

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN**(Brand Name:N/A)**

188 S. Northwest Highway Cary, IL60013

LED Luminaires

Model name(s): LED-8029M40C-A

Representative (Tested) Model: LED-8029M40C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Apr.17,2017

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

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Tel: 8620-3229 0320

Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029M40C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	220-347Vac, 50/60 Hz	
Nominal Power	24W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-BF1	
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 16,2017
Date of Test	Jan 17,2017
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 277 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 277 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 277 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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8029M40C-A		

Electrical Measurement :

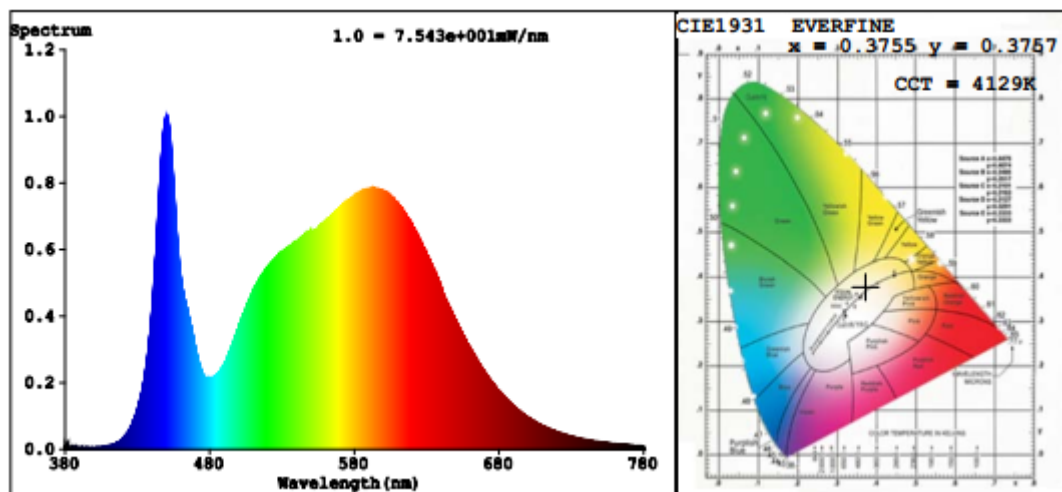
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.0886	23.22	0.9462
BF1	347.0	60	0.0769	24.90	0.9336

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	6
Frequency (Hz)	60	R2	88	R10	70
CCT (K)	4129	R3	93	R11	80
Duv	0.0010	R4	82	R12	58
Chromaticity (x, y)	x=0.3755 y=0.3757	R5	80	R13	82
Chromaticity (u', v')	u'=0.2223 v'=0.5004	R6	83	R14	96
Color Rendering Index (CRI)	82.2	R7	86	R15	75
R9	6	R8	65	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	3404.8	3541.5
Luminous Efficacy (lm/W)	146.63	142.23
Beam Angle (°)	270.2	--
Center Beam Candle Power (cd)	256	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	244.8	6.9%
0-40	459.2	13%
0-60	1,066.5	30.1%
60-90	1,055.8	29.8%
70-100	1,040.1	29.4%
90-120	928.1	26.2%
0-90	2,122.3	59.9%
90-180	1,419.4	40.1%
0-180	3,541.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	24.9	0.7%	90-100	337.7	9.5%
10-20	78.5	2.2%	100-110	315.4	8.9%
20-30	141.5	4.0%	110-120	274.9	7.8%
30-40	214.4	6.1%	120-130	216.0	6.1%
40-50	280.5	7.9%	130-140	147.0	4.2%
50-60	326.8	9.2%	140-150	86.3	2.4%
60-70	353.4	10.0%	150-160	35.2	1%
70-80	355.5	10.0%	160-170	6.5	0.2%
80-90	346.9	9.8%	170-180	0.3	0%

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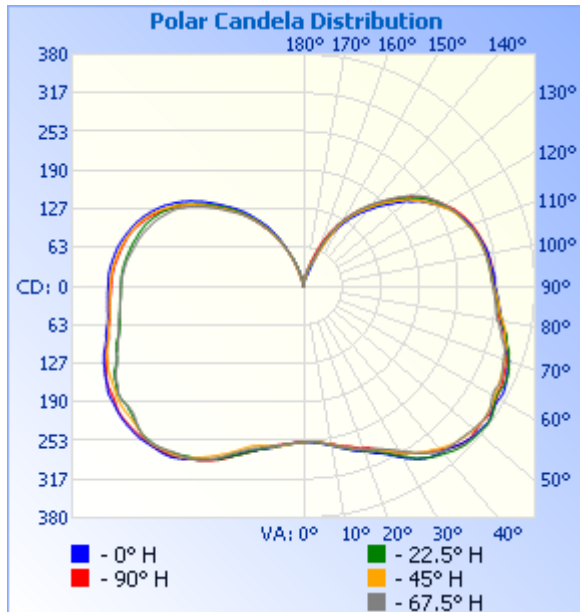
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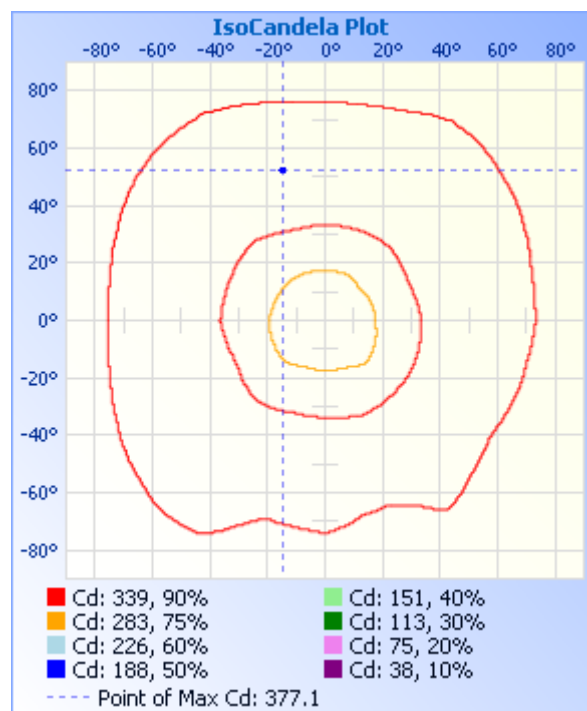
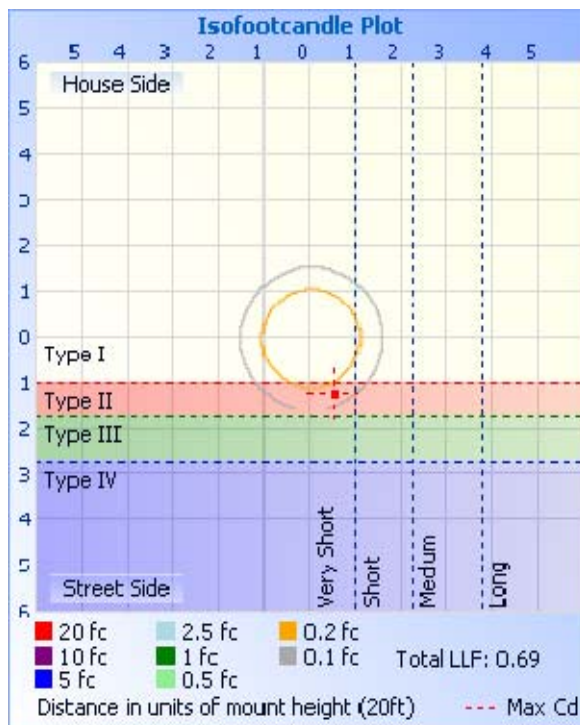
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Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.88 fc	
34.0ft	0.22 fc	
51.0ft	0.10 fc	
68.0ft	0.06 fc	
85.0ft	0.04 fc	
102.0ft	0.02 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	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
1	256	255	255	255	255	255	256	255	256	256	256	256	256	256	257	255	256
2	256	255	255	255	255	255	256	256	256	257	257	257	256	256	258	256	256
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28	315	313	307	303	308	314	304	318	321	322	315	321	324	328	325	312	315

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29	320	317	311	307	312	319	309	322	324	324	320	326	326	332	328	316	320
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93	313	309	308	308	312	313	323	307	321	300	316	298	315	308	315	309	313
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123	249	255	249	258	257	264	259	255	251	244	243	236	241	243	243	246	249
124	245	251	246	254	254	260	256	251	246	240	237	232	237	238	239	242	245

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131	209	219	215	225	222	226	220	215	209	203	198	196	199	201	201	208	209
132	204	212	210	219	215	220	215	209	204	198	194	190	195	195	197	202	204
133	198	208	205	214	211	214	209	204	198	192	188	185	189	190	191	196	198
134	194	201	199	208	205	208	204	197	193	188	183	180	185	186	186	192	194
135	188	195	195	202	200	203	198	192	187	182	178	174	179	181	182	186	188
136	183	190	189	197	194	197	193	185	182	178	173	170	175	175	176	182	183
137	178	184	185	191	188	192	187	181	177	172	168	165	169	171	171	176	178
138	172	178	179	186	184	186	182	176	172	167	162	161	163	165	166	171	172
139	167	174	174	181	178	182	177	171	168	162	158	156	159	161	160	167	167
140	162	170	169	175	173	177	172	165	162	155	152	151	153	155	156	162	162
141	157	165	163	171	167	171	168	160	157	151	147	146	148	150	151	156	157
142	153	160	158	165	162	166	162	155	151	144	142	140	142	146	146	152	153
143	147	154	153	159	157	161	157	149	146	139	137	135	137	140	141	146	147
144	142	150	148	155	152	156	151	144	139	134	131	129	131	134	134	141	142
145	137	143	143	147	148	150	145	138	133	128	125	124	125	129	130	136	137
146	131	139	138	142	142	146	141	134	128	123	120	118	120	123	123	130	131
147	126	132	131	136	136	140	135	128	123	117	114	113	114	118	117	126	126
148	119	128	126	130	131	135	130	122	119	112	109	107	109	112	112	120	119
149	113	121	119	125	125	129	124	117	113	105	102	102	104	107	106	115	113
150	107	116	112	119	119	123	119	111	107	101	97	96	99	100	101	108	107
151	100	108	100	114	113	118	112	106	99	94	90	90	94	94	93	96	100
152	95	100	92	106	107	111	107	99	92	89	84	84	88	89	84	87	95
153	86	93	83	99	102	106	101	93	86	82	78	78	81	82	76	75	86
154	78	86	76	91	96	99	95	86	78	74	72	73	74	76	68	67	78
155	72	77	66	83	90	93	89	79	71	68	66	66	68	70	62	55	72
156	63	71	61	74	85	86	82	73	63	61	60	61	62	63	53	45	63

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157	52	61	53	66	78	79	76	66	57	57	54	55	56	58	47	36	52
158	45	56	47	58	72	73	69	61	51	51	48	50	50	51	43	26	45
159	37	48	44	52	65	66	63	54	47	47	43	45	44	45	38	20	37
160	31	42	40	46	58	61	57	50	43	42	37	38	35	41	34	16	31
161	25	38	37	42	54	55	52	44	38	38	30	31	23	33	30	11	25
162	21	34	37	37	48	50	47	39	34	33	24	20	14	26	25	6	21
163	19	33	37	35	43	45	42	35	29	28	17	12	6	20	19	4	19
164	19	28	33	33	38	41	37	30	25	23	15	7	4	15	12	4	19
165	19	25	26	32	33	36	32	27	20	19	10	5	2	13	7	4	19
166	18	23	21	29	29	31	29	24	17	16	7	4	2	10	5	3	18
167	16	20	17	25	24	26	25	20	15	13	6	3	2	6	4	3	16
168	14	15	16	21	21	22	22	17	13	11	6	3	1	4	3	3	14
169	11	11	14	18	18	19	18	14	9	7	3	3	1	2	2	3	11
170	9	8	11	14	14	16	13	10	7	6	2	2	1	1	1	2	9
171	7	6	9	10	10	13	10	8	6	4	3	1	1	1	1	2	7
172	6	5	7	8	8	9	9	5	4	3	2	1	1	1	1	2	6
173	4	3	4	6	6	7	7	4	2	1	1	1	1	1	1	1	4
174	2	3	3	4	4	6	4	3	2	1	1	1	1	1	1	1	2
175	1	2	2	3	2	3	3	2	2	1	1	1	1	1	1	1	1
176	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
177	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06
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 *******