



Date of issue 2021-02-20

Version 1.0

Total pages 39

## Test report of

## IES LM-79-08

## Approved Method: Electrical and Photometric

## Measurements of Solid-State Lighting Products

### Applicant:

LIGHT EFFICIENT DESIGN

### Address:

188 S. Northwest Highway Cary, IL 60013 USA

### For Product:

3'T8 Lamps -- 2-Lamp External Driver (UL Type C) Lamps

### Product Model No.:

RP-T8C-G2-15W-3FT-2L-830-[OCN, Blank]-10V,  
RP-T8C-G2-15W-3FT-2L-850-[OCN, Blank]-10V,  
RP-T8C-G2-18W-3FT-2L-830-[OCN, Blank]-10V,  
RP-T8C-G2-18W-3FT-2L-850-[OCN, Blank]-10V,  
RP-T8C-G2-20W-3FT-2L-830-[OCN, Blank]-10V,  
RP-T8C-G2-20W-3FT-2L-850-[OCN, Blank]-10V,  
RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V,  
RP-T8C-G2-25W-3FT-2L-850-[OCN, Blank]-10V

Test laboratory: Shenzhen Belling Efficiency Testing Lab Co.,Ltd, 1Floor, No.1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov.518101 China.

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Complied by: Jarvis zhang

Review by: Jason zhou

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Project Engineer

Technical Manager

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Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Belling Efficiency Testing Lab Co.,Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the U.S. Government.



# 1 General

## 1.1 Product Information

<b>Manufacturer</b>	LIGHT EFFICIENT DESIGN
<b>Manufacturer Address</b>	188 S. Northwest Highway Cary, IL 60013 USA
<b>Brand Name</b>	REMPHOS OR LIGHT EFFICIENT DESIGN
<b>Luminaire Type</b>	3'T8 Lamps -- 2-Lamp External Driver (UL Type C) Lamps
<b>Test Model Number</b>	RP-T8C-G2-15W-3FT-2L-830-[OCN, Blank]-10V, RP-T8C-G2-15W-3FT-2L-850-[OCN, Blank]-10V, RP-T8C-G2-18W-3FT-2L-830-[OCN, Blank]-10V, RP-T8C-G2-18W-3FT-2L-850-[OCN, Blank]-10V, RP-T8C-G2-20W-3FT-2L-830-[OCN, Blank]-10V, RP-T8C-G2-20W-3FT-2L-850-[OCN, Blank]-10V, RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V, RP-T8C-G2-25W-3FT-2L-850-[OCN, Blank]-10V
<b>Rated Inputs</b>	AC 100-277V 50/60Hz
<b>Field-Adjustable Product</b>	Yes, Wattage setting: 15W, 18W, 20W, 25W
<b>Nominal CCT</b>	3000K, 5000K
<b>Dimming Capability</b>	Continuous
<b>Integral Control Sensors</b>	Optional
<b>Date of Receipt Samples</b>	2020-12-21
<b>Date of test</b>	2020-12-23 to 2021-01-22
<b>Burning Time Before Test</b>	0hour(For New Products)

## 1.2 Standards or methods

- ANSI C78.377-2017:Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-10:2014:Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment - Solid State
- CIE Publication No.13.3-1995:Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



### 1.3 Equipment list

Device	Manufacture	Model No.	Serial No.	Calibration due date
Goniophotometric System	SENSING	GMS-3000	N.A	2021-04-02
AC Power Source	ALL POWER	APW-110N	992257	2021-04-02
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S1510065	2021-04-08
Total Spectral Radiant Flux Standard Lamp	SENSING	12V/20W	LSD12201731	2021-04-08
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2021-04-02
Integral Sphere	SENSING	SPR-600M	N.A	2021-04-02
Digital Power Meter	YOKOGAWA	WT210	91L929742	2021-04-02
Optical Color and Electrical Measurement System	SENSING	SPR-3000	S1101108	2021-04-02
Environment Measurer	XUYAO	HS-1	N/A	2021-04-08
Environment Measurer	XUYAO	HS-1	N/A	2021-04-08
Stop watch	KISLO	K610	N/A	2021-04-27
Digital Anemometer	TECMAN	TD8901	026141	2021-09-09

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab Co.,Ltd attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



## 2 Test conducted and method

### 2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , the air flow around the sample(s) being tested did not affect the performance.

### 2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within  $\pm 0.2$  percent under load.

### 2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

### 2.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards.  $4\pi$  geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Integrating Sphere Uncertainty: The uncertainty of the light output (luminous flux) measurements is  $U=1.8\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=20\text{K}$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=1.8(K=2)$ , at the 95% confidence level. The uncertainty of power meter AC current  $U=0.18\%$  of rdg, AC Voltage  $U=0.16\%$  of rdg, Power  $U=0.20\%$  ( $K=2$ ), at the 95% confidence level.



## 2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.

Goniophotometer Uncertainty :The uncertainty of the luminous intensity is  $U=1.6\%$  ( $K=2$ ), at the 95% confidence level.



## 3 Test Result Summary

### 3.1 Integrating Sphere System (Total operating time for integrating sphere test: 1.0 hour)

#### 3.1.1 Model Number: RP-T8C-G2-15W-3FT-2L-830-[OCN, Blank]-10V(Bare lamp)

##### Electrical data

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.16	60	0.062	7.37	0.991

##### Photometric data

Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
948.24	128.66	2983

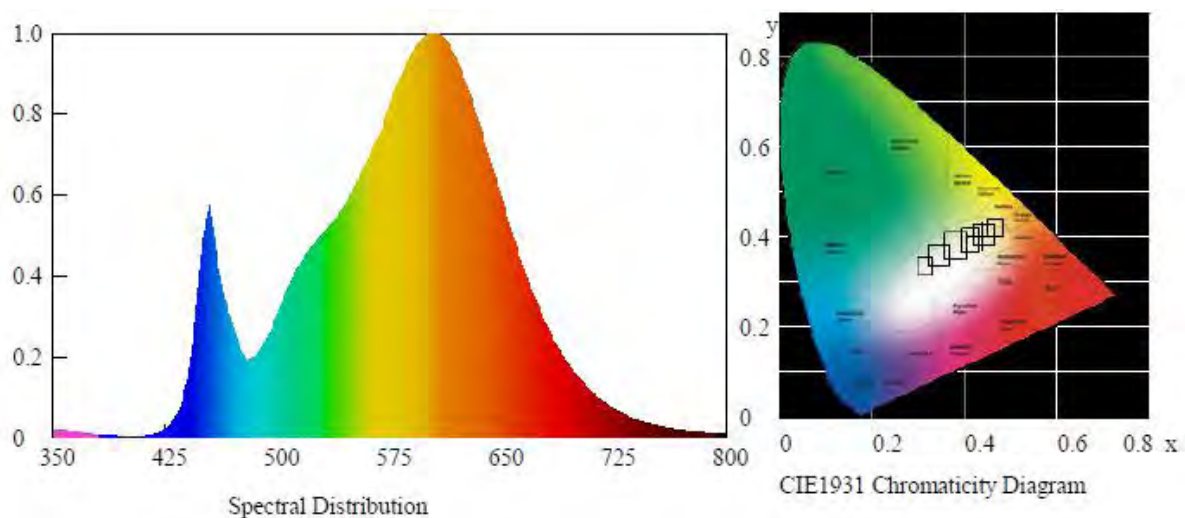
##### Chromaticity Coordinate

Duv	x	y	u'	v'
-0.00003	0.4382	0.4044	0.2512	0.5217

##### Color Rendering

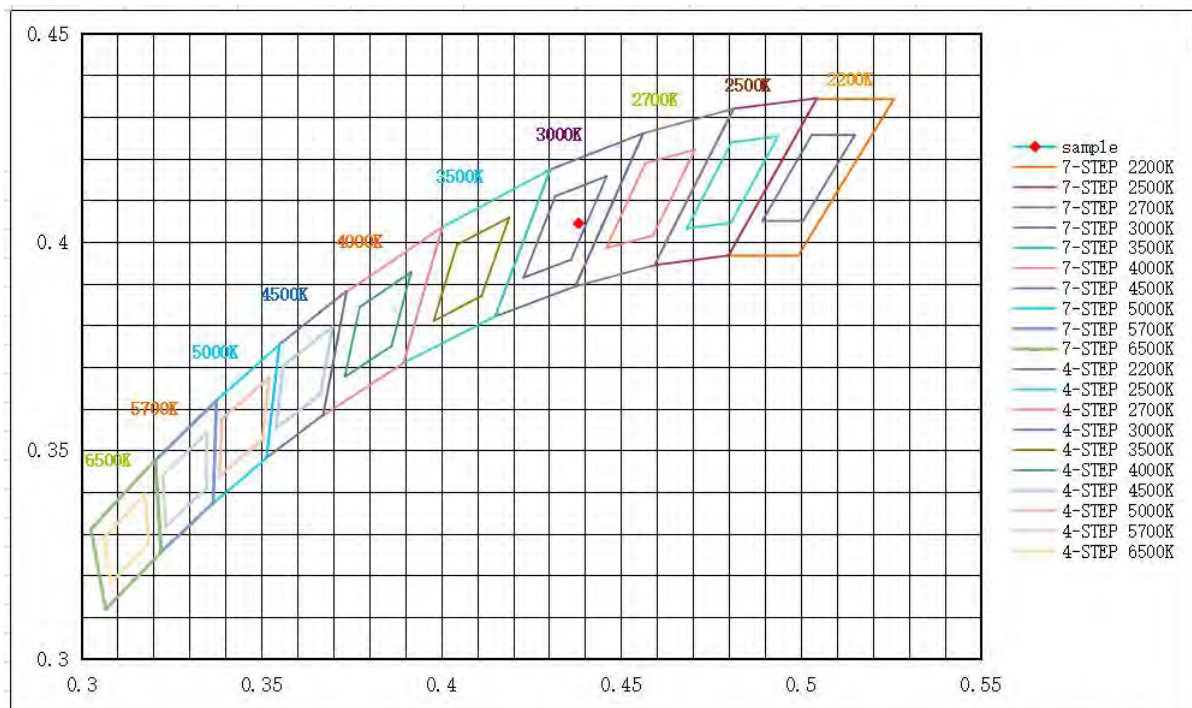
CRI	R9	Rf	Rg	Rcs,h1(%)
82.8	9	84	95	-11

##### Spectral Distribution





## 7/4 Step Quadrangle







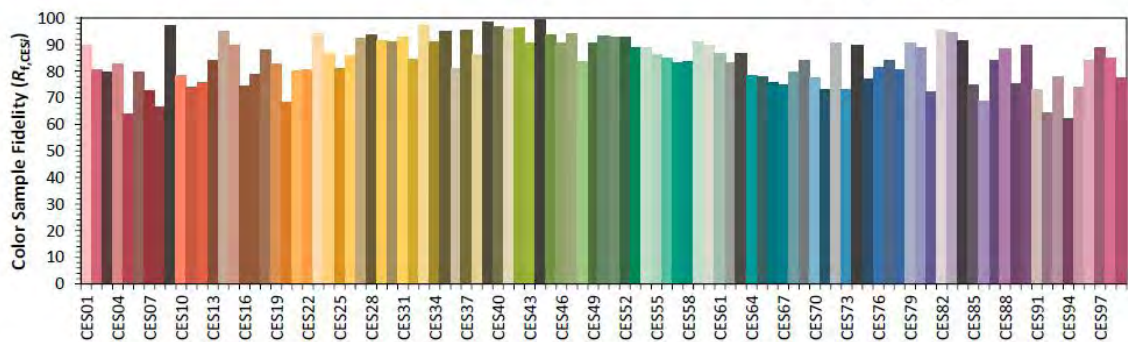
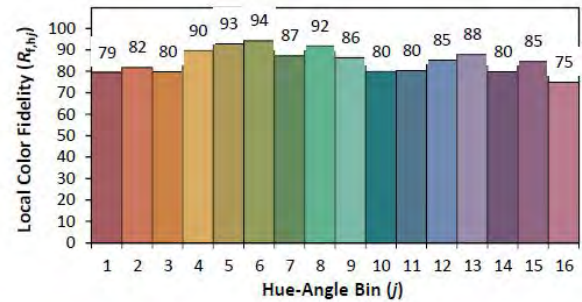
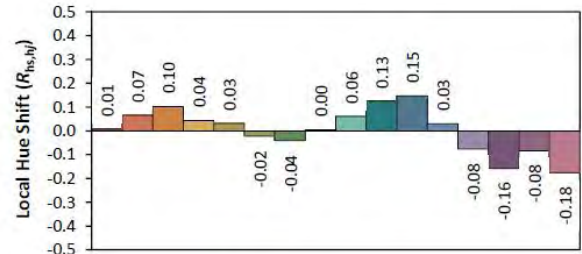
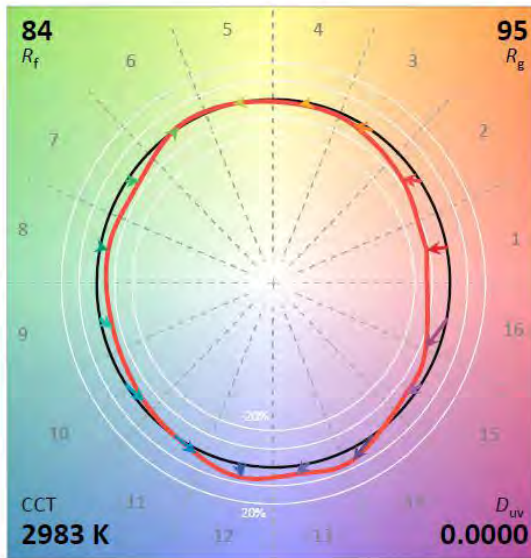
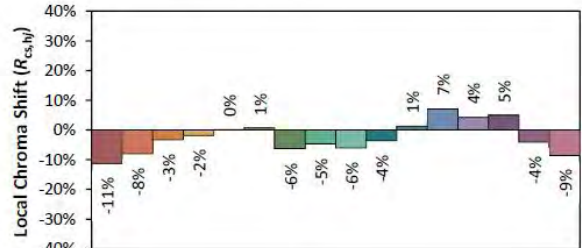
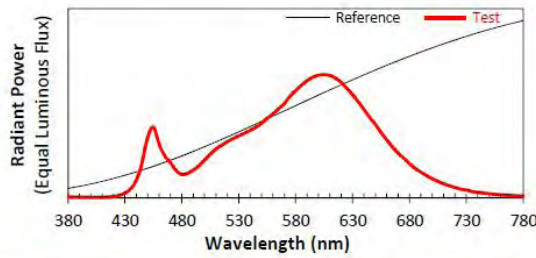
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-15W-3FT-2L-830-[OCN, Blank]-10V



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

$x$  0.4382  
 $y$  0.4044  
 $u'$  0.2512  
 $v'$  0.5217

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.



**3.1.2 Model Number: RP-T8C-G2-15W-3FT-2L-850-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.16	60	0.062	7.42	0.991

**Photometric data**

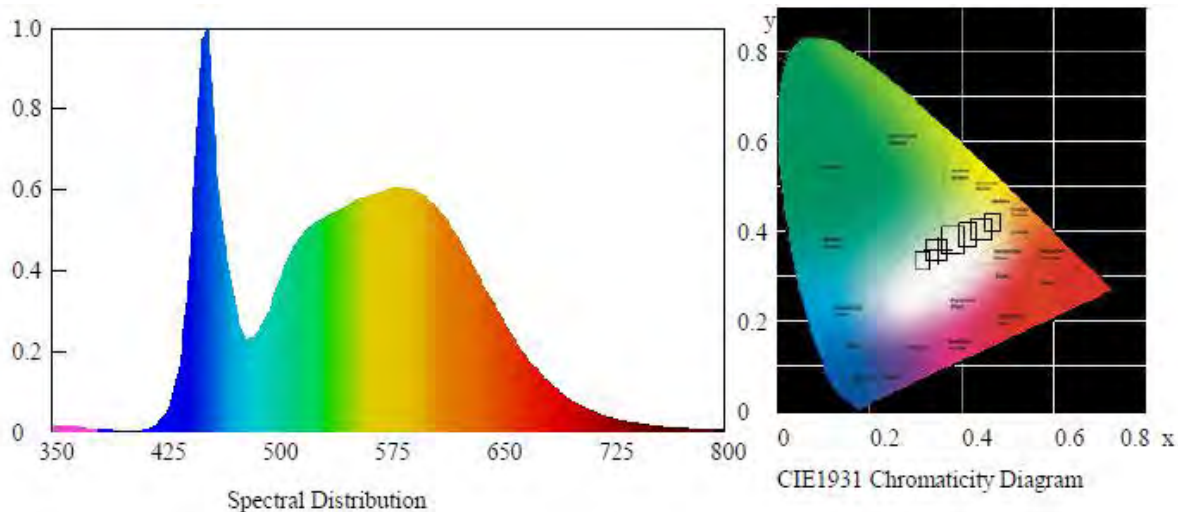
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
975.86	131.52	4948

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00304	0.3473	0.3595	0.2099	0.4888

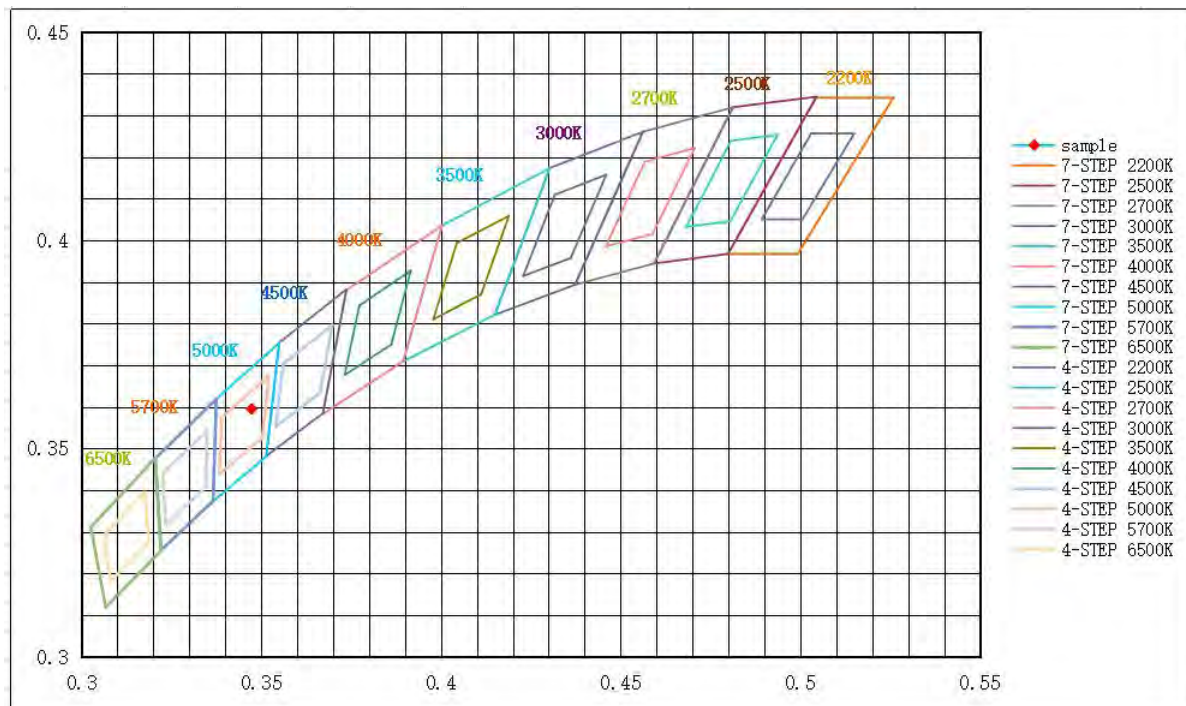
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
83.0	11	83	95	-12

**Spectral Distribution**



## 7/4 Step Quadrangle





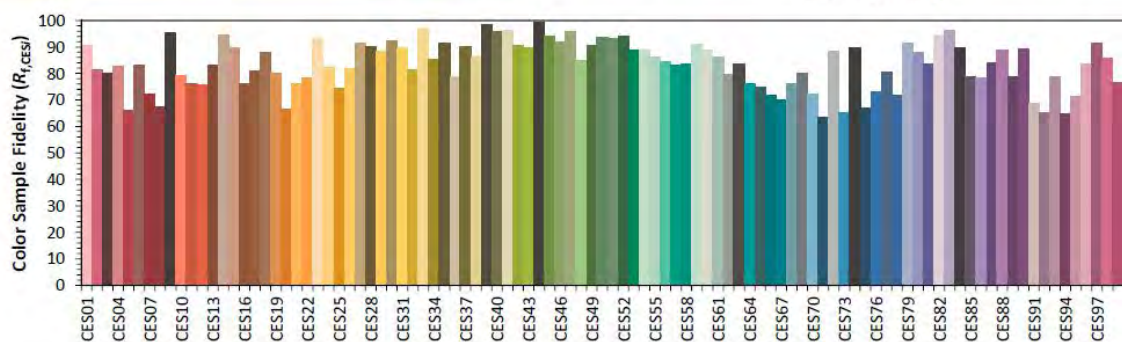
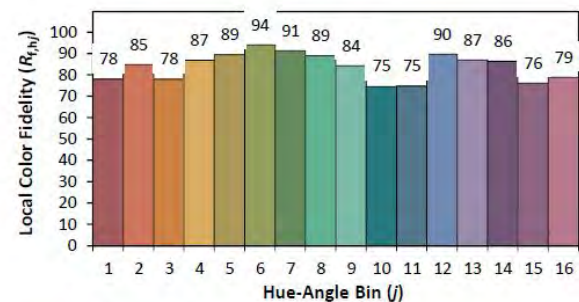
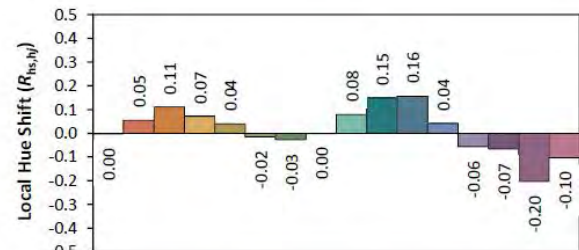
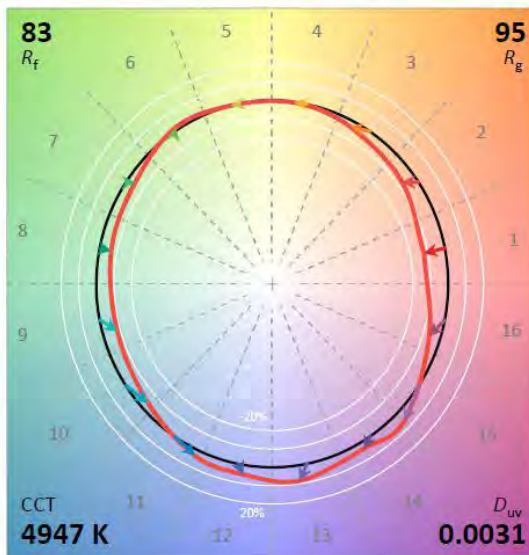
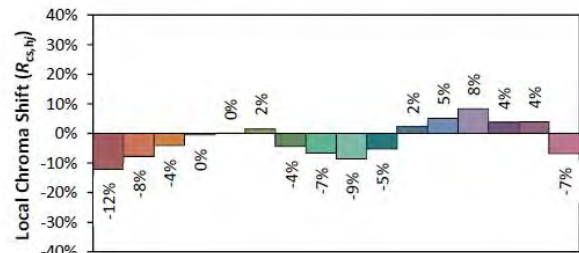
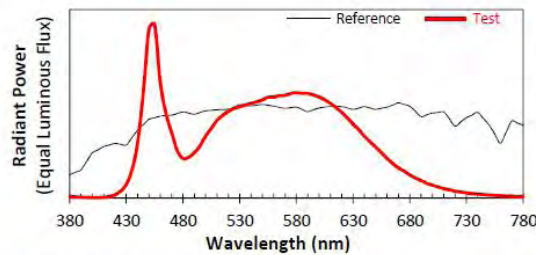
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-15W-3FT-2L-850-[OCN, Blank]-10V



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

$x$  0.3473  
 $y$  0.3595  
 $u'$  0.2099  
 $v'$  0.4888

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  10

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

**3.1.3 Model Number: RP-T8C-G2-18W-3FT-2L-830-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.13	60	0.074	8.84	0.993

**Photometric data**

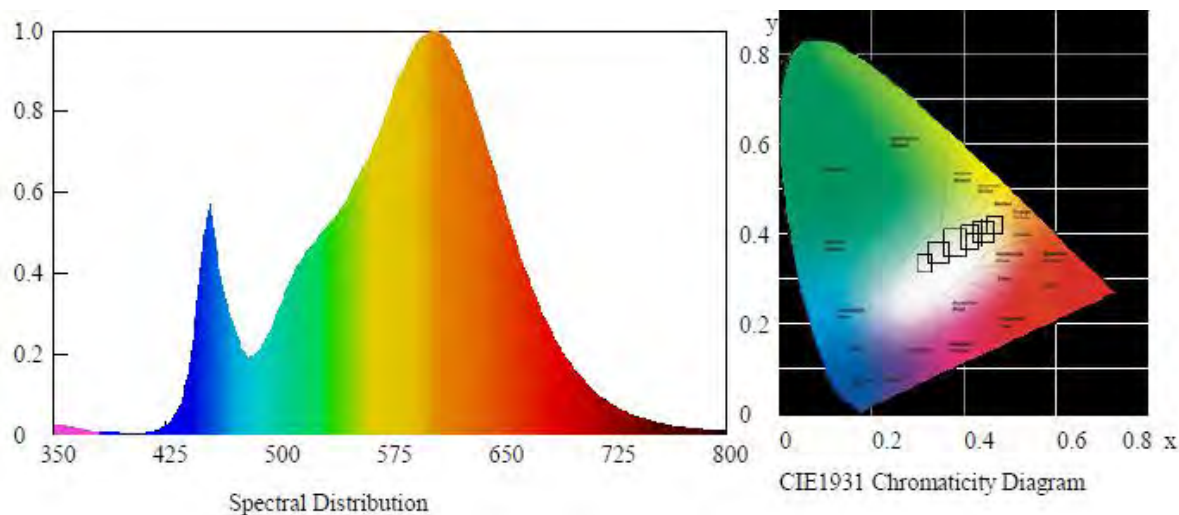
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1115.37	126.24	2982

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00005	0.4383	0.4047	0.2512	0.5218

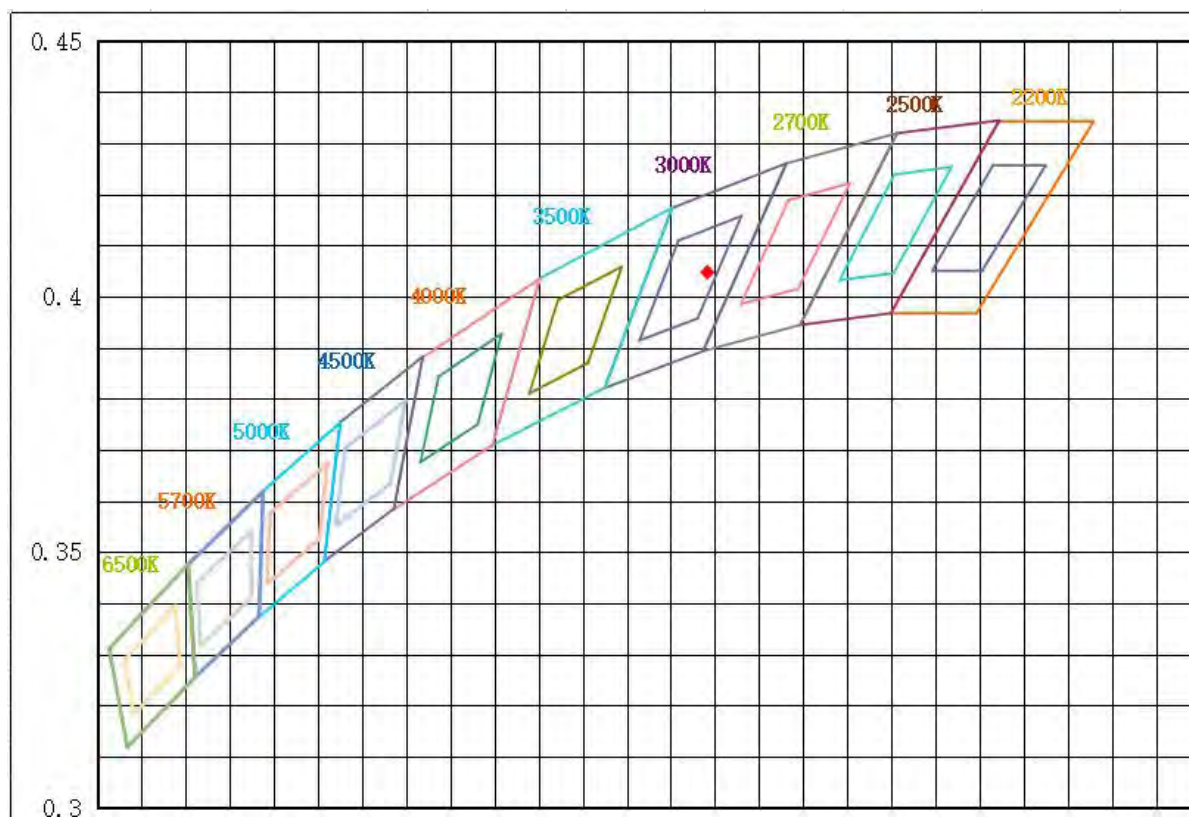
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
82.6	8	84	95	-11

**Spectral Distribution**



## 7/4 Step Quadrangle







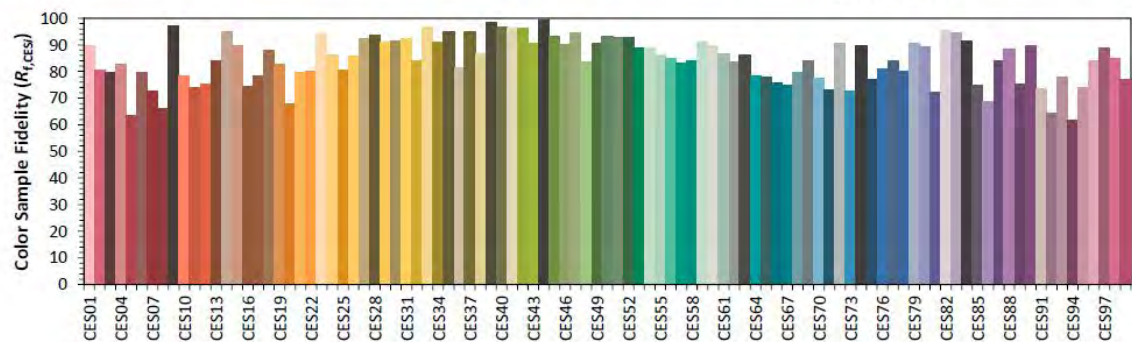
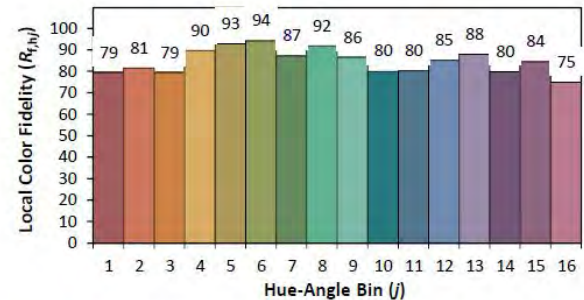
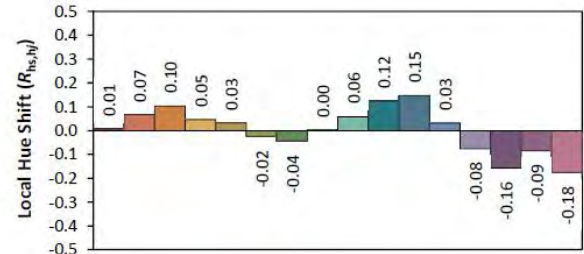
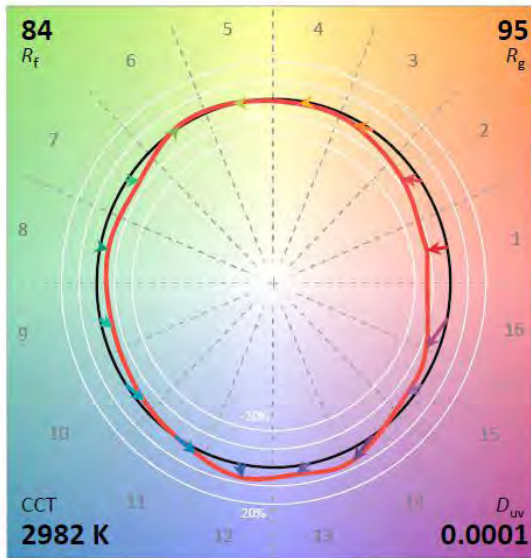
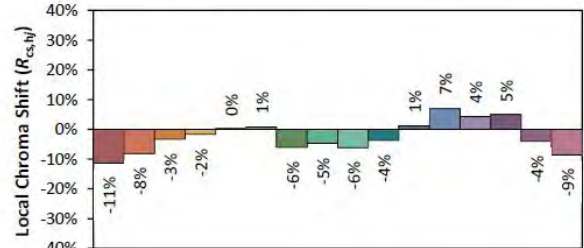
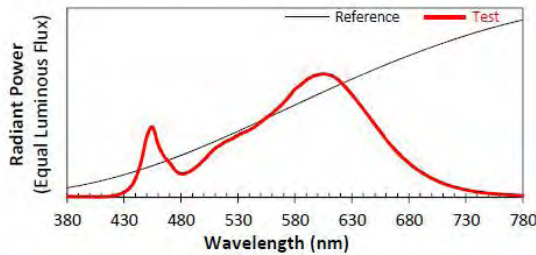
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-18W-3FT-2L-830-[OCN, Blank]-10V



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

$x$  0.4383  
 $y$  0.4047  
 $u'$  0.2512  
 $v'$  0.5218

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.



**3.1.4 Model Number: RP-T8C-G2-18W-3FT-2L-850-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.13	60	0.074	8.83	0.993

**Photometric data**

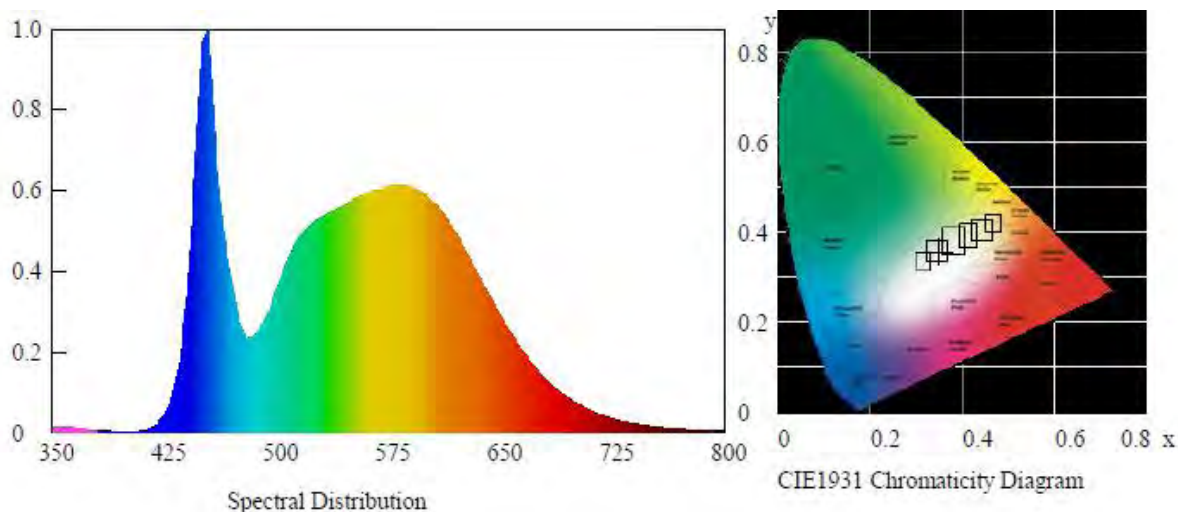
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1139.07	128.93	4961

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00293	0.3468	0.3589	0.2098	0.4884

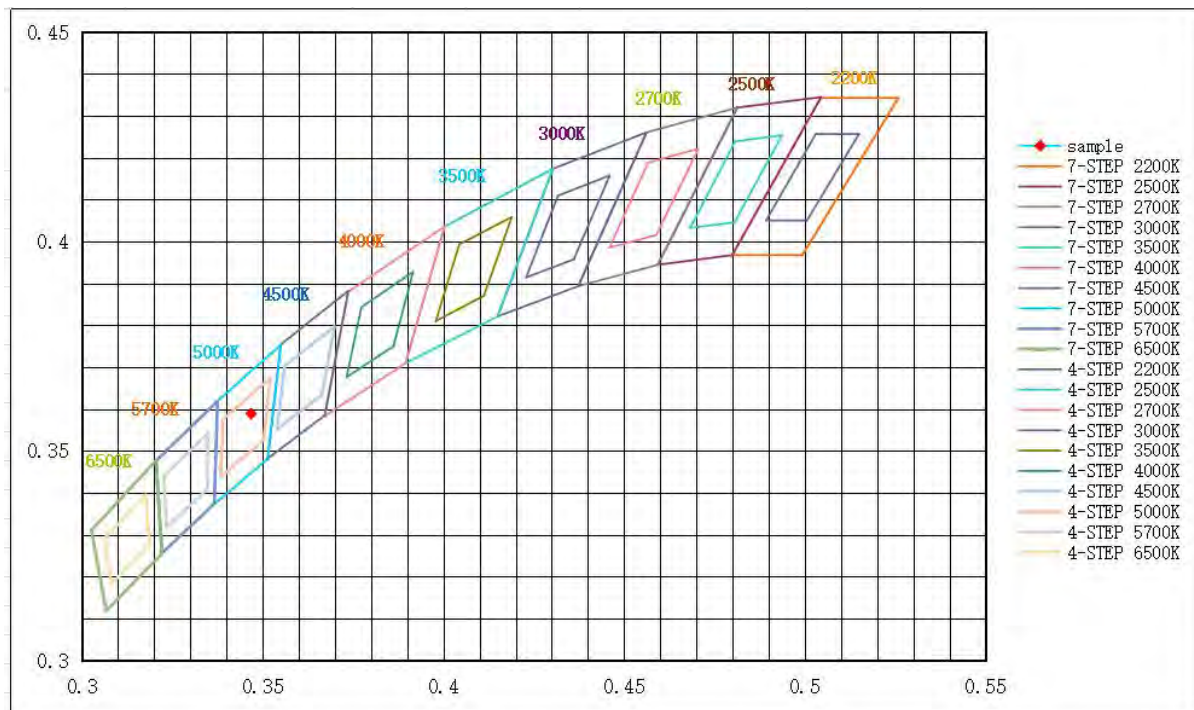
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
82.9	10	83	95	-12

**Spectral Distribution**



## 7/4 Step Quadrangle





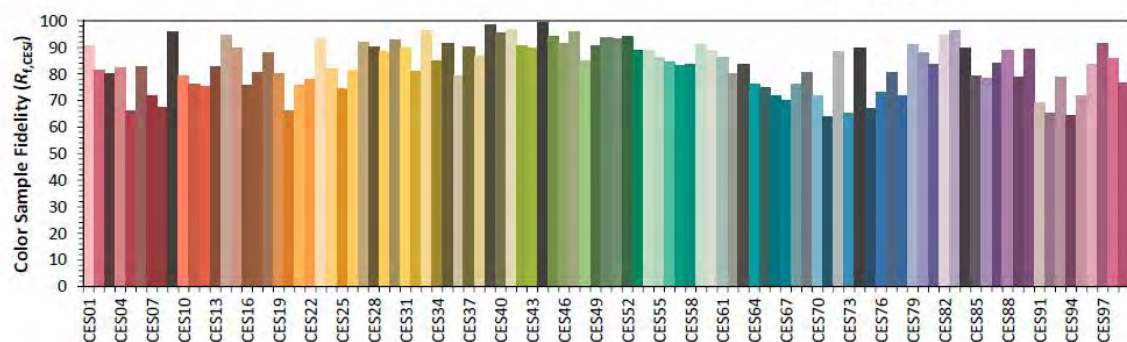
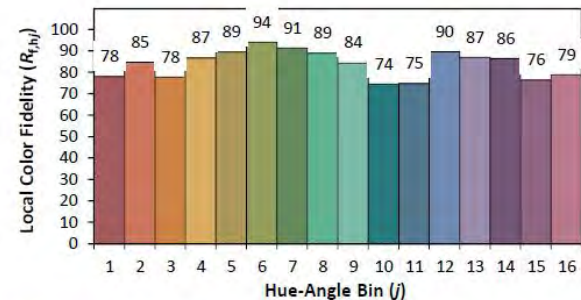
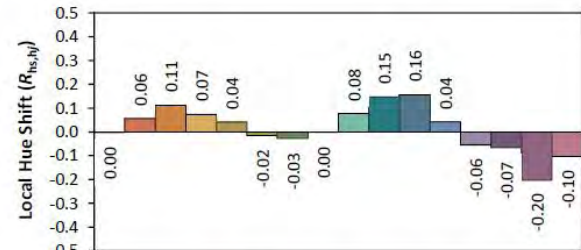
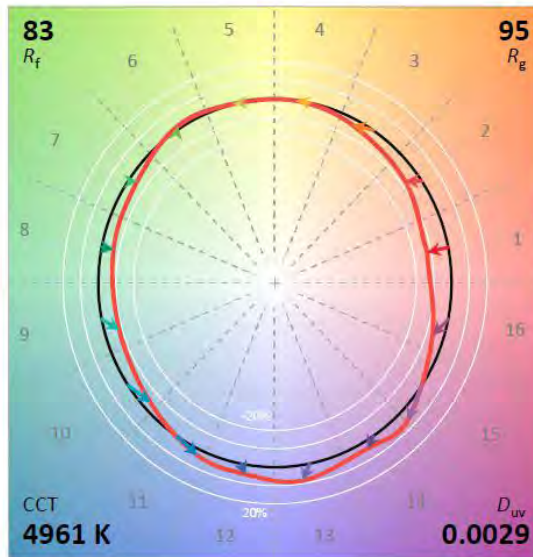
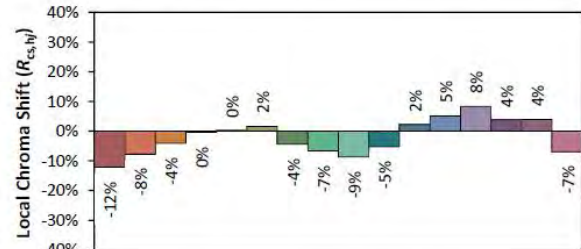
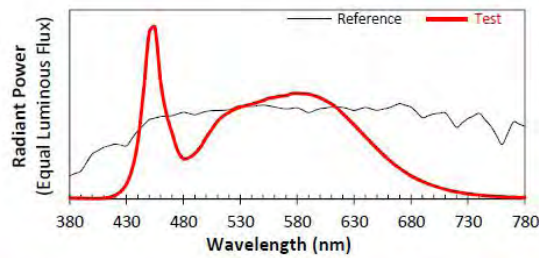
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-18W-3FT-2L-850-[OCN, Blank]-10V



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

$x$  0.3468  
 $y$  0.3589  
 $u'$  0.2098  
 $v'$  0.4884

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  10

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

**3.1.5 Model Number: RP-T8C-G2-20W-3FT-2L-830-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.11	60	0.083	9.87	0.994

**Photometric data**

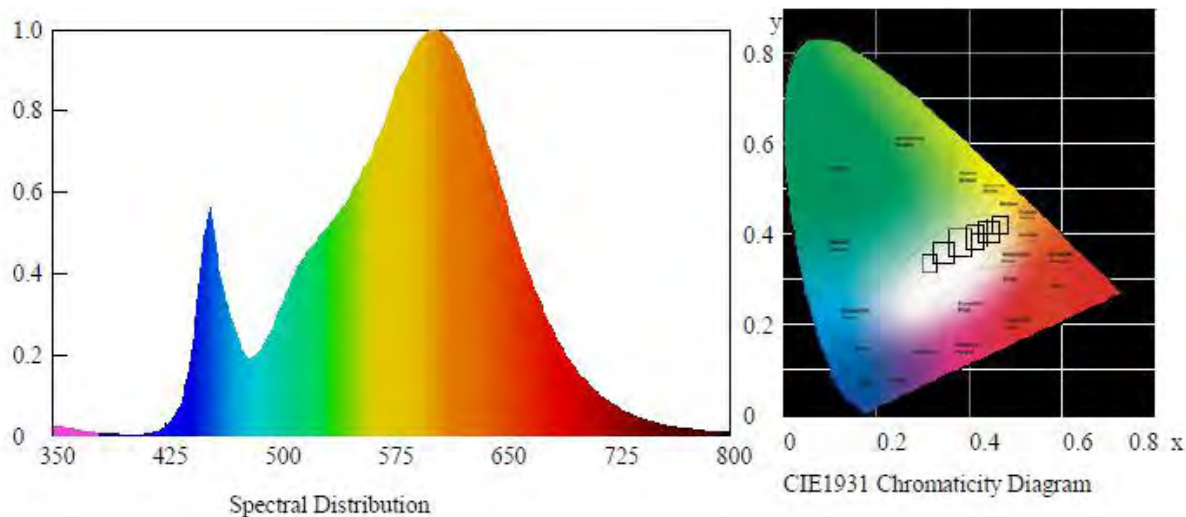
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1214.79	123.08	2984

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00007	0.4382	0.4047	0.2511	0.5218

**Color Rendering**

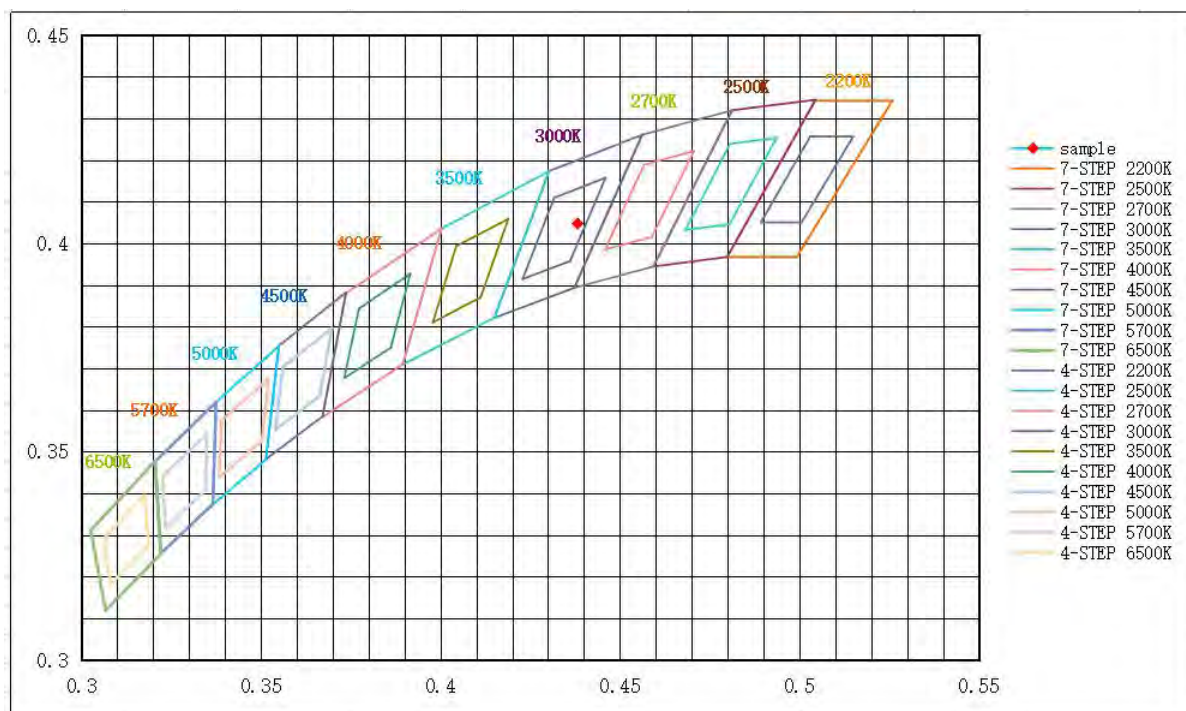
CRI	R9	Rf	Rg	Rcs,h1(%)
82.6	8	84	95	-11

**Spectral Distribution**





## 7/4 Step Quadrangle





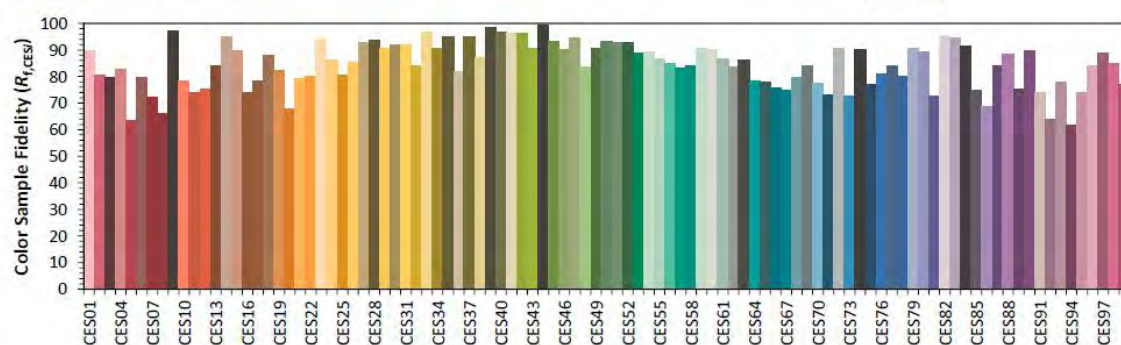
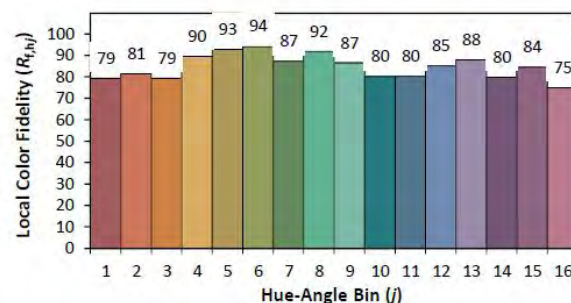
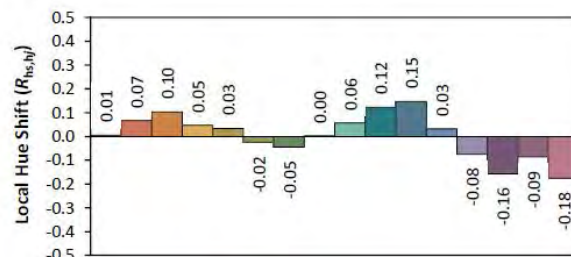
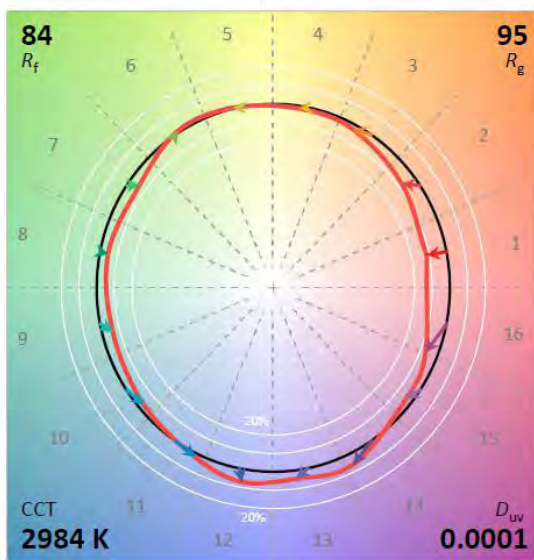
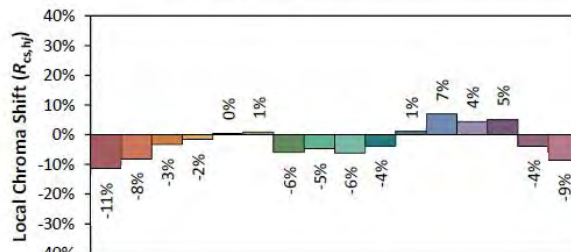
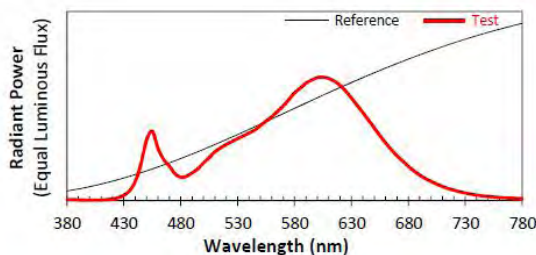
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-20W-3FT-2L-830-[OCN, Blank]-10V



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

$x$  0.4382  
 $y$  0.4047  
 $u'$  0.2511  
 $v'$  0.5218

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.



**3.1.6 Model Number: RP-T8C-G2-20W-3FT-2L-850-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.10	60	0.083	9.88	0.994

**Photometric data**

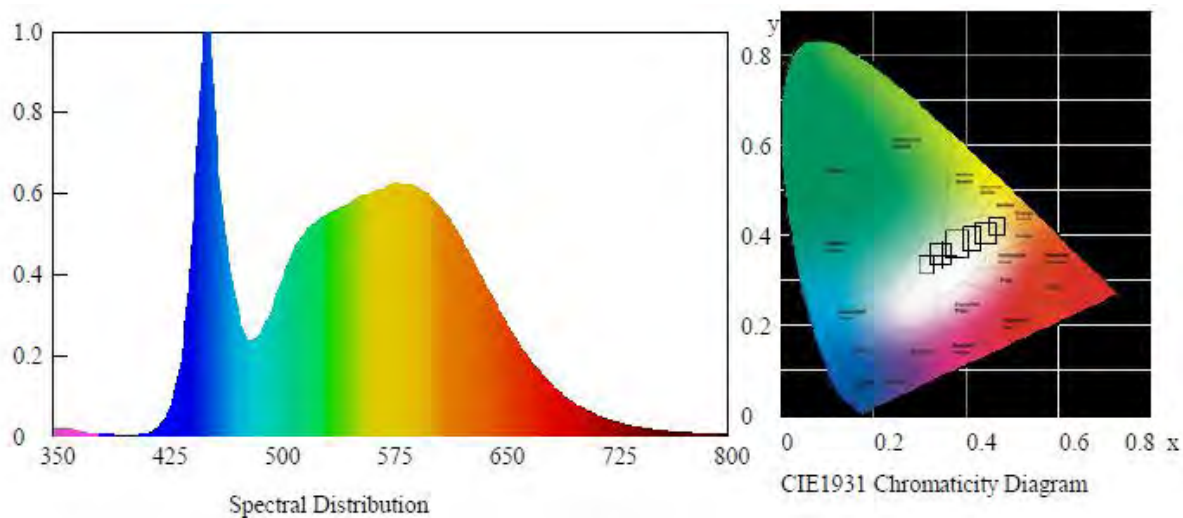
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1250.04	126.46	4956

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00293	0.3470	0.3590	0.2098	0.4885

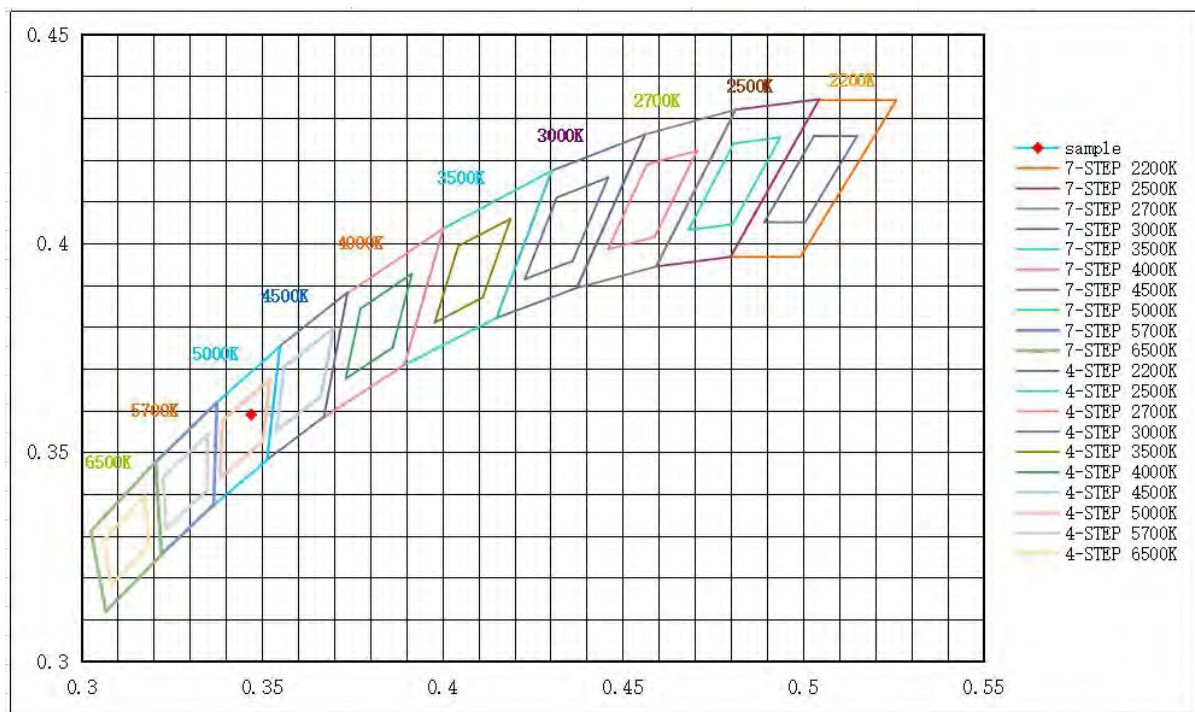
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
82.8	10	83	95	-12

**Spectral Distribution**



## 7/4 Step Quadrangle





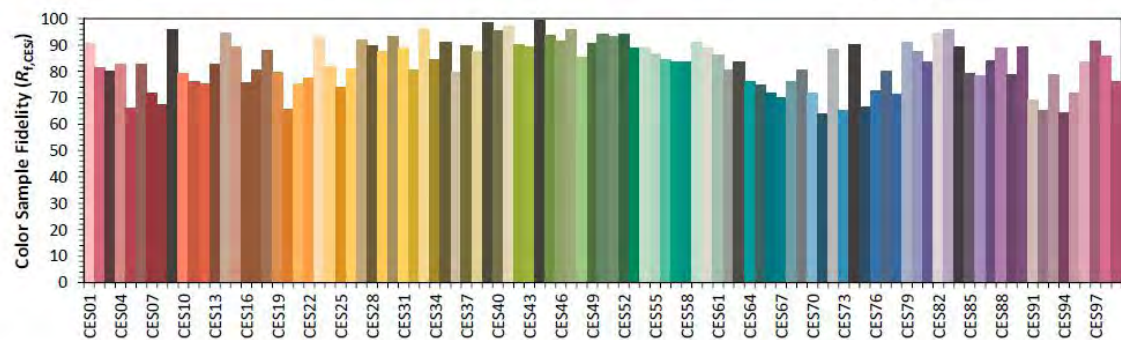
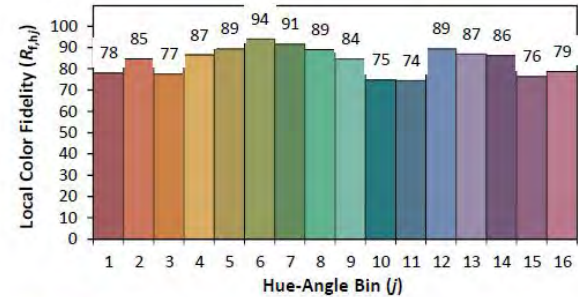
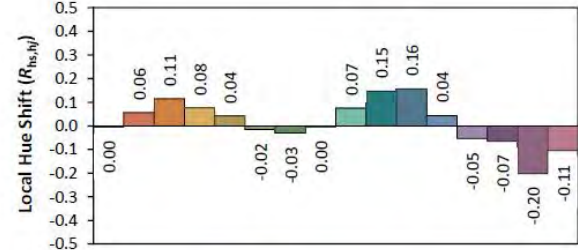
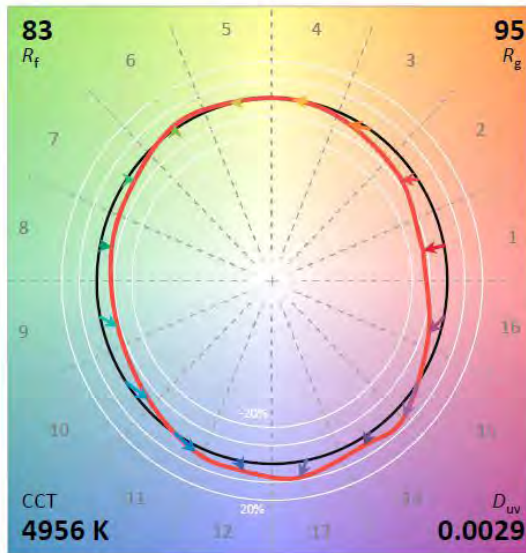
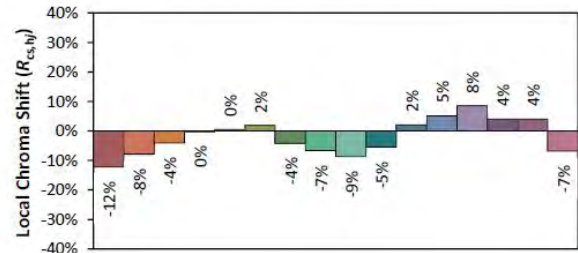
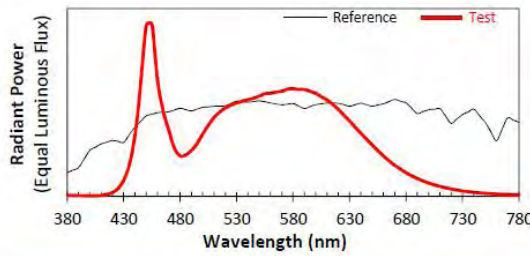
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-20W-3FT-2L-850-[OCN, Blank]-10V



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

$x$  0.3470  
 $y$  0.3590  
 $u'$  0.2098  
 $v'$  0.4885

CIE 13.3-1995  
(CRI)

$R_a$  83  
 $R_g$  10

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

**3.1.7 Model Number: RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.95	60	0.103	12.31	0.995

**Photometric data**

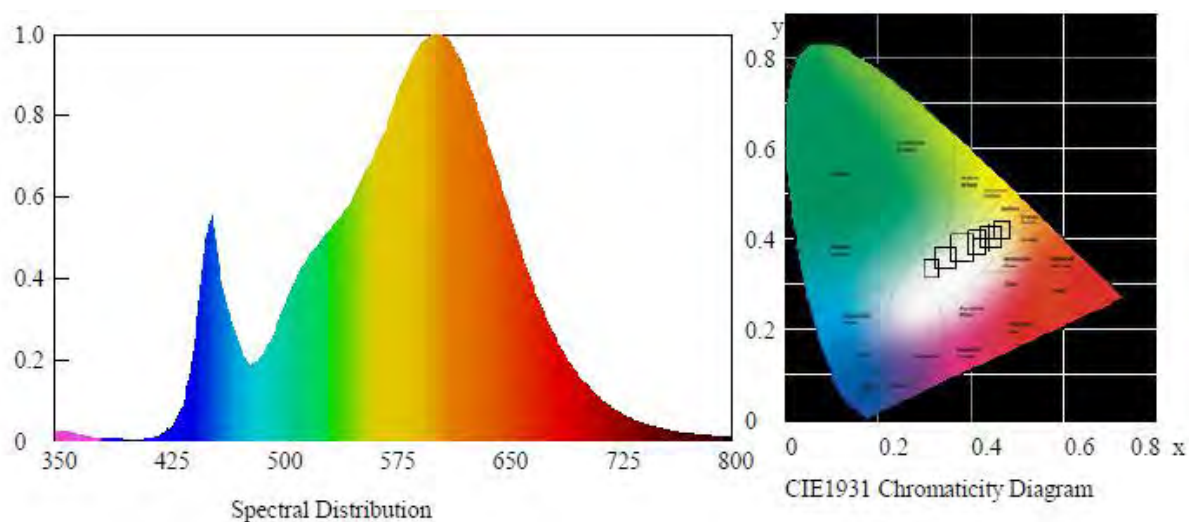
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1468.57	119.30	2985

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.0002	0.4383	0.4050	0.2510	0.5220

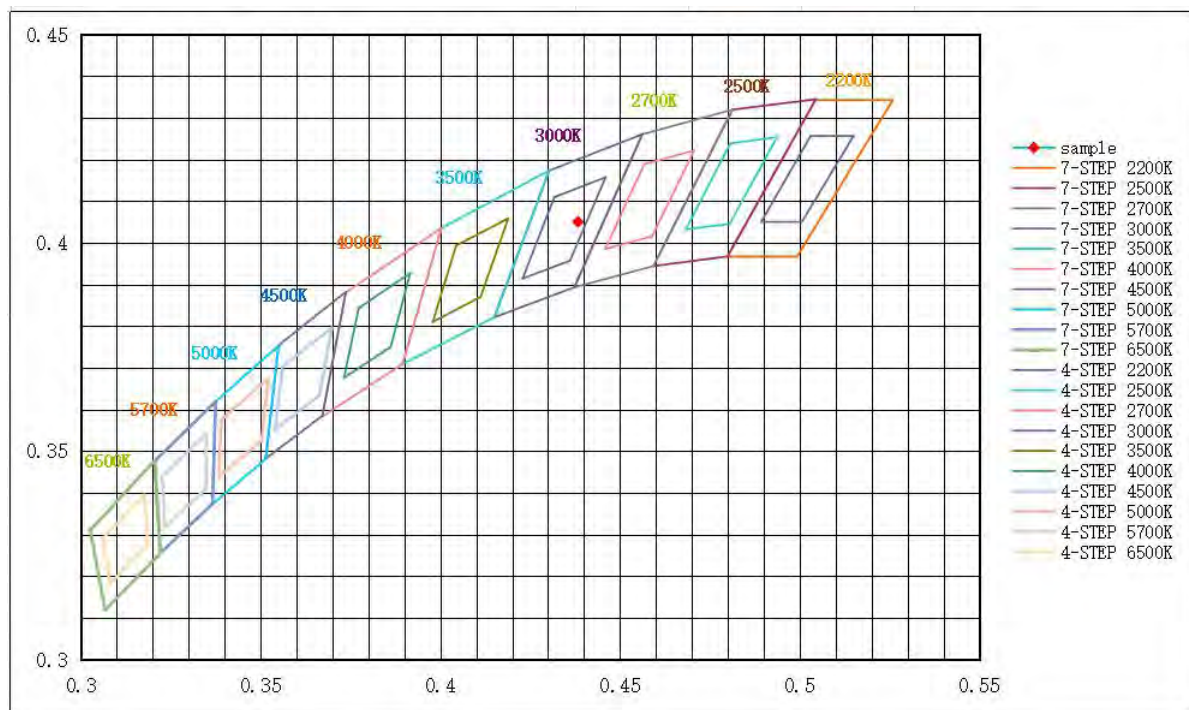
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
82.5	8	84	95	-11

**Spectral Distribution**



### 7/4 Step Quadrangle







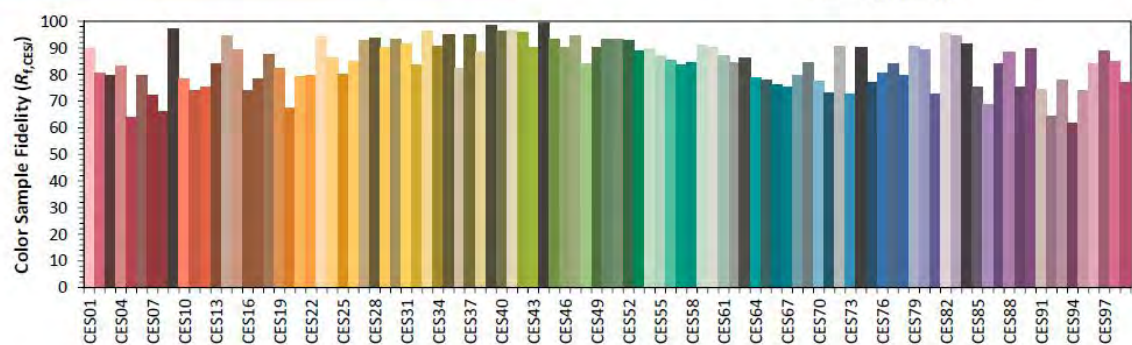
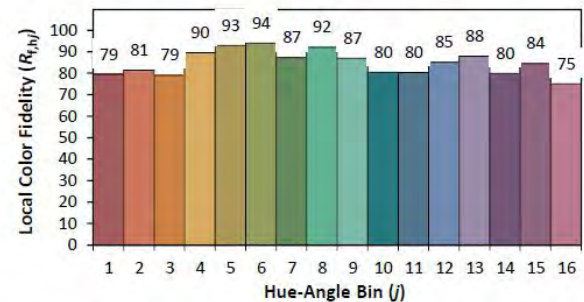
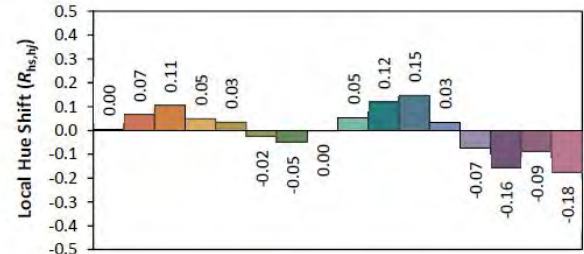
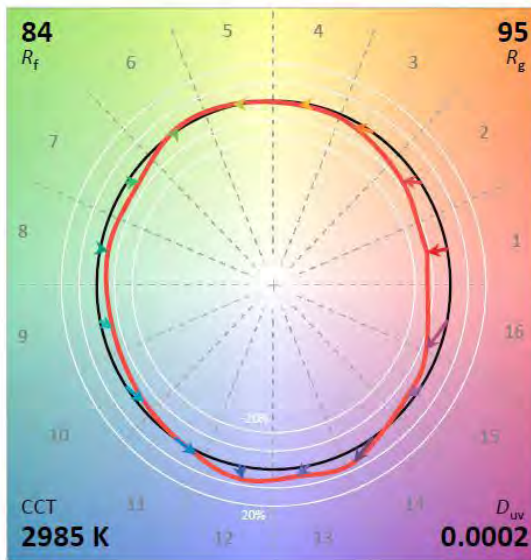
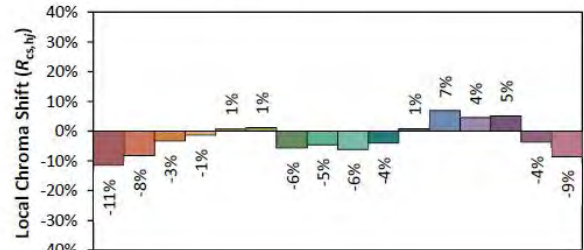
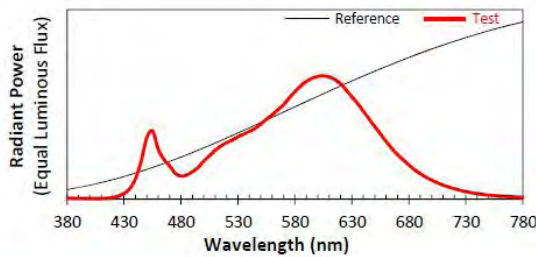
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V



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

 $x$  0.4383 $y$  0.4050 $u'$  0.2510 $v'$  0.5220CIE 13.3-1995  
(CRI) $R_a$  83 $R_g$  7

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



**3.1.8 Model Number: RP-T8C-G2-25W-3FT-2L-850-[OCN, Blank]-10V(Bare lamp)****Electrical data**

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.15	60	0.103	12.37	0.995

**Photometric data**

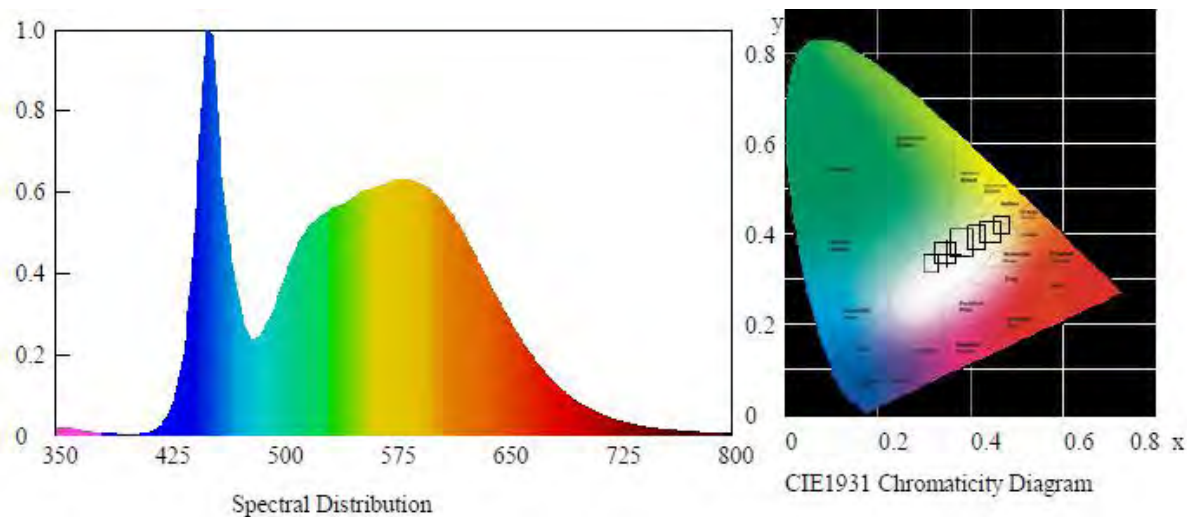
Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)
1523.91	123.24	4961

**Chromaticity Coordinate**

Duv	x	y	u'	v'
+0.00284	0.3468	0.3587	0.2098	0.4883

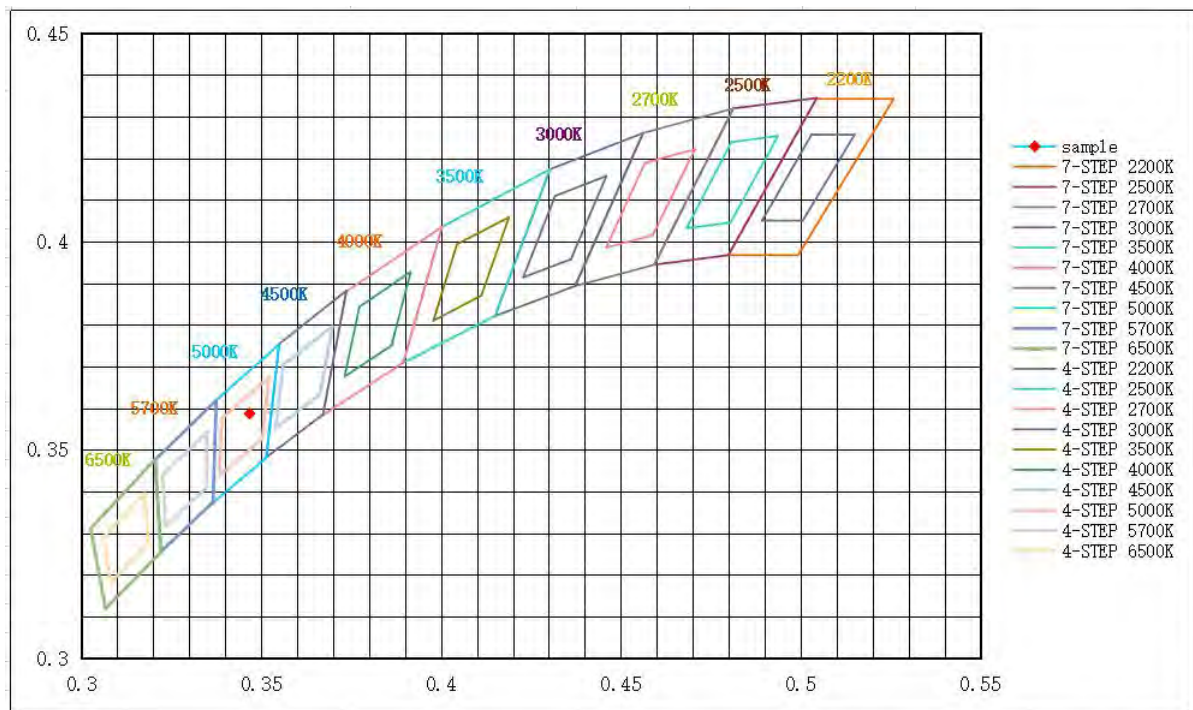
**Color Rendering**

CRI	R9	Rf	Rg	Rcs,h1(%)
82.7	9	83	96	-12

**Spectral Distribution**



## 7/4 Step Quadrangle





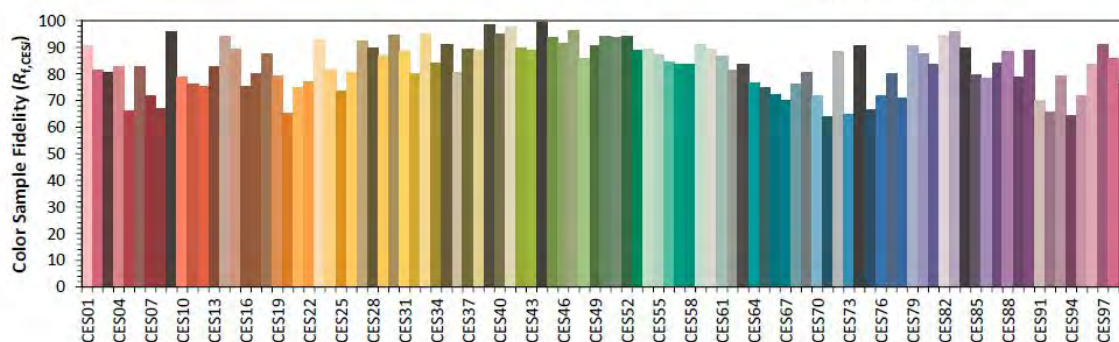
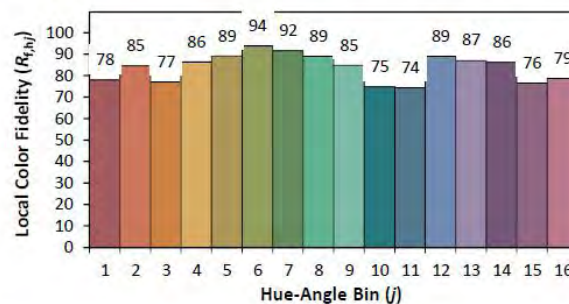
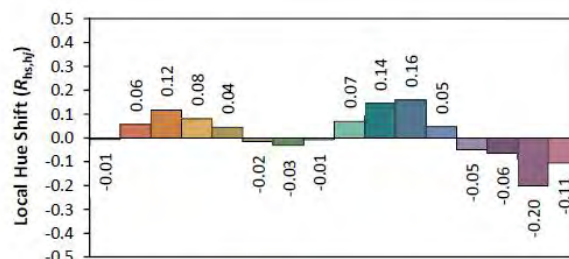
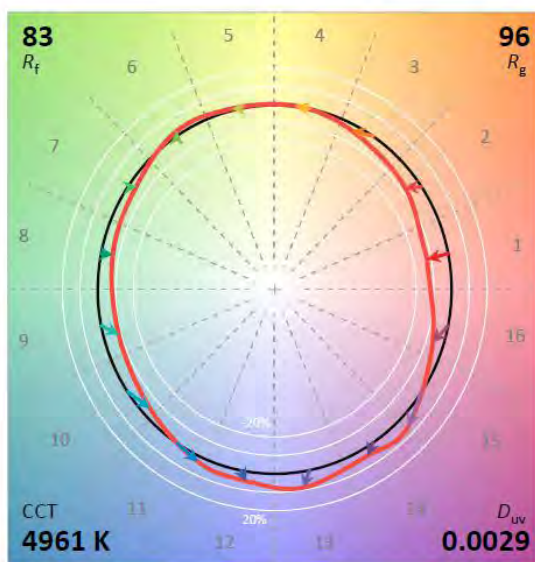
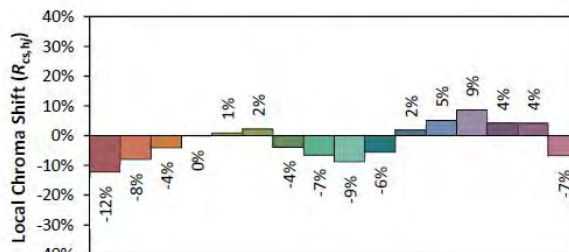
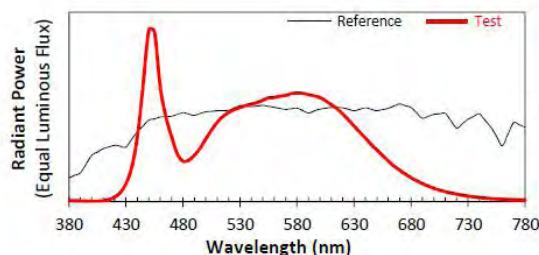
## ANSI/IES TM-30-18 Color Rendition Report

Source: BL210126007-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2020/1/27

Model: RP-T8C-G2-25W-3FT-2L-850-[OCN, Blank]-10V



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

$x$  0.3468  
 $y$  0.3587  
 $u'$  0.2098  
 $v'$  0.4883

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.



### 3.2 Goniophotometer System (Total operating time for luminous intensity distribution: 1.0 hour)

#### 3.2.1 Model Number: RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V(Bare lamp)

##### Electrical data

Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.100	60	0.103	12.250	0.990

##### Photometric data

Luminous Flux (lm)	Efficacy (lm/W)	Beam Angle(° )
1464.45	119.55	194.5



**Zonal Flux Diagram**

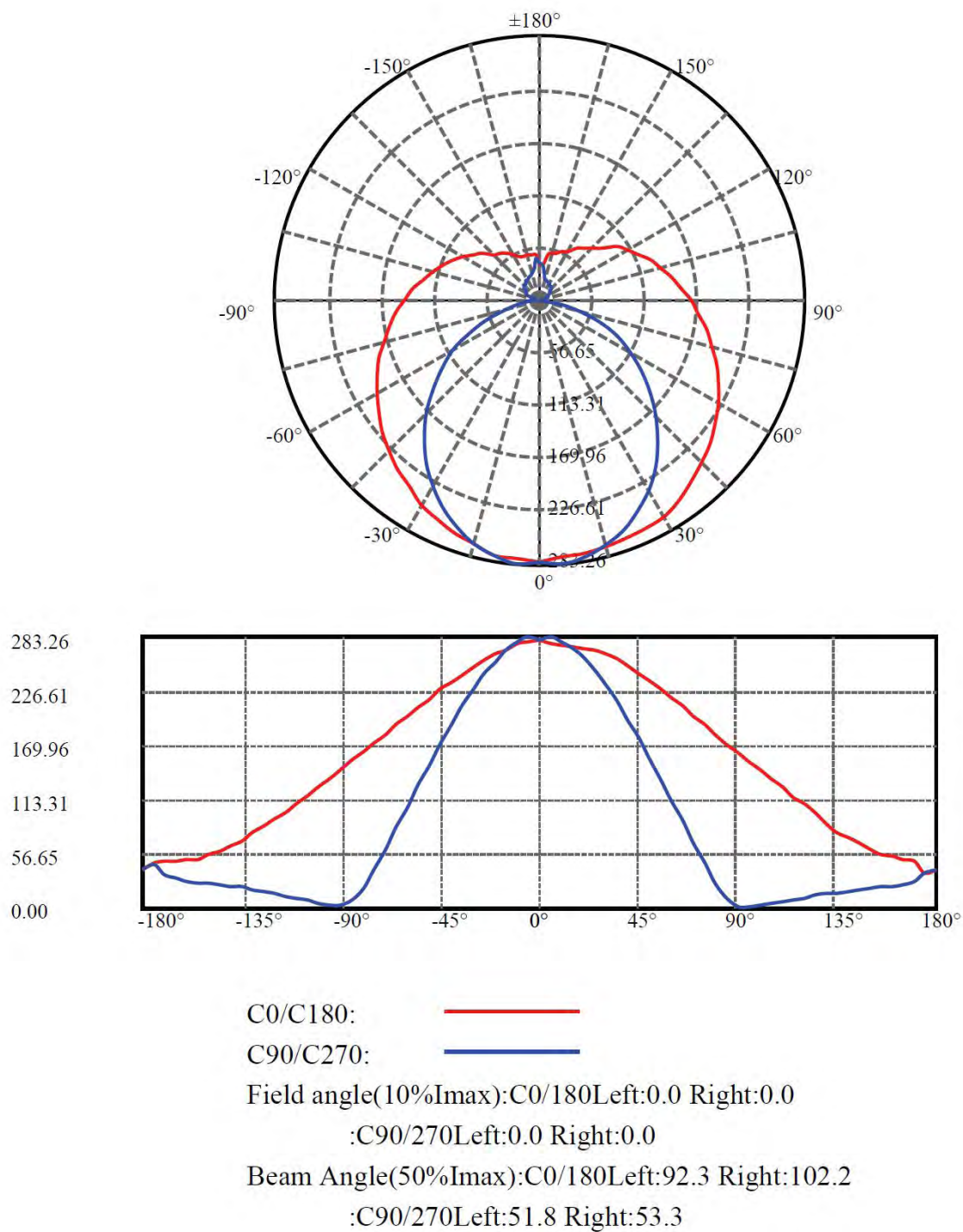
Zonal flux distribution table

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	279.651	0.000	0	0.00%	0.00%
5.0	278.694	6.675	6.675	0.00%	0.46%
10.0	275.639	19.830	26.505	0.00%	1.81%
15.0	270.051	32.370	58.875	0.00%	4.02%
20.0	262.688	43.905	102.78	0.00%	7.02%
25.0	253.731	54.163	156.943	0.00%	10.72%
30.0	243.234	62.891	219.835	0.00%	15.01%
35.0	231.301	69.879	289.713	0.00%	19.78%
40.0	218.402	75.029	364.743	0.00%	24.91%
45.0	204.823	78.364	443.106	0.00%	30.26%
50.0	190.723	79.926	523.032	0.00%	35.72%
55.0	176.596	79.867	602.899	0.00%	41.17%
60.0	162.417	78.362	681.261	0.00%	46.52%
65.0	148.839	75.667	756.928	0.00%	51.69%
70.0	135.365	71.962	828.891	0.00%	56.60%
75.0	122.753	67.468	896.359	0.00%	61.21%
80.0	111.185	62.595	958.954	0.00%	65.48%
85.0	101.289	57.734	1016.688	0.00%	69.42%
90.0	92.985	53.194	1069.882	0.00%	73.06%
95.0	86.092	49.033	1118.915	0.00%	76.41%
100.0	80.295	45.211	1164.126	0.00%	79.49%
105.0	74.916	41.530	1205.656	0.00%	82.33%
110.0	70.294	37.955	1243.611	0.00%	84.92%
115.0	65.803	34.460	1278.072	0.00%	87.27%
120.0	62.095	31.092	1309.164	0.00%	89.40%
125.0	58.047	27.770	1336.934	0.00%	91.29%
130.0	53.556	24.266	1361.2	0.00%	92.95%
135.0	50.083	20.942	1382.142	0.00%	94.38%
140.0	47.602	18.087	1400.23	0.00%	95.61%
145.0	46.062	15.627	1415.857	0.00%	96.68%
150.0	44.312	13.308	1429.165	0.00%	97.59%
155.0	43.294	11.087	1440.251	0.00%	98.35%
160.0	41.988	8.945	1449.196	0.00%	98.96%
165.0	40.735	6.818	1456.014	0.00%	99.42%
170.0	38.724	4.713	1460.727	0.00%	99.75%
175.0	38.881	2.776	1463.503	0.00%	99.94%
180.0	39.985	0.943	1464.446	0.00%	100.00%



## Luminous Intensity Distribution Diagram

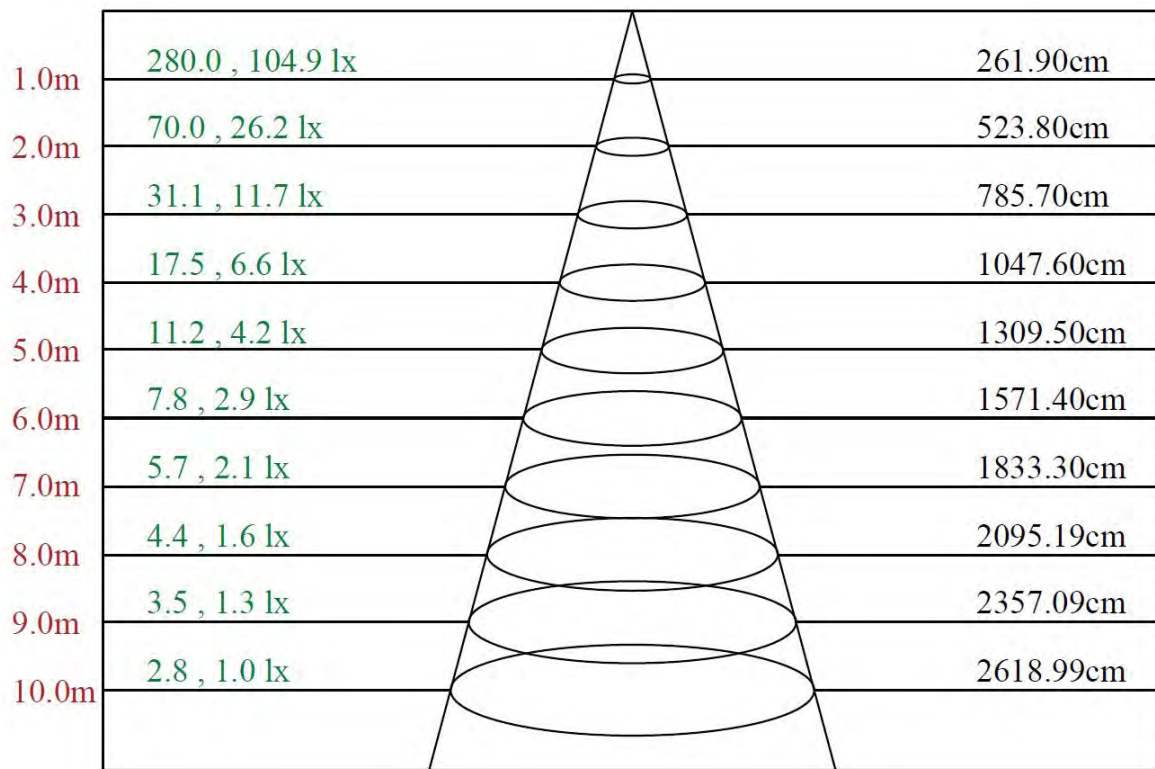
Light Distribution Curve [Unit:cd]







## Lux distance Curve



Max , Ave

Beam angle of C90 plane 105.27

**Luminous Intensity Distribution Data**

C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	279.65	275.74	274.49	273.24	271.15	269.48	265.72	260.29	253.18
22.5	279.65	278.67	276.58	273.24	268.22	261.96	254.85	246.92	238.56
45.0	279.65	274.07	271.15	265.30	258.61	248.59	238.98	226.86	214.33
67.5	279.65	275.33	270.31	262.37	251.51	239.81	224.36	208.06	191.35
90.0	279.65	283.26	278.67	271.57	261.54	248.17	233.96	216.84	197.20
112.5	279.65	281.18	277.42	269.48	259.87	247.75	233.96	217.67	201.38
135.0	279.65	278.25	275.33	269.90	262.37	252.77	241.07	229.37	215.16
157.5	279.65	279.92	277.00	271.57	265.30	257.78	249.84	241.07	231.04
180.0	279.65	277.42	275.74	269.90	264.88	258.20	251.51	243.16	235.64
202.5	279.65	278.67	275.74	270.73	264.88	258.20	250.68	241.49	232.71
225.0	279.65	274.07	270.73	265.72	257.78	248.17	237.73	226.44	213.91
247.5	279.65	277.00	274.07	267.81	259.03	248.59	234.80	220.18	203.05
270.0	279.65	282.43	277.42	269.06	257.36	244.41	228.53	210.57	191.35
292.5	279.65	281.59	277.42	270.31	260.70	249.42	234.80	219.34	202.63
315.0	279.65	279.09	277.00	271.98	265.30	258.20	249.42	238.56	227.28
337.5	279.65	282.43	281.18	278.67	274.49	268.22	261.54	254.02	245.66
360.0	279.65	275.74	274.49	273.24	271.15	269.48	265.72	260.29	253.18
C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	244.83	237.31	228.53	220.18	210.99	200.96	190.93	181.74	170.88
22.5	228.95	218.92	209.32	199.71	190.10	180.91	172.13	163.36	154.58
45.0	201.38	188.01	175.47	162.10	149.57	138.29	128.26	119.07	111.97
67.5	172.97	154.17	135.78	118.24	100.69	84.39	71.03	59.74	51.39
90.0	177.14	155.84	134.11	112.39	91.08	68.52	46.79	26.74	10.86
112.5	184.25	165.03	146.23	127.85	111.55	94.84	79.80	66.01	55.98
135.0	201.79	188.01	175.06	162.52	150.41	138.29	127.43	116.56	107.79
157.5	221.43	211.82	200.96	190.51	181.32	170.46	160.85	151.66	142.05
180.0	228.12	218.51	208.90	199.71	190.93	181.74	172.55	162.94	154.17
202.5	222.68	212.66	203.05	192.19	181.32	172.13	162.52	152.91	142.89
225.0	201.79	188.84	176.73	164.19	151.66	140.80	129.93	118.65	109.46
247.5	186.34	167.54	149.15	130.77	113.22	96.51	81.47	68.52	57.66
270.0	170.46	149.15	128.26	105.70	83.98	61.83	40.11	21.31	7.94
292.5	184.25	167.12	148.74	130.77	114.48	97.76	83.14	71.86	62.25
315.0	214.75	201.38	188.01	175.06	162.94	150.82	139.13	128.68	120.74
337.5	236.05	227.28	217.25	206.81	197.20	187.59	177.98	169.21	160.02
360.0	244.83	237.31	228.53	220.18	210.99	200.96	190.93	181.74	170.88
C/γ(°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	162.10	152.50	143.72	134.95	126.17	116.98	108.63	100.27	87.32
22.5	146.65	137.04	127.85	119.91	112.39	104.03	97.35	89.41	78.55
45.0	104.87	96.93	90.66	85.65	80.22	76.04	71.86	67.68	60.16
67.5	46.38	42.62	40.11	37.60	36.35	35.10	34.26	34.26	35.93
90.0	2.09	1.67	2.93	4.60	6.69	9.19	10.86	13.37	15.04
112.5	48.05	41.78	37.60	34.26	31.34	28.41	28.83	29.66	30.50
135.0	99.02	91.50	84.39	76.87	71.86	66.01	61.83	55.15	49.72
157.5	132.86	123.67	115.73	106.96	99.44	91.92	84.81	78.55	69.35
180.0	143.72	135.37	127.01	117.40	109.04	101.11	93.17	85.65	78.96
202.5	133.69	124.50	116.56	107.37	99.44	91.50	84.81	78.55	70.19
225.0	99.44	91.08	83.56	76.87	71.03	65.59	61.42	55.15	51.81
247.5	47.63	40.94	36.35	32.59	31.34	29.66	28.41	28.41	30.08
270.0	2.93	4.18	5.43	8.36	10.45	12.95	15.88	17.55	20.05
292.5	55.57	48.88	45.54	43.03	41.36	40.11	38.86	38.02	37.18
315.0	112.80	103.61	96.09	89.83	83.98	78.55	73.95	65.59	61.83
337.5	149.99	141.21	131.19	122.41	113.64	105.70	98.60	91.50	80.22
360.0	162.10	152.50	143.72	134.95	126.17	116.98	108.63	100.27	87.32





C/ $\gamma$ (°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	79.80	73.53	68.10	61.42	56.82	53.90	51.81	50.14	37.60
22.5	72.70	67.27	61.42	55.57	52.64	51.81	46.38	30.92	33.84
45.0	55.57	50.14	48.05	46.38	45.54	36.77	30.50	29.66	42.20
67.5	35.93	36.35	38.44	38.44	33.42	29.66	29.25	34.26	45.54
90.0	16.71	18.38	19.64	21.31	22.14	23.40	23.81	27.99	37.18
112.5	32.59	30.92	32.59	34.68	33.84	29.66	27.57	28.83	35.93
135.0	46.38	43.87	43.03	42.20	42.62	39.27	31.75	27.57	30.08
157.5	61.83	56.82	53.06	48.88	48.05	47.21	46.79	37.18	24.23
180.0	69.77	65.59	60.58	55.57	51.81	50.55	50.14	48.88	48.05
202.5	61.00	57.66	53.48	50.14	50.14	50.14	48.88	48.46	48.46
225.0	45.96	43.87	42.62	42.62	43.03	44.29	45.96	46.79	38.86
247.5	32.17	31.34	33.84	36.35	38.02	40.11	42.62	39.69	34.26
270.0	22.14	23.40	25.49	25.90	27.16	27.99	30.92	34.68	45.96
292.5	37.18	38.86	40.11	40.53	41.78	43.87	45.12	37.60	42.20
315.0	57.66	53.90	50.97	48.88	49.30	49.72	48.88	47.21	39.69
337.5	73.95	69.77	65.59	60.16	56.40	53.48	51.39	49.72	38.02
360.0	79.80	73.53	68.10	61.42	56.82	53.90	51.81	50.14	37.60
C/ $\gamma$ (°)	180.0								
0.0	39.99								
22.5	39.99								
45.0	39.99								
67.5	39.99								
90.0	39.99								
112.5	39.99								
135.0	39.99								
157.5	39.99								
180.0	39.99								
202.5	39.99								
225.0	39.99								
247.5	39.99								
270.0	39.99								
292.5	39.99								
315.0	39.99								
337.5	39.99								
360.0	39.99								



## 4 Additional Test

### Electrical data at 277V

Model Number	Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
RP-T8C-G2-25W-3FT-2L-830-[OCN, Blank]-10V	Power Factor	277	60	0.915
	THD	277	60	11.8%

## 5 Performance Assessment

Model name	CCT(K)	Total Luminous(lm)	Power(W)	Luminous Efficacy(lm/W)
RP-T8C-G2-15W-3FT-2L-830-[OCN, Blank]-10V	3000	948.24	7.37	128.66
RP-T8C-G2-15W-3FT-2L-835-[OCN, Blank]-10V	3500	955.15 <sup>*1</sup>	7.40 <sup>*2</sup>	129.16 <sup>*3</sup>
RP-T8C-G2-15W-3FT-2L-840-[OCN, Blank]-10V	4000	962.05 <sup>*1</sup>	7.40 <sup>*2</sup>	130.09 <sup>*3</sup>
RP-T8C-G2-15W-3FT-2L-850-[OCN, Blank]-10V	5000	975.86	7.42	131.52

\*1: This value is calculated and the calculation formula is as below:

$$955.15 = (975.86 - 948.24) / 4 + 948.24$$

$$962.05 = (975.86 - 948.24) / 4 + 955.15$$

\*2: This value is calculated and the calculation formula is as below:

$$7.40 = (7.37 + 7.42) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$129.16 = 955.15 / 7.40$$

$$130.09 = 962.05 / 7.40$$





Model name	CCT(K)	Total Luminous(lm)	Power(W)	Luminous Efficacy(lm/W)
RP-T8C-G2-18W-3FT-2L -830-[OCN, Blank]-10V	3000	1115.37	8.84	126.24
RP-T8C-G2-18W-3FT-2L -835-[OCN, Blank]-10V	3500	1121.30 <sup>*1</sup>	8.84 <sup>*2</sup>	126.92 <sup>*3</sup>
RP-T8C-G2-18W-3FT-2L -840-[OCN, Blank]-10V	4000	1127.22 <sup>*1</sup>	8.84 <sup>*2</sup>	127.59 <sup>*3</sup>
RP-T8C-G2-18W-3FT-2L -850-[OCN, Blank]-10V	5000	1139.07	8.83	128.93

\*1: This value is calculated and the calculation formula is as below:

$$1121.30 = (1139.07 - 1115.37) / 4 + 1115.37$$

$$1127.22 = (1139.07 - 1115.37) / 4 + 1121.30$$

\*2: This value is calculated and the calculation formula is as below:

$$8.84 = (8.84 + 8.83) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$126.92 = 1121.30 / 8.84$$

$$127.59 = 1127.22 / 8.84$$

Model name	CCT(K)	Total Luminous(lm)	Power(W)	Luminous Efficacy(lm/W)
RP-T8C-G2-20W-3FT-2L -830-[OCN, Blank]-10V	3000	1214.79	9.87	123.08
RP-T8C-G2-20W-3FT-2L -835-[OCN, Blank]-10V	3500	1223.60 <sup>*1</sup>	9.88 <sup>*2</sup>	123.91 <sup>*3</sup>
RP-T8C-G2-20W-3FT-2L -840-[OCN, Blank]-10V	4000	1232.42 <sup>*1</sup>	9.88 <sup>*2</sup>	124.80 <sup>*3</sup>
RP-T8C-G2-20W-3FT-2L -850-[OCN, Blank]-10V	5000	1250.04	9.88	126.46

\*1: This value is calculated and the calculation formula is as below:

$$1223.60 = (1250.04 - 1214.79) / 4 + 1214.79$$

$$1232.42 = (1250.04 - 1214.79) / 4 + 1223.60$$

\*2: This value is calculated and the calculation formula is as below:

$$9.88 = (9.87 + 9.88) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$123.91 = 1223.60 / 9.88$$

$$124.80 = 1232.42 / 9.88$$



Model name	CCT(K)	Total Luminous(lm)	Power(W)	Luminous Efficacy(lm/W)
RP-T8C-G2-25W-3FT-2L -830-[OCN, Blank]-10V	3000	1468.57	12.31	119.30
RP-T8C-G2-25W-3FT-2L -835-[OCN, Blank]-10V	3500	1482.41 <sup>*1</sup>	12.34 <sup>*2</sup>	120.13 <sup>*3</sup>
RP-T8C-G2-25W-3FT-2L -840-[OCN, Blank]-10V	4000	1496.24 <sup>*1</sup>	12.34 <sup>*2</sup>	121.25 <sup>*3</sup>
RP-T8C-G2-25W-3FT-2L -850-[OCN, Blank]-10V	5000	1523.91	12.37	123.24

\*1: This value is calculated and the calculation formula is as below:

$$1482.41 = (1523.91 - 1468.57) / 4 + 1468.57$$

$$1496.24 = (1523.91 - 1468.57) / 4 + 1482.41$$

\*2: This value is calculated and the calculation formula is as below:

$$12.34 = (12.31 + 12.37) / 2$$

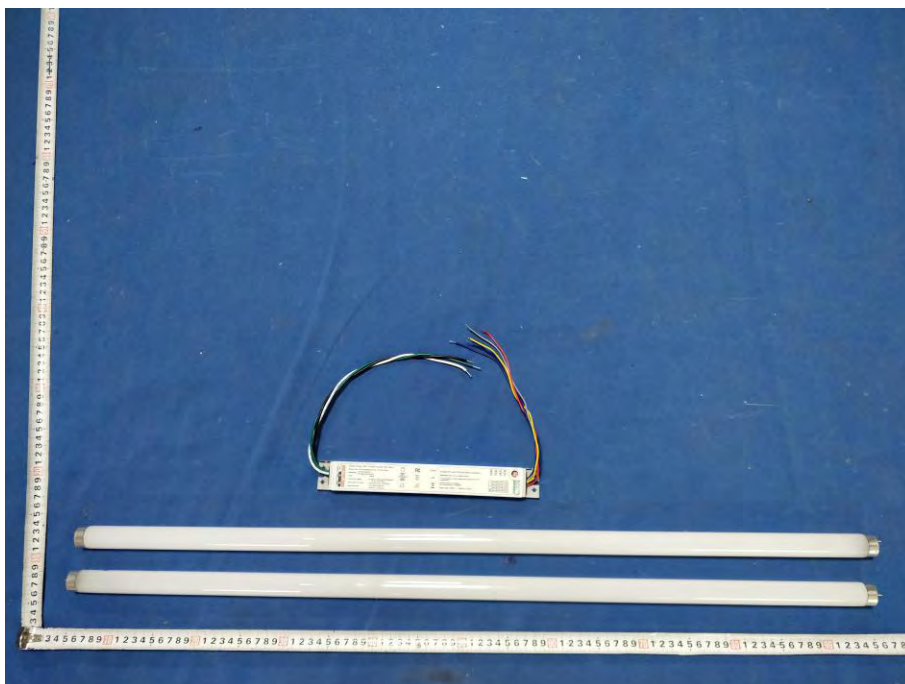
\*3: This value is calculated and the calculation formula is as below:

$$120.13 = 1482.41 / 12.34$$

$$121.25 = 1496.24 / 12.34$$



## Photo Document



\*\*\*\*End of test report\*\*\*\*