

LM-79-08 Test Report

For

IKIO LED LIGHTING**(Brand Name: IKIO)**8470 Allison Pointe Blvd, Suite 128
Indianapolis, IN 46250**Internal Driver/Line Voltage Lamp-Style Retrofit Kits
(UL Type B)**

Model name(s): IK-T808-0040-DN-XXB-J

Representative (Tested) Model: IK-T808-0040-DN-30B-J
IK-T808-0040-DN-50B-J
IK-T804-0022-DN-30B-J

The construction of Model IK-T804-0022-DN-30B-J (1.2m) is similar with IK-T808-0040-DN-30B-J, except for length and wattage. The IES was tested to IK-T804-0022-DN-30B-J (1.2m) to be the representative model for IK-T808-0040-DN-30B-J.

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

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Apr.15, 2018

Review By:

Univ Xie

Manager: Univ Xie

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 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


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1.1 Product Information:

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-T808-0040-DN-XXB-J	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Internal Driver/Line Voltage Lamp-Style Retrofit Kits (UL Type B)	
Rated Voltage / Frequency	120 ~ 277 Vac, 50/60 Hz	
Nominal Power	40W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,5000K	
LED Manufacturer	Xiamen Dacol Photoelectronics Technology Co.,Ltd.	
LED Model	SMD 2835	
Sample Number	GZE1813055-C1,C2(3000K), C3(5000K), C4, C5(1.2m-3000K)	
Lamp Length	600	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s
Photo		
8FT		
		
		
4FT		
		
		

1.2 Test Specifications:

Date of Receipt	Apr.12, 2018
Date of Test	Apr.14, 2018
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	2018-04-14	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0022-DN-30B-J		

Electrical Measurement for 2-lamp in Lithonia C 2 32 MV:

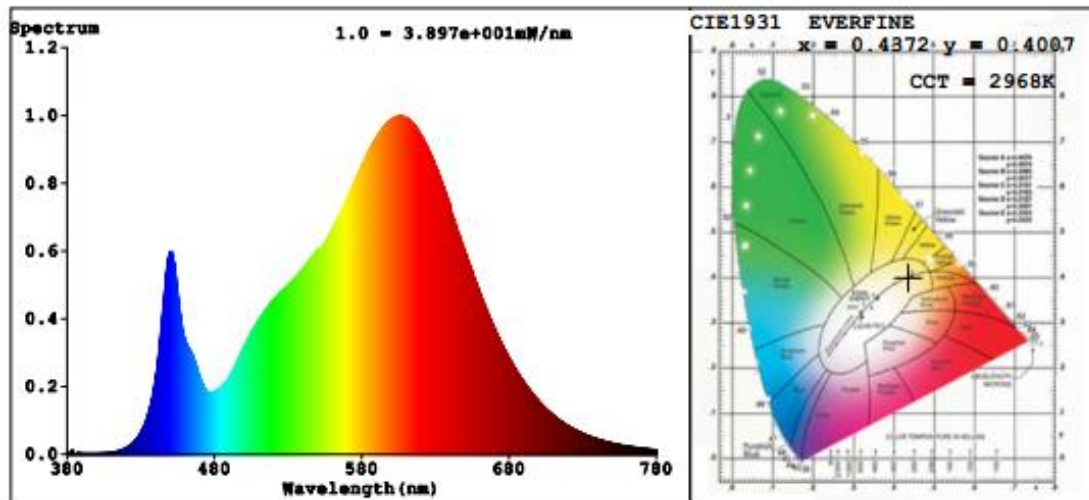
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE181305	120.0	60	0.3517	38.94	0.9226	7.14
5-C4,C5	277.0	60	0.1513	39.04	0.9315	20.10

Chromaticity Measurement for 2-lamp in Lithonia C 2 32 MV -**Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	2968	R3	96	R11	82
Duv	-0.0014	R4	82	R12	73
Chromaticity (x, y)	x=0.4372 y=0.4007	R5	83	R13	85
Chromaticity (u', v')	u'=0.2522 v'=0.5201	R6	90	R14	99
Color Rendering Index (CRI)	83.9	R7	83	R15	76
R9	13	R8	61	--	--
Total Luminous (lm)	5571				
Luminous Efficacy (lm/W)	143.07				

Photometric Measurement 2-lamp in Lithonia C 2 32 MV – Goniophotometer**Method:**

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5697.5	5777.9
Luminous Efficacy (lm/W)	146.31	148.00
Zonal lumens in the 0-60 ° zone (%)	78.7	--
SC: 0-180 ° (if applicable)	1.30	--
SC: 90-270 ° (if applicable)	1.25	--
Beam Angle (°)	111.9	--
Center Beam Candle Power (cd)	1967	--



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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-04-14	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T808-0040-DN-30B-J		

Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE181305 5-C1	120.0	60	0.3528	39.05	0.9223	7.20
	277.0	60	0.1527	39.37	0.9309	20.84

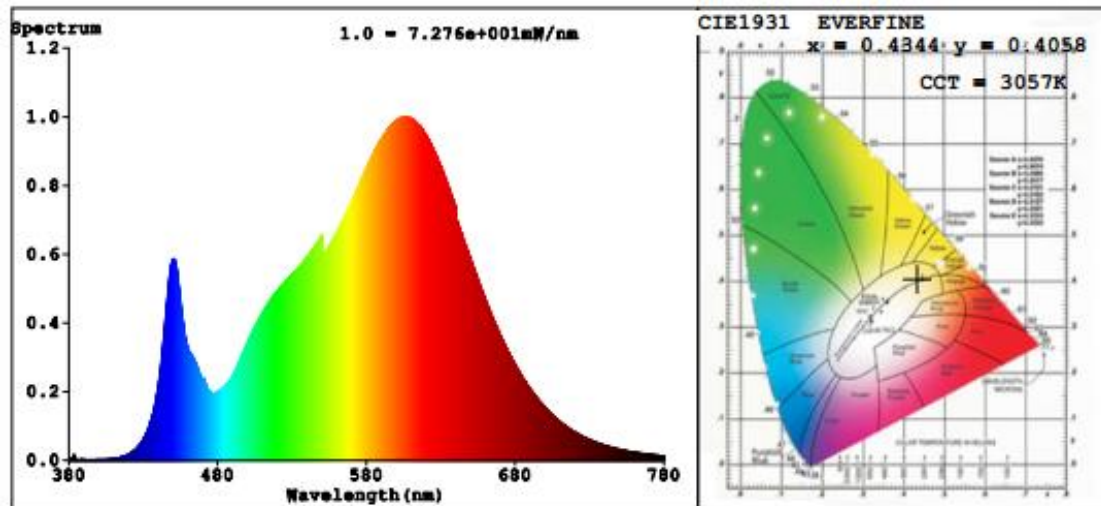
Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	16
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	3057	R3	98	R11	85
Duv	0.0010	R4	85	R12	72
Chromaticity (x, y)	x=0.4344 y=0.4058	R5	84	R13	86
Chromaticity (u', v')	u'=0.2482 v'=0.5217	R6	91	R14	99
Color Rendering Index (CRI)	85.2	R7	85	R15	76
R9	16	R8	63	--	--

Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5740	5841
Luminous Efficacy (lm/W)	146.99	148.36

Spectral Power Distribution & Chromaticity Diagram



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2.3 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2018-04-14	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T808-0040-DN-30B-J		

Electrical Measurement for 2-lamp in Lithonia C 2 96T8 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE181305	120.0	60	0.7092	78.36	0.9207	7.14
5-C1,C2	277.0	60	0.3060	78.95	0.9314	20.48

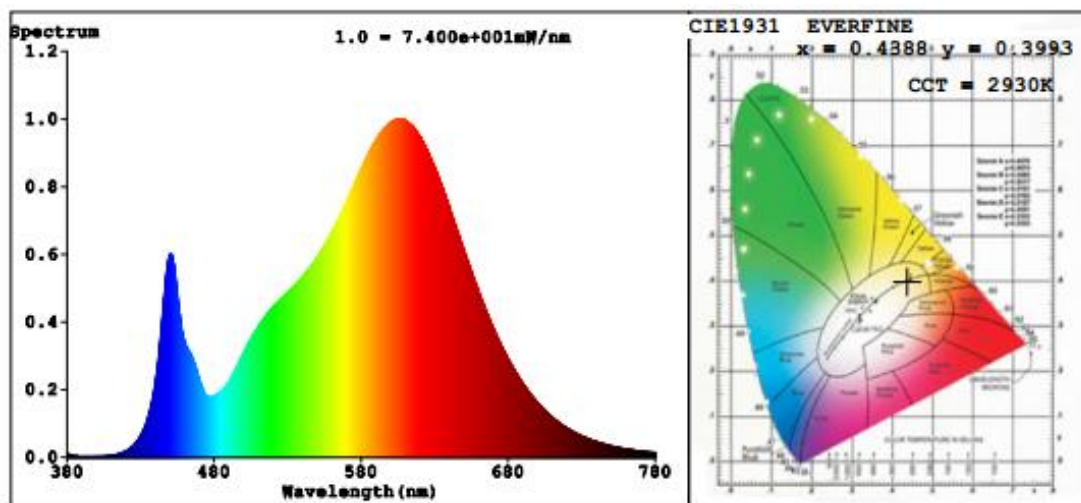
**Chromaticity Measurement for 2-lamp in Lithonia C 2 96T8 MVOLT GEB10IS
- Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	2930	R3	96	R11	81
Duv	-0.0021	R4	82	R12	74
Chromaticity (x, y)	x=0.4388 y=0.3993	R5	83	R13	85
Chromaticity (u', v')	u'=0.2538 v'=0.5198	R6	90	R14	99
Color Rendering Index (CRI)	83.6	R7	83	R15	76
R9	13	R8	61	--	--
Total Luminous (lm)	11123				
Luminous Efficacy (lm/W)	141.95				

Calculate Luminous in Goniophotometer:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	11375
Luminous Efficacy (lm/W)	145.16

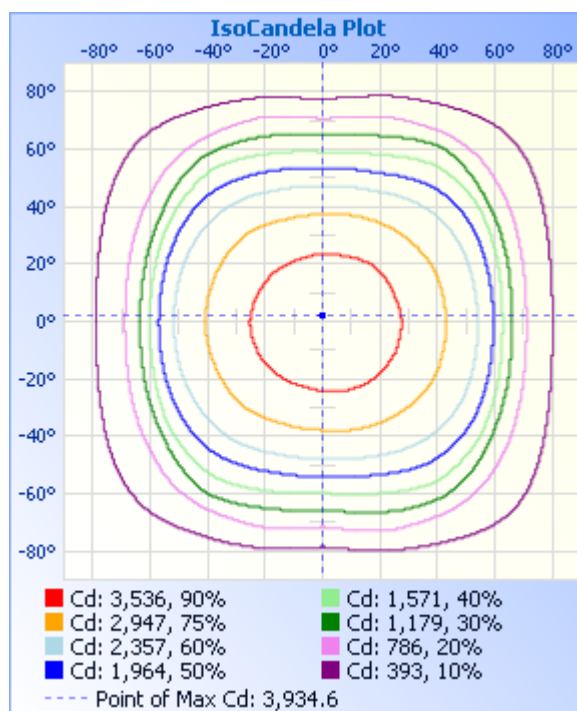
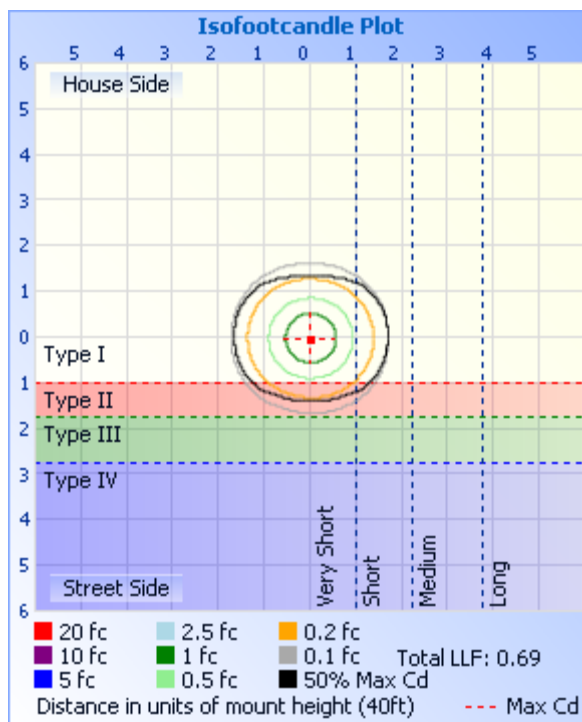
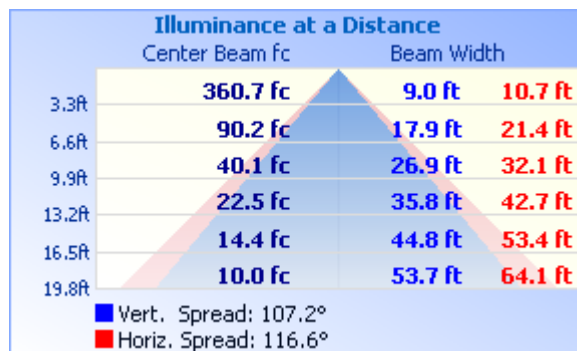
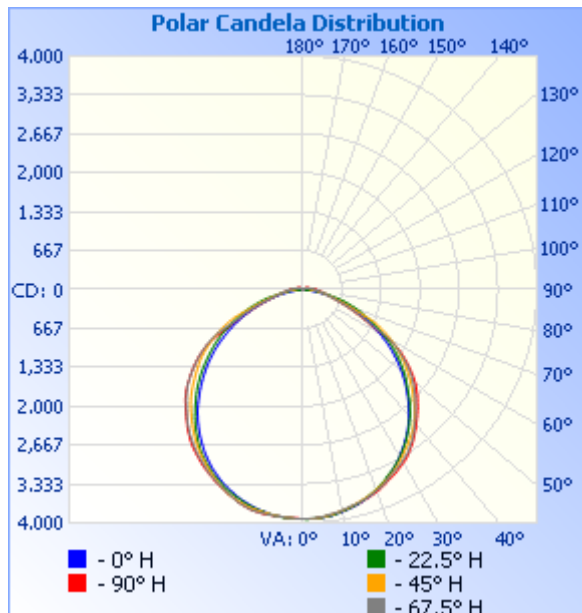
****The calculation method is on page 15.**



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,073.1	27%
0-40	5,052.9	44.4%
0-60	8,955.7	78.7%
60-90	2,158.2	19%
70-100	1,004.4	8.8%
90-120	225.3	2%
0-90	11,113.9	97.7%
90-180	260.1	2.3%
0-180	11,374.0	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	372.0	3.3%	90-100	119.4	1.1%
10-20	1,070.5	9.4%	100-110	67.5	0.6%
20-30	1,630.6	14.3%	110-120	38.4	0.3%
30-40	1,979.8	17.4%	120-130	16.7	0.1%
40-50	2,057.1	18.1%	130-140	5.5	0%
50-60	1,845.7	16.2%	140-150	4.7	0%
60-70	1,273.2	11.2%	150-160	3.9	0%
70-80	627.6	5.5%	160-170	2.9	0%
80-90	257.4	2.3%	170-180	1.1	0%

Photometric Data


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Table--1

UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	3928	
5	3912	3919	3919	3910	3917	3918	3911	3901	3911	3912	3911	3911	3911	3919	3911	3910	
10	3902	3900	3884	3857	3863	3853	3843	3836	3854	3848	3851	3856	3860	3868	3876	3894	
15	3846	3857	3828	3776	3780	3770	3756	3767	3781	3775	3770	3761	3774	3792	3822	3842	
20	3727	3734	3737	3661	3656	3644	3647	3665	3686	3675	3648	3636	3655	3682	3728	3727	
25	3598	3575	3577	3518	3501	3483	3513	3525	3555	3537	3504	3481	3498	3539	3567	3590	
30	3454	3420	3381	3346	3301	3307	3344	3395	3425	3373	3336	3285	3304	3365	3385	3431	
35	3288	3235	3177	3135	3074	3091	3157	3216	3244	3192	3127	3066	3068	3142	3188	3261	
40	3080	3043	2954	2879	2813	2842	2950	2976	3011	2949	2920	2818	2807	2879	2960	3058	
45	2845	2793	2698	2579	2517	2555	2672	2715	2767	2689	2663	2540	2506	2593	2721	2820	
50	2594	2546	2420	2249	2206	2268	2379	2449	2508	2421	2355	2226	2194	2296	2441	2583	
55	2274	2231	2117	1928	1876	1966	2079	2126	2162	2113	2046	1918	1871	1977	2163	2264	
60	1902	1878	1818	1597	1531	1622	1751	1725	1653	1736	1737	1606	1526	1665	1851	1915	
65	1218	1311	1463	1282	1189	1284	1374	1101	1087	1105	1369	1263	1190	1338	1502	1305	
70	828	852	1041	967	856	975	855	742	737	743	870	942	863	1036	990	876	
75	543	549	603	680	546	666	535	502	508	494	536	655	563	724	624	568	
80	387	380	368	377	283	355	349	363	381	358	333	352	300	404	391	399	
85	294	287	242	183	92.9	190	245	273	293	271	223	172	99.0	215	268	301	
90	222	212	161	78.2	7.32	101	170	204	222	202	154	76.0	8.22	110	184	226	
95	171	162	118	47.6	3.65	67.4	127	157	172	156	115	46.5	4.54	69.3	133	171	
100	132	123	87.7	32.3	3.61	47.1	97.5	122	134	122	87.5	31.1	5.88	48.2	98.1	130	
105	105	96.6	68.4	18.1	4.95	34.5	77.6	97.4	106	96.1	68.6	17.7	6.91	35.1	76.6	101	
110	85.8	77.5	54.9	6.74	5.57	11.7	62.6	79.3	85.9	78.1	54.8	4.08	7.43	11.6	61.9	80.4	
115	69.6	62.9	43.2	6.90	6.29	6.26	50.5	65.4	70.4	63.8	42.5	4.60	8.05	5.79	50.1	64.7	
120	57.3	51.9	15.5	7.55	6.36	6.40	28.8	53.9	57.9	52.3	17.4	5.51	8.04	6.72	29.1	53.2	
125	44.7	30.8	6.50	8.08	6.39	7.13	7.51	35.8	45.1	31.9	4.96	5.94	7.74	7.05	9.53	36.0	
130	17.8	7.08	6.52	8.30	6.70	7.95	6.39	11.2	19.8	7.38	5.37	6.53	8.26	7.65	5.87	9.52	
135	5.81	5.89	6.81	8.47	7.72	8.22	6.43	5.94	5.53	5.44	6.09	6.94	9.08	8.04	6.33	5.21	
140	5.47	5.94	7.64	9.07	8.34	8.37	6.94	5.94	5.15	5.75	6.30	7.30	9.59	8.68	6.95	5.88	
145	5.57	6.28	7.93	9.28	8.66	8.58	7.46	6.36	5.54	6.38	6.92	7.71	10.3	9.41	7.78	6.67	
150	5.84	6.90	8.46	9.59	9.07	8.89	7.98	6.57	6.28	7.02	7.43	7.86	10.9	10.1	8.92	7.41	
155	6.59	7.43	9.19	10.00	9.55	9.30	8.29	7.50	6.64	7.43	7.64	8.11	10.9	10.4	9.71	8.13	
160	6.70	8.06	9.54	10.3	10.1	9.81	8.92	8.02	7.23	7.69	8.06	8.48	10.7	10.7	10.3	8.76	
165	7.66	9.00	10.6	11.4	11.2	11.7	10.6	9.06	8.62	8.80	9.41	10.8	12.5	12.2	12.3	10.7	
170	8.82	10.2	11.6	12.4	13.0	12.8	11.9	10.2	9.79	9.62	10.5	11.8	13.3	13.5	13.6	12.3	
175	10.1	11.0	12.5	13.2	13.9	13.7	12.9	11.3	10.1	10.1	10.6	12.1	13.6	14.0	14.1	12.8	
180	10.2	10.6	12.3	12.9	13.5	13.2	12.5	11.0	10.2	10.0	10.5	12.0	13.1	13.6	13.4	12.6	

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2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-04-14	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T808-0040-DN-50B-J		

Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE181305	120.0	60	0.3516	38.90	0.9221	7.01
5-C3	277.0	60	0.1516	39.05	0.9301	20.74

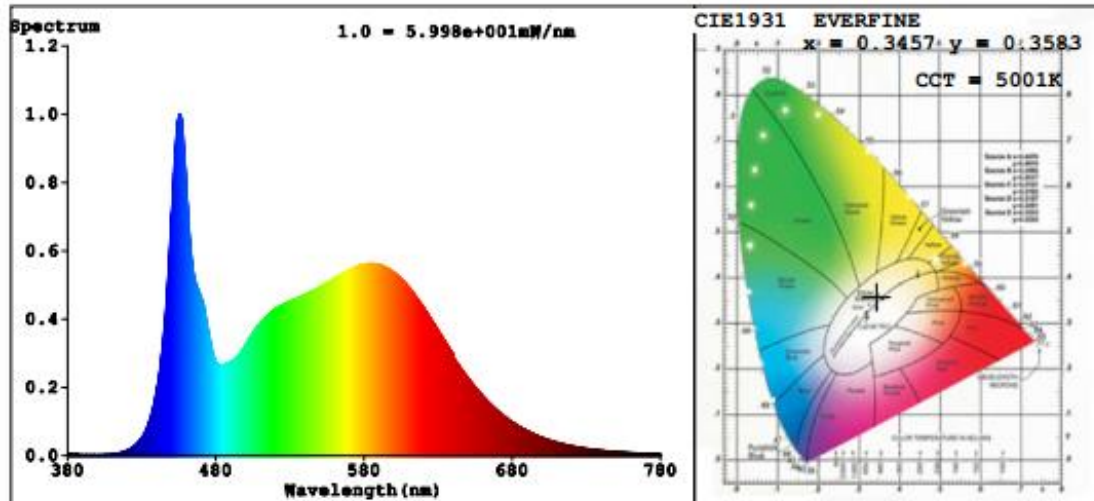
Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	0
Frequency (Hz)	60	R2	92	R10	79
CCT (K)	5001	R3	94	R11	78
Duv	0.0031	R4	79	R12	60
Chromaticity (x, y)	x=0.3457 y=0.3583	R5	81	R13	84
Chromaticity (u', v')	u'=0.2093 v'=0.4880	R6	87	R14	98
Color Rendering Index (CRI)	82.4	R7	84	R15	74
R9	0	R8	62	--	--

Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5838	5913
Luminous Efficacy (lm/W)	150.08	151.42

Spectral Power Distribution & Chromaticity Diagram



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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
IK-T808-0040-DN-30B-J	3000K	5740	39.05	146.99
IK-T808-0040-DN-35B-J	3500K	5765 ^{*1}	38.98 ^{*2}	147.90 ^{*3}
IK-T808-0040-DN-40B-J	4000K	5789 ^{*1}	38.98 ^{*2}	148.51 ^{*3}
IK-T808-0040-DN-50B-J	5000K	5838	38.90	150.08

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

$$5765 = (5838 - 5740) / 4 * 1 + 5740$$

$$5789 = (5838 - 5740) / 4 * 2 + 5740$$

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

$$38.98 = (38.90 + 39.05) / 2$$

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

$$147.90 = 5765 / 38.98$$

$$148.51 = 5789 / 38.98$$

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Summary

Model	IK-T804-0022-DN-30B-J	IK-T808-0040-DN-30B-J
Overall Appearance	Picture 1	
Cross Section	Picture 2	
LED Spacing (mm)	7.91	7.91
Materials	Aluminium, PC	Aluminium, PC
Calculation Method	Please refer to below "Calculation method"	
LED Working Current (mA)	54.4	54.0

Picture 1



Picture 2


Calculation method

Model number	IK-T804-0022-DN-30B-J	IK-T808-0040-DN-304B-J
Strip fixture model	Lithonia C 2 32 MV	Lithonia C 2 96T8 MVOLT GEB10IS
Test Voltage (V)	120	120
Frequency (Hz)	60	60
Total Luminous of integrating sphere (lm)	5571	11123
Total Luminous of goniophotometer (lm)	5697.5	11375**
Scale factor= $\frac{\text{goniophotometer (lm)}}{\text{integrating sphere (lm)}}$	1.0227	--

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

$$11375 = 11123 * 1.0227$$

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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

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