SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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TEST REPORT

Application No.:	SHEM1803001619HS
Applicant:	CIXI BOTAI ELECTRIC TECH CO.,LTD
Address of Applicant:	Fuhai Industrial Zone, Nanyuan Village Fuhai Town, Cixi, Ningbo, 315332 Zhejiang, China
Manufacturer:	CIXI BOTAI ELECTRIC TECH CO.,LTD
Address of Manufacturer:	Fuhai Industrial Zone, Nanyuan Village Fuhai Town, Cixi, Ningbo, 315332 Zhejiang, China
Factory:	CIXI BOTAI ELECTRIC TECH CO.,LTD
Address of Factory:	Fuhai Industrial Zone, Nanyuan Village Fuhai Town, Cixi, Ningbo, 315332 Zhejiang, China
Equipment Under Test (EUT):	
EUT Name:	Heater (Fireplace Heater)
Model No.:	YH-09, YH-09A, YH-09B, YH-09C, YH-10 ¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) :	EN 55014-1:2017, EN 61000-3-2:2014 EN 61000-3-3:2013, EN 55014-2:2015
Date of Receipt:	2016-04-22 & 2018-03-05
Date of Test:	2016-04-27 to 2016-05-04 & 2018-03-09 to 2018-03-14
Date of Issue:	2018-04-27
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 EU Declaration of Conformity and compliance with all relevant EU Directives.

Parlam Zhan
E&E Section 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.

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Added new model	2018-04-27	Based on SHEM160400218501

Authorized for issue by:				
				
		Leo Xu /Project Engineer		
				
		Zenger Zhang /Reviewer		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 55014-1:2017	CISPR 16-2-1	N/A	Pass
Discontinuous Disturbance (150kHz-30MHz)	EN 55014-1:2017	EN 55014-1:2017	N/A	Pass
Disturbance Power	EN 55014-1:2017	CISPR 16-2-2	N/A	Pass
Harmonic Current Emission	EN 61000-3-2:2014	EN 61000-3-2:2014	Class A	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	EN 61000-3-3:2013	Clause 5 of EN 61000-3-3	Pass
Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 55014-2:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Electrical Fast Transients/Burst at Power Port	EN 55014-2:2015	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 55014-2:2015	EN 61000-4-5:2014	1.2/50μs Tr/Td 1kV Line to Line 2kV Line to Ground	Pass
Voltage Dips and Interruptions	EN 55014-2:2015	EN 61000-4-11:2004	For 50Hz: 0 % UT for 0.5per 40 % UT for 10per 70 % UT for 25per UT is Supply Voltage	Pass
Conducted Immunity at Power Port (150kHz-230MHz)	EN 55014-2:2015	EN 61000-4-6:2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass

N/A: Not applicable

Note1:

Declaration of EUT Family Grouping:

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model YH-09 was tested since their differences are model number and appearance.

Note2:

We add models YH-09A, YH-09B, YH-09C in this report. The new models mentioned in this report are the same as the original models, in Electronic or Electrical characters. Which were already EMC tested in the report YH-09. So the new models in this report are deemed to fulfil the EMC requirements without testing. Update temperature controller and add test data and photos.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply: 220-240V~, 50/60Hz, 1500W
Test voltage: AC230V 50Hz
Cable: For the model YH-09 without temperature controller: AC input cable 1.2m
For the model YH-09 with temperature controller: AC input cable 1.6m

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	3.2dB (9kHz to 150kHz)
		3.0dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.9 dB(9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	2.4 dB(150kHz to 30MHz)
4	Radiated Power	3.5dB
5	Radiated emission	4.4dB (30MHz-1GHz)
		4.6dB (1GHz-6GHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

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

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 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.

• NVLAP (Certificate No. 201034-0)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

• FCC –Designation Number: CN5033

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

• Industry Canada (IC) – IC Assigned Code: 8617A

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868,C-4336,T-12221,G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: working status

5 Equipment List

For the model YH-09 without temperature controller

CE M(150k-30M)					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2017-01-12
2	Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2017-01-12
3	Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2016-08-04

RP					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	Absorbing clamp	Liithi	MDS21	SHEM014-1	2016-08-09
2	EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2017-01-12
3	Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2017-01-12
4	DE coupling clamp	LIITHI	FTC101	SHEM027-2	N/A
5	Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2016-08-04

ESD					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-1	2016-08-24

EFT(Mains)					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-01-12
2	Ultra-compact simulator	EM test	UCS500M4	SHEM026-1	2017-01-12
3	Capacitive coupling clamp	EM test	HFK	SHEM026-2	2016-08-04
4	Data coupling network 4 line	EM test	CNV 504	SHEM026-3	2016-08-04
5	Matching resistors for EFT/burst generators	EM test	KW50	SHEM026-4	N/A
6	Matching resistors for EFT/burst generators	EM test	KW1000	SHEM026-5	N/A

Surge(Mains)					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-01-12
2	Ultra-compact simulator	EM test	UCS500M4	SHEM026-1	2017-01-12
3	Data coupling network 4 line	EM test	CNV 504	SHEM026-3	2016-08-04
4	Matching resistors for EFT/burst generators	EM test	KW50	SHEM026-4	N/A
5	Matching resistors for EFT/burst generators	EM test	KW1000	SHEM026-5	N/A

V-Dips					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-01-12
2	Ultra-compact simulator	EM test	UCS500M4	SHEM026-1	2017-01-12
3	Motorised Variac	MV2616	MV2616	SHEM026-6	2017-01-12

Harmonic & Flicker					
Item	**Equipment**	**Manufacturer**	**Model No**	**Inventory No**	**Cal Due Date**
1	AC source 6KVA	EM test	ACS500	SHEM025-1	2017-01-12

General used equipment					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Due date**
1	Digital pressure meter	YONGZHI	DYM3-01	101012	2017-03-02
2	Temperature& humidity recorder	ShangHai weather meter work	ZJ 1-2B	84320600 803136, F304020153,201 01201FS100A6K ,201106117	2016-08-02
3	Digital Multimeter	FLUKE	17B	19720439	2017-01-13
4	Autoformer regulator	Guangzhou bao de	TDGC2-5KVA-	/	/
5	CLAMP METER	FLUKE	316	2503030971	2017-01-13

For the model YH-09 with temperature controller

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2017-12-20	2018-12-19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2017-12-20	2018-12-19
CE test Cable	/	/	CE01	2017-12-26	2018-12-25

Discontinuous Disturbance (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Click analyzer	SCHAFFNER	DIA1512D	SHEM013-1	2017-12-20	2018-12-19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2017-12-20	2018-12-19

Disturbance Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2017-12-20	2018-12-19
Absorbing clamp	Liithi	MDS21	SHEM014-1	2017-12-20	2018-12-19
DE coupling clamp	LIITHI	FTC101	SHEM027-2	N/A	N/A
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2017-12-20	2018-12-19
Attenuator	HUAXIANG	TS2-6dB	SHEM122-1	N/A	N/A
CE test Cable	/	/	CE01	2017-12-26	2018-12-25

Harmonic & Voltage Fluctuations and Flicker					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Harmonic&Flicker analyzer	AMETEK	PACS-1	SHEM024-2	2017-08-22	2018-08-21
AC Power Source 5KVA	AMETEK	5001iX	SHEM025-2	2017-08-22	2018-08-21

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-1	2017-09-26	2018-09-25

Electrical Fast Transients/Burst at Power Port					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-12-20	2018-12-19

Surge at Power Port					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-12-20	2018-12-19

Voltage Dips and Interruptions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2017-12-20	2018-12-19

Conducted Immunity at Power Port (150kHz-230MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2017-09-26	2018-09-25
PAMP Conducted RF test system	HAEFFLY	PAMP250	SHEM023-1	2017-12-20	2018-12-19
6dB Attenuator	HUAXIANG	TST-150-761	SHEM151-1	N/A	N/A
CDN impedance and K-factor	LUTHI	L-801 M1	SHEM023-5	2017-12-20	2018-12-19
CDN impedance and K-factor	LUTHI	L-801 M2/M3	SHEM023-6	2017-12-20	2018-12-19
Shielding Room	ZHONGYU	5*5*3M	SHEM079-6	2016-12-29	2019-12-28

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2018-01-25	2019-01-24
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2017-09-13	2018-09-12
Digital Multimeter	FLUKE	17B	SHEM043-3	2017-09-11	2018-09-10
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2017-12-20	2018-12-19

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	EN 55014-1:2017
Test Method:	CISPR 16-2-1
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 59dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

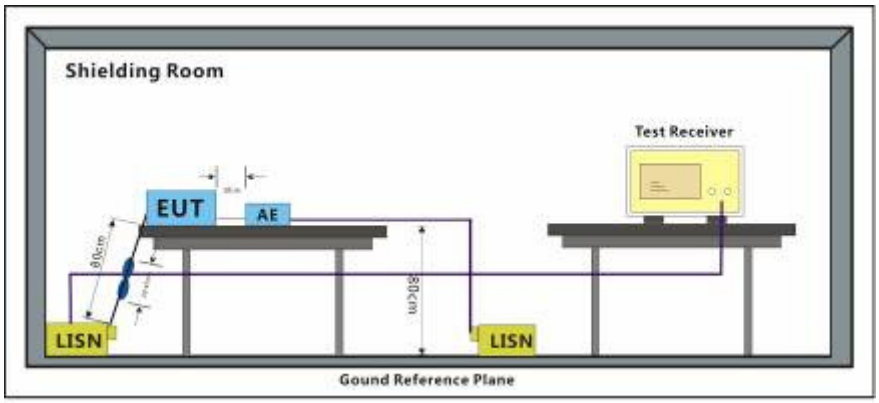
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:Keep EUT heating & running continual.

6.1.2 Test Setup Diagram

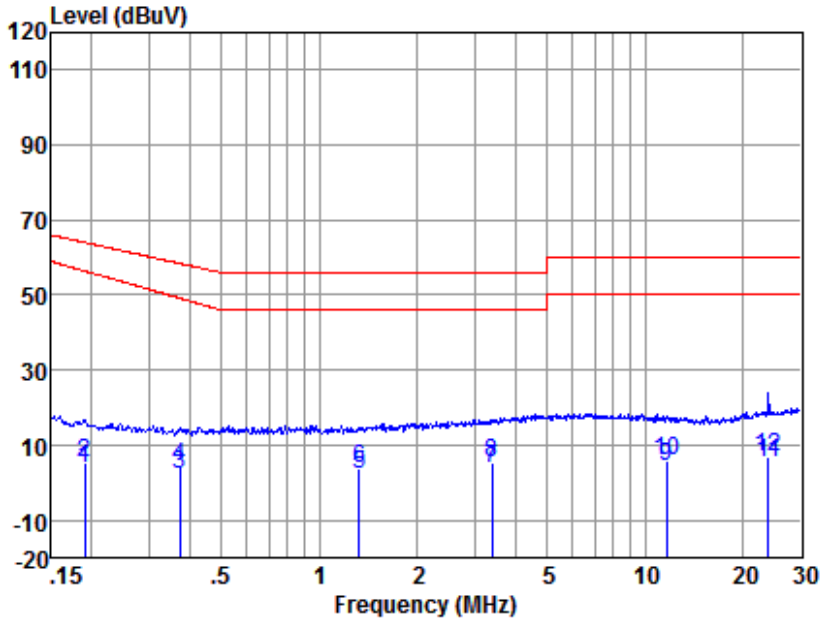


6.1.3 Measurement Data

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

For the model YH-09 without temperature controller

Mode:a;Line:Live Line

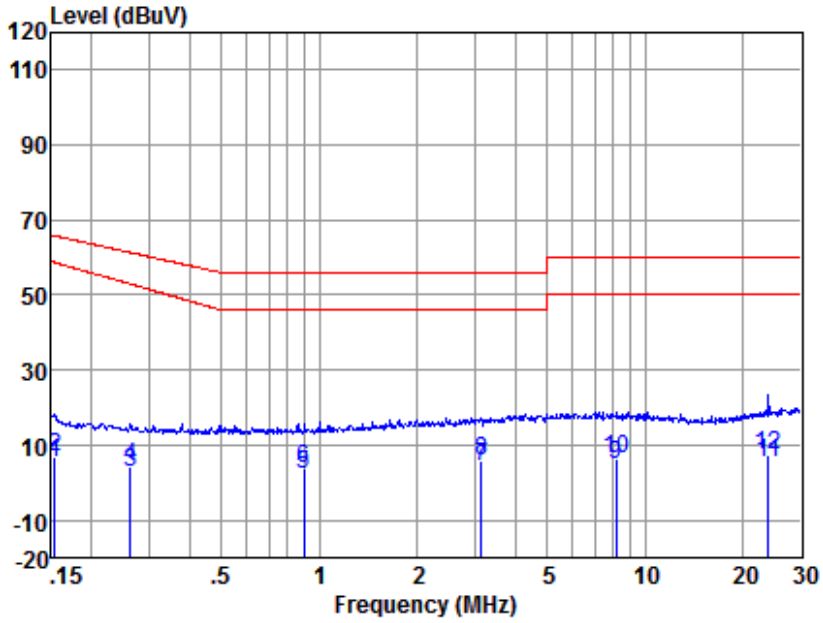


Site : chamber
Condition : 55014_CE-QP LISN-L-2015
EUT/Project No: 2185HS
Test mode : a

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.190	-6.25	9.86	3.88	56.43	-52.55	Average
2	0.190	-4.59	9.86	5.54	64.02	-58.48	QP
3	0.373	-8.02	9.86	2.09	49.16	-47.07	Average
4	0.373	-6.06	9.86	4.05	58.43	-54.38	QP
5	1.324	-8.13	9.87	1.99	46.00	-44.01	Average
6	1.324	-6.39	9.87	3.73	56.00	-52.27	QP
7	3.399	-6.31	9.88	3.95	46.00	-42.05	Average
8	3.399	-4.78	9.88	5.48	56.00	-50.52	QP
9	11.683	-5.79	9.90	4.44	50.00	-45.56	Average
10	11.683	-4.54	9.90	5.69	60.00	-54.31	QP
11	24.015	-4.96	9.98	5.43	50.00	-44.57	Average
12	24.015	-3.28	9.98	7.11	60.00	-52.89	QP

Notes: Emission Level=Read Level + LISN Factor + Cable Loss

Mode:a;Line:Neutral Line

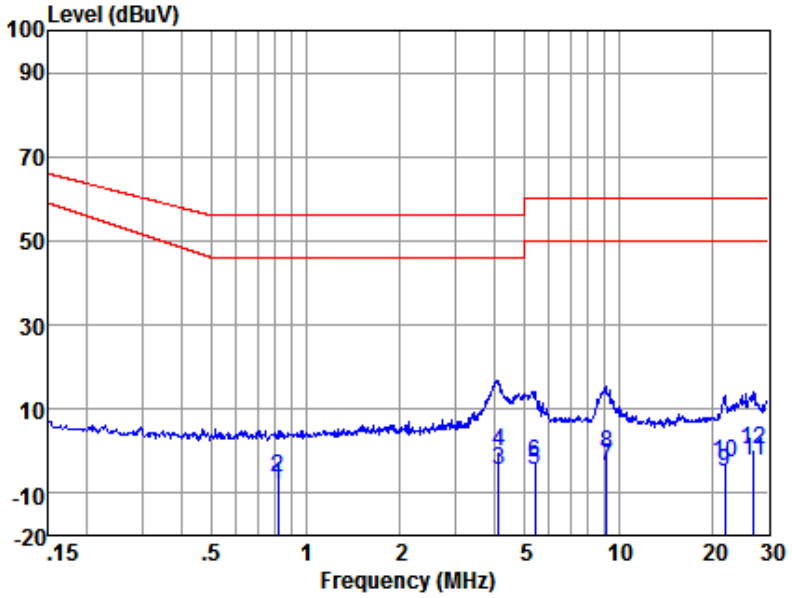


Site : chamber
Condition : 55014_CE-QP LISN-N-2015
EUT/Project No: 2185HS
Test mode : a

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.154	-4.87	9.86	5.33	58.71	-53.38	Average
2	0.154	-3.38	9.86	6.82	65.78	-58.96	QP
3	0.263	-7.30	9.86	2.85	52.94	-50.09	Average
4	0.263	-5.66	9.86	4.49	61.34	-56.85	QP
5	0.899	-7.86	9.87	2.23	46.00	-43.77	Average
6	0.899	-6.51	9.87	3.58	56.00	-52.42	QP
7	3.156	-6.30	9.87	4.28	46.00	-41.72	Average
8	3.156	-4.90	9.87	5.68	56.00	-50.32	QP
9	8.192	-5.26	9.87	5.03	50.00	-44.97	Average
10	8.192	-3.81	9.87	6.48	60.00	-53.52	QP
11	24.015	-4.94	9.98	5.51	50.00	-44.49	Average
12	24.015	-3.24	9.98	7.21	60.00	-52.79	QP

Notes: Emission Level=Read Level + LISN Factor + Cable Loss

For the model YH-09 with temperature controller
Mode:a; Line:Live Line

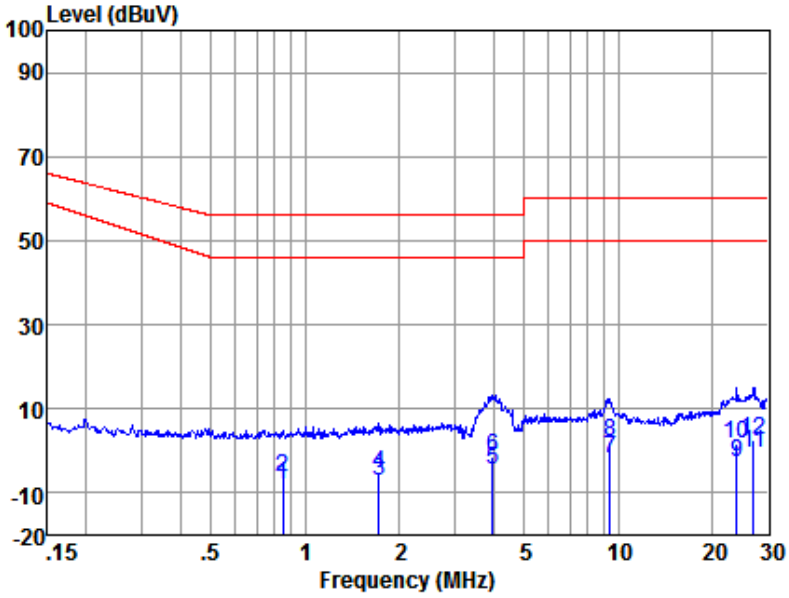


LISN : LINE
EUT/Project No : 1619HS
Test Mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.81	-18.10	0.11	9.83	-8.16	46.00	-54.16	Average
2	0.81	-16.17	0.11	9.83	-6.23	56.00	-62.23	QP
3	4.14	-14.49	0.11	9.85	-4.53	46.00	-50.53	Average
4	4.14	-10.04	0.11	9.85	-0.08	56.00	-56.08	QP
5	5.42	-14.54	0.11	9.86	-4.57	50.00	-54.57	Average
6	5.42	-12.88	0.11	9.86	-2.91	60.00	-62.91	QP
7	9.16	-13.51	0.10	9.87	-3.54	50.00	-53.54	Average
8	9.16	-10.33	0.10	9.87	-0.36	60.00	-60.36	QP
9	21.95	-15.25	0.19	10.04	-5.02	50.00	-55.02	Average
10	21.95	-13.15	0.19	10.04	-2.92	60.00	-62.92	QP
11	27.13	-12.64	0.22	10.06	-2.36	50.00	-52.36	Average
12	27.13	-9.87	0.22	10.06	0.41	60.00	-59.59	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Mode:a; Line:Neutral Line



LISN : NEUTRAL
EUT/Project No : 1619HS
Test Mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.85	-17.91	0.11	9.83	-7.97	46.00	-53.97	Average
2	0.85	-16.20	0.11	9.83	-6.26	56.00	-62.26	QP
3	1.72	-17.06	0.12	9.85	-7.09	46.00	-53.09	Average
4	1.72	-15.51	0.12	9.85	-5.54	56.00	-61.54	QP
5	3.96	-14.51	0.13	9.85	-4.53	46.00	-50.53	Average
6	3.96	-11.31	0.13	9.85	-1.33	56.00	-57.33	QP
7	9.45	-11.65	0.13	9.87	-1.65	50.00	-51.65	Average
8	9.45	-7.96	0.13	9.87	2.04	60.00	-57.96	QP
9	24.01	-13.08	0.22	10.04	-2.82	50.00	-52.82	Average
10	24.01	-8.62	0.22	10.04	1.64	60.00	-58.36	QP
11	27.13	-10.93	0.23	10.06	-0.64	50.00	-50.64	Average
12	27.13	-7.66	0.23	10.06	2.63	60.00	-57.37	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

6.2 Discontinuous Disturbance (150kHz-30MHz)

Test Requirement: EN 55014-1:2017

Test Method: EN 55014-1:2017

Frequency Range: 150kHz to 30MHz

Limit:

0.15MHz	Limit=66dB(μV)+Lq	Lq= 44 dB	N < 0.2
	Lq= 20 lg(30/N) dB	0.2≤N<30	
0.5MHz	Limit=56dB(μV)+Lq	Lq= 44 dB	N < 0.2
	Lq= 20 lg(30/N) dB	0.2≤N<30	
1.4MHz	Limit=56dB(μV)+Lq	Lq= 44 dB	N < 0.2
	Lq=20 lg(30/N) dB	0.2≤N<30	
30MHz	Limit=60dB(μV)+Lq	Lq= 44 dB	N < 0.2
	Lq= 20 lg(30/N) dB	0.2≤N<30	

Lq is click limit, N is click rates

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

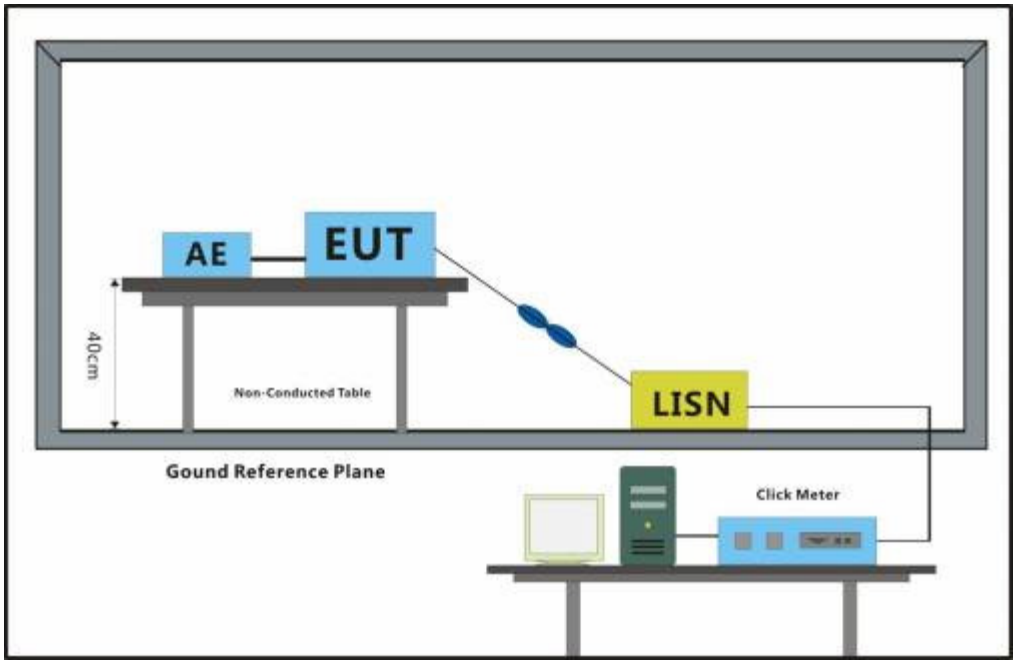
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode a:Keep EUT heating & running continual.

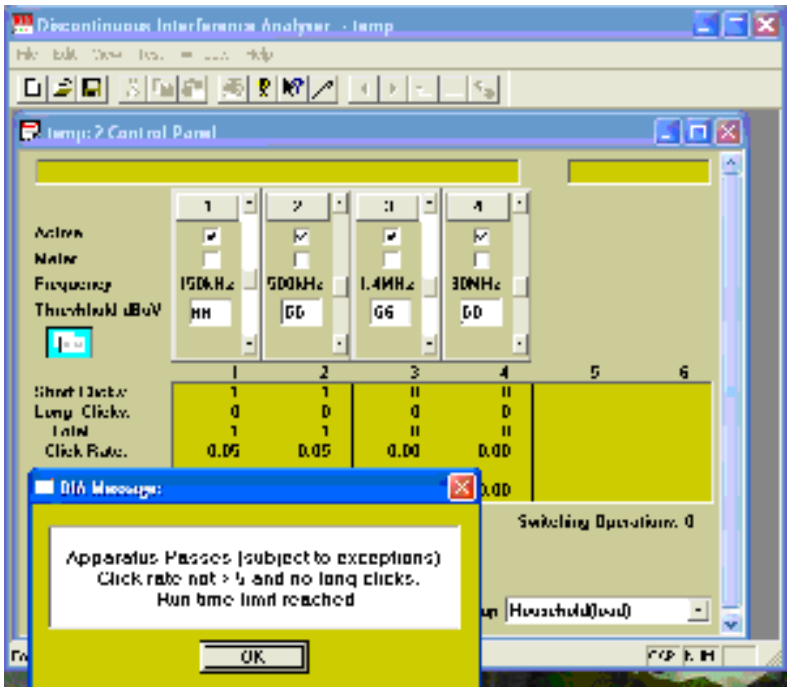
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

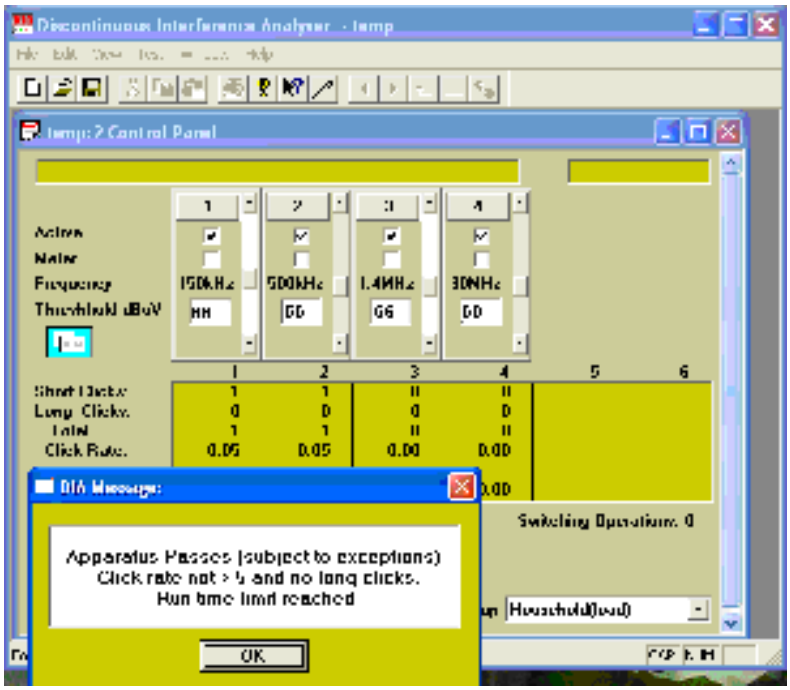
For the model YH-09 without temperature controller

Mode a



For the model YH-09 with temperature controller

Mode a



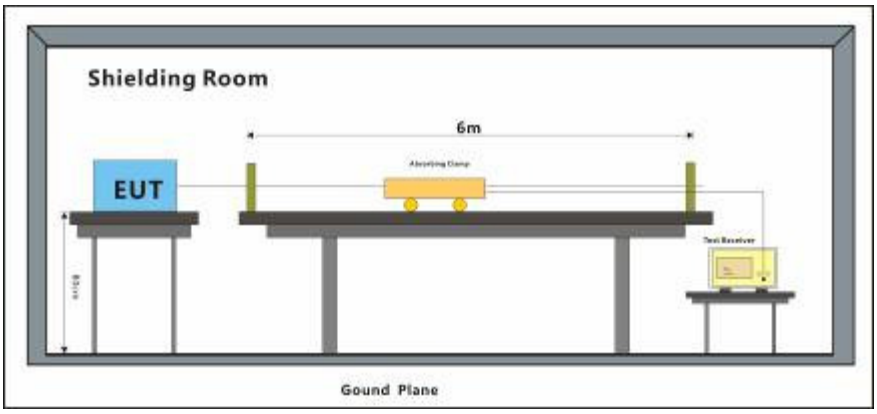
6.3 Disturbance Power

Test Requirement: EN 55014-1:2017
Test Method: CISPR 16-2-2
Frequency Range: 30MHz to 300MHz
Limit:
30MHz- 300MHz 45dB(pw)-55dB(pw) quasi-peak, 35dB(pw)-45dB(pw) average
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 300MHz

6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar
Test mode a:Keep EUT heating & running continual.

6.3.2 Test Setup Diagram

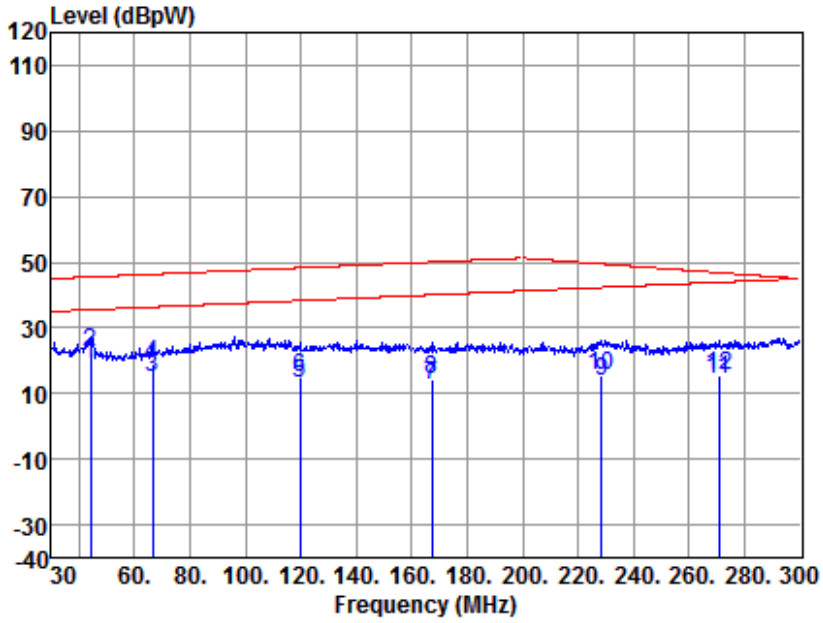


6.3.3 Measurement Data

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

For the model YH-09 without temperature controller

Mode:a

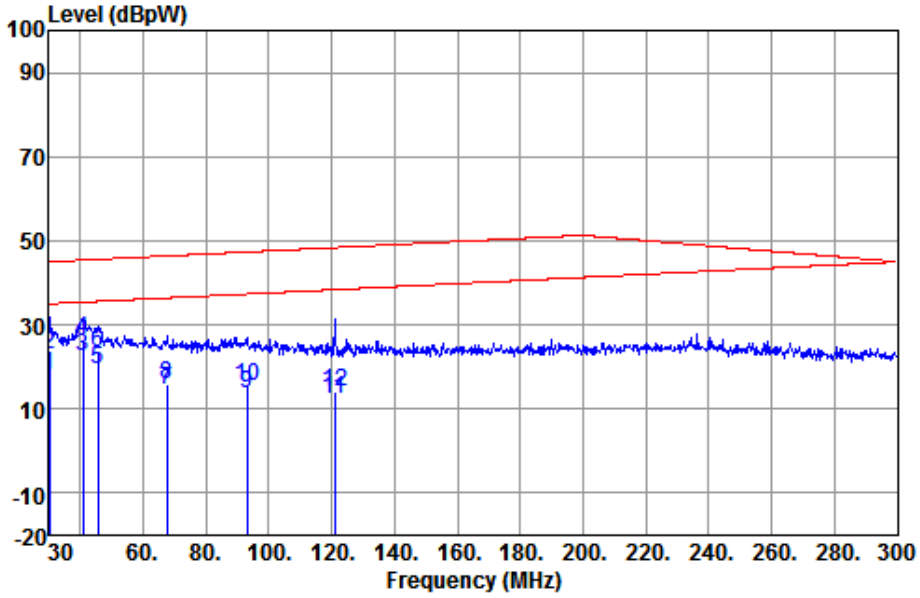


Site : chamber
Condition : 55014-DP-QP-NEW
EUT/Project No: 2185HS
Test mode : a

	Freq	Read Level	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	44.310	-4.09	22.36	1.02	19.29	35.54	-16.25	Average
2	44.310	-0.83	22.36	1.02	22.55	45.54	-22.99	QP
3	66.450	-8.73	22.47	1.33	15.07	36.36	-21.29	Average
4	66.450	-5.00	22.47	1.33	18.80	46.36	-27.56	QP
5	119.910	-11.82	23.35	1.60	13.13	38.34	-25.21	Average
6	119.910	-10.31	23.35	1.60	14.64	48.34	-33.70	QP
7	167.160	-11.64	22.04	2.14	12.54	40.09	-27.55	Average
8	167.160	-10.00	22.04	2.14	14.18	50.09	-35.91	QP
9	228.450	-10.83	22.37	2.40	13.94	42.36	-28.42	Average
10	228.450	-9.41	22.37	2.40	15.36	49.52	-34.16	QP
11	270.570	-11.63	23.05	2.73	14.15	43.92	-29.77	Average
12	270.570	-10.31	23.05	2.73	15.47	46.86	-31.39	QP

Notes: Emission Level=Read Level + Aux Factor + Cable Loss

For the model YH-09 with temperature controller
Mode:a



EUT/Project No : 1619HS
Test Mode : a

	Freq (MHz)	Read level (dBpW)	Aux Factor (dB)	Cable Loss (dB)	Emission Level (dBpW)	Limit (dBpW)	Over Limit (dB)	Remark
1	30.27	-9.11	20.68	6.57	18.14	35.02	-16.88	Average
2	30.27	-4.42	20.68	6.57	22.83	45.02	-22.19	QP
3	40.80	-5.01	20.57	6.78	22.34	35.41	-13.07	Average
4	40.80	-0.77	20.57	6.78	26.58	45.41	-18.83	QP
5	45.66	-7.73	20.42	6.85	19.54	35.59	-16.05	Average
6	45.66	-3.90	20.42	6.85	23.37	45.59	-22.22	QP
7	67.53	-12.23	19.60	7.07	14.44	36.40	-21.96	Average
8	67.53	-10.71	19.60	7.07	15.96	46.40	-30.44	QP
9	93.18	-12.03	18.55	7.35	13.87	37.35	-23.48	Average
10	93.18	-10.56	18.55	7.35	15.34	47.35	-32.01	QP
11	120.99	-11.92	16.90	7.54	12.52	38.38	-25.86	Average
12	120.99	-10.47	16.90	7.54	13.97	48.38	-34.41	QP

Notes: Emission Level = Read Level +Aux Factor + Cable loss

6.4 Harmonic Current Emission

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

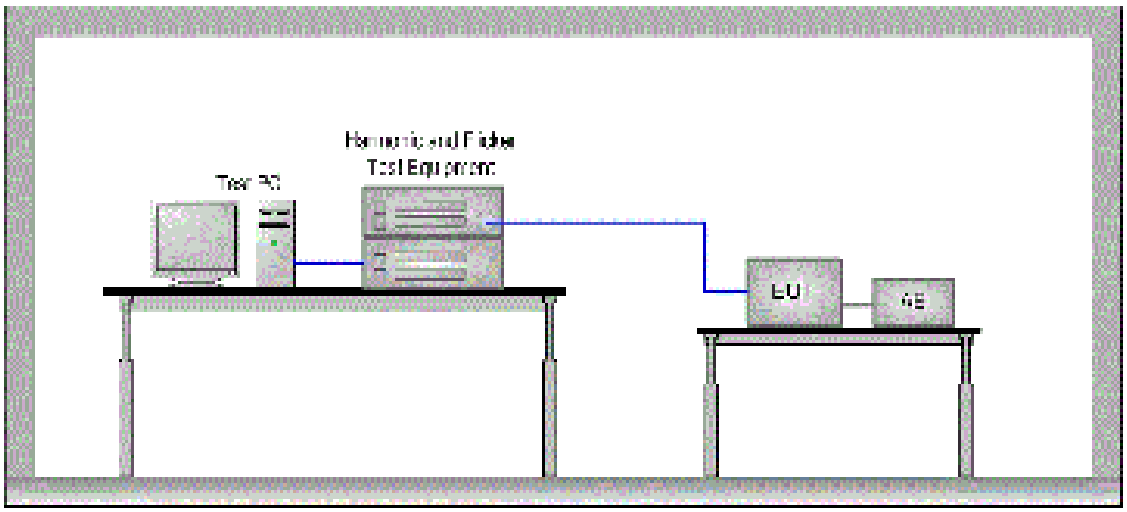
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode: a:Heating mode_keep the EUT on heating continuously and turning.

6.4.2 Test Setup



6.4.3 Measurement Data

For the model YH-09 without temperature controller
Mode:a
Power Factor:0.992

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	6.882			
2	1.629E-3	0.151	1.08	PASS
3	958.606E-3	41.679	2.30	PASS
4	2.237E-3	0.520	430.00E-3	PASS
5	159.952E-3	14.031	1.14	PASS
6	890.953E-6	0.297	300.00E-3	PASS
7	51.045E-3	6.629	770.00E-3	PASS
8	852.813E-6	0.371	230.00E-3	PASS
9	22.054E-3	5.514	400.00E-3	PASS
10	757.314E-6	0.412	184.00E-3	PASS
11	13.165E-3	3.989	330.00E-3	PASS
12	763.615E-6	0.498	153.33E-3	PASS
13	5.465E-3	2.603	210.00E-3	PASS
14	759.805E-6	0.578	131.43E-3	PASS
15	2.795E-3	1.864	150.00E-3	PASS
16	771.260E-6	0.671	115.00E-3	PASS
17	3.597E-3	2.718	132.35E-3	PASS
18	772.662E-6	0.756	102.22E-3	PASS
19	2.709E-3	2.288	118.42E-3	PASS
20	772.071E-6	0.839	92.00E-3	PASS
21	2.207E-3	1.373	160.71E-3	PASS
22	791.144E-6	0.946	83.64E-3	PASS
23	2.115E-3	1.442	146.74E-3	PASS
24	752.394E-6	0.981	76.66E-3	PASS
25	1.452E-3	1.076	135.00E-3	PASS
26	1.028E-3	1.453	70.77E-3	PASS
27	1.572E-3	1.258	124.99E-3	PASS
28	758.340E-6	1.154	65.71E-3	PASS
29	2.482E-3	2.133	116.39E-3	PASS
30	1.014E-3	1.653	61.33E-3	PASS
31	2.467E-3	2.266	108.87E-3	PASS
32	765.964E-6	1.332	57.50E-3	PASS
33	1.848E-3	1.807	102.27E-3	PASS
34	976.376E-6	1.804	54.12E-3	PASS
35	1.141E-3	1.183	96.44E-3	PASS
36	763.111E-6	1.493	51.11E-3	PASS
37	1.525E-3	1.672	91.21E-3	PASS
38	798.094E-6	1.648	48.42E-3	PASS
39	2.166E-3	2.503	86.53E-3	PASS
40	796.931E-6	1.732	46.00E-3	PASS

Maximum harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	8.183			
2	8.617E-3	0.532	1.62	PASS
3	986.880E-3	28.605	3.45	PASS
4	3.946E-3	0.612	645.00E-3	PASS
5	177.239E-3	10.365	1.71	PASS
6	2.124E-3	0.472	450.00E-3	PASS
7	59.425E-3	5.145	1.15	PASS
8	1.701E-3	0.493	345.00E-3	PASS
9	25.246E-3	4.208	600.00E-3	PASS
10	1.411E-3	0.511	276.00E-3	PASS
11	15.721E-3	3.176	495.00E-3	PASS
12	1.289E-3	0.560	229.99E-3	PASS
13	9.288E-3	2.949	315.00E-3	PASS
14	1.151E-3	0.584	197.15E-3	PASS
15	5.158E-3	2.292	225.00E-3	PASS
16	1.094E-3	0.634	172.50E-3	PASS
17	4.157E-3	2.094	198.52E-3	PASS
18	1.017E-3	0.664	153.33E-3	PASS
19	3.527E-3	1.986	177.63E-3	PASS
20	983.762E-6	0.713	138.00E-3	PASS
21	3.290E-3	2.047	160.71E-3	PASS
22	957.544E-6	0.763	125.46E-3	PASS
23	2.649E-3	1.805	146.74E-3	PASS
24	941.347E-6	0.819	114.99E-3	PASS
25	2.230E-3	1.652	135.00E-3	PASS
26	1.213E-3	1.143	106.16E-3	PASS
27	2.105E-3	1.684	124.99E-3	PASS
28	926.896E-6	0.940	98.57E-3	PASS
29	3.044E-3	2.616	116.39E-3	PASS
30	1.178E-3	1.281	92.00E-3	PASS
31	2.974E-3	2.732	108.87E-3	PASS
32	921.167E-6	1.068	86.25E-3	PASS
33	2.679E-3	2.619	102.27E-3	PASS
34	1.104E-3	1.360	81.18E-3	PASS
35	2.511E-3	2.604	96.44E-3	PASS
36	915.767E-6	1.195	76.66E-3	PASS
37	2.213E-3	2.426	91.21E-3	PASS
38	974.978E-6	1.342	72.63E-3	PASS
39	2.577E-3	2.979	86.53E-3	PASS
40	970.931E-6	1.407	69.00E-3	PASS

Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.87	100.380		
2	39.74E-3	0.017	0.2	PASS
3	182.36E-3	0.079	0.9	PASS
4	17.38E-3	0.008	0.2	PASS
5	51.91E-3	0.023	0.4	PASS
6	11.54E-3	0.005	0.2	PASS
7	56.17E-3	0.024	0.3	PASS
8	15.43E-3	0.007	0.2	PASS
9	72.53E-3	0.032	0.2	PASS
10	14.78E-3	0.006	0.2	PASS
11	74.52E-3	0.032	0.1	PASS
12	15.71E-3	0.007	0.1	PASS
13	68.58E-3	0.030	0.1	PASS
14	14.02E-3	0.006	0.1	PASS
15	62.07E-3	0.027	0.1	PASS
16	14.04E-3	0.006	0.1	PASS
17	57.54E-3	0.025	0.1	PASS
18	13.53E-3	0.006	0.1	PASS
19	85.13E-3	0.037	0.1	PASS
20	12.84E-3	0.006	0.1	PASS
21	81.37E-3	0.035	0.1	PASS
22	13.37E-3	0.006	0.1	PASS
23	81.43E-3	0.035	0.1	PASS
24	14.13E-3	0.006	0.1	PASS
25	80.79E-3	0.035	0.1	PASS
26	12.93E-3	0.006	0.1	PASS
27	52.30E-3	0.023	0.1	PASS
28	14.60E-3	0.006	0.1	PASS
29	75.24E-3	0.033	0.1	PASS
30	14.81E-3	0.006	0.1	PASS
31	76.21E-3	0.033	0.1	PASS
32	14.17E-3	0.006	0.1	PASS
33	68.83E-3	0.030	0.1	PASS
34	16.08E-3	0.007	0.1	PASS
35	66.57E-3	0.029	0.1	PASS
36	14.99E-3	0.007	0.1	PASS
37	72.61E-3	0.032	0.1	PASS
38	15.88E-3	0.007	0.1	PASS
39	65.14E-3	0.028	0.1	PASS
40	14.40E-3	0.006	0.1	PASS

For the model YH-09 with temperature controller

Mode:a

Highest parameter values during test:

V_RMS (Volts):	229.93	Frequency(Hz):	50.00
I_Peak (Amps):	17.897	I_RMS (Amps):	12.041
I_Fund (Amps):	3.078	Crest Factor:	7.789
Power (Watts):	2003.8	Power Factor:	0.999

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.008	1.620	N/A	Pass
3	0.159	2.300	6.9	0.873	3.450	25.3	Pass
4	0.001	0.430	N/A	0.005	0.645	N/A	Pass
5	0.017	1.140	1.4	0.156	1.710	9.1	Pass
6	0.000	0.300	N/A	0.002	0.450	N/A	Pass
7	0.006	0.770	0.7	0.054	1.155	4.7	Pass
8	0.000	0.230	N/A	0.002	0.345	N/A	Pass
9	0.002	0.400	N/A	0.023	0.600	N/A	Pass
10	0.000	0.184	N/A	0.002	0.276	N/A	Pass
11	0.001	0.330	N/A	0.013	0.495	N/A	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.001	0.210	N/A	0.007	0.315	N/A	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.000	0.150	N/A	0.004	0.225	N/A	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.000	0.132	N/A	0.003	0.198	N/A	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.000	0.118	N/A	0.002	0.178	N/A	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.000	0.107	N/A	0.001	0.161	N/A	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.000	0.098	N/A	0.001	0.147	N/A	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.000	0.090	N/A	0.001	0.135	N/A	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.000	0.083	N/A	0.001	0.125	N/A	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.000	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.000	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.000	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.000	0.064	N/A	0.000	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.054	0.460	11.74	OK
3	0.437	2.069	21.11	OK
4	0.041	0.459	8.94	OK
5	0.077	0.919	8.37	OK
6	0.022	0.460	4.82	OK
7	0.032	0.690	4.60	OK
8	0.012	0.460	2.65	OK
9	0.035	0.459	7.66	OK
10	0.016	0.460	3.44	OK
11	0.017	0.230	7.49	OK
12	0.030	0.230	13.00	OK
13	0.016	0.230	6.98	OK
14	0.017	0.230	7.29	OK
15	0.015	0.230	6.39	OK
16	0.009	0.230	3.82	OK
17	0.008	0.230	3.32	OK
18	0.008	0.230	3.50	OK
19	0.007	0.230	2.89	OK
20	0.010	0.230	4.23	OK
21	0.007	0.230	3.16	OK
22	0.004	0.230	1.93	OK
23	0.006	0.230	2.64	OK
24	0.004	0.230	1.91	OK
25	0.005	0.230	2.15	OK
26	0.006	0.230	2.44	OK
27	0.006	0.230	2.81	OK
28	0.003	0.230	1.48	OK
29	0.005	0.230	2.33	OK
30	0.002	0.230	1.04	OK
31	0.003	0.230	1.26	OK
32	0.003	0.230	1.19	OK
33	0.004	0.230	1.63	OK
34	0.002	0.230	1.08	OK
35	0.003	0.230	1.50	OK
36	0.002	0.230	0.83	OK
37	0.003	0.230	1.46	OK
38	0.002	0.230	0.85	OK
39	0.003	0.230	1.52	OK
40	0.006	0.230	2.48	OK

6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

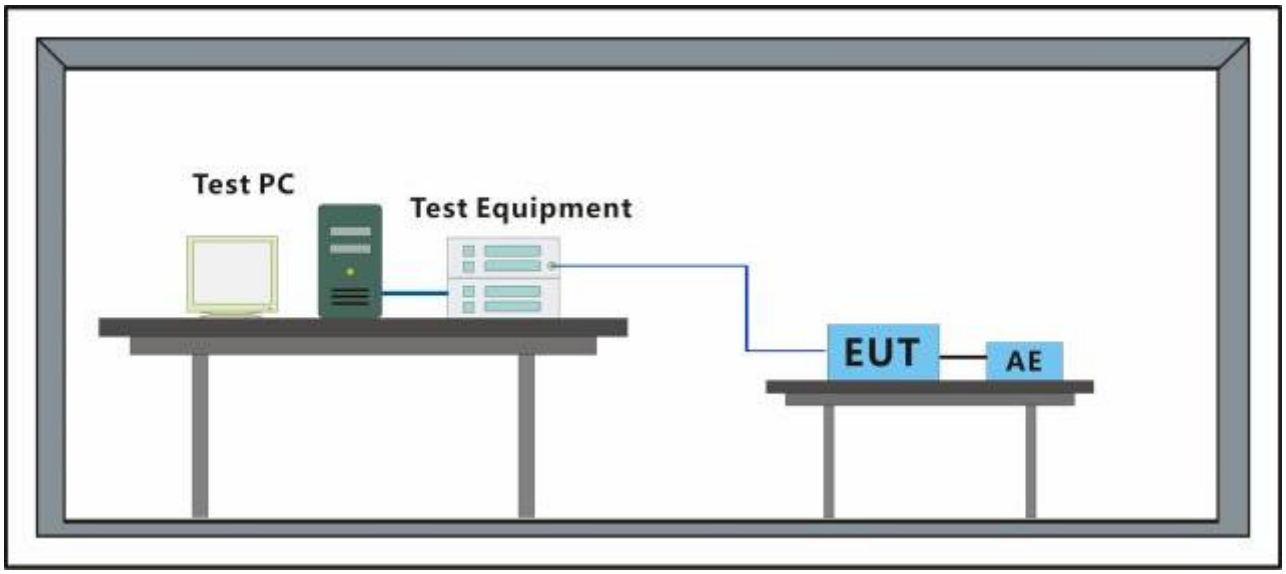
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode a:Keep EUT heating & running continual.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

For the model YH-09 without temperature controller

Mode:a

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.044	1.00	PASS
Plt	0.044	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.178	4.00	PASS
Tmax [s]	0.000	0.50	PASS

For the model YH-09 with temperature controller

Mode:a

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.96			
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.77	Test limit (%):	3.30	Pass
Highest dmax (%):	0.94	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.252	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.126	Test limit:	0.650	Pass

7 Immunity Test Results

7.1 Performance Criteria Description in EN 55014-2:2015

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 permissible 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.

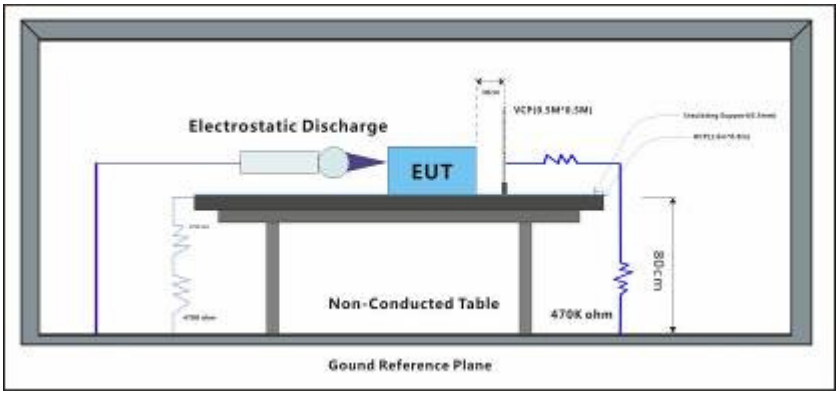
Criterion B The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation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

7.2 Electrostatic Discharge

Test Requirement: EN 55014-2:2015
Test Method: EN 61000-4-2:2009
Performance Criterion: B
Discharge Impedance: 330Ω/150pF
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar
Test mode: a:Keep EUT heating & running continual.

7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

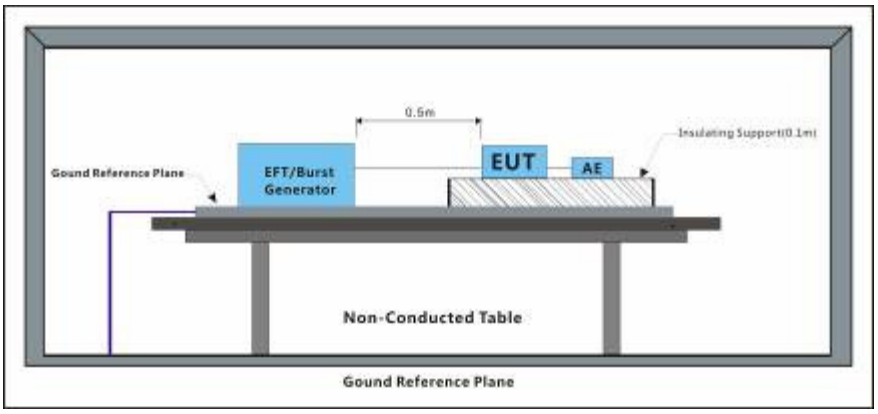
Results:

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

7.3 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 55014-2:2015
Test Method: EN 61000-4-4:2012
Performance Criterion: B
Repetition Frequency: 5kHz
Burst Period: 300ms
Test Duration: 2 minute per level & polarity

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar
Test mode: a:Keep EUT heating & running continual.

7.3.3 Test Results:

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

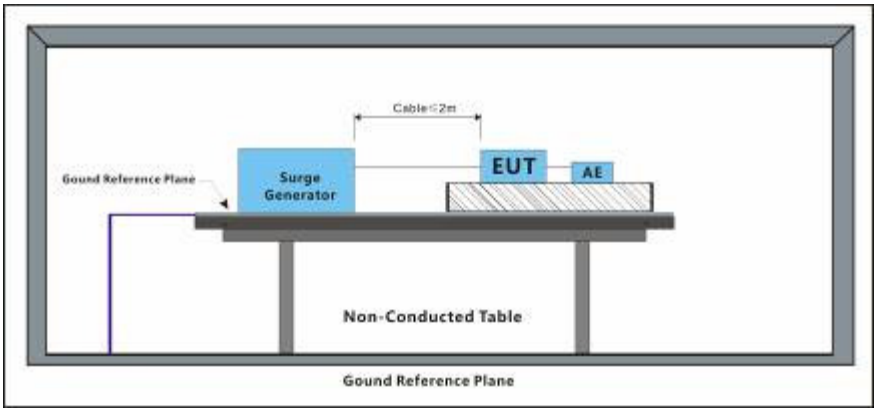
Results:

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

7.4 Surge at Power Port

Test Requirement: EN 55014-2:2015
Test Method: EN 61000-4-5:2014
Performance Criterion: B
Interval: 60s between each surge
No. of surges: 5 positive at 90°, 5 negative at 270°.

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar
Test mode: a:Keep EUT heating & running continual.

7.4.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A

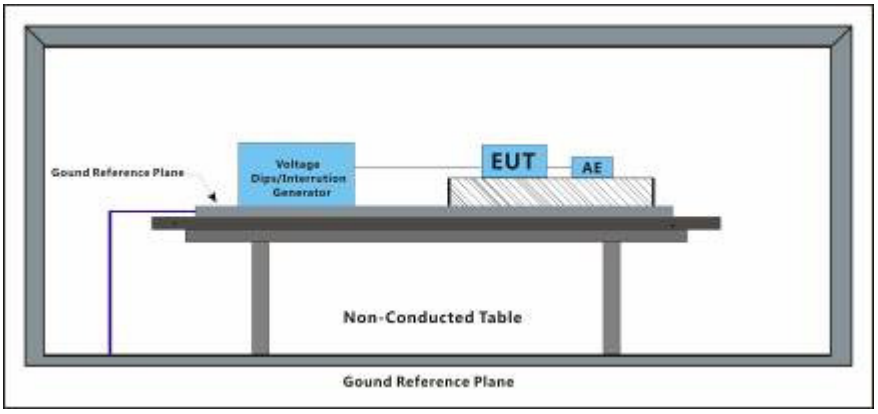
Results:

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

7.5 Voltage Dips and Interruptions

Test Requirement: EN 55014-2:2015
Test Method: EN 61000-4-11:2004
Performance Criterion: For 50Hz:
0% of UT (Rated Voltage) for 0.5 Cycle: C;
40% of UT for 10 Cycle: C;
70% of UT for 25 Cycle: C
No. of Dips / Interruptions: 3 per Level
Time between dropout 10s

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar
Test mode: a:Keep EUT heating & running continual.

7.5.3 Test Results:

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycles	3	A
0	180°	0.5 Cycles	3	A
40	0°	10 Cycles	3	A
40	180°	10 Cycles	3	A
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A

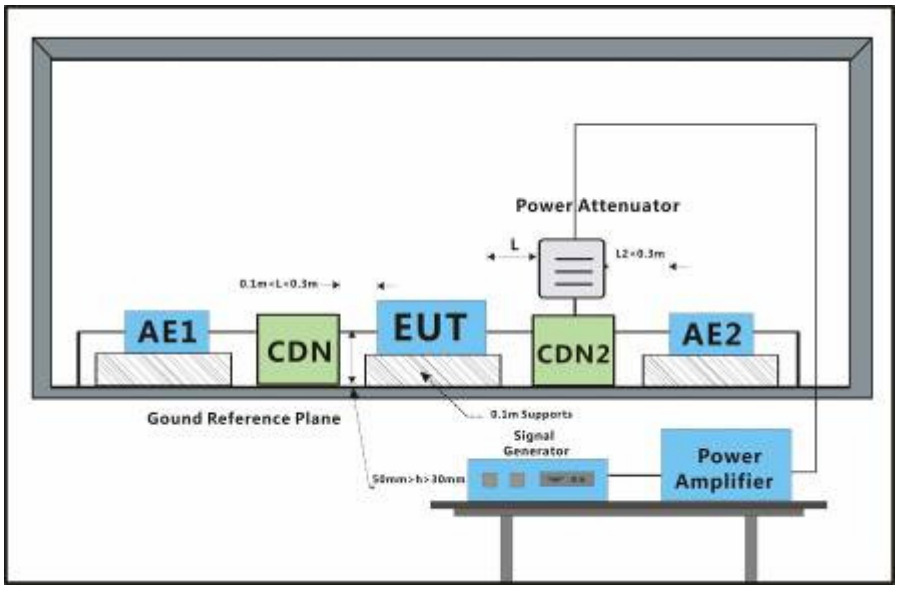
Results:

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

7.6 Conducted Immunity at Power Port (150kHz-230MHz)

Test Requirement: EN 55014-2:2015
Test Method: EN 61000-4-6:2014
Performance Criterion: A
Frequency Range: 0.15MHz to 230MHz
Modulation: 80%, 1kHz Amplitude Modulation
Step Size 1%

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a:Keep EUT heating & running continual.

7.6.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	2s	A

Results:

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

8 Photographs

8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup

For the model YH-09 without temperature controller

For the model YH-09 with temperature controller

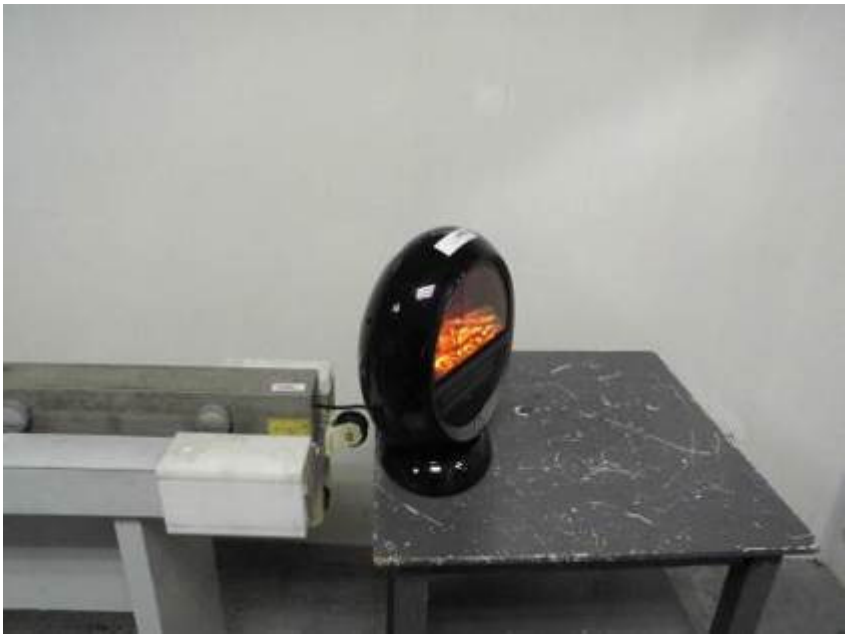
8.2 Discontinuous Disturbance (150kHz-30MHz) Test Setup

For the model YH-09 without temperature controller

For the model YH-09 with temperature controller

8.3 Disturbance Power Test Setup

For the model YH-09 without temperature controller



For the model YH-09 with temperature controller

8.4 Harmonic & Voltage Fluctuations and Flicker Test Setup

For the model YH-09 without temperature controller

For the model YH-09 with temperature controller

8.5 Electrostatic Discharge Test Setup

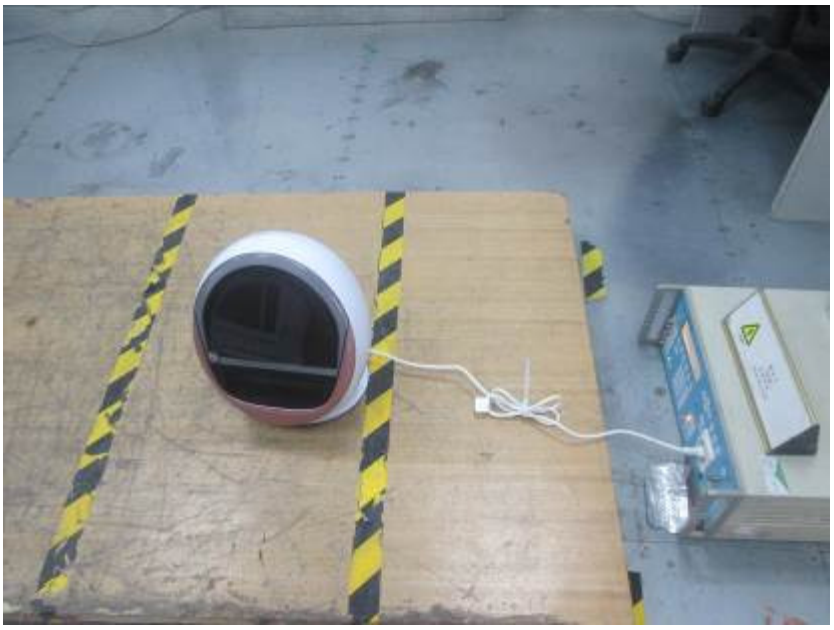
For the model YH-09 without temperature controller

For the model YH-09 with temperature controller

8.6 Electrical Fast Transients/Burst at Power Port Test Setup

For the model YH-09 without temperature controller

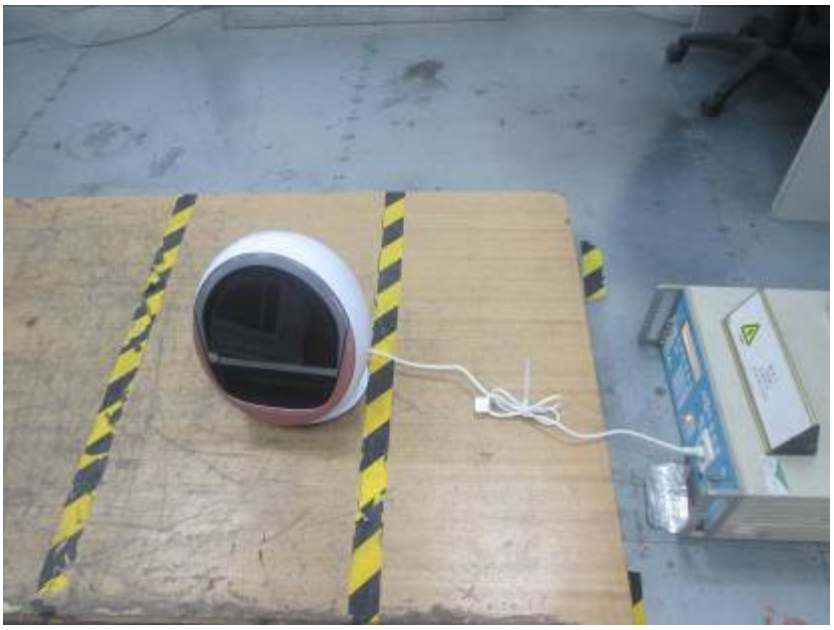
For the model YH-09 with temperature controller



8.7 Surge at Power Port Test Setup

For the model YH-09 without temperature controller

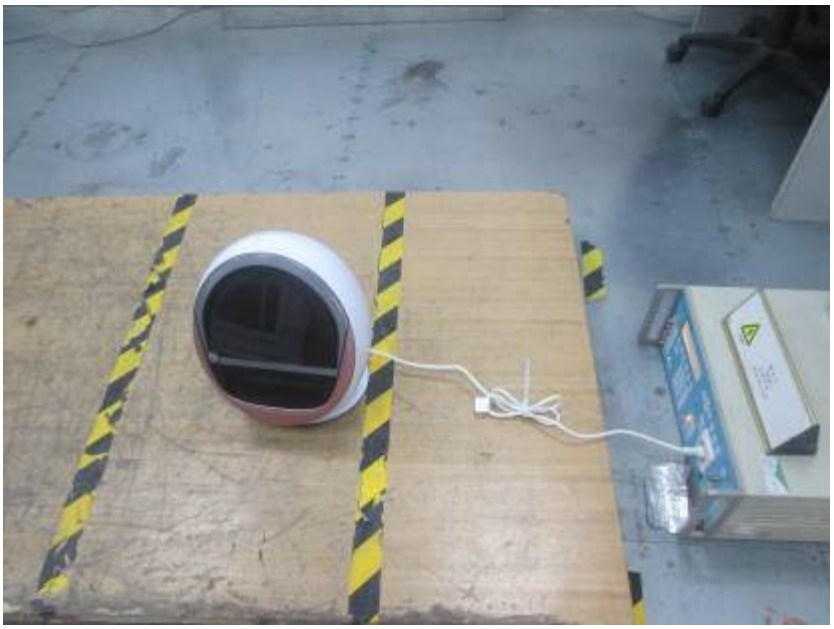
For the model YH-09 with temperature controller



8.8 Voltage Dips and Interruptions Test Setup

For the model YH-09 without temperature controller

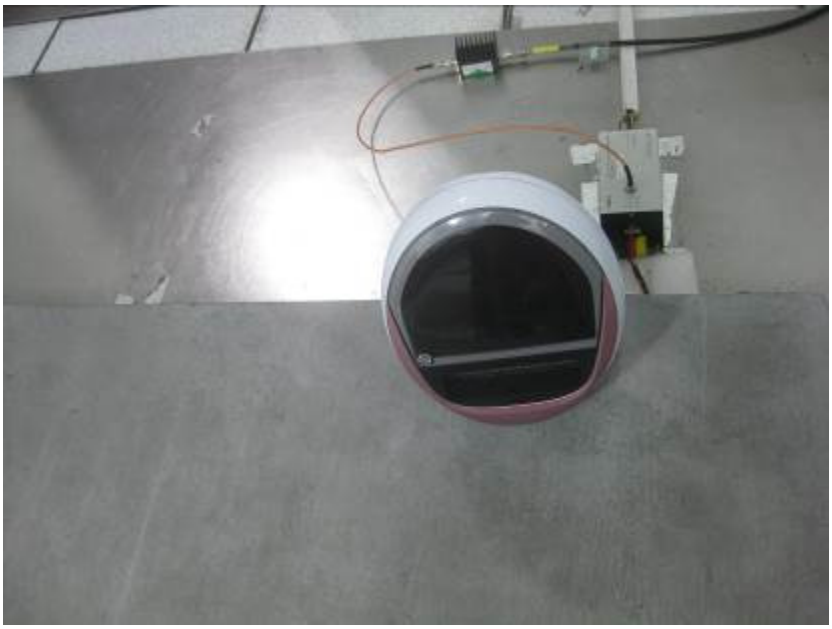
For the model YH-09 with temperature controller



8.9 Conducted Immunity at Power Port (150kHz-230MHz) Test Setup

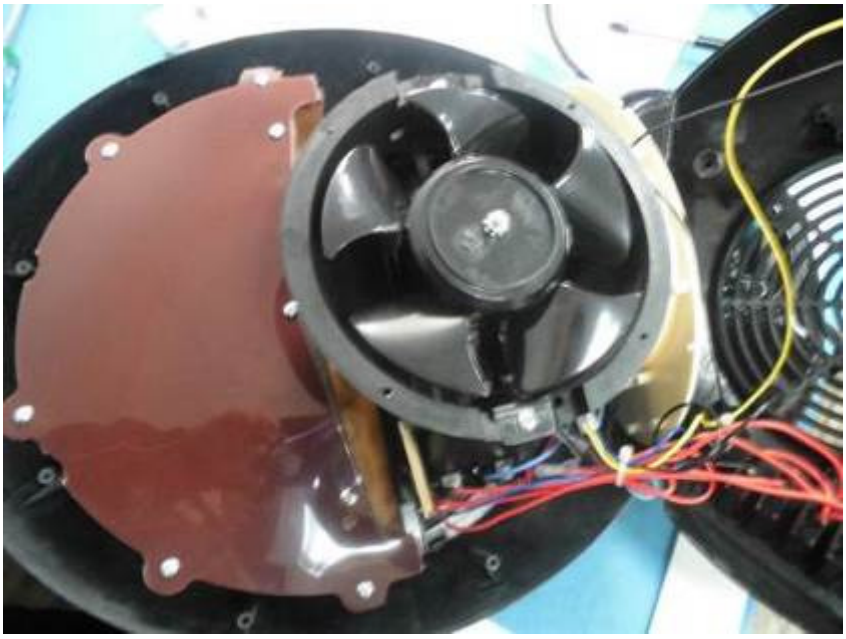
For the model YH-09 without temperature controller

For the model YH-09 with temperature controller

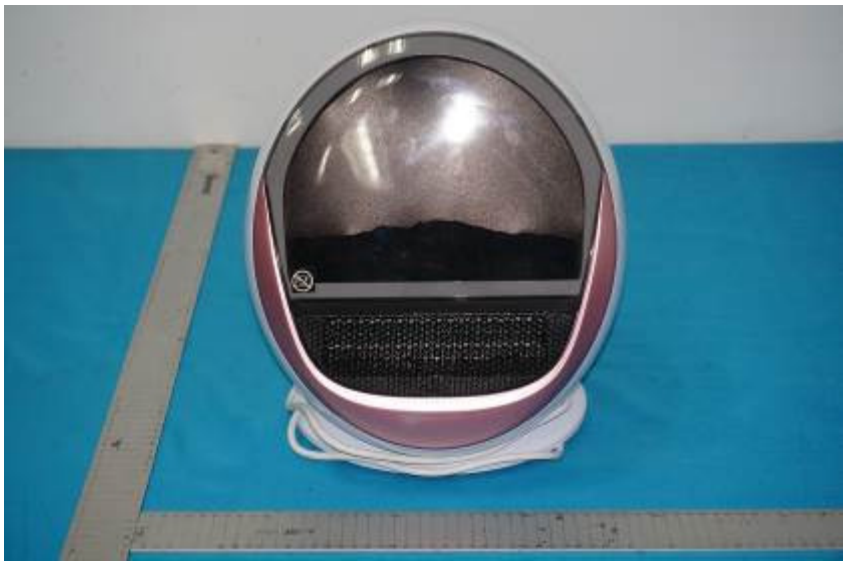


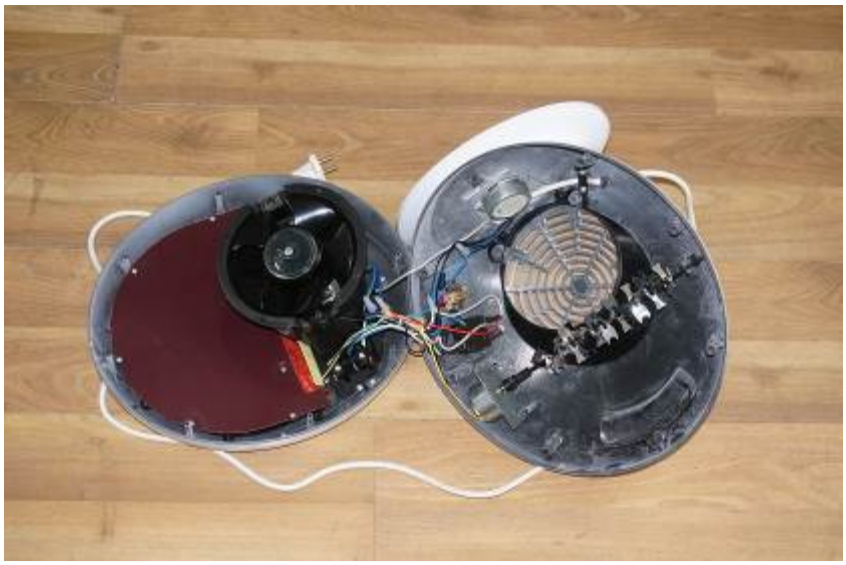
8.10 EUT Constructional Details (EUT Photos)

For the model YH-09 without temperature controller



For the model YH-09 with temperature controller





- End of the Report -