



IESNA LM-80-2008

MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES

MEASUREMENT AND TEST REPORT

For

Shenzhen Lepower Opto Electronics Corp., Ltd

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Model: LY-IE280101Y1833-80

Report Type: 6000 Hours Test Report	Product Type: LED Package
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Revised Note:	The previous report RSZ141126502-10 is replaced by this report on 2015-11-11
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Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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TABLE OF CONTENTS

1 - GENERAL INFORMATION.....	3
1.1 DESCRIPTION OF LED LIGHT SOURCES	3
1.2 STANDARDS USED:.....	3
1.3 TEST FACILITY	3
1.4 DESCRIPTION OF AUXILIARY EQUIPMENT	3
1.5 OPERATING CYCLE.....	4
1.6 AMBIENT CONDITIONS	4
1.7 PHOTOMETRY MEASUREMENT UNCERTAINTY	4
1.8 SAMPLE SET	5
2 - SUMMARY OF TEST RESULT	6
3 - TEST DATA	7
3.1 DATA SET 1, 55°C, 150MA (LUMEN MAINTENANCE)	7
3.2 DATA SET 1, 55°C, 150MA (CHROMATICITY SHIFT)	8
3.3 DATA SET 2, 100°C, 150MA (LUMEN MAINTENANCE)	9
3.4 DATA SET 2, 100°C, 150MA (CHROMATICITY SHIFT)	10
APPENDIX A – EUT PHOTO	11
A.1 MECHANICAL DIMENSIONS (TA = 25°C)	11
A.2 EUT PHOTO	11

1 - GENERAL INFORMATION

1.1 Description of LED Light Sources

Devices tested

Part Number: LY-IE280101Y1833-80
 Part Type: LED Package
 Nominal CCT: 3000K

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(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				

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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, RH <65%.

1.7 Photometry Measurement Uncertainty

The uncertainty of the light output measurements is $U=1.59\%$ ($K=2$), 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. This calibration results traceable to the NATIONAL INSTITUTE OF METROLOGY (NIM).

1.8 Sample Set

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.

Sample Size:

Total 50Pcs;

Each Ts test condition 25Pcs

The samples tested at Ts 55°C and Ts 100°C were received at 2014-11-26 and tested during 2014-11-27 to 2015-08-05. The samples were numbered from 1 to 25 and 26 to 50

Data Set 1: 55°C, 150mA

Part Number:	LY-IE280101Y1833-80
Number of Units:	25
Actual Case Temperature(T _S):	T _S =54.1°C
Actual Ambient Temperature(T _A):	T _A =52.8°C
Life Test Drive Current:	I _F = 150mA
Measurement Current:	I _F = 150mA

Data Set 2: 100°C,150mA

Part Number:	LY-IE280101Y1833-80
Number of Units:	25
Actual Case Temperature(T _S):	T _S =98.9°C
Actual Ambient Temperature(T _A):	T _A =97.5°C
Life Test Drive Current:	I _F =150mA
Measurement Current:	I _F = 150mA

2 - SUMMARY OF TEST RESULT

Data Set:	Data Set 1, 55°C, 150mA
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:	97.20%
Average Chromaticity Shift at 6000 hours ($u'v'$):	0.0015
Reported TM-21 L_{70} Lifetime:	>36,000 hours

Data Set:	Data Set 2, 100°C, 150mA
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:	96.23%
Average Chromaticity Shift at 6000 hours($\Delta u'v'$):	0.0020
Reported TM-21 L_{70} Lifetime:	>36,000 hours

3 - Test Data

3.1 Data Set 1, 55°C, 150mA (Lumen Maintenance)

No.	V _F (V)		Lumen Maintenance (%)					
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	3.186	54.36	99.72	99.47	99.06	98.34	97.77	97.20
2	3.178	54.90	101.60	101.09	100.49	99.80	99.23	98.87
3	3.188	54.17	99.74	99.13	98.63	97.95	97.06	96.94
4	3.175	54.19	99.35	98.63	97.82	97.20	96.59	96.29
5	3.186	54.68	100.46	99.85	99.36	98.61	98.13	97.68
6	3.176	54.82	100.07	99.78	99.12	98.49	97.94	97.63
7	3.179	54.90	100.33	99.58	98.65	97.83	97.09	96.79
8	3.177	55.28	100.34	98.81	97.97	97.29	96.89	96.69
9	3.190	54.97	99.40	98.93	98.09	97.51	97.16	96.34
10	3.170	52.89	101.00	100.53	99.28	98.64	97.98	96.54
11	3.176	53.02	100.87	100.45	99.66	98.98	98.42	97.28
12	3.177	51.84	99.00	98.71	98.13	97.43	96.61	96.55
13	3.173	55.04	100.35	99.91	98.80	97.93	97.31	96.77
14	3.173	53.54	100.30	99.96	99.22	98.54	97.91	97.20
15	3.187	54.12	100.39	99.94	98.28	97.75	97.03	96.60
16	3.179	53.58	101.08	100.69	99.27	98.36	97.87	97.69
17	3.178	53.10	101.13	100.92	99.25	98.57	98.04	97.19
18	3.171	54.02	99.39	99.11	98.56	97.96	97.56	96.50
19	3.175	54.27	100.96	100.37	99.87	99.26	98.67	96.92
20	3.182	53.69	100.48	100.13	99.83	99.01	98.38	97.75
21	3.178	54.94	100.25	99.96	98.93	98.05	97.36	97.01
22	3.177	54.72	100.79	100.35	99.56	98.79	98.23	97.02
23	3.178	53.02	98.98	98.79	98.06	97.36	96.55	96.19
24	3.179	55.10	100.64	100.42	99.66	98.87	98.37	98.29
25	3.181	53.34	100.51	100.09	99.91	99.29	98.54	98.16
Ave.	3.179	54.10	100.29	99.82	99.02	98.31	97.79	97.20
Med.	3.178	54.19	100.35	99.94	99.12	98.36	97.91	97.02
st dev	0.0052	0.8805	0.6884	0.7174	0.7074	0.6936	0.7041	0.7185
Min.	3.170	51.84	98.98	98.63	97.82	97.20	96.55	96.19
Max.	3.190	55.28	101.60	101.09	100.49	99.80	99.23	98.87

TM-21 Projection:

α :
 β :

3.3 Data Set 2, 100°C, 150mA (Lumen Maintenance)

No.	V _F (V)		Lumen Maintenance (%)					
	Ohr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	3.171	55.27	100.69	100.20	99.57	98.73	98.03	97.83
27	3.183	54.63	99.69	99.30	99.18	98.33	97.68	96.63
28	3.187	54.24	100.15	99.67	99.04	98.06	97.22	96.48
29	3.174	55.40	99.96	99.51	99.39	98.70	98.09	97.47
30	3.193	54.62	99.40	98.96	98.00	97.31	96.52	96.27
31	3.173	53.86	100.54	99.94	99.07	97.99	97.16	96.79
32	3.181	53.97	100.02	99.44	98.26	97.65	96.87	96.20
33	3.181	55.86	99.71	99.30	98.01	97.24	96.54	95.67
34	3.175	54.69	100.20	99.69	98.99	98.06	97.37	95.96
35	3.179	54.69	100.26	99.73	99.27	98.39	97.66	96.91
36	3.187	54.71	99.98	99.45	98.45	97.66	96.93	96.64
37	3.181	55.98	98.00	97.66	98.00	97.21	96.41	95.23
38	3.179	53.92	100.43	99.72	98.91	98.02	97.20	96.40
39	3.179	53.04	100.09	99.70	98.89	98.10	97.29	96.83
40	3.180	53.85	99.81	99.09	98.31	97.59	96.75	95.65
41	3.175	54.07	100.07	99.50	98.30	97.36	96.58	96.02
42	3.188	54.73	100.27	99.73	98.87	97.97	97.06	96.22
43	3.184	54.29	99.93	99.32	98.62	97.86	97.14	95.67
44	3.185	54.57	99.65	99.29	98.24	97.40	96.48	95.73
45	3.183	54.53	99.65	99.14	97.32	96.50	95.62	95.21
46	3.180	53.96	100.13	99.63	98.18	97.52	96.83	95.18
47	3.192	54.11	100.11	99.67	99.08	98.21	97.60	96.62
48	3.179	54.51	99.93	99.50	98.79	97.87	97.12	95.73
49	3.182	54.82	100.00	99.58	99.01	98.14	97.45	96.68
50	3.179	54.98	99.71	99.18	98.31	97.44	96.73	95.69
Ave.	3.181	54.53	99.94	99.44	98.64	97.81	97.05	96.23
Med.	3.181	54.57	100.00	99.50	98.79	97.87	97.12	96.22
st dev	0.0055	0.6544	0.5003	0.4625	0.5376	0.5081	0.5521	0.6774
Min.	3.171	53.04	98.00	97.66	97.32	96.50	95.62	95.18
Max.	3.193	55.98	100.69	100.20	99.57	98.73	98.09	97.83

TM-21 Projection:

 α : β :

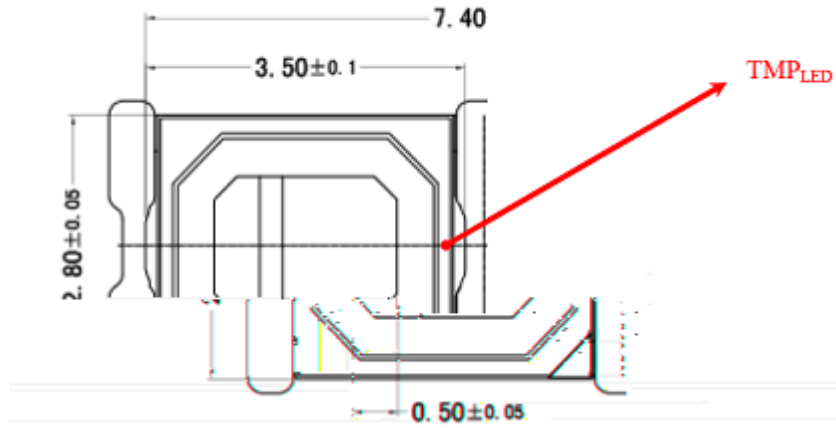
3.4 Data Set 2, 100°C, 150mA (Chromaticity Shift)

No.	CCT(K)	CCT(K)						
		0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2512							

FINAL

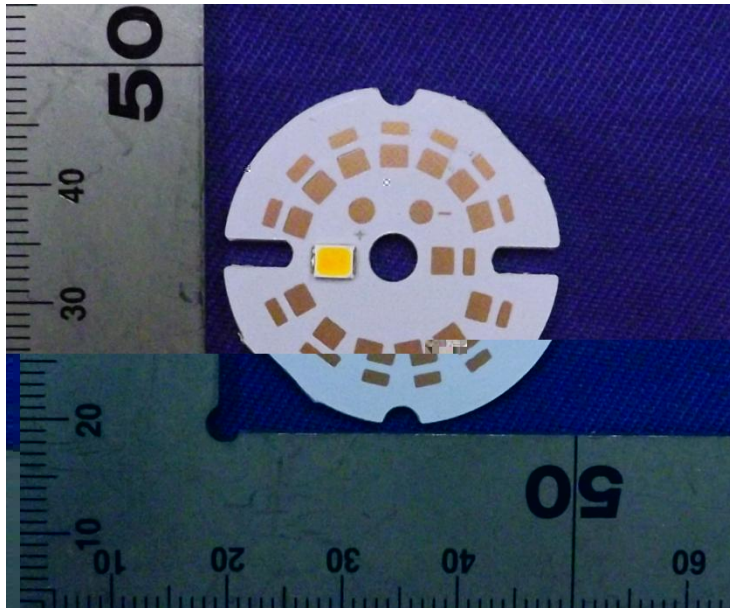
Appendix A – EUT PHOTO

A.1 Mechanical Dimensions (Ta = 25°C)



All dimensions are in millimeter

A.2 EUT Photo



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