



## Verification Services

Project No.: 4786480425-16  
Report No.: 4786480425-16a  
Report Issued Date: 2015-04-02


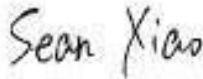
# Test Report

<b>Customer Company &amp; Address:</b>			
SORAA Inc 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>	SM16-07-36D-827-03
<b>Electrical Specification:</b>	12 V AC, 60 Hz

<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			
<b>Telephone:</b>	+86 20 28667188	<b>Fax:</b>	+86 20 83486605

<b>Receipt of Test Samples :</b>	2015-03-10	<b>Test Period:</b>	2015-03-10 ~ 2015-3-31
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Tested By	Approved By
 / Jackson Zeng	 / Sean Xiao
<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.



# 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	2077602-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2077602-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-FS019	Measurement Standard Lamp	08/22/2014	08/21/2015

### Test Sample

2077602-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)	THD (%)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	12.01	60	0.761	7.85	35.67	0.892	Base up	58	50

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	2650	515.8	82.9	65.7



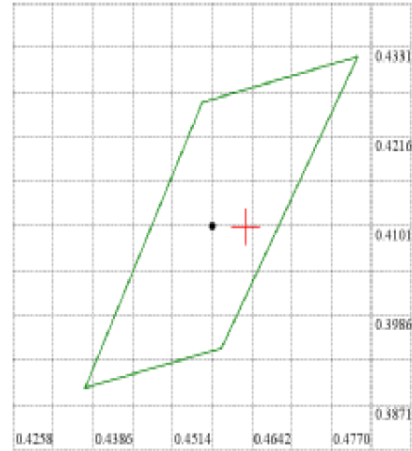
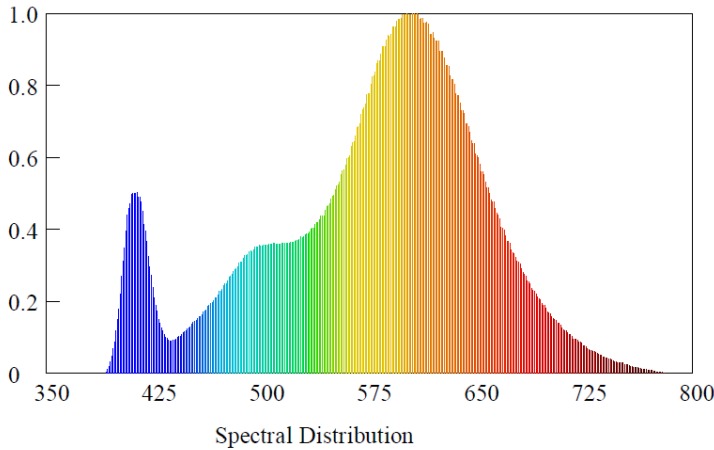
# Test Report

## Test Condition

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

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

## Spectroradiometric Parameters



Nominal CCT:Manual  
 $x_0=0.4632$   $y_0=0.4100$

Chromaticity Coordinates:  $x=0.4632$   $y=0.4100$   $u'=0.2649$   $v'=0.5276$

Correlated Color Temperature: 2650 K

Dominant Wavelength: 583.0 nm(E)

Luminous Flux: 515.790 lm

Purity: 0.6246

Chromaticity Difference: -0.00049Duv

Peak Wavelength: 608.4 nm

Color Ratio:  $K_r=49.2\%$   $K_g=43.1\%$   $K_b=7.7\%$

Color Tolerance(SDCM): 0

Bandwidth: 105.4nm

Radiant Flux: 1.547 W

Rendering Index:  $R_a=82.9$

$R_1=82$   $R_2=95$   $R_3=88$   $R_4=81$   $R_5=85$   $R_6=98$   $R_7=79$   $R_8=55$

$R_9=7$   $R_{10}=92$   $R_{11}=82$   $R_{12}=90$   $R_{13}=86$   $R_{14}=93$   $R_{15}=73$



# 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**

2077602-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	0.725	7.73	0.889	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	521.3	1324	58.3	58.3	33.3	33.4	67.5



NVLAP Lab Code: 200952-0

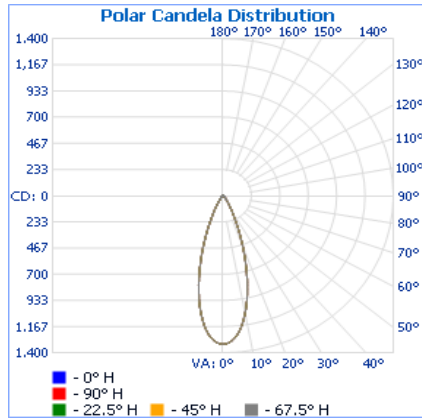
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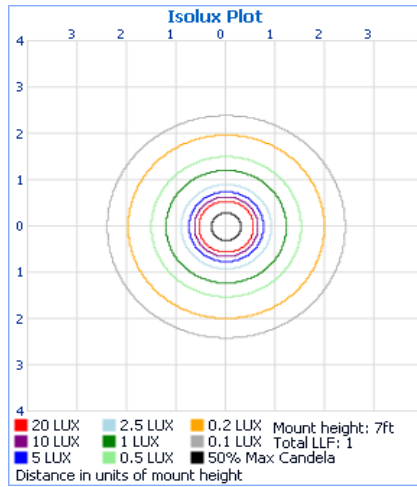
# Test Report

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### Light Distribution Curve



### Isolux Plot





NVLAP Lab Code: 200952-0

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# Test Report

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## Zonal Lumen Tabulation

### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	434.3	83.3%
0-40	472.6	90.7%
0-60	504.5	96.8%
60-90	15.3	2.9%
70-100	6.4	1.2%
90-120	0.4	0.1%
0-90	519.9	99.7%
90-180	1.4	0.3%
0-180	521.3	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	30.8	5.9%	90-95	0.1	0%
5-10	82.6	15.8%	95-100	0.1	0%
10-15	107.3	20.6%	100-105	0.1	0%
15-20	99.8	19.1%	105-110	0.1	0%
20-25	71.5	13.7%	110-115	0.1	0%
25-30	42.3	8.1%	115-120	0.1	0%
30-35	23.9	4.6%	120-125	0.1	0%
35-40	14.5	2.8%	125-130	0.1	0%
40-45	10.4	2.0%	130-135	0.1	0%
45-50	8.4	1.6%	135-140	0.1	0%
50-55	7.1	1.4%	140-145	0.1	0%
55-60	6.0	1.2%	145-150	0.1	0%
60-65	5.0	1.0%	150-155	0.1	0%
65-70	4.1	0.8%	155-160	0.1	0%
70-75	3.0	0.6%	160-165	0.1	0%
75-80	2.0	0.4%	165-170	0.0	0%
80-85	1.0	0.2%	170-175	0.0	0%
85-90	0.3	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	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324	1324
1	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321	1321
2	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312
3	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299
4	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280
5	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255	1255
6	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225
7	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190	1190
8	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149	1149
9	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103	1103
10	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055	1055
11	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003	1003
12	948	948	948	948	948	948	948	948	948	948	948	948	948	948	948	948	948
13	886	886	886	886	886	886	886	886	886	886	886	886	886	886	886	886	886
14	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826
15	764	764	764	764	764	764	764	764	764	764	764	764	764	764	764	764	764
16	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704
17	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639
18	581	581	581	581	581	581	581	581	581	581	581	581	581	581	581	581	581
19	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522	522
20	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
25	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238
30	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
35	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
40	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
45	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
50	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
55	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
60	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
65	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
70	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
75	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
80	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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

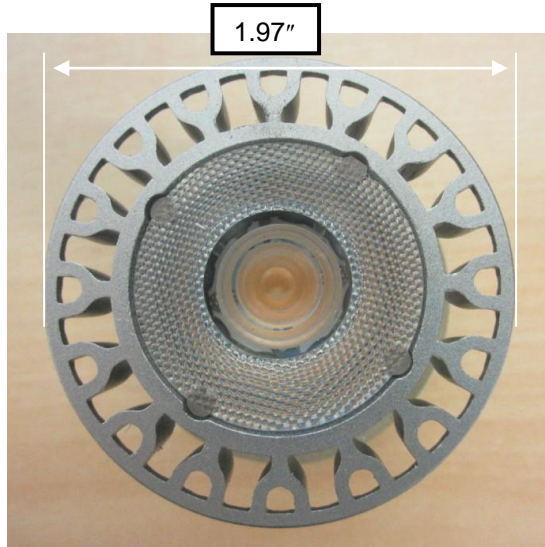




# Test Report

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## Photos of sample



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