



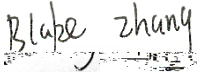
# TEST REPORT

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-AM-2835H421W-S1-08HL-HR3**

<b>Report Type:</b> 10000 Hours Test Report	<b>Product Type:</b> LED Package
<b>Reviewed By:</b>	Pote Wang
<b>Report Number:</b>	SZ2220119-02804E-10-10000
<b>Test Date:</b>	2022-01-26 to 2023-04-12
<b>Report Date:</b>	2023-04-20
<b>Approved by:</b>	Blake Zhang / EE Engineer 
<b>Prepared By:</b>	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
<b>Test Facility:</b>	Test facility was located at No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.



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The NVLAP Lab Code is 200707-0

# TABLE OF CONTENTS

<b>1 - General Information</b> .....	<b>3</b>
1.1 Description of LED Light Sources	



## 1 - General Information

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

#### Sample Size:

50 PCS test samples were in good condition and received on 2022-01-19. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-AM-2835H421W-S1-08HL-HR3
Part Type:	LED Package
Drive Level:	DC 150mA
Nominal CCT:	2700K
Power:	0.51 W
Average Current Density per LED die:	861.113 mA/mm <sup>2</sup>
Average Power Density per LED die:	2.928 W/mm <sup>2</sup>
CRI:	80
Die Spacing:	/

#### 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* (September 28, 2017)

This report covers the following models:

Series Name	Model Name	CRI (typ.)	Total Input Current (mA)	Power (W)	CCT (K)	Number of dies	Driver current per die(mA)	Current Density per Die mA/mm <sup>2</sup>	Power Density per PCB (W/mm <sup>2</sup> )	Die Spacing (mm)
Test model	HL-AM-2835H421W-S1-08HL-HR3	80	150	0.51	2700	1	150	861.113	0.0520	/
Multiple model	HL-AM-2835D***W-****-S1-08**-HR*-***	70-80	150	0.51	2700-6500	1	150	861.113	0.0520	/
	HL-AM-2835H***W-****-S1-08**-HR*-***	70-80	150	0.51	2700-6500	1	150	861.113	0.0520	/

-AM-2835D\*\*\*W-\*\*\*\*-S1-08\*\*-HR\*-

- 1.
2. The second "\*\*\*\*\*" which stands for the Zener chip code or None, no impact on product performances Zener chip code refers to the electrostatic capacity.
- 3.
4. yle
- 5.

### 1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- \*CIE 127:2007: Measurement of LEDs (This standard was not accredited by NVLAP)



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- \*ENERGY STAR<sup>®</sup> Requirements for the Use of LM-80 Data (This standard was not accredited by NVLAP)

### 1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date
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### 1.8 Sample Set

#### Data Set 1: 55°C, 150mA

Part Number: HL-AM-2835H421W-S1-08HL-HR3  
Number of Units: 25  
Case Temperature: >53°C  
Ambient Temperature: >50°C  
Life Test Drive Current: 150mA  
Measurement Current: 150mA

#### Data Set 2: 105°C, 150mA

Part Number: HL-AM-2835H421W-S1-08HL-HR3  
Number of Units: 25  
Case Temperature: >103°C  
Ambient Temperature: >100°C  
Life Test Drive Current: 150mA  
Measurement Current: 150mA



## 2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	$\alpha$	$\beta$	Reported TM-21 L <sub>70</sub> Lifetime
1	25	0	1000hrs	10000hrs	2.193E-06	1.003	>60000 hours
2	25	0	1000hrs	10000hrs	2.530E-06	1.001	>60000 hours

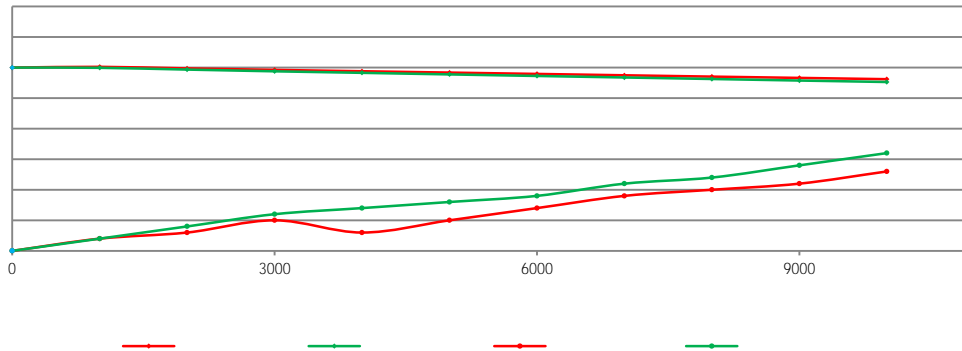
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.12%	99.86%	99.62%	99.40%	99.18%	98.96%	98.74%	98.52%	98.31%	98.10%
2	99.96%	99.67%	99.39%	99.14%	98.88%	98.63%	98.38%	98.13%	97.88%	97.64%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.0002	0.0003	0.0005	0.0003	0.0005	0.0007	0.0009	0.0010	0.0011	0.0013
2	0.0002	0.0004	0.0006	0.0007	0.0008	0.0009	0.0011	0.0012	0.0014	0.0016

Average Lumen Maintenance and Chromaticity Shift VS. Time





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### 3 - Test Data

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#### 3.1 Data Set 1, 55°C, 150mA (Lumen Maintenance)

No.	Lumen Maintenance (%)										
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	62.82	100.38	99.98								



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## 3.3 Data Set 1, 55°C, 150mA (Chromaticity Shift) 7

No.			CCT(K)										
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2595	0.5293	2753	0.0004	0.0002	0.0006	0.0001	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012
2	0.2627	0.5304	2684	0.0001	0.0001	0.0001	0.0002	0.0004	0.0005	0.0007	0.0007	0.0009	0.0009
3	0.2610	0.5303	2720	0.0004	0.0001	0.0003	0.0002	0.0003	0.0005	0.0007	0.0010	0.0010	0.0012
4	0.2599	0.5293	2746	0.0001	0.0003	0.0004	0.0001	0.0003	0.0006	0.0008	0.0011	0.0013	0.0015
									0.0005	0.0008	0.0008	0.0010	0.0013
									0.0005	0.0006	0.0007	0.0008	0.0011
									0.0007	0.0009	0.0009	0.0011	0.0012



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### 3.4 Data Set 2, 105°C, 150mA (Lumen Maintenance)

No.	Ohr(Initial)	Lumen Maintenance (%)									
		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	60.55	100.07	99.85	99.64	99.32	99.04	98.78	98.51	98.22	97.90	97.65
27	61.01	100.02	99.95	99.66	99.44	99.25	99.02	98.79	98.54	98.31	98.10
28	60.74	99.70	99.31	98.96	98.75	98.50	98.32	98.02	97.76	97.56	97.28
29	60.73	100.03	99.82	99.59	99.37	99.09	98.81	98.55	98.30	98.06	97.79
30	61.81	99.87	99.71	99.34	99.05	98.79	98.56	98.29	98.06	97.85	97.54
31	61.13	100.26	99.97	99.59	99.36	99.10	98.81	98.56	98.33	98.12	97.87
32	61.94	99.98	99.84	99.39	99.16	98.93	98.66	98.43	98.16	97.92	97.66
33	62.54	99.89	99.55	99.31	99.06	98.74	98.53	98.31	98.08	97.79	97.55
34	61.97	99.85	99.35	98.97	98.74	98.52	98.22	98.00	97.72	97.43	97.16
35	60.91	100.16	99.95	99.62	99.41	99.08	98.82	98.57	98.31	98.10	97.78
36	61.18	100.16	99.95	99.79	99.56	99.31	99.02	98.74	98.51	98.20	98.02
37	62.01	99.98	99.65	99.47	99.24	98.95	98.61	98.39	98.15	97.94	97.68
38	61.49	99.77	99.25	98.88	98.50	98.31	98.06	97.77	97.58	97.27	96.98
39	61.05	99.77	99.41	99.10	98.89	98.64	98.31	97.99	97.76	97.54	97.36
40	62.31	99.92	99.79	99.65	99.36	99.12	98.86	98.59	98.33	98.11	97.90
41	61.11	100.23	99.98	99.82	99.56	99.28	98.95	98.69	98.49	98.18	97.95
42	62.46	99.82	99.52	99.23	99.02	98.82	98.61	98.33	98.11	97.85	97.58
43	61.03	99.90	99.49	99.10	98.84	98.62	98.39	98.16	97.90	97.61	97.41
44	61.18	100.05	99.61	99.44	99.20	98.94	98.69	98.46	98.22	97.97	97.73
45	61.70	99.84	99.59	99.50	99.25	99.03	98.80	98.61	98.33	98.09	97.88
46	61.02	99.95	99.75	99.67	99.41	99.16	98.95	98.66	98.41	98.16	97.95
47	60.97	100.07	99.79	99.62	99.33	99.11	98.87	98.66	98.41	98.13	97.87
48	60.02	99.83	99.43	99.15	98.95	98.68	98.47	98.17	97.97	97.73	97.53
49	61.55	100.03	99.71	99.38	99.11	98.80	98.51	98.28	98.05	97.87	97.63
50	61.86	99.73	99.47	98.79	98.55	98.29	98.08	97.90	97.64	97.41	97.17
Avg.	61.37	99.96	99.67	99.39	99.14	98.88	98.63	98.38	98.13	97.88	97.64
Med.	61.18	99.95	99.71	99.44	99.20	98.94	98.66	98.43	98.16	97.92	97.66
st dev	0.63	0.1530	0.2230	0.2941	0.2978	0.2904	0.2794	0.2823	0.2801	0.2797	0.2898
Min.	60.02	99.70	99.25	98.79	98.50	98.29	98.06	97.77	97.58	97.27	96.98
Max.	62.54	100.26	99.98	99.82	99.56	99.31	99.02	98.79	98.54	98.31	98.10

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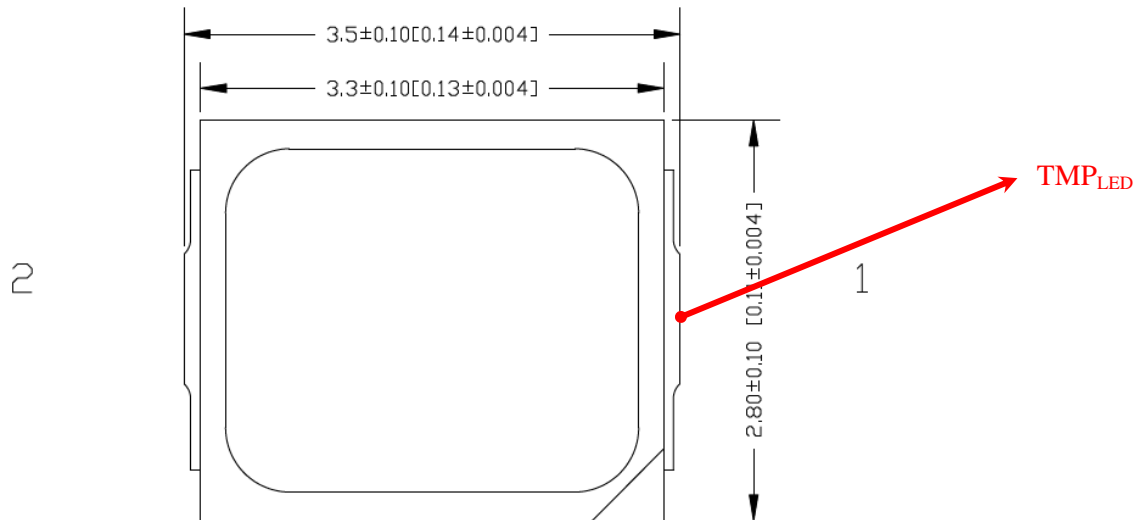
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aticity Shift)

	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
	0.0005	0.0006	0.0007	0.0008	0.0010	0.0011	0.0013	0.0013	0.0015
	0.0007	0.0010	0.0013	0.0013	0.0014	0.0016	0.0016	0.0019	0.0020
	0.0004	0.0005	0.0006	0.0008	0.0011	0.0014	0.0016	0.0017	0.0020
	0.0002	0.0003	0.0004	0.0005	0.0007	0.0008	0.0010	0.0011	0.0013
	0.0005	0.0006	0.0007	0.0008	0.0008	0.0010	0.0012	0.0013	0.0014
	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0014	0.0014	0.0016
	0.0002	0.0002	0.0002	0.0005	0.0008	0.0011	0.0012	0.0013	0.0014
	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0013	0.0015	0.0016
	0.0005	0.0006	0.0009	0.0010	0.0012	0.0013	0.0014	0.0015	0.0017
	0.0002	0.0005	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016	0.0020
	0.0003	0.0004	0.0005	0.0006	0.0007	0.0010	0.0012	0.0013	0.0016
	0.0003	0.0006	0.0008	0.0009	0.0010	0.0013	0.0014	0.0015	0.0017
	0.0005	0.0006	0.0008	0.0009	0.0009	0.0010	0.0012	0.0014	0.0018
	0.0006	0.0008	0.0009	0.0009	0.0010	0.0012	0.0013	0.0014	0.0016
	0.0005	0.0006	0.0009	0.0010	0.0011	0.0012	0.0013	0.0015	0.0017
	0.0004	0.0004	0.0005	0.0007	0.0009	0.0010	0.0011	0.0012	0.0014
	0.0003	0.0005	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0012
	0.0004	0.0007	0.0009	0.0009	0.0011	0.0013	0.0014	0.0015	0.0017
	0.0005	0.0006	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0017
	0.0003	0.0004	0.0006	0.0008	0.0008	0.0008	0.0009	0.0011	0.0013
	0.0006	0.0008	0.0008	0.0009	0.0011	0.0013	0.0013	0.0016	0.0018
	0.0005	0.0007	0.0008	0.0011	0.0013	0.0014	0.0014	0.0016	0.0018
	0.0004	0.0006	0.0007	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012
	0.0007	0.0007	0.0006	0.0006	0.0004	0.0005	0.0004	0.0005	0.0007
	0.0002	0.0003	0.0004	0.0005	0.0007	0.0008	0.0011	0.0011	0.0013

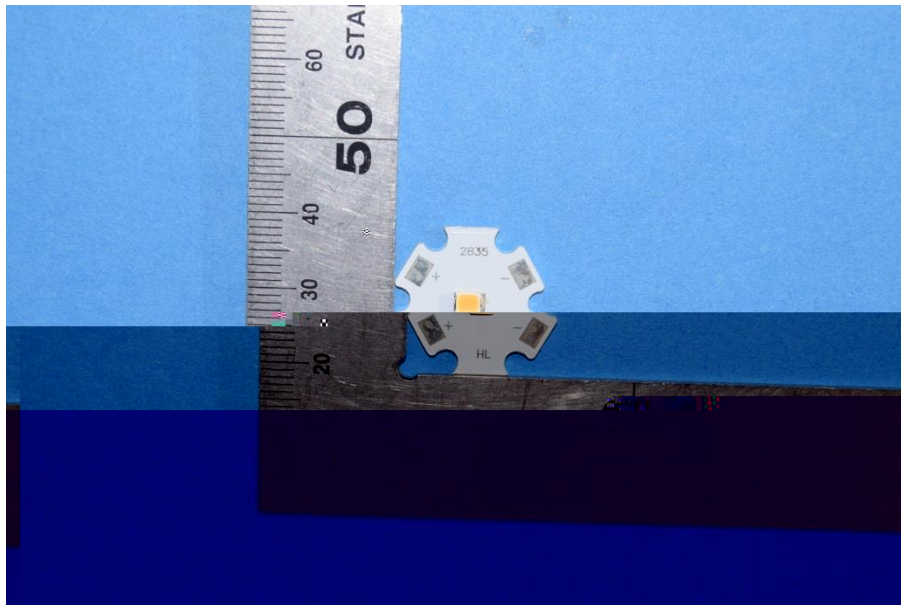
## 4 - DUT Photo

### 4.1 Mechanical Dimensions



All dimensions are in millimeter

### 4.2 DUT Photo





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### Directions

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