

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

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

Test Model: LE309027DIM120VMD/ADR6BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722005-10-2
Test Date:	2019-07-22 to 2019-08-07
Report Date:	2019-08-07
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: LE309027DIM120VMD/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**

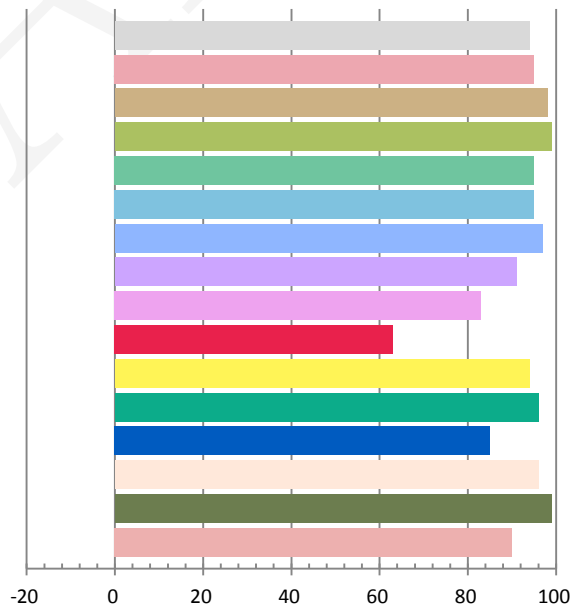
Photometric and Electrical Measurement Result

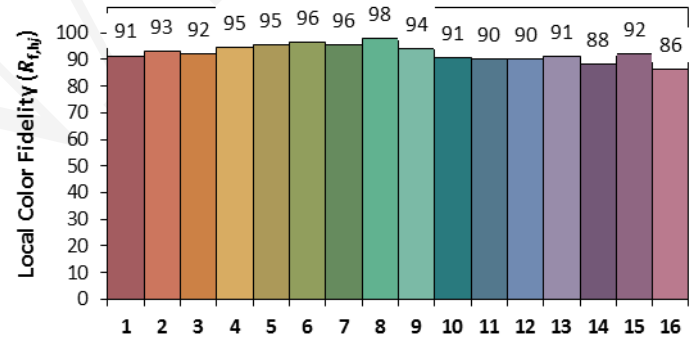
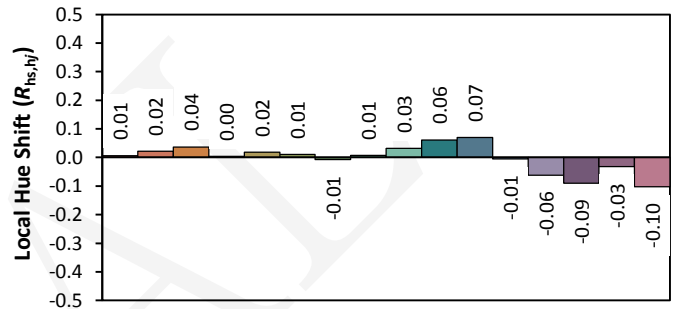
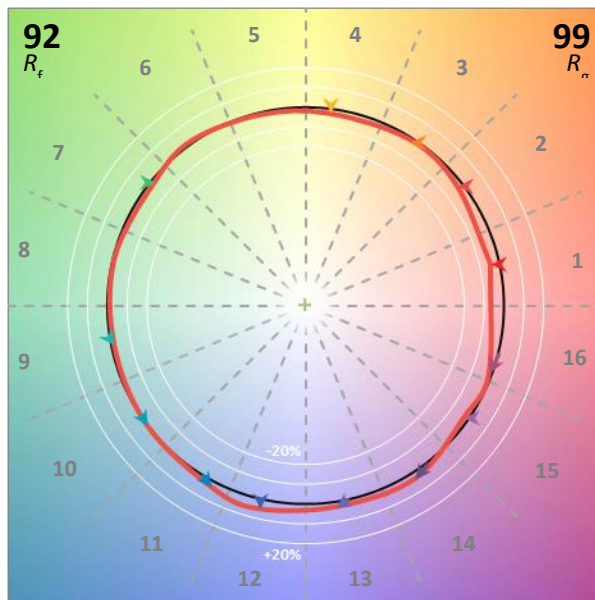
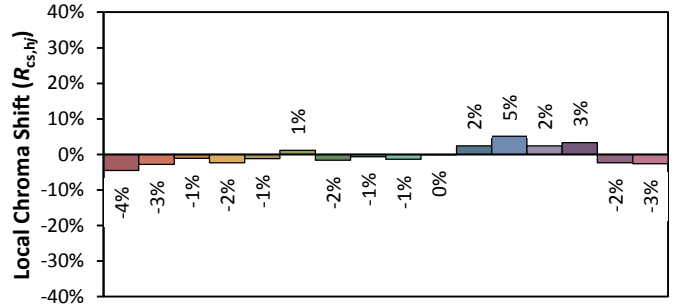
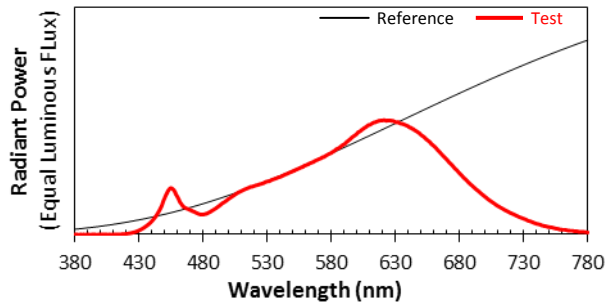
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120	60	0.3313	39.4	0.991	2720.81	69.06

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
9.638	2702	-0.00035	0.4591	0.4095	0.2625	0.5268

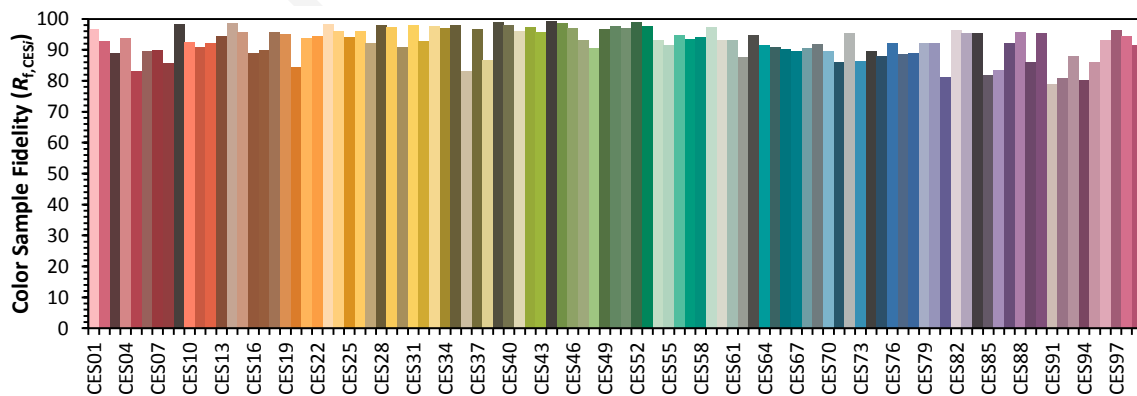
Color Rendering Index

Ra			
94.0			
R1	R2	R3	R4
95	98	99	95
R5	R6	R7	R8
95	97	91	83
R9	R10	R11	R12
63	94	96	85
R13	R14	R15	
96	99	90	

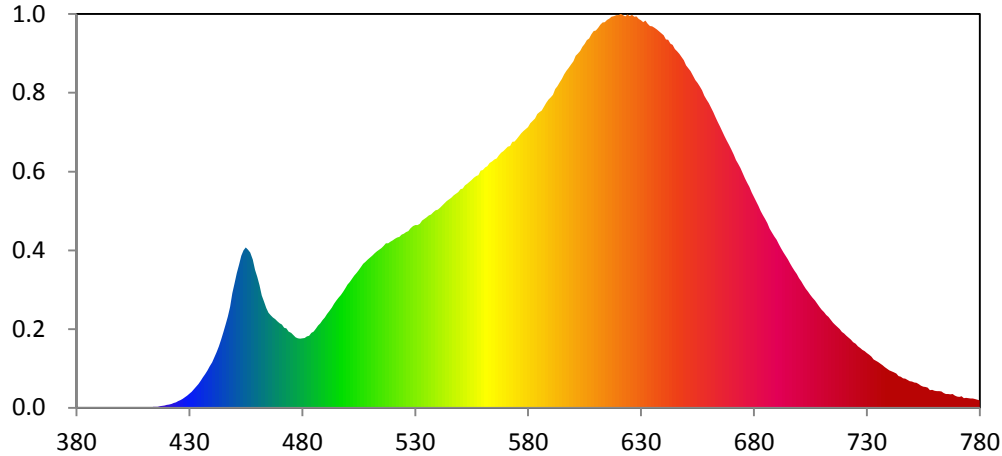




Hue-Angle Bin (j)



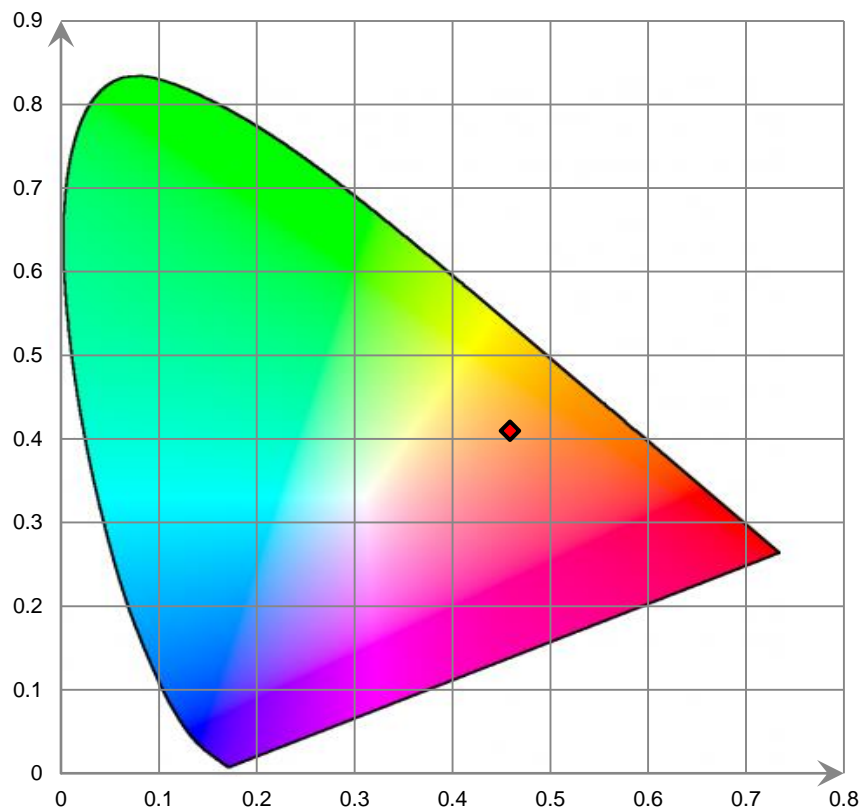
Relative Spectral Power Distribution



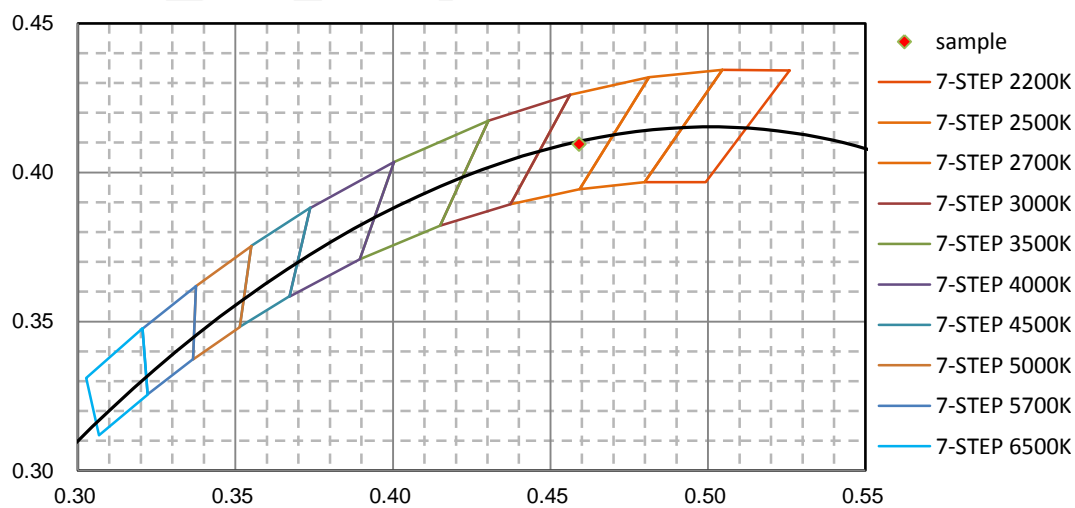
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	3.050E-02	421	5.066E-01	462	1.717E+01	503	2.021E+01	544	3.157E+01
381	2.800E-02	422	6.015E-01	463	1.622E+01	504	2.061E+01	545	3.183E+01
382	3.980E-02	423	7.190E-01	464	1.524E+01	505	2.105E+01	546	3.206E+01
383	3.300E-03	424	8.467E-01	465	1.453E+01	506	2.152E+01	547	3.246E+01
384	5.040E-02	425	9.999E-01	466	1.412E+01	507	2.198E+01	548	3.273E+01
385	5.930E-02	426	1.170E+00	467	1.376E+01	508	2.230E+01	549	3.294E+01
386	6.100E-03	427	1.373E+00	468	1.356E+01	509	2.262E+01	550	3.339E+01
387	8.780E-02	428	1.608E+00	469	1.319E+01	510	2.292E+01	551	3.348E+01
388	2.290E-02	429	1.870E+00	470	1.291E+01	511	2.328E+01	552	3.396E+01
389	1.320E-02	430	2.149E+00	471	1.272E+01	512	2.360E+01	553	3.421E+01
390	5.120E-02	431	2.463E+00	472	1.224E+01	513	2.393E+01	554	3.454E+01
391	2.590E-02	432	2.816E+00	473	1.212E+01	514	2.413E+01	555	3.479E+01
392	1.100E-03	433	3.233E+00	474	1.165E+01	515	2.441E+01	556	3.516E+01
393	3.500E-03	434	3.626E+00	475	1.143E+01	516	2.472E+01	557	3.542E+01
394	1.400E-03	435	4.104E+00	476	1.108E+01	517	2.510E+01	558	3.557E+01
395	3.180E-02	436	4.619E+00	477	1.077E+01	518	2.511E+01	559	3.622E+01
396	3.180E-02	437	5.121E+00	478	1.059E+01	519	2.536E+01	560	3.634E+01
397	1.390E-02	438	5.685E+00	479	1.054E+01	520	2.558E+01	561	3.672E+01
398	4.600E-03	439	6.306E+00	480	1.059E+01	521	2.582E+01	562	3.691E+01
399	2.000E-04	440	6.931E+00	481	1.066E+01	522	2.600E+01	563	3.740E+01
400	0.000E+00	441	7.714E+00	482	1.090E+01	523	2.613E+01	564	3.764E+01
401	2.630E-02	442	8.528E+00	483	1.099E+01	524	2.647E+01	565	3.794E+01
402	3.370E-02	443	9.364E+00	484	1.146E+01	525	2.660E+01	566	3.809E+01
403	3.320E-02	444	1.042E+01	485	1.165E+01	526	2.684E+01	567	3.857E+01
404	3.840E-02	445	1.154E+01	486	1.208E+01	527	2.697E+01	568	3.896E+01
405	3.080E-02	446	1.269E+01	487	1.256E+01	528	2.741E+01	569	3.920E+01
406	1.330E-02	447	1.395E+01	488	1.293E+01	529	2.775E+01	570	3.957E+01
407	1.124E-01	448	1.537E+01	489	1.340E+01	530	2.790E+01	571	3.991E+01
408	2.220E-02	449	1.749E+01	490	1.380E+01	531	2.789E+01	572	4.001E+01
409	6.450E-02	450	1.904E+01	491	1.434E+01	532	2.813E+01	573	4.061E+01
410	8.630E-02	451	2.060E+01	492	1.475E+01	533	2.858E+01	574	4.066E+01
411	7.990E-02	452	2.186E+01	493	1.530E+01	534	2.885E+01	575	4.107E+01
412	8.230E-02	453	2.322E+01	494	1.586E+01	535	2.908E+01	576	4.153E+01
413	5.370E-02	454	2.405E+01	495	1.639E+01	536	2.938E+01	577	4.194E+01
414	1.591E-01	455	2.448E+01	496	1.682E+01	537	2.952E+01	578	4.229E+01
415	1.513E-01	456	2.413E+01	497	1.721E+01	538	2.989E+01	579	4.259E+01
416	1.540E-01	457	2.369E+01	498	1.771E+01	539	3.014E+01	580	4.286E+01
417	2.367E-01	458	2.266E+01	499	1.821E+01	540	3.029E+01	581	4.346E+01
418	3.039E-01	459	2.105E+01	500	1.880E+01	541	3.055E+01	582	4.383E+01
419	3.287E-01	460	1.998E+01	501	1.921E+01	542	3.091E+01	583	4.423E+01
420	4.523E-01	461	1.872E+01	502	1.971E+01	543	3.125E+01	584	4.488E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.520E+01	626	6.003E+01	667	4.149E+01	708	1.587E+01	749	4.040E+00
586	4.543E+01	627	5.976E+01	668	4.082E+01	709	1.538E+01	750	3.990E+00
587	4.602E+01	628	5.980E+01	669	4.019E+01	710	1.498E+01	751	3.843E+00
588	4.657E+01	629	5.942E+01	670	3.950E+01	711	1.461E+01	752	3.805E+00
589	4.709E+01	630	5.919E+01	671	3.867E+01	712	1.418E+01	753	3.592E+00
590	4.744E+01	631	5.892E+01	672	3.786E+01	713	1.387E+01	754	3.390E+00
591	4.784E+01	632	5.915E+01	673	3.727E+01	714	1.345E+01	755	3.201E+00
592	4.870E+01	633	5.866E+01	674	3.664E+01	715	1.302E+01	756	3.151E+00
593	4.916E+01	634	5.833E+01	675	3.582E+01	716	1.267E+01	757	3.067E+00
594	4.973E+01	635	5.828E+01	676	3.505E+01	717	1.234E+01	758	2.660E+00
595	5.024E+01	636	5.801E+01	677	3.435E+01	718	1.201E+01	759	2.746E+00
596	5.095E+01	637	5.782E+01	678	3.376E+01	719	1.160E+01	760	2.564E+00
597	5.149E+01	638	5.749E+01	679	3.291E+01	720	1.133E+01	761	2.537E+00
598	5.194E+01	639	5.720E+01	680	3.222E+01	721	1.098E+01	762	2.552E+00
599	5.242E+01	640	5.689E+01	681	3.155E+01	722	1.071E+01	763	2.474E+00
600	5.295E+01	641	5.628E+01	682	3.086E+01	723	1.040E+01	764	2.265E+00
601	5.378E+01	642	5.623E+01	683	3.004E+01	724	1.002E+01	765	2.115E+00
602	5.410E+01	643	5.563E+01	684	2.942E+01	725	9.767E+00	766	2.075E+00
603	5.454E+01	644	5.546E+01	685	2.886E+01	726	9.396E+00	767	2.042E+00
604	5.517E+01	645	5.481E+01	686	2.819E+01	727	9.137E+00	768	2.086E+00
605	5.558E+01	646	5.449E+01	687	2.738E+01	728	8.852E+00	769	1.851E+00
606	5.617E+01	647	5.406E+01	688	2.679E+01	729	8.629E+00	770	1.690E+00
607	5.643E+01	648	5.361E+01	689	2.617E+01	730	8.336E+00	771	1.682E+00
608	5.707E+01	649	5.309E+01	690	2.567E+01	731	8.103E+00	772	1.753E+00
609	5.754E+01	650	5.232E+01	691	2.499E+01	732	7.830E+00	773	1.463E+00
610	5.763E+01	651	5.187E+01	692	2.433E+01	733	7.385E+00	774	1.517E+00
611	5.805E+01	652	5.143E+01	693	2.377E+01	734	7.174E+00	775	1.451E+00
612	5.851E+01	653	5.081E+01	694	2.323E+01	735	7.010E+00	776	1.401E+00
613	5.889E+01	654	5.009E+01	695	2.268E+01	736	6.763E+00	777	1.402E+00
614	5.892E+01	655	4.961E+01	696	2.205E+01	737	6.520E+00	778	1.304E+00
615	5.924E+01	656	4.907E+01	697	2.147E+01	738	6.191E+00	779	1.224E+00
616	5.946E+01	657	4.852E+01	698	2.092E+01	739	5.974E+00	780	1.134E+00
617	5.974E+01	658	4.765E+01	699	2.041E+01	740	5.730E+00		
618	5.987E+01	659	4.706E+01	700	1.981E+01	741	5.564E+00		
619	5.998E+01	660	4.655E+01	701	1.932E+01	742	5.413E+00		
620	5.999E+01	661	4.588E+01	702	1.872E+01	743	5.220E+00		
621	6.018E+01	662	4.518E+01	703	1.821E+01	744	4.855E+00		
622	6.002E+01	663	4.437E+01	704	1.774E+01	745	4.751E+00		
623	5.978E+01	664	4.368E+01	705	1.728E+01	746	4.472E+00		
624	6.010E+01	665	4.297E+01	706	1.683E+01	747	4.446E+00		
625	5.986E+01	666	4.222E+01	707	1.636E+01	748	4.259E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

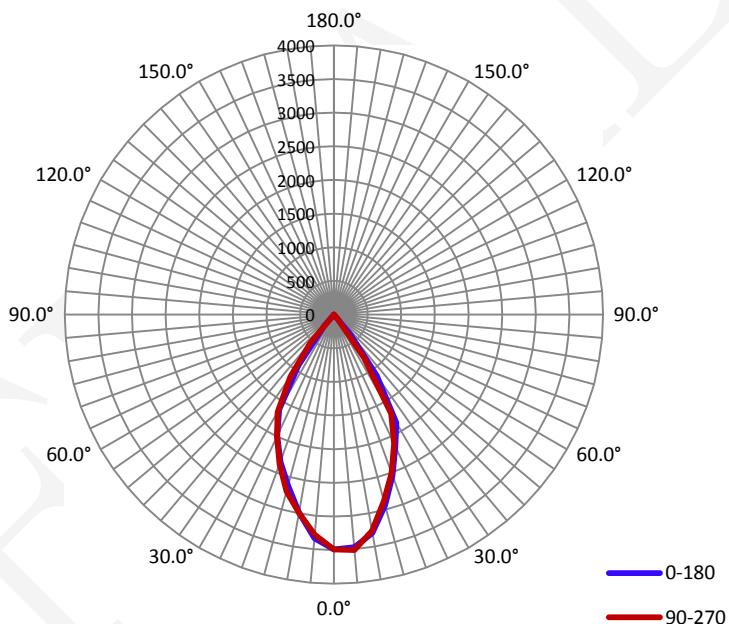
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.3430	39.41	0.9570

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2728	69.27	3519.0	0.84	0.84

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	59.1	58.0	58.1	59.6	58.7
Field Angle(10% I_{max}):	79.3	79.6	79.9	79.6	79.6

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	3490	3490	3490	3490	3490	3490	3490	3490
5.0°	3471	3495	3519	3501	3513	3488	3452	3456
10.0°	3296	3317	3303	3272	3263	3224	3189	3159
15.0°	2935	2967	2973	2917	2872	2825	2805	2798
20.0°	2548	2566	2578	2538	2510	2429	2371	2382
25.0°	2166	2197	2205	2151	2120	2098	2085	2067
30.0°	1854	1859	1812	1759	1702	1672	1665	1669
35.0°	1109	1020	921	824	783	782	792	881
40.0°	370	243	148	100	80	79	97	173
45.0°	0	0	0	0	0	0	0	0
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

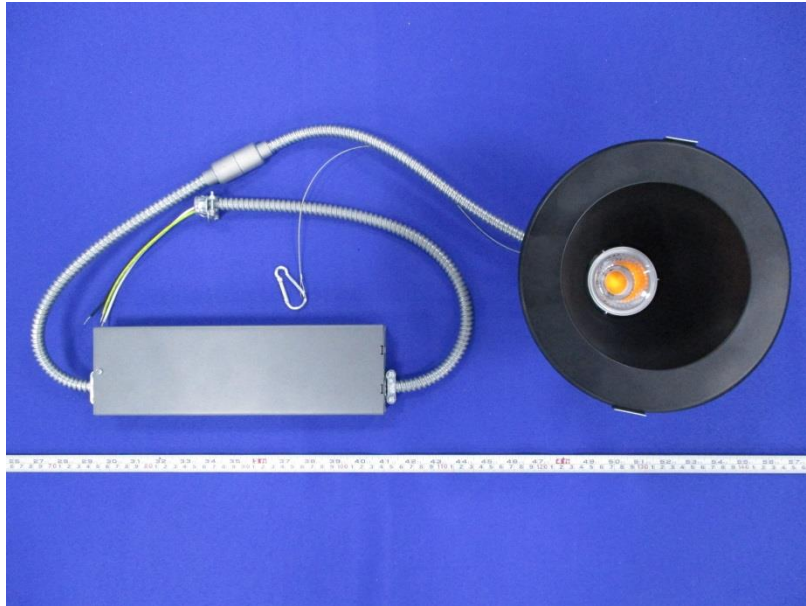
Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	3490	3490	3490	3490	3490	3490	3490	3490
5.0°	3338	3329	3276	3264	3283	3298	3343	3448
10.0°	2990	2996	2995	2957	2993	3090	3155	3266
15.0°	2633	2623	2665	2668	2721	2790	2808	2932
20.0°	2327	2308	2298	2309	2361	2410	2466	2568
25.0°	1994	1949	1923	1951	2002	2046	2125	2245
30.0°	1628	1638	1616	1618	1676	1746	1823	1880
35.0°	920	994	1052	1087	1127	1170	1174	1148
40.0°	211	326	430	511	550	555	492	421
45.0°	0	0	0	0	0	0	0	0
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)	%	Deg	Flux (lm)	%
0-5	82.4	3.02	0-5	82.4	3.02
5-10	234.6	8.60	0-10	317.0	11.62
10-15	353.7	12.96	0-15	670.7	24.59
15-20	432.2	15.84	0-20	1102.9	40.43
20-25	473.9	17.37	0-25	1576.8	57.80
25-30	482.0	17.67	0-30	2058.8	75.47
30-35	399.4	14.64	0-35	2458.2	90.11
35-40	214.4	7.86	0-40	2672.7	97.97
40-45	55.4	2.03	0-45	2728.0	100.00
45-50	0.0	0.00	0-50	2728.0	100.00
50-55	0.0	0.00	0-55	2728.0	100.00
55-60	0.0	0.00	0-60	2728.0	100.00
60-65	0.0	0.00	0-65	2728.0	100.00
65-70	0.0	0.00	0-70	2728.0	100.00
70-75	0.0	0.00	0-75	2728.0	100.00
75-80	0.0	0.00	0-80	2728.0	100.00
80-85	0.0	0.00	0-85	2728.0	100.00
85-90	0.0	0.00	0-90	2728.0	100.00
90-95	0.0	0.00	0-95	2728.0	100.00
95-100	0.0	0.00	0-100	2728.0	100.00
100-105	0.0	0.00	0-105	2728.0	100.00
105-110	0.0	0.00	0-110	2728.0	100.00
110-115	0.0	0.00	0-115	2728.0	100.00
115-120	0.0	0.00	0-120	2728.0	100.00
120-125	0.0	0.00	0-125	2728.0	100.00
125-130	0.0	0.00	0-130	2728.0	100.00
130-135	0.0	0.00	0-135	2728.0	100.00
135-140	0.0	0.00	0-140	2728.0	100.00
140-145	0.0	0.00	0-145	2728.0	100.00
145-150	0.0	0.00	0-150	2728.0	100.00
150-155	0.0	0.00	0-155	2728.0	100.00
155-160	0.0	0.00	0-160	2728.0	100.00
160-165	0.0	0.00	0-165	2728.0	100.00
165-170	0.0	0.00	0-170	2728.0	100.00
170-175	0.0	0.00	0-175	2728.0	100.00
175-180	0.0	0.00	0-180	2728.0	100.00

6. Product Photo



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