

**CEC Title 24 (CEC-400-2015-038-CMF 2016****REFERENCE APPENDICES JA8 and JA10) Test Report**

For

**L-TECH CORPORTION****(Brand Name: L-TECH CORP)**SHAOGANGTOU DISTRICT.QIAOTOU TOWN.DONGGUAN  
CITY.GUANGDONG PROVINCE,CHINA**LED Luminaires**

Model name(s): ULD16-27

Model Different: N/A

Test &amp; Report By:

*Jack Luo*

Engineer: Jack Luo

Date: Apr.28,2017

Review By:

*Tommy Liang*

Manager: Tommy Liang

Note: 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/QR4909-A/2

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

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<http://www.standard-tech.com>

**Laboratory Information:**

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	Apr.28,2017
Test Report No.	GZE170330-H-I
Laboratory Contact Name	Tommy Liang

**Product Information:**

Organization Name	L-TECH CORPORTION		
Brand Name	L-TECH CORP		
Model Number	ULD16-27		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires		
Rated Voltage / Frequency	120Vac, 60 Hz		
Nominal Power	20W		
Rated Initial Lamp Lumen	--		
Declared CCT	2700K		
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD		
LED Model	67-21S Series		
Sample Number	GZE170330-H-I1,I4-I12		
Luminaire Aperture (for downlights)	--	in.  mm  mm  s	
Luminaire Length	--		
Luminaires Width	--		
Number of Units (modular products)	N/A		

**Photo**

**Test Specifications:**

Date of Receipt	Apr.21,2017
Date of Test	Apr.23,2017
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> <li>8. Start Time</li> <li>9. In-Situ Temperature</li> <li>10. Dimming, Reduced Flicker Operation and Audible Noise</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. Joint Appendix JA8-2016</li> <li>8. Joint Appendix JA10-2016</li> <li>9. ENERGY STAR Program Requirements Product Specifications for Lamps 1.1</li> </ol>

**Test Methods****1. 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.

**2. 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.

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**2.1 Electrical, Photometric and Chromaticity Measurements**

Test date	2017-04-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	ULD16-27		

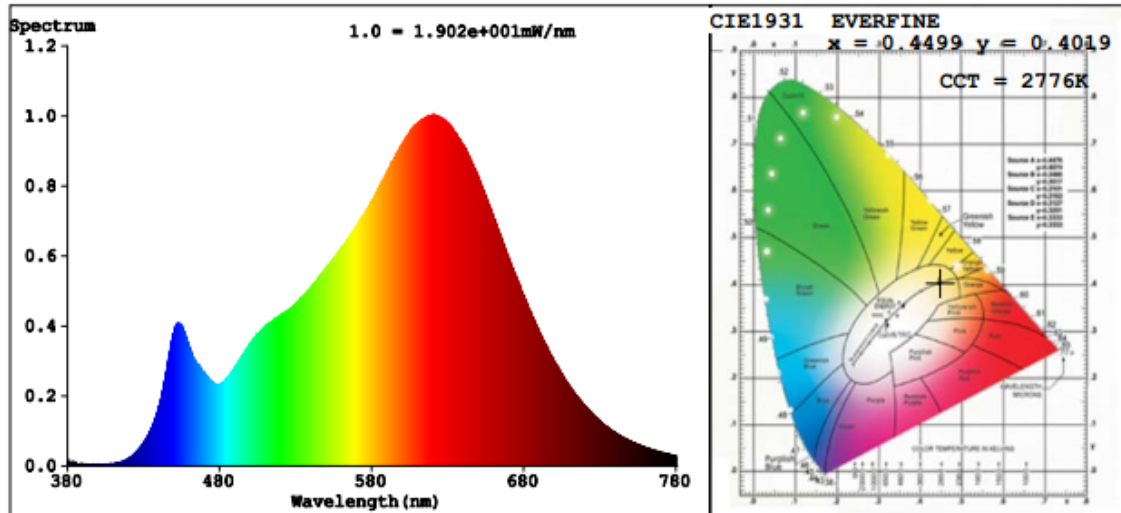
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
GZE170330-H-II	120.0	60	0.1581	18.86	0.9938

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	94	R9	56
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	2776	R3	96	R11	94
Duv	-0.0024	R4	92	R12	88
Chromaticity (x, y)	x=0.4499 y=0.4019	R5	94	R13	95
Chromaticity (u', v')	u'=0.2599 v'=0.5225	R6	97	R14	99
Color Rendering Index (CRI)	92.3	R7	89	R15	89
R9	56	R8	79	--	--
Total Luminous (lm)	880.7				
Luminous Efficacy (lm/W)	46.70				

**Spectral Power Distribution & Chromaticity Diagram**



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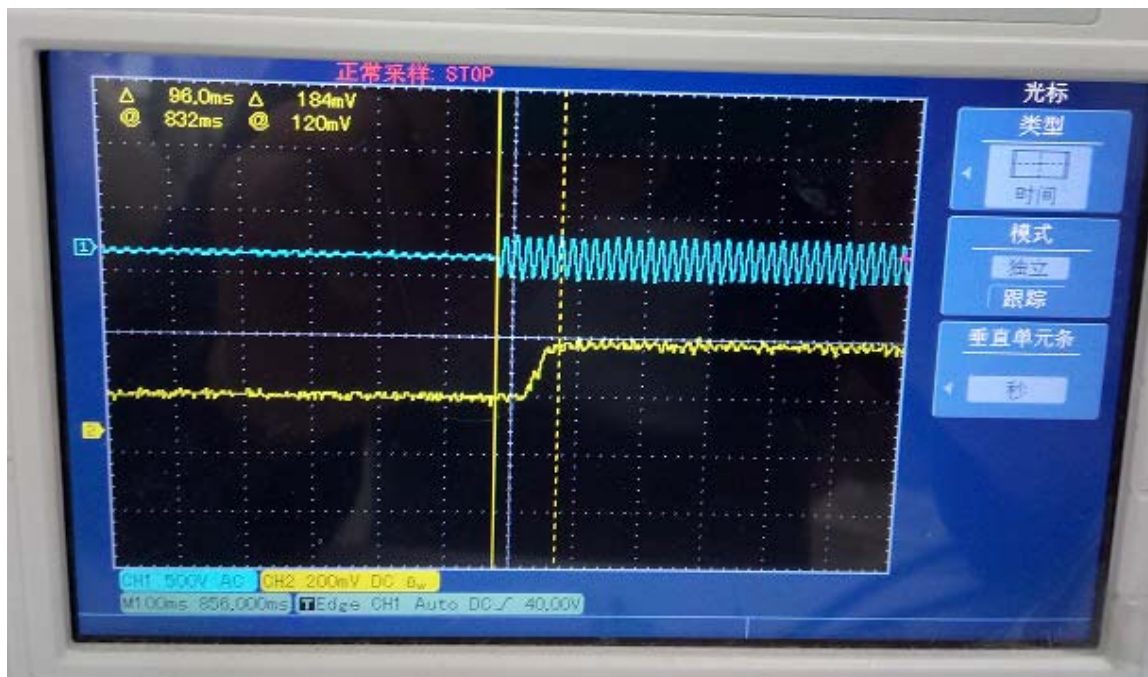
### 2.3 Start Time Test

Test date	2017-04-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	ULD16-27		

#### Electrical Measurement:

Sample No.	Start Time (ms)
GZE170330-H-I1	98.0
GZE170330-H-I4	100
GZE170330-H-I5	104
Average	101

#### Graph (Start Time):



**2.4 In-Situ Temperature Measurement Test (ISTMT)**

Test date	2017-04-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	ULD16-27		

**Electrical Measurement:**

Input Vol./Frequency	120 V / 60 Hz		Output Current of Single LED(mA)	41.4	
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum LED Ts Point Temperature Limited (°C)	Maximum Measured LED Driver Td Point Temperature (°C)	Maximum LED Driver Td Point Temperature Limited (°C)
GZE170330-H-I1	67-21S Series	58.2	105	53.6	105
GZE170330-H-I4		57.7		54.8	
GZE170330-H-I5		58.4		55.2	
GZE170330-H-I6		56.2		54.6	
GZE170330-H-I7		56.6		55.2	
GZE170330-H-I8		57.9		53.6	
GZE170330-H-I9		56.2		55.0	
GZE170330-H-I10		56.0		54.8	
GZE170330-H-I11		58.1		54.8	
GZE170330-H-I12		56.0		53.8	

## Results

Time (t) at which to estimate lumen maintenance (hours):	36,000
Lumen maintenance at time (t) (%):	82.74%
Reported L70 (hours):	>36000

**2.5 Dimming, Reduced Flicker Operation and Audible Noise**

Test date	2017-04-23	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	ULD16-27		

**Electrical Measurement:**

Dimmer Model	LEVITON MFG CO INC (E31373), Cat. No. 6681		
Sample No.	Input	Dimming (100%)	Dimming (<10%)
		Luminous flux (lm)	Luminous flux (lm)
GZE170330-H-I1	120.0 V / 60 Hz	880.7	79.2
GZE170330-H-I4	120.0 V / 60 Hz	905.1	85.2
GZE170330-H-I5	120.0 V / 60 Hz	890.4	81.3
		Dimming (100%)	Dimming (20%)
Sample No.	Input	Peak Noise Reading (dBA)	Peak Noise Reading (dBA)
GZE170330-H-I1	120.0 V / 60 Hz	18.5	19.2
GZE170330-H-I4	120.0 V / 60 Hz	20.1	21.0
GZE170330-H-I5	120.0 V / 60 Hz	19.5	20.6

Dimming Level	100% Dimming Level	20% Dimming Level	Nominal Dimming Level
Percent Flicker (Unfiltered)	19.461%	22.015%	18.852%
Percent Flicker (1000Hz cut-off)	19.349%	20.686%	18.785%
Percent Flicker (400Hz cut-off)	19.265%	20.741%	18.695%
Percent Flicker (200Hz cut-off)	18.989%	16.517%	18.470%
Percent Flicker (90Hz cut-off)	0.373%	0.800%	0.361%
Percent Flicker (40Hz cut-off)	0.203%	0.593%	0.206%

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**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-015	Flux Meter	2016-07-01	2017-06-30
ST-R-277	Oscillograph	2016-07-01	2017-06-30
ST-R-EM01	Surge Generator	2016-07-01	2017-06-30
ST-R-EM02	EMC Coupler/Decoupler Module	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K			

**\*\*\*\*\* END OF REPORT \*\*\*\*\***

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