



## Energy Star Test Report

For

# L-TECH CORPORATION

(Brand Name: N/A)

Shaogangtou District, Qiaotou Town, Dongguan City

**Model name(s):**

**LJKT564AS-2790 LJKT564AS-3090**

**LJKT564AS-4090 LJKT564AS-5090**

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

**Type of Luminaire:** Downlights

**Report Date:** 2019-11-20

Ningbo TengLi Testing Co., Ltd

**Prepared By:** 2nd floor, Block B, Ningbo Testing and Certification Base, No. 66 Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang

Test & Report By:

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Review By:

*Johnson Sun*

Manager: Johnson Sun

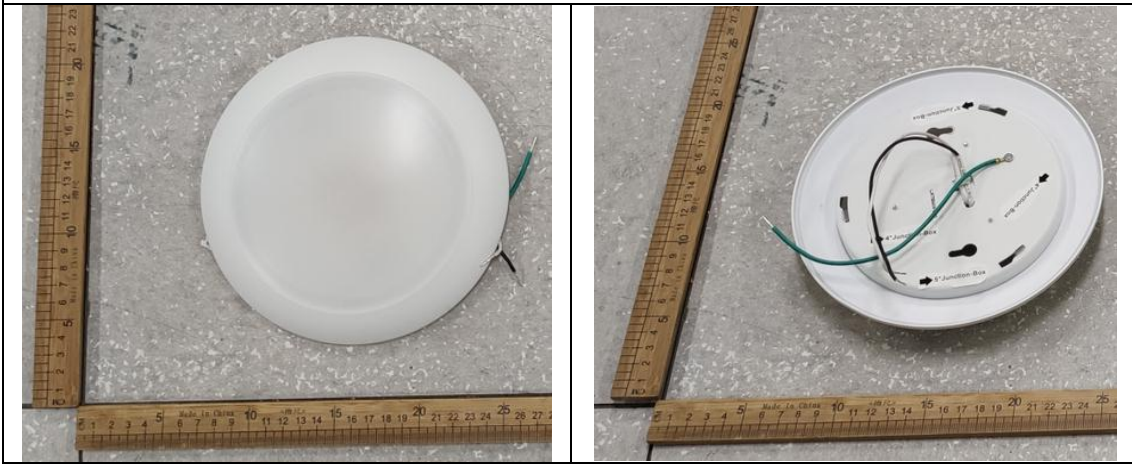
Note: 1.The results contained in this report pertain only to the tested samples.  
2.This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



<b>1.1 Product Information:</b>		
Model Number	LJKT564AS-2790 LJKT564AS-3090 LJKT564AS-4090 LJKT564AS-5090	
Remark	N/A	
Representative (Tested) Model	LJKT564AS-2790	
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)	Downlights	
LED Manufacturer	Samsung Electronics Co., LTD	
LED Model	SPMWHx229xxxxxxxxx	
Dimming	Dimmable	
Sample Number	JCE190816-H-B1(2700K)	
Date of Receipt	Nov.12,2019	
Luminaire Aperture (for Inseparable SSL Luminaire)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

<b>1.2 Rated Values:</b>	
Rated Voltage / Frequency	120Vac, 50/60Hz
Nominal Power	16W
Rated Initial Lamp Lumen	1020lm
Declared CCT	2700K,3000K,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> </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 C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> <li>7. UL1993 4<sup>th</sup> Edition, Self-Ballasted Lamps and Lamp Adapters</li> <li>8. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2</li> </ol>
Reference Work Instruction	QD25
Remark	<p>Below test and data are not covered by NVLAP accreditation:</p> <ul style="list-style-type: none"> <li>- Operating Frequency</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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , 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  $1\text{ }^{\circ}$  vertical intervals and  $22.5\text{ }^{\circ}$  horizontal intervals.

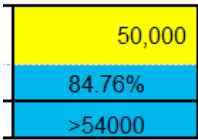
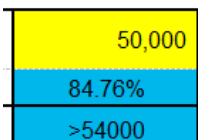
### 2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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	$\leq$ Rated Wattage	15.38W	Pass
Luminous Efficacy	Downlights	$\geq 55$ lm/W	66.43lm/W	Pass
Luminaire Minimum Light Output	Downlights	$\leq 4.5''$ aperture: 345 lumens $> 4.5''$ aperture: 575 lumens	1021.7lm	Pass
Luminaire Zonal Lumen Density Requirement	Downlights	$\geq 75\%$ of total initial lumens within the 0-60 °zone	76.3	Pass
Correlated Color Temperature (CCT)	Solid State	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	2715K Duv=-0.0012	Pass
Color Rendering Index (CRI)	Solid State	$R_a \geq 80$ $R_9 > 0$	$R_a = 94.0$ $R_9 = 63$	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	0.0006	Pass
Lumen Maintenance	Solid State Option 1:	L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for inseparable luminaires		Pass
Light Source Life	Solid State	L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for		Pass



		inseparable luminaires		
Color Maintenance	Solid State Indoor Luminaires	$\Delta u'v' \leq 0.007$	Max.0.0026in LM-80 report	Pass
Source Start Time	Solid State	<750 ms	50.0ms	Pass
Power Factor	Solid State	Total luminaire input power $\leq 5$ watts: PF $\geq 0.5$ Total luminaire input power $> 5$ watts: PF $\geq 0.7$	0.9944	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 $\geq 120$ Hz	120.10Hz	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 the luminaire is attached.	N/A	N/A



Maximum Measured Driver Case Temperature	Solid State	shall not exceed the driver manufacturer's maximum recommended temperature during in situ operation. $\leq 105\text{ }^{\circ}\text{C}$	62.2 $^{\circ}\text{C}$	Pass
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70 $\geq$ 50,000 hrs $\leq 105\text{ }^{\circ}\text{C}$	60.3 $^{\circ}\text{C}$	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: $\geq 3$ years incorporating non-replaceable drivers: $\geq 5$ 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 4000K 5000K	Pass





<b>2.2 Electrical, Photometric and Chromaticity Measurements</b> (Refer to Work Instruction QD25)	<b>IES LM-79 2008</b>
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<b>Test date</b>	2019-11-13	<b>Test Ambient:</b>	25.0 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	LJKT564AS-2790		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JCE190816-H-B1	120.0	60	0.1289	15.38	0.9944

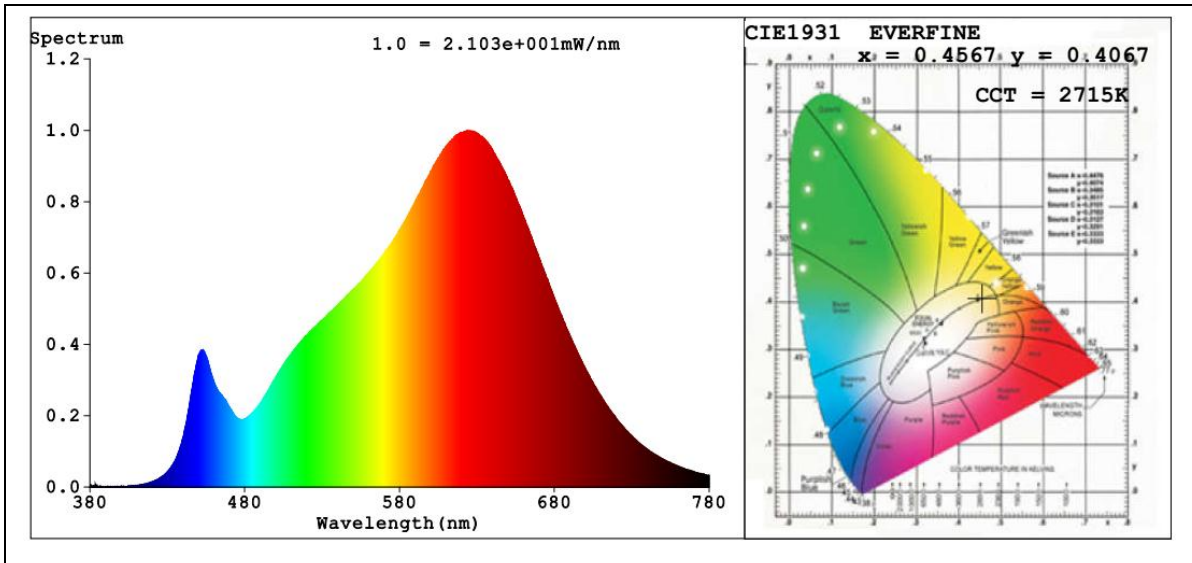
**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	94.0
R9	63
CCT (K)	2715
Duv	-0.0012

**Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1021.7
Luminous Efficacy (lm/W)	66.43
Beam Angle °	109.3
Center Beam Candle Power (cd)	358

**Spectral Power Distribution and Chromaticity Diagram**



**Colorimetric Parameters**

**Colorimetric Parameters**

Chromaticity Coordinate:  $x=0.4567 \quad y=0.4067/u'=0.2622 \quad v'=0.5254$

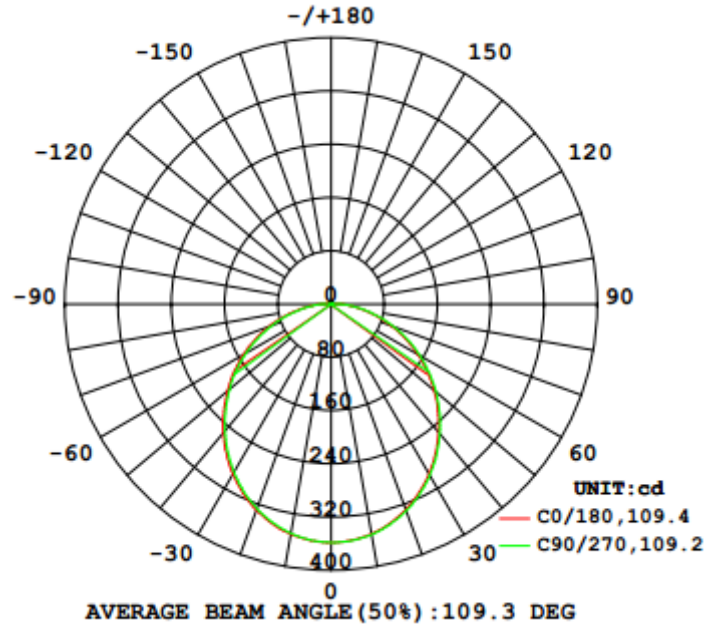
CCT=2715K (Duv=-0.0012) Dominant WL:Ld =584.5nm Purity=59.2%

Peak WL:Lp=624.1nm FWHM=145.1nm

Render Index: Ra=94.0 CRI=91.9

R1 =95	R2 =98	R3 =99	R4 =94	R5 =95	R6 =97	R7 =92	
R8 =83	R9 =63	R10=94	R11=96	R12=86	R13=96	R14=99	R15=90

**Zonal Lumen Tabulation**



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	274.2	26.8%
0-40	445.5	43.6%
0-60	779.4	76.3%
60-90	230.8	22.6%
70-100	111.2	10.9%
90-120	5.8	0.6%
0-90	1,010.2	98.9%
90-180	11.4	1.1%
0-180	1,021.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	33.8	3.3%	90-100	3.6	0.3%
10-20	96.2	9.4%	100-110	1.0	0.1%
20-30	144.1	14.1%	110-120	1.2	0.1%
30-40	171.3	16.8%	120-130	1.6	0.2%
40-50	175.6	17.2%	130-140	1.7	0.2%
50-60	158.4	15.5%	140-150	1.3	0.1%
60-70	123.2	12.1%	150-160	0.7	0.1%
70-80	76.6	7.5%	160-170	0.3	0%
80-90	31.0	3.0%	170-180	0.1	0%



Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5		
0	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358		
5	356	356	356	357	357	357	356	356	356	356	356	356	356	356	356	356		
10	350	351	351	351	351	351	351	351	351	350	350	350	350	350	350	351		
15	341	342	342	342	343	342	342	342	342	341	340	340	340	340	340	341		
20	328	329	330	330	330	330	330	329	329	328	327	327	327	327	327	328		
25	313	313	314	315	315	315	314	314	313	312	311	311	311	311	312	313		
30	294	295	296	296	297	297	296	295	295	294	293	292	292	293	293	294		
35	274	275	275	276	277	276	276	275	275	273	272	271	271	272	272	274		
40	251	252	253	254	254	254	254	253	252	251	249	248	248	249	250	251		
45	227	228	229	230	231	230	230	229	229	227	225	224	224	225	226	227		
50	202	203	204	205	206	206	205	204	204	202	200	199	199	200	201	202		
55	176	178	179	179	180	180	179	178	179	177	175	174	174	175	176	177		
60	150	151	152	153	154	154	153	152	152	151	149	148	148	148	149	151		
65	123	125	126	126	127	127	127	126	126	124	122	121	121	122	123	124		
70	96.8	98.0	99.1	99.9	101	101	100	99.3	99.3	97.7	96.2	95.2	95.2	95.7	96.4	97.4		
75	71.5	72.5	73.4	74.3	74.9	75.1	74.8	74.0	73.5	72.0	70.6	69.7	69.6	70.0	70.7	71.6		
80	47.3	48.1	48.9	49.6	50.2	50.5	50.5	49.8	49.4	48.1	46.9	46.0	46.0	46.3	46.8	47.5		
85	26.6	27.2	27.8	28.3	28.8	29.1	29.2	28.8	28.6	27.6	26.6	26.0	26.0	26.1	26.4	26.8		
90	11.8	12.2	12.6	13.0	13.3	13.4	13.4	13.1	13.1	12.5	11.9	11.5	11.4	11.5	11.6	11.8		
95	0.04	0.04	0.02	3.97	0.46	2.86	0.02	0.07	0.08	0.03	0.02	3.75	1.82	3.60	0.02	0.03		
100	0.58	0.37	1.41	1.71	1.74	1.69	1.46	0.25	0.34	0.24	1.17	1.33	1.36	1.38	1.24	0.49		
105	1.51	0.67	0.75	1.10	1.17	1.08	0.76	0.60	1.46	0.77	0.67	0.93	0.99	0.95	0.72	0.79		
110	1.87	1.39	0.43	0.82	0.98	0.85	0.58	1.26	1.83	1.43	0.66	0.80	0.84	0.82	0.84	1.28		
115	2.30	1.97	0.39	0.59	0.67	0.68	0.57	1.80	2.31	1.92	0.75	0.95	0.90	0.96	0.93	1.63		
120	2.52	2.50	1.51	0.43	0.50	0.46	1.07	2.20	2.62	2.26	1.83	0.89	0.38	0.83	1.33	1.91		
125	2.96	3.00	2.25	1.22	0.65	0.64	1.56	2.50	3.07	2.52	2.31	1.65	1.13	0.70	1.52	2.17		
130	3.28	3.52	2.79	1.09	1.11	0.83	1.69	2.69	3.23	2.81	2.63	1.24	1.50	1.01	1.68	2.40		
135	3.36	3.87	3.07	1.76	1.09	0.73	1.75	2.69	2.95	3.03	2.73	2.13	0.34	0.78	1.79	2.38		
140	3.28	3.79	3.16	0.77	1.55	0.82	1.79	2.55	2.77	3.09	2.60	1.54	1.85	0.67	1.66	2.28		
145	3.00	3.58	2.41	1.68	1.68	1.07	1.08	2.35	2.75	2.88	1.98	0.81	1.77	1.59	1.21	2.32		
150	2.33	2.47	2.73	2.32	1.76	1.73	1.71	1.49	2.59	2.41	2.00	0.34	1.29	0.98	0.54	1.36		
155	2.36	1.76	0.76	2.20	1.77	1.76	0.93	1.24	1.42	1.55	2.35	0.85	0.18	0.28	1.10	1.77		
160	1.40	0.07	1.44	1.54	1.79	1.62	1.03	0.57	2.03	1.99	0.89	2.13	1.26	1.35	1.77	1.05		
165	1.51	1.13	0.41	1.31	1.48	0.57	0.22	0.76	0.82	1.05	1.71	2.00	1.20	1.68	0.86	1.78		
170	1.14	0.32	0.08	0.42	0.42	0.29	0.37	1.33	1.11	1.12	1.39	1.27	1.10	1.63	0.60	0.80		
175	0.69	0.06	0.27	0.79	1.12	0.76	0.51	0.55	0.91	0.92	0.99	0.99	1.03	1.41	1.05	0.62		
180	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		



<b>2.4 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	2019-11-13	Test Ambient	25.1 °C
Sample No.		Maximum $\Delta u'v'$	
JCE190816-H-B1		0.0006	

Gamma\C	CIE u'	CIE v'	$\Delta u'v'$	CIE u'	CIE v'	$\Delta u'v'$
-55	0.2625	0.5247	0.0005	0.2627	0.5247	0.0003
-54	0.2626	0.5248	0.0004	0.2626	0.5246	0.0004
-53	0.2626	0.5248	0.0004	0.2627	0.5247	0.0003
-52	0.2626	0.5247	0.0004	0.2627	0.5246	0.0003
-51	0.2626	0.5247	0.0004	0.2627	0.5246	0.0003
-50	0.2626	0.5247	0.0004	0.2627	0.5246	0.0003
-49	0.2626	0.5247	0.0004	0.2627	0.5247	0.0003
-48	0.2627	0.5248	0.0003	0.2627	0.5246	0.0003
-47	0.2626	0.5247	0.0004	0.2627	0.5247	0.0003
-46	0.2626	0.5247	0.0004	0.2628	0.5247	0.0002
-45	0.2627	0.5247	0.0003	0.2628	0.5247	0.0002
-44	0.2627	0.5248	0.0003	0.2628	0.5247	0.0002
-43	0.2627	0.5247	0.0003	0.2628	0.5246	0.0002
-42	0.2627	0.5248	0.0003	0.2629	0.5247	0.0001
-41	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
-40	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
-39	0.2628	0.5247	0.0002	0.2629	0.5247	0.0001
-38	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
-37	0.2628	0.5247	0.0002	0.2629	0.5247	0.0001
-36	0.2628	0.5248	0.0002	0.2629	0.5247	0.0001
-35	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
-34	0.2628	0.5248	0.0002	0.2629	0.5247	0.0001
-33	0.2629	0.5247	0.0001	0.263	0.5247	0
-32	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
-31	0.2629	0.5247	0.0001	0.263	0.5247	0
-30	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
-29	0.2629	0.5247	0.0001	0.263	0.5247	0
-28	0.2629	0.5247	0.0001	0.263	0.5247	0
-27	0.2629	0.5247	0.0001	0.263	0.5247	0



-26	0.263	0.5247	0	0.263	0.5247	0
-25	0.2629	0.5247	0.0001	0.263	0.5247	0
-24	0.263	0.5247	0	0.263	0.5247	0
-23	0.263	0.5247	0	0.263	0.5247	0
-22	0.263	0.5247	0	0.263	0.5247	0
-21	0.263	0.5247	0	0.263	0.5247	0
-20	0.263	0.5247	0	0.263	0.5247	0
-19	0.263	0.5247	0	0.263	0.5247	0
-18	0.263	0.5247	0	0.263	0.5246	0.0001
-17	0.263	0.5247	0	0.263	0.5247	0
-16	0.263	0.5247	0	0.2631	0.5247	0.0001
-15	0.263	0.5247	0	0.2631	0.5246	0.0001
-14	0.263	0.5247	0	0.2631	0.5247	0.0001
-13	0.263	0.5247	0	0.2631	0.5247	0.0001
-12	0.263	0.5247	0	0.263	0.5246	0.0001
-11	0.2631	0.5247	0.0001	0.2631	0.5247	0.0001
-10	0.263	0.5247	0	0.263	0.5246	0.0001
-9	0.263	0.5247	0	0.2631	0.5247	0.0001
-8	0.2631	0.5247	0.0001	0.263	0.5246	0.0001
-7	0.263	0.5247	0	0.2631	0.5247	0.0001
-6	0.263	0.5247	0	0.2631	0.5246	0.0001
-5	0.2631	0.5247	0.0001	0.263	0.5247	0
-4	0.263	0.5247	0	0.2631	0.5247	0.0001
-3	0.2631	0.5247	0.0001	0.2631	0.5247	0.0001
-2	0.263	0.5247	0	0.2631	0.5246	0.0001
-1	0.263	0.5247	0	0.263	0.5247	0
0	0.263	0.5247	0	0.263	0.5247	0
1	0.2631	0.5246	0.0001	0.2631	0.5247	0.0001
2	0.2631	0.5247	0.0001	0.2631	0.5246	0.0001
3	0.2631	0.5247	0.0001	0.2631	0.5246	0.0001
4	0.2631	0.5247	0.0001	0.263	0.5246	0.0001
5	0.263	0.5247	0	0.263	0.5247	0
6	0.2631	0.5247	0.0001	0.263	0.5247	0
7	0.263	0.5247	0	0.263	0.5247	0
8	0.263	0.5247	0	0.263	0.5246	0.0001
9	0.263	0.5247	0	0.263	0.5246	0.0001
10	0.263	0.5247	0	0.2631	0.5247	0.0001
11	0.263	0.5247	0	0.263	0.5247	0
12	0.263	0.5247	0	0.263	0.5247	0
13	0.263	0.5247	0	0.263	0.5247	0
14	0.263	0.5247	0	0.263	0.5246	0.0001



15	0.263	0.5247	0	0.263	0.5247	0
16	0.263	0.5247	0	0.263	0.5247	0
17	0.263	0.5247	0	0.263	0.5247	0
18	0.263	0.5247	0	0.263	0.5246	0.0001
19	0.263	0.5247	0	0.2629	0.5247	0.0001
20	0.263	0.5247	0	0.263	0.5247	0
21	0.263	0.5247	0	0.263	0.5247	0
22	0.263	0.5247	0	0.263	0.5247	0
23	0.263	0.5247	0	0.263	0.5247	0
24	0.263	0.5247	0	0.2629	0.5247	0.0001
25	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
26	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
27	0.263	0.5247	0	0.2629	0.5247	0.0001
28	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
29	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
30	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
31	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
32	0.2629	0.5247	0.0001	0.2629	0.5247	0.0001
33	0.2629	0.5247	0.0001	0.2628	0.5247	0.0002
34	0.2629	0.5247	0.0001	0.2628	0.5247	0.0002
35	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
36	0.2628	0.5248	0.0002	0.2628	0.5247	0.0002
37	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
38	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
39	0.2628	0.5247	0.0002	0.2627	0.5247	0.0003
40	0.2628	0.5247	0.0002	0.2628	0.5247	0.0002
41	0.2627	0.5247	0.0003	0.2627	0.5247	0.0003
42	0.2628	0.5247	0.0002	0.2627	0.5247	0.0003
43	0.2627	0.5247	0.0003	0.2627	0.5247	0.0003
44	0.2627	0.5247	0.0003	0.2627	0.5247	0.0003
45	0.2627	0.5247	0.0003	0.2627	0.5247	0.0003
46	0.2627	0.5247	0.0003	0.2626	0.5247	0.0004
47	0.2627	0.5247	0.0003	0.2626	0.5247	0.0004
48	0.2627	0.5247	0.0003	0.2626	0.5247	0.0004
49	0.2626	0.5247	0.0004	0.2626	0.5247	0.0004
50	0.2626	0.5247	0.0004	0.2626	0.5247	0.0004
51	0.2626	0.5246	0.0004	0.2626	0.5247	0.0004
52	0.2625	0.5247	0.0005	0.2626	0.5247	0.0004
53	0.2626	0.5247	0.0004	0.2626	0.5247	0.0004
54	0.2626	0.5247	0.0004	0.2626	0.5247	0.0004
55	0.2625	0.5247	0.0005	0.2625	0.5246	0.0005



**Ningbo TengLi Testing Co., Ltd**

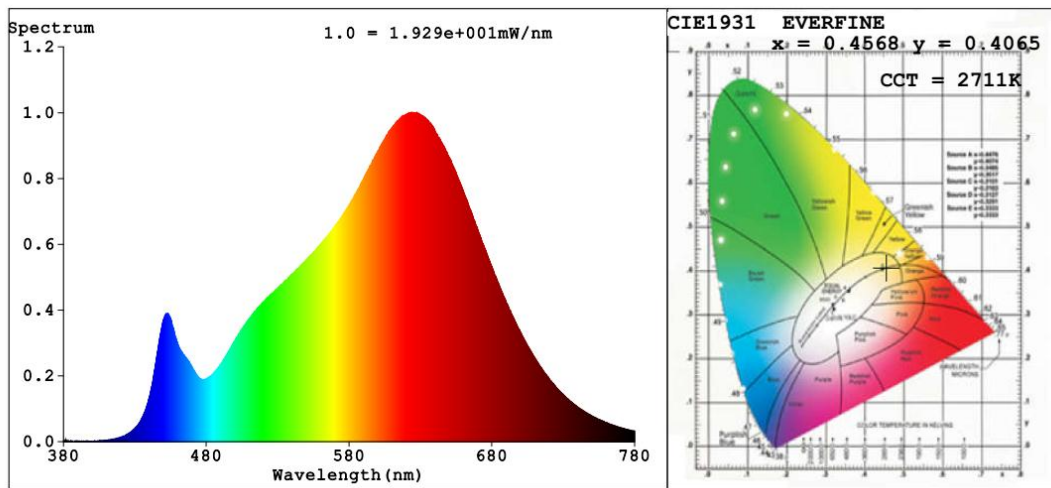
2nd floor, Block B, Ningbo Testing and Certification Base, No. 66  
Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang  
Tel: 86574-8783 6802  
Fax: 86574-8783 5902

56	0.2624	0.5247	0.0006	0.2625	0.5247	0.0005
57	0.2625	0.5247	0.0005	0.2624	0.5247	0.0006
58	0.2625	0.5247	0.0005	0.2625	0.5247	0.0005
59	0.2625	0.5246	0.0005	0.2625	0.5246	0.0005
60	0.2625	0.5247	0.0005	0.2624	0.5246	0.0006



<b>2.5 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>
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<b>Test date</b>	2019-11-13		<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>
JCE190816-H-B1	Input: 120.0 V / 60 Hz	Light outout(Lumen)	993.4	39.46
		Percentage	87.44%	4.42%



**Colorimetric Parameters**

Chromaticity Coordinate:  $x=0.4568$   $y=0.4065$  /  $u'=0.2624$   $v'=0.5253$   
 CCT=2711K (Duv=-0.0013) Dominant WL:Ld =584.6nm Purity=59.1%  
 Peak WL:Lp=627.6nm FWHM=145.0nm  
 Render Index: Ra=94.1 CRI=92.0  
 R1 =95 R2 =98 R3 =99 R4 =94 R5 =95 R6 =97 R7 =92  
 R8 =83 R9 =64 R10=95 R11=96 R12=86 R13=96 R14=99 R15=91

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

Dimmer	Peak Noise Reading (dBA)	Test Condition	Distance between the microphone and the UUT
LUTRON MACL-153M	21.6	Dimmer adjusted to lowest light output	< 1 m



<b>2.6 Flicker</b>	<b>NEMA 77-2017 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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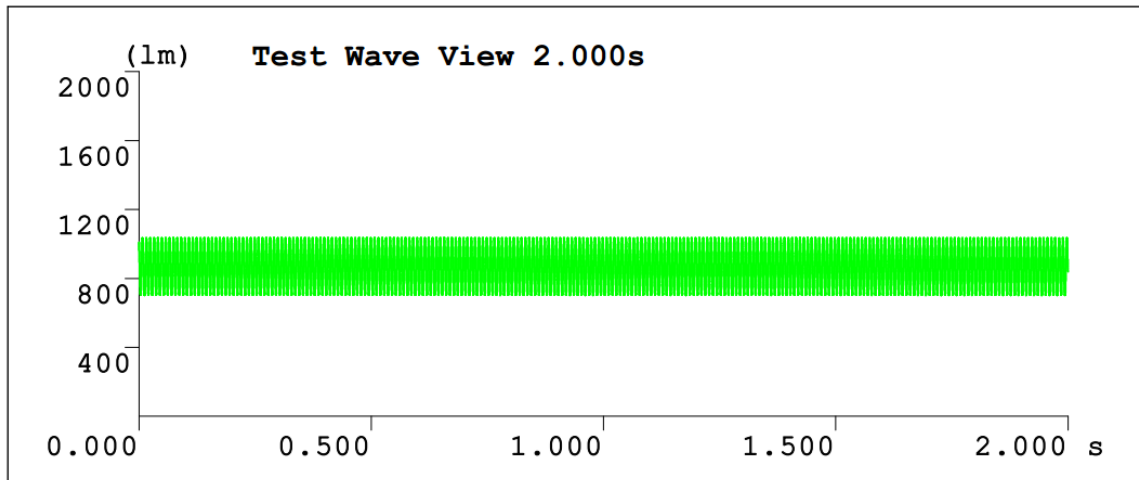
<b>Dimming Technology</b>	phase-cut
<b>Dimmer</b>	LUTRON MACL-153M

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
<b>Maximum conduction</b>	0.106	0.696
<b>Intermediate conduction</b>	0.344	0.906
<b>Minimum conduction</b>	0.000	0.00



<b>2.7 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 NVLAP accreditation</b>	

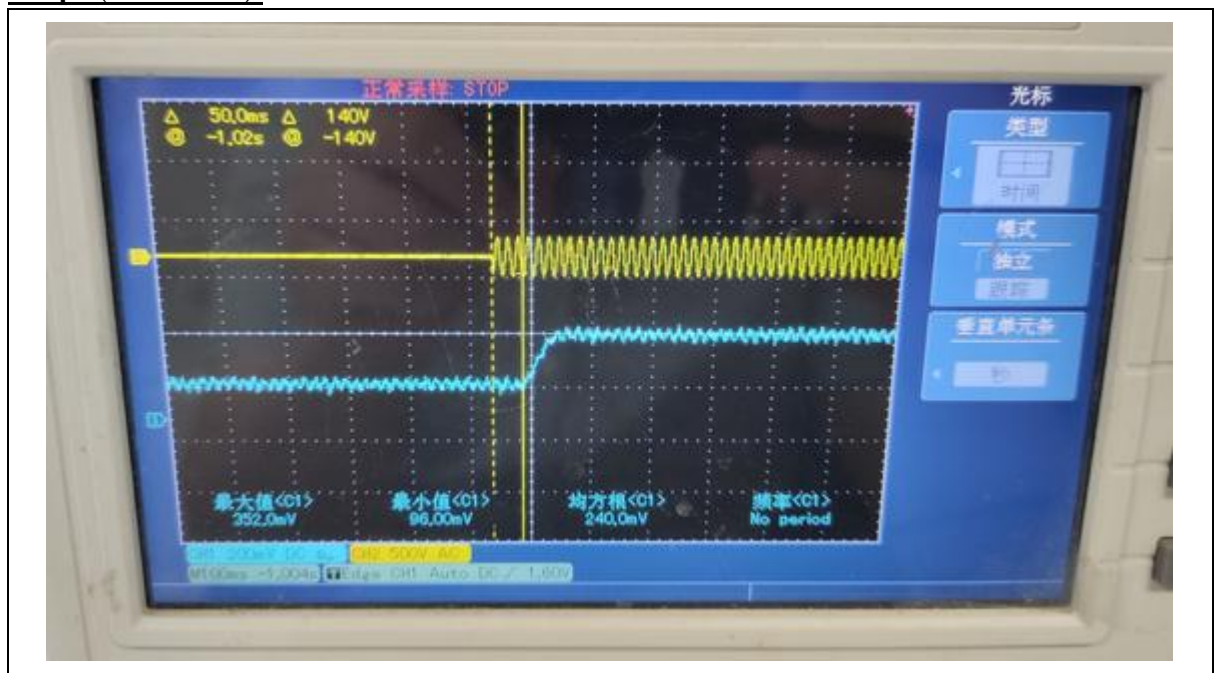
Test date	2019-11-13	Test Ambient:	25.1 °C
<b>Sample No.</b>		<b>Operating Frequency (Hz)</b>	
JCE190816-H-B1		120.10	



<b>2.8 Starting Time</b> <i>(Refer to Work Instruction QD28)</i>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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Test date	2019-11-13	Test Ambient:	25.1 °C
Sample No.	Start Time (ms)		
JCE190816-H-B1	50.0		

**Graph (Start Time):**





<b>2.9 Transient Protection Test</b> <i>(Refer to Work Instruction QD34)</i>	<b>ANSI/IEEE C62.41</b> <b>ENERGY STAR® Program Requirements</b> <b>for Luminaires – Version 2.2</b>
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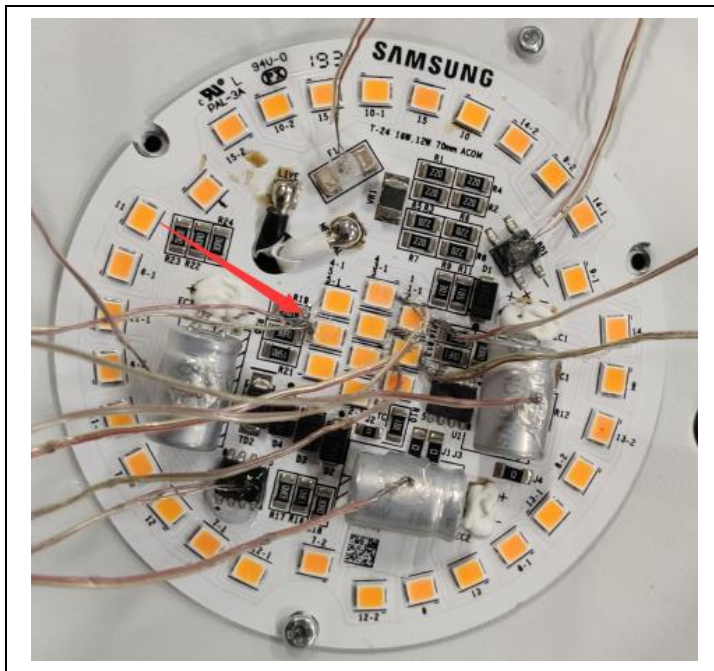
**Test voltage: 120V,60Hz**

Test date	2019-11-13	Test Ambient	25.1 °C
Sample No.		Transient Protection Test - Seven Strikes	
JCE190816-H-B1		Survival	

<b>2.10 In-Situ Temperature Measurement Test (ISTMT)</b>	<b>UL1598-2008, 3<sup>rd</sup> Edition</b>
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<b>Test date</b>	2019-11-13	<b>Test Ambient</b>	25.1 °C
<b>Input Vol./Frequency</b>	120 V / 60 Hz	<b>Output Current of Single LED(mA)</b>	100
<b>Sample No.</b>	<b>LED Package Model</b>	<b>Maximum Measured LED Ts Point Temperature ( °C)</b>	<b>Maximum permitted Ts temperature for L70 ≥ 50,000 hrs ( °C)</b>
JCE190816-H-B1	SPMWHx229xxxxxx xxx	60.3	105

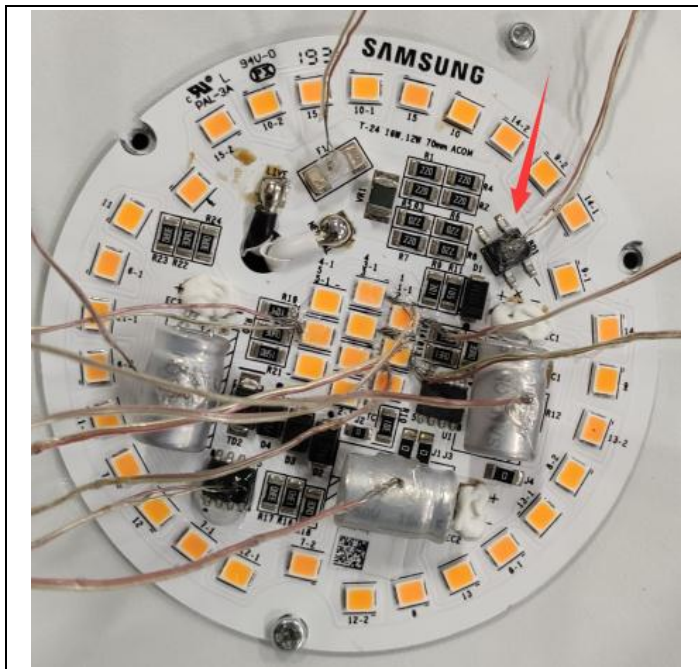
**In-Situ Picture - Ts:**



<b>2.11 Maximum Measured Ballast or Driver Case Temperature</b>	<b>UL1598-2008, 3<sup>rd</sup> Edition</b>
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Test date	2019-11-13	Test Ambient	25.1 °C
Sample No.	Maximum Measured Driver Case Temperature ( °C)	Maximum Driver Case Temperature Limited ( °C)	
JCE190816-H-B1	62.2	105	

**In-Situ Picture - Ts:**





<b>2.12 Off-State 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>	2019-11-13	<b>Test Ambient:</b>	25.0 °C
<b>Model Number</b>	LJKT564AS-2790	<b>Stabilization Time (min)</b>	90

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

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)
JCE190816-H-B1	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	2019-02-07	2020-02-06
ST-R-704	Power Meter for Integrating Sphere	2019-01-06	2020-01-05
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	D908S Standard Lamp	2019-02-12	2020-02-11
ST-R-711	Power Meter for Goniophotometer	2019-01-06	2020-01-05
ST-R-720	Digital Luxmeter	2019-01-06	2020-01-05
ST-R-622	Oscillograph	2019-01-06	2020-01-05
ST-R-721	EMS61000-12C	2019-01-06	2020-01-05
ST-R-725	LFA-3000	2019-01-06	2020-01-05
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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