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-7324-27K-G2

Representative (Tested) Model: LED-7324-27K-G2

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

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Feb.12,2017

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.

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-7324-27K-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	SAMSUNG	
LED Model	SPMWHT327F********	
Sample Number	GZE1707080-H-A1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo

1.2 Test Specifications:

Date of Receipt	Feb.05,2018
Date of Test	Feb.06,2018
Test item	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	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

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.

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 ºC ±1 ºC. 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 ºC ±1 ºC. 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 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-02-06	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7324-27K-G2		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170708 0-H-A1	120.0	60	0.1028	11.36	0.9210	37.42
	277.0	60	0.0453	11.00	0.8770	54.04

Chromaticity Measurement - Sphere-Spectroradiometer Method:

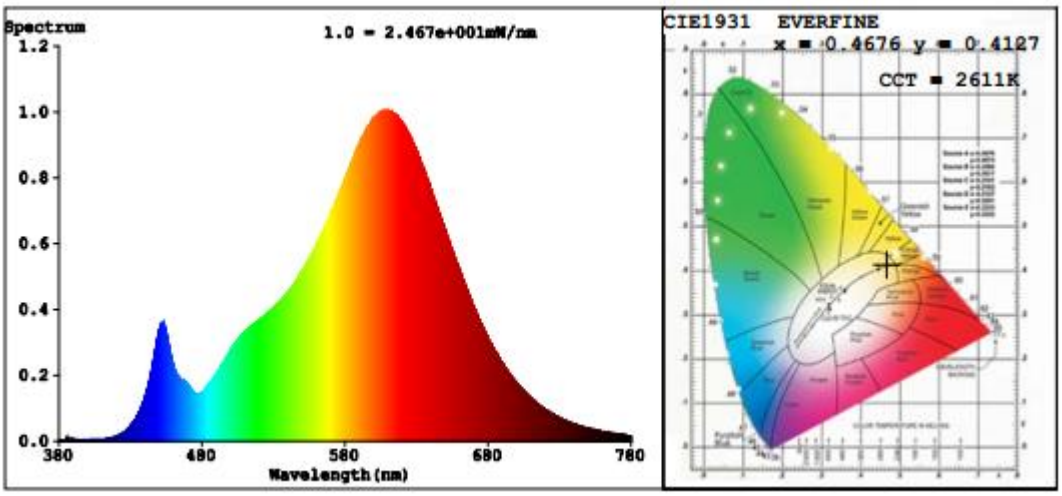
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2611
Duv	0.0002
Chromaticity (x, y)	x=0.4676 y=0.4127
Chromaticity (u', v')	u'=0.2666 v'=0.5293
Color Rendering Index (CRI)	83.0
R9	10

Special Color Rendering Indices			
R1	82	R9	10
R2	93	R10	84
R3	95	R11	81
R4	81	R12	79
R5	82	R13	84
R6	93	R14	98
R7	81	R15	74
R8	58	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	1041.1	989.84
Luminous Efficacy (lm/W)	91.65	89.99
Beam Angle ( )	114.1	--
Center Beam Candle Power (cd)	304	--

Spectral Power Distribution & Chromaticity Diagram

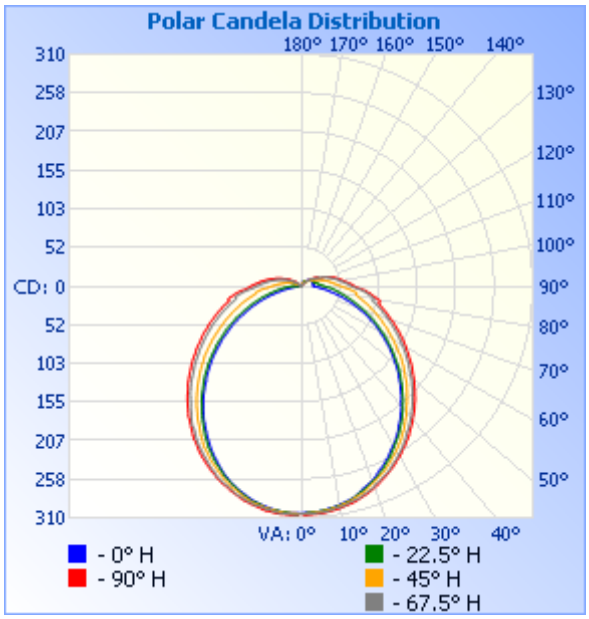


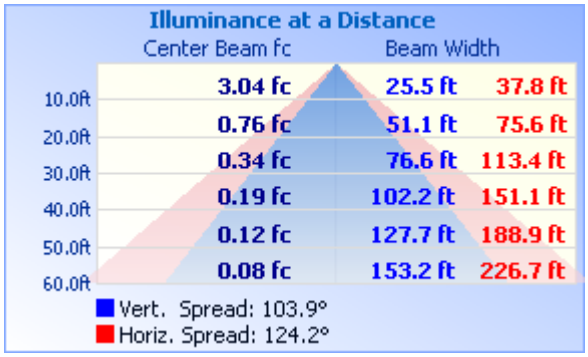
Zonal Lumen Tabulation

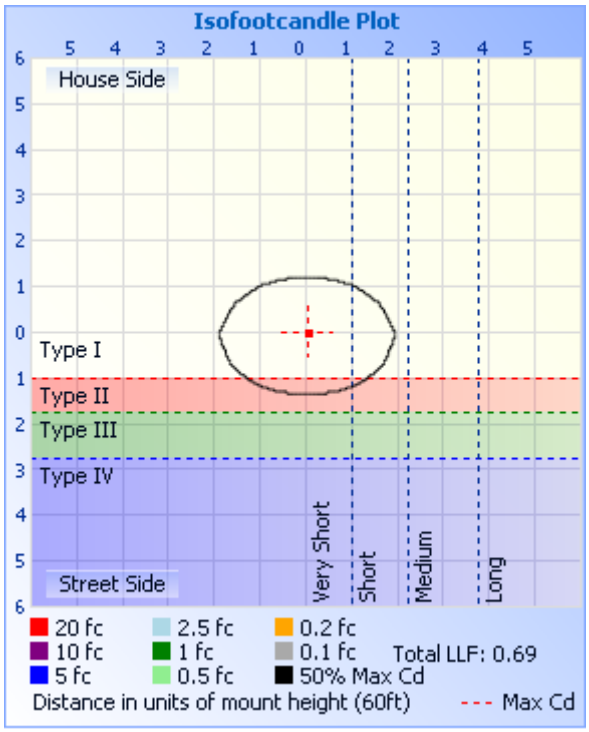
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	234.7	22.5%
0-40	383.0	36.8%
0-60	678.1	65.1%
60-90	265.8	25.5%
70-100	188.3	18.1%
90-120	81.9	7.9%
0-90	944.0	90.7%
90-180	97.1	9.3%
0-180	1,041.0	100%

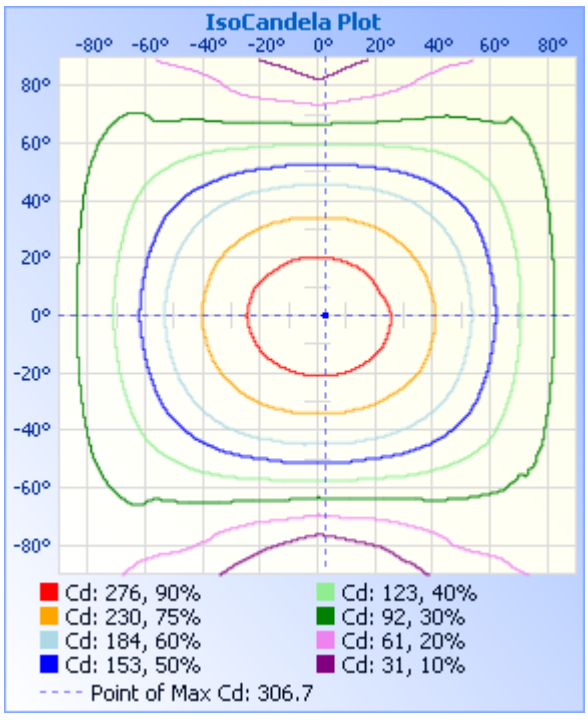
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.7	2.8%	90-100	39.6	3.8%
10-20	82.2	7.9%	100-110	26.4	2.5%
20-30	123.8	11.9%	110-120	15.8	1.5%
30-40	148.3	14.2%	120-130	8.5	0.8%
40-50	153.6	14.8%	130-140	3.6	0.3%
50-60	141.6	13.6%	140-150	1.8	0.2%
60-70	117.2	11.3%	150-160	0.9	0.1%
70-80	87.5	8.4%	160-170	0.3	0%
80-90	61.2	5.9%	170-180	0.1	0%

Photometric Data









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	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304
1	303	304	304	305	**307**	302	302	303	303	305	304	306	**307**	302	302	303	303
2	303	303	304	305	306	302	303	303	304	305	304	306	306	302	302	303	303
3	303	303	304	305	306	302	303	303	304	304	304	305	306	301	302	302	303
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6	301	301	302	303	305	301	302	302	302	302	303	305	306	300	300	300	301
7	300	301	301	303	304	300	301	301	301	301	302	303	305	299	300	300	300
8	299	300	300	302	303	299	300	300	300	301	301	302	304	298	297	298	299
9	298	299	300	300	303	298	298	298	299	300	300	302	304	297	296	297	298
10	297	298	298	300	302	297	297	297	298	298	299	300	303	296	297	296	297
11	295	296	297	299	300	296	296	296	296	296	298	299	301	295	295	294	295
12	294	295	296	298	299	295	295	295	295	296	297	299	300	294	294	293	294
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116	16	16	19	25	25	19	9	3	1	1	7	17	22	25	20	15	16
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123	13	13	14	18	19	12	4	2	1	2	2	10	13	17	14	13	13
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126	13	12	12	15	15	9	2	2	1	2	2	7	10	14	11	12	13
127	13	12	12	14	14	8	2	2	1	2	2	6	9	13	10	12	13
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145	8	7	6	3	1	1	1	1	1	1	1	1	1	2	5	7	8
146	8	7	5	3	1	1	1	1	1	1	1	1	1	2	5	7	8
147	7	7	5	3	1	1	1	1	1	1	1	1	1	2	5	7	7
148	7	7	5	3	1	1	1	1	0	1	1	1	1	2	5	7	7
149	7	6	5	3	1	1	1	1	1	1	1	1	1	2	5	6	7
150	7	6	5	2	1	1	1	1	1	1	1	1	1	2	5	6	7
151	6	6	5	2	0	1	1	0	1	1	1	1	1	2	4	6	6
152	6	6	4	2	1	1	1	0	0	1	1	1	1	2	4	6	6
153	6	6	4	2	1	1	1	0	1	1	1	1	1	2	4	6	6
154	6	5	4	2	0	1	0	0	1	1	1	1	1	2	4	5	6
155	6	5	4	1	0	1	0	0	0	1	1	1	1	2	4	5	6
156	5	5	4	1	1	1	0	0	1	1	1	1	1	2	4	5	5

157	5	5	4	1	0	1	0	1	0	1	1	1	1	2	4	5	5
158	5	5	3	1	0	0	0	0	0	1	1	1	1	2	4	4	5
159	5	4	3	1	0	0	0	1	1	1	1	1	1	2	3	4	5
160	4	4	2	1	0	0	0	0	0	1	1	1	1	2	3	4	4
161	4	4	1	1	0	0	0	0	0	0	1	1	1	2	3	4	4
162	4	4	1	1	0	0	0	0	0	1	1	1	1	2	3	4	4
163	4	3	1	1	0	0	0	0	0	1	1	1	1	2	3	3	4
164	4	2	1	0	0	0	0	0	0	0	1	1	1	2	2	3	4
165	3	1	1	0	0	0	0	0	0	1	1	1	1	1	2	3	3
166	2	1	1	0	0	0	0	0	0	0	0	1	1	1	2	3	2
167	2	1	1	1	0	0	0	0	0	0	0	1	1	1	2	2	2
168	2	1	1	1	0	0	0	0	0	0	1	1	1	1	2	2	2
169	2	1	1	1	0	0	0	0	0	0	1	1	0	1	2	2	2
170	2	1	1	1	0	0	0	0	0	1	1	1	0	1	2	2	2
171	2	1	1	1	0	0	0	0	0	0	1	0	0	1	1	2	2
172	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	2	1
173	1	1	1	0	0	0	0	0	0	0	1	0	0	1	1	1	1
174	1	1	1	0	0	0	0	0	0	0	1	0	0	1	1	1	1
175	1	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1	1
176	1	1	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1
177	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
178	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
179	0	0	0	1	0	0	0	0	0	0	1	0	1	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 ********