

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014
- ☒ UL1598-2008

Prepared For

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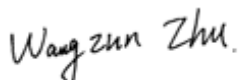
Test Date

2018/4/16

Issue Date

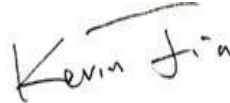
2018/4/16

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Architectural Flood and Spot Luminaires				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Lamp Output (lm)	IES LM-79-2008	1000	1874	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	87.3	89.7	P
Allowable CCTs* (K)	IES LM-79-2008	5700	3001	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	70.3	P
Power Factor	ANSI C82.77:2014	0.873	0.911	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	12.54%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HSLED18Y/D10	D1
2	Goniophotometer Test	2018/4/16	HSLED18Y/D10	D1
3	THD and PF Test	2018/4/16	HSLED18Y/D10	D1

Remark(If any)

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3.0 Production Description

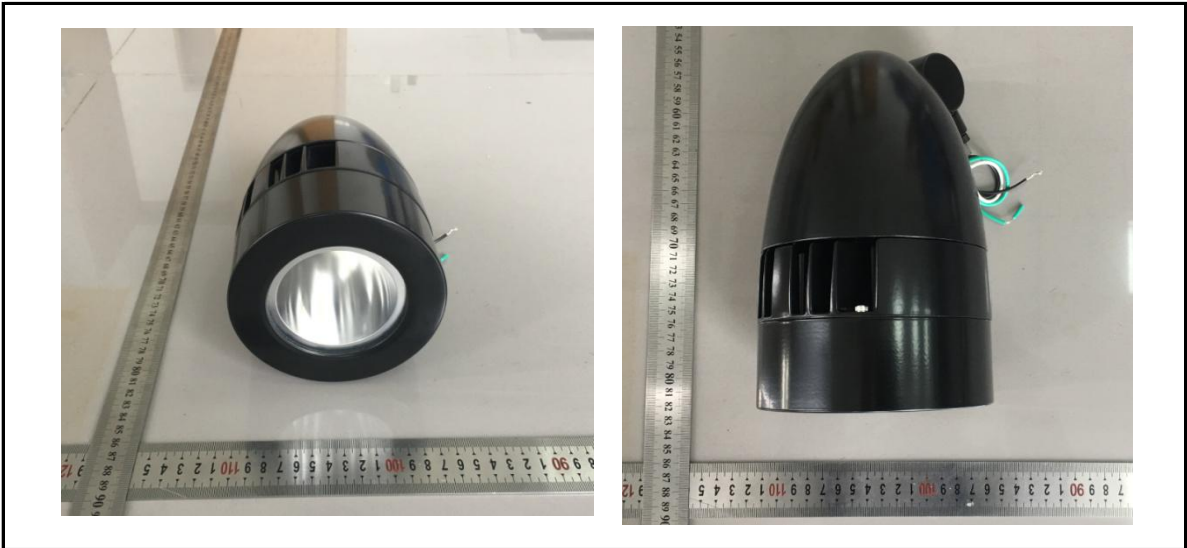
Luminaire Description:

Electrical Specification: 120V-277V,50/60HZ

Light source: SPMWH1228xxxxxxxxx

Manufacturer Of Light Source: Samsung Electronics Co., LTD.

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	HSLED18Y/D10	Sample ID.	D1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.1	277.02	60	0.084	21.13	0.912

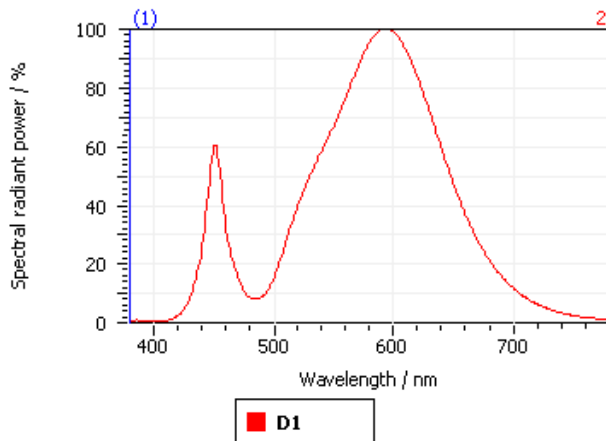
Test Result

CCT (K)	CRI (Ra)	Duv
3001	70.3	1.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

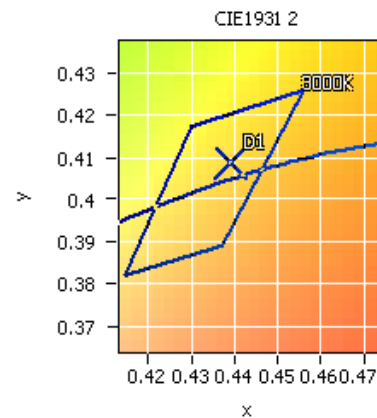
DominantWavelength	582.28 nm
Purity	0.545
PeakWavelength	594.05 nm
Width50%:	117.68 nm

Color Coordinates

Correlated Color Temperature 3001 K

x: 0.4391 u: 0.2500 u': 0.2500
y: 0.4088 v: 0.3490 v': 0.5235

ResultsCRICRI01	66.4	ResultsCRICRI09	-33.4
ResultsCRICRI02	80.1	ResultsCRICRI10	53.3
ResultsCRICRI03	91.6	ResultsCRICRI11	58.8
ResultsCRICRI04	65.9	ResultsCRICRI12	40.2
ResultsCRICRI05	64.8	ResultsCRICRI13	68.7
ResultsCRICRI06	71.3	ResultsCRICRI14	95.0
ResultsCRICRI07	78.5	ResultsCRICRI15	59.3
ResultsCRICRI08	43.9	ResultsCRICRI16	58.9
ResultsCRI	70.3		



Nominal CCT: 3000K

PlanckDistance 1.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	HSLED18Y/D10	Sample ID.	D1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

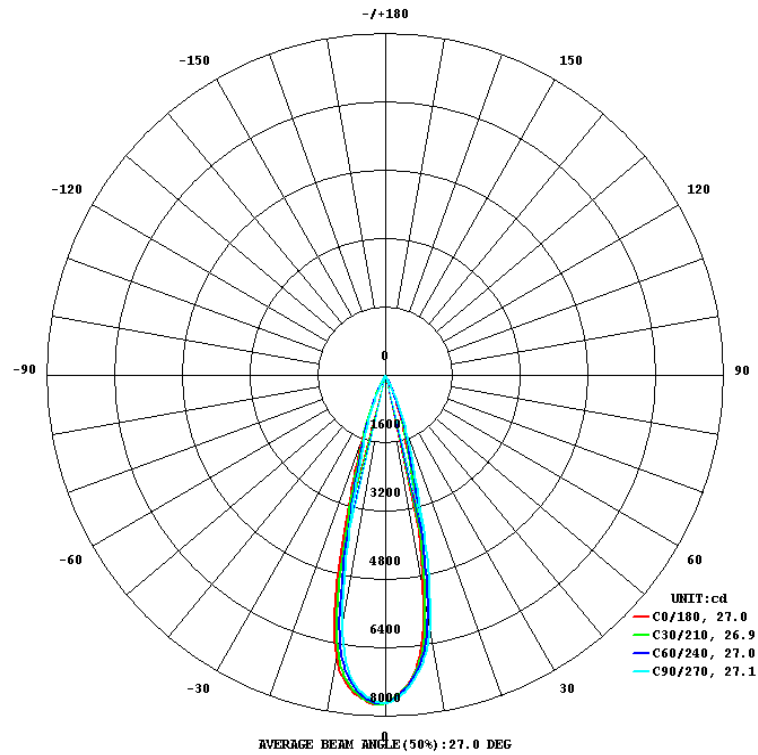
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	277.01	60	0.083	20.89	0.911	Light Down

Test Result

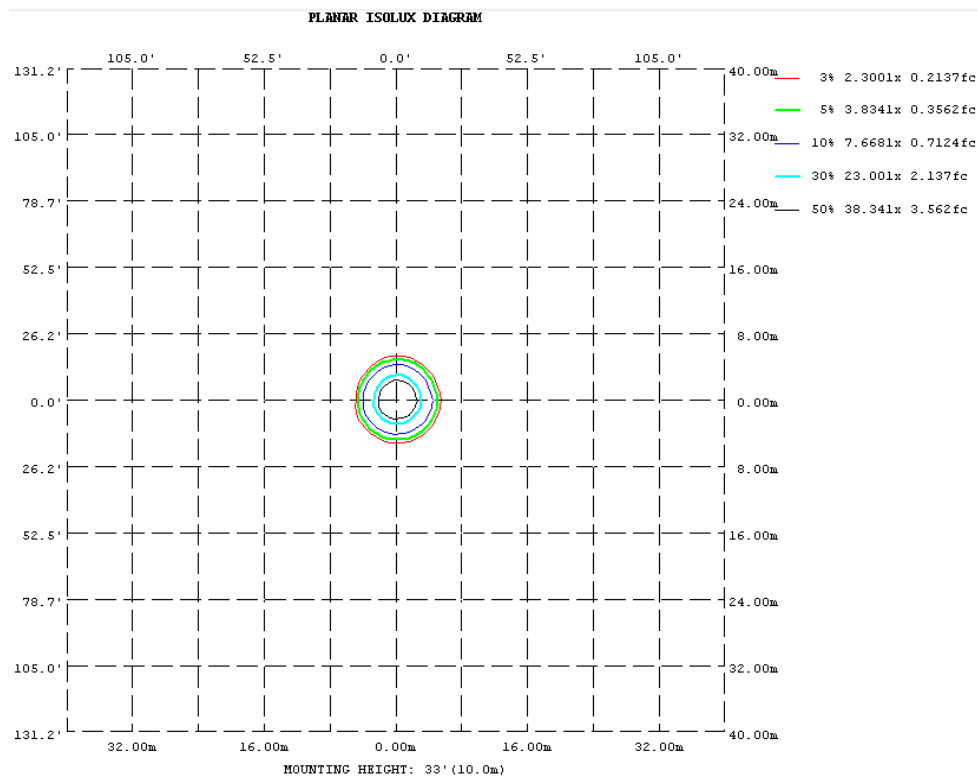
Flux(lm)	Zonal Lumen Requirement (0° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
1874	100.00%	47.9	47.7	27.1	27	89.7

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

°	C0	C45	C90	C135	C180	C225	C270	C315
10	6742	6444	5961	5660	5212	5678	6078	6366
20	1764	1540	1364	1297	1204	1350	1530	1636
30	212.7	160.5	121.3	91.71	63.59	87.26	157.3	187.7
40	15.31	13.91	13.07	11.99	10.79	12.00	14.14	14.95
50	6.164	5.886	5.785	5.514	5.286	5.554	6.068	6.126
60	4.027	3.916	3.970	3.871	3.826	3.917	4.142	4.072
70	3.081	2.912	2.810	2.692	2.667	2.809	3.004	1.763
80	1.217	0.9974	0.6882	0.6548	0.5871	0.7099	0.7928	0.9395
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 2.9 %							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	653.35	0 - 10	653.35	34.86%
10 - 20	876.04	0 - 20	1529.38	81.61%
20 - 30	299.02	0 - 30	1828.41	97.57%
30 - 40	29.04	0 - 40	1857.45	99.12%
40 - 50	6.72	0 - 50	1864.17	99.48%
50 - 60	4.24	0 - 60	1868.40	99.70%
60 - 70	3.37	0 - 70	1871.78	99.88%
70 - 80	1.91	0 - 80	1873.68	99.98%
80 - 90	0.32	0 - 90	1874.00	100.00%
90 - 100	0.00	0 - 100	1874.00	100.00%
100 - 110	0.00	0 - 110	1874.00	100.00%
110 - 120	0.00	0 - 120	1874.00	100.00%
120 - 130	0.00	0 - 130	1874.00	100.00%
130 - 140	0.00	0 - 140	1874.00	100.00%
140 - 150	0.00	0 - 150	1874.00	100.00%
150 - 160	0.00	0 - 160	1874.00	100.00%
160 - 170	0.00	0 - 170	1874.00	100.00%
170 - 180	0.00	0 - 180	1874.00	100.00%

4.3 Goniophotometer Test

Axial Candela

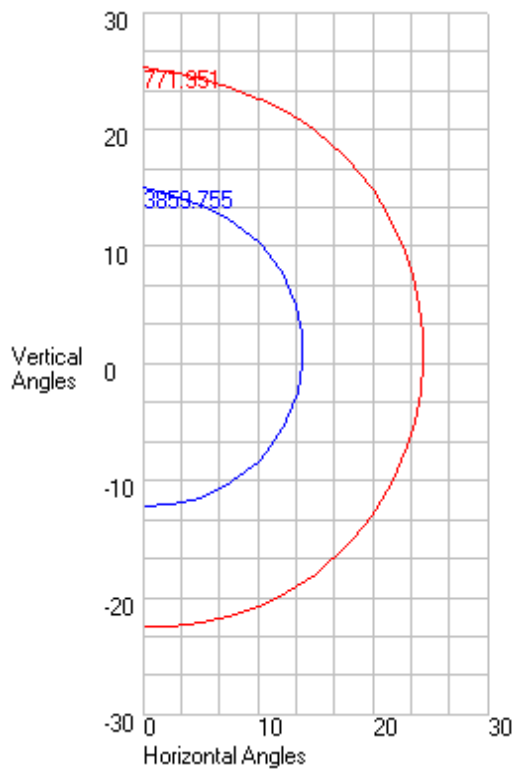
DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	0.04	85	0.31
75	1.98	75	2.27
65	3.66	65	3.58
55	4.81	55	4.76
47.5	7.09	47.5	7.25
42.5	10.69	42.5	11.37
37.5	19.58	37.5	22.3
33	49.68	33	65.65
29	218.21	29	301.48
25.5	587.8	25.5	729.33
22.5	1077.38	22.5	1249.21
19.5	1633.97	19.5	1883.23
17	2319.77	17	2743.06
15	3193.52	15	3876.93
13	4388.54	13	5250.16
11	5617.54	11	6371.88
9	6432.6	9	7000.86
7	6914.43	7	7340.57
5	7244.76	5	7544.18
3	7491.19	3	7673.28
1	7648.67	1	7719.51
0	7679.227	0	7679.227
-1	7674.59	-1	7608.5
-3	7580.18	-3	7419.25
-5	7392.22	-5	7136.53
-7	7059.5	-7	6662.37
-9	6436.82	-9	5829.17
-11	5370.54	-11	4545.82
-13	4013.52	-13	3297.69
-15	2850.59	-15	2378.67
-17	2066.01	-17	1786.6
-19.5	1464.52	-19.5	1294.24
-22.5	929.75	-22.5	763
-25.5	518.29	-25.5	350.69
-29	175.39	-29	92.16
-33	46.81	-33	28.92
-37.5	18.04	-37.5	14.37
-42.5	10.04	-42.5	8.57
-47.5	6.72	-47.5	6.04
-55	4.61	-55	4.34
-65	3.48	-65	3.37
-75	1.81	-75	1.63
-85	0.02	-85	0.03
-90	0	-90	0

4.3 Goniophotometer Test

Characteristics

NEMA Type	4 H x 4 V
Maximum Candela	7719.51
Maximum Candela Angle	0 H 1 V
Horizontal Beam Angle (50%)	27.3
Vertical Beam Angle (50%)	27.1
Horizontal Field Angle (10%)	48.1
Vertical Field Angle (10%)	47.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	1060
Beam Efficiency	N.A.
Field Lumens	1712
Field Efficiency	N.A.
Spill Lumens	163
Luminaire Lumens	1874
Total Efficiency	N.A.
Total Luminaire Watts	20.8945
Ballast Factor	1

ISOCANDELA CURVES



Axial Candela

	0	1	3	5	7	9	11	13	15	17	19.5	22.5	25.5	29	33	37.5	42.5	47.5	55	65	75	85	90
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	0.31	0.303	0.29	0.277	0.263	0.25	0.236	0.21	0.193	0.188	0.18	0.168	0.154	0.14	0.117	0.09	0.056	0.03	0.005	0	0	0	0
75	2.27	2.259	2.237	2.215	2.171	2.134	2.094	2.049	2.01	1.977	1.935	1.875	1.809	1.718	1.552	1.366	1.152	0.956	0.653	0.245	0.007	0	0
65	3.58	3.576	3.569	3.554	3.538	3.521	3.5	3.474	3.454	3.438	3.417	3.376	3.324	3.176	2.742	2.026	1.117	1.373	0.988	0.944	0.196	0	0
55	4.76	4.75	4.731	4.682	4.636	4.581	4.524	4.474	4.43	4.385	4.321	4.245	4.162	4.052	3.933	3.8	3.634	3.269	2.884	1.436	0.515	0	0
47.5	7.25	7.224	7.171	7.021	6.877	6.709	6.523	6.386	6.236	6.074	5.862	5.584	5.309	4.998	4.67	4.377	4.095	3.866	3.438	2.149	0.821	0	0
42.5	11.37	11.3	11.16	10.759	10.382	9.965	9.571	9.305	8.939	8.489	7.993	7.429	6.789	6.161	5.524	4.96	4.492	4.137	3.685	2.662	1.044	0.001	0
37.5	22.3	22.057	21.229	20.17	19.042	17.551	16.553	15.541	14.637	13.655	12.393	10.659	9.358	8.1	6.856	5.83	5.011	4.461	3.885	2.974	1.255	0.002	0
33	65.65	64.178	58.985	52.557	45.736	40.708	36.405	31.508	27.549	24.015	20.19	16.443	13.677	10.824	8.644	6.918	5.633	4.782	4.048	3.16	1.423	0.006	0
29	301.48	292.682	264.043	230.599	194.587	165.181	131.492	94.248	70.656	53.466	38.457	27.621	20.214	14.963	10.886	8.222	6.291	5.124	4.186	3.292	1.55	0.01	0
25.5	729.33	712.74	656.057	583.541	506.753	443.619	371.892	295.748	226.276	166.867	91.36	50.305	31.252	20.191	13.789	9.545	6.944	5.449	4.306	3.403	1.653	0.014	0
22.5	1249.21	1227.69	1149.13	1049.24	950.361	843.435	723.547	594.105	465.927	345.191	220.977	104.391	50.244	27.732	16.586	10.844	7.591	5.747	4.41	3.46	1.728	0.02	0
19.5	1883.23	1849.37	1731.96	1584.14	1475.78	1346.38	1188.35	1003.29	811.896	623.635	412.135	219.163	91.298	38.763	20.387	12.688	8.184	6.045	4.497	3.518	1.793	0.025	0
17	2743.06	2674.01	2441.92	2207.75	2027.77	1820.39	1596.39	1378.13	1153.27	909.441	623.46	342.194	164.868	53.74	24.291	13.923	8.725	6.283	4.57	3.556	1.84	0.029	0
15	3876.93	3760.73	3363.09	3010.55	2698.06	2346.52	2005.15	1690.18	1432.17	1152.47	812.943	464.156	221.267	70.531	27.856	14.918	9.207	6.464	4.624	3.583	1.879	0.032	0
13	5250.16	5091.82	4564.99	4150.43	3656.21	3089.46	2531.76	2068.97	1686.02	1374.14	1003.89	595.172	287.099	93.951	31.951	15.887	9.605	6.626	4.676	3.604	1.902	0.034	0
11	6371.88	6229.60	5752.69	5432.19	4780.75	4017.89	3238.47	2523.71	1995.41	1588.43	1184.40	725.722	362.262	128.492	36.937	16.941	9.885	6.765	4.713	3.621	1.926	0.042	0
9	7000.86	6888.90	6582.85	6291.24	5757.39	4958.28	3985.96	3062.21	2333.21	1803.72	1335.54	844.257	433.696	159.701	41.288	17.877	10.178	6.888	4.746	3.636	1.946	0.042	0
7	7340.57	7241.69	7029.25	6827.15	6404.30	5699.24	4688.22	3597.09	2674.18	2005.55	1459.01	946.423	498.939	183.522	44.617	18.8	10.409	6.985	4.776	3.647	1.961	0.041	0
5	7544.18	7449.97	7296.23	7116.64	6788.08	6172.57	5262.15	4021.32	2957.93	2182.38	1557.79	1022.55	547.814	201.516	47.755	19.259	10.591	7.054	4.797	3.655	1.986	0.041	0
3	7673.28	7566.23	7464.95	7254.14	6926.71	6407.79	5543.23	4315.25	3153.54	2296.02	1618.68	1064.25	579.178	213.367	49.658	19.59	10.777	7.125	4.818	3.663	1.984	0.041	0
1	7719.51	7669.47	7515.79	7286.65	6961.2	6476.04	5662.19	4437.44	3231.18	2341.34	1644.43	1083.91	592.568	219.37	50.208	19.68	10.719	7.102	4.813	3.661	1.981	0.04	0
0	7679.22	7648.67	7491.19	7244.76	6914.43	6432.6	5617.54	4388.54	3193.52	2319.77	1633.97	1077.38	587.8	218.21	49.68	19.58	10.69	7.09	4.81	3.66	1.98	0.04	0
-1	7608.5	7586.36	7440.03	7205.49	6876.29	6395.91	5573.83	4333.22	3151.30	2293.16	1621.15	1068.27	581.392	214.886	49.123	19.472	10.655	7.077	4.805	3.658	1.979	0.04	0
-3	7419.25	7406.21	7281.94	7035.91	6684.23	6150.98	5232.65	3992.04	2928.34	2162.55	1552.95	1018.49	546.633	199.7	46.55	18.983	10.585	7.05	4.795	3.654	1.977	0.04	0
-5	7136.53	7145.20	7000.77	6759.53	6376.10	5686.57	4697.69	3536.73	2638.40	1989.78	1459.07	949.545	496.474	178.131	43.009	18.293	10.286	6.931	4.758	3.641	1.975	0.04	0
-7	6662.37	6686.25	6537.50	6285.22	5738.37	4931.09	3933.34	3017.41	2300.61	1778.76	1333.20	846.556	434.603	149.546	38.798	17.524	10.002	6.817	4.722	3.627	1.945	0.04	0
-9	5829.17	5872.25	5698.28	5323.32	4717.02	3938.48	3167.57	2487.79	1958.35	1568.09	1179.56	724.62	358.059	114.647	34.859	16.412	9.678	6.681	4.68	3.61	1.925	0.039	0
-11	4545.82	4589.28	4411.26	4112.14	3590.71	3036.06	2491.70	2027.50	1667.39	1368.30	1004.27	595.79	280.274	85.14	30.701	15.32	9.31	6.525	4.634	3.591	1.901	0.039	0
-13	3297.69	3329.82	3211.62	2987.76	2667.74	2312.80	1968.80	1671.35	1411.98	1152.72	820.099	459.852	210.889	65.468	26.414	14.332	8.971	6.352	4.586	3.568	1.872	0.032	0
-15	2378.67	2398.91	2332.00	2196.98	2018.68	1799.19	1595.98	1381.98	1176.49	922.511	625.876	335.05	148.937	48.675	22.846	13.329	8.542	6.166	4.521	3.542	1.844	0.029	0
-17	1786.6	1797.93	1762.35	1684.78	1575.26	1437.33	1279.82	1098.1	896.585	682.589	445.185	226.134	90.365	37.878	19.896	12.223	8.069	5.974	4.461	3.51	1.801	0.026	0
-19.5	1294.24	1302.70	1279.82	1226.89	1143.34	1031.94	892.757	735.463	572.762	420.617	257.719	122.16	54.225	28.156	16.707	10.952	7.538	5.734	4.383	3.465	1.749	0.022	0
-22.5	763	770.081	753.35	715.225	648.722	565.962	469.178	370.475	276.378	200.443	107.93	55.072	32.906	20.913	13.899	9.531	6.972	5.44	4.28	3.4	1.677	0.016	0
-25.5	350.69	353.899	343.119	318.522	282.089	238.666	200.495	156.225	104.05	70.835	47.278	31.254	22.09	15.729	11.405	8.393	6.375	5.156	4.177	3.327	1.596	0.009	0
-29	92.16	93.164	90.392	83.518	74.003	63.877	53.781	45.176	37.049	30.873	24.706	19.44	15.233	12.189	9.28	7.289	5.788	4.85	4.06	3.211	1.482	0.006	0
-33	28.92	29.051	28.638	27.677	26.207	24.733	22.859	20.623	18.66	16.841	14.868	12.842	10.811	9.066	7.533	6.234	5.214	4.538	3.924	3.065	1.346	0.003	0
-37.5	14.37	14.405	14.316	14.102	13.828	13.245	12.647	11.942	11.213	10.549	9.795	8.775	7.914	7.024	6.138	5.348	4.7	4.246	3.763	2.862	1.179	0	0
-42.5	8.57	8.584	8.611	8.475	8.344	8.171	7.963	7.782	7.524	7.209	6.848	6.448	6.011	5.548	5.084	4.648	4.272	3.969	3.554	2.595	0.976	0	0
-47.5	6.04	6.046	6.059	6.002	5.947	5.87	5.774	5.679	5.569	5.444	5.281	5.075	4.874	4.646	4.403	4.166	3.936	3.719	3.294	2.263	0.768	0	0
-55	4.34	4.342	4.345	4.33	4.316	4.296	4.266	4.232	4.196	4.156	4.105	4.034	3.969	3.885	3.786	3.659	3.485	3.254	2.728	1.667	0.474	0	0
-65	3.37	3.371	3.374	3.367	3.36	3.35	3.337	3.317	3.294	3.269	3.237	3.186	3.124	3.022	2.9	2.72	2.472	2.179	1.63	0.79	0.146	0	0
-75	1.63	1.634	1.642	1.651	1.634	1.626	1.614	1.597	1.582	1.552	1.515	1.461	1.4	1.318	1.214	1.078	0.915	0.726	0.444	0.14	0	0	0
-85	0.03	0.031	0.032	0.033	0.035	0.036	0.037	0.034	0.033	0.031	0.029	0.025	0.02	0.015	0.007	0	0	0	0	0	0	0	0
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LUMEN TABULATION

	0	1	3	5	7	9	11	13	15	17	20	23	26	29	33	38	43	48	55	65	75	85	90	Total
90		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
85		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
75		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
65		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
55		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
47.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
42.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37.5		0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
33		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	
29		0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
25.5		0.6	1	1	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	
22.5		0.90 *	1.73 *	1.61 *	1.46 *	1.3	1.1	0.9	0.7	0.5	0.4	0.3	0.1	0.1	0.1	0	0	0	0	0	0	0	0	
19.5		1.42 *	2.75 *	2.57 *	2.36 *	2.13 *	1.86 *	1.57 *	1.3	1	0.9	0.6	0.3	0.1	0.1	0.1	0	0	0	0	0	0	0	
17		1.75 *	3.35 *	3.09 *	2.82 *	2.54 *	2.23 *	1.90 *	1.58 *	1.25 *	1.1	0.8	0.4	0.2	0.1	0.1	0	0	0	0	0	0	0	
15		2.00 *	3.79 *	3.44 *	3.07 *	2.69 *	2.31 *	1.95 *	1.63 *	1.32 *	1.22 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	0	
13		2.75 *	5.21 *	4.72 *	4.16 *	3.54 *	2.94 *	2.41 *	1.97 *	1.59 *	1.50 *	1.2	0.6	0.3	0.1	0.1	0	0	0	0	0	0	0	
11		3.51 *	6.72 *	6.20 *	5.53 *	4.67 *	3.78 *	2.99 *	2.36 *	1.87 *	1.77 *	1.42 *	0.8	0.4	0.1	0.1	0	0	0	0	0	0	0	
9		4.05 *	7.87 *	7.45 *	6.82 *	5.87 *	4.76 *	3.68 *	2.80 *	2.16 *	2.03 *	1.64 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	
7		4.35 *	8.54 *	8.23 *	7.73 *	6.88 *	5.69 *	4.40 *	3.28 *	2.45 *	2.27 *	1.84 *	1.1	0.6	0.2	0.1	0	0	0	0	0	0	0	
5		4.52 *	8.91 *	8.67 *	8.28 *	7.57 *	6.46 *	5.06 *	3.72 *	2.72 *	2.47 *	2.00 *	1.2	0.6	0.2	0.1	0	0	0	0	0	0	0	
3		4.62 *	9.12 *	8.92 *	8.57 *	7.95 *	6.93 *	5.52 *	4.06 *	2.93 *	2.62 *	2.11 *	1.26 *	0.7	0.3	0.1	0	0	0	0	0	0	0	
1		4.67 *	9.24 *	9.03 *	8.68 *	8.11 *	7.15 *	5.76 *	4.26 *	3.05 *	2.70 *	2.17 *	1.30 *	0.7	0.3	0.1	0	0	0	0	0	0	0	
0		2.34 *	4.63 *	4.52 *	4.35 *	4.06 *	3.59 *	2.90 *	2.15 *	1.53 *	1.36 *	1.09 *	0.65 *	0.4	0.1	0	0	0	0	0	0	0	0	

-1	2.33 *	4.61 *	4.50 *	4.32 *	4.04 *	3.57 *	2.87 *	2.12 *	1.52 *	1.35 *	1.09 *	0.65 *	0.4	0.1	0	0	0	0	0	0	0	0	
-3	4.58 *	9.09 *	8.87 *	8.50 *	7.90 *	6.91 *	5.52 *	4.07 *	2.93 *	2.62 *	2.12 *	1.26 *	0.7	0.2	0.1	0	0	0	0	0	0	0	
-5	4.44 *	8.83 *	8.60 *	8.19 *	7.51 *	6.43 *	5.05 *	3.71 *	2.72 *	2.47 *	2.01 *	1.2	0.6	0.2	0.1	0	0	0	0	0	0	0	
-7	4.22 *	8.39 *	8.15 *	7.66 *	6.83 *	5.69 *	4.41 *	3.28 *	2.45 *	2.27 *	1.85 *	1.1	0.6	0.2	0.1	0	0	0	0	0	0	0	
-9	3.83 *	7.64 *	7.35 *	6.74 *	5.83 *	4.74 *	3.68 *	2.81 *	2.16 *	2.04 *	1.65 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	
-11	3.19 *	6.41 *	6.11 *	5.48 *	4.65 *	3.78 *	2.99 *	2.36 *	1.87 *	1.78 *	1.42 *	0.8	0.4	0.1	0.1	0	0	0	0	0	0	0	
-13	2.42 *	4.88 *	4.66 *	4.17 *	3.56 *	2.95 *	2.42 *	1.97 *	1.60 *	1.51 *	1.2	0.6	0.3	0.1	0.1	0	0	0	0	0	0	0	
-15	1.75 *	3.53 *	3.39 *	3.09 *	2.70 *	2.32 *	1.96 *	1.64 *	1.33 *	1.23 *	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0	0	
-17	1.28 *	2.58 *	2.51 *	2.33 *	2.10 *	1.84 *	1.59 *	1.32 *	1.05 *	0.9	0.7	0.3	0.2	0.1	0	0	0	0	0	0	0	0	
-20	1.18 *	2.37 *	2.33 *	2.19 *	1.99 *	1.75 *	1.49 *	1.21 *	0.9	0.8	0.6	0.3	0.1	0.1	0	0	0	0	0	0	0	0	
-23	0.95 *	1.90 *	1.86 *	1.75 *	1.57 *	1.4	1.1	0.9	0.7	0.5	0.4	0.2	0.1	0.1	0	0	0	0	0	0	0	0	
-26	0.5	1	1	1	0.8	0.7	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	
-29	0.2	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
-33	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	
-38	0	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	69	136	130	121	109	93	74	57	43	39	31	17	9.4	3.9	1.8	1.2	0.8	0.8	0.7	0.3	0	0	937.2

5.0 THD and PF Test

Model No.	HSLED18Y/D10	Sample ID.	D1
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Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	277.02	60	0.084	21.10	0.911	12.54%
25.1	120.01	60	0.174	20.60	0.987	10.68%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last	Calibration Due
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

***** End of Test Report*****