



Verification Services

Project No. 4787070113-1

Report No. 4787070113-1a

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-830-03
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:	2015-08-28	Test Date:	2015-08-30
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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	2210454-S001	Evaluate by customer
2	Goniophotometer Test	2210454-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	2016-08-20

Test Sample

2210454-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	120.02	60	0.065	0.956	7.5

Test Type	CCT (K)	CRI	Lumen Output (lm)	Luminous Efficacy (lm/W)
Output	2907	86	521	69.8



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NVLAP Lab Code: 200952-0



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Test Condition

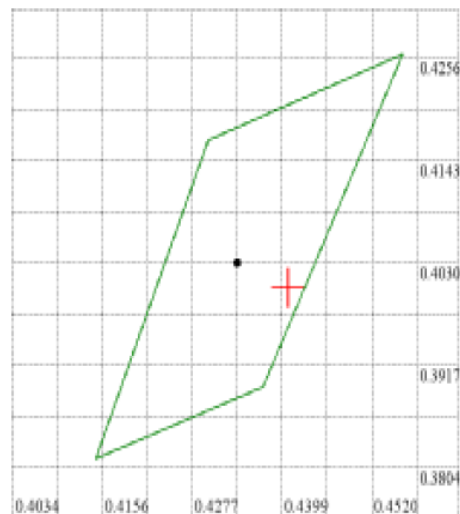
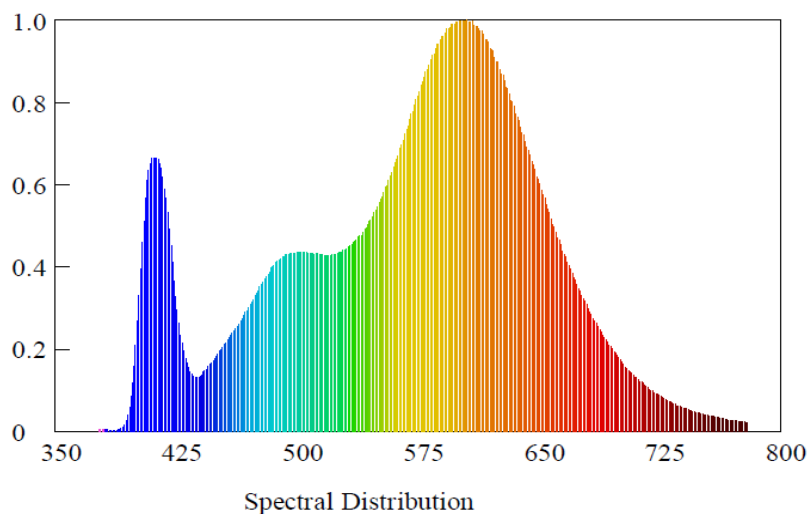
Temperature: 25.1°C

Spectrum Range: 380-780 nm

RH: ----%

Scan Step: 1 nm

Spectroradiometric Parameters



Nominal CCT: LED_3000K
x0=0.4407 y0=0.4003

Chromaticity Coordinates: x=0.4407 y=0.4003 u'=0.2547 v'=0.5205

Correlated Color Temperature: 2907 K

Dominant Wavelength: 582.0 nm(E)

Luminous Flux: 520.627 lm

Purity: 0.5283

Chromaticity Difference: -0.0020Duv

Peak Wavelength: 605.6 nm

Color Ratio: Kr=46.7% Kg=44.3% Kb=9.0%

Bandwidth: 113nm

Radiant Flux: 1.818 W

Rendering Index: Ra=85.7

R1=86 R2=98 R3=88 R4=86 R5=90 R6=97 R7=81 R8=61

R9=18 R10=97 R11=88 R12=85 R13=90 R14=93 R15=77

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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-GS002	Goniophotometer	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	2015-08-21	2016-08-20

Test Sample

2210454-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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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	119.96	60	0.063	0.960	7.3

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	527	7447	19.6	19.6	12.2	12.2	72.4



Test Report



NVLAP Lab Code: 200952-0



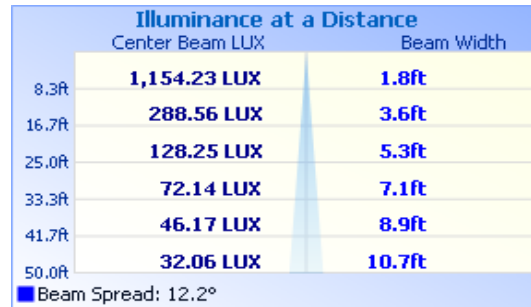
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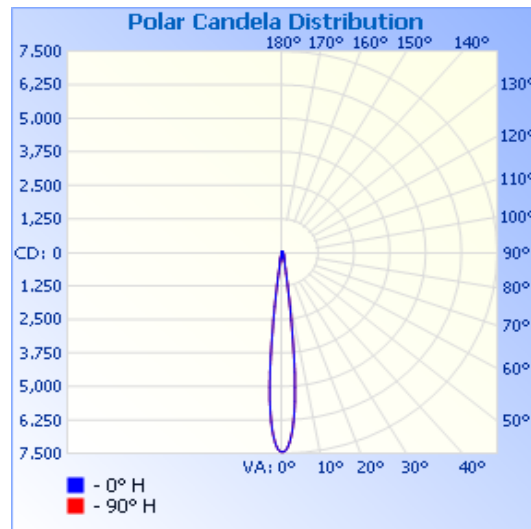
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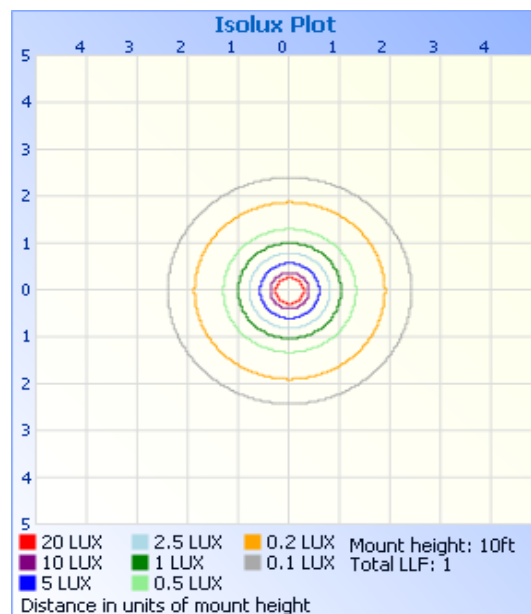
Illuminance at a Distance



Polar Candela Distribution



Isolux Plot





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Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	410.7	78%
0-40	447.7	85%
0-60	488.4	92.8%
60-90	33.1	6.3%
70-100	16.7	3.2%
90-120	2.2	0.4%
0-90	521.6	99.1%
90-180	5.0	0.9%
0-180	526.5	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	150.6	28.6%	90-95	0.4	0.1%
5-10	150.0	28.5%	95-100	0.3	0.1%
10-15	41.9	7.9%	100-105	0.4	0.1%
15-20	26.6	5.0%	105-110	0.4	0.1%
20-25	21.6	4.1%	110-115	0.3	0.1%
25-30	20.2	3.8%	115-120	0.4	0.1%
30-35	19.6	3.7%	120-125	0.3	0.1%
35-40	17.3	3.3%	125-130	0.3	0.1%
40-45	13.2	2.5%	130-135	0.3	0.1%
45-50	9.5	1.8%	135-140	0.3	0.1%
50-55	9.0	1.7%	140-145	0.3	0.1%
55-60	8.9	1.7%	145-150	0.2	0%
60-65	8.8	1.7%	150-155	0.2	0%
65-70	8.4	1.6%	155-160	0.2	0%
70-75	7.2	1.4%	160-165	0.2	0%
75-80	5.1	1.0%	165-170	0.1	0%
80-85	2.8	0.5%	170-175	0.1	0%
85-90	0.9	0.2%	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	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447	7447
0.5	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431	7431
1	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373	7373
2	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117	7117
3	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658	6658
4	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997	5997
5	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052	5052
6	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874	3874
7	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547	2547
8	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567	1567
9	956	956	956	956	956	956	956	956	956	956	956	956	956	956	956	956	956
10	636	636	636	636	636	636	636	636	636	636	636	636	636	636	636	636	636
11	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
12	376	376	376	376	376	376	376	376	376	376	376	376	376	376	376	376	376
13	303	303	303	303	303	303	303	303	303	303	303	303	303	303	303	303	303
14	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
15	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219
16	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
17	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169	169
18	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151
19	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136
20	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
25	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
30	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73
35	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
40	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
50	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
55	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
60	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
65	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
70	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
75	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
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	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
130	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
135	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
145	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
150	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
155	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
165	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
175	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1



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Photos of sample



End of Test Report