

Original Data

Relevant Standards

- IES LM-79-2019
- ANSI C82.77:2014

Prepared For

RAB lighting INC
408 W 14th St New York, NY 10014 United States

Prepared By

RAB lighting INC

Project Number

25111122

Data Number

2025/11/12

Test Date

2025/11/12

1.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2025/11/12	T10EM-36	A1
2	Goniophotometer Test	2025/11/12	T10EM-36	A1
3	THD and PF Test	2025/11/12	T10EM-36	A1

1.1 Test Summary

Requirement Category	Test Method	Requirements	Test value
Integrating Sphere system			
Power (W)	IES LM-79-2008	9 ±10%	11.64
Lamp Output for bare lamp (lm)	IES LM-79-2008	1150 ±10%	1507
Lamp Efficacy (lm/W)	IES LM-79-2008	> 115.0	124.28
Allowable CCTs* (K)	IES LM-79-2019	4 step	2725 ± 83
		7 step	2725 ± 145
		4 step	3045±100
		7 step	3045±175
		4 step	3465±124
		7 step	3465±245
		4 step	3985±154
		7 step	3985±275
		4 step	5029±220
		7 step	5029±283
		4 step	6532±340
		7 step	6532±510
CRI	IES LM-79-2019 CIE 13.3-1995	>80	82.60
R9	IES LM-79-2019 CIE 13.3-1995	>0	4.30
Rf	ANSI/IES TM-30-18	>70	83.00
Rg	ANSI/IES TM-30-18	>89	95.00
Rcs,h1	ANSI/IES TM-30-18	Rcs=>-12%,h1<=23%	-12.00%
Power Factor	ANSI C82.77:2014	>0.9	0.93
Total Harmonic Distortion (A%)	ANSI C82.77:2014	<25%	19.69%
Goniophotometer system			
Lamp Output (lm)	IES LM-79-2019	1150 ±10%	1652.0
Luminaire Efficacy(lm/W)	IES LM-79-2019	> 115.0	137.7
Beam Angle	IES LM-79-2019		137.0

2.0 Production Description

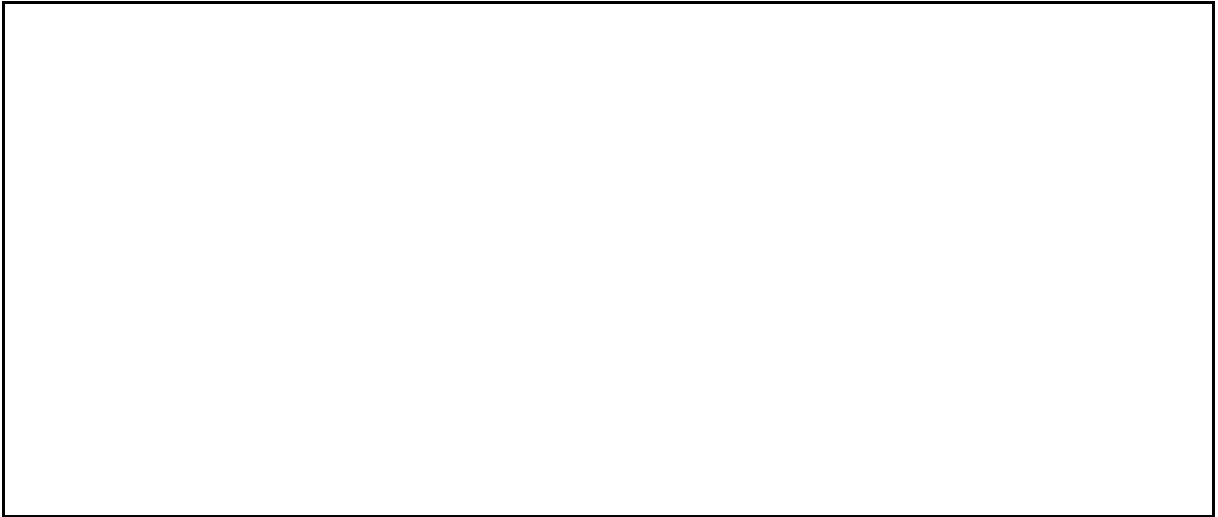
Luminaire Description: T10EM-36

Electrical Specification: 120V~277V,50/60HZ

Light source:

Manufacturer Of Light Source: Seoul Semiconductor Co.,LTD

Photos of Luminaire Characteristics



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time (Min.)	15
Temperature (°C)	25.3	Humidity %	55

Test Method
<p>The samples were tested according to the IES LM-79-2008.</p> <p>Photometric 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.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.</p>

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux (lm)	Efficacy (lm/W)
25.3	120.00	60.00	0.101	11.930	0.9818	1507.0	126.3
25.3	277.02	60.00	0.047	12.230	0.9374	1520.0	124.3

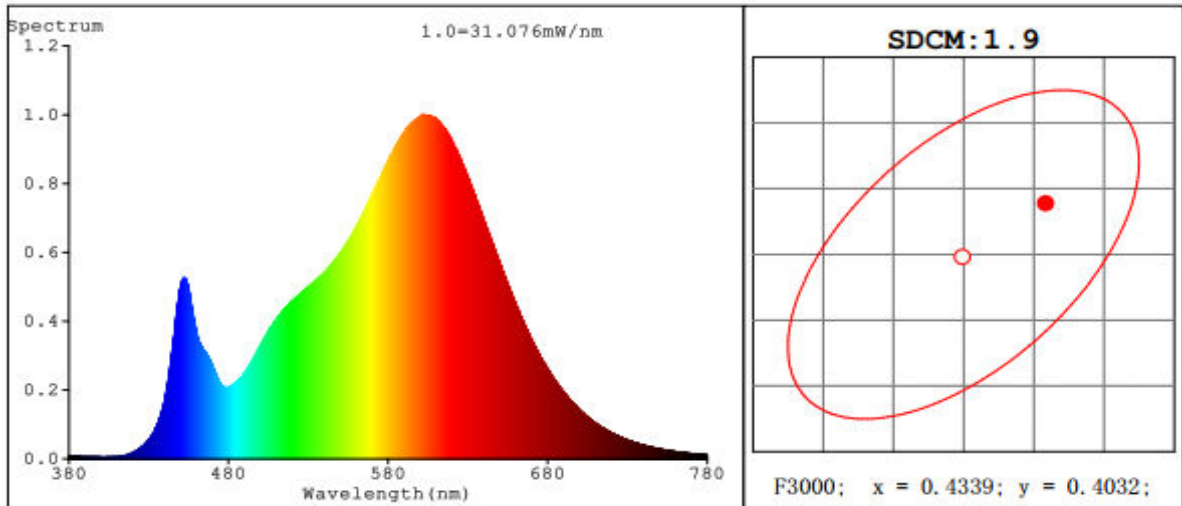
Test Result

Tc(K)	色差(Duv)	Rf	Rg	Ra	R9	SDCM
3004	7.0E-04	84	95	82.6	5.6	1.9
3004	7.0E-04	84	95	82.7	5.7	1.9

3.1 Integrating Sphere Test

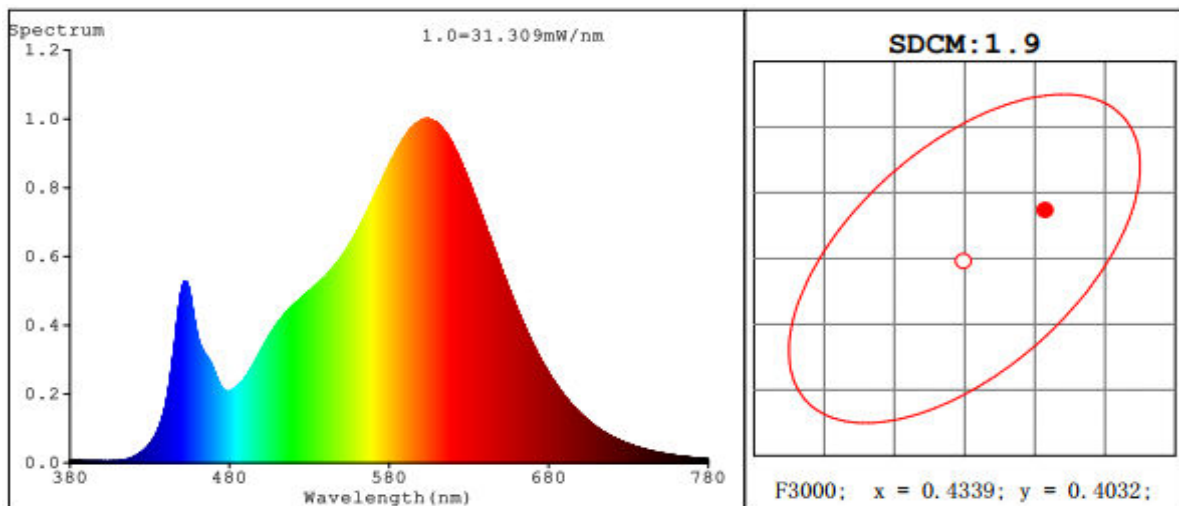
Spectroradiometric Parameters

120V



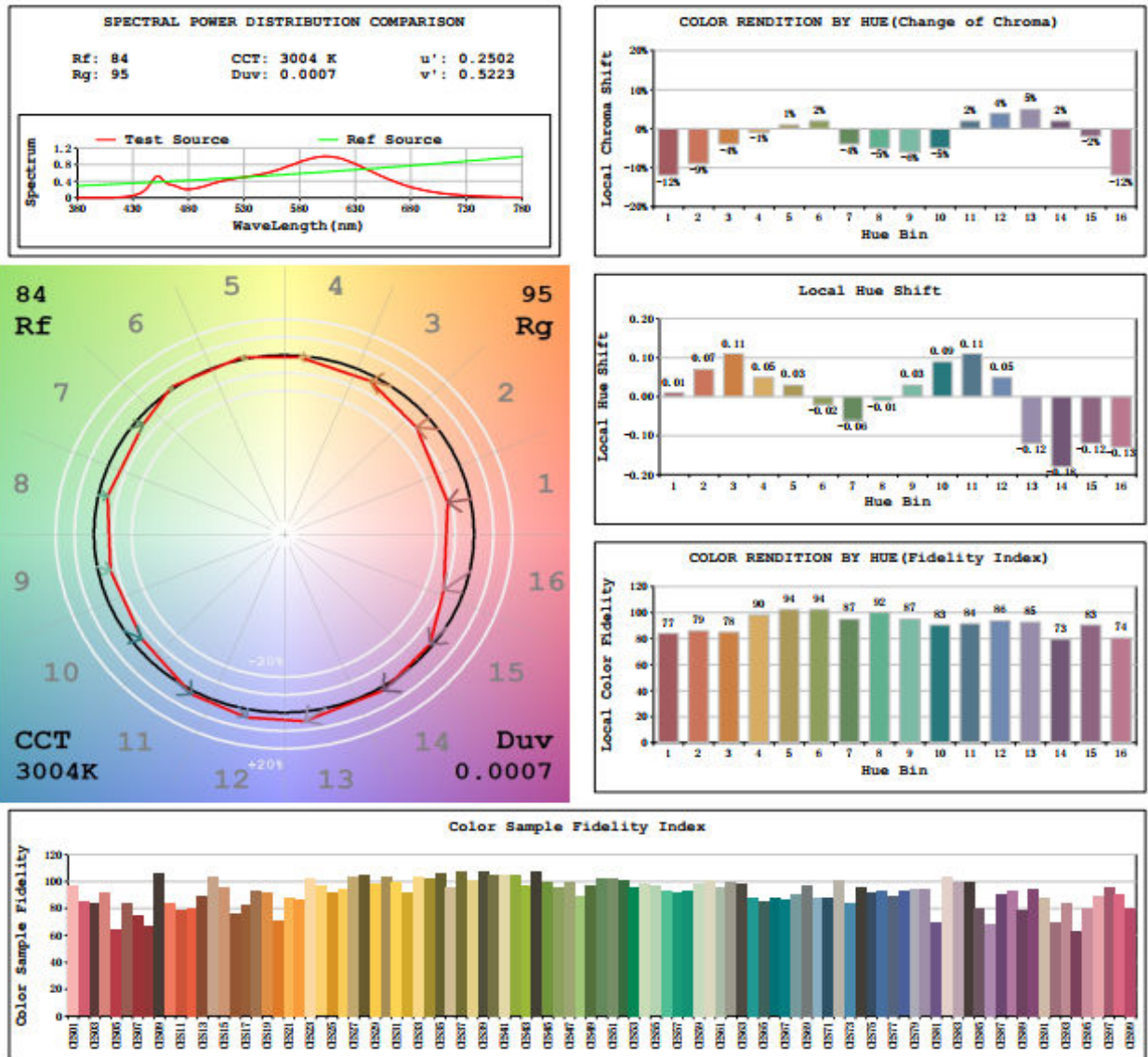
R1 =81.2 R2 =91.7 R3 =95.7 R4 =80.4 R5 =81.6 R6 =90.4 R7 =82.2
 R8 =58.0 R9 =5.6 R10=81.3 R11=80.0 R12=71.7 R13=83.7 R14=98.3 R15=73.1

277V



R1 =81.2 R2 =91.8 R3 =95.6 R4 =80.4 R5 =81.6 R6 =90.5 R7 =82.2
 R8 =58.1 R9 =5.7 R10=81.4 R11=80.0 R12=71.7 R13=83.8 R14=98.3 R15=73.2

3.2 Integrating Sphere Test - Minimum CCT



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time (Min.)	15
Temperature (°C)	25.3	Humidity %	55

Test Method
<p>The samples were tested according to the IES LM-79-2008.</p> <p>Photometric 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.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.</p>

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux (lm)	Efficacy (lm/W)
25.3	120.00	60.00	0.100	11.800	0.9823	1552.0	131.5
25.3	277.02	60.00	0.047	12.120	0.9363	1569.0	129.5

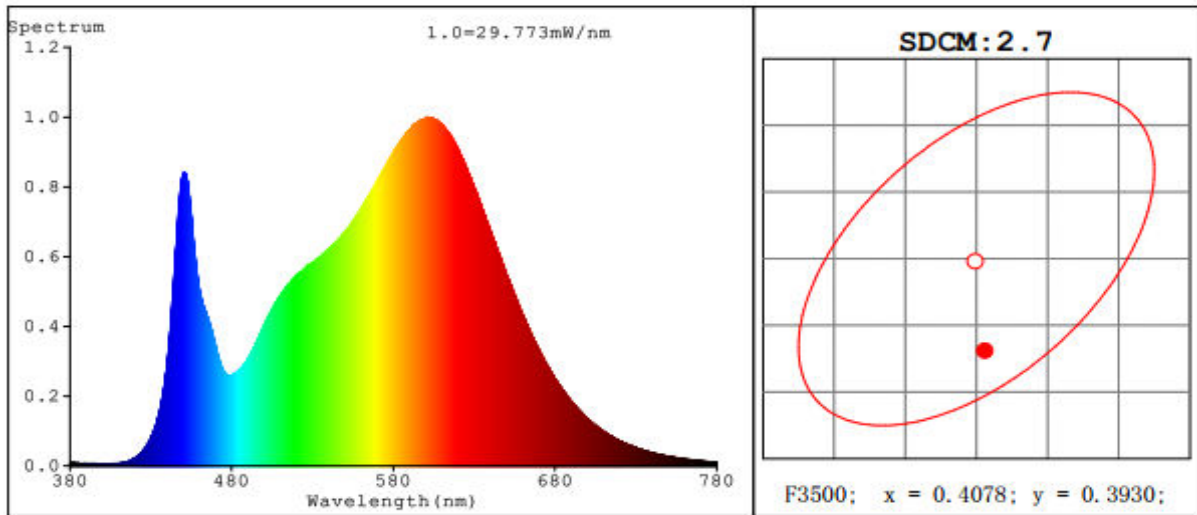
Test Result

Tc(K)	色差(Duv)	Rf	Rg	Ra	R9	SDCM
3415	-1.7E-03	85	96	84.6	13.6	2.7
3416	-1.7E-03	85	96	84.6	13.7	2.7

3.1 Integrating Sphere Test

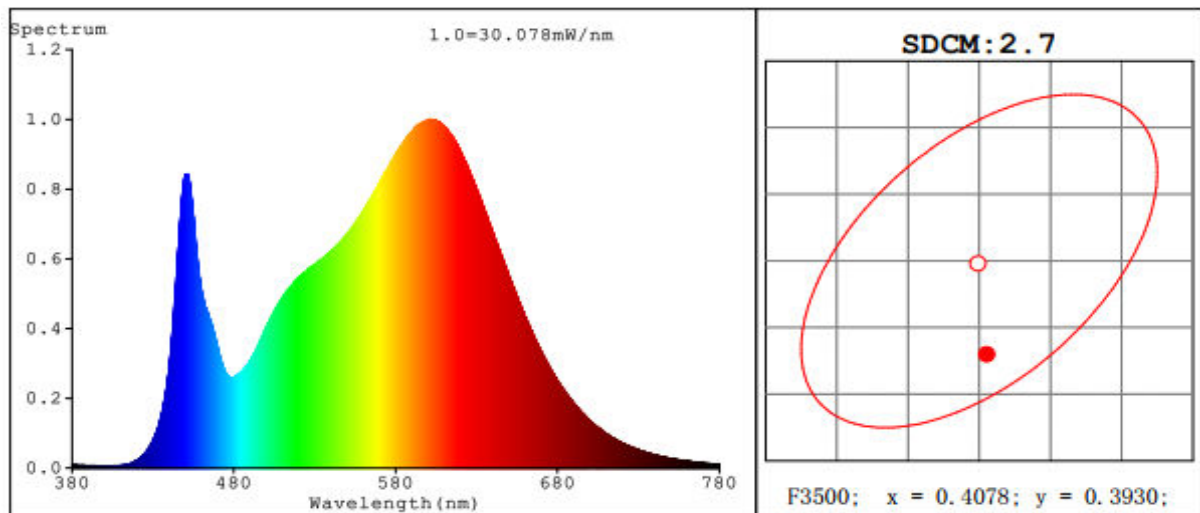
Spectroradiometric Parameters

120V



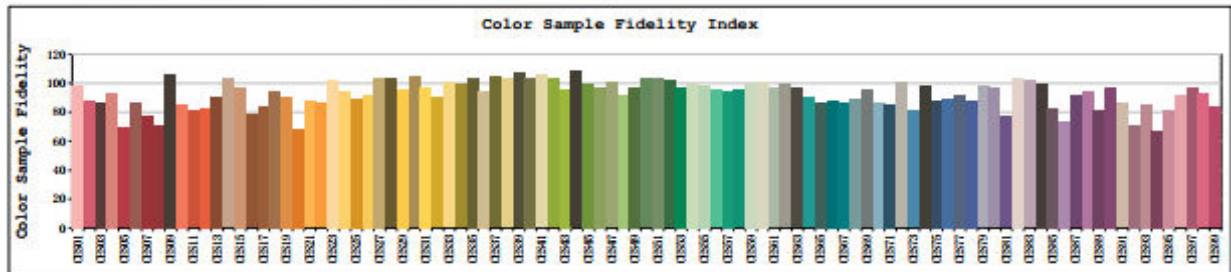
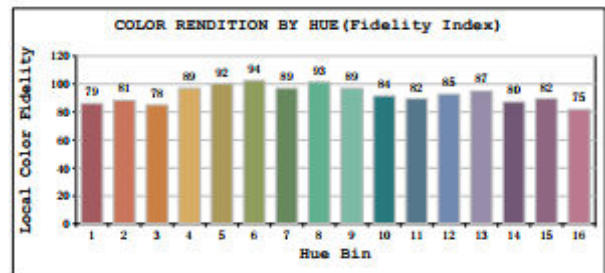
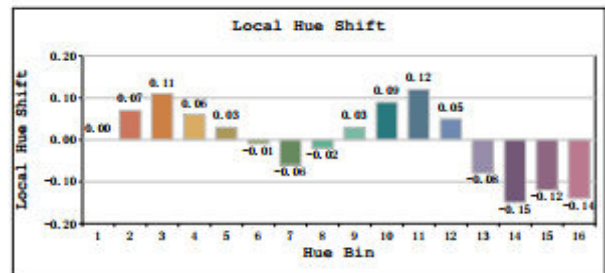
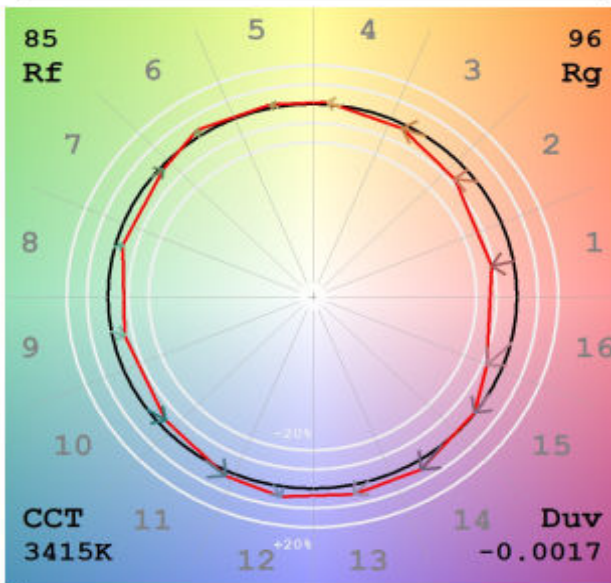
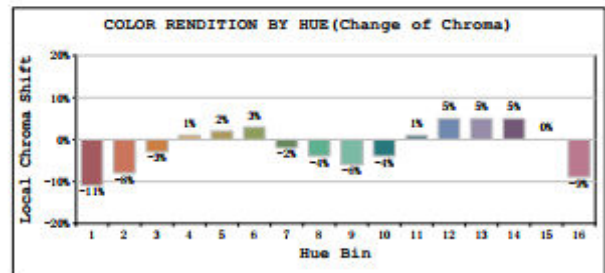
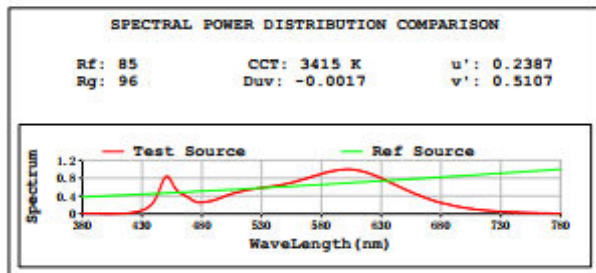
R1 =83.7 R2 =92.6 R3 =96.1 R4 =82.9 R5 =84.1 R6 =90.1 R7 =84.1
R8 =63.2 R9 =13.6 R10=82.5 R11=82.8 R12=70.7 R13=86.2 R14=98.6 R15=77.0

277V



R1 =83.7 R2 =92.6 R3 =96.1 R4 =83.0 R5 =84.1 R6 =90.2 R7 =84.0
R8 =63.2 R9 =13.7 R10=82.5 R11=82.9 R12=70.7 R13=86.1 R14=98.6 R15=77.0

3.2 Integrating Sphere Test - Minimum CCT



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time (Min.)	15
Temperature (°C)	25.3	Humidity %	55

Test Method
<p>The samples were tested according to the IES LM-79-2008.</p> <p>Photometric 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.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.</p>

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux (lm)	Efficacy (lm/W)
25.3	120.00	60.00	0.098	11.640	0.9830	1590.0	136.6
25.3	277.02	60.00	0.046	11.970	0.9347	1608.0	134.3

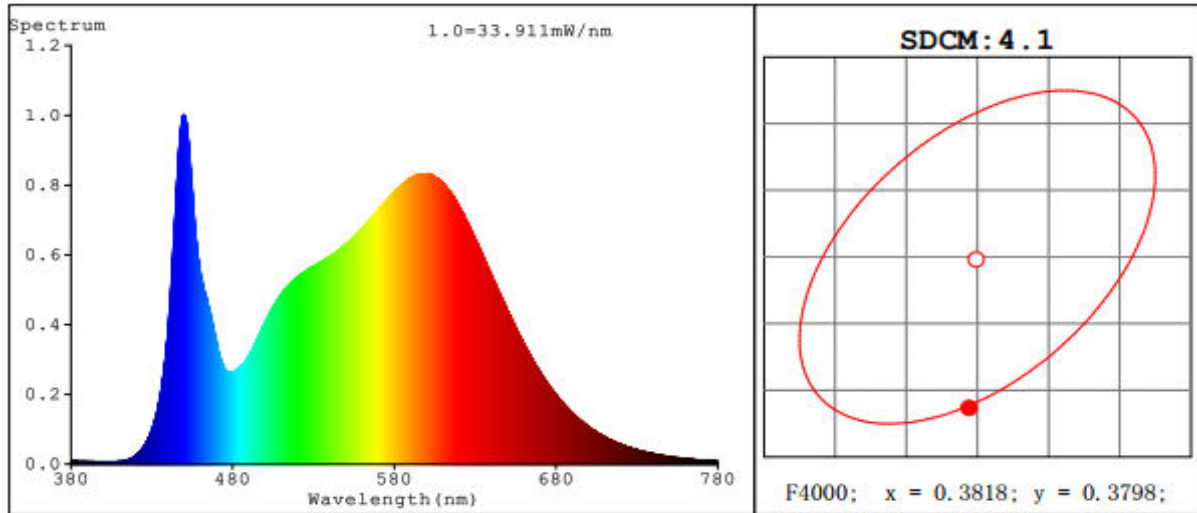
Test Result

Tc(K)	色差(Duv)	Rf	Rg	Ra	R9	SDCM
3936	-2.5E-03	85	97	85.7	18.6	4.1
3938	-2.5E-03	85	97	85.7	18.8	4.1

3.1 Integrating Sphere Test

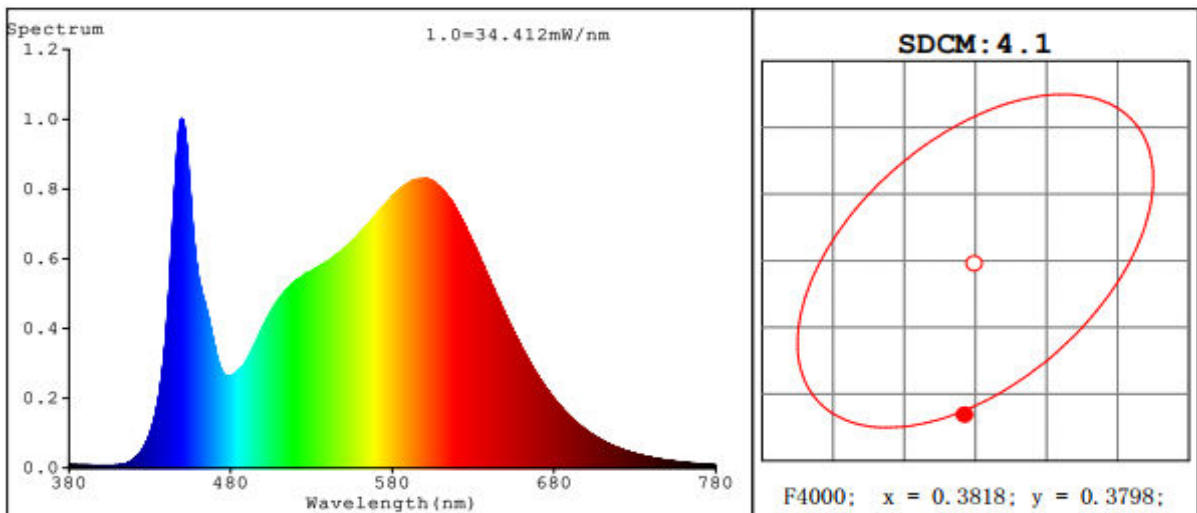
Spectroradiometric Parameters

120V



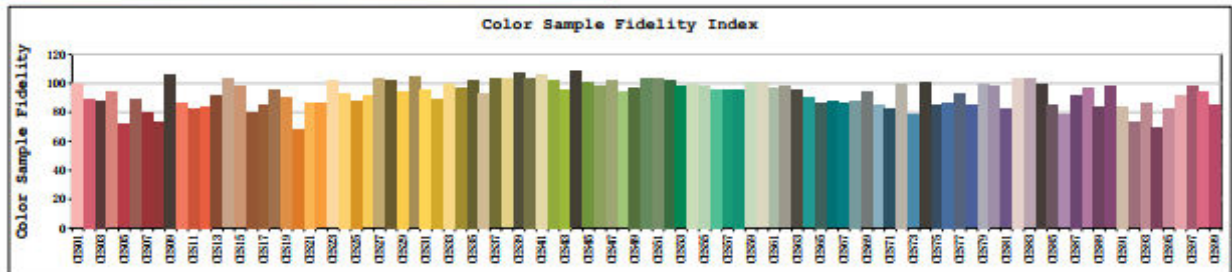
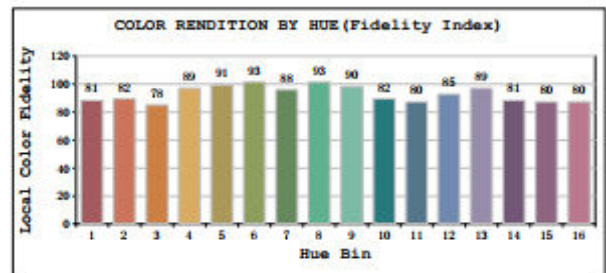
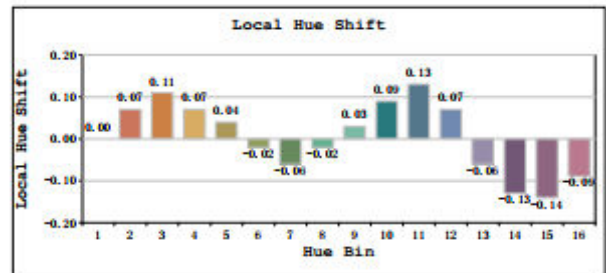
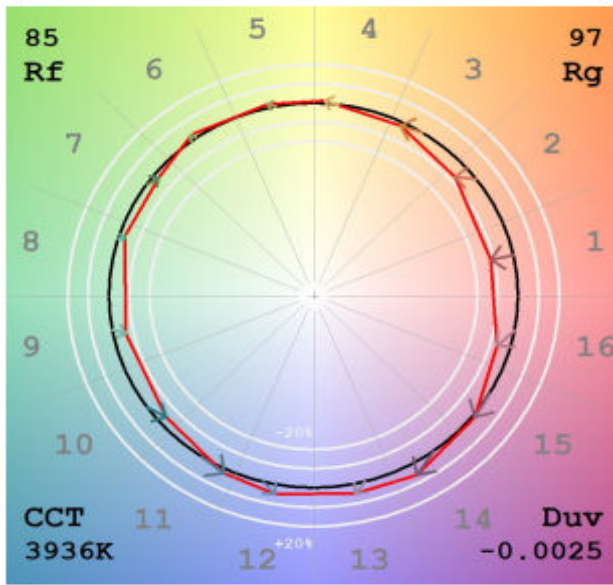
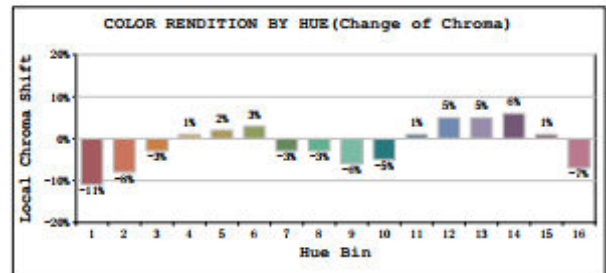
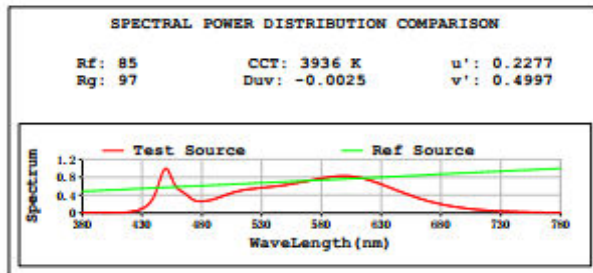
R1 =85.0 R2 =92.3 R3 =96.0 R4 =84.7 R5 =85.2 R6 =88.7 R7 =86.1
 R8 =67.4 R9 =18.6 R10=81.2 R11=84.6 R12=67.7 R13=87.1 R14=98.3 R15=79.4

277V



R1 =85.0 R2 =92.3 R3 =96.0 R4 =84.7 R5 =85.3 R6 =88.7 R7 =86.1
 R8 =67.4 R9 =18.8 R10=81.3 R11=84.6 R12=67.7 R13=87.1 R14=98.3 R15=79.4

3.2 Integrating Sphere Test - Minimum CCT



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time (Min.)	15
Temperature (°C)	25.3	Humidity %	55

Test Method
<p>The samples were tested according to the IES LM-79-2008.</p> <p>Photometric 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.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.</p>

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux (lm)	Efficacy (lm/W)
25.3	120.00	60.00	0.099	11.700	0.9827	1611.0	137.7
25.3	277.02	60.00	0.046	12.030	0.9353	1628.0	135.3

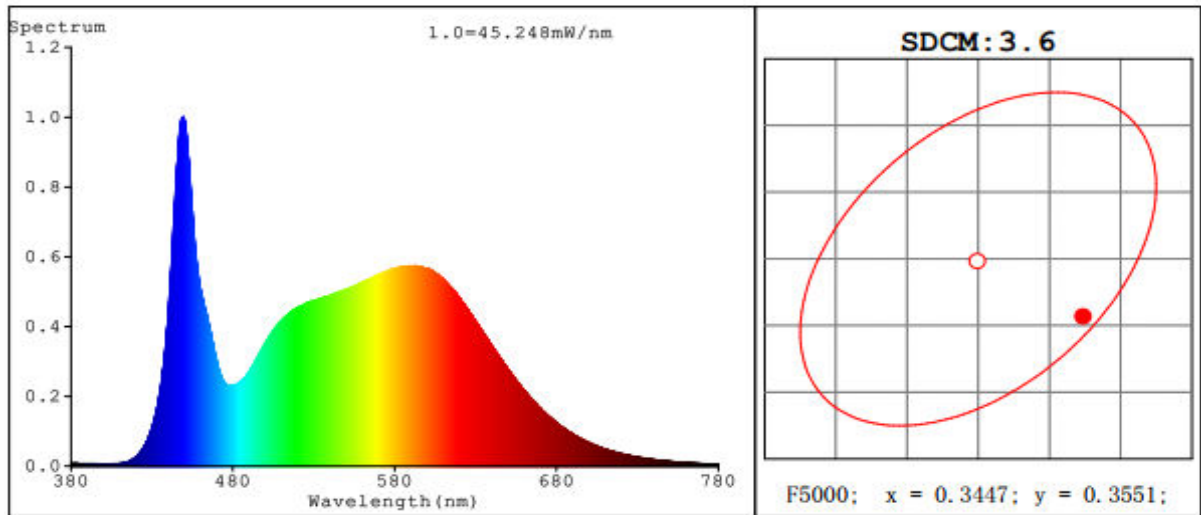
Test Result

Tc(K)	色差(Duv)	Rf	Rg	Ra	R9	SDCM
4860	-1.1E-03	84	97	85.3	18.0	3.6
4858	-1.1E-03	84	97	85.3	18.1	3.6

3.1 Integrating Sphere Test

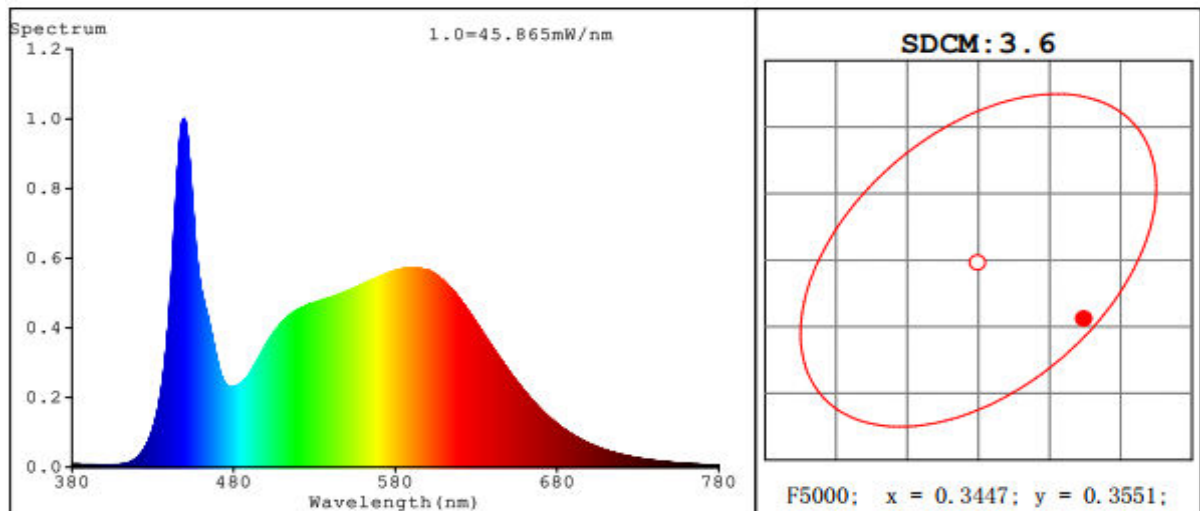
Spectroradiometric Parameters

120V



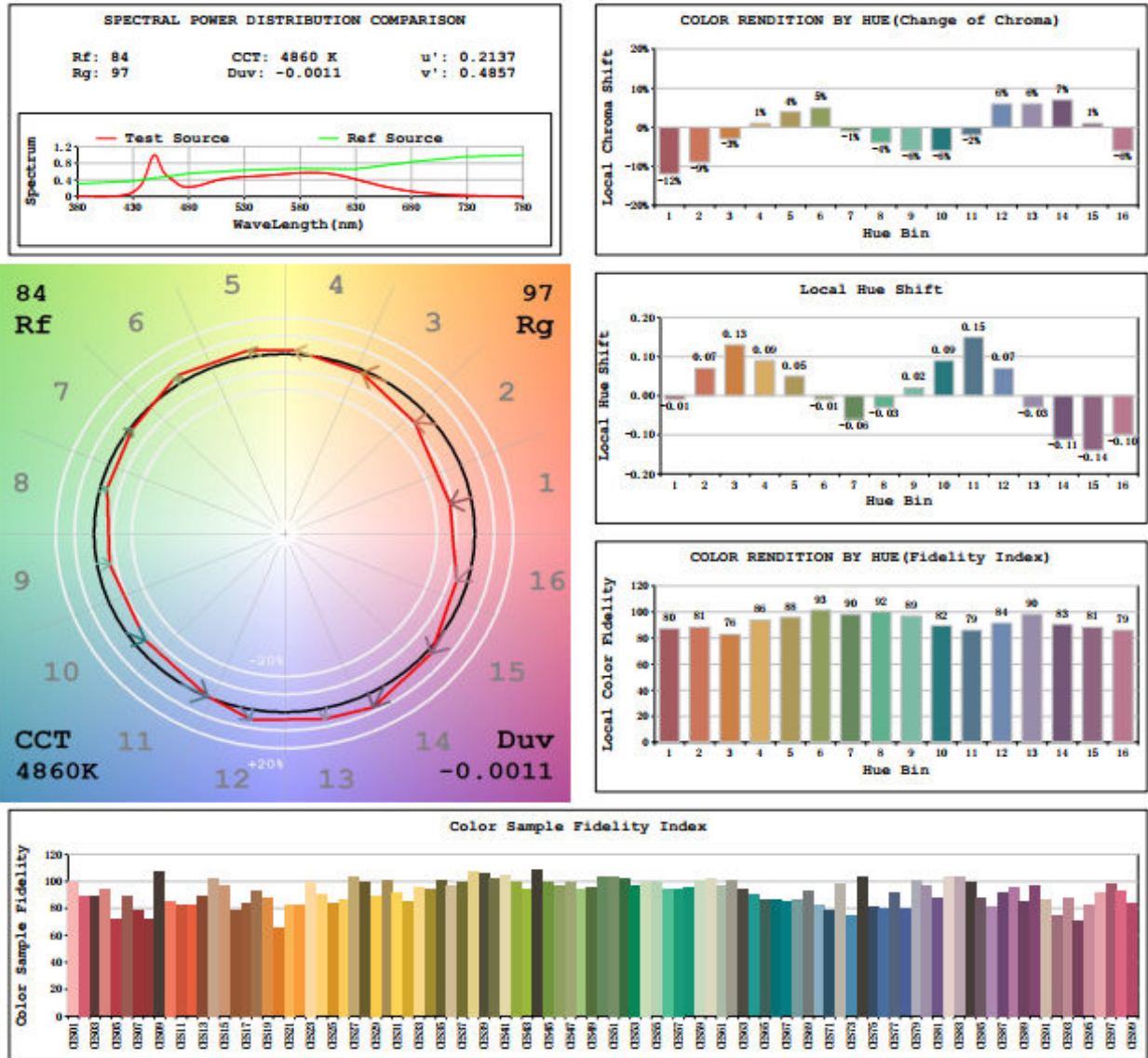
R1 =84.3 R2 =90.5 R3 =93.9 R4 =85.1 R5 =84.5 R6 =85.6 R7 =88.0
 R8 =70.3 R9 =18.0 R10=76.6 R11=84.7 R12=61.8 R13=86.2 R14=96.9 R15=79.5

277V



R1 =84.4 R2 =90.5 R3 =94.0 R4 =85.1 R5 =84.5 R6 =85.6 R7 =88.0
 R8 =70.3 R9 =18.1 R10=76.8 R11=84.7 R12=61.8 R13=86.2 R14=96.9 R15=79.5

3.2 Integrating Sphere Test - Minimum CCT



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time (Min.)	15
Temperature (°C)	25.3	Humidity %	55

Test Method
<p>The samples were tested according to the IES LM-79-2008.</p> <p>Photometric 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.</p> <p>The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.</p> <p>The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.</p> <p>The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.</p>

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux (lm)	Efficacy (lm/W)
25.3	120.00	60.00	0.101	11.920	0.9817	1578.0	132.4
25.3	277.02	60.00	0.047	12.260	0.9377	1595.0	130.1

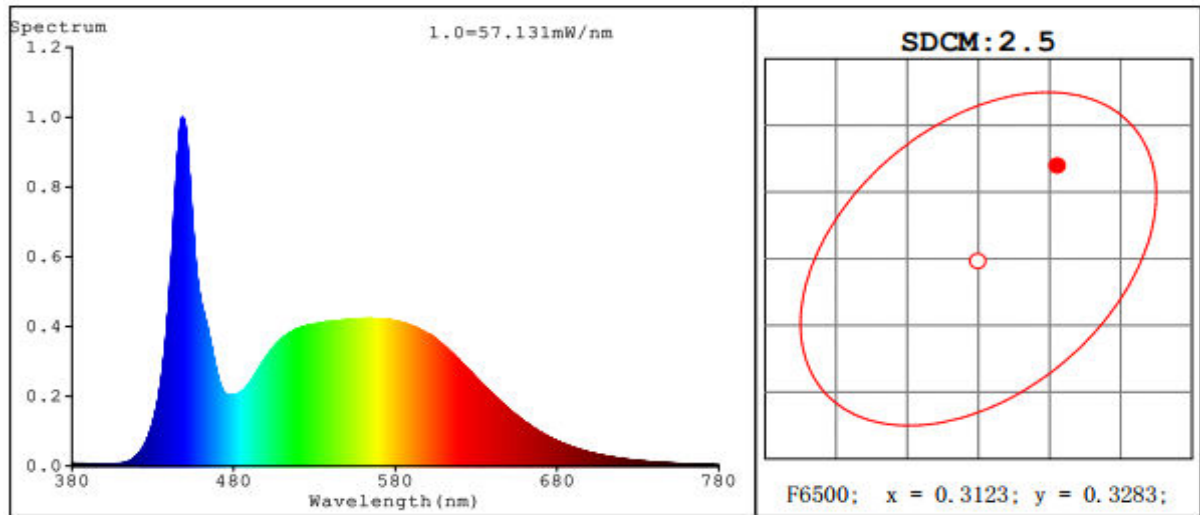
Test Result

Tc(K)	色差(Duv)	Rf	Rg	Ra	R9	SDCM
6344	3.7E-03	83	95	82.7	4.3	2.5
6347	3.7E-03	83	95	82.7	4.4	2.4

3.1 Integrating Sphere Test

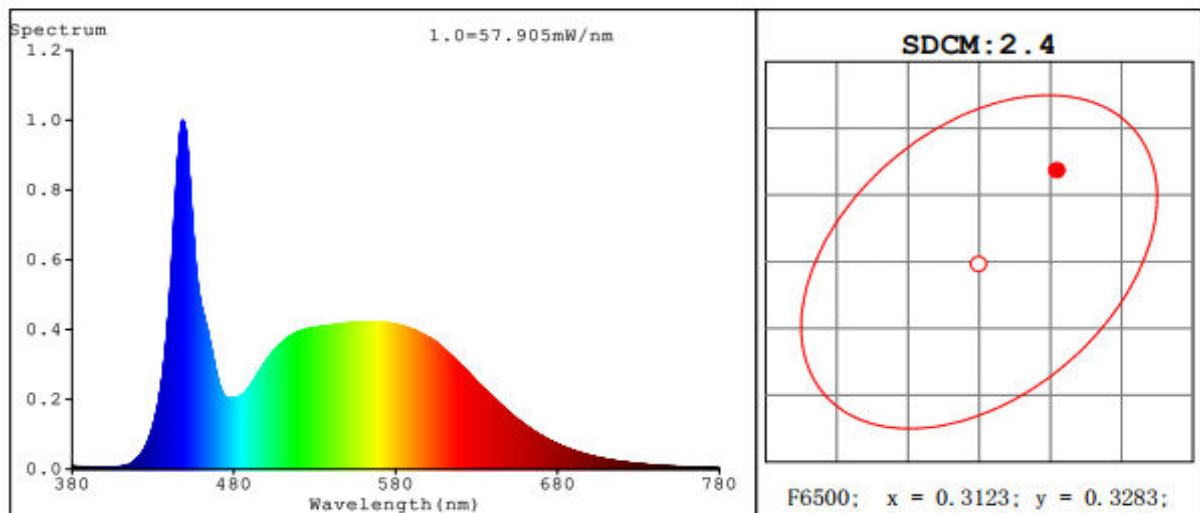
Spectroradiometric Parameters

120V



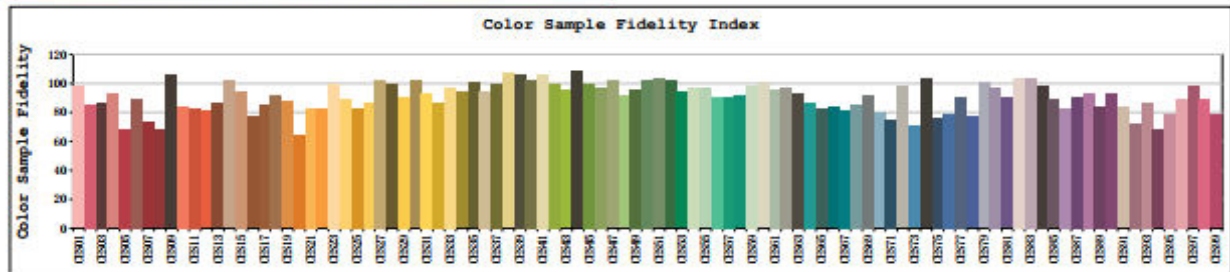
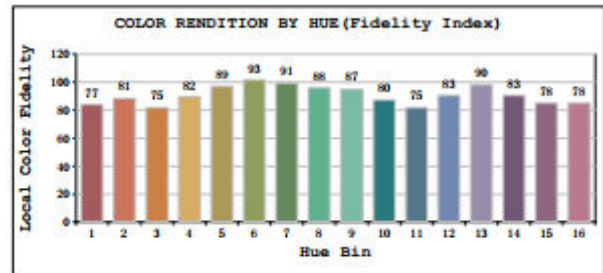
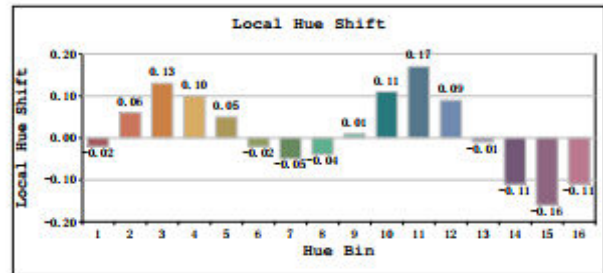
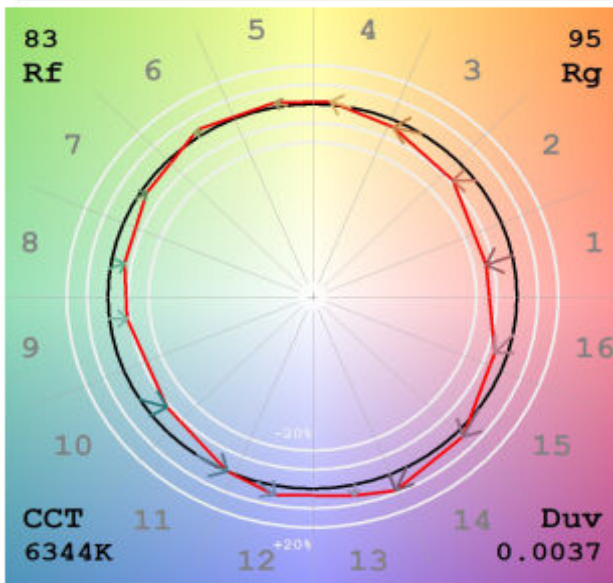
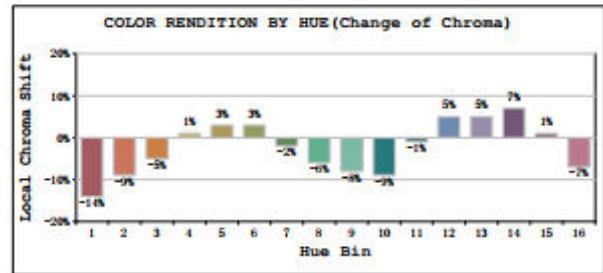
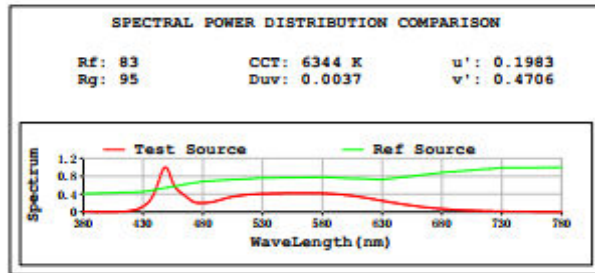
R1 =80.7 R2 =86.4 R3 =90.1 R4 =83.5 R5 =82.2 R6 =81.5 R7 =87.7
 R8 =69.3 R9 =4.3 R10=67.8 R11=83.2 R12=59.3 R13=82.2 R14=94.8 R15=75.7

277V



R1 =80.8 R2 =86.5 R3 =90.2 R4 =83.5 R5 =82.2 R6 =81.6 R7 =87.7
 R8 =69.3 R9 =4.4 R10=67.9 R11=83.2 R12=59.2 R13=82.2 R14=94.9 R15=75.7

3.2 Integrating Sphere Test - Minimum CCT



3.3 Goniophotometer Test

Model No.	T10EM-36	Sample ID.	A1
Operate time (Min.)	15	Stabilization time	15

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5o vertical intervals and 10o horizontal intervals.

Test Conditions

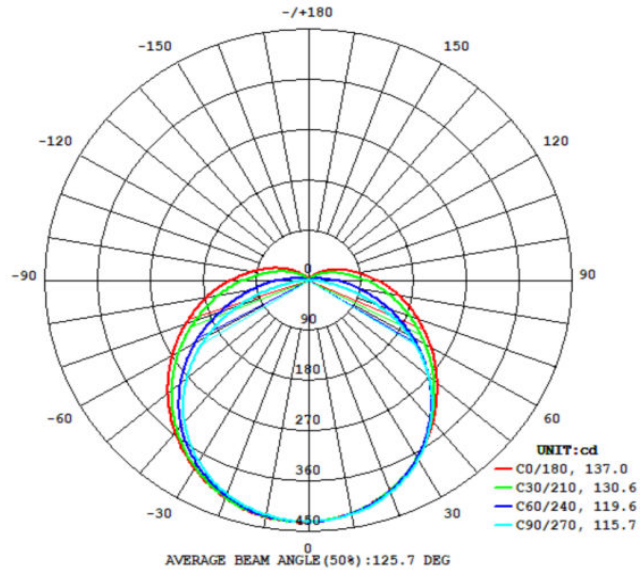
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Flux(lm)
25.3	120.00	60.00	0.102	12.0	0.979	1652.0

Test Result

Beam Angle	Zonal Lumen Requirement(0° - 60°)	Efficacy (lm/W)
137	62.7%	137.7

3.3 Goniophotometer Test

Light Distribution Curve



Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	423.5	423.3	425.0	428.0	430.8	428.9	426.4	423.8
20	401.2	401.7	405.0	411.7	415.4	413.2	407.7	403.2
30	369.9	368.2	372.2	383.1	389.5	384.6	375.5	370.9
40	330.8	325.2	326.0	342.8	355.3	345.6	330.4	327.9
50	287.6	274.0	268.7	295.5	314.5	296.5	272.3	278.7
60	242.6	219.3	198.8	242.7	269.3	242.1	202.3	224.8
70	198.3	165.1	120.4	188.8	223.3	185.7	122.0	172.6
80	156.6	116.7	42.25	137.7	178.0	132.6	42.45	124.3
90	118.9	77.18	0.2325	93.69	135.4	88.18	0.3748	84.87
100	86.28	48.12	0.1328	60.03	98.35	54.68	0.1276	54.57
110	59.42	28.68	0.1946	36.05	67.24	31.94	0.1967	33.44
120	38.36	16.57	0.2479	20.72	42.79	17.95	0.2652	19.64
130	22.85	9.360	0.3030	11.39	25.03	9.856	0.3516	11.21
140	12.53	5.151	0.3494	6.025	13.41	5.343	0.4520	6.166
150	6.109	2.681	0.3892	3.007	6.371	2.916	0.5043	3.076
160	2.522	1.289	0.4305	1.398	2.676	1.677	0.5738	1.316
170	0.8070	0.5554	0.4125	0.6173	0.9404	0.8116	0.5279	0.6050
180	0.4355	0.4455	0.4542	0.4446	0.4368	0.4477	0.4570	0.4506
DEG	LUMINOUS INTENSITY:cd							

5.0 THD and PF Test

Model No.	T10EM-36	Sample ID.	A1
Temperature (°C)	25.3	Humidity %	49

Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at 25° C ± 1° C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.3	120.00	60.00	0.101	11.9	0.982	19.69%
25.3	277.02	60.00	0.047	12.2	0.937	18.73%