ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

LED One Corporation

12437 Bellegrave Ave, Eastvale, CA 91752

Test Model: LOC-8DL-MW(35/42/52)MCCT(27/30/35/40/50)D-HO

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution, THD
Reviewed By:	Ezer Pan
Report Number:	KS2240126-06265E-EE
Test Date:	2023-12-29 to 2023-12-30
Report Date:	2024-02-21
Approved by:	Blake Zhang / EE Engineer
Prepared By:	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
Test Location 1:	Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
Test Location 2:	Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

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(35/42/52)MCCT(27/30/35/40/50)D-HO
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:	35W/42W/52W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Nominal Lumen Output:	5000lm

Note:

1. The applicant *LED One Corporation* declared that their products are the same to the product in report# KS2231225-78269E-EE-1 and is authorized by original applicant to use their test data.
2. All the data in previous report (KS2231225-78269E-EE-1) 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°C±1.2°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.

4π 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=22K (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 (γ) 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 (γ) 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°C±1.2°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)
119.9	60	0.4097	48.99	0.997	5099.3	104.09

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
17.63	5096	0.00263	0.3429	0.3551	0.2086	0.4860

Color Rendering Index

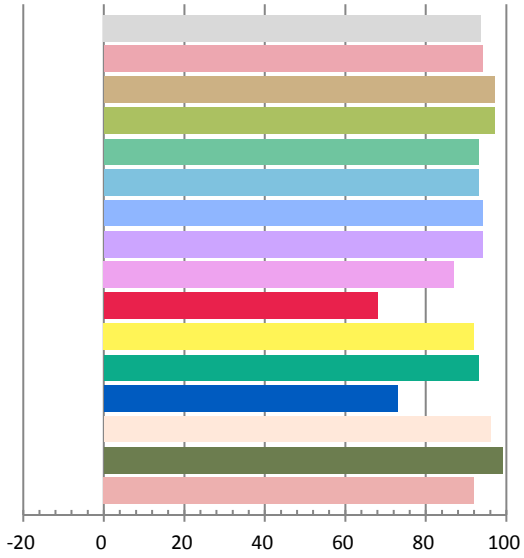
Ra
93.7

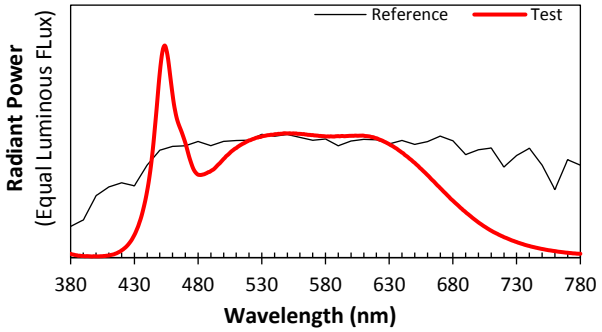
R1	R2	R3	R4
94	97	97	93

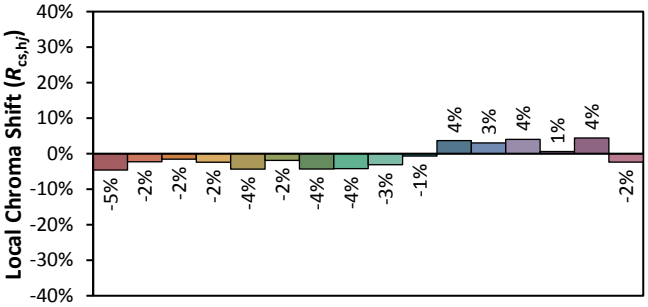
R5	R6	R7	R8
93	94	94	87

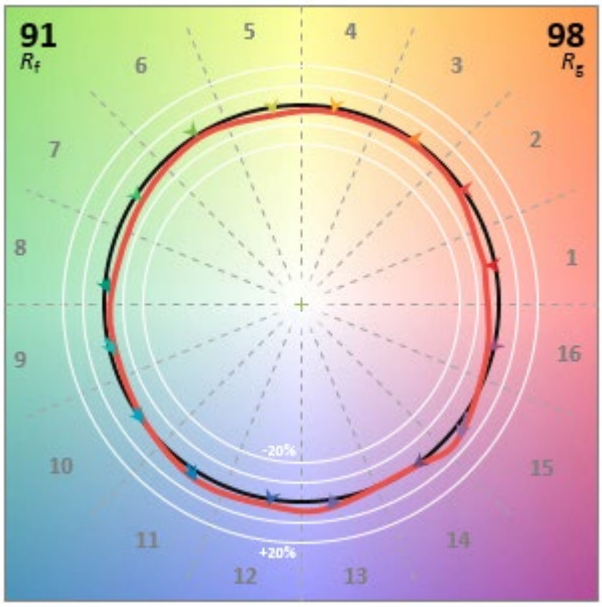
R9	R10	R11	R12
68	92	93	73

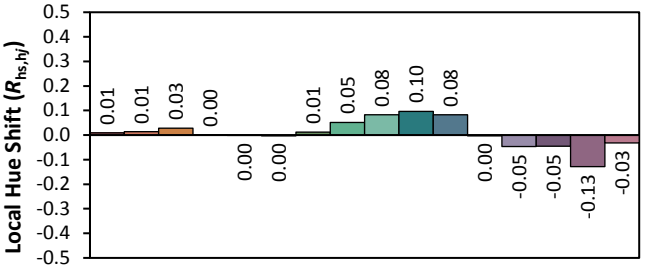
R13	R14	R15
96	99	92

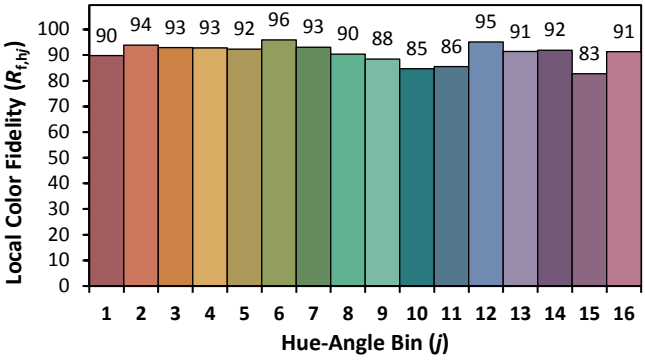


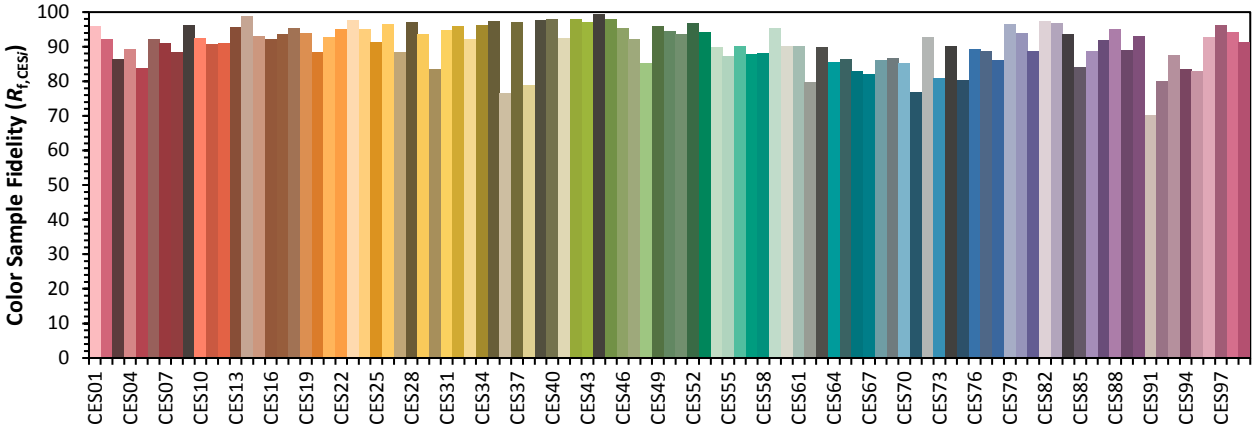

Reference
Test
Radiant Power
(Equal Luminous FLux)
380 430 480 530 580 630 680 730 780
Wavelength (nm)


Local Chroma Shift ($R_{cs,hj}$)
40% 30% 20% 10% 0% -10% -20% -30% -40%
-5% -2% -2% -2% -4% -2% -4% -4% -3% -1% 4% 3% 4% 1% 4% -2%

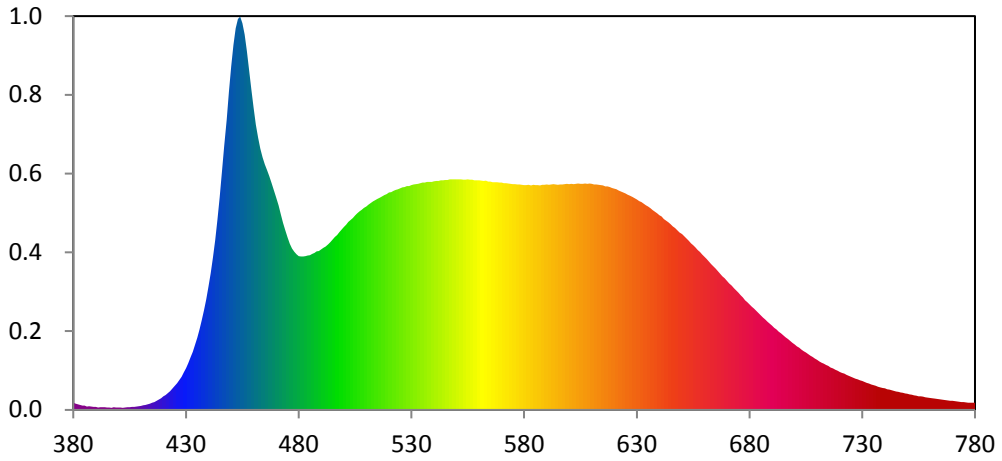

91
R_f
98
R_g
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
-20%
+20%


Local Hue Shift ($R_{hs,hj}$)
0.5 0.4 0.3 0.2 0.1 0.0 -0.1 -0.2 -0.3 -0.4 -0.5
0.01 0.01 0.03 0.00 0.00 0.00 0.01 0.05 0.08 0.10 0.08 0.00 -0.05 -0.05 -0.13 -0.03


Local Color Fidelity ($R_{f,hj}$)
100 90 80 70 60 50 40 30 20 10 0
90 94 93 93 92 96 93 90 88 85 86 95 91 92 83 91
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Hue-Angle Bin (j)


Color Sample Fidelity ($R_{f,CESi}$)
100 90 80 70 60 50 40 30 20 10 0
CES01 CES04 CES07 CES10 CES13 CES16 CES19 CES22 CES25 CES28 CES31 CES34 CES37 CES40 CES43 CES46 CES49 CES52 CES55 CES58 CES61 CES64 CES67 CES70 CES73 CES76 CES79 CES82 CES85 CES88 CES91 CES94 CES97

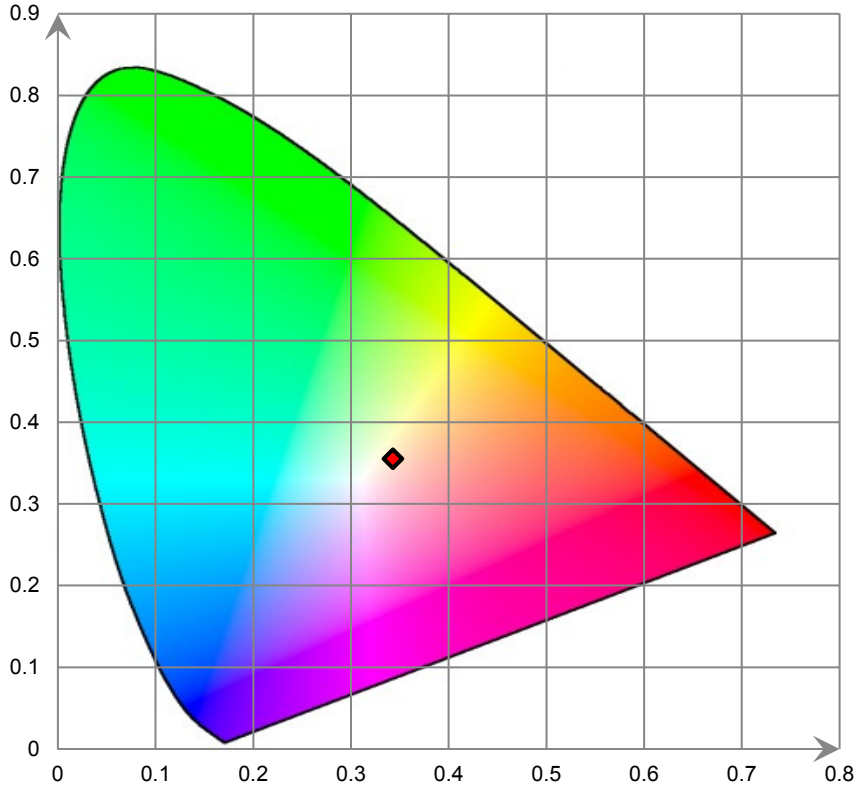
Relative Spectral Power Distribution



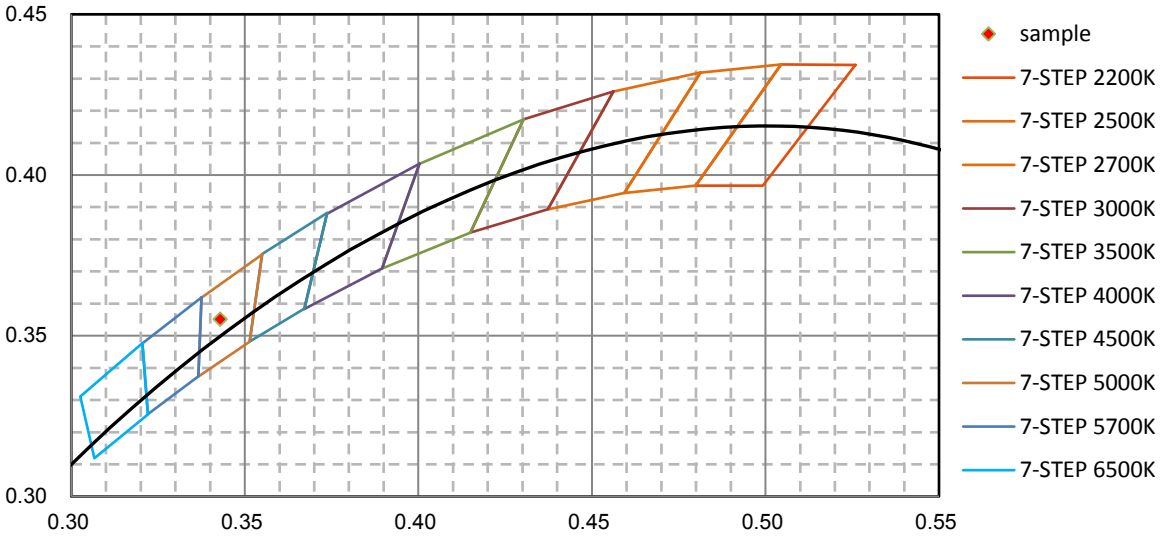
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.289E+00	421	4.765E+00	462	8.685E+01	503	6.055E+01	544	7.317E+01
381	1.947E+00	422	5.399E+00	463	8.326E+01	504	6.121E+01	545	7.327E+01
382	1.788E+00	423	6.001E+00	464	8.054E+01	505	6.195E+01	546	7.327E+01
383	1.630E+00	424	6.741E+00	465	7.834E+01	506	6.270E+01	547	7.349E+01
384	1.412E+00	425	7.563E+00	466	7.642E+01	507	6.328E+01	548	7.355E+01
385	1.362E+00	426	8.504E+00	467	7.451E+01	508	6.386E+01	549	7.349E+01
386	1.086E+00	427	9.505E+00	468	7.238E+01	509	6.444E+01	550	7.345E+01
387	1.158E+00	428	1.061E+01	469	7.017E+01	510	6.480E+01	551	7.346E+01
388	1.030E+00	429	1.197E+01	470	6.787E+01	511	6.544E+01	552	7.354E+01
389	9.440E-01	430	1.336E+01	471	6.523E+01	512	6.594E+01	553	7.337E+01
390	9.829E-01	431	1.492E+01	472	6.241E+01	513	6.644E+01	554	7.343E+01
391	7.891E-01	432	1.674E+01	473	5.965E+01	514	6.687E+01	555	7.348E+01
392	8.524E-01	433	1.854E+01	474	5.725E+01	515	6.731E+01	556	7.338E+01
393	8.832E-01	434	2.080E+01	475	5.502E+01	516	6.766E+01	557	7.343E+01
394	8.375E-01	435	2.302E+01	476	5.301E+01	517	6.808E+01	558	7.319E+01
395	7.811E-01	436	2.565E+01	477	5.150E+01	518	6.851E+01	559	7.322E+01
396	7.298E-01	437	2.863E+01	478	5.042E+01	519	6.886E+01	560	7.318E+01
397	6.572E-01	438	3.180E+01	479	4.961E+01	520	6.934E+01	561	7.312E+01
398	8.360E-01	439	3.528E+01	480	4.905E+01	521	6.943E+01	562	7.301E+01
399	7.486E-01	440	3.928E+01	481	4.892E+01	522	6.980E+01	563	7.307E+01
400	7.471E-01	441	4.357E+01	482	4.887E+01	523	7.012E+01	564	7.284E+01
401	7.344E-01	442	4.860E+01	483	4.899E+01	524	7.033E+01	565	7.281E+01
402	7.216E-01	443	5.417E+01	484	4.917E+01	525	7.068E+01	566	7.263E+01
403	7.852E-01	444	6.061E+01	485	4.936E+01	526	7.095E+01	567	7.260E+01
404	8.286E-01	445	6.776E+01	486	4.973E+01	527	7.102E+01	568	7.256E+01
405	8.338E-01	446	7.587E+01	487	5.005E+01	528	7.136E+01	569	7.244E+01
406	9.536E-01	447	8.402E+01	488	5.053E+01	529	7.132E+01	570	7.247E+01
407	9.665E-01	448	9.263E+01	489	5.069E+01	530	7.167E+01	571	7.228E+01
408	1.104E+00	449	1.016E+02	490	5.120E+01	531	7.187E+01	572	7.224E+01
409	1.184E+00	450	1.096E+02	491	5.169E+01	532	7.199E+01	573	7.217E+01
410	1.248E+00	451	1.164E+02	492	5.211E+01	533	7.212E+01	574	7.212E+01
411	1.473E+00	452	1.216E+02	493	5.277E+01	534	7.231E+01	575	7.195E+01
412	1.622E+00	453	1.246E+02	494	5.355E+01	535	7.244E+01	576	7.197E+01
413	1.792E+00	454	1.254E+02	495	5.437E+01	536	7.247E+01	577	7.188E+01
414	1.965E+00	455	1.233E+02	496	5.513E+01	537	7.267E+01	578	7.184E+01
415	2.306E+00	456	1.197E+02	497	5.579E+01	538	7.268E+01	579	7.179E+01
416	2.548E+00	457	1.145E+02	498	5.664E+01	539	7.268E+01	580	7.168E+01
417	2.945E+00	458	1.083E+02	499	5.747E+01	540	7.294E+01	581	7.162E+01
418	3.332E+00	459	1.022E+02	500	5.831E+01	541	7.302E+01	582	7.172E+01
419	3.710E+00	460	9.636E+01	501	5.902E+01	542	7.302E+01	583	7.157E+01
420	4.293E+00	461	9.100E+01	502	5.995E+01	543	7.322E+01	584	7.175E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	7.164E+01	626	6.859E+01	667	4.340E+01	708	1.683E+01	749	5.235E+00
586	7.162E+01	627	6.828E+01	668	4.260E+01	709	1.635E+01	750	5.110E+00
587	7.160E+01	628	6.787E+01	669	4.195E+01	710	1.593E+01	751	4.974E+00
588	7.177E+01	629	6.748E+01	670	4.112E+01	711	1.550E+01	752	4.820E+00
589	7.180E+01	630	6.707E+01	671	4.040E+01	712	1.507E+01	753	4.659E+00
590	7.186E+01	631	6.658E+01	672	3.960E+01	713	1.472E+01	754	4.533E+00
591	7.174E+01	632	6.621E+01	673	3.883E+01	714	1.433E+01	755	4.377E+00
592	7.185E+01	633	6.579E+01	674	3.813E+01	715	1.399E+01	756	4.296E+00
593	7.194E+01	634	6.528E+01	675	3.736E+01	716	1.354E+01	757	4.187E+00
594	7.185E+01	635	6.481E+01	676	3.658E+01	717	1.321E+01	758	4.055E+00
595	7.178E+01	636	6.436E+01	677	3.586E+01	718	1.283E+01	759	3.945E+00
596	7.186E+01	637	6.374E+01	678	3.498E+01	719	1.253E+01	760	3.853E+00
597	7.191E+01	638	6.320E+01	679	3.430E+01	720	1.212E+01	761	3.734E+00
598	7.196E+01	639	6.268E+01	680	3.366E+01	721	1.183E+01	762	3.585E+00
599	7.203E+01	640	6.209E+01	681	3.293E+01	722	1.155E+01	763	3.473E+00
600	7.202E+01	641	6.169E+01	682	3.223E+01	723	1.122E+01	764	3.398E+00
601	7.206E+01	642	6.089E+01	683	3.157E+01	724	1.090E+01	765	3.301E+00
602	7.202E+01	643	6.033E+01	684	3.089E+01	725	1.058E+01	766	3.215E+00
603	7.213E+01	644	5.981E+01	685	3.018E+01	726	1.025E+01	767	3.123E+00
604	7.213E+01	645	5.919E+01	686	2.943E+01	727	9.984E+00	768	3.004E+00
605	7.206E+01	646	5.849E+01	687	2.884E+01	728	9.743E+00	769	2.927E+00
606	7.208E+01	647	5.796E+01	688	2.807E+01	729	9.428E+00	770	2.886E+00
607	7.213E+01	648	5.729E+01	689	2.753E+01	730	9.205E+00	771	2.778E+00
608	7.212E+01	649	5.660E+01	690	2.685E+01	731	8.883E+00	772	2.705E+00
609	7.218E+01	650	5.605E+01	691	2.618E+01	732	8.663E+00	773	2.646E+00
610	7.210E+01	651	5.530E+01	692	2.564E+01	733	8.400E+00	774	2.523E+00
611	7.192E+01	652	5.463E+01	693	2.499E+01	734	8.164E+00	775	2.496E+00
612	7.187E+01	653	5.397E+01	694	2.440E+01	735	7.945E+00	776	2.454E+00
613	7.181E+01	654	5.310E+01	695	2.373E+01	736	7.660E+00	777	2.347E+00
614	7.171E+01	655	5.248E+01	696	2.313E+01	737	7.436E+00	778	2.317E+00
615	7.159E+01	656	5.175E+01	697	2.255E+01	738	7.234E+00	779	2.284E+00
616	7.132E+01	657	5.101E+01	698	2.198E+01	739	7.022E+00	780	2.288E+00
617	7.128E+01	658	5.033E+01	699	2.140E+01	740	6.861E+00		
618	7.106E+01	659	4.958E+01	700	2.082E+01	741	6.610E+00		
619	7.072E+01	660	4.882E+01	701	2.028E+01	742	6.442E+00		
620	7.060E+01	661	4.811E+01	702	1.979E+01	743	6.257E+00		
621	7.029E+01	662	4.727E+01	703	1.926E+01	744	6.099E+00		
622	6.991E+01	663	4.644E+01	704	1.873E+01	745	5.898E+00		
623	6.964E+01	664	4.572E+01	705	1.826E+01	746	5.755E+00		
624	6.935E+01	665	4.504E+01	706	1.779E+01	747	5.569E+00		
625	6.903E+01	666	4.422E+01	707	1.728E+01	748	5.419E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

The photometric distance: 2.513m

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

Test orientation: **Downward**

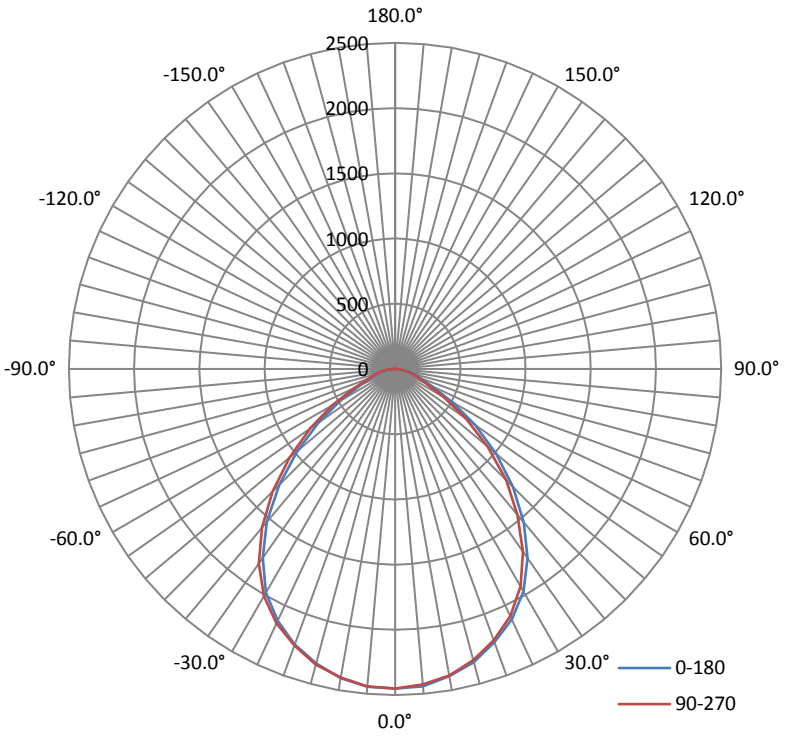
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.10	60	0.4094	49.010	0.9968

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
5109.95	104.26	2453	1.20	1.17

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	91.6	91.5	91.5	91.6	91.6
Field Angle (10% I_{max}):	134.1	134.0	133.9	134.1	134.0

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	2450	2450	2450	2450	2450	2450	2450	2450
1°	2451	2449	2446	2449	2449	2451	2453	2449
2°	2452	2443	2443	2448	2448	2449	2448	2447
3°	2449	2438	2443	2447	2447	2449	2450	2445
4°	2444	2440	2441	2445	2445	2447	2450	2442
5°	2444	2439	2430	2447	2442	2440	2446	2437
6°	2436	2430	2427	2439	2438	2436	2440	2433
7°	2422	2428	2422	2433	2430	2425	2431	2427
8°	2416	2413	2413	2426	2421	2422	2426	2418
9°	2410	2406	2408	2417	2413	2418	2417	2411
10°	2405	2398	2399	2409	2402	2407	2406	2402
11°	2392	2387	2387	2396	2397	2396	2398	2389
12°	2383	2373	2374	2388	2381	2384	2382	2374
13°	2366	2359	2365	2379	2370	2371	2370	2366
14°	2352	2348	2348	2363	2359	2359	2357	2352
15°	2337	2337	2330	2350	2347	2342	2341	2339
16°	2319	2317	2316	2336	2332	2329	2330	2322
17°	2303	2299	2299	2320	2317	2309	2312	2303
18°	2284	2279	2278	2302	2297	2295	2295	2283
19°	2265	2262	2262	2282	2278	2277	2275	2264
20°	2248	2239	2245	2260	2255	2257	2255	2245
21°	2226	2218	2222	2242	2239	2237	2230	2226
22°	2200	2198	2200	2223	2213	2219	2213	2202
23°	2178	2179	2178	2201	2196	2196	2191	2181
24°	2154	2153	2152	2179	2174	2168	2169	2157
25°	2130	2130	2129	2156	2151	2143	2143	2131
26°	2103	2102	2103	2130	2125	2122	2118	2112
27°	2073	2076	2074	2101	2100	2092	2092	2089
28°	2041	2044	2045	2079	2074	2071	2065	2056
29°	2010	2011	2017	2049	2046	2040	2037	2024
30°	1980	1977	1979	2018	2010	2010	2004	1990
31°	1938	1938	1939	1982	1977	1976	1970	1954
32°	1898	1898	1903	1945	1937	1939	1934	1917
33°	1856	1858	1864	1907	1902	1900	1893	1879
34°	1813	1817	1822	1864	1863	1858	1853	1839
35°	1768	1774	1778	1825	1821	1813	1810	1797
36°	1724	1728	1732	1782	1778	1771	1766	1755
37°	1677	1681	1685	1734	1733	1728	1718	1709
38°	1627	1632	1636	1688	1686	1682	1673	1661
39°	1579	1582	1589	1641	1637	1633	1626	1615
40°	1529	1530	1539	1590	1586	1585	1578	1566
41°	1474	1481	1484	1542	1538	1536	1530	1515
42°	1423	1428	1431	1491	1484	1483	1482	1464
43°	1366	1371	1381	1437	1436	1432	1426	1413
44°	1313	1317	1327	1384	1381	1379	1373	1360
45°	1255	1266	1272	1328	1329	1326	1318	1307
46°	1202	1208	1217	1277	1275	1271	1267	1255
47°	1146	1154	1162	1220	1220	1220	1211	1199
48°	1091	1098	1107	1167	1166	1163	1157	1145

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
49°	1036	1044	1052	1112	1110	1108	1103	1091
50°	980	988	996	1056	1055	1053	1050	1036
51°	923	935	942	1001	1001	1000	996	984
52°	871	880	888	949	951	946	944	932
53°	818	827	836	895	895	894	890	878
54°	766	774	783	843	844	842	838	826
55°	714	723	732	789	792	790	785	775
56°	664	672	683	739	740	741	735	726
57°	613	624	633	690	690	692	685	675
58°	569	579	588	640	641	642	636	626
59°	524	534	543	595	596	597	592	582
60°	481	489	498	549	551	552	548	538
61°	438	446	455	504	507	507	503	494
62°	397	406	414	462	465	463	460	450
63°	360	367	375	420	421	422	418	409
64°	324	331	339	380	382	383	379	371
65°	293	299	305	344	346	346	343	335
66°	264	269	275	310	311	313	310	302
67°	239	244	248	279	281	282	279	273
68°	217	221	225	252	254	255	253	247
69°	200	203	207	229	231	233	232	227
70°	188	190	194	210	213	215	215	212
71°	177	180	184	198	201	203	203	200
72°	168	170	174	187	190	192	192	189
73°	159	160	164	177	180	181	181	179
74°	149	151	154	167	170	171	171	169
75°	139	141	144	157	160	161	161	159
76°	130	132	134	148	150	151	151	148
77°	119	122	125	138	140	141	140	138
78°	110	112	115	128	129	130	130	127
79°	99	102	105	118	119	120	120	117
80°	89	92	95	107	109	110	109	107
81°	79	82	85	98	99	100	99	96
82°	68	71	75	87	89	89	89	85
83°	57	60	65	77	79	79	78	74
84°	46	49	54	67	69	69	67	63
85°	35	38	43	57	58	58	56	52
86°	23	27	32	47	48	48	45	40
87°	11	14	21	37	38	38	34	28
88°	7	10	9	26	27	27	22	16
89°	4	5	0	15	15	15	10	4
90°	0	0	0	10	10	10	7	2
91°	0	0	0	5	5	5	3	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 / γ	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°	1	1	1	0	0	0	0	0
115°	1	1	1	1	1	1	1	1
116°	1	1	1	1	1	1	1	1
117°	1	1	1	1	1	1	1	1
118°	1	1	1	1	1	1	1	1
119°	1	1	1	1	1	1	1	1
120°	1	1	1	1	1	1	1	1
121°	1	1	1	1	1	1	1	1
122°	1	1	1	1	1	1	1	1
123°	1	1	1	1	1	1	1	1
124°	1	1	1	1	1	1	1	1
125°	1	1	1	1	1	1	1	1
126°	1	1	1	1	1	1	1	1
127°	1	1	1	1	1	1	1	1
128°	1	1	1	1	1	1	1	1
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	2	2	2	2	2	1	1
135°	2	2	2	2	2	2	2	1
136°	2	2	2	2	2	2	2	2
137°	2	2	2	2	2	2	2	2
138°	2	2	2	2	2	2	2	2
139°	2	2	2	2	2	2	2	2
140°	2	2	2	2	2	2	2	2
141°	2	2	2	2	2	2	2	2
142°	2	2	3	2	2	2	2	2
143°	2	3	3	3	3	3	2	2
144°	3	3	3	3	3	3	3	2
145°	3	3	3	3	3	3	3	3
146°	3	3	3	3	3	3	3	3

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
147°	3	3	3	3	3	3	3	3
148°	3	3	3	3	3	3	3	3
149°	3	3	3	3	3	3	3	3
150°	3	3	3	3	3	3	3	3
151°	3	3	4	3	4	4	3	3
152°	3	4	4	4	4	4	3	3
153°	3	4	4	4	4	4	4	3
154°	4	4	4	4	4	4	4	4
155°	4	4	4	4	4	4	4	4
156°	4	4	4	4	4	4	4	4
157°	4	4	4	4	4	4	4	4
158°	4	4	4	4	4	4	4	4
159°	4	4	4	4	4	4	4	4
160°	4	4	4	4	4	4	4	4
161°	4	4	4	4	4	4	4	4
162°	4	4	4	4	4	4	4	4
163°	4	4	4	4	4	4	4	4
164°	4	4	4	4	4	4	4	4
165°	4	4	4	4	4	4	4	4
166°	4	4	4	4	4	4	4	4
167°	4	4	4	4	4	4	4	4
168°	4	4	4	4	4	4	4	4
169°	4	4	4	4	4	4	4	4
170°	4	4	4	4	4	4	4	4
171°	4	4	4	4	4	4	4	4
172°	4	4	4	4	4	4	4	4
173°	4	4	4	4	4	4	4	4
174°	4	4	4	4	4	4	4	4
175°	4	4	4	4	4	4	4	4
176°	4	4	4	4	4	4	4	4
177°	4	3	3	3	3	4	4	4
178°	3	3	3	3	3	3	4	4
179°	3	3	3	3	3	3	3	4
180°	3	3	3	3	3	3	3	3

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	2450	2450	2450	2450	2450	2450	2450	2450
1°	2449	2445	2443	2448	2446	2450	2452	2449
2°	2446	2442	2442	2445	2441	2447	2450	2448
3°	2447	2440	2439	2442	2437	2440	2450	2441
4°	2444	2436	2435	2439	2433	2437	2443	2439
5°	2443	2432	2427	2434	2429	2430	2436	2434
6°	2431	2422	2420	2422	2424	2425	2429	2427
7°	2426	2415	2414	2415	2415	2421	2422	2419
8°	2414	2407	2406	2403	2406	2412	2408	2411
9°	2404	2398	2399	2393	2395	2405	2403	2402
10°	2390	2391	2389	2379	2386	2387	2389	2391
11°	2384	2376	2375	2373	2370	2375	2382	2380
12°	2371	2363	2359	2358	2357	2361	2369	2364
13°	2357	2348	2350	2343	2342	2347	2356	2347
14°	2342	2334	2335	2330	2324	2329	2340	2340
15°	2329	2315	2320	2308	2312	2316	2321	2323
16°	2314	2302	2304	2292	2292	2301	2303	2304
17°	2292	2280	2288	2273	2273	2280	2287	2286
18°	2275	2264	2268	2257	2257	2263	2267	2270
19°	2253	2247	2249	2235	2241	2243	2248	2247
20°	2229	2229	2225	2212	2214	2220	2230	2227
21°	2215	2202	2205	2191	2189	2199	2207	2204
22°	2195	2181	2177	2166	2166	2176	2181	2180
23°	2166	2156	2156	2141	2143	2152	2158	2153
24°	2142	2133	2133	2118	2114	2133	2132	2134
25°	2118	2104	2111	2091	2091	2107	2107	2107
26°	2091	2082	2082	2059	2061	2074	2080	2082
27°	2063	2053	2053	2031	2031	2039	2047	2051
28°	2034	2024	2024	1997	1997	2007	2015	2017
29°	2003	1992	1990	1962	1966	1970	1980	1982
30°	1968	1960	1953	1924	1924	1936	1944	1946
31°	1934	1920	1920	1883	1884	1895	1902	1909
32°	1897	1881	1876	1844	1843	1851	1860	1868
33°	1854	1844	1838	1801	1799	1810	1817	1824
34°	1814	1799	1797	1753	1754	1770	1770	1779
35°	1771	1754	1755	1711	1709	1721	1729	1735
36°	1724	1713	1711	1661	1663	1672	1679	1688
37°	1679	1667	1660	1615	1615	1624	1632	1639
38°	1630	1617	1613	1567	1564	1574	1582	1592
39°	1584	1569	1562	1517	1512	1521	1533	1539
40°	1536	1521	1511	1462	1459	1468	1481	1486
41°	1487	1470	1459	1412	1406	1415	1425	1432
42°	1434	1416	1409	1359	1355	1364	1373	1380
43°	1378	1366	1360	1307	1305	1312	1322	1326
44°	1327	1317	1309	1256	1255	1261	1271	1278
45°	1278	1268	1259	1205	1204	1209	1219	1229
46°	1228	1219	1208	1152	1148	1154	1164	1171
47°	1177	1165	1156	1096	1092	1098	1107	1116
48°	1124	1108	1100	1042	1036	1044	1053	1060

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
49°	1067	1053	1044	986	980	988	998	1003
50°	1014	1000	990	932	926	932	942	949
51°	961	945	937	878	872	878	886	895
52°	905	892	883	825	820	823	833	841
53°	851	839	828	773	767	771	780	789
54°	800	786	777	720	717	718	728	737
55°	749	736	725	671	666	669	677	686
56°	698	686	674	622	617	618	627	636
57°	649	636	626	574	568	571	579	587
58°	600	588	577	527	522	524	533	540
59°	554	541	531	482	477	480	488	494
60°	509	496	486	439	435	437	444	452
61°	465	453	443	398	394	396	402	411
62°	423	411	402	359	356	358	365	372
63°	383	372	364	324	320	322	328	335
64°	347	336	327	291	288	289	295	301
65°	313	303	295	263	260	261	265	271
66°	282	274	267	239	235	235	239	244
67°	255	248	242	219	216	216	218	222
68°	233	226	222	205	202	201	202	204
69°	216	211	207	194	191	191	190	191
70°	203	199	196	183	180	180	180	181
71°	192	188	185	173	170	170	170	171
72°	182	178	175	163	161	160	160	162
73°	171	168	165	152	151	150	150	152
74°	161	158	154	142	140	140	139	142
75°	152	147	144	131	130	130	129	132
76°	141	137	133	121	120	120	119	122
77°	130	126	123	111	110	110	109	112
78°	120	116	113	101	100	100	100	103
79°	109	106	103	91	90	90	90	93
80°	99	96	93	81	80	80	80	82
81°	88	85	83	71	70	70	70	72
82°	77	75	73	61	60	60	60	61
83°	66	64	62	51	50	50	50	51
84°	55	53	52	41	40	40	39	40
85°	44	42	41	31	29	30	28	28
86°	32	30	30	21	20	20	19	19
87°	21	20	21	11	10	10	10	10
88°	11	10	11	0	0	0	0	0
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 / γ	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	1	1	1	1	0
126°	0	0	1	1	1	1	1	1
127°	1	1	1	1	1	1	1	1
128°	1	1	1	1	1	1	1	1
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 (cont.)

C / γ	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	2
151°	1	1	1	2	2	2	2	2
152°	1	1	1	2	2	2	2	2
153°	2	1	2	2	2	2	2	2
154°	2	1	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	3
172°	3	2	2	2	2	2	2	3
173°	3	3	2	2	2	2	3	3
174°	3	3	3	3	3	3	3	3
175°	3	3	3	3	3	3	3	3
176°	3	3	3	3	3	3	3	3
177°	3	3	3	3	3	3	3	3
178°	3	3	3	3	3	3	3	3
179°	3	3	3	3	3	3	3	3
180°	3	3	3	3	3	3	3	3

Zonal Lumen Density Measurement

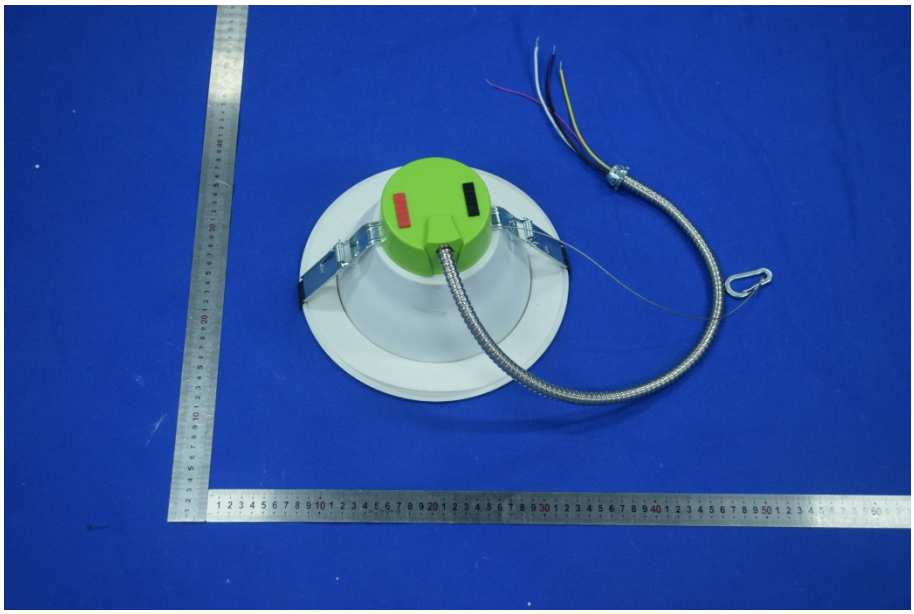
Deg	Flux (lm)	%
0-5	58.4	1.14
5-10	172.8	3.39
10-15	280.2	5.48
15-20	376.3	7.36
20-25	457.1	8.95
25-30	518.3	10.14
30-35	550.5	10.78
35-40	549.7	10.75
40-45	516.7	10.12
45-50	456.3	8.93
50-55	373.6	7.31
55-60	281.0	5.49
60-65	190.8	3.74
65-70	122.0	2.39
70-75	88.9	1.74
75-80	63.9	1.25
80-85	37.1	0.72
85-90	9.8	0.20
90-95	0.3	0.00
95-100	0.1	0.00
100-105	0.1	0.01
105-110	0.1	0.00
110-115	0.2	0.00
115-120	0.2	0.01
120-125	0.3	0.00
125-130	0.4	0.01
130-135	0.4	0.01
135-140	0.5	0.01
140-145	0.6	0.01
145-150	0.6	0.01
150-155	0.6	0.01
155-160	0.6	0.02
160-165	0.5	0.01
165-170	0.4	0.00
170-175	0.2	0.01
175-180	0.1	0.00

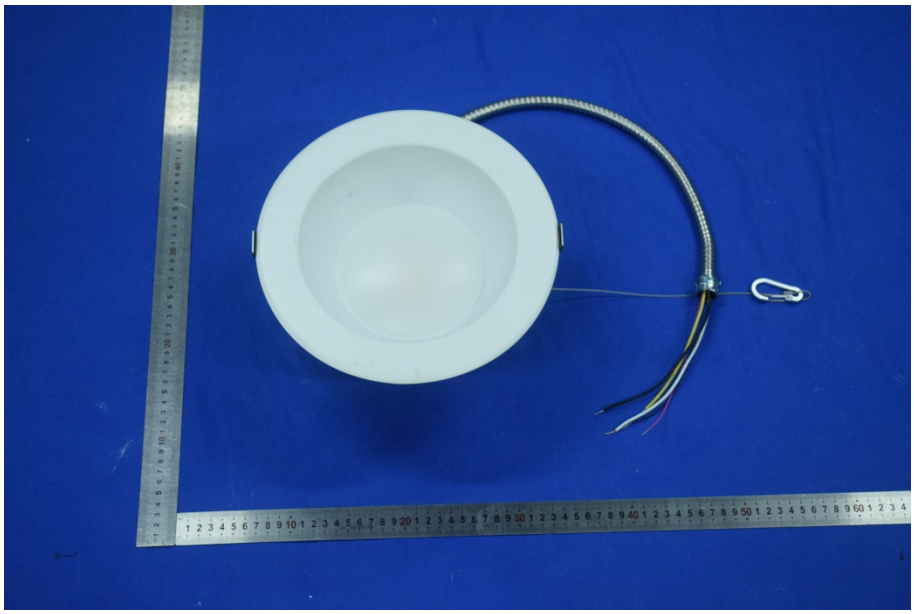
Deg	Flux (lm)	%
0-5	58.4	1.14
0-10	231.2	4.53
0-15	511.5	10.01
0-20	887.8	17.37
0-25	1344.9	26.32
0-30	1863.2	36.46
0-35	2413.8	47.24
0-40	2963.4	57.99
0-45	3480.1	68.11
0-50	3936.5	77.04
0-55	4310.1	84.35
0-60	4591.0	89.84
0-65	4781.9	93.58
0-70	4903.8	95.97
0-75	4992.7	97.71
0-80	5056.6	98.96
0-85	5093.8	99.68
0-90	5103.6	99.88
0-95	5103.9	99.88
0-100	5104.0	99.88
0-105	5104.1	99.89
0-110	5104.3	99.89
0-115	5104.5	99.89
0-120	5104.7	99.90
0-125	5105.0	99.90
0-130	5105.3	99.91
0-135	5105.8	99.92
0-140	5106.3	99.93
0-145	5106.9	99.94
0-150	5107.5	99.95
0-155	5108.1	99.96
0-160	5108.8	99.98
0-165	5109.3	99.99
0-170	5109.6	99.99
0-175	5109.9	100.00
0-180	5110.0	100.00

[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Total Harmonic Distortion:	120	60	5.68%

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.
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**********END OF REPORT**********