



Report No.: GZE160886-J

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): TLHBE220XYZZ

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 :
BK=Black, WH=White.

Representative (Tested) Model: TLHBE2204YKBK
TLHBE2205YKBK

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

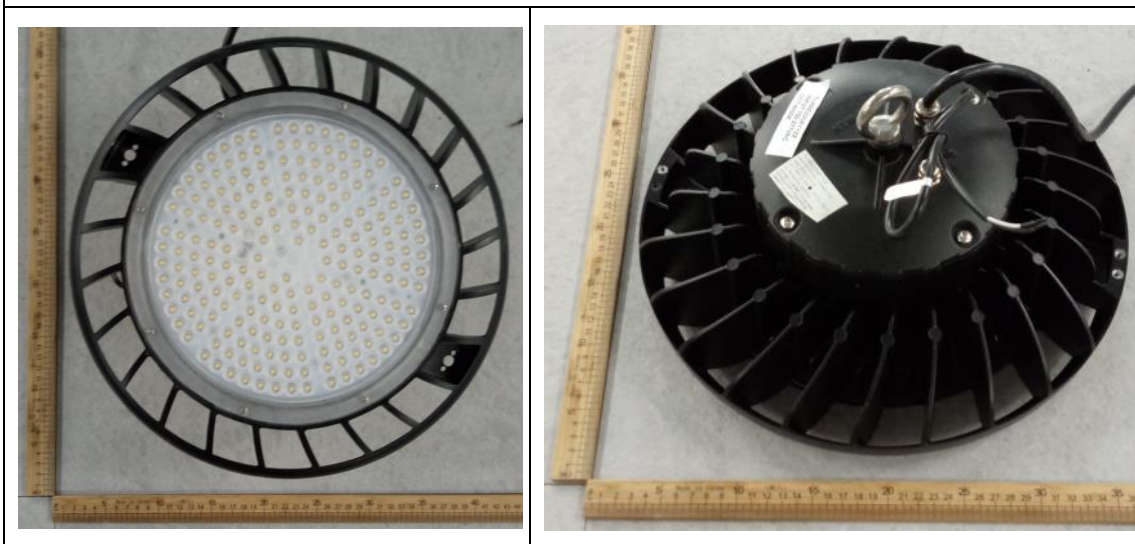
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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	DONGGUAN THAILIGHT SEMICONDUCTOR LIGHTING CO.,LTD	
Brand Name	THAILIGHT	
Model Number	TLHBE220XYZZ	
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	220W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Philips Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE160886-J1(4000K);J2(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	TLHBE2204YKBK		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160886-	120.0	60	1.865	221.5	0.9895	11.77
J1	277.0	60	0.8455	217.2	0.9274	18.67
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

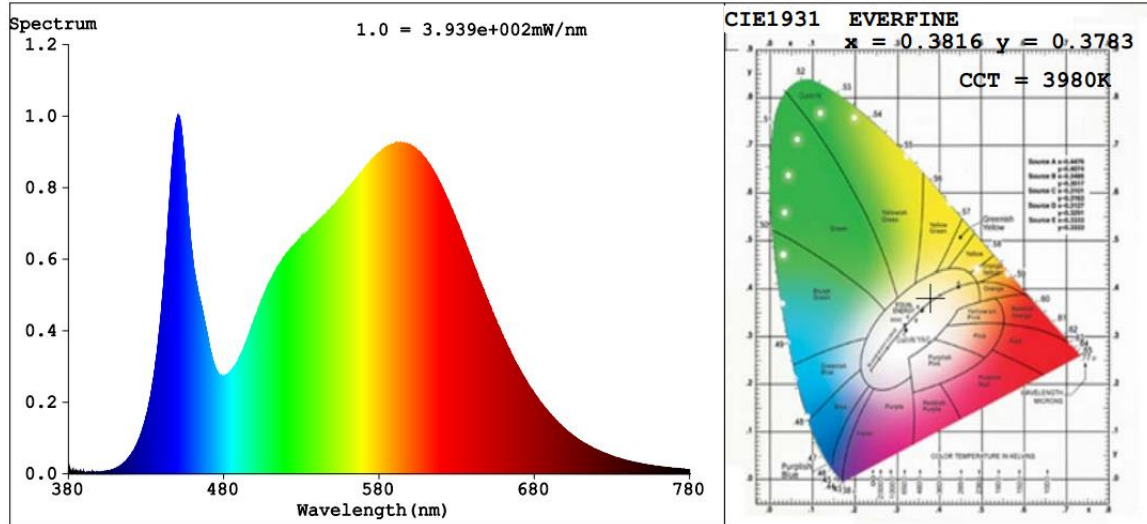
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	10
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3980	R3	95	R11	81
Duv	0.0004	R4	82	R12	63
Chromaticity (x, y)	x=0.3816 y=0.3783	R5	81	R13	83
Chromaticity (u', v')	u'=0.2253 v'=0.5024	R6	85	R14	97
Color Rendering Index (CRI)	83.0	R7	86	R15	75
R9	10	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)	26266	25853	>=10000 (-10%)	
Luminous Efficacy (lm/W)	118.58	119.03	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 20-50 °zone (%)	55.2	--	>=30(-10)	
Beam Angle (°)	92.7	--	--	
Center Beam Candle Power (cd)	12471	--	--	

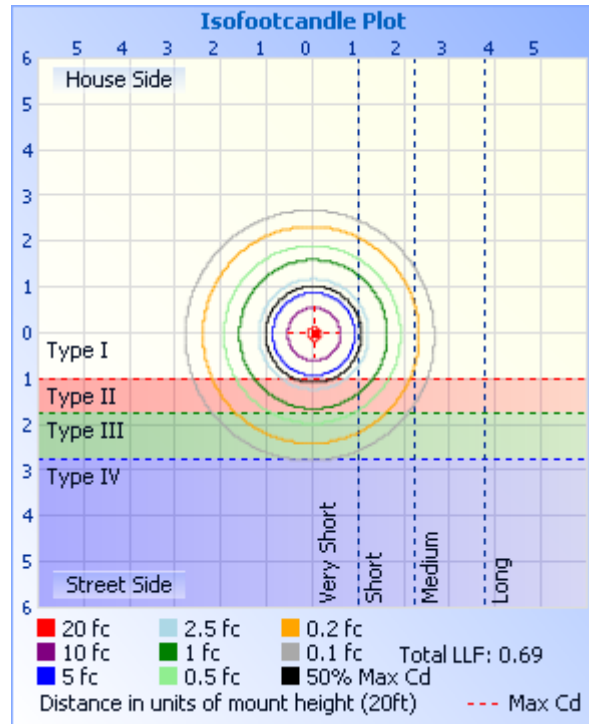
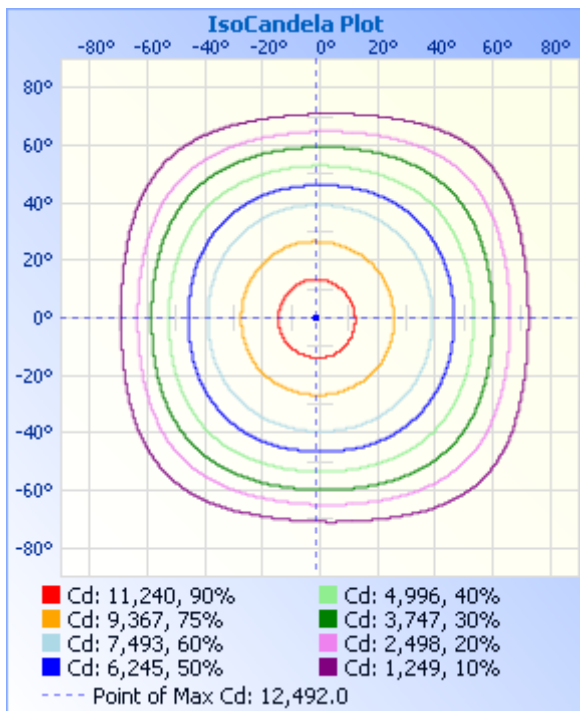
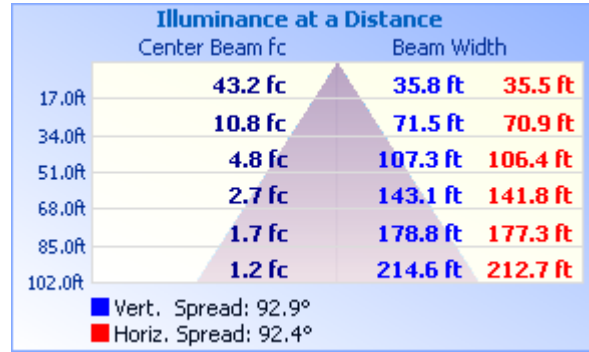
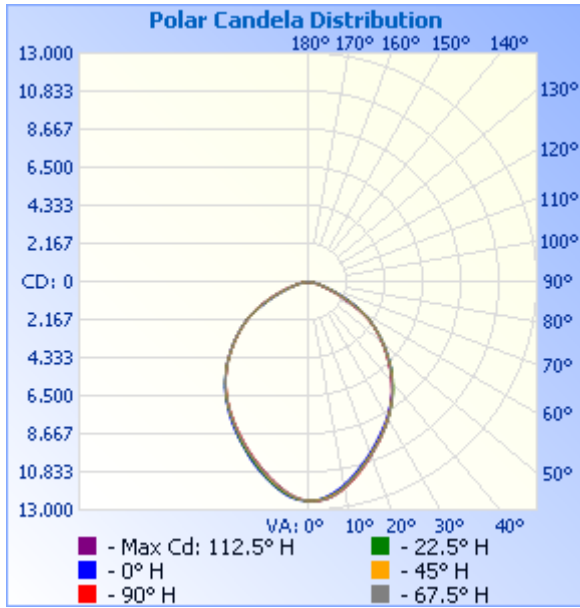
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	8,676.6	33%
0-40	13,777.3	52.5%
0-60	22,916.6	87.3%
60-90	3,345.8	12.7%
70-100	913.8	3.5%
90-120	0	0%
0-90	26,262.4	100%
90-180	0	0%
0-180	26,262.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,152.7	4.4%	90-100	0	0%
10-20	3,101.6	11.8%	100-110	0	0%
20-30	4,422.3	16.8%	110-120	0	0%
30-40	5,100.7	19.4%	120-130	0	0%
40-50	4,998.8	19.0%	130-140	0	0%
50-60	4,140.6	15.8%	140-150	0	0%
60-70	2,432.0	9.3%	150-160	0	0%
70-80	798.9	3.0%	160-170	0	0%
80-90	114.9	0.4%	170-180	0	0%



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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	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247	1247
5	1212	1214	1217	1223	1227	1233	1235	1240	1240	1237	1234	1230	1227	1223	1217	1214
10	1149	1151	1155	1164	1173	1184	1187	1191	1194	1189	1184	1178	1170	1167	1157	1152
15	1079	1081	1086	1095	1104	1114	1118	1121	1125	1121	1116	1107	1103	1097	1086	1083
20	1009	1012	1016	1023	1033	1043	1044	1049	1050	1047	1042	1035	1029	1025	1015	1014
25	940	943	947	954	963	974	975	978	978	974	970	962	957	951	945	945
30	873	875	879	886	895	905	902	906	905	903	899	892	886	880	876	876
35	804	806	809	815	823	830	826	829	826	824	822	816	812	810	805	805
40	729	731	734	739	744	747	744	741	738	737	735	734	734	732	730	730
45	647	648	650	654	656	657	652	650	646	646	647	647	648	647	645	646
50	553	555	558	560	562	562	559	558	555	556	557	556	558	557	554	554
55	462	463	465	466	469	468	465	465	463	464	465	465	467	465	463	464
60	370	370	371	372	372	368	361	356	351	351	352	356	364	367	369	371
65	264	265	265	260	254	245	234	226	218	217	222	227	238	248	255	262
70	160	162	160	156	149	141	131	125	117	117	120	125	134	142	149	156
75	82.3	83.9	83.0	80.5	76.4	70.4	65.4	62.4	57.4	57.9	59.6	61.5	67.1	71.1	75.6	80.0
80	35.4	36.6	36.5	35.1	33.7	30.7	28.9	28.3	25.3	25.8	26.6	26.3	29.0	30.4	32.4	34.8
85	9.75	10.2	9.61	8.26	8.05	7.79	8.24	8.67	7.65	7.73	7.30	5.97	6.24	6.70	7.96	9.48
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

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BUG Rating: B4-U0-G1

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	4333.2	16.5
FM - Front-Medium(30-60)	7141.1	27.2
FH - Front-High(60-80)	1676.1	6.4
FVH - Front-Very High(80-90)	61.942	0.2
Total Forward Light	13212	50.3

BL - Back-Low(0-30)	4343.9	16.5
BM - Back-Medium(30-60)	7101.9	27.0
BH - Back-High(60-80)	1554.8	5.9
BVH - Back-Very High(80-90)	52.968	0.2
Total Back Light	13054	49.7

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	B4-U0-G1
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	13054	0	13054
Street Side	13212	0	13212

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	TLHBE2205YKKB		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160886-	120.0	60	1.9002	225.7	0.9898	11.53
J2	277.0	60	0.8612	221.3	0.9277	18.42
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

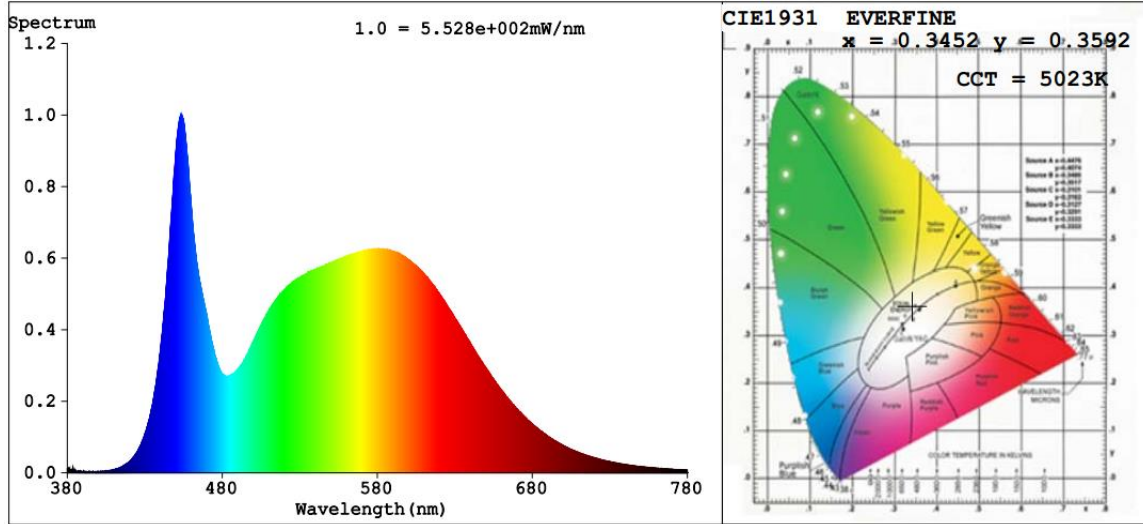
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	7
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	5023	R3	94	R11	80
Duv	0.0037	R4	81	R12	60
Chromaticity (x, y)	x=0.3452 y=0.3592	R5	81	R13	83
Chromaticity (u', v')	u'=0.2086 v'=0.4883	R6	84	R14	97
Color Rendering Index (CRI)	82.9	R7	87	R15	75
R9	7	R8	66	--	--

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)	27023	26598	>=10000 (-10%)	
Luminous Efficacy (lm/W)	119.73	120.19	Standard: >= 105(-3%)	Premium: >= 130(-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 *******