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): 1130SG-33T

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: 1130SG-332
1130SG-334

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:

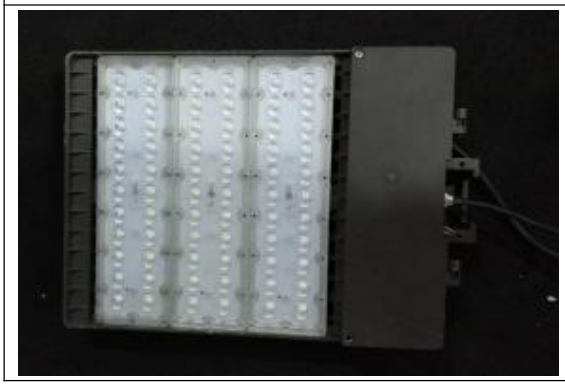
Tommy Liang

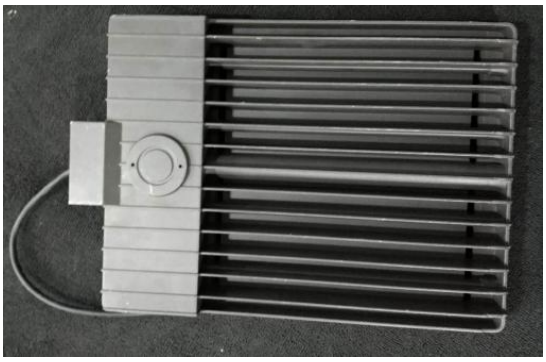
Manager: Tommy Liang

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name	Revolution Lighting	
Model Number	1130SG-33T	
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	215W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	BLC1803017E-J1(4000K),J2(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo





Certificate#4810.01

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.

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	1130SG-332		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180301 7E-J1	120.0	60	1.8014	214.79	0.9936	5.27
	277.0	60	0.8714	216.94	0.8988	14.07
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

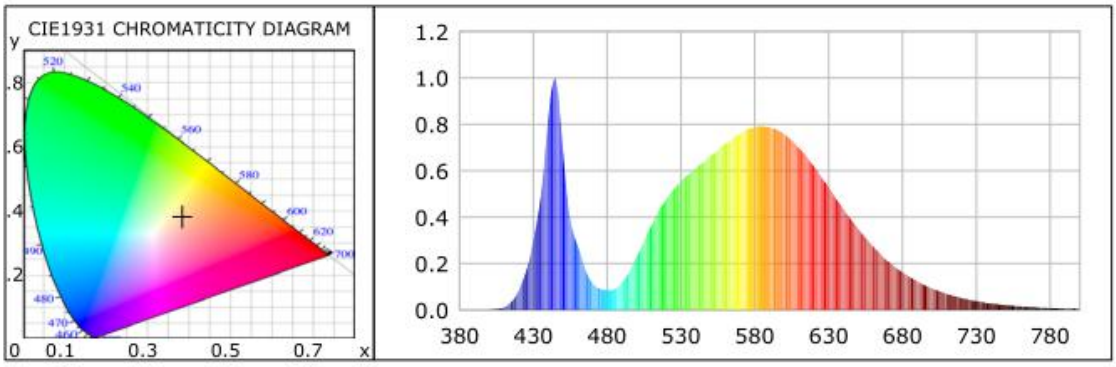
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3910
Duv	-0.00037
Chromaticity (x, y)	x=0.3842 y=0.3783
Chromaticity (u', v')	u(u')=0.2270 v'=0.5028
Color Rendering Index (CRI)	72.2
R9	0

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)	27192.7	27720.7	>=10000(-10%)
Luminous Efficacy (lm/W)	126.60	127.78	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	125.35		
Zonal lumens in the 0-90° zone (%)	99.6	--	>=100(-1)
Zonal lumens in the 80-90° zone (%)	1.8	--	<=10(+3)
Beam Angle (°)	143.4	--	--
Center Beam Candle Power (cd)	6506	--	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

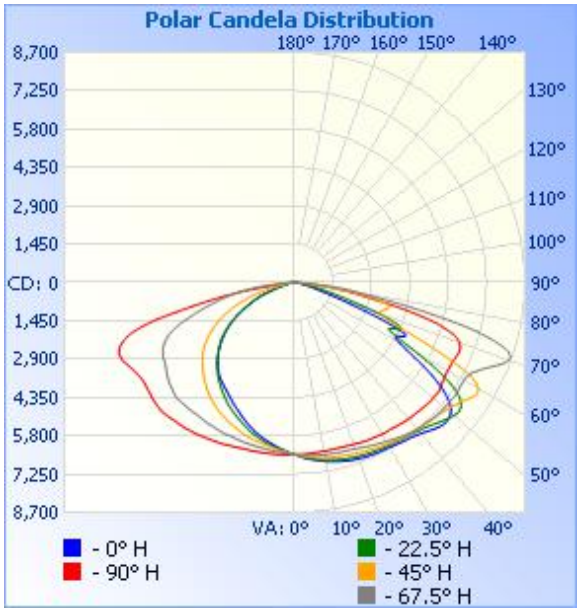
Zonal Lumen Summary

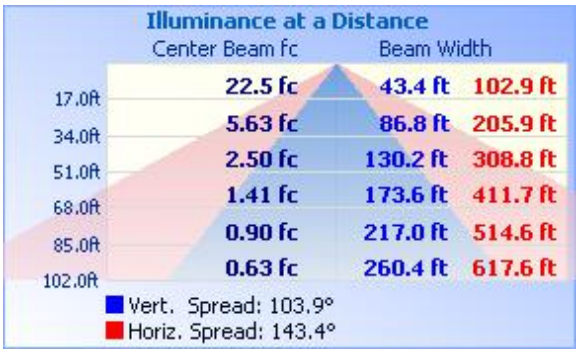
Zone	Lumens	% Lamp	% Luminaire
0-30	5,400.5	19.9%	19.9%
0-40	9,357.8	34.4%	34.4%
0-60	19,398.8	71.3%	71.3%
60-90	7,682.7	28.3%	28.3%
70-100	3,208.9	11.8%	11.8%
90-120	61.9	0.2%	0.2%
0-90	27,081.5	99.6%	99.6%
90-180	109.5	0.4%	0.4%
0-180	27,190.9	100%	100%

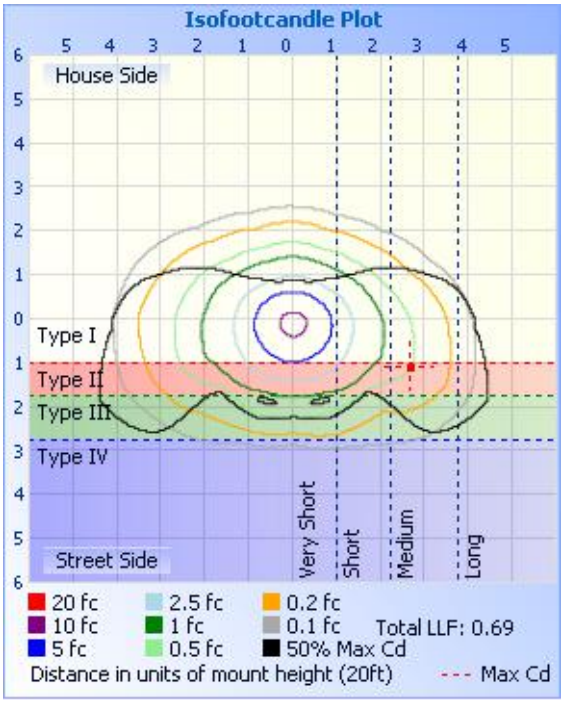
Lumens Per Zone

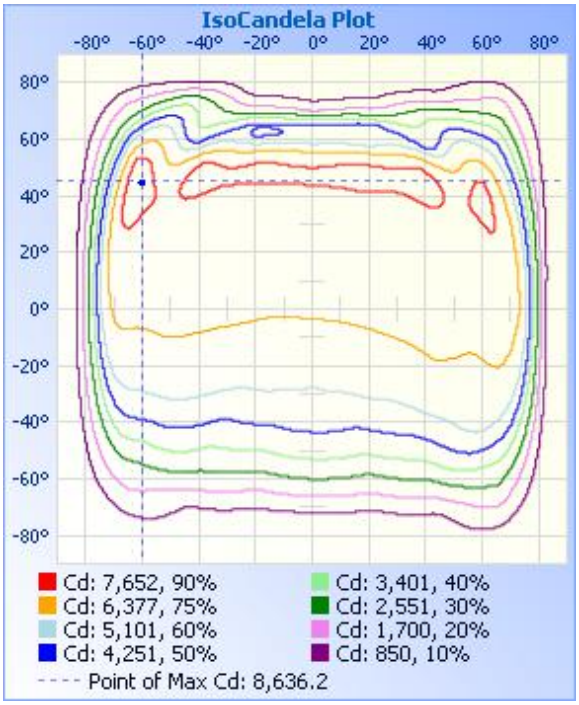
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	620.1	2.3%	90-100	25.3	0.1%
10-20	1,829.0	6.7%	100-110	19.8	0.1%
20-30	2,951.3	10.9%	110-120	16.8	0.1%
30-40	3,957.3	14.6%	120-130	14.5	0.1%
40-50	4,821.3	17.7%	130-140	11.0	0%
50-60	5,219.7	19.2%	140-150	9.1	0%
60-70	4,499.2	16.5%	150-160	7.1	0%
70-80	2,694.7	9.9%	160-170	4.3	0%
80-90	488.8	1.8%	170-180	1.5	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	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506	6506
1	6548	6535	6532	6516	6509	6486	6475	6474	6468	6473	6475	6492	6516	6522	6534	6547	6548
2	6589	6570	6555	6534	6504	6465	6444	6437	6428	6438	6448	6476	6522	6537	6563	6585	6589
3	6632	6607	6580	6545	6506	6447	6416	6403	6391	6412	6422	6468	6526	6552	6591	6613	6632
4	6670	6643	6604	6558	6501	6429	6381	6365	6347	6372	6393	6451	6529	6569	6616	6649	6670
5	6710	6675	6630	6567	6492	6410	6353	6326	6301	6335	6368	6445	6530	6578	6647	6680	6710
6	6740	6703	6651	6581	6486	6386	6324	6282	6256	6300	6342	6431	6533	6588	6668	6714	6740
7	6772	6733	6675	6589	6484	6370	6290	6240	6207	6271	6317	6421	6534	6605	6692	6747	6772
8	6801	6758	6694	6598	6476	6350	6262	6199	6162	6234	6295	6411	6538	6615	6717	6780	6801
9	6832	6786	6711	6604	6475	6331	6231	6162	6120	6199	6269	6402	6538	6628	6737	6806	6832
10	6867	6816	6720	6610	6471	6309	6202	6119	6070	6161	6242	6390	6546	6637	6752	6833	6867
11	6896	6838	6738	6621	6477	6297	6173	6076	6022	6121	6222	6375	6548	6648	6772	6862	6896
12	6921	6856	6757	6623	6472	6283	6145	6034	5977	6076	6198	6368	6553	6658	6790	6886	6921
13	6944	6880	6771	6634	6476	6269	6111	5984	5927	6028	6173	6359	6560	6673	6804	6910	6944
14	6972	6901	6785	6637	6473	6253	6087	5939	5875	5981	6155	6360	6566	6687	6819	6935	6972
15	6993	6923	6800	6647	6476	6242	6059	5896	5827	5940	6132	6346	6569	6699	6833	6954	6993
16	7018	6948	6812	6652	6481	6231	6028	5846	5764	5900	6109	6345	6569	6709	6843	6976	7018
17	7043	6953	6825	6657	6490	6221	5989	5800	5701	5854	6082	6337	6577	6718	6861	6987	7043
18	7061	6970	6838	6672	6495	6210	5958	5741	5646	5799	6059	6333	6591	6730	6871	7007	7061
19	7076	6984	6852	6679	6504	6200	5924	5694	5591	5747	6025	6319	6598	6740	6881	7017	7076
20	7086	7004	6870	6696	6514	6189	5882	5643	5526	5695	5999	6314	6615	6753	6894	7032	7086
21	7107	7017	6884	6712	6523	6170	5839	5584	5464	5638	5966	6305	6629	6766	6901	7043	7107
22	7119	7028	6902	6732	6542	6154	5802	5531	5401	5587	5939	6296	6644	6782	6914	7053	7119
23	7128	7036	6915	6758	6555	6146	5769	5478	5338	5537	5902	6292	6666	6800	6921	7064	7128
24	7137	7044	6933	6785	6568	6136	5723	5421	5287	5480	5873	6293	6682	6824	6927	7075	7137
25	7149	7056	6948	6810	6576	6129	5680	5370	5232	5437	5840	6294	6698	6842	6933	7089	7149
26	7160	7070	6964	6840	6583	6117	5639	5322	5164	5379	5808	6291	6709	6867	6945	7102	7160
27	7161	7087	6989	6862	6589	6105	5589	5265	5113	5328	5767	6279	6717	6886	6952	7107	7161
28	7172	7094	7004	6888	6596	6088	5544	5210	5057	5282	5735	6272	6736	6916	6973	7122	7172
29	7180	7101	7023	6914	6603	6070	5498	5149	4999	5216	5697	6260	6755	6943	6988	7129	7180

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30	7193	7112	7043	6942	6615	6053	5452	5094	4944	5156	5658	6255	6772	6972	6992	7142	7193
31	7215	7122	7067	6970	6633	6040	5400	5041	4885	5102	5620	6252	6789	7003	7018	7150	7215
32	7227	7137	7089	7005	6633	6022	5346	4983	4838	5035	5577	6250	6806	7024	7032	7167	7227
33	7247	7148	7104	7035	6630	6008	5284	4929	4793	4975	5525	6239	6826	7050	7053	7182	7247
34	7270	7166	7129	7069	6640	5992	5221	4867	4748	4915	5485	6232	6835	7085	7067	7200	7270
35	7294	7182	7152	7096	6650	5982	5159	4797	4709	4843	5445	6223	6851	7114	7084	7222	7294
36	7313	7202	7170	7124	6672	5962	5093	4732	4664	4777	5395	6220	6870	7148	7104	7250	7313
37	7336	7223	7190	7155	6684	5946	5037	4666	4622	4723	5339	6217	6891	7185	7119	7286	7336
38	7369	7251	7211	7177	6700	5924	4975	4594	4578	4659	5279	6225	6898	7219	7139	7314	7369
39	7409	7278	7227	7204	6714	5909	4906	4514	4520	4589	5230	6226	6904	7251	7158	7354	7409
40	7450	7310	7250	7220	6718	5892	4832	4445	4463	4517	5174	6228	6912	7287	7185	7396	7450
41	7498	7338	7265	7231	6729	5877	4754	4375	4394	4441	5115	6224	6918	7312	7211	7444	7498
42	7556	7385	7282	7249	6738	5848	4687	4297	4322	4372	5056	6227	6935	7338	7238	7504	7556
43	7614	7432	7305	7267	6745	5825	4607	4218	4254	4287	4994	6232	6954	7360	7273	7576	7614
44	7670	7481	7328	7290	6759	5804	4540	4143	4177	4215	4933	6233	6971	7382	7311	7637	7670
45	7724	7540	7350	7311	6767	5784	4470	4063	4098	4131	4872	6233	6983	7414	7357	7692	7724
46	7764	7609	7366	7334	6780	5755	4392	3978	4020	4053	4812	6226	6991	7436	7400	7759	7764
47	7785	7663	7383	7345	6804	5721	4323	3887	3942	3968	4747	6207	6988	7455	7448	7820	7785
48	7787	7723	7411	7358	6814	5686	4245	3786	3856	3874	4669	6176	6972	7463	7501	7894	7787
49	7765	7787	7449	7374	6823	5645	4165	3691	3777	3789	4606	6134	6955	7461	7554	7941	7765
50	7700	7842	7498	7386	6820	5600	4090	3601	3674	3698	4542	6104	6942	7456	7615	7959	7700
51	7608	7886	7548	7392	6816	5556	4010	3491	3572	3612	4476	6079	6930	7457	7695	7955	7608
52	7457	7897	7600	7395	6828	5502	3931	3393	3475	3515	4398	6041	6905	7453	7776	7913	7457
53	7234	7867	7665	7402	6830	5448	3846	3283	3368	3408	4314	6000	6879	7453	7867	7821	7234
54	6969	7778	7726	7413	6817	5389	3751	3161	3253	3293	4231	5950	6866	7445	7951	7664	6969
55	6623	7633	7800	7421	6781	5322	3652	3042	3140	3173	4143	5898	6845	7418	8030	7432	6623
56	6244	7393	7885	7416	6736	5258	3556	2927	3030	3051	4043	5856	6833	7402	8087	7099	6244
57	5806	7037	7982	7400	6717	5180	3463	2800	2910	2941	3945	5814	6828	7399	8099	6659	5806
58	5348	6561	8054	7397	6696	5095	3358	2654	2786	2798	3836	5769	6837	7419	8049	6134	5348
59	4919	6032	8079	7390	6687	4986	3253	2522	2648	2670	3725	5744	6859	7435	7890	5614	4919
60	4594	5408	8024	7394	6680	4891	3155	2390	2500	2535	3612	5719	6884	7482	7593	5033	4594
61	4373	4836	7860	7410	6678	4776	3055	2247	2357	2388	3485	5685	6916	7541	7172	4573	4373

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62	4334	4350	7539	7455	6675	4655	2934	2103	2218	2255	3361	5645	6953	7621	6528	4259	4334
63	4473	4035	7006	7522	6679	4526	2821	1966	2078	2120	3232	5590	7008	7720	5780	4190	4473
64	4647	3983	6281	7653	6695	4394	2695	1820	1925	1988	3100	5514	7053	7833	5062	4365	4647
65	4601	4139	5550	7784	6710	4247	2558	1694	1791	1854	2955	5429	7102	7947	4333	4650	4601
66	4187	4323	4832	7941	6731	4070	2420	1562	1671	1709	2794	5324	7145	8030	3897	4733	4187
67	3547	4365	4237	8124	6753	3909	2257	1428	1532	1573	2645	5197	7158	8068	3626	4468	3547
68	2893	4168	3821	8318	6744	3742	2099	1304	1394	1440	2483	5049	7156	8025	3531	3974	2893
69	2271	3789	3583	8493	6705	3557	1932	1187	1210	1308	2320	4858	7107	7866	3548	3355	2271
70	1813	3244	3463	8607	6629	3352	1766	1035	1041	1172	2139	4655	7011	7563	3599	2798	1813
71	1424	2698	3430	8636	6501	3153	1572	876	899	1006	1953	4370	6865	7134	3660	2261	1424
72	1152	2215	3467	8496	6291	2968	1410	760	768	848	1777	4112	6664	6625	3673	1841	1152
73	959	1842	3543	8207	5959	2754	1235	667	651	725	1601	3845	6377	6136	3591	1524	959
74	803	1508	3635	7687	5579	2575	1066	565	548	620	1402	3581	5963	5605	3363	1249	803
75	679	1225	3694	7110	5035	2389	864	484	480	521	1213	3352	5390	5123	3049	1013	679
76	580	1022	3677	6266	4413	2208	693	423	422	442	1022	3102	4632	4707	2660	833	580
77	488	826	3556	5303	3773	2047	591	374	372	391	827	2887	3922	4340	2225	680	488
78	420	669	3333	4480	3130	1888	485	336	342	345	667	2657	3293	3943	1816	554	420
79	369	539	3037	3638	2638	1709	405	294	300	298	529	2429	2702	3510	1427	460	369
80	309	460	2569	2986	2244	1521	344	253	255	266	427	2167	2145	3088	1104	393	309
81	264	378	2028	2433	1863	1315	281	212	211	221	345	1906	1461	2649	851	329	264
82	207	303	1501	2111	1439	1074	249	182	176	184	296	1644	917	2303	651	256	207
83	163	233	1038	1766	1032	756	197	154	154	150	233	1373	609	2034	488	192	163
84	120	183	637	1327	720	564	154	110	119	125	183	1061	402	1717	340	159	120
85	90	130	371	853	506	393	121	107	104	116	137	705	282	1372	242	100	90
86	58	73	229	494	351	232	83	88	63	83	106	438	172	880	151	62	58
87	34	52	117	254	216	122	55	49	59	45	77	233	99	364	79	49	34
88	41	38	57	131	118	69	31	36	37	41	49	132	62	100	43	39	41
89	33	32	27	63	75	32	21	22	29	26	35	69	29	36	30	38	33
90	32	32	26	51	28	21	12	18	20	26	26	56	22	29	33	29	32
91	31	26	27	41	24	23	13	22	22	21	26	36	18	29	23	32	31
92	31	26	24	34	18	17	15	24	17	18	29	36	20	25	23	33	31
93	35	30	26	42	17	28	15	18	26	25	26	45	24	21	26	25	35

94	19	30	17	40	17	16	16	18	20	24	22	44	0	25	29	27	19
95	36	26	20	35	20	17	0	15	25	22	26	42	18	16	24	31	36
96	28	19	15	41	14	16	12	16	16	0	25	37	13	21	20	29	28
97	29	18	20	37	12	20	13	16	27	22	20	42	12	19	23	27	29
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104	25	20	13	26	12	19	16	22	23	20	24	39	0	18	19	23	25
105	21	21	0	32	12	15	15	25	22	15	23	36	0	18	16	19	21
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124	21	16	0	24	12	18	18	20	28	24	21	29	0	15	0	20	21
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157	15	19	0	25	0	17	14	22	20	20	16	23	15	16	15	16	15

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165	20	22	0	25	0	17	0	20	23	20	17	27	11	0	11	17	20
166	20	24	0	26	0	12	17	22	20	19	12	23	15	14	13	15	20
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177	16	19	16	27	0	13	13	13	18	19	14	24	0	16	18	21	16
178	21	18	11	24	0	15	12	16	22	19	12	24	11	13	14	22	21
179	21	18	0	25	0	14	16	16	21	20	16	24	0	16	17	19	21
180	19	16	0	20	0	0	19	13	24	21	13	23	15	14	19	20	19

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	1130SG-334		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180301 7E-J2	120.0	60	1.7983	214.31	0.9931	5.55
	277.0	60	0.8639	215.68	0.9013	14.39
				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)	4895
Duv	0.00103
Chromaticity (x, y)	x=0.3484 y=0.3563
Chromaticity (u', v')	u(u')=0.2118 v'=0.4874
Color Rendering Index (CRI)	74
R9	0

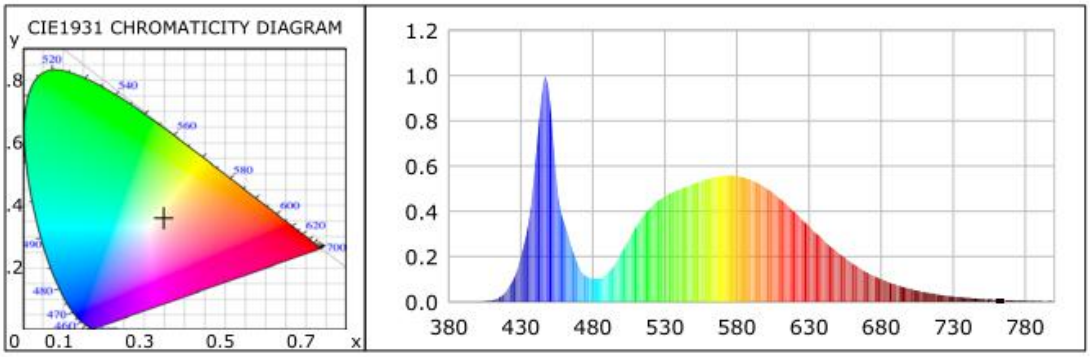
Special Color Rendering Indices			
R1	72	R9	0
R2	78	R10	48
R3	83	R11	72
R4	75	R12	44
R5	72	R13	72
R6	70	R14	90
R7	82	R15	67
R8	60	--	--

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)	27701.71	28003.89	>=10000(-10%)
Luminous Efficacy (lm/W)	129.26	129.84	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	128.44		

Certificate#4810.01

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 ********