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LM-79-19 Test Report

For

Beyond LED Technology

(Brand Name:Beyond LED Technology
1939 Parker Court, Stone Mountain, GA 30087

Model name(s):
BR01R-4224L-CS-3CCT

Report Type: Testing and Report According to IES LM-79-2019
Type of Luminaire: Bollards
Report Date: 2024-04-08

Test & Report By:

Review By:

Ferrum Li

Garman Mo

Engineer: Ferrum Li

Manager: Garman Mo

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.

Project No.: JBE240311 Report No.: JBE240311-A

Report Format Number STP-QP019-101-B/0

<https://bestway-compliance.com>

1 / 20

1.1 Product Information:		
Model Number	BR01R-4224L-CS-3CCT	
Remark	The [C;CS;CM;CSM] can be: C=adjustable color temperature, CS=adjustable power switch with adjustable color temperature, CM=microwave motion sensor with adjustable color temperature, CSM=adjustable power switch with adjustable color temperature with microwave motion sensor.	
Representative (Tested) Model	BR01R-4224L-CS-3CCT(0%,3000K) BR01R-4224L-CS-3CCT(50%,4000K) BR01R-4224L-CS-3CCT(100%,5000K)	
Model Difference	N/A	
SKU (if available)	--	
Type of Luminaire (for integral lamps, list base type and lamp type)	Bollards	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3070RC35001K1 L128-5070RC35001K1	
Integral Controls Availability	Yes	
Dimming	Continuous	
Sample Number	JBE240311-A1	
Date of Receipt	2024-03-27	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaire Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 50/60Hz
Nominal Power	24W
Rated Initial Lamp Lumen	--
Declared CCT	3000K,4000K,5000K(Color Tunable)

1.3 Test Specifications:

Test item	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	1. IES LM-79-2019 Optical and Electrical Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 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

1.4 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 Summary of Test Result

Criteria Item	Measured Value		Compliance	Requirement (DLC V5.1)	
Minimum Total Luminous	2903.0		Pass	$\geq 500(-10\%)$	
Minimum Luminous Efficacy	120.86		Pass	Standard: $\geq 105(-3\%)$	Premium: $\geq 120(-3\%)$
Minimum Power Factor	0.9037		Pass	$\geq 0.9(-3\%)$	
Maximum THD %	22.51		Pass	$\leq 20(+5)$	
Minimum CRI	72.4		Pass	$\geq 70(-1)$	
Minimum R9	-28		Pass	$\geq -40(-1)$	
Minimum Rg	95		Pass	$\geq 89(-1)$	
Minimum Rf	73		Pass	$\geq 70(-1)$	
Rcs, h1(%)	-17		Pass	-18%-23%(-1%)	
CCT (K)	3000K	3106	Pass	$\leq 6500K$	
	4000K	3860			
	5000K	5132			
Zonal Lumen Requirement (%)	90-110 °	0.9	Pass	$\leq 15(+3)$	
	>110 °	0.8	Pass	$\leq 0(+3)$	
BUG rating	B1-U2-G1		--	BUG rating	

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-03-27	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	BR01R-4224L-CS-3CCT	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE240311-A1	120.0	60	0.2058	24.19	0.9796	7.22
	277.0	60	0.0957	23.95	0.9037	22.51

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

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2923.5	2903.0
Luminous Efficacy (lm/W)	120.86	121.21
Zonal lumens in the 90-110 °zone (%)	0.9	--
Zonal lumens in the >110 °zone (%)	0.8	--
BUG rating	B1-U2-G1	--
Beam Angle (°)	339.3	--
Center Beam Candle Power (cd)	0	--

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	363.5	12.4%
0-40	1,126.6	38.5%
0-60	2,395.8	82%
60-90	477.3	16.3%
70-100	224.9	7.7%
90-120	34.4	1.2%
0-90	2,873.1	98.3%
90-180	50.2	1.7%
0-180	2,923.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.2	0.0%	90-100	14.7	0.5%
10-20	42.1	1.4%	100-110	11.0	0.4%
20-30	321.2	11.0%	110-120	8.7	0.3%
30-40	763.0	26.1%	120-130	7.3	0.2%
40-50	796.4	27.2%	130-140	5.2	0.2%
50-60	472.9	16.2%	140-150	2.4	0.1%
60-70	267.1	9.1%	150-160	0.7	0%
70-80	156.4	5.4%	160-170	0.2	0%
80-90	53.8	1.8%	170-180	0.0	0%

Photometric Data

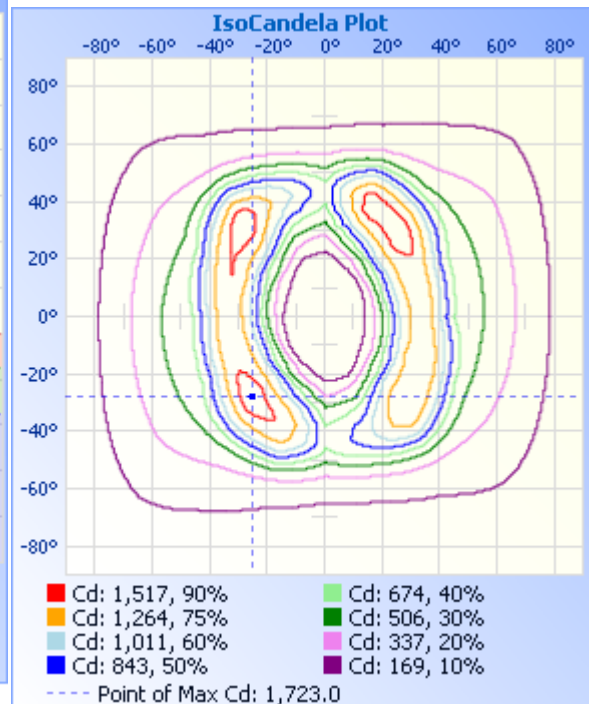
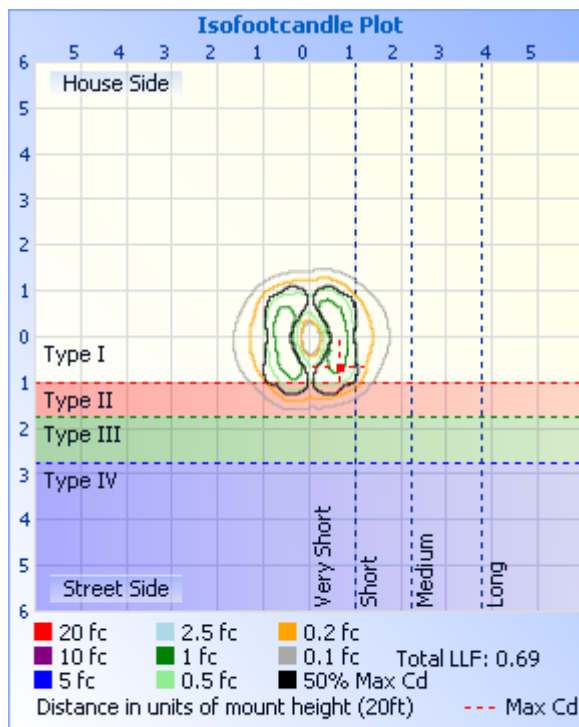
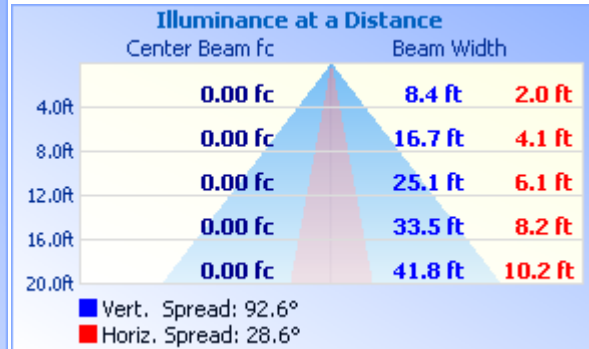
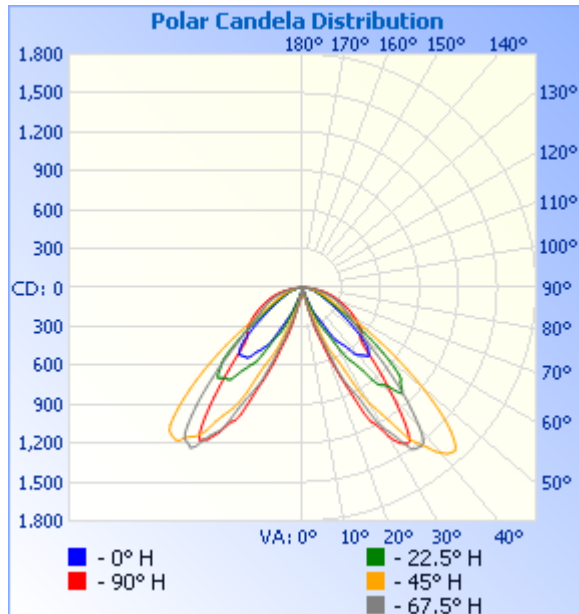
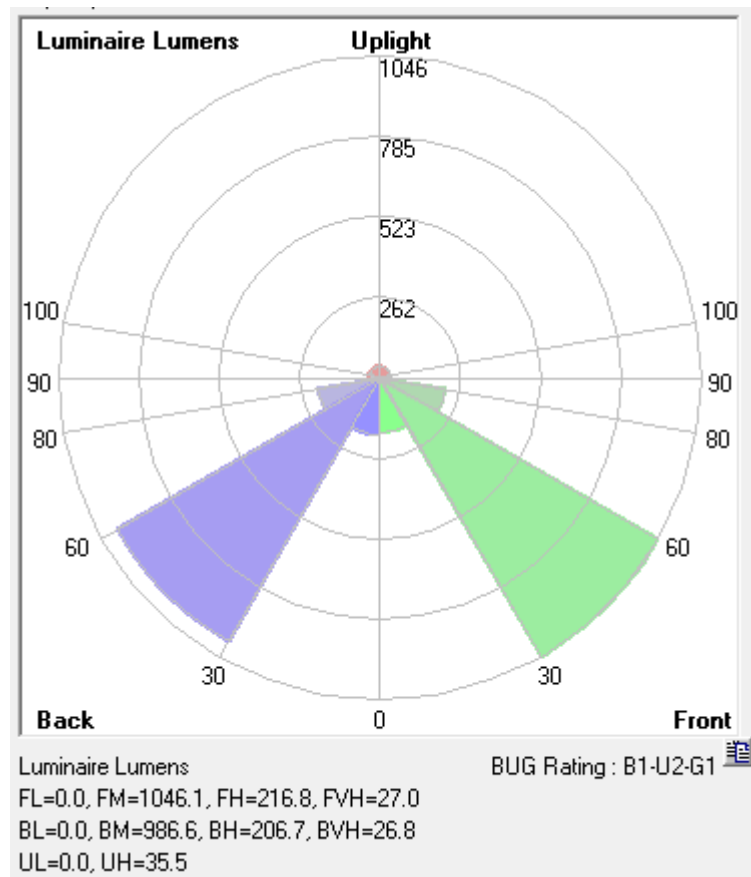


Table--1

UNIT: cd

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	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		
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.34	0.11	0.11	0.11	0.23	0.56	0.45		
10	45.1	25.6	1.57	0.34	0.11	0.00	6.43	18.7	24.6	18.2	2.96	1.47	1.01	1.24	2.87	22.0		
15	219	173	116	22.8	4.18	25.2	111	174	180	161	110	23.4	5.65	20.5	119	193		
20	538	546	461	250	58.6	115	263	419	497	547	478	279	84.8	120	290	454		
25	960	943	866	509	224	303	589	838	932	966	924	577	257	346	618	856		
30	1292	1330	1263	849	373	492	1032	1255	1320	1375	1325	897	468	521	1071	1272		
35	1392	1441	1582	1285	534	737	1415	1518	1443	1484	1617	1282	598	760	1386	1507		
40	1001	1109	1672	1605	679	980	1662	1399	1067	1160	1627	1447	692	912	1528	1375		
45	672	753	1294	1588	725	1076	1648	998	722	791	1237	1318	687	911	1404	984		
50	557	580	847	1202	588	869	1226	653	586	600	808	922	526	696	999	648		
55	509	512	509	689	393	519	730	495	544	524	495	514	344	415	581	470		
60	431	434	356	350	261	297	388	402	464	442	350	291	230	257	326	374		
65	355	361	275	220	182	195	248	337	385	369	271	200	163	175	220	307		
70	283	288	211	153	131	137	176	267	302	291	208	146	121	127	159	242		
75	214	220	149	103	94.5	96.2	120	196	229	222	150	102	89.3	91.3	110	177		
80	141	147	93.7	64.5	60.4	61.9	74.9	127	154	149	96.2	65.3	57.4	58.7	69.5	113		
85	66.1	68.7	46.7	32.0	25.3	29.1	39.6	64.6	76.3	76.2	50.2	33.9	23.4	27.1	37.2	55.6		
90	21.3	20.7	19.1	13.4	4.50	8.22	16.5	20.7	20.8	21.0	19.8	14.2	3.38	7.76	16.8	20.4		
95	18.9	18.7	16.9	11.6	3.66	6.75	14.1	17.9	18.0	18.2	17.6	11.7	2.98	6.18	14.1	18.0		
100	17.3	16.8	14.9	10.1	3.38	5.63	12.0	15.4	15.7	16.1	14.5	9.45	2.91	5.06	12.1	15.4		
105	15.6	15.2	13.1	8.89	3.22	5.06	10.3	13.6	13.9	14.1	12.4	8.21	2.84	4.61	10.3	13.5		
110	14.1	13.7	11.8	8.32	3.23	4.93	9.34	12.2	12.3	12.4	10.7	7.30	2.94	4.54	9.21	12.1		
115	12.8	12.5	11.3	8.36	3.25	4.90	9.13	11.2	10.9	10.7	9.87	7.22	3.26	4.46	9.12	10.9		
120	12.1	12.1	11.2	8.40	3.26	4.87	9.10	10.8	9.89	9.78	9.11	7.14	3.23	4.38	9.04	10.7		
125	11.6	11.5	11.1	8.35	3.26	5.06	9.04	10.6	8.77	8.77	8.88	6.93	3.19	4.25	8.66	9.50		
130	11.1	11.1	11.0	8.17	3.26	5.06	8.67	9.91	8.09	8.21	8.43	6.74	3.16	3.83	7.31	8.89		
135	10.2	10.4	10.0	7.32	3.26	4.73	7.43	8.89	6.97	7.08	6.97	5.40	2.59	3.37	5.96	7.42		
140	8.44	8.78	8.00	5.52	3.27	3.71	5.74	7.31	5.85	5.96	5.40	3.71	2.13	2.14	4.49	5.62		
145	6.31	6.64	5.86	3.94	2.48	2.70	3.94	5.40	4.39	4.15	3.60	2.58	1.29	1.69	2.58	3.71		
150	4.28	4.17	3.49	2.36	1.53	1.69	2.37	3.49	2.69	2.47	2.02	1.57	0.32	0.11	1.23	1.91		
155	2.48	2.48	2.03	1.31	0.85	0.95	1.33	2.14	1.55	2.22	1.58	1.30	0.00	0.00	0.00	1.16		
160	2.05	2.00	1.65	1.07	0.61	0.63	1.16	1.91	1.42	1.96	1.45	1.04	0.00	0.00	0.00	0.67		
165	1.35	1.35	1.13	0.67	0.00	0.12	0.79	1.08	0.79	1.23	0.67	0.33	0.00	0.00	0.00	0.00		
170	0.46	0.46	0.23	0.00	0.00	0.00	0.14	0.34	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



2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-03-27	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	BR01R-4224L-CS-3CCT	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE240311-A1	120.0	60	0.2071	24.31	0.9781	7.20
	277.0	60	0.0961	24.07	0.9040	22.47

Chromaticity Measurement - Sphere-Spectroradiometer

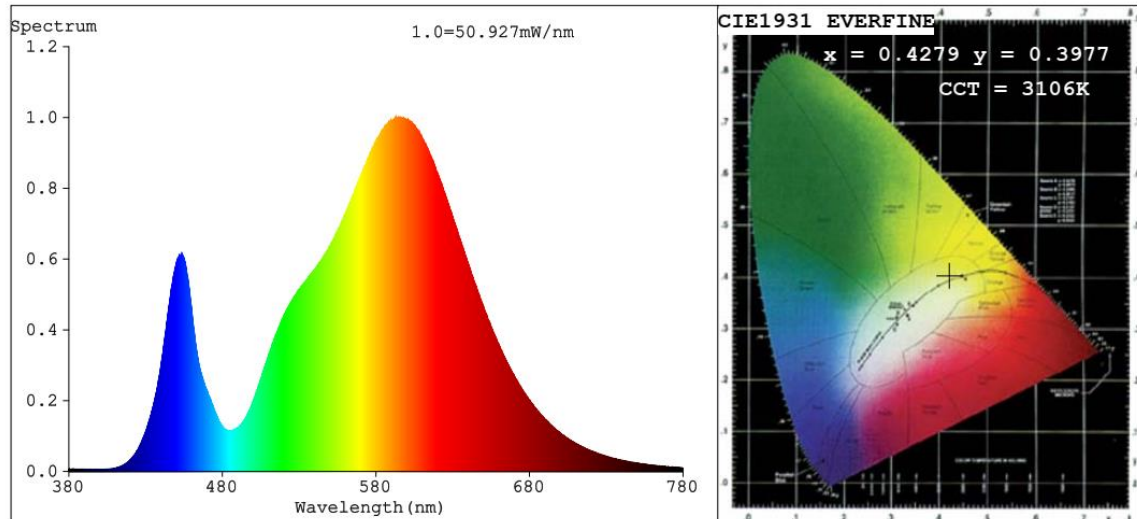
Method(Self-absorption:1.0987) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	74.2
Frequency (Hz)	60	R9	-25
CCT (K)	3106	Rg	95
Duv	-0.0013	Rf	76
Chromaticity (x, y)	x=0.4279 y=0.3977	Rcs,h1(%)	-16
Chromaticity (u', v')	u'=0.2475 v'=0.5175		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2947	2926
Luminous Efficacy (lm/W)	121.23	121.56

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =71	R2 =84	R3 =94	R4 =70	R5 =71	R6 =78	R7 =79	
R8 =47	R9 =-25	R10=63	R11=66	R12=52	R13=74	R14=97	R15=64

TM30

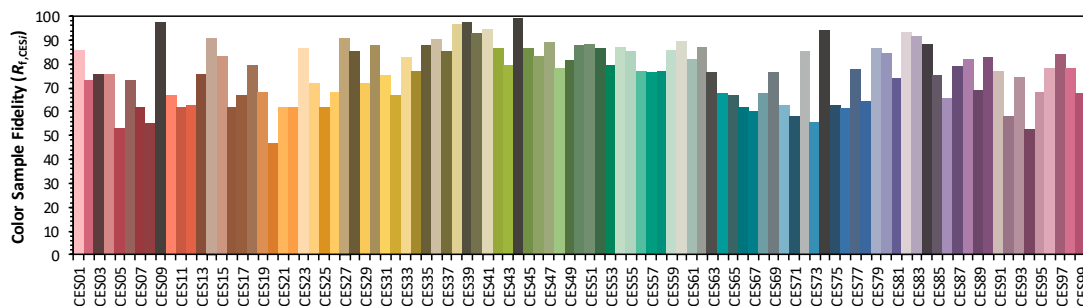
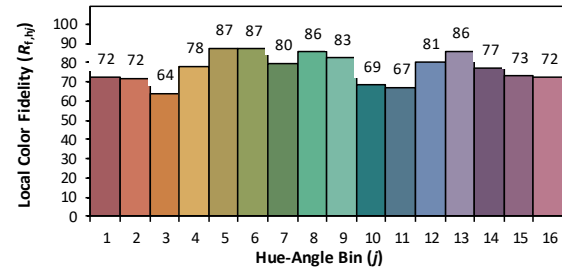
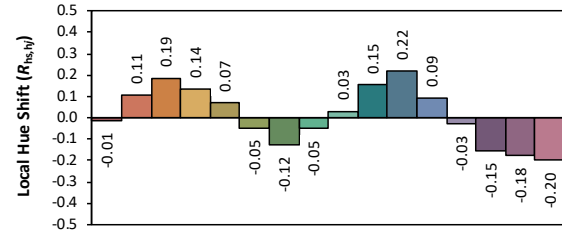
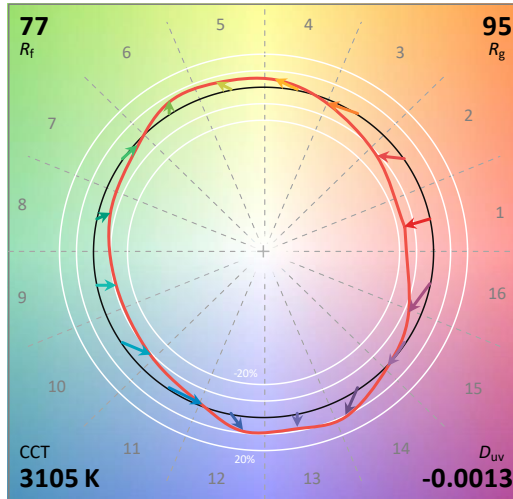
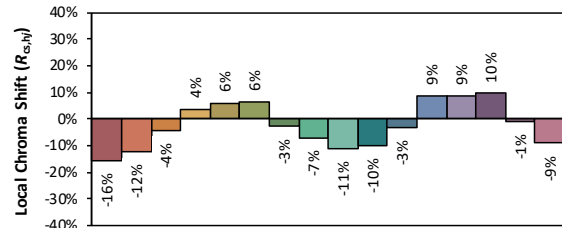
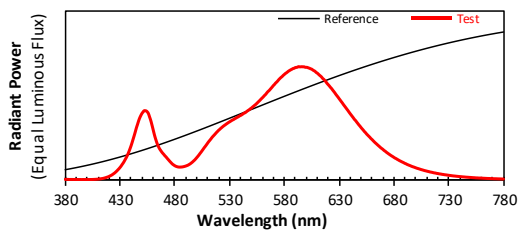
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3070RC35001K1

Manufacturer: Beyond LED Technology

Date: 2024-03-27

Model: BR01R-4224L-CS-3CCT



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

x 0.4279
 y 0.3975
 u' 0.2475
 v' 0.5174

CIE 13.3-1995
(CRI)

R_a 74
 R_g -25

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-03-27	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	BR01R-4224L-CS-3CCT	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE240311-A1	120.0	60	0.2024	23.77	0.9788	7.05
	277.0	60	0.0940	23.55	0.9045	22.34

Chromaticity Measurement - Sphere-Spectroradiometer

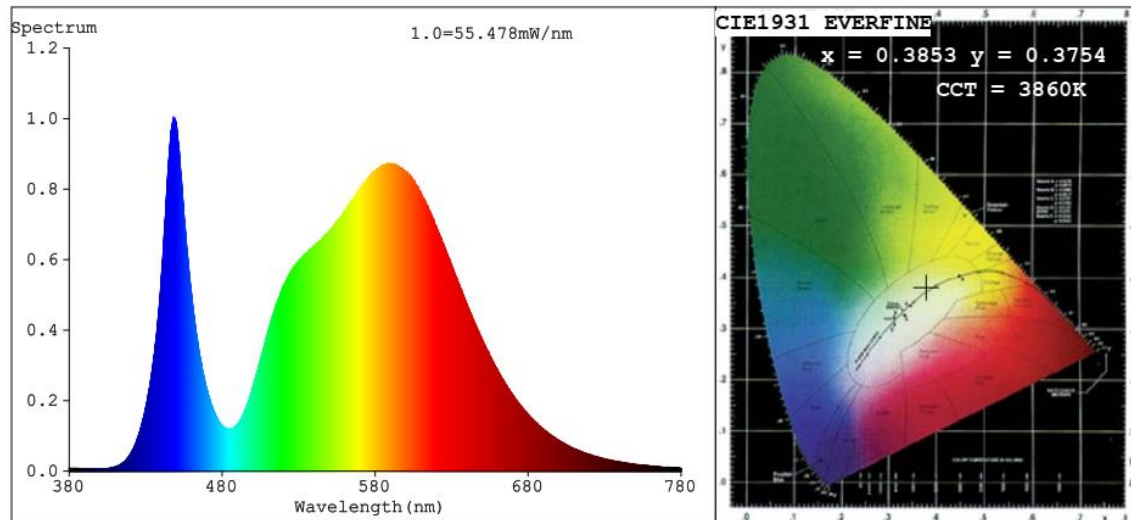
Method(Self-absorption:1.0988) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	75.3
Frequency (Hz)	60	R9	-19
CCT (K)	3860	Rg	96
Duv	-0.0020	Rf	76
Chromaticity (x, y)	x=0.3853 y=0.3754	Rcs,h1(%)	-16
Chromaticity (u', v')	u'=0.2288 v'=0.5017		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	3215	3192
Luminous Efficacy (lm/W)	135.25	135.54

Spectral Power Distribution & Chromaticity Diagram



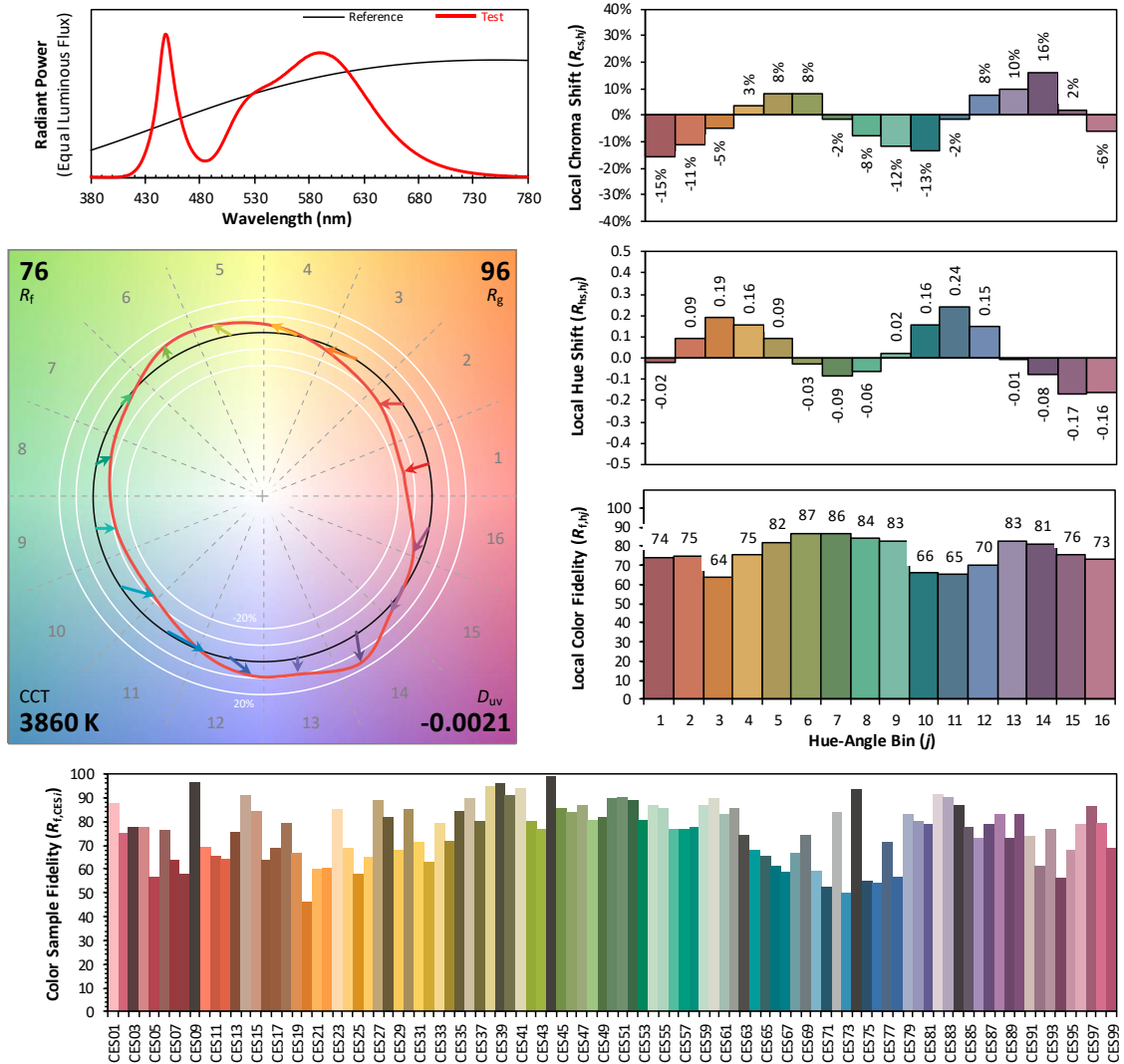
Special Color Rendering Indices

R1 =73	R2 =82	R3 =89	R4 =74	R5 =73	R6 =75	R7 =82	
R8 =55	R9 =-19	R10=57	R11=71	R12=48	R13=75	R14=93	R15=67

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3070RC35001K1
L128-5070RC35001K1
Date: 2024-03-27
Manufacturer: Beyond LED Technology
Model: BR01R-4224L-CS-3CCT



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

x 0.3852
 y 0.3752
 u' 0.2289
 v' 0.5016

CIE 13.3-1995
(CRI)

R_a 75
 R_g -19

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

2.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-03-27	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	BR01R-4224L-CS-3CCT	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE240311-A1	120.0	60	0.2049	24.12	0.9811	7.15
	277.0	60	0.0953	23.87	0.9042	22.43

Chromaticity Measurement - Sphere-Spectroradiometer

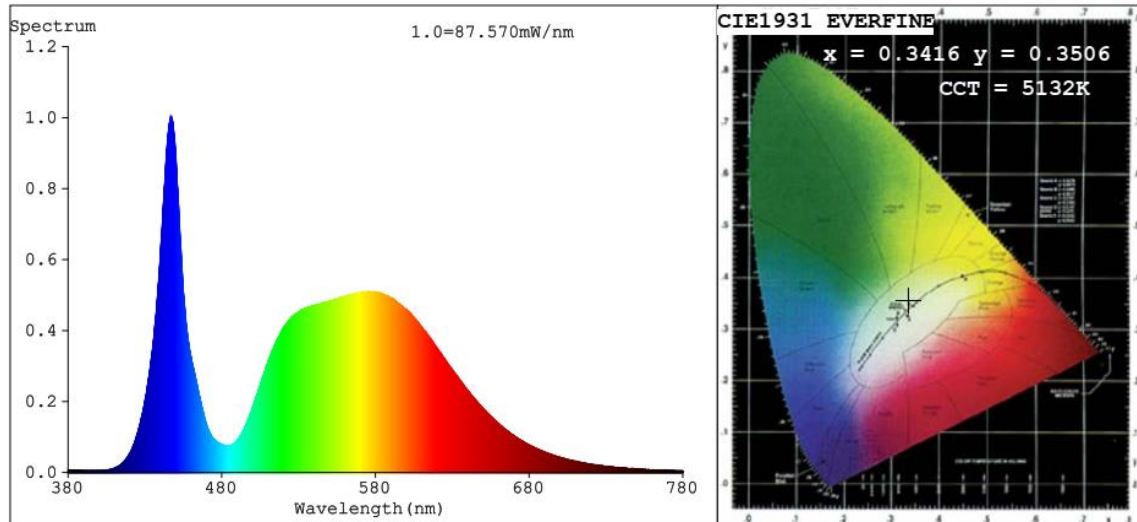
Method(Self-absorption:1.0990) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	72.4
Frequency (Hz)	60	R9	-28
CCT (K)	5132	Rg	95
Duv	0.0009	Rf	73
Chromaticity (x, y)	x=0.3416 y=0.3506	Rcs,h1(%)	-17
Chromaticity (u', v')	u'=0.2095 v'=0.4837		

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	3160	3138
Luminous Efficacy (lm/W)	131.01	131.46

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =71	R2 =76	R3 =80	R4 =74	R5 =72	R6 =68	R7 =80	
R8 =58	R9 =-28	R10=44	R11=73	R12=44	R13=71	R14=89	R15=65

TM30

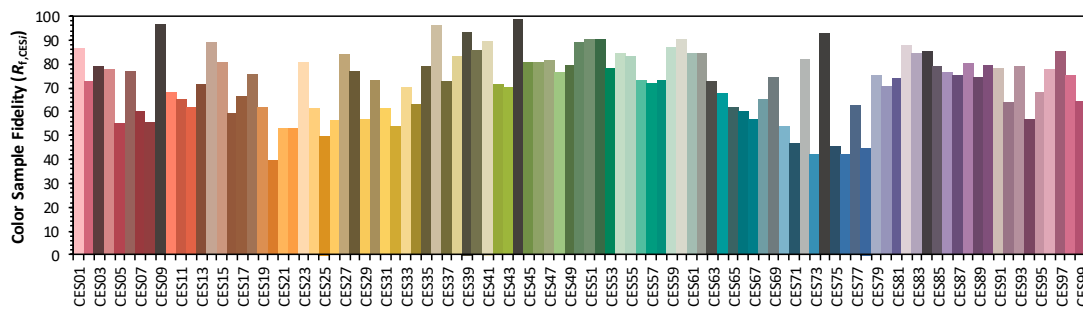
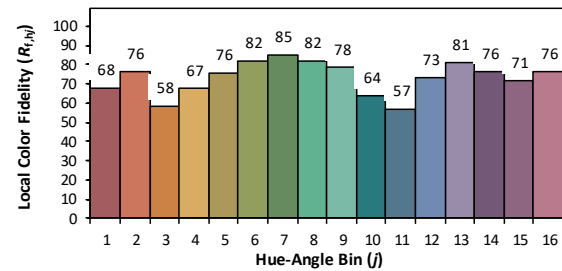
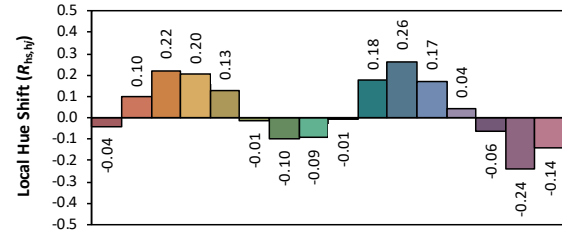
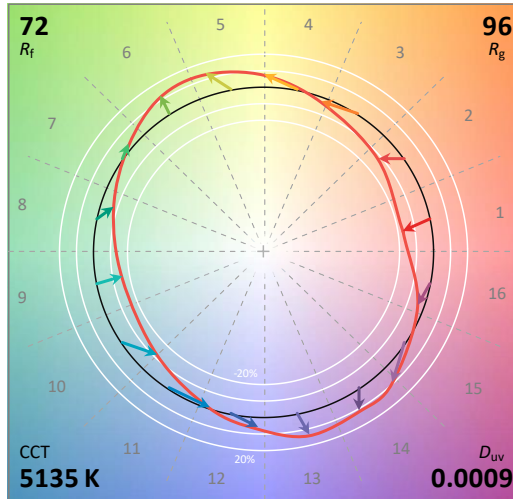
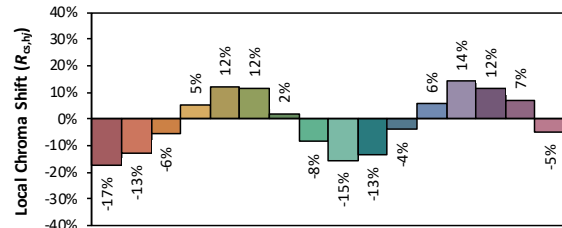
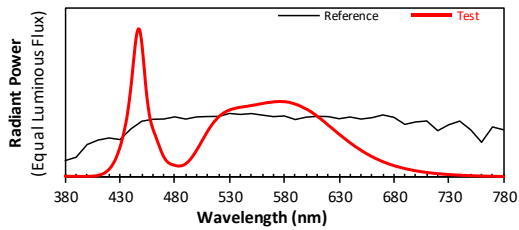
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5070RC35001K1

Manufacturer: Beyond LED Technology

Date: 2024-03-27

Model: BR01R-4224L-CS-3CCT



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

x 0.3415
 y 0.3504
 u' 0.2095
 v' 0.4836

CIE 13.3-1995
(CRI)

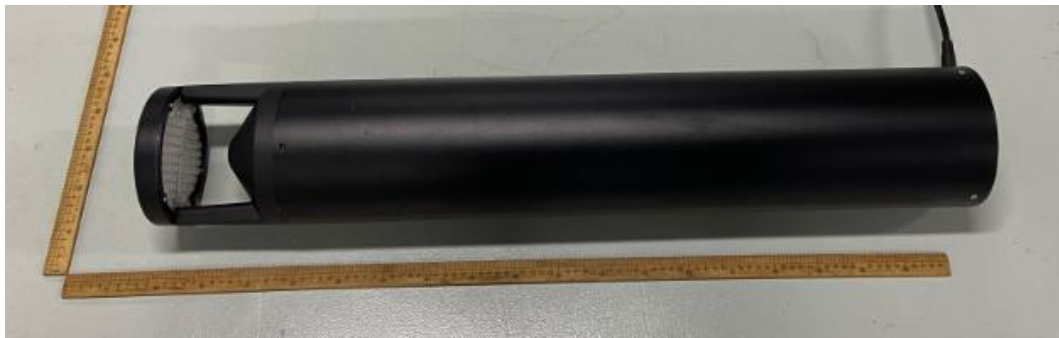
R_a 72
 R_g -28

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-S-451	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-S-455	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-S-452	Standard Lamp D204	2023-06-26	2026-06-25
ST-R-S-453	Power Meter for Integrating Sphere	2023-06-14	2024-06-13
ST-R-S-467	Hygrothermograph	2023-06-20	2024-06-19
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp D908S	2022-07-21	2025-07-20
ST-R-357	AC Power Source	2024-01-31	2025-01-30
ST-R-S-453	Power Meter for Goniophotometer	2023-06-14	2024-06-13
ST-R-S-458	hygrothermograph for Goniophotometer	2023-06-14	2024-06-13
Uncertainty: Photometric Measurement (Sphere):2.94%, k=2 Chromaticity Measurement(Sphere):52.28K, k=2 Photometric Measurement(Goniophotometer): 2.94%, k=2			

4. Product Photo



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