



ShenZhen Xin An Biao Technology Service Co. Ltd Testing Center

Floor 3, Building 3, No. 17, Yigongliu road, Loucun community building, Xinhua Street, Guangming New district, Shenzhen 518107

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## Energy Star Test Report

For

# L-TECH CORPORATION

(Brand Name: N/A)

Shaogangtou District, Qiaotou Town, Dongguan City

**Model name(s):**

**SLKT400/403-5CCT**

**Report Type:**

Testing and Report According to ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2

**Type of Luminaire:**

Downlight retrofits

**Report Date:**

2021-06-07

Test & Report By:

*Garman Mo*

Engineer: Garman Mo

Review By:

*Johnson Sun*

Manager: Johnson Sun

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 A2LA or any agency of the Federal Government.

3. This report contains data that are not covered by the A2LA accreditation.



<b>1.1 Product Information:</b>		
Model Number	SLKT400/403-5CCT	
Remark	N/A	
Representative (Tested) Model	SLKT400/403-5CCT(2700K) SLKT400/403-5CCT(3000K) SLKT400/403-5CCT(3500K) SLKT400/403-5CCT(4000K) SLKT400/403-5CCT(5000K)	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlight retrofits	
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD	
LED Model	67-21S Series	
Dimming	10%-100%	
Sample Number	JCE210313-DL-K1	
Date of Receipt	Apr.05,2021	
Luminaire Aperture (for Downlight retrofits)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
Recessed Can Model	H400/H400R	
Recessed Can UL File/Cert. No.	E252582	
Recessed Can Diameter, mm	4"	
Recessed Can Height, mm	5"	

<b>1.2 Rated Values:</b>	
Rated Voltage / Frequency	120Vac, 50/60Hz
Nominal Power	13W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,5000K

### 1.3 Product Photos





**1.4 Test Specifications:**

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> <li>8. Color Angular Uniformity</li> <li>9. Dimming</li> <li>10. Flicker</li> <li>11. Operating Frequency</li> <li>12. Starting Time</li> <li>13. Transient Protection Test</li> <li>14. In-Situ Temperature Measurement Test</li> <li>15. Standby Power Consumption</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 C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. C82.77-10:2014 American National Standard for Lighting Equipment-Harmonic Emission Limits-Related Power Quality Requirements</li> <li>4. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>5. CIE 15-2004 Technical Report Colorimetry</li> <li>6. UL1993 4<sup>th</sup> Edition, Self-Ballasted Lamps and Lamp Adapters</li> <li>7. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2</li> <li>8. ANSI/IEEE C62.41.2:2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage(1000V and Less) AC Power Circuits</li> <li>9. IEC 62301:2011 Household electrical appliances - Measurement of standby power</li> <li>10. NEMA 77-2017 Standard for Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria</li> </ol>
Remark	<p>Below test and data are not covered by A2LA accreditation:</p> <ul style="list-style-type: none"> <li>- Operating Frequency</li> <li>- Noise</li> </ul>



## 1.5 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 Summary of Test Result

Criteria Item	The Type of Luminaires	Requirement (ES for Luminaires V2.2)	Measured Value	Status
Input Wattage	All	≤ Rated Wattage	11.77W	Pass
Luminous Efficacy	Downlight retrofits	≥60 lm/W	68.50lm/W	Pass
Luminaire Minimum Light Output	Downlight retrofits	≤ 4.5" aperture: 345 lumens > 4.5" aperture: 575 lumens	806.27lm	Pass
Correlated Color Temperature (CCT)	Downlight retrofits	Shall be capable of providing at least one of the following nominal correlated color temperatures (CCTs): • 2700 Kelvin • 3000 Kelvin • 3500 Kelvin • 4000 Kelvin • 5000 Kelvin	2712K Duv=-0.0006	Pass
Color Rendering Index (CRI)	Downlight retrofits	Ra ≥ 80 R9 >0	Ra =91.2 R9 =56	Pass
Luminaire Zonal Lumen Density	Downlight retrofits	Luminaire shall deliver a minimum of 75% of total lumens within the 0-60° zone (axially symmetric about the nadir)	87.9	Pass
Color Angular Uniformity	Downlight retrofits	Throughout the beam angle, the variation of chromaticity shall be within a total linear distance of 0.006 from the weighted average point on the CIE 1976 (u',v') diagram.	0.0017	Pass
Lumen Maintenance	Solid State Option 1:	L70 lumen maintenance: ≥ 25,000 hours for indoor ≥ 35,000 hours for outdoor ≥ 50,000 hours for inseparable luminaires		Pass



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Light Source Life	Solid State	L70 lumen maintenance: ≥ 25,000 hours for indoor ≥ 35,000 hours for outdoor ≥ 50,000 hours for inseparable luminaires	<table border="1"> <tr><td>50,000</td></tr> <tr><td>70.92%</td></tr> <tr><td>52,000</td></tr> </table>	50,000	70.92%	52,000	Pass
50,000							
70.92%							
52,000							
Color Maintenance	Downlight retrofits	$\Delta u'v' \leq 0.007$	Max.0.00665 in LM-80 report*	Pass			
Source Start Time	Downlight retrofits	<750 ms	64.0ms	Pass			
Power Factor	Solid State	Total luminaire input power ≤ 5 watts: PF ≥ 0.5 Total luminaire input power > 5 watts: PF ≥ 0.7	0.956	Pass			
Transient Protection	Solid State	The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode.	Survival	Pass			
Standby Power Consumption	All Luminaires	Luminaires shall not draw power in the off state.	0W	Pass			
Operating Frequency	Solid State	Frequency ≥ 120 Hz	120.002Hz	Pass			
Maximum Measured Driver Case Temperature	Solid State	shall not exceed the driver manufacturer's maximum recommended temperature during in situ operation. ≤ 105 °C	100.7°C	Pass			
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70≥50,000 hrs ≤ 105°C	101.4°C	Pass			
Dimming	Solid State	The luminaire and its components shall provide continuous dimming from 100% to 20% of total light output. Luminaire shall not emit	Validated	Pass			



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		noise above 24dBA at 1 meter or less at the minimum output.		
CCT	Solid State	Packaging shall clearly describe the nominal color designation in units of Kelvin (e.g. 2700K, 3000K).	2700K,3000K,3500K,4000K,5000K	Pass

Note: The information or data with an “\*” are provided by the manufacturer.

Our laboratory has no responsibility for the decision of compliance with specification that based on the data or information with the “\*”.





<b>2.2.1 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	SLKT400/403-5CCT(2700 K)	<b>Total Operating Time (min)</b>	75

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-K1	120.0	60	0.103	11.77	0.956

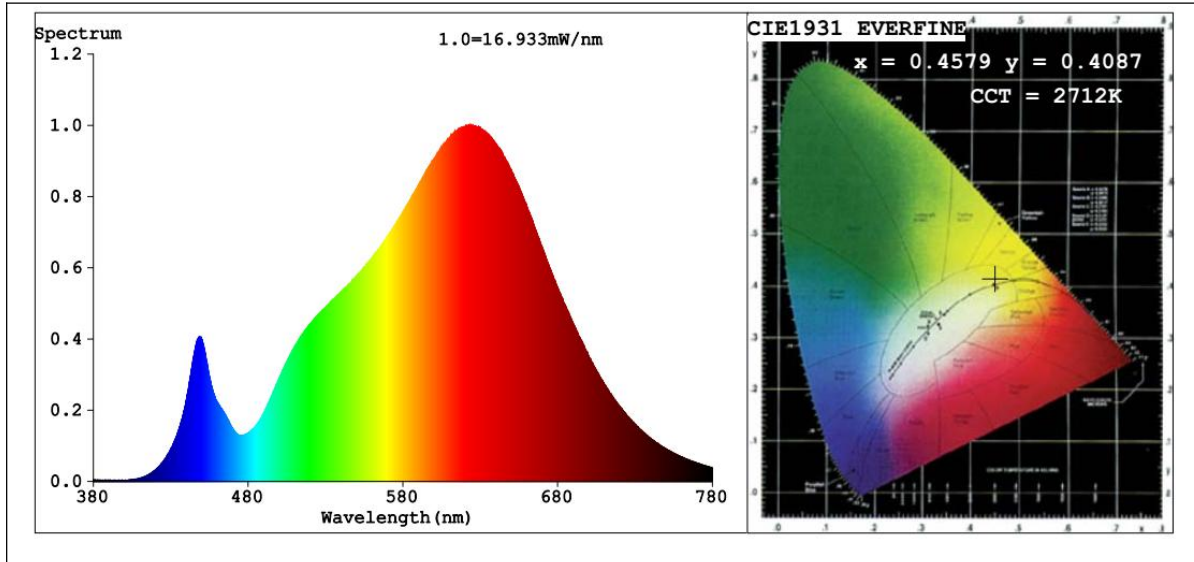
**Sphere-Spectroradiometer Method(Self-absorption:1.0459):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	91.2
R9	56
CCT (K)	2712
Duv	-0.0006

**Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	806.27
Luminous Efficacy (lm/W)	68.50
Beam Angle°	88.8
Center Beam Candle Power (cd)	378

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4579$   $y=0.4087$   $u'=0.2621$   $v'=0.5263$

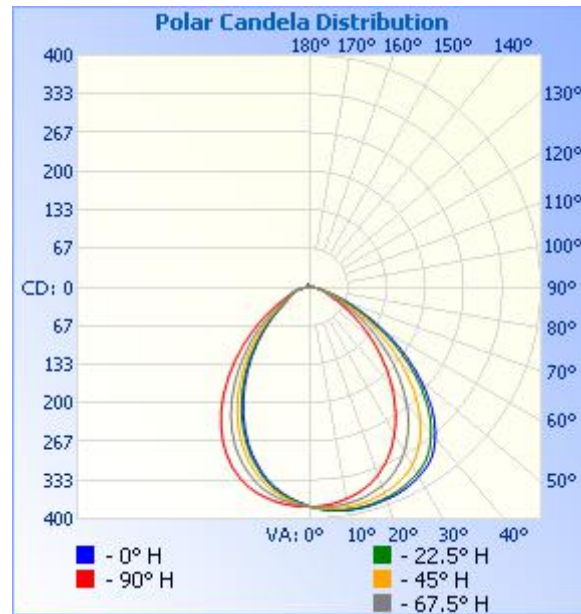
CCT=2712K (Duv=-0.0006) Dominant WL:Ld =584.3nm WL:Lc = --nm Purity=60.1%

Ratio:R=26.1% G=71.8% B=2.1% Peak WL:Lp=622.4nm FWHM=151.4nm

Render Index:Ra=91.2 AvgR=88.2 TM30:Rf=90 Rg=101

R1 =91	R2 =94	R3 =96	R4 =92	R5 =91	R6 =93	R7 =91	
R8 =80	R9 =56	R10=86	R11=93	R12=82	R13=92	R14=97	R15=87

### Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	286.9	35.6%
0-40	454.9	56.4%
0-60	708.2	87.9%
60-90	94.1	11.7%
70-100	36.7	4.6%
90-120	1.2	0.1%
0-90	802.3	99.5%
90-180	3.9	0.5%
0-180	806.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	35.8	4.4%	90-100	0.4	0.1%
10-20	101.6	12.6%	100-110	0.4	0%
20-30	149.5	18.6%	110-120	0.4	0%
30-40	168.0	20.8%	120-130	0.5	0.1%
40-50	149.7	18.6%	130-140	0.6	0.1%
50-60	103.7	12.9%	140-150	0.6	0.1%
60-70	57.8	7.2%	150-160	0.5	0.1%
70-80	28.2	3.5%	160-170	0.4	0%
80-90	8.1	1.0%	170-180	0.1	0%



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	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	378	378	378	378	378	378	378	378	378	378	378	378	378	378	378	378	378
1	380	380	380	380	379	377	376	376	375	376	377	378	379	378	379	380	380
2	382	382	381	380	379	375	374	373	373	374	375	377	379	379	380	381	382
3	383	383	382	380	378	374	373	371	371	372	374	376	379	379	382	383	383
4	385	385	383	381	378	373	370	369	368	369	372	375	378	380	383	384	385
5	386	386	384	381	377	372	368	366	366	367	370	373	378	380	383	386	386
6	387	387	384	381	376	370	366	363	362	364	368	372	377	380	384	387	387
7	389	388	385	380	375	368	364	361	360	362	365	370	376	380	385	388	389
8	389	389	385	380	374	366	361	357	356	358	362	369	375	380	385	388	389
9	390	389	385	380	373	364	358	354	352	355	360	366	374	380	386	389	390
10	391	390	385	379	371	362	355	351	349	352	357	364	373	379	386	389	391
11	391	390	385	378	370	359	351	346	345	348	354	362	372	379	386	390	391
12	391	390	385	378	368	357	348	343	341	344	351	359	370	378	386	390	391
13	392	390	385	377	366	353	344	338	336	339	346	357	369	377	385	390	392
14	392	390	384	375	364	351	339	333	332	335	342	353	367	376	385	390	392
15	392	390	383	374	361	347	335	328	326	329	338	350	365	375	384	390	392
16	391	390	383	373	359	342	330	323	320	324	333	346	362	373	384	390	391
17	391	389	382	371	356	339	326	318	315	319	329	341	359	372	383	390	391
18	390	389	381	369	353	334	320	312	309	313	323	338	357	370	382	389	390
19	390	388	380	367	349	330	316	307	304	308	319	333	353	369	381	389	390
20	389	387	378	366	346	325	310	300	297	302	313	329	350	367	380	388	389
21	389	386	377	363	341	321	303	293	292	296	307	324	346	365	379	387	389
22	389	385	375	361	337	315	298	288	285	289	302	318	342	362	377	386	389
23	388	384	373	357	333	309	291	281	277	282	295	313	338	359	376	385	388
24	387	383	371	354	328	304	286	275	272	276	290	307	333	356	374	384	387
25	386	381	370	350	323	298	279	267	264	269	283	302	328	352	373	382	386
26	385	380	367	346	317	292	271	260	256	262	276	296	323	348	370	381	385
27	383	378	365	343	313	285	265	254	250	256	270	289	318	344	367	379	383
28	382	376	362	338	306	278	258	246	242	248	262	283	312	340	365	377	382
29	380	374	359	334	300	272	250	238	234	240	255	276	306	335	361	375	380
30	378	372	355	328	294	265	244	232	228	233	248	268	299	329	358	373	378



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31	375	369	350	323	287	257	236	224	220	225	240	262	292	325	354	371	375
32	373	367	347	317	281	251	228	216	212	217	232	254	287	318	350	368	373
33	371	364	341	310	274	243	221	209	205	211	226	246	279	313	345	364	371
34	368	360	337	305	268	235	213	201	197	203	218	240	271	306	339	361	368
35	364	356	331	298	260	227	205	193	189	195	210	232	265	300	334	356	364
36	361	352	326	292	252	220	199	186	183	188	201	223	257	293	327	351	361
37	356	346	319	284	245	212	191	178	175	180	195	215	248	285	322	346	356
38	350	340	313	277	236	204	182	170	167	172	186	208	241	278	315	340	350
39	345	334	305	269	230	197	176	162	160	165	178	199	233	270	308	334	345
40	338	327	297	260	221	189	168	156	152	157	172	191	224	263	300	327	338
41	332	321	291	253	214	180	160	148	145	149	164	184	215	254	293	321	332
42	324	313	282	244	205	174	152	141	137	142	155	175	208	247	285	313	324
43	317	306	274	237	198	165	146	134	131	135	149	167	198	237	277	306	317
44	309	297	265	228	189	157	138	127	123	128	141	158	189	230	268	297	309
45	301	289	257	220	180	149	130	119	116	120	133	152	182	220	258	289	301
46	291	279	247	211	173	143	124	114	110	114	125	143	173	210	250	279	291
47	281	269	237	203	165	135	117	106	103	107	119	135	164	203	240	269	281
48	272	261	229	193	158	128	109	99	96	100	111	129	157	193	231	260	272
49	262	250	218	184	149	121	104	94	91	94	104	121	148	185	221	249	262
50	253	241	209	176	142	113	97	87	84	87	98	114	139	175	212	240	253
51	241	229	199	166	134	107	91	81	78	82	91	107	132	167	202	229	241
52	232	220	190	158	127	100	84	76	73	76	85	99	124	158	193	220	232
53	220	209	179	149	119	92	78	70	67	70	79	94	116	150	182	209	220
54	211	199	171	142	112	87	73	65	63	65	72	86	109	141	174	199	211
55	199	188	160	133	105	80	67	60	58	60	68	81	101	133	163	188	199
56	189	178	152	125	97	75	62	56	53	55	62	75	95	125	153	179	189
57	177	167	142	117	91	69	58	52	50	52	58	69	88	116	145	167	177
58	168	158	134	110	84	64	53	49	47	48	54	64	81	109	135	158	168
59	156	147	124	101	79	59	50	45	44	45	50	58	76	101	127	147	156
60	145	136	116	95	72	55	47	44	43	43	47	53	69	94	117	139	145
61	136	127	107	87	67	50	44	42	42	41	43	50	64	87	110	128	136
62	125	117	98	81	62	47	42	41	41	40	41	46	59	81	101	118	125



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64	106	99	83	69	52	41	39	39	39	38	38	40	50	69	85	100	106
65	98	92	77	63	49	39	38	38	38	37	37	37	45	62	79	92	98
66	88	83	70	57	45	37	37	37	36	36	36	35	41	57	71	83	88
67	81	76	64	53	42	36	36	35	35	34	35	34	38	52	66	76	81
68	72	68	58	48	38	35	35	34	33	33	34	33	35	48	59	68	72
69	66	62	53	44	36	34	34	32	31	31	32	32	32	43	54	62	66
70	58	55	47	40	34	33	32	31	30	30	31	31	31	39	48	55	58
71	52	50	43	37	33	32	31	29	28	28	30	30	29	35	44	49	52
72	45	44	39	34	31	30	29	27	27	27	28	29	28	33	39	44	45
73	40	40	35	31	30	29	28	26	25	25	26	27	27	30	35	39	40
74	35	35	31	29	29	27	26	24	23	24	25	25	26	28	31	35	35
75	31	31	29	28	28	25	24	22	22	22	22	24	24	26	28	31	31
76	26	27	26	26	27	24	22	21	20	20	20	22	23	25	25	26	26
77	23	24	24	25	25	22	20	19	19	19	19	20	21	23	23	24	23
78	20	21	22	24	24	20	19	17	17	17	17	18	19	22	22	21	20
79	19	20	21	23	22	18	17	15	15	15	15	16	18	21	21	20	19
80	18	19	20	21	20	16	15	14	13	13	14	14	15	20	20	19	18
81	18	18	19	20	18	14	13	12	12	11	12	12	13	18	18	18	18
82	16	17	17	18	16	12	11	10	10	10	10	10	11	16	16	16	16
83	15	15	16	16	14	10	9	8	8	8	8	8	9	13	15	15	15
84	12	13	13	14	12	8	7	6	6	5	6	6	7	11	12	12	12
85	10	10	11	11	10	6	5	4	4	4	4	4	4	8	10	9	10
86	6	7	8	8	7	4	3	3	2	2	2	2	2	6	6	6	6
87	3	4	5	6	5	2	1	1	1	1	1	1	1	3	4	3	3
88	1	1	2	3	3	1	1	1	1	0	0	1	1	1	1	1	1
89	1	1	1	1	1	0	0	0	1	0	0	0	0	1	1	1	1
90	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1
91	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1
92	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1
93	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
94	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1



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95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
96	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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109	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0
111	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
113	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
114	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
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117	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0
118	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0
119	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0
120	0	0	0	0	1	1	1	1	0	1	1	0	0	0	1	0	0
121	0	0	1	1	1	0	1	1	1	1	1	0	0	1	1	1	0
122	0	0	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0
123	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0
124	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0
125	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0
126	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0



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127	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	0
128	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0
129	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
130	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0
131	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
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133	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0
134	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	0	1
135	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
136	1	0	1	1	1	1	1	1	2	1	1	1	0	1	1	0	1
137	0	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	0
138	0	1	1	1	1	1	1	1	2	2	1	1	0	1	1	1	0
139	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
141	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
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143	1	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1
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147	1	1	1	1	1	1	2	1	4	2	2	1	1	1	1	1	1
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158	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1





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159	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1
160	1	1	1	1	1	1	1	2	3	2	2	1	1	1	1	1
161	1	1	1	1	1	1	1	3	3	2	2	1	1	1	1	1
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165	1	1	1	1	1	1	1	3	4	3	1	1	1	1	1	1
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169	1	1	1	1	1	1	2	2	1	3	2	1	1	1	1	1
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179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1



<b>2.2.2 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	SLKT400/403-5CCT(3000 K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-K1	120.0	60	0.104	11.82	0.946

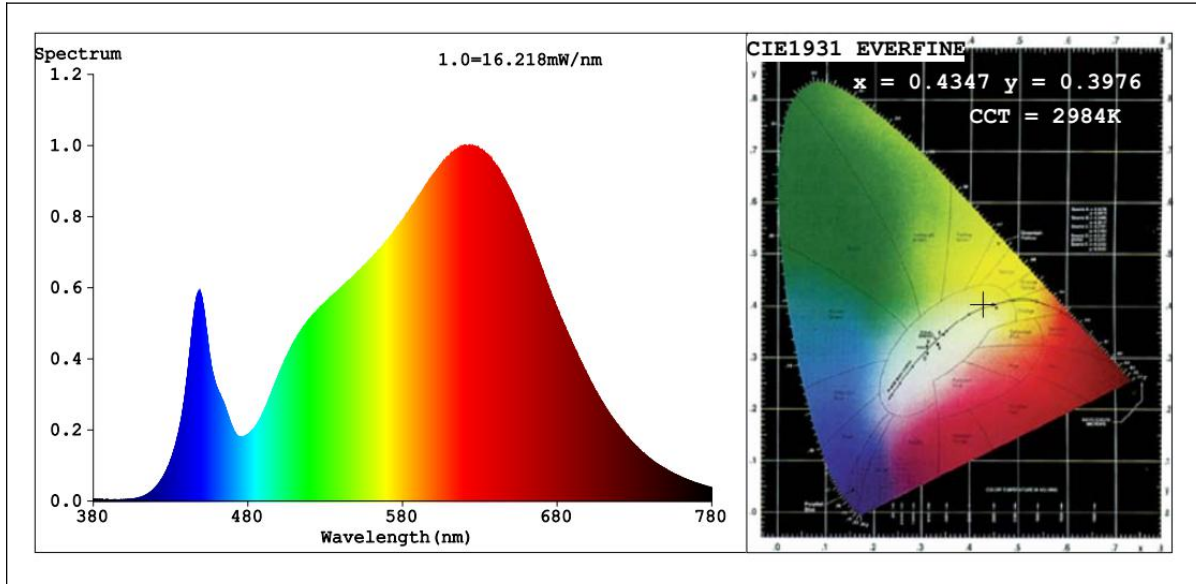
**Sphere-Spectroradiometer Method(Self-absorption:1.0459):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.6
R9	64
CCT (K)	2984
Duv	-0.0023

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	827.7
Luminous Efficacy (lm/W)	70.03

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4347$   $y=0.3976$  /  $u'=0.2520$   $v'=0.5185$   
 CCT=2984K (Duv=-0.0023) Dominant WL:Ld =583.7nm WL:Lc = --nm Purity=49.8%  
 Ratio:R=24.5% G=72.9% B=2.6% Peak WL:Lp=623.4nm FWHM=166.2nm  
 Render Index:Ra=92.6 AvgR=90.1 TM30:Rf=90 Rg=102

R1 =93	R2 =95	R3 =96	R4 =93	R5 =93	R6 =94	R7 =92
R8 =84	R9 =64	R10=88	R11=94	R12=83	R13=94	R14=97 R15=90



<b>2.2.3 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	SLKT400/403-5CCT(3500 K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-K1	120.0	60	0.105	11.88	0.946

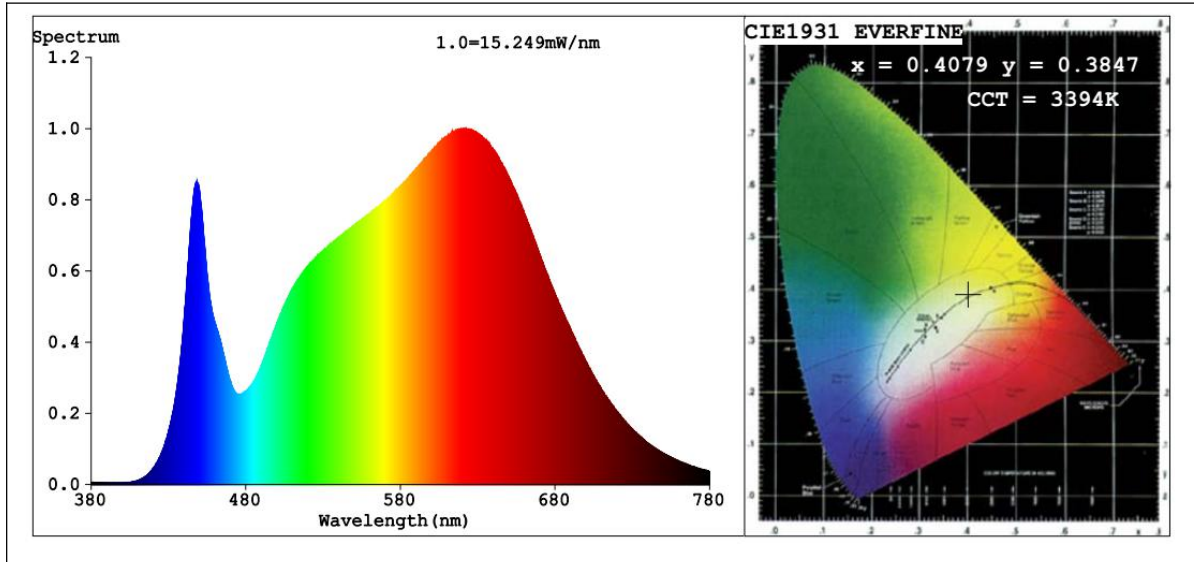
**Sphere-Spectroradiometer Method(Self-absorption:1.0459):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	93.7
R9	71
CCT (K)	3394
Duv	-0.0032

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	852.1
Luminous Efficacy (lm/W)	71.73

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4079$   $y=0.3847$  /  $u'=0.2399$   $v'=0.5091$   
 CCT=3394K (Duv=-0.0032) Dominant WL:Ld =582.7nm WL:Lc = --nm Purity=37.9%  
 Ratio:R=22.4% G=74.3% B=3.3% Peak WL:Lp=622.4nm FWHM=178.7nm  
 Render Index:Ra=93.7 AvgR=91.3 TM30:Rf=91 Rg=103

R1 =95	R2 =96	R3 =95	R4 =94	R5 =95	R6 =94	R7 =94	
R8 =88	R9 =71	R10=89	R11=94	R12=81	R13=95	R14=96	R15=93



<b>2.2.4 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	SLKT400/403-5CCT(4000 K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-K1	120.0	60	0.105	11.96	0.945

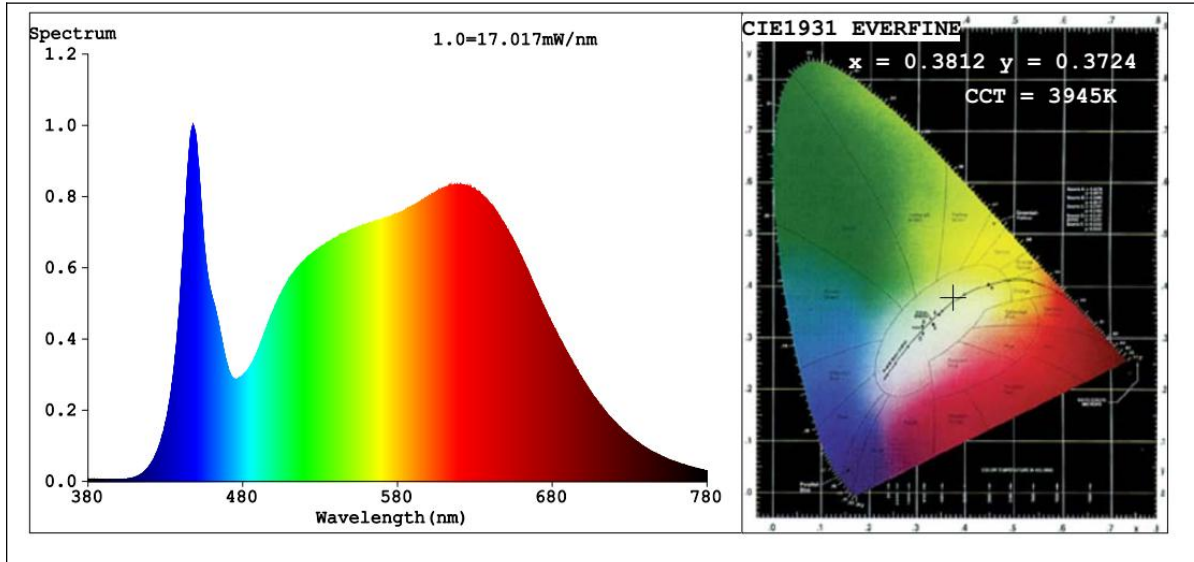
**Sphere-Spectroradiometer Method(Self-absorption:1.0459):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	93.8
R9	75
CCT (K)	3945
Duv	-0.0023

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	872.7
Luminous Efficacy (lm/W)	72.97

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.3812$   $y=0.3724$   $u'=0.2274$   $v'=0.4997$

CCT=3945K (Duv=-0.0023) Dominant WL:Ld =580.6nm WL:Lc = --nm Purity=26.1%

Ratio:R=20.2% G=75.9% B=3.9% Peak WL:Lp=447.8nm FWHM=21.9nm

Render Index:Ra=93.8 AvgR=91.3 TM30:Rf=92 Rg=102

R1 =95	R2 =95	R3 =93	R4 =94	R5 =94	R6 =92	R7 =95
R8 =91	R9 =75	R10=87	R11=94	R12=77	R13=95	R14=96 R15=94



<b>2.2.5 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	SLKT400/403-5CCT(5000 K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JCE210313-DL-K1	120.0	60	0.106	12.04	0.945

**Sphere-Spectroradiometer Method(Self-absorption:1.0459):**

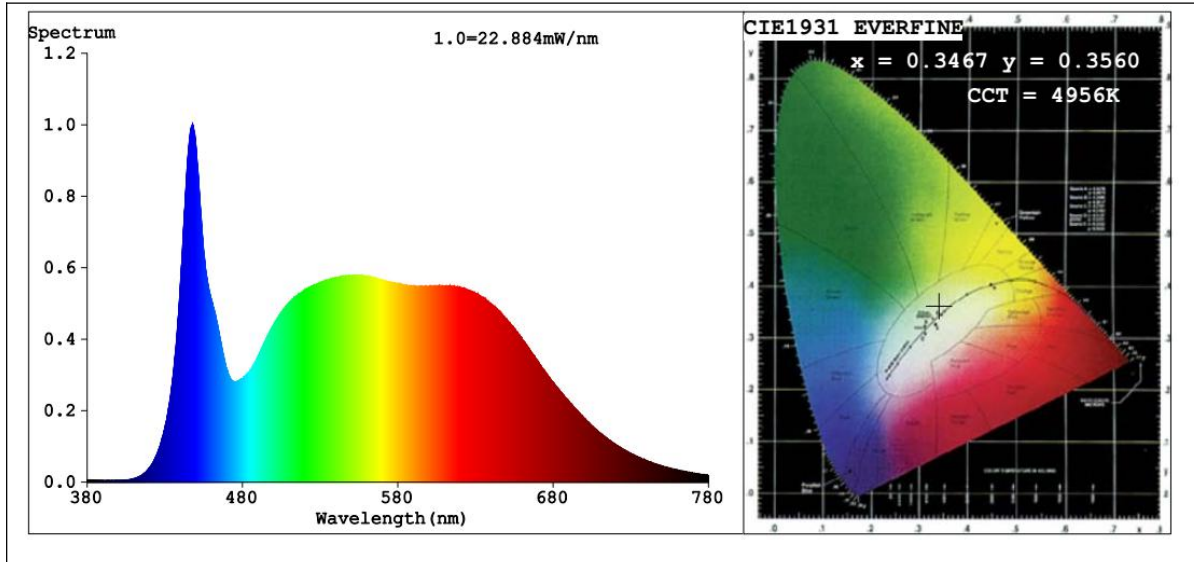
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.0
R9	69
CCT (K)	4956
Duv	0.0015

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	889.9
Luminous Efficacy (lm/W)	73.91



### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.3467$   $y=0.3560$   $u'=0.2108$   $v'=0.4870$

CCT=4956K (Duv=0.0015) Dominant WL:Ld =571.8nm WL:Lc = --nm Purity=10.8%

Ratio:R=17.1% G=78.0% B=4.9% Peak WL:Lp=447.8nm FWHM=21.4nm

Render Index:Ra=92.0 AvgR=88.5 TM30:Rf=91 Rg=101

R1 =92	R2 =93	R3 =92	R4 =93	R5 =91	R6 =89	R7 =95
R8 =90	R9 =69	R10=83	R11=92	R12=69	R13=92	R14=96 R15=91



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<b>2.3 Color Spatial Uniformity</b>	<b>IES LM-79 2008</b> <b>ENERGY STAR® Program Requirements</b> <b>Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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**Test Data:**

Test date	2021-04-08	Test Ambient	25.1°C
Sample No.		Maximum $\Delta u'v'$	
JCE210313-DL-K1		0.0017	



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C0				C90			
gamma	Au'	Δv'	Δu'v'	gamma	Au'	Δv'	Δu'v'
0	0.00035	0.00038	0.00052	0	0.00031	0.00027	0.00041
1	0.00035	0.00038	0.00052	1	0.00031	0.00027	0.00041
2	0.00040	0.00034	0.00052	2	0.00042	0.00025	0.00049
3	0.00040	0.00034	0.00052	3	0.00042	0.00025	0.00049
4	0.00040	0.00034	0.00052	4	0.00040	0.00019	0.00045
5	0.00040	0.00034	0.00052	5	0.00047	0.00021	0.00051
6	0.00044	0.00030	0.00054	6	0.00047	0.00021	0.00051
7	0.00040	0.00034	0.00052	7	0.00047	0.00021	0.00051
8	0.00033	0.00032	0.00046	8	0.00051	0.00017	0.00054
9	0.00044	0.00030	0.00054	9	0.00051	0.00017	0.00054
10	0.00040	0.00034	0.00052	10	0.00049	0.00012	0.00051
11	0.00044	0.00030	0.00054	11	0.00056	0.00013	0.00057
12	0.00044	0.00030	0.00054	12	0.00060	0.00009	0.00061
13	0.00038	0.00029	0.00047	13	0.00060	0.00009	0.00061
14	0.00038	0.00029	0.00047	14	0.00065	0.00005	0.00065
15	0.00038	0.00029	0.00047	15	0.00058	0.00004	0.00059
16	0.00044	0.00030	0.00054	16	0.00060	0.00009	0.00061
17	0.00042	0.00025	0.00049	17	0.00065	0.00005	0.00065
18	0.00038	0.00029	0.00047	18	0.00069	0.00002	0.00069
19	0.00044	0.00030	0.00054	19	0.00069	0.00002	0.00069
20	0.00042	0.00025	0.00049	20	0.00069	0.00002	0.00069
21	0.00038	0.00029	0.00047	21	0.00074	-0.00002	0.00074
22	0.00036	0.00023	0.00043	22	0.00074	-0.00002	0.00074
23	0.00036	0.00023	0.00043	23	0.00074	-0.00002	0.00074
24	0.00042	0.00025	0.00049	24	0.00074	-0.00002	0.00074
25	0.00036	0.00023	0.00043	25	0.00074	-0.00002	0.00074
26	0.00034	0.00018	0.00038	26	0.00079	-0.00006	0.00079
27	0.00034	0.00018	0.00038	27	0.00079	-0.00006	0.00079
28	0.00034	0.00018	0.00038	28	0.00079	-0.00006	0.00079
29	0.00032	0.00012	0.00034	29	0.00085	-0.00005	0.00085
30	0.00032	0.00012	0.00034	30	0.00085	-0.00005	0.00085
31	0.00025	0.00011	0.00028	31	0.00083	-0.00010	0.00084
32	0.00023	0.00006	0.00024	32	0.00085	-0.00005	0.00085
33	0.00023	0.00006	0.00024	33	0.00085	-0.00005	0.00085
34	0.00021	0.00000	0.00021	34	0.00090	-0.00009	0.00090
35	0.00019	-0.00005	0.00020	35	0.00090	-0.00009	0.00090
36	0.00013	-0.00007	0.00015	36	0.00090	-0.00009	0.00090
37	0.00006	-0.00008	0.00010	37	0.00094	-0.00012	0.00095
38	0.00004	-0.00014	0.00014	38	0.00094	-0.00012	0.00095
39	-0.00004	-0.00020	0.00021	39	0.00094	-0.00012	0.00095
40	-0.00017	-0.00023	0.00029	40	0.00099	-0.00016	0.00100
41	-0.00019	-0.00029	0.00035	41	0.00099	-0.00016	0.00100
42	-0.00032	-0.00032	0.00045	42	0.00099	-0.00016	0.00100
43	-0.00030	-0.00041	0.00051	43	0.00092	-0.00018	0.00094
44	-0.00041	-0.00039	0.00056	44	0.00097	-0.00022	0.00099
45	-0.00043	-0.00044	0.00061	45	0.00095	-0.00027	0.00098
46	-0.00046	-0.00055	0.00072	46	0.00088	-0.00029	0.00093
47	-0.00066	-0.00059	0.00089	47	0.00088	-0.00029	0.00093
48	-0.00068	-0.00065	0.00094	48	0.00086	-0.00034	0.00093
49	-0.00070	-0.00070	0.00099	49	0.00078	-0.00041	0.00088
50	-0.00085	-0.00079	0.00116	50	0.00078	-0.00041	0.00088
51	-0.00087	-0.00084	0.00121	51	0.00074	-0.00052	0.00090





Certificate #4703.03

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C180				C270			
gamma	Δu'	Δv'	Δu'v'	gamma	Δu'	Δv'	Δu'v'
0	0.00035	0.00038	0.00052	0	0.00031	0.00027	0.00041
1	0.00035	0.00038	0.00052	1	0.00036	0.00023	0.00043
2	0.00035	0.00038	0.00052	2	0.00031	0.00027	0.00041
3	0.00042	0.00039	0.00057	3	0.00033	0.00032	0.00046
4	0.00040	0.00034	0.00052	4	0.00027	0.00031	0.00041
5	0.00035	0.00038	0.00052	5	0.00027	0.00031	0.00041
6	0.00031	0.00042	0.00052	6	0.00020	0.00029	0.00036
7	0.00035	0.00038	0.00052	7	0.00027	0.00031	0.00041
8	0.00031	0.00042	0.00052	8	0.00014	0.00028	0.00031
9	0.00031	0.00042	0.00052	9	0.00014	0.00028	0.00031
10	0.00031	0.00042	0.00052	10	0.00016	0.00033	0.00037
11	0.00033	0.00047	0.00057	11	0.00009	0.00032	0.00033
12	0.00031	0.00042	0.00052	12	0.00009	0.00032	0.00033
13	0.00026	0.00046	0.00053	13	0.00003	0.00030	0.00030
14	0.00026	0.00046	0.00053	14	0.00009	0.00032	0.00033
15	0.00026	0.00046	0.00053	15	-0.00004	0.00029	0.00029
16	0.00026	0.00046	0.00053	16	-0.00004	0.00029	0.00029
17	0.00026	0.00046	0.00053	17	-0.00004	0.00029	0.00029
18	0.00022	0.00049	0.00054	18	-0.00004	0.00029	0.00029
19	0.00020	0.00044	0.00048	19	-0.00010	0.00027	0.00029
20	0.00015	0.00048	0.00050	20	-0.00017	0.00026	0.00031
21	0.00020	0.00044	0.00048	21	-0.00017	0.00026	0.00031
22	0.00020	0.00044	0.00048	22	-0.00023	0.00024	0.00034
23	0.00015	0.00048	0.00050	23	-0.00023	0.00024	0.00034
24	0.00009	0.00046	0.00047	24	-0.00023	0.00024	0.00034
25	0.00009	0.00046	0.00047	25	-0.00030	0.00023	0.00037
26	0.00009	0.00046	0.00047	26	-0.00030	0.00023	0.00037
27	0.00015	0.00048	0.00050	27	-0.00036	0.00021	0.00042
28	0.00007	0.00041	0.00042	28	-0.00036	0.00021	0.00042
29	0.00007	0.00041	0.00042	29	-0.00038	0.00016	0.00041
30	0.00000	0.00040	0.00040	30	-0.00038	0.00016	0.00041
31	-0.00006	0.00038	0.00039	31	-0.00045	0.00014	0.00047
32	-0.00006	0.00038	0.00039	32	-0.00040	0.00011	0.00041
33	-0.00006	0.00038	0.00039	33	-0.00058	0.00011	0.00059
34	-0.00008	0.00033	0.00034	34	-0.00051	0.00013	0.00053
35	-0.00021	0.00030	0.00036	35	-0.00060	0.00006	0.00060
36	-0.00028	0.00028	0.00039	36	-0.00055	0.00002	0.00055
37	-0.00023	0.00024	0.00034	37	-0.00062	0.00001	0.00062
38	-0.00030	0.00023	0.00037	38	-0.00068	-0.00001	0.00068
39	-0.00032	0.00017	0.00036	39	-0.00070	-0.00006	0.00070
40	-0.00038	0.00016	0.00041	40	-0.00072	-0.00012	0.00073
41	-0.00047	0.00009	0.00047	41	-0.00079	-0.00013	0.00080
42	-0.00055	0.00002	0.00055	42	-0.00081	-0.00019	0.00083
43	-0.00062	0.00001	0.00062	43	-0.00081	-0.00019	0.00083
44	-0.00064	-0.00005	0.00064	44	-0.00083	-0.00024	0.00086
45	-0.00075	-0.00002	0.00075	45	-0.00091	-0.00031	0.00096
46	-0.00085	-0.00015	0.00086	46	-0.00104	-0.00034	0.00109
47	-0.00087	-0.00020	0.00089	47	-0.00101	-0.00043	0.00110
48	-0.00100	-0.00023	0.00103	48	-0.00104	-0.00034	0.00109
49	-0.00102	-0.00028	0.00106	49	-0.00112	-0.00041	0.00120
50	-0.00117	-0.00037	0.00123	50	-0.00125	-0.00044	0.00133
51	-0.00128	-0.00034	0.00133	51	-0.00127	-0.00049	0.00137



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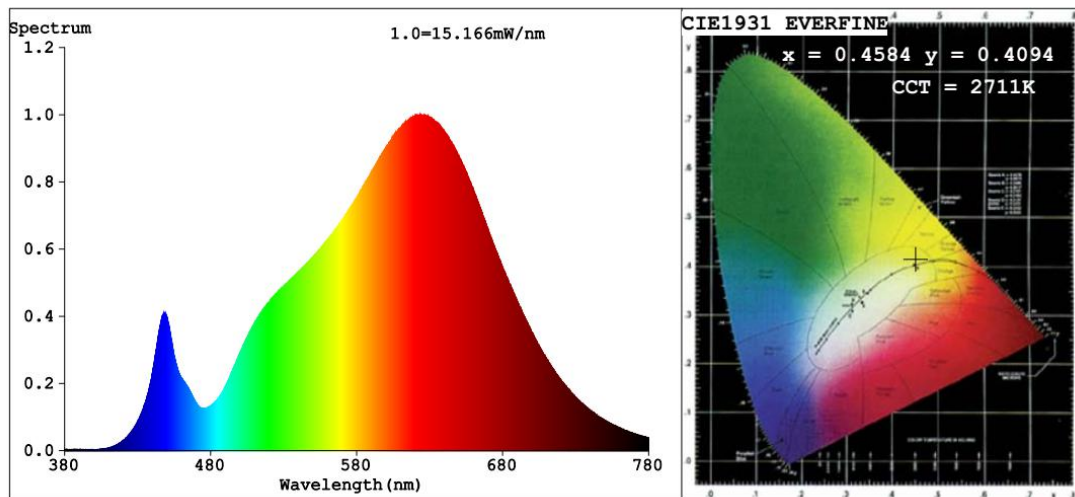
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Fax: (+86)755-2319 2815

C180				C270			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
52	-0.00127	-0.00049	0.00137	52	-0.00127	-0.00049	0.00137
53	-0.00145	-0.00048	0.00153	53	-0.00123	-0.00053	0.00134
54	-0.00155	-0.00061	0.00167	54	-0.00140	-0.00052	0.00150
55	-0.00162	-0.00062	0.00173	55	-0.00153	-0.00055	0.00163

<b>2.4 Electrical and Photometric Measurements, with dimming</b>	<b>IES LM-79 2008 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
<b>Noted: The noise test and data are not covered by A2LA accreditation</b>	

<b>Test date</b>	2021-04-08		<b>Test Ambient:</b>	25±1° C
<b>Dimmer Technology</b>			Forward phase-cut	
<b>Sample No.</b>		<b>Maximum Level</b>	<b>Minimum Level</b>	
JCE210313-DL-K1	Input: 120.0V / 60Hz	Light outout(Lumen)	734.5	45.08
		Percentage	91.10%	6.14%



**Color Parameters:**

Chromaticity Coordinate:  $x=0.4584$   $y=0.4094$  /  $u'=0.2621$   $v'=0.5267$   
 CCT=2711K (Duv=-0.0003) Dominant WL:Ld =584.3nm WL:Lc = --nm Purity=60.5%  
 Ratio:R=26.1% G=71.8% B=2.1% Peak WL:Lp=623.7nm FWHM=151.8nm  
 Render Index:Ra=91.3 AvgR=88.3 TM30:Rf=90 Rg=101

R1 =92 R2 =94 R3 =96 R4 =92 R5 =91 R6 =93 R7 =92  
 R8 =81 R9 =57 R10=86 R11=93 R12=82 R13=92 R14=97 R15=88

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

<b>Dimmer Technology</b>	<b>Peak Noise Reading (dBA)</b>	<b>Test Condition</b>	<b>Distance between the microphone and the UUT</b>
LUTRON MACL-153M	14.3	Dimmer adjusted to lowest light output	< 1 m



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<b>2.5 Flicker</b>	<b>NEMA 77-2017 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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<b>Dimming Technology</b>	Forward phase-cut
<b>Dimmer</b>	LUTRON MACL-153M

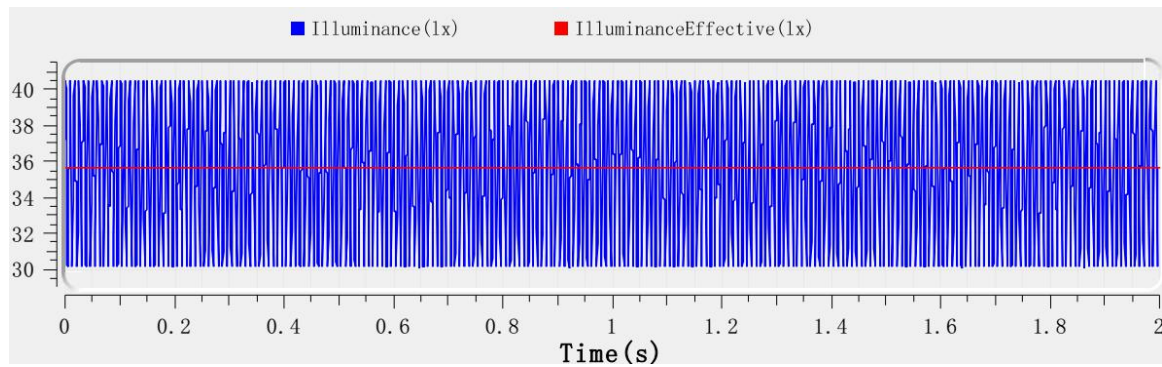
Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
<b>Maximum conduction</b>	0.133	0.613
<b>Intermediate conduction</b>	0.174	0.956
<b>Minimum conduction</b>	0.666	0.498





<b>2.6 Operating Frequency</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
<b>Noted: This test and data are not covered by A2LA accreditation</b>	

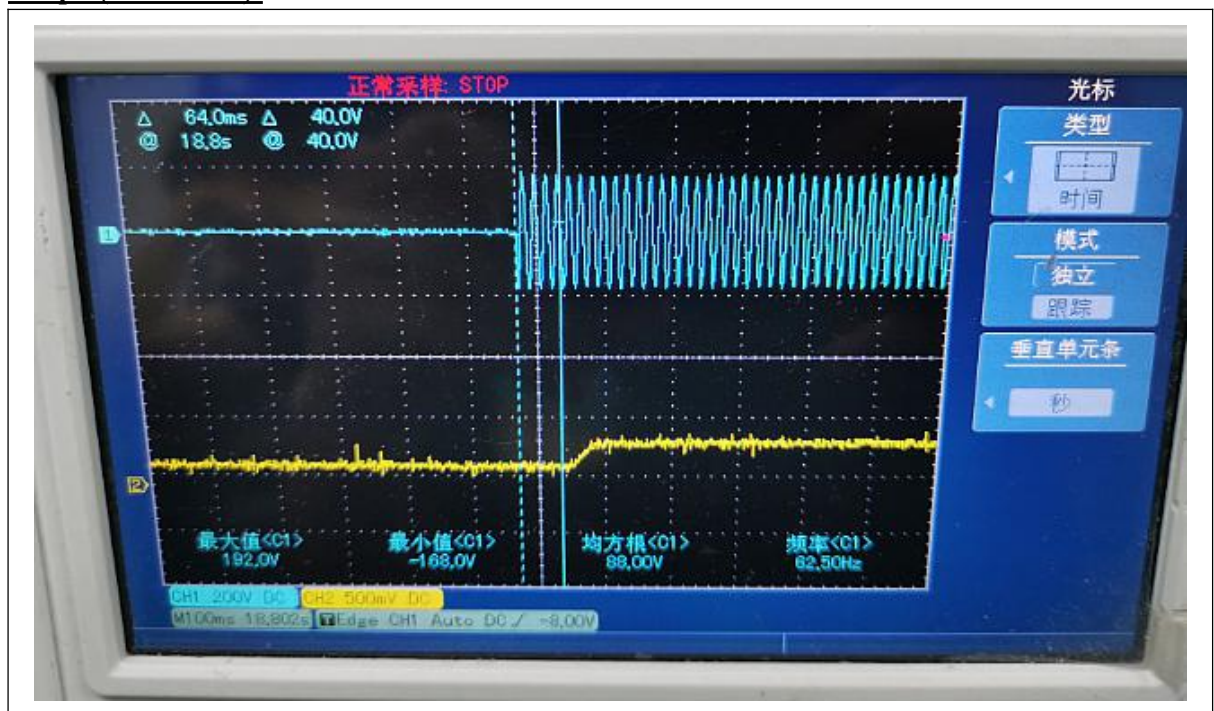
<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25±1° C
<b>Sample No.</b>	<b>Operating Frequency (Hz)</b>		
JCE210313-DL-K1	120.002		



<b>2.7 Starting Time</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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Test date	2021-04-08	Test Ambient:	25±1° C
Sample No.	Start Time (ms)		
JCE210313-DL-K1	64.0		

**Graph (Start Time):**





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<b>2.8 Transient Protection Test</b>	<b>ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.2</b>
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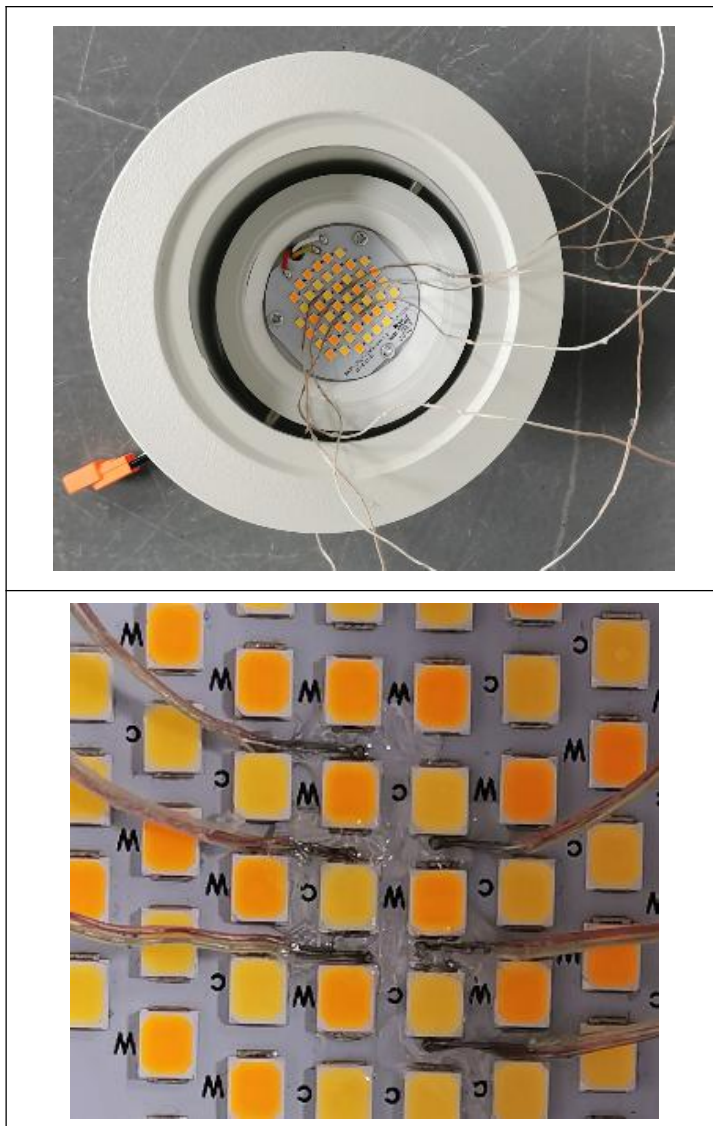
**Test voltage: 120V,60Hz**

<b>Test date</b>	2021-04-08	<b>Test Ambient</b>	25±1° C
<b>Sample No.</b>		<b>Transient Protection Test - Seven Strikes</b>	
JCE210313-DL-K1		Survival	

**2.9 In-Situ Temperature Measurement Test (ISTMT) | UL1598-2008, 3<sup>rd</sup> Edition**

Test date	2021-04-08	Test Ambient	25±5° C
Input Vol./Frequency	120.0V / 60Hz	Output Current of Single LED(mA)	143.1
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum permitted Ts temperature for L70 ≥ 50,000 hrs (°C)
JCE210313-DL-K1	67-21S Series	101.4	105

**In-Situ Picture - Ts:**



<b>2.10 Maximum Measured Ballast or Driver Case Temperature</b>	<b>UL1598-2008, 3<sup>rd</sup> Edition</b>
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Test date	2021-04-08	Test Ambient	25±5° C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
JCE210313-DL-K1	100.7	105	

**In-Situ Picture - Ts:**





<b>2.11 Standby Power Consumption:</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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<b>Test date</b>	2021-04-08	<b>Test Ambient:</b>	25±1° C
<b>Model Number</b>	SLKT400/403-5CCT(2700K)	<b>Stabilization Time (min)</b>	60

**Electrical Measurement – when the luminaires turned off:**

<b>Sample No.</b>	<b>Standby Power Consumption(W):</b>
JCE210313-DL-K1	0



### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-S-451	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-S-455	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-S-452	Standard Lamp D204	2021-04-15	2022-04-14
ST-R-S-453	Power Meter for Integrating Sphere	2021-04-08	2022-04-06
ST-R-S-407	Goniophotometer system	Verified by S1530039 standard lamp	
ST-R-S-410	Standard Lamp S1530039	2021-04-15	2022-04-14
ST-R-S-408	Power Meter for Goniophotometer	2021-04-08	2022-04-06
ST-R-S-027	Digital Luxmeter	2021-04-08	2022-04-07
ST-R-S-016	Oscillograph	2021-04-08	2022-04-06
ST-R-S-017	Probe	2021-04-08	2022-04-07
ST-R-361	ZLB61012X	2020-08-19	2021-08-20
ST-R-414	LFA-3000	2020-12-18	2021-12-17
Uncertainty: Photometric Measurement (Sphere): 2.72%, k=2 Chromaticity Measurement(Sphere): 43.60K, k=2 Photometric Measurement(Goniophotometer): 3.44%, k=2			

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