



IES LM-79-19

MEASUREMENT AND TEST REPORT

For

LED One Corporation

12437 Bellegrave Ave, Eastvale, CA 91752

Test Model: LOC-9.5DL-MW(20/25/32)MCCT(30/40/50)D

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	Bay Wang
Report Number:	RKSB230306004-10
Test Date:	2021-12-30 to 2021-12-31
Report Date:	2023-03-17
Reviewed By:	Seven Xia / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu, People's Republic of China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
Accreditation:	The IAS Accreditation Number TL-1044.

1. Product Description#

General Information:

One sample was received on 2021-12-30 and used for testing.

Model Tested:	LOC-9.5DL-MW(20/25/32)MCCT(30/40/50)D
Manufacturer:	LED One Corporation
Brand Name:	LED One
Product Designation:	LED Recessed Downlight
Burning Time Before Test:	0hour(For New Products)
Color Tunable:	White-Tunable
CCT Range:	3000K, 3500K, 4000K
Least Efficient Setting:	3000K
Most Consumptive Setting:	3000K
Default Setting:	3000K

Rated Values:

Rated Voltage/Frequency:	120-277V 50/60Hz
Rated Power:	20W/25W/32W
Nominal CCT:	3000K, 3500K, 4000K
Nominal Lumen Output:	3000lm

Note:

1. The applicant *LED One Corporation* declared that their products are the same to the product in report# RKS211230202-10-2 and is authorized by original applicant to use their test data.
2. All the data in previous report (RKS211230202-10-2) is shared in report.

2. Standards Used

- IES LM-79-19: Approved Method: Optical and Electrical Measurements of Solid-state Lighting Products
- ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment
- IES TM-30-18^{*}: IES Method for Evaluating Light Source Color Rendition

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	G121960CS1361154D	2021-11-02	2022-11-01
spectroradiometer	EVERFINE	HAAS-2000	M12048CS1361148	2021-11-02	2022-11-01
Digital CC&CV DC Power Supply	EVERFINE	WY305	G115986CN1361134	2021-11-02	2022-11-01
Thermal Meter	ANYMETRE	TH-20E	N/A	2021-11-19	2022-11-18
Standard Light Source	Osram	24V/50W	JWWCR020106	2021-09-15	2022-09-14
Digital Power Meter	YOKOGAWA	WT210	91KB35700	2021-11-13	2022-11-12
Intelligence ac power supply	EVERFINE	DPS1005	G119890CS1361121	2021-11-02	2022-11-01

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2021-11-02	2022-11-01
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2021-11-02	2022-11-01
Power Meter	INVENTFINE	WT500	GSDSQ200007	2021-03-16	2022-03-15
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2021-11-15	2022-11-14
Wireless Weather Station	ZHONGXING	KG218	N/A	2021-11-02	2022-11-01
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2021-12-23	2022-12-22

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with ANSI/IES LM-79-19. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ during measurement. And relative humidity is maintained between 10% than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

4 π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U_{rel}=2.7\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=27\text{K}$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.7(k=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U_{rel}=0.27\%$ of rdg, AC Voltage $U_{rel}=0.26\%$ of rdg, Power $U_{rel}=0.41\%$ ($k=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. For measurement of luminous intensity distribution, The horizontal angle (C plane) test intervals were set 22.5 degree, the vertical angle (γ) test intervals were set 1 degree while data for 5 degree intervals is reported.

The uncertainty of the luminous flux is $U_{rel}=2.6\%$ ($k=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_i , R_g was calculated according to IES TM-30-18 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Control Setting: 3000K

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

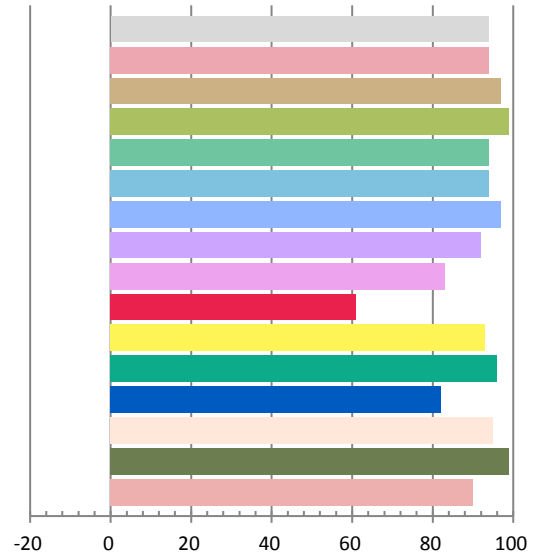
Photometric and Electrical Measurement Result

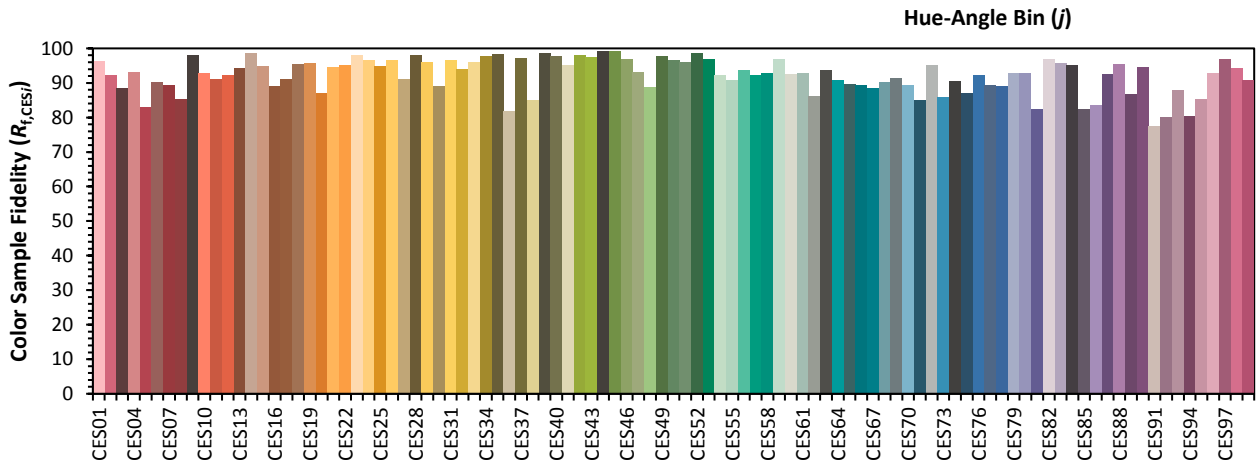
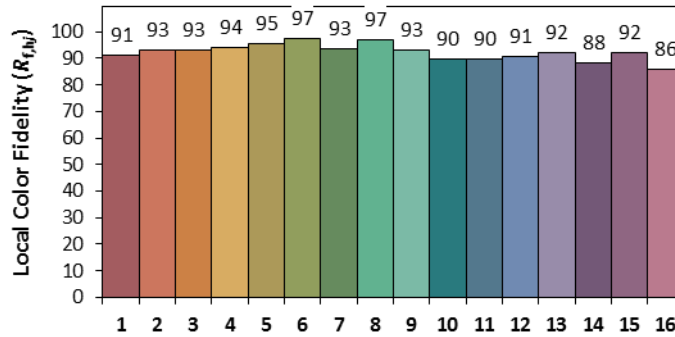
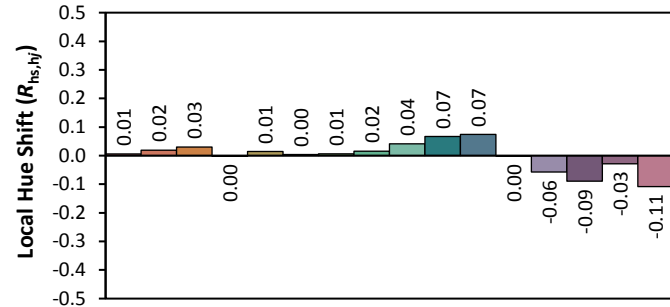
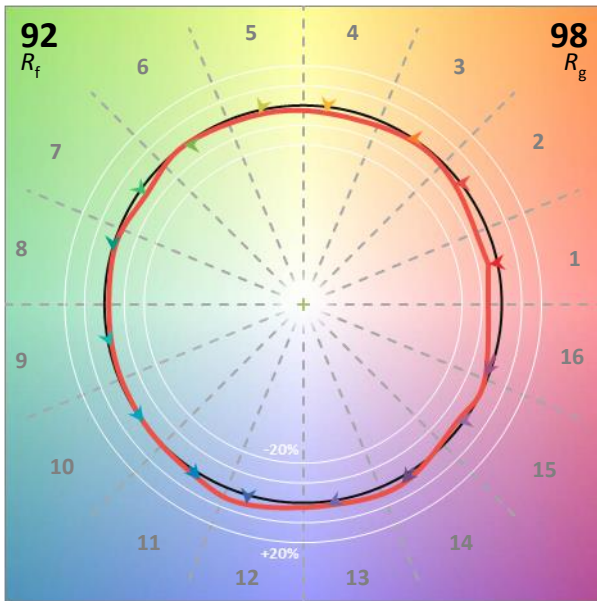
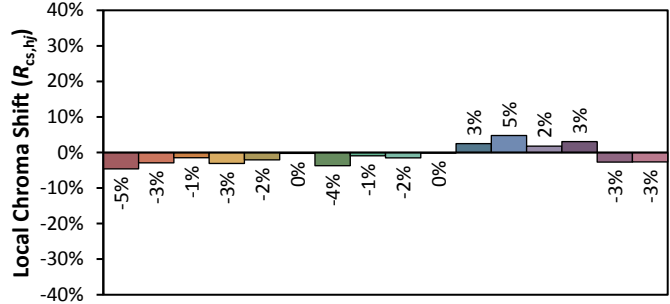
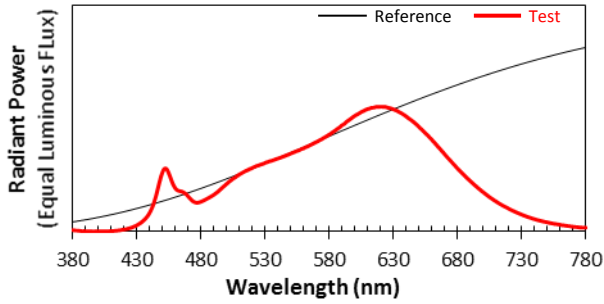
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
119.9	60	0.2592	30.86	0.9926	3001.5	97.27

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
10.364	2978	0.00077	0.4397	0.4070	0.2511	0.5229

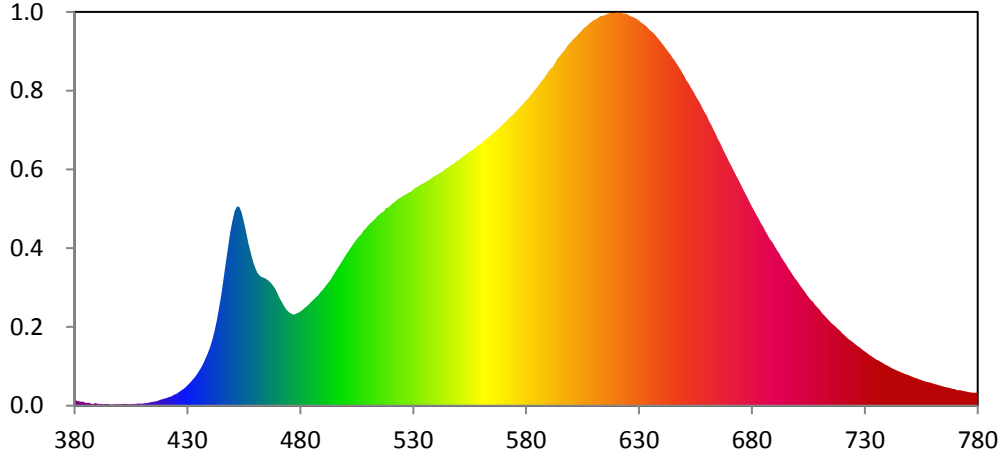
Color Rendering Index

Ra			
93.9			
R1	R2	R3	R4
94	97	99	94
R5	R6	R7	R8
94	97	92	83
R9	R10	R11	R12
61	93	96	82
R13	R14	R15	
95	99	90	





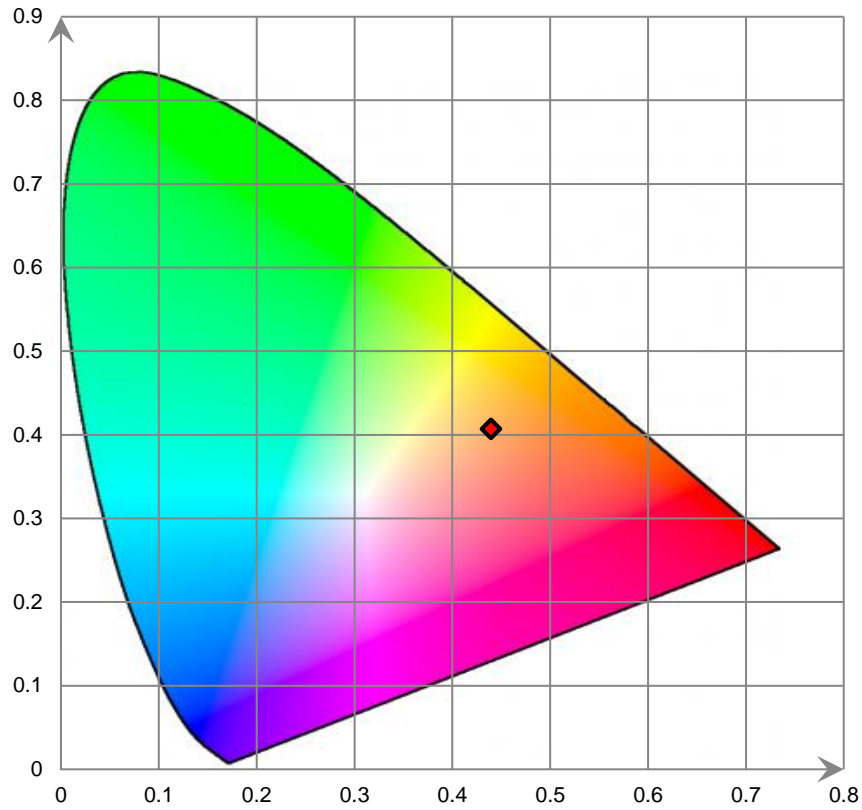
Relative Spectral Power Distribution



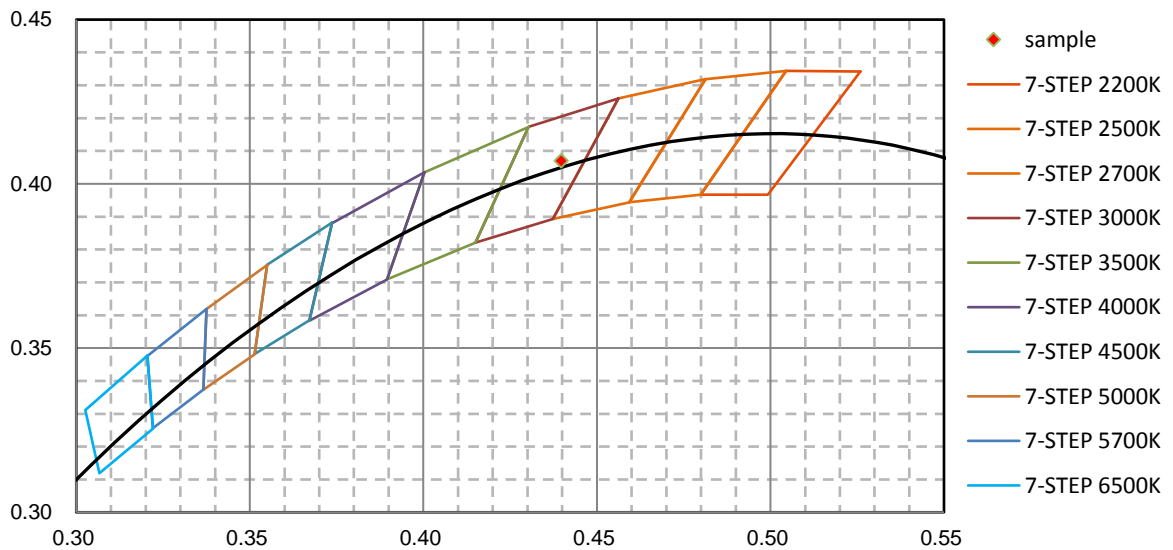
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	8.506E-01	421	1.205E+00	462	2.006E+01	503	2.472E+01	544	3.639E+01
381	7.550E-01	422	1.369E+00	463	1.983E+01	504	2.519E+01	545	3.665E+01
382	6.886E-01	423	1.475E+00	464	1.970E+01	505	2.571E+01	546	3.687E+01
383	6.323E-01	424	1.694E+00	465	1.954E+01	506	2.607E+01	547	3.717E+01
384	6.114E-01	425	1.821E+00	466	1.926E+01	507	2.643E+01	548	3.735E+01
385	4.451E-01	426	2.062E+00	467	1.894E+01	508	2.698E+01	549	3.766E+01
386	4.471E-01	427	2.279E+00	468	1.850E+01	509	2.730E+01	550	3.790E+01
387	3.758E-01	428	2.541E+00	469	1.801E+01	510	2.777E+01	551	3.814E+01
388	2.164E-01	429	2.803E+00	470	1.726E+01	511	2.813E+01	552	3.841E+01
389	4.048E-01	430	3.113E+00	471	1.653E+01	512	2.847E+01	553	3.866E+01
390	3.211E-01	431	3.496E+00	472	1.592E+01	513	2.881E+01	554	3.893E+01
391	2.683E-01	432	3.885E+00	473	1.526E+01	514	2.919E+01	555	3.920E+01
392	2.730E-01	433	4.268E+00	474	1.477E+01	515	2.948E+01	556	3.937E+01
393	2.263E-01	434	4.715E+00	475	1.439E+01	516	2.977E+01	557	3.963E+01
394	2.604E-01	435	5.264E+00	476	1.421E+01	517	3.000E+01	558	3.996E+01
395	2.760E-01	436	5.824E+00	477	1.406E+01	518	3.045E+01	559	4.027E+01
396	1.421E-01	437	6.439E+00	478	1.418E+01	519	3.056E+01	560	4.041E+01
397	1.919E-01	438	7.207E+00	479	1.433E+01	520	3.093E+01	561	4.080E+01
398	2.437E-01	439	8.022E+00	480	1.452E+01	521	3.123E+01	562	4.105E+01
399	2.382E-01	440	9.079E+00	481	1.479E+01	522	3.146E+01	563	4.129E+01
400	2.427E-01	441	1.020E+01	482	1.512E+01	523	3.181E+01	564	4.162E+01
401	2.120E-01	442	1.156E+01	483	1.539E+01	524	3.201E+01	565	4.196E+01
402	2.605E-01	443	1.319E+01	484	1.572E+01	525	3.220E+01	566	4.223E+01
403	2.576E-01	444	1.514E+01	485	1.608E+01	526	3.243E+01	567	4.249E+01
404	2.060E-01	445	1.716E+01	486	1.639E+01	527	3.265E+01	568	4.287E+01
405	2.421E-01	446	1.964E+01	487	1.676E+01	528	3.286E+01	569	4.318E+01
406	2.684E-01	447	2.207E+01	488	1.707E+01	529	3.303E+01	570	4.350E+01
407	2.602E-01	448	2.446E+01	489	1.752E+01	530	3.335E+01	571	4.378E+01
408	2.985E-01	449	2.682E+01	490	1.788E+01	531	3.363E+01	572	4.418E+01
409	3.040E-01	450	2.862E+01	491	1.835E+01	532	3.377E+01	573	4.453E+01
410	3.417E-01	451	3.007E+01	492	1.880E+01	533	3.402E+01	574	4.479E+01
411	3.607E-01	452	3.072E+01	493	1.927E+01	534	3.425E+01	575	4.517E+01
412	4.169E-01	453	3.065E+01	494	1.982E+01	535	3.439E+01	576	4.559E+01
413	4.901E-01	454	2.984E+01	495	2.039E+01	536	3.462E+01	577	4.593E+01
414	5.506E-01	455	2.845E+01	496	2.095E+01	537	3.480E+01	578	4.629E+01
415	5.996E-01	456	2.687E+01	497	2.152E+01	538	3.508E+01	579	4.668E+01
416	6.771E-01	457	2.517E+01	498	2.206E+01	539	3.531E+01	580	4.708E+01
417	7.767E-01	458	2.358E+01	499	2.257E+01	540	3.550E+01	581	4.741E+01
418	8.925E-01	459	2.222E+01	500	2.316E+01	541	3.570E+01	582	4.793E+01
419	9.965E-01	460	2.124E+01	501	2.367E+01	542	3.590E+01	583	4.836E+01
420	1.113E+00	461	2.046E+01	502	2.423E+01	543	3.616E+01	584	4.880E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.918E+01	626	6.011E+01	667	3.973E+01	708	1.554E+01	749	4.758E+00
586	4.969E+01	627	5.998E+01	668	3.901E+01	709	1.511E+01	750	4.614E+00
587	5.013E+01	628	5.983E+01	669	3.835E+01	710	1.478E+01	751	4.463E+00
588	5.054E+01	629	5.963E+01	670	3.757E+01	711	1.430E+01	752	4.315E+00
589	5.106E+01	630	5.938E+01	671	3.686E+01	712	1.396E+01	753	4.197E+00
590	5.163E+01	631	5.912E+01	672	3.617E+01	713	1.356E+01	754	4.058E+00
591	5.199E+01	632	5.886E+01	673	3.546E+01	714	1.320E+01	755	3.962E+00
592	5.234E+01	633	5.862E+01	674	3.483E+01	715	1.281E+01	756	3.801E+00
593	5.300E+01	634	5.824E+01	675	3.413E+01	716	1.250E+01	757	3.747E+00
594	5.355E+01	635	5.787E+01	676	3.344E+01	717	1.221E+01	758	3.631E+00
595	5.394E+01	636	5.756E+01	677	3.275E+01	718	1.187E+01	759	3.565E+00
596	5.440E+01	637	5.723E+01	678	3.213E+01	719	1.156E+01	760	3.428E+00
597	5.483E+01	638	5.679E+01	679	3.136E+01	720	1.118E+01	761	3.307E+00
598	5.532E+01	639	5.640E+01	680	3.072E+01	721	1.088E+01	762	3.224E+00
599	5.578E+01	640	5.596E+01	681	3.006E+01	722	1.056E+01	763	3.124E+00
600	5.617E+01	641	5.549E+01	682	2.945E+01	723	1.025E+01	764	3.030E+00
601	5.659E+01	642	5.499E+01	683	2.883E+01	724	9.972E+00	765	2.930E+00
602	5.687E+01	643	5.456E+01	684	2.816E+01	725	9.676E+00	766	2.844E+00
603	5.726E+01	644	5.413E+01	685	2.761E+01	726	9.385E+00	767	2.777E+00
604	5.763E+01	645	5.360E+01	686	2.694E+01	727	9.140E+00	768	2.685E+00
605	5.803E+01	646	5.313E+01	687	2.631E+01	728	8.891E+00	769	2.575E+00
606	5.835E+01	647	5.259E+01	688	2.570E+01	729	8.625E+00	770	2.534E+00
607	5.859E+01	648	5.204E+01	689	2.517E+01	730	8.347E+00	771	2.415E+00
608	5.897E+01	649	5.146E+01	690	2.458E+01	731	8.113E+00	772	2.379E+00
609	5.919E+01	650	5.089E+01	691	2.399E+01	732	7.844E+00	773	2.326E+00
610	5.952E+01	651	5.019E+01	692	2.351E+01	733	7.650E+00	774	2.266E+00
611	5.962E+01	652	4.972E+01	693	2.289E+01	734	7.391E+00	775	2.173E+00
612	5.984E+01	653	4.907E+01	694	2.234E+01	735	7.130E+00	776	2.089E+00
613	6.011E+01	654	4.843E+01	695	2.182E+01	736	6.998E+00	777	2.043E+00
614	6.012E+01	655	4.782E+01	696	2.125E+01	737	6.776E+00	778	2.001E+00
615	6.022E+01	656	4.722E+01	697	2.074E+01	738	6.565E+00	779	2.005E+00
616	6.042E+01	657	4.669E+01	698	2.022E+01	739	6.345E+00	780	2.009E+00
617	6.055E+01	658	4.592E+01	699	1.969E+01	740	6.180E+00		
618	6.057E+01	659	4.529E+01	700	1.926E+01	741	5.993E+00		
619	6.057E+01	660	4.472E+01	701	1.871E+01	742	5.800E+00		
620	6.062E+01	661	4.389E+01	702	1.825E+01	743	5.612E+00		
621	6.062E+01	662	4.331E+01	703	1.780E+01	744	5.470E+00		
622	6.057E+01	663	4.256E+01	704	1.729E+01	745	5.301E+00		
623	6.049E+01	664	4.190E+01	705	1.682E+01	746	5.180E+00		
624	6.049E+01	665	4.107E+01	706	1.639E+01	747	5.004E+00		
625	6.034E+01	666	4.048E+01	707	1.601E+01	748	4.861E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Control Setting: 3000K

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Downward**

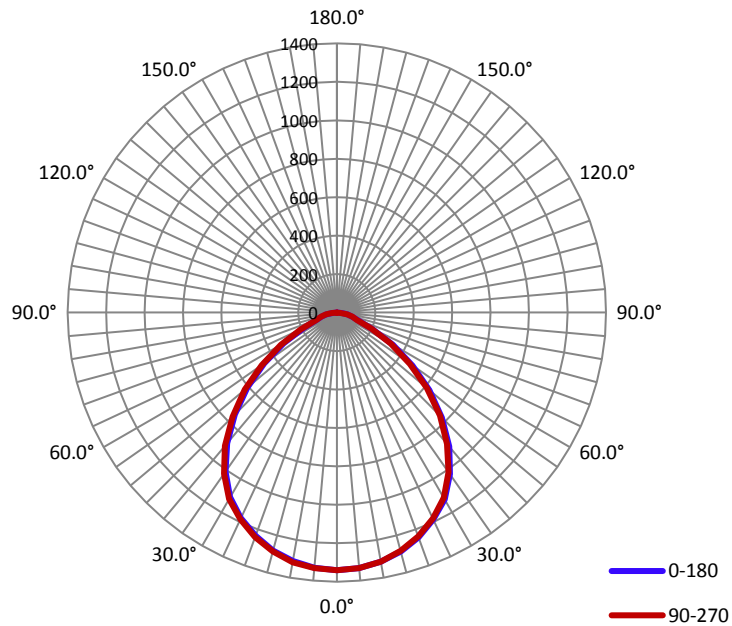
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.2590	31.01	0.9980

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
3002.4	96.87	1340.0	1.23	1.23

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	96.3	96.4	96.4	96.4	96.4
Field Angle(10% I_{max}):	137.6	137.7	137.7	137.7	137.7

Luminous Intensity (cd) Distribution Data

C \ Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1340	1340	1340	1340	1340	1340	1340	1340
5.0°	1334	1335	1334	1335	1335	1333	1334	1333
10.0°	1316	1316	1315	1315	1315	1315	1316	1315
15.0°	1286	1286	1285	1285	1283	1283	1284	1285
20.0°	1244	1242	1240	1239	1238	1238	1239	1242
25.0°	1188	1186	1184	1184	1182	1181	1184	1185
30.0°	1122	1118	1114	1113	1112	1112	1114	1118
35.0°	1026	1021	1017	1015	1013	1013	1015	1020
40.0°	909	904	898	896	892	892	895	901
45.0°	772	770	764	759	758	757	759	763
50.0°	629	626	621	615	611	612	615	618
55.0°	481	479	473	468	465	466	468	471
60.0°	336	334	330	326	323	324	325	328
65.0°	207	203	202	199	197	196	199	201
70.0°	116	114	114	113	113	114	114	115
75.0°	85	84	84	84	84	84	85	85
80.0°	57	56	55	55	54	55	56	57
85.0°	27	27	25	23	23	24	26	28
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

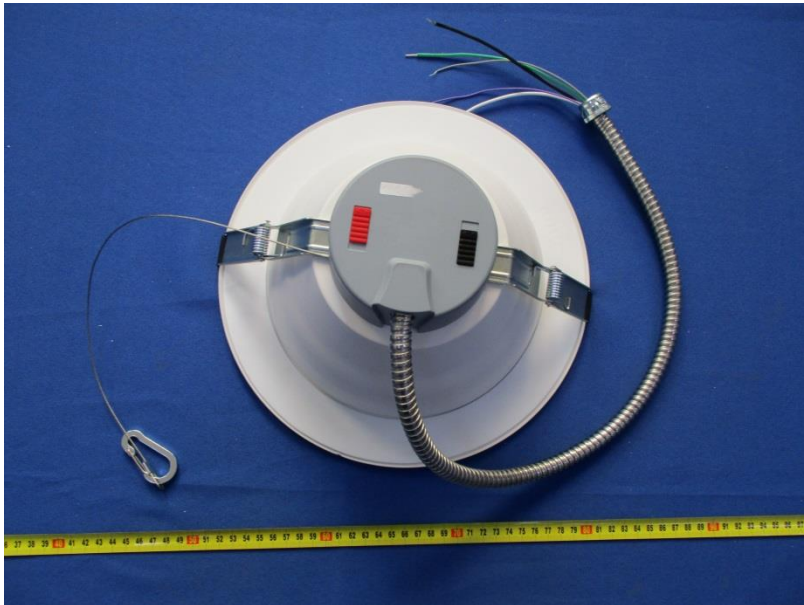
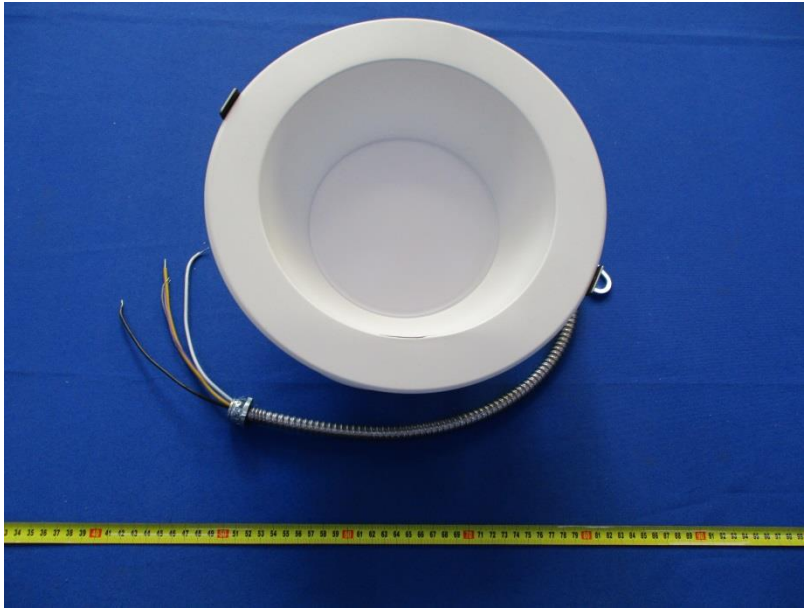
C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1340	1340	1340	1340	1340	1340	1340	1340
5.0°	1332	1334	1334	1336	1335	1334	1335	1334
10.0°	1313	1315	1315	1317	1318	1317	1317	1314
15.0°	1281	1283	1285	1287	1286	1286	1284	1283
20.0°	1236	1240	1241	1242	1243	1241	1241	1239
25.0°	1180	1182	1185	1187	1186	1186	1185	1184
30.0°	1109	1112	1116	1120	1119	1119	1118	1114
35.0°	1009	1015	1020	1022	1022	1023	1023	1019
40.0°	888	893	898	902	905	903	903	900
45.0°	750	758	763	766	767	767	768	765
50.0°	607	611	615	620	624	621	621	618
55.0°	460	463	468	474	477	477	473	470
60.0°	317	320	326	332	335	335	330	327
65.0°	191	196	201	205	207	204	203	200
70.0°	111	112	115	116	115	114	114	113
75.0°	83	83	83	84	84	84	83	82
80.0°	55	55	55	56	56	56	55	54
85.0°	25	26	27	27	27	27	26	26
90.0°	0	0	0	0	0	0	0	0
95.0°	0	0	0	0	0	0	0	0
100.0°	0	0	0	0	0	0	0	0
105.0°	0	0	0	0	0	0	0	0
110.0°	0	0	0	0	0	0	0	0
115.0°	0	0	0	0	0	0	0	0
120.0°	0	0	0	0	0	0	0	0
125.0°	0	0	0	0	0	0	0	0
130.0°	0	0	0	0	0	0	0	0
135.0°	0	0	0	0	0	0	0	0
140.0°	0	0	0	0	0	0	0	0
145.0°	0	0	0	0	0	0	0	0
150.0°	0	0	0	0	0	0	0	0
155.0°	0	0	0	0	0	0	0	0
160.0°	0	0	0	0	0	0	0	0
165.0°	0	0	0	0	0	0	0	0
170.0°	0	0	0	0	0	0	0	0
175.0°	0	0	0	0	0	0	0	0
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	32.0	1.06
5-10	94.8	3.16
10-15	154.2	5.14
15-20	208.1	6.93
20-25	254.3	8.47
25-30	291.0	9.69
30-35	314.2	10.47
35-40	319.8	10.65
40-45	307.6	10.24
45-50	279.0	9.29
50-55	236.7	7.88
55-60	184.6	6.15
60-65	128.6	4.28
65-70	79.7	2.65
70-75	51.6	1.72
75-80	37.2	1.24
80-85	22.1	0.74
85-90	7.1	0.24
90-95	0.0	0.00
95-100	0.0	0.00
100-105	0.0	0.00
105-110	0.0	0.00
110-115	0.0	0.00
115-120	0.0	0.00
120-125	0.0	0.00
125-130	0.0	0.00
130-135	0.0	0.00
135-140	0.0	0.00
140-145	0.0	0.00
145-150	0.0	0.00
150-155	0.0	0.00
155-160	0.0	0.00
160-165	0.0	0.00
165-170	0.0	0.00
170-175	0.0	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	32.0	1.06
0-10	126.8	4.22
0-15	281.0	9.36
0-20	489.1	16.29
0-25	743.3	24.76
0-30	1034.4	34.45
0-35	1348.6	44.92
0-40	1668.4	55.57
0-45	1976.0	65.81
0-50	2254.9	75.10
0-55	2491.6	82.99
0-60	2676.2	89.14
0-65	2804.8	93.42
0-70	2884.4	96.07
0-75	2936.0	97.79
0-80	2973.2	99.03
0-85	2995.3	99.76
0-90	3002.4	100.00
0-95	3002.4	100.00
0-100	3002.4	100.00
0-105	3002.4	100.00
0-110	3002.4	100.00
0-115	3002.4	100.00
0-120	3002.4	100.00
0-125	3002.4	100.00
0-130	3002.4	100.00
0-135	3002.4	100.00
0-140	3002.4	100.00
0-145	3002.4	100.00
0-150	3002.4	100.00
0-155	3002.4	100.00
0-160	3002.4	100.00
0-165	3002.4	100.00
0-170	3002.4	100.00
0-175	3002.4	100.00
0-180	3002.4	100.00

6. Product Photo



Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★"
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
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*****END OF REPORT*****