



TEST REPORT

According to ANSI/IES LM-80-15
For

Shenzhen Refond Optoelectronic Co., Ltd.

1 to 8th Floor, Building #1, 10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, SHENZHEN, CHINA

Model: RF-27TI32DS-FF-J

Report Type: 9000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Pote Wang	<i>Pote Wang</i>	
Report Number:	R2DG161221051-10-M1		
Test Date:	2016-12-24 to 2018-01-14		
Report Date:	2018-07-30		
Revised Note:	The previous report R2DG161221051-10 is replaced by this report on 2018-07-30.		
Reviewed By:	Daniel Duan / EE Manager	<i>Daniel Duan</i>	
Test Facility:	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.		
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Accreditation:	The IAS Accreditation Number TL-460.		

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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1 - General Information

1.1 Description of LED Light Sources

Sample Size:

90 PCS samples were received on 2016-12-21. The samples were numbered from 1 to 30, 31 to 60 and 61 to 90.

Manufacturer:	Shenzhen Refond Optoelectronic Co., Ltd.
Part Number:	RF-27TI32DS-FF-J
Part Type:	LED Package
Drive Level:	DC 150mA
Nominal CCT:	2700K
Power:	0.5W
Current Density per LED die:	533.33 mA/mm ²
Power Density per LED die:	1.78 W/mm ²
CRI:	90
Die Spacing:	N/A

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.

Family products covered by this report:

According to *ENERGY STAR® Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR® Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Testing Model	Multiple Model	Difference	Details
RF-27TI32DS-FF-J	R*-* ** * 32DS-**-** (-Y)	CCT Internal management code	All models are identical except the CCT and Internal management code.

Note

- The first * can be F or T, it is an internal Market code which does not affect property.
- The second * represent customer name, it can be C, D, H, K, L, M, P, S, T, W, Y, which also can be excluded.
- The third to fourth * represent CCT, it can be 22, 24, 27, 30, 35, 40, 45, 50, 57, 60, 62, 65, 82; ** don't mean only two numbers, it maybe also as mentioned 2, 3, 4, 5, 6, 7, 8.
- The fifth * represent Chromogenic index, it can be R, M, H, T, or Q&S which does not affect product property.
- The sixth * represent power, it can be I&P.
- The seventh to eighth * can be AF, BF, CF, DF, EF, FF, FD or FH, it is an internal Market code which does not affect product property.
- The ninth to tenth ** can be N, 2N, 3N or J, it is an internal Market code which does not affect product property.
- The letter "Y" on behalf of the centrifugal power equipment is not used, No "Y" on behalf of using centrifugal power equipment.

1.2 Standards Used:

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs (This standard was not accredited by IAS)
- ENERGY STAR® Requirements for the Use of LM-80 Data (This standard was not accredited by IAS)

1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
0.3m integrating sphere	EVERFINE	Diameter 0.3m	1011119	2017-03-09	2018-03-09

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2017-03-03	2018-03-03
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2017-03-09	2018-03-09
Standard Light Source	EVERFINE	D062	1011093	2017-09-13	2018-09-13
Precision digital stabilized DC power supply	EVERFINE	WY605-V110	G115987CJ7321114	2017-03-03	2018-03-03
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06606	2017-10-23	2018-10-23
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06605	2017-10-23	2018-10-23
DC Power Supply	Taishan Xingguang	T0150E8.5-80	ST06604	2017-10-23	2018-10-23
Multilayer aging machine	BACL	B2-270	20005	2017-09-01	2018-09-01

1.4 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within $\pm 3\%$ of the specified value of the manufacturer during maintenance test, and was within $\pm 0.5\%$ during photometric and electrical measurement test.

1.5 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP_{LED}) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP_{LED} of the coldest LEDs were maintained at a temperature that was greater than or equal to $2^{\circ}C$ below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to $5^{\circ}C$ below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within $\pm 3\%$ of the specified value of the manufacturer.

The relative humidity within chamber was kept less than 65% during test.

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

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate $u'v'$. 2π measurement was used and sample was driven by DC power supply. The forward current was regulated to within $\pm 0.5\%$ of the nominal value. The test system was calibrated by halogen reference lamp. The ambient temperature during test was set to $25^{\circ}C \pm 2^{\circ}C$, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

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.

The uncertainty of the temperature is $U=0.8671^{\circ}C$ ($K=2$), at the 95% confidence level.

1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.8 Sample Set

Data Set 1: 55°C, 150mA

Part Number: RF-27TI32DS-FF-J
Number of Units: 30
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

Data Set 2: 85°C, 150mA

Part Number: RF-27TI32DS-FF-J
Number of Units: 30
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

Data Set 3: 105°C, 150mA

Part Number: RF-27TI32DS-FF-J
Number of Units: 30
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 150mA
Measurement Current: 150mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α :	β :	Reported TM-21 L ₇₀ Lifetime	Reported TM-21 L ₉₀ Lifetime
1	30	0	1000hrs	9000hrs	1.959E-06	1.003	>54000hrs	>54000hrs
2	30	0	1000hrs	9000hrs	2.454E-06	1.002	>54000hrs	44000hrs
3	30	0	1000hrs	9000hrs	2.899E-06	1.000	>54000hrs	36000 hrs

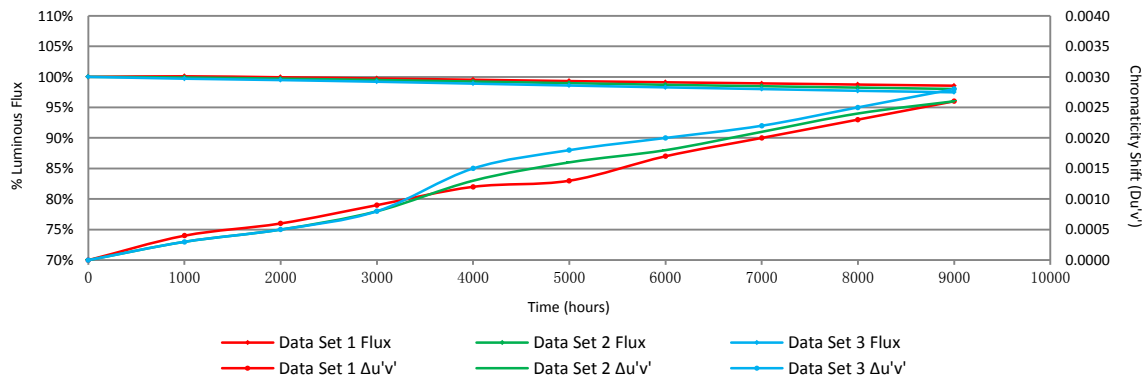
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	100.09%	99.93%	99.73%	99.53%	99.31%	99.11%	98.93%	98.74%	98.55%
2	99.90%	99.71%	99.48%	99.23%	98.97%	98.70%	98.47%	98.24%	98.02%
3	99.70%	99.47%	99.20%	98.89%	98.58%	98.28%	98.00%	97.72%	97.47%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.0005	0.0008	0.0009	0.0012	0.0017	0.0018	0.0022	0.0024	0.0026
2	0.0003	0.0005	0.0008	0.0013	0.0016	0.0018	0.0021	0.0024	0.0026
3	0.0003	0.0005	0.0008	0.0015	0.0018	0.002	0.0022	0.0025	0.0028

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

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

No.	Φ(lm)	Lumen Maintenance (%)								
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	56.67	100.09	100.02	99.93	99.75	99.56	99.26	99.15	98.98	98.80
2	57.91	99.95	99.64	99.43	99.34	99.03	98.79	98.60	98.45	98.38
3	57.25	99.84	99.62	99.28	99.18	98.90	98.57	98.36	98.15	97.90
4	57.49	99.93	99.62	99.46	99.13	98.85	98.64	98.28	98.17	97.70
5	57.45	99.84	99.74	99.48	99.30	99.18	99.11	98.96	98.75	98.59
6	58.33	100.55	100.51	100.19	99.88	99.54	99.37	99.14	99.09	98.92
7	56.96	100.19	100.07	99.67	99.60	99.40	99.14	98.98	98.68	98.38
8	56.94	99.95	99.86	99.60	99.49	99.40	99.26	99.17	98.88	98.58
9	56.13	99.84	99.68	99.61	99.41	99.23	99.18	98.91	98.75	98.36
10	56.82	99.93	99.68	99.58	99.31	99.16	98.96	98.82	98.56	98.22
11	56.42	100.12	99.95	99.77	99.61	99.56	99.47	99.42	99.27	99.15
12	56.56	100.50	100.39	100.28	100.27	100.19	100.02	99.73	99.50	99.38
13	57.13	100.21	100.05	99.74	99.40	99.18	98.93	98.86	98.62	98.55
14	56.05	100.09	100.02	99.89	99.66	99.25	98.95	98.79	98.57	98.34
15	56.18	100.28	100.11	99.96	99.73	99.56	99.36	99.22	99.06	98.95
16	57.96	100.03	99.90	99.67	99.43	99.00	98.78	98.46	98.43	98.17
17	55.87	99.87	99.71	99.48	99.23	99.05	98.80	98.62	98.34	98.19
18	57.42	100.03	99.97	99.65	99.51	99.29	99.09	98.90	98.68	98.43
19	58.00	99.95	99.81	99.55	99.34	99.26	99.21	99.12	98.97	98.83
20	58.22	99.86	99.74	99.60	99.35	99.02	98.94	98.75	98.66	98.42
21	57.06	100.23	100.11	99.86	99.58	99.37	99.02	98.90	98.65	98.55
22	56.15	100.45	100.16	99.88	99.48	99.39	99.23	99.15	98.81	98.63
23	56.78	100.28	100.02	99.95	99.81	99.63	99.40	99.17	99.01	98.80
24	57.07	100.42	100.14	100.02	99.88	99.72	99.61	99.35	99.19	99.05
25	57.34	100.47	100.31	100.17	100.02	99.70	99.56	99.41	99.25	98.90
26	56.50	100.16	100.00	99.81	99.68	99.40	99.20	99.01	98.87	98.58
27	56.59	99.91	99.65	99.52	99.42	99.08	98.85	98.78	98.66	98.55
28	56.92	99.86	99.81	99.65	99.40	99.17	98.89	98.75	98.44	98.37
29	56.25	99.96	99.73	99.64	99.50	99.29	98.97	98.83	98.76	98.67
30	57.70	99.98	99.76	99.53	99.20	98.91	98.60	98.44	98.13	98.01
Ave.	57.00	100.09	99.93	99.73	99.53	99.31	99.11	98.93	98.74	98.55
Med.	56.95	100.03	99.92	99.66	99.49	99.27	99.10	98.91	98.72	98.55
st dev	0.68	0.2191	0.2371	0.2428	0.2623	0.2926	0.3242	0.3335	0.3408	0.3694
Min.	55.87	99.84	99.62	99.28	99.13	98.85	98.57	98.28	98.13	97.70
Max.	58.33	100.55	100.51	100.28	100.27	100.19	100.02	99.73	99.50	99.38

3.2 Data Set 1, 55°C, 150mA (Forward Voltage)

No.	Forward Voltage (V)									
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.057	3.068	3.071	3.062	3.063	3.062	3.060	3.054	3.071	3.056
2	3.081	3.091	3.102	3.088	3.093	3.089	3.086	3.076	3.093	3.081
3	3.061	3.066	3.069	3.062	3.067	3.069	3.062	3.055	3.074	3.058
4	3.089	3.096	3.101	3.091	3.099	3.093	3.089	3.083	3.107	3.086
5	3.064	3.071	3.072	3.067	3.076	3.070	3.062	3.057	3.078	3.059
6	3.057	3.063	3.063	3.057	3.056	3.061	3.054	3.051	3.074	3.050
7	3.060	3.068	3.066	3.063	3.062	3.065	3.060	3.055	3.072	3.055
8	3.070	3.081	3.080	3.074	3.075	3.075	3.070	3.064	3.105	3.068
9	3.086	3.093	3.089	3.085	3.083	3.088	3.083	3.074	3.095	3.078
10	3.062	3.073	3.075	3.069	3.072	3.070	3.065	3.060	3.083	3.062
11	3.044	3.052	3.051	3.048	3.059	3.050	3.049	3.039	3.074	3.042
12	3.080	3.093	3.090	3.086	3.095	3.087	3.081	3.074	3.094	3.077
13	3.090	3.109	3.101	3.096	3.096	3.098	3.093	3.088	3.100	3.089
14	3.061	3.077	3.071	3.068	3.065	3.069	3.065	3.065	3.070	3.059
15	3.063	3.074	3.071	3.067	3.067	3.070	3.064	3.058	3.080	3.060
16	3.081	3.100	3.089	3.087	3.091	3.087	3.084	3.079	3.090	3.078
17	3.083	3.097	3.092	3.089	3.094	3.090	3.087	3.077	3.093	3.081
18	3.062	3.082	3.074	3.071	3.069	3.073	3.066	3.062	3.072	3.063
19	3.054	3.064	3.062	3.059	3.071	3.060	3.055	3.049	3.073	3.054
20	3.066	3.083	3.075	3.071	3.077	3.074	3.069	3.063	3.075	3.067
21	3.062	3.076	3.081	3.070	3.068	3.068	3.064	3.058	3.072	3.062
22	3.044	3.060	3.056	3.051	3.059	3.051	3.046	3.040	3.051	3.042
23	3.059	3.072	3.072	3.067	3.069	3.067	3.061	3.056	3.068	3.057
24	3.079	3.095	3.091	3.088	3.088	3.086	3.082	3.078	3.091	3.079
25	3.051	3.064	3.058	3.055	3.056	3.058	3.052	3.045	3.059	3.050
26	3.065	3.077	3.072	3.068	3.082	3.072	3.063	3.061	3.073	3.065
27	3.063	3.081	3.072	3.068	3.094	3.071	3.066	3.061	3.070	3.063
28	3.080	3.092	3.088	3.087	3.089	3.084	3.079	3.074	3.090	3.078
29	3.077	3.087	3.084	3.084	3.090	3.083	3.077	3.070	3.087	3.074
30	3.063	3.073	3.070	3.067	3.081	3.069	3.062	3.058	3.071	3.061
Ave.	3.067	3.079	3.077	3.072	3.077	3.074	3.069	3.063	3.080	3.065
Med.	3.063	3.077	3.073	3.069	3.076	3.071	3.065	3.061	3.075	3.063
st dev	0.0126	0.0137	0.0134	0.0129	0.0135	0.0124	0.0126	0.0124	0.0133	0.0125
Min.	3.044	3.052	3.051	3.048	3.056	3.050	3.046	3.039	3.051	3.042
Max.	3.090	3.109	3.102	3.096	3.099	3.098	3.093	3.088	3.107	3.089

3.3 Data Set 1, 55°C, 150mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	0.2588	0.5215	2805	0.0005	0.0008	0.0009	0.0012	0.0017	0.0018	0.0022	0.0024	0.0026
2	0.2611	0.5258	2736	0.0004	0.0008	0.0009	0.0012	0.0015	0.0019	0.0021	0.0025	0.0027
3	0.2628	0.5276	2692	0.0002	0.0006	0.0009	0.0011	0.0012	0.0017	0.0018	0.0020	0.0025
4	0.2627	0.5286	2692	0.0005	0.0008	0.0009	0.0011	0.0012	0.0019	0.0019	0.0022	0.0026
5	0.2612	0.5282	2724	0.0004	0.0007	0.0008	0.0010	0.0012	0.0017	0.0019	0.0021	0.0025
6	0.2613	0.5285	2721	0.0006	0.0009	0.0010	0.0012	0.0014	0.0018	0.0023	0.0024	0.0025
7	0.2617	0.5313	2700	0.0002	0.0005	0.0008	0.0010	0.0012	0.0016	0.0019	0.0021	0.0025
8	0.2603	0.5269	2748	0.0004	0.0006	0.0008	0.0011	0.0011	0.0016	0.0020	0.0022	0.0025
9	0.2612	0.5271	2728	0.0002	0.0004	0.0008	0.0011	0.0012	0.0015	0.0018	0.0021	0.0024
10	0.2623	0.5269	2706	0.0007	0.0011	0.0009	0.0013	0.0016	0.0018	0.0023	0.0025	0.0028
11	0.2577	0.5267	2805	0.0005	0.0007	0.0009	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027
12	0.2627	0.5288	2691	0.0008	0.0012	0.0012	0.0014	0.0016	0.0019	0.0023	0.0027	0.0030
13	0.2583	0.5263	2793	0.0003	0.0006	0.0009	0.0012	0.0013	0.0016	0.0020	0.0022	0.0026
14	0.2627	0.5265	2699	0.0003	0.0006	0.0009	0.0011	0.0013	0.0016	0.0020	0.0022	0.0027
15	0.2601	0.5234	2769	0.0009	0.0008	0.0011	0.0015	0.0016	0.0019	0.0023	0.0026	0.0030
16	0.2611	0.5259	2735	0.0003	0.0004	0.0009	0.0011	0.0013	0.0016	0.0018	0.0023	0.0024
17	0.2617	0.5287	2712	0.0003	0.0005	0.0008	0.0011	0.0012	0.0016	0.0019	0.0022	0.0026
18	0.2617	0.5270	2718	0.0003	0.0005	0.0009	0.0011	0.0015	0.0019	0.0021	0.0025	0.0027
19	0.2623	0.5287	2700	0.0004	0.0004	0.0008	0.0010	0.0012	0.0016	0.0018	0.0021	0.0024
20	0.2623	0.5286	2698	0.0003	0.0004	0.0009	0.0011	0.0012	0.0016	0.0019	0.0021	0.0025
21	0.2597	0.5257	2766	0.0003	0.0004	0.0008	0.0011	0.0012	0.0016	0.0019	0.0021	0.0024
22	0.2617	0.5257	2723	0.0003	0.0004	0.0008	0.0011	0.0012	0.0016	0.0018	0.0022	0.0024
23	0.2601	0.5245	2763	0.0002	0.0005	0.0008	0.0011	0.0012	0.0016	0.0018	0.0023	0.0026
24	0.2600	0.5235	2770	0.0004	0.0007	0.0009	0.0012	0.0013	0.0016	0.0019	0.0023	0.0026
25	0.2593	0.5225	2790	0.0005	0.0005	0.0008	0.0011	0.0013	0.0016	0.0019	0.0022	0.0025
26	0.2624	0.5274	2702	0.0006	0.0007	0.0011	0.0013	0.0015	0.0018	0.0021	0.0025	0.0029
27	0.2610	0.5258	2738	0.0004	0.0005	0.0008	0.0010	0.0012	0.0016	0.0019	0.0021	0.0025
28	0.2584	0.5215	2814	0.0003	0.0004	0.0008	0.0010	0.0012	0.0016	0.0021	0.0024	0.0026
29	0.2601	0.5271	2751	0.0001	0.0004	0.0009	0.0011	0.0013	0.0017	0.0020	0.0021	0.0026
30	0.2628	0.5282	2691	0.0003	0.0005	0.0009	0.0012	0.0014	0.0017	0.0021	0.0026	0.0027
Ave.	0.2610	0.5265	2736	0.0004	0.0006	0.0009	0.0012	0.0013	0.0017	0.0020	0.0023	0.0026
Med.	0.2612	0.5269	2726	0.0003	0.0005	0.0009	0.0011	0.0013	0.0016	0.0020	0.0022	0.0026
st dev	0.0015	0.0023	38	0.0002	0.0002	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002
Min.	0.2577	0.5215	2691	0.0001	0.0004	0.0008	0.0010	0.0011	0.0015	0.0018	0.0020	0.0024
Max.	0.2628	0.5313	2814	0.0009	0.0012	0.0012	0.0015	0.0017	0.0019	0.0023	0.0027	0.0030

3.4 Data Set 2, 85°C, 150mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)								
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
31	57.46	99.98	99.63	99.41	99.10	98.82	98.57	98.40	98.21	98.05
32	57.50	100.12	99.83	99.60	99.32	98.92	98.64	98.50	98.37	98.16
33	57.14	100.04	99.88	99.68	99.42	99.18	98.79	98.41	98.32	98.16
34	57.85	100.19	100.03	99.76	99.52	99.19	98.95	98.76	98.48	98.31
35	57.39	99.98	99.70	99.44	99.29	98.87	98.76	98.48	98.19	98.05
36	57.60	99.84	99.70	99.55	99.32	99.08	98.92	98.59	98.30	97.97
37	57.36	99.95	99.74	99.58	99.30	99.11	98.94	98.80	98.57	98.10
38	57.13	99.91	99.75	99.61	99.37	99.12	98.86	98.70	98.48	98.11
39	56.20	100.04	99.79	99.41	99.20	98.97	98.67	98.29	98.02	97.79
40	57.47	100.05	99.97	99.69	99.44	99.29	99.01	98.69	98.31	97.91
41	57.31	99.90	99.83	99.60	99.37	99.23	99.04	98.83	98.52	98.34
42	57.64	100.02	99.86	99.51	99.36	99.25	99.01	98.87	98.46	98.27
43	57.05	99.88	99.70	99.60	99.37	99.05	98.84	98.60	98.56	98.48
44	57.45	98.82	98.52	98.36	98.19	97.82	97.63	97.44	97.13	96.90
45	57.25	99.77	99.58	99.23	98.86	98.66	98.34	98.04	97.85	97.62
46	56.99	99.91	99.63	99.37	99.14	98.88	98.46	98.10	97.86	97.67
47	56.92	99.95	99.72	99.49	99.21	98.98	98.61	98.47	98.24	98.01
48	56.80	100.18	99.84	99.70	99.35	99.10	98.80	98.57	98.33	98.24
49	58.25	100.14	99.97	99.78	99.55	99.26	98.90	98.78	98.49	98.25
50	57.06	99.77	99.58	99.35	99.14	98.93	98.83	98.60	98.25	98.07
51	57.23	99.77	99.51	99.30	98.95	98.71	98.50	98.20	97.78	97.48
52	57.09	99.95	99.68	99.32	98.95	98.77	98.51	98.30	97.99	97.69
53	57.19	99.86	99.79	99.44	99.09	98.90	98.51	98.23	98.01	97.87
54	57.79	99.84	99.64	99.24	98.86	98.70	98.23	98.04	97.94	97.82
55	57.47	99.72	99.67	99.30	99.08	98.83	98.47	98.21	98.14	98.05
56	56.63	99.84	99.70	99.45	99.28	98.94	98.69	98.45	98.34	98.13
57	56.98	99.77	99.58	99.44	99.23	98.98	98.67	98.63	98.51	98.35
58	56.88	100.14	100.00	99.89	99.81	99.45	99.23	99.16	99.00	98.75
59	56.06	99.89	99.77	99.68	99.54	99.16	98.89	98.63	98.41	98.07
60	58.14	99.86	99.59	99.54	99.36	99.00	98.64	98.45	98.09	97.99
Ave.	57.24	99.90	99.71	99.48	99.23	98.97	98.70	98.47	98.24	98.02
Med.	57.24	99.91	99.71	99.50	99.29	98.98	98.73	98.49	98.31	98.06
st dev	0.48	0.2423	0.2609	0.2684	0.2888	0.2901	0.3027	0.3262	0.3358	0.3389
Min.	56.06	98.82	98.52	98.36	98.19	97.82	97.63	97.44	97.13	96.90
Max.	58.25	100.19	100.03	99.89	99.81	99.45	99.23	99.16	99.00	98.75

3.5 Data Set 2, 85°C, 150mA (Forward Voltage)

No.	Forward Voltage (V)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
31	3.062	3.078	3.072	3.071	3.084	3.069	3.064	3.060	3.074	3.063
32	3.083	3.099	3.092	3.091	3.094	3.092	3.085	3.083	3.097	3.085
33	3.057	3.070	3.066	3.063	3.067	3.071	3.058	3.053	3.065	3.056
34	3.051	3.064	3.060	3.059	3.062	3.074	3.055	3.050	3.063	3.052
35	3.043	3.057	3.054	3.052	3.053	3.059	3.048	3.041	3.053	3.044
36	3.051	3.061	3.060	3.058	3.061	3.069	3.051	3.049	3.060	3.051
37	3.065	3.077	3.074	3.070	3.074	3.077	3.067	3.062	3.077	3.063
38	3.049	3.062	3.058	3.053	3.067	3.065	3.049	3.045	3.060	3.048
39	3.055	3.067	3.062	3.059	3.065	3.065	3.054	3.049	3.062	3.053
40	3.083	3.096	3.094	3.089	3.094	3.087	3.086	3.081	3.095	3.083
41	3.048	3.064	3.057	3.054	3.056	3.289	3.050	3.045	3.057	3.046
42	3.070	3.081	3.080	3.075	3.082	3.087	3.069	3.068	3.076	3.069
43	3.043	3.058	3.054	3.049	3.052	3.066	3.046	3.042	3.054	3.044
44	3.080	3.092	3.088	3.085	3.088	3.099	3.090	3.078	3.085	3.076
45	3.048	3.065	3.059	3.055	3.059	3.066	3.050	3.046	3.055	3.047
46	3.052	3.065	3.062	3.061	3.063	3.066	3.055	3.051	3.062	3.053
47	3.044	3.057	3.052	3.049	3.062	3.057	3.043	3.040	3.050	3.042
48	3.091	3.105	3.101	3.099	3.109	3.112	3.092	3.092	3.101	3.092
49	3.056	3.068	3.063	3.061	3.065	3.073	3.055	3.058	3.063	3.055
50	3.054	3.068	3.062	3.059	3.064	3.075	3.055	3.055	3.064	3.055
51	3.064	3.080	3.073	3.073	3.080	3.074	3.066	3.064	3.075	3.063
52	3.085	3.101	3.095	3.093	3.097	3.103	3.088	3.084	3.096	3.086
53	3.086	3.099	3.096	3.094	3.101	3.121	3.088	3.086	3.094	3.086
54	3.086	3.101	3.096	3.095	3.102	3.134	3.090	3.091	3.096	3.084
55	3.068	3.078	3.075	3.073	3.075	3.107	3.069	3.066	3.074	3.066
56	3.082	3.100	3.092	3.088	3.095	3.092	3.087	3.080	3.092	3.082
57	3.060	3.072	3.067	3.066	3.069	3.069	3.063	3.057	3.068	3.058
58	3.049	3.060	3.055	3.055	3.058	3.055	3.051	3.043	3.055	3.045
59	3.046	3.059	3.051	3.052	3.065	3.055	3.047	3.040	3.051	3.042
60	3.055	3.064	3.060	3.061	3.076	3.065	3.056	3.051	3.061	3.052
Ave.	3.062	3.076	3.071	3.069	3.075	3.086	3.064	3.0603	3.0712	3.0614
Med.	3.057	3.069	3.065	3.062	3.068	3.074	3.057	3.0560	3.0645	3.0555
st dev	0.0154	0.0159	0.0159	0.0158	0.0163	0.0432	0.0162	0.0167	0.0161	0.0158
Min.	3.043	3.057	3.051	3.049	3.052	3.055	3.043	3.0400	3.0500	3.0420
Max.	3.091	3.105	3.101	3.099	3.109	3.289	3.092	3.0920	3.1010	3.0920

3.6 Data Set 2, 85°C, 150mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
31	0.2609	0.5300	2722	0.0005	0.0005	0.0008	0.0013	0.0013	0.0018	0.0019	0.0025	0.0026
32	0.2580	0.5267	2799	0.0003	0.0005	0.0009	0.0013	0.0016	0.0018	0.0018	0.0021	0.0024
33	0.2609	0.5269	2736	0.0004	0.0007	0.0008	0.0012	0.0016	0.0018	0.0021	0.0021	0.0024
34	0.2628	0.5282	2690	0.0003	0.0005	0.0007	0.0011	0.0016	0.0017	0.0020	0.0021	0.0022
35	0.2619	0.5275	2712	0.0004	0.0005	0.0008	0.0013	0.0015	0.0017	0.0021	0.0022	0.0025
36	0.2623	0.5291	2698	0.0003	0.0007	0.0009	0.0014	0.0016	0.0018	0.0021	0.0022	0.0025
37	0.2617	0.5287	2710	0.0002	0.0005	0.0008	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024
38	0.2603	0.5260	2752	0.0003	0.0004	0.0008	0.0012	0.0016	0.0018	0.0021	0.0022	0.0025
39	0.2622	0.5275	2705	0.0003	0.0007	0.0008	0.0012	0.0015	0.0018	0.0020	0.0023	0.0024
40	0.2629	0.5280	2689	0.0003	0.0006	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0025
41	0.2628	0.5272	2695	0.0003	0.0006	0.0008	0.0013	0.0016	0.0018	0.0022	0.0024	0.0025
42	0.2615	0.5289	2714	0.0004	0.0005	0.0008	0.0012	0.0016	0.0017	0.0021	0.0023	0.0026
43	0.2608	0.5248	2747	0.0002	0.0004	0.0008	0.0014	0.0017	0.0018	0.0022	0.0024	0.0028
44	0.2609	0.5251	2743	0.0005	0.0005	0.0009	0.0013	0.0016	0.0019	0.0022	0.0025	0.0027
45	0.2577	0.5212	2831	0.0002	0.0005	0.0008	0.0013	0.0016	0.0018	0.0021	0.0025	0.0028
46	0.2627	0.5298	2687	0.0004	0.0007	0.0009	0.0014	0.0016	0.0018	0.0022	0.0024	0.0029
47	0.2612	0.5296	2717	0.0004	0.0004	0.0008	0.0012	0.0014	0.0016	0.0019	0.0023	0.0026
48	0.2584	0.5249	2798	0.0003	0.0005	0.0008	0.0013	0.0014	0.0017	0.0022	0.0024	0.0029
49	0.2598	0.5273	2758	0.0002	0.0005	0.0009	0.0013	0.0016	0.0019	0.0020	0.0024	0.0027
50	0.2606	0.5276	2740	0.0002	0.0005	0.0008	0.0012	0.0016	0.0019	0.0022	0.0024	0.0028
51	0.2611	0.5284	2725	0.0002	0.0004	0.0008	0.0012	0.0015	0.0018	0.0021	0.0023	0.0027
52	0.2626	0.5294	2690	0.0001	0.0006	0.0009	0.0012	0.0015	0.0018	0.0022	0.0025	0.0027
53	0.2622	0.5284	2701	0.0002	0.0004	0.0008	0.0012	0.0015	0.0017	0.0021	0.0024	0.0026
54	0.2589	0.5246	2788	0.0003	0.0004	0.0009	0.0013	0.0016	0.0019	0.0021	0.0026	0.0029
55	0.2607	0.5268	2739	0.0002	0.0004	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026
56	0.2617	0.5257	2723	0.0003	0.0004	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027
57	0.2618	0.5265	2718	0.0003	0.0004	0.0008	0.0013	0.0016	0.0018	0.0021	0.0025	0.0028
58	0.2619	0.5264	2717	0.0004	0.0006	0.0009	0.0014	0.0017	0.0020	0.0022	0.0026	0.0028
59	0.2575	0.5262	2811	0.0003	0.0005	0.0008	0.0012	0.0016	0.0018	0.0021	0.0024	0.0027
60	0.2623	0.5284	2701	0.0002	0.0005	0.0009	0.0013	0.0017	0.0019	0.0021	0.0025	0.0028
Ave.	0.2610	0.5272	2732	0.0003	0.0005	0.0008	0.0013	0.0016	0.0018	0.0021	0.0024	0.0026
Med.	0.2614	0.5274	2720	0.0003	0.0005	0.0008	0.0013	0.0016	0.0018	0.0021	0.0024	0.0027
st dev	0.0016	0.0019	39	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Min.	0.2575	0.5212	2687	0.0001	0.0004	0.0007	0.0011	0.0013	0.0016	0.0018	0.0021	0.0022
Max.	0.2629	0.5300	2831	0.0005	0.0007	0.0009	0.0014	0.0017	0.0020	0.0022	0.0026	0.0029

3.7 Data Set 3, 105°C, 150mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)								
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
61	58.41	99.91	99.66	99.47	99.09	99.02	98.75	98.34	98.22	98.10
62	56.80	99.63	99.40	99.12	98.91	98.61	98.24	98.01	97.69	97.64
63	57.35	99.72	99.60	99.23	99.01	98.67	98.41	98.17	97.86	97.59
64	57.48	99.90	99.76	99.46	99.13	98.82	98.45	98.23	97.81	97.43
65	57.90	99.74	99.46	99.15	98.93	98.74	98.45	98.22	98.00	97.62
66	58.01	99.81	99.64	99.40	99.02	98.64	98.40	98.35	98.05	97.59
67	56.30	99.54	99.33	99.20	98.92	98.58	98.37	98.08	97.80	97.69
68	57.61	99.72	99.31	99.11	98.68	98.30	97.92	97.69	97.52	97.07
69	57.32	99.77	99.44	99.16	98.87	98.67	98.29	98.05	97.77	97.54
70	57.14	99.88	99.67	99.30	98.90	98.62	98.46	98.14	97.93	97.60
71	57.99	99.57	99.28	99.10	98.97	98.64	98.36	98.21	97.79	97.53
72	57.89	99.55	99.33	99.05	98.79	98.51	98.20	97.93	97.79	97.51
73	57.94	99.33	99.14	98.77	98.53	98.27	98.00	97.81	97.65	97.48
74	57.65	99.62	99.44	99.20	98.79	98.51	98.23	98.01	97.71	97.57
75	57.62	99.34	99.06	98.80	98.40	98.11	97.81	97.62	97.43	97.17
76	57.66	100.05	99.77	99.55	99.15	98.84	98.53	98.27	98.07	97.80
77	57.73	99.69	99.50	99.24	99.05	98.65	98.41	98.11	97.73	97.56
78	56.86	99.86	99.56	99.38	99.10	98.77	98.45	98.26	98.15	97.89
79	55.14	99.85	99.62	99.33	98.86	98.53	98.13	97.93	97.79	97.53
80	56.11	99.80	99.54	99.16	98.90	98.82	98.56	98.11	97.75	97.45
81	57.38	99.70	99.62	99.39	99.01	98.52	98.17	97.82	97.54	97.46
82	56.88	99.67	99.49	99.33	99.05	98.77	98.47	98.22	97.89	97.64
83	57.37	99.65	99.55	99.22	98.85	98.55	98.36	98.07	97.70	97.44
84	55.22	99.58	99.57	99.31	98.99	98.68	98.37	97.92	97.56	97.28
85	58.07	99.69	99.41	99.09	98.79	98.54	98.26	97.95	97.55	97.21
86	57.72	100.45	100.21	100.00	99.60	99.22	98.84	98.48	98.13	98.04
87	56.19	99.52	99.20	98.68	98.49	98.06	97.70	97.37	97.06	96.89
88	57.70	99.36	98.94	98.73	98.46	97.99	97.76	97.33	96.85	96.52
89	58.61	99.61	99.32	98.98	98.65	98.29	97.87	97.49	97.22	96.84
90	58.62	99.51	99.22	99.04	98.84	98.52	98.07	97.82	97.65	97.39
Ave.	57.36	99.70	99.47	99.20	98.89	98.58	98.28	98.00	97.72	97.47
Med.	57.62	99.69	99.48	99.20	98.90	98.61	98.36	98.06	97.76	97.53
st dev	0.86	0.2230	0.2451	0.2646	0.2406	0.2656	0.2746	0.2844	0.3057	0.3334
Min.	55.14	99.33	98.94	98.68	98.40	97.99	97.70	97.33	96.85	96.52
Max.	58.62	100.45	100.21	100.00	99.60	99.22	98.84	98.48	98.22	98.10

3.8 Data Set 3, 105°C, 150mA (Forward Voltage)

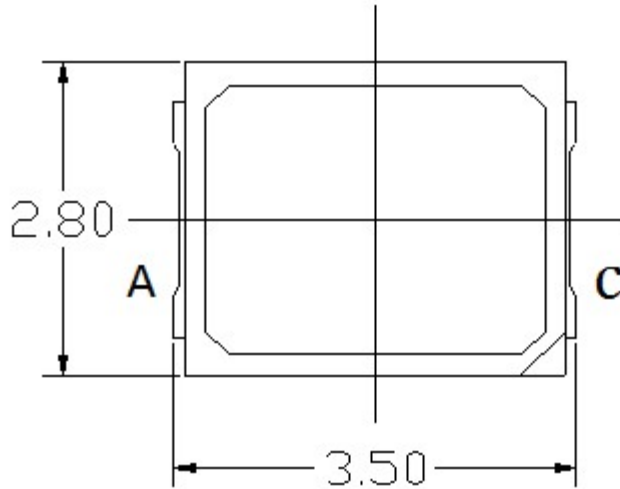
No.	Forward Voltage (V)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
61	3.085	3.098	3.092	3.092	3.091	3.098	3.089	3.081	3.096	3.082
62	3.058	3.075	3.067	3.067	3.067	3.069	3.062	3.056	3.072	3.056
63	3.063	3.077	3.071	3.071	3.073	3.073	3.066	3.062	3.072	3.062
64	3.047	3.057	3.054	3.052	3.052	3.055	3.044	3.041	3.053	3.044
65	3.062	3.070	3.068	3.068	3.071	3.071	3.059	3.062	3.074	3.060
66	3.063	3.074	3.074	3.068	3.071	3.070	3.063	3.065	3.079	3.061
67	3.057	3.075	3.068	3.063	3.067	3.063	3.058	3.067	3.063	3.055
68	3.067	3.080	3.077	3.072	3.074	3.071	3.067	3.062	3.074	3.065
69	3.058	3.071	3.069	3.065	3.121	3.067	3.060	3.054	3.088	3.059
70	3.078	3.092	3.086	3.083	3.096	3.085	3.078	3.072	3.108	3.074
71	3.071	3.083	3.080	3.077	3.082	3.079	3.071	3.070	3.080	3.070
72	3.094	3.108	3.103	3.103	3.100	3.101	3.092	3.088	3.105	3.093
73	3.056	3.068	3.064	3.063	3.065	3.064	3.055	3.053	3.073	3.055
74	3.083	3.096	3.102	3.089	3.096	3.088	3.082	3.082	3.096	3.079
75	3.062	3.078	3.072	3.071	3.090	3.071	3.064	3.066	3.114	3.061
76	3.049	3.066	3.058	3.056	3.056	3.054	3.050	3.047	3.086	3.046
77	3.062	3.076	3.077	3.068	3.074	3.068	3.062	3.059	3.143	3.065
78	3.052	3.065	3.061	3.060	3.061	3.059	3.056	3.049	3.062	3.054
79	3.048	3.061	3.057	3.055	3.055	3.055	3.046	3.049	3.058	3.046
80	3.056	3.070	3.064	3.061	3.079	3.062	3.057	3.058	3.063	3.053
81	3.047	3.058	3.055	3.050	3.068	3.052	3.044	3.045	3.060	3.042
82	3.054	3.064	3.061	3.057	3.063	3.060	3.050	3.055	3.073	3.053
83	3.047	3.062	3.054	3.052	3.056	3.056	3.046	3.048	3.052	3.046
84	3.090	3.102	3.097	3.096	3.118	3.200	3.091	3.091	3.097	3.087
85	3.081	3.094	3.089	3.086	3.094	3.090	3.082	3.084	3.162	3.080
86	3.065	3.074	3.075	3.069	3.072	3.077	3.065	3.062	3.073	3.063
87	3.059	3.073	3.067	3.065	3.080	3.085	3.059	3.062	3.064	3.059
88	3.078	3.098	3.086	3.085	3.084	3.097	3.081	3.084	3.083	3.076
89	3.053	3.063	3.059	3.057	3.059	3.066	3.052	3.062	3.056	3.051
90	3.062	3.075	3.070	3.069	3.071	3.099	3.065	3.062	3.069	3.060
Ave.	3.064	3.077	3.073	3.070	3.077	3.077	3.064	3.0633	3.0816	3.0619
Med.	3.062	3.075	3.070	3.068	3.073	3.071	3.062	3.0620	3.0735	3.0600
st dev	0.0133	0.0138	0.0140	0.0137	0.0176	0.0274	0.0139	0.0133	0.0254	0.0132
Min.	3.047	3.057	3.054	3.050	3.052	3.052	3.044	3.0410	3.0520	3.0420
Max.	3.094	3.108	3.103	3.103	3.121	3.200	3.092	3.0910	3.1620	3.0930

3.9 Data Set 3, 105°C, 150mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)								
	Ohr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
61	0.2604	0.5266	2747	0.0002	0.0004	0.0007	0.0015	0.0015	0.0019	0.0021	0.0024	0.0023
62	0.2617	0.5286	2712	0.0003	0.0004	0.0009	0.0014	0.0016	0.0019	0.0024	0.0024	0.0028
63	0.2627	0.5286	2691	0.0003	0.0004	0.0008	0.0015	0.0016	0.0019	0.0021	0.0025	0.0027
64	0.2619	0.5282	2709	0.0002	0.0003	0.0008	0.0014	0.0015	0.0019	0.0020	0.0023	0.0028
65	0.2624	0.5277	2701	0.0003	0.0004	0.0008	0.0015	0.0014	0.0020	0.0021	0.0024	0.0026
66	0.2626	0.5308	2685	0.0002	0.0007	0.0008	0.0015	0.0017	0.0019	0.0020	0.0024	0.0027
67	0.2572	0.5225	2836	0.0002	0.0004	0.0008	0.0014	0.0018	0.0020	0.0021	0.0025	0.0028
68	0.2613	0.5284	2721	0.0003	0.0005	0.0008	0.0015	0.0019	0.0020	0.0021	0.0024	0.0027
69	0.2616	0.5270	2720	0.0004	0.0005	0.0007	0.0015	0.0018	0.0019	0.0021	0.0024	0.0027
70	0.2629	0.5275	2691	0.0003	0.0005	0.0008	0.0015	0.0018	0.0020	0.0020	0.0024	0.0026
71	0.2612	0.5272	2727	0.0002	0.0005	0.0008	0.0015	0.0018	0.0020	0.0022	0.0023	0.0028
72	0.2613	0.5273	2725	0.0003	0.0004	0.0007	0.0015	0.0017	0.0020	0.0023	0.0024	0.0026
73	0.2610	0.5264	2735	0.0003	0.0004	0.0008	0.0015	0.0017	0.0020	0.0021	0.0024	0.0028
74	0.2628	0.5281	2692	0.0004	0.0006	0.0008	0.0016	0.0019	0.0020	0.0023	0.0026	0.0029
75	0.2621	0.5293	2701	0.0003	0.0007	0.0009	0.0015	0.0019	0.0021	0.0024	0.0025	0.0027
76	0.2618	0.5274	2714	0.0002	0.0003	0.0008	0.0015	0.0018	0.0020	0.0022	0.0025	0.0028
77	0.2624	0.5295	2694	0.0003	0.0004	0.0008	0.0015	0.0017	0.0020	0.0022	0.0024	0.0025
78	0.2606	0.5279	2737	0.0003	0.0004	0.0009	0.0015	0.0019	0.0020	0.0023	0.0025	0.0028
79	0.2604	0.5265	2748	0.0002	0.0004	0.0009	0.0015	0.0019	0.0021	0.0023	0.0026	0.0028
80	0.2600	0.5284	2748	0.0004	0.0004	0.0008	0.0015	0.0018	0.0021	0.0024	0.0027	0.0029
81	0.2599	0.5233	2773	0.0002	0.0005	0.0008	0.0015	0.0018	0.0020	0.0022	0.0024	0.0029
82	0.2606	0.5227	2761	0.0004	0.0006	0.0008	0.0015	0.0018	0.0022	0.0024	0.0026	0.0028
83	0.2599	0.5238	2771	0.0002	0.0004	0.0008	0.0015	0.0018	0.0021	0.0023	0.0026	0.0030
84	0.2567	0.5275	2823	0.0003	0.0004	0.0008	0.0015	0.0017	0.0020	0.0023	0.0025	0.0027
85	0.2616	0.5272	2719	0.0003	0.0005	0.0007	0.0014	0.0017	0.0020	0.0022	0.0025	0.0027
86	0.2620	0.5288	2705	0.0004	0.0008	0.0009	0.0017	0.0021	0.0023	0.0027	0.0029	0.0030
87	0.2619	0.5285	2707	0.0004	0.0006	0.0009	0.0013	0.0019	0.0021	0.0024	0.0026	0.0027
88	0.2627	0.5293	2688	0.0001	0.0005	0.0009	0.0015	0.0018	0.0021	0.0022	0.0025	0.0028
89	0.2587	0.5241	2795	0.0002	0.0005	0.0008	0.0015	0.0019	0.0022	0.0023	0.0026	0.0028
90	0.2600	0.5295	2743	0.0002	0.0004	0.0008	0.0014	0.0019	0.0021	0.0022	0.0022	0.0027
Ave.	0.2611	0.5273	2731	0.0003	0.0005	0.0008	0.0015	0.0018	0.0020	0.0022	0.0025	0.0028
Med.	0.2615	0.5276	2721	0.0003	0.0004	0.0008	0.0015	0.0018	0.0020	0.0022	0.0025	0.0028
st dev	0.0015	0.0021	39	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001
Min.	0.2567	0.5225	2685	0.0001	0.0003	0.0007	0.0013	0.0014	0.0019	0.0020	0.0022	0.0023
Max.	0.2629	0.5308	2836	0.0004	0.0008	0.0009	0.0017	0.0021	0.0023	0.0027	0.0029	0.0030

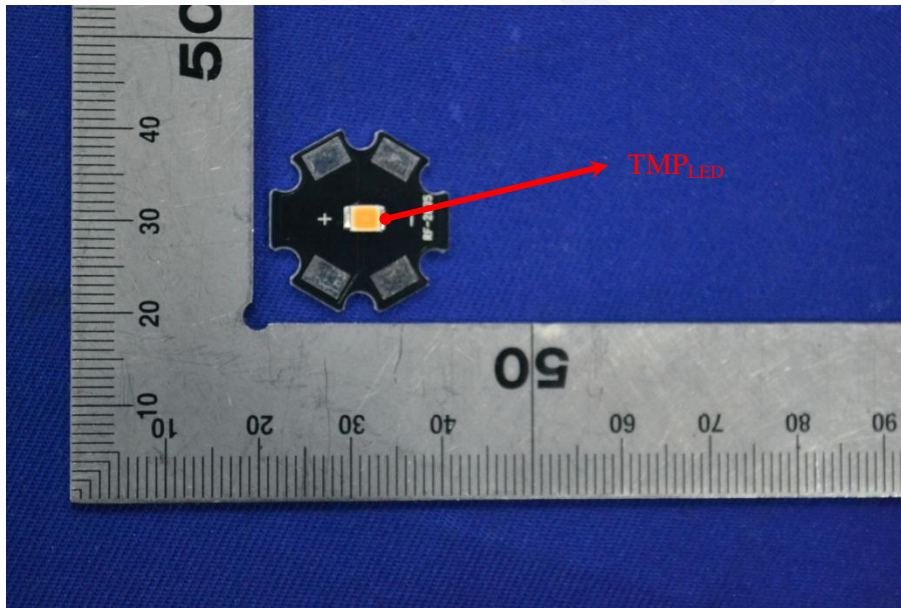
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



5 - Report Revision

Report Number	Report Date	Contents
R2DG161221051-10	2018-02-05	Original report.
R2DG161221051-10-M1	2018-07-30	Add the Family products in page 3 and Reported TM-21 L ₉₀ Lifetime in page 6.

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