

EMC TEST REPORT

REPORT NO.: ECE2106118R

MODEL NO.: To see page 5

RECEIVED: June 03, 2021

TESTED: June 04, 2021 to June 09, 2021

APPLICANT: Ningbo Grand Star Electric Co., Ltd.

ADDRESS: No 1, Zhanjia, Xidian Town, Ninghai County, Ningbo City, Zhejiang Province, China

ISSUED BY: Shenzhen SETEK Technology Co., Ltd.

LAB LOCATION: 1003, C Bldg, Fuyuan Business Trade Center, 44 District Bao'an, Shenzhen, China

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SHENZHEN SETEK TECHNOLOGY CO., LTD.

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Prepared for : Ningbo Grand Star Electric Co., Ltd.

Address : No 1, Zhanjia, Xidian Town, Ninghai County, Ningbo City, Zhejiang Province, China

Product : Flashlight

Model No. : To see page 5

Trademark : ONLYSTAR

Test Standard : EN IEC 55015:2019+A11:2020
EN 61547: 2009
EN61000-3-2: 2014, EN61000-3-3: 2013+A1:2019
(EN61000-4-2: 2009, EN61000-4-3: 2006+A1: 2008+A2: 2010,
EN61000-4-4:2012, EN61000-4-5: 2014, EN61000-4-6: 2014,
EN61000-4-11: 2004)

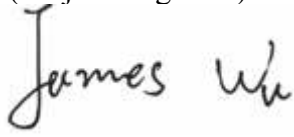
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Report Number : ECE2106118R

Date of Test : June 04, 2021 to June 09, 2021

Date of Report : June 10, 2021



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Appendix I (Photos of EUT)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Flashlight
Model Number	: GS-9100, GS-4001, GS-4003, GS-4003A, GS-4004, GS-4004A, GS-4005, GS-4007, GS-4007A, GS-4010, GS-4013, GS-4013A, GS-4014, GS-4021, GS-4024, GS-4024A, GS-4025, GS-4028, GS-4029, GS-4030, GS-4036, GS-4037, GS-4037A, GS-4038, GS-4038A, GS-4040, GS-4048, GS-4049, GS-4050, GS-4050A, GS-4056, GS-4062, GS-4063, GS-4071, GS-4081, GS-4081A, GS-4084, GS-4085, GS-4087, GS-4089, GS-4095, GS-4097, GS-4099, GS-4100, GS-4102, GS-4103, GS-4104, GS-4105, GS-4106, GS-4114, GS-4115, GS-4116, GS-5002, GS-5006, GS-5007, GS-5020, GS-5025, GS-5026, GS-5027, GS-6001, GS-6001A, GS-6008, GS-6009, GS-6040, GS-6041, GS-6041A, GS-6042, GS-7002C, GS-7002D, GS-7004, GS-7006, GS-7006A, GS-7013, GS-7016B, GS-7020, GS-7023, GS-7027, GS-7028, GS-7029, GS-7030, GS-7030A, GS-7031, GS-7032, GS-8001, GS-8005, GS-8008, GS-8013, GS-8015B, GS-8016, GS-8016S, GS-8017, GS-8024, GS-8027A, GS-8028, GS-8036A, GS-8039, GS-8040, GS-8040A, GS-8041, GS-8042, GS-8042A, GS-8043, GS-8045, GS-8046, GS-8049, GS-8062, GS-8063, GS-8065, GS-8066, GS-8068, GS-8085, GS-8087, GS-8088, GS-8300, GS-9003, GS-9016, GS-9016A, GS-9016B, GS-9021-2AA, GS-9021-2C, GS-9021-3C, GS-9025A, GS-9025B, GS-9027, GS-9045, GS-9047, GS-9048-1AA, GS-9048-2AA, GS-9050, GS-9052, GS-9053, GS-9059, GS-9069, GS-9080, GS-9081, GS-9087, GS-9097, GS-9099, GS-9106, GS-9166, GS-9401, GS-9410, GS-9412, GS-9414, GS-9419, GS-9438, GS-9440, GS-9447, GS-9455, GS-9504, GS-9805 The applicant models are all identical in interior structure, electrical circuits and components, and just the model names are different for the marketing requirement. We prepare GS-9100 for the test
Power Supply	: DC 3V
Applicant	: Ningbo Grand Star Electric Co., Ltd.



Address : No 1, Zhanjia, Xidian Town, Ninghai County, Ningbo
City, Zhejiang Province, China

Manufacturer : Ningbo Grand Star Electric Co., Ltd.

Address : No 1, Zhanjia, Xidian Town, Ninghai County, Ningbo
City, Zhejiang Province, China

Date of sample receiver : June 03, 2021

Date of Test : June 04, 2021 to June 09, 2021

1.2. Test Standards

Test Standards	
EN IEC 55015:2019+A11:2020	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 61547:2009	Equipment for general lighting purposes-EMC immunity requirements
EN61000-3-2: 2014	Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN61000-3-3:2013 +A1:2019	Electromagnetic compatibility (EMC)-Part 3-3: Limits-Limitation of voltage changes, Voltage fluctuations and flicker in public low-voltage supply systems. For equipment with Rated current ≤ 16 A per phase and not subject to conditional connection

1.3. Measurement Uncertainty

Radiation Uncertainty : $U_r = 3.84\text{dB}$

Conduction Uncertainty : $U_c = 2.72\text{dB}$

2. MEASURING DEVICES AND TEST EQUIPMENT

2.1 For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 15, 2021	1 Year
2.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	May 15, 2021	1 Year
3.	50ΩCoaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 15, 2021	1 Year
5.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 15, 2021	1 Year

2.2 For Magnetic Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 15, 2021	1 Year
2.	Loop Antenna	Laplace Instrument Ltd	RF300	8006	May 15, 2021	1 Year
3.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 15, 2021	1 Year
4.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	May 15, 2021	1 Year
5.	Coaxial Switch	Anritsu	MP59B	M73989	May 15, 2021	1 Year

2.3 For Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	HAEFELY	PHF555	080419-03	May 15, 2021	1 Year
2.	PC	N/A	P2L97	N/A	N/A	N/A

2.4 For Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	May 15, 2021	1 Year

2.5 For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3625U00573	May 15, 2021	1 Year
2.	Amplifier	A&R	500A100	17034	May 15, 2021	1 Year
3.	Amplifier	A&R	100W/1000M	17028	May 15, 2021	1 Year

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4.	Isotropic Field Monitor	A&R	FM2000	16829	May 15, 2021	1 Year
5.	Isotropic Field Probe	A&R	FP2000	16755	May 15, 2021	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	May 15, 2021	1 Year
7.	Log-periodic Antenna	A&R	AT1080	1621931	May 15, 2021	1 Year
8.	PC	N/A	486DX2	N/A	N/A	N/A

2.6 For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	May 15, 2021	1 Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	May 15, 2021	1 Year

2.7 For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	May 15, 2021	1 Year

2.8 For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	May 15, 2021	1 Year
2.	CDN	EMTEST	CDN-M2	5100100100	May 15, 2021	1 Year
3.	CDN	EMTEST	CDN-M3	0900-11	May 15, 2021	1 Year
4.	Injection Clamp	EMTEST	F-2031-23MM	368	May 15, 2021	1 Year
5.	Attenuator	EMTEST	ATT6	0010222A	May 15, 2021	1 Year

2.9 For Magnetic Field Immunity Test

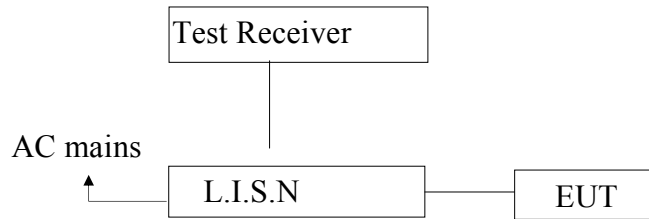
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 15, 2021	1 Year
2	AC Transformer	CHOKUN	TDGC2J-5	N/A	N/A	N/A

2.10 For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-18	May 15, 2021	1 Year

3. POWER LINE CONDUCTED MEASUREMENT

3.1 Block Diagram of Test Setup



(EUT: Flashlight)

3.2 Conducted Power Line Emission Measurement Standard and Limits

3.2.1 Standard:

EN IEC 55015:2019+A11:2020

3.2.2 Limits

Frequency	At mains terminals (dB μ V)	
	Quasi-peak Level	Average Level
9KHz ~ 50KHz	110	--
50KHz ~ 150KHz	90 ~ 80*	--
150KHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz ~ 2.51MHz	56	46
2.51MHz ~ 3.0MHz	73	63
3.0MHz ~ 5.0MHz	56	46
5.0MHz ~ 30MHz	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

3.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 1.1.

3.4 Operating Condition of EUT

3.4.1 Setup the EUT as shown in Section 3.1.

3.4.2 Turn on the power of all equipments.

3.4.3 Let the EUT work in test mode (On) and measure it.

The device described above is tested by SHENZHEN SETTEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETTEK TECHNOLOGY CO., LTD.

3.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN55015 standard.

The bandwidth of the test receiver (R&S ESCS30) is set at 200Hz in 9K~150KHz range and 9KHz in 150K~30MHz range.

The frequency range from 9KHz to 30MHz is checked.

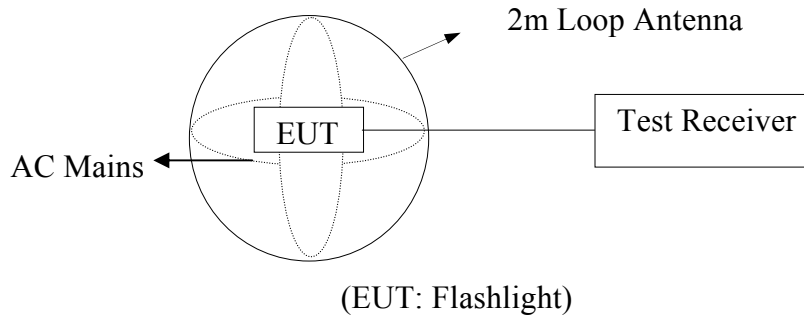
3.6 Measurement Results

N/A.

* N/A --- Not apply

4.MAGNETIC FIELD EMISSION MEASUREMENT

4.1 Block Diagram of Test Setup



4.2 Magnetic Field Emission Measurement Standard and Limits

4.2.1 Test Standard

EN IEC 55015:2019+A11:2020

4.2.2 Test Limits

Frequency	Limits for loop diameter (dB μ A)
	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 2.2MHz	58 ~ 26*
2.2MHz ~ 3.0MHz	58
3.0MHz ~ 30MHz	22

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 1.1.

4.4 Operating Condition of EUT

4.4.1 Setup the EUT as shown in Section 4.1.

4.4.2 Turn on the power of all equipments.

3.4.3 The EUT work in test mode (ON) and measure it

4.5 Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver.

Three field components are checked by means of a coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESCS30) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz .

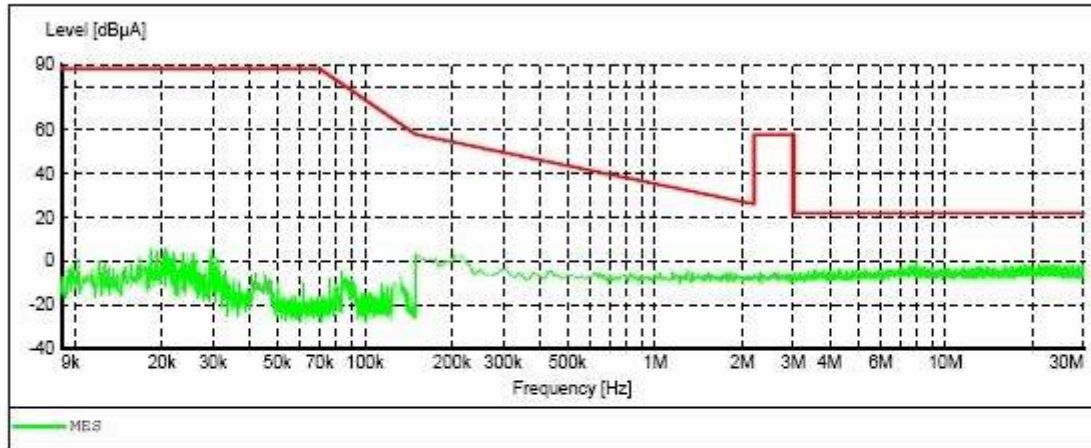
4.6 Test Results

PASS.

Please reference to the following pages

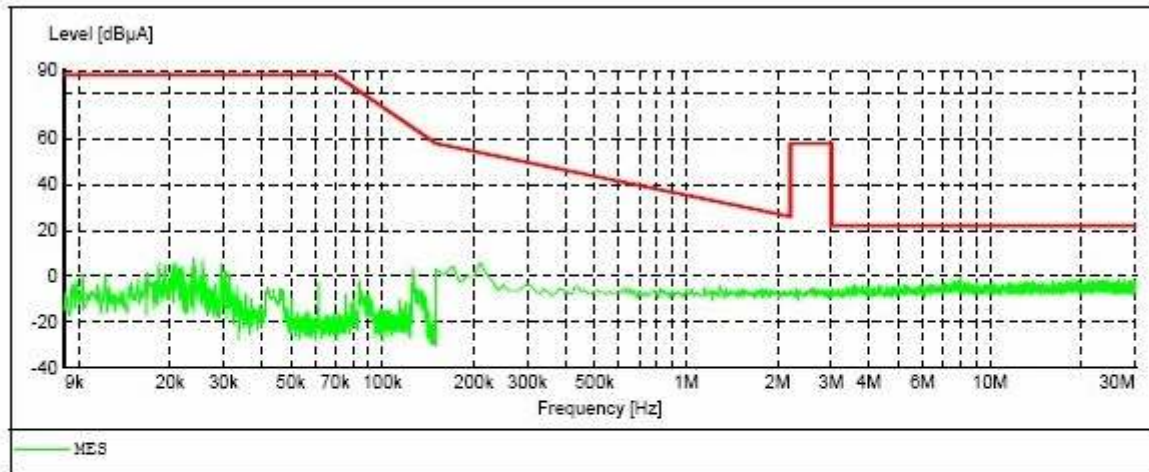
X Test Data

SCAN TABLE: "Magnetic test fin"
Short Description: ENS5015 Triple Loop



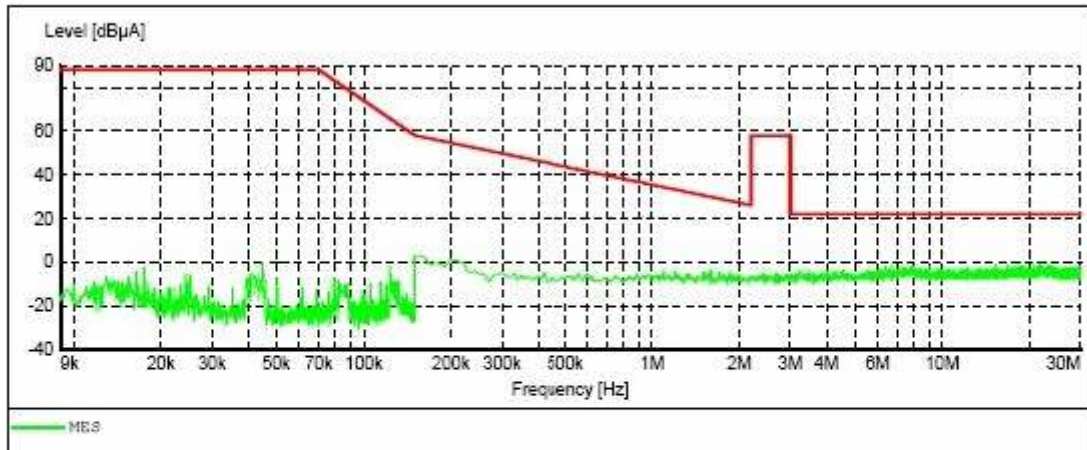
Y Test Data

SCAN TABLE: "Magnetic test fin"
Short Description: ENS5015 Triple Loop



Z Test Data

SCAN TABLE: "Magnetic test fin"
Short Description: ENS5015 Triple Loop



5. RADIATED EMISSION MEASUREMENT

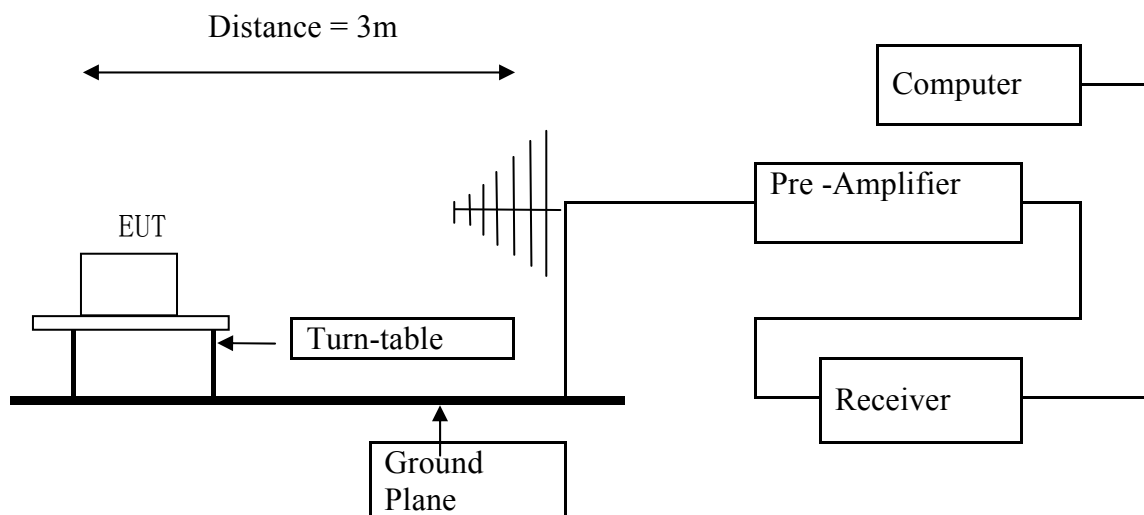
5.1 Block Diagram of Test Setup

5.1.1 Block diagram of connection between the EUT and simulators



(EUT: Flashlight)

5.1.2 Block diagram of test setup (In chamber)



(EUT: Flashlight)

5.2 Measuring Standard

EN IEC 55015:2019+A11:2020

5.3 Radiated Emission Limits

All emanations from a device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30-230	3	40
230-300	3	47

- Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4 EUT Configuration on Test

The EN55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

5.5 Operating Condition of EUT

5.5.1 Turn on the power.

5.5.2 After that, let the EUT work in test mode (Normal) and measure it.

5.6 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCS30) is set at 120 kHz.

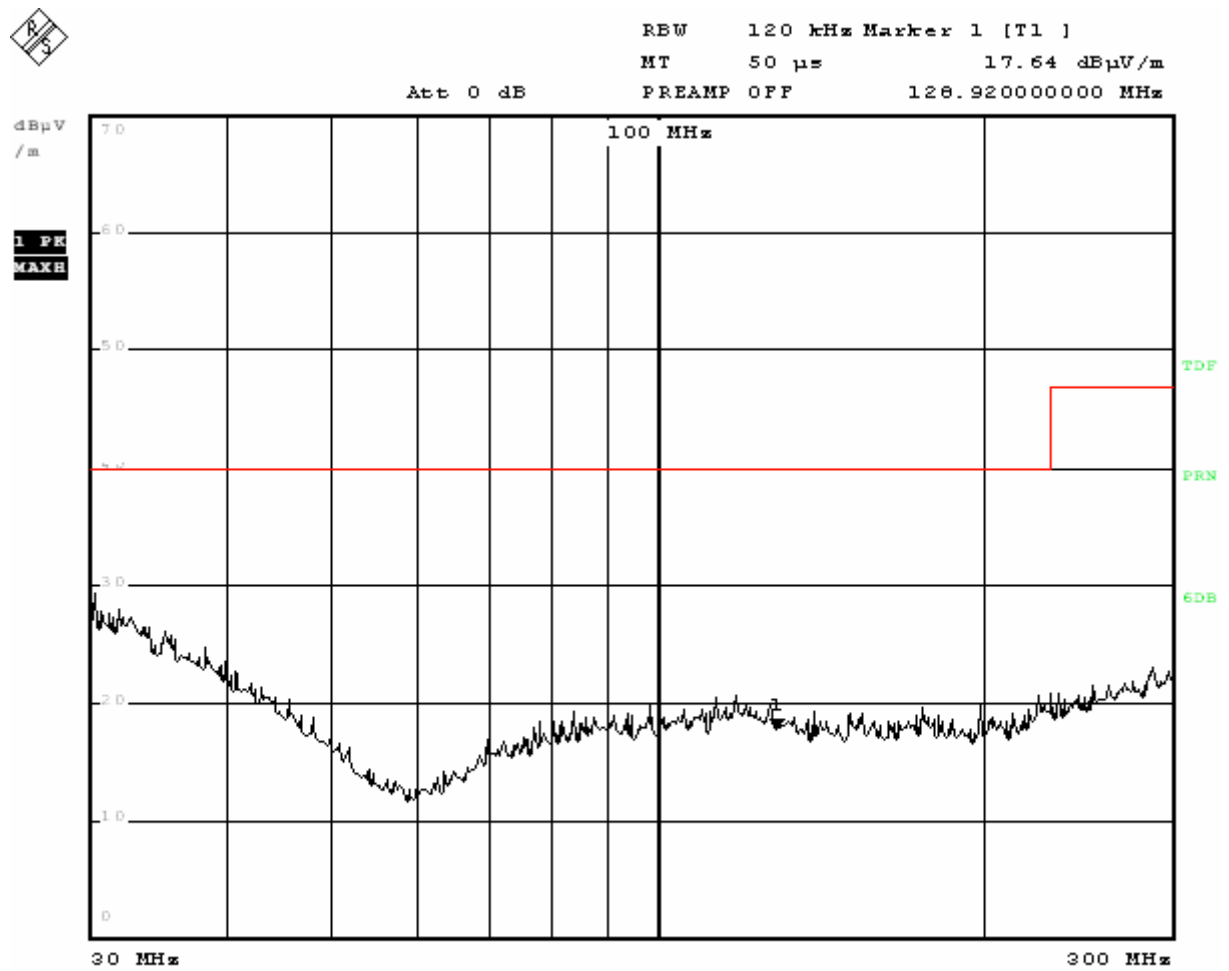
The frequency range from 30MHz to 300MHz is investigated.

5.7 Measuring Results

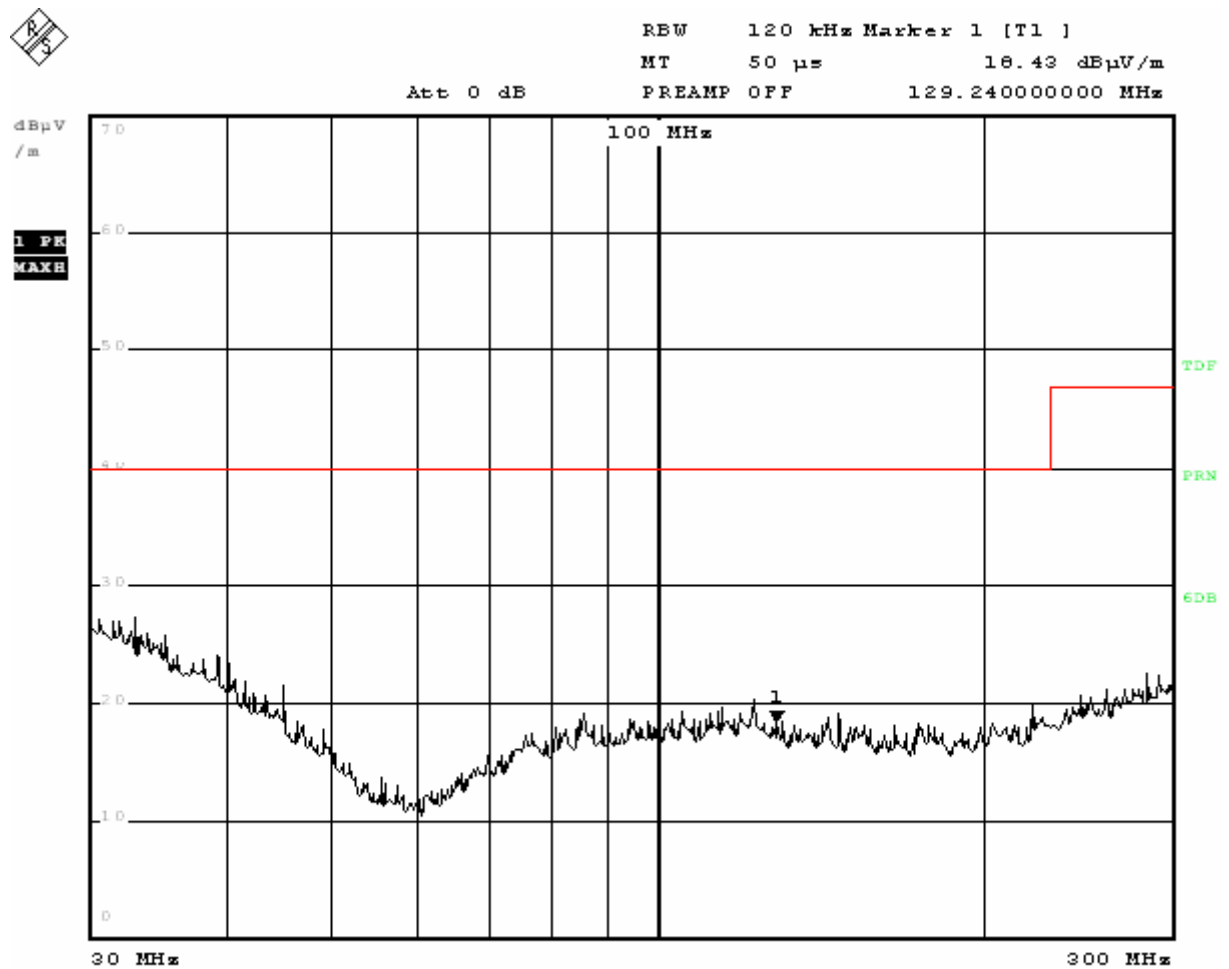
PASS.

Please refer to the following page.

Horizontal Polarization Test Data

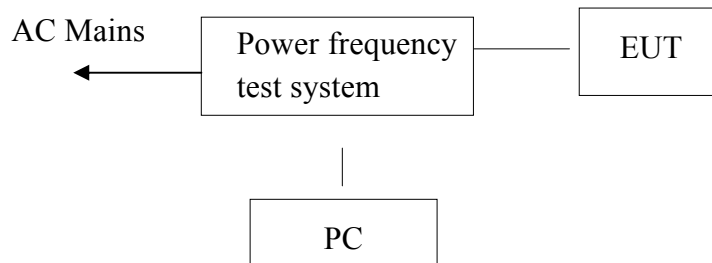


Vertical Polarization Test Data



6.HARMONIC CURRENT MEASUREMENT

6.1 Block Diagram of Test Setup



(EUT: Flashlight)

6.2 Measuring Standard

EN61000-3-2: 2014 CLASS C

6.3 Operating Condition of EUT

Same as Section 3.4. except the test setup replaced by Section 5.1.

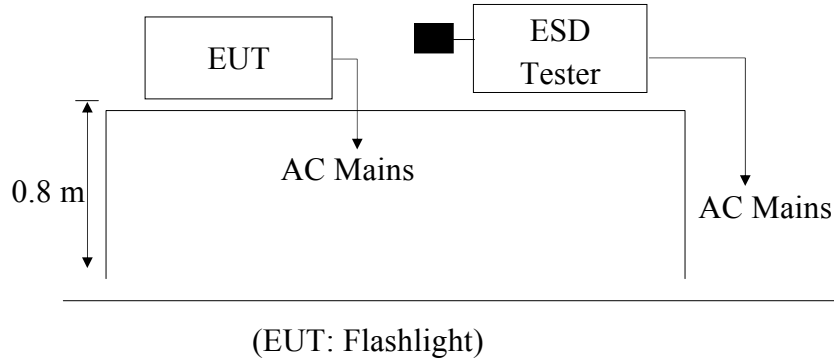
6.4 Test Results

N/A.

* N/A --- Not apply

7. ELECTROSTATIC DISCHARGE TEST

7.1 Block Diagram of ESD Test Setup



7.2 Test Standard

EN61547: 2009 (EN61000-4-2: 2009, Severity Level:
Air Discharge: Level 3, ± 8 KV Contact Discharge: Level 2, ± 4 KV)

7.3 Severity Levels and Performance Criterion

7.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

7.3.2 Performance criterion: **B**

7.4 EUT Configuration

The configuration of EUT is listed in Section 1.1

7.5 Operating Condition of EUT

7.5.1 Setup the EUT as shown in Section 7.1.

7.5.2 Turn on the power of all equipments.

7.5.3 Let the EUT work in test mode (On) and measure it.

7.6 Test Procedure

7.6.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

7.6.2 Contact Discharge:

All the procedure shall be same as Section 6.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

7.6.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

7.7 Test Results

PASS.

Please refer to the following page

Electrostatic Discharge Test Results

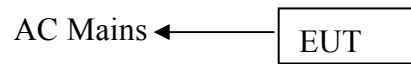
Applicant	: Ningbo Grand Star Electric Co., Ltd.	
EUT	: Flashlight	Test Date : June 08, 2021
M/N	: GS-9100	Temperature : 22°C
Power Supply	: DC 3V	Humidity : 50%
Test Mode	: Normal	Criterion : B
Air Discharge: ±8KV		
Contact Discharge: ±4KV # For each point positive 10 times and negative 10 times		
Location	Kind A-Air Discharge C-Contact Discharge	Result
Gap of the EUT	A	PASS
Metal parts	C	PASS
HCP	C	PASS
VCP of Front	C	PASS
VCP of Rear	C	PASS
VCP of Left	C	PASS
VCP of Right	C	PASS
Remark :	Test Equipment : ESD Tester (HAEFELY, PESD1600)	

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

8 RF FIELD STRENGTH SUSCEPTIBILITY TEST

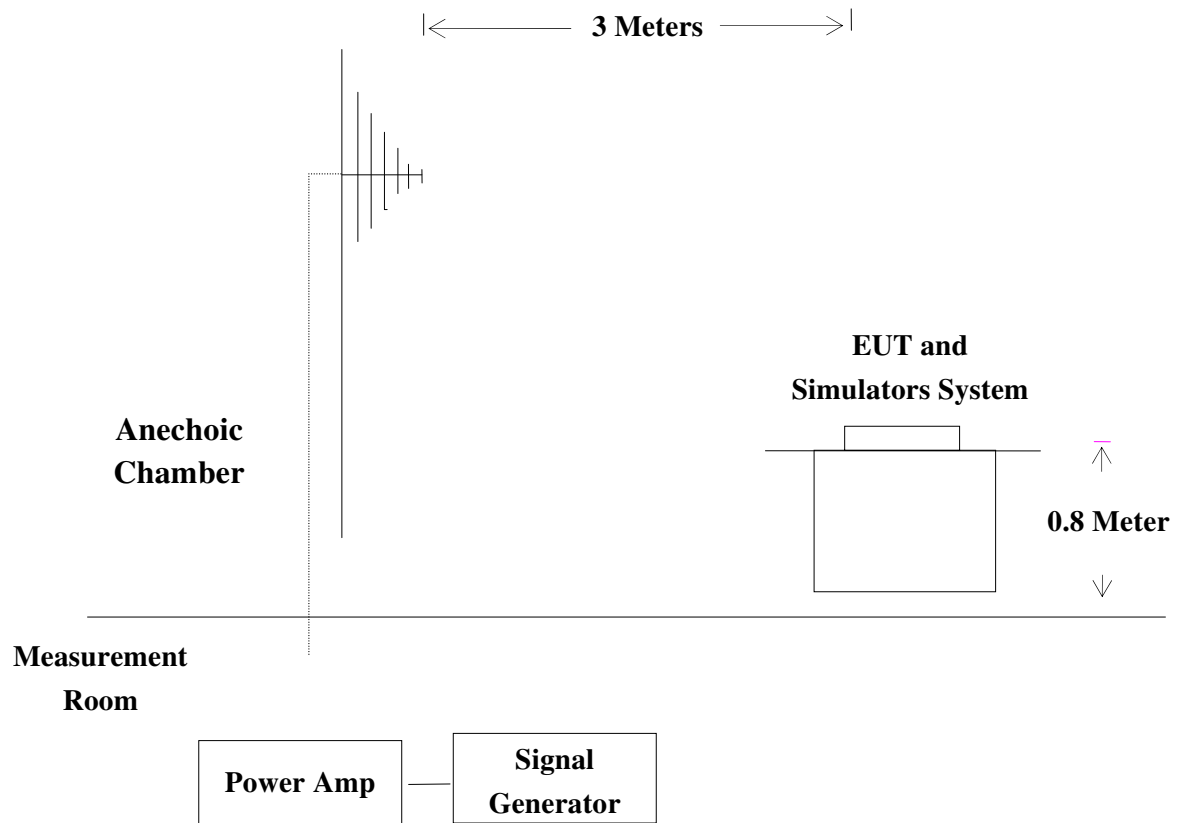
8.1 Block Diagram of Test Setup

8.1.1 Block Diagram of the EUT and the simulators



(EUT: Flashlight)

8.1.2 R/S Test Setup



8.2 Test Standard

EN61547: 2009 (EN61000-4-3: 2006+A1: 2008+A2: 2010, Severity Level: 2, 3V / m)

8.3 Severity Levels and Performance Criterion

8.3.1 Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

8.3.2 Performance criterion : A

8.4 EUT Configuration

The configuration of EUT are listed in Section 1.1.

8.5 Operating Condition of EUT

8.5.1 Setup the EUT as shown in Section 8.1.

8.5.2 Turn on the power of all equipments.

8.5.3 Let the EUT work in test mode (On) and measure it.

8.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

8.7 Test Results

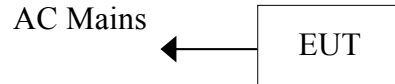
PASS.

Please refer to the following page.

9 ELECTRICAL FAST TRANSIENT/BURST TEST

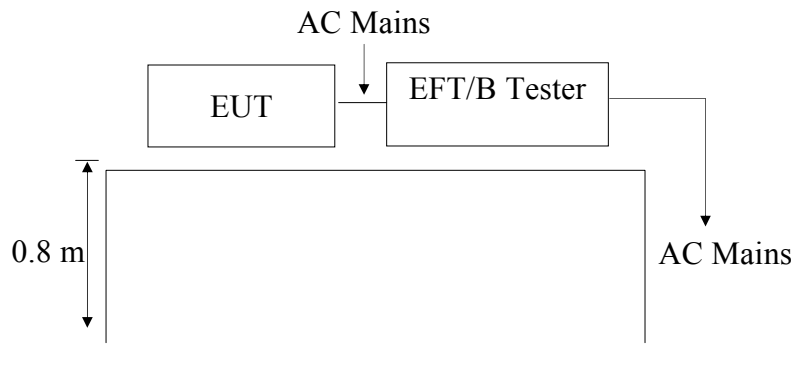
9.1 Block Diagram of Test Setup

9.1.1 Block Diagram of the EUT



(EUT: Flashlight)

9.1.2 EFT Test Setup



9.2 Test Standard

EN61547: 2009 (EN61000-4-4: 2012, Severity Level, Level 2 : 1KV)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

9.3.2 Performance criterion : B

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

9.4 EUT Configuration

The configuration of EUT are listed in Section 1.1.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (On) and measure it.

9.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.6.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6.2 For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

9.6.3 For DC output line ports:

It's unnecessary to test.

9.7 Test Result

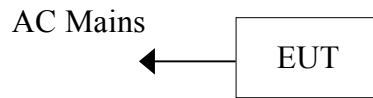
N/A.

* N/A --- Not apply

10 SURGE IMMUNITY TEST

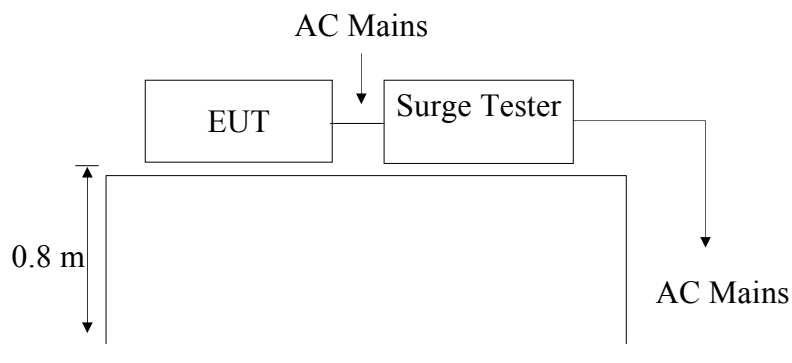
10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of the EUT



(EUT: Flashlight)

10.1.2 Surge Test Setup



(EUT: Flashlight)

10.2 Test Standard

EN61547: 2009 (EN61000-4-5: 2014, Severity Level : Line to Line: Level 2 , 1.0KV)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

9.3.2 Performance criterion : B

The device described above is tested by SHENZHEN SETTEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETTEK TECHNOLOGY CO., LTD.

10.4 EUT Configuration

The configuration of EUT are listed in Section 1.1

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.

10.5.2 Turn on the power of all equipments.

10.5.3 Let the EUT work in test mode (ON) and measure it.

10.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 10.1.2.
- 2) For line to line coupling mode, provide a 1 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

10.7 Test Result

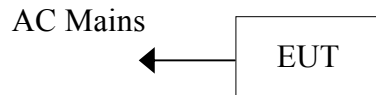
N/A

* N/A --- Not apply

11 INJECTED CURRENTS SUSCEPTIBILITY TEST

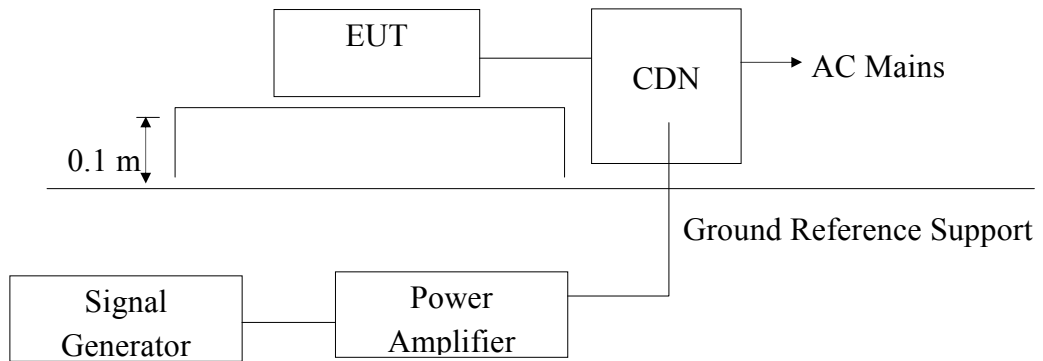
11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



(EUT: Flashlight)

11.1.2 Block Diagram of Test Setup



(EUT: Flashlight)

11.2 Test Standard

EN61547: 2009 (EN61000-4-6: 2009, Severity Level: 3V (rms), 0.15MHz ~ 80MHz)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

11.3.2 Performance criterion: A

11.4 EUT Configuration

The configuration of EUT are listed in Section 1.1.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 11.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

11.7 Test Results

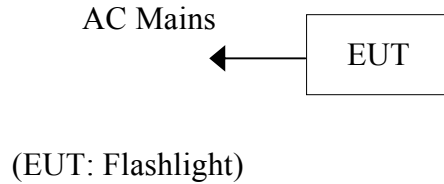
N/A .

* N/A --- Not apply

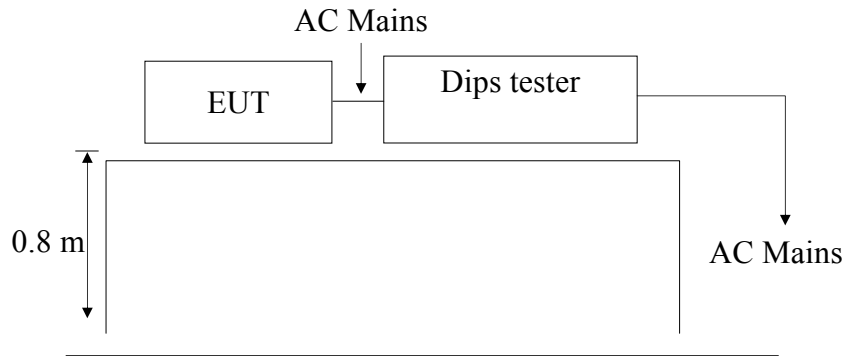
12 VOLTAGE DIPS AND INTERRUPTIONS TEST

12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



12.1.2 Dips Test Setup



12.2 Test Standard

EN61547: 2009 (EN61000-4-11: 2004)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Test Level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Duration (in period)
0	100	0.5
40	60	1
70	30	5
		10
		25
		50
		*

12.3.2 Performance criterion : B, C

12.4 EUT Configuration

The configuration of EUT are listed in Section 1.1.

12.5 Operating Condition of EUT

12.5.1 Setup the EUT as shown in Section 13.1.

12.5.2 Turn on the power of all equipments.

12.5.3 Let the EUT work in test mode (On) and measure it.

12.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 13.1.2.
- 2) The interruptions is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

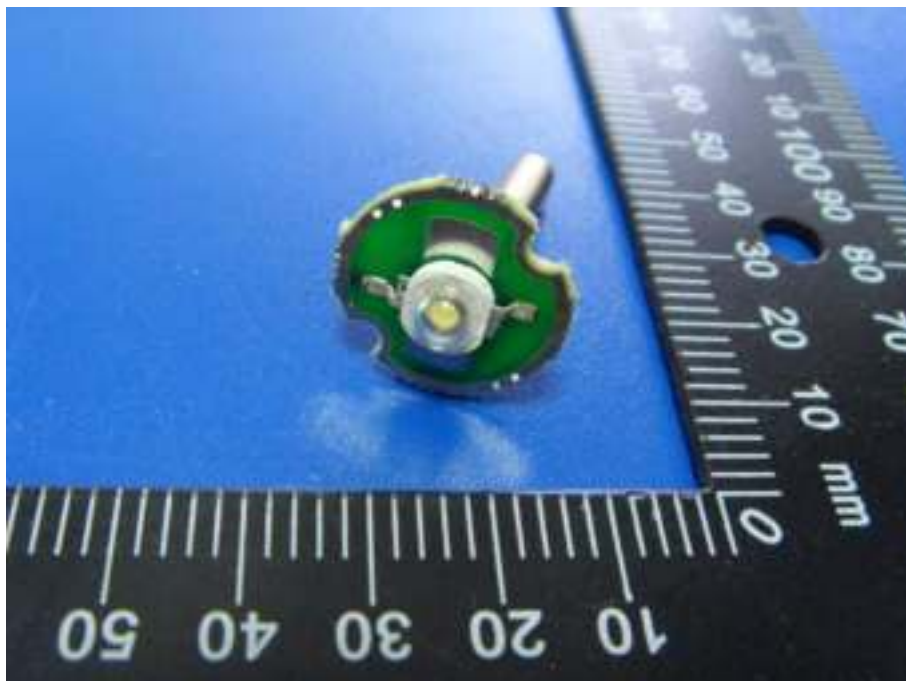
12.7 Test Result

N/A

* N/A --- Not apply

APPENDIX I

(Photos of EUT)





GS-4001



GS-4003



GS-4003A



GS-4004



GS-4004A



GS-4005



GS-4007



GS-4007A



GS-4010



GS-4013



GS-4013A



GS-4014



GS-4021



GS-4024



GS-4024A



GS-4025



GS-4028



GS-4029



GS-4030



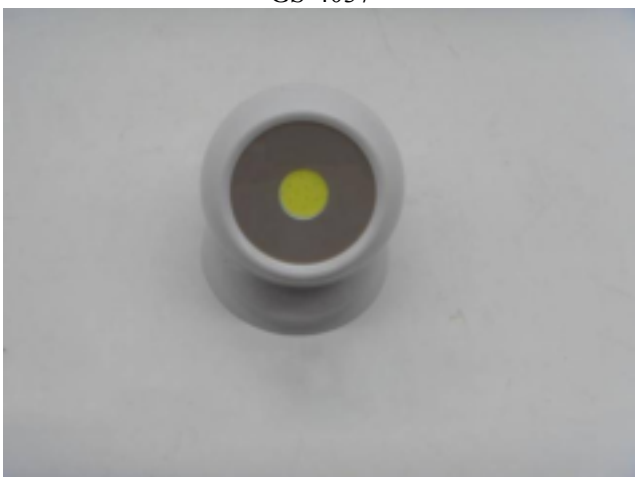
GS-4036



GS-4037



GS-4037A



GS-4038



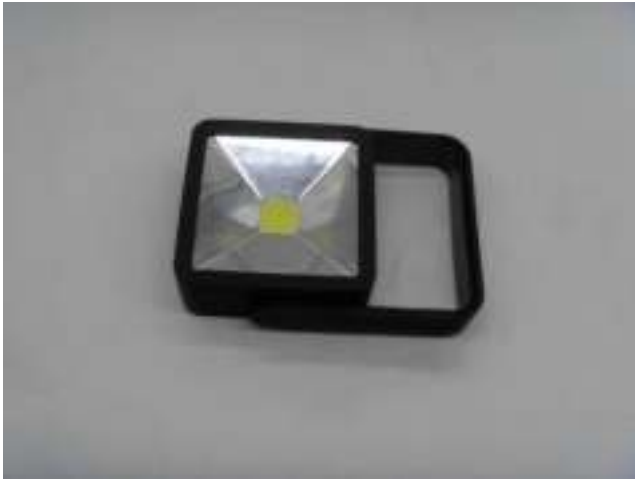
GS-4038A



GS-4040



GS-4048



GS-4049



GS-4050



GS-4050A



GS-4056



GS-4062



GS-4063



GS-4071



GS-4081



GS-4081A



GS-4084



GS-4085



GS-4087



GS-4089



GS-4095



GS-4097



GS-4099



GS-4100



GS-4102



GS-4103



GS-4104



GS-4105



GS-4106



GS-4114



GS-4115



GS-4116



GS-5002



GS-5006



GS-5007



GS-5020



GS-5025



GS-5026



GS-5027



GS-6001



GS-6001A



GS-6008



GS-6009



GS-6040



GS-6041



GS-6041A



GS-6042



GS-7002C



GS-7002D



GS-7004



GS-7006



GS-7006A



GS-7013



GS-7016B



GS-7020



GS-7023



GS-7027



GS-7028



GS-7029



GS-7030



GS-7030A



GS-7031



GS-7032



GS-8001



GS-8005



GS-8008



GS-8013



GS-8015B



GS-8016



GS-8016S



GS-8017



GS-8024



GS-8027A



GS-8028



GS-8036A



GS-8039



GS-8040



GS-8040A



GS-8041



GS-8042



GS-8042A



GS-8043



GS-8045



GS-8046



GS-8049



GS-8062



GS-8063



GS-8065



GS-8066



GS-8068



GS-8085



GS-8087



GS-8088



GS-8300



GS-9003



GS-9016



GS-9016A



GS-9016B



GS-9021-2AA



GS-9021-2C



GS-9021-3C



GS-9016



GS-9016A



GS-9016B



GS-9021-2AA



GS-9021-2C



GS-9021-3C



GS-9048-2AA



GS-9050



GS-9052



GS-9053



GS-9059



GS-9069



GS-9080



GS-9081



GS-9087



GS-9097



GS-9099



GS-9106



GS-9166



GS-9401



GS-9410



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GS-9447



GS-9455



GS-9504



GS-9805



GS-9100

End of the Report