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): DLS0059(DSK4R79FA120WS)

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Downlights
Report Date:	2020-09-11

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	7.0W
Rated Initial Lamp Lumen	650 lm
Declared CCT	2700K/3000K/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	2020-09-11	**Test Ambient:**	25.3 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	DLS0059(DSK4R79FA120WS)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009110002	120.0	60	0.056	6.63	0.979

Chromaticity Measurement - Sphere-Spectroradiometer Method:

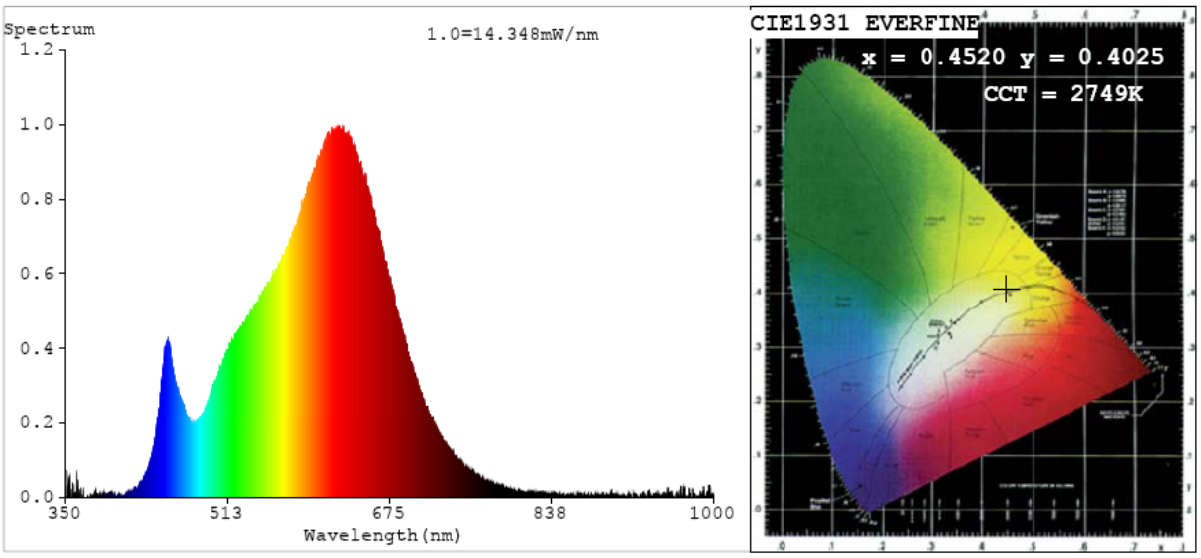
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2749
Duv	0.0023
Chromaticity (x, y)	x=0.4520 y=0.4025
Chromaticity (u', v')	u'=0.2610 v'=0.5230
Color Rendering Index (CRI)	94.1
R9	65

Special Color Rendering Indices			
R1	95	R9	65
R2	98	R10	95
R3	98	R11	96
R4	94	R12	87
R5	95	R13	96
R6	97	R14	99
R7	91	R15	91
R8	83	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	652.8
Luminous Efficacy (lm/W)	98.46
Beam Angle (°)	104.6
Center Beam Candle Power (cd)	239.9

Spectral Power Distribution & Chromaticity Diagram



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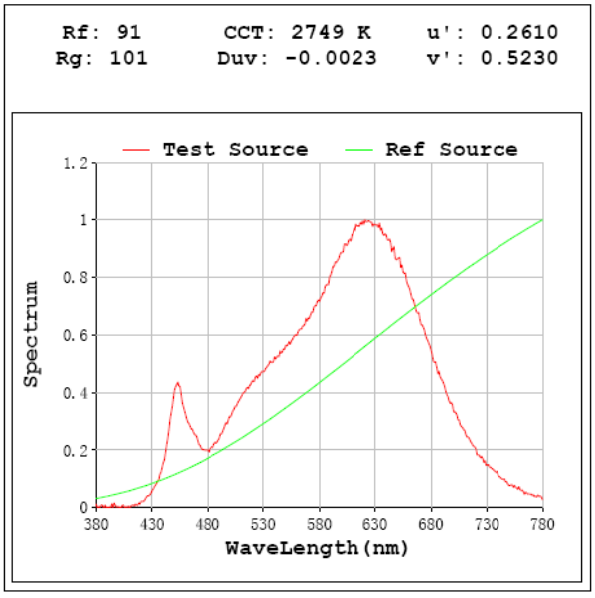
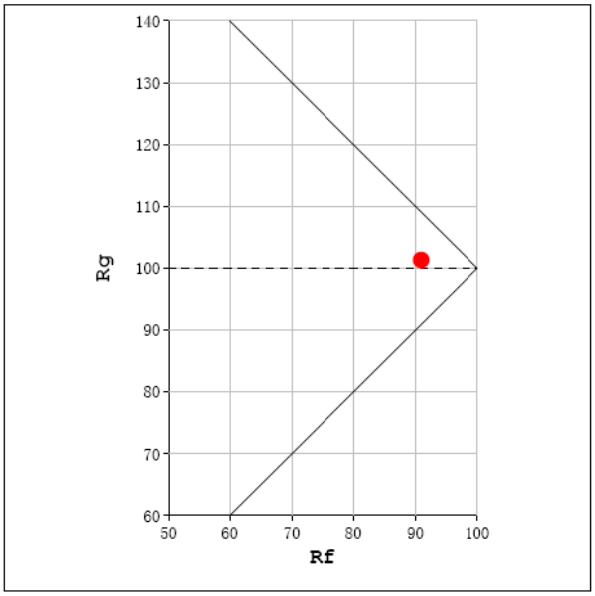
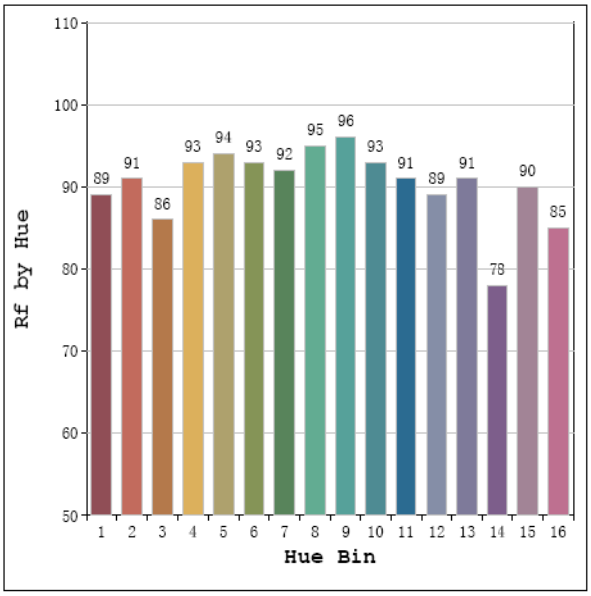
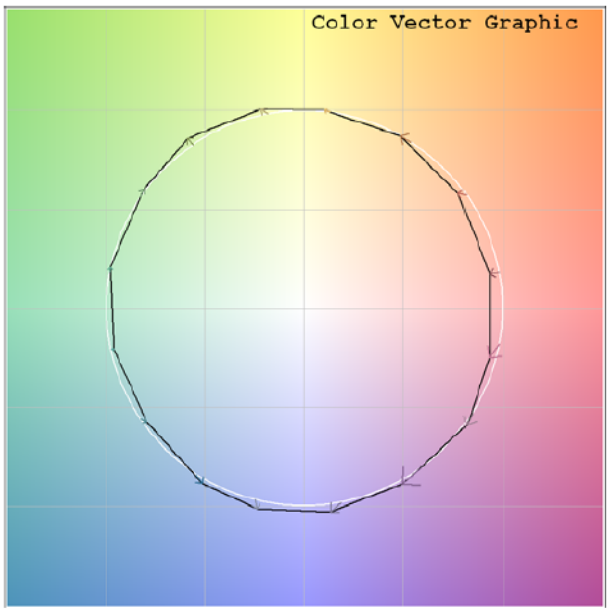






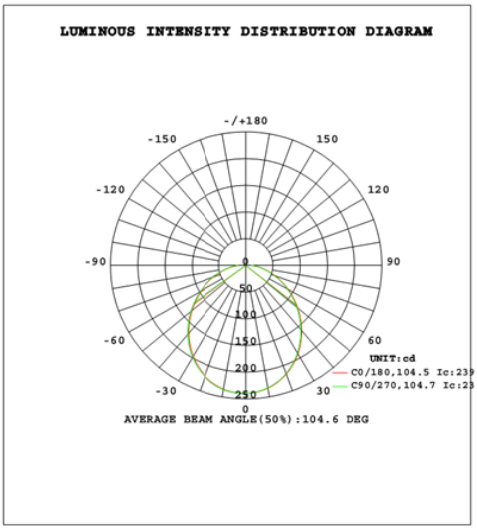


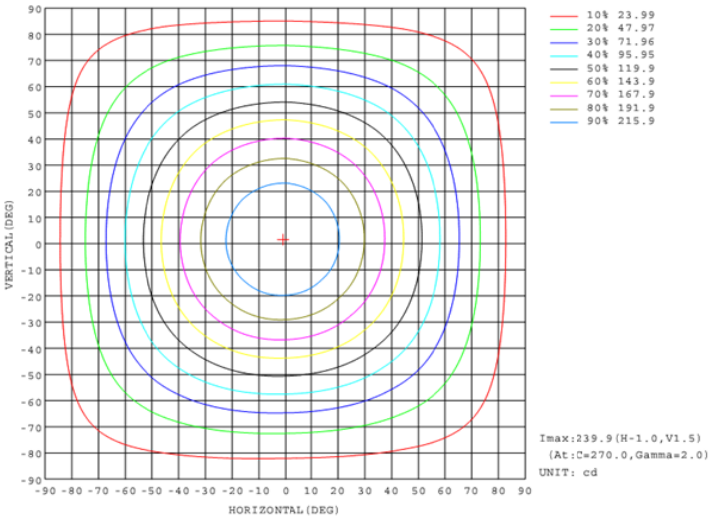
Zonal Lumen Tabulation

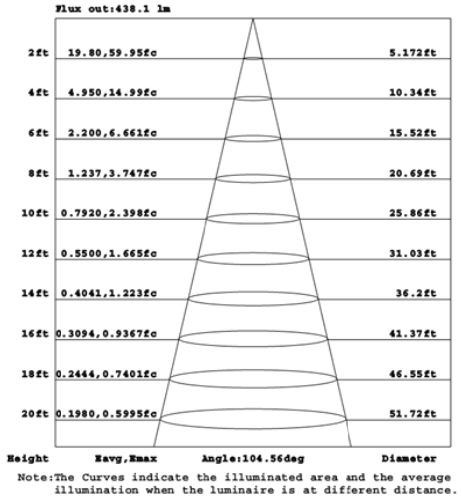
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	182.4	27.9%
0-40	294.3	45.1%
0-60	505.4	77.4%
60-90	147.4	22.6%
70-100	71.7	11.0%
90-120	0.0	0.0%
0-90	652.8	100.0%
90-180	0.0	0.0%
0-180	652.8	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	22.6	3.5%	90-100	0.0	0.0%
10-20	64.2	9.8%	100-110	0.0	0.0%
20-30	95.5	14.6%	110-120	0.0	0.0%
30-40	111.9	17.1%	120-130	0.0	0.0%
40-50	112.3	17.2%	130-140	0.0	0.0%
50-60	98.8	15.1%	140-150	0.0	0.0%
60-70	75.7	11.6%	150-160	0.0	0.0%
70-80	48.3	7.4%	160-170	0.0	0.0%
80-90	23.5	3.6%	170-180	0.0	0.0%

Photometric Data







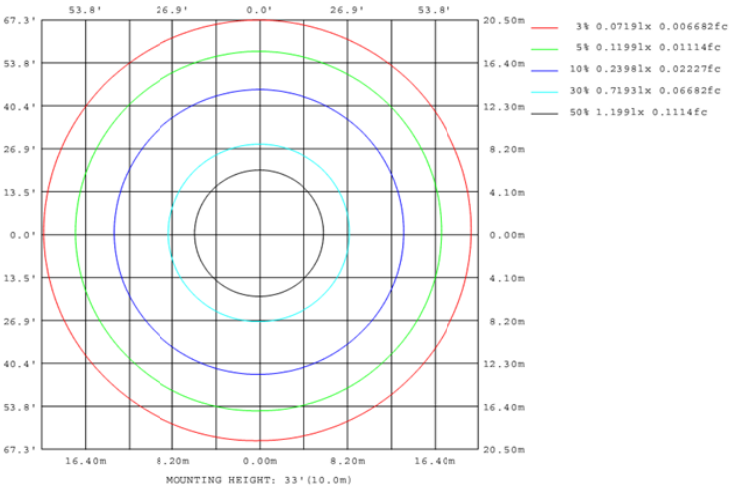


Table--1

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	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240			
5	238	238	237	237	238	238	238	239	239	239	239	239	239	239	239	238			
10	233	233	232	233	233	233	234	235	235	236	236	236	236	236	235	234			
15	226	226	225	225	225	226	227	228	229	230	231	231	231	230	229	228			
20	217	216	215	215	215	217	218	219	221	221	222	222	222	221	220	218			
25	205	204	202	203	203	205	206	208	210	211	212	212	212	210	209	207			
30	191	190	188	189	189	191	193	195	197	198	199	199	199	198	196	193			
35	176	174	172	173	174	176	178	180	182	183	185	185	185	183	181	178			
40	159	157	156	156	157	159	161	164	166	167	169	169	169	167	165	162			
45	142	140	138	139	140	142	144	147	149	150	152	152	152	150	148	145			
50	124	122	121	121	122	125	127	129	131	133	134	134	134	133	131	127			
55	107	105	103	104	105	107	109	112	114	115	117	117	117	115	113	110			
60	89.6	87.9	86.3	86.8	87.5	89.7	91.6	94.3	96.4	97.5	99.1	99.1	99.1	97.3	95.5	92.4			
65	73.1	71.4	70.0	70.4	71.0	73.1	74.8	77.3	79.4	80.5	81.9	81.9	82.0	80.2	78.6	75.7			
70	57.4	56.0	54.6	54.9	55.4	57.2	58.7	61.1	63.1	64.1	65.5	65.5	65.5	64.0	62.4	59.9			
75	42.9	41.6	40.5	40.7	41.1	42.7	44.0	46.0	47.9	48.8	50.0	50.0	50.0	48.7	47.4	45.1			
80	30.1	29.1	28.1	28.3	28.5	29.8	30.8	32.5	34.2	35.0	36.0	36.0	36.1	35.0	33.9	32.1			
85	19.5	18.7	17.9	18.0	18.2	19.1	20.0	21.2	22.6	23.2	24.0	24.0	24.1	23.3	22.5	21.1			
90	11.5	10.8	10.5	10.4	10.7	11.2	11.8	12.5	13.6	14.1	14.5	14.6	14.5	14.1	13.4	12.7			

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-11	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0059(DSK4R79FA120WS)	3000K	

Electrical Measurement:

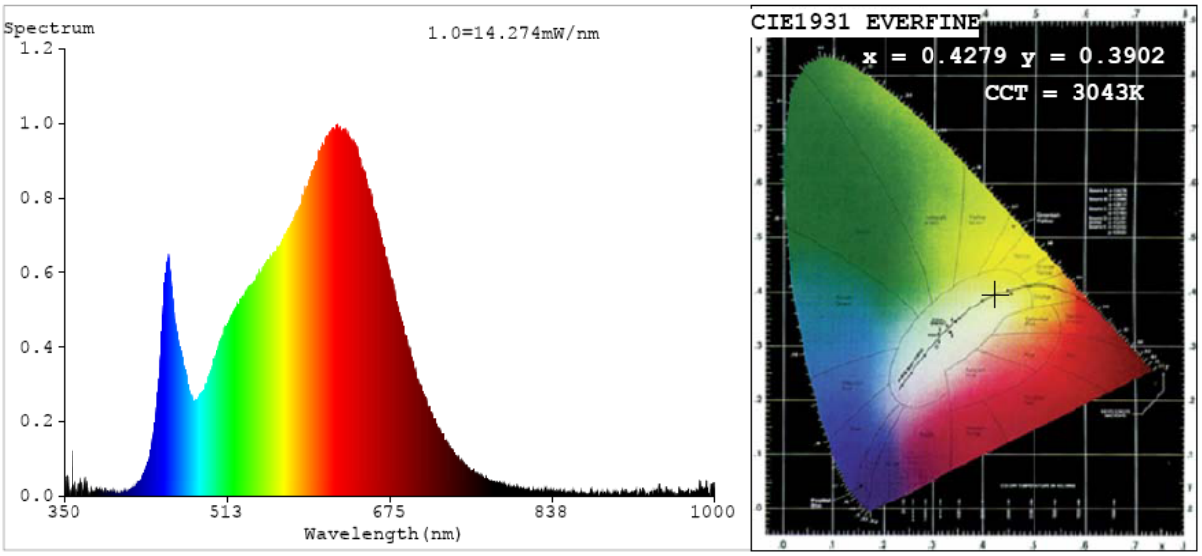
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009110002	120.0	60	0.056	6.54	0.976

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3043
Duv	0.0044
Chromaticity (x, y)	x=0.4279 y=0.3902
Chromaticity (u', v')	u'=0.2507 v'=0.5144
Color Rendering Index (CRI)	95.6
R9	75
Total Luminous (lm)	692.0
Luminous Efficacy (lm/W)	105.89

Special Color Rendering Indices			
R1	97	R9	73
R2	98	R10	98
R3	97	R11	96
R4	95	R12	82
R5	97	R13	99
R6	95	R14	99
R7	91	R15	95
R8	86	--	--

Spectral Power Distribution & Chromaticity Diagram



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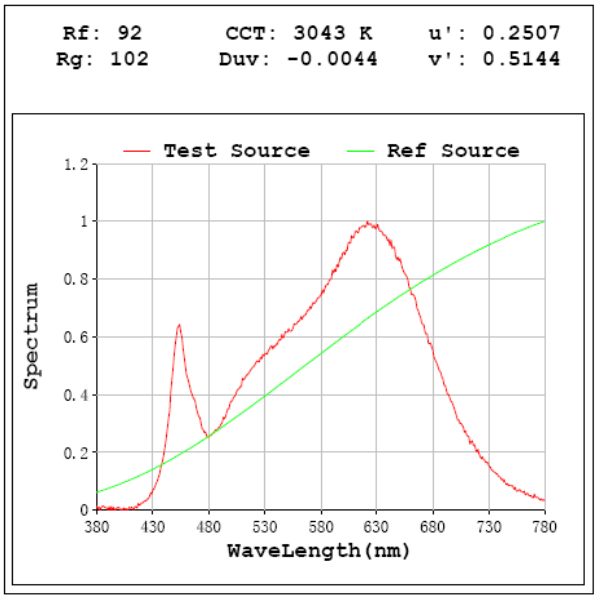
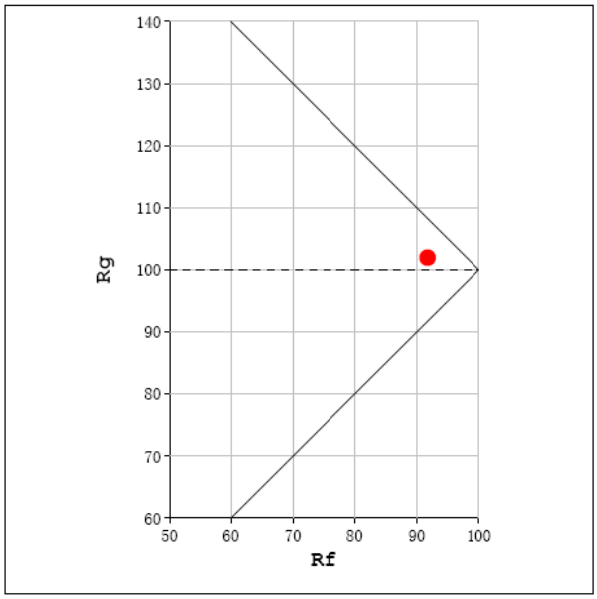
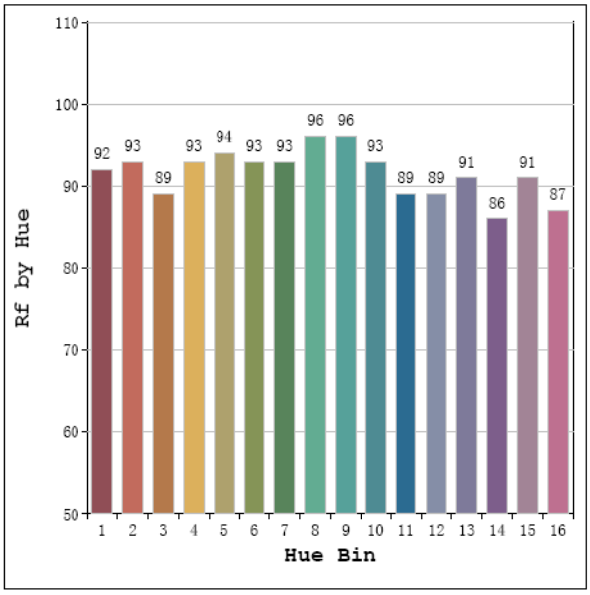

Rf: 92
CCT: 3043 K
u': 0.2507
Rg: 102
Duv: -0.0044
v': 0.5144
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
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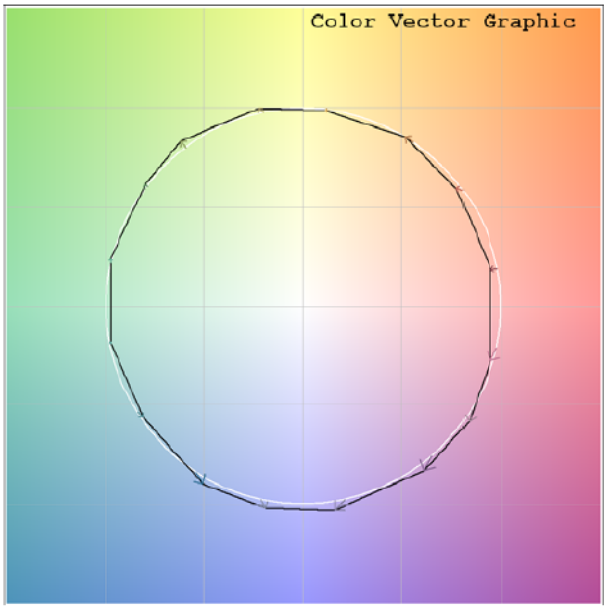
92 93 89 93 94 93 93 96 96 93 89 89 91 86 91 87


Color Vector Graphic

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-11	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0059(DSK4R79FA120WS)	4000K	

Electrical Measurement:

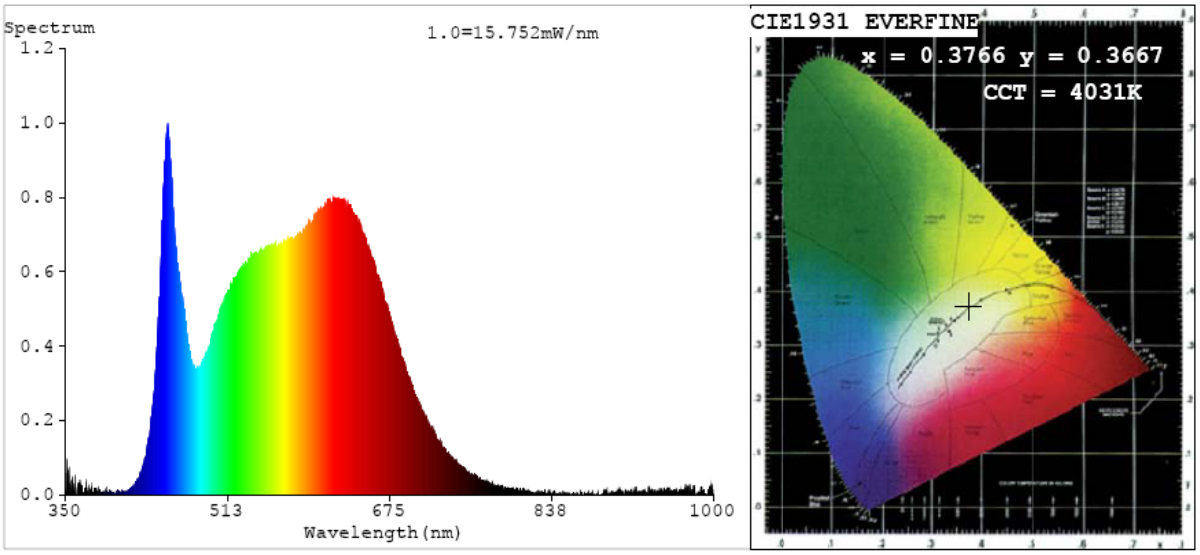
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009110002	120.0	60	0.055	6.46	0.975

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4031
Duv	0.0037
Chromaticity (x, y)	x=0.3766 y=0.3667
Chromaticity (u', v')	u'=0.2266 v'=0.4965
Color Rendering Index (CRI)	96.5
R9	88
Total Luminous (lm)	751.9
Luminous Efficacy (lm/W)	116.43

Special Color Rendering Indices			
R1	98	R9	88
R2	99	R10	95
R3	96	R11	96
R4	97	R12	75
R5	97	R13	99
R6	95	R14	97
R7	97	R15	98
R8	95	--	--

Spectral Power Distribution & Chromaticity Diagram



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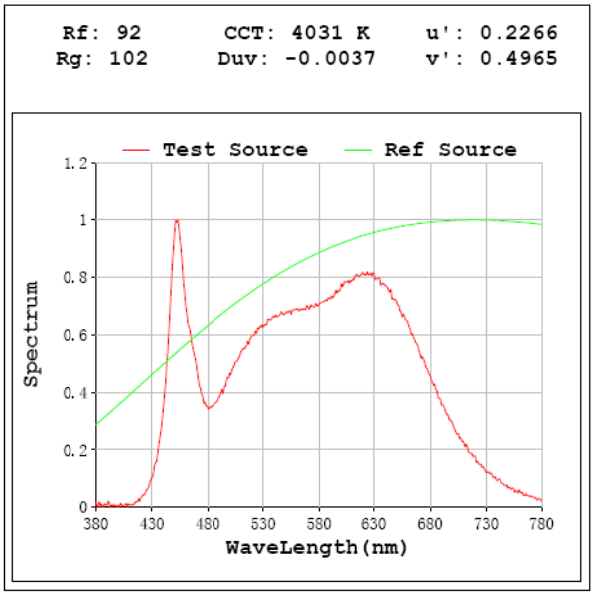
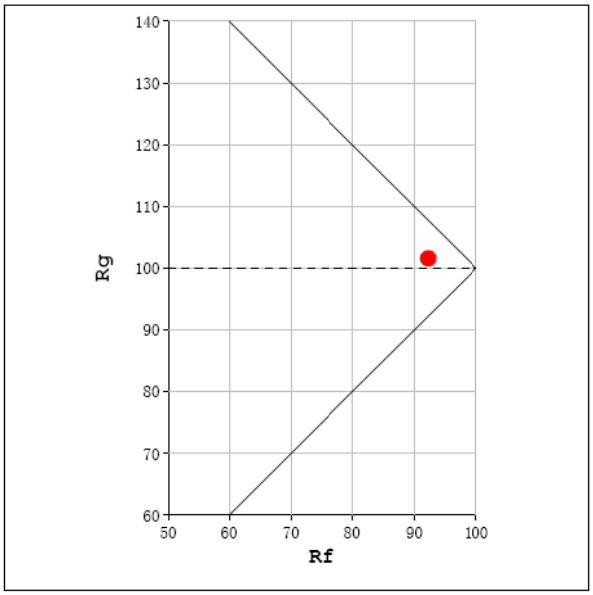
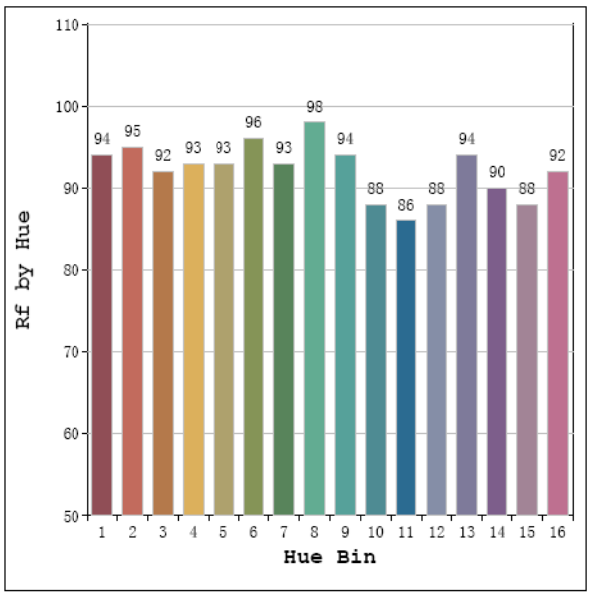
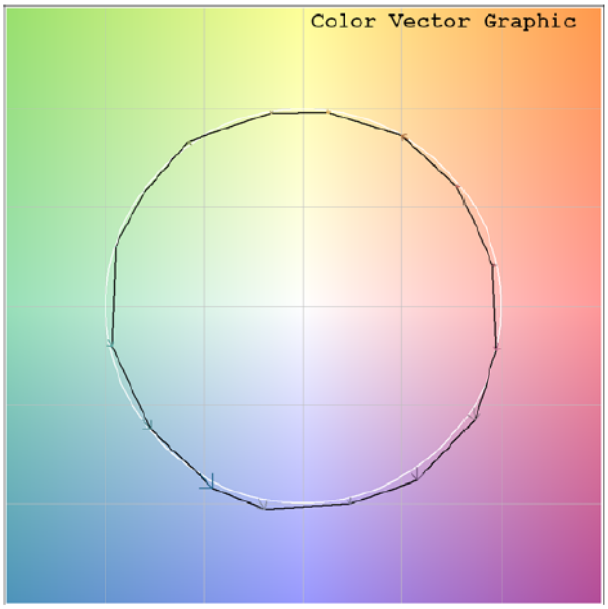

Rf: 92
CCT: 4031 K
u': 0.2266
Rg: 102
Duv: -0.0037
v': 0.4965
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
94 95 92 93 93 96 93 98 94 88 86 88 94 90 88 92


Color Vector Graphic

2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-11	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0059(DSK4R79FA120WS)	5000K	

Electrical Measurement:

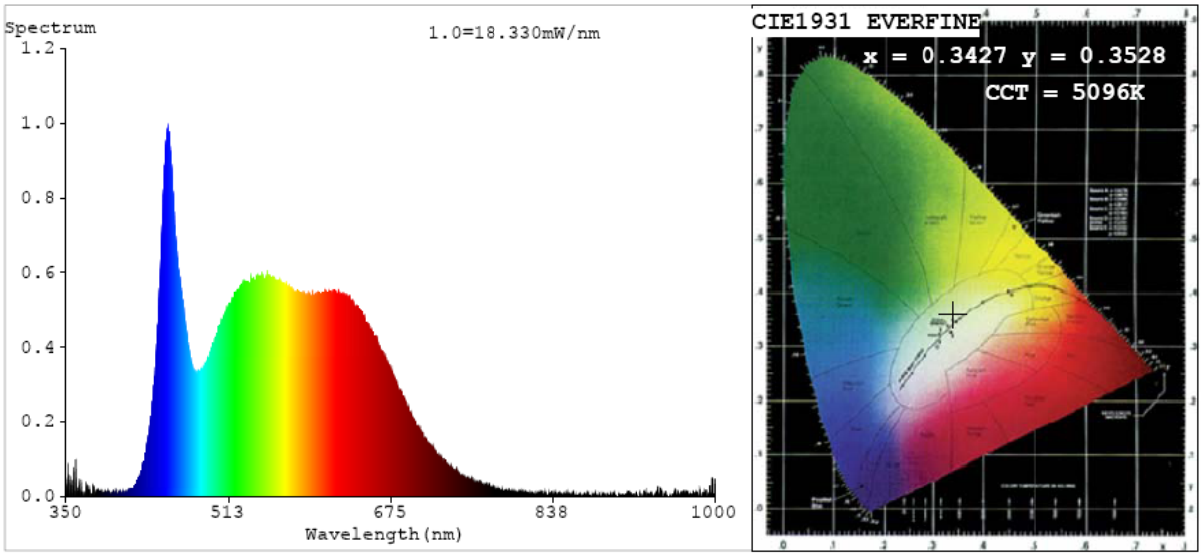
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009110002	120.0	60	0.056	6.61	0.977

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5096
Duv	0.0016
Chromaticity (x, y)	x=0.3427 y=0.3528
Chromaticity (u', v')	u'=0.2093 v'=0.4849
Color Rendering Index (CRI)	93.8
R9	78
Total Luminous (lm)	728.3
Luminous Efficacy (lm/W)	110.13

Special Color Rendering Indices			
R1	94	R9	78
R2	95	R10	86
R3	93	R11	94
R4	94	R12	72
R5	94	R13	95
R6	91	R14	96
R7	96	R15	94
R8	92	--	--

Spectral Power Distribution & Chromaticity Diagram



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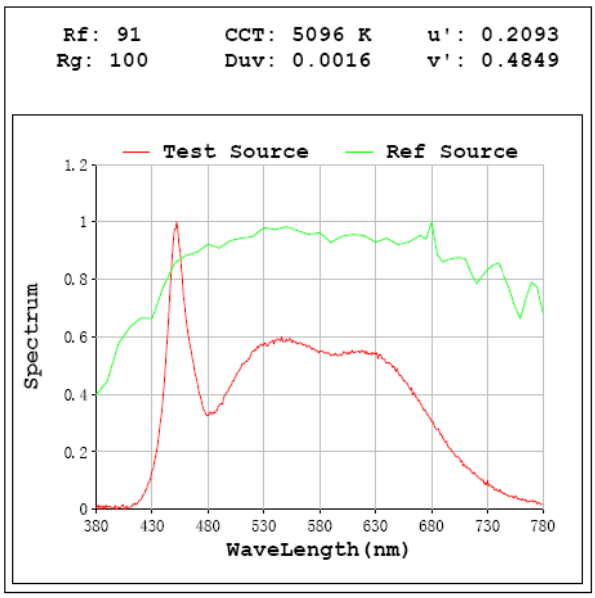
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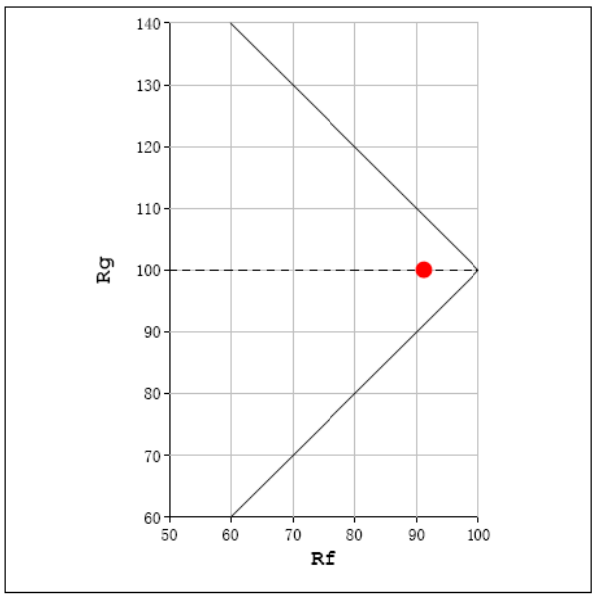
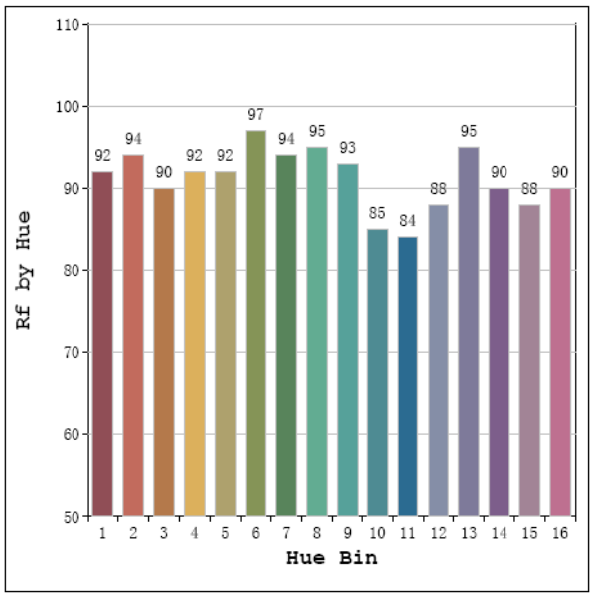
CCT: 5096 K
u': 0.2093
Rg: 100
Duv: 0.0016
v': 0.4849
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf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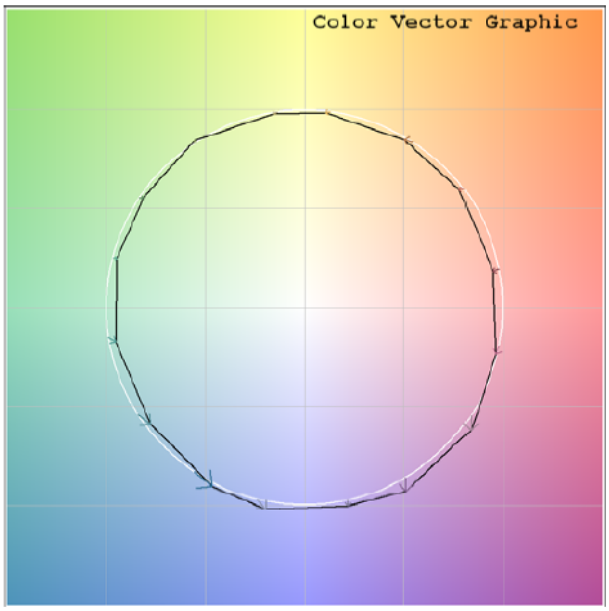
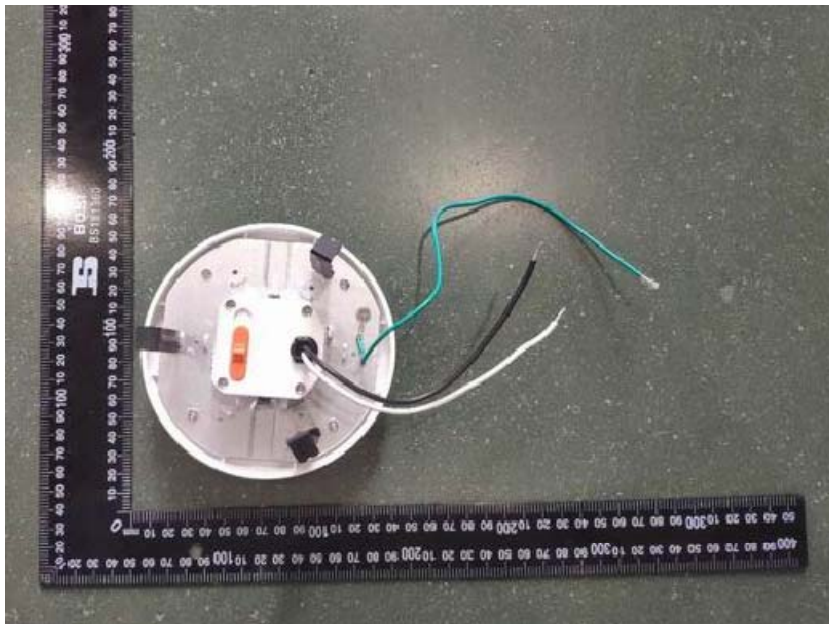

Color Vector Graphic

3. Product Photo



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