



Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-10-2014
- ☒ UL1598-2008

Prepared For

Beyond LED Technology

1939 Parker Court, Stone Mountain, GA 30087

Test Laboratory: UL Verification Services (Guangzhou) Co., Ltd.

Test Laboratory Address: 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China

Catalog Number

ZPS-MX114-70W-V1-T1-E6-D1-D-G2

Project Number

4790039594

Report Number

4790039594-2a

Test Date

1/19/2022

Issue Date

3/7/2022

Revision Date

N/A

Prepared By

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Approved By

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The results contained in this report pertain only to the tested sample.

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The laboratory is not responsible for the information which provided by customer, its authenticity can affect the validity of the result in the test report.



1.0 Test List

Sample Received Date: 2021-12-17

Test No.	Test Item	Sample ID	Model Number	Test Conducted By
1	Integrating Sphere Test	4508371	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Lily Chen
2	Goniophotometer Test	4508371	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Lily Chen
3	Goniophotometer Test	4508370	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Lily Chen
4	THD and PF Test	4508371	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Lily Chen
5	In-Situ Temperature Measurement Test	4508371	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Lily Chen

Remark (if any)

[X] 1. UL test equipment information is recorded on Meter Use in UL's Aurora database.
[X] 2. At the temperature measurement point of LED is referred to the LM-80 test report, which is provided by the customer.
[X] 3. At the temperature measurement point for the hottest location on the driver case is provided by the driver manufacturer or the customer.



2.0 Product Description

Luminaire Description: Fuel Pump Canopy Luminaires

Model Number: ZPS-MX114-70W-V1-T1-E6-D1-D-G2

Electrical Ratings and CCT: 120-277 Vac, 50/60 Hz, 70 W, 3000K/4000K/5000K

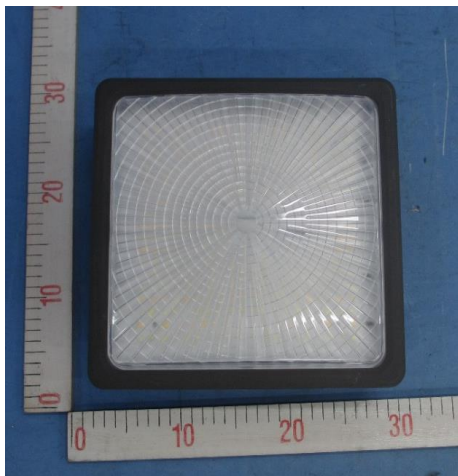
Driver Model Number: GY-70W-120V-0570-UNV-10-H-ADJ2

LED Package: BXVN-xxC-21L-3GV

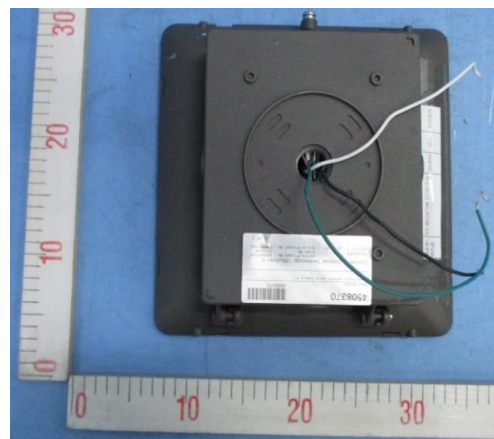
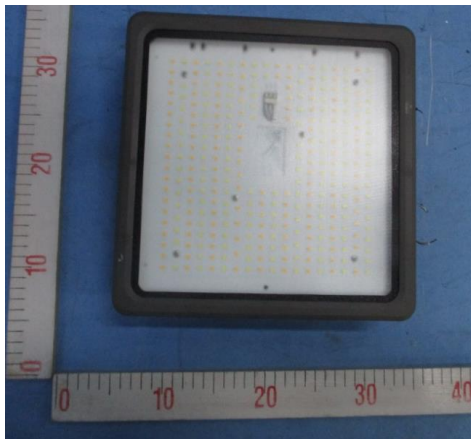
Family Model and Variation: ZPS-MX114-70W.V1-T1-E6-D1-[D;B;W;G]-[G1;G2] ([D;B;W;G] represents lamp color different: D=dark bronze; B=black; W=white; G=gray); [G1;G2] represents lens type, where G1 represents PC, G2 represents frosted glass.)

Photos of Luminaire Characteristics

ZPS-MX114-70W-V1-T1-E6-D1-D-G2



ZPS-MX114-70W-V1-T1-E6-D1-D-G2





3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test for 3000K

Model No.	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Sample ID.	4508371
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.

2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.

3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 5 nm intervals over the range of 380 to 780 nm.

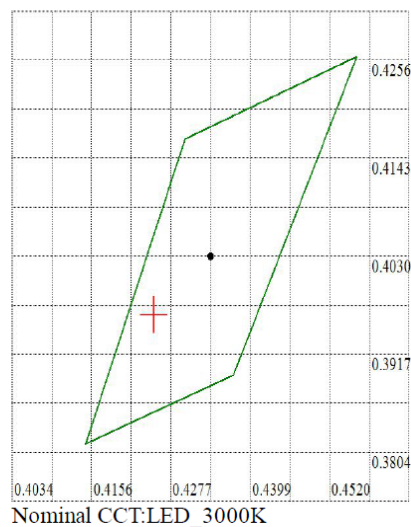
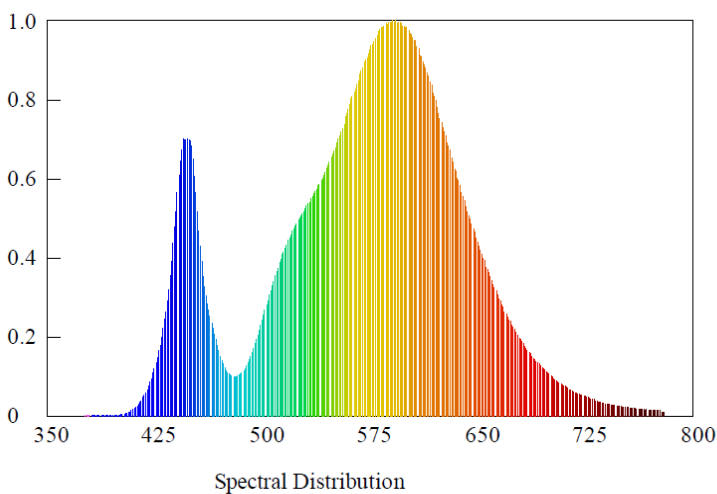
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.02	60	0.56	66.98	0.9920	Horizontal

Test Results

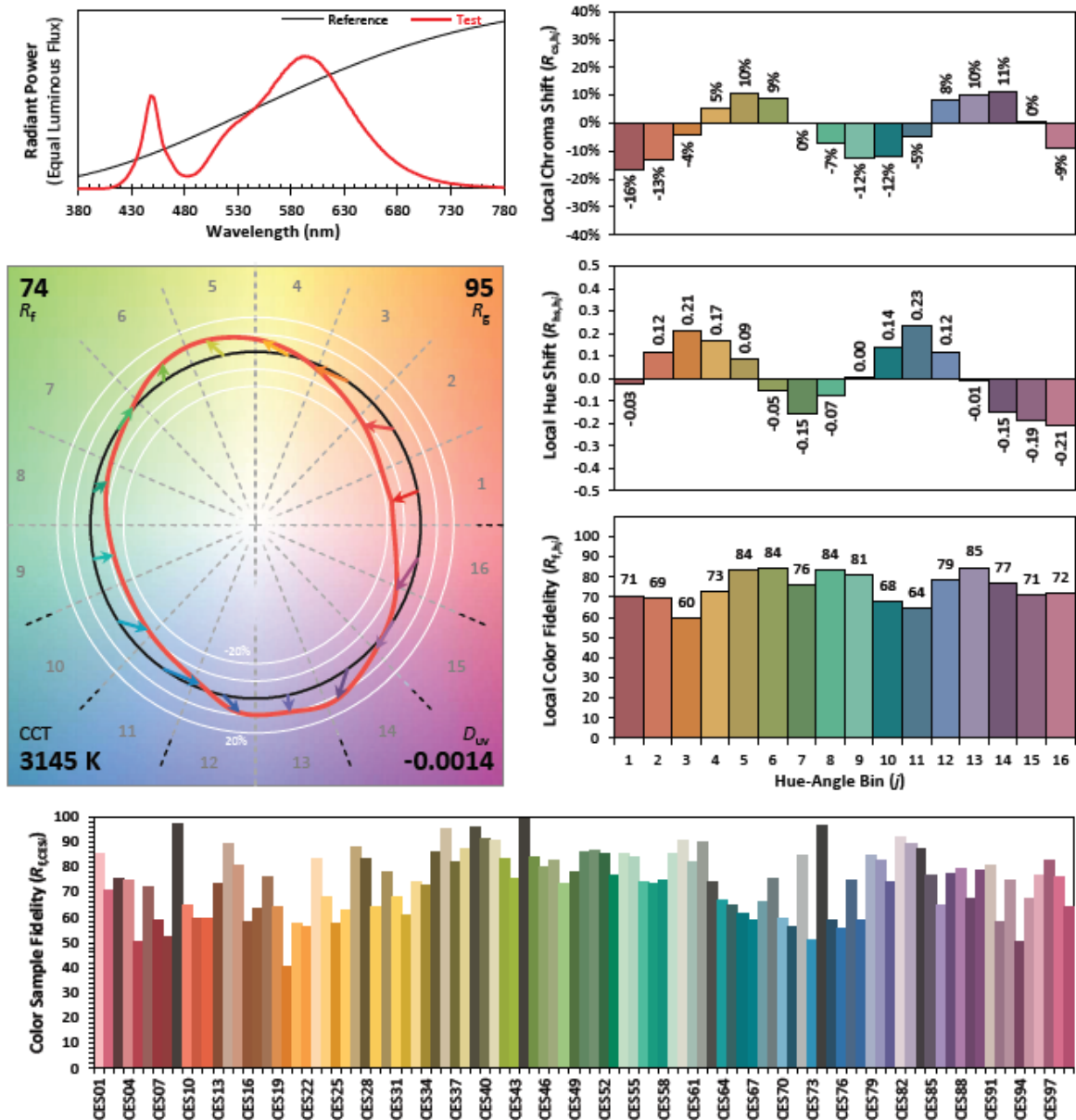
CCT (K)	CRI (Ra)	R9	Rf	Rg	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3145	72	-33	74	95	9684.62	144.59

Spectroradiometric Parameters





ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4251
 y 0.3963
 u' 0.2463
 v' 0.5165

CIE 13.3-1995
(CRI)
 R_a 72
 R_g -33

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test for 4000K

Model No.	ZPS-MX114-70W-V1-T1-E6-D1-D-G2	Sample ID.	4508371
Operate time (Min.)		Stabilization time (Min.)	

Test Method

1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.

2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China..

3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 5 nm intervals over the range of 380 to 780 nm.

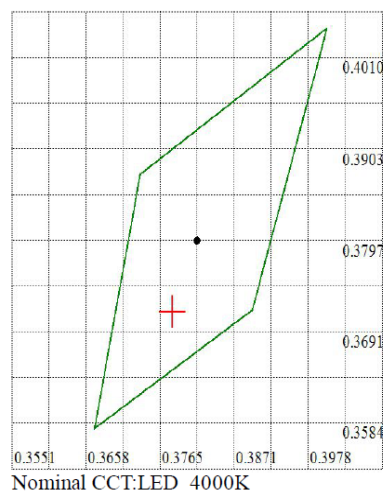
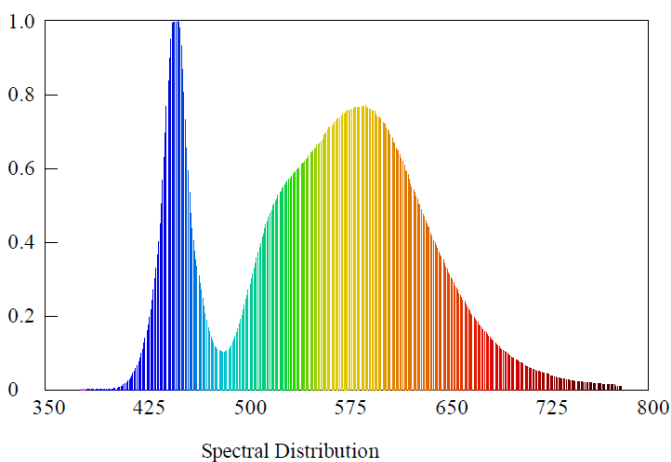
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.03	60	0.54	64.73	0.9910	Horizontal

Test Results

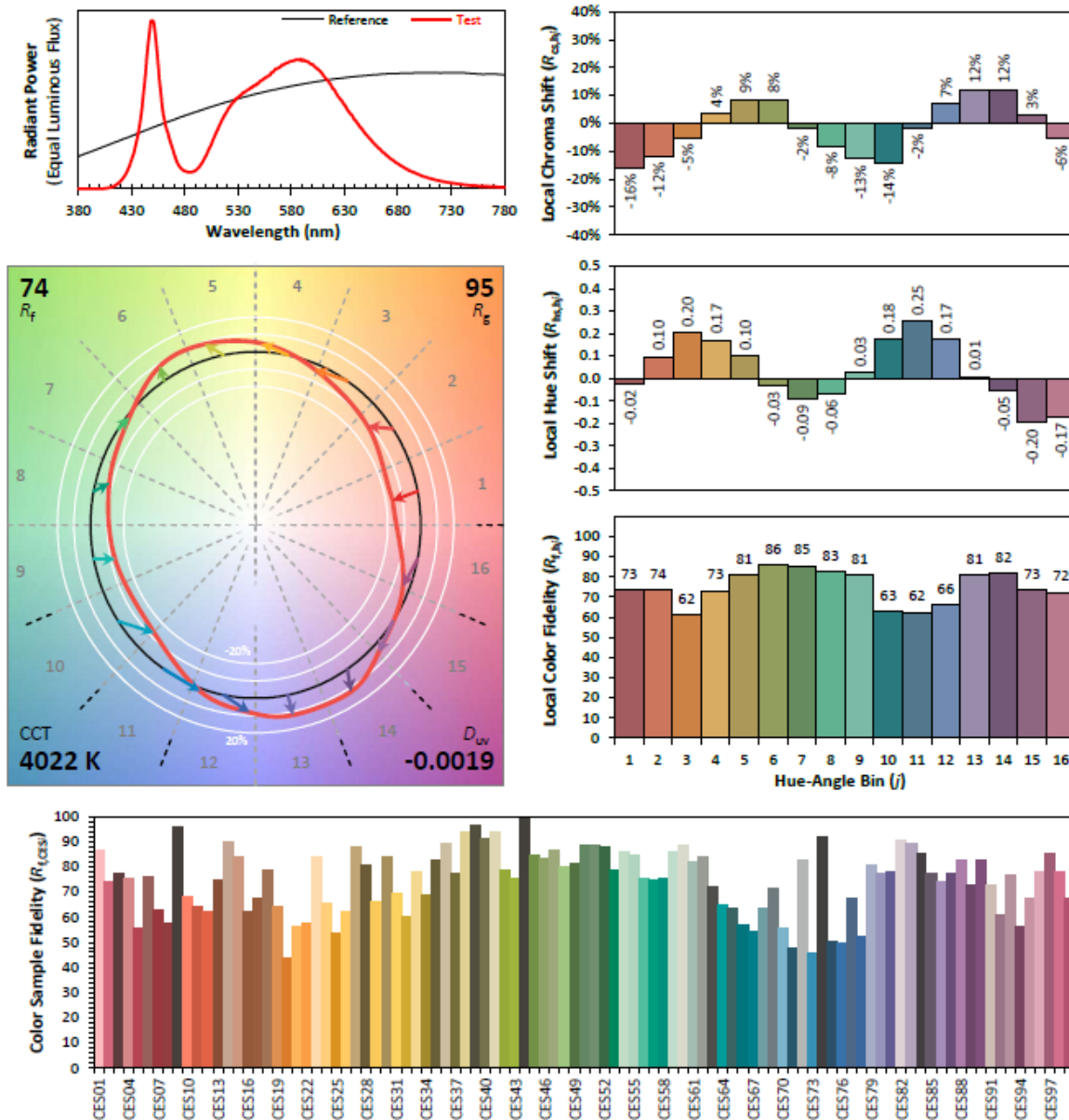
CCT (K)	CRI (Ra)	R9	Rf	Rg	Luminous Flux (lm)	Luminous Efficacy (lm/W)
4022	74	21	74	95	9514.87	146.99

Spectroradiometric Parameters





ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3782
 y 0.3713
 u' 0.2258
 v' 0.4988

CIE 13.3-1995
(CRI)
 R_a 74
 R_g -21

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test for 5000K

Model No.	ZPS-MX114-70W.V1-T1-E6-D1-D-G1	Sample ID.	4508371
Operate time (Min.)		Stabilization time (Min.)	

Test Method

1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.

2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China..

3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 5 nm intervals over the range of 380 to 780 nm.

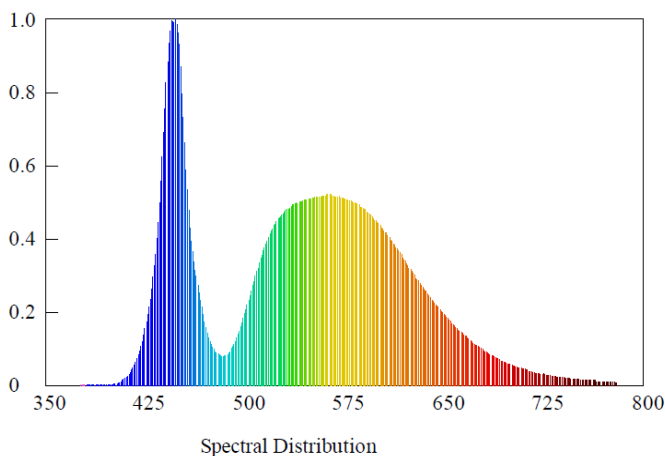
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	120.03	60	0.57	67.54	0.9920	Horizotal

Test Results

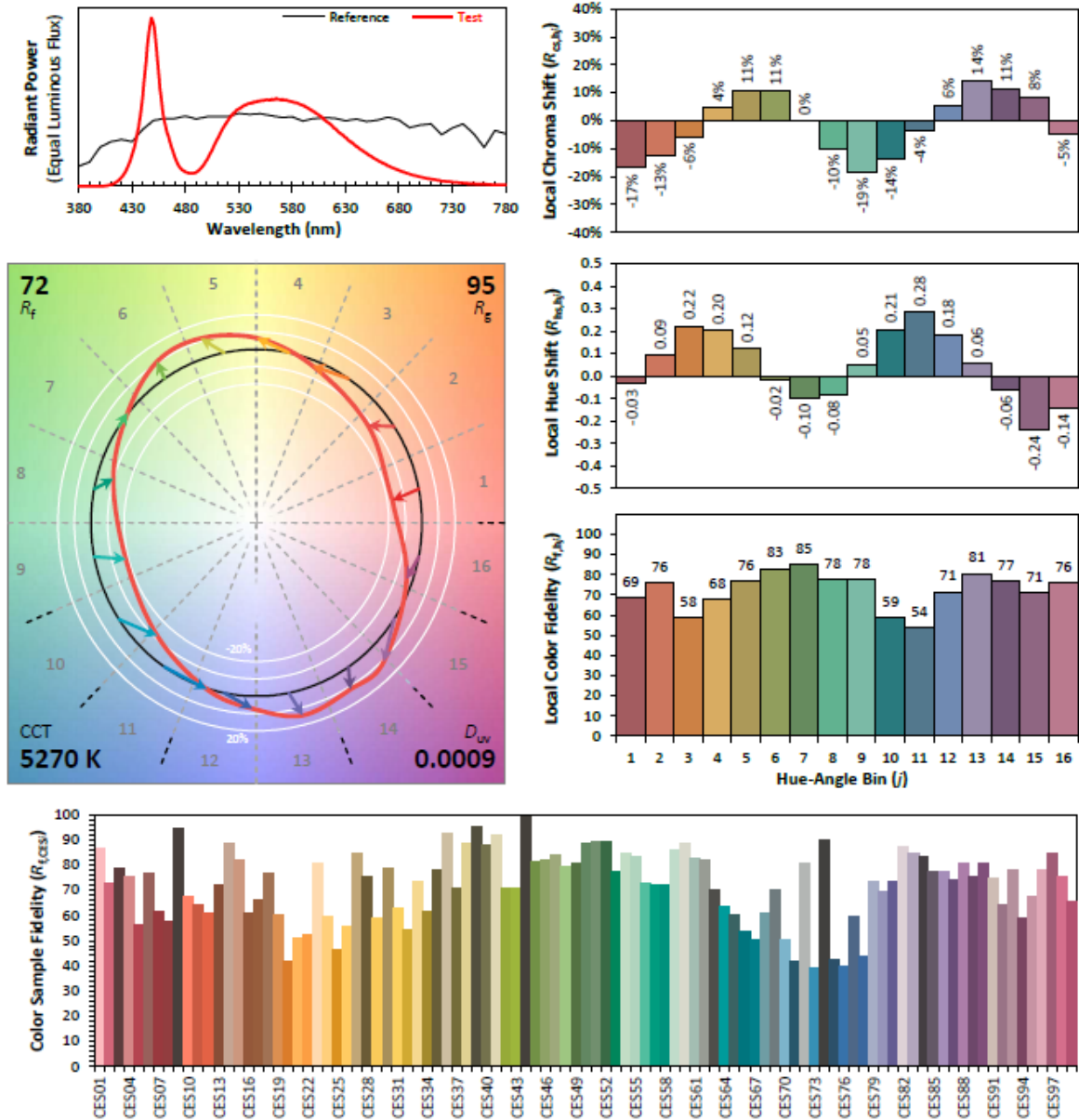
CCT (K)	CRI (Ra)	R9	Rf	Rg	Luminous Flux (lm)	Luminous Efficacy (lm/W)
5270	72	-23	72	95	9944.71	147.24

Spectroradiometric Parameters





ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3380
 y 0.3475
 u' 0.2082
 v' 0.4816

CIE 13.3-1995
(CRI)

R_a 72
 R_g -23

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



3.0 LM-79 Measurement and Test Results

3.2 Goniophotometer Test - 3000K

Model No.	ZPS-MX114-70W.V1-T1-E6-D1-D-G1	Sample ID.	4508371
Operate time (Min.)	60	Stabilization time (Min.)	50

Test Method

- 1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
- 2.Photometric paramters were measured using a type C goniophotometer and software.
- 3.The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is power 1000W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
- 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.5	120.1	60	0.566	67.42	0.9925	Horizontal

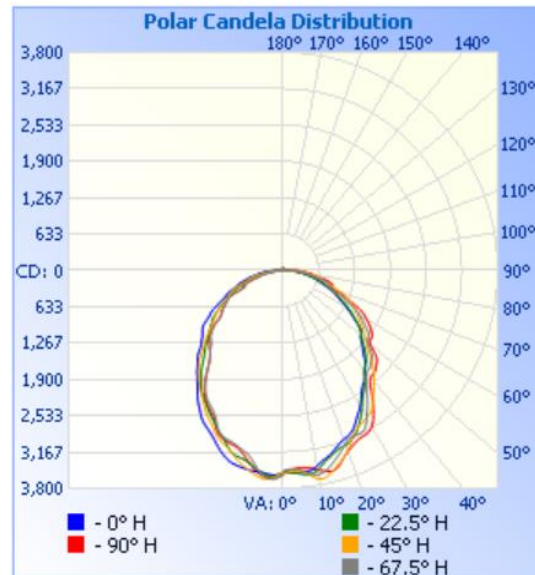
Test Result

Flux (lm)	Zone Light Distribution (ZLD)		Beam Angle (50%)		Luminous Efficacy (lm/W)
	0~40°	40°~70°	Horizontal Spread	Vertical Spread	
9681	44.2%	42.6%	99.5	99.5	143.59
BUG Ratings					
Backlight	Uplight	Glare			
B3	U3	G3			

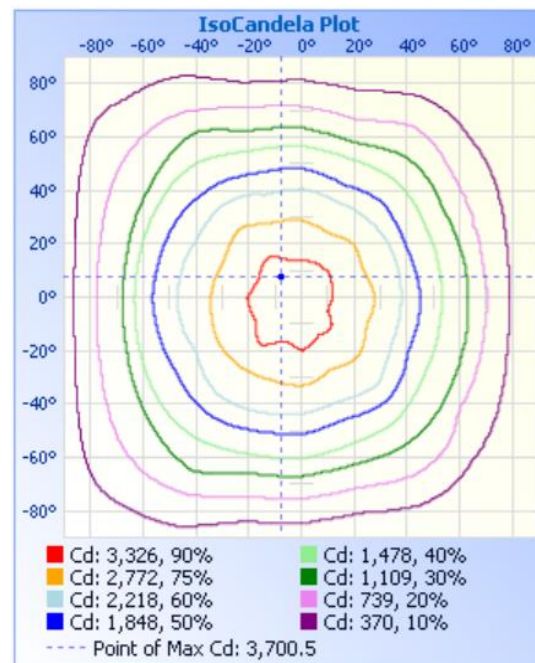


3.2 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





3.2 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	2,677.2	27.7%	27.7%
0-40	4,275.8	44.2%	44.2%
0-60	7,289.2	75.3%	75.3%
60-90	2,117.6	21.9%	21.9%
70-100	1,102.1	11.4%	11.4%
90-120	190.1	2%	2%
0-90	9,406.8	97.2%	97.2%
90-180	273.3	2.8%	2.8%
0-180	9,680.0	100%	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	335.6	3.5%	90-100	96.5	1%
10-20	950.0	9.8%	100-110	58.5	0.6%
20-30	1,391.7	14.4%	110-120	35.0	0.4%
30-40	1,598.6	16.5%	120-130	23.4	0.2%
40-50	1,581.4	16.3%	130-140	20.0	0.2%
50-60	1,431.9	14.8%	140-150	16.7	0.2%
60-70	1,112.0	11.5%	150-160	12.6	0.1%
70-80	705.1	7.3%	160-170	7.8	0.1%
80-90	300.5	3.1%	170-180	2.6	0%



3.2 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533	3533
1	3515	3519	3524	3476	3510	3471	3515	3530	3552	3580	3554	3602	3550	3580	3550	3539	3504
2	3515	3526	3506	3465	3484	3456	3497	3515	3565	3598	3587	3631	3578	3587	3563	3545	3504
3	3521	3534	3500	3465	3467	3447	3480	3495	3569	3600	3618	3646	3602	3572	3572	3543	3510
4	3528	3545	3504	3476	3456	3443	3465	3480	3563	3593	3637	3639	3618	3539	3565	3528	3517
5	3532	3559	3515	3493	3456	3445	3451	3476	3550	3578	3644	3618	3613	3502	3541	3510	3519
6	3532	3572	3539	3519	3460	3449	3447	3480	3539	3554	3642	3578	3596	3471	3506	3489	3519
7	3530	3583	3574	3552	3467	3454	3449	3491	3537	3519	3622	3521	3563	3447	3473	3471	3517
8	3519	3580	3618	3583	3478	3467	3462	3506	3537	3478	3593	3451	3521	3425	3447	3454	3506
9	3495	3563	3661	3604	3502	3489	3491	3526	3534	3445	3563	3377	3467	3406	3423	3438	3480
10	3458	3530	3692	3611	3528	3517	3532	3550	3530	3414	3530	3314	3410	3388	3406	3430	3447
11	3419	3484	3701	3602	3550	3543	3580	3567	3519	3386	3500	3266	3353	3364	3395	3419	3408
12	3386	3438	3685	3578	3572	3567	3622	3559	3510	3364	3467	3235	3301	3334	3384	3401	3373
13	3358	3397	3650	3543	3593	3576	3648	3524	3502	3353	3432	3209	3253	3303	3366	3373	3347
14	3331	3364	3609	3500	3604	3567	3657	3465	3493	3342	3395	3187	3216	3272	3329	3334	3320
15	3301	3334	3565	3454	3591	3537	3644	3403	3480	3329	3353	3161	3187	3240	3275	3288	3290
16	3264	3303	3526	3408	3554	3491	3613	3355	3458	3303	3312	3141	3170	3200	3209	3237	3255
17	3224	3275	3484	3364	3502	3441	3572	3312	3430	3261	3270	3126	3161	3165	3146	3194	3211
18	3187	3255	3441	3316	3445	3393	3526	3272	3393	3209	3237	3113	3150	3130	3084	3154	3174
19	3157	3244	3393	3268	3397	3347	3486	3229	3353	3157	3209	3104	3137	3091	3043	3113	3146
20	3135	3235	3340	3218	3355	3305	3451	3194	3309	3106	3185	3091	3122	3045	3012	3074	3124
25	2988	3087	3065	3148	3224	3139	3259	3185	3093	2903	2977	2833	2879	2779	2849	2840	2975
30	2731	2790	2962	2960	3143	3093	3043	2903	2916	2715	2779	2650	2691	2602	2700	2576	2720
35	2455	2506	2776	2580	2763	2807	2735	2648	2648	2536	2565	2401	2431	2407	2401	2322	2447
40	2254	2235	2503	2309	2420	2440	2580	2401	2375	2254	2329	2022	2020	2084	2081	2143	2248
45	2002	2073	2209	2213	2333	2184	2329	2217	2148	1960	2052	1803	1844	1734	1876	1829	1994
50	1791	1817	1927	1955	2019	2044	2008	1889	1885	1729	1750	1643	1691	1551	1681	1691	1783
55	1601	1608	1717	1820	1922	1800	1775	1731	1745	1536	1500	1327	1344	1323	1442	1434	1591
60	1302	1345	1511	1573	1708	1621	1564	1503	1479	1304	1283	1175	1193	1108	1217	1129	1298
65	1057	1082	1318	1214	1367	1362	1381	1207	1167	1044	1061	955	1009	981	957	913	1053
70	816	880	1061	864	934	991	1175	993	943	836	921	703	744	663	793	685	814
75	615	653	757	803	894	829	913	757	744	625	643	464	501	448	559	490	610
80	425	431	608	527	607	597	645	523	529	406	425	289	322	260	364	334	423
85	244	249	389	339	416	384	453	330	350	212	220	115	132	108	173	138	242
90	102	107	196	160	246	199	250	138	141	93	103	77	81	80	93	77	102
95	82	76	96	78	105	91	116	75	78	77	82	68	81	63	77	72	82
100	74	61	79	73	78	74	81	68	76	58	62	54	68	49	59	58	74
105	63	48	63	62	75	58	64	55	68	45	48	44	56	38	45	48	63
110	51	37	50	54	66	47	51	45	57	35	34	34	45	30	32	37	51
115	41	29	37	43	55	37	37	36	44	27	25	26	36	24	28	30	40
120	33	25	30	33	43	29	27	27	35	22	24	22	29	23	27	25	33
125	29	25	28	27	35	23	25	22	28	21	25	22	26	24	28	25	29
130	29	26	28	24	28	23	25	22	25	22	25	23	27	25	29	26	29
135	30	26	29	25	28	23	25	22	25	22	25	24	27	25	29	27	29
140	30	27	29	26	28	24	26	23	25	23	26	24	28	26	29	28	30
145	30	28	29	26	28	24	26	24	25	24	26	25	28	26	29	28	30
150	30	28	30	27	29	25	26	24	26	24	26	25	28	26	30	28	30
155	31	29	30	27	28	26	26	24	26	24	26	25	28	27	30	28	30
160	31	29	30	28	29	26	26	25	26	24	26	25	28	28	30	29	31
165	31	29	30	28	29	26	27	25	26	24	26	25	28	28	30	29	31
170	31	30	30	29	29	26	27	25	26	25	26	25	28	28	29	29	31
175	31	30	30	29	29	26	27	25	26	25	26	26	28	28	29	29	30
180	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28



3.0 LM-79 Measurement and Test Results

3.3 Goniophotometer Test - 3000K

Model No.	ZPS-MX114-70W.V1-T1-E6-D1-D-G2	Sample ID.	4508370
Operate time (Min.)	60	Stabilization time (Min.)	50

Test Method

- 1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
- 2.Photometric paramters were measured using a type C goniophotometer and software.
- 3.The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is power 1000W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
- 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.5	120	60	0.566	67.41	0.9930	Horizontal

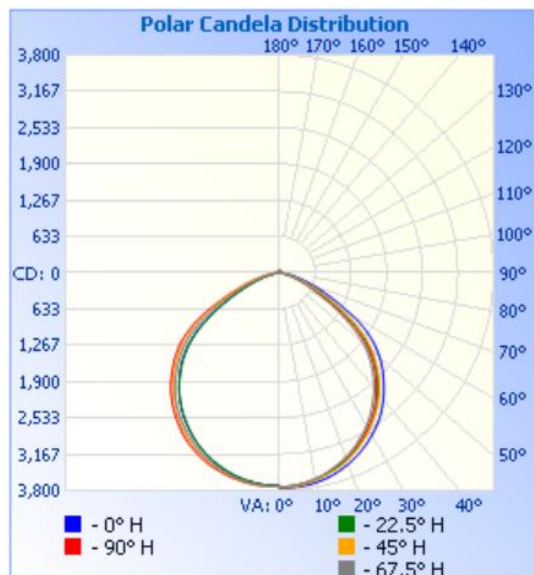
Test Result

Flux (lm)	Zone Light Distribution (ZLD)		Beam Angle (50%)		Luminous Efficacy (lm/W)
	0~40°	40°~70°	Horizontal Spread	Vertical Spread	
9739	49.2%	45.2%	110.5	110.4	144.47
BUG Ratings					
Backlight	Uplight	Glare			
B3	U3	G1			



3.3 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





3.3 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	2,918.2	30%	30%
0-40	4,795.4	49.2%	49.2%
0-60	8,323.3	85.5%	85.5%
60-90	1,266.9	13%	13%
70-100	415.7	4.3%	4.3%
90-120	63.5	0.7%	0.7%
0-90	9,590.2	98.5%	98.5%
90-180	147.2	1.5%	1.5%
0-180	9,737.4	100%	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	353.3	3.6%	90-100	21.6	0.2%
10-20	1,015.6	10.4%	100-110	20.7	0.2%
20-30	1,549.2	15.9%	110-120	21.2	0.2%
30-40	1,877.2	19.3%	120-130	21.6	0.2%
40-50	1,931.7	19.8%	130-140	20.5	0.2%
50-60	1,596.2	16.4%	140-150	17.5	0.2%
60-70	872.7	9.0%	150-160	13.2	0.1%
70-80	320.3	3.3%	160-170	8.1	0.1%
80-90	73.9	0.8%	170-180	2.7	0%



3.3 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733	3733
1	3755	3740	3749	3735	3740	3731	3744	3722	3714	3725	3733	3727	3727	3722	3716	3727	3735
2	3755	3735	3744	3729	3735	3727	3740	3716	3714	3720	3733	3727	3727	3720	3718	3727	3735
3	3753	3731	3742	3725	3729	3720	3733	3711	3711	3714	3733	3727	3727	3720	3718	3725	3733
4	3751	3725	3738	3716	3725	3711	3727	3705	3709	3709	3729	3727	3729	3720	3716	3722	3729
5	3749	3718	3731	3707	3716	3701	3720	3696	3703	3703	3727	3722	3729	3718	3716	3718	3727
6	3744	3707	3722	3698	3707	3690	3711	3687	3698	3696	3722	3716	3727	3714	3714	3714	3722
7	3740	3698	3714	3687	3696	3676	3703	3676	3690	3687	3718	3711	3722	3705	3716	3707	3718
8	3733	3685	3703	3674	3685	3666	3690	3666	3681	3679	3711	3707	3716	3696	3711	3701	3709
9	3725	3674	3687	3661	3674	3650	3676	3652	3672	3670	3703	3701	3711	3690	3707	3690	3703
10	3716	3661	3674	3646	3661	3635	3666	3639	3661	3661	3694	3690	3705	3679	3698	3679	3694
11	3707	3648	3661	3631	3646	3618	3652	3624	3650	3648	3685	3676	3696	3666	3687	3668	3685
12	3694	3631	3646	3613	3631	3600	3639	3607	3635	3635	3676	3666	3685	3652	3679	3655	3672
13	3681	3613	3628	3596	3611	3578	3624	3589	3620	3620	3666	3655	3674	3642	3666	3639	3659
14	3668	3593	3613	3572	3591	3559	3607	3569	3602	3602	3655	3642	3666	3631	3652	3626	3646
15	3650	3576	3596	3548	3569	3539	3589	3550	3587	3585	3639	3624	3655	3620	3639	3609	3631
16	3635	3556	3578	3526	3548	3515	3565	3530	3567	3565	3622	3604	3639	3604	3624	3591	3613
17	3615	3537	3561	3502	3526	3489	3545	3506	3548	3545	3604	3585	3624	3589	3607	3569	3596
18	3596	3515	3539	3476	3502	3462	3526	3480	3528	3526	3587	3565	3611	3574	3589	3550	3576
19	3574	3495	3515	3447	3476	3436	3504	3454	3508	3504	3569	3545	3596	3556	3574	3528	3554
20	3554	3473	3489	3421	3451	3408	3478	3427	3484	3480	3548	3526	3578	3539	3556	3506	3532
25	3427	3331	3347	3264	3303	3240	3331	3279	3353	3349	3436	3406	3473	3419	3454	3386	3408
30	3272	3168	3174	3080	3124	3050	3148	3098	3187	3183	3290	3253	3340	3270	3323	3226	3253
35	3091	2960	2975	2857	2921	2835	2925	2881	2997	2993	3111	3078	3165	3100	3130	3034	3074
40	2864	2715	2750	2606	2665	2576	2685	2634	2772	2766	2903	2870	2967	2897	2923	2818	2849
45	2606	2442	2477	2311	2388	2272	2403	2344	2510	2495	2663	2613	2728	2652	2691	2567	2593
50	2329	2123	2158	1954	2054	1907	2081	1999	2206	2187	2383	2320	2458	2366	2436	2274	2311
55	1975	1707	1749	1465	1593	1401	1639	1532	1822	1790	2050	1971	2153	2027	2120	1911	1961
60	1487	1183	1244	936	1028	896	1136	1032	1308	1300	1591	1498	1728	1570	1689	1431	1479
65	986	743	788	558	632	534	714	637	849	849	1116	1002	1192	1070	1220	966	981
70	616	431	454	311	364	293	403	361	521	503	708	615	755	662	796	586	613
75	351	220	237	152	190	138	204	178	290	273	414	354	457	383	468	324	347
80	174	96	109	66	90	58	93	76	138	126	212	182	257	198	244	156	172
85	78	33	41	14	28	16	31	22	62	52	95	81	127	88	112	65	78
90	24	14	22	15	22	16	23	17	24	17	35	25	56	29	44	16	24
95	21	15	21	16	22	17	22	17	23	17	24	16	23	16	22	15	21
100	21	16	21	16	22	17	23	18	23	18	23	17	22	16	21	15	21
105	21	16	21	17	22	18	23	19	23	18	23	18	22	16	21	16	21
110	21	17	21	18	22	19	23	20	24	20	23	18	22	17	21	17	21
115	22	18	22	19	23	21	24	22	25	21	24	20	23	18	22	18	22
120	23	20	23	21	25	23	26	24	26	23	25	22	23	19	22	19	22
125	24	21	24	23	26	24	28	25	28	25	26	23	25	21	23	21	24
130	25	23	25	24	27	26	29	26	29	26	28	24	26	23	25	22	24
135	26	24	26	25	28	27	30	28	30	28	29	26	27	24	26	23	25
140	26	25	27	26	29	28	30	29	31	28	30	27	28	25	26	24	26
145	27	25	28	26	29	28	30	29	31	29	30	28	29	26	27	25	27
150	28	26	28	27	29	28	31	30	31	29	30	28	29	26	28	25	27
155	28	26	28	27	29	29	31	29	31	30	31	29	29	27	28	26	27
160	28	26	28	27	29	29	31	30	31	30	31	29	30	27	28	26	28
165	28	26	28	27	29	29	31	30	31	30	31	29	30	28	28	26	28
170	28	26	28	27	29	29	31	30	31	30	31	29	30	28	28	26	28
175	27	26	28	27	29	29	30	30	31	30	31	29	29	28	28	26	27
180	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28



4.0 THD and PF Test

Model No.	ZPS-MX114-70W.V1-T1-E6-D1-D-G1	Sample ID.	4508371
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Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

CCT Range	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
0%-3000K	120	60	0.566	67.42	0.9925	10.17%
	277	60	0.261	66.59	0.918	15.61%
50%-4000K	120	60	0.551	65.43	0.9832	10.31%
	277	60	0.254	64.32	0.9134	15.81%
100%-5000K	120	60	0.564	66.58	0.9837	10.13%
	277	60	0.260	66.13	0.9177	15.59%



5.0 In-Situ Temperature Measurement Test

Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL1598-2008.
2. The testing was conducted in a room with ambient temperature of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. Thermocouples were placed on the LED driver case in the locations specified by the manufacture if necessary. The temperature was recorded after the lamp was operated by 3.5 hours in stability or by 7.5 hours.

In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.7	120.10	60	0.5656	67.42	0.9925	Horizontal

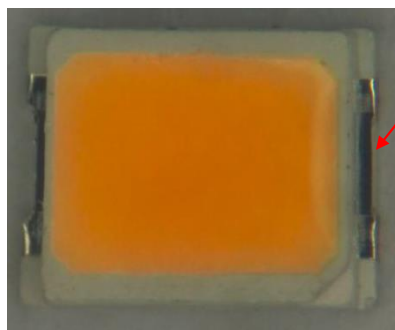
Test Results(LED)

Thermocouple Location	Manufacturer Declared Current (mA)	Temperature for Lighting source (°C)		LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp. (°C)
		Test result column 1	Test result (Correct to 25 °C)			
TMP of LEDs	60	60	59.3	BXVN-xxC-21L-3GV	60	105
Ambient temperature		25.7	25.0			

Test Results(Driver)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp. (°C)
	Test result column 1	Test result (Correct to 25 °C)		
Tc of Driver	62.1	61.4	GY-70W-120V-0570-UNV-10-H-ADJ2	85
Ambient temperature	25.7	25.0		

TMP point in LM-80 report

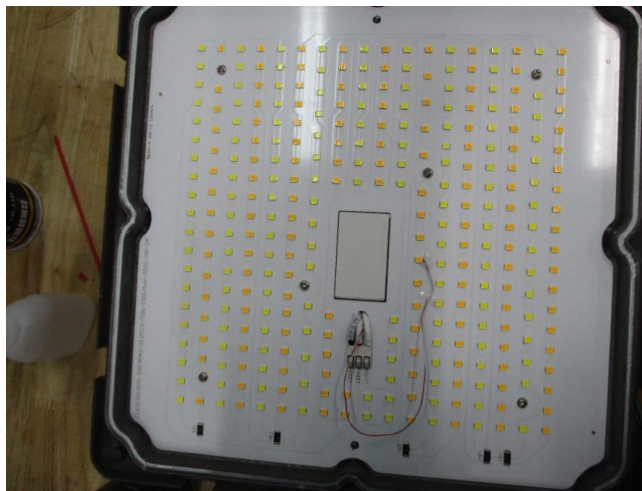
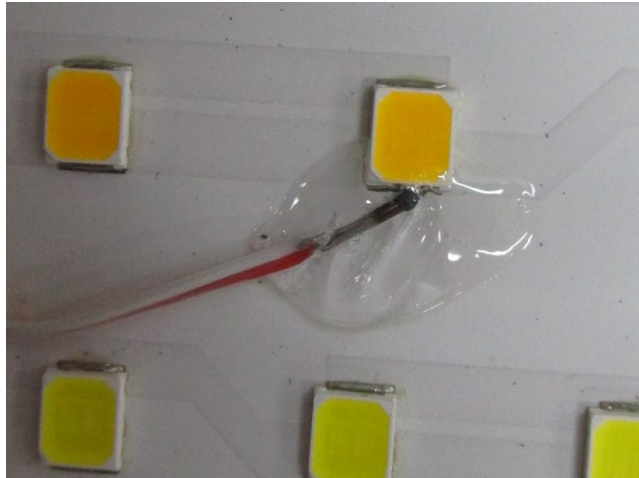


Ts Location on cathode



5.0 In-Situ Temperature Measurement Test (Cont'd)

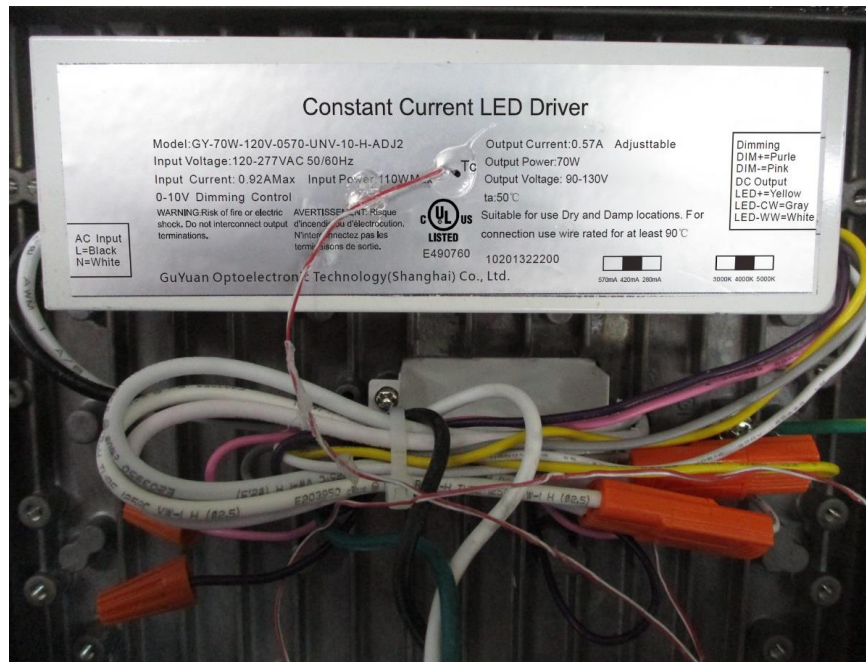
Test Photos for TMP of LED Packages





5.0 In-Situ Temperature Measurement Test (Cont'd)

Test Photos for Tc Point of Driver





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