



8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Report No: L031703001



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Issue Date: 3/15/2017

Report Prepared For: Aion LED, Inc.
2325 3rd Street #330 San Francisco, CA 94107

Model Number: 9524-22-FR

Test: Electrical and Photometric tests

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. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 3/13/17

Date of Tests: 3/14/17 - 3/15/17

Seasoning of Sample: 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	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
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.

Test Summary

Manufacturer:	Aion LED, Inc.
Model Number:	9524-22-FR
Driver Model Number:	N/A
Total Lumens:	840.13
Input Voltage (VDC):	24.00
Input Current (Amp):	0.45
Input Power (W):	10.70
Input Power Factor:	1.00
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	N/A
Efficacy:	79
Color Rendering Index (CRI):	95
Correlated Color Temperature (K):	2078
Chromaticity Coordinate x:	0.5108
Chromaticity Coordinate y:	0.4040
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	0:50

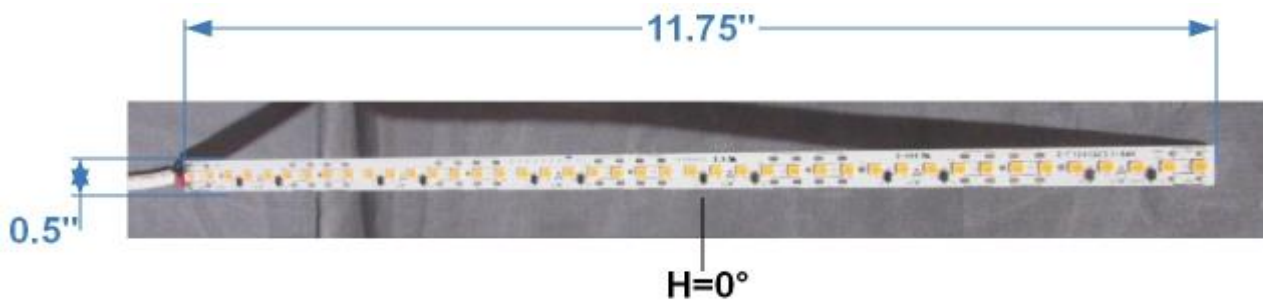
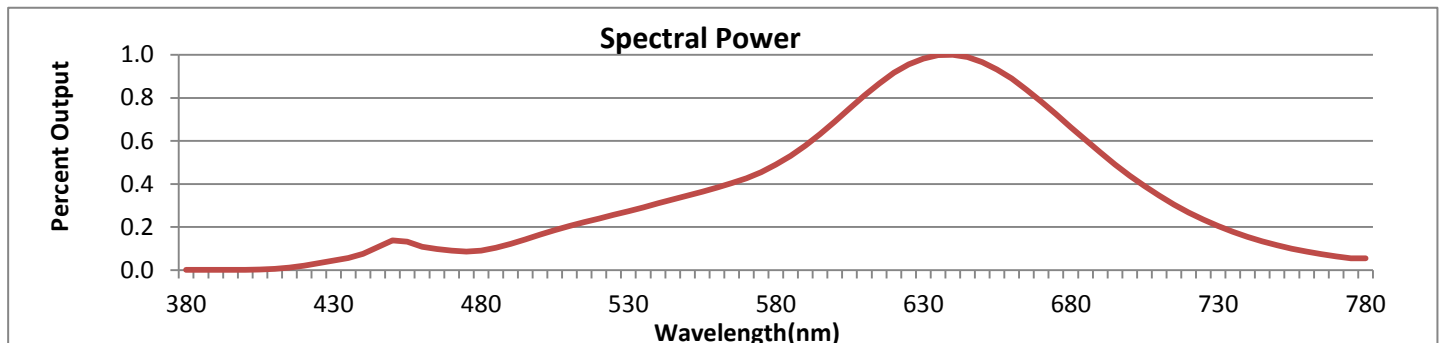


FIG. 1 LUMINAIRE



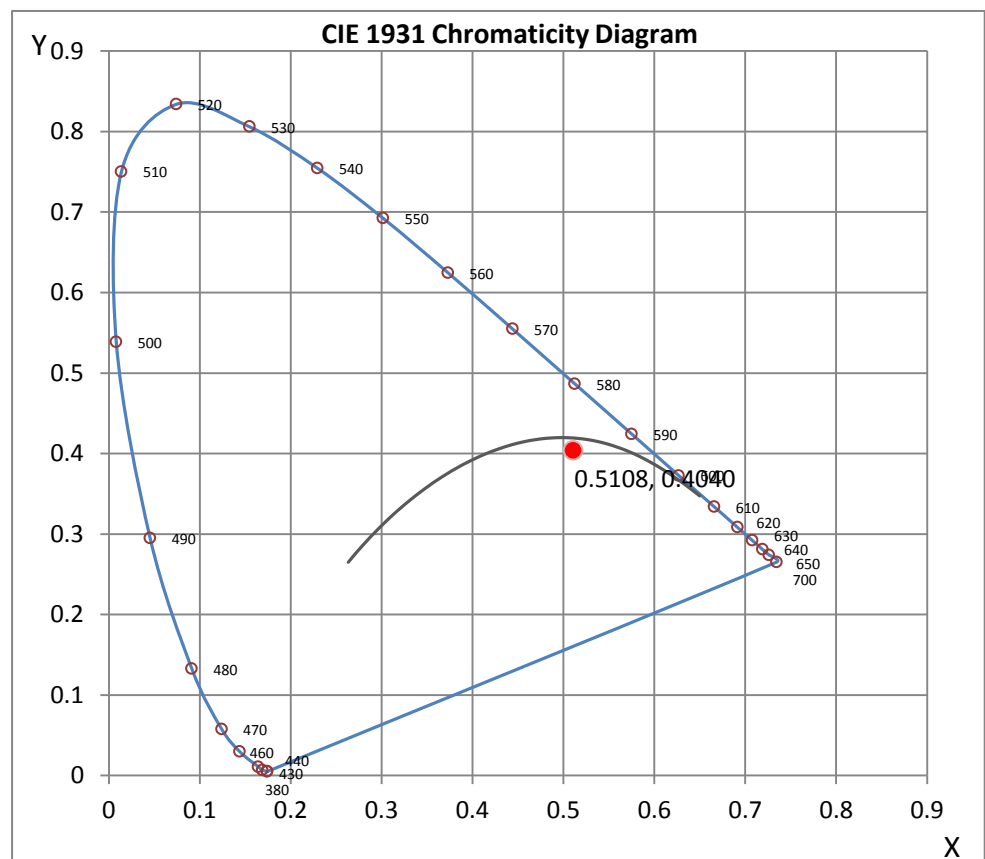
Wavelength	W/m ² nm	440	0.0755	510	0.2051	580	0.4900	650	0.9659	720	0.2672
380	0.0007	450	0.1375	520	0.2396	590	0.5787	660	0.8901	730	0.2041
390	0.0007	460	0.1086	530	0.2739	600	0.6897	670	0.7834	740	0.1540
400	0.0015	470	0.0906	540	0.3108	610	0.8109	680	0.6635	750	0.1158
410	0.0061	480	0.0908	550	0.3467	620	0.9164	690	0.5464	760	0.0866
420	0.0212	490	0.1219	560	0.3832	630	0.9822	700	0.4389	770	0.0642
430	0.0436	500	0.1648	570	0.4270	640	1.0000	710	0.3455	780	0.0553

CRI & CCT

x	0.5108
y	0.4040
u'	0.2993
v'	0.5326
CRI	95.40
CCT	2078
Duv	-0.00344

R Values

R1	98.70
R2	97.39
R3	98.57
R4	96.64
R5	97.23
R6	92.09
R7	92.73
R8	90.01
R9	82.02
R10	96.13
R11	91.89
R12	87.22
R13	97.48
R14	98.21



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 : Keyur Patel

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 : L031703001.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L031703001
[TESTLAB] LIGHT LABORATORY, INC.
[ISSUEDATE] 3/15/2017
[MANUFAC] AION LED, INC.
[LUMCAT] 9524-22-FR
[LUMINAIRE] LED STRIP LIGHT
[BALLASTCAT] N/A
[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, 10.70W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	840
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	79
Total Luminaire Watts	10.7
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.40
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.02 ft
Luminous Width (90-270)	0.98 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	151795	152734	152897
55	147264	148498	148220
65	138095	139173	138952
75	116169	118204	118819
85	71640	69247	75795

IES INDOOR REPORT
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CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	288.64	288.64	288.64	288.64	288.64
5	285.98	286.89	287.81	288.26	288.22
10	282.41	283.16	284.07	284.69	284.48
15	276.51	277.30	278.17	278.71	278.42
20	268.37	269.21	269.95	270.53	270.45
25	257.66	258.83	259.61	259.70	259.99
30	245.54	246.08	246.62	247.49	246.95
35	230.93	231.47	232.17	232.84	232.17
40	213.99	214.98	215.56	215.73	215.56
45	195.63	196.34	196.84	197.25	197.05
50	176.12	176.49	176.74	177.66	176.79
55	153.95	154.53	155.24	155.20	154.95
60	130.87	131.36	131.66	131.90	131.61
65	106.37	106.99	107.20	107.37	107.03
70	81.79	81.58	81.71	82.21	81.63
75	54.80	55.59	55.76	55.39	56.05
80	30.81	31.64	31.85	31.22	32.05
85	11.38	11.58	11.00	10.21	12.04
90	0.00	0.00	0.00	0.00	0.00

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	105.79	N.A.	12.60
0-30	225.29	N.A.	26.80
0-40	370.39	N.A.	44.10
0-60	660.46	N.A.	78.60
0-80	825.49	N.A.	98.30
0-90	840.13	N.A.	100.00
10-90	812.80	N.A.	96.70
20-40	264.60	N.A.	31.50
20-50	416.36	N.A.	49.60
40-70	395.90	N.A.	47.10
60-80	165.03	N.A.	19.60
70-80	59.20	N.A.	7.00
80-90	14.64	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	840.13	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	27.33
10-20	78.46
20-30	119.50
30-40	145.10
40-50	151.75
50-60	138.32
60-70	105.83
70-80	59.20
80-90	14.64
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

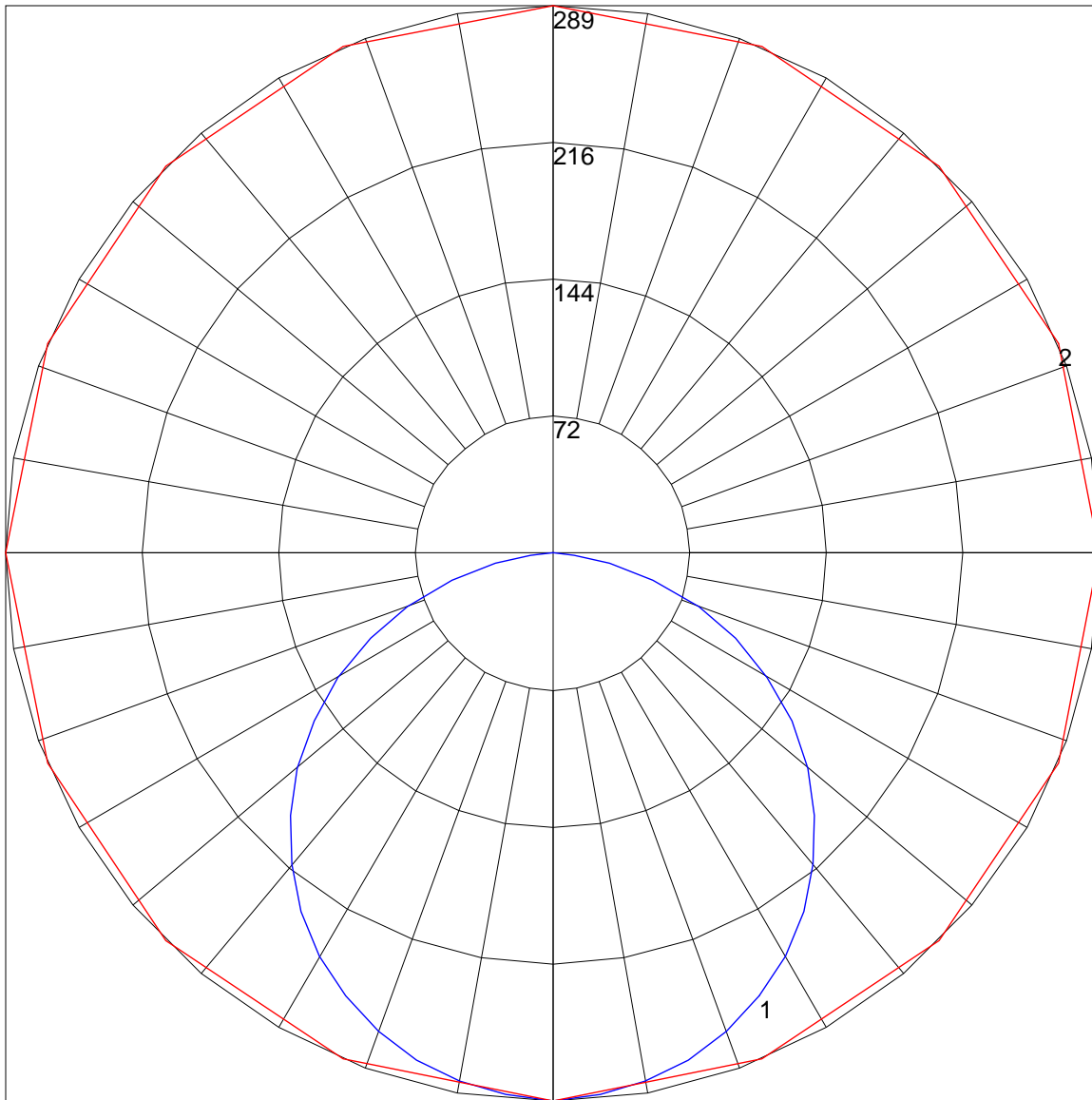
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	100	96	106	102	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	76	63	53	47	73	61	53	46	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	35	47	40	35	46	40	35	33
8	60	46	38	32	59	46	38	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	34	28	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 = 288.64 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.)