



Verification Services

Project No.: 4786480425-10
Report No.: 4786480425-10a
Report Issued Date: 2015-2-3


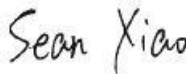
Test Report

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:	SM16-07-36D-927-03
Electrical Specification:	12 V AC, 60 Hz

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 :	2015-1-13	Test Period:	2015-1-13 ~ 2015-1-30
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Tested By	Approved By
 / Jackson Zeng	 / Sean Xiao
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	2047353-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2047353-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	08/22/2013	08/21/2015

Test Sample

2047353-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	0.709	7.76	0.912	Base up	50	30

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	R9	Luminous Efficacy (lm/W)
Output	2705	407.0	96.4	96.6	52.4



NVLAP Lab Code: 200952-0

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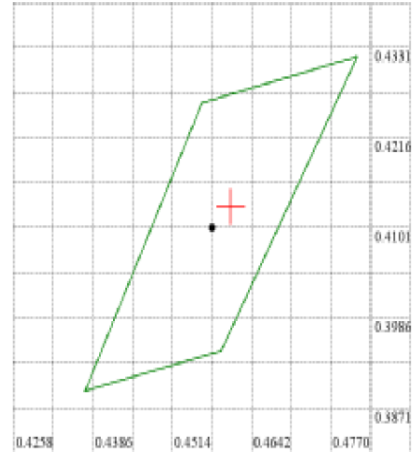
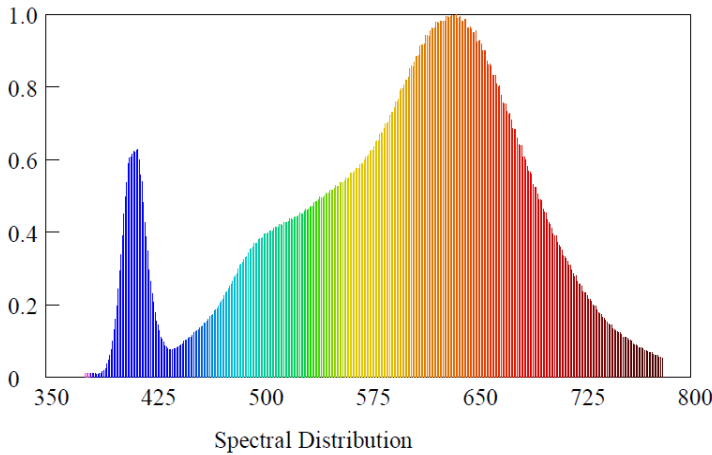
Test Report

Test Condition

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

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

Spectroradiometric Parameters



Nominal CCT:Manual
x0=0.4608 y0=0.4128

Chromaticity Coordinates: x=0.4608 y=0.4128 u'=0.2621 v'=0.5283

Correlated Color Temperature: 2705 K

Dominant Wavelength: 582.0 nm(E)

Luminous Flux: 407.012 lm

Purity: 0.6271

Chromaticity Difference: 0.0008Duv

Peak Wavelength: 635.7 nm

Color Ratio: Kr=46.1% Kg=45.3% Kb=8.5%

Color Tolerance(SDCM): 0

Bandwidth: 143.6nm

Radiant Flux: 1.544 W

Rendering Index: Ra=96.6

R1=97 R2=98 R3=99 R4=94 R5=95 R6=94 R7=98 R8=97

R9=92 R10=96 R11=90 R12=78 R13=97 R14=99 R15=98



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	08/22/2013	08/21/2015
GVS-LE-CA008	Digital Calliper	09/18/2014	09/17/2015

Test Sample

2047353-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	12.01	60	0.708	7.73	0.910	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	412.1	1027	59.5	59.5	33.3	33.3	53.3



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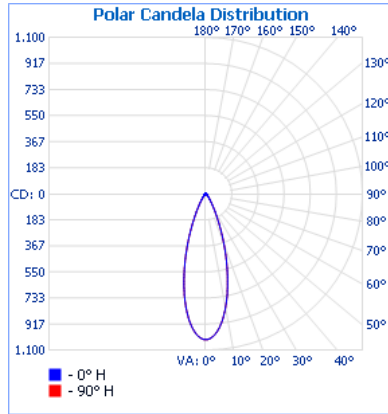
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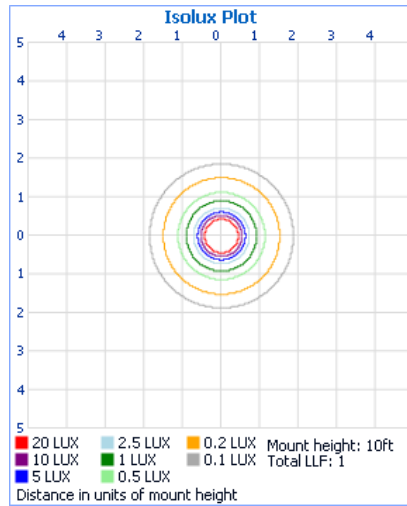
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Test Report

Light Distribution Curve



Isolux Plot





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Test Report

Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	339.7	82.4%
0-40	372.0	90.3%
0-60	397.9	96.6%
60-90	13.0	3.1%
70-100	5.6	1.4%
90-120	0.4	0.1%
0-90	410.9	99.7%
90-180	1.2	0.3%
0-180	412.1	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	23.8	5.8%	90-95	0.1	0%
5-10	63.2	15.3%	95-100	0.1	0%
10-15	82.1	19.9%	100-105	0.1	0%
15-20	77.6	18.8%	105-110	0.1	0%
20-25	57.4	13.9%	110-115	0.1	0%
25-30	35.5	8.6%	115-120	0.1	0%
30-35	20.3	4.9%	120-125	0.1	0%
35-40	12.1	2.9%	125-130	0.1	0%
40-45	8.5	2.1%	130-135	0.1	0%
45-50	6.8	1.7%	135-140	0.1	0%
50-55	5.7	1.4%	140-145	0.1	0%
55-60	4.9	1.2%	145-150	0.1	0%
60-65	4.1	1.0%	150-155	0.1	0%
65-70	3.4	0.8%	155-160	0.1	0%
70-75	2.6	0.6%	160-165	0.0	0%
75-80	1.7	0.4%	165-170	0.0	0%
80-85	0.9	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)

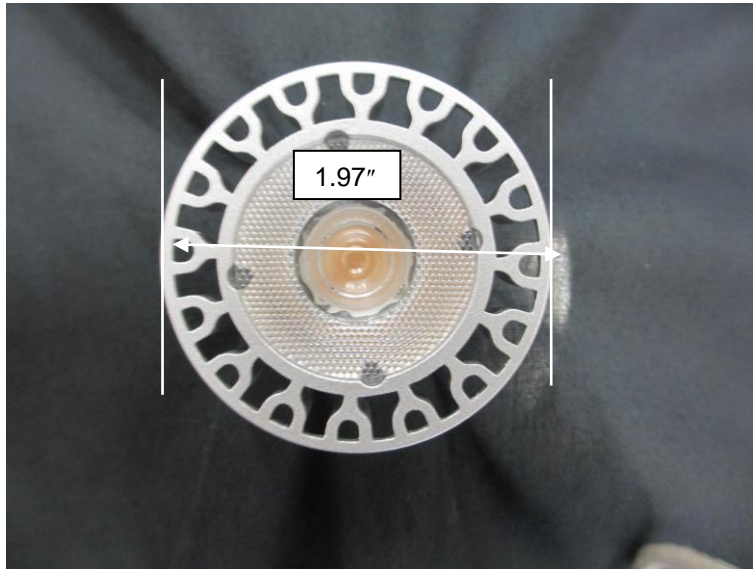
Candela Table - Type C

	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	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027	1027
0.5	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026
1.5	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020	1020
2.5	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010
3.5	996	996	996	996	996	996	996	996	996	996	996	996	996	996	996	996	996
4.5	977	977	977	977	977	977	977	977	977	977	977	977	977	977	977	977	977
5.5	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954	954
6.5	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926	926
7.5	897	897	897	897	897	897	897	897	897	897	897	897	897	897	897	897	897
8.5	862	862	862	862	862	862	862	862	862	862	862	862	862	862	862	862	862
9.5	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826
10.5	785	785	785	785	785	785	785	785	785	785	785	785	785	785	785	785	785
11.5	746	746	746	746	746	746	746	746	746	746	746	746	746	746	746	746	746
12.5	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700
13.5	656	656	656	656	656	656	656	656	656	656	656	656	656	656	656	656	656
14.5	609	609	609	609	609	609	609	609	609	609	609	609	609	609	609	609	609
15.5	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565	565
16.5	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519
17.5	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476	476
18.5	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
19.5	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
24.5	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212
29.5	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105
34.5	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
39.5	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
49.5	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
54.5	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
59.5	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
64.5	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
69.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
74.5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
79.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
84.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
89.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179.5	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*******