



DesignLights Consortium Test Report

Reference Standards

UL1598-2008

ANSI C82.77-10-2014

IES LM-79-2008

Prepared For

IK-AT14F-202530-CCT-D

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Test Laboratory:

UL-CCIC Company Limited

Test Laboratory Address:

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Catalog Number

IK-AT14F-202530-CCT-D

Project Number

4790110308

Report Number

4790110308_17

Test Date

2021-12-26

Issue Date

2022-01-12

Revision Date

N/A

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Wu, Elvis

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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	≥1500	-10%	2750.93
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥110	-3%	129.51
Spacing Criteria (0-180°)	IES LM-79-2008	1.0-2.0	±0.1	1.20
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%	80.30%
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3422
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	4073
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-1	83
Minimum R9	IES LM-79-2008	≥0	-1	8.0
Minimum Rg	IES LM-79-2008	≥89	-1	93
Minimum Rf	IES LM-79-2008	≥70	-1	82
Rcs,h1	IES LM-79-2008	-12%-23%	-1%	-12%
Unified Glare Rating (UGR)	IES LM-79-2008	≤22	N/A	21.6
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	0.9354
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	13.37%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	40.2
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	56.5
Max Chromaticity Shift (1000-6000h)	N/A	≤0.004	0.0004	0.0024
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5



Test List

Sample Received Date: 2021-12-07

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 30W	Yang, Gavin X
Integrating Sphere Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 840(A3+B3) 30W	Yang, Gavin X
Integrating Sphere Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3) 30W	Yang, Gavin X
Integrating Sphere Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 25W	Yang, Gavin X
Integrating Sphere Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 20W	Yang, Gavin X
Goniophotometer Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 30W	Yang, Gavin X
Goniophotometer Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3) 30W	Yang, Gavin X
THD and PF Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 30W	Yang, Gavin X
THD and PF Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 840(A3+B3) 30W	Yang, Gavin X
THD and PF Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3) 30W	Yang, Gavin X
THD and PF Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 25W	Yang, Gavin X
THD and PF Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 20W	Yang, Gavin X
In-Situ Temperature Measurement Test	2021-12-26	ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3) 30W	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: 1X4 Luminaires for Ambient Lighting of Interior Commercial Spaces

Model Number: ETLDI01B-14/NF/30/25/20/YDM/CCT 835(A3+B3)

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

LED Package: STW8A2PD-XX

Dimming Information: Continuous dimming capability

Products Scaled Value

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3)	3500k	3840	30	128
ETLDI01B-14/NF/30/25/20/YDM/ CCT 840(A3+B3)	4000k	3870	30	129
ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3)	5000k	3900	30	130
ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3)	3500k	3375	25	135
ETLDI01B-14/NF/30/25/20/YDM/ CCT 840(A3+B3)	4000k	3400	25	136
ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3)	5000k	3425	25	137
ETLDI01B-14/NF/30/25/20/YDM/ CCT 835(A3+B3)	3500k	2760	20	138
ETLDI01B-14/NF/30/25/20/YDM/ CCT 840(A3+B3)	4000k	2780	20	139
ETLDI01B-14/NF/30/25/20/YDM/ CCT 850(A3+B3)	5000k	2800	20	140

Photos of Products Characteristics





Integrating Sphere Test

Model No.	IK-AT14F-202530-CCT-D 3500 K (30 W)		Sample ID.	4472593
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

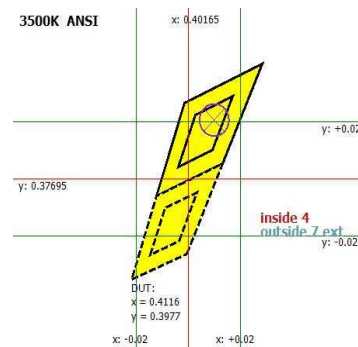
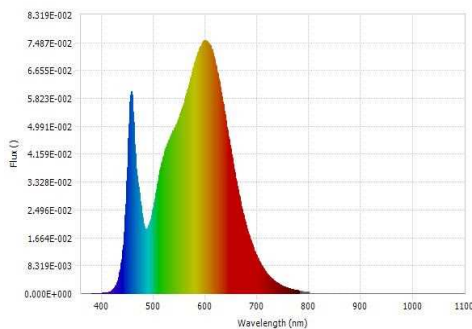
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 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional 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
24.8	119.98	60	0.2558	30.363	0.9892	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3422	83	8.0	0.0017	3979.12	131.05	N/A



Luminous Flux (lm)	3979.12	Chrom x	0.4116
Chrom y	0.3977	Chrom u	0.2369
Chrom v	0.3434	Duv	0.0017
Chrom u'	0.2369	Chrom v'	0.5151
CCT (K)	3422	Luminous Efficacy (lm/W)	131.05
Ra	83	R1	81.0
R2	91.0	R3	97.0
R4	79.0	R5	81.0
R6	88.0	R7	84.0
R8	61.0	R9	8.0
R10	78.0	R11	78.0
R12	62.0	R13	84.0
R14	99.0	R15	74.0
Rf	83	Rg	93
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

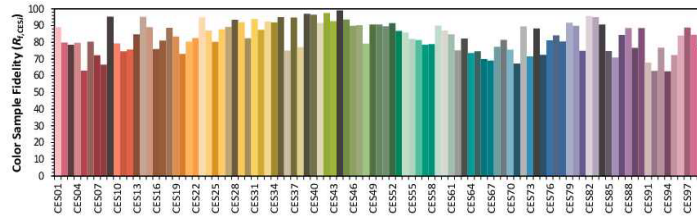
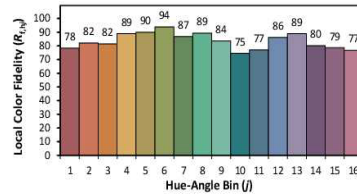
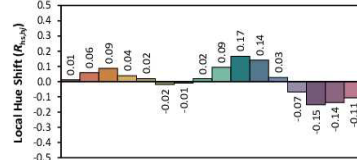
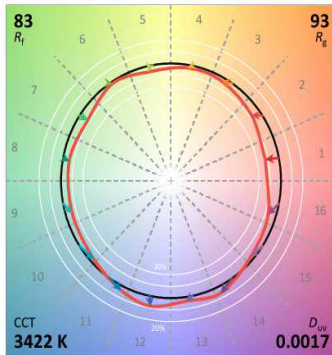
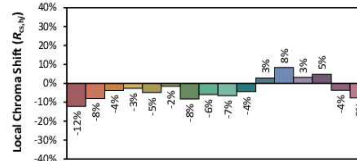
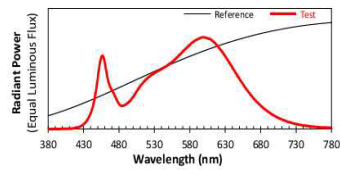
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-XX

Manufacturer: IKIO LED Lighting

Date: 12/26/2021

Model: IK-AT14F-202530-CCT-D
 3500 K (30 W)



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

x 0.4116
 y 0.3977
 u' 0.2369
 v' 0.5151

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

Model No.	IK-AT14F-202530-CCT-D 4000 K(30 W)		Sample ID.	4472593
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

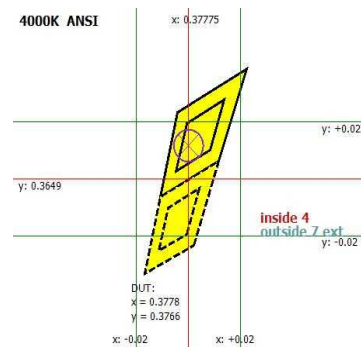
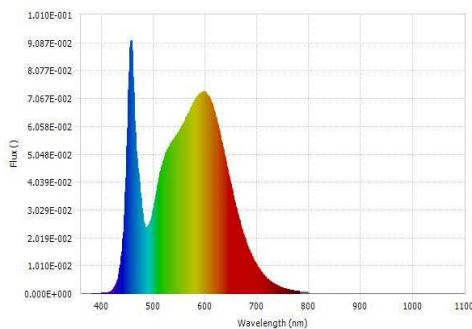
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 2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology P.R.China.
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Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.8	120	60	0.2451	29.088	0.9891	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4073	84	14.0	0.0007	4256.2	146.32	N/A



Luminous Flux (lm)	4256.2	Chrom x	0.3778
Chrom y	0.3766	Chrom u	0.2234
Chrom v	0.3341	Duv	0.0007
Chrom u'	0.2234	Chrom v'	0.5011
CCT (K)	4073	Luminous Efficacy (lm/W)	146.32
Ra	84	R1	83.0
R2	92.0	R3	96.0
R4	81.0	R5	82.0
R6	87.0	R7	86.0
R8	66.0	R9	14.0
R10	78.0	R11	79.0
R12	58.0	R13	85.0
R14	98.0	R15	77.0
Rf	83	Rg	93
Rcs,h1	-12%		



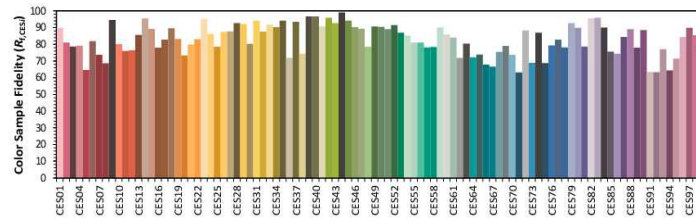
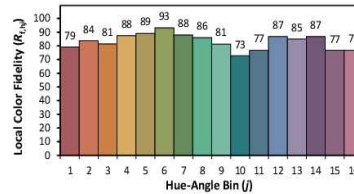
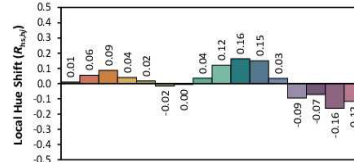
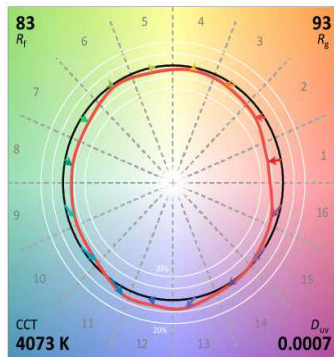
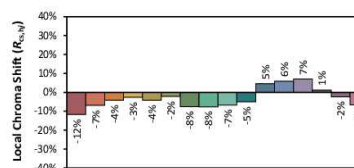
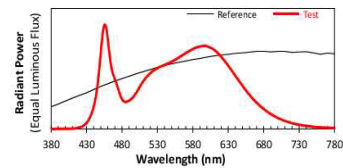
Integrating Sphere Test (Cont'd)

TM-30 Report

ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-XX
Date: 12/26/2021

Manufacturer: IKIO LED Lighting
Model: IK-AT14F-202530-CCT-D
4000 K (30 W)



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

x 0.3778
 y 0.3766
 u' 0.2234
 v' 0.5011

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 14

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



Integrating Sphere Test

Model No.	IK-AT14F-202530-CCT-D 5000 K(30 W)		Sample ID.	4472593
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

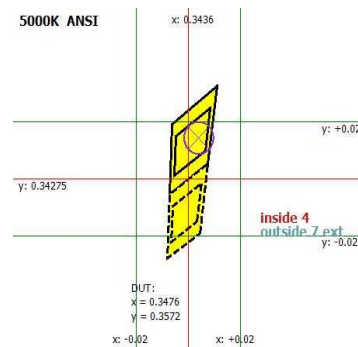
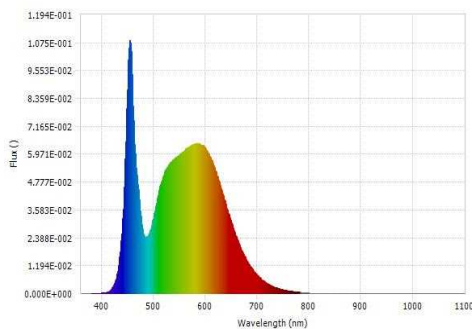
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Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.8	119.99	60	0.2544	30.19	0.9892	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4925	83	9.0	0.0018	4038.46	133.77	N/A



Luminous Flux (lm)	4038.46	Chrom x	0.3476
Chrom y	0.3572	Chrom u	0.2110
Chrom v	0.3252	Duv	0.0018
Chrom u'	0.2110	Chrom v'	0.4878
CCT (K)	4925	Luminous Efficacy (lm/W)	133.77
Ra	83	R1	81.0
R2	89.0	R3	93.0
R4	80.0	R5	80.0
R6	83.0	R7	87.0
R8	67.0	R9	9.0
R10	72.0	R11	78.0
R12	52.0	R13	83.0
R14	96.0	R15	76.0
Rf	82	Rg	95
Rcs,h1	-13%		



Integrating Sphere Test (Cont'd)

TM-30 Report

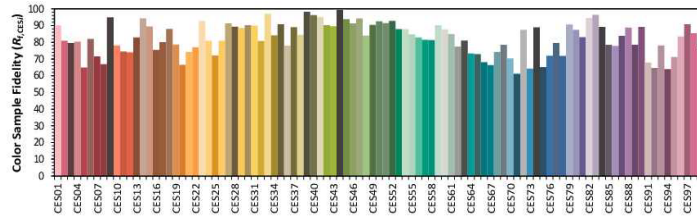
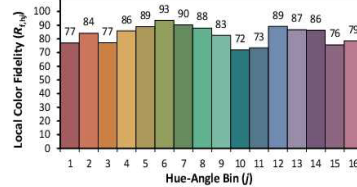
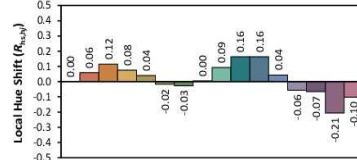
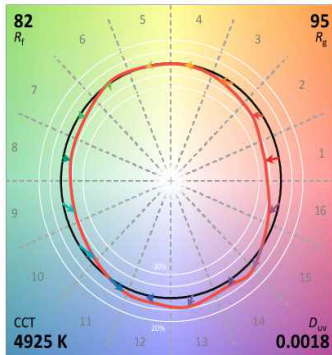
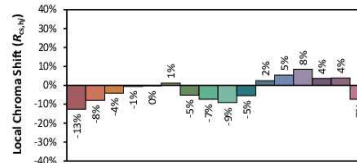
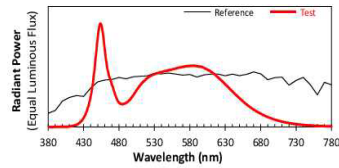
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-XX

Manufacturer: IKIO LED Lighting

Date: 12/26/2021

Model: IK-AT14F-202530-CCT-D
5000 K (30 W)



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

x 0.3476
y 0.3572
u' 0.2110
v' 0.4878

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.



Integrating Sphere Test

Model No.	IK-AT14F-202530-CCT-D 3500 K(25 W)		Sample ID.	4472593
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

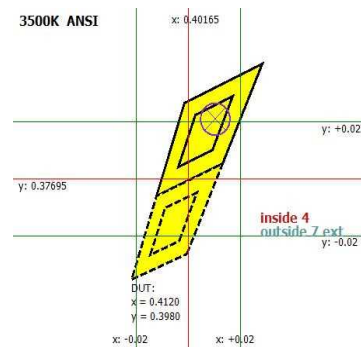
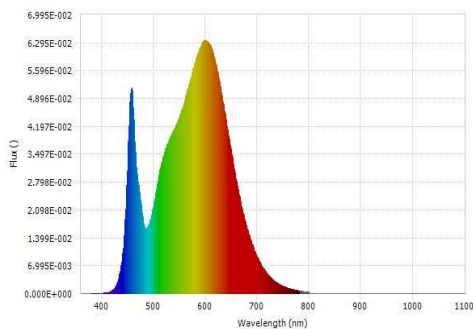
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Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.8	120.06	60	0.2072	24.514	0.9857	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3417	83	8.0	0.0017	3341.35	136.30	N/A



Luminous Flux (lm)	3341.35	Chrom x	0.4120
Chrom y	0.3980	Chrom u	0.2371
Chrom v	0.3435	Duv	0.0017
Chrom u'	0.2371	Chrom v'	0.5152
CCT (K)	3417	Luminous Efficacy (lm/W)	136.30
Ra	83	R1	82.0
R2	91.0	R3	97.0
R4	80.0	R5	81.0
R6	88.0	R7	84.0
R8	61.0	R9	8.0
R10	79.0	R11	78.0
R12	62.0	R13	84.0
R14	99.0	R15	74.0
Rf	83	Rg	93
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

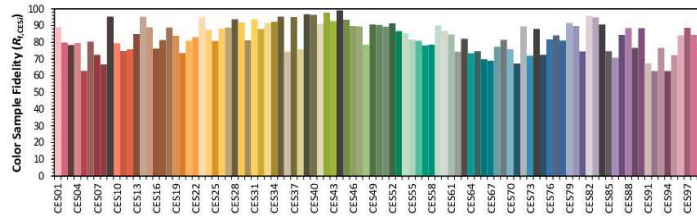
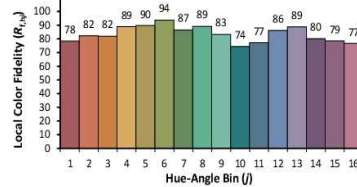
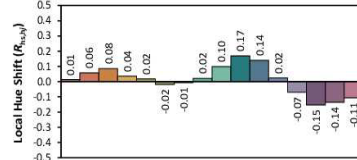
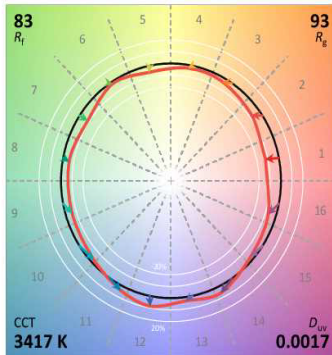
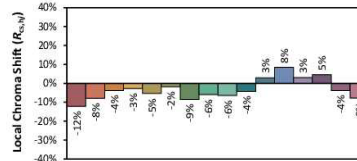
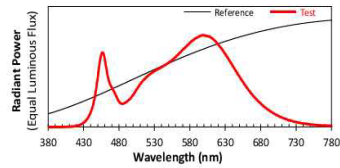
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-XX

Manufacturer: IKIO LED Lighting

Date: 12/26/2021

Model: IK-AT14F-202530-CCT-D
 3500 K (25 W)



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

x 0.4120
 y 0.3980
 u' 0.2371
 v' 0.5152

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

Model No.	IK-AT14F-202530-CCT-D 3500 K (20 W)		Sample ID.	4472593
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

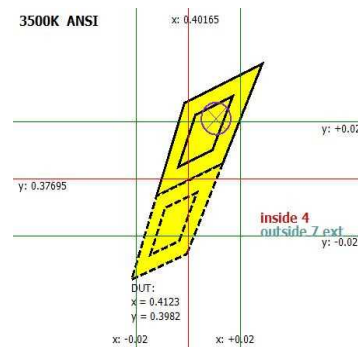
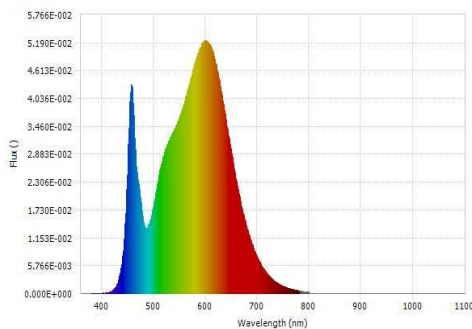
1. The sample was tested according to the IES LM-79-2008, and the product is assumed to be brand new without seasoning.
 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 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
24.8	120.09	60	0.1660	19.532	0.9795	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3412	83	9.0	0.0017	2750.93	140.84	N/A



Luminous Flux (lm)	2750.93	Chrom x	0.4123
Chrom y	0.3982	Chrom u	0.2372
Chrom v	0.3436	Duv	0.0017
Chrom u'	0.2372	Chrom v'	0.5153
CCT (K)	3412	Luminous Efficacy (lm/W)	140.84
Ra	83	R1	82.0
R2	92.0	R3	96.0
R4	80.0	R5	81.0
R6	89.0	R7	84.0
R8	61.0	R9	9.0
R10	79.0	R11	78.0
R12	62.0	R13	84.0
R14	99.0	R15	75.0
Rf	83	Rg	93
Rcs,h1	-12%		



Integrating Sphere Test (Cont'd)

TM-30 Report

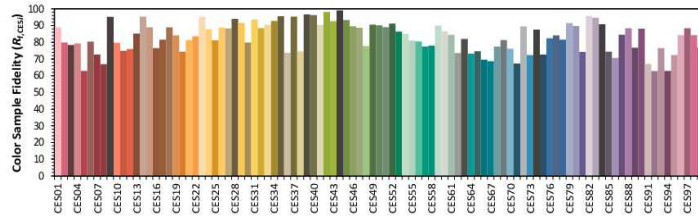
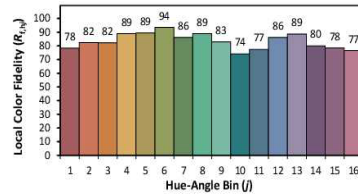
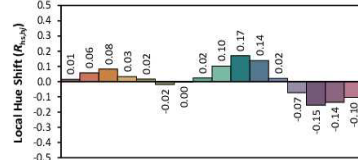
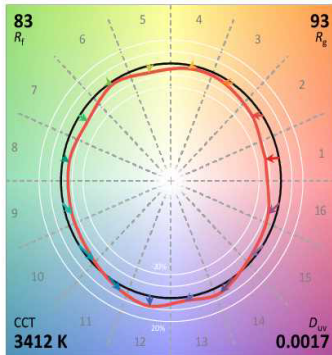
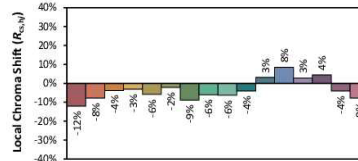
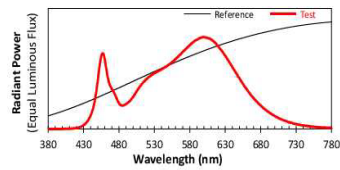
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-XX

Manufacturer: IKIO LED Lighting

Date: 12/26/2021

Model: IK-AT14F-202530-CCT-D
3500 K (20 W)



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

x 0.4123
 y 0.3982
 u' 0.2372
 v' 0.5153

CIE 13.3-1995
 (CRI)
 R_a 83
 R_9 9

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



Goniophotometer Test

Model No.	IK-AT14F-202530-CCT-D 3500 K (30 W)	Sample ID.	4472593
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
25.7	120.09	60	0.2551	30.35	0.9908	11.22%	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	
3930.5	80.50%	N/A	115.3	94.1	129.51

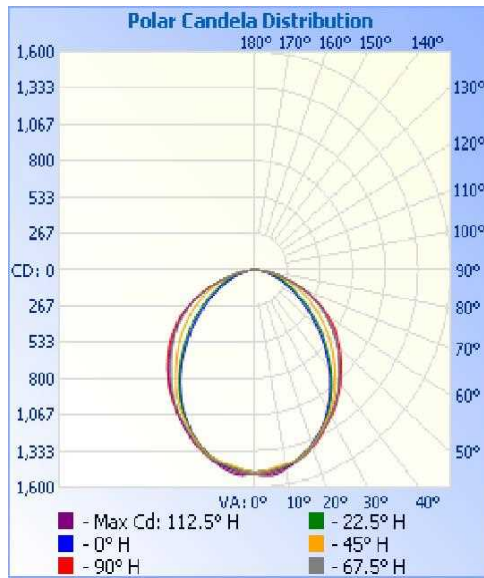
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
19	21.6	1.20	1.26

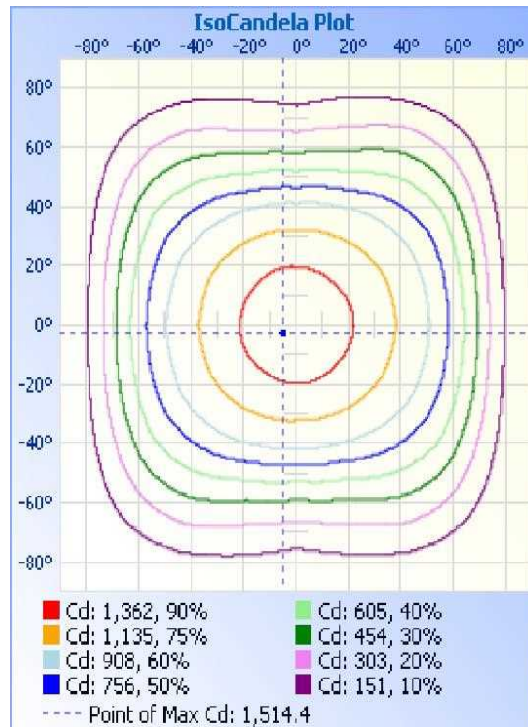


Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot





Goniophotometer Test (Cont'd)
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1140.3	29.00%
0-40	1842.3	46.90%
0-60	3157.4	80.30%
60-90	761.7	19.40%
70-100	308.5	7.80%
90-120	3.6	0.10%
0-90	3919.1	99.70%
90-180	11.4	0.30%
0-180	3930.5	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	35.7	0.90%	90-95	0.8	0.00%
5-10	105.9	2.70%	95-100	0.6	0.00%
10-15	171.7	4.40%	100-105	0.6	0.00%
15-20	230.3	5.90%	105-110	0.6	0.00%
20-25	279.1	7.10%	110-115	0.6	0.00%
25-30	317.6	8.10%	115-120	0.6	0.00%
30-35	344.3	8.80%	120-125	0.6	0.00%
35-40	357.6	9.10%	125-130	0.6	0.00%
40-45	356.8	9.10%	130-135	0.7	0.00%
45-50	344.8	8.80%	135-140	0.8	0.00%
50-55	322.7	8.20%	140-145	0.8	0.00%
55-60	290.8	7.40%	145-150	0.8	0.00%
60-65	251.0	6.40%	150-155	0.8	0.00%
65-70	203.6	5.20%	155-160	0.7	0.00%
70-75	150.9	3.80%	160-165	0.7	0.00%
75-80	96.9	2.50%	165-170	0.6	0.00%
80-85	48.5	1.20%	170-175	0.4	0.00%
85-90	10.7	0.30%	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	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491	1491
1	1486	1486	1488	1504	1506	1499	1490	1486	1486	1484	1487	1502	1504	1497	1489	1490	1486
2	1487	1484	1485	1500	1509	1503	1497	1491	1486	1482	1483	1499	1504	1503	1498	1492	1487
3	1489	1480	1482	1498	1508	1509	1502	1493	1485	1478	1479	1497	1503	1507	1502	1495	1489
4	1486	1479	1477	1493	1503	1512	1508	1496	1484	1473	1472	1490	1499	1512	1508	1497	1486
5	1487	1475	1470	1489	1499	1514	1509	1496	1483	1470	1465	1486	1496	1510	1508	1498	1487
6	1485	1474	1466	1484	1495	1514	1507	1495	1481	1468	1458	1481	1490	1508	1506	1497	1485
7	1482	1472	1459	1479	1491	1508	1506	1492	1478	1464	1453	1474	1485	1503	1504	1494	1482
8	1478	1470	1457	1474	1486	1502	1502	1487	1474	1463	1449	1466	1479	1497	1500	1490	1478
9	1472	1466	1455	1469	1480	1495	1494	1482	1467	1456	1445	1459	1475	1491	1494	1484	1472
10	1467	1463	1450	1462	1476	1482	1487	1475	1461	1453	1442	1453	1470	1481	1485	1478	1467
11	1460	1458	1449	1457	1468	1475	1474	1464	1453	1445	1439	1448	1462	1472	1475	1469	1460
12	1454	1452	1447	1452	1463	1465	1465	1458	1446	1441	1436	1444	1455	1462	1464	1461	1454
13	1445	1445	1445	1450	1452	1453	1452	1447	1436	1431	1431	1441	1448	1452	1452	1448	1445
14	1434	1437	1439	1445	1445	1446	1440	1435	1426	1424	1425	1434	1439	1442	1440	1439	1434
15	1425	1428	1432	1440	1436	1435	1427	1422	1415	1414	1418	1431	1430	1431	1427	1425	1425
16	1415	1416	1421	1434	1428	1422	1413	1407	1404	1401	1408	1424	1420	1420	1414	1412	1415
17	1402	1406	1410	1424	1420	1410	1399	1393	1392	1391	1398	1414	1412	1409	1402	1399	1402
18	1390	1396	1398	1412	1408	1400	1386	1380	1379	1379	1386	1403	1404	1398	1388	1385	1390
19	1377	1384	1384	1398	1400	1388	1374	1366	1366	1366	1371	1388	1394	1387	1376	1372	1377
20	1363	1370	1371	1383	1388	1377	1360	1351	1351	1353	1357	1373	1382	1376	1362	1358	1363
25	1285	1294	1295	1310	1317	1312	1295	1279	1270	1276	1280	1300	1312	1314	1300	1288	1285
30	1189	1202	1218	1239	1247	1237	1216	1188	1176	1183	1204	1232	1245	1241	1224	1200	1189
35	1076	1094	1130	1164	1174	1158	1123	1085	1061	1078	1117	1156	1175	1165	1133	1094	1076
40	950	969	1018	1069	1091	1073	1022	965	938	957	1010	1066	1096	1086	1035	976	950
45	811	838	907	972	999	976	914	841	803	829	902	974	1008	992	932	852	811
50	672	709	799	882	909	880	802	714	666	705	798	886	921	898	820	723	672
55	539	580	684	780	811	780	691	586	539	579	689	787	825	801	712	593	539
60	419	459	572	671	701	673	584	470	421	462	579	678	712	692	604	478	419
65	315	352	460	550	574	555	477	370	317	358	468	554	573	562	492	376	315
70	223	261	352	416	429	421	369	280	228	269	361	415	424	420	377	283	223
75	147	185	249	275	272	277	261	202	153	195	255	266	253	262	262	204	147
80	81	113	146	151	148	154	157	128	87	124	152	142	133	137	146	125	81
85	29	45	52	51	51	56	61	56	35	54	57	49	44	45	49	48	29
90	1	2	1	2	2	3	3	2	4	2	3	2	2	2	2	1	1
95	1	1	1	1	1	2	2	1	1	1	2	1	1	2	1	1	1
100	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1
105	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	0	1
110	1	1	1	1	1	2	1	1	1	0	1	1	1	1	1	1	1
115	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	1
125	1	1	2	1	2	2	1	2	1	1	1	1	1	2	1	1	1
130	1	2	2	2	2	2	1	2	1	1	2	2	1	2	1	2	1
135	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2
140	2	3	2	3	3	3	2	2	2	2	2	2	2	3	2	2	2
145	2	2	2	3	3	3	2	3	3	3	2	3	3	2	3	2	2
150	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
155	3	4	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3
160	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
165	4	4	5	5	5	4	4	5	5	5	5	4	4	5	5	5	4
170	6	5	6	6	5	5	6	6	5	5	6	5	6	5	6	5	6
175	5	5	6	6	5	5	5	5	5	6	6	6	5	5	6	6	5
180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5



Goniophotometer Test

Model No.	IK-AT14F-202530-CCT-D 5000 K (30 W)	Sample ID.	4472593
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
25.8	120.02	60	0.2536	30.155	0.9908	11.20%	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	
3981.9	80.30%	N/A	116.3	94.8	132.05

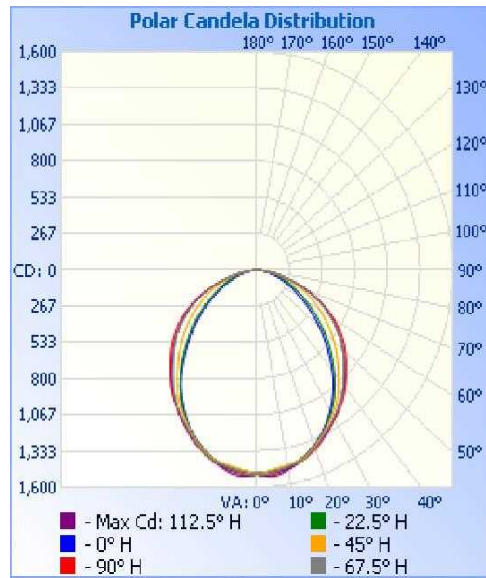
Backlight	Uplight	Glare
N/A	N/A	N/A

UGR		Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
Crosswise	Endwise		
18.9	21.5	1.20	1.28

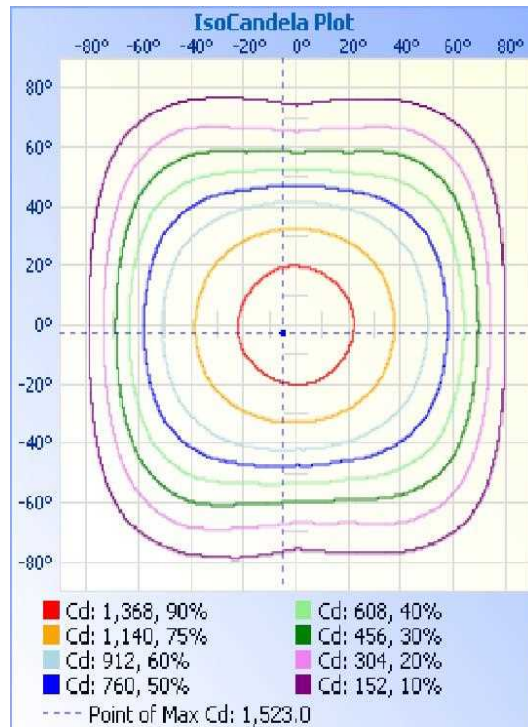


Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot





Goniophotometer Test (Cont'd)
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1150.1	28.90%
0-40	1861.4	46.70%
0-60	3198.0	80.30%
60-90	771.9	19.40%
70-100	311.3	7.80%
90-120	4.0	0.10%
0-90	3969.9	99.70%
90-180	12.0	0.30%
0-180	3981.9	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	35.9	0.90%	90-95	0.8	0.00%
5-10	106.5	2.70%	95-100	0.8	0.00%
10-15	172.9	4.30%	100-105	0.7	0.00%
15-20	232.1	5.80%	105-110	0.5	0.00%
20-25	281.8	7.10%	110-115	0.5	0.00%
25-30	321.0	8.10%	115-120	0.6	0.00%
30-35	348.6	8.80%	120-125	0.7	0.00%
35-40	362.7	9.10%	125-130	0.7	0.00%
40-45	362.1	9.10%	130-135	0.7	0.00%
45-50	350.4	8.80%	135-140	0.8	0.00%
50-55	328.2	8.20%	140-145	0.9	0.00%
55-60	295.9	7.40%	145-150	0.9	0.00%
60-65	255.2	6.40%	150-155	0.8	0.00%
65-70	207.0	5.20%	155-160	0.8	0.00%
70-75	153.2	3.80%	160-165	0.7	0.00%
75-80	97.7	2.50%	165-170	0.6	0.00%
80-85	48.4	1.20%	170-175	0.4	0.00%
85-90	10.3	0.30%	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	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499	1499
1	1494	1494	1496	1510	1516	1507	1500	1495	1495	1492	1494	1509	1513	1506	1498	1496	1494
2	1494	1492	1493	1509	1516	1513	1506	1499	1494	1489	1491	1507	1513	1512	1504	1500	1494
3	1494	1489	1490	1504	1516	1518	1512	1500	1494	1485	1488	1505	1513	1516	1510	1504	1494
4	1494	1485	1483	1500	1512	1522	1516	1503	1492	1482	1481	1500	1511	1520	1516	1506	1494
5	1492	1483	1476	1495	1507	1523	1517	1503	1492	1479	1474	1495	1505	1521	1517	1507	1492
6	1491	1481	1470	1490	1504	1520	1517	1503	1490	1476	1470	1490	1501	1519	1516	1506	1491
7	1488	1480	1467	1484	1499	1516	1514	1501	1487	1473	1465	1484	1496	1515	1514	1503	1488
8	1486	1477	1464	1479	1494	1508	1510	1497	1483	1472	1461	1479	1491	1509	1511	1499	1486
9	1480	1475	1461	1473	1491	1500	1504	1491	1478	1468	1457	1474	1487	1502	1504	1494	1480
10	1473	1470	1458	1469	1484	1490	1494	1485	1472	1464	1454	1467	1482	1493	1495	1485	1473
11	1467	1465	1456	1464	1478	1481	1484	1476	1465	1457	1450	1462	1475	1483	1485	1477	1467
12	1459	1460	1454	1460	1471	1472	1473	1467	1457	1451	1449	1458	1467	1473	1476	1468	1459
13	1451	1451	1450	1456	1464	1462	1461	1456	1449	1444	1443	1454	1459	1463	1465	1459	1451
14	1443	1442	1445	1453	1455	1453	1448	1445	1440	1437	1438	1448	1451	1454	1453	1448	1443
15	1432	1434	1437	1448	1447	1443	1436	1433	1429	1426	1432	1444	1442	1444	1439	1436	1432
16	1421	1422	1428	1442	1440	1432	1424	1419	1419	1417	1422	1438	1433	1432	1426	1422	1421
17	1409	1413	1417	1433	1432	1421	1410	1404	1406	1406	1411	1427	1423	1421	1413	1409	1409
18	1398	1401	1405	1422	1424	1411	1398	1392	1392	1393	1398	1416	1414	1409	1399	1395	1398
19	1384	1389	1392	1409	1415	1402	1386	1379	1378	1380	1384	1400	1403	1397	1386	1382	1384
20	1370	1377	1379	1395	1404	1392	1373	1364	1364	1368	1370	1385	1392	1386	1374	1369	1370
25	1293	1302	1307	1322	1336	1333	1315	1293	1287	1292	1296	1310	1320	1322	1310	1296	1293
30	1198	1213	1234	1259	1271	1262	1240	1209	1190	1199	1214	1238	1249	1246	1230	1208	1198
35	1086	1107	1149	1188	1202	1187	1150	1105	1081	1092	1128	1164	1178	1167	1137	1102	1086
40	956	984	1041	1097	1124	1108	1055	990	954	969	1017	1069	1094	1082	1034	979	956
45	818	855	932	1003	1034	1013	951	870	816	837	904	972	1002	986	926	852	818
50	679	726	827	916	945	918	839	741	681	709	797	883	915	891	810	720	679
55	544	594	713	814	847	817	727	611	554	585	687	785	820	792	698	587	544
60	423	474	598	699	729	705	620	496	430	462	573	673	709	683	589	471	423
65	317	365	482	569	588	576	507	392	324	355	462	552	577	559	480	367	317
70	224	273	370	425	432	433	391	298	235	267	356	421	434	423	367	274	224
75	147	196	260	272	262	277	276	216	156	189	250	274	267	271	254	194	147
80	80	121	150	143	137	147	160	138	88	118	149	149	143	146	145	117	80
85	29	48	51	45	45	50	60	60	35	50	57	52	48	48	49	45	29
90	1	1	2	2	2	3	3	2	2	2	2	2	2	1	2	1	1
95	1	1	1	2	1	2	2	2	1	1	1	2	2	1	2	1	1
100	1	1	1	1	2	2	2	1	1	1	1	1	2	2	2	1	1
105	1	1	1	1	2	2	2	1	1	1	1	1	1	2	1	0	1
110	0	1	1	1	2	2	2	1	1	1	1	1	1	1	1	0	0
115	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
120	1	2	1	2	2	1	1	2	1	1	1	2	2	1	2	1	1
125	2	1	1	2	2	1	2	1	2	1	1	2	2	1	2	2	2
130	1	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	1
135	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
140	2	3	2	2	3	2	3	2	2	2	2	3	2	2	3	2	2
145	3	3	3	3	3	3	3	3	2	3	2	3	3	3	3	3	3
150	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3
155	4	3	4	4	3	4	4	4	3	3	3	3	3	3	3	3	4
160	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
165	5	5	5	5	5	4	5	5	5	5	4	5	4	5	5	5	5
170	6	6	5	5	6	6	5	5	6	5	5	6	5	5	5	6	6
175	5	5	5	6	6	5	5	6	5	5	5	5	5	5	5	6	5
180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6



THD and PF Test

Model No.	IK-AT14F-202530-CCT-D 3500 K (30 W)	Sample ID.	4472593
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
25.7	120.09	60	0.2551	30.35	0.9908	11.22%	Horizontal
25.7	277.02	60	0.1100	29.51	0.9683	8.17%	Horizontal



THD and PF Test

Model No.	IK-AT14F-202530-CCT-D 4000 K (30 W)	Sample ID.	4472593
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
25.7	120.01	60	0.2442	29.05	0.9908	11.05%	Horizontal
25.7	277.05	60	0.1060	28.37	0.9658	8.24%	Horizontal



THD and PF Test

Model No.	IK-AT14F-202530-CCT-D 5000 K (30 W)		Sample ID.	4472593
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
25.7	120.01	60	0.2535	30.15	0.9908	11.19%	Horizontal
25.7	277.11	60	0.1093	29.30	0.9677	8.22%	Horizontal



THD and PF Test

Model No.	IK-AT14F-202530-CCT-D 3500 K (25 W)	Sample ID.	4472593
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
25.7	120.07	60	0.2061	24.43	0.9879	12.24%	Horizontal
25.7	277.05	60	0.0928	24.52	0.9542	9.73%	Horizontal



THD and PF Test

Model No.	IK-AT14F-202530-CCT-D 3500 K (20 W)	Sample ID.	4472593
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
25.7	120.08	60	0.1645	19.44	0.9839	13.37%	Horizontal
25.7	277.06	60	0.0787	20.39	0.9354	11.48%	Horizontal



In-Situ Temperature Measurement Test

Model No.	IK-AT14F-202530-CCT-D 30 W	Sample ID.	4472593
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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 °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.
 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 (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.3	120.09	60	0.2551	30.35	0.9908	11.22%	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	24.3	25.0				
TMP of Location 1	110	39.5	40.2	0.0024	STW8A2PD-XX	200	105

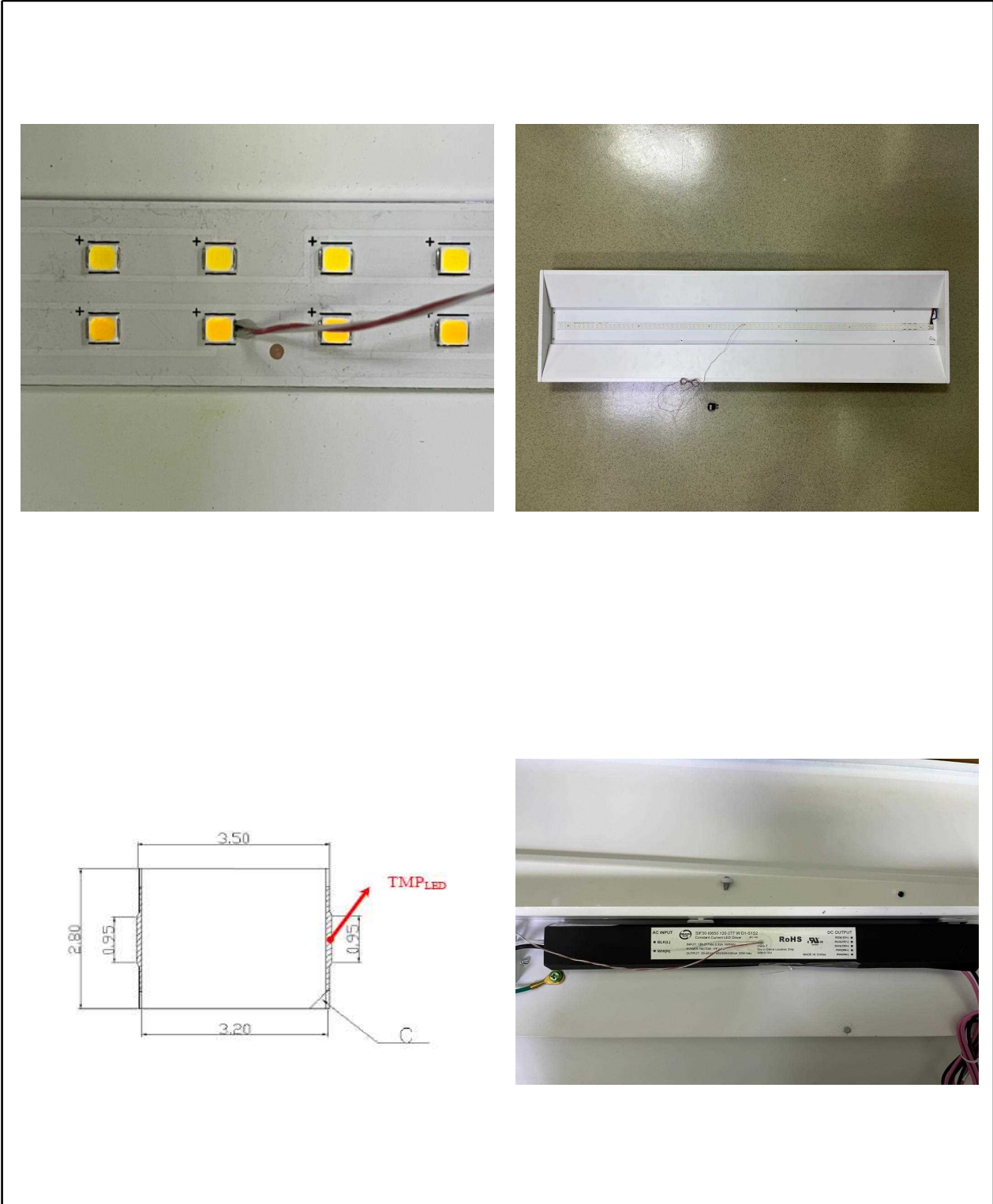
Test Results (Drivers)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp (°C)
	Test Result	Test Result (Correct to 25 °C)		
Ambient TEMP	24.3	25.0		
TMP of Location 1	55.8	56.5	SIF 30-I0650 120-277 W D1-S1S2	85



In-Situ Temperature Measurement Test (Cont'd)

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





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