



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

Test #: L04142412R01

Date: 3/12/2015



NVLAP LAB CODE 200927-0

**Test Report:** L04142412R01

**Model Number:** 4924-35-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 4924-35-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:** 4/10/14 - 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>	4924-35-XX
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	222.05
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.11
<b>Input Power (W):</b>	2.65
<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>	84
<b>Color Rendering Index (CRI):</b>	92
<b>Correlated Color Temperature (K):</b>	3396
<b>Chromaticity Coordinate x:</b>	0.4108
<b>Chromaticity Coordinate y:</b>	0.3925
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:30
<b>Total Operating Time (Hours):</b>	1:05
<b>Off State Power(W):</b>	0.00

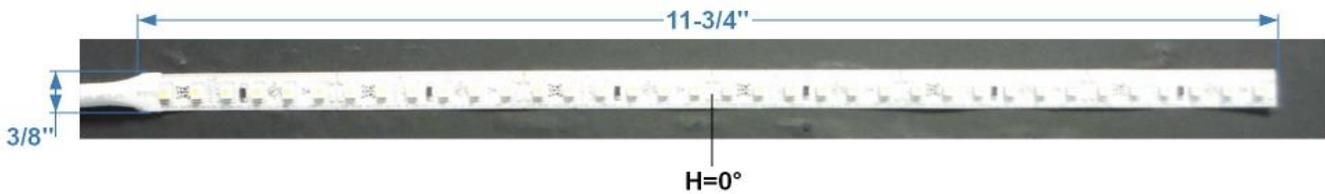
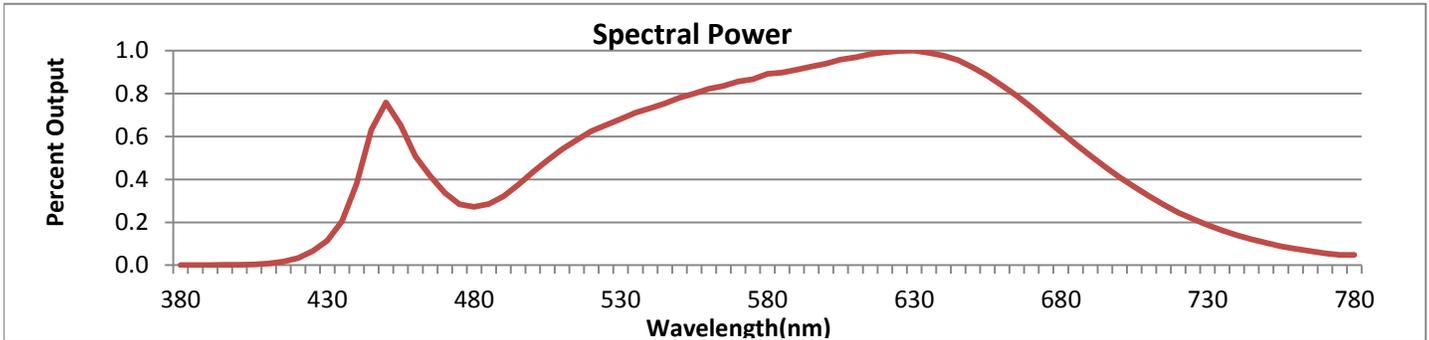


FIG.1 LUMINAIRE

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



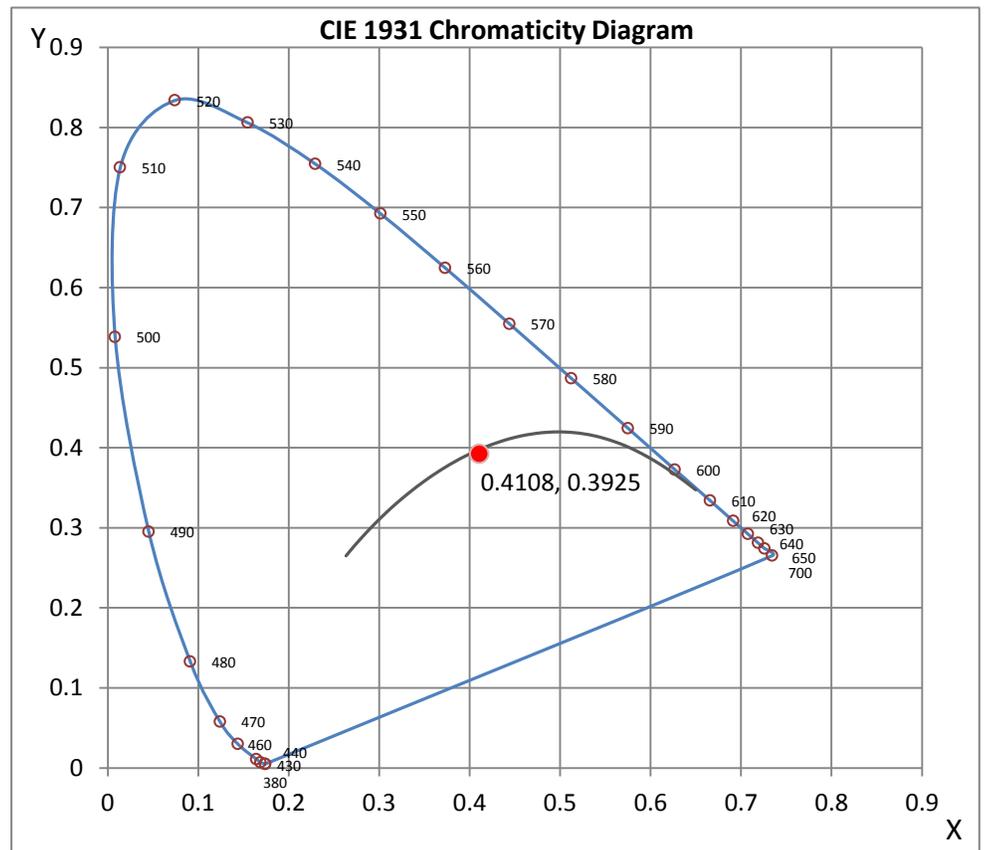
Wavelength	W/m <sup>2</sup> nm	440	0.0013	510	0.0018	580	0.0030	650	0.0031	720	0.0008
380	0.0000	450	0.0026	520	0.0021	590	0.0031	660	0.0028	730	0.0006
390	0.0000	460	0.0017	530	0.0023	600	0.0032	670	0.0025	740	0.0005
400	0.0000	470	0.0011	540	0.0025	610	0.0033	680	0.0021	750	0.0004
410	0.0000	480	0.0009	550	0.0026	620	0.0034	690	0.0017	760	0.0003
420	0.0001	490	0.0011	560	0.0028	630	0.0034	700	0.0014	770	0.0002
430	0.0004	500	0.0015	570	0.0029	640	0.0033	710	0.0011	780	0.0002

**CRI & CCT**

x	0.4108
y	0.3925
u'	0.2385
v'	0.5128
CRI	91.90
CCT	3396
Duv	-0.00039

**R Values**

R1	92.22
R2	93.83
R3	93.54
R4	92.20
R5	91.04
R6	90.34
R7	94.73
R8	87.65
R9	69.25
R10	84.19
R11	91.37
R12	73.40
R13	92.39
R14	95.74



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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:

Test Report Reviewed by:

Jeff Ahn  
 Engineering Manager

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 : L04142412R01.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L04142412R01  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 3/12/2015  
 [MANUFAC] AION LED  
 [LUMCAT] 4924-35-XX  
 [LUMINAIRE] 3/8"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, 2.65W  
 [\_TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	222
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	84
Total Luminaire Watts	2.65
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	1.30
Spacing Criterion (90-270)	1.28
Spacing Criterion (Diagonal)	1.42
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.01 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	82368	81679	80044
55	80895	80344	78696
65	77970	77472	75619
75	67977	68604	65982
85	56115	55999	52169

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142412R01.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>	73.425	73.425	73.425	73.425	73.425	73.425	73.425	73.425	73.425	73.425
<b>5</b>	74.077	74.060	74.009	73.957	73.847	73.702	73.548	73.505	73.267	73.258
<b>10</b>	73.258	73.216	73.147	73.122	73.011	72.883	72.721	72.704	72.406	72.440
<b>15</b>	71.826	71.817	71.749	71.740	71.604	71.468	71.348	71.289	70.982	71.041
<b>20</b>	69.899	69.873	69.814	69.805	69.703	69.566	69.430	69.387	69.106	69.183
<b>25</b>	67.358	67.332	67.299	67.281	67.187	67.068	66.915	66.897	66.693	66.753
<b>30</b>	64.340	64.323	64.280	64.246	64.161	64.075	63.956	63.922	63.785	63.785
<b>35</b>	60.708	60.673	60.648	60.622	60.562	60.469	60.341	60.281	60.213	60.017
<b>40</b>	56.683	56.641	56.632	56.623	56.564	56.487	56.367	56.308	56.240	56.103
<b>45</b>	51.994	51.968	51.968	51.934	51.917	51.883	51.772	51.712	51.627	51.559
<b>50</b>	46.963	46.946	46.963	46.937	46.912	46.878	46.818	46.750	46.682	46.622
<b>55</b>	41.421	41.404	41.438	41.421	41.387	41.395	41.327	41.242	41.174	41.139
<b>60</b>	35.572	35.572	35.580	35.597	35.597	35.589	35.597	35.495	35.436	35.384
<b>65</b>	29.416	29.348	29.382	29.373	29.416	29.390	29.373	29.348	29.288	29.228
<b>70</b>	22.782	22.791	22.800	22.799	22.825	22.808	22.808	22.800	22.783	22.731
<b>75</b>	15.706	15.876	15.893	15.885	15.927	15.910	15.902	15.902	15.868	15.851
<b>80</b>	9.379	9.379	9.388	9.388	9.396	9.405	9.388	9.388	9.396	9.362
<b>85</b>	4.366	4.366	4.374	4.391	4.391	4.391	4.374	4.374	4.374	4.357
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**Vert. Angles 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>	73.425	73.425	73.425	73.425	73.425	73.425	73.425	73.425	73.425
<b>5</b>	73.480	73.420	72.934	72.585	72.627	72.678	72.354	72.124	71.911
<b>10</b>	72.610	72.534	72.141	71.783	71.800	71.834	71.570	71.263	71.059
<b>15</b>	71.246	71.204	70.769	70.419	70.444	70.462	70.197	69.924	69.746
<b>20</b>	69.319	69.353	68.935	68.620	68.535	68.577	68.313	68.066	67.835
<b>25</b>	66.770	66.846	66.429	66.207	66.079	66.087	65.823	65.601	65.414
<b>30</b>	63.683	63.751	63.453	63.206	63.069	63.137	62.873	62.651	62.447
<b>35</b>	60.068	60.077	59.906	59.667	59.497	59.522	59.284	59.113	58.951
<b>40</b>	56.120	56.078	55.950	55.720	55.574	55.558	55.353	55.165	55.046
<b>45</b>	51.457	51.397	51.362	51.175	51.039	50.954	50.766	50.595	50.527
<b>50</b>	46.503	46.434	46.417	46.264	46.136	46.042	45.880	45.727	45.684
<b>55</b>	41.071	40.952	40.875	40.807	40.713	40.568	40.474	40.287	40.295
<b>60</b>	35.316	35.222	35.154	35.078	34.992	34.847	34.779	34.600	34.634
<b>65</b>	29.169	29.100	29.049	28.964	28.887	28.794	28.657	28.555	28.529
<b>70</b>	22.689	22.629	22.552	22.501	22.399	22.348	22.280	22.169	22.134
<b>75</b>	15.851	15.612	15.552	15.501	15.441	15.347	15.313	15.245	15.245
<b>80</b>	9.345	9.311	9.285	9.226	9.183	9.123	9.063	9.029	9.038
<b>85</b>	4.331	4.306	4.289	4.255	4.221	4.152	4.110	4.067	4.059
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**IES INDOOR REPORT**  
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**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	27.02	N.A.	12.20
0-30	57.75	N.A.	26.00
0-40	95.34	N.A.	42.90
0-60	171.72	N.A.	77.30
0-80	217.18	N.A.	97.80
0-90	222.05	N.A.	100.00
10-90	215.09	N.A.	96.90
20-40	68.32	N.A.	30.80
20-50	108.03	N.A.	48.70
40-70	105.14	N.A.	47.30
60-80	45.46	N.A.	20.50
70-80	16.70	N.A.	7.50
80-90	4.87	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	222.05	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	6.96
10-20	20.06
20-30	30.73
30-40	37.59
40-50	39.71
50-60	36.67
60-70	28.76
70-80	16.70
80-90	4.87
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

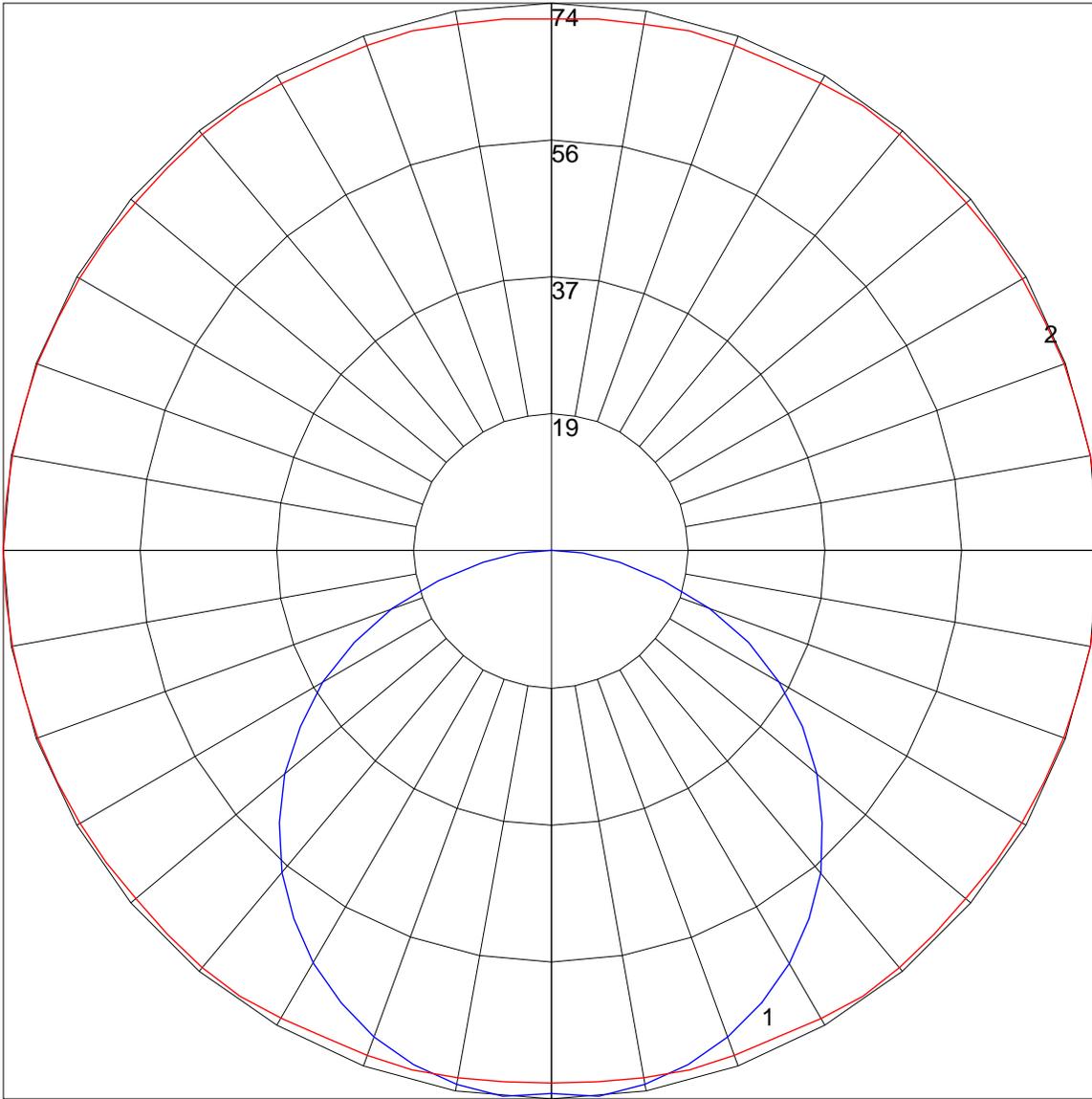
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	103	99	95	106	101	97	93	97	94	91	93	90	88	89	87	85	83
2	98	90	83	77	96	88	81	76	84	79	74	81	76	72	78	74	71	69
3	89	79	70	64	87	77	69	63	74	67	62	71	65	61	69	64	60	57
4	82	69	60	54	79	68	60	53	66	58	52	63	57	52	61	55	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	46	40	67	55	46	40	53	45	39	51	44	39	49	43	39	37
7	64	50	41	35	62	50	41	35	48	40	35	46	40	34	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	31	43	36	31	41	35	31	29
9	56	42	34	28	54	41	33	28	40	33	28	39	32	28	38	32	28	26
10	52	39	31	25	51	38	31	25	37	30	25	36	30	25	35	29	25	23

POLAR GRAPH



Maximum Candela = 74.077 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.)