



# TEST REPORT

According to ANSI/IES LM-80-15  
For

## Shenzhen MTC Lighting Co., Ltd.

MTC Industry Park, Xialilang community, Nanwan street, Longgang district, Shenzhen, China

**#Model: MTR-281CWM-ABD**

<b>Report Type:</b> 12000 Hours Test Report		<b>Product Type:</b> LED Package	
<b>Test Engineer:</b>	Pote Wang <i>Pote Wang</i>		
<b>Report Number:</b>	RSZ181002503-10		
<b>Test Date:</b>	2018-10-03 to 2020-03-03		
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<b>Reviewed By:</b>	Blake Zhang / EE Engineer <i>Blake Zhang</i>		
<b>Test Facility:</b>	Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.		
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<b>Accreditation:</b>	The IAS Accreditation Number TL-460.		



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## 1 - General Information

### 1.1 Description of LED Light Sources

#### Sample Size:

75 PCS test samples were in good condition and received on 2018-10-02. The samples were numbered from 1 to 25, 26 to 50 and 51 to 75.

#Manufacturer:	Shenzhen MTC Lighting Co., Ltd.
#Part Number:	MTR-281CWM-ABD
#Part Type:	LED Package
#Drive Level:	DC 60mA
#Nominal CCT:	2700K
#Power:	1.08W
#Average Current Density per LED die:	185mA/mm <sup>2</sup>
#Average Power Density per LED die:	1.7W/mm <sup>2</sup>
#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<sup>®</sup> 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<sup>®</sup> Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Test Models	Multiple Models	Differences Items
MTR-281CWM-ABD	MTR-281CxM-xxx	x1=CCT x2,x3,x4= PKG rank

### 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<sup>®</sup> 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	2019-03-08	2020-03-07
Programmable Test Power for LEDs	EVERFINE	LED300E	1008002	2019-03-08	2020-03-07
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	2019-03-08	2020-03-07
Standard Light Source	EVERFINE	D062	G100278CJ7351206	2019-12-24	2020-12-24
Multilayer aging machine	BACL	B2-270	20022	2019-03-10	2020-03-09

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
DC Power Supply	BACL	B12001-12	90023	2020-01-07	2021-01-07

#### 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<sub>LED</sub>) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP<sub>LED</sub> of the coldest LEDs were maintained at a temperature that was greater than or equal to 2°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°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  $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , RH <65%.

#### 1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate u'v'. 2 $\pi$  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  $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , 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 (luminous flux) measurements is U=2.5% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=20K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=2.5 (K=2), at the 95% confidence level.

The uncertainty of the temperature is U=0.8671°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: 85°C, 60mA

Part Number: MTR-281CWM-ABD  
Number of Units: 25  
Case Temperature: >83°C  
Ambient Temperature: >80°C  
Life Test Drive Current: 60mA  
Measurement Current: 60mA

### Data Set 2: 105°C, 60mA

Part Number: MTR-281CWM-ABD  
Number of Units: 25  
Case Temperature: >103°C  
Ambient Temperature: >100°C  
Life Test Drive Current: 60mA  
Measurement Current: 60mA

### Data Set 3: 115°C, 60mA

Part Number: MTR-281CWM-ABD  
Number of Units: 25  
Case Temperature: >113°C  
Ambient Temperature: >110°C  
Life Test Drive Current: 60mA  
Measurement Current: 60mA

## 2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	$\alpha$	$\beta$	Reported TM-21 L <sub>70</sub> Lifetime	Reported TM-21 L <sub>90</sub> Lifetime
1	25	0	1000hrs	12000hrs	2.242E-06	1.004	>72000 hours	49,000 hours
2	25	0	1000hrs	12000hrs	2.813E-06	1.007	>72000 hours	40,000 hours
3	25	0	1000hrs	12000hrs	3.112E-06	1.007	>72000 hours	36,000 hours

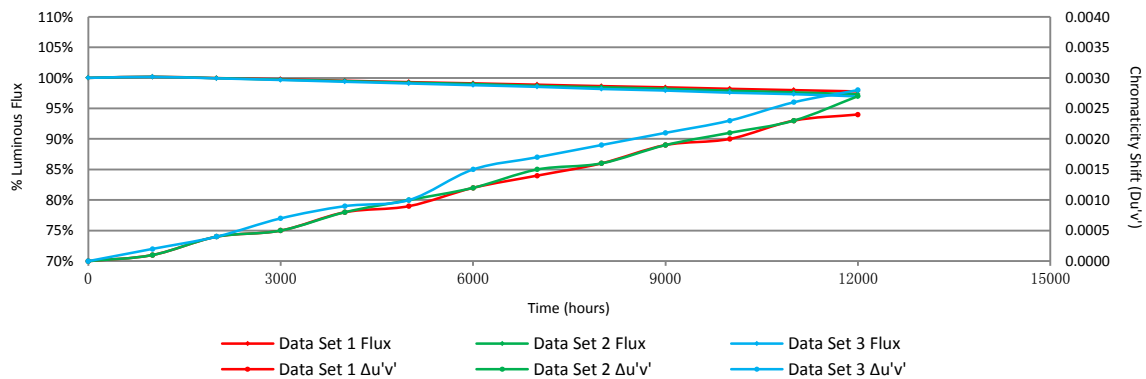
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	100.18%	99.96%	99.77%	99.53%	99.30%	99.10%	98.88%	98.65%	98.45%	98.21%	97.99%	97.78%
2	100.17%	99.95%	99.71%	99.47%	99.21%	99.00%	98.68%	98.46%	98.21%	97.90%	97.63%	97.31%
3	100.15%	99.92%	99.65%	99.36%	99.08%	98.80%	98.53%	98.18%	97.92%	97.57%	97.33%	96.96%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	0.0001	0.0004	0.0005	0.0008	0.0009	0.0012	0.0014	0.0016	0.0019	0.002	0.0023	0.0024
2	0.0001	0.0004	0.0005	0.0008	0.001	0.0012	0.0015	0.0016	0.0019	0.0021	0.0023	0.0027
3	0.0002	0.0004	0.0007	0.0009	0.001	0.0015	0.0017	0.0019	0.0021	0.0023	0.0026	0.0028

Average Lumen Maintenance and Chromaticity Shift VS. Time



### 3 - Test Data

#### 3.1 Data Set 1, 85°C, 60mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	163.30	100.18	100.00	99.88	99.63	99.51	99.14	98.96	98.65	98.59	98.47	98.29	98.10
2	164.70	100.18	100.12	99.88	99.70	99.33	99.09	98.85	98.60	98.48	98.36	98.18	98.06
3	165.50	100.12	99.82	99.52	99.15	99.03	98.85	98.61	98.49	98.37	98.07	97.89	97.76
4	164.40	100.18	99.88	99.57	99.33	99.03	98.84	98.66	98.30	98.24	98.11	97.87	97.57
5	165.90	100.06	99.94	99.82	99.58	99.52	99.40	99.10	99.04	98.73	98.49	98.19	97.83
6	163.30	100.24	99.94	99.69	99.51	99.14	98.84	98.53	98.22	97.86	97.49	97.37	97.12
7	166.10	100.12	99.82	99.76	99.46	99.16	98.92	98.74	98.49	98.13	97.83	97.59	97.47
8	164.90	100.12	99.94	99.70	99.45	99.15	98.85	98.73	98.54	98.36	98.00	97.82	97.63
9	163.90	100.18	100.12	100.00	99.82	99.45	99.27	99.02	98.66	98.29	98.05	97.74	97.44
10	165.50	100.12	99.82	99.76	99.58	99.27	99.09	98.79	98.49	98.13	97.82	97.70	97.46
11	166.70	100.30	100.06	99.88	99.64	99.34	99.28	99.16	98.86	98.68	98.56	98.38	98.02
12	164.70	100.12	99.76	99.64	99.27	99.15	98.97	98.72	98.48	98.36	98.12	97.75	97.63
13	163.90	100.12	99.88	99.57	99.51	99.45	99.15	99.02	98.84	98.72	98.47	98.17	97.99
14	164.80	100.30	100.06	100.00	99.76	99.70	99.58	99.21	98.97	98.73	98.36	98.06	97.75
15	165.90	100.30	100.06	99.82	99.46	99.16	98.92	98.73	98.43	98.25	98.01	97.71	97.65
16	165.60	100.18	100.00	99.82	99.70	99.34	99.09	98.91	98.61	98.37	98.13	98.01	97.77
17	165.80	100.24	99.94	99.88	99.58	99.28	99.16	98.91	98.73	98.49	98.13	98.07	97.83
18	164.30	100.18	99.82	99.57	99.39	99.33	99.21	98.84	98.66	98.48	98.11	97.81	97.57
19	164.40	100.24	100.06	99.94	99.64	99.45	99.33	99.21	98.97	98.84	98.60	98.42	98.24
20	166.00	100.12	99.82	99.52	99.22	99.16	98.98	98.73	98.43	98.31	98.19	97.89	97.77
21	165.00	100.12	99.88	99.76	99.70	99.39	99.27	98.91	98.79	98.42	98.24	98.06	97.94
22	166.30	100.24	100.06	99.70	99.46	99.16	98.92	98.86	98.68	98.62	98.38	98.14	97.84
23	163.80	100.24	100.12	99.82	99.51	99.39	99.21	99.02	98.84	98.72	98.41	98.35	98.05
24	165.50	100.18	100.12	100.06	99.70	99.46	99.09	98.97	98.91	98.61	98.49	98.43	98.31
25	165.90	100.06	99.94	99.64	99.52	99.16	98.98	98.73	98.43	98.37	98.31	97.95	97.77
Avg.	165.04	100.18	99.96	99.77	99.53	99.30	99.10	98.88	98.65	98.45	98.21	97.99	97.78
Med.	165.00	100.18	99.94	99.76	99.52	99.33	99.09	98.86	98.65	98.42	98.19	98.01	97.77
st dev	0.96	0.07	0.12	0.15	0.17	0.17	0.19	0.18	0.22	0.23	0.26	0.28	0.27
Min.	163.30	100.06	99.76	99.52	99.15	99.03	98.84	98.53	98.22	97.86	97.49	97.37	97.12
Max.	166.70	100.30	100.12	100.06	99.82	99.70	99.58	99.21	99.04	98.84	98.60	98.43	98.31

**3.2 Data Set 1, 85°C, 60mA (Forward Voltage)**

No.	Forward Voltage (V)												
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	18.46	18.47	18.48	18.48	18.48	18.49	18.49	18.49	18.50	18.50	18.50	18.51	18.52
2	18.33	18.34	18.35	18.35	18.36	18.36	18.37	18.37	18.38	18.38	18.38	18.38	18.39
3	18.32	18.32	18.32	18.33	18.34	18.34	18.35	18.35	18.35	18.35	18.35	18.36	18.36
4	18.38	18.38	18.38	18.39	18.40	18.41	18.41	18.41	18.41	18.42	18.42	18.42	18.42
5	18.39	18.39	18.39	18.40	18.41	18.42	18.42	18.42	18.42	18.42	18.43	18.44	18.44
6	18.44	18.44	18.45	18.46	18.46	18.46	18.47	18.47	18.48	18.48	18.48	18.48	18.48
7	18.42	18.42	18.42	18.42	18.42	18.43	18.44	18.44	18.44	18.45	18.45	18.45	18.45
8	18.18	18.19	18.20	18.20	18.20	18.20	18.21	18.21	18.22	18.23	18.23	18.23	18.23
9	18.18	18.18	18.19	18.19	18.19	18.19	18.20	18.21	18.21	18.22	18.22	18.22	18.22
10	18.46	18.46	18.46	18.47	18.48	18.48	18.49	18.49	18.50	18.51	18.51	18.52	18.52
11	18.42	18.43	18.43	18.43	18.44	18.44	18.44	18.44	18.44	18.45	18.46	18.47	18.47
12	18.36	18.36	18.36	18.37	18.37	18.38	18.39	18.39	18.40	18.40	18.40	18.40	18.41
13	18.30	18.31	18.31	18.32	18.33	18.34	18.34	18.34	18.34	18.34	18.35	18.35	18.36
14	18.43	18.44	18.44	18.44	18.44	18.45	18.45	18.46	18.46	18.47	18.48	18.49	18.49
15	18.57	18.58	18.58	18.59	18.59	18.60	18.60	18.60	18.61	18.62	18.63	18.64	18.65
16	18.52	18.52	18.53	18.53	18.53	18.54	18.55	18.56	18.57	18.58	18.58	18.59	18.60
17	18.30	18.30	18.31	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.33
18	18.30	18.30	18.30	18.30	18.30	18.30	18.30	18.31	18.32	18.32	18.33	18.33	18.33
19	18.35	18.36	18.37	18.37	18.37	18.37	18.37	18.38	18.38	18.39	18.40	18.40	18.40
20	18.38	18.38	18.38	18.38	18.39	18.40	18.41	18.41	18.42	18.43	18.44	18.44	18.45
21	18.28	18.28	18.29	18.29	18.30	18.30	18.31	18.32	18.33	18.33	18.33	18.33	18.34
22	18.35	18.35	18.35	18.35	18.36	18.37	18.38	18.39	18.40	18.40	18.41	18.42	18.43
23	18.37	18.38	18.38	18.38	18.39	18.39	18.40	18.41	18.41	18.42	18.43	18.43	18.43
24	18.39	18.40	18.41	18.42	18.42	18.43	18.44	18.45	18.46	18.47	18.47	18.47	18.48
25	18.49	18.50	18.51	18.51	18.51	18.52	18.53	18.54	18.55	18.56	18.57	18.58	18.59
Avg.	18.37	18.38	18.38	18.39	18.39	18.40	18.40	18.41	18.41	18.42	18.42	18.43	18.43
Med.	18.38	18.38	18.38	18.38	18.39	18.40	18.41	18.41	18.41	18.42	18.43	18.43	18.43
st dev	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.09	0.10	0.10	0.10	0.10	0.10
Min.	18.18	18.18	18.19	18.19	18.19	18.19	18.20	18.21	18.21	18.22	18.22	18.22	18.22
Max.	18.57	18.58	18.58	18.59	18.59	18.60	18.60	18.60	18.61	18.62	18.63	18.64	18.65



**3.3 Data Set 1, 85°C, 60mA (Chromaticity Shift)**

No.	u'	v'	CCT(K)	Chromaticity Shift ( $\Delta u'v'$ )											
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
1	0.2621	0.5248	2718	0.0002	0.0004	0.0006	0.0008	0.0009	0.0011	0.0014	0.0016	0.0018	0.0019	0.0021	0.0023
2	0.2643	0.5275	2662	0.0001	0.0004	0.0005	0.0006	0.0008	0.0010	0.0013	0.0014	0.0017	0.0018	0.0021	0.0021
3	0.2624	0.5276	2701	0.0002	0.0005	0.0007	0.0008	0.0010	0.0013	0.0015	0.0016	0.0019	0.0021	0.0024	0.0025
4	0.2627	0.5274	2696	0.0001	0.0004	0.0004	0.0006	0.0008	0.0009	0.0011	0.0013	0.0015	0.0017	0.0021	0.0022
5	0.2628	0.5271	2695	0.0001	0.0004	0.0005	0.0008	0.0008	0.0010	0.0013	0.0014	0.0017	0.0019	0.0021	0.0022
6	0.2637	0.5278	2674	0.0001	0.0004	0.0005	0.0007	0.0009	0.0011	0.0015	0.0016	0.0020	0.0021	0.0025	0.0026
7	0.2630	0.5284	2685	0.0001	0.0003	0.0003	0.0004	0.0006	0.0007	0.0010	0.0011	0.0013	0.0013	0.0015	0.0016
8	0.2624	0.5266	2704	0.0001	0.0004	0.0007	0.0009	0.0010	0.0013	0.0016	0.0016	0.0019	0.0021	0.0024	0.0025
9	0.2615	0.5243	2735	0.0001	0.0004	0.0006	0.0008	0.0010	0.0011	0.0014	0.0017	0.0019	0.0021	0.0022	0.0023
10	0.2601	0.5251	2761	0.0002	0.0003	0.0004	0.0007	0.0009	0.0010	0.0013	0.0014	0.0018	0.0019	0.0021	0.0021
11	0.2627	0.5285	2692	0.0001	0.0004	0.0006	0.0008	0.0010	0.0013	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
12	0.2644	0.5277	2660	0.0001	0.0003	0.0006	0.0009	0.0009	0.0012	0.0014	0.0017	0.0021	0.0022	0.0025	0.0027
13	0.2622	0.5248	2717	0.0002	0.0004	0.0004	0.0006	0.0008	0.0009	0.0012	0.0013	0.0017	0.0019	0.0021	0.0022
14	0.2650	0.5276	2649	0.0001	0.0003	0.0006	0.0008	0.0011	0.0013	0.0015	0.0017	0.0020	0.0021	0.0023	0.0025
15	0.2619	0.5271	2714	0.0001	0.0003	0.0005	0.0007	0.0009	0.0011	0.0014	0.0014	0.0017	0.0020	0.0024	0.0024
16	0.2620	0.5255	2719	0.0002	0.0004	0.0006	0.0009	0.0011	0.0014	0.0016	0.0017	0.0021	0.0022	0.0026	0.0026
17	0.2627	0.5277	2694	0.0001	0.0005	0.0007	0.0010	0.0012	0.0016	0.0018	0.0020	0.0023	0.0025	0.0028	0.0029
18	0.2605	0.5240	2758	0.0002	0.0004	0.0006	0.0007	0.0009	0.0011	0.0014	0.0016	0.0019	0.0020	0.0023	0.0024
19	0.2621	0.5261	2713	0.0001	0.0004	0.0004	0.0006	0.0009	0.0012	0.0014	0.0016	0.0018	0.0018	0.0022	0.0023
20	0.2613	0.5274	2726	0.0001	0.0003	0.0004	0.0007	0.0009	0.0012	0.0014	0.0016	0.0018	0.0020	0.0023	0.0025
21	0.2646	0.5300	2648	0.0002	0.0004	0.0005	0.0009	0.0010	0.0011	0.0015	0.0016	0.0018	0.0020	0.0022	0.0023
22	0.2629	0.5285	2687	0.0001	0.0004	0.0006	0.0009	0.0011	0.0014	0.0018	0.0019	0.0023	0.0025	0.0029	0.0029
23	0.2633	0.5262	2688	0.0001	0.0003	0.0005	0.0008	0.0011	0.0013	0.0015	0.0016	0.0020	0.0021	0.0024	0.0025
24	0.2641	0.5291	2661	0.0001	0.0004	0.0006	0.0009	0.0011	0.0014	0.0017	0.0019	0.0022	0.0024	0.0026	0.0027
25	0.2631	0.5266	2690	0.0001	0.0003	0.0003	0.0006	0.0008	0.0010	0.0014	0.0016	0.0019	0.0021	0.0024	0.0025
Avg.	0.2627	0.5269	2698	0.0001	0.0004	0.0005	0.0008	0.0009	0.0012	0.0014	0.0016	0.0019	0.0020	0.0023	0.0024
Med.	0.2627	0.5274	2695	0.0001	0.0004	0.0005	0.0008	0.0009	0.0011	0.0014	0.0016	0.0019	0.0021	0.0023	0.0025
st dev	0.0012	0.0015	30	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003
Min.	0.2601	0.5240	2648	0.0001	0.0003	0.0003	0.0004	0.0006	0.0007	0.0010	0.0011	0.0013	0.0013	0.0015	0.0016
Max.	0.2650	0.5300	2761	0.0002	0.0005	0.0007	0.0010	0.0012	0.0016	0.0018	0.0020	0.0023	0.0025	0.0029	0.0029

**3.4 Data Set 2, 105°C, 60mA (Lumen Maintenance)**

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
26	164.40	100.12	99.94	99.88	99.57	99.21	98.97	98.66	98.42	97.99	97.75	97.32	96.96
27	164.60	100.24	99.94	99.76	99.57	99.33	99.09	98.66	98.30	98.48	98.12	98.00	97.69
28	164.50	100.24	100.18	100.00	99.57	99.51	99.39	99.09	98.97	98.72	98.42	98.42	98.12
29	164.60	100.24	99.94	99.64	99.57	99.21	98.97	98.60	98.24	98.12	97.81	97.45	97.27
30	165.00	100.06	99.94	99.76	99.39	99.45	99.21	98.97	98.79	98.36	98.18	97.76	97.64
31	164.80	100.30	99.88	99.64	99.21	99.15	99.03	98.54	98.30	98.00	97.75	97.15	96.97
32	166.10	100.06	99.94	99.52	99.22	99.10	98.86	98.43	98.25	98.13	97.71	97.71	97.53
33	165.10	100.24	99.94	99.58	99.45	98.97	98.79	98.36	98.06	97.82	97.52	97.46	96.97
34	163.90	100.18	100.12	99.82	99.45	99.08	98.78	98.41	98.29	97.93	97.44	97.56	97.13
35	167.00	100.12	99.88	99.64	99.40	99.28	99.22	98.80	98.62	98.26	97.84	97.43	97.19
36	166.20	100.12	99.82	99.76	99.58	99.28	98.98	98.68	98.44	98.44	98.13	97.71	97.47
37	165.60	100.18	99.88	99.70	99.52	99.40	99.21	99.03	98.67	98.31	97.89	97.71	97.22
38	167.00	100.18	100.06	99.82	99.52	99.28	98.92	98.74	98.50	98.44	98.26	97.78	97.60
39	163.70	100.24	100.12	100.00	99.88	99.45	99.21	99.02	98.78	98.53	98.35	98.11	97.68
40	164.30	100.24	99.88	99.70	99.33	99.33	99.15	98.97	98.90	98.48	98.30	97.75	97.63
41	165.40	100.06	99.82	99.52	99.40	98.85	98.49	98.19	98.00	97.76	97.34	97.28	96.80
42	164.10	100.18	99.88	99.76	99.51	99.33	98.96	98.60	98.35	98.17	98.05	97.50	97.26
43	164.60	100.24	100.18	100.06	99.64	99.03	99.39	99.21	98.91	98.78	98.36	98.24	97.81
44	165.80	100.12	99.82	99.52	99.28	98.79	98.61	98.13	98.01	97.83	97.47	97.47	97.04
45	164.50	100.18	100.00	99.76	99.51	99.21	99.03	98.91	98.60	98.18	97.81	97.51	97.14
46	164.10	100.24	99.88	99.57	99.39	99.09	98.84	98.54	98.42	97.93	97.50	97.32	97.01
47	166.10	100.06	99.70	99.40	99.34	98.86	98.56	98.19	98.01	97.65	97.35	97.05	96.87
48	162.60	100.18	100.06	99.69	99.57	99.26	98.83	98.40	98.34	98.15	97.91	97.66	97.42
49	164.40	100.24	100.06	99.64	99.39	99.21	99.15	98.91	98.78	98.24	98.11	97.63	97.20
50	164.10	100.06	99.94	99.70	99.39	99.51	99.27	98.90	98.54	98.42	98.23	97.68	97.26
Avg.	164.90	100.17	99.95	99.71	99.47	99.21	99.00	98.68	98.46	98.21	97.90	97.63	97.31
Med.	164.60	100.18	99.94	99.70	99.45	99.21	98.98	98.66	98.42	98.18	97.89	97.63	97.26
st dev	1.04	0.08	0.12	0.16	0.15	0.20	0.24	0.30	0.29	0.30	0.34	0.32	0.33
Min.	162.60	100.06	99.70	99.40	99.21	98.79	98.49	98.13	98.00	97.65	97.34	97.05	96.80
Max.	167.00	100.30	100.18	100.06	99.88	99.51	99.39	99.21	98.97	98.78	98.42	98.42	98.12

**3.5 Data Set 2, 105°C, 60mA (Forward Voltage)**

No.	Forward Voltage (V)												
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
26	18.46	18.47	18.47	18.47	18.48	18.48	18.48	18.49	18.49	18.50	18.51	18.52	18.53
27	18.27	18.27	18.28	18.28	18.29	18.29	18.30	18.30	18.31	18.32	18.33	18.33	18.33
28	18.37	18.37	18.38	18.39	18.39	18.39	18.39	18.39	18.39	18.39	18.40	18.41	18.41
29	18.41	18.41	18.41	18.41	18.41	18.41	18.41	18.41	18.42	18.43	18.43	18.43	18.43
30	18.42	18.43	18.44	18.45	18.45	18.46	18.46	18.46	18.46	18.47	18.47	18.48	18.49
31	18.27	18.28	18.28	18.29	18.30	18.31	18.31	18.31	18.32	18.32	18.33	18.33	18.33
32	18.44	18.44	18.45	18.46	18.46	18.46	18.47	18.47	18.48	18.48	18.48	18.49	18.49
33	18.30	18.30	18.31	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.32	18.33
34	18.31	18.32	18.33	18.33	18.33	18.34	18.34	18.35	18.35	18.36	18.37	18.37	18.37
35	18.48	18.49	18.50	18.51	18.51	18.51	18.51	18.51	18.52	18.53	18.53	18.54	18.54
36	18.56	18.57	18.57	18.57	18.58	18.59	18.59	18.59	18.59	18.59	18.59	18.59	18.60
37	18.27	18.27	18.27	18.27	18.27	18.27	18.27	18.28	18.29	18.30	18.31	18.31	18.31
38	18.29	18.29	18.30	18.30	18.31	18.31	18.31	18.32	18.33	18.33	18.34	18.35	18.35
39	18.20	18.21	18.21	18.21	18.21	18.22	18.22	18.23	18.24	18.25	18.25	18.26	18.26
40	18.39	18.40	18.40	18.40	18.40	18.41	18.42	18.42	18.43	18.43	18.43	18.43	18.43
41	18.31	18.32	18.33	18.33	18.34	18.35	18.36	18.37	18.38	18.39	18.40	18.41	18.41
42	18.36	18.36	18.37	18.37	18.37	18.37	18.38	18.39	18.40	18.41	18.42	18.42	18.43
43	18.38	18.39	18.39	18.40	18.41	18.41	18.42	18.43	18.44	18.45	18.45	18.45	18.45
44	18.22	18.22	18.22	18.22	18.22	18.23	18.24	18.24	18.25	18.26	18.26	18.27	18.27
45	18.24	18.25	18.25	18.25	18.26	18.26	18.27	18.28	18.28	18.29	18.30	18.30	18.31
46	18.24	18.25	18.25	18.26	18.27	18.27	18.28	18.29	18.29	18.29	18.30	18.30	18.31
47	18.28	18.28	18.29	18.29	18.29	18.30	18.30	18.31	18.31	18.31	18.32	18.33	18.33
48	18.36	18.37	18.38	18.38	18.38	18.38	18.39	18.40	18.41	18.42	18.42	18.43	18.44
49	18.44	18.45	18.46	18.47	18.48	18.48	18.49	18.50	18.51	18.52	18.53	18.53	18.54
50	18.33	18.34	18.35	18.35	18.35	18.35	18.35	18.35	18.35	18.36	18.37	18.37	18.38
Avg.	18.34	18.35	18.36	18.36	18.36	18.37	18.37	18.38	18.38	18.39	18.39	18.40	18.40
Med.	18.33	18.34	18.35	18.35	18.35	18.35	18.36	18.37	18.38	18.39	18.40	18.41	18.41
st dev	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Min.	18.20	18.21	18.21	18.21	18.21	18.22	18.22	18.23	18.24	18.25	18.25	18.26	18.26
Max.	18.56	18.57	18.57	18.57	18.58	18.59	18.59	18.59	18.59	18.59	18.59	18.59	18.60

**3.6 Data Set 2, 105°C, 60mA (Chromaticity Shift)**

No.	u'	v'	CCT(K)	Chromaticity Shift ( $\Delta u'v'$ )											
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs
26	0.2620	0.5267	2714	0.0002	0.0005	0.0007	0.0010	0.0012	0.0014	0.0015	0.0015	0.0019	0.0020	0.0021	0.0027
27	0.2645	0.5278	2657	0.0000	0.0002	0.0004	0.0007	0.0009	0.0010	0.0013	0.0015	0.0018	0.0020	0.0021	0.0024
28	0.2626	0.5267	2700	0.0001	0.0003	0.0004	0.0006	0.0008	0.0011	0.0014	0.0016	0.0019	0.0021	0.0023	0.0027
29	0.2626	0.5262	2703	0.0001	0.0003	0.0004	0.0007	0.0009	0.0011	0.0015	0.0017	0.0021	0.0023	0.0027	0.0031
30	0.2621	0.5256	2716	0.0002	0.0004	0.0007	0.0008	0.0011	0.0011	0.0014	0.0016	0.0020	0.0023	0.0024	0.0026
31	0.2653	0.5279	2640	0.0002	0.0004	0.0005	0.0008	0.0010	0.0012	0.0016	0.0017	0.0021	0.0023	0.0025	0.0029
32	0.2618	0.5288	2709	0.0001	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0016	0.0018	0.0021	0.0023	0.0027
33	0.2623	0.5258	2710	0.0001	0.0004	0.0006	0.0009	0.0011	0.0013	0.0016	0.0018	0.0022	0.0023	0.0025	0.0028
34	0.2644	0.5263	2665	0.0001	0.0003	0.0006	0.0009	0.0012	0.0014	0.0016	0.0018	0.0020	0.0021	0.0023	0.0027
35	0.2628	0.5268	2696	0.0001	0.0003	0.0004	0.0006	0.0010	0.0011	0.0014	0.0015	0.0018	0.0022	0.0023	0.0028
36	0.2635	0.5263	2683	0.0000	0.0004	0.0004	0.0006	0.0008	0.0009	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024
37	0.2622	0.5252	2716	0.0001	0.0004	0.0006	0.0009	0.0011	0.0011	0.0013	0.0013	0.0016	0.0016	0.0018	0.0021
38	0.2596	0.5270	2763	0.0002	0.0004	0.0005	0.0009	0.0012	0.0014	0.0017	0.0017	0.0019	0.0021	0.0023	0.0025
39	0.2644	0.5264	2666	0.0001	0.0004	0.0004	0.0007	0.0011	0.0011	0.0015	0.0017	0.0021	0.0023	0.0027	0.0029
40	0.2643	0.5261	2667	0.0001	0.0004	0.0006	0.0010	0.0011	0.0013	0.0017	0.0017	0.0020	0.0022	0.0023	0.0027
41	0.2640	0.5276	2669	0.0001	0.0004	0.0006	0.0009	0.0011	0.0012	0.0015	0.0017	0.0021	0.0022	0.0025	0.0028
42	0.2642	0.5260	2670	0.0002	0.0004	0.0005	0.0008	0.0012	0.0012	0.0014	0.0015	0.0018	0.0019	0.0021	0.0027
43	0.2627	0.5258	2701	0.0001	0.0003	0.0004	0.0006	0.0010	0.0012	0.0015	0.0016	0.0018	0.0019	0.0021	0.0024
44	0.2620	0.5283	2706	0.0001	0.0004	0.0005	0.0007	0.0010	0.0012	0.0014	0.0017	0.0021	0.0022	0.0024	0.0028
45	0.2630	0.5261	2695	0.0000	0.0004	0.0005	0.0008	0.0010	0.0011	0.0014	0.0016	0.0020	0.0022	0.0025	0.0030
46	0.2634	0.5260	2686	0.0000	0.0002	0.0004	0.0007	0.0009	0.0011	0.0014	0.0016	0.0018	0.0019	0.0022	0.0027
47	0.2613	0.5262	2730	0.0002	0.0005	0.0005	0.0009	0.0011	0.0013	0.0016	0.0016	0.0018	0.0021	0.0024	0.0027
48	0.2641	0.5269	2670	0.0001	0.0004	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0019	0.0021	0.0024	0.0027
49	0.2646	0.5289	2652	0.0002	0.0004	0.0006	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0021	0.0023	0.0029
50	0.2654	0.5260	2646	0.0001	0.0004	0.0006	0.0009	0.0013	0.0014	0.0016	0.0017	0.0020	0.0023	0.0026	0.0030
Avg.	0.2632	0.5267	2689	0.0001	0.0004	0.0005	0.0008	0.0010	0.0012	0.0015	0.0016	0.0019	0.0021	0.0023	0.0027
Med.	0.2630	0.5263	2695	0.0001	0.0004	0.0005	0.0008	0.0011	0.0012	0.0015	0.0016	0.0019	0.0021	0.0023	0.0027
st dev	0.0014	0.0010	29	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
Min.	0.2596	0.5252	2640	0.0000	0.0002	0.0004	0.0006	0.0008	0.0009	0.0012	0.0013	0.0016	0.0016	0.0018	0.0021
Max.	0.2654	0.5289	2763	0.0002	0.0005	0.0007	0.0010	0.0013	0.0014	0.0017	0.0018	0.0022	0.0023	0.0027	0.0031

**3.7 Data Set 3, 115°C, 60mA (Lumen Maintenance)**

No.	Φ(lm)	Lumen Maintenance (%)											
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
51	164.00	100.24	99.88	99.57	99.39	99.15	98.90	98.72	98.35	98.23	97.80	97.56	97.26
52	165.00	100.18	100.06	99.94	99.64	99.33	99.15	98.91	98.48	98.30	97.82	97.52	97.09
53	163.80	100.12	99.94	99.51	99.15	98.72	98.35	98.23	97.80	97.56	97.44	97.37	96.89
54	165.40	100.24	99.82	99.52	99.40	99.03	98.55	98.07	97.94	97.76	97.40	97.10	96.61
55	164.80	100.12	99.88	99.45	98.97	98.79	98.73	98.36	98.00	97.88	97.45	97.03	96.48
56	164.90	100.06	100.06	99.94	99.64	99.21	98.85	98.48	98.12	97.88	97.57	97.27	97.03
57	164.00	100.18	100.06	99.82	99.63	99.39	99.33	99.27	98.84	98.78	98.41	98.23	97.68
58	163.10	100.18	100.06	99.82	99.33	99.14	98.65	98.47	98.22	97.79	97.42	97.06	96.87
59	164.60	100.06	99.94	99.64	99.33	99.21	98.78	98.48	97.93	97.57	97.27	96.96	96.66
60	165.10	100.24	100.06	100.00	99.64	99.45	99.03	98.67	98.24	97.82	97.52	97.33	96.79
61	165.60	100.06	99.82	99.46	99.34	99.21	99.03	98.67	98.43	98.25	97.83	97.64	97.40
62	164.20	100.24	99.94	99.82	99.57	99.45	99.27	98.78	98.48	98.42	98.29	98.17	97.69
63	168.00	100.06	99.58	99.29	99.17	98.75	98.63	98.21	97.74	97.50	97.20	96.96	96.85
64	166.50	100.24	100.12	99.70	99.52	99.16	99.04	98.86	98.50	98.08	97.90	97.90	97.42
65	166.00	100.12	100.06	100.00	99.76	99.40	99.10	98.61	98.25	97.89	97.59	97.23	96.69
66	164.00	100.18	99.88	99.63	99.27	98.90	98.72	98.54	98.05	97.68	97.13	96.89	96.52
67	164.80	100.06	99.82	99.70	99.58	99.45	99.21	98.91	98.54	98.12	97.63	97.39	97.15
68	166.90	100.18	99.82	99.40	99.04	98.74	98.38	98.26	98.14	98.02	97.54	97.42	97.06
69	165.60	100.18	99.82	99.40	98.97	98.55	98.31	98.25	97.71	97.28	96.80	96.56	96.07
70	164.10	100.12	99.88	99.51	99.02	98.72	98.29	98.11	97.87	97.81	97.50	97.26	96.89
71	166.40	100.24	100.00	99.94	99.76	99.52	99.10	98.92	98.62	98.38	97.90	97.84	97.48
72	163.00	100.06	99.94	99.82	99.39	98.96	98.65	98.34	97.98	97.55	97.36	97.18	96.81
73	165.70	100.06	99.64	99.34	98.97	98.73	98.67	98.37	97.95	97.77	97.28	96.92	96.50
74	166.30	100.24	99.88	99.58	99.10	98.92	98.62	98.38	98.20	97.78	97.47	97.11	96.75
75	166.50	100.18	99.94	99.58	99.46	99.10	98.74	98.32	98.08	97.90	97.78	97.42	97.30
Avg.	165.13	100.15	99.92	99.65	99.36	99.08	98.80	98.53	98.18	97.92	97.57	97.33	96.96
Med.	165.00	100.18	99.94	99.63	99.39	99.14	98.74	98.48	98.14	97.88	97.52	97.27	96.89
st dev	1.23	0.07	0.13	0.22	0.26	0.29	0.30	0.30	0.29	0.34	0.35	0.40	0.40
Min.	163.00	100.06	99.58	99.29	98.97	98.55	98.29	98.07	97.71	97.28	96.80	96.56	96.07
Max.	168.00	100.24	100.12	100.00	99.76	99.52	99.33	99.27	98.84	98.78	98.41	98.23	97.69

**3.8 Data Set 3, 115° C, 60mA (Forward Voltage)**

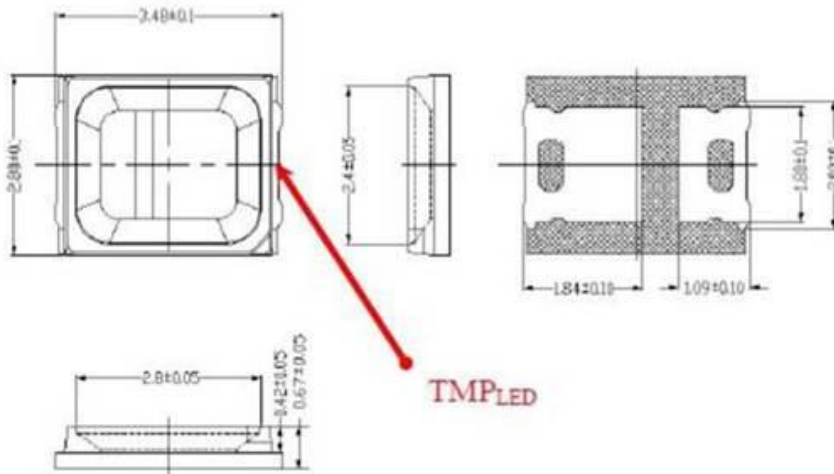
No.	Forward Voltage (V)												
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs	12000hrs
51	18.31	18.31	18.31	18.31	18.31	18.32	18.32	18.33	18.33	18.34	18.34	18.34	18.34
52	18.41	18.42	18.43	18.44	18.44	18.45	18.45	18.45	18.46	18.47	18.48	18.49	18.49
53	18.18	18.19	18.20	18.20	18.21	18.22	18.23	18.23	18.23	18.24	18.25	18.25	18.25
54	18.42	18.42	18.43	18.43	18.43	18.43	18.44	18.44	18.44	18.44	18.45	18.46	18.47
55	18.43	18.44	18.45	18.46	18.47	18.48	18.48	18.49	18.50	18.50	18.50	18.50	18.51
56	18.34	18.34	18.35	18.35	18.35	18.36	18.36	18.37	18.37	18.38	18.38	18.39	18.39
57	18.45	18.45	18.46	18.47	18.48	18.49	18.50	18.51	18.52	18.52	18.52	18.52	18.52
58	18.45	18.46	18.46	18.47	18.48	18.49	18.50	18.50	18.50	18.50	18.50	18.50	18.51
59	18.27	18.28	18.28	18.29	18.30	18.30	18.30	18.31	18.31	18.32	18.33	18.34	18.35
60	18.26	18.27	18.28	18.29	18.30	18.31	18.32	18.33	18.33	18.33	18.34	18.35	18.35
61	18.26	18.26	18.26	18.27	18.28	18.29	18.30	18.30	18.31	18.31	18.32	18.33	18.34
62	18.32	18.32	18.33	18.34	18.35	18.36	18.37	18.38	18.38	18.38	18.38	18.39	18.39
63	18.58	18.58	18.58	18.58	18.58	18.58	18.59	18.59	18.60	18.60	18.60	18.61	18.62
64	18.35	18.36	18.37	18.37	18.38	18.38	18.39	18.39	18.40	18.40	18.41	18.42	18.43
65	18.41	18.42	18.42	18.42	18.42	18.42	18.42	18.42	18.43	18.44	18.45	18.45	18.46
66	18.41	18.41	18.42	18.42	18.43	18.43	18.44	18.45	18.46	18.47	18.47	18.48	18.48
67	18.32	18.33	18.33	18.33	18.33	18.34	18.35	18.36	18.36	18.36	18.37	18.38	18.39
68	18.50	18.50	18.50	18.51	18.52	18.53	18.53	18.54	18.55	18.55	18.56	18.57	18.58
69	18.34	18.35	18.36	18.37	18.38	18.39	18.39	18.39	18.39	18.40	18.41	18.41	18.41
70	18.39	18.40	18.41	18.41	18.42	18.42	18.42	18.42	18.43	18.44	18.45	18.45	18.46
71	18.28	18.29	18.30	18.30	18.31	18.31	18.31	18.32	18.33	18.34	18.35	18.35	18.35
72	18.34	18.34	18.34	18.35	18.35	18.35	18.35	18.35	18.35	18.35	18.36	18.36	18.37
73	18.33	18.33	18.34	18.35	18.36	18.36	18.37	18.37	18.38	18.38	18.39	18.40	18.41
74	18.56	18.56	18.56	18.57	18.57	18.58	18.59	18.60	18.60	18.60	18.60	18.60	18.60
75	18.29	18.30	18.30	18.31	18.32	18.33	18.34	18.35	18.35	18.36	18.37	18.38	18.39
Avg.	18.37	18.37	18.38	18.38	18.39	18.40	18.40	18.41	18.41	18.42	18.42	18.43	18.43
Med.	18.34	18.35	18.36	18.37	18.38	18.38	18.39	18.39	18.39	18.40	18.41	18.41	18.41
st dev	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Min.	18.18	18.19	18.20	18.20	18.21	18.22	18.23	18.23	18.23	18.24	18.25	18.25	18.25
Max.	18.58	18.58	18.58	18.58	18.58	18.58	18.59	18.60	18.60	18.60	18.60	18.61	18.62

**3.9 Data Set 3, 115° C, 60mA (Chromaticity Shift)**

No.	u'	v'	CCT(K)	Chromaticity Shift ( $\Delta u'v'$ )											
				0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs	10000hrs	11000hrs
51	0.2649	0.5275	2650	0.0002	0.0004	0.0007	0.0009	0.0010	0.0014	0.0016	0.0018	0.0021	0.0024	0.0028	0.0032
52	0.2630	0.5273	2690	0.0002	0.0005	0.0008	0.0010	0.0012	0.0017	0.0020	0.0021	0.0023	0.0025	0.0029	0.0032
53	0.2648	0.5279	2651	0.0002	0.0004	0.0006	0.0008	0.0008	0.0014	0.0016	0.0017	0.0019	0.0022	0.0026	0.0028
54	0.2617	0.5259	2723	0.0001	0.0001	0.0004	0.0006	0.0007	0.0015	0.0016	0.0018	0.0021	0.0021	0.0024	0.0024
55	0.2633	0.5278	2682	0.0001	0.0004	0.0007	0.0009	0.0011	0.0012	0.0016	0.0019	0.0020	0.0021	0.0024	0.0025
56	0.2638	0.5276	2672	0.0001	0.0002	0.0005	0.0007	0.0009	0.0016	0.0019	0.0020	0.0022	0.0022	0.0024	0.0027
57	0.2612	0.5251	2736	0.0002	0.0004	0.0006	0.0009	0.0011	0.0016	0.0019	0.0020	0.0022	0.0023	0.0026	0.0027
58	0.2607	0.5249	2748	0.0001	0.0004	0.0007	0.0009	0.0009	0.0014	0.0018	0.0020	0.0023	0.0025	0.0029	0.0031
59	0.2638	0.5290	2668	0.0003	0.0006	0.0009	0.0011	0.0012	0.0017	0.0020	0.0021	0.0023	0.0024	0.0027	0.0028
60	0.2634	0.5266	2684	0.0002	0.0004	0.0006	0.0008	0.0009	0.0011	0.0015	0.0017	0.0018	0.0021	0.0024	0.0027
61	0.2605	0.5267	2744	0.0002	0.0004	0.0007	0.0010	0.0011	0.0016	0.0018	0.0019	0.0021	0.0023	0.0026	0.0030
62	0.2632	0.5274	2685	0.0001	0.0004	0.0008	0.0011	0.0011	0.0016	0.0019	0.0021	0.0021	0.0024	0.0027	0.0027
63	0.2629	0.5280	2689	0.0002	0.0004	0.0006	0.0009	0.0009	0.0014	0.0017	0.0019	0.0021	0.0023	0.0026	0.0027
64	0.2624	0.5262	2707	0.0002	0.0005	0.0007	0.0009	0.0011	0.0016	0.0019	0.0021	0.0023	0.0025	0.0027	0.0030
65	0.2639	0.5283	2668	0.0002	0.0003	0.0005	0.0009	0.0009	0.0014	0.0016	0.0017	0.0020	0.0022	0.0024	0.0026
66	0.2620	0.5252	2719	0.0003	0.0004	0.0008	0.0010	0.0011	0.0015	0.0016	0.0018	0.0021	0.0022	0.0025	0.0029
67	0.2636	0.5261	2683	0.0002	0.0004	0.0006	0.0009	0.0009	0.0017	0.0019	0.0020	0.0022	0.0023	0.0025	0.0025
68	0.2622	0.5278	2704	0.0002	0.0005	0.0009	0.0010	0.0010	0.0013	0.0016	0.0018	0.0020	0.0021	0.0024	0.0028
69	0.2625	0.5257	2707	0.0002	0.0004	0.0007	0.0009	0.0011	0.0016	0.0019	0.0021	0.0024	0.0026	0.0028	0.0030
70	0.2608	0.5253	2744	0.0002	0.0004	0.0007	0.0009	0.0009	0.0013	0.0016	0.0018	0.0019	0.0021	0.0023	0.0026
71	0.2626	0.5278	2695	0.0001	0.0003	0.0006	0.0009	0.0011	0.0015	0.0017	0.0017	0.0020	0.0021	0.0025	0.0027
72	0.2640	0.5257	2675	0.0001	0.0004	0.0007	0.0009	0.0010	0.0014	0.0017	0.0019	0.0022	0.0025	0.0027	0.0030
73	0.2632	0.5270	2688	0.0001	0.0004	0.0007	0.0009	0.0011	0.0016	0.0019	0.0021	0.0022	0.0024	0.0027	0.0029
74	0.2636	0.5254	2686	0.0001	0.0003	0.0006	0.0009	0.0009	0.0013	0.0016	0.0019	0.0021	0.0023	0.0025	0.0028
75	0.2619	0.5269	2713	0.0001	0.0004	0.0006	0.0009	0.0010	0.0011	0.0014	0.0015	0.0016	0.0018	0.0022	0.0026
Avg.	0.2628	0.5268	2696	0.0002	0.0004	0.0007	0.0009	0.0010	0.0015	0.0017	0.0019	0.0021	0.0023	0.0026	0.0028
Med.	0.2630	0.5269	2689	0.0002	0.0004	0.0007	0.0009	0.0010	0.0015	0.0017	0.0019	0.0021	0.0023	0.0026	0.0028
st dev	0.0012	0.0012	28	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Min.	0.2605	0.5249	2650	0.0001	0.0001	0.0004	0.0006	0.0007	0.0011	0.0014	0.0015	0.0016	0.0018	0.0022	0.0024
Max.	0.2649	0.5290	2748	0.0003	0.0006	0.0009	0.0011	0.0012	0.0017	0.0020	0.0021	0.0024	0.0026	0.0029	0.0032

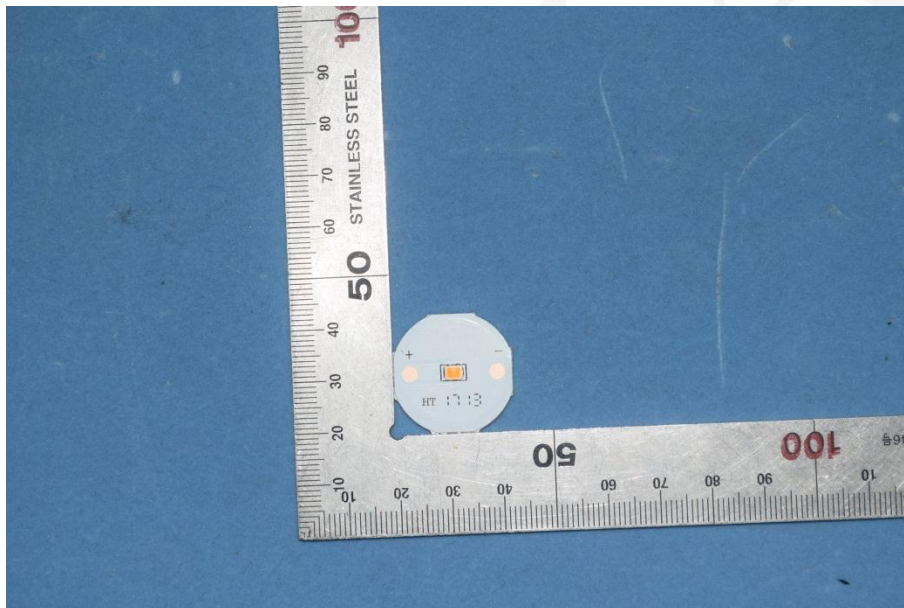
#### 4 - DUT Photo

##### 4.1 #Mechanical Dimensions



All dimensions are in millimeter

##### 4.2 DUT Photo





### Directions

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1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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\*\*\*\*\*END OF REPORT\*\*\*\*\*