

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN, LLC

(Brand Name: N/A)

188 S.Northwest Highway, Cary, IL60013, USA

LED Luminaires

Model name(s): LED-7320-27K-G2

Representative (Tested) Model: LED-7320-27K-G2

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

Test & Report By:

Biao Zhong

Engineer: Biao Zhong

Date: Mar.23,2018

Review By:

Univ Xie

Manager: Univ Xie

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/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>

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-7320-27K-G2	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	11W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K	
LED Manufacturer	Everlight Electronics Co., LTD	
LED Model	67-21S/KK5C-H272433Z6-2T	
Sample Number	GZE1711047-H-A1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



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1.2 Test Specifications:

Date of Receipt	Jan.03,2018
Date of Test	Jan.05,2018
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
Reference Work Instruction	QD25

1.3 Test Methods

<p>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 °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 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.</p>
<p>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 °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 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.</p>
<p>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 °C ± 1 °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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-01-05	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7320-27K-G2		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171104	120.0	60	0.1066	11.18	0.8742	43.61
7-H-A1	277.0	60	0.0478	10.65	0.8041	66.88

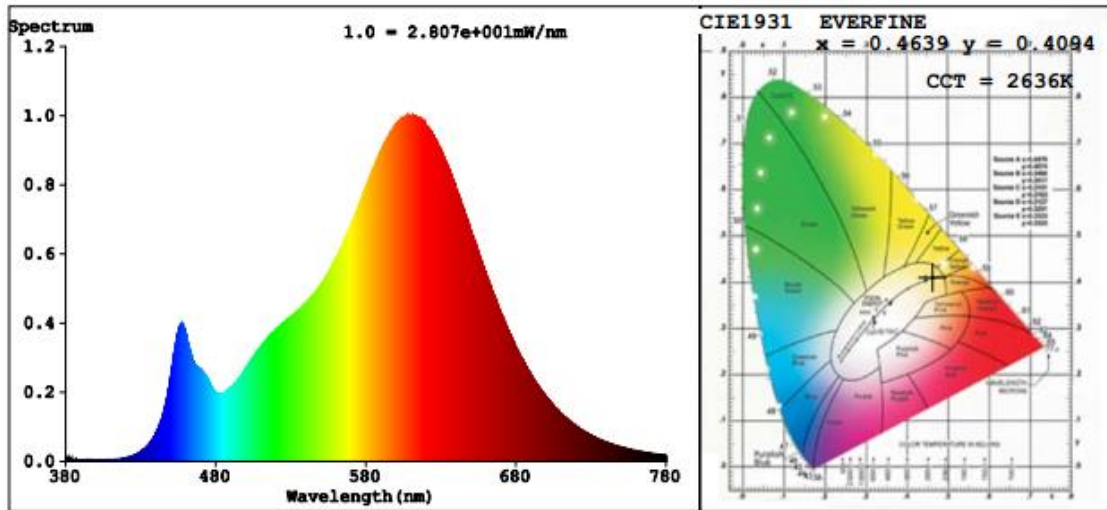
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	19
Frequency (Hz)	60	R2	95	R10	89
CCT (K)	2636	R3	93	R11	83
Duv	-0.0007	R4	82	R12	80
Chromaticity (x, y)	x=0.4639 y=0.4094	R5	85	R13	88
Chromaticity (u', v')	u'=0.2656 v'=0.5275	R6	95	R14	97
Color Rendering Index (CRI)	84.8	R7	81	R15	77
R9	19	R8	61	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	1358.4	1273.9
Luminous Efficacy (lm/W)	121.50	119.62
Beam Angle (°)	280.9	--
Center Beam Candle Power (cd)	7	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	32.6	2.4%
0-40	78.0	5.7%
0-60	252.9	18.6%
60-90	441.1	32.5%
70-100	472.4	34.8%
90-120	435.0	32%
0-90	694.0	51.1%
90-180	665.0	48.9%
0-180	1,359.0	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	% Total
0-10	1.2	0.1%	90-100	160.7	11.8%
10-20	8.2	0.6%	100-110	148.3	10.9%
20-30	23.2	1.7%	110-120	126.0	9.3%
30-40	45.4	3.3%	120-130	97.7	7.2%
40-50	72.7	5.4%	130-140	67.6	5%
50-60	102.1	7.5%	140-150	40.3	3%
60-70	129.4	9.5%	150-160	18.8	1.4%
70-80	150.3	11.1%	160-170	5.2	0.4%
80-90	161.4	11.9%	170-180	0.3	0%

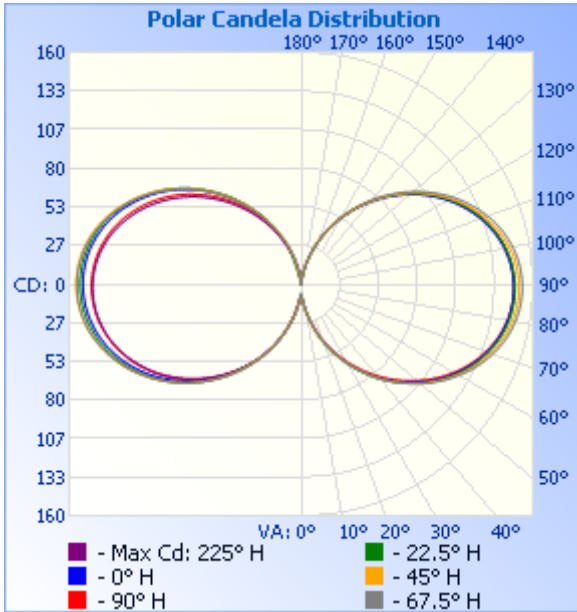
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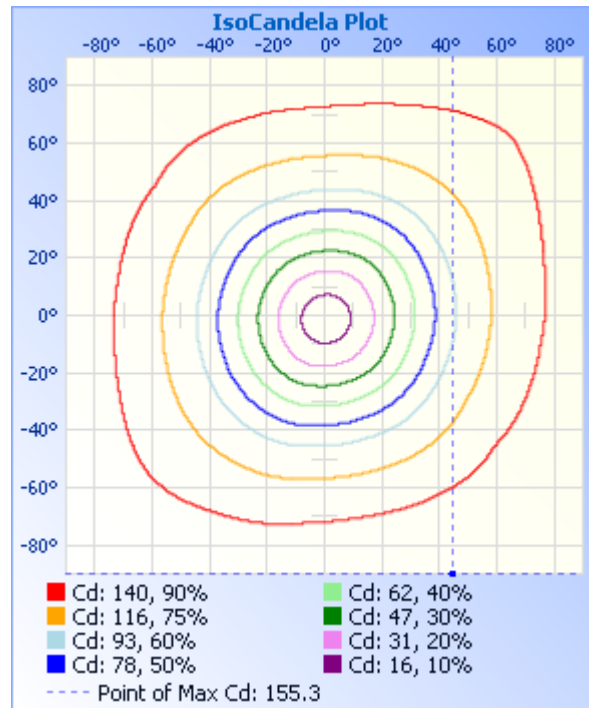
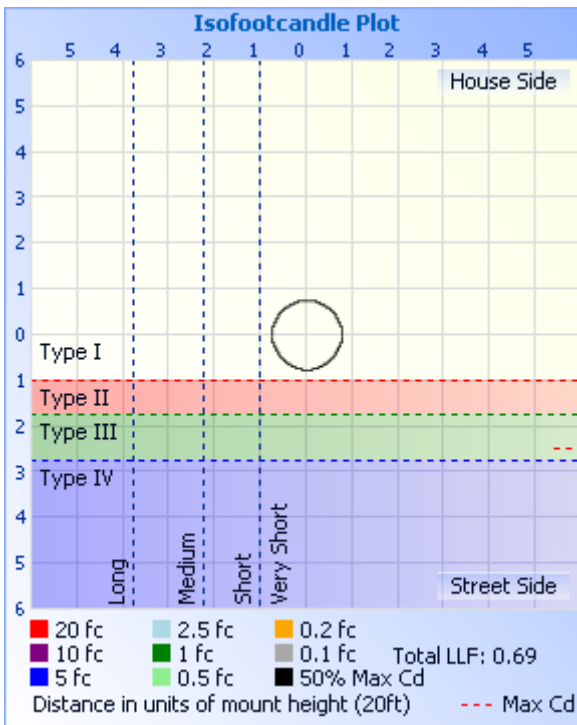
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Photometric Data



Illuminance at a Distance	
Center Beam fc	Beam Width
12.0ft	0.05 fc
24.0ft	0.01 fc
36.0ft	0.01 fc
48.0ft	0.00 fc
60.0ft	0.00 fc



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
1	8	8	8	8	8	7	7	7	7	7	7	7	8	8	8	8	8
2	8	9	9	8	8	8	8	8	7	7	8	8	8	8	8	8	8
3	9	9	9	9	9	8	8	8	8	8	8	9	9	9	9	9	9
4	10	10	10	10	9	9	9	9	9	9	9	9	9	10	10	10	10
5	11	12	11	11	10	10	10	10	10	10	10	10	10	11	11	11	11
6	13	13	13	13	12	11	11	11	11	11	11	11	11	12	12	12	13
7	14	14	14	14	13	13	12	12	12	12	12	13	13	13	13	14	14
8	16	16	16	16	15	14	14	13	13	14	14	14	14	15	15	15	16
9	18	18	18	17	16	16	15	15	15	15	15	16	16	16	17	17	18
10	19	20	19	19	18	18	17	16	17	17	17	17	18	18	18	19	19
11	21	22	21	21	20	19	19	18	18	19	19	19	19	20	20	21	21
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13	25	26	25	25	24	23	22	22	22	22	23	23	23	24	24	24	25
14	27	28	27	27	26	25	24	24	24	25	24	25	25	26	26	26	27
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16	31	32	31	31	30	29	28	28	28	29	29	29	29	30	30	30	31
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23	47	47	47	47	45	45	43	43	44	44	44	45	44	45	44	45	47
24	49	50	49	49	47	47	46	45	46	47	46	47	46	47	46	47	49
25	51	52	51	51	50	49	48	47	48	49	49	49	49	49	49	49	51
26	54	54	54	54	52	51	50	49	51	51	51	52	51	51	51	52	54
27	56	57	56	56	54	54	52	51	53	54	53	54	53	53	53	54	56
28	58	59	58	58	56	56	54	54	55	56	56	56	55	56	55	56	58

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29	60	61	61	60	59	58	57	56	58	58	58	58	57	58	57	58	60
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92	146	147	150	152	147	147	149	149	150	152	155	155	144	142	144	145	146

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93	146	147	150	152	147	147	149	149	150	152	155	154	144	142	143	145	146
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116	123	124	126	128	124	125	126	126	129	131	131	130	123	121	120	121	123
117	121	122	124	126	123	123	124	125	127	129	130	129	121	119	119	119	121
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125	107	108	108	110	108	109	109	110	112	114	114	113	107	105	104	104	107
126	105	106	106	108	106	107	107	108	110	112	112	111	105	103	102	102	105
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129	98	99	100	101	100	101	101	101	104	105	105	104	99	97	96	96	98
130	96	97	98	99	98	98	99	99	102	103	103	102	97	95	94	94	96
131	94	95	95	97	95	96	96	97	100	101	100	100	94	93	92	92	94
132	92	93	93	95	93	94	94	95	97	99	98	97	92	91	90	90	92
133	90	91	91	92	91	92	92	92	95	96	96	95	90	89	87	87	90
134	88	88	89	90	89	90	90	90	93	94	93	93	88	86	85	85	88
135	85	86	86	88	87	87	87	88	90	92	91	90	86	84	83	83	85
136	83	84	84	85	84	85	85	86	88	89	89	88	84	82	81	81	83
137	81	82	82	83	82	83	83	83	86	87	86	86	81	80	79	79	81
138	78	79	79	81	80	80	80	81	83	84	84	83	79	78	76	76	78
139	76	77	77	78	77	78	78	78	81	82	81	81	77	75	74	74	76
140	74	75	75	76	75	76	76	76	79	80	79	78	74	73	72	72	74
141	71	72	72	73	73	73	73	74	76	77	77	76	72	71	70	69	71
142	69	70	70	71	70	71	71	71	74	75	74	73	70	69	67	67	69
143	67	68	67	69	68	69	69	69	71	72	72	71	67	66	65	65	67
144	64	65	65	66	66	66	66	67	69	70	69	68	65	64	63	63	64
145	62	63	63	64	63	64	64	64	66	67	67	66	63	62	60	60	62
146	60	60	60	61	61	62	62	62	64	65	64	63	60	59	58	58	60
147	57	58	58	59	59	59	59	59	62	62	62	61	58	57	56	56	57
148	55	56	56	57	56	57	57	57	59	60	60	58	56	55	54	53	55
149	53	53	53	54	54	54	55	54	57	57	57	56	54	53	51	51	53
150	50	51	51	52	51	52	52	52	54	55	55	54	51	50	49	49	50
151	48	49	48	49	49	50	50	50	52	53	52	51	49	48	47	47	48
152	46	46	46	47	47	47	48	47	49	50	50	49	47	46	45	44	46
153	43	44	44	45	44	45	45	45	47	48	48	46	44	43	42	42	43
154	41	41	41	42	42	42	43	42	44	45	45	44	42	41	40	40	41
155	39	39	39	40	40	40	41	40	42	43	43	41	40	39	38	38	39
156	36	37	37	38	37	38	38	38	39	39	40	39	37	37	36	35	36

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

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157	34	34	34	35	35	35	36	35	37	36	38	37	35	34	33	33	34
158	32	32	32	33	33	33	34	33	35	34	36	34	33	32	31	31	32
159	29	30	30	31	30	31	31	31	32	33	33	32	31	30	29	29	29
160	27	28	28	28	28	28	29	29	30	31	31	30	28	28	27	27	27
161	25	25	25	26	26	26	27	27	28	28	29	28	26	25	25	25	25
162	23	23	23	24	24	24	25	24	25	25	26	26	24	23	23	22	23
163	21	21	21	22	22	22	22	22	23	19	24	24	22	21	21	20	21
164	19	19	19	19	19	20	20	20	21	14	21	21	20	19	19	18	19
165	17	17	17	17	17	18	18	18	19	8	18	19	18	17	17	16	17
166	15	15	15	15	15	16	16	16	17	4	15	17	16	15	15	15	15
167	13	13	13	13	13	13	14	14	15	1	11	15	14	13	13	13	13
168	11	11	11	11	11	12	12	12	12	0	9	13	12	11	11	11	11
169	9	9	9	9	10	10	10	10	10	0	8	11	10	10	9	9	9
170	7	7	7	6	8	8	8	9	8	0	6	9	8	8	7	7	7
171	6	5	5	3	6	6	7	7	6	0	5	8	7	6	5	6	6
172	4	4	2	2	4	4	5	6	5	1	4	6	5	5	3	4	4
173	3	2	0	2	2	2	2	4	4	1	2	3	4	3	0	2	3
174	1	1	0	1	0	0	1	1	3	1	1	0	2	2	0	0	1
175	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06

Expand Uncertainty:
Photometric Measurement (Sphere):2.04%, k=2
Chromaticity Measurement(Sphere):28.8K, k=2
Photometric Measurement(Goniophotometer):2.36%, k=2

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