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Test #: L04132101R02

Date: 7/22/2013



NVLAP LAB CODE 200927-0

Test Report: L04132101R02

Model Number: 4924-22-XX

Report Prepared For: Aion LED, Incorporated
2325 3rd St #330 San Francisco, CA 94107

Test: Electrical and Photometric tests as required by the IESNA test standards.

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products

Description of Sample: Client submitted the sample. Fixture catalog number is 4924-22-XX. Received in working and undamaged condition. No modifications were necessary.

Sample Arrival Date: 4/5/13

Date of Tests: 4/11/13 - 4/11/13

Seasoning of Sample SSL: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	01/04/14
Xitron Power Analysis System	2503AH	MT-EL01	01/09/14
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/14
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

LM-79 Test Summary

Manufacturer:	Aion LED, Incorporated
Model Number:	4924-22-XX
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	128.64
Input Voltage (VDC/60Hz):	24.00
Input Current (Amp):	0.09
Input Power (W):	2.26
Input Power Factor:	N/A
Total Harmonic Distortion @ 120V(%):	N/A
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	56.80
Color Rendering Index (CRI):	94.30
Correlated Color Temperature (K):	2170
Chromaticity Coordinate x:	0.5030
Chromaticity Coordinate y:	0.4080
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:20
Total Operating Time (Hours):	0:40
Off State Power(W):	0.00

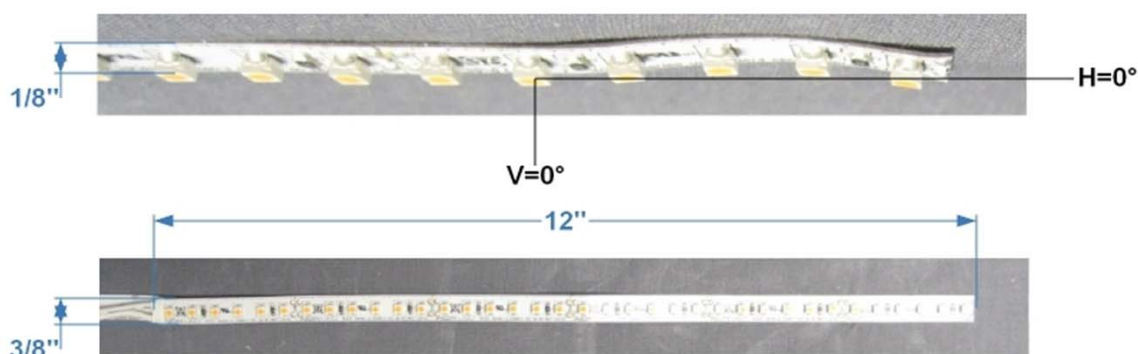
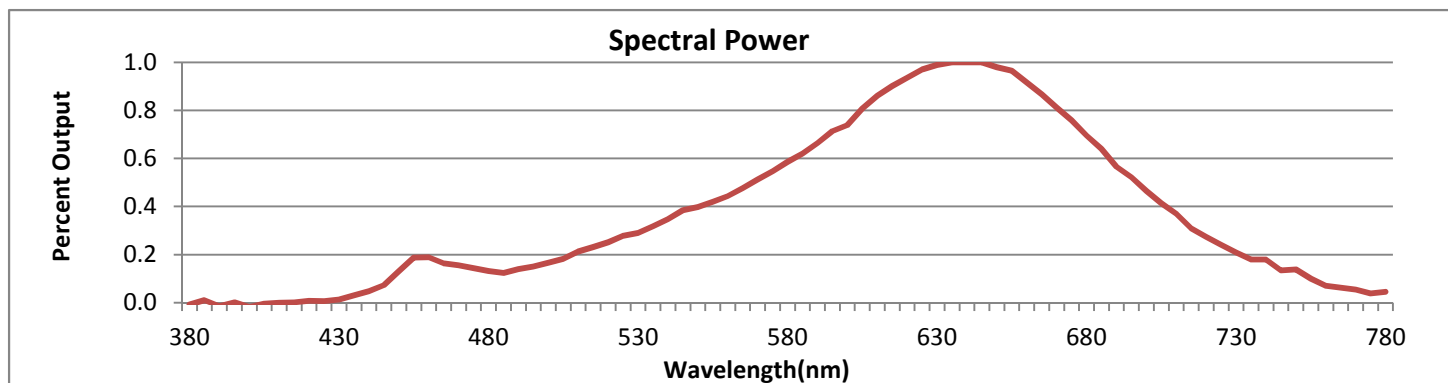


FIG.1 LUMINAIRE



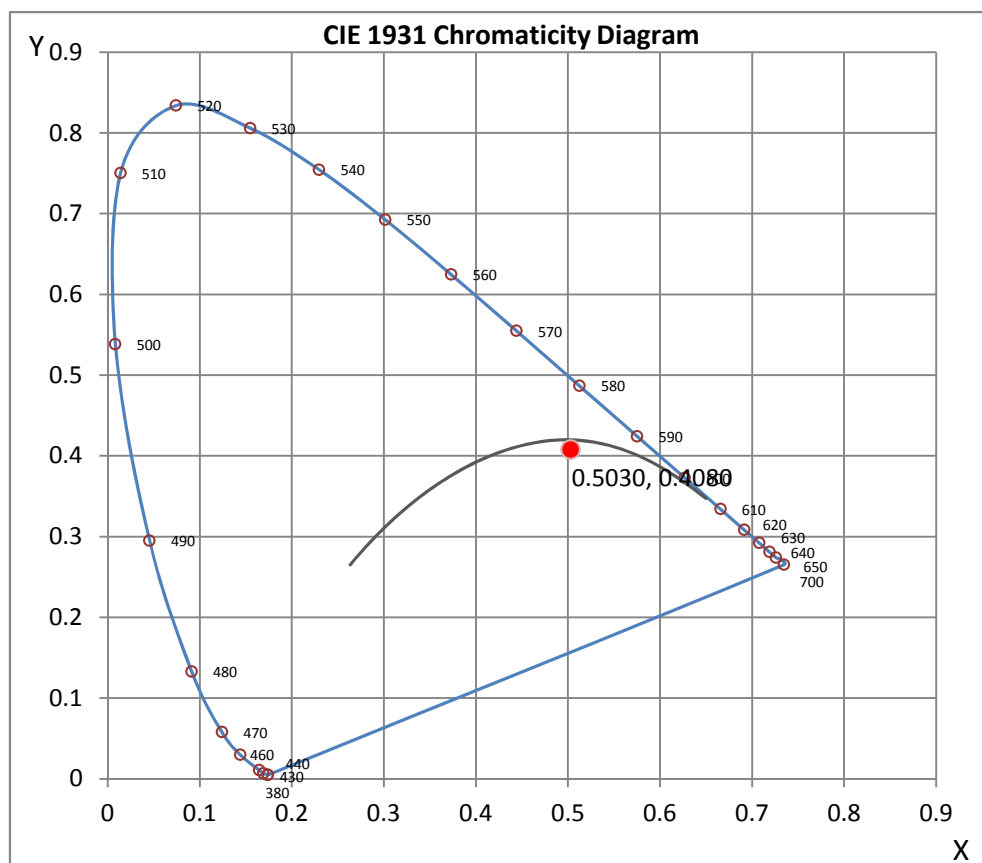
Wavelength	W/m ² nm	440	0.0010	510	0.0043	580	0.0119	650	0.0199	720	0.0056
380	0.0000	450	0.0027	520	0.0051	590	0.0135	660	0.0186	730	0.0042
390	0.0000	460	0.0038	530	0.0059	600	0.0150	670	0.0165	740	0.0036
400	0.0000	470	0.0032	540	0.0070	610	0.0175	680	0.0141	750	0.0028
410	0.0000	480	0.0027	550	0.0081	620	0.0190	690	0.0115	760	0.0014
420	0.0002	490	0.0028	560	0.0090	630	0.0201	700	0.0094	770	0.0011
430	0.0003	500	0.0034	570	0.0104	640	0.0203	710	0.0075	780	0.0009

CRI & CCT

x	0.5030
y	0.4080
u'	0.2920
v'	0.5329
CRI	94.30
CCT	2170
Duv	-0.00234

R Values

R1	95.60
R2	99.20
R3	98.00
R4	93.60
R5	95.80
R6	96.50
R7	90.90
R8	84.50
R9	71.30
R10	97.60
R11	94.70
R12	88.90
R13	97.00
R14	99.20





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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Test Report Released by:

Jeff Ahn
Engineering Manager

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 9*



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Photometric Test Report

IES INDOOR REPORT

PHOTOMETRIC FILENAME : L04132101R02.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L04132101R02
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 7/22/2013
[MANUFAC] AION LED INC.
[LUMCAT] 4924-22-XX
[LUMINAIRE] 12"L. X 3/8"W. X 1/8"H. LED FLEX CIRCUIT LIGHT ENGINE ONLY
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[POWER SUPPLY] 24VDC CONSTANT VOLTAGE SOURCE
[INPUT] 24VDC, 2.26W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	129
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	57
Total Luminaire Watts	2.26
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.26
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.96 ft
Luminous Width (90-270)	0.01 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	47890	47874	47336
55	46247	46227	45485
65	42834	43576	42304
75	36789	36789	34062
85	21978	21850	19793

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04132101R02.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	44.62	44.62	44.62	44.62	44.62
5	44.47	44.43	44.46	44.44	44.41
10	43.87	43.88	43.87	43.89	43.76
15	42.94	42.91	42.94	42.92	42.80
20	41.71	41.66	41.71	41.64	41.47
25	39.97	40.03	39.97	40.01	39.76
30	38.01	37.91	37.99	38.02	37.74
35	35.85	35.71	35.68	35.69	35.43
40	33.07	33.16	33.08	33.15	32.77
45	30.23	30.15	30.22	30.09	29.88
50	27.12	27.12	27.11	27.10	26.74
55	23.68	23.76	23.67	23.70	23.29
60	20.11	20.01	20.10	19.99	19.59
65	16.16	16.37	16.44	16.37	15.96
70	12.39	12.40	12.39	12.39	11.96
75	8.50	8.40	8.50	8.38	7.87
80	4.72	4.83	4.68	4.79	4.42
85	1.71	1.75	1.70	1.68	1.54
90	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04132101R02.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	16.34	N.A.	12.70
0-30	34.76	N.A.	27.00
0-40	57.07	N.A.	44.40
0-60	101.45	N.A.	78.90
0-80	126.44	N.A.	98.30
0-90	128.64	N.A.	100.00
10-90	124.42	N.A.	96.70
20-40	40.73	N.A.	31.70
20-50	63.99	N.A.	49.70
40-70	60.45	N.A.	47.00
60-80	24.99	N.A.	19.40
70-80	8.91	N.A.	6.90
80-90	2.20	N.A.	1.70
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	128.64	N.A.	100.00

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	4.22
10-20	12.12
20-30	18.42
30-40	22.31
40-50	23.26
50-60	21.12
60-70	16.08
70-80	8.91
80-90	2.20
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

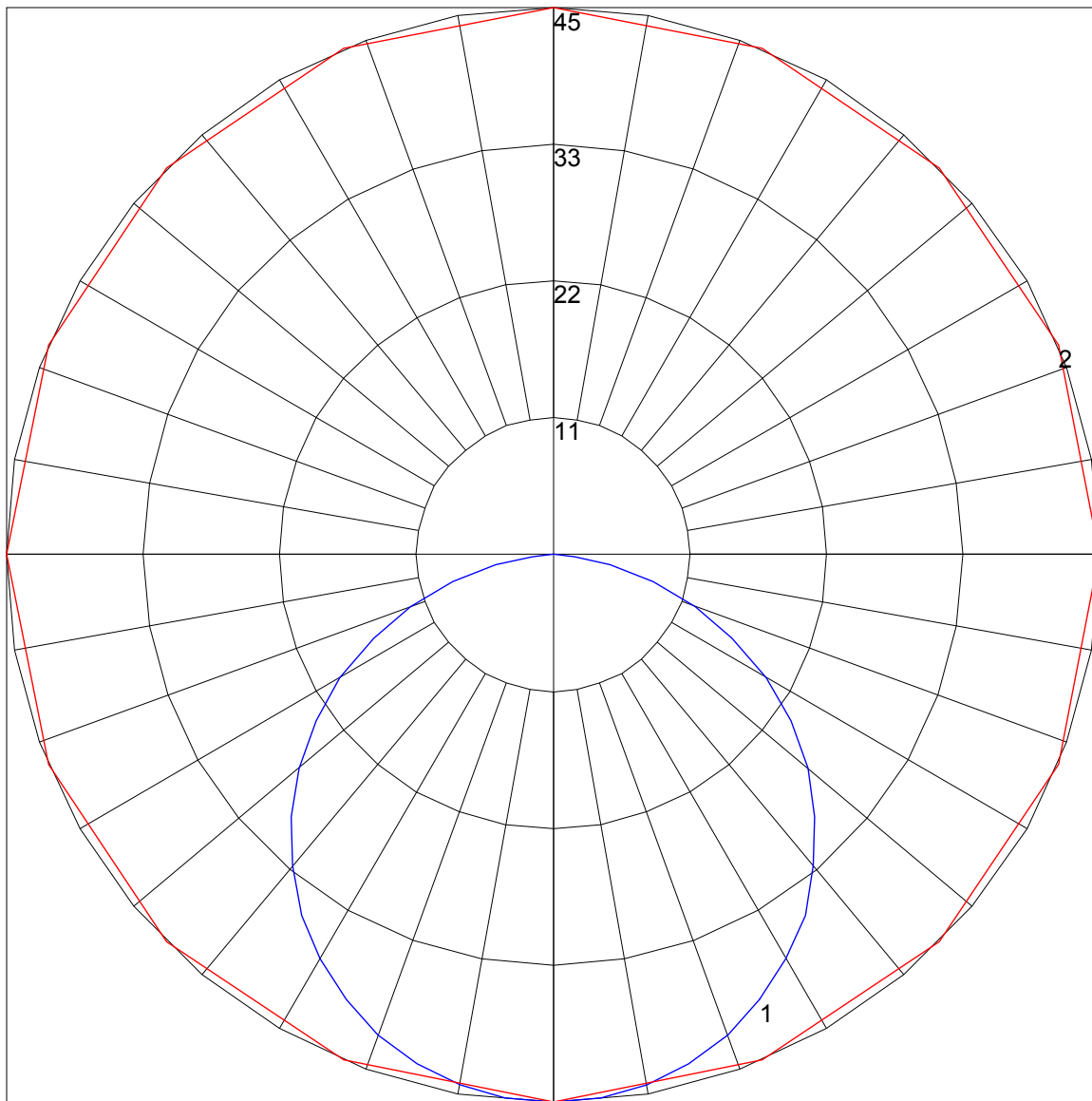
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	104	99	96	106	101	97	94	97	94	91	93	91	88	90	88	86	83
2	99	90	83	78	96	88	82	77	85	79	75	82	77	73	78	75	72	69
3	90	79	71	64	87	78	70	64	75	68	63	72	66	62	69	65	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	53	62	56	52	50
5	75	62	53	47	73	61	53	47	59	52	46	57	51	45	55	50	45	43
6	70	56	47	41	68	55	47	41	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	49	41	36	47	40	35	46	40	35	33
8	60	46	38	32	58	46	38	32	44	37	32	43	36	32	42	36	31	29
9	56	43	34	29	55	42	34	29	41	34	29	40	33	28	39	33	28	26
10	53	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	26	24

POLAR GRAPH



Maximum Candela = 44.62 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)