



Report No.: GZE161062-A

## 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-T804-0012-DN-XXB-J

Representative (Tested) Model:      IK-T804-0012-DN-30B-J  
   IK-T804-0012-DN-35B-J  
   IK-T804-0012-DN-40B-J  
   IK-T804-0012-DN-50B-J

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

Test & 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

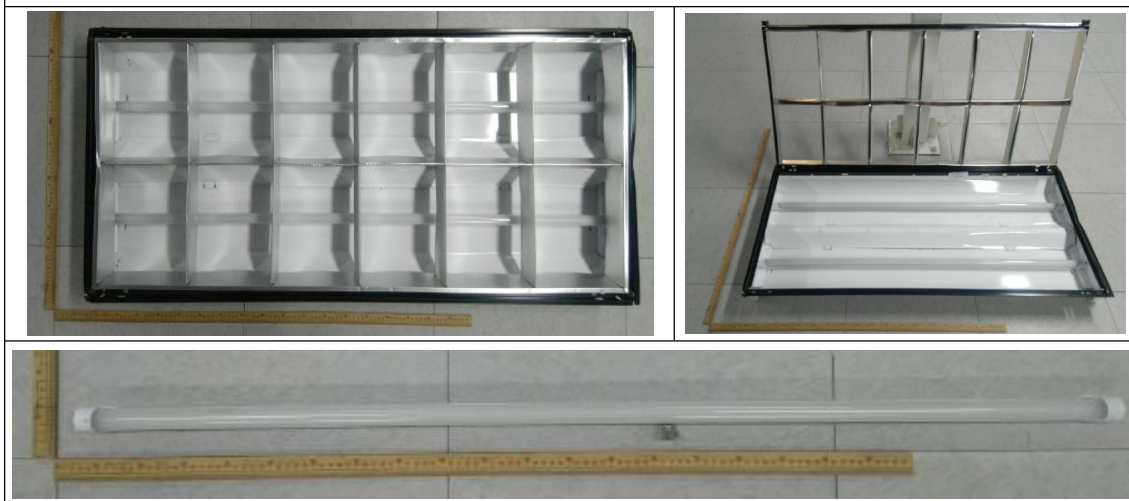
Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

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-T804-0012-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	12W	
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-A1,A2(3000K),A3(3500K), A4(4000K),A5(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-T804-0012-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	0.0983	11.45	0.9701	15.38
-A1	277.0	60	0.0469	11.72	0.9023	20.99
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

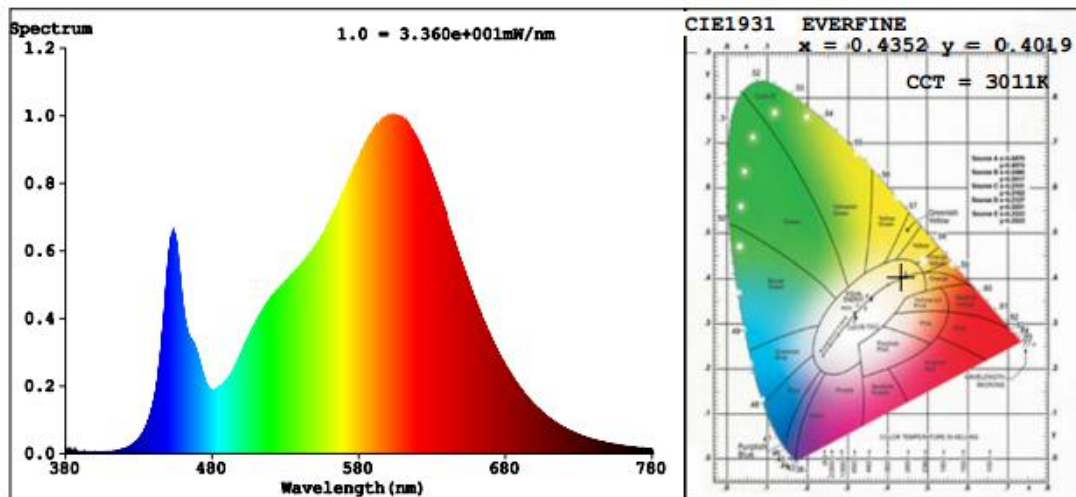
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	5
Frequency (Hz)	60	R2	91	R10	80
CCT (K)	3011	R3	96	R11	78
Duv	-0.0006	R4	79	R12	67
Chromaticity (x, y)	x=0.4352 y=0.4019	R5	81	R13	83
Chromaticity (u', v')	u'=0.2504 v'=0.5203	R6	89	R14	99
Color Rendering Index (CRI)	82.1	R7	82	R15	73
R9	5	R8	58	--	--

### 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)	1656	1661	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	144.63	141.72	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-T804-0012-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	0.1962	22.89	0.9722	14.83
-A1,A2	277.0	60	0.0937	23.44	0.9029	21.12
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

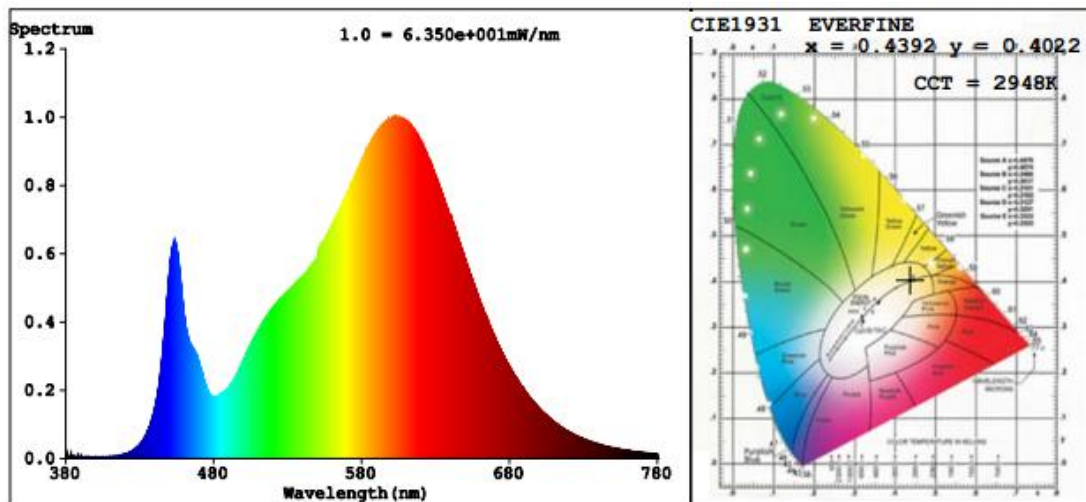
### Chromaticity Measurement for 2-lamp in Lithonia 2PM3N 12 cell 2x4 parabolic - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	5
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	2948	R3	96	R11	77
Duv	-0.0010	R4	78	R12	68
Chromaticity (x, y)	x=0.4392 y=0.4022	R5	80	R13	83
Chromaticity (u', v')	u'=0.2528 v'=0.5210	R6	89	R14	98
Color Rendering Index (CRI)	81.6	R7	81	R15	73
R9	5	R8	57	--	--

### 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)	2845.4	2854.3	In luminaire (2 lamps): >= 3000(-10%)
Luminous Efficacy (lm/W)	124.31	121.77	In luminaire: >= 100(-3%)
Zonal lumens in the 0-60° zone (%)	89.9	--	>= 75(-3)
SC: 0-180° (if applicable)	1.34	--	1.0-2.0(±0.1)
SC: 90-270° (if applicable)	1.14	--	1.0-2.0(±0.1)
Beam Angle (°)	103.1	--	--
Center Beam Candle Power (cd)	1172	--	--

## Spectral Power Distribution & Chromaticity Diagram



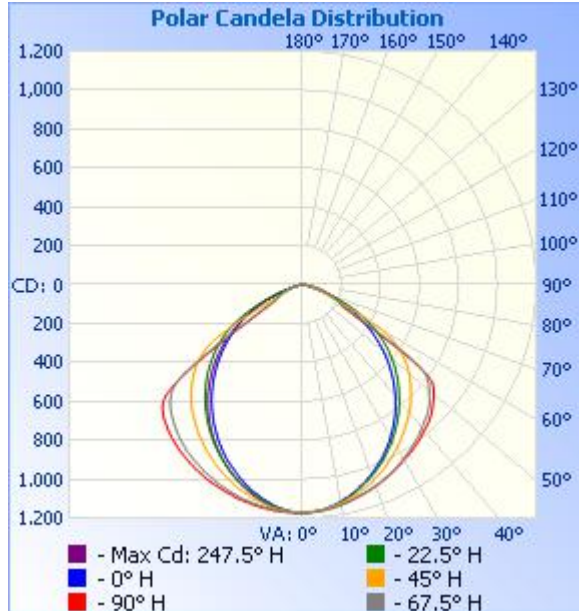
## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	894.6	31.4%
0-40	1,466.3	51.5%
0-60	2,557.0	89.9%
60-90	287.9	10.1%
70-100	76.4	2.7%
90-120	0.1	0%
0-90	2,844.8	100%
90-180	0.1	0%
0-180	2,844.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	110.4	3.9%	90-100	0.0	0%
10-20	312.8	11.0%	100-110	0.0	0%
20-30	471.4	16.6%	110-120	0.0	0%
30-40	571.7	20.1%	120-130	0.0	0%
40-50	603.8	21.2%	130-140	0.0	0%
50-60	486.9	17.1%	140-150	0.0	0%
60-70	211.5	7.4%	150-160	0	0%
70-80	66.1	2.3%	160-170	0	0%
80-90	10.3	0.4%	170-180	0.0	0%



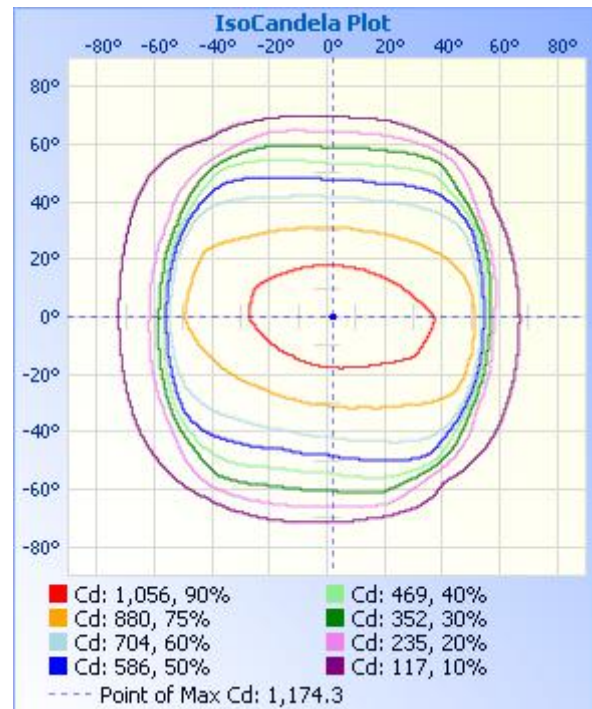
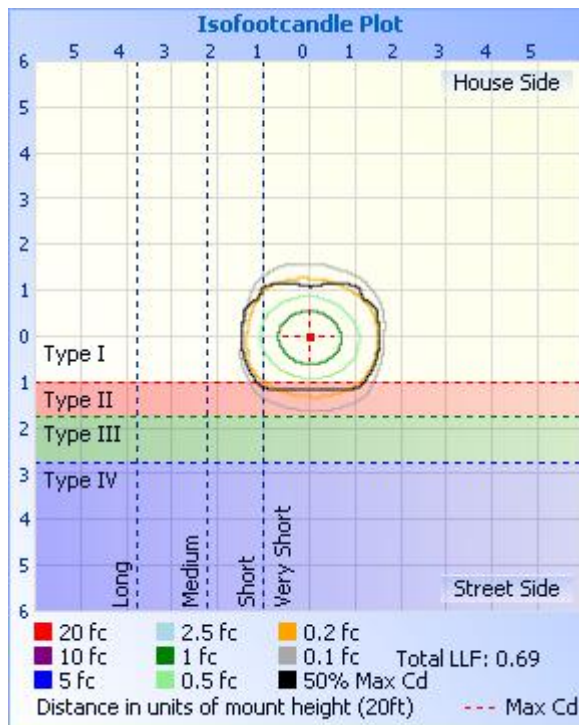
## Photometric Data



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	4.06 fc	38.0 ft	48.7 ft
34.0ft	1.01 fc	76.0 ft	97.5 ft
51.0ft	0.45 fc	114.0 ft	146.2 ft
68.0ft	0.25 fc	152.0 ft	195.0 ft
85.0ft	0.16 fc	190.0 ft	243.7 ft
102.0ft	0.11 fc	228.0 ft	292.4 ft

■ Vert. Spread: 96.4°  
 ■ Horiz. Spread: 110.2°



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Table--1 UNIT: cd

$\gamma$ (DEG) \ C (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	
5	1171	1171	1167	1165	1163	1162	1162	1167	1163	1160	1161	1158	1159	1162	1165	1169	
10	1165	1159	1147	1136	1132	1136	1140	1151	1147	1137	1129	1123	1124	1132	1143	1159	
15	1154	1139	1112	1095	1088	1094	1108	1127	1124	1109	1085	1076	1075	1088	1114	1145	
20	1137	1109	1072	1044	1036	1045	1069	1102	1101	1072	1036	1019	1020	1041	1076	1124	
25	1119	1073	1022	984	975	987	1022	1072	1073	1026	982	955	957	983	1033	1098	
30	1096	1032	961	915	905	922	970	1035	1041	979	919	885	886	922	987	1071	
35	1069	988	902	839	826	850	912	997	1011	929	852	807	809	852	934	1041	
40	1039	938	835	757	741	774	852	955	975	878	780	723	726	778	875	999	
45	999	879	759	667	648	692	787	914	937	818	707	637	636	699	811	951	
50	935	805	672	571	549	602	717	850	881	750	627	546	544	614	734	884	
55	454	679	568	467	445	506	622	737	715	662	539	453	447	520	636	533	
60	169	235	439	356	335	397	493	296	277	395	433	356	348	413	378	170	
65	129	120	260	239	224	271	194	198	204	179	299	255	248	275	121	126	
70	90.1	78.7	76.0	119	119	142	114	143	148	124	117	145	141	124	76.8	86.5	
75	55.7	45.0	37.8	51.8	56.8	55.0	64.9	89.8	95.0	73.6	57.7	64.3	61.0	45.6	42.5	53.1	
80	26.8	20.8	17.6	21.5	24.3	24.8	29.6	41.9	44.7	33.4	25.9	24.7	22.0	18.9	19.6	25.2	
85	8.28	6.44	5.51	6.18	7.16	7.83	9.75	12.9	13.6	9.83	7.37	6.36	5.69	5.28	5.81	7.51	
90	0.00	0.00	0.00	0.01	0.02	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	0.36	0.00	0.00	0.00	0.00	0.00	
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.10	
115	0.25	0.35	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	0.36	
120	0.10	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	
125	0.05	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	
130	0.05	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	
135	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	
140	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	
145	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	
150	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	
155	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	
160	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	
165	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	
170	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	
175	0.00	0.00	0.00	0.00	0.05	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	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	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-T804-0012-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	0.0985	11.47	0.9703	14.47
-A3	277.0	60	0.0465	11.63	0.9023	20.53
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

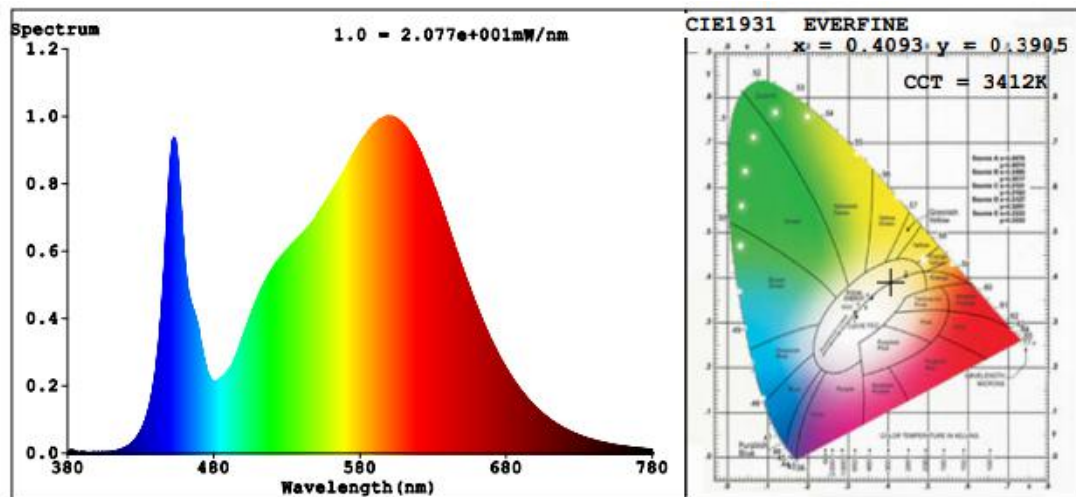
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	3412	R3	96	R11	79
Duv	-0.0009	R4	80	R12	62
Chromaticity (x, y)	x=0.4093 y=0.3905	R5	81	R13	83
Chromaticity (u', v')	u'=0.2384 v'=0.5118	R6	86	R14	98
Color Rendering Index (CRI)	82.6	R7	84	R15	75
R9	9	R8	62	--	--

### 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)	1681	1666	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	146.56	143.25	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-T804-0012-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	0.0962	11.24	0.9736	15.28
-A4	277.0	60	0.0468	11.69	0.9026	21.03
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

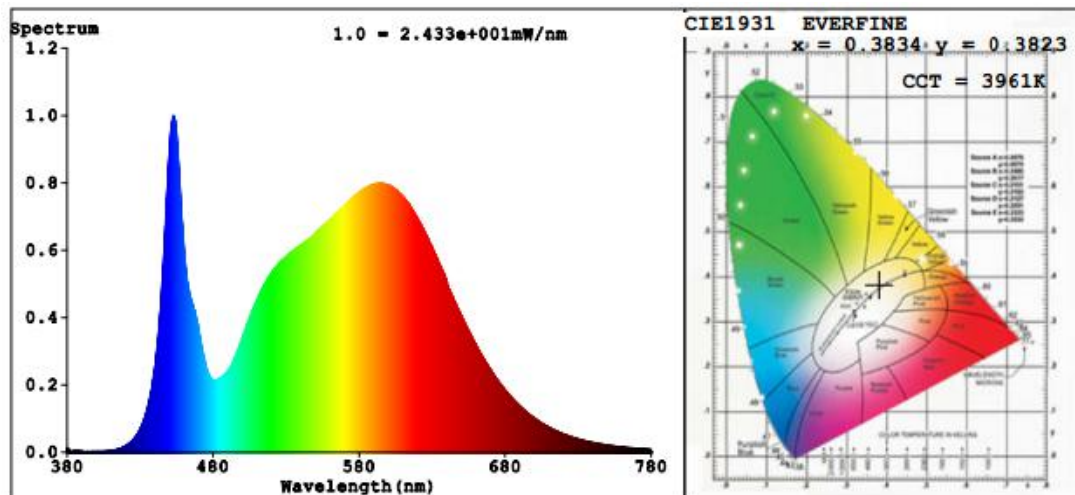
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	7
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	3961	R3	94	R11	79
Duv	0.0017	R4	80	R12	56
Chromaticity (x, y)	x=0.3834 y=0.3823	R5	80	R13	83
Chromaticity (u', v')	u'=0.2249 v'=0.5044	R6	84	R14	97
Color Rendering Index (CRI)	82.2	R7	86	R15	74
R9	7	R8	64	--	--

### 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)	1668	1702	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	148.40	145.59	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-T804-0012-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	0.0989	11.55	0.9734	15.42
-A5	277.0	60	0.0470	11.75	0.9020	21.09
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

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

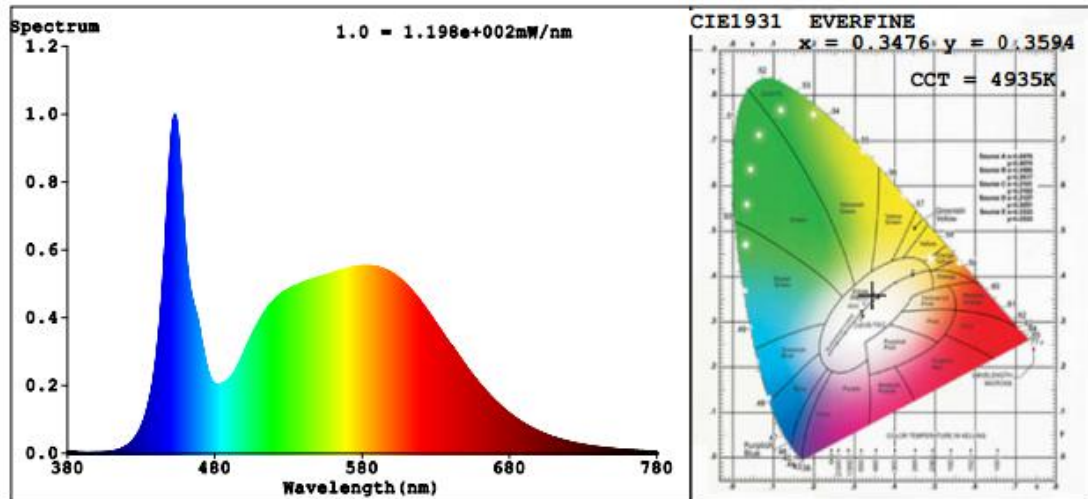
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	7
Frequency (Hz)	60	R2	88	R10	70
CCT (K)	4935	R3	93	R11	78
Duv	0.0029	R4	80	R12	51
Chromaticity (x, y)	x=0.3476 y=0.3594	R5	80	R13	83
Chromaticity (u', v')	u'=0.2101 v'=0.4888	R6	82	R14	96
Color Rendering Index (CRI)	82.2	R7	88	R15	75
R9	7	R8	67	--	--

### 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)	1722	1723	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	149.09	146.64	Bare lamp: >= 110(-3%)



**Spectral Power Distribution & Chromaticity Diagram**



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

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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 \*\*\*\*\***