



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-5730D1W-S1-08-HR5(LY)

Report Type: 10000 Hours Test Report		Product Type: LED Package	
Reviewed By:	Pote Wang	<i>Pote Wang</i>	
Report Number:	SZ2220402-12256E-10-10000		
Test Date:	2022-04-09 to 2023-07-06		
Report Date:	2023-07-11		
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 1 st 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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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-A-5730D1W-S1-08-HR5(LY)
Part Type:	LED Package
Drive Level:	DC 150mA
Nominal CCT:	2700K
Power:	0.510W
Average Current Density per LED die:	775.002mA/mm ²
Average Power Density per LED die:	2.635W/mm ²
CRI:	90
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-A-5730D1W-S1-08-HR5(LY)	90	150	0.51	2700	1	150	775.002	0.0298	/
Multiple model	HL-A-5730D***W-S1-08*-HR5(LY)-***	90	150	0.51	2700-6500	1	150	775.002	0.0298	/
Multiple model	HL-A-5730H***W-S1-08*-HR5(LY)-***	90	150	0.51	2700-6500	1	150	775.002	0.0298	/

Note:

The model name begins with "HL", such as "HL-A-5730D***W-S1-08**-HR5(LY)-***", " " is described in detail as follows:

1. The first "****" is the number from 1 to 999 which stands for the brightness level.
2. The second "*" is the letter L or None which stands for the bonding wire style.
3. The third "****" is the letter which stands for the customer code.

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	Calibration date	Calibration due date
0.5m integrating sphere	EVERFINE	AIS-2	G185304TA1381172	2022-11-18	2023-11-17
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2022-11-18	2023-11-17
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2022-11-18	2023-11-17
Standard Light Source	EVERFINE	D062	1011093	2021-09-15	2023-09-14
Multilayer aging machine	BACL	B2-270	20005	2022-10-19	2023-10-18
Program-controlled D.C. Stabilized Voltage Supply	Hanshenpuyuan	HSPY-60-03	N/A	2022-10-19	2023-10-18

1.4 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within $\pm 3\%$ of the specified value of the manufacturer during maintenance test, and was within $\pm 0.5\%$ during photometric and electrical measurement test.

1.5 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP_{LED}) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP_{LED} of the coldest LEDs were maintained at a temperature that was greater than or equal to 2°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°C below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within $\pm 3\%$ of the specified value of the manufacturer.

The relative humidity within chamber was kept less than 65% during test.

For photometry measurement, the ambient temperature during test was set to $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, RH <65%.

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate $u'v'$. 2π measurement was used and sample was driven by DC power supply. The forward current was regulated to within $\pm 0.5\%$ of the nominal value. The test system was calibrated by halogen reference lamp. The ambient temperature during test was set to $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

The uncertainty of the light output measurements is $U=1.59\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=21\text{K}$ ($K=2$), at the 95% confidence level.

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, 150mA

Part Number: HL-A-5730D1W-S1-08-HR5(LY)
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-A-5730D1W-S1-08-HR5(LY)
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	2.097E-06	1.005	>60,000 hours
2	25	0	1000hrs	10000hrs	2.639E-06	1.005	>60,000 hours

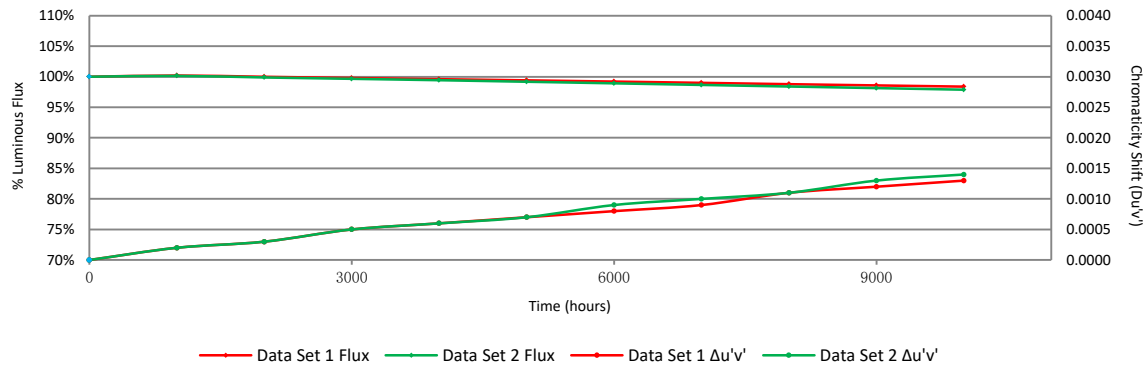
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	100.20%	99.99%	99.79%	99.60%	99.41%	99.21%	99.00%	98.78%	98.58%	98.38%
2	100.14%	99.88%	99.66%	99.43%	99.18%	98.92%	98.66%	98.40%	98.14%	97.88%

Average Chromaticity Shift

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

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

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

No.	Φ(lm)	Lumen Maintenance (%)									
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	51.25	100.08	99.82	99.77	99.65	99.47	99.30	99.12	98.99	98.85	98.65
2	51.23	100.18	100.02	99.69	99.53	99.36	99.20	99.06	98.83	98.69	98.44
3	51.55	100.10	99.96	99.81	99.63	99.40	99.22	99.03	98.82	98.60	98.35
4	51.53	100.31	100.06	99.98	99.79	99.59	99.42	99.22	99.07	98.80	98.58
5	51.14	100.27	100.10	99.78	99.61	99.47	99.20	99.06	98.94	98.77	98.61
6	51.34	100.12	99.98	99.65	99.45	99.18	98.97	98.75	98.58	98.36	98.19
7	51.47	100.19	100.06	99.79	99.51	99.28	99.11	98.87	98.66	98.52	98.31
8	51.65	100.23	100.06	99.86	99.67	99.38	99.15	98.86	98.66	98.41	98.24
9	52.09	100.21	99.96	99.64	99.50	99.35	99.19	99.04	98.83	98.62	98.43
10	51.48	100.35	100.14	99.88	99.75	99.53	99.32	99.05	98.80	98.56	98.35
11	51.48	100.12	99.90	99.79	99.51	99.42	99.28	99.07	98.87	98.64	98.54
12	50.39	100.12	100.02	99.78	99.66	99.46	99.21	98.93	98.65	98.45	98.27
13	51.34	100.16	100.04	99.67	99.59	99.38	99.20	98.93	98.68	98.38	98.13
14	52.87	100.19	100.04	99.85	99.74	99.58	99.39	99.22	99.04	98.88	98.73
15	52.99	100.23	99.92	99.77	99.57	99.41	99.26	99.11	98.92	98.77	98.57
16	52.18	100.17	99.98	99.79	99.67	99.50	99.33	99.14	98.87	98.58	98.37
17	51.17	100.16	99.90	99.73	99.55	99.43	99.28	99.04	98.77	98.51	98.32
18	51.32	100.27	100.12	99.98	99.65	99.49	99.28	99.08	98.85	98.67	98.40
19	51.75	100.37	100.15	99.98	99.73	99.48	99.27	99.05	98.80	98.69	98.45
20	51.82	100.15	99.92	99.79	99.52	99.40	99.21	98.92	98.69	98.49	98.28
21	51.91	100.29	99.88	99.73	99.56	99.42	99.25	98.96	98.65	98.52	98.25
22	51.84	100.23	100.06	99.88	99.46	99.19	98.96	98.78	98.53	98.30	98.05
23	52.33	100.23	100.02	99.79	99.58	99.35	99.08	98.89	98.62	98.49	98.34
24	53.23	100.19	99.87	99.66	99.55	99.42	99.19	98.99	98.72	98.44	98.25
25	52.26	100.17	99.87	99.73	99.48	99.29	99.08	98.79	98.58	98.49	98.34
Avg.	51.74	100.20	99.99	99.79	99.60	99.41	99.21	99.00	98.78	98.58	98.38
Med.	51.55	100.19	100.02	99.79	99.58	99.42	99.21	99.04	98.80	98.56	98.35
st dev	0.64	0.08	0.09	0.10	0.09	0.10	0.11	0.13	0.15	0.16	0.17
Min.	50.39	100.08	99.82	99.64	99.45	99.18	98.96	98.75	98.53	98.30	98.05
Max.	53.23	100.37	100.15	99.98	99.79	99.59	99.42	99.22	99.07	98.88	98.73



3.2 Data Set 1, 55°C, 150mA (Forward Voltage)

No.	Forward Voltage (V)										
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	3.188	3.199	3.204	3.217	3.207	3.211	3.215	3.212	3.216	3.214	3.206
2	3.192	3.201	3.207	3.213	3.210	3.214	3.218	3.212	3.214	3.215	3.210
3	3.177	3.193	3.195	3.198	3.197	3.207	3.205	3.206	3.211	3.211	3.200
4	3.179	3.190	3.196	3.198	3.199	3.198	3.205	3.204	3.199	3.207	3.199
5	3.186	3.202	3.198	3.202	3.197	3.203	3.211	3.198	3.205	3.212	3.199
6	3.174	3.214	3.192	3.192	3.192	3.195	3.205	3.207	3.201	3.196	3.195
7	3.180	3.207	3.198	3.203	3.200	3.202	3.214	3.199	3.216	3.211	3.206
8	3.177	3.212	3.194	3.194	3.200	3.197	3.210	3.193	3.199	3.201	3.195
9	3.190	3.198	3.208	3.207	3.207	3.216	3.214	3.215	3.213	3.214	3.214
10	3.176	3.214	3.195	3.198	3.198	3.196	3.210	3.199	3.202	3.206	3.199
11	3.200	3.205	3.217	3.219	3.218	3.219	3.218	3.226	3.225	3.219	3.224
12	3.162	3.212	3.179	3.179	3.183	3.179	3.211	3.184	3.190	3.184	3.184
13	3.190	3.202	3.204	3.205	3.204	3.202	3.201	3.219	3.212	3.207	3.213
14	3.197	3.201	3.215	3.214	3.217	3.213	3.218	3.222	3.212	3.217	3.218
15	3.189	3.194	3.204	3.204	3.204	3.203	3.208	3.210	3.216	3.211	3.207
16	3.190	3.215	3.203	3.204	3.204	3.201	3.209	3.203	3.219	3.213	3.203
17	3.188	3.228	3.202	3.200	3.201	3.202	3.205	3.204	3.208	3.208	3.202
18	3.189	3.193	3.207	3.207	3.210	3.206	3.202	3.232	3.225	3.202	3.211
19	3.179	3.205	3.194	3.197	3.199	3.199	3.211	3.200	3.201	3.206	3.199
20	3.186	3.203	3.203	3.205	3.206	3.204	3.206	3.216	3.211	3.211	3.212
21	3.188	3.196	3.204	3.201	3.203	3.203	3.205	3.220	3.217	3.207	3.204
22	3.178	3.202	3.196	3.195	3.196	3.195	3.228	3.198	3.219	3.197	3.197
23	3.171	3.200	3.190	3.192	3.195	3.190	3.219	3.193	3.196	3.192	3.196
24	3.193	3.217	3.208	3.210	3.212	3.206	3.208	3.208	3.216	3.206	3.208
25	3.186	3.207	3.206	3.204	3.204	3.201	3.209	3.215	3.219	3.221	3.207
Avg.	3.184	3.204	3.201	3.202	3.203	3.202	3.211	3.208	3.210	3.208	3.204
Med.	3.186	3.202	3.203	3.203	3.203	3.202	3.210	3.207	3.212	3.208	3.204
st dev	0.009	0.009	0.008	0.009	0.008	0.009	0.006	0.011	0.009	0.009	0.009
Min.	3.162	3.190	3.179	3.179	3.183	3.179	3.201	3.184	3.190	3.184	3.184
Max.	3.200	3.228	3.217	3.219	3.218	3.219	3.228	3.232	3.225	3.221	3.224

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)									
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2604	0.5294	2736	0.0001	0.0002	0.0004	0.0005	0.0008	0.0008	0.0008	0.0011	0.0012	0.0013
2	0.2583	0.5282	2785	0.0001	0.0002	0.0003	0.0004	0.0006	0.0009	0.0011	0.0012	0.0012	0.0015
3	0.2610	0.5308	2718	0.0001	0.0002	0.0004	0.0005	0.0005	0.0008	0.0009	0.0011	0.0011	0.0014
4	0.2608	0.5319	2717	0.0002	0.0003	0.0005	0.0006	0.0009	0.0010	0.0011	0.0013	0.0012	0.0015
5	0.2590	0.5323	2753	0.0001	0.0002	0.0005	0.0006	0.0006	0.0009	0.0009	0.0011	0.0011	0.0013
6	0.2595	0.5313	2746	0.0001	0.0002	0.0004	0.0005	0.0006	0.0009	0.0010	0.0012	0.0013	0.0015
7	0.2565	0.5310	2812	0.0001	0.0002	0.0005	0.0006	0.0008	0.0009	0.0010	0.0012	0.0012	0.0014
8	0.2592	0.5289	2763	0.0001	0.0002	0.0004	0.0005	0.0009	0.0011	0.0012	0.0014	0.0014	0.0016
9	0.2583	0.5295	2779	0.0001	0.0002	0.0005	0.0006	0.0008	0.0009	0.0010	0.0012	0.0013	0.0015
10	0.2605	0.5303	2729	0.0001	0.0002	0.0004	0.0005	0.0006	0.0007	0.0008	0.0008	0.0010	0.0011
11	0.2610	0.5309	2717	0.0001	0.0002	0.0004	0.0005	0.0006	0.0005	0.0006	0.0007	0.0008	0.0008
12	0.2628	0.5342	2667	0.0002	0.0003	0.0004	0.0005	0.0007	0.0006	0.0007	0.0007	0.0008	0.0011
13	0.2575	0.5277	2805	0.0002	0.0004	0.0005	0.0006	0.0006	0.0005	0.0006	0.0008	0.0010	0.0011
14	0.2591	0.5318	2753	0.0002	0.0003	0.0005	0.0007	0.0006	0.0005	0.0006	0.0009	0.0011	0.0011
15	0.2567	0.5296	2813	0.0002	0.0003	0.0005	0.0006	0.0007	0.0007	0.0009	0.0012	0.0012	0.0013
16	0.2599	0.5311	2738	0.0002	0.0003	0.0005	0.0006	0.0009	0.0008	0.0009	0.0013	0.0014	0.0016
17	0.2624	0.5314	2685	0.0003	0.0004	0.0006	0.0007	0.0008	0.0008	0.0009	0.0012	0.0013	0.0013
18	0.2606	0.5305	2728	0.0003	0.0004	0.0006	0.0007	0.0008	0.0007	0.0007	0.0011	0.0013	0.0014
19	0.2589	0.5302	2763	0.0002	0.0003	0.0004	0.0005	0.0009	0.0008	0.0010	0.0013	0.0014	0.0013
20	0.2580	0.5321	2774	0.0001	0.0002	0.0004	0.0005	0.0006	0.0006	0.0006	0.0011	0.0013	0.0013
21	0.2585	0.5293	2776	0.0002	0.0003	0.0004	0.0006	0.0007	0.0008	0.0009	0.0009	0.0012	0.0013
22	0.2586	0.5295	2773	0.0002	0.0004	0.0006	0.0007	0.0009	0.0009	0.0008	0.0011	0.0013	0.0013
23	0.2585	0.5325	2761	0.0002	0.0004	0.0006	0.0007	0.0009	0.0007	0.0009	0.0012	0.0013	0.0014
24	0.2568	0.5313	2804	0.0001	0.0002	0.0004	0.0005	0.0007	0.0006	0.0008	0.0009	0.0012	0.0013
25	0.2583	0.5313	2771	0.0002	0.0003	0.0005	0.0006	0.0007	0.0006	0.0007	0.0009	0.0011	0.0013
Avg.	0.2592	0.5307	2755	0.0002	0.0003	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0012	0.0013
Med.	0.2590	0.5309	2761	0.0002	0.0003	0.0005	0.0006	0.0007	0.0008	0.0009	0.0011	0.0012	0.0013
st dev	0.0017	0.0015	37	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2565	0.5277	2667	0.0001	0.0002	0.0003	0.0004	0.0005	0.0005	0.0006	0.0007	0.0008	0.0008
Max.	0.2628	0.5342	2813	0.0003	0.0004	0.0006	0.0007	0.0009	0.0011	0.0012	0.0014	0.0014	0.0016

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

No.	Φ(lm)	Lumen Maintenance (%)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	51.53	100.21	99.79	99.73	99.38	99.17	98.91	98.64	98.39	98.20	97.92
27	51.56	100.27	100.14	99.69	99.36	99.19	98.86	98.56	98.25	97.94	97.61
28	52.23	100.19	99.92	99.85	99.52	99.18	98.83	98.66	98.41	98.09	97.84
29	51.31	100.27	100.18	99.98	99.59	99.32	99.01	98.79	98.60	98.36	98.05
30	52.69	100.09	99.83	99.70	99.43	99.15	98.90	98.61	98.29	98.03	97.72
31	51.66	100.14	99.86	99.59	99.54	99.26	99.07	98.84	98.51	98.26	98.01
32	51.17	100.27	100.14	99.88	99.67	99.43	99.20	99.00	98.75	98.46	98.10
33	51.04	100.24	99.96	99.75	99.53	99.33	99.14	98.90	98.59	98.32	97.98
34	51.89	100.02	99.85	99.67	99.46	99.27	99.06	98.77	98.48	98.21	97.96
35	52.22	99.96	99.69	99.48	99.25	99.06	98.77	98.51	98.22	98.01	97.78
36	51.75	99.96	99.63	99.46	99.30	99.03	98.78	98.53	98.34	98.11	97.87
37	52.55	100.13	99.87	99.75	99.62	99.41	99.20	98.92	98.65	98.40	98.14
38	51.83	100.15	99.79	99.48	99.11	98.90	98.61	98.38	98.13	97.82	97.65
39	51.28	100.27	100.10	99.79	99.38	99.14	98.89	98.62	98.42	98.19	97.99
40	51.36	100.08	99.96	99.86	99.49	99.22	99.01	98.75	98.44	98.27	97.98
41	51.16	100.23	99.96	99.57	99.37	99.18	98.85	98.63	98.40	98.08	97.87
42	52.11	100.06	99.79	99.29	99.10	98.89	98.62	98.31	98.00	97.70	97.43
43	52.20	100.08	99.69	99.46	99.31	99.08	98.85	98.58	98.35	98.08	97.78
44	51.29	100.23	99.79	99.43	99.36	99.03	98.79	98.52	98.23	97.99	97.70
45	51.87	100.12	99.65	99.54	99.40	99.07	98.75	98.44	98.19	97.90	97.67
46	51.35	100.08	99.84	99.55	99.36	99.05	98.77	98.48	98.23	97.94	97.70
47	52.06	100.08	99.81	99.77	99.58	99.33	99.08	98.83	98.54	98.31	98.06
48	51.57	100.02	99.79	99.55	99.46	99.17	98.97	98.66	98.41	98.10	97.91
49	52.64	100.04	99.89	99.66	99.41	99.11	98.88	98.65	98.40	98.21	97.99
50	52.27	100.19	100.13	99.98	99.83	99.60	99.29	98.95	98.79	98.45	98.22
Avg.	51.78	100.14	99.88	99.66	99.43	99.18	98.92	98.66	98.40	98.14	97.88
Med.	51.75	100.13	99.85	99.67	99.41	99.17	98.89	98.64	98.40	98.11	97.91
st dev	0.49	0.10	0.16	0.18	0.16	0.16	0.18	0.18	0.19	0.20	0.19
Min.	51.04	99.96	99.63	99.29	99.10	98.89	98.61	98.31	98.00	97.70	97.43
Max.	52.69	100.27	100.18	99.98	99.83	99.60	99.29	99.00	98.79	98.46	98.22

3.5 Data Set 2, 105°C, 150mA (Forward Voltage)

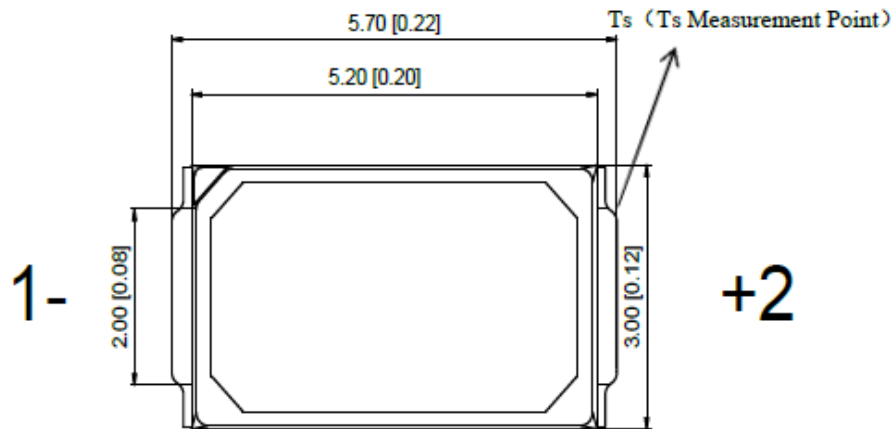
No.	Forward Voltage (V)										
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	3.192	3.219	3.208	3.210	3.215	3.206	3.206	3.210	3.204	3.214	3.205
27	3.184	3.210	3.202	3.204	3.204	3.202	3.204	3.206	3.205	3.205	3.204
28	3.171	3.196	3.196	3.195	3.199	3.192	3.204	3.203	3.192	3.194	3.193
29	3.170	3.194	3.190	3.188	3.195	3.198	3.206	3.196	3.187	3.213	3.190
30	3.190	3.215	3.210	3.207	3.210	3.206	3.204	3.222	3.205	3.216	3.210
31	3.192	3.213	3.215	3.212	3.212	3.212	3.211	3.223	3.211	3.217	3.212
32	3.186	3.215	3.206	3.205	3.205	3.204	3.208	3.218	3.204	3.232	3.212
33	3.186	3.210	3.205	3.204	3.203	3.203	3.204	3.225	3.202	3.216	3.206
34	3.184	3.211	3.204	3.204	3.203	3.203	3.202	3.232	3.201	3.207	3.204
35	3.189	3.214	3.210	3.208	3.205	3.207	3.202	3.208	3.214	3.211	3.210
36	3.179	3.207	3.202	3.201	3.199	3.198	3.222	3.205	3.203	3.201	3.201
37	3.191	3.200	3.211	3.210	3.208	3.205	3.203	3.240	3.212	3.214	3.208
38	3.178	3.206	3.199	3.201	3.198	3.196	3.218	3.206	3.208	3.202	3.198
39	3.180	3.204	3.202	3.200	3.200	3.219	3.214	3.216	3.205	3.225	3.201
40	3.176	3.204	3.196	3.196	3.195	3.211	3.208	3.203	3.211	3.204	3.197
41	3.201	3.201	3.225	3.223	3.221	3.231	3.229	3.224	3.228	3.226	3.222
42	3.178	3.201	3.201	3.197	3.199	3.201	3.212	3.202	3.213	3.207	3.197
43	3.175	3.196	3.197	3.194	3.198	3.214	3.214	3.208	3.207	3.199	3.195
44	3.183	3.208	3.202	3.200	3.203	3.220	3.226	3.202	3.205	3.204	3.199
45	3.189	3.194	3.206	3.205	3.205	3.201	3.214	3.220	3.223	3.207	3.205
46	3.184	3.205	3.205	3.204	3.203	3.207	3.213	3.207	3.208	3.212	3.203
47	3.184	3.205	3.199	3.201	3.206	3.234	3.206	3.203	3.224	3.203	3.200
48	3.197	3.201	3.212	3.212	3.214	3.202	3.213	3.219	3.217	3.215	3.208
49	3.181	3.197	3.197	3.198	3.199	3.201	3.205	3.208	3.206	3.200	3.196
50	3.181	3.199	3.197	3.197	3.203	3.207	3.201	3.214	3.201	3.197	3.197
Avg.	3.184	3.205	3.204	3.203	3.204	3.207	3.210	3.213	3.208	3.210	3.203
Med.	3.184	3.205	3.202	3.204	3.203	3.205	3.208	3.208	3.206	3.207	3.203
st dev	0.008	0.007	0.007	0.007	0.006	0.010	0.008	0.011	0.009	0.009	0.007
Min.	3.170	3.194	3.190	3.188	3.195	3.192	3.201	3.196	3.187	3.194	3.190
Max.	3.201	3.219	3.225	3.223	3.221	3.234	3.229	3.240	3.228	3.232	3.222

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

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)									
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
26	0.2596	0.5304	2747	0.0001	0.0002	0.0004	0.0005	0.0008	0.0008	0.0008	0.0011	0.0012	0.0013
27	0.2596	0.5306	2747	0.0001	0.0002	0.0004	0.0006	0.0007	0.0009	0.0010	0.0013	0.0014	0.0016
28	0.2592	0.5322	2749	0.0001	0.0002	0.0003	0.0004	0.0007	0.0007	0.0010	0.0010	0.0013	0.0014
29	0.2587	0.5305	2766	0.0001	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0011	0.0011	0.0013
30	0.2603	0.5330	2722	0.0002	0.0004	0.0005	0.0006	0.0006	0.0008	0.0009	0.0011	0.0013	0.0013
31	0.2593	0.5303	2755	0.0002	0.0005	0.0006	0.0007	0.0009	0.0011	0.0012	0.0014	0.0016	0.0017
32	0.2584	0.5286	2781	0.0003	0.0004	0.0005	0.0006	0.0006	0.0009	0.0009	0.0011	0.0014	0.0014
33	0.2574	0.5295	2798	0.0001	0.0003	0.0005	0.0006	0.0006	0.0009	0.0008	0.0011	0.0013	0.0013
34	0.2602	0.5318	2730	0.0001	0.0003	0.0005	0.0006	0.0009	0.0008	0.0009	0.0009	0.0012	0.0012
35	0.2608	0.5329	2713	0.0003	0.0004	0.0005	0.0006	0.0009	0.0008	0.0008	0.0012	0.0012	0.0013
36	0.2604	0.5305	2732	0.0001	0.0004	0.0006	0.0007	0.0009	0.0009	0.0010	0.0012	0.0012	0.0012
37	0.2557	0.5307	2830	0.0002	0.0004	0.0006	0.0007	0.0007	0.0008	0.0009	0.0009	0.0012	0.0011
38	0.2584	0.5302	2773	0.0002	0.0004	0.0007	0.0009	0.0009	0.0010	0.0010	0.0010	0.0014	0.0013
39	0.2606	0.5294	2731	0.0003	0.0004	0.0006	0.0007	0.0009	0.0011	0.0010	0.0012	0.0014	0.0014
40	0.2587	0.5316	2762	0.0001	0.0002	0.0004	0.0005	0.0006	0.0009	0.0009	0.0012	0.0013	0.0013
41	0.2598	0.5346	2727	0.0001	0.0003	0.0004	0.0005	0.0008	0.0010	0.0009	0.0010	0.0011	0.0012
42	0.2578	0.5272	2802	0.0001	0.0002	0.0004	0.0005	0.0007	0.0008	0.0011	0.0012	0.0013	0.0014
43	0.2593	0.5318	2748	0.0001	0.0003	0.0004	0.0005	0.0007	0.0009	0.0009	0.0011	0.0011	0.0013
44	0.2609	0.5304	2721	0.0001	0.0003	0.0004	0.0006	0.0006	0.0009	0.0008	0.0009	0.0010	0.0012
45	0.2576	0.5283	2801	0.0002	0.0005	0.0006	0.0007	0.0007	0.0011	0.0011	0.0014	0.0013	0.0016
46	0.2598	0.5313	2740	0.0001	0.0003	0.0005	0.0006	0.0006	0.0009	0.0011	0.0011	0.0011	0.0014
47	0.2591	0.5317	2753	0.0003	0.0005	0.0006	0.0007	0.0008	0.0010	0.0012	0.0012	0.0013	0.0016
48	0.2619	0.5315	2697	0.0001	0.0003	0.0005	0.0006	0.0008	0.0011	0.0013	0.0013	0.0015	0.0016
49	0.2568	0.5297	2810	0.0001	0.0003	0.0005	0.0006	0.0006	0.0009	0.0012	0.0011	0.0011	0.0014
50	0.2594	0.5321	2744	0.0002	0.0005	0.0008	0.0009	0.0008	0.0010	0.0012	0.0013	0.0013	0.0015
Avg.	0.2592	0.5308	2755	0.0002	0.0003	0.0005	0.0006	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014
Med.	0.2593	0.5306	2748	0.0001	0.0003	0.0005	0.0006	0.0007	0.0009	0.0010	0.0011	0.0013	0.0013
st dev	0.0014	0.0016	33	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Min.	0.2557	0.5272	2697	0.0001	0.0002	0.0003	0.0004	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011
Max.	0.2619	0.5346	2830	0.0003	0.0005	0.0008	0.0009	0.0009	0.0011	0.0013	0.0014	0.0016	0.0017

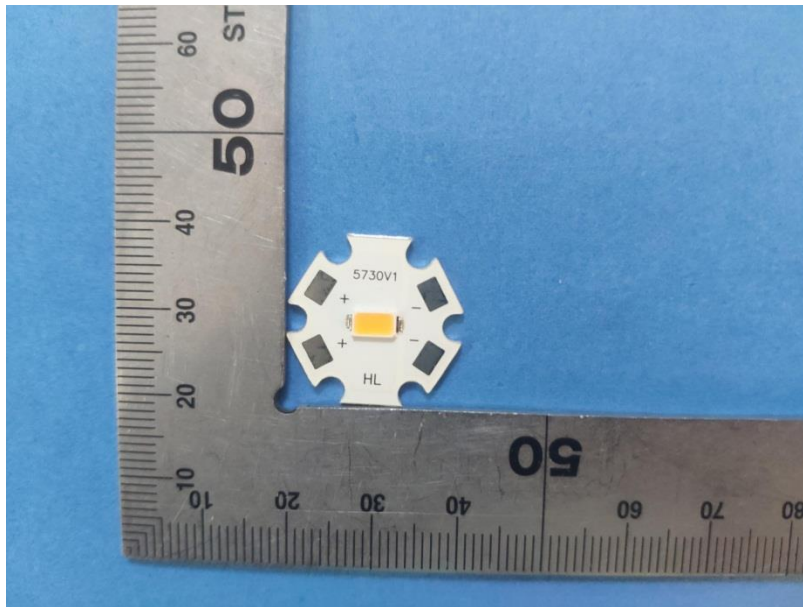
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions

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2. This report includes some test methods are not in NVLAP accreditation scope marked *.
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
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*****END OF REPORT*****