

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

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

Test Model: LE079027DIM120VMD/ADR4BL

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB190722002-10-2
Test Date:	2019-07-22
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.

1. Product Description

General Information:

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

Model Tested: LE079027DIM120VMD/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: 120-277 VAC 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 $U_{\text{rel}}=2.70\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=27\text{K}$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.7(k=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U_{\text{rel}}=0.27\%$ of rdg, AC Voltage $U_{\text{rel}}=0.26\%$ of rdg, Power $U_{\text{rel}}=0.41\%$ ($k=2$), 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 $U_{\text{rel}}=2.6\%$ ($k=2$), 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**

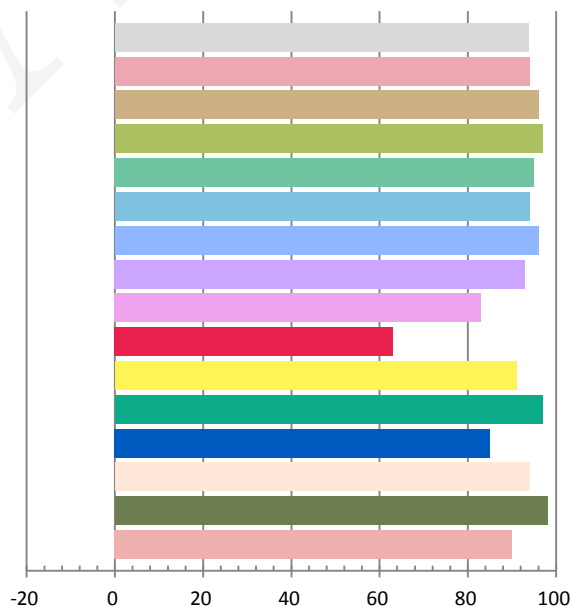
Photometric and Electrical Measurement Result

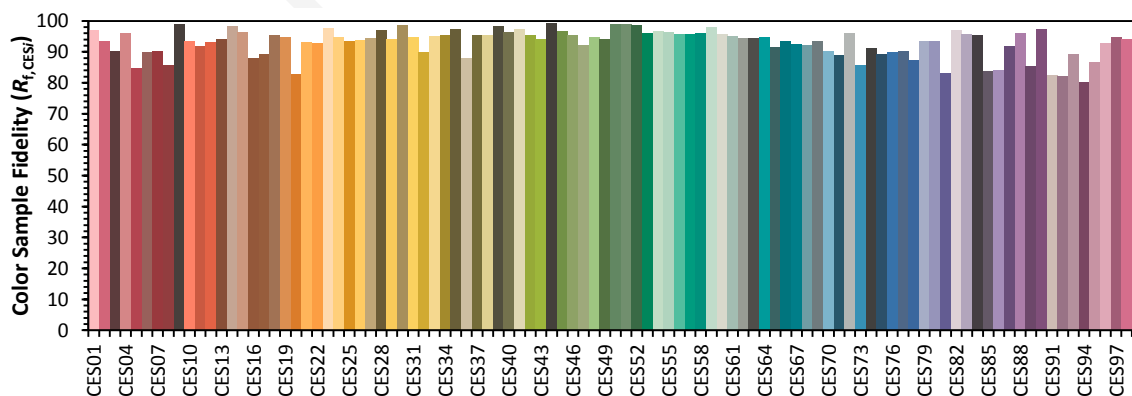
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
120.01	60	0.0686	8.05	0.9778	613.31	76.19

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
2.142	2710	0.00080	0.4604	0.4129	0.2618	0.5283

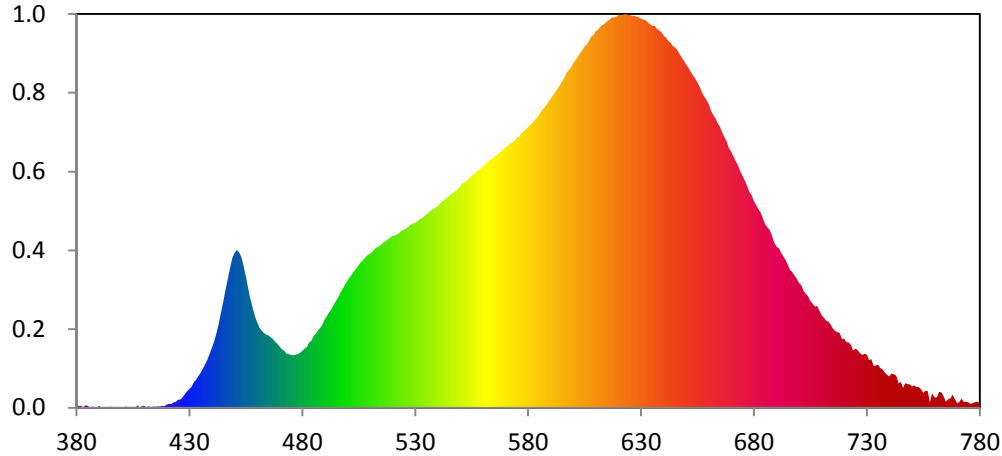
Color Rendering Index

Ra			
93.7			
R1	R2	R3	R4
94	96	97	95
R5	R6	R7	R8
94	96	93	83
R9	R10	R11	R12
63	91	97	85
R13	R14	R15	
94	98	90	





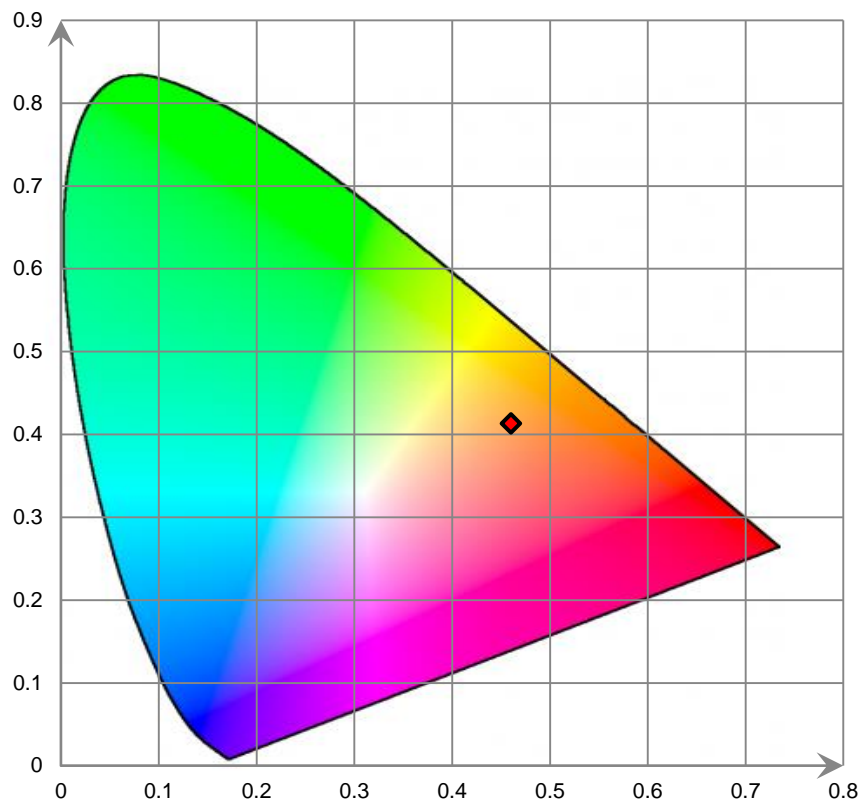
Relative Spectral Power Distribution



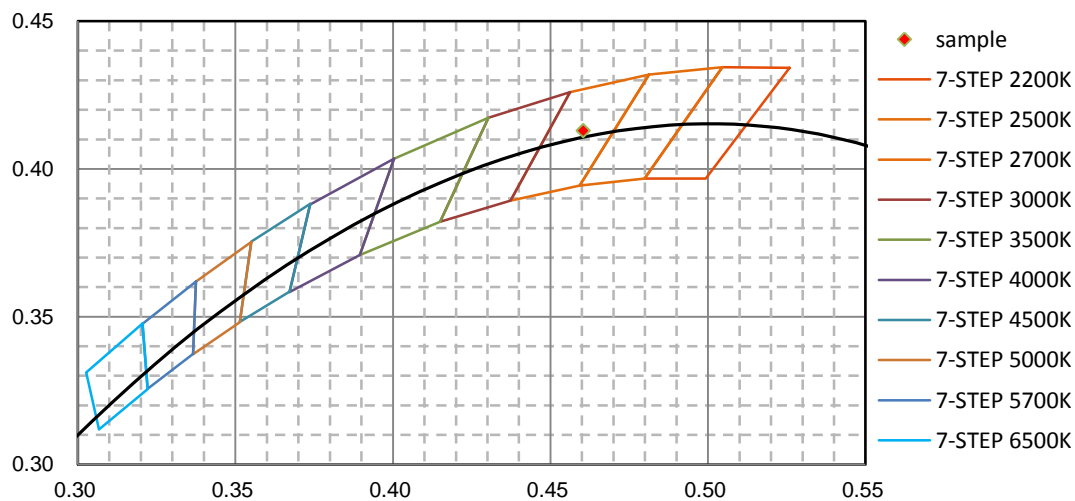
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.180E-02	421	1.311E-01	462	2.644E+00	503	4.701E+00	544	7.202E+00
381	6.890E-02	422	1.347E-01	463	2.559E+00	504	4.786E+00	545	7.255E+00
382	6.540E-02	423	1.870E-01	464	2.513E+00	505	4.900E+00	546	7.331E+00
383	1.440E-02	424	2.065E-01	465	2.484E+00	506	4.997E+00	547	7.383E+00
384	8.870E-02	425	2.717E-01	466	2.411E+00	507	5.072E+00	548	7.441E+00
385	6.380E-02	426	2.895E-01	467	2.356E+00	508	5.175E+00	549	7.523E+00
386	4.800E-03	427	3.609E-01	468	2.256E+00	509	5.241E+00	550	7.604E+00
387	4.660E-02	428	4.720E-01	469	2.196E+00	510	5.284E+00	551	7.706E+00
388	1.160E-02	429	5.647E-01	470	2.097E+00	511	5.360E+00	552	7.740E+00
389	3.300E-03	430	6.420E-01	471	2.014E+00	512	5.447E+00	553	7.813E+00
390	6.750E-02	431	7.190E-01	472	1.969E+00	513	5.516E+00	554	7.883E+00
391	2.110E-02	432	8.744E-01	473	1.853E+00	514	5.547E+00	555	7.975E+00
392	9.000E-04	433	9.627E-01	474	1.841E+00	515	5.614E+00	556	8.007E+00
393	7.700E-03	434	1.086E+00	475	1.806E+00	516	5.671E+00	557	8.087E+00
394	9.300E-03	435	1.193E+00	476	1.804E+00	517	5.720E+00	558	8.141E+00
395	4.770E-02	436	1.337E+00	477	1.825E+00	518	5.789E+00	559	8.207E+00
396	1.690E-02	437	1.488E+00	478	1.845E+00	519	5.845E+00	560	8.283E+00
397	8.600E-03	438	1.645E+00	479	1.885E+00	520	5.896E+00	561	8.348E+00
398	6.000E-04	439	1.839E+00	480	1.953E+00	521	5.914E+00	562	8.424E+00
399	0.000E+00	440	2.076E+00	481	2.034E+00	522	5.949E+00	563	8.504E+00
400	0.000E+00	441	2.306E+00	482	2.091E+00	523	6.005E+00	564	8.547E+00
401	2.100E-02	442	2.580E+00	483	2.242E+00	524	6.067E+00	565	8.621E+00
402	3.750E-02	443	2.913E+00	484	2.293E+00	525	6.102E+00	566	8.676E+00
403	1.610E-02	444	3.282E+00	485	2.457E+00	526	6.146E+00	567	8.733E+00
404	1.820E-02	445	3.659E+00	486	2.537E+00	527	6.204E+00	568	8.804E+00
405	2.830E-02	446	4.062E+00	487	2.651E+00	528	6.280E+00	569	8.875E+00
406	5.800E-03	447	4.424E+00	488	2.741E+00	529	6.324E+00	570	8.941E+00
407	7.740E-02	448	4.796E+00	489	2.866E+00	530	6.344E+00	571	8.991E+00
408	7.200E-03	449	5.141E+00	490	3.035E+00	531	6.397E+00	572	9.055E+00
409	5.840E-02	450	5.310E+00	491	3.145E+00	532	6.469E+00	573	9.106E+00
410	6.720E-02	451	5.411E+00	492	3.278E+00	533	6.502E+00	574	9.169E+00
411	2.520E-02	452	5.337E+00	493	3.401E+00	534	6.571E+00	575	9.263E+00
412	4.850E-02	453	5.184E+00	494	3.552E+00	535	6.637E+00	576	9.298E+00
413	4.900E-03	454	4.874E+00	495	3.675E+00	536	6.696E+00	577	9.422E+00
414	4.510E-02	455	4.517E+00	496	3.806E+00	537	6.768E+00	578	9.488E+00
415	3.370E-02	456	4.127E+00	497	3.978E+00	538	6.810E+00	579	9.557E+00
416	4.080E-02	457	3.759E+00	498	4.100E+00	539	6.868E+00	580	9.630E+00
417	4.440E-02	458	3.414E+00	499	4.239E+00	540	6.916E+00	581	9.709E+00
418	6.040E-02	459	3.145E+00	500	4.358E+00	541	7.005E+00	582	9.787E+00
419	5.200E-02	460	2.917E+00	501	4.484E+00	542	7.081E+00	583	9.894E+00
420	1.082E-01	461	2.743E+00	502	4.576E+00	543	7.131E+00	584	9.960E+00

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.008E+01	626	1.345E+01	667	9.285E+00	708	3.488E+00	749	8.050E-01
586	1.020E+01	627	1.345E+01	668	9.130E+00	709	3.315E+00	750	7.292E-01
587	1.028E+01	628	1.341E+01	669	8.901E+00	710	3.172E+00	751	7.727E-01
588	1.038E+01	629	1.341E+01	670	8.783E+00	711	3.083E+00	752	7.169E-01
589	1.049E+01	630	1.335E+01	671	8.607E+00	712	2.987E+00	753	7.159E-01
590	1.061E+01	631	1.332E+01	672	8.443E+00	713	2.953E+00	754	6.400E-01
591	1.071E+01	632	1.330E+01	673	8.301E+00	714	2.851E+00	755	5.120E-01
592	1.082E+01	633	1.323E+01	674	8.091E+00	715	2.712E+00	756	5.809E-01
593	1.094E+01	634	1.316E+01	675	7.954E+00	716	2.637E+00	757	5.742E-01
594	1.105E+01	635	1.311E+01	676	7.789E+00	717	2.595E+00	758	1.984E-01
595	1.119E+01	636	1.310E+01	677	7.613E+00	718	2.572E+00	759	4.924E-01
596	1.132E+01	637	1.300E+01	678	7.402E+00	719	2.361E+00	760	3.460E-01
597	1.148E+01	638	1.294E+01	679	7.288E+00	720	2.372E+00	761	3.596E-01
598	1.157E+01	639	1.289E+01	680	7.092E+00	721	2.248E+00	762	5.429E-01
599	1.167E+01	640	1.276E+01	681	6.945E+00	722	2.233E+00	763	5.304E-01
600	1.183E+01	641	1.270E+01	682	6.816E+00	723	2.165E+00	764	3.802E-01
601	1.194E+01	642	1.260E+01	683	6.694E+00	724	1.959E+00	765	2.114E-01
602	1.205E+01	643	1.253E+01	684	6.495E+00	725	2.034E+00	766	3.003E-01
603	1.217E+01	644	1.242E+01	685	6.298E+00	726	1.962E+00	767	3.128E-01
604	1.228E+01	645	1.237E+01	686	6.191E+00	727	1.861E+00	768	4.476E-01
605	1.239E+01	646	1.228E+01	687	6.105E+00	728	1.808E+00	769	2.998E-01
606	1.248E+01	647	1.214E+01	688	5.915E+00	729	1.851E+00	770	1.520E-01
607	1.259E+01	648	1.203E+01	689	5.660E+00	730	1.819E+00	771	1.979E-01
608	1.274E+01	649	1.191E+01	690	5.521E+00	731	1.638E+00	772	3.149E-01
609	1.280E+01	650	1.178E+01	691	5.476E+00	732	1.668E+00	773	1.944E-01
610	1.292E+01	651	1.168E+01	692	5.319E+00	733	1.439E+00	774	2.073E-01
611	1.298E+01	652	1.153E+01	693	5.192E+00	734	1.450E+00	775	1.837E-01
612	1.307E+01	653	1.141E+01	694	5.073E+00	735	1.485E+00	776	1.317E-01
613	1.313E+01	654	1.129E+01	695	4.910E+00	736	1.362E+00	777	1.644E-01
614	1.317E+01	655	1.115E+01	696	4.725E+00	737	1.319E+00	778	1.917E-01
615	1.326E+01	656	1.101E+01	697	4.656E+00	738	1.204E+00	779	2.126E-01
616	1.331E+01	657	1.081E+01	698	4.534E+00	739	1.128E+00	780	1.385E-01
617	1.338E+01	658	1.067E+01	699	4.423E+00	740	1.074E+00		
618	1.340E+01	659	1.055E+01	700	4.279E+00	741	1.176E+00		
619	1.341E+01	660	1.042E+01	701	4.207E+00	742	1.156E+00		
620	1.349E+01	661	1.019E+01	702	4.019E+00	743	1.100E+00		
621	1.347E+01	662	1.005E+01	703	3.904E+00	744	8.377E-01		
622	1.348E+01	663	9.941E+00	704	3.835E+00	745	8.930E-01		
623	1.351E+01	664	9.759E+00	705	3.667E+00	746	6.775E-01		
624	1.347E+01	665	9.635E+00	706	3.581E+00	747	8.414E-01		
625	1.348E+01	666	9.442E+00	707	3.473E+00	748	8.090E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Downward**

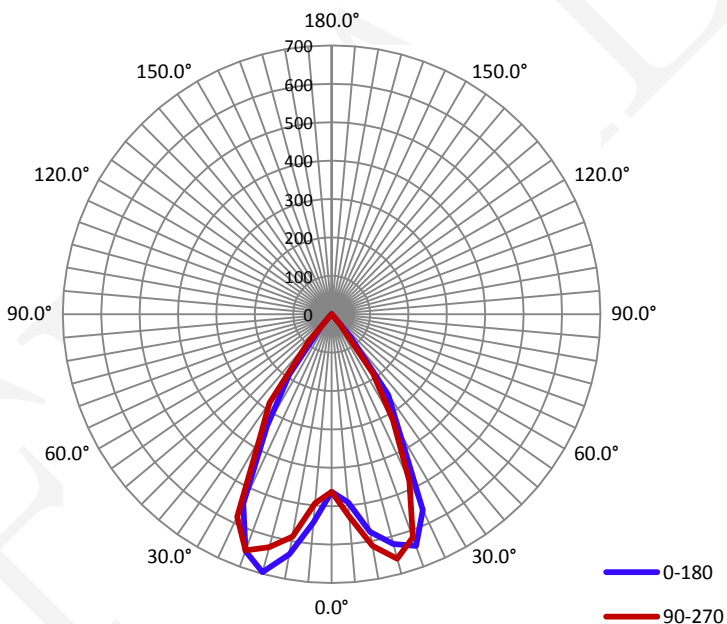
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
120.0	60	0.0720	8.06	0.9330

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	$I_{max}(cd)$	S/MH(C0/180)	S/MH(C90/270)
615.9	76.46	695.3	1.14	1.15

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50% I_{max}):	59.9	61.2	62.1	61.1	61.1
Field Angle(10% I_{max}):	79.5	78.6	80.5	79.9	79.6

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	462	462	462	462	462	462	462	462
5.0°	492	505	514	522	529	538	544	543
10.0°	575	591	602	604	613	625	634	639
15.0°	620	634	641	645	659	668	681	691
20.0°	642	641	630	624	618	626	640	657
25.0°	563	547	515	491	479	479	508	536
30.0°	351	344	338	326	319	325	328	335
35.0°	257	239	217	201	189	186	183	194
40.0°	75	58	37	34	32	32	37	45
45.0°	2	2	1	2	2	2	2	2
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.)

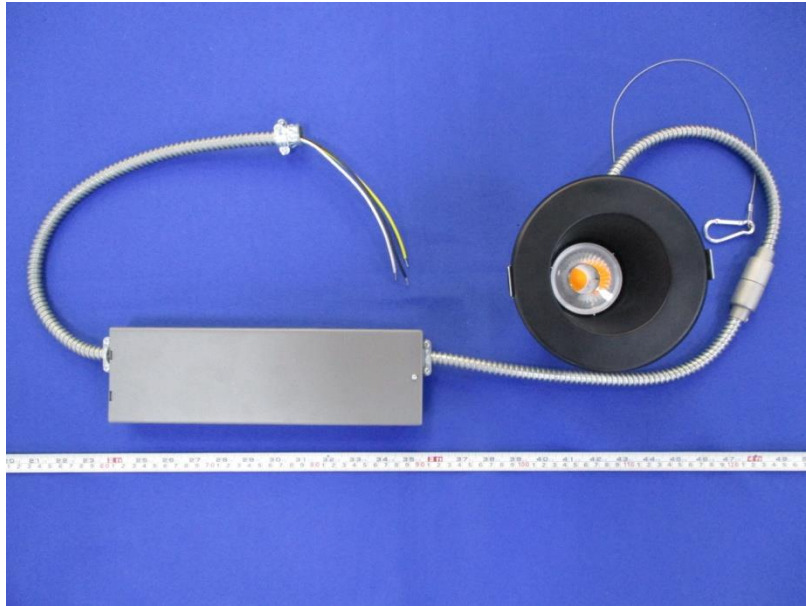
C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	462	462	462	462	462	462	462	462
5.0°	544	533	522	509	495	483	482	485
10.0°	635	629	623	610	588	581	577	575
15.0°	695	692	677	655	628	624	622	621
20.0°	656	668	672	666	655	654	653	645
25.0°	544	573	589	588	582	584	574	573
30.0°	337	354	371	379	374	376	367	356
35.0°	191	217	240	260	281	283	276	255
40.0°	43	44	49	67	95	95	84	70
45.0°	2	2	3	5	6	4	4	4
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	11.7	1.90
5-10	40.1	6.51
10-15	74.7	12.13
15-20	107.1	17.40
20-25	125.0	20.30
25-30	113.1	18.37
30-35	85.1	13.82
35-40	47.6	7.73
40-45	10.9	1.76
45-50	0.5	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	11.7	1.90
0-10	51.8	8.41
0-15	126.5	20.54
0-20	233.6	37.94
0-25	358.6	58.23
0-30	471.7	76.60
0-35	556.9	90.42
0-40	604.5	98.15
0-45	615.3	99.91
0-50	615.9	100.00
0-55	615.9	100.00
0-60	615.9	100.00
0-65	615.9	100.00
0-70	615.9	100.00
0-75	615.9	100.00
0-80	615.9	100.00
0-85	615.9	100.00
0-90	615.9	100.00
0-95	615.9	100.00
0-100	615.9	100.00
0-105	615.9	100.00
0-110	615.9	100.00
0-115	615.9	100.00
0-120	615.9	100.00
0-125	615.9	100.00
0-130	615.9	100.00
0-135	615.9	100.00
0-140	615.9	100.00
0-145	615.9	100.00
0-150	615.9	100.00
0-155	615.9	100.00
0-160	615.9	100.00
0-165	615.9	100.00
0-170	615.9	100.00
0-175	615.9	100.00
0-180	615.9	100.00

6. Product Photo



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