



Verification Services

Project No: 4787016661-8
Report No: 4787016661-8a
Report Issued Date: 2015-10-14


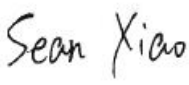
Test Report

Applicant Company & Address:			
SHENZHEN SNOWBALL LIGHTING LIMITED ADD: NO.82 CENTER VILLAGE, MISSION HILLS SONGYUANXIA, GUANLAN TOWN, LONGHUA DISTRICT, SHENZHEN, GUANGDONG PROVINCE, CHINA 518110			
Contact Person:	Judy Briggs (judy@snowball-co.com)		
Telephone:	86-755-29078625	Fax:	--

Manufacturer Name:	SHENZHEN SNOWBALL LIGHTING LIMITED		
Country of Origin:	China		
Country of Export:	USA, Canada		
Product Description:	Lamp Type: Outdoor Pole/Arm-Mounted Area and Roadway Luminaires Total amount of light source: 48 pcs Manufacturer Of Light Source: Cree Inc. Model Number Of Light Source: XPG2		
Model Number:	SB-ST/T2/100W/3D/AWW		
Electrical Specification:	120-277V AC, 50/60Hz, 100W (3000K)		

Test Laboratory & Address:			
UL Verification Services (Guangzhou) Co., Ltd. ADD: Building A1, 1F & 2F, Nansha Science and Technology Innovation Center, No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China			
Telephone:	+86 20 28667188	Fax:	+86 20 83486605

Receipt of Test Samples:	2015-09-02	Test Period:	2015-09-08, 2015-10-13
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Tested By	Approved By
 / Sam Tse	 / Sean Xiao
Tester Signature / Print Name	Approver Signature / Print Name

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.



Test Report

Statement of Results

Test Flow	Test Method	Sample ID (Lab)	Sample Serial No.	Pass/Fail/NA
1. Integrating Sphere Test	LM-79-08	2217450-S001	N/A	Evaluate by customer
2. Goniophotometer Test	LM-79-08	2217450-S001	N/A	Evaluate by customer
3. Total Harmonic Distortion Test	ANSI C82.77-2002	2217450-S001	N/A	Evaluate by customer

Deviation from Test Method (if any)

N/A

Remark (if any)

1. This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.



Test Report

Test No.1: Integrating Sphere Test

Environmental Conditions

Temperature:	25.1°C
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Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE003	Integrating Sphere	Before Use	Before Use
GVS-LE-FS009	Measurement Standard Lamp	2015-08-20	2016-08-19

Test Sample

2217450-S001

Test Method

<ol style="list-style-type: none"> The sample was tested according to the IES LM-79-2008. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25°C ± 1°C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.
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Test Result

Test Type	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	120.11	60	0.8385	100.23	0.995	Face Down	58	50

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	3004	11445.16	70	114.19



Test Report

Test Condition

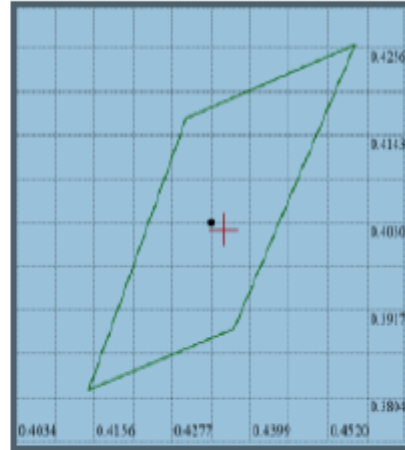
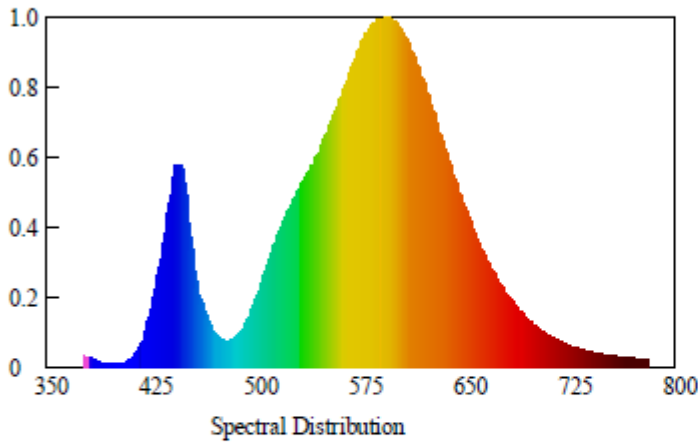
Temperature: 25.1°C

RH: ----%

Spectrum Range: 380-780 nm

Scan Step: 1 nm

Spectroradiometric Parameters



Nominal CCT: LED 3000K
x0=0.4357 y0=0.4021

Chromaticity Coordinates: x=0.4357 y=0.4021 u'=0.2507 v'=0.5204

Correlated Color Temperature: 3004 K

Dominant Wavelength: 582.0 nm(E)

Luminous Flux: 11445.160 lm

Purity: 0.5149

Chromaticity Difference: -0.00065Duv

Peak Wavelength: 596.0 nm

Color Ratio: Kr=44.5% Kg=50.5% Kb=4.9%

Bandwidth: 114.2nm

Radiant Flux: 25.19 W

Rendering Index: Ra=70.0

R1=66 R2=80 R3=91 R4=67 R5=65 R6=71 R7=77 R8=43

R9=-35 R10=53 R11=61 R12=45 R13=69 R14=95 R15=59



Test Report

Test No.2: Goniophotometer Test

Environmental Conditions

Temperature:	25.1°C
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Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-GS002	Goniophotometer	Before Use	Before Use
GVS-LE-CA015	Digital Caliper	2014-12-18	2015-12-17
GVS-LE-FS009	Measurement Standard Lamp	2015-08-20	2016-08-19

Test Sample

2217450-S001

Test Method

1. The sample was tested according to the IES LM-79-2008.
2. Photometric parameters were measured using a type C goniophotometer and software.
3. The ambient temperature shall be maintained at 25 °C ± 1°C, measured at a point not more than 1 m from the sample and at the same height as the sample.
4. The samples were operated at rated voltage and were stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals.

Test Result

Test Type	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	120.05	60	0.8402	100.38	0.9952	Face Down	70	30

Test Type	Flux (lm)	Field Angle (10%)		Beam Angle (50%)		Zonal Lumen Result		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	0°~90°	80°~90°	
Output	11458.2	114.5	139	84.1	119.5	99.8%	0.6%	114.15



NVLAP Lab Code: 200952-0

Verification Services

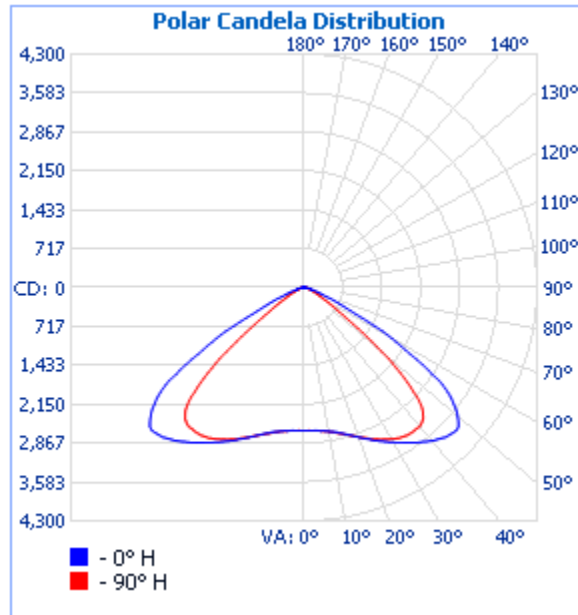
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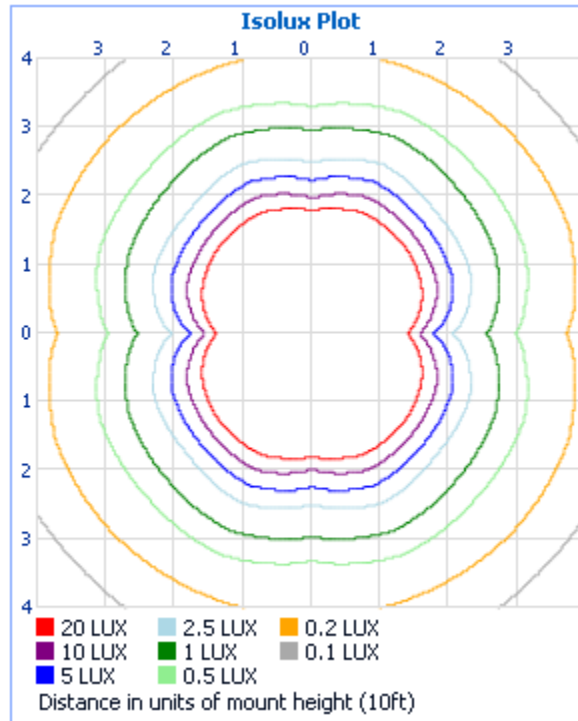
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Test Report

Light Distribution Curve



Isolux Plot





NVLAP Lab Code: 200952-0

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Test Report

Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	2,495.0	21.8%
0-40	4,713.4	41.1%
0-60	10,234.2	89.3%
60-90	1,196.0	10.4%
70-100	271.8	2.4%
90-120	17.8	0.2%
0-90	11,430.2	99.8%
90-180	28.0	0.2%
0-180	11,458.2	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	63.1	0.6%	90-95	7.8	0.1%
5-10	190.6	1.7%	95-100	4.3	0%
10-15	324.2	2.8%	100-105	2.1	0%
15-20	470.4	4.1%	105-110	1.3	0%
20-25	633.8	5.5%	110-115	1.2	0%
25-30	812.8	7.1%	115-120	1.1	0%
30-35	1,006.2	8.8%	120-125	1.5	0%
35-40	1,212.3	10.6%	125-130	1.1	0%
40-45	1,414.7	12.3%	130-135	1.5	0%
45-50	1,538.2	13.4%	135-140	1.3	0%
50-55	1,450.8	12.7%	140-145	1.3	0%
55-60	1,117.0	9.7%	145-150	1.0	0%
60-65	646.3	5.6%	150-155	0.7	0%
65-70	290.1	2.5%	155-160	0.7	0%
70-75	127.4	1.1%	160-165	0.5	0%
75-80	64.3	0.6%	165-170	0.3	0%
80-85	43.7	0.4%	170-175	0.3	0%
85-90	24.2	0.2%	175-180	0.1	0%



Test Report

Intensity Data(cd)

Candela Table - Type C																	
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633	2633
1	2633	2627	2631	2640	2633	2640	2631	2627	2633	2627	2631	2640	2633	2640	2631	2627	2633
2	2633	2631	2636	2640	2629	2640	2636	2631	2633	2631	2636	2640	2629	2640	2636	2631	2633
3	2642	2633	2638	2640	2633	2640	2638	2633	2642	2633	2638	2640	2633	2640	2638	2633	2642
4	2638	2638	2642	2642	2638	2642	2642	2638	2638	2638	2642	2642	2638	2642	2642	2638	2638
5	2638	2644	2642	2648	2646	2648	2642	2644	2638	2644	2642	2648	2646	2648	2642	2644	2638
6	2651	2646	2646	2655	2650	2655	2646	2646	2651	2646	2646	2655	2650	2655	2646	2646	2651
7	2659	2655	2657	2659	2663	2659	2657	2655	2659	2655	2657	2659	2663	2659	2657	2655	2659
8	2664	2659	2659	2670	2667	2670	2659	2659	2664	2659	2659	2670	2667	2670	2659	2659	2664
9	2681	2711	2659	2642	2680	2681	2672	2672	2681	2625	2667	2710	2680	2681	2672	2672	2681
10	2690	2685	2685	2689	2697	2689	2685	2685	2690	2685	2685	2689	2697	2689	2685	2685	2690
11	2707	2696	2698	2702	2710	2702	2698	2696	2707	2696	2698	2702	2710	2702	2698	2696	2707
12	2716	2717	2713	2726	2727	2726	2713	2717	2716	2717	2713	2726	2727	2726	2713	2717	2716
13	2733	2737	2730	2739	2748	2739	2730	2737	2733	2737	2730	2739	2748	2739	2730	2737	2733
14	2764	2756	2751	2758	2769	2758	2751	2756	2764	2756	2751	2758	2769	2758	2751	2756	2764
15	2781	2782	2770	2786	2795	2786	2770	2782	2781	2782	2770	2786	2795	2786	2770	2782	2781
16	2807	2803	2796	2810	2816	2810	2796	2803	2807	2803	2796	2810	2816	2810	2796	2803	2807
17	2838	2835	2828	2835	2842	2835	2828	2835	2838	2835	2828	2835	2842	2835	2828	2835	2838
18	2868	2863	2856	2868	2867	2868	2856	2863	2868	2863	2856	2868	2867	2868	2856	2863	2868
19	2903	2904	2882	2906	2893	2906	2882	2904	2903	2904	2882	2906	2893	2906	2882	2904	2903
20	2933	2934	2925	2934	2922	2934	2925	2934	2933	2934	2925	2934	2922	2934	2925	2934	2933
25	3111	3132	3102	3115	3084	3115	3102	3132	3111	3132	3102	3115	3084	3115	3102	3132	3111
30	3290	3362	3303	3310	3220	3310	3303	3362	3290	3362	3303	3310	3220	3310	3303	3362	3290
35	3489	3621	3536	3530	3322	3530	3536	3621	3489	3621	3536	3530	3322	3530	3536	3621	3489
40	3676	3905	3809	3728	3326	3728	3809	3905	3676	3905	3809	3728	3326	3728	3809	3905	3676
50	3698	4225	4094	3494	2030	3494	4094	4225	3698	4225	4094	3494	2030	3494	4094	4225	3698
55	3116	3759	3512	2502	866	2502	3512	3759	3116	3759	3512	2502	866	2502	3512	3759	3116
60	1873	2547	2279	1491	420	1491	2279	2547	1873	2547	2279	1491	420	1491	2279	2547	1873
65	769	1248	961	728	255	728	961	1248	769	1248	961	728	255	728	961	1248	769
70	339	490	366	327	166	327	366	490	339	490	366	327	166	327	366	490	339
75	152	176	165	148	106	148	165	176	152	176	165	148	106	148	165	176	152
80	100	105	88	97	68	97	88	105	100	105	88	97	68	97	88	105	100
85	70	79	54	75	51	75	54	79	70	79	54	75	51	75	54	79	70
90	22	28	21	24	19	24	21	28	22	28	21	24	19	24	21	28	22
95	17	15	13	9	4	9	13	15	17	15	13	9	4	9	13	15	17
100	13	6	6	2	0	2	6	6	13	6	6	2	0	2	6	6	13
105	0	2	4	2	0	2	4	2	0	2	4	2	0	2	4	2	0
110	0	2	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0
115	0	2	2	4	4	4	2	2	0	2	2	4	4	4	2	2	0
120	0	4	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0
125	0	0	4	4	0	4	4	0	0	0	4	4	0	4	4	0	0
130	0	4	4	9	0	9	4	4	0	4	4	9	0	9	4	4	0
135	0	2	0	2	4	2	0	2	0	2	0	2	4	2	0	2	0
140	9	4	4	4	4	4	4	4	9	4	4	4	4	4	4	4	9
145	9	2	2	2	4	2	2	2	9	2	2	2	4	2	2	2	9
150	4	2	4	0	0	0	4	2	4	2	4	0	0	0	4	2	4
155	0	0	4	0	6	0	4	0	0	0	4	0	6	0	4	0	0
160	0	2	6	4	0	4	6	2	0	2	6	4	0	4	6	2	0
165	0	4	2	0	6	0	2	4	0	4	2	0	6	0	2	4	0
170	9	4	4	9	0	9	4	4	9	4	4	9	0	9	4	4	9
175	0	4	6	6	4	6	6	4	0	4	6	6	4	6	6	4	0
180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5



Test Report

Test No.3: Total Harmonic Distortion Test

Environmental Conditions

Temperature:	25.1°C
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Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PM012	Digital Power Meter	2015-04-28	2016-04-27
GVS-LE-FS047	Power Supply	Before Use	Before Use

Test Sample

2217450-S001

Test Method

<p>1. The sample was tested according to the ANSI C82.77-2002.</p> <p>2. The ambient temperature condition was maintained at 25°C ± 1°C. The sample measurements were made using a digital power meter and power supply.</p> <p>3. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion was calculated from the digital power meter.</p>

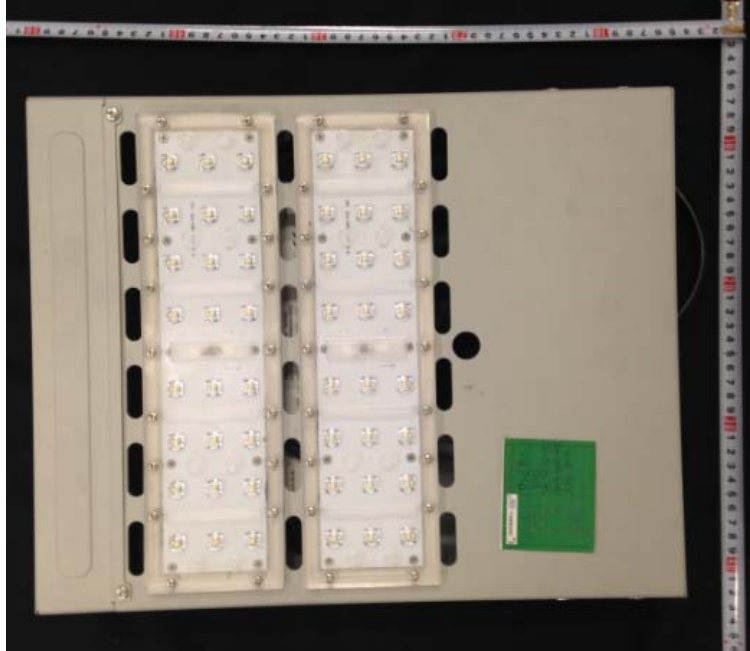
Test Result

Test Type	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD (%)	Operate time (Min.)	Stabilization time (Min.)
Input	277	60	0.3846	100.2	0.9403	12.41	60	50



Test Report

Photos of sample



*******END OF TEST REPORT*******