

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): CRX3

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

**Type of
Luminaire:** Downlights

Report Date: 2024-07-12

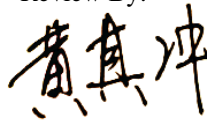
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120V-277Vac, 60 Hz
Nominal Power	15.0W/12.0W/9.0 W
Rated Initial Lamp Lumen	1500lm/1200lm/900lm (mode2700K)
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	2024-07-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRX3	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020005	120.0	60	0.123	14.70	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

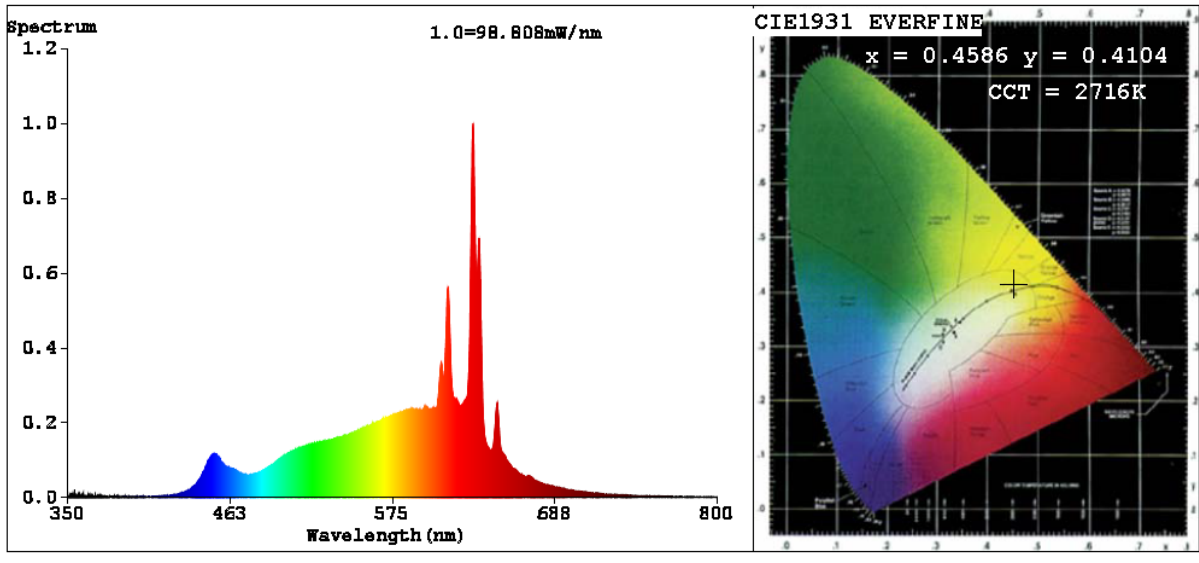
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	66
Frequency (Hz)	60	R2	100	R10	97
CCT (K)	2716	R3	99	R11	97
Duv	-0.0000	R4	99	R12	90
Chromaticity (x, y)	x=0.4586 y=0.4104	R5	99	R13	99
Chromaticity (u', v')	u'=0.2618 v'=0.5271	R6	95	R14	98
Color Rendering Index (CRI)	95.8	R7	92	R15	93
R9	66	R8	85	--	--
Rg	99				
Rf	92				
Rcs,h1%	-6				

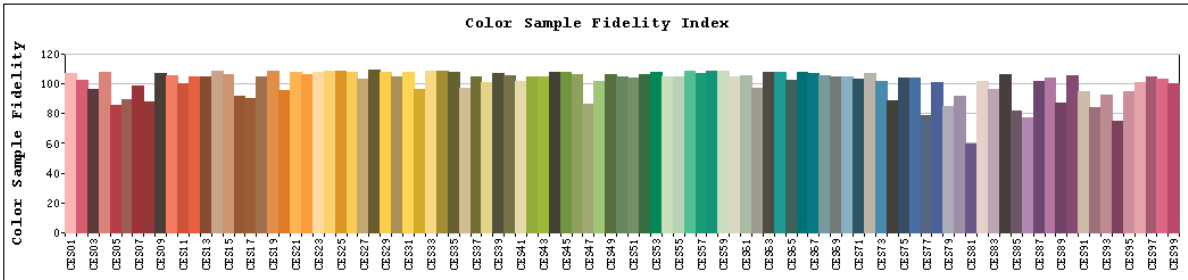
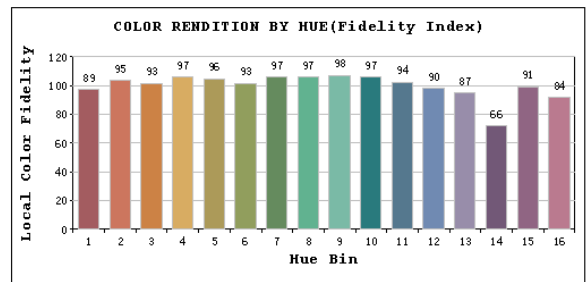
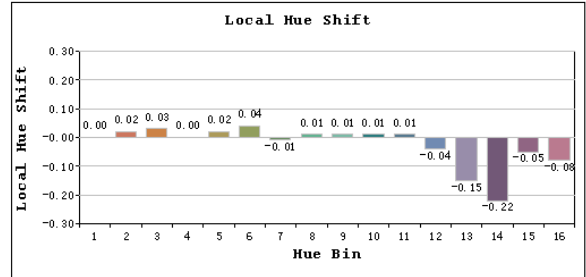
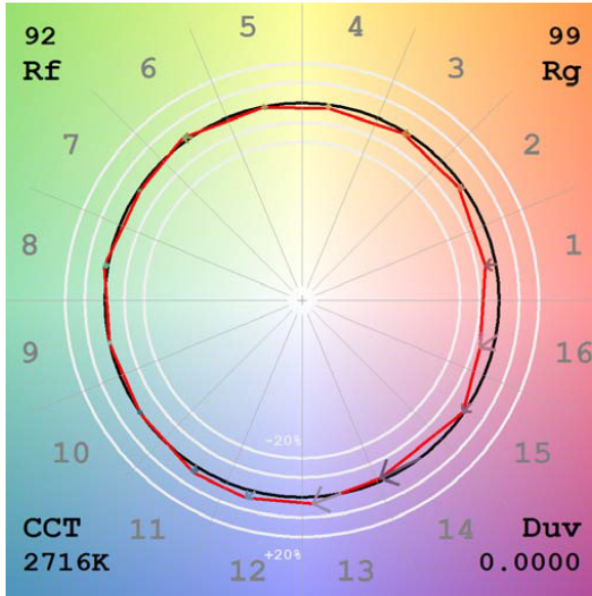
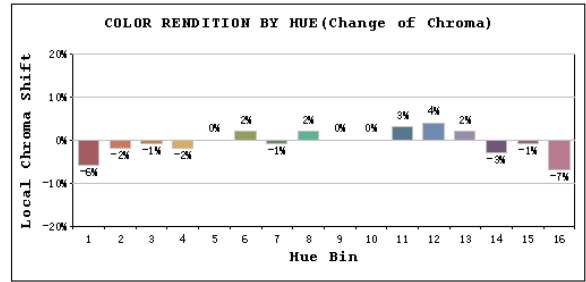
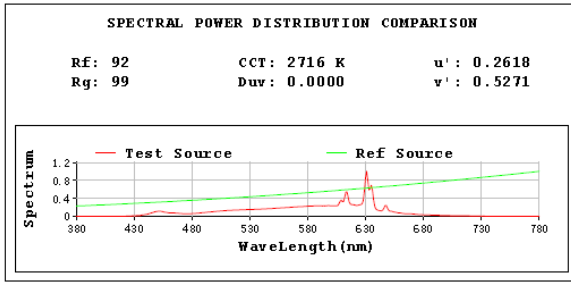
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1516.5
Luminous Efficacy (lm/W)	103.16
Beam Angle (°)	72.7
Center Beam Candle Power (cd)	983.7

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1479.0
Luminous Efficacy (lm/W)	100.82

Spectral Power Distribution & Chromaticity Diagram



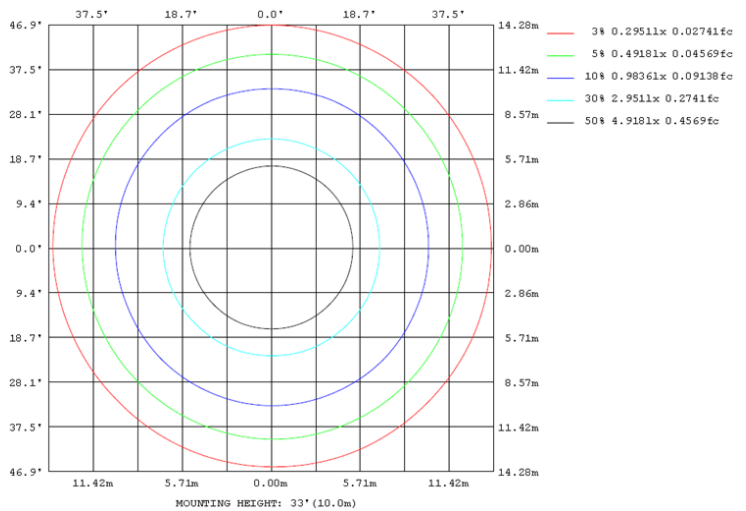
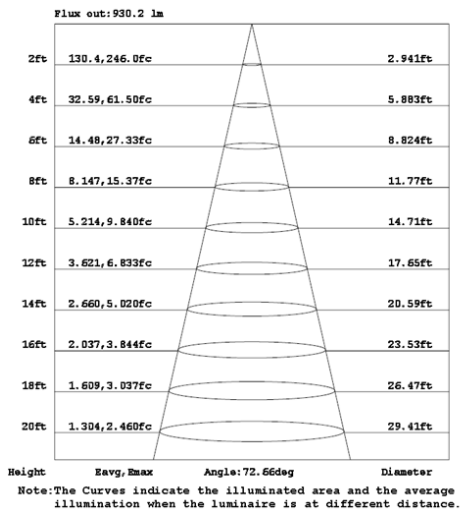
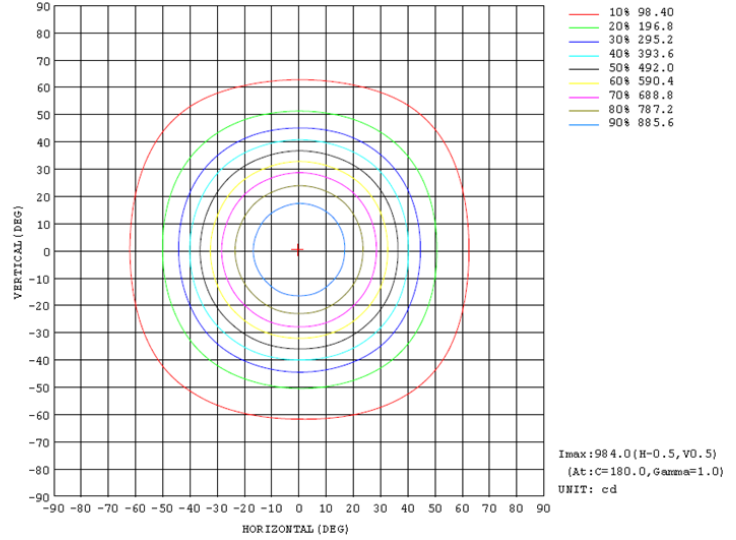
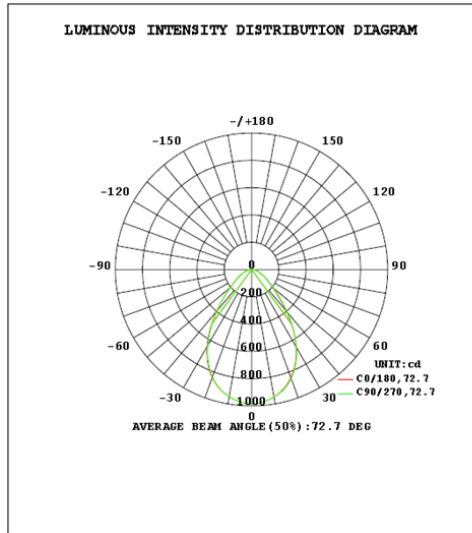


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	692.8	45.7%
0-40	1019.6	67.2%
0-60	1379.9	91.0%
60-90	136.6	9.0%
70-100	53.3	3.5%
90-120	0.0	0.0%
0-90	1516.5	100.0%
90-180	0.0	0.0%
0-180	1516.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	92.1	6.1%	90-100	0.0	0.0%
10-20	254.2	16.8%	100-110	0.0	0.0%
20-30	346.5	22.8%	110-120	0.0	0.0%
30-40	326.9	21.6%	120-130	0.0	0.0%
40-50	224.6	14.8%	130-140	0.0	0.0%
50-60	135.7	8.9%	140-150	0.0	0.0%
60-70	83.3	5.5%	150-160	0.0	0.0%
70-80	43.0	2.8%	160-170	0.0	0.0%
80-90	10.4	0.7%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRX3	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020005	120.0	60	0.121	14.50	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

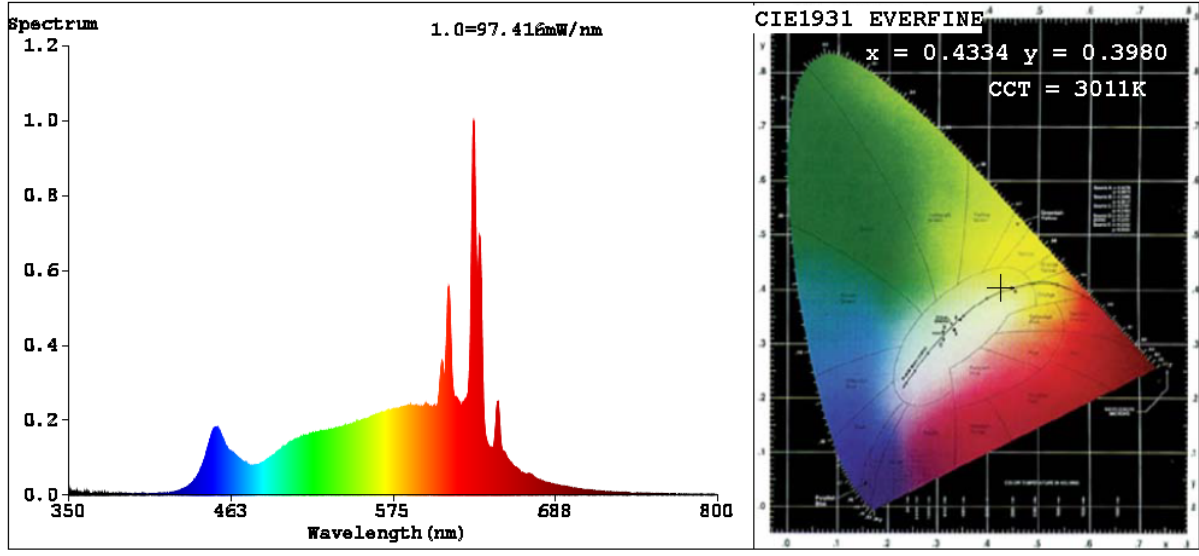
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	77
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3011	R3	99	R11	95
Duv	-0.0019	R4	99	R12	87
Chromaticity (x, y)	x=0.4334 y=0.3980	R5	99	R13	99
Chromaticity (u', v')	u'=0.2509 v'=0.5184	R6	94	R14	98
Color Rendering Index (CRI)	96.4	R7	93	R15	97
R9	77	R8	90	--	--
Rg	101				
Rf	93				
Rcs,h1%	-4				

Photometric Measurement – Goniophotometer Method:

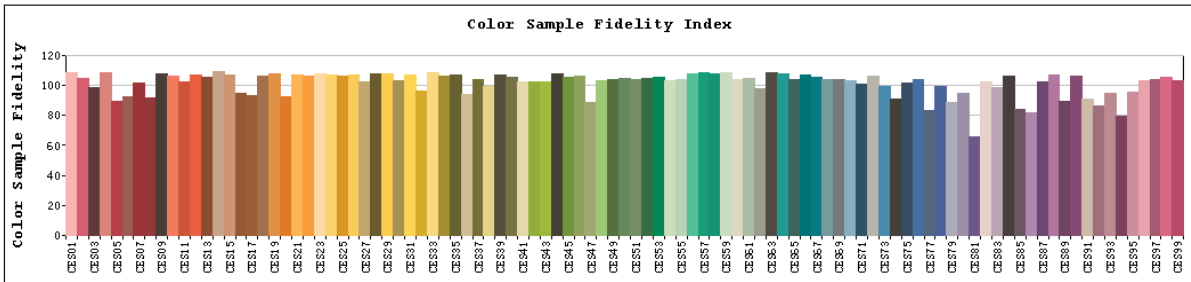
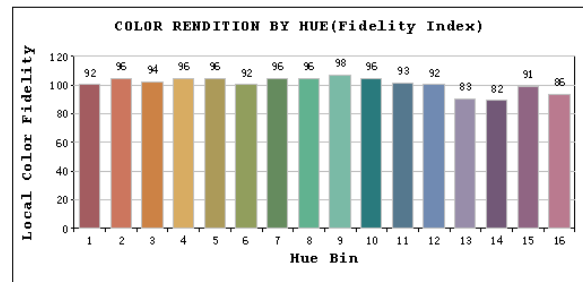
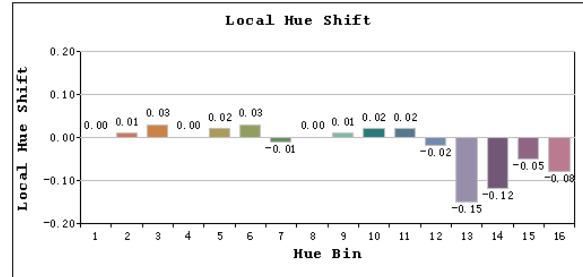
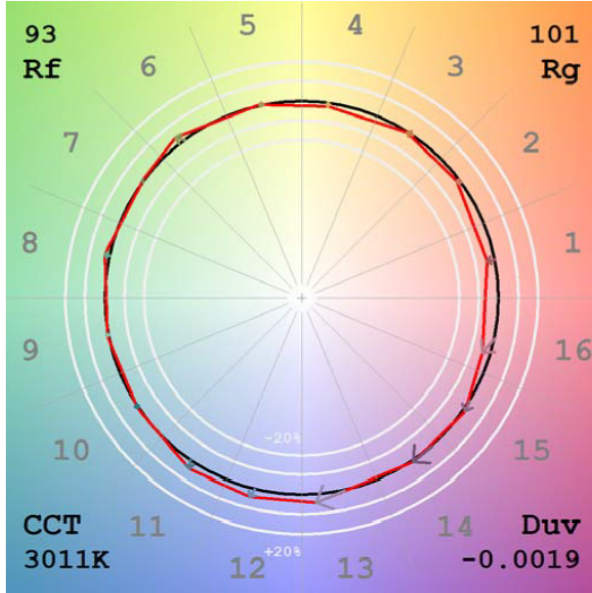
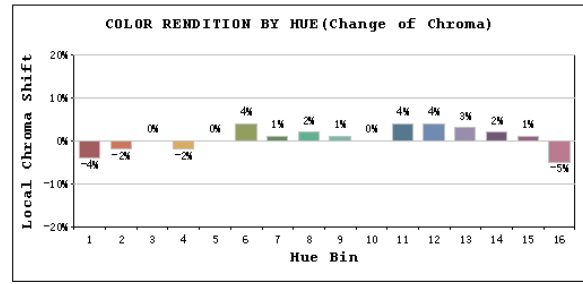
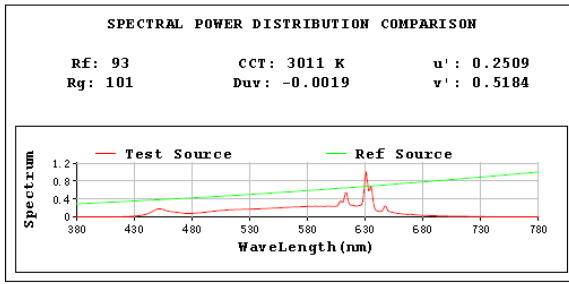
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1581.2
Luminous Efficacy (lm/W)	109.05

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1542.0
Luminous Efficacy (lm/W)	106.64

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRX3	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020005	120.0	60	0.119	14.20	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

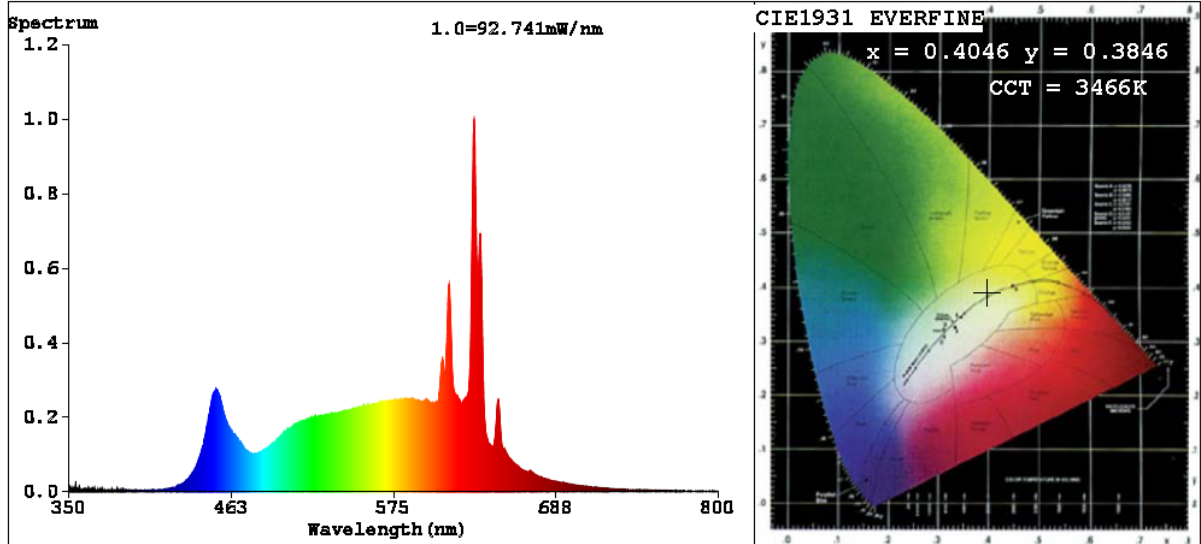
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	86
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3466	R3	97	R11	95
Duv	-0.0025	R4	98	R12	83
Chromaticity (x, y)	x=0.4046 y=0.3846	R5	98	R13	98
Chromaticity (u', v')	u'=0.2378 v'=0.5086	R6	95	R14	97
Color Rendering Index (CRI)	96.8	R7	96	R15	99
R9	86	R8	94	--	--
Rg	102				
Rf	93				
Rcs,h1%	-3				

Photometric Measurement – Goniophotometer Method:

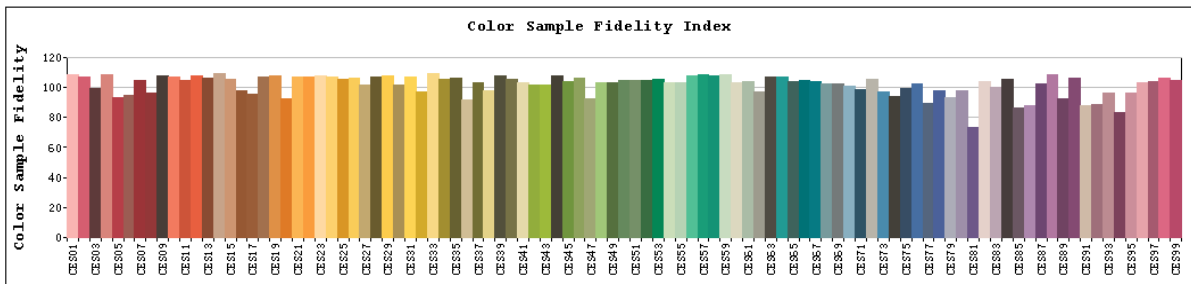
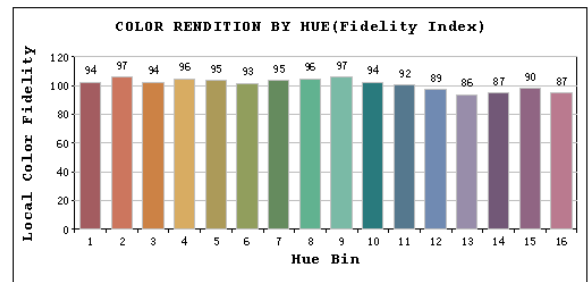
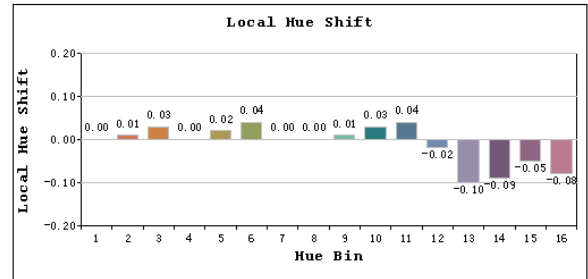
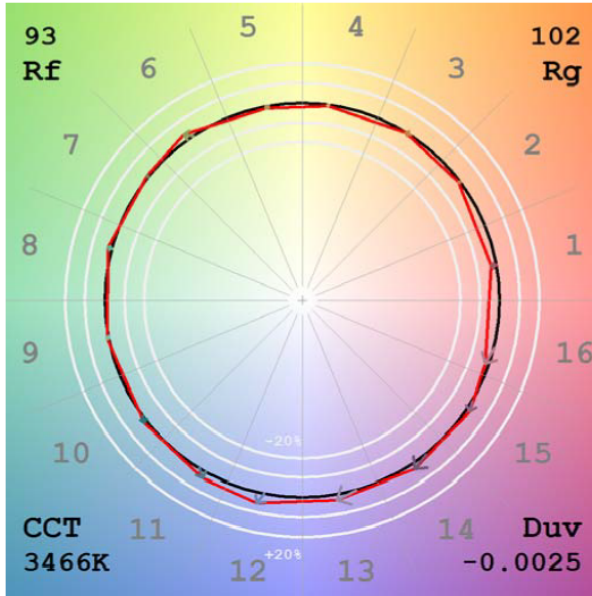
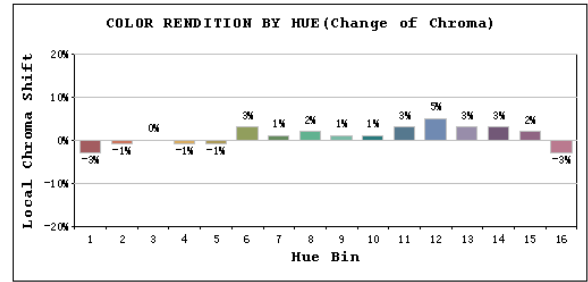
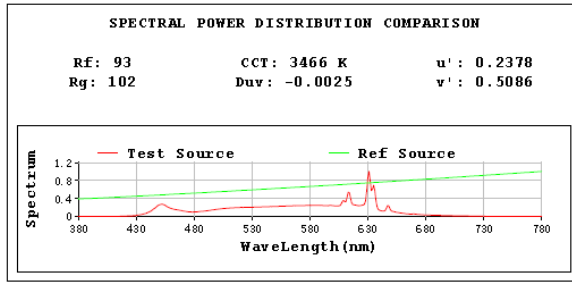
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1646.1
Luminous Efficacy (lm/W)	115.92

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1606.0
Luminous Efficacy (lm/W)	113.18

Spectral Power Distribution & Chromaticity Diagram



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2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRX3	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020005	120.0	60	0.119	14.20	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

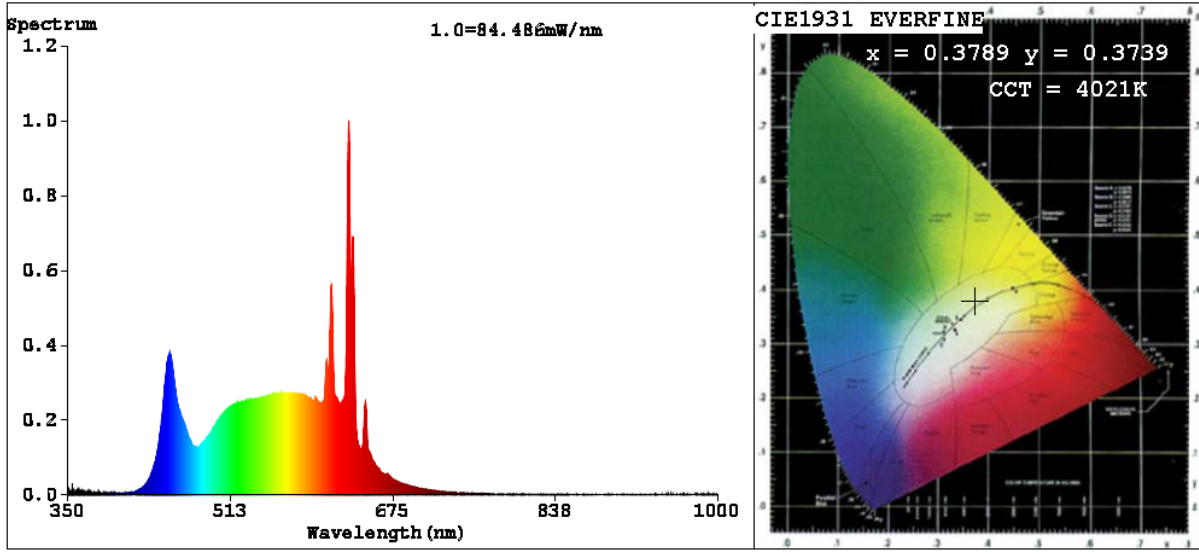
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	88
Frequency (Hz)	60	R2	99	R10	96
CCT (K)	4021	R3	95	R11	96
Duv	-0.0009	R4	99	R12	77
Chromaticity (x, y)	x=0.3789 y=0.3739	R5	98	R13	100
Chromaticity (u', v')	u'=0.2252 v'=0.5001	R6	96	R14	96
Color Rendering Index (CRI)	97.5	R7	97	R15	98
R9	88	R8	96	--	--
Rg	101				
Rf	93				
Rcs,h1%	-3				

Photometric Measurement – Goniophotometer Method:

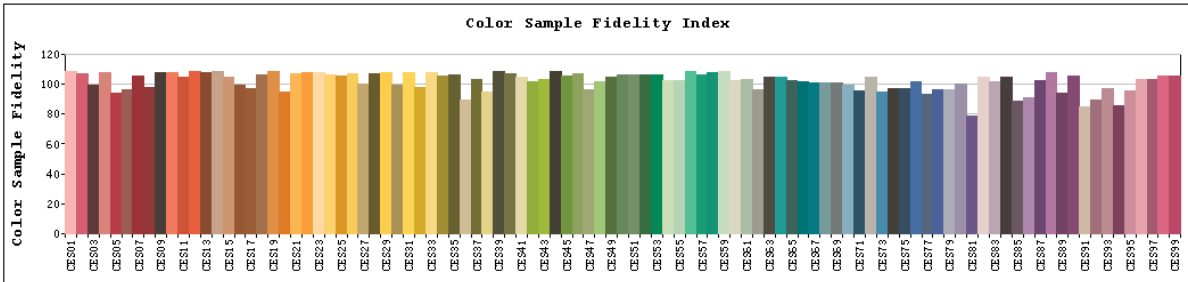
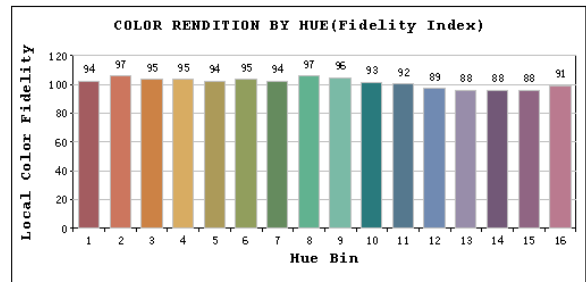
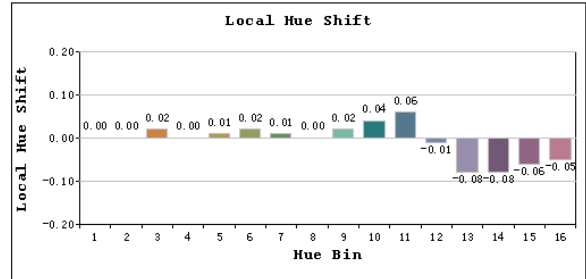
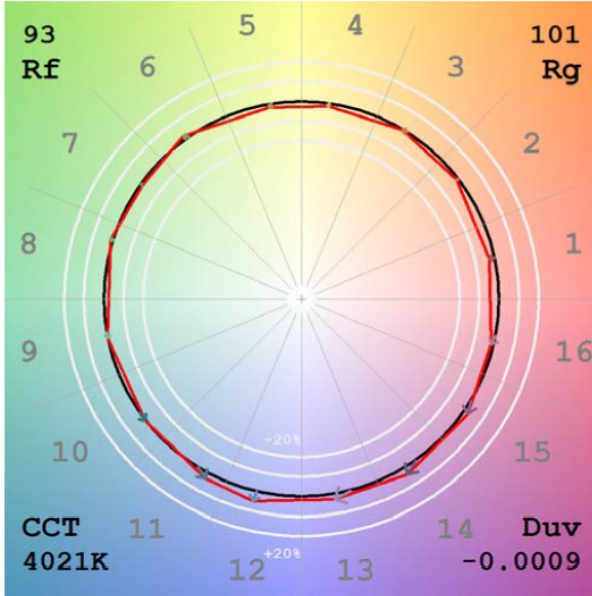
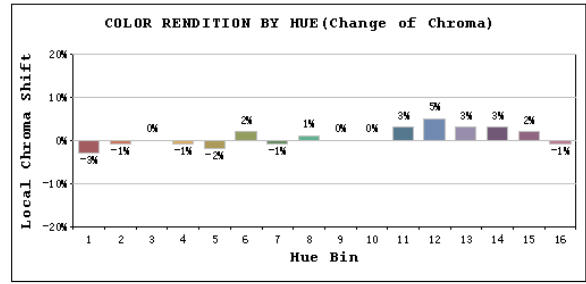
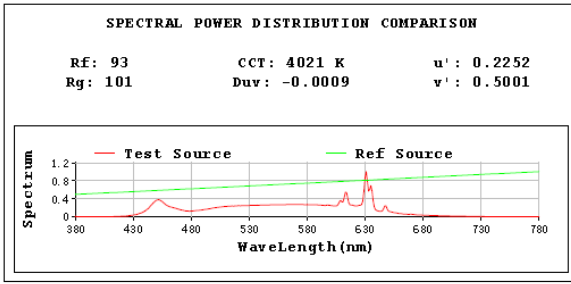
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1679.2
Luminous Efficacy (lm/W)	118.25

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1634.0
Luminous Efficacy (lm/W)	115.31

Spectral Power Distribution & Chromaticity Diagram



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2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-07-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRX3	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202407020005	120.0	60	0.122	14.60	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

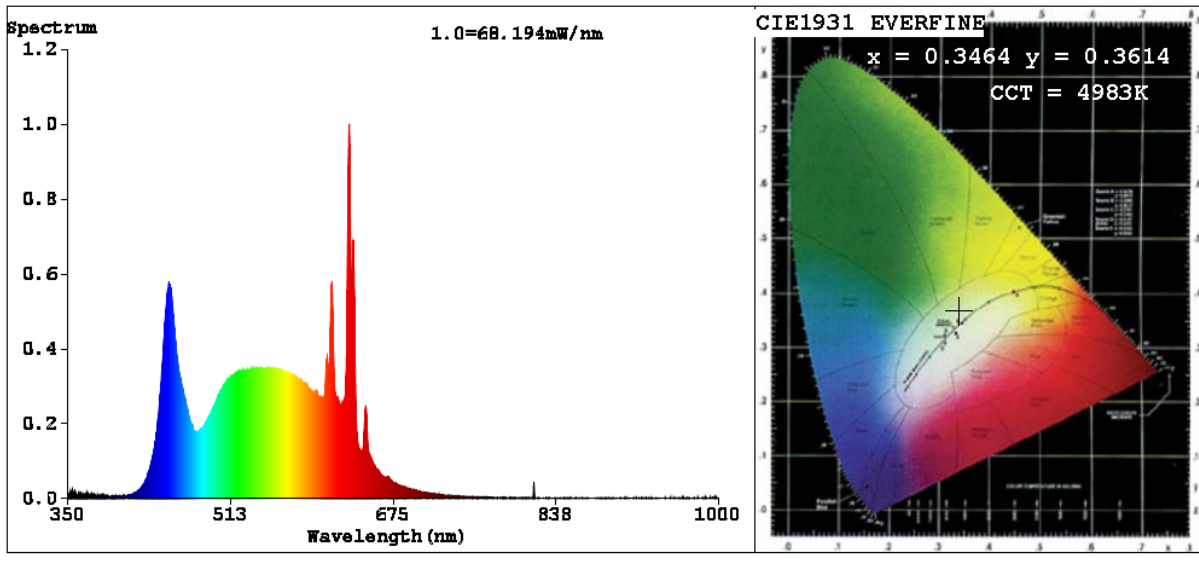
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	77
Frequency (Hz)	60	R2	95	R10	87
CCT (K)	4983	R3	94	R11	94
Duv	0.0043	R4	95	R12	67
Chromaticity (x, y)	x=0.3464 y=0.3614	R5	93	R13	95
Chromaticity (u', v')	u'=0.2086 v'=0.4895	R6	92	R14	96
Color Rendering Index (CRI)	94.3	R7	98	R15	93
R9	77	R8	92	--	--
Rg	100				
Rf	92				
Rcs,h1%	-4				

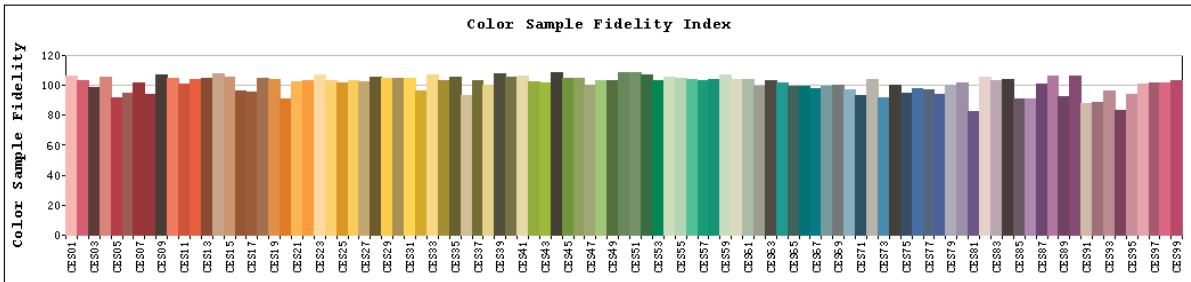
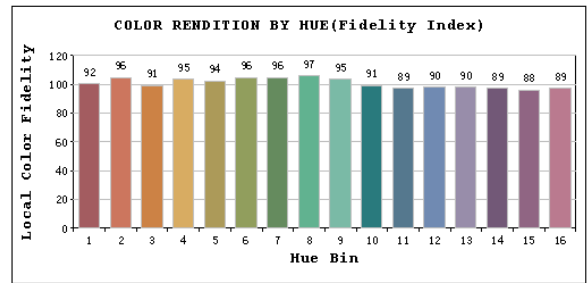
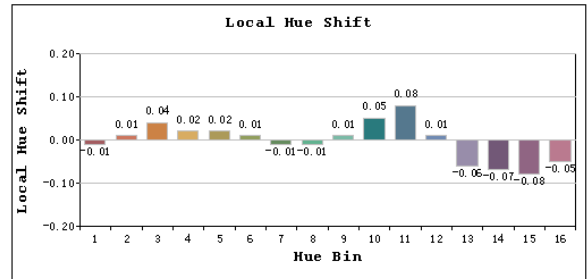
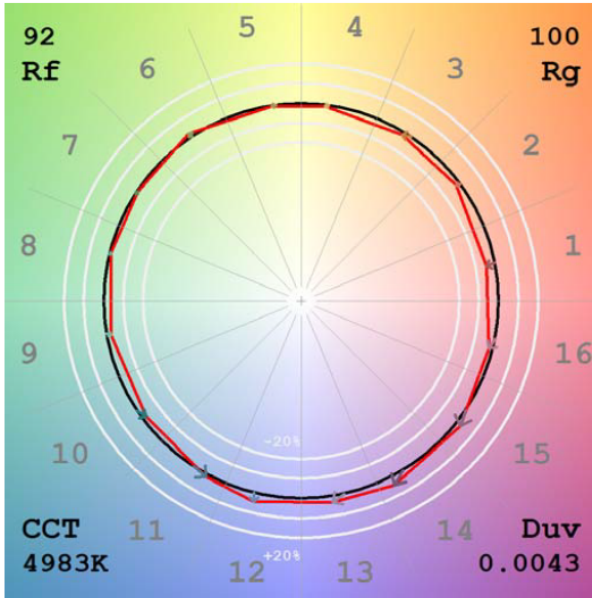
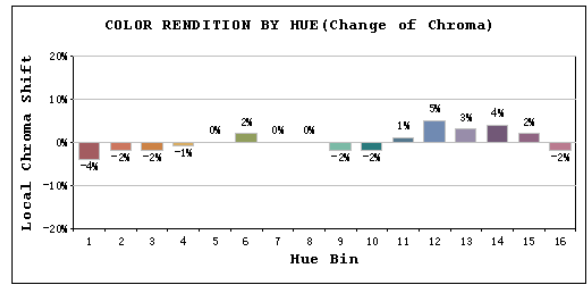
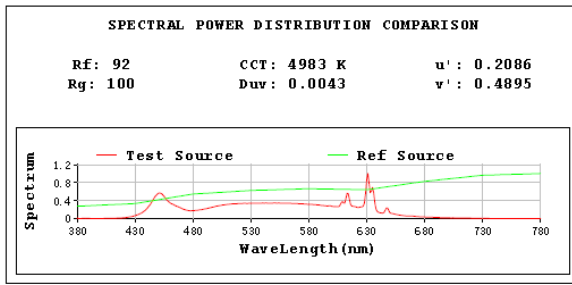
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1669.6
Luminous Efficacy (lm/W)	114.36

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1629.0
Luminous Efficacy (lm/W)	111.81

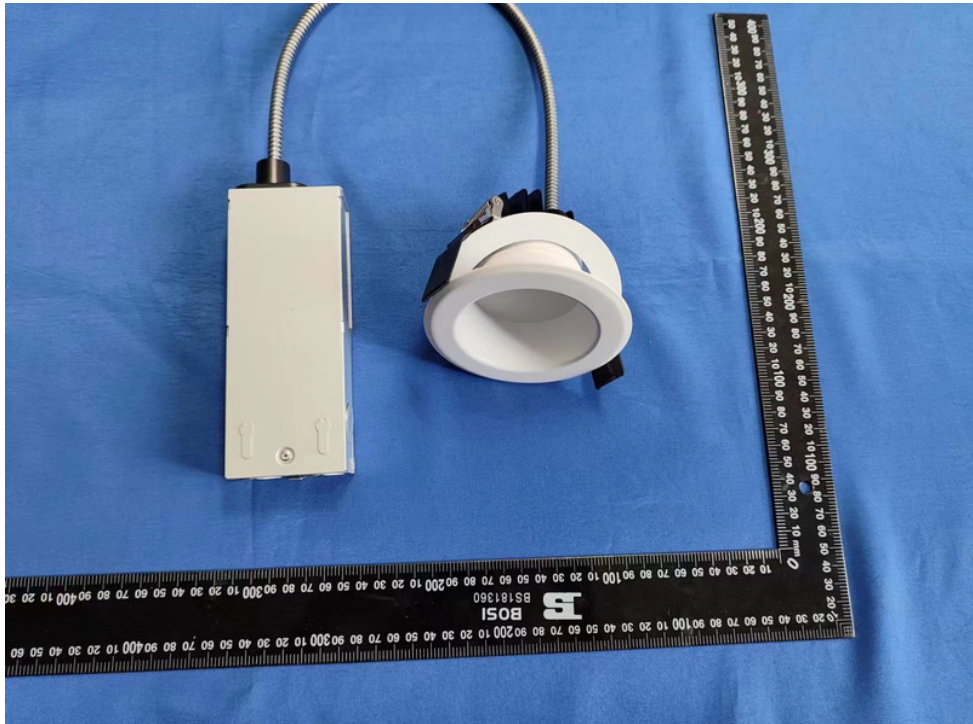
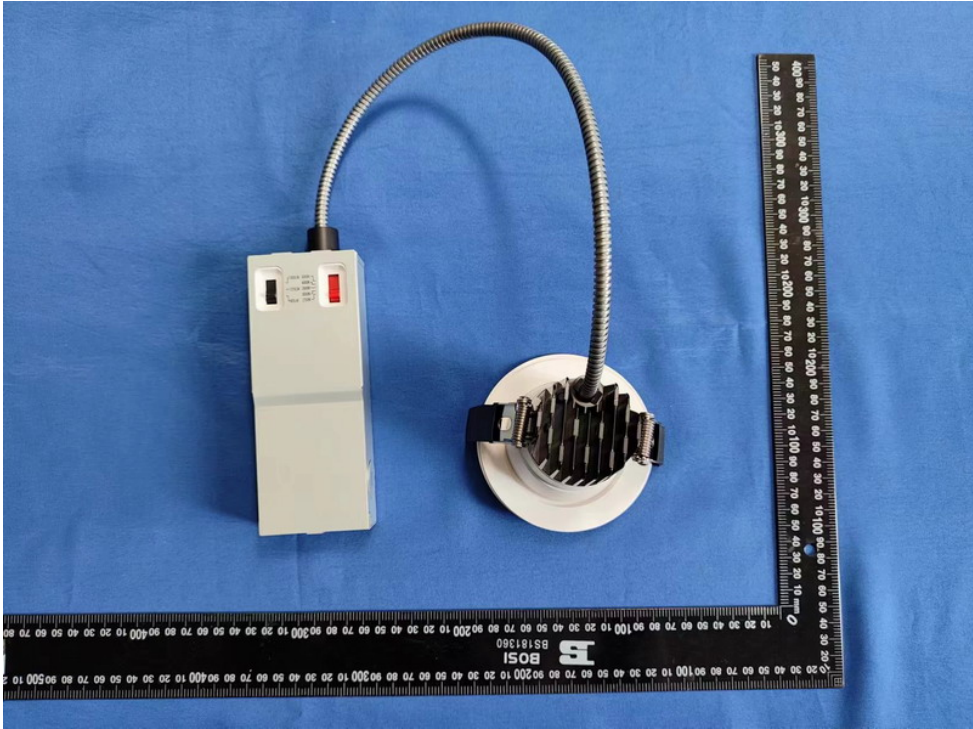
Spectral Power Distribution & Chromaticity Diagram





Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
CRX3	9W-2700K setting	120	931.3	8.51	109.44
		277	916.3	8.94	102.47
	12W-2700K setting	120	1248.4	11.60	107.62
		277	1221.0	11.79	103.56
	15W-2700K setting	120	1516.5	14.70	103.16
		277	1479.0	14.67	100.82
	15W-3000K setting	120	1581.2	14.50	109.05
		277	1542.0	14.46	106.64
	15W-3500K setting	120	1646.1	14.20	115.92
		277	1606.0	14.19	113.18
	15W-4000K setting	120	1679.2	14.20	118.25
		277	1634.0	14.17	115.31
	15W-5000K setting	120	1669.6	14.60	114.36
		277	1629.0	14.57	111.81

3. Product Photo



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