ACCREDITED
Lab Code:TL-460

IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Shenzhen Runlite Technology Co.,Ltd.

4F east,3 building,Tian Fu An Industry Zone,Le Zhu Jiao Village ,Xi Xiang Town ,BaoAn District, ShenZhen City, GuangDong Province , CHINA

Model: T3527

Report Type: 6000 Hours Test Report	**Product Type:** LED Package
Test Engineer:	Daniel Duan
Report Number:	RSZ121114502-10
Test Date:	2012-11-16 to 2013-7-31
Report Date:	2013-08-02
Reviewed By:	Jeanne Han /Safety Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China. Tel: +86-0769-86858888 Fax:+86-0769-86858588

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1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Devices tested

Part Number: T3527
Part Name: /
Part Type: LED Package
Nominal CCT: 2700K

1.2 Standards Used:

- IESNA LM-80-08: IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- ENERGY STAR® Program Guidance Regarding LED Package, LED Array and LED Module Lumen Maintenance Performance Data Supporting Qualification of Lighting Products(This test method was not accredited by IAS)

1.3 Test Facility

The testing facility used by Bay Area Compliance Laboratories Corp. (Dongguan). is located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.

1.4 Description of Auxiliary Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Integral Sphere	EVERFINE	Diameter 0.3M	1011119	380-780nm, length:0.3M ,0-1999LUMEN	2013-03-08	2014-03-08
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2013-03-25	2014-03-25
Standard Light Source	EVERFINE	D062	1011064	N/A	2013-03-08	2014-03-08
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2013-03-08	2014-03-08

1.5 Operating Cycle

Samples are driven with a constant direct current (DC)

1.6 Ambient Conditions

For lumen maintenance test, samples were operated in thermal chambers with minimal ambient airflow. For long term reliability test, the case temperature was controlled by mounting several thermocouples on a sample reliability stress board at the designated thermal measurement point, as shown in APPENDIX. The ambient temperature T_A was measured by several thermocouples at a distance of 5 mm above the reliability test board. The relative humidity within chamber was less than 65%.

For photometry measurement, temperature was set to 25°C ± 2°C, RH <65%.

1.7 Photometry Measurement Uncertainty

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=21K (K=2), at the 95% confidence level. This calibration results traceable to the NATIONAL INSTITUTE OF METROLOGY (NIM).

1.8 Sample Set

Data Set 1: 55°C,20mA	
Part Number:	T3527
Number of Units:	25
Actual Case Temperature(T_S):	T_S =55.9℃
Actual Ambient Temperature(T_A):	T_A =55.3℃
Life Test Drive Current:	I_F = 20mA
Measurement Current:	I_F = 20mA

Data Set 2: 70°C, 20mA	
Part Number:	T3527
Number of Units:	25
Actual Case Temperature(T_S):	T_S =71.8℃
Actual Ambient Temperature(T_A):	T_A =70.2℃
Life Test Drive Current:	I_F = 20mA
Measurement Current:	I_F =20mA

Data Set 3: 85°C, 20mA	
Part Number:	T3527
Number of Units:	25
Actual Case Temperature(T_S):	T_S =85.4℃
Actual Ambient Temperature(T_A):	T_A =84.6℃
Life Test Drive Current:	I_F = 20mA
Measurement Current:	I_F =20mA

2 - SUMMARY OF TEST RESULT

Data Set:	**Data Set 1, 55°C, 20mA**
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	96.78%
Average Chromaticity Shift at 6000 hours (Δu'v'):	0.0014
Reported TM-21 L_{70} Lifetime:	>36,000 hours

Data Set:	**Data Set 2, 70°C, 20mA**
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	96.17%
Average Chromaticity Shift at 6000 hours(Δu'v'):	0.0014
Reported TM-21 L_{70} Lifetime	>36,000 hours

Data Set:	**Data Set 3, 85°C, 20mA**
Number of Units:	25
Failures Observed:	0
Test Interval and Test Duration:	0h,1000h,2000h,3000h,4000h,5000h,6000h
Average. Lumen Maintenance at 6000 hours:	95.63%
Average Chromaticity Shift at 6000 hours(Δu'v'):	0.0014
Reported TM-21 L_{70} Lifetime	>36,000 hours

3 - Test Data

3.1 Data Set 1, 55°C, 20mA (Lumen Maintenance)

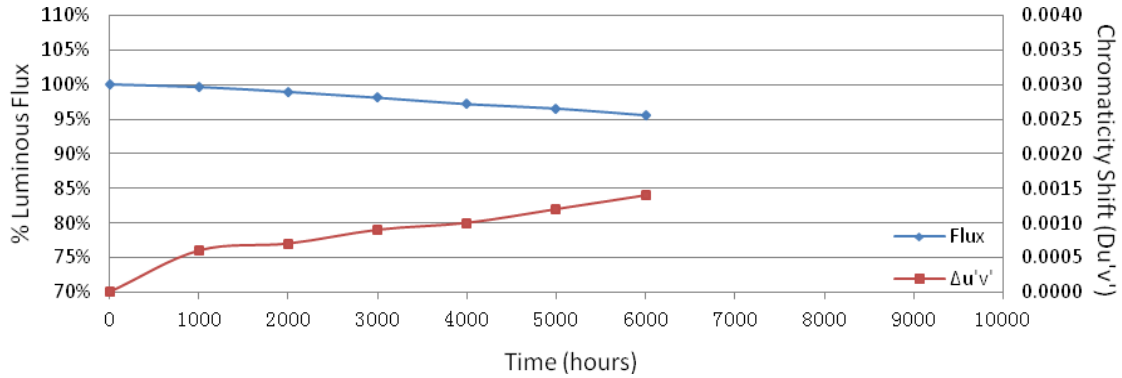
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3.124	6.730	99.76	99.47	98.84	98.19	97.82	96.57
2	3.126	6.814	99.49	99.10	98.72	97.99	97.59	96.57
3	3.144	6.850	99.84	99.15	98.91	97.93	97.61	96.76
4	3.142	6.706	100.27	99.25	98.49	97.97	97.60	96.66
5	3.130	6.677	99.69	99.21	98.37	97.92	97.72	96.51
6	3.156	6.720	99.90	99.49	98.51	97.77	97.56	96.59
7	3.148	6.782	99.85	99.34	98.72	98.19	97.71	96.82
8	3.136	6.539	99.50	99.16	98.88	98.20	97.61	96.93
9	3.141	6.810	99.72	99.03	98.85	98.25	97.75	96.89
10	3.132	6.716	99.43	98.97	98.85	97.87	97.53	96.61
11	3.125	6.875	99.68	99.26	98.84	97.99	97.86	97.03
12	3.137	6.764	99.79	99.19	98.57	97.96	97.84	96.94
13	3.144	6.807	99.85	99.40	98.77	98.08	97.83	96.96
14	3.116	6.634	99.64	99.31	98.58	97.87	97.68	96.86
15	3.149	6.452	99.81	99.38	98.45	97.86	97.66	96.99
16	3.130	6.719	99.82	99.48	98.50	97.98	97.51	96.96
17	3.154	6.890	99.65	99.35	98.82	98.07	97.76	96.52
18	3.121	6.972	99.54	99.27	98.97	98.18	97.68	96.96
19	3.132	6.825	99.65	99.27	98.95	98.18	97.67	96.57
20	3.149	6.528	100.14	99.68	98.97	98.22	97.56	96.57
21	3.142	6.749	99.56	99.29	98.65	98.15	97.53	96.67
22	3.147	6.590	99.67	99.27	98.97	98.16	97.78	96.81
23	3.152	6.674	99.82	99.52	98.82	98.16	97.84	96.96
24	3.143	6.849	99.45	99.02	98.51	97.82	97.78	97.02
25	3.146	6.671	100.09	99.66	98.91	97.99	97.80	96.72
Ave.	3.139	6.734	99.74	99.30	98.74	98.04	97.69	96.78
Med.	3.142	6.730	99.72	99.27	98.82	97.99	97.68	96.81
st dev	0.0110	0.1224	0.2100	0.1825	0.1877	0.1424	0.1115	0.1807
Min.	3.116	6.452	99.43	98.97	98.37	97.77	97.51	96.51
Max.	3.156	6.972	100.27	99.68	98.97	98.25	97.86	97.03

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 5.978E-06
β: 1.005
Calculated L_{70}: 60,000 hours
Reported L_{70}: >36,000 hours

3.2 Data Set 1, 55°C, 20mA (Chromaticity Shift)

No.	u'	v'	Chromaticity Shift (Δu'v')					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2605	0.5261	0.0011	0.0013	0.0013	0.0013	0.0014	0.0016
2	0.2580	0.5254	0.0009	0.0009	0.0011	0.0014	0.0015	0.0016
3	0.2565	0.5219	0.0005	0.0009	0.0011	0.0012	0.0015	0.0017
4	0.2576	0.5233	0.0005	0.0008	0.0010	0.0011	0.0014	0.0013
5	0.2611	0.5282	0.0006	0.0009	0.0011	0.0012	0.0011	0.0016
6	0.2594	0.5240	0.0001	0.0004	0.0005	0.0005	0.0009	0.0015
7	0.2617	0.5276	0.0005	0.0007	0.0008	0.0008	0.0010	0.0010
8	0.2656	0.5321	0.0013	0.0014	0.0013	0.0013	0.0013	0.0016
9	0.2611	0.5281	0.0009	0.0011	0.0010	0.0010	0.0013	0.0016
10	0.2626	0.5300	0.0005	0.0009	0.0010	0.0010	0.0013	0.0014
11	0.2580	0.5240	0.0002	0.0005	0.0007	0.0008	0.0009	0.0015
12	0.2564	0.5219	0.0004	0.0008	0.0009	0.0012	0.0016	0.0018
13	0.2618	0.5273	0.0011	0.0013	0.0014	0.0014	0.0013	0.0012
14	0.2608	0.5278	0.0004	0.0006	0.0013	0.0014	0.0016	0.0019
15	0.2623	0.5316	0.0008	0.0011	0.0012	0.0012	0.0011	0.0015
16	0.2613	0.5312	0.0008	0.0012	0.0014	0.0014	0.0016	0.0017
17	0.2575	0.5240	0.0003	0.0005	0.0006	0.0007	0.0009	0.0011
18	0.2560	0.5230	0.0007	0.0008	0.0011	0.0012	0.0016	0.0015
19	0.2567	0.5238	0.0001	0.0006	0.0007	0.0008	0.0012	0.0014
20	0.2590	0.5291	0.0007	0.0008	0.0008	0.0009	0.0014	0.0013
21	0.2574	0.5208	0.0006	0.0008	0.0009	0.0011	0.0012	0.0013
22	0.2621	0.5309	0.0004	0.0008	0.0009	0.0009	0.0011	0.0012
23	0.2605	0.5279	0.0004	0.0006	0.0007	0.0008	0.0011	0.0012
24	0.2643	0.5323	0.0004	0.0009	0.0011	0.0013	0.0012	0.0014
25	0.2624	0.5291	0.0002	0.0003	0.0005	0.0005	0.0006	0.0011
Ave.	0.2600	0.5269	0.0006	0.0008	0.0010	0.0011	0.0012	0.0014
Med.	0.2605	0.5276	0.0005	0.0008	0.0010	0.0011	0.0013	0.0015
st dev	0.0026	0.0035	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
Min.	0.2560	0.5208	0.0001	0.0003	0.0005	0.0005	0.0006	0.0010
Max.	0.2656	0.5323	0.0013	0.0014	0.0014	0.0014	0.0016	0.0019



3.3 Data Set 2, 70°C, 20mA (Lumen Maintenance)

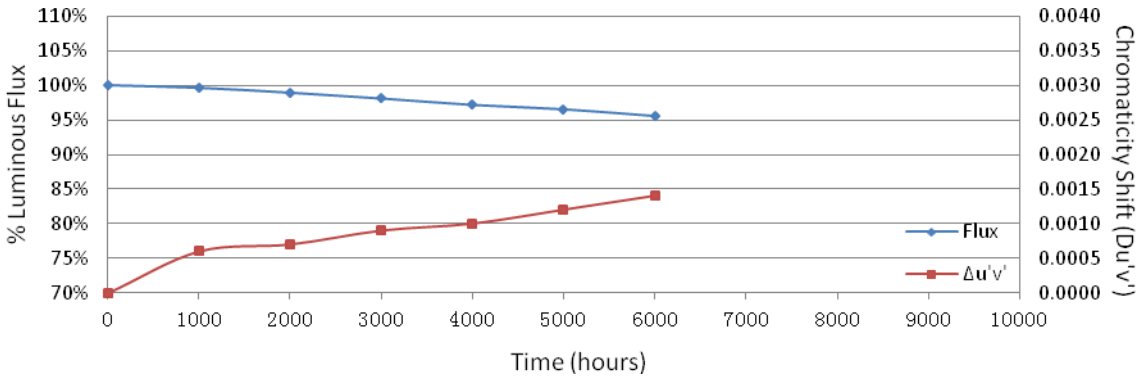
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3.148	6.548	100.18	99.50	98.85	97.89	97.14	96.41
2	3.153	6.809	99.59	99.07	98.27	97.53	97.15	96.34
3	3.148	6.800	99.87	99.26	98.28	97.24	96.96	96.29
4	3.125	6.821	99.63	98.93	98.39	97.83	97.10	96.29
5	3.144	6.855	99.61	99.01	98.34	97.77	96.97	96.22
6	3.138	6.843	99.44	98.92	98.38	97.54	97.09	96.42
7	3.158	6.771	99.48	99.01	98.20	97.50	97.02	96.49
8	3.129	6.873	99.68	98.95	98.20	97.50	97.19	96.04
9	3.143	6.815	99.63	99.09	98.17	97.37	96.89	96.20
10	3.153	6.771	100.04	99.45	98.76	98.01	96.96	96.01
11	3.139	6.887	99.40	98.93	98.53	97.87	96.95	96.01
12	3.145	6.879	99.83	99.22	98.39	97.54	97.06	96.12
13	3.150	6.729	99.41	98.80	98.41	97.61	96.86	96.24
14	3.154	6.864	100.19	99.55	98.06	97.58	96.87	96.17
15	3.159	6.560	99.94	99.42	98.46	97.65	96.92	96.08
16	3.145	6.866	100.10	99.45	97.73	97.61	96.90	96.18
17	3.130	6.552	100.02	99.47	98.67	97.57	96.93	96.17
18	3.150	6.816	100.09	99.47	98.69	97.77	97.02	96.45
19	3.132	6.723	99.46	98.88	98.04	97.52	96.80	96.07
20	3.156	6.305	99.79	99.16	98.68	97.56	97.07	96.07
21	3.119	6.748	99.48	98.89	98.28	97.45	97.15	96.15
22	3.159	6.140	99.45	99.15	98.60	97.69	97.17	95.93
23	3.132	6.445	99.39	98.82	98.03	97.22	97.07	95.90
24	3.140	6.764	99.84	99.32	98.71	97.47	97.16	96.04
25	3.130	6.742	99.67	99.17	98.43	97.42	97.17	96.00
Ave.	3.143	6.717	99.73	99.16	98.38	97.59	97.02	96.17
Med.	3.145	6.771	99.67	99.15	98.39	97.56	97.02	96.17
st dev	0.0114	0.1905	0.2653	0.2410	0.2702	0.1912	0.1156	0.1636
Min.	3.119	6.140	99.39	98.80	97.73	97.22	96.80	95.90
Max.	3.159	6.887	100.19	99.55	98.85	98.01	97.19	96.49

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 7.284E-06
β: 1.005
Calculated L_{70}: 50,000 hours
Reported L_{70}: >36,000 hours

3.4 Data Set 2, 70°C, 20mA (Chromaticity Shift)

No.	u'	v'	Chromaticity Shift (Δu'v')					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2581	0.5287	0.0005	0.0005	0.0007	0.0009	0.0012	0.0013
2	0.2599	0.5267	0.0009	0.0010	0.0012	0.0013	0.0014	0.0016
3	0.2582	0.5236	0.0006	0.0007	0.0007	0.0008	0.0013	0.0014
4	0.2596	0.5283	0.0002	0.0008	0.0008	0.0011	0.0011	0.0011
5	0.2640	0.5327	0.0001	0.0008	0.0009	0.0011	0.0015	0.0017
6	0.2605	0.5289	0.0007	0.0010	0.0012	0.0012	0.0012	0.0014
7	0.2621	0.5271	0.0003	0.0006	0.0009	0.0009	0.0013	0.0015
8	0.2600	0.5250	0.0004	0.0004	0.0006	0.0008	0.0010	0.0014
9	0.2629	0.5314	0.0005	0.0009	0.0009	0.0012	0.0016	0.0017
10	0.2581	0.5206	0.0005	0.0005	0.0006	0.0007	0.0008	0.0009
11	0.2620	0.5310	0.0004	0.0006	0.0006	0.0009	0.0014	0.0015
12	0.2572	0.5228	0.0004	0.0010	0.0010	0.0010	0.0011	0.0014
13	0.2610	0.5278	0.0005	0.0008	0.0010	0.0011	0.0013	0.0015
14	0.2593	0.5249	0.0005	0.0008	0.0008	0.0010	0.0010	0.0014
15	0.2587	0.5240	0.0008	0.0009	0.0011	0.0013	0.0016	0.0017
16	0.2607	0.5305	0.0006	0.0007	0.0007	0.0008	0.0012	0.0014
17	0.2605	0.5293	0.0004	0.0006	0.0008	0.0008	0.0009	0.0011
18	0.2571	0.5240	0.0003	0.0007	0.0008	0.0009	0.0010	0.0012
19	0.2624	0.5289	0.0007	0.0009	0.0011	0.0011	0.0013	0.0014
20	0.2606	0.5285	0.0002	0.0007	0.0009	0.0008	0.0013	0.0014
21	0.2596	0.5267	0.0002	0.0007	0.0009	0.0010	0.0012	0.0013
22	0.2630	0.5319	0.0004	0.0007	0.0008	0.0010	0.0014	0.0015
23	0.2643	0.5337	0.0001	0.0005	0.0007	0.0012	0.0013	0.0015
24	0.2652	0.5294	0.0008	0.0008	0.0008	0.0008	0.0009	0.0010
25	0.2590	0.5265	0.0007	0.0009	0.0009	0.0010	0.0010	0.0013
Ave.	0.2606	0.5277	0.0005	0.0007	0.0009	0.0010	0.0012	0.0014
Med.	0.2605	0.5283	0.0005	0.0007	0.0008	0.0010	0.0012	0.0014
st dev	0.0022	0.0033	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2571	0.5206	0.0001	0.0004	0.0006	0.0007	0.0008	0.0009
Max.	0.2652	0.5337	0.0009	0.0010	0.0012	0.0013	0.0016	0.0017



3.5 Data Set 3, 85°C, 20mA (Lumen Maintenance)

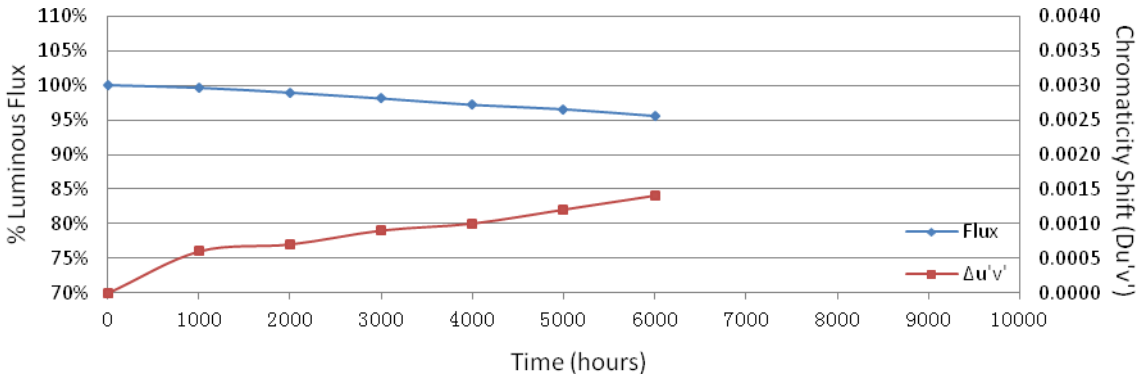
No.	V_F(V)	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3.150	6.723	99.90	99.26	98.26	97.37	96.45	95.43
2	3.148	6.840	99.77	98.89	98.06	97.09	96.68	95.48
3	3.130	6.828	99.82	99.08	98.10	97.25	96.51	95.71
4	3.145	6.804	99.43	98.68	97.87	97.09	96.65	95.63
5	3.143	6.768	99.42	98.88	98.30	97.37	96.69	95.61
6	3.141	6.836	99.40	98.73	98.14	97.40	96.66	95.76
7	3.154	6.867	99.59	98.97	98.30	97.39	96.52	95.43
8	3.131	6.652	99.49	98.89	97.97	97.23	96.53	95.70
9	3.139	6.775	99.32	98.72	97.89	97.23	96.63	95.68
10	3.138	6.753	99.59	98.92	98.05	96.95	96.43	95.44
11	3.135	6.852	99.62	98.64	98.29	97.45	96.58	95.55
12	3.149	6.912	99.58	98.86	98.23	97.32	96.76	95.72
13	3.124	6.186	99.68	99.00	98.12	97.12	96.78	95.64
14	3.134	6.525	99.74	99.03	98.28	97.38	96.63	95.63
15	3.136	6.819	99.49	98.75	97.80	96.99	96.64	96.67
16	3.140	6.747	99.93	99.23	98.21	97.18	96.41	95.73
17	3.142	6.892	99.61	98.84	98.11	97.17	96.56	95.68
18	3.142	6.722	99.49	98.97	98.10	97.17	96.65	95.48
19	3.157	6.884	99.54	98.77	98.02	97.02	96.40	95.45
20	3.131	6.879	99.36	98.88	98.18	97.02	96.58	95.64
21	3.148	6.787	99.79	98.85	98.22	96.91	96.51	95.59
22	3.137	6.491	99.54	98.83	98.17	96.90	96.40	95.56
23	3.126	6.825	99.87	99.24	98.30	97.44	96.70	95.66
24	3.125	6.737	99.82	99.14	98.26	97.39	96.42	95.56
25	3.150	6.807	99.88	99.19	97.88	97.52	96.75	95.42
Ave.	3.140	6.756	99.63	98.93	98.12	97.21	96.58	95.63
Med.	3.140	6.804	99.59	98.89	98.14	97.23	96.58	95.63
st dev	0.0091	0.1570	0.1826	0.1796	0.1508	0.1834	0.1197	0.2406
Min.	3.124	6.186	99.32	98.64	97.80	96.90	96.40	95.42
Max.	3.157	6.912	99.93	99.26	98.30	97.52	96.78	96.67

TM-21 Projection:

Test Duration: 6000 hours
Failures Observed: 0
α: 8.151E-06
β: 1.005
Calculated L_{70}: 44,000 hours
Reported L_{70}: >36,000 hours

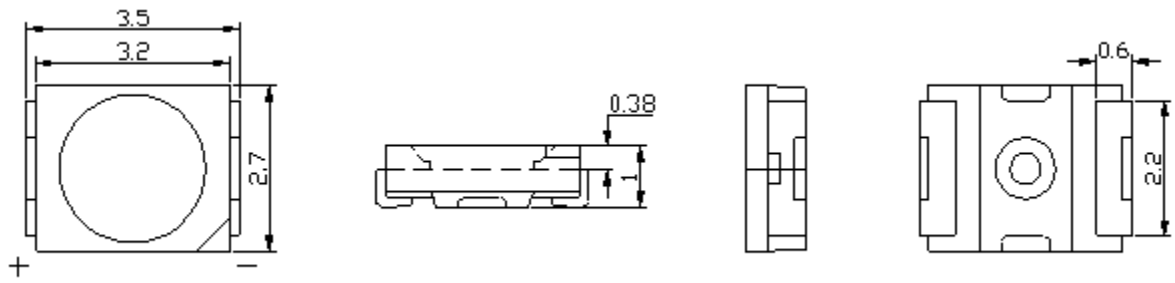
3.6 Data Set 3, 85°C, 20mA (Chromaticity Shift)

No.	u'	v'	Chromaticity Shift (Δu'v')					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2621	0.5263	0.0009	0.0010	0.0012	0.0012	0.0012	0.0014
2	0.2596	0.5243	0.0006	0.0006	0.0008	0.0009	0.0013	0.0013
3	0.2617	0.5296	0.0008	0.0009	0.0011	0.0013	0.0013	0.0014
4	0.2610	0.5291	0.0002	0.0004	0.0004	0.0006	0.0010	0.0014
5	0.2603	0.5265	0.0004	0.0008	0.0009	0.0011	0.0011	0.0017
6	0.2604	0.5284	0.0007	0.0009	0.0009	0.0009	0.0014	0.0016
7	0.2560	0.5232	0.0004	0.0005	0.0007	0.0007	0.0012	0.0014
8	0.2575	0.5230	0.0007	0.0010	0.0012	0.0013	0.0012	0.0014
9	0.2627	0.5325	0.0006	0.0008	0.0012	0.0012	0.0015	0.0016
10	0.2618	0.5306	0.0005	0.0005	0.0006	0.0009	0.0012	0.0015
11	0.2628	0.5315	0.0007	0.0010	0.0011	0.0012	0.0016	0.0019
12	0.2600	0.5243	0.0006	0.0006	0.0009	0.0011	0.0009	0.0011
13	0.2608	0.5259	0.0005	0.0005	0.0006	0.0009	0.0012	0.0014
14	0.2668	0.5331	0.0006	0.0009	0.0010	0.0011	0.0012	0.0012
15	0.2620	0.5301	0.0006	0.0007	0.0016	0.0017	0.0018	0.0019
16	0.2644	0.5304	0.0006	0.0007	0.0009	0.0009	0.0008	0.0011
17	0.2597	0.5241	0.0003	0.0004	0.0006	0.0008	0.0013	0.0015
18	0.2569	0.5240	0.0005	0.0009	0.0011	0.0013	0.0015	0.0016
19	0.2579	0.5260	0.0007	0.0008	0.0010	0.0012	0.0012	0.0015
20	0.2564	0.5235	0.0006	0.0009	0.0006	0.0007	0.0011	0.0011
21	0.2579	0.5285	0.0002	0.0006	0.0006	0.0007	0.0007	0.0009
22	0.2653	0.5335	0.0004	0.0005	0.0006	0.0007	0.0008	0.0010
23	0.2595	0.5255	0.0005	0.0007	0.0007	0.0009	0.0013	0.0016
24	0.2578	0.5237	0.0007	0.0009	0.0011	0.0012	0.0012	0.0016
25	0.2581	0.5230	0.0006	0.0007	0.0009	0.0010	0.0011	0.0012
Ave.	0.2604	0.5272	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014
Med.	0.2603	0.5263	0.0006	0.0007	0.0009	0.0010	0.0012	0.0014
st dev	0.0028	0.0034	0.0002	0.0002	0.0003	0.0003	0.0002	0.0003
Min.	0.2560	0.5230	0.0002	0.0004	0.0004	0.0006	0.0007	0.0009
Max.	0.2668	0.5335	0.0009	0.0010	0.0016	0.0017	0.0018	0.0019



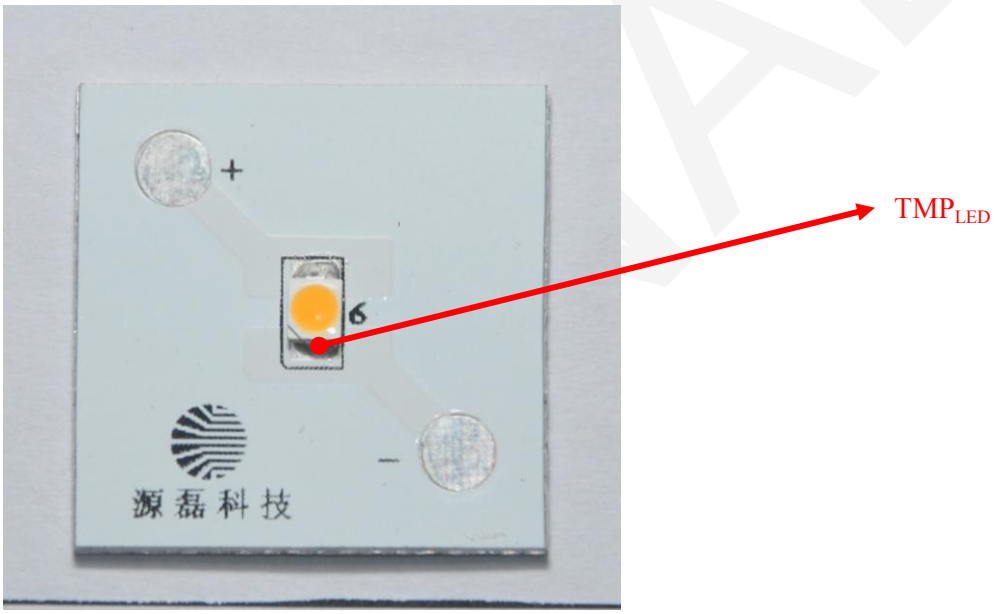
Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

A.2 EUT Photo



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