



8165 E Kaiser Blvd. Anaheim, CA 92808
p. 714.282.2270
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Test #: L04142413R01

Date: 3/12/2015



NVLAP LAB CODE 200927-0

Test Report: L04142413R01

Model Number: 8924-35-XX

Report Prepared For: AION LED
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
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Fixture catalog number is 8924-35-XX. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 4/3/14

Date of Tests: 4/10/14 - 4/16/14

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	01/04/15
Xitron Power Analysis System	2503AH	MT-EL01	01/09/15
BK Precision DC Power Supply	1747	PSDC-04	01/08/15
Fluke Digital Thermometer	52k/J	MT-TP02-GC	01/04/15
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

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

LM-79 Test Summary

Manufacturer:	AION LED
Model Number:	8924-35-XX
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	438.80
Input Voltage (VDC):	24.00
Input Current (Amp):	0.22
Input Power (W):	5.36
Input Power Factor:	1.00
Total Harmonic Distortion @ 120V(%):	N/A
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	82
Color Rendering Index (CRI):	92
Correlated Color Temperature (K):	3388
Chromaticity Coordinate x:	0.4106
Chromaticity Coordinate y:	0.3911
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:05
Off State Power(W):	0.00

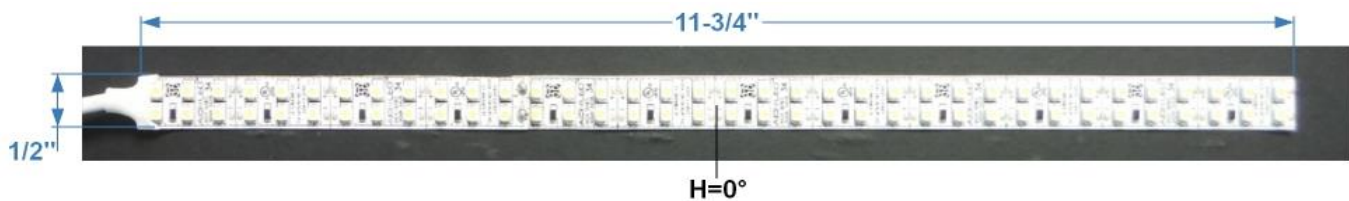
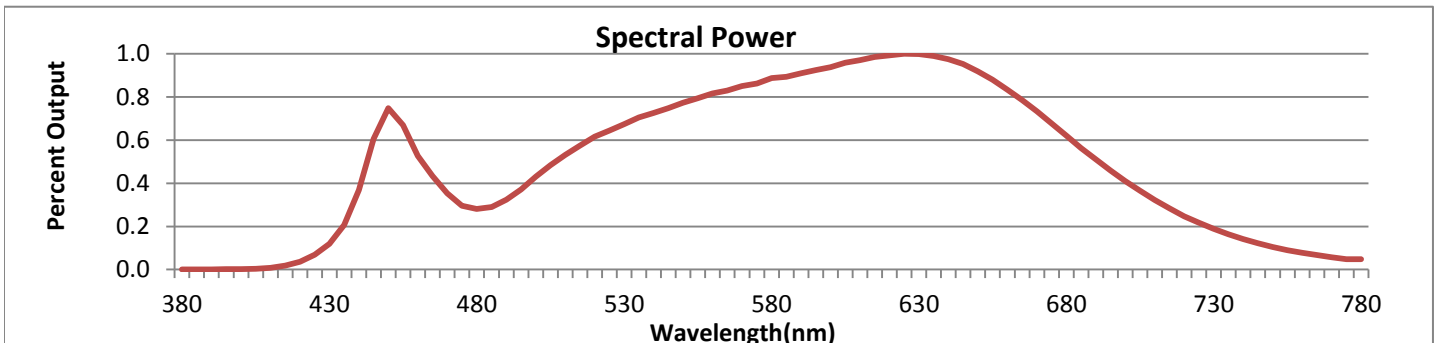


FIG.1 LUMINAIRE



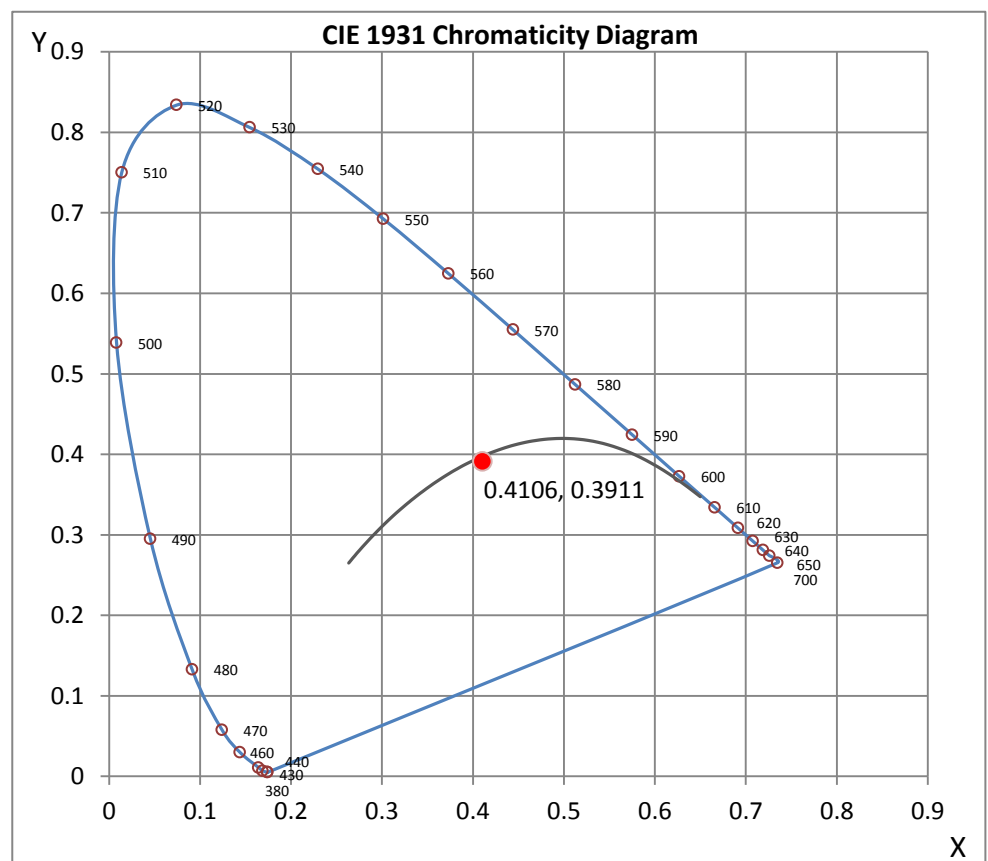
Wavelength	W/m ² nm	440	0.0024	510	0.0035	580	0.0058	650	0.0060	720	0.0016
380	0.0000	450	0.0049	520	0.0040	590	0.0060	660	0.0055	730	0.0012
390	0.0000	460	0.0035	530	0.0044	600	0.0062	670	0.0048	740	0.0009
400	0.0000	470	0.0023	540	0.0048	610	0.0064	680	0.0041	750	0.0007
410	0.0001	480	0.0018	550	0.0051	620	0.0065	690	0.0034	760	0.0005
420	0.0002	490	0.0021	560	0.0054	630	0.0066	700	0.0027	770	0.0004
430	0.0008	500	0.0028	570	0.0056	640	0.0064	710	0.0021	780	0.0003

CRI & CCT

x	0.4106
y	0.3911
u'	0.2390
v'	0.5122
CRI	92.20
CCT	3388
Duv	-0.00096

R Values

R1	92.60
R2	94.33
R3	93.97
R4	92.29
R5	91.44
R6	90.96
R7	94.66
R8	87.73
R9	69.94
R10	85.21
R11	91.41
R12	74.27
R13	92.88
R14	95.96





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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.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Wilson Khounlavong

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 : L04142413R01.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L04142413R01
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 3/12/2015
[MANUFAC] AION LED
[LUMCAT] 8924-35-XX
[LUMINAIRE] 1/2"L. X 11-3/4"W. X 1/8"H. LED STRIP
[LAMPPOSITION] 0,0
[LAMPCAT] N/A
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_INPUT] 24VDC, 5.36W
[_TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	439
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	82
Total Luminaire Watts	5.36
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.30
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.03 ft
Luminous Width (90-270)	0.96 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	54148	53789	52690
55	53050	52835	51689
65	50741	50688	49451
75	45560	45661	44478
85	36673	37744	35302

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04142413R01.IES

CANDELA TABULATION

	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>
0	145.21	145.21	145.21	145.21	145.21	145.21	145.21	145.21	145.21	145.21
5	146.28	146.30	146.27	146.12	145.95	145.72	145.48	145.23	144.86	144.91
10	144.66	144.70	144.65	144.53	144.35	144.14	143.89	143.67	143.31	143.29
15	141.88	141.96	141.91	141.81	141.65	141.42	141.17	140.99	140.67	140.55
20	138.31	138.27	138.24	138.17	138.01	137.79	137.57	137.37	137.08	136.97
25	133.18	133.22	133.19	133.13	133.00	132.82	132.55	132.42	132.05	132.08
30	127.15	127.24	127.23	127.16	127.05	126.92	126.67	126.52	126.12	126.16
35	119.86	119.91	119.94	119.91	119.80	119.68	119.45	119.33	119.05	118.91
40	111.83	111.89	111.94	111.91	111.85	111.73	111.52	111.39	111.20	110.90
45	102.54	102.57	102.63	102.60	102.56	102.48	102.33	102.19	102.03	101.86
50	92.58	92.61	92.69	92.69	92.63	92.62	92.45	92.31	92.14	92.03
55	81.49	81.55	81.64	81.65	81.61	81.61	81.50	81.41	81.26	81.16
60	69.75	69.82	69.90	69.92	69.91	69.92	69.88	69.79	69.68	69.57
65	57.43	57.46	57.54	57.60	57.59	57.60	57.63	57.54	57.43	57.37
70	44.35	44.40	44.47	44.56	44.57	44.58	44.58	44.54	44.48	44.39
75	31.58	31.60	31.67	31.74	31.74	31.79	31.77	31.76	31.73	31.65
80	18.49	18.66	18.69	18.74	18.77	18.81	18.83	18.84	18.79	18.78
85	8.56	8.59	8.63	8.69	8.71	8.76	8.79	8.81	8.82	8.81
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles **Horizontal Angles**

	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>70</u>	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
0	145.21	145.21	145.21	145.21	145.21	145.21	145.21	145.21	145.21
5	145.34	144.98	144.36	143.74	143.52	143.50	143.07	142.62	142.10
10	143.77	143.46	142.77	142.14	141.95	141.95	141.49	141.08	140.53
15	140.98	140.82	140.05	139.45	139.27	139.29	138.85	138.37	137.89
20	137.19	137.20	136.43	135.88	135.71	135.67	135.22	134.75	134.26
25	132.12	132.14	131.48	130.94	130.81	130.72	130.27	129.89	129.41
30	126.16	126.32	125.70	125.23	124.92	124.85	124.46	124.06	123.65
35	118.85	118.99	118.52	118.01	117.80	117.63	117.31	116.90	116.54
40	110.97	110.91	110.65	110.20	110.02	109.80	109.49	109.09	108.78
45	101.76	101.59	101.43	101.14	100.90	100.63	100.38	100.03	99.78
50	91.85	91.73	91.63	91.36	91.17	90.89	90.67	90.30	90.11
55	81.02	80.80	80.73	80.51	80.33	80.05	79.83	79.52	79.40
60	69.45	69.30	69.12	69.01	68.86	68.56	68.38	68.11	68.01
65	57.25	57.09	56.94	56.81	56.67	56.42	56.29	56.08	55.97
70	44.29	44.18	44.01	43.88	43.75	43.60	43.45	43.27	43.23
75	31.56	31.51	31.41	31.30	31.19	31.05	30.97	30.87	30.83
80	18.78	19.00	18.82	18.78	18.72	18.55	18.53	18.50	18.45
85	8.77	8.75	8.75	8.72	8.64	8.54	8.40	8.32	8.24
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	53.46	N.A.	12.20
0-30	114.29	N.A.	26.00
0-40	188.65	N.A.	43.00
0-60	339.41	N.A.	77.30
0-80	428.99	N.A.	97.80
0-90	438.80	N.A.	100.00
10-90	425.03	N.A.	96.90
20-40	135.19	N.A.	30.80
20-50	213.65	N.A.	48.70
40-70	207.14	N.A.	47.20
60-80	89.58	N.A.	20.40
70-80	33.20	N.A.	7.60
80-90	9.81	N.A.	2.20
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	438.80	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	13.77
10-20	39.69
20-30	60.83
30-40	74.37
40-50	78.46
50-60	72.30
60-70	56.38
70-80	33.20
80-90	9.81
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

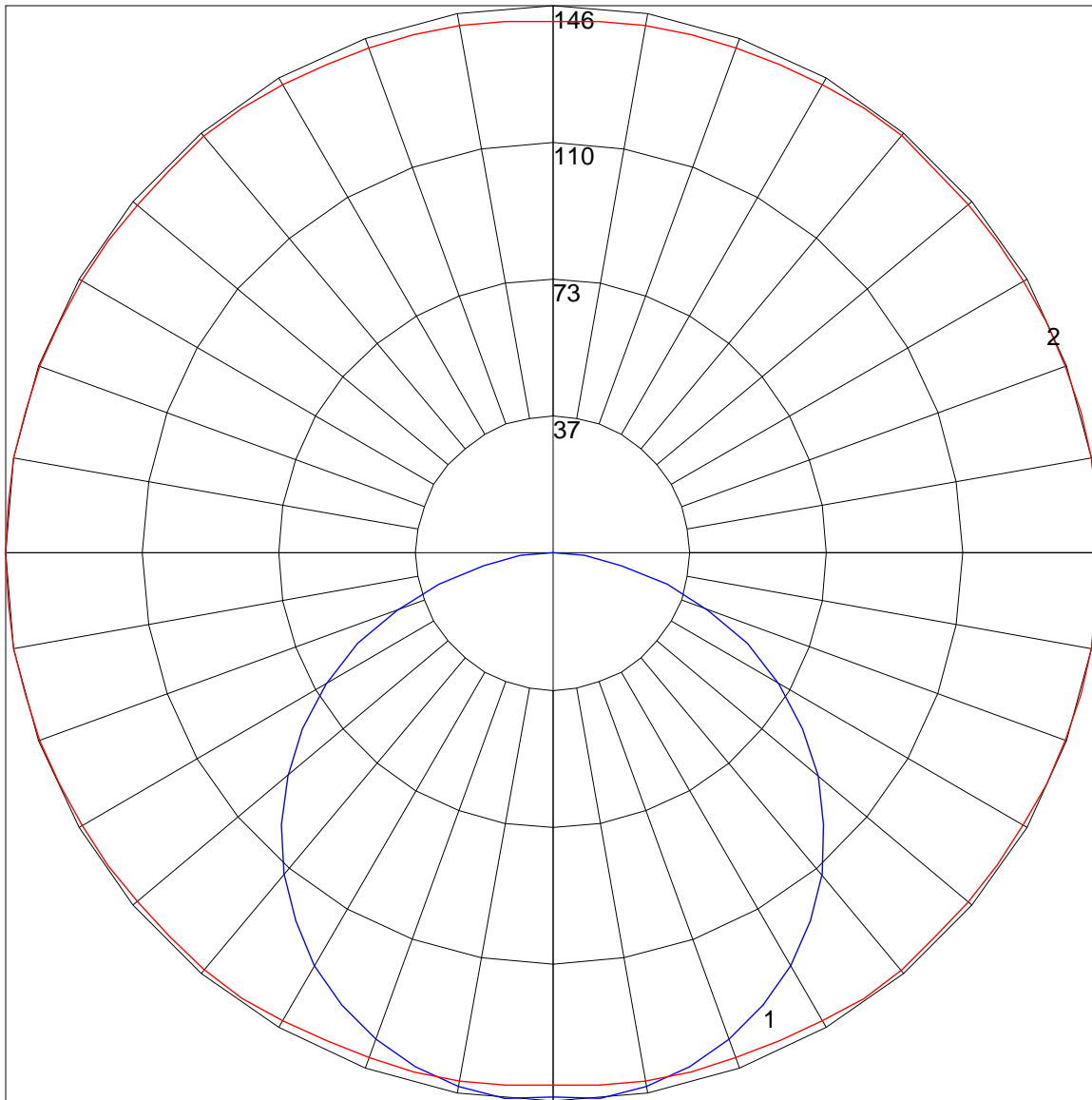
IES INDOOR REPORT
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	103	99	95	106	101	97	93	97	93	90	93	90	88	89	87	85	83
2	98	90	83	77	96	88	81	76	84	79	74	81	76	72	78	74	71	69
3	89	79	70	63	87	77	69	63	74	67	62	71	65	61	69	64	60	57
4	82	69	60	54	79	68	60	53	65	58	52	63	57	52	61	55	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	46	40	67	55	46	40	53	45	39	51	44	39	49	43	39	37
7	64	50	41	35	62	49	41	35	48	40	35	46	40	34	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	31	43	36	31	41	35	31	29
9	56	42	34	28	54	41	33	28	40	33	28	39	32	28	38	32	28	26
10	52	39	31	25	51	38	31	25	37	30	25	36	30	25	35	29	25	23

POLAR GRAPH



Maximum Candela = 146.3 Located At Horizontal Angle = 5, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)