



8165 E Kaiser Blvd. Anaheim, CA 92808  
 p. 714.282.2270  
 f. 714.676.5558

Test #: L04142407R01  
 Date: 3/12/2015



NVLAP LAB CODE 200927-0

**Test Report:** L04142407R01

**Model Number:** 8924-27-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 8924-27-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:** 4/11/14 - 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**

<b>Manufacturer:</b>	AION LED
<b>Model Number:</b>	8924-27-XX
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	391.09
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.22
<b>Input Power (W):</b>	5.27
<b>Input Power Factor:</b>	1.00
<b>Total Harmonic Distortion @ 120V(%):</b>	N/A
<b>Total Harmonic Distortion @ 277V(%):</b>	N/A
<b>Efficacy:</b>	74
<b>Color Rendering Index (CRI):</b>	93
<b>Correlated Color Temperature (K):</b>	2662
<b>Chromaticity Coordinate x:</b>	0.4596
<b>Chromaticity Coordinate y:</b>	0.4053
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:35
<b>Total Operating Time (Hours):</b>	1:05
<b>Off State Power(W):</b>	0.00

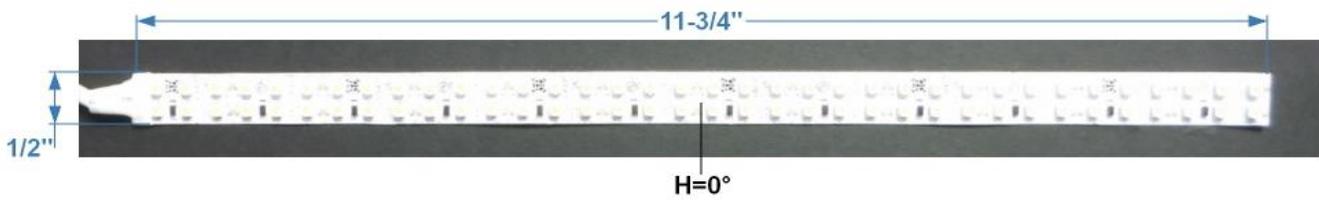
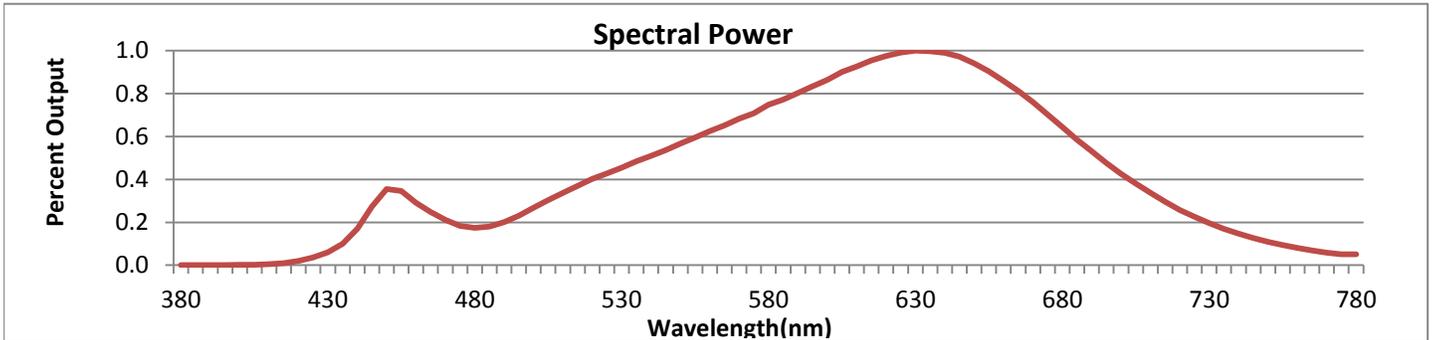


FIG.1 LUMINAIRE

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



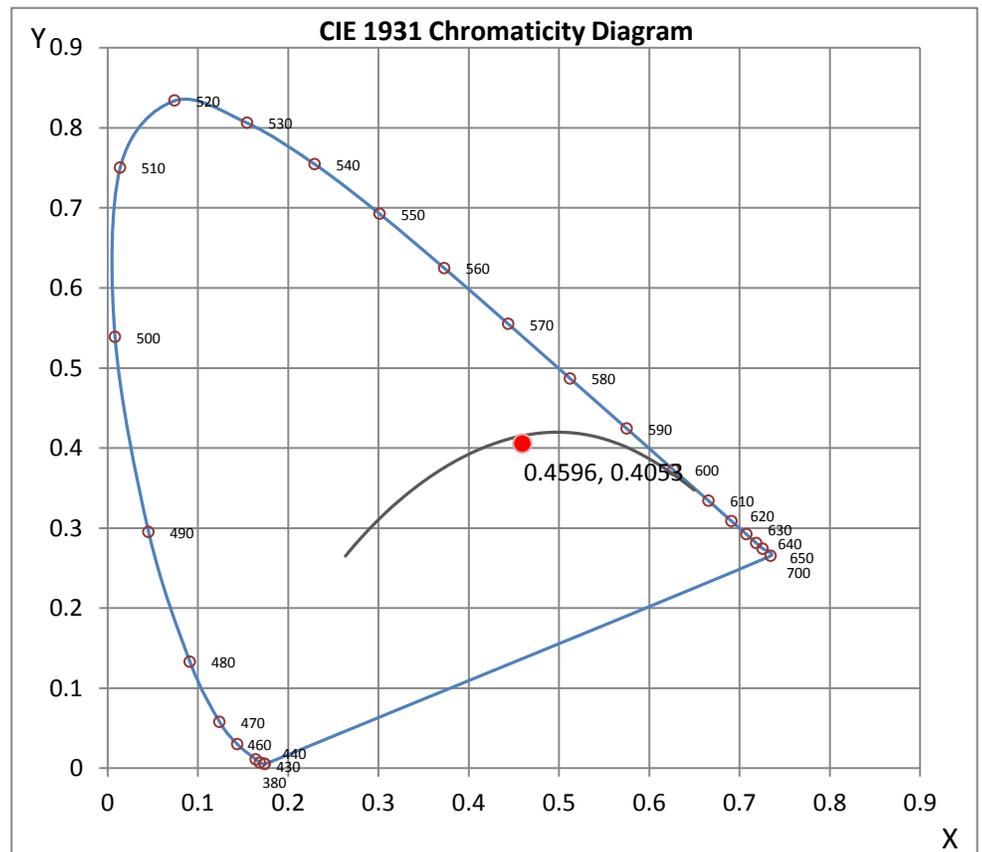
Wavelength	W/m <sup>2</sup> nm	440	0.0012	510	0.0025	580	0.0055	650	0.0069	720	0.0019
380	0.0000	450	0.0026	520	0.0029	590	0.0059	660	0.0063	730	0.0014
390	0.0000	460	0.0021	530	0.0033	600	0.0063	670	0.0055	740	0.0011
400	0.0000	470	0.0015	540	0.0037	610	0.0068	680	0.0047	750	0.0008
410	0.0000	480	0.0013	550	0.0041	620	0.0071	690	0.0039	760	0.0006
420	0.0001	490	0.0015	560	0.0046	630	0.0073	700	0.0031	770	0.0004
430	0.0004	500	0.0020	570	0.0050	640	0.0072	710	0.0025	780	0.0004

**CRI & CCT**

x	0.4596
y	0.4053
u'	0.2647
v'	0.5253
CRI	92.60
CCT	2662
Duv	-0.00194

**R Values**

R1	92.73
R2	96.02
R3	97.02
R4	91.64
R5	92.00
R6	94.46
R7	92.49
R8	84.15
R9	66.59
R10	89.44
R11	91.28
R12	83.10
R13	93.49
R14	97.55



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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 : L04142407R01.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L04142407R01  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 3/12/2015  
 [MANUFAC] AION LED  
 [LUMCAT] 8924-27-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, 5.27W  
 [\_TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	391
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	74
Total Luminaire Watts	5.27
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.30
Spacing Criterion (90-270)	1.26
Spacing Criterion (Diagonal)	1.40
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	48349	47953	46976
55	47171	46917	45895
65	44928	44760	43708
75	40107	40208	39097
85	31789	32346	30547

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142407R01.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>
<b>0</b>	131.19	131.19	131.19	131.19	131.19	131.19	131.19	131.19	131.19	131.19
<b>5</b>	132.30	132.23	132.12	132.03	131.86	131.63	131.35	131.17	130.83	130.74
<b>10</b>	130.71	130.66	130.56	130.49	130.30	130.09	129.83	129.65	129.30	129.23
<b>15</b>	128.13	128.08	127.99	127.93	127.74	127.55	127.27	127.14	126.71	126.74
<b>20</b>	124.48	124.46	124.37	124.29	124.14	123.96	123.69	123.57	123.13	123.21
<b>25</b>	119.80	119.74	119.67	119.59	119.45	119.28	119.05	118.95	118.57	118.58
<b>30</b>	114.17	114.14	114.08	114.02	113.90	113.74	113.54	113.41	113.12	113.11
<b>35</b>	107.42	107.41	107.37	107.31	107.22	107.11	106.87	106.78	106.59	106.38
<b>40</b>	100.08	100.07	100.04	100.00	99.95	99.81	99.66	99.52	99.41	99.16
<b>45</b>	91.56	91.55	91.53	91.50	91.47	91.36	91.24	91.11	90.99	90.81
<b>50</b>	82.48	82.48	82.47	82.45	82.43	82.40	82.29	82.15	82.03	81.91
<b>55</b>	72.46	72.45	72.49	72.48	72.47	72.46	72.39	72.24	72.14	72.07
<b>60</b>	61.94	61.94	61.96	62.00	61.97	61.99	61.94	61.84	61.71	61.67
<b>65</b>	50.85	50.83	50.87	50.89	50.90	50.90	50.91	50.87	50.77	50.66
<b>70</b>	39.19	39.20	39.24	39.27	39.30	39.29	39.31	39.30	39.23	39.15
<b>75</b>	27.80	27.81	27.85	27.85	27.93	27.95	27.96	27.93	27.90	27.87
<b>80</b>	16.17	16.33	16.35	16.38	16.40	16.43	16.45	16.47	16.44	16.41
<b>85</b>	7.42	7.43	7.45	7.49	7.53	7.55	7.58	7.59	7.58	7.55
<b>90</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Vert. 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>
<b>0</b>	131.19	131.19	131.19	131.19	131.19	131.19	131.19	131.19	131.19
<b>5</b>	131.05	130.93	130.20	129.58	129.72	129.76	129.34	128.88	128.42
<b>10</b>	129.47	129.38	128.74	128.12	128.20	128.24	127.82	127.38	126.89
<b>15</b>	126.90	126.86	126.18	125.62	125.67	125.70	125.28	124.88	124.40
<b>20</b>	123.36	123.28	122.64	122.13	122.05	122.15	121.72	121.33	120.89
<b>25</b>	118.58	118.70	118.04	117.67	117.48	117.54	117.13	116.74	116.33
<b>30</b>	112.97	113.12	112.54	112.21	111.97	112.04	111.61	111.28	110.86
<b>35</b>	106.33	106.37	106.03	105.60	105.44	105.43	105.05	104.69	104.36
<b>40</b>	99.14	99.09	98.86	98.46	98.26	98.21	97.81	97.49	97.27
<b>45</b>	90.65	90.63	90.51	90.19	90.00	89.85	89.55	89.20	88.96
<b>50</b>	81.70	81.61	81.52	81.31	81.09	80.94	80.67	80.35	80.22
<b>55</b>	71.92	71.73	71.63	71.47	71.32	71.11	70.91	70.62	70.50
<b>60</b>	61.54	61.38	61.24	61.13	61.00	60.77	60.61	60.33	60.23
<b>65</b>	50.59	50.45	50.35	50.21	50.10	49.91	49.75	49.53	49.47
<b>70</b>	39.07	39.00	38.86	38.78	38.66	38.53	38.40	38.24	38.16
<b>75</b>	27.81	27.75	27.66	27.57	27.46	27.35	27.29	27.16	27.10
<b>80</b>	16.38	16.39	16.12	16.06	16.00	15.89	15.83	15.77	15.69
<b>85</b>	7.51	7.50	7.49	7.45	7.40	7.31	7.21	7.15	7.13
<b>90</b>	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	48.20	N.A.	12.30
0-30	102.83	N.A.	26.30
0-40	169.40	N.A.	43.30
0-60	303.58	N.A.	77.60
0-80	382.62	N.A.	97.80
0-90	391.09	N.A.	100.00
10-90	378.66	N.A.	96.80
20-40	121.19	N.A.	31.00
20-50	191.17	N.A.	48.90
40-70	184.05	N.A.	47.10
60-80	79.04	N.A.	20.20
70-80	29.18	N.A.	7.50
80-90	8.47	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	391.09	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	12.43
10-20	35.77
20-30	54.63
30-40	66.56
40-50	69.98
50-60	64.21
60-70	49.86
70-80	29.18
80-90	8.47
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

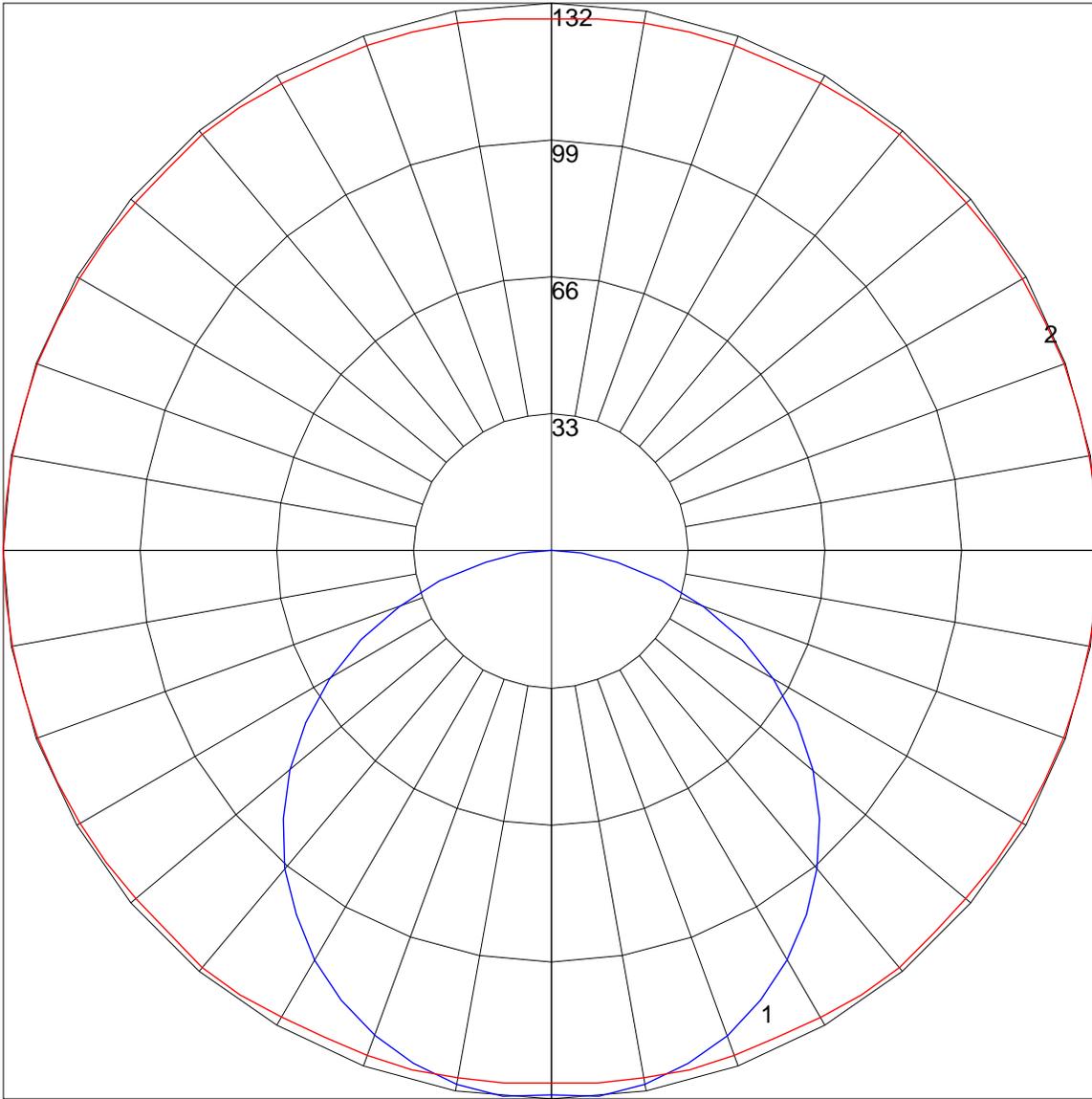
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	108	104	99	95	106	101	97	94	97	94	91	93	90	88	89	87	85	83
2	98	90	83	77	96	88	82	76	84	79	74	81	77	73	78	74	71	69
3	90	79	70	64	87	77	69	63	74	67	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	53	66	58	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	44	39	50	44	39	37
7	64	51	42	35	62	50	41	35	48	41	35	47	40	35	45	39	34	32
8	60	46	37	31	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

POLAR GRAPH



Maximum Candela = 132.3 Located At Horizontal Angle = 0, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)