



Testing Lab.
Shenzhen Southern LCS Compliance Testing Laboratory Ltd.



Report No.:LCS190731036BS

TEST REPORT of IESNA LM-80-15

Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules

Client..... : Shenzhen Guangmai Electronics Co., Ltd.
Address..... : 5th floor, B Building, Jingang Hi-tech Zone, Qiaotou Community, Fuyong Street, Baoan District, Shenzhen
Brand Name..... : N/A
Testing laboratory..... : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
Address..... : B Area, 2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, Guangdong, China
Product description : LED
Model..... : 2835
Rating..... : 150mA, 5.9-6.1V
Date of Test..... : August 01, 2019 – September 21, 2020
Date of Issue..... : September 21, 2020

Test by:

Zero Huang

Zero Huang/ Project Engineer

Check by:

Ian Luo

Ian Luo/ Director



Jesse Liu/ Manager



Test Summary

Life test condition			Summary of result				
Test condition	Current (mA)	Case temperature (°C)	Test duration (h)	Average lumen maintenance (%)	Maximum chromaticity shift ($\Delta u'v'$)	Average Power Density (W/mm ²)	Average Current Density (mA/mm ²)
1	150	55	10000	95.59%	0.0032	0.0918	15.3061
2	150	85	10000	95.05%	0.0033		
3	150	105	10000	94.49%	0.0036		

1. Number of LED Light Sources tested

- 25 Packages tested at actual case temperature 54.3°C
- 25 Packages tested at actual case temperature 84.1°C
- 25 Packages tested at actual case temperature 104.6°C

2. Description of LED Light Sources

- Part Number: .2835
- Part Type: LED
- IF =150mA, CCT(Nominal) = 5500K-6000K

3. Description of auxiliary equipment

- 1) EVERFINE LT-200A Accelerated Aging-Life Test System for LEDs
- 2) Instrument Integrating sphere 0.5m
- 3) SENSING SPR-3000 Photometric, Colorimetric& Electric System for Light Sources

4. Operating time

LED packages are driven with a constant direct current.

- Number of units : 25 at 55°C, 85°C and 105°C
- Drive current :150mA
- Typical voltage : 6V

5. Ambient conditions including airflow, temperature and relative humidity

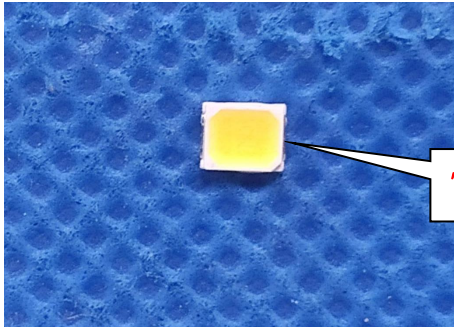
The minimal airflow is maintained in chamber.

The ambient temperature around the LED packages inside chamber is controlled by air flowing and the thermocouple readings are monitored.

- Case temperature : Contorlled to -2°C
- Surrounding air temperature : Contorlled to -5°C
- Relative humidity : < 65%RH



6. Case temperature (Test point temperature)



Ts Measurement

7. Drive current of the LED Light Sources during lifetime test

See Sub-clause 9.1, 9.2 and 9.3

8. Initial luminous flux and forward voltage

See the table

9. Lumen maintenance data for each individual LED Light Sources

See the table

Quantity	Model	Serial Number
25	2835	A01-A25 (55°C)
25	2835	B01-B25 (85°C)
25	2835	C01-C25 (105°C)



9.1 Test condition 1: 55 °C, Drive Current : 150mA

Item	VF(V)	Flux(lm)	Ra	T=55°C Luminous Maintenance (%)									
				0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h
A01	6.03	117.96	81.3	100.23	99.94	99.45	99.09	98.75	98.17	97.33	96.79	96.08	95.57
A02	6.07	117.76	81.2	100.18	99.89	99.40	99.11	98.68	98.05	97.30	96.69	96.06	95.52
A03	6.02	117.86	81.8	100.11	99.84	99.39	99.05	98.79	98.09	97.39	96.73	96.11	95.48
A04	6.01	117.46	81.6	100.14	99.92	99.34	99.01	98.71	98.05	97.54	96.96	96.27	95.72
A05	6.07	117.36	81.9	100.00	99.89	99.32	99.09	98.77	97.97	97.47	96.83	96.09	95.55
A06	6.06	117.86	81.0	100.08	99.87	99.42	99.04	98.69	98.05	97.76	97.25	96.59	96.14
A07	6.00	117.96	82.1	100.18	99.95	99.46	99.12	98.74	98.11	97.29	96.75	96.03	95.38
A08	6.04	117.96	81.8	100.07	99.91	99.40	99.11	98.67	98.02	97.75	97.12	96.53	96.02
A09	6.06	117.16	81.1	100.34	100.15	99.58	99.15	98.66	97.99	97.42	96.87	96.25	95.69
A10	6.03	117.66	81.3	100.08	99.99	99.52	99.03	98.67	98.12	97.26	96.72	96.01	95.46
A11	6.02	117.96	81.8	100.17	99.94	99.46	99.09	98.61	98.03	97.25	96.64	95.95	95.32
A12	6.04	117.36	81.6	100.18	100.01	99.51	99.06	98.66	98.08	97.27	96.61	95.90	95.25
A13	6.06	117.96	81.4	100.06	99.99	99.49	99.11	98.58	97.99	97.49	96.91	96.18	95.63
A14	6.08	117.66	81.7	100.01	99.87	99.41	99.05	98.64	97.95	97.10	96.46	95.83	95.20
A15	6.05	117.76	81.1	100.13	99.99	99.52	99.09	98.57	98.09	97.12	96.61	95.90	95.26
A16	6.03	117.66	81.9	100.18	99.88	99.40	99.05	98.64	98.10	97.64	97.10	96.49	95.96
A17	6.06	117.76	82.0	100.26	99.99	99.49	99.11	98.56	98.06	97.53	96.90	96.28	95.74
A18	6.09	117.36	80.9	100.08	99.90	99.42	99.06	98.61	98.05	97.55	97.00	96.31	95.70
A19	6.05	117.26	81.8	100.21	99.93	99.45	99.08	98.67	98.12	97.17	96.54	95.93	95.27
A20	6.08	117.76	81.6	100.26	99.99	99.52	99.11	98.58	98.10	97.54	96.89	96.27	95.69
A21	6.03	117.86	81.1	100.00	99.92	99.48	99.05	98.63	97.96	97.00	96.45	95.76	95.12
A22	6.03	117.66	81.2	100.08	99.90	99.39	99.09	98.56	98.01	97.08	96.45	95.73	95.10
A23	6.06	117.26	82.1	100.16	99.97	99.51	99.07	98.62	98.12	97.64	97.11	96.52	96.00
A24	6.08	117.36	81.0	100.20	99.96	99.47	99.11	98.58	97.98	97.85	97.31	96.69	96.18
A25	6.06	117.46	81.9	100.26	99.97	99.46	99.11	98.53	98.07	97.63	97.02	96.31	95.78
Ave.	6.05	117.64	81.5	100.15	99.94	99.45	99.08	98.65	98.05	97.41	96.83	96.16	95.59
Med.	6.05	117.66	81.6	100.16	99.94	99.46	99.09	98.64	98.05	97.42	96.83	96.11	95.57
St dev	0.0239	0.2593	0.3803	0.0888	0.0636	0.0615	0.0334	0.0694	0.0583	0.2309	0.2443	0.2648	0.3124
Max.	6.09	117.96	82.1	100.34	100.15	99.58	99.15	98.79	98.17	97.85	97.31	96.69	96.18
Min.	6.00	117.16	80.9	100.00	99.84	99.32	99.01	98.53	97.95	97.00	96.45	95.73	95.10



9.1.1 Test condition 1: 55 °C, Drive Current : 150mA

No.	T=55°C Chromaticity Shift ($\Delta u'v'$)												
	0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	u'	v'	CCT(K)										
A01	0.2029	0.4775	5726	0.0002	0.0005	0.0008	0.001	0.0014	0.0017	0.0019	0.0024	0.0027	0.003
A02	0.2028	0.4773	5728	0.0005	0.0007	0.0009	0.001	0.0014	0.0018	0.002	0.0026	0.0029	0.0031
A03	0.2025	0.4778	5717	0.0003	0.0007	0.0011	0.0011	0.0015	0.0018	0.0021	0.0027	0.0033	0.0035
A04	0.2023	0.4777	5727	0.0004	0.0006	0.0009	0.0011	0.0014	0.0017	0.002	0.0024	0.0027	0.0028
A05	0.2029	0.4773	5711	0.0003	0.0006	0.0009	0.0012	0.0011	0.0014	0.0018	0.0024	0.0029	0.0032
A06	0.2028	0.4773	5722	0.0003	0.0006	0.0011	0.0012	0.0014	0.0017	0.0021	0.0025	0.0026	0.0028
A07	0.2030	0.4775	5724	0.0005	0.0007	0.0009	0.0011	0.0015	0.0018	0.0019	0.0024	0.0028	0.003
A08	0.2027	0.4773	5718	0.0002	0.0005	0.0007	0.0012	0.0017	0.002	0.0023	0.0029	0.003	0.0031
A09	0.2024	0.4778	5719	0.0003	0.0004	0.0006	0.0011	0.0015	0.0018	0.0019	0.0023	0.0027	0.003
A10	0.2023	0.4777	5713	0.0005	0.0008	0.0009	0.0011	0.0014	0.0018	0.0018	0.0024	0.0027	0.0031
A11	0.2023	0.4779	5726	0.0003	0.0004	0.0007	0.0009	0.0013	0.0016	0.0022	0.0027	0.0031	0.0035
A12	0.2025	0.4778	5722	0.0003	0.0007	0.0009	0.001	0.0014	0.0018	0.0021	0.0025	0.0027	0.0029
A13	0.2023	0.4774	5724	0.0003	0.0005	0.0007	0.0013	0.0017	0.002	0.0022	0.0023	0.0025	0.0028
A14	0.2028	0.4780	5712	0.0003	0.0006	0.0009	0.0013	0.0015	0.0018	0.0019	0.0024	0.0028	0.003
A15	0.2027	0.4777	5723	0.0002	0.0004	0.0007	0.0011	0.0014	0.0017	0.0021	0.0025	0.0029	0.0031
A16	0.2024	0.4775	5721	0.0002	0.0005	0.0008	0.0012	0.0016	0.0018	0.0021	0.0028	0.0032	0.0034
A17	0.2030	0.4780	5719	0.0004	0.0007	0.001	0.0013	0.0016	0.0019	0.0023	0.0027	0.003	0.0034
A18	0.2028	0.4777	5716	0.0004	0.0007	0.001	0.0014	0.0018	0.0023	0.0023	0.0027	0.0029	0.0032
A19	0.2025	0.4774	5723	0.0002	0.0004	0.0006	0.0009	0.0012	0.0016	0.0018	0.0025	0.003	0.0034
A20	0.2023	0.4778	5726	0.0003	0.0005	0.0009	0.0012	0.0015	0.0019	0.0021	0.0027	0.0032	0.0034
A21	0.2028	0.4779	5713	0.0002	0.0004	0.0008	0.0013	0.0014	0.0018	0.0019	0.0023	0.0028	0.003
A22	0.2027	0.4775	5715	0.0004	0.0007	0.0009	0.0011	0.0014	0.0017	0.0022	0.0025	0.0029	0.0032
A23	0.2029	0.4773	5725	0.0002	0.0005	0.0009	0.0014	0.0017	0.0018	0.0021	0.0028	0.0034	0.0035
A24	0.2027	0.4779	5716	0.0003	0.0005	0.0006	0.0009	0.0015	0.0018	0.0023	0.0024	0.0029	0.0033
A25	0.2025	0.4778	5721	0.0003	0.0006	0.0008	0.001	0.0016	0.0019	0.0024	0.0026	0.0032	0.0033
Ave.	0.2026	0.4776	5720	0.0003	0.0006	0.0008	0.0011	0.0015	0.0018	0.0021	0.0025	0.0029	0.0032
Med.	0.2027	0.4777	5721	0.0003	0.0006	0.0009	0.0011	0.0015	0.0018	0.0021	0.0025	0.0029	0.0031
St dev	0.0002	0.0002	5.0787	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Max.	0.2030	0.4780	5728	0.0005	0.0008	0.0011	0.0014	0.0018	0.0023	0.0024	0.0029	0.0034	0.0035
Min.	0.2023	0.4773	5711	0.0002	0.0004	0.0006	0.0009	0.0011	0.0014	0.0018	0.0023	0.0025	0.0028



9.2 Test condition 2: 85 °C, Drive Current :150mA

Item	VF(V)	Flux(lm)	Ra	T=85°C Luminous Maintenance (%)									
				0 h	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
B01	6.04	117.36	81.2	99.97	99.76	99.38	98.94	98.39	97.80	96.94	96.31	95.67	95.03
B02	6.10	117.31	81.4	100.15	99.82	99.40	98.88	98.37	97.87	96.84	96.29	95.78	95.02
B03	6.03	117.31	81.4	100.07	99.80	99.38	98.90	98.36	97.81	96.88	96.34	95.80	94.97
B04	5.99	117.03	82.0	99.96	99.73	99.37	98.89	98.39	97.87	97.11	96.50	95.87	95.10
B05	6.08	116.95	82.4	99.92	99.75	99.39	98.83	98.35	97.70	96.98	96.32	95.71	94.93
B06	6.10	117.22	80.4	100.07	99.81	99.38	98.84	98.36	97.85	97.40	96.82	96.19	95.52
B07	6.00	117.44	82.4	100.04	99.83	99.37	98.88	98.35	97.81	96.90	96.26	95.61	94.84
B08	6.07	117.53	81.9	99.97	99.75	99.42	98.90	98.36	97.79	97.27	96.76	96.13	95.49
B09	6.04	116.75	80.7	99.96	99.76	99.36	98.86	98.37	97.68	97.02	96.48	95.95	95.19
B10	6.01	117.02	81.0	100.01	99.86	99.38	98.94	98.42	97.83	96.87	96.24	95.70	95.03
B11	6.03	117.36	82.4	99.97	99.75	99.32	98.87	98.35	97.77	96.79	96.18	95.57	94.71
B12	6.07	116.91	81.1	99.99	99.81	99.40	98.88	98.36	97.80	96.76	96.13	95.60	94.85
B13	6.07	117.44	81.8	99.89	99.74	99.37	98.83	98.37	97.71	97.06	96.41	95.87	95.10
B14	6.06	117.23	82.1	99.95	99.79	99.39	98.84	98.38	97.69	96.61	96.06	95.45	94.62
B15	6.07	117.12	80.8	99.96	99.83	99.38	98.82	98.29	97.70	96.76	96.13	95.49	94.63
B16	6.00	117.06	82.2	99.94	99.84	99.43	98.88	98.38	97.78	97.25	96.72	96.21	95.44
B17	6.02	117.31	82.1	99.97	99.82	99.42	98.87	98.34	97.81	97.05	96.51	95.88	95.12
B18	6.07	116.81	81.3	99.98	99.75	99.37	98.91	98.35	97.83	97.15	96.54	95.93	95.19
B19	6.06	116.85	81.3	100.01	99.76	99.35	98.93	98.33	97.74	96.69	96.16	95.53	94.67
B20	6.03	117.12	82.2	100.03	99.72	99.39	98.83	98.29	97.82	97.04	96.50	95.85	95.15
B21	6.02	117.31	81.4	99.99	99.77	99.38	98.92	98.27	97.70	96.60	95.99	95.36	94.59
B22	6.04	117.25	80.8	100.00	99.72	99.37	98.87	98.35	97.81	96.60	95.96	95.41	94.58
B23	6.04	116.62	81.9	99.98	99.70	99.35	98.88	98.28	97.87	97.26	96.75	96.21	95.59
B24	6.05	116.95	81.3	100.04	99.79	99.33	98.91	98.36	97.69	97.46	96.92	96.31	95.58
B25	6.05	116.82	82.0	99.99	99.87	99.46	98.90	98.42	98.78	97.17	96.54	96.03	95.38
Ave.	6.05	117.12	81.6	99.99	99.78	99.38	98.88	98.35	97.82	96.98	96.39	95.80	95.05
Med.	6.04	117.12	81.4	99.98	99.77	99.38	98.88	98.36	97.80	96.98	96.34	95.80	95.03
St dev	0.0297	0.2450	0.5902	0.0537	0.0462	0.0302	0.0350	0.0383	0.2093	0.2443	0.2648	0.2715	0.3206
Max.	6.10	117.53	82.4	100.15	99.87	99.46	98.94	98.42	98.78	97.46	96.92	96.31	95.59
Min.	5.99	116.62	80.4	99.89	99.70	99.32	98.82	98.27	97.68	96.60	95.96	95.36	94.58



9.2.1 Test condition 2: 85 °C, Drive Current :150mA

No.	T=85°CChromaticity Shift ($\Delta u'v'$)												
	0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	u'	v'	CCT(K)										
B01	0.2031	0.4772	5738	0.0003	0.0007	0.001	0.0013	0.0015	0.002	0.0024	0.0027	0.0029	0.0032
B02	0.2023	0.4772	5738	0.0003	0.0005	0.0007	0.001	0.0014	0.0018	0.0023	0.0028	0.0031	0.0033
B03	0.2026	0.4775	5732	0.0002	0.0004	0.0006	0.001	0.0014	0.0018	0.0024	0.0028	0.003	0.0032
B04	0.2021	0.4779	5738	0.0003	0.0007	0.0009	0.0013	0.0018	0.0021	0.0022	0.0026	0.0028	0.0029
B05	0.2026	0.4773	5727	0.0002	0.0005	0.0008	0.0014	0.0017	0.0023	0.0023	0.0027	0.003	0.0033
B06	0.2025	0.4776	5735	0.0004	0.0008	0.0009	0.0013	0.0019	0.0023	0.0024	0.0029	0.0031	0.0033
B07	0.2032	0.4777	5739	0.0002	0.0006	0.0009	0.0011	0.0016	0.002	0.0022	0.0028	0.0029	0.0031
B08	0.2028	0.4771	5730	0.0004	0.0008	0.001	0.0012	0.0018	0.002	0.0024	0.0027	0.003	0.0031
B09	0.2021	0.4777	5737	0.0003	0.0007	0.0009	0.0013	0.0019	0.0023	0.0026	0.0031	0.0033	0.0036
B10	0.2022	0.4779	5734	0.0002	0.0006	0.0008	0.0014	0.0018	0.0021	0.0026	0.0032	0.0033	0.0037
B11	0.2026	0.4781	5737	0.0003	0.0005	0.0006	0.0009	0.0015	0.002	0.0023	0.0027	0.0029	0.0033
B12	0.2025	0.4780	5733	0.0002	0.0006	0.0009	0.0013	0.0017	0.002	0.0024	0.0028	0.0031	0.0033
B13	0.2021	0.4777	5740	0.0003	0.0005	0.0008	0.0014	0.0016	0.0021	0.0026	0.003	0.0031	0.0034
B14	0.2032	0.4777	5726	0.0002	0.0006	0.0009	0.0013	0.0018	0.0023	0.0025	0.0029	0.0031	0.0033
B15	0.2024	0.4779	5733	0.0004	0.0007	0.001	0.0015	0.0018	0.0022	0.0024	0.003	0.0032	0.0034
B16	0.2026	0.4774	5736	0.0003	0.0005	0.0008	0.0014	0.0017	0.0022	0.0025	0.0028	0.0029	0.0031
B17	0.2028	0.4777	5732	0.0004	0.0007	0.001	0.0011	0.0018	0.0021	0.0024	0.0028	0.0032	0.0036
B18	0.2031	0.4777	5732	0.0002	0.0005	0.0009	0.0013	0.0018	0.0021	0.0026	0.003	0.0031	0.0034
B19	0.2027	0.4773	5741	0.0003	0.0005	0.0007	0.0012	0.0016	0.0022	0.0024	0.0029	0.0032	0.0036
B20	0.2026	0.4774	5746	0.0002	0.0006	0.0008	0.0011	0.0015	0.002	0.0026	0.0031	0.0033	0.0035
B21	0.2032	0.4780	5727	0.0003	0.0007	0.0009	0.0012	0.0019	0.0024	0.0027	0.0028	0.0031	0.0033
B22	0.2025	0.4774	5727	0.0004	0.0008	0.001	0.0013	0.0017	0.0022	0.0025	0.0028	0.0031	0.0034
B23	0.2029	0.4774	5739	0.0002	0.0004	0.0009	0.0014	0.0017	0.0022	0.0024	0.0028	0.0031	0.0032
B24	0.2029	0.4782	5732	0.0004	0.0006	0.0009	0.0012	0.0019	0.0023	0.0026	0.0029	0.003	0.0034
B25	0.2024	0.4776	5731	0.0002	0.0007	0.0008	0.0013	0.0016	0.0022	0.0025	0.0028	0.003	0.0031
Ave.	0.2026	0.4776	5734	0.0003	0.0006	0.0009	0.0012	0.0017	0.0021	0.0024	0.0029	0.0031	0.0033
Med.	0.2026	0.4777	5734	0.0003	0.0006	0.0009	0.0013	0.0017	0.0021	0.0024	0.0028	0.0031	0.0033
St dev	0.0003	0.0003	5.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0002
Max.	0.2032	0.4782	5746	0.0004	0.0008	0.0010	0.0015	0.0019	0.0024	0.0027	0.0032	0.0033	0.0037
Min.	0.2021	0.4771	5726	0.0002	0.0004	0.0006	0.0009	0.0014	0.0018	0.0022	0.0026	0.0028	0.0029



9.3 Test condition 3: 105 °C, Drive Current :150mA

Item	VF(V)	Flux(lm)	Ra	T=105°C Luminous Maintenance (%)									
				0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h
C01	6.06	116.91	81.0	99.89	99.68	99.20	98.61	98.01	97.48	96.69	96.11	95.54	94.49
C02	6.09	116.76	81.1	99.93	99.77	99.21	98.66	98.00	97.53	96.59	96.09	95.56	94.39
C03	6.05	116.88	81.7	99.97	99.76	99.14	98.64	97.95	97.46	96.63	96.14	95.60	94.36
C04	6.01	116.62	82.1	99.88	99.64	99.15	98.65	97.95	97.51	96.86	96.30	95.65	94.59
C05	6.09	116.31	82.8	99.90	99.71	99.17	98.61	97.96	97.49	96.73	96.12	95.47	94.40
C06	6.09	116.70	79.9	99.87	99.65	99.21	98.63	97.92	97.55	97.15	96.62	95.97	94.98
C07	6.03	117.01	83.0	99.97	99.73	99.20	98.62	97.91	97.53	96.65	96.06	95.49	94.29
C08	6.08	117.12	82.2	99.92	99.74	99.24	98.61	97.90	97.53	97.02	96.56	96.00	94.92
C09	6.05	116.11	81.2	99.96	99.77	99.22	98.66	98.88	97.51	96.77	96.28	95.75	94.56
C10	6.03	116.42	80.4	99.97	99.73	99.24	98.62	97.92	97.47	96.62	96.04	95.58	94.41
C11	6.04	116.91	82.7	99.88	99.66	99.26	98.65	98.88	97.43	96.54	95.98	95.34	94.16
C12	6.09	116.36	81.2	99.95	99.71	99.25	98.64	97.93	97.46	96.51	95.93	95.50	94.23
C13	6.08	116.80	81.4	99.87	99.78	99.19	98.63	97.89	97.48	96.81	96.21	95.65	94.54
C14	6.07	116.71	81.8	99.85	99.72	99.27	98.61	97.96	97.46	96.36	95.86	95.25	94.04
C15	6.06	116.69	81.4	99.97	99.69	99.23	98.60	98.85	97.44	96.51	95.93	95.27	94.00
C16	6.02	116.42	81.7	100.02	99.78	99.25	98.65	97.94	97.51	97.00	96.52	95.97	94.90
C17	6.05	116.71	82.5	99.94	99.80	99.17	98.67	97.99	97.48	96.80	96.31	95.66	94.70
C18	6.08	116.36	81.9	99.89	99.64	99.26	98.60	97.95	97.49	96.90	96.34	95.80	94.66
C19	6.04	116.30	81.6	99.86	99.62	99.18	98.61	97.96	97.52	96.44	95.96	95.33	94.12
C20	6.04	116.71	81.8	99.87	99.65	99.20	98.60	97.91	97.44	96.79	96.30	95.73	94.62
C21	6.04	116.67	81.2	99.93	99.77	99.25	98.58	97.94	97.46	96.35	95.79	95.23	93.94
C22	6.05	116.61	81.1	99.97	99.66	99.18	98.65	97.96	97.47	96.35	95.76	95.21	93.91
C23	6.06	116.07	82.0	99.94	99.71	99.20	98.63	97.98	97.51	97.01	96.55	96.11	95.05
C24	6.07	116.54	81.2	99.89	99.74	99.24	98.61	97.99	97.45	97.21	96.72	96.09	95.05
C25	6.07	116.18	82.1	99.94	99.78	99.19	98.55	98.98	97.53	96.92	96.34	95.91	94.83
Avg.	6.06	116.60	81.64	99.92	99.72	99.21	98.62	98.10	97.49	96.73	96.19	95.63	94.49
Med.	6.06	116.67	81.70	99.93	99.72	99.21	98.62	97.96	97.48	96.73	96.14	95.60	94.49
ST dev.	0.0231	0.2806	0.7217	0.0450	0.0538	0.0361	0.0277	0.3569	0.0337	0.2443	0.2648	0.2743	0.3487
Max.	6.09	117.12	83.0	100.02	99.80	99.27	98.67	98.98	97.55	97.21	96.72	96.11	95.05
Min.	6.01	116.07	79.9	99.85	99.62	99.14	98.55	97.89	97.43	96.35	95.76	95.21	93.91

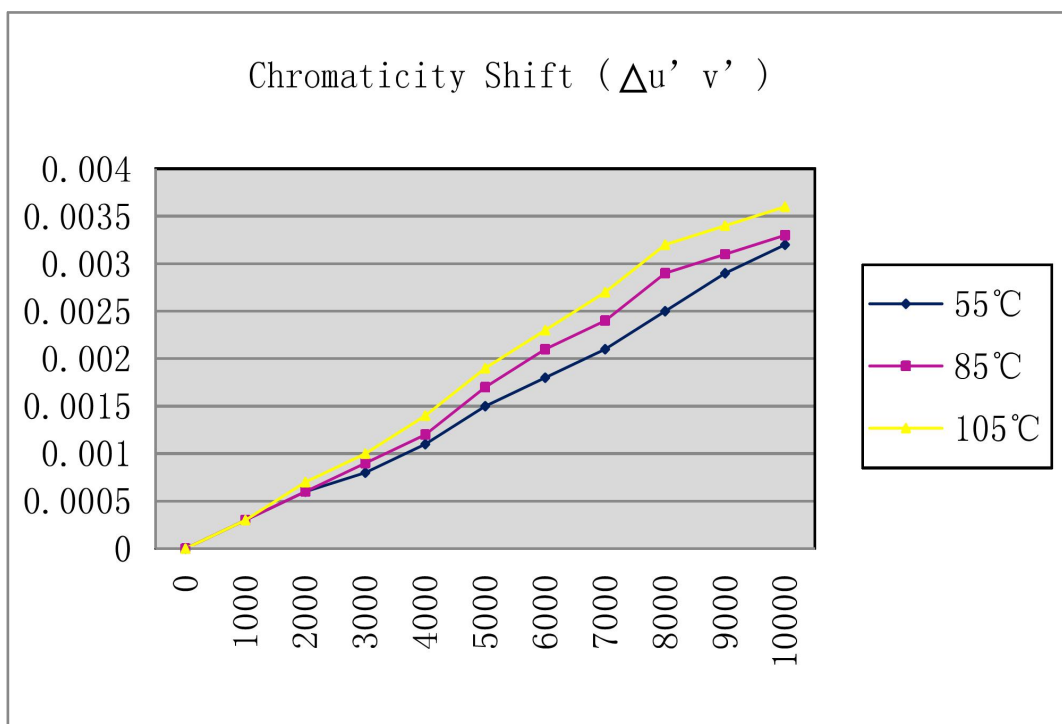
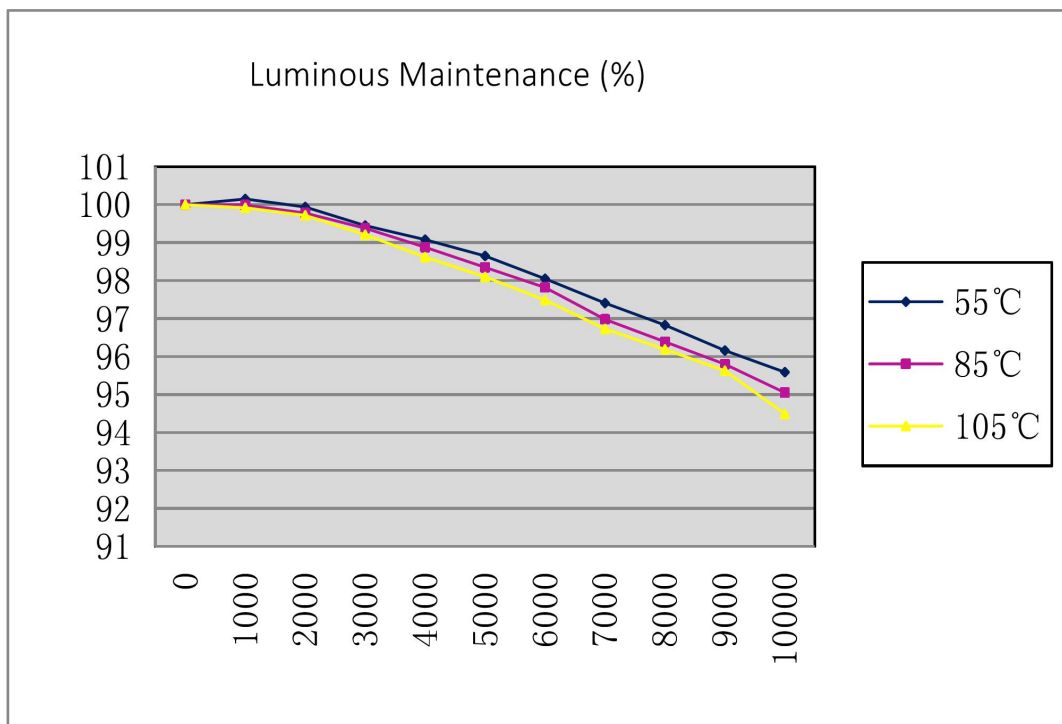


9.3.1 Test condition 3: 105 °C, Drive Current :150mA

No.	T=105°C Chromaticity Shift ($\Delta u'v'$)												
	0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	u'	v'	CCT(K)										
C01	0.2029	0.4773	5748	0.0003	0.0007	0.001	0.0014	0.002	0.0022	0.0026	0.0028	0.0032	0.0034
C02	0.2024	0.4770	5753	0.0003	0.0006	0.0011	0.0013	0.0018	0.0021	0.0027	0.0031	0.0033	0.0034
C03	0.2028	0.4774	5745	0.0004	0.0007	0.0012	0.0014	0.0018	0.0022	0.0026	0.0032	0.0034	0.0035
C04	0.2024	0.4775	5754	0.0003	0.0008	0.0012	0.0015	0.002	0.0024	0.003	0.0034	0.0036	0.0036
C05	0.2026	0.4775	5745	0.0002	0.0007	0.0009	0.0014	0.0018	0.0021	0.0025	0.0029	0.0033	0.0035
C06	0.2022	0.4775	5755	0.0004	0.0005	0.0009	0.0014	0.0017	0.0022	0.0026	0.0031	0.0032	0.0033
C07	0.2034	0.4774	5753	0.0003	0.0007	0.0011	0.0016	0.002	0.0023	0.0028	0.0032	0.0033	0.0034
C08	0.2030	0.4772	5751	0.0004	0.0006	0.001	0.0013	0.0018	0.0022	0.0026	0.0031	0.0034	0.0034
C09	0.2019	0.4777	5756	0.0002	0.0007	0.0009	0.0014	0.0021	0.0024	0.0027	0.0031	0.0033	0.0035
C10	0.2023	0.4782	5751	0.0003	0.0008	0.0012	0.0015	0.0022	0.0025	0.0028	0.0033	0.0035	0.0038
C11	0.2024	0.4780	5752	0.0004	0.0007	0.001	0.0014	0.0018	0.0022	0.0027	0.0032	0.0034	0.0037
C12	0.2027	0.4782	5749	0.0003	0.0006	0.0009	0.0016	0.0021	0.0021	0.0026	0.003	0.0033	0.0034
C13	0.2018	0.4778	5755	0.0004	0.0005	0.0008	0.0013	0.0018	0.0022	0.0028	0.0032	0.0034	0.0036
C14	0.2035	0.4776	5743	0.0002	0.0007	0.0009	0.0014	0.0018	0.0023	0.0026	0.0031	0.0033	0.0034
C15	0.2026	0.4779	5743	0.0005	0.0006	0.0008	0.0015	0.002	0.0022	0.0026	0.0032	0.0035	0.0036
C16	0.2027	0.4772	5755	0.0003	0.0008	0.0012	0.0014	0.0021	0.0023	0.003	0.0034	0.0035	0.0036
C17	0.2030	0.4780	5749	0.0003	0.0007	0.0011	0.0014	0.0018	0.0022	0.0028	0.003	0.0034	0.0037
C18	0.2033	0.4779	5748	0.0004	0.0006	0.001	0.0014	0.0019	0.0024	0.003	0.0033	0.0036	0.0038
C19	0.2025	0.4776	5756	0.0002	0.0007	0.0013	0.0016	0.0021	0.0023	0.0026	0.0031	0.0035	0.0038
C20	0.2028	0.4771	5764	0.0003	0.0005	0.0008	0.0014	0.0018	0.0022	0.0027	0.0032	0.0034	0.0035
C21	0.2029	0.4779	5743	0.0002	0.0007	0.0012	0.0015	0.002	0.0023	0.0028	0.0033	0.0035	0.0036
C22	0.2025	0.4773	5743	0.0004	0.0008	0.0011	0.0014	0.0019	0.0022	0.0029	0.0034	0.0036	0.0038
C23	0.2028	0.4772	5760	0.0004	0.0007	0.0009	0.0015	0.002	0.0024	0.003	0.0033	0.0035	0.0035
C24	0.2028	0.4784	5751	0.0003	0.0006	0.001	0.0014	0.0019	0.0023	0.0028	0.0032	0.0034	0.0037
C25	0.2026	0.4775	5746	0.0002	0.0007	0.0011	0.0016	0.0021	0.0022	0.0026	0.003	0.0033	0.0033
Ave.	0.2027	0.4776	5751	0.0003	0.0007	0.0010	0.0014	0.0019	0.0023	0.0027	0.0032	0.0034	0.0036
Med.	0.2027	0.4775	5751	0.0003	0.0007	0.0010	0.0014	0.0019	0.0022	0.0027	0.0032	0.0034	0.0035
St dev	0.0004	0.0004	5.5642	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0002
Max.	0.2035	0.4784	5764	0.0005	0.0008	0.0013	0.0016	0.0022	0.0025	0.0030	0.0034	0.0036	0.0038
Min.	0.2018	0.4770	5743	0.0002	0.0005	0.0008	0.0013	0.0017	0.0021	0.0025	0.0028	0.0032	0.0033



9.4 Chart





10. Observation of failures

No optical, Electrical or mechanical failure of any LED Package was seen during the lifetime testing.

11. Photometric measurement uncertainty

2%

12. TM-21-11 report: Projecting long term lumen maintenance of LED Light Sources

Test Condition 1 - 55° C Case Temp		Test Condition 2 - 85° C Case Temp		Test Condition 3 - 105° C Case Temp	
Sample size	23	Sample size	23	Sample size	23
Number of failures	0	Number of failures	0	Number of failures	0
DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150	DUT drive current used in the test (mA)	150
Test duration (hours)	10,000	Test duration (hours)	10,000	Test duration (hours)	10,000
Test duration used for projection (hour to hour)	5,000 - 10,000	Test duration used for projection (hour to hour)	5,000 - 10,000	Test duration used for projection (hour to hour)	5,000 - 10,000
Tested case temperature (° C)	55	Tested case temperature (° C)	85	Tested case temperature (° C)	105
α	6.340E-06	α	6.839E-06	α	7.167E-06
B	1.018	B	1.018	B	1.018
Reported L70(10k) (hours)	59,000	Reported L70(10k) (hours)	55,000	Reported L70(10k) (hours)	52,000

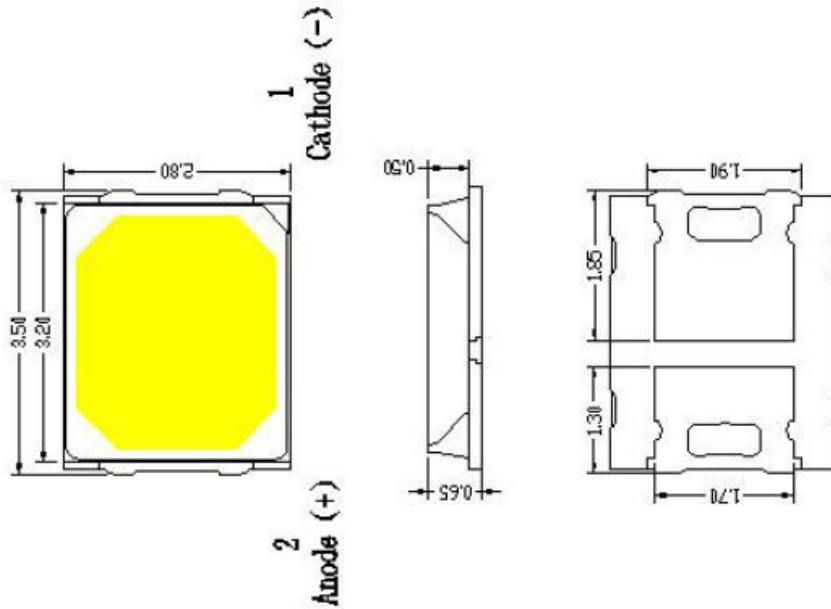


13. ENERGY STAR® LM-80 Cover Sheet

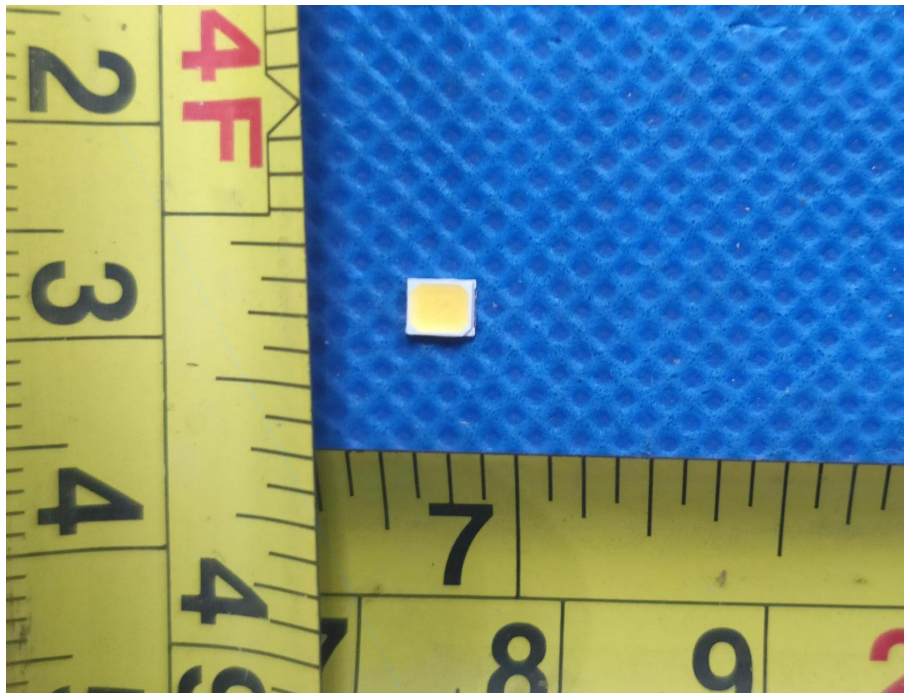
Administrative Information	
Tested subcomponent series:	-
Tested subcomponent model number:	2835
Report issue date:	September 21, 2020
Report revision date (if applicable):	-
Testing start date:	August 01, 2019
Testing completion date:	September 21, 2020
DUT sampling method:	LED samples for IESNA LM-80 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. Each Sample is soldered to all of the reliability stress boards for a given set of IESNA LM-80 tests.
DUT Identification	
DUT manufacturer's name:	Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
DUT identification, e.g., model number:	2835
Description of DUT, including if the DUT is an LED package or module:	LED
DUT Characteristics	
Total input power (W):	0.9
Average current density per LED die (mA/mm ²):	15.3061
Average power density per LED die (W/mm ²):	0.0918
Representative CRI (Ra) of the tested sample set:	80
Minimum die edge to die edge spacing:	-



14.Mechanical Dimensions



15. Photo of samples:



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