The frequency spectra are as follows:

Model: GJC24AC-E3RNC2A

Cool mode **Port: Power Cord**

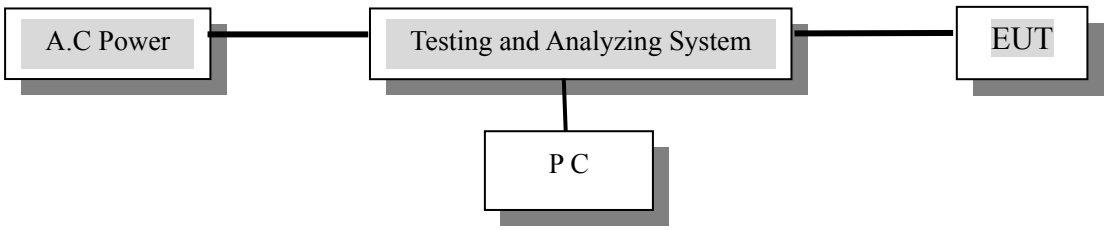


Remark: The all margin values>10dB.

4.4 Harmonics on AC Mains

Date of testing	**:**	2009.12.09
Temperature	**:**	28°C
Humidity	**:**	66%RH~67%RH
Test procedure	**:**	EN61000-3-2: 2006
Harmonics order	**:**	2 – 40
Equipment Class	**:**	A
Operational mode	**:**	Cool, High speed
Test result	**:**	Pass

1.Test Setup:



2. Test result.

The test results are shown as follows:

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Model: GJC24AC-E3RNC2A

Cool mode

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	1.046	1.080	96.9	1.070	1.620	66.02	Pass
3	0.905	2.300	39.4	0.922	3.450	26.71	Pass
4	0.096	0.430	22.4	0.105	0.645	16.34	Pass
5	0.145	1.140	12.8	0.153	1.710	8.94	Pass
6	0.039	0.300	13.1	0.043	0.450	9.57	Pass
7	0.062	0.770	8.1	0.066	1.155	5.73	Pass
8	0.029	0.230	12.6	0.032	0.345	9.29	Pass
9	0.036	0.400	9.1	0.041	0.600	6.80	Pass
10	0.012	0.184	6.3	0.013	0.276	4.80	Pass
11	0.018	0.330	5.5	0.020	0.495	4.00	Pass
12	0.007	0.153	4.9	0.009	0.230	3.71	Pass
13	0.009	0.210	4.3	0.010	0.315	3.12	Pass
14	0.009	0.131	6.6	0.010	0.197	4.87	Pass
15	0.009	0.150	5.8	0.010	0.225	4.29	Pass
16	0.006	0.115	5.0	0.007	0.173	3.77	Pass
17	0.006	0.132	4.3	0.006	0.199	3.22	Pass
18	0.003	0.102	2.8	0.004	0.153	2.30	Pass
19	0.003	0.118	2.5	0.004	0.178	2.03	Pass
20	0.004	0.092	4.1	0.004	0.138	3.15	Pass
21	0.003	0.107	2.5	0.003	0.161	2.11	Pass
22	0.004	0.084	4.6	0.004	0.125	3.41	Pass
23	0.002	0.098	2.5	0.003	0.147	2.00	Pass
24	0.002	0.077	3.2	0.003	0.115	2.47	Pass
25	0.002	0.090	2.1	0.002	0.135	1.65	Pass
26	0.002	0.071	2.2	0.002	0.106	2.13	Pass
27	0.002	0.083	2.3	0.002	0.125	1.92	Pass
28	0.002	0.066	3.6	0.003	0.099	2.98	Pass
29	0.002	0.078	2.4	0.003	0.116	2.29	Pass
30	0.002	0.061	3.7	0.003	0.092	3.10	Pass
31	0.002	0.073	2.5	0.002	0.109	2.16	Pass
32	0.001	0.058	2.6	0.002	0.086	2.39	Pass
33	0.002	0.068	2.2	0.002	0.102	2.17	Pass
34	0.001	0.054	2.6	0.002	0.081	2.34	Pass
35	0.001	0.064	2.1	0.002	0.096	1.85	Pass
36	0.001	0.051	2.8	0.002	0.077	2.16	Pass
37	0.001	0.061	2.0	0.001	0.091	1.60	Pass
38	0.001	0.048	2.6	0.002	0.073	2.06	Pass
39	0.001	0.058	2.0	0.001	0.087	1.55	Pass
40	0.001	0.046	2.5	0.001	0.069	1.94	Pass

4.5 Voltage Fluctuation on AC Mains

Date of testing : 2009.12.09

Temperature : 24°C~28°C

Humidity : 66%RH~67%RH

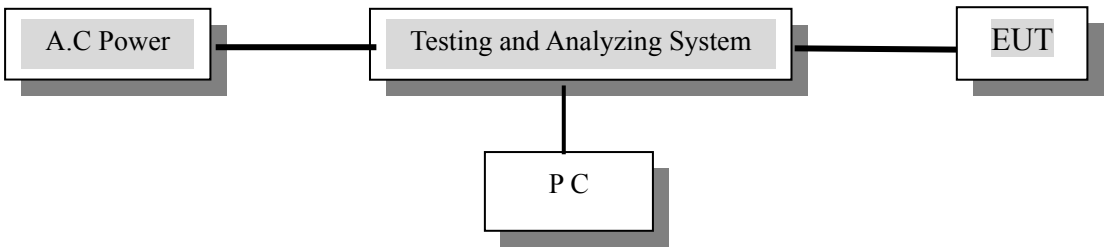
Test procedure : EN 61000-3-3: 1995+A1: 2001+A2: 2005

Frequency Range : 0-2kHz

Operational mode : Cool

Test result : Pass

1.Test Setup:



2. Test result.

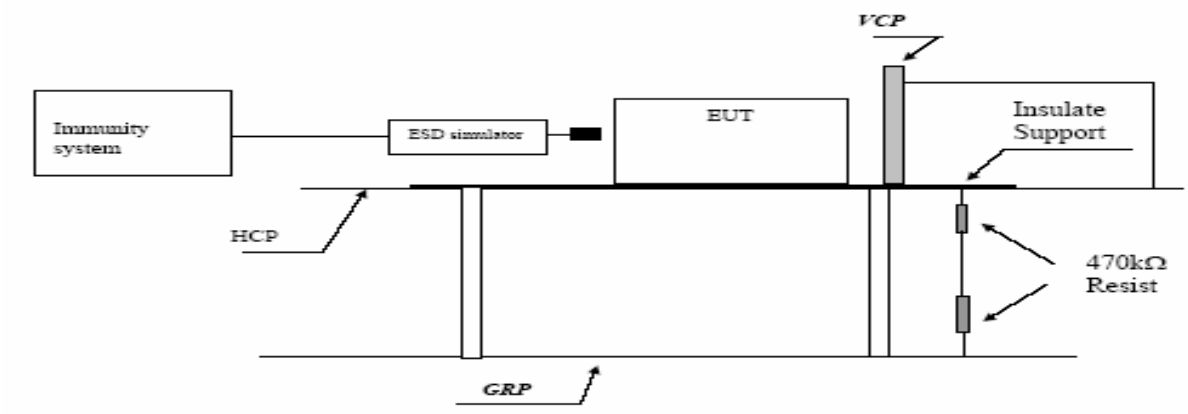
Model: GJC24AC-E3RNC2A					
Parameter	**d_c [%]**	**d_{max} [%]**	**d (t)[ms]**	**Pst**	**Plt**
Reading	1.49	5.89	30.0	0.957	0.645
Limit	**3.30**	**6.00**	**500.0**	**1.000**	**0.650**
Remark:/					

5. Immunity Tests

5.1 Electrostatic Discharge (ESD)

Date of testing	**:**	2009.12.09
Temperature	**:**	26°C~28°C
Humidity	**:**	55%RH
Test procedure	**:**	EN55014-2: 1997+A1:2001
Basic Standard	**:**	IEC 61000-4-2:2001
Performance Criterion	**:**	B
Operational mode	**:**	Cool, High fan
Test result	**:**	Pass

1. Test setup



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

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.

2. Test result

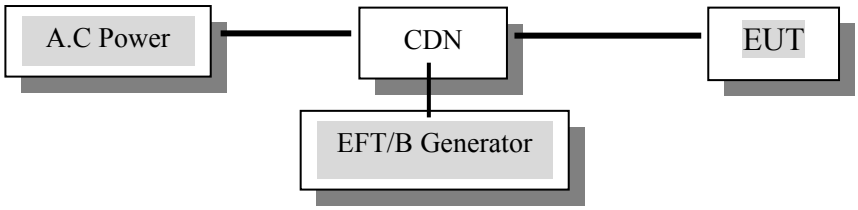
Location of Discharge	Type of Discharge	Level(kV)	Polarity	Number of Discharge	Result
Remote Receiver	Air	8.0	±	10	A
Display window	Air	8.0	±	10	A
Manual key	Air	8.0	±	10	A
Touchable screw	Contact	4.0	±	10	A
Remote Controller	Air	8.0	±	10	A
	HCP	4.0	±	10	A
	VCP	4.0	±	10	A
Remark: The Air discharge could not occur and the EUT worked normally during the test, no degradation of function occurred.					

Air -Air Discharge
Contact -Contact Discharge
HCP—Horizontal Coupling Plate,
VCP—Vertical Coupling Plate

5.2 Electrical Fast Transient/Burst (EFT)

Date of testing	**:**	2009.12.09
Temperature	**:**	26°C
Humidity	**:**	66%RH
Test procedure	**:**	EN55014-2: 1997+A1:2001
Basic Standard	**:**	IEC 61000-4-4:2004
Repetition Frequency	**:**	5kHz
Performance Criterion	**:**	B
Operational mode	**:**	Cool, High fan
Test result	**:**	Pass

1.Test Setup



The EUT is placed on an insulating plane, it is 0.1m high for table model and 0.1m high for floor type above the grounded reference plane. EUT is at least 0.5m away from the wall of the EMC laboratory and other metal conductors grounded except the grounded reference plane., and its four borders are at least 0.1m away from the borders of the grounded reference plane. The cable between EUT and CDN is not more than 0.5m.

For signal lines and control lines, the burst signal is coupled by a capacitive coupling clamp.

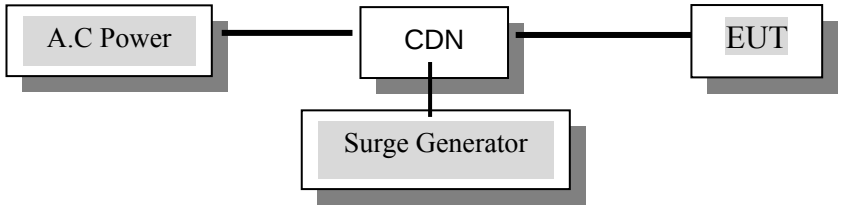
2. Test result:

Location	Voltage (kV)	Duration (s)	Coupled by	Result
L +N+PE	±1	120	CDN	A
Interconnection line	±0.5	120	Capacitive Coupling Clamp	None
Remark: The EUT worked normally during the test, no degradation of function occurred.				

5.3 Surge

Date of testing	:	2009.12.09
Temperature	:	26°C
Humidity	:	66%RH
Test procedure	:	EN55014-2: 1997+A1:2001
Basic Standard	:	IEC 61000-4-5:2005
Performance Criterion	:	B
Operational mode	:	Cool, High fan
Test result	:	Pass

1.Test Setup



The cable between EUT and CDN is not more than 1m..
No other special specifications.

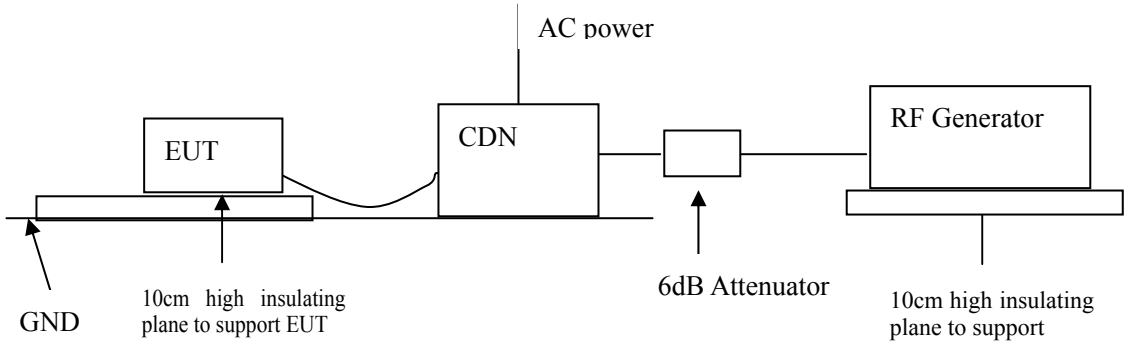
2.Test result

Location	Polarity	Phase Angle	Number of test	Pulse Voltage (kV)	Result
L—N	±	0°	5	1	A
	±	90°	5	1	A
	±	180°	5	1	A
	±	270°	5	1	A
L-PE	±	0°	5	2	A
	±	90°	5	2	A
	±	180°	5	2	A
	±	270°	5	2	A
N-PE	±	0°	5	2	A
	±	90°	5	2	A
	±	180°	5	2	A
	±	270°	5	2	A
Remark: The EUT worked normally during the test, no degradation of function occurred.					

5.4 Immunity to conducted Disturbances, induced by RF fields

Date of testing	:	2009.12.09
Temperature	:	26°C
Humidity	:	66%RH
Test procedure	:	EN55014-2: 1997+A1:2001
Basic Standard	:	IEC 61000-4-6:2006
Frequency range	:	150k~230MHz
Modulation	:	80%AM, 1kHz sine-wave
Performance Criterion	:	A
Operational mode	:	Cool, High fan
Test result	:	Pass

1. Test Setup

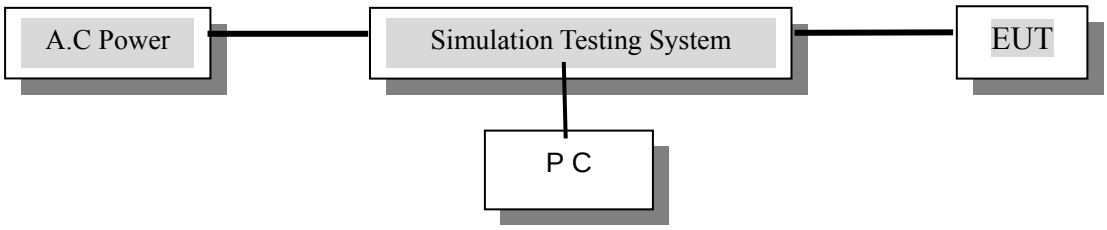


Frequency Range	Coupling Port	Strength	Coupling Method	Result
0.15MHz~80MHz	AC Mains	3V	CDN	A
80MHz~230MHz	AC Mains	3V	CDN	A
0.15MHz~80MHz	Interconnection wire	1V	Coupling/Decoupling Network	None
80MHz~230MHz	Interconnection wire	1V	Coupling/Decoupling Network	None
Remark: The EUT worked normally during the test, no degradation of function occurred.				

5.5 Voltage Dips and Short interruptions

Date of testing	**:**	2009.12.09
Temperature	**:**	26°C
Humidity	**:**	66%RH
Test procedure	**:**	EN55014-2: 1997+A1:2001
Basic Standard	**:**	IEC 61000-4-11:2004
Performance Criterion	**:**	C
Operational mode	**:**	Cool, High fan
Test result	**:**	Pass

1.Test Setup



No other special specifications.

2. Test result.

Severity Level		Test Level	Duration	Intervals	Phase Angle	Number of Test	Result
Short Interruption 100%		0%U_T	0.5P	3min	0°	3	A
					180°	3	A
Voltage Dips	60%	40%U_T	10P	3min	0°	3	B
					180°	3	B
	30%	70%U_T	50P	3min	0°	3	B
					180°	3	B

Remark:

1, U_T: Nominal Voltage of EUT.

2, During the test of 40%U_T, 70%U_T the EUT stopped, but it could recover the primal status. No degradation of function occurred.