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): DLW0056(WFRL6R139FA120WB)

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Downlights
Report Date:	2020-08-17

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	13.0W
Rated Initial Lamp Lumen	950 lm
Declared CCT	2700K/3000K/3500K/4000K/5000K

1.2 Test Specifications:

Test item	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	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

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.

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 25ºC ±1ºC. 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 25ºC ±1ºC. 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.

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-15	**Test Ambient:**	25.3 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	DLW0056(WFRL6R139FA120WB)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
2008140026	120.0	60	0.106	12.60	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

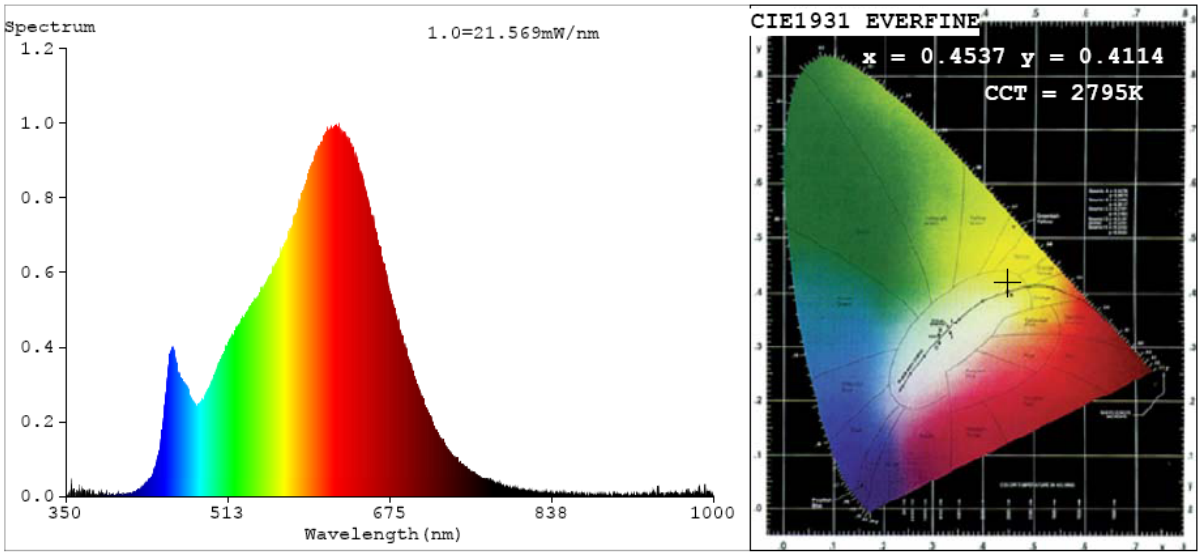
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2795
Duv	0.0009
Chromaticity (x, y)	x=0.4537 y=0.4114
Chromaticity (u', v')	u'=0.2581 v'=0.5267
Color Rendering Index (CRI)	92.6
R9	57

Special Color Rendering Indices			
R1	93	R9	57
R2	98	R10	95
R3	97	R11	93
R4	92	R12	83
R5	93	R13	95
R6	98	R14	99
R7	90	R15	88
R8	80	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1007.3
Luminous Efficacy (lm/W)	79.95
Beam Angle (°)	111.1
Center Beam Candle Power (cd)	358.0

Spectral Power Distribution & Chromaticity Diagram



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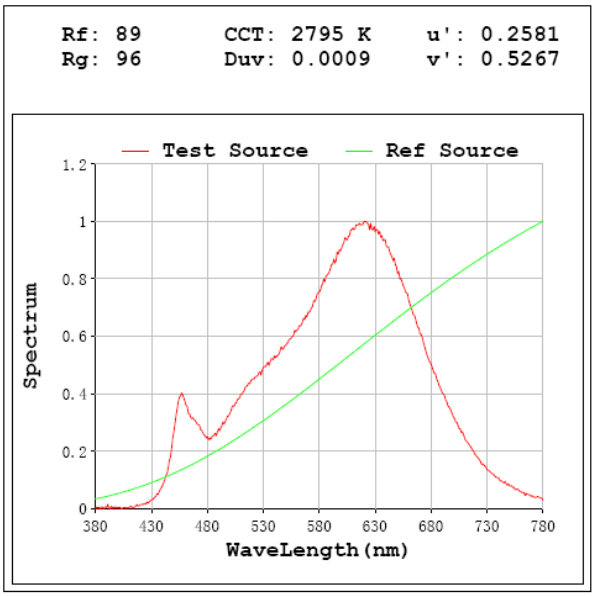
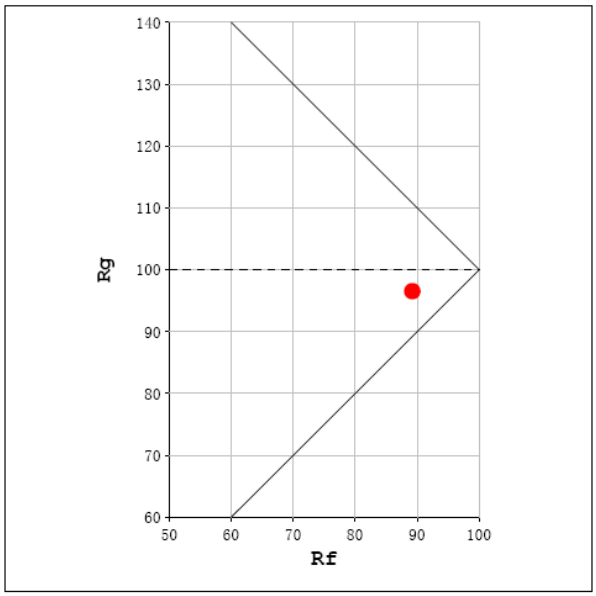
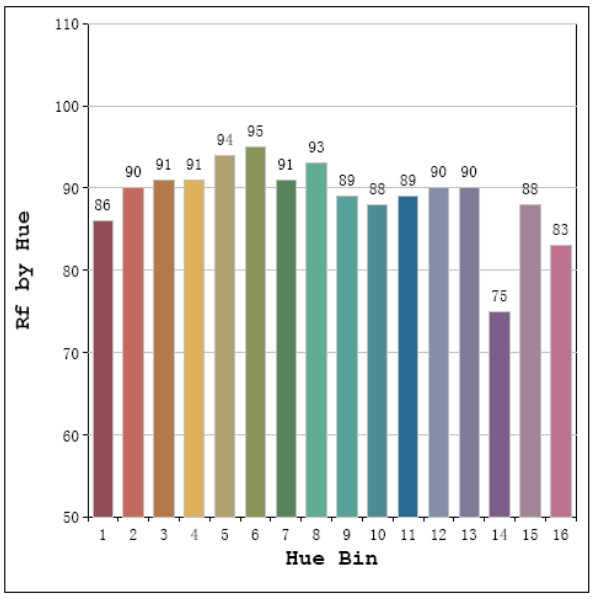
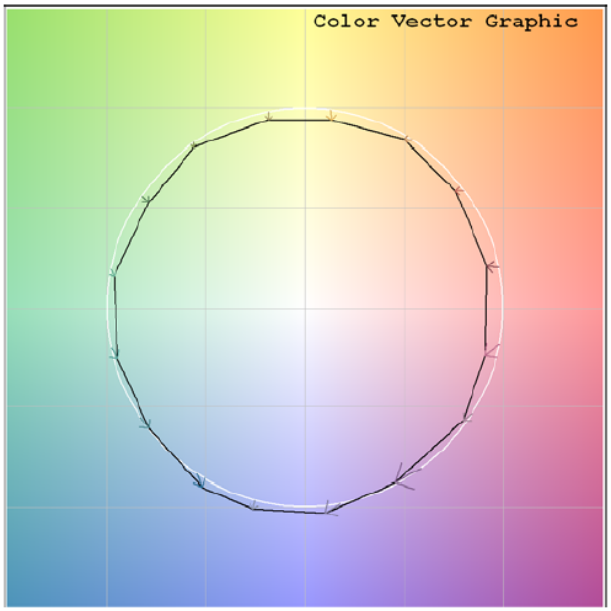






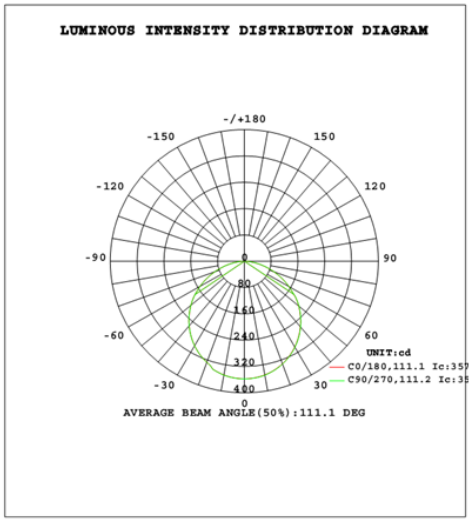


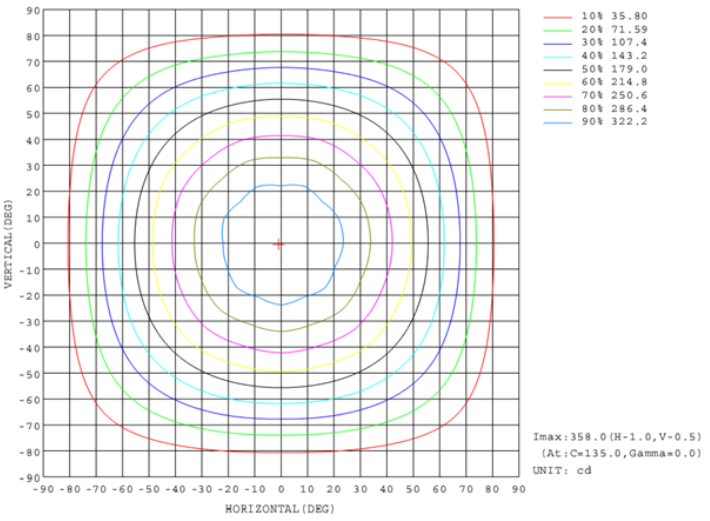
Zonal Lumen Tabulation

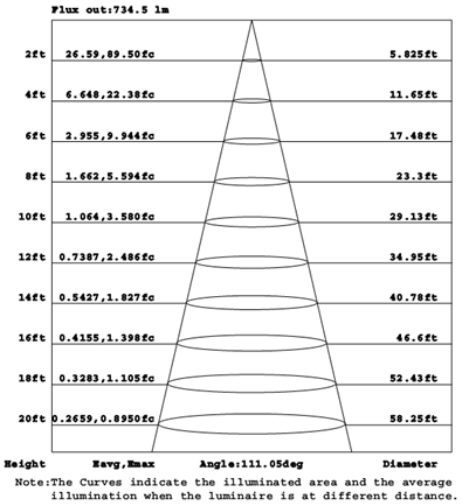
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	276.2	27.4%
0-40	451.3	44.8%
0-60	795.8	79.0%
60-90	211.6	21.0%
70-100	89.2	8.9%
90-120	0.0	0.0%
0-90	1007.4	100.0%
90-180	0.0	0.0%
0-180	1007.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	33.9	3.4%	90-100	0.0	0.0%
10-20	96.7	9.6%	100-110	0.0	0.0%
20-30	145.6	14.5%	110-120	0.0	0.0%
30-40	175.2	17.4%	120-130	0.0	0.0%
40-50	181.4	18.0%	130-140	0.0	0.0%
50-60	163.0	16.2%	140-150	0.0	0.0%
60-70	122.3	12.1%	150-160	0.0	0.0%
70-80	69.2	6.9%	160-170	0.0	0.0%
80-90	20.0	2.0%	170-180	0.0	0.0%

Photometric Data







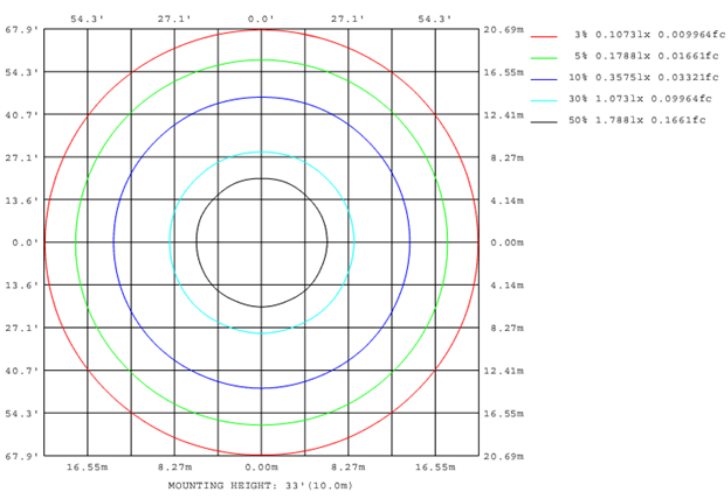


Table--1

UNIT: cd

γ (DEG) \ 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	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358	358			
5	356	356	356	356	356	357	356	356	356	356	356	356	356	356	356	356			
10	351	351	351	352	352	352	352	352	351	351	351	351	351	351	352	351			
15	343	344	344	344	344	344	344	344	343	343	343	343	343	343	344	343			
20	332	328	332	328	333	328	333	328	327	332	327	332	327	332	328	332			
25	318	314	318	314	319	315	319	314	313	318	313	318	313	318	314	318			
30	301	297	302	298	302	298	302	298	297	301	297	301	297	301	297	301			
35	282	278	282	279	283	279	282	279	278	281	278	281	278	282	278	282			
40	260	257	261	258	261	258	261	257	256	259	256	259	256	260	257	260			
45	237	234	237	235	238	235	237	234	233	236	233	236	233	236	234	237			
50	212	209	212	210	212	210	212	209	208	211	208	211	208	211	209	212			
55	183	183	185	183	185	183	183	182	182	182	181	182	181	182	182	183			
60	153	154	154	154	153	154	153	154	153	152	152	152	153	152	154	153			
65	124	125	124	125	124	125	124	124	123	122	123	122	123	123	124	124			
70	93.9	95.0	94.5	95.3	94.4	95.2	94.1	94.4	94.0	92.9	93.4	92.5	93.5	93.2	94.5	94.1			
75	65.0	66.1	65.6	66.4	65.8	66.5	65.5	65.7	65.4	64.3	64.7	63.9	64.7	64.4	65.6	65.3			
80	38.3	39.2	38.8	39.7	39.1	39.7	38.8	39.0	39.0	38.0	38.2	37.4	38.1	38.0	38.9	38.7			
85	15.8	16.4	16.1	16.7	16.1	16.6	15.9	16.1	16.4	15.7	15.9	15.4	16.0	15.7	16.4	16.3			
90	6.72	6.77	6.79	6.74	6.73	6.72	6.73	6.70	6.95	6.97	6.94	6.96	6.94	6.97	6.97	7.04			

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-15	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0056(WFRL6R139FA120WB)	3000K	

Electrical Measurement:

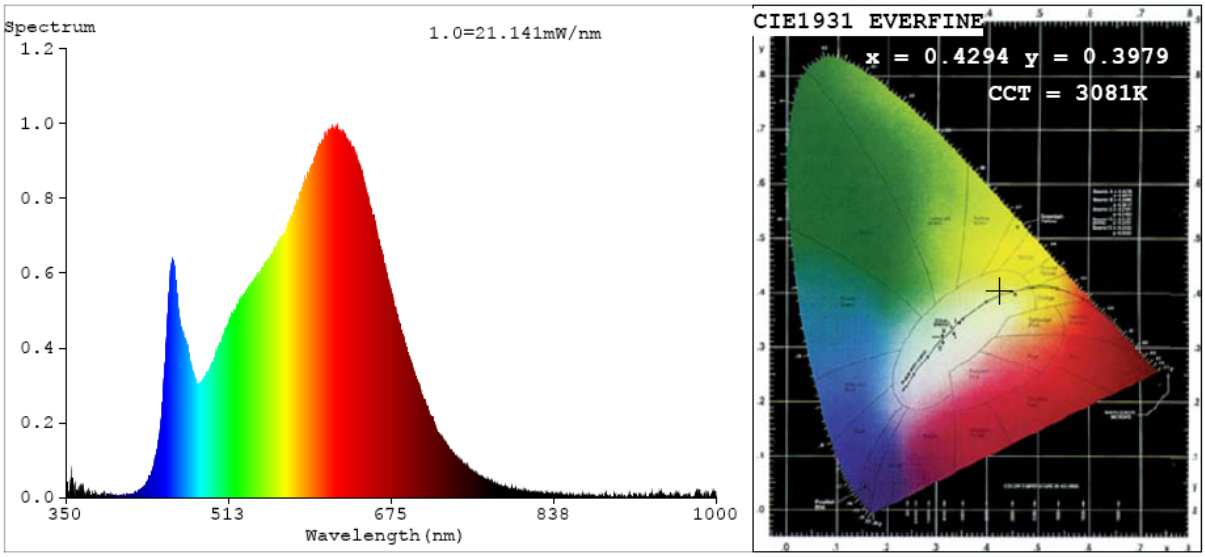
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
2008140026	120.0	60	0.108	12.77	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3081
Duv	0.0014
Chromaticity (x, y)	x=0.4294 y=0.3979
Chromaticity (u', v')	u'=0.2483 v'=0.5178
Color Rendering Index (CRI)	93.8
R9	66
Total Luminous (lm)	1048
Luminous Efficacy (lm/W)	82.06

Special Color Rendering Indices			
R1	96	R9	66
R2	100	R10	98
R3	97	R11	94
R4	93	R12	80
R5	95	R13	97
R6	96	R14	99
R7	91	R15	92
R8	83	--	--

Spectral Power Distribution & Chromaticity Diagram



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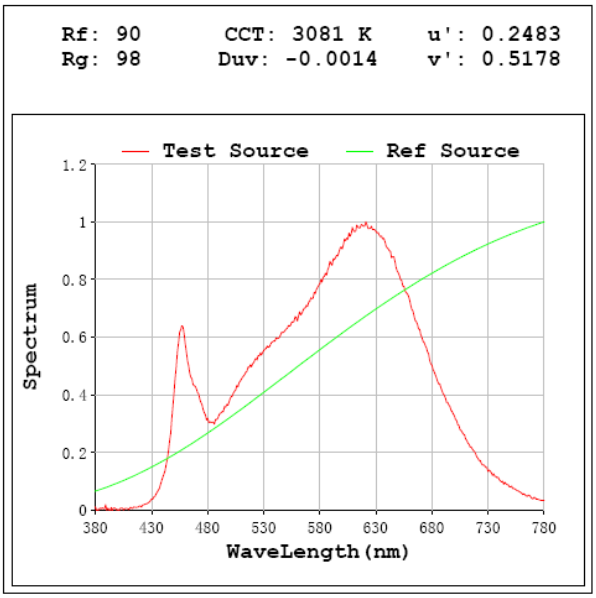
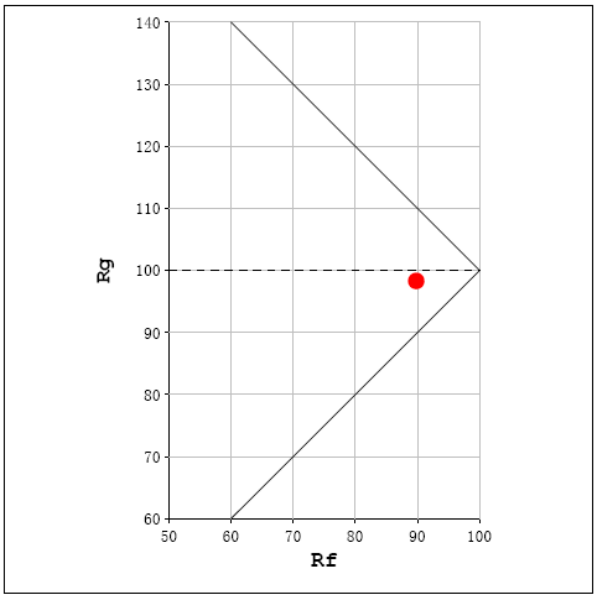
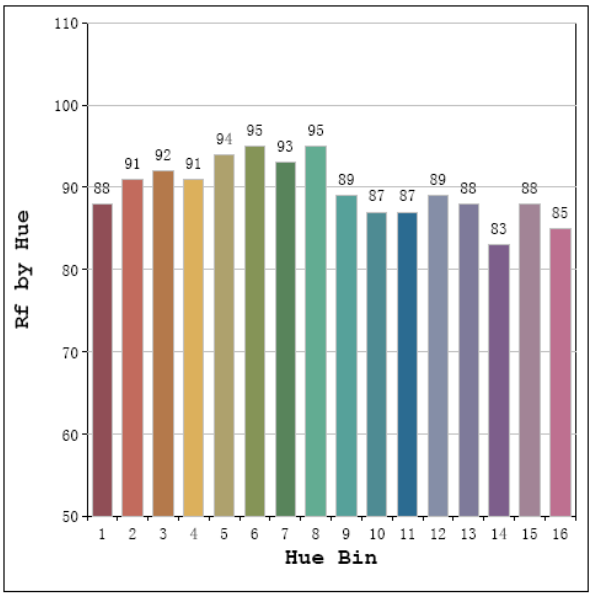
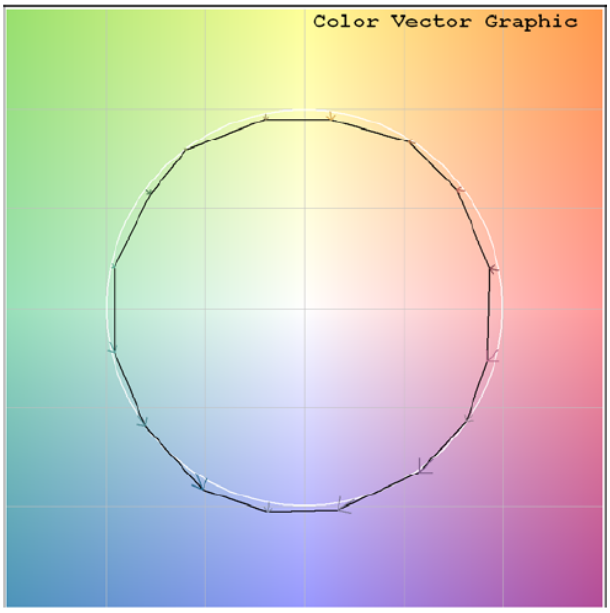

Rf: 90 CCT: 3081 K u': 0.2483
Rg: 98 Duv: -0.0014 v': 0.5178
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
88 91 92 91 94 95 93 95 89 87 87 89 88 83 88 85


Color Vector Graphic

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-15	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0056(WFRL6R139FA120WB)	3500K	

Electrical Measurement:

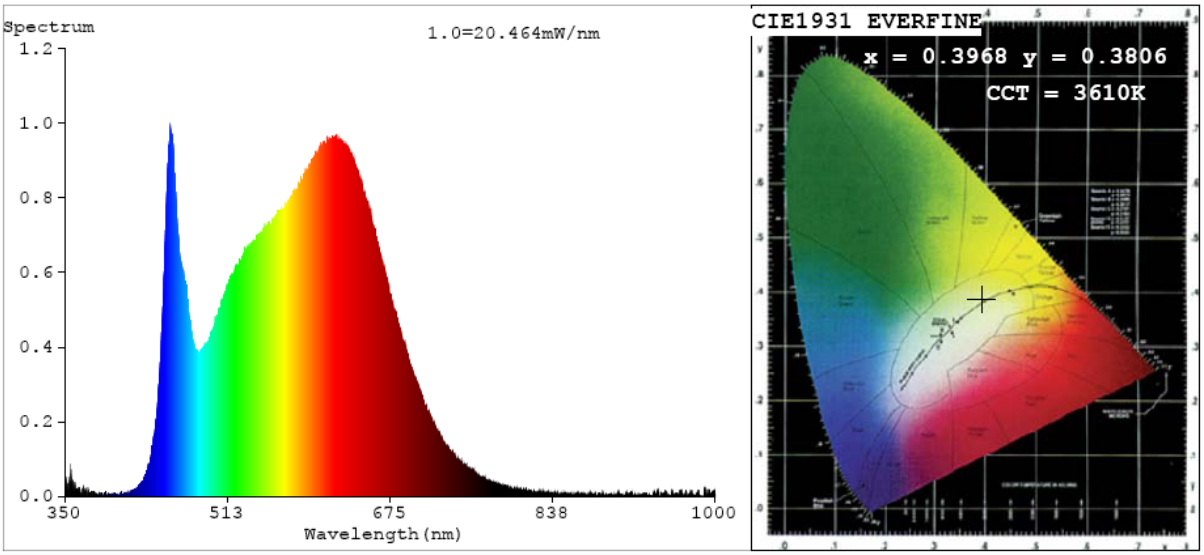
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
2008140026	120.0	60	0.106	12.52	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3610
Duv	0.0026
Chromaticity (x, y)	x=0.3968 y=0.3806
Chromaticity (u', v')	u'=0.2344 v'=0.5057
Color Rendering Index (CRI)	94.8
R9	76
Total Luminous (lm)	1103
Luminous Efficacy (lm/W)	88.13

Special Color Rendering Indices			
R1	97	R9	76
R2	99	R10	98
R3	98	R11	95
R4	93	R12	74
R5	95	R13	99
R6	95	R14	100
R7	92	R15	95
R8	88	--	--

Spectral Power Distribution & Chromaticity Diagram



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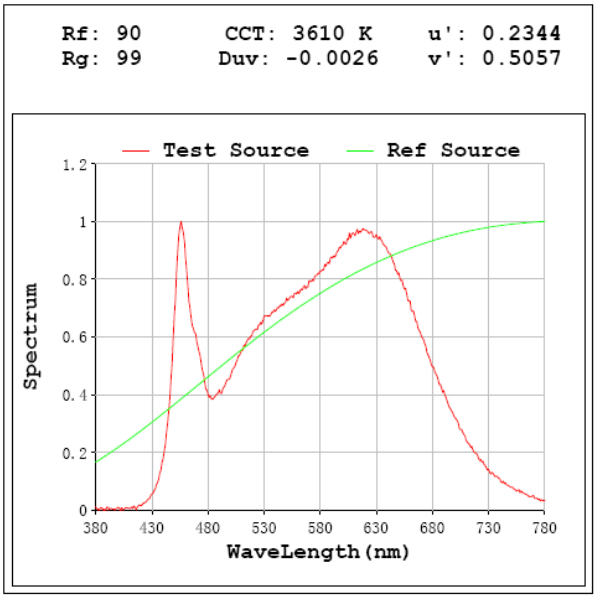
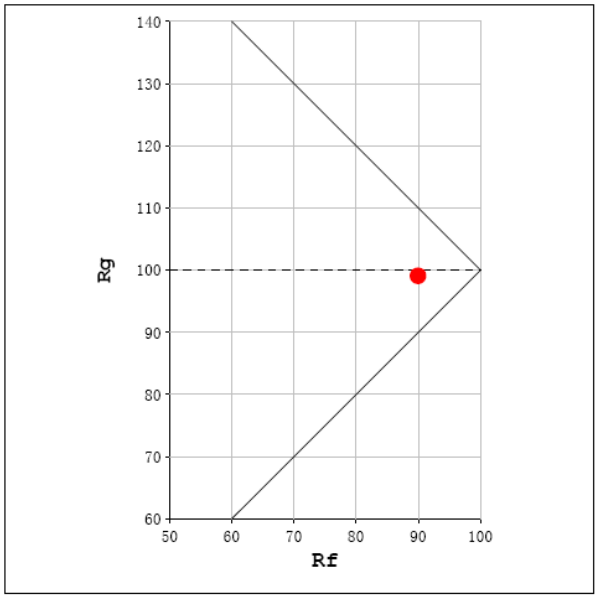
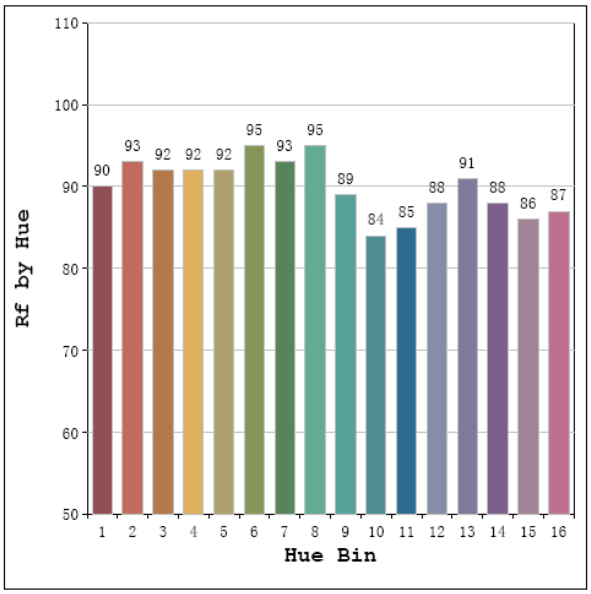

Rf: 90
CCT: 3610 K
u': 0.2344
Rg: 99
Duv: -0.0026
v': 0.5057
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
90
93
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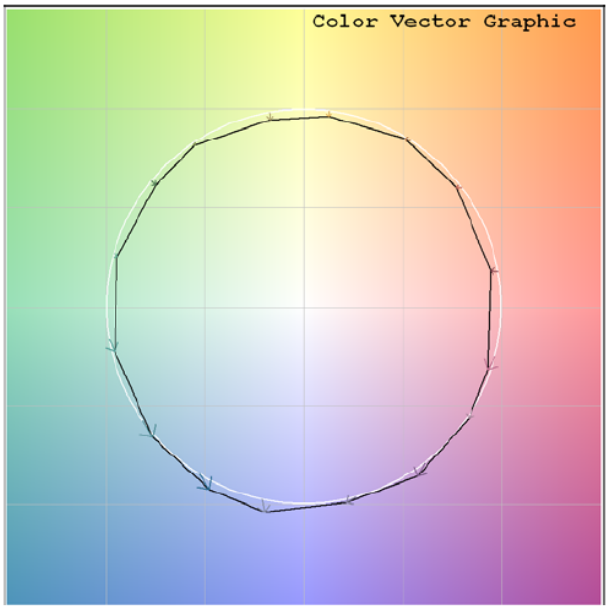

Color Vector Graphic

2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-15	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0056(WFRL6R139FA120WB)	4000K	

Electrical Measurement:

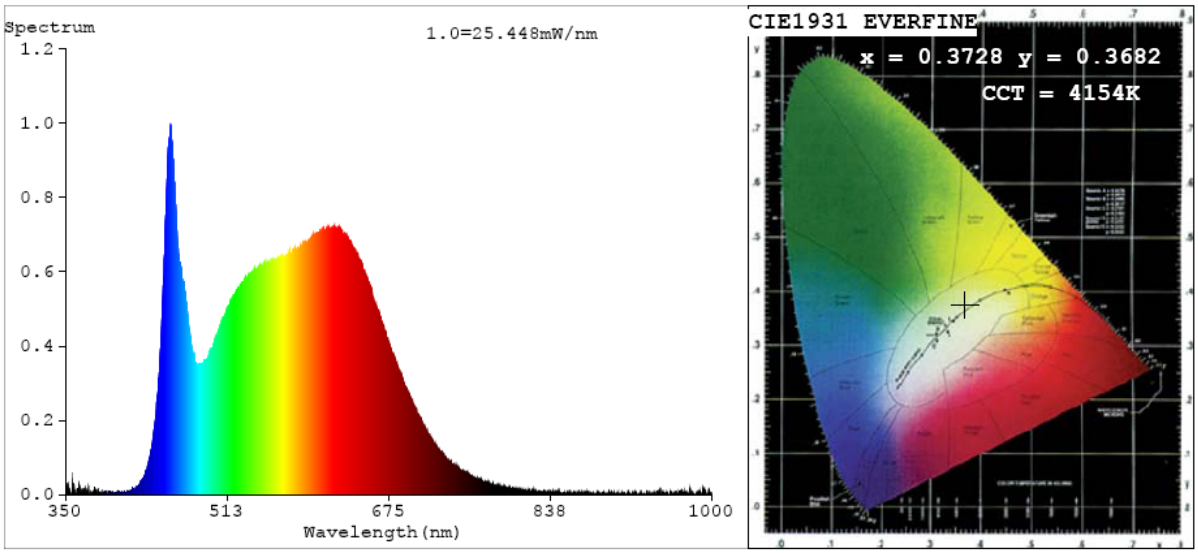
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
2008140026	120.0	60	0.107	12.64	0.986

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4154
Duv	0.0018
Chromaticity (x, y)	x=0.3728 y=0.3682
Chromaticity (u', v')	u'=0.2235 v'=0.4966
Color Rendering Index (CRI)	94.8
R9	79
Total Luminous (lm)	1130
Luminous Efficacy (lm/W)	89.44

Special Color Rendering Indices			
R1	96	R9	79
R2	99	R10	96
R3	98	R11	93
R4	93	R12	70
R5	94	R13	98
R6	95	R14	99
R7	93	R15	95
R8	90	--	--

Spectral Power Distribution & Chromaticity Diagram



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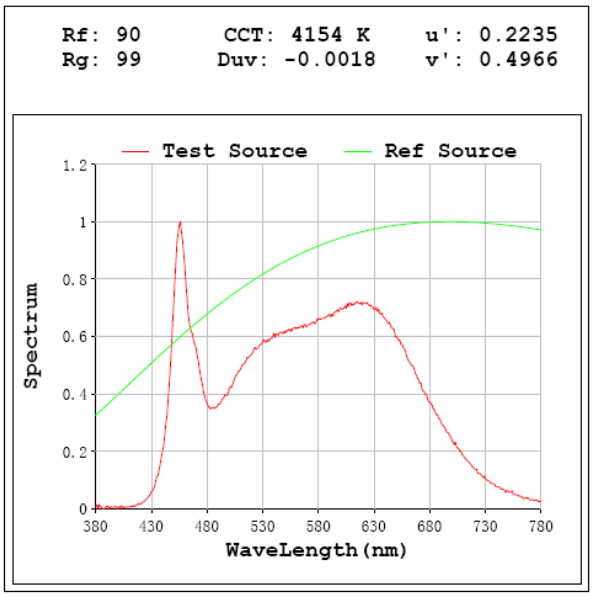
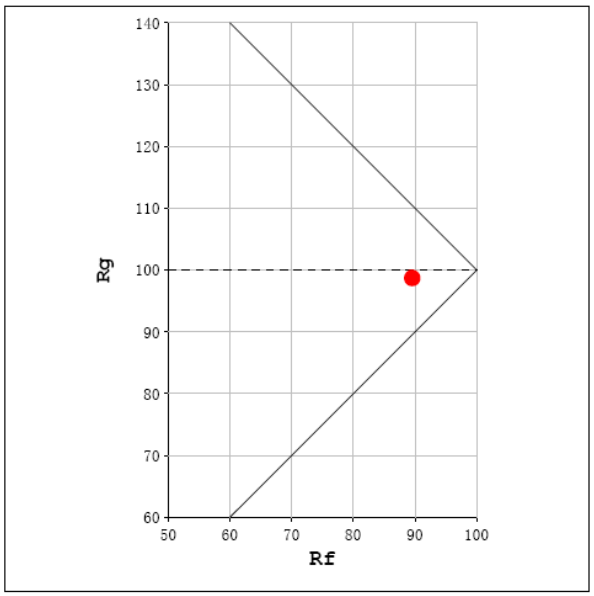
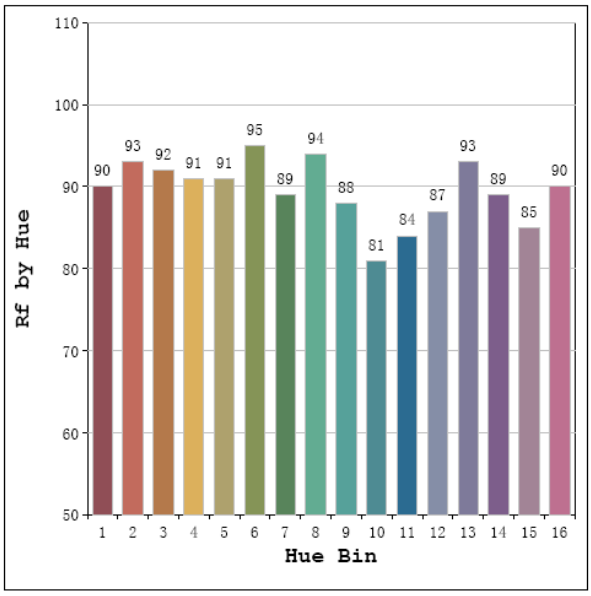
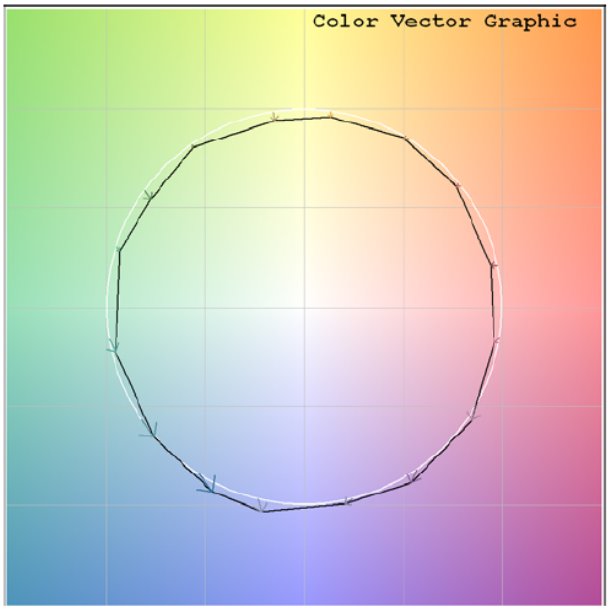

Rf: 90
CCT: 4154 K
u': 0.2235
Rg: 99
Duv: -0.0018
v': 0.4966
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
90 93 92 91 91 95 89 94 88 81 84 87 93 89 85 90


Color Vector Graphic

2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-15	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0056(WFRL6R139FA120WB)	5000K	

Electrical Measurement:

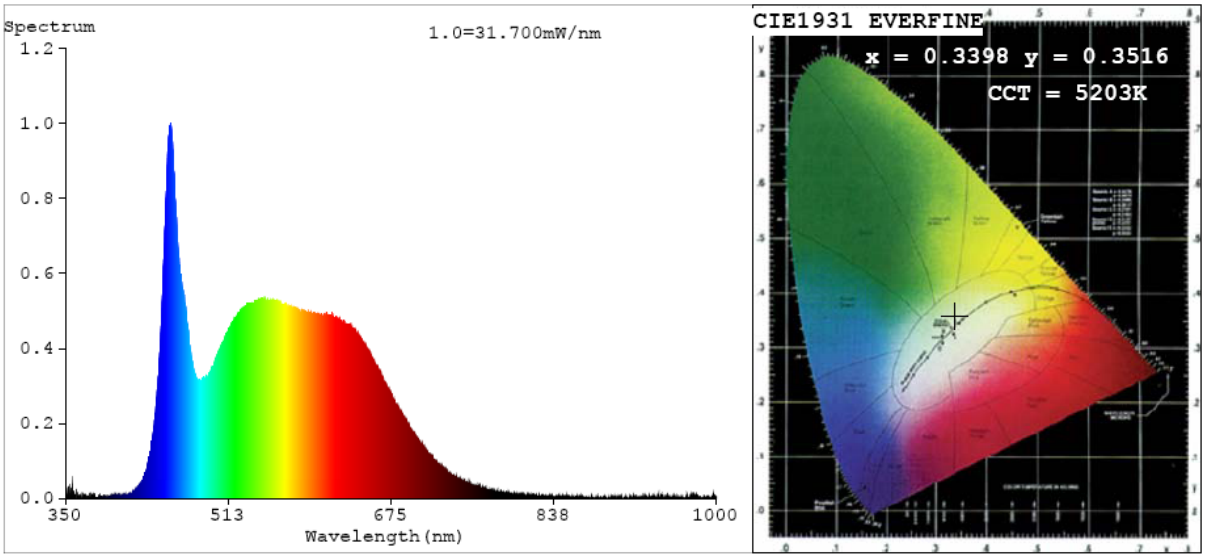
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
2008140026	120.0	60	0.109	12.95	0.987

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5203
Duv	0.0021
Chromaticity (x, y)	x=0.3398 y=0.3516
Chromaticity (u', v')	u'=0.2079 v'=0.4839
Color Rendering Index (CRI)	92.8
R9	71
Total Luminous (lm)	1137
Luminous Efficacy (lm/W)	87.82

Special Color Rendering Indices			
R1	93	R9	71
R2	96	R10	89
R3	96	R11	91
R4	91	R12	67
R5	92	R13	95
R6	92	R14	98
R7	94	R15	92
R8	88	--	--

Spectral Power Distribution & Chromaticity Diagram



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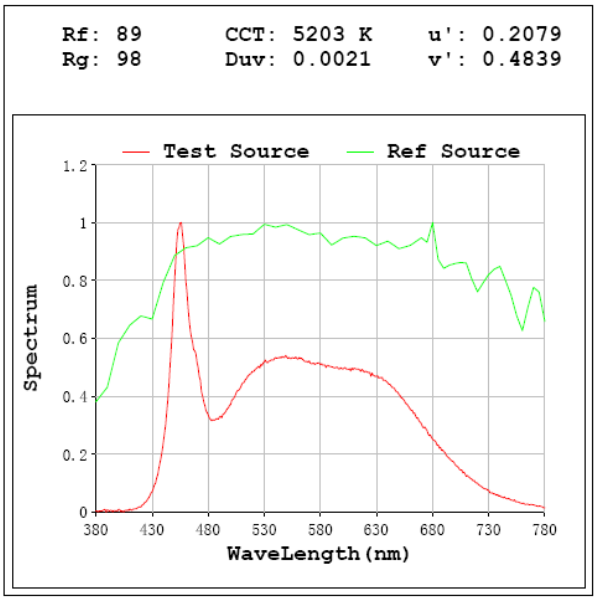
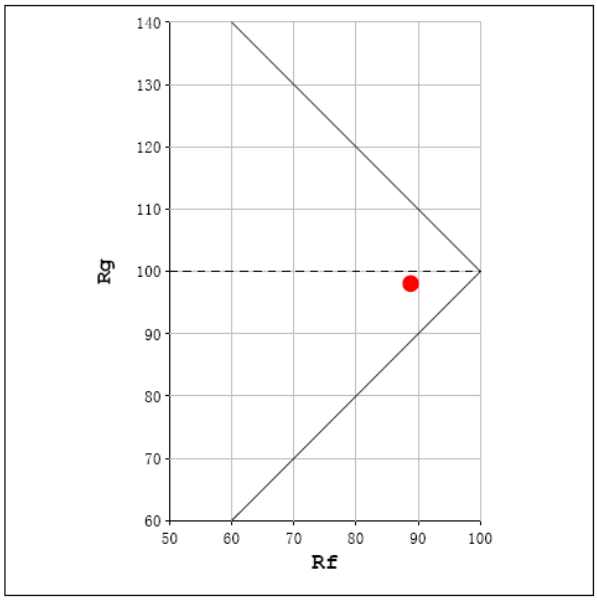
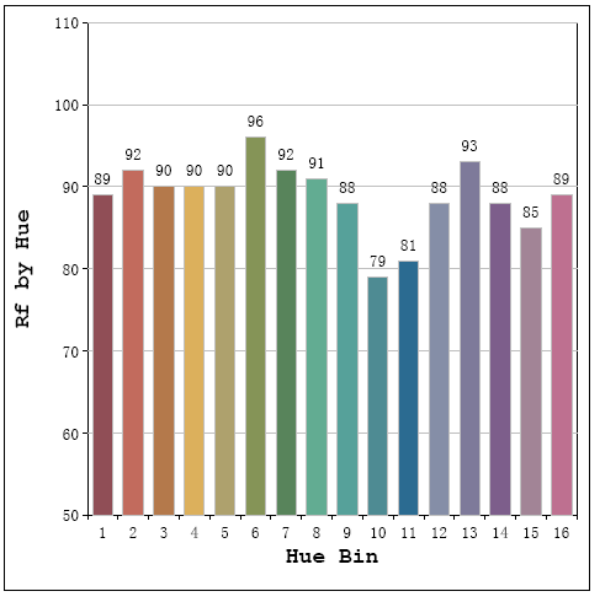
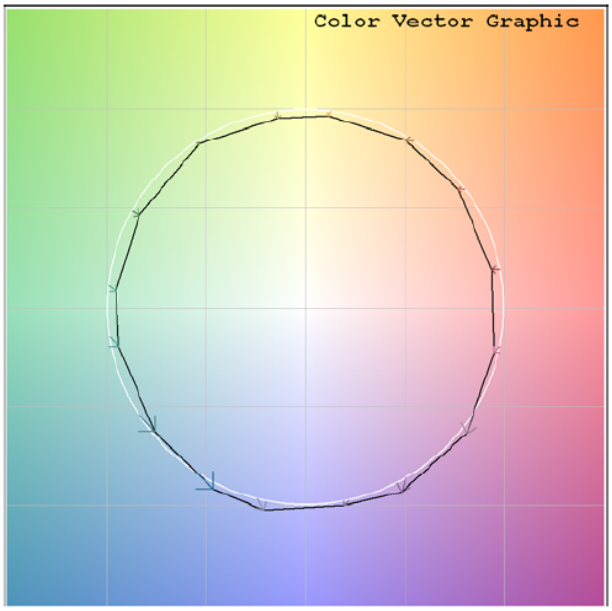
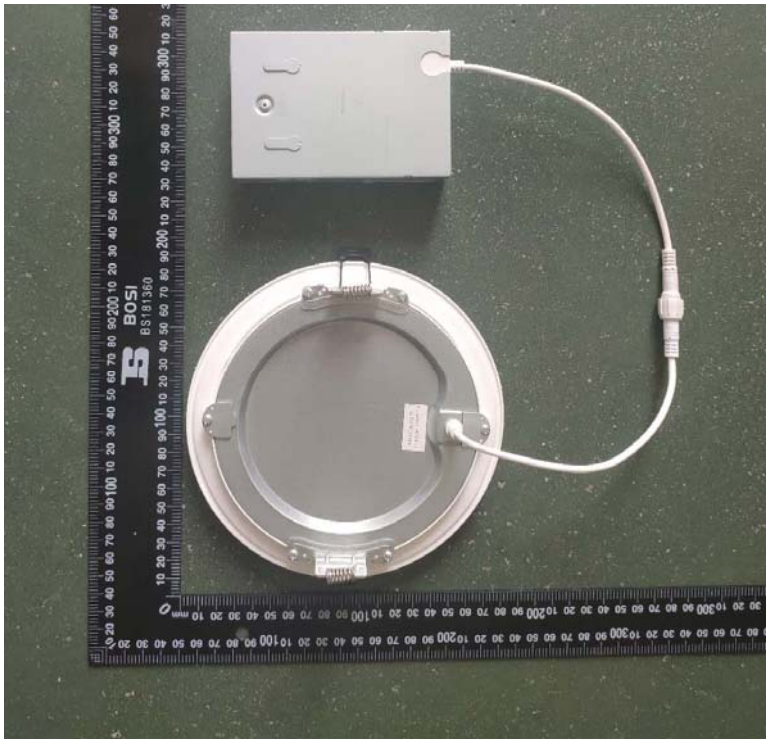

Rf: 89
CCT: 5203 K
u': 0.2079
Rg: 98
Duv: 0.0021
v': 0.4839
Test Source
Ref Source
Spectrum
WaveLength(nm)

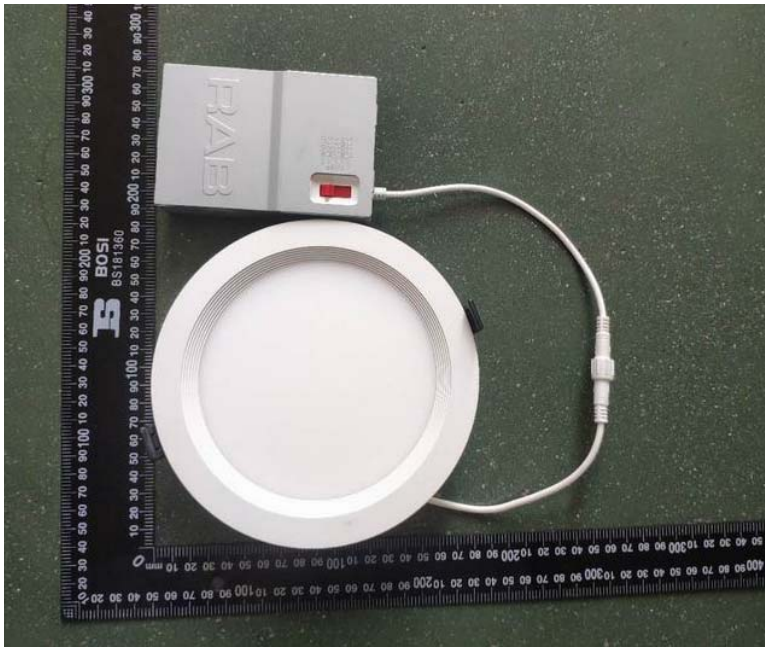

Rg
Rf


Rf by Hue
Hue Bin
89
92
90
90
90
96
92
91
88
79
81
88
93
88
85
89


Color Vector Graphic

3. Product Photo





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