

Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: HALO COMMERCIAL

Report Number: P776459

Luminaire Tested: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

Issue Date: 2/13/2024

Test Information

Test Method: LM-79-2019
Report Number: P776459
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (A2312156B044)
Test Lab:
Issue Date: 2/13/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO COMMERCIAL
Catalog Number: HCDJBS3040CSD-HCD81TRMW-4000lm-5000K
Description: 8 INCH ROUND SHALLOW-WIDE MATTE WHITE TRIM
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 5000K CCT
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 5047.1 lumens
Efficiency: N/A
Efficacy: 131.1 lumens/watt
Spacing Criteria (0/90/45): 1.25 / 1.25 / 1.35
Luminous Opening: Circular (Dia: 0.67' x H: 0')
CIE Type: Direct

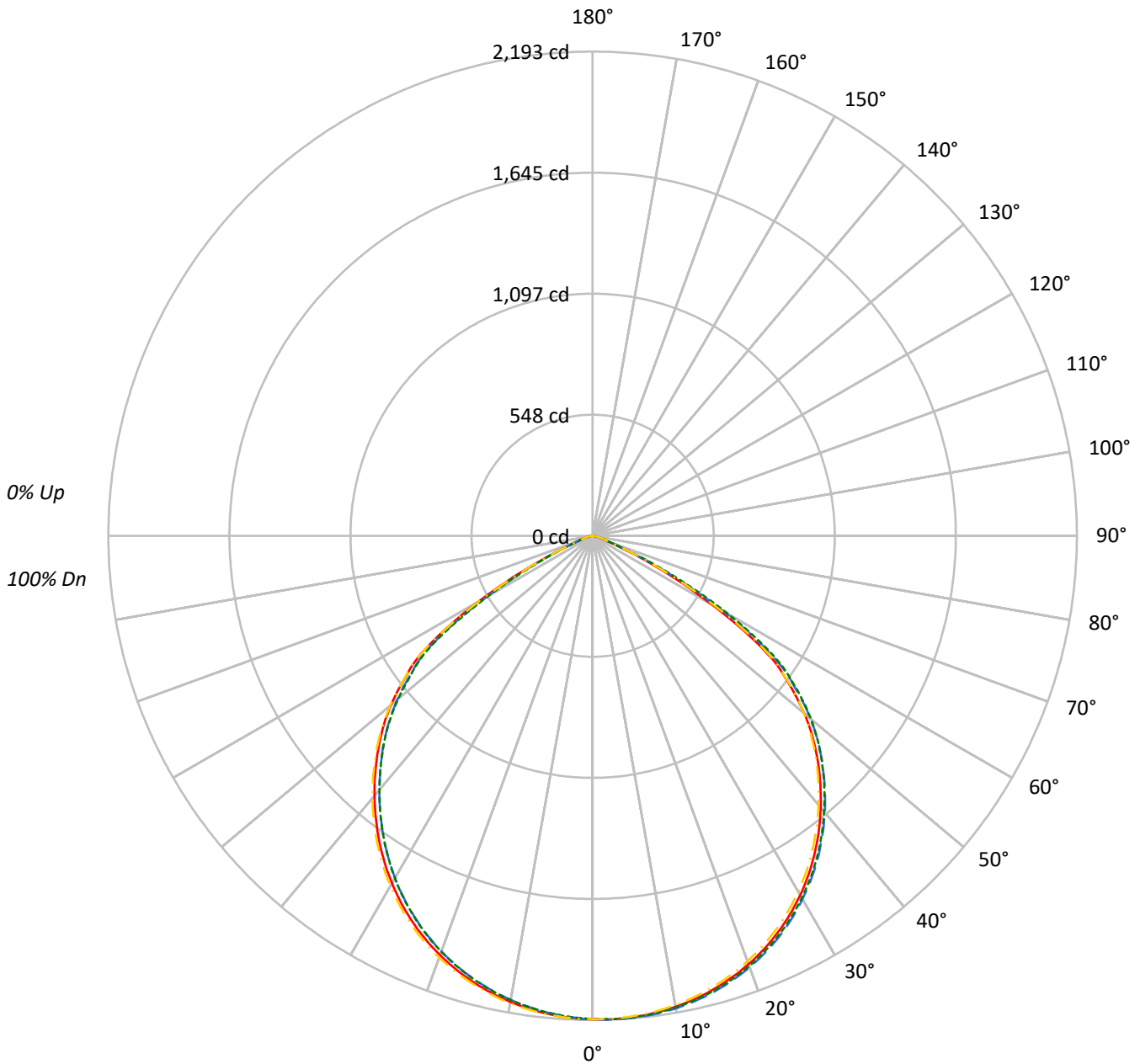
Input Watts (W): 38.5
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



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Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20					20					20					20					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	50	30	10	50	30	10	0		
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100					100			
1	111	107	104	101	109	105	102	99	101	98	96	97	95	93	94	92	91	89					89			
2	103	96	90	85	100	94	89	84	91	86	83	87	84	81	85	82	79	77					77			
3	95	86	79	73	92	84	78	72	81	76	71	79	74	70	76	72	69	67					67			
4	87	77	69	63	85	75	68	63	73	67	62	71	65	61	69	64	60	58					58			
5	81	69	61	55	79	68	60	55	66	59	54	64	58	54	62	57	53	51					51			
6	75	62	54	48	73	62	54	48	60	53	48	58	52	47	57	51	47	45					45			
7	69	57	49	43	68	56	48	43	55	48	43	53	47	42	52	46	42	40					40			
8	65	52	44	39	63	51	44	38	50	43	38	49	43	38	48	42	38	36					36			
9	60	48	40	35	59	47	40	35	46	39	35	45	39	34	44	38	34	32					32			
10	57	44	37	32	55	44	36	32	43	36	31	42	36	31	41	35	31	29					29			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	66864	66864	66864	66864
5°	67046	67071	66706	66531
10°	67149	67263	66464	66185
15°	67181	67374	66122	65734
20°	67091	67384	65668	65125
25°	66793	67208	64988	64274
30°	66252	66787	64076	63125
35°	65365	66066	62834	61616
40°	64046	64991	61244	59841
45°	62252	63525	59359	57770
50°	59352	61294	56616	54574
55°	54197	56831	51647	49475
60°	38328	43145	36502	33406
65°	18819	22510	16984	15329
70°	5990	6606	6025	5909
75°	4341	4872	4388	4482
80°	3024	3587	3024	3235
85°	1716	2452	1716	1997

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 67.5°
 Vertical Angle: 45°
 Luminance: 63664 cd/sqm



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	207.3	4.1
10°-20°	594.7	11.8
20°-30°	900.1	17.8
30°-40°	1072.9	21.3
40°-50°	1082.8	21.5
50°-60°	860.1	17.0
60°-70°	278.9	5.5
70°-80°	42.8	0.8
80°-90°	7.5	0.1
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	1702.2	33.7
0°-40°	2775.1	55.0
0°-60°	4718.0	93.5
0°-90°	5047.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	5047.1	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	2190	2190	2190	2190	2190	
5°	2188	2188	2177	2171	2188	208
15°	2126	2132	2092	2080	2126	600
25°	1983	1995	1929	1908	1983	914
35°	1754	1773	1686	1653	1754	1096
45°	1442	1471	1375	1338	1442	1109
55°	1018	1068	970	930	1018	878
65°	260	312	235	212	260	282
75°	37	41	37	38	37	41
85°	5	7	5	6	5	6
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1
0.5°	2191.3	2190.9	2190.9	2191.3	2189.3	2189.7	2190.5	2190.5	2190.1	2189.3	2188.9
1°	2191.3	2191.3	2191.8	2192.2	2190.1	2190.1	2190.1	2190.1	2189.3	2188.1	2187.7
1.5°	2191.8	2191.8	2192.2	2192.6	2190.5	2190.1	2190.1	2189.7	2188.1	2186.8	2186.0
2°	2191.3	2191.8	2192.6	2193.0	2190.9	2190.1	2189.7	2188.9	2187.3	2185.2	2184.4
2.5°	2190.9	2191.8	2192.6	2193.0	2190.9	2190.1	2188.9	2187.7	2185.6	2184.0	2182.8
3°	2190.9	2191.8	2192.6	2193.0	2190.5	2189.7	2188.5	2186.4	2184.4	2181.9	2181.1
3.5°	2190.1	2191.3	2192.2	2193.0	2190.5	2188.9	2187.3	2185.2	2182.8	2179.9	2178.7
4°	2189.7	2190.9	2191.8	2192.2	2190.1	2188.5	2186.0	2183.6	2180.7	2177.9	2176.6
4.5°	2188.5	2190.1	2191.3	2191.8	2189.3	2187.3	2184.8	2181.9	2178.7	2175.4	2173.8
5°	2187.7	2189.3	2190.9	2190.9	2188.5	2186.4	2183.2	2179.9	2176.6	2172.9	2171.3
5.5°	2186.4	2188.1	2189.7	2190.1	2187.3	2185.2	2181.5	2177.9	2173.8	2170.1	2168.4
6°	2184.8	2186.8	2188.5	2188.9	2186.0	2183.6	2179.5	2175.8	2171.3	2167.2	2165.6
6.5°	2183.2	2185.6	2187.3	2187.7	2184.8	2181.9	2177.4	2173.4	2168.4	2163.9	2162.3
7°	2181.1	2184.0	2186.0	2186.0	2183.2	2179.9	2175.4	2170.9	2165.6	2160.7	2158.6
7.5°	2179.1	2181.9	2184.4	2184.4	2181.5	2177.9	2173.4	2167.6	2162.3	2157.4	2155.4
8°	2177.0	2179.9	2182.3	2182.8	2179.5	2175.8	2170.5	2164.8	2159.0	2153.7	2151.3
8.5°	2174.2	2177.9	2180.3	2180.3	2177.4	2172.9	2167.6	2161.5	2155.4	2150.0	2147.6
9°	2171.7	2175.8	2178.3	2178.3	2175.0	2170.5	2164.4	2158.2	2151.7	2146.0	2143.5
9.5°	2168.9	2172.9	2175.8	2175.8	2172.5	2168.0	2161.5	2154.5	2148.0	2141.9	2139.0
10°	2166.0	2170.5	2172.9	2172.9	2169.7	2164.8	2158.2	2150.9	2143.9	2137.4	2134.5
10.5°	2162.7	2167.6	2170.1	2170.1	2166.8	2161.5	2155.0	2146.8	2139.4	2132.9	2129.6
11°	2159.4	2164.4	2167.2	2167.2	2163.5	2158.2	2150.9	2142.7	2134.9	2128.0	2124.7
11.5°	2155.8	2161.1	2163.9	2163.9	2160.3	2154.5	2146.8	2138.6	2130.4	2123.1	2119.8
12°	2152.1	2157.8	2160.7	2160.7	2156.6	2150.9	2142.7	2133.7	2125.5	2118.1	2114.5
12.5°	2148.4	2154.1	2157.0	2157.0	2153.3	2146.8	2138.6	2129.2	2120.2	2112.4	2108.7
13°	2143.9	2150.0	2153.3	2152.9	2149.2	2142.7	2134.1	2124.3	2114.9	2107.1	2103.4
13.5°	2139.4	2145.5	2149.2	2148.8	2145.1	2138.2	2129.6	2119.0	2109.6	2101.4	2097.3
14°	2134.9	2141.5	2145.1	2144.7	2140.6	2133.7	2124.7	2114.1	2103.8	2095.7	2091.2
14.5°	2130.4	2137.0	2141.0	2140.2	2136.6	2128.8	2119.4	2108.3	2098.1	2089.5	2085.0
15°	2125.5	2132.9	2136.6	2135.7	2131.6	2124.3	2114.1	2102.6	2092.0	2083.0	2078.9
15.5°	2120.2	2127.6	2131.6	2130.8	2126.7	2119.0	2108.7	2097.3	2085.8	2076.9	2071.9
16°	2114.9	2122.6	2126.7	2125.5	2121.4	2113.7	2103.0	2090.8	2079.3	2069.9	2065.0
16.5°	2109.6	2117.3	2121.4	2120.2	2116.5	2108.3	2097.3	2084.6	2072.8	2063.4	2058.0
17°	2103.4	2112.0	2116.1	2114.9	2111.2	2102.6	2091.2	2078.1	2066.2	2056.4	2050.7
17.5°	2097.7	2106.3	2110.8	2109.2	2105.5	2096.9	2084.6	2071.5	2058.9	2048.6	2043.3
18°	2091.6	2100.2	2104.7	2103.4	2099.7	2090.8	2078.5	2064.6	2051.9	2041.3	2035.6
18.5°	2085.4	2094.4	2098.9	2096.9	2093.6	2084.2	2071.9	2057.6	2044.5	2033.5	2027.8
19°	2078.5	2088.3	2092.4	2091.2	2087.1	2077.7	2065.0	2050.3	2036.8	2025.3	2019.6
19.5°	2071.9	2081.8	2086.3	2084.6	2080.5	2071.1	2058.0	2042.9	2029.0	2017.6	2011.4
20°	2065.0	2074.8	2079.7	2078.1	2074.0	2064.2	2050.7	2035.6	2021.2	2009.4	2002.8
20.5°	2058.0	2067.9	2072.8	2071.1	2067.0	2057.2	2043.3	2027.4	2012.7	2000.8	1994.3
21°	2050.3	2060.9	2065.4	2064.2	2059.7	2049.9	2035.1	2019.2	2004.5	1991.8	1985.3



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
22.5°	2027.0	2038.0	2043.3	2041.3	2037.2	2026.6	2011.0	1994.3	1977.9	1964.4	1957.4
23°	2018.4	2030.2	2035.1	2033.5	2029.4	2018.4	2002.8	1984.8	1968.5	1955.4	1947.6
23.5°	2010.2	2022.1	2027.4	2025.3	2020.8	2010.2	1993.8	1976.3	1959.1	1945.2	1937.8
24°	2001.2	2013.5	2018.8	2017.1	2012.7	2001.6	1984.8	1966.9	1949.7	1935.8	1927.6
24.5°	1992.2	2004.9	2010.2	2008.2	2004.1	1992.6	1975.8	1957.4	1939.5	1925.1	1917.0
25°	1982.8	1995.9	2001.2	1999.2	1995.1	1983.2	1966.9	1947.6	1929.2	1914.9	1906.3
25.5°	1973.8	1986.9	1992.2	1990.2	1986.1	1974.2	1957.4	1937.4	1919.4	1904.7	1895.7
26°	1964.4	1977.5	1982.8	1981.2	1976.7	1964.8	1947.6	1927.6	1908.8	1893.7	1885.1
26.5°	1954.6	1968.1	1973.8	1971.8	1966.9	1955.4	1937.4	1917.4	1898.2	1882.6	1873.6
27°	1944.4	1958.3	1963.6	1961.9	1957.0	1945.6	1927.6	1906.7	1887.1	1871.6	1862.2
27.5°	1934.1	1948.0	1954.2	1951.7	1947.6	1935.4	1917.0	1896.1	1876.1	1860.1	1850.7
28°	1923.5	1937.8	1944.0	1941.5	1937.4	1925.1	1906.3	1884.7	1864.6	1848.7	1839.3
28.5°	1912.9	1927.2	1933.3	1931.3	1926.8	1914.5	1895.7	1873.6	1853.2	1836.4	1827.0
29°	1902.2	1917.0	1922.7	1920.6	1916.1	1903.5	1884.3	1862.2	1841.7	1825.0	1814.7
29.5°	1890.8	1906.3	1912.1	1910.0	1905.5	1892.8	1873.2	1850.7	1829.5	1812.3	1802.5
30°	1879.3	1894.9	1900.6	1899.0	1894.5	1881.4	1861.8	1838.9	1817.6	1800.0	1789.8
30.5°	1868.3	1883.4	1889.6	1887.5	1883.4	1870.4	1850.3	1827.0	1804.9	1787.3	1776.7
31°	1856.0	1872.0	1878.1	1876.1	1871.6	1858.5	1838.0	1814.7	1792.7	1774.7	1764.0
31.5°	1844.2	1860.1	1866.3	1864.2	1860.1	1846.6	1826.2	1802.1	1780.0	1761.6	1750.9
32°	1831.9	1847.9	1854.4	1852.4	1848.3	1834.8	1813.9	1789.8	1766.9	1748.5	1737.9
32.5°	1819.2	1835.6	1842.5	1840.1	1836.0	1822.5	1801.2	1776.7	1753.8	1735.0	1723.6
33°	1807.0	1823.3	1830.3	1827.8	1824.1	1810.2	1788.6	1764.0	1740.3	1721.5	1710.5
33.5°	1793.9	1810.7	1817.6	1815.6	1811.5	1797.6	1775.5	1750.5	1727.2	1707.2	1696.2
34°	1780.4	1797.6	1804.9	1802.5	1798.4	1784.9	1762.8	1737.0	1713.3	1693.3	1682.3
34.5°	1767.3	1784.5	1791.8	1789.4	1785.3	1771.4	1749.3	1723.6	1699.4	1679.4	1667.5
35°	1753.8	1771.0	1778.8	1776.3	1772.6	1758.3	1735.8	1710.1	1685.9	1665.1	1653.6
35.5°	1739.9	1757.5	1765.3	1762.8	1759.1	1744.8	1721.9	1695.7	1671.6	1650.4	1638.9
36°	1726.0	1744.0	1751.4	1749.7	1746.0	1731.3	1708.4	1681.4	1656.9	1636.0	1624.2
36.5°	1711.7	1729.7	1737.5	1735.8	1731.7	1717.4	1694.5	1667.5	1642.6	1621.3	1609.5
37°	1697.4	1715.4	1723.6	1721.9	1718.2	1703.5	1680.2	1653.6	1627.5	1606.2	1594.7
37.5°	1683.1	1701.1	1709.6	1707.6	1703.9	1688.8	1665.9	1638.5	1612.7	1591.5	1579.2
38°	1667.9	1686.3	1694.9	1693.3	1689.6	1674.9	1651.2	1623.8	1598.0	1575.9	1564.1
38.5°	1653.2	1671.6	1680.2	1679.0	1674.9	1660.2	1636.5	1609.1	1582.9	1560.8	1548.5
39°	1638.1	1656.5	1665.5	1663.9	1660.6	1645.5	1621.7	1593.9	1567.8	1545.3	1533.4
39.5°	1622.6	1641.4	1650.4	1649.1	1645.9	1630.3	1606.2	1578.8	1552.2	1529.7	1517.9
40°	1607.0	1625.8	1635.6	1634.0	1630.7	1615.6	1591.1	1562.9	1536.7	1514.2	1501.9
40.5°	1591.5	1610.3	1619.7	1618.9	1615.6	1600.1	1575.5	1547.3	1521.1	1497.8	1486.4
41°	1575.1	1594.3	1604.2	1603.3	1599.7	1584.5	1560.0	1531.8	1505.2	1482.3	1470.0
41.5°	1558.8	1578.4	1588.2	1587.8	1584.5	1569.0	1544.5	1516.2	1489.7	1466.3	1454.1
42°	1542.8	1562.4	1572.7	1572.3	1569.0	1553.0	1528.5	1500.7	1473.3	1450.0	1437.7
42.5°	1526.5	1546.1	1556.7	1556.3	1553.0	1537.1	1512.6	1484.3	1456.9	1434.0	1421.8
43°	1510.1	1529.3	1540.4	1540.4	1537.5	1521.1	1496.6	1468.4	1441.0	1417.3	1405.4
43.5°	1493.3	1513.0	1524.0	1524.4	1521.1	1504.8	1480.3	1452.0	1424.6	1400.9	1389.1



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	1441.8	1461.4	1473.7	1474.5	1471.3	1454.9	1430.8	1403.0	1374.8	1350.6	1339.2
45.5°	1423.8	1443.9	1456.1	1457.8	1454.5	1437.7	1413.6	1385.4	1358.0	1333.9	1322.4
46°	1406.2	1426.7	1439.0	1440.6	1437.3	1420.6	1396.8	1368.6	1340.8	1316.7	1305.2
46.5°	1388.2	1407.9	1421.4	1423.0	1420.1	1403.4	1379.3	1351.4	1323.2	1299.5	1288.1
47°	1369.4	1389.9	1403.4	1405.4	1403.0	1385.4	1361.3	1333.5	1305.6	1281.9	1270.1
47.5°	1350.6	1371.1	1385.0	1387.4	1385.4	1367.4	1343.3	1315.5	1288.1	1263.5	1252.1
48°	1331.8	1351.9	1366.6	1369.0	1366.6	1349.4	1326.5	1297.9	1270.1	1245.5	1234.1
48.5°	1311.8	1332.2	1346.9	1350.2	1348.6	1331.4	1306.9	1279.5	1251.3	1227.1	1215.3
49°	1292.2	1313.0	1327.7	1331.8	1329.8	1311.8	1288.1	1260.3	1231.6	1207.5	1195.7
49.5°	1271.3	1292.6	1307.7	1311.8	1310.6	1292.6	1268.4	1240.6	1212.4	1187.9	1175.6
50°	1249.6	1271.3	1287.2	1291.7	1290.5	1272.9	1249.2	1221.0	1192.0	1167.4	1154.8
50.5°	1227.5	1248.8	1266.0	1270.1	1269.7	1252.9	1228.4	1199.7	1171.1	1145.8	1133.5
51°	1205.9	1227.1	1243.9	1249.2	1248.8	1230.8	1206.3	1178.1	1149.0	1124.1	1111.8
51.5°	1182.2	1203.8	1221.0	1226.7	1227.5	1209.1	1184.6	1156.0	1127.8	1103.2	1090.2
52°	1158.8	1181.3	1198.5	1204.2	1204.6	1186.7	1162.1	1133.1	1104.5	1080.3	1067.3
52.5°	1135.5	1157.2	1175.2	1180.5	1181.7	1163.3	1138.8	1110.2	1082.4	1057.8	1045.2
53°	1112.2	1133.5	1151.5	1158.0	1158.4	1140.4	1115.5	1087.3	1059.9	1035.8	1023.5
53.5°	1089.3	1109.8	1128.2	1134.3	1135.5	1118.0	1092.6	1065.6	1038.6	1015.3	1003.5
54°	1067.3	1088.1	1105.7	1112.6	1113.1	1095.1	1070.9	1043.9	1018.2	994.5	982.2
54.5°	1044.4	1065.6	1083.2	1090.2	1090.6	1073.8	1049.3	1021.5	995.7	972.0	960.1
55°	1018.2	1039.0	1057.8	1065.2	1067.7	1049.7	1025.1	996.9	970.3	947.0	935.2
55.5°	989.2	1010.0	1030.0	1037.4	1041.1	1023.5	997.7	969.1	940.1	916.0	905.3
56°	955.2	978.9	997.3	1005.1	1011.2	994.1	966.7	935.6	906.1	882.8	871.4
56.5°	919.2	943.8	962.6	971.2	978.1	961.3	933.5	900.8	871.4	846.4	835.0
57°	880.8	904.9	925.8	934.8	942.9	924.5	896.7	864.4	833.8	808.8	796.6
57.5°	840.3	863.2	887.3	898.0	906.1	886.5	858.7	826.8	795.7	771.2	757.3
58°	798.2	821.5	847.7	860.3	868.5	846.4	817.8	786.7	756.9	731.5	717.6
58.5°	756.9	779.4	806.4	821.5	830.1	806.8	777.7	747.5	718.0	693.5	678.0
59°	713.1	737.7	765.5	781.8	789.2	763.4	735.2	705.8	677.6	653.4	637.1
59.5°	671.0	694.7	723.4	740.1	747.9	721.7	692.7	664.1	637.5	613.8	597.4
60°	627.7	653.4	681.2	699.2	706.6	679.6	650.2	621.5	597.8	574.9	559.0
60.5°	586.8	612.1	638.7	656.7	665.3	639.1	607.6	581.1	558.2	535.7	520.1
61°	545.5	571.7	596.2	614.2	622.4	597.8	566.3	538.9	518.1	498.1	482.5
61.5°	505.4	532.4	555.3	570.8	581.5	559.0	525.9	498.9	479.2	461.2	445.3
62°	466.6	492.3	515.2	528.7	541.0	518.1	486.6	459.2	441.2	425.3	410.1
62.5°	428.9	454.3	475.6	486.2	499.3	478.8	447.3	420.4	406.0	391.7	377.4
63°	392.6	416.7	436.7	445.7	459.6	440.4	413.0	385.6	370.9	358.2	344.3
63.5°	357.0	380.3	397.5	404.4	421.2	405.2	378.2	350.4	335.7	324.3	311.2
64°	322.6	344.3	360.7	366.0	384.8	369.7	343.5	315.3	300.5	290.7	278.5
64.5°	290.3	310.8	324.7	328.8	348.4	334.5	308.7	280.5	265.8	256.8	249.0
65°	260.5	278.1	289.9	293.6	311.6	298.9	274.4	249.8	235.1	227.4	222.0
65.5°	230.2	246.6	257.2	260.9	275.2	263.7	243.3	221.6	207.3	199.5	197.1
66°	199.5	216.3	225.3	229.0	241.7	231.4	215.1	195.9	180.7	174.2	173.8



TEST NUMBER: P776459

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	130.9	139.4	145.2	148.4	155.8	151.3	141.9	130.4	114.1	114.5	116.9
68°	115.7	123.5	130.0	132.9	132.9	128.8	121.4	113.7	98.5	100.6	102.6
68.5°	100.6	108.0	115.3	117.4	113.3	109.2	104.7	99.0	86.3	90.0	90.8
69°	85.9	92.4	100.6	102.2	96.9	93.2	91.2	86.7	77.3	81.0	81.0
69.5°	70.7	76.9	85.9	86.7	83.8	81.4	79.7	76.9	71.2	73.6	73.2
70°	67.1	69.5	71.2	71.2	74.0	72.8	71.6	69.9	67.5	67.9	68.3
70.5°	63.8	65.0	66.2	66.2	67.9	67.5	67.1	65.8	64.2	64.6	64.6
71°	60.1	61.7	63.0	63.0	64.2	64.2	63.8	62.6	60.9	61.3	61.7
71.5°	56.8	58.9	60.1	60.1	61.3	60.9	60.5	59.3	57.2	58.1	58.5
72°	53.6	55.6	56.8	56.8	58.1	58.1	57.7	56.4	54.4	55.2	55.6
72.5°	50.7	52.3	54.0	54.0	55.2	54.8	54.4	53.2	51.1	51.9	52.7
73°	47.4	49.5	50.7	51.1	52.3	51.9	51.5	50.3	48.3	49.1	49.9
73.5°	44.6	46.6	47.8	48.3	49.5	49.1	48.7	47.4	45.4	46.2	47.0
74°	42.1	43.8	45.4	45.4	46.6	46.2	46.2	44.6	42.5	43.3	44.2
74.5°	39.3	40.9	42.5	42.5	43.8	43.8	43.3	41.7	39.7	40.9	41.7
75°	36.8	38.4	40.1	40.1	41.3	40.9	40.9	39.3	37.2	38.0	39.3
75.5°	34.3	36.0	37.6	37.6	38.8	38.4	38.4	36.8	35.2	35.6	36.8
76°	31.9	33.5	35.2	35.2	36.4	36.4	36.0	34.3	32.7	33.5	34.8
76.5°	29.9	31.1	32.7	33.1	34.3	33.9	33.9	32.3	30.7	31.5	32.3
77°	27.8	29.0	30.7	31.1	31.9	31.9	31.5	30.3	28.2	29.0	30.3
77.5°	25.8	27.0	28.6	29.0	29.9	29.9	29.4	27.8	26.2	27.0	28.2
78°	23.7	24.9	26.6	27.0	27.8	27.8	27.4	25.8	24.1	24.9	25.8
78.5°	22.1	23.3	24.5	24.9	25.8	25.8	25.4	23.7	22.1	22.9	24.1
79°	20.4	21.3	22.9	23.3	23.7	23.7	23.3	21.7	20.4	20.9	22.1
79.5°	18.4	19.6	21.3	21.3	22.1	22.1	21.7	20.0	18.8	19.2	20.4
80°	17.2	18.0	19.2	19.6	20.4	20.4	20.0	18.4	17.2	17.6	18.8
80.5°	15.5	16.4	17.6	18.0	18.8	18.8	18.4	16.8	15.5	15.9	17.2
81°	13.9	14.7	16.4	16.8	17.2	17.2	16.8	15.1	13.9	14.3	15.5
81.5°	12.7	13.5	14.7	15.1	15.5	15.5	15.1	13.9	12.7	13.1	13.9
82°	11.4	12.3	13.5	13.5	14.3	14.3	13.9	12.3	11.4	11.4	12.7
82.5°	9.8	10.6	11.9	12.3	12.7	12.7	12.3	11.0	9.8	10.2	11.4
83°	8.6	9.4	10.6	11.0	11.4	11.4	11.0	9.8	8.6	9.0	10.2
83.5°	7.8	8.2	9.4	9.8	10.2	10.2	9.8	8.6	7.8	7.8	9.0
84°	6.5	7.0	8.2	8.6	9.0	9.0	8.6	7.4	6.5	7.0	7.8
84.5°	5.7	6.1	7.0	7.4	7.8	7.8	7.4	6.1	5.7	5.7	6.5
85°	4.9	5.3	6.1	6.5	7.0	7.0	6.5	5.3	4.9	4.9	5.7
85.5°	3.7	4.1	5.3	5.7	5.7	5.7	5.3	4.1	4.1	3.7	4.9
86°	3.3	3.3	4.5	4.5	4.9	4.9	4.5	3.3	3.3	2.9	4.1
86.5°	2.5	2.5	3.7	3.7	4.1	4.1	3.7	2.9	2.5	2.5	3.3
87°	1.6	2.0	2.9	3.3	3.3	3.3	2.9	2.0	1.6	1.6	2.5
87.5°	1.2	1.6	2.0	2.5	2.5	2.5	2.5	1.6	1.2	1.2	2.0
88°	0.8	1.2	1.6	1.6	2.0	2.0	1.6	1.2	0.8	0.8	1.2
88.5°	0.4	0.8	0.8	1.2	1.2	1.2	1.2	0.8	0.4	0.4	0.8



TEST NUMBER: P776459
CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P776459

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
0°	2190.1	2190.1	2190.1	2190.1	2190.1	2190.1
0.5°	2189.3	2187.7	2188.5	2189.7	2190.9	2191.3
1°	2188.1	2186.4	2187.7	2189.3	2190.9	2191.3
1.5°	2186.8	2185.2	2186.4	2188.9	2190.9	2191.8
2°	2185.2	2184.0	2185.2	2188.1	2190.5	2191.3
2.5°	2183.6	2182.3	2184.0	2186.8	2189.7	2190.9
3°	2181.5	2180.3	2182.3	2185.6	2188.9	2190.9
3.5°	2179.5	2178.3	2180.7	2184.4	2188.1	2190.1
4°	2177.0	2176.2	2178.7	2182.8	2186.8	2189.7
4.5°	2174.6	2173.8	2176.6	2181.1	2185.6	2188.5
5°	2172.1	2170.9	2174.6	2179.1	2184.0	2187.7
5.5°	2168.9	2168.4	2172.1	2177.0	2182.3	2186.4
6°	2166.0	2165.6	2169.3	2175.0	2180.3	2184.8
6.5°	2163.1	2162.3	2166.4	2172.1	2178.3	2183.2
7°	2159.4	2159.0	2163.9	2169.7	2176.2	2181.1
7.5°	2156.2	2155.4	2160.7	2166.8	2173.8	2179.1
8°	2152.1	2151.7	2157.0	2163.5	2171.3	2177.0
8.5°	2148.4	2147.6	2153.3	2160.7	2168.0	2174.2
9°	2144.3	2143.5	2149.2	2157.0	2165.2	2171.7
9.5°	2139.8	2139.4	2145.5	2153.3	2161.9	2168.9
10°	2135.3	2134.9	2141.5	2149.6	2158.6	2166.0
10.5°	2130.4	2130.4	2137.0	2145.5	2155.0	2162.7
11°	2125.9	2125.5	2132.5	2141.5	2151.3	2159.4
11.5°	2120.6	2120.6	2127.6	2137.0	2147.6	2155.8
12°	2115.3	2115.3	2122.6	2132.5	2143.1	2152.1
12.5°	2110.0	2110.0	2117.7	2127.6	2139.0	2148.4
13°	2104.2	2104.2	2112.4	2122.6	2134.5	2143.9
13.5°	2098.1	2098.5	2106.7	2117.3	2129.6	2139.4
14°	2092.0	2092.0	2101.0	2112.0	2124.7	2134.9
14.5°	2085.8	2085.8	2095.3	2106.7	2119.4	2130.4
15°	2079.7	2079.7	2089.1	2101.0	2114.1	2125.5
15.5°	2072.8	2073.2	2082.2	2094.8	2108.7	2120.2
16°	2065.8	2066.2	2075.6	2088.7	2103.0	2114.9
16.5°	2058.9	2059.3	2069.1	2082.2	2096.9	2109.6
17°	2051.9	2052.3	2062.1	2075.6	2090.8	2103.4
17.5°	2043.7	2044.5	2055.2	2069.1	2084.6	2097.7
18°	2036.4	2037.2	2047.4	2062.1	2077.7	2091.6
18.5°	2028.6	2029.0	2040.0	2054.8	2071.1	2085.4
19°	2020.4	2021.2	2032.3	2047.4	2064.2	2078.5
19.5°	2012.2	2012.7	2024.1	2040.0	2057.2	2071.9
20°	2003.7	2004.5	2015.9	2032.3	2049.5	2065.0
20.5°	1994.7	1995.5	2007.7	2024.1	2042.1	2058.0
21°	1985.7	1986.5	1998.7	2015.9	2034.3	2050.3

TEST NUMBER: P776459

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	1957.4	1958.7	1972.2	1989.8	2009.8	2027.0
23°	1948.0	1948.9	1962.4	1980.8	2001.2	2018.4
23.5°	1937.8	1939.0	1953.0	1971.8	1992.2	2010.2
24°	1927.6	1928.8	1943.1	1961.9	1983.2	2001.2
24.5°	1917.4	1918.6	1932.5	1952.5	1973.8	1992.2
25°	1906.7	1908.0	1922.3	1942.3	1964.4	1982.8
25.5°	1895.7	1897.3	1912.1	1932.5	1954.6	1973.8
26°	1885.1	1886.3	1901.4	1921.9	1944.8	1964.4
26.5°	1873.6	1875.3	1890.8	1911.7	1934.1	1954.6
27°	1862.2	1863.8	1879.3	1900.6	1923.9	1944.4
27.5°	1850.7	1852.0	1867.9	1889.6	1913.3	1934.1
28°	1838.9	1840.1	1856.4	1878.5	1902.7	1923.5
28.5°	1826.6	1828.2	1845.0	1867.1	1891.6	1912.9
29°	1814.3	1816.0	1832.3	1855.6	1880.2	1902.2
29.5°	1801.7	1803.7	1820.5	1843.8	1868.7	1890.8
30°	1788.6	1790.6	1808.2	1831.5	1857.3	1879.3
30.5°	1775.9	1777.9	1795.1	1819.2	1845.0	1868.3
31°	1763.2	1764.9	1782.8	1807.0	1832.7	1856.0
31.5°	1749.7	1751.8	1769.8	1794.3	1820.5	1844.2
32°	1736.2	1737.9	1756.3	1781.6	1808.2	1831.9
32.5°	1722.3	1724.4	1742.8	1768.1	1795.5	1819.2
33°	1708.8	1710.9	1729.7	1755.0	1782.8	1807.0
33.5°	1694.9	1696.6	1715.4	1742.0	1769.4	1793.9
34°	1680.6	1682.3	1701.5	1728.1	1755.9	1780.4
34.5°	1665.9	1668.3	1687.6	1714.1	1742.4	1767.3
35°	1651.6	1653.2	1673.3	1700.2	1728.5	1753.8
35.5°	1637.3	1639.3	1658.5	1685.9	1714.6	1739.9
36°	1622.6	1624.2	1644.2	1671.6	1700.2	1726.0
36.5°	1607.4	1609.9	1629.5	1657.3	1686.3	1711.7
37°	1592.7	1594.7	1614.4	1642.6	1671.6	1697.4
37.5°	1577.2	1579.2	1599.2	1627.5	1656.9	1683.1
38°	1562.0	1563.7	1583.7	1612.3	1641.8	1667.9
38.5°	1546.9	1548.5	1568.6	1597.2	1626.6	1653.2
39°	1531.0	1533.0	1553.0	1582.1	1611.5	1638.1
39.5°	1515.4	1517.1	1537.5	1566.1	1596.4	1622.6
40°	1499.9	1501.5	1521.6	1550.6	1580.8	1607.0
40.5°	1483.9	1485.6	1505.2	1534.6	1565.3	1591.5
41°	1468.4	1469.6	1489.7	1518.7	1548.9	1575.1
41.5°	1452.0	1452.9	1472.9	1502.3	1533.0	1558.8
42°	1436.1	1437.3	1456.9	1486.8	1517.1	1542.8
42.5°	1420.1	1420.6	1440.6	1470.4	1500.3	1526.5
43°	1403.4	1404.6	1424.6	1453.7	1483.9	1510.1
43.5°	1387.0	1387.8	1407.5	1436.9	1467.2	1493.3



TEST NUMBER: P776459

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
45°	1337.5	1338.0	1356.8	1386.2	1416.5	1441.8
45.5°	1320.8	1320.8	1339.6	1369.0	1398.5	1423.8
46°	1303.6	1303.2	1322.0	1351.4	1380.9	1406.2
46.5°	1286.4	1285.2	1304.4	1333.5	1362.9	1388.2
47°	1268.8	1268.0	1286.0	1315.1	1344.5	1369.4
47.5°	1250.4	1249.2	1266.8	1296.2	1325.7	1350.6
48°	1232.0	1230.4	1248.0	1277.0	1306.1	1331.8
48.5°	1213.2	1210.8	1228.8	1257.4	1286.4	1311.8
49°	1193.6	1191.2	1208.7	1237.0	1266.8	1292.2
49.5°	1173.6	1170.7	1187.9	1216.9	1245.9	1271.3
50°	1152.7	1149.0	1166.6	1194.8	1224.7	1249.6
50.5°	1131.5	1128.2	1144.9	1173.2	1202.2	1227.5
51°	1109.8	1106.1	1123.3	1151.5	1180.1	1205.9
51.5°	1087.7	1084.0	1100.4	1129.4	1157.6	1182.2
52°	1064.8	1061.9	1078.7	1106.5	1134.3	1158.8
52.5°	1042.7	1039.9	1056.6	1083.6	1109.8	1135.5
53°	1021.5	1019.0	1035.4	1061.9	1088.1	1112.2
53.5°	1000.6	999.0	1015.3	1041.1	1066.4	1089.3
54°	980.6	978.5	994.5	1020.6	1045.2	1067.3
54.5°	958.1	955.6	972.0	997.3	1021.9	1044.4
55°	933.9	929.5	947.0	972.4	996.9	1018.2
55.5°	905.3	898.4	916.0	941.3	966.3	989.2
56°	870.6	864.0	882.0	907.0	932.3	955.2
56.5°	834.2	827.2	844.8	871.0	895.5	919.2
57°	796.6	788.4	806.4	832.5	858.3	880.8
57.5°	757.3	747.9	767.5	793.7	818.6	840.3
58°	717.6	707.0	727.9	754.4	778.6	798.2
58.5°	676.3	666.9	687.8	714.8	734.8	756.9
59°	635.0	625.6	647.3	673.1	694.3	713.1
59.5°	594.6	586.8	607.6	633.0	652.6	671.0
60°	554.1	547.1	568.4	592.1	609.7	627.7
60.5°	514.8	508.3	529.1	551.2	566.7	586.8
61°	475.6	469.4	489.9	510.3	526.3	545.5
61.5°	439.2	433.9	452.3	471.5	486.6	505.4
62°	406.0	397.1	416.3	431.8	446.1	466.6
62.5°	373.3	362.7	380.3	393.8	408.5	428.9
63°	340.6	329.6	345.1	357.0	370.9	392.6
63.5°	307.9	297.7	312.0	321.8	335.7	357.0
64°	275.2	267.0	278.9	287.9	301.0	322.6
64.5°	247.8	239.2	248.2	256.4	269.9	290.3
65°	222.0	212.2	219.2	226.1	239.6	260.5
65.5°	197.9	188.1	191.8	198.3	211.4	230.2
66°	175.0	165.2	166.0	173.0	185.6	199.5



TEST NUMBER: P776459

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	119.4	117.8	116.9	122.3	126.4	130.9
68°	104.3	104.3	103.9	108.0	111.6	115.7
68.5°	91.6	90.8	90.8	93.6	97.3	100.6
69°	81.4	77.3	77.7	79.3	82.6	85.9
69.5°	73.2	70.3	70.7	72.0	73.6	70.7
70°	67.9	66.2	66.7	67.5	67.9	67.1
70.5°	64.6	63.4	63.8	64.2	64.2	63.8
71°	61.7	60.1	60.5	61.3	61.3	60.1
71.5°	58.5	57.2	57.7	58.1	58.1	56.8
72°	55.6	54.0	54.4	55.2	54.8	53.6
72.5°	52.3	51.1	51.5	52.3	51.9	50.7
73°	49.5	48.3	48.7	49.1	48.7	47.4
73.5°	47.0	45.8	45.8	46.6	45.8	44.6
74°	44.2	42.9	43.3	43.8	43.3	42.1
74.5°	41.7	40.5	40.9	41.3	40.5	39.3
75°	39.3	38.0	38.4	38.4	38.0	36.8
75.5°	36.8	35.6	36.0	36.4	35.6	34.3
76°	34.8	33.5	33.5	33.9	33.1	31.9
76.5°	32.3	31.1	31.5	31.5	30.7	29.9
77°	30.3	29.0	29.4	29.4	28.6	27.8
77.5°	28.2	27.0	27.4	27.4	26.6	25.8
78°	26.2	25.4	25.4	25.8	24.5	23.7
78.5°	24.1	23.3	23.7	23.7	22.9	22.1
79°	22.5	21.7	21.7	22.1	20.9	20.4
79.5°	20.9	20.0	20.0	20.0	19.2	18.4
80°	19.2	18.4	18.4	18.4	17.6	17.2
80.5°	17.6	16.8	16.8	16.8	15.9	15.5
81°	15.9	15.5	15.5	15.5	14.7	13.9
81.5°	14.3	13.9	14.3	13.9	13.1	12.7
82°	13.1	12.7	12.7	12.7	11.9	11.4
82.5°	11.9	11.4	11.4	11.4	10.2	9.8
83°	10.6	9.8	10.2	9.8	9.0	8.6
83.5°	9.4	9.0	9.0	8.6	7.8	7.8
84°	8.2	7.8	7.8	7.8	7.0	6.5
84.5°	7.0	6.5	7.0	6.5	5.7	5.7
85°	6.1	5.7	5.7	5.7	4.9	4.9
85.5°	5.3	4.9	4.9	4.9	3.7	3.7
86°	4.1	4.1	4.1	4.1	3.3	3.3
86.5°	3.7	3.3	3.3	3.3	2.5	2.5
87°	2.9	2.5	2.5	2.5	2.0	1.6
87.5°	2.0	1.6	1.6	1.6	1.6	1.2
88°	1.2	1.2	1.2	1.2	0.8	0.8
88.5°	0.8	0.4	0.4	0.4	0.4	0.4



TEST NUMBER: P776459
CATALOG NUMBER: HCDJBL3040CSD-HCD81TRMW-4000lm-5000K

CANDELA DISTRIBUTION (continued):

	247.5°	270°	292.5°	315°	337.5°	360°
90°	0.0	0.0	0.0	0.0	0.0	0.0



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— 0°-180° - - 45°-225° - - - - 90°-270° - · - · 135°-315°

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21.5°	2042.5	2053.5	2058.4	2056.8	2052.3	2042.1	2027.4	2011.0	1995.9	1982.8	1976.3
22°	2034.7	2046.2	2050.7	2049.5	2045.0	2034.3	2019.2	2002.8	1987.3	1974.2	1966.9



44°	1476.2	1496.2	1507.2	1507.6	1504.4	1488.4	1463.9	1436.1	1407.9	1384.2	1372.7
44.5°	1459.0	1478.6	1490.1	1491.3	1488.4	1471.3	1447.1	1419.3	1391.5	1367.8	1355.9



66.5°	171.3	189.3	196.3	200.0	211.0	202.4	188.1	171.3	155.8	151.3	152.9
67°	146.0	163.2	169.3	172.6	182.8	175.8	163.6	150.1	132.9	131.3	133.7



89°	0.0	0.4	0.4	0.4	0.8	0.4	0.4	0.4	0.0	0.0	0.0
89.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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21.5°	1976.7	1977.9	1990.2	2007.7	2026.1	2042.5
22°	1967.3	1968.5	1981.2	1998.7	2018.0	2034.7



44°	1370.7	1371.5	1391.1	1420.6	1450.4	1476.2
44.5°	1354.3	1354.7	1373.9	1403.8	1433.6	1459.0



66.5°	154.6	145.2	143.5	150.5	163.2	171.3
67°	136.6	131.7	130.0	136.2	141.1	146.0

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89°	0.0	0.0	0.0	0.0	0.0	0.0
89.5°	0.0	0.0	0.0	0.0	0.0	0.0

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(END OF REPORT)