



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:

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Catalog Number

55752

Project Number

4790746003

Report Number

4790746003_1

Test Date

2023-02-27~2023-02-28

Issue Date

2023-03-01

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%	4037.25
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥125	-3%	124.88
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	3437
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	4043
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	4945
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3435
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3433
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-1	82
Minimum R9	IES LM-79-2008	≥0	-1	6.0
Minimum Rg	IES LM-79-2008	≥89	-1	96
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	20.2
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	0.9411
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	14.61%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	37.4
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	55.8
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: 2023-02-25

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2023-02-28	55752-40W-35K	Yang, Gavin X
Integrating Sphere Test	2023-02-28	55752-40W-40K	Yang, Gavin X
Integrating Sphere Test	2023-02-28	55752-40W-50K	Yang, Gavin X
Integrating Sphere Test	2023-02-28	55752-35W-35K	Yang, Gavin X
Integrating Sphere Test	2023-02-28	55752-30W-35K	Yang, Gavin X
Goniophotometer Test	2023-02-27	55752-40W-35K	Yang, Gavin X
Goniophotometer Test	2023-02-27	55752-40W-50K	Yang, Gavin X
THD and PF Test	2023-02-27	55752-40W-35K	Yang, Gavin X
THD and PF Test	2023-02-27	55752-40W-40K	Yang, Gavin X
THD and PF Test	2023-02-27	55752-40W-50K	Yang, Gavin X
THD and PF Test	2023-02-27	55752-35W-35K	Yang, Gavin X
THD and PF Test	2023-02-27	55752-30W-35K	Yang, Gavin X
In-Situ Temperature Measurement Test	2023-02-28	55752-40W-35K	Yang, Gavin X

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: 55752

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

LED Package: BXEN-(A)E-13H-9RA

Dimming Information: continuous dimming capability

Products Scaled Value

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
55752-40W-35K	3500K	5040	40	126
55752-40W-40K	4000K	5440	40	136
55752-40W-50K	5000K	5120	40	128
55752-35W-35K	3500K	4550	35	130
55752-35W-40K	4000K	4900	35	140
55752-35W-50K	5000K	4620	35	132
55752-30W-35K	3500K	4020	30	134
55752-30W-40K	4000K	4320	30	144
55752-30W-50K	5000K	4080	30	136



Integrating Sphere Test

Model No.	55752-40W-35K		Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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.

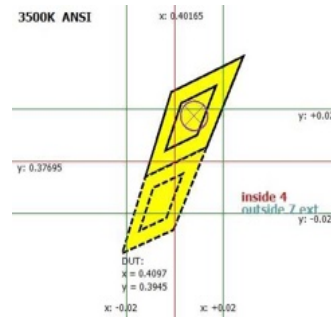
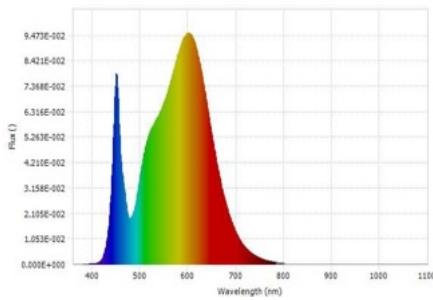
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption 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	119.98	60	0.3407	40.39	0.9881	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3437	83	7.0	0.0007	5118.3	126.72	N/A



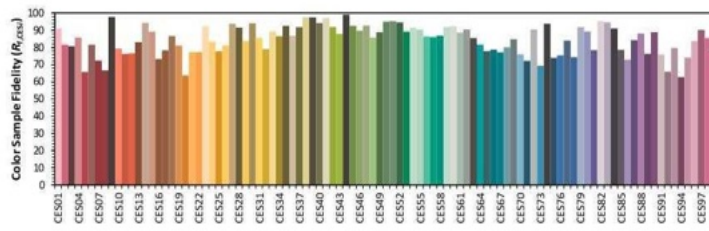
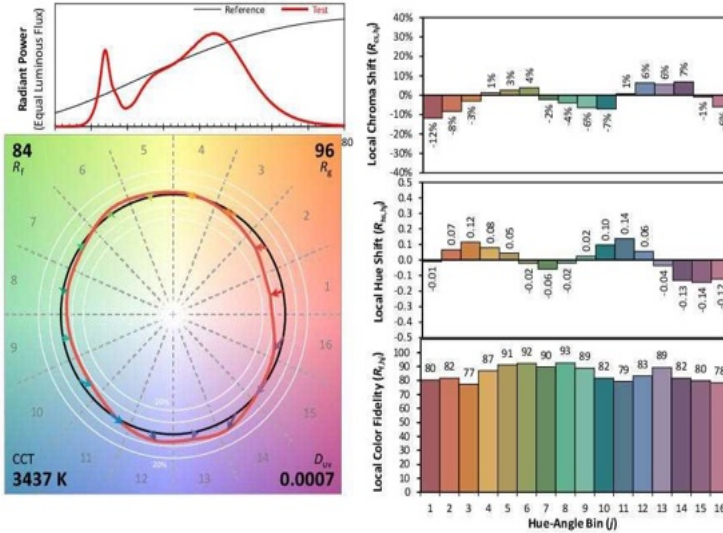
Luminous Flux (lm)	5118.3	Chrom x	0.4097
Chrom y	0.3945	Chrom u	0.2370
Chrom v	0.3423	Duv	0.0007
Chrom u'	0.2370	Chrom v'	0.5135
CCT (K)	3437	Luminous Efficacy (lm/W)	126.72
Ra	83	R1	81.0
R2	89.0	R3	96.0
R4	82.0	R5	81.0
R6	86.0	R7	85.0
R8	62.0	R9	7.0
R10	75.0	R11	82.0
R12	66.0	R13	83.0
R14	98.0	R15	74.0
Rf	84	Rg	96
Rcs,h1	-12%		

Integrating Sphere Test (Cont'd)

TM-30 Report

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RA Manufacturer: P.Q.L., Inc.
 Date: 2/28/2023 Model: 55752-40W-35K



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

x	0.4097	CIE 13.3-1995 (CRI)
y	0.3945	
u'	0.2370	
v'	0.5135	

R_a 83
R₉ 7

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

Integrating Sphere Test

Model No.	55752-40W-40K		Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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.

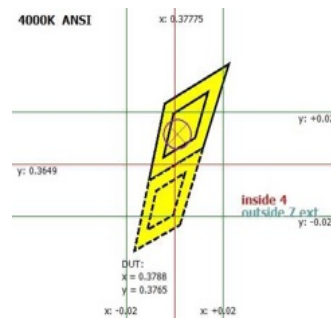
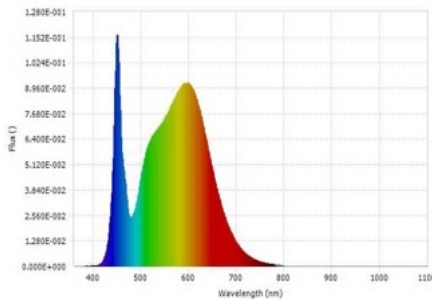
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption 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	119.97	60	0.3285	38.937	0.9880	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4043	84	12.0	0.0004	5386.18	138.33	N/A



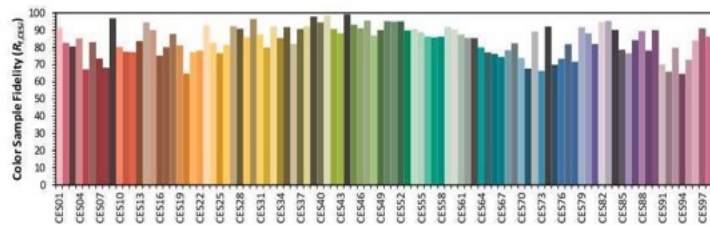
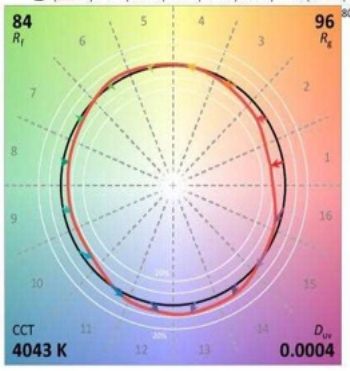
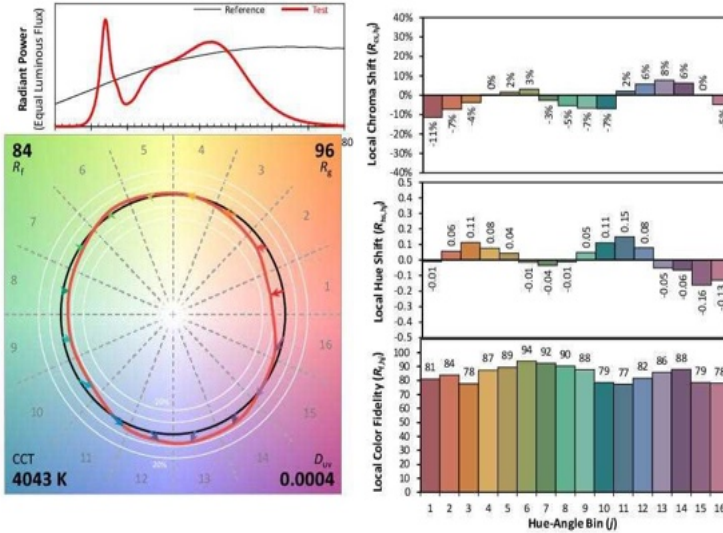
Luminous Flux (lm)	5386.18	Chrom x	0.3788
Chrom y	0.3765	Chrom u	0.2241
Chrom v	0.3342	Duv	0.0004
Chrom u'	0.2241	Chrom v'	0.5012
CCT (K)	4043	Luminous Efficacy (lm/W)	138.33
Ra	84	R1	82.0
R2	89.0	R3	94.0
R4	83.0	R5	82.0
R6	85.0	R7	87.0
R8	66.0	R9	12.0
R10	74.0	R11	83.0
R12	62.0	R13	84.0
R14	97.0	R15	76.0
Rf	84	Rg	96
Rcs,h1	-11%		

Integrating Sphere Test (Cont'd)

TM-30 Report

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RA Manufacturer: P.Q.L., Inc.
 Date: 2/28/2023 Model: 55752-40W-40K



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

x	0.3788	CIE 13.3-1995 (CRI)
y	0.3765	
u'	0.2241	
v'	0.5012	

R_a 84
 R_g 12

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Integrating Sphere Test

Model No.	55752-40W-50K		Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

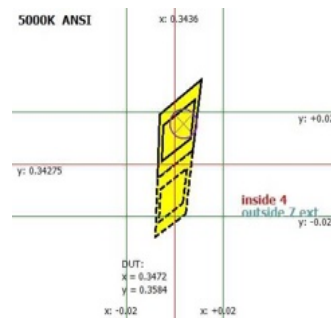
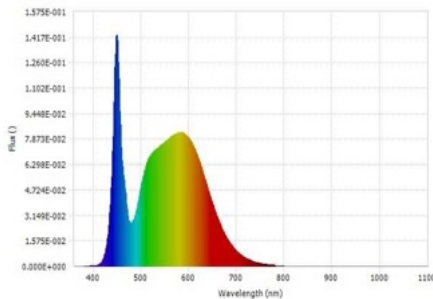
1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
 2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °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	119.96	60	0.3440	40.785	0.9883	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4945	82	6.0	0.0025	5227.03	128.16	N/A



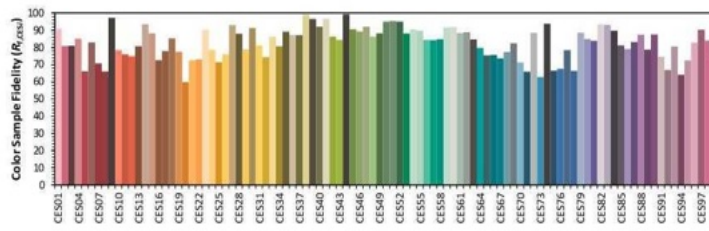
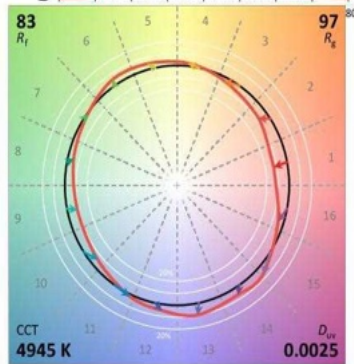
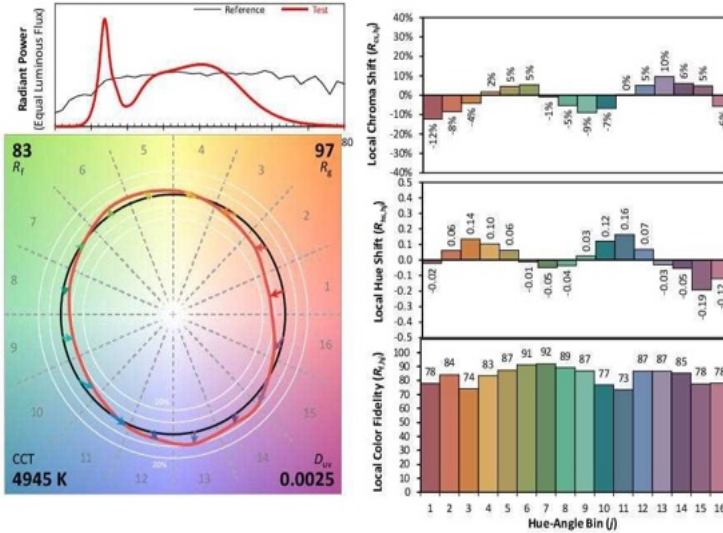
Luminous Flux (lm)	5227.03	Chrom x	0.3472
Chrom y	0.3584	Chrom u	0.2102
Chrom v	0.3255	Duv	0.0025
Chrom u'	0.2102	Chrom v'	0.4882
CCT (K)	4945	Luminous Efficacy (lm/W)	128.16
Ra	82	R1	80.0
R2	86.0	R3	91.0
R4	82.0	R5	80.0
R6	81.0	R7	87.0
R8	67.0	R9	6.0
R10	67.0	R11	81.0
R12	56.0	R13	81.0
R14	95.0	R15	74.0
Rf	83	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-13H-9RA Manufacturer: P.Q.L., Inc.
 Date: 2/28/2023 Model: 55752-40W-50K



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

x	0.3472	CIE 13.3-1995 (CRI)
y	0.3584	
u'	0.2102	
v'	0.4882	

R_a : 82
 R_g : 6

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Integrating Sphere Test

Model No.	55752-35W-35K		Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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.

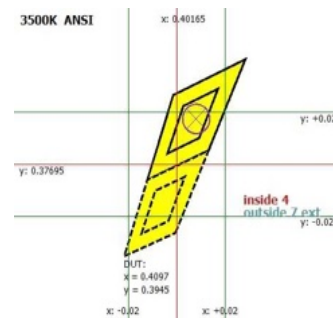
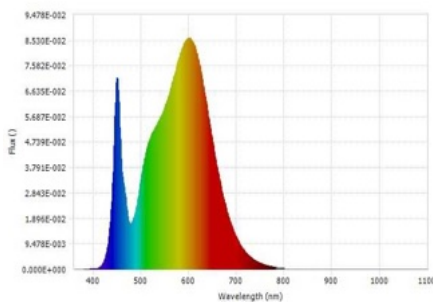
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption 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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.7	120.02	60	0.2974	35.386	0.9913	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3435	83	8.0	0.0007	4603.18	130.08	N/A



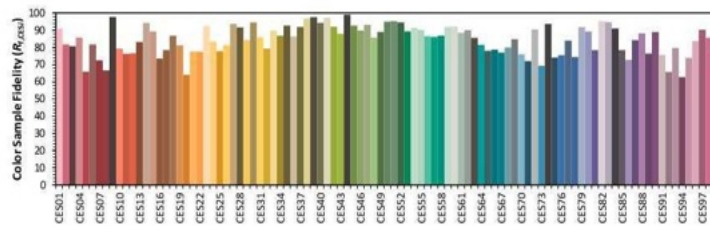
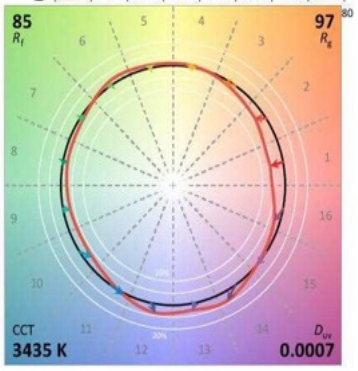
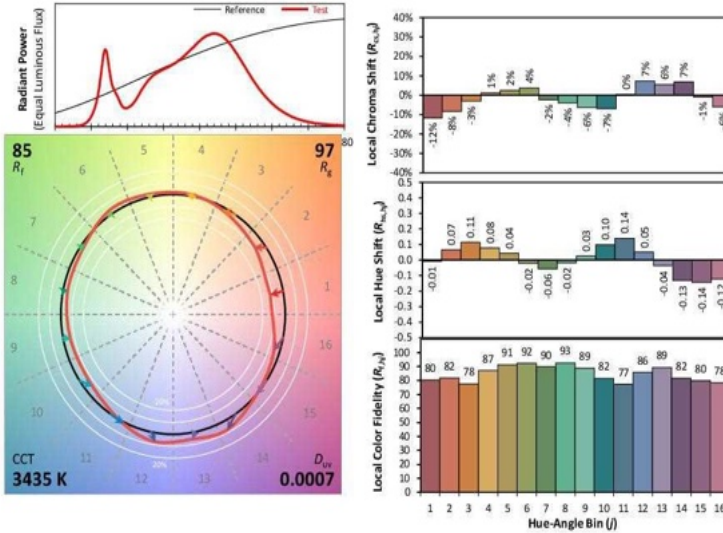
Luminous Flux (lm)	4603.18	Chrom x	0.4097
Chrom y	0.3945	Chrom u	0.2370
Chrom v	0.3423	Duv	0.0007
Chrom u'	0.2370	Chrom v'	0.5135
CCT (K)	3435	Luminous Efficacy (lm/W)	130.08
Ra	83	R1	81.0
R2	89.0	R3	96.0
R4	82.0	R5	81.0
R6	86.0	R7	85.0
R8	62.0	R9	8.0
R10	75.0	R11	82.0
R12	66.0	R13	83.0
R14	98.0	R15	74.0
Rf	85	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-13H-9RA Manufacturer: P.Q.L., Inc.
 Date: 2/28/2023 Model: 55752-35W-35K



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

x	0.4097	CIE 13.3-1995 (CRI)
y	0.3945	
u'	0.2370	
v'	0.5135	

R_a 83
 R_g 8

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Integrating Sphere Test

Model No.	55752-30W-35K		Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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.

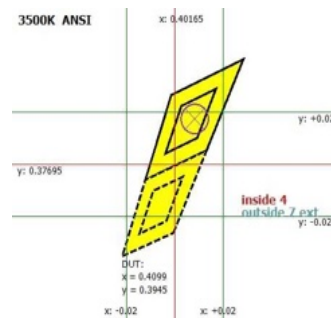
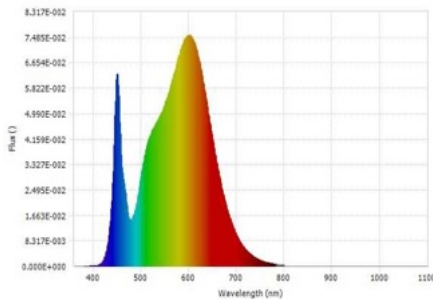
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption 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	120.02	60	0.2537	30.212	0.9925	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3433	83	8.0	0.0007	4037.25	133.63	N/A



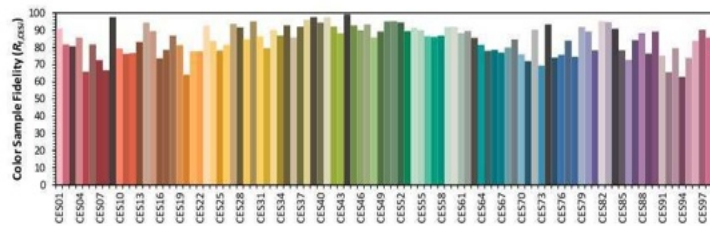
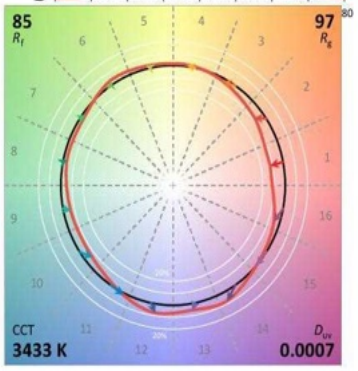
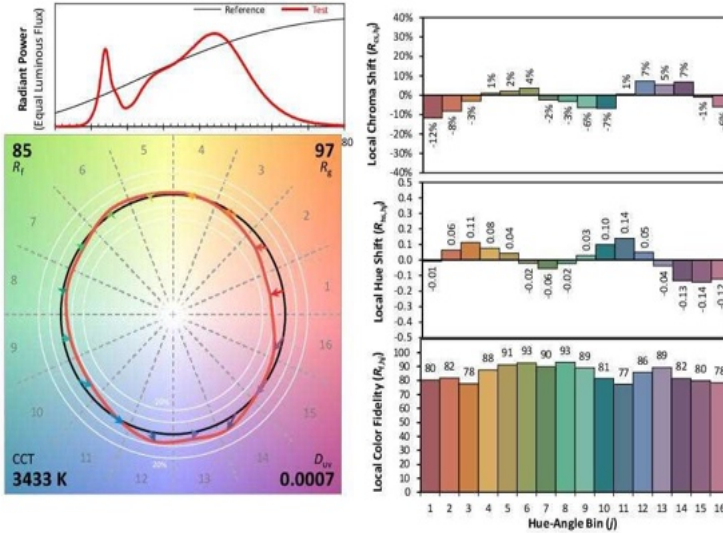
Luminous Flux (lm)	4037.25	Chrom x	0.4099
Chrom y	0.3945	Chrom u	0.2371
Chrom v	0.3423	Duv	0.0007
Chrom u'	0.2371	Chrom v'	0.5135
CCT (K)	3433	Luminous Efficacy (lm/W)	133.63
Ra	83	R1	81.0
R2	89.0	R3	96.0
R4	82.0	R5	81.0
R6	86.0	R7	85.0
R8	62.0	R9	8.0
R10	75.0	R11	82.0
R12	66.0	R13	83.0
R14	98.0	R15	74.0
Rf	85	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-13H-9RA Manufacturer: P.Q.L., Inc.
 Date: 2/28/2023 Model: 55752-30W-35K



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

x	0.4099	CIE 13.3-1995 (CRI)
y	0.3945	
u'	0.2371	
v'	0.5135	

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.

Goniophotometer Test

Model No.	55752-40W-35K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.07	60	0.3392	40.42	0.9924	4.70%	Horizontal

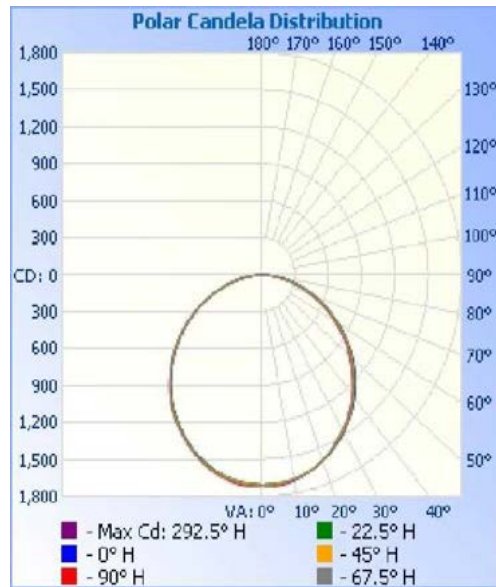
Test Results

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	
5047.6	77.70%	N/A	113.7	114.3	124.88

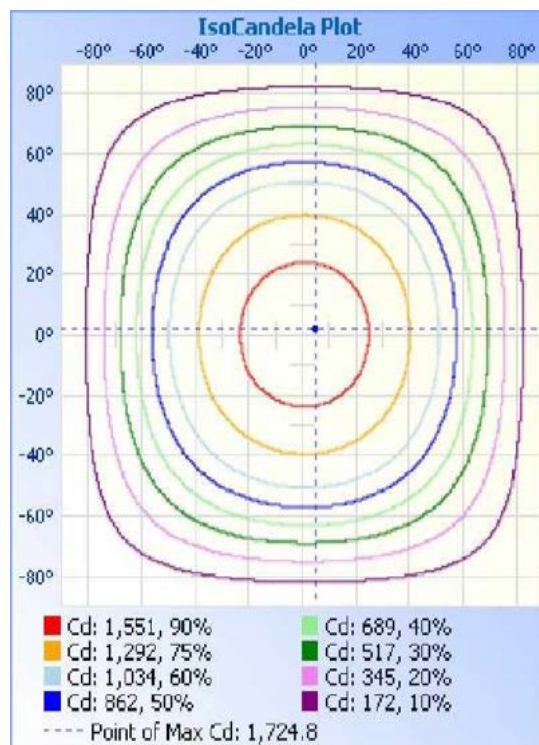
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
20.1	19.5	1.30	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	1338.0	26.50%
0-40	2201.0	43.60%
0-60	3922.4	77.70%
60-90	1110.4	22.00%
70-100	487.5	9.70%
90-120	5.8	0.10%
0-90	5032.8	99.70%
90-180	14.9	0.30%
0-180	5047.6	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	40.9	0.80%	90-95	1.8	0.00%
5-10	121.6	2.40%	95-100	1.0	0.00%
10-15	198.3	3.90%	100-105	0.9	0.00%
15-20	268.2	5.30%	105-110	0.8	0.00%
20-25	329.3	6.50%	110-115	0.7	0.00%
25-30	379.8	7.50%	115-120	0.7	0.00%
30-35	418.8	8.30%	120-125	0.7	0.00%
35-40	444.2	8.80%	125-130	0.8	0.00%
40-45	453.7	9.00%	130-135	0.9	0.00%
45-50	448.2	8.90%	135-140	0.9	0.00%
50-55	427.8	8.50%	140-145	0.9	0.00%
55-60	391.8	7.80%	145-150	1.0	0.00%
60-65	342.5	6.80%	150-155	0.9	0.00%
65-70	283.1	5.60%	155-160	0.9	0.00%
70-75	218.4	4.30%	160-165	0.8	0.00%
75-80	151.8	3.00%	165-170	0.7	0.00%
80-85	86.6	1.70%	170-175	0.4	0.00%
85-90	28.0	0.60%	175-180	0.1	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	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707
1	1704	1701	1706	1714	1719	1715	1709	1703	1700	1701	1706	1714	1718	1716	1710	1706	1702
2	1704	1700	1707	1714	1722	1719	1713	1706	1702	1699	1704	1716	1721	1720	1714	1707	1702
3	1704	1699	1704	1714	1722	1721	1716	1708	1700	1698	1704	1714	1722	1724	1717	1711	1704
4	1702	1699	1703	1712	1722	1723	1718	1708	1700	1696	1702	1713	1723	1724	1722	1712	1702
5	1702	1696	1700	1710	1719	1722	1717	1707	1697	1694	1700	1710	1720	1725	1721	1712	1702
6	1701	1694	1698	1705	1716	1719	1716	1705	1696	1691	1697	1706	1718	1723	1720	1711	1700
7	1700	1693	1696	1701	1711	1715	1712	1703	1693	1688	1694	1702	1714	1719	1718	1710	1699
8	1696	1689	1690	1696	1706	1710	1707	1699	1691	1685	1690	1698	1709	1715	1715	1706	1695
9	1692	1685	1687	1691	1699	1704	1702	1696	1687	1681	1686	1693	1703	1710	1708	1701	1692
10	1688	1682	1683	1687	1692	1697	1693	1689	1681	1675	1680	1688	1695	1704	1702	1695	1687
11	1681	1677	1677	1681	1686	1689	1687	1679	1675	1670	1675	1682	1691	1696	1696	1690	1682
12	1675	1671	1671	1674	1678	1681	1678	1674	1668	1664	1669	1678	1684	1688	1688	1682	1676
13	1670	1666	1666	1669	1670	1670	1670	1666	1662	1659	1663	1671	1677	1681	1681	1674	1670
14	1663	1659	1660	1662	1664	1662	1660	1657	1652	1653	1656	1664	1670	1672	1670	1666	1662
15	1655	1650	1652	1656	1654	1652	1650	1646	1644	1644	1650	1657	1660	1662	1662	1656	1653
16	1645	1643	1644	1646	1644	1641	1639	1636	1633	1634	1642	1648	1652	1652	1651	1648	1645
17	1636	1634	1635	1636	1636	1630	1627	1625	1623	1624	1632	1639	1643	1642	1640	1638	1636
18	1625	1623	1626	1626	1625	1619	1615	1612	1613	1615	1623	1629	1633	1631	1630	1627	1625
19	1615	1613	1615	1615	1613	1607	1602	1602	1603	1605	1611	1619	1622	1621	1620	1617	1616
20	1605	1604	1604	1605	1602	1594	1592	1590	1589	1595	1601	1607	1611	1611	1608	1606	1606
25	1548	1544	1538	1536	1532	1531	1528	1528	1529	1532	1534	1539	1544	1548	1548	1548	1547
30	1475	1472	1468	1461	1455	1452	1450	1452	1455	1459	1463	1466	1470	1474	1475	1478	1476
35	1393	1389	1384	1379	1370	1367	1365	1367	1369	1374	1379	1383	1386	1391	1393	1394	1393
40	1296	1291	1283	1277	1271	1268	1266	1269	1270	1273	1276	1283	1288	1295	1299	1299	1298
45	1188	1182	1173	1163	1154	1152	1152	1156	1160	1163	1166	1170	1173	1180	1187	1190	1190
50	1070	1067	1057	1046	1033	1028	1028	1032	1039	1045	1048	1051	1054	1058	1064	1069	1072
55	942	936	926	913	903	896	896	900	908	913	917	919	924	927	934	938	940
60	799	795	784	771	761	756	756	759	767	772	775	778	782	789	795	800	801
65	655	649	639	626	616	611	611	615	621	626	628	631	636	643	650	655	656
70	510	503	492	480	471	467	468	472	476	481	482	486	492	499	507	512	510
75	371	366	354	342	334	330	331	336	340	344	346	348	354	361	369	374	373
80	241	234	224	212	203	200	201	206	212	214	216	218	222	229	235	241	241
85	119	112	104	96	89	86	85	88	94	96	98	102	106	111	115	119	120
90	14	12	11	10	8	6	4	3	4	5	9	12	15	16	16	16	15
95	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
100	2	2	2	1	2	2	1	2	2	1	2	2	1	2	1	2	2
105	1	2	2	1	2	2	1	2	2	2	1	2	1	2	2	2	2
110	2	2	2	1	2	2	1	2	2	2	1	2	1	2	2	1	2
115	2	2	2	1	1	1	1	2	2	2	1	1	1	2	2	1	2
120	2	2	2	1	1	1	1	1	2	2	2	2	1	1	2	2	2
125	2	2	2	1	2	1	2	2	2	2	2	2	1	1	2	2	2
130	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
135	3	3	3	2	2	2	2	2	3	2	2	2	2	2	2	2	3
140	3	3	3	3	2	2	3	2	3	3	3	2	2	2	3	2	2
145	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
150	3	4	3	4	4	3	3	3	4	4	3	4	4	3	4	4	3
155	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
160	4	4	5	4	5	4	5	4	4	5	5	4	5	4	4	5	4
165	5	5	5	5	6	6	5	5	5	5	6	5	6	5	5	5	5
170	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
175	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6
180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

Goniophotometer Test

Model No.	55752-40W-50K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
24.8	120.09	60	0.3424	40.80	0.9923	4.54%	Horizontal

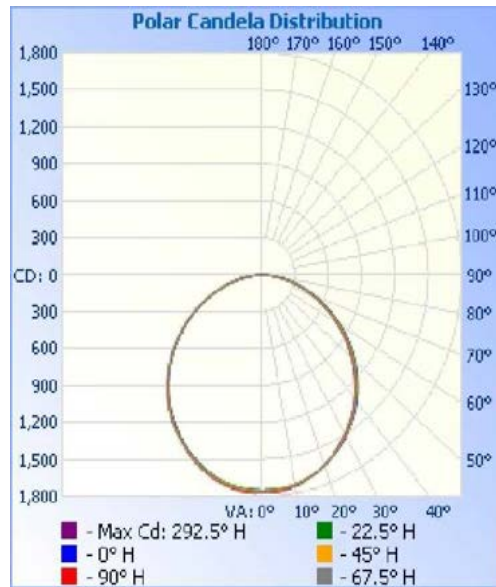
Test Results

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	
5159.7	77.90%	N/A	113.2	113.9	126.46

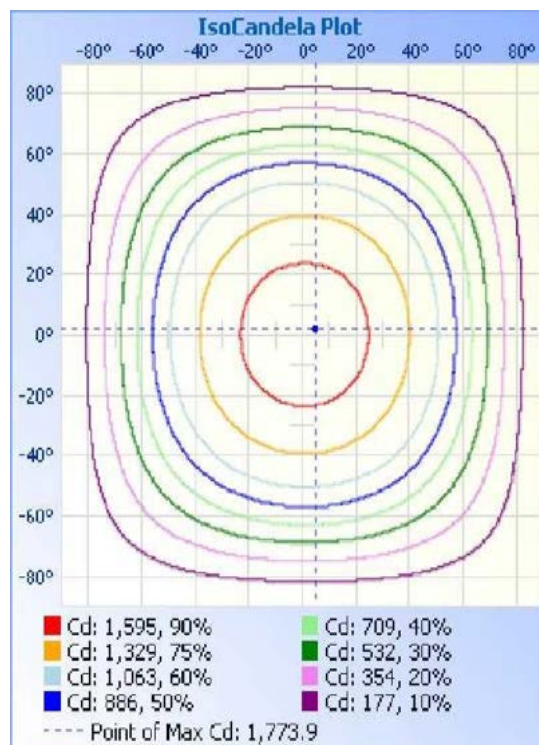
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
20.2	19.6	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	1374.7	26.60%
0-40	2259.8	43.80%
0-60	4021.4	77.90%
60-90	1123.8	21.80%
70-100	489.1	9.50%
90-120	5.5	0.10%
0-90	5145.2	99.70%
90-180	14.5	0.30%
0-180	5159.7	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	42.0	0.80%	90-95	1.6	0.00%
5-10	125.0	2.40%	95-100	1.0	0.00%
10-15	203.8	3.90%	100-105	0.8	0.00%
15-20	275.6	5.30%	105-110	0.7	0.00%
20-25	338.3	6.60%	110-115	0.7	0.00%
25-30	390.0	7.60%	115-120	0.7	0.00%
30-35	429.7	8.30%	120-125	0.7	0.00%
35-40	455.4	8.80%	125-130	0.8	0.00%
40-45	464.9	9.00%	130-135	0.9	0.00%
45-50	458.9	8.90%	135-140	1.0	0.00%
50-55	437.6	8.50%	140-145	0.9	0.00%
55-60	400.1	7.80%	145-150	0.9	0.00%
60-65	349.3	6.80%	150-155	0.9	0.00%
65-70	287.9	5.60%	155-160	0.9	0.00%
70-75	221.1	4.30%	160-165	0.8	0.00%
75-80	152.8	3.00%	165-170	0.7	0.00%
80-85	86.2	1.70%	170-175	0.4	0.00%
85-90	26.5	0.50%	175-180	0.1	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	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755	1755
1	1750	1747	1755	1762	1767	1763	1757	1751	1748	1748	1754	1763	1768	1764	1758	1753	1750
2	1750	1747	1752	1763	1770	1767	1761	1753	1748	1747	1752	1764	1770	1770	1764	1756	1749
3	1749	1745	1751	1762	1770	1770	1764	1755	1747	1745	1752	1763	1771	1773	1768	1760	1750
4	1749	1745	1749	1760	1770	1771	1766	1755	1746	1743	1749	1761	1772	1774	1769	1760	1749
5	1748	1742	1745	1756	1767	1770	1765	1755	1745	1741	1746	1757	1770	1774	1771	1760	1747
6	1745	1740	1744	1752	1764	1768	1764	1753	1743	1738	1743	1754	1767	1772	1770	1760	1747
7	1745	1738	1740	1747	1759	1763	1762	1750	1741	1734	1741	1750	1764	1768	1767	1757	1746
8	1740	1733	1736	1742	1754	1758	1757	1747	1737	1731	1736	1745	1758	1764	1765	1753	1743
9	1739	1730	1733	1739	1746	1750	1750	1742	1733	1727	1732	1740	1751	1758	1758	1747	1738
10	1733	1726	1728	1734	1738	1745	1742	1735	1727	1722	1727	1736	1743	1752	1752	1743	1734
11	1729	1721	1724	1727	1732	1735	1736	1729	1721	1718	1721	1730	1738	1745	1745	1738	1730
12	1720	1715	1718	1722	1725	1729	1725	1721	1714	1710	1714	1724	1730	1736	1737	1730	1722
13	1713	1710	1711	1714	1718	1717	1718	1713	1707	1705	1709	1718	1725	1727	1728	1723	1716
14	1706	1703	1705	1708	1709	1709	1707	1702	1698	1698	1702	1710	1716	1718	1718	1714	1708
15	1698	1693	1697	1699	1699	1698	1696	1692	1688	1689	1695	1703	1709	1708	1710	1704	1700
16	1688	1686	1689	1690	1690	1687	1684	1680	1679	1679	1685	1693	1699	1699	1698	1695	1690
17	1680	1677	1680	1681	1680	1675	1672	1669	1669	1670	1677	1683	1689	1688	1687	1684	1681
18	1669	1668	1670	1671	1669	1664	1660	1658	1658	1660	1667	1675	1678	1677	1676	1673	1671
19	1659	1658	1660	1660	1657	1652	1648	1646	1647	1649	1657	1663	1667	1666	1663	1662	1661
20	1648	1647	1648	1648	1646	1640	1635	1634	1634	1638	1645	1653	1656	1656	1654	1651	1650
25	1587	1584	1580	1576	1574	1573	1570	1568	1571	1573	1577	1582	1586	1590	1592	1590	1588
30	1513	1511	1506	1499	1494	1491	1490	1490	1494	1498	1503	1504	1508	1513	1514	1515	1515
35	1427	1424	1419	1414	1406	1401	1400	1400	1404	1409	1416	1420	1423	1425	1428	1430	1428
40	1329	1322	1314	1307	1302	1299	1299	1300	1303	1307	1310	1315	1321	1326	1330	1332	1330
45	1214	1210	1200	1191	1182	1180	1180	1184	1188	1191	1194	1198	1203	1210	1216	1219	1219
50	1094	1091	1080	1069	1059	1052	1052	1056	1065	1070	1074	1076	1078	1083	1088	1094	1097
55	963	957	946	933	923	916	914	920	928	934	938	940	943	948	954	959	961
60	816	811	800	787	776	771	772	776	783	788	790	793	799	804	811	816	818
65	667	661	650	638	628	622	624	627	633	638	640	644	649	656	663	667	668
70	519	510	499	487	479	474	475	478	484	487	490	494	499	507	515	519	518
75	374	368	357	344	337	332	334	339	344	348	349	352	356	364	373	378	377
80	241	235	224	212	204	200	202	207	212	215	216	219	223	229	236	241	241
85	117	111	102	92	86	83	84	87	92	94	97	100	104	109	114	117	117
90	10	10	9	8	6	5	3	3	3	4	7	10	12	14	14	13	11
95	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
100	2	2	2	2	1	1	2	1	2	2	2	2	2	2	2	2	2
105	1	1	2	1	2	1	1	1	1	2	2	1	2	2	2	1	2
110	1	1	1	1	1	1	1	2	1	2	1	1	2	2	2	2	1
115	1	2	2	1	1	1	1	2	2	2	1	1	2	1	1	2	1
120	1	2	2	1	2	1	2	1	2	2	1	1	2	1	1	2	1
125	2	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	1
130	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
135	2	2	3	2	3	2	2	2	2	3	3	3	2	2	2	3	2
140	3	3	3	3	3	2	3	2	3	3	3	3	3	2	2	3	2
145	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3
150	3	3	4	4	4	3	3	3	3	3	3	3	4	3	3	3	3
155	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
160	4	4	5	4	5	4	4	4	5	4	4	5	5	4	4	5	5
165	5	5	5	6	5	5	6	5	6	5	5	5	5	5	5	5	5
170	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
175	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

THD and PF Test

Model No.	55752-40W-35K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.07	60	0.3392	40.42	0.9924	4.70%	Horizontal
25.6	277.06	60	0.1495	39.78	0.9602	13.99%	Horizontal

THD and PF Test

Model No.	55752-40W-40K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.09	60	0.3272	38.98	0.9920	4.79%	Horizontal
25.6	277.07	60	0.1447	38.39	0.9578	14.21%	Horizontal

THD and PF Test

Model No.	55752-40W-50K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.08	60	0.3423	40.79	0.9923	4.54%	Horizontal
25.6	277.12	60	0.1508	40.14	0.9605	13.95%	Horizontal

THD and PF Test

Model No.	55752-35W-35K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.10	60	0.2953	35.31	0.9954	5.10%	Horizontal
25.6	277.08	60	0.1339	35.32	0.9525	14.26%	Horizontal

THD and PF Test

Model No.	55752-30W-35K	Sample ID.	5819889
Operate time (Min.)	90	Stabilization time (Min.)	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
25.6	120.04	60	0.2515	30.05	0.9952	5.63%	Horizontal
25.6	277.10	60	0.1175	30.64	0.9411	14.61%	Horizontal

In-Situ Temperature Measurement Test

Model No.	55752-40W-35K	Sample ID.	5819889
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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
24.5	120.07	60	0.3392	40.42	0.9924	4.70%	Horizontal

Test Results (LEDs)

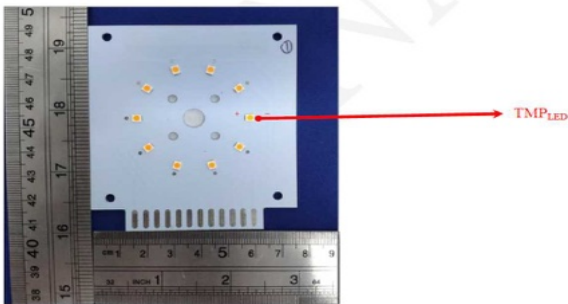
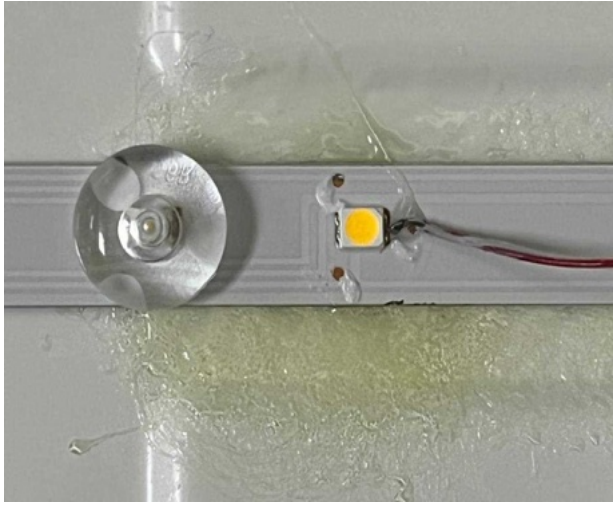
Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source (°C)		Max Chromaticity Shift (1000-6000h)	LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp (°C)
		Test Result	Test Result (Correct to 25 °C)				
Ambient TEMP	N/A	24.5	25.0				
TMP of Location 1	35	36.9	37.4	0.0016	BXEN-(A)E-13H-9RA	100	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	24.5	25.0		
TMP of Location 1	55.3	55.8	SIF 40-I1050 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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