



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

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Report No.: SHEM171000697401  
Page: 1 of 43

## TEST REPORT

**Application No.:** SHEM1710006974HS  
**Applicant:**  
**Address of Applicant:**

**Manufacturer:**  
**Address of Manufacturer:**

**Factory:**  
**Address of Factory:**

### Equipment Under Test (EUT):

**EUT Name:** HAIR CLIPPER  
**Model No.:** HC-002, HC-001, HC-005, HC-006, HC-008, HC-2011 ✕  
✕ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

### Trade Mark:

**Standards:** EN 55014-1:2006 +A1:2009 +A2:2011, EN 61000-3-2:2014  
EN 61000-3-3:2013, EN 55014-2:2015

**Date of Receipt:** 2017-10-18  
**Date of Test:** 2017-10-23 to 2017-10-24  
**Date of Issue:** 2017-11-27

<b>Test Result :</b>	<b>Pass*</b>
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\* 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.

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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
00	/	2017-11-27	/	Original

<b>Authorized for issue by:</b>			
<b>Tested By</b>			2017-10-23
	_____		_____
	<b>Andy_yang /Project Engineer</b>		<b>Date</b>
<b>Checked By</b>			2017-10-24
	_____		_____
	<b>Zenger_zhang /Reviewer</b>		<b>Date</b>



## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 55014-1:2006 +A1:2009 +A2:2011	CISPR 16-2-1	N/A	Pass
Radiated Emissions (30MHz-1GHz)	EN 55014-1:2006 +A1:2009 +A2:2011	CISPR 16-2-3	N/A	Pass
Harmonic Current Emission	EN 61000-3-2:2014	EN 61000-3-2:2014	Class A	N/A*
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 For 60Hz: 0% UT for 0.5per 40 % UT for 12per 70 % UT for 30per	Pass
Conducted Immunity at Power Port (150kHz-230MHz)	EN 55014-2:2015	EN 61000-4-6:2014	3Vrms (emf), 80%, 1kHz Amp. Mod.	Pass
Radiated Immunity (80MHz-1GHz)	EN 55014-2:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass

N/A: Not applicable

N/A\*: Please refer to section 6.3 of this report for more details.

Note: There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model HC-002 was tested since their differences are model number and appearance.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	Input :100-240V 50/60Hz 0.2A MAX Output : DC 3V 600Ma 3W
Test voltage:	For charging mode: 230V For running mode: DC 3V
Cable:	DC cable 1.8m

### 4.2 Description of Support Units

None.

### 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)
	Conducted Emission at mains port using VP	1.9 dB(9kHz to 30MHz)
	Conducted Emission at telecommunication port using AAN	2.4 dB(150kHz to 30MHz)
2	Radiated Power	3.5dB
3	Radiated emission	4.4dB (30MHz-1GHz )
		4.6dB (1GHz-6GHz )
4	Radiated Immunity	1.64dB
5	Conducted Immunity	0.96dB
6	ESD	6 %
7	EFT (Electrical Fast Transients)	5 %
8	Surge Immunity	5 %
9	Voltage Dips and Interruptions	4 %
10	20 system	1.5dB
11	Temperature test	1 °C
12	Humidity test	3%
13	DC power test	0.5 %



#### 4.4 Standards Applicable for Testing

**Table 1 : Tests Carried Out Under EN 55014-1:2006 +A1:2009 +A2:2011**

Item	Status
Conducted Emissions at Mains Terminals (9kHz-30MHz)	×
Conducted Emissions at Mains Terminals (150kHz-30MHz)	√
Conducted Emissions at Load Terminals and Additional Terminals	×
Discontinuous Disturbance (150kHz-30MHz)	×
Disturbance Power	×
Radiated Emissions (30MHz-1GHz)	√
Radiated Emissions (Magnetic field Induced Current)(9kHz-30MHz)	×

**Table 2 : Tests Carried Out Under EN 61000-3-2:2014**

Item	Status
Harmonic Current Emission	×

**Table 3 : Tests Carried Out Under EN 61000-3-3:2013**

Item	Status
Voltage Fluctuations and Flicker	√

**Table 4 : Tests Carried Out Under EN 55014-2:2015**

Item	Status
Electrostatic Discharge	√
Radiated Immunity (80MHz-1GHz)	√
Electrical Fast Transients/Burst at Power Port	√
Electrical Fast Transients/Burst at Signal Port	×
Surge at Power Port	√
Conducted Immunity at Power Port (150kHz-80MHz)	×
Conducted Immunity at Signal Port (150kHz-80MHz)	×
Voltage Dips and Interruptions	√
Conducted Immunity at Power Port (150kHz-230MHz)	√
Conducted Immunity at Signal Port (150kHz-230MHz)	×
Electrical Fast Transients/Burst at DC port	×
Conducted Immunity at DC Port (150kHz-80MHz)	×

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



#### **4.5 Test Location**

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

Tests were sub-contracted.

Ningbo Joysun Product Testing Service Co., Ltd.

No. 66, Qingyi Road, Hi-Tech Distric, Ningbo, Zhejiang, China

#### **4.6 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.

- **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-2221,G-830 respectively.

#### **4.7 Deviation from Standards**

None

#### **4.8 Abnormalities from Standard Conditions**

None

#### **4.9 Monitoring of EUT for All Immunity Test**

Visual: Working Status of the EUT



## 5 Equipment List

CE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESCI	100708	R&S	2018/2/24
Artificial mains network	ENV216	101022	R&S	2018/2/24
Artificial mains network	ESH2-Z5	100198	R&S	2018/2/24
Pulse Limiter	ESH3-Z2	100847	R&S	2018/2/24
Control Room2	(11.2*5.2*3.3)		Albatross	2020/3/2

RE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESU26	100224	R&S	2018/2/24
Combined antenna	VULB 9163	9163-563	SCHWARZBECK	2018/2/24
Horn antenna	HF907	100147	R&S	2018/2/24
Preamplifier	SCU18	10042	R&S	2018/2/24
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)		Albatross	2019/10/8
EMI receiver	ESR 7	101203	R&S	2018/2/24
Combined antenna	VULB 9163	9163-560	SCHWARZBECK	2018/2/24
Semi -Anechoic Chamber	5M (12.1*7.3*6)		Albatross	2020/3/2

Flicker

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Harmonic and flicker test system	DPA500	V0746103124	EM TEST	2018/2/24
AC Power Source	500lix-400-413	58311	CI	2018/2/24
Shielding Room1	(10*6.1*3.3)		Albatross	2020/3/2
Harmonic and flicker test system(3phase)	DPA503	V0828104013	EM TEST	2018/2/24
AC Power Source	61705	617050000124	Chroma	2018/2/24
Shielding Room2	(10*4.9*3.0)		Albatross	2020/3/2

ESD

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
ESD gun	dito	DITO B07040	EM TEST	2018/2/24



EFT

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2018/2/24
booster	MV2616	V0746103126	EM TEST	2018/2/24
Coupling clamp	HFK	0108-27	EM TEST	2018/2/24
Shielding Room2	(10*4.9*3.0)		Albatross	2020/3/2

Surge

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2018/2/24
booster	MV2616	V0746103126	EM TEST	2018/2/24
Shielding Room2	(10*4.9*3.0)		Albatross	2020/3/2

CI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Attenuator	75-A-FFN-06	141733	BIRD	2018/2/24
CDN for Two/Three Supply Main Line	FCC-801-M2/M3-16A	7079	FISCHER	2018/2/24
CDN for Two/Three Supply Main Line	CDN-M2+3	A2210412/2016	Frankonia	2018/2/24
Coupling/Decoupling Network	DC2600M2	327429	AR	2018/2/24
Decoupling network	F-2031-23MM-DCN	8225	FISCHER	2018/2/24
EM injection clamp	F-2031-23MM	8562	FISCHER	2018/2/24
POWER AMPLIFIER	75A250A	327549	AR	2018/2/24
Integrated measurement system	IMS	100012	R&S	2018/2/24
Smart sensor technology	NRP-Z91	100520	R&S	2018/2/24
Control Room1	(11.2*5.2*3.3)		Albatross	2020/3/2
Conduct Immunity Test System	CIT-10-75	126B1413/2016	Frankonia	2018/2/24
Shielding Room2	(10*4.9*3.0)		Albatross	2020/3/2



Dips

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2018/2/24
booster	MV2616	V0746103126	EM TEST	2018/2/24
Shielding Room2	(10*4.9*3.0)		Albatross	2020/3/2

RI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)		Albatross	2019/10/8
LOGPERIODIC ANTENNA	AT1080	325189	AR	2018/2/24
Horn antenna	AT4002A	328236	AR	2018/2/24
Coupling/Decoupling Network	DC6180M1	328058	AR	2018/2/24
Coupling/Decoupling Network	DC7144M1	327100	AR	2018/2/24
POWER AMPLIFIER	250W1000A	327579	AR	2018/2/24
POWER AMPLIFIER	80S1G3	327495	AR	2018/2/24
Integrated measurement system	IMS	100012	R&S	2018/2/24
Smart sensor technology	NRP-Z91	100520	R&S	2018/2/24

## 6 Emission Test Results

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

Test Requirement:	EN 55014-1:2006 +A1:2009 +A2:2011
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

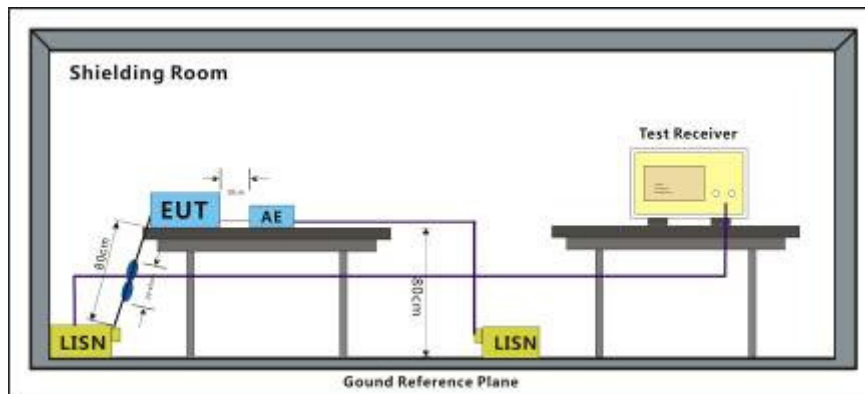
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1010 mbar

The worst case for final test: b: Charging mode: Keep EUT charging continuously.

#### 6.1.2 Test Setup Diagram



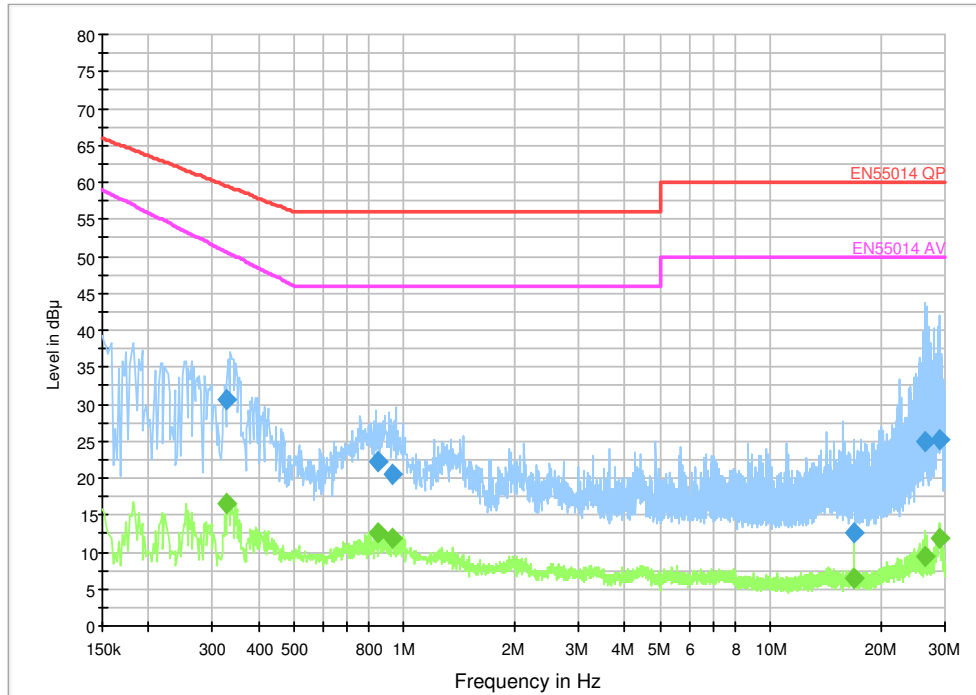
#### 6.1.3 Measurement Data

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.



Mode:b; Line:Live Line

Voltage with 2-Line-LISN



### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.329000	30.7	1000.0	9.000	Off	L1	10.7	28.8	59.5
0.844000	22.1	1000.0	9.000	Off	L1	10.8	33.9	56.0
0.929000	20.5	1000.0	9.000	Off	L1	10.8	35.5	56.0
16.963000	12.7	1000.0	9.000	Off	L1	10.9	47.3	60.0
26.410000	24.8	1000.0	9.000	Off	L1	11.0	35.2	60.0
28.968000	25.2	1000.0	9.000	Off	L1	11.0	34.8	60.0

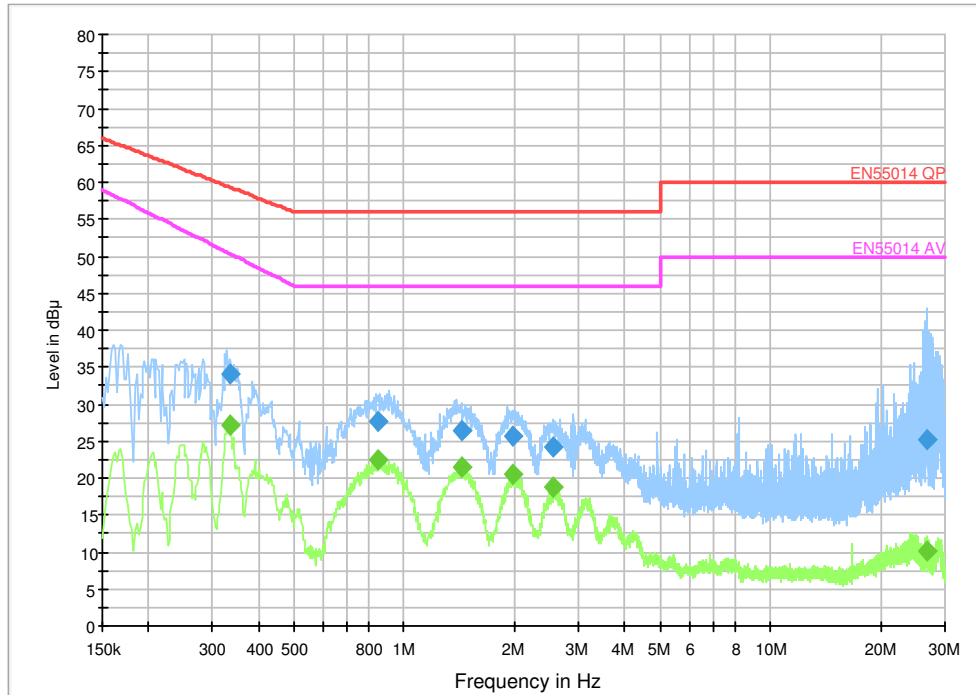
### Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.329000	16.6	1000.0	9.000	Off	L1	10.7	33.9	50.5
0.844000	12.6	1000.0	9.000	Off	L1	10.8	33.4	46.0
0.929000	11.9	1000.0	9.000	Off	L1	10.8	34.1	46.0
16.963000	6.5	1000.0	9.000	Off	L1	10.9	43.5	50.0
26.410000	9.3	1000.0	9.000	Off	L1	11.0	40.7	50.0
28.968000	12.0	1000.0	9.000	Off	L1	11.0	38.0	50.0



Mode:b; Line:Neutral Line

Voltage with 2-Line-LISN



### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.333000	34.1	1000.0	9.000	Off	N	10.7	25.3	59.4
0.852000	27.7	1000.0	9.000	Off	N	10.8	28.3	56.0
1.438000	26.4	1000.0	9.000	Off	N	10.7	29.6	56.0
1.983000	25.6	1000.0	9.000	Off	N	10.8	30.4	56.0
2.554000	24.3	1000.0	9.000	Off	N	10.8	31.7	56.0
26.838000	25.2	1000.0	9.000	Off	N	11.2	34.8	60.0

### Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.333000	27.2	1000.0	9.000	Off	N	10.7	23.2	50.4
0.852000	22.4	1000.0	9.000	Off	N	10.8	23.6	46.0
1.438000	21.6	1000.0	9.000	Off	N	10.7	24.4	46.0
1.983000	20.5	1000.0	9.000	Off	N	10.8	25.5	46.0
2.554000	18.8	1000.0	9.000	Off	N	10.8	27.2	46.0
26.838000	10.1	1000.0	9.000	Off	N	11.2	39.9	50.0

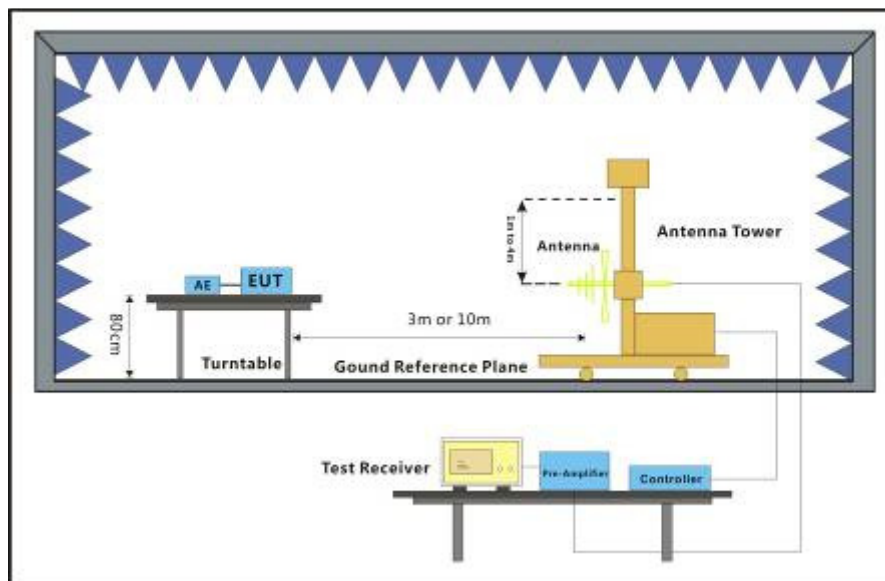
## 6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 55014-1:2006 +A1:2009 +A2:2011
Test Method:	CISPR 16-2-3
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz-230MHz	40 dB(μV/m) quasi-peak
230MHz-1GHz	47 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

### 6.2.1 E.U.T. Operation

Operating Environment:	
Temperature:	22 °C      Humidity: 52 % RH      Atmospheric Pressure: 1004 mbar
The worst case for final test:	a: Running mode: Keep the internal motor of EUT running continuously. b: Charging mode: Keep EUT charging continuously.

### 6.2.2 Test Setup Diagram



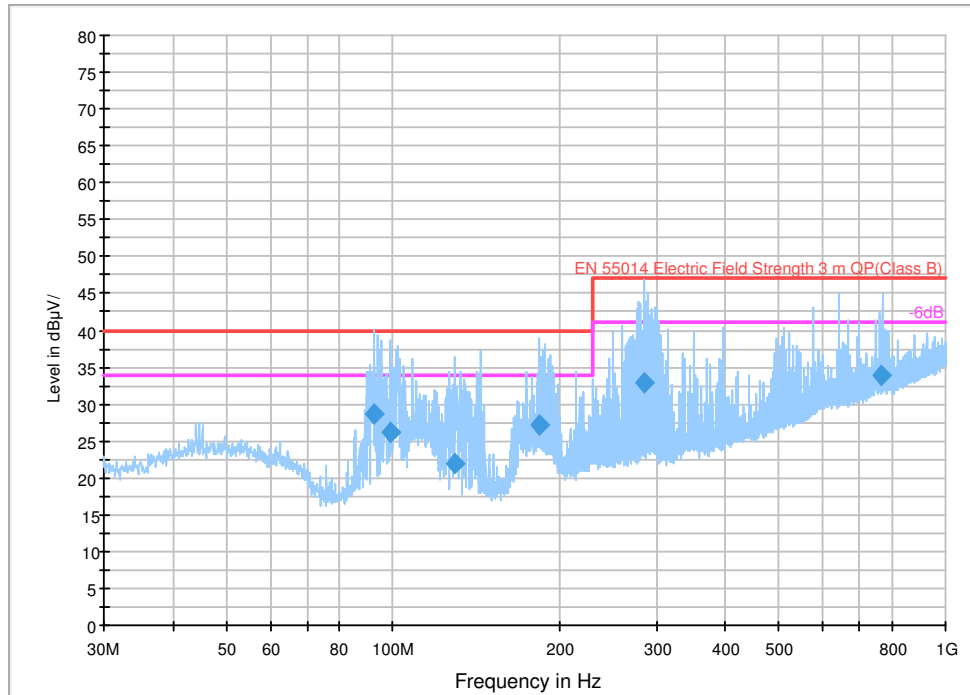
### 6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



Mode:a; Polarization:Horizontal

Radiated EMI Auto Test (30-1000MHz)



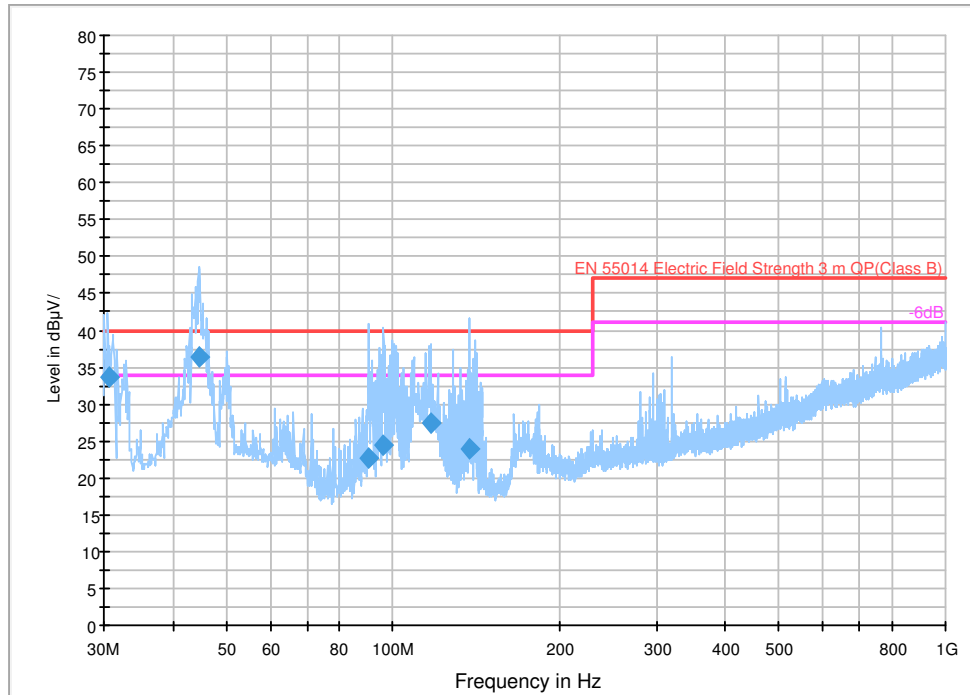
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)
92.408000	28.7	1000.0	120.000	192.0	H	-12.0	12.4	11.3	40.0
99.047000	26.1	1000.0	120.000	248.0	H	2.0	13.4	13.9	40.0
129.856000	22.0	1000.0	120.000	148.0	H	30.0	10.4	18.0	40.0
184.196000	27.1	1000.0	120.000	165.0	H	0.0	11.7	12.9	40.0
285.424000	33.0	1000.0	120.000	100.0	H	99.0	15.1	14.0	47.0
767.759000	33.8	1000.0	120.000	100.0	H	-30.0	23.6	13.2	47.0



Mode:a; Polarization:Vertical

Radiated EMI Auto Test (30-1000MHz)



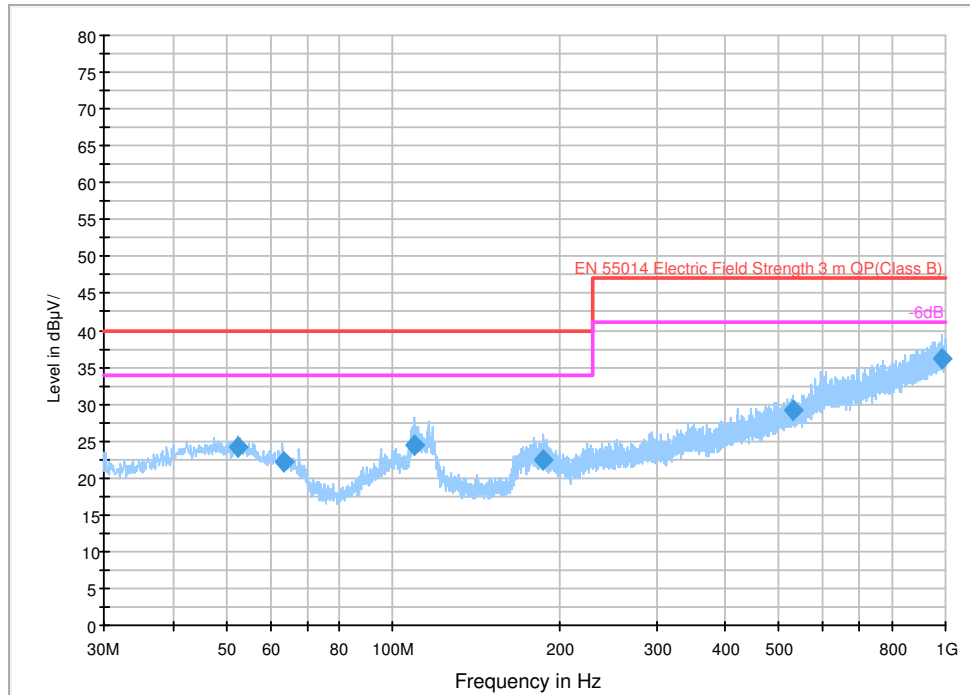
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)
30.645000	33.7	1000.0	120.000	100.0	V	62.0	12.2	6.3	40.0
44.761000	36.3	1000.0	120.000	100.0	V	170.0	15.3	3.7	40.0
90.280000	22.8	1000.0	120.000	133.0	V	354.0	11.9	17.2	40.0
96.408000	24.3	1000.0	120.000	148.0	V	274.0	13.0	15.7	40.0
116.792000	27.5	1000.0	120.000	100.0	V	320.0	12.4	12.5	40.0
137.596000	23.9	1000.0	120.000	100.0	V	315.0	10.0	16.1	40.0



Mode:b; Polarization:Horizontal

Radiated EMI Auto Test (30-1000MHz)



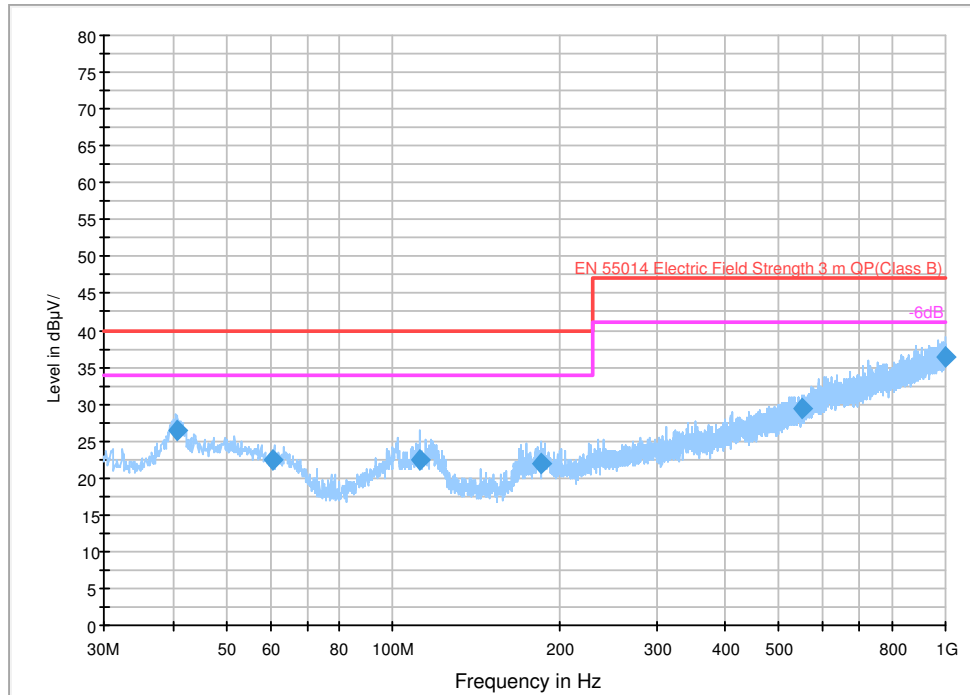
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)
52.527000	24.1	1000.0	120.000	119.0	H	52.0	15.4	15.9	40.0
63.311000	22.2	1000.0	120.000	100.0	H	219.0	13.5	17.8	40.0
109.312000	24.5	1000.0	120.000	291.0	H	8.0	13.5	15.5	40.0
187.445000	22.4	1000.0	120.000	163.0	H	214.0	12.1	17.6	40.0
529.470000	29.1	1000.0	120.000	120.0	H	256.0	19.9	17.9	47.0
981.062000	36.1	1000.0	120.000	191.0	H	-5.0	25.8	10.9	47.0



Mode:b; Polarization:Vertical

Radiated EMI Auto Test (30-1000MHz)



### Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB µ V/m)
40.753000	26.4	1000.0	120.000	119.0	V	252.0	14.6	13.6	40.0
60.783000	22.5	1000.0	120.000	100.0	V	-24.0	13.8	17.5	40.0
112.376000	22.5	1000.0	120.000	100.0	V	124.0	13.2	17.5	40.0
185.648000	21.8	1000.0	120.000	100.0	V	40.0	11.9	18.2	40.0
548.368000	29.4	1000.0	120.000	205.0	V	324.0	20.1	17.6	47.0
999.960000	36.3	1000.0	120.000	119.0	V	28.0	26.0	10.7	47.0



### **6.3 Harmonic Current Emission**

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2:2014.

For further details, please refer to Clause 7 of EN 61000-3-2 which states:

"For the following categories of equipment, limits are not specified in this standard.- equipment with a rated power of 75W or less, other than lighting equipment."

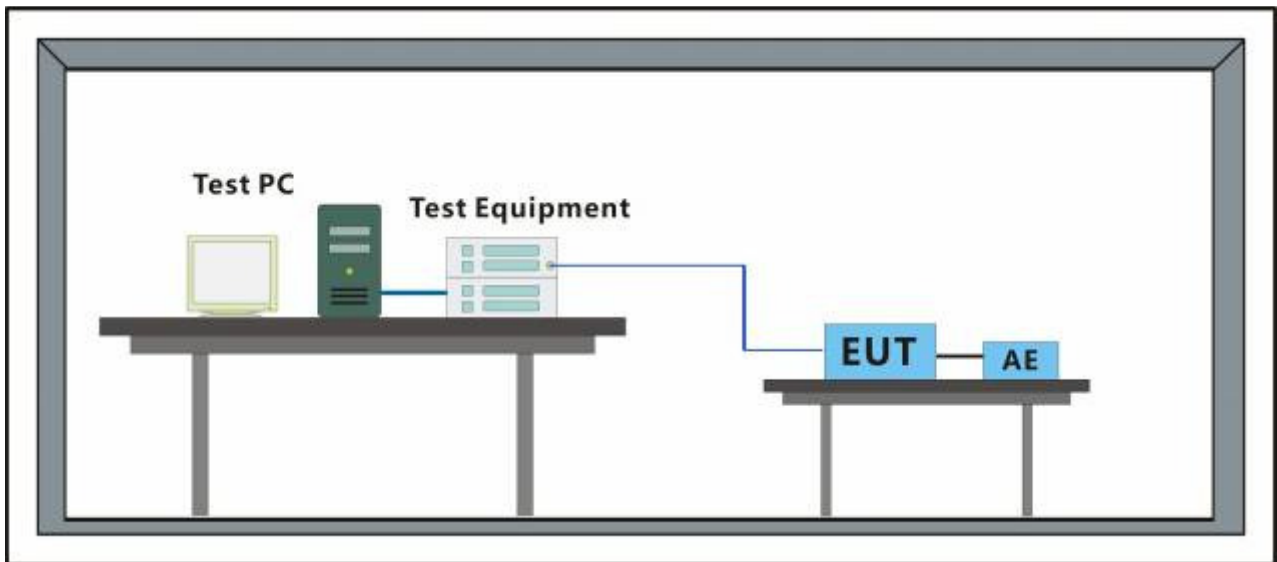
## 6.4 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013  
Test Method: EN 61000-3-3:2013

### 6.4.1 E.U.T. Operation

Operating Environment:  
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar  
The worst case for final test: b: Charging mode: Keep EUT charging continuously.

### 6.4.2 Test Setup Diagram



### 6.4.3 Measurement Data

Mode:b

#### Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.004	3.30	PASS
dmax [%]	0.095	7.00	PASS
dt [s]	0.000	0.50	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.





**7.2.3 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

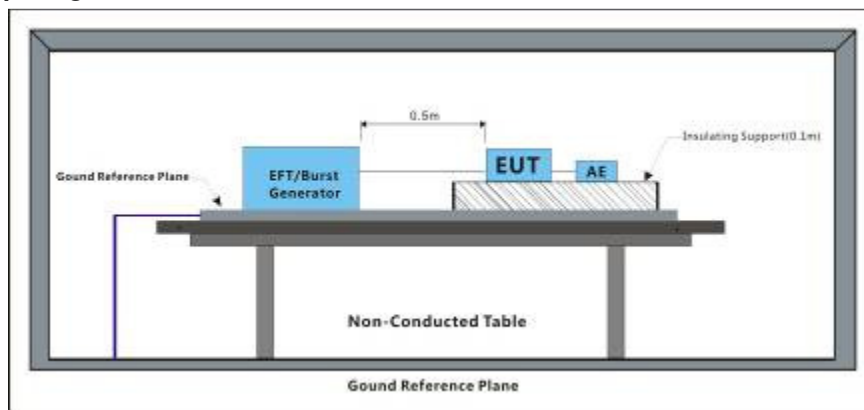
**Results:**

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: 51 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: b: Charging mode: Keep EUT charging continuously.

#### 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

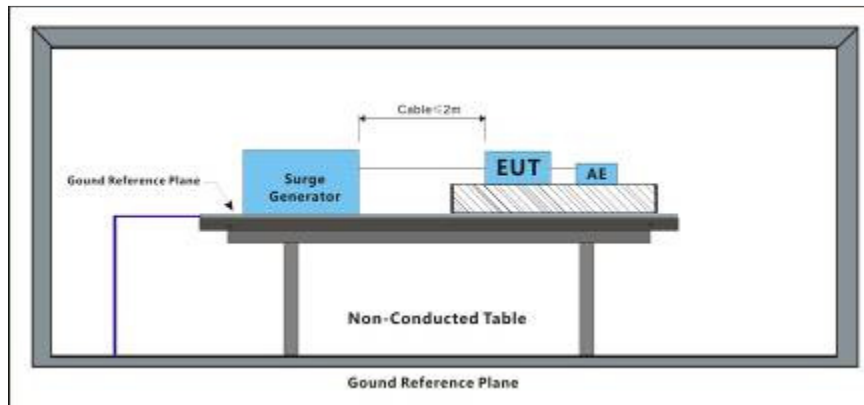
#### Results:

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: 51 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: b: Charging mode: Keep EUT charging continuously.

### 7.4.3 Test Results:

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

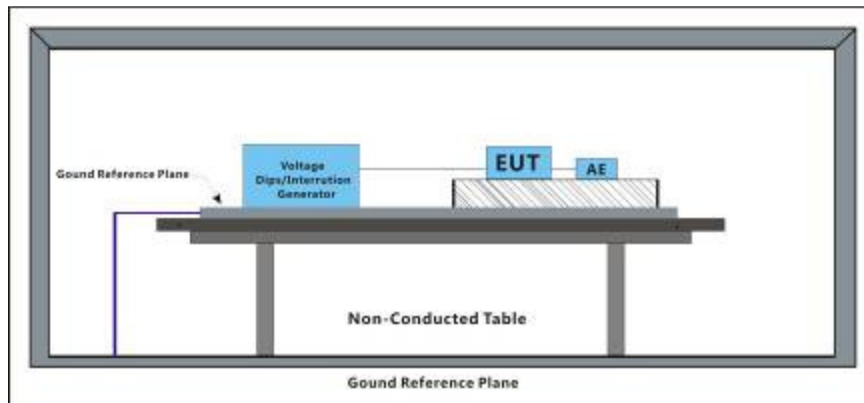
#### Results:

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  
 For 60Hz:  
 0% of UT (Rated Voltage) for 0.5 Cycle: C;  
 40% of UT for 12 Cycle: C;  
 70% of UT for 30 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: 51 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: b: Charging mode: Keep EUT charging continuously.

### 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

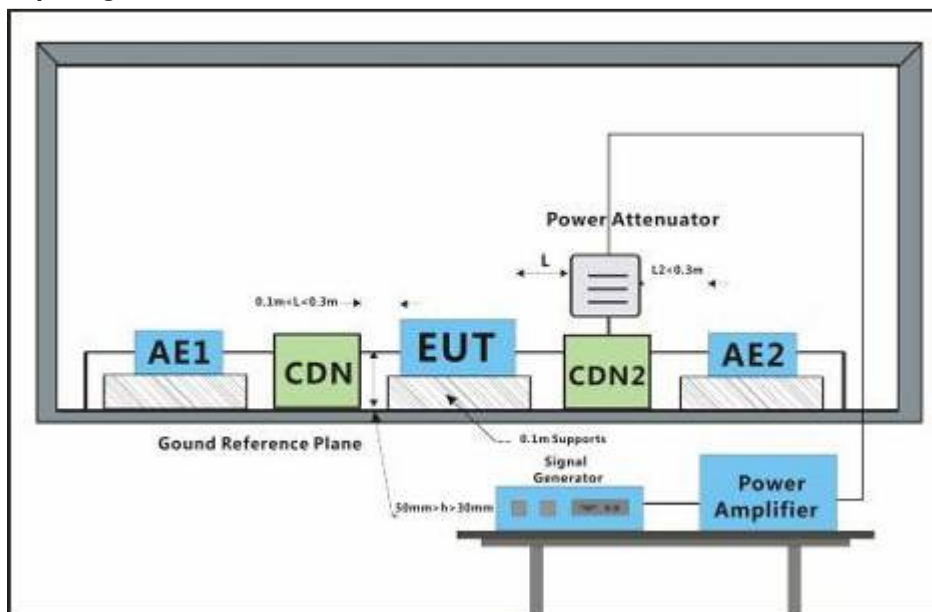
### Results:

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:	21 °C	Humidity:	50 % RH	Atmospheric Pressure:	1002 mbar
Test mode:	b: Charging mode: Keep EUT charging continuously.				

### 7.6.3 Test Results:

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

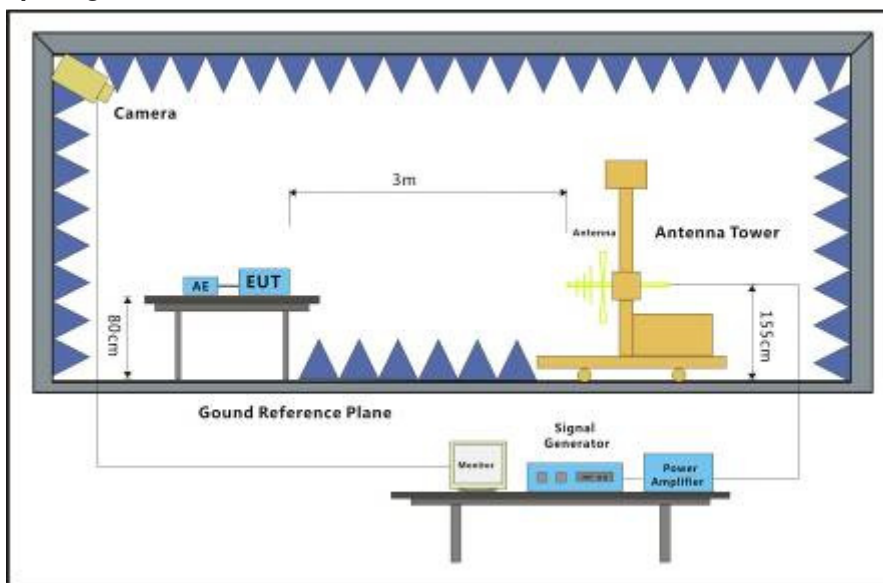
#### Results:

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

### 7.7 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 55014-2:2015  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

#### 7.7.1 Test Setup Diagram



#### 7.7.2 E.U.T. Operation

Operating Environment:  
 Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar  
 Test mode:  
 a: Running mode: Keep the internal motor of EUT running continuously.  
 b: Charging mode: Keep EUT charging continuously.

#### 7.7.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	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



### 8.2 Radiated Emissions (30MHz-1GHz) Test Setup

Running mode



Charging mode



### 8.3 Voltage Fluctuations and Flicker Test Setup



### 8.4 Electrostatic Discharge Test Setup

Running mode



Charging mode



### 8.5 Electrical Fast Transients/Burst at Power Port Test Setup



### 8.6 Surge at Power Port Test Setup



### 8.7 Voltage Dips and Interruptions Test Setup



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



## 8.9 Radiated Immunity (80MHz-1GHz) Test Setup

Running mode



Charging mode

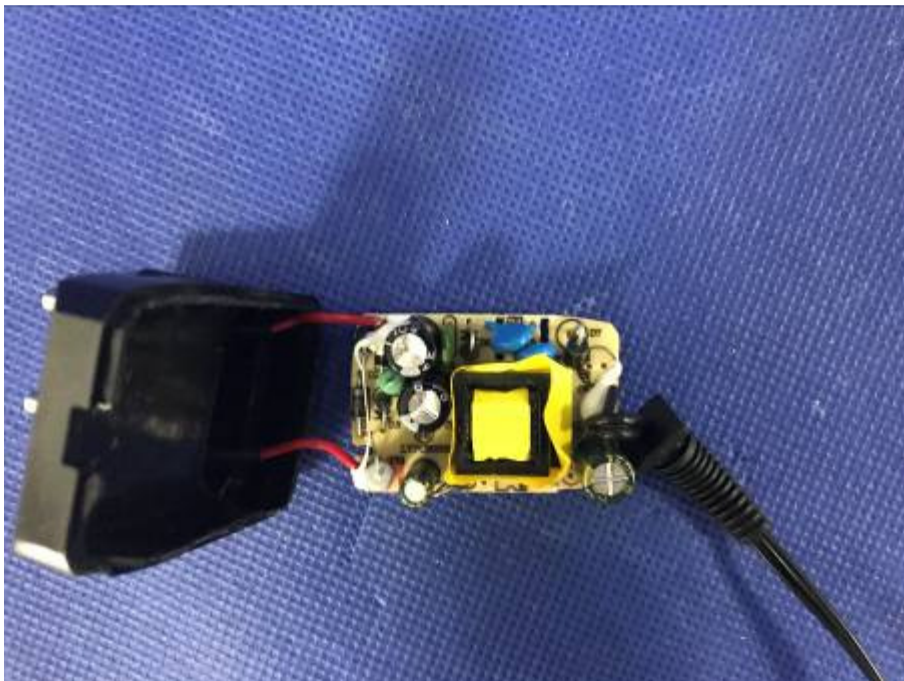
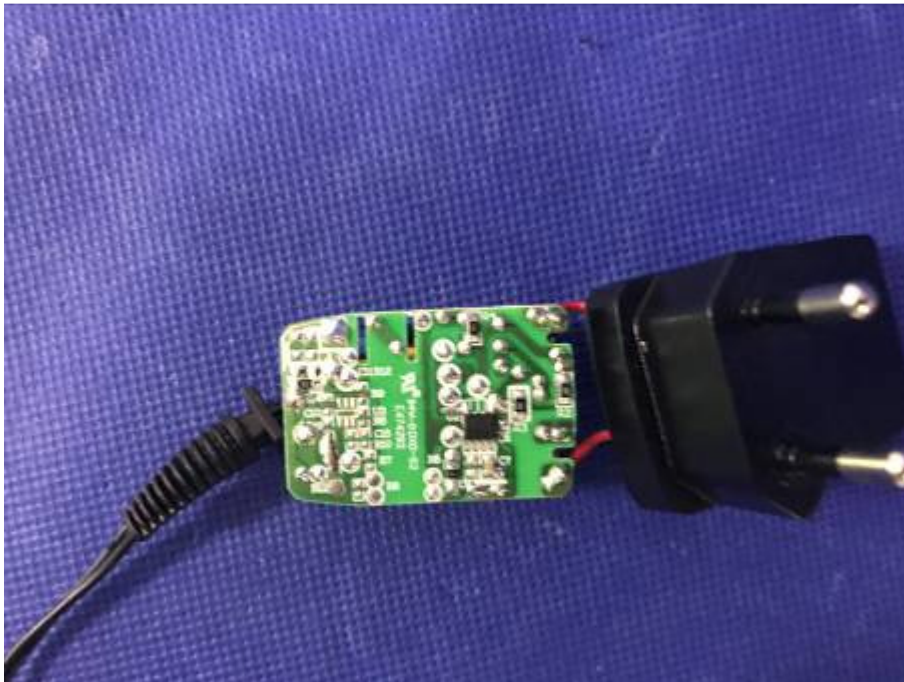


### 8.10 EUT Constructional Details











Model: HC-001





Model: HC-008



Model: HC-005



Model: HC-006



Model: HC-2011



--End of the Report--