LM-79-08 Test Report

For

Revolution Lighting Technologies, Inc.

(Brand Name: Revolution Lighting)

2280 Ward Ave. Simi Valley, CA. 93065

Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

Model name(s): 1130SD-35T

Remark:S represents Sensor Options,can be 1 =N/A, 2 = 7-Pin Photocell, 9 = 3-Pin Photocell
T represents CCT,can be 2=4000K,4=5000K

Representative (Tested) Model: 1130SD-352
1130SD-354

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Grace Li

Engineer: Grace Li
Date:April.09,2018

Review By:

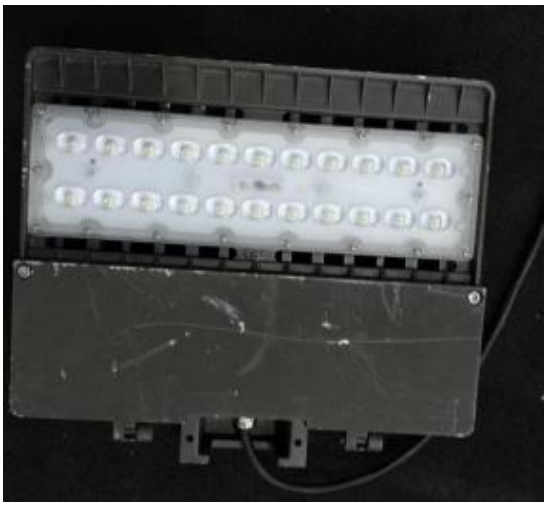
Tommy Liang

Manager: Tommy Liang

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name	Revolution Lighting	
Model Number	1130SD-35T	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	100-277Vac, 50/60 Hz	
Nominal Power	62W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	BLC1803017E-B1(4000K),B2(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	April.04,2018
Date of Test	April.08,2018
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	BL-QP-033

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method: Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.
2) Chromaticity Measurement – Sphere-Spectroradiometer Method: Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.
3) Electrical Measurements: Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25º C ± 1º C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

Certificate#4810.01

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2018-4-8	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	1130SD-352		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180301 7E-B1	120.0	60	0.5259	62.93	0.9972	5.03
	277.0	60	0.2273	61.17	0.9716	13.62
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3906
Duv	-0.00035
Chromaticity (x, y)	x=0.3844 y=0.3784
Chromaticity (u', v')	u(u')=0.2271 v'=0.5029
Color Rendering Index (CRI)	72.2
R9	0

Special Color Rendering Indices			
R1	70	R9	0
R2	78	R10	48
R3	84	R11	69
R4	73	R12	45
R5	70	R13	71
R6	69	R14	91
R7	80	R15	64
R8	55	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	8611	8600	5000-10000(-10%)
Luminous Efficacy (lm/W)	136.83	140.59	Premium: >= 115(-3%)
Most worst Luminous/Highest Watts	136.66		
Zonal lumens in the 0-90° zone (%)	99.7	--	>=100(-1)
Zonal lumens in the 80-90° zone (%)	0.2	--	<=10(+3)
Beam Angle (°)	122.8	--	--
Center Beam Candle Power (cd)	1763	--	--

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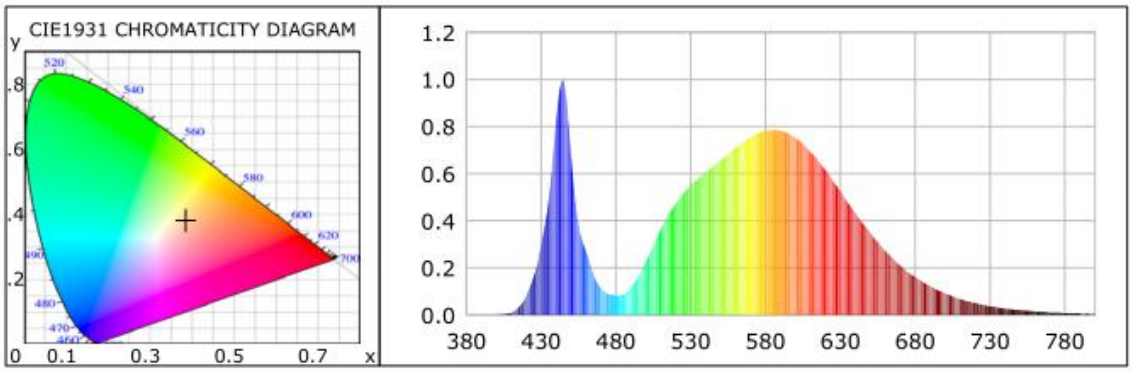
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

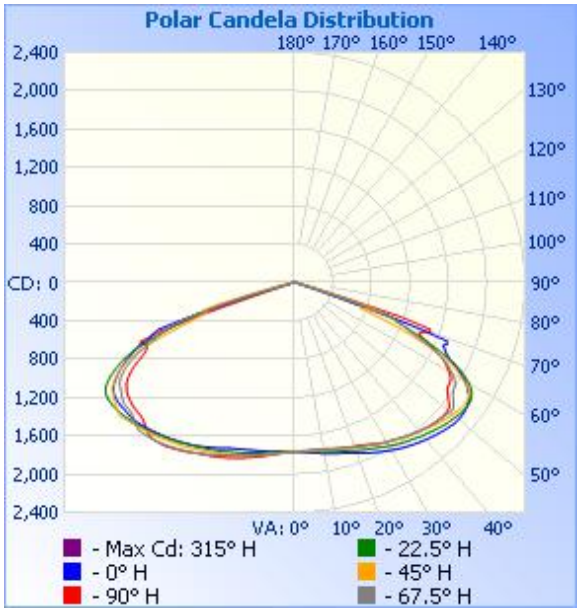
Zonal Lumen Summary

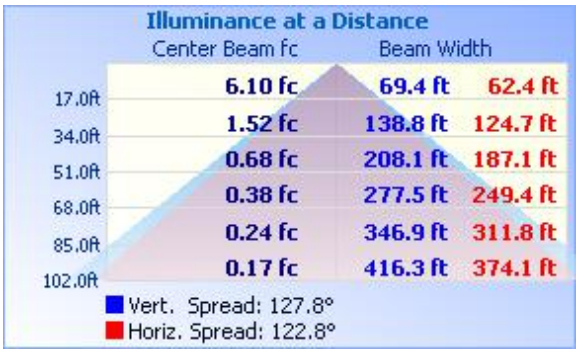
Zone	Lumens	% Lamp	% Luminaire
0-30	1,583.9	18.4%	18.4%
0-40	2,866.0	33.3%	33.3%
0-60	6,469.9	75.1%	75.1%
60-90	2,111.1	24.5%	24.5%
70-100	429.7	5%	5%
90-120	15.1	0.2%	0.2%
0-90	8,581.0	99.7%	99.7%
90-180	29.3	0.3%	0.3%
0-180	8,610.3	100%	100%

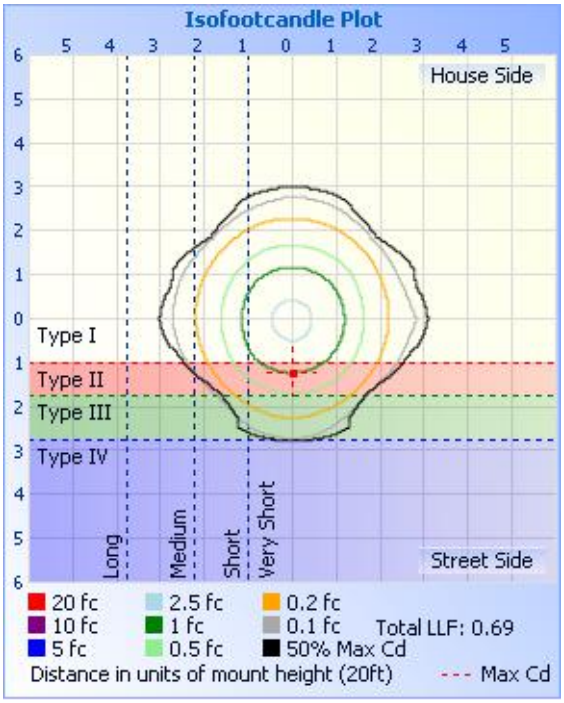
Lumens Per Zone

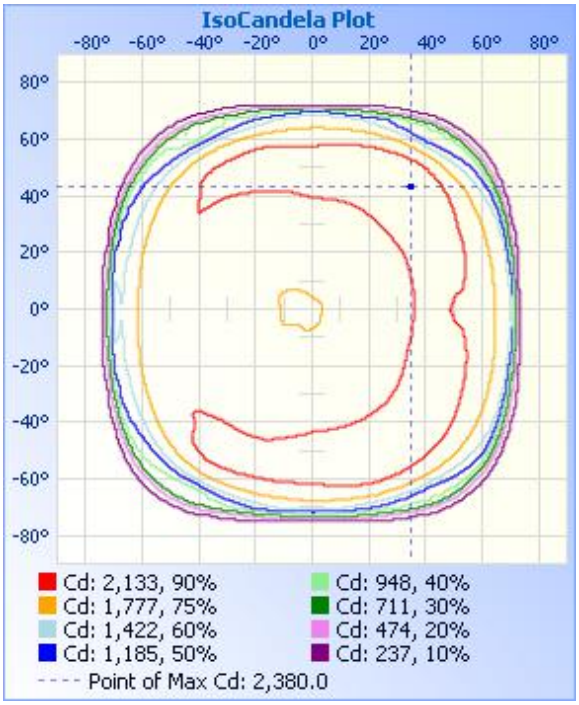
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	170.2	2.0%	90-100	5.8	0.1%
10-20	521.1	6.1%	100-110	4.6	0.1%
20-30	892.6	10.4%	110-120	4.7	0.1%
30-40	1,282.0	14.9%	120-130	4.3	0%
40-50	1,662.8	19.3%	130-140	3.4	0%
50-60	1,941.2	22.5%	140-150	2.8	0%
60-70	1,687.2	19.6%	150-160	2.1	0%
70-80	406.7	4.7%	160-170	1.2	0%
80-90	17.2	0.2%	170-180	0.4	0%

Photometric Data









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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763
1	1765	1764	1763	1760	1762	1760	1762	1762	1762	1762	1764	1765	1766	1766	1765	1764	1765
2	1767	1765	1763	1759	1762	1760	1763	1762	1763	1763	1768	1769	1770	1770	1768	1766	1767
3	1771	1766	1762	1757	1763	1760	1766	1764	1765	1766	1774	1775	1776	1775	1772	1770	1771
4	1775	1768	1763	1756	1762	1761	1768	1767	1769	1770	1780	1780	1784	1781	1777	1774	1775
5	1780	1770	1763	1756	1762	1761	1771	1768	1772	1775	1786	1786	1793	1789	1782	1779	1780
6	1786	1774	1763	1757	1761	1761	1773	1770	1775	1779	1792	1793	1800	1797	1789	1784	1786
7	1792	1778	1765	1757	1762	1762	1777	1773	1779	1783	1799	1802	1809	1806	1795	1790	1792
8	1798	1782	1766	1759	1764	1764	1781	1777	1781	1789	1806	1809	1818	1814	1803	1795	1798
9	1805	1788	1770	1760	1767	1766	1786	1782	1784	1796	1813	1817	1827	1823	1810	1801	1805
10	1812	1794	1774	1762	1771	1769	1792	1786	1786	1803	1822	1825	1837	1831	1818	1806	1812
11	1818	1799	1778	1767	1775	1771	1799	1790	1790	1811	1831	1833	1848	1839	1827	1812	1818
12	1825	1805	1782	1773	1779	1775	1803	1795	1794	1818	1839	1841	1859	1846	1835	1819	1825
13	1830	1811	1787	1778	1785	1779	1808	1801	1799	1826	1848	1851	1869	1854	1845	1825	1830
14	1837	1817	1792	1782	1789	1785	1813	1808	1804	1835	1855	1859	1880	1863	1854	1832	1837
15	1845	1824	1798	1788	1793	1792	1818	1815	1809	1844	1865	1868	1891	1873	1863	1839	1845
16	1853	1830	1805	1796	1796	1798	1824	1821	1816	1852	1874	1877	1902	1885	1874	1848	1853
17	1863	1838	1813	1803	1799	1804	1830	1827	1821	1859	1882	1886	1915	1894	1884	1858	1863
18	1873	1846	1821	1811	1805	1812	1836	1833	1828	1866	1890	1895	1925	1903	1892	1869	1873
19	1884	1855	1829	1819	1813	1818	1844	1839	1836	1874	1898	1907	1935	1913	1902	1878	1884
20	1895	1865	1836	1827	1820	1824	1851	1846	1844	1883	1907	1918	1946	1921	1910	1889	1895
21	1907	1875	1843	1837	1828	1829	1858	1854	1853	1892	1916	1929	1957	1931	1918	1900	1907
22	1920	1884	1850	1847	1833	1837	1867	1863	1865	1902	1928	1942	1968	1944	1926	1913	1920
23	1933	1895	1857	1856	1841	1844	1875	1872	1878	1911	1939	1955	1979	1955	1936	1927	1933
24	1945	1903	1865	1864	1852	1851	1880	1881	1892	1921	1947	1968	1988	1968	1945	1941	1945
25	1957	1912	1875	1873	1862	1857	1885	1892	1906	1932	1958	1983	2000	1982	1958	1953	1957
26	1969	1922	1883	1881	1876	1866	1893	1901	1918	1942	1968	1997	2011	1993	1972	1966	1969
27	1982	1933	1892	1892	1891	1875	1898	1910	1931	1952	1979	2012	2020	2006	1986	1977	1982
28	1995	1946	1901	1901	1905	1886	1906	1920	1945	1962	1990	2026	2029	2019	2001	1988	1995
29	2007	1957	1910	1910	1916	1897	1916	1929	1959	1972	2000	2040	2042	2033	2016	2000	2007

30	2019	1969	1922	1918	1926	1905	1925	1939	1974	1982	2011	2056	2055	2046	2031	2011	2019
31	2033	1981	1932	1927	1930	1916	1934	1948	1987	1995	2022	2069	2069	2057	2045	2024	2033
32	2046	1993	1943	1936	1940	1923	1943	1958	2002	2005	2035	2081	2087	2070	2058	2036	2046
33	2058	2006	1953	1946	1951	1930	1952	1967	2014	2016	2048	2093	2101	2082	2073	2049	2058
34	2069	2016	1964	1957	1964	1937	1961	1978	2025	2029	2060	2106	2114	2096	2086	2062	2069
35	2080	2027	1974	1967	1976	1944	1972	1989	2037	2042	2074	2121	2128	2111	2100	2074	2080
36	2092	2038	1986	1976	1986	1956	1983	2001	2050	2055	2083	2133	2140	2124	2114	2087	2092
37	2103	2047	1997	1987	1997	1968	1993	2014	2062	2068	2091	2145	2154	2138	2130	2101	2103
38	2114	2060	2005	1999	2006	1980	2004	2026	2075	2081	2105	2158	2168	2149	2145	2113	2114
39	2127	2072	2012	2011	2016	1990	2014	2038	2088	2093	2115	2169	2180	2159	2157	2127	2127
40	2137	2083	2023	2024	2024	2000	2024	2050	2100	2106	2128	2182	2189	2169	2173	2139	2137
41	2148	2092	2035	2035	2032	2011	2036	2062	2110	2119	2142	2194	2194	2181	2187	2150	2148
42	2158	2103	2047	2045	2043	2020	2046	2072	2122	2135	2154	2205	2200	2193	2202	2163	2158
43	2169	2115	2059	2054	2053	2029	2061	2082	2134	2149	2166	2213	2201	2208	2214	2176	2169
44	2180	2127	2075	2063	2060	2041	2073	2091	2146	2161	2177	2222	2195	2223	2233	2188	2180
45	2190	2139	2092	2071	2067	2050	2084	2102	2158	2175	2188	2228	2180	2233	2252	2200	2190
46	2200	2151	2104	2079	2074	2057	2097	2111	2169	2188	2201	2236	2161	2232	2272	2212	2200
47	2209	2162	2112	2086	2080	2066	2111	2121	2180	2199	2213	2234	2144	2221	2296	2222	2209
48	2218	2170	2121	2090	2082	2071	2125	2131	2191	2213	2225	2224	2130	2207	2312	2231	2218
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53	2224	2211	2174	2075	2006	2098	2179	2162	2215	2268	2288	2178	2120	2176	2380	2270	2224
54	2217	2214	2180	2042	1972	2081	2190	2167	2219	2276	2282	2183	2111	2178	2376	2273	2217
55	2207	2214	2181	2017	1944	2046	2201	2174	2221	2283	2269	2178	2105	2171	2356	2271	2207
56	2194	2212	2179	2000	1932	2013	2210	2180	2223	2290	2255	2166	2098	2156	2325	2264	2194
57	2171	2199	2172	1990	1930	1987	2217	2185	2221	2292	2241	2148	2088	2133	2290	2250	2171
58	2136	2180	2148	1975	1918	1975	2218	2189	2216	2291	2226	2134	2065	2105	2262	2223	2136
59	2095	2146	2101	1944	1897	1967	2215	2186	2201	2288	2213	2122	2043	2080	2226	2185	2095
60	2048	2099	2029	1899	1860	1947	2203	2169	2179	2275	2194	2104	2009	2048	2180	2135	2048
61	1990	2034	1961	1851	1819	1907	2169	2144	2147	2250	2157	2076	1965	2004	2118	2069	1990

62	1927	1963	1890	1795	1780	1859	2109	2105	2105	2211	2109	2034	1911	1949	2026	1999	1927
63	1858	1875	1787	1719	1727	1802	2027	2055	2057	2154	2058	1985	1846	1871	1908	1923	1858
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67	1681	1381	1089	1308	1430	1444	1553	1715	1808	1821	1655	1661	1669	1468	1203	1492	1681
68	1715	1258	872	1238	1404	1315	1382	1591	1749	1658	1466	1572	1700	1377	1003	1385	1715
69	1698	1140	736	1175	1432	1208	1156	1511	1601	1510	1270	1487	1722	1248	909	1298	1698
70	1240	1115	823	1067	1509	1105	930	1412	1575	1350	1108	1411	1481	1099	1024	1239	1240
71	528	976	977	912	1486	1024	789	1280	1500	1194	977	1275	962	909	1057	926	528
72	149	574	777	651	1161	965	805	1083	1091	1094	956	1074	388	613	735	512	149
73	80	289	441	364	602	872	953	822	573	905	1003	793	146	346	428	243	80
74	61	177	271	214	205	602	843	483	245	547	820	481	81	205	258	149	61
75	52	110	182	130	94	354	514	232	92	270	494	250	60	137	172	94	52
76	46	70	122	91	62	217	303	110	60	133	285	149	45	99	119	66	46
77	41	51	88	70	49	143	195	67	47	70	177	106	39	76	85	47	41
78	34	41	64	57	43	101	134	52	41	55	118	77	34	60	63	37	34
79	28	31	48	46	37	77	84	42	35	44	80	62	31	50	45	29	28
80	24	26	35	38	33	63	48	33	25	36	49	51	27	44	34	24	24
81	19	21	29	32	30	53	38	24	22	26	34	41	24	35	26	19	19
82	15	17	23	27	26	42	32	20	17	21	28	34	21	27	21	15	15
83	14	14	17	22	23	31	24	15	14	16	24	29	17	21	16	13	14
84	12	11	14	19	20	24	18	12	13	12	17	22	15	18	11	11	12
85	10	11	11	15	17	19	13	10	10	11	13	17	13	13	10	10	10
86	9	8	9	11	14	15	11	9	11	10	11	14	10	11	9	8	9
87	9	9	8	9	10	13	10	9	10	9	8	10	9	9	7	8	9
88	8	7	7	8	10	10	9	8	9	9	8	8	7	8	8	7	8
89	8	7	6	7	6	10	9	6	9	7	8	8	7	8	8	7	8
90	6	7	6	7	8	8	8	7	8	7	7	7	6	7	5	6	6
91	6	7	6	6	6	7	6	6	7	6	7	7	6	8	6	6	6
92	6	5	5	6	6	6	6	6	7	6	6	5	6	6	6	5	6
93	6	5	6	5	5	6	7	5	6	6	6	6	5	7	6	5	6

94	7	5	6	5	6	6	7	5	7	5	6	6	5	6	5	5	7
95	4	4	5	5	5	5	5	5	6	6	5	5	4	5	5	2	4
96	6	5	5	5	5	5	6	5	6	5	6	5	4	5	5	4	6
97	4	3	5	4	5	5	4	5	5	5	5	5	4	6	5	5	4
98	4	4	4	5	4	6	6	4	7	3	5	4	5	5	3	3	4
99	4	3	4	4	5	5	6	5	5	4	5	5	4	6	4	4	4
100	4	3	5	4	3	5	4	4	5	4	5	5	4	5	5	4	4
101	4	4	4	4	4	6	5	4	6	4	4	5	4	4	4	3	4
102	5	4	4	4	5	5	5	4	5	4	5	5	3	5	4	3	5
103	5	5	4	4	5	5	5	4	5	5	5	5	3	5	4	3	5
104	4	4	4	4	5	5	5	4	5	5	5	4	3	5	3	3	4
105	5	3	3	3	5	6	5	3	6	5	5	5	4	5	4	3	5
106	4	3	4	4	4	6	4	4	5	4	5	5	2	4	4	3	4
107	4	4	4	4	4	6	5	4	6	4	3	5	3	5	4	4	4
108	5	4	3	4	5	5	5	4	6	5	5	5	4	5	4	3	5
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Certificate#4810.01

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2018-4-8	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	1130SD-354		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180301 7E-B2	120.0	60	0.5233	62.59	0.9967	5.49
	277.0	60	0.2287	61.36	0.9685	13.54
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

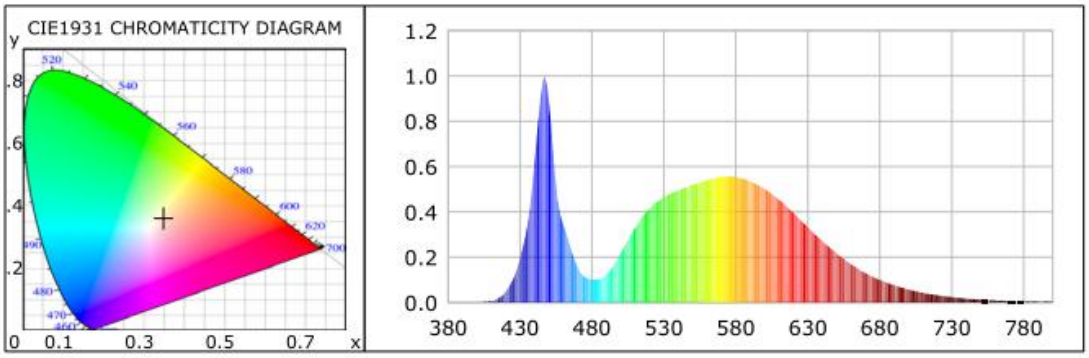
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4891
Duv	0.00112
Chromaticity (x, y)	x=0.3485 y=0.3566
Chromaticity (u', v')	u(u')=0.2118 v'=0.4876
Color Rendering Index (CRI)	73.9
R9	0

Special Color Rendering Indices			
R1	72	R9	0
R2	78	R10	48
R3	83	R11	72
R4	75	R12	44
R5	72	R13	72
R6	70	R14	90
R7	82	R15	67
R8	60	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	8701.89	8751.16	5000-10000(-10%)
Luminous Efficacy (lm/W)	139.03	142.62	Premium: >= 115(-3%)
Most worst Luminous/Highest Watts	139.03		

Spectral Power Distribution & Chromaticity Diagram



3. Test Equipment

Equipment Name	Model No.	Serial No.	Next Calibration Date
Goniophotometeric System	GPM-3000	DYHXF120001	2019-01-15
AC Power Source	CHP-500C	N/A	2019-01-14
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2019-01-22
Digital Power Meter	WT500	DYDWQ200006	2019-01-14
Integral Sphere (2M)	2M	DYJCE120067	2019-01-15
Digital Power Meter	WT500	DYDWQ200006	2019-01-14
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2019-01-15
Expand Uncertainty: Photometric Measurement (Sphere): 2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.7%, k=2			

******** END OF REPORT ********