



TEST REPORT

According to ANSI/IES LM-80-15
For

Seoul Semiconductor Co., LTD

97-11, Sandan-ro 163, Danwon-gu, Ansan-si, Gyeonggi-do, Korea 15429

Model: STW8A42E

Report Type: 6000 Hours Test Report		Product Type: LED Package	
Test Engineer:	Pote Wang	<i>Pote Wang</i>	
Report Number:	RSZ190625517-10-M2		
Test Date:	2018-07-02 to 2019-03-15		
Report Date:	2019-08-14		
Reviewed By:	Bill Xiong / EE Engineer	<i>Bill Xiong</i>	
Revised Note:	The previous report RSZ190625517-10-M1 is replaced by this report on 2019-08-14		
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:

75 PCS samples were received on 2018-06-26. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

Part Number:	STW8A42E
Part Type:	LED Package
Drive Level:	DC 100mA
Nominal CCT:	2700K
Power:	1.2W
Average Current Density per LED die:	1076.39mA/mm ²
Average Power Density per LED die:	3.2298W/mm ²
CRI:	80
Die Spacing:	0.2mm

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

Covered Model	Power (W)	Total Input Current (mA)	CCT (K)	Number of Dies	Current Density per Die (mA/mm ²)	Power Density per PCB (W/mm ²)	Power Density per die (W/mm ²)	Die Spacing (mm)
STW8A42E	1.2	100	2700	4	1076.39	0.133	3.229	0.20
STWXA32E-D7	1	100	≥2200	3	553.57	0.102	1.845	0.20
STWXA32E-D8	0.5	60	≥2200	3	830.36	0.055	2.491	0.2

Note:

1. The applicant Seoul Semiconductor Co., LTD declare that their products with model STW8A42E are the same to the products in report # RSZ180626508-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RSZ180626508-10) is shared in this report.

1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs
- 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
0.5m integrating sphere	EVERFINE	AIS-2	G185304TA1381172	2018-06-28	2019-06-28
LED Test Source	EVERFINE	LTS-300	P185616CD1371113	2018-06-28	2019-06-28
High Accuracy Array Spectroradiometer	EVERFINE	HAAS-2000	P600674CM1381123	2018-06-28	2019-06-28
Standard Light Source	EVERFINE	D062	G100278CJ7351206	2018-12-24	2019-12-24
Multilayer aging machine	BACL	B2-270	20023	2019-03-13	2020-03-12
Digital CC&CV DC Power Supply	EVERFINE	WY5015	11060002	2018-06-15	2019-06-15

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, 100mA

Part Number: STW8A42E
Number of Units: 25
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 2: 85°C, 100mA

Part Number: STW8A42E
Number of Units: 25
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

Data Set 3: 105°C, 100mA

Part Number: STW8A42E
Number of Units: 25
Case Temperature: >103°C
Ambient Temperature: >100°C
Life Test Drive Current: 100mA
Measurement Current: 100mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L ₇₀ Lifetime
1	25	0	1000hrs	6000hrs	2.930E-06	1.004	>36000hours
2	25	0	1000hrs	6000hrs	3.327E-06	1.002	>36000hours
3	25	0	1000hrs	6000hrs	3.863E-06	1.001	>36000hours

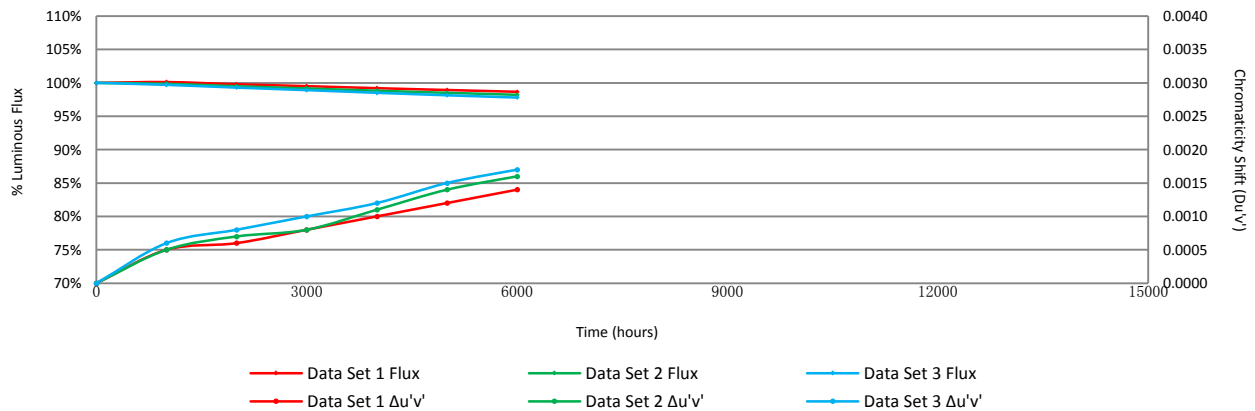
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	100.12%	99.79%	99.51%	99.20%	98.93%	98.66%
2	99.86%	99.49%	99.16%	98.82%	98.51%	98.21%
3	99.70%	99.29%	98.91%	98.51%	98.14%	97.80%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014
2	0.0005	0.0007	0.0008	0.0011	0.0014	0.0016
3	0.0006	0.0008	0.0010	0.0012	0.0015	0.0017

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

3.1 Data Set 1, 55°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	142.8	99.93	99.58	99.37	99.09	98.95	98.67
2	141.9	100.14	99.72	99.30	98.87	98.73	98.31
3	143.2	100.14	99.79	99.65	99.44	99.09	98.74
4	140.3	99.93	99.64	99.43	99.29	99.14	98.86
5	142.8	100.28	100.07	99.65	99.30	99.09	98.74
6	141.8	100.07	99.65	99.29	98.87	98.66	98.52
7	143.3	100.21	99.86	99.72	99.51	99.16	98.95
8	143.9	100.14	99.79	99.37	99.03	98.75	98.54
9	142.7	100.07	99.86	99.65	99.37	99.16	98.88
10	141.5	100.21	99.86	99.43	99.08	98.73	98.52
11	141.4	100.07	99.93	99.79	99.50	99.15	98.87
12	141.8	99.93	99.51	99.37	98.87	98.45	98.24
13	144.2	100.07	99.93	99.51	99.24	98.96	98.61
14	139.9	100.21	99.93	99.64	99.36	99.21	98.93
15	143.3	100.14	99.65	99.37	99.02	98.67	98.33
16	140.3	100.29	100.14	99.93	99.64	99.29	99.00
17	142.5	100.07	99.72	99.37	99.02	98.67	98.46
18	142.1	100.14	99.86	99.51	99.16	98.94	98.66
19	141.7	100.07	99.65	99.44	99.22	98.94	98.66
20	144.1	100.14	99.86	99.72	99.44	99.24	99.03
21	141.6	100.07	99.58	99.15	98.80	98.52	98.23
22	142.2	100.14	99.79	99.44	99.16	98.87	98.59
23	141.6	100.21	99.93	99.72	99.44	99.22	99.01
24	140.3	100.07	99.57	99.29	99.07	98.86	98.57
25	141.3	100.14	99.93	99.65	99.15	98.87	98.51
Avg.	142.1	100.12	99.79	99.51	99.20	98.93	98.66
Med.	141.9	100.14	99.79	99.44	99.16	98.94	98.66
st dev	1.2	0.10	0.16	0.19	0.23	0.24	0.24
Min.	139.9	99.93	99.51	99.15	98.80	98.45	98.23
Max.	144.2	100.29	100.14	99.93	99.64	99.29	99.03

3.2 Data Set 1, 55°C, 100mA (Forward Voltage)

No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	12.02	11.97	11.99	12.03	12.10	12.04	12.03
2	11.97	11.90	11.93	12.04	12.04	12.00	11.97
3	11.93	11.88	11.91	11.97	12.07	11.87	11.98
4	11.95	11.88	11.92	11.94	12.05	11.96	11.97
5	11.98	11.90	11.95	11.99	11.94	11.87	11.89
6	12.01	11.95	11.99	12.09	12.07	12.08	12.05
7	11.89	11.83	11.87	11.87	11.93	11.98	11.98
8	11.97	11.90	11.93	11.96	11.93	11.86	12.02
9	11.88	11.82	11.85	11.87	11.96	11.96	11.98
10	12.00	11.94	11.98	12.08	12.06	12.02	12.07
11	11.97	11.89	11.92	12.08	12.06	11.92	12.08
12	11.87	11.81	11.85	11.86	12.02	12.00	12.04
13	11.90	11.85	11.89	11.90	11.92	12.02	12.03
14	11.96	11.90	11.93	11.92	12.00	11.93	12.00
15	12.00	11.92	11.96	12.14	12.02	12.04	12.04
16	11.96	11.88	11.92	11.95	11.93	12.13	12.09
17	11.87	11.82	11.85	11.87	12.04	11.90	12.02
18	12.03	11.96	11.98	12.03	12.13	11.92	12.14
19	12.01	11.93	11.97	12.11	12.07	11.88	12.06
20	11.95	11.88	11.93	11.97	12.01	11.82	12.01
21	11.98	11.90	11.93	11.93	11.99	11.96	11.99
22	11.98	11.91	11.95	11.95	12.03	11.93	12.09
23	11.98	11.92	11.96	12.00	12.03	11.88	12.04
24	11.99	11.92	11.96	12.01	12.01	11.90	11.98
25	11.88	11.81	11.86	11.89	11.83	11.81	11.91
Avg.	11.96	11.89	11.93	11.98	12.01	11.95	12.02
Med.	11.97	11.90	11.93	11.97	12.02	11.93	12.02
st dev	0.05	0.05	0.04	0.08	0.07	0.08	0.06
Min.	11.87	11.81	11.85	11.86	11.83	11.81	11.89
Max.	12.03	11.97	11.99	12.14	12.13	12.13	12.14

3.3 Data Set 1, 55°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2622	0.5237	2721	0.0005	0.0006	0.0008	0.0009	0.0012	0.0014
2	0.2624	0.5228	2722	0.0002	0.0004	0.0005	0.0007	0.0013	0.0016
3	0.2622	0.5240	2721	0.0006	0.0009	0.0010	0.0011	0.0013	0.0016
4	0.2640	0.5280	2667	0.0005	0.0007	0.0009	0.0012	0.0014	0.0016
5	0.2587	0.5249	2791	0.0004	0.0005	0.0006	0.0008	0.0012	0.0013
6	0.2632	0.5243	2697	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016
7	0.2636	0.5254	2684	0.0003	0.0006	0.0007	0.0009	0.0011	0.0013
8	0.2608	0.5228	2755	0.0006	0.0007	0.0009	0.0012	0.0014	0.0017
9	0.2635	0.5240	2693	0.0004	0.0005	0.0006	0.0009	0.0010	0.0011
10	0.2627	0.5236	2711	0.0004	0.0005	0.0007	0.0008	0.0011	0.0014
11	0.2643	0.5226	2682	0.0004	0.0006	0.0008	0.0010	0.0012	0.0015
12	0.2629	0.5218	2713	0.0004	0.0006	0.0008	0.0011	0.0013	0.0014
13	0.2637	0.5238	2689	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013
14	0.2589	0.5212	2805	0.0007	0.0009	0.0010	0.0011	0.0013	0.0014
15	0.2633	0.5231	2700	0.0007	0.0008	0.0010	0.0012	0.0014	0.0017
16	0.2625	0.5218	2722	0.0003	0.0005	0.0007	0.0009	0.0010	0.0012
17	0.2624	0.5222	2723	0.0005	0.0006	0.0008	0.0010	0.0013	0.0014
18	0.2618	0.5236	2730	0.0002	0.0005	0.0006	0.0007	0.0009	0.0011
19	0.2628	0.5237	2709	0.0006	0.0008	0.0010	0.0011	0.0013	0.0015
20	0.2615	0.5255	2729	0.0005	0.0006	0.0007	0.0009	0.0010	0.0011
21	0.2633	0.5244	2694	0.0005	0.0007	0.0008	0.0010	0.0012	0.0013
22	0.2627	0.5227	2715	0.0004	0.0005	0.0007	0.0009	0.0011	0.0014
23	0.2612	0.5208	2755	0.0004	0.0006	0.0007	0.0010	0.0014	0.0015
24	0.2618	0.5226	2735	0.0005	0.0006	0.0009	0.0011	0.0012	0.0016
25	0.2632	0.5235	2701	0.0009	0.0011	0.0012	0.0014	0.0015	0.0017
Avg.	0.2624	0.5235	2719	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014
Med.	0.2627	0.5236	2715	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014
st dev	0.0014	0.0015	32	0.0002	0.0001	0.0002	0.0002	0.0001	0.0002
Min.	0.2587	0.5208	2667	0.0002	0.0004	0.0005	0.0007	0.0009	0.0011
Max.	0.2643	0.5280	2805	0.0009	0.0011	0.0012	0.0014	0.0015	0.0017

3.4 Data Set 2, 85°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	144.2	100.07	99.72	99.38	99.24	98.96	98.75
27	144.9	99.93	99.72	99.31	98.83	98.55	98.21
28	141.6	99.65	99.22	99.08	98.66	98.31	97.95
29	140.6	100.07	99.57	99.29	99.08	98.79	98.65
30	141.9	100.14	99.86	99.65	99.30	99.01	98.66
31	142.7	99.79	99.58	99.23	98.95	98.60	98.46
32	142.0	100.14	99.86	99.51	99.08	99.01	98.73
33	143.1	99.86	99.51	99.16	98.88	98.60	98.18
34	142.7	99.93	99.51	99.30	99.02	98.81	98.60
35	143.9	99.79	99.37	98.96	98.47	98.12	97.85
36	143.6	99.65	99.30	99.09	98.75	98.54	98.40
37	143.2	99.93	99.44	99.09	98.67	98.25	97.84
38	142.5	100.14	99.65	99.16	98.74	98.39	97.96
39	143.3	99.79	99.51	99.09	98.81	98.46	98.19
40	140.0	99.86	99.29	98.93	98.64	98.29	97.93
41	140.8	98.86	98.44	98.08	97.94	97.59	97.37
42	142.2	100.14	99.79	99.51	99.02	98.59	98.38
43	142.7	99.72	99.44	99.23	98.81	98.53	98.11
44	143.4	99.65	99.30	98.95	98.61	98.33	98.12
45	142.1	99.79	99.37	98.94	98.45	97.96	97.54
46	141.4	99.86	99.36	99.15	98.80	98.44	98.09
47	140.6	100.07	99.64	99.22	98.93	98.65	98.36
48	140.8	99.93	99.72	99.36	99.01	98.72	98.44
49	142.9	99.86	99.51	99.16	98.74	98.46	98.18
50	142.3	99.93	99.65	99.23	99.02	98.74	98.38
Avg.	142.4	99.86	99.49	99.16	98.82	98.51	98.21
Med.	142.5	99.86	99.51	99.16	98.81	98.54	98.19
st dev	1.2	0.26	0.29	0.29	0.28	0.33	0.35
Min.	140.0	98.86	98.44	98.08	97.94	97.59	97.37
Max.	144.9	100.14	99.86	99.65	99.30	99.01	98.75

3.5 Data Set 2, 85°C, 100mA (Forward Voltage)

No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	11.88	11.82	11.87	11.92	11.92	11.89	11.89
27	11.86	11.81	11.86	11.96	11.91	12.03	12.02
28	11.89	11.83	11.87	11.80	11.92	11.96	11.97
29	11.93	11.88	11.91	12.00	11.96	11.93	11.93
30	11.97	11.89	11.93	11.95	11.99	12.00	12.01
31	12.01	11.94	11.97	12.05	12.04	11.89	12.02
32	11.96	11.89	11.93	11.91	12.06	11.94	11.94
33	11.97	11.90	11.93	11.92	12.04	12.01	12.05
34	11.89	11.83	11.87	11.85	11.92	12.00	11.97
35	11.90	11.84	11.88	11.90	11.93	11.84	11.94
36	11.96	11.90	11.93	11.94	11.98	11.99	11.98
37	11.90	11.84	11.88	12.06	11.94	12.04	11.94
38	11.89	11.83	11.87	11.88	11.96	11.96	11.94
39	11.94	11.87	11.91	11.89	11.97	12.04	11.99
40	12.00	11.92	11.97	12.03	12.01	11.92	12.01
41	11.99	11.93	11.97	12.16	11.89	11.93	12.04
42	11.94	11.87	11.90	11.93	11.96	11.98	12.00
43	11.98	11.93	11.97	12.00	12.02	11.94	12.04
44	11.89	11.83	11.87	11.89	11.92	11.96	11.95
45	11.92	11.86	11.89	11.94	11.99	11.97	11.97
46	11.99	11.91	11.96	12.01	12.01	12.01	12.03
47	11.97	11.89	11.93	12.00	12.04	11.89	12.01
48	11.99	11.91	11.96	11.91	12.01	11.96	12.03
49	11.94	11.88	11.91	11.96	11.95	12.02	11.99
50	11.97	11.91	11.94	11.93	12.07	11.92	12.01
Avg.	11.94	11.88	11.92	11.95	11.98	11.96	11.99
Med.	11.94	11.88	11.91	11.94	11.97	11.96	11.99
st dev	0.04	0.04	0.04	0.08	0.05	0.05	0.04
Min.	11.86	11.81	11.86	11.80	11.89	11.84	11.89
Max.	12.01	11.94	11.97	12.16	12.07	12.04	12.05

3.6 Data Set 2, 85°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
26	0.2621	0.5240	2722	0.0004	0.0006	0.0007	0.0009	0.0010	0.0014
27	0.2617	0.5244	2728	0.0004	0.0005	0.0007	0.0009	0.0012	0.0013
28	0.2626	0.5206	2726	0.0004	0.0006	0.0007	0.0009	0.0013	0.0014
29	0.2638	0.5280	2670	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015
30	0.2622	0.5222	2728	0.0004	0.0007	0.0010	0.0012	0.0015	0.0017
31	0.2631	0.5242	2700	0.0006	0.0009	0.0010	0.0013	0.0016	0.0020
32	0.2630	0.5236	2704	0.0005	0.0007	0.0009	0.0012	0.0017	0.0019
33	0.2641	0.5253	2674	0.0004	0.0006	0.0007	0.0009	0.0013	0.0016
34	0.2621	0.5246	2720	0.0005	0.0006	0.0008	0.0010	0.0014	0.0016
35	0.2627	0.5237	2710	0.0005	0.0007	0.0009	0.0011	0.0014	0.0016
36	0.2615	0.5262	2725	0.0004	0.0005	0.0007	0.0009	0.0012	0.0015
37	0.2622	0.5234	2722	0.0006	0.0007	0.0009	0.0011	0.0011	0.0013
38	0.2622	0.5234	2722	0.0004	0.0006	0.0008	0.0011	0.0016	0.0016
39	0.2623	0.5233	2721	0.0005	0.0006	0.0008	0.0011	0.0013	0.0016
40	0.2623	0.5234	2720	0.0004	0.0006	0.0009	0.0010	0.0013	0.0016
41	0.2636	0.5246	2688	0.0008	0.0010	0.0013	0.0014	0.0017	0.0018
42	0.2617	0.5242	2729	0.0005	0.0008	0.0010	0.0012	0.0015	0.0016
43	0.2642	0.5225	2684	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019
44	0.2653	0.5253	2650	0.0004	0.0005	0.0007	0.0009	0.0016	0.0018
45	0.2629	0.5235	2707	0.0006	0.0008	0.0010	0.0011	0.0014	0.0017
46	0.2634	0.5225	2700	0.0004	0.0007	0.0008	0.0011	0.0014	0.0016
47	0.2627	0.5211	2722	0.0004	0.0007	0.0008	0.0011	0.0016	0.0018
48	0.2638	0.5242	2686	0.0004	0.0005	0.0006	0.0008	0.0011	0.0013
49	0.2634	0.5251	2689	0.0004	0.0005	0.0006	0.0007	0.0011	0.0012
50	0.2633	0.5253	2692	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013
Avg.	0.2629	0.5239	2706	0.0005	0.0007	0.0008	0.0011	0.0014	0.0016
Med.	0.2627	0.5240	2710	0.0004	0.0006	0.0008	0.0011	0.0014	0.0016
st dev	0.0009	0.0016	22	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002
Min.	0.2615	0.5206	2650	0.0004	0.0005	0.0006	0.0007	0.0010	0.0012
Max.	0.2653	0.5280	2729	0.0008	0.0010	0.0013	0.0014	0.0017	0.0020

3.7 Data Set 3, 105°C, 100mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	141.1	99.79	99.43	99.22	99.01	98.44	98.09
52	141.9	99.58	99.08	98.87	98.45	98.24	97.96
53	142.5	99.51	99.23	98.81	98.46	97.89	97.54
54	141.9	99.79	99.22	98.87	98.52	98.17	97.89
55	140.0	99.93	99.50	99.14	98.86	98.57	98.36
56	140.9	99.43	99.01	98.65	98.23	97.80	97.37
57	142.8	99.37	98.88	98.39	97.97	97.48	97.20
58	142.3	99.58	99.30	98.81	98.31	98.03	97.75
59	142.9	99.79	99.30	99.02	98.60	98.39	98.04
60	141.3	99.79	99.29	98.87	98.37	97.88	97.52
61	141.6	100.07	99.79	99.44	99.08	98.73	98.31
62	143.9	99.65	99.10	98.82	98.54	98.05	97.64
63	142.3	99.51	99.16	98.81	98.24	97.82	97.40
64	142.3	99.58	99.16	98.74	98.38	97.96	97.61
65	143.5	99.65	99.44	99.09	98.68	98.40	98.12
66	140.7	99.72	99.22	98.86	98.44	98.22	98.01
67	141.5	99.86	99.51	99.15	98.73	98.45	98.16
68	142.8	99.72	99.16	98.67	98.46	98.18	97.83
69	143.9	99.65	99.31	99.03	98.61	98.05	97.71
70	140.0	99.79	99.29	99.00	98.71	98.43	98.21
71	142.1	99.86	99.44	98.94	98.59	98.17	97.82
72	142.5	99.65	99.23	98.81	98.39	97.89	97.40
73	141.3	99.43	99.08	98.58	98.09	97.66	97.31
74	140.6	100.07	99.72	99.22	98.86	98.65	98.22
75	141.2	99.79	99.43	98.87	98.23	97.88	97.52
Avg.	141.9	99.70	99.29	98.91	98.51	98.14	97.80
Med.	141.9	99.72	99.29	98.87	98.46	98.17	97.82
st dev	1.1	0.18	0.21	0.23	0.27	0.32	0.34
Min.	140.0	99.37	98.88	98.39	97.97	97.48	97.20
Max.	143.9	100.07	99.79	99.44	99.08	98.73	98.36

3.8 Data Set 3, 105°C, 100mA (Forward Voltage)

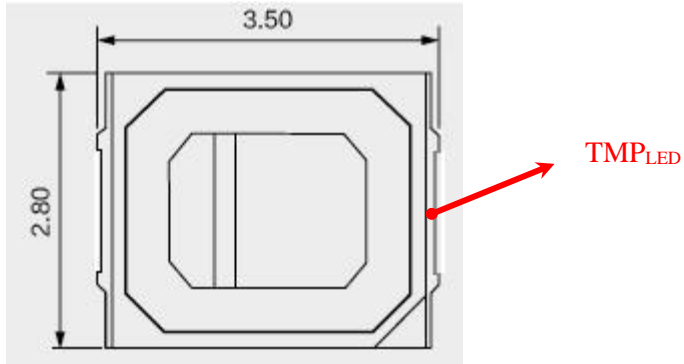
No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	11.97	11.91	11.94	11.98	11.92	11.91	11.94
52	11.99	11.92	11.96	12.04	12.04	11.92	11.92
53	11.96	11.91	11.95	11.98	11.97	11.82	12.01
54	11.99	11.92	11.95	11.99	11.98	11.99	11.96
55	11.98	11.92	11.95	12.06	12.04	11.87	11.92
56	11.97	11.90	11.95	12.07	12.05	11.89	11.94
57	11.87	11.81	11.86	11.89	11.89	11.93	11.94
58	12.00	11.93	11.97	12.00	12.01	11.96	11.92
59	11.96	11.91	11.95	11.97	12.01	12.00	12.03
60	11.98	11.92	11.96	11.87	11.95	12.06	12.04
61	11.87	11.82	11.87	11.86	11.95	12.01	12.04
62	11.86	11.79	11.84	11.89	11.94	11.95	11.92
63	11.93	11.87	11.90	11.98	11.92	11.89	11.92
64	11.96	11.89	11.94	11.91	11.97	11.95	12.02
65	12.00	11.93	11.97	11.86	11.99	12.04	12.07
66	11.95	11.89	11.93	12.07	11.96	11.97	12.00
67	11.96	11.91	11.95	12.01	12.09	11.98	12.02
68	11.97	11.90	11.94	12.00	12.06	12.04	12.03
69	11.98	11.92	11.95	11.85	12.01	12.05	12.09
70	11.95	11.88	11.92	11.97	11.95	11.89	12.00
71	11.87	11.81	11.85	11.94	11.89	12.01	12.01
72	11.87	11.81	11.85	11.86	11.95	11.81	11.94
73	11.98	11.91	11.95	12.04	11.99	11.91	12.03
74	11.93	11.87	11.91	11.94	11.95	11.87	12.01
75	11.98	11.93	11.96	12.03	12.00	11.93	12.04
Avg.	11.95	11.89	11.93	11.96	11.98	11.95	11.99
Med.	11.96	11.91	11.95	11.98	11.97	11.95	12.01
st dev	0.05	0.04	0.04	0.07	0.05	0.07	0.05
Min.	11.86	11.79	11.84	11.85	11.89	11.81	11.92
Max.	12.00	11.93	11.97	12.07	12.09	12.06	12.09

3.9 Data Set 3, 105°C, 100mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
51	0.2633	0.5224	2704	0.0006	0.0008	0.0011	0.0013	0.0016	0.0019
52	0.2612	0.5217	2752	0.0006	0.0009	0.0010	0.0012	0.0015	0.0019
53	0.2642	0.5252	2673	0.0007	0.0009	0.0011	0.0014	0.0016	0.0018
54	0.2616	0.5213	2745	0.0008	0.0010	0.0012	0.0014	0.0017	0.0018
55	0.2628	0.5220	2715	0.0006	0.0008	0.0010	0.0011	0.0014	0.0017
56	0.2617	0.5196	2750	0.0005	0.0007	0.0008	0.0011	0.0013	0.0014
57	0.2617	0.5232	2735	0.0006	0.0007	0.0010	0.0012	0.0015	0.0016
58	0.2621	0.5218	2732	0.0007	0.0010	0.0011	0.0014	0.0016	0.0018
59	0.2616	0.5252	2727	0.0005	0.0007	0.0008	0.0010	0.0013	0.0016
60	0.2640	0.5245	2679	0.0004	0.0007	0.0008	0.0010	0.0017	0.0019
61	0.2657	0.5237	2649	0.0005	0.0006	0.0009	0.0011	0.0014	0.0018
62	0.2618	0.5243	2728	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015
63	0.2615	0.5207	2749	0.0006	0.0009	0.0010	0.0013	0.0014	0.0015
64	0.2625	0.5252	2708	0.0005	0.0006	0.0007	0.0008	0.0011	0.0012
65	0.2616	0.5220	2741	0.0005	0.0008	0.0010	0.0011	0.0013	0.0016
66	0.2632	0.5262	2690	0.0005	0.0006	0.0008	0.0010	0.0016	0.0018
67	0.2637	0.5268	2678	0.0006	0.0008	0.0010	0.0011	0.0015	0.0016
68	0.2622	0.5228	2725	0.0007	0.0009	0.0011	0.0013	0.0016	0.0018
69	0.2622	0.5236	2722	0.0004	0.0006	0.0007	0.0009	0.0014	0.0017
70	0.2564	0.5197	2869	0.0005	0.0008	0.0009	0.0011	0.0014	0.0016
71	0.2628	0.5246	2706	0.0006	0.0008	0.0010	0.0013	0.0017	0.0019
72	0.2643	0.5247	2674	0.0006	0.0009	0.0010	0.0011	0.0012	0.0014
73	0.2649	0.5238	2664	0.0004	0.0007	0.0008	0.0010	0.0011	0.0012
74	0.2614	0.5250	2733	0.0005	0.0007	0.0009	0.0013	0.0016	0.0018
75	0.2627	0.5224	2715	0.0004	0.0006	0.0009	0.0013	0.0017	0.0019
Avg.	0.2624	0.5233	2719	0.0006	0.0008	0.0010	0.0012	0.0015	0.0017
Med.	0.2622	0.5236	2722	0.0006	0.0008	0.0010	0.0011	0.0015	0.0017
st dev	0.0017	0.0019	43	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.	0.2564	0.5196	2649	0.0004	0.0006	0.0007	0.0008	0.0011	0.0012
Max.	0.2657	0.5268	2869	0.0008	0.0010	0.0012	0.0014	0.0017	0.0019

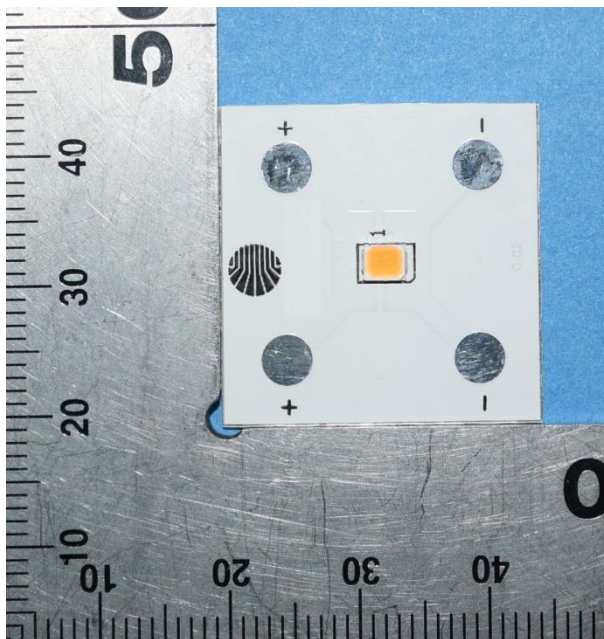
4 - DUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



5 - Report Revision

Report Number	Report Date	Contents
RSZ190625517-10	2019-06-26	Original report.
RSZ190625517-10-M1	2019-07-16	Delete the manufacturer in page3.
RSZ190625517-10-M2	2019-08-14	Update the Family cover model and model number.

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