



**IES LM-80-2008
MEASURING LUMEN MAINTENANCE
OF LED LIGHT SOURCES**

MEASUREMENT AND TEST REPORT

For

Guangzhou Hongli Opto-Electronic Co., Ltd.

West side of Dongfeng Highway, Automobile industrial Base, Huadu Dist, Guangzhou, China

Model: 3528HW

Report Type: Original Report	Product Type: LED Package
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Report Number:	RSZ110803501-10
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Report Date:	2012-04-09
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1 - GENERAL INFORMATION

1.1 Description of LED light sources

Devices tested

Part Number: 3528HW

Part Name: /

Part Type: LED Package

Nominal CCT: 6500K

1.2 Standards Used:

- IESNA LM-80-08: IES 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

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.

Bay Area Compliance Laboratories Corp. (Dongguan). is the International Accreditation Service (IAS) accredited laboratory. The IAS Lab Code is TL-460.

Bay Area Compliance Laboratories Corp. (Dongguan) is recognized by EPA to test LED package, module or array (IES LM-80-2008) for the ENERGY STAR program.

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, lamp length:0.3M ,0- 1999LUMEN	2012-02-19	2013-02-18
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	15V/2000mA	2012-02-15	2013-02-14
Standard Light Source	EVERFINE	D062	1011064	N/A	2012-02-23	2013-02-22
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	/	2012-02-15	2013-02-14

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 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 50 mm above the reliability test board. The relative humidity within chamber was less than 65%.

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

1.7 Photometry Measurement Uncertainty

The uncertainty of the light output measurements is $U=1.50\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=14\text{K}$ ($K=2$), 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:	3528HW
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 54.9^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 54.8^\circ\text{C}$
Life Test Drive Current:	$I_F = 20\text{mA}$
Measurement Current:	$I_F = 20\text{mA}$

Data Set 2: 70°C , 20mA

Part Number:	3528HW
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 69.9^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 69.8^\circ\text{C}$
Life Test Drive Current:	$I_F = 20\text{mA}$
Measurement Current:	$I_F = 20\text{mA}$

Data Set 3: 85°C , 20mA

Part Number:	3528HW
Number of Units:	25
Actual Case Temperature(T_S):	$T_S = 84.8^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A = 84.6^\circ\text{C}$
Life Test Drive Current:	$I_F = 20\text{mA}$
Measurement Current:	$I_F = 20\text{mA}$

2 - SUMMARY OF TEST RESULT

Data Set: **Data Set 1, 55°C, 20mA**

Number of Units: 25
Failures Observed: N/A
Average. Lumen Maintenance at 6000 hours: 101.32%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$): 0.0024
Reported TM-21 L₇₀ Lifetime >36000

Data Set: **Data Set 2, 70°C, 20mA**

Number of Units: 25
Failures Observed: N/A
Average. Lumen Maintenance at 6000 hours: 100.01%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$): 0.0022
Reported TM-21 L₇₀ Lifetime >36000

Data Set: **Data Set 3, 85°C, 20mA**

Number of Units: 25
Failures Observed: N/A
Average. Lumen Maintenance at 6000 hours: 99.13%
Average Chromaticity Shift at 6000 hours ($\Delta u'v'$): 0.0015
Reported TM-21 L₇₀ Lifetime >36000

3 - Test Data

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

Data Set 1	VF	Φ(lm)	Lumen maintenance (%)									
			0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.024	7.802	102.36	100.14	101.36	100.85	100.67	100.19				
2	3.031	7.516	103.58	102.01	105.84	105.20	104.23	102.82				
3	3.018	7.473	103.04	103.25	106.25	105.77	104.31	103.28				
4	3.016	8.026	102.19	99.94	100.85	100.45	99.44	99.05				
5	3.026	7.642	101.99	101.53	104.42	104.08	103.35	102.07				
6	3.026	7.590	100.83	100.76	104.15	103.65	103.28	102.09				
7	3.022	7.542	102.17	102.19	105.10	104.64	104.19	102.63				
8	3.023	7.513	102.40	102.01	104.75	103.94	102.65	101.38				
9	3.017	7.798	99.08	99.15	101.38	100.73	100.00	99.51				
10	3.024	7.943	101.91	99.71	100.65	99.89	99.36	99.13				
11	3.026	7.530	104.04	105.27	106.39	104.99	103.68	102.22				
12	3.025	7.439	103.90	105.38	106.22	105.61	104.58	102.85				
13	3.019	7.712	99.70	100.23	101.96	101.45	100.34	98.98				
14	3.030	7.418	103.95	104.85	106.69	105.51	103.95	102.10				
15	3.024	7.861	101.90	100.03	100.59	100.08	99.03	98.65				
16	3.028	7.480	103.16	104.53	106.07	105.61	104.32	103.10				
17	3.021	7.560	102.31	103.62	105.50	105.09	103.60	101.92				
18	3.022	7.459	103.31	104.73	105.55	105.05	104.14	102.75				
19	3.021	7.568	102.29	103.66	104.82	102.63	102.27	100.81				
20	3.018	7.873	99.12	100.06	101.71	101.23	99.95	99.56				
21	3.018	7.523	102.59	104.60	105.85	102.50	101.95	100.64				
22	3.022	7.625	101.90	103.58	104.50	103.93	102.65	100.80				
23	3.026	7.560	102.34	103.51	104.71	104.10	103.56	102.04				
24	3.020	7.662	102.00	102.34	103.15	102.41	101.57	100.80				
25	3.024	7.296	103.48	105.56	106.35	105.83	104.45	103.74				
Ave.	3.023	7.616	102.22	102.51	104.19	103.41	102.46	101.32				
Med.	3.023	7.560	102.31	102.34	104.75	103.94	103.28	101.92				
st dev	0.004	0.179	0.013	0.021	0.021	0.020	0.019	0.015				
Min.	3.016	7.296	99.08	99.15	100.59	99.89	99.03	98.65				
Max.	3.031	8.026	104.04	105.56	106.69	105.83	104.58	103.74				

TM-21 Projection:

Test Duration: 6000 hours

α : 1.520E-06

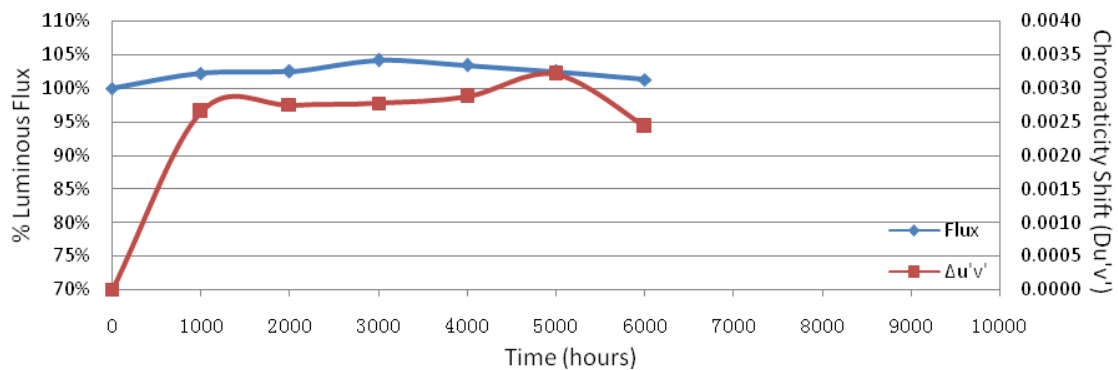
β : 1.032

Calculated L_{70} : 256,000

Reported L_{70} : >36000

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

Data Set 1	u'	v'	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2005	0.4583	0.0015	0.0017	0.0014	0.0014	0.0016	0.0017				
2	0.2017	0.4591	0.0032	0.0033	0.0033	0.0034	0.0037	0.0031				
3	0.2014	0.4619	0.0028	0.0026	0.0029	0.0031	0.0032	0.0030				
4	0.1989	0.4671	0.0014	0.0015	0.0014	0.0016	0.0019	0.0010				
5	0.2003	0.4625	0.0031	0.0028	0.0030	0.0031	0.0036	0.0025				
6	0.2002	0.4603	0.0014	0.0025	0.0031	0.0031	0.0038	0.0028				
7	0.2001	0.463	0.0034	0.0031	0.0033	0.0035	0.0038	0.0031				
8	0.2001	0.4617	0.0034	0.0032	0.0034	0.0035	0.0045	0.0032				
9	0.1999	0.4631	0.0013	0.0013	0.0014	0.0014	0.0018	0.0016				
10	0.2012	0.4666	0.0016	0.0017	0.0015	0.0016	0.0021	0.0017				
11	0.2004	0.463	0.0033	0.0031	0.0032	0.0036	0.0037	0.0028				
12	0.2021	0.461	0.0035	0.0036	0.0036	0.0036	0.0040	0.0029				
13	0.2013	0.4641	0.0015	0.0016	0.0016	0.0016	0.0019	0.0018				
14	0.2028	0.4595	0.0039	0.0038	0.0040	0.0039	0.0043	0.0057				
15	0.2007	0.4597	0.0015	0.0015	0.0015	0.0015	0.0017	0.0017				
16	0.2016	0.4624	0.0030	0.0030	0.0031	0.0032	0.0036	0.0022				
17	0.2019	0.4649	0.0034	0.0034	0.0035	0.0036	0.0038	0.0026				
18	0.2039	0.461	0.0037	0.0038	0.0039	0.0040	0.0045	0.0033				
19	0.2007	0.459	0.0032	0.0032	0.0034	0.0037	0.0038	0.0027				
20	0.2011	0.4636	0.0014	0.0016	0.0015	0.0015	0.0017	0.0011				
21	0.1995	0.4632	0.0035	0.0036	0.0034	0.0036	0.0038	0.0021				
22	0.2019	0.4645	0.0029	0.0031	0.0031	0.0034	0.0037	0.0019				
23	0.2021	0.4628	0.0032	0.0037	0.0031	0.0031	0.0037	0.0022				
24	0.2025	0.4619	0.0017	0.0025	0.0024	0.0023	0.0025	0.0015				
25	0.2012	0.4564	0.0033	0.0034	0.0032	0.0033	0.0036	0.0025				
Ave.	0.2011	0.4620	0.0026	0.0028	0.0028	0.0029	0.0032	0.0024				
Med.	0.2012	0.4624	0.0031	0.0031	0.0031	0.0032	0.0037	0.0025				
st dev	0.0011	0.0025	0.0009	0.0008	0.0009	0.0009	0.0010	0.0009				
Min.	0.1989	0.4564	0.0013	0.0013	0.0014	0.0014	0.0016	0.0010				
Max.	0.2039	0.4671	0.0039	0.0038	0.0040	0.0040	0.0045	0.0057				



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

Data Set 2	VF	Φ(lm)	Lumen maintenance (%)									
			0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.032	7.443	103.39	100.99	102.83	101.32	100.55	99.45				
2	3.032	7.834	101.86	98.02	99.62	99.40	98.39	97.79				
3	3.024	8.021	101.06	98.94	99.39	99.34	98.20	97.93				
4	3.024	7.878	99.10	100.77	101.50	101.17	100.15	99.02				
5	3.025	7.321	105.31	107.06	107.28	106.87	105.60	103.17				
6	3.027	7.752	100.22	100.28	101.28	101.06	100.05	99.12				
7	3.023	7.861	102.44	100.36	99.82	99.86	98.73	98.10				
8	3.024	7.455	103.02	103.51	104.52	104.52	103.31	100.76				
9	3.020	7.470	102.81	104.87	105.31	104.94	103.98	101.27				
10	3.026	7.939	102.04	100.14	100.49	100.06	98.77	98.40				
11	3.021	7.518	101.52	103.37	103.41	102.08	101.57	99.81				
12	3.023	7.414	102.99	101.66	104.03	103.56	102.39	100.73				
13	3.025	7.512	103.17	101.74	104.98	100.24	98.67	98.16				
14	3.026	7.434	103.81	105.54	106.01	105.64	104.06	101.30				
15	3.029	7.486	103.62	105.26	105.94	105.58	104.25	102.20				
16	3.023	7.440	103.43	104.49	106.01	105.59	104.13	102.45				
17	3.025	7.146	106.05	103.69	106.84	106.54	105.14	103.08				
18	3.015	7.550	102.57	104.21	104.87	99.81	98.37	97.83				
19	3.023	7.674	99.93	101.94	102.14	101.38	100.42	99.43				
20	3.021	7.833	100.52	100.55	101.19	100.65	100.00	99.00				
21	3.021	7.638	99.14	99.96	101.32	100.68	99.83	99.07				
22	3.024	7.926	102.37	99.04	100.62	100.15	99.50	98.81				
23	3.024	7.450	103.49	105.41	105.50	104.91	103.81	101.34				
24	3.021	7.626	99.31	101.82	102.02	101.30	99.61	98.54				
25	3.024	7.298	105.55	104.26	107.26	106.73	105.22	103.48				
Ave.	3.024	7.597	102.35	102.32	103.37	102.54	101.39	100.01				
Med.	3.024	7.518	102.57	101.82	103.41	101.32	100.42	99.43				
st dev	0.004	0.229	0.019	0.024	0.026	0.026	0.025	0.018				
Min.	3.015	7.146	99.10	98.02	99.39	99.34	98.20	97.79				
Max.	3.032	8.021	106.05	107.06	107.28	106.87	105.60	103.48				

TM-21 Projection:

Test Duration: 6000 hours

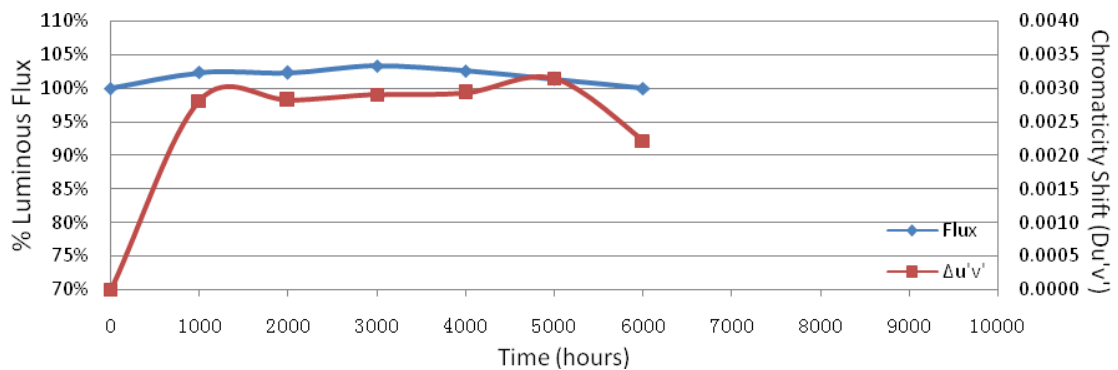
α: 4.317E-06

β: 1.035

Calculated L₇₀: 91,000Reported L₇₀: >36000

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

Data Set 2	u'	v'	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.2017	0.456	0.0035	0.0036	0.0035	0.0039	0.0042	0.0035				
2	0.2021	0.4604	0.0011	0.0009	0.0011	0.0011	0.0011	0.0010				
3	0.2004	0.4657	0.0010	0.0012	0.0010	0.0010	0.0011	0.0009				
4	0.1995	0.4619	0.0015	0.0017	0.0017	0.0017	0.0019	0.0010				
5	0.2031	0.4592	0.0040	0.0044	0.0045	0.0046	0.0049	0.0040				
6	0.2004	0.4598	0.0030	0.0015	0.0015	0.0015	0.0018	0.0016				
7	0.2007	0.4621	0.0016	0.0019	0.0016	0.0017	0.0021	0.0019				
8	0.2007	0.4574	0.0036	0.0032	0.0034	0.0036	0.0041	0.0024				
9	0.2017	0.4582	0.0034	0.0035	0.0038	0.0040	0.0043	0.0029				
10	0.2002	0.4683	0.0021	0.0020	0.0016	0.0015	0.0018	0.0017				
11	0.2021	0.4607	0.0028	0.0030	0.0033	0.0034	0.0039	0.0029				
12	0.2006	0.463	0.0034	0.0030	0.0030	0.0030	0.0032	0.0028				
13	0.2005	0.461	0.0037	0.0035	0.0039	0.0036	0.0039	0.0031				
14	0.2011	0.459	0.0040	0.0041	0.0045	0.0046	0.0045	0.0035				
15	0.2026	0.4625	0.0038	0.0038	0.0041	0.0041	0.0044	0.0029				
16	0.2013	0.463	0.0034	0.0035	0.0037	0.0037	0.0040	0.0027				
17	0.205	0.4573	0.0050	0.0047	0.0051	0.0051	0.0052	0.0025				
18	0.1994	0.4659	0.0036	0.0037	0.0040	0.0039	0.0039	0.0026				
19	0.2023	0.4613	0.0020	0.0022	0.0021	0.0021	0.0024	0.0011				
20	0.2006	0.4654	0.0015	0.0017	0.0015	0.0015	0.0017	0.0012				
21	0.2001	0.4687	0.0016	0.0023	0.0020	0.0019	0.0017	0.0009				
22	0.1992	0.466	0.0017	0.0016	0.0018	0.0019	0.0021	0.0019				
23	0.2023	0.4611	0.0036	0.0037	0.0037	0.0038	0.0040	0.0019				
24	0.2008	0.4586	0.0016	0.0018	0.0017	0.0018	0.0021	0.0019				
25	0.2033	0.4608	0.0039	0.0041	0.0043	0.0042	0.0045	0.0026				
Ave.	0.2013	0.4617	0.0028	0.0028	0.0029	0.0029	0.0031	0.0022				
Med.	0.2008	0.4611	0.0034	0.0030	0.0033	0.0034	0.0039	0.0024				
st dev	0.0014	0.0034	0.0011	0.0011	0.0013	0.0013	0.0013	0.0009				
Min.	0.1992	0.4560	0.0010	0.0009	0.0010	0.0010	0.0011	0.0009				
Max.	0.2050	0.4687	0.0050	0.0047	0.0051	0.0051	0.0052	0.0040				



3.5 Data Set 1, 85°C, 20mA (Lumen maintenance)

Data Set 3	VF	Φ(lm)	Lumen maintenance (%)									
			0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.010	7.619	100.09	98.90	103.70	102.26	101.40	99.21				
2	3.012	7.503	101.75	102.91	103.23	102.45	101.53	100.19				
3	3.018	7.349	101.40	103.01	103.63	102.99	101.96	100.03				
4	3.008	7.533	101.09	101.02	101.43	100.36	99.35	98.70				
5	3.017	7.538	100.62	101.68	102.16	100.97	99.79	99.63				
6	3.017	7.504	104.26	106.20	106.94	105.77	104.88	102.88				
7	3.010	7.651	100.37	100.77	101.25	100.10	99.27	98.58				
8	3.007	7.454	99.93	101.91	106.43	105.77	104.13	102.56				
9	3.012	7.550	100.98	102.36	102.86	91.87	91.52	91.10				
10	3.023	7.540	100.66	101.78	102.24	100.84	99.23	98.32				
11	3.023	7.861	99.52	98.96	98.00	96.62	96.02	95.22				
12	3.016	7.757	101.57	101.77	101.53	100.22	99.17	98.45				
13	3.028	7.388	102.22	102.88	103.30	101.89	101.02	99.76				
14	3.027	7.567	101.92	100.74	100.98	99.91	99.34	98.22				
15	3.018	7.611	101.62	98.78	104.03	102.98	101.97	100.18				
16	3.021	7.510	102.16	103.10	103.42	102.42	100.83	99.17				
17	3.024	7.905	101.92	99.53	99.20	98.00	97.17	96.57				
18	3.024	7.459	103.32	104.89	104.45	103.42	101.80	100.16				
19	3.023	7.509	103.57	100.28	104.23	102.92	101.31	99.93				
20	3.022	7.421	99.41	101.78	105.39	104.53	103.37	101.71				
21	3.017	7.341	102.27	104.05	104.54	103.20	101.73	100.40				
22	3.018	7.788	99.26	99.29	99.68	98.10	97.23	96.56				
23	3.024	7.480	102.93	103.70	104.51	103.53	102.03	100.48				
24	3.018	7.443	102.49	99.26	103.72	102.65	101.12	100.51				
25	3.021	7.470	102.38	99.32	103.12	102.02	100.47	99.77				
Ave.	3.018	7.550	101.51	101.55	102.96	101.43	100.30	99.13				
Med.	3.018	7.510	101.62	101.77	103.30	102.26	101.02	99.76				
st dev	0.0059	0.1467	1.3232	2.0074	2.1162	2.9951	2.7637	2.4069				
Min.	3.007	7.341	99.26	98.78	98.00	91.87	91.52	91.10				
Max.	3.028	7.905	104.26	106.20	106.94	105.77	104.88	102.88				

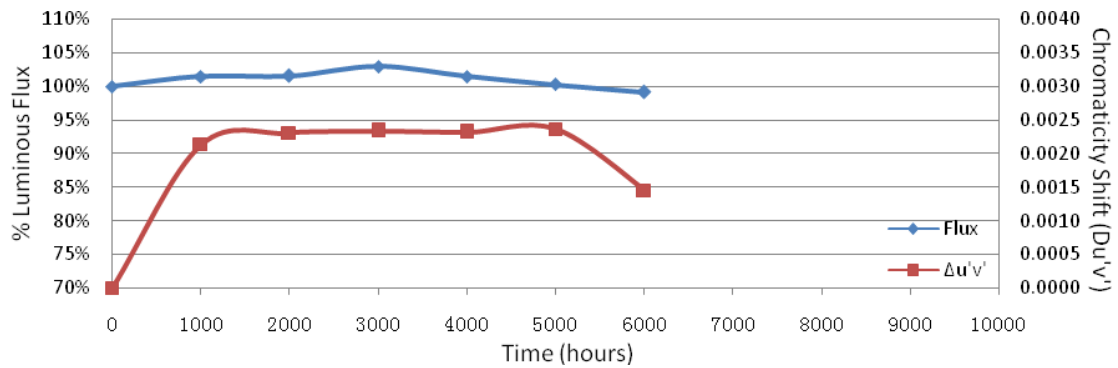
TM-21 Projection:

Test Duration: 6000 hours

 α : 4.879E-06 β : 1.029Calculated L₇₀: 79,000Reported L₇₀: >36000

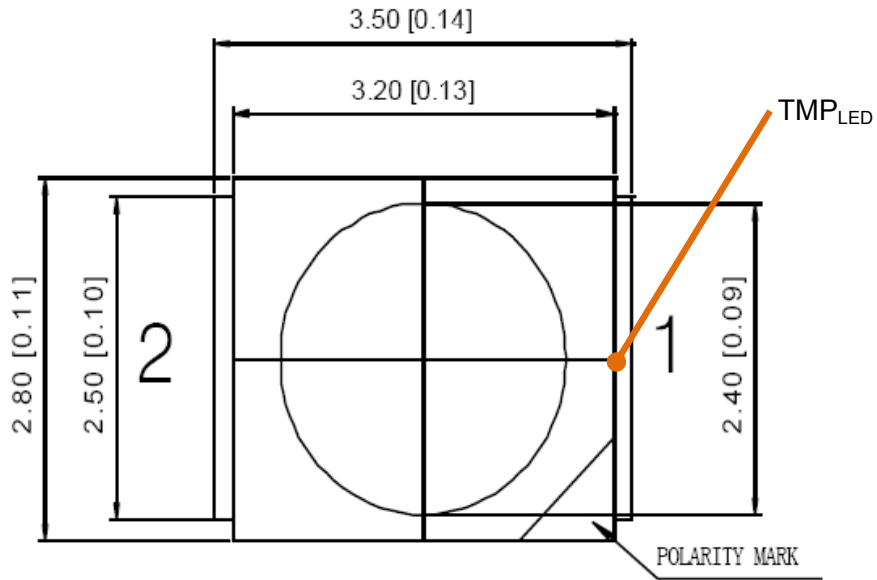
3.6 Data Set 1, 85°C, 20mA (Chromaticity Shift)

Data Set 3	u'	v'	Chromaticity Shift ($\Delta u'v'$)									
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs
1	0.1997	0.4665	0.0018	0.0009	0.0021	0.0021	0.0021	0.0022				
2	0.1982	0.4639	0.0004	0.0004	0.0002	0.0001	0.0004	0.0001				
3	0.2005	0.4639	0.0004	0.0010	0.0007	0.0006	0.0007	0.0005				
4	0.1991	0.4601	0.0002	0.0003	0.0007	0.0009	0.0005	0.0007				
5	0.2007	0.467	0.0007	0.0005	0.0003	0.0003	0.0003	0.0009				
6	0.1983	0.4674	0.0029	0.0030	0.0029	0.0027	0.0031	0.0008				
7	0.1988	0.4632	0.0002	0.0009	0.0007	0.0009	0.0005	0.0008				
8	0.1994	0.4627	0.0004	0.0009	0.0009	0.0010	0.0012	0.0007				
9	0.1989	0.4635	0.0004	0.0005	0.0004	0.0018	0.0007	0.0008				
10	0.2003	0.4604	0.0036	0.0035	0.0038	0.0034	0.0033	0.0022				
11	0.2007	0.4607	0.0011	0.0031	0.0013	0.0013	0.0013	0.0015				
12	0.2032	0.4692	0.0022	0.0031	0.0028	0.0025	0.0026	0.0019				
13	0.2015	0.4598	0.0036	0.0034	0.0035	0.0032	0.0036	0.0020				
14	0.2002	0.4611	0.0032	0.0031	0.0033	0.0031	0.0034	0.0024				
15	0.2002	0.4631	0.0036	0.0015	0.0016	0.0017	0.0017	0.0027				
16	0.2003	0.4599	0.0035	0.0033	0.0034	0.0033	0.0036	0.0017				
17	0.1997	0.4615	0.0015	0.0016	0.0014	0.0012	0.0013	0.0011				
18	0.2018	0.4626	0.0038	0.0040	0.0040	0.0039	0.0041	0.0020				
19	0.2021	0.4613	0.0039	0.0040	0.0038	0.0036	0.0039	0.0021				
20	0.2004	0.4577	0.0016	0.0037	0.0045	0.0045	0.0047	0.0026				
21	0.2016	0.4606	0.0028	0.0032	0.0035	0.0038	0.0036	0.0013				
22	0.1994	0.4619	0.0010	0.0020	0.0022	0.0020	0.0021	0.0009				
23	0.2006	0.4609	0.0035	0.0033	0.0035	0.0033	0.0036	0.0006				
24	0.201	0.4567	0.0036	0.0033	0.0034	0.0032	0.0035	0.0018				
25	0.2022	0.4606	0.0035	0.0032	0.0035	0.0033	0.0034	0.0021				
Ave.	0.2004	0.4622	0.0021	0.0023	0.0023	0.0023	0.0024	0.0015				
Med.	0.2003	0.4615	0.0022	0.0031	0.0028	0.0025	0.0026	0.0015				
st dev	0.0013	0.0029	0.0014	0.0013	0.0014	0.0013	0.0014	0.0008				
Min.	0.1982	0.4567	0.0002	0.0003	0.0002	0.0001	0.0003	0.0001				
Max.	0.2032	0.4692	0.0039	0.0040	0.0045	0.0045	0.0047	0.0027				



Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25°C)



A.2 EUT Photo

