NVLAP Lab Code: 200952-0

Verification Services

Project No.: 4786480425-6
Report No.: 4786480425-6a
Report Issued Date: 2015-01-04

Test Report

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

Manufacturer:	SORAA Inc.
Country of Origin:	USA
Country of Export:	USA
Product Description:	Lamp Type: MR16 GU5.3 LED Lamp Total Amount Of Light Source: 1 pc
Model Number:	SM16-09-25D-930-03
Electrical Specification:	12 V AC, 60 Hz, 7.5W

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 :	2014-11-28	**Test Period:**	2014-11-29 ~ 2014-12-09

Tested By	Approved By
Jackson Zeng / Jackson Zeng	Xavier Xiong / Xavier Xiong
Test Personnel Name & Signatory	**Approval Name & Signatory**

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	2014821-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2014821-S001	N/A	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.

Test Report

Test No. 1 : Integrating Sphere Test

Environmental Conditions

Temperature:	25.1º C

Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE003	Integrating Sphere	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	08/22/2014	08/21/2015

Test Sample

2014821-S001

Test Method

The sample was tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 (W)	THD (%)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	12.01	60	0.845	9.25	41.25	0.912	Base up	58	50

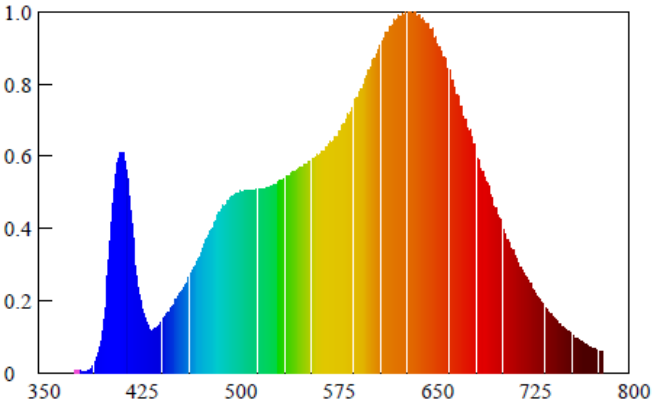
Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	3018	497.1	94.9	53.7

Test Report

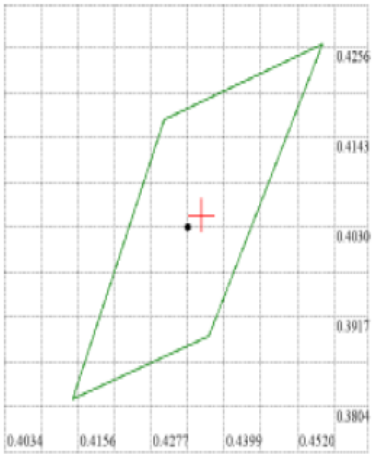
Test Condition

Temperature: 25.1°C RH: ----%
Spectrum Range: 380-780 nm Scan Step: 1 nm

Spectroradiometric Parameters



Spectral Distribution



Nominal CCT:LED_3000K
x0=0.4361 y0=0.4045

Chromaticity Coordinates: x=0.4361 y=0.4045 u'=0.2498 v'=0.5214
Correlated Color Temperature: 3018 K Dominant Wavelength: 581.0 nm(E)
Luminous Flux: 497.109 lm Purity: 0.5254
Chromaticity Difference: 0.0003Duv Peak Wavelength: 636.8 nm
Color Ratio: Kr=43.5% Kg=46.3% Kb=10.2%
Bandwidth: 175.8nm Radiant Flux: 1.827 W
Rendering Index: Ra=94.9
R1=94 R2=96 R3=97 R4=93 R5=92 R6=90 R7=98 R8=99
R9=97 R10=90 R11=88 R12=77 R13=94 R14=99 R15=97

Test Report

Test No.2: Goniophotometer Test

Environmental Conditions

Temperature: 25.1 º 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	08/19/2014	08/18/2015
GVS-LE-CA008	Digital Calliper	09/18/2014	09/17/2015

Test Sample

2014821-S001

Test Method

The sample was tested according to the IES LM-79-2008.
Photometric paramters 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.

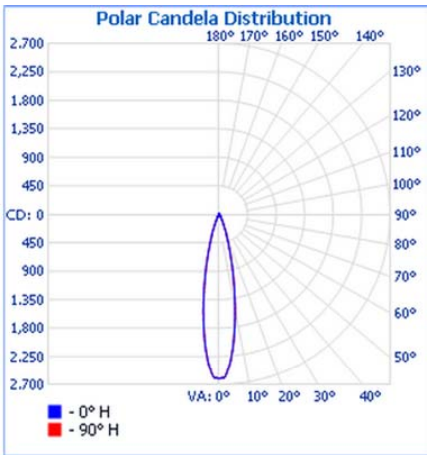
Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Opreate time (Min.)	Stabilization time (Min.)
Input	11.99	60	0.846	9.25	0.912	Base up	70	30

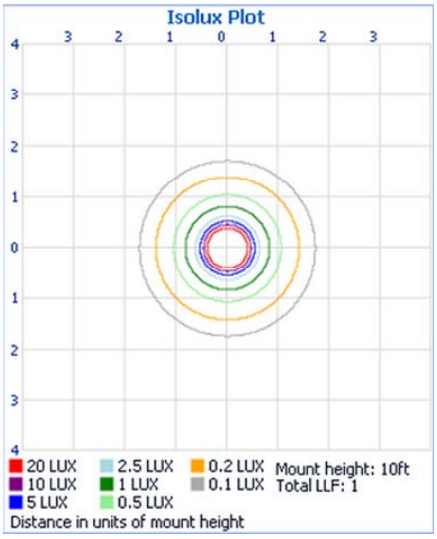
Test Type	Flux (lm)	Center Beam Candle Power (cd)	Field angle (10%)		Beam angle (50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
Output	498.7	2605	42.3	42.3	21.6	21.6	53.9

Test Report

Light Distribution Curve



Isolux Plot



Test Report

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	449.2	90.1%
0-40	467.9	93.8%
0-60	488.1	97.9%
60-90	9.3	1.9%
70-100	3.8	0.8%
90-120	0.4	0.1%
0-90	497.4	99.7%
90-180	1.2	0.3%
0-180	498.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	58.3	11.7%	90-95	0.1	0%
5-10	128.9	25.8%	95-100	0.1	0%
10-15	122.1	24.5%	100-105	0.1	0%
15-20	78.9	15.8%	105-110	0.1	0%
20-25	41.5	8.3%	110-115	0.1	0%
25-30	19.6	3.9%	115-120	0.1	0%
30-35	10.9	2.2%	120-125	0.1	0%
35-40	7.8	1.6%	125-130	0.1	0%
40-45	6.4	1.3%	130-135	0.1	0%
45-50	5.5	1.1%	135-140	0.1	0%
50-55	4.6	0.9%	140-145	0.1	0%
55-60	3.8	0.8%	145-150	0.1	0%
60-65	3.1	0.6%	150-155	0.1	0%
65-70	2.5	0.5%	155-160	0.1	0%
70-75	1.8	0.4%	160-165	0.1	0%
75-80	1.1	0.2%	165-170	0.1	0%
80-85	0.6	0.1%	170-175	0.0	0%
85-90	0.2	0.0%	175-180	0.0	0%

Test Report

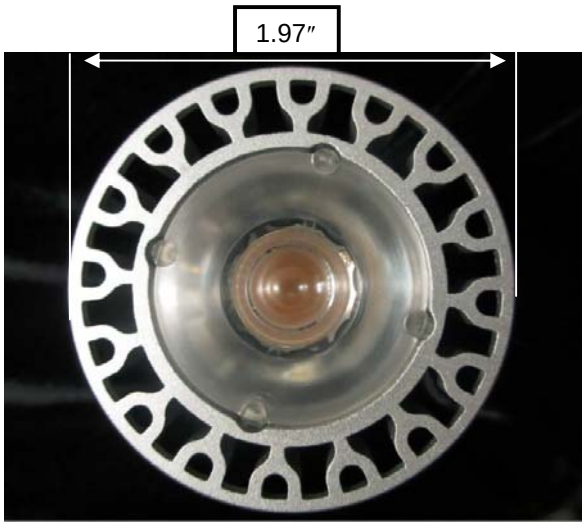
Intensity Data(cd)

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	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605
1	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590
2	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582	2582
3	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491
4	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383	2383
5	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242	2242
6	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096	2096
7	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935
8	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766
9	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594	1594
10	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430
11	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266	1266
12	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114	1114
13	975	975	975	975	975	975	975	975	975	975	975	975	975	975	975	975	975
14	839	839	839	839	839	839	839	839	839	839	839	839	839	839	839	839	839
15	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711
16	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616
17	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514	514
18	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432	432
19	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368
20	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319	319
25	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119
30	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
35	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
40	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
50	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
55	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
60	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
65	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
70	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
75	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
80	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
85	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Test Report

Photos of sample



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