



Verification Services

Project No.: 4786480425-5

Report No.: 4786480425-5a

Report Issued Date: 2014-12-12


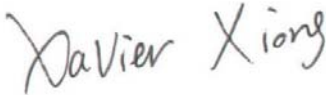
Test Report

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-830-03
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
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Tested By	Approved By
 / Jackson Zeng	 / 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.



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Test Report

Statement of Results

Test Flow	Test Method	Sample ID (Lab)	Sample Serial No.	Pass/Fail/NA
1.	Integrating Sphere Test	2014820-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2014820-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.



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Test Report

Test No. 1 : Integrating Sphere Test

Environmental Conditions

Temperature: 25.1° C

Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE003	Integrating Sphere	Before Use	Before Use
GVS-LE-FS023	Measurement Standard Lamp	12/23/2013	12/22/2014

Test Sample

2014820-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° 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.

Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	12.00	60	0.880	9.68	0.917	Base up	58	50

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	2997	603.6	84.3	62.4



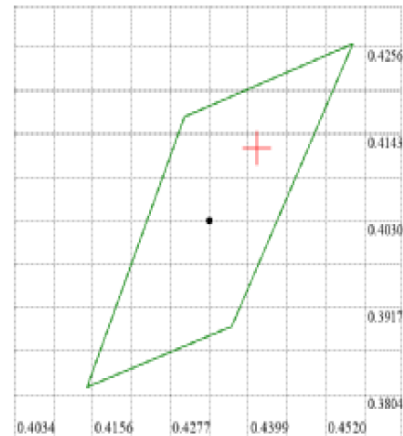
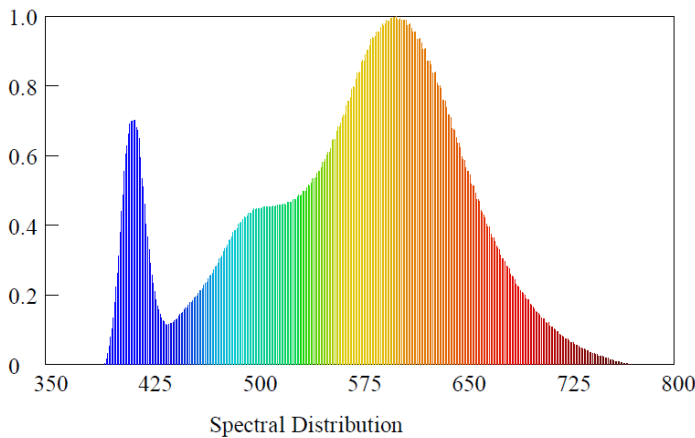
Test Report

Test Condition

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

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

Spectroradiometric Parameters



Nominal CCT:LED_3000K
 $x_0=0.4412$ $y_0=0.4125$

Chromaticity Coordinates: $x=0.4412$ $y=0.4125$ $u'=0.2497$ $v'=0.5253$

Correlated Color Temperature: 2997 K

Dominant Wavelength: 580.0 nm(E)

Luminous Flux: 603.621 lm

Purity: 0.5654

Chromaticity Difference: +0.00274Duv

Peak Wavelength: 600.7 nm

Color Ratio: $K_r=45.2\%$ $K_g=46.1\%$ $K_b=8.7\%$

Bandwidth: 118.5nm

Radiant Flux: 1.876 W

Rendering Index: $R_a=84.3$

R1=83 R2=94 R3=92 R4=83 R5=85 R6=96 R7=83 R8=59

R9=9 R10=88 R11=84 R12=88 R13=86 R14=95 R15=73



Test Report

Test No.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	08/19/2014	08/18/2015
GVS-LE-CA008	Digital Calliper	09/18/2014	09/17/2015

Test Sample

2014820-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

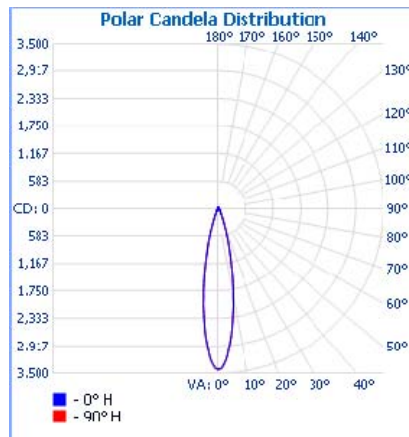
Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	12.00	60	0.898	9.62	0.918	Base up	70	30

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	595.7	3419	39.7	39.7	20.7	20.7	61.9

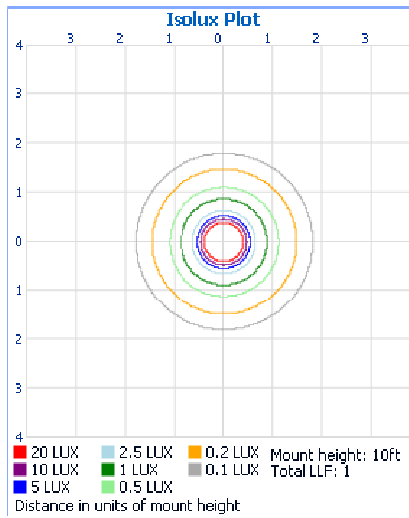


Test Report

Light Distribution Curve



Isolux Plot





Test Report

Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	539.8	90.6%
0-40	560.4	94.1%
0-60	584.2	98.1%
60-90	10.6	1.8%
70-100	4.1	0.7%
90-120	0.1	0%
0-90	594.8	99.8%
90-180	0.9	0.2%
0-180	595.7	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	74.3	12.5%	90-95	0.0	0%
5-10	161.3	27.1%	95-100	0.0	0%
10-15	149.5	25.1%	100-105	0.0	0%
15-20	92.4	15.5%	105-110	0.0	0%
20-25	42.5	7.1%	110-115	0.0	0%
25-30	19.7	3.3%	115-120	0.0	0%
30-35	11.7	2.0%	120-125	0.0	0%
35-40	8.9	1.5%	125-130	0.1	0%
40-45	7.5	1.3%	130-135	0.1	0%
45-50	6.4	1.1%	135-140	0.1	0%
50-55	5.4	0.9%	140-145	0.1	0%
55-60	4.5	0.8%	145-150	0.1	0%
60-65	3.6	0.6%	150-155	0.1	0%
65-70	2.9	0.5%	155-160	0.1	0%
70-75	2.1	0.3%	160-165	0.1	0%
75-80	1.3	0.2%	165-170	0.1	0%
80-85	0.6	0.1%	170-175	0.0	0%
85-90	0.1	0.0%	175-180	0.0	0%



Test Report

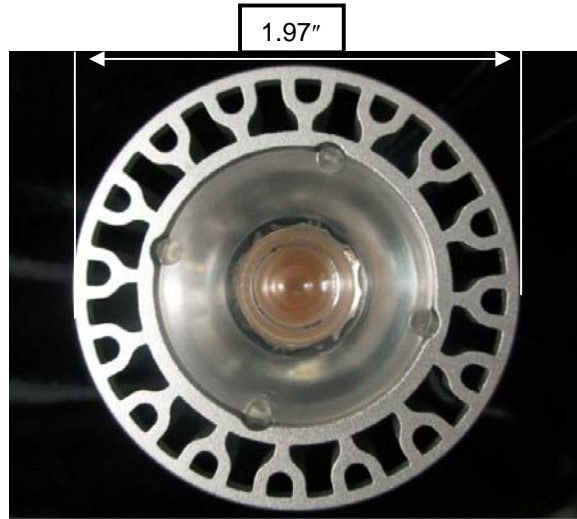
Intensity Data(cd)

	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	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419	3419
1	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397	3397
2	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314	3314
3	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194
4	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012	3012
5	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830	2830
6	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643	2643
7	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413	2413
8	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209	2209
9	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
10	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785	1785
11	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573	1573
12	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379	1379
13	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184	1184
14	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004
15	857	857	857	857	857	857	857	857	857	857	857	857	857	857	857	857	857
16	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744
17	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610
18	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518
19	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412
20	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330
25	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119
30	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
35	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
40	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
50	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
55	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
60	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
65	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
70	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
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*******