

## **LM-79-08 Test Report**

For

### **Beyond LED Technology**

**(Brand Name: Beyond LED Technology)**

## **Outdoor Non-Cutoff and Semi-Cutoff Wall Mounted Area Luminaires**

Model name(s): WP09-120L-CSP-3CCT

Remark: Please see next page for detail.

Representative (Tested) Model: WP09-120L-CSP-3CCT

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

Test & Report By:

Review By:

Engineer: Ferrum Li

Manager: Garman Mo

Date: Jul.15,2022

Note: 1. The results contained in this report pertain only to the tested samples.

2. This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.

**Remark:**

Suffix "X" can be D,S,M,P,E,SP,SM,SE,ME,PE,SPE,SME denote control type.

D= Driver dimmable;

S= Adjustable Power Switch;

M= Microwave Motion Sensor;

P= Photocell sensor;

E= Emergency Battery;

SP= Photocell Sensor and Adjustable power switch;

SM= Microwave Motion Sensor and Adjustable power switch;

SE= Adjustable Power Switch and Emergency Battery;

ME= Microwave Motion Sensor and Emergency Battery;

PE= Photocell sensor and Emergency Battery;

SPE= Photocell Sensor and Adjustable power switch, Emergency Battery;

SME= Microwave Motion Sensor and Adjustable power switch, Emergency Battery

Suffix "YY" can be 35/40/50/57/65, denote CCT (e.g. 35=3500K, 40=4000K, 50=5000K, 57=5700K, 65=6500K)

**1.1 Product Information:**

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED Technology	
Model Number	WP09-120L-CSP-3CCT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall Mounted Area Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60Hz	
Nominal Power	120W/90W/60W/30W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,5000K,5700K,6500K	
LED Manufacturer	Lumileds Holding B.V	
LED Model	3500K: L128-3580RC35001D1 6500K: L128-6580RC35001D1	
Integral Controls Availability	Yes	
Dimming	Continuous	
Sample Number	JBE220412-U1(3500K),U2(6500K)	
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	Jun.14,2022
Date of Test	Jun.15,2022
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2017 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>

## 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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**

<b>Test date</b>	2022-06-15	<b>Test Ambient:</b>	25±1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	WP09-120L-CSP-3CCT	<b>Total Operating Time (min)</b>	75

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE220412-	120.1	60	0.9772	116.8	0.9948	7.52
U1	277.1	60	0.4329	114.1	0.9513	8.63
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Photometric Measurement – Goniophotometer Method(Test Distance: 26.000m):**

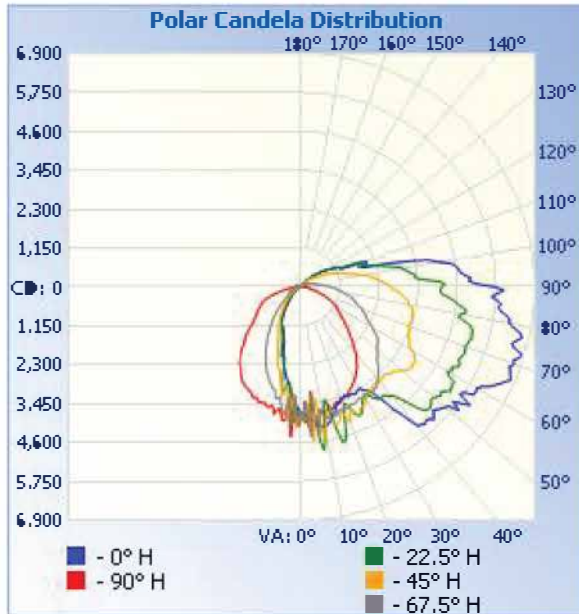
Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	16647	16313	--	
Luminous Efficacy (lm/W)	142.57	142.95	--	
Total Luminous (lm)(0-90°)	13718	13456	>=300 (-10%)	
Luminous Efficacy (lm/W)(0-90°)	117.45	117.93	Standard: >= 105(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 80-90° zone (%) (0-90°)	12.3	--	<= 10(+3)	
BUG Ratings	B2-U5-G5	--	--	
Beam Angle (°)	102.0	--	--	
Center Beam Candle Power (cd)	3696	--	--	

**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,596.9	15.6%
0-40	4,191.6	25.2%
0-60	8,051.8	48.3%
60-90	5,666.1	34%
70-100	4,940.5	29.7%
90-120	2,552.1	15.3%
0-90	13,718.0	82.4%
90-180	2,936.8	17.6%
0-180	16,654.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	350.2	2.1%	90-100	1,291.3	7.8%
10-20	927.3	5.6%	100-110	807.9	4.9%
20-30	1,319.4	7.9%	110-120	452.9	2.7%
30-40	1,594.7	9.6%	120-130	228.4	1.4%
40-50	1,865.5	11.2%	130-140	98.5	0.6%
50-60	1,994.7	12.0%	140-150	38.0	0.2%
60-70	2,016.9	12.1%	150-160	13.8	0.1%
70-80	1,957.8	11.8%	160-170	4.3	0%
80-90	1,691.4	10.2%	170-180	1.6	0%

**Photometric Data**



**Illuminance at a Distance**

Height	Center Beam fc	Beam Width	Beam Width
4.0ft	231.0 fc	10.7 ft	8.3 ft
8.0ft	57.8 fc	21.3 ft	16.6 ft
12.0ft	25.7 fc	32.0 ft	24.8 ft
16.0ft	14.4 fc	42.7 ft	33.1 ft
20.0ft	9.2 fc	53.4 ft	41.4 ft

■ Vert. Spread: 106.3°  
■ Horiz. Spread: 92.0°

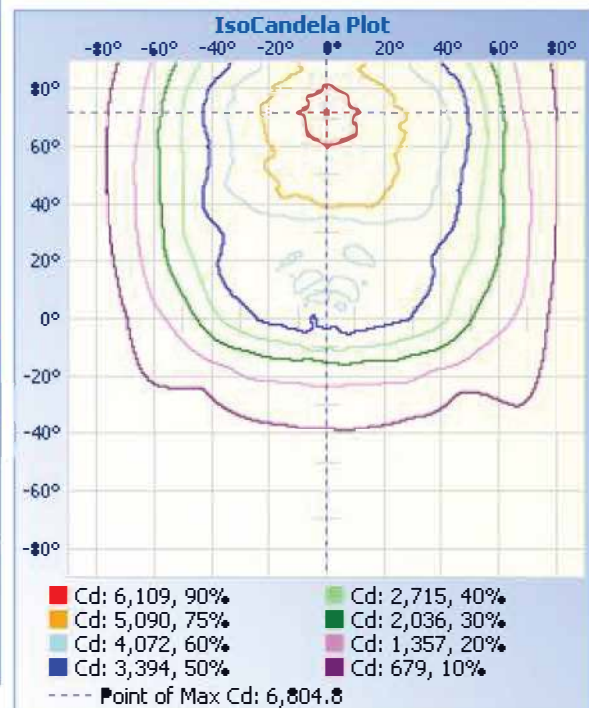
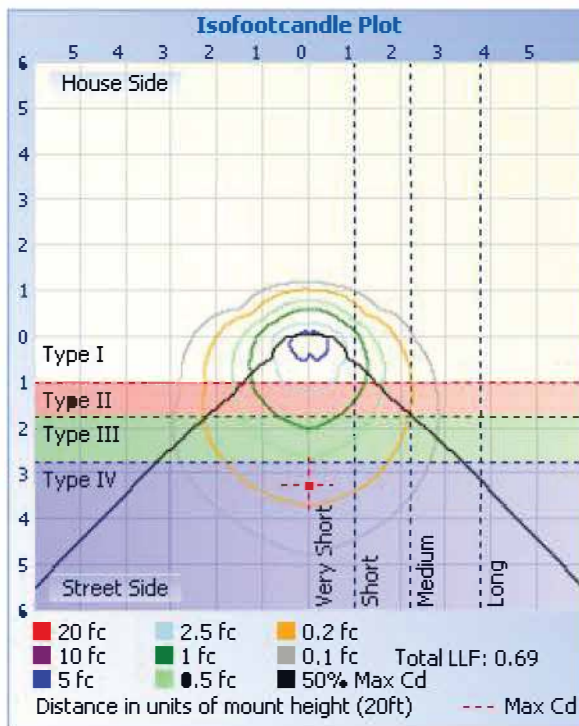
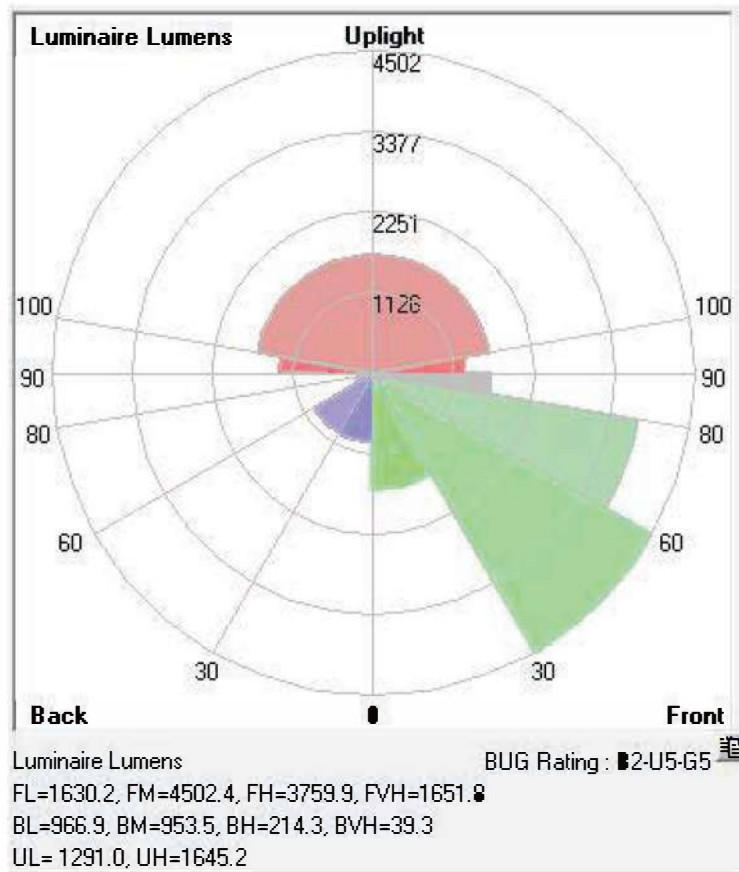


Table--1 UNIT: cd

□ (DEG) \ C (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	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697	3697		
5	3877	4456	3694	4246	3960	3521	4558	3205	3102	3421	4078	3229	3194	3378	3745	4107		
10	3647	3894	3948	3967	4173	3957	4161	3838	3741	3407	3444	3043	2630	3132	3262	3479		
15	3677	3724	4029	4456	3860	4720	4176	3947	3704	3057	2390	1844	2026	2112	2509	3119		
20	3593	3912	3992	3716	3487	3689	4239	3825	3565	2624	1890	1712	1491	1568	2011	2805		
25	3471	3881	4035	4504	3490	4163	4101	3792	3360	2301	1496	1294	1307	1297	1553	2463		
30	3335	3629	4050	3670	3462	3690	3853	3711	3143	1863	1280	1133	1120	1117	1311	2077		
35	3121	3675	3603	3948	3982	4035	3650	3734	2875	1518	1041	901	843	920	1058	1677		
40	2839	3451	3476	4873	5348	4185	3623	3530	2485	1189	814	617	562	656	823	1320		
45	2412	3144	4079	5310	5527	5140	3629	3189	2062	857	611	444	421	454	626	991		
50	2052	3007	4268	5465	5538	5089	3836	2929	1692	624	438	286	230	314	466	724		
55	1693	2933	4161	5650	6077	5369	3995	2762	1406	492	298	153	112	183	338	512		
60	1495	2643	4038	5274	5983	4992	3812	2441	1192	391	191	83.6	56.2	102	240	394		
65	1323	2328	4044	5533	6629	5136	3483	2105	949	312	131	42.0	25.5	57.5	173	337		
70	1134	2078	4116	5233	6678	5155	3342	1916	658	245	73.5	10.4	10.9	11.7	110	291		
75	783	1865	4031	5434	6442	5221	3370	1641	389	186	35.7	13.1	13.9	12.5	60.0	237		
80	454	1638	3812	5113	6246	4756	3243	1367	226	141	28.5	15.8	16.1	14.6	46.8	186		
85	231	1361	3500	4535	5916	4502	3010	1116	150	107	23.8	18.3	18.8	17.0	36.7	143		
90	138	1143	3009	4535	5695	4150	2655	861	118	87.4	20.5	19.3	20.4	18.0	28.8	116		
95	112	886	2591	3608	4739	3366	2286	601	108	71.4	18.7	19.4	21.3	18.6	23.3	99.7		
100	112	665	2019	3279	4175	3052	1919	430	113	55.2	17.4	19.4	22.2	18.5	20.0	86.1		
105	120	514	1728	2474	2658	2354	1481	329	116	41.0	16.3	18.8	21.7	18.3	18.3	71.0		
110	119	382	1258	2089	2067	1781	1173	258	106	31.1	15.0	18.2	20.7	17.8	16.6	53.6		
115	104	304	1039	1405	1278	1377	888	218	82.3	23.8	14.1	17.6	20.0	17.4	14.9	37.4		
120	76.3	245	709	1153	1072	1096	633	159	59.5	19.0	13.2	16.7	18.8	16.6	13.5	28.4		
125	56.9	230	549	843	817	782	476	127	42.6	16.0	12.0	14.9	17.0	14.4	12.0	22.8		
130	44.3	175	404	547	565	543	356	105	31.1	14.1	12.1	13.4	14.8	12.8	11.6	19.2		
135	35.1	148	290	350	362	332	258	72.8	24.1	13.1	12.0	13.2	14.1	12.8	11.5	16.8		
140	28.7	90.7	205	217	234	202	217	47.0	19.5	12.4	12.0	13.2	14.5	13.3	12.2	14.4		
145	23.2	53.5	160	131	142	129	150	30.2	15.8	12.4	12.0	13.4	15.1	13.6	12.7	13.0		
150	19.7	31.1	106	99.1	100.0	99.3	85.9	20.4	13.8	12.3	11.9	13.2	15.0	13.3	12.7	12.6		
155	16.7	17.8	53.7	75.9	77.8	69.1	38.1	16.3	11.7	11.3	11.4	11.1	12.3	11.7	11.6	11.8		
160	15.1	14.4	25.6	43.0	49.9	37.1	19.6	14.1	11.4	10.8	11.7	10.4	10.9	11.1	11.2	11.4		
165	14.7	14.5	15.1	20.2	21.7	18.1	12.9	14.3	11.1	10.8	12.4	10.3	10.9	11.6	11.3	11.2		
170	16.2	15.7	14.8	14.2	11.7	13.6	14.7	15.6	16.1	16.0	16.8	16.4	15.2	14.8	16.4	16.6		
175	16.9	17.7	17.0	14.7	13.4	15.3	16.9	17.3	17.3	17.6	19.1	19.4	16.7	16.2	17.8	18.7		
180	17.0	17.9	17.7	15.6	15.3	16.6	17.8	17.4	17.7	17.2	18.1	17.9	15.5	15.0	16.4	17.6		



**BUG Ratings**



**2.2 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-06-15	<b>Test Ambient:</b>	25±1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	WP09-120L-CSP-3CCT	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE220412-	120.0	60	0.9808	117.1	0.9949	7.50
U1	277.0	60	0.4339	114.4	0.9518	8.61
<b>DLC Pass Criteria</b>					≥ 0.9(-3%)	≤ 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer**

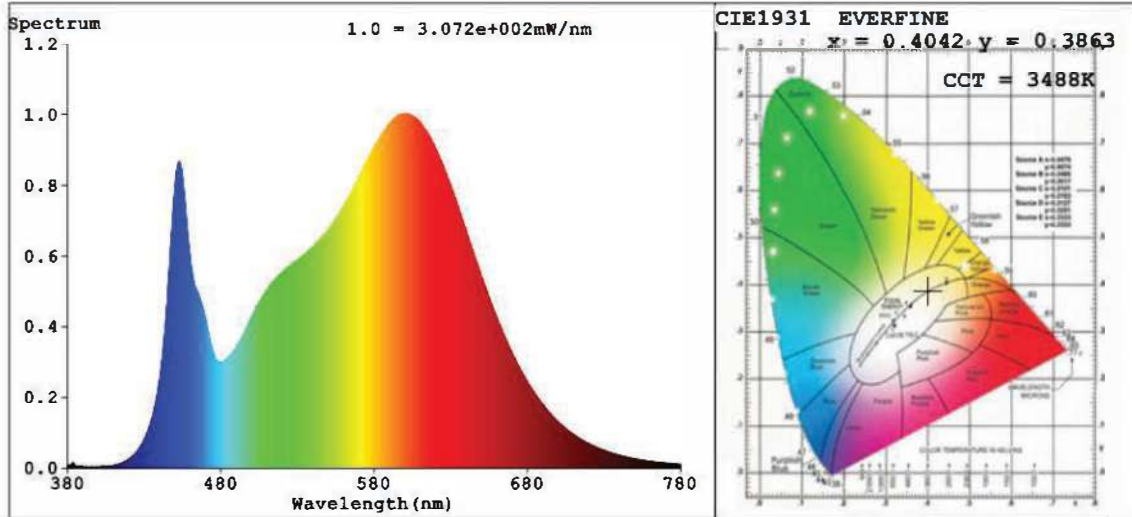
**Method(Self-absorption:1.1785)(4π geometry):**

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	85.0
Frequency (Hz)	60	R9	15
CCT (K)	3488	Rg	95
Duv	-0.0017	Rf	85
Chromaticity (x, y)	x=0.4042 y=0.3863	Rcs,h1(%)	-11
Chromaticity (u', v')	u'=0.2368 v'=0.5093		

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	16771	16435	≥300 (-10%)	
Luminous Efficacy (lm/W)	143.22	143.66	Standard: ≥105(-3%)	Premium: ≥120(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



**Special Color Rendering Indices**

R1 =84	R2 =94	R3 =95	R4 =83	R5 =85	R6 =92	R7 =84		
R8 =63	R9 =15	R10=86	R11=83	R12=71	R13=87	R14=98	R15=78	

**TM30**

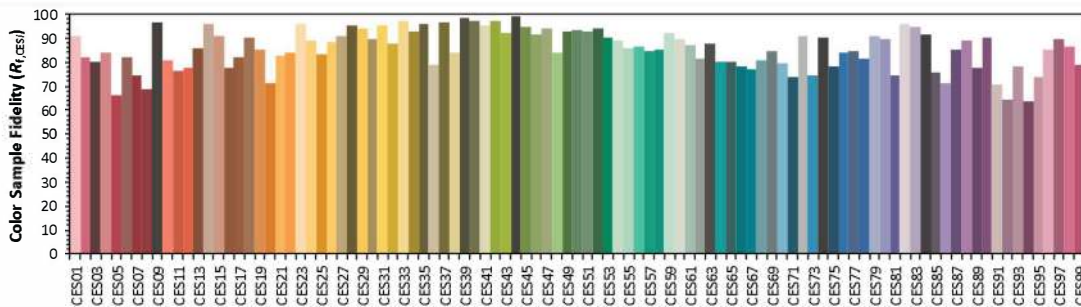
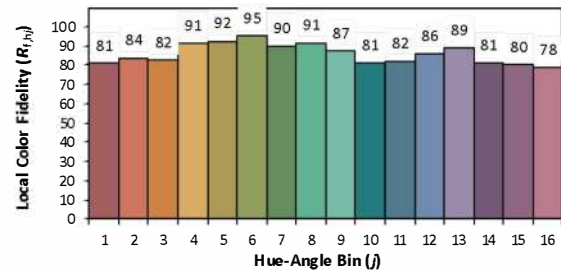
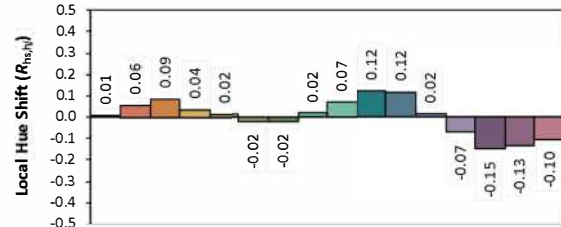
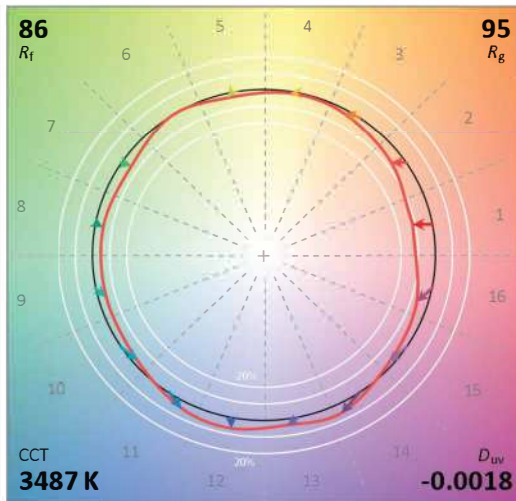
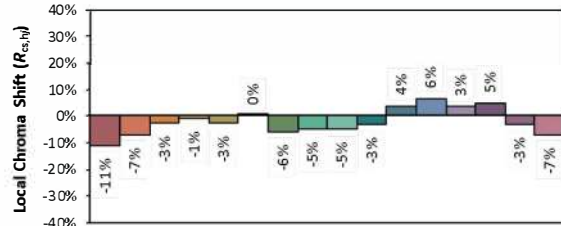
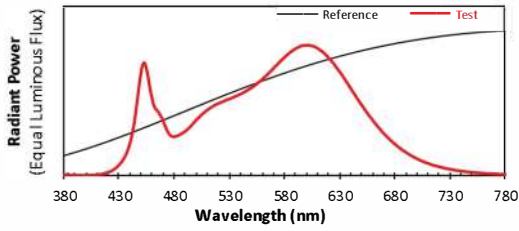
**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-3580RC35001D1

Manufacturer: Beyond LED Technology

Date: 2022-06-15

Model: WP09-120L-CSP-3CCT



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4042  
 $y$  0.3862  
 $u'$  0.2369  
 $v'$  0.5092

CIE 13.3-1995  
(CRI)

$R_a$  85  
 $R_g$  15

**2.3 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-06-15	<b>Test Ambient:</b>	25±1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	WP09-120L-CSP-3CCT	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE220412-	120.0	60	0.9742	116.4	0.9957	7.35
U2	277.0	60	0.4311	113.8	0.9529	8.44
<b>DLC Pass Criteria</b>					≥ 0.9(-3%)	≤ 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer**

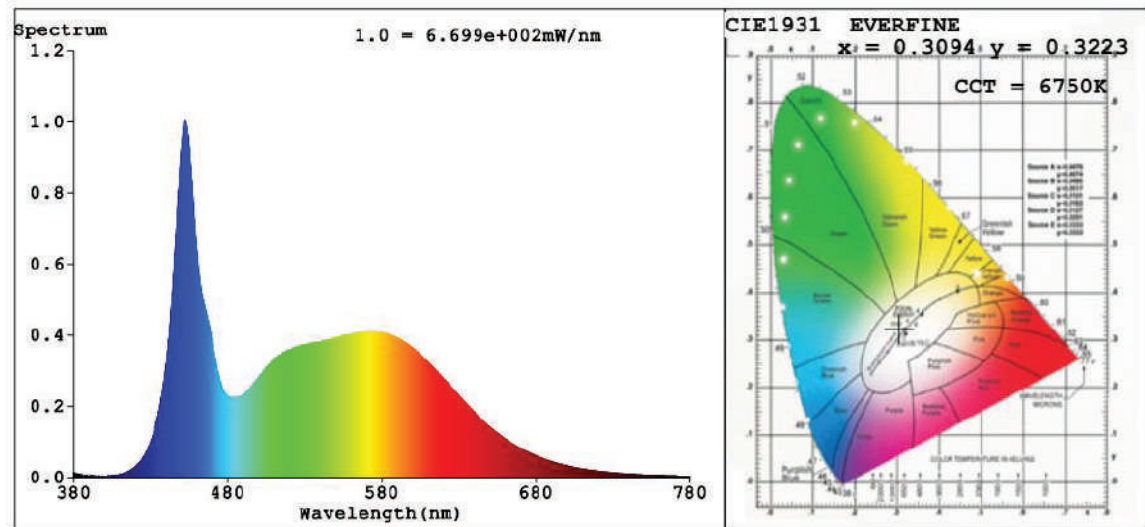
**Method(Self-absorption:1.1784)(4π geometry):**

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	83.1
Frequency (Hz)	60	R9	3
CCT (K)	6750	Rg	93
Duv	0.0014	Rf	82
Chromaticity (x, y)	x=0.3094 y=0.3223	Rcs,h1(%)	-15
Chromaticity (u', v')	u'=0.1980 v'=0.4642		

**Photometric Measurement – Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V5.1 Pass Criteria	
Test Voltage (V)	120	277	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	17337	16989	≥300 (-10%)	
Luminous Efficacy (lm/W)	148.94	149.29	Standard: ≥105(-3%)	Premium: ≥120(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



**Special Color Rendering Indices**

R1 =81	R2 =90	R3 =92	R4 =81	R5 =82	R6 =83	R7 =87		
R8 =68	R9 =3	R10=74	R11=81	R12=57	R13=84	R14=96	R15=77	

TM30

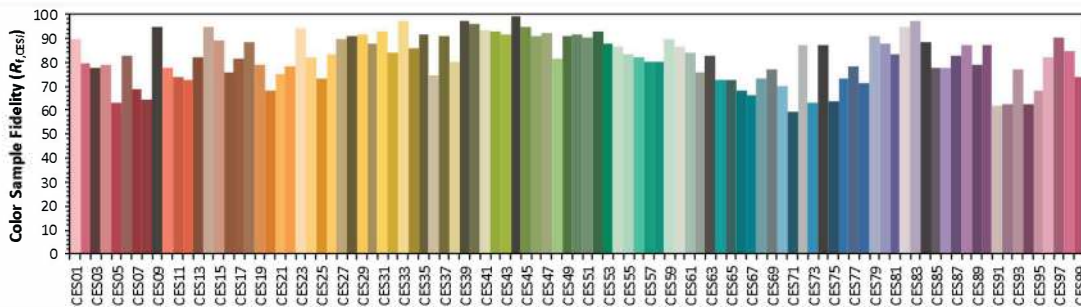
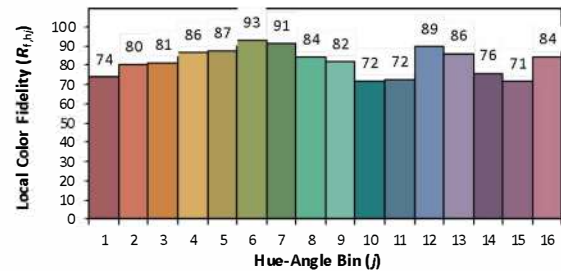
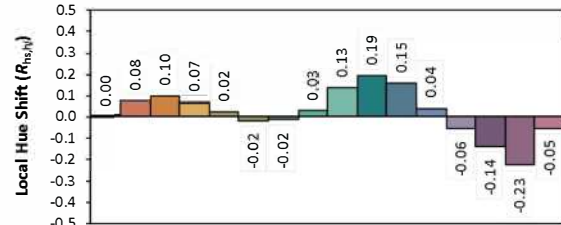
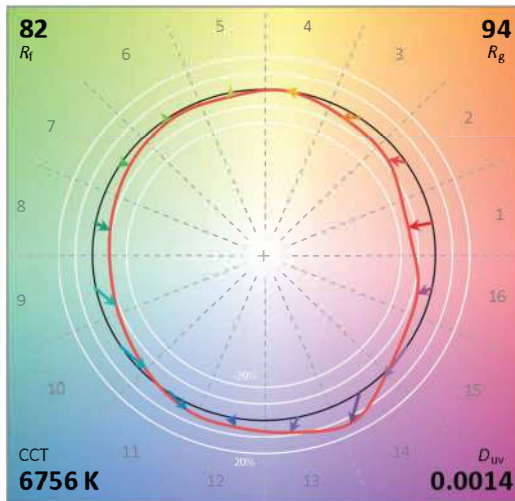
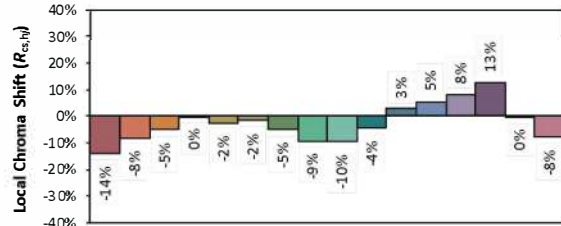
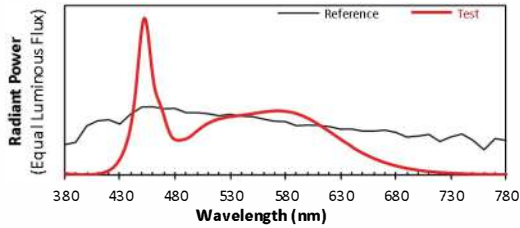
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-6580RC35001D1

Manufacturer: Beyond LED Technology

Date: 2022-06-15

Model: WP09-120L-CSP-3CCT



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3093  
 $y$  0.3221  
 $u'$  0.1981  
 $v'$  0.4641

CIE 13.3-1995  
 (CRI)  
 $R_a$  83  
 $R_g$  3

**2.4 Performance Assessment:**

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
WP09-120L-CSP-3CCT	3500K	16647	116.8	142.57
WP09-120L-CSP-3CCT	4000K	16785* <sup>1</sup>	116.6* <sup>2</sup>	143.95* <sup>3</sup>
WP09-120L-CSP-3CCT	5000K	17061* <sup>1</sup>	116.6* <sup>2</sup>	146.32* <sup>3</sup>
WP09-120L-CSP-3CCT	5700K	17199* <sup>1</sup>	116.6* <sup>2</sup>	147.50* <sup>3</sup>
WP09-120L-CSP-3CCT	6500K	17337	116.4	148.94

\*1: This value is calculated and the calculation formula is as below:

$$16785 = (17337 - 16647) / 5 * 1 + 16647$$

$$17061 = (17337 - 16647) / 5 * 3 + 16647$$

$$17199 = (17337 - 16647) / 5 * 4 + 16647$$

\*2: This value is calculated and the calculation formula is as below:

$$116.6 = (116.8 + 116.4) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$143.95 = (16785 / 116.6)$$

$$146.32 = (17061 / 116.6)$$

$$147.50 = (17199 / 116.6)$$



**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2021-07-07	2022-07-06
ST-R-333	Power Meter for Integrating Sphere	2022-07-11	2023-07-10
ST-R-405	Temperature Probe for Integrating Sphere	2022-01-19	2023-01-18
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2021-07-07	2022-07-06
ST-R-358	Power Meter for Goniophotometer	2022-07-11	2023-07-10
ST-R-354	hygrothermograph for Goniophotometer	2022-07-11	2023-07-10
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.20K, k=2 Photometric Measurement(Goniophotometer):3.36%, k=2			

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