



Verification Services

Project No.: 4786480425-1

Report No.: 4786480425-1a

Report Issued Date: 2014-12-12


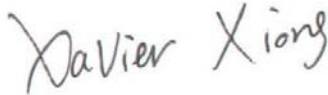
# Test Report

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

<b>Manufacturer:</b>	SORAA Inc.
<b>Country of Origin:</b>	USA
<b>Country of Export:</b>	USA
<b>Product Description:</b>	Lamp Type: MR16 GU5.3 LED Lamp Total Amount Of Light Source: 1 pc
<b>Model Number:</b>	SM16-07-25D-827-03
<b>Electrical Specification:</b>	12 V AC, 60 Hz, 7.5W

<b>Test Laboratory &amp; Address:</b>			
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			
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<b>Receipt of Test Samples :</b>	2014-11-28	<b>Test Period:</b>	2014-11-29 ~ 2014-12-09
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<b>Tested By</b>	<b>Approved By</b>
 / Jackson Zeng	 / Xavier Xiong
<b>Test Personnel Name &amp; Signatory</b>	<b>Approval Name &amp; Signatory</b>

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

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## **Statement of Results**

Test Flow	Test Method	Sample ID (Lab)	Sample Serial No.	Pass/Fail/NA
1.	Integrating Sphere Test	2014816-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2014816-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: 25.1° 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

2014816-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	12.01	60	0.710	7.79	0.914	Base up	58	50

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	2696	501.3	82.9	64.3



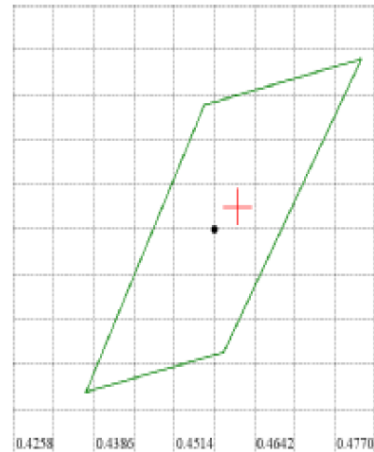
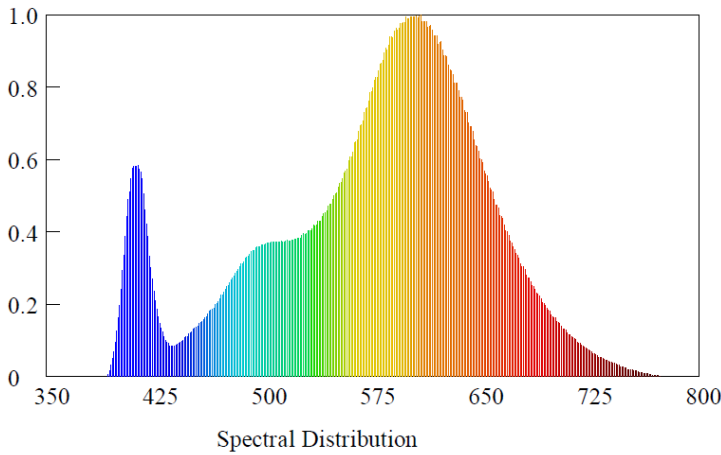
# Test Report

## Test Condition

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

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

## Spectroradiometric Parameters



Nominal CCT:Manual  
 $x_0=0.4615$   $y_0=0.4130$

Chromaticity Coordinates:  $x=0.4615$   $y=0.4130$   $u'=0.2625$   $v'=0.5285$   
 Correlated Color Temperature: 2696 K      Dominant Wavelength: 582.0 nm(E)  
 Luminous Flux: 501.291 lm      Purity: 0.6300  
 Chromaticity Difference: 0.0007Duv      Peak Wavelength: 608.0 nm  
 Color Ratio:  $K_r=48.6\%$   $K_g=43.7\%$   $K_b=7.8\%$       Color Tolerance(SDCM): 0  
 Bandwidth: 108.1nm      Radiant Flux: 1.557 W  
 Rendering Index:  $R_a=82.9$   
 $R_1=82$   $R_2=95$   $R_3=89$   $R_4=81$   $R_5=84$   $R_6=98$   $R_7=80$   $R_8=55$   
 $R_9=6$   $R_{10}=91$   $R_{11}=82$   $R_{12}=89$   $R_{13}=86$   $R_{14}=94$   $R_{15}=72$



# 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

2014816-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

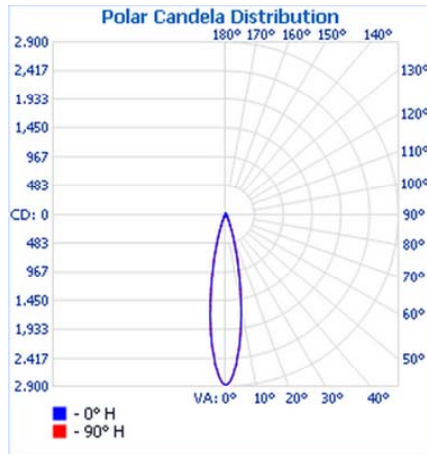
Test Type	Voltage (V AC)	Frequency (Hz )	Current (A)	Power (W)	Power Factor	Orientation	Opreate time (Min.)	Stabilization time (Min.)
Input	11.99	60	0.745	7.80	0.915	Base up	70	30

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	501.8	2872	39.8	39.8	20.5	20.5	64.3

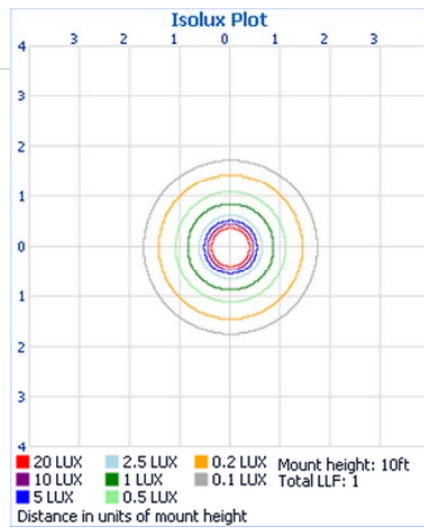


# Test Report

## Light Distribution Curve



## Isolux Plot





# Test Report

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## Zonal Lumen Tabulation

### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	450.2	89.7%
0-40	469.7	93.6%
0-60	492.1	98.1%
60-90	8.9	1.8%
70-100	3.4	0.7%
90-120	0.1	0%
0-90	501.0	99.9%
90-180	0.7	0.1%
0-180	501.8	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	62.0	12.4%	90-95	0.0	0%
5-10	134.5	26.8%	95-100	0.0	0%
10-15	123.0	24.5%	100-105	0.0	0%
15-20	76.3	15.2%	105-110	0.0	0%
20-25	36.5	7.3%	110-115	0.0	0%
25-30	17.8	3.6%	115-120	0.0	0%
30-35	11.1	2.2%	120-125	0.0	0%
35-40	8.5	1.7%	125-130	0.0	0%
40-45	7.2	1.4%	130-135	0.1	0%
45-50	6.1	1.2%	135-140	0.1	0%
50-55	5.0	1.0%	140-145	0.1	0%
55-60	4.0	0.8%	145-150	0.1	0%
60-65	3.1	0.6%	150-155	0.1	0%
65-70	2.4	0.5%	155-160	0.1	0%
70-75	1.7	0.3%	160-165	0.1	0%
75-80	1.1	0.2%	165-170	0.0	0%
80-85	0.5	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	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872	2872
1	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848	2848
2	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767	2767
3	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658	2658
4	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529	2529
5	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348	2348
6	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207	2207
7	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030	2030
8	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840	1840
9	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655	1655
10	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476	1476
11	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289	1289
12	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124
13	965	965	965	965	965	965	965	965	965	965	965	965	965	965	965	965	965
14	832	832	832	832	832	832	832	832	832	832	832	832	832	832	832	832	832
15	723	723	723	723	723	723	723	723	723	723	723	723	723	723	723	723	723
16	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604	604
17	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498	498
18	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
19	348	348	348	348	348	348	348	348	348	348	348	348	348	348	348	348	348
20	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279
25	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
30	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
35	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
40	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
50	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
55	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
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	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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

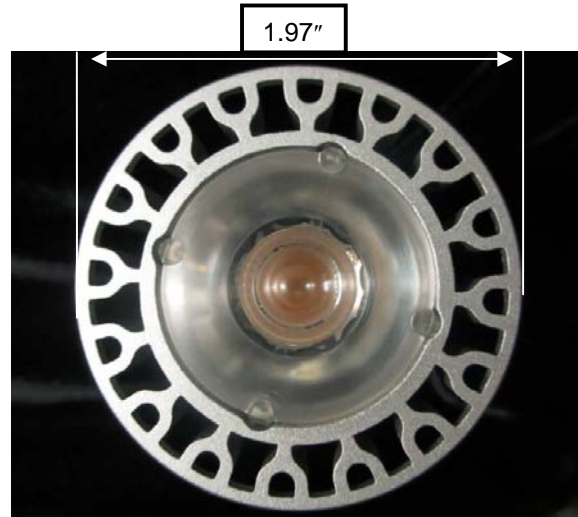




# Test Report

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## Photos of sample



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