

LM-79-08 Test Report
For
RAB LIGHTING INC

(Brand Name: N/A)

170 Ludlow Ave, PO BOX 970, Northvale, NJ 07647-2305 USA

Model name(s):
WFRL4R99FA120WBB

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

**Type of
Luminaire:** Downlights

Report Date: 2024-11-22

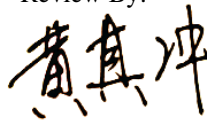
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	9.0W
Rated Initial Lamp Lumen	750lm (mode 5000K)
Declared CCT	2700K/3000K/3500K/4000K/5000K

1.2 Test Specifications:

Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

<p>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°C ±1°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°vertical intervals and 22.5°horizontal intervals.</p>
<p>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°C ±1°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</p>
<p>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°C ±1°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.</p>

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-20	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFRL4R99FA120WBB	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202411160002	120.0	60	0.077	8.99	0.964

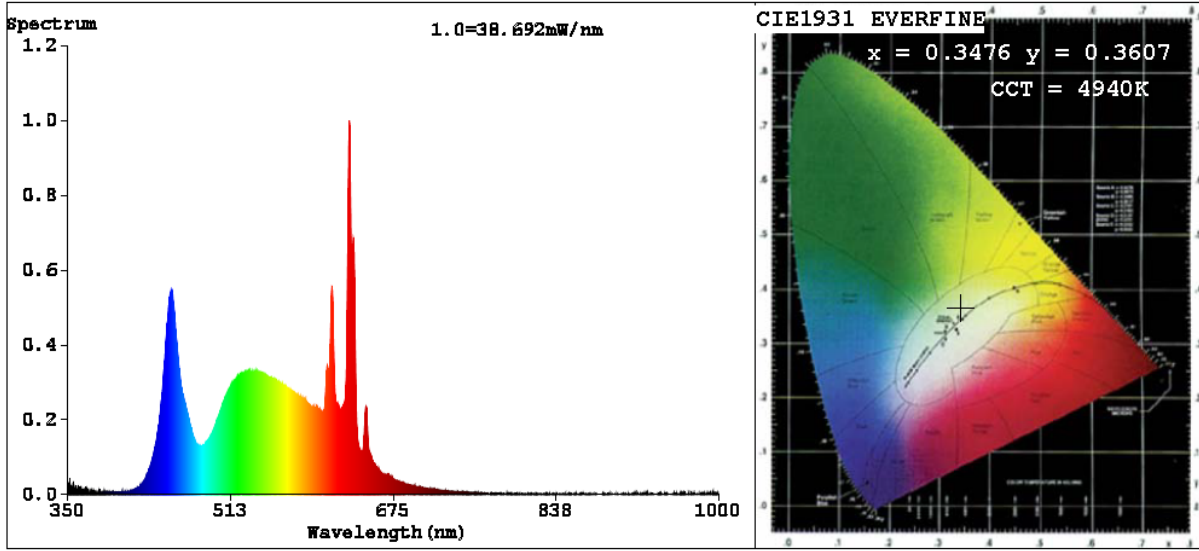
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	98
Frequency (Hz)	60	R2	95	R10	85
CCT (K)	4940	R3	88	R11	93
Duv	0.0035	R4	97	R12	63
Chromaticity (x, y)	x=0.3476 y=0.3607	R5	96	R13	97
Chromaticity (u', v')	u'=0.2096 v'=0.4894	R6	92	R14	92
Color Rendering Index (CRI)	95.1	R7	97	R15	97
R9	98	R8	98	--	--
Rg	103				
Rf	93				
Rcs,h1%	-2				

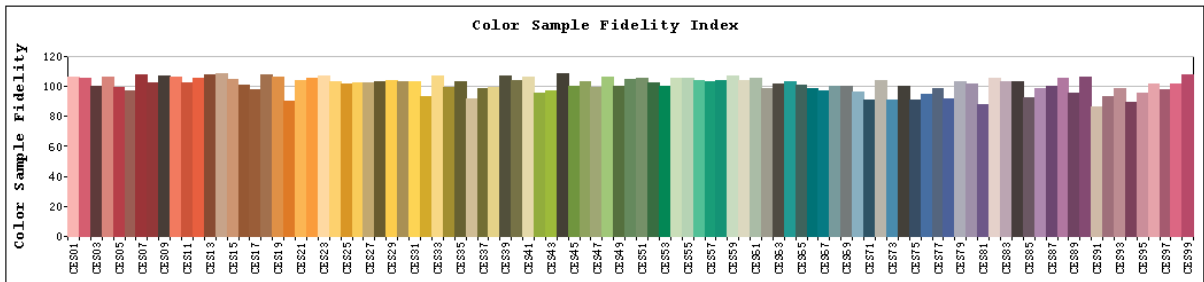
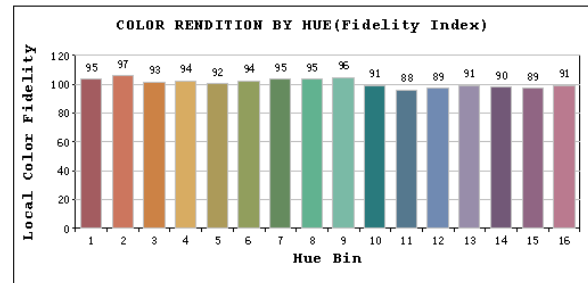
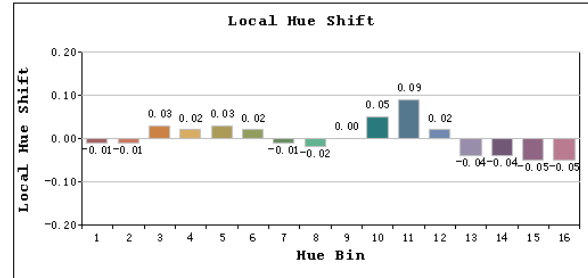
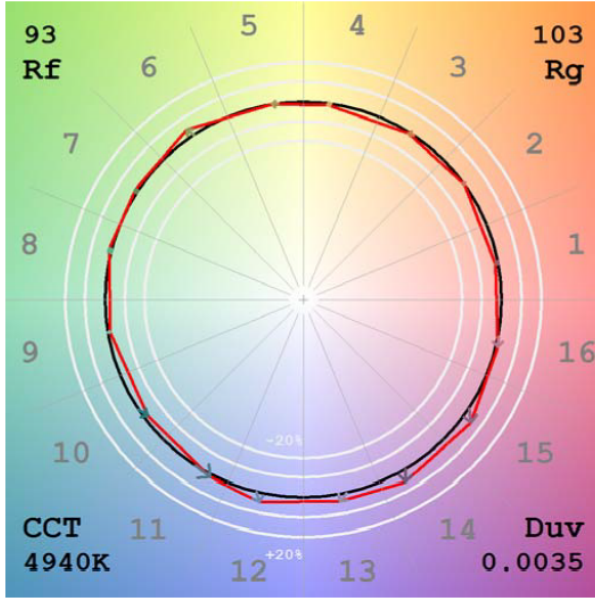
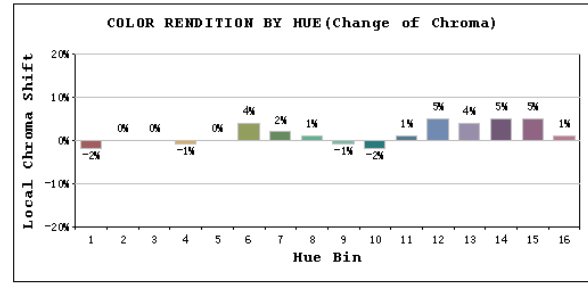
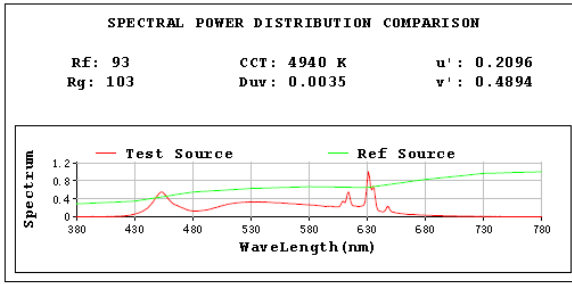
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	806.5
Luminous Efficacy (lm/W)	89.71
Beam Angle (°)	109.8
Center Beam Candle Power (cd)	299.5

Spectral Power Distribution & Chromaticity Diagram



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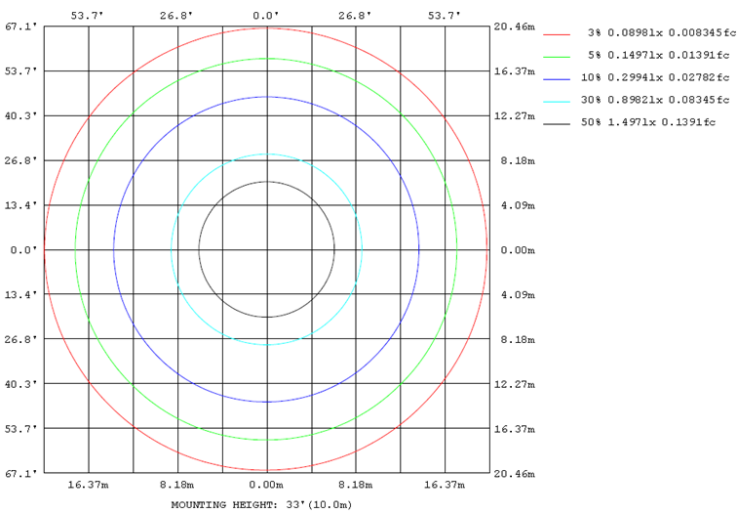
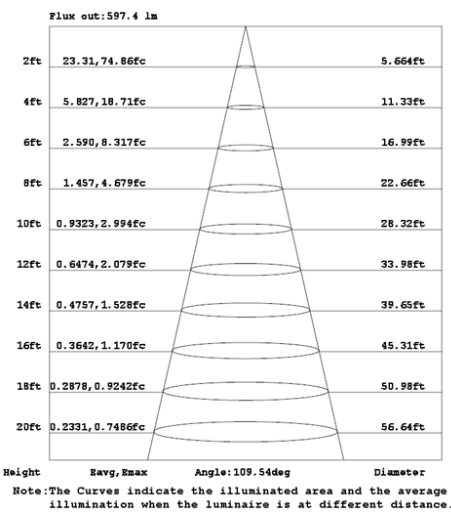
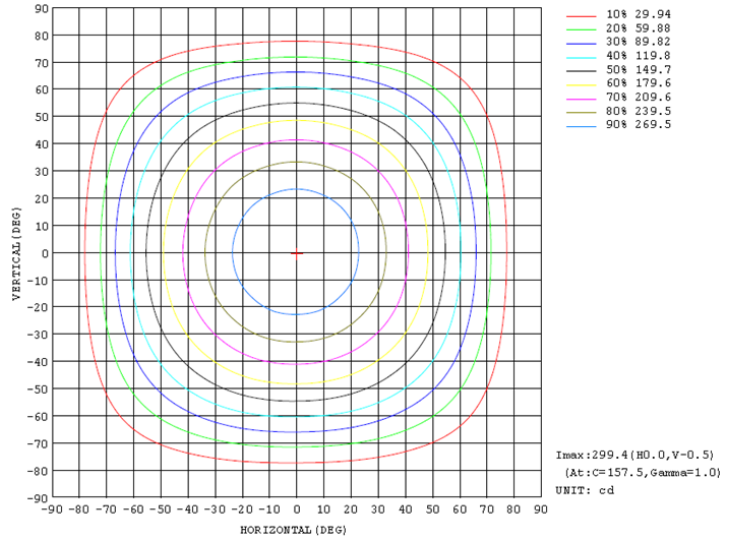
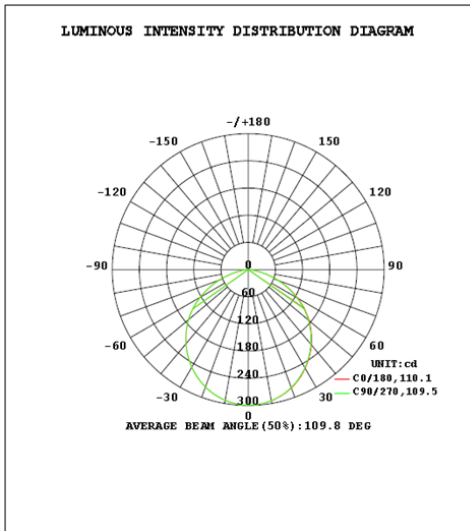


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	231.1	28.6%
0-40	377.0	46.7%
0-60	660.5	81.9%
60-90	146.0	18.1%
70-100	50.4	6.3%
90-120	0.0	0.0%
0-90	806.5	100.0%
90-180	0.0	0.0%
0-180	806.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.3	3.5%	90-100	0.0	0.0%
10-20	80.8	10.0%	100-110	0.0	0.0%
20-30	121.9	15.1%	110-120	0.0	0.0%
30-40	146.0	18.1%	120-130	0.0	0.0%
40-50	150.2	18.6%	130-140	0.0	0.0%
50-60	133.3	16.5%	140-150	0.0	0.0%
60-70	95.6	11.9%	150-160	0.0	0.0%
70-80	45.5	5.6%	160-170	0.0	0.0%
80-90	5.0	0.6%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-20	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFRL4R99FA120WBB	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202411160002	120.0	60	0.077	8.95	0.964

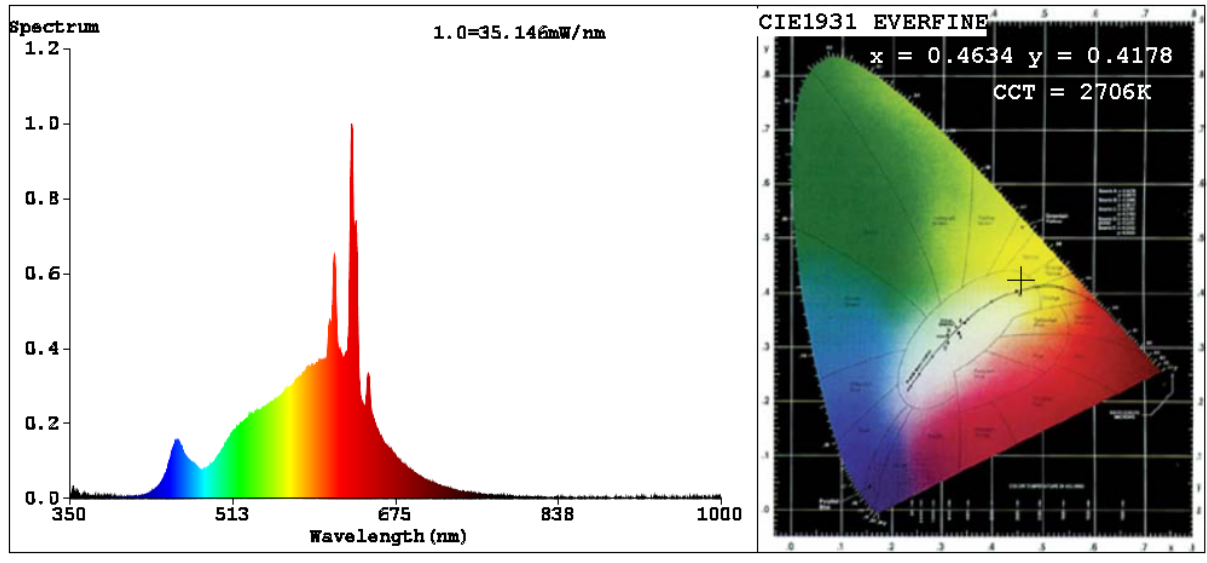
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	94	R9	53
Frequency (Hz)	60	R2	96	R10	89
CCT (K)	2706	R3	98	R11	95
Duv	0.0023	R4	94	R12	80
Chromaticity (x, y)	x=0.4634 y=0.4178	R5	93	R13	94
Chromaticity (u', v')	u'=0.2616 v'=0.5306	R6	97	R14	97
Color Rendering Index (CRI)	92.6	R7	91	R15	87
R9	53	R8	79	--	--
Rg	97				
Rf	91				
Rcs,h1%	-7				

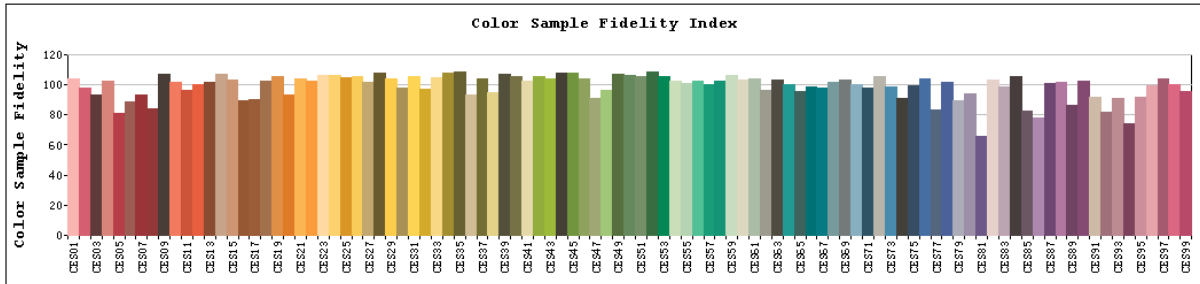
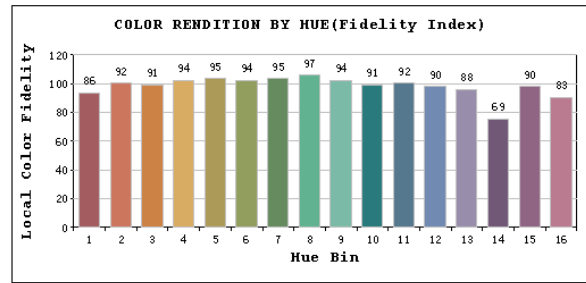
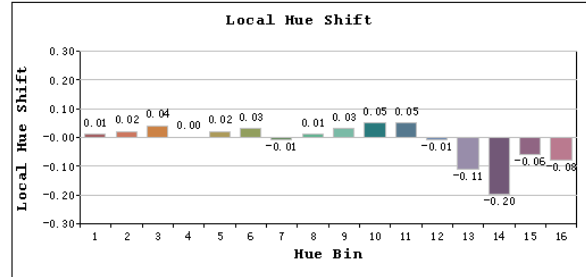
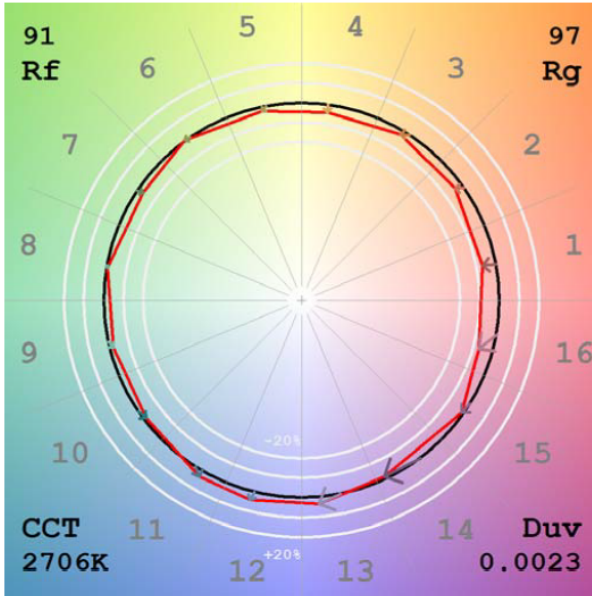
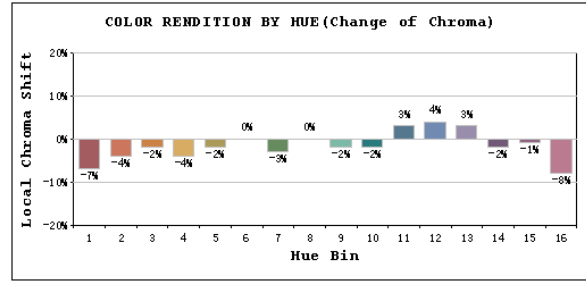
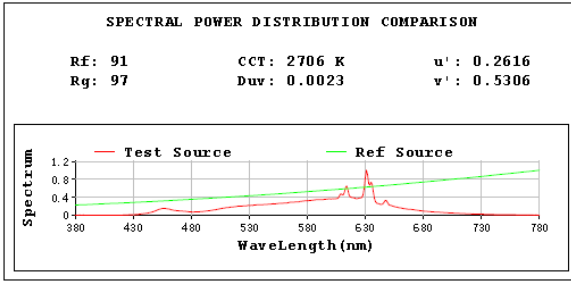
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	717.0
Luminous Efficacy (lm/W)	80.11

Spectral Power Distribution & Chromaticity Diagram



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2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-20	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFRL4R99FA120WBB	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202411160002	120.0	60	0.076	8.88	0.963

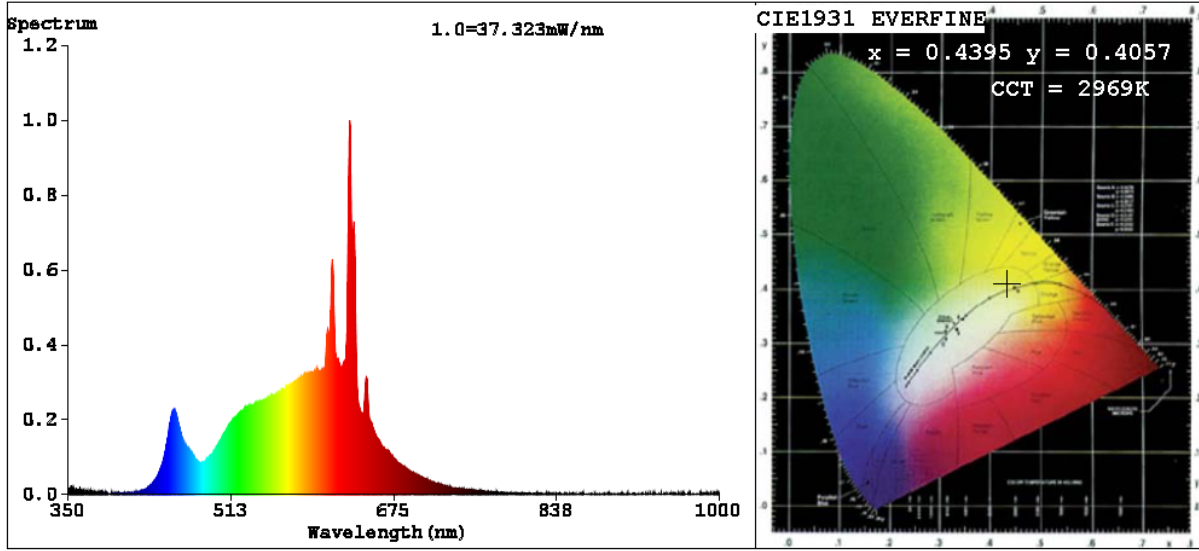
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	66
Frequency (Hz)	60	R2	98	R10	92
CCT (K)	2969	R3	96	R11	98
Duv	0.0003	R4	97	R12	80
Chromaticity (x, y)	x=0.4395 y=0.4057	R5	96	R13	97
Chromaticity (u', v')	u'=0.2516 v'=0.5224	R6	97	R14	97
Color Rendering Index (CRI)	95.0	R7	93	R15	92
R9	66	R8	86	--	--
Rg	100				
Rf	92				
Rcs,h1%	-5				

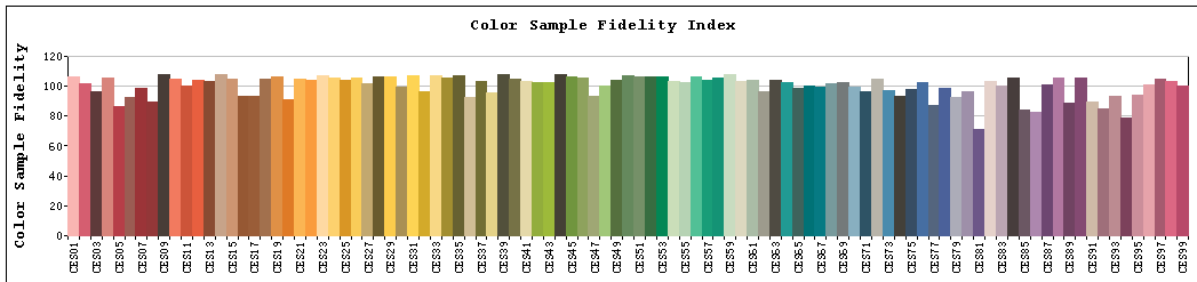
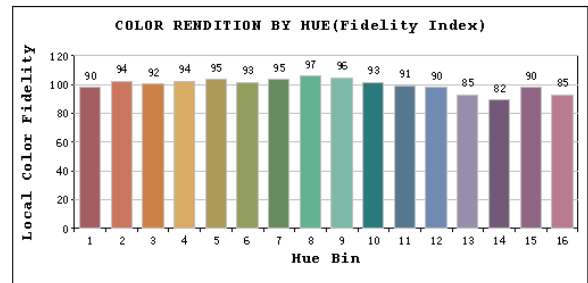
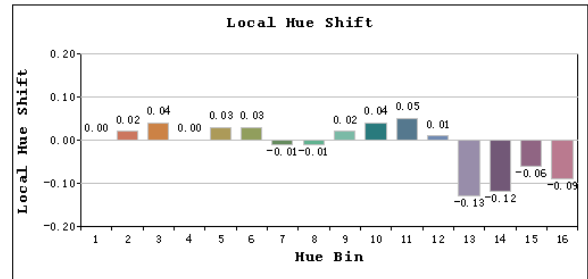
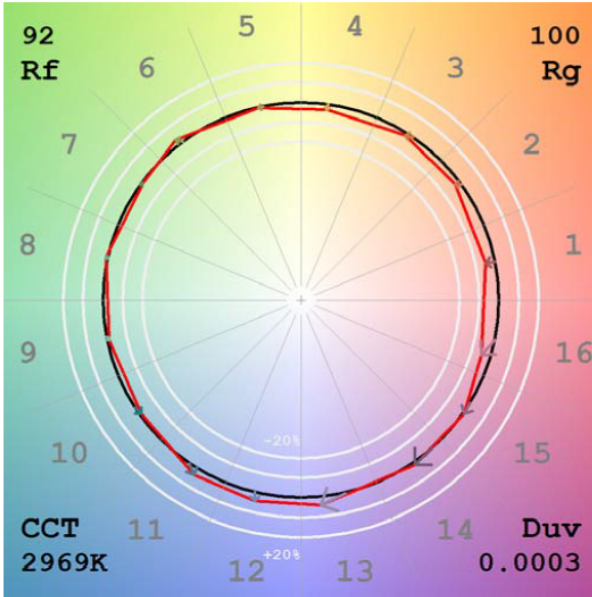
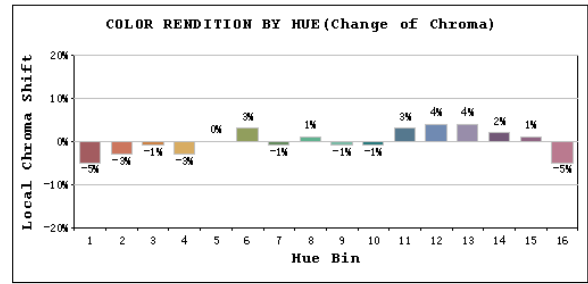
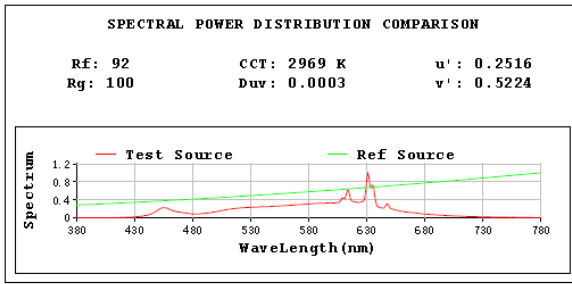
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	747.6
Luminous Efficacy (lm/W)	84.19

Spectral Power Distribution & Chromaticity Diagram



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2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-20	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFRL4R99FA120WBB	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202411160002	120.0	60	0.075	8.78	0.963

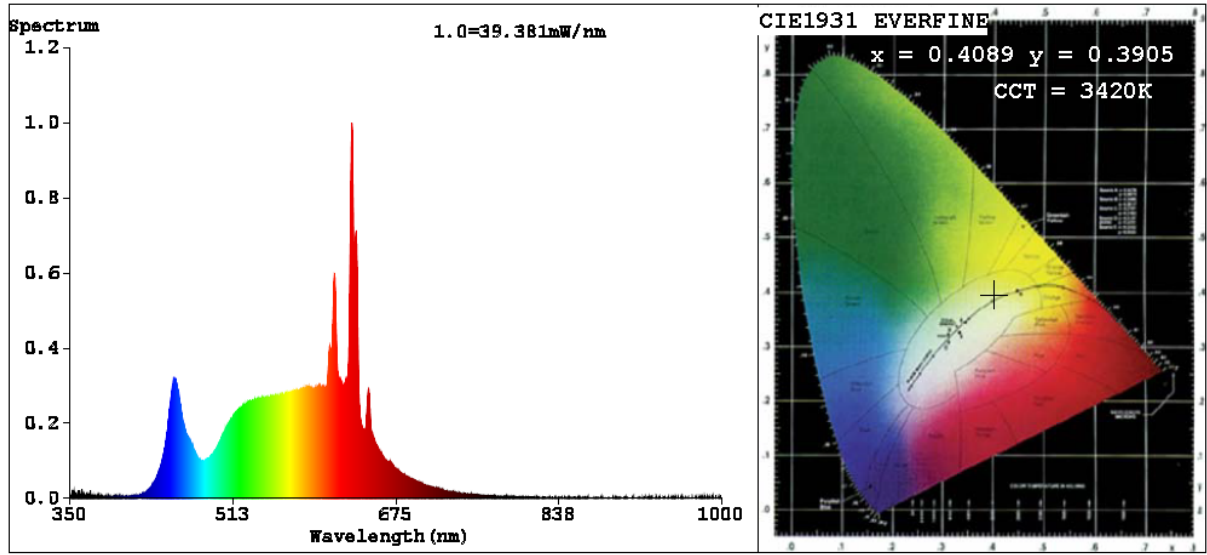
Chromaticity Measurement - Sphere-Spectroradiometer Method:

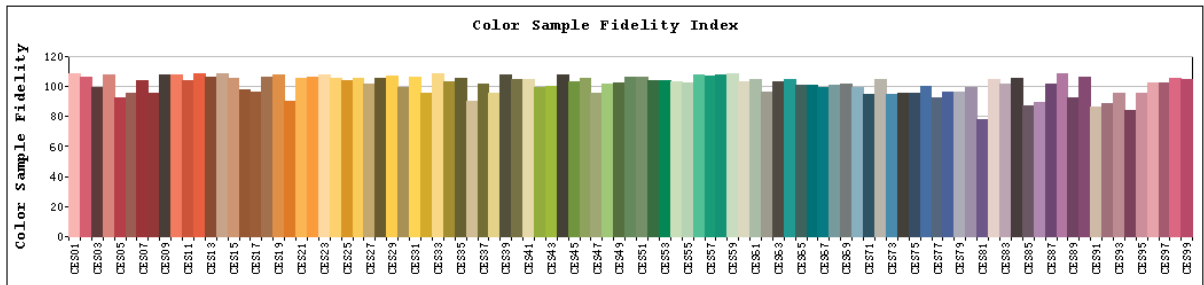
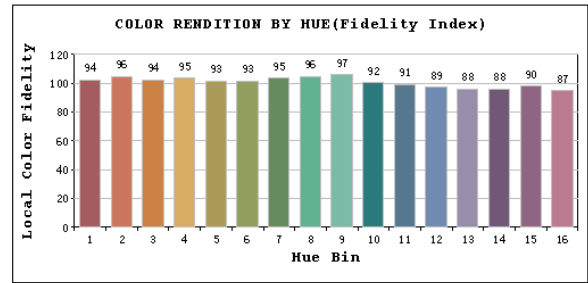
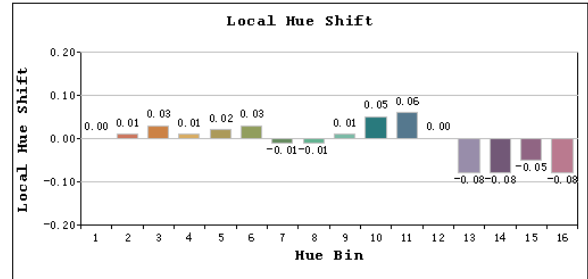
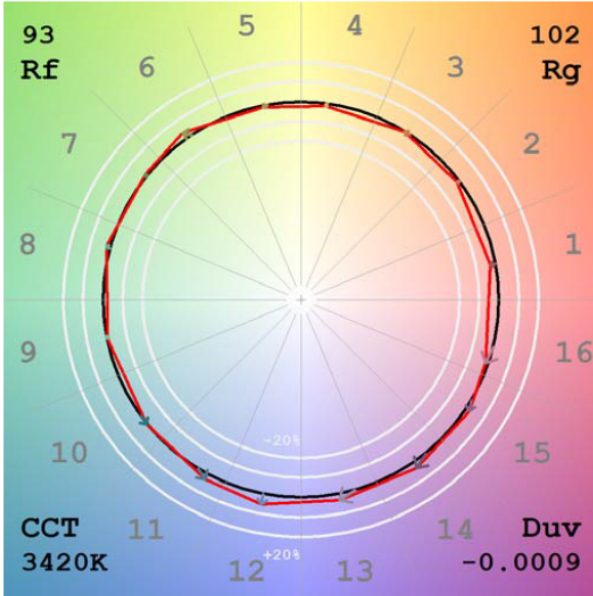
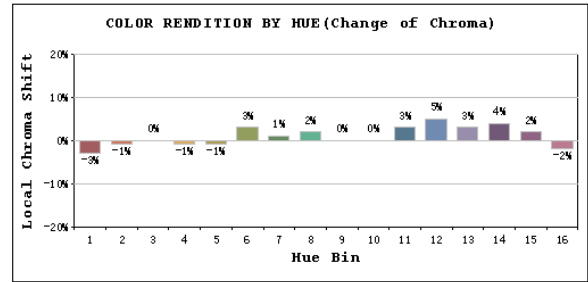
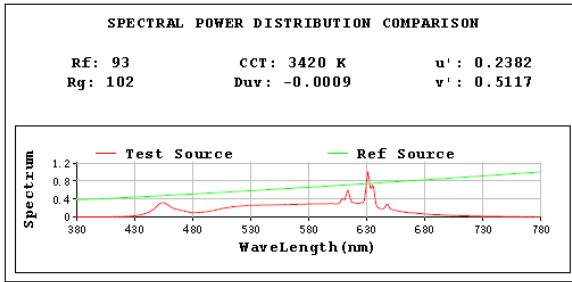
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	82
Frequency (Hz)	60	R2	98	R10	93
CCT (K)	3420	R3	94	R11	96
Duv	-0.0009	R4	98	R12	76
Chromaticity (x, y)	x=0.4089 y=0.3905	R5	98	R13	100
Chromaticity (u', v')	u'=0.2382 v'=0.5117	R6	96	R14	95
Color Rendering Index (CRI)	96.8	R7	97	R15	97
R9	82	R8	94	--	--
Rg	102				
Rf	93				
Rcs,h1%	-3				

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	784.7
Luminous Efficacy (lm/W)	89.37

Spectral Power Distribution & Chromaticity Diagram





2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-20	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFRL4R99FA120WBB	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202411160002	120.0	60	0.076	8.83	0.963

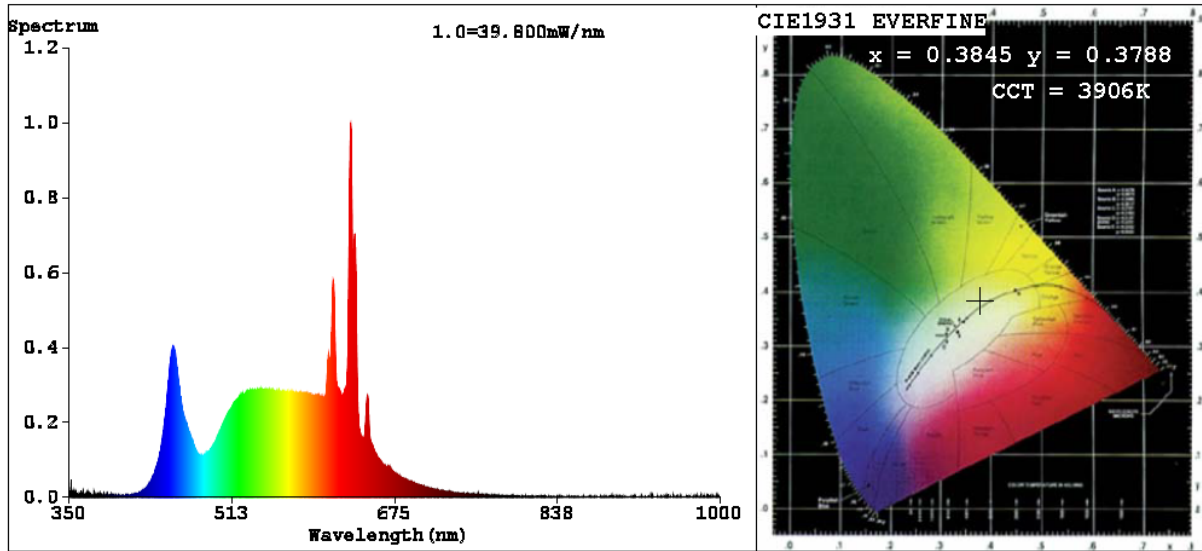
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	92
Frequency (Hz)	60	R2	98	R10	91
CCT (K)	3906	R3	91	R11	94
Duv	-0.0002	R4	97	R12	72
Chromaticity (x, y)	x=0.3845 y=0.3788	R5	98	R13	99
Chromaticity (u', v')	u'=0.2270 v'=0.5031	R6	95	R14	94
Color Rendering Index (CRI)	97.0	R7	99	R15	98
R9	92	R8	99	--	--
Rg	102				
Rf	93				
Rcs,h1%	-2				

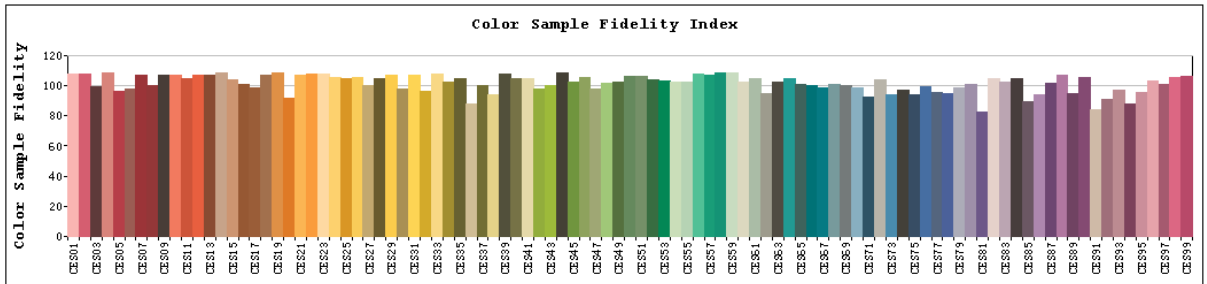
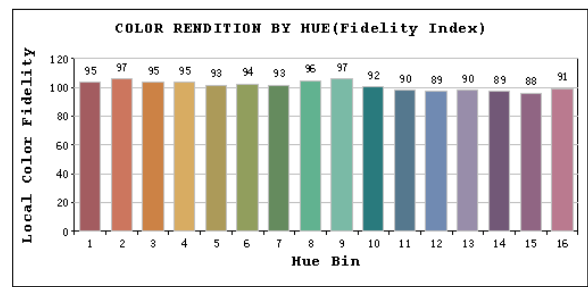
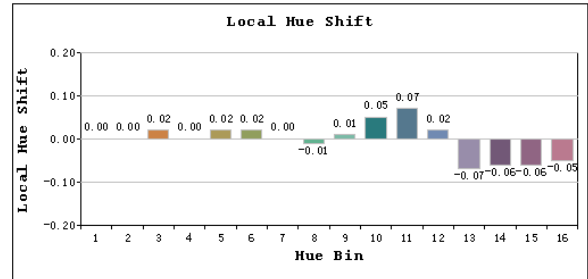
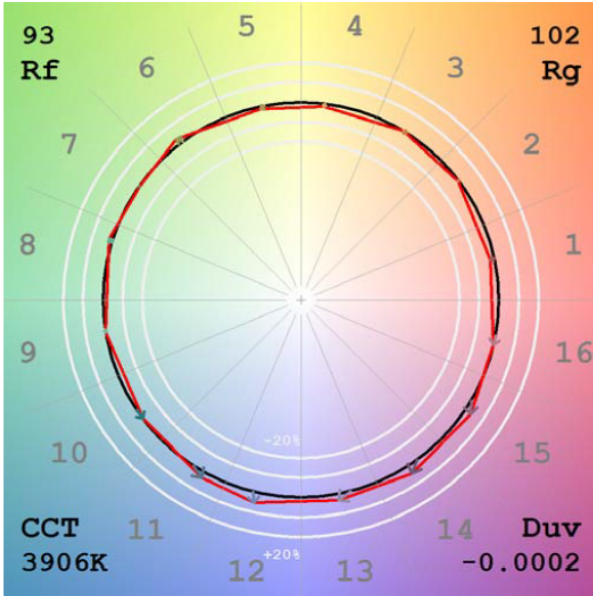
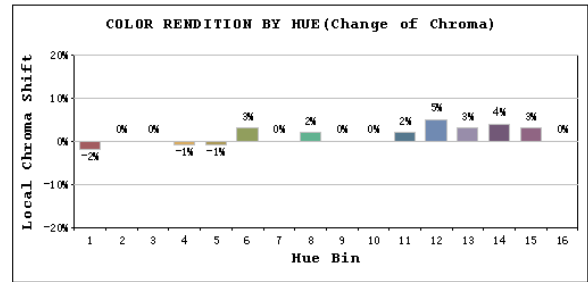
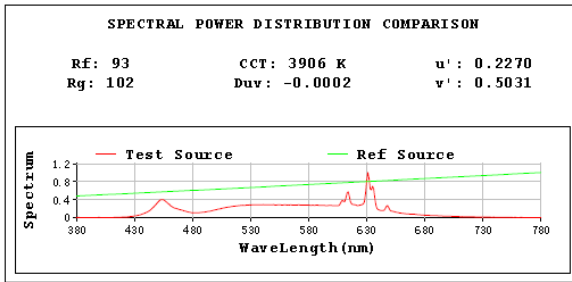
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	802.8
Luminous Efficacy (lm/W)	90.91

Spectral Power Distribution & Chromaticity Diagram

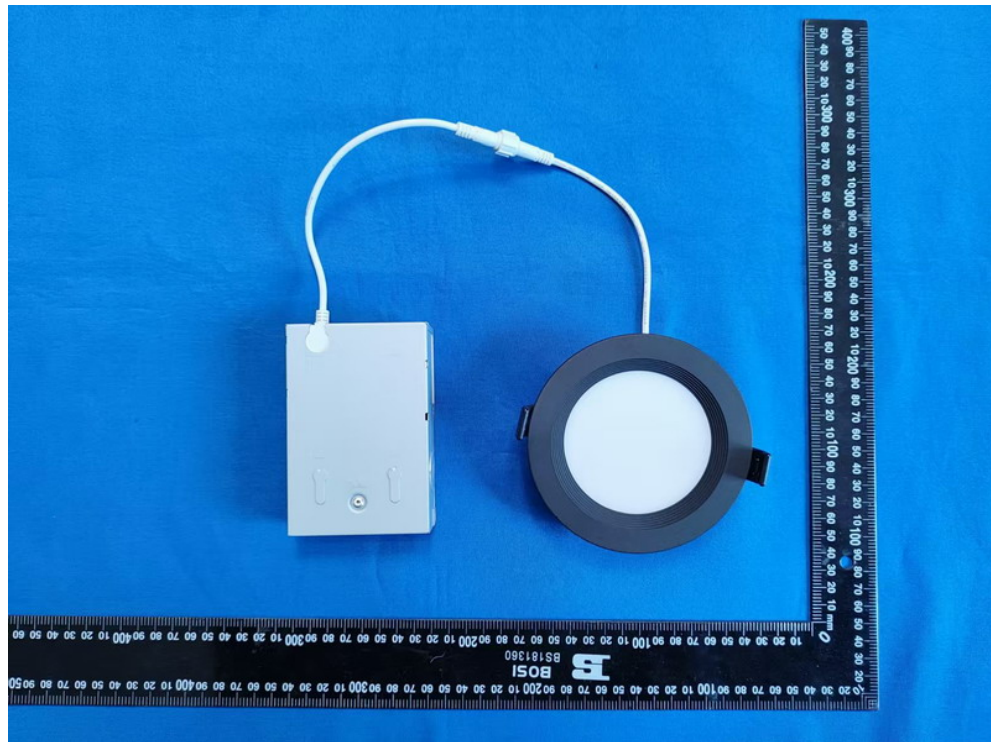
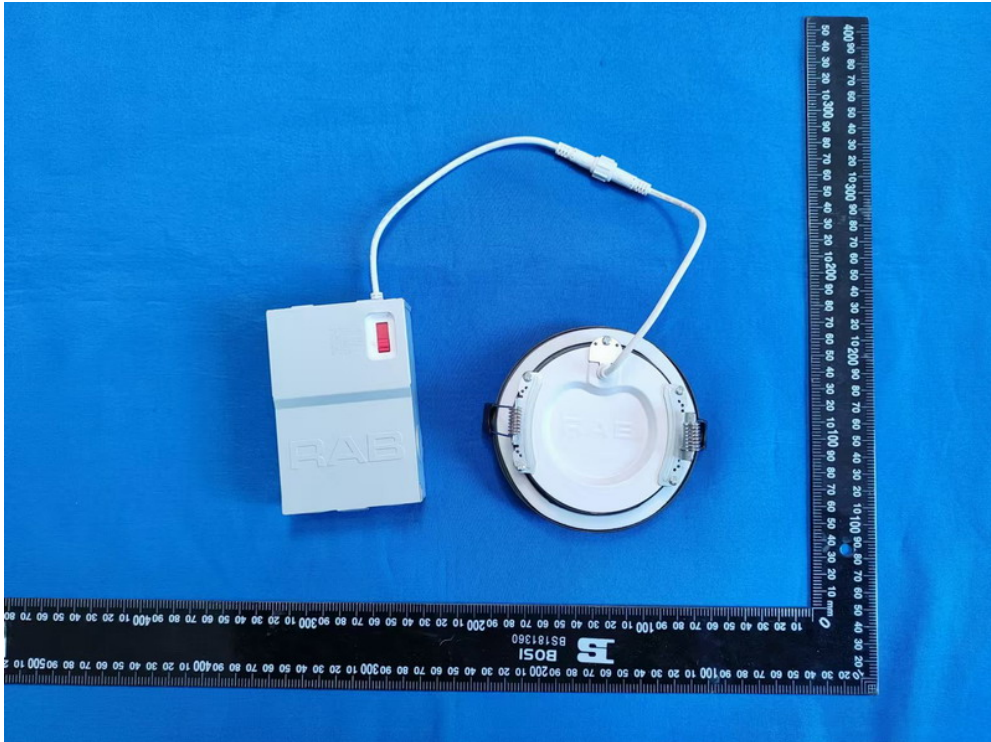


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Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
WFRL4R99FA120WBB	2700K setting	120	717.0	8.95	80.11
	3000K setting	120	747.6	8.88	84.19
	3500K setting	120	784.7	8.78	89.37
	4000K setting	120	802.8	8.83	90.91
	5000K setting	120	806.5	8.99	89.71

3. Product Photo



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