TEST REPORT

IES LM-80-08

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.:	R0117010091L1
Product Name:	5050
Model No.:	LY-WE070801S2235
Test Initiation Date:	2017-01-04
Revision Date:	2017-02-21
Test Completion Date:	2017-02-15
Tested By:	Alcander Lou
Reviewed By:	Raymond Song
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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant:	SHENZHEN LEPOWER OPTO ELECTRONCIS CORP., LTD
Tested Model:	LY-WE070801S2235
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 is 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:	2017-01-04
Test Duration:	2017-01-04 to 2017-02-15

1.2 Standards Used

IESNA LM-80-08: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources

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.	Calibration Date	Calibration Due Date
Digital Power Meter	YOKOGAWA	WT210	SE-074	2016-04-06	2017-04-05
LM-80 Aging Test System	KEYI	KY-3X-LH60	SE-564	2016-04-06	2017-04-05
DC Power Supply	EVERFINE	WY605	SE-605	2016-06-23	2017-06-22
Standard Lamp	EVERFINE	D062	SE-606	2016-07-02	2017-07-01
Spectrum Analyzer	EVERFINE	HAAS-2000	SE-607	2016-06-23	2017-06-22
Integrating Sphere (0.5m)	EVERFINE	AIS-2	SE-608	2016-06-23	2017-06-22

2 Summary of Test Result

Data Set	Case Temperature (Ts)	Ambient Temperature (Ta)	Drive Current	Average Lumen Maintenance at 6000 hours	Average Chromaticity Shift (Δu'v') at 6000 hours
1	54.3°C	53.1°C	200 mA	--	--
2	84.4°C	83.3°C	200 mA	--	--
3	104.2°C	103.4°C	200 mA	--	--

3 Test Method

3.1 Photometric and Electrical Measurement

Total light output (luminous flux) for the 25°C±1°C 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°C, 85°C, 105°C (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°C, 200 mA

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	54.3°C
Ambient Temperature:	53.1°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Lumen Maintenance (%)

Sample No.	VF(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L1	24.84	637.9	99.23%	--	--	--	--	--
L2	24.69	623.7	99.26%	--	--	--	--	--
L3	24.81	628.8	99.06%	--	--	--	--	--
L4	24.83	625.9	99.21%	--	--	--	--	--
L5	24.79	631.7	99.36%	--	--	--	--	--
L6	24.75	624.3	99.22%	--	--	--	--	--
L7	24.76	628.9	99.32%	--	--	--	--	--
L8	24.81	632.0	99.24%	--	--	--	--	--
L9	24.80	631.8	99.03%	--	--	--	--	--
L10	24.78	620.2	99.07%	--	--	--	--	--
L11	24.98	650.7	99.19%	--	--	--	--	--
L12	24.66	616.3	99.17%	--	--	--	--	--
L13	24.90	646.5	99.28%	--	--	--	--	--
L14	24.88	631.8	99.18%	--	--	--	--	--
L15	24.82	627.4	99.07%	--	--	--	--	--
L16	24.78	625.4	99.38%	--	--	--	--	--
L17	24.86	639.1	99.12%	--	--	--	--	--
L18	24.91	644.9	99.44%	--	--	--	--	--
L19	24.70	612.4	99.07%	--	--	--	--	--
L20	24.90	643.4	99.16%	--	--	--	--	--
L21	24.90	647.8	99.06%	--	--	--	--	--
L22	24.94	653.9	99.32%	--	--	--	--	--
L23	24.86	644.4	99.37%	--	--	--	--	--
L24	24.78	620.5	99.19%	--	--	--	--	--
L25	24.77	623.5	99.41%	--	--	--	--	--
AV	24.82	632.5	99.22%	--	--	--	--	--
MIN	24.66	612.4	99.03%	--	--	--	--	--
MAX	24.98	653.9	99.44%	--	--	--	--	--
STDEV	0.0787	11.2585	0.0012	--	--	--	--	--
Number	25	25	25	--	--	--	--	--

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	54.3°C
Ambient Temperature:	53.1°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Chromaticity Shift (△ u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L1	0.2543	0.5291	2870	0.0009	--	--	--	--	--
L2	0.2535	0.5291	2886	0.0007	--	--	--	--	--
L3	0.2541	0.5296	2870	0.0008	--	--	--	--	--
L4	0.2542	0.5285	2873	0.0009	--	--	--	--	--
L5	0.2533	0.5297	2887	0.0009	--	--	--	--	--
L6	0.2532	0.5298	2891	0.0010	--	--	--	--	--
L7	0.2537	0.5297	2880	0.0009	--	--	--	--	--
L8	0.2536	0.5280	2890	0.0008	--	--	--	--	--
L9	0.2538	0.5285	2883	0.0010	--	--	--	--	--
L10	0.2543	0.5294	2866	0.0008	--	--	--	--	--
L11	0.2543	0.5299	2864	0.0007	--	--	--	--	--
L12	0.2540	0.5304	2869	0.0009	--	--	--	--	--
L13	0.2541	0.5303	2868	0.0007	--	--	--	--	--
L14	0.2538	0.5284	2884	0.0008	--	--	--	--	--
L15	0.2539	0.5300	2873	0.0009	--	--	--	--	--
L16	0.2534	0.5297	2886	0.0010	--	--	--	--	--
L17	0.2537	0.5296	2880	0.0008	--	--	--	--	--
L18	0.2546	0.5295	2861	0.0009	--	--	--	--	--
L19	0.2535	0.5301	2881	0.0008	--	--	--	--	--
L20	0.2538	0.5300	2875	0.0008	--	--	--	--	--
L21	0.2537	0.5302	2876	0.0007	--	--	--	--	--
L22	0.2541	0.5297	2870	0.0007	--	--	--	--	--
L23	0.2534	0.5297	2886	0.0008	--	--	--	--	--
L24	0.2535	0.5290	2887	0.0008	--	--	--	--	--
L25	0.2540	0.5293	2873	0.0008	--	--	--	--	--
AV	0.2538	0.5295	2877	0.0008	--	--	--	--	--
MIN	0.2532	0.5280	2861	0.0007	--	--	--	--	--
MAX	0.2546	0.5304	2891	0.0010	--	--	--	--	--
STDEV	0.0004	0.0006	8.7019	0.0001	--	--	--	--	--
Number	25	25	25	25	--	--	--	--	--

5 Data Set 2: 85°C, 200 mA

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	84.4°C
Ambient Temperature:	83.3°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Lumen Maintenance (%)

Sample No.	V_F(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L26	24.89	640.2	99.19%	--	--	--	--	--
L27	24.86	636.0	98.81%	--	--	--	--	--
L28	24.66	610.4	98.88%	--	--	--	--	--
L29	24.92	645.3	99.19%	--	--	--	--	--
L30	24.75	623.5	98.80%	--	--	--	--	--
L31	24.83	643.5	98.97%	--	--	--	--	--
L32	24.76	626.5	98.83%	--	--	--	--	--
L33	24.82	645.2	99.06%	--	--	--	--	--
L34	24.69	613.8	98.88%	--	--	--	--	--
L35	24.75	617.8	99.12%	--	--	--	--	--
L36	24.85	647.1	98.85%	--	--	--	--	--
L37	24.93	649.6	99.01%	--	--	--	--	--
L38	24.67	609.7	99.15%	--	--	--	--	--
L39	24.82	644.2	99.19%	--	--	--	--	--
L40	24.85	638.9	98.96%	--	--	--	--	--
L41	24.85	644.4	99.11%	--	--	--	--	--
L42	24.78	624.5	98.98%	--	--	--	--	--
L43	24.92	651.5	98.89%	--	--	--	--	--
L44	24.72	614.5	98.91%	--	--	--	--	--
L45	24.70	622.9	99.04%	--	--	--	--	--
L46	24.69	621.3	99.15%	--	--	--	--	--
L47	24.84	644.2	98.85%	--	--	--	--	--
L48	24.77	642.0	99.03%	--	--	--	--	--
L49	24.83	646.1	98.92%	--	--	--	--	--
L50	24.92	642.9	99.10%	--	--	--	--	--
AV	24.80	633.8	98.99%	--	--	--	--	--
MIN	24.66	609.7	98.80%	--	--	--	--	--
MAX	24.93	651.5	99.19%	--	--	--	--	--
STDEV	0.0837	13.6560	0.0013	--	--	--	--	--
Number	25	25	25	--	--	--	--	--

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	84.4°C
Ambient Temperature:	83.3°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Chromaticity Shift (△ u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L26	0.2534	0.5300	2884	0.0010	--	--	--	--	--
L27	0.2562	0.5331	2808	0.0010	--	--	--	--	--
L28	0.2539	0.5293	2878	0.0012	--	--	--	--	--
L29	0.2541	0.5305	2866	0.0011	--	--	--	--	--
L30	0.2534	0.5296	2886	0.0010	--	--	--	--	--
L31	0.2541	0.5296	2871	0.0012	--	--	--	--	--
L32	0.2535	0.5312	2875	0.0010	--	--	--	--	--
L33	0.2535	0.5306	2879	0.0010	--	--	--	--	--
L34	0.2531	0.5300	2892	0.0010	--	--	--	--	--
L35	0.2533	0.5294	2890	0.0011	--	--	--	--	--
L36	0.2530	0.5303	2892	0.0011	--	--	--	--	--
L37	0.2537	0.5303	2876	0.0013	--	--	--	--	--
L38	0.2533	0.5300	2888	0.0013	--	--	--	--	--
L39	0.2545	0.5303	2859	0.0012	--	--	--	--	--
L40	0.2552	0.5332	2829	0.0011	--	--	--	--	--
L41	0.2538	0.5298	2876	0.0012	--	--	--	--	--
L42	0.2539	0.5295	2875	0.0011	--	--	--	--	--
L43	0.2536	0.5301	2879	0.0011	--	--	--	--	--
L44	0.2531	0.5297	2894	0.0010	--	--	--	--	--
L45	0.2532	0.5297	2890	0.0010	--	--	--	--	--
L46	0.2541	0.5296	2871	0.0010	--	--	--	--	--
L47	0.2551	0.5301	2845	0.0012	--	--	--	--	--
L48	0.2533	0.5300	2887	0.0012	--	--	--	--	--
L49	0.2539	0.5305	2870	0.0011	--	--	--	--	--
L50	0.2540	0.5297	2872	0.0013	--	--	--	--	--
AV	0.2538	0.5302	2873	0.0011	--	--	--	--	--
MIN	0.2530	0.5293	2808	0.0010	--	--	--	--	--
MAX	0.2562	0.5332	2894	0.0013	--	--	--	--	--
STDEV	0.0007	0.0010	20.1877	0.0001	--	--	--	--	--
Number	25	25	25	25	--	--	--	--	--

6 Data Set 3: 105°C, 200 mA

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	104.2°C
Ambient Temperature:	103.4°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Lumen Maintenance (%)

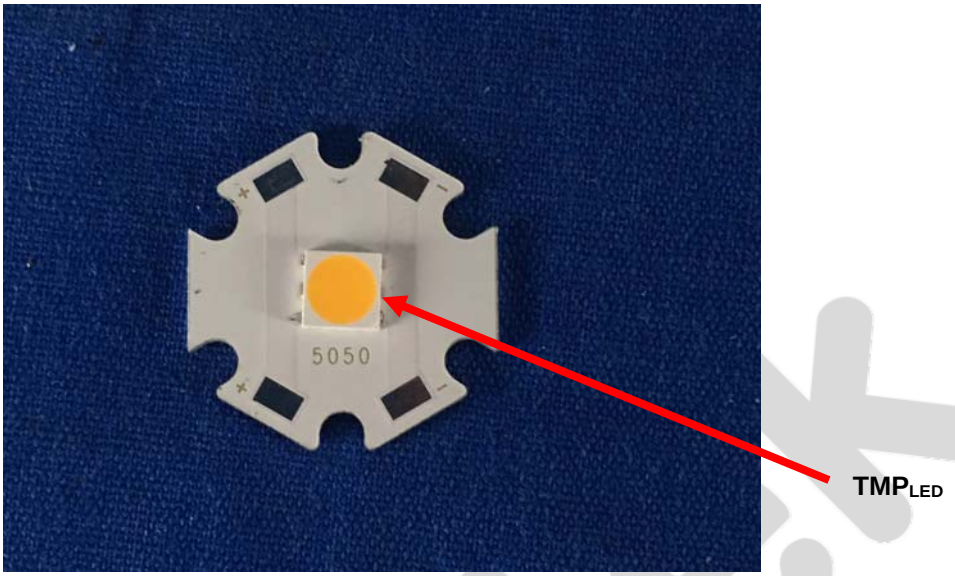
Sample No.	V_F(V)	Φ(lm)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L51	24.74	618.5	98.62%	--	--	--	--	--
L52	24.63	632.8	99.02%	--	--	--	--	--
L53	24.66	620.5	98.76%	--	--	--	--	--
L54	24.64	619.0	98.89%	--	--	--	--	--
L55	24.85	637.6	98.71%	--	--	--	--	--
L56	24.74	627.5	98.86%	--	--	--	--	--
L57	24.70	620.5	99.04%	--	--	--	--	--
L58	24.82	640.8	98.90%	--	--	--	--	--
L59	24.86	632.2	98.64%	--	--	--	--	--
L60	24.90	640.1	98.78%	--	--	--	--	--
L61	24.73	618.8	98.70%	--	--	--	--	--
L62	24.79	625.0	98.64%	--	--	--	--	--
L63	24.79	641.2	99.01%	--	--	--	--	--
L64	24.70	615.0	98.82%	--	--	--	--	--
L65	24.66	640.2	99.01%	--	--	--	--	--
L66	24.77	630.1	98.65%	--	--	--	--	--
L67	24.67	614.9	98.71%	--	--	--	--	--
L68	24.94	648.9	98.99%	--	--	--	--	--
L69	24.85	643.5	98.97%	--	--	--	--	--
L70	24.67	615.9	98.99%	--	--	--	--	--
L71	24.86	647.8	99.02%	--	--	--	--	--
L72	24.99	656.1	98.81%	--	--	--	--	--
L73	24.95	654.7	98.98%	--	--	--	--	--
L74	24.94	651.6	98.99%	--	--	--	--	--
L75	24.82	639.2	98.77%	--	--	--	--	--
AV	24.79	633.3	98.85%	--	--	--	--	--
MIN	24.63	614.9	98.62%	--	--	--	--	--
MAX	24.99	656.1	99.04%	--	--	--	--	--
STDEV	0.1075	13.2099	0.0015	--	--	--	--	--
Number	25	25	25	--	--	--	--	--

Description of Light Sources Tested:	LY-WE070801S2235
Case Temperature:	104.2°C
Ambient Temperature:	103.4°C
Drive Current:	200 mA
Measure Current:	200 mA
Failures Observed:	None

Chromaticity Shift (△ u'v')

Sample No.	u'	v'	CCT(K)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
L51	0.2536	0.5301	2880	0.0013	--	--	--	--	--
L52	0.2535	0.5286	2889	0.0016	--	--	--	--	--
L53	0.2534	0.5299	2884	0.0012	--	--	--	--	--
L54	0.2538	0.5298	2876	0.0013	--	--	--	--	--
L55	0.2538	0.5297	2878	0.0014	--	--	--	--	--
L56	0.2530	0.5296	2895	0.0014	--	--	--	--	--
L57	0.2538	0.5297	2877	0.0015	--	--	--	--	--
L58	0.2542	0.5303	2866	0.0012	--	--	--	--	--
L59	0.2568	0.5344	2790	0.0014	--	--	--	--	--
L60	0.2535	0.5295	2885	0.0015	--	--	--	--	--
L61	0.2528	0.5292	2902	0.0012	--	--	--	--	--
L62	0.2536	0.5305	2878	0.0012	--	--	--	--	--
L63	0.2532	0.5299	2889	0.0013	--	--	--	--	--
L64	0.2528	0.5293	2901	0.0016	--	--	--	--	--
L65	0.2533	0.5287	2894	0.0015	--	--	--	--	--
L66	0.2533	0.5298	2887	0.0013	--	--	--	--	--
L67	0.2541	0.5297	2871	0.0014	--	--	--	--	--
L68	0.2542	0.5304	2865	0.0013	--	--	--	--	--
L69	0.2537	0.5303	2876	0.0015	--	--	--	--	--
L70	0.2533	0.5303	2886	0.0015	--	--	--	--	--
L71	0.2541	0.5302	2869	0.0012	--	--	--	--	--
L72	0.2539	0.5298	2874	0.0012	--	--	--	--	--
L73	0.2541	0.5296	2870	0.0014	--	--	--	--	--
L74	0.2541	0.5299	2870	0.0015	--	--	--	--	--
L75	0.2535	0.5299	2883	0.0012	--	--	--	--	--
AV	0.2537	0.5300	2877	0.0014	--	--	--	--	--
MIN	0.2528	0.5286	2790	0.0012	--	--	--	--	--
MAX	0.2568	0.5344	2902	0.0016	--	--	--	--	--
STDEV	0.0008	0.0010	20.8986	0.0001	--	--	--	--	--
Number	25	25	25	25	--	--	--	--	--

7 Product Photo



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