Shenzhen Anbotek Compliance Laboratory Limited

IESNA LM-80:2008

Measurement and Test Report
For

SHENZHEN LEPOWER OPTO ELECTRONCIS CORP., LTD

3-5 Floors, Bldg B, Chuangfu Science Technology Park, Shihuan Rd No.202, Shangwu Community, Shiyan St, Bao'an District, Shenzhen

Report No:	R011605418L
Model No:	LY-SMD3030
Product Name:	LED (SMD)
Test Initiation Date:	04/28/2016 to 06/12/2016
Revision Date:	06/14/2016
Test Completion Date:	06/14/2016
Tested By:	Rain chen
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1-GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Applicant :	SHENZHEN LEPOWER OPTO ELECTRONCIS CORP., LTD
Trade Mark :	LEPOWER
Model Name :	LED (SMD)
Model Number :	LY-SMD3030
Part Type:	LED package
Nominal CCT:	3000K
Number of LED Light Source tested :	See tables.
Case temperature (test point temperature) :	See tables.
Drive current of the LED light source during lifetime test :	See tables.
Initial luminous flux and forward voltage at photometric measurement current :	See tables.
Lumen maintenance data for each individual LED light source along with median value, standard deviation, minimum and maximum lumen maintenance value for all of the LED Light sources :	See tables.
Observation of LED light source failure including the failure conditions and time of failure. :	See tables.
LED light source monitoring interval :	The LED light source are inspected at regular interval (24 hours) throughout the 6000 hours test.
Photometric measurement uncertainty :	±1.5 on flux measurements for LM-80 testing.
Chromaticity shift reported over the Measurement time :	See tables.
LED Light Source Test interval :	At regular intervals(1000 hours) throughout the 6000 hours test.
Date of Receiving Sample :	04/28/2016
Test Duration :	04/28/2016 to 06/12/2016

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 Description

The test facility used by Shenzhen Anbotek Compliance Laboratory Limited is located at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,Nanshan District,Shenzhen, Guangdong, China.

1.4 Test Equipment List

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2016-03-14	2017-03-13
0.3m Integral Sphere	LINKCOLOR	LCB-03	-	380nm-780nm,0.011lm～6.00×10^5lm	2016-04-06	2017-04-05
Digital Power Meter	YOKOGAWA	WT210	-	0-600V/0-10A/0-100Hz	2016-04-06	2017-04-05
DC Power Supply	Linkcolor	Linkcolor	-	DC 30V, 5A	2016-03-28	2017-03-27
Total Luminous Flux Standard Lamp	SENSING	12V/10W	LSD1210111	Refer specification	2016-03-30	2017-03-29
Total Luminous Flux Standard Lamp	SENSING	12V/10W	SL1054	Refer specification	2016-03-30	2017-03-29
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2016-03-14	2017-03-13
LM-80aging measurement system	KEYI	KY-3X-LH60	-	55, 85, 105℃	2016-04-06	2017-04-05

2-Summary of Test Result

Data Set	Case Temperature(Ts) ℃	Ambient Temperature(Ta)℃	Drive Current (mA)	Average Lumen Maintenance at 6000 hours	Average Chromaticity Shift (△u'v') at 6000 hours
1	54.5	53.7	700		
2	84.3	83.9	700		
3	104.2	103.1	700		

3-Test Method

3.1 Photometric and Electrical Measurement

Total light output (luminous flux) for the 25℃±1℃ ambient temperature conditions is measured using a integrating sphere. Each LED package is operated at rated drive current(CC Mode).

The total uncertainty of the light output measurements is estimated, at the 95% confidence level, not to exceed±1.6% over the wavelength range 380-800nm.

3.2 Season the LED Package from 0 hours to 6000 hours

Three LM-80 aging measurement system Temperature Chambers are using for Seasoning, and the temperature is set to 55 ℃,85 ℃,105 ℃（manufacture defined）,the airflow is minimum to keep the uniformity to temperature. LED package are operated steady state (no cycling) for a period of 6000 hours, checked the lumen flux and Chromaticity Shift every 1000 hours. The samples are inspected at regular intervals (24 hours) throughout the 6000 hours. The time and date of failure of each lamp is recorded. The actual elapsed time for each light package is in hour.

4-Data Set 1: 55℃; 700mA

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	54.5℃
Ambient Temperature :	53.7℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

Lumen Maintenance (%)

Sample No.	V_F(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L1	3.21	249.8	99.68%	/	/	/	/	/
L2	3.21	249.4	99.70%	/	/	/	/	/
L3	3.21	251.5	99.70%	/	/	/	/	/
L4	3.21	253.0	100.08%	/	/	/	/	/
L5	3.22	252.6	99.33%	/	/	/	/	/
L6	3.22	244.7	99.70%	/	/	/	/	/
L7	3.23	253.0	104.82%	/	/	/	/	/
L8	3.22	257.1	99.70%	/	/	/	/	/
L9	3.23	252.5	99.62%	/	/	/	/	/
L10	3.21	252.0	99.70%	/	/	/	/	/
L11	3.22	251.6	100.08%	/	/	/	/	/
L12	3.23	252.1	102.03%	/	/	/	/	/
L13	3.22	248.8	99.70%	/	/	/	/	/
L14	3.22	248.4	99.76%	/	/	/	/	/
L15	3.22	249.1	104.94%	/	/	/	/	/
L16	3.23	255.3	102.46%	/	/	/	/	/
L17	3.22	249.2	104.61%	/	/	/	/	/
L18	3.22	250.7	103.55%	/	/	/	/	/
L19	3.22	254.1	99.70%	/	/	/	/	/
L20	3.21	245.5	102.62%	/	/	/	/	/
L21	3.22	250.8	99.36%	/	/	/	/	/
L22	3.22	246.7	99.70%	/	/	/	/	/
L23	3.22	261.9	100.08%	/	/	/	/	/
L24	3.21	256.8	99.70%	/	/	/	/	/
L25	3.22	251.8	99.40%	/	/	/	/	/
Avg.	3.22	251.5	100.79%	/	/	/	/	/
MIN	3.21	244.7	99.33%	/	/	/	/	/
MAX	3.23	261.9	104.94%	/	/	/	/	/
STDEV	0.0059	3.7520	0.0189	/	/	/	/	/
N	25	25	25	25	25	25	25	25

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	54.5℃
Ambient Temperature :	53.7℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

Chromaticity Shift (△u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L1	0.2474	0.5377	2977	0.0004	/	/	/	/	/
L2	0.2459	0.5380	3011	0.0003	/	/	/	/	/
L3	0.2461	0.5352	3022	0.0002	/	/	/	/	/
L4	0.2467	0.5374	2996	0.0003	/	/	/	/	/
L5	0.2457	0.5383	3013	0.0004	/	/	/	/	/
L6	0.2512	0.5398	2883	0.0005	/	/	/	/	/
L7	0.2475	0.5392	2967	0.0004	/	/	/	/	/
L8	0.2484	0.5402	2941	0.0003	/	/	/	/	/
L9	0.2442	0.5355	3065	0.0002	/	/	/	/	/
L10	0.2491	0.5391	2933	0.0003	/	/	/	/	/
L11	0.2464	0.5393	2992	0.0004	/	/	/	/	/
L12	0.2495	0.5400	2918	0.0005	/	/	/	/	/
L13	0.2495	0.5381	2930	0.0003	/	/	/	/	/
L14	0.2434	0.5347	3088	0.0004	/	/	/	/	/
L15	0.2449	0.5356	3048	0.0003	/	/	/	/	/
L16	0.2484	0.5405	2941	0.0004	/	/	/	/	/
L17	0.2504	0.5393	2903	0.0002	/	/	/	/	/
L18	0.2491	0.5382	2936	0.0003	/	/	/	/	/
L19	0.2477	0.5392	2963	0.0003	/	/	/	/	/
L20	0.2474	0.5370	2982	0.0003	/	/	/	/	/
L21	0.2465	0.5365	3006	0.0004	/	/	/	/	/
L22	0.2451	0.5371	3034	0.0005	/	/	/	/	/
L23	0.2394	0.5355	3181	0.0003	/	/	/	/	/
L24	0.2432	0.5404	3058	0.0002	/	/	/	/	/
L25	0.2415	0.5337	3142	0.0003	/	/	/	/	/
AV	0.2466	0.5378	2997	0.0003	/	/	/	/	/
MIN	0.2394	0.5337	2883	0.0002	/	/	/	/	/
MAX	0.2512	0.5405	3181	0.0005	/	/	/	/	/
STDEV	0.0028	0.0019	72	0.0001	/	/	/	/	/
N	25	25	25	25	25	25	25	25	25

5-Data Set 2: 85℃; 700mA

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	84.3℃
Ambient Temperature :	83.9℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

Lumen Maintenance (%)

Sample No.	V_F(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L26	3.22	257.7	99.88%	/	/	/	/	/
L27	3.22	252.0	99.40%	/	/	/	/	/
L28	3.22	259.5	99.40%	/	/	/	/	/
L29	3.22	246.5	99.47%	/	/	/	/	/
L30	3.22	248.4	99.40%	/	/	/	/	/
L31	3.21	247.9	101.42%	/	/	/	/	/
L32	3.22	248.0	99.31%	/	/	/	/	/
L33	3.22	248.0	99.40%	/	/	/	/	/
L34	3.22	257.1	99.40%	/	/	/	/	/
L35	3.21	255.3	99.27%	/	/	/	/	/
L36	3.21	245.8	102.28%	/	/	/	/	/
L37	3.22	247.9	99.31%	/	/	/	/	/
L38	3.22	252.6	99.40%	/	/	/	/	/
L39	3.21	251.0	99.24%	/	/	/	/	/
L40	3.21	252.6	99.33%	/	/	/	/	/
L41	3.22	250.7	99.40%	/	/	/	/	/
L42	3.21	247.7	99.39%	/	/	/	/	/
L43	3.21	248.7	99.40%	/	/	/	/	/
L44	3.22	253.8	99.23%	/	/	/	/	/
L45	3.21	250.7	99.20%	/	/	/	/	/
L46	3.21	249.0	99.40%	/	/	/	/	/
L47	3.22	256.1	99.06%	/	/	/	/	/
L48	3.21	249.7	99.40%	/	/	/	/	/
L49	3.21	250.7	99.56%	/	/	/	/	/
L50	3.21	247.7	101.05%	/	/	/	/	/
Avg.	3.22	251.0	99.64%	/	/	/	/	/
MIN	3.21	245.8	99.06%	/	/	/	/	/
MAX	3.22	259.5	102.28%	/	/	/	/	/
STDEV	0.0044	3.7478	0.0077	/	/	/	/	/
N	25	25	25	25	25	25	25	25

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	84.3℃
Ambient Temperature :	83.9℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

Chromaticity Shift (△u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L26	0.2430	0.5404	3064	0.0005	/	/	/	/	/
L27	0.2459	0.5368	3019	0.0006	/	/	/	/	/
L28	0.2459	0.5375	3013	0.0005	/	/	/	/	/
L29	0.2505	0.5419	2888	0.0006	/	/	/	/	/
L30	0.2437	0.5346	3084	0.0006	/	/	/	/	/
L31	0.2493	0.5390	2928	0.0007	/	/	/	/	/
L32	0.2495	0.5391	2923	0.0006	/	/	/	/	/
L33	0.2508	0.5410	2886	0.0004	/	/	/	/	/
L34	0.2485	0.5398	2941	0.0006	/	/	/	/	/
L35	0.2485	0.5397	2942	0.0006	/	/	/	/	/
L36	0.2475	0.5377	2976	0.0005	/	/	/	/	/
L37	0.2451	0.5355	3044	0.0007	/	/	/	/	/
L38	0.2484	0.5383	2952	0.0004	/	/	/	/	/
L39	0.2476	0.5373	2977	0.0004	/	/	/	/	/
L40	0.2481	0.5382	2959	0.0006	/	/	/	/	/
L41	0.2472	0.5381	2980	0.0007	/	/	/	/	/
L42	0.2500	0.5395	2910	0.0006	/	/	/	/	/
L43	0.2454	0.5350	3040	0.0006	/	/	/	/	/
L44	0.2476	0.5392	2965	0.0005	/	/	/	/	/
L45	0.2444	0.5357	3058	0.0005	/	/	/	/	/
L46	0.2501	0.5396	2908	0.0006	/	/	/	/	/
L47	0.2450	0.5359	3044	0.0006	/	/	/	/	/
L48	0.2409	0.5323	3167	0.0007	/	/	/	/	/
L49	0.2415	0.5336	3143	0.0006	/	/	/	/	/
L50	0.2458	0.5382	3012	0.0005	/	/	/	/	/
AV	0.2468	0.5378	2993	0.0006	/	/	/	/	/
MIN	0.2409	0.5323	2886	0.0004	/	/	/	/	/
MAX	0.2508	0.5419	3167	0.0007	/	/	/	/	/
STDEV	0.0027	0.0024	75	0.0001	/	/	/	/	/
N	25	25	25	25	25	25	25	25	25

6-Data Set 3: 105℃; 700mA

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	104.2℃
Ambient Temperature :	103.1℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

Lumen Maintenance (%)

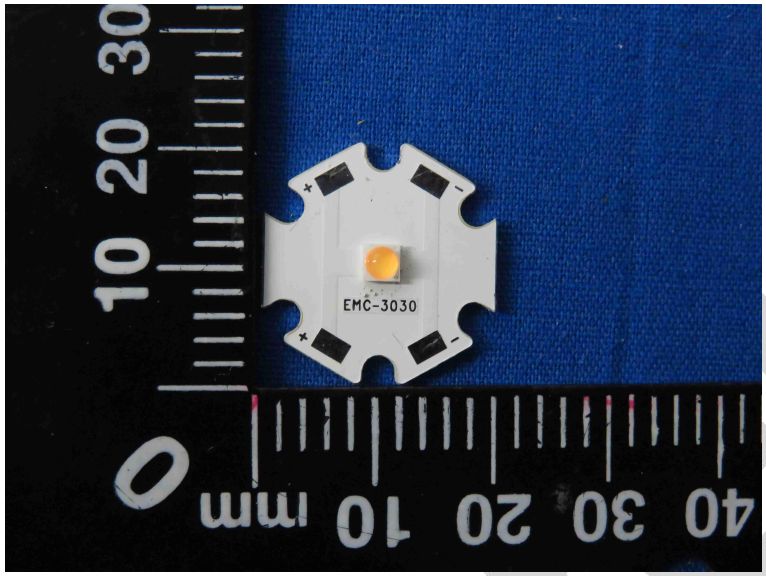
Sample No.	V_F(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L51	3.22	244.3	99.39%	/	/	/	/	/
L52	3.22	248.1	99.73%	/	/	/	/	/
L53	3.22	249.1	99.60%	/	/	/	/	/
L54	3.20	248.3	100.00%	/	/	/	/	/
L55	3.22	247.8	99.48%	/	/	/	/	/
L56	3.22	249.3	99.25%	/	/	/	/	/
L57	3.21	242.8	99.59%	/	/	/	/	/
L58	3.22	249.2	99.56%	/	/	/	/	/
L59	3.21	241.8	99.25%	/	/	/	/	/
L60	3.22	252.9	99.37%	/	/	/	/	/
L61	3.21	245.3	99.71%	/	/	/	/	/
L62	3.21	247.8	102.30%	/	/	/	/	/
L63	3.21	246.5	99.25%	/	/	/	/	/
L64	3.22	249.6	99.68%	/	/	/	/	/
L65	3.20	248.1	99.89%	/	/	/	/	/
L66	3.22	245.9	99.25%	/	/	/	/	/
L67	3.21	242.8	99.25%	/	/	/	/	/
L68	3.22	255.1	99.84%	/	/	/	/	/
L69	3.21	240.0	99.25%	/	/	/	/	/
L70	3.21	251.8	99.27%	/	/	/	/	/
L71	3.22	247.8	99.25%	/	/	/	/	/
L72	3.27	246.2	99.35%	/	/	/	/	/
L73	3.22	253.7	99.25%	/	/	/	/	/
L74	3.22	249.8	98.76%	/	/	/	/	/
L75	3.22	254.0	99.45%	/	/	/	/	/
Avg.	3.22	247.9	99.56%	/	/	/	/	/
MIN	3.20	240.0	98.76%	/	/	/	/	/
MAX	3.27	255.1	102.30%	/	/	/	/	/
STDEV	0.0125	3.8458	0.0063	/	/	/	/	/
N	25	25	25	25	25	25	25	25

Description of Light Sources tested :	LY-SMD3030
Case Temperature :	104.2℃
Ambient Temperature :	103.1℃
Drive Current :	700mA
Measure Current :	700mA
Failures Observed :	None

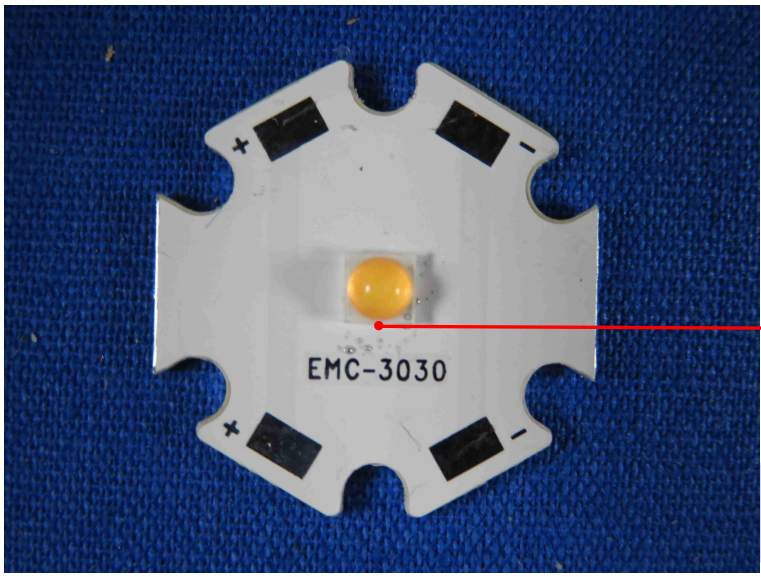
Chromaticity Shift (△u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L51	0.2478	0.5386	2963	0.0007	/	/	/	/	/
L52	0.2451	0.5349	3047	0.0006	/	/	/	/	/
L53	0.2491	0.5413	2921	0.0007	/	/	/	/	/
L54	0.2492	0.5391	2931	0.0008	/	/	/	/	/
L55	0.2464	0.5364	3008	0.0007	/	/	/	/	/
L56	0.2498	0.5400	2912	0.0007	/	/	/	/	/
L57	0.2507	0.5422	2883	0.0006	/	/	/	/	/
L58	0.2478	0.5391	2960	0.0009	/	/	/	/	/
L59	0.2507	0.5380	2903	0.0005	/	/	/	/	/
L60	0.2487	0.5403	2935	0.0006	/	/	/	/	/
L61	0.2452	0.5371	3031	0.0005	/	/	/	/	/
L62	0.2471	0.5362	2993	0.0007	/	/	/	/	/
L63	0.2507	0.5391	2897	0.0008	/	/	/	/	/
L64	0.2445	0.5354	3059	0.0007	/	/	/	/	/
L65	0.2460	0.5352	3025	0.0009	/	/	/	/	/
L66	0.2484	0.5398	2944	0.0006	/	/	/	/	/
L67	0.2478	0.5369	2974	0.0005	/	/	/	/	/
L68	0.2448	0.5378	3036	0.0006	/	/	/	/	/
L69	0.2503	0.5452	2876	0.0006	/	/	/	/	/
L70	0.2488	0.5395	2937	0.0007	/	/	/	/	/
L71	0.2473	0.5363	2987	0.0007	/	/	/	/	/
L72	0.2490	0.5413	2924	0.0008	/	/	/	/	/
L73	0.2490	0.5396	2933	0.0009	/	/	/	/	/
L74	0.2492	0.5391	2931	0.0008	/	/	/	/	/
L75	0.2450	0.5368	3038	0.0007	/	/	/	/	/
AV	0.2479	0.5386	2962	0.0007	/	/	/	/	/
MIN	0.2445	0.5349	2876	0.0005	/	/	/	/	/
MAX	0.2507	0.5452	3059	0.0009	/	/	/	/	/
STDEV	0.0020	0.0024	55	0.0001	/	/	/	/	/
N	25	25	25	25	25	25	25	25	25

7-EUT Photos



8-TMP



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