



Report No.: RHL22081501-9

# LM-79-08 Test Report

For

LED ONE Corporation

## Internal Driver/Line Voltage (UL Type A+B) Lamps

12437 Bellegrave Ave Eastvale CA 91752 United States

Model name(s): LOC-T82FTU-15WMCCT(35-40-50)D AB

Remark: The color temperature can be adjusted to 3500K, 4000K, 5000K.

Test & Report By:

*Sun Liang*

Engineer: Sun Liang

Date: Sep,05,2022

Review By:

*Harry Wei*

Manager: Harry Wei

Note: 1. All the test results related only to the samples tested.

2. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the U. S. Government.

3. This report contains data that are not covered by the NVLAP accreditation.

**Laboratory: Hopestar Test Lab Limited, NVLAP Code: 600245-0**  
**Add: Room 212, 24 Building, 7 Qingyi Road, Hi-Tech Zone, Ningbo, China**  
**www.hopestartest.com**

Report Format Number HL-Report-EEL-001

**1.1 Product Information:**

Organization Name	LED ONE Corporation	
Brand Name	LEDONE	
Model Number	LOC-T82FTU-15WMCCT(35/40/50)D AB	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Internal Driver/Line Voltage (UL Type A+B) Lamps	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	15W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K, 5000K(Color tunable)	
Test Ballast	OSRAM SYLVANIA QTP 3X32T8/UNV ISN-SC	
LED Manufacturer	Seoul Semiconductor Co., Ltd.	
LED Model	STW8A12D-D2-VN	
Sample Number	RHL22081501-902	
Lamp Length	600	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**





**1.2 Test Specifications:**

Date of Receipt	Aug. 15, 2022
Date of Test	Aug. 15, 2022
Test item	<ol style="list-style-type: none"><li>1. Total Luminous Flux</li><li>2. Luminous Distribution Intensity</li><li>3. Luminous Efficacy</li><li>4. Correlated Color Temperature</li><li>5. Color Rendering Index</li><li>6. Chromaticity Coordinate</li><li>7. Electrical Parameters</li></ol>
Reference Standard	<ol style="list-style-type: none"><li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products and IES-LM-79-2019 OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS</li><li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li><li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li><li>4. CIE 15-2004 Technical Report Colorimetry</li><li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li><li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li></ol>
Reference Work Instruction	HL-WI-EE-001, HL-WI-EE-002



### 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals.

**The reference standard lamp D204 is rated 4.0241A,21.62V, The Series No.**

**M133806CA8391160 omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.**

#### 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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 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.

**The reference standard lamp D204 is rated 4.0241A,21.62V, The Series No. M133806CA8391160 omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.**

#### 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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.



**2.1 Electrical, Photometric and Chromaticity Measurements**  
(Refer to Work Instruction HL-WI-EE-001, HL-WI-EE-002)

<b>Test date</b>	2022-08-15	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	Horizontal	<b>Total operation burning time(min):</b>	90
<b>Model Number</b>	LOC-T82FTU-15WMCCT(35/40/50)D AB (switch on 3500K) Connected to line voltage	<b>Stabilization Time(min):</b>	60

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
RHL2208	120.0	60	0.1248	14.72	0.9824	10.74
1501-902	277.0	60	0.0620	15.00	0.8738	23.81

**Chromaticity Measurement - Sphere-Spectroradiometer Method**  
(Self-absorption:1.0253) (4 $\pi$  geometry):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	11
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	3468	R3	96	R11	79
Duv	0.0005	R4	81	R12	65
Chromaticity (x, y)	x = 0.4076 y = 0.3930	R5	81	R13	83
Chromaticity (u', v')	u' = 0.2363 v' = 0.5125	R6	86	R14	98
Color Rendering Index (CRI)	83.0	R7	85	R15	75
R9	11	R8	63	--	--
Rf	85	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

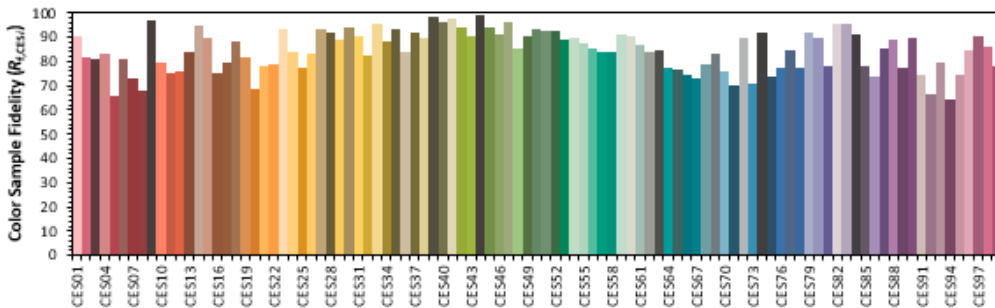
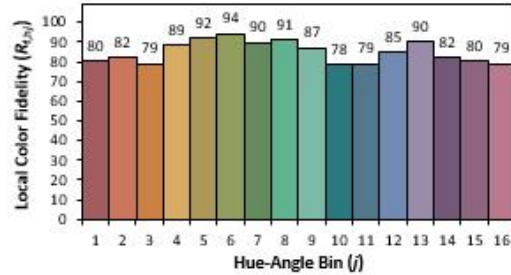
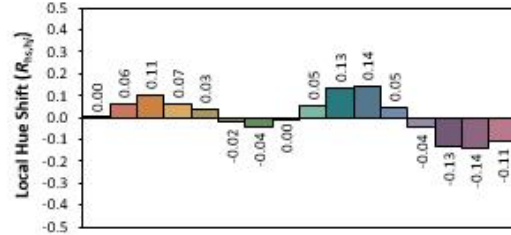
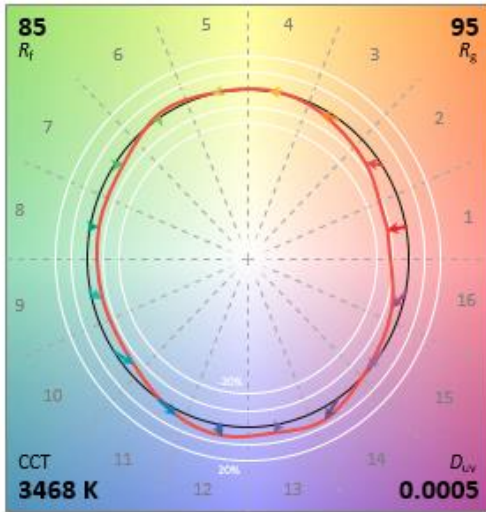
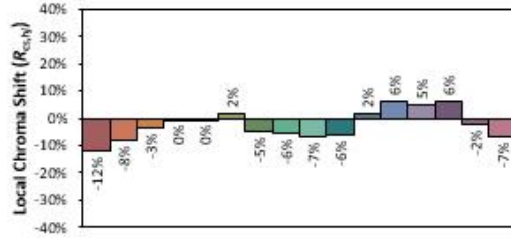
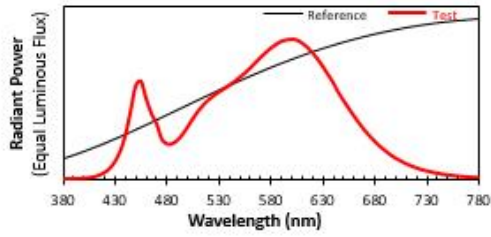
**Photometric Measurement – Sphere-Spectroradiometer Method:**  
(Self-absorption:1.0253) (4 $\pi$  geometry)

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2025.80	2034.40	Bare Lamp: >= 1400(-10%)
Luminous Efficacy (lm/W)	137.62	135.63	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	135.05		



Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	0.0048	485	0.2536	590	0.9817	695	0.1783
385	0.0049	490	0.2777	595	0.9921	700	0.1535
390	0.0059	495	0.3194	600	0.9977	705	0.1329
395	0.0065	500	0.3736	605	0.9929	710	0.1138
400	0.0079	505	0.4316	610	0.9726	715	0.0978
405	0.0120	510	0.4844	615	0.9430	720	0.0840
410	0.0192	515	0.5280	620	0.9043	725	0.0709
415	0.0306	520	0.5659	625	0.8595	730	0.0613
420	0.0486	525	0.5953	630	0.8072	735	0.0525
425	0.0792	530	0.6215	635	0.7498	740	0.0452
430	0.1276	535	0.6444	640	0.6927	745	0.0382
435	0.1990	540	0.6695	645	0.6234	750	0.0331
440	0.3141	545	0.6954	650	0.5650	755	0.0281
445	0.4847	550	0.7255	655	0.5084	760	0.0242
450	0.6660	555	0.7549	660	0.4554	765	0.0208
455	0.6996	560	0.7898	665	0.4035	770	0.0176
460	0.5771	565	0.8277	670	0.3551	775	0.0156
465	0.4698	570	0.8648	675	0.3129	780	0.0145
470	0.3980	575	0.9002	680	0.2732		
475	0.2890	580	0.9330	685	0.2374		
480	0.2533	585	0.9604	690	0.2071		

**TM-30**



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  **0.4076**  
 $y$  **0.3930**  
 $u'$  **0.2363**  
 $v'$  **0.5125**

CIE 13.3-1995 (CRI)	
$R_a$	83
$R_9$	11



**2.2 Electrical, Photometric and Chromaticity Measurements**  
(Refer to Work Instruction HL-WI-EE-001, HL-WI-EE-002)

<b>Test date</b>	2022-08-15	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	Horizontal	<b>Total operation burning time(min):</b>	90
<b>Model Number</b>	LOC-T82FTU-15WMCCT(35/40/50)D AB (switch on 3500K) With ballast OSRAM SYLVANIA QTP 3X32T8/UNV ISN-SC	<b>Stabilization Time(min):</b>	60

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
RHL2208	120.0	60	0.1322	15.80	0.9962	7.33
1501-902, 903,904	277.0	60	0.0578	15.70	0.9805	7.62

**Chromaticity Measurement - Sphere-Spectroradiometer Method**  
(Self-absorption:1.0253) (4 $\pi$  geometry):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	90	R10	76
CCT (K)	3433	R3	96	R11	79
Duv	0.0009	R4	81	R12	65
Chromaticity (x, y)	x = 0.4102 y = 0.3953	R5	81	R13	83
Chromaticity (u', v')	u' = 0.2370 v' = 0.5139	R6	86	R14	98
Color Rendering Index (CRI)	83.0	R7	85	R15	74
R9	9	R8	63	--	--
Rf	84	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

**Photometric Measurement – Sphere-Spectroradiometer Method:**  
(Self-absorption:1.0253) (4 $\pi$  geometry)

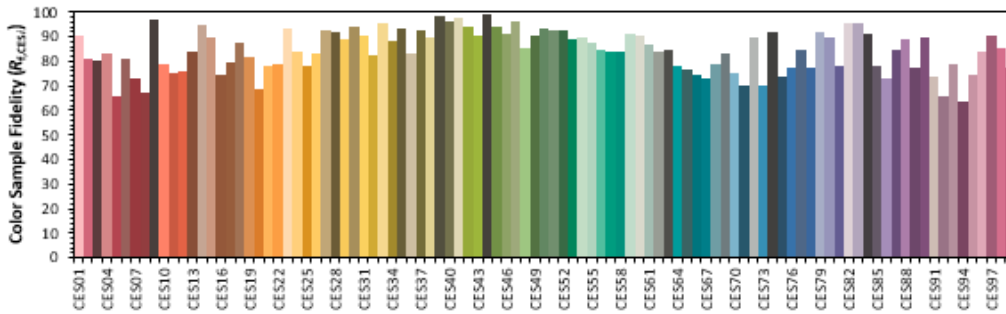
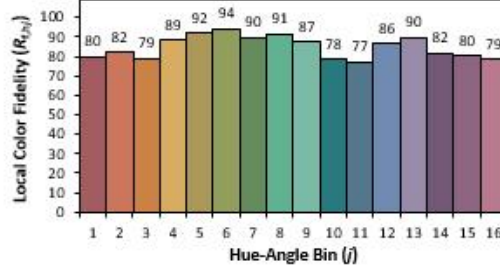
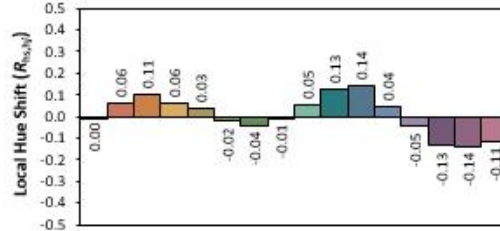
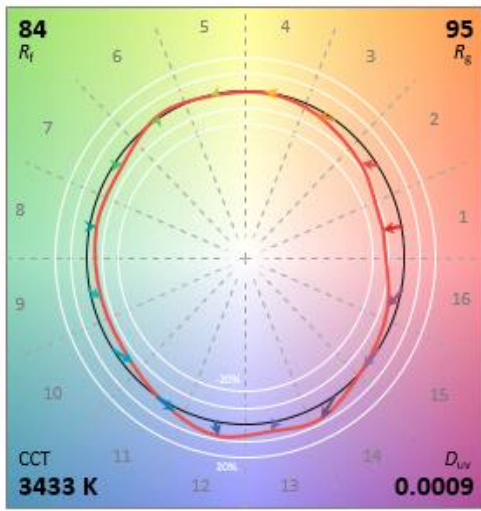
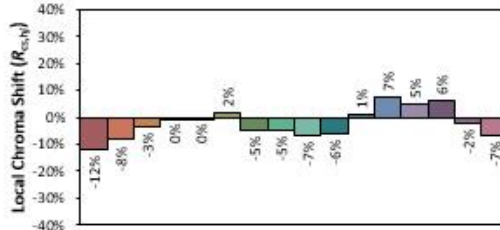
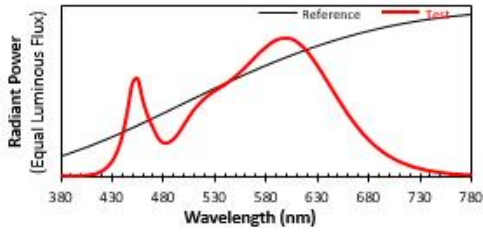
Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1904.10	1908.10	Bare Lamp: >= 1400(-10%)
Luminous Efficacy (lm/W)	120.51	121.54	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	120.51		





Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	0.0111	485	0.2470	590	0.9829	695	0.1768
385	0.0086	490	0.2719	595	0.9957	700	0.1528
390	0.0073	495	0.3146	600	0.9970	705	0.1312
395	0.0070	500	0.3724	605	0.9933	710	0.1124
400	0.0077	505	0.4302	610	0.9743	715	0.0972
405	0.0109	510	0.4829	615	0.9460	720	0.0830
410	0.0154	515	0.5244	620	0.9068	725	0.0704
415	0.0247	520	0.5613	625	0.8591	730	0.0609
420	0.0420	525	0.5915	630	0.8058	735	0.0520
425	0.0683	530	0.6169	635	0.7484	740	0.0445
430	0.1114	535	0.6400	640	0.6889	745	0.0379
435	0.1811	540	0.6621	645	0.6293	750	0.0327
440	0.2942	545	0.6906	650	0.5691	755	0.0278
445	0.4701	550	0.7189	655	0.5109	760	0.0241
450	0.6734	555	0.7518	660	0.4545	765	0.0206
455	0.7075	560	0.7863	665	0.4035	770	0.0181
460	0.5556	565	0.8243	670	0.3560	775	0.0151
465	0.4375	570	0.8631	675	0.3110	780	0.0146
470	0.3550	575	0.8994	680	0.2720		
475	0.2805	580	0.9315	685	0.2366		
480	0.2456	585	0.9607	690	0.2053		

**TM-30**



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  **0.4102**  
 $y$  **0.3953**  
 $u'$  **0.2370**  
 $v'$  **0.5139**

CIE 13.3-1995 (CRI)  
 $R_a$  83  
 $R_9$  9



**Summary**

Sample No.	Test Method	Voltage (Vac)	Frequency (Hz )	Lumen Output(lm)	Power (W)	Lumen Efficacy(lm/w)
RHL22081501-902	With Ballast	120.0	60	1904.10	15.80	120.51
RHL22081501-902	Connected to line voltage	120.0	60	2025.80	14.72	137.62

**The measured lumen efficacy of test condition “with ballast” was less than test condition “Connect to line voltage”. So the following test will be “with ballast”.**



**2.3 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction HL-WI-EE-001, HL-WI-EE-002)*

<b>Test date</b>	2022-08-15	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	Horizontal	<b>Total operation burning time(min):</b>	90
<b>Model Number</b>	LOC-T82FTU-15WMCCT(35/40/50)D AB (switch on 3500K) With ballast OSRAM SYLVANIA QTP 3X32T8/UNV ISN-SC	<b>Stabilization Time(min):</b>	60

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
RHL2208	120.0	60	0.132	15.78	0.9960	7.28
1501-902, 903,904	277.0	60	0.058	15.79	0.9830	7.57

**Photometric Measurement – Goniophotometer Method:**

**(Goniophotometer far field detector  $f1'=1.42\%$ , Test distance: 16.900m)**

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1896.30	1899.70	Bare Lamp: $\geq 1600(-10\%)$
Luminous Efficacy (lm/W)	120.17	120.31	Bare lamp: $\geq 120(-3\%)$
Most worst Luminous/Highest Watts	120.09		
Beam Angle (°)	169.5		140° (-5°)
Center Beam Candle Power (cd)	388		--



## Zonal Lumen Tabulation

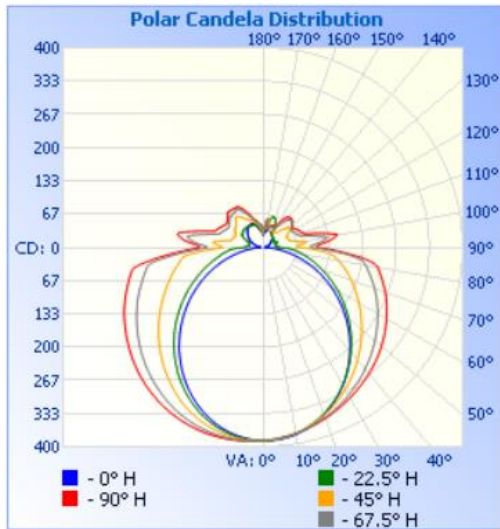
### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	305.6	16.1%	16.1%
0-40	508.5	26.8%	26.8%
0-60	957.8	50.5%	50.5%
60-90	536.4	28.3%	28.3%
70-100	413.8	21.8%	21.8%
90-120	219.4	11.6%	11.6%
0-90	1,494.2	78.8%	78.8%
90-180	402.0	21.2%	21.2%
0-180	1,896.2	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	36.7	1.9%	90-100	90.2	4.8%
10-20	105.9	5.6%	100-110	71.7	3.8%
20-30	163.0	8.6%	110-120	57.5	3%
30-40	202.9	10.7%	120-130	54.0	2.8%
40-50	223.5	11.8%	130-140	49.4	2.6%
50-60	225.8	11.9%	140-150	37.1	2%
60-70	212.8	11.2%	150-160	24.8	1.3%
70-80	188.5	9.9%	160-170	13.6	0.7%
80-90	135.1	7.1%	170-180	3.9	0.2%

**Photometric Data**



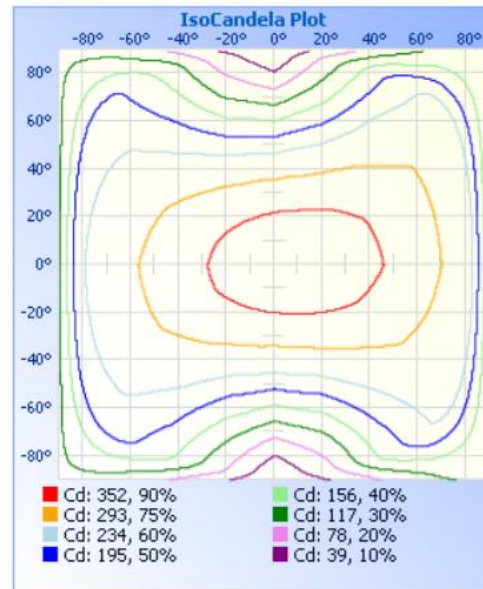
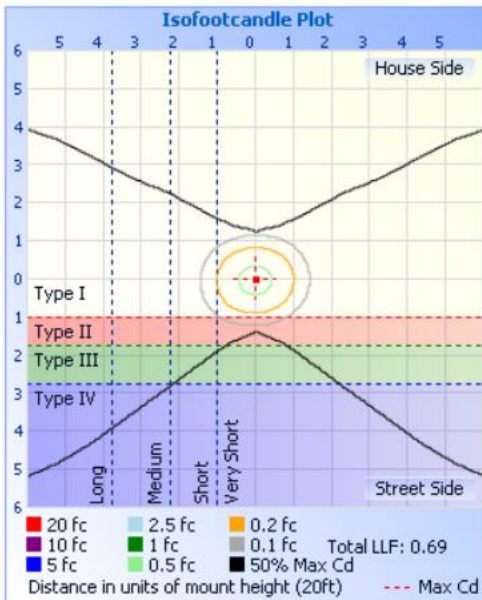
**Illuminance at a Distance**

Distance (ft)	Center Beam fc	Beam Width
17.0ft	1.34 fc	48.1 ft 369.9 ft
34.0ft	0.34 fc	96.3 ft 739.7 ft
51.0ft	0.15 fc	144.4 ft 1,109.6 ft
68.0ft	0.08 fc	192.6 ft 1,479.4 ft
85.0ft	0.05 fc	240.7 ft 1,849.3 ft
102.0ft	0.04 fc	288.9 ft 2,219.2 ft

■ Vert. Spread: 109.5°  
■ Horiz. Spread: 169.5°

**Flood Summary**

	Efficiency	Lumens	Horizontal Spread	Vertical Spread
Field (10%):	97.9%	1,856.7	n/a	173.1
Beam (50%):	65.5%	1,241.4	169.5	109.5





**Candela Table - Type C**

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	388	388	388	388	388	388	388	388	388	388	388	388	388	388	388	388	388
1	388	387	387	387	387	387	387	387	387	388	388	388	388	388	388	388	388
2	388	387	387	386	386	386	386	387	387	387	388	388	389	389	388	388	388
3	387	387	386	386	385	385	385	386	386	387	388	389	389	389	389	388	387
4	387	386	385	385	385	385	385	385	385	386	388	389	390	390	389	388	387
5	386	385	384	384	384	384	383	384	384	386	388	389	390	390	389	388	386
6	386	384	383	383	383	383	382	383	383	385	387	389	390	390	389	387	386
7	385	383	382	382	382	382	381	381	382	384	387	389	391	390	389	386	385
8	383	382	381	381	381	381	380	380	381	383	386	389	391	390	388	386	383
9	382	381	380	380	380	379	378	378	379	382	385	389	391	390	388	385	382
10	381	379	379	379	379	378	377	376	377	380	384	389	391	390	388	384	381
11	379	377	377	377	377	377	375	375	375	379	383	388	391	390	387	382	379
12	377	375	375	376	376	376	374	373	373	377	382	388	391	390	386	381	377
13	375	373	373	375	375	374	372	370	371	375	381	387	391	390	385	379	375
14	373	371	372	373	374	373	370	368	368	373	380	387	391	389	384	378	373
15	371	369	370	372	372	371	368	365	366	371	378	386	390	389	383	376	371
16	369	366	368	370	371	370	366	363	363	368	376	385	390	389	382	374	369
17	366	364	365	368	370	368	364	360	360	366	375	384	390	388	381	372	366
18	363	361	363	367	368	367	362	357	357	363	373	384	389	387	380	369	363
19	360	358	361	365	366	365	359	355	354	360	371	383	389	387	378	367	360
20	357	355	358	363	365	363	357	352	351	357	369	382	388	386	376	364	357
21	354	352	356	361	363	362	355	348	347	354	367	381	387	385	375	362	354
22	351	349	353	359	362	360	352	345	343	351	365	379	387	384	373	359	351
23	347	345	350	357	360	358	349	342	340	348	362	378	386	383	371	356	347
24	343	342	348	355	359	356	347	338	336	344	360	377	385	382	369	353	343
25	340	339	345	353	357	355	344	334	332	341	357	375	384	381	367	350	340
26	336	335	342	351	355	353	341	331	328	337	355	374	383	380	365	346	336
27	332	331	339	349	353	351	339	327	324	333	352	372	382	379	363	343	332
28	328	327	336	347	352	349	336	323	320	330	349	370	381	377	361	340	328
29	324	323	332	344	350	347	333	319	315	325	346	368	380	376	358	336	324
30	319	319	329	342	348	345	330	315	310	321	343	367	378	374	356	333	319
31	315	315	326	340	347	343	327	311	306	317	340	365	377	372	353	329	315

**Laboratory: Hopestar Test Lab Limited, NVLAP Code: 600245-0**  
**Add: Room 212, 24 Building, 7 Qingyi Road, Hi-Tech Zone, Ningbo, China**  
**www.hopestartest.com**



32	311	311	323	338	345	341	324	307	301	313	337	363	376	371	351	325	311
33	306	307	319	335	343	339	321	303	297	309	334	361	374	369	348	321	306
34	301	302	316	333	341	337	318	299	292	304	330	359	373	367	345	317	301
35	296	297	312	330	339	335	315	295	286	300	327	356	371	365	342	313	296
36	291	293	309	328	338	332	312	291	281	295	323	354	370	363	340	309	291
37	286	288	305	326	336	330	309	286	276	290	320	352	368	362	337	304	286
38	281	284	302	323	334	328	306	281	271	286	317	350	366	360	334	300	281
39	276	279	298	321	332	326	303	277	266	281	313	347	365	357	331	296	276
40	271	274	295	318	330	324	299	273	261	276	310	345	363	355	328	292	271
41	265	269	291	316	328	321	296	268	255	271	306	343	361	353	325	287	265
42	260	264	287	313	326	319	293	264	250	266	302	340	359	351	322	283	260
43	255	259	284	311	324	316	290	259	245	261	299	338	357	349	319	278	255
44	250	254	280	308	322	314	286	254	239	256	295	335	355	347	316	273	250
45	244	250	276	306	320	312	283	250	234	251	291	333	353	345	312	269	244
46	238	245	273	303	318	309	280	245	229	247	288	330	351	343	309	264	238
47	233	239	269	300	316	307	277	241	223	241	284	328	349	341	306	260	233
48	227	234	265	298	314	304	274	236	217	236	280	325	347	339	303	255	227
49	221	229	262	295	312	302	270	231	212	231	276	322	345	336	299	250	221
50	216	224	258	292	309	300	267	227	206	226	273	320	342	334	296	245	216
51	210	219	254	290	307	297	264	222	200	220	269	317	340	332	293	241	210
52	204	214	251	287	305	295	261	218	194	215	265	314	338	329	290	236	204
53	198	208	247	284	302	293	257	213	188	210	261	311	335	327	286	231	198
54	192	203	243	282	300	290	254	208	182	205	258	309	333	325	283	227	192
55	187	198	239	279	298	287	251	204	177	200	254	306	331	322	279	222	187
56	181	193	236	276	295	285	248	199	171	194	250	303	328	320	276	217	181
57	174	188	232	273	293	282	245	195	165	189	246	300	326	318	273	213	174
58	169	183	228	271	290	280	242	190	159	184	243	297	323	315	269	208	169
59	163	178	225	268	288	277	238	185	153	179	239	295	321	313	266	203	163
60	157	173	222	265	286	275	235	181	148	174	235	292	319	311	262	198	157
61	151	168	218	263	283	272	232	177	142	169	232	289	316	308	259	194	151
62	145	163	215	260	281	270	229	173	136	164	228	286	314	305	256	189	145
63	139	157	211	257	278	267	225	168	130	158	224	283	312	303	253	185	139
64	133	153	207	254	276	265	222	164	124	153	221	281	309	300	250	181	133

Laboratory: Hopestar Test Lab Limited, NVLAP Code: 600245-0  
 Add: Room 212, 24 Building, 7 Qingyi Road, Hi-Tech Zone, Ningbo, China  
[www.hopestartest.com](http://www.hopestartest.com)





65	127	148	204	252	274	262	219	160	118	148	217	278	306	297	246	176	127
66	121	143	201	249	271	260	216	156	113	144	214	275	304	294	243	172	121
67	115	138	197	246	268	258	213	152	107	139	210	273	301	291	240	167	115
68	109	133	194	243	266	255	210	148	101	134	207	270	299	288	237	163	109
69	104	128	191	240	263	252	207	143	95	129	204	267	296	284	234	159	104
70	98	124	187	237	261	249	204	140	90	125	201	264	293	281	231	154	98
71	92	119	184	235	258	246	201	136	84	120	198	261	290	279	228	150	92
72	86	115	181	232	255	243	198	132	79	116	194	258	288	276	225	146	86
73	81	110	177	229	252	240	195	128	73	111	191	255	285	273	221	143	81
74	75	106	174	226	249	236	192	125	68	107	188	252	282	270	218	138	75
75	70	102	171	223	247	233	189	121	62	103	185	249	280	267	214	135	70
76	64	98	168	220	244	230	186	117	57	99	182	247	277	265	210	131	64
77	58	93	164	217	241	227	183	114	52	95	178	244	274	262	207	128	58
78	53	89	160	214	238	224	180	111	47	91	175	241	272	259	203	124	53
79	48	86	157	212	236	222	176	107	42	88	173	239	269	257	200	120	48
80	43	82	154	209	233	219	173	104	37	85	170	236	266	254	197	116	43
81	38	78	150	206	230	216	170	101	33	81	167	233	261	251	193	113	38
82	33	74	146	202	223	211	167	98	29	78	164	226	249	241	190	109	33
83	29	70	143	195	212	200	164	94	24	75	161	212	233	228	186	105	29
84	25	67	139	184	199	187	155	91	21	72	154	197	217	213	177	101	25
85	20	63	133	172	183	173	144	89	17	69	143	181	200	196	164	97	20
86	17	58	122	156	168	159	131	85	14	66	128	165	184	178	150	92	17
87	13	54	110	142	153	144	118	77	12	61	114	149	167	162	135	84	13
88	10	48	98	128	139	129	103	66	10	53	101	134	152	148	121	72	10
89	7	41	85	114	126	115	90	55	7	44	88	120	138	133	105	61	7
90	5	32	72	100	111	103	79	47	5	38	81	111	127	119	93	50	5
91	4	28	67	95	108	101	78	45	4	35	82	113	128	119	90	48	4
92	4	29	68	97	109	104	82	45	4	34	86	120	134	124	94	50	4
93	4	30	72	101	114	109	86	47	5	33	90	127	141	130	100	53	4
94	5	31	77	108	121	116	92	48	6	32	95	135	149	138	106	56	5
95	6	29	81	113	128	123	97	46	7	30	98	141	157	145	111	58	6
96	7	26	84	119	135	129	102	43	7	28	101	146	162	151	115	53	7
97	7	25	87	123	140	135	106	39	7	28	96	150	167	156	119	48	7

**Laboratory: Hopestar Test Lab Limited, NVLAP Code: 600245-0**  
**Add: Room 212, 24 Building, 7 Qingyi Road, Hi-Tech Zone, Ningbo, China**  
**www.hopestartest.com**



98	7	25	82	127	145	139	102	36	8	28	90	153	170	159	118	44	7
99	8	25	76	130	149	143	95	35	9	28	83	150	173	162	111	43	8
100	8	25	70	124	151	139	88	34	10	28	77	141	170	157	103	42	8
101	8	25	64	116	142	131	82	34	11	27	71	133	161	148	96	42	8
102	9	25	59	109	134	123	75	33	12	27	67	125	152	139	90	41	9
103	9	26	57	101	126	114	68	33	13	27	65	116	142	130	83	41	9
104	10	27	56	94	117	106	64	33	14	27	64	109	133	122	78	41	10
105	10	28	55	87	110	98	63	33	15	28	64	101	125	114	76	41	10
106	11	29	54	81	101	91	62	32	16	28	63	95	117	107	75	41	11
107	11	30	54	79	94	85	61	32	17	29	63	92	110	101	74	42	11
108	11	30	53	77	89	81	60	33	18	30	62	90	104	96	73	43	11
109	12	31	53	76	86	80	59	33	19	31	61	89	101	95	72	45	12
110	12	31	52	75	85	78	59	33	20	32	61	88	100	94	72	46	12
111	12	30	52	74	84	77	58	34	21	34	60	87	99	93	71	48	12
112	13	29	51	73	83	76	57	35	23	35	60	86	98	91	70	50	13
113	13	28	51	72	82	75	56	35	24	37	60	85	97	90	70	52	13
114	14	27	52	71	81	74	56	36	25	39	60	84	96	89	69	54	14
115	15	25	53	70	80	73	55	36	26	41	60	83	94	88	69	55	15
116	15	24	54	69	79	72	55	36	27	43	61	82	93	87	70	55	15
117	16	24	55	68	78	71	55	36	28	45	61	81	92	86	71	54	16
118	16	24	56	67	77	70	55	36	29	46	62	80	91	85	72	54	16
119	17	24	58	67	75	69	56	36	30	47	63	80	90	84	73	54	17
120	17	24	60	67	74	68	57	36	31	48	64	80	89	84	74	53	17
121	18	24	61	67	73	68	57	36	32	49	65	80	88	84	76	53	18
122	19	24	63	67	72	68	58	37	33	49	66	80	87	84	78	52	19
123	19	25	65	68	72	68	59	37	34	49	67	80	87	85	80	52	19
124	20	25	66	69	72	68	60	36	35	50	68	81	87	86	81	52	20
125	21	25	66	70	72	69	61	36	36	50	68	82	88	87	83	51	21
126	21	25	65	71	72	69	62	36	36	50	68	83	89	88	85	51	21
127	22	26	64	72	72	70	63	37	37	51	68	84	89	89	87	50	22
128	22	26	63	74	73	71	63	38	38	51	68	85	90	91	88	50	22
129	23	26	62	75	74	72	62	39	39	51	69	86	91	92	88	49	23
130	24	27	60	77	75	73	62	41	40	52	70	87	93	94	87	49	24

Laboratory: Hopestar Test Lab Limited, NVLAP Code: 600245-0  
Add: Room 212, 24 Building, 7 Qingyi Road, Hi-Tech Zone, Ningbo, China  
[www.hopestartest.com](http://www.hopestartest.com)



131	24	27	57	78	76	74	62	42	40	52	71	88	94	95	86	48	24
132	25	27	55	79	78	76	61	43	41	52	72	90	95	97	85	48	25
133	25	28	52	78	79	77	61	44	42	52	74	90	96	98	84	47	25
134	26	28	49	78	81	77	60	46	43	52	75	90	97	100	83	47	26
135	27	28	46	77	81	76	60	47	44	52	77	89	99	100	83	46	27
136	27	29	43	76	81	76	58	47	45	52	79	89	100	99	82	46	27
137	28	29	41	75	81	75	55	47	45	52	80	89	99	98	81	46	28
138	28	29	39	73	80	74	53	47	46	52	81	89	99	98	80	45	28
139	29	29	39	71	79	74	51	47	47	52	81	90	98	97	80	45	29
140	29	29	38	69	78	73	49	47	48	51	80	90	98	96	80	44	29
141	30	29	38	65	78	71	46	48	48	51	79	90	98	95	79	44	30
142	30	29	38	62	76	69	44	47	49	52	77	91	97	94	78	43	30
143	31	29	38	58	73	65	45	47	49	52	76	92	97	94	76	43	31
144	31	30	38	54	70	61	46	48	50	52	75	92	97	93	75	42	31
145	32	30	37	50	66	57	47	49	50	51	73	93	97	92	73	42	32
146	32	33	37	47	62	54	48	50	51	51	71	93	96	92	71	41	32
147	33	38	37	45	58	50	48	50	51	51	70	91	96	91	70	41	33
148	33	39	37	44	53	47	49	50	52	50	68	89	96	89	68	42	33
149	34	41	37	44	49	47	51	50	52	50	67	87	95	87	67	42	34
150	34	42	37	44	47	47	52	50	52	49	65	85	92	85	65	42	34
151	34	44	37	44	47	48	52	49	52	49	64	82	90	82	64	43	34
152	35	49	37	44	48	49	51	49	52	49	62	80	87	80	62	43	35
153	35	55	37	44	48	49	51	48	52	49	61	77	84	78	61	43	35
154	35	58	37	44	48	50	51	48	51	49	60	75	82	75	59	43	35
155	36	60	37	44	48	51	50	49	51	49	59	72	79	73	57	43	36
156	36	62	37	44	48	51	50	49	51	49	58	70	76	70	55	42	36
157	36	63	36	44	48	50	51	50	51	49	56	68	73	68	54	42	36
158	37	63	36	44	47	49	52	51	51	48	55	65	71	65	53	41	37
159	37	63	36	43	47	49	51	51	51	48	55	63	68	63	53	41	37
160	37	64	36	43	47	48	50	51	49	48	55	61	65	61	52	41	37
161	37	64	36	42	46	48	49	51	48	48	54	59	62	59	52	41	37
162	37	64	42	41	46	49	47	52	47	48	53	58	60	57	51	40	37
163	37	64	44	40	46	48	47	53	46	48	52	56	59	56	50	40	37



164	37	61	46	40	44	47	47	52	44	47	51	55	57	55	49	40	37
165	36	57	49	39	43	45	47	52	43	46	50	55	55	54	47	40	36
166	36	53	56	40	42	44	47	51	42	44	49	54	55	52	47	40	36
167	35	50	58	46	42	46	48	49	40	42	48	52	54	51	46	40	35
168	34	48	59	48	47	47	48	43	39	40	48	51	52	49	44	40	34
169	33	46	58	52	49	45	48	41	37	38	48	49	50	48	43	40	33
170	32	44	57	58	52	46	48	38	36	38	46	48	49	47	43	40	32
171	31	43	56	58	55	45	46	35	34	37	44	47	48	46	43	40	31
172	30	40	51	56	52	44	45	35	33	37	42	46	47	45	43	40	30
173	29	36	43	54	50	44	40	35	32	35	40	45	46	44	42	39	29
174	30	34	40	46	46	42	38	36	33	33	37	45	46	44	43	39	30
175	30	31	40	37	32	38	38	37	34	33	36	44	45	44	42	40	30
176	32	31	36	37	25	38	37	37	35	33	34	42	45	44	40	41	32
177	33	32	31	33	24	36	36	39	36	34	32	41	44	41	43	41	33
178	34	34	30	27	27	30	36	39	36	35	31	36	44	42	44	41	34
179	35	35	32	23	33	37	38	40	36	35	33	30	38	44	41	41	35
180	36	35	33	24	41	43	40	40	36	35	33	24	41	43	40	40	36



**2.3 Electrical, Photometric and Chromaticity Measurements**  
(Refer to Work Instruction HL-WI-EE-001, HL-WI-EE-002)

<b>Test date</b>	2022-08-15	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	Horizontal	<b>Total operation burning time(min):</b>	90
<b>Model Number</b>	LOC-T82FTU-15WMCCT(35/40/50)D AB (switch on 4000K) With ballast OSRAM SYLVANIA QTP 3X32T8/UNV ISN-SC	<b>Stabilization Time(min):</b>	60

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
RHL220815	120.0	60	0.1315	15.72	0.9961	7.42
01-902, 903,904	277.0	60	0.0575	15.69	0.9851	7.73
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer Method**  
(Self-absorption:1.0253) (4 $\pi$  geometry):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	15
Frequency (Hz)	60	R2	91	R10	77
CCT (K)	4004	R3	96	R11	80
Duv	0.0013	R4	82	R12	62
Chromaticity (x, y)	x = 0.3812 y = 0.3800	R5	82	R13	85
Chromaticity (u', v')	u' = 0.2243 v' = 0.5031	R6	87	R14	98
Color Rendering Index (CRI)	84.0	R7	87	R15	77
R9	15	R8	66	--	--
Rf	84				
Rg	94				
Rcs,h1(%)	-11				

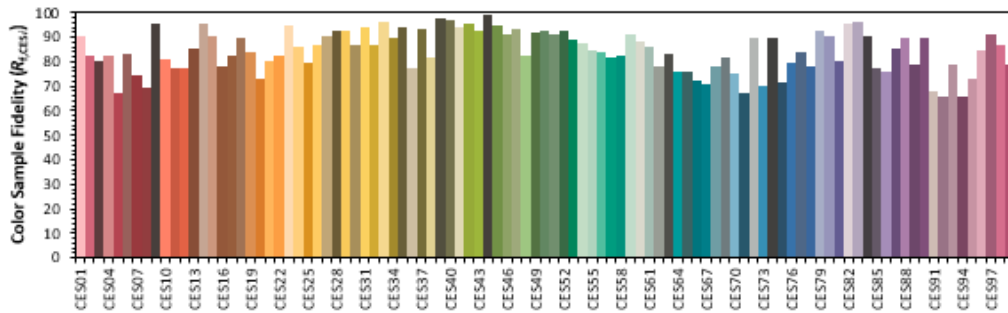
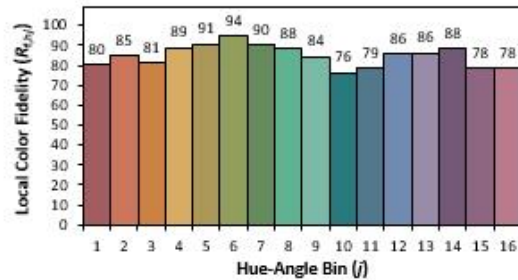
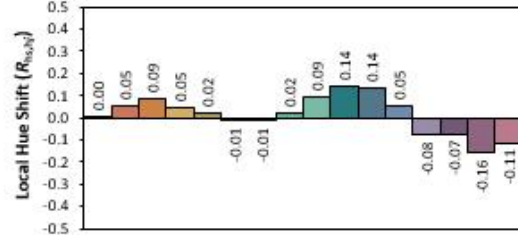
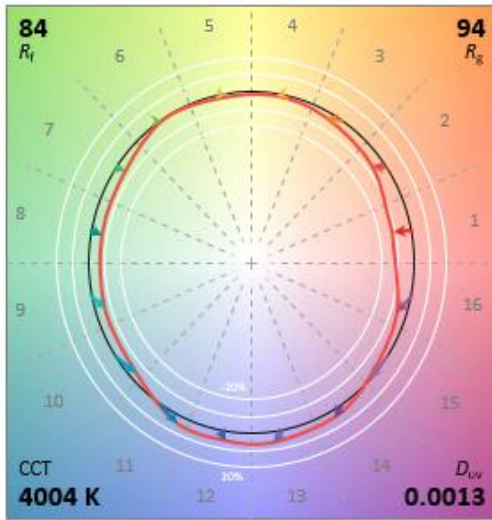
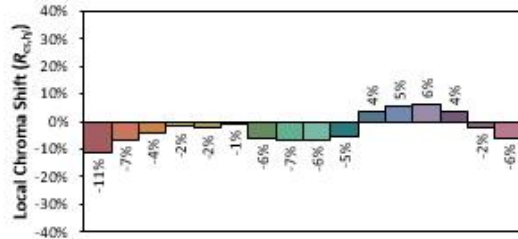
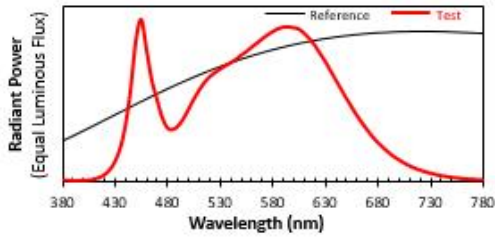
**Photometric Measurement – Goniophotometer Method(Goniophotometer far field detector f1'=1.42%, Test distance: 16.644m):**

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1988.40	1989.70	Bare Lamp: >= 1400(-10%)
Luminous Efficacy (lm/W)	126.49	126.81	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	126.49		



Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	0.0125	485	0.3212	590	0.9480	695	0.1585
385	0.0107	490	0.3417	595	0.9505	700	0.1374
390	0.0077	495	0.3856	600	0.9452	705	0.1177
395	0.0087	500	0.4433	605	0.9369	710	0.1004
400	0.0084	505	0.5058	610	0.9120	715	0.0859
405	0.0110	510	0.5612	615	0.8801	720	0.0740
410	0.0162	515	0.6074	620	0.8395	725	0.0629
415	0.0269	520	0.6436	625	0.7904	730	0.0543
420	0.0441	525	0.6693	630	0.7409	735	0.0466
425	0.0745	530	0.6905	635	0.6852	740	0.0396
430	0.1242	535	0.7112	640	0.6283	745	0.0338
435	0.2071	540	0.7296	645	0.5724	750	0.0289
440	0.3463	545	0.7499	650	0.5166	755	0.0249
445	0.5718	550	0.7752	655	0.4633	760	0.0213
450	0.8701	555	0.7980	660	0.4121	765	0.0185
455	0.9955	560	0.8247	665	0.3640	770	0.0158
460	0.8130	565	0.8497	670	0.3213	775	0.0138
465	0.6251	570	0.8763	675	0.2796	780	0.0130
470	0.5060	575	0.8996	680	0.2445		
475	0.3946	580	0.9207	685	0.2131		
480	0.3306	585	0.9380	690	0.1843		

**TM-30**



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3812  
 $y$  0.3800  
 $u'$  0.2243  
 $v'$  0.5031

CIE 13.3-1995 (CRI)  
 $R_a$  84  
 $R_g$  15



### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction HL-WI-EE-001, HL-WI-EE-002)

<b>Test date</b>	2022-08-15	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	Horizontal	<b>Total operation burning time(min):</b>	90
<b>Model Number</b>	LOC-T82FTU-15WMCCT(35/40/50)D AB (switch on 5000K) With ballast OSRAM SYLVANIA QTP 3X32T8/UNV ISN-SC	<b>Stabilization Time(min):</b>	60

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
RHL220815	120.0	60	0.1327	15.86	0.9962	7.36
01-902, 903,904	277.0	60	0.0579	15.80	0.9852	7.59
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

#### Chromaticity Measurement - Sphere-Spectroradiometer Method (Self-absorption:1.0253) (4 $\pi$ geometry):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	11
Frequency (Hz)	60	R2	90	R10	74
CCT (K)	4900	R3	95	R11	79
Duv	0.0042	R4	81	R12	57
Chromaticity (x, y)	x = 0.3489 y = 0.3631	R5	81	R13	84
Chromaticity (u', v')	u' = 0.2096 v' = 0.4907	R6	85	R14	97
Color Rendering Index (CRI)	83.0	R7	88	R15	76
R9	11	R8	68	--	--
Rf	84				
Rg	94				
Rcs,h1(%)	-12				

#### Photometric Measurement – Goniophotometer Method(Goniophotometer far field detector f1'=1.42%, Test distance: 16.644m):

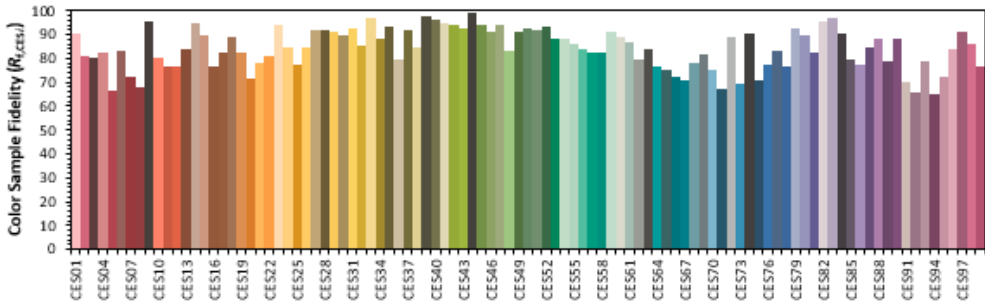
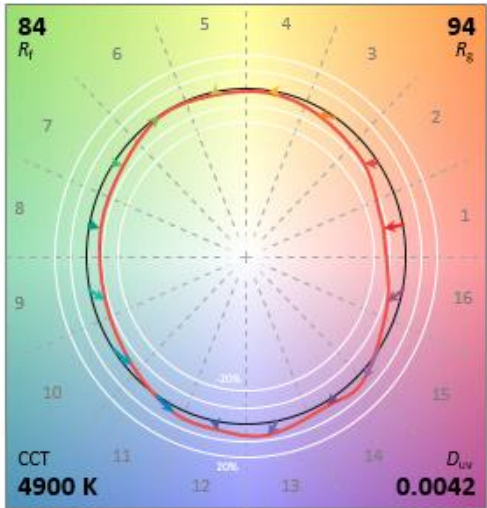
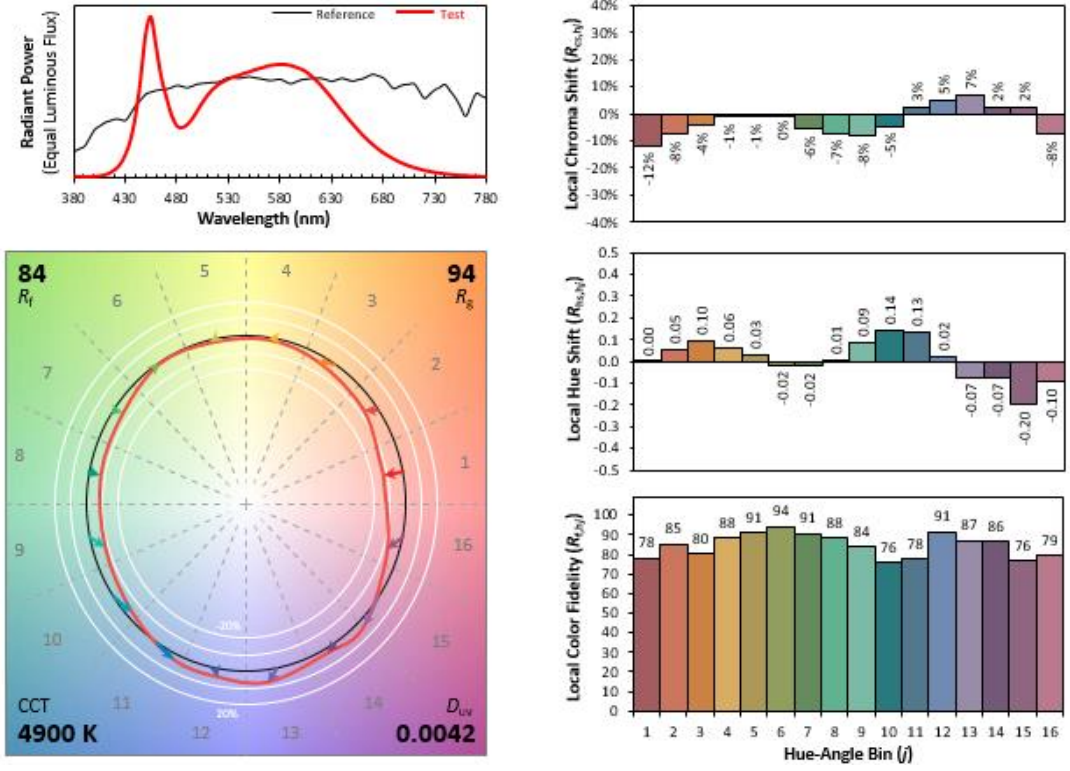
Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1915.40	1917.60	Bare Lamp: >= 1400(-10%)
Luminous Efficacy (lm/W)	120.77	121.37	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	120.77		





Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	0.0113	485	0.3101	590	0.6954	695	0.1035
385	0.0091	490	0.3262	595	0.6865	700	0.0886
390	0.0074	495	0.3619	600	0.6737	705	0.0767
395	0.0073	500	0.4117	605	0.6595	710	0.0658
400	0.0086	505	0.4635	610	0.6352	715	0.0566
405	0.0119	510	0.5090	615	0.6069	720	0.0483
410	0.0176	515	0.5459	620	0.5741	725	0.0414
415	0.0299	520	0.5737	625	0.5368	730	0.0354
420	0.0498	525	0.5931	630	0.4990	735	0.0306
425	0.0815	530	0.6095	635	0.4589	740	0.0261
430	0.1371	535	0.6225	640	0.4183	745	0.0223
435	0.2266	540	0.6320	645	0.3792	750	0.0190
440	0.3729	545	0.6444	650	0.3414	755	0.0164
445	0.5994	550	0.6533	655	0.3055	760	0.0144
450	0.8822	555	0.6653	660	0.2702	765	0.0121
455	0.9946	560	0.6744	665	0.2387	770	0.0107
460	0.8214	565	0.6833	670	0.2095	775	0.0092
465	0.6297	570	0.6933	675	0.1833	780	0.0086
470	0.5038	575	0.6975	680	0.1594		
475	0.3937	580	0.7011	685	0.1384		
480	0.3251	585	0.7007	690	0.1205		

**TM-30**



**Notes:** This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$	<b>0.3489</b>	CIE 13.3-1995 (CRI)
$y$	<b>0.3631</b>	
$u'$	<b>0.2096</b>	
$v'$	<b>0.4907</b>	
		$R_g$ 11

**3. Test Equipment**

Equipment Name	Model No.	Serial No.	Next Calibration Date
Goniophotometric System	GPM-3000	91N827816	2022-11-04
AC Power Source	CHP-1000	213630	2022-09-17
Total Luminous Flux Standard Lamp	24V150W	24V150W	2022-11-08
Digital Power Meter	WT500	TBS1012 C020506	2022-09-18
Integral Sphere (2M)	2m sphere	N.A	2022-11-04
Digital Power Meter	PF310A	P609877CD1391157	2023-01-10
Optical Color and Electrical Measurement System	HAAS-2000	M108544CM5351115	2022-11-04
Standard Lamp	D204	M133806CJ6391158	2022-11-04
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

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