



Report No.: GZE160765-D

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

DONGGUAN THAILIGHT SEMICONDUCTOR LIGHTING CO.,LTD

(Brand Name: THAILIGHT)

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

Fuel Pump Canopy Luminaires

Model name(s): TLCLC80XYZZ

Remark: The letter "X" in the model name stand for CCT as bellow :
4=4000K,5=5000K,6=5700K; "YY" stand for different mounting option
as bellow CL=Ceiling, PD=Pendant; "ZZ" stand for different as bellow
BR=Bronze, BK=Black, WH=White, GY=Gary.

Representative (Tested) Model: TLCLC804YYZZ
TLCLC806YYZZ

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Date: Jul.23,2016

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.

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

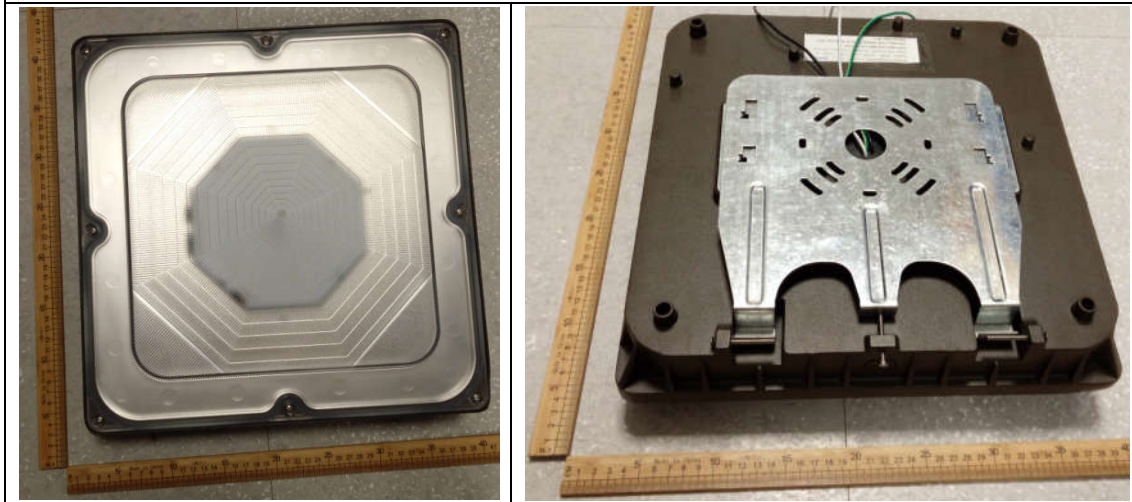
Tel: 8620-3229 0320

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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	DONGGUAN THAILIGHT SEMICONDUCTOR LIGHTING CO.,LTD	
Brand Name	THAILIGHT	
Model Number	TLCLC80XYZZ	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Fuel Pump Canopy Luminaires	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	80W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K,5700K	
LED Manufacturer	Philips Lumileds	
LED Model	L130-xyy003000W21	
Sample Number	GZE160765-D1(4000K),D2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


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1.2 Test Specifications:

Date of Receipt	Jul.21,2016
Date of Test	Jul.22,2016
Test item	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 QD25)

Test date	2016-07-22	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLCLC804YYZZ		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160765-	120.0	60	0.6728	79.63	0.9863	4.71
D1	277.0	60	0.3102	77.48	0.9016	12.32
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	7
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	4058	R3	95	R11	78
Duv	0.0023	R4	80	R12	57
Chromaticity (x, y)	x=0.3794 y=0.3811	R5	80	R13	83
Chromaticity (u', v')	u'=0.2227 v'=0.5033	R6	84	R14	97
Color Rendering Index (CRI)	82.5	R7	86	R15	75
R9	7	R8	64	--	--

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)	9548.4	9441.5	$\geq 2000(-10\%)$	
Luminous Efficacy (lm/W)	119.91	121.86	Standard: $\geq 95(-3\%)$	Premium: $\geq 115(-3\%)$
Zonal lumens in the 0-40° zone (%)	44.1	--	$\geq 40(-3)$	
Zonal lumens in the 40-70° zone (%)	45.1	--	$\geq 40(-3)$	
SC: 0-180° (if applicable)	--	--	--	
SC: 90-270° (if applicable)	--	--	--	
Beam Angle (°)	110.2	--	--	
Center Beam Candle Power (cd)	3337	--	--	

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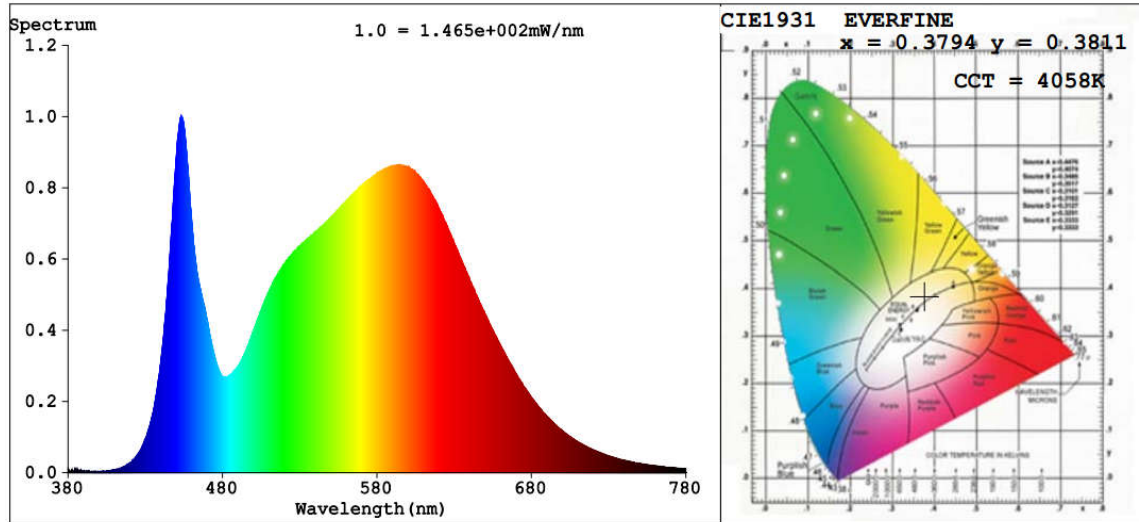
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Spectral Power Distribution & Chromaticity Diagram

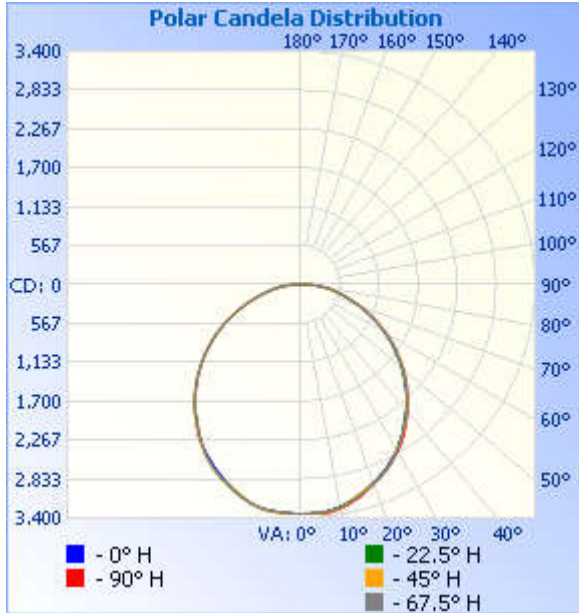


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,585.8	27.1%
0-40	4,212.3	44.1%
0-60	7,387.7	77.4%
60-90	2,125.0	22.3%
70-100	1,002.5	10.5%
90-120	22.2	0.2%
0-90	9,512.6	99.6%
90-180	34.9	0.4%
0-180	9,547.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	317.3	3.3%	90-100	17.1	0.2%
10-20	904.2	9.5%	100-110	2.7	0%
20-30	1,364.3	14.3%	110-120	2.4	0%
30-40	1,626.4	17.0%	120-130	3.0	0%
40-50	1,674.3	17.5%	130-140	3.0	0%
50-60	1,501.2	15.7%	140-150	2.6	0%
60-70	1,139.6	11.9%	150-160	2.1	0%
70-80	687.8	7.2%	160-170	1.4	0%
80-90	297.5	3.1%	170-180	0.6	0%

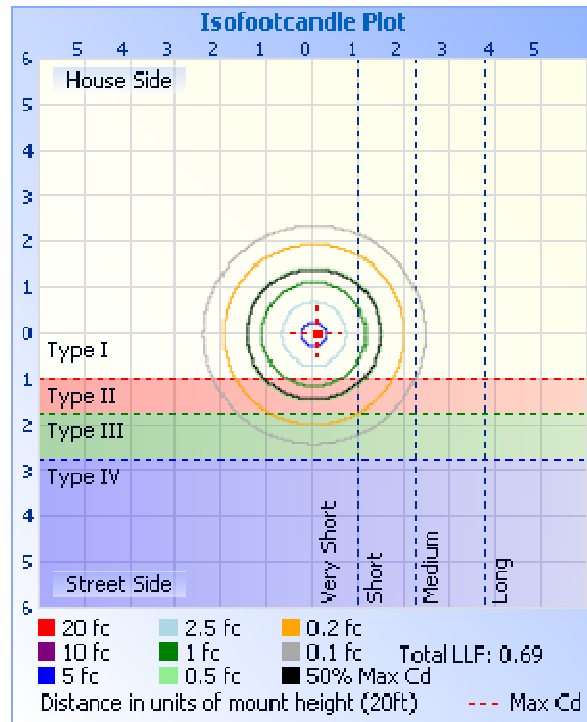
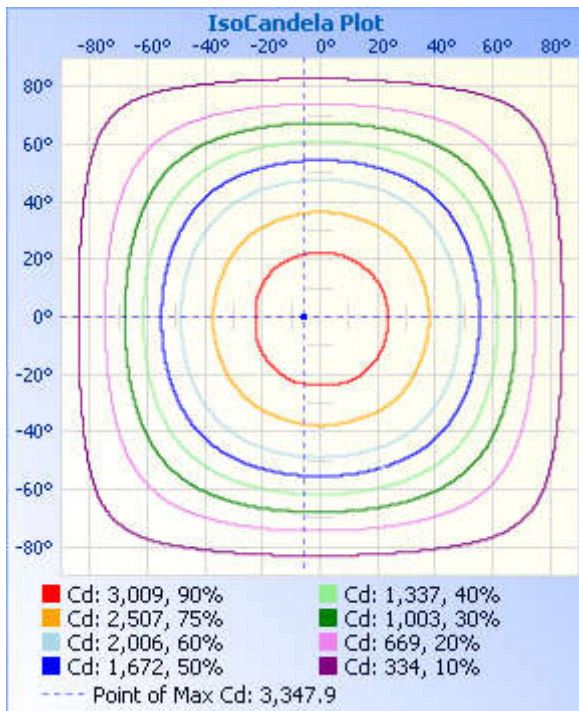
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	11.55 fc	48.3 ft	49.0 ft
34.0ft	2.89 fc	96.6 ft	98.1 ft
51.0ft	1.28 fc	144.9 ft	147.1 ft
68.0ft	0.72 fc	193.2 ft	196.1 ft
85.0ft	0.46 fc	241.5 ft	245.2 ft
102.0ft	0.32 fc	289.8 ft	294.2 ft

■ Vert. Spread: 109.7°
■ Horiz. Spread: 110.5°



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C (DEG) \ y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337	3337
5	3332	3333	3332	3333	3333	3332	3341	3335	3343	3332	3336	3333	3327	3331	3335	3329
10	3310	3310	3295	3285	3286	3285	3299	3298	3312	3306	3293	3290	3303	3310	3309	3309
15	3227	3208	3188	3198	3194	3177	3184	3202	3221	3210	3187	3212	3221	3219	3208	3220
20	3097	3095	3073	3078	3068	3079	3081	3097	3084	3096	3096	3104	3094	3111	3097	3099
25	2959	2971	2955	2955	2939	2961	2958	2963	2952	2973	2971	2981	2950	2984	2975	2978
30	2808	2804	2782	2781	2773	2782	2781	2793	2805	2799	2798	2808	2795	2810	2813	2807
35	2621	2603	2591	2577	2584	2580	2599	2590	2621	2600	2606	2593	2611	2597	2613	2603
40	2399	2390	2389	2371	2375	2378	2395	2395	2408	2406	2404	2395	2396	2391	2409	2393
45	2163	2166	2160	2160	2152	2160	2170	2176	2179	2189	2187	2181	2171	2176	2175	2177
50	1925	1930	1924	1920	1915	1921	1935	1944	1948	1952	1949	1940	1933	1931	1935	1933
55	1672	1675	1677	1666	1667	1671	1689	1692	1699	1696	1695	1682	1675	1670	1678	1675
60	1414	1414	1417	1411	1412	1416	1430	1435	1437	1436	1428	1416	1411	1403	1409	1411
65	1151	1147	1147	1146	1148	1150	1163	1170	1174	1168	1160	1145	1136	1132	1133	1145
70	885	884	883	883	888	892	900	908	913	907	895	878	869	866	872	882
75	645	641	637	637	645	649	657	667	673	661	646	633	622	620	625	638
80	455	442	428	441	457	452	449	471	484	462	437	435	433	424	419	440
85	297	285	262	259	268	272	279	303	311	291	263	249	243	242	252	276
90	101	105	106	107	119	120	123	121	116	113	105	81.9	93.5	88.4	96.2	101
95	1.59	1.38	1.33	18.3	13.6	16.8	1.49	1.52	1.16	1.16	1.16	15.2	16.8	13.1	1.38	1.33
100	2.88	7.44	1.75	1.27	1.33	1.43	1.86	1.38	1.38	1.50	1.48	1.22	1.17	1.38	1.91	7.27
105	3.96	2.81	1.85	1.43	1.43	1.48	1.59	2.29	2.37	1.74	1.80	1.69	1.49	1.64	2.07	2.50
110	3.12	2.96	2.17	2.06	2.01	2.12	2.02	2.34	2.17	2.11	1.90	1.85	1.86	1.80	2.02	2.71
115	3.12	3.01	2.64	2.17	2.33	2.07	2.39	2.92	2.43	2.43	2.22	1.85	2.33	1.91	2.34	2.66
120	3.49	3.33	3.01	2.96	2.86	2.60	2.98	3.35	2.75	2.85	2.59	2.60	2.60	2.55	2.55	2.87
125	3.97	3.70	3.23	3.81	4.14	3.87	3.08	3.72	2.96	3.12	2.59	3.17	3.55	3.24	2.55	3.14
130	4.39	4.02	3.23	4.07	4.40	3.98	3.14	3.93	3.39	3.12	2.80	3.75	3.82	3.87	2.98	3.35
135	4.44	4.02	3.23	4.39	4.45	4.55	3.40	3.88	3.86	3.44	2.96	4.23	4.19	4.08	3.14	3.51
140	4.60	4.07	3.64	4.65	4.51	4.61	3.72	3.88	4.02	3.75	3.12	4.28	4.19	4.29	3.14	3.88
145	4.71	3.81	3.75	4.71	4.30	4.61	3.46	3.88	4.50	3.86	3.44	4.45	4.35	4.56	3.83	4.04
150	4.71	3.80	4.65	4.76	5.14	4.98	4.04	3.93	4.66	4.23	4.02	4.60	4.61	4.77	4.89	4.36
155	4.61	4.02	4.97	5.45	5.41	4.98	4.63	4.14	4.28	4.49	4.34	4.76	4.35	4.61	4.84	4.68
160	4.39	4.13	5.02	5.34	5.46	4.98	4.73	4.41	4.29	4.49	4.49	4.97	4.62	4.77	4.84	4.84
165	4.71	4.23	5.02	4.92	5.20	4.98	4.73	4.41	4.87	4.65	4.60	5.08	4.93	5.04	5.00	5.32
170	5.34	4.81	5.71	6.08	5.94	5.94	5.63	4.62	5.82	5.66	5.50	6.25	6.79	6.69	6.59	6.48
175	5.77	5.23	6.03	6.35	6.89	6.31	6.16	4.94	6.24	5.92	5.50	6.35	6.89	7.21	6.65	6.43
180	5.77	5.39	6.03	6.40	7.16	6.36	6.22	4.89	5.87	5.76	5.45	6.03	6.26	6.84	6.28	6.22

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-07-22	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLCLC806YYZZ		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160765-D2	120.0	60	0.6717	79.46	0.9858	4.75
	277.0	60	0.3097	77.31	0.9012	12.36
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

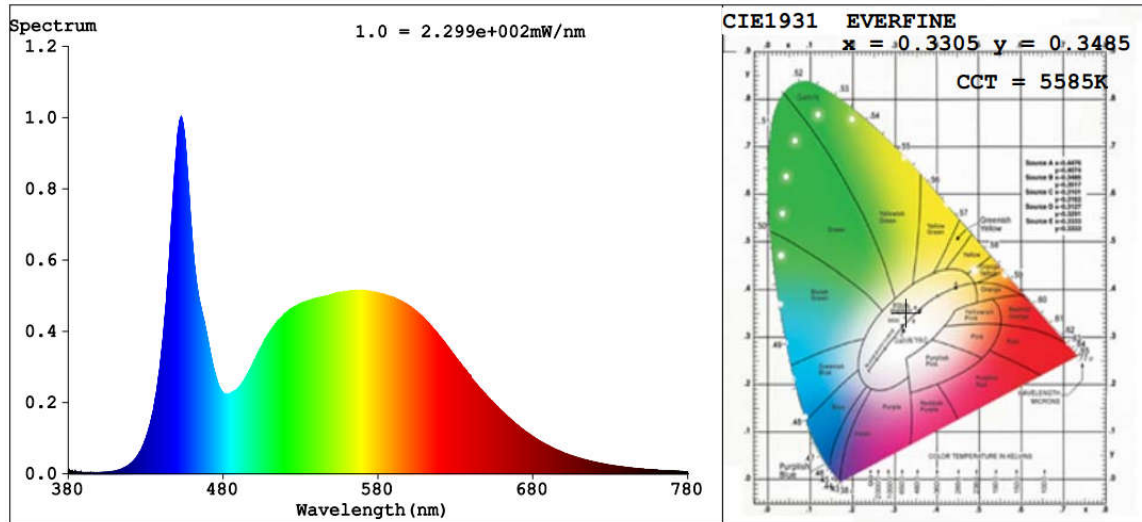
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	87	R10	70
CCT (K)	5585	R3	92	R11	80
Duv	0.0047	R4	81	R12	56
Chromaticity (x, y)	x=0.3305 y=0.3485	R5	81	R13	82
Chromaticity (u', v')	u'=0.2027 v'=0.4810	R6	82	R14	96
Color Rendering Index (CRI)	82.2	R7	88	R15	75
R9	4	R8	67	--	--

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)	9703	9594	>=2000(-10%)	
Luminous Efficacy (lm/W)	122.11	124.10	Standard: >= 95(-3%)	Premium: >= 115(-3%)

Spectral Power Distribution & Chromaticity Diagram



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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 *******