

IES LM-79-08

MEASUREMENT AND TEST REPORT For

GREEN CREATIVE LTD

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

Test Model: LE079027DIM120VVN/ADR4BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722002-10-10
Test Date:	2019-07-22
Report Date:	2019-08-09
Reviewed By:	Ray Gao/EE Engineer <i>Ray 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:

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

Model Tested: LE079027DIM120VN/ADR4BL
 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: 120-277VAC, 60Hz
 Rated Power: 8W
 Nominal CCT: 2700K
 Nominal Lumen Output: 580lm

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 $U_{rel}=2.61\%$ ($k=2$), 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 $U_{rel}=0.48\%$ of rdg, AC Voltage $U_{rel}=0.25\%$ of rdg, Power $U_{rel}=0.44\%$ ($k=2$), 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 $U_{rel}=2.6\%$ ($k=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_i , R_g was calculated according to IES TM-30-18 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**

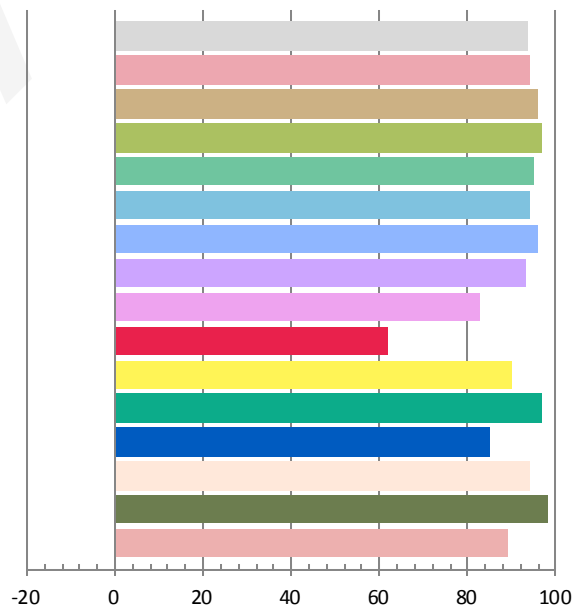
Photometric and Electrical Measurement Result

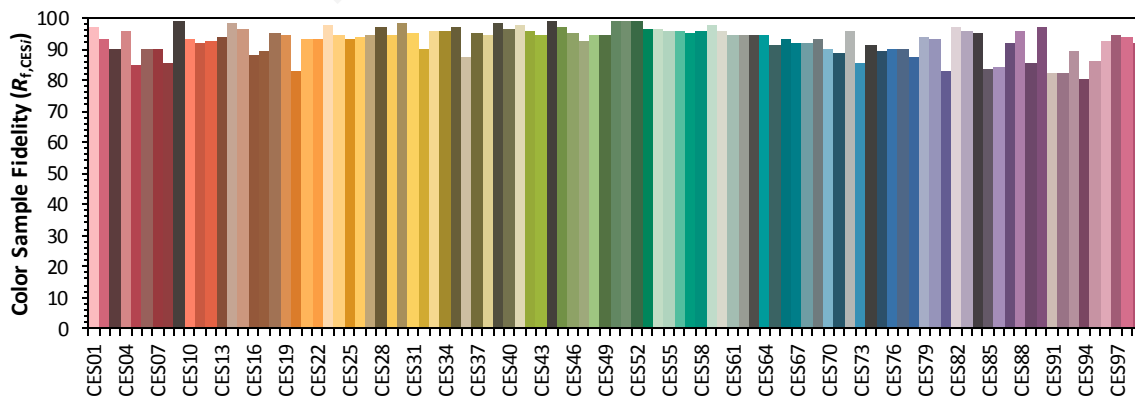
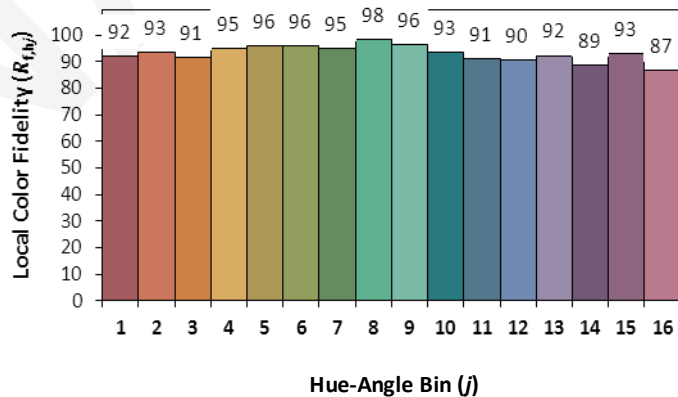
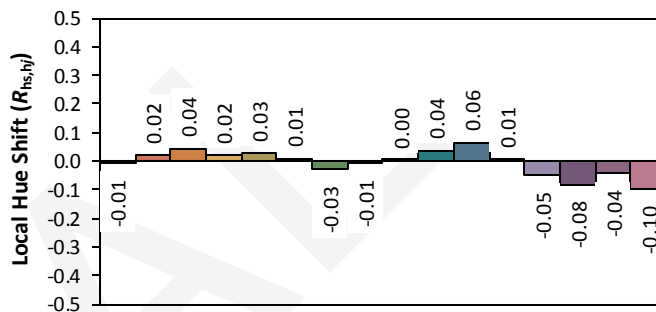
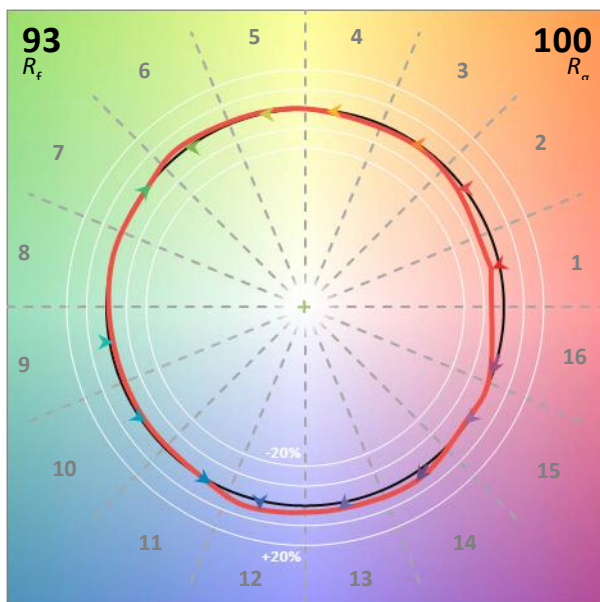
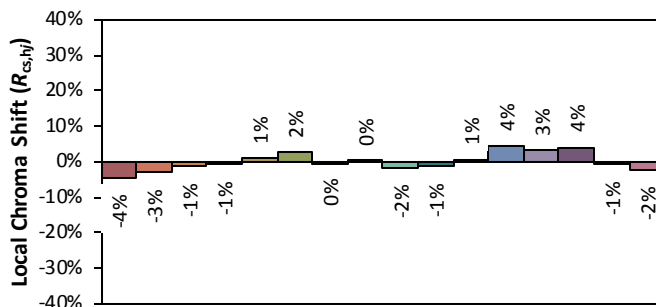
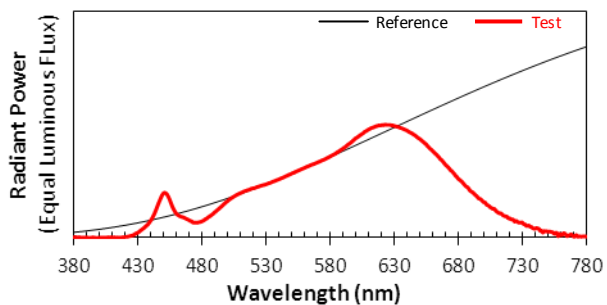
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.01	60	0.0686	8.05	0.9778	584.77	72.64

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.036	2717	0.00106	0.4603	0.4136	0.2614	0.5285

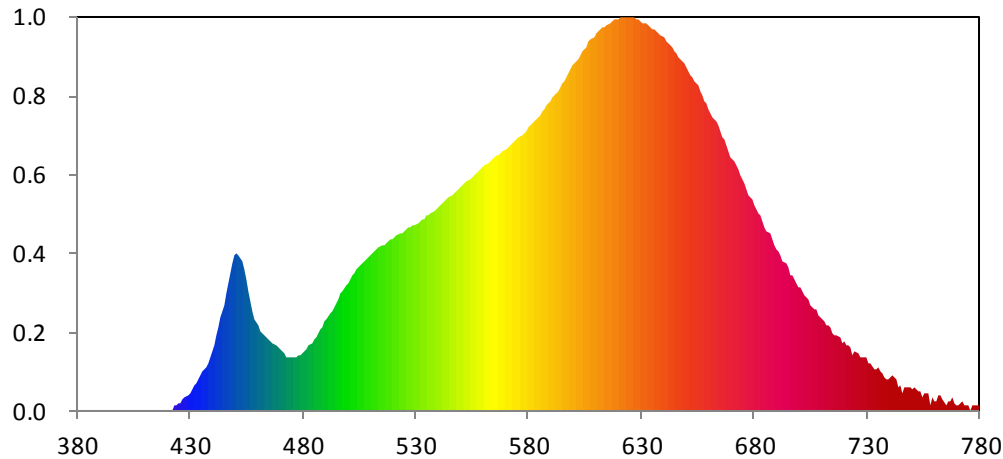
Color Rendering Index

Ra			
93.5			
R1	R2	R3	R4
94	96	97	95
R5	R6	R7	R8
94	96	93	83
R9	R10	R11	R12
62	90	97	85
R13	R14	R15	
94	98	89	





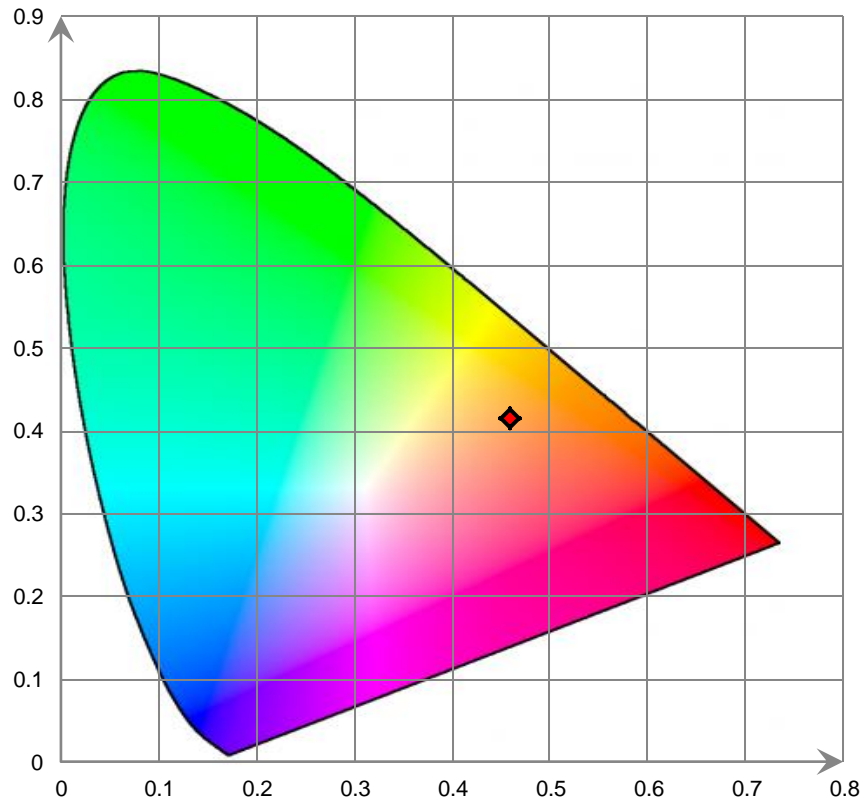
Relative Spectral Power Distribution



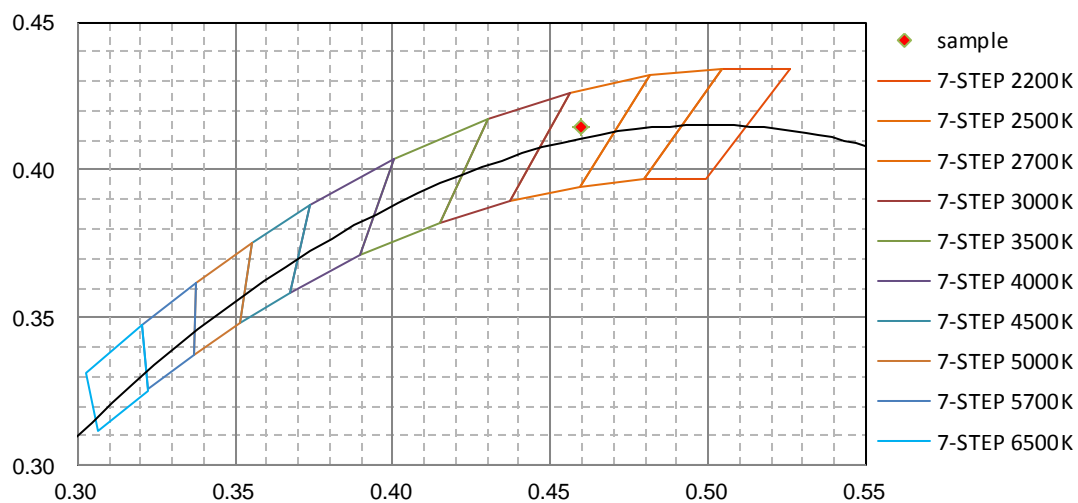
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.330E-02	421	1.141E-01	462	2.533E+00	503	4.496E+00	544	6.868E+00
381	9.840E-02	422	1.276E-01	463	2.441E+00	504	4.580E+00	545	6.934E+00
382	7.340E-02	423	1.767E-01	464	2.390E+00	505	4.680E+00	546	7.024E+00
383	2.620E-02	424	1.923E-01	465	2.352E+00	506	4.754E+00	547	7.056E+00
384	7.550E-02	425	2.568E-01	466	2.287E+00	507	4.848E+00	548	7.153E+00
385	5.420E-02	426	2.691E-01	467	2.221E+00	508	4.923E+00	549	7.193E+00
386	4.600E-03	427	3.429E-01	468	2.143E+00	509	4.985E+00	550	7.271E+00
387	3.250E-02	428	4.499E-01	469	2.085E+00	510	5.064E+00	551	7.351E+00
388	1.330E-02	429	5.264E-01	470	2.005E+00	511	5.116E+00	552	7.378E+00
389	4.700E-03	430	5.923E-01	471	1.916E+00	512	5.191E+00	553	7.481E+00
390	6.030E-02	431	6.839E-01	472	1.879E+00	513	5.258E+00	554	7.529E+00
391	2.110E-02	432	8.190E-01	473	1.751E+00	514	5.312E+00	555	7.608E+00
392	8.000E-04	433	9.198E-01	474	1.739E+00	515	5.362E+00	556	7.656E+00
393	0.000E+00	434	1.030E+00	475	1.710E+00	516	5.411E+00	557	7.727E+00
394	9.400E-03	435	1.129E+00	476	1.708E+00	517	5.445E+00	558	7.796E+00
395	5.680E-02	436	1.269E+00	477	1.737E+00	518	5.525E+00	559	7.855E+00
396	1.790E-02	437	1.402E+00	478	1.782E+00	519	5.588E+00	560	7.914E+00
397	9.500E-03	438	1.543E+00	479	1.794E+00	520	5.611E+00	561	7.987E+00
398	7.000E-04	439	1.741E+00	480	1.857E+00	521	5.630E+00	562	8.067E+00
399	0.000E+00	440	1.938E+00	481	1.934E+00	522	5.684E+00	563	8.105E+00
400	0.000E+00	441	2.161E+00	482	2.006E+00	523	5.759E+00	564	8.175E+00
401	1.960E-02	442	2.433E+00	483	2.141E+00	524	5.794E+00	565	8.242E+00
402	2.940E-02	443	2.742E+00	484	2.187E+00	525	5.837E+00	566	8.302E+00
403	2.050E-02	444	3.074E+00	485	2.346E+00	526	5.890E+00	567	8.335E+00
404	1.830E-02	445	3.437E+00	486	2.417E+00	527	5.944E+00	568	8.389E+00
405	2.720E-02	446	3.823E+00	487	2.529E+00	528	5.979E+00	569	8.475E+00
406	5.600E-03	447	4.161E+00	488	2.633E+00	529	6.013E+00	570	8.522E+00
407	7.970E-02	448	4.497E+00	489	2.742E+00	530	6.059E+00	571	8.604E+00
408	7.000E-03	449	4.829E+00	490	2.895E+00	531	6.107E+00	572	8.633E+00
409	6.030E-02	450	5.037E+00	491	2.986E+00	532	6.187E+00	573	8.724E+00
410	7.240E-02	451	5.119E+00	492	3.144E+00	533	6.214E+00	574	8.782E+00
411	2.970E-02	452	5.046E+00	493	3.246E+00	534	6.264E+00	575	8.840E+00
412	5.020E-02	453	4.897E+00	494	3.388E+00	535	6.340E+00	576	8.902E+00
413	9.400E-03	454	4.634E+00	495	3.516E+00	536	6.395E+00	577	8.972E+00
414	4.220E-02	455	4.306E+00	496	3.645E+00	537	6.441E+00	578	9.066E+00
415	3.160E-02	456	3.916E+00	497	3.793E+00	538	6.499E+00	579	9.121E+00
416	4.630E-02	457	3.549E+00	498	3.907E+00	539	6.568E+00	580	9.218E+00
417	3.840E-02	458	3.236E+00	499	4.053E+00	540	6.614E+00	581	9.292E+00
418	5.110E-02	459	2.989E+00	500	4.131E+00	541	6.680E+00	582	9.360E+00
419	4.860E-02	460	2.765E+00	501	4.279E+00	542	6.751E+00	583	9.444E+00
420	1.082E-01	461	2.614E+00	502	4.386E+00	543	6.802E+00	584	9.511E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	9.621E+00	626	1.280E+01	667	8.814E+00	708	3.307E+00	749	7.402E-01
586	9.735E+00	627	1.278E+01	668	8.659E+00	709	3.131E+00	750	6.918E-01
587	9.794E+00	628	1.274E+01	669	8.466E+00	710	2.969E+00	751	7.312E-01
588	9.916E+00	629	1.274E+01	670	8.285E+00	711	2.882E+00	752	6.877E-01
589	1.000E+01	630	1.267E+01	671	8.152E+00	712	2.783E+00	753	6.530E-01
590	1.010E+01	631	1.264E+01	672	8.010E+00	713	2.801E+00	754	6.134E-01
591	1.021E+01	632	1.259E+01	673	7.859E+00	714	2.688E+00	755	4.621E-01
592	1.030E+01	633	1.258E+01	674	7.655E+00	715	2.548E+00	756	5.619E-01
593	1.043E+01	634	1.251E+01	675	7.569E+00	716	2.473E+00	757	5.574E-01
594	1.055E+01	635	1.244E+01	676	7.382E+00	717	2.442E+00	758	1.754E-01
595	1.065E+01	636	1.242E+01	677	7.240E+00	718	2.403E+00	759	4.603E-01
596	1.076E+01	637	1.234E+01	678	7.019E+00	719	2.206E+00	760	3.177E-01
597	1.088E+01	638	1.229E+01	679	6.904E+00	720	2.232E+00	761	3.056E-01
598	1.102E+01	639	1.222E+01	680	6.693E+00	721	2.100E+00	762	5.126E-01
599	1.114E+01	640	1.215E+01	681	6.583E+00	722	2.104E+00	763	5.006E-01
600	1.128E+01	641	1.206E+01	682	6.462E+00	723	2.040E+00	764	3.466E-01
601	1.135E+01	642	1.196E+01	683	6.342E+00	724	1.835E+00	765	1.795E-01
602	1.147E+01	643	1.189E+01	684	6.154E+00	725	1.937E+00	766	2.774E-01
603	1.157E+01	644	1.182E+01	685	5.997E+00	726	1.844E+00	767	2.952E-01
604	1.168E+01	645	1.171E+01	686	5.831E+00	727	1.742E+00	768	4.103E-01
605	1.176E+01	646	1.164E+01	687	5.758E+00	728	1.715E+00	769	2.726E-01
606	1.186E+01	647	1.152E+01	688	5.612E+00	729	1.745E+00	770	1.545E-01
607	1.201E+01	648	1.140E+01	689	5.380E+00	730	1.732E+00	771	1.480E-01
608	1.208E+01	649	1.129E+01	690	5.255E+00	731	1.538E+00	772	3.259E-01
609	1.217E+01	650	1.120E+01	691	5.182E+00	732	1.551E+00	773	1.566E-01
610	1.227E+01	651	1.108E+01	692	5.051E+00	733	1.365E+00	774	1.503E-01
611	1.234E+01	652	1.096E+01	693	4.893E+00	734	1.362E+00	775	1.818E-01
612	1.242E+01	653	1.084E+01	694	4.780E+00	735	1.405E+00	776	1.342E-01
613	1.248E+01	654	1.071E+01	695	4.642E+00	736	1.274E+00	777	1.508E-01
614	1.252E+01	655	1.059E+01	696	4.440E+00	737	1.239E+00	778	1.759E-01
615	1.258E+01	656	1.040E+01	697	4.430E+00	738	1.117E+00	779	1.753E-01
616	1.264E+01	657	1.026E+01	698	4.302E+00	739	1.043E+00	780	1.391E-01
617	1.268E+01	658	1.010E+01	699	4.155E+00	740	1.033E+00		
618	1.273E+01	659	1.000E+01	700	4.018E+00	741	1.123E+00		
619	1.272E+01	660	9.849E+00	701	4.010E+00	742	1.059E+00		
620	1.277E+01	661	9.711E+00	702	3.770E+00	743	1.020E+00		
621	1.279E+01	662	9.551E+00	703	3.694E+00	744	7.856E-01		
622	1.278E+01	663	9.427E+00	704	3.617E+00	745	8.166E-01		
623	1.283E+01	664	9.272E+00	705	3.464E+00	746	5.973E-01		
624	1.280E+01	665	9.127E+00	706	3.384E+00	747	7.604E-01		
625	1.279E+01	666	8.919E+00	707	3.282E+00	748	7.386E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **2.0hour**

Test orientation: **Downward**

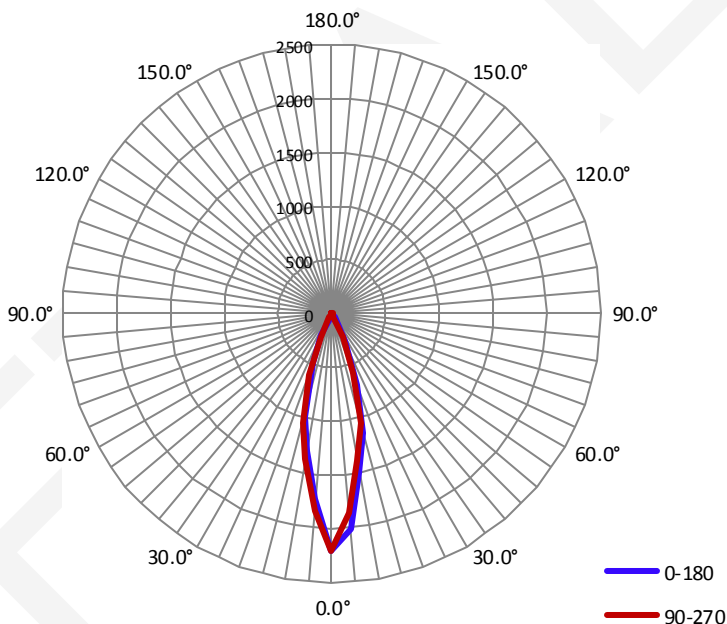
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0720	8.07	0.9340

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
587.5	72.86	2202.1	0.47	0.46

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	28.7	28.7	28.6	28.8	28.7
Field Angle(10% I_{max}):	51.2	51.1	51.3	51.3	51.2

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2202	2202	2202	2202	2202	2202	2202	2202
5.0°	2011	1970	1922	1884	1858	1803	1766	1744
10.0°	1497	1480	1438	1417	1397	1388	1350	1324
15.0°	1141	1129	1104	1084	1055	1037	1027	998
20.0°	704	684	653	632	596	563	560	538
25.0°	276	271	263	253	245	237	237	233
30.0°	46	42	38	36	34	32	33	34
35.0°	19	19	18	18	18	18	17	17
40.0°	11	11	11	11	11	11	12	11
45.0°	6	6	6	4	6	5	5	5
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.)

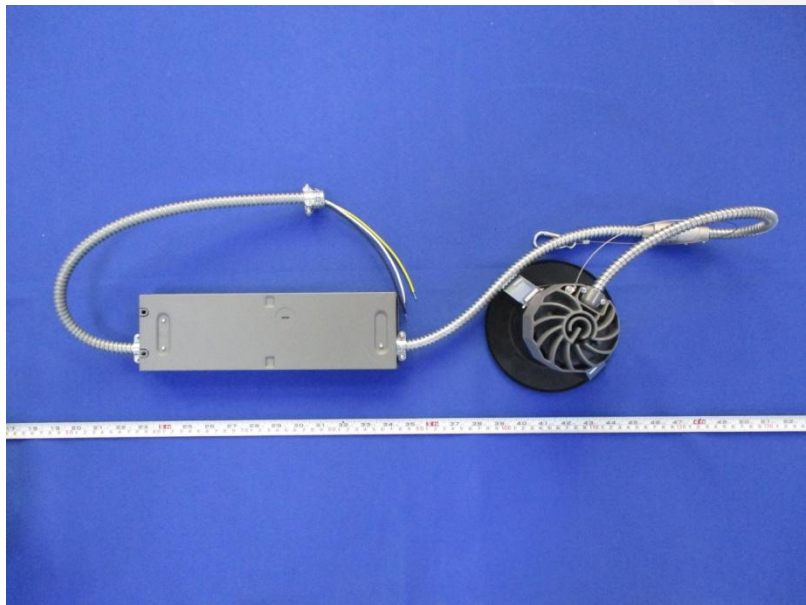
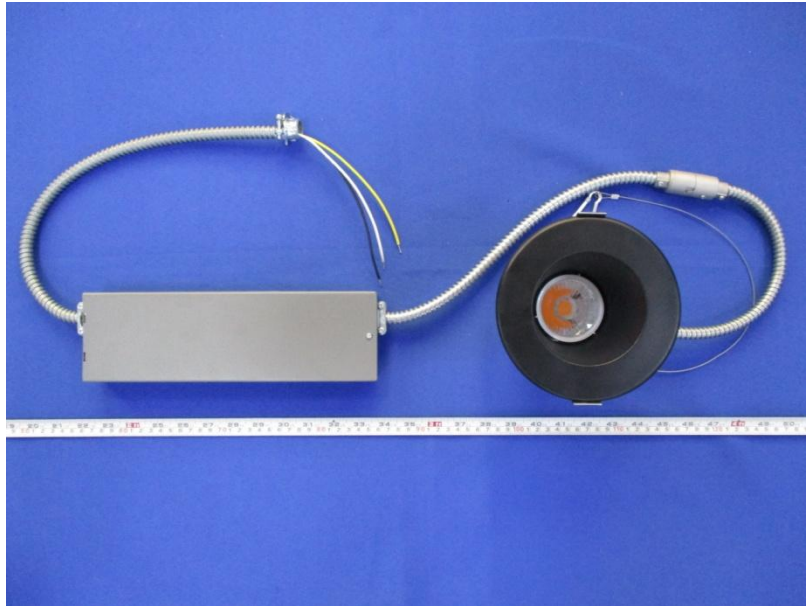
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2202	2202	2202	2202	2202	2202	2202	2202
5.0°	1728	1747	1762	1802	1845	1886	1910	1926
10.0°	1307	1332	1348	1370	1377	1407	1422	1433
15.0°	988	983	1008	1037	1051	1078	1095	1101
20.0°	494	516	532	565	609	640	661	673
25.0°	220	222	226	234	250	255	261	261
30.0°	31	32	33	33	35	36	38	38
35.0°	17	17	17	18	17	18	18	18
40.0°	11	11	10	9	10	9	10	10
45.0°	4	3	5	5	6	5	6	6
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	48.4	8.24
5-10	115.9	19.73
10-15	145.3	24.74
15-20	136.7	23.26
20-25	88.9	15.13
25-30	35.7	6.08
30-35	7.9	1.34
35-40	4.7	0.81
40-45	2.9	0.50
45-50	1.0	0.18
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	48.4	8.24
0-10	164.3	27.97
0-15	309.7	52.71
0-20	446.3	75.97
0-25	535.2	91.10
0-30	570.9	97.17
0-35	578.8	98.51
0-40	583.5	99.32
0-45	586.5	99.82
0-50	587.5	100.00
0-55	587.5	100.00
0-60	587.5	100.00
0-65	587.5	100.00
0-70	587.5	100.00
0-75	587.5	100.00
0-80	587.5	100.00
0-85	587.5	100.00
0-90	587.5	100.00
0-95	587.5	100.00
0-100	587.5	100.00
0-105	587.5	100.00
0-110	587.5	100.00
0-115	587.5	100.00
0-120	587.5	100.00
0-125	587.5	100.00
0-130	587.5	100.00
0-135	587.5	100.00
0-140	587.5	100.00
0-145	587.5	100.00
0-150	587.5	100.00
0-155	587.5	100.00
0-160	587.5	100.00
0-165	587.5	100.00
0-170	587.5	100.00
0-175	587.5	100.00
0-180	587.5	100.00

6. Product Photo



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