LEKOLED TECHNOLOGY CORPORATION

TEST REPORT

Prepared For:	LEKOLED TECHNOLOGY CORPORATION 3rd Floor, WeiQun Industrial Park, BaiHua Community, GuangMing District, Shenzhen, China
Product Name:	SMD LED
Model Number:	0.2W 2835 SMD
Prepared By:	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China.
Test Date:	Feb.6, 2018 –Mar.15, 2019
Date of Report:	Mar.15, 2019
Report No.:	BST190312055601SR-2

TEST REPORT

LUMEN MAINTENANCE TESTING ACCORDING TO THE IESNA LM-80-08 TEST STANDARD

Testing laboratory	: Shenzhen BST Technology Co., Ltd.
Address	: Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China.
Testing location	: Shenzhen BST Technology Co., Ltd.
Applicant	: LEKOLED TECHNOLOGY CORPORATION
Address	: 3rd Floor, WeiQun Industrial Park, BaiHua Community, GuangMing District, Shenzhen,China
Standard	: IES LM-80-08
Non-standard test method	: N.A.
Type of test object	: SMD LED
Trademark	
Model/type reference	: 0.2W 2835 SMD
Rating	: 3.1V ⎓, 60mA , 0.2W, CCT:5000K
Manufacturer	: LEKOLED TECHNOLOGY CORPORATION
Address	: 3rd Floor, WeiQun Industrial Park, BaiHua Community, GuangMing District, Shenzhen, China

Name and address of the testing laboratory: Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China

Prepared by : Tracy Yang

Engineer

Reviewer : Owen

Supervisor

Approved & Authorized Signer :

Manager

Possible test case verdicts :

Test case does not apply to the test object …….. : N(.A.)

Test object does meet the requirement …….. : P(ass)

Test object does not meet the requirement ……. : F(ail)

General remarks:

Throughout this report a point is used as the decimal separator. The test results presented in this report relate only to the object tested.

Test Results Summary:

Summary	I	II	III
Condition	Ts=55℃ T_A=53.9℃ R.H.<65% I_F=60mA	Ts=85℃ T_A=84.6℃ R.H.<65% I_F=60mA	Ts=104.9℃ T_A=103.4℃ R.H.<65% I_F=60mA
Duration(hour)	9000	9000	9000
Interval(hour)	1000,2000,3000,4000, 5000, 6000,7000,8000,9000	1000,2000,3000,4000, 5000, 6000,7000,8000,9000	1000,2000,3000,4000, 5000, 6000,7000,8000,9000
Sample number	20	20	20
Average Lumen Maintenance at 9000 hour	96.88%	96.12%	95.96%
Average Chromaticity Shift △u'v' at 9000 hour	0.0022	0.0026	0.0028
Failure	None	None	None
α	4.989E-06	5.483E-06	6.077E-06
β	1.011	1.009	1.012
Calculated L70(9k) (hours)	74,000	67,000	61,000
Reported TM-21 L70 Lifetime:	>54,000	>54,000	>54,000

Equipments Used for Testing:

Equipment	Model	Equipment No.
DC Power Supply	IT6122	BSTNX001
Power meter	WT210	BSTNX001
Spectroradiometer	SPEC300	BN067
0.3m Integrating Sphere	--	BSTNX002

Test Data:

Operating Condition: 55℃/60mA

Sample No.	VF(V)	LF(lm)	Lumen Maintenance (%)								
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.11	33.07	102.34	101.73	99.86	99.49	99.19	98.82	98.64	97.75	96.83
2	3.06	33.70	102.21	101.86	100.44	99.27	98.91	97.95	97.37	96.25	96.37
3	2.87	33.27	101.33	100.92	99.84	99.32	98.42	98.05	97.89	97.42	97.01
4	2.91	33.56	101.33	100.54	99.82	99.01	98.74	97.87	97.52	97.47	97.11
5	2.86	34.01	101.62	100.58	100.01	98.85	98.42	98.04	97.28	97.07	96.71
6	2.87	34.53	101.41	100.72	99.94	99.36	98.77	98.17	97.74	97.71	97.17
7	2.84	32.89	101.34	100.81	100.04	99.93	99.73	98.75	98.29	98.21	97.45
8	2.91	34.24	101.38	100.72	99.82	99.21	98.84	98.09	97.13	96.47	95.59
9	3.02	33.35	101.12	100.55	99.76	99.15	98.51	97.35	96.69	96.72	96.07
10	3.12	34.26	101.56	100.59	99.63	99.51	98.06	97.53	96.57	97.61	97.38
11	3.08	32.90	101.98	100.72	100.04	99.83	97.92	97.54	97.08	96.97	96.67
12	3.02	34.19	102.16	101.64	100.58	99.91	98.94	97.7	96.74	96.85	97.29
13	2.95	33.41	102.86	101.71	100.62	99.78	99.02	97.53	96.57	97.57	97.45
14	2.88	33.27	101.11	100.24	99.43	98.82	98.05	97.94	97.98	97.41	97.05
15	2.97	33.24	101.04	100.57	99.93	99.29	98.77	97.5	96.54	96.14	96.87
16	2.92	33.98	101.11	100.71	100.08	99.46	99.01	98.53	97.97	97.72	97.34
17	2.88	33.13	101.32	100.62	99.79	99.52	98.86	98.23	97.83	97.94	97.41
18	2.93	32.94	101.9	100.64	99.83	99.06	98.72	98.12	97.95	97.64	97.42
19	3.07	34.24	101.81	101.3	100.72	98.74	98.25	97.99	97.03	97.36	96.62
20	3.11	33.35	101.44	100.79	100.11	98.84	97.82	97.55	96.59	96.01	95.83
Avg.	2.97	33.58	101.62	100.90	100.01	99.32	98.65	97.96	97.37	97.21	96.88
Median	2.94	33.38	101.43	100.72	99.94	99.31	98.76	97.97	97.33	97.42	97.03
δ	0.093	0.511	0.475	0.462	0.329	0.358	0.459	0.402	0.627	0.612	0.541
Min.	2.84	32.89	101.04	100.24	99.43	98.74	97.82	97.35	96.54	96.01	95.59
Max.	3.12	34.53	102.86	101.86	100.72	99.93	99.73	98.82	98.64	98.21	97.45

Operating Condition: 55℃/60mA

No.	CCT(K)	Chromaticity Shift △u'v'								
	0h (Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	4893	0.0002	0.0006	0.0008	0.0010	0.0013	0.0016	0.0018	0.0021	0.0025
2	4906	0.0003	0.0005	0.0007	0.0012	0.0015	0.0017	0.0020	0.0020	0.0023
3	5051	0.0003	0.0007	0.0010	0.0011	0.0014	0.0016	0.0018	0.0019	0.0021
4	4998	0.0004	0.0006	0.0009	0.0016	0.0018	0.0020	0.0020	0.0022	0.0024
5	4922	0.0003	0.0005	0.0007	0.0011	0.0013	0.0016	0.0017	0.0019	0.0023
6	5007	0.0002	0.0003	0.0009	0.0015	0.0015	0.0016	0.0016	0.0018	0.0022
7	5062	0.0002	0.0003	0.0010	0.0013	0.0014	0.0016	0.0017	0.0019	0.0019
8	5047	0.0003	0.0004	0.0006	0.0013	0.0015	0.0019	0.0021	0.0022	0.0023
9	4925	0.0003	0.0005	0.0008	0.0012	0.0015	0.0016	0.0017	0.0020	0.0022
10	4916	0.0003	0.0005	0.0009	0.0013	0.0015	0.0017	0.0020	0.0022	0.0025
11	4945	0.0002	0.0004	0.0006	0.0011	0.0014	0.0016	0.0018	0.0020	0.0021
12	4955	0.0002	0.0004	0.0009	0.0012	0.0013	0.0014	0.0018	0.0020	0.0022
13	5012	0.0002	0.0004	0.0008	0.0013	0.0014	0.0017	0.0017	0.0019	0.0021
14	4962	0.0004	0.0008	0.0010	0.0012	0.0013	0.0014	0.0015	0.0016	0.0018
15	5028	0.0001	0.0003	0.0006	0.0010	0.0013	0.0013	0.0016	0.0021	0.0023
16	4940	0.0001	0.0005	0.0010	0.0011	0.0015	0.0017	0.0018	0.0020	0.0021
17	5027	0.0002	0.0004	0.0006	0.0009	0.0011	0.0012	0.0014	0.0017	0.0021
18	4968	0.0003	0.0004	0.0008	0.0011	0.0014	0.0016	0.0018	0.0022	0.0024
19	4954	0.0004	0.0006	0.0010	0.0014	0.0017	0.0019	0.0020	0.0023	0.0025
20	4961	0.0005	0.0008	0.0013	0.0015	0.0016	0.0018	0.0019	0.0021	0.0024
Avg.	4974	0.0003	0.0005	0.0008	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022
Median	4962	0.0003	0.0005	0.0009	0.0012	0.0014	0.0016	0.0018	0.0020	0.0023
δ	50.30	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	4893	0.0001	0.0003	0.0006	0.0009	0.0011	0.0012	0.0014	0.0016	0.0018
Max.	5062	0.0005	0.0008	0.0013	0.0016	0.0018	0.0020	0.0021	0.0023	0.0025

Operating Condition: 85℃/60mA

Sample No.	VF(V)	LF(lm)	Lumen Maintenance (%)								
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	2.94	33.23	100.75	100.01	99.95	98.68	97.96	97.42	96.78	96.74	96.64
2	2.92	33.32	100.69	99.95	99.87	99.18	98.95	97.95	96.96	96.43	95.99
3	2.98	33.74	100.63	99.89	99.21	98.52	97.95	97.38	96.82	96.49	96.15
4	3.01	32.55	100.66	99.92	99.76	98.62	97.88	97.20	96.66	95.80	95.69
5	2.95	33.10	100.7	99.96	99.87	98.46	97.48	97.47	96.58	96.77	96.37
6	3.03	33.20	100.64	99.9	99.66	98.96	98.23	98.06	96.86	96.52	96.41
7	2.91	32.76	100.52	99.78	98.56	97.04	97.16	97.27	96.65	96.65	96.34
8	2.86	34.03	100.57	99.83	99.17	98.74	97.77	97.54	96.89	97.61	97.04
9	2.95	34.24	100.49	99.75	99.05	98.61	97.68	97.34	96.74	96.20	95.47
10	2.98	33.82	100.72	99.98	99.63	98.78	98.03	97.96	96.94	96.79	96.62
11	2.87	33.00	100.74	100.21	99.87	99.26	98.84	98.46	97.68	96.76	96.53
12	3.01	32.75	101.71	100.97	100.05	99.73	98.93	98.28	97.84	96.88	95.84
13	2.87	33.31	100.81	100.07	99.97	98.72	97.67	97.30	96.39	95.73	95.33
14	2.99	32.49	100.85	100.11	99.87	99.52	98.94	98.24	96.83	96.84	95.69
15	2.85	33.08	100.92	100.18	99.83	99.68	98.82	98.35	97.29	96.56	96.08
16	2.93	33.21	100.59	99.85	99.26	98.64	97.64	97.38	97.17	96.83	96.44
17	2.94	33.53	100.59	99.85	99.69	98.67	97.61	97.52	96.76	95.95	95.30
18	2.97	33.68	100.54	99.8	99.68	98.6	97.56	97.61	97.12	97.22	96.31
19	3.08	34.32	100.82	100.08	99.97	99.59	98.92	98.29	97.78	96.76	96.33
20	2.98	33.15	100.73	99.99	99.24	98.52	98.03	97.87	97.19	97.08	95.79
Avg.	2.95	33.33	100.73	100.00	99.61	98.83	98.10	97.74	97.00	96.63	96.12
Median	2.95	33.22	100.70	99.96	99.73	98.70	97.96	97.58	96.88	96.75	96.23
δ	0.059	0.507	0.250	0.255	0.384	0.579	0.568	0.409	0.387	0.446	0.459
Min.	2.85	32.49	100.49	99.75	98.56	97.04	97.16	97.20	96.39	95.73	95.30
Max.	3.08	34.32	101.71	100.97	100.05	99.73	98.95	98.46	97.84	97.61	97.04

Operating Condition: 85℃/60mA

No.	CCT(K)	Chromaticity Shift △u'v'								
	0h (Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	4891	0.0004	0.0007	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0025
2	4915	0.0003	0.0009	0.0012	0.0016	0.0019	0.0021	0.0023	0.0025	0.0027
3	4960	0.0003	0.0005	0.0010	0.0011	0.0015	0.0017	0.0019	0.0021	0.0023
4	4902	0.0004	0.0008	0.0012	0.0013	0.0017	0.0018	0.0021	0.0023	0.0025
5	4877	0.0004	0.0006	0.0010	0.0013	0.0015	0.0018	0.0023	0.0025	0.0027
6	4866	0.0003	0.0007	0.0011	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023
7	4941	0.0004	0.0008	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0025
8	4944	0.0004	0.0008	0.0012	0.0014	0.0018	0.0021	0.0022	0.0025	0.0027
9	4850	0.0002	0.0005	0.0007	0.0011	0.0013	0.0015	0.0017	0.0020	0.0023
10	4925	0.0005	0.0007	0.0013	0.0015	0.0019	0.0022	0.0025	0.0026	0.0028
11	4979	0.0005	0.0008	0.0012	0.0014	0.0016	0.00218	0.0020	0.0023	0.0027
12	4964	0.0009	0.0013	0.0012	0.0014	0.0014	0.0018	0.0021	0.0023	0.0029
13	4918	0.0002	0.0006	0.0008	0.0012	0.0015	0.0017	0.0019	0.0021	0.0023
14	4951	0.0004	0.0009	0.0013	0.0013	0.0016	0.0019	0.0021	0.0023	0.0028
15	4937	0.0006	0.0009	0.0011	0.0015	0.0019	0.0021	0.0023	0.0025	0.0027
16	4849	0.0006	0.0010	0.0013	0.0015	0.0017	0.0019	0.0022	0.0024	0.0026
17	4936	0.0003	0.0006	0.0009	0.0013	0.0017	0.0021	0.0024	0.0025	0.0029
18	4917	0.0003	0.0007	0.0011	0.0013	0.0016	0.0021	0.0025	0.0026	0.0028
19	4963	0.0006	0.0010	0.0014	0.0016	0.0018	0.0020	0.0020	0.0022	0.0024
20	4890	0.0004	0.0008	0.0010	0.0013	0.0016	0.0019	0.0022	0.0024	0.0026
Avg.	4919	0.0004	0.0008	0.0011	0.0014	0.0016	0.0019	0.0021	0.0023	0.0026
Median	4922	0.0004	0.0008	0.0012	0.0014	0.0017	0.0019	0.0021	0.0023	0.0027
δ	37.54	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	4849	0.0002	0.0005	0.0007	0.0011	0.0013	0.0015	0.0017	0.0020	0.0023
Max.	4979	0.0009	0.0013	0.0014	0.0016	0.0019	0.0022	0.0025	0.0026	0.0029

Operating Condition: 105℃/60mA

Sample No.	VF(V)	LF(lm)	Lumen Maintenance (%)								
	0hr(Initial)		1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	3.01	33.3	100.39	99.96	99.35	98.82	97.90	97.33	96.94	96.46	95.73
2	2.94	32.35	99.84	99.27	98.74	98.85	98.27	97.81	97.28	96.95	96.62
3	2.85	32.3	100.08	99.46	98.88	98.41	97.95	97.64	96.84	96.43	95.82
4	2.95	32.27	100.11	99.89	99.35	98.79	98.43	97.73	97.64	97.14	96.68
5	2.86	33.01	101.26	100.22	99.76	98.53	97.98	97.24	96.74	96.02	95.78
6	2.98	33.56	100.43	99.81	98.52	98.17	98.78	98.10	96.82	96.42	95.62
7	2.95	33.92	100.18	99.95	99.36	98.84	98.54	97.87	97.40	96.88	96.44
8	2.98	32.27	100.39	100.13	99.35	98.77	98.66	97.87	97.7	97.01	96.04
9	3.03	33.38	100.00	99.55	98.36	98.18	97.88	96.80	95.92	95.43	95.22
10	3.01	33.29	100.23	99.68	99.04	99.07	98.43	97.39	96.47	96.32	95.81
11	2.97	33.3	100.16	99.95	99.11	99.06	98.54	97.70	96.56	95.77	96.12
12	2.88	32.35	100.21	99.68	98.55	98.31	98.23	97.99	96.27	95.56	95.74
13	2.93	32.3	101.17	100.58	99.61	99.03	98.42	97.48	96.46	96.28	95.90
14	2.94	32.27	100.08	99.69	99.49	99.27	98.91	98.08	96.95	96.52	96.50
15	3.01	33.01	100.34	99.02	98.92	98.94	98.22	96.90	96.26	94.85	95.32
16	2.93	33.56	100.29	99.25	99.09	98.98	97.86	97.07	96.63	96.22	95.79
17	2.89	33.92	100.86	100.14	98.95	98.40	99.22	97.75	97.26	95.65	96.17
18	2.97	32.27	100.91	100.27	98.69	99.10	99.42	97.91	97.46	97.33	96.61
19	2.92	33.38	100.43	99.81	99.22	98.82	97.59	97.25	96.93	96.07	95.07
20	2.91	33.29	100.18	99.59	98.87	98.04	97.83	97.36	96.86	96.27	96.16
Avg.	2.95	32.97	100.38	99.80	99.06	98.72	98.35	97.56	96.87	96.28	95.96
Median	2.95	33.15	100.26	99.81	99.07	98.82	98.35	97.67	96.85	96.30	95.86
δ	0.050	0.587	0.374	0.372	0.369	0.347	0.471	0.374	0.468	0.607	0.452
Min.	2.85	32.27	99.84	99.02	98.36	98.04	97.59	96.80	95.92	94.85	95.07
Max.	3.03	33.92	101.26	100.58	99.76	99.27	99.42	98.10	97.70	97.33	96.68

Operating Condition: 105℃/60mA

No.	CCT(K)	Chromaticity Shift △u'v'								
	0h (Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	4913	0.0003	0.0008	0.0013	0.0015	0.0019	0.0021	0.0023	0.0025	0.0030
2	4811	0.0003	0.0011	0.0013	0.0017	0.0016	0.0018	0.0020	0.0024	0.0028
3	4902	0.0005	0.0011	0.0012	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
4	4844	0.0006	0.0012	0.0015	0.0017	0.0019	0.0021	0.0024	0.0026	0.0029
5	4869	0.0004	0.0013	0.0015	0.0018	0.0016	0.0020	0.0024	0.0026	0.0028
6	4858	0.0001	0.0009	0.0014	0.0015	0.0017	0.0019	0.0021	0.0023	0.0028
7	4901	0.0001	0.0010	0.0014	0.0013	0.0019	0.0020	0.0022	0.0024	0.0030
8	4898	0.0002	0.0012	0.0015	0.0017	0.0021	0.0023	0.0025	0.0027	0.0029
9	4892	0.0004	0.0012	0.0013	0.0015	0.0017	0.0019	0.0021	0.0023	0.0027
10	4867	0.0004	0.0011	0.0013	0.0018	0.0016	0.0025	0.0025	0.0026	0.0026
11	4900	0.0007	0.0010	0.0014	0.0016	0.0017	0.0019	0.0021	0.0023	0.0028
12	4906	0.0006	0.0008	0.0010	0.0016	0.0016	0.0018	0.0020	0.0022	0.0026
13	4856	0.0003	0.0010	0.0014	0.0017	0.0014	0.0018	0.0020	0.0022	0.0024
14	4906	0.0007	0.0008	0.0013	0.0010	0.0017	0.0019	0.0021	0.0023	0.0025
15	4879	0.0005	0.0011	0.0012	0.0017	0.0016	0.0018	0.0020	0.0024	0.0026
16	4851	0.0005	0.0009	0.0010	0.0016	0.0019	0.0020	0.0022	0.0026	0.0028
17	4878	0.0005	0.0010	0.0012	0.0018	0.0021	0.0023	0.0025	0.0027	0.0029
18	4839	0.0007	0.0011	0.0012	0.0017	0.0019	0.0021	0.0025	0.0027	0.0029
19	4885	0.0007	0.0010	0.0012	0.0018	0.0019	0.0022	0.0024	0.0026	0.0028
20	4832	0.0007	0.0011	0.0014	0.0017	0.0019	0.0022	0.0025	0.0028	0.0030
Avg.	4874	0.0005	0.0010	0.0013	0.0016	0.0018	0.0020	0.0023	0.0025	0.0028
Median	4879	0.0005	0.0011	0.0013	0.0017	0.0018	0.0020	0.0022	0.0025	0.0028
δ	28.16	0.0002	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	4811	0.0001	0.0008	0.0010	0.0010	0.0014	0.0018	0.0020	0.0022	0.0024
Max.	4913	0.0007	0.0013	0.0015	0.0018	0.0021	0.0025	0.0025	0.0028	0.0030

In situ Temperature and Driver Current Measurements of Final

Product 1.1 Reference Standard

ANSI/UL 8750-2009: Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
ANSI/UL 153-2002: Standard for Safety of Portable Electric Luminaires
ANSI/UL 1598-2008: Standard for Safety of Luminaires

1.2 Test Equipment

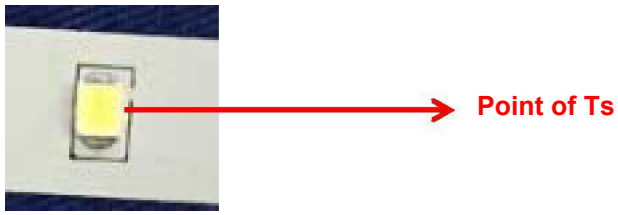
Device	Manufacture	Model No	Serial No	Cal Due
AC Power Source	ALL POWER	APW-110N	992257	2019-08-28
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2019-08-30
Hybrid Recorder (60 channel)	AGILENT	34970A	MY41009304	2019-09-13

Statement of Traceability: Shenzhen BST Technology Co., Ltd. that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.3 - Temperature Measurement Data The sample was operated until constant temperatures were obtained. temperature was considered constant if the sample was operating for at least three hours and upon three A successive readings - taken at 15 minute intervals - were within one degree and were not rising. Thermocouples were attached at locations described in the results by means of a cement made of water glass and Fuller's earth, solder, or epoxy.

Ambient Temperature,℃: 25±5℃
Relative Humidity, % : 56 %
Supply voltage: 120 V 60 Hz Type of thermocouples: K

Temperature measurement point of [Ts]:



ANNEX:

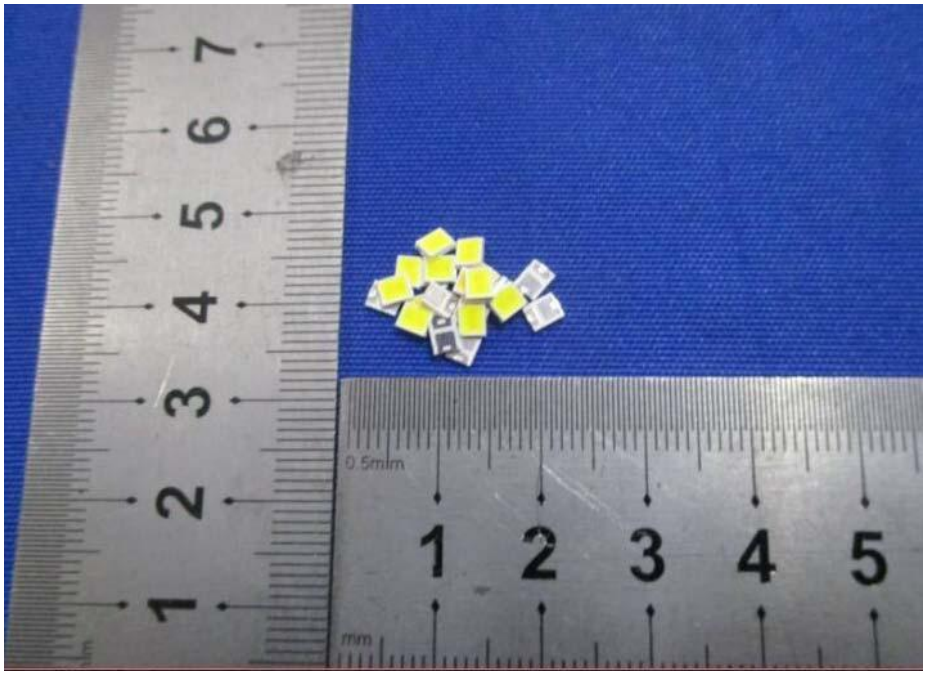


Photo-documentation