

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-8029M57C-A

Representative (Tested) Model: LED-8029M57C-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

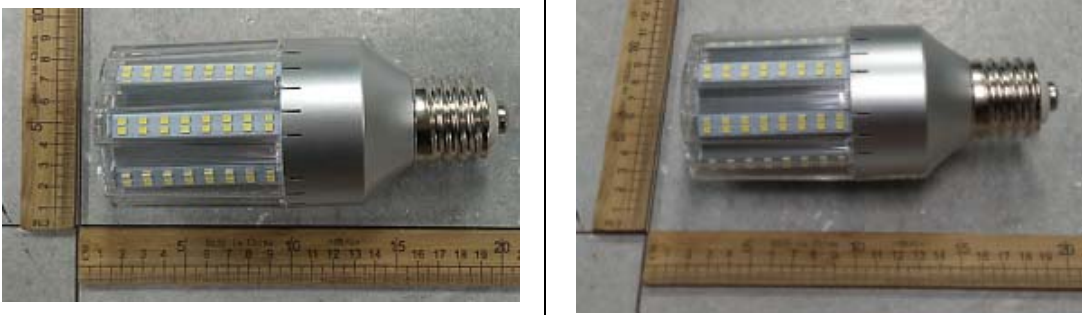
Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029M57C-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	5700K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-AN1	
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 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-8029M57C-A		

Electrical Measurement :

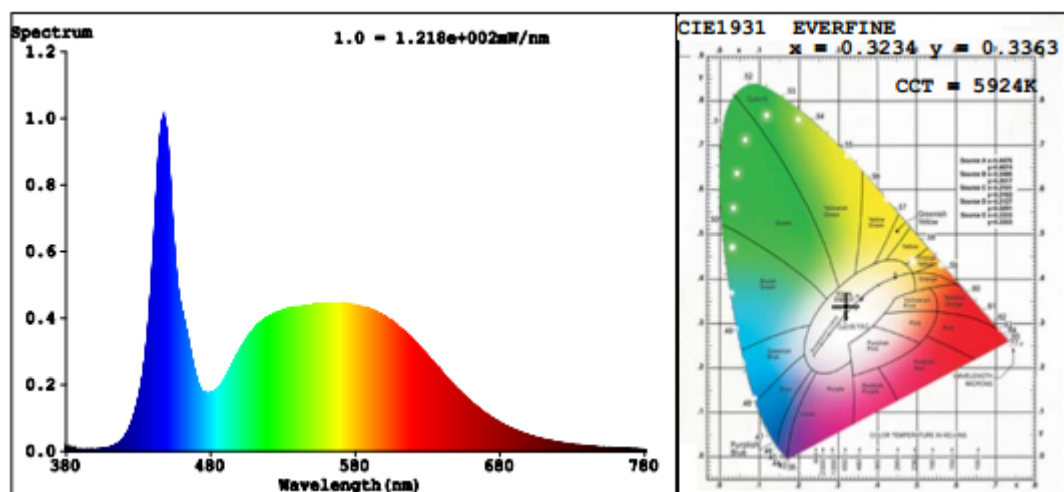
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.0878	22.89	0.9412
AN1	347.0	60	0.0717	23.06	0.9271

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	81	R9	10
Frequency (Hz)	60	R2	85	R10	65
CCT (K)	5924	R3	87	R11	84
Duv	0.0017	R4	84	R12	60
Chromaticity (x, y)	x=0.3234 y=0.3363	R5	83	R13	82
Chromaticity (u', v')	u'=0.2025 v'=0.4737	R6	80	R14	93
Color Rendering Index (CRI)	82.2	R7	87	R15	77
R9	10	R8	71	--	--

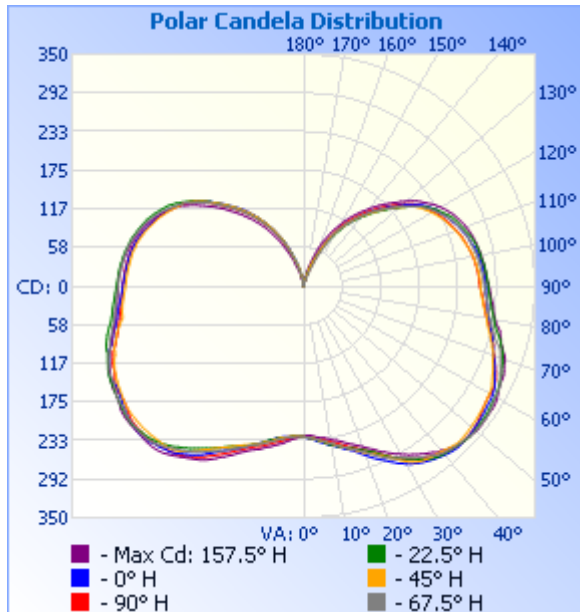
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	3165.2	3168.8
Luminous Efficacy (lm/W)	138.28	137.42
Beam Angle (°)	270.7	--
Center Beam Candle Power (cd)	227	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

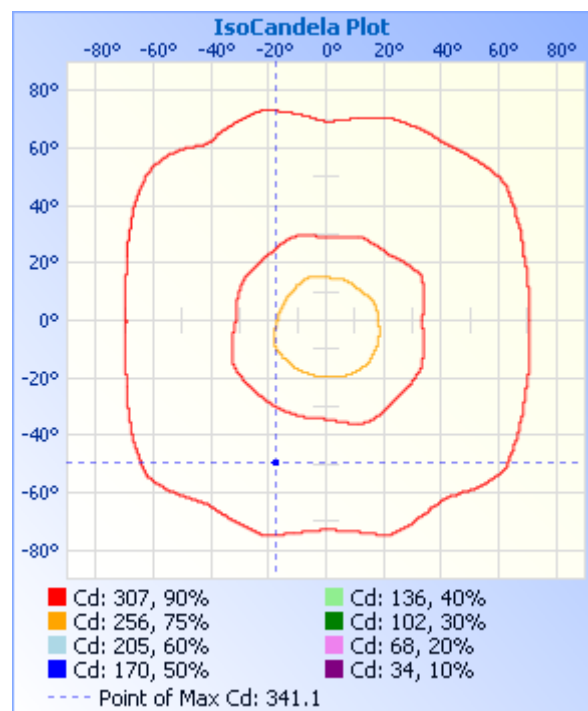
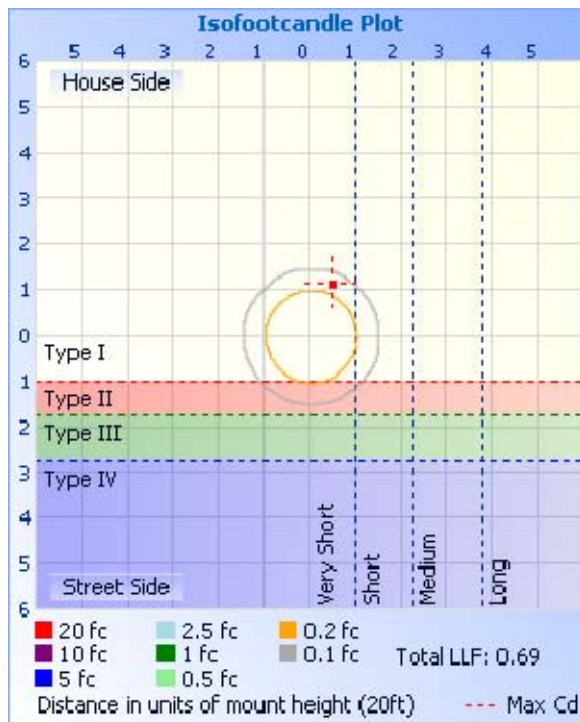
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	222.4	7%
0-40	418.1	13.2%
0-60	970.0	30.6%
60-90	939.9	29.7%
70-100	918.7	29%
90-120	815.7	25.8%
0-90	1,909.9	60.3%
90-180	1,255.4	39.7%
0-180	3,165.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	22.3	0.7%	90-100	296.7	9.4%
10-20	71.1	2.2%	100-110	277.1	8.8%
20-30	129.0	4.1%	110-120	241.8	7.6%
30-40	195.7	6.2%	120-130	192.0	6.1%
40-50	255.6	8.1%	130-140	131.0	4.1%
50-60	296.3	9.4%	140-150	76.9	2.4%
60-70	317.9	10.0%	150-160	32.7	1%
70-80	316.3	10.0%	160-170	6.9	0.2%
80-90	305.7	9.7%	170-180	0.3	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.79 fc	
34.0ft	0.20 fc	
51.0ft	0.09 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	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227
1	229	229	229	229	228	227	227	226	226	227	227	227	227	228	228	228	229
2	230	229	229	229	229	227	226	225	225	226	226	227	228	228	229	229	230
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5	235	233	233	232	231	227	228	229	228	228	228	229	231	231	233	234	235
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29	306	297	301	297	297	285	285	290	289	279	280	285	293	284	299	300	306
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93	275	277	266	271	265	273	265	277	271	281	268	280	272	276	275	280	275
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133	174	169	171	171	177	178	179	185	185	185	185	182	182	172	176	173	174
134	169	165	167	167	173	174	176	180	181	180	180	176	176	167	171	168	169
135	163	160	162	163	168	169	171	175	176	175	176	172	172	163	166	163	163
136	159	156	156	158	164	165	167	170	172	170	170	167	167	158	161	157	159
137	154	151	152	154	159	160	162	166	166	166	166	163	162	153	156	153	154
138	149	145	148	150	154	155	157	161	162	161	161	158	158	148	152	148	149
139	144	141	143	144	150	151	153	157	158	157	157	153	153	143	147	143	144
140	138	137	139	139	145	146	149	152	154	151	152	148	149	139	143	138	138
141	134	132	135	134	141	142	146	147	150	147	148	144	144	135	138	133	134
142	129	127	130	131	135	137	141	143	146	142	143	139	140	130	132	129	129
143	123	123	125	126	130	133	137	138	141	138	140	135	135	126	128	124	123
144	119	118	120	120	127	128	131	134	135	133	135	130	130	121	123	119	119
145	114	113	116	116	122	124	127	129	131	128	130	125	125	116	118	114	114
146	110	108	110	111	116	119	122	124	126	124	126	121	121	112	113	109	110
147	105	101	106	105	112	115	117	119	121	119	120	115	115	106	107	104	105
148	100	96	101	101	107	110	113	115	116	115	116	111	111	102	103	98	100
149	95	90	95	95	103	104	108	109	111	109	110	106	106	97	97	92	95
150	90	85	91	89	96	99	104	105	106	105	106	101	101	91	91	87	90
151	85	80	86	79	90	93	99	99	101	100	101	96	96	86	87	81	85
152	79	75	80	69	84	88	94	94	96	95	96	92	90	80	80	77	79
153	72	71	73	63	75	82	89	90	91	90	91	87	86	75	75	71	72
154	67	65	67	56	69	77	85	84	86	85	85	82	80	69	69	65	67
155	60	59	62	51	61	72	80	80	80	79	80	76	75	63	62	60	60
156	54	55	54	42	53	67	75	74	76	74	74	71	69	58	58	54	54

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

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157	50	48	49	34	47	62	68	70	70	68	69	66	64	53	52	50	50
158	45	44	45	28	40	58	62	64	65	62	63	60	58	48	46	45	45
159	41	39	41	22	34	53	57	59	59	57	56	55	53	44	42	40	41
160	36	35	38	18	29	47	51	52	54	51	49	49	48	40	38	35	36
161	31	31	33	15	24	42	47	47	48	48	46	45	43	37	34	31	31
162	28	27	29	11	22	37	41	43	44	42	40	39	38	32	29	27	28
163	24	23	25	9	18	33	38	38	39	39	37	34	33	27	25	24	24
164	21	19	19	8	16	29	33	34	35	35	33	29	31	24	21	20	21
165	18	16	13	6	13	26	30	30	31	32	31	26	27	20	18	17	18
166	14	14	11	5	10	22	23	25	26	28	27	23	23	16	15	14	14
167	10	11	8	5	7	18	18	18	22	22	22	21	20	13	11	11	10
168	8	8	6	5	4	12	12	12	17	19	18	18	16	10	9	8	8
169	6	6	4	3	4	9	7	6	13	15	15	13	13	9	7	6	6
170	5	4	3	2	4	7	4	3	9	12	13	12	10	7	5	4	5
171	3	3	2	1	2	6	2	3	5	7	11	9	8	4	3	2	3
172	2	2	2	1	1	4	2	2	3	5	8	7	6	3	2	1	2
173	2	2	1	1	1	2	1	2	3	5	6	5	4	2	2	1	2
174	1	1	1	1	1	1	1	2	3	4	4	4	3	1	1	1	1
175	1	1	1	1	1	1	1	2	2	2	3	2	1	1	1	1	1
176	1	1	1	1	1	1	1	2	2	2	2	2	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 *******