

**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-8029E57C-A

Representative (Tested) Model: LED-8029E57C-A

Model Different: N/A

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Mar.30,2017

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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**1.1 Product Information:**

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029E57C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	277-347Vac, 50/60 Hz	
Nominal Power	24W	
Rated Initial Lamp Lumen	--	
Declared CCT	5700K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-Q1	
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"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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-8029E57C-A		

**Electrical Measurement :**

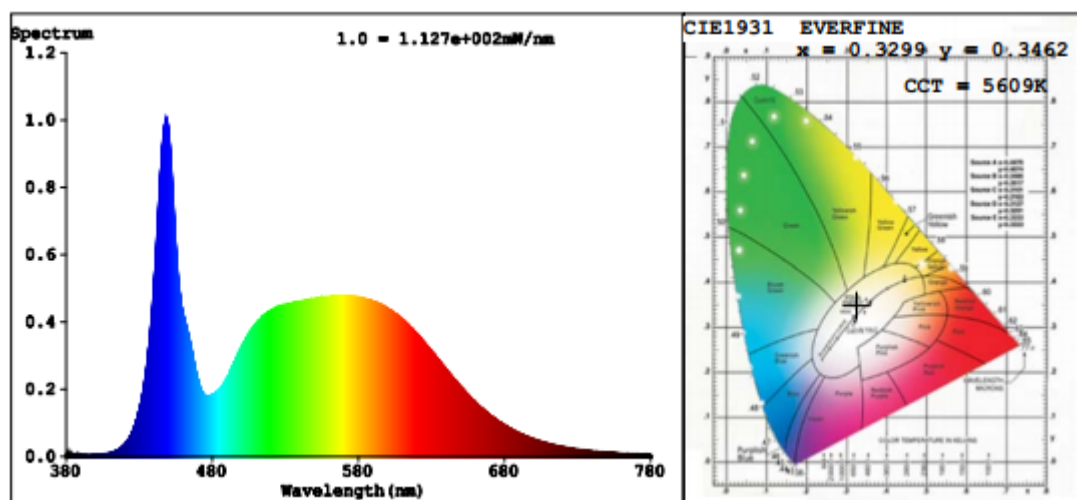
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.0919	23.60	0.9273
Q1	347.0	60	0.0735	23.08	0.9049

**Chromaticity Measurement - Sphere-Spectroradiometer Method :**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	80	R9	6
Frequency (Hz)	60	R2	85	R10	66
CCT (K)	5609	R3	89	R11	83
Duv	0.0038	R4	83	R12	60
Chromaticity (x, y)	x=0.3299 y=0.3462	R5	82	R13	81
Chromaticity (u', v')	u'=0.2032 v'=0.4798	R6	81	R14	94
Color Rendering Index (CRI)	82.0	R7	87	R15	75
R9	6	R8	69	--	--

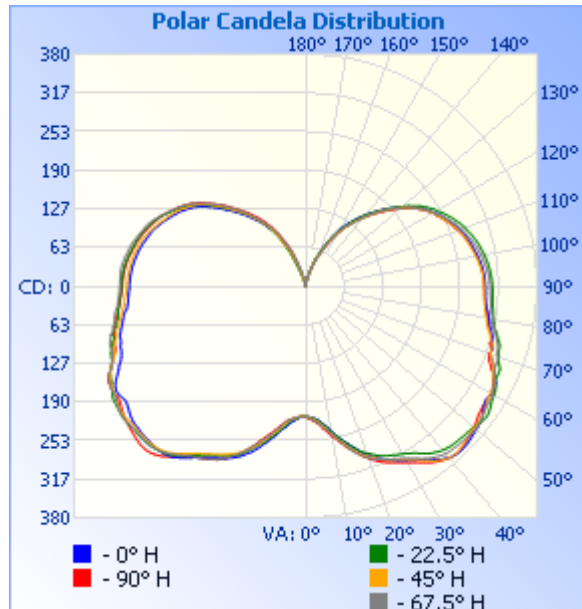
**Photometric Measurement – Goniophotometer Method :**

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	3426.0	3339.5
Luminous Efficacy (lm/W)	145.17	144.69
Beam Angle (°)	266.3	--
Center Beam Candle Power (cd)	214	--

**Spectral Power Distribution & Chromaticity Diagram**

**Zonal Lumen Tabulation**

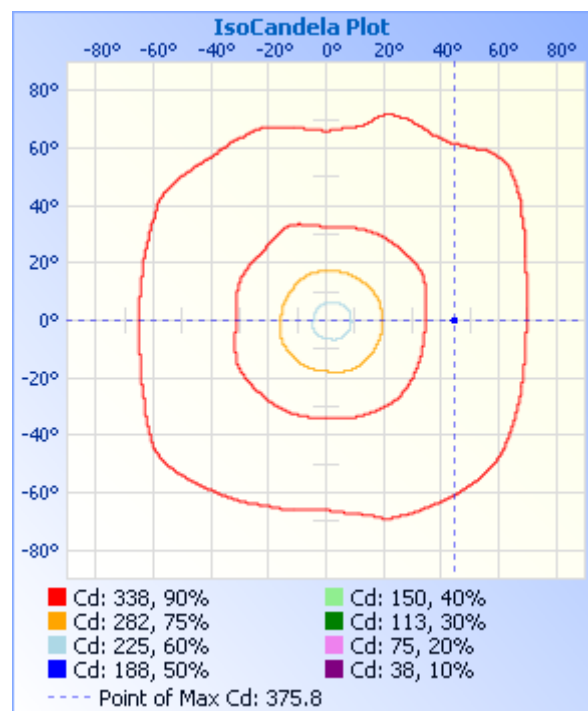
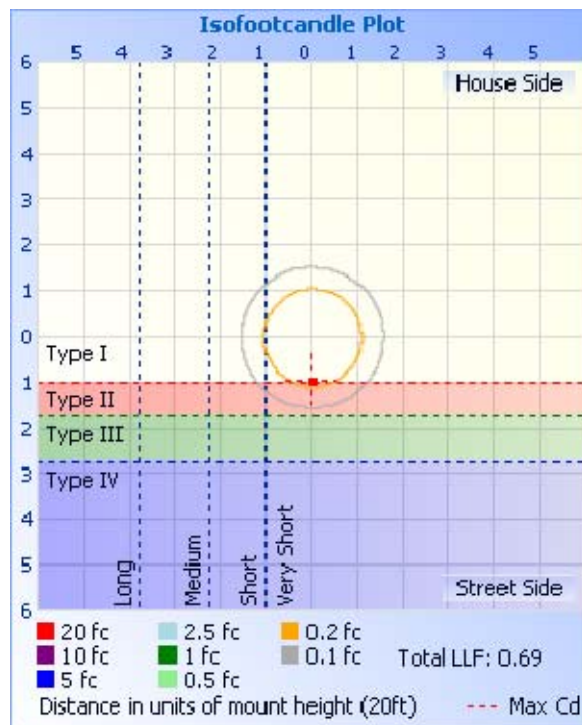
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	241.9	7.1%
0-40	457.0	13.3%
0-60	1,063.3	31%
60-90	1,018.1	29.7%
70-100	997.0	29.1%
90-120	882.0	25.7%
0-90	2,081.4	60.7%
90-180	1,344.8	39.3%
0-180	3,426.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	21.7	0.6%	90-100	323.7	9.4%
10-20	76.4	2.2%	100-110	299.7	8.7%
20-30	143.8	4.2%	110-120	258.6	7.5%
30-40	215.1	6.3%	120-130	203.8	5.9%
40-50	281.6	8.2%	130-140	138.5	4%
50-60	324.7	9.5%	140-150	80.5	2.4%
60-70	344.8	10.1%	150-160	33.5	1%
70-80	341.6	10.0%	160-170	6.3	0.2%
80-90	331.7	9.7%	170-180	0.2	0%

**Photometric Data**


**Illuminance at a Distance**

	Center Beam fc	Beam Width
17.0ft	<b>0.74 fc</b>	
34.0ft	<b>0.19 fc</b>	
51.0ft	<b>0.08 fc</b>	
68.0ft	<b>0.05 fc</b>	
85.0ft	<b>0.03 fc</b>	
102.0ft	<b>0.02 fc</b>	



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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	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214
1	214	214	215	216	217	214	214	214	214	213	213	214	215	213	213	213	214
2	215	216	217	217	219	216	216	215	215	214	214	214	214	213	213	214	215
3	216	217	218	219	220	218	217	217	217	216	215	215	214	213	214	216	216
4	218	218	220	221	223	220	219	219	219	217	216	216	216	214	215	217	218
5	220	221	223	225	226	223	223	222	222	219	218	217	217	215	216	219	220
6	223	224	227	228	230	227	226	227	224	222	220	219	219	217	219	221	223
7	227	228	231	232	235	231	231	230	228	225	223	221	221	219	221	224	227
8	230	232	235	237	239	236	236	235	233	230	226	223	223	222	225	228	230
9	235	236	241	241	245	242	241	240	236	235	230	228	227	226	229	231	235
10	241	242	247	247	250	247	247	244	241	240	236	233	232	231	234	237	241
11	248	247	251	251	255	252	253	250	248	245	241	238	236	236	239	242	248
12	252	252	257	258	260	257	257	255	253	250	246	244	241	241	246	246	252
13	257	258	262	263	265	263	263	259	258	254	251	249	247	246	251	251	257
14	263	263	268	269	270	267	269	265	264	260	256	253	251	253	256	257	263
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16	273	274	279	280	281	277	278	275	275	269	268	264	262	263	268	270	273
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29	326	315	326	323	331	319	320	320	321	317	315	324	325	317	319	325	326
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61	354	356	351	352	350	357	355	352	355	363	360	360	360	366	363	362	354
62	352	353	351	349	348	355	353	349	354	359	359	361	361	365	364	362	352
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93	294	305	292	301	292	301	288	299	288	302	292	305	300	307	298	312	294
94	294	305	291	301	292	300	287	299	288	301	292	305	299	306	297	312	294
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111	267	276	265	270	264	271	262	272	265	276	267	279	274	280	271	281	267
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114	260	268	257	261	256	263	256	263	257	269	260	271	267	272	264	273	260
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122	236	241	234	234	234	235	233	235	235	242	239	245	245	246	242	245	236
123	232	237	230	231	230	231	231	231	232	239	235	241	241	243	238	242	232
124	229	233	227	227	226	227	227	228	228	234	232	237	238	239	235	237	229

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125	225	229	223	223	222	222	224	225	226	231	230	234	234	236	232	234	225
126	221	224	218	219	217	217	219	220	221	226	226	230	231	232	228	230	221
127	216	219	214	214	211	213	216	217	217	221	222	224	226	227	224	224	216
128	211	214	209	210	207	207	210	212	212	217	217	220	221	223	220	220	211
129	206	208	205	204	202	203	205	207	207	211	213	215	216	218	214	215	206
130	202	202	199	199	197	196	200	201	202	206	208	211	211	212	210	210	202
131	196	197	194	194	192	191	195	196	196	201	202	205	206	208	204	206	196
132	191	192	189	189	186	186	191	191	191	195	197	201	201	201	199	201	191
133	187	187	183	183	181	181	185	185	186	190	191	196	196	196	194	196	187
134	181	181	178	179	176	176	179	180	180	184	186	190	191	191	187	190	181
135	177	176	173	173	170	171	175	175	176	180	180	185	187	185	182	184	177
136	172	172	168	167	166	166	169	170	170	175	175	179	181	180	177	180	172
137	166	166	162	162	161	161	165	165	166	170	170	175	175	175	171	174	166
138	162	161	157	156	156	155	159	159	160	165	165	170	171	169	167	168	162
139	157	156	152	151	151	151	153	154	156	160	160	164	166	165	161	163	157
140	152	151	147	146	146	146	148	149	151	156	155	159	161	159	155	157	152
141	148	147	142	140	142	141	143	144	146	150	151	154	156	154	151	151	148
142	142	141	136	136	137	136	138	138	142	146	145	149	152	149	145	147	142
143	138	136	132	130	131	131	133	134	136	140	140	143	147	144	141	141	138
144	133	131	127	125	127	125	129	128	132	135	135	138	142	140	136	137	133
145	128	126	121	121	122	119	124	123	127	130	130	133	138	134	131	131	128
146	123	120	117	116	117	114	119	119	123	124	126	128	132	128	128	126	123
147	118	116	111	112	111	108	114	113	117	119	120	124	128	123	123	121	118
148	113	110	106	107	104	104	108	108	112	112	116	119	122	117	117	116	113
149	108	106	102	101	99	98	103	102	108	106	109	115	117	111	113	110	108
150	102	100	95	95	92	93	97	98	102	100	103	109	112	106	107	105	102
151	97	94	90	88	85	87	92	92	97	95	95	104	105	100	102	99	97
152	90	89	84	82	80	82	85	87	89	86	85	98	100	95	95	94	90
153	83	84	77	75	74	76	79	81	83	78	80	92	93	88	88	88	83
154	78	77	72	68	69	70	73	75	75	70	73	87	87	82	82	80	78
155	71	70	65	63	64	66	68	70	70	60	68	79	81	76	75	75	71
156	65	65	61	57	59	60	62	64	61	51	62	73	74	70	68	68	65

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157	60	59	56	52	55	56	57	59	54	40	56	66	69	64	64	63	60
158	55	54	51	49	51	51	53	54	48	31	47	61	62	57	58	58	55
159	51	50	47	44	47	46	49	50	42	26	42	54	56	49	54	53	51
160	47	45	42	40	42	41	45	45	37	20	36	48	48	43	49	49	47
161	42	40	38	35	36	38	41	39	32	12	28	42	39	36	43	44	42
162	38	35	33	30	30	34	37	35	27	9	22	35	30	28	38	39	38
163	33	30	28	26	25	28	31	31	20	8	14	29	23	21	33	36	33
164	28	26	24	22	21	24	25	27	15	8	13	25	15	14	28	31	28
165	23	22	20	18	20	19	21	22	13	8	13	20	10	10	24	26	23
166	20	19	16	15	17	16	18	18	12	5	12	14	7	6	20	21	20
167	17	15	14	12	13	14	15	15	10	4	8	11	4	5	17	18	17
168	14	12	11	10	10	11	13	11	8	4	5	7	3	4	15	15	14
169	10	10	8	8	8	8	9	9	6	4	2	4	2	4	12	11	10
170	8	7	7	6	5	6	7	7	5	3	1	2	1	3	9	9	8
171	6	5	5	4	4	5	5	5	3	2	1	1	1	2	7	7	6
172	4	4	4	3	3	3	3	3	2	1	1	1	1	2	5	5	4
173	3	3	2	2	2	2	3	2	2	1	1	1	1	1	4	3	3
174	2	2	2	1	1	1	2	1	1	1	1	1	1	1	3	2	2
175	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1
176	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
177	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
178	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	0	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 \*\*\*\*\***