



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

Report No: L031703002



**Report No:** L031703002

**Issue Date:** 3/15/2017

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

**Model Number:** 9524-27-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

<b>Manufacturer:</b>	Aion LED, Inc.
<b>Model Number:</b>	9524-27-FR
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	1004.98
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.44
<b>Input Power (W):</b>	10.67
<b>Input Power Factor:</b>	1.00
<b>Current ATHD @ 120V(%):</b>	N/A
<b>Current ATHD @ 277V(%):</b>	N/A
<b>Efficacy:</b>	94
<b>Color Rendering Index (CRI):</b>	97
<b>Correlated Color Temperature (K):</b>	2707
<b>Chromaticity Coordinate x:</b>	0.4549
<b>Chromaticity Coordinate y:</b>	0.4027
<b>Ambient Temperature (°C):</b>	25.0
<b>Stabilization Time (Hours):</b>	0:30
<b>Total Operating Time (Hours):</b>	0:50

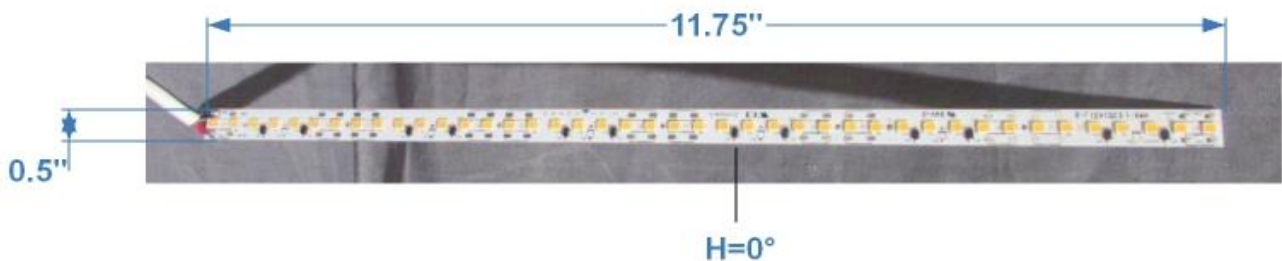
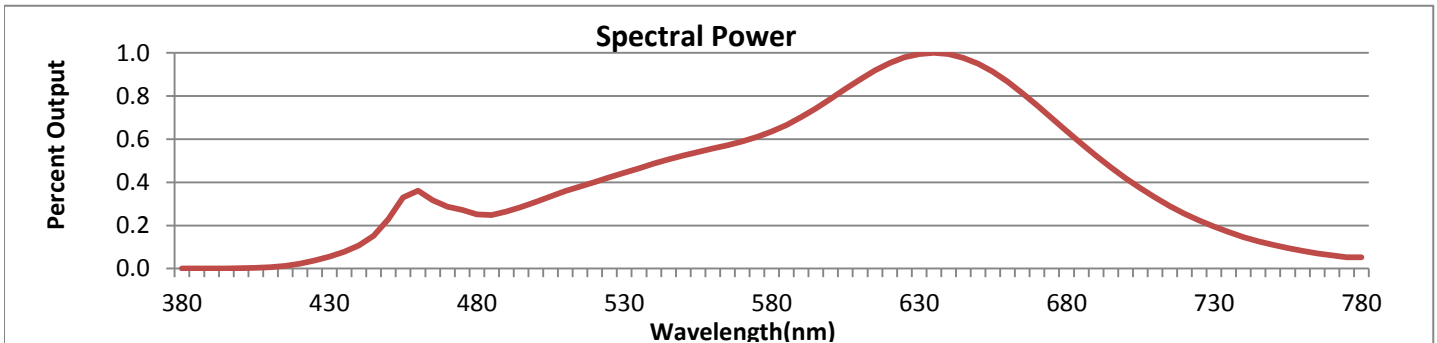


FIG. 1 LUMINAIRE



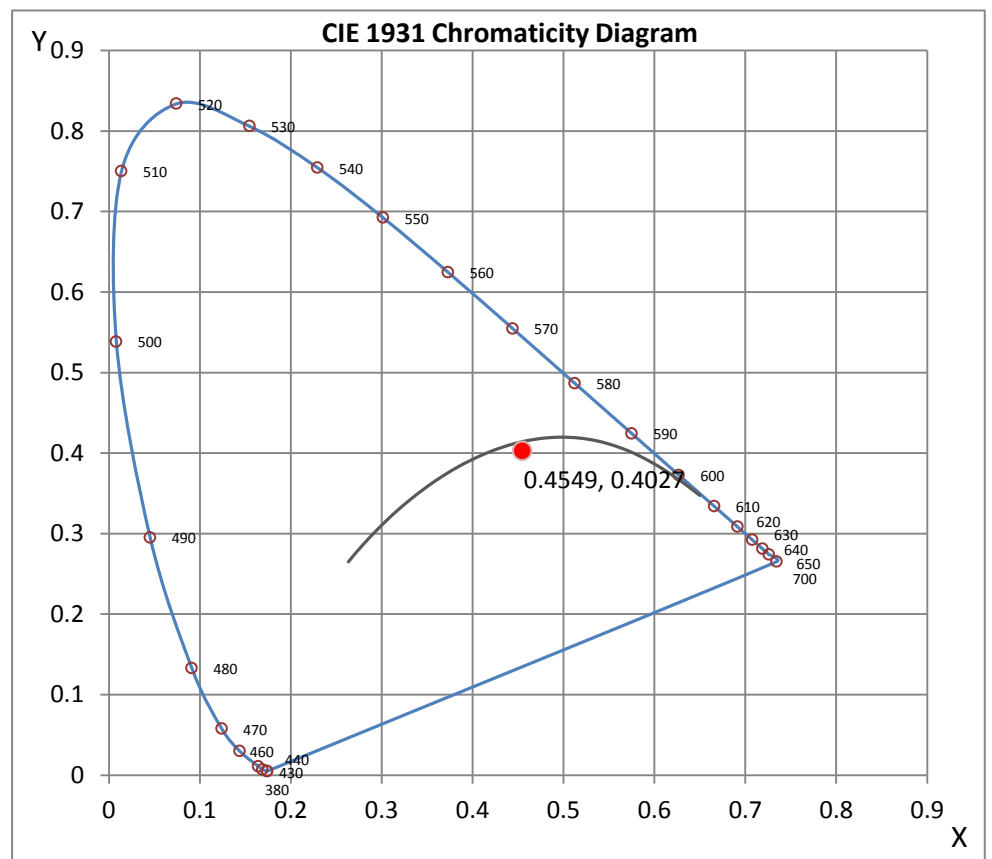
Wavelength	W/m <sup>2</sup> nm	440	0.1068	510	0.3594	580	0.6350	650	0.9496	720	0.2543
380	0.0006	450	0.2292	520	0.4017	590	0.7020	660	0.8671	730	0.1942
390	0.0009	460	0.3616	530	0.4436	600	0.7874	670	0.7579	740	0.1464
400	0.0018	470	0.2865	540	0.4868	610	0.8771	680	0.6393	750	0.1099
410	0.0059	480	0.2519	550	0.5248	620	0.9532	690	0.5235	760	0.0821
420	0.0226	490	0.2649	560	0.5567	630	0.9950	700	0.4191	770	0.0611
430	0.0551	500	0.3096	570	0.5893	640	0.9946	710	0.3295	780	0.0525

**CRI & CCT**

x	0.4549
y	0.4027
u'	0.2628
v'	0.5235
CRI	96.70
CCT	2707
Duv	-0.00253

**R Values**

R1	97.40
R2	96.91
R3	98.86
R4	98.83
R5	97.00
R6	93.55
R7	95.35
R8	95.34
R9	92.62
R10	95.26
R11	96.53
R12	86.53
R13	96.71
R14	99.04



## 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 : L031703002.IES

### DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L031703002  
[TESTLAB] LIGHT LABORATORY, INC.  
[ISSUEDATE] 3/15/2017  
[MANUFAC] AION LED, INC.  
[LUMCAT] 9524-27-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, 10.67W  
[TEST PROCEDURE] IESNA:LM-79-08

### CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1005
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	94
Total Luminaire Watts	10.67
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.30
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	180986	182599	182856
55	175942	177721	177769
65	165696	167747	167202
75	142053	143728	141523
85	100346	95373	90966

IES INDOOR REPORT  
PHOTOMETRIC FILENAME : L031703002.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
<b>0</b>	341.18	341.18	341.18	341.18	341.18
<b>5</b>	337.71	339.12	340.12	340.95	341.03
<b>10</b>	334.06	335.09	335.68	337.00	337.13
<b>15</b>	327.58	328.16	330.20	330.15	331.23
<b>20</b>	318.28	319.69	320.73	321.68	321.68
<b>25</b>	306.24	307.40	308.61	309.52	309.15
<b>30</b>	291.21	292.79	293.87	294.57	294.78
<b>35</b>	274.10	275.68	276.72	277.72	277.59
<b>40</b>	254.76	256.21	257.04	257.95	257.50
<b>45</b>	233.25	234.33	235.33	236.24	235.66
<b>50</b>	209.50	211.08	211.95	212.28	211.74
<b>55</b>	183.93	184.96	185.79	186.46	185.84
<b>60</b>	156.52	157.65	157.44	158.10	158.02
<b>65</b>	127.63	128.54	129.21	129.66	128.79
<b>70</b>	97.32	98.15	99.31	99.15	98.40
<b>75</b>	67.01	67.18	67.80	67.59	66.76
<b>80</b>	39.03	38.99	38.99	38.16	38.20
<b>85</b>	15.94	15.69	15.15	13.29	14.45
<b>90</b>	0.00	0.00	0.00	0.00	0.00

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L031703002.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	125.35	N.A.	12.50
0-30	267.47	N.A.	26.60
0-40	440.39	N.A.	43.80
0-60	787.35	N.A.	78.30
0-80	986.38	N.A.	98.10
0-90	1004.98	N.A.	100.00
10-90	972.66	N.A.	96.80
20-40	315.04	N.A.	31.30
20-50	496.36	N.A.	49.40
40-70	474.22	N.A.	47.20
60-80	199.03	N.A.	19.80
70-80	71.76	N.A.	7.10
80-90	18.60	N.A.	1.90
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	1004.98	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	32.32
10-20	93.04
20-30	142.12
30-40	172.92
40-50	181.32
50-60	165.64
60-70	127.26
70-80	71.76
80-90	18.60
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

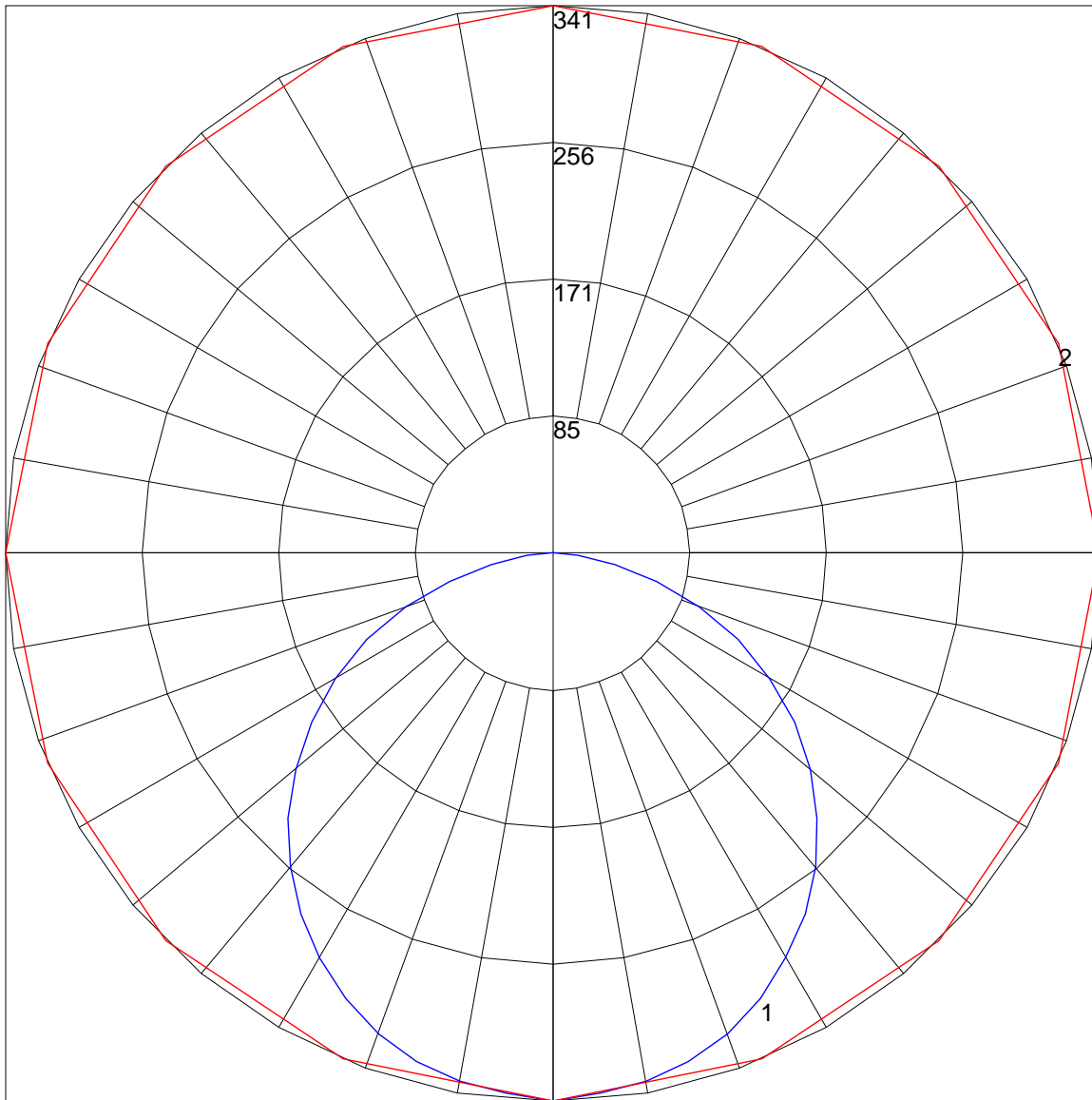
**IES INDOOR REPORT**  
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	109	104	99	96	106	101	98	94	97	94	91	93	91	88	90	88	86	83
2	99	90	83	78	96	88	82	77	85	79	75	81	77	73	78	75	71	69
3	90	79	71	64	87	77	70	64	74	68	62	72	66	61	69	64	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	57	52	62	56	52	49
5	75	62	53	47	73	61	53	46	59	52	46	57	50	45	55	49	45	43
6	70	56	47	41	68	55	47	40	53	46	40	52	45	40	50	44	39	37
7	64	51	42	36	63	50	42	36	48	41	35	47	40	35	46	39	35	33
8	60	46	38	32	58	46	37	32	44	37	31	43	36	31	42	36	31	29
9	56	42	34	29	55	42	34	28	41	33	28	40	33	28	39	32	28	26
10	52	39	31	26	51	39	31	26	38	31	26	37	30	26	36	30	25	24

POLAR GRAPH



Maximum Candela = 341.18 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.)