



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

Test #: L04142405

Date: 4/16/2014



NVLAP LAB CODE 200927-0

**Test Report:** L04142405

**Model Number:** 3924-27-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 3924-27-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>	3924-27-XX
<b>LAMPCAT:</b>	N/A
<b>Driver Model Number:</b>	N/A
<b>Total Lumens:</b>	99.38
<b>Input Voltage (VDC):</b>	24.00
<b>Input Current (Amp):</b>	0.06
<b>Input Power (W):</b>	1.33
<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>	75
<b>Color Rendering Index (CRI):</b>	92
<b>Correlated Color Temperature (K):</b>	2665
<b>Chromaticity Coordinate x:</b>	0.4604
<b>Chromaticity Coordinate y:</b>	0.4071
<b>Ambient Temperature (°F):</b>	77.0
<b>Stabilization Time (Hours):</b>	0:30
<b>Total Operating Time (Hours):</b>	1:20
<b>Off State Power(W):</b>	0.00

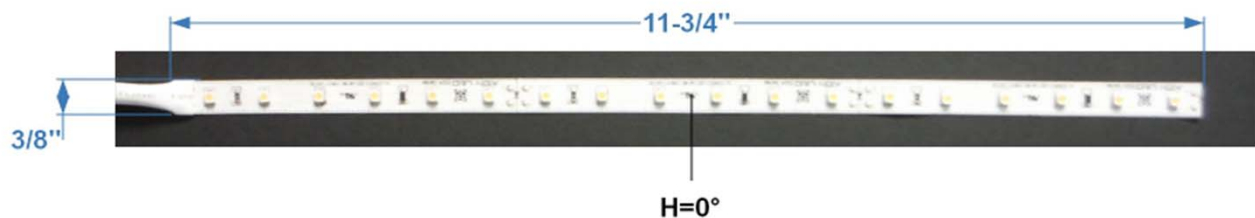
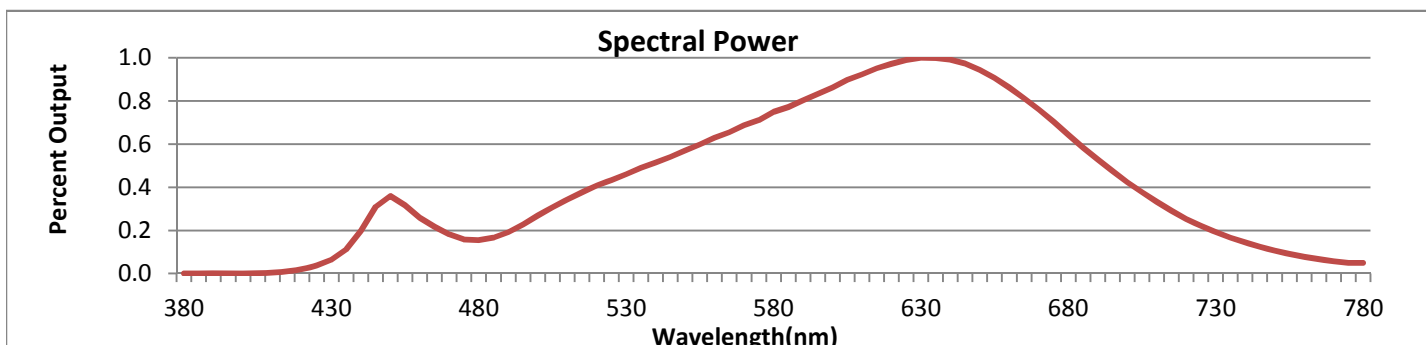


FIG.1 LUMINAIRE



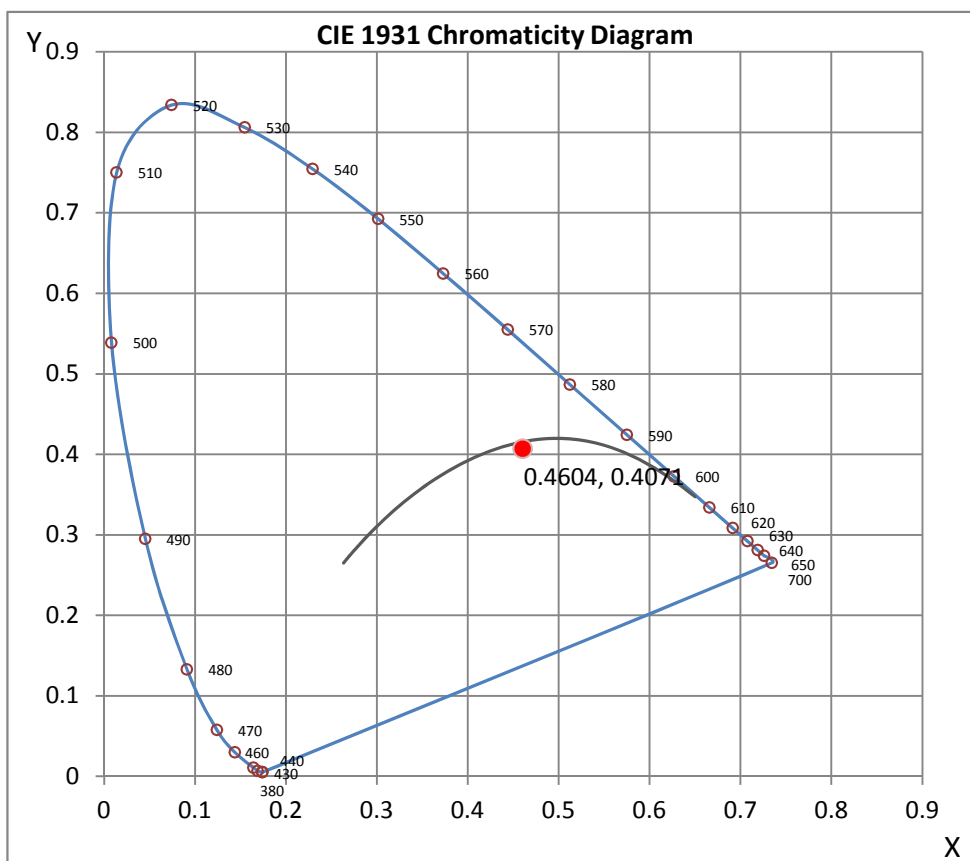
Wavelength	W/m <sup>2</sup> nm	440	0.0004	510	0.0007	580	0.0015	650	0.0019	720	0.0005
380	0.0000	450	0.0007	520	0.0008	590	0.0016	660	0.0017	730	0.0004
390	0.0000	460	0.0005	530	0.0009	600	0.0017	670	0.0015	740	0.0003
400	0.0000	470	0.0004	540	0.0010	610	0.0018	680	0.0013	750	0.0002
410	0.0000	480	0.0003	550	0.0011	620	0.0019	690	0.0010	760	0.0002
420	0.0000	490	0.0004	560	0.0012	630	0.0020	700	0.0008	770	0.0001
430	0.0001	500	0.0005	570	0.0014	640	0.0020	710	0.0007	780	0.0001

**CRI & CCT**

x	0.4604
y	0.4071
u'	0.2644
v'	0.5261
CRI	92.10
CCT	2665
Duv	-0.00133

**R Values**

R1	92.28
R2	95.11
R3	95.97
R4	91.75
R5	91.44
R6	93.28
R7	92.89
R8	84.35
R9	66.10
R10	87.51
R11	91.55
R12	81.97
R13	92.79
R14	96.90





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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 : 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*

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



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## Photometric Test Report

### IES INDOOR REPORT

PHOTOMETRIC FILENAME : L04142405.IES

### DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002  
[TEST] L04142405  
[TESTLAB] LIGHT LABORATORY, INC.  
[ISSUEDATE] 04/16/2014  
[MANUFAC] AION LED  
[LUMCAT] 3924-27-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, 1.33W  
[\_TEST PROCEDURE] IESNA:LM-79-08

### CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	99
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	75
Total Luminaire Watts	1.33
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)	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	37348	37415	37483
55	36165	36249	36165
65	34084	34084	34311
75	29681	29867	30053
85	22039	23693	22039

**IES INDOOR REPORT**  
**PHOTOMETRIC FILENAME : L04142405.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>	33.913	33.913	33.913	33.913	33.913	33.913	33.913	33.913	33.913	33.913
<b>5</b>	33.829	33.829	33.829	33.829	33.745	33.787	33.745	33.787	33.745	33.745
<b>10</b>	33.325	33.367	33.367	33.367	33.325	33.325	33.367	33.367	33.367	33.367
<b>15</b>	32.738	32.738	32.654	32.654	32.654	32.696	32.696	32.654	32.654	32.696
<b>20</b>	31.730	31.730	31.730	31.730	31.730	31.730	31.730	31.730	31.730	31.730
<b>25</b>	30.471	30.513	30.471	30.513	30.513	30.471	30.471	30.513	30.471	30.471
<b>30</b>	29.044	29.002	29.002	29.002	29.002	29.044	29.002	29.002	28.960	29.002
<b>35</b>	27.281	27.239	27.239	27.281	27.281	27.281	27.281	27.281	27.281	27.281
<b>40</b>	25.351	25.267	25.309	25.309	25.351	25.267	25.309	25.309	25.309	25.351
<b>45</b>	23.084	23.084	23.126	23.084	23.084	23.126	23.168	23.126	23.084	23.126
<b>50</b>	20.734	20.734	20.734	20.776	20.734	20.734	20.776	20.776	20.776	20.818
<b>55</b>	18.132	18.216	18.132	18.132	18.216	18.174	18.132	18.216	18.216	18.174
<b>60</b>	15.445	15.445	15.445	15.487	15.445	15.445	15.487	15.529	15.445	15.445
<b>65</b>	12.591	12.591	12.591	12.633	12.591	12.633	12.591	12.633	12.591	12.591
<b>70</b>	9.653	9.653	9.653	9.653	9.653	9.695	9.695	9.695	9.695	9.737
<b>75</b>	6.715	6.757	6.715	6.757	6.757	6.757	6.757	6.757	6.799	6.757
<b>80</b>	3.945	3.987	4.029	3.945	4.029	3.987	4.029	4.071	4.029	4.071
<b>85</b>	1.679	1.763	1.721	1.805	1.805	1.805	1.763	1.805	1.805	1.805
<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>	33.913	33.913	33.913	33.913	33.913	33.913	33.913	33.913	33.913
<b>5</b>	33.745	33.745	33.745	33.745	33.745	33.829	33.829	33.829	33.745
<b>10</b>	33.409	33.325	33.325	33.325	33.325	33.367	33.367	33.367	33.409
<b>15</b>	32.696	32.654	32.654	32.696	32.696	32.654	32.654	32.696	32.738
<b>20</b>	31.730	31.688	31.730	31.730	31.730	31.730	31.730	31.730	31.646
<b>25</b>	30.471	30.471	30.513	30.471	30.513	30.513	30.471	30.471	30.555
<b>30</b>	29.002	29.044	29.044	29.044	29.044	28.960	29.002	29.002	28.960
<b>35</b>	27.323	27.239	27.281	27.323	27.281	27.323	27.281	27.281	27.281
<b>40</b>	25.309	25.351	25.267	25.309	25.351	25.309	25.309	25.309	25.351
<b>45</b>	23.084	23.168	23.168	23.126	23.168	23.084	23.168	23.126	23.168
<b>50</b>	20.776	20.776	20.776	20.734	20.734	20.818	20.734	20.818	20.734
<b>55</b>	18.216	18.216	18.132	18.174	18.216	18.216	18.216	18.216	18.132
<b>60</b>	15.445	15.529	15.529	15.487	15.445	15.529	15.487	15.487	15.529
<b>65</b>	12.591	12.633	12.633	12.633	12.633	12.591	12.675	12.591	12.675
<b>70</b>	9.737	9.695	9.695	9.695	9.695	9.695	9.653	9.737	9.653
<b>75</b>	6.757	6.757	6.799	6.799	6.757	6.799	6.799	6.715	6.799
<b>80</b>	4.071	4.029	4.071	4.071	3.987	4.071	4.071	4.029	4.029
<b>85</b>	1.847	1.847	1.847	1.847	1.805	1.847	1.763	1.763	1.679
<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 : L04142405.IES**

**ZONAL LUMEN SUMMARY**

Zone	Lumens	%Lamp	%Fixt
0-20	12.44	N.A.	12.50
0-30	26.49	N.A.	26.70
0-40	43.55	N.A.	43.80
0-60	77.64	N.A.	78.10
0-80	97.31	N.A.	97.90
0-90	99.38	N.A.	100.00
10-90	96.17	N.A.	96.80
20-40	31.12	N.A.	31.30
20-50	48.96	N.A.	49.30
40-70	46.56	N.A.	46.80
60-80	19.67	N.A.	19.80
70-80	7.19	N.A.	7.20
80-90	2.08	N.A.	2.10
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	99.38	N.A.	100.00

Total Luminaire Efficiency = N.A.%

**ZONAL LUMEN SUMMARY**

Zone	Lumens
0-10	3.21
10-20	9.23
20-30	14.05
30-40	17.06
40-50	17.84
50-60	16.25
60-70	12.48
70-80	7.19
80-90	2.08
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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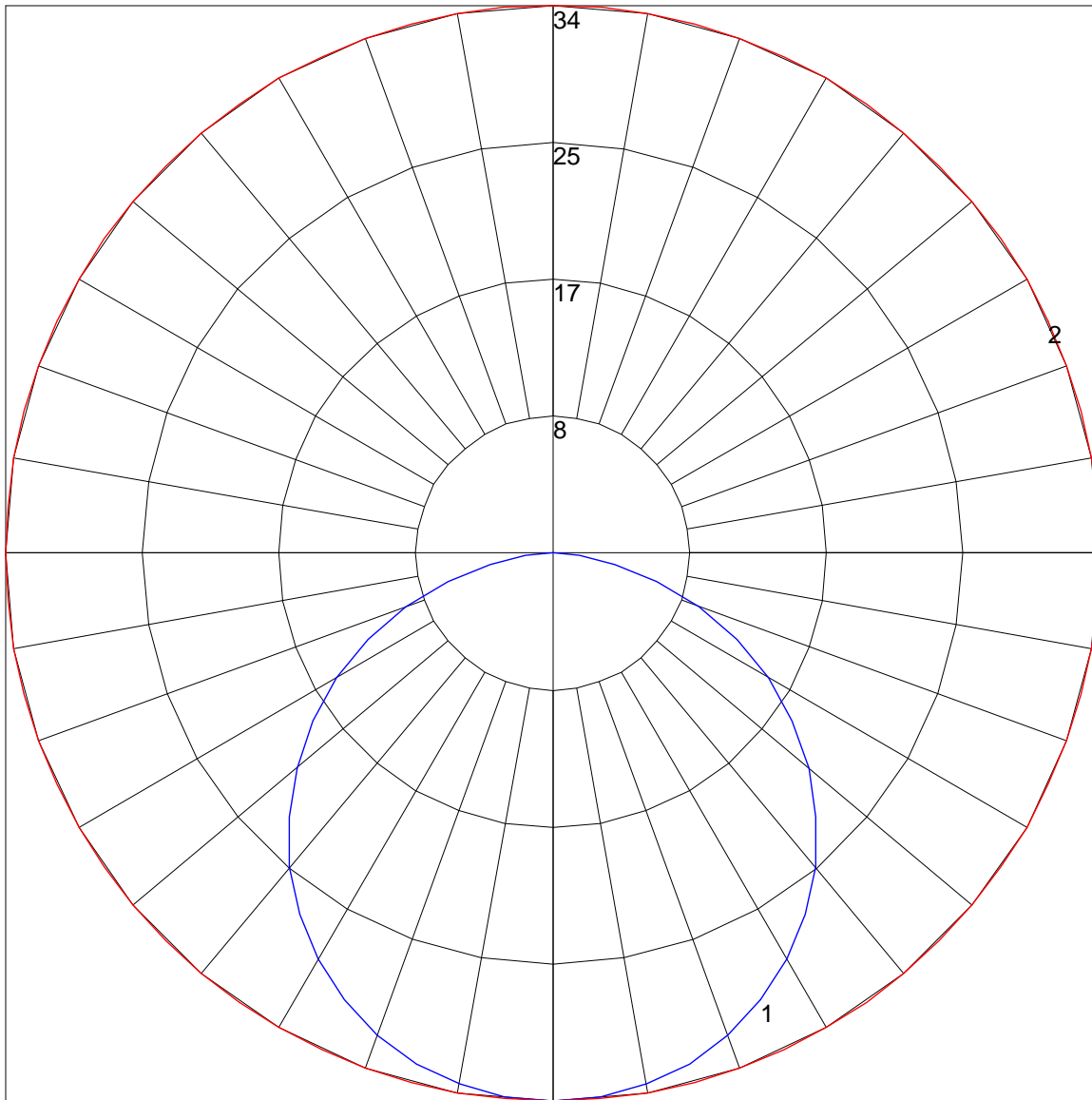
**COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD**

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	120	120	120	120	117	117	117	117	112	112	112	107	107	107	102	102	102	100
1	109	104	100	96	106	102	98	94	97	94	91	94	91	88	90	88	86	84
2	99	90	83	78	96	89	82	77	85	80	75	82	77	73	79	75	72	69
3	90	79	71	64	88	78	70	64	75	68	63	72	66	61	69	65	60	58
4	82	70	61	54	80	69	60	54	66	59	53	64	58	52	62	56	52	50
5	76	63	53	47	74	61	53	46	59	52	46	57	51	45	55	50	45	43
6	70	56	47	41	68	55	47	40	53	46	40	52	45	40	50	44	39	37
7	65	51	42	36	63	50	42	36	49	41	35	47	40	35	46	40	35	33
8	60	46	38	32	59	46	38	32	44	37	32	43	36	31	42	36	31	29
9	56	43	34	29	55	42	34	29	41	34	28	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 = 33.913 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.)