

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): FGIMBAL4

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

**Type of
Luminaire:** Downlights

Report Date: 2024-07-05

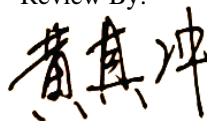
Prepared By:

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 (mode5000K)
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	2024-07-04	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	FGIMBAL4	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020003	120.0	60	0.074	8.69	0.976

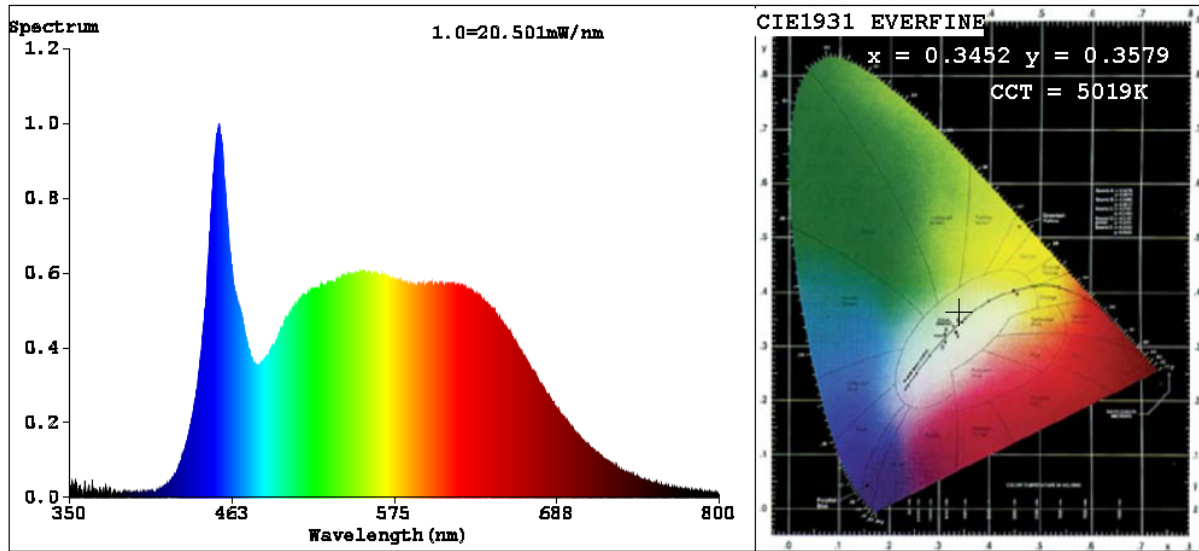
Chromaticity Measurement - Sphere-Spectroradiometer Method:

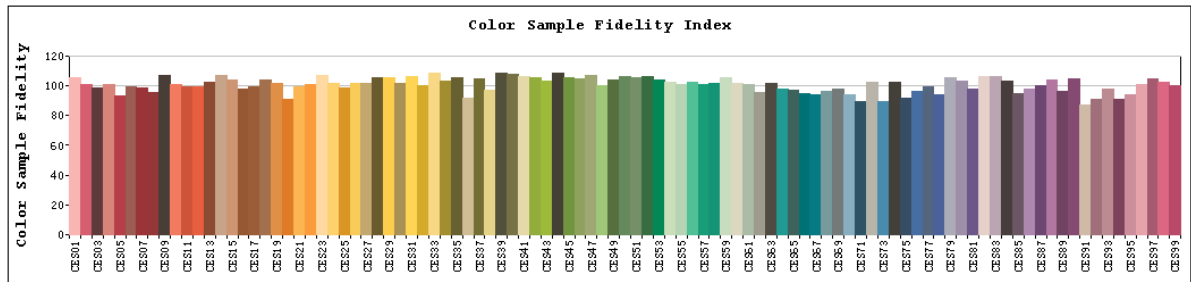
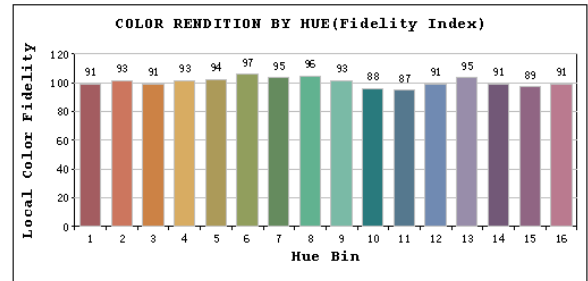
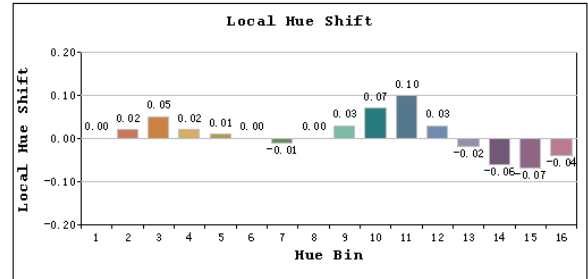
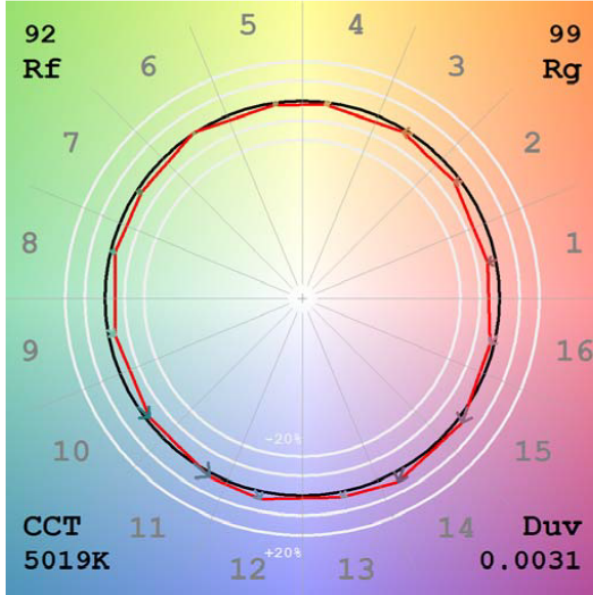
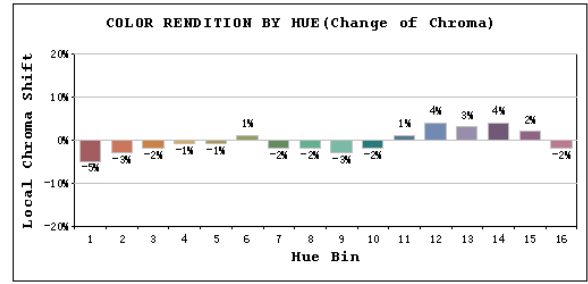
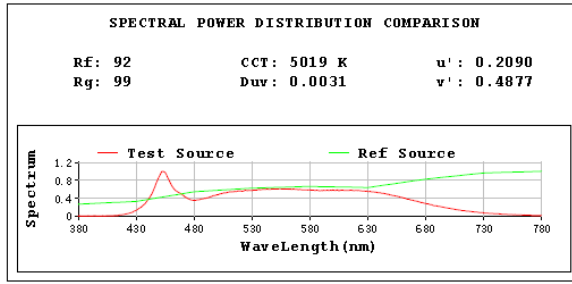
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	69
Frequency (Hz)	60	R2	96	R10	89
CCT (K)	5019	R3	96	R11	93
Duv	0.0031	R4	93	R12	73
Chromaticity (x, y)	x=0.3452 y=0.3579	R5	93	R13	94
Chromaticity (u', v')	u'=0.2090 v'=0.4877	R6	93	R14	98
Color Rendering Index (CRI)	93.4	R7	95	R15	92
R9	69	R8	88	--	--
Rg	99				
Rf	92				
Rcs,h1%	-5				

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	775.8
Luminous Efficacy (lm/W)	89.28
Beam Angle (°)	36.2
Center Beam Candle Power (cd)	1181.0

Spectral Power Distribution & Chromaticity Diagram



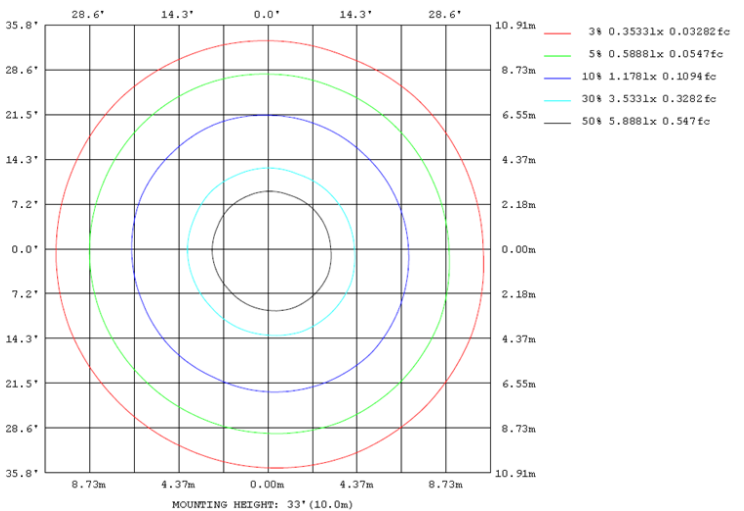
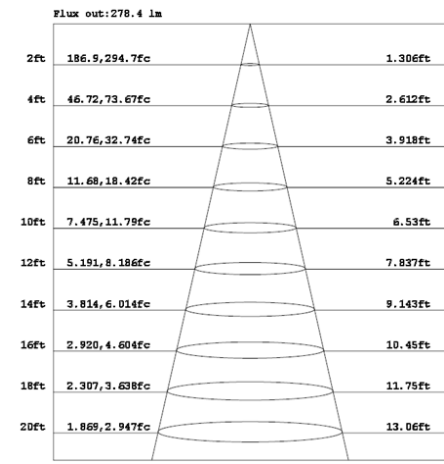
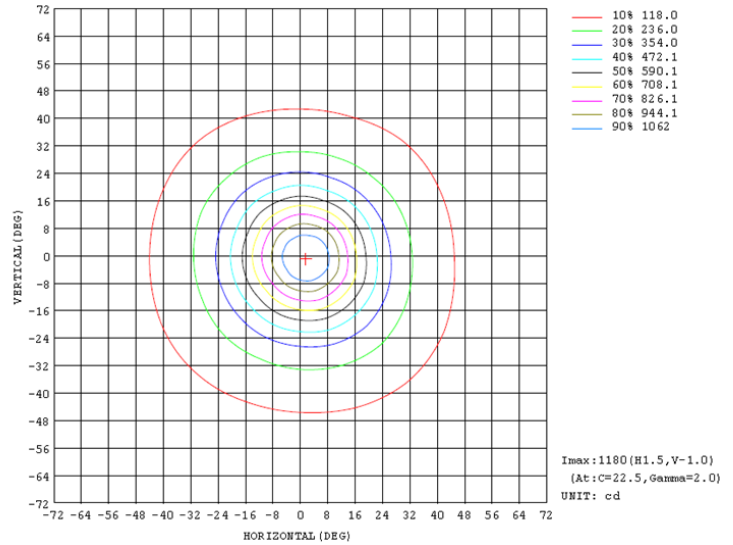
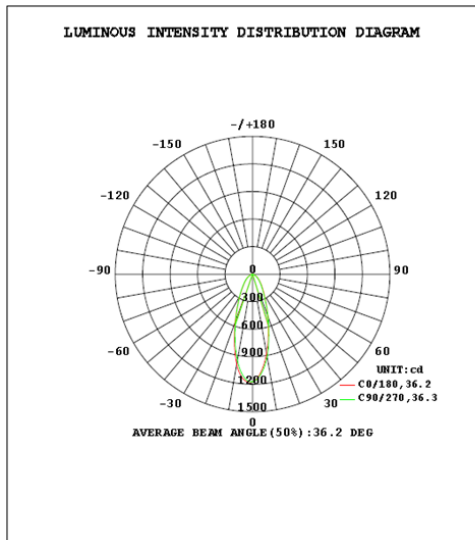


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	468.6	60.4%
0-40	593.2	76.5%
0-60	741.9	95.6%
60-90	33.9	4.4%
70-100	8.7	1.1%
90-120	0.0	0.0%
0-90	775.8	100.0%
90-180	0.0	0.0%
0-180	775.8	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	100.2	12.9%	90-100	0.0	0.0%
10-20	197.9	25.5%	100-110	0.0	0.0%
20-30	170.5	22.0%	110-120	0.0	0.0%
30-40	124.6	16.1%	120-130	0.0	0.0%
40-50	89.4	11.5%	130-140	0.0	0.0%
50-60	59.3	7.6%	140-150	0.0	0.0%
60-70	25.2	3.3%	150-160	0.0	0.0%
70-80	6.9	0.9%	160-170	0.0	0.0%
80-90	1.8	0.2%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-04	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	FGIMBAL4	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020003	120.0	60	0.071	8.38	0.974

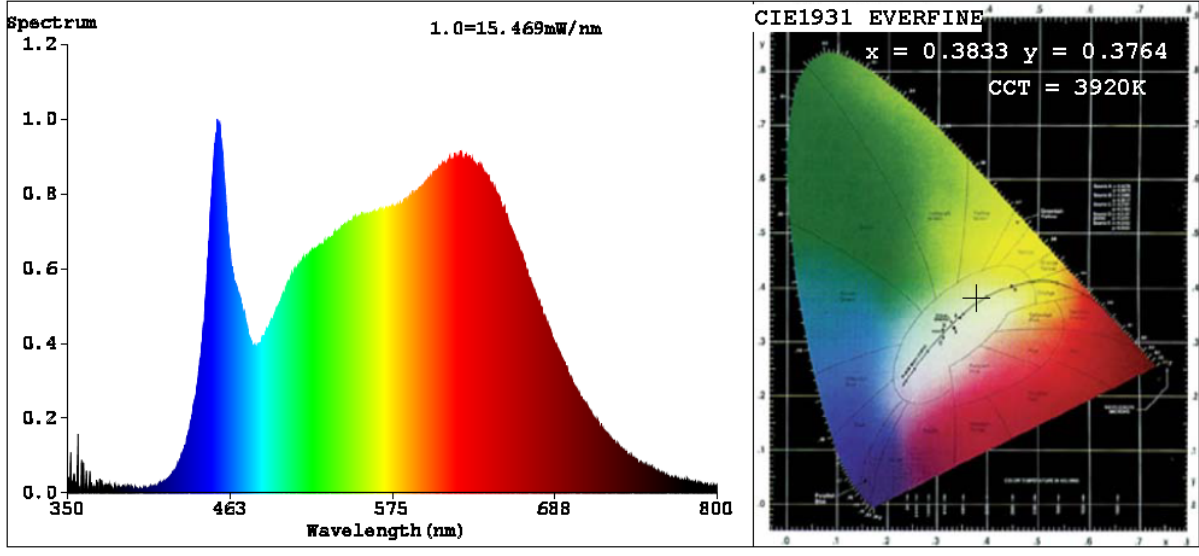
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	85
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	3920	R3	98	R11	98
Duv	-0.0010	R4	97	R12	77
Chromaticity (x, y)	x=0.3833 y=0.3764	R5	97	R13	99
Chromaticity (u', v')	u'=0.2271 v'=0.5018	R6	96	R14	98
Color Rendering Index (CRI)	96.7	R7	96	R15	96
R9	85	R8	93	--	--
Rg	100				
Rf	94				
Rcs,h1%	-3				

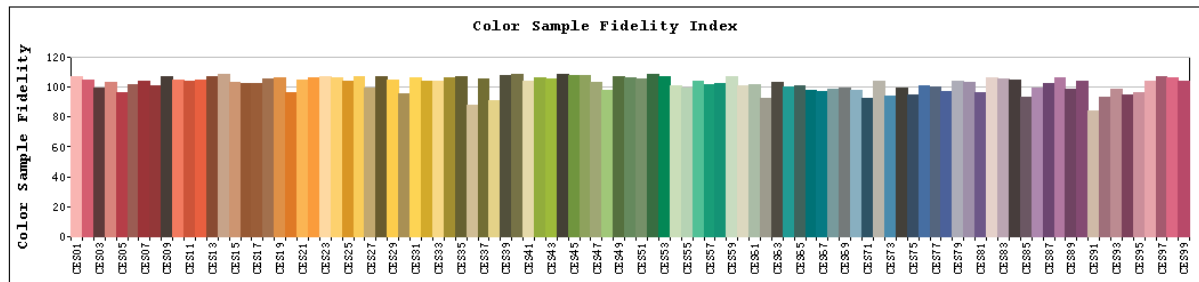
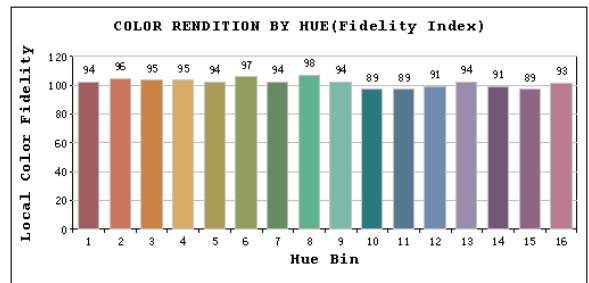
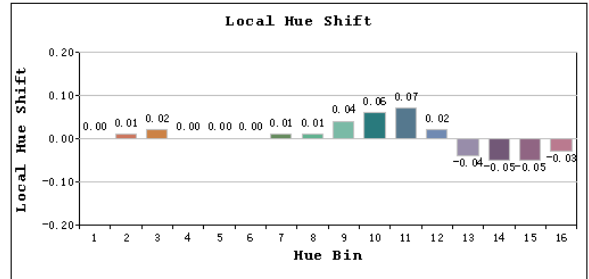
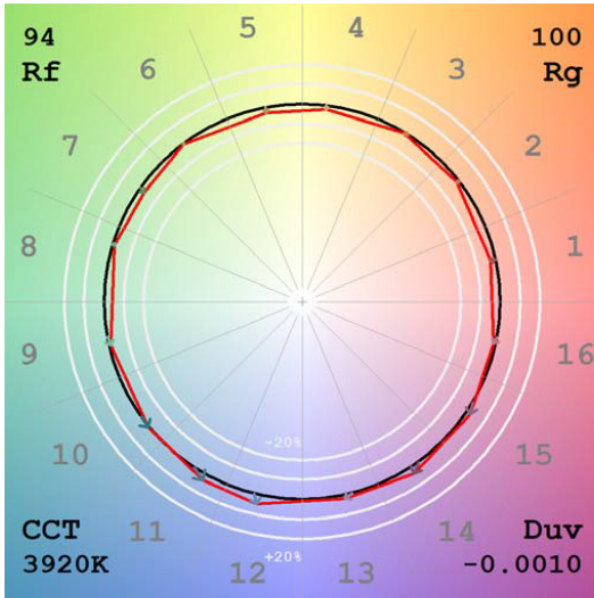
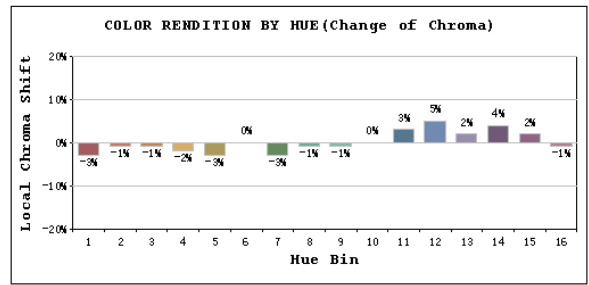
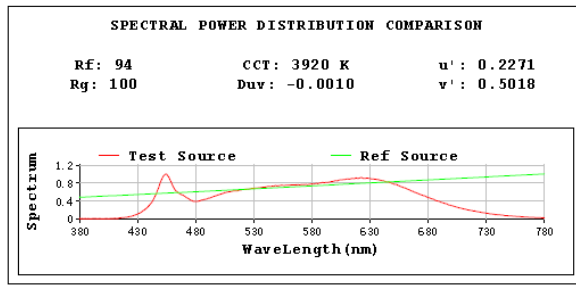
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	772.2
Luminous Efficacy (lm/W)	92.15

Spectral Power Distribution & Chromaticity Diagram



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2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-04	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	FGIMBAL4	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020003	120.0	60	0.071	8.39	0.974

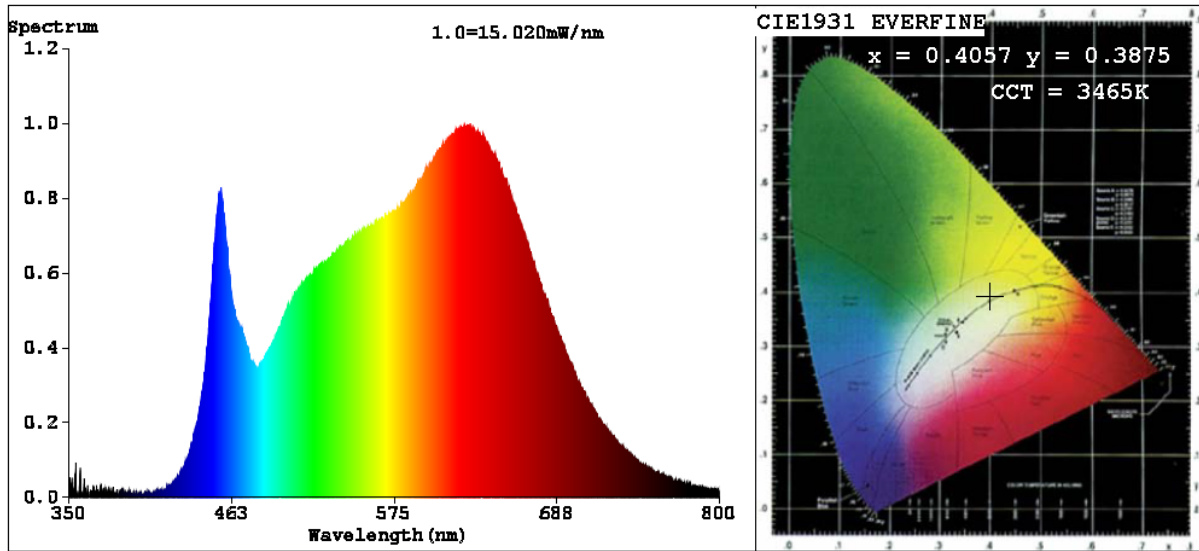
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	85
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3465	R3	99	R11	99
Duv	-0.0015	R4	98	R12	81
Chromaticity (x, y)	x=0.4057 y=0.3875	R5	98	R13	100
Chromaticity (u', v')	u'=0.2373 v'=0.5100	R6	96	R14	99
Color Rendering Index (CRI)	97.3	R7	96	R15	97
R9	85	R8	93	--	--
Rg	100				
Rf	94				
Rcs,h1%	-2				

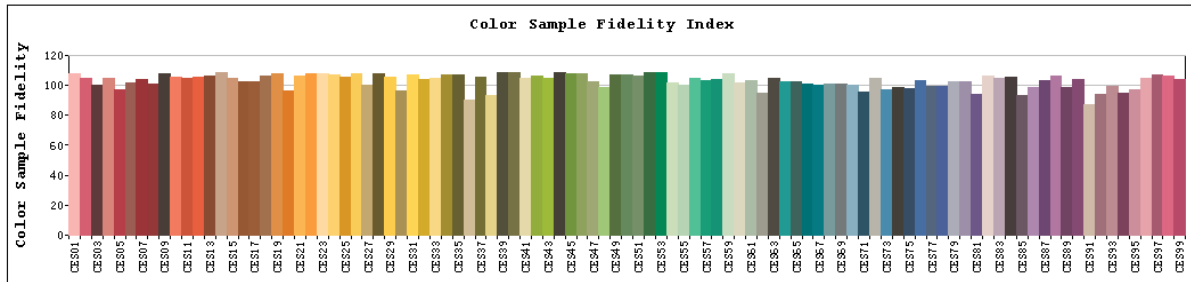
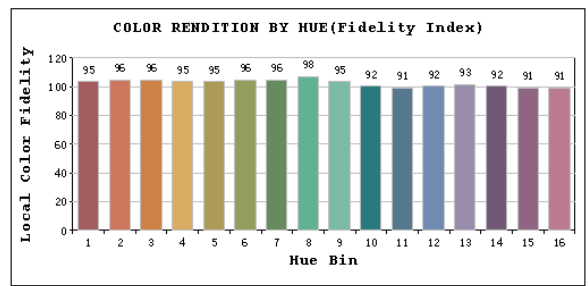
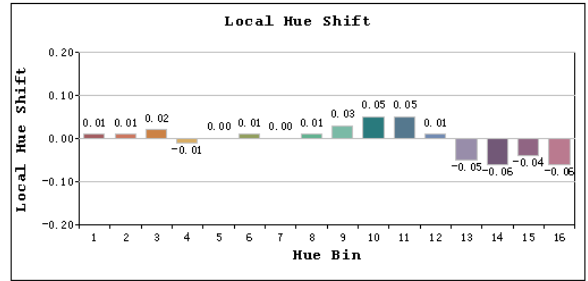
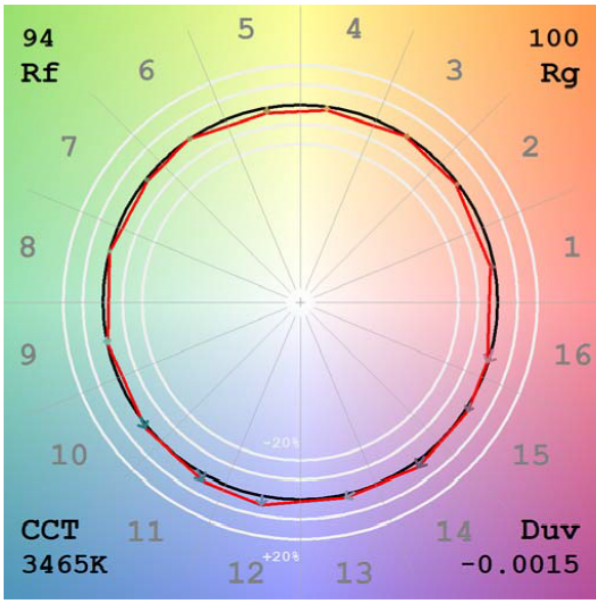
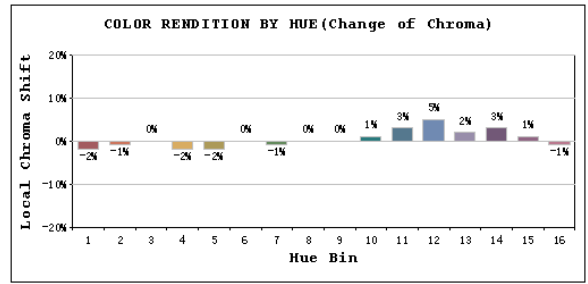
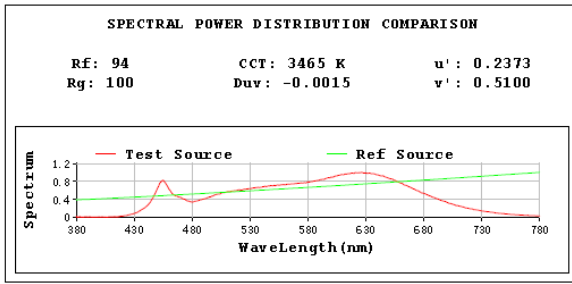
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	749.6
Luminous Efficacy (lm/W)	89.35

Spectral Power Distribution & Chromaticity Diagram



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2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-04	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	FGIMBAL4	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020003	120.0	60	0.073	8.55	0.975

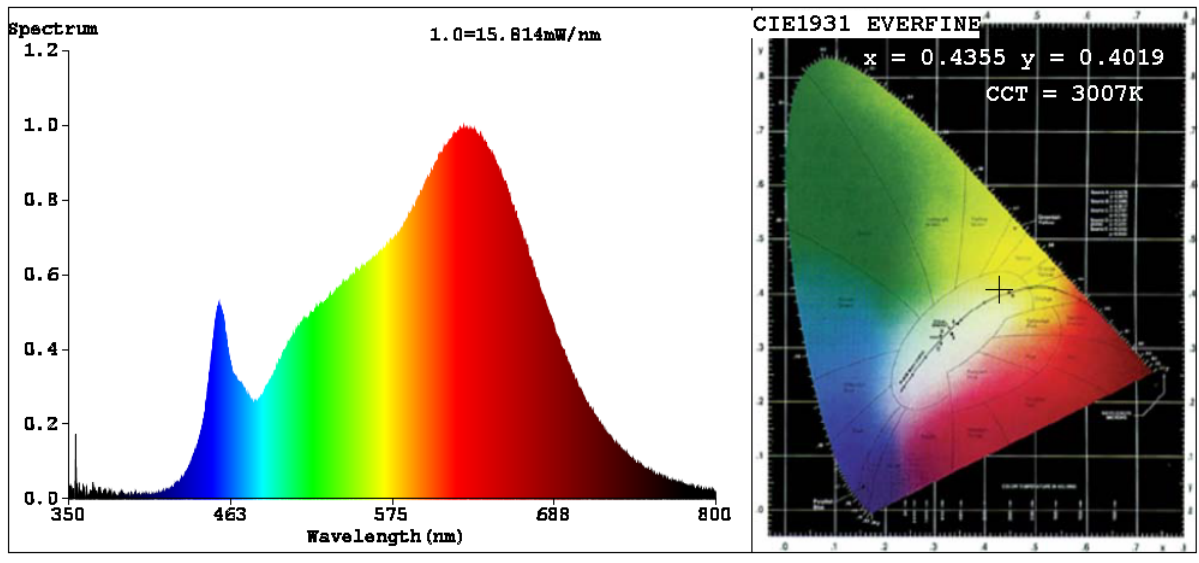
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	80
Frequency (Hz)	60	R2	100	R10	99
CCT (K)	3007	R3	99	R11	98
Duv	-0.0007	R4	99	R12	86
Chromaticity (x, y)	x=0.4355 y=0.4019	R5	98	R13	100
Chromaticity (u', v')	u'=0.2505 v'=0.5203	R6	97	R14	99
Color Rendering Index (CRI)	97.3	R7	95	R15	96
R9	80	R8	91	--	--
Rg	100				
Rf	95				
Rcs,h1%	-3				

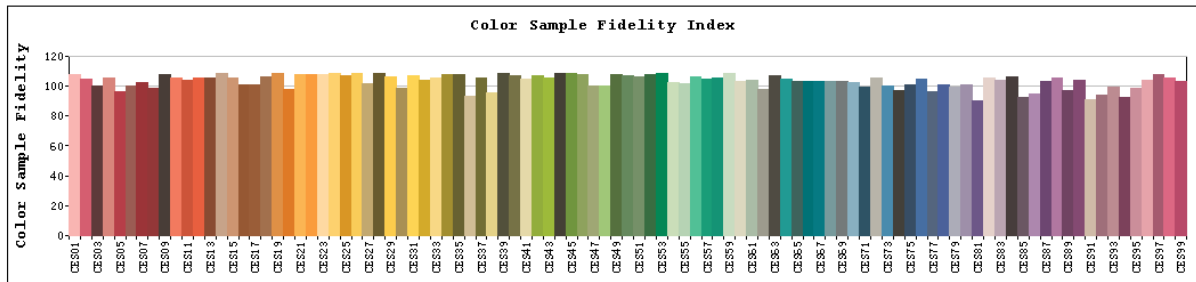
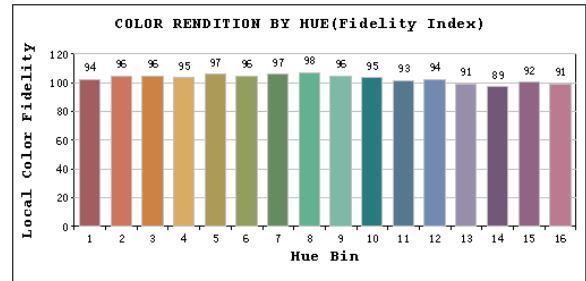
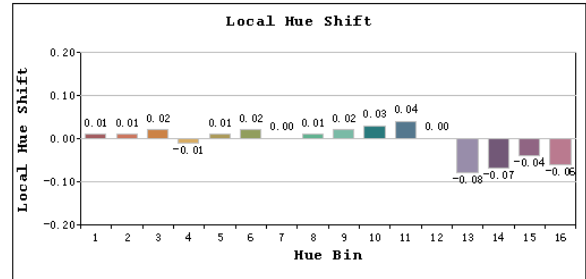
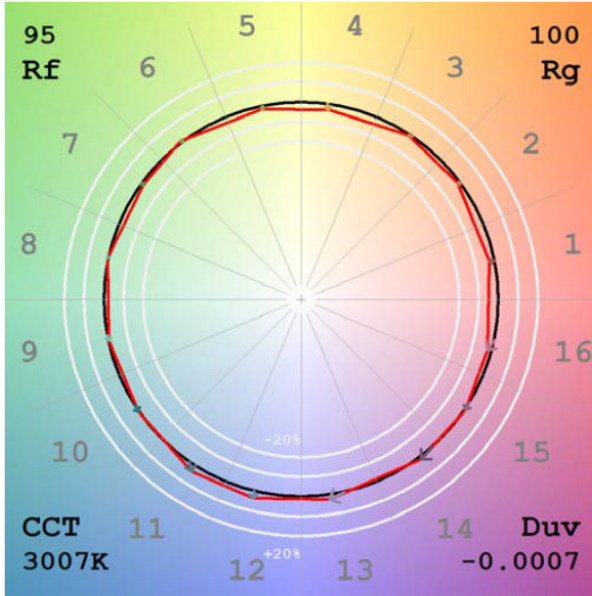
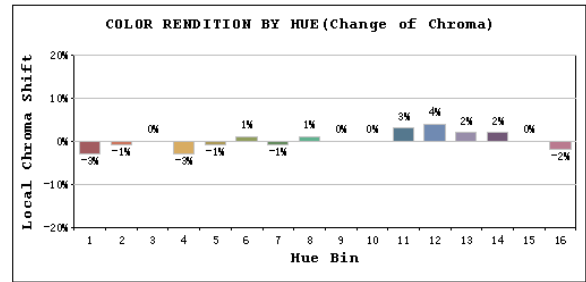
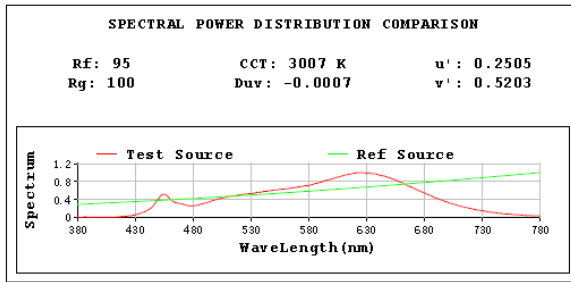
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	707.0
Luminous Efficacy (lm/W)	86.69

Spectral Power Distribution & Chromaticity Diagram



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2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-04	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	FGIMBAL4	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020003	120.0	60	0.074	8.65	0.975

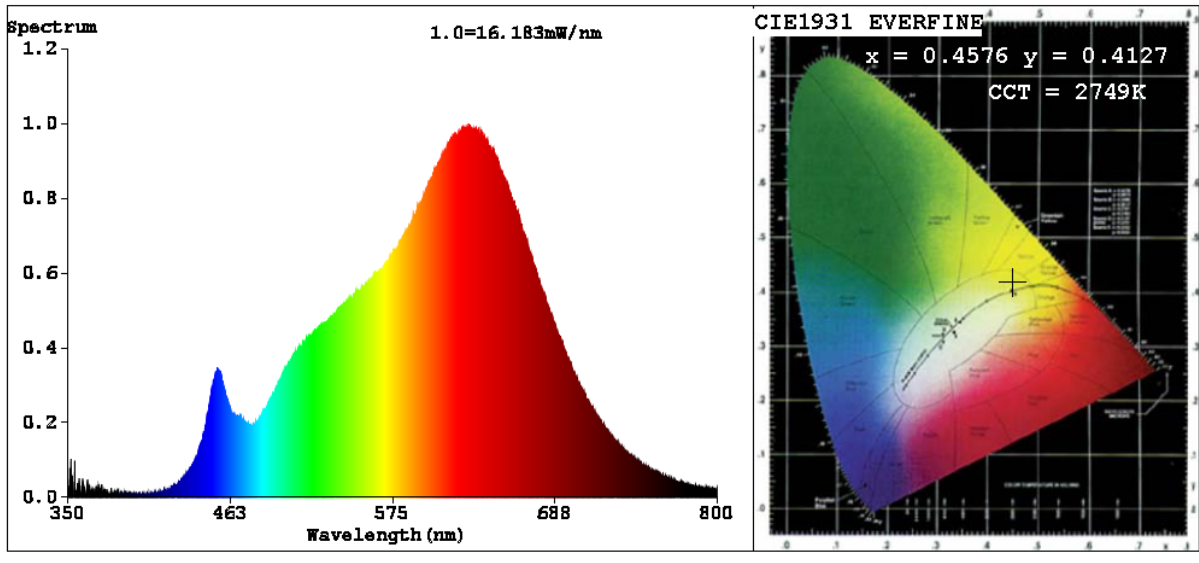
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	75
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	2749	R3	99	R11	98
Duv	0.0010	R4	99	R12	89
Chromaticity (x, y)	x=0.4576 y=0.4127	R5	98	R13	98
Chromaticity (u', v')	u'=0.2601 v'=0.5278	R6	98	R14	98
Color Rendering Index (CRI)	96.7	R7	95	R15	94
R9	75	R8	89	--	--
Rg	99				
Rf	95				
Rcs,h1%	-4				

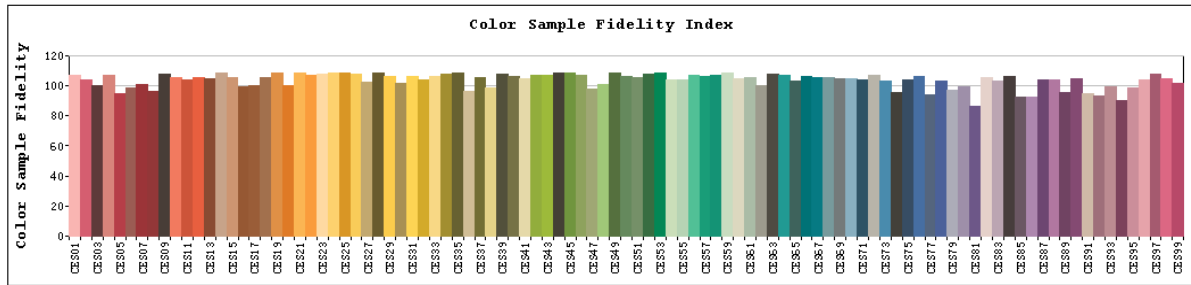
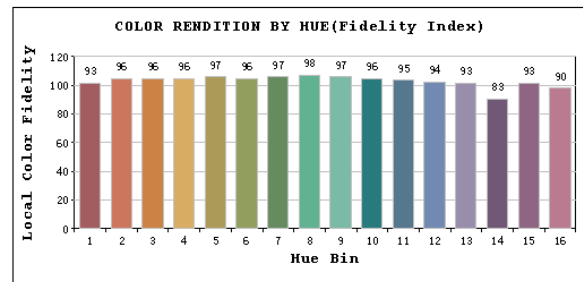
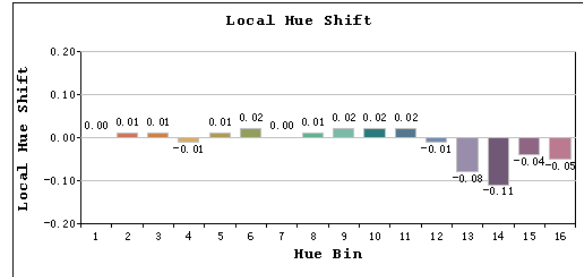
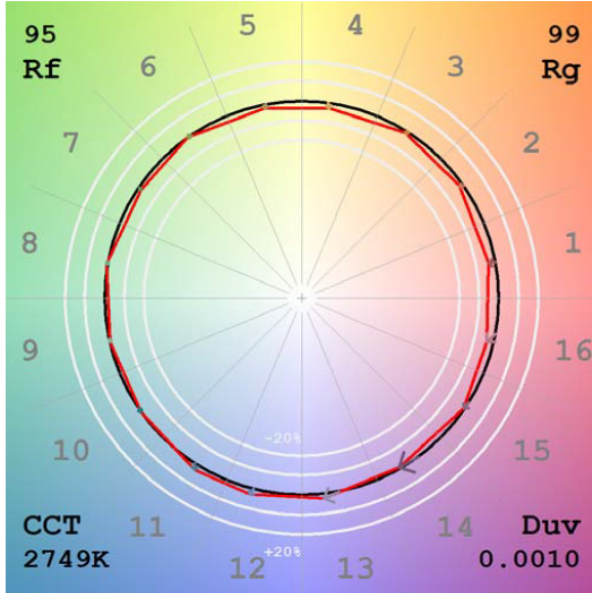
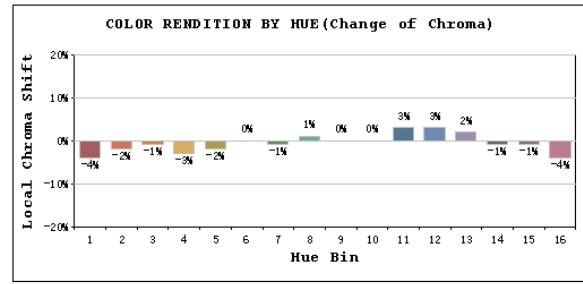
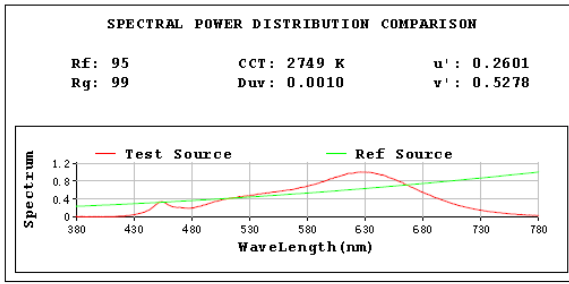
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	671.8
Luminous Efficacy (lm/W)	77.67

Spectral Power Distribution & Chromaticity Diagram

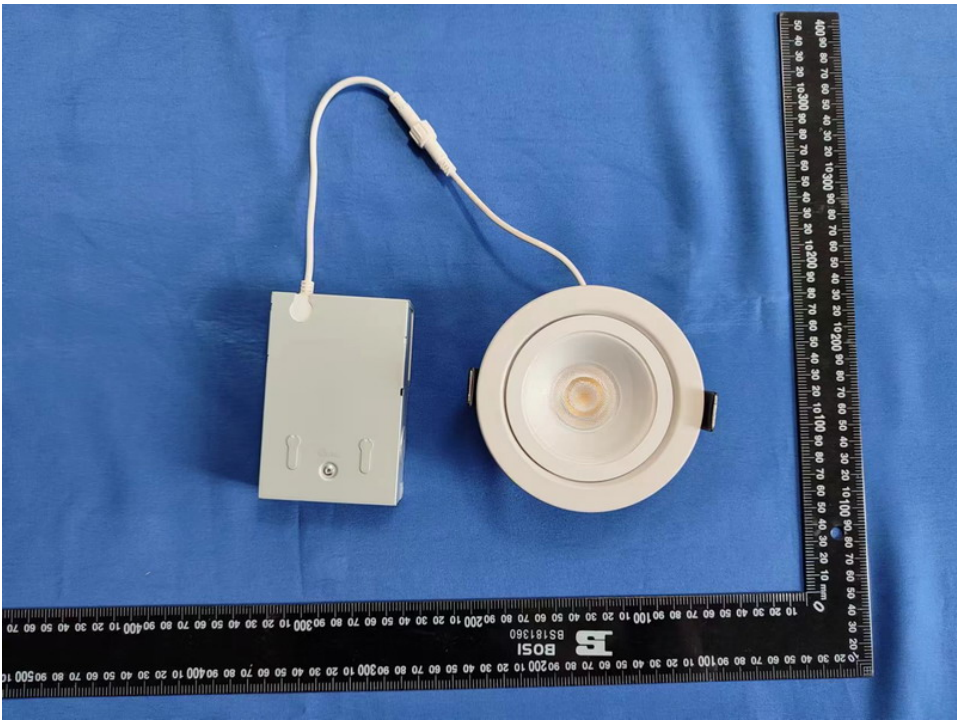


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Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
FGIMBAL4	2700K setting	120	671.8	8.65	77.67
	3000K setting	120	707.0	8.55	86.69
	3500K setting	120	749.6	8.39	89.35
	4000K setting	120	772.2	8.38	92.15
	5000K setting	120	775.8	8.69	89.28

3. Product Photo



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