

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

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

Test Model: LE309027DIM120VNR/ADR6BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722005-10-1
Test Date:	2019-07-22 to 2019-07-24
Report Date:	2019-07-29
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: LE309027DIM120VNR/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**

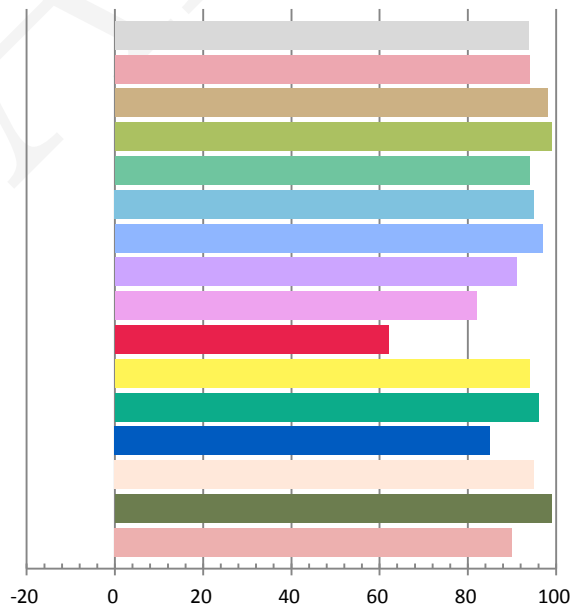
Photometric and Electrical Measurement Result

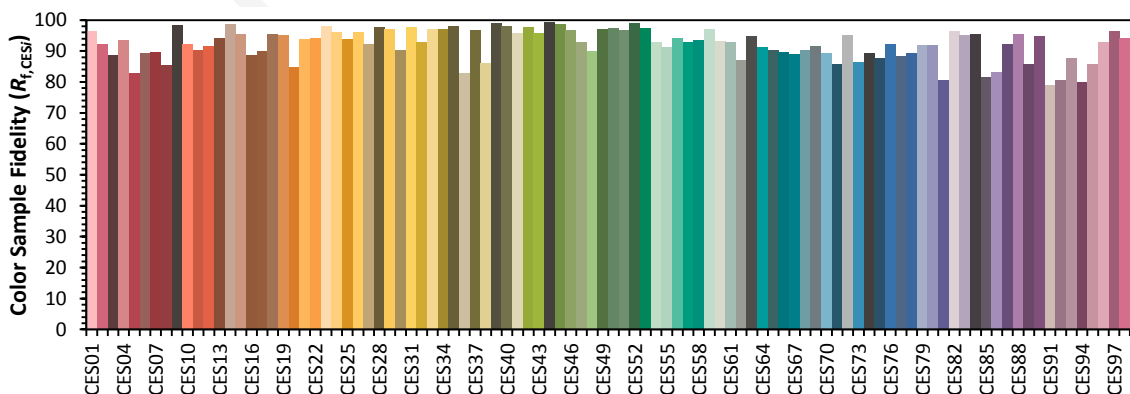
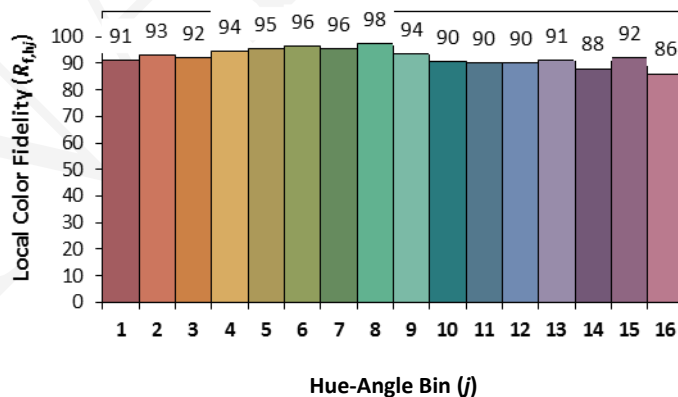
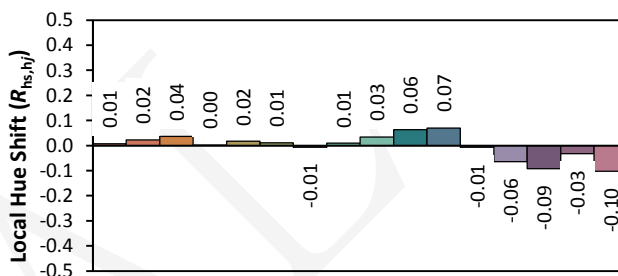
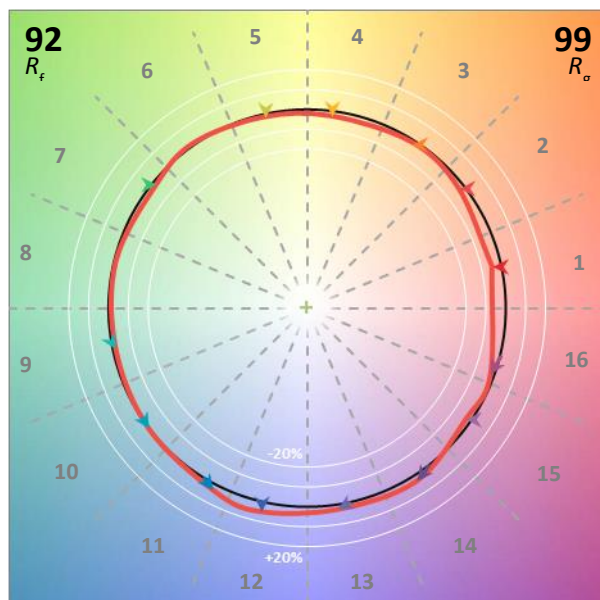
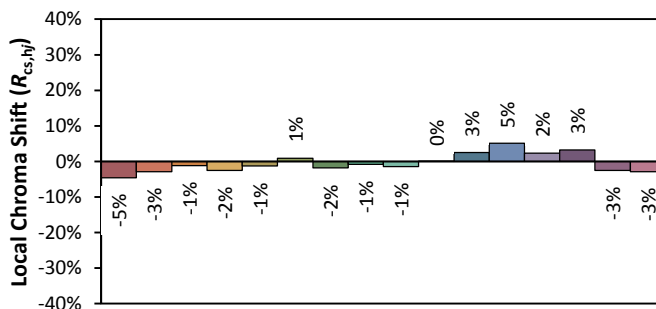
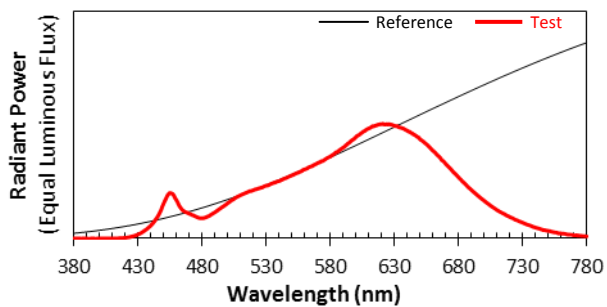
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
119.98	60	0.3325	39.5	0.9903	2688.93	68.07

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
9.522	2694	-0.00035	0.4598	0.4096	0.2629	0.5270

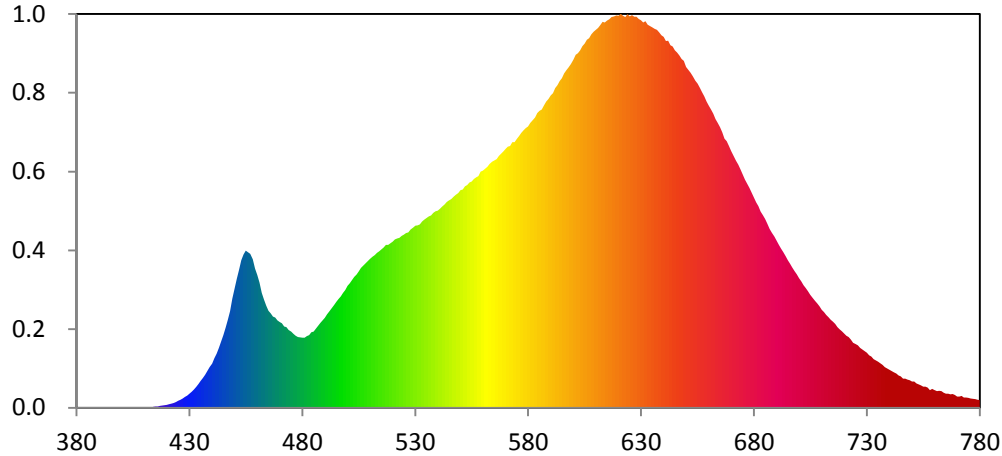
Color Rendering Index

Ra			
93.8			
R1	R2	R3	R4
94	98	99	94
R5	R6	R7	R8
95	97	91	82
R9	R10	R11	R12
62	94	96	85
R13	R14	R15	
95	99	90	





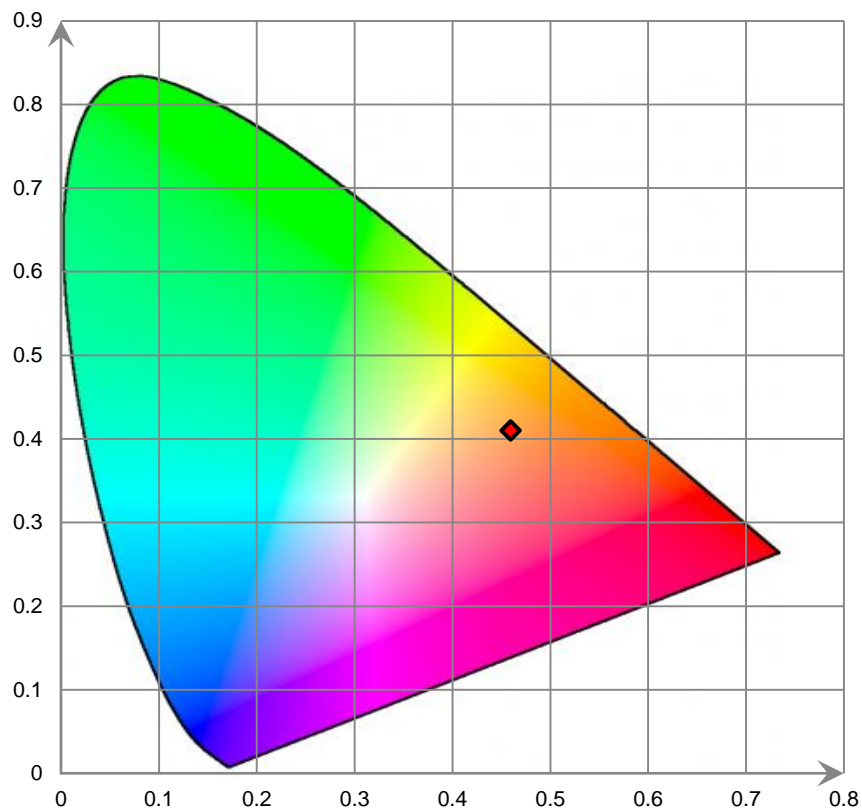
Relative Spectral Power Distribution



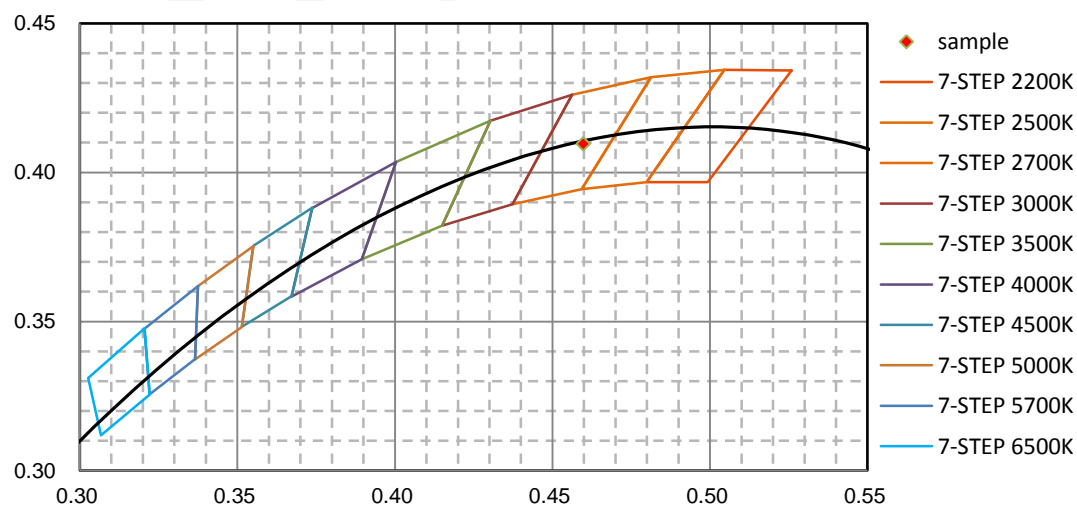
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	7.410E-02	421	5.150E-01	462	1.737E+01	503	1.981E+01	544	3.111E+01
381	7.700E-02	422	6.159E-01	463	1.636E+01	504	2.016E+01	545	3.137E+01
382	8.110E-02	423	7.079E-01	464	1.542E+01	505	2.060E+01	546	3.159E+01
383	6.260E-02	424	8.547E-01	465	1.467E+01	506	2.113E+01	547	3.193E+01
384	6.290E-02	425	1.045E+00	466	1.426E+01	507	2.149E+01	548	3.226E+01
385	7.470E-02	426	1.196E+00	467	1.378E+01	508	2.184E+01	549	3.249E+01
386	7.400E-03	427	1.385E+00	468	1.364E+01	509	2.219E+01	550	3.292E+01
387	7.350E-02	428	1.622E+00	469	1.322E+01	510	2.250E+01	551	3.300E+01
388	4.370E-02	429	1.848E+00	470	1.295E+01	511	2.284E+01	552	3.348E+01
389	2.530E-02	430	2.116E+00	471	1.277E+01	512	2.310E+01	553	3.371E+01
390	8.410E-02	431	2.428E+00	472	1.230E+01	513	2.344E+01	554	3.409E+01
391	3.410E-02	432	2.760E+00	473	1.220E+01	514	2.366E+01	555	3.422E+01
392	1.500E-03	433	3.146E+00	474	1.175E+01	515	2.395E+01	556	3.463E+01
393	1.000E-03	434	3.561E+00	475	1.151E+01	516	2.426E+01	557	3.485E+01
394	2.200E-03	435	4.047E+00	476	1.119E+01	517	2.465E+01	558	3.507E+01
395	5.390E-02	436	4.493E+00	477	1.091E+01	518	2.463E+01	559	3.573E+01
396	2.990E-02	437	4.973E+00	478	1.068E+01	519	2.488E+01	560	3.586E+01
397	1.190E-02	438	5.552E+00	479	1.065E+01	520	2.511E+01	561	3.615E+01
398	8.000E-04	439	6.132E+00	480	1.057E+01	521	2.545E+01	562	3.643E+01
399	1.310E-02	440	6.686E+00	481	1.061E+01	522	2.560E+01	563	3.690E+01
400	3.200E-03	441	7.481E+00	482	1.086E+01	523	2.572E+01	564	3.721E+01
401	2.410E-02	442	8.198E+00	483	1.097E+01	524	2.601E+01	565	3.744E+01
402	5.120E-02	443	9.028E+00	484	1.141E+01	525	2.617E+01	566	3.761E+01
403	2.680E-02	444	1.000E+01	485	1.151E+01	526	2.644E+01	567	3.811E+01
404	3.290E-02	445	1.099E+01	486	1.194E+01	527	2.652E+01	568	3.845E+01
405	4.800E-02	446	1.208E+01	487	1.238E+01	528	2.694E+01	569	3.876E+01
406	1.760E-02	447	1.328E+01	488	1.280E+01	529	2.727E+01	570	3.916E+01
407	9.290E-02	448	1.462E+01	489	1.323E+01	530	2.752E+01	571	3.951E+01
408	2.140E-02	449	1.652E+01	490	1.361E+01	531	2.758E+01	572	3.960E+01
409	7.900E-02	450	1.802E+01	491	1.411E+01	532	2.774E+01	573	4.020E+01
410	9.560E-02	451	1.952E+01	492	1.455E+01	533	2.816E+01	574	4.020E+01
411	8.950E-02	452	2.086E+01	493	1.505E+01	534	2.847E+01	575	4.068E+01
412	1.134E-01	453	2.230E+01	494	1.555E+01	535	2.869E+01	576	4.112E+01
413	9.860E-02	454	2.317E+01	495	1.604E+01	536	2.896E+01	577	4.160E+01
414	1.633E-01	455	2.376E+01	496	1.645E+01	537	2.909E+01	578	4.197E+01
415	1.842E-01	456	2.352E+01	497	1.687E+01	538	2.948E+01	579	4.229E+01
416	1.986E-01	457	2.330E+01	498	1.738E+01	539	2.974E+01	580	4.254E+01
417	2.637E-01	458	2.245E+01	499	1.781E+01	540	2.983E+01	581	4.309E+01
418	3.332E-01	459	2.103E+01	500	1.843E+01	541	3.011E+01	582	4.351E+01
419	3.671E-01	460	2.011E+01	501	1.881E+01	542	3.044E+01	583	4.388E+01
420	4.439E-01	461	1.891E+01	502	1.932E+01	543	3.076E+01	584	4.460E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.493E+01	626	5.942E+01	667	4.070E+01	708	1.578E+01	749	4.144E+00
586	4.512E+01	627	5.916E+01	668	4.033E+01	709	1.533E+01	750	3.986E+00
587	4.576E+01	628	5.916E+01	669	3.958E+01	710	1.479E+01	751	3.948E+00
588	4.632E+01	629	5.881E+01	670	3.881E+01	711	1.446E+01	752	3.696E+00
589	4.673E+01	630	5.862E+01	671	3.807E+01	712	1.404E+01	753	3.531E+00
590	4.724E+01	631	5.829E+01	672	3.738E+01	713	1.369E+01	754	3.398E+00
591	4.757E+01	632	5.851E+01	673	3.678E+01	714	1.333E+01	755	3.167E+00
592	4.837E+01	633	5.796E+01	674	3.608E+01	715	1.300E+01	756	3.201E+00
593	4.880E+01	634	5.774E+01	675	3.530E+01	716	1.267E+01	757	3.047E+00
594	4.943E+01	635	5.757E+01	676	3.450E+01	717	1.220E+01	758	2.636E+00
595	4.985E+01	636	5.734E+01	677	3.390E+01	718	1.186E+01	759	2.834E+00
596	5.058E+01	637	5.719E+01	678	3.326E+01	719	1.158E+01	760	2.660E+00
597	5.107E+01	638	5.678E+01	679	3.251E+01	720	1.123E+01	761	2.526E+00
598	5.150E+01	639	5.635E+01	680	3.182E+01	721	1.089E+01	762	2.564E+00
599	5.201E+01	640	5.613E+01	681	3.108E+01	722	1.068E+01	763	2.508E+00
600	5.266E+01	641	5.550E+01	682	3.049E+01	723	1.031E+01	764	2.271E+00
601	5.339E+01	642	5.554E+01	683	2.967E+01	724	9.843E+00	765	2.113E+00
602	5.363E+01	643	5.486E+01	684	2.913E+01	725	9.645E+00	766	2.118E+00
603	5.409E+01	644	5.464E+01	685	2.854E+01	726	9.414E+00	767	2.017E+00
604	5.469E+01	645	5.406E+01	686	2.783E+01	727	9.047E+00	768	2.059E+00
605	5.512E+01	646	5.375E+01	687	2.707E+01	728	8.789E+00	769	1.911E+00
606	5.567E+01	647	5.330E+01	688	2.645E+01	729	8.574E+00	770	1.671E+00
607	5.590E+01	648	5.278E+01	689	2.588E+01	730	8.302E+00	771	1.696E+00
608	5.652E+01	649	5.248E+01	690	2.526E+01	731	7.953E+00	772	1.788E+00
609	5.687E+01	650	5.156E+01	691	2.465E+01	732	7.727E+00	773	1.539E+00
610	5.718E+01	651	5.112E+01	692	2.403E+01	733	7.371E+00	774	1.547E+00
611	5.745E+01	652	5.068E+01	693	2.351E+01	734	7.163E+00	775	1.484E+00
612	5.790E+01	653	5.014E+01	694	2.292E+01	735	6.966E+00	776	1.414E+00
613	5.841E+01	654	4.949E+01	695	2.232E+01	736	6.743E+00	777	1.343E+00
614	5.827E+01	655	4.902E+01	696	2.178E+01	737	6.471E+00	778	1.313E+00
615	5.860E+01	656	4.842E+01	697	2.120E+01	738	6.140E+00	779	1.219E+00
616	5.877E+01	657	4.773E+01	698	2.065E+01	739	5.972E+00	780	1.165E+00
617	5.911E+01	658	4.711E+01	699	2.019E+01	740	5.735E+00		
618	5.920E+01	659	4.631E+01	700	1.962E+01	741	5.548E+00		
619	5.937E+01	660	4.571E+01	701	1.913E+01	742	5.359E+00		
620	5.931E+01	661	4.512E+01	702	1.856E+01	743	5.158E+00		
621	5.958E+01	662	4.450E+01	703	1.810E+01	744	4.887E+00		
622	5.932E+01	663	4.369E+01	704	1.763E+01	745	4.738E+00		
623	5.913E+01	664	4.308E+01	705	1.708E+01	746	4.388E+00		
624	5.953E+01	665	4.246E+01	706	1.666E+01	747	4.400E+00		
625	5.921E+01	666	4.166E+01	707	1.615E+01	748	4.252E+00		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

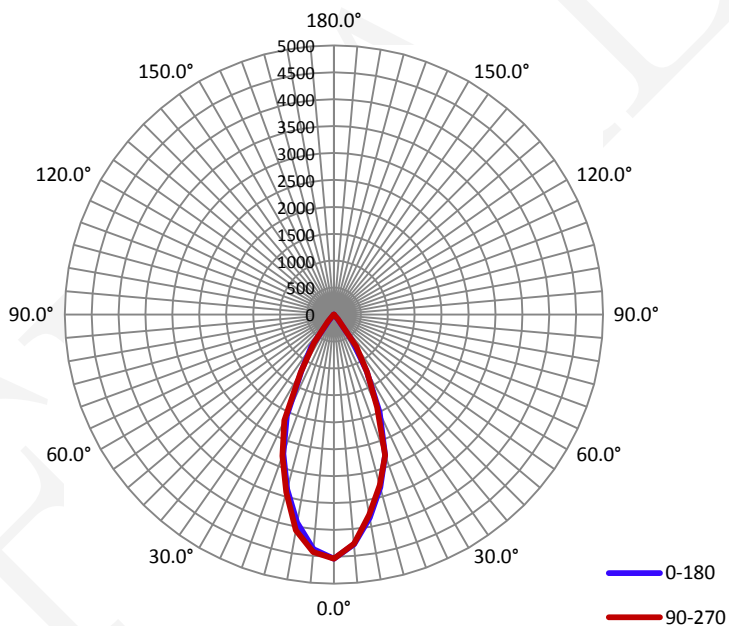
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
119.9	60	0.3440	39.47	0.9570

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
2693.9	68.30	4531.9	0.73	0.74

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	46.9	47.0	47.2	47.2	47.0
Field Angle(10% I_{max}):	73.7	74.0	74.2	73.3	73.8

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	4532	4532	4532	4532	4532	4532	4532	4532
5.0°	4286	4298	4254	4238	4274	4275	4325	4391
10.0°	3834	3791	3800	3790	3778	3788	3824	3883
15.0°	3322	3305	3300	3291	3285	3304	3348	3367
20.0°	2776	2774	2755	2786	2785	2801	2783	2798
25.0°	2007	1935	1879	1885	1903	1963	2051	2113
30.0°	1208	1215	1220	1226	1241	1227	1233	1251
35.0°	589	601	630	664	725	751	770	794
40.0°	103	99	96	99	119	126	130	141
45.0°	12	12	0	13	10	14	12	17
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.)

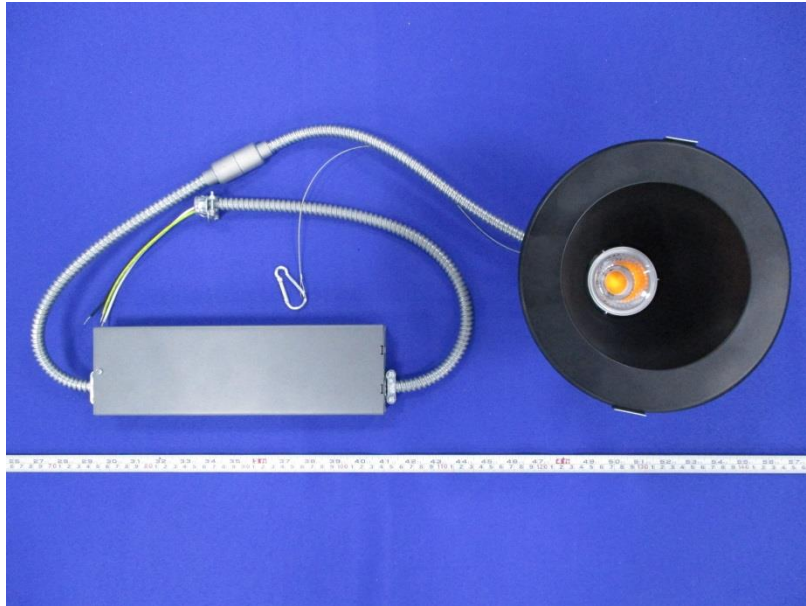
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	4532	4532	4532	4532	4532	4532	4532	4532
5.0°	4376	4420	4444	4442	4427	4409	4355	4295
10.0°	3921	4032	4096	4109	4070	3988	3898	3861
15.0°	3357	3408	3459	3456	3417	3391	3348	3295
20.0°	2753	2821	2813	2843	2796	2802	2796	2753
25.0°	2071	2126	2171	2195	2173	2110	2078	1996
30.0°	1200	1227	1226	1249	1240	1194	1163	1145
35.0°	734	740	704	681	638	559	523	507
40.0°	129	147	165	168	171	136	117	100
45.0°	15	18	15	11	12	10	13	8
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	106.1	3.94
5-10	295.1	10.95
10-15	430.5	15.98
15-20	506.3	18.79
20-25	506.6	18.81
25-30	412.3	15.30
30-35	276.8	10.27
35-40	132.0	4.90
40-45	25.9	0.96
45-50	2.4	0.09
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	106.1	3.94
0-10	401.2	14.89
0-15	831.7	30.87
0-20	1337.9	49.67
0-25	1844.6	68.47
0-30	2256.8	83.78
0-35	2533.6	94.05
0-40	2665.6	98.95
0-45	2691.4	99.91
0-50	2693.9	100.00
0-55	2693.9	100.00
0-60	2693.9	100.00
0-65	2693.9	100.00
0-70	2693.9	100.00
0-75	2693.9	100.00
0-80	2693.9	100.00
0-85	2693.9	100.00
0-90	2693.9	100.00
0-95	2693.9	100.00
0-100	2693.9	100.00
0-105	2693.9	100.00
0-110	2693.9	100.00
0-115	2693.9	100.00
0-120	2693.9	100.00
0-125	2693.9	100.00
0-130	2693.9	100.00
0-135	2693.9	100.00
0-140	2693.9	100.00
0-145	2693.9	100.00
0-150	2693.9	100.00
0-155	2693.9	100.00
0-160	2693.9	100.00
0-165	2693.9	100.00
0-170	2693.9	100.00
0-175	2693.9	100.00
0-180	2693.9	100.00

6. Product Photo



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