



# ANSI/IES LM-79-19

## MEASUREMENT AND TEST REPORT

For

**LED One Corporation**  
12437 Belgrave Ave, Eastvale, CA 91752

**Test Model: LOC-8DL-MW(10/15/24)MCCT(27/30/35/40/50)D**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution, THD
<b>Reviewed By:</b>	Ezer Pan <span style="float: right;"><i>Ezer Pan</i></span>
<b>Report Number:</b>	KS2240126-06267E-EE
<b>Test Date:</b>	2024-01-04
<b>Report Date:</b>	2024-02-21
<b>Approved by:</b>	Blake Zhang / EE Engineer
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Shenzhen) 5/F(B-West) -7/F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, Guangdong, China. Tel: +86-755-33320018 Fax: +86-755-33320008
<b>Test Location 1:</b>	Test facility was located at No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.
<b>Test Location 2:</b>	Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government. \*This report contains data that are not covered by the NVLAP accreditation.

## 1. Product Description#

### General Information:

One test sample was in good condition and received on 2023-12-25, and used for testing. All tests and evaluations were performed at the most consumptive white light setting.

Model Tested: LOC-8DL-MW(10/15/24)MCCT(27/30/35/40/50)D  
 Manufacturer: LED One Corporation  
 Brand Name: LED One  
 Product Designation: LED recessed downlight  
 Burning Time Before Test: 0hour(For New Products)

### Rated Values:

Rated Voltage/Frequency: 120-277V AC 50/60Hz  
 Rated Power: 10W/15W24W  
 Nominal CCT: 2700K/3000K/3500K/4000K/5000K  
 Nominal Lumen Output: 2400lm

### Note:

1. The applicant *LED One Corporation* declared that their products are the same to the product in report# KS2231225-78268-EE and is authorized by original applicant to use their test data.
2. All the data in previous report (KS2231225-78268-EE) is shared in report

## 2. Standards Used

- ANSI/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
- \*IES TM-30-18: IES Method for Evaluating Light Source Color Rendition (This method is not in NVLAP accreditation scope)

## 3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2023-09-02	2024-09-01
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2023-09-02	2024-09-01
Digital Power Meter	EVERFINE	PF2010A	1011004	2023-09-02	2024-09-01
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2023-09-02	2024-09-01
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2023-09-02	2024-09-01
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2023-09-02	2024-09-01
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2023-09-02	2024-09-01

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Digital power meter	YOKOGAWA	WT-210	91j926132	2023-09-02	2024-09-01
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2023-09-02	2024-09-01
wireless remote thermohygrometer	N/A	AOK-5017B	N/A	2023-09-02	2024-09-01
Standard Light Source	EVERFINE	D908	N/A	2023-05-12	2025-05-11

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) 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% and 65%. The air flow around the SSL product is less than 0.2m/s.

##### 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.

$4\pi$  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  $U=2.1\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=22\text{K}$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.1(K=2)$ , at the 95% confidence level.

The uncertainty of power meter AC current  $U=0.19\%$  of rdg, AC Voltage  $U=0.18\%$  of rdg, Power  $U=0.46\%$  ( $K=2$ ), 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 luminous intensity distribution, The vertical angle ( $\gamma$ ) test intervals were set no more than 2.5 degree, The horizontal angle (C plane) test intervals were set no more than 22.5 degree. For color spatial uniformity, The vertical angle ( $\gamma$ ) test intervals were set no more than 90 degree, The horizontal angle (C plane) test intervals were set no more than 10 degree

The uncertainty of the luminous intensity is  $U=2.00\%$  ( $K=2$ ), at the 95% confidence level.

##### Additional Test

The Additional Test item may not be covered by ANSI/IES LM-79-2019. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at  $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ . Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current  $U=0.19\%$  of rdg, AC Voltage  $U=0.15\%$  of rdg, Power  $U=0.46\%$  ( $K=2$ ), at the 95% confidence level.

##### Fidelity Index and Gamut Index Calculation

The  $R_f$ ,  $R_g$  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]

Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

The diameter of the sphere: 2M

The coating reflectance of sphere: 98%

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

Test orientation: **Downward**

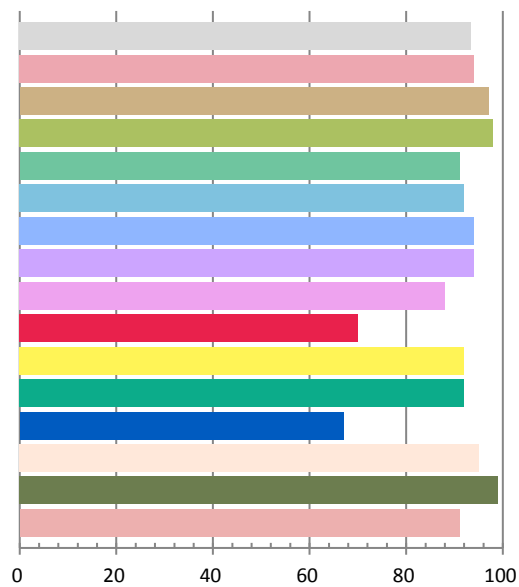
### Photometric and Electrical Measurement Result

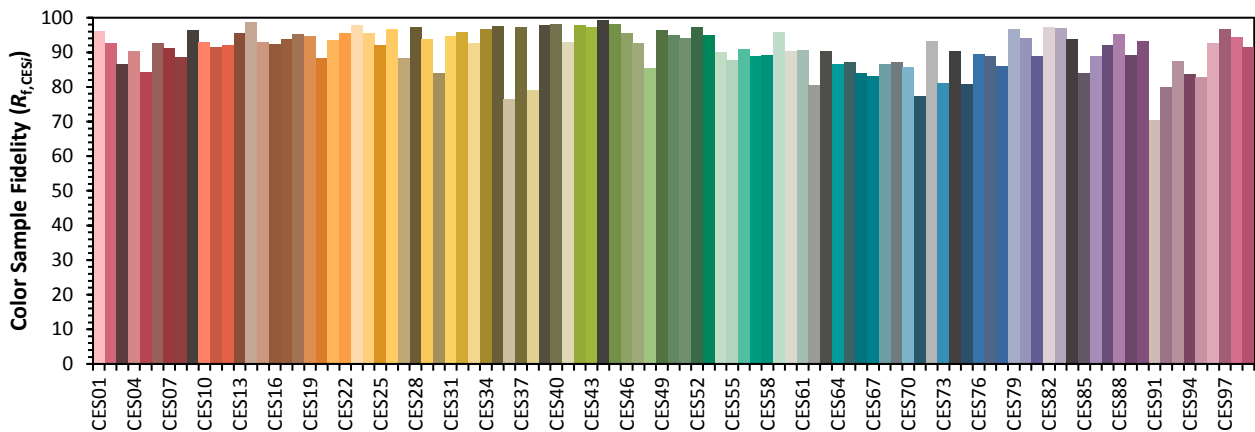
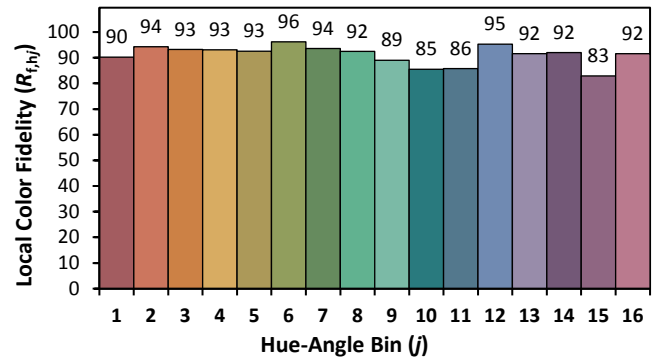
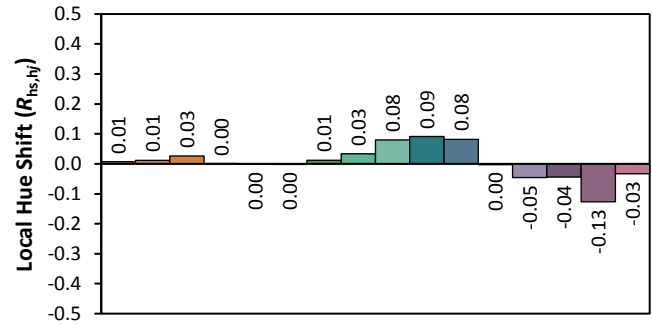
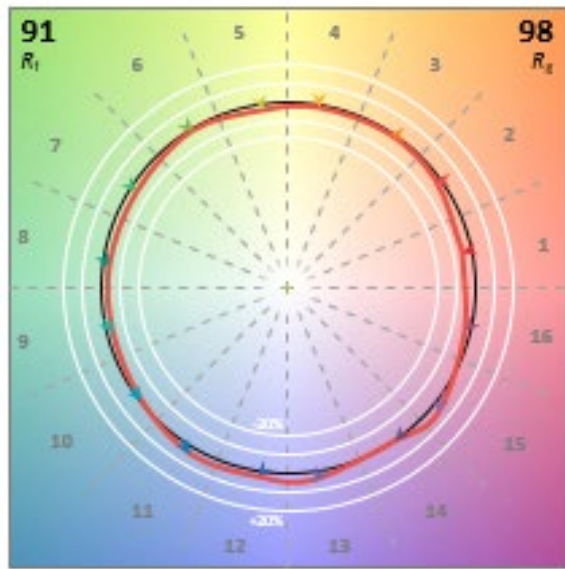
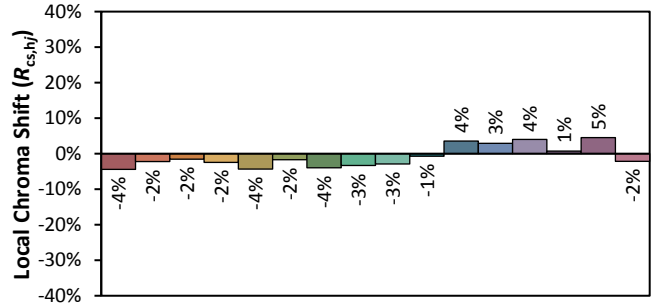
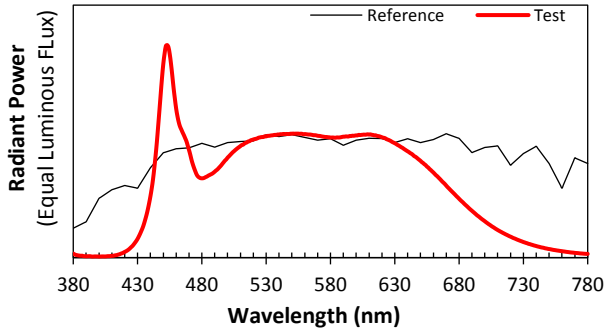
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.1914	22.87	0.9957	2434.9	106.45

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
8.3912	4999	0.00342	0.3458	0.3591	0.2090	0.4884

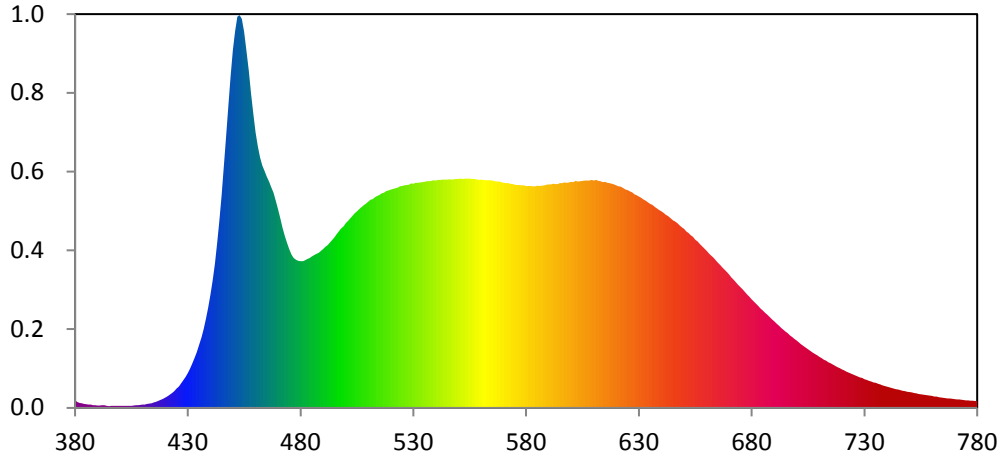
### Color Rendering Index

Ra			
<b>93.4</b>			
R1	R2	R3	R4
94	97	98	91
R5	R6	R7	R8
92	94	94	88
R9	R10	R11	R12
70	92	92	67
R13	R14	R15	
95	99	91	





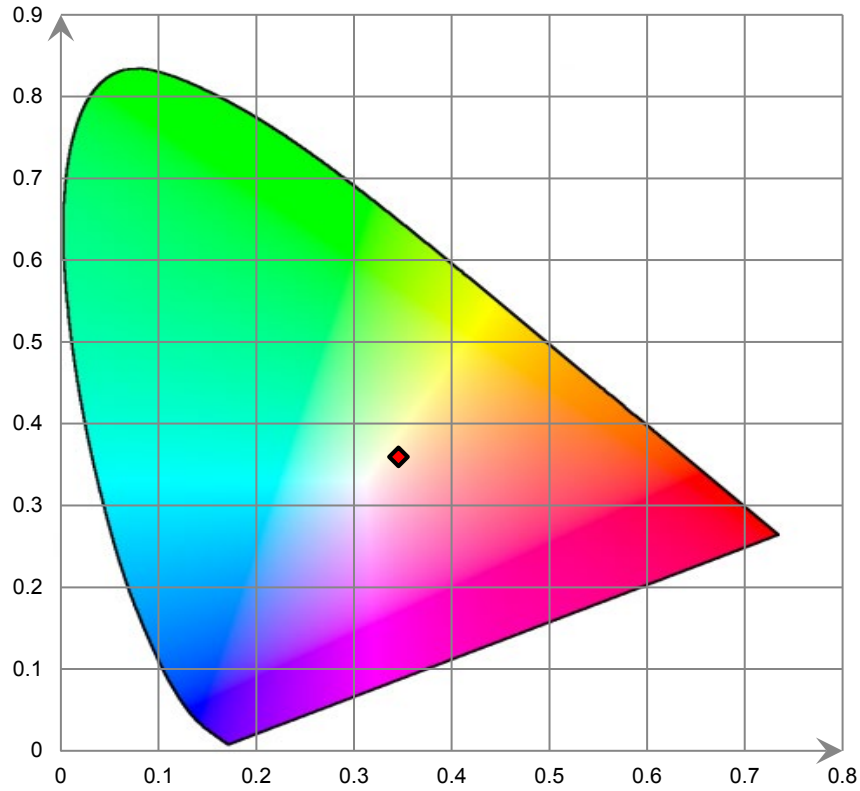
**Relative Spectral Power Distribution**



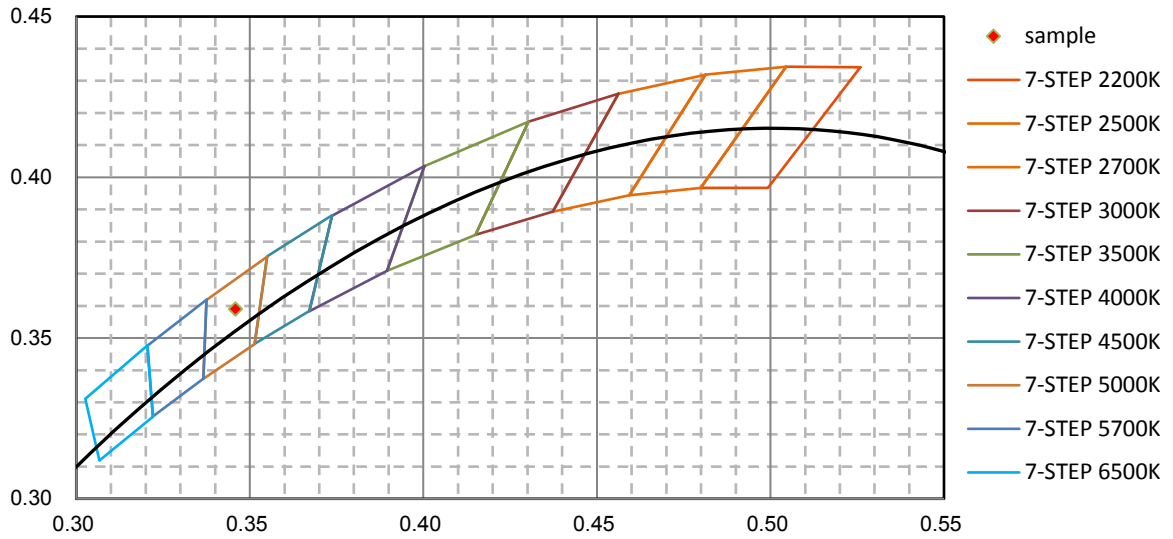
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.149E+00	421	1.794E+00	462	3.827E+01	503	2.936E+01	544	3.491E+01
381	9.211E-01	422	2.012E+00	463	3.702E+01	504	2.974E+01	545	3.489E+01
382	7.694E-01	423	2.272E+00	464	3.620E+01	505	3.005E+01	546	3.492E+01
383	6.845E-01	424	2.589E+00	465	3.535E+01	506	3.038E+01	547	3.490E+01
384	6.107E-01	425	2.948E+00	466	3.459E+01	507	3.068E+01	548	3.492E+01
385	5.621E-01	426	3.275E+00	467	3.373E+01	508	3.097E+01	549	3.499E+01
386	5.227E-01	427	3.720E+00	468	3.286E+01	509	3.123E+01	550	3.499E+01
387	5.381E-01	428	4.205E+00	469	3.164E+01	510	3.150E+01	551	3.502E+01
388	4.165E-01	429	4.712E+00	470	3.039E+01	511	3.179E+01	552	3.499E+01
389	4.049E-01	430	5.293E+00	471	2.904E+01	512	3.188E+01	553	3.501E+01
390	3.690E-01	431	5.992E+00	472	2.754E+01	513	3.218E+01	554	3.501E+01
391	3.855E-01	432	6.751E+00	473	2.631E+01	514	3.239E+01	555	3.501E+01
392	3.993E-01	433	7.591E+00	474	2.524E+01	515	3.254E+01	556	3.496E+01
393	4.033E-01	434	8.465E+00	475	2.428E+01	516	3.280E+01	557	3.499E+01
394	3.353E-01	435	9.545E+00	476	2.342E+01	517	3.287E+01	558	3.495E+01
395	2.910E-01	436	1.079E+01	477	2.290E+01	518	3.313E+01	559	3.483E+01
396	3.179E-01	437	1.211E+01	478	2.262E+01	519	3.323E+01	560	3.489E+01
397	3.428E-01	438	1.365E+01	479	2.244E+01	520	3.336E+01	561	3.485E+01
398	3.280E-01	439	1.539E+01	480	2.240E+01	521	3.347E+01	562	3.480E+01
399	3.275E-01	440	1.732E+01	481	2.242E+01	522	3.355E+01	563	3.476E+01
400	2.922E-01	441	1.952E+01	482	2.255E+01	523	3.366E+01	564	3.476E+01
401	3.115E-01	442	2.208E+01	483	2.275E+01	524	3.385E+01	565	3.471E+01
402	3.303E-01	443	2.524E+01	484	2.291E+01	525	3.393E+01	566	3.464E+01
403	3.403E-01	444	2.874E+01	485	2.315E+01	526	3.402E+01	567	3.457E+01
404	3.301E-01	445	3.261E+01	486	2.333E+01	527	3.405E+01	568	3.457E+01
405	3.274E-01	446	3.707E+01	487	2.352E+01	528	3.408E+01	569	3.451E+01
406	3.689E-01	447	4.158E+01	488	2.370E+01	529	3.428E+01	570	3.441E+01
407	4.149E-01	448	4.622E+01	489	2.397E+01	530	3.423E+01	571	3.437E+01
408	4.055E-01	449	5.074E+01	490	2.427E+01	531	3.437E+01	572	3.434E+01
409	4.496E-01	450	5.468E+01	491	2.460E+01	532	3.439E+01	573	3.424E+01
410	4.959E-01	451	5.759E+01	492	2.487E+01	533	3.444E+01	574	3.418E+01
411	5.117E-01	452	5.976E+01	493	2.526E+01	534	3.451E+01	575	3.412E+01
412	5.948E-01	453	6.002E+01	494	2.565E+01	535	3.454E+01	576	3.406E+01
413	6.706E-01	454	5.943E+01	495	2.605E+01	536	3.462E+01	577	3.406E+01
414	7.294E-01	455	5.750E+01	496	2.652E+01	537	3.466E+01	578	3.400E+01
415	8.569E-01	456	5.473E+01	497	2.696E+01	538	3.467E+01	579	3.398E+01
416	9.516E-01	457	5.142E+01	498	2.741E+01	539	3.477E+01	580	3.391E+01
417	1.116E+00	458	4.792E+01	499	2.775E+01	540	3.476E+01	581	3.391E+01
418	1.240E+00	459	4.489E+01	500	2.823E+01	541	3.485E+01	582	3.392E+01
419	1.412E+00	460	4.208E+01	501	2.859E+01	542	3.483E+01	583	3.387E+01
420	1.612E+00	461	3.996E+01	502	2.898E+01	543	3.490E+01	584	3.386E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	3.394E+01	626	3.309E+01	667	2.145E+01	708	8.244E+00	749	2.478E+00
586	3.392E+01	627	3.290E+01	668	2.112E+01	709	8.020E+00	750	2.419E+00
587	3.393E+01	628	3.266E+01	669	2.076E+01	710	7.799E+00	751	2.364E+00
588	3.399E+01	629	3.249E+01	670	2.034E+01	711	7.593E+00	752	2.284E+00
589	3.408E+01	630	3.230E+01	671	1.993E+01	712	7.383E+00	753	2.205E+00
590	3.415E+01	631	3.210E+01	672	1.957E+01	713	7.197E+00	754	2.145E+00
591	3.416E+01	632	3.185E+01	673	1.919E+01	714	6.986E+00	755	2.093E+00
592	3.423E+01	633	3.166E+01	674	1.882E+01	715	6.809E+00	756	2.024E+00
593	3.421E+01	634	3.143E+01	675	1.846E+01	716	6.610E+00	757	1.976E+00
594	3.420E+01	635	3.119E+01	676	1.810E+01	717	6.440E+00	758	1.915E+00
595	3.435E+01	636	3.100E+01	677	1.773E+01	718	6.257E+00	759	1.867E+00
596	3.432E+01	637	3.073E+01	678	1.734E+01	719	6.071E+00	760	1.815E+00
597	3.443E+01	638	3.049E+01	679	1.700E+01	720	5.914E+00	761	1.758E+00
598	3.440E+01	639	3.025E+01	680	1.662E+01	721	5.749E+00	762	1.713E+00
599	3.446E+01	640	3.002E+01	681	1.625E+01	722	5.558E+00	763	1.650E+00
600	3.452E+01	641	2.980E+01	682	1.591E+01	723	5.427E+00	764	1.601E+00
601	3.451E+01	642	2.952E+01	683	1.559E+01	724	5.278E+00	765	1.558E+00
602	3.467E+01	643	2.932E+01	684	1.521E+01	725	5.109E+00	766	1.504E+00
603	3.460E+01	644	2.904E+01	685	1.487E+01	726	4.967E+00	767	1.458E+00
604	3.466E+01	645	2.869E+01	686	1.455E+01	727	4.823E+00	768	1.425E+00
605	3.469E+01	646	2.849E+01	687	1.420E+01	728	4.683E+00	769	1.395E+00
606	3.474E+01	647	2.823E+01	688	1.385E+01	729	4.550E+00	770	1.335E+00
607	3.471E+01	648	2.791E+01	689	1.353E+01	730	4.400E+00	771	1.308E+00
608	3.476E+01	649	2.762E+01	690	1.322E+01	731	4.287E+00	772	1.281E+00
609	3.482E+01	650	2.733E+01	691	1.290E+01	732	4.153E+00	773	1.245E+00
610	3.474E+01	651	2.697E+01	692	1.259E+01	733	4.047E+00	774	1.193E+00
611	3.481E+01	652	2.672E+01	693	1.227E+01	734	3.893E+00	775	1.167E+00
612	3.468E+01	653	2.638E+01	694	1.194E+01	735	3.815E+00	776	1.142E+00
613	3.465E+01	654	2.612E+01	695	1.168E+01	736	3.685E+00	777	1.103E+00
614	3.451E+01	655	2.571E+01	696	1.139E+01	737	3.584E+00	778	1.082E+00
615	3.455E+01	656	2.544E+01	697	1.108E+01	738	3.461E+00	779	1.056E+00
616	3.440E+01	657	2.504E+01	698	1.080E+01	739	3.366E+00	780	1.058E+00
617	3.433E+01	658	2.473E+01	699	1.054E+01	740	3.267E+00		
618	3.426E+01	659	2.437E+01	700	1.027E+01	741	3.156E+00		
619	3.413E+01	660	2.404E+01	701	9.986E+00	742	3.075E+00		
620	3.399E+01	661	2.366E+01	702	9.725E+00	743	2.977E+00		
621	3.386E+01	662	2.328E+01	703	9.458E+00	744	2.879E+00		
622	3.379E+01	663	2.298E+01	704	9.224E+00	745	2.819E+00		
623	3.361E+01	664	2.260E+01	705	8.955E+00	746	2.737E+00		
624	3.339E+01	665	2.224E+01	706	8.714E+00	747	2.627E+00		
625	3.326E+01	666	2.185E+01	707	8.499E+00	748	2.571E+00		

**CIE 1931 x y Chromaticity Diagram**



**7-Step Chromaticity Quadrangles**



**[Goniophotometer System]**

Test facility was located at No.12, Pulong East 1<sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.

The photometric distance: 2.513m

Total operating time for luminous intensity distribution: **1.5 hour**

Test orientation: **Downward**

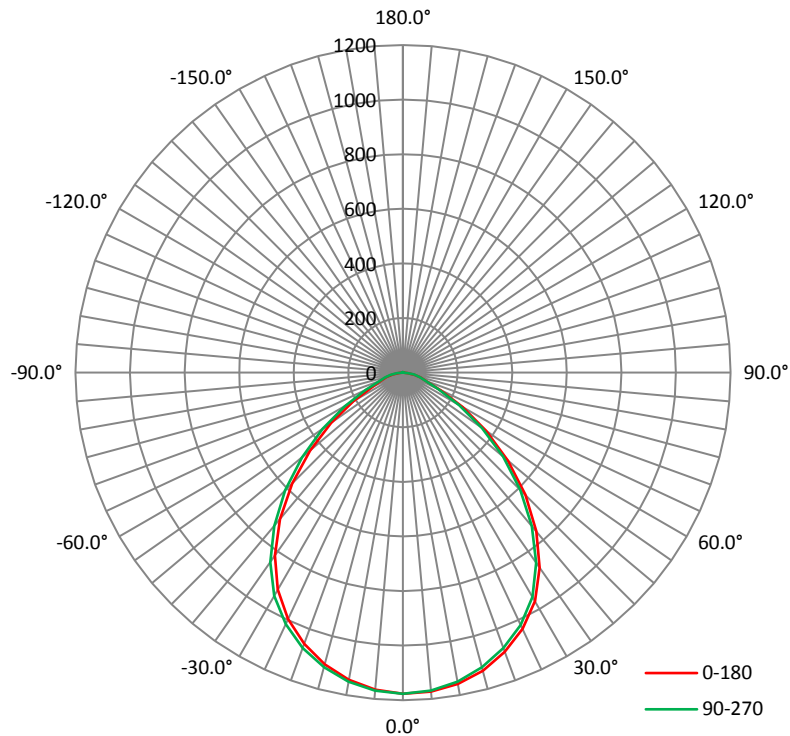
**Electrical Measurement**

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.02	60	0.1918	22.910	0.9952

**Photometric Measurement**

Luminous Flux (lm)	Efficacy (lm/W)	I <sub>max</sub> (cd)	S/MH (C0/180)	S/MH (C90/270)
2446.03	106.77	1178	1.22	1.20

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I <sub>max</sub> ):	91.1	91.6	91.6	91.6	91.5
Field Angle (10% I <sub>max</sub> ):	132.6	134.1	134.0	133.8	133.6

**Luminous Intensity (cd) Distribution Data**

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	1176	1176	1176	1176	1176	1176	1176	1176
1°	1176	1175	1175	1177	1176	1176	1177	1176
2°	1175	1175	1173	1175	1175	1175	1176	1177
3°	1172	1171	1172	1174	1173	1174	1175	1176
4°	1169	1170	1169	1172	1171	1173	1174	1175
5°	1166	1166	1167	1169	1170	1170	1173	1172
6°	1162	1163	1164	1167	1167	1168	1170	1170
7°	1159	1159	1159	1163	1164	1164	1167	1167
8°	1154	1154	1155	1159	1160	1161	1163	1165
9°	1149	1149	1150	1153	1155	1157	1159	1160
10°	1143	1144	1145	1148	1149	1152	1155	1156
11°	1136	1137	1139	1143	1145	1147	1150	1150
12°	1129	1130	1133	1137	1139	1143	1143	1145
13°	1122	1123	1126	1129	1132	1135	1137	1139
14°	1115	1116	1117	1121	1126	1129	1131	1133
15°	1107	1106	1110	1114	1118	1121	1124	1127
16°	1097	1098	1101	1106	1109	1114	1117	1119
17°	1088	1089	1092	1097	1102	1105	1109	1110
18°	1078	1079	1083	1089	1093	1097	1100	1102
19°	1069	1070	1072	1078	1083	1088	1091	1093
20°	1058	1059	1062	1067	1073	1078	1081	1083
21°	1046	1047	1051	1057	1062	1067	1071	1074
22°	1035	1036	1039	1046	1051	1057	1061	1064
23°	1022	1024	1028	1036	1040	1046	1050	1052
24°	1010	1011	1016	1022	1028	1034	1039	1041
25°	996	997	1002	1010	1016	1023	1027	1029
26°	982	984	988	997	1003	1010	1015	1017
27°	968	970	974	984	990	997	1002	1004
28°	952	954	959	968	976	983	988	991
29°	935	938	944	953	961	968	973	975
30°	918	921	928	937	945	951	956	958
31°	899	903	910	919	926	933	939	940
32°	881	885	892	901	908	915	920	922
33°	860	864	872	881	889	895	901	903
34°	839	844	852	862	868	876	881	883
35°	818	822	831	840	848	856	860	863
36°	796	800	809	819	825	834	839	841
37°	773	778	787	797	805	811	816	818
38°	749	755	765	774	781	788	793	796
39°	725	731	741	750	758	765	770	772
40°	700	707	717	727	734	741	746	748
41°	676	683	694	703	711	717	722	724
42°	651	658	669	679	686	692	697	698
43°	626	633	645	654	661	667	672	673
44°	600	607	620	629	636	641	646	648
45°	574	582	595	604	610	616	621	622
46°	548	557	570	579	585	591	595	596
47°	522	531	544	553	560	565	569	569
48°	496	505	519	528	534	539	542	543

**Luminous Intensity (cd) Distribution Data**

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	471	480	493	503	508	513	517	517
50°	445	455	468	478	483	488	491	491
51°	420	429	444	452	458	462	466	465
52°	394	405	418	427	433	437	440	438
53°	370	380	395	403	408	412	415	413
54°	345	355	370	379	383	388	390	387
55°	321	332	346	354	359	363	365	363
56°	297	308	323	331	335	339	341	338
57°	274	286	300	308	312	316	317	314
58°	252	263	278	285	289	293	294	290
59°	230	242	256	263	267	270	272	267
60°	209	221	235	242	246	248	250	246
61°	189	201	214	220	224	227	228	224
62°	170	182	195	200	204	207	208	203
63°	152	164	176	182	185	188	189	184
64°	136	148	159	164	167	169	170	166
65°	123	133	143	147	150	152	153	149
66°	111	120	128	132	135	136	137	133
67°	103	109	115	119	121	122	123	120
68°	97	100	105	108	109	110	110	108
69°	92	94	97	99	100	100	100	98
70°	87	89	91	93	94	94	93	91
71°	82	84	86	89	89	89	87	85
72°	77	79	81	84	84	84	83	81
73°	73	74	77	79	80	79	78	76
74°	68	69	71	74	75	75	73	71
75°	63	64	67	69	70	70	68	66
76°	58	59	62	64	65	65	63	61
77°	53	55	57	59	60	60	58	56
78°	48	50	52	55	56	55	54	52
79°	43	45	47	50	51	51	49	47
80°	38	40	43	45	46	46	44	42
81°	33	35	38	40	42	41	39	37
82°	28	30	33	36	37	36	34	32
83°	23	25	28	31	32	31	29	27
84°	18	20	23	26	27	26	24	22
85°	13	15	18	21	23	22	19	16
86°	7	9	13	16	18	17	14	11
87°	4	6	8	11	13	12	9	8
88°	0	3	4	6	6	7	6	4
89°	0	0	0	3	3	3	3	1
90°	0	0	0	0	0	0	0	0
91°	0	0	0	0	0	0	0	0
92°	0	0	0	0	0	0	0	0
93°	0	0	0	0	0	0	0	0
94°	0	0	0	0	0	0	0	0
95°	0	0	0	0	0	0	0	0
96°	0	0	0	0	0	0	0	0
97°	0	0	0	0	0	0	0	0

**Luminous Intensity (cd) Distribution Data**

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
98°	0	0	0	0	0	0	0	0
99°	0	0	0	0	0	0	0	0
100°	0	0	0	0	0	0	0	0
101°	0	0	0	0	0	0	0	0
102°	0	0	0	0	0	0	0	0
103°	0	0	0	0	0	0	0	0
104°	0	0	0	0	0	0	0	0
105°	0	0	0	0	0	0	0	0
106°	0	0	0	0	0	0	0	0
107°	0	0	0	0	0	0	0	0
108°	0	0	0	0	0	0	0	0
109°	0	0	0	0	0	0	0	0
110°	0	0	0	0	0	0	0	0
111°	0	0	0	0	0	0	0	0
112°	0	0	0	0	0	0	0	0
113°	0	0	0	0	0	0	0	0
114°	0	0	0	0	0	0	0	0
115°	0	0	0	0	0	0	0	0
116°	0	0	0	0	0	0	0	0
117°	0	0	0	0	0	0	0	0
118°	0	0	0	0	0	0	0	0
119°	0	0	0	0	0	0	0	0
120°	0	0	0	0	0	0	0	0
121°	0	0	0	0	0	0	0	0
122°	0	0	0	0	0	0	0	0
123°	0	0	0	0	0	0	0	0
124°	0	0	0	0	0	0	0	0
125°	0	0	0	0	0	0	0	0
126°	0	0	0	0	0	0	0	0
127°	0	0	1	1	1	1	0	0
128°	1	1	1	1	1	1	1	0
129°	1	1	1	1	1	1	1	1
130°	1	1	1	1	1	1	1	1
131°	1	1	1	1	1	1	1	1
132°	1	1	1	1	1	1	1	1
133°	1	1	1	1	1	1	1	1
134°	1	1	1	1	1	1	1	1
135°	1	1	1	1	1	1	1	1
136°	1	1	1	1	1	1	1	1
137°	1	1	1	1	1	1	1	1
138°	1	1	1	1	1	1	1	1
139°	1	1	1	1	1	1	1	1
140°	1	1	1	1	1	1	1	1
141°	1	1	1	1	1	1	1	1
142°	1	1	1	1	1	1	1	1
143°	1	1	1	1	1	1	1	1
144°	1	1	1	1	1	1	1	1
145°	1	1	1	1	1	1	1	1
146°	1	1	1	1	1	1	1	1

**Luminous Intensity (cd) Distribution Data**

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
147°	1	1	1	2	2	2	1	1
148°	1	1	2	2	2	2	1	1
149°	1	2	2	2	2	2	2	1
150°	1	2	2	2	2	2	2	1
151°	2	2	2	2	2	2	2	2
152°	2	2	2	2	2	2	2	2
153°	2	2	2	2	2	2	2	2
154°	2	2	2	2	2	2	2	2
155°	2	2	2	2	2	2	2	2
156°	2	2	2	2	2	2	2	2
157°	2	2	2	2	2	2	2	2
158°	2	2	2	2	2	2	2	2
159°	2	2	2	2	2	2	2	2
160°	2	2	2	2	2	2	2	2
161°	2	2	2	2	2	2	2	2
162°	2	2	2	2	2	2	2	2
163°	2	2	2	2	2	2	2	2
164°	2	2	2	2	2	2	2	2
165°	2	2	2	2	2	2	2	2
166°	2	2	2	2	2	2	2	2
167°	2	2	2	2	2	2	2	2
168°	2	2	2	2	2	2	2	2
169°	2	2	2	2	2	2	2	2
170°	2	2	2	2	2	2	2	2
171°	2	2	2	2	2	2	2	2
172°	2	2	2	2	2	2	2	2
173°	2	2	2	2	2	2	2	2
174°	2	2	2	2	2	2	2	2
175°	2	2	2	2	2	2	2	2
176°	2	2	2	2	2	2	2	2
177°	2	2	2	2	2	2	2	2
178°	2	2	2	2	2	2	2	2
179°	2	2	2	1	1	2	2	2
180°	2	2	1	1	1	1	2	2

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	1176	1176	1176	1176	1176	1176	1176	1176
1°	1178	1177	1176	1176	1176	1176	1176	1175
2°	1177	1177	1175	1176	1174	1174	1175	1174
3°	1177	1176	1175	1176	1174	1173	1172	1173
4°	1176	1175	1173	1174	1172	1171	1170	1170
5°	1173	1173	1172	1172	1170	1168	1167	1167
6°	1171	1171	1170	1169	1167	1165	1164	1164
7°	1168	1168	1166	1166	1163	1161	1161	1160
8°	1166	1165	1163	1163	1159	1157	1156	1156
9°	1163	1161	1160	1158	1154	1153	1151	1150
10°	1158	1157	1155	1154	1150	1147	1145	1144
11°	1154	1153	1151	1149	1145	1142	1139	1139
12°	1148	1147	1145	1143	1140	1136	1133	1132
13°	1143	1141	1139	1137	1133	1129	1127	1126
14°	1136	1135	1133	1130	1126	1122	1119	1118
15°	1130	1128	1125	1123	1118	1114	1111	1110
16°	1123	1122	1118	1116	1110	1105	1103	1102
17°	1115	1113	1110	1107	1102	1097	1095	1092
18°	1107	1106	1102	1098	1093	1089	1085	1083
19°	1097	1096	1093	1089	1084	1079	1076	1073
20°	1089	1087	1083	1079	1073	1068	1065	1063
21°	1079	1078	1073	1070	1063	1058	1054	1052
22°	1069	1066	1063	1059	1053	1048	1043	1040
23°	1058	1056	1052	1047	1042	1036	1032	1029
24°	1046	1045	1040	1037	1031	1025	1021	1016
25°	1036	1034	1030	1025	1019	1013	1009	1004
26°	1024	1022	1018	1013	1008	1001	997	990
27°	1011	1009	1006	1001	995	988	982	977
28°	998	996	991	987	980	973	967	962
29°	982	980	976	972	965	958	951	946
30°	966	964	960	955	949	941	935	929
31°	949	947	943	938	931	924	918	912
32°	932	929	924	920	912	904	898	892
33°	914	910	904	900	892	885	879	872
34°	892	890	884	880	872	864	858	851
35°	873	869	865	859	850	843	837	830
36°	851	848	843	837	830	821	815	808
37°	829	825	820	815	806	799	792	785
38°	806	803	797	791	782	775	769	762
39°	783	780	773	767	759	752	746	739
40°	759	756	750	743	735	728	722	714
41°	735	731	726	719	710	703	697	690
42°	710	706	701	693	686	678	672	665
43°	685	681	675	668	659	653	647	639
44°	660	656	650	642	634	627	621	614
45°	634	630	623	616	608	602	596	588
46°	607	604	597	590	582	576	570	561
47°	580	578	571	564	556	550	544	536
48°	554	551	544	537	530	524	518	510

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
49°	527	525	518	511	504	498	492	484
50°	501	498	492	485	478	472	467	458
51°	475	472	466	459	452	447	441	433
52°	448	446	441	433	426	421	416	408
53°	422	420	415	408	401	397	391	382
54°	397	395	390	383	377	372	367	358
55°	371	369	365	358	352	347	343	334
56°	346	345	341	334	328	324	319	310
57°	322	321	317	311	305	300	296	287
58°	298	297	294	288	282	278	273	264
59°	274	274	271	265	260	255	251	242
60°	252	252	249	243	238	234	230	221
61°	230	230	228	223	217	214	210	201
62°	209	210	208	203	197	194	190	182
63°	189	190	188	183	179	176	173	164
64°	171	172	171	165	161	158	155	147
65°	153	155	153	147	143	140	138	132
66°	135	137	136	132	128	125	123	119
67°	121	123	122	118	115	112	111	108
68°	108	110	109	106	103	101	100	99
69°	98	99	98	96	94	93	93	93
70°	91	91	90	89	88	88	88	88
71°	86	84	84	83	83	83	83	83
72°	81	80	79	79	78	78	78	78
73°	76	75	74	74	74	73	73	73
74°	72	70	70	70	69	69	68	69
75°	67	66	65	65	65	64	64	64
76°	62	61	60	60	60	59	59	59
77°	57	56	56	55	55	55	54	54
78°	52	51	51	50	51	50	49	49
79°	48	47	46	46	46	45	45	45
80°	43	42	41	41	41	41	40	40
81°	38	37	37	36	37	36	35	35
82°	33	32	32	31	32	31	30	30
83°	28	27	27	27	27	27	25	25
84°	23	22	22	22	23	22	21	20
85°	17	17	17	17	18	17	16	15
86°	12	12	12	12	13	12	11	10
87°	7	6	7	8	8	8	6	5
88°	2	2	3	3	3	3	2	1
89°	1	1	1	0	0	0	0	0
90°	0	0	0	0	0	0	0	0
91°	0	0	0	0	0	0	0	0
92°	0	0	0	0	0	0	0	0
93°	0	0	0	0	0	0	0	0
94°	0	0	0	0	0	0	0	0
95°	0	0	0	0	0	0	0	0
96°	0	0	0	0	0	0	0	0
97°	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°
98°	0	0	0	0	0	0	0	0
99°	0	0	0	0	0	0	0	0
100°	0	0	0	0	0	0	0	0
101°	0	0	0	0	0	0	0	0
102°	0	0	0	0	0	0	0	0
103°	0	0	0	0	0	0	0	0
104°	0	0	0	0	0	0	0	0
105°	0	0	0	0	0	0	0	0
106°	0	0	0	0	0	0	0	0
107°	0	0	0	0	0	0	0	0
108°	0	0	0	0	0	0	0	0
109°	0	0	0	0	0	0	0	0
110°	0	0	0	0	0	0	0	0
111°	0	0	0	0	0	0	0	0
112°	0	0	0	0	0	0	0	0
113°	0	0	0	0	0	0	0	0
114°	0	0	0	0	0	0	0	0
115°	0	0	0	0	0	0	0	0
116°	0	0	0	0	0	0	0	0
117°	0	0	0	0	0	0	0	0
118°	0	0	0	0	0	0	0	0
119°	0	0	0	0	0	0	0	0
120°	0	0	0	0	0	0	0	0
121°	0	0	0	0	0	0	0	0
122°	0	0	0	0	0	0	0	0
123°	0	0	0	0	0	0	0	0
124°	0	0	0	0	0	0	0	0
125°	0	0	0	0	0	0	0	0
126°	0	0	0	0	0	0	0	0
127°	0	0	0	0	0	0	0	0
128°	0	0	0	0	0	0	0	0
129°	0	0	0	0	0	0	0	0
130°	0	0	0	0	0	0	0	0
131°	0	0	0	0	0	0	0	0
132°	0	0	0	0	0	0	0	0
133°	0	0	0	0	0	0	0	0
134°	0	0	0	0	0	0	0	0
135°	0	0	0	0	0	0	0	0
136°	0	0	0	0	0	0	0	0
137°	0	0	0	0	0	0	0	0
138°	0	0	0	0	0	0	0	0
139°	0	0	0	0	0	0	0	0
140°	0	0	0	0	0	0	0	0
141°	0	0	0	0	0	0	0	0
142°	0	0	0	1	1	0	1	1
143°	0	0	1	1	1	1	1	1
144°	1	0	1	1	1	1	1	1
145°	1	1	1	1	1	1	1	1
146°	1	1	1	1	1	1	1	1

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
147°	1	1	1	1	1	1	1	1
148°	1	1	1	1	1	1	1	1
149°	1	1	1	1	1	1	1	1
150°	1	1	1	1	1	1	1	1
151°	1	1	1	1	1	1	1	1
152°	1	1	1	1	1	1	1	1
153°	1	1	1	1	1	1	1	1
154°	1	1	1	1	1	1	1	1
155°	1	1	1	1	1	1	1	1
156°	1	1	1	1	1	1	1	1
157°	1	1	1	1	1	1	1	1
158°	1	1	1	1	1	1	1	1
159°	1	1	1	1	1	1	1	1
160°	1	1	1	1	1	1	1	1
161°	1	1	1	1	1	1	1	1
162°	1	1	1	1	1	1	1	1
163°	1	1	1	1	1	1	1	1
164°	1	1	1	1	1	1	1	1
165°	1	1	1	1	1	1	1	1
166°	1	1	1	1	1	1	1	1
167°	1	1	1	1	1	1	1	1
168°	1	1	1	1	1	1	1	1
169°	1	1	1	1	1	1	1	1
170°	1	1	1	1	1	1	1	1
171°	1	1	1	1	1	1	1	1
172°	1	1	1	1	1	1	1	1
173°	1	1	1	1	1	1	1	1
174°	1	1	1	1	1	1	1	1
175°	1	1	1	1	1	1	1	1
176°	1	1	1	1	1	1	1	1
177°	1	1	1	1	1	1	1	1
178°	1	1	1	1	1	1	1	1
179°	1	1	1	1	1	1	1	2
180°	2	2	2	1	1	1	1	2

**Zonal Lumen Density Measurement**

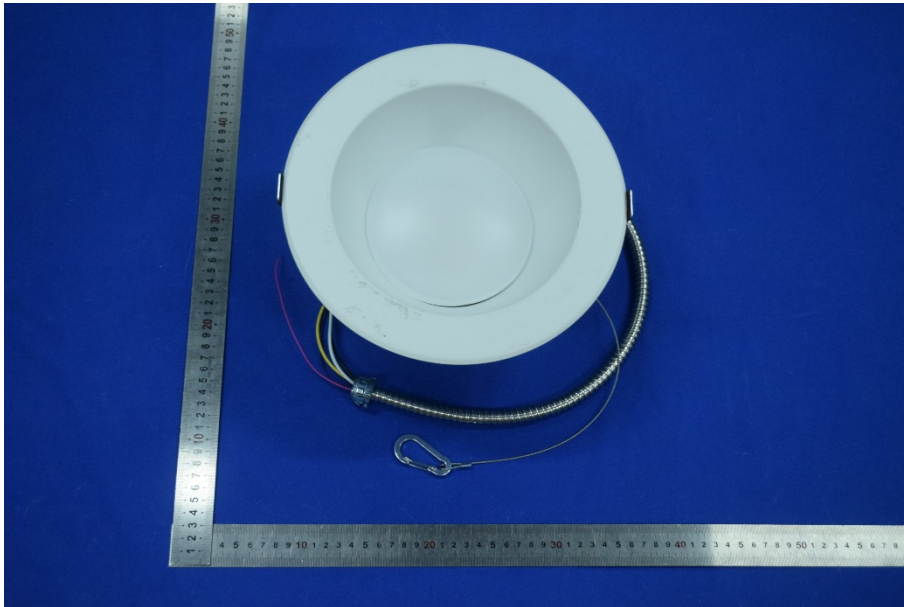
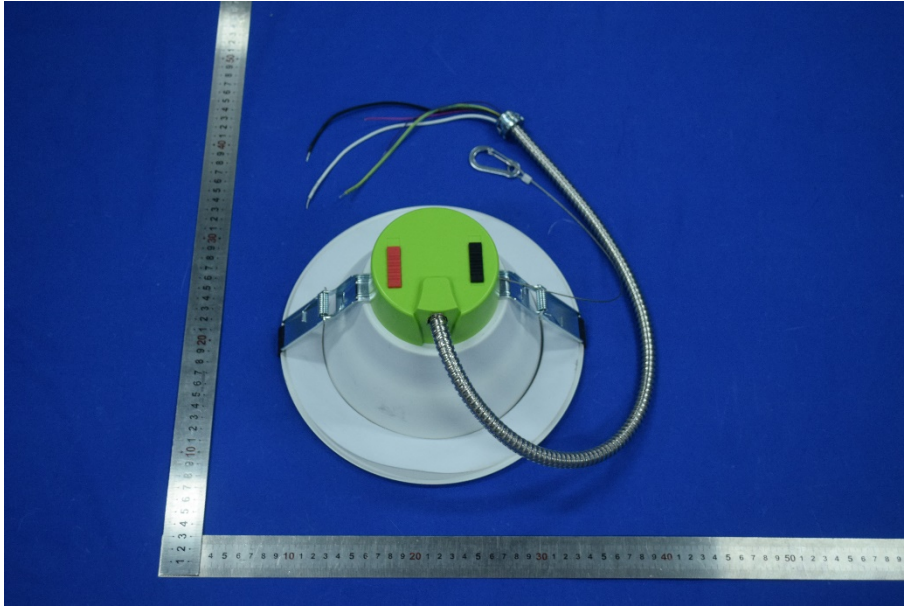
Deg	Flux (lm)	%
0-5	28.0	1.15
5-10	83.0	3.39
10-15	134.6	5.50
15-20	180.6	7.38
20-25	219.2	8.96
25-30	248.5	10.16
30-35	264.1	10.80
35-40	263.7	10.78
40-45	248.1	10.14
45-50	219.0	8.96
50-55	180.1	7.36
55-60	135.9	5.55
60-65	91.9	3.76
65-70	57.1	2.34
70-75	40.7	1.66
75-80	28.9	1.18
80-85	16.2	0.66
85-90	3.7	0.15
90-95	0.0	0.00
95-100	0.0	0.01
100-105	0.1	0.00
105-110	0.1	0.00
110-115	0.1	0.00
115-120	0.1	0.01
120-125	0.1	0.00
125-130	0.2	0.01
130-135	0.2	0.01
135-140	0.2	0.01
140-145	0.3	0.01
145-150	0.3	0.01
150-155	0.3	0.02
155-160	0.3	0.01
160-165	0.2	0.01
165-170	0.2	0.00
170-175	0.1	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	28.0	1.15
0-10	111.0	4.54
0-15	245.6	10.04
0-20	426.2	17.42
0-25	645.3	26.38
0-30	893.8	36.54
0-35	1157.9	47.34
0-40	1421.7	58.12
0-45	1669.7	68.26
0-50	1888.8	77.22
0-55	2068.9	84.58
0-60	2204.7	90.13
0-65	2296.6	93.89
0-70	2353.7	96.23
0-75	2394.5	97.89
0-80	2423.3	99.07
0-85	2439.5	99.73
0-90	2443.2	99.88
0-95	2443.2	99.88
0-100	2443.2	99.89
0-105	2443.3	99.89
0-110	2443.4	99.89
0-115	2443.4	99.89
0-120	2443.6	99.90
0-125	2443.7	99.90
0-130	2443.8	99.91
0-135	2444.0	99.92
0-140	2444.3	99.93
0-145	2444.6	99.94
0-150	2444.9	99.95
0-155	2445.2	99.97
0-160	2445.5	99.98
0-165	2445.7	99.99
0-170	2445.9	99.99
0-175	2446.0	100.00
0-180	2446.0	100.00

**[Additional Test]**

<b>Test Item</b>	<b>Test Voltage (V)</b>	<b>Frequency (Hz)</b>	<b>Test Result</b>
Total Harmonic Distortion:	120	60	7.78%

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 includes some test methods are not in NVLAP accreditation scope marked \*.
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.
5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor  $K=2$  with the 95% confidence interval.
6. This report cannot be reproduced except in full, without prior written approval of the Company.
7. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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