

LM-79-08 Test Report

For

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

188 S.Northwest Highway, Cary, IL60013, USA

LED Luminaires

Model name(s): LED-8146M40-A

Representative (Tested) Model: LED-8146M40-A

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: May.18,2018

Review By:

Univ Xie

Manager: Univ Xie

Note: 1.The results contained in this report pertain only to the tested samples.

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC			
Brand Name	N/A			
Model Number	LED-8146M40-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	65W			
Rated Initial Lamp Lumen	--			
Declared CCT	4000K			
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD			
LED Model	SPMWH1228FD5WAT0SE			
Sample Number	GZE1801030-H-R1			
Luminaire Aperture (for downlights)	--	in. mm mm s		
Luminaire Length	--			
Luminaires Width	--			
Number of Units (modular products)	N/A			
Photo				
				

1.2 Test Specifications:

Date of Receipt	May.01,2018
Date of Test	May.02,2018
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	2018-05-02	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8146M40-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	120.0	60	0.5622	66.18	0.9810	16.18
0-H-R1	277.0	60	0.2649	67.05	0.9136	18.86

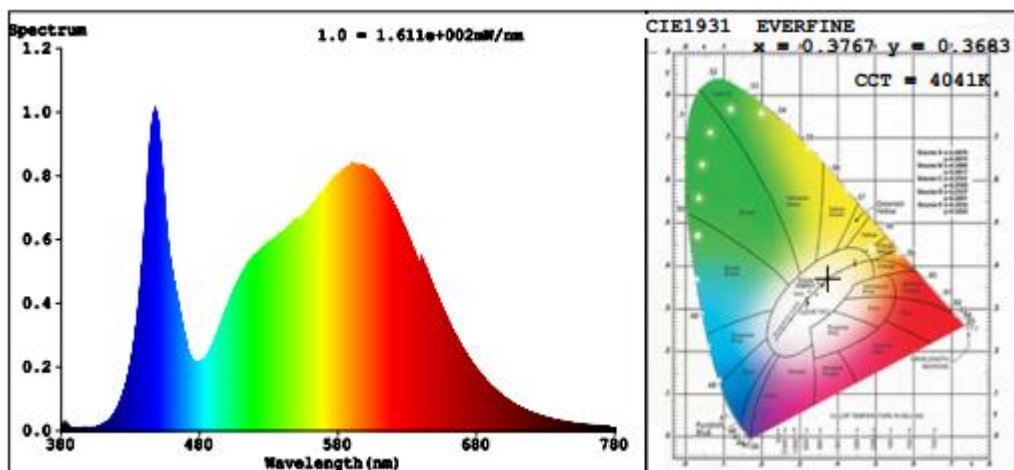
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	10
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	4041	R3	93	R11	82
Duv	-0.0029	R4	83	R12	65
Chromaticity (x, y)	x=0.3767 y=0.3683	R5	82	R13	83
Chromaticity (u', v')	u'=0.2261 v'=0.4972	R6	84	R14	96
Color Rendering Index (CRI)	82.9	R7	85	R15	76
R9	10	R8	66	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	8493.9	8715.5
Luminous Efficacy (lm/W)	128.35	129.99
Most worst Luminous/Highest Watts	126.68	
Beam Angle (°)	323.6	--
Center Beam Candle Power (cd)	0	--

Spectral Power Distribution & Chromaticity Diagram

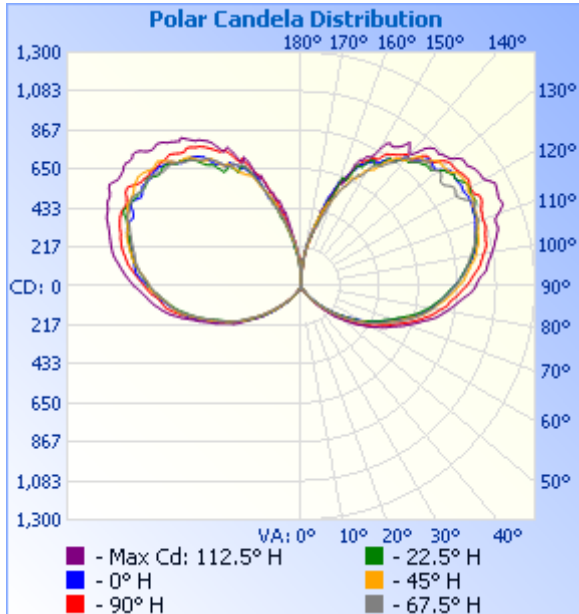


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	8.4	0.1%
0-40	45.1	0.5%
0-60	458.5	5.4%
60-90	2,077.3	24.4%
70-100	2,620.6	30.8%
90-120	3,203.7	37.6%
0-90	2,535.8	29.8%
90-180	5,974.2	70.2%
0-180	8,510.1	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.1	0.0%	90-100	1,027.9	12.1%
10-20	1.2	0.0%	100-110	1,093.8	12.9%
20-30	7.1	0.1%	110-120	1,082.0	12.7%
30-40	36.7	0.4%	120-130	965.9	11.4%
40-50	127.7	1.5%	130-140	781.9	9.2%
50-60	285.7	3.4%	140-150	554.4	6.5%
60-70	484.6	5.7%	150-160	328.5	3.9%
70-80	702.5	8.3%	160-170	121.5	1.4%
80-90	890.2	10.5%	170-180	18.3	0.2%

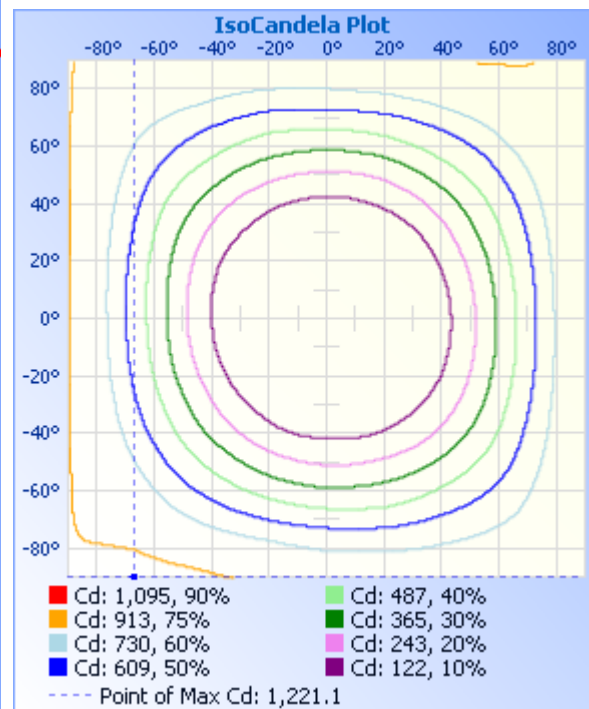
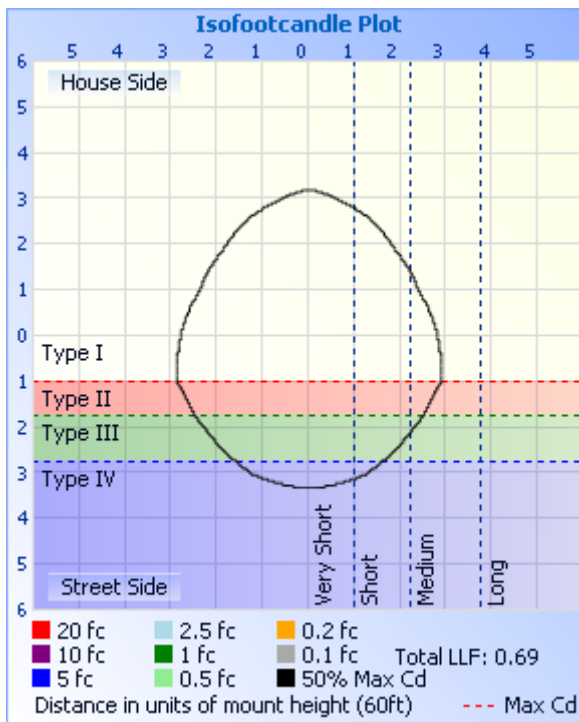
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
10.0ft	0.00 fc	21.3 ft
20.0ft	0.00 fc	42.7 ft
30.0ft	0.00 fc	64.0 ft
40.0ft	0.00 fc	85.3 ft
50.0ft	0.00 fc	106.6 ft
60.0ft	0.00 fc	128.0 ft

■ Beam Spread: 93.7°



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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
8	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1
11	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
12	1	2	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1
13	2	2	3	3	3	4	4	3	3	2	2	2	2	2	2	2	2
14	2	3	3	3	4	4	4	4	3	3	2	2	2	2	2	2	2
15	3	3	4	4	5	5	5	4	4	3	3	3	3	3	3	3	3
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29	19	20	22	23	25	27	26	23	23	21	19	17	18	20	20	19	19
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61	402	402	419	421	457	469	462	441	403	398	403	397	407	432	428	409	402
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92	876	879	904	879	944	987	969	911	884	865	860	860	895	957	948	895	876

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93	889	889	913	892	953	1000	979	921	900	877	871	873	911	971	967	907	889
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103	994	992	1009	986	1057	1106	1078	1008	975	977	981	960	1027	1087	1075	1010	994
104	999	1001	1015	995	1056	1119	1089	1019	981	981	993	968	1033	1095	1086	1021	999
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106	1006	1014	1023	1009	1064	1139	1106	1042	1003	993	1009	984	1043	1110	1098	1036	1006
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114	1044	1053	1056	1057	1097	1202	1163	1110	1025	1070	1059	1046	1076	1175	1145	1088	1044
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121	1046	1085	1082	1001	1090	1174	1169	1083	1030	1034	1083	1036	1089	1177	1162	1106	1046
122	1053	1083	1085	1011	1101	1174	1170	1064	1041	1028	1086	1031	1072	1177	1157	1089	1053
123	1050	1069	1083	1010	1102	1171	1155	1054	1041	1029	1089	1035	1062	1180	1154	1075	1050
124	1046	1053	1079	998	1097	1166	1142	1045	1036	1039	1091	1040	1059	1190	1154	1072	1046

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NVLAP CODE: 201011-0

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125	1045	1045	1076	977	1091	1154	1141	1038	1034	1046	1085	1038	1053	1190	1154	1075	1045
126	1050	1050	1072	969	1084	1141	1136	1055	1028	1033	1077	1031	1049	1181	1146	1069	1050
127	1054	1041	1049	969	1077	1141	1133	1059	1035	1013	1066	1029	1050	1178	1144	1052	1054
128	1048	1030	1040	989	1075	1144	1132	1053	1036	1004	1053	1019	1049	1188	1149	1038	1048
129	1028	1022	1036	1000	1076	1129	1122	1049	1032	1008	1050	1000	1040	1185	1153	1024	1028
130	1004	1003	1033	997	1074	1102	1107	1043	1033	1011	1057	995	1039	1169	1151	1022	1004
131	988	982	1034	984	1060	1087	1081	1036	1020	1014	1058	995	1041	1141	1143	1033	988
132	990	968	1035	972	1039	1081	1063	1029	1014	1008	1040	995	1036	1127	1138	1049	990
133	996	968	1023	981	1008	1072	1057	1028	1013	999	1017	991	1033	1122	1132	1067	996
134	1005	968	1002	988	998	1061	1058	1031	996	977	997	982	1034	1126	1124	1058	1005
135	998	958	979	982	1008	1066	1052	1009	968	967	974	974	1035	1124	1111	1048	998
136	975	952	976	963	1006	1064	1021	991	953	970	964	958	1024	1111	1094	1031	975
137	960	943	980	950	991	1052	989	980	952	959	963	945	1009	1091	1066	1014	960
138	946	924	968	935	952	1030	964	974	943	944	959	938	996	1080	1053	1006	946
139	940	910	944	921	926	989	960	969	943	934	950	928	991	1065	1040	999	940
140	932	912	920	931	928	955	951	971	938	913	930	916	995	1052	1026	967	932
141	923	904	898	923	941	954	954	940	926	883	900	904	993	1062	1014	950	923
142	895	892	901	889	928	979	953	900	914	855	883	892	981	1040	988	948	895
143	873	866	891	861	912	1001	918	884	899	842	872	886	968	1018	960	929	873
144	858	861	871	848	900	964	895	874	860	834	874	876	960	998	933	913	858
145	859	864	852	831	894	945	873	861	827	799	863	855	945	993	934	892	859
146	849	846	829	804	881	933	859	850	822	766	828	838	928	978	921	871	849
147	828	808	794	797	878	927	866	829	811	766	800	811	910	963	904	855	828
148	807	794	764	797	850	936	859	840	782	772	795	788	889	942	885	845	807
149	807	786	755	781	818	924	817	837	785	783	795	776	871	902	852	831	807
150	801	806	747	744	823	882	800	818	794	761	771	775	873	864	822	813	801
151	787	803	733	708	810	833	795	794	768	724	735	781	860	869	809	799	787
152	774	775	698	689	789	810	786	776	768	734	712	763	827	874	784	779	774
153	762	740	667	697	780	810	783	750	731	744	704	752	790	834	754	750	762
154	752	744	669	660	760	780	751	724	737	738	688	752	766	776	745	731	752
155	718	740	666	632	731	774	688	693	710	733	680	733	780	763	757	715	718
156	705	680	618	606	703	739	660	641	679	694	673	707	744	785	731	676	705

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157	675	637	592	598	671	653	652	613	681	657	640	655	714	753	688	649	675
158	637	643	576	570	648	613	612	565	655	618	597	616	677	674	664	633	637
159	621	646	562	532	615	641	597	520	584	581	573	580	665	643	638	606	621
160	612	584	512	525	588	581	563	488	517	546	555	531	636	655	603	561	612
161	571	522	481	480	568	531	513	485	526	514	528	482	606	586	589	514	571
162	536	508	490	428	482	526	495	443	509	486	505	468	549	551	550	504	536
163	516	472	465	405	451	472	453	403	451	436	472	452	530	547	523	490	516
164	467	435	439	384	425	453	419	374	444	392	414	399	498	498	502	447	467
165	403	414	411	345	392	437	374	347	395	382	405	400	453	497	459	426	403
166	373	366	382	342	354	347	357	341	384	358	381	366	421	484	441	392	373
167	357	346	359	328	319	331	327	303	339	321	335	334	391	423	403	363	357
168	324	304	329	313	303	300	310	307	322	298	313	323	342	421	386	338	324
169	312	285	304	294	276	273	283	285	281	269	286	292	320	369	356	319	312
170	271	259	282	274	252	266	276	280	256	262	265	283	294	316	329	295	271
171	247	247	232	260	230	242	245	234	217	215	246	265	263	269	247	292	247
172	230	218	217	232	208	219	229	211	209	204	233	235	253	244	228	240	230
173	213	192	202	193	202	195	208	189	189	183	196	230	219	214	194	214	213
174	180	175	179	168	168	171	189	168	168	162	179	190	192	196	188	201	180
175	150	160	164	145	137	147	171	146	148	140	162	150	180	159	153	176	150
176	153	126	127	122	112	119	132	115	115	107	124	125	146	154	141	141	153
177	111	86	90	91	84	92	92	83	87	86	86	91	108	136	109	105	111
178	62	43	53	48	42	65	53	52	58	64	48	57	54	78	55	53	62
179	13	1	15	0	0	38	13	21	30	43	10	23	1	20	1	1	13
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-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06
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 *******