



TL-749



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai, China

Test Model: LE309027DIM120VVN/ADR6BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722005-10-11
Test Date:	2019-07-22 to 2019-07-24
Report Date:	2019-08-09
Reviewed By:	Ray Gao/EE Engineer <i>Ry Gao</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
Accreditation:	The IAS Accreditation Number TL-749.

Note: The test data was only valid for the test sample(s). 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. (Kunshan). 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.

1. Product Description

General Information:

One sample was received on 2019-07-22 and used for testing.

Model Tested: LE309027DIM120VVN/ADR6BL
 Manufacturer: GREEN CREATIVE LTD
 Brand Name: GREEN CREATIVE
 Product Designation: LED Recessed Downlight
 Burning Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120-277 VAC 60Hz
 Rated Power: 40W
 Nominal CCT: 2700K
 Nominal Lumen Output: 2450lm

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement 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
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2019-01-23	2020-01-22
Power Meter	INVENTFINE	WT500	GSJWQ20009	2019-04-23	2020-04-22
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2019-01-23	2020-01-22
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2019-04-23	2020-04-22
Standard Light Source	INVENTFINE	N/A	JWWCR020106	2018-12-24	2019-12-23
Thermal Meter	KEJIAN	TA298	N/A	2018-12-01	2019-11-30
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2019-04-23	2020-04-22
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2019-04-23	2020-04-22
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2019-04-23	2020-04-22
Power Meter	INVENTFINE	WT500	GSDSQ200007	2019-04-23	2020-04-22
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2019-01-24	2020-01-23
Wireless Weather Station	ZHONGXING	KG218	N/A	2018-12-01	2019-11-30
Standard Light Source	INVENTFINE	N/A	JWBYR040008	2019-03-08	2020-03-07

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 IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less 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.

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 $U_{re}=2.61\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=34\text{K}$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.5(k=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U_{re}=0.48\%$ of rdg, AC Voltage $U_{re}=0.25\%$ of rdg, Power $U_{re}=0.44\%$, ($k=2$), 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. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

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

Fidelity Index and Gamut Index Calculation

The R_i , R_g was calculated according to IES TM-30-15 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**

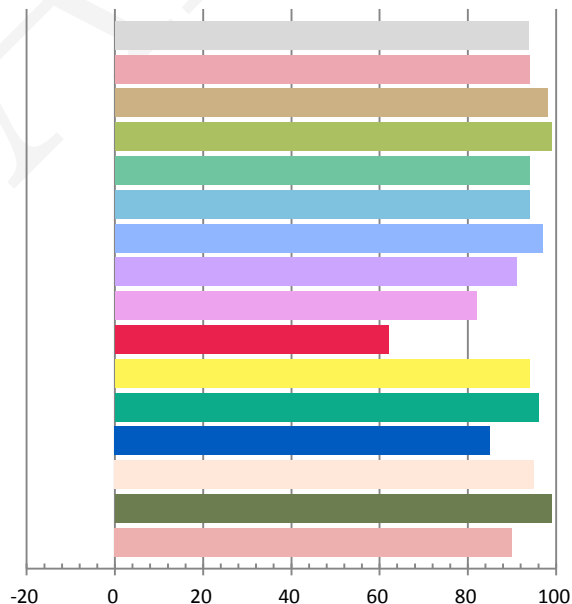
Photometric and Electrical Measurement Result

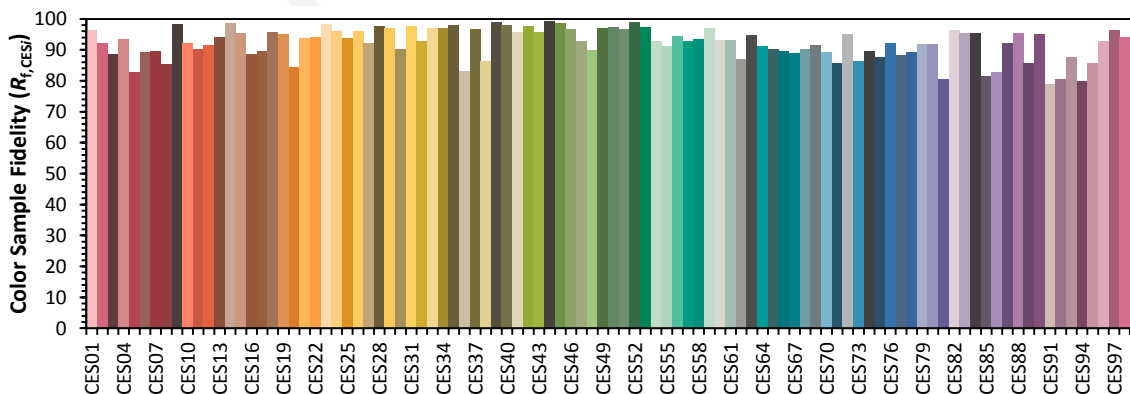
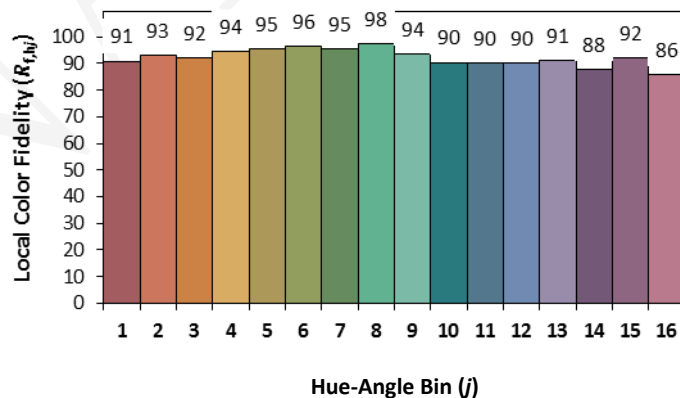
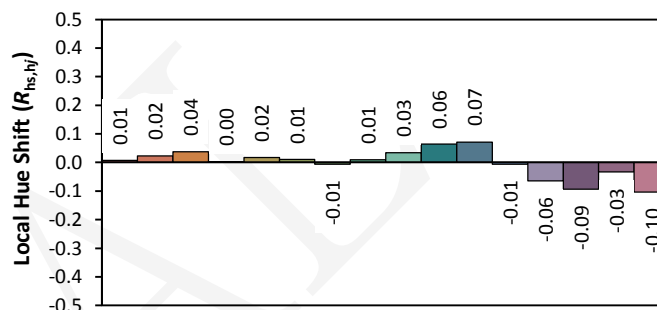
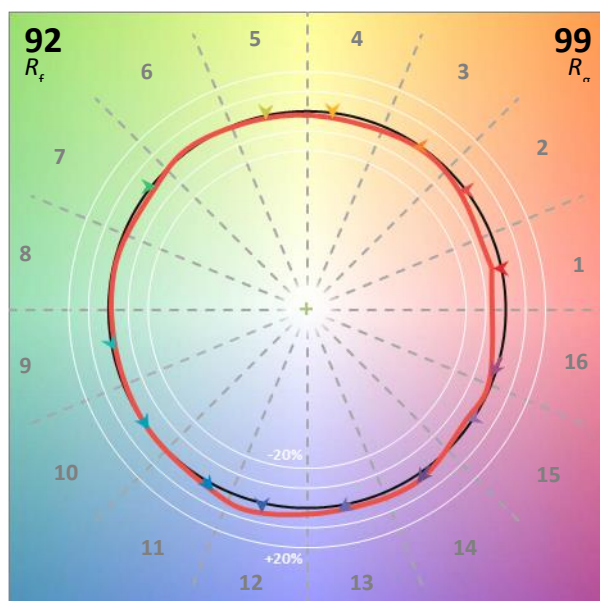
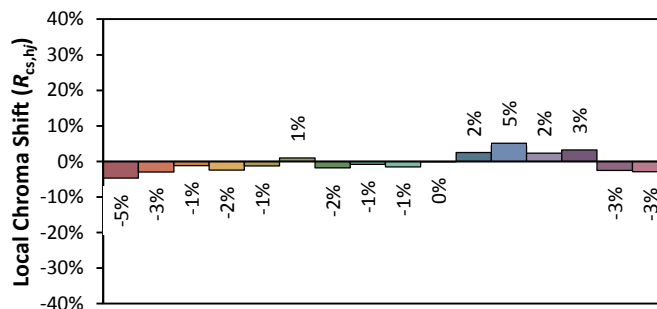
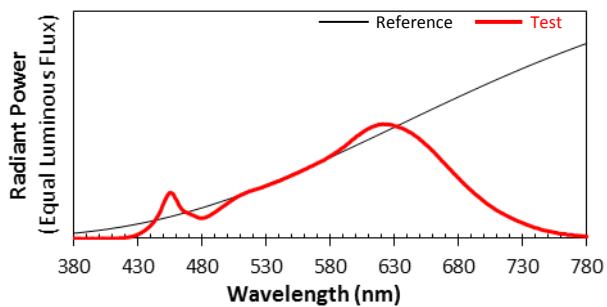
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.3328	39.55	0.9903	2660.78	67.28

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
9.392	2698	-0.00036	0.4594	0.4095	0.2627	0.5269

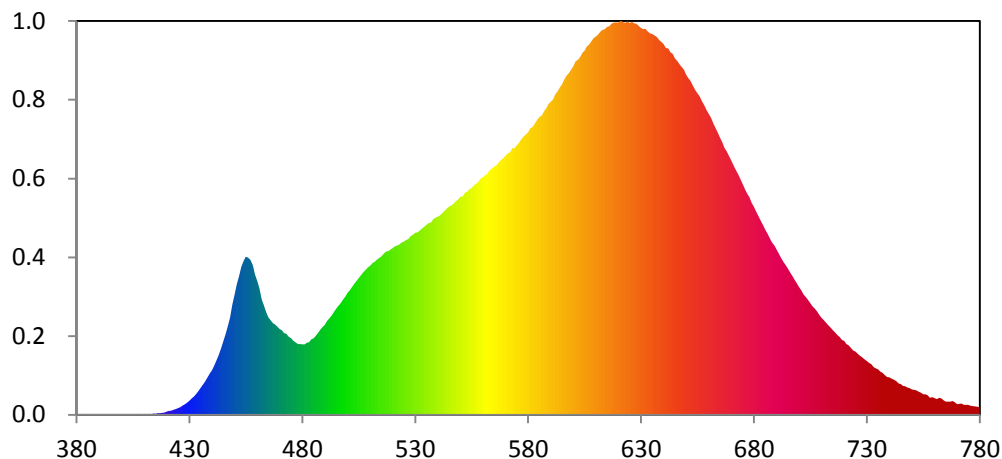
Color Rendering Index

Ra			
93.7			
R1	R2	R3	R4
94	98	99	94
R5	R6	R7	R8
94	97	91	82
R9	R10	R11	R12
62	94	96	85
R13	R14	R15	
95	99	90	





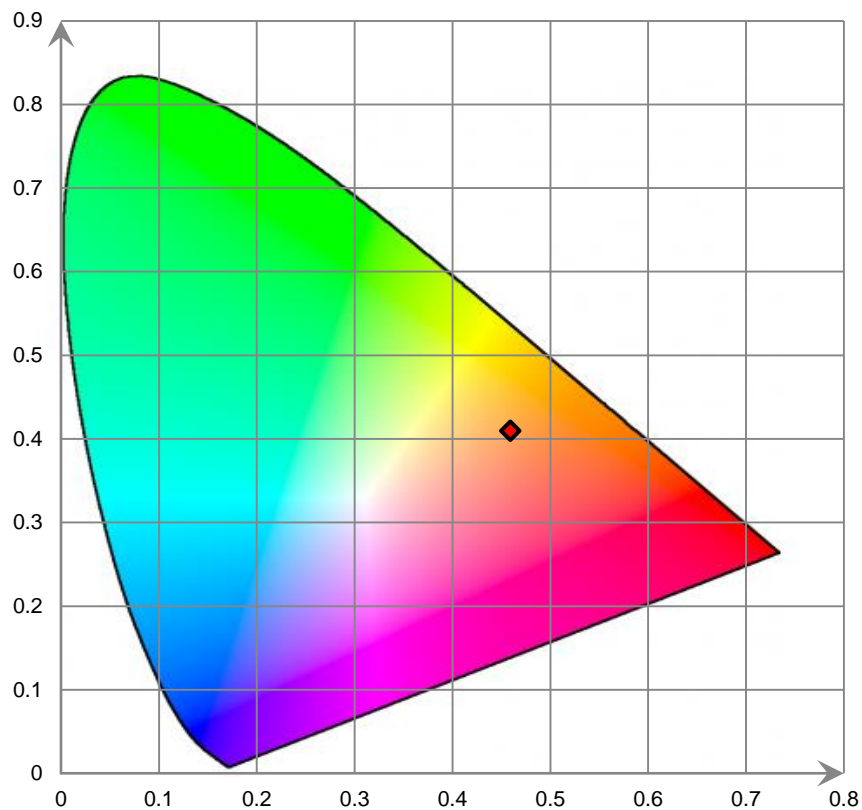
Relative Spectral Power Distribution



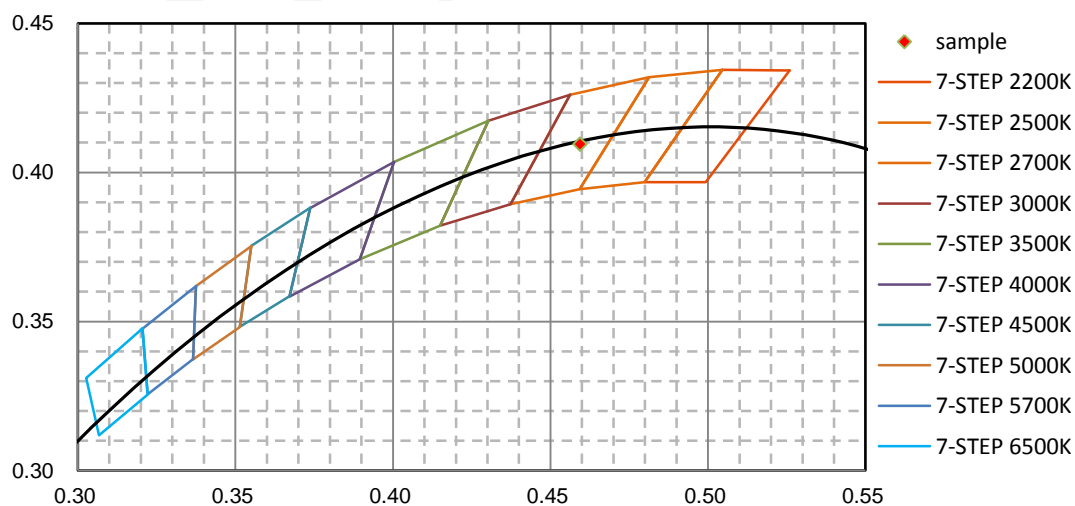
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.490E-02	421	5.625E-01	462	1.722E+01	503	1.957E+01	544	3.080E+01
381	7.520E-02	422	6.083E-01	463	1.629E+01	504	2.000E+01	545	3.110E+01
382	5.480E-02	423	7.500E-01	464	1.529E+01	505	2.041E+01	546	3.126E+01
383	9.300E-03	424	8.462E-01	465	1.454E+01	506	2.085E+01	547	3.157E+01
384	1.292E-01	425	1.020E+00	466	1.412E+01	507	2.126E+01	548	3.196E+01
385	9.010E-02	426	1.144E+00	467	1.370E+01	508	2.163E+01	549	3.217E+01
386	6.600E-03	427	1.370E+00	468	1.348E+01	509	2.198E+01	550	3.261E+01
387	3.680E-02	428	1.582E+00	469	1.313E+01	510	2.224E+01	551	3.264E+01
388	1.870E-02	429	1.829E+00	470	1.282E+01	511	2.265E+01	552	3.318E+01
389	1.970E-02	430	2.120E+00	471	1.264E+01	512	2.287E+01	553	3.334E+01
390	6.280E-02	431	2.443E+00	472	1.218E+01	513	2.321E+01	554	3.371E+01
391	3.020E-02	432	2.734E+00	473	1.209E+01	514	2.344E+01	555	3.390E+01
392	2.900E-03	433	3.098E+00	474	1.164E+01	515	2.367E+01	556	3.430E+01
393	1.160E-02	434	3.552E+00	475	1.141E+01	516	2.406E+01	557	3.455E+01
394	1.880E-02	435	3.990E+00	476	1.107E+01	517	2.441E+01	558	3.480E+01
395	7.290E-02	436	4.470E+00	477	1.083E+01	518	2.442E+01	559	3.531E+01
396	4.910E-02	437	4.964E+00	478	1.057E+01	519	2.469E+01	560	3.548E+01
397	1.830E-02	438	5.544E+00	479	1.055E+01	520	2.490E+01	561	3.584E+01
398	1.750E-02	439	6.140E+00	480	1.052E+01	521	2.517E+01	562	3.603E+01
399	3.300E-03	440	6.703E+00	481	1.053E+01	522	2.532E+01	563	3.653E+01
400	1.700E-03	441	7.423E+00	482	1.074E+01	523	2.546E+01	564	3.682E+01
401	2.540E-02	442	8.185E+00	483	1.087E+01	524	2.571E+01	565	3.709E+01
402	7.290E-02	443	8.987E+00	484	1.130E+01	525	2.587E+01	566	3.729E+01
403	7.660E-02	444	9.940E+00	485	1.143E+01	526	2.612E+01	567	3.774E+01
404	3.830E-02	445	1.099E+01	486	1.183E+01	527	2.625E+01	568	3.809E+01
405	4.340E-02	446	1.203E+01	487	1.225E+01	528	2.667E+01	569	3.836E+01
406	2.220E-02	447	1.326E+01	488	1.270E+01	529	2.693E+01	570	3.875E+01
407	1.265E-01	448	1.452E+01	489	1.309E+01	530	2.720E+01	571	3.906E+01
408	1.940E-02	449	1.645E+01	490	1.343E+01	531	2.727E+01	572	3.922E+01
409	9.540E-02	450	1.791E+01	491	1.399E+01	532	2.755E+01	573	3.982E+01
410	1.248E-01	451	1.949E+01	492	1.439E+01	533	2.785E+01	574	3.983E+01
411	1.072E-01	452	2.072E+01	493	1.486E+01	534	2.813E+01	575	4.029E+01
412	1.159E-01	453	2.211E+01	494	1.540E+01	535	2.842E+01	576	4.068E+01
413	6.950E-02	454	2.298E+01	495	1.587E+01	536	2.864E+01	577	4.117E+01
414	1.716E-01	455	2.362E+01	496	1.632E+01	537	2.875E+01	578	4.157E+01
415	1.546E-01	456	2.346E+01	497	1.669E+01	538	2.920E+01	579	4.191E+01
416	2.116E-01	457	2.321E+01	498	1.722E+01	539	2.945E+01	580	4.218E+01
417	2.374E-01	458	2.235E+01	499	1.766E+01	540	2.959E+01	581	4.278E+01
418	2.897E-01	459	2.093E+01	500	1.820E+01	541	2.980E+01	582	4.306E+01
419	3.460E-01	460	1.998E+01	501	1.862E+01	542	3.011E+01	583	4.356E+01
420	4.642E-01	461	1.882E+01	502	1.909E+01	543	3.047E+01	584	4.408E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.451E+01	626	5.871E+01	667	3.991E+01	708	1.539E+01	749	3.967E+00
586	4.472E+01	627	5.848E+01	668	3.936E+01	709	1.486E+01	750	3.795E+00
587	4.534E+01	628	5.844E+01	669	3.867E+01	710	1.444E+01	751	3.738E+00
588	4.584E+01	629	5.812E+01	670	3.803E+01	711	1.411E+01	752	3.617E+00
589	4.643E+01	630	5.784E+01	671	3.719E+01	712	1.372E+01	753	3.448E+00
590	4.678E+01	631	5.763E+01	672	3.654E+01	713	1.333E+01	754	3.304E+00
591	4.709E+01	632	5.770E+01	673	3.592E+01	714	1.301E+01	755	3.064E+00
592	4.787E+01	633	5.729E+01	674	3.521E+01	715	1.263E+01	756	3.081E+00
593	4.830E+01	634	5.701E+01	675	3.448E+01	716	1.228E+01	757	2.931E+00
594	4.886E+01	635	5.691E+01	676	3.371E+01	717	1.192E+01	758	2.527E+00
595	4.936E+01	636	5.668E+01	677	3.303E+01	718	1.160E+01	759	2.631E+00
596	5.006E+01	637	5.643E+01	678	3.252E+01	719	1.120E+01	760	2.501E+00
597	5.065E+01	638	5.599E+01	679	3.168E+01	720	1.103E+01	761	2.360E+00
598	5.104E+01	639	5.570E+01	680	3.110E+01	721	1.059E+01	762	2.523E+00
599	5.149E+01	640	5.537E+01	681	3.039E+01	722	1.035E+01	763	2.455E+00
600	5.212E+01	641	5.483E+01	682	2.970E+01	723	9.982E+00	764	2.152E+00
601	5.285E+01	642	5.476E+01	683	2.902E+01	724	9.592E+00	765	1.958E+00
602	5.301E+01	643	5.421E+01	684	2.840E+01	725	9.433E+00	766	1.980E+00
603	5.344E+01	644	5.393E+01	685	2.767E+01	726	9.062E+00	767	1.949E+00
604	5.410E+01	645	5.330E+01	686	2.710E+01	727	8.797E+00	768	2.040E+00
605	5.444E+01	646	5.291E+01	687	2.643E+01	728	8.546E+00	769	1.859E+00
606	5.506E+01	647	5.244E+01	688	2.579E+01	729	8.267E+00	770	1.569E+00
607	5.534E+01	648	5.199E+01	689	2.531E+01	730	8.037E+00	771	1.602E+00
608	5.582E+01	649	5.158E+01	690	2.469E+01	731	7.765E+00	772	1.661E+00
609	5.628E+01	650	5.082E+01	691	2.405E+01	732	7.544E+00	773	1.462E+00
610	5.654E+01	651	5.032E+01	692	2.341E+01	733	7.112E+00	774	1.479E+00
611	5.683E+01	652	4.986E+01	693	2.287E+01	734	6.937E+00	775	1.479E+00
612	5.723E+01	653	4.922E+01	694	2.238E+01	735	6.765E+00	776	1.344E+00
613	5.754E+01	654	4.851E+01	695	2.184E+01	736	6.436E+00	777	1.301E+00
614	5.762E+01	655	4.804E+01	696	2.128E+01	737	6.256E+00	778	1.236E+00
615	5.797E+01	656	4.753E+01	697	2.075E+01	738	5.937E+00	779	1.203E+00
616	5.807E+01	657	4.681E+01	698	2.017E+01	739	5.629E+00	780	1.076E+00
617	5.845E+01	658	4.622E+01	699	1.963E+01	740	5.568E+00		
618	5.862E+01	659	4.552E+01	700	1.909E+01	741	5.422E+00		
619	5.864E+01	660	4.497E+01	701	1.862E+01	742	5.266E+00		
620	5.866E+01	661	4.437E+01	702	1.799E+01	743	5.012E+00		
621	5.886E+01	662	4.358E+01	703	1.758E+01	744	4.692E+00		
622	5.869E+01	663	4.287E+01	704	1.717E+01	745	4.601E+00		
623	5.857E+01	664	4.220E+01	705	1.671E+01	746	4.277E+00		
624	5.879E+01	665	4.143E+01	706	1.622E+01	747	4.239E+00		
625	5.853E+01	666	4.072E+01	707	1.581E+01	748	4.074E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

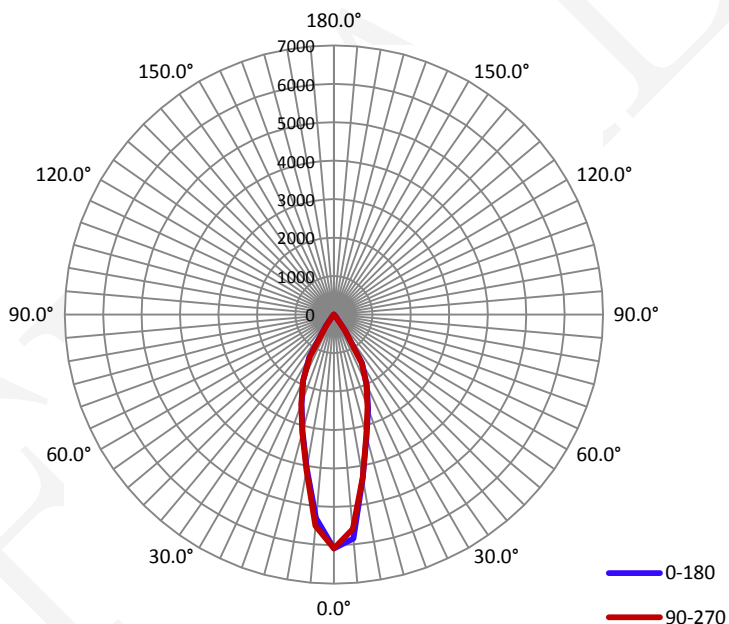
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.3450	39.58	0.9570

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2668.3	67.47	6086.7	0.51	0.51

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	32.5	32.7	32.4	32.7	32.6
Field Angle(10% I_{max}):	68.0	68.1	68.1	67.8	68.0

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	6087	6087	6087	6087	6087	6087	6087	6087
5.0°	5843	5792	5733	5651	5596	5499	5417	5380
10.0°	4327	4361	4379	4340	4303	4270	4204	4144
15.0°	3287	3338	3350	3301	3253	3275	3270	3229
20.0°	2608	2617	2596	2584	2561	2564	2570	2543
25.0°	2034	2021	2010	2000	1983	1965	1962	1955
30.0°	1459	1464	1457	1459	1456	1414	1386	1389
35.0°	482	516	530	531	524	496	469	468
40.0°	85	92	86	89	92	94	90	85
45.0°	43	46	47	44	41	50	48	48
50.0°	0	0	0	0	0	0	0	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
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.)

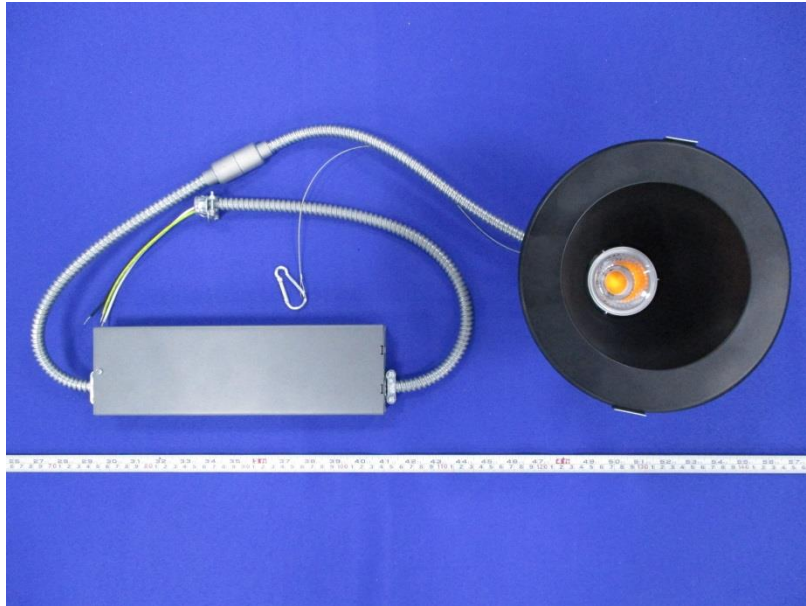
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	6087	6087	6087	6087	6087	6087	6087	6087
5.0°	5313	5347	5396	5439	5514	5593	5690	5707
10.0°	4047	4041	4076	4065	4100	4113	4127	4169
15.0°	3134	3110	3127	3152	3166	3164	3184	3210
20.0°	2467	2452	2462	2471	2486	2510	2531	2533
25.0°	1895	1874	1910	1896	1910	1936	1941	1962
30.0°	1277	1253	1262	1258	1254	1270	1292	1320
35.0°	372	352	337	322	335	321	342	359
40.0°	79	76	73	68	70	67	73	73
45.0°	38	40	40	41	37	36	41	38
50.0°	0	0	0	0	0	0	0	0
55.0°	0	0	0	0	0	0	0	0
60.0°	0	0	0	0	0	0	0	0
65.0°	0	0	0	0	0	0	0	0
70.0°	0	0	0	0	0	0	0	0
75.0°	0	0	0	0	0	0	0	0
80.0°	0	0	0	0	0	0	0	0
85.0°	0	0	0	0	0	0	0	0
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	139.2	5.22
5-10	348.7	13.07
10-15	439.8	16.48
15-20	474.4	17.78
20-25	470.7	17.64
25-30	418.6	15.69
30-35	261.6	9.81
35-40	83.9	3.15
40-45	22.8	0.85
45-50	8.6	0.32
50-55	0.0	0.00
55-60	0.0	0.00
60-65	0.0	0.00
65-70	0.0	0.00
70-75	0.0	0.00
75-80	0.0	0.00
80-85	0.0	0.00
85-90	0.0	0.00
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	139.2	5.22
0-10	487.9	18.29
0-15	927.7	34.77
0-20	1402.1	52.55
0-25	1872.8	70.19
0-30	2291.4	85.87
0-35	2553.0	95.68
0-40	2636.9	98.82
0-45	2659.8	99.68
0-50	2668.3	100.00
0-55	2668.3	100.00
0-60	2668.3	100.00
0-65	2668.3	100.00
0-70	2668.3	100.00
0-75	2668.3	100.00
0-80	2668.3	100.00
0-85	2668.3	100.00
0-90	2668.3	100.00
0-95	2668.3	100.00
0-100	2668.3	100.00
0-105	2668.3	100.00
0-110	2668.3	100.00
0-115	2668.3	100.00
0-120	2668.3	100.00
0-125	2668.3	100.00
0-130	2668.3	100.00
0-135	2668.3	100.00
0-140	2668.3	100.00
0-145	2668.3	100.00
0-150	2668.3	100.00
0-155	2668.3	100.00
0-160	2668.3	100.00
0-165	2668.3	100.00
0-170	2668.3	100.00
0-175	2668.3	100.00
0-180	2668.3	100.00

6. Product Photo



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