IESNA LM -80-08

MEASURING LUMEN MAINTENANCE OF LED LIGHTSOURCES

MEASUREMENT AND TEST REPORT

For

HongliZhihui Group Co.,Ltd. Guangzhou Branch

Room 316, Building 2, No.1, Xianke Road, Huadong Town, Huadu District, Guangzhou, China

Model: HL-AS-2835H466W

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1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Part Number:	HL-AS-2835H466W3C-S1-08L-PCT-HR3(R9)
Part Name:	2835
Part Type:	LED Package
#Nominal CCT:	3000K
#Power:	1W
#Average Current Density per LED di	906.43 mA/mm^2
#Average Power Density per LED di	3.07W/mm^2
#CRI:	80
#Die Spacing	0.15mm

Family products covered by this report:
According to ENERGY STAR® Requirements for the Use of LM-80 Data, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of ENERGY STAR® Requirements for the Use of LM-80 Data (September 28, 2017).
This report covers the following models:

Model type	Model name	CRI	CCT (K)	Series	Parallel	Power density W/mm^2	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies (mm)	Current (mA)
Master model	HL-AS-2835H466W3C-S1-08L-PCT-HR3(R9)	80	3000	3	1	0.102041	906.43	100	0.15	100
Multiple model	HL-**-2835H***W-3C-S1-08*-PCT-HR3(R9)-***	80	2700-6500	3	1	0.102041	906.43	100	0.15	100
	HL-**-2835H***W-3C-S1-08*-PCT-HR3-***	80	2700-6500	3	1	0.102041	906.43	100	0.15	100
	HL-**-2835D***W-3C-S1-08*-PCT-HR3(R9)-***	80	2700-6500	3	1	0.102041	516.668	100	0.15	100

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Model type	Model name	CRI	CCT (K)	Series	Parallel	Power density W/mm^2	Current density per LED die (mA/mm^2)	Current per die (mA)	Distance between of dies(mm)	Current (mA)
Multiple model	HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-***	80	2700-6500	1	2	0.052	679.825	75	0.15	150
	HL-**-2835H***W-2-S1-08*-PCT-HR3-***	80	2700-6500	1	2	0.052	679.825	75	0.15	150
	HL-**-2835D***W-2-S1-08*-PCT-HR3(R9)-***	80	2700-6500	1	2	0.052	387.5	75	0.15	150
	HL-**-2835D***W-2-S1-08*-PCT-HR3-***	80	2700-6500	1	2	0.052	387.5	75	0.15	150
	HL-**-2835H***W-2-S1-08*-PCT-HR3(R9)-***	80	2700-6500	1	2	0.020882 0 0 1 271.693 676. 108.74 5430.5 2582.02 29.604 r1f* 219. ET Q c				

1.3 Test Facility

The testing facility used by Bay Area Compliance Laboratories Corp. (Dongguan) is located at No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong,. China

1.4 Description of Auxiliary Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Integral Sphere	EVERFINE	Diameter 0.3m	1011119	2016-03-10	2017-03-09
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2016-03-04	2017-03-03
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2016-03-10	2017-03-09
Standard Light Source	EVERFINE	D062	1011093	2015-09-17	2016-09-16
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ732114	2016-03-04	2017-03-

1.8 Sample Set

Sampling Method:
LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive day(i)-(i)4 737.34 243.08 :32 i1 34

Coatesv ATJ ET BT 1 0 67.0 1132 726.42 Tm [( )] TJ ET BT 1 0 694 126132 726.42 Tw-2([(rm)8(ecet)-24afd aferent2 [(81

2 - SUMMARY OF TEST RESULT

Data Set:	Data Set1, 85℃, 100mA
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000, 9000h,10000h
Average. Lumen Maintenance at 10000 hours	96.16%
Average Chromaticity Shift at 10000 hours :	0.0032
Reported TM-21 L_{70} Lifetime:	>60,000 hours

Data Set:	Data Set2, 105℃ , 100mA
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h,7000h,8000, 9000h,10000h
Average. Lumen Maintenance at 10000 hours	94.52%
Average Chromaticity Shift at 10000 hours	0.0029
Reported TM-21 L_{70} Lifetime:	58,000 hours

3 - Test Data

3.1 Data Set1, 85℃, 100 mA (Lumen Maintenance)

No.	V_F(V)		Lumen Maintenance (%)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	9.154	118.7	100.67	100.51	100.42	99.83	99.16	98.57	97.81	97.56	97.30	97.05
2	9.176	116.9	101.45	101.03	100.77	100.26	99.57	98.97	98.46	98.20	97.95	97.43
3	9.147	117.1	101.02	100.94	100.77	100.26	99.40	98.98	98.21	97.95	97.69	97.10
4	9.144	117.4	101.28	100.77	100.26	99.49	98.72	98.04	97.53	97.19	96.85	96.51
5	9.138	117.3	100.85	100.43	100.00	99.49	98.81	98.29	97.70	97.10	96.85	96.33
6	9.094	116.5	101.29	100.77	100.34	99.74	99.14	98.63	98.28	97.94	97.60	97.00
7	9.137	119.3	100.25	99.92	99.50	98.91	98.41	97.74	96.90	96.65	96.14	96.06
8	9.193	117.7	101.10	100.68	100.34	100.08	99.49	98.64	98.05	97.88	97.45	97.11
9	9.170	117.4	101.28	100.85	100.43	99.83	99.15	98.55	98.21	97.96	97.70	97.27
10	9.156	118.7	100.84	100.25	99.49	98.99	98.32	97.64	96.88	96.29	95.96	95.45
11	9.153	117.9	101.70	101.10	100.51	99.75	98.98	98.22	97.54	96.86	96.69	96.27
12	9.130	118.2	101.10	100.76	100.17	99.58	98.73	97.97	97.38	96.70	96.28	95.69
13	9.136	118.1	101.19	100.85	100.34	99.92	99.15	98.48	97.54	97.21	96.95	96.53
14	9.173	118.8	100.51	100.00	99.58	98.99	98.23	97.64	96.97	96.80	96.38	95.88
15	9.171	120.2	100.50	100.25	99.75	99.00	98.17	97.50	96.76	96.51	96.34	96.01
16	9.172	117.5	101.11	100.26	99.83	99.15	98.47	97.96	97.28	96.68	96.43	96.09
17	9.131	118.7	100.84	100.51	100.08	99.07	98.32	97.73	97.22	96.97	96.38	95.96
18	9.172	117.1	101.20	100.85	100.43	99.66	98.89	98.21	97.52	97.01	96.84	96.24
19	9.147	119.1	100.92	100.50	100.34	99.50	98.66	98.07	97.06	96.56	96.14	95.89
20	9.108	119.2	100.67	99.92	99.75	99.08	98.49	97.65	97.06	96.31	95.97	95.47
21	9.148	118.3	101.27	100.51	99.83	98.56	97.46	96.79	96.45	96.03	95.69	95.01
22	9.150	117.4	100.85	100.00	99.40	98.89	98.38	97.96	97.19	96.76	96.34	96.00
23	9.206	117.5	100.94	100.00	99.23	98.81	97.96	97.28	96.60	95.91	95.74	95.15
24	9.079	118.6	100.25	99.58	98.74	98.40	97.22	96.88	96.29	95.78	95.62	95.03
25	9.137	119.3	100.50	99.66	98.91	98.49	97.65	97.07	96.81	96.23	96.06	95.39
Ave.	9.149	118.1	100.94	100.44	99.97	99.35	98.60	97.98	97.35	96.92	96.61	96.16
Med.	9.148	118.1	100.94	100.51	100.08	99.49	98.66	97.97	97.28	96.80	96.38	96.06
st dev	0.0285	0.9	0.3654	0.4336	0.5446	0.5406	0.6127	0.5992	0.5936	0.6834	0.6820	0.7110
Min.	9.079	116.5	100.25	99.58	98.74	98.40	97.22	96.79	96.29	95.78	95.62	95.01
Max.	9.206	120.2	101.70	101.10	100.77	100.26	99.57	98.98	98.46	98.20	97.95	97.43

3.3 Data Set2, 105℃, 100 mA (Lumen Maintenance)

No.	V_F(V)		Lumen Maintenance (%)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	9.172	117.3	100.85	99.91	99.15	98.29	97.44	96.59	95.57	94.80	94.54	94.29
27	9.174	117.2	100.85	99.91	99.32	98.98	98.21	97.61	95.56	94.88	94.37	93.77
28	9.130	117.0	100.34	99.83	99.32	98.55	97.62	96.85	96.09	95.92	95.49	94.90
29	9.157	117.5	100.60	100.00	99.32	98.81	97.79	96.85	96.17	95.32	94.89	94.47
30	9.194	117.2	100.77	99.91	99.23	98.81	97.95	97.18	96.33	96.16	95.90	95.56
31	9.138	117.7	101.19	100.17	99.07	98.13	97.28	96.35	95.33	94.73	94.14	93.71
32	9.196	117.3	100.94	99.74	98.64	97.70	96.76	96.08	95.57	94.97	94.54	94.12
33	9.112	119.0	100.92	99.83	98.91	97.82	96.72	95.88	95.04	94.54	94.12	93.78
34	9.173	118.1	101.52	100.68	99.58	98.81	97.97	97.29	96.53	95.85	95.34	94.83
35	9.155	119.9	100.50	99.83	99.17	97.83	96.83	96.08	95.33	94.75	94.33	93.83
36	9.095	119.2	100.92	100.25	99.50	98.91	98.15	97.57	96.81	96.39	95.97	95.39
37	9.118	119.1	100.67	99.92	99.33	98.66	97.65	96.81	96.73	96.22	95.72	95.21
38	9.127	119.7	100.58	99.67	99.08	98.50	97.66	96.74	95.99	95.57	95.15	94.65
39	9.172	117.7	101.70	100.85	99.92	99.07	97.96	97.11	96.52	96.18	95.75	95.07
40	9.165	117.6	101.36	100.26	99.23	98.38	97.28	96.68	95.92	95.83	95.58	94.90
41	9.150	117.9	101.78	100.93	99.92	98.98	97.79	97.03	96.18	95.50	95.17	94.66
42	9.104	117.7	100.08	99.15	98.73	98.05	97.20	96.69	96.01	95.33	95.16	94.65
43	9.131	118.9	100.93	99.16	98.82	97.98	96.80	96.13	95.29	94.70	94.37	93.78
44	9.163	118.6	101.35	100.51	99.83	98.65	97.22	96.63	95.70	95.19	94.77	94.10
45	9.177	118.2	101.02	100.08	98.98	97.97	97.12	96.36	95.52	94.75	94.59	93.91
46	9.166	118.2	100.51	99.83	99.15	97.80	97.04	96.19	95.18	94.59	94.25	93.74
47	9.155	118.7	101.52	100.51	99.92	99.24	97.47	96.71	95.53	94.95	94.44	93.93
48	9.121	117.9	100.76	100.08	99.32	98.73	97.88	97.20	96.27	95.76	95.42	94.83
49	9.142	119.1	100.42	99.41	98.66	98.24	97.48	96.47	95.89	95.38	95.21	94.63
50	9.158	117.4	101.87	101.11	100.43	99.91	98.98	98.21	97.27	96.59	96.42	96.25
Ave.	9.150	118.2	100.96	100.06	99.30	98.51	97.53	96.77	95.93	95.39	95.03	94.52
Med.	9.155	117.9	100.92	99.92	99.23	98.55	97.48	96.71	95.92	95.33	95.15	94.63
st dev	0.0271	0.8	0.4730	0.4983	0.4399	0.5381	0.5328	0.5491	0.5635	0.6243	0.6504	0.6671
Min.	9.095	117.0	100.08	99.15	98.64	97.70	96.72	95.88	95.04	94.54	94.12	93.71
Max.	9.196	119.9	101.87	101.11	100.43	99.91	98.98	98.21	97.27	96.59	96.42	96.25

TM-21 Projection:

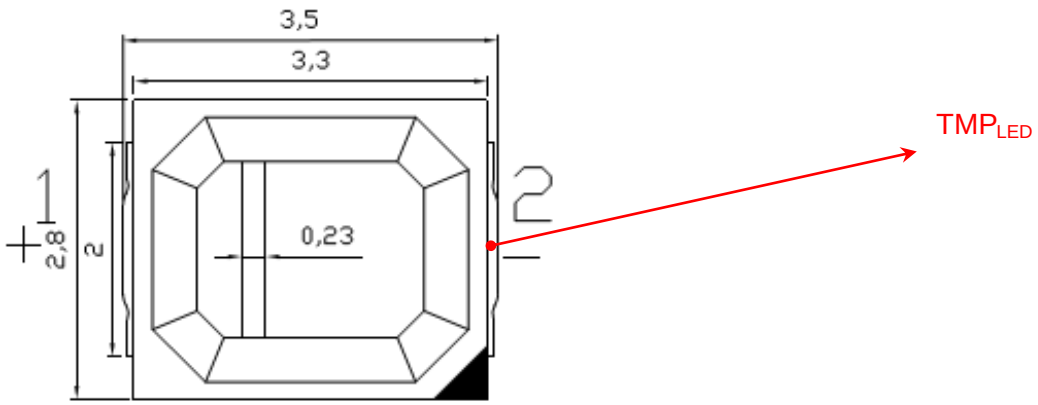
10000 hours
0
6.195E-06
1.004
58,000 hours
58,000 hours

0 mA (Chromaticity Shift)

1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
0.0006	0.0009	0.0006	0.0008	0.0014	0.0019	0.0020	0.0023	0.0028	0.0031
0.0006	0.0008	0.0004	0.0006	0.0012	0.0020	0.0022	0.0025	0.0029	0.0032
0.0008	0.0009	0.0006	0.0007	0.0013	0.0021	0.0024	0.0026	0.0029	0.0032
0.0006	0.0008	0.0004	0.0006	0.0010	0.0018	0.0021	0.0023	0.0026	0.0030
0.0006	0.0009	0.0006	0.0006	0.0014	0.0020	0.0022	0.0026	0.0028	0.0031
0.0006	0.0010	0.0007	0.0006	0.0010	0.0017	0.0020	0.0023	0.0025	0.0028
0.0006	0.0008	0.0006	0.0008	0.0015	0.0022	0.0026	0.0028	0.0031	0.0034
0.0007	0.0011	0.0006	0.0006	0.0011	0.0018	0.0022	0.0024	0.0026	0.0029
									0.0026
									0.0027
									0.0027

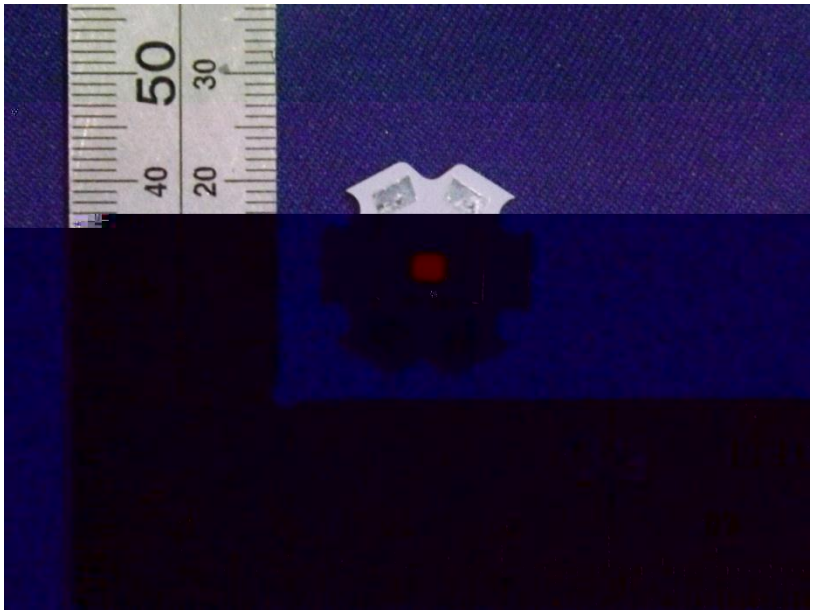
Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta =25°C)



All dimensions are in millimeter

A.2 EUT Photo



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