



TEST REPORT

According to ANSI/IES LM-80-15
For

Hongli Zhihui Group Co.,Ltd. Guangzhou Branch

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

Model: HL-AF-5060H343W-3-S1-THL-HR3

Report Type: 6000 Hours Test Report		Product Type: LED Package	
Reviewed By:	Pote Wang	<i>Pote Wang</i>	
Report Number:	SZ2220402-12242E-10-6000		
Test Date:	2022-04-09 to 2022-12-15		
Report Date:	2023-01-12		
Approved by:	Blake Zhang / EE Engineer	<i>Blake Zhang</i>	
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5/F(B-West) -7/F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China. Tel: +86-755-33320018 Fax: +86-755-33320008		
Test Facility:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.		

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1 - General Information

1.1 Description of LED Light Sources[#]

Sample Size:

50 PCS test samples were in good condition and received on 2022-04-02. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-AF-5060H343W-3-S1-THL-HR3
Part Type:	LED Package
Drive Level:	DC 60mA
Nominal CCT:	2700K
Power:	0.192W
Average Current Density per LED die:	229.630mA/mm ²
Average Power Density per LED die:	0.689W/mm ²
CRI:	80
Die Spacing:	0.728mm

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 days.

These manufacturing lots are picked to represent a wide parametric distribution.

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 (typ.)	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)
Test model	HL-AF-5060H343W-3-S1-THL-HR3	80	2700	1	3	0.00711	229.630	20	0.728	60
Multiple models	HL-AF-5060H***W-3-S1-T**-HR*-***	70-80	2700-6500	1	3	0.00711	229.630	20	0.728	60
	HL-AF-5060H***W-3-S1-T**-HR*(R9)-***	70-80	2700-6500	1	3	0.00711	229.630	20	0.728	60
	HL-AF-5060H***W-2-S1-T**-HR*-***	70-80	2700-6500	1	2	0.00474	229.630	20	0.728	40
	HL-AF-5060H***W-2-S1-T**-HR*(R9)-***	70-80	2700-6500	1	2	0.00474	229.630	20	0.728	40
	HL-AF-5060H***W-1-S1-T**-HR*-***	70-80	2700-6500	1	1	0.00237	229.630	20	/	20
	HL-AF-5060H***W-1-S1-T**-HR*(R9)-***	70-80	2700-6500	1	1	0.00237	229.630	20	/	20



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The uncertainty of the temperature is $U=0.8671^{\circ}\text{C}$ ($K=2$), at the 95% confidence level.

1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.8 Sample Set

Data Set 1: 55°C, 60mA

Part Number: HL-AF-5060H343W-3-S1-THL-HR3
Number of Units: 25
Case Temperature: $>53^{\circ}\text{C}$
Ambient Temperature: $>50^{\circ}\text{C}$
Life Test Drive Current: 60mA
Measurement Current: 60mA

Data Set 2: 85°C, 60mA

Part Number: HL-AF-5060H343W-3-S1-THL-HR3
Number of Units: 25
Case Temperature: $>83^{\circ}\text{C}$
Ambient Temperature: $>80^{\circ}\text{C}$
Life Test Drive Current: 60mA
Measurement Current: 60mA



2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration			Reported TM-21 L ₇₀ Lifetime
1	25	0	1000hrs	6000hrs	2.079E-06	1.004	>36000 hours
2	25	0	1000hrs	6000hrs	2.487E-06	1.004	>36000 hours

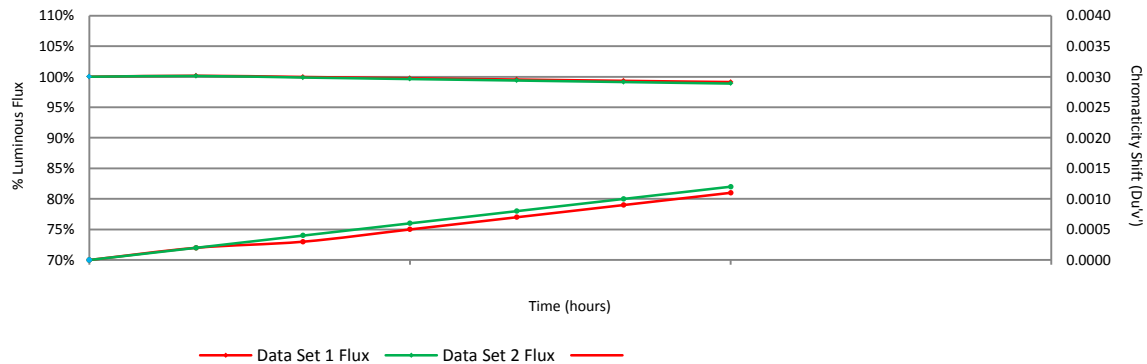
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	100.16%	99.96%	99.75%	99.54%	99.33%	99.13%
2	100.12%	99.87%	99.62%	99.38%	99.13%	98.88%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.0002	0.0003	0.0005	0.0007	0.0009	0.0011
2	0.0002	0.0004	0.0006	0.0008	0.0010	0.0012

Average Lumen Maintenance and Chromaticity Shift VS. Time





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3 - Test Data

3.1 Data Set 1, 55°C, 60mA (Lumen Maintenance)

No.	Lumen Maintenance (%)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	24.10	100.04	99.88	99.75	99.59	99.38	99.09

(Forward Volt

Forward					
2000hrs					
2.857					
2.850					
2.838					
2.855					
2.834					
2.817					
2.856					
3 2.872					
2.876					
2.876					
2.852					
2.872					
2.863	2.867	2.892	2.842	2.852	
2.825	2.851	2.906	2.821	2.866	
	2.825	2.850	2.869	2.865	



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3.3 Data Set 1, 55°C, 60mA (Chromaticity Shift)

No.			CCT(K)						
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2585	0.5271	2787	0.0002	0.0004	0.0004	0.0005	0.0008	0.0011
2	0.2602	0.5272	2750	0.0002	0.0005	0.0006	0.0006	0.0010	0.0013
3	0.2599	0.5259	2762	0.0002	0.0004	0.0006	0.0008	0.0011	0.0013
4	0.2588	0.5254	2787	0.0001	0.0002	0.0005	0.0006	0.0011	0.0013
5	0.2594	0.5261	2772	0.0002	0.0003	0.0004	0.0008	0.0008	0.0009
6	0.2572	0.5270	2814	0.0002	0.0001	0.0002	0.0005	0.0006	0.0008
7	0.2563	0.5274	2833	0.0002	0.0001	0.0003	0.0005	0.0006	0.0009
8	0.2577	0.5249	2813	0.0002	0.0001	0.0003	0.0006	0.0009	0.0011
9	0.2581	0.5274	2793	0.0001	0.0001	0.0004	0.0005	0.0006	0.0009
10	0.2622	0.5265	2709	0.0001	0.0002	0.0005	0.0008	0.0011	0.0011
11	0.2624	0.5289	2696	0.0002	0.0003	0.0005	0.0007	0.0008	0.0012
12	0.2598	0.5277	2755	0.0001	0.0001	0.0004	0.0006	0.0006	0.0008
13	0.2599	0.5272	2754	0.0001	0.0003	0.0002	0.0006	0.0007	0.0009
14	0.2576	0.5267	2807	0.0001	0.0003	0.0004	0.0006	0.0007	0.0009
15	0.2592	0.5267	2773	0.0001	0.0001	0.0003	0.0007	0.0010	0.0011
16	0.2585	0.5271	2785	0.0001	0.0004	0.0003	0.0003	0.0007	0.0009
17	0.2581	0.5247	2806	0.0002	0.0004	0.0003	0.0005	0.0007	0.0009
18	0.2573	0.5255	2820	0.0002	0.0003	0.0004	0.0008	0.0011	0.0012
19	0.2604	0.5261	2750	0.0001	0.0003	0.0004	0.0004	0.0007	0.0009
20	0.2587	0.5249	2791	0.0002	0.0002	0.0006	0.0006	0.0007	0.0009
21	0.2590	0.5264	2778	0.0001	0.0005	0.0005	0.0008	0.0009	0.0010
22	0.2605	0.5257	2748	0.0001	0.0003	0.0006	0.0009	0.0010	0.0012
23	0.2589	0.5269	2777	0.0001	0.0003	0.0007	0.0011	0.0012	0.0015
24	0.2583	0.5270	2791	0.0001	0.0001	0.0007	0.0009	0.0013	0.0016
25	0.2594	0.5261	2770	0.0002	0.0002	0.0009	0.0012	0.0013	0.0015
Avg.	0.2591	0.5265	2777	0.0002	0.0003	0.0005	0.0007	0.0009	0.0011
Med.	0.2589	0.5267	2778	0.0001	0.0003	0.0004	0.0006	0.0008	0.0011
st dev	0.0014	0.0010	32	0.0000	0.0001	0.0002	0.0002	0.0002	0.0002
Min.	0.2563	0.5247	2696	0.0001	0.0001	0.0002	0.0003	0.0006	0.0008
Max.	0.2624	0.5289	2833	0.0002	0.0005	0.0009	0.0012	0.0013	0.0016

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3.6 Data Set 2, 85°C, 60mA (Chromaticity Shift)

No.			CCT(K)						
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2590	0.5257	2782	0.0001	0.0003	0.0007	0.0010	0.0012	0.0014
27	0.2594	0.5270	2767	0.0001	0.0003	0.0005	0.0006	0.0008	0.0011
28	0.2588	0.5277	2776	0.0001	0.0003	0.0004	0.0005	0.0008	0.0010
29	0.2574	0.5269	2812	0.0001	0.0005	0.0005	0.0006	0.0008	0.0011
30	0.2600	0.5285	2748	0.0002	0.0005	0.0004	0.0006	0.0009	0.0011
31	0.2589	0.5283	2771	0.0001	0.0005	0.0005	0.0007	0.0008	0.0011
32	0.2584	0.5270	2788	0.0002	0.0004	0.0006	0.0008	0.0009	0.0011
33	0.2584	0.5272	2787	0.0001	0.0004	0.0006	0.0006	0.0008	0.0009
34	0.2572	0.5281	2809	0.0001	0.0004	0.0006	0.0006	0.0008	0.0009
35	0.2585	0.5263	2789	0.0002	0.0004	0.0006	0.0007	0.0009	0.0011
36	0.2566	0.5249	2838	0.0002	0.0004	0.0006	0.0007	0.0009	0.0011
37	0.2585	0.5278	2782	0.0001	0.0004	0.0006	0.0006	0.0009	0.0013
38	0.2598	0.5276	2757	0.0001	0.0004	0.0006	0.0007	0.0009	0.0013
39	0.2587	0.5275	2779	0.0001	0.0004	0.0005	0.0006	0.0008	0.0012
40	0.2577	0.5271	2803	0.0001	0.0004	0.0005	0.0008	0.0009	0.0013
41	0.2592	0.5262	2775	0.0002	0.0004	0.0006	0.0007	0.0010	0.0013
42	0.2597	0.5263	2763	0.0002	0.0005	0.0006	0.0008	0.0011	0.0015
43	0.2571	0.5271	2817	0.0001	0.0004	0.0006	0.0007	0.0010	0.0013
44	0.2564	0.5249	2843	0.0001	0.0005	0.0004	0.0009	0.0009	0.0013
45	0.2593	0.5262	2773	0.0001	0.0003	0.0006	0.0007	0.0009	0.0012
46	0.2601	0.5279	2748	0.0002	0.0005	0.0005	0.0007	0.0008	0.0009
47	0.2577	0.5251	2814	0.0002	0.0004	0.0008	0.0010	0.0014	0.0016
48	0.2594	0.5259	2772	0.0001	0.0004	0.0006	0.0010	0.0013	0.0015
49	0.2582	0.5264	2795	0.0001	0.0004	0.0004	0.0011	0.0015	0.0015
50	0.2602	0.5278	2747	0.0001	0.0006	0.0004	0.0008	0.0013	0.0012
Avg.	0.2586	0.5269	2785	0.0002	0.0004	0.0006	0.0008	0.0010	0.0012
Med.	0.2587	0.5270	2782	0.0001	0.0004	0.0006	0.0007	0.0009	0.0012
st dev	0.0011	0.0010	26	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Min.	0.2564	0.5249	2747	0.0001	0.0003	0.0004	0.0005	0.0008	0.0009
Max.	0.2602	0.5285	2843	0.0002	0.0006	0.0008	0.0011	0.0015	0.0016

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Directions

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