

#Model: HL LH004F95W-48B8C12(Ra2)-CS

Report Type: 7000 Hours Test Report	Product Type: LED Module
Test Engineer:	Pote Wang
Report Number:	RSZ190603512-10
Test Date:	2019-06-04 to 2020-03-28
Report Date:	2020-03-30
Reviewed By:	Blake Zhang / EE Engineer
Test Facility:	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.
	-076986858588
Accreditation	The IAS Accreditation Number: IL-460.



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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

24 PCS test samples were in good condition and received on 2019-06-03. The samples were numbered from 1 to 12 and 13 to 24.

#Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
#Part Number:	HL LH004F95W-48B8C12(Ra2)-CS
#Part Type:	LED Module
#Drive Level:	DC 1400mA
#Nominal CCT:	2700K
#Power:	50.4 W
#Average Current Density per LED die:	692 mA/mm ²
#Average Power Density per LED die:	2.145W/mm ²
#CRI:	80
#Die Spacing:	0.48



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Model type	Model name	CRI (typ.)	CCT (typ.)	Series& Parallel	Power density (W/mm ²)	Current density per LED die (mA/mm ²)	Current per die(mA)	Die Spacing	Current (mA)
	LH1311D101W-12B4C12(Ra2)-CS	80	2500K-6500K	B2C12+B2C12	0.0592	596.2	150	0.48	300
	LH1307F95W-12B2C12(Ra2)-CS	80	2500K-6500K	B1C12+B1C12	0.0592	692.0	300	0.50	300
	LH029F95W-9B2C18(Ra2)-CS	80	2500K-6500K	B1C18+B1C18	0.0661	692.0	300	0.48	300

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
- ENERGY STAR[®] Requirements for the Use of LM-80 Data (This standard was not accredited by IAS)

1.3 Testing Equipment

Device	Manufacture	Model No	



1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate u_v . 2 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 (luminous flux) measurements is $U=2.1\%$ ($K=2$), 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 CRI is $U=2.1$ ($K=2$), 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. (Dongguan) 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: 85°C, 1400mA

Part Number: HL LH004F95W-48B8C12(Ra2)-CS
Number of Units: 12
Case Temperature: $>83^\circ\text{C}$
Ambient Temperature: $>80^\circ\text{C}$
Life Test Drive Current: 1400mA
Measurement Current: 1400mA

Data Set 2: 105°C, 1400mA

Part Number: HL LH004F95W-48B8C12(Ra2)-CS
Number of Units: 12
Case Temperature: $>103^\circ\text{C}$
Ambient Temperature: $>100^\circ\text{C}$
Life Test Drive Current: 1400mA
Measurement Current: 1400mA



2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration			Reported TM-21 L ₇₀ Lifetime
1	12	0	1000hrs	7000hrs	5.711E-06	1.008	>39000 hours
2	12	0	1000hrs	7000hrs	6.457E-06	1.002	>39000 hours

Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	100.08%	99.57%	99.08%	98.65%	97.93%	97.36%	96.82%
2	99.61%	98.87%	98.26%	97.68%	97.03%	96.38%	95.73%

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3 - Test Data

3.1 Data Set 1, 85°C, 1400mA (Lumen Maintenance)

No.	Lumen Maintenance (%)							
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	4814.37	99.64	99.13	98.77	98.18	97.43	96.84	96.43
2	5001.42	100.49	99.76	99.16	98.94	98.34	97.79	97.16
3	4996.16	100.24	99.92	99.31	98.67	98.12	97.54	96.91
4	5037.21	99.60	99.12	98.55	98.21	97.50	97.12	96.73
5	4937.52	100.20	99.75	99.25	98.74	98.08	97.87	97.11
6	4943.38	100.24	99.87	99.54	99.07	98.44	97.51	97.24
7	4749.87	100.25	99.49	98.98	98.68	98.00	97.41	96.75
8	4855.42	99.75	99.54	98.95	98.59	97.45	96.97	96.45
9	4884.74	100.25	99.50	98.80	98.34	97.34	96.66	96.43
10	4960.97	99.96	99.51	99.30	98.89	98.02	97.64	96.89
11	5002.02	100.24	99.92	99.31	98.81	98.52	97.54	96.92
12	4966.84	100.12	99.39	99.07	98.74	97.87	97.41	96.78
Avg.	4929.16	100.08	99.57	99.08	98.65	97.93	97.36	96.82
Med.	4952.18	100.22	99.52	99.11	98.71		97.46	96.83
st dev	86.41	0.28	0.28					



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3.3 Data Set 1, 85°C, 1400mA (Chromaticity Shift)

No.	CCT(K)	4					
		0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs

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3.4 Data Set 2, 105°C, 1400mA (Lumen Maintenance)

No.	0hr(Initial)	Lumen Maintenance (%)						
		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs

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3.5 Data Set 2, 105°C, 1400mA (Forward Voltage)

No.	Forward Voltage (V)							
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	36.68	36.54	36.40	36.30	36.77	37.16	36.54	36.40
2	36.85	36.66	36.52	36.39	37.00	37.05	36.66	36.52
4	36.68	36.54	36.40	36.19	36.83	36.53	36.54	36.40

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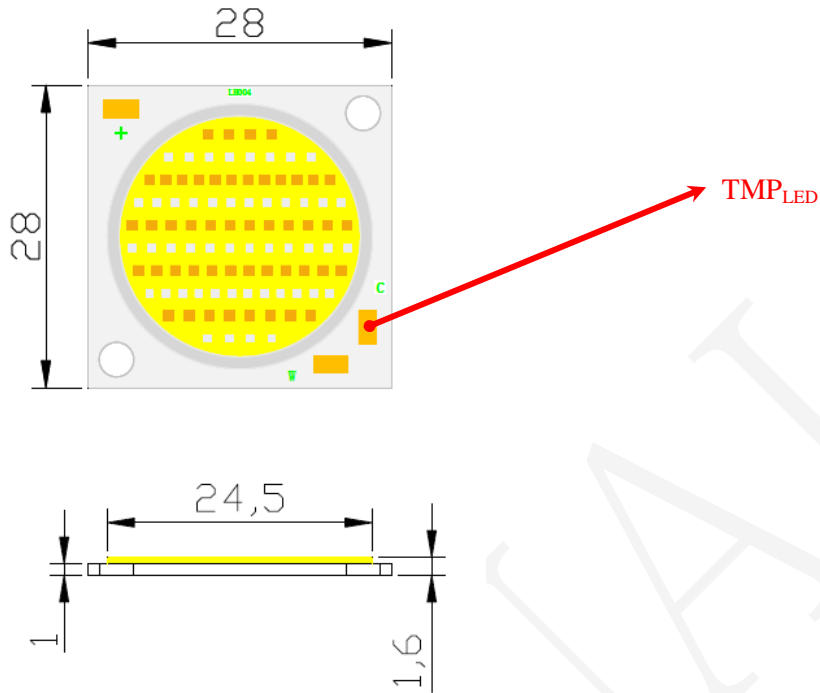
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3.6 Data Set 2, 105°C, 1400mA (Chromaticity Shift)

No.			CCT(K)	4						
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	0.2708	0.5360	2512	0.0003	0.0005	0.0009	0.0016	0.0016	0.0018	0.0021
2	0.2690	0.5354	2546	0.0003	0.0004	0.0007	0.0016	0.0016	0.0018	0.0020
3	0.2705	0.5360	2516	0.0002	0.0006	0.0007	0.0017	0.0020	0.0018	0.0021
4	0.2694	0.5345	2540	0.0003	0.0006	0.0014	0.0017	0.0017	0.0018	0.0021
5	0.2691	0.5356	2542	0.0001	0.0005	0.0011	0.0017	0.0019	0.0017	0.0021
6	0.2691	0.5345	2546	0.0004	0.0008	0.0011	0.0016	0.0018	0.0019	0.0023
7	0.2713	0.5362	2502	0.0004	0.0007	0.0011	0.0017	0.0017	0.0020	0.0023
8	0.2704	0.5360	2518	0.0003	0.0006	0.0012	0.0016	0.0017	0.0018	0.0021
9	0.2732	0.5350	2472	0.0005	0.0007	0.0015	0.0017	0.0021	0.0021	0.0023
10	0.2704	0.5354	2520	0.0005	0.0010	0.0018	0.0018	0.0018	0.0021	0.0025
11	0.2690	0.5350	2546	0.0004	0.0006	0.0009	0.0016	0.0018	0.0019	0.0021
12	0.2691	0.5348	2546	0.0003	0.0006	0.0013	0.0016	0.0018	0.0018	0.0021
Avg.	0.2701	0.5354	2526	0.0003	0.0006	0.0012	0.0017	0.0018	0.0019	0.0022
Med.	0.2699	0.5354	2530	0.0003	0.0006	0.0011	0.0017	0.0018	0.0018	0.0021
st dev	0.0013	0.0006	23	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0002
Min.	0.2690	0.5345	2472	0.0001	0.0004	0.0007	0.0016	0.0016	0.0017	0.0020
Max.	0.2732	0.5362	2546	0.0005	0.0010	0.0018	0.0018	0.0021	0.0021	0.0025

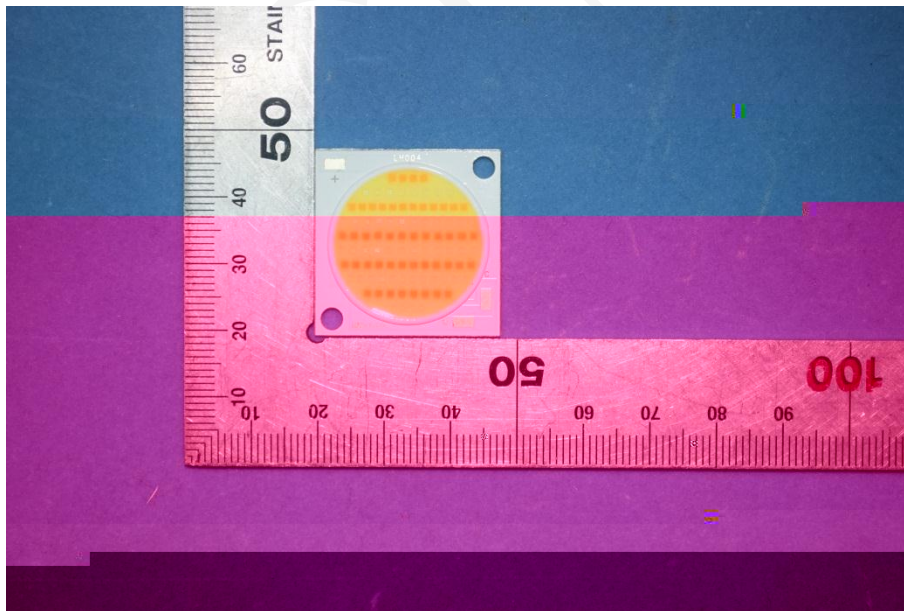
4 - DUT Photo

4.1 #Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo





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Directions

*****END OF REPORT*****

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