



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

Test #: L04142411R01

Date: 3/12/2015



NVLAP LAB CODE 200927-0

**Test Report:** L04142411R01

**Model Number:** 3924-35-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 3924-35-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>	3924-35-XX
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	111.24
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.05
<b>Input Power (W):</b>	1.32
<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>	91
<b>Correlated Color Temperature (K):</b>	3394
<b>Chromaticity Coordinate x:</b>	0.4116
<b>Chromaticity Coordinate y:</b>	0.3941
<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

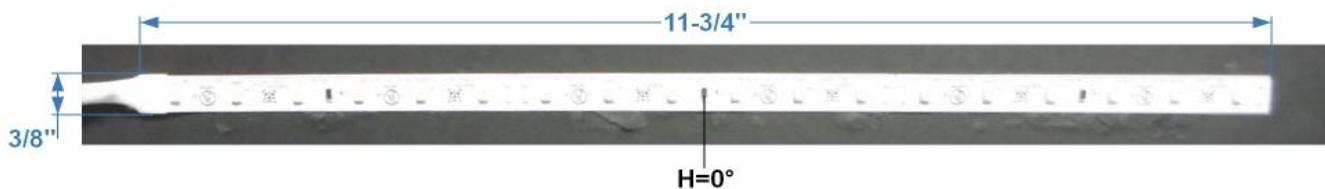
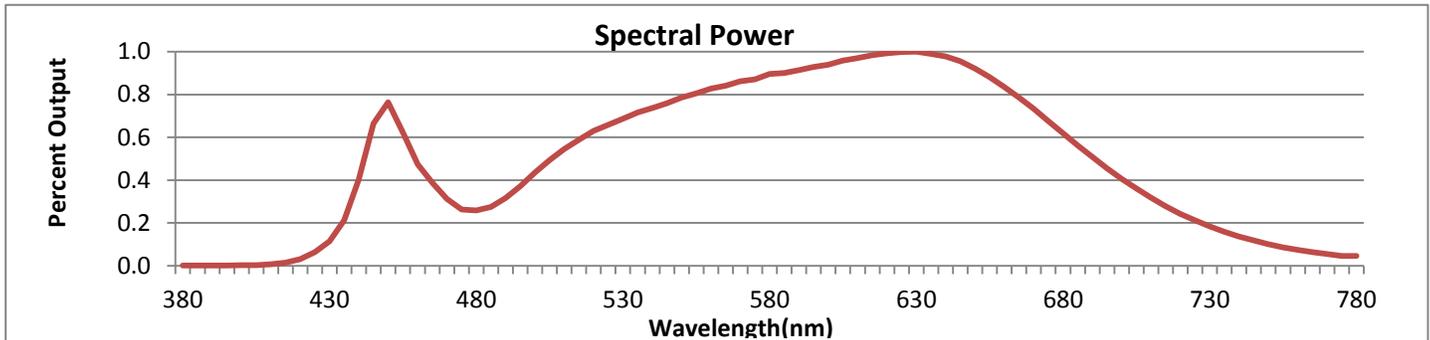


FIG.1 LUMINAIRE

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



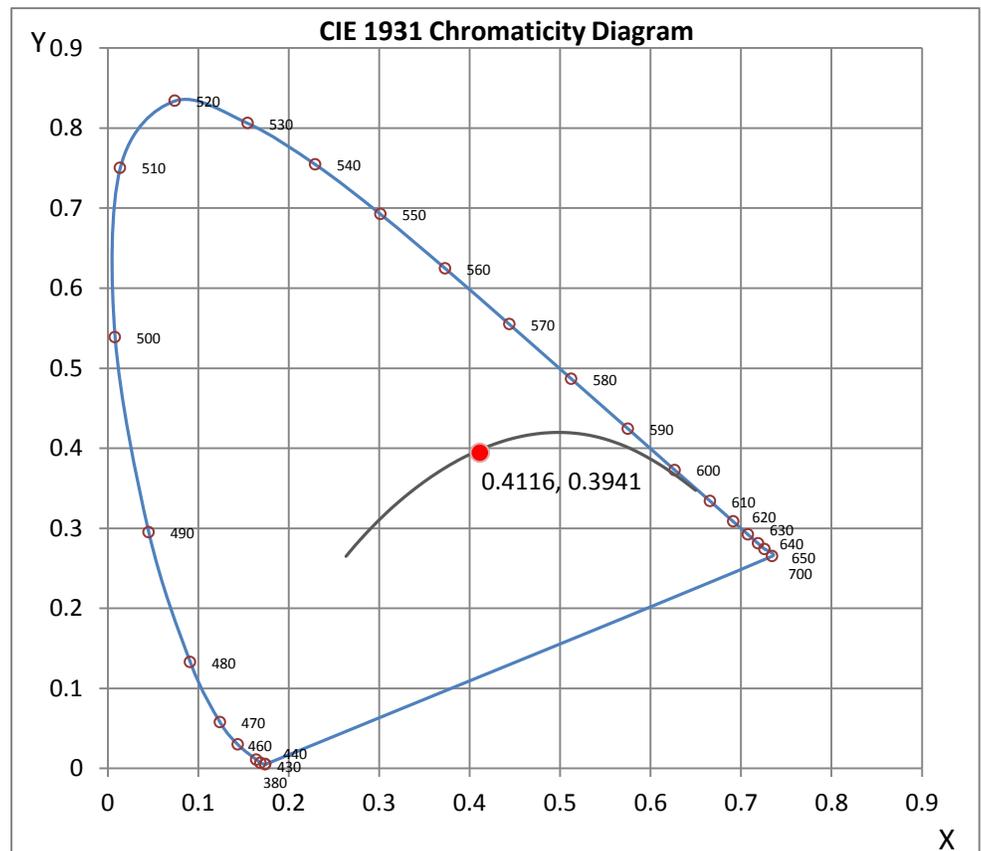
Wavelength	W/m <sup>2</sup> nm	440	0.0007	510	0.0010	580	0.0016	650	0.0016	720	0.0004
380	0.0000	450	0.0013	520	0.0011	590	0.0016	660	0.0015	730	0.0003
390	0.0000	460	0.0008	530	0.0012	600	0.0016	670	0.0013	740	0.0002
400	0.0000	470	0.0005	540	0.0013	610	0.0017	680	0.0011	750	0.0002
410	0.0000	480	0.0005	550	0.0014	620	0.0017	690	0.0009	760	0.0001
420	0.0001	490	0.0006	560	0.0015	630	0.0018	700	0.0007	770	0.0001
430	0.0002	500	0.0008	570	0.0015	640	0.0017	710	0.0006	780	0.0001

**CRI & CCT**

x	0.4116
y	0.3941
u'	0.2384
v'	0.5136
CRI	91.40
CCT	3394
Duv	0.00014

**R Values**

R1	91.68
R2	93.15
R3	92.91
R4	91.96
R5	90.49
R6	89.49
R7	94.55
R8	87.29
R9	67.88
R10	82.78
R11	91.20
R12	72.52
R13	91.73
R14	95.40



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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 : L04142411R01.IES**

**DESCRIPTION INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] L04142411R01  
 [TESTLAB] LIGHT LABORATORY, INC.  
 [ISSUEDATE] 3/12/2015  
 [MANUFAC] AION LED  
 [LUMCAT] 3924-35-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, 1.32W  
 [\_TEST PROCEDURE] IESNA:LM-79-08

**CHARACTERISTICS**

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	111
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	84
Total Luminaire Watts	1.32
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)	0.94 ft
Luminous Height	0.00 ft

**LUMINANCE DATA (cd/sq.m)**

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	42073	41895	41054
55	41155	41002	40204
65	39100	39121	38315
75	34672	34937	34071
85	29547	29993	28878

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142411R01.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>	36.990	36.990	36.990	36.990	36.990	36.990	36.990	36.990	36.990	36.990
<b>5</b>	37.260	37.303	37.294	37.235	37.175	37.107	37.055	37.013	36.945	36.910
<b>10</b>	36.868	36.885	36.876	36.817	36.774	36.706	36.663	36.612	36.544	36.518
<b>15</b>	36.169	36.186	36.169	36.109	36.066	36.015	35.956	35.913	35.810	35.811
<b>20</b>	35.180	35.188	35.188	35.137	35.103	35.052	34.992	34.941	34.822	34.856
<b>25</b>	33.884	33.901	33.884	33.849	33.824	33.781	33.713	33.670	33.568	33.662
<b>30</b>	32.332	32.349	32.357	32.315	32.298	32.255	32.204	32.161	32.102	32.127
<b>35</b>	30.456	30.473	30.490	30.448	30.456	30.405	30.354	30.311	30.268	30.251
<b>40</b>	28.410	28.418	28.435	28.401	28.410	28.376	28.325	28.282	28.256	28.188
<b>45</b>	26.005	26.014	26.056	26.022	26.031	26.022	25.954	25.929	25.912	25.895
<b>50</b>	23.448	23.456	23.482	23.465	23.473	23.473	23.430	23.388	23.379	23.345
<b>55</b>	20.634	20.617	20.651	20.651	20.651	20.651	20.625	20.591	20.591	20.557
<b>60</b>	17.616	17.616	17.633	17.650	17.632	17.641	17.650	17.616	17.607	17.581
<b>65</b>	14.444	14.452	14.461	14.486	14.469	14.486	14.486	14.478	14.478	14.452
<b>70</b>	11.118	11.110	11.118	11.135	11.144	11.161	11.161	11.161	11.161	11.144
<b>75</b>	7.844	7.853	7.861	7.870	7.887	7.904	7.904	7.913	7.904	7.904
<b>80</b>	4.690	4.698	4.707	4.724	4.724	4.732	4.732	4.749	4.749	4.741
<b>85</b>	2.251	2.243	2.260	2.268	2.277	2.277	2.294	2.294	2.277	2.285
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**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>	36.990	36.990	36.990	36.990	36.990	36.990	36.990	36.990	36.990
<b>5</b>	37.081	36.962	36.791	36.612	36.586	36.578	36.442	36.322	36.220
<b>10</b>	36.663	36.586	36.407	36.220	36.177	36.186	36.041	35.938	35.828
<b>15</b>	35.964	35.913	35.708	35.572	35.495	35.521	35.376	35.239	35.145
<b>20</b>	34.958	34.975	34.753	34.591	34.540	34.549	34.412	34.284	34.191
<b>25</b>	33.620	33.662	33.492	33.329	33.261	33.287	33.150	33.048	32.929
<b>30</b>	32.076	32.162	31.999	31.863	31.744	31.761	31.658	31.565	31.462
<b>35</b>	30.200	30.226	30.158	30.004	29.902	29.936	29.817	29.723	29.655
<b>40</b>	28.197	28.222	28.146	28.018	27.924	27.915	27.813	27.736	27.677
<b>45</b>	25.809	25.792	25.784	25.681	25.604	25.579	25.485	25.408	25.375
<b>50</b>	23.302	23.260	23.251	23.183	23.132	23.055	22.987	22.919	22.902
<b>55</b>	20.506	20.463	20.438	20.404	20.361	20.284	20.242	20.139	20.157
<b>60</b>	17.530	17.496	17.471	17.436	17.411	17.326	17.292	17.206	17.223
<b>65</b>	14.418	14.384	14.350	14.324	14.299	14.231	14.205	14.137	14.154
<b>70</b>	11.119	11.101	11.067	11.033	10.999	10.957	10.948	10.888	10.914
<b>75</b>	7.896	7.861	7.836	7.827	7.810	7.768	7.768	7.717	7.708
<b>80</b>	4.724	4.724	4.715	4.698	4.698	4.672	4.656	4.613	4.622
<b>85</b>	2.277	2.268	2.268	2.251	2.251	2.251	2.242	2.200	2.200
<b>90</b>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142411R01.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	13.62	N.A.	12.20
0-30	29.10	N.A.	26.20
0-40	48.00	N.A.	43.20
0-60	86.22	N.A.	77.50
0-80	108.73	N.A.	97.70
0-90	111.24	N.A.	100.00
10-90	107.73	N.A.	96.80
20-40	34.38	N.A.	30.90
20-50	54.30	N.A.	48.80
40-70	52.42	N.A.	47.10
60-80	22.51	N.A.	20.20
70-80	8.31	N.A.	7.50
80-90	2.51	N.A.	2.30
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	111.24	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	3.51
10-20	10.11
20-30	15.48
30-40	18.90
40-50	19.92
50-60	18.30
60-70	14.20
70-80	8.31
80-90	2.51
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

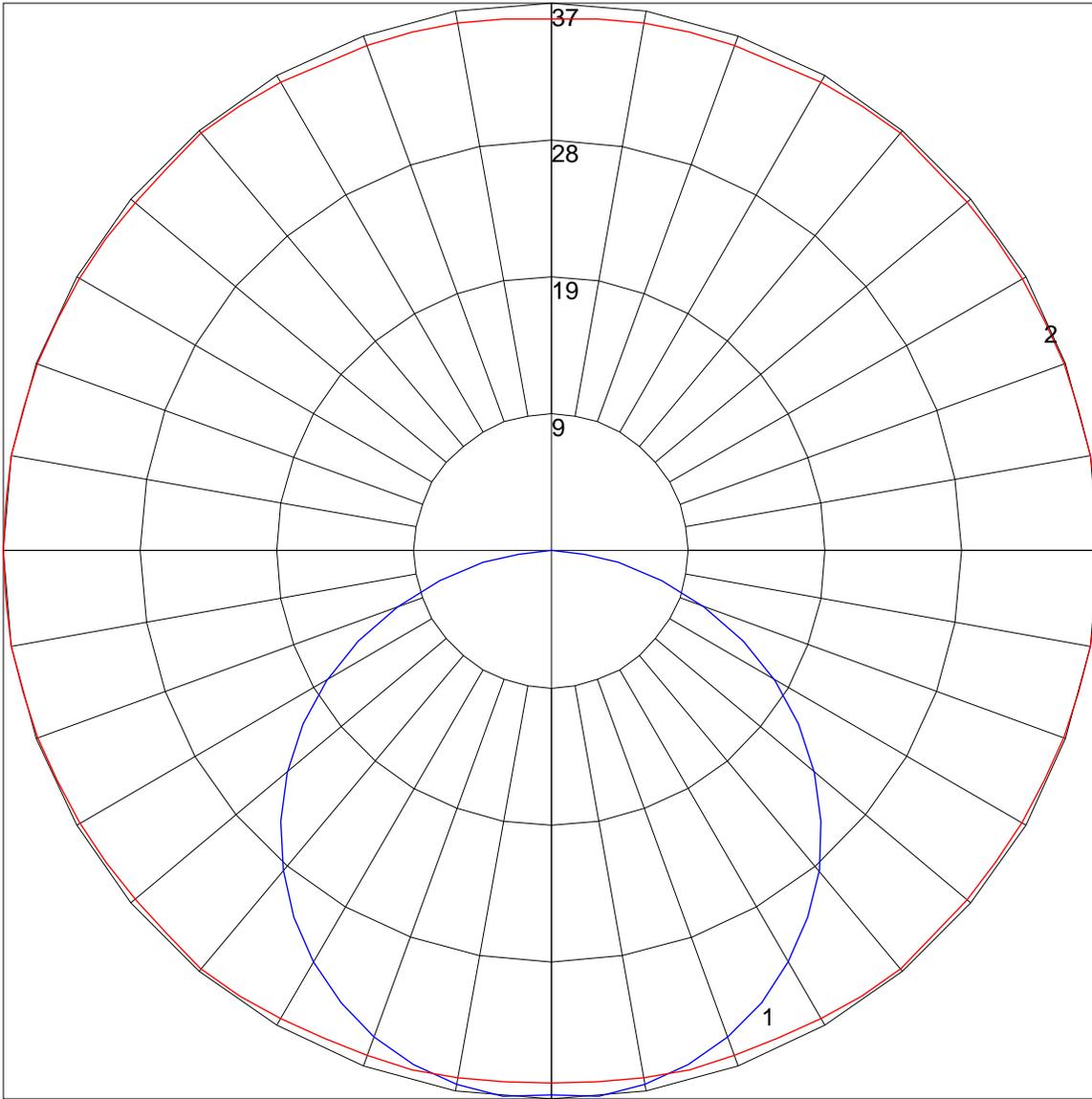
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**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	119	119	119	119	117	117	117	117	111	111	111	107	107	107	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	99	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	70	64	87	77	69	63	74	68	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	63	50	41	35	48	40	35	47	40	35	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	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	25	37	30	25	36	30	25	36	29	25	23

POLAR GRAPH



Maximum Candela = 37.303 Located At Horizontal Angle = 5, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (5 - 185) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)