



ANSI/IES LM-79-19

MEASUREMENT AND TEST REPORT

For

Shenzhen Ul led lighting Photoelectricity CO.,ltd

1401-1402,Building A,Yonghuayuan,No.6 Baotian 2nd Road,Chentian Community,Xixiang Street,Baoan District,Shenzhen,Guangdong, China

Test Model: UL-PL6060-36W-TC

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution
Reviewed By:	Ezer Pan <i>Ezer Pan</i>
Report Number:	DG5240229-10011E-EE
Test Date:	2024-03-11 to 2024-03-12
Report Date:	2024-04-01
Approved by:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588

1. Product Description[#]

General Information:

One test sample was in good condition and received on 2024-02-29, and used for testing.

Model Tested: UL-PL6060-36W-TC
Manufacturer: Shenzhen UI led lighting Photoelectricity CO.,Ltd
Brand Name: ULA1L
Product Designation: LED Panel Light
Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 220-240V AC 50/60Hz
Rated Power: 36W
Nominal CCT: 4000/5000K
Nominal Lumen Output: 4680lm

2. Standards Used

- ANSI/IES LM-79-19: Approved method :Optical and Electrical Measurements of Solid-State Lighting Products
- ANSI C82.77-10-2020: Harmonic Emission Limits-Related Power Quality Requirements for Lighting
- 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
1.5m temperature integrating sphere	SENSING	SPR-600	S09008	2023-09-02	2024-09-01
High-precision rapid spectral analysis system	EVERFINE	HAAS-2000	M112048CA1361125	2023-09-02	2024-09-01
Digital power meter	YOKOGAWA	WT310	13398	2023-10-13	2024-10-12
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2023-09-02	2024-09-01
thermometer	SENSING	N/A	N/A	2023-10-13	2024-10-12
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Precision frequency power supply	ALL Power	APW-105N	970613	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
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

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Standard Light Source	EVERFINE	D908	N/A	2023-05-12	2025-05-11

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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.

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 $U=32\text{K}$ ($K=2$), 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 $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), 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 10 degree, the horizontal angle (C plane) test intervals were set no more than 90 degree.

The uncertainty of the luminous intensity is $U=2.82\%$ ($K=2$), 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]

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

Test orientation: **Downward**

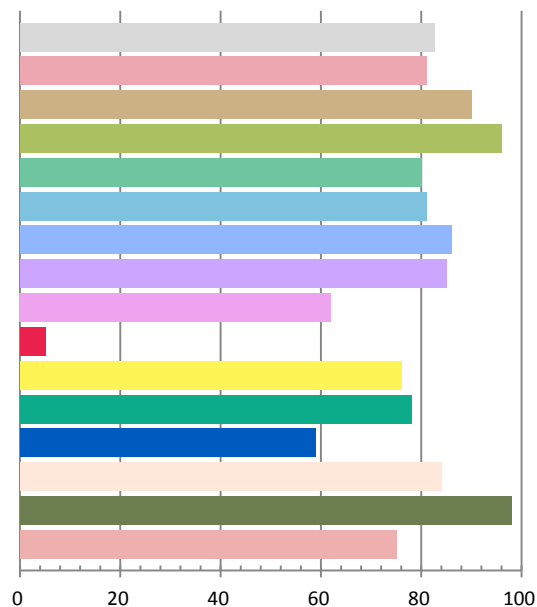
Photometric and Electrical Measurement Result

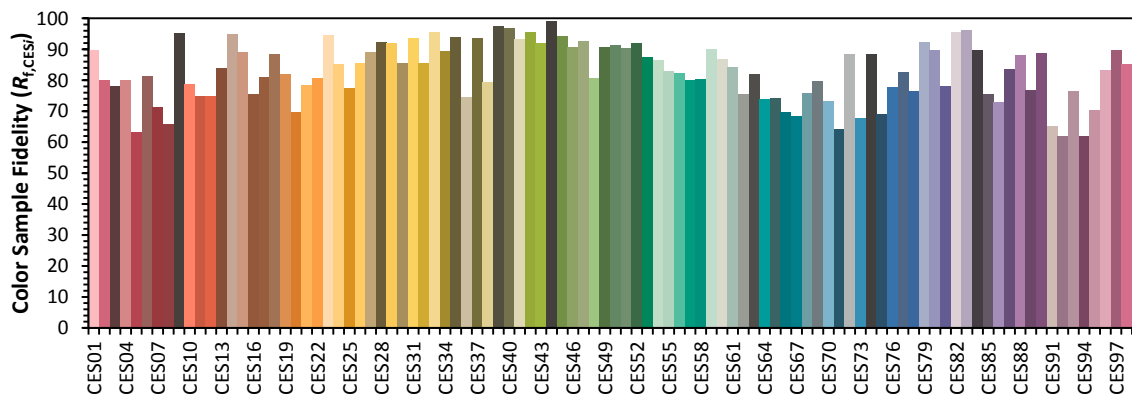
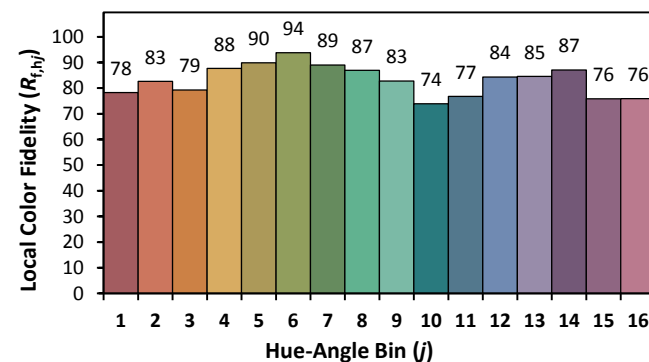
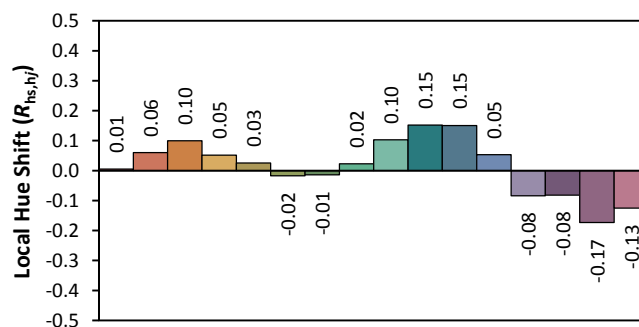
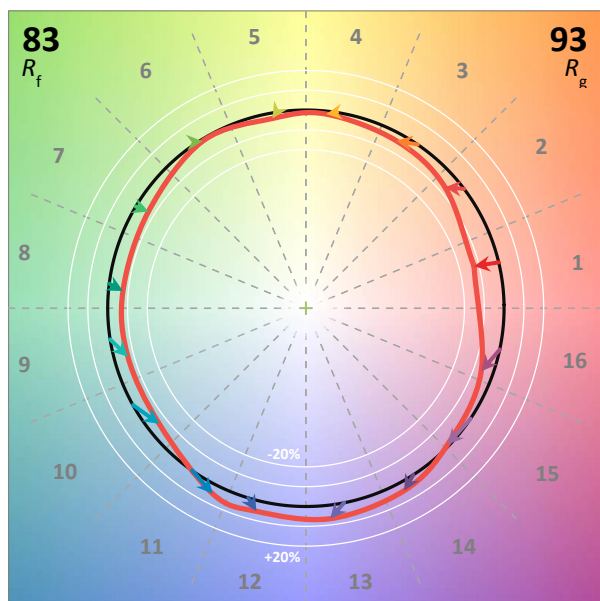
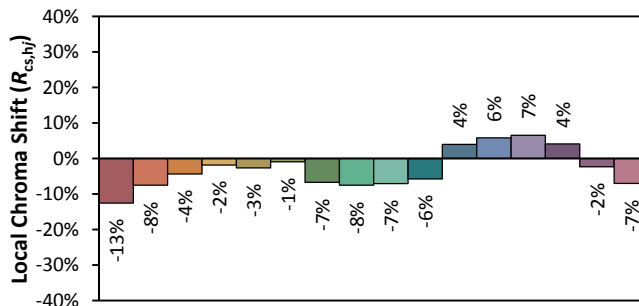
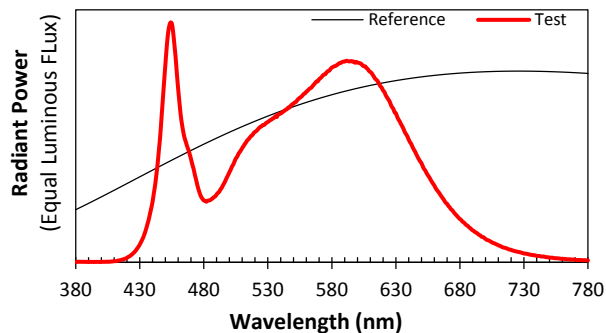
Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
230.0	50	0.1512	34.00	0.9777	4685.3	137.81

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
14.052	3993	0.00092	0.3814	0.3793	0.2247	0.5029

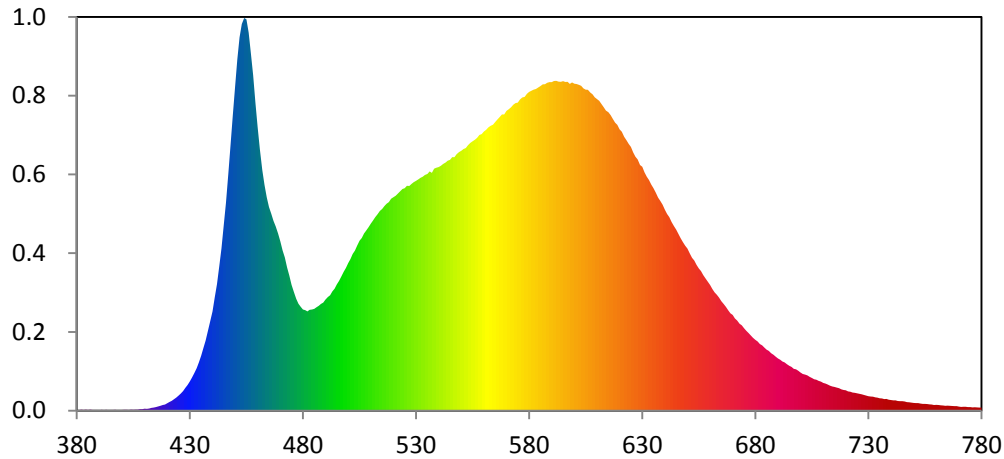
Color Rendering Index

Ra			
82.6			
R1	R2	R3	R4
81	90	96	80
R5	R6	R7	R8
81	86	85	62
R9	R10	R11	R12
5	76	78	59
R13	R14	R15	
84	98	75	





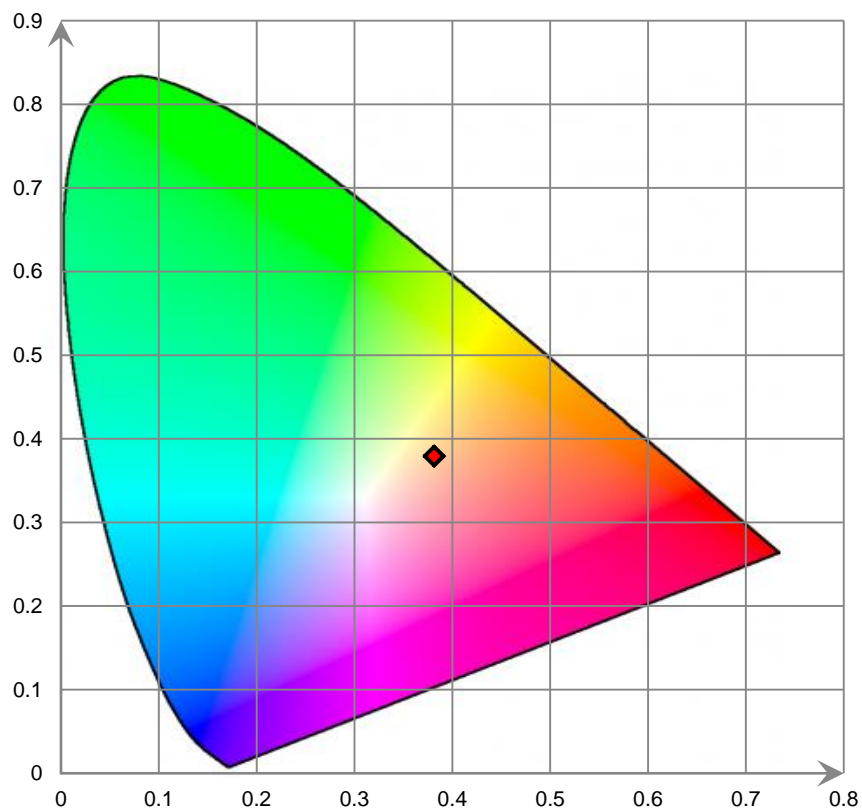
Relative Spectral Power Distribution



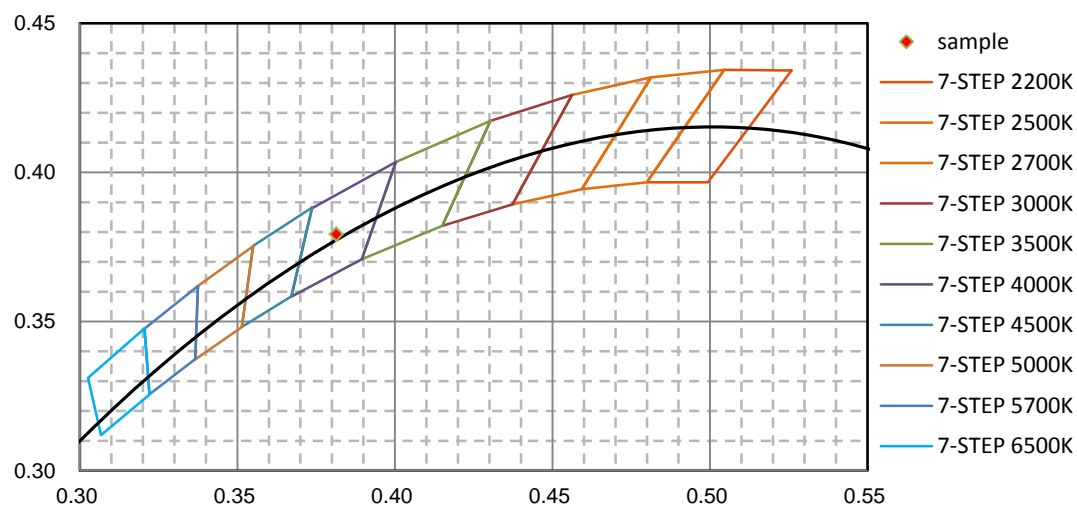
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.389E-01	421	2.195E+00	462	5.994E+01	503	3.984E+01	544	6.224E+01
381	1.504E-01	422	2.446E+00	463	5.617E+01	504	4.110E+01	545	6.244E+01
382	2.707E-01	423	2.871E+00	464	5.312E+01	505	4.232E+01	546	6.312E+01
383	2.004E-01	424	3.259E+00	465	5.068E+01	506	4.301E+01	547	6.311E+01
384	2.536E-01	425	3.778E+00	466	4.906E+01	507	4.413E+01	548	6.388E+01
385	1.829E-01	426	4.273E+00	467	4.725E+01	508	4.490E+01	549	6.437E+01
386	2.633E-01	427	4.883E+00	468	4.585E+01	509	4.568E+01	550	6.470E+01
387	1.718E-01	428	5.683E+00	469	4.407E+01	510	4.656E+01	551	6.515E+01
388	2.009E-01	429	6.391E+00	470	4.212E+01	511	4.736E+01	552	6.540E+01
389	1.892E-01	430	7.264E+00	471	3.991E+01	512	4.818E+01	553	6.609E+01
390	1.298E-01	431	8.291E+00	472	3.813E+01	513	4.895E+01	554	6.666E+01
391	2.123E-01	432	9.361E+00	473	3.567E+01	514	4.974E+01	555	6.708E+01
392	1.624E-01	433	1.058E+01	474	3.363E+01	515	5.023E+01	556	6.746E+01
393	2.155E-01	434	1.205E+01	475	3.134E+01	516	5.092E+01	557	6.795E+01
394	1.354E-01	435	1.369E+01	476	2.950E+01	517	5.153E+01	558	6.863E+01
395	1.905E-01	436	1.560E+01	477	2.787E+01	518	5.191E+01	559	6.886E+01
396	1.798E-01	437	1.747E+01	478	2.664E+01	519	5.274E+01	560	6.951E+01
397	2.206E-01	438	1.982E+01	479	2.588E+01	520	5.316E+01	561	6.991E+01
398	1.661E-01	439	2.217E+01	480	2.522E+01	521	5.351E+01	562	7.051E+01
399	1.475E-01	440	2.473E+01	481	2.504E+01	522	5.406E+01	563	7.092E+01
400	1.731E-01	441	2.822E+01	482	2.471E+01	523	5.465E+01	564	7.121E+01
401	2.149E-01	442	3.152E+01	483	2.511E+01	524	5.518E+01	565	7.189E+01
402	2.130E-01	443	3.591E+01	484	2.522E+01	525	5.537E+01	566	7.250E+01
403	2.102E-01	444	4.043E+01	485	2.536E+01	526	5.597E+01	567	7.311E+01
404	2.624E-01	445	4.612E+01	486	2.576E+01	527	5.593E+01	568	7.374E+01
405	2.108E-01	446	5.174E+01	487	2.613E+01	528	5.647E+01	569	7.375E+01
406	2.711E-01	447	5.909E+01	488	2.662E+01	529	5.691E+01	570	7.464E+01
407	2.542E-01	448	6.632E+01	489	2.693E+01	530	5.721E+01	571	7.504E+01
408	3.683E-01	449	7.362E+01	490	2.766E+01	531	5.760E+01	572	7.554E+01
409	3.759E-01	450	8.060E+01	491	2.831E+01	532	5.797E+01	573	7.617E+01
410	5.043E-01	451	8.743E+01	492	2.874E+01	533	5.824E+01	574	7.659E+01
411	4.688E-01	452	9.295E+01	493	2.970E+01	534	5.870E+01	575	7.671E+01
412	5.677E-01	453	9.623E+01	494	3.038E+01	535	5.892E+01	576	7.751E+01
413	7.036E-01	454	9.775E+01	495	3.144E+01	536	5.956E+01	577	7.795E+01
414	7.948E-01	455	9.740E+01	496	3.235E+01	537	5.922E+01	578	7.814E+01
415	9.174E-01	456	9.408E+01	497	3.340E+01	538	6.024E+01	579	7.886E+01
416	1.071E+00	457	8.890E+01	498	3.461E+01	539	6.046E+01	580	7.936E+01
417	1.212E+00	458	8.350E+01	499	3.557E+01	540	6.064E+01	581	7.966E+01
418	1.426E+00	459	7.673E+01	500	3.676E+01	541	6.098E+01	582	7.991E+01
419	1.562E+00	460	7.060E+01	501	3.773E+01	542	6.143E+01	583	8.008E+01
420	1.850E+00	461	6.507E+01	502	3.903E+01	543	6.176E+01	584	8.044E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.079E+01	626	6.431E+01	667	2.585E+01	708	7.445E+00	749	2.022E+00
586	8.122E+01	627	6.325E+01	668	2.500E+01	709	7.254E+00	750	1.961E+00
587	8.126E+01	628	6.256E+01	669	2.423E+01	710	6.910E+00	751	1.891E+00
588	8.163E+01	629	6.114E+01	670	2.384E+01	711	6.767E+00	752	1.907E+00
589	8.180E+01	630	6.073E+01	671	2.296E+01	712	6.533E+00	753	1.783E+00
590	8.181E+01	631	5.934E+01	672	2.247E+01	713	6.233E+00	754	1.715E+00
591	8.208E+01	632	5.824E+01	673	2.164E+01	714	6.043E+00	755	1.688E+00
592	8.211E+01	633	5.740E+01	674	2.127E+01	715	5.912E+00	756	1.652E+00
593	8.193E+01	634	5.632E+01	675	2.054E+01	716	5.771E+00	757	1.599E+00
594	8.188E+01	635	5.538E+01	676	1.989E+01	717	5.603E+00	758	1.551E+00
595	8.204E+01	636	5.432E+01	677	1.934E+01	718	5.329E+00	759	1.439E+00
596	8.183E+01	637	5.302E+01	678	1.876E+01	719	5.182E+00	760	1.462E+00
597	8.187E+01	638	5.221E+01	679	1.815E+01	720	5.096E+00	761	1.410E+00
598	8.134E+01	639	5.130E+01	680	1.765E+01	721	4.818E+00	762	1.359E+00
599	8.172E+01	640	5.004E+01	681	1.726E+01	722	4.742E+00	763	1.290E+00
600	8.138E+01	641	4.897E+01	682	1.659E+01	723	4.541E+00	764	1.247E+00
601	8.130E+01	642	4.819E+01	683	1.627E+01	724	4.440E+00	765	1.251E+00
602	8.112E+01	643	4.699E+01	684	1.571E+01	725	4.313E+00	766	1.216E+00
603	8.087E+01	644	4.597E+01	685	1.521E+01	726	4.203E+00	767	1.197E+00
604	8.023E+01	645	4.509E+01	686	1.490E+01	727	4.096E+00	768	1.130E+00
605	7.991E+01	646	4.398E+01	687	1.434E+01	728	3.937E+00	769	1.157E+00
606	7.990E+01	647	4.292E+01	688	1.395E+01	729	3.782E+00	770	1.039E+00
607	7.919E+01	648	4.196E+01	689	1.344E+01	730	3.619E+00	771	9.624E-01
608	7.878E+01	649	4.111E+01	690	1.301E+01	731	3.552E+00	772	9.819E-01
609	7.800E+01	650	4.038E+01	691	1.271E+01	732	3.495E+00	773	9.711E-01
610	7.758E+01	651	3.913E+01	692	1.225E+01	733	3.354E+00	774	9.134E-01
611	7.714E+01	652	3.805E+01	693	1.202E+01	734	3.258E+00	775	9.246E-01
612	7.635E+01	653	3.739E+01	694	1.159E+01	735	3.088E+00	776	8.144E-01
613	7.552E+01	654	3.630E+01	695	1.119E+01	736	3.057E+00	777	8.843E-01
614	7.471E+01	655	3.546E+01	696	1.089E+01	737	2.900E+00	778	8.351E-01
615	7.431E+01	656	3.476E+01	697	1.041E+01	738	2.941E+00	779	8.058E-01
616	7.358E+01	657	3.376E+01	698	1.031E+01	739	2.755E+00	780	7.869E-01
617	7.264E+01	658	3.288E+01	699	9.964E+00	740	2.646E+00		
618	7.171E+01	659	3.208E+01	700	9.513E+00	741	2.586E+00		
619	7.114E+01	660	3.130E+01	701	9.158E+00	742	2.588E+00		
620	7.002E+01	661	3.029E+01	702	9.002E+00	743	2.433E+00		
621	6.946E+01	662	2.948E+01	703	8.779E+00	744	2.360E+00		
622	6.818E+01	663	2.884E+01	704	8.432E+00	745	2.389E+00		
623	6.732E+01	664	2.813E+01	705	8.172E+00	746	2.301E+00		
624	6.644E+01	665	2.729E+01	706	7.840E+00	747	2.137E+00		
625	6.568E+01	666	2.654E+01	707	7.728E+00	748	2.114E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

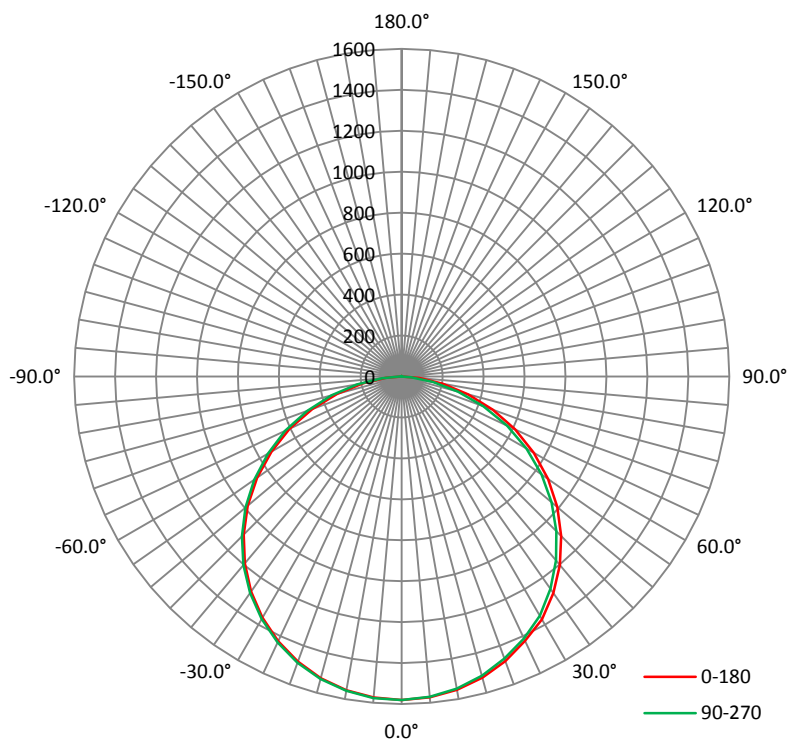
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
230.03	50	0.1512	34.010	0.9778

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
4686.97	137.81	1581	1.29	1.27

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	116.1	115.8	115.3	115.7	115.7
Field Angle (10% I_{max}):	163.3	163.0	162.3	163.0	162.9

Luminous Intensity (cd) Distribution Data

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0°	1580	1580	1580	1580	1580	1580	1580	1580
1°	1580	1580	1580	1580	1581	1580	1580	1580
2°	1579	1579	1580	1580	1580	1580	1580	1580
3°	1578	1578	1579	1579	1579	1579	1579	1579
4°	1577	1576	1578	1577	1578	1577	1578	1577
5°	1574	1574	1576	1576	1577	1576	1576	1575
6°	1572	1571	1574	1574	1574	1573	1573	1572
7°	1569	1568	1571	1571	1571	1571	1570	1570
8°	1565	1564	1568	1567	1567	1567	1567	1566
9°	1560	1560	1565	1564	1564	1563	1563	1562
10°	1556	1555	1560	1559	1559	1559	1558	1558
11°	1551	1551	1556	1554	1555	1554	1553	1553
12°	1545	1545	1550	1549	1549	1548	1548	1548
13°	1539	1539	1545	1543	1543	1542	1542	1542
14°	1533	1532	1538	1537	1537	1537	1536	1536
15°	1526	1525	1532	1530	1530	1530	1529	1529
16°	1518	1517	1525	1523	1523	1522	1521	1521
17°	1509	1509	1517	1515	1515	1514	1514	1513
18°	1501	1500	1508	1506	1506	1506	1505	1505
19°	1492	1491	1500	1498	1497	1497	1496	1496
20°	1482	1482	1491	1489	1488	1487	1487	1487
21°	1472	1472	1480	1478	1478	1477	1477	1477
22°	1461	1461	1470	1468	1468	1467	1466	1467
23°	1450	1450	1460	1458	1457	1456	1456	1456
24°	1439	1438	1449	1446	1445	1444	1444	1445
25°	1427	1427	1438	1435	1433	1432	1432	1433
26°	1414	1415	1425	1422	1421	1420	1421	1421
27°	1402	1401	1413	1410	1409	1408	1408	1408
28°	1388	1388	1400	1397	1395	1395	1395	1395
29°	1374	1374	1386	1383	1382	1381	1381	1381
30°	1360	1360	1373	1369	1368	1366	1367	1368
31°	1345	1345	1358	1355	1353	1352	1352	1353
32°	1330	1330	1343	1340	1338	1337	1338	1338
33°	1314	1314	1328	1324	1323	1322	1322	1323
34°	1298	1298	1312	1308	1306	1306	1306	1307
35°	1282	1282	1296	1292	1291	1290	1290	1291
36°	1265	1265	1279	1276	1274	1273	1274	1275
37°	1247	1247	1262	1258	1256	1255	1256	1257
38°	1229	1229	1245	1241	1239	1238	1239	1240
39°	1211	1211	1227	1223	1221	1220	1221	1222
40°	1192	1192	1208	1204	1202	1201	1202	1204
41°	1173	1173	1190	1185	1183	1182	1183	1185
42°	1153	1153	1171	1166	1164	1164	1164	1165
43°	1133	1133	1151	1146	1144	1144	1145	1146
44°	1112	1112	1131	1126	1124	1124	1125	1126
45°	1092	1092	1110	1106	1103	1103	1104	1105
46°	1070	1071	1090	1085	1083	1082	1083	1085
47°	1049	1050	1068	1064	1062	1062	1063	1064
48°	1027	1028	1047	1043	1041	1040	1041	1042
49°	1004	1004	1025	1020	1018	1018	1019	1021

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
50°	981	982	1002	998	996	996	997	998
51°	958	959	980	976	974	973	974	975
52°	935	936	957	952	950	950	951	952
53°	911	912	933	929	927	927	928	929
54°	887	887	910	906	904	904	905	905
55°	862	863	885	881	879	879	880	881
56°	837	838	861	857	855	855	856	857
57°	812	813	836	832	830	830	831	833
58°	786	787	811	807	806	805	807	807
59°	760	761	786	782	780	780	782	782
60°	734	735	760	756	755	754	756	756
61°	708	709	734	730	729	728	730	730
62°	682	694	708	704	703	703	704	704
63°	657	663	682	679	678	678	679	679
64°	632	633	657	654	653	653	654	654
65°	604	605	632	629	628	628	629	629
66°	576	578	605	602	601	601	602	602
67°	548	550	578	575	574	574	575	575
68°	520	522	550	547	546	546	547	547
69°	492	494	522	520	519	519	520	520
70°	464	466	494	492	491	491	492	492
71°	436	438	467	464	463	464	464	464
72°	408	410	439	437	436	436	437	436
73°	380	383	411	409	408	409	409	409
74°	353	355	384	382	382	382	382	382
75°	325	328	356	354	354	354	355	354
76°	298	301	329	328	327	327	328	327
77°	271	274	302	301	301	301	301	300
78°	244	247	275	275	274	275	275	273
79°	218	221	250	249	247	248	249	246
80°	193	196	224	222	220	222	224	221
81°	168	171	199	196	194	196	199	195
82°	144	148	174	170	168	170	173	171
83°	121	124	150	145	143	146	149	147
84°	99	102	125	121	120	122	125	124
85°	78	80	101	99	97	99	101	102
86°	58	61	79	77	75	77	79	81
87°	39	41	59	57	56	57	59	61
88°	20	21	39	37	37	38	40	41
89°	3	4	19	18	17	18	20	22
90°	2	2	4	12	12	4	6	7
91°	0	0	2	6	6	2	3	3
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
98°	0	0	0	0	0	0	0	0
99°	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°
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°	1	0	0	0	0	0	0	0
110°	1	0	0	0	0	0	0	0
111°	1	1	0	0	0	0	0	1
112°	1	1	0	0	1	1	1	1
113°	1	1	1	1	1	1	1	1
114°	1	1	1	1	1	1	1	1
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	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°	2	2	2	2	2	2	1	1
142°	2	2	2	2	2	2	2	1
143°	2	2	2	2	2	2	2	2
144°	2	2	2	2	2	2	2	2
145°	2	2	2	2	2	2	2	2
146°	2	2	2	2	2	2	2	2
147°	2	2	2	2	2	2	2	2
148°	2	2	2	2	2	2	2	2
149°	2	2	2	2	2	2	2	2

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
150°	2	2	2	2	2	2	2	2
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	3	2	2
160°	2	2	2	2	2	3	2	2
161°	2	2	2	2	2	3	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	2	2	2	2	2
180°	2	2	2	2	2	2	2	2

Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0°	1580	1580	1580	1580	1580	1580	1580	1580
1°	1579	1580	1579	1579	1580	1580	1579	1579
2°	1579	1579	1578	1578	1578	1578	1578	1578
3°	1578	1578	1576	1575	1576	1576	1577	1577
4°	1576	1576	1573	1573	1574	1574	1575	1574
5°	1573	1573	1571	1570	1571	1571	1572	1572
6°	1570	1570	1567	1567	1567	1568	1568	1569
7°	1567	1567	1563	1563	1564	1564	1565	1565
8°	1563	1563	1559	1559	1559	1560	1560	1561
9°	1559	1559	1553	1553	1554	1555	1556	1557
10°	1554	1554	1548	1548	1548	1550	1551	1551
11°	1549	1549	1543	1543	1543	1544	1544	1545
12°	1543	1542	1536	1536	1537	1538	1539	1540
13°	1537	1537	1529	1529	1530	1531	1532	1533
14°	1530	1530	1522	1521	1522	1524	1525	1526
15°	1523	1522	1514	1514	1513	1516	1517	1519
16°	1515	1514	1506	1505	1506	1507	1509	1511
17°	1507	1506	1497	1496	1496	1498	1500	1502
18°	1498	1498	1487	1487	1487	1489	1491	1493
19°	1489	1488	1478	1477	1478	1479	1482	1484
20°	1480	1479	1467	1466	1467	1469	1471	1474
21°	1470	1468	1457	1456	1456	1458	1461	1463
22°	1459	1458	1446	1444	1444	1447	1450	1453
23°	1448	1447	1434	1433	1433	1435	1438	1441
24°	1437	1436	1423	1421	1422	1423	1427	1429
25°	1425	1424	1411	1412	1412	1412	1416	1418
26°	1414	1413	1402	1403	1403	1403	1406	1409
27°	1404	1403	1393	1393	1394	1394	1396	1400
28°	1395	1394	1382	1379	1380	1382	1386	1390
29°	1385	1384	1367	1365	1365	1367	1372	1376
30°	1370	1369	1352	1349	1350	1353	1356	1361
31°	1356	1354	1336	1334	1333	1337	1341	1346
32°	1340	1339	1320	1318	1318	1320	1325	1330
33°	1325	1323	1303	1301	1301	1304	1309	1314
34°	1309	1306	1287	1284	1284	1287	1292	1297
35°	1292	1290	1269	1267	1267	1269	1274	1280
36°	1275	1272	1252	1249	1249	1252	1257	1262
37°	1257	1255	1234	1230	1231	1233	1239	1244
38°	1239	1237	1215	1212	1211	1214	1220	1226
39°	1221	1219	1196	1192	1192	1195	1201	1207
40°	1202	1200	1176	1173	1173	1176	1182	1188
41°	1183	1181	1157	1153	1153	1156	1162	1168
42°	1163	1161	1136	1133	1132	1136	1142	1148
43°	1143	1140	1116	1112	1111	1115	1121	1127
44°	1123	1120	1095	1091	1090	1094	1100	1106
45°	1102	1099	1073	1070	1069	1072	1078	1085
46°	1081	1078	1052	1047	1047	1050	1056	1063
47°	1059	1056	1029	1025	1024	1027	1034	1041
48°	1037	1034	1007	1003	1002	1005	1012	1018
49°	1014	1012	984	979	978	982	989	995

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
50°	992	989	961	956	955	959	965	972
51°	969	966	937	932	931	935	941	949
52°	945	942	913	909	908	911	917	924
53°	921	918	889	884	883	887	893	900
54°	897	894	864	859	858	861	868	875
55°	873	869	839	834	833	836	843	850
56°	848	845	814	809	808	811	818	824
57°	823	820	788	783	782	785	791	798
58°	797	794	762	758	756	759	766	772
59°	771	768	736	731	730	733	739	746
60°	745	742	710	705	703	706	713	719
61°	719	715	683	678	676	679	686	692
62°	692	688	656	651	649	652	658	665
63°	665	661	629	624	623	625	631	638
64°	638	635	602	597	595	597	603	610
65°	611	607	574	570	568	570	576	583
66°	584	580	547	542	539	542	548	554
67°	556	552	519	514	511	514	520	527
68°	529	525	491	486	483	486	492	499
69°	501	497	464	458	454	458	464	471
70°	473	469	436	430	425	430	437	443
71°	445	442	408	401	397	401	409	415
72°	418	414	381	373	368	373	381	387
73°	390	387	354	344	340	344	353	359
74°	363	359	326	316	312	316	326	332
75°	335	332	299	288	284	288	299	305
76°	307	305	272	261	257	261	271	278
77°	281	278	245	235	230	234	244	251
78°	254	251	218	209	205	208	218	225
79°	228	226	192	184	180	183	192	200
80°	203	200	168	159	156	158	167	176
81°	179	176	143	135	131	134	143	151
82°	155	152	118	113	109	111	118	127
83°	130	128	96	90	87	90	95	104
84°	108	105	75	70	67	69	74	82
85°	86	83	55	50	47	49	54	61
86°	66	62	36	34	32	33	35	41
87°	46	43	24	18	17	18	23	28
88°	31	29	12	3	2	2	12	14
89°	16	15	0	0	0	0	0	0
90°	1	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
98°	0	0	0	0	0	0	0	0
99°	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°
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°	1	1	1	0	0	0	0	1
123°	1	1	1	0	0	0	1	1
124°	1	1	1	1	0	0	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	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
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

Luminous Intensity (cd) Distribution Data (cont.)

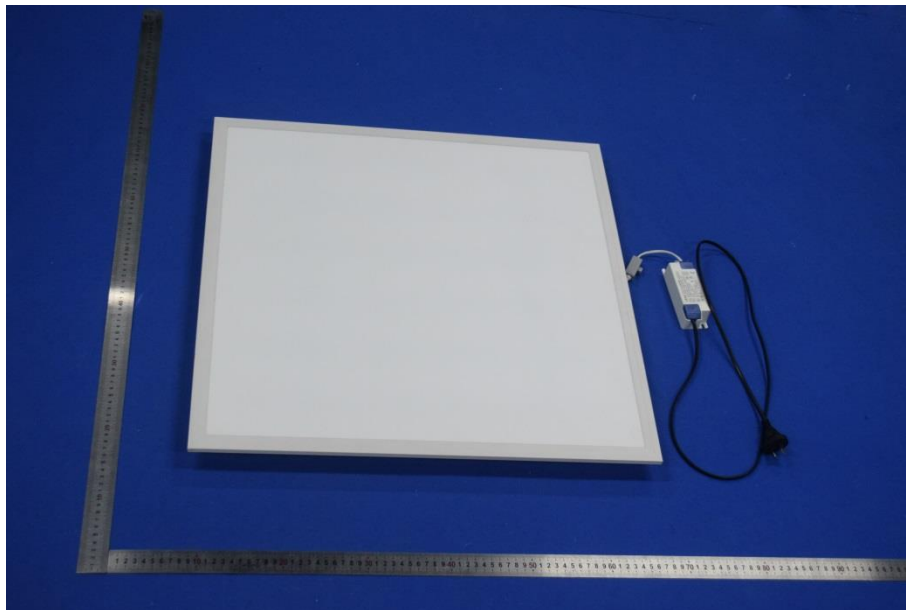
$\begin{matrix} C \\ \backslash \\ Y \end{matrix}$	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
150°	1	1	1	1	1	1	1	1
151°	1	1	1	1	1	1	1	1
152°	1	1	1	1	1	1	1	1
153°	1	1	1	1	1	1	1	1
154°	1	1	1	1	1	1	1	1
155°	1	1	1	1	1	1	1	1
156°	1	1	1	1	1	1	1	1
157°	1	1	1	1	1	1	1	1
158°	1	1	1	1	1	1	1	1
159°	1	1	1	1	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°	2	2	2	1	1	1	1	2
169°	2	2	2	1	1	1	1	2
170°	2	2	2	2	1	1	1	2
171°	2	2	2	2	1	1	1	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	2	2	2	2	2
180°	2	2	2	2	2	2	2	2

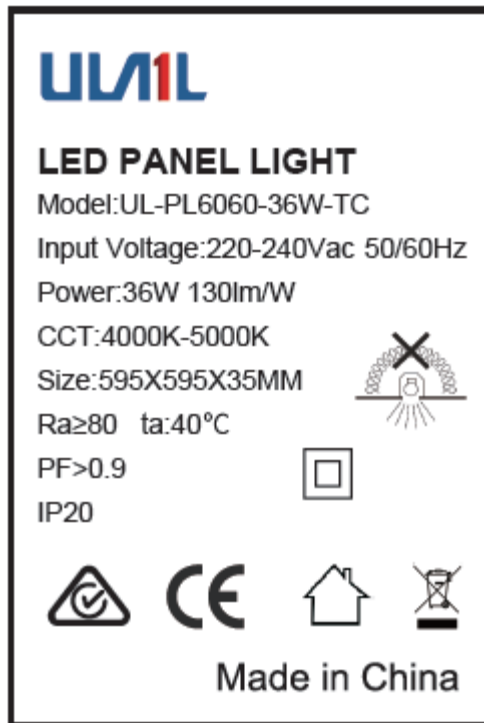
Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	37.7	0.80
5-10	111.9	2.39
10-15	182.5	3.90
15-20	247.4	5.28
20-25	304.4	6.49
25-30	352.9	7.53
30-35	389.4	8.31
35-40	412.9	8.81
40-45	422.9	9.02
45-50	418.9	8.94
50-55	400.8	8.55
55-60	369.0	7.87
60-65	324.9	6.93
65-70	270.0	5.76
70-75	206.1	4.40
75-80	138.5	2.95
80-85	72.9	1.56
85-90	18.8	0.40
90-95	0.4	0.01
95-100	0.2	0.00
100-105	0.2	0.01
105-110	0.2	0.00
110-115	0.2	0.01
115-120	0.2	0.00
120-125	0.3	0.01
125-130	0.3	0.00
130-135	0.4	0.01
135-140	0.4	0.01
140-145	0.4	0.01
145-150	0.4	0.01
150-155	0.4	0.01
155-160	0.4	0.00
160-165	0.3	0.01
165-170	0.2	0.01
170-175	0.1	0.00
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	37.7	0.80
0-10	149.6	3.19
0-15	332.1	7.09
0-20	579.6	12.37
0-25	884.0	18.86
0-30	1236.8	26.39
0-35	1626.2	34.70
0-40	2039.2	43.51
0-45	2462.0	52.53
0-50	2880.9	61.47
0-55	3281.7	70.02
0-60	3650.6	77.89
0-65	3975.5	84.82
0-70	4245.5	90.58
0-75	4451.6	94.98
0-80	4590.2	97.93
0-85	4663.1	99.49
0-90	4681.9	99.89
0-95	4682.3	99.90
0-100	4682.5	99.90
0-105	4682.6	99.91
0-110	4682.8	99.91
0-115	4683.1	99.92
0-120	4683.3	99.92
0-125	4683.6	99.93
0-130	4683.9	99.93
0-135	4684.2	99.94
0-140	4684.6	99.95
0-145	4685.0	99.96
0-150	4685.5	99.97
0-155	4685.9	99.98
0-160	4686.3	99.98
0-165	4686.6	99.99
0-170	4686.8	100.00
0-175	4686.9	100.00
0-180	4687.0	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. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. 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.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
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*****END OF REPORT*****