



## LM-79-08 Test Report

For

### Suzhou RUNLUX Electric Ltd

(Brand Name: RUNLUX)

No. 9 Dongtinghu Road, Kunshan Economic & Technological Development Zone,  
KUNSHAN CITY Jiangsu China

### Model name(s):

**R5-4VTA35WDHV13P#zL-3CK**

**Report Type:** Testing and Report According to IES LM-79-2008

**Type of Luminaire:** Application1: Direct Linear Ambient Luminaires  
Application2: Stairwell and Passageway Luminaires

**Report Date:** 2022-08-22

Ningbo TengLi Testing Co., Ltd

**Prepared By:** 2nd floor, Block B, Ningbo Testing and Certification Base,  
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Ningbo, Zhejiang

Test & Report By:

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Engineer: Nick Song

Review By:

*Garman Mo*

Manager: Garman Mo

Note: 1. The results contained in this report pertain only to the tested samples

2. This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.



<b>1.1 Product Information:</b>		
Model Number	R5-4VTA35WDHV13P#zL-3CK	
Remark	The “#” denotes sensor, #=B denotes sensor B; #=C denotes sensor C; Blank denotes no sensor employed; the “z” denotes enclosure color, z=G the enclosure is gray; Blank denotes the enclosure is white gray.	
Representative (Tested) Model	R5-4VTA35WDHV13PL-3CK (0%,3500K) R5-4VTA35WDHV13PL-3CK (50%,4000K) R5-4VTA35WDHV13PL-3CK (100%,5000K)	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Application1: Direct Linear Ambient Luminaires Application2: Stairwell and Passageway Luminaires	
LED Manufacturer	Seoul Semiconductor Co., LTD	
LED Model	STW8A2PD-B2	
Dimming	Continuous	
Integral Controls	Yes	
Sample Number	STD220813NB-N1	
Date of Receipt	Aug 10,2022	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

<b>1.2 Rated Values:</b>	
Rated Voltage / Frequency	120-347Vac, 50/60Hz
Nominal Power	20W/28W/35W (Power Adjustable)
Rated Initial Lamp Lumen	--
Declared CCT	3500K,4000K,5000K (Color Tunable)



### 1.3 Test Specifications:

Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> </ol>

### 1.4 Test Methods

#### 1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. 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 sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals.

#### 2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity 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 sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

#### 3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.



**2.1 Summary of Test Result**

Criteria Item	Measured Value		Compliance	Requirement (DLC V5.1)
Minimum Total Luminous	4537.0		Pass	Direct Linear Ambient: $\geq$ 375 lm/ft (-10%) Stairwell and Passageway Luminaires: $\geq$ 750(-10%)
Minimum Luminous Efficacy	130.01		Pass	Standard: $\geq$ 115(-3%) Premium: $\geq$ 130(-3%)
Minimum Power Factor	0.9290		Pass	$\geq$ 0.9(-3%)
Maximum THD %	15.12		Pass	$\leq$ 20(+5)
Minimum CRI	83.4		Pass	$\geq$ 80(-1)
Minimum R9	7		Pass	$\geq$ 0(-1)
Minimum Rg	96		Pass	$\geq$ 89(-1)
Minimum Rf	84		Pass	$\geq$ 70(-1)
Rcs, h1	-13		Pass	-12%-23%(-1%)
CCT (K)	3500K	3473	Pass	$\leq$ 6500K
	4000K	4203		
	5000K	5026		
Direct Linear Ambient: Zonal Lumen Requirement	0-60°:	82.4	Pass	$\geq$ 40(-3)
Stairwell and Passageway Luminaires: Zonal Lumen Requirement	0-90°	97.8	Pass	$\geq$ 85(-3)
UGR	21.1		Pass	--
BUG	B2-U3-G1		Pass	--



**2.2 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-08-11	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	R5-4VTA35WDHV13PL-3CK (0%,3500K)	<b>Total Operating Time(min)</b>	75

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD220813	120.0	60.01	0.2954	35.23	0.9940	7.88
NB-N1	347.0	60.01	0.1083	34.90	0.9290	15.12

**Photometric Measurement – Goniophotometer Method(Tset Dstance: 26.00m):**

Parameter	Result	
Test Voltage (V)	120	347
Frequency (Hz)	60	60
Total Luminous (lm)	4667.1	4537.0
Luminous Efficacy (lm/W)	132.49	130.01
Zonal lumens in the 0-60° zone (%)	82.4	--
Zonal lumens in the 0-90° zone (%)	97.8	--
Beam Angle (°)	82.6	--
Center Beam Candle Power (cd)	2322	--
UGR Viewed Crosswise	21.1	--
UGR Viewed Endwise	21.0	--
BUG	B2-U3-G1	--



**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,656.2	35.5%
0-40	2,532.9	54.3%
0-60	3,846.5	82.4%
60-90	720.5	15.4%
70-100	395.5	8.5%
90-120	86.8	1.9%
0-90	4,567.0	97.8%
90-180	100.4	2.2%
0-180	4,667.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	218.1	4.7%	90-100	56.3	1.2%
10-20	601.2	12.9%	100-110	15.5	0.3%
20-30	836.8	17.9%	110-120	15.0	0.3%
30-40	876.7	18.8%	120-130	6.0	0.1%
40-50	751.7	16.1%	130-140	2.9	0.1%
50-60	561.9	12.0%	140-150	2.0	0%
60-70	381.4	8.2%	150-160	1.4	0%
70-80	225.8	4.8%	160-170	0.9	0%
80-90	113.4	2.4%	170-180	0.4	0%

**Photometric Data**

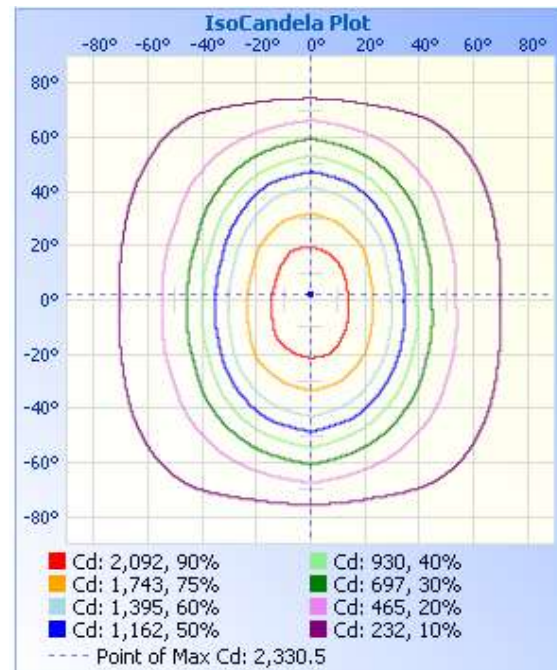
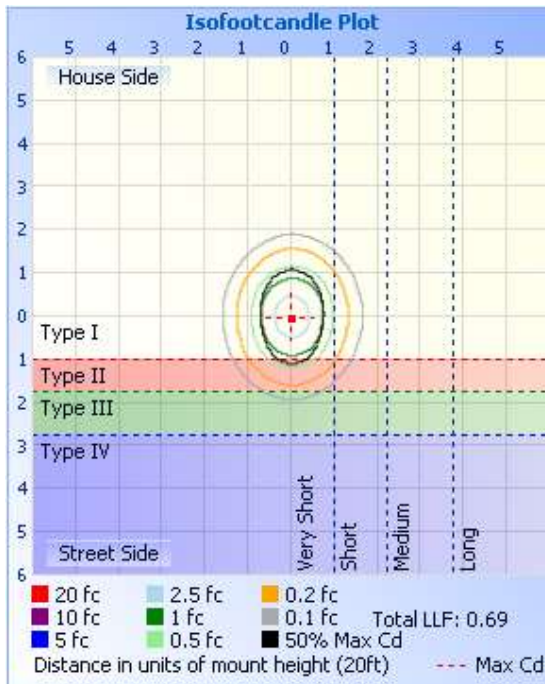
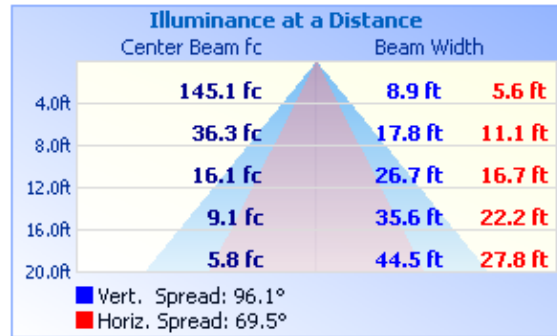
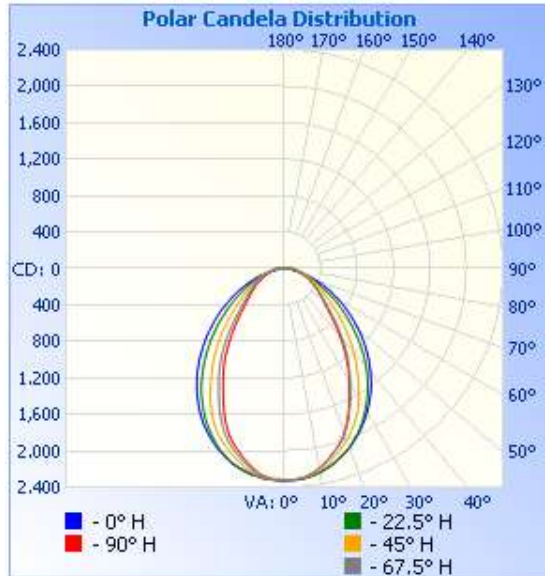




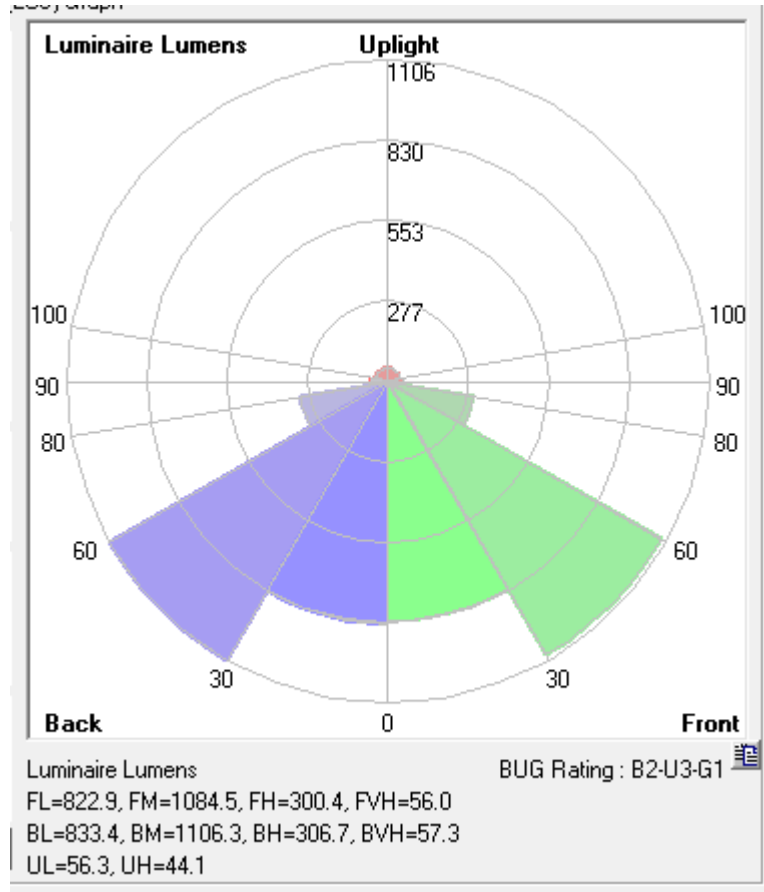
Table--1 UNIT: ed

C (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5		
0	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322	2322		
5	2294	2293	2300	2303	2317	2309	2307	2302	2308	2309	2312	2309	2316	2309	2309	2307		
10	2192	2205	2237	2256	2268	2271	2247	2218	2222	2231	2268	2271	2278	2276	2247	2214		
15	2040	2056	2118	2174	2189	2191	2132	2088	2088	2113	2178	2198	2216	2209	2139	2083		
20	1850	1893	1983	2055	2091	2088	2001	1925	1921	1967	2056	2095	2115	2098	2009	1921		
25	1595	1662	1820	1909	1965	1949	1842	1696	1677	1752	1899	1954	1992	1953	1846	1690		
30	1346	1409	1612	1743	1816	1782	1635	1446	1422	1502	1702	1791	1846	1782	1628	1447		
35	1107	1182	1378	1561	1652	1597	1402	1215	1184	1265	1468	1611	1673	1594	1394	1216		
40	865	947	1158	1363	1471	1394	1178	980	937	1031	1230	1412	1491	1378	1171	975		
45	662	733	943	1156	1278	1177	960	764	722	805	1009	1201	1289	1162	950	751		
50	526	571	746	947	1078	961	761	596	571	625	800	987	1090	947	742	587		
55	433	459	575	752	879	763	593	480	468	500	621	782	890	751	575	476		
60	358	375	447	577	693	585	465	394	386	407	483	603	700	576	450	391		
65	289	306	351	427	520	436	369	321	312	331	378	451	527	427	357	319		
70	228	246	276	305	363	316	293	256	245	266	297	324	371	309	283	255		
75	173	191	214	210	229	222	228	198	187	207	230	223	236	216	220	198		
80	129	144	161	138	121	151	173	149	140	156	172	147	127	146	167	149		
85	96.5	108	119	87.5	46.2	98.4	128	111	104	116	127	92.7	50.2	96.4	125	111		
90	74.9	82.6	88.2	56.0	15.4	64.8	94.6	84.7	80.4	87.0	92.4	58.7	16.6	64.4	92.7	85.6		
95	63.1	67.3	66.0	22.6	14.2	32.5	69.9	68.2	66.2	69.2	67.5	29.5	12.8	36.6	70.9	70.3		
100	50.1	41.8	9.26	16.0	12.7	18.4	13.2	50.5	55.7	51.7	14.5	16.4	11.3	19.2	13.8	48.9		
105	0.28	0.36	26.9	11.2	11.1	13.0	24.3	0.31	0.36	0.38	24.2	11.3	10.7	13.6	25.0	0.45		
110	30.4	32.0	18.4	7.82	9.50	8.46	20.0	31.8	21.3	31.7	19.0	7.87	9.75	9.01	22.1	35.3		
115	27.4	24.2	11.7	3.92	6.22	3.82	13.2	24.4	28.7	24.2	11.3	5.38	8.46	5.52	14.5	27.2		
120	19.7	16.5	7.02	2.20	3.17	2.04	7.70	16.8	20.6	16.6	6.40	2.41	4.29	2.84	8.85	19.1		
125	13.0	10.3	4.10	2.43	2.93	2.11	3.91	10.5	13.5	10.2	3.47	2.38	3.14	2.81	5.41	12.3		
130	7.60	5.58	3.21	4.53	3.74	4.35	2.78	5.59	7.73	5.46	2.89	3.48	2.93	3.96	3.73	6.92		
135	3.91	3.51	2.82	3.52	4.82	3.49	2.62	3.12	3.80	3.02	2.87	3.85	4.18	4.07	3.40	3.93		
140	3.18	3.02	2.73	3.09	4.52	3.10	2.57	2.98	2.87	2.99	2.87	3.50	3.98	4.28	3.05	3.28		
145	2.82	2.88	2.73	3.07	4.52	2.97	2.62	2.92	2.65	2.99	2.84	3.24	3.98	4.28	3.05	3.26		
150	2.76	2.94	2.05	3.02	4.31	2.99	2.73	2.92	2.65	2.99	2.76	3.22	4.01	4.00	2.59	3.23		
155	2.73	2.83	2.05	2.99	3.75	2.99	2.38	2.97	2.62	2.99	2.42	3.12	3.62	3.58	3.32	2.58		
160	2.04	2.33	2.71	3.19	3.65	3.07	2.89	2.55	2.34	2.47	2.60	3.07	3.19	3.66	3.68	3.01		
165	2.76	3.07	2.84	3.65	4.03	3.63	2.97	3.03	2.90	2.94	3.13	3.07	3.47	3.94	4.14	3.34		
170	3.01	3.40	3.34	4.05	5.10	4.43	3.38	3.54	3.18	3.07	3.39	3.37	4.06	4.77	4.84	3.62		
175	3.34	3.79	3.66	4.31	5.38	4.90	3.81	3.65	3.46	3.38	3.76	3.57	4.29	5.41	5.38	3.90		
180	3.46	3.84	3.71	4.43	5.36	4.87	3.84	3.90	3.48	3.40	3.68	3.55	4.39	5.41	5.11	3.90		





**BUG**





**2.2 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-08-11	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	R5-4VTA35WDHV13PL-3CK (0%,3500K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD220813	120.0	60	0.2970	35.44	0.9943	7.85
NB-N1	347.0	60	0.1088	35.11	0.9296	15.02

**Chromaticity Measurement - Sphere-Spectroradiometer**

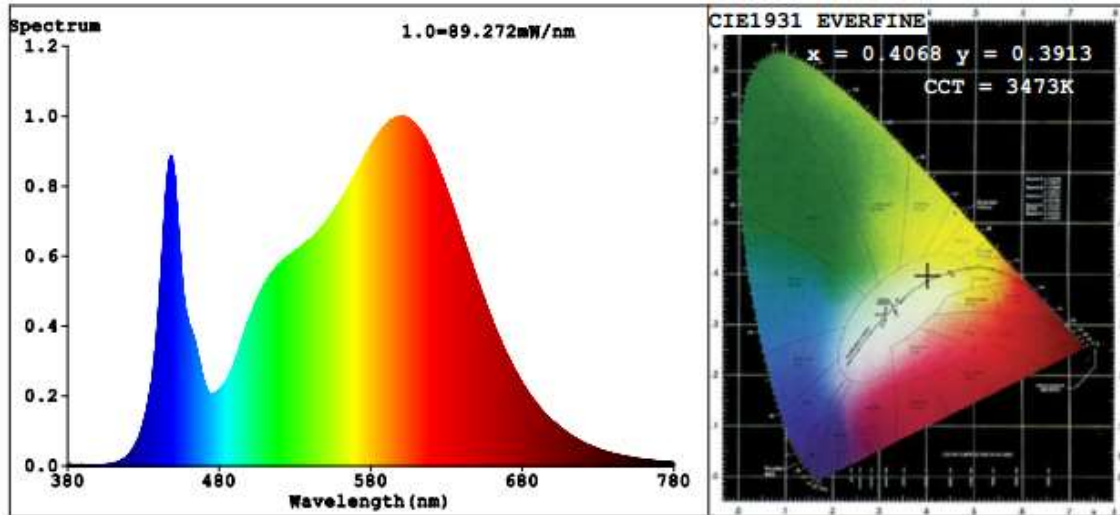
**Method(Self-absorption:1.2087)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3473
Duv	-0.0001
Chromaticity (x, y)	x=0.4068 y=0.3913
Chromaticity (u', v')	u'=0.2364 v'=0.5117
Color Rendering Index (CRI)	83.5
R9	8
Rg	97
Rf	84
Rcs,h1(%)	-12

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result	
Test Voltage (V)	120	347
Frequency (Hz)	60	60
Total Luminous (lm)	4714	4583
Luminous Efficacy (lm/W)	133.01	130.53

**Spectral Power Distribution & Chromaticity Diagram**



R1 =82	R2 =90	R3 =96	R4 =83	R5 =82	R6 =87	R7 =85		
R8 =62	R9 =8	R10=77	R11=83	R12=69	R13=84	R14=98	R15=75	

TM30

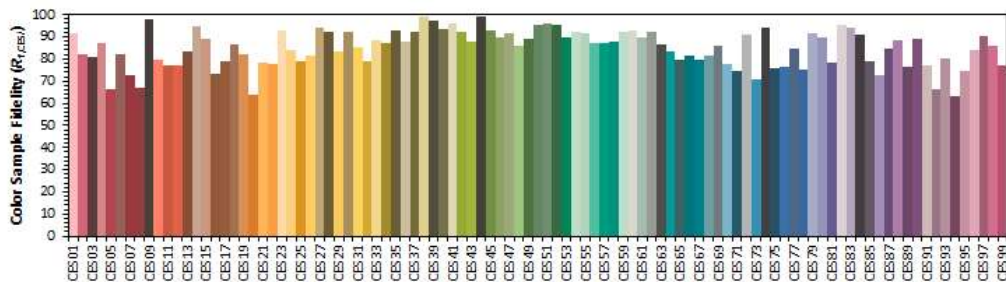
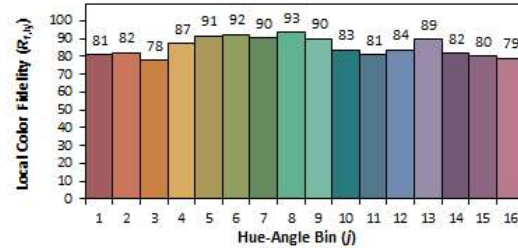
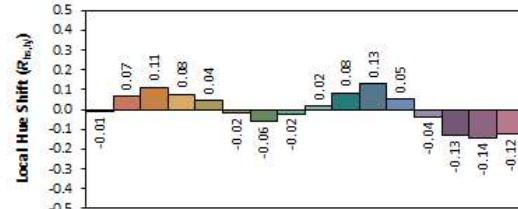
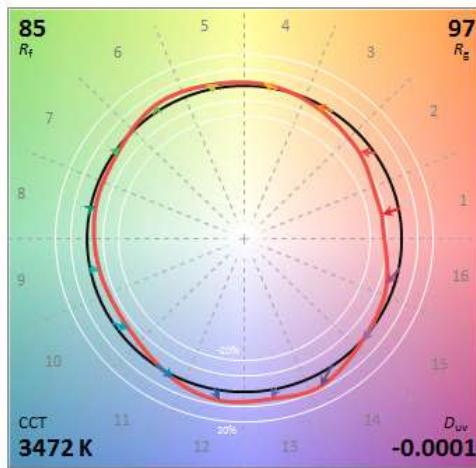
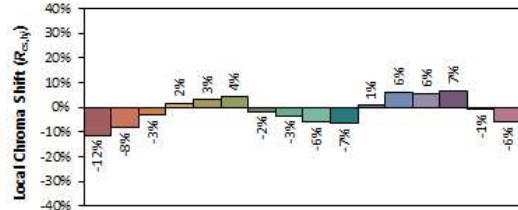
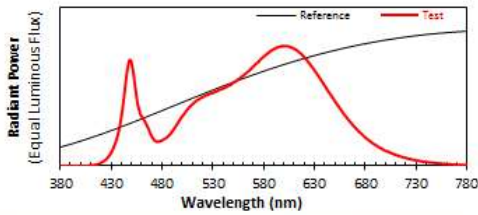
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-B2

Manufacturer: Suzhou RUNLUX Electric Ltd

Date: 2022-08-11

Model: R5-4VTA35WDHV13PL-3CK (0%, 3500K)



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

$x$  0.4068  
 $y$  0.3912  
 $u'$  0.2365  
 $v'$  0.5117

CIE 13.3-1995 (CRI)  
 $R_a$  84  
 $R_g$  8

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



**2.3 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-08-11	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	R5-4VTA35WDHV13PL-3CK (50%,4000K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD220813	120.0	60	0.2834	33.79	0.9935	7.89
NB-N1	347.0	60	0.1038	33.47	0.9293	15.09

**Chromaticity Measurement - Sphere-Spectroradiometer**

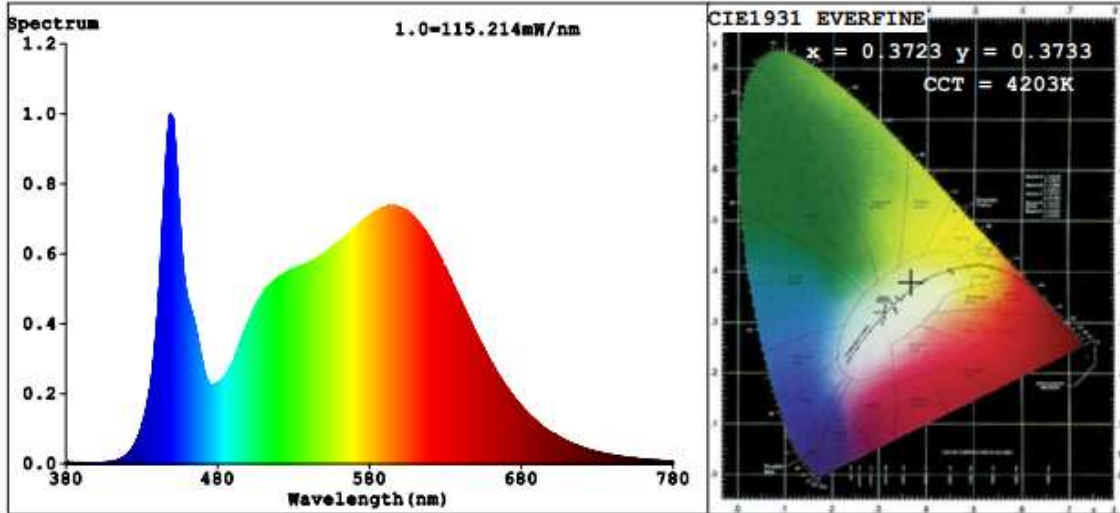
**Method(Self-absorption:1.2083)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4203
Duv	0.0008
Chromaticity (x, y)	x=0.3723 y=0.3733
Chromaticity (u', v')	u'=0.2212 v'=0.4988
Color Rendering Index (CRI)	84.7
R9	14
Rg	96
Rf	85
Rcs,h1(%)	-12

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result	
Test Voltage (V)	120	347
Frequency (Hz)	60	60
Total Luminous (lm)	4977	4838
Luminous Efficacy (lm/W)	147.29	144.55

**Spectral Power Distribution & Chromaticity Diagram**



R1 =83	R2 =90	R3 =95	R4 =85	R5 =84	R6 =86	R7 =87		
R8 =67	R9 =14	R10=76	R11=85	R12=64	R13=85	R14=98	R15=77	

TM30

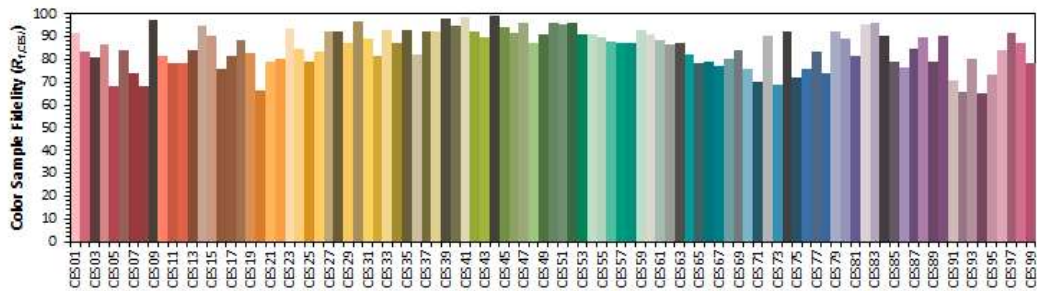
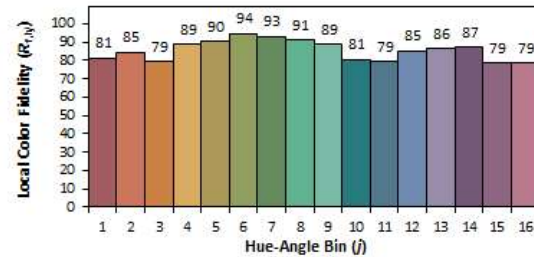
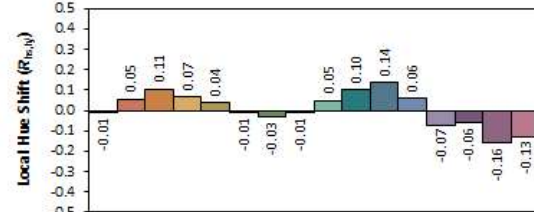
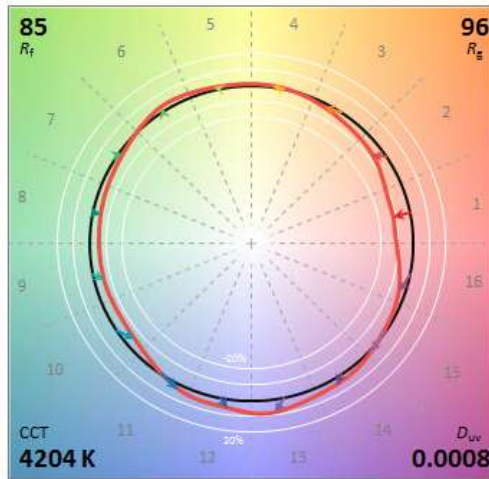
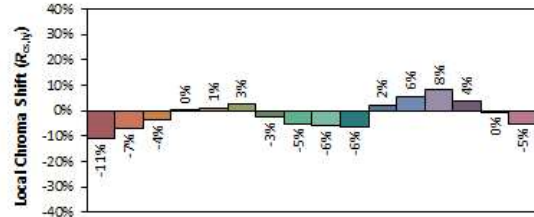
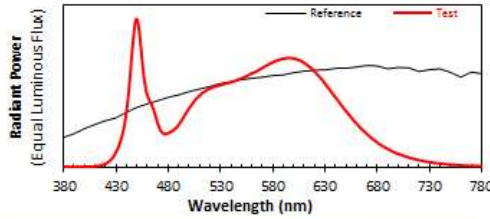
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-B2

Manufacturer: Suzhou RUNLUX Electric Ltd

Date: 2022-08-11

Model: R5-4VTA35WDHV13PL-3CK (50%, 4000K)



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

$x$  0.3723  
 $y$  0.3731  
 $u'$  0.2212  
 $v'$  0.4988

CIE 13.3-1995  
(CRI)  
 $R_a$  85  
 $R_g$  14

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



**2.4 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2022-08-11	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	R5-4VTA35WDHV13PL-3CK (100%,5000K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD220813	120.0	60	0.2923	34.90	0.9951	7.83
NB-N1	347.0	60	0.1071	34.57	0.9298	15.11

**Chromaticity Measurement - Sphere-Spectroradiometer**

**Method(Self-absorption:1.2080)(4π geometry):**

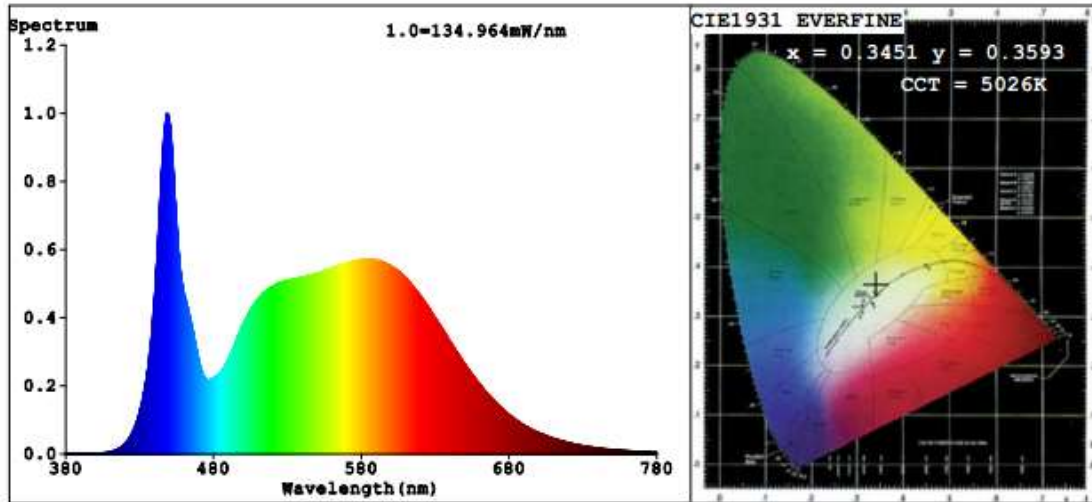
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5026
Duv	0.0038
Chromaticity (x, y)	x=0.3451 y=0.3593
Chromaticity (u', v')	u'=0.2085 v'=0.4884
Color Rendering Index (CRI)	83.4
R9	7
Rg	96
Rf	84
Rcs,h1(%)	-13

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result	
Test Voltage (V)	120	347
Frequency (Hz)	60	60
Total Luminous (lm)	4896	4760
Luminous Efficacy (lm/W)	140.29	137.69



**Spectral Power Distribution & Chromaticity Diagram**



R1 =81	R2 =88	R3 =93	R4 =84	R5 =83	R6 =84	R7 =87		
R8 =67	R9 =7	R10=71	R11=84	R12=64	R13=83	R14=96	R15=75	

TM30

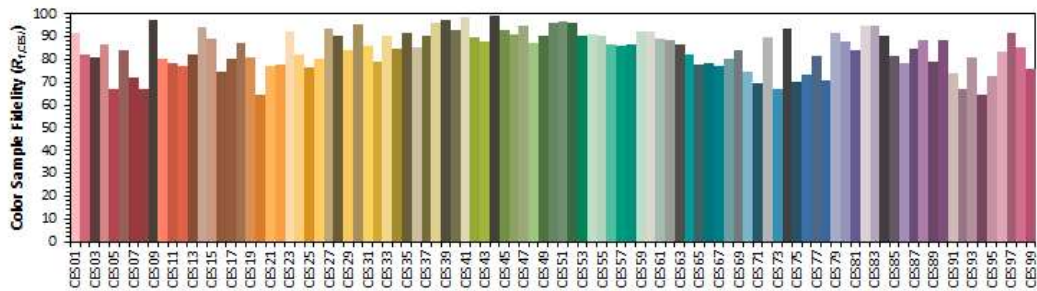
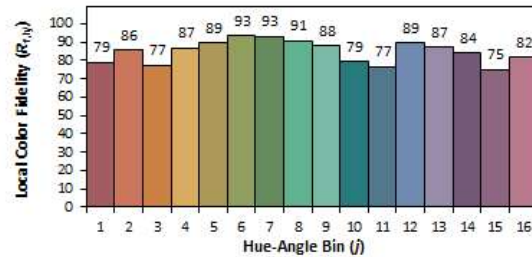
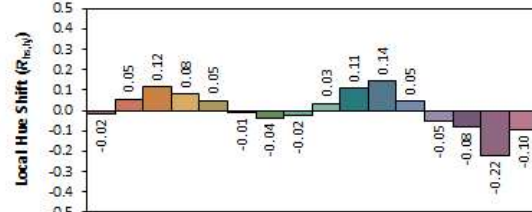
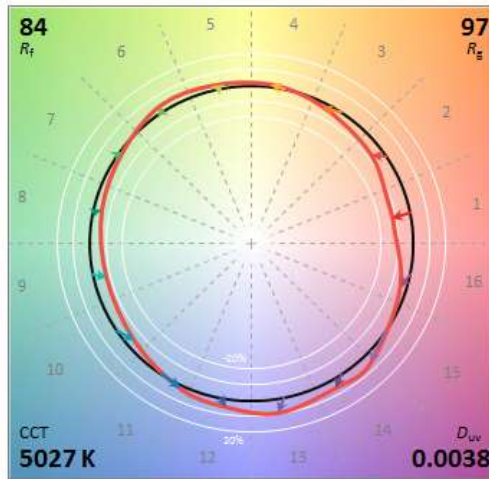
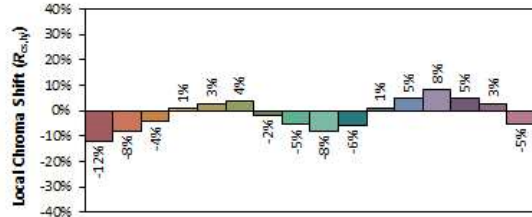
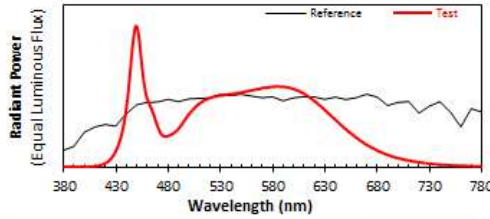
ANSI/IES TM-30-18 Color Rendition Report

Source: STW8A2PD-B2

Manufacturer: Suzhou RUNLUX Electric Ltd

Date: 2022-08-11

Model: R5-4VTA35WDHV13PL-3CK (100%, 5000K)



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

$x$  0.3450  
 $y$  0.3591  
 $u'$  0.2085  
 $v'$  0.4883

CIE 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.



**2.5 Data comparison for different power**

<b>Test date</b>	2022-08-11	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	R5-4VTA35WDHV13PL-3CK	<b>Total Operating Time(min)</b>	61

Sample No.	Wattage and CCT setting	Test Voltage (V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
STD220813NB-N1	20W,3500K setting	120.0	2747	19.59	140.22
STD220813NB-N1	28W,3500K setting	120.0	3853	28.21	136.58
STD220813NB-N1	35W,3500K setting	120.0	4667.1	35.23	132.49



### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2022-01-14	2023-01-13
ST-R-704	Power Meter for Integrating Sphere	2022-01-03	2023-01-02
ST-R-707	Temperature Probe for Integrating Sphere	2022-01-03	2023-01-02
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2022-01-14	2023-01-13
ST-R-711	Power Meter for Goniophotometer	2022-01-03	2023-01-02
ST-R-709	Hygrothermograph for Goniophotometer	2022-01-03	2023-01-02
Uncertainty(K=2): Photometric Measurement (Sphere):3.40% Chromaticity Measurement(Sphere):44.8K Photometric Measurement(Goniophotometer):3.64%			

#### 4. Product Photo



\*\*\*\*\* END OF REPORT \*\*\*\*\*