



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Reference No. : WTX23F07149945N
Applicant..... : Guangzhou Tianxin photoelectric Co., Ltd.
Address..... : #15-1., Jingu Road South, Huadong Town, Huadu District, Guangzhou, China
Manufacturer : Guangzhou Tianxin photoelectric Co., Ltd.
Address..... : #15-1., Jingu Road South, Huadong Town, Huadu District, Guangzhou, China
Product Name..... : LED Chip
#Model No...... : TX-3535WS
Test specification..... : ANSI/IES LM-80-20
Date of Receipt sample : 2023-07-13
Date of Test..... : 2023-07-13 to 2024-10-23
Date of Issue..... : 2024-10-24
Test Report Form No. : WPL-LM8020A-02A
Test Result..... : **See following pages**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Tested by:

Finn Yu

Approved by:

Akin Xu



1. DUT (device under test) Identification

Manufacturer's name: Guangzhou Tianxin photoelectric Co., Ltd.
 #Model number: TX-3535WS
 Description: LED package
 Drive Level: DC 350mA (Each CCT)
 Nominal CCT: 2700K (2700/6000K)*
 Power: 2W (Each CCT 2W)
 Average Current Density per LED die: 442.858 mA/mm²
 Average Power Density per LED die: 6.3265 W/mm²
 CRI: 90
 Die Spacing: 0.15 mm

Sample Size:

Total 33 pcs test samples were in good condition. The samples were numbered from A1 to A11, B12 to B22 and C23 to C33.

* Remark: The model TX-3535WS is White-Tunable product and has two CCTs (2700K+6000K); all tests at mode CCT 2700K; and covers this specification.

#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:

Model Name	Current (mA)	Power (W)	CCT (K)	Number of dies	Driver Current per die (mA)	Current Density per die (mA/mm ²)	Power Density per PCB (W/mm ²)	Die Spacing (mm)
TX-3535WS	350	2*2	2700/6000	2*2	350	442.858	6.3265	0.15
TX-3535WS5FCB2-0G4DB-01H90	350	2*2	2700/6000	2*2	350	442.858	6.3265	0.15
TX-3535WS8FCD1-0G4DB-01H80	350*2	2*2	2200/5300	2*2	350	442.858	6.3265	0.15
TX-3535WS8FCD1-0G4DB-01H90	350*2	2*2	2700/6000	2*2	350	442.858	6.3265	0.15
TX-3535WS8FCD1-0G4DB-02H80	350*2	2*2	2200/4200	2*2	350	442.858	6.3265	0.15
TX-3535WS8FCB2-0G4CD-01H90	350	2*2	2200/7500	2*2	350	344.48	3.875	0.15
TX-3535WS8FCB2-0G4CD-01BH90	350	2*2	2200/7500	2*2	350	344.48	3.875	0.15

2. Standards Used

- ANSI/IES LM-80-20: MEASURING LUMINOUS FLUX AND COLOR MAINTENANCE OF LED PACKAGES, ARRAYS, AND MODULES
- CIE 127:2007: measurement of LEDs
- ENERGY STAR® Program Guidance Regarding LED Package, LED Array and LED Module Lumen Maintenance Performance Data Supporting Qualification of Lighting Products(This method was not accredited by CNAS)



- ANSI/IES TM-21-21: PROJECTING LONG-TERM LUMEN, PHOTON, AND RADIANT FLUX MAINTENANCE OF LED LIGHT SOURCES

3. Test Facility

The testing facility used by Waltek Testing Group (Foshan) Co., Ltd. is located at No. 13-19, 2/F, 2nd Building, Sunlink International Machinery City, Chencun Town, Shunde District, Foshan, Guangdong, China

4. Operating Cycle

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.

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°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%.

6. Photometric Measurement Method

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 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

7. Measurement Uncertainty

The uncertainty of power meter DC current $U=0.08\%$ of rdg ($K=2$), multimeter DC current $U=0.20\%$ of rdg ($K=2$), at the 95% confidence level.

The uncertainty of the light output measurements is $U=1.8\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=20\text{K}$ ($K=2$), at the 95% confidence level.

The uncertainty of the temperature is $U=0.3^{\circ}\text{C}$ ($K=2$), at the 95% confidence level.

8. Decision Rules:

For the measurement parameters that need to be assessed for compliance, the measurement uncertainty should be fully considered. In order to avoid mis-judgment on whether the measurement results meet the requirements of the standard, the following decision rules should be used:

For measurements results with only the lower limit of tolerance interval:

- When $\eta_m \geq TI + U$, we directly determine the measurement result as PASS (P).
- When $\eta_m \leq TI - U$, we directly determine the measurement result as FAIL (F).
- When $TI - U \leq \eta_m \leq TI + U$, we determine the measurement result as UNCERTAIN (UC).

For measurements results with only the upper limit of tolerance interval:

- When $\eta_m \leq Tu - U$, we directly determine the measurement result as PASS (P).



- When $\eta m \geq Tu + U$, we directly determine the measurement result as FAIL (F).
 - When $Tu - U \leq \eta m \leq Tu + U$, we determine the measurement result as UNCERTAIN (UC).
- For measurements results with the lower and upper limit of tolerance interval:
- When $Tl + U \leq \eta m \leq Tu - U$, we directly determine the measurement result as PASS (P).
 - When $\eta m \leq Tl - U$ and $\eta m \geq Tu + U$, we directly determine the measurement result as FAIL (F).
 - When $Tl - U \leq \eta m \leq Tl + U$ and $Tu - U \leq \eta m \leq Tu + U$ we determine the measurement result as UNCERTAIN (UC).

Here:

ηm : Measurement value

Tl: Lower limit of tolerance interval

Tu: Upper limit of tolerance interval

U: Expanded uncertainty

For parameters in the standard that do not need to be assessed for conformity, the influence of uncertainty on the conformity assessment of measurement results will not be considered.

9. Sample Set

Data Set 1: 55°C, 350mA

Part Number:	TX-3535WS
Number of Units:	11
Actual Case Temperature(T_S):	$T_S > 53^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A > 50^\circ\text{C}$
Life Test Drive Current:	$I_F = 350\text{mA}$
Measurement Current:	$I_F = 350\text{mA}$

Data Set 2: 85°C, 350mA

Part Number:	TX-3535WS
Number of Units:	11
Actual Case Temperature(T_S):	$T_S > 83^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A > 80^\circ\text{C}$
Life Test Drive Current:	$I_F = 350\text{mA}$
Measurement Current:	$I_F = 350\text{mA}$

Data Set 3: 105°C, 350mA

Part Number:	TX-3535WS
Number of Units:	11
Actual Case Temperature(T_S):	$T_S > 103^\circ\text{C}$
Actual Ambient Temperature(T_A):	$T_A > 100^\circ\text{C}$
Life Test Drive Current:	$I_F = 350\text{mA}$
Measurement Current:	$I_F = 350\text{mA}$



10. Summary of Test Result

Data Set	Sample Size	Failures Observed	Test Interval	Test Duration	α	β	TM-21 Lifetime (hours)		
							L ₇₀	L ₈₀	L ₉₀
1	11	0	1000h	10000h	2.000E-06	1.0084	>55000	>55000	>55000
2	11	0	1000h	10000h	2.000E-06	1.0023	>55000	>55000	53900
3	11	0	1000h	10000h	2.599E-06	0.9965	>55000	>55000	39200

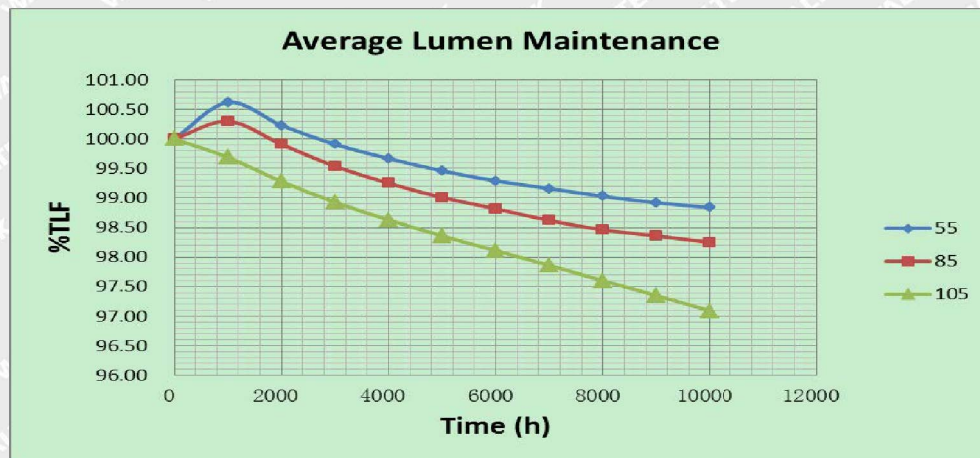
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
1	100.62 %	100.23 %	99.91%	99.67%	99.46%	99.29%	99.16%	99.03%	98.92%	98.84%
2	100.30 %	99.91%	99.54%	99.25%	99.01%	98.82%	98.62%	98.46%	98.36%	98.25%
3	99.69%	99.28%	98.93%	98.63%	98.36%	98.11%	97.86%	97.60%	97.35%	97.09%

Average Chromaticity Shift

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
1	0.0005	0.0009	0.0013	0.0017	0.0020	0.0023	0.0026	0.0028	0.0030	0.0031
2	0.0007	0.0013	0.0018	0.0023	0.0028	0.0032	0.0036	0.0039	0.0041	0.0043
3	0.0010	0.0016	0.0022	0.0027	0.0032	0.0036	0.0040	0.0044	0.0047	0.0050

Average Lumen Maintenance and Color Maintenance VS. Time





Appendix: Data sheet

Data Set 1, 55°C, 350mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
A01	189.31	100.43	100.07	99.71	99.56	99.29	99.12	99.00	98.85	98.73	98.67
A02	206.62	100.66	100.28	99.90	99.72	99.43	99.26	99.11	98.99	98.90	98.84
A03	194.67	100.50	100.06	99.71	99.46	99.22	99.00	98.86	98.71	98.62	98.51
A04	214.26	100.40	99.98	99.61	99.38	99.24	99.12	98.94	98.81	98.72	98.64
A05	210.21	100.86	100.46	100.24	99.96	99.70	99.48	99.36	99.26	99.17	99.09
A06	188.68	100.60	100.16	99.80	99.45	99.28	99.14	99.01	98.86	98.78	98.70
A07	201.04	100.46	100.08	99.78	99.51	99.36	99.25	99.10	98.98	98.88	98.80
A08	212.07	100.74	100.35	100.13	99.91	99.67	99.53	99.40	99.29	99.16	99.09
A09	188.11	100.83	100.40	100.14	99.86	99.62	99.40	99.26	99.10	98.99	98.92
A10	203.76	100.83	100.44	100.05	99.83	99.68	99.48	99.36	99.25	99.14	99.04
A11	196.37	100.52	100.21	99.96	99.78	99.57	99.45	99.34	99.18	99.07	98.99
Ave.	200.46	100.62	100.23	99.91	99.67	99.46	99.29	99.16	99.03	98.92	98.84
Max	214.26	100.86	100.46	100.24	99.96	99.70	99.53	99.40	99.29	99.17	99.09
Min	188.11	100.40	99.98	99.61	99.38	99.22	99.00	98.86	98.71	98.62	98.51
Med	201.04	100.60	100.21	99.90	99.72	99.43	99.26	99.11	98.99	98.90	98.84
Std.dev	9.67	0.17	0.17	0.21	0.21	0.19	0.18	0.19	0.20	0.20	0.20



Data Set 1, 55°C, 350mA (Chromaticity Shift_Δu'v')												
S/N	Initial(0hr)		Δu'v'									
	CIE u'	CIE v'	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
A01	0.2591	0.5187	0.0004	0.0007	0.0010	0.0014	0.0017	0.0019	0.0022	0.0024	0.0026	0.0026
A02	0.2590	0.5211	0.0006	0.0010	0.0015	0.0019	0.0023	0.0025	0.0027	0.0030	0.0032	0.0033
A03	0.2600	0.5214	0.0006	0.0011	0.0014	0.0017	0.0021	0.0024	0.0026	0.0027	0.0028	0.0028
A04	0.2598	0.5221	0.0006	0.0010	0.0015	0.0019	0.0022	0.0026	0.0028	0.0030	0.0032	0.0034
A05	0.2591	0.5206	0.0004	0.0007	0.0011	0.0015	0.0019	0.0022	0.0024	0.0027	0.0029	0.0030
A06	0.2590	0.5161	0.0004	0.0008	0.0011	0.0014	0.0017	0.0021	0.0023	0.0026	0.0028	0.0029
A07	0.2593	0.5205	0.0007	0.0010	0.0014	0.0018	0.0021	0.0024	0.0027	0.0028	0.0029	0.0030
A08	0.2583	0.5207	0.0003	0.0007	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026	0.0027	0.0028
A09	0.2591	0.5184	0.0006	0.0010	0.0014	0.0017	0.0021	0.0024	0.0027	0.0030	0.0032	0.0033
A10	0.2594	0.5199	0.0005	0.0010	0.0015	0.0018	0.0022	0.0026	0.0029	0.0031	0.0032	0.0033
A11	0.2595	0.5200	0.0006	0.0010	0.0015	0.0019	0.0022	0.0025	0.0027	0.0029	0.0031	0.0032
Ave.	0.2592	0.5200	0.0005	0.0009	0.0013	0.0017	0.0020	0.0023	0.0026	0.0028	0.0030	0.0031
Max	0.2600	0.5221	0.0007	0.0011	0.0015	0.0019	0.0023	0.0026	0.0029	0.0031	0.0032	0.0034
Min	0.2583	0.5161	0.0003	0.0007	0.0010	0.0014	0.0017	0.0019	0.0022	0.0024	0.0026	0.0026
Med	0.2591	0.5205	0.0006	0.0010	0.0014	0.0017	0.0021	0.0024	0.0027	0.0028	0.0029	0.0030
Std.dev	0.0005	0.0017	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003



Data Set 1, 85°C, 350mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
B12	202.66	100.00	99.68	99.26	98.91	98.72	98.54	98.29	98.18	98.10	97.99
B13	184.03	100.16	99.75	99.36	98.98	98.75	98.64	98.39	98.19	98.17	98.07
B14	210.87	100.29	99.90	99.52	99.29	99.04	98.83	98.71	98.58	98.48	98.39
B15	202.32	100.49	100.02	99.61	99.33	99.00	98.78	98.56	98.40	98.26	98.18
B16	193.31	100.47	100.08	99.66	99.32	98.99	98.84	98.65	98.44	98.27	98.16
B17	203.15	100.48	100.14	99.84	99.61	99.44	99.17	98.96	98.80	98.72	98.60
B18	198.64	100.30	99.80	99.49	99.22	98.87	98.74	98.60	98.44	98.34	98.22
B19	202.00	100.34	99.95	99.58	99.25	99.07	98.93	98.70	98.49	98.40	98.29
B20	199.13	100.42	99.94	99.59	99.34	99.10	98.88	98.64	98.48	98.31	98.19
B21	194.66	100.15	99.82	99.37	99.15	98.90	98.71	98.53	98.39	98.23	98.11
B22	208.04	100.22	99.90	99.64	99.39	99.23	98.94	98.80	98.66	98.64	98.52
Ave.	199.89	100.30	99.91	99.54	99.25	99.01	98.82	98.62	98.46	98.36	98.25
Max	210.87	100.49	100.14	99.84	99.61	99.44	99.17	98.96	98.80	98.72	98.60
Min	184.03	100.00	99.68	99.26	98.91	98.72	98.54	98.29	98.18	98.10	97.99
Med	202.00	100.30	99.90	99.58	99.29	99.00	98.83	98.64	98.44	98.31	98.19
Std.dev	7.35	0.16	0.14	0.16	0.19	0.21	0.17	0.18	0.18	0.19	0.19



Data Set 1, 85°C, 350mA (Chromaticity Shift_Δu'v')												
S/N	Initial(0hr)		Δu'v'									
	CIE u'	CIE v'	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
B12	0.2587	0.5196	0.0006	0.0010	0.0015	0.0020	0.0026	0.0029	0.0032	0.0036	0.0039	0.0041
B13	0.2593	0.5178	0.0009	0.0014	0.0018	0.0023	0.0027	0.0031	0.0034	0.0037	0.0040	0.0042
B14	0.2592	0.5234	0.0009	0.0014	0.0020	0.0026	0.0030	0.0034	0.0037	0.0040	0.0042	0.0044
B15	0.2602	0.5209	0.0009	0.0014	0.0020	0.0024	0.0030	0.0033	0.0037	0.0041	0.0043	0.0045
B16	0.2596	0.5197	0.0008	0.0014	0.0020	0.0025	0.0031	0.0035	0.0038	0.0041	0.0044	0.0046
B17	0.2597	0.5224	0.0008	0.0014	0.0019	0.0025	0.0031	0.0036	0.0040	0.0043	0.0046	0.0048
B18	0.2595	0.5193	0.0006	0.0011	0.0017	0.0023	0.0027	0.0031	0.0035	0.0037	0.0039	0.0041
B19	0.2574	0.5205	0.0007	0.0013	0.0019	0.0024	0.0030	0.0034	0.0037	0.0040	0.0042	0.0043
B20	0.2588	0.5192	0.0006	0.0012	0.0017	0.0022	0.0027	0.0030	0.0033	0.0036	0.0039	0.0041
B21	0.2601	0.5202	0.0006	0.0012	0.0017	0.0021	0.0026	0.0030	0.0033	0.0035	0.0037	0.0039
B22	0.2582	0.5217	0.0008	0.0013	0.0018	0.0023	0.0027	0.0032	0.0036	0.0040	0.0042	0.0043
Ave.	0.2592	0.5204	0.0007	0.0013	0.0018	0.0023	0.0028	0.0032	0.0036	0.0039	0.0041	0.0043
Max	0.2602	0.5234	0.0009	0.0014	0.0020	0.0026	0.0031	0.0036	0.0040	0.0043	0.0046	0.0048
Min	0.2574	0.5178	0.0006	0.0010	0.0015	0.0020	0.0026	0.0029	0.0032	0.0035	0.0037	0.0039
Med	0.2593	0.5202	0.0008	0.0013	0.0018	0.0023	0.0027	0.0032	0.0036	0.0040	0.0042	0.0043
Std.dev	0.0008	0.0016	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003



Data Set 1, 105°C, 350mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
C23	191.24	99.60	99.30	98.89	98.55	98.34	98.04	97.81	97.54	97.29	97.06
C24	210.83	99.87	99.55	99.20	98.84	98.51	98.21	97.93	97.67	97.40	97.11
C25	201.93	99.54	99.20	98.84	98.53	98.26	98.04	97.83	97.61	97.32	97.05
C26	195.45	99.63	99.17	98.91	98.64	98.33	98.05	97.76	97.48	97.26	97.01
C27	200.37	99.89	99.53	99.27	98.96	98.74	98.47	98.25	98.04	97.82	97.56
C28	190.97	99.81	99.32	98.94	98.72	98.46	98.23	97.98	97.74	97.49	97.20
C29	195.72	99.77	99.36	98.95	98.60	98.33	98.08	97.82	97.52	97.31	97.03
C30	193.43	99.71	99.23	98.79	98.45	98.24	98.02	97.78	97.55	97.26	97.00
C31	186.27	99.60	99.15	98.82	98.49	98.19	97.96	97.67	97.38	97.12	96.84
C32	193.68	99.51	99.07	98.74	98.50	98.19	97.95	97.72	97.45	97.18	96.97
C33	190.88	99.64	99.20	98.88	98.63	98.37	98.14	97.89	97.66	97.43	97.14
Ave.	195.52	99.69	99.28	98.93	98.63	98.36	98.11	97.86	97.60	97.35	97.09
Max	210.83	99.89	99.55	99.27	98.96	98.74	98.47	98.25	98.04	97.82	97.56
Min	186.27	99.51	99.07	98.74	98.45	98.19	97.95	97.67	97.38	97.12	96.84
Med	193.68	99.64	99.23	98.89	98.60	98.33	98.05	97.82	97.55	97.31	97.05
Std.dev	6.73	0.13	0.15	0.16	0.16	0.16	0.15	0.16	0.18	0.19	0.18



Data Set 1, 105°C, 350mA (Chromaticity Shift $\Delta u'v'$)												
S/N	Initial(0hr)		$\Delta u'v'$									
	CIE u'	CIE v'	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
C23	0.2586	0.5190	0.0011	0.0016	0.0022	0.0026	0.0030	0.0034	0.0038	0.0042	0.0044	0.0046
C24	0.2604	0.5208	0.0009	0.0014	0.0020	0.0025	0.0031	0.0036	0.0041	0.0045	0.0049	0.0052
C25	0.2584	0.5209	0.0011	0.0018	0.0023	0.0029	0.0033	0.0037	0.0042	0.0046	0.0049	0.0052
C26	0.2595	0.5190	0.0009	0.0015	0.0021	0.0026	0.0032	0.0037	0.0042	0.0045	0.0048	0.0050
C27	0.2612	0.5197	0.0012	0.0018	0.0023	0.0028	0.0032	0.0037	0.0040	0.0043	0.0047	0.0049
C28	0.2600	0.5199	0.0012	0.0019	0.0024	0.0029	0.0034	0.0038	0.0041	0.0045	0.0048	0.0051
C29	0.2588	0.5189	0.0009	0.0014	0.0020	0.0024	0.0028	0.0032	0.0037	0.0040	0.0043	0.0046
C30	0.2615	0.5190	0.0009	0.0015	0.0021	0.0026	0.0031	0.0035	0.0040	0.0043	0.0046	0.0048
C31	0.2593	0.5176	0.0011	0.0018	0.0023	0.0029	0.0034	0.0039	0.0043	0.0047	0.0050	0.0053
C32	0.2586	0.5201	0.0011	0.0016	0.0022	0.0027	0.0032	0.0037	0.0041	0.0044	0.0047	0.0050
C33	0.2600	0.5210	0.0011	0.0017	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0046	0.0049
Ave.	0.2597	0.5196	0.0010	0.0016	0.0022	0.0027	0.0032	0.0036	0.0040	0.0044	0.0047	0.0050
Max	0.2615	0.5210	0.0012	0.0019	0.0024	0.0029	0.0034	0.0039	0.0043	0.0047	0.0050	0.0053
Min	0.2584	0.5176	0.0009	0.0014	0.0020	0.0024	0.0028	0.0032	0.0037	0.0040	0.0043	0.0046
Med	0.2595	0.5197	0.0011	0.0016	0.0022	0.0027	0.0032	0.0037	0.0041	0.0044	0.0047	0.0050
Std.dev	0.0011	0.0010	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

**Attachment 1: Equipment List**

Equipment	Model/Type	Internal ID	Cal. Due. Date
Temperature & Humidity Datalogger	Testo 608-H1	WTFN1009A1-002	2025-01-04
High accuracy array spectroradio meter system	EVERFINE HAAS-2000	WTFN1014A1-001	2025-01-04
Integrating sphere	EVERFINE Φ 2.0m	WTFN2004B0-002	2025-01-04
Integrating sphere	EVERFINE Φ 0.3m	WTFN2004B0-003	2025-01-04
Standard lamp	EVERFINE D204	WTFN1015A1-002	2025-01-04
AC power source	Ainuo AN60002H	WTFN1005A1-005	2025-01-04
DC power source	EVERFINE WY305	WTFN1006A1-002	2025-01-04
Digital power meter	EVERFINE PF2010A	WTFN1004A1-002	2025-01-04
Digital power meter	YOKOGAWA WT310E	WTFL1003A1-003	2025-01-16
Temperature Recorder	Agilent 34970A	WTFL1005A1-001	2025-01-16
Multimeter	FLUKE 15B+	WTFJ1016A1-005	2025-01-16
Walk-in Environmental Test Lab	BUL-50-26	WTFJ1012A1-002	2025-01-16
Environmental Chamber	KSON THS-D4C-100	WTFJ1012A1-001	2025-01-16
LED accelerated aging and longevity test system	EVERFINE LT-200A	WTFN1020A1-001	2025-01-04

WALTEK



Attachment 2: Photo document

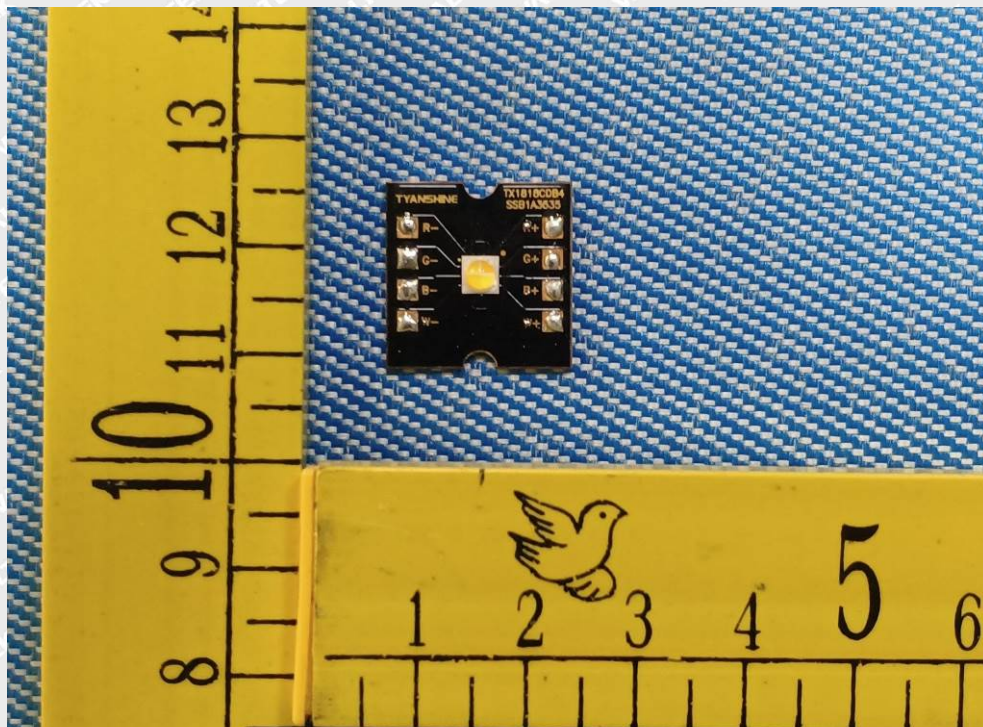


Photo 1

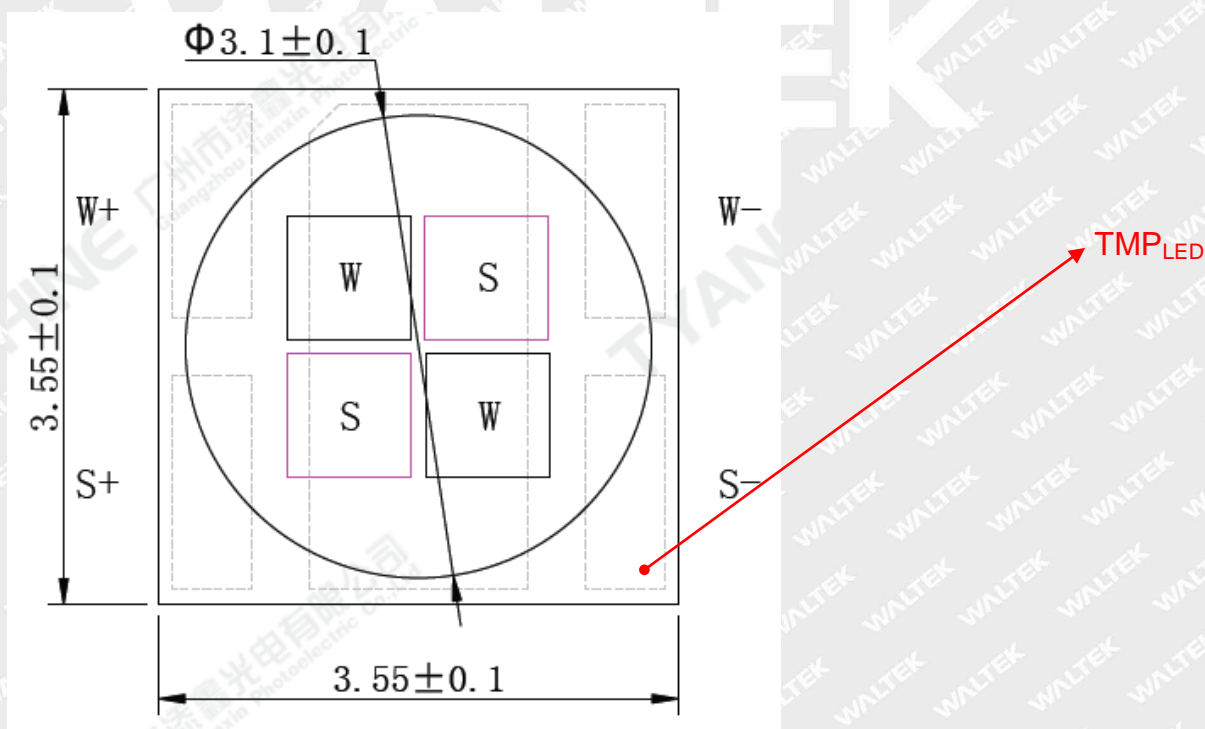


Photo 2 (Mechanical Dimensions: millimeter)

===== End of Report =====