

**Verification Services**

Project No. 4787070113-5
 Report No. 4787070113-5a
 Report Issued Date: 2016-04-26



Test Report

Customer Company & Address:			
SORAA Inc ADD: 6500 Kaiser Dr, Fremont, CA 94555			
Contact Person:	Steve Yang		
Phone Number:	510-4567183	Email Address:	SYang@soraa.com

Relevant Standards:	IES LM-79-2008		
Product Description:	Integral LED Lamp, PAR16 GU10		
Brand Name:	SORAA		
Tested Model Number:	SM16GA-07-10D-827-03		
Product Family:	N/A		
Allowable Variations:	N/A		
Electrical Specification:	120 V AC, 60 Hz, 7.5 W		

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

Sample Reception Date:	2015-10-13	Test Date:	2015-10-15
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Tested By	Approved By
 / Derek Zhang	 / Candy Zhang
Signatory & Test Personnel Name	Signatory & Approval 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.



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Statement of Results

Test Flow	Test Item	Sample ID (Lab)	Pass/Fail/NA
1	Integrating Sphere Test	2225377-S001	Evaluate by customer
2	Goniophotometer Test	2225377-S001	Evaluate by customer

Deviation from Test Method (if any)

N/A

Remark (if any)

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



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Test Flow 1: Integrating Sphere Test

Environmental Conditions

Temperature: 25.1°C

Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE002	Integrating Sphere	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	2015-08-21	2016-08-19

Test Sample

2225377-S001

Test Method

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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.

Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	120.03	60	0.063	0.961	7.3

Test Type	CCT (K)	CRI	Lumen Output (lm)	Luminous Efficacy (lm/W)
Output	2624	83	511	70.3



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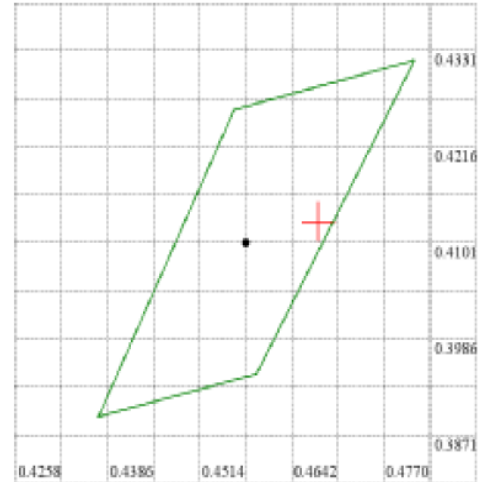
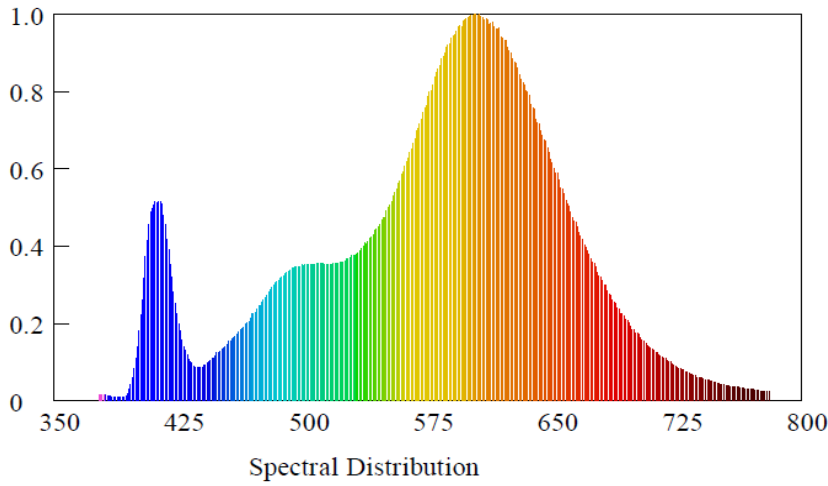
Test Report

Test Condition

Temperature: 25.1°C
Spectrum Range: 380-780 nm

RH: -----%
Scan Step: 1 nm

Spectroradiometric Parameters



Nominal CCT:LED_2700K
x0=0.4679 y0=0.4126

Chromaticity Coordinates: $x=0.4647$ $y=0.4094$ $u'=0.2662$ $v'=0.5276$
 Correlated Color Temperature: 2624 K Dominant Wavelength: 583.0 nm(E)
 Luminous Flux: 510.588 lm Purity: 0.6287
 Chromaticity Difference: -0.0008Duv Peak Wavelength: 606.2 nm
 Color Ratio: $K_r=49.5\%$ $K_g=42.8\%$ $K_b=7.7\%$
 Bandwidth: 106nm Radiant Flux: 1.653 W
 Rendering Index: Ra=83.1
 R1=83 R2=96 R3=87 R4=82 R5=86 R6=98 R7=79 R8=55
 R9=8 R10=94 R11=83 R12=89 R13=87 R14=93 R15=73



Test Report

Test Flow 2: Goniophotometer Test

Environmental Conditions

Temperature: 25.1°C

Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-GS001	Goniophotometer	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	2015-08-21	2016-08-19

Test Sample

2225377-S001

Test Method

The sample was tested according to the IES LM-79-2008.
 Photometric parameters were measured using a type C goniophotometer and software.
 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.
 The samples were operated at rated voltage and was 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 Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	120.01	60	0.062	0.958	7.1

Test Type	Lumen Output (lm)	Center Beam Candle Power (cd)	Field angle (10%)		Beam angle (50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
Output	516	6917	22.2	22.2	12.4	12.4	72.5



Test Report



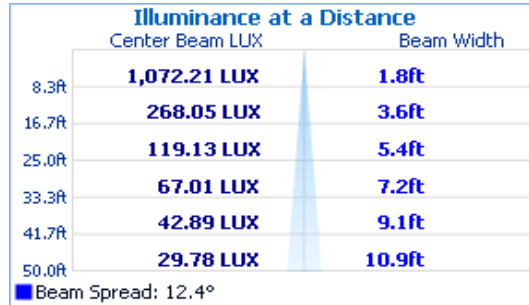
NVLAP Lab Code: 200952-0



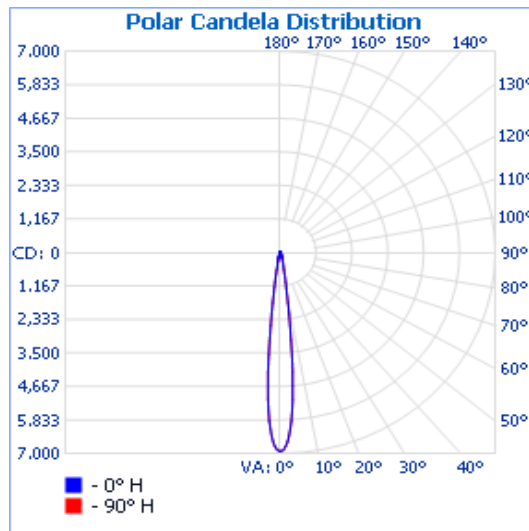
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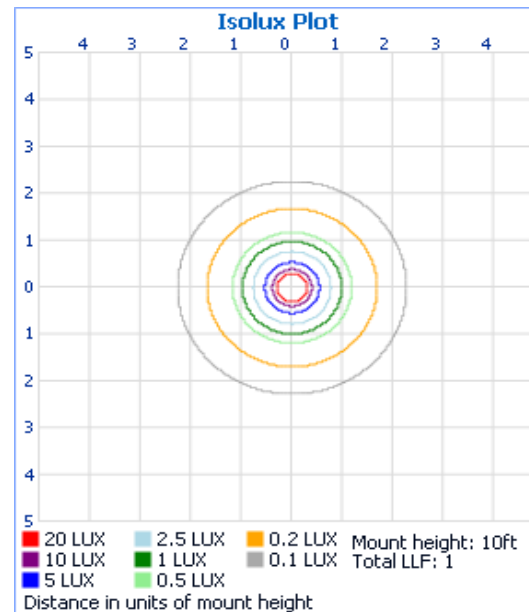
Illuminance at a Distance



Polar Candela Distribution



Isolux Plot





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Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	421.1	81.6%
0-40	453.5	87.9%
0-60	487.1	94.4%
60-90	28.0	5.4%
70-100	14.3	2.8%
90-120	0.2	0%
0-90	515.1	99.8%
90-180	0.8	0.2%
0-180	515.9	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	139.3	27.0%	90-95	0.1	0%
5-10	155.2	30.1%	95-100	0.0	0%
10-15	55.4	10.7%	100-105	0.0	0%
15-20	31.5	6.1%	105-110	0.0	0%
20-25	21.5	4.2%	110-115	0.0	0%
25-30	18.2	3.5%	115-120	0.0	0%
30-35	16.9	3.3%	120-125	0.0	0%
35-40	15.5	3.0%	125-130	0.1	0%
40-45	11.7	2.3%	130-135	0.1	0%
45-50	7.9	1.5%	135-140	0.1	0%
50-55	7.2	1.4%	140-145	0.1	0%
55-60	6.8	1.3%	145-150	0.1	0%
60-65	6.8	1.3%	150-155	0.1	0%
65-70	7.0	1.4%	155-160	0.1	0%
70-75	6.3	1.2%	160-165	0.1	0%
75-80	4.6	0.9%	165-170	0.1	0%
80-85	2.5	0.5%	170-175	0.0	0%
85-90	0.7	0.1%	175-180	0.0	0%



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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	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917	6917
0.5	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904	6904
1	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853	6853
2	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609	6609
3	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167	6167
4	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510	5510
5	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654	4654
6	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596	3596
7	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564	2564
8	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757
9	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257	1257
10	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888	888
11	621	621	621	621	621	621	621	621	621	621	621	621	621	621	621	621	621
12	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485	485
13	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402
14	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
15	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
16	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237
17	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
18	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175
19	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151
20	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
25	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
30	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
35	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
50	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
55	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
60	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
65	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
70	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
75	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
80	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
85	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

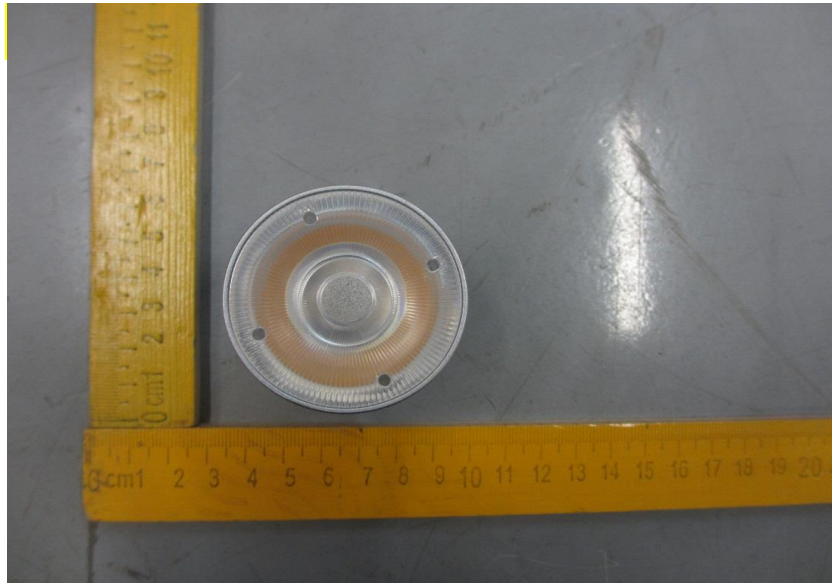


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Photos of sample



End of Test Report