



IES INDOOR REPORT

PHOTOMETRIC FILENAME : KEL-LED-325-900-35-4-AS.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
 [TEST]20200615-2
 [TESTLAB]Intense Lighting Lab
 [TESTDATE]2020/06/15
 [ISSUE DATE]2020/06/26
 [MANUFAC]BirchWood
 [LUMCAT]KEL-LED-325-HLO-35-4-AS
 [LUMINAIRE]
 [LAMPCAT]59637
 [LAMP]3500K 80CRI
 [BALLASTCAT]Osram 50w
 [OTHER] DFLB20+DF90C
 [OPTICS]AS
 [WATTAGE] 35.02
 [VOLTAGE]120

CHARACTERISTICS

| | |
|---------------------------------|-----------------|
| Lumens Per Lamp | N.A. (absolute) |
| Total Lamp Lumens | N.A. (absolute) |
| Luminaire Lumens | 3632 |
| Total Luminaire Efficiency | N.A. |
| Luminaire Efficacy Rating (LER) | 104 |
| Total Luminaire Watts | 35 |
| Ballast Factor | 1.00 |
| CIE Type | Direct |
| Spacing Criterion (0-180) | 1.08 |
| Spacing Criterion (90-270) | 1.18 |
| Spacing Criterion (Diagonal) | 1.32 |
| Basic Luminous Shape | Rectangular |
| Luminous Length (0-180) | 1.19 m |
| Luminous Width (90-270) | 0.08 m |
| Luminous Height | 0.00 m |

LUMINANCE DATA (cd/sq.m)

| Angle In Degrees | Average 0-Deg | Average 45-Deg | Average 90-Deg |
|---------------------|------------------|-------------------|-------------------|
| 45 | 14167 | 12369 | 12694 |
| 55 | 13293 | 11567 | 9237 |
| 65 | 11167 | 9813 | 5142 |
| 75 | 6940 | 6228 | 3461 |
| 85 | 3213 | 2763 | 1870 |

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CANDELA TABULATION

| | <u>0</u> | <u>10</u> | <u>20</u> | <u>30</u> | <u>40</u> | <u>50</u> | <u>60</u> | <u>70</u> | <u>80</u> | <u>90</u> |
|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 |
| 5 | 1425.011 | 1425.306 | 1428.046 | 1432.785 | 1439.042 | 1446.583 | 1455.362 | 1464.054 | 1471.864 | 1479.526 |
| 10 | 1333.361 | 1335.103 | 1341.725 | 1352.610 | 1366.990 | 1383.078 | 1400.970 | 1420.201 | 1438.797 | 1454.895 |
| 15 | 1236.629 | 1238.102 | 1245.429 | 1259.067 | 1279.686 | 1306.764 | 1335.364 | 1361.397 | 1388.070 | 1413.969 |
| 20 | 1161.094 | 1160.749 | 1163.370 | 1170.886 | 1188.383 | 1218.624 | 1258.118 | 1293.510 | 1321.077 | 1355.244 |
| 25 | 1099.257 | 1097.411 | 1096.785 | 1099.377 | 1106.662 | 1127.744 | 1168.023 | 1212.318 | 1238.987 | 1275.155 |
| 30 | 1067.570 | 1059.863 | 1044.546 | 1031.898 | 1030.935 | 1042.026 | 1073.190 | 1114.322 | 1140.694 | 1175.129 |
| 35 | 1050.586 | 1040.855 | 1014.320 | 979.268 | 955.665 | 955.185 | 977.629 | 1004.909 | 1027.197 | 1067.660 |
| 40 | 991.950 | 986.559 | 968.930 | 931.936 | 885.842 | 863.196 | 874.331 | 887.430 | 905.117 | 951.335 |
| 45 | 906.343 | 903.281 | 891.682 | 865.598 | 814.963 | 767.736 | 758.254 | 760.124 | 791.879 | 812.163 |
| 50 | 803.432 | 801.696 | 794.644 | 775.555 | 732.854 | 668.417 | 633.869 | 633.961 | 678.831 | 646.606 |
| 55 | 689.875 | 688.032 | 682.492 | 668.777 | 636.023 | 564.585 | 514.565 | 524.708 | 559.343 | 479.388 |
| 60 | 565.451 | 563.775 | 559.352 | 549.081 | 525.295 | 457.359 | 408.425 | 427.891 | 436.596 | 321.246 |
| 65 | 426.998 | 425.738 | 423.383 | 417.885 | 402.473 | 347.946 | 311.642 | 333.173 | 315.583 | 196.618 |
| 70 | 284.203 | 283.192 | 282.053 | 280.225 | 272.765 | 237.545 | 217.001 | 233.991 | 204.031 | 124.774 |
| 75 | 162.529 | 161.633 | 160.521 | 159.194 | 155.254 | 136.433 | 127.973 | 136.527 | 113.970 | 81.041 |
| 80 | 76.850 | 76.232 | 75.320 | 74.181 | 71.745 | 63.182 | 59.718 | 61.559 | 51.613 | 42.474 |
| 85 | 25.334 | 25.017 | 24.569 | 24.003 | 23.005 | 20.570 | 19.378 | 19.049 | 16.507 | 14.744 |
| 90 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 |

Vert. Angles **Horizontal Angles**

| | <u>100</u> | <u>110</u> | <u>120</u> | <u>130</u> | <u>140</u> | <u>150</u> | <u>160</u> | <u>170</u> | <u>180</u> | <u>190</u> |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 0 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 |
| 5 | 1486.459 | 1492.560 | 1497.803 | 1502.215 | 1505.904 | 1508.573 | 1510.514 | 1511.541 | 1512.639 | 1512.088 |
| 10 | 1468.149 | 1478.970 | 1487.475 | 1494.805 | 1500.536 | 1504.834 | 1508.167 | 1509.935 | 1510.839 | 1510.379 |
| 15 | 1433.549 | 1448.457 | 1460.428 | 1469.683 | 1476.720 | 1482.061 | 1485.366 | 1487.614 | 1488.180 | 1487.951 |
| 20 | 1383.156 | 1402.809 | 1417.378 | 1427.905 | 1435.384 | 1440.838 | 1444.306 | 1446.344 | 1446.753 | 1446.618 |
| 25 | 1316.890 | 1342.203 | 1358.833 | 1369.910 | 1377.945 | 1383.160 | 1386.131 | 1387.697 | 1387.680 | 1387.935 |
| 30 | 1236.004 | 1267.241 | 1285.143 | 1297.342 | 1305.046 | 1309.087 | 1310.555 | 1310.495 | 1309.819 | 1310.902 |
| 35 | 1139.271 | 1177.550 | 1197.906 | 1210.947 | 1217.146 | 1218.385 | 1217.476 | 1216.131 | 1214.394 | 1216.283 |
| 40 | 1023.740 | 1074.469 | 1098.499 | 1111.002 | 1114.072 | 1112.141 | 1107.951 | 1103.832 | 1101.178 | 1104.263 |
| 45 | 881.773 | 956.972 | 987.032 | 997.954 | 996.885 | 990.907 | 982.828 | 977.583 | 974.698 | 978.013 |
| 50 | 704.558 | 825.305 | 864.634 | 872.282 | 866.187 | 856.339 | 846.756 | 841.614 | 838.536 | 842.074 |
| 55 | 497.531 | 683.952 | 734.990 | 735.325 | 723.413 | 711.513 | 701.987 | 696.852 | 694.077 | 697.458 |
| 60 | 306.336 | 537.542 | 600.774 | 592.002 | 572.488 | 560.574 | 552.203 | 547.453 | 544.703 | 548.033 |
| 65 | 188.409 | 392.914 | 460.092 | 447.220 | 421.683 | 409.009 | 402.387 | 399.248 | 396.988 | 399.715 |
| 70 | 128.070 | 256.020 | 316.557 | 305.157 | 280.126 | 267.804 | 263.991 | 262.387 | 261.027 | 262.953 |
| 75 | 84.461 | 140.111 | 183.047 | 176.760 | 160.474 | 152.363 | 150.892 | 150.687 | 150.037 | 151.281 |
| 80 | 43.961 | 60.980 | 82.949 | 82.089 | 75.664 | 72.229 | 72.095 | 72.260 | 72.130 | 72.969 |
| 85 | 15.227 | 18.805 | 25.008 | 25.818 | 24.698 | 24.121 | 24.297 | 24.532 | 24.678 | 25.138 |
| 90 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 |

Vert. Angles **Horizontal Angles**

| | <u>200</u> | <u>210</u> | <u>220</u> | <u>230</u> | <u>240</u> | <u>250</u> | <u>260</u> | <u>270</u> | <u>280</u> | <u>290</u> |
|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 0 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 |
| 5 | 1510.746 | 1508.914 | 1506.527 | 1502.997 | 1500.358 | 1495.408 | 1489.567 | 1482.665 | 1474.908 | 1466.481 |
| 10 | 1508.613 | 1505.909 | 1501.730 | 1496.522 | 1491.011 | 1482.938 | 1472.593 | 1459.031 | 1442.539 | 1424.041 |
| 15 | 1486.318 | 1483.620 | 1478.975 | 1472.460 | 1464.900 | 1453.686 | 1439.214 | 1419.002 | 1393.746 | 1367.479 |
| 20 | 1445.335 | 1442.760 | 1438.405 | 1431.880 | 1422.878 | 1409.049 | 1389.463 | 1360.762 | 1329.526 | 1299.899 |
| 25 | 1387.590 | 1385.894 | 1381.702 | 1375.081 | 1365.560 | 1349.781 | 1324.079 | 1282.368 | 1249.161 | 1219.487 |
| 30 | 1312.215 | 1312.583 | 1309.919 | 1303.835 | 1293.358 | 1276.198 | 1243.615 | 1185.954 | 1150.715 | 1122.168 |
| 35 | 1219.672 | 1222.491 | 1223.129 | 1218.580 | 1207.461 | 1188.275 | 1147.527 | 1079.026 | 1033.969 | 1015.825 |

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CANDELA TABULATION - (Cont.)

| | | | | | | | | | | |
|-----------|----------|----------|----------|----------|----------|----------|----------|---------|---------|---------|
| 40 | 1110.909 | 1117.188 | 1121.268 | 1119.658 | 1109.125 | 1086.564 | 1033.497 | 962.758 | 912.164 | 900.258 |
| 45 | 986.542 | 997.153 | 1005.184 | 1007.744 | 998.819 | 970.229 | 897.005 | 826.459 | 801.473 | 769.763 |
| 50 | 850.851 | 863.597 | 875.699 | 883.167 | 877.387 | 838.407 | 724.523 | 665.398 | 690.793 | 640.085 |
| 55 | 706.376 | 719.497 | 734.142 | 747.411 | 748.077 | 695.347 | 511.851 | 500.208 | 573.313 | 530.436 |
| 60 | 556.879 | 568.961 | 583.940 | 604.935 | 614.416 | 545.622 | 313.116 | 340.634 | 452.418 | 434.508 |
| 65 | 406.883 | 417.381 | 432.936 | 460.758 | 473.995 | 398.875 | 192.229 | 210.367 | 331.818 | 341.648 |
| 70 | 267.894 | 274.964 | 290.604 | 317.818 | 329.543 | 261.257 | 132.637 | 132.710 | 218.802 | 243.641 |
| 75 | 153.909 | 157.745 | 168.588 | 186.669 | 193.390 | 144.692 | 89.545 | 87.115 | 124.342 | 144.835 |
| 80 | 74.394 | 76.033 | 81.211 | 88.693 | 89.606 | 64.595 | 48.107 | 46.859 | 57.212 | 66.831 |
| 85 | 25.809 | 26.431 | 27.884 | 29.597 | 28.796 | 21.360 | 17.634 | 17.116 | 19.149 | 21.802 |
| 90 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 |

**Vert.
Angles**

Horizontal Angles

| | <u>300</u> | <u>310</u> | <u>320</u> | <u>330</u> | <u>340</u> | <u>350</u> | <u>360</u> |
|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 0 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 | 1489.069 |
| 5 | 1457.784 | 1449.645 | 1442.041 | 1435.720 | 1430.622 | 1427.493 | 1424.579 |
| 10 | 1405.312 | 1387.344 | 1370.457 | 1355.935 | 1344.754 | 1337.628 | 1332.972 |
| 15 | 1340.110 | 1311.037 | 1283.224 | 1262.323 | 1248.611 | 1240.878 | 1235.695 |
| 20 | 1262.622 | 1221.510 | 1192.088 | 1174.633 | 1166.152 | 1162.532 | 1159.352 |
| 25 | 1170.984 | 1130.520 | 1110.642 | 1103.639 | 1099.454 | 1098.115 | 1097.319 |
| 30 | 1075.675 | 1045.135 | 1035.663 | 1036.384 | 1048.018 | 1061.766 | 1066.746 |
| 35 | 980.613 | 958.346 | 961.527 | 985.025 | 1020.572 | 1044.649 | 1050.304 |
| 40 | 879.049 | 868.134 | 893.423 | 940.844 | 975.703 | 990.110 | 991.605 |
| 45 | 766.004 | 775.358 | 824.976 | 874.004 | 898.351 | 906.647 | 906.017 |
| 50 | 645.245 | 678.313 | 744.931 | 783.977 | 800.699 | 804.897 | 803.199 |
| 55 | 526.695 | 575.737 | 648.613 | 677.110 | 688.336 | 691.317 | 689.691 |
| 60 | 418.202 | 469.229 | 537.784 | 557.584 | 565.298 | 567.481 | 565.690 |
| 65 | 319.456 | 359.645 | 414.376 | 426.527 | 429.574 | 429.815 | 427.487 |
| 70 | 224.018 | 247.961 | 283.214 | 288.191 | 287.781 | 286.978 | 284.743 |
| 75 | 133.783 | 143.972 | 162.848 | 165.086 | 164.842 | 164.476 | 163.000 |
| 80 | 63.888 | 67.777 | 76.388 | 77.833 | 77.981 | 77.923 | 77.112 |
| 85 | 21.742 | 22.849 | 25.205 | 25.731 | 25.785 | 25.715 | 25.383 |
| 90 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 | 4.202 |

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ZONAL LUMEN SUMMARY

| Zone | Lumens | %Lamp | %Fixt |
|---------|---------|-------|--------|
| 0-20 | 530.83 | N.A. | 14.60 |
| 0-30 | 1110.33 | N.A. | 30.60 |
| 0-40 | 1797.72 | N.A. | 49.50 |
| 0-60 | 3062.64 | N.A. | 84.30 |
| 0-80 | 3599.69 | N.A. | 99.10 |
| 0-90 | 3632.21 | N.A. | 100.00 |
| 10-90 | 3492.56 | N.A. | 96.20 |
| 20-40 | 1266.9 | N.A. | 34.90 |
| 20-50 | 1957.2 | N.A. | 53.90 |
| 40-70 | 1639.66 | N.A. | 45.10 |
| 60-80 | 537.05 | N.A. | 14.80 |
| 70-80 | 162.31 | N.A. | 4.50 |
| 80-90 | 32.52 | N.A. | 0.90 |
| 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 | 3632.21 | N.A. | 100.00 |

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

| Zone | Lumens |
|---------|--------|
| 0-10 | 139.65 |
| 10-20 | 391.18 |
| 20-30 | 579.50 |
| 30-40 | 687.40 |
| 40-50 | 690.31 |
| 50-60 | 574.61 |
| 60-70 | 374.74 |
| 70-80 | 162.31 |
| 80-90 | 32.52 |
| 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 |

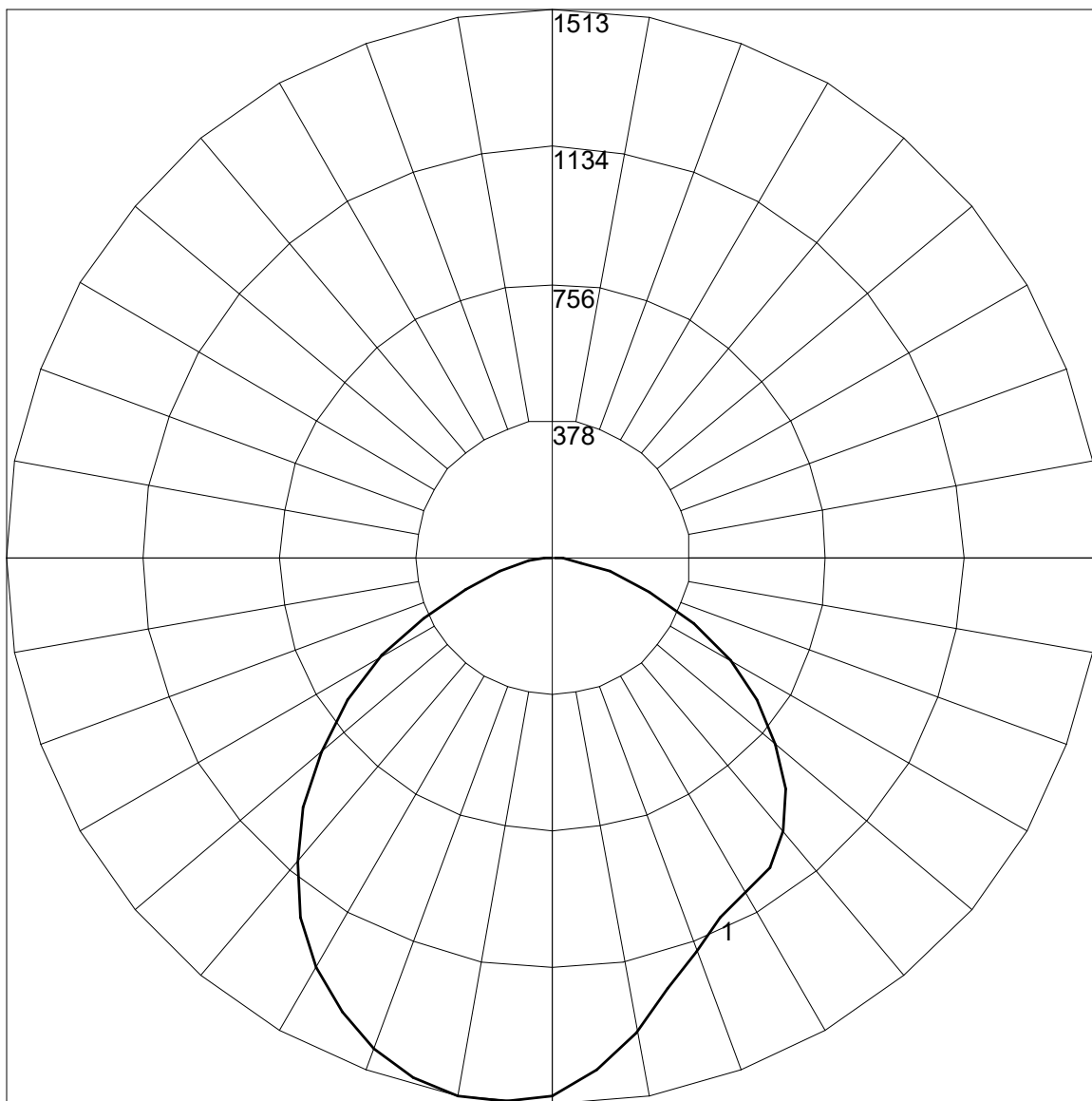
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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 | 110 | 105 | 102 | 98 | 107 | 103 | 100 | 96 | 99 | 96 | 93 | 95 | 93 | 91 | 92 | 90 | 88 | 86 |
| 2 | 100 | 93 | 86 | 81 | 98 | 91 | 85 | 80 | 87 | 83 | 78 | 84 | 80 | 77 | 81 | 78 | 75 | 73 |
| 3 | 92 | 82 | 74 | 68 | 90 | 81 | 73 | 68 | 78 | 71 | 66 | 75 | 70 | 65 | 72 | 68 | 64 | 62 |
| 4 | 85 | 73 | 65 | 58 | 82 | 72 | 64 | 58 | 69 | 63 | 57 | 67 | 61 | 56 | 65 | 60 | 56 | 54 |
| 5 | 78 | 66 | 57 | 51 | 76 | 64 | 56 | 50 | 62 | 55 | 50 | 60 | 54 | 49 | 59 | 53 | 49 | 47 |
| 6 | 72 | 59 | 51 | 44 | 70 | 58 | 50 | 44 | 56 | 49 | 44 | 55 | 48 | 43 | 53 | 48 | 43 | 41 |
| 7 | 67 | 54 | 45 | 39 | 65 | 53 | 45 | 39 | 51 | 44 | 39 | 50 | 44 | 39 | 49 | 43 | 38 | 36 |
| 8 | 62 | 49 | 41 | 35 | 61 | 48 | 41 | 35 | 47 | 40 | 35 | 46 | 39 | 35 | 45 | 39 | 34 | 33 |
| 9 | 58 | 45 | 37 | 32 | 57 | 45 | 37 | 32 | 43 | 36 | 32 | 42 | 36 | 31 | 41 | 36 | 31 | 29 |
| 10 | 55 | 42 | 34 | 29 | 53 | 41 | 34 | 29 | 40 | 33 | 29 | 39 | 33 | 29 | 38 | 33 | 28 | 27 |

POLAR GRAPH



Maximum Candela = 1512.639 Located At Horizontal Angle = 180, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)