



DesignLights Consortium Test Report

Reference Standards

UL1598-2008

ANSI C82.77-10-2014

IES LM-79-2008

Prepared For

Jiangsu Ever-tie Lighting Inc

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Test Laboratory:

UL-CCIC Company Limited

Test Laboratory Address:

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

Catalog Number

ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)

Project Number

4790746003

Report Number

4790746003_7

Test Date

2023-03-09~2023-03-21

Issue Date

2023-03-27

Revision Date

N/A

Prepared By

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Approved By

Maxine Zhou

Zhou, Maxine

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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	≥2000	-10%	3735.03
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥125	-3%	126.94
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 (3000K)	IES LM-79-2008/ANSI C78.377-2015	3045±175	N/A	2990
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3433
Allowable CCT (4000K)	IES LM-79-2008/ANSI C78.377-2015	3985±275	N/A	3791
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	4865
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-1	83
Minimum R9	IES LM-79-2008	≥0	-1	9.0
Minimum Rg	IES LM-79-2008	≥89	-1	96
Minimum Rf	IES LM-79-2008	≥70	-1	84
Rcs,h1	IES LM-79-2008	-12%-23%	-1%	-11%
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	0.9599
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	7.52%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	37.6
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	47.3
Max Chromaticity Shift (1000-6000h)	N/A	≤0.004	0.0004	0.0016
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5

Test List

Sample Received Date: 2023-03-01

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	2023-03-20	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	Yang, Gavin X
Integrating Sphere Test	2023-03-20	ETLPZ-22/DC/30/YDM/CCT/APP 835(A3+B7)	Yang, Gavin X
Integrating Sphere Test	2023-03-21	ETLPZ-22/DC/30/YDM/CCT/APP 840(A3+B7)	Yang, Gavin X
Integrating Sphere Test	2023-03-21	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)	Yang, Gavin X
Goniophotometer Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	Yang, Gavin X
Goniophotometer Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)	Yang, Gavin X
THD and PF Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	Yang, Gavin X
THD and PF Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 835(A3+B7)	Yang, Gavin X
THD and PF Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 840(A3+B7)	Yang, Gavin X
THD and PF Test	2023-03-09	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)	Yang, Gavin X
In-Situ Temperature Measurement Test	2023-03-21	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	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: 2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces

Model Number: ETLpz-22/DC/30/YDM/CCT/APP 830(A3+B7)

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

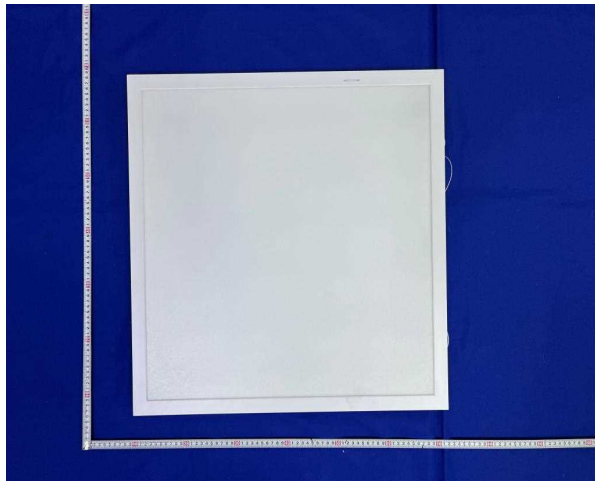
LED Package: BXEN-(A)E-13H-9RB

Dimming Information: Continuing Dimming Capability

Products Scaled Value

Model Number	CCT	Luminous Flux	Power	Luminous Efficacy
ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	3500K	3750	30	125
ETLPZ-22/DC/30/YDM/CCT/APP 835(A3+B7)	4000K	3780	30	126
ETLPZ-22/DC/30/YDM/CCT/APP 840(A3+B7)	5000K	3810	30	127
ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)	5000K	3840	30	128

Photos of Products Characteristics



Integrating Sphere Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)		Sample ID.	5833653
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

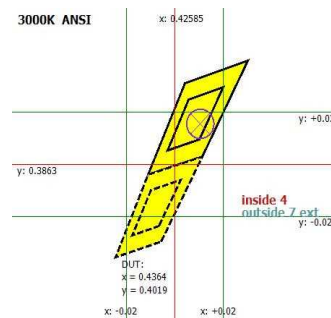
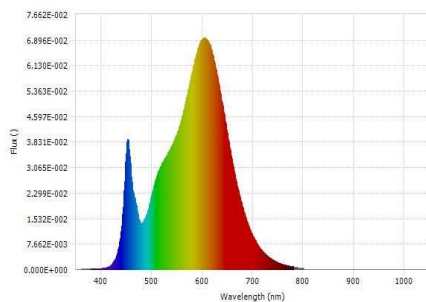
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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
25.1	119.89	60	0.2444	29.148	0.9949	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
2990	83	9.0	-0.0008	3735.03	128.14	N/A



Luminous Flux (lm)	3735.03	Chrom x	0.4364
Chrom y	0.4019	Chrom u	0.2512
Chrom v	0.3470	Duv	-0.0008
Chrom u'	0.2512	Chrom v'	0.5204
CCT (K)	2990	Luminous Efficacy (lm/W)	128.14
Ra	83	R1	82.0
R2	92.0	R3	95.0
R4	81.0	R5	83.0
R6	91.0	R7	82.0
R8	59.0	R9	9.0
R10	83.0	R11	81.0
R12	74.0	R13	85.0
R14	98.0	R15	75.0
Rf	85	Rg	96
Rcs,h1	-11%		

Integrating Sphere Test (Cont'd)

TM-30 Report

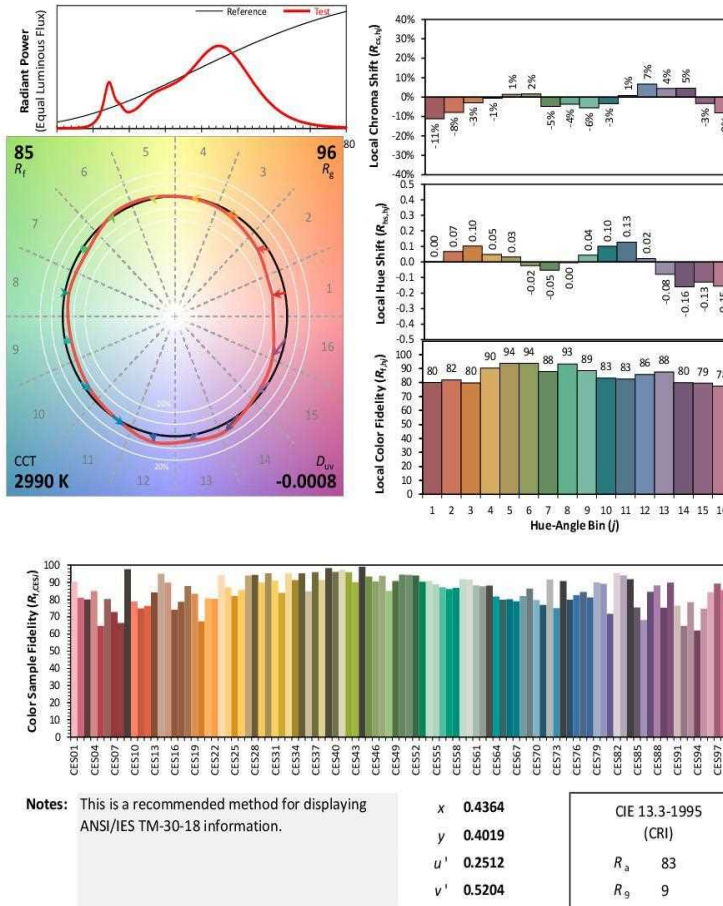
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RB

Manufacturer: Jiangsu Ever-tie Lighting Inc

Date: 3/20/2023

Model: ETLpz-22/DC/30/YDM/CCT/APP
830(A3+B7)



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

Integrating Sphere Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 835(A3+B7)	Sample ID.	5833653
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

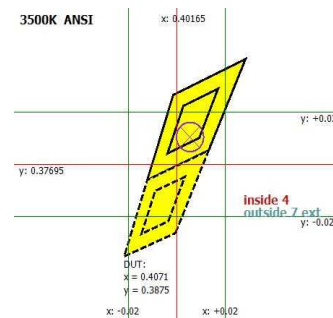
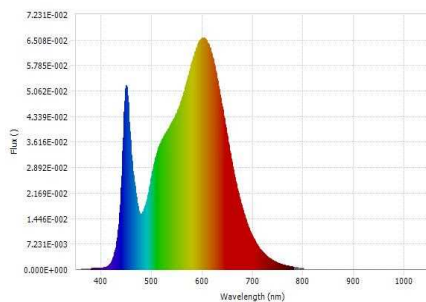
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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
25.1	119.91	60	0.2416	28.811	0.9947	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3433	85	16.0	-0.0018	3851.82	133.69	N/A



Luminous Flux (lm)	3851.82	Chrom x	0.4071
Chrom y	0.3875	Chrom u	0.2382
Chrom v	0.3401	Duv	-0.0018
Chrom u'	0.2382	Chrom v'	0.5102
CCT (K)	3433	Luminous Efficacy (lm/W)	133.69
Ra	85	R1	84.0
R2	92.0	R3	97.0
R4	84.0	R5	85.0
R6	89.0	R7	85.0
R8	65.0	R9	16.0
R10	81.0	R11	84.0
R12	72.0	R13	86.0
R14	99.0	R15	78.0
Rf	86	Rg	98
Rcs,h1	-11%		

Integrating Sphere Test (Cont'd)

TM-30 Report

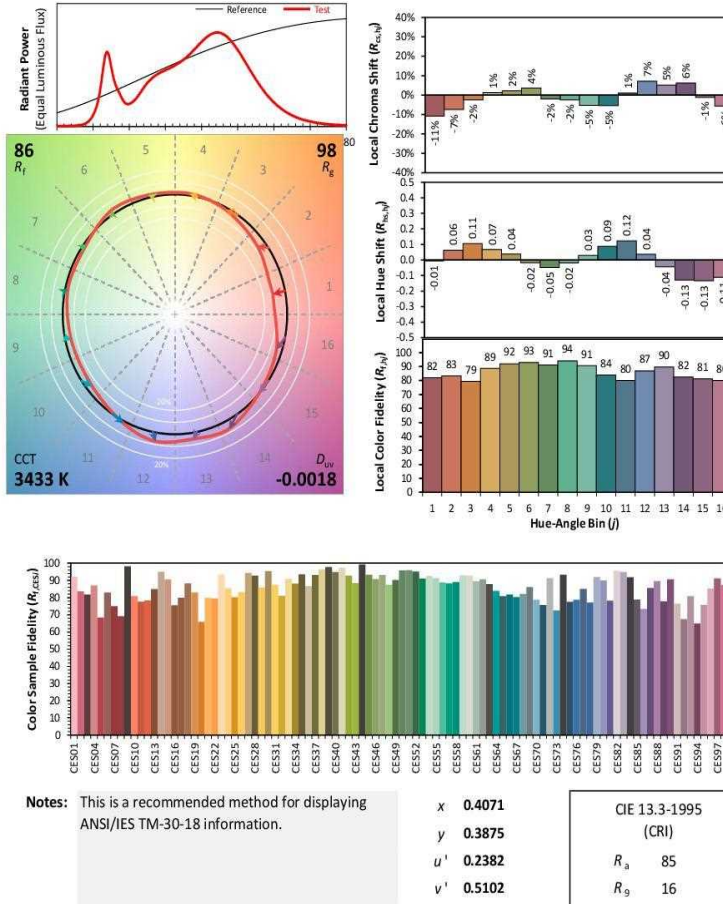
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RB

Manufacturer: Jiangsu Ever-tie Lighting Inc

Date: 3/20/2023

Model: ETLpz-22/DC/30/YDM/CCT/APP
835(A3+B7)



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Integrating Sphere Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 840(A3+B7)	Sample ID.	5833653
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

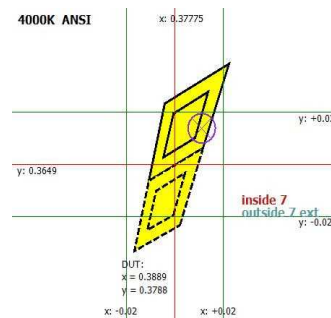
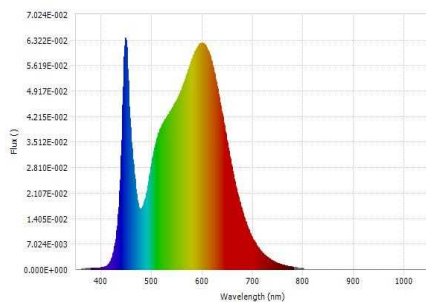
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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
25.0	120.01	60	0.2418	28.869	0.9947	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
3791	85	18.0	-0.0014	3886.32	134.62	N/A



Luminous Flux (lm)	3886.32	Chrom x	0.3889
Chrom y	0.3788	Chrom u	0.2299
Chrom v	0.3358	Duv	-0.0014
Chrom u'	0.2299	Chrom v'	0.5037
CCT (K)	3791	Luminous Efficacy (lm/W)	134.62
Ra	85	R1	84.0
R2	91.0	R3	96.0
R4	85.0	R5	85.0
R6	88.0	R7	87.0
R8	67.0	R9	18.0
R10	78.0	R11	85.0
R12	70.0	R13	86.0
R14	98.0	R15	78.0
Rf	86	Rg	98
Rcs,h1	-11%		

Integrating Sphere Test (Cont'd)

TM-30 Report

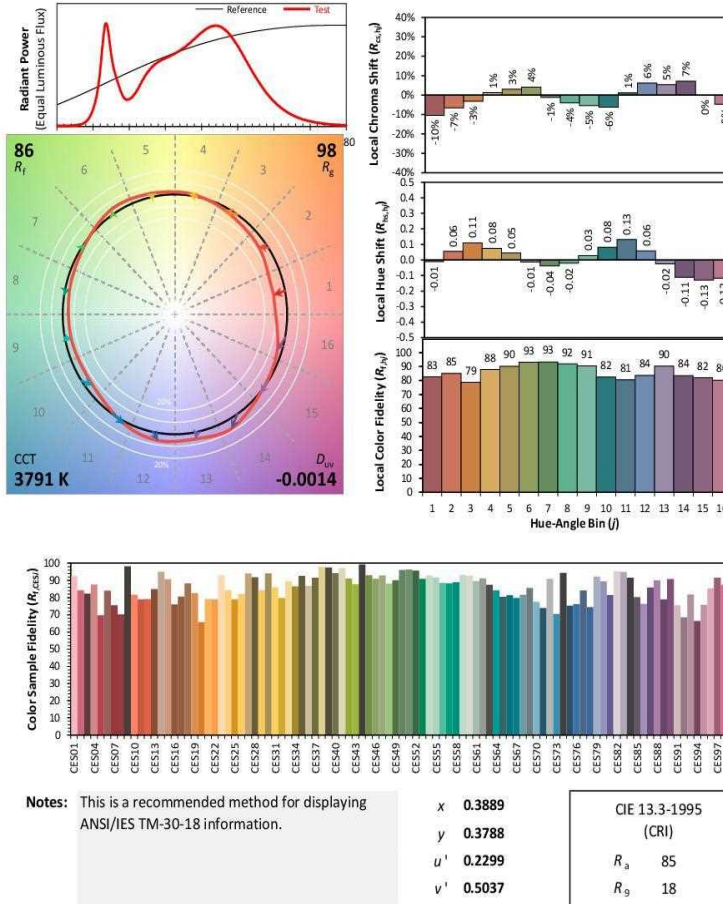
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RB

Manufacturer: Jiangsu Ever-tie Lighting Inc

Date: 3/20/2023

Model: ETLPZ-22/DC/30/YDM/CCT/APP
840(A3+B7)



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

Integrating Sphere Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)		Sample ID.	5833653
Operate time (Min.)	90	Stabilization time (Min.)	45	

Test Method

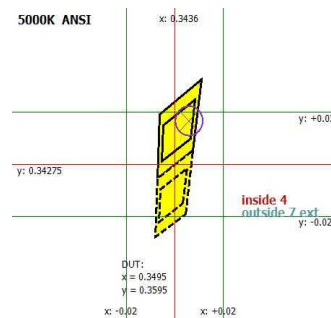
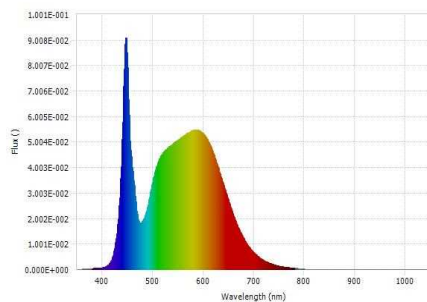
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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
25.0	120.01	60	0.2459	29.353	0.9948	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Efficacy(lm/ft)
4865	83	11.0	0.0022	3870.22	131.85	N/A



Luminous Flux (lm)	3870.22	Chrom x	0.3495
Chrom y	0.3595	Chrom u	0.2114
Chrom v	0.3261	Duv	0.0022
Chrom u'	0.2114	Chrom v'	0.4891
CCT (K)	4865	Luminous Efficacy (lm/W)	131.85
Ra	83	R1	81.0
R2	87.0	R3	91.0
R4	84.0	R5	82.0
R6	82.0	R7	88.0
R8	69.0	R9	11.0
R10	69.0	R11	84.0
R12	62.0	R13	82.0
R14	95.0	R15	75.0
Rf	84	Rg	98
Rcs,h1	-11%		

Integrating Sphere Test (Cont'd)

TM-30 Report

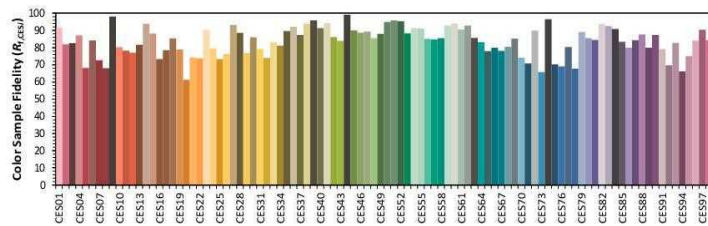
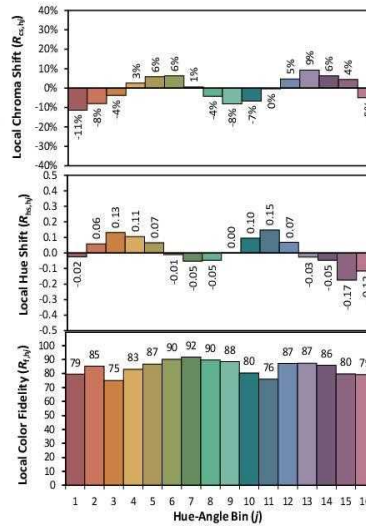
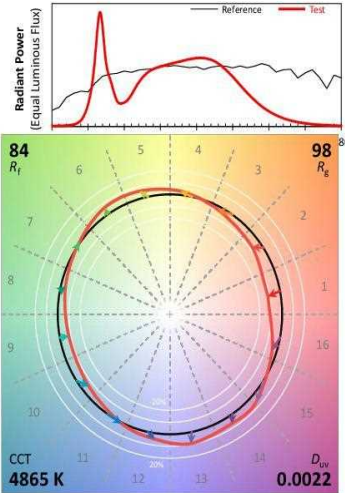
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-(A)E-13H-9RB

Manufacturer: Jiangsu Ever-tie Lighting Inc

Date: 3/20/2023

Model: ETLPZ-22/DC/30/YDM/CCT/APP
850(A3+B7)



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

x 0.3495
 y 0.3595
 u' 0.2114
 v' 0.4891

CIE 13.3-1995
(CRI)
 R_a 83
 R_g 11

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

Goniophotometer Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	Sample ID.	5833653
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is 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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.7	120.07	60	0.2480	29.67	0.9962	5.24%	Horizontal

Test Results

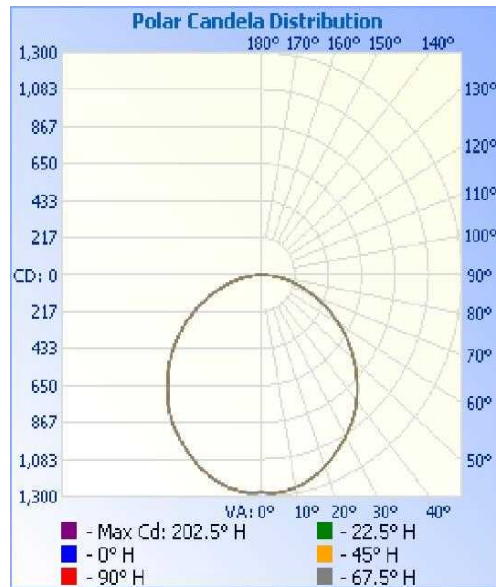
Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	$0^{\circ}\text{-}60^{\circ}$	N/A	Horizontal Spread	Vertical Spread	
3766.3	77.70%	N/A	114.4	114.2	126.94

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

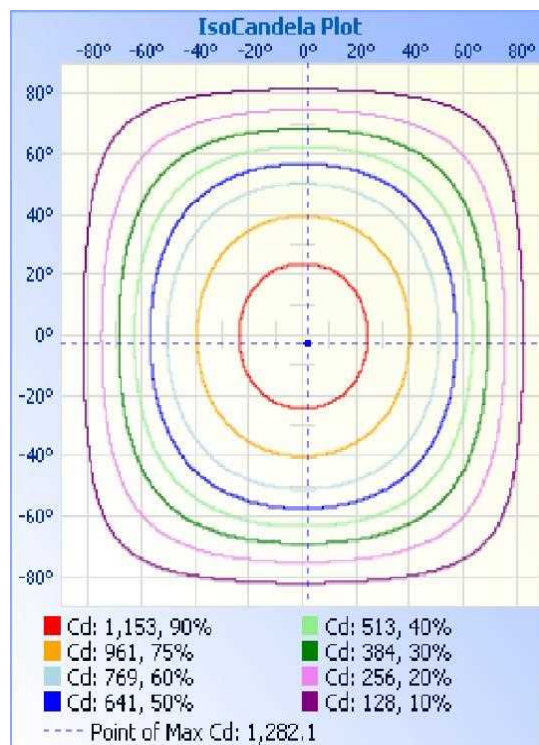
UGR		Spacing Criteria ($0\text{-}180^{\circ}$)	Spacing Criteria ($90^{\circ}\text{-}270^{\circ}$)
Crosswise	Endwise		
21.4	21.5	1.28	1.28

Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot



Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	998.3	26.50%
0-40	1642.8	43.60%
0-60	2928.4	77.80%
60-90	826.8	22.00%
70-100	362.7	9.60%
90-120	3.9	0.10%
0-90	3755.2	99.70%
90-180	11.0	0.30%
0-180	3766.3	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	30.6	0.80%	90-95	1.0	0.00%
5-10	91.0	2.40%	95-100	0.7	0.00%
10-15	148.3	3.90%	100-105	0.6	0.00%
15-20	200.3	5.30%	105-110	0.5	0.00%
20-25	245.3	6.50%	110-115	0.5	0.00%
25-30	282.7	7.50%	115-120	0.5	0.00%
30-35	312.6	8.30%	120-125	0.6	0.00%
35-40	331.9	8.80%	125-130	0.6	0.00%
40-45	338.7	9.00%	130-135	0.7	0.00%
45-50	334.5	8.90%	135-140	0.7	0.00%
50-55	319.6	8.50%	140-145	0.8	0.00%
55-60	292.7	7.80%	145-150	0.8	0.00%
60-65	255.4	6.80%	150-155	0.7	0.00%
65-70	210.5	5.60%	155-160	0.7	0.00%
70-75	162.5	4.30%	160-165	0.6	0.00%
75-80	113.7	3.00%	165-170	0.5	0.00%
80-85	64.9	1.70%	170-175	0.3	0.00%
85-90	19.9	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	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274	1274
1	1278	1276	1276	1275	1276	1277	1278	1278	1277	1277	1276	1275	1274	1274	1275	1275	1276
2	1280	1278	1279	1278	1279	1279	1280	1280	1280	1280	1279	1278	1277	1277	1278	1278	1278
3	1280	1280	1281	1280	1280	1280	1281	1281	1281	1282	1281	1279	1279	1279	1279	1279	1280
4	1280	1281	1282	1280	1280	1280	1281	1281	1282	1282	1282	1280	1280	1279	1279	1279	1280
5	1280	1280	1281	1280	1279	1279	1279	1280	1280	1281	1282	1280	1279	1278	1278	1279	1279
6	1278	1279	1280	1278	1277	1277	1278	1278	1278	1279	1280	1278	1277	1276	1277	1277	1278
7	1275	1276	1278	1276	1275	1274	1275	1275	1275	1276	1277	1276	1275	1274	1274	1275	1275
8	1272	1273	1274	1273	1272	1271	1272	1272	1272	1273	1274	1273	1272	1271	1271	1272	1272
9	1269	1269	1270	1269	1268	1267	1268	1268	1268	1269	1270	1269	1268	1267	1268	1268	1269
10	1265	1265	1266	1265	1263	1263	1263	1263	1263	1264	1265	1264	1264	1263	1264	1264	1264
11	1260	1260	1261	1260	1259	1258	1258	1258	1258	1259	1260	1260	1259	1259	1259	1260	1260
12	1255	1255	1256	1255	1254	1253	1254	1254	1253	1253	1254	1254	1254	1254	1255	1255	1255
13	1250	1250	1250	1249	1249	1248	1248	1248	1248	1248	1248	1248	1249	1249	1249	1250	1250
14	1244	1243	1243	1242	1243	1242	1242	1242	1242	1242	1242	1242	1243	1243	1243	1244	1244
15	1237	1237	1236	1236	1236	1236	1236	1235	1236	1235	1235	1235	1236	1237	1237	1237	1237
16	1230	1229	1229	1228	1228	1229	1228	1228	1228	1228	1228	1227	1228	1229	1230	1230	1230
17	1222	1222	1221	1220	1220	1221	1221	1220	1220	1220	1220	1219	1220	1221	1222	1222	1222
18	1214	1214	1213	1212	1211	1212	1212	1212	1212	1212	1212	1211	1212	1213	1214	1214	1214
19	1204	1205	1205	1203	1203	1203	1204	1204	1203	1203	1204	1203	1203	1204	1206	1205	1205
20	1195	1196	1196	1195	1194	1195	1195	1195	1194	1194	1195	1194	1194	1195	1197	1197	1196
25	1146	1145	1146	1145	1144	1144	1144	1144	1143	1143	1144	1143	1143	1144	1145	1145	1145
30	1092	1093	1093	1092	1091	1092	1091	1091	1090	1090	1090	1090	1090	1090	1092	1092	1093
35	1033	1033	1033	1032	1032	1032	1032	1031	1030	1030	1030	1029	1029	1030	1032	1032	1032
40	958	959	959	958	957	958	958	957	956	956	956	956	955	957	958	959	959
45	872	874	875	874	873	873	873	872	871	871	871	872	871	872	873	874	874
50	781	785	785	786	785	785	784	783	782	782	782	782	783	784	784	784	784
55	687	687	688	688	688	688	687	685	684	684	684	685	685	686	686	686	686
60	581	580	582	582	583	582	581	579	578	578	578	580	581	581	581	580	581
65	466	470	472	473	474	474	471	469	468	468	469	470	471	472	470	469	469
70	359	361	364	366	367	366	363	360	358	358	360	362	364	364	362	361	360
75	259	259	261	264	265	264	261	258	256	256	258	261	263	263	261	259	258
80	162	164	166	169	170	169	166	163	161	161	163	166	168	168	165	164	163
85	74	74	76	78	79	77	75	72	72	72	73	75	77	76	75	74	75
90	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4
95	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
130	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
135	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
140	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
145	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
150	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
155	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
160	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
165	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
170	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
175	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Goniophotometer Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)	Sample ID.	5833653
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is 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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.8	120.10	60	0.2487	29.76	0.9962	5.26%	Horizontal

Test Results

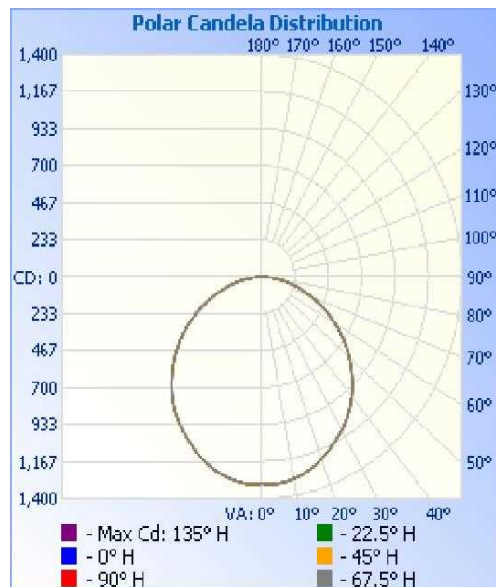
Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)
	$0^{\circ}\text{-}60^{\circ}$	N/A	Horizontal Spread	Vertical Spread	
3855.0	77.70%	N/A	114.5	114.2	129.54

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

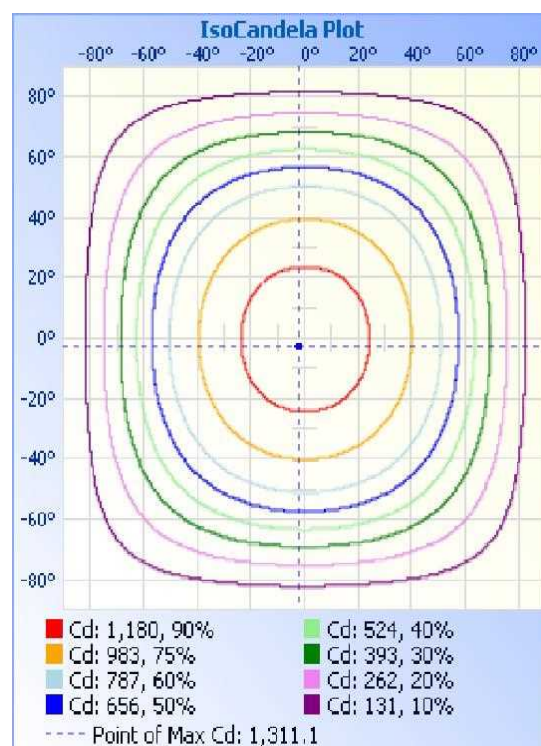
UGR		Spacing Criteria ($0\text{-}180^{\circ}$)	Spacing Criteria ($90^{\circ}\text{-}270^{\circ}$)
Crosswise	Endwise		
21.5	21.6	1.28	1.28

Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot



Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1021.7	26.50%
0-40	1681.4	43.60%
0-60	2997.1	77.70%
60-90	846.6	22.00%
70-100	371.3	9.60%
90-120	4.0	0.10%
0-90	3843.8	99.70%
90-180	11.3	0.30%
0-180	3855.0	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	31.3	0.80%	90-95	1.0	0.00%
5-10	93.1	2.40%	95-100	0.7	0.00%
10-15	151.7	3.90%	100-105	0.6	0.00%
15-20	205.0	5.30%	105-110	0.5	0.00%
20-25	251.1	6.50%	110-115	0.5	0.00%
25-30	289.4	7.50%	115-120	0.5	0.00%
30-35	319.9	8.30%	120-125	0.6	0.00%
35-40	339.7	8.80%	125-130	0.6	0.00%
40-45	346.7	9.00%	130-135	0.7	0.00%
45-50	342.2	8.90%	135-140	0.8	0.00%
50-55	327.2	8.50%	140-145	0.8	0.00%
55-60	299.7	7.80%	145-150	0.8	0.00%
60-65	261.5	6.80%	150-155	0.7	0.00%
65-70	215.6	5.60%	155-160	0.7	0.00%
70-75	166.4	4.30%	160-165	0.6	0.00%
75-80	116.3	3.00%	165-170	0.5	0.00%
80-85	66.4	1.70%	170-175	0.4	0.00%
85-90	20.5	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	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303
1	1307	1305	1306	1305	1305	1306	1307	1306	1306	1306	1306	1306	1304	1304	1305	1304	1304
2	1309	1308	1308	1308	1308	1309	1309	1308	1309	1309	1308	1307	1307	1307	1307	1307	1307
3	1310	1309	1310	1309	1309	1310	1311	1310	1310	1310	1310	1309	1309	1309	1309	1308	1309
4	1310	1310	1310	1310	1310	1311	1311	1310	1311	1311	1311	1310	1310	1309	1310	1309	1310
5	1309	1309	1310	1309	1309	1309	1310	1309	1310	1310	1310	1309	1309	1308	1309	1309	1309
6	1307	1307	1308	1308	1307	1307	1308	1308	1308	1308	1309	1308	1307	1307	1308	1307	1307
7	1304	1305	1306	1305	1304	1305	1306	1305	1305	1305	1306	1305	1305	1304	1305	1305	1305
8	1301	1302	1303	1302	1301	1301	1302	1302	1301	1302	1303	1302	1301	1300	1302	1302	1302
9	1297	1298	1299	1298	1297	1297	1298	1298	1297	1297	1299	1298	1297	1297	1298	1298	1298
10	1294	1294	1295	1294	1293	1292	1293	1293	1292	1292	1294	1293	1293	1293	1294	1294	1294
11	1289	1289	1289	1289	1288	1288	1288	1288	1288	1288	1289	1288	1288	1288	1289	1289	1289
12	1284	1284	1284	1283	1283	1282	1283	1283	1283	1282	1283	1283	1283	1283	1284	1284	1284
13	1278	1278	1278	1278	1277	1277	1277	1277	1277	1277	1277	1278	1278	1278	1279	1278	1279
14	1272	1272	1272	1271	1272	1271	1271	1271	1271	1271	1271	1271	1272	1272	1272	1272	1273
15	1264	1266	1265	1265	1265	1265	1264	1264	1264	1264	1264	1264	1265	1265	1265	1265	1266
16	1257	1258	1258	1257	1257	1258	1257	1256	1257	1257	1257	1256	1257	1258	1258	1258	1258
17	1249	1250	1250	1249	1249	1250	1249	1248	1248	1249	1249	1248	1249	1250	1250	1250	1250
18	1241	1241	1242	1240	1240	1241	1241	1240	1240	1240	1241	1240	1240	1241	1242	1242	1242
19	1233	1233	1233	1232	1231	1232	1233	1232	1231	1232	1232	1232	1231	1232	1234	1233	1233
20	1224	1223	1224	1223	1222	1223	1224	1223	1222	1223	1224	1223	1222	1223	1225	1224	1223
25	1171	1172	1174	1173	1172	1172	1172	1171	1170	1171	1171	1171	1170	1171	1172	1172	1172
30	1118	1118	1118	1118	1117	1117	1117	1116	1116	1115	1116	1116	1115	1116	1117	1118	1118
35	1055	1057	1058	1057	1056	1057	1056	1056	1054	1054	1054	1054	1054	1055	1056	1056	1056
40	980	981	982	981	980	981	981	980	978	979	979	979	978	980	981	981	981
45	894	894	893	893	893	893	893	892	891	892	892	892	892	893	893	894	894
50	802	803	801	802	803	803	803	801	801	800	800	800	801	801	802	802	802
55	702	703	705	706	706	705	703	701	700	700	700	701	702	702	702	702	702
60	594	594	596	596	597	596	594	593	592	592	593	594	595	595	594	594	594
65	480	482	481	483	485	485	483	481	479	479	480	482	483	483	482	480	480
70	369	370	373	376	377	375	372	368	367	367	369	371	373	373	371	369	368
75	264	265	268	270	271	270	267	264	262	262	264	268	270	269	267	265	264
80	167	168	169	172	174	173	169	166	164	164	167	170	172	171	169	168	167
85	77	76	78	80	81	79	76	74	74	73	75	77	79	78	77	76	77
90	4	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4
95	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
130	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
135	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
140	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
145	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
150	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
155	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
160	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
165	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
170	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
175	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
180	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

THD and PF Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)		Sample ID.	5833653
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.7	120.07	60	0.2480	29.67	0.9962	5.24%	Horizontal
24.7	277.09	60	0.1110	29.54	0.9605	7.30%	Horizontal

THD and PF Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 835(A3+B7)		Sample ID.	5833653
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.7	120.05	60	0.2452	29.31	0.9961	5.55%	Horizontal
24.7	277.13	60	0.1099	29.22	0.9599	7.52%	Horizontal

THD and PF Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 840(A3+B7)		Sample ID.	5833653
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
24.7	120.07	60	0.2455	29.36	0.9961	5.41%	Horizontal
24.7	277.11	60	0.1100	29.26	0.9600	7.48%	Horizontal

THD and PF Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 850(A3+B7)		Sample ID.	5833653
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
24.7	120.09	60	0.2487	29.76	0.9962	5.26%	Horizontal
24.7	277.10	60	0.1114	29.65	0.9606	7.41%	Horizontal

In-Situ Temperature Measurement Test

Model No.	ETLPZ-22/DC/30/YDM/CCT/APP 830(A3+B7)	Sample ID.	5833653
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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 $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. Thermocouples were placed on the LED driver case in the locations specified by the manufacture if necessary. The temperature was recorded after the lamp was operated by 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
24.2	120.07	60	0.2480	29.67	0.9962	5.24%	Horizontal

Test Results (LEDs)

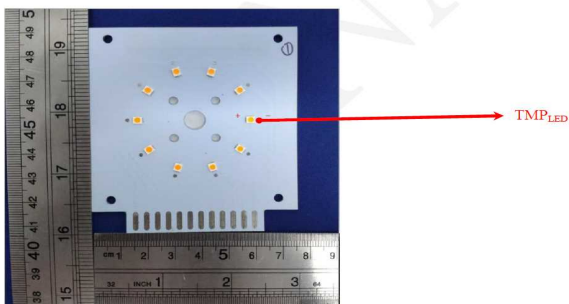
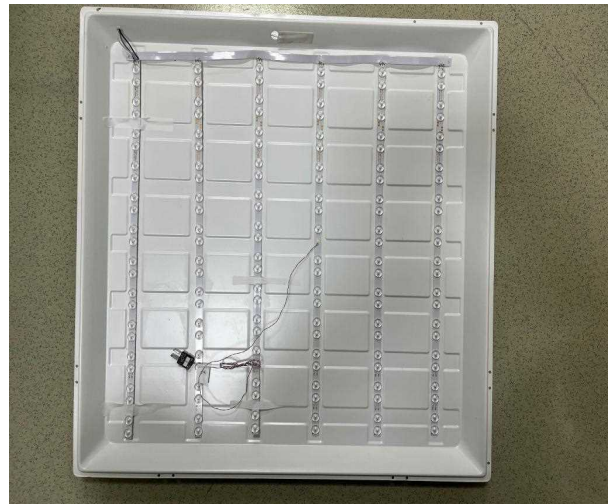
Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source ($^{\circ}\text{C}$)		Max Chromaticity Shift (1000-6000h)	LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp ($^{\circ}\text{C}$)
		Test Result	Test Result (Correct to 25°C)				
Ambient TEMP	N/A	24.2	25.0				
TMP of Location 1	40	36.8	37.6	0.0016	BXEN-(A)E-13H-9RB	100	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°C)		
Ambient TEMP	24.2	25.0		
TMP of Location 1	46.5	47.3	SIF 30-I750 120-277 T D1 APP	90

In-Situ Temperature Measurement Test (Cont'd)

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





***** END OF REPORT. THIS PAGE INTENTIONALLY LEFT BLANK *****