

**LM-79-08 Test Report**

For

**IKIO LED LIGHTING****(Brand Name: IKIO)**8470 Allison Pointe Blvd, Suite 128  
Indianapolis, IN 46250**Internal driver Lamp-style retrofit kits (UL Type B)**

Model name(s): IK-T804-0015-DN-XXB-J

Representative (Tested) Model:      IK-T804-0015-DN-30B-J  
   IK-T804-0015-DN-35B-J  
   IK-T804-0015-DN-40B-J  
   IK-T804-0015-DN-50B-J

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

Test &amp; Report By:

*Jack Luo*

Engineer: Jack Luo

Date: Nov.22,2016

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**

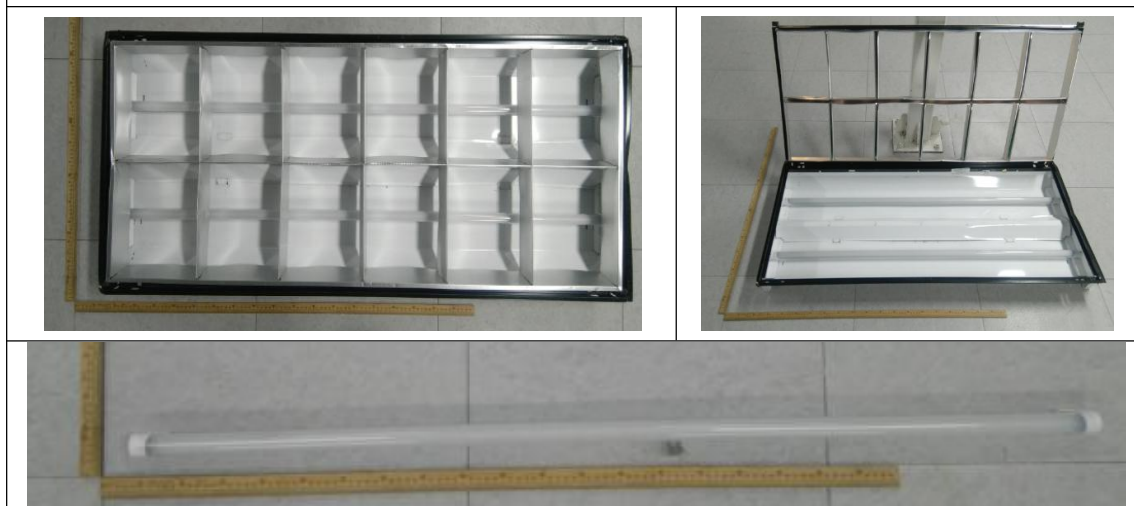
Report Format Number STD/QR4909-A/2

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	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-T804-0015-DN-XXB-J	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Internal driver Lamp-style retrofit kits (UL Type B)	
Rated Voltage / Frequency	100-277 Vac, 50/60 Hz	
Nominal Power	15W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,5000K	
LED Manufacturer	EVERLIGHT ELECTRONICS CO.,LTD	
LED Model	67-21S Series	
Test Ballast	--	
Sample Number	GZE161062-C1,C2(3000K),C3(3500K), C4(4000K),C5(5000K)	
Lamp Length	1200	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**


**1.2 Test Specifications:**

Date of Receipt	Nov.19, 2016
Date of Test	Nov.20, 2016
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 C78.377-2008 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>
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  $1^{\circ}$  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

(Refer to Work Instruction QD25)

Test date	2016-11-20	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0015-DN-30B-J		

### Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161062	120.0	60	0.1224	14.34	0.9761	19.84
-C1	277.0	60	0.0572	14.28	0.9016	23.84
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

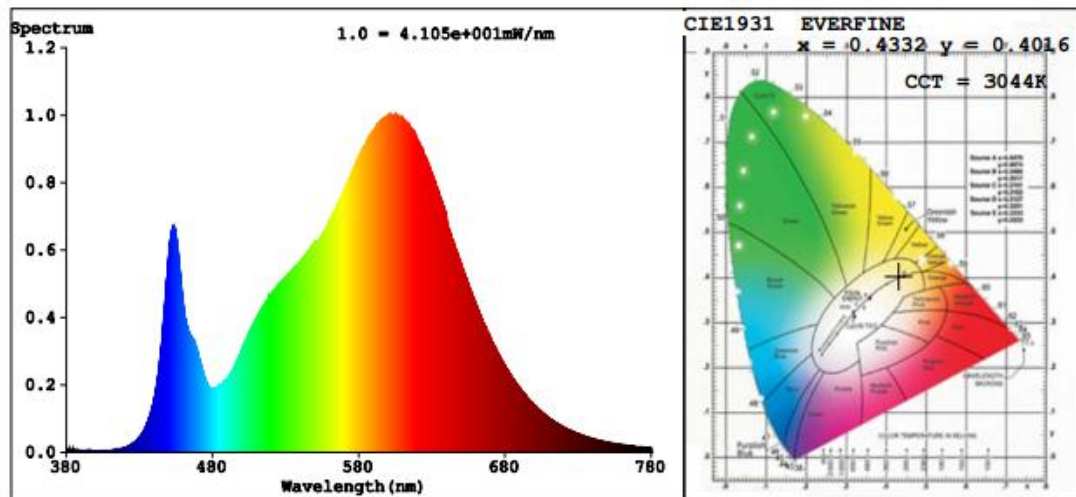
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	6
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	3044	R3	96	R11	79
Duv	-0.0055	R4	80	R12	67
Chromaticity (x, y)	x=0.4332 y=0.4016	R5	81	R13	84
Chromaticity (u', v')	u'=0.2492 v'=0.5198	R6	89	R14	99
Color Rendering Index (CRI)	82.4	R7	82	R15	74
R9	6	R8	59	--	--

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

Parameter	Result		DLC V4.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2026	2035	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	141.28	142.51	Bare lamp: >= 110(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



**Laboratory: Standard-Tech Co. Ltd Testing Center**  
**NVLAP CODE: 201011-0**

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## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-20	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0015-DN-30B-J		

### Electrical Measurement for 2-lamp in Lithonia 2PM3N 12 cell 2x4 parabolic:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161062	120.0	60	0.2450	28.67	0.9750	19.35
-C1,C2	277.0	60	0.1143	28.55	0.9019	23.47
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

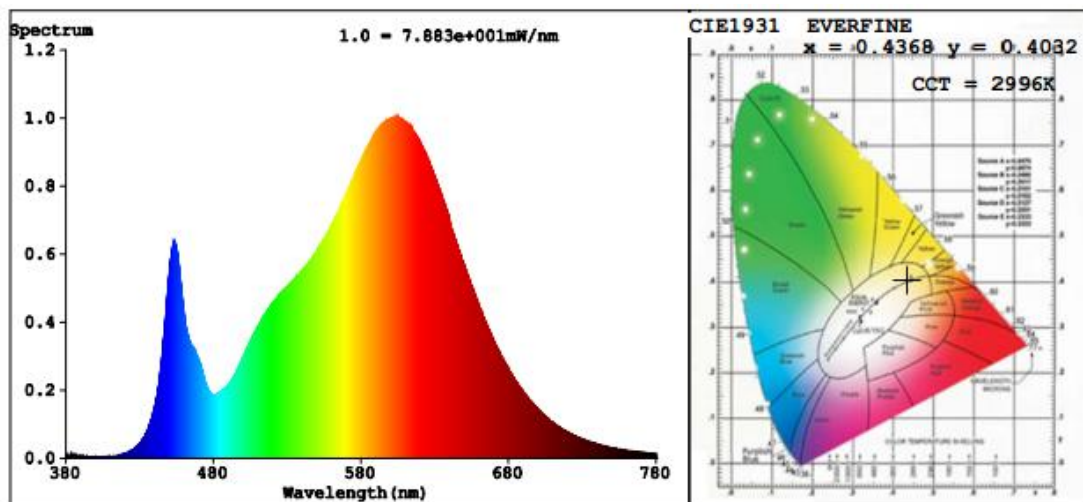
### Chromaticity Measurement for 2-lamp in Lithonia 2PM3N 12 cell 2x4 parabolic - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	5
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	2996	R3	96	R11	78
Duv	-0.0003	R4	79	R12	67
Chromaticity (x, y)	x=0.4368 y=0.4032	R5	80	R13	83
Chromaticity (u', v')	u'=0.2508 v'=0.5210	R6	89	R14	99
Color Rendering Index (CRI)	81.9	R7	82	R15	73
R9	5	R8	58	--	--

### Photometric Measurement 2-lamp in Lithonia 2PM3N 12 cell 2x4 parabolic – Goniophotometer Method:

Parameter	Result		DLC V4.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3508.8	3524.7	In luminaire (2 lamps): >= 3000(-10%)
Luminous Efficacy (lm/W)	122.39	123.46	In luminaire: >= 100(-3%)
Zonal lumens in the 0-60° zone (%)	89.9	--	>= 75(-3)
SC: 0-180° (if applicable)	1.35	--	1.0-2.0(±0.1)
SC: 90-270° (if applicable)	1.14	--	1.0-2.0(±0.1)
Beam Angle (°)	102.9	--	--
Center Beam Candle Power (cd)	1443	--	--

## Spectral Power Distribution &amp; Chromaticity Diagram



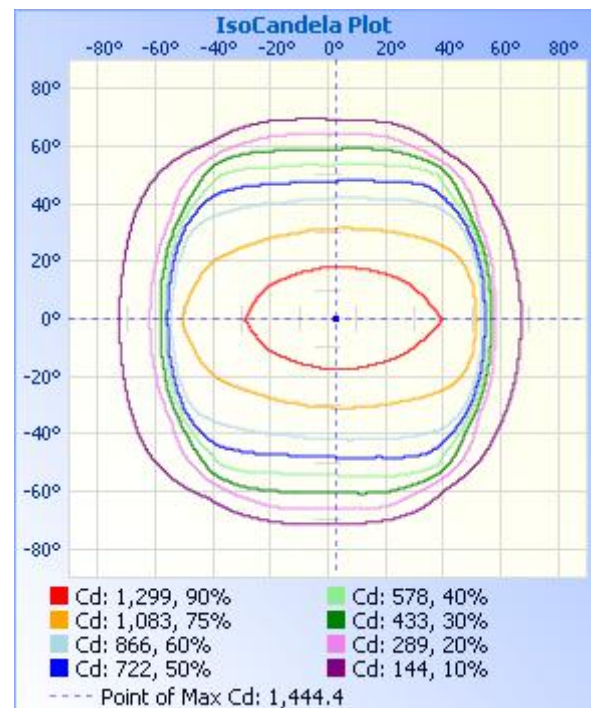
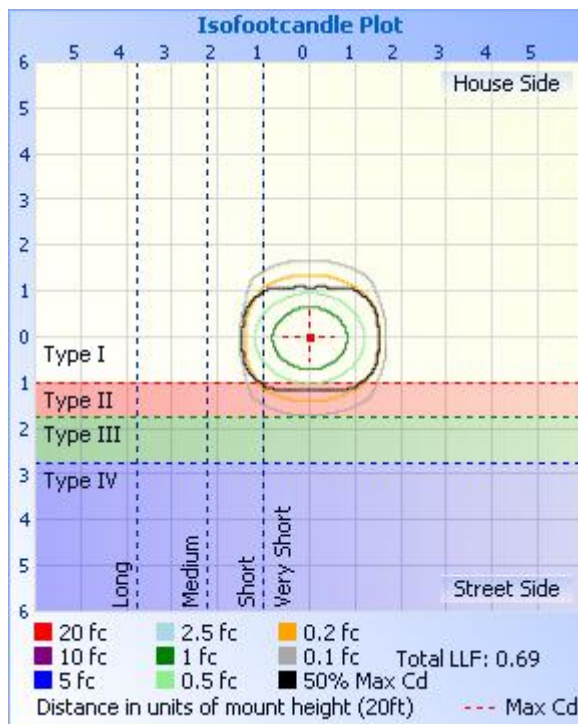
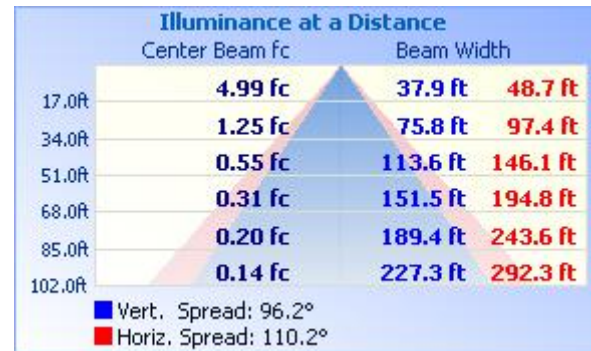
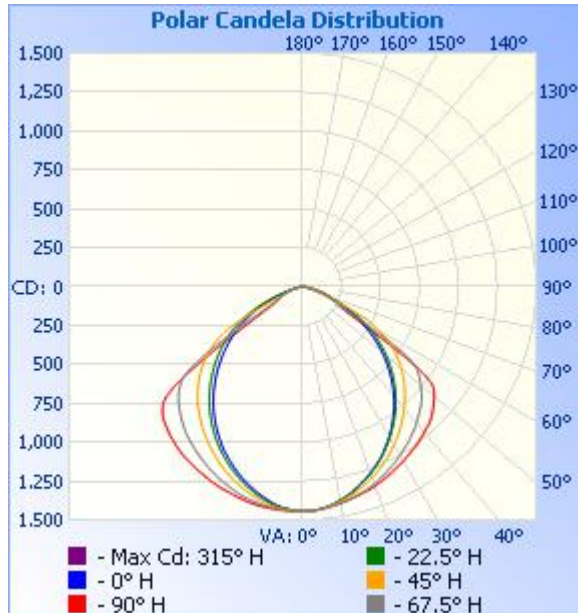
## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,102.5	31.4%
0-40	1,807.6	51.5%
0-60	3,152.7	89.9%
60-90	355.3	10.1%
70-100	94.5	2.7%
90-120	0.2	0%
0-90	3,508.0	100%
90-180	0.4	0%
0-180	3,508.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	136.0	3.9%	90-100	0.0	0%
10-20	385.5	11.0%	100-110	0.0	0%
20-30	581.0	16.6%	110-120	0.2	0%
30-40	705.1	20.1%	120-130	0.1	0%
40-50	744.8	21.2%	130-140	0.1	0%
50-60	600.3	17.1%	140-150	0.0	0%
60-70	260.8	7.4%	150-160	0.0	0%
70-80	81.6	2.3%	160-170	0.0	0%
80-90	12.9	0.4%	170-180	0.0	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	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	1443	
5	1443	1443	1440	1434	1433	1432	1434	1434	1434	1432	1429	1426	1427	1430	1435	1439	
10	1437	1431	1416	1403	1394	1395	1402	1411	1412	1408	1392	1385	1382	1393	1407	1426	
15	1424	1412	1382	1354	1341	1342	1359	1384	1389	1376	1344	1326	1322	1339	1366	1404	
20	1402	1381	1332	1293	1275	1277	1306	1347	1363	1338	1288	1257	1253	1274	1316	1370	
25	1383	1346	1277	1223	1201	1204	1243	1301	1329	1290	1225	1181	1177	1201	1255	1331	
30	1356	1304	1214	1141	1113	1121	1176	1251	1294	1237	1154	1098	1089	1119	1188	1287	
35	1329	1256	1144	1054	1017	1029	1099	1200	1259	1184	1075	1007	993	1029	1117	1238	
40	1293	1204	1066	956	911	930	1015	1139	1218	1125	994	910	889	932	1039	1185	
45	1249	1138	979	851	798	824	929	1076	1173	1060	910	806	779	828	954	1119	
50	1172	1054	875	735	675	709	831	992	1105	976	815	696	664	720	856	1037	
55	555	799	746	607	546	586	719	880	873	865	708	584	545	606	739	784	
60	210	231	571	466	410	454	570	406	337	388	570	466	423	481	569	229	
65	162	152	200	309	271	307	320	231	254	229	304	331	300	335	203	152	
70	114	102	90.1	148	142	163	130	163	185	162	136	183	172	173	95.4	103	
75	70.9	60.4	47.1	58.5	67.6	69.9	70.1	100	119	99.3	73.2	79.4	76.2	67.2	50.8	62.1	
80	34.6	28.7	22.5	24.9	28.9	30.2	33.0	46.5	56.0	45.8	34.1	31.4	28.5	25.3	23.7	29.5	
85	10.9	8.98	7.37	7.63	8.65	9.21	10.7	14.4	17.3	13.5	10.1	8.43	7.71	7.12	7.18	8.97	
90	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95	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	
100	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	
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.10	0.00	
110	0.00	0.00	0.40	0.00	0.00	0.00	0.25	0.00	0.00	0.16	0.45	0.00	0.00	0.00	0.10	0.31	
115	0.51	0.70	0.15	0.00	0.00	0.00	0.20	0.30	0.30	0.10	0.56	0.00	0.00	0.00	0.00	0.46	
120	0.26	0.31	0.10	0.00	0.00	0.00	0.10	0.25	0.05	0.05	0.61	0.00	0.00	0.00	0.00	0.00	
125	0.25	0.30	0.10	0.00	0.00	0.00	0.10	0.40	0.00	0.10	0.56	0.00	0.00	0.00	0.00	0.00	
130	0.20	0.35	0.10	0.00	0.00	0.00	0.05	0.36	0.00	0.35	0.45	0.00	0.00	0.00	0.00	0.00	
135	0.15	0.41	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	
140	0.15	0.35	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	
145	0.05	0.10	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	
150	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.05	0.00	0.00	0.00	
155	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.15	0.15	0.05	0.00	
160	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.20	0.20	0.20	0.10	0.00	
165	0.10	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.20	0.20	0.30	0.15	0.00	
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.25	0.25	0.10	0.00	
175	0.00	0.00	0.00	0.15	0.30	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.05	0.00	
180	0.00	0.00	0.00	0.15	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.20	0.05	0.00	

### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-20	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0015-DN-35B-J		

#### Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161062	120.0	60	0.1246	14.57	0.9745	20.07
-C3	277.0	60	0.0579	14.49	0.9037	22.94
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

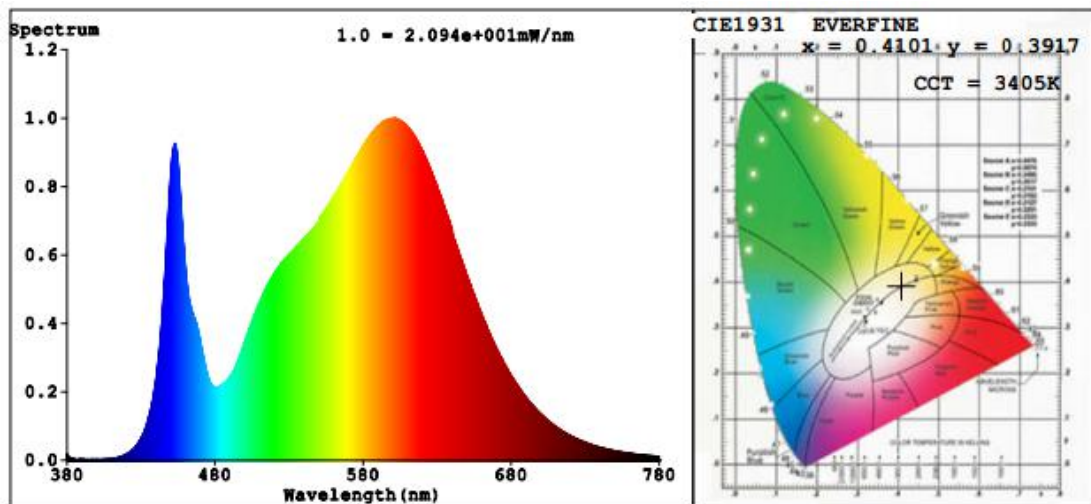
#### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	7
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	3405	R3	96	R11	79
Duv	-0.0006	R4	80	R12	62
Chromaticity (x, y)	x=0.4101 y=0.3917	R5	81	R13	83
Chromaticity (u', v')	u'=0.2384 v'=0.5124	R6	86	R14	98
Color Rendering Index (CRI)	82.4	R7	84	R15	75
R9	7	R8	61	--	--

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

Parameter	Result		DLC V4.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2089	2092	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	143.38	144.38	Bare lamp: >= 110(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



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## 2.4 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-20	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0015-DN-40B-J		

### Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161062	120.0	60	0.1219	14.54	0.9731	18.69
-C4	277.0	60	0.0564	14.49	0.9023	23.38
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

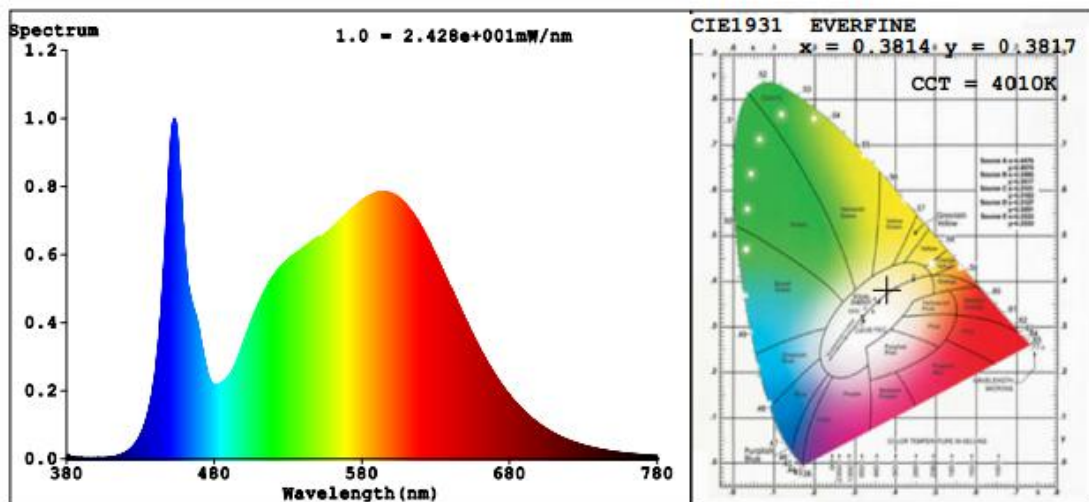
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	4010	R3	94	R11	79
Duv	0.0020	R4	81	R12	56
Chromaticity (x, y)	x=0.3814 y=0.3817	R5	80	R13	83
Chromaticity (u', v')	u'=0.2238 v'=0.5039	R6	84	R14	97
Color Rendering Index (CRI)	82.7	R7	87	R15	75
R9	9	R8	65	--	--

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

Parameter	Result		DLC V4.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2114	2118	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	145.39	146.17	Bare lamp: >= 110(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



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## 2.5 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-20	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T804-0015-DN-50B-J		

### Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161062	120.0	60	0.1238	14.52	0.9771	19.35
-C5	277.0	60	0.0573	14.31	0.9021	23.28
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

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

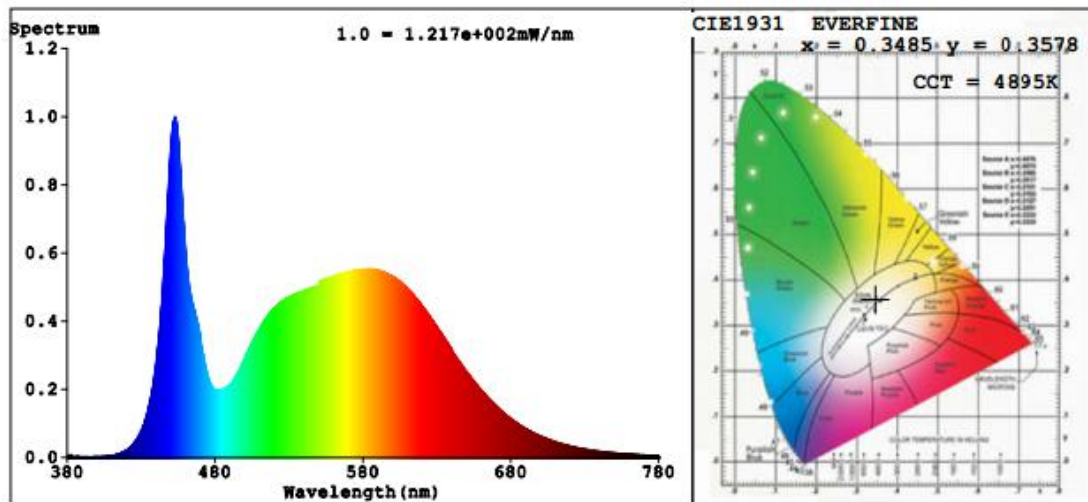
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	6
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	4895	R3	93	R11	78
Duv	0.0017	R4	80	R12	51
Chromaticity (x, y)	x=0.3485 y=0.3578	R5	80	R13	82
Chromaticity (u', v')	u'=0.2113 v'=0.4882	R6	82	R14	96
Color Rendering Index (CRI)	82.0	R7	87	R15	75
R9	6	R8	66	--	--

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

Parameter	Result		DLC V4.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2130	2106	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	146.69	147.17	Bare lamp: >= 110(-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-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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

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