EMC TEST REPORT

For

SHENZHEN SRESKY CO., LTD

Solar Light

Model No.: SSL series

Additional Model No.: ESL series, SCL series, SDL series, SGL series, SL series, SLL

series, SML series, SWL series, SBC series, BLP series, Hubi series

Prepared for Address		SHENZHEN SRESKY CO.,LTD Jingmei Building, TaiWan industrial Park, SHIYAN Town, BaoAn District, ShenZhen, China
Prepared by	:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample Number of tested samples Serial number Date of Test Date of Report	:	January 13, 2018 1 Prototype January 13, 2018 ~ January 18, 2018 January 18, 2018



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Shenzhen Soumern Ees Compitance Te	sting Laboratory Ltd. Report No.: LCS180111028B.		
	EMC TEST REPORT		
	EN 55015: 2013+A1: 2015		
Limits and methods of measur	ement of radio disturbance characteristics of electrical lighting and		
	similar equipment		
Equipment for get	EN 61547: 2009		
Report Reference No	neral lighting purposes - EMC immunity requirements LCS180111028BE		
Date Of Issue:			
	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.		
Address:	B Area, 1-2/F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming		
	New District, Shenzhen, Guangdong, China		
Testing Location/ Procedure:	Full application of Harmonised standards		
	Partial application of Harmonised standards		
	Other standard testing method		
Applicant's Name:			
Address:	Jingmei Building, TaiWan industrial Park, SHIYAN Town, BaoAr District, ShenZhen, China		
Test Specification:			
Standard:	EN 55015: 2013+A1: 2015 EN 61547: 2009		
Test Report Form No:	LCSEMC-1.0		
TRF Originator:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.		
Master TRF	Dated 2011-03		
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Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

EMC -- TEST REPORT

Test Report No. : LCS180111028BE

January 18, 2018 Date of issue

Type/Model	SSL series
EUT:	Solar Light
	SHENZHEN SRESKY CO.,LTD
Address	Jingmei Building, TaiWan industrial Park, SHIYAN Town,
	BaoAn District, ShenZhen, China
Telephone	/
Fax:	/
Manufacturer:	SHENZHEN SRESKY CO.,LTD
	Jingmei Building, TaiWan industrial Park, SHIYAN Town,
	BaoAn District, ShenZhen, China
Telephone	/
Fax:	/
Factory:	SHENZHEN SRESKY CO.,LTD
	Jingmei Building, TaiWan industrial Park, SHIYAN Town,
	BaoAn District, ShenZhen, China
Telephone	/
Fax:	

Test Result according to the standards on page 7: **Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	January 18, 2018	Initial Issue	Cherry Chen

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1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION (EN 55015: 2013+A1: 2015)						
Description of Test Item		Standard	Limits	Results		
Conducted disturbance at mains terminals		EN 55015: 2013+A1: 2015			N/A	
Magnetic field emission		EN 55015: 2013+A1: 2015			PASS	
Radiated disturbance		EN 55015: 2013+A1: 2015			PASS	
Harmonic current emissions		EN 61000-3-2: 2014		Class C	N/A	
Voltage fluctuations & flicker		EN 61000-3-3: 2013			N/A	
	IN	IMUNITY (EN 61547: 2009)				
Description of Test Item		Basic Standard		formance Criteria	Results	
Electrostatic discharge (ESD)		EN 61000-4-2: 2009		В	PASS	
Electrical fast transient (EFT)		EN 61000-4-4: 2012		В	N/A	
Surge (Input a.c. power ports)	EN 61000-4-5: 2014 B		В	N/A		
Radio-frequency, Continuous conducted disturbance	cted disturbance EN 61000-4-6: 2014			А	N/A	
Power frequency magnetic field		EN 61000-4-8: 2010		А	PASS	
Voltage dips, 30% reduction				С	N/A	
Voltage interruptions		EN 61000-4-11: 2004		В	N/A	
N/A is an abbreviation for Not App	olica	ble.				

1.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.
- 1.2.1.Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.2.Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.3.Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.

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2. GENERAL INFORMATION

2.1.Description of Device (EUT)

EUT

201	• 501ml 21811
Trade Mark	: N/A
Model Number	: SSL series
Power Supply	: DC 18V 1A

: Solar Light

2.2.Description of Test Facility

Site Description EMC Lab. :	TUV RH Registration Number. is UA 50362241 0001. UL Registration Number. is 100571-492. NVLAP Registration Number. is 600112-0.
Test Facilities	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2/F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, Guangdong, China
RF Field Strength Susceptibility	Shenzhen LCS Compliance Testing Laboratory Ltd. 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue., Bao'an District, Shenzhen, Guangdong, China

2.3.Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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Test	Parameters	Expanded uncertainty (U _{lab})	Expanded uncertainty (U _{cispr})	
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 1.40 dB ± 2.80 dB	± 4.0 dB ± 3.6 dB	
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	Level accuracy + 3.46 dB		
Radiated Emission	Level accuracy (9kHz to 30MHz)			
Radiated Emission	Level accuracy (30MHz to 200MHz)	\pm 4.66 dB	\pm 5.2 dB	
Radiated Emission	Level accuracy (200MHz to 1000MHz)	± 4.64 dB	\pm 5.0 dB	
Mains Harmonic	Voltage	± 0.640%	N/A	
Voltage Fluctuations & Flicker	Voltage	± 0.530%	N/A	

2.4. Measurement Uncertainty

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. MEASURING DEVICES AND TEST EQUIPMENT

Item Test Equipment Manufacturer Model No. Serial No. Last Cal. EMI Test Receiver **ROHDE & SCHWARZ** ESR 7 101142 2017-06-18 1 2 EMI Test Receiver **ROHDE & SCHWARZ** ESPI3 101840 2017-06-18 3 Triple-loop Antenna LAPLACE MK II-A 9161 2017-06-18 4 10dB Attenuator LAPLACE HAT-10 15542 2017-06-18 AUDIX 5 EMI Test Software E3 N/A N/A

3.1.Radiated Electromagnetic Disturbance

3.2.Radiated Disturbance (Electric Field)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03СН03-НҮ	2017-06-18
2	EMI Test Receiver	ROHDE & SCHWARZ	ESR 7	101181	2017-06-18
3	Log per Antenna	SCHWARZBECK	VULB9163	9163-470	2016-04-18
4	EMI Test Software	AUDIX	E3	N/A	2017-06-18
5	Positioning Controller	MF	MF-7082	/	2017-06-18

3.3.Electrostatic Discharge

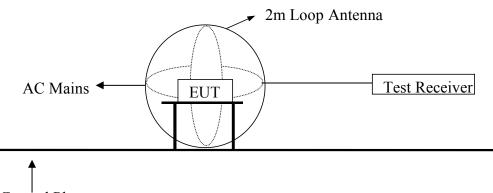
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	SCHLODER	SESD 230	604035	2017-06-18

3.4. Power Frequency Magnetic Field Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2017-06-18

4. MAGNETIC FIELD EMISSION MEASUREMENT

4.1.Block Diagram of Test Setup



Ground Plane

4.2. Magnetic Field Emission Measurement Standard and Limits

4.2.1.Test Standard

EN 55015: 2013+A1: 2015

4.2.2.Test Limits

Frequency	Limits for loop diameter (dBµA)
Trequency	2m
9kHz ~ 70kHz	88
70kHz ~ 150kHz	88 ~ 58*
150kHz ~ 3.0MHz	58 ~ 22*
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 Test

The configuration of the EUT is same as Section 3.3.

4.4.Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.4, except the test set up replaced by Section 4.1.

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.

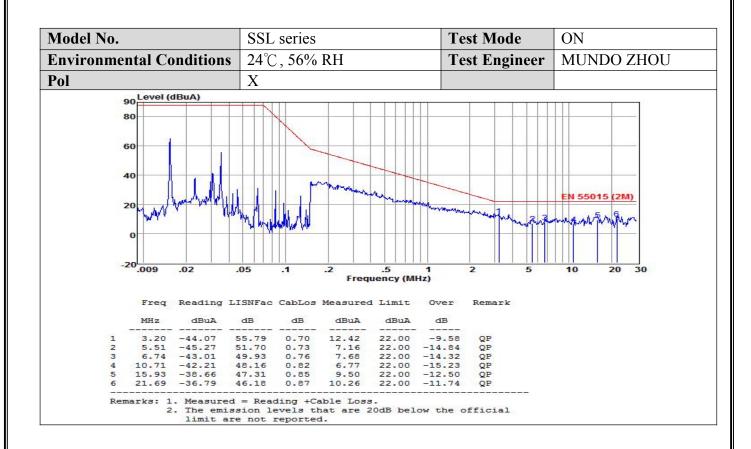
The frequency range from 9kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9kHz to 150kHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

All the test results are listed in Section 4.6.

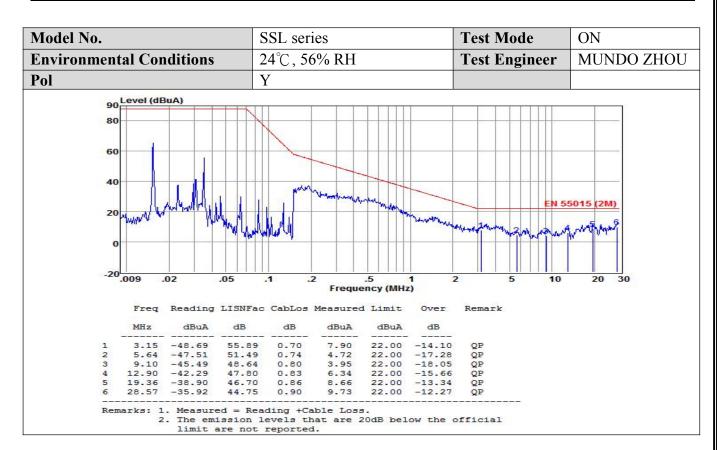
4.6.Test Results

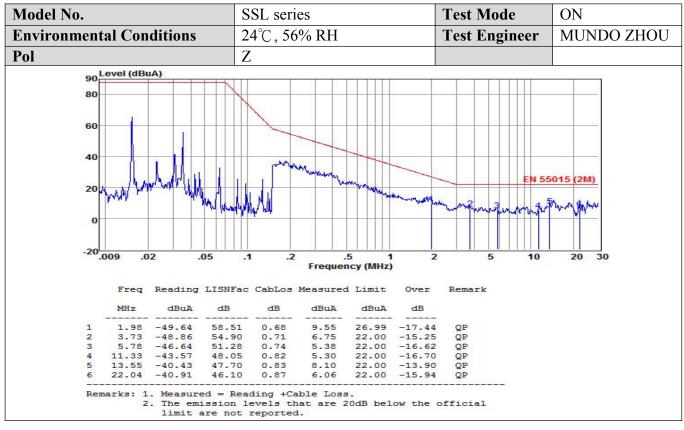
PASS.

The frequency range from 9kHz to 30MHz is investigated.



Report No.: LCS180111028BE





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5. RADIATED EMISSION MEASUREMENT

$H = \frac{1}{1000}$

5.1.Block Diagram of Test Setup

5.2.Test Standard

EN 55015: 2013+A1: 2015

5.3.Radiated Emission Limits

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

FREQUENCY	DISTANCE	FIELD STRENGTHS LIMIT
(MHz)	(Meters)	$(dB\mu V/m)$
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.

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5.4.EUT Configuration on Test

The EN 55015 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 (ON) and measure it.

5.6.Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable 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 an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

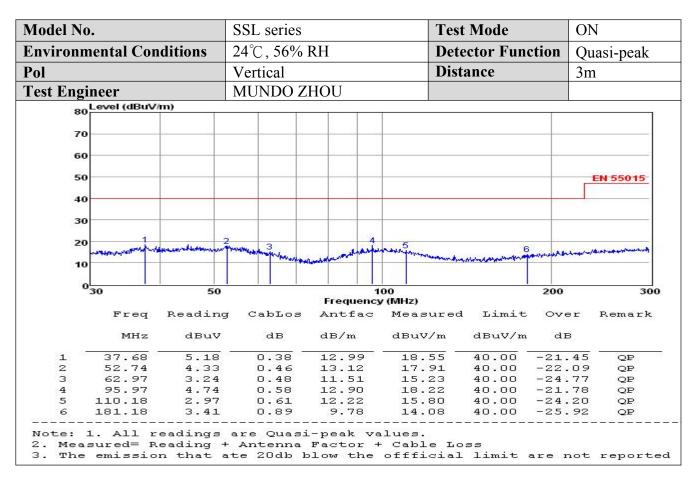
The frequency range from 30MHz to 300MHz is investigated.

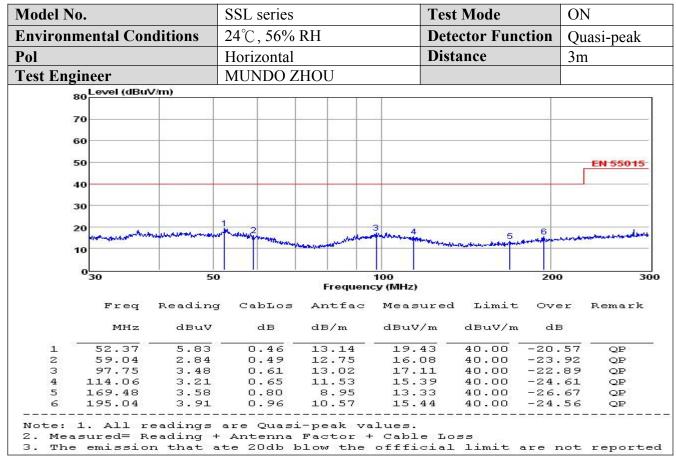
5.7.Test Results

PASS.

The test result please refer to the next page.

Report No.: LCS180111028BE

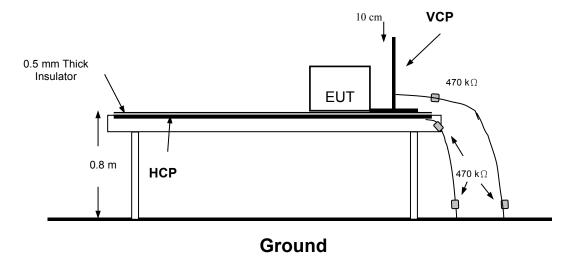




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6. ELECTROSTATIC DISCHARGE TEST

6.1.Block Diagram of Test Setup



6.2.Test Standard

EN 61547: 2009 (EN 61000-4-2: 2009, Severity Level: Air Discharge: Level 3, ± 8 KV Contact Discharge: Level 2, ± 4 KV)

6.3. Severity Levels and Performance Criterion

6.3.1.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

6.3.2.Performance criterion: **B**

6.4.EUT Configuration on Test

The configuration of EUT is listed in Section 3.6

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6.5. Operating Condition of EUT

- 6.5.1.Setup the EUT as shown in Section 6.1.
- 6.5.2.Turn on the power of all equipments.
- 6.5.3.Let the EUT work in test mode (ON) and measure it.

6.6.Test Procedure

6.6.1.Air Discharge

This test is done on a non-conductive surfaces. 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.

Because the case of the EUT is metal surface, so it does not need to be tested.

6.6.2.Contact Discharge

All the procedure shall be same as Section 9.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.6.3.Indirect Discharge For Horizontal Coupling Plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

6.6.4.Indirect Discharge For Vertical Coupling Plane

At least 20 single discharge 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.

6.7.Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

Standard	□ IEC 61000-4-2 ☑ EN 61000-4-2			
Applicant	SHENZHEN SRESKY CO.,LTD			
EUT	Solar Light	Temperature	23℃	
M/N	SSL series	Humidity	56%	
Criterion	В	Pressure	1021mbar	
Test Mode	ON	Test Engineer	MUNDO ZHOU	

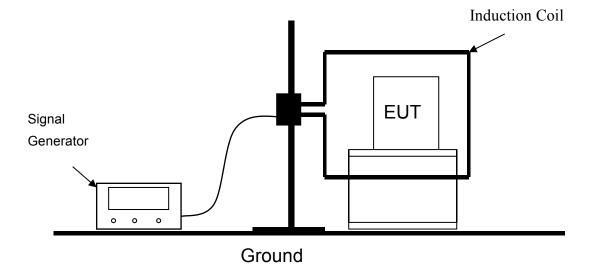
		А	ir Discharg	e		
		Test Levels	8	Results		
Test Points	± 2KV	±4KV	±8KV	Pass	Fail	Performance Criterion
Front	\boxtimes	\square	\boxtimes	\boxtimes		$\Box \mathbf{A} \boxtimes \mathbf{B}$
Back		\square		\square		$\Box \mathbf{A} \boxtimes \mathbf{B}$
Left		\square		\square		$\Box A \boxtimes B$
Right		\square				
Тор		\square		\square		$\square A \boxtimes B$
Bottom	\square	\square	\boxtimes	\square		$\square A \square B$
		Con	itact Discha	rge		
		Test Levels	S		Resu	lts
Test Points	± 2 KV	7	±4 KV	Pass	Fail	Performance Criterion
Front			\boxtimes	\square		
Back	\boxtimes		\boxtimes	\boxtimes		$\square A \square B$
Left	\boxtimes		\boxtimes	\boxtimes		$\square A \square B$
Right	\square		\boxtimes	\boxtimes		$\Box \mathbf{A} \boxtimes \mathbf{B}$
Тор			\boxtimes			$\Box \mathbf{A} \boxtimes \mathbf{B}$
Bottom	\square		\boxtimes	\square		$\Box A \boxtimes B$
]	Discharge T	fo Horizonta	al Coupling	Plane	
		Test Levels			Resu	lts
Side of EUT ± 2 KV		r	±4 KV	Pass	Fail	Performance Criterion
Front	\boxtimes		\boxtimes	\boxtimes		
Back	\boxtimes		\boxtimes	\boxtimes		
Left			\boxtimes	\square		
Right	\boxtimes		\boxtimes			
]	Discharge T	o Vertical (Coupling Pla	ane	
		Test Levels	S	Results		lts
Side of EUT	± 2 KV	± 2 KV		Pass	Pass Fail	Performance Criterion
Front			\boxtimes	\square		
Back			\boxtimes	\square		$\Box \mathbf{A} \boxtimes \mathbf{B}$
Left			\boxtimes	\square		$\Box \mathbf{A} \boxtimes \mathbf{B}$
Right			\boxtimes	\boxtimes		$\square A \square B$

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7. MAGNETIC FIELD IMMUNITY TEST

7.1.Block Diagram of Test Setup



7.2.Test Standard

EN 61547: 2009 (EN 61000-4-8: 2010, Severity Level 2: 3A/m)

7.3. Severity Levels and Performance Criterion

Level	Magnetic Field Strength (A/m)	
1.	1	
2.	3	
3.	10	
4.	30	
5.	100	
X	Special	

7.3.2.Performance criterion: A

7.4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.10.

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.Set up the EUT system as shown on Section 7.1.
- 7.6.2. The Induction coil is set up in horizontal or vertical.
- 7.6.3.Let the EUT work in test mode and measure it.

7.7.Test Results

PASS.

Please refer to the following page.

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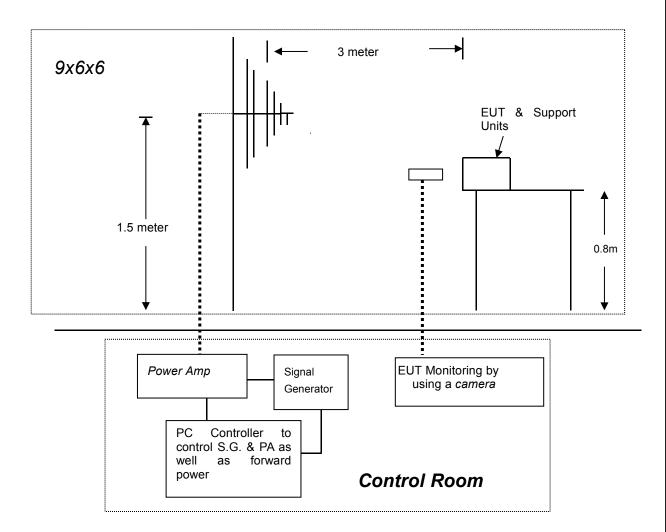
	Magnetic Field Immunity Test Result				
Standard	□ IEC 61000-4-8 ☑ EN 61000-4-8				
Applicant	SHENZHEN SRESKY CO.,LTD				
EUT	Solar Light	Temperature	23°C		
M/N	SSL series	Humidity	56%		
Test Mode	ON	Criterion	А		
Test Engineer	MUNDO ZHOU				

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
3	5 mins	Х	А	PASS
3	5 mins	Y	А	PASS
3	5 mins	Z	А	PASS

Note:

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8. RF FIELD STRENGTH SUSCEPTIBILITY TEST



8.1.Block Diagram of Test Setup

8.2.Test Standard

EN 61547: 2009 (EN 61000-4-3: 2006+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

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8.4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.13.

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	Unmodulated
3.	Scanning Frequency	80 - 1000 MHz
4.	Dwell time of radiated	0.0015 decade/s
5.	Waiting Time	3 Sec.

8.7.Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Standard	□ IEC 61000-4-3 ☑ EN 61000-4-3			
Applicant	SHENZHEN SRESKY CO.,LTD			
EUT	Solar Light		Temperature	26℃
M/N	SSL series		Humidity	51%
Field Strength	3 V/m		Criterion	А
Test Mode	ON		Test Engineer	MUNDO ZHOU
Frequency Range	80 MHz to 1000 MHz			
Modulation		I Pulse ☑	AM 1KHz 80%	
Steps	1%			

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

Test Equipment:

- 1. Signal Generator: 2031 (MARCONI)
- 2. Power Amplifier: 500A100 & 100W/1000M1 (A&R)
- 3. Power Antenna: 3108 (EMCO) & AT1080 (A&R)
- 4. Field Monitor: FM2000 (A&R)

Note:

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9. PHOTOGRAPH

9.1. Photo of Radiated Electromagnetic Disturbance Measurement



9.2. Photo of Radiated Measurement



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9.3. Photo of Electrostatic Discharge Test



9.4. Photo of Magnetic Field Immunity Test



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10. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2

-----THE END OF TEST REPORT-----

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