



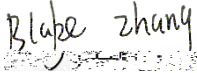
# TEST REPORT

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-A-3014H416W-S1-08HL-HR6**

<b>Report Type:</b> 10000 Hours Test Report		<b>Product Type:</b> LED Package	
<b>Reviewed By:</b>	Pote Wang		
<b>Report Number:</b>	SZ2220725-33705E-EE-10000		
<b>Test Date:</b>	2022-07-29 to 2023-10-20		
<b>Report Date:</b>	2023-10-31		
<b>Approved by:</b>	Blake Zhang / EE Engineer		
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588		



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## 1 - General Information

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### 1.1 Description of LED Light Sources<sup>#</sup>

#### Sample Size:

50 PCS test samples were in good condition and received on 2022-07-25. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-A-3014H416W-S1-08HL-HR6
Part Type:	LED Package
Drive Level:	DC 30mA
Nominal CCT:	2700K
Power:	0.102W
Average Current Density per LED die:	387.5mA/mm <sup>2</sup>
Average Power Density per LED die:	1.318W/mm <sup>2</sup>
CRI:	95
Die Spacing:	N/A

#### 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<sup>®</sup> 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<sup>®</sup> Requirements for the Use of LM-80 Data.



## 1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.



## 1.8 Sample Set

### Data Set 1: 55°C, 30mA

Part Number: HL-A-3014H416W-S1-08HL-HR6

Number of Units: 25

Case Temperature: >53°C

Ambient Temperature: >50°C

Life Test Drive Current: 30mA

Measurement Current: 30mA

### Data Set 2: 85°C, 30mA

Part Number: HL-A-3014H416W-S1-08HL-HR6

Number of Units: 25

Case Temperature: >83°C

Ambient Temperature: >80°C

Life Test Drive Current: 30mA

Measurement Current: 30mA



## 2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration			Reported TM-21 L <sub>70</sub> Lifetime
1	25	0	1000hrs	10000hrs	1.994E-06	1.004	>60000 hours
2	25	0	1000hrs	10000hrs	2.376E-06	1.005	>60000 hours

Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.18%	99.97%	99.76%	99.57%	99.38%	99.19%	98.99%	98.79%	98.59%	98.40%
2	100.14%	99.95%	99.76%	99.54%	99.32%	99.09%	98.85%	98.62%	98.38%	98.15%



### 3 - Test Data

#### 3.1 Data Set 1, 55°C, 30mA (Lumen Maintenance)

No.	Lumen Maintenance (%)										
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	9.732	100.21	99.90	99.75	99.57	99.47	99.28	99.14	99.04	98.87	98.58
2	9.767	100.22	100.02	99.92	99.75	99.62	99.51	99.17	98.95	98.85	98.75
3	9.676	100.27	100.19	99.87	99.76	99.67	99.51	99.39	99.15	98.88	98.72
4	9.840	100.32	100.11	99.91	99.66	99.40	99.24	99.15	98.99	98.89	98.67
5	9.794	100.30	100.13	99.99	99.71	99.58	99.39	99.06	98.81	98.51	98.14
6	9.484	100.27	99.98	99.79	99.53	99.33	99.19	99.07	98.83	98.65	98.51
7	9.425	100.33	100.07	99.78	99.55	99.30	99.01	98.82	98.65	98.48	98.33
8	9.716	100.19	99.86	99.77	99.61	99.41	99.10	98.84	98.62	98.27	98.02
9	9.733	100.15	99.82	99.65	99.55	99.29	98.97	98.86	98.55	98.38	98.20
10	9.692	100.03	99.87	99.75	99.58	99.47	99.37	99.16	98.94	98.72	98.41
11	9.538	100.04	99.85	99.67	99.49	99.36	99.27	99.06	98.89	98.63	98.35



**3.2 Data Set 1, 55°C, 30mA (Forward Voltage)**

No.	Forward Voltage (V)										
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	2.913	2.919	2.915	2.916	2.919	2.906	2.914	2.909	2.907	2.903	2.916
2	2.919	2.915	2.922	2.918	2.900	2.923	2.900	2.909	2.908	2.908	2.901
3	2.916	2.934	2.919	2.917	2.907	2.914	2.916	2.906	2.902	2.905	2.913
4	2.913	2.911	2.914	2.901	2.916	2.906	2.914	2.912	2.906	2.908	2.916
5	2.909	2.919	2.909	2.902	2.927	2.908	2.912	2.90.15 5t			





**3.3 Data Set 1, 55°C, 30mA (Chromaticity Shift)**

No.			CCT(K)										
	**0hr(Initial)			**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2591	0.5334	2745	0.0001	0.0002	0.0004	0.0005	0.0007	0.0009	0.0010	0.0013	0.0017	0.0019
2	0.2567	0.5292	2816	0.0001	0.0002	0.0004	0.0005	0.0008	0.0009	0.0011	0.0014	0.0016	0.0018
3	0.2585	0.5309	2768	0.0001	0.0002	0.0003	0.0005	0.0007	0.0008	0.0010	0.0014	0.0017	0.0019
4	0.2586	0.5332	2757	0.0002	0.0003	0.0003	0.0005	0.0006	0.0009	0.0010	0.0013	0.0016	0.0019
5	0.2577	0.5326	2778	0.0001	0.0002	0.0003	0.0005	0.0006	0.0009	0.0011	0.0015	0.0017	0.0019
6	0.2586	0.5310	2765	0.0001	0.0002	0.0002	0.0002	0.0004	0.0008	0.0009	0.0012	0.0013	0.0015
7	0.2594	0.5315	2747	0.0001	0.0002	0.0004	0.0005	0.0006	0.0009	0.0011	0.0014	0.0015	0.0016
8	0.2610	0.5332	2708	0.0001	0.0002	0.0003	0.0007	0.0007	0.0010	0.0011	0.0015	0.0015	0.0016
9	0.2591	0.5325	2750	0.0002	0.0003	0.0004	0.0005	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016
10	0.2592	0.5314	2752	0.0001	0.0002	0.0003	0.0004	0.0005	0.0009	0.0010	0.0013	0.0014	0.0016
11	0.2620	0.5319	2693	0.0001	0.0002	0.0002	0.0004	0.0006	0.0009	0.0011	0.0011	0.0014	0.0016
12	0.2608	0.5315	2718	0.0001	0.0002	0.0002	0.0004	0.0006	0.0009	0.0011	0.0011	0.0014	0.0015
13	0.2572	0.5295	2803	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0012	0.0011	0.0014	0.0016
14	0.2573	0.5322	2789	0.0001	0.0002	0.0004	0.0004	0.0007	0.0008	0.0011	0.0011	0.0013	0.0015
15	0.2574	0.5305	2794	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0011	0.0015	0.0017
16	0.2603	0.5302	2734	0.0001	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0010	0.0014	0.0016
17	0.2566	0.5301	2813	0.0001	0.0002	0.0002	0.0004	0.0005	0.0005	0.0007	0.0009	0.0011	0.0013
18	0.2581	0.5329	2768	0.0001	0.0002	0.0002	0.0004	0.0005	0.0006	0.0009	0.0010	0.0012	0.0014
19	0.2596	0.5311	2745	0.0001	0.0002	0.0002	0.0004	0.0007	0.0009	0.0009	0.0011	0.0012	0.0015
20	0.2605	0.5329	2719	0.0001	0.0002	0.0003	0.0004	0.0008	0.0009	0.0009	0.0009	0.0011	0.0014
21	0.2594	0.5316	2746	0.0001	0.0002	0.0004	0.0004	0.0008	0.0011	0.0012	0.0012	0.0016	0.0018
22	0.2585	0.5313	2767	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0014	0.0013	0.0016	0.0019
23	0.2581	0.5311	2776	0.0001	0.0002	0.0002	0.0004	0.0009	0.0012	0.0013	0.0014	0.0015	0.0018
24	0.2616	0.5312	2704	0.0001	0.0002	0.0002	0.0004	0.0009	0.0011	0.0016	0.0015	0.0014	0.0017
25	0.2587	0.5331	2755	0.0001	0.0002	0.0002	0.0007	0.0009	0.0012	0.0013	0.0016	0.0017	0.0018
Avg.	0.2590	0.5316	2756	0.0001	0.0002	0.0003	0.0005	0.0007	0.0009	0.0011	0.0013	0.0015	0.0017
Med.	0.2587	0.5315	2755	0.0001	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0013	0.0015	0.0016
st dev	0.0015	0.0012	33	0.0000	0.0000	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2566	0.5292	2693	0.0001	0.0002	0.0002	0.0002	0.0004	0.0005	0.0007	0.0009	0.0011	0.0013
Max.	0.2620	0.5334	2816	0.0002	0.0003	0.0004	0.0007	0.0009	0.0012	0.0016	0.0016	0.0017	0.0019

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**3.5 Data Set 2, 85°C, 30mA (Forward Voltage) 2**

No.	Forward Voltage (V)										
	**0hr(Initial)	**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	2.910	2.919	2.913	2.902	2.914	2.919	2.903	2.919	2.937	2.914	2.904
27	2.916	2.929	2.921	2.916	2.917	2.917	2.912	2.913	2.911	2.917	2.910
28	2.915	2.915	2.919	2.931	2.915	2.919	2.936	2.915	2.914	2.918	2.903
29	2.912	2.928	2.917	2.918	2.914	2.911	2.928	2.912	2.911	2.910	2.914
30	2.905	2.915	2.908	2.917	2.910	2.905	2.917	2.911	2.936	2.916	2.903
31	2.907	2.919	2.912	2.901	2.916	2.917	2.912	2.908	2.912	2.916	2.907
32	2.919	2.924	2.924	2.915	2.920	2.930	2.914	2.913	2.910	2.915	2.903
33	2.913	2.917	2.916	2.910	2.915	2.913	2.916	2.917	2.922	2.916	2.922
34	2.906	2.910	2.910	2.911	2.909	2.904	2.904	2.900	2.939	2.919	2.939
35	2.934	2.940	2.939	2.927	2.910	2.902	2.914	2.917	2.936	2.911	2.912
36	2.912	2.923	2.916	2.919	2.921	2.914	2.912	2.916	2.930	2.918	2.901
37	2.933	2.938	2.937	2.929	2.906	2.927	2.900	2.926	2.938		



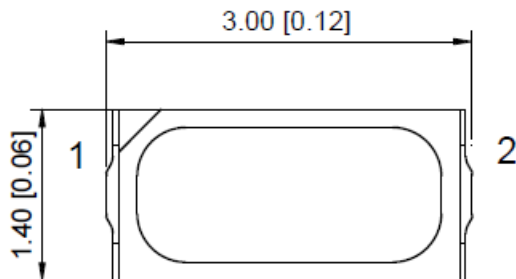
**3.6 Data Set 2, 85°C, 30mA (Chromaticity Shift)**

No.			CCT(K)										
	**0hr(Initial)			**1000hrs	**2000hrs	**3000hrs	**4000hrs	**5000hrs	**6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	0.2603	0.5322	2726	0.0001	0.0002	0.0002	0.0005	0.0007	0.0010	0.0012	0.0014	0.0017	0.0019
27	0.2592	0.5331	2744	0.0001	0.0002	0.0007	0.0006	0.0006	0.0009	0.0013	0.0014	0.0016	0.0017
28	0.2598	0.5335	2731	0.0002	0.0003	0.0004	0.0007	0.0007	0.0008	0.0014	0.0015	0.0017	0.0019
29	0.2595	0.5329	2739	0.0001	0.0002	0.0004	0.0006	0.0008	0.0010	0.0013	0.0016	0.0018	0.0019
30	0.2610	0.5328	2709	0.0001	0.0002	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017	0.0019
31	0.2611	0.5331	2706	0.0001	0.0002	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012	0.0014	0.0016
32	0.2601	0.5325	2728	0.0001	0.0002	0.0003	0.0005	0.0008	0.0009	0.0010	0.0011	0.0014	0.0015
33	0.2589	0.5328	2751	0.0001	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0010	0.0013	0.0014
34	0.2599	0.5323	2734	0.0001	0.0002	0.0004	0.0006	0.0008	0.0009	0.0012	0.0012	0.0014	0.0015
35	0.2593	0.5335	2741	0.0001	0.0002	0.0003	0.0003	0.0005	0.0008	0.0009	0.0010	0.0013	0.0014
36	0.2593	0.5302	2755	0.0001	0.0002	0.0004	0.0004	0.0006	0.0009	0.0009	0.0011	0.0014	0.0015
37	0.2562	0.5315	2816	0.0001	0.0002	0.0002	0.0002	0.0005	0.0008	0.0009	0.0010	0.0014	0.0017
38	0.2586	0.5321	2762	0.0001	0.0002	0.0003	0.0003	0.0003	0.0008	0.0010	0.0012	0.0015	0.0019
39	0.2598	0.5314	2740	0.0001	0.0002	0.0003	0.0003	0.0003	0.0007	0.0010	0.0012	0.0014	0.0019
40	0.2581	0.5317	2774	0.0001	0.0002	0.0005	0.0006	0.0009	0.0009	0.0009	0.0012	0.0014	0.0018
41	0.2587	0.5309	2765	0.0001	0.0002	0.0004	0.0006	0.0007	0.0010	0.0010	0.0011	0.0014	0.0018
42	0.2577	0.5331	2777	0.0002	0.0003	0.0005	0.0006	0.0009	0.0011	0.0011	0.0013	0.0015	0.0017
43	0.2583	0.5321	2767	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0012	0.0016	0.0017	0.0018
44	0.2589	0.5319	2756	0.0001	0.0002	0.0004	0.0005	0.0008	0.0011	0.0012	0.0017	0.0020	0.0021
45	0.2623	0.5315	2688	0.0001	0.0002	0.0004	0.0004	0.0008	0.0011	0.0013	0.0017	0.0018	0.0021
46	0.2617	0.5321	2697	0.0001	0.0002	0.0004	0.0007	0.0010	0.0014	0.0015	0.0016	0.0019	0.0021
47	0.2590	0.5331	2750	0.0001	0.0002	0.0004	0.0008	0.0010	0.0012	0.0016	0.0018	0.0020	0.0022
48	0.2579	0.5331	2771	0.0001	0.0002	0.0003	0.0008	0.0011	0.0012	0.0016	0.0017	0.0020	0.0021
49	0.2613	0.5321	2705	0.0001	0.0002	0.0004	0.0008	0.0012	0.0012	0.0013	0.0016	0.0018	0.0018
50	0.2618	0.5323	2696	0.0002	0.0003	0.0005	0.0009	0.0014	0.0016	0.0017	0.0019	0.0021	0.0021
Avg.	0.2595	0.5323	2741	0.0001	0.0001								

## 4 - DUT Photo

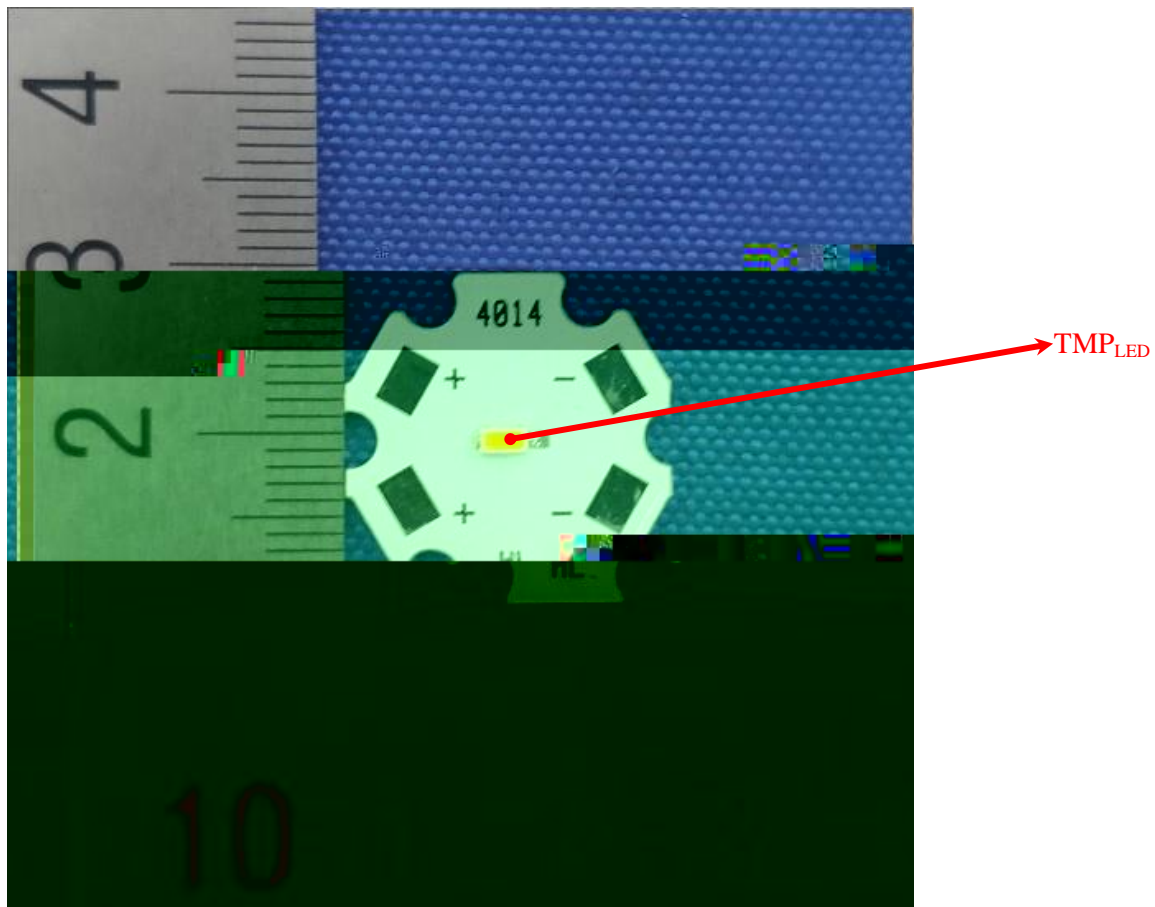
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### 4.1 Mechanical Dimensions



All dimensions are in millimeter

### 4.2 DUT Photo





## Bay Area Compliance Laboratories Corp. (Dongguan)

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