



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):

LRKT643/644EN-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

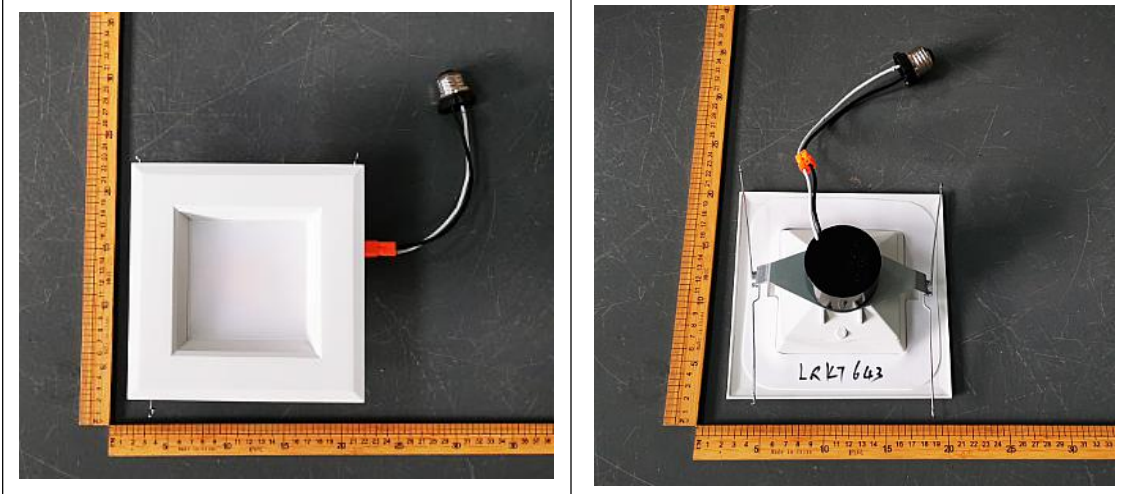
- Note: 1. The results contained in this report pertain only to the tested samples.
2. This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.
3. This report contains data that are not covered by the A2LA accreditation.



1.1 Product Information:		
Model Number	LRKT643/644EN-5CCT	
Remark	N/A	
Representative (Tested) Model	LRKT643/644EN-5CCT(2700K) LRKT643/644EN-5CCT(3000K) LRKT643/644EN-5CCT(3500K) LRKT643/644EN-5CCT(4000K) LRKT643/644EN-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-E1	
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"	

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac, 50/60Hz
Nominal Power	16W
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"> 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 8. Color Angular Uniformity 9. Dimming 10. Flicker 11. Operating Frequency 12. Starting Time 13. Transient Protection Test 14. In-Situ Temperature Measurement Test 15. Standby Power Consumption
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. C82.77-10:2014 American National Standard for Lighting Equipment-Harmonic Emission Limits-Related Power Quality Requirements 4. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 5. CIE 15-2004 Technical Report Colorimetry 6. UL1993 4th Edition, Self-Ballasted Lamps and Lamp Adapters 7. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2 8. ANSI/IEEE C62.41.2:2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage(1000V and Less) AC Power Circuits 9. IEC 62301:2011 Household electrical appliances - Measurement of standby power 10. NEMA 77-2017 Standard for Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria
Remark	<p>Below test and data are not covered by A2LA accreditation:</p> <ul style="list-style-type: none"> - Operating Frequency - Noise



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° 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 Summary of Test Result

Criteria Item	The Type of Luminaires	Requirement (ES for Luminaires V2.2)	Measured Value	Status
Input Wattage	All	≤ Rated Wattage	13.94W	Pass
Luminous Efficacy	Downlight retrofits	≥60 lm/W	78.53lm/W	Pass
Luminaire Minimum Light Output	Downlight retrofits	≤ 4.5" aperture: 345 lumens > 4.5" aperture: 575 lumens	1094.7lm	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	2704K Duv=-0.0010	Pass
Color Rendering Index (CRI)	Downlight retrofits	Ra ≥ 80 R9 >0	Ra =90.6 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)	85.4	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.	0.0008	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	<table border="1"> <tr><td>50,000</td></tr> <tr><td>76.15%</td></tr> <tr><td>>54000</td></tr> </table>	50,000	76.15%	>54000	Pass
50,000							
76.15%							
>54000							
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	92.0ms	Pass			
Power Factor	Solid State	Total luminaire input power ≤ 5 watts: PF ≥ 0.5 Total luminaire input power > 5 watts: PF ≥ 0.7	0.980	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	78.8°C	Pass			
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70≥50,000 hrs ≤ 105°C	67.7°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 “*”.



2.2.1 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2021-04-07	Test Ambient:	25 ± 1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LRKT643/644EN-5CCT(2700K)	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-E1	120.0	60	0.119	13.94	0.980

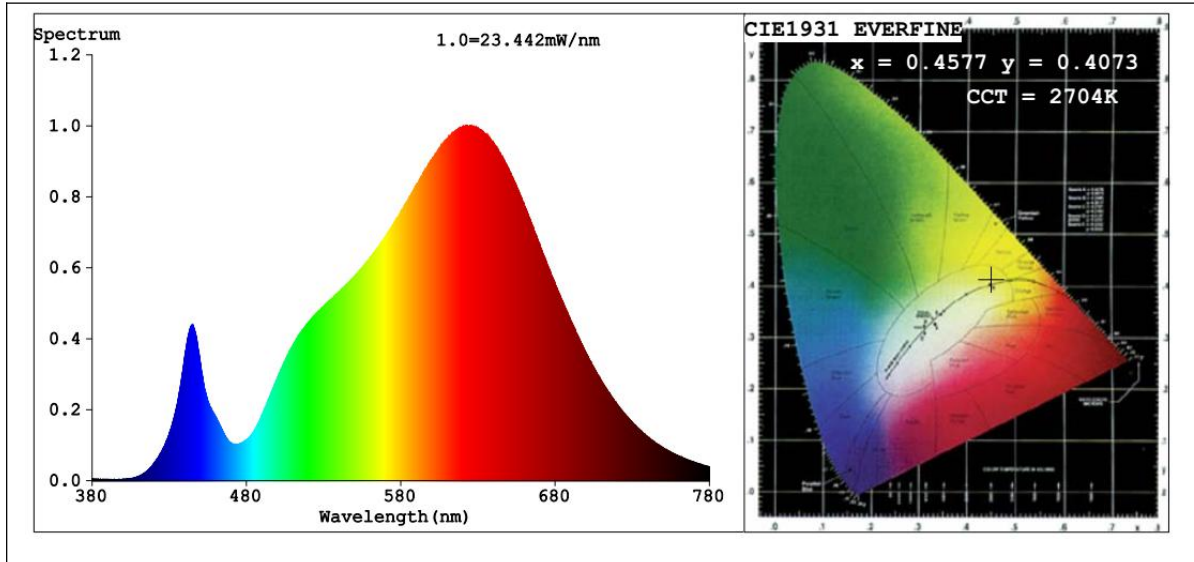
Sphere-Spectroradiometer Method(Self-absorption:1.0566):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	90.6
R9	56
CCT (K)	2704
Duv	-0.0010

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1094.7
Luminous Efficacy (lm/W)	78.53
Beam Angle°	101.4
Center Beam Candle Power (cd)	452

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Color Parameters:

Chromaticity Coordinate: $x=0.4577$ $y=0.4073$ $u'=0.2626$ $v'=0.5258$

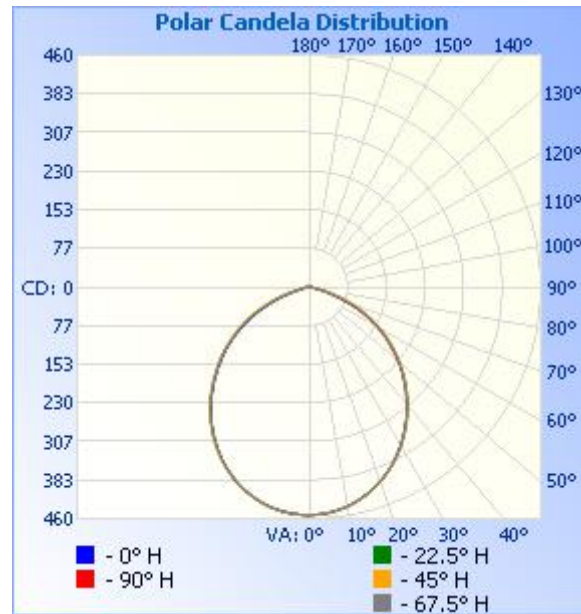
CCT=2704K (Duv=-0.0010) Dominant WL:Ld =584.5nm WL:Lc = --nm Purity=59.6%

Ratio:R=26.2% G=71.9% B=1.9% Peak WL:Lp=622.4nm FWHM=153.0nm

Render Index:Ra=90.6 AvgR=87.6 TM30:Rf=87 Rg=103

R1 =91	R2 =93	R3 =95	R4 =91	R5 =90	R6 =92	R7 =91
R8 =80	R9 =56	R10=84	R11=93	R12=82	R13=91	R14=96 R15=87

Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	343.6	31.4%
0-40	553.3	50.6%
0-60	934.8	85.4%
60-90	156.2	14.3%
70-100	43.5	4%
90-120	1.5	0.1%
0-90	1,091.0	99.7%
90-180	3.5	0.3%
0-180	1,094.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	42.7	3.9%	90-100	0.5	0%
10-20	121.0	11.1%	100-110	0.5	0%
20-30	179.9	16.4%	110-120	0.5	0%
30-40	209.7	19.2%	120-130	0.5	0%
40-50	207.2	18.9%	130-140	0.5	0%
50-60	174.3	15.9%	140-150	0.4	0%
60-70	113.3	10.3%	150-160	0.3	0%
70-80	37.7	3.4%	160-170	0.2	0%
80-90	5.3	0.5%	170-180	0.1	0%



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



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Certificate #4703.03

127	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1
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159	1	1	1	1	1	1	1	1	1	1	1	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



2.2.2 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
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Test date	2021-04-07	Test Ambient:	25 ± 1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LRKT643/644EN-5CCT(3000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-E1	120.0	60	0.120	13.97	0.969

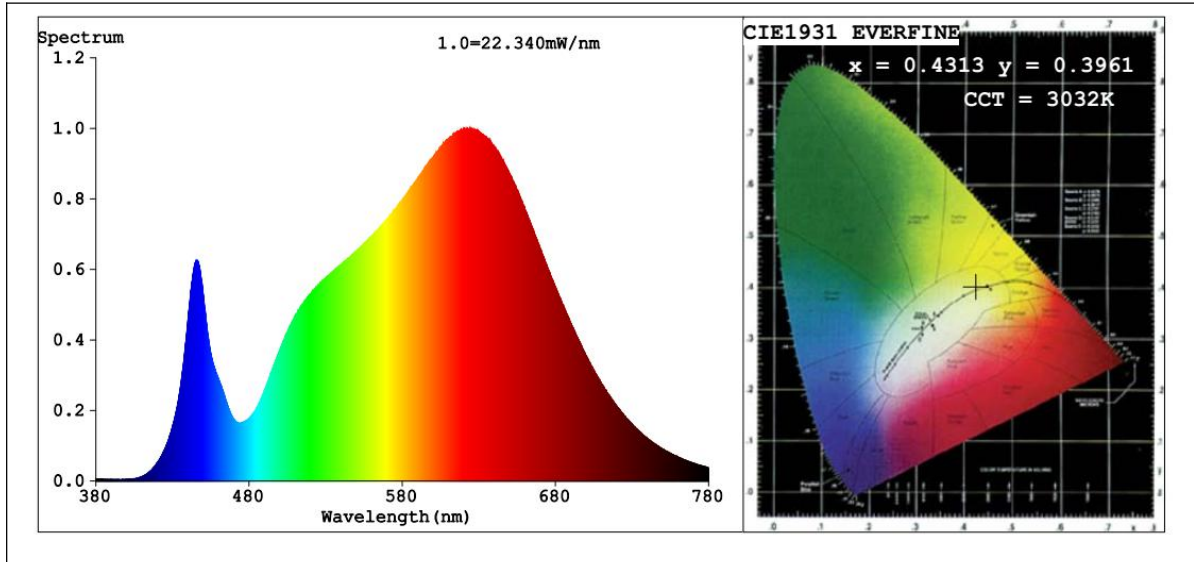
Sphere-Spectroradiometer Method(Self-absorption:1.0566):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.2
R9	64
CCT (K)	3032
Duv	-0.0024

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1133
Luminous Efficacy (lm/W)	81.10

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Color Parameters:

Chromaticity Coordinate: $x=0.4313$ $y=0.3961$ $u'=0.2503$ $v'=0.5174$
 CCT=3032K (Duv=-0.0024) Dominant WL:Ld =583.6nm WL:Lc = --nm Purity=48.3%
 Ratio:R=24.1% G=73.3% B=2.6% Peak WL:Lp=622.4nm FWHM=170.1nm
 Render Index:Ra=92.2 AvgR=89.7 TM30:Rf=89 Rg=103

R1 =93	R2 =95	R3 =94	R4 =93	R5 =93	R6 =93	R7 =92
R8 =85	R9 =64	R10=87	R11=94	R12=84	R13=94	R14=96 R15=90



2.2.3 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
--	-----------------------

Test date	2021-04-07	Test Ambient:	25 ± 1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LRKT643/644EN-5CCT(3500K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-E1	120.0	60	0.121	13.92	0.960

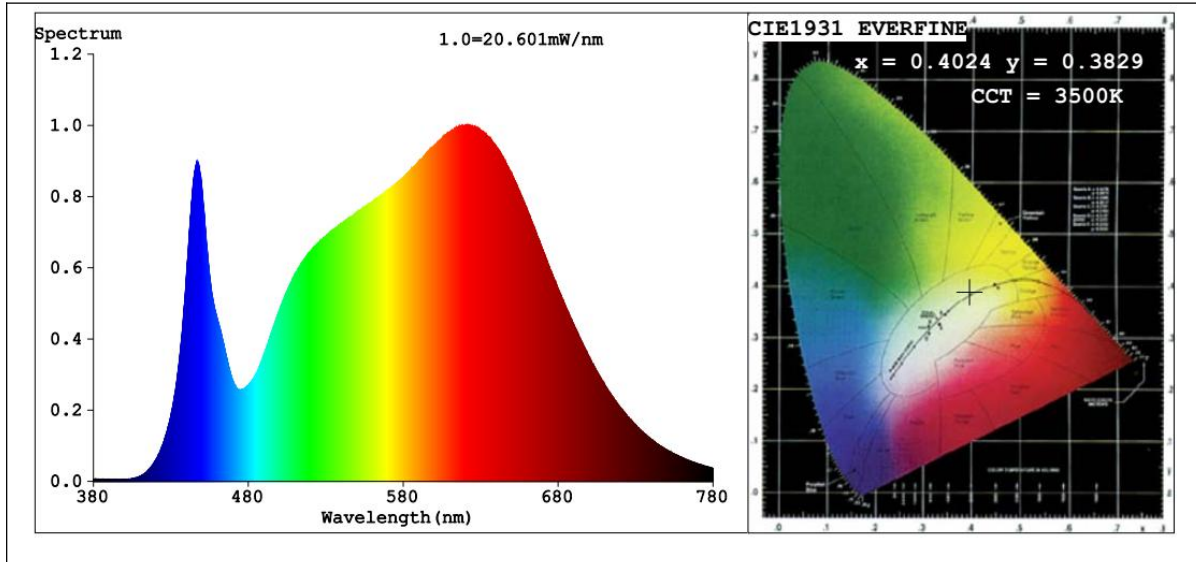
Sphere-Spectroradiometer Method(Self-absorption:1.0566):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	93.3
R9	71
CCT (K)	3500
Duv	-0.0028

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1159
Luminous Efficacy (lm/W)	83.26

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Color Parameters:

Chromaticity Coordinate: $x=0.4024$ $y=0.3829$ $u'=0.2371$ $v'=0.5075$

CCT=3500K (Duv=-0.0028) Dominant WL:Ld =582.2nm WL:Lc = --nm Purity=35.7%

Ratio:R=21.9% G=74.8% B=3.3% Peak WL:Lp=622.1nm FWHM=182.1nm

Render Index:Ra=93.3 AvgR=90.9 TM30:Rf=91 Rg=103

R1 =95	R2 =95	R3 =94	R4 =94	R5 =94	R6 =93	R7 =94
R8 =88	R9 =71	R10=87	R11=94	R12=81	R13=95	R14=96 R15=93



2.2.4 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
--	-----------------------

Test date	2021-04-07	Test Ambient:	25 ± 1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LRKT643/644EN-5CCT(4000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-E1	120.0	60	0.121	13.91	0.962

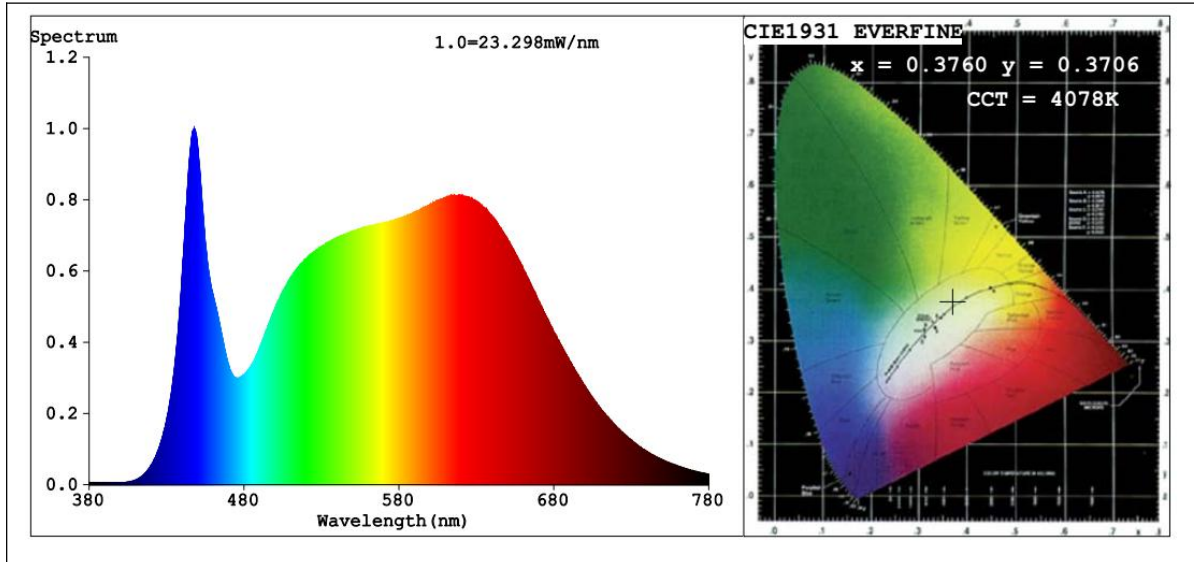
Sphere-Spectroradiometer Method(Self-absorption:1.0566):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	93.4
R9	74
CCT (K)	4078
Duv	-0.0016

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1226
Luminous Efficacy (lm/W)	88.14

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Color Parameters:

Chromaticity Coordinate: $x=0.3760$ $y=0.3706$ $u'=0.2246$ $v'=0.4982$
 CCT=4078K (Duv=-0.0016) Dominant WL:Ld =579.7nm WL:Lc = --nm Purity=24.1%
 Ratio:R=19.7% G=76.3% B=4.0% Peak WL:Lp=447.8nm FWHM=23.2nm
 Render Index:Ra=93.4 AvgR=90.8 TM30:Rf=92 Rg=102

R1 =95	R2 =95	R3 =93	R4 =94	R5 =94	R6 =92	R7 =95
R8 =90	R9 =74	R10=86	R11=94	R12=76	R13=95	R14=96 R15=94



2.2.5 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008
--	-----------------------

Test date	2021-04-07	Test Ambient:	25 ± 1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	LRKT643/644EN-5CCT(5000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE210313-DL-E1	120.0	60	0.120	13.85	0.962

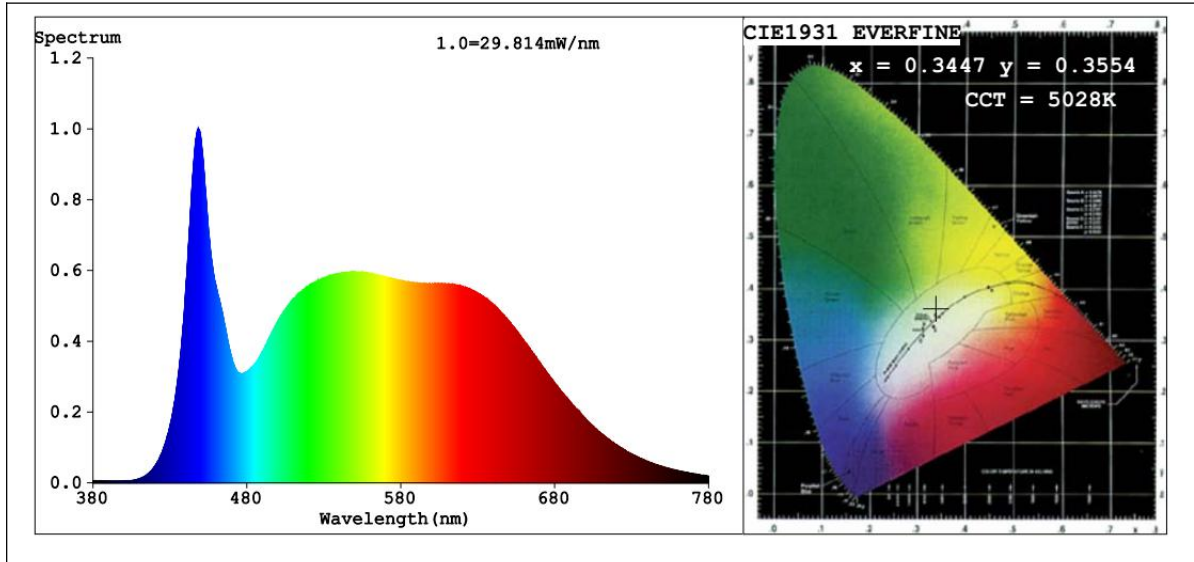
Sphere-Spectroradiometer Method(Self-absorption:1.0566):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	91.9
R9	67
CCT (K)	5028
Duv	0.0021

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1253
Luminous Efficacy (lm/W)	90.47

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Color Parameters:

Chromaticity Coordinate: $x=0.3447$ $y=0.3554$ $u'=0.2097$ $v'=0.4864$

CCT=5028K (Duv=0.0021) Dominant WL:Ld =570.3nm WL:Lc = --nm Purity=10.1%

Ratio:R=17.0% G=78.1% B=5.0% Peak WL:Lp=448.5nm FWHM=23.6nm

Render Index:Ra=91.9 AvgR=88.7 TM30:Rf=91 Rg=100

R1 =92	R2 =93	R3 =92	R4 =93	R5 =92	R6 =90	R7 =94	
R8 =88	R9 =67	R10=83	R11=93	R12=74	R13=92	R14=96	R15=91



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

Test date	2021-04-07	Test Ambient	25.1°C
Sample No.	Maximum $\Delta u'v'$		
JCE210313-DL-E1	0.0008		



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C0				C90			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
0	0.00015	-0.00001	0.00016	0	0.00015	-0.00001	0.00016
1	0.00015	-0.00001	0.00016	1	0.00015	-0.00001	0.00016
2	0.00015	-0.00001	0.00016	2	0.00020	-0.00005	0.00021
3	0.00015	-0.00001	0.00016	3	0.00020	-0.00005	0.00021
4	0.00015	-0.00001	0.00016	4	0.00014	-0.00006	0.00015
5	0.00020	-0.00005	0.00021	5	0.00020	-0.00005	0.00021
6	0.00015	-0.00001	0.00016	6	0.00020	-0.00005	0.00021
7	0.00015	-0.00001	0.00016	7	0.00020	-0.00005	0.00021
8	0.00022	0.00001	0.00022	8	0.00027	-0.00003	0.00027
9	0.00022	0.00001	0.00022	9	0.00027	-0.00003	0.00027
10	0.00027	-0.00003	0.00027	10	0.00027	-0.00003	0.00027
11	0.00027	-0.00003	0.00027	11	0.00027	-0.00003	0.00027
12	0.00027	-0.00003	0.00027	12	0.00027	-0.00003	0.00027
13	0.00022	0.00001	0.00022	13	0.00027	-0.00003	0.00027
14	0.00027	-0.00003	0.00027	14	0.00027	-0.00003	0.00027
15	0.00027	-0.00003	0.00027	15	0.00027	-0.00003	0.00027
16	0.00022	0.00001	0.00022	16	0.00027	-0.00003	0.00027
17	0.00033	-0.00002	0.00033	17	0.00033	-0.00002	0.00033
18	0.00022	0.00001	0.00022	18	0.00027	-0.00003	0.00027
19	0.00028	0.00002	0.00029	19	0.00033	-0.00002	0.00033
20	0.00028	0.00002	0.00029	20	0.00033	-0.00002	0.00033
21	0.00028	0.00002	0.00029	21	0.00033	-0.00002	0.00033
22	0.00028	0.00002	0.00029	22	0.00027	-0.00003	0.00027
23	0.00024	0.00006	0.00025	23	0.00033	-0.00002	0.00033
24	0.00028	0.00002	0.00029	24	0.00033	-0.00002	0.00033
25	0.00024	0.00006	0.00025	25	0.00033	-0.00002	0.00033
26	0.00028	0.00002	0.00029	26	0.00033	-0.00002	0.00033
27	0.00028	0.00002	0.00029	27	0.00033	-0.00002	0.00033
28	0.00028	0.00002	0.00029	28	0.00028	0.00002	0.00029
29	0.00028	0.00002	0.00029	29	0.00033	-0.00002	0.00033
30	0.00028	0.00002	0.00029	30	0.00033	-0.00002	0.00033
31	0.00028	0.00002	0.00029	31	0.00033	-0.00002	0.00033
32	0.00022	0.00001	0.00022	32	0.00027	-0.00003	0.00027
33	0.00015	-0.00001	0.00016	33	0.00027	-0.00003	0.00027
34	0.00017	0.00004	0.00018	34	0.00022	0.00001	0.00022
35	0.00022	0.00001	0.00022	35	0.00020	-0.00005	0.00021
36	0.00022	0.00001	0.00022	36	0.00020	-0.00005	0.00021
37	0.00015	-0.00001	0.00016	37	0.00025	-0.00009	0.00026
38	0.00022	0.00001	0.00022	38	0.00025	-0.00009	0.00026
39	0.00015	-0.00001	0.00016	39	0.00018	-0.00010	0.00021
40	0.00015	-0.00001	0.00016	40	0.00018	-0.00010	0.00021
41	0.00009	-0.00002	0.00009	41	0.00012	-0.00012	0.00016
42	0.00014	-0.00006	0.00015	42	0.00016	-0.00016	0.00022
43	0.00012	-0.00012	0.00016	43	0.00010	-0.00017	0.00020
44	0.00001	-0.00009	0.00009	44	0.00003	-0.00019	0.00019
45	0.00001	-0.00009	0.00009	45	0.00003	-0.00019	0.00019
46	-0.00006	-0.00011	0.00012	46	-0.00005	-0.00025	0.00026
47	-0.00006	-0.00011	0.00012	47	-0.00005	-0.00025	0.00026
48	-0.00008	-0.00016	0.00018	48	-0.00007	-0.00031	0.00032
49	-0.00008	-0.00016	0.00018	49	-0.00014	-0.00032	0.00035
50	-0.00010	-0.00022	0.00024	50	-0.00020	-0.00034	0.00039
51	-0.00016	-0.00023	0.00028	51	-0.00027	-0.00035	0.00044



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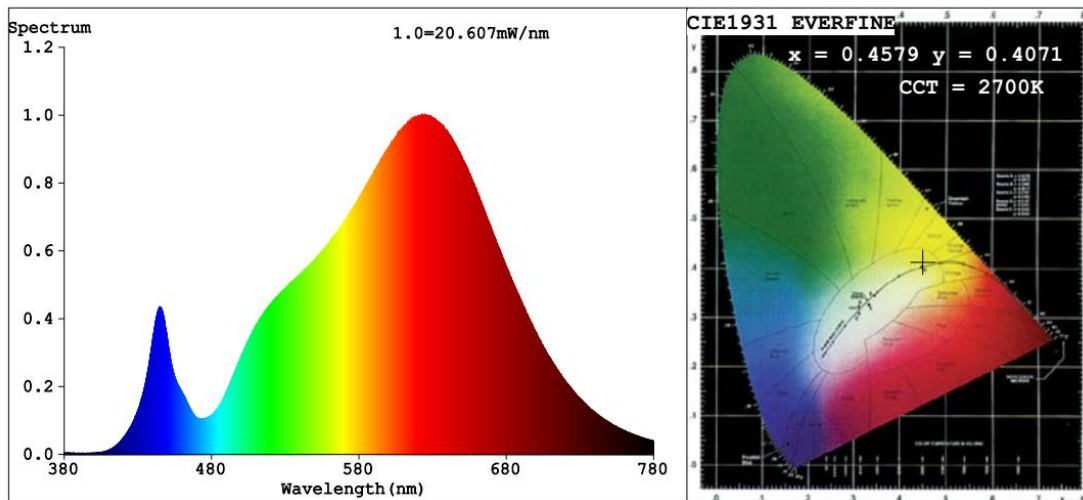
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C180				C270			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
0	0.00015	-0.00001	0.00016	0	0.00015	-0.00001	0.00016
1	0.00015	-0.00001	0.00016	1	0.00020	-0.00005	0.00021
2	0.00015	-0.00001	0.00016	2	0.00015	-0.00001	0.00016
3	0.00015	-0.00001	0.00016	3	0.00015	-0.00001	0.00016
4	0.00015	-0.00001	0.00016	4	0.00015	-0.00001	0.00016
5	0.00009	-0.00002	0.00009	5	0.00014	-0.00006	0.00015
6	0.00011	0.00003	0.00011	6	0.00015	-0.00001	0.00016
7	0.00011	0.00003	0.00011	7	0.00015	-0.00001	0.00016
8	0.00004	0.00001	0.00005	8	0.00011	0.00003	0.00011
9	0.00011	0.00003	0.00011	9	0.00011	0.00003	0.00011
10	0.00004	0.00001	0.00005	10	0.00011	0.00003	0.00011
11	0.00006	0.00007	0.00009	11	0.00011	0.00003	0.00011
12	0.00004	0.00001	0.00005	12	0.00004	0.00001	0.00005
13	0.00011	0.00003	0.00011	13	0.00011	0.00003	0.00011
14	0.00006	0.00007	0.00009	14	0.00011	0.00003	0.00011
15	0.00002	0.00011	0.00011	15	0.00011	0.00003	0.00011
16	0.00006	0.00007	0.00009	16	0.00011	0.00003	0.00011
17	0.00002	0.00011	0.00011	17	0.00004	0.00001	0.00005
18	0.00002	0.00011	0.00011	18	0.00006	0.00007	0.00009
19	0.00002	0.00011	0.00011	19	0.00000	0.00005	0.00005
20	-0.00003	0.00015	0.00015	20	0.00006	0.00007	0.00009
21	-0.00009	0.00013	0.00016	21	-0.00005	0.00009	0.00010
22	-0.00003	0.00015	0.00015	22	0.00002	0.00011	0.00011
23	-0.00003	0.00015	0.00015	23	-0.00005	0.00009	0.00010
24	-0.00009	0.00013	0.00016	24	-0.00005	0.00009	0.00010
25	-0.00009	0.00013	0.00016	25	-0.00005	0.00009	0.00010
26	-0.00009	0.00013	0.00016	26	-0.00005	0.00009	0.00010
27	-0.00009	0.00013	0.00016	27	-0.00011	0.00008	0.00014
28	-0.00009	0.00013	0.00016	28	-0.00009	0.00013	0.00016
29	-0.00020	0.00015	0.00025	29	-0.00009	0.00013	0.00016
30	-0.00016	0.00012	0.00019	30	-0.00011	0.00008	0.00014
31	-0.00016	0.00012	0.00019	31	-0.00016	0.00012	0.00019
32	-0.00020	0.00015	0.00025	32	-0.00011	0.00008	0.00014
33	-0.00020	0.00015	0.00025	33	-0.00011	0.00008	0.00014
34	-0.00022	0.00010	0.00024	34	-0.00016	0.00012	0.00019
35	-0.00022	0.00010	0.00024	35	-0.00022	0.00010	0.00024
36	-0.00029	0.00009	0.00030	36	-0.00022	0.00010	0.00024
37	-0.00029	0.00009	0.00030	37	-0.00022	0.00010	0.00024
38	-0.00029	0.00009	0.00030	38	-0.00029	0.00009	0.00030
39	-0.00040	0.00011	0.00041	39	-0.00024	0.00005	0.00025
40	-0.00035	0.00007	0.00036	40	-0.00024	0.00005	0.00025
41	-0.00035	0.00007	0.00036	41	-0.00031	0.00003	0.00031
42	-0.00042	0.00006	0.00042	42	-0.00026	-0.00001	0.00026
43	-0.00042	0.00006	0.00042	43	-0.00033	-0.00002	0.00033
44	-0.00044	0.00000	0.00044	44	-0.00033	-0.00002	0.00033
45	-0.00050	-0.00001	0.00050	45	-0.00033	-0.00002	0.00033
46	-0.00052	-0.00007	0.00052	46	-0.00039	-0.00004	0.00039
47	-0.00059	-0.00008	0.00059	47	-0.00046	-0.00005	0.00046
48	-0.00059	-0.00008	0.00059	48	-0.00041	-0.00009	0.00042
49	-0.00072	-0.00011	0.00072	49	-0.00048	-0.00011	0.00049
50	-0.00067	-0.00015	0.00069	50	-0.00048	-0.00011	0.00049
51	-0.00075	-0.00022	0.00079	51	-0.00056	-0.00017	0.00059

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

Test date	2021-04-07		Test Ambient:	25±1° C
Dimmer Technology			Forward phase-cut	
Sample No.		Maximum Level	Minimum Level	
JCE210313-DL-E1	Input: 120.0V / 60Hz	Light outout(Lumen)	994.9	50.58
		Percentage	90.88%	5.35%



Color Parameters:

Chromaticity Coordinate: x=0.4579 y=0.4071/u'=0.2628 v'=0.5257
CCT=2700K (Duv=-0.0011) Dominant WL:Ld =584.6nm WL:Lc = --nm Purity=59.7%
Ratio:R=26.2% G=71.8% B=2.0% Peak WL:Lp=622.4nm FWHM=152.3nm
Render Index:Ra=90.6 AvgR=87.7 TM30:Rf=87 Rg=103

R1 =91 R2 =93 R3 =95 R4 =91 R5 =91 R6 =92 R7 =91
R8 =80 R9 =56 R10=85 R11=93 R12=83 R13=91 R14=96 R15=87

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

Dimmer Technology	Peak Noise Reading (dBA)	Test Condition	Distance between the microphone and the UUT
LUTRON MACL-153M	14.2	Dimmer adjusted to lowest light output	< 1 m



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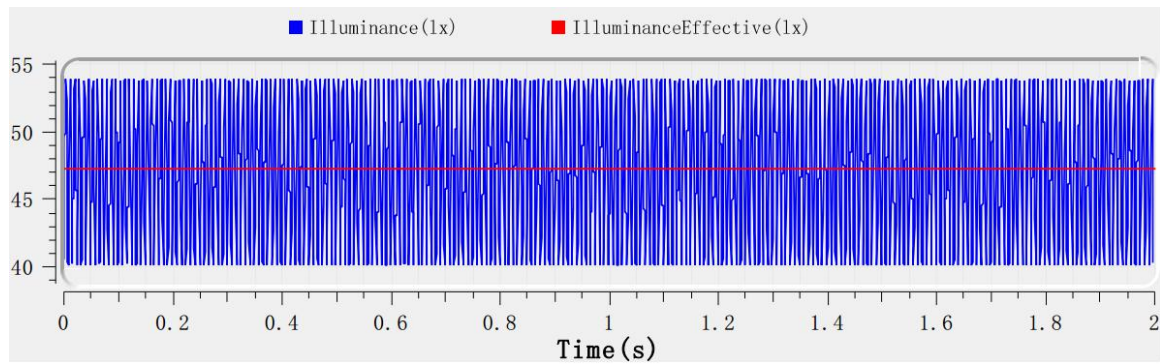
Dimming Technology	Forward phase-cut
Dimmer	LUTRON MACL-153M

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
Maximum conduction	0.057	0.575
Intermediate conduction	0.177	0.839
Minimum conduction	0.742	0.439



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

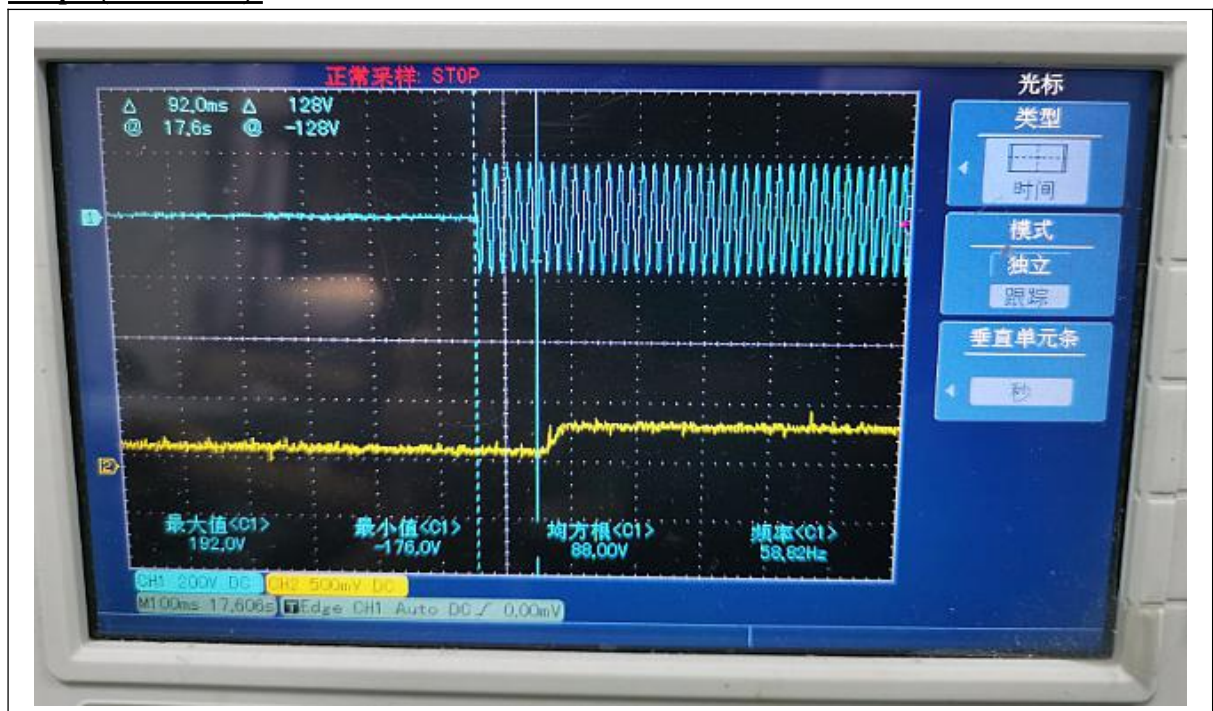
Test date	2021-04-07	Test Ambient:	25±1° C
Sample No.	Operating Frequency (Hz)		
JCE210313-DL-E1	120.002		



2.7 Starting Time	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2
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Test date	2021-04-07	Test Ambient:	25±1° C
Sample No.	Start Time (ms)		
JCE210313-DL-E1	92.0		

Graph (Start Time):





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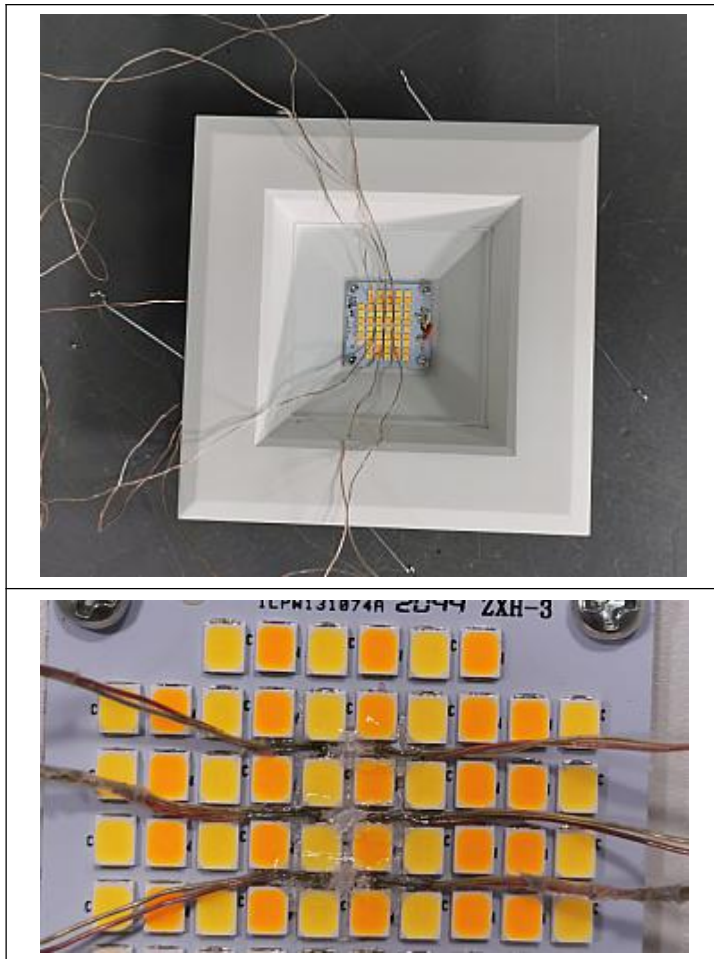
Test voltage: 120V,60Hz

Test date	2021-04-07	Test Ambient	25±1° C
Sample No.		Transient Protection Test - Seven Strikes	
JCE210313-DL-E1		Survival	

2.9 In-Situ Temperature Measurement Test (ISTMT)	UL1598-2008, 3rd Edition
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Test date	2021-04-07	Test Ambient	25±5° C
Input Vol./Frequency	120.0V / 60Hz	Output Current of Single LED(mA)	144.8
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum permitted Ts temperature for L70 ≥ 50,000 hrs (°C)
JCE210313-DL-E1	67-21S Series	67.7	105

In-Situ Picture - Ts:



2.10 Maximum Measured Ballast or Driver Case Temperature	UL1598-2008, 3rd Edition
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Test date	2021-04-07	Test Ambient	25±5° C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
JCE210313-DL-E1	78.8	105	

In-Situ Picture - Ts:





2.11 Standby Power Consumption:	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2
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Test date	2021-04-07	Test Ambient:	25±1° C
Model Number	LRKT643/644EN-5CCT(2700 K)	Stabilization Time (min)	60

Electrical Measurement – when the luminaires turned off:

Sample No.	Standby Power Consumption(W):
JCE210313-DL-E1	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 *****