



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

55759

Project Number

4790562779

Report Number

4790562779_11

Test Date

2022-09-24~2022-09-28

Issue Date

2022-10-12

Revision Date

N/A

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Approved By

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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/ft)-Luminaires	IES LM-79-2008	≥375	-10%	1182.61
Zonal Lumen Requirement 1(0°-60°)	IES LM-79-2008	≥40%	-3%	61.20%
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥115	-3%	127.05
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3508
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	4106
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	5059
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3501
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3496
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-1	81
Minimum R9	IES LM-79-2008	≥0	-1	4.0
Minimum Rf	IES LM-79-2008	≥70	-1	82
Minimum Rg	IES LM-79-2008	≥89	-1	97
Rcs,h1	IES LM-79-2008	-12%-23%	-1%	-12%
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	0.9593
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	10.78%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	51.7
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	66.4
Max Chromaticity Shift (1000-6000h)	N/A	≤0.004	0.0004	0.0022
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5



Test List

Sample Received Date: 2022-09-19

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2022-09-28	55759-45W-35K	Yang, Gavin X
Integrating Sphere Test	2022-09-28	55759-45W-40K	Yang, Gavin X
Integrating Sphere Test	2022-09-28	55759-45W-50K	Yang, Gavin X
Integrating Sphere Test	2022-09-28	55759-38W-35K	Yang, Gavin X
Integrating Sphere Test	2022-09-28	55759-34W-35K	Yang, Gavin X
Goniophotometer Test	2022-09-24	55759-45W-35K	Yang, Gavin X
Goniophotometer Test	2022-09-24	55759-45W-50K	Yang, Gavin X
THD and PF Test	2022-09-24	55759-45W-35K	Yang, Gavin X
THD and PF Test	2022-09-24	55759-45W-40K	Yang, Gavin X
THD and PF Test	2022-09-24	55759-45W-50K	Yang, Gavin X
THD and PF Test	2022-09-24	55759-38W-35K	Yang, Gavin X
THD and PF Test	2022-09-24	55759-34W-35K	Yang, Gavin X
In-Situ Temperature Measurement Test	2022-09-28	55759-45W-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: Direct Linear Ambient Luminaires

Model Number: 55759

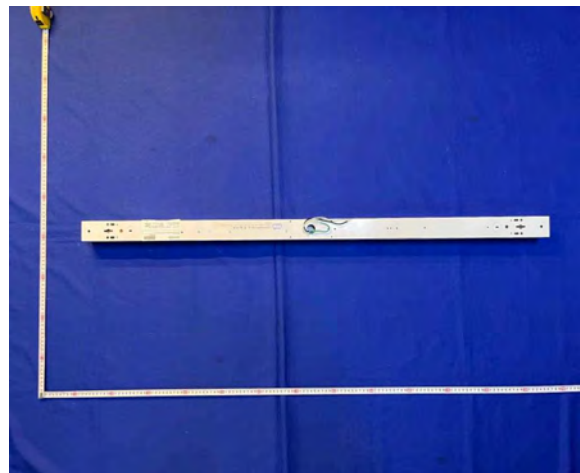
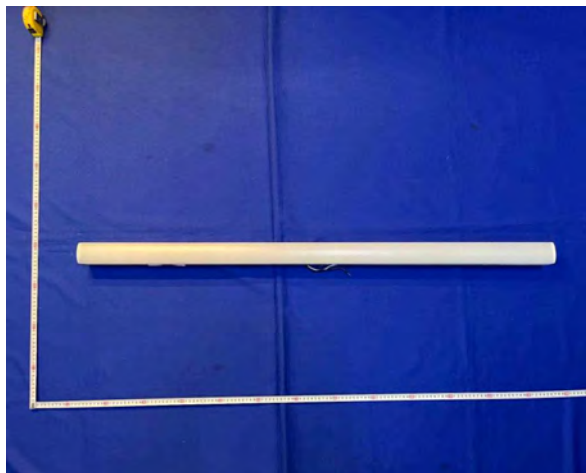
Electrical Parameter: 120-277V, 50/60Hz

LED Package: BXEN-(A)E-11M-3AA

Dimming Information: Continuous dimming capability

Products Scaled Value

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
55759-45W-35K	3500K	5850	45	130
55759-45W-40K	4000K	6300	45	140
55759-45W-50K	5000K	5940	45	132
55759-38W-35K	3500K	5054	38	133
55759-38W-40K	4000K	5434	38	143
55759-38W-50K	5000K	5130	38	135
55759-34W-35K	3500K	4624	34	136
55759-34W-40K	4000K	4964	34	146
55759-34W-50K	5000K	4692	34	138





Integrating Sphere Test

Model No.	55759-45W-35K	Sample ID.	5350101
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 assumed 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 omnidirectional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

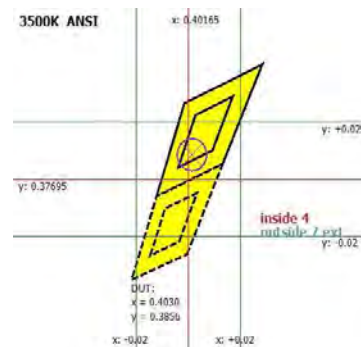
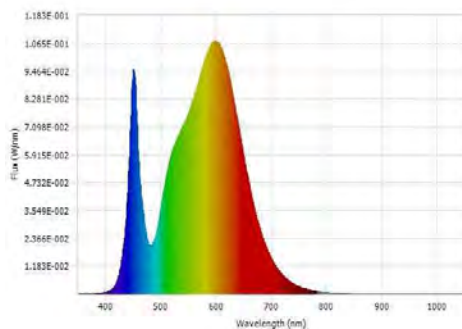
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions were using 4π geometry. The self-absorption 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
25.0	119.96	60	0.3924	46.792	0.9942	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3508	81	4.0	-0.0018	5999.68	128.22	1499.92



Luminous Flux (lm)	5999.68	Chrom x	0.4030
Chrom y	0.3856	Chrom u	0.2364
Chrom v	0.3392	Duv	-0.0018
Chrom u'	0.2364	Chrom v'	0.5088
CCT (K)	3508	Luminous Efficacy (lm/W)	128.22
Ra	81	R1	80.0
R2	88.0	R3	94.0
R4	80.0	R5	80.0
R6	83.0	R7	84.0
R8	61.0	R9	4.0
R10	71.0	R11	79.0
R12	63.0	R13	81.0
R14	97.0	R15	73.0
Rf	82	Rg	97
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

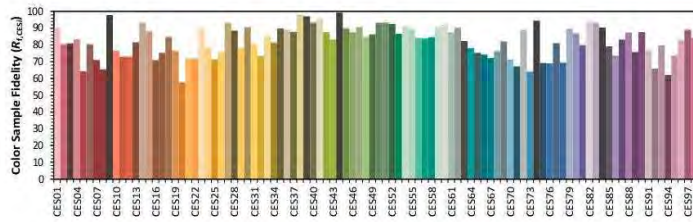
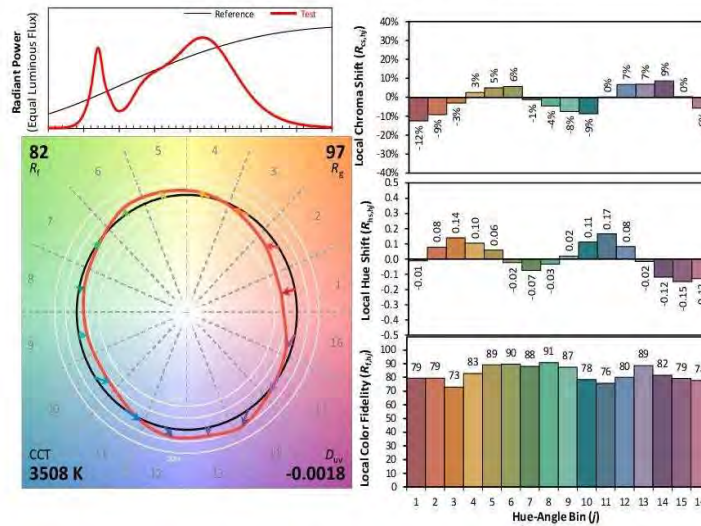
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-11M-3AA

Manufacturer: P.Q.L., Inc.

Date: 9/28/2022

Model: 55759-45W-35K



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

x 0.4030
y 0.3856
u' 0.2364
v' 0.5088

CIE 13.3-1995
(CRI)
 R_a 81
 R_g 4

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



Integrating Sphere Test

Model No.	55759-45W-40K	Sample ID.	5350101
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 assumed 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 omnidirectional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

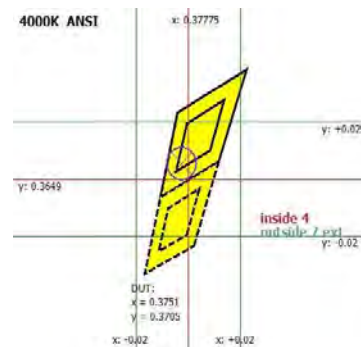
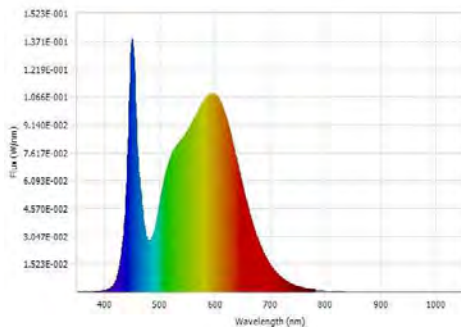
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions were using 4π geometry. The self-absorption 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
25.0	119.99	60	0.3741	44.64	0.9946	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4106	83	12.0	-0.0013	6589.85	147.62	1647.46



Luminous Flux (lm)	6589.85	Chrom x	0.3751
Chrom y	0.3705	Chrom u	0.2241
Chrom v	0.3320	Duv	-0.0013
Chrom u'	0.2241	Chrom v'	0.4980
CCT (K)	4106	Luminous Efficacy (lm/W)	147.62
Ra	83	R1	82.0
R2	88.0	R3	93.0
R4	83.0	R5	82.0
R6	83.0	R7	86.0
R8	67.0	R9	12.0
R10	71.0	R11	82.0
R12	61.0	R13	83.0
R14	96.0	R15	76.0
Rf	83	Rg	97
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

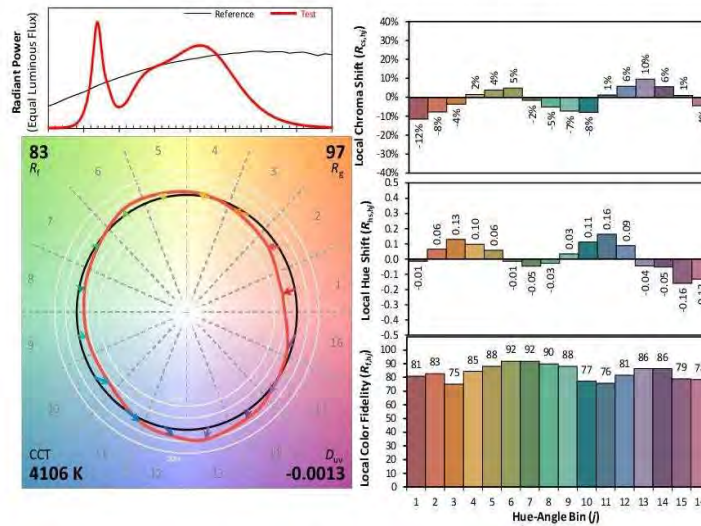
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-11M-3AA

Manufacturer: P.Q.L., Inc.

Date: 9/28/2022

Model: 55759-45W-40K



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

x 0.3751
 y 0.3705
 u' 0.2240
 v' 0.4980

CIE 13.3-1995
 (CRI)
 R_a 83
 R_g 12

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



Integrating Sphere Test

Model No.	55759-45W-50K		Sample ID.	5350101
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 assumed 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 omnidirectional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

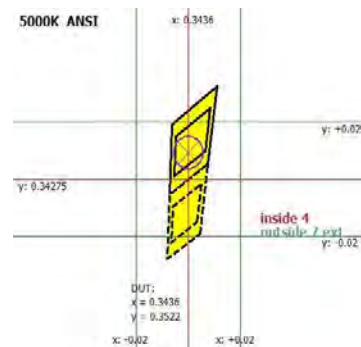
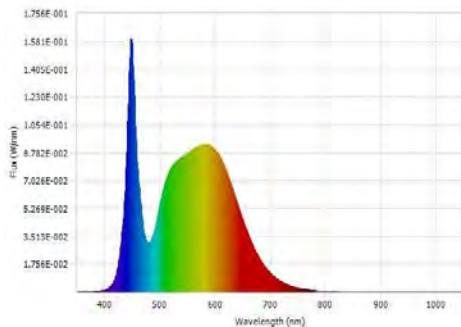
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions were using 4π geometry. The self-absorption 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
25.0	119.95	60	0.3993	47.618	0.9941	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
5059	82	10.0	0.0009	6173.01	129.64	1543.25



Luminous Flux (lm)	6173.01	Chrom x	0.3436
Chrom y	0.3522	Chrom u	0.2102
Chrom v	0.3232	Duv	0.0009
Chrom u'	0.2102	Chrom v'	0.4847
CCT (K)	5059	Luminous Efficacy (lm/W)	129.64
Ra	82	R1	81.0
R2	86.0	R3	89.0
R4	84.0	R5	82.0
R6	81.0	R7	86.0
R8	69.0	R9	10.0
R10	66.0	R11	84.0
R12	64.0	R13	82.0
R14	94.0	R15	76.0
Rf	82	Rg	99
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

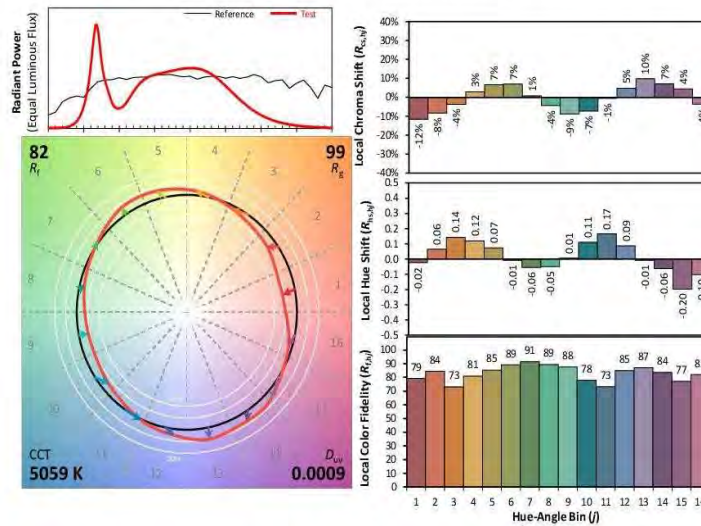
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-11M-3AA

Manufacturer: P.Q.L., Inc.

Date: 9/28/2022

Model: 55759-45W-50K



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

x 0.3436
 y 0.3522
 u' 0.2102
 v' 0.4847

CIE 13.3-1995
 (CRI)
 R_a 82
 R_g 10

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



Integrating Sphere Test

Model No.	55759-38W-35K		Sample ID.	5350101
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 assumed 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 omnidirectional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

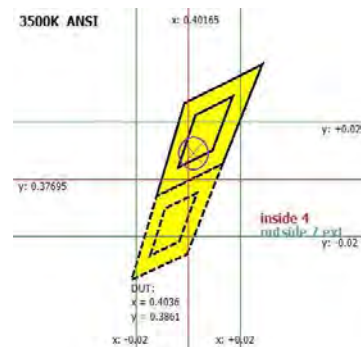
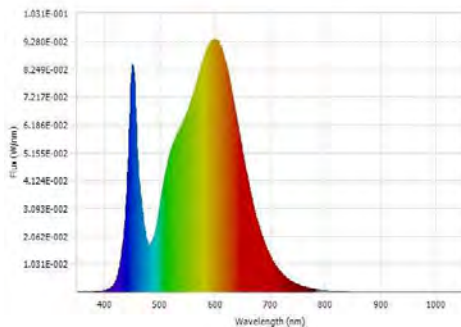
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions were using 4π geometry. The self-absorption 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
25.0	120	60	0.3251	38.692	0.9919	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3501	81	4.0	-0.0016	5225.95	135.07	1306.49



Luminous Flux (lm)	5225.95	Chrom x	0.4036
Chrom y	0.3861	Chrom u	0.2365
Chrom v	0.3394	Duv	-0.0016
Chrom u'	0.2365	Chrom v'	0.5091
CCT (K)	3501	Luminous Efficacy (lm/W)	135.07
Ra	81	R1	80.0
R2	88.0	R3	94.0
R4	80.0	R5	80.0
R6	84.0	R7	84.0
R8	61.0	R9	4.0
R10	72.0	R11	79.0
R12	63.0	R13	82.0
R14	97.0	R15	73.0
Rf	82	Rg	97
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

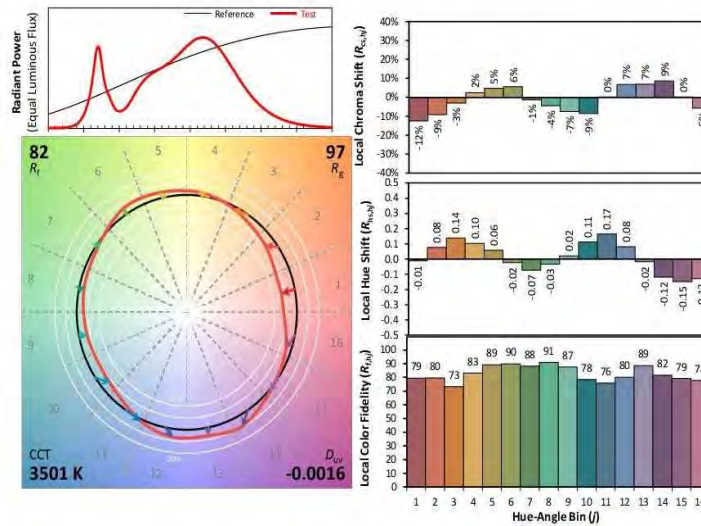
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-11M-3AA

Manufacturer: P.Q.L., Inc.

Date: 9/28/2022

Model: 55759-38W-35K



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

x 0.4036
 y 0.3861
 u' 0.2365
 v' 0.5091

CIE 13.3-1995
 (CRI)
 R_a 81
 R_g 4

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



Integrating Sphere Test

Model No.	55759-34W-35K		Sample ID.	5350101
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 assumed 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 omnidirectional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.

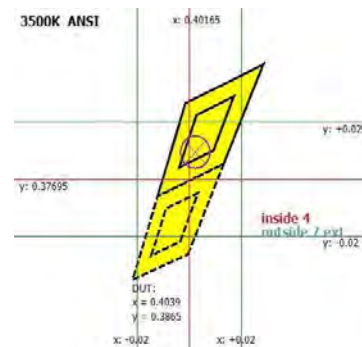
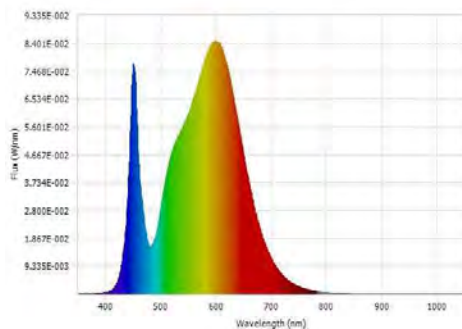
3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions were using 4π geometry. The self-absorption 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
25.0	120.03	60	0.2858	33.956	0.9898	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3496	81	4.0	-0.0016	4730.45	139.31	1182.61



Luminous Flux (lm)	4730.45	Chrom x	0.4039
Chrom y	0.3865	Chrom u	0.2365
Chrom v	0.3395	Duv	-0.0016
Chrom u'	0.2365	Chrom v'	0.5093
CCT (K)	3496	Luminous Efficacy (lm/W)	139.31
Ra	81	R1	80.0
R2	88.0	R3	94.0
R4	80.0	R5	80.0
R6	84.0	R7	84.0
R8	61.0	R9	4.0
R10	72.0	R11	79.0
R12	62.0	R13	82.0
R14	97.0	R15	73.0
Rf	82	Rg	97
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

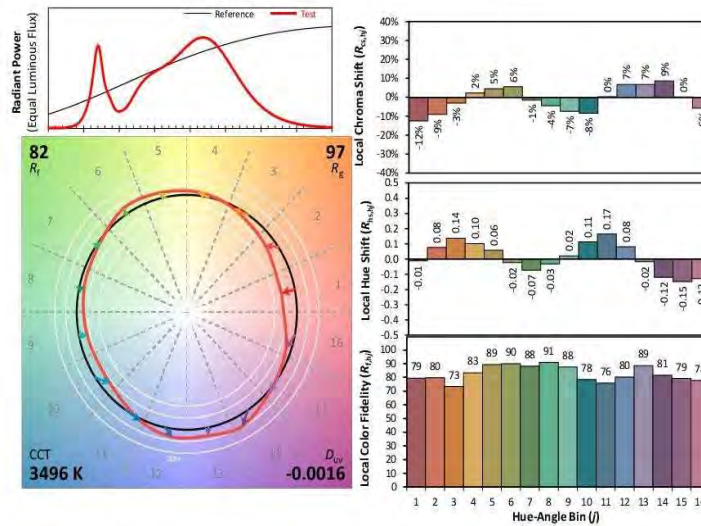
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-11M-3AA

Manufacturer: P.Q.L., Inc.

Date: 9/28/2022

Model: 55759-34W-35K



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

x 0.4039
y 0.3865
u' 0.2365
v' 0.5093

CIE 13.3-1995
(CRI)
 R_a 81
 R_g 4

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



Goniophotometer Test

Model No.	55759-45W-35K	Sample ID.	5350101
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
25.3	120.08	60	0.3920	46.82	0.9948	7.91%	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	
5948.4	61.30%	N/A	136.1	109.6	127.05

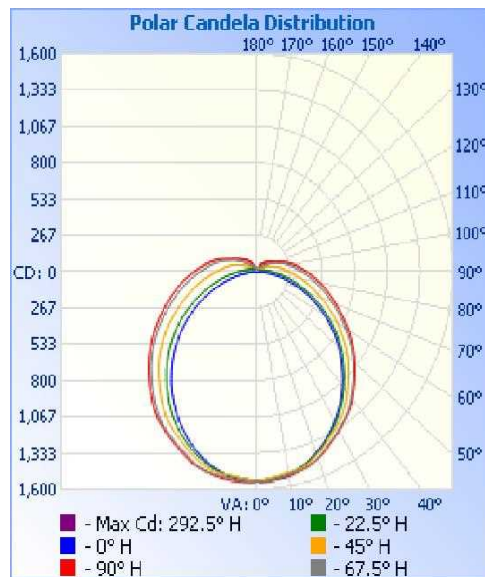
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
N/A	N/A	N/A	N/A

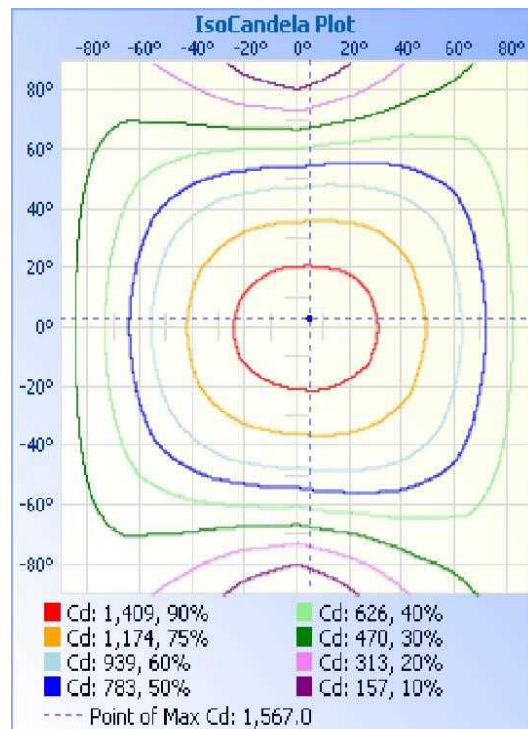


Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot





Goniophotometer Test (Cont'd)
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1210.3	20.30%
0-40	2000.1	33.60%
0-60	3647.6	61.30%
60-90	1580.0	26.60%
70-100	1150.7	19.30%
90-120	544.6	9.20%
0-90	5227.6	87.90%
90-180	720.8	12.10%
0-180	5948.4	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	36.8	0.60%	90-95	138.2	2.30%
5-10	109.6	1.80%	95-100	117.2	2.00%
10-15	179.0	3.00%	100-105	97.8	1.60%
15-20	242.4	4.10%	105-110	78.8	1.30%
20-25	297.8	5.00%	110-115	62.4	1.00%
25-30	344.6	5.80%	115-120	50.3	0.80%
30-35	381.9	6.40%	120-125	40.4	0.70%
35-40	407.9	6.90%	125-130	32.6	0.50%
40-45	421.0	7.10%	130-135	26.1	0.40%
45-50	422.5	7.10%	135-140	21.2	0.40%
50-55	412.5	6.90%	140-145	17.0	0.30%
55-60	391.5	6.60%	145-150	13.4	0.20%
60-65	361.2	6.10%	150-155	9.8	0.20%
65-70	323.5	5.40%	155-160	6.6	0.10%
70-75	283.4	4.80%	160-165	4.5	0.10%
75-80	242.7	4.10%	165-170	2.8	0.00%
80-85	202.9	3.40%	170-175	1.4	0.00%
85-90	166.3	2.80%	175-180	0.4	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	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537	1537
1	1536	1531	1533	1549	1549	1542	1537	1535	1533	1532	1535	1551	1550	1544	1536	1535	1533
2	1534	1531	1530	1549	1548	1548	1543	1538	1534	1530	1534	1551	1554	1551	1545	1538	1536
3	1534	1525	1526	1545	1549	1551	1547	1540	1531	1526	1530	1547	1552	1558	1551	1543	1534
4	1534	1522	1521	1541	1545	1556	1553	1540	1533	1524	1525	1545	1552	1563	1557	1544	1532
5	1530	1519	1515	1535	1541	1555	1553	1542	1531	1520	1521	1542	1551	1567	1559	1546	1532
6	1529	1516	1511	1532	1538	1555	1553	1541	1528	1519	1517	1538	1548	1565	1561	1547	1529
7	1527	1513	1507	1527	1534	1551	1550	1538	1526	1520	1513	1538	1549	1566	1563	1546	1526
8	1524	1512	1502	1524	1529	1547	1548	1533	1521	1515	1510	1535	1548	1560	1558	1542	1523
9	1520	1509	1498	1516	1528	1542	1541	1529	1516	1516	1508	1532	1545	1558	1556	1536	1518
10	1514	1505	1498	1515	1523	1532	1533	1523	1510	1512	1510	1528	1544	1551	1550	1531	1511
11	1507	1500	1495	1509	1520	1526	1525	1515	1504	1506	1510	1530	1541	1546	1543	1524	1507
12	1501	1496	1492	1508	1512	1519	1516	1507	1496	1503	1511	1526	1537	1540	1535	1517	1499
13	1492	1488	1491	1504	1508	1509	1503	1498	1490	1494	1508	1528	1535	1533	1526	1508	1491
14	1482	1481	1488	1502	1502	1501	1495	1486	1479	1489	1506	1526	1531	1528	1517	1498	1483
15	1474	1474	1481	1501	1494	1493	1484	1476	1469	1482	1502	1526	1528	1522	1507	1488	1474
16	1465	1462	1475	1496	1488	1485	1471	1464	1459	1473	1497	1525	1523	1516	1497	1478	1462
17	1453	1453	1467	1490	1484	1475	1459	1451	1448	1463	1488	1522	1518	1508	1486	1464	1452
18	1441	1442	1455	1481	1476	1468	1450	1439	1437	1452	1480	1514	1515	1502	1477	1453	1439
19	1428	1433	1443	1471	1469	1460	1437	1426	1426	1443	1469	1506	1511	1497	1468	1442	1428
20	1415	1424	1432	1457	1459	1451	1427	1415	1413	1434	1459	1497	1506	1492	1458	1431	1415
25	1349	1355	1370	1395	1404	1400	1375	1350	1347	1375	1406	1443	1461	1454	1416	1372	1348
30	1270	1285	1308	1340	1349	1338	1314	1281	1269	1309	1355	1403	1414	1403	1364	1307	1270
35	1186	1202	1239	1282	1285	1272	1235	1197	1182	1231	1295	1356	1368	1348	1294	1228	1185
40	1090	1109	1149	1200	1214	1201	1152	1105	1088	1140	1215	1285	1310	1288	1222	1143	1091
45	986	1008	1059	1114	1130	1113	1063	1007	983	1045	1129	1207	1233	1209	1141	1054	989
50	879	906	968	1030	1046	1021	960	899	872	946	1046	1130	1155	1124	1046	953	879
55	765	796	867	938	958	930	854	782	753	837	952	1045	1075	1041	949	841	764
60	640	680	764	842	866	838	754	667	628	723	852	954	988	954	854	732	642
65	517	559	659	746	773	742	650	549	501	604	749	861	899	862	753	618	516
70	395	446	558	654	686	653	555	436	377	491	648	771	813	775	658	508	394
75	275	344	470	572	608	575	469	336	259	388	559	688	732	694	571	405	277
80	169	252	392	499	537	501	392	246	151	294	478	610	657	616	487	311	169
85	74	178	322	430	470	432	322	175	59	214	402	535	584	542	411	229	74
90	17	124	262	368	408	369	263	122	11	152	333	466	514	470	343	166	18
95	12	93	220	318	354	319	221	94	10	116	281	408	453	410	289	126	12
100	11	68	186	276	309	278	189	70	10	86	239	357	398	359	247	92	12
105	11	54	148	234	265	236	151	59	10	66	193	305	344	308	202	75	11
110	12	41	111	192	219	194	125	53	10	51	143	249	285	252	164	65	12
115	12	35	81	160	181	162	108	49	10	42	107	206	235	211	140	60	12
120	12	32	63	124	154	139	96	46	11	38	85	159	199	179	121	56	12
125	12	31	54	93	132	120	85	42	11	37	71	122	170	152	105	52	12
130	13	32	48	71	114	103	75	39	11	36	61	95	143	129	92	47	13
135	14	31	44	54	99	92	67	36	12	35	56	72	122	112	81	43	14
140	15	31	43	44	86	80	61	33	13	33	53	57	106	98	73	40	15
145	15	30	41	39	73	70	53	31	13	31	49	49	89	84	65	37	16
150	16	29	39	33	62	59	46	29	14	29	44	42	75	72	55	34	16
155	17	27	35	28	39	48	39	27	15	28	39	34	46	58	47	31	17
160	18	26	32	26	21	40	34	25	15	25	33	30	26	47	40	28	17
165	18	24	28	24	18	32	29	23	16	23	29	26	21	37	34	26	18
170	19	21	23	20	14	23	23	20	17	20	23	21	16	26	26	22	19
175	18	19	18	16	10	16	17	18	16	17	17	15	11	17	20	20	18
180	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13



Goniophotometer Test

Model No.	55759-45W-50K	Sample ID.	5350101
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
25.3	120.07	60	0.3987	47.613	0.9946	8.16%	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	
6148.5	61.20%	N/A	136.6	109.8	129.13

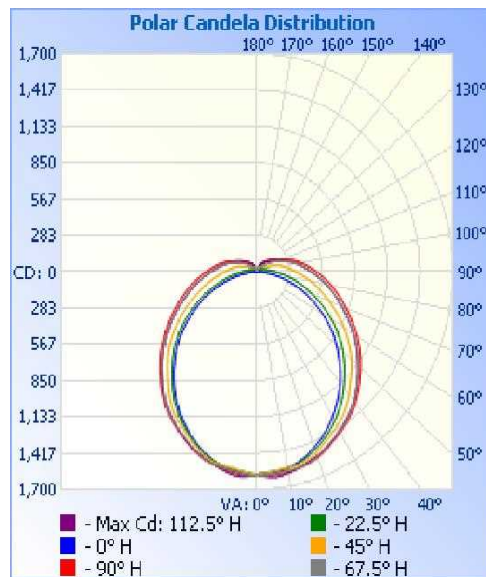
Backlight	Uplight	Glare
N/A	N/AN/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
N/A	N/A	N/A	N/A

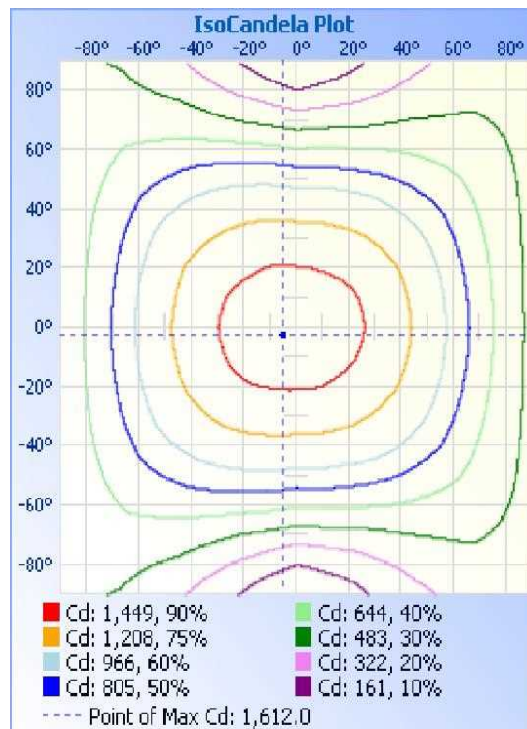


Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot





Goniophotometer Test (Cont'd)
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1247.4	20.30%
0-40	2062.6	33.50%
0-60	3765.0	61.20%
60-90	1636.3	26.60%
70-100	1192.9	19.40%
90-120	565.1	9.20%
0-90	5401.2	87.80%
90-180	747.3	12.20%
0-180	6148.5	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	37.9	0.60%	90-95	143.6	2.30%
5-10	112.9	1.80%	95-100	121.6	2.00%
10-15	184.4	3.00%	100-105	101.6	1.70%
15-20	249.8	4.10%	105-110	81.7	1.30%
20-25	307.1	5.00%	110-115	64.6	1.10%
25-30	355.4	5.80%	115-120	52.0	0.80%
30-35	394.2	6.40%	120-125	41.8	0.70%
35-40	421.0	6.80%	125-130	33.7	0.50%
40-45	434.4	7.10%	130-135	27.0	0.40%
45-50	436.4	7.10%	135-140	21.9	0.40%
50-55	426.8	6.90%	140-145	17.6	0.30%
55-60	404.7	6.60%	145-150	13.8	0.20%
60-65	373.5	6.10%	150-155	10.2	0.20%
65-70	335.1	5.40%	155-160	6.8	0.10%
70-75	293.2	4.80%	160-165	4.7	0.10%
75-80	251.7	4.10%	165-170	2.9	0.00%
80-85	210.4	3.40%	170-175	1.4	0.00%
85-90	172.5	2.80%	175-180	0.4	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	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582	1582
1	1578	1577	1578	1594	1594	1588	1585	1582	1581	1579	1580	1595	1596	1588	1581	1578	1578
2	1578	1574	1576	1595	1598	1597	1593	1584	1580	1575	1576	1596	1597	1595	1588	1582	1575
3	1578	1571	1574	1593	1599	1602	1596	1588	1580	1570	1573	1593	1594	1600	1593	1586	1576
4	1577	1568	1570	1589	1594	1606	1604	1590	1579	1565	1566	1588	1593	1602	1599	1586	1576
5	1573	1565	1566	1586	1595	1611	1605	1591	1577	1564	1562	1581	1589	1605	1600	1588	1574
6	1572	1564	1561	1584	1592	1612	1607	1590	1576	1562	1556	1578	1587	1603	1600	1586	1573
7	1570	1563	1558	1583	1592	1608	1606	1587	1572	1560	1550	1574	1584	1602	1598	1586	1569
8	1568	1561	1553	1579	1590	1605	1603	1586	1568	1558	1545	1569	1580	1596	1594	1582	1568
9	1563	1559	1553	1577	1588	1598	1597	1581	1562	1554	1546	1564	1576	1591	1591	1576	1561
10	1557	1558	1553	1575	1589	1595	1591	1573	1557	1548	1543	1561	1572	1582	1584	1571	1556
11	1550	1552	1553	1574	1585	1588	1584	1566	1551	1545	1543	1558	1568	1574	1575	1563	1550
12	1542	1547	1553	1573	1583	1582	1576	1557	1543	1539	1540	1553	1563	1566	1566	1554	1543
13	1535	1541	1553	1572	1579	1578	1567	1550	1536	1532	1539	1552	1557	1558	1556	1545	1536
14	1527	1535	1551	1572	1575	1568	1558	1541	1526	1526	1535	1550	1550	1550	1546	1534	1529
15	1517	1526	1546	1570	1569	1563	1549	1530	1515	1516	1531	1549	1544	1543	1531	1523	1516
16	1506	1518	1540	1568	1563	1556	1538	1517	1504	1507	1520	1544	1538	1534	1520	1511	1506
17	1496	1508	1532	1563	1560	1548	1527	1506	1493	1498	1512	1537	1534	1526	1509	1499	1494
18	1484	1499	1522	1558	1555	1542	1517	1495	1481	1488	1502	1530	1528	1516	1499	1485	1482
19	1471	1487	1514	1547	1551	1536	1508	1482	1468	1477	1488	1520	1522	1510	1486	1473	1470
20	1458	1478	1503	1534	1544	1529	1498	1471	1457	1465	1478	1506	1514	1502	1478	1461	1458
25	1390	1418	1446	1482	1495	1489	1454	1410	1389	1402	1417	1446	1460	1455	1428	1397	1390
30	1311	1348	1391	1436	1448	1433	1395	1343	1308	1327	1356	1392	1402	1394	1364	1327	1310
35	1224	1269	1329	1386	1396	1376	1325	1262	1221	1244	1289	1336	1344	1330	1288	1243	1224
40	1127	1176	1246	1310	1333	1312	1247	1171	1122	1145	1196	1252	1272	1258	1205	1149	1125
45	1018	1080	1159	1231	1255	1229	1160	1075	1012	1042	1100	1163	1184	1166	1114	1052	1021
50	907	979	1074	1154	1176	1145	1064	972	902	938	1010	1078	1097	1076	1011	945	911
55	791	868	976	1067	1094	1059	964	856	780	822	905	983	1007	980	904	825	788
60	660	752	874	973	1005	968	865	738	650	699	795	881	911	882	797	706	662
65	532	631	769	878	913	875	763	624	522	576	686	785	820	786	692	590	535
70	408	513	666	783	823	784	664	509	393	454	581	691	730	693	591	470	406
75	285	408	574	699	741	701	576	402	270	348	490	604	648	612	502	364	286
80	171	311	492	620	665	621	492	308	160	256	412	530	576	535	421	271	174
85	75	225	410	542	589	544	411	224	62	180	339	458	504	464	347	194	74
90	15	160	339	470	518	473	342	162	13	127	279	396	440	400	287	137	16
95	11	119	284	410	454	412	288	123	13	98	235	345	386	347	241	104	11
100	10	85	240	356	397	360	245	91	13	74	202	301	338	302	207	78	11
105	10	66	191	302	340	306	197	75	12	59	164	257	292	260	169	64	11
110	11	48	140	242	278	248	161	67	13	46	122	212	242	216	138	56	11
115	10	40	102	202	229	207	138	62	13	39	93	176	201	180	119	52	11
120	11	36	78	156	194	176	121	57	13	36	74	137	172	153	104	48	12
125	11	35	65	116	165	150	106	53	13	36	63	105	147	131	90	45	12
130	12	36	57	87	142	128	94	48	14	35	56	82	124	112	80	41	12
135	13	35	52	66	122	113	83	44	15	33	50	63	106	98	71	38	12
140	13	34	51	52	105	98	75	41	16	32	48	50	93	85	65	35	13
145	14	33	48	46	89	85	65	39	16	31	45	44	79	74	57	33	14
150	14	30	44	38	75	72	56	36	17	29	42	38	66	63	48	30	14
155	16	29	40	32	50	57	48	33	18	27	37	31	39	51	41	28	15
160	16	27	36	30	26	48	42	30	18	26	32	28	24	42	36	26	16
165	16	25	30	26	21	39	35	27	19	24	28	24	20	34	30	23	17
170	17	22	24	21	16	28	27	24	19	21	23	20	15	24	23	20	17
175	18	18	19	16	11	18	21	20	20	18	18	15	10	16	17	18	17
180	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14



THD and PF Test

Model No.	55759-45W-35K	Sample ID.	5350101
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.08	60	0.3920	46.82	0.9948	7.91%	Horizontal
25.3	277.14	60	0.1716	46.33	0.9751	8.61%	Horizontal



THD and PF Test

Model No.	55759-45W-40K	Sample ID.	5350101
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.07	60	0.3730	44.59	0.9950	7.37%	Horizontal
25.3	277.13	60	0.1640	44.19	0.9726	8.95%	Horizontal



THD and PF Test

Model No.	55759-45W-50K	Sample ID.	5350101
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.10	60	0.3987	47.63	0.9946	8.14%	Horizontal
25.3	277.07	60	0.1740	47.03	0.9758	8.58%	Horizontal



THD and PF Test

Model No.	55759-38W-35K	Sample ID.	5350101
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
25.3	120.07	60	0.3251	38.72	0.9924	9.64%	Horizontal
25.3	277.04	60	0.1483	39.73	0.9670	9.15%	Horizontal



THD and PF Test

Model No.	55759-34W-35K	Sample ID.	5350101
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.3	120.09	60	0.2845	33.84	0.9903	10.78%	Horizontal
25.3	277.06	60	0.1342	35.76	0.9593	9.82%	Horizontal



In-Situ Temperature Measurement Test

Model No.	55759-45W-35K	Sample ID.	5350101
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Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL 1598-2008, Section 14.
2. The testing was conducted in a room with ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. 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 7.5 hours.
3. 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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
23.4	120.08	60	0.3920	46.82	0.9948	7.91%	Horizontal

Test Results (LEDs)

Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source ($^{\circ}\text{C}$)		Max Chromaticity Shift (1000-6000h)	LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp ($^{\circ}\text{C}$)
		Test Result	Test Result (Correct to $25\text{ }^{\circ}\text{C}$)				
Ambient TEMP	N/A	23.4	25.0				
TMP of Location 1	125	50.1	51.7	0.0022	BXEN-(A)E-11M-3AA	150	105

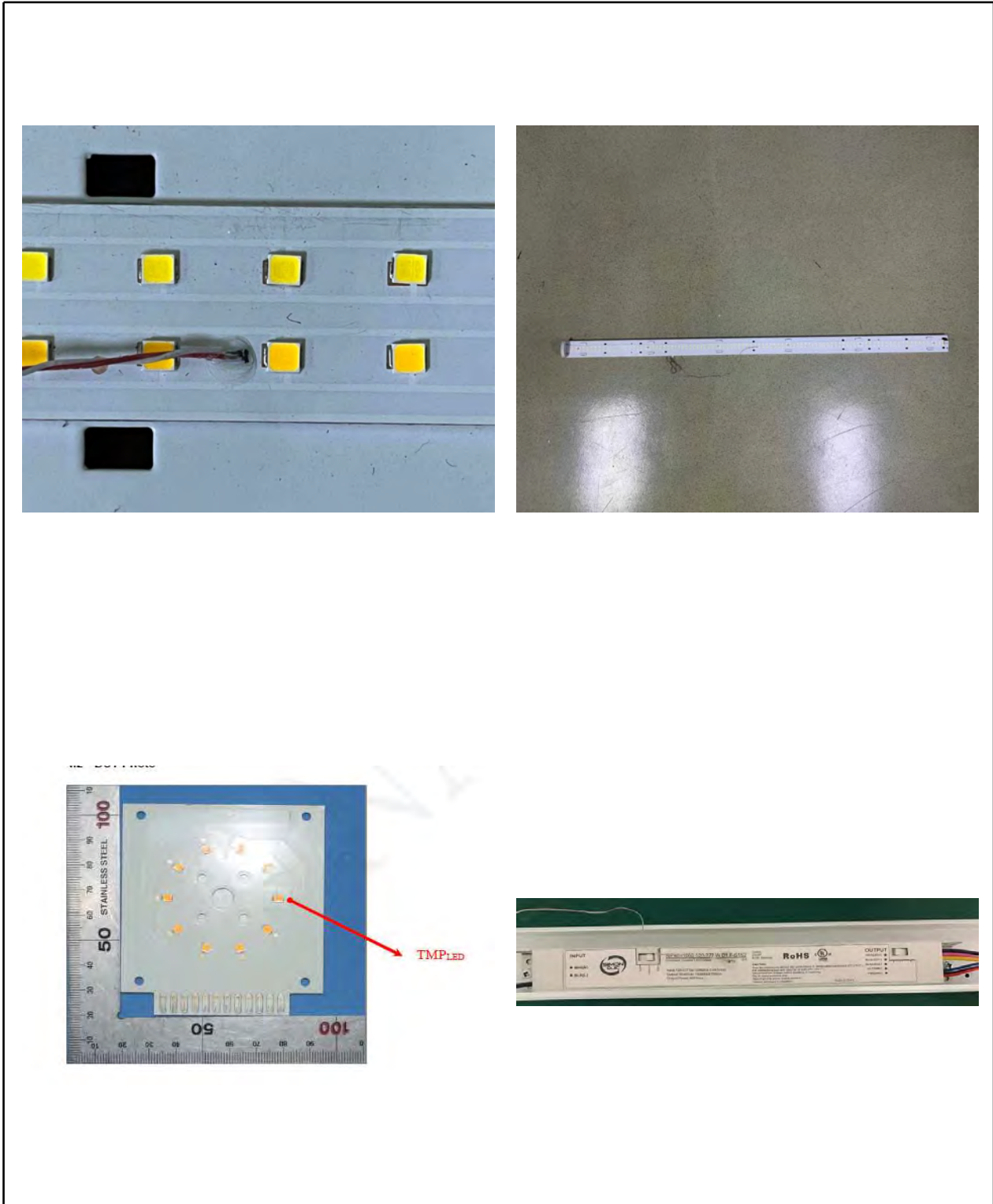
Test Results (Drivers)

Thermocouple Location	Temperature for Driver ($^{\circ}\text{C}$)		Driver Model Number	Driver Limit Temp ($^{\circ}\text{C}$)
	Test Result	Test Result (Correct to $25\text{ }^{\circ}\text{C}$)		
Ambient TEMP	23.4	25.0		
TMP of Location 1	64.8	66.4	SIF 40-I1000 120-277 W D1 F-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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