



NVLAP LAB CODE 201011-0

Report No.: GZE160820-E

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest HighwayCary, IL60013

LED Lamp

Model name(s): LED-7312-35A

Representative (Tested) Model: LED-7312-35A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Aug 19,2016

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

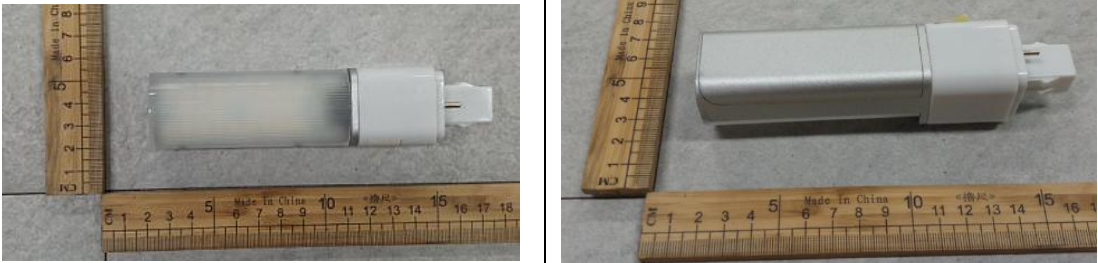
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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-7312-35A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamp	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	7W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K	
LED Manufacturer	Samsung Electronics LED Business	
LED Model	SPMWHT327F*****	
Sample Number	GZE160820-E1(3500K)	
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	Aug 13,2016
Date of Test	Aug.14,2016
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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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° 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-08-14	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7312-35A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160820-E1	120.0	60	0.0643	6.97	0.9032	18.02

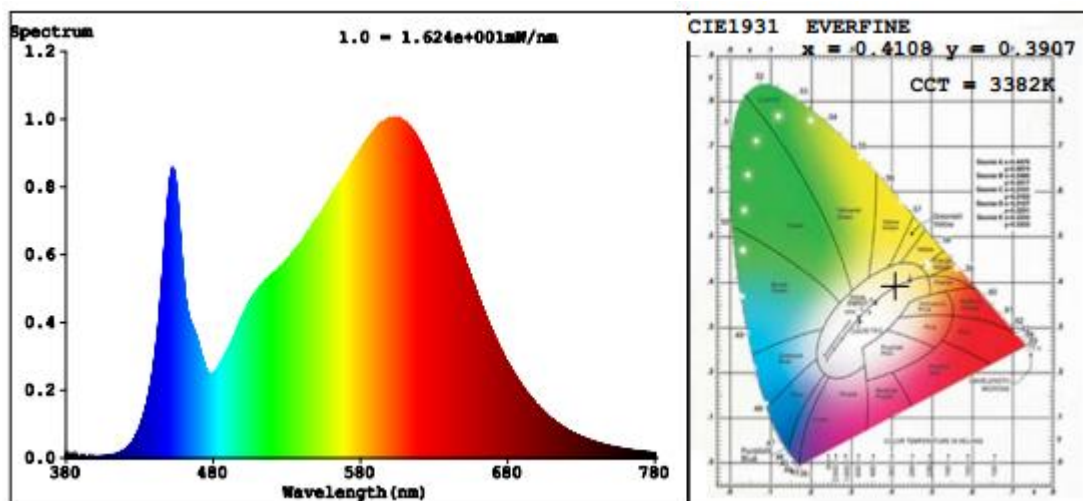
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	18
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	3382	R3	97	R11	82
Duv	-0.0012	R4	83	R12	70
Chromaticity (x, y)	x=0.4108 y=0.3907	R5	84	R13	86
Chromaticity (u', v')	u'=0.2393 v'=0.5121	R6	90	R14	99
Color Rendering Index (CRI)	84.9	R7	85	R15	78
R9	18	R8	65	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	899.66
Luminous Efficacy (lm/W)	129.08
Beam Angle (°)	109.8
Center Beam Candle Power (cd)	295

Spectral Power Distribution & Chromaticity Diagram

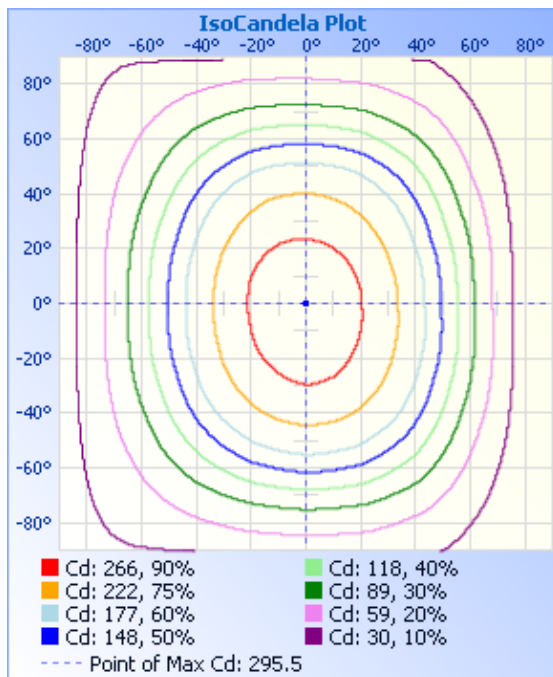
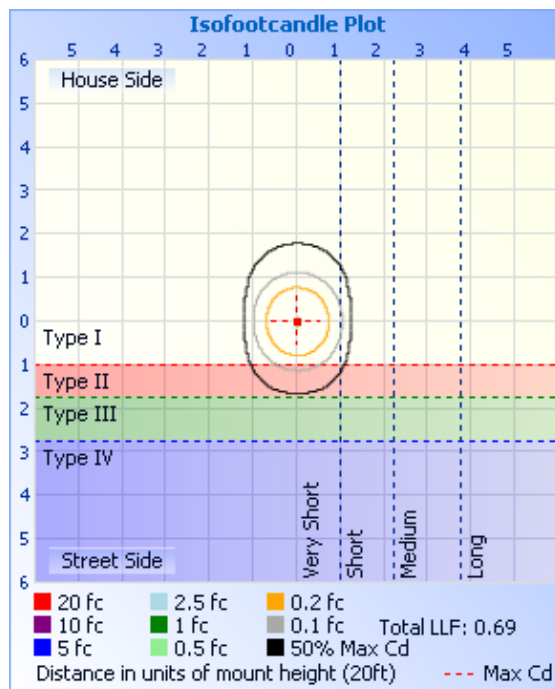
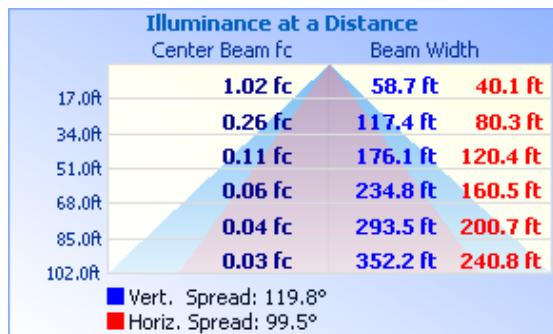
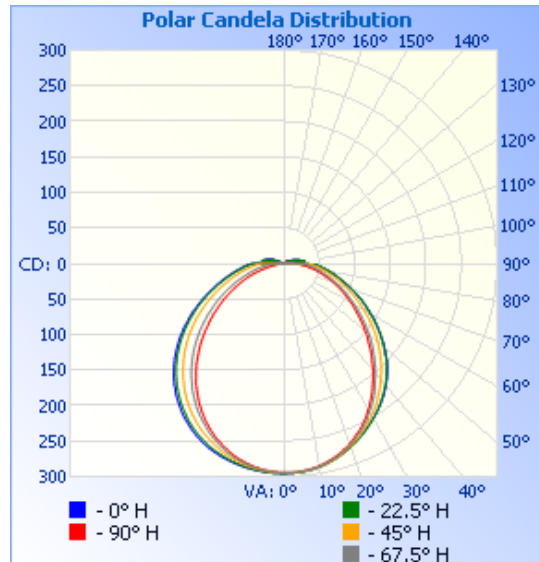


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	228.1	25.4%
0-40	372.5	41.4%
0-60	654.5	72.8%
60-90	221.0	24.6%
70-100	126.1	14%
90-120	22.8	2.5%
0-90	875.5	97.3%
90-180	24.1	2.7%
0-180	899.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.9	3.1%	90-100	10.0	1.1%
10-20	79.7	8.9%	100-110	9.5	1.1%
20-30	120.5	13.4%	110-120	3.3	0.4%
30-40	144.4	16.1%	120-130	0.6	0.1%
40-50	148.6	16.5%	130-140	0.2	0%
50-60	133.4	14.8%	140-150	0.2	0%
60-70	104.9	11.7%	150-160	0.2	0%
70-80	72.2	8.0%	160-170	0.1	0%
80-90	43.9	4.9%	170-180	0.0	0%

Photometric Data



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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	295	295	295	294	294	294	294	294	295	295	295	294	294	294	294	294	295
1	295	295	295	295	294	294	294	294	295	295	295	294	294	293	294	294	295
2	295	295	295	294	294	294	294	294	295	295	294	294	293	293	293	293	295
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5	294	294	294	294	293	293	293	293	295	294	293	293	292	292	292	292	294
6	294	294	294	293	293	292	292	293	294	294	293	292	291	291	291	292	294
7	293	293	293	292	292	292	292	292	294	293	292	291	290	290	290	291	293
8	292	293	292	292	291	291	291	292	293	293	291	290	289	289	290	290	292
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10	291	291	290	290	289	289	290	290	292	292	289	287	286	286	287	288	291
11	289	290	289	289	288	288	289	289	292	291	288	286	285	285	286	288	289
12	288	289	288	287	286	286	287	289	291	290	287	285	283	283	285	286	288
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23	269	269	267	264	261	264	269	275	278	276	268	261	257	259	261	265	269
24	266	267	264	262	259	261	267	273	277	274	266	259	255	256	259	263	266
25	264	264	262	258	256	258	265	271	275	272	264	256	251	253	256	261	264
26	261	262	259	256	253	255	262	269	273	270	262	253	248	249	254	258	261
27	259	260	256	252	249	252	260	266	271	268	259	250	245	246	250	255	259
28	257	257	253	249	246	248	257	264	269	266	257	246	241	243	248	253	257

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29	254	255	250	245	242	246	255	262	267	263	254	244	238	239	244	250	254
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56	159	159	147	131	124	133	151	165	172	167	153	129	112	119	140	155	159
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61	138	137	126	111	104	112	129	142	149	145	130	105	88	96	119	134	138
62	133	132	122	106	101	107	124	137	145	141	125	100	84	92	115	129	133
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87	48	48	43	34	23	33	42	50	53	50	39	19	2	13	34	45	48
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89	39	40	37	29	19	28	38	46	48	46	35	16	1	8	30	41	39
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91	2	1	1	2	4	5	4	11	22	22	18	6	0	2	3	7	2
92	1	1	1	1	0	1	1	1	6	5	1	1	0	1	1	1	1

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93	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	1	1
94	1	2	8	1	0	1	3	1	1	1	2	1	0	1	2	1	1
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96	25	30	9	13	4	8	13	31	18	23	5	6	0	5	3	24	25
97	29	30	9	14	8	11	12	31	30	31	5	7	0	4	3	27	29
98	28	28	8	12	10	9	11	30	31	30	5	6	0	4	3	26	28
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112	12	11	2	0	6	1	1	9	13	10	1	0	0	0	1	11	12
113	11	10	1	0	6	1	0	8	11	9	1	0	0	0	1	9	11
114	10	8	1	0	6	1	0	6	10	7	1	0	0	0	0	8	10
115	8	7	0	0	6	1	0	5	8	6	0	0	0	0	0	7	8
116	7	5	0	0	6	1	0	4	7	5	0	0	0	0	0	6	7
117	6	4	0	0	6	1	0	2	6	4	0	0	0	0	0	4	6
118	5	3	0	0	6	1	0	2	5	3	0	0	0	0	0	3	5
119	4	2	0	0	6	0	0	1	3	2	0	0	0	0	0	2	4
120	3	1	0	0	6	0	0	0	2	1	0	0	0	0	0	1	3
121	2	1	0	0	6	0	0	0	1	0	0	0	0	0	0	1	2
122	1	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	1
123	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0

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126	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
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128	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
161	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
163	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
164	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
165	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
166	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
167	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
168	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	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-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-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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