

Report No: L031805603

Issue Date: 3/30/2018

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

Model Number: 1524-35-LE

Test: Photometric/Colorimetric/Electrical Test

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: 3/28/18

Date of Tests: 3/29/18 - 3/30/18

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-S4	1/9/19
BK PRECISION	1747	PS-DC04	1/10/19
Fluke Digital Thermometer	52K/J	MT-TP05	1/10/19
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
Model Number:	1524-35-LE
Driver Model Number:	N/A
Total Lumens:	416.36
Input Voltage (VDC):	24.00
Input Current (Amp):	0.19
Input Power (W):	4.46
Input Power Factor:	1.00
Current ATHD @ 120V(%):	N/A
Current ATHD @ 277V(%):	N/A
Efficacy:	93
Color Rendering Index (CRI):	98
Correlated Color Temperature (K):	3381
Chromaticity Coordinate x:	0.4112
Chromaticity Coordinate y:	0.3915
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	0:50

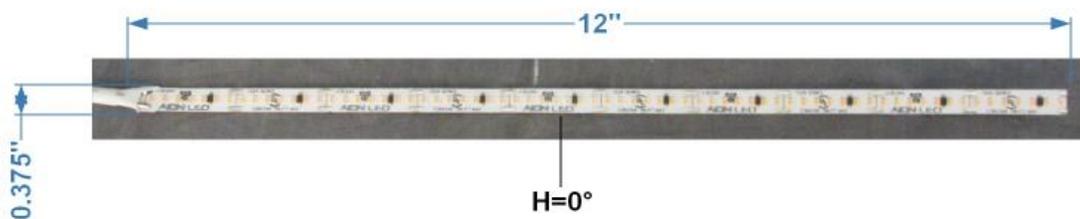
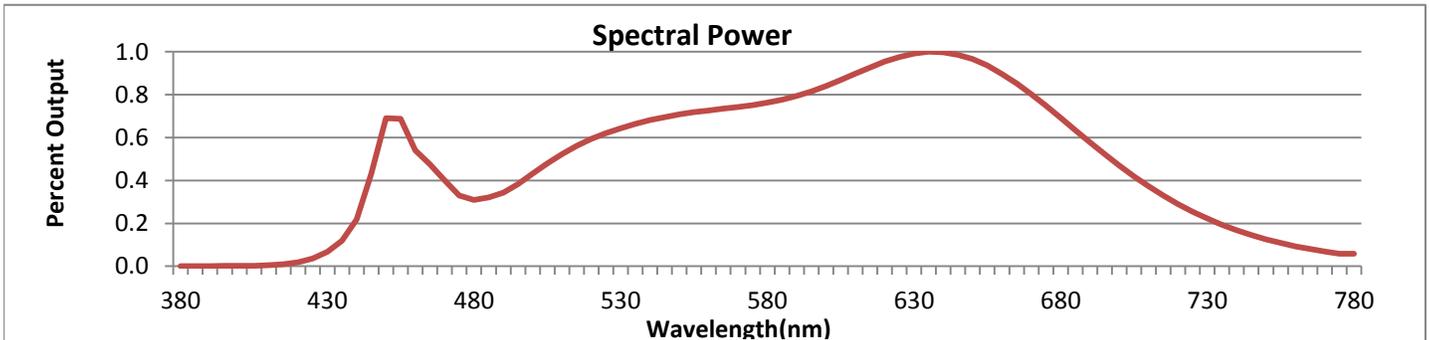


FIG. 1 LUMINAIRE

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



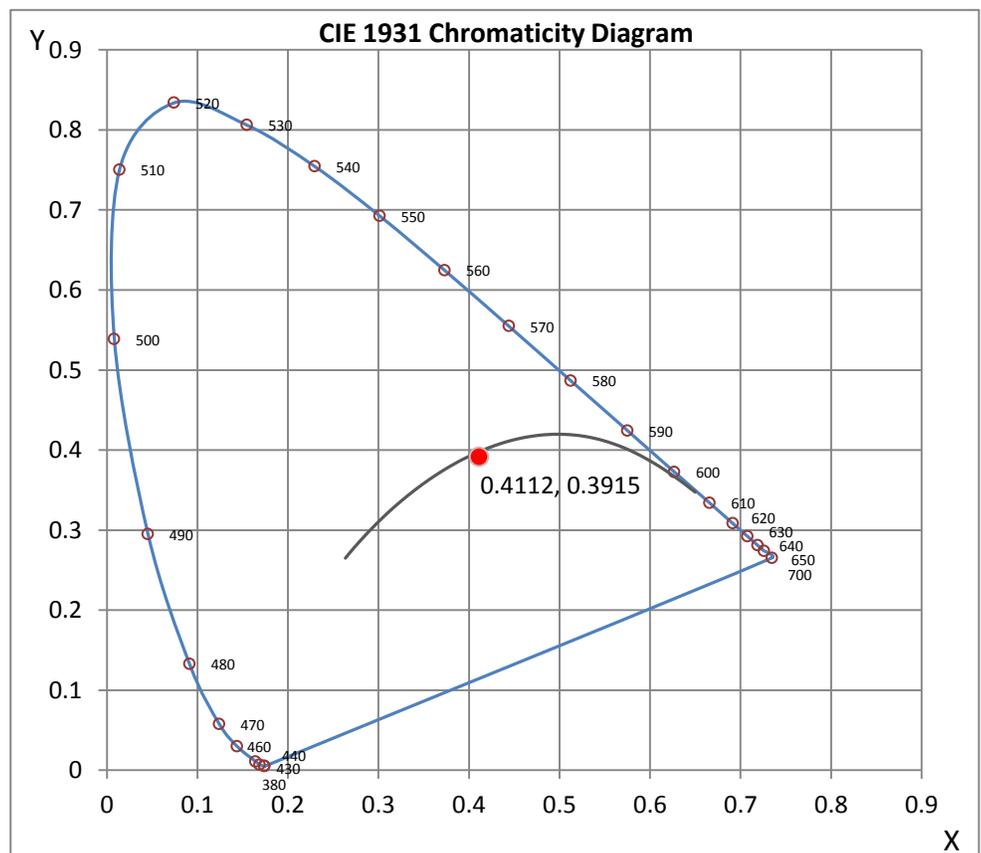
Wavelength	W/m ² nm	440	0.2181	510	0.5234	580	0.7633	650	0.9661	720	0.2900
380	0.0009	450	0.6901	520	0.5943	590	0.7940	660	0.8973	730	0.2224
390	0.0010	460	0.5413	530	0.6435	600	0.8407	670	0.8016	740	0.1679
400	0.0018	470	0.4019	540	0.6814	610	0.8980	680	0.6919	750	0.1257
410	0.0050	480	0.3098	550	0.7077	620	0.9544	690	0.5774	760	0.0932
420	0.0186	490	0.3435	560	0.7262	630	0.9916	700	0.4694	770	0.0688
430	0.0665	500	0.4319	570	0.7426	640	0.9983	710	0.3728	780	0.0591

CRI & CCT

x	0.4112
y	0.3915
u'	0.2392
v'	0.5125
CRI	98.10
CCT	3381
Duv	-0.00091

R Values

R1	99.20
R2	98.86
R3	95.29
R4	98.96
R5	98.05
R6	96.36
R7	99.31
R8	98.83
R9	96.87
R10	95.20
R11	97.41
R12	78.39
R13	99.82
R14	96.48



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

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.

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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*



8165 E. Kaiser Blvd. Anaheim, CA 92808
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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805603.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L031805603
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 3/30/2018
[MANUFAC] AION LED
[LUMCAT] 1524-35-LE
[LUMINAIRE] 8 mm board 12" LED Strip Light
[BALLASTCAT] 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, 4.46W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	416
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	93
Total Luminaire Watts	4.46
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)	0.01 ft
Luminous Width (90-270)	1.00 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	149527	150272	149527
55	145415	145565	143222
65	136287	134812	127407
75	114885	110397	99013
85	72798	72181	50218

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805603.IES

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	142.89	142.89	142.89	142.89	142.89
5	141.91	142.20	142.37	142.45	142.66
10	140.25	140.50	140.66	140.79	140.83
15	137.34	137.72	137.88	137.92	138.09
20	133.61	133.90	133.98	134.15	134.27
25	128.62	128.83	129.08	129.16	129.04
30	122.48	122.81	122.98	122.98	122.98
35	115.59	115.80	115.92	115.88	116.09
40	107.53	107.57	107.70	107.91	107.62
45	98.32	98.57	98.81	98.48	98.32
50	88.35	88.81	88.81	88.31	87.85
55	77.56	77.85	77.64	76.98	76.39
60	65.93	66.06	65.52	64.23	63.69
65	53.56	53.85	52.98	51.03	50.07
70	40.85	41.15	39.90	37.62	36.54
75	27.65	27.94	26.57	24.50	23.83
80	16.11	15.94	15.07	13.70	13.70
85	5.90	6.02	5.85	5.31	4.07
90	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L031805603.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	52.45	N.A.	12.60
0-30	111.90	N.A.	26.90
0-40	184.35	N.A.	44.30
0-60	329.34	N.A.	79.10
0-80	409.28	N.A.	98.30
0-90	416.36	N.A.	100.00
10-90	402.82	N.A.	96.70
20-40	131.91	N.A.	31.70
20-50	207.89	N.A.	49.90
40-70	196.81	N.A.	47.30
60-80	79.94	N.A.	19.20
70-80	28.12	N.A.	6.80
80-90	7.07	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	416.36	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

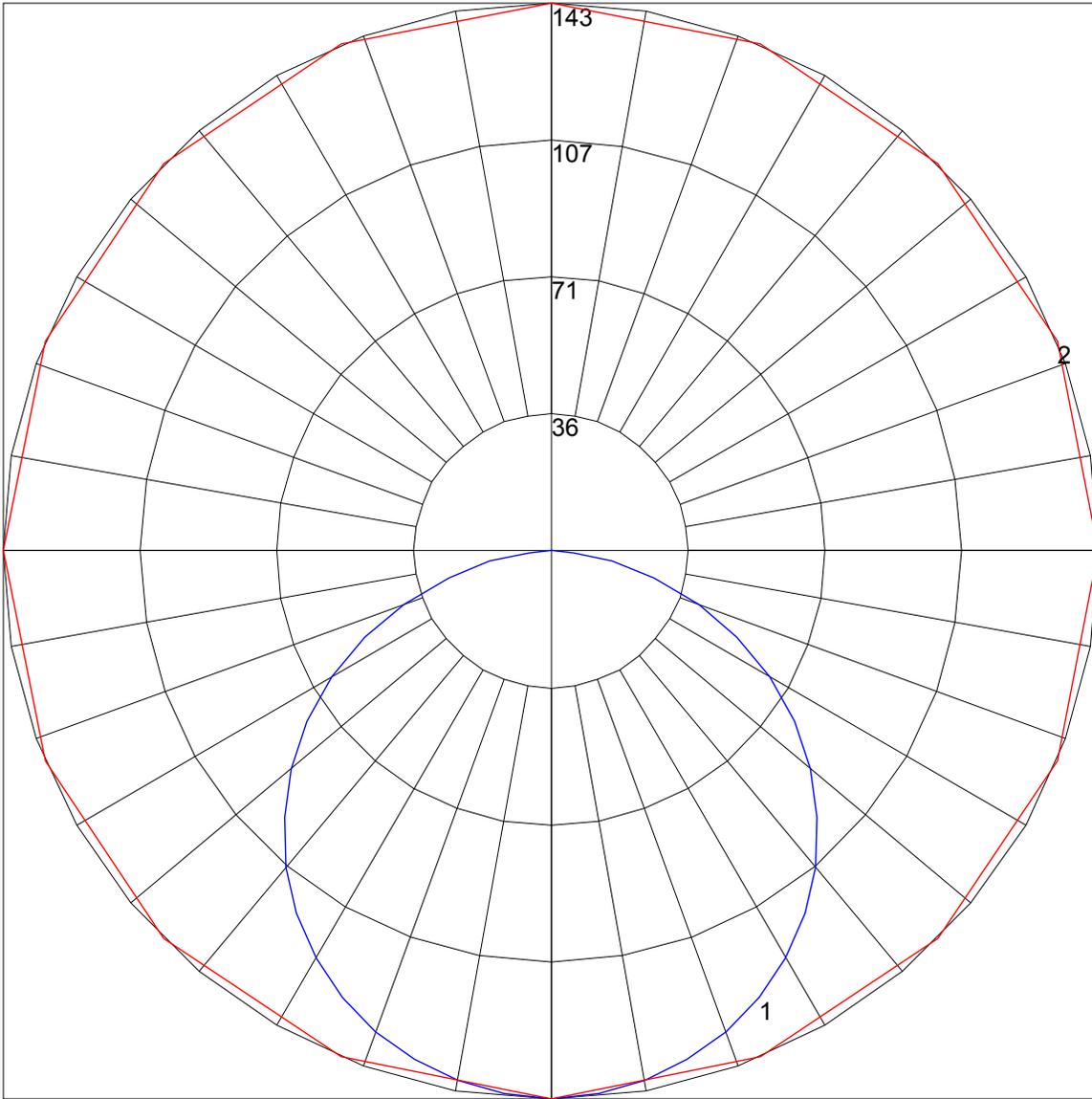
Zone	Lumens
0-10	13.53
10-20	38.92
20-30	59.45
30-40	72.45
40-50	75.98
50-60	69.01
60-70	51.82
70-80	28.12
80-90	7.07
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

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	98	94	91	94	91	89	90	88	86	84
2	99	91	84	78	96	89	82	77	85	80	75	82	77	74	79	75	72	70
3	90	79	71	65	88	78	70	64	75	68	63	72	67	62	70	65	61	59
4	82	70	61	55	80	69	61	54	66	59	54	64	58	53	62	57	52	50
5	76	63	54	47	74	62	53	47	59	52	46	57	51	46	56	50	45	43
6	70	56	47	41	68	55	47	41	54	46	40	52	45	40	50	44	40	38
7	65	51	42	36	63	50	42	36	49	41	36	47	40	35	46	40	35	33
8	60	47	38	32	59	46	38	32	45	37	32	43	37	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 = 142.89 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.)