



## DesignLights Consortium Test Report

### Reference Standards

UL1598-2008

ANSI C82.77-10-2014

IES LM-79-2008

### Prepared For

**P.Q.L., Inc.**

2285 Ward Avenue

Simi Valley, CA 93065

Test Laboratory:

**UL-CCIC Company Limited**

Test Laboratory Address:

No.2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China

### Catalog Number

55753

### Project Number

4790746003

### Report Number

4790746003\_3

### Test Date

2023-03-09~2023-03-13

### Issue Date

2023-03-15

### Revision Date

N/A

### Prepared By

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Zhao, Elaine

### Approved By

*Maxine Zhou*

Zhou, Maxine

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

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## Test Summary

### DLC Technical Requirements V5.1- issued 2020-02-14

Requirement Category	Test Method	Requirements	Tolerance	Test Result
Minimum Light Output (lm)-Luminaires	IES LM-79-2008	≥3000	-10%	4093.32
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥125	-3%	128.77
Spacing Criteria (0-180°)	IES LM-79-2008	1.0-2.0	±0.1	1.28
Spacing Criteria (90-270°)	IES LM-79-2008	1.0-2.0	±0.1	1.28
Zonal Lumen Requirement 1(0°-60°)	IES LM-79-2008	≥75%	-3%	77.70%
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3451
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	4029
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	4956
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3446
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3442
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-1	82
Minimum R9	IES LM-79-2008	≥0	-1	5.0
Minimum Rg	IES LM-79-2008	≥89	-1	97
Minimum Rf	IES LM-79-2008	≥70	-1	83
Rcs,h1	IES LM-79-2008	-12%-23%	-1%	-12%
Unified Glare Rating (UGR)	IES LM-79-2008	≤22	N/A	20.9
L70 Lumen maintenance (Hours)	N/A	≥50000	N/A	≥50000
L90 Lumen maintenance (Hours)	N/A	≥36000	N/A	≥36000
Power Factor	ANSI C82.77-10-2014	≥0.9	-0.03	0.8946
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	19.70%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	33.1
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	52.3
Max Chromaticity Shift (1000-6000h)	N/A	≤0.004	0.0004	0.0016
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5

**Test List**

Sample Received Date: 2023-03-01

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2023-03-10	55753-50W-35K	Li, Coulson
Integrating Sphere Test	2023-03-10	55753-50W-40K	Li, Coulson
Integrating Sphere Test	2023-03-10	55753-50W-50K	Li, Coulson
Integrating Sphere Test	2023-03-10	55753-40W-35K	Li, Coulson
Integrating Sphere Test	2023-03-10	55753-30W-35K	Li, Coulson
Goniophotometer Test	2023-03-13	55753-50W-35K	Li, Coulson
Goniophotometer Test	2023-03-13	55753-50W-50K	Li, Coulson
THD and PF Test	2023-03-09	55753-50W-35K	Li, Coulson
THD and PF Test	2023-03-09	55753-50W-40K	Li, Coulson
THD and PF Test	2023-03-09	55753-50W-50K	Li, Coulson
THD and PF Test	2023-03-09	55753-40W-35K	Li, Coulson
THD and PF Test	2023-03-09	55753-30W-35K	Li, Coulson
In-Situ Temperature Measurement Test	2023-03-10	55753-50W-35K	Li, Coulson

**Remark (if any)**

1. UL test equipment information is recorded on Meter Use in UL’s Aurora database.
2. The accuracy method decision rule is applied when the compliance or verdict is made to the results of this report.

**Product Description**

**Lamp/Luminaire Description:** 2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces

**Model Number:** 55753

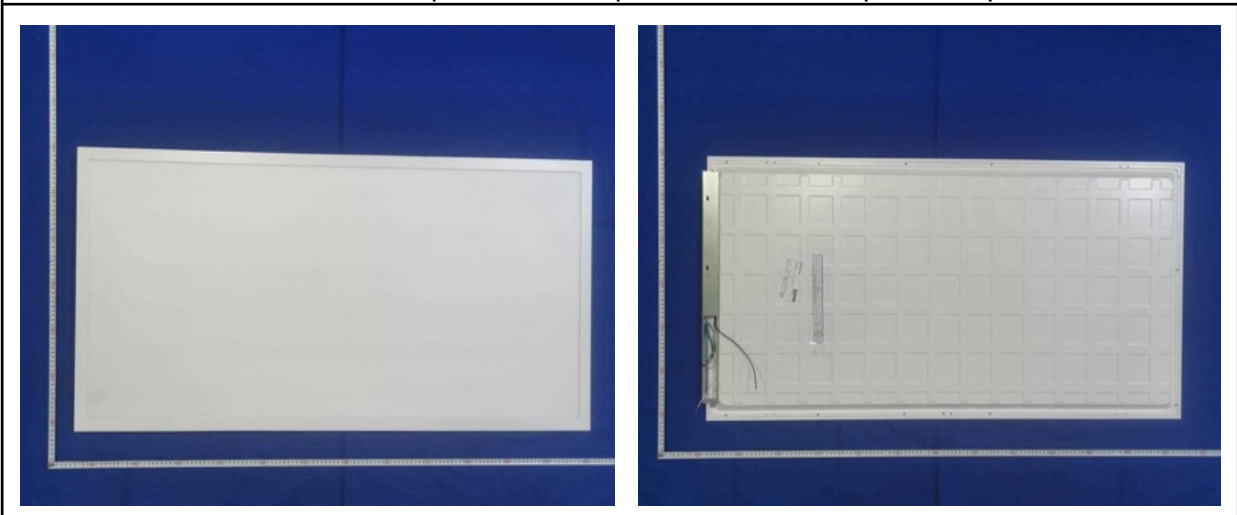
**Electrical Parameter:** 120-277V, 50/60Hz

**LED Package:** BXEN-(A)E-12H-6RB

**Dimming Information:** Continuous dimming capability

**Products Scaled Value**

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
55753-50W-35K	3500K	6300	50	126
55753-50W-40K	4000K	6800	50	136
55753-50W-50K	5000K	6400	50	128
55753-40W-35K	3500K	5200	40	130
55753-40W-40K	4000K	5600	40	140
55753-40W-50K	5000K	5280	40	132
55753-30W-35K	3500K	4050	30	132
55753-30W-40K	4000K	4030	30	135
55753-50W-50K	5000K	4110	30	145



### Integrating Sphere Test

<b>Model No.</b>	55753-50W-35K		<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

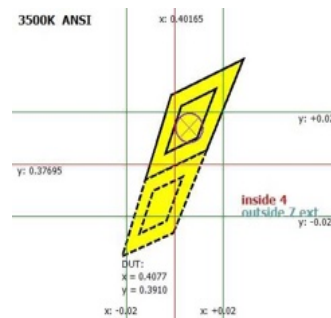
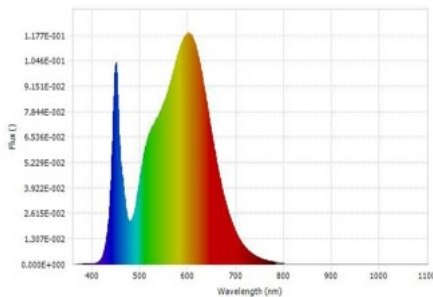
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.  
 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.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 1 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
24.7	120.05	60	0.4106	48.993	0.9938	Horizontal

#### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3451	83	8.0	-0.0004	6349.2	129.59	N/A



Luminous Flux (lm)	6349.2	Chrom x	0.4077
Chrom y	0.3910	Chrom u	0.2371
Chrom v	0.3412	Duv	-0.0004
Chrom u'	0.2371	Chrom v'	0.5117
CCT (K)	3451	Luminous Efficacy (lm/W)	129.59
Ra	83	R1	81.0
R2	89.0	R3	95.0
R4	82.0	R5	81.0
R6	85.0	R7	85.0
R8	62.0	R9	8.0
R10	74.0	R11	82.0
R12	66.0	R13	83.0
R14	97.0	R15	74.0
Rf	84	Rg	97
Rcs,h1	-12%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report

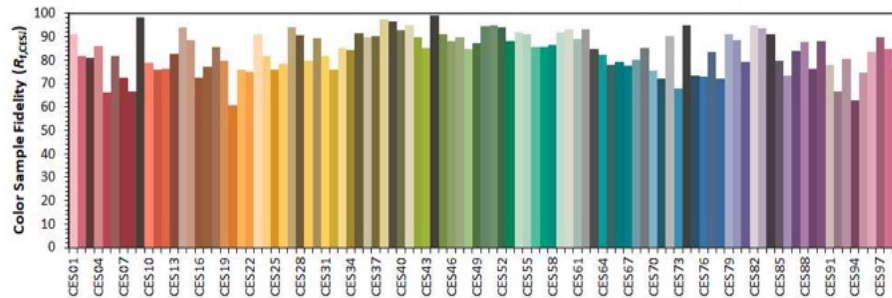
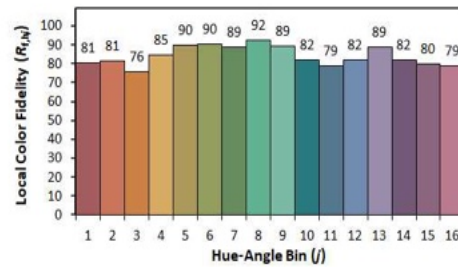
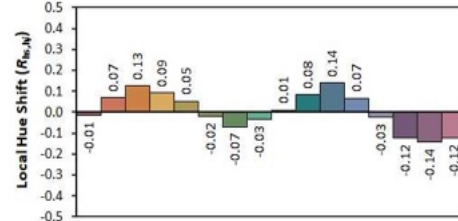
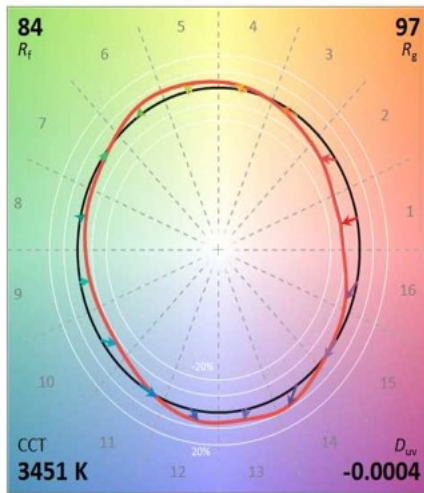
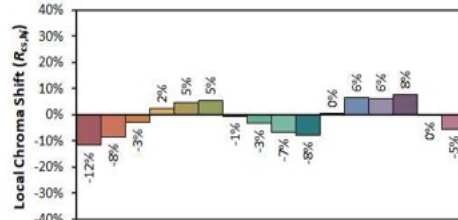
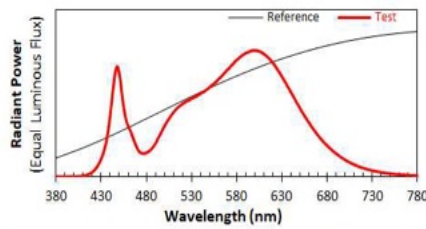
### ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-12H-6RB

Manufacturer: P.Q.L., Inc.

Date: 2023/3/10

Model: 55753-50W-35K



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

x 0.4077  
y 0.3910  
u<sup>1</sup> 0.2371  
v<sup>1</sup> 0.5117

CIE 13.3-1995  
(CRI)  
R<sub>a</sub> 83  
R<sub>g</sub> 8

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

## Integrating Sphere Test

<b>Model No.</b>	55753-50W-40K		<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

### 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 parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

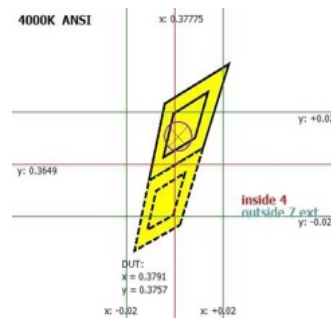
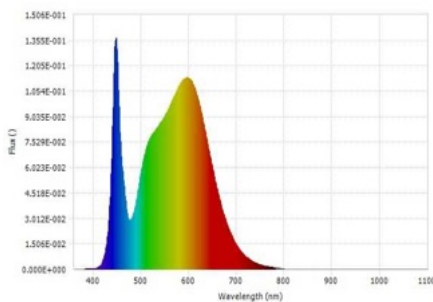
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption 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 1 nm intervals over the range of 380 to 780 nm.

### Integrating Sphere Test Conditions

Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.7	120.06	60	0.3953	47.17	0.9941	Horizontal

### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4029	84	12.0	-0.0001	6591.69	139.74	N/A



Luminous Flux (lm)	6591.69	Chrom x	0.3791
Chrom y	0.3757	Chrom u	0.2246
Chrom v	0.3339	Duv	-0.0001
Chrom u'	0.2246	Chrom v'	0.5009
CCT (K)	4029	Luminous Efficacy (lm/W)	139.74
Ra	84	R1	82.0
R2	88.0	R3	94.0
R4	84.0	R5	83.0
R6	85.0	R7	87.0
R8	66.0	R9	12.0
R10	73.0	R11	84.0
R12	66.0	R13	84.0
R14	97.0	R15	76.0
Rf	85	Rg	98
Rcs,h1	-11%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report

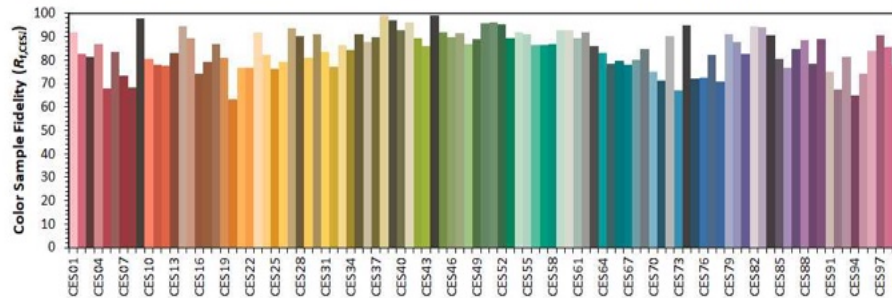
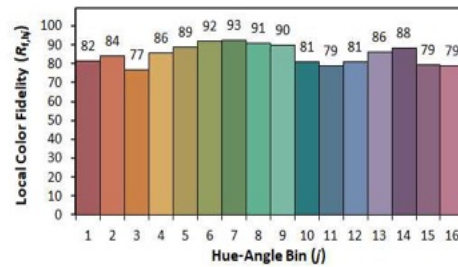
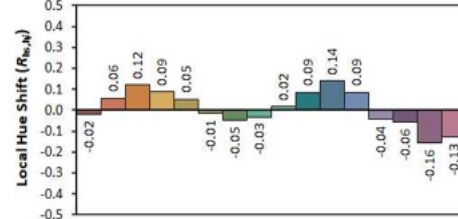
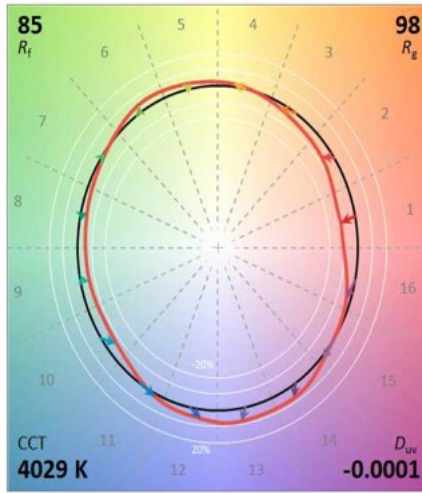
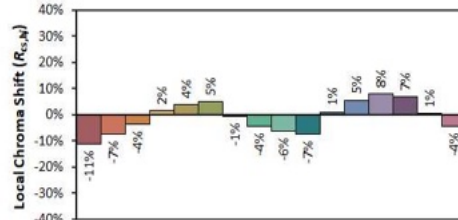
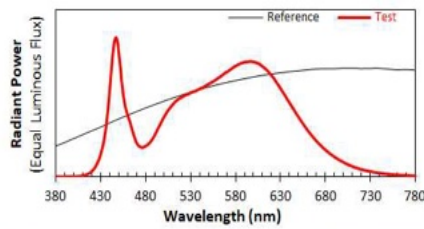
### ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-12H-6RB

Manufacturer: P.Q.L., Inc.

Date: 2023/3/10

Model: 55753-50W-40K



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

x 0.3791  
y 0.3757  
u' 0.2246  
v' 0.5009

CIE 13.3-1995  
(CRI)  
Ra 84  
Rg 12

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



## Integrating Sphere Test

<b>Model No.</b>	55753-50W-50K		<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

### 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 parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

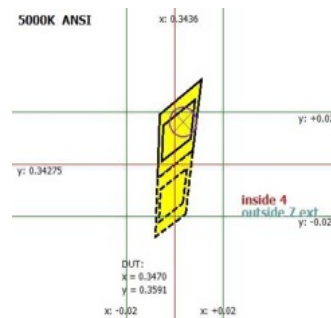
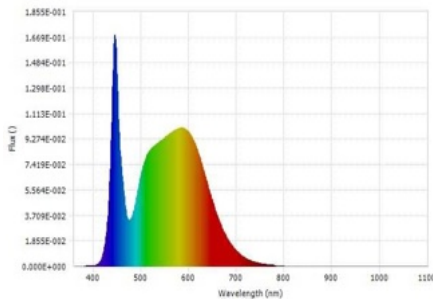
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption 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 1 nm intervals over the range of 380 to 780 nm.

### Integrating Sphere Test Conditions

Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.7	120.04	60	0.4156	49.584	0.9938	Horizontal

### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4956	82	5.0	0.0030	6478.18	130.65	N/A



Luminous Flux (lm)	6478.18	Chrom x	0.3470
Chrom y	0.3591	Chrom u	0.2098
Chrom v	0.3257	Duv	0.0030
Chrom u'	0.2098	Chrom v'	0.4886
CCT (K)	4956	Luminous Efficacy (lm/W)	130.65
Ra	82	R1	80.0
R2	86.0	R3	91.0
R4	83.0	R5	81.0
R6	81.0	R7	87.0
R8	67.0	R9	5.0
R10	67.0	R11	83.0
R12	63.0	R13	81.0
R14	95.0	R15	73.0
Rf	83	Rg	98
Rcs,h1	-12%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report

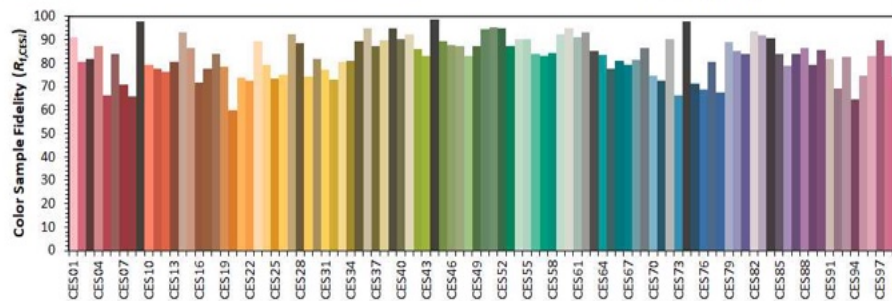
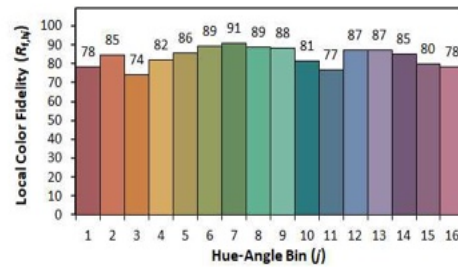
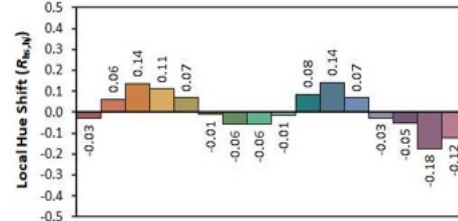
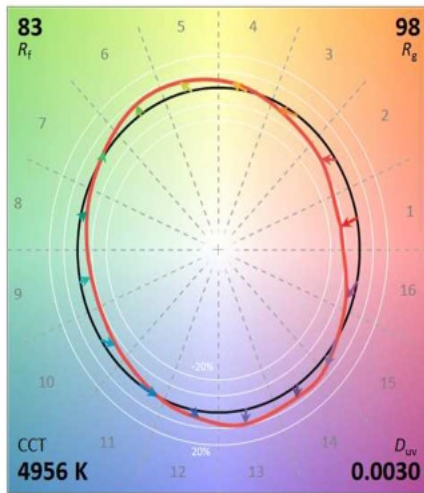
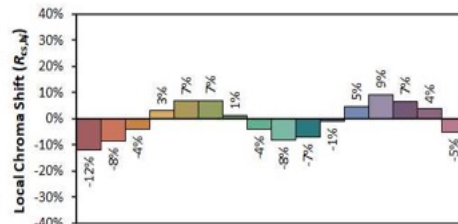
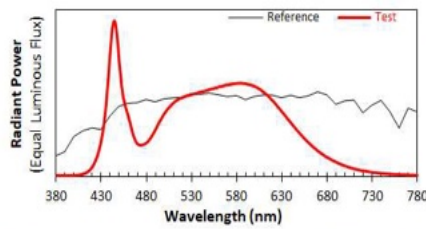
### ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-12H-6RB

Manufacturer: P.Q.L., Inc.

Date: 2023/3/10

Model: 55753-50W-50K



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

x 0.3470  
y 0.3591  
u' 0.2098  
v' 0.4886

CIE 13.3-1995  
(CRI)  
R<sub>a</sub> 82  
R<sub>g</sub> 5

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

## Integrating Sphere Test

<b>Model No.</b>	55753-40W-35K		<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

### 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 parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

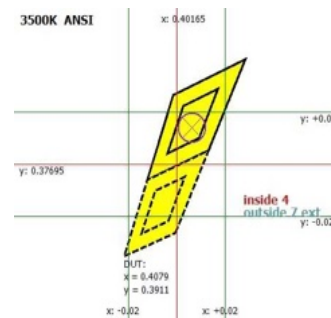
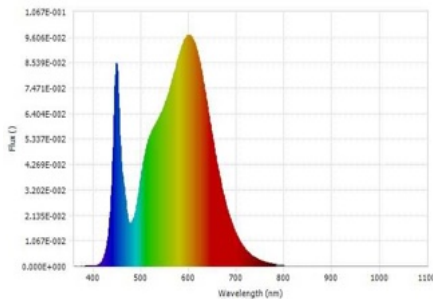
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption 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 1 nm intervals over the range of 380 to 780 nm.

### Integrating Sphere Test Conditions

Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.7	120.11	60	0.3206	38.263	0.9938	Horizontal

### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3446	83	8.0	-0.0004	5185.83	135.53	N/A



Luminous Flux (lm)	5185.83	Chrom x	0.4079
Chrom y	0.3911	Chrom u	0.2372
Chrom v	0.3412	Duv	-0.0004
Chrom u'	0.2372	Chrom v'	0.5118
CCT (K)	3446	Luminous Efficacy (lm/W)	135.53
Ra	83	R1	81.0
R2	89.0	R3	95.0
R4	82.0	R5	81.0
R6	86.0	R7	85.0
R8	63.0	R9	8.0
R10	74.0	R11	82.0
R12	66.0	R13	83.0
R14	97.0	R15	74.0
Rf	84	Rg	97
Rcs,h1	-12%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report

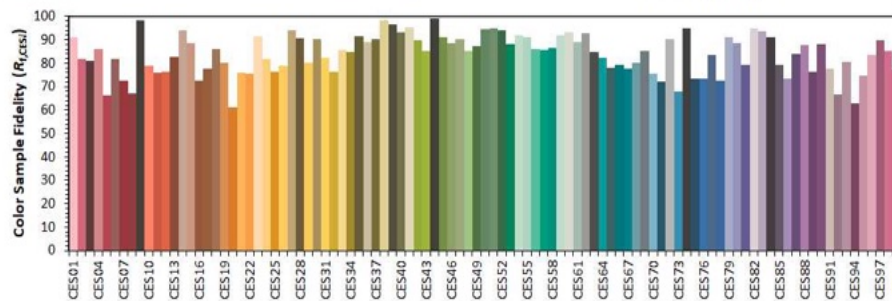
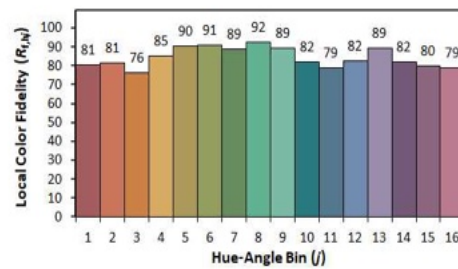
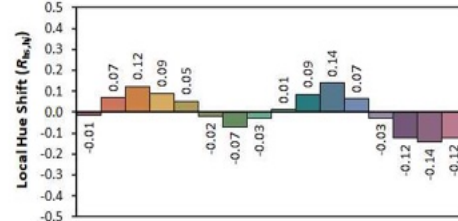
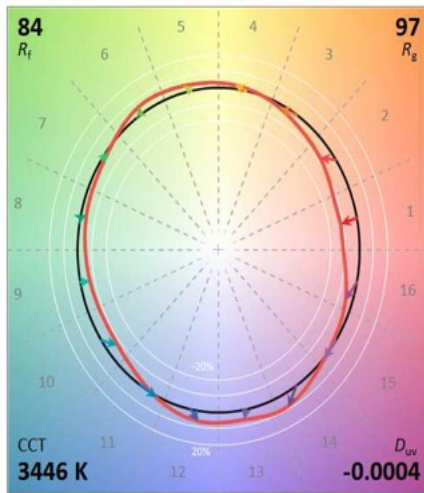
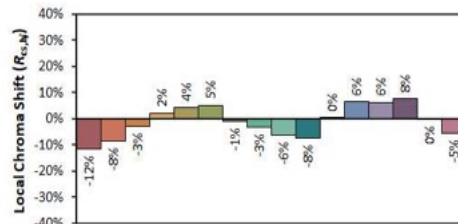
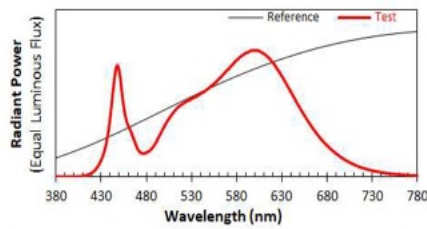
### ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-12H-6RB

Manufacturer: P.Q.L., Inc.

Date: 2023/3/10

Model: 55753-40W-35K



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

x 0.4079  
y 0.3911  
u' 0.2372  
v' 0.5118

CIE 13.3-1995  
(CRI)  
 $R_a$  83  
 $R_g$  8

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

### Integrating Sphere Test

<b>Model No.</b>	55753-30W-35K		<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45	

#### Test Method

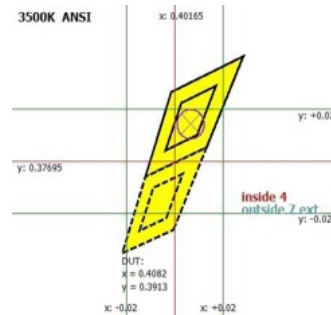
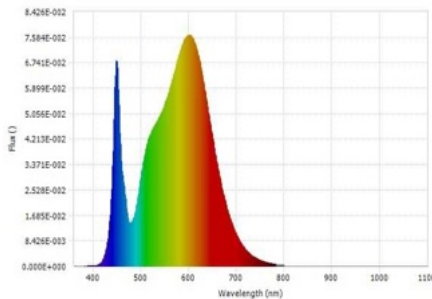
1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.  
 2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.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 1 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
24.7	120.01	60	0.2449	29.1	0.9900	Horizontal

#### Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3442	83	9.0	-0.0004	4093.32	140.66	N/A



Luminous Flux (lm)	4093.32	Chrom x	0.4082
Chrom y	0.3913	Chrom u	0.2373
Chrom v	0.3413	Duv	-0.0004
Chrom u'	0.2373	Chrom v'	0.5119
CCT (K)	3442	Luminous Efficacy (lm/W)	140.66
Ra	83	R1	81.0
R2	89.0	R3	95.0
R4	83.0	R5	82.0
R6	86.0	R7	85.0
R8	63.0	R9	9.0
R10	75.0	R11	82.0
R12	66.0	R13	83.0
R14	98.0	R15	74.0
Rf	84	Rg	97
Rcs,h1	-12%		

# Integrating Sphere Test (Cont'd)

## TM-30 Report

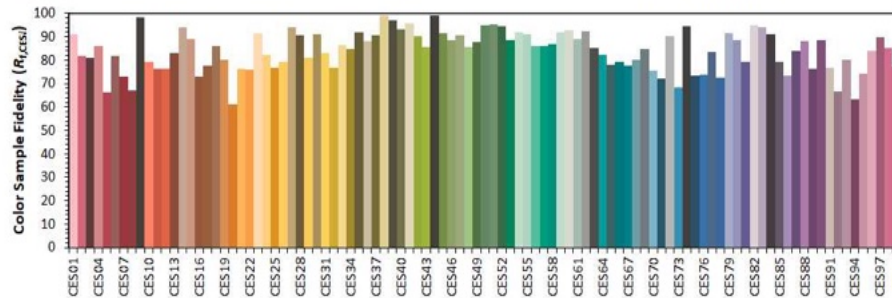
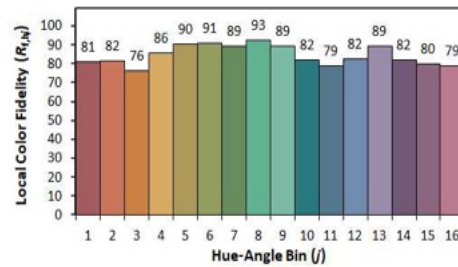
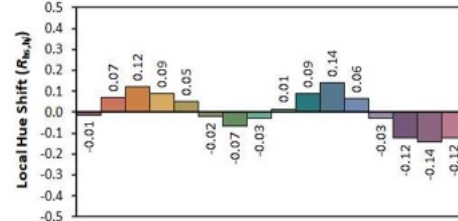
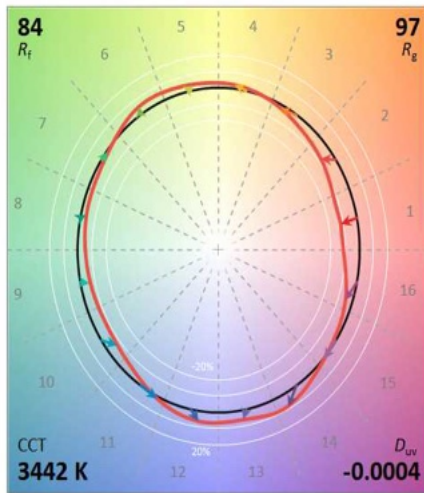
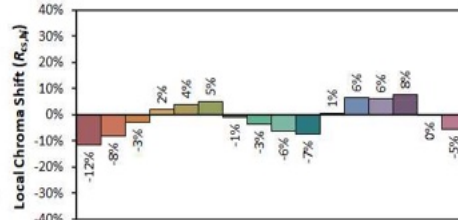
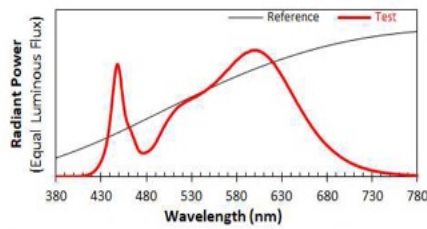
### ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-12H-6RB

Manufacturer: P.Q.L., Inc.

Date: 2023/3/10

Model: 55753-30W-35K



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

x 0.4082  
y 0.3913  
 $u'$  0.2373  
 $v'$  0.5119

CIE 13.3-1995  
(CRI)  
 $R_a$  83  
 $R_g$  9

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

## Goniophotometer Test

<b>Model No.</b>	55753-50W-35K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

### 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 parameters were measured using a type C goniophotometer and software.
- 3.The ambient temperature shall be maintained at 25° C ± 1° 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 rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.
- 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen 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	Current THD	Orientation
25.1	120.07	60	0.4106	48.981	0.9936	5.94%	Horizontal

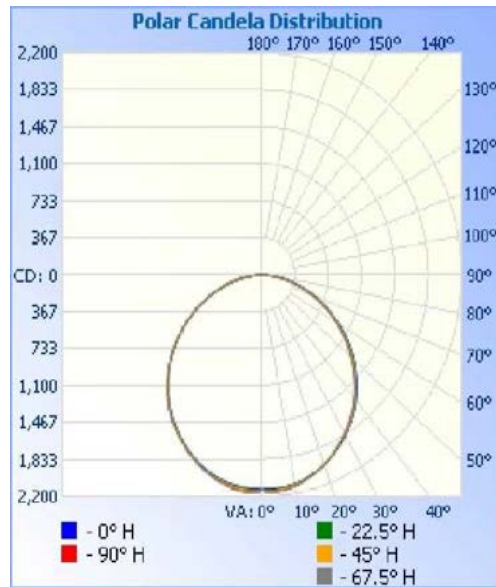
### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	0°-60°	N/A	Horizontal Spread	Vertical Spread	
6307.5	77.70%	N/A	113.4	114.1	128.77

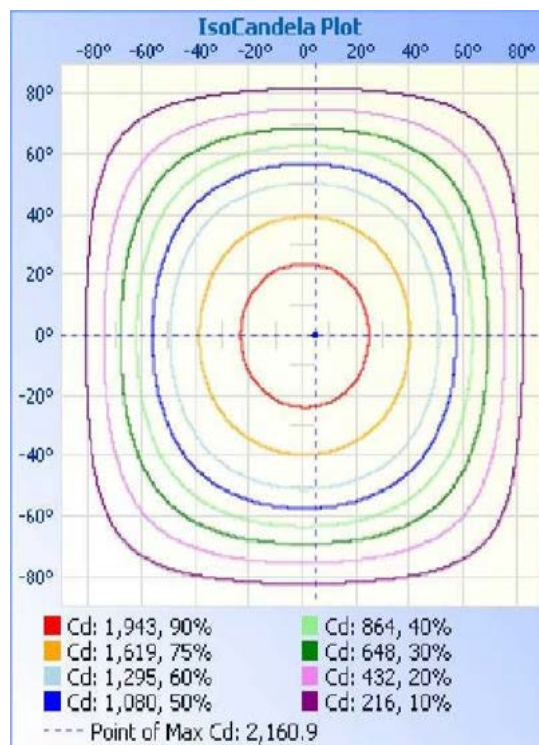
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
20.7	20.4	1.28	1.28

**Goniophotometer Test (Cont'd)**  
**Polar Candela Distribution**



**IsoCandela Plot**





**Goniophotometer Test (Cont'd)**  
**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1675.0	26.60%
0-40	2754.5	43.70%
0-60	4905.5	77.80%
60-90	1384.5	21.90%
70-100	606.1	9.60%
90-120	6.3	0.10%
0-90	6289.9	99.70%
90-180	17.6	0.30%
0-180	6307.5	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	51.2	0.80%	90-95	1.7	0.00%
5-10	152.3	2.40%	95-100	1.2	0.00%
10-15	248.3	3.90%	100-105	1.0	0.00%
15-20	335.7	5.30%	105-110	0.8	0.00%
20-25	412.2	6.50%	110-115	0.8	0.00%
25-30	475.3	7.50%	115-120	0.8	0.00%
30-35	524.0	8.30%	120-125	0.9	0.00%
35-40	555.4	8.80%	125-130	1.0	0.00%
40-45	567.1	9.00%	130-135	1.1	0.00%
45-50	560.3	8.90%	135-140	1.1	0.00%
50-55	534.5	8.50%	140-145	1.2	0.00%
55-60	489.2	7.80%	145-150	1.2	0.00%
60-65	427.9	6.80%	150-155	1.1	0.00%
65-70	353.4	5.60%	155-160	1.1	0.00%
70-75	272.6	4.30%	160-165	1.0	0.00%
75-80	189.6	3.00%	165-170	0.8	0.00%
80-85	107.5	1.70%	170-175	0.5	0.00%
85-90	33.5	0.50%	175-180	0.2	0.00%

**Goniophotometer Test (Cont'd)**  
Intensity Data(cd)

**Candela Table - Type C**

	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	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136	2136
1	2128	2138	2149	2150	2147	2139	2133	2130	2127	2136	2146	2152	2148	2141	2135	2130	2130
2	2129	2135	2148	2156	2152	2146	2136	2130	2129	2136	2148	2155	2154	2148	2139	2131	2128
3	2127	2135	2146	2156	2156	2149	2139	2128	2129	2134	2146	2157	2157	2152	2139	2130	2129
4	2127	2131	2144	2153	2156	2150	2140	2126	2124	2132	2143	2157	2161	2155	2143	2132	2127
5	2123	2128	2140	2152	2156	2152	2138	2126	2122	2127	2140	2156	2159	2156	2144	2130	2124
6	2122	2126	2137	2148	2152	2150	2138	2124	2119	2124	2135	2151	2156	2154	2144	2129	2122
7	2117	2123	2129	2143	2147	2147	2133	2122	2113	2120	2132	2147	2152	2151	2140	2126	2118
8	2114	2115	2125	2138	2141	2141	2129	2118	2111	2117	2127	2142	2150	2147	2136	2124	2115
9	2110	2110	2117	2126	2134	2132	2122	2113	2104	2110	2119	2133	2140	2140	2130	2120	2109
10	2105	2105	2110	2120	2125	2122	2116	2105	2099	2102	2112	2126	2132	2128	2123	2113	2104
11	2098	2099	2105	2110	2116	2114	2107	2098	2092	2097	2107	2117	2121	2122	2114	2106	2098
12	2091	2092	2098	2103	2103	2104	2099	2092	2085	2091	2098	2106	2110	2112	2106	2098	2092
13	2084	2084	2090	2092	2093	2091	2088	2081	2076	2081	2091	2099	2103	2102	2096	2091	2084
14	2074	2076	2082	2083	2081	2080	2076	2071	2069	2072	2083	2091	2092	2093	2085	2078	2074
15	2065	2067	2071	2074	2067	2068	2063	2060	2058	2066	2072	2078	2081	2080	2075	2067	2064
16	2054	2057	2060	2059	2056	2051	2050	2047	2050	2055	2064	2068	2068	2066	2063	2057	2056
17	2044	2047	2048	2048	2042	2039	2036	2033	2037	2045	2052	2057	2054	2053	2049	2047	2042
18	2034	2033	2034	2034	2029	2023	2022	2021	2024	2034	2040	2042	2042	2038	2034	2035	2031
19	2021	2020	2022	2019	2015	2010	2006	2008	2011	2019	2028	2030	2027	2026	2022	2020	2018
20	2007	2007	2008	2005	1999	1996	1993	1993	2000	2006	2013	2015	2013	2012	2010	2008	2005
25	1928	1926	1921	1920	1919	1916	1914	1915	1920	1922	1927	1933	1935	1936	1935	1933	1930
30	1840	1835	1829	1822	1820	1820	1822	1825	1828	1833	1835	1835	1841	1842	1844	1843	1840
35	1732	1730	1723	1717	1711	1713	1715	1717	1723	1729	1732	1734	1735	1738	1739	1737	1735
40	1611	1600	1594	1589	1590	1591	1592	1595	1597	1600	1604	1609	1613	1615	1618	1614	1610
45	1470	1460	1452	1446	1446	1449	1454	1458	1460	1461	1463	1464	1472	1475	1480	1478	1473
50	1323	1316	1306	1294	1290	1293	1300	1309	1314	1316	1315	1315	1317	1322	1328	1331	1326
55	1163	1151	1139	1130	1126	1127	1135	1144	1150	1151	1149	1150	1151	1154	1160	1164	1160
60	983	972	961	953	952	955	961	971	974	973	974	974	975	982	987	988	983
65	799	790	780	772	770	775	782	788	792	791	791	791	795	801	806	807	801
70	619	607	597	591	590	596	603	608	611	610	608	610	615	621	625	624	617
75	444	434	424	418	419	425	433	439	441	439	437	438	441	448	453	454	447
80	282	271	262	256	257	262	270	277	278	276	275	274	277	282	287	288	282
85	129	122	115	112	112	116	122	128	128	128	128	128	130	133	135	135	129
90	7	7	7	7	5	5	4	5	6	9	11	12	11	10	9	7	7
95	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
100	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
105	2	2	2	1	2	2	2	2	2	1	1	2	2	2	2	1	2
110	1	1	2	2	1	1	2	2	2	1	2	2	2	1	1	2	2
115	2	2	2	1	1	2	1	2	2	1	2	2	2	2	1	2	1
120	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2
125	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2
130	3	2	2	2	2	2	3	2	2	2	2	2	3	2	3	3	3
135	3	3	3	3	2	3	3	3	3	3	3	3	2	3	3	3	3
140	3	4	3	4	3	3	3	4	3	4	3	3	3	3	4	3	4
145	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
150	4	4	4	4	4	4	4	4	4	4	5	5	4	4	4	4	4
155	4	5	4	5	4	5	5	5	5	5	5	5	5	5	5	4	4
160	6	5	5	6	6	5	5	5	6	6	5	5	5	6	6	6	5
165	7	6	7	6	7	6	7	6	6	6	7	7	7	7	6	6	6
170	7	8	7	7	8	8	8	8	8	7	8	7	7	7	7	7	8
175	8	7	7	7	7	7	8	7	8	7	7	8	8	7	7	7	7
180	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

## Goniophotometer Test

<b>Model No.</b>	55753-50W-50K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

### 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 parameters were measured using a type C goniophotometer and software.
- 3.The ambient temperature shall be maintained at 25° C ± 1° 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 rated current 3.8581A, 3.8558A, 3.8466A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.
- 4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen 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	Current THD	Orientation
25.1	120.09	60	0.4157	49.587	0.9935	6.08%	Horizontal

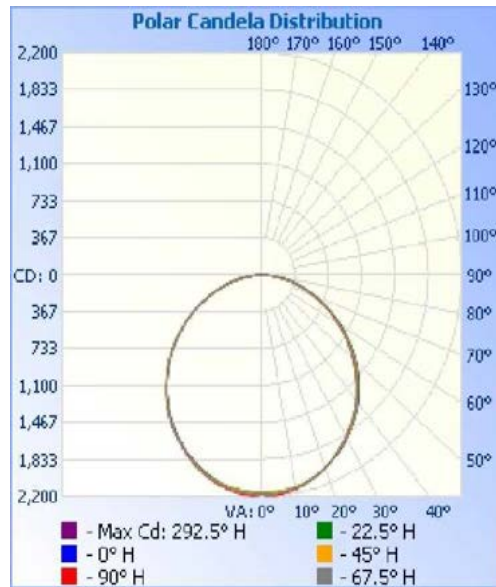
### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	0°-60°	N/A	Horizontal Spread	Vertical Spread	
6417.4	77.70%	N/A	113.5	114.2	129.42

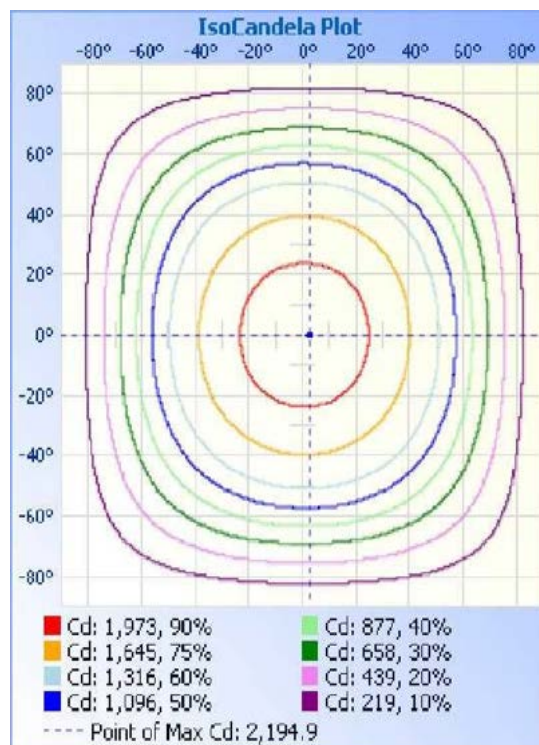
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
20.9	20.5	1.28	1.28

**Goniophotometer Test (Cont'd)**  
Polar Candela Distribution



IsoCandela Plot



**Goniophotometer Test (Cont'd)**  
**Zonal Lumen Summary**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1702.6	26.50%
0-40	2800.0	43.60%
0-60	4987.7	77.70%
60-90	1411.6	22.00%
70-100	619.6	9.70%
90-120	6.7	0.10%
0-90	6399.3	99.70%
90-180	18.1	0.30%
0-180	6417.4	100.00%

**Lumens Per Zone**

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	52.0	0.80%	90-95	1.9	0.00%
5-10	154.8	2.40%	95-100	1.2	0.00%
10-15	252.3	3.90%	100-105	1.0	0.00%
15-20	341.2	5.30%	105-110	0.9	0.00%
20-25	419.0	6.50%	110-115	0.9	0.00%
25-30	483.2	7.50%	115-120	0.9	0.00%
30-35	532.6	8.30%	120-125	0.9	0.00%
35-40	564.7	8.80%	125-130	1.0	0.00%
40-45	576.8	9.00%	130-135	1.1	0.00%
45-50	569.7	8.90%	135-140	1.2	0.00%
50-55	543.3	8.50%	140-145	1.2	0.00%
55-60	497.9	7.80%	145-150	1.2	0.00%
60-65	435.5	6.80%	150-155	1.2	0.00%
65-70	359.6	5.60%	155-160	1.1	0.00%
70-75	278.0	4.30%	160-165	1.0	0.00%
75-80	193.6	3.00%	165-170	0.8	0.00%
80-85	110.1	1.70%	170-175	0.5	0.00%
85-90	34.7	0.50%	175-180	0.2	0.00%



**Goniophotometer Test (Cont'd)**  
Intensity Data(cd)

**Candela Table - Type C**

	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	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171	2171
1	2166	2162	2171	2182	2188	2182	2174	2168	2162	2163	2170	2180	2187	2182	2176	2170	2164
2	2165	2163	2170	2182	2190	2188	2180	2170	2163	2163	2170	2181	2191	2190	2182	2173	2165
3	2164	2160	2167	2179	2192	2191	2183	2173	2162	2160	2169	2180	2194	2193	2186	2175	2166
4	2165	2160	2166	2180	2192	2192	2186	2173	2160	2158	2166	2179	2191	2195	2189	2176	2165
5	2166	2155	2162	2174	2189	2192	2185	2172	2160	2153	2161	2176	2191	2194	2190	2177	2165
6	2162	2156	2157	2169	2184	2188	2185	2171	2158	2151	2158	2169	2186	2193	2190	2176	2163
7	2158	2151	2155	2164	2177	2183	2180	2168	2155	2148	2154	2167	2182	2188	2187	2174	2160
8	2156	2148	2149	2159	2171	2178	2177	2164	2150	2145	2150	2162	2175	2182	2180	2170	2157
9	2151	2142	2146	2152	2163	2168	2170	2158	2146	2138	2144	2158	2167	2175	2175	2166	2153
10	2146	2139	2139	2146	2156	2160	2159	2152	2137	2132	2137	2148	2160	2168	2167	2158	2144
11	2138	2132	2132	2139	2147	2150	2149	2142	2132	2126	2131	2139	2151	2157	2159	2151	2138
12	2130	2125	2124	2132	2136	2140	2138	2131	2124	2121	2125	2133	2143	2149	2148	2142	2132
13	2122	2117	2118	2123	2126	2128	2126	2121	2114	2112	2116	2126	2133	2137	2139	2131	2122
14	2111	2108	2111	2116	2115	2114	2115	2109	2102	2103	2108	2116	2124	2127	2127	2122	2113
15	2102	2096	2101	2106	2104	2103	2099	2096	2092	2091	2097	2108	2113	2114	2114	2110	2102
16	2091	2087	2090	2094	2094	2090	2086	2082	2081	2081	2088	2097	2102	2100	2099	2096	2090
17	2079	2074	2078	2082	2082	2076	2073	2068	2068	2069	2077	2085	2090	2089	2087	2083	2079
18	2068	2064	2068	2070	2069	2063	2058	2056	2053	2057	2064	2073	2078	2076	2071	2069	2067
19	2054	2051	2052	2055	2055	2047	2044	2040	2039	2044	2052	2063	2064	2061	2056	2056	2054
20	2038	2038	2040	2042	2038	2034	2028	2026	2026	2030	2038	2046	2050	2049	2044	2043	2042
25	1963	1960	1957	1953	1950	1950	1946	1945	1946	1954	1956	1957	1965	1968	1969	1966	1966
30	1874	1870	1865	1859	1852	1851	1851	1852	1855	1858	1861	1866	1868	1871	1874	1875	1875
35	1763	1764	1759	1752	1744	1741	1739	1742	1745	1751	1756	1761	1761	1764	1766	1767	1765
40	1644	1637	1628	1622	1618	1616	1615	1619	1622	1624	1627	1632	1635	1642	1645	1646	1642
45	1504	1498	1488	1476	1468	1471	1475	1478	1483	1484	1483	1486	1490	1497	1501	1506	1505
50	1351	1347	1338	1324	1316	1312	1314	1322	1330	1334	1338	1336	1337	1338	1343	1350	1351
55	1186	1182	1172	1158	1150	1144	1145	1153	1163	1170	1171	1169	1169	1171	1174	1180	1185
60	1005	1002	992	980	970	968	972	978	988	992	991	990	992	994	1000	1006	1008
65	821	814	804	794	786	784	788	796	802	805	804	804	806	808	816	820	821
70	635	629	618	608	603	602	606	614	618	620	621	620	622	626	633	637	636
75	460	456	444	433	426	428	434	442	449	450	446	446	447	450	457	463	462
80	294	288	277	268	263	262	268	277	283	284	283	281	281	284	289	294	294
85	138	133	125	119	114	114	118	125	131	132	132	131	132	134	137	138	140
90	8	7	8	7	7	7	6	5	6	8	10	12	14	13	12	10	9
95	2	3	3	2	3	3	3	3	2	3	2	3	3	3	2	2	3
100	2	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	2
105	2	2	2	2	2	2	2	1	1	2	2	1	1	1	2	1	2
110	2	2	1	2	2	2	2	2	2	1	2	2	2	2	1	2	1
115	2	2	2	1	2	2	1	1	2	2	2	2	2	1	2	2	2
120	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2
125	2	2	2	2	2	2	3	2	2	2	2	2	2	2	3	2	2
130	3	3	3	2	3	2	2	2	3	2	2	3	2	2	2	3	2
135	3	3	3	3	3	3	2	2	3	3	3	3	2	4	2	4	3
140	3	4	4	4	4	3	3	4	4	4	4	4	4	3	3	4	4
145	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4
150	4	4	4	4	4	5	4	5	4	5	5	4	4	5	4	4	4
155	5	5	5	5	5	5	4	4	5	4	5	5	5	5	4	5	5
160	6	5	5	6	6	6	6	5	6	5	6	5	5	6	5	6	5
165	6	6	6	6	6	6	7	7	6	7	6	7	7	7	7	7	6
170	8	7	8	8	8	8	7	8	7	8	8	7	8	7	7	8	8
175	7	8	8	8	8	7	7	8	7	8	7	8	8	8	7	8	7
180	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

### THD and PF Test

<b>Model No.</b>	55753-50W-35K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.1	120.03	60	0.4133	49.27	0.9932	8.37%	Horizontal
25.1	277.03	60	0.1843	48.38	0.9472	15.25%	Horizontal

### THD and PF Test

<b>Model No.</b>	55753-50W-40K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.1	120.04	60	0.3973	47.36	0.9930	8.46%	Horizontal
25.1	277.04	60	0.1782	46.63	0.9445	15.44%	Horizontal



### THD and PF Test

<b>Model No.</b>	55753-50W-50K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.1	120.03	60	0.4173	49.74	0.9929	8.64%	Horizontal
25.1	277.03	60	0.1864	48.97	0.9482	15.15%	Horizontal

### THD and PF Test

<b>Model No.</b>	55753-40W-35K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.1	120.05	60	0.3226	38.45	0.9927	6.73%	Horizontal
25.1	277.05	60	0.1508	38.72	0.9268	17.07%	Horizontal

### THD and PF Test

<b>Model No.</b>	55753-30W-35K	<b>Sample ID.</b>	5833654
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at 25 °C ± 1 °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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.1	120.02	60	0.2464	29.22	0.9879	8.45%	Horizontal
25.1	277.06	60	0.1229	30.48	0.8946	19.70%	Horizontal

## In-Situ Temperature Measurement Test

<b>Model No.</b>	55753-50W-35K	<b>Sample ID.</b>	5833654
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### Test Method

- In-Situ Temperature Measurement Test is conducted according to the UL 1598-2008, Section 14.
- The testing was conducted in a room with ambient temperature of 25 °C ± 5 °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 7.5 hours.
- The data and photos in LM-80 test report is provided by the customer/ The data and photos in driver specification is provided by the customer.

### In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
23.3	120.07	60	0.4106	48.981	0.9936	5.94%	Horizontal

### Test Results (LEDs)

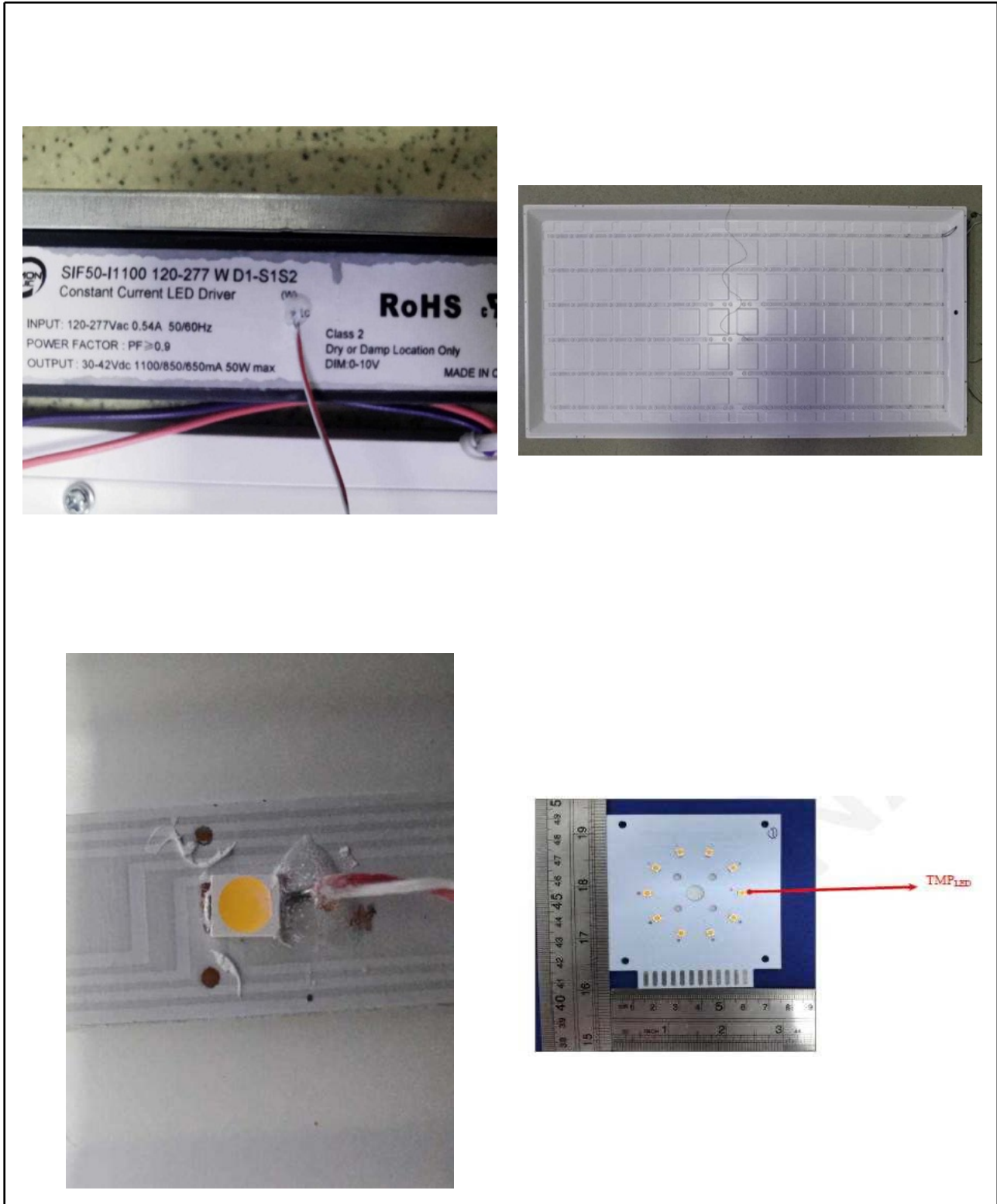
Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source (°C)		Max Chromaticity Shift (1000-6000h)	LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp (°C)
		Test Result	Test Result (Correct to 25 °C)				
Ambient TEMP	N/A	23.3	25.0				
TMP of Location 1	60	31.4	33.1	0.0016	BXEN-(A)E-12H-6RB	150	105

### Test Results (Drivers)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp (°C)
	Test Result	Test Result (Correct to 25 °C)		
Ambient TEMP	23.3	25.0		
TMP of Location 1	50.6	52.3	SIF 50-I1100 120-277 W D1-S1S2	90

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

Test Photos for Ts Point of Light Sources & Tc Point of Drivers





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