

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-8029E40-A

LED-8029-CW-E27-A

Remark: The two models are the same product with two model names

Representative (Tested) Model: LED-8029E40-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Apr.13,2017

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

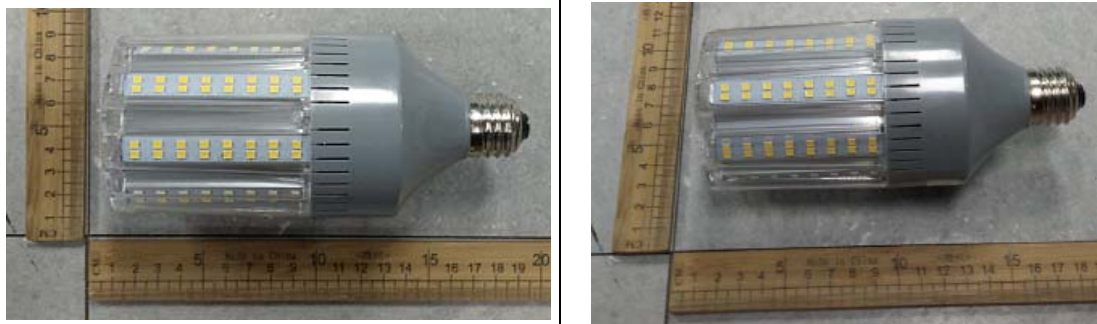
Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029E40-A;LED-8029-CW-E27-A	
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	24W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-AI1	
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	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 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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8029E40-A		

Electrical Measurement :

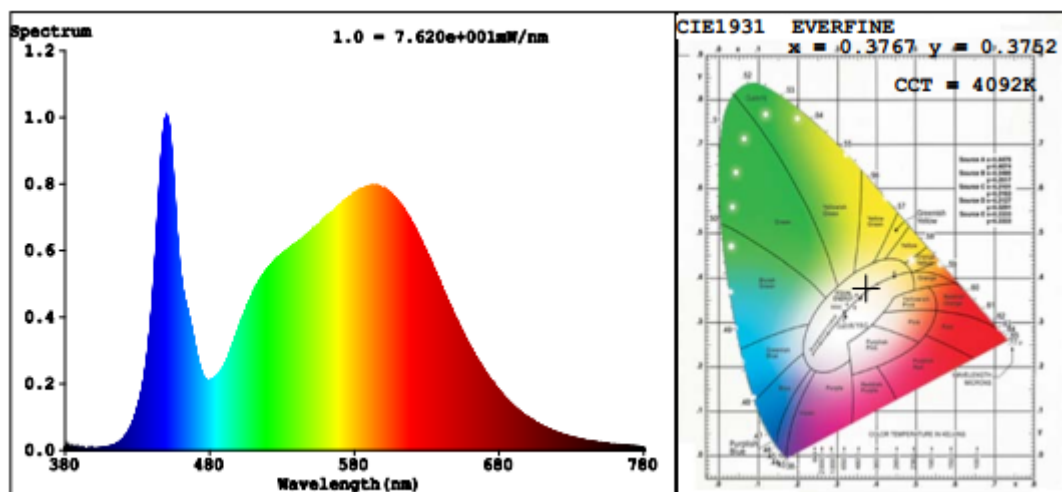
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	120.0	60	0.2040	24.08	0.9838
AI1	277.0	60	0.0948	24.30	0.9252

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	6
Frequency (Hz)	60	R2	88	R10	70
CCT (K)	4092	R3	93	R11	80
Duv	0.0004	R4	81	R12	58
Chromaticity (x, y)	x=0.3767 y=0.3752	R5	80	R13	82
Chromaticity (u', v')	u'=0.2233 v'=0.5003	R6	83	R14	96
Color Rendering Index (CRI)	82.0	R7	86	R15	75
R9	6	R8	64	--	--

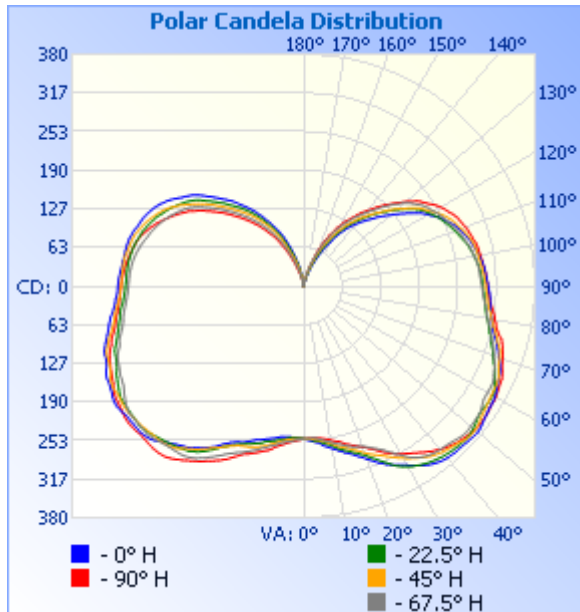
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	3422.4	3459.0
Luminous Efficacy (lm/W)	142.13	142.35
Beam Angle (°)	267.4	--
Center Beam Candle Power (cd)	250	--

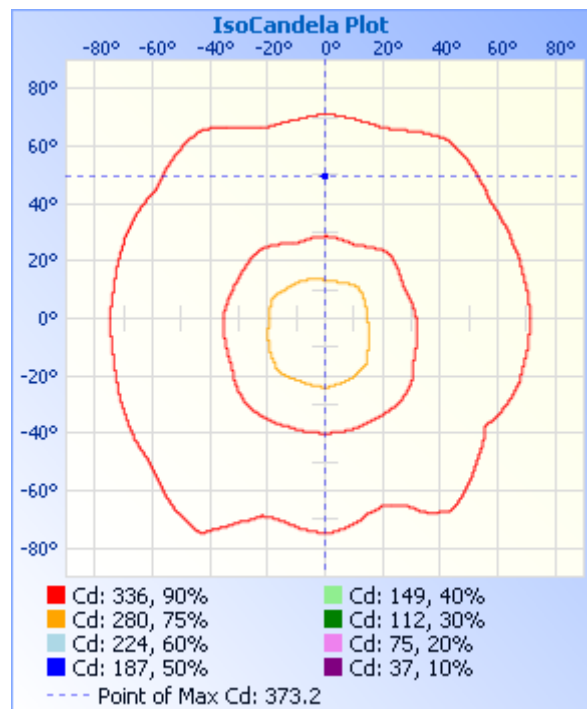
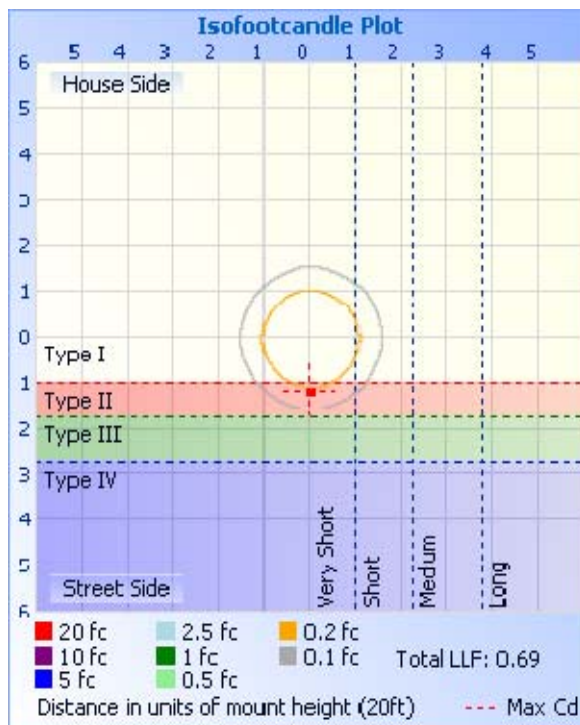
Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	242.6	7.1%
0-40	454.9	13.3%
0-60	1,051.6	30.7%
60-90	1,019.9	29.8%
70-100	997.2	29.1%
90-120	882.2	25.8%
0-90	2,071.5	60.5%
90-180	1,351.1	39.5%
0-180	3,422.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	24.4	0.7%	90-100	321.6	9.4%
10-20	77.7	2.3%	100-110	300.0	8.8%
20-30	140.6	4.1%	110-120	260.5	7.6%
30-40	212.3	6.2%	120-130	204.9	6%
40-50	275.8	8.1%	130-140	139.2	4.1%
50-60	320.9	9.4%	140-150	81.4	2.4%
60-70	344.3	10.1%	150-160	35.3	1%
70-80	343.4	10.0%	160-170	7.8	0.2%
80-90	332.2	9.7%	170-180	0.3	0%

Photometric Data


Illuminance at a Distance		
	Center Beam fc	Beam Width
17.0ft	0.87 fc	
34.0ft	0.22 fc	
51.0ft	0.10 fc	
68.0ft	0.05 fc	
85.0ft	0.03 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	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
1	252	251	250	250	250	248	248	251	249	249	250	251	252	250	251	252	252
2	253	251	251	250	250	247	248	250	249	249	250	252	253	252	252	254	253
3	254	253	251	250	250	247	246	247	249	249	251	253	254	254	254	255	254
4	256	254	252	250	250	248	245	246	248	249	251	254	255	256	255	256	256
5	257	255	253	251	250	248	245	246	248	250	252	255	257	257	257	258	257
6	259	256	254	252	251	248	246	246	249	251	253	256	259	260	259	260	259
7	263	259	256	254	252	249	246	247	249	253	255	258	261	263	262	263	263
8	265	261	258	256	253	249	247	248	249	254	256	259	263	265	264	266	265
9	268	263	260	258	254	250	248	249	250	255	259	262	265	267	267	269	268
10	270	265	262	260	256	252	249	250	253	257	261	264	268	269	268	272	270
11	273	269	265	262	258	253	251	252	254	258	263	266	272	271	270	273	273
12	276	272	268	264	260	256	253	254	255	260	265	268	275	273	272	276	276
13	278	274	270	266	262	258	255	255	257	261	269	271	277	275	274	278	278
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25	322	319	307	295	299	290	282	284	283	288	289	304	314	321	312	324	322
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28	332	334	318	309	311	300	287	293	296	301	300	317	325	333	323	337	332
29	335	338	322	315	315	304	291	296	301	306	304	321	328	336	327	342	335

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30	339	342	325	320	317	309	294	300	305	311	307	326	332	339	330	345	339
31	343	345	329	326	321	313	298	305	309	316	311	329	335	343	335	348	343
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94	299	292	296	290	300	294	309	294	302	291	299	287	297	290	294	294	299
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126	203	215	217	228	236	241	251	242	247	236	228	220	210	207	198	205	203
127	197	211	212	225	232	238	247	238	244	232	224	216	205	202	192	200	197
128	192	205	206	221	225	234	242	233	240	228	219	210	200	196	187	196	192
129	186	199	202	217	221	231	238	230	237	224	214	205	195	190	182	190	186
130	181	195	196	212	215	227	232	226	232	219	209	200	190	185	177	186	181
131	176	189	191	206	209	223	227	222	228	213	204	194	185	179	172	180	176
132	170	183	186	201	204	217	221	217	222	209	199	190	180	173	166	174	170
133	166	178	180	195	198	211	215	212	216	203	193	184	175	168	162	170	166
134	160	173	174	189	193	207	211	208	211	199	189	180	170	162	157	164	160
135	155	168	170	184	189	202	204	203	205	193	183	174	164	158	152	158	155
136	151	163	164	177	182	197	199	199	201	189	179	169	159	152	147	153	151
137	146	157	160	171	177	191	193	193	195	184	174	164	154	147	142	148	146
138	142	152	155	167	171	187	189	189	191	178	169	159	149	142	138	144	142
139	137	147	150	161	166	181	183	184	186	174	165	155	145	137	132	138	137
140	132	141	146	157	162	177	179	180	182	169	159	149	139	132	126	133	132
141	128	137	141	151	156	171	174	175	176	165	155	145	135	127	121	128	128
142	123	132	135	146	152	165	169	171	170	160	151	139	130	121	115	123	123
143	119	127	131	142	146	160	164	166	166	156	147	135	126	117	111	117	119
144	114	121	126	136	140	154	159	161	160	151	142	130	120	111	105	112	114
145	108	116	121	132	136	150	154	157	156	146	137	125	115	106	99	106	108
146	103	111	115	127	131	145	148	151	150	141	132	120	110	101	94	102	103
147	96	105	110	121	127	140	144	146	146	136	126	115	104	95	88	95	96
148	89	100	105	116	121	135	139	141	140	130	122	110	100	89	81	89	89
149	84	94	99	111	115	130	135	137	135	124	117	104	95	84	76	84	84
150	78	88	95	106	111	124	129	131	129	120	112	100	90	78	70	77	78
151	73	83	89	100	105	119	124	126	123	114	106	94	84	73	65	72	73
152	67	76	83	94	99	114	118	119	118	109	102	89	79	67	60	66	67
153	61	71	78	89	94	108	113	114	112	103	96	83	73	60	55	59	61
154	56	65	72	83	87	103	106	109	107	98	91	78	68	55	50	55	56
155	50	58	67	77	82	97	99	103	101	92	85	71	61	50	45	49	50
156	45	54	62	72	76	92	93	98	97	87	79	66	56	45	41	44	45
157	42	48	56	65	69	85	86	92	91	81	71	59	51	40	37	40	42

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

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158	37	44	51	59	64	79	81	87	86	75	64	53	45	35	33	35	37
159	34	39	45	53	56	69	76	80	79	70	59	48	41	31	29	32	34
160	29	34	41	47	48	61	70	74	73	64	54	43	34	27	23	27	29
161	25	30	37	44	43	52	63	67	67	58	50	39	30	23	19	23	25
162	21	26	32	40	36	42	57	62	61	53	46	34	26	20	17	20	21
163	18	22	28	34	32	35	49	56	55	49	42	30	24	16	14	17	18
164	15	20	24	30	27	27	42	51	48	43	38	27	21	14	11	13	15
165	13	16	20	26	22	23	37	46	44	38	35	23	19	11	9	10	13
166	10	13	17	22	19	17	31	41	38	33	28	18	15	8	7	8	10
167	8	11	14	16	17	15	27	37	35	29	23	15	12	6	6	7	8
168	6	8	12	13	12	11	23	30	30	24	20	14	10	5	4	5	6
169	5	6	10	11	10	8	20	24	22	19	17	11	8	3	2	3	5
170	3	5	7	9	7	4	15	16	11	13	14	9	6	2	2	2	3
171	2	3	6	7	5	3	11	11	4	6	6	7	5	2	2	2	2
172	2	3	4	4	3	3	9	6	1	3	5	6	3	1	1	1	2
173	1	2	3	2	1	2	7	3	2	3	6	4	3	1	1	1	1
174	1	1	1	1	1	1	5	2	3	2	4	2	2	1	1	1	1
175	1	1	1	1	1	1	2	1	2	2	3	2	1	1	1	1	1
176	1	1	1	1	1	1	1	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

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 *******