

LM-79-08 Test Report

For

IKIO LED LIGHTING, LLC

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

Direct Linear Ambient Luminaires

Model name(s): IK-LLB02-25W-30/40/50K-MV-WH

Remark: "a" can be any two letters for housing color;

"b" can be "R", "M" or blank for AC PIR sensor, DC Motion Sensor provided or not;

"d" can be any digits for CCT.

Representative (Tested) Model:

IK-LLB02-25W-30/40/50K-MV-WH (25W, 3000K)

IK-LLB02-25W-30/40/50K-MV-WH (25W, 4000K)

IK-LLB02-25W-30/40/50K-MV-WH (25W, 5000K)

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

Test & Report By:



Engineer: Winny Wu

Date: 2024-03-28

Review By:

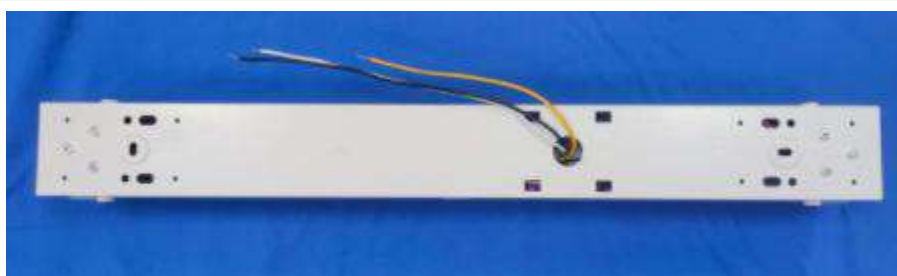
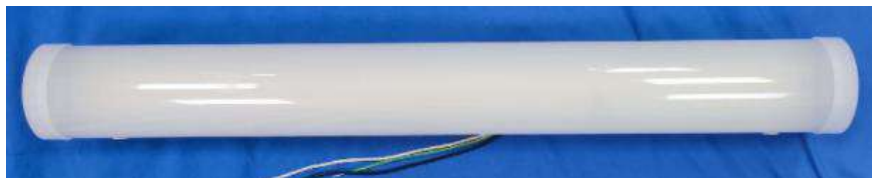


Manager: Jason Luo

1.1 Product Information:

Organization Name	IKIO LED LIGHTING, LLC	
Brand Name	IKIO	
Model Number	IK-LLB02-25W-30/40/50K-MV-WH	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	25W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K, 5000K (Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RA35003H1 L128-5080RA35003H1	
Sample Number	UTC2403011E-A1	
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	2024-03-13
Date of Test	2024-03-15
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-79-2019 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	BL-QP-033

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. Goniophotometer far field detector $f1'=1.42\%$, Test distance: 14.14m

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. Use 2m diameter integrated sphere (94-98% coating reflectance) and 4π geometry.

Self-absorption:

AST-LA01D-25W2FTBTG1A1-abd :1.0595

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.

Laboratory: UTEST TECHNICAL LABORATORY CO.LTD A2LA Certificate# 4810.01

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Report Format Number BL-FM-SA-012

3 / 21

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-15	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-LLB02-25W-30/40/50K-MV-WH (25W,3000K)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC240301	120.0	60	0.206	24.54	0.995	3.74
1E-A1	277.0	60	0.098	24.77	0.912	13.82
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

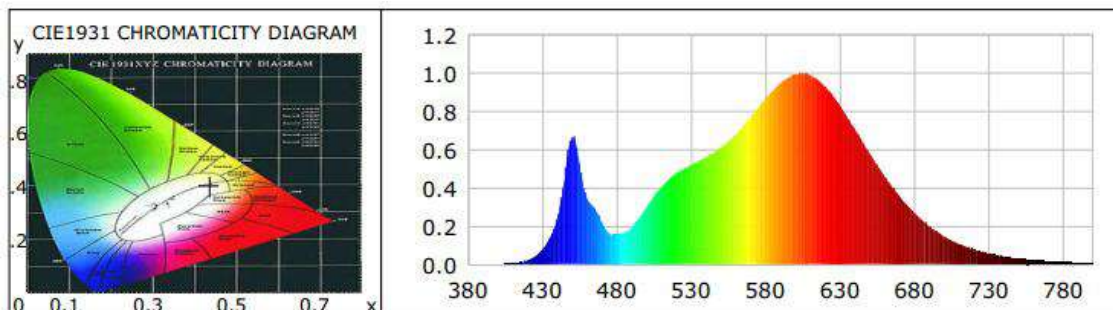
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	8
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	3024	R3	96	R11	81
Duv	-0.0015	R4	81	R12	69
Chromaticity (x, y)	x=0.4331 y=0.3990	R5	82	R13	83
Chromaticity (u', v')	u(u')=0.2503 v'=0.5188	R6	88	R14	98
Color Rendering Index (CRI)	83	R7	82	R15	74
R9	8	R8	60	--	--
Rf	84	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3628.9	3621.6	>=375 lm/ft(-10%)
Luminous Efficacy (lm/W)	147.88	146.21	Standard: >= 115(-3%)
Most worst Luminous/Highest	146.21		
Zonal lumens in the 0-60° zone (%)	68.6	--	>=40(-3%)
Beam Angle (°)	118.9	--	--
Center Beam Candle Power (cd)	1124	--	--

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.0364	535	0.4991	40.8094	690	0.3563	29.1324
385	0.0003	0.0279	540	0.5198	42.4981	695	0.3105	25.3888
390	0.0003	0.0225	545	0.5393	44.0933	700	0.2693	22.0217
395	0.0002	0.0202	550	0.5596	45.7561	705	0.2336	19.0967
400	0.0008	0.0630	555	0.5824	47.6172	710	0.2009	16.4273
405	0.0015	0.1227	560	0.6108	49.9389	715	0.1731	14.1518
410	0.0036	0.2962	565	0.6438	52.6408	720	0.1463	11.9621
415	0.0090	0.7389	570	0.6805	55.6372	725	0.1256	10.2719
420	0.0201	1.6413	575	0.7238	59.1779	730	0.1073	8.7723
425	0.0411	3.3602	580	0.7709	63.0300	735	0.0919	7.5156
430	0.0771	6.3029	585	0.8171	66.8113	740	0.0779	6.3730
435	0.1365	11.1609	590	0.8659	70.7988	745	0.0665	5.4404
440	0.2389	19.5296	595	0.9091	74.3299	750	0.0556	4.5470
445	0.4516	36.9240	600	0.9454	77.2984	755	0.0466	3.8100
450	0.6653	54.3936	605	0.9757	79.7783	760	0.0407	3.3253
455	0.5356	43.7926	610	0.9921	81.1213	765	0.0357	2.9185
460	0.3502	28.6345	615	0.9990	81.6806	770	0.0305	2.4973
465	0.2960	24.2051	620	0.9898	80.9283	775	0.0264	2.1558
470	0.2215	18.1079	625	0.9668	79.0471	780	0.0220	1.8018
475	0.1635	13.3658	630	0.9319	76.1939	785	0.0186	1.5234
480	0.1550	12.6704	635	0.8848	72.3446	790	0.0169	1.3800
485	0.1666	13.6214	640	0.8325	68.0669	795	0.0128	1.0458
490	0.1939	15.8546	645	0.7715	63.0805	800	0.0110	0.8994
495	0.2413	19.7267	650	0.7079	57.8787			
500	0.2992	24.4667	655	0.6424	52.5249			
505	0.3527	28.8382	660	0.5808	47.4896			
510	0.4017	32.8439	665	0.5188	42.4177			
515	0.4429	36.2107	670	0.4598	37.5940			
520	0.4739	38.7508	675	0.4058	33.1783			
525	0.4991	40.8094	680	0.3563	29.1324			
530	0.5198	42.4981	685	0.3105	25.3888			

TM30

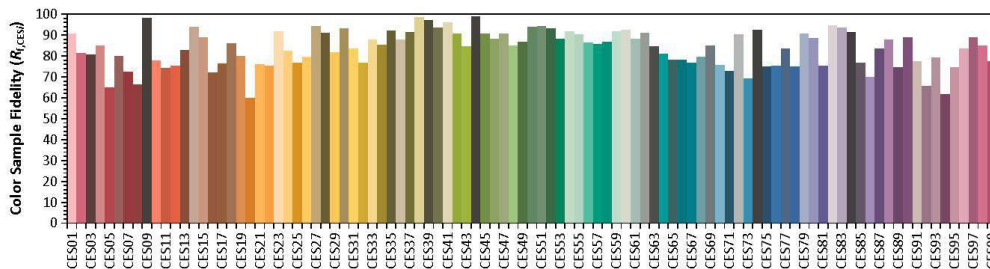
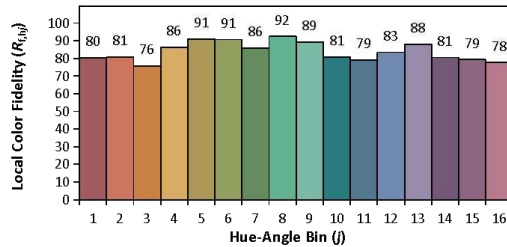
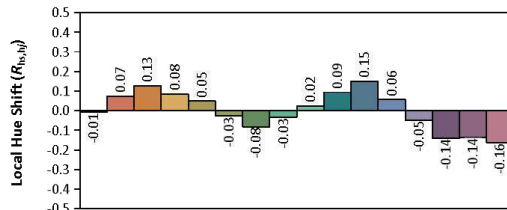
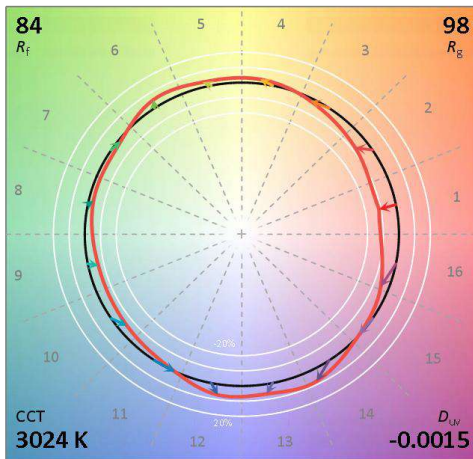
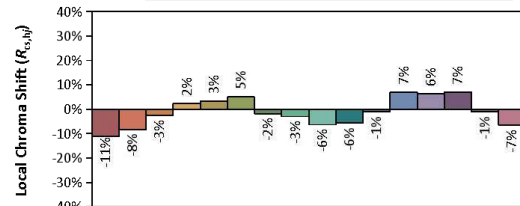
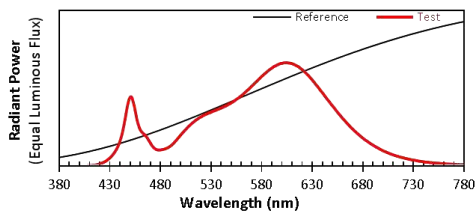
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35003H1

Manufacturer: IKIO LED LIGHTING

Date: 2024/3/15

Model: IK-LLB02-25W-30/40/50K-
MV-WH (25W, 3000K)



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

x 0.4331
 y 0.3990
 u' 0.2503
 v' 0.5188

CIE 13.3-1995
(CRI)
 R_a 83
 R_9 8

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

Zonal Lumen Tabulation

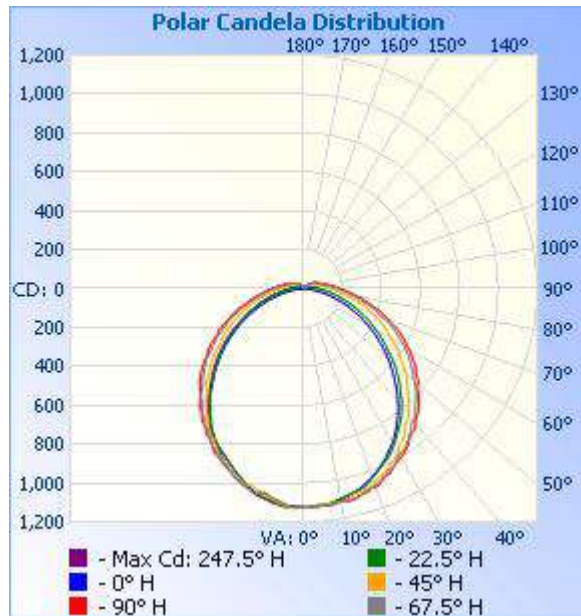
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	867.0	23.9%	23.9%
0-40	1,414.8	39%	39%
0-60	2,489.0	68.6%	68.6%
60-90	859.5	23.7%	23.7%
70-100	555.0	15.3%	15.3%
90-120	218.6	6%	6%
0-90	3,348.5	92.3%	92.3%
90-180	280.2	7.7%	7.7%
0-180	3,628.7	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	106.0	2.9%	90-100	104.2	2.9%
10-20	303.4	8.4%	100-110	68.8	1.9%
20-30	457.6	12.6%	110-120	45.7	1.3%
30-40	547.8	15.1%	120-130	28.3	0.8%
40-50	563.1	15.5%	130-140	15.8	0.4%
50-60	511.1	14.1%	140-150	9.3	0.3%
60-70	408.7	11.3%	150-160	5.2	0.1%
70-80	280.8	7.7%	160-170	2.3	0.1%
80-90	170.0	4.7%	170-180	0.5	0%

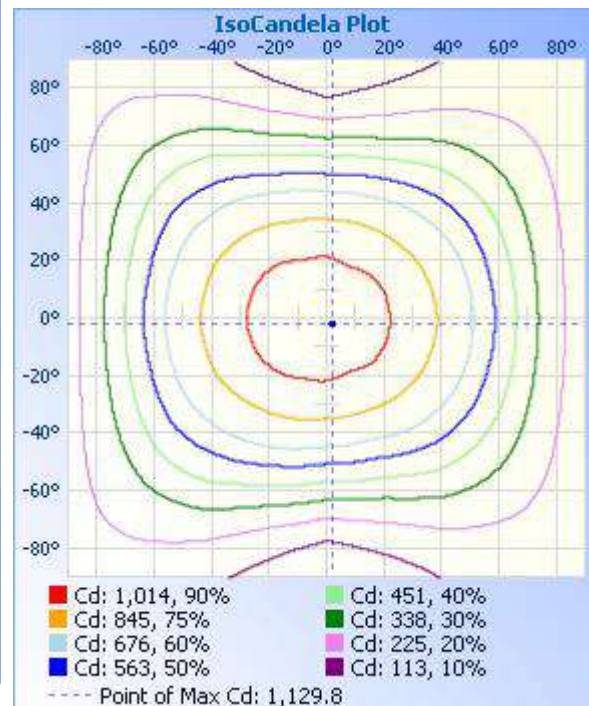
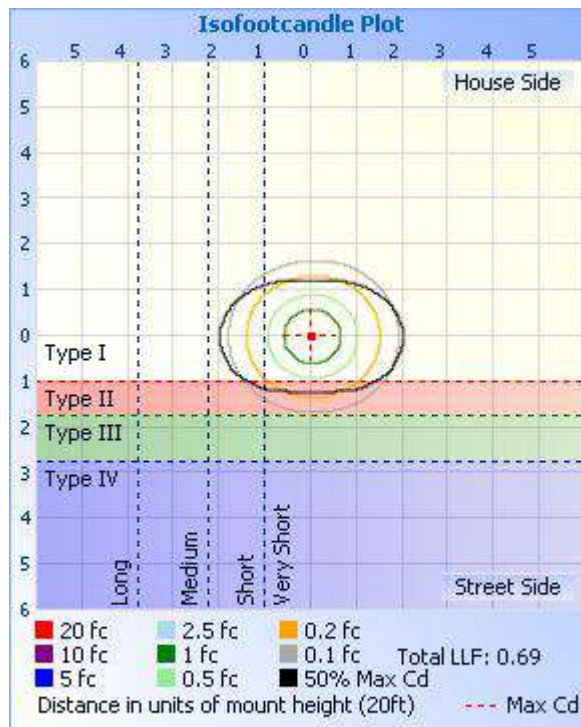
Photometric Data



Illuminance at a Distance

Center Beam fc	Beam Width
3.89 fc	41.1 ft 61.9 ft
0.97 fc	82.2 ft 123.8 ft
0.43 fc	123.4 ft 185.6 ft
0.24 fc	164.5 ft 247.5 ft
0.16 fc	205.6 ft 309.4 ft
0.11 fc	246.7 ft 371.3 ft

Vert. Spread: 100.8°
Horiz. Spread: 122.4°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124
1	1124	1125	1126	1127	1126	1126	1126	1126	1124	1124	1125	1125	1123	1123	1123	1123	1124
2	1123	1126	1125	1125	1121	1123	1124	1125	1123	1124	1128	1130	1126	1127	1125	1123	1123
3	1122	1124	1122	1120	1117	1119	1121	1125	1122	1124	1129	1126	1125	1127	1127	1123	1122
4	1121	1122	1119	1116	1115	1115	1116	1121	1120	1126	1124	1119	1118	1120	1125	1124	1121
5	1118	1121	1114	1115	1117	1115	1112	1118	1118	1124	1118	1115	1113	1115	1119	1123	1118
6	1116	1116	1111	1117	1123	1119	1111	1114	1116	1121	1113	1107	1104	1108	1113	1121	1116
7	1113	1111	1111	1123	1123	1123	1110	1110	1113	1117	1109	1101	1098	1100	1108	1117	1113
8	1109	1106	1112	1121	1118	1119	1112	1105	1109	1111	1100	1094	1092	1094	1100	1113	1109
9	1105	1101	1115	1115	1113	1112	1114	1099	1105	1105	1093	1087	1085	1087	1092	1106	1105
10	1100	1095	1113	1109	1111	1108	1110	1094	1100	1100	1087	1078	1075	1079	1088	1100	1100
11	1095	1091	1108	1107	1111	1105	1104	1090	1095	1094	1078	1069	1071	1069	1080	1094	1095
12	1090	1086	1100	1105	1116	1107	1095	1085	1090	1088	1071	1071	1079	1066	1071	1088	1090
13	1085	1082	1093	1110	1116	1110	1091	1081	1084	1080	1062	1079	1085	1074	1062	1081	1085
14	1078	1078	1090	1110	1112	1109	1088	1078	1078	1071	1053	1080	1078	1077	1052	1072	1078
15	1072	1075	1085	1107	1104	1104	1082	1075	1071	1061	1048	1069	1064	1071	1046	1062	1072
16	1064	1072	1084	1099	1098	1096	1082	1072	1063	1051	1051	1059	1060	1058	1046	1053	1064
17	1056	1067	1083	1089	1096	1087	1080	1066	1055	1041	1054	1053	1057	1053	1050	1041	1056
18	1047	1059	1078	1085	1092	1084	1075	1058	1047	1030	1050	1049	1047	1047	1047	1031	1047
19	1039	1048	1072	1083	1084	1081	1068	1049	1038	1019	1040	1039	1040	1038	1040	1020	1039
20	1029	1036	1064	1076	1084	1072	1059	1036	1029	1008	1028	1031	1034	1028	1027	1009	1029
21	1020	1025	1053	1068	1082	1066	1048	1025	1019	996	1019	1024	1020	1022	1015	997	1020
22	1010	1014	1043	1067	1066	1066	1038	1015	1009	984	1008	1013	1006	1013	1005	985	1010
23	1000	1003	1038	1062	1052	1058	1033	1004	998	973	998	996	1002	996	995	974	1000
24	988	993	1031	1045	1052	1038	1025	995	987	961	986	988	995	985	984	964	988
25	977	985	1021	1030	1048	1028	1015	985	975	951	976	984	987	980	972	953	977
26	965	977	1008	1029	1035	1027	1002	978	963	942	968	975	979	972	963	944	965
27	952	967	1000	1024	1024	1021	996	968	951	934	958	965	964	963	954	936	952
28	939	954	995	1012	1016	1006	991	957	938	924	943	955	964	952	940	924	939

Laboratory: UTEST TECHNICAL LABORATORY CO.LTD A2LA Certificate# 4810.01

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31	900	913	950	979	995	976	943	921	897	890	901	924	921	922	895	895	900
32	885	899	939	972	986	969	931	904	883	878	894	912	909	909	888	883	885
33	870	884	930	963	974	959	923	890	868	865	885	892	905	890	880	871	870
34	855	870	921	953	965	948	911	877	853	849	868	878	899	873	867	858	855
35	839	859	909	942	947	937	899	865	838	831	853	874	878	868	847	841	839
36	822	846	888	926	931	922	878	852	820	813	839	865	866	862	834	824	822
37	805	833	871	916	925	909	864	840	804	794	824	845	861	843	819	805	805
38	789	817	862	898	923	891	856	826	787	775	813	834	852	828	808	787	789
39	771	801	853	884	915	879	846	810	770	760	799	829	832	823	795	772	771
40	754	786	840	878	895	875	833	795	753	746	783	815	817	811	780	756	754
41	736	768	826	873	882	869	819	777	734	732	764	792	810	790	762	742	736
42	718	751	809	858	872	852	802	759	716	713	744	778	800	775	741	726	718
43	700	730	793	841	863	835	785	741	698	693	725	771	782	766	721	707	700
44	680	713	776	828	850	823	769	725	679	674	716	763	764	758	711	688	680
45	661	699	760	815	839	811	754	710	659	658	706	741	751	739	702	672	661
46	643	682	745	803	823	800	739	695	641	643	693	722	739	719	689	656	643
47	625	664	729	791	808	786	723	678	623	626	673	707	729	704	672	641	625
48	606	646	712	776	790	770	707	659	606	609	656	697	719	693	655	622	606
49	588	630	701	759	774	753	697	642	588	592	641	684	704	681	638	606	588
50	570	611	689	742	765	737	684	623	569	575	627	669	688	667	625	589	570
51	552	592	671	727	760	722	666	604	551	557	614	656	677	654	612	571	552
52	534	574	654	710	740	707	649	587	533	541	592	641	662	637	591	554	534
53	516	554	636	699	723	695	632	569	515	522	580	631	645	626	579	537	516
54	496	537	620	685	712	681	617	551	497	506	564	618	627	614	564	521	496
55	478	520	607	671	704	666	603	532	477	489	545	596	610	596	545	502	478
56	461	502	592	657	689	653	588	515	460	473	527	577	595	576	526	485	461
57	443	485	577	644	669	640	572	498	441	454	513	559	581	557	513	467	443
58	426	469	559	630	656	626	555	483	425	438	497	546	573	542	497	451	426
59	406	454	542	613	643	609	540	466	406	420	486	530	560	528	485	432	406

60	388	436	525	599	627	594	521	446	388	404	471	521	541	517	471	416	388
61	370	418	509	584	609	580	504	429	370	388	461	506	521	505	462	399	370
62	353	402	495	568	597	563	491	413	351	370	444	489	502	488	445	381	353
63	336	385	482	547	582	542	478	395	333	355	426	470	493	468	426	365	336
64	317	370	469	535	560	532	467	379	317	338	410	453	483	452	410	347	317
65	299	355	456	521	553	516	452	363	299	323	395	439	465	436	396	331	299
66	282	340	442	504	537	500	439	346	281	310	381	429	450	427	382	317	282
67	265	322	427	492	518	488	424	330	264	295	365	416	434	413	366	302	265
68	248	308	409	475	497	471	407	313	246	281	354	398	419	396	354	288	248
69	231	293	391	456	474	452	389	298	231	267	339	381	400	379	339	272	231
70	216	279	378	436	464	433	376	283	215	254	326	366	391	363	327	258	216
71	199	264	361	418	449	413	360	269	199	241	313	353	376	351	313	245	199
72	184	251	347	404	431	400	346	254	183	229	299	341	358	340	300	233	184
73	169	239	335	392	415	387	332	241	169	215	286	323	344	322	287	218	169
74	155	226	322	374	401	370	321	227	155	204	272	309	329	309	274	206	155
75	141	213	306	361	381	356	304	213	140	191	260	299	316	298	261	194	141
76	127	200	291	343	362	338	291	200	127	180	249	285	302	284	250	182	127
77	114	188	276	326	348	324	275	189	114	169	237	271	288	270	239	171	114
78	103	178	264	313	336	309	262	177	102	160	225	260	278	259	226	160	103
79	91	167	252	300	320	297	251	167	90	149	214	249	264	249	215	151	91
80	80	157	239	286	307	281	237	157	79	140	205	238	253	238	206	142	80
81	69	147	227	272	295	270	225	146	69	131	196	227	242	227	196	132	69
82	58	138	216	262	278	260	214	137	59	122	185	218	232	216	185	123	58
83	50	129	205	249	264	248	205	128	50	114	176	209	222	208	175	115	50
84	42	120	194	235	252	232	193	120	41	106	168	200	212	199	168	108	42
85	35	112	185	225	242	223	183	112	34	99	160	192	204	190	160	101	35
86	29	105	178	216	230	214	175	104	28	93	153	183	195	181	151	94	29
87	24	97	169	206	218	203	168	97	23	86	145	176	187	174	145	87	24
88	20	91	160	195	207	192	158	91	19	80	139	169	180	167	139	82	20
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91	17	75	138	171	181	168	135	74	15	66	121	149	159	147	121	67	17
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93	17	66	126	156	166	153	124	65	15	58	112	138	147	136	110	59	17
94	16	62	120	149	160	147	118	61	15	54	107	133	141	131	106	56	16
95	16	59	115	144	152	142	113	58	15	52	102	128	135	126	102	53	16
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99	16	48	97	121	129	118	94	47	15	43	87	109	115	108	87	44	16
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114	15	25	56	72	75	68	53	24	13	26	52	66	69	66	51	27	15
115	14	24	53	69	72	66	51	22	13	25	50	64	67	64	49	26	14
116	14	22	52	67	69	63	49	21	12	25	49	62	64	62	48	26	14
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120	14	19	43	57	60	55	41	18	12	23	43	55	57	55	41	24	14
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164	5	9	10	10	9	9	9	7	6	6	9	10	9	9	7	4	5
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166	7	8	10	10	9	9	8	6	5	6	7	9	8	8	6	5	7
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179	5	6	5	5	4	4	5	5	6	5	6	5	4	5	5	6	5
180	6	6	5	4	2	4	5	6	6	6	6	6	4	5	6	6	6

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-15	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-LLB02-25W-30/40/50K-MV-WH (25W, 4000K)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC240301	120.0	60	0.203	24.17	0.994	3.59
1E-A1	277.0	60	0.096	24.38	0.913	14
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

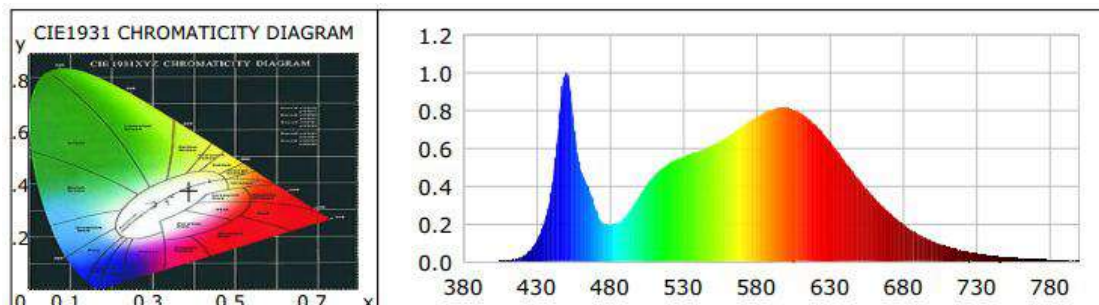
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	15
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	3827	R3	94	R11	83
Duv	-0.0029	R4	84	R12	64
Chromaticity (x, y)	x=0.3861 y=0.3740	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2299 v'=0.5012	R6	86	R14	97
Color Rendering Index (CRI)	84	R7	85	R15	78
R9	15	R8	66	--	--
Rf	84	--	--	--	--
Rg	98	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3814.3	3799.1	≥ 375 lm/ft(-10%)
Luminous Efficacy (lm/W)	157.81	155.83	Standard: ≥ 115 (-3%)
Most worst Luminous/Highest Watts	155.83		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.0310	535	0.5380	48.8529	690	0.2632	23.9003
385	0.0001	0.0107	540	0.5538	50.2894	695	0.2290	20.7942
390	0.0004	0.0404	545	0.5659	51.3849	700	0.1979	17.9689
395	0.0004	0.0380	550	0.5812	52.7763	705	0.1711	15.5328
400	0.0006	0.0558	555	0.5970	54.2119	710	0.1470	13.3462
405	0.0017	0.1572	560	0.6144	55.7884	715	0.1267	11.5091
410	0.0041	0.3716	565	0.6365	57.7946	720	0.1082	9.8229
415	0.0104	0.9418	570	0.6629	60.1956	725	0.0922	8.3760
420	0.0253	2.3014	575	0.6877	62.4450	730	0.0786	7.1333
425	0.0537	4.8740	580	0.7156	64.9864	735	0.0663	6.0168
430	0.1077	9.7843	585	0.7416	67.3458	740	0.0558	5.0709
435	0.1998	18.1457	590	0.7657	69.5278	745	0.0489	4.4421
440	0.3682	33.4381	595	0.7865	71.4238	750	0.0425	3.8594
445	0.7115	64.6141	600	0.8020	72.8256	755	0.0352	3.1937
450	1.0000	90.8076	605	0.8124	73.7697	760	0.0303	2.7544
455	0.7735	70.2400	610	0.8133	73.8510	765	0.0268	2.4378
460	0.4939	44.8490	615	0.8040	73.0098	770	0.0217	1.9720
465	0.4023	36.5351	620	0.7882	71.5770	775	0.0189	1.7135
470	0.2882	26.1723	625	0.7613	69.1307	780	0.0166	1.5051
475	0.2057	18.6751	630	0.7239	65.7397	785	0.0129	1.1716
480	0.1919	17.4295	635	0.6819	61.9234	790	0.0121	1.0951
485	0.2026	18.3951	640	0.6341	57.5833	795	0.0092	0.8394
490	0.2320	21.0698	645	0.5850	53.1207	800	0.0084	0.7589
495	0.2848	25.8575	650	0.5329	48.3956			
500	0.3467	31.4810	655	0.4823	43.7973			
505	0.4018	36.4837	660	0.4333	39.3425			
510	0.4519	41.0372	665	0.3848	34.9457			
515	0.4885	44.3573	670	0.3417	31.0304			
520	0.5174	46.9829	675	0.3004	27.2741			
525	0.5380	48.8529	680	0.2632	23.9003			
530	0.5538	50.2894	685	0.2290	20.7942			

TM30

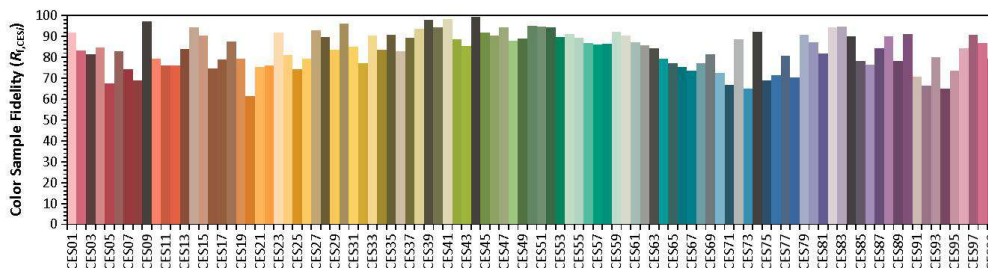
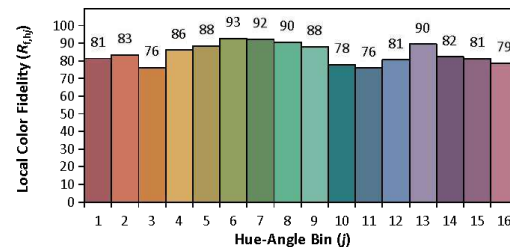
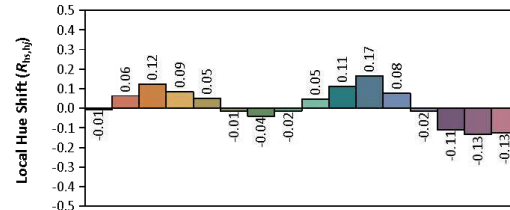
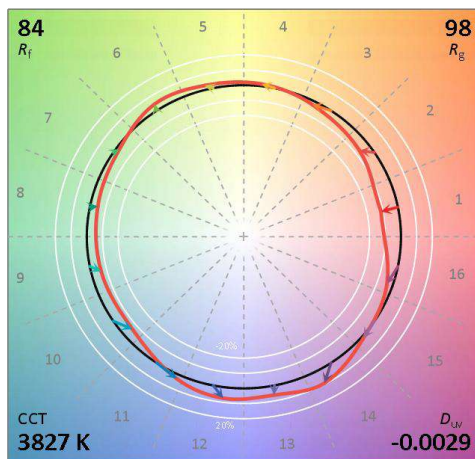
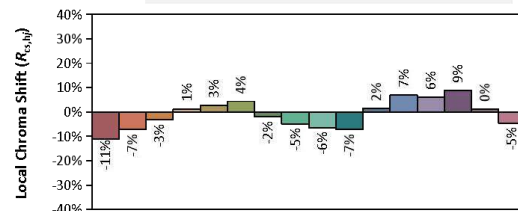
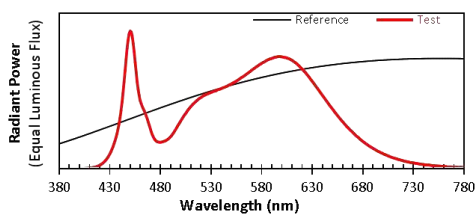
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35003H1
L128-5080RA35003H1

Manufacturer: IKIO LED LIGHTING

Date: 2024/3/15

Model: IK-LLB02-25W-30/40/50K-
MV-WH (25W, 4000K)



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

x 0.3861
 y 0.3740
 u' 0.2300
 v' 0.5012

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 15

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

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2024-03-15	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-LLB02-25W-30/40/50K-MV-WH (25W, 5000K)	Operation time(min)	110

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC240301	120.0	60	0.205	24.53	0.995	3.77
1E-A1	277.0	60	0.098	24.72	0.911	13.85
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

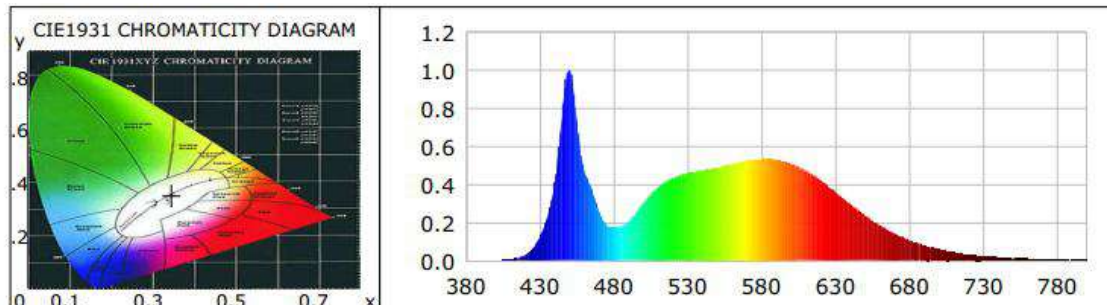
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	5
Frequency (Hz)	60	R2	87	R10	68
CCT (K)	5059	R3	90	R11	82
Duv	0.0002	R4	83	R12	60
Chromaticity (x, y)	x=0.3435 y=0.3507	R5	82	R13	82
Chromaticity (u', v')	u(u')=0.2107v'=0.4840	R6	81	R14	95
Color Rendering Index (CRI)	82	R7	86	R15	76
R9	5	R8	67	--	--
Rf	82	--	--	--	--
Rg	97	--	--	--	--
Rcs,h1(%)	-13				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3814.7	3800.5	>=375 lm/ft(-10%)
Luminous Efficacy (lm/W)	155.51	153.74	Standard: >= 115(-3%)
Most worst Luminous/Highest Watts	153.74		

Spectral Power Distribution & Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0009	0.1147	535	0.4473	56.7055	690	0.1424	18.0536
385	0.0003	0.0365	540	0.4566	57.8876	695	0.1238	15.6985
390	0.0002	0.0234	545	0.4636	58.7671	700	0.1065	13.5028
395	0.0005	0.0627	550	0.4712	59.7345	705	0.0926	11.7395
400	0.0007	0.0920	555	0.4788	60.6955	710	0.0805	10.2050
405	0.0018	0.2288	560	0.4863	61.6493	715	0.0686	8.6961
410	0.0050	0.6366	565	0.4957	62.8419	720	0.0586	7.4274
415	0.0124	1.5753	570	0.5063	64.1902	725	0.0501	6.3466
420	0.0295	3.7447	575	0.5153	65.3241	730	0.0421	5.3392
425	0.0622	7.8903	580	0.5238	66.4043	735	0.0367	4.6468
430	0.1228	15.5711	585	0.5295	67.1225	740	0.0309	3.9133
435	0.2262	28.6748	590	0.5307	67.2809	745	0.0259	3.2894
440	0.4098	51.9463	595	0.5310	67.3098	750	0.0222	2.8104
445	0.7565	95.9089	600	0.5283	66.9749	755	0.0197	2.5037
450	1.0000	126.7723	605	0.5213	66.0806	760	0.0166	2.1104
455	0.7455	94.5032	610	0.5097	64.6217	765	0.0138	1.7450
460	0.4791	60.7400	615	0.4924	62.4231	770	0.0132	1.6687
465	0.3760	47.6666	620	0.4737	60.0530	775	0.0112	1.4255
470	0.2627	33.3033	625	0.4502	57.0667	780	0.0090	1.1370
475	0.1892	23.9889	630	0.4215	53.4382	785	0.0085	1.0761
480	0.1744	22.1066	635	0.3900	49.4402	790	0.0074	0.9378
485	0.1819	23.0578	640	0.3599	45.6281	795	0.0056	0.7065
490	0.2069	26.2354	645	0.3280	41.5763	800	0.0051	0.6408
495	0.2509	31.8038	650	0.2965	37.5849			
500	0.3011	38.1697	655	0.2670	33.8458			
505	0.3461	43.8751	660	0.2366	29.9936			
510	0.3838	48.6614	665	0.2100	26.6237			
515	0.4134	52.4058	670	0.1857	23.5379			
520	0.4336	54.9744	675	0.1628	20.6324			
525	0.4473	56.7055	680	0.1424	18.0536			
530	0.4566	57.8876	685	0.1238	15.6985			

TM30

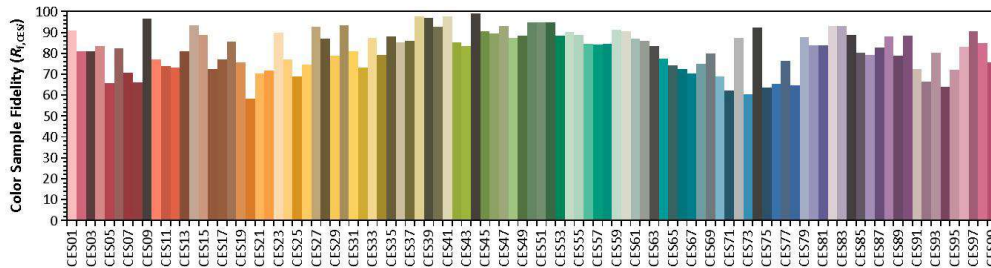
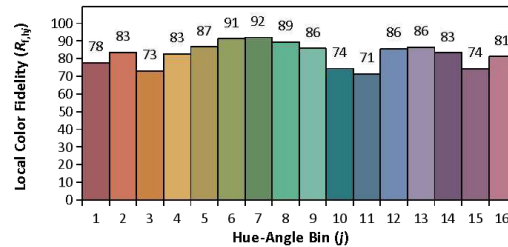
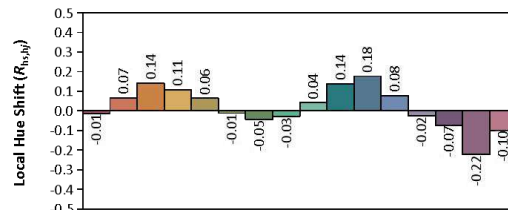
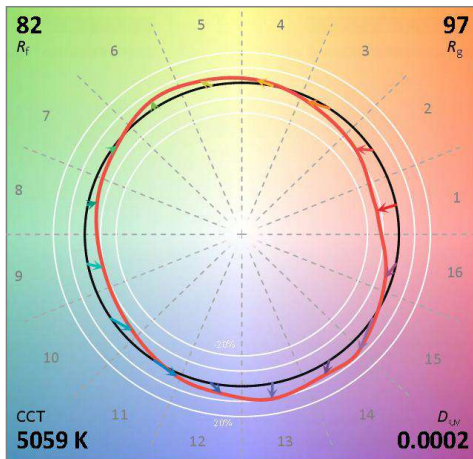
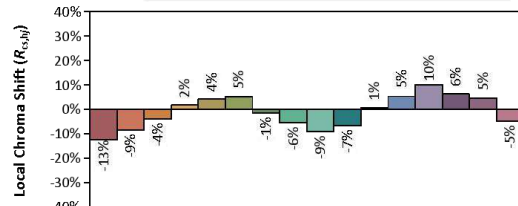
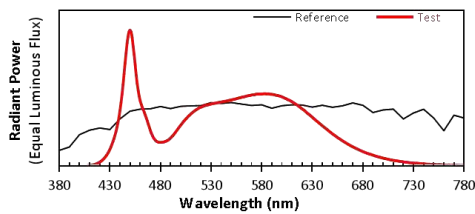
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-5080RA35003H1

Manufacturer: IKIO LED LIGHTING

Date: 2024/3/15

Model: IK-LLB02-25W-30/40/50K-MV-WH (25W, 5000K)



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

x 0.3435
 y 0.3507
 u' 0.2107
 v' 0.4840

CIE 13.3-1995
(CRI)
 R_a 82
 R_g 5

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

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2024-01-09
AC Power Source	CHP-500C	DYBWD010159	2024-01-08
Standard Lamp*	24V/150W	DYJYR040040	2024-01-17
Standard Lamp**	24V/100W	DYBWR030014	2024-01-17
Digital Power Meter	WT500	DYDWQ20010	2024-01-08
Integral Sphere (2M)	2M	DYJCE120067	2024-01-09
Digital Power Meter	WT500	DYDWQ200006	2024-01-08
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2024-01-09

* Reference standard lamp (150W incandescent directional lamp) calibrated by Guangzhou Institute of Measurement and Testing Technology.

** Reference standard lamp (100W incandescent omni-directional lamp) calibrated by Guangzhou Institute of Measurement and Testing Technology.

Expand Uncertainty:

Photometric Measurement (Sphere): 2.02%, k=2

Chromaticity Measurement(Sphere):24.8K, k=2

Photometric Measurement(Goniophotometer):2.88%, k=2

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