

TEST REPORT

Reference No. : WTX22F09185174N
Applicant..... : Guangzhou Tianxin photoelectric Co., Ltd.
Address..... : #15-1., Jingu Road South, Huadong Town, Huadu District, Guangzhou, China
Manufacturer : The same as above
Address..... : The same as above
Product Name..... : LED Chip
Model No...... : TX-5050RGBW
Test specification..... : ANSI/IES LM-80-15
Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
Date of Receipt sample : 2021-06-07
Date of Test..... : 2021-06-07 to 2022-09-19
Date of Issue..... : 2022-09-19
Test Report Form No. : WPL-LM8015A-01A
Test Result..... : **See following pages**

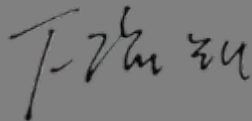
Remarks:

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:

Waltek Testing Group (Foshan) Co., Ltd.

Address: N



TX- 5050RGBW15VRD1 -NG4AA-	1000	12.4	RGBW	4	1000	1051	0.5061	0.1
TX- 5050RGBW10VCD1 -NG4AA-	1000	12.4	RGBW	4	1000	1051	0.5061	0.1
TX- 5050RGBW8VSD1- NG4AA-	1000	12.4	RGBW	4	1000	1051	0.5061	0.1
TX- 5050RGS10VCD1- NG4AA-	1000	12.4	RGBW	4	1000	1051	0.5061	0.1

2. Standards Used

IESNA LM-80-15: IESNA Approved Method for Measuring Lumen Maintenance of LED Light Sources

6. Photometric Measurement Method

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate $u'v'$. 2 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 $m \geq \text{TI} + U$, we directly determine the measurement result as PASS (P).

When $m < \text{TI} - U$, we directly determine the measurement result as FAIL (F).

When $\text{TI} - U < m < \text{TI} + U$, we determine the measurement result as UNCERTAIN (UC).

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

When $m \leq \text{TU} - U$, we directly determine the measurement result as PASS (P).

When $m > \text{TU} + U$, we directly determine the measurement result as FAIL (F).

When $\text{TU} - U < m < \text{TU} + U$, we determine the measurement result as UNCERTAIN (UC).

For measurements results with the lower and upper limit of tolerance interval:

When $\text{TI} + U \leq m \leq \text{TU} - U$, we directly determine the measurement result as PASS (P).

When $m < \text{TI} - U$ and $m > \text{TU} + U$, we directly determine the measurement result as FAIL (F).

When $\text{TI} - U < m < \text{TI} + U$ and $\text{TU} - U < m < \text{TU} + U$ we determine the measurement result as UNCERTAIN (UC).

Here:

m: Measurement value

TI: Lower limit of tolerance interval

Tu: Upper limit of tolerance interval

U: Expanded uncertainty

9. Sample Set

Data Set 1: 55°C, 1000mA	
Part Number:	TX-5050RGBW
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:	$I_F = 1000\text{mA}$
Measurement Current:	$I_F = 1000\text{mA}$
Data Set 2: 85°C, 1000mA	
Part Number:	TX-5050RGBW
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:	$I_F = 1000\text{mA}$
Measurement Current:	$I_F = 1000\text{mA}$
Data Set 3: 105°C, 1000mA	
Part Number:	TX-5050RGBW
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:	$I_F = 1000\text{mA}$
Measurement Current:	$I_F = 1000\text{mA}$

10. Summary of Test Result

Data Set	Sample Size	Failures Observed	Test Interval	Test Duration			TM-21 Lifetime	
							L ₇₀	L ₉₀
1	25	0	1000h	10000h	2.0000E-06	1.0010	>55000h	53000h
2	25	0	1000h	10000h	2.6961E-06	1.0063	>55000h	41000h
3	25	0	1000h	10000h	4.9114E-06	1.0100	>55000h	23000h

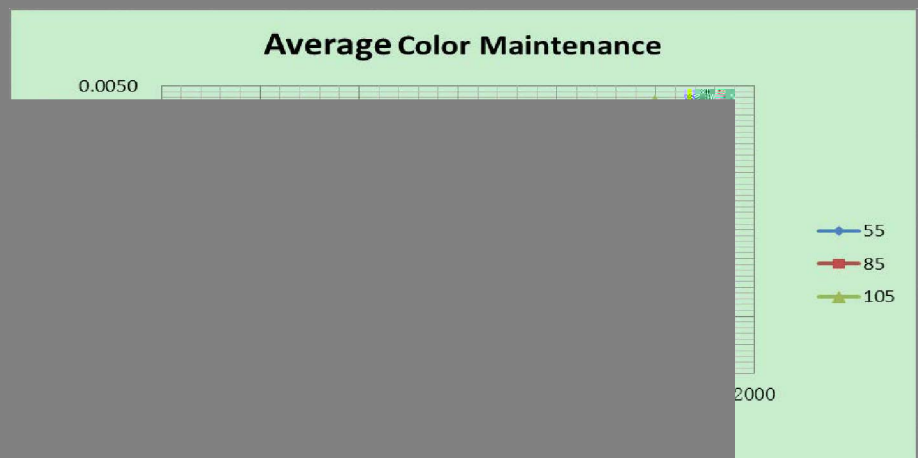
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
1	100.31	100.60	100.31	99.92	99.52	99.24	99.04	98.92	98.86	98.81
2	100.42	100.93	100.54	99.86	99.35	99.01	98.67	98.44	98.20	98.02
3	100.08	100.00	99.67	99.20	98.68	98.08	97.45	96.98	96.62	96.30

Average Chromaticity Shift

Data Set	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
1	0.0005	0.0008	0.0012	0.0015	0.0019	0.0022	0.0025	0.0027	0.0029	0.0032
2	0.0007	0.0011	0.0014	0.0017	0.0022	0.0026	0.0028	0.0032	0.0035	0.0037
3	0.0009	0.0013	0.0017	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0047

Average Lumen Maintenance and Chromaticity Shift VS. Time



Appendix: Data sheet

Data Set 1, 55°C, 1000mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
A01	633.84	100.70	100.70	100.35	100.05	99.65	99.41	99.10	98.91	98.88	98.86
A02	646.50	100.23	100.70	100.39	100.09	99.62	99.26	99.15	99.04	98.92	98.91
A03	658.65	99.99	100.25	99.96	99.62	99.27	99.02	98.97	98.95	98.88	98.82
A04	636.86	99.84	100.10	99.74	99.38	98.87	98.62	98.31	98.31	98.32	98.28
A05	658.84	100.08	100.43	100.27	99.95	99.51	99.22	99.22	99.13	99.04	99.02
A06	644.20	100.21	100.56	100.36	99.90	99.44	99.21	98.86	98.66	98.53	98.49
A07	637.05	100.16	100.21	99.82	99.31	99.04	98.89	98.56	98.37	98.40	98.32
A08	631.76	100.65	101.16	100.92	100.52	100.12	99.87	99.67	99.43	99.44	99.35
A09	645.52	100.66	100.71	100.44	100.04	99.57	99.22	99.02	99.00	99.01	98.93
A10	654.86	100.66	101.14	100.81	100.43	100.13	99.66	99.49	99.48	99.32	99.27
A11	643.83	100.18	100.61	100.30	99.88	99.49	99.28	99.09	98.88	98.73	98.70
Ave.	644.72	100.31	100.60	100.31	99.92	99.52	99.24	99.04	98.92	98.86	98.81
Max	658.84	100.70	101.16	100.92	100.52	100.13	99.87	99.67	99.48	99.44	99.35
Min	631.76	99.84	100.10	99.74	99.31	98.87	98.62	98.31	98.31	98.32	98.28
Med	644.20	100.21	100.61	100.35	99.95	99.51	99.22	99.09	98.95	98.88	98.86
Std.dev	9.09	0.29	0.33	0.35	0.36	0.37	0.32	0.36	0.35	0.34	0.33

Data Set 1, 55°C, 1000mA (Chromaticity Shift_ u'v')												
S/N	Initial(0hr)		1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	CIE u'	CIE v'										
A01	0.2324	0.3854	0.0007	0.0009	0.0011	0.0014	0.0017	0.0020	0.0023	0.0025	0.0027	0.0030
A02	0.2337	0.3853	0.0007	0.0009	0.0012	0.0015	0.0019	0.0022	0.0025	0.0028	0.0030	0.0032
A03	0.2343	0.3855	0.0005	0.0008	0.0012	0.0014	0.0017	0.0019	0.0021	0.0023	0.0025	0.0028
A04	0.2348	0.3851	0.0005	0.0008	0.0012	0.0016	0.0020	0.0023	0.0025	0.0027	0.0029	0.0031
A05	0.2346	0.3853	0.0005	0.0008	0.0010	0.0013	0.0016	0.0019	0.0022	0.0025	0.0027	0.0029
A06	0.2331	0.3855	0.0005	0.0008	0.0011	0.0015	0.0019	0.0023	0.0025	0.0028	0.0031	0.0033
A07	0.2346	0.3854	0.0005	0.0009	0.0013	0.0015	0.0018	0.0021	0.0024	0.0026	0.0028	0.0030
A08	0.2331	0.3855	0.0005	0.0008	0.0012	0.0016	0.0020	0.0023	0.0027	0.0030	0.0032	0.0034
A09	0.2346	0.3852	0.0006	0.0009	0.0013	0.0016	0.0020	0.0024	0.0028	0.0031	0.0034	0.0037
A10	0.2332	0.3853	0.0004	0.0008	0.0012	0.0017	0.0021	0.0023	0.0025	0.0027	0.0030	0.0032
A11	0.2350	0.3853	0.0004	0.0007	0.0010	0.0014	0.0018	0.0021	0.0025	0.0027	0.0030	0.0032
Ave.	0.2339	0.3853	0.0005	0.0008	0.0012	0.0015	0.0019	0.0022	0.0025	0.0027	0.0029	0.0032
Max	0.2350	0.3855	0.0007	0.0009	0.0013	0.0017	0.0021	0.0024	0.0028	0.0031	0.0034	0.0037
Min	0.2324	0.3851	0.0004	0.0007	0.0010	0.0013	0.0016	0.0019	0.0021	0.0023	0.0025	0.0028
Med	0.2343	0.3853	0.0005	0.0008	0.0012	0.0015	0.0019	0.0022	0.0025	0.0027	0.0030	0.0032
Std.dev	0.0008	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002

Data Set 1, 55°C, 1000mA (Forward Voltage)											
S/N	VF(V)										
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
A01	12.11	12.13	12.15	12.15	12.14	12.11	12.08	12.04	12.03	12.02	12.01
A02	12.23	12.26	12.28	12.30	12.29	12.26	12.24	12.22	12.19	12.17	12.16
A03	12.23	12.25	12.28	12.29	12.28	12.27	12.24	12.21	12.19	12.18	12.17
A04	12.09	12.12	12.13	12.14	12.12	12.11	12.08	12.05	12.04	12.03	12.01
A05	12.22	12.25	12.27	12.27	12.25	12.24	12.22	12.18	12.16	12.15	12.14
A06	12.20	12.22	12.24	12.24	12.22	12.19	12.16	12.13	12.11	12.09	12.07
A07	12.23	12.24	12.26	12.26	12.24	12.22	12.20	12.17	12.16	12.14	12.12
A08	12.09	12.12	12.15	12.16	12.15	12.12	12.10	12.07	12.06	12.05	12.04
A09	12.16	12.19	12.22	12.23	12.21	12.20	12.17	12.14	12.12	12.11	12.09
A10	12.23	12.25	12.28	12.29	12.28	12.26	12.23	12.21	12.19	12.17	12.15
A11	12.19	12.21	12.23	12.24	12.22	12.21	12.18	12.14	12.12	12.10	12.08
Ave.	12.18	12.20	12.23	12.23	12.22	12.20	12.17	12.14	12.12	12.11	12.09
Max	12.23	12.26	12.28	12.30	12.29	12.27	12.24	12.22	12.19	12.18	12.17
Min	12.09	12.12	12.13	12.14	12.12	12.11	12.08	12.04	12.03	12.02	12.01
Med	12.20	12.22	12.24	12.24	12.22	12.21	12.18	12.14	12.12	12.11	12.09
Std.dev	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06

Data Set 2, 85°C, 1000mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
B01	657.34	100.27	100.79	100.48	99.86	99.36	98.96	98.60	98.30	98.00	97.93
B02	646.05	100.47	100.83	100.36	99.66	99.25	98.78	98.27	97.92	97.75	97.57
B03	634.55	100.66	101.18	100.70	99.97	99.40	99.22	98.99	98.67	98.34	98.32
B04	641.88	100.51	101.26	100.95	100.13	99.52	98.97	98.63	98.31	98.14	97.95
B05	659.49	100.35	100.66	100.29	99.64	99.10	98.82	98.35	98.23	98.05	97.84
B06	634.40	100.69	101.03	100.81	100.19	99.83	99.54	99.21	98.89	98.73	98.58
B07	633.67	100.16	100.87	100.30	99.67	99.02	98.70	98.53	98.44	98.11	97.89
B08	637.81	100.43	101.03	100.56	99.77	99.18	98.83	98.32	98.15	97.83	97.62
B09	632.35	100.62	101.13	100.81	100.16	99.51	99.23	98.71	98.45	98.26	98.00
B10	653.04	100.43	100.84	100.49	99.88	99.56	99.23	99.09	98.91	98.52	98.28
B11	641.91	100.05	100.60	100.22	99.56	99.10	98.88	98.66	98.57	98.43	98.26
Ave.	642.95	100.42	100.93	100.54	99.86	99.35	99.01	98.67	98.44	98.20	98.02
Max	659.49	100.69	101.26	100.95	100.19	99.83	99.54	99.21	98.91	98.73	98.58
Min	632.35	100.05	100.60	100.22	99.56	99.02	98.70	98.27	97.92	97.75	97.57
Med	641.88	100.43	100.87	100.49	99.86	99.36	98.96	98.63	98.44	98.14	97.95
Std.dev	9.36	0.19	0.20	0.23	0.21	0.23	0.24	0.30	0.29	0.28	0.29

Data Set 1, 85°C, 1000mA (Chromaticity Shift_ u'v')												
S/N	Initial(Ohr)		1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	CIE u'	CIE v'										
B01	0.2330	0.3852	0.0006	0.0009	0.0013	0.0017	0.0020	0.0024	0.0028	0.0032	0.0035	0.0038

B

Data Set 1, 105°C, 1000mA (Lumen Maintenance)											
S/N	TLF(lm)	Lumen Maintenance (%)									
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
C01	647.44	99.87	99.71	99.48	99.09	98.41	97.75	97.01	96.35	96.10	95.75
C02	631.77	100.27	99.99	99.64	99.14	98.57	98.13	97.57	96.94	96.65	96.22
C03	650.81	100.21	100.26	99.90	99.40	99.01	98.58	98.22	97.89	97.35	97.13
C04	633.10	100.19	100.05	99.86	99.38	98.88	98.13	97.30	96.98	96.55	96.20
C05	645.16	99.88	99.82	99.43	98.93	98.45	97.87	97.46	96.85	96.49	96.13
C06	633.05	100.16	100.22	99.93	99.34	98.74	98.30	97.88	97.48	96.93	96.49
C07	635.20	100.25	100.18	99.88	99.28	98.80	97.96	97.26	96.89	96.67	96.49
C08	652.30	99.84	99.82	99.41	99.14	98.47	97.76	97.06	96.46	96.22	95.90
C09	655.64	100.22	100.23	99.83	99.27	98.82	98.02	97.17	96.70	96.41	96.13
C10	644.50	100.01	99.88	99.51	99.02	98.60	98.11	97.31	96.91	96.50	96.31
C11	649.84	100.00	99.88	99.53	99.17	98.73	98.23	97.72	97.36	96.94	96.57
Ave.	643.53	100.08	100.00	99.67	99.20	98.68	98.08	97.45	96.98	96.62	96.30
Max	655.64	100.27	100.26	99.93	99.40	99.01	98.58	98.22	97.89	97.35	97.13
Min	631.77	99.84	99.71	99.41	98.93	98.41	97.75	97.01	96.35	96.10	95.75
Med	645.16	100.16	99.99	99.64	99.17	98.73	98.11	97.31	96.91	96.55	96.22
Std.dev	8.32	0.16	0.19	0.20	0.14	0.19	0.23	0.35	0.43	0.34	0.35

Data Set 1, 105°C, 1000mA (Chromaticity Shift_ u'v')												
S/N	Initial(0hr)		1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
	CIE u'	CIE v'										
C01	0.2339	0.3854	0.0010	0.0014	0.0018	0.0024	0.0029	0.0033	0.0038	0.0042	0.0045	0.0050
C02	0.2326	0.3855	0.0010	0.0014	0.0019	0.0024	0.0029	0.0032	0.0036	0.0039	0.0042	0.0047
C03	0.2345	0.3854	0.0009	0.0014	0.0018	0.0024	0.0027	0.0031	0.0034	0.0039	0.0042	0.0046
C04	0.2343	0.3855	0.0007	0.0011	0.0015	0.0019	0.0025	0.0028	0.0031	0.0036	0.0040	0.0044
C05	0.2328	0.3855	0.0006	0.0011	0.0015	0.0022	0.0026	0.0030	0.0034	0.0037	0.0040	0.0045
C06	0.2332	0.3855	0.0010	0.0015	0.0020	0.0023	0.0028	0.0031	0.0036	0.0040	0.0043	0.0047
C07	0.2333	0.3852	0.0007	0.0010	0.0016	0.0020	0.0025	0.0030	0.0034	0.0038	0.0042	0.0048
C08	0.2326	0.3851	0.0007	0.0013	0.0017	0.0023	0.0028	0.0032	0.0036	0.0040	0.0043	0.0048
C09	0.2341	0.3856	0.0009	0.0013	0.0016	0.0023	0.0027	0.0032	0.0035	0.0040	0.0044	0.0049
C10	0.2328	0.3851	0.0011	0.0015	0.0021	0.0028	0.0033	0.0037	0.0041	0.0045	0.0048	0.0053
C11	0.2339	0.3853	0.0008	0.0012	0.0016	0.0019	0.0024	0.0028	0.0031	0.0035	0.0039	0.0044
Ave.	0.2335	0.3854	0.0009	0.0013	0.0017	0.0023	0.0027	0.0031	0.0035	0.0039	0.0043	0.0047
Max	0.2345	0.3856	0.0011	0.0015	0.0021	0.0028	0.0033	0.0037	0.0041	0.0045	0.0048	0.0053
Min	0.2326	0.3851	0.0006	0.0010	0.0015	0.0019	0.0024	0.0028	0.0031	0.0035	0.0039	0.0044
Med	0.2333	0.3854	0.0009	0.0013	0.0017	0.0023	0.0027	0.0031	0.0035	0.0039	0.0042	0.0047
Std.dev	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0003

Data Set 1, 105°C, 1000mA (Forward Voltage)											
S/N	VF(V)										
	Initial(0hr)	1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h	10000h
C01	12.13	12.15	12.15	12.13	12.11	12.08	12.06	12.03	11.99	11.96	11.89
C02	12.25	12.26	12.27	12.25	12.23	12.22	12.19	12.16	12.12	12.07	12.01
C03	12.15	12.19	12.20	12.17	12.15	12.14	12.12	12.07	12.04	12.00	11.95
C04	12.11	12.15	12.16	12.13	12.11	12.08	12.04	11.99	11.96	11.92	11.87
C05	12.13	12.15	12.16	12.13	12.11	12.09	12.06	12.03	11.98	11.94	11.91
C06	12.23	12.26	12.26	12.24	12.22	12.21	12.16	12.12	12.08	12.02	11.97
C07	12.21	12.22	12.24	12.21	12.20	12.18	12.14	12.11	12.08	12.02	11.96
C08	12.16	12.18	12.18	12.15	12.14	12.13	12.11	12.07	12.04	12.00	11.97
C09	12.23	12.25	12.25	12.23	12.21	12.20	12.17	12.14	12.10	12.07	12.04
C10	12.24	12.26	12.27	12.25	12.23	12.22	12.20	12.16	12.11	12.06	12.00
C11	12.11	12.14	12.16	12.14	12.12	12.11	12.08	12.04	11.99	11.96	11.93
Ave.	12.18	12.20	12.21	12.18	12.17	12.15	12.12	12.08	12.04	12.00	11.95
Max	12.25	12.26	12.27	12.25	12.23	12.22	12.20	12.16	12.12	12.07	12.04
Min	12.11	12.14	12.15	12.13	12.11	12.08	12.04	11.99	11.96	11.92	11.87
Med	12.16	12.19	12.20	12.17	12.15	12.14	12.12	12.07	12.04	12.00	11.96
Std.dev	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05

Attachment 1: Equipment List

Equipment	Model/Type	Cal. Due. Date
DC power supply	EVERFINE WY305-V1	2023-01-11
Digital Power Meter	EVERFINE PF2010A-V1	2023-01-11
High accuracy array spectroradio meter	EVERFINE HAAS-2000	2023-01-11
Integrating Sphere	EVERFINE R98&R80&0.3m	2023-01-11
Standard light source	EVERFINE D204	2023-01-11
Standard light source	EVERFINE D062	2023-01-11
Temperature & Humidity Datalogger	Testo 608-H1	2023-01-11
AC power supply	EVERFINE DPS 1060	2023-01-11
DC power supply	EVERFINE WY12010	2023-01-11
Digital Power Meter	EVERFINE PF2010A-V1-CAN	2023-01-11
Digital power meter	YOKOGAWA WT310E	2023-01-11
LED accelerated aging and longevity test system	EVERFINE LT-200A	2023-01-11
Walk-in Environmental Test Lab	Dongzhixu BUL-50-26	2023-01-11
Environmental Chamber	KSON THS-D4C-100	2023-01-11
Multimeter	FLUKE 15B	2023-01-11
Temperature Recorder	YOKOGAWA DR231-00-33-1R	2023-01-11

Attachment 2: Photo document



Photo 1



Photo 2

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