

**LM-79-08 Test Report**

For

**IKIO LED LIGHTING****(Brand Name: IKIO)**8470 Allison Pointe Blvd, Suite 128  
Indianapolis, IN 46250**Replacement Lamps (“Plug and Play”) (UL Type A)**

Model name(s): IK-T504-L130-0027-XXA-J

Representative (Tested) Model: IK-T504-L130-0027-40A-J  
IK-T504-L130-0027-50A-J

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

Test &amp; Report By:

*Jack Luo*

Engineer: Jack Luo

Date: Sept.11,2017

Review By:

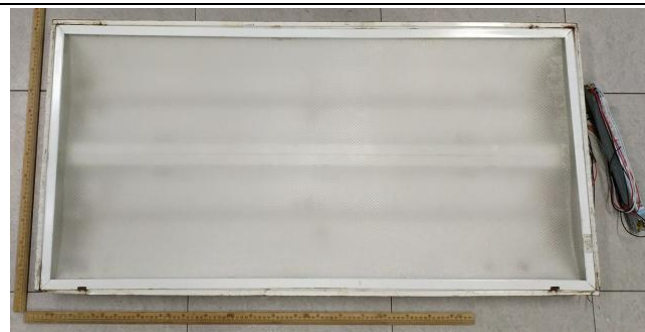
*Tommy Liang*

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**1.1 Product Information:**

Organization Name	IKIO LED LIGHTING	
Brand Name	IKIO	
Model Number	IK-T504-L130-0027-XXA-J	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Replacement Lamps ("Plug and Play") (UL Type A)	
Rated Voltage / Frequency	120~277 Vac, 50/60 Hz	
Nominal Power	27W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Xiamen Dacol Photoelectronics Technology Co.,Ltd.	
LED Model	SMD 2835	
Test Ballast	Philips ADVANCE ICN-2S54-T	
Sample Number	GZE1719042-A1,A2(4000K),A3(5000K)	
Lamp Length	1200	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**

**1.2 Test Specifications:**

Date of Receipt	Sept.08,2017
Date of Test	Sept.08,2017
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	2017-09-08	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T504-L130-0027-40A-J with ballast Philips ADVANCE ICN-2S54-T		

**Electrical Measurement for Bare-lamp:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171904	120.0	60	0.2307	27.42	0.9904	6.85
2-A1	277.0	60	0.1057	27.29	0.9325	9.63
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

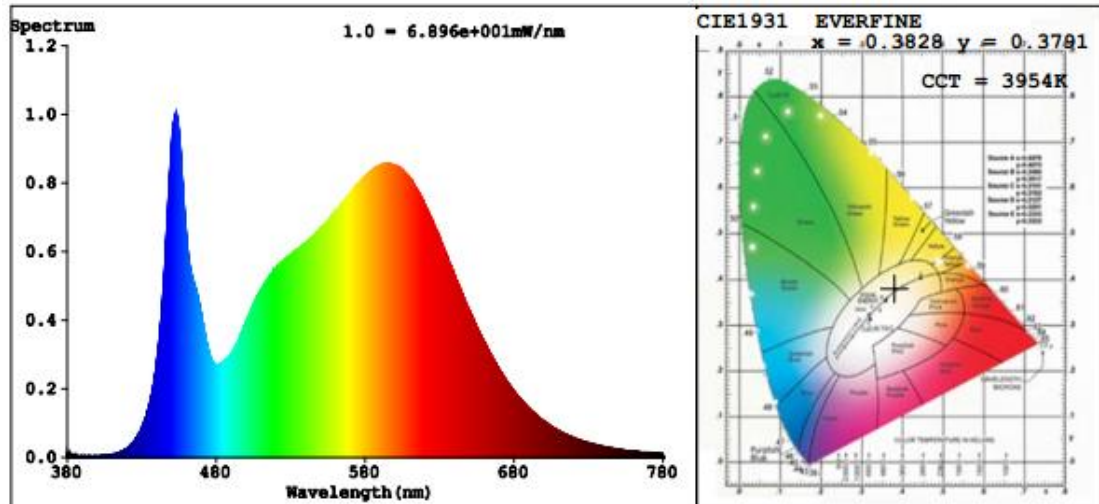
**Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	8
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3954	R3	96	R11	80
Duv	0.0004	R4	81	R12	61
Chromaticity (x, y)	x=0.3828 y=0.3791	R5	82	R13	84
Chromaticity (u', v')	u'=0.2257 v'=0.5030	R6	87	R14	98
Color Rendering Index (CRI)	83.2	R7	85	R15	75
R9	8	R8	63	--	--

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

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3883	3905	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	141.61	143.09	Bare lamp: >= 110(-3%)
Most Worst Luminous/Highest Watts	141.61		

**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	2017-09-08	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T504-L130-0027-40A-J, with ballast Philips ADVANCE ICN-2S54-T		

### Electrical Measurement for 2-lamp in Lithonia 2GT8 lensed 2x4:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171904	120.0	60	0.4589	54.68	0.9929	6.41
2-A1,A2	277.0	60	0.2101	54.56	0.9377	8.97
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement for 2-lamp in Lithonia 2GT8 lensed 2x4 - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	8
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	3935	R3	96	R11	80
Duv	0.0007	R4	81	R12	61
Chromaticity (x, y)	x=0.3839 y=0.3804	R5	82	R13	84
Chromaticity (u', v')	u'=0.2259 v'=0.5037	R6	86	R14	98
Color Rendering Index (CRI)	83.3	R7	85	R15	75
R9	8	R8	64	--	--

### Photometric Measurement 2-lamp in Lithonia 2GT8 lensed 2x4 – Goniophotometer Method:

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	6310.7	6365.2	In luminaire (2 lamps): >=3000(-10%)
Luminous Efficacy (lm/W)	115.41	116.66	In luminaire: >= 100(-3%)
Most Worst Luminous/Highest Watts	115.41		
Zonal lumens in the 0-60° zone (%)	84.5	--	>= 75(-3)
SC: 0-180° (if applicable)	1.15	--	1.0-2.0(±0.1)
SC: 90-270° (if applicable)	1.18	--	1.0-2.0(±0.1)
Beam Angle (°)	96.0	--	--
Center Beam Candle Power (cd)	2691	--	--

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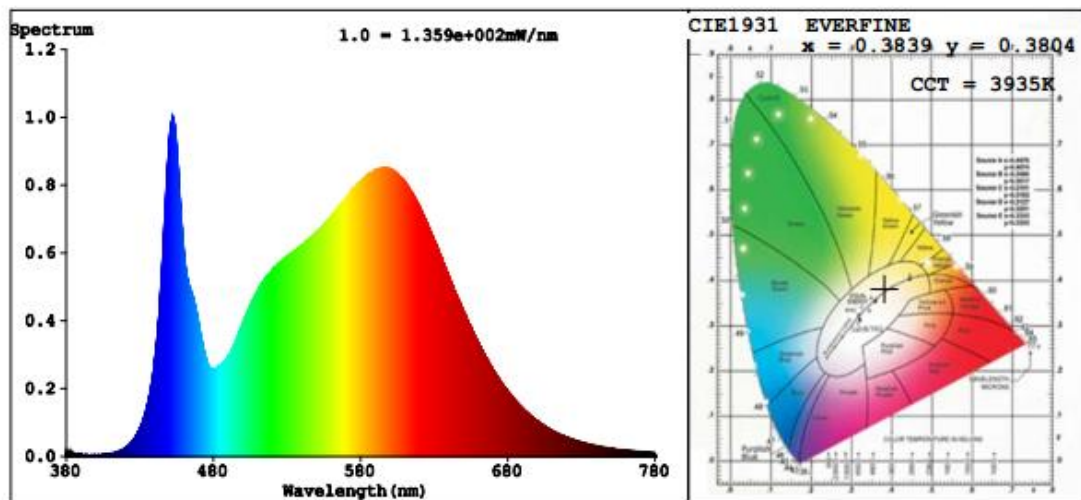
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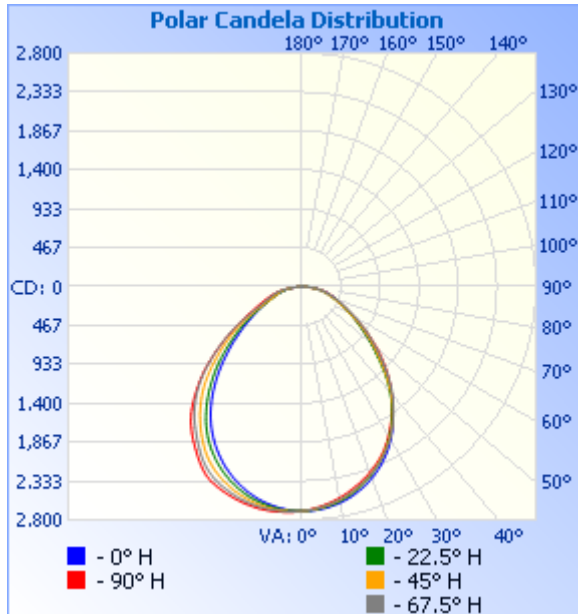
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**Spectral Power Distribution & Chromaticity Diagram**

**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,059.5	32.6%
0-40	3,304.7	52.4%
0-60	5,328.9	84.5%
60-90	978.8	15.5%
70-100	434.0	6.9%
90-120	0.8	0%
0-90	6,307.6	100%
90-180	2.3	0%
0-180	6,309.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	254.2	4.0%	90-100	0.2	0%
10-20	723.8	11.5%	100-110	0.2	0%
20-30	1,081.5	17.1%	110-120	0.4	0%
30-40	1,245.1	19.7%	120-130	0.4	0%
40-50	1,156.8	18.3%	130-140	0.3	0%
50-60	867.3	13.7%	140-150	0.3	0%
60-70	545.0	8.6%	150-160	0.3	0%
70-80	326.5	5.2%	160-170	0.2	0%
80-90	107.3	1.7%	170-180	0.1	0%

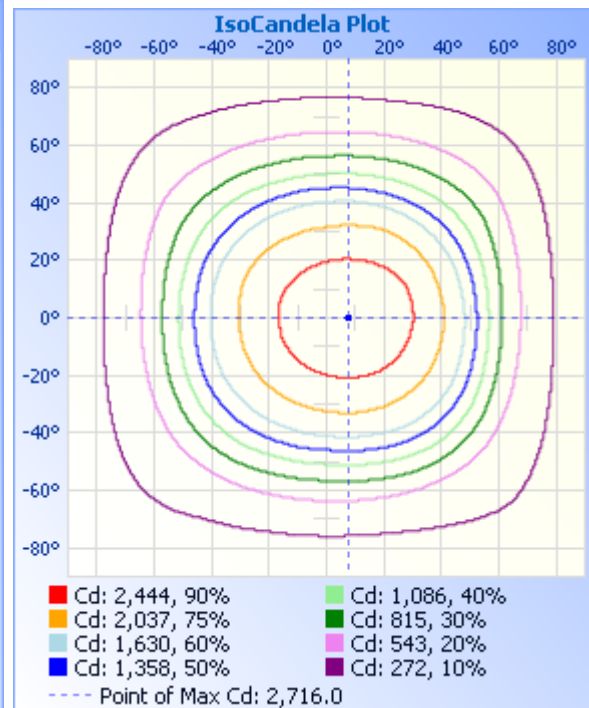
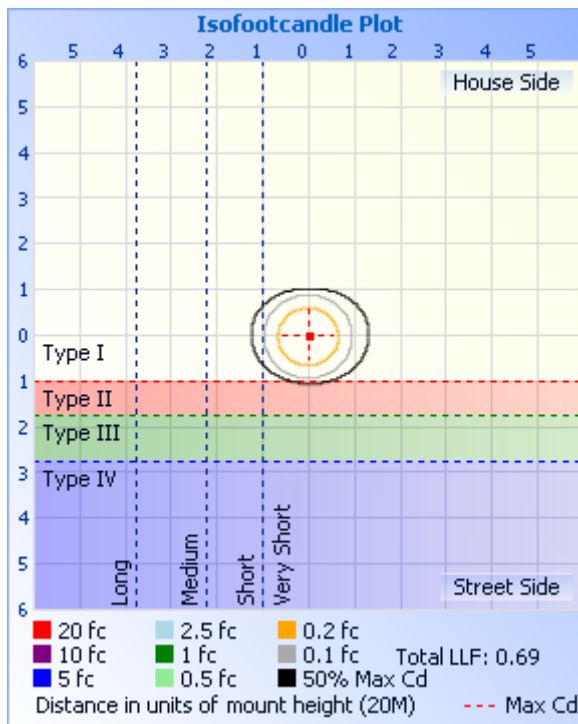


**Photometric Data**


**Illuminance at a Distance**

	Center Beam fc	Beam Width
20.0M	0.63 fc	41.2 M 46.5 M
40.0M	0.16 fc	82.4 M 92.9 M
60.0M	0.07 fc	123.6 M 139.4 M
80.0M	0.04 fc	164.8 M 185.9 M
100.0M	0.03 fc	206.0 M 232.3 M

■ Vert. Spread: 91.7°  
■ Horiz. Spread: 98.6°


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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	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	2691	
5	2714	2709	2701	2691	2678	2666	2659	2655	2644	2649	2653	2663	2673	2686	2696	2704	
10	2713	2701	2682	2659	2631	2611	2598	2592	2572	2582	2587	2604	2623	2649	2675	2693	
15	2688	2670	2634	2595	2553	2525	2509	2505	2480	2491	2494	2514	2541	2583	2625	2661	
20	2643	2617	2559	2500	2443	2408	2395	2396	2370	2379	2377	2395	2429	2487	2549	2603	
25	2578	2541	2460	2373	2300	2264	2257	2268	2238	2243	2234	2249	2289	2360	2447	2521	
30	2443	2432	2335	2212	2120	2088	2096	2106	2069	2066	2059	2073	2117	2204	2303	2386	
35	2268	2244	2155	2012	1903	1880	1894	1905	1872	1863	1853	1866	1911	2006	2112	2201	
40	2072	2012	1890	1764	1661	1634	1650	1678	1664	1657	1633	1624	1662	1762	1897	2007	
45	1802	1734	1582	1464	1394	1357	1375	1425	1432	1430	1396	1368	1390	1496	1649	1778	
50	1497	1422	1284	1178	1114	1093	1123	1171	1184	1177	1137	1101	1115	1210	1349	1483	
55	1161	1135	1015	932	881	865	891	939	938	930	896	859	866	942	1062	1167	
60	854	883	783	728	693	679	690	739	715	692	664	647	658	701	772	853	
65	621	661	592	562	543	529	524	569	545	502	461	469	490	494	514	578	
70	470	478	438	423	419	402	395	429	426	384	339	352	372	365	367	435	
75	356	338	321	313	316	302	296	315	332	306	273	272	281	280	294	342	
80	240	231	217	211	218	208	205	220	233	222	201	189	193	193	215	247	
85	86.0	106	99.9	107	110	108	94.5	101	91.6	93.8	86.6	91.8	93.1	94.2	94.5	103	
90	0.00	0.07	0.37	0.72	0.73	0.72	0.25	0.44	0.00	0.06	0.00	2.79	0.35	0.41	0.12	0.00	
95	0.00	0.00	0.06	0.12	0.06	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.29	0.47	0.00	0.00	
100	0.00	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.18	1.00	0.23	0.47	0.24	0.06	
105	0.00	0.00	0.00	0.06	0.11	0.00	0.28	0.00	0.29	0.24	0.47	0.49	0.00	0.35	0.42	0.31	
110	0.27	0.23	0.23	0.06	0.35	0.26	0.57	0.29	0.41	0.47	0.65	0.32	0.00	0.00	0.45	0.47	
115	0.43	0.52	0.36	0.06	0.29	0.12	0.64	0.76	0.71	0.70	0.76	0.00	0.00	0.00	0.47	0.51	
120	0.50	0.53	0.47	0.00	0.00	0.00	0.71	0.93	0.73	0.70	0.86	0.00	0.00	0.00	0.35	0.49	
125	0.54	0.60	0.50	0.00	0.00	0.00	0.73	1.00	0.75	0.70	0.88	0.00	0.00	0.00	0.17	0.51	
130	0.57	0.58	0.47	0.00	0.00	0.00	0.76	1.00	0.77	0.70	0.58	0.00	0.08	0.00	0.00	0.53	
135	0.58	0.57	0.35	0.00	0.00	0.00	0.58	1.00	0.79	0.70	0.48	0.27	0.21	0.12	0.00	0.60	
140	0.58	0.56	0.06	0.00	0.00	0.00	0.06	1.00	0.81	0.70	0.29	0.41	0.58	0.23	0.00	0.63	
145	0.58	0.55	0.00	0.00	0.12	0.14	0.00	0.93	0.80	0.70	0.29	0.65	0.67	0.47	0.12	0.52	
150	0.58	0.54	0.00	0.29	0.37	0.35	0.00	0.74	0.77	0.70	0.42	0.76	0.93	0.81	0.45	0.41	
155	0.58	0.48	0.06	0.38	0.41	0.48	0.00	0.61	0.74	0.75	0.45	0.79	1.12	1.00	0.77	0.35	
160	0.58	0.41	0.28	0.47	0.58	0.57	0.35	0.48	0.72	0.83	0.46	0.82	1.18	1.23	1.04	0.53	
165	0.58	0.41	0.39	0.70	0.76	0.64	0.55	0.47	0.69	0.84	0.47	0.86	1.24	1.39	1.11	0.57	
170	0.72	0.41	0.49	0.76	1.22	1.11	0.59	0.47	0.66	0.83	0.50	0.75	1.31	1.46	1.16	0.60	
175	0.79	0.49	0.58	1.05	1.37	1.23	0.63	0.47	0.65	0.82	0.52	0.70	1.23	1.23	1.11	0.63	
180	0.82	0.53	0.58	1.11	1.17	0.94	0.64	0.59	0.64	0.82	0.53	0.59	1.17	1.23	1.06	0.65	

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## 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-09-08	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IK-T504-L130-0027-50A-J, with ballast Philips ADVANCE ICN-2S54-T		

### Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171904	120.0	60	0.2283	27.15	0.9910	6.78
2-A3	277.0	60	0.1045	27.02	0.9332	9.39
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

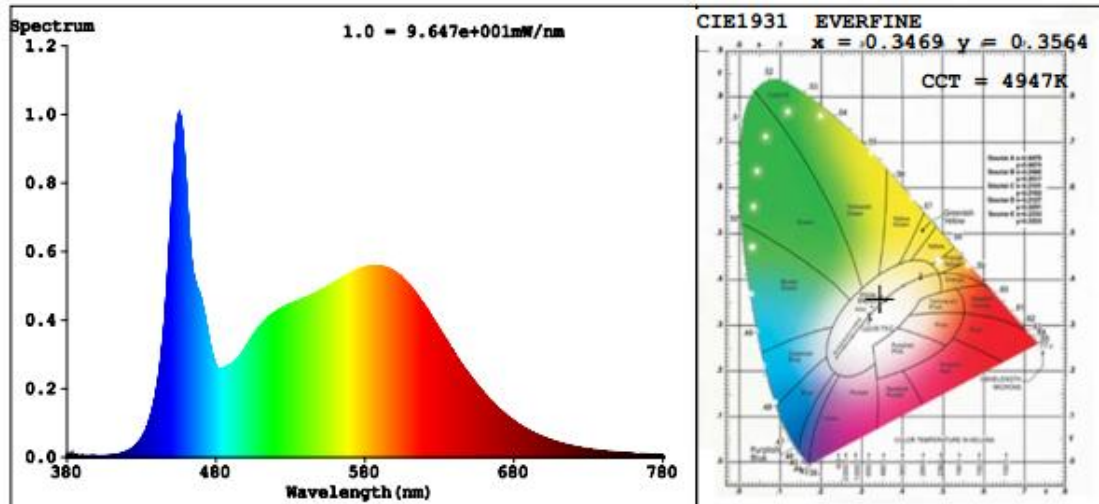
### Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	6
Frequency (Hz)	60	R2	93	R10	81
CCT (K)	4947	R3	95	R11	77
Duv	0.0017	R4	78	R12	55
Chromaticity (x, y)	x=0.3469 y=0.3564	R5	81	R13	86
Chromaticity (u', v')	u'=0.2108 v'=0.4873	R6	87	R14	98
Color Rendering Index (CRI)	83.1	R7	84	R15	76
R9	6	R8	64	--	--

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

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3883	3910	Bare Lamp: >= 1600(-10%)
Luminous Efficacy (lm/W)	143.02	144.71	Bare lamp: >= 110(-3%)
Most Worst Luminous/Highest Watts	143.02		

**Spectral Power Distribution & Chromaticity Diagram**



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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			

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