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Test #: L04132102R02

Date: 7/22/2013



NVLAP LAB CODE 200927-0

Test Report: L04132102R02

Model Number: 3924-22-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 3924-22-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

*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, Incorporated
Model Number:	3924-22-XX
LAMPCAT:	N/A
Driver Model Number:	N/A
Total Lumens:	80.84
Input Voltage (VDC/60Hz):	24.00
Input Current (Amp):	0.06
Input Power (W):	1.40
Input Power Factor:	N/A
Total Harmonic Distortion @ 120V(%):	N/A
Total Harmonic Distortion @ 277V(%):	N/A
Efficacy:	57.71
Color Rendering Index (CRI):	94.40
Correlated Color Temperature (K):	2180
Chromaticity Coordinate x:	0.5030
Chromaticity Coordinate y:	0.4080
Ambient Temperature (°F):	77.0
Stabilization Time (Hours):	0:20
Total Operating Time (Hours):	0:50
Off State Power(W):	0.00

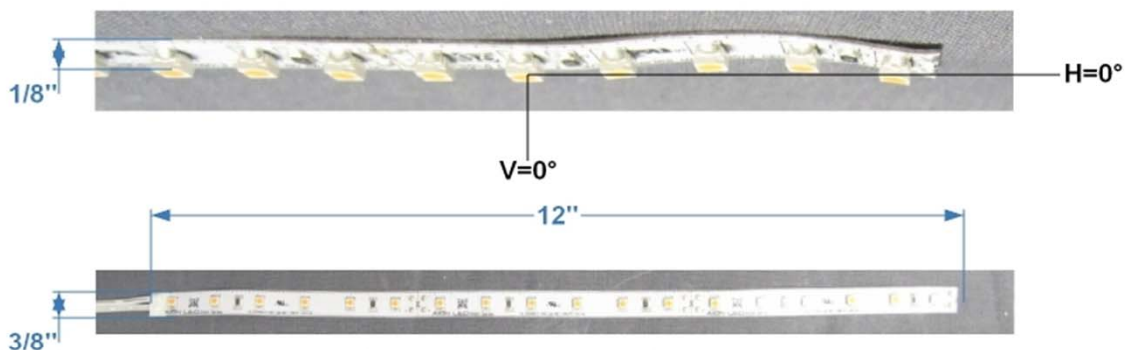
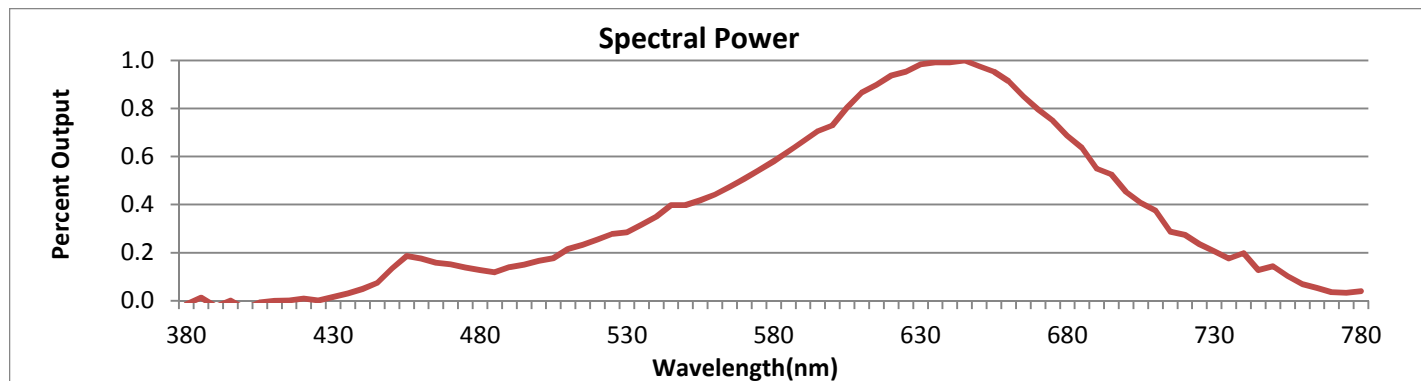


FIG.1 LUMINAIRE



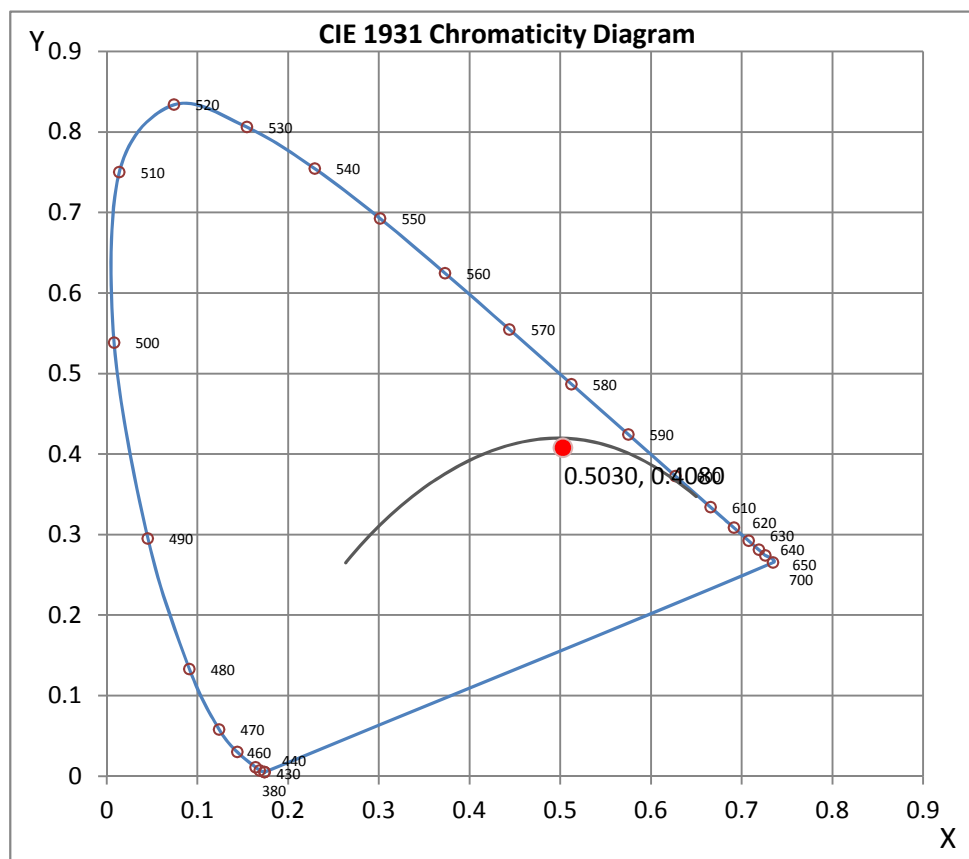
Wavelength	W/m ² nm	440	0.0006	510	0.0028	580	0.0074	650	0.0125	720	0.0035
380	0.0000	450	0.0017	520	0.0033	590	0.0085	660	0.0117	730	0.0026
390	0.0000	460	0.0022	530	0.0037	600	0.0093	670	0.0102	740	0.0025
400	0.0000	470	0.0019	540	0.0045	610	0.0111	680	0.0088	750	0.0018
410	0.0000	480	0.0016	550	0.0051	620	0.0120	690	0.0070	760	0.0009
420	0.0001	490	0.0018	560	0.0057	630	0.0126	700	0.0058	770	0.0004
430	0.0002	500	0.0021	570	0.0065	640	0.0127	710	0.0048	780	0.0005

CRI & CCT

x	0.5030
y	0.4080
u'	0.2920
v'	0.5329
CRI	94.40
CCT	2180
Duv	-0.00234

R Values

R1	95.60
R2	99.20
R3	98.50
R4	93.80
R5	95.70
R6	96.80
R7	91.20
R8	84.70
R9	71.10
R10	96.90
R11	94.90
R12	89.30
R13	96.90
R14	98.90





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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 : L04132102R02.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L04132102R02
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 7/22/2013
[MANUFAC] AION LED INC.
[LUMCAT] 3924-22-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, 1.40W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	81
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	58
Total Luminaire Watts	1.4
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)	0.94 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	30708	30708	30368
55	29699	29679	29220
65	27801	27909	26935
75	23515	23206	22322
85	13914	13914	12601

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04132102R02.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	28.06	28.06	28.06	28.06	28.06
5	27.94	27.94	27.95	27.94	27.91
10	27.60	27.59	27.59	27.57	27.52
15	26.99	27.01	27.00	26.96	26.91
20	26.16	26.19	26.20	26.18	26.08
25	25.13	25.16	25.16	25.13	24.99
30	23.89	23.91	23.88	23.87	23.73
35	22.45	22.45	22.42	22.45	22.29
40	20.78	20.79	20.77	20.80	20.59
45	18.98	18.98	18.98	18.95	18.77
50	17.04	17.03	17.02	17.04	16.82
55	14.89	14.85	14.88	14.91	14.65
60	12.64	12.57	12.64	12.64	12.39
65	10.27	10.27	10.31	10.27	9.95
70	7.78	7.74	7.77	7.80	7.51
75	5.32	5.26	5.25	5.32	5.05
80	3.03	3.00	2.97	2.99	2.77
85	1.06	1.08	1.06	1.06	0.96
90	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L04132102R02.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	10.27	N.A.	12.70
0-30	21.85	N.A.	27.00
0-40	35.87	N.A.	44.40
0-60	63.76	N.A.	78.90
0-80	79.46	N.A.	98.30
0-90	80.84	N.A.	100.00
10-90	78.18	N.A.	96.70
20-40	25.60	N.A.	31.70
20-50	40.22	N.A.	49.80
40-70	37.99	N.A.	47.00
60-80	15.70	N.A.	19.40
70-80	5.60	N.A.	6.90
80-90	1.38	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	80.84	N.A.	100.00

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	2.66
10-20	7.62
20-30	11.58
30-40	14.02
40-50	14.62
50-60	13.27
60-70	10.10
70-80	5.60
80-90	1.38
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

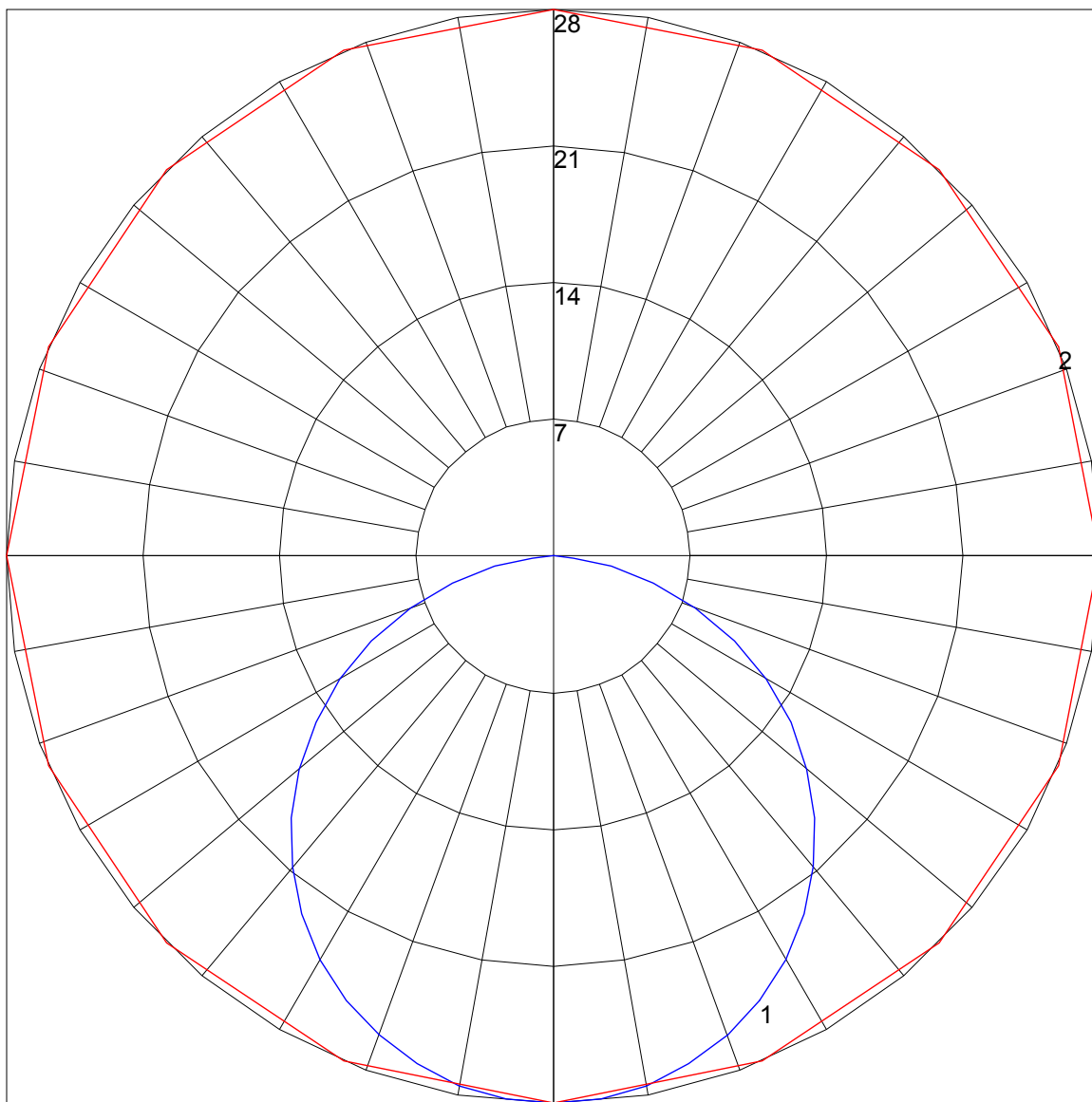
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	109	104	99	96	106	101	98	94	97	94	91	93	91	88	90	88	86	84
2	99	90	83	78	96	88	82	77	85	80	75	82	77	73	79	75	72	69
3	90	79	71	64	87	78	70	64	75	68	63	72	66	62	69	65	61	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	53	62	56	52	50
5	75	63	54	47	73	61	53	47	59	52	46	57	51	46	55	50	45	43
6	70	56	47	41	68	55	47	41	53	46	40	52	45	40	50	44	40	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	59	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 = 28.06 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.)