



TEST REPORT

According to ANSI/IES LM-80-15
For

Luminus Devices Inc.

1145 Sonora Ct., Sunnyvale, CA 94086 USA

#Model: CLM-22-27-90-36-AC40

Report Type: 14000 Hours Test Report		Product Type: LED Module	
Reviewed By:	Pote Wang <i>Pote Wang</i>		
Report Number:	RSZ210202501-10-M1		
Test Date:	2018-07-20 to 2020-11-20		
Report Date:	2021-02-22		
Approved By:	Blake Zhang / EE Engineer		
Revised Note:	The previous report RSZ210202501-10 is replaced by this report on 2021-02-22		
Test Facility:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.		
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax: +86-0769-86858588		
Accreditation:	The IAS Accreditation Number TL-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 2018-07-02. The samples were numbered from 1 to 12 and 13 to 24.

#Manufacturer:	FUJIAN LIGHTNING OPTOELECTRONIC Co.,LTD.
#Part Number:	CLM-22-27-90-36-AC40
#Part Type:	LED Module
#Drive Level:	DC 3200mA
#Nominal CCT:	2700K
#Power:	130W
#Average Current Density per LED die:	403mA/mm ²
#Average Power Density per LED die:	1.36W/mm ²
#CRI:	90
#Die Spacing:	0.3mm

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:

Model Name	Series	Parallel	Current (mA)	Current Density (mA/mm ²)	Power Density Per PCB(W/mm ²)	Die Spacing (mm)
CLM-22-XX-XX-36-AC4X	12	16	3200	403	0.17	0.3
CIM-22-XX-XX-36-AC4X	12	13	2600	403	0.14	0.5
CXM-18-XX-XX-36-AA4X	12	12	2200	403	0.17	0.5
CGM-14-XX-XX-36-AC4X	12	11	1750	390	0.17	0.3
CXM-14-XX-XX-36-AX4X	12	9	1750	390	0.17	0.4
CLM-14-XX-XX-36-AX4X	12	8	1600	403	0.16	0.5
CIM-14-XX-XX-36-AC4X	12	6	1200	403	0.11	0.5
CXM-11-XX-XX-36-AA4X	12	6	1200	403	0.12	0.3
CXM-9-XX-XX-36-AX4X	12	5	1000	403	0.16	0.4
CLM-9-XX-XX-36-AX4X	12	4	800	403	0.16	0.6
CIM-9-XX-XX-36-AC4X	12	2	400	403	0.08	0.6
CXM-6-XX-XX-36-AX4X	12	2	400	403	0.08	0.3
CXM-6-XX-XX-18-AX4X	6	4	800	403	0.16	0.3
CXM-4-XX-XX-36-AX4X	12	2	230	403	0.05	0.3
CXM-4-XX-XX-18-AX4X	6	4	460	403	0.05	0.3
CXM-3-XX-XX-36-AX40	12	1	130	403	0.03	0.3
CXM-3-XX-XX-18-AX40	6	2	230	403	0.03	0.3

Note:

The "X" means the Part code number.

Note:

1. The applicant Luminus Devices Inc. declare that their products with model CLM-22-27-90-36-AC40 are the same to the products in report#RSZ180702511-10-14000 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ180702511-10-14000) is shared in this report.

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	Serial No	Calibration date	Calibration due date
1.0m integrating sphere	SENSING	SCD-20008	N/A	2020-10-22	2021-10-21
spectroradiometer	SENSING	SCD-20008	N/A	2020-10-22	2021-10-21
DC Power Supply	Hanshenpuyuan	HSPY-100-05	2013010210003	2020-07-23	2021-07-22
Standard Light Source	EVERFINE	D204	N/A	2020-10-20	2021-10-19
DC Power Supply	BACL	B25001	90020	2020-08-25	2021-08-24
Multilayer aging machine	BACL	B3-900	20030	2020-07-29	2021-07-28
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090003	2020-07-01	2021-06-30
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090006	2020-03-16	2021-03-15
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090007	2020-03-16	2021-03-15
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11090004	2020-03-10	2021-03-09
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060002	2020-07-01	2021-06-30
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060010	2020-03-06	2021-03-05

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°C \pm 2°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'. 2 π 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. (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, 3200mA

Part Number: CLM-22-27-90-36-AC40
Number of Units: 12
Case Temperature: $>83^{\circ}\text{C}$
Ambient Temperature: $>80^{\circ}\text{C}$
Life Test Drive Current: 3200mA
Measurement Current: 3200mA

Data Set 2: 105°C, 3200mA

Part Number: CLM-22-27-90-36-AC40
Number of Units: 12
Case Temperature: $>103^{\circ}\text{C}$
Ambient Temperature: $>100^{\circ}\text{C}$
Life Test Drive Current: 3200mA
Measurement Current: 3200mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L ₇₀ Lifetime
1	12	0	1000hrs	14000hrs	4.097E-06	1.004	>77000 hours
2	12	0	1000hrs	14000hrs	4.923E-06	1.005	73,000 hours

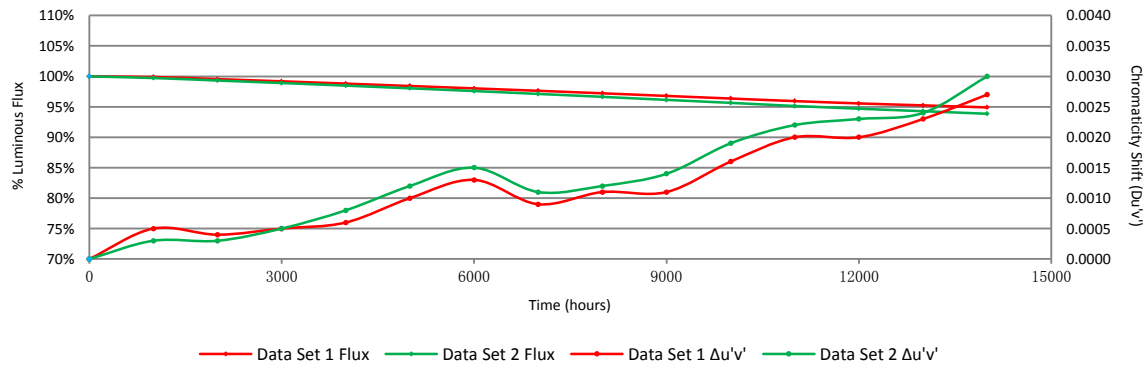
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
1	99.90%	99.55%	99.19%	98.81%	98.42%	98.03%	97.63%	97.22%	96.79%	96.36%	95.94%	95.56%	95.24%	94.90%
2	99.73%	99.32%	98.91%	98.48%	98.04%	97.59%	97.12%	96.64%	96.14%	95.65%	95.14%	94.69%	94.28%	93.86%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
1	0.0005	0.0004	0.0005	0.0006	0.001	0.0013	0.0009	0.0011	0.0011	0.0016	0.002	0.002	0.0023	0.0027
2	0.0003	0.0003	0.0005	0.0008	0.0012	0.0015	0.0011	0.0012	0.0014	0.0019	0.0022	0.0023	0.0024	0.003

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

3.1 Data Set 1, 85°C, 3200mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)													
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
1	13786.35	99.74	99.58	99.30	98.89	98.49	98.14	97.59	97.35	97.07	96.87	96.57	96.27	96.01	95.68
2	13909.49	99.87	99.68	99.12	98.71	98.24	97.81	97.43	97.12	96.60	96.14	95.80	95.32	95.02	94.53
3	13880.17	99.95	99.79	99.54	99.10	98.76	98.43	98.21	97.77	97.33	96.72	96.42	96.02	95.86	95.73
4	13862.58	99.78	99.28	99.12	98.85	98.44	98.12	97.71	97.08	96.69	96.25	95.86	95.48	95.25	94.79
5	13798.07	100.08	99.66	99.26	98.90	98.56	98.10	97.86	97.29	97.07	96.58	96.29	96.04	95.77	95.58
6	13651.47	99.65	99.31	98.69	98.57	98.21	97.81	97.41	97.08	96.76	96.37	95.82	95.42	94.86	94.63
7	13715.98	99.78	99.24	98.69	97.98	97.70	97.38	96.85	96.50	96.24	95.90	95.31	94.83	94.47	93.96
8	13768.75	100.29	99.97	99.70	99.29	98.87	98.43	98.08	97.50	96.99	96.53	96.11	95.87	95.51	95.16
9	13774.62	100.08	99.58	99.32	98.91	98.55	98.08	97.59	97.15	96.56	95.89	95.50	95.17	94.87	94.34
10	14050.23	99.49	99.25	98.96	98.70	98.26	97.91	97.66	97.33	96.89	96.51	95.94	95.40	95.07	94.77
11	13768.75	100.06	99.61	99.36	98.99	98.60	98.14	97.71	97.37	96.85	96.32	95.82	95.48	94.98	94.74
12	13938.81	100.04	99.62	99.24	98.84	98.38	97.97	97.43	97.06	96.47	96.24	95.79	95.46	95.20	94.90
Avg.	13825.44	99.90	99.55	99.19	98.81	98.42	98.03	97.63	97.22	96.79	96.36	95.94	95.56	95.24	94.90
Med.	13792.21	99.91	99.60	99.25	98.87	98.46	98.09	97.63	97.22	96.81	96.34	95.84	95.47	95.14	94.78
st dev	108.02	0.22	0.23	0.30	0.32	0.30	0.28	0.35	0.31	0.30	0.30	0.36	0.41	0.46	0.55
Min.	13651.47	99.49	99.24	98.69	97.98	97.70	97.38	96.85	96.50	96.24	95.89	95.31	94.83	94.47	93.96
Max.	14050.23	100.29	99.97	99.70	99.29	98.87	98.43	98.21	97.77	97.33	96.87	96.57	96.27	96.01	95.73

3.2 Data Set 1, 85°C, 3200mA (Forward Voltage)

No.	Forward Voltage (V)														
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
1	40.00	40.07	39.93	40.16	40.02	39.97	39.87	39.97	39.91	39.84	39.89	39.87	39.93	40.10	40.04
2	40.09	40.22	40.00	40.76	40.49	40.37	40.18	40.03	39.83	39.77	39.84	39.84	40.06	40.05	40.06
3	40.30	40.42	40.15	40.49	40.25	40.08	39.96	40.01	39.81	39.79	39.88	39.87	40.03	40.05	40.03
4	40.09	40.28	39.94	40.53	40.28	40.09	39.93	40.12	39.89	39.79	39.83	39.81	40.09	39.96	39.82
5	40.08	40.28	40.00	40.59	40.37	40.15	40.06	39.98	39.70	39.60	39.64	39.59	39.84	39.93	39.82
6	40.14	40.28	39.99	40.61	40.39	40.15	40.06	39.91	39.69	39.59	39.63	39.58	39.73	39.84	39.74
7	39.88	40.08	39.80	40.13	39.95	39.81	39.71	39.78	39.59	39.53	39.58	39.57	39.78	39.78	39.66
8	40.09	40.28	40.00	40.39	40.20	40.09	40.00	40.17	39.97	39.93	39.91	39.90	40.08	39.98	39.88
9	39.91	40.02	39.84	40.13	40.04	39.88	39.77	40.00	39.78	39.71	39.76	39.72	39.91	39.78	39.67
10	40.31	40.37	40.20	40.42	40.19	40.04	39.95	39.99	39.77	39.70	39.75	39.74	39.98	39.89	39.75
11	40.18	40.26	40.33	40.35	40.11	39.99	39.89	40.01	39.78	39.69	39.77	39.72	39.74	39.62	39.43
12	40.11	40.22	40.06	40.36	40.13	39.95	39.84	39.93	39.67	39.58	39.62	39.56	39.65	39.71	39.78
Avg.	40.10	40.23	40.02	40.41	40.20	40.05	39.94	39.99	39.78	39.71	39.76	39.73	39.90	39.89	39.81
Med.	40.09	40.27	40.00	40.41	40.20	40.06	39.94	40.00	39.78	39.71	39.77	39.73	39.92	39.91	39.80
st dev	0.13	0.12	0.15	0.20	0.16	0.15	0.13	0.10	0.11	0.12	0.12	0.13	0.15	0.15	0.18
Min.	39.88	40.02	39.80	40.13	39.95	39.81	39.71	39.78	39.59	39.53	39.58	39.56	39.65	39.62	39.43
Max.	40.31	40.42	40.33	40.76	40.49	40.37	40.18	40.17	39.97	39.93	39.91	39.90	40.09	40.10	40.06

3.3 Data Set 1, 85°C, 3200mA (Ra)

No.	Ra														
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
1	91.19	91.50	91.01	92.01	91.81	91.96	91.60	91.65	91.21	91.52	91.44	91.03	91.26	90.28	90.65
2	91.33	91.47	91.22	91.98	91.82	91.94	91.76	91.56	91.71	91.47	91.38	91.28	90.87	91.36	90.88
3	91.65	91.87	91.54	91.74	91.36	91.26	90.62	91.54	91.58	91.34	91.31	91.47	91.22	91.24	91.20
4	92.38	92.09	92.54	92.01	92.00	91.62	91.81	92.18	91.54	91.07	91.24	91.20	90.98	91.01	90.93
5	91.53	91.31	91.50	92.35	92.03	91.65	91.56	91.18	91.57	91.16	91.25	91.08	91.24	90.89	90.95
6	91.33	92.06	92.14	91.94	91.84	91.55	91.65	91.22	90.92	91.02	90.83	90.73	90.61	90.47	91.65
7	91.09	91.82	91.95	92.34	92.46	92.11	91.66	91.65	91.56	91.97	91.67	91.40	91.12	91.07	91.29
8	91.03	91.52	91.47	91.91	91.43	91.34	91.59	91.35	91.43	91.07	91.18	90.86	91.02	90.35	90.52
9	91.70	91.52	91.49	91.84	92.19	91.76	91.77	91.60	91.16	91.08	91.41	91.16	91.26	90.89	90.86
10	91.22	91.32	91.47	91.93	92.00	91.98	91.92	91.73	91.08	91.17	91.39	91.34	90.78	90.90	91.06
11	91.72	91.55	91.25	92.56	91.98	92.07	91.49	91.78	91.52	91.57	91.39	91.38	91.20	91.32	91.09
12	91.34	91.43	91.55	92.43	92.02	91.88	91.72	91.69	91.51	91.22	91.16	90.90	91.15	90.86	90.91
Avg.	91.46	91.62	91.59	92.09	91.91	91.76	91.60	91.59	91.40	91.31	91.30	91.15	91.06	90.89	91.00
Med.	91.34	91.52	91.50	92.00	91.99	91.82	91.66	91.63	91.52	91.20	91.35	91.18	91.14	90.90	90.94
st dev	0.37	0.27	0.42	0.26	0.30	0.28	0.33	0.27	0.24	0.28	0.20	0.24	0.21	0.36	0.30
Min.	91.03	91.31	91.01	91.74	91.36	91.26	90.62	91.18	90.92	91.02	90.83	90.73	90.61	90.28	90.52
Max.	92.38	92.09	92.54	92.56	92.46	92.11	91.92	92.18	91.71	91.97	91.67	91.47	91.26	91.36	91.65

3.4 Data Set 1, 85°C, 3200mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)													
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
1	0.2613	0.5297	2714	0.0003	0.0004	0.0005	0.0004	0.0009	0.0012	0.0010	0.0010	0.0013	0.0017	0.0020	0.0022	0.0024	0.0027
2	0.2614	0.5299	2712	0.0003	0.0002	0.0002	0.0004	0.0011	0.0015	0.0009	0.0009	0.0011	0.0015	0.0019	0.0017	0.0020	0.0025
3	0.2623	0.5312	2688	0.0004	0.0003	0.0004	0.0006	0.0011	0.0015	0.0009	0.0010	0.0011	0.0016	0.0019	0.0019	0.0021	0.0024
4	0.2608	0.5291	2728	0.0005	0.0003	0.0004	0.0006	0.0010	0.0015	0.0009	0.0008	0.0008	0.0013	0.0019	0.0018	0.0021	0.0024
5	0.2615	0.5299	2710	0.0006	0.0007	0.0007	0.0004	0.0009	0.0012	0.0011	0.0011	0.0010	0.0015	0.0022	0.0020	0.0022	0.0026
6	0.2631	0.5307	2674	0.0005	0.0003	0.0005	0.0005	0.0010	0.0013	0.0009	0.0011	0.0011	0.0015	0.0020	0.0019	0.0024	0.0025
7	0.2617	0.5295	2706	0.0004	0.0005	0.0006	0.0005	0.0008	0.0012	0.0008	0.0009	0.0009	0.0013	0.0017	0.0017	0.0020	0.0023
8	0.2612	0.5297	2716	0.0004	0.0002	0.0001	0.0007	0.0010	0.0014	0.0008	0.0010	0.0010	0.0015	0.0019	0.0020	0.0025	0.0029
9	0.2618	0.5307	2700	0.0005	0.0002	0.0004	0.0005	0.0008	0.0011	0.0008	0.0011	0.0009	0.0014	0.0020	0.0019	0.0023	0.0026
10	0.2615	0.5301	2710	0.0004	0.0002	0.0005	0.0009	0.0012	0.0014	0.0010	0.0013	0.0015	0.0019	0.0023	0.0020	0.0023	0.0027
11	0.2621	0.5303	2696	0.0006	0.0006	0.0006	0.0006	0.0008	0.0010	0.0009	0.0011	0.0013	0.0017	0.0021	0.0023	0.0025	0.0030
12	0.2615	0.5301	2710	0.0004	0.0005	0.0007	0.0009	0.0014	0.0015	0.0012	0.0014	0.0016	0.0020	0.0024	0.0025	0.0029	0.0033
Avg.	0.2617	0.5301	2705	0.0005	0.0004	0.0005	0.0006	0.0010	0.0013	0.0009	0.0011	0.0011	0.0016	0.0020	0.0020	0.0023	0.0027
Med.	0.2615	0.5300	2710	0.0004	0.0003	0.0005	0.0006	0.0010	0.0013	0.0009	0.0010	0.0011	0.0015	0.0020	0.0019	0.0023	0.0026
st dev	0.0006	0.0006	14	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003
Min.	0.2608	0.5291	2674	0.0003	0.0002	0.0001	0.0004	0.0008	0.0010	0.0008	0.0008	0.0008	0.0013	0.0017	0.0017	0.0020	0.0023
Max.	0.2631	0.5312	2728	0.0006	0.0007	0.0007	0.0009	0.0014	0.0015	0.0012	0.0014	0.0016	0.0020	0.0024	0.0025	0.0029	0.0033

3.5 Data Set 2, 105°C, 3200mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)													
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
13	13944.68	99.91	99.71	99.03	98.43	97.88	97.52	96.93	96.49	96.10	95.65	95.29	94.88	94.46	94.11
14	13944.68	99.49	99.16	98.85	98.57	98.33	97.67	97.22	96.65	96.12	95.80	95.28	94.82	94.43	94.22
15	13903.63	99.32	99.11	98.87	98.21	97.81	97.42	96.97	96.53	95.97	95.44	94.80	94.38	93.99	93.44
16	13927.08	100.16	99.75	99.39	98.93	98.49	98.11	97.65	97.13	96.52	96.01	95.61	95.21	94.72	94.24
17	13821.53	99.91	99.24	98.86	98.52	97.97	97.46	96.90	96.29	96.07	95.62	95.15	94.78	94.40	94.07
18	14138.19	99.59	99.01	98.69	98.27	97.77	97.42	96.85	96.51	96.20	95.84	95.41	94.97	94.56	94.11
19	13833.26	99.91	99.60	99.13	98.85	98.44	97.95	97.41	96.96	96.35	95.88	95.40	94.90	94.40	94.03
20	13821.53	99.79	99.32	98.84	98.44	98.02	97.52	96.99	96.46	95.98	95.37	94.80	94.26	93.88	93.51
21	13956.40	99.26	98.91	98.48	97.88	97.34	96.82	96.68	96.34	95.77	95.18	94.53	94.07	93.76	93.28
22	13938.81	99.76	99.22	98.85	98.49	98.13	97.52	97.01	96.53	95.91	95.42	94.84	94.39	93.99	93.59
23	13850.85	99.82	99.62	99.16	98.82	98.37	98.08	97.78	97.31	96.90	96.36	95.92	95.47	95.10	94.55
24	13827.39	99.86	99.15	98.79	98.37	97.94	97.60	97.03	96.42	95.78	95.25	94.66	94.22	93.64	93.16
Avg.	13909.00	99.73	99.32	98.91	98.48	98.04	97.59	97.12	96.64	96.14	95.65	95.14	94.69	94.28	93.86
Med.	13915.36	99.81	99.23	98.86	98.47	97.99	97.52	97.00	96.52	96.08	95.63	95.21	94.80	94.40	94.05
st dev	90.28	0.27	0.28	0.24	0.30	0.33	0.35	0.33	0.32	0.32	0.34	0.42	0.43	0.43	0.44
Min.	13821.53	99.26	98.91	98.48	97.88	97.34	96.82	96.68	96.29	95.77	95.18	94.53	94.07	93.64	93.16
Max.	14138.19	100.16	99.75	99.39	98.93	98.49	98.11	97.78	97.31	96.90	96.36	95.92	95.47	95.10	94.55

3.6 Data Set 2, 105°C, 3200mA (Forward Voltage)

No.	Forward Voltage (V)														
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
13	40.14	40.29	40.11	40.43	40.16	39.95	39.82	39.76	39.70	38.91	38.75	38.68	39.38	39.72	39.20
14	40.17	40.26	40.13	40.32	40.02	39.84	39.70	39.57	39.54	38.76	38.61	38.47	39.72	39.60	39.45
15	40.22	40.31	40.26	40.53	40.18	40.03	39.89	39.81	39.80	39.04	38.88	38.76	39.80	39.45	39.49
16	40.28	40.45	40.26	40.22	39.99	39.85	39.76	39.65	39.63	38.85	38.72	38.57	39.56	39.59	39.36
17	40.10	40.28	39.91	40.06	39.85	39.74	39.65	39.54	39.52	38.76	38.63	38.51	39.51	39.53	39.29
18	40.06	40.02	39.98	40.20	39.98	39.82	39.72	39.51	39.50	38.74	38.61	38.48	39.60	39.35	39.43
19	40.33	40.48	40.17	40.57	40.35	40.17	40.08	39.83	39.80	39.03	38.88	38.72	39.77	39.45	39.56
20	39.96	39.96	39.97	40.19	39.95	39.72	39.60	39.60	39.58	38.81	38.68	38.55	39.87	39.43	39.67
21	39.76	39.84	39.74	40.06	39.87	39.71	39.60	39.47	39.45	38.69	38.55	38.46	39.49	39.28	39.32
22	39.95	40.00	39.95	39.56	39.37	39.23	39.13	39.55	39.57	38.83	38.70	38.60	39.45	39.46	39.28
23	39.87	40.04	39.91	39.69	39.51	39.36	39.27	39.58	39.61	38.87	38.77	38.67	39.64	39.35	39.47
24	39.82	39.85	39.79	40.11	39.98	39.91	39.80	39.67	39.70	38.96	38.84	38.75	39.60	39.19	39.51
Avg.	40.06	40.15	40.02	40.16	39.93	39.78	39.67	39.63	39.62	38.85	38.72	38.60	39.62	39.45	39.42
Med.	40.08	40.15	39.98	40.20	39.98	39.83	39.71	39.59	39.60	38.84	38.71	38.59	39.60	39.45	39.44
st dev	0.18	0.22	0.17	0.30	0.27	0.26	0.26	0.12	0.11	0.11	0.11	0.11	0.15	0.15	0.13
Min.	39.76	39.84	39.74	39.56	39.37	39.23	39.13	39.47	39.45	38.69	38.55	38.46	39.38	39.19	39.20
Max.	40.33	40.48	40.26	40.57	40.35	40.17	40.08	39.83	39.80	39.04	38.88	38.76	39.87	39.72	39.67

3.7 Data Set 2, 105°C, 3200mA (Ra)

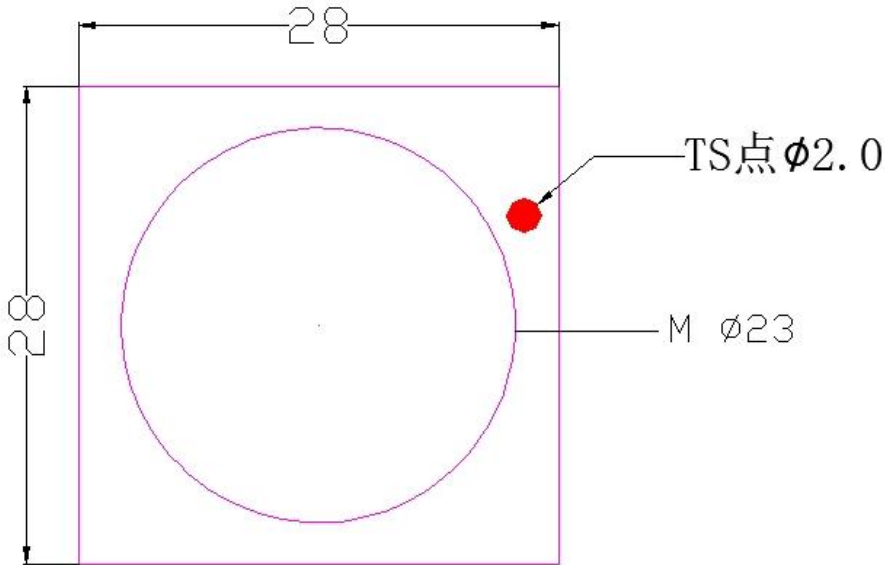
No.	Ra														
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs	14000hrs
13	92.04	92.03	92.00	92.13	91.88	91.64	91.42	91.41	91.15	90.86	91.02	90.87	90.25	90.25	91.44
14	91.54	91.63	91.68	91.88	91.35	91.21	91.10	90.89	90.76	90.47	90.61	90.60	90.25	90.93	90.42
15	91.83	91.68	91.61	92.30	92.24	92.14	91.92	91.53	91.69	91.71	91.55	91.07	91.00	91.04	90.92
16	91.44	91.62	91.55	92.13	92.13	91.78	91.74	91.08	91.47	91.23	91.00	91.05	90.75	90.46	90.72
17	91.92	92.00	92.00	92.18	91.90	91.76	91.97	91.32	90.98	90.91	90.79	91.17	90.55	90.77	91.41
18	91.61	91.61	91.62	92.43	92.40	92.06	91.94	91.86	91.77	91.69	91.41	91.28	90.93	90.96	90.99
19	91.84	91.68	91.58	92.29	92.27	91.54	92.27	91.53	91.84	91.79	91.61	91.53	91.40	90.42	91.34
20	91.59	91.65	91.81	92.45	92.07	91.94	91.84	91.51	91.75	91.87	91.40	91.52	91.46	90.99	91.12
21	91.32	91.11	91.57	91.85	92.20	91.92	91.84	91.26	91.32	91.28	91.35	91.21	90.94	90.78	90.81
22	91.22	91.59	91.44	92.17	91.81	91.98	91.84	91.54	91.64	91.22	91.18	91.02	91.04	91.19	90.78
23	91.85	91.75	91.57	92.52	92.26	91.99	91.83	91.37	91.38	91.21	91.21	91.08	91.31	90.70	90.73
24	91.32	91.19	91.42	91.88	91.46	91.55	91.77	91.05	91.09	90.80	90.90	91.25	90.82	90.59	90.77
Avg.	91.63	91.63	91.65	92.18	92.00	91.79	91.79	91.36	91.40	91.25	91.17	91.14	90.89	90.76	90.95
Med.	91.60	91.64	91.60	92.18	92.10	91.85	91.84	91.39	91.43	91.23	91.20	91.13	90.94	90.78	90.87
st dev	0.27	0.27	0.19	0.23	0.33	0.27	0.29	0.26	0.35	0.44	0.31	0.26	0.40	0.28	0.32
Min.	91.22	91.11	91.42	91.85	91.35	91.21	91.10	90.89	90.76	90.47	90.61	90.60	90.25	90.25	90.42
Max.	92.04	92.03	92.00	92.52	92.40	92.14	92.27	91.86	91.84	91.87	91.61	91.53	91.46	91.19	91.44

3.8 Data Set 2, 105°C, 3200mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)													
				Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs	13000hrs
13	0.2607	0.5297	2726	0.0004	0.0002	0.0003	0.0004	0.0009	0.0012	0.0008	0.0010	0.0012	0.0018	0.0021	0.0026	0.0029	0.0032
14	0.2628	0.5314	2680	0.0002	0.0002	0.0004	0.0008	0.0013	0.0018	0.0012	0.0014	0.0013	0.0019	0.0024	0.0022	0.0026	0.0031
15	0.2616	0.5294	2710	0.0004	0.0004	0.0004	0.0009	0.0011	0.0013	0.0011	0.0013	0.0015	0.0018	0.0022	0.0023	0.0016	0.0032
16	0.2617	0.5305	2704	0.0005	0.0004	0.0009	0.0008	0.0011	0.0014	0.0013	0.0015	0.0012	0.0017	0.0021	0.0025	0.0024	0.0032
17	0.2607	0.5296	2728	0.0004	0.0005	0.0004	0.0007	0.0009	0.0013	0.0011	0.0012	0.0012	0.0016	0.0021	0.0023	0.0028	0.0031
18	0.2616	0.5305	2706	0.0002	0.0003	0.0007	0.0011	0.0015	0.0018	0.0014	0.0014	0.0018	0.0022	0.0026	0.0027	0.0029	0.0033
19	0.2618	0.5299	2704	0.0004	0.0005	0.0004	0.0010	0.0013	0.0015	0.0010	0.0013	0.0015	0.0019	0.0022	0.0021	0.0023	0.0028
20	0.2616	0.5291	2710	0.0001	0.0001	0.0004	0.0007	0.0011	0.0014	0.0010	0.0011	0.0014	0.0017	0.0021	0.0019	0.0020	0.0025
21	0.2613	0.5293	2716	0.0002	0.0001	0.0004	0.0009	0.0012	0.0015	0.0011	0.0011	0.0016	0.0021	0.0025	0.0024	0.0021	0.0030
22	0.2614	0.5303	2712	0.0004	0.0003	0.0004	0.0007	0.0011	0.0014	0.0010	0.0011	0.0014	0.0018	0.0022	0.0025	0.0026	0.0029
23	0.2613	0.5289	2720	0.0004	0.0003	0.0004	0.0007	0.0011	0.0015	0.0010	0.0011	0.0012	0.0018	0.0020	0.0020	0.0020	0.0025
24	0.2615	0.5313	2706	0.0004	0.0004	0.0004	0.0009	0.0012	0.0016	0.0011	0.0012	0.0014	0.0018	0.0023	0.0024	0.0026	0.0029
Avg.	0.2615	0.5300	2710	0.0003	0.0003	0.0005	0.0008	0.0012	0.0015	0.0011	0.0012	0.0014	0.0019	0.0022	0.0023	0.0024	0.0030
Med.	0.2616	0.5298	2710	0.0004	0.0003	0.0004	0.0008	0.0011	0.0015	0.0011	0.0012	0.0014	0.0018	0.0022	0.0024	0.0025	0.0030
st dev	0.0005	0.0008	13	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003
Min.	0.2607	0.5289	2680	0.0001	0.0001	0.0003	0.0004	0.0009	0.0012	0.0008	0.0010	0.0012	0.0016	0.0020	0.0019	0.0016	0.0025
Max.	0.2628	0.5314	2728	0.0005	0.0005	0.0009	0.0011	0.0015	0.0018	0.0014	0.0015	0.0018	0.0022	0.0026	0.0027	0.0029	0.0033

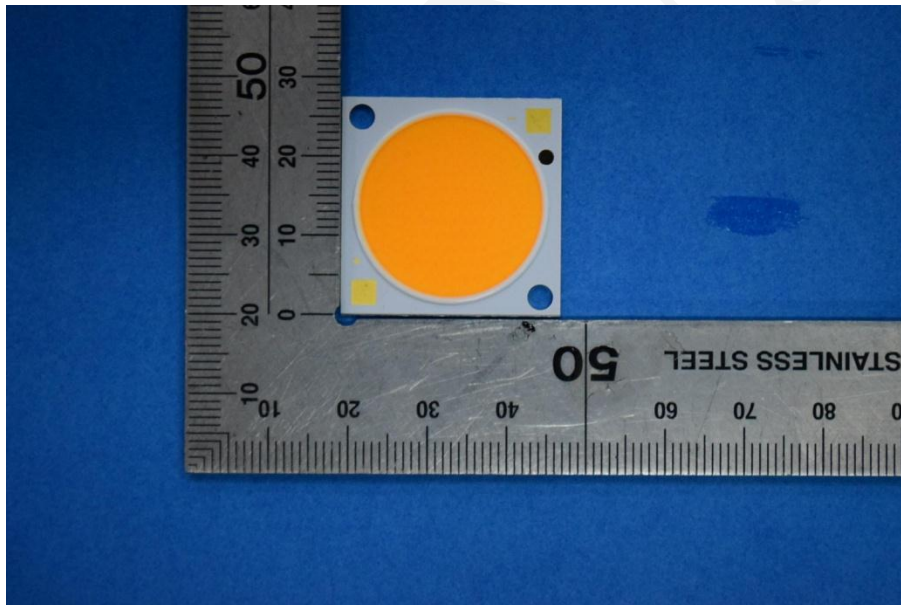
4 - DUT Photo

4.1 #Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



5 - Report Revision

Report Number	Report Date	Contents
RSZ210202501-10	2021-02-04	Original report.
RSZ210202501-10-M1	2021-02-22	Correct the Die Spacing of the model CLM-22-XX-XX-36-AC4X.

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Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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*****END OF REPORT*****