LM-79-08 Test Report

For

DONGGUAN THAILIGHT SEMICONDCTOR LIGHTING CO.,LTD

(Brand Name: THAILIGHT)

Sanhui Ind. Area, Cunwei, Hengli, Dongguan, China.

Fuel Pump Canopy Luminaires

Model name(s): TLCLB60XYYZZ
Remark: X=CCT(4=4000K,5=5000K)
YY=Mounting Option(PD=Pendant, CL=Ceiling)
ZZ=Housing Color（use 2 digits to indicate all of color）

Representative (Tested) Model: TLCLB604PDZZ
TLCLB605PDZZ

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Update: Nov.03, 2016

Review By:

Tommy Liang

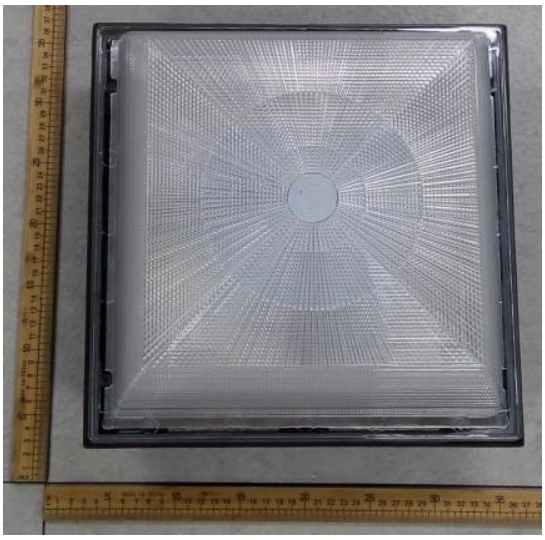
Manager: Tommy Liang

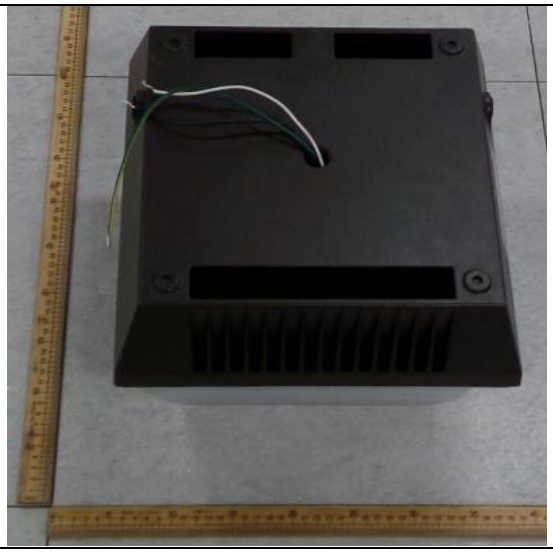
Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.1 Product Information:

Organization Name	DONGGUAN THAILIGHT SEMICONDCTOR LIGHTING CO.,LTD	
Brand Name	THAILIGHT	
Model Number	TLCLB60XYYZZ	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Fuel Pump Canopy Luminaires	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Philips Lumileds	
LED Model	L130-2780003000W21	
Sample Number	GZE161105-K1(4000K),K2(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	: Oct.31,2016
Date of Test	: Nov.01,2016
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	QD25

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 25 ºC ±1 ºC. 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 25 ºC ±1 ºC. 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 QD25)

Test date	2016-11-01	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	TLCLB604PDZZ		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161105-K1	120.0	60	0.5211	61.67	0.9863	13.28
	277.0	60	0.2462	62.39	0.9147	16.73
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

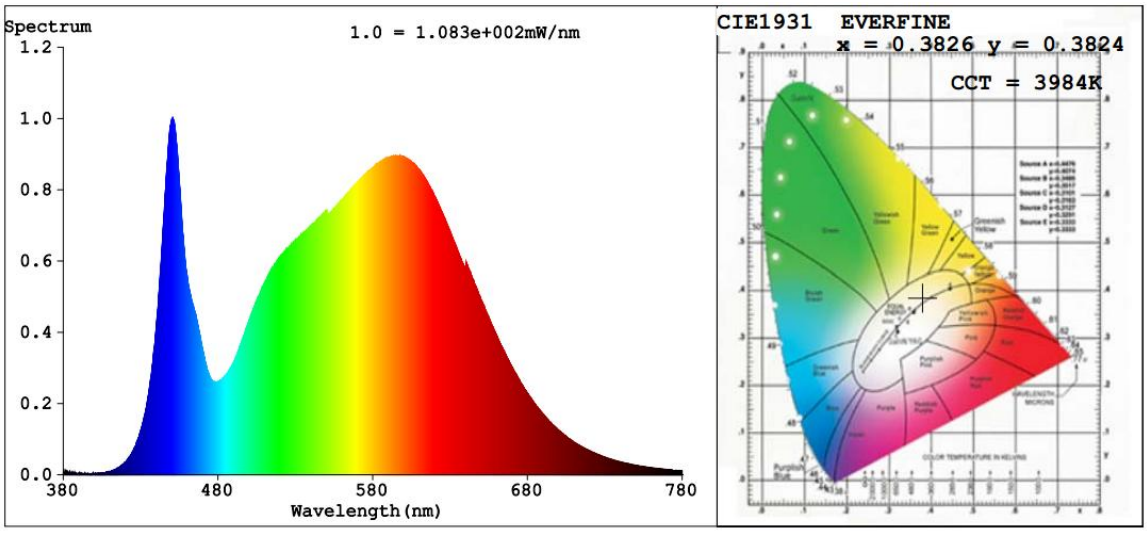
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3984
Duv	0.0020
Chromaticity (x, y)	x=0.3826 y=0.3824
Chromaticity (u', v')	u'=0.2243 v'=0.5044
Color Rendering Index (CRI)	83.4
R9	12

Special Color Rendering Indices			
R1	82	R9	12
R2	89	R10	74
R3	95	R11	82
R4	83	R12	61
R5	82	R13	83
R6	85	R14	97
R7	87	R15	76
R8	66	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7597.1	7566.1	>=2000 (-10%)	
Luminous Efficacy (lm/W)	123.19	121.27	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-40 °zone (%)	42.6	--	>=40(-3)	
Zonal lumens in the 40-70 °zone (%)	40.7	--	>=40(-3)	
Beam Angle ( )	106.7	--	--	
Center Beam Candle Power (cd)	2543	--	--	

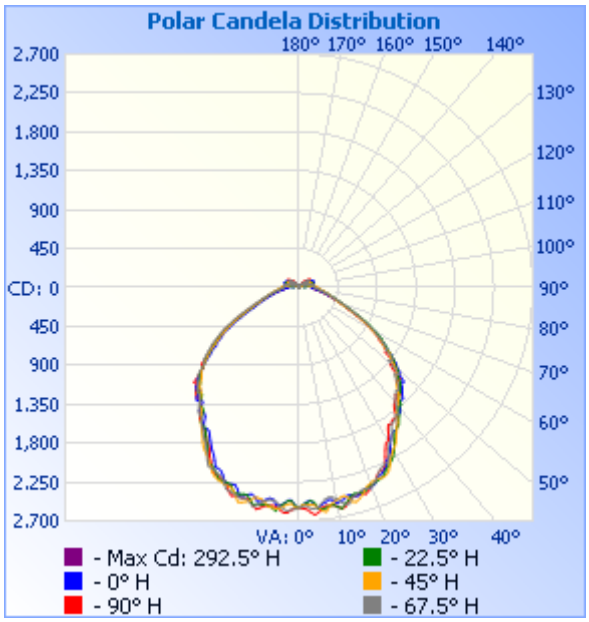
Spectral Power Distribution & Chromaticity Diagram

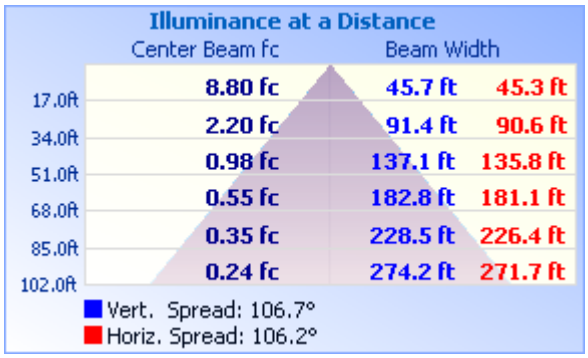


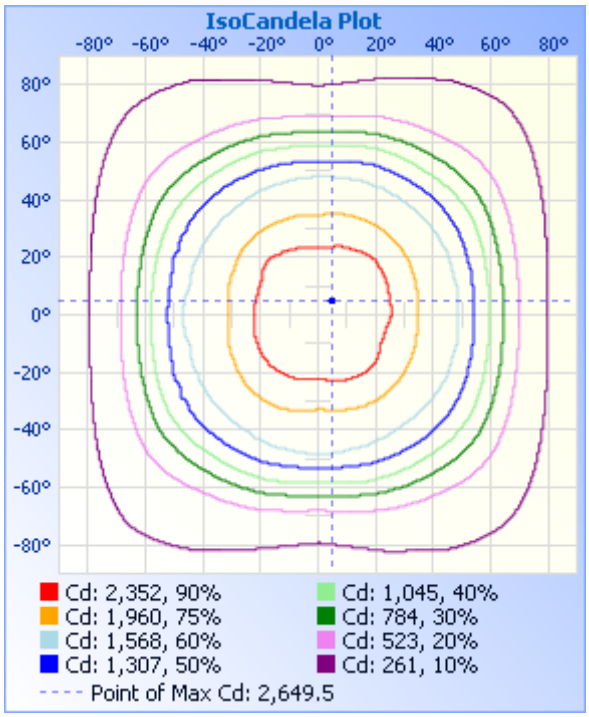
Zonal Lumen Tabulation

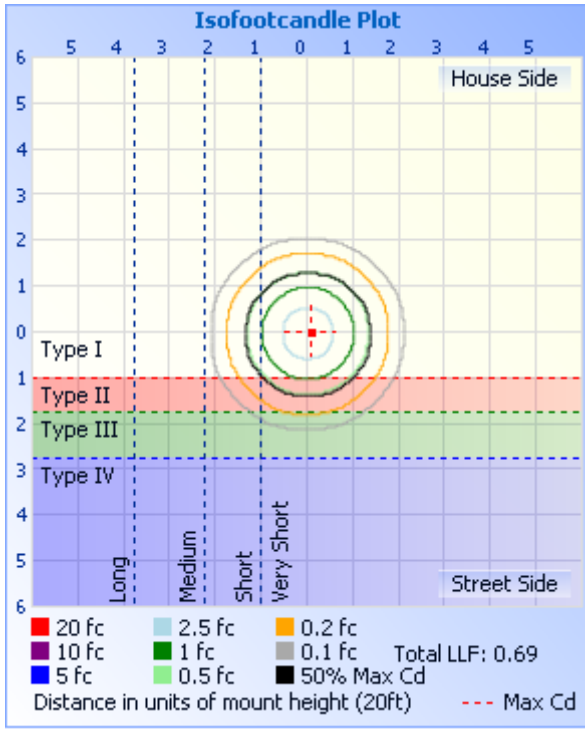
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,018.7	26.6%
0-40	3,239.1	42.6%
0-60	5,609.5	73.8%
60-90	1,378.9	18.2%
70-100	827.0	10.9%
90-120	431.3	5.7%
0-90	6,988.3	92%
90-180	608.2	8%
0-180	7,596.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	241.8	3.2%	90-100	170.4	2.2%
10-20	708.3	9.3%	100-110	137.8	1.8%
20-30	1,068.6	14.1%	110-120	123.2	1.6%
30-40	1,220.3	16.1%	120-130	102.1	1.3%
40-50	1,263.0	16.6%	130-140	50.6	0.7%
50-60	1,107.4	14.6%	140-150	17.9	0.2%
60-70	722.3	9.5%	150-160	4.5	0.1%
70-80	408.5	5.4%	160-170	1.2	0%
80-90	248.1	3.3%	170-180	0.5	0%


Polar Candela Distribution
180° 170° 160° 150° 140°
2,700
2,250
1,800
1,350
900
450
CD: 0
450
900
1,350
1,800
2,250
2,700
130°
120°
110°
100°
90°
80°
70°
60°
50°
VA: 0° 10° 20° 30° 40°
- Max Cd: 292.5° H
- 22.5° H
- 0° H
- 45° H
- 90° H
- 67.5° H


Illuminance at a Distance
Center Beam fc
Beam Width
17.0ft
34.0ft
51.0ft
68.0ft
85.0ft
102.0ft
8.80 fc 45.7 ft 45.3 ft
2.20 fc 91.4 ft 90.6 ft
0.98 fc 137.1 ft 135.8 ft
0.55 fc 182.8 ft 181.1 ft
0.35 fc 228.5 ft 226.4 ft
0.24 fc 274.2 ft 271.7 ft
Vert. Spread: 106.7°
Horiz. Spread: 106.2°


IsoCandela Plot
-80° -60° -40° -20° 0° 20° 40° 60° 80°
80°
60°
40°
20°
0°
-20°
-40°
-60°
-80°
Cd: 2,352, 90%
Cd: 1,045, 40%
Cd: 1,960, 75%
Cd: 784, 30%
Cd: 1,568, 60%
Cd: 523, 20%
Cd: 1,307, 50%
Cd: 261, 10%
Point of Max Cd: 2,649.5


Isofootcandle Plot
5 4 3 2 1 0 1 2 3 4 5
House Side
Type I
Type II
Type III
Type IV
Long
Medium
Short
Very Short
Street Side
20 fc
2.5 fc
0.2 fc
10 fc
1 fc
0.1 fc
Total LLF: 0.69
5 fc
0.5 fc
50% Max Cd
Distance in units of mount height (20ft)
Max Cd

γ (DEG) \ C (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543	2543
5	2578	2543	2574	2586	2560	2561	2550	2547	2608	2559	2562	2532	2524	2537	2561	2540
10	2586	2550	2504	2599	2533	2575	2492	2477	2572	2514	2467	2564	2511	2554	2487	2530
15	2524	2516	2584	2490	2495	2467	2565	2492	2499	2490	2547	2495	2492	2470	2572	2519
20	2430	2498	2472	2444	2454	2428	2408	2454	2434	2431	2451	2401	2416	2401	2435	2475
25	2354	2384	2402	2357	2321	2351	2388	2276	2321	2297	2342	2293	2289	2316	2364	2325
30	2094	2168	2228	2215	2109	2189	2169	2082	2049	2071	2142	2114	2049	2119	2178	2144
35	1946	1966	2042	2002	1967	1973	1968	1896	1870	1885	1941	1953	1922	1943	1966	1950
40	1789	1824	1824	1848	1816	1797	1773	1727	1722	1731	1764	1812	1735	1786	1777	1798
45	1691	1680	1672	1691	1686	1649	1596	1626	1636	1628	1609	1614	1674	1631	1622	1666
50	1452	1539	1508	1528	1510	1490	1452	1418	1370	1446	1456	1456	1463	1465	1465	1490
55	1239	1288	1277	1307	1241	1238	1211	1226	1209	1212	1197	1231	1166	1244	1233	1279
60	1011	1056	1008	1064	1011	1025	965	1001	963	1009	944	984	932	990	973	1042
65	713	790	741	780	711	745	695	729	686	730	668	689	644	707	700	771
70	505	548	519	550	496	523	486	524	491	528	477	487	448	500	495	540
75	350	403	402	411	358	393	382	393	351	400	376	373	333	381	386	392
80	252	305	322	311	262	303	313	299	256	307	308	288	242	294	311	297
85	177	232	254	240	189	236	252	230	184	238	246	220	172	230	245	226
90	139	185	207	191	149	192	207	183	145	191	204	179	138	189	204	182
95	138	181	194	155	133	162	197	176	142	184	187	137	121	149	190	177
100	146	163	140	60.0	57.2	54.5	145	161	149	162	131	71.8	51.4	66.0	142	161
105	133	125	119	168	174	162	113	125	137	122	111	162	168	160	117	123
110	85.3	86.3	129	162	181	161	119	80.9	87.2	82.2	129	156	171	152	119	79.6
115	70.3	79.4	156	153	177	152	147	72.9	73.1	81.0	151	144	166	140	144	68.0
120	115	105	142	131	153	129	138	109	124	112	132	121	139	118	135	107
125	158	123	115	104	127	103	111	126	159	124	106	94.1	114	92.6	109	132
130	138	108	82.0	65.9	35.7	69.9	77.4	113	140	110	71.6	60.0	26.7	63.8	73.6	116
135	115	88.7	50.5	44.7	55.6	43.7	44.9	91.4	118	88.4	39.1	37.1	47.1	35.3	47.0	94.7
140	86.7	66.8	31.3	21.4	32.3	17.9	33.7	67.9	86.2	65.6	30.2	13.4	23.8	11.2	34.4	70.3
145	61.7	48.3	20.0	4.61	7.27	4.60	21.7	48.2	59.9	49.6	22.0	4.18	4.02	4.12	20.3	50.1
150	43.3	32.6	5.04	4.55	4.71	4.65	9.41	32.7	41.7	35.9	14.0	4.18	4.50	4.28	4.34	31.0
155	21.6	11.2	4.61	4.82	4.71	4.65	4.18	16.1	23.4	20.4	3.92	4.18	3.97	4.07	3.97	5.30
160	3.81	3.76	4.50	4.77	4.71	4.50	4.18	4.12	3.76	3.97	3.81	4.29	4.02	3.97	3.97	3.91
165	3.86	3.71	4.45	4.55	4.50	4.65	4.18	3.75	4.28	4.08	3.87	4.29	4.02	4.28	4.02	4.28
170	4.60	4.13	5.03	5.24	5.08	5.13	4.97	3.91	5.23	5.09	4.82	5.61	5.88	5.76	5.45	5.29
175	4.81	4.60	5.40	5.45	5.88	5.34	5.39	4.18	5.39	5.40	4.82	5.45	5.82	6.19	5.50	5.50
180	4.86	4.76	5.40	5.25	6.09	5.29	5.18	4.07	4.86	4.82	4.66	5.24	5.30	5.87	5.23	5.23

BUG Rating: B3-U3-G2

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	1014.6	13.4
FM - Front-Medium(30-60)	1815.9	23.9
FH - Front-High(60-80)	577.96	7.6
FVH - Front-Very High(80-90)	125.68	1.7
Total Forward Light	3842.3	50.6

BL - Back-Low(0-30)	1004.2	13.2
BM - Back-Medium(30-60)	1775.5	23.4
BH - Back-High(60-80)	552.77	7.3
BVH - Back-Very High(80-90)	122.35	1.6
Total Back Light	3755	49.4

UL - Uplight-Low(90-100)	170.37	2.2
UH - Uplight-High(100-180)	437.89	5.8
Total Up Light	608.26	8.0

BUG(Back,Up,Glare) Rating	B3-U3-G2

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3454.8	300.13	3755
Street Side	3534.1	308.14	3842.3

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-01	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLCLB605PDZZ		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161105-K2	120.0	60	0.5220	61.75	0.9858	13.25
	277.0	60	0.2467	62.47	0.9142	16.71
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

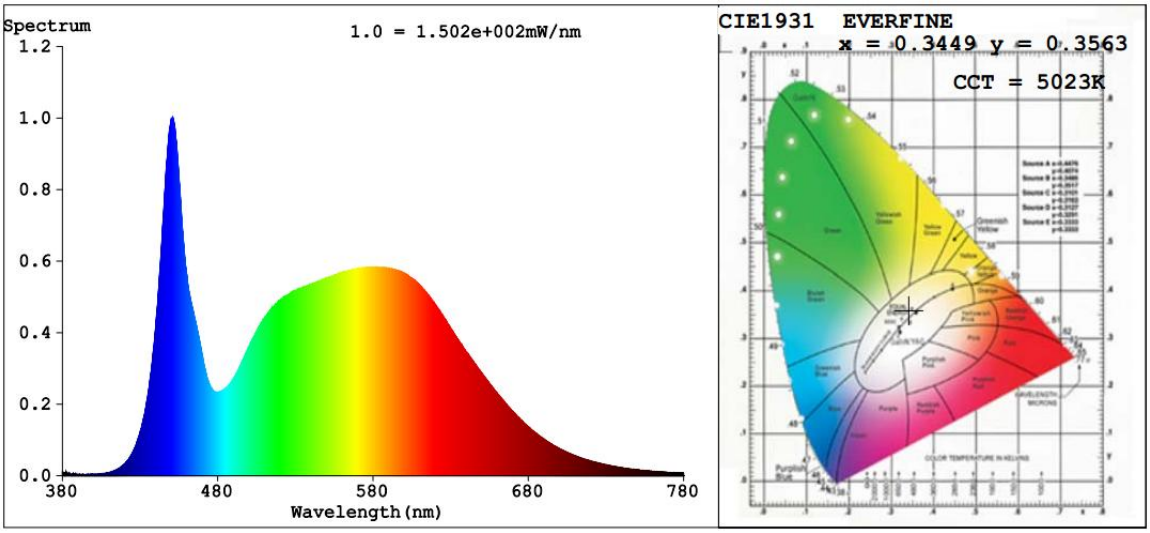
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5023
Duv	0.0024
Chromaticity (x, y)	x=0.3449 y=0.3563
Chromaticity (u', v')	u'=0.2095 v'=0.4869
Color Rendering Index (CRI)	83.5
R9	11

Special Color Rendering Indices			
R1	82	R9	11
R2	88	R10	72
R3	92	R11	83
R4	84	R12	62
R5	83	R13	83
R6	84	R14	96
R7	87	R15	77
R8	69	--	--

Photometric Measurement – Sphere-Spectroradiometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7715	7685	>=2000 (-10%)	
Luminous Efficacy (lm/W)	124.94	123.02	Standard: >= 100(-3%)	Premium: >= 120(-3%)

Spectral Power Distribution & Chromaticity Diagram



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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