



ShenZhen Xin An Biao Technology Service Co. Ltd Testing Center

Floor 3, Building 3, No. 17, Yigongliu road, Loucun community building, Xihu 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):

## LRKT448/449EN-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

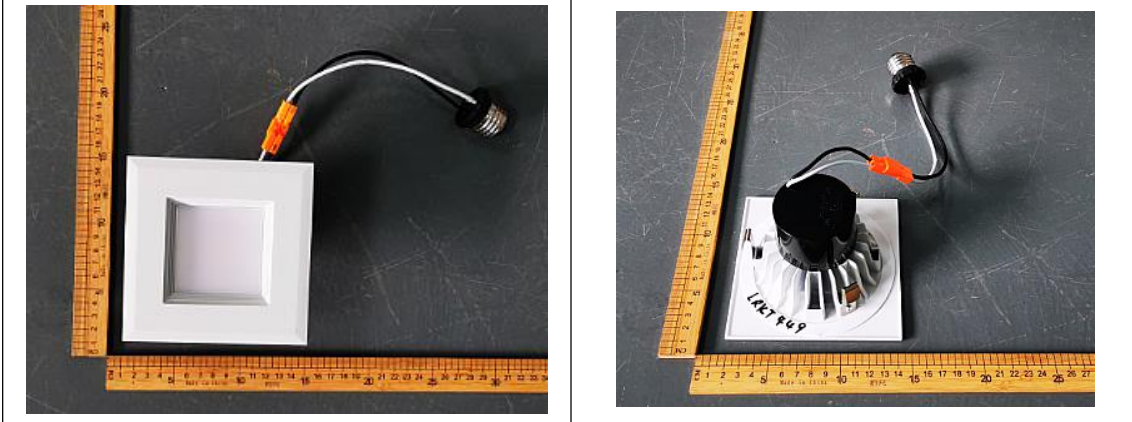
- Note: 1. The results contained in this report pertain only to the tested samples.  
2. This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.  
3. This report contains data that are not covered by the A2LA accreditation.



<b>1.1 Product Information:</b>		
Model Number	LRKT448/449EN-5CCT	
Remark	N/A	
Representative (Tested) Model	LRKT448/449EN-5CCT(2700K) LRKT448/449EN-5CCT(3000K) LRKT448/449EN-5CCT(3500K) LRKT448/449EN-5CCT(4000K) LRKT448/449EN-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-B1	
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	11W
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	10.23W	Pass
Luminous Efficacy	Downlight retrofits	≥60 lm/W	74.35lm/W	Pass
Luminaire Minimum Light Output	Downlight retrofits	≤ 4.5" aperture: 345 lumens > 4.5" aperture: 575 lumens	760.62lm	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	2701K Duv=-0.0004	Pass
Color Rendering Index (CRI)	Downlight retrofits	Ra ≥ 80 R9 >0	Ra =92.0 R9 =60	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)	84.5	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.	0.013	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



Light Source Life	Solid State	L70 lumen maintenance: ≥ 25,000 hours for indoor ≥ 35,000 hours for outdoor ≥ 50,000 hours for inseparable luminaires		Pass
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	86.0ms	Pass
Power Factor	Solid State	Total luminaire input power ≤ 5 watts: PF ≥ 0.5 Total luminaire input power > 5 watts: PF ≥ 0.7	0.957	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	120.004Hz	Pass
Maximum Measured Driver Case Temperature	Solid State	shall not exceed the driver manufacturer's maximum recommended temperature during in situ operation. ≤ 105 °C	102.3°C	Pass
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70≥50,000 hrs ≤ 105°C	101.5°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>	2021-04-07	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	LRKT448/449EN-5CCT(2700K)	<b>Total Operating Time (min)</b>	75

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-B1	120.0	60	0.089	10.23	0.957

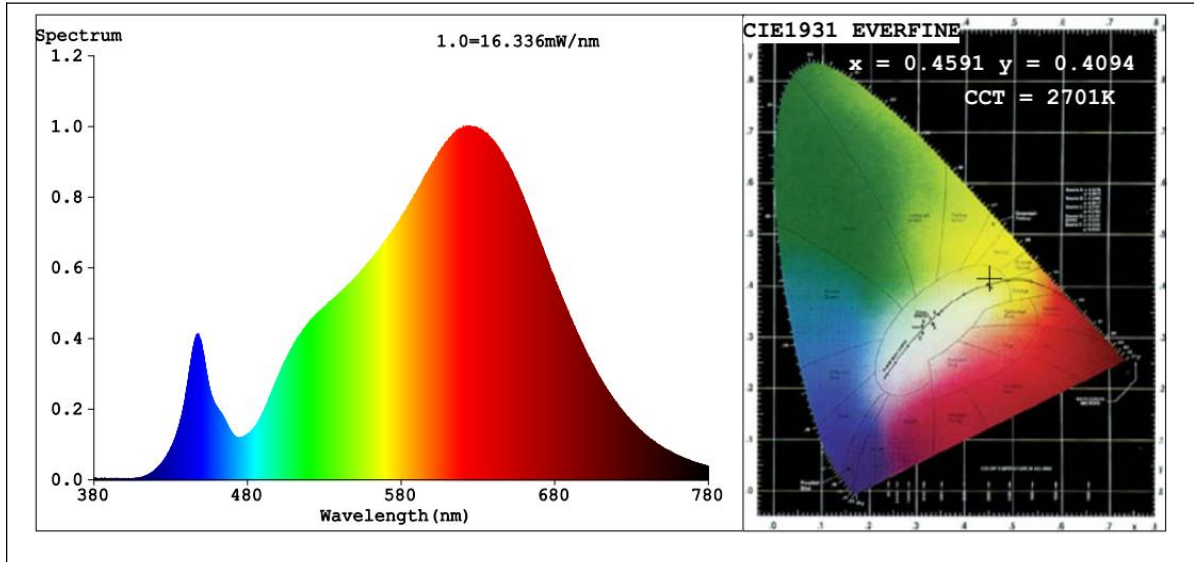
**Sphere-Spectroradiometer Method(Self-absorption:1.0453):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.0
R9	60
CCT (K)	2701
Duv	-0.0004

**Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	760.62
Luminous Efficacy (lm/W)	74.35
Beam Angle°	100.6
Center Beam Candle Power (cd)	311

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4591$   $y=0.4094$   $u'=0.2625$   $v'=0.5268$

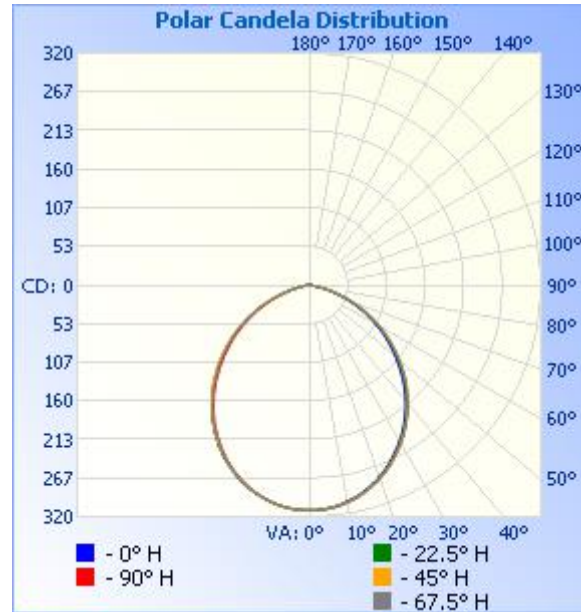
CCT=2701K (Duv=-0.0004) Dominant WL:Ld =584.3nm WL:Lc = --nm Purity=60.7%

Ratio:R=26.3% G=71.6% B=2.1% Peak WL:Lp=625.0nm FWHM=152.8nm

Render Index:Ra=92.0 AvgR=89.2 TM30:Rf=90 Rg=102

R1 =93	R2 =95	R3 =96	R4 =93	R5 =92	R6 =94	R7 =92	
R8 =82	R9 =60	R10=87	R11=94	R12=83	R13=93	R14=97	R15=89

## Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	236.0	31%
0-40	380.3	50%
0-60	642.4	84.5%
60-90	115.2	15.1%
70-100	36.4	4.8%
90-120	1.3	0.2%
0-90	757.6	99.6%
90-180	3.0	0.4%
0-180	760.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.3	3.9%	90-100	0.5	0.1%
10-20	83.2	10.9%	100-110	0.4	0.1%
20-30	123.5	16.2%	110-120	0.4	0.1%
30-40	144.3	19.0%	120-130	0.4	0.1%
40-50	142.7	18.8%	130-140	0.4	0.1%
50-60	119.4	15.7%	140-150	0.3	0%
60-70	79.2	10.4%	150-160	0.3	0%
70-80	31.7	4.2%	160-170	0.2	0%
80-90	4.3	0.6%	170-180	0.1	0%



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106	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
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108	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	1
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126	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1



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127	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1
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158	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1





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159	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
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<b>2.2.2 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-07	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	LRKT448/449EN-5CCT(3000K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-B1	120.0	60	0.091	10.25	0.944

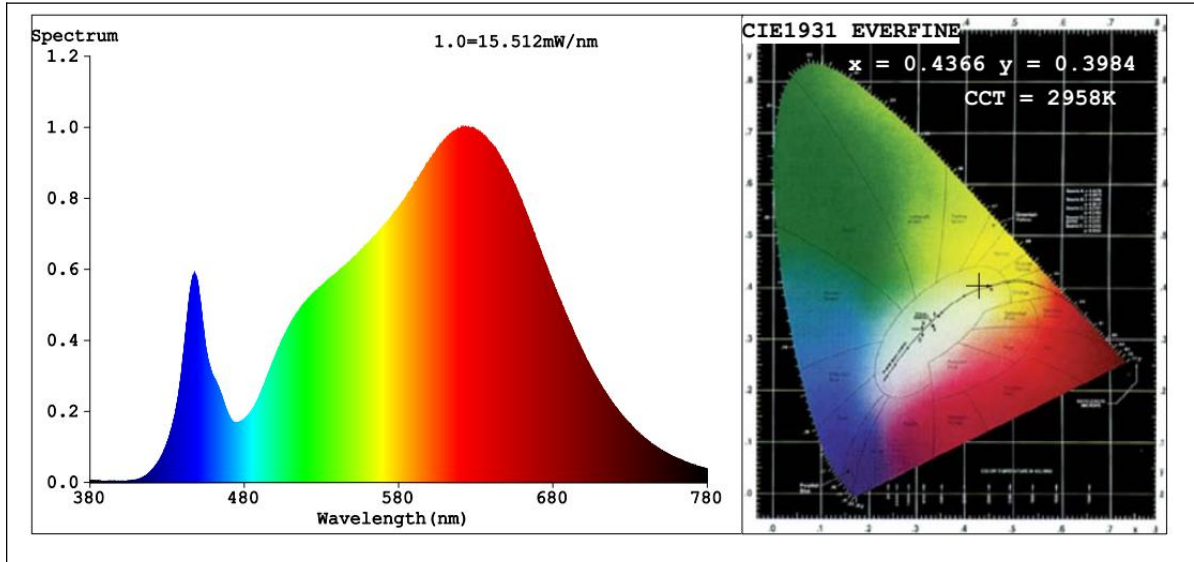
**Sphere-Spectroradiometer Method(Self-absorption:1.0453):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	93.2
R9	67
CCT (K)	2958
Duv	-0.0023

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	771.3
Luminous Efficacy (lm/W)	75.25

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4366$   $y=0.3984$   $u'=0.2529$   $v'=0.5191$

CCT=2958K (Duv=-0.0023) Dominant WL:Ld =583.8nm WL:Lc = --nm Purity=50.6%

Ratio:R=24.7% G=72.7% B=2.6% Peak WL:Lp=623.7nm FWHM=167.5nm

Render Index:Ra=93.2 AvgR=90.8 TM30:Rf=90 Rg=103

R1 =94	R2 =95	R3 =95	R4 =94	R5 =94	R6 =94	R7 =93
R8 =86	R9 =67	R10=89	R11=94	R12=84	R13=95	R14=97 R15=91



<b>2.2.3 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-07	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	LRKT448/449EN-5CCT(3 500K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-B1	120.0	60	0.091	10.26	0.944

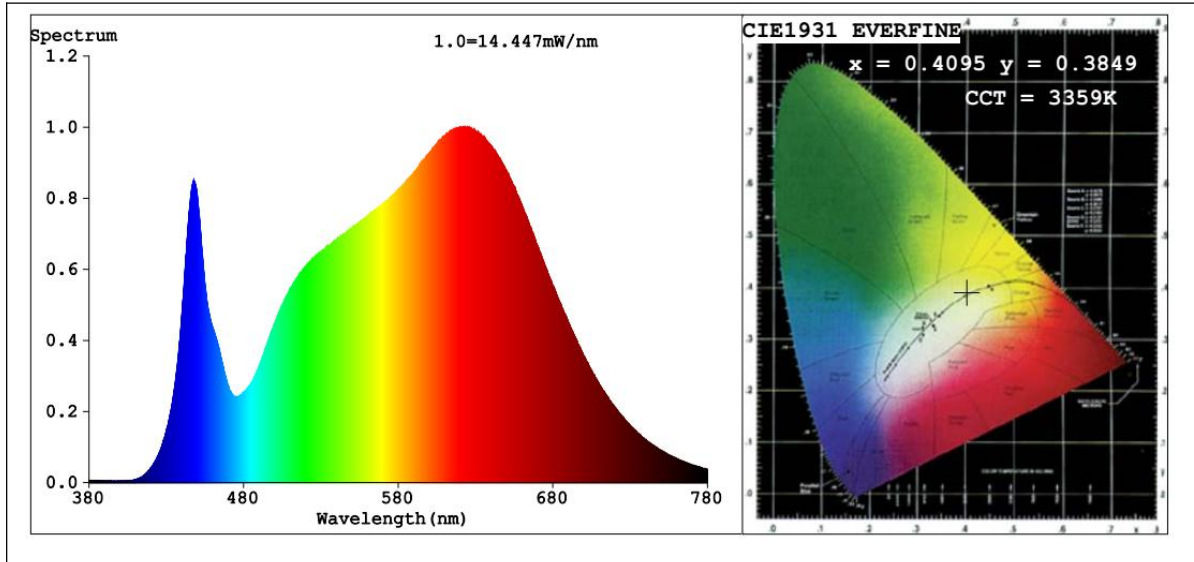
**Sphere-Spectroradiometer Method(Self-absorption:1.0453):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	94.1
R9	74
CCT (K)	3359
Duv	-0.0034

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	786.9
Luminous Efficacy (lm/W)	76.70

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.4095$   $y=0.3849$   $u'=0.2409$   $v'=0.5095$

CCT=3359K (Duv=-0.0034) Dominant WL:Ld =582.9nm WL:Lc = --nm Purity=38.4%

Ratio:R=22.7% G=74.1% B=3.2% Peak WL:Lp=622.4nm FWHM=180.0nm

Render Index:Ra=94.1 AvgR=92.0 TM30:Rf=91 Rg=103

R1 =96	R2 =96	R3 =95	R4 =94	R5 =95	R6 =94	R7 =94
R8 =89	R9 =74	R10=90	R11=94	R12=83	R13=96	R14=96 R15=94



<b>2.2.4 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-07	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	LRKT448/449EN-5CCT(4000K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-B1	120.0	60	0.091	10.27	0.944

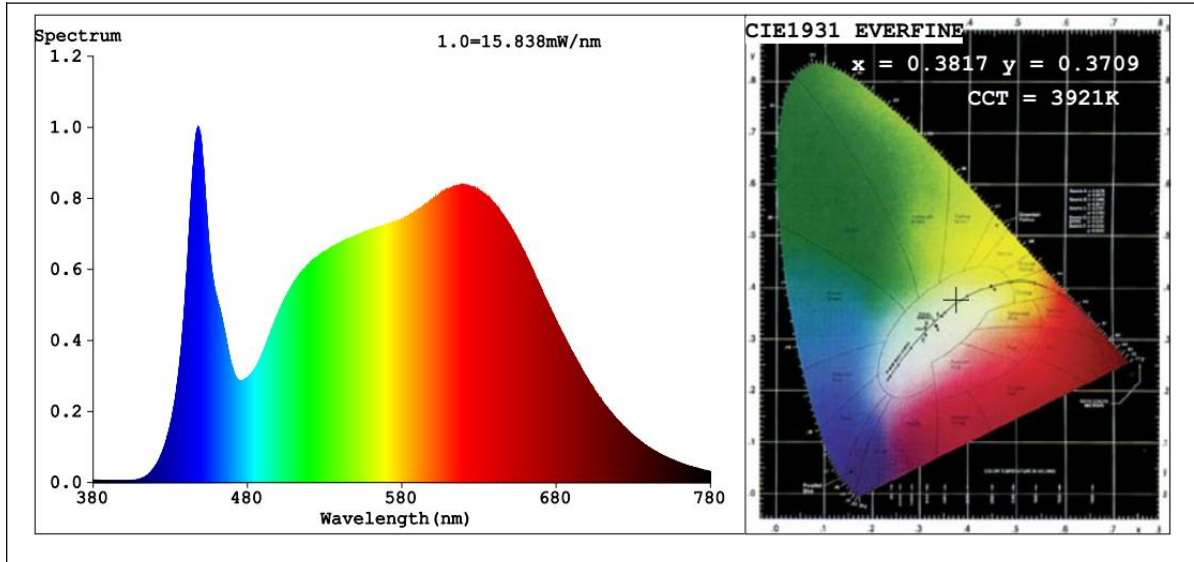
**Sphere-Spectroradiometer Method(Self-absorption:1.0453):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	94.4
R9	79
CCT (K)	3921
Duv	-0.0031

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	803.4
Luminous Efficacy (lm/W)	78.23

### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.3817$   $y=0.3709$   $u'=0.2283$   $v'=0.4992$   
 CCT=3921K (Duv=-0.0031) Dominant WL:Ld =581.2nm WL:Lc = --nm Purity=25.8%  
 Ratio:R=20.5% G=75.6% B=3.9% Peak WL:Lp=448.5nm FWHM=21.9nm  
 Render Index:Ra=94.4 AvgR=92.2 TM30:Rf=92 Rg=103

R1 =96	R2 =96	R3 =93	R4 =95	R5 =96	R6 =93	R7 =95
R8 =92	R9 =79	R10=89	R11=94	R12=78	R13=96	R14=96 R15=95



<b>2.2.5 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2021-04-07	<b>Test Ambient:</b>	25 ± 1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	LRKT448/449EN-5CCT(5000K)	<b>Total Operating Time (min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-B1	120.0	60	0.091	10.28	0.945

**Sphere-Spectroradiometer Method(Self-absorption:1.0453):**

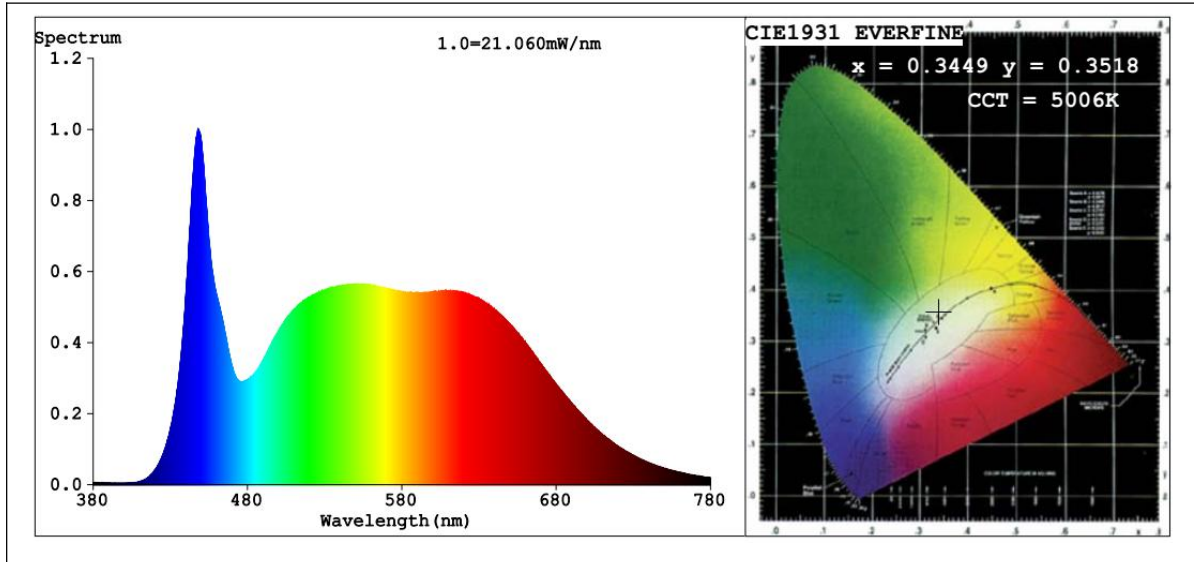
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.8
R9	73
CCT (K)	5006
Duv	0.0001

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	821.7
Luminous Efficacy (lm/W)	79.93



### Spectral Power Distribution and Chromaticity Diagram



### Colorimetric Parameters

#### Color Parameters:

Chromaticity Coordinate:  $x=0.3449$   $y=0.3518$   $u'=0.2113$   $v'=0.4847$   
 CCT=5006K (Duv=0.0001) Dominant WL:Ld =572.5nm WL:Lc = --nm Purity=9.0%  
 Ratio:R=17.3% G=77.7% B=5.0% Peak WL:Lp=447.9nm FWHM=22.4nm  
 Render Index:Ra=92.8 AvgR=90.1 TM30:Rf=91 Rg=102

R1 =94	R2 =94	R3 =92	R4 =94	R5 =94	R6 =91	R7 =94
R8 =90	R9 =73	R10=85	R11=94	R12=76	R13=94	R14=95 R15=93



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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	2021-04-07	Test Ambient	25.1°C
Sample No.		Maximum $\Delta u'v'$	
JCE210313-DL-B1		0.0013	



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C0				C90			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
0	0.00041	0.00025	0.00048	0	0.00045	0.00021	0.00050
1	0.00041	0.00025	0.00048	1	0.00045	0.00021	0.00050
2	0.00047	0.00026	0.00054	2	0.00045	0.00021	0.00050
3	0.00045	0.00021	0.00050	3	0.00045	0.00021	0.00050
4	0.00052	0.00023	0.00056	4	0.00045	0.00021	0.00050
5	0.00052	0.00023	0.00056	5	0.00045	0.00021	0.00050
6	0.00052	0.00023	0.00056	6	0.00052	0.00023	0.00056
7	0.00052	0.00023	0.00056	7	0.00045	0.00021	0.00050
8	0.00052	0.00023	0.00056	8	0.00045	0.00021	0.00050
9	0.00052	0.00023	0.00056	9	0.00056	0.00019	0.00059
10	0.00052	0.00023	0.00056	10	0.00050	0.00017	0.00053
11	0.00052	0.00023	0.00056	11	0.00056	0.00019	0.00059
12	0.00052	0.00023	0.00056	12	0.00056	0.00019	0.00059
13	0.00052	0.00023	0.00056	13	0.00056	0.00019	0.00059
14	0.00050	0.00017	0.00053	14	0.00050	0.00017	0.00053
15	0.00052	0.00023	0.00056	15	0.00056	0.00019	0.00059
16	0.00050	0.00017	0.00053	16	0.00056	0.00019	0.00059
17	0.00045	0.00021	0.00050	17	0.00054	0.00013	0.00056
18	0.00050	0.00017	0.00053	18	0.00050	0.00017	0.00053
19	0.00050	0.00017	0.00053	19	0.00054	0.00013	0.00056
20	0.00050	0.00017	0.00053	20	0.00054	0.00013	0.00056
21	0.00050	0.00017	0.00053	21	0.00054	0.00013	0.00056
22	0.00050	0.00017	0.00053	22	0.00054	0.00013	0.00056
23	0.00048	0.00012	0.00049	23	0.00048	0.00012	0.00049
24	0.00054	0.00013	0.00056	24	0.00052	0.00008	0.00053
25	0.00050	0.00017	0.00053	25	0.00048	0.00012	0.00049
26	0.00041	0.00010	0.00043	26	0.00041	0.00010	0.00043
27	0.00041	0.00010	0.00043	27	0.00041	0.00010	0.00043
28	0.00041	0.00010	0.00043	28	0.00039	0.00005	0.00040
29	0.00041	0.00010	0.00043	29	0.00039	0.00005	0.00040
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31	0.00039	0.00005	0.00040	31	0.00033	0.00003	0.00033
32	0.00028	0.00007	0.00029	32	0.00031	-0.00002	0.00031
33	0.00037	0.00000	0.00037	33	0.00026	0.00002	0.00026
34	0.00033	0.00003	0.00033	34	0.00024	-0.00003	0.00025
35	0.00026	0.00002	0.00026	35	0.00029	-0.00007	0.00030
36	0.00024	-0.00003	0.00025	36	0.00022	-0.00009	0.00024
37	0.00024	-0.00003	0.00025	37	0.00016	-0.00010	0.00019
38	0.00013	-0.00001	0.00013	38	0.00014	-0.00016	0.00021
39	0.00018	-0.00005	0.00019	39	0.00014	-0.00016	0.00021
40	0.00009	-0.00012	0.00015	40	0.00008	-0.00017	0.00019
41	0.00009	-0.00012	0.00015	41	0.00006	-0.00022	0.00023
42	0.00008	-0.00017	0.00019	42	0.00006	-0.00022	0.00023
43	0.00001	-0.00019	0.00019	43	-0.00003	-0.00029	0.00029
44	0.00001	-0.00019	0.00019	44	-0.00009	-0.00031	0.00032
45	-0.00007	-0.00025	0.00027	45	-0.00011	-0.00036	0.00038
46	-0.00009	-0.00031	0.00032	46	-0.00011	-0.00036	0.00038
47	-0.00020	-0.00028	0.00035	47	-0.00026	-0.00045	0.00052
48	-0.00022	-0.00034	0.00041	48	-0.00026	-0.00045	0.00052
49	-0.00018	-0.00038	0.00042	49	-0.00035	-0.00051	0.00062
50	-0.00031	-0.00041	0.00051	50	-0.00030	-0.00055	0.00063
51	-0.00033	-0.00046	0.00057	51	-0.00056	-0.00061	0.00083



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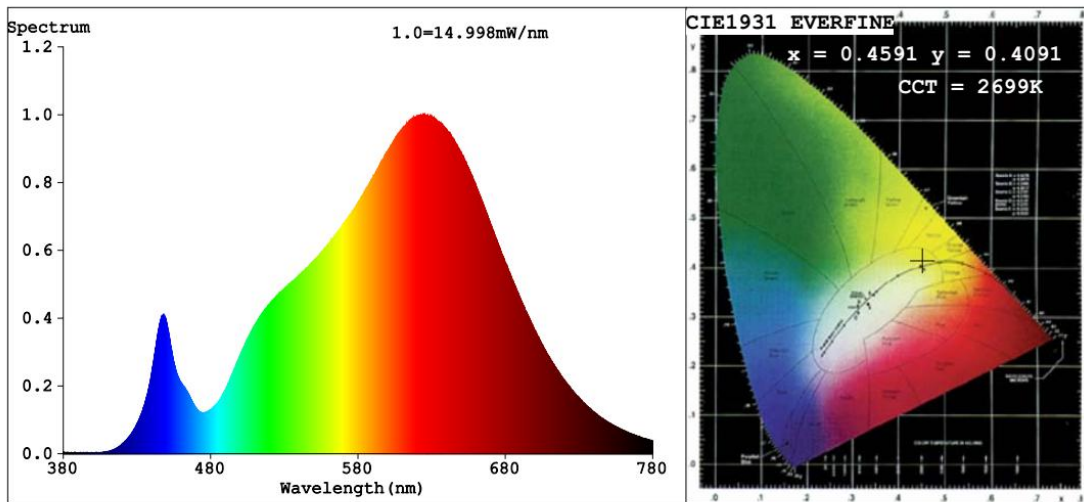
Fax: (+86)755-2319 2815

Certificate #4703.03

C0			C90		
gamma	u'	v'	gamma	u'	v'
0	0.26342	0.52659	0	0.26347	0.52655
1	0.26342	0.52659	1	0.26347	0.52655
2	0.26349	0.52661	2	0.26347	0.52655
3	0.26347	0.52655	3	0.26347	0.52655
4	0.26353	0.52657	4	0.26347	0.52655
5	0.26353	0.52657	5	0.26347	0.52655
6	0.26353	0.52657	6	0.26353	0.52657
7	0.26353	0.52657	7	0.26347	0.52655
8	0.26353	0.52657	8	0.26347	0.52655
9	0.26353	0.52657	9	0.26358	0.52653
10	0.26353	0.52657	10	0.26352	0.52651
11	0.26353	0.52657	11	0.26358	0.52653
12	0.26353	0.52657	12	0.26358	0.52653
13	0.26353	0.52657	13	0.26358	0.52653
14	0.26352	0.52651	14	0.26352	0.52651
15	0.26353	0.52657	15	0.26358	0.52653
16	0.26352	0.52651	16	0.26358	0.52653
17	0.26347	0.52655	17	0.26356	0.52648
18	0.26352	0.52651	18	0.26352	0.52651
19	0.26352	0.52651	19	0.26356	0.52648
20	0.26352	0.52651	20	0.26356	0.52648
21	0.26352	0.52651	21	0.26356	0.52648
22	0.26352	0.52651	22	0.26356	0.52648
23	0.26350	0.52646	23	0.26350	0.52646
24	0.26356	0.52648	24	0.26354	0.52642
25	0.26352	0.52651	25	0.26350	0.52646
26	0.26343	0.52645	26	0.26343	0.52645
27	0.26343	0.52645	27	0.26343	0.52645
28	0.26343	0.52645	28	0.26341	0.52639
29	0.26343	0.52645	29	0.26341	0.52639
30	0.26337	0.52643	30	0.26341	0.52639
31	0.26341	0.52639	31	0.26335	0.52638
32	0.26330	0.52642	32	0.26333	0.52632
33	0.26339	0.52634	33	0.26328	0.52636
34	0.26335	0.52638	34	0.26326	0.52631
35	0.26328	0.52636	35	0.26331	0.52627
36	0.26326	0.52631	36	0.26324	0.52626
37	0.26326	0.52631	37	0.26318	0.52624
38	0.26315	0.52633	38	0.26316	0.52619
39	0.26320	0.52629	39	0.26316	0.52619
40	0.26311	0.52623	40	0.26309	0.52617
41	0.26311	0.52623	41	0.26307	0.52612
42	0.26309	0.52617	42	0.26307	0.52612
43	0.26303	0.52616	43	0.26299	0.52605
44	0.26303	0.52616	44	0.26292	0.52603
45	0.26294	0.52609	45	0.26290	0.52598
46	0.26292	0.52603	46	0.26290	0.52598
47	0.26281	0.52606	47	0.26275	0.52590
48	0.26279	0.52600	48	0.26275	0.52590
49	0.26284	0.52597	49	0.26267	0.52583
50	0.26271	0.52594	50	0.26272	0.52579
51	0.26269	0.52588	51	0.26246	0.52573

<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>	2021-04-07		<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-B1	Input: 120.0V / 60Hz	Light outout(Lumen)	689.7	52.53
		Percentage	90.67%	7.62%



**Color Parameters:**

Chromaticity Coordinate: x=0.4591 y=0.4091/u'=0.2627 v'=0.5267  
CCT=2699K (Duv=-0.0005) Dominant WL:Ld =584.4nm WL:Lc = --nm Purity=60.6%  
Ratio:R=26.4% G=71.6% B=2.1% Peak WL:Lp=625.1nm FWHM=152.3nm  
Render Index:Ra=92.0 AvgR=89.2 TM30:Rf=90 Rg=102

R1 =92 R2 =95 R3 =96 R4 =93 R5 =92 R6 =94 R7 =92  
R8 =82 R9 =60 R10=87 R11=94 R12=83 R13=93 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	13.8	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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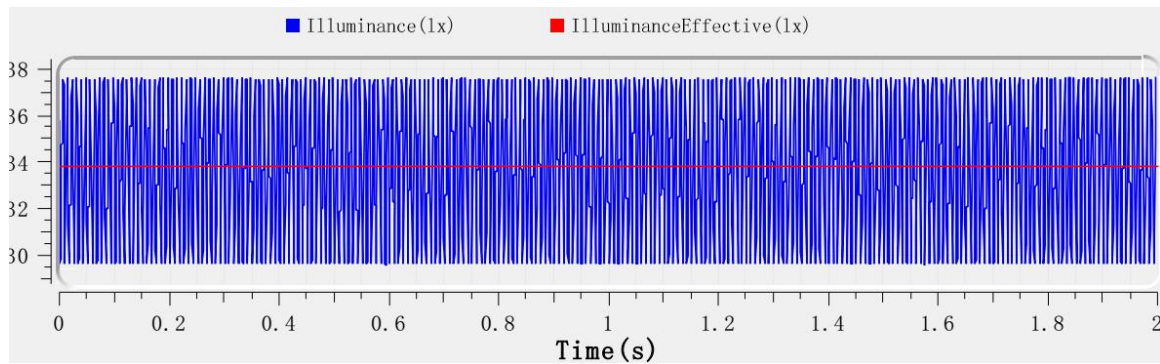
<b>Dimming Technology</b>	Forward phase-cut
<b>Dimmer</b>	LUTRON MACL-153M

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
<b>Maximum conduction</b>	0.043	0.452
<b>Intermediate conduction</b>	0.172	0.764
<b>Minimum conduction</b>	0.675	0.422



<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>	

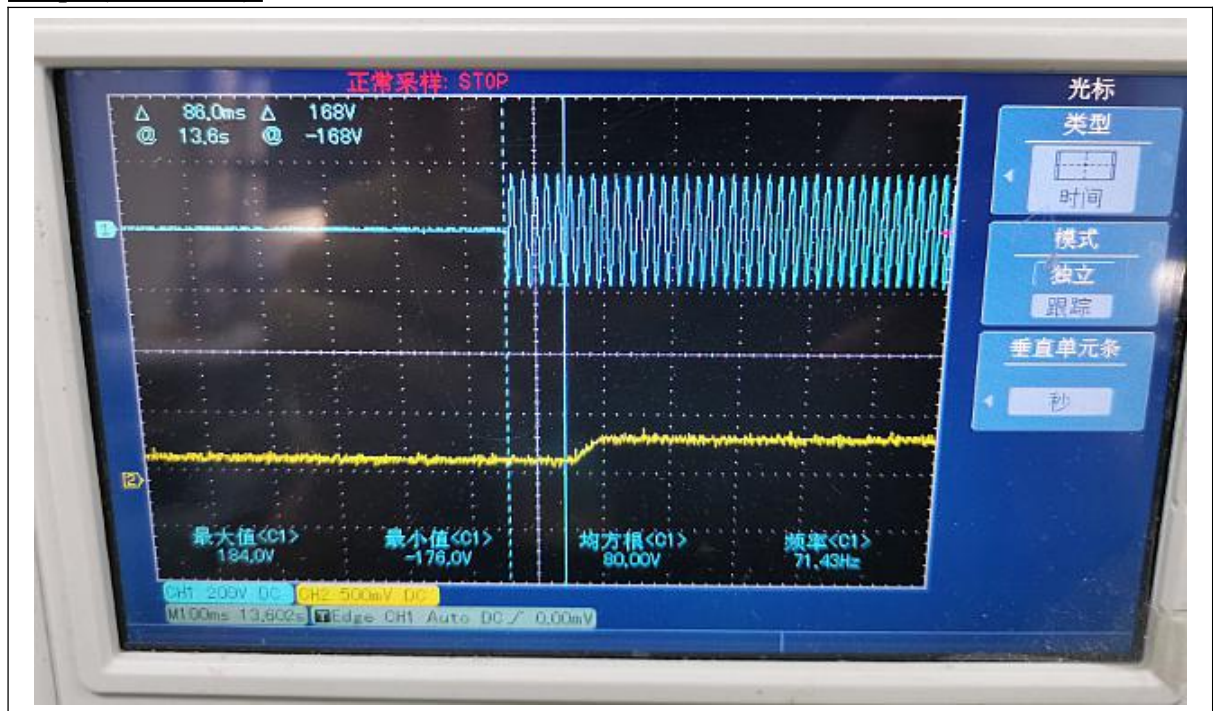
<b>Test date</b>	2021-04-07	<b>Test Ambient:</b>	25±1° C
<b>Sample No.</b>	<b>Operating Frequency (Hz)</b>		
JCE210313-DL-B1	120.004		



<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	2021-04-07	Test Ambient:	25±1° C
Sample No.	Start Time (ms)		
JCE210313-DL-B1	86.0		

**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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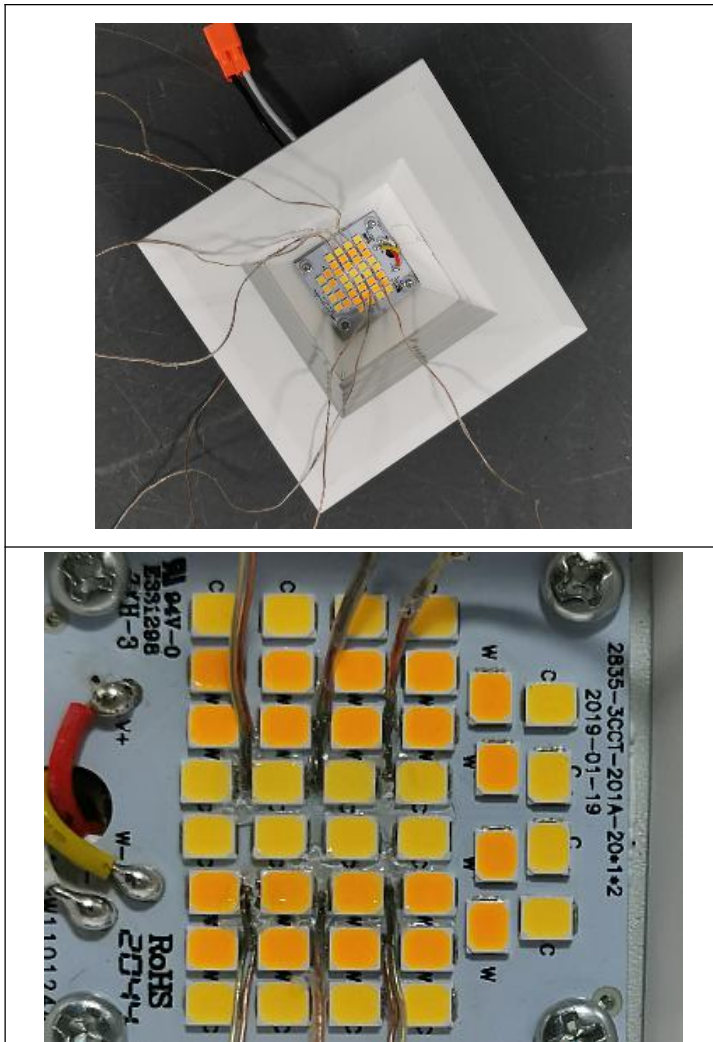
**Test voltage: 120V,60Hz**

<b>Test date</b>	2021-04-07	<b>Test Ambient</b>	25±1° C
<b>Sample No.</b>		<b>Transient Protection Test - Seven Strikes</b>	
JCE210313-DL-B1		Survival	

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

Test date	2021-04-07	Test Ambient	25±5° C
Input Vol./Frequency	120.0V / 60Hz	Output Current of Single LED(mA)	148.4
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum permitted Ts temperature for L70 <sub>≥</sub> 50,000 hrs (°C)
JCE210313-DL-B1	67-21S Series	101.5	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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<b>Test date</b>	2021-04-07	<b>Test Ambient</b>	25±5° C
<b>Sample No.</b>	<b>Maximum Measured Driver Case Temperature (°C)</b>	<b>Maximum Driver Case Temperature Limited (°C)</b>	
JCE210313-DL-B1	102.3	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>	2021-04-07	<b>Test Ambient:</b>	25±1° C
<b>Model Number</b>	LRKT448/449EN-5CCT(2700 K)	<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-B1	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	2021-04-07	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	2021-04-07	2022-04-06
ST-R-S-027	Digital Luxmeter	2021-04-08	2022-04-07
ST-R-S-016	Oscillograph	2021-04-07	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 \*\*\*\*\*