



Report No.: GZE160886-P

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.

High-bay Luminaires for Commercial and Industrial Buildings

Model name(s): TLHBF360XYZZ

Remark: The letter "X" in the model name stands for CCT as bellow :
4=4000K, 5=5000K; "YY" stands for mounting option as bellow : YK=
Yoke, PD=Knuckle ; "ZZ" stands for housing color as bellow :
BR=Bronze, BK=Black, WH=White, GY=Gray.

Representative (Tested) Model: TLHBF3604YK BK
TLHBF3605YK BK

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Update: Sep.14, 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

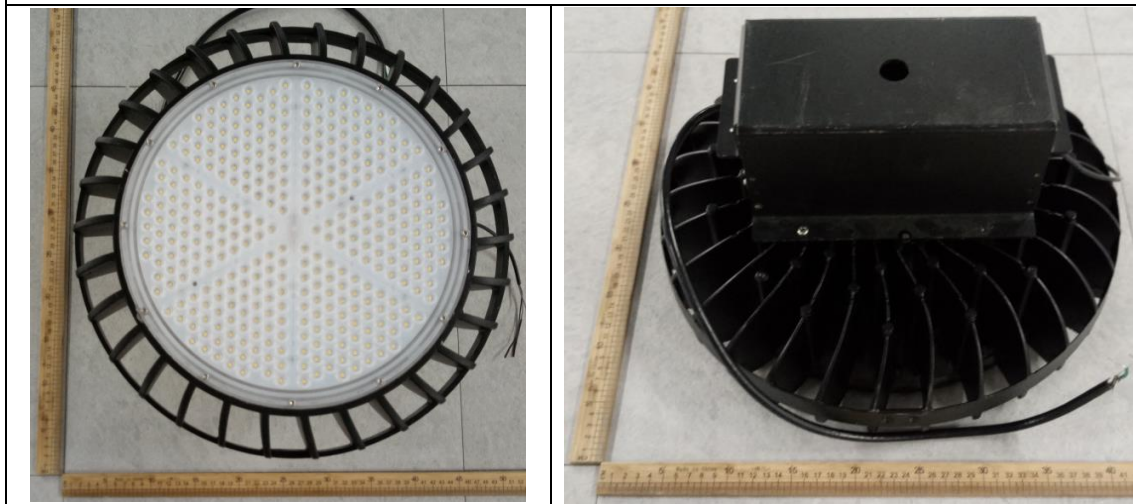
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	DONGGUAN THAILIGHT SEMICONDUCTOR LIGHTING CO.,LTD	
Brand Name	THAILIGHT	
Model Number	TLHBF360XYZZ	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-bay Luminaires for Commercial and Industrial Buildings	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	360W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Philips Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE160886-P1(4000K);P2(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	: Sep.08,2016
Date of Test	: Sep.10,2016
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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	2016-09-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLHBF3604YKKB		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160886-	120.0	60	3.050	365.2	0.9977	5.01
P1	277.0	60	1.333	353.3	0.9569	7.38
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

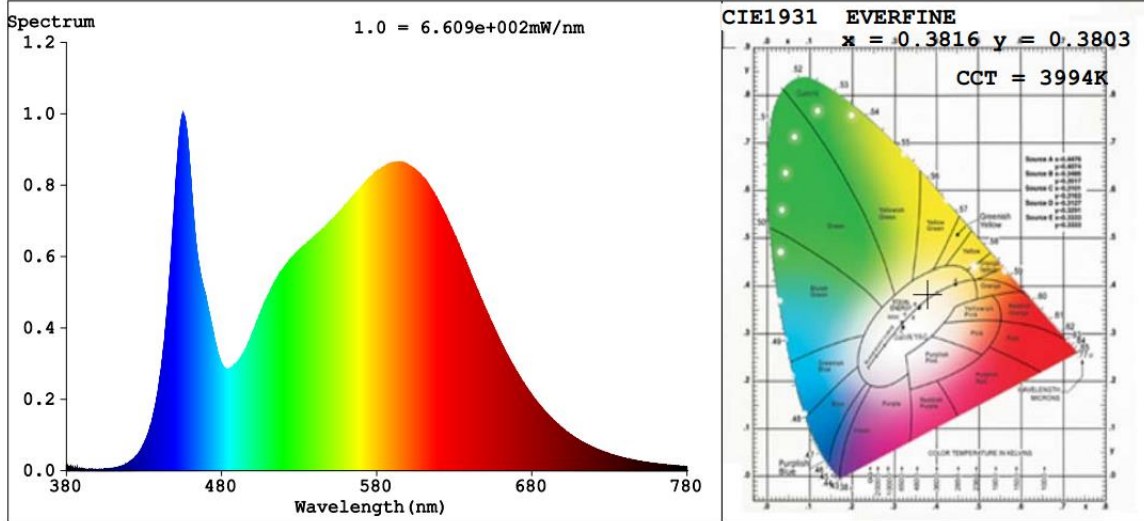
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3994	R3	96	R11	78
Duv	0.0013	R4	80	R12	59
Chromaticity (x, y)	x=0.3816 y=0.3803	R5	81	R13	85
Chromaticity (u', v')	u'=0.2245 v'=0.5033	R6	87	R14	98
Color Rendering Index (CRI)	83.4	R7	86	R15	76
R9	12	R8	65	--	--

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)	43144	42363	>=10000 (-10%)	
Luminous Efficacy (lm/W)	118.14	119.91	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 20-50 °zone (%)	56.7	--	>=30(-10)	
Beam Angle (°)	89.0	--	--	
Center Beam Candle Power (cd)	21895	--	--	

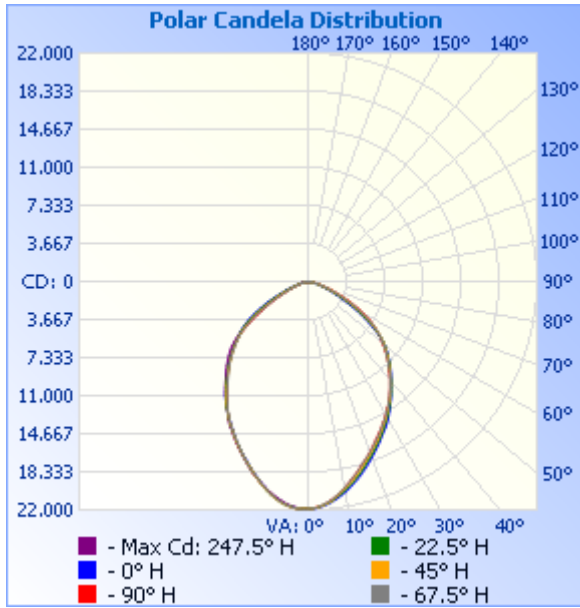
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	15,001.1	34.8%
0-40	23,557.1	54.6%
0-60	38,483.5	89.2%
60-90	4,653.7	10.8%
70-100	1,320.0	3.1%
90-120	0	0%
0-90	43,137.2	100%
90-180	0	0%
0-180	43,137.2	100%

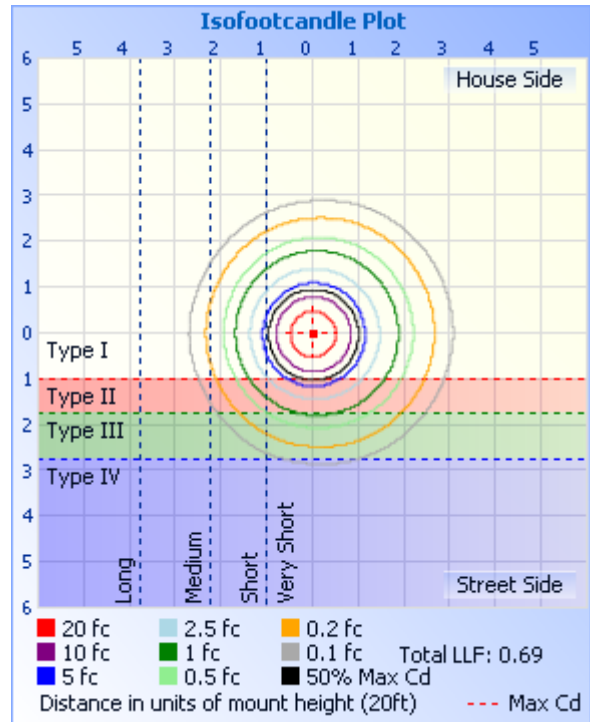
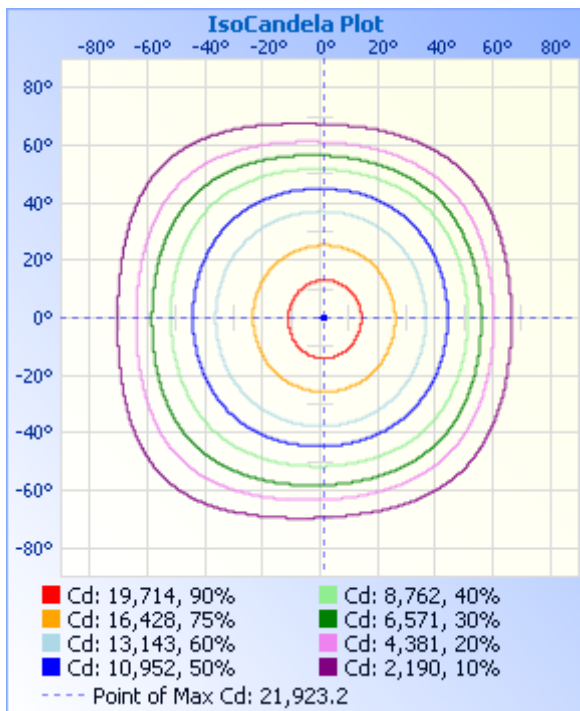
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	2,022.3	4.7%	90-100	0	0%
10-20	5,398.0	12.5%	100-110	0	0%
20-30	7,580.8	17.6%	110-120	0	0%
30-40	8,555.9	19.8%	120-130	0	0%
40-50	8,313.1	19.3%	130-140	0	0%
50-60	6,613.3	15.3%	140-150	0	0%
60-70	3,333.7	7.7%	150-160	0	0%
70-80	1,102.6	2.6%	160-170	0	0%
80-90	217.4	0.5%	170-180	0	0%



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	75.8 fc	33.7 ft	33.2 ft
34.0ft	18.9 fc	67.4 ft	66.3 ft
51.0ft	8.4 fc	101.1 ft	99.5 ft
68.0ft	4.7 fc	134.8 ft	132.7 ft
85.0ft	3.0 fc	168.5 ft	165.9 ft
102.0ft	2.1 fc	202.2 ft	199.0 ft

■ Vert. Spread: 89.5°
■ Horiz. Spread: 88.6°



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 Fax: 8620-32290422 <http://www.standard-tech.com>

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189	2189
5	2166	2161	2158	2158	2151	2143	2141	2133	2136	2132	2140	2150	2165	2167	2170	2170
10	2072	2069	2067	2064	2058	2041	2025	2016	2022	2017	2034	2052	2072	2079	2081	2078
15	1948	1952	1947	1941	1934	1916	1897	1876	1874	1869	1893	1916	1934	1940	1943	1942
20	1803	1803	1805	1806	1798	1777	1759	1743	1741	1736	1758	1777	1796	1802	1802	1802
25	1666	1661	1666	1669	1661	1647	1628	1616	1609	1605	1622	1638	1657	1660	1662	1659
30	1526	1522	1529	1534	1534	1517	1502	1490	1488	1481	1491	1505	1519	1524	1521	1518
35	1360	1357	1371	1381	1386	1379	1369	1362	1363	1353	1362	1372	1384	1380	1370	1354
40	1209	1209	1224	1236	1242	1239	1233	1225	1224	1216	1220	1228	1227	1216	1205	1199
45	1066	1068	1085	1099	1105	1102	1095	1084	1085	1075	1073	1076	1070	1062	1055	1053
50	914	923	936	952	965	963	958	948	940	933	926	925	915	907	901	899
55	688	680	695	722	751	777	792	799	796	784	778	771	762	746	724	700
60	436	427	441	476	508	547	580	601	614	612	606	593	564	527	486	447
65	249	240	252	282	302	340	371	392	413	413	406	386	355	320	280	251
70	139	132	142	159	165	190	211	226	242	240	235	221	195	173	150	135
75	79.4	74.7	79.0	89.5	89.8	101	111	118	128	125	123	115	100	90.1	79.3	73.3
80	43.0	40.7	42.3	47.8	47.3	50.5	54.0	55.9	60.7	58.9	57.3	53.8	48.0	43.9	39.7	38.3
85	16.7	16.3	17.0	18.3	17.6	18.9	20.2	20.6	21.6	20.4	19.7	17.9	15.4	15.0	14.4	14.7
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BUG Rating: B5-U0-G2

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	7520.5	17.4
FM - Front-Medium(30-60)	11751	27.2
FH - Front-High(60-80)	2068.6	4.8
FVH - Front-Very High(80-90)	109.19	0.3
Total Forward Light	21449	49.7

BL - Back-Low(0-30)	7481.7	17.3
BM - Back-Medium(30-60)	11736	27.2
BH - Back-High(60-80)	2367.9	5.5
BVH - Back-Very High(80-90)	108.21	0.3
Total Back Light	21694	50.3

UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B5-U0-G2
----------------------------------	-----------------

Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	21694	0	21694
Street Side	21449	0	21449

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-09-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLHBF3605YKBBK		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160886-	120.0	60	2.996	358.6	0.9975	5.23
P2	277.0	60	1.308	346.7	0.9566	7.61
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

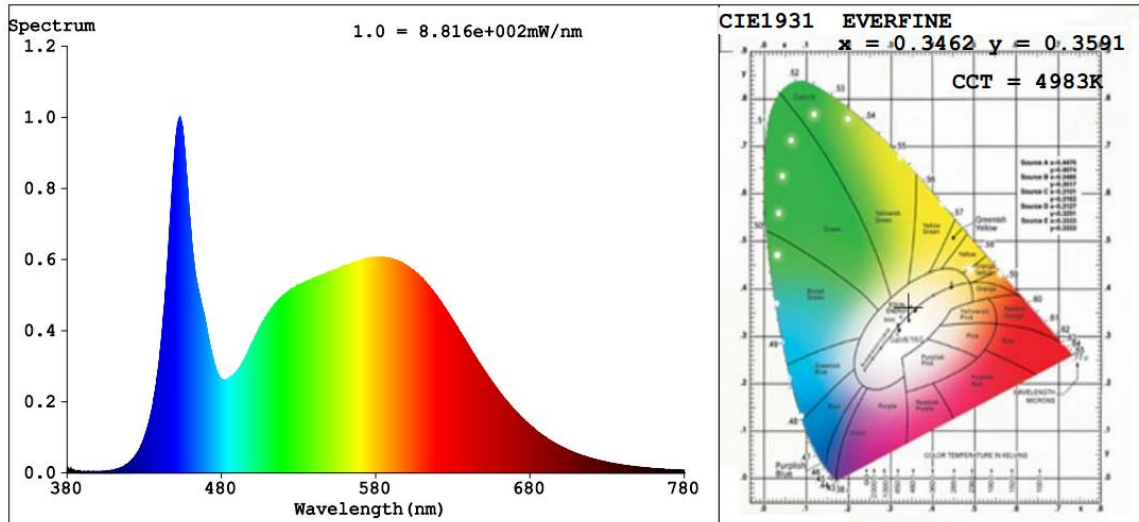
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	4983	R3	94	R11	80
Duv	0.0032	R4	81	R12	55
Chromaticity (x, y)	x=0.3462 y=0.3591	R5	81	R13	84
Chromaticity (u', v')	u'=0.2093 v'=0.4884	R6	84	R14	97
Color Rendering Index (CRI)	83.6	R7	88	R15	76
R9	12	R8	68	--	--

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)	43887	43093	>=10000 (-10%)	
Luminous Efficacy (lm/W)	122.38	124.29	Standard: >= 105(-3%)	Premium: >= 130(-3%)

Spectral Power Distribution & Chromaticity Diagram



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 Fax: 8620-32290422 <http://www.standard-tech.com>

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 *******