

Energy Star Test Report

For

Shenzhen OKT Lighting CO.,LTD

(Brand Name: OKT Lighting)

NO.2076 Jincheng Rd,Shajing Town, Bao'an District, Shenzhen, China.

**Model name(s): CP4-D20W-XXE,
CP6-D20W-XXE, CP8-D20W-XXE**

Report Type: Testing and Report According to ENERGY STAR® Program
Requirements Product Specification for Luminaires (Light
Fixtures) - Version 2.1

**Type of
Luminaire:** Downlights

Report Date: 2018-07-13

Test & Report By:

Allen Shao

Review By:

John Li

Engineer: Allen Shao

Manager: John Li

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

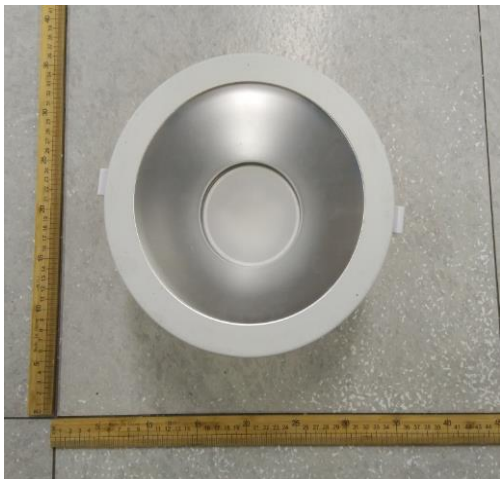
Report Format Number STD/QR4910-A/1

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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1.1 Product Information:		
Model Number	CP4-D20W-XXE, CP6-D20W-XXE, CP8-D20W-XXE	
Remark	"XX" denotes CCT, example: 30 identifies "3000K", 35 identifies "3500K", 40 identifies "4000K", 50 identifies "5000K".	
Representative (Tested) Model	CP4-D20W-30E	
Model Difference	All construction and rating are the same, except CCT and Trim Size.	
Type of Luminaire	Downlights	
LED Manufacturer	Guangdong Elite Optoelectronic Technology Co.,Ltd	
LED Model	SMD 3030	
Dimming	Dimmable	
Sample Number	JAE180708-C1	
Date of Receipt	July.10, 2018	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
1.2 Rated Values:		
Rated Voltage / Frequency	120-347Vac, 50/60 Hz	
Nominal Power	20W	
Rated Initial Lamp Lumen	--	
Declared CC	3000K, 3500K, 4000K, 5000K	
Sample Number	JAE180708-C1(3000K)	
Photo		
		

1.3 Test Specifications:	
Date of Receipt	July.10,2018
Date of Test	July.12,2018
Test item	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	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 7. UL1993 4th Edition, Self-Ballasted Lamps and Lamp Adapters 8. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.1
Reference Work Instruction	QD25
Remark	Below test and data are not covered by NVLAP accreditation: - Operating Frequency

1.4 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)	IES LM-79 2008
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Test date	2018-07-12	Test Ambient:	25.0 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CP4-D20W-30E		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JAE180708-C1	120.0	60	0.1689	19.93	0.9833
	347.0	60	0.0656	19.84	0.8720

Sphere-Spectroradiometer Method:

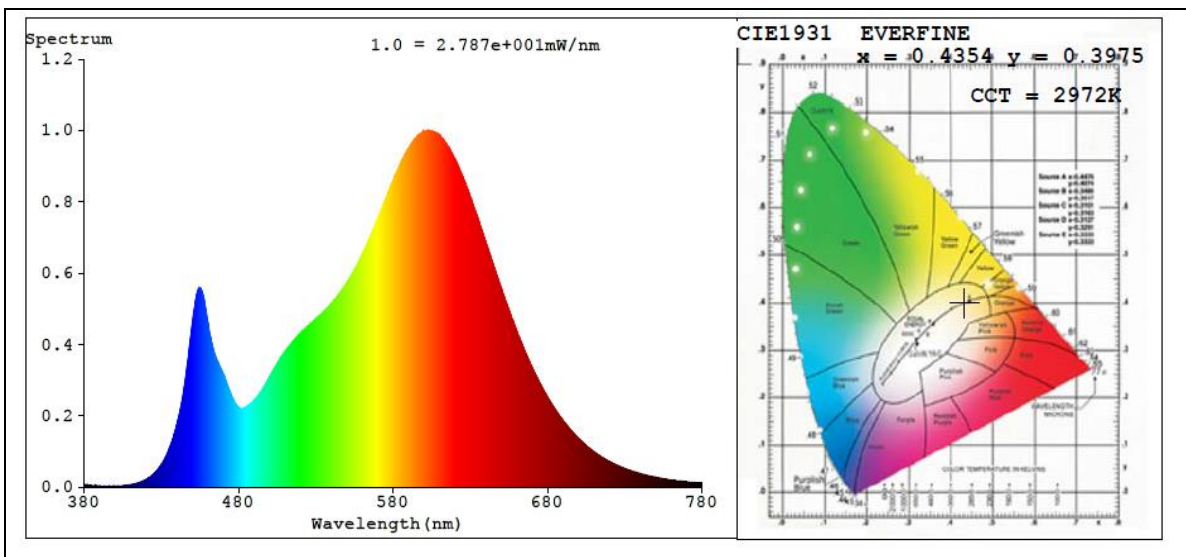
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	82.2
R9	5
CCT (K)	2972
Chromaticity (x, y)	x=0.4354 y=0.3975
Chromaticity (u', v')	u'=0.2524 v'=0.5185
Duv	-0.0024

Special Color Rendering Indices			
R1	82	R9	5
R2	93	R10	85
R3	93	R11	78
R4	79	R12	75
R5	82	R13	85
R6	92	R14	97
R7	80	R15	74
R8	56	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1559.2
Luminous Efficacy (lm/W)	78.23
Beam Angle °	72.1
Zonal Lumen Density(0-60 °)	98.3
Center Beam Candle Power (cd)	1107

Spectral Power Distribution and Chromaticity Diagram



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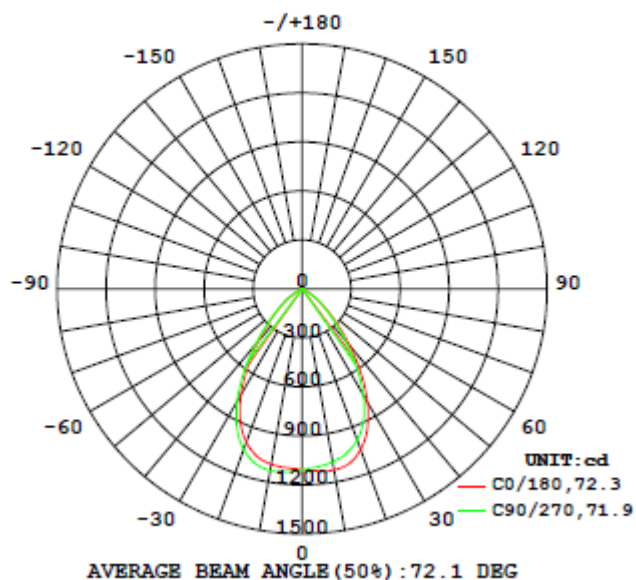
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Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	828.7	53.1%
0-40	1,203.2	77.2%
0-60	1,532.7	98.3%
60-90	26.4	1.7%
70-100	3.4	0.2%
90-120	0.0	0%
0-90	1,559.1	100%
90-180	0.1	0%
0-180	1,559.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	105.8	6.8%	90-100	0.0	0%
10-20	303.7	19.5%	100-110	0.0	0%
20-30	419.1	26.9%	110-120	0.0	0%
30-40	374.5	24.0%	120-130	0.0	0%
40-50	227.2	14.6%	130-140	0.0	0%
50-60	102.2	6.6%	140-150	0.0	0%
60-70	23.0	1.5%	150-160	0.0	0%
70-80	3.0	0.2%	160-170	0.0	0%
80-90	0.4	0.0%	170-180	0.0	0%

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107	1107			
5	1120	1115	1106	1098	1094	1090	1091	1095	1100	1106	1113	1118	1125	1125	1127	1124			
10	1125	1116	1104	1087	1076	1071	1075	1084	1091	1103	1115	1123	1129	1133	1135	1135			
15	1109	1097	1083	1061	1044	1037	1045	1053	1063	1077	1091	1101	1107	1113	1120	1118			
20	1047	1037	1023	1003	985	978	982	988	999	1013	1030	1041	1046	1054	1062	1060			
25	946	936	923	906	890	882	882	886	896	909	925	937	945	952	961	959			
30	800	791	779	763	748	739	738	741	751	762	777	790	798	807	815	814			
35	626	618	606	590	576	568	568	573	583	592	603	614	623	632	639	639			
40	454	446	434	419	409	403	404	409	420	428	433	438	445	452	459	462			
45	305	301	292	282	275	271	274	278	285	288	291	292	295	300	306	310			
50	194	192	189	184	179	178	180	182	186	187	188	187	188	191	196	199			
55	115	114	113	111	110	109	110	111	113	112	111	110	110	112	115	117			
60	56.4	56.4	56.5	56.3	56.0	56.1	56.6	56.8	57.0	55.8	54.5	53.4	53.3	54.1	56.1	57.4			
65	18.4	18.5	18.4	18.3	18.5	18.8	19.1	19.4	21.9	20.9	19.1	18.3	18.1	18.5	19.5	20.9			
70	6.53	6.43	5.96	5.91	5.93	6.07	6.55	6.69	6.36	5.96	5.53	5.30	5.30	5.54	5.87	6.21			
75	2.69	2.63	2.58	2.58	2.60	2.66	2.71	2.74	2.71	2.53	2.35	2.25	2.26	2.36	2.54	2.68			
80	1.08	1.06	1.03	1.01	1.01	1.03	1.06	1.08	1.06	0.97	0.88	0.84	0.85	0.91	0.99	1.07			
85	0.32	0.31	0.30	0.27	0.28	0.29	0.30	0.30	0.30	0.26	0.23	0.22	0.22	0.25	0.28	0.31			
90	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			
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	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.01	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			
115	0.00	0.00	0.02	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			
120	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
125	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
130	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02			
135	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
140	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.03	0.03			
145	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.04	0.04	0.03	0.04	0.05	0.04	0.04			
150	0.04	0.04	0.04	0.03	0.06	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.06	0.04	0.05			
155	0.04	0.04	0.04	0.04	0.07	0.07	0.05	0.04	0.05	0.05	0.05	0.05	0.04	0.04	0.06	0.05			
160	0.04	0.04	0.04	0.05	0.10	0.09	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.09	0.08	0.06			
165	0.06	0.04	0.04	0.04	0.09	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.11	0.09	0.08			
170	0.04	0.04	0.04	0.04	0.04	0.07	0.04	0.07	0.05	0.05	0.05	0.07	0.07	0.11	0.09	0.08			
175	0.06	0.07	0.04	0.06	0.09	0.04	0.04	0.04	0.05	0.05	0.06	0.07	0.09	0.08	0.06	0.09			
180	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			

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2.2 Color Spatial Uniformity**IES LM-79 2008****ENERGY STAR® Program Requirements****Product Specification for Luminaires (Light Fixtures) - Version 2.1****Test Data :**

Test date	2017-07-12	Test Ambient	25.1°C
Sample No.		Maximum $\Delta u'v'$	
JAE180708-C1		0.0020	

Gamma\C	CIE u'	CIE v'	$du'v'$	CIE u'	CIE v'	$du'v'$
-55	0.2497	0.5162	0.0019	0.2496	0.5162	0.002
-54	0.2498	0.5162	0.0018	0.2496	0.5162	0.002
-53	0.2498	0.5163	0.0017	0.2497	0.5163	0.0018
-52	0.2499	0.5163	0.0016	0.2498	0.5163	0.0017
-51	0.2498	0.5163	0.0017	0.2498	0.5163	0.0017
-50	0.2501	0.5163	0.0014	0.2499	0.5163	0.0016
-49	0.25	0.5163	0.0015	0.2499	0.5163	0.0016
-48	0.25	0.5163	0.0015	0.25	0.5163	0.0015
-47	0.2503	0.5164	0.0012	0.25	0.5162	0.0015
-46	0.2503	0.5164	0.0012	0.2502	0.5162	0.0014
-45	0.2503	0.5164	0.0012	0.2502	0.5162	0.0014
-44	0.2506	0.5165	0.0009	0.2504	0.5162	0.0012
-43	0.2506	0.5165	0.0009	0.2504	0.5162	0.0012
-42	0.2507	0.5165	0.0008	0.2506	0.5163	0.001
-41	0.2508	0.5165	0.0007	0.2507	0.5163	0.0009
-40	0.2508	0.5166	0.0006	0.2507	0.5164	0.0009
-39	0.2512	0.5167	0.0003	0.2509	0.5165	0.0006
-38	0.2513	0.5167	0.0002	0.251	0.5165	0.0005
-37	0.2513	0.5168	0.0001	0.2512	0.5166	0.0003
-36	0.2514	0.5168	0.0001	0.2513	0.5166	0.0002
-35	0.2515	0.5169	0.0001	0.2514	0.5167	0.0002
-34	0.2515	0.5169	0.0001	0.2516	0.5168	0.0002
-33	0.2517	0.517	0.0003	0.2516	0.5168	0.0002
-32	0.2517	0.517	0.0004	0.2517	0.5169	0.0003
-31	0.2519	0.5171	0.0005	0.2518	0.5169	0.0003
-30	0.2519	0.5171	0.0006	0.252	0.517	0.0006
-29	0.252	0.5172	0.0006	0.252	0.517	0.0006
-28	0.2521	0.5172	0.0008	0.2521	0.5171	0.0007
-27	0.2522	0.5172	0.0008	0.2521	0.5171	0.0007
-26	0.2522	0.5173	0.0008	0.2521	0.5171	0.0007

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-25	0.2523	0.5173	0.001	0.2523	0.5172	0.0009
-24	0.2523	0.5173	0.001	0.2523	0.5172	0.0009
-23	0.2523	0.5173	0.001	0.2523	0.5172	0.001
-22	0.2523	0.5173	0.001	0.2523	0.5172	0.001
-21	0.2523	0.5174	0.0011	0.2523	0.5172	0.001
-20	0.2524	0.5174	0.0012	0.2523	0.5172	0.001
-19	0.2524	0.5174	0.0012	0.2524	0.5173	0.001
-18	0.2524	0.5174	0.0012	0.2524	0.5173	0.001
-17	0.2524	0.5174	0.0011	0.2523	0.5173	0.001
-16	0.2524	0.5174	0.0012	0.2523	0.5173	0.001
-15	0.2524	0.5174	0.0012	0.2523	0.5173	0.001
-14	0.2524	0.5174	0.0011	0.2523	0.5173	0.001
-13	0.2524	0.5174	0.0011	0.2523	0.5172	0.001
-12	0.2524	0.5174	0.0011	0.2523	0.5172	0.001
-11	0.2524	0.5174	0.0011	0.2523	0.5172	0.0009
-10	0.2523	0.5173	0.001	0.2522	0.5172	0.0009
-9	0.2523	0.5173	0.001	0.2523	0.5172	0.0009
-8	0.2523	0.5173	0.001	0.2522	0.5172	0.0009
-7	0.2522	0.5173	0.0009	0.2522	0.5171	0.0008
-6	0.2522	0.5172	0.0008	0.2521	0.5171	0.0007
-5	0.2522	0.5172	0.0008	0.2521	0.5171	0.0007
-4	0.2521	0.5172	0.0007	0.252	0.5171	0.0007
-3	0.2521	0.5172	0.0007	0.252	0.5171	0.0006
-2	0.252	0.5172	0.0007	0.252	0.517	0.0006
-1	0.252	0.5171	0.0007	0.252	0.517	0.0006
0	0.2527	0.5176	0.0015	0.2527	0.5176	0.0015
1	0.252	0.5171	0.0006	0.2519	0.517	0.0005
2	0.252	0.5171	0.0006	0.2519	0.517	0.0005
3	0.252	0.5171	0.0006	0.2519	0.517	0.0005
4	0.252	0.5172	0.0007	0.2519	0.517	0.0005
5	0.252	0.5172	0.0007	0.252	0.517	0.0006
6	0.2521	0.5172	0.0007	0.252	0.5171	0.0006
7	0.2521	0.5172	0.0008	0.252	0.5171	0.0006
8	0.2521	0.5172	0.0008	0.252	0.5171	0.0006
9	0.2522	0.5173	0.0009	0.2519	0.5171	0.0005
10	0.2522	0.5173	0.0009	0.2519	0.5171	0.0006
11	0.2522	0.5173	0.0009	0.252	0.5171	0.0006
12	0.2522	0.5173	0.0009	0.252	0.5171	0.0006
13	0.2523	0.5173	0.001	0.252	0.5172	0.0007
14	0.2523	0.5173	0.001	0.252	0.5172	0.0007

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15	0.2523	0.5173	0.001	0.2521	0.5172	0.0007
16	0.2523	0.5173	0.001	0.2521	0.5172	0.0007
17	0.2523	0.5173	0.001	0.2521	0.5172	0.0008
18	0.2523	0.5173	0.001	0.2521	0.5172	0.0008
19	0.2523	0.5173	0.001	0.2522	0.5172	0.0008
20	0.2523	0.5173	0.001	0.2522	0.5172	0.0008
21	0.2523	0.5173	0.001	0.2522	0.5172	0.0008
22	0.2523	0.5173	0.001	0.2521	0.5171	0.0007
23	0.2523	0.5173	0.001	0.2521	0.5172	0.0007
24	0.2523	0.5173	0.0009	0.2521	0.5172	0.0007
25	0.2521	0.5172	0.0008	0.2521	0.5171	0.0007
26	0.252	0.5172	0.0007	0.2519	0.5171	0.0006
27	0.252	0.5172	0.0007	0.2519	0.5171	0.0006
28	0.252	0.5171	0.0006	0.2519	0.5171	0.0005
29	0.2519	0.5171	0.0006	0.2519	0.5171	0.0005
30	0.2517	0.517	0.0003	0.2518	0.517	0.0004
31	0.2516	0.517	0.0003	0.2517	0.517	0.0004
32	0.2516	0.517	0.0002	0.2516	0.517	0.0002
33	0.2515	0.5169	0.0001	0.2513	0.5168	0.0001
34	0.2513	0.5168	0.0001	0.2513	0.5168	0.0001
35	0.2513	0.5168	0.0001	0.2512	0.5168	0.0002
36	0.2512	0.5168	0.0002	0.2512	0.5167	0.0003
37	0.251	0.5167	0.0005	0.2511	0.5167	0.0004
38	0.2509	0.5167	0.0005	0.2508	0.5166	0.0007
39	0.2508	0.5166	0.0006	0.2507	0.5165	0.0008
40	0.2506	0.5166	0.0009	0.2506	0.5165	0.0009
41	0.2506	0.5166	0.0009	0.2505	0.5165	0.001
42	0.2503	0.5165	0.0012	0.2505	0.5165	0.001
43	0.2503	0.5165	0.0012	0.2502	0.5164	0.0013
44	0.2502	0.5165	0.0012	0.2502	0.5164	0.0013
45	0.2501	0.5165	0.0014	0.2501	0.5164	0.0014
46	0.2501	0.5164	0.0014	0.2502	0.5165	0.0013
47	0.2499	0.5164	0.0016	0.2502	0.5165	0.0013
48	0.2499	0.5165	0.0016	0.25	0.5165	0.0015
49	0.2498	0.5164	0.0017	0.2501	0.5165	0.0014
50	0.2498	0.5165	0.0017	0.2501	0.5165	0.0014
51	0.2497	0.5164	0.0018	0.2499	0.5165	0.0016
52	0.2497	0.5164	0.0018	0.2499	0.5165	0.0016
53	0.2496	0.5164	0.0019	0.2499	0.5165	0.0015
54	0.2496	0.5164	0.0019	0.2497	0.5164	0.0018

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

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55	0.2494	0.5163	0.002	0.2497	0.5164	0.0018
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Laboratory: Standard-Tech Co., Ltd. Testing Center
NVLAP CODE: 201011-0

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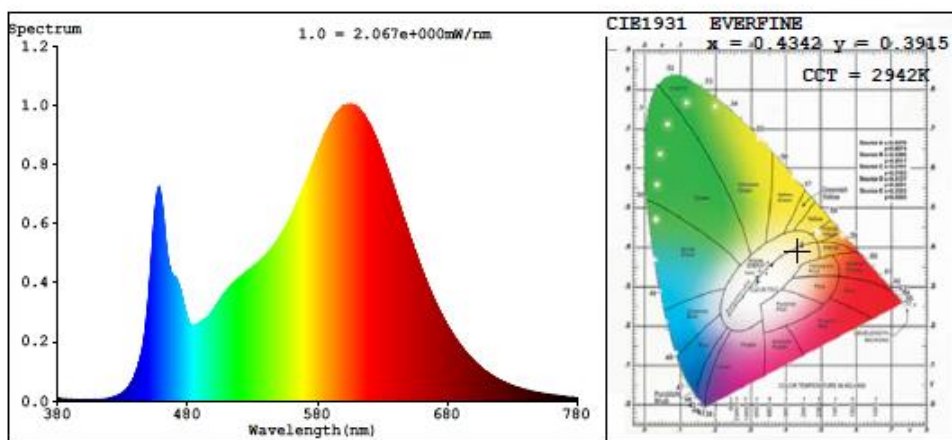
Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

3. Electrical and Photometric Measurements, with dimming

**IES LM-79 2008
ENERGY STAR® Program Requirements Product
Specification for Luminaires (Light Fixtures) -
Version 2.1**

Test date	2017-07-12	Test Ambient:	25.1°C
Dimmer Model	N/A		
Sample No.		Maximum Level	Minimum Level
JAE180708-C1	Input: 120.0 V / 60 Hz	Light output (Lumen)	79.1
		Percentage	5.07%



Colorimetric Parameters

Chromaticity Coordinate: x=0.4342 y=0.3915/u'=0.2543 v'=0.5159

CCT=2942K(Duv=-0.0047) Dominant WL:Ld =584.9nm Purity=47.8%

Peak WL:Lp=605.4nm FWHM=113.2nm

Render Index:Ra=83.3 CRI=79.5

R1 =85	R2 =97	R3 =89	R4 =79	R5 =86	R6 =94	R7 =78
R8 =58	R9 =13	R10=94	R11=80	R12=76	R13=89	R14=95
						R15=77

The luminaires [can] ~~can not~~ provide less than 20% of total light output with continuous dimmer.

Dimmer	Peak Noise Reading (dBA)	Test Condition	Distance between the microphone and the UUT
LEVITON MFG CO INC (E31373), Cat. No. 6681	17.8	Dimmer adjusted to lowest light output	< 1 m

4. Flicker

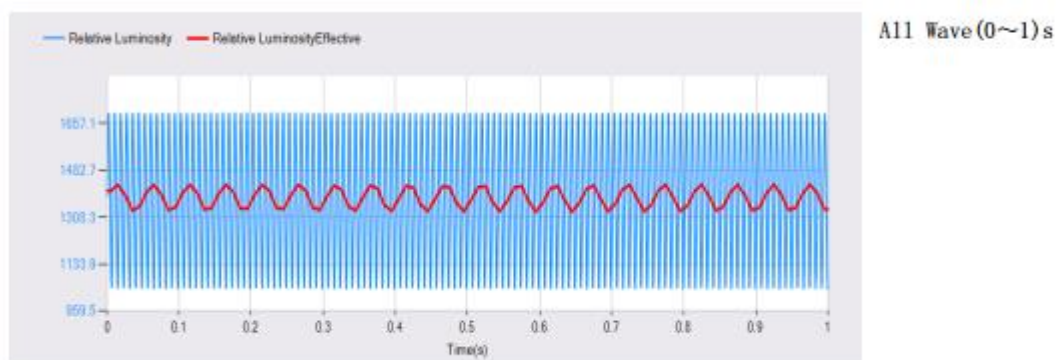
**NEMA 77-2017
ENERGY STAR® Program Requirements Product
Specification for Luminaires (Light Fixtures) -
Version 2.1**

Dimming Technology	0-10V
Dimmer	N/A

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
Full light output	0.077	0.453
Maximum Level (100%)	0.039	0.753
Minimun Level (20%)	0.050	0.615

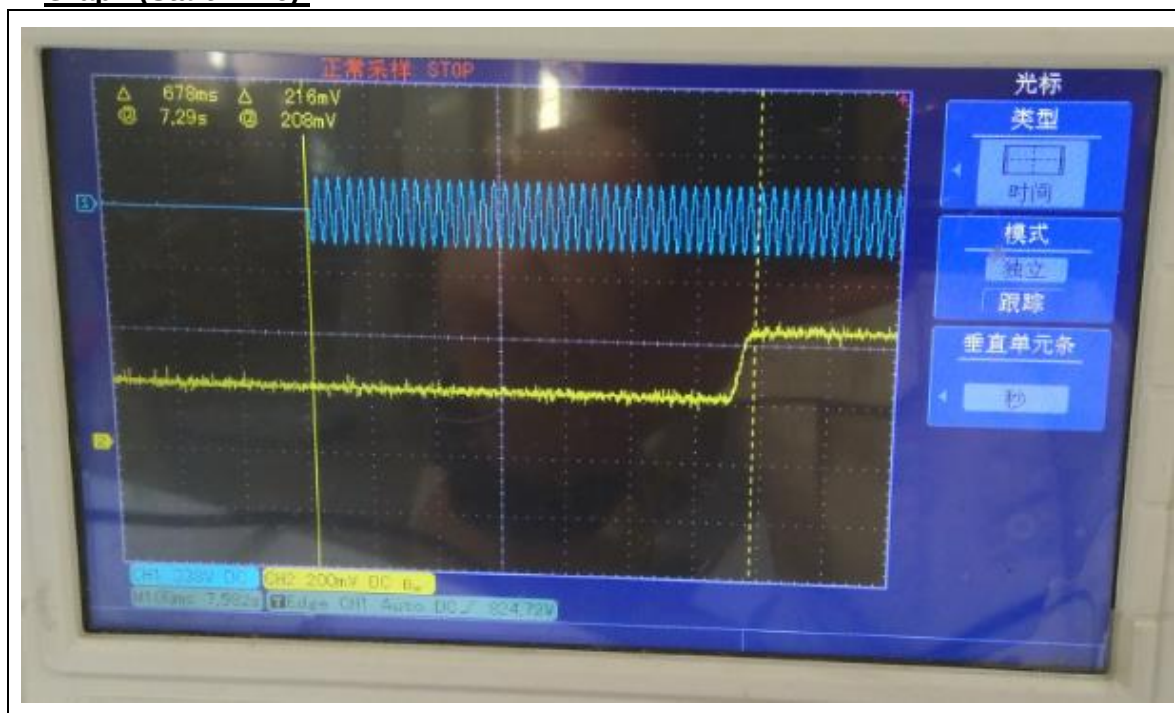
5. Operating Frequency	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.1
Noted: This test and data are not covered by NVLAP accreditation	

Test date	2018-07-12	Test Ambient:	25.1°C
Sample No.	Operating Frequency (Hz)		
JAE180708-C1	120.02		



6. Starting Time (Refer to Work Instruction QD28)	ENERGY STAR [®] Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.1
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Test date	2018-07-12	Test Ambient:	25.1°C
Sample No.	Start Time (ms)		
JAE180708-C1	678		

Graph (Start Time):

7. Transient Protection Test (Refer to Work Instruction QD34)	ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.1
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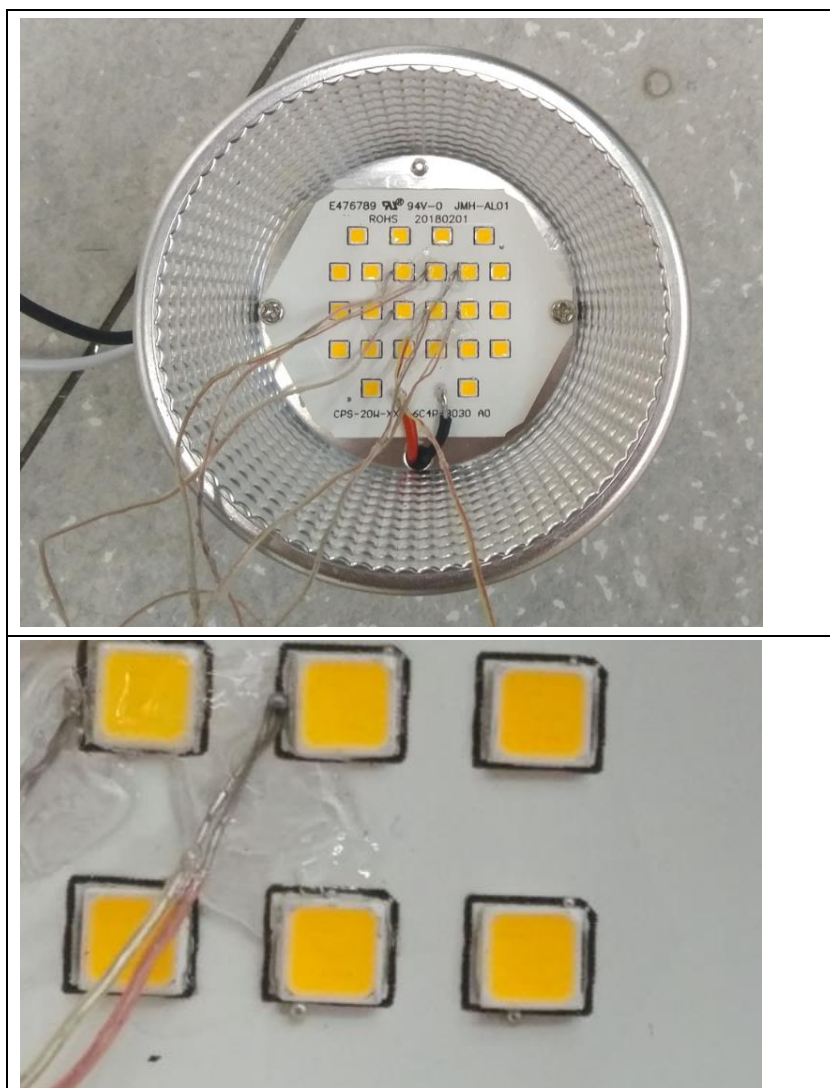
Test date	2018-07-12	Test Ambient	25.1°C
Sample No.		Transient Protection Test - Seven Strikes	
JAE180708-C1		Pass	

8.1 In-Situ Temperature Measurement Test (ISTMT)

UL1598-2008, 3rd Edition

Test date	2018-07-12	Test Ambient	25.1°C
Input Vol./Frequency	120 V / 60 Hz	Output Current of Single LED(mA)	123.5
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum LED Ts Point Temperature Limited (°C)
JAE180708-C1	SMD 3030	88.0	105

In-Situ Picture - Ts:



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8.2 Maximum Measured Ballast or Driver Case Temperature **UL1598-2008, 3rd Edition**

Test date	2018-07-12	Test Ambient	25.1°C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
JAE180708-C1	73.1	105	

In-Situ Picture - Ts:

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

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9. Off-State Power Consumption:

**ENERGY STAR® Program Requirements
Product Specification for Luminaires
(Light Fixtures) - Version 2.1**

Test date	2018-07-12	Test Ambient:	25.0 °C
Model Number	CP4-D20W-30E	Stabilization Time (min)	90

Electrical Measurement – when the luminaires turned off:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)
JAE180708-C1	120.0	60	0	0

10. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2018-07-01	2019-06-30
ST-R-331	Spectral analysis system HAAS-2000	2018-07-01	2019-06-30
EE-09	Goniophotometer system	2018-07-01	2019-06-30
D908S	Standard Lamp	2018-07-01	2019-06-30
D204	Standard Lamp	2018-07-01	2019-06-30
PF2010	Power Meter for Integrating Sphere	2018-07-01	2019-06-30
PF210	Power Meter for Goniophotometer	2018-07-01	2019-06-30
EE-015	Flux Meter	2018-07-01	2019-06-30
ST-R-277	Oscillograph	2018-07-01	2019-06-30
ST-R-EM01	Surge Generator	2018-07-01	2019-06-30
ST-R-EM02	EMC Coupler/Decoupler Module	2018-07-01	2019-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF DATASHEET PACKAGE *******