

## **Energy Star Test Report**

For

### **L-TECH CORPORTION**

**(Brand Name: L-TECH CORP)**

SHAOGANGTOU DISTRICT.QIAOTOU TOWN.DONGGUAN  
CITY.GUANGDONG PROVINCE,CHINA

### **Downlights**

Model name(s): LRKT449W-EN-##90

Remark: "##" in the model name stands for different CCT as bellow:  
27=2700K,30=3000K,40=4000K,50=5000K

Representative (Tested) Model: LRKT449W-EN-2790

Model Different: All construction and rating are the same, except CCT

Test & Report By:

*Bill Luo*

Engineer: Bill Luo

Date: Oct.16,2017

Review By:

*Tommy Liang*

Manager: Tommy Liang

- 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 NVLAP, NIST,  
or any agency of the Federal Government.

**Laboratory: Standard-Tech Co. Ltd Testing Center**  
**NVLAP CODE: 201011-0**

Report Format Number STD/QR4910-A/1

Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

U.S. Department of Energy

**Lighting Facts™ Uniform LM-79 Reporting Template**

**Laboratory Information:**

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	Oct.16,2017
Test Report No.	GZE1709109-H-G
Laboratory Contact Name	Tommy Liang

**Product Information:**

Organization Name	L-TECH CORPORTION		
Brand Name	L-TECH CORP		
Model Number	LRKT449W-EN-##90		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlights		
Luminaire Aperture (for Downlightss)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

**Integrating Sphere**

**Goniophotometer**

**Electrical Measurements:**

	Output	Output	
Input Wattage	--	10.65	W
Input Current	--	0.0937	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9474	
Off-State Power	--	0	W

**Photometric Characteristics**

Total Initial Lumen Output	--	753.03	lm
Initial Lumen Efficacy	--	70.71	lm/w
Correlated color temperature / CCT	2753	--	K
Color rendering index / CRI	92.8	--	
R9 Value	57	--	
Duv	-0.0016	--	
<b>Luminous Intensity Distribution</b>			
Center beam candlepower (if applicable)		307	cd
Beam angle (if applicable)		101.5	°
Zonal lumens in the 0°-60° zone		84.5	%
Zonal lumens in the 60°-90° zone	-----	15.5	%
Zonal lumens in the 90°-120° zone		0	%
Zonal lumens in the 120°-180° zone		0	%

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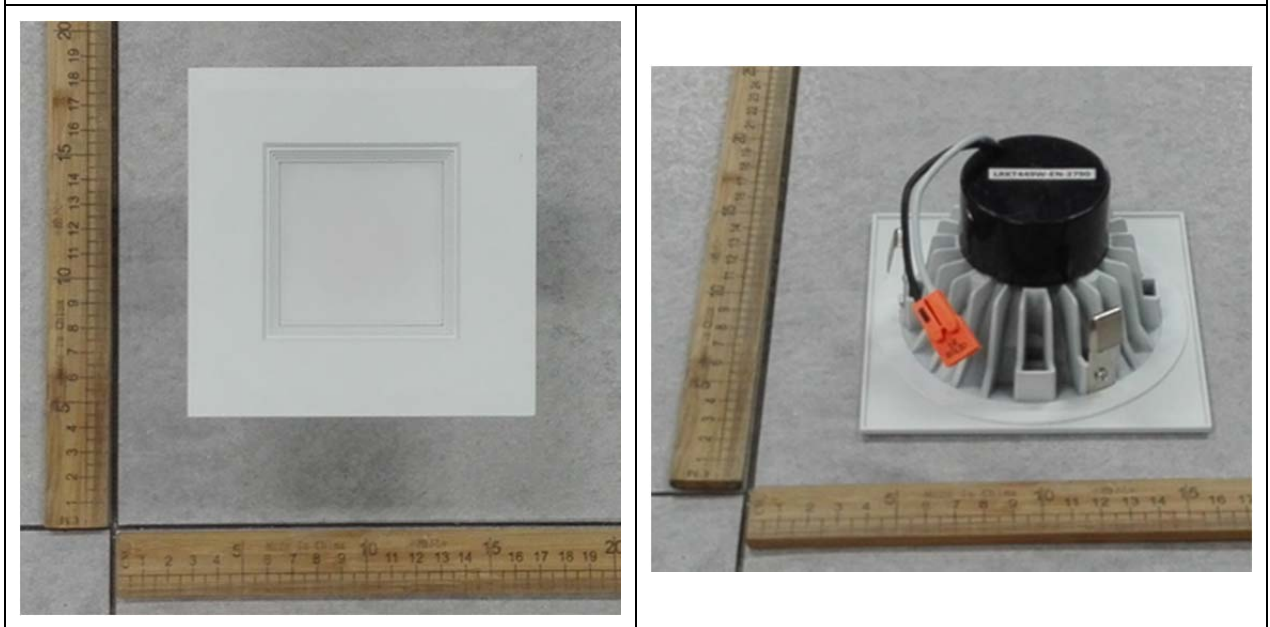
Test Specifications:	
Date of Receipt	Sep.20,2017
Date of Test	Oct.09,2017
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems UL1993 4 <sup>th</sup> Edition, Self-Ballasted Lamps and Lamp Adapters ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.0
Reference Work Instruction	QD25
Remark	Below test and data are not covered by NVLAP accreditation: - Operating Frequency

<p><b>Test Methods</b></p> <p><b>1. Photometric and Electrical measurements – Light Distribution Method:</b>          Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° 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 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.</p> <p><b>2. Photometric and Electrical Measurements – Integrating Sphere Method:</b>          Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.</p>
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**1. Product Information:**

Brand Name	L-TECH CORP
Model Number	LRKT449W-EN-##90
Luminaire Type	Downlights
Rated Voltage / Frequency	120Vac, 50/60 Hz
Nominal Power	11W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,4000K,5000K
LED Manufacturer	Edison Opto Corporation
LED Model	2T03X5WW11000003
Sample Receipt Date	Sep.20,2017
Sample Number	GZE1709109-H-G1,G2,G3

**Photo**



<b>2.1 Electrical, Photometric and Chromaticity Measurements</b> <i>(Refer to Work Instruction QD25)</i>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2017-10-09	<b>Test Ambient:</b>	25.0 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	LRKT449W-EN-2790		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE1709109-H-G1	120.0	60	0.0937	10.65	0.9474
GZE1709109-H-G2	120.0	60	0.0943	10.71	0.9468
GZE1709109-H-G3	120.0	60	0.0946	10.76	0.9477
Average			0.0942	10.71	0.9473

**Sphere-Spectroradiometer Method:**

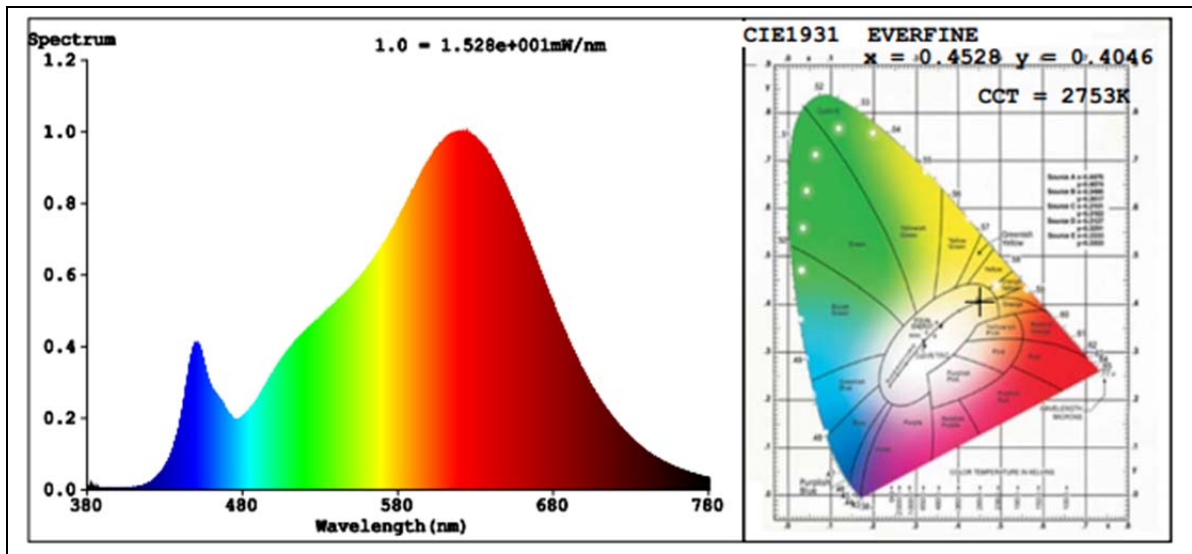
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.8
R9	57
CCT (K)	2753
Chromaticity (x, y)	x=0.4528 y=0.4046
Chromaticity (u', v')	u'=0.2607 v'=0.5240
Duv	-0.0016

Special Color Rendering Indices			
R1	93	R9	57
R2	97	R10	94
R3	98	R11	95
R4	93	R12	88
R5	94	R13	95
R6	97	R14	99
R7	90	R15	89
R8	80	--	--

**Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	753.03
Luminous Efficacy (lm/W)	70.71
Beam Angle°	101.5
Center Beam Candle Power (cd)	307

**Spectral Power Distribution and Chromaticity Diagram**



Laboratory: Standard-Tech Co. Ltd Testing Center  
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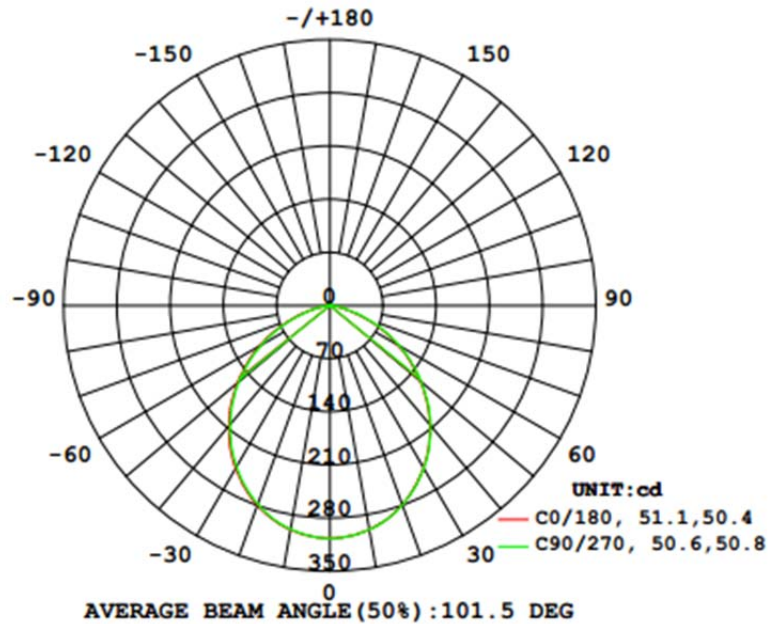
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**Zonal Lumen Tabulation**

**LUMINOUS INTENSITY DISTRIBUTION DIAGRAM**



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	232.8	30.9%
0-40	375.3	49.8%
0-60	636.3	84.5%
60-90	116.7	15.5%
70-100	36.7	4.9%
90-120	0.0	0%
0-90	752.9	100%
90-180	0.0	0%
0-180	752.9	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	28.9	3.8%	90-100	0.0	0%
10-20	82.1	10.9%	100-110	0	0%
20-30	121.8	16.2%	110-120	0.0	0%
30-40	142.5	18.9%	120-130	0.0	0%
40-50	141.6	18.8%	130-140	0.0	0%
50-60	119.3	15.9%	140-150	0.0	0%
60-70	79.9	10.6%	150-160	0.0	0%
70-80	32.5	4.3%	160-170	0.0	0%
80-90	4.2	0.6%	170-180	0.0	0%

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Table--1

UNIT: cd

C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307
5	305	305	305	305	305	305	305	305	305	305	305	304	304	305	305	305
10	299	300	300	300	300	300	300	300	300	300	299	299	299	299	299	300
15	291	291	292	292	291	292	291	291	291	291	291	291	290	290	291	291
20	279	280	280	280	280	280	280	280	280	280	279	279	278	279	279	279
25	264	265	266	265	265	265	266	265	265	265	265	264	263	264	265	264
30	246	248	248	248	247	248	248	248	248	248	248	246	246	246	247	247
35	227	228	229	228	228	229	229	229	229	229	229	227	226	227	228	228
40	205	207	208	207	206	207	209	208	207	208	208	206	204	205	207	206
45	181	184	186	184	183	185	187	185	184	185	186	183	181	182	185	183
50	156	159	161	159	157	160	162	160	159	161	162	159	156	158	160	159
55	129	133	136	134	131	135	137	135	133	135	137	134	131	133	135	133
60	103	106	109	107	105	109	111	109	107	109	111	108	104	107	108	106
65	75.8	79.5	82.0	80.3	78.5	82.1	84.4	82.7	80.5	82.8	84.0	81.5	77.7	80.0	81.3	79.4
70	49.5	53.0	55.7	54.5	52.5	56.1	58.5	56.8	54.3	56.6	57.9	55.0	51.4	53.5	54.9	52.6
75	25.7	27.9	30.5	29.5	28.5	31.0	33.4	31.7	30.1	31.5	32.8	29.9	27.4	28.6	29.8	27.6
80	9.65	10.3	11.0	11.3	11.5	12.3	12.9	12.6	12.2	12.3	12.3	11.3	10.5	10.5	10.4	10.1
85	2.56	2.76	2.80	3.00	3.05	3.21	3.39	3.34	3.29	3.30	3.16	3.02	2.81	2.78	2.62	2.70
90	0.00	0.00	0.01	0.02	0.08	0.12	0.21	0.22	0.21	0.17	0.06	0.01	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	0.01	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	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
135	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
140	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
145	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
150	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
155	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
160	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
165	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
170	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
175	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	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

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<b>2.2 Color Spatial Uniformity</b>	<b>IES LM-79 2008          ENERGY STAR® Program Requirements          Product Specification for Luminaires (Light Fixtures) - Version 2.0</b>
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**Test Data :**

<b>Test date</b> 2017-10-09	<b>Test Ambient</b> 25.1°C
<b>Sample No.</b>	<b>Maximum Δu'v'</b>
GZE1709109-H-G1	0.0030

Gamma\C	CIE u'	CIE v'	du' v'	CIE u'	CIE v'	du' v'
-75	0.2585	0.523	0.002	0.2578	0.5227	0.0028
-74	0.2587	0.5229	0.0019	0.2579	0.5226	0.0028
-73	0.2586	0.5228	0.002	0.2578	0.5225	0.0028
-72	0.2589	0.5228	0.0018	0.258	0.5225	0.0027
-71	0.2589	0.5228	0.0018	0.2582	0.5225	0.0025
-70	0.2592	0.5228	0.0015	0.2582	0.5225	0.0025
-69	0.2592	0.5229	0.0014	0.2584	0.5226	0.0023
-68	0.2592	0.5228	0.0014	0.2584	0.5226	0.0022
-67	0.2595	0.523	0.0011	0.2587	0.5227	0.002
-66	0.2595	0.523	0.0011	0.2587	0.5227	0.002
-65	0.2596	0.523	0.001	0.2589	0.5228	0.0017
-64	0.2596	0.523	0.001	0.2589	0.5228	0.0017
-63	0.2599	0.5231	0.0007	0.259	0.5228	0.0016
-62	0.2599	0.5232	0.0006	0.2592	0.5229	0.0014
-61	0.26	0.5232	0.0006	0.2592	0.523	0.0014
-60	0.26	0.5232	0.0006	0.2592	0.523	0.0014
-59	0.26	0.5233	0.0005	0.2594	0.523	0.0012
-58	0.2604	0.5233	0.0002	0.2594	0.5231	0.0011
-57	0.2604	0.5234	0.0002	0.2595	0.5231	0.0011
-56	0.2604	0.5234	0.0001	0.2595	0.5231	0.001
-55	0.2604	0.5234	0.0001	0.2597	0.5232	0.0008
-54	0.2604	0.5234	0.0001	0.2598	0.5232	0.0008
-53	0.2605	0.5235	0	0.2598	0.5232	0.0007
-52	0.2605	0.5235	0	0.2598	0.5232	0.0007
-51	0.2608	0.5236	0.0003	0.2598	0.5233	0.0007
-50	0.2608	0.5236	0.0004	0.26	0.5233	0.0005
-49	0.2609	0.5236	0.0004	0.26	0.5234	0.0005
-48	0.2609	0.5236	0.0004	0.2601	0.5234	0.0004
-47	0.2609	0.5237	0.0005	0.2601	0.5234	0.0004
-46	0.2609	0.5237	0.0005	0.2601	0.5234	0.0004

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-45	0.2609	0.5237	0.0005	0.2601	0.5234	0.0004
-44	0.2609	0.5237	0.0005	0.2603	0.5235	0.0002
-43	0.261	0.5237	0.0005	0.2603	0.5235	0.0002
-42	0.2611	0.5238	0.0007	0.2603	0.5235	0.0001
-41	0.2611	0.5238	0.0007	0.2603	0.5235	0.0001
-40	0.2611	0.5238	0.0007	0.2604	0.5235	0.0001
-39	0.2611	0.5238	0.0007	0.2604	0.5235	0.0001
-38	0.2611	0.5238	0.0007	0.2604	0.5235	0.0001
-37	0.2613	0.5238	0.0009	0.2604	0.5235	0.0001
-36	0.2613	0.5238	0.0009	0.2606	0.5236	0.0001
-35	0.2613	0.5238	0.0009	0.2606	0.5236	0.0002
-34	0.2613	0.5238	0.0009	0.2606	0.5236	0.0002
-33	0.2613	0.5239	0.0009	0.2606	0.5236	0.0002
-32	0.2615	0.5239	0.0011	0.2606	0.5236	0.0002
-31	0.2615	0.5239	0.001	0.2607	0.5236	0.0002
-30	0.2615	0.5239	0.0011	0.2607	0.5236	0.0002
-29	0.2614	0.5239	0.001	0.2607	0.5236	0.0002
-28	0.2614	0.5239	0.001	0.2607	0.5236	0.0002
-27	0.2615	0.5239	0.001	0.2607	0.5235	0.0002
-26	0.2615	0.5239	0.0011	0.2607	0.5236	0.0002
-25	0.2615	0.5239	0.0011	0.2609	0.5236	0.0004
-24	0.2616	0.5239	0.0012	0.2609	0.5236	0.0004
-23	0.2616	0.5239	0.0012	0.2609	0.5236	0.0004
-22	0.2616	0.5239	0.0012	0.2609	0.5236	0.0004
-21	0.2616	0.5239	0.0012	0.2609	0.5236	0.0005
-20	0.2616	0.5239	0.0012	0.2609	0.5236	0.0005
-19	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
-18	0.2616	0.5239	0.0012	0.2609	0.5236	0.0005
-17	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
-16	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
-15	0.2616	0.5239	0.0012	0.2609	0.5236	0.0005
-14	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
-13	0.2617	0.5239	0.0013	0.261	0.5236	0.0005
-12	0.2617	0.5239	0.0013	0.261	0.5236	0.0005
-11	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
-10	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
-9	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
-8	0.2617	0.5239	0.0013	0.261	0.5236	0.0005
-7	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
-6	0.2617	0.5239	0.0013	0.261	0.5236	0.0005

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-5	0.2617	0.5239	0.0013	0.261	0.5236	0.0005
-4	0.2617	0.5239	0.0013	0.261	0.5236	0.0005
-3	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
-2	0.2617	0.5239	0.0013	0.2609	0.5236	0.0004
-1	0.2617	0.5239	0.0012	0.261	0.5236	0.0005
0	0.2617	0.5239	0.0013	0.2617	0.5239	0.0013
1	0.2617	0.5239	0.0013	0.2609	0.5236	0.0005
2	0.2617	0.5239	0.0012	0.2609	0.5236	0.0004
3	0.2617	0.5239	0.0012	0.261	0.5236	0.0005
4	0.2617	0.5239	0.0012	0.261	0.5236	0.0005
5	0.2617	0.5239	0.0012	0.261	0.5236	0.0005
6	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
7	0.2616	0.5239	0.0012	0.261	0.5236	0.0005
8	0.2616	0.5239	0.0012	0.2608	0.5235	0.0003
9	0.2616	0.5239	0.0012	0.2608	0.5236	0.0004
10	0.2616	0.5239	0.0012	0.2608	0.5236	0.0003
11	0.2616	0.5239	0.0012	0.2608	0.5236	0.0003
12	0.2616	0.5239	0.0012	0.2608	0.5236	0.0003
13	0.2616	0.5239	0.0012	0.2608	0.5236	0.0003
14	0.2616	0.5239	0.0011	0.2608	0.5236	0.0003
15	0.2616	0.5239	0.0012	0.2608	0.5236	0.0004
16	0.2616	0.5239	0.0011	0.2608	0.5236	0.0003
17	0.2616	0.5239	0.0011	0.2608	0.5235	0.0003
18	0.2616	0.5239	0.0011	0.2608	0.5235	0.0003
19	0.2615	0.5239	0.0011	0.2608	0.5236	0.0003
20	0.2616	0.5238	0.0011	0.2608	0.5236	0.0003
21	0.2615	0.5239	0.0011	0.2608	0.5236	0.0003
22	0.2615	0.5239	0.0011	0.2608	0.5236	0.0003
23	0.2615	0.5238	0.0011	0.2606	0.5235	0.0002
24	0.2615	0.5239	0.0011	0.2606	0.5235	0.0002
25	0.2615	0.5239	0.0011	0.2606	0.5235	0.0001
26	0.2615	0.5238	0.0011	0.2606	0.5235	0.0001
27	0.2615	0.5239	0.001	0.2606	0.5235	0.0001
28	0.2614	0.5238	0.001	0.2606	0.5235	0.0001
29	0.2613	0.5238	0.0008	0.2606	0.5235	0.0001
30	0.2612	0.5238	0.0008	0.2606	0.5235	0.0001
31	0.2612	0.5238	0.0008	0.2604	0.5235	0.0001
32	0.2612	0.5238	0.0008	0.2604	0.5235	0.0001
33	0.2612	0.5238	0.0008	0.2604	0.5235	0.0001
34	0.2612	0.5238	0.0008	0.2604	0.5235	0.0001

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35	0.2612	0.5238	0.0007	0.2604	0.5235	0.0001
36	0.2611	0.5238	0.0007	0.2604	0.5234	0.0001
37	0.2611	0.5238	0.0007	0.2602	0.5234	0.0003
38	0.2611	0.5238	0.0007	0.2602	0.5234	0.0003
39	0.2611	0.5237	0.0007	0.2602	0.5234	0.0003
40	0.2609	0.5237	0.0004	0.2602	0.5234	0.0003
41	0.2609	0.5237	0.0004	0.2602	0.5234	0.0003
42	0.2609	0.5237	0.0004	0.2601	0.5234	0.0004
43	0.2608	0.5237	0.0004	0.26	0.5234	0.0005
44	0.2608	0.5236	0.0004	0.26	0.5233	0.0005
45	0.2608	0.5236	0.0003	0.26	0.5233	0.0005
46	0.2608	0.5236	0.0003	0.2599	0.5233	0.0007
47	0.2606	0.5236	0.0001	0.2599	0.5233	0.0007
48	0.2606	0.5235	0.0001	0.2599	0.5232	0.0007
49	0.2605	0.5235	0.0001	0.2598	0.5232	0.0007
50	0.2605	0.5235	0.0001	0.2597	0.5232	0.0008
51	0.2605	0.5235	0	0.2597	0.5232	0.0009
52	0.2605	0.5235	0	0.2597	0.5231	0.0009
53	0.2603	0.5234	0.0002	0.2596	0.5231	0.0009
54	0.2602	0.5234	0.0003	0.2596	0.5231	0.0009
55	0.2602	0.5234	0.0003	0.2596	0.5231	0.001
56	0.2602	0.5234	0.0003	0.2596	0.523	0.001
57	0.2599	0.5233	0.0006	0.2593	0.5229	0.0013
58	0.2599	0.5233	0.0006	0.2593	0.5229	0.0013
59	0.2599	0.5233	0.0006	0.2592	0.5229	0.0014
60	0.2599	0.5232	0.0007	0.2592	0.5229	0.0014
61	0.2597	0.5232	0.0009	0.2592	0.5229	0.0014
62	0.2596	0.5231	0.0009	0.2591	0.5228	0.0015
63	0.2596	0.5231	0.001	0.2588	0.5227	0.0019
64	0.2596	0.5231	0.001	0.2588	0.5227	0.0019
65	0.2593	0.523	0.0012	0.2588	0.5227	0.0019
66	0.2593	0.523	0.0013	0.2588	0.5226	0.0019
67	0.2591	0.5229	0.0015	0.2584	0.5226	0.0023
68	0.2591	0.5229	0.0015	0.2584	0.5225	0.0023
69	0.259	0.5229	0.0016	0.2583	0.5225	0.0024
70	0.2588	0.5228	0.0018	0.2583	0.5225	0.0025
71	0.2586	0.5228	0.002	0.2582	0.5225	0.0025
72	0.2586	0.5228	0.002	0.258	0.5224	0.0027
73	0.2585	0.5228	0.0022	0.258	0.5224	0.0027
74	0.2585	0.5228	0.0021	0.2577	0.5224	0.003

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75	0.2584	0.5229	0.0022	0.2578	0.5226	0.0028
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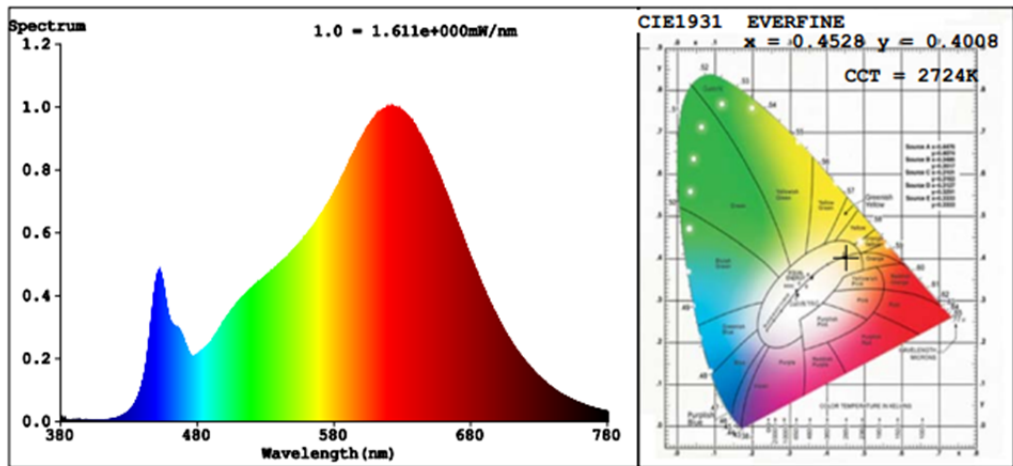
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<b>3. Electrical and Photometric Measurements, with dimming</b>	<b>IES LM-79 2008 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0</b>
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Test date	2017-10-09	Test Ambient:	25.1°C		
Dimmer Model		LEVITON MFG CO INC (E31373), Cat. No. 6681			
Sample No.	Input	Luminous flux (lm)	CCT (K)	CRI	P.F.
GZE1709109-H-G1	120.0 V / 60 Hz	73.93	2724	93.5	0.2077
GZE1709109-H-G2	120.0 V / 60 Hz	49.81	2722	93.6	0.1994
GZE1709109-H-G3	120.0 V / 60 Hz	119.2	2724	93.3	0.2444
Average		80.98	2723	93.5	0.2172



**Colorimetric Parameters**

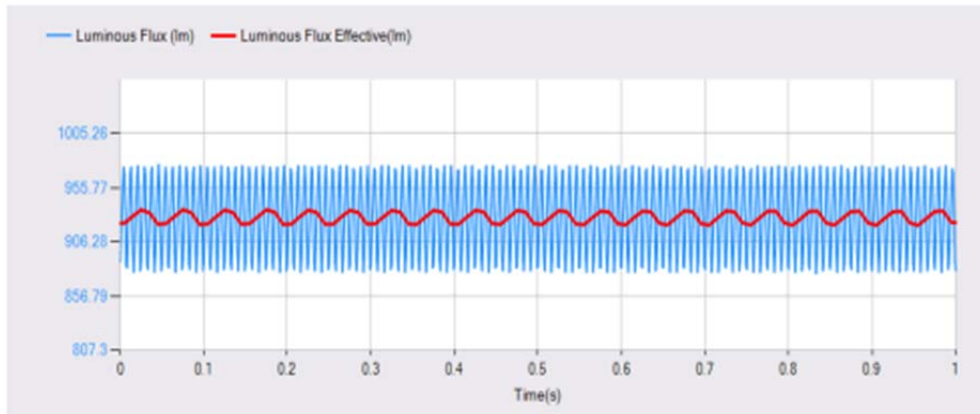
Chromaticity Coordinate:  $x=0.4528$   $y=0.4008$   $u'=0.2623$   $v'=0.5225$   $Dx, Dy: -0.0052, -0.0094$   
 CCT=2724K (Duv=-0.0031) Dominant WL:Ld =585.2nm Purity=56.2%  
 Peak WL:Lp=622.9nm FWHM=141.2nm  
 Render Index:Ra=93.5 CRI=91.9  
 R1 =95 R2 =99 R3 =97 R4 =94 R5 =96 R6 =96 R7 =90  
 R8 =81 R9 =62 R10=98 R11=96 R12=86 R13=97 R14=99 R15=91

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
LEVITON MFG CO INC (E31373), Cat. No. 6681	19.3	Dimmer adjusted to lowest light output	< 1 m

<b>4 Operating Frequency</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0</b>
<b>Noted: This test and data are not covered by NVLAP accreditation</b>	

<b>Test date</b>	2017-10-09	<b>Test Ambient:</b>	25.1°C
<b>Sample No.</b>	<b>Operating Frequency (Hz)</b>		
GZE1709109-H-G1	120.37		
GZE1709109-H-G2	120.25		
GZE1709109-H-G3	120.29		
Average	120.30		



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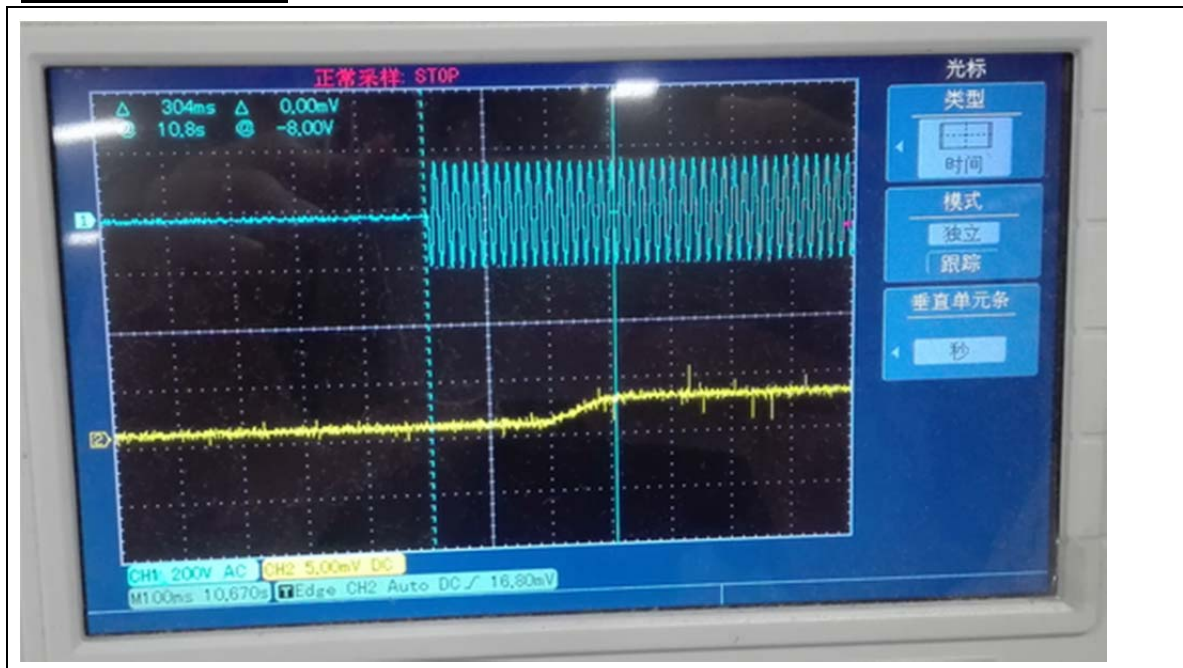
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<p><b>5 Starting Time</b>  <i>(Refer to Work Instruction QD28)</i></p>	<p><b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0</b></p>
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Test date	2017-10-09	Test Ambient:	25.1°C
Sample No.	Start Time (ms)		
GZE1709109-H-G1	304		
GZE1709109-H-G2	306		
GZE1709109-H-G3	322		
Average	311		

**Graph (Start Time):**



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<p><b>6. Transient Protection Test</b>  <i>(Refer to Work Instruction QD34)</i></p>	<p><b>ANSI/IEEE C62.41</b>  <b>ENERGY STAR® Program Requirements for Luminaires – Version 2.0</b></p>
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**Test voltage: 120V,60Hz**

<b>Test date</b>	2017-10-09	<b>Test Ambient</b>	25.1°C
<b>Sample No.</b>		<b>Transient Protection Test - Seven Strikes</b>	
GZE1709109-H-G1		Pass	
GZE1709109-H-G2		Pass	
GZE1709109-H-G3		Pass	

<b>7.1 In-Situ Temperature Measurement Test (ISTMT)</b>	<b>UL1598-2008, 3<sup>rd</sup> Edition</b>
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Test date	2017-10-09	Test Ambient	25.1°C
Input Vol./Frequency	120 V / 60 Hz	Output Current of Single LED(mA)	145
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum LED Ts Point Temperature Limited (°C)
GZE1709109-H-G1	2T03X5WW11000003	80.5	105

**In-Situ Picture - Ts:**



<b>7.2 Maximum Measured Ballast or Driver Case Temperature</b>	<b>UL1598-2008, 3<sup>rd</sup> Edition</b>
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Test date	2017-10-09	Test Ambient	25.1°C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
GZE1709109-H-G1	82.2	105	

**In-Situ Picture - Ts:**



<b>8 Off-State Power Consumption:</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0</b>
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<b>Test date</b>	2017-10-09	<b>Test Ambient:</b>	25.0 ° C
<b>Model Number</b>	LRKT449W-EN-2790	<b>Stabilization Time (min)</b>	90

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

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)
GZE1709109-H -G1	120.0	60	0	0

**8. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-331	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
EE-09	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-01	2018-06-30
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
PF210	Power Meter for Goniophotometer	2017-07-01	2018-06-30
EE-015	Flux Meter	2017-07-01	2018-06-30
ST-R-277	Oscillograph	2017-07-01	2018-06-30
ST-R-EM01	Surge Generator	2017-07-01	2018-06-30
ST-R-EM02	EMC Coupler/Decoupler Module	2017-07-01	2018-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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