

## TEST REPORT

Test Report # 23D-000873(A1) Date of Report Issue: September 1, 2023  
Date of Sample Received: August 14, 2023 Pages: Page 1 of 14

### CLIENT INFORMATION:

Company: Mid Ocean Brands B.V.  
Company Address: 7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong



### SAMPLE INFORMATION:

Description: String with 20 led lights (wood figurine star)  
Assortment: - Purchase Order Number: -  
SKU/Style/UPC No.: CX1462 Toy Co./Agency: -  
Factory/Supplier/Vendor: - Buyer: -  
Country of Origin: - Labeled Age Grade: -  
Country of Distribution: Europe Recommended Age Grade: -  
Quantity Submitted: 5 pcs + 1 lot parts Tested Age Grade: -  
Testing Period: 08/14/2023 – 08/30/2023 Materials: wood

### OVERALL RESULT:

 **PASS**

Refer to page 2 for test result summary and appropriate notes.

QIMA Hansecontrol Testing Service (Dongguan)  
Co. Ltd.

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Organic & Inorganic Leader, Chemical Laboratory

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Test(s) marked with 'φ' was subcontracted to external laboratory.

The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and method /regulation section(s) tested as described herein. If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule.

<https://www.qima.com/conditions-of-service#decisionRule>.

**TEST RESULTS SUMMARY:**

At the request of the client, the following tests were conducted:

CONCLUSION	TEST(S) CONDUCTED
PASS	Directive 2011/65/EU and its amendment Directive (EU) 2015/863, Restriction of the Use of Certain Hazardous Substances (RoHS), Phthalates Content (DBP, BBP, DEHP, DIBP)
PASS	Directive 2011/65/EU and amendments, Restriction of the Use of Certain Hazardous Substances in Electrical and electronic equipment (RoHS)
PASS	Regulation (EC) No. 2019/1021 Persistent Organic Pollutants, ANNEX I – Pentachlorophenol and its Salts and Esters Content
PASS	Client's Requirement, Formaldehyde Release in resin-bonded wood
PASS	EN 62471:2008 Photobiological Safety of Lamps and Lamps systems <sup>ϕ</sup>
PASS	EN 55015 / EN 61547-Lighting Equipment (D.C.)-Electromagnetic Compatibility (EMC) <sup>ϕ</sup>

Appendix I attached.

**DETAILED RESULTS:**

**Directive 2011/65/EU and its amendment Directive (EU) 2015/863, Restriction of the Use of Certain Hazardous Substances (RoHS), Phthalates Content (DBP, BBP, DEHP, DIBP)**

Test Method: IEC 62321-8:2017  
 Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		2+3+4	5+6+7	15	---	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl phthalate (DBP)	84-74-2	ND	ND	ND	---	<b>0.1</b>
Benzyl butyl phthalate (BBP)	85-68-7	ND	ND	ND	---	<b>0.1</b>
Di-(2-ethylhexyl) phthalate (DEHP)	117-81-7	ND	ND	ND	---	<b>0.1</b>
Diisobutyl phthalate (DIBP)	84-69-5	ND	ND	ND	---	<b>0.1</b>
<b>Conclusion</b>		PASS	PASS	PASS	---	

**Note:**

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

**DETAILED RESULTS:**

**Directive 2011/65/EU and amendments, Restriction of the Use of Certain Hazardous Substances in Electrical and electronic equipment (RoHS)**

Test Method: IEC 62321-3-1:2013 for Cadmium, Lead, Mercury, Chromium and Bromine by XRF  
 IEC 62321-5:2013 for Lead, Cadmium and Chromium by ICP-OES  
 IEC 62321-6:2015 for PBBs and PBDEs by GC-MS

Analytical Method: X-ray Fluorescence Spectrometry  
 Inductively Coupled Plasma-Optical Emission Spectrometry  
 Gas Chromatography Mass Spectrometry

No.	Specimen Description	Test Item (mg/kg)						Conclusion
		Pb	Cd	Hg	CrVI	PBBs	PBDEs	
	Limit	1000	100	1000	1000	1000	1000	
	XRF RL	700	70	700	700	300	300	
1	Natural wood(Star)	BL	BL	BL	BL	BL	BL	PASS
2	Clear plastic(Battery box body)	BL	BL	BL	BL	BL	BL	PASS
3	Clear plastic(Sleeve)	BL	BL	BL	BL	BL	BL	PASS
4	Black plastic(Switch)	BL	BL	BL	BL	ND*	ND*	PASS
5	Translucent plastic(LED shell)	BL	BL	BL	BL	BL	BL	PASS
6	Translucent glue(Star connect)	BL	BL	BL	BL	BL	BL	PASS
7	Clear soft plastic(Wire jacket)	BL	BL	BL	BL	BL	BL	PASS
8	Silver metal(Battery contact plate)	BL	BL	BL	BL	NA	NA	PASS
9	Silver metal(Battery contact spring)	BL	BL	BL	BL	NA	NA	PASS
10	Silver solder(End of wire)	67*	BL	BL	BL	NA	NA	PASS
11	Silver metal(Wire)	BL	BL	BL	BL	NA	NA	PASS
12	Gunmetal metal(Switch inner spring )	BL	BL	BL	BL	NA	NA	PASS
13	Silver metal(Switch inner U-ring )	BL	BL	BL	BL	NA	NA	PASS
14	Silver metal(Switch pin)	BL	BL	BL	BL	NA	NA	PASS
15	Brown plastic(Switch under board )	BL	BL	BL	BL	BL	BL	PASS

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*Test(s) marked with 'φ' was subcontracted to external laboratory.*

*The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and method /regulation section(s) tested as described herein.*

*If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule.*

<https://www.qima.com/conditions-of-service#decisionRule>.

No.	Specimen Description	Test Item (mg/kg)						Conclusion
		Pb	Cd	Hg	CrVI	PBBs	PBDEs	
Limit		1000	100	1000	1000	1000	1000	
XRF RL		700	70	700	700	300	300	
16	Antique silver metal(Switch under frame)	BL	BL	BL	BL	BL	BL	PASS
17	Yellow body(LED body)	BL	BL	BL	BL	BL	BL	PASS

**Note:**

mg/kg (Milligrams per kilogram) = ppm (Parts per million)

LT = Less than

NA = Not Regulated or Not Applicable

BL = Below Limit by XRF screening;

NE = Negative, Absence of Cr (VI), the concentration of Cr (VI) in sample solution is less than 0.10 µg/cm<sup>2</sup>.

PO = Positive, Presence of Cr (VI), the concentration of Cr (VI) in sample solution is more than 0.13 µg/cm<sup>2</sup>.

Total Chromium by XRF screening method is reported for Chromium (VI) unless specified.

Total Bromine by XRF screening method is reported for PBBs and PBDEs unless specified.

**Remark:**

\*Result reported with wet chemical confirmation test with ICP-OES / GC-MS / UV-Vis.

ND = Not detected. Result value is less than below reporting limit (RL).

Test item	RL
Lead	20 mg/kg
Cadmium	20 mg/kg
Chromium VI	20 mg/kg
PBBs	100 mg/kg
PBDEs	100 mg/kg

**DETAILED RESULTS:**

**Regulation (EC) No. 2019/1021 Persistent Organic Pollutants, ANNEX I – Pentachlorophenol and its Salts and Esters Content**

Test Method: With reference EN ISO 17070:2015  
 Analytical Method: Gas Chromatography with Mass Spectrometry

**For material other than leather**

Specimen No.	1	---	---	---	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Pentachlorophenol (PCP) and its Salts and Esters	ND	---	---	---	5
<b>Conclusion</b>	PASS	---	---	---	

*Note:*  
 mg/kg = Milligrams per kilogram  
 LT = Less than  
 ND = Not detected (Reporting Limit = 1 mg/kg)

**DETAILED RESULTS:**

**Client's Requirement, Formaldehyde Release in resin-bonded wood**

Test Method: EN 717-3:1996  
 Analytical Method: Ultraviolet-Visible Spectrophotometry

Specimen No.	1	---	---	---	Limit (mg/kg)
Test Item	CAS No.	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Formaldehyde	50-00-0	ND	---	---	<b>80</b>
<b>Conclusion</b>		PASS	---	---	

*Note:*  
 mg/kg = Milligrams per kilogram  
 LT = Less than  
 ND = Not detected (Reporting Limit = 16 mg/kg)

**DETAILED RESULTS:**

**EN 62471:2008 Photobiological Safety of Lamps and Lamps systems<sup>ϕ</sup>**

**1.1 Test Data for Hazard of total irradiance**

Hazard name: irradiance based values	Limit for Exempt level / low risk / mod risk	Measured value
E <sub>UVA</sub> : Eye UV-A: 315-400nm (Near-UV hazard for eye) (W/ m <sup>2</sup> )	10 / 33 / 100	1.230e-5
E <sub>S</sub> : Actinic UV skin & eye : 200-400nm (Actinic UV hazard for skin and eye) (W/ m <sup>2</sup> )	0.001 / 0.003 / 0.03	8.735e-5
E <sub>B</sub> : Blue-light small source: 300-700nm (small source defined as one with $\alpha < 0.011$ radian) (W/ m <sup>2</sup> )	1.0	2.143e-3
E <sub>IR</sub> : Retinal thermal hazard (W/ m <sup>2</sup> )	100	1.046e-4
E <sub>H</sub> : Thermal hazard for the skin (W/ m <sup>2</sup> )	3560	1.879e-2
Distance (cm) for at 20 cm for non-GLS	-	20cm
Voltage (V)	-	3Vdc
Current(mA)	-	-
Wattage (W)	-	-



**DETAILED RESULTS:**

**EN 62471:2008 Photobiological Safety of Lamps and Lamps systems<sup>ϕ</sup>**

**1.2 Test Data for Hazard of spectral radiance of the source**

Hazard name: radiance based values	Limit for Exempt level / low risk / mod risk	Measured value
LB: Blue light: 300-700nm (Near-UV hazard for eye) (W.m <sup>-2</sup> .sr <sup>-1</sup> )	100 / - / -	6.948e-2
LR: Retinal thermal 380 – 1400nm (W m <sup>-2</sup> . Sr <sup>-1</sup> )	$\frac{28000}{\alpha}$ / $\frac{28000}{\alpha}$ / $\frac{71000}{\alpha}$	8.482e0
Distance (cm) for lx = 500lux for GLS or 20 cm for non-GLS	-	20cm
D (mm)	-	200mm
$\alpha_{eff}$ (radian)	-	0.0380
Voltage (V)	-	3Vdc
Current(mA)	-	-
Wattage (W)	-	-

**Remark :**

The  $\alpha$  of these product samples are bigger than 0.011 radian, so the blue light small source limit is not applicable.

Ambient temperature: 25.3°C

Ambient Humidity: 65.0 %

**1.3 Result**

According to the test result, this LED product can be assigned to Exempt Group

**SPECIMEN DESCRIPTION:**

Specimen No.	Specimen Description	Location
1	Natural wood	Star
2	Clear plastic	Battery box body
3	Clear plastic	Sleeve
4	Black plastic	Switch
5	Translucent plastic	LED shell
6	Translucent glue	Star connect
7	Clear soft plastic	Wire jacket
8	Silver metal	Battery contact plate
9	Silver metal	Battery contact spring
10	Silver solder	End of wire
11	Silver metal	Wire
12	Gunmetal metal	Switch inner spring
13	Silver metal	Switch inner U-ring
14	Silver metal	Switch pin
15	Brown plastic	Switch under board
16	Antique silver metal	Switch under frame
17	Yellow body	LED body

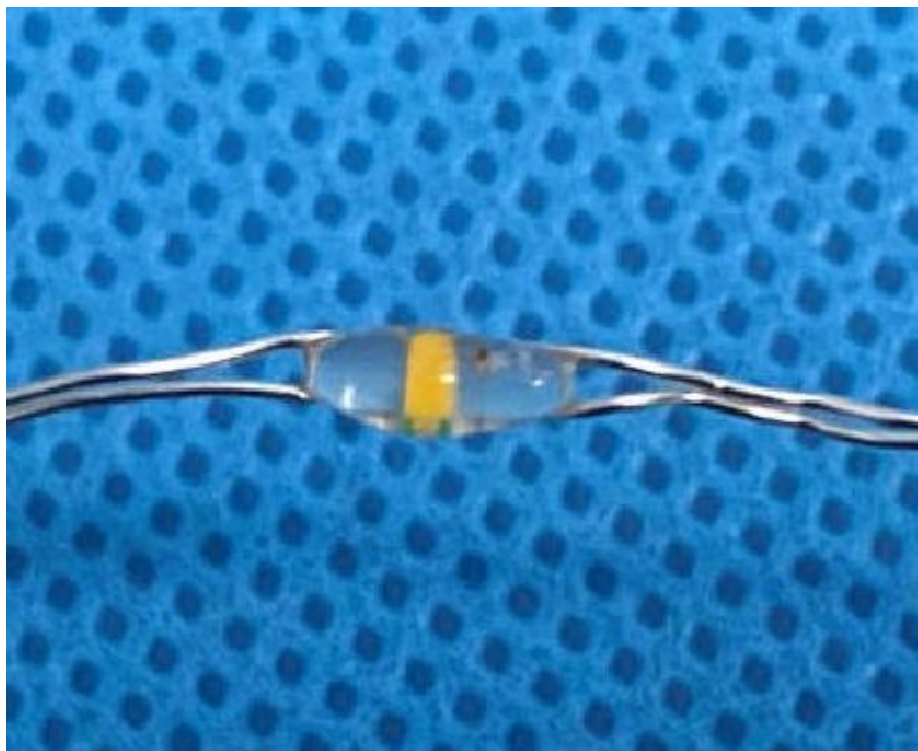
**SAMPLE PHOTO:**



**SAMPLE PHOTO:**



**SAMPLE PHOTO:**



-End Report-

## Appendix I

The test was performed by Attestation of Global Compliance (Shenzhen) Co., Ltd.

Test Report No. AGC12364230804E2.

Test Report No. AGC12364230804EE01.

## Attestation of Conformity

Registration No. AGC12364230804E2

Applicant QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.  
Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town,  
Dongguan City-523400 Guangdong-P.R. China.

Product Designation String with 20 led lights (wood figurine star)

Brand Name N/A

Model / Series Models CX1462

Manufacturer QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.  
Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town,  
Dongguan City-523400 Guangdong-P.R. China.

Requirement	Applied Standards	Document Evidence	Result
EMC Directive	EN IEC 55015:2019+A11:2020 EN 61547:2009	Test Report: AGC12364230804EE01	Conform



Signed by General Manager(King Zhang)

Issue Date: August 22, 2023

This Attestation of Conformity is recognized by Attestation of Global Compliance (Shenzhen) Co., Ltd. and made in accordance with the EMC Directive 2014/30/EU. The attestation doesn't imply assessment of the production. The Applicant of the attestation is authorized to use this attestation in connection with EC declaration of conformity to the Directive. The attestation is only applicable to the equipments described above. This attestation shall not be re-produced except in full without the written approval of Attestation of Global Compliance (Shenzhen) Co., Ltd.

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



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# EMC Test Report

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Report No.:AGC12364230804EE01

**PRODUCT DESIGNATION** : String with 20 led lights (wood figurine star)

**BRAND NAME** : N/A

**MODEL NAME** : CX1462

**APPLICANT** : QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.

**DATE OF ISSUE** : Aug. 18, 2023

**STANDARD(S)** : EN IEC 55015:2019+A11:2020  
EN 61547:2009

**REPORT VERSION** : V1.0



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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 18, 2023	Valid	Initial release

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### 1. VERIFICATION OF CONFORMITY

<b>Applicant</b>	QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
<b>Address</b>	Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town, Dongguan City • 523400 Guangdong • P.R. China.
<b>Manufacturer</b>	QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
<b>Address</b>	Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town, Dongguan City • 523400 Guangdong • P.R. China.
<b>Factory</b>	QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
<b>Address</b>	Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town, Dongguan City • 523400 Guangdong • P.R. China.
<b>Product Designation</b>	String with 20 led lights (wood figurine star)
<b>Brand Name</b>	N/A
<b>Test Model</b>	CX1462
<b>Date of receipt of test item</b>	Aug. 16, 2023
<b>Date of test</b>	Aug. 16, 2023 to Aug. 18, 2023
<b>Deviation</b>	No deviation from the test method.
<b>Condition of Test Sample</b>	Normal
<b>Test Result</b>	Pass

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Prepared By   


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 Jack Gui  
 (Project Engineer) Aug. 18, 2023

Reviewed By   


---

 Calvin Liu  
 (Reviewer) Aug. 18, 2023

Approved By   


---

 Max Zhang  
 (Authorized Officer) Aug. 18, 2023

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## 2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Lighting mode	--

## 3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Radiated Emission,  $U_c = \pm 3.9$  dB

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#### 4. PRODUCT INFORMATION

<b>Housing Type</b>	Plastic and wood
<b>EUT Input Rating</b>	DC 3.0V by battery
<b>Hardware Version</b>	N/A
<b>Software Version</b>	N/A

I/O Port Information ( Applicable  Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
--	--	--	--

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### 5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

Note: "--" means no any support device during testing.

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## 6. TEST FACILITY

<b>Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

## 7. TEST EQUIPMENT LIST

### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Antenna	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Test software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A

### TEST EQUIPMENT OF RADIATED ELECTROMAGNETIC DISTURBANCE TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Triple Loop Antenna	LAPLACE	RF300	9070	Jun. 03, 2023	Jun. 02, 2024
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024

### TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Dec. 30, 2022	Dec. 29, 2023

### TEST EQUIPMENT OF RS IMMUNITY TEST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Power Sensor	R&S	URV5-Z4	100124	Mar. 24, 2023	Mar. 23, 2025
Power Meter	R&S	NRVD	8323781027	Mar. 24, 2023	Mar. 23, 2025
Power Amplifier	KALMUS	7100LC	04-02/17-06-001	N/A	N/A
Power Amplifier	Milmega	AS0104-55_55	1004793	N/A	N/A
Wideband Antenna	SCHWARZBECK	VULB9168	D69250	May 11, 2023	May 10, 2025
Test software	Tonscend	2.0.1.8	N/A	N/A	N/A

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**TEST EQUIPMENT OF PFMF TEST**

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PFMF system	HTEC	HPFMF	161701	Jun. 01, 2023	May 31, 2024

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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>

## 8. TEST SUMMARY LIST

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted emission	EN IEC 55015	EN IEC 55015	0.009MHz -30MHz	N/A
Radiated emission	EN IEC 55015	EN IEC 55015	30MHz -1000MHz	Pass
Radiated electromagnetic disturbance	EN IEC 55015	EN IEC 55015	0.009MHz -30MHz	Pass
Harmonic current emission	EN IEC 61000-3-2	EN IEC 61000-3-2	Class C	N/A
Voltage fluctuations & flicker	EN 61000-3-3	EN 61000-3-3	§5 of EN 61000-3-3	N/A
Electrostatic discharge immunity	EN 61547	EN 61000-4-2	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)	Pass
Radiated electromagnetic field immunity	EN 61547	EN 61000-4-3	3V/m with 80% AM. 1kHz Modulation.	Pass
Electrical fast transient/burst Immunity	EN 61547	EN 61000-4-4	+/- 1kV for Power Supply Lines	N/A
Surge immunity	EN 61547	EN 61000-4-5	>25W +/-1kV (Line to Line) +/-2kV (Line to Ground) <25W +/-0.5kV (Line to Line) +/-1kV (Line to Ground)	N/A
Immunity to Conducted Disturbances Induced by RF fields	EN 61547	EN 61000-4-6	3V with 80% AM. 1 kHz Modulation	N/A
Power frequency magnetic fields	EN 61547	EN 61000-4-8	50/60 Hz, 3A/m	Pass
Voltage dips and short interruptions immunity	EN 61547	EN 61000-4-11	PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees	N/A

**Note:** N/A means not applicable.

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## 9. EN IEC 55015 RADIATED EMISSION TEST

### 9.1. LIMITS OF RADIATED DISTURBANCES

#### AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

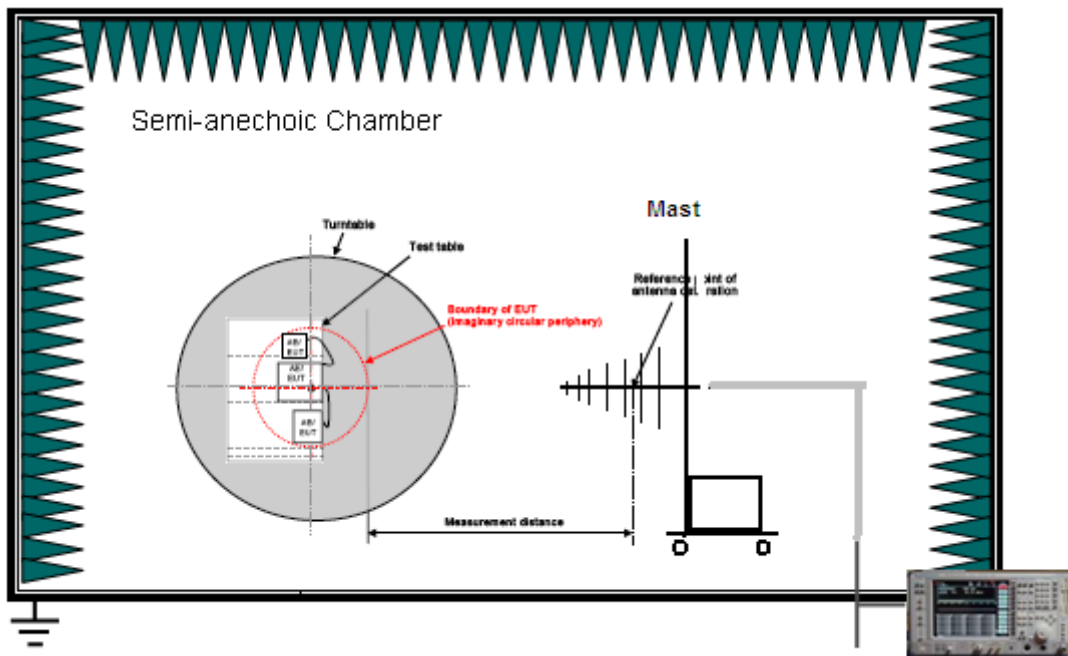
#### AT 3M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40.00
230-1000	3	47.00

Note: The lower limit shall apply at the transition frequency.

### 9.2. BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



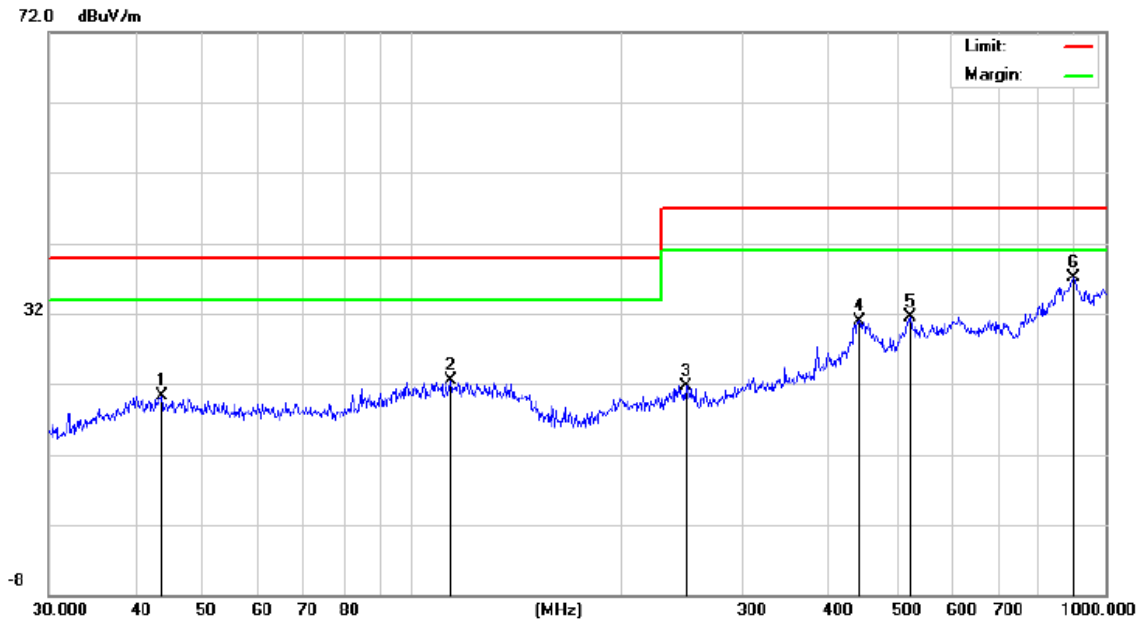
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### 9.3. PROCEDURE OF RADIATED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN IEC 55015 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10cm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN IEC 55015.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN IEC 55015.
- (4) The EUT was turned on.
- (5) The antenna was placed at 3 meters away from the EUT as stated in EN IEC 55015. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (7) The test mode(s) were scanned during the test:
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

### 9.4. TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal



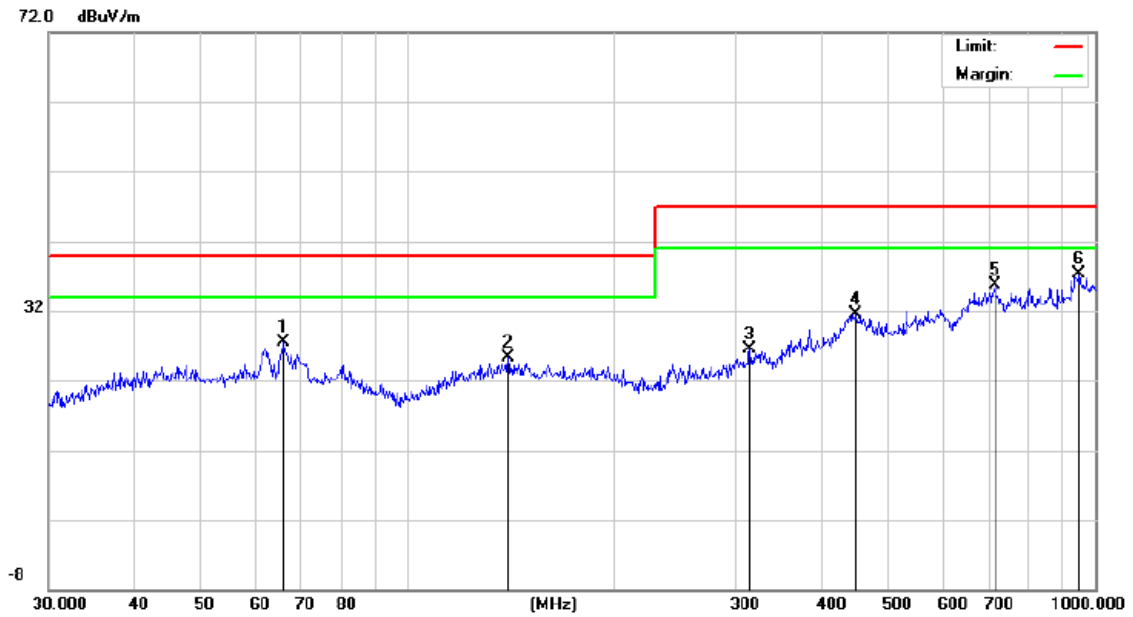
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		43.6584	6.67	13.64	20.31	40.00	-19.69	peak
2		114.1138	6.14	16.34	22.48	40.00	-17.52	peak
3		248.5519	6.62	15.14	21.76	47.00	-25.24	peak
4		441.7426	5.96	25.04	31.00	47.00	-16.00	peak
5		522.7180	6.57	25.02	31.59	47.00	-15.41	peak
6	*	900.1474	5.37	31.78	37.15	47.00	-9.85	peak

**RESULT: PASS**

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Radiated Emission Test at 3m Distance-Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		66.0342	10.44	17.04	27.48	40.00	-12.52	peak
2		139.8508	7.07	18.20	25.27	40.00	-14.73	peak
3		314.3765	6.56	19.91	26.47	47.00	-20.53	peak
4		447.9822	5.85	25.74	31.59	47.00	-15.41	peak
5		714.1734	7.10	28.60	35.70	47.00	-11.30	peak
6	*	948.7610	6.69	30.65	37.34	47.00	-9.66	peak

**RESULT: PASS**

Note:

$$\text{Level(dBuV/m)} = \text{Reading(dBuV)} + \text{Factor(dB/m)}$$

$$\text{Factor(dB/m)} = \text{Antenna Factor(dB/m)} + \text{Cable loss(dB)} + \text{Attenuation(dB) for Attenuator}$$

$$\text{Over} = \text{Measurement} - \text{Limit}$$

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**10. EN IEC 55015 RADIATED ELECTROMAGNETIC DISTURBANCE TEST**

**10.1. LIMITS OF RADIATED ELECTROMAGNETIC DISTURBANCE IN THE RANGE 9 KHZ TO 30 MHZ**

Frequency Range	Limits for Loop Diameter dB(uA) *		
	2m	3m	4m
9 KHz-70 KHz	88 *	81 *	75 *
70 KHz-150 KHz	88 to 58 * *	81 to 51 * *	75 to 45 * *
150 kHz-3.0 MHz	58 to 22 * *	51 to 15 * *	45 to 9 * *
3.0 MHz-30 MHz	22 * * *	15 to 16 * * *	9 to 12 * * *

Note:

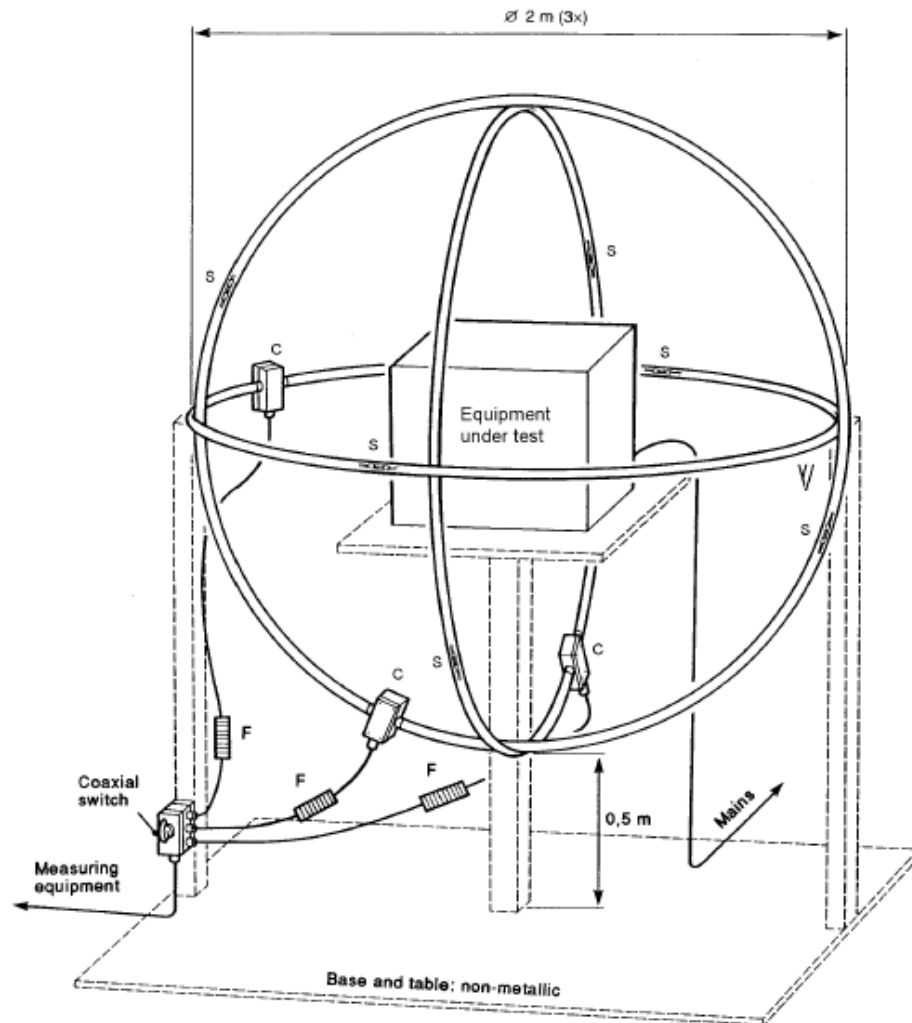
\* At the transition frequency, the lower limit applies.

\* \* Decreasing linearly with the logarithm of the frequency. For electrode less lamps and luminaries, the limit in the frequency range of 2.2 MHz to 3.0 MHz is 58 dB(uA) for 2m, 51 dB(uA) for 3m and 45 dB(uA) for 4m loop diameter.

\* \* \* Increasing linearly with the logarithm of the frequency.

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### 10.2. BLOCK DIAGRAM OF TEST SETUP



### 10.3. TEST PROCEDURE

The magnetic component shall be measured by means of a loop antenna as described in EN IEC 55015. The lighting equipment shall be placed in the centre of the antenna, and the position is not critical.

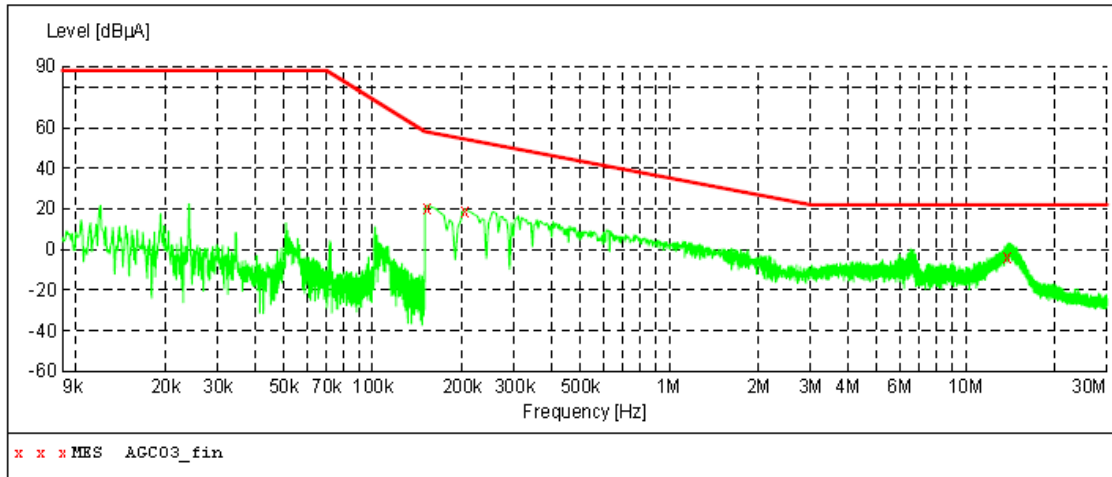
The test object was operated at its upper limit of its rated voltage and its rated frequency. The induced current in the loop antenna is measured by means of a current probe(1V/A) and the CISPR measuring receiver. By means of a coaxial switch the three field directions can be measured in sequence. Each value shall fulfill the requirements given.

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**10.4. TEST RESULTS OF RADIATED ELECTROMAGNETIC DISTURBANCE**

X



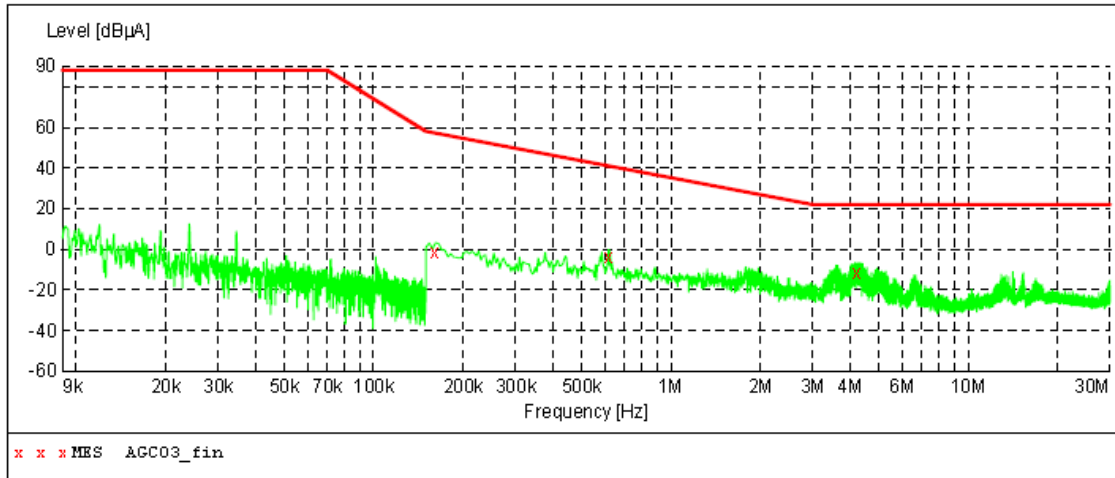
**MEASUREMENT RESULT: "AGC03\_fin"**

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.154000	20.60	-13.1	58	37.1	QP	X
0.206000	18.50	-15.5	54	35.7	QP	X
13.946000	-3.50	-21.9	22	25.5	QP	X

**RESULT: PASS**

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Y



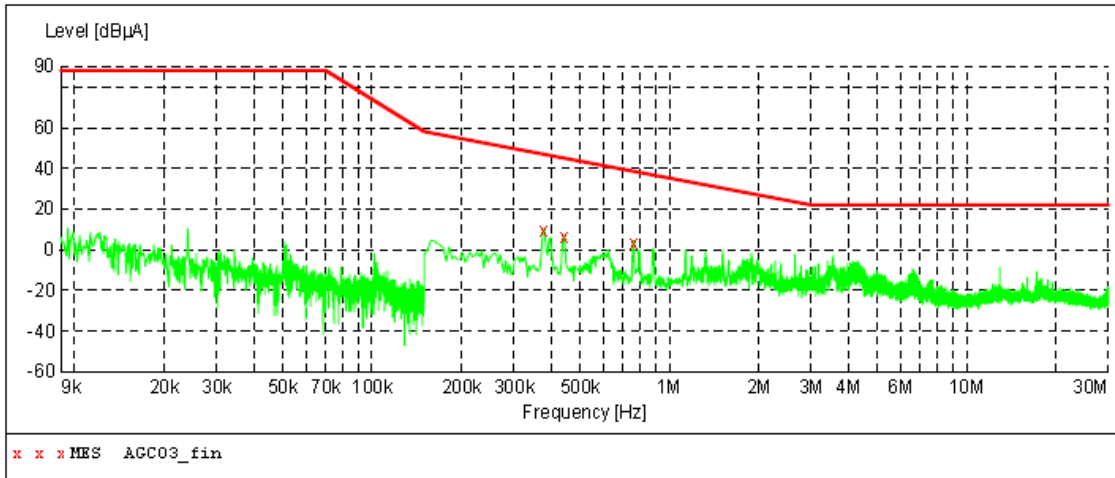
**MEASUREMENT RESULT: "AGC03\_fin"**

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.162000	-1.50	-13.5	57	58.6	QP	Y
0.618000	-3.80	-22.4	41	44.8	QP	Y
4.250000	-11.50	-25.1	22	33.5	QP	Y

**RESULT: PASS**

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Z



**MEASUREMENT RESULT: "AGC03\_fin"**

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.378000	9.70	-19.8	47	37.2	QP	Z
0.442000	6.00	-20.7	45	39.0	QP	Z
0.758000	3.00	-23.3	39	35.5	QP	Z

**RESULT: PASS**

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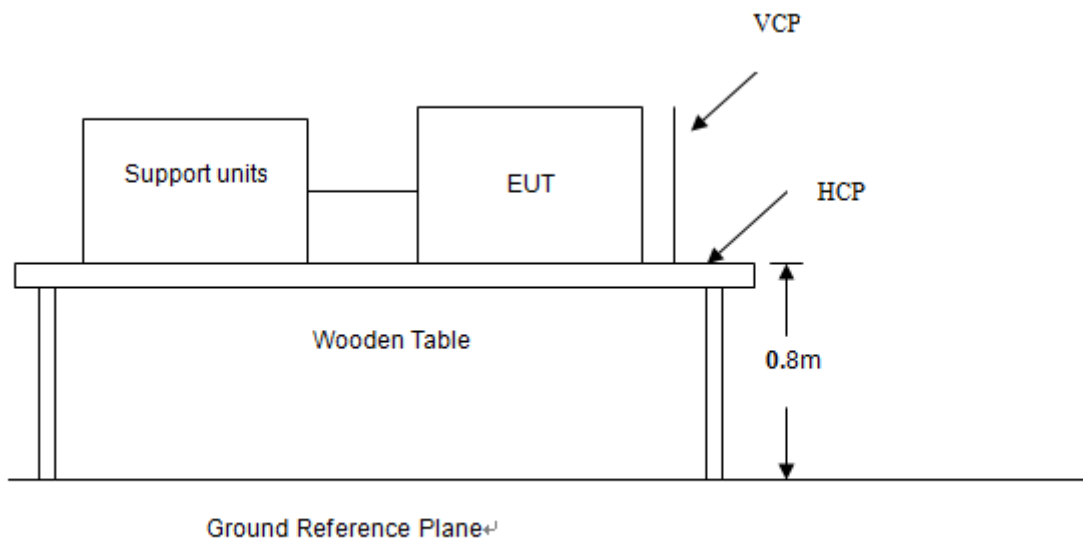
## 11. EN 61000-4-2 ESD IMMUNITY TEST

### ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

<b>Port</b>	Enclosure
<b>Basic Standard</b>	EN 61000-4-2
<b>Test Level</b>	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
<b>Standard require</b>	B
<b>Temperature</b>	23°C
<b>Humidity</b>	45% RH

#### 11.1. BLOCK DIAGRAM OF TEST SETUP

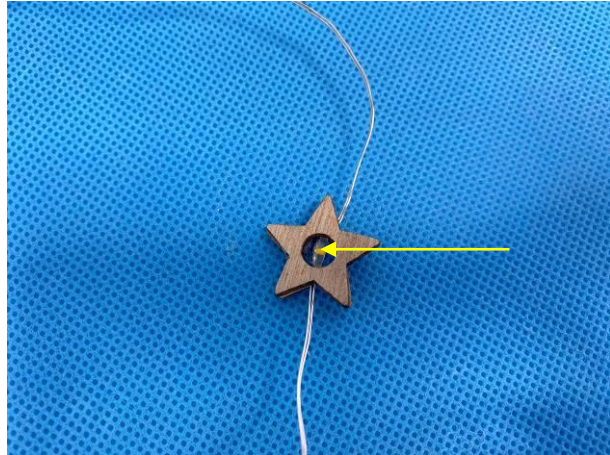
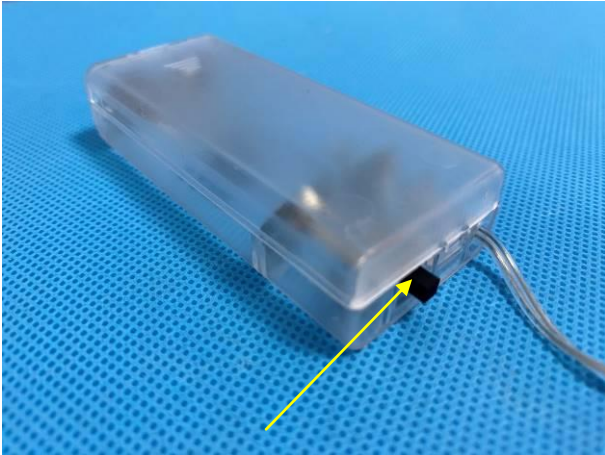
(The 470 k ohm resistors are installed per standard requirement)



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**ESD LOCATION:**

Yellow line: Air discharge



Note: Contact discharge point not found.

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## 11.2. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Activates the communication function if the EUT with such port(s).

As per the requirement of EN 61547: Contact discharge is the preferred test method, twenty discharges (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure, terminals are excluded. Air discharges shall be used where contact discharges cannot be applied. Discharges shall be applied on the horizontal or vertical coupling planes as specified in EN 61000-4-2.

The following test condition was followed during the tests.

**Note:** As per the A2 to EN 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

Voltage	Coupling	Test Performance	Result
±4kV	Contact Discharge	No function loss	N/A
±4kV	Indirect Discharge HCP (Front)	No function loss	A
±4kV	Indirect Discharge HCP (Left)	No function loss	A
±4kV	Indirect Discharge HCP (Right)	No function loss	A
±4kV	Indirect Discharge HCP (Back)	No function loss	A
±4kV	Indirect Discharge VCP (Front)	No function loss	A
±4kV	Indirect Discharge VCP (Left)	No function loss	A
±4kV	Indirect Discharge VCP (Back)	No function loss	A
±4kV	Indirect Discharge VCP (Right)	No function loss	A
±8kV	Air Discharge	No function loss	A

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**11.3. PERFORMANCE & RESULT**

<b>Criteria A:</b>	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<b>Criteria B:</b>	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
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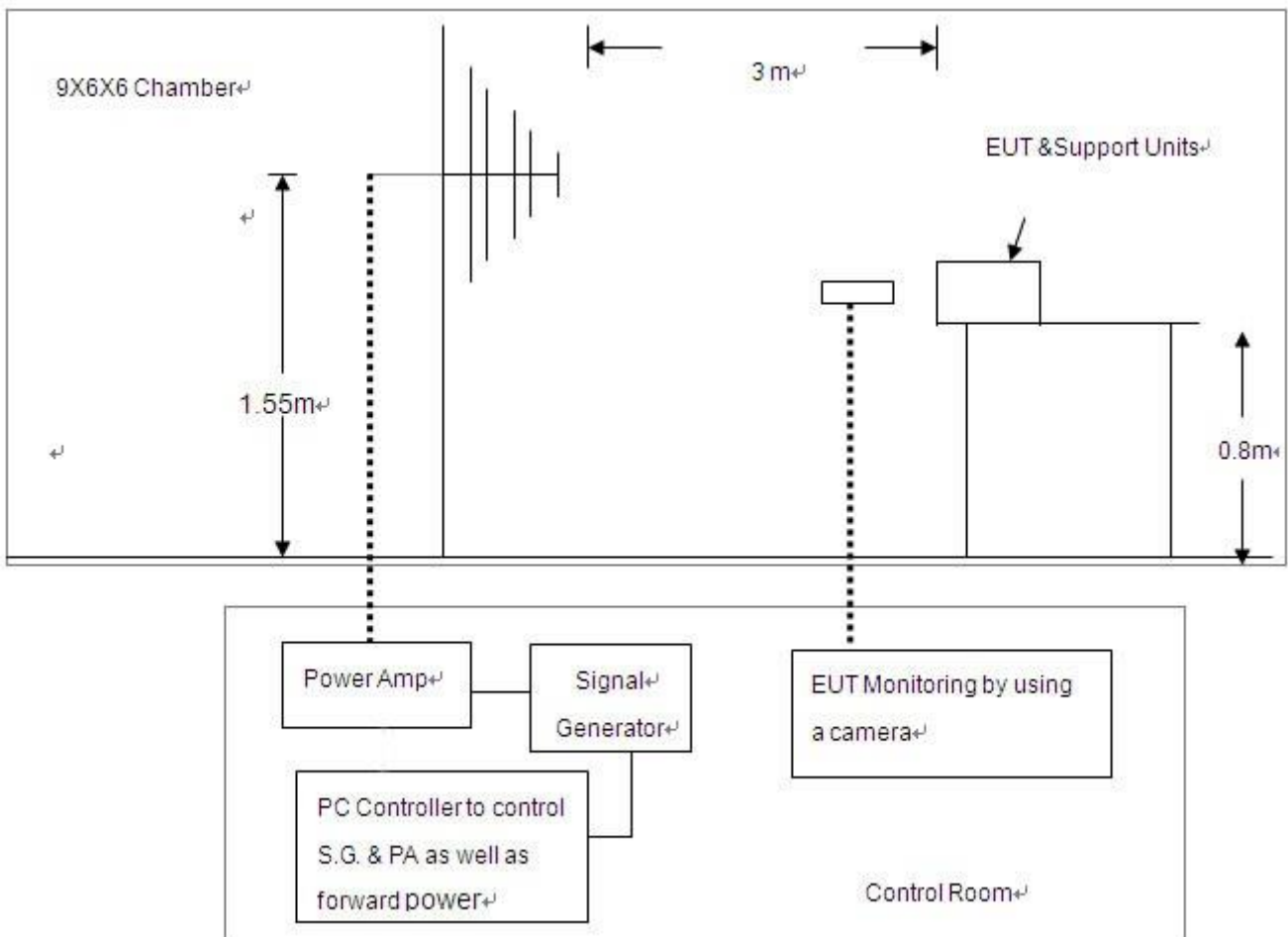
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## 12. EN 61000-4-3 RS IMMUNITY TEST

### RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

<b>Port</b>	Enclosure
<b>Basic Standard</b>	EN 61000-4-3
<b>Test Level:</b>	3V/m with 80% AM. 1kHz Modulation.
<b>Standard require</b>	A
<b>Temperature</b>	23.7°C
<b>Humidity</b>	57.4% RH

#### 12.1. BLOCK DIAGRAM OF TEST SETUP



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## 12.2. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per EN 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per EN 61000-4-3.

Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz.

Recording the test result in following table.

### EN 61000-4-3 Final test conditions:

Test level: 3V/m

Steps: 1 % of fundamental

Dwell Time: 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result
80-1000	3V/m	AM	H	Front	No function loss	A
80-1000	3V/m	AM	H	Left	No function loss	A
80-1000	3V/m	AM	H	Back	No function loss	A
80-1000	3V/m	AM	H	Right	No function loss	A
80-1000	3V/m	AM	V	Front	No function loss	A
80-1000	3V/m	AM	V	Left	No function loss	A
80-1000	3V/m	AM	V	Back	No function loss	A
80-1000	3V/m	AM	V	Right	No function loss	A

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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

**12.3. PERFORMANCE & RESULT**

<b>Criteria A:</b>	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<b>Criteria B:</b>	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

<input checked="" type="checkbox"/> <b>PASS</b>	<input type="checkbox"/> <b>FAIL</b>
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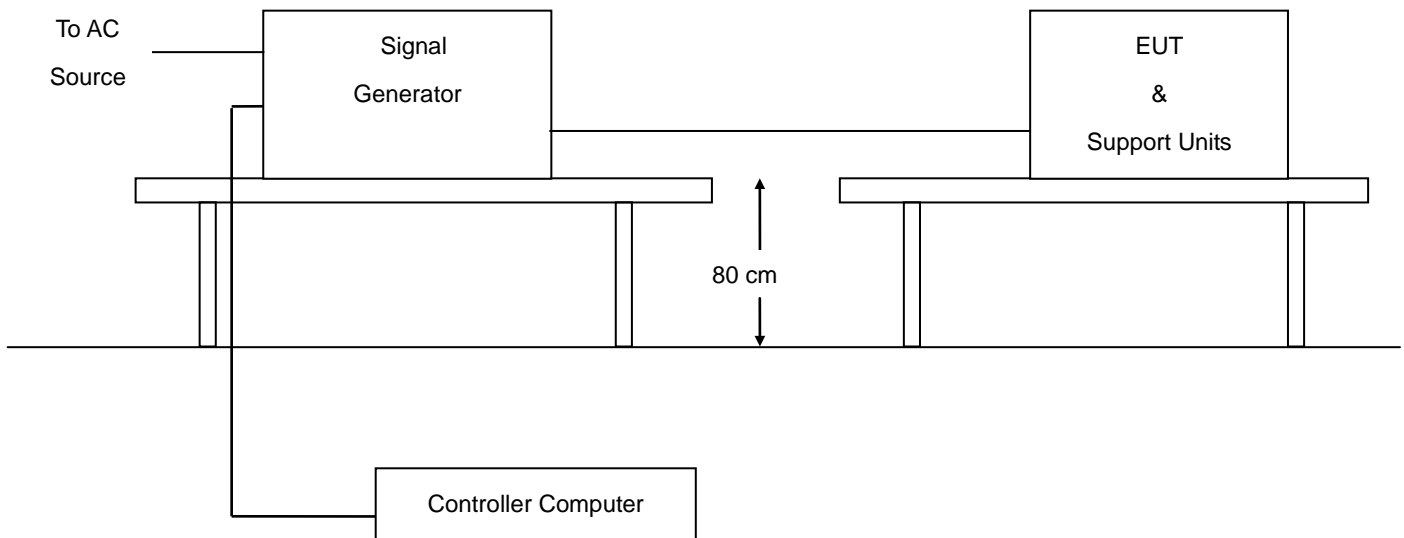
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### 13. EN 61000-4-8 PFMF TEST

#### POWER FREQUENCY MAGNETIC FIELDS IMMUNITY TEST

<b>Port</b>	Enclosure
<b>Basic Standard</b>	EN 61000-4-8
<b>Requirements</b>	50/60 Hz, 3A/m
<b>Standard require</b>	A
<b>Temperature</b>	23°C
<b>Humidity</b>	51% RH

#### 13.1. BLOCK DIAGRAM OF TEST SETUP



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### 13.2. TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m x 1m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

**Test Conditions:**

Frequency	Polarity	Level	Test Performance	Performance Result
50 Hz	X	3 A/m	No function loss	A
50 Hz	Y	3 A/m	No function loss	A
50 Hz	Z	3 A/m	No function loss	A

### 13.3. PERFORMANCE & RESULT

<b>Criteria A:</b>	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<b>Criteria B:</b>	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

<input checked="" type="checkbox"/> <b>PASS</b> <input type="checkbox"/> <b>FAIL</b>
--

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**APPENDIX A: PHOTOGRAPHS OF TEST SETUP**  
**EN IEC 55015 RADIATED EMISSION TEST SETUP**

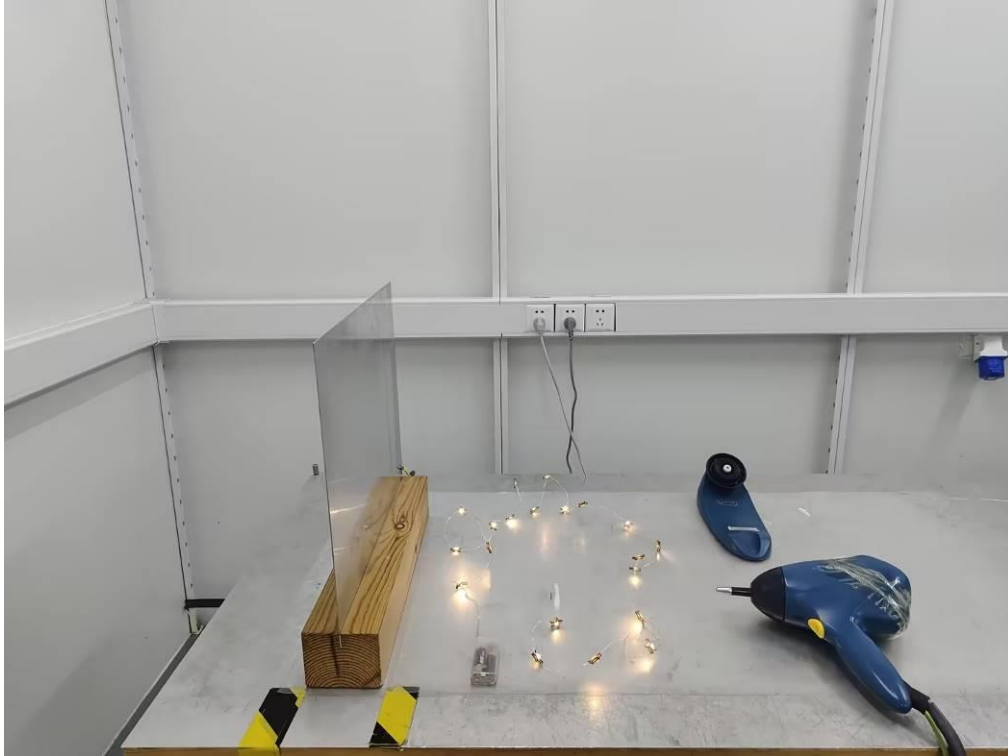


**EN IEC 55015 RADIATED ELECTROMAGNETIC DISTURBANCE TEST SETUP**

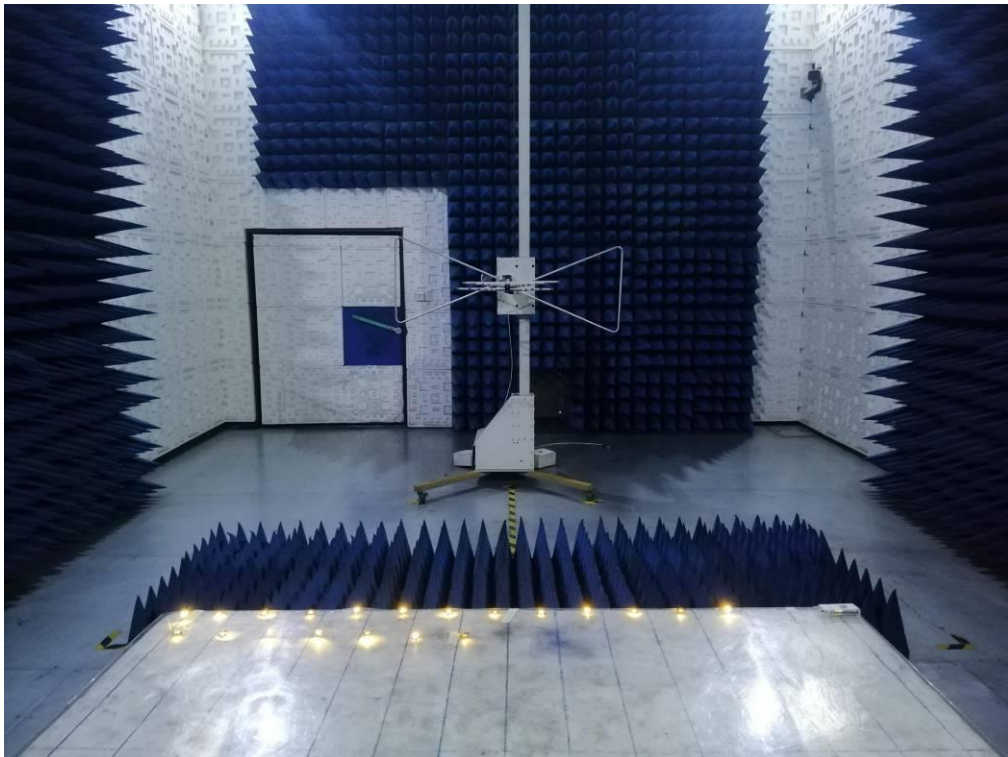


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### EN 61000-4-2 ESD IMMUNITY TEST SETUP



### EN 61000-4-3 RS IMMUNITY TEST SETUP



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## EN 61000-4-8 PFMF TEST SETUP



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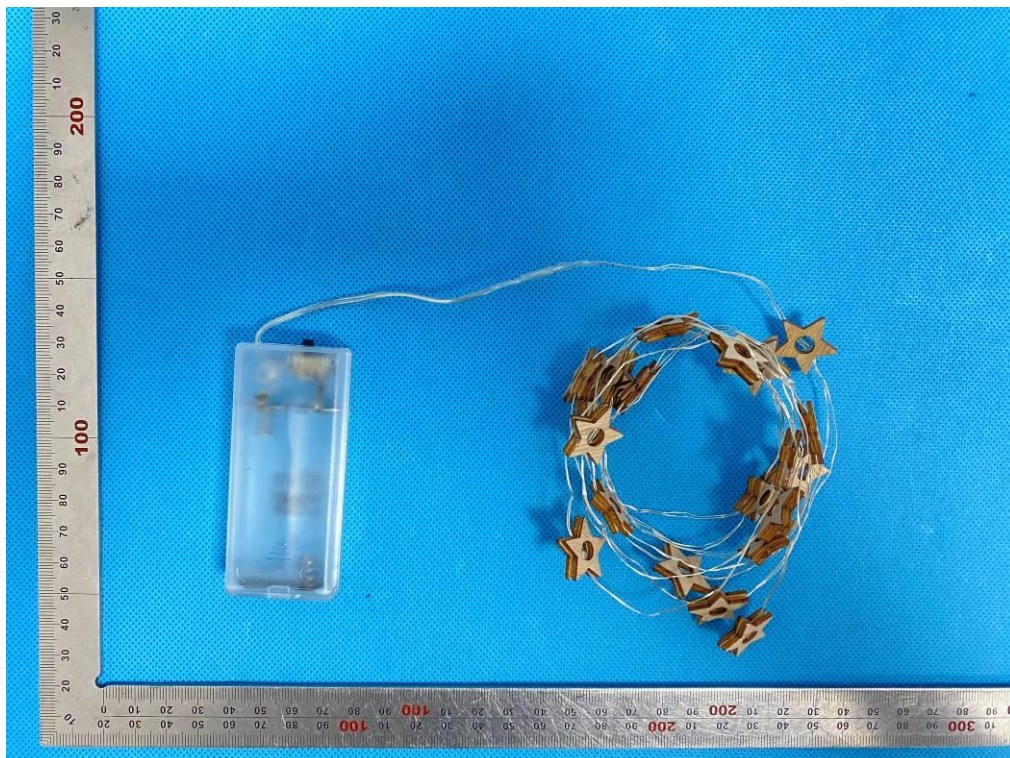
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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>

### APPENDIX B: PHOTOGRAPHS OF EUT

FRONT VIEW OF EUT



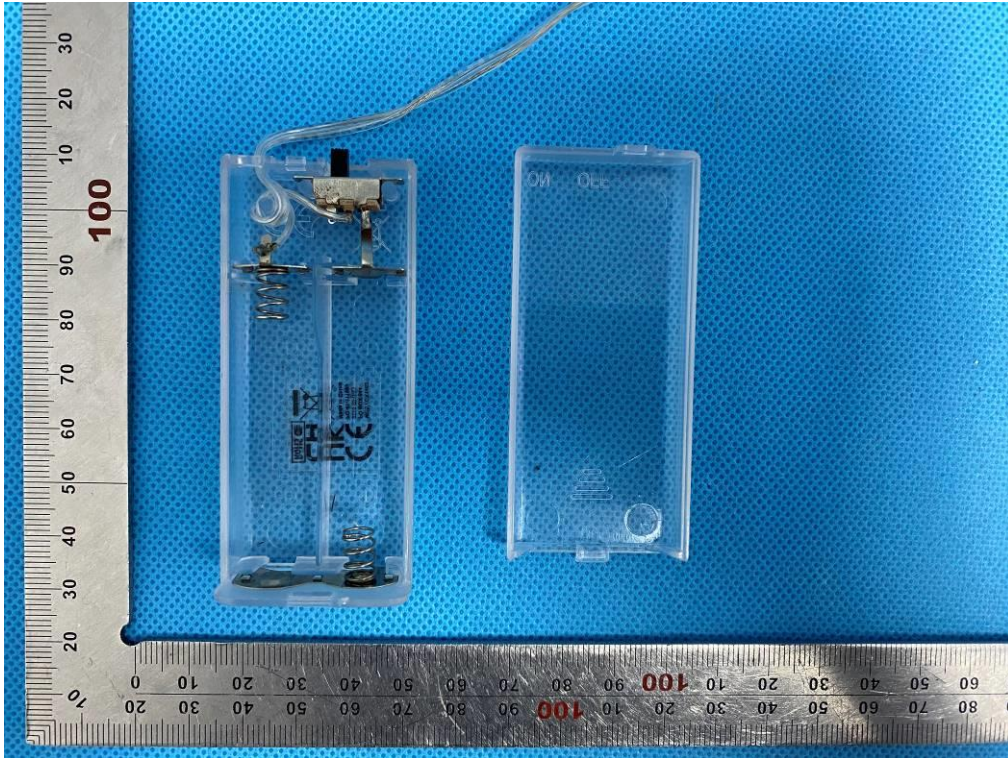
BACK VIEW OF EUT



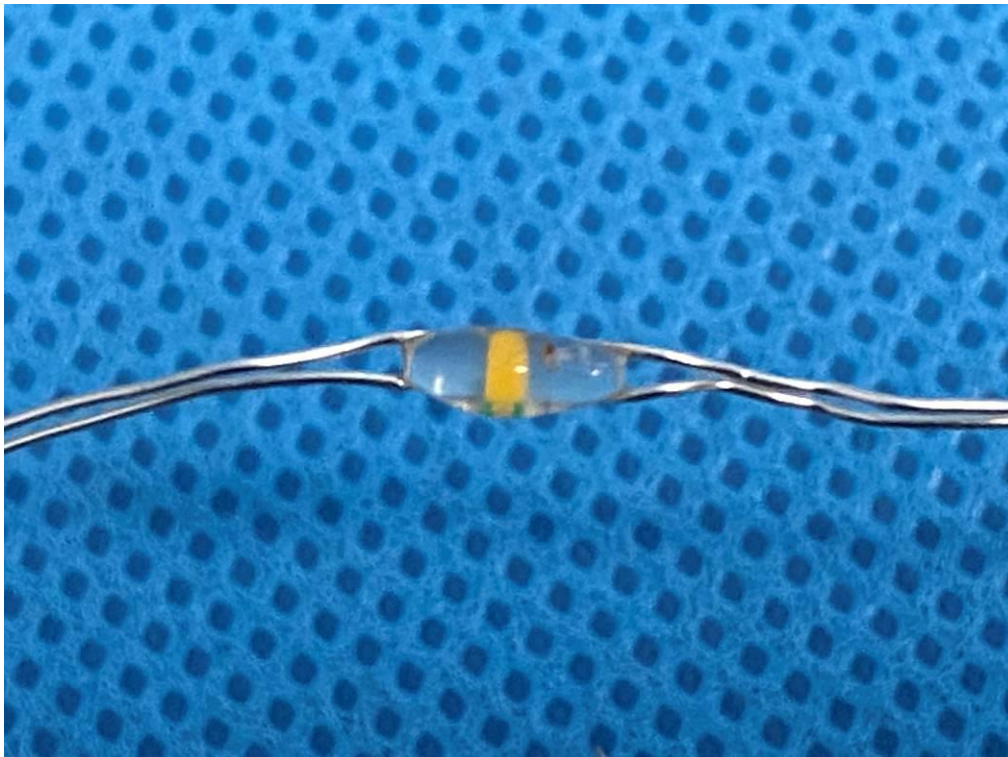
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**OPEN VIEW OF EUT**



**INTERNAL VIEW OF EUT**



**----END OF REPORT----**

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## Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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