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

Report Type: 10000 Hours Test Report	**Product Type:** LED Package
Reviewed By:	Pote Wang
Report Number:	SZ2220119-02804E-10-10000
Test Date:	2022-01-26 to 2023-04-12
Report Date:	2023-04-20
Approved by:	Blake Zhang / EE Engineer
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 1st 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 2022-01-19. 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^2
Average Power Density per LED die:	2.928 W/mm^2
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® 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:

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^2)	Power Density per PCB (W/mm^2)	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)

- *ENERGY STAR® 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 G4TETQ90.5Calibrati72o-3(a 1 datq72 633.88 86.28 22.04 renBTF3

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	α	β	Reported TM-21 L_{70} 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

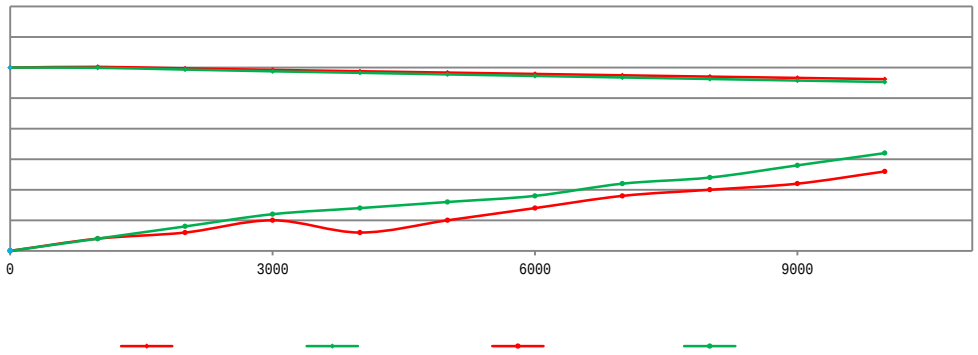
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

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



3 - Test Data

3.1 Data Set 1, 55°C, 150mA (Lumen Maintenance) 550225.92 610.96 41.2 622.78 37.62 0.48 rq41.2 60hrs

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

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

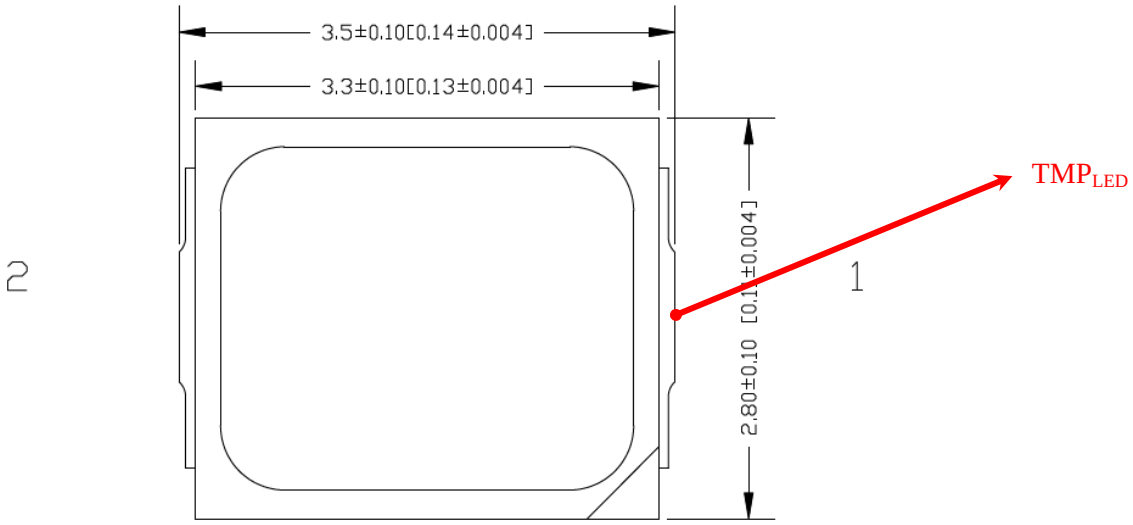
No.		Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	60.55	100.07	99.85	99.64	99.32	99.04	98.78	98.51	98.22	97.90	97.65
27	61.01	100.02	99.95	99.66	99.44	99.25	99.02	98.79	98.54	98.31	98.10
28	60.74	99.70	99.31	98.96	98.75	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

3.6 Data Set 2, 105°C, 150mA (Chromaticity Shift)

No.			CCT(K)										
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	0.2620	0.5293	2703	0.0001	0.0005	0.0006	0.0007	0.0008	0.0010	0.0011	0.0013	0.0013	0.0015
27	0.2619	0.5288	2706	0.0001	0.0007	0.0010	0.0013	0.0013	0.0014	0.0016	0.0016	0.0019	0.0020
28	0.2625	0.5307	2686	0.0001	0.0004	0.0005	0.0006	0.0008	0.0011	0.0014	0.0016	0.0017	0.0020
29	0.2632	0.5281	2682	0.0002	0.0002	0.0003	0.0004	0.0005	0.0007	0.0008	0.0010	0.0011	0.0013
30	0.2610	0.5288	2726	0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0010	0.0012	0.0013	0.0014
31	0.2623	0.5286	2700	0.0003	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0014	0.0014	0.0016
32	0.2592	0.5280	2767	0.0004	0.0002	0.0002	0.0002	0.0005	0.0008	0.0011	0.0012	0.0013	0.0014
33	0.2619	0.5293	2704	0.0002	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0013	0.0015	0.0016
34	0.2601	0.5285	2745	0.0001	0.0005	0.0006	0.0009	0.0010	0.0012	0.0013	0.0014	0.0015	0.0017
35	0.2583	0.5251	2798	0.0001	0.0002	0.0005	0.0006	0.0009	0.0010	0.0013	0.0015	0.0016	0.0020
36	0.2625	0.5300	2690	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0010	0.0012	0.0013	0.0016
37	0.2599	0.5291	2746	0.0001	0.0003	0.0006	0.0008	0.0009	0.0010	0.0013	0.0014	0.0015	0.0017
38	0.2603	0.5289	2739	0.0002	0.0005	0.0006	0.0008	0.0009	0.0009	0.0010	0.0012	0.0014	0.0018
39	0.2649	0.5275	2651	0.0005	0.0006	0.0008	0.0009	0.0009	0.0010	0.0012	0.0013	0.0014	0.0016
40	0.2613	0.5301	2714	0.0002	0.0005	0.0006	0.0009	0.0010	0.0011	0.0012	0.0013	0.0015	0.0017
41	0.2611	0.5306	2716	0.0002	0.0004	0.0004	0.0005	0.0007	0.0009	0.0010	0.0011	0.0012	0.0014
42	0.2609	0.5280	2732	0.0004	0.0003	0.0005	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0012
43	0.2624	0.5298	2693	0.0003	0.0004	0.0007	0.0009	0.0009	0.0011	0.0013	0.0014	0.0015	0.0017
44	0.2636	0.5314	2663	0.0002	0.0005	0.0006	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0017
45	0.2610	0.5285	2725	0.0001	0.0003	0.0004	0.0006	0.0008	0.0008	0.0008	0.0009	0.0011	0.0013
46	0.2625	0.5305	2688	0.0001	0.0006	0.0008	0.0008	0.0009	0.0011	0.0013	0.0013	0.0016	0.0018
47	0.2606	0.5302	2728	0.0000	0.0005	0.0007	0.0008	0.0011	0.0013	0.0014	0.0014	0.0016	0.0018
48	0.2651	0.5289	2641	0.0000	0.0004	0.0006	0.0007	0.0009	0.0009	0.0009	0.0011	0.0011	0.0012
49	0.2631	0.5298	2677	0.0001	0.0007	0.0007	0.0006	0.0006	0.0004	0.0005	0.0004	0.0005	0.0007
50	0.2610	0.5288	2724	0.0001	0.0002	0.0003	0.0004	0.0005	0.0007	0.0008	0.0011	0.0011	0.0013

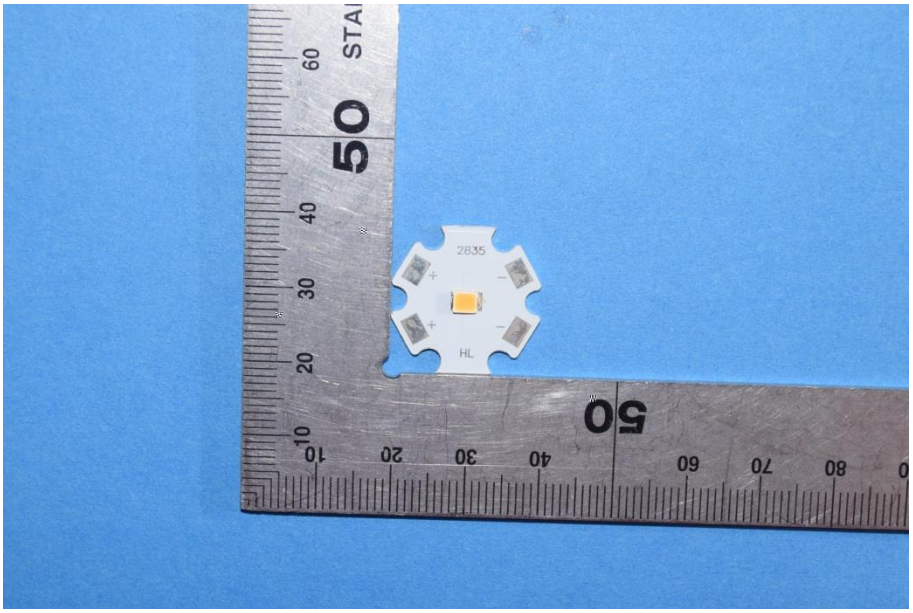
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions