

LM-79-08 Test Report

For

Beyond LED Technology

(Brand Name: Beyond)

1939 Parker Court, Stone Mountain, GA 30087

2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces

Model name(s):BLT-TF24-DM-60P

Representative (Tested) Model: TF24-DM-35P
TF24-DM-40P
TF24-DM-50P

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

Test & Report By:

Bill Luo

Engineer: Bill Luo

Date: Jun.14,2017

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	Beyond LED Technology	
Brand Name	Beyond	
Model Number	BLT-TF24-DM-60P	
SKU (if available)	150827	
Type of Luminaire (for integral lamps, list base type and lamp type)	2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	48W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,5000K	
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD	
LED Model	67-21S Series (3000K)	
Sample Number	GZE1706040-B1(3500K), B2(4000K), B3(5000K)	
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	Jun.07,2017
Date of Test	Jun.09,2017
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	2017-06-09	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-TF24-DM-60P		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170604	120.0	60	0.4064	48.46	0.9938	6.52
0-B1	277.0	60	0.1923	47.35	0.8890	13.26
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

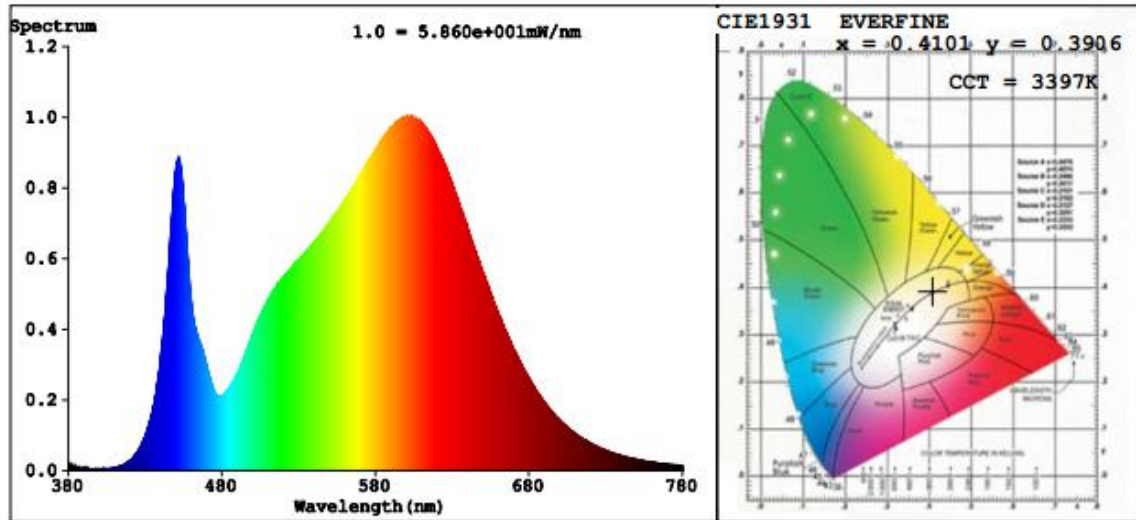
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	3397	R3	96	R11	81
Duv	-0.0010	R4	82	R12	66
Chromaticity (x, y)	x=0.4101 y=0.3906	R5	82	R13	84
Chromaticity (u', v')	u'=0.2388 v'=0.5119	R6	87	R14	98
Color Rendering Index (CRI)	83.5	R7	85	R15	76
R9	12	R8	63	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	6022.7	5992.0	>=3000(-10%)	
Luminous Efficacy (lm/W)	124.28	126.55	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	123.65		100(-3%)	125(-3%)
Zonal lumens in the 0-60° zone (%)	75.8	--	>= 75(-3)	
SC: 0-180° (if applicable)	1.27	--	1.0-2.0(±0.1)	
SC: 90-270° (if applicable)	1.21	--	1.0-2.0(±0.1)	
Beam Angle (°)	117.0	--	--	
Center Beam Candle Power (cd)	2029	--	--	

Spectral Power Distribution & Chromaticity Diagram

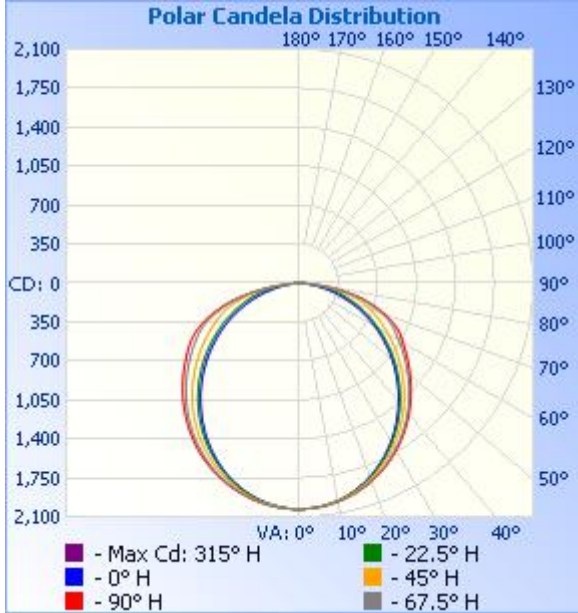


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,567.2	26%
0-40	2,562.1	42.5%
0-60	4,562.8	75.8%
60-90	1,458.5	24.2%
70-100	657.4	10.9%
90-120	0.5	0%
0-90	6,021.4	100%
90-180	0.8	0%
0-180	6,022.2	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	191.9	3.2%	90-100	0.2	0%
10-20	548.0	9.1%	100-110	0.2	0%
20-30	827.3	13.7%	110-120	0.2	0%
30-40	994.9	16.5%	120-130	0.1	0%
40-50	1,037.1	17.2%	130-140	0.0	0%
50-60	963.6	16.0%	140-150	0.0	0%
60-70	801.4	13.3%	150-160	0.0	0%
70-80	524.5	8.7%	160-170	0.1	0%
80-90	132.7	2.2%	170-180	0.0	0%

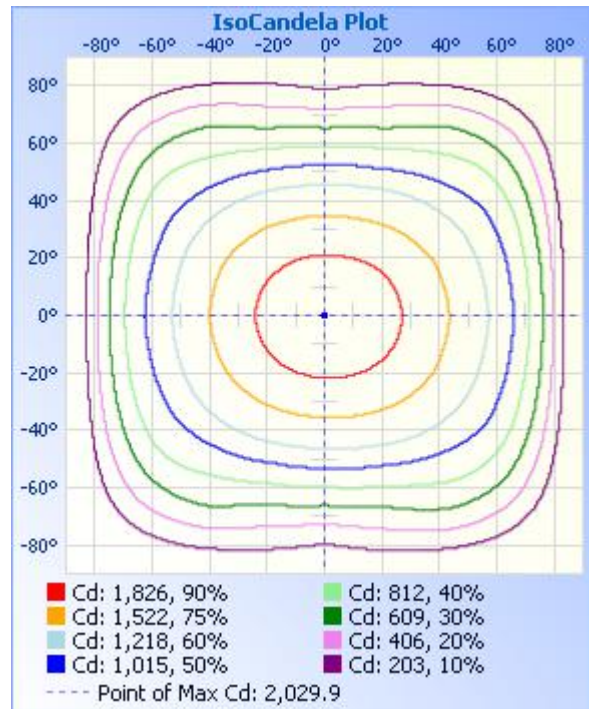
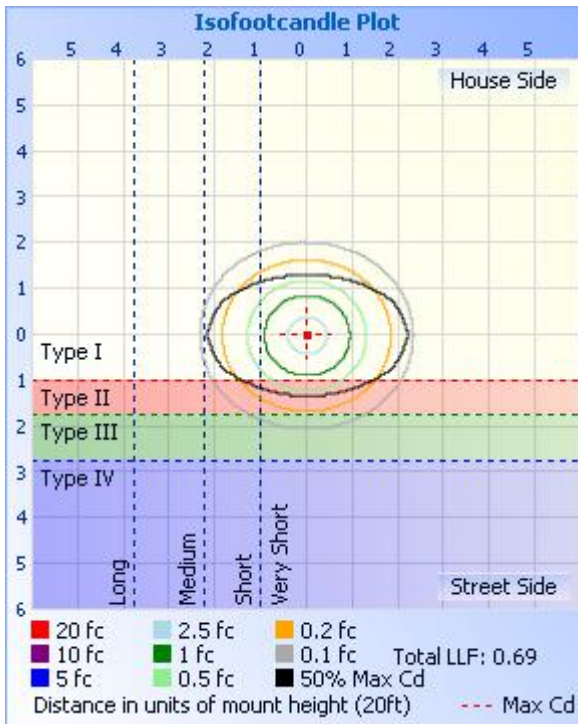
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	7.02 fc	44.6 ft	70.5 ft
34.0ft	1.76 fc	89.1 ft	141.0 ft
51.0ft	0.78 fc	133.7 ft	211.5 ft
68.0ft	0.44 fc	178.3 ft	282.0 ft
85.0ft	0.28 fc	222.9 ft	352.5 ft
102.0ft	0.20 fc	267.4 ft	423.0 ft

■ Vert. Spread: 105.3°
 ■ Horiz. Spread: 128.5°



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Table--1

UNIT: cd

C (DEG) \ y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029	2029
5	2024	2023	2023	2020	2017	2017	2018	2019	2019	2017	2017	2018	2018	2020	2021	2023
10	2003	2001	1997	1987	1983	1984	1987	1991	1993	1988	1986	1983	1984	1988	1994	2000
15	1966	1961	1951	1933	1927	1930	1938	1947	1951	1943	1936	1926	1928	1935	1947	1961
20	1916	1906	1888	1861	1850	1856	1870	1886	1893	1882	1867	1850	1852	1862	1884	1906
25	1853	1839	1808	1770	1755	1764	1786	1812	1821	1806	1782	1758	1757	1773	1807	1838
30	1776	1757	1712	1663	1643	1657	1687	1723	1736	1716	1683	1651	1646	1668	1713	1756
35	1687	1663	1604	1543	1519	1537	1577	1623	1638	1614	1571	1530	1521	1550	1608	1663
40	1588	1558	1485	1414	1385	1405	1456	1512	1530	1501	1448	1398	1387	1422	1492	1558
45	1482	1444	1358	1274	1242	1266	1328	1394	1417	1382	1318	1258	1245	1284	1366	1445
50	1372	1325	1224	1130	1095	1121	1194	1272	1299	1260	1184	1112	1096	1140	1234	1328
55	1260	1204	1086	981	943	973	1057	1149	1184	1139	1048	963	944	991	1099	1209
60	1151	1084	950	828	787	823	923	1031	1074	1021	914	813	788	842	967	1093
65	1030	966	818	676	630	674	793	925	972	918	785	665	631	692	838	978
70	857	806	688	528	473	530	676	779	813	774	671	521	474	548	713	817
75	644	607	524	389	319	392	523	596	623	592	517	386	320	412	542	617
80	373	372	333	254	177	264	340	373	385	373	334	262	179	276	347	378
85	96.5	108	119	102	63.2	111	129	114	107	113	124	108	67.7	115	124	108
90	0.53	0.56	0.70	0.53	0.28	0.60	0.60	0.68	0.30	0.25	0.30	0.00	0.66	0.46	0.30	0.20
95	0.05	0.15	0.10	0.20	0.05	0.05	0.05	0.10	0.00	0.00	0.00	0.05	1.01	0.41	0.05	0.00
100	0.00	0.05	0.00	0.30	0.10	0.00	0.05	0.05	0.00	0.00	0.00	0.10	1.77	0.41	0.05	0.00
105	0.00	0.05	0.00	0.45	0.35	0.05	0.05	0.05	0.00	0.00	0.00	0.10	1.26	0.30	0.05	0.00
110	0.15	0.05	0.20	0.50	0.41	0.20	0.35	0.20	0.00	0.00	0.00	0.10	0.76	0.25	0.05	0.00
115	0.20	0.36	0.25	0.15	0.41	0.30	0.36	0.31	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00
120	0.20	0.31	0.30	0.00	0.00	0.00	0.41	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.20	0.31	0.41	0.00	0.00	0.00	0.41	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.20	0.15	0.20	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.05	0.05	0.00	0.00	0.00	0.00	0.20	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
145	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.10	0.00	0.00
150	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.46	0.30	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	0.25	0.46	0.41	0.25	0.00
160	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.05	0.00	0.40	0.56	0.51	0.41	0.05
165	0.00	0.00	0.00	0.25	0.15	0.20	0.00	0.00	0.15	0.10	0.00	0.40	0.56	0.51	0.46	0.05
170	0.00	0.00	0.05	0.40	0.40	0.46	0.00	0.00	0.20	0.20	0.00	0.45	0.56	0.51	0.51	0.05
175	0.05	0.00	0.25	0.45	0.46	0.46	0.05	0.00	0.10	0.15	0.00	0.30	0.51	0.46	0.51	0.05
180	0.20	0.00	0.25	0.50	0.46	0.56	0.05	0.00	0.10	0.10	0.00	0.25	0.51	0.46	0.41	0.05

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-09	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-TF24-DM-60P		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170604	120.0	60	0.4066	48.51	0.9943	6.96
0-B2	277.0	60	0.1923	47.42	0.8902	13.57
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

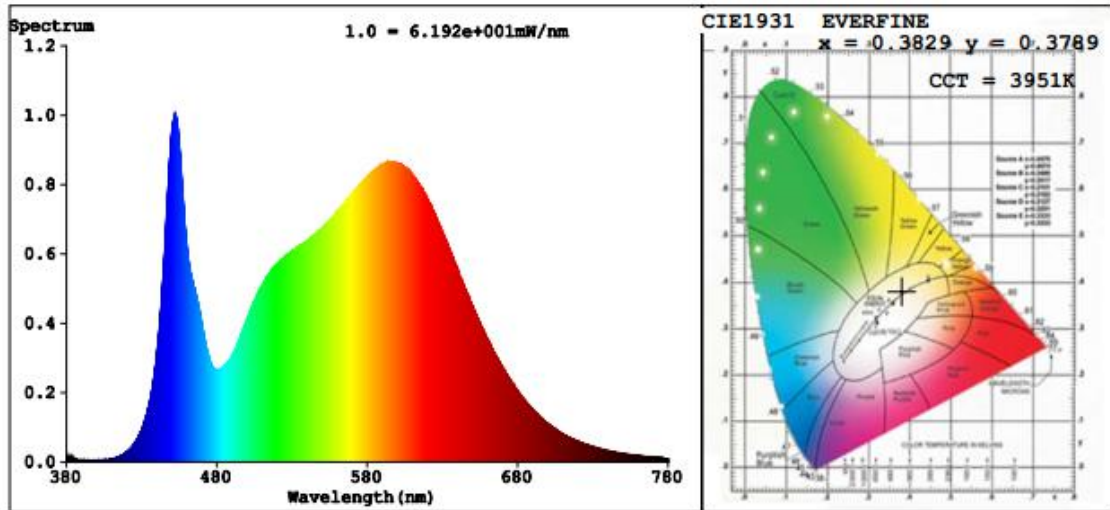
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3951	R3	96	R11	82
Duv	0.0003	R4	83	R12	63
Chromaticity (x, y)	x=0.3829 y=0.3789	R5	83	R13	85
Chromaticity (u', v')	u'=0.2258 v'=0.5029	R6	87	R14	98
Color Rendering Index (CRI)	84.3	R7	86	R15	77
R9	13	R8	65	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	6059	5938	>=3000(-10%)	
Luminous Efficacy (lm/W)	124.90	125.22	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	122.41		100(-3%)	125(-3%)

Spectral Power Distribution & Chromaticity Diagram



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Test date	2017-06-09	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-TF24-DM-60P		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170604	120.0	60	0.4067	48.58	0.9954	6.37
0-B2	277.0	60	0.1924	47.50	0.8912	13.45
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

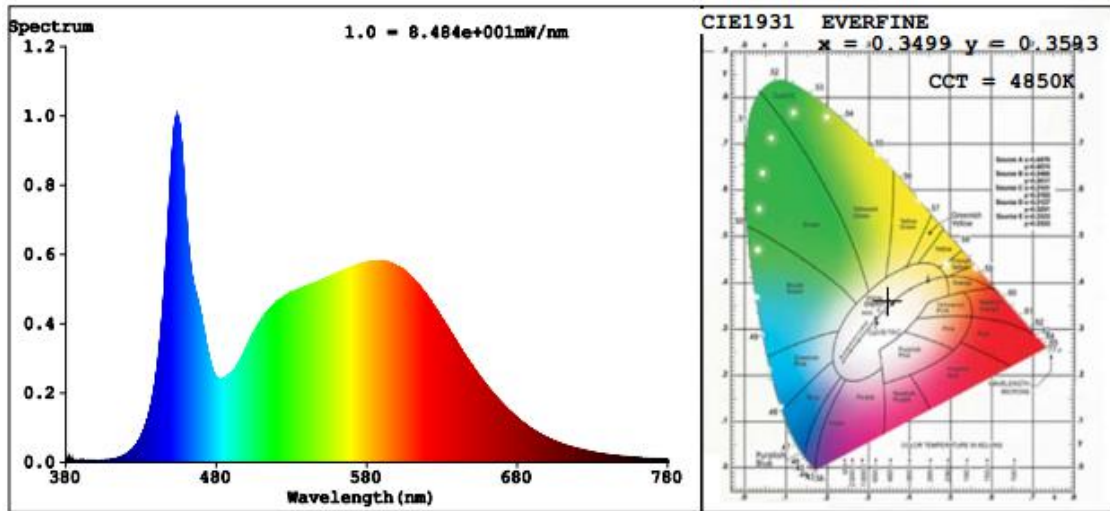
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	91	R10	77
CCT (K)	4850	R3	95	R11	80
Duv	0.0019	R4	81	R12	55
Chromaticity (x, y)	x=0.3499 y=0.3593	R5	82	R13	85
Chromaticity (u', v')	u'=0.2117 v'=0.4891	R6	86	R14	98
Color Rendering Index (CRI)	83.9	R7	87	R15	77
R9	13	R8	68	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	6136	6110	>=3000(-10%)	
Luminous Efficacy (lm/W)	126.31	128.63	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	125.77		100(-3%)	125(-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-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06

Expand Uncertainty:
Photometric Measurement (Sphere):2.04%, k=2
Chromaticity Measurement(Sphere):28.8K, k=2
Photometric Measurement(Goniophotometer):2.36%, k=2

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

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