



Energy Star Test Report

For

L-TECH CORPORATION

(Brand Name: N/A)

Shaogangtou District, Qiaotou Town, Dongguan City

Model name(s):

LRKT311W/3571W-3CT-27-35

LRKT311W/3571W-3CT-30-50

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: 2020-05-14

Ningbo TengLi Testing Co., Ltd

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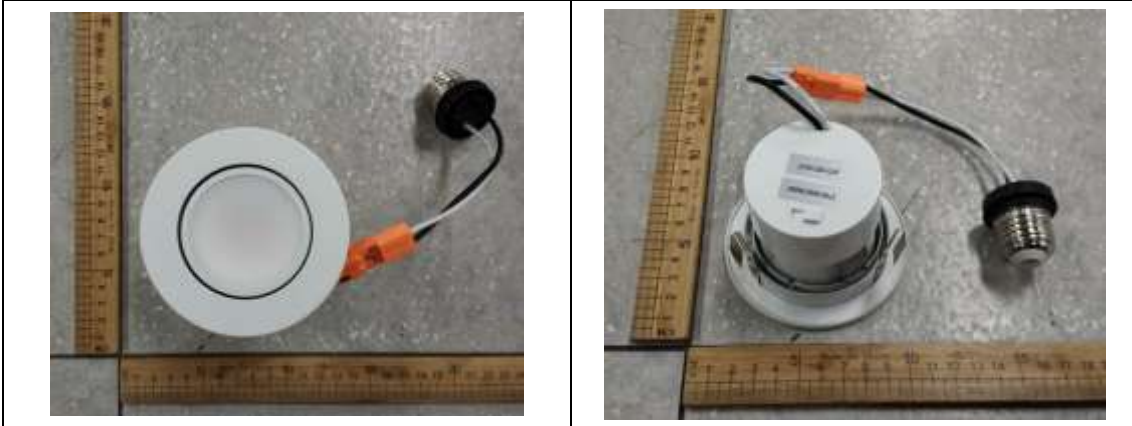
Note: 1. The results contained in this report pertain only to the tested samples.
2. This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



1.1 Product Information:		
Model Number	LRKT311W/3571W-3CT-27-35 LRKT311W/3571W-3CT-30-50	
Remark	According to the test data, 2700K is the most inefficient mode.	
Representative (Tested) Model	LRKT311W/3571W-3CT-27-35(0%,2700K) LRKT311W/3571W-3CT-27-35(50%,3000K) LRKT311W/3571W-3CT-27-35(100%,3500K)	
Model Difference	All construction and rating are the same, except CCT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlight retrofits	
LED Manufacturer	Seoul Semiconductor Co.,LTD	
LED Model	SAWxC22B-xx	
Dimming	Dimmable	
Sample Number	JCE200410-D1	
Date of Receipt	Apr.20,2020	
Luminaire Aperture (for Inseparable SSL Luminaire)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac, 50/60Hz
Nominal Power	9W
Rated Initial Lamp Lumen	--
Declared CCT for LRKT311W/3571W-3CT-27-35	2700K,3000K,3500K
Declared CCT for LRKT311W/3571W-3CT-30-50	3000K,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
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems 7. UL1993 4th Edition, Self-Ballasted Lamps and Lamp Adapters 8. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2
Reference Work Instruction	QD25
Remark	Below test and data are not covered by A2LA accreditation: - Operating Frequency



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	8.195W	Pass
Luminous Efficacy	Downlight retrofits	≥60 lm/W	85.76lm/W	Pass
Luminaire Minimum Light Output	Downlight retrofits	≤4.5" aperture: 345 lumens >4.5" aperture: 575 lumens	702.77lm	Pass
Luminaire Zonal Lumen Density Requirement	Downlight retrofits	≥75% of total initial lumens within the 0-60° zone	82.3	Pass
Correlated Color Temperature (CCT)	Solid State	Shall be capable of providing at least one of the following nominal correlated color temperatures (CCTs): <ul style="list-style-type: none"> • 2700 Kelvin • 3000 Kelvin • 3500 Kelvin • 4000 Kelvin • 5000 Kelvin 	2713K Duv=-0.0011	Pass
Color Rendering Index (CRI)	Solid State	Ra ≥ 80 R9 >0	Ra =93.3 R9=61	Pass
Color Angular Uniform	Directional Solid State Indoor Luminaires	The variation of chromaticity shall be within 0.006 from the weighted average point on the CIE 1976(u',v') diagram	0.0015	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	Solid State Indoor Luminaires	$\Delta u'v' \leq 0.007$	Max.0.0032in LM-80 report	Pass
Source Start Time	Solid State	<750 ms	154ms	Pass
Power Factor	Solid State	Total luminaire input power ≤ 5 watts: PF ≥ 0.5 Total luminaire input power > 5 watts: PF ≥ 0.7	0.9409	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	120.20Hz	Pass
Light Source Replaceability	Solid State	LED light engines or retrofit kits shall make use of electrical interconnects that allow for consumer replacement of the engine or kit without the cutting of wires or the use of solder.	N/A	N/A
Driver Replaceability	Solid State: Directional	Drivers shall be accessible and removable by an electrician without the cutting of wires and without damage to the luminaire housing, trim, decorative elements or the carpentry (e.g., ceilingdrywall) to which theluminaire is attached.	N/A	N/A
Maximum Measured Driver Case	Solid State	shall not exceed the driver manufacturer's maximum recommended temperature	45.9°C	Pass



Temperature		during in situ operation. ≤ 105 °C		
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70≥50,000 hrs ≤ 105°C	76.4°C	Pass
Electronic Driver Safety	Solid State: Directional	Demonstrate compliance with ANSI/UL 1310-2010, ANSI/UL 2108-2004, ANSI/UL 8750-2009, as applicable.	Driver safety report has been verified	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 noise above 24dBA at 1 meter or less at the minimum output.	Pass	Pass
Warranty Requirements	Solid State	incorporating replaceable drivers: ≥ 3 years incorporating non-replaceable drivers: ≥ 5 years	5 years	Pass
Lighting Toxics Reduction Requirements	Solid State	Luminaires and lamps shall not exceed: 1000 ppm: Mercury, Lead, Hexavalent Chromium, PBB and PBDE 100 ppm: Cadmium	RoHS report has been verified	Pass
CCT	Solid State	Packaging shall clearly describe the nominal color designation in units of Kelvin (e.g. 2700K, 3000K).	2700K,3000K, 3500K	Pass



2.2.1 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2020-04-22	Test Ambient:	25.0 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LRKT311W/3571W-3CT- 27-35(0%,2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE200410-D1	120.0	60	0.0726	8.195	0.9409

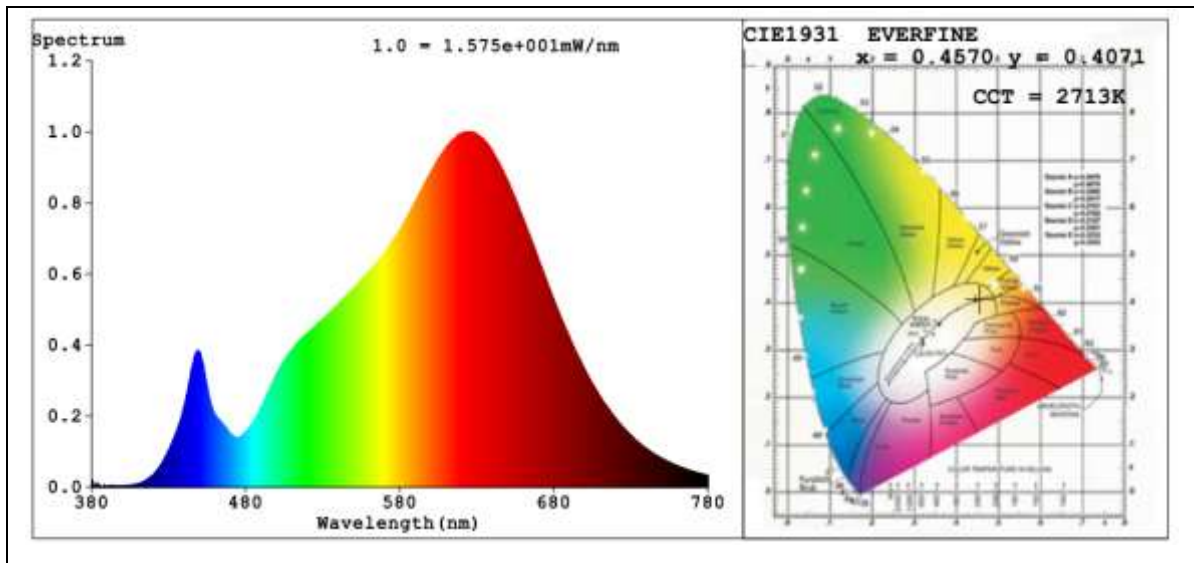
Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	93.3
R9	61
CCT (K)	2713
Duv	-0.0011

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	702.77
Luminous Efficacy (lm/W)	85.76
Beam Angle°	98.3
Center Beam Candle Power (cd)	289

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.4570$ $y=0.4071$ $u'=0.2622$ $v'=0.5256$

CCT=2713K (Duv=-0.0011) Dominant WL:Ld =584.5nm Purity=59.4%

Peak WL:Lp=622.5nm FWHM=145.9nm

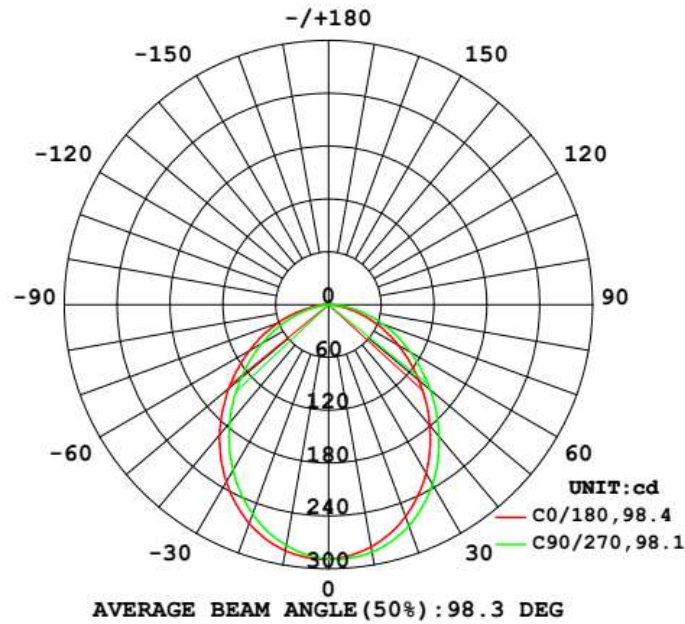
Render Index:Ra=93.3 Render Index:AvgR =91.1

R1 =94 R2 =96 R3 =98 R4 =94 R5 =94 R6 =96 R7 =92

R8 =83 R9 =61 R10=91 R11=96 R12=89 R13=95 R14=98 R15=90

Zonal Lumen Tabulation

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	216.5	30.8%
0-40	345.9	49.2%
0-60	578.1	82.3%
60-90	124.5	17.7%
70-100	48.8	6.9%
90-120	0.1	0%
0-90	702.6	100%
90-180	0.1	0%
0-180	702.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.2	3.9%	90-100	0.1	0%
10-20	76.7	10.9%	100-110	0	0%
20-30	112.6	16.0%	110-120	0	0%
30-40	129.4	18.4%	120-130	0.0	0%
40-50	126.0	17.9%	130-140	0.0	0%
50-60	106.2	15.1%	140-150	0.0	0%
60-70	75.8	10.8%	150-160	0.0	0%
70-80	40.1	5.7%	160-170	0.0	0%
80-90	8.7	1.2%	170-180	0.0	0%



Certificate#4703.02

Table--1

UNIT: cd

C (DEG) θ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5		
0	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289		
5	286	286	287	288	289	290	290	290	288	288	287	285	285	284	284	284		
10	279	280	282	284	285	287	287	287	284	283	281	279	278	276	276	276		
15	269	271	273	277	278	281	281	281	276	274	272	268	267	264	264	264		
20	256	258	260	265	267	271	271	271	264	262	260	255	253	249	249	250		
25	240	242	245	251	253	258	258	257	250	247	244	238	236	232	232	233		
30	221	224	227	234	236	242	242	241	233	230	226	219	217	212	212	213		
35	201	204	207	214	217	223	224	223	213	210	207	199	197	192	191	193		
40	179	182	185	193	196	202	203	202	193	189	186	178	175	169	169	170		
45	157	160	163	171	173	180	181	180	171	167	163	155	153	147	147	148		
50	134	137	140	148	151	158	159	158	148	145	141	133	130	124	124	125		
55	112	115	118	126	129	135	136	135	125	122	118	111	108	102	102	103		
60	91.1	93.9	97.1	104	107	113	114	113	103	100	96.5	89.0	86.6	81.3	81.2	82.3		
65	71.1	74.1	77.2	84.3	86.5	91.4	92.5	91.8	82.2	79.0	75.4	68.2	65.9	60.9	60.9	62.1		
70	51.7	54.5	57.7	64.4	66.6	72.1	72.4	71.4	61.6	58.5	55.1	48.1	46.0	41.4	41.6	42.8		
75	33.3	36.0	39.0	45.4	47.5	52.5	52.6	51.4	42.0	39.0	35.8	29.5	27.6	23.5	23.7	25.0		
80	16.6	18.9	21.4	27.2	29.0	33.7	33.5	32.3	23.4	21.0	18.4	13.1	11.7	8.49	8.69	9.58		
85	3.49	4.74	6.62	10.5	11.3	15.7	15.5	14.4	7.46	5.88	4.43	1.86	1.33	0.18	0.24	0.54		
90	0.00	0.00	0.01	0.97	1.16	2.81	2.69	2.22	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
150	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
155	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
170	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		



2.2.2 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2020-04-22	Test Ambient:	25.0 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LRKT311W/3571W-3CT- 27-35(50%,3000K)		

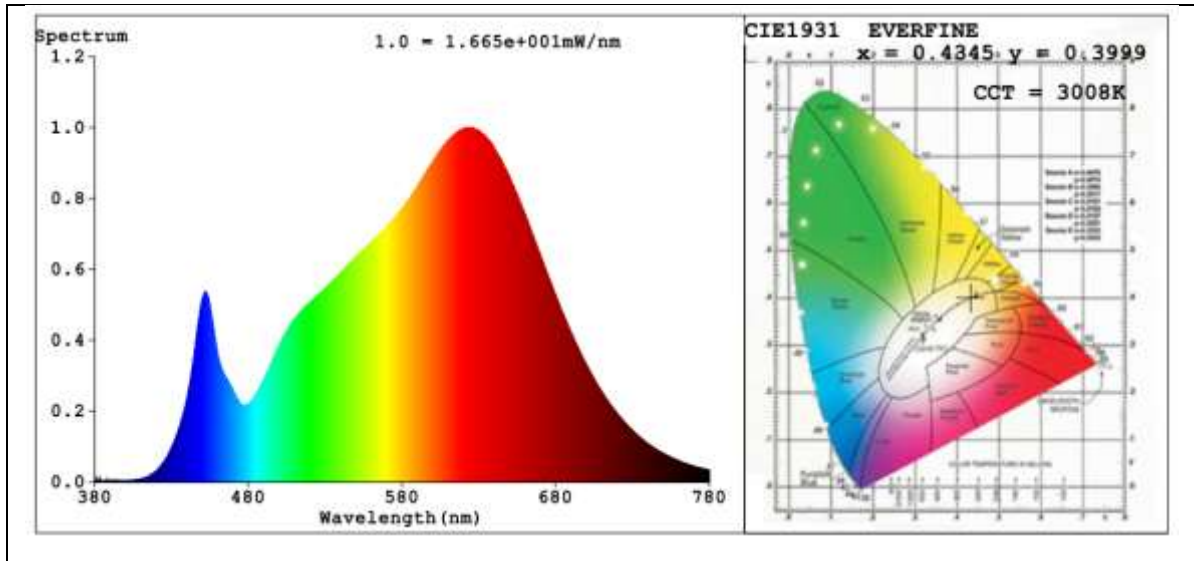
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE200410-D1	120.0	60	0.0714	8.053	0.9403

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	94.3
R9	68
CCT (K)	3008
Duv	-0.00013
Total Luminous (lm)	806.8
Luminous Efficacy (lm/W)	100.19

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: x=0.4345 y=0.3999/u'=0.2508 v'=0.5194

CCT=3008K(Duv=-0.0013) Dominant WL:Ld =583.3nm Purity=50.4%

Peak WL:Lp=622.5nm FWHM=163.9nm

Render Index:Ra=94.3 Render Index:AvgR =92.1

R1 =95 R2 =97 R3 =98 R4 =95 R5 =95 R6 =96 R7 =93

R8 =86 R9 =68 R10=92 R11=96 R12=85 R13=96 R14=98 R15=92



2.2.3 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2020-04-22	Test Ambient:	25.0 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LRKT311W/3571W-3CT- 27-35(100%,3500K)		

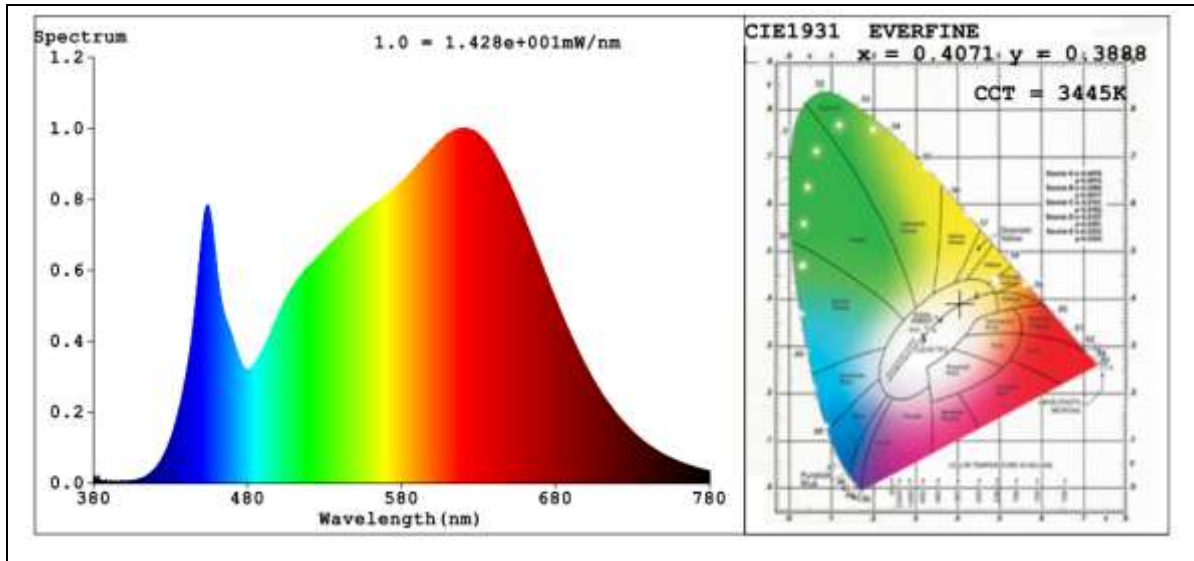
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
JCE200410-D1	120.0	60	0.0738	8.354	0.9437

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	94.2
R9	69
CCT (K)	3445
Duv	-0.0012
Total Luminous (lm)	774.1
Luminous Efficacy (lm/W)	92.66

Spectral Power Distribution and Chromaticity Diagram



Colorimetric Parameters

Colorimetric Parameters

Chromaticity Coordinate: $x=0.4071$ $y=0.3888$ / $u'=0.2377$ $v'=0.5107$

CCT=3445K (Duv=-0.0012) Dominant WL:Ld =581.6nm Purity=38.9%

Peak WL:Lp=620.6nm FWHM=179.0nm

Render Index:Ra=94.2 Render Index:AvgR =91.6

R1 =95 R2 =97 R3 =97 R4 =94 R5 =94 R6 =95 R7 =94

R8 =87 R9 =69 R10=92 R11=94 R12=79 R13=96 R14=98 R15=92



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	2020-04-22	Test Ambient	25.1°C
Sample No.	Maximum $\Delta u'v'$		
JCE200410-D1	0.0013		

Gamma\C	CIE u'	CIE v'	$\Delta u'v'$	CIE u'	CIE v'	$\Delta u'v'$
-52	0.2625	0.5255	0.0013	0.2625	0.5251	0.0013
-51	0.2625	0.5255	0.0013	0.2625	0.5252	0.0013
-50	0.2625	0.5255	0.0013	0.2625	0.5252	0.0013
-49	0.2627	0.5255	0.0011	0.2627	0.5252	0.0011
-48	0.2627	0.5255	0.0011	0.2627	0.5252	0.0011
-47	0.2627	0.5255	0.0011	0.2627	0.5252	0.0011
-46	0.2629	0.5256	0.0009	0.2628	0.5252	0.001
-45	0.2629	0.5256	0.0009	0.2628	0.5252	0.001
-44	0.2629	0.5255	0.0009	0.2628	0.5252	0.001
-43	0.2629	0.5255	0.0009	0.2628	0.5252	0.001
-42	0.263	0.5256	0.0008	0.263	0.5253	0.0008
-41	0.2631	0.5256	0.0007	0.263	0.5252	0.0008
-40	0.2631	0.5256	0.0007	0.263	0.5252	0.0008
-39	0.2631	0.5255	0.0007	0.263	0.5253	0.0008
-38	0.2632	0.5255	0.0006	0.2632	0.5253	0.0006
-37	0.2632	0.5255	0.0006	0.2631	0.5253	0.0007
-36	0.2632	0.5255	0.0006	0.2631	0.5252	0.0007
-35	0.2632	0.5255	0.0006	0.2632	0.5252	0.0006
-34	0.2632	0.5255	0.0006	0.2631	0.5252	0.0007
-33	0.2632	0.5255	0.0006	0.2631	0.5252	0.0007
-32	0.2633	0.5255	0.0005	0.2633	0.5253	0.0005
-31	0.2634	0.5255	0.0004	0.2633	0.5252	0.0005
-30	0.2634	0.5255	0.0004	0.2633	0.5252	0.0005
-29	0.2634	0.5254	0.0004	0.2633	0.5252	0.0005
-28	0.2633	0.5254	0.0005	0.2633	0.5252	0.0005
-27	0.2633	0.5254	0.0005	0.2632	0.5252	0.0006
-26	0.2635	0.5254	0.0003	0.2634	0.5252	0.0004
-25	0.2635	0.5254	0.0003	0.2634	0.5252	0.0004
-24	0.2635	0.5254	0.0003	0.2634	0.5251	0.0005



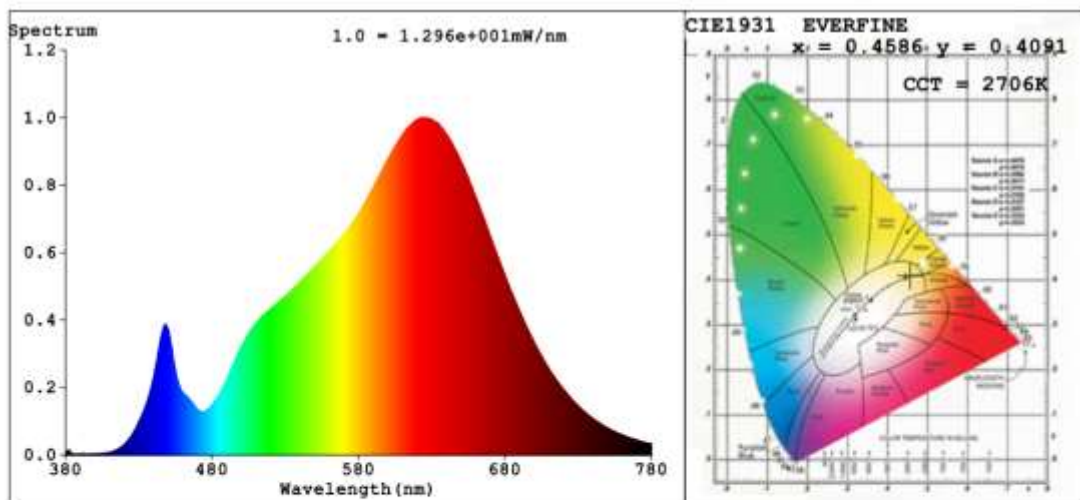
-23	0.2634	0.5253	0.0004	0.2634	0.5252	0.0004
-22	0.2634	0.5253	0.0004	0.2634	0.5251	0.0005
-21	0.2634	0.5253	0.0004	0.2633	0.5251	0.0006
-20	0.2634	0.5253	0.0004	0.2634	0.5251	0.0005
-19	0.2634	0.5253	0.0004	0.2633	0.5251	0.0006
-18	0.2635	0.5253	0.0003	0.2635	0.5251	0.0004
-17	0.2635	0.5252	0.0004	0.2635	0.5251	0.0004
-16	0.2635	0.5252	0.0004	0.2635	0.5251	0.0004
-15	0.2635	0.5252	0.0004	0.2635	0.525	0.0005
-14	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
-13	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
-12	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
-11	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
-10	0.2635	0.5251	0.0004	0.2634	0.525	0.0006
-9	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
-8	0.2635	0.5251	0.0004	0.2634	0.5249	0.0006
-7	0.2635	0.5251	0.0004	0.2634	0.5249	0.0006
-6	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
-5	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
-4	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
-3	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
-2	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
-1	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
0	0.2638	0.5254	0	0.2638	0.5254	0
1	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
2	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
3	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
4	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
5	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
6	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
7	0.2635	0.5251	0.0004	0.2634	0.525	0.0006
8	0.2635	0.5251	0.0004	0.2634	0.5249	0.0006
9	0.2635	0.5251	0.0004	0.2634	0.5249	0.0006
10	0.2634	0.5251	0.0005	0.2634	0.5249	0.0006
11	0.2635	0.5251	0.0004	0.2634	0.525	0.0006
12	0.2635	0.5251	0.0004	0.2634	0.525	0.0006
13	0.2635	0.5251	0.0004	0.2634	0.525	0.0006
14	0.2635	0.5252	0.0004	0.2634	0.525	0.0006
15	0.2635	0.5251	0.0004	0.2635	0.525	0.0005
16	0.2635	0.5252	0.0004	0.2635	0.525	0.0005
17	0.2635	0.5252	0.0004	0.2635	0.525	0.0005



18	0.2635	0.5252	0.0004	0.2635	0.525	0.0005
19	0.2635	0.5252	0.0004	0.2635	0.5251	0.0004
20	0.2636	0.5252	0.0003	0.2635	0.5251	0.0004
21	0.2636	0.5252	0.0003	0.2635	0.5251	0.0004
22	0.2636	0.5252	0.0003	0.2635	0.5251	0.0004
23	0.2636	0.5253	0.0002	0.2635	0.5251	0.0004
24	0.2636	0.5253	0.0002	0.2635	0.5251	0.0004
25	0.2636	0.5253	0.0002	0.2635	0.5251	0.0004
26	0.2636	0.5253	0.0002	0.2635	0.5252	0.0004
27	0.2636	0.5253	0.0002	0.2636	0.5252	0.0003
28	0.2636	0.5253	0.0002	0.2635	0.5252	0.0004
29	0.2636	0.5253	0.0002	0.2635	0.5252	0.0004
30	0.2636	0.5253	0.0002	0.2635	0.5252	0.0004
31	0.2636	0.5254	0.0002	0.2633	0.5252	0.0005
32	0.2634	0.5253	0.0004	0.2634	0.5252	0.0004
33	0.2634	0.5254	0.0004	0.2634	0.5252	0.0004
34	0.2634	0.5254	0.0004	0.2633	0.5252	0.0005
35	0.2634	0.5254	0.0004	0.2633	0.5252	0.0005
36	0.2634	0.5254	0.0004	0.2633	0.5252	0.0005
37	0.2634	0.5254	0.0004	0.2633	0.5253	0.0005
38	0.2634	0.5254	0.0004	0.2633	0.5253	0.0005
39	0.2634	0.5254	0.0004	0.2633	0.5253	0.0005
40	0.2634	0.5254	0.0004	0.2633	0.5253	0.0005
41	0.2632	0.5254	0.0006	0.2631	0.5252	0.0007
42	0.2632	0.5253	0.0006	0.2631	0.5252	0.0007
43	0.2631	0.5254	0.0007	0.263	0.5252	0.0008
44	0.2631	0.5254	0.0007	0.2631	0.5252	0.0007
45	0.2631	0.5253	0.0007	0.263	0.5252	0.0008
46	0.2631	0.5253	0.0007	0.263	0.5252	0.0008
47	0.2631	0.5253	0.0007	0.263	0.5252	0.0008
48	0.2629	0.5253	0.0009	0.2628	0.5252	0.001
49	0.2629	0.5253	0.0009	0.2628	0.5252	0.001
50	0.2628	0.5253	0.001	0.2627	0.5252	0.0011
51	0.2628	0.5253	0.001	0.2627	0.5252	0.0011
52	0.2628	0.5253	0.001	0.2627	0.5252	0.0011

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
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Test date	2020-04-22		Test Ambient:	25.1°C
Dimmer Technology			Forward phase-cut	
Sample No.			Maximum Level	Minimum Level
JCE200410-D1	Input: 120.0 V / 60 Hz	Light outout(Lumen)	686.5	52.87
		Percentage	97.68%	7.70%



Colorimetric Parameters

Chromaticity Coordinate: $x=0.4586$ $y=0.4091$ / $u'=0.2624$ $v'=0.5266$
 CCT=2706K (Duv=-0.0005) Dominant WL:Ld =584.3nm Purity=60.4%
 Peak WL:Lp=624.4nm FWHM=146.1nm
 Render Index:Ra=93.6 Render Index:AvgR =91.3
 R1 =94 R2 =96 R3 =97 R4 =95 R5 =94 R6 =96 R7 =93
 R8 =83 R9 =63 R10=91 R11=96 R12=89 R13=95 R14=98 R15=90

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

Dimmer	Peak Noise Reading (dBA)	Test Condition	Distance between the microphone and the UUT
LUTRON MACL-153M	22.2	Dimmer adjusted to lowest light output	< 1 m



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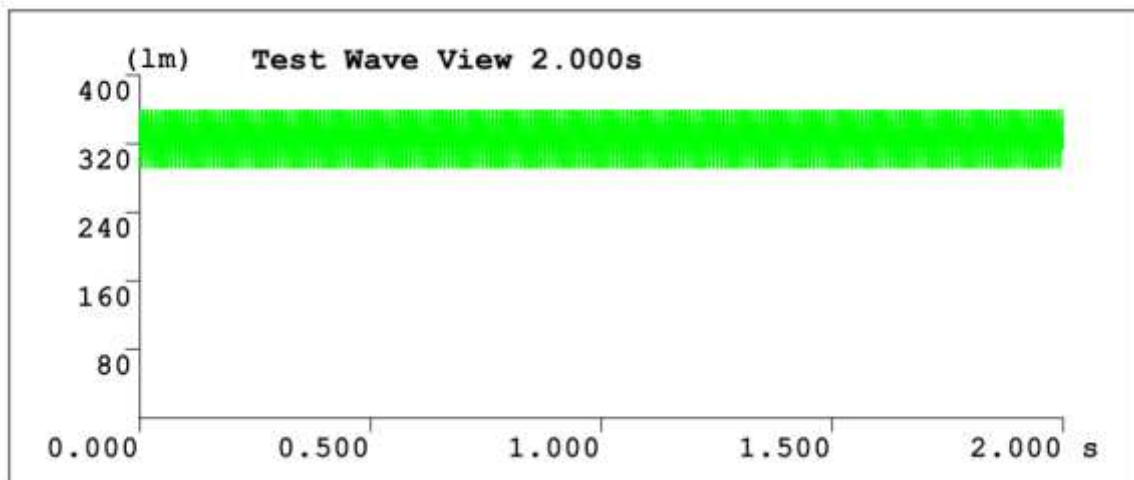
Dimming Technology	phase-cut
Dimmer	LUTRON MACL-153M

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
Maximum conduction	0.052	0.539
Intermediate conduction	0.096	0.695
Minimum conduction	0.406	0.460



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	2020-04-22	Test Ambient:	25.1°C
Sample No.	Operating Frequency (Hz)		
JCE200410-D1	120.20		

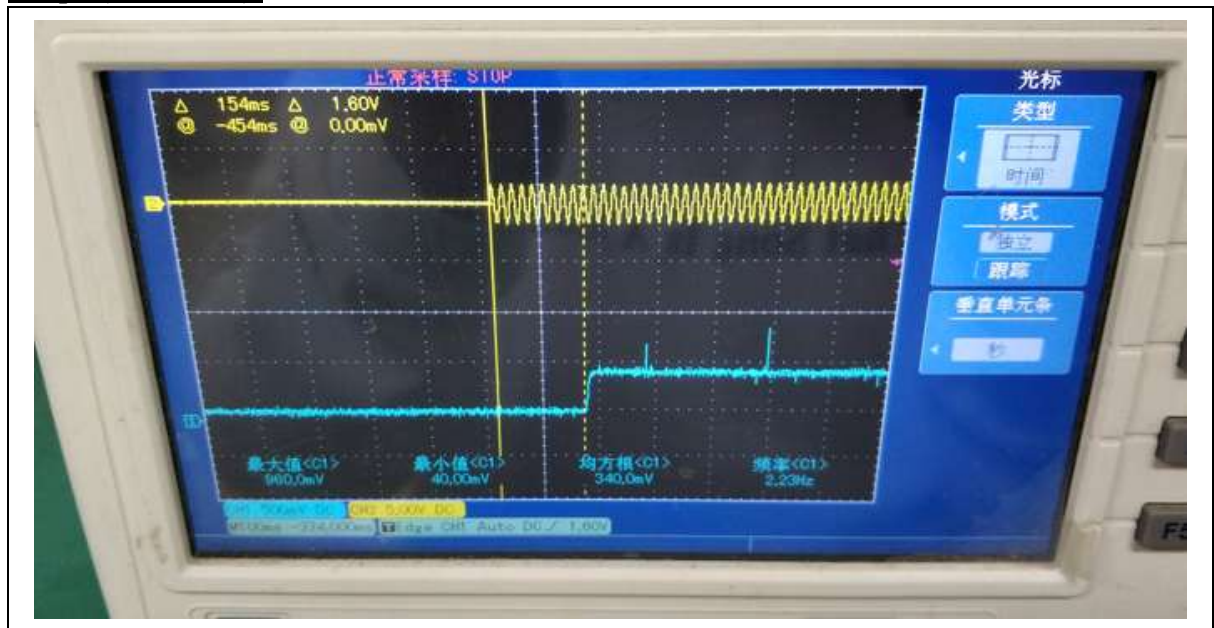




2.7 Starting Time <i>(Refer to Work Instruction QD28)</i>	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2
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Test date	2020-04-22	Test Ambient:	25.1°C
Sample No.	Start Time (ms)		
JCE200410-D1	154		

Graph (Start Time):





2.8 Transient Protection Test <i>(Refer to Work Instruction QD34)</i>	ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.2
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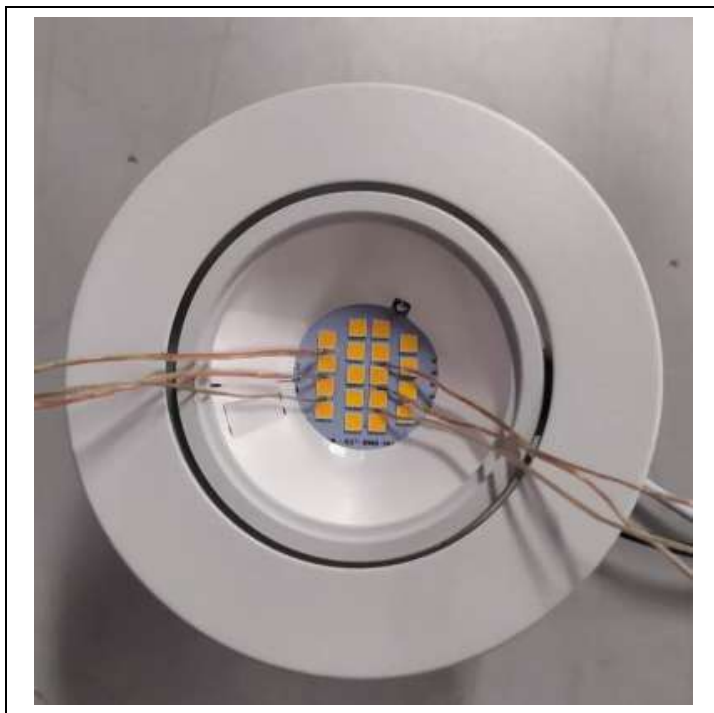
Test voltage: 120V,60Hz

Test date	2020-04-22	Test Ambient	25.1°C
Sample No.		Transient Protection Test - Seven Strikes	
JCE200410-D1		Survival	

2.9 In-Situ Temperature Measurement Test (ISTMT)	UL1598-2008, 3rd Edition
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Test date	2020-04-22	Test Ambient	25.1°C
Input Vol./Frequency	120 V / 60 Hz	Output Current of Single LED(mA)	70
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum permitted Ts temperature for L70 ≥ 50,000 hrs (°C)
JCE200410-D1	SAWxC22B-xx	76.4	105

In-Situ Picture - Ts:





2.10 Maximum Measured Ballast or Driver Case Temperature	UL1598-2008, 3rd Edition
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Test date	2020-04-22	Test Ambient	25.1°C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
JCE200410-D1	45.9	105	

In-Situ Picture - Ts:





2.11 Off-State Power Consumption:	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2
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Test date	2020-04-22	Test Ambient:	25.0 °C
Model Number	LRKT311W/3571W-3CT-27-3 5(0%,2700K)	Stabilization Time (min)	90

Electrical Measurement – when the luminaires turned off:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)
JCE200410-D1	120.0	60	0	0



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-705	D204 Standard Lamp	2020-02-06	2021-02-05
ST-R-704	Power Meter for Integrating Sphere	2020-01-05	2021-01-04
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	D908S Standard Lamp	2020-02-11	2021-02-10
ST-R-711	Power Meter for Goniophotometer	2020-01-05	2021-01-04
ST-R-720	Digital Luxmeter	2020-01-05	2021-01-04
ST-R-622	Oscillograph	2020-01-05	2021-01-04
ST-R-721	EMS61000-12C	2020-01-05	2021-01-04
ST-R-725	LFA-3000	2020-01-05	2021-01-04
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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