



Verification Services

Project No.: 4786480425-7

Report No.: 4786480425-7a

Report Issued Date: 2015-01-04


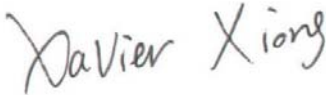
Test Report

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:	SM16-09-36D-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 :	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	2014822-S001	N/A	Evaluate by customer
2.	Goniophotometer Test	2014822-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-FS019	Measurement Standard Lamp	08/22/2014	08/21/2015

Test Sample

2014822-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	12.00	60	0.865	9.47	41.06	0.912	Base up	58	50

Test Type	CCT (K)	Luminous Flux (lm)	Color Rendering Index Ra	Luminous Efficacy (lm/W)
Output	2705	465.7	95.4	49.2



Test Report

Test Condition

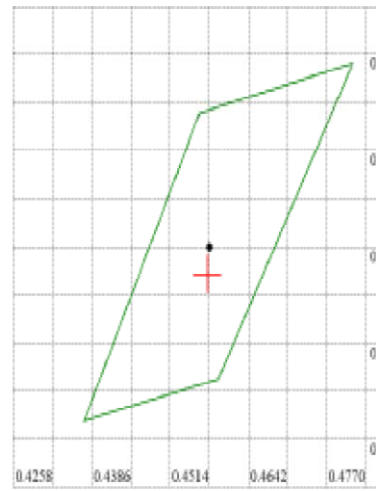
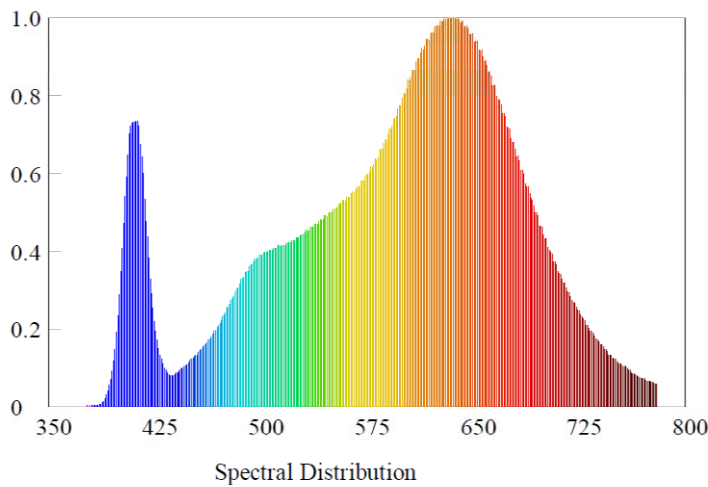
Temperature: 25.1°C

RH: -----%

Spectrum Range: 380-780 nm

Scan Step: 1 nm

Spectroradiometric Parameters



Nominal CCT:Manual
x0=0.4575 y0=0.4069

Chromaticity Coordinates: $x=0.4575$ $y=0.4069$ $u'=0.2626$ $v'=0.5256$

Correlated Color Temperature: 2705 K

Dominant Wavelength: 583.0 nm(E)

Luminous Flux: 465.711 lm

Purity: 0.5978

Chromaticity Difference: -0.0012Duv

Peak Wavelength: 636.5 nm

Color Ratio: $K_r=46.3\%$ $K_g=44.9\%$ $K_b=8.9\%$

Color Tolerance(SDCM): 0

Bandwidth: 140.5nm

Radiant Flux: 1.842 W

Rendering Index: $R_a=95.4$

R1=95 R2=96 R3=98 R4=92 R5=93 R6=91 R7=98 R8=99

R9=98 R10=92 R11=88 R12=73 R13=95 R14=99 R15=97



Test Report

Test No.2: Goniophotometer Test

Environmental Conditions

Temperature:	25.1 °C
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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

2014822-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

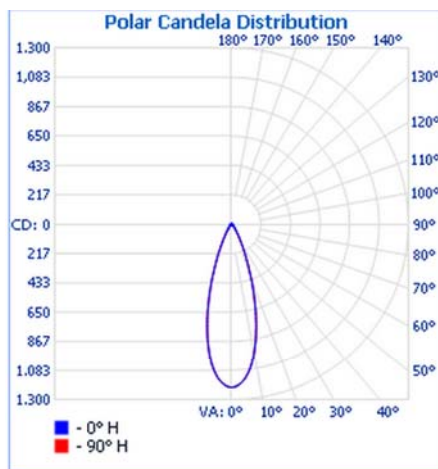
Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation	Operate time (Min.)	Stabilization time (Min.)
Input	12.01	60	0.864	9.47	0.912	Base up	70	30

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	466.0	1210	57.3	57.3	32.8	32.8	49.2

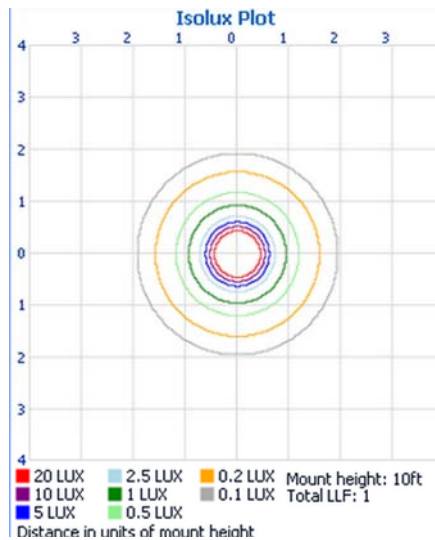


Test Report

Light Distribution Curve



Isolux Plot





Test Report

Zonal Lumen Tabulation

Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	387.4	83.1%
0-40	420.5	90.2%
0-60	449.9	96.6%
60-90	14.8	3.2%
70-100	6.3	1.3%
90-120	0.4	0.1%
0-90	464.7	99.7%
90-180	1.3	0.3%
0-180	466.0	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	28.1	6.0%	90-95	0.1	0%
5-10	75.2	16.1%	95-100	0.1	0%
10-15	96.8	20.8%	100-105	0.1	0%
15-20	88.7	19.0%	105-110	0.1	0%
20-25	62.0	13.3%	110-115	0.1	0%
25-30	36.6	7.8%	115-120	0.1	0%
30-35	20.5	4.4%	120-125	0.1	0%
35-40	12.7	2.7%	125-130	0.1	0%
40-45	9.3	2.0%	130-135	0.1	0%
45-50	7.8	1.7%	135-140	0.1	0%
50-55	6.7	1.4%	140-145	0.1	0%
55-60	5.7	1.2%	145-150	0.1	0%
60-65	4.7	1.0%	150-155	0.1	0%
65-70	3.9	0.8%	155-160	0.1	0%
70-75	2.9	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%



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	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210	1210
1	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206
2	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198	1198
3	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185	1185
4	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167
5	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145	1145
6	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118	1118
7	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086	1086
8	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047
9	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005	1005
10	957	957	957	957	957	957	957	957	957	957	957	957	957	957	957	957	957
11	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907	907
12	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853	853
13	799	799	799	799	799	799	799	799	799	799	799	799	799	799	799	799	799
14	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744	744
15	686	686	686	686	686	686	686	686	686	686	686	686	686	686	686	686	686
16	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627	627
17	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570
18	515	515	515	515	515	515	515	515	515	515	515	515	515	515	515	515	515
19	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461
20	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410
25	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209
30	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
35	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
40	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
50	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
55	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
60	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
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
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*******