



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong

Test Model: 6.5MR16DIM/940FL35

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Project Engineer:	George Chen <i>George Chen</i>
Report Number:	KS2211025-54727E-10
Test Date:	2021-07-19 to 2021-07-28
Report Date:	2021-11-16
Reviewed By:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax: +86-0769-86858588
Accreditation:	The IAS Accreditation Number TL-460.

1. Product Description[#]

General Information:

Two samples were received on 2021-07-06. One was tested in integrating sphere and the other was tested in goniophotometer.

Model Tested:	6.5MR16DIM/940FL35
Manufacturer:	GREEN CREATIVE LTD
Brand Name:	GREEN CREATIVE
Product Designation:	Directional LED Lamp
Burning Time Before Test:	0hour (For New Products)

Rated Values:

Rated Voltage/Frequency:	12 VAC 60Hz
Rated Power:	6.5W
Nominal CCT:	4000K
Nominal Lumen Output:	540lm

Note:

- The applicant GREEN CREATIVE LTD declare that their products with model 6.5MR16DIM/940FL35 are the same to the products in report#KS2210706-27605E-10 and is authorized by original applicant to use their test data.
- All the data in previous report (KS2210706-27605E-10) is shared in this report.

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 (This method is not in IAS accreditation scope)

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2020-10-21	2021-10-20
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2020-10-21	2021-10-20
Digital Power Meter	EVERFINE	PF2010A	1011004	2020-10-21	2021-10-20
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2021-06-30	2022-06-29
Rapid Recording Photometer	EVERFINE	PHOTO-2000F	1007010	2020-11-05	2021-11-04
Standard Light Source	EVERFINE	D204	N/A	2020-10-20	2021-10-19
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2021-01-04	2022-01-03
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2021-01-04	2022-01-03

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2021-01-04	2022-01-03
Digital power meter	YOKOGAWA	WT-210	91j926132	2021-01-04	2022-01-03
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2021-03-12	2022-03-11
wireless remote thermohygrometer	N/A	433MHz	N/A	2021-03-12	2022-03-11
Standard Light Source	EVERFINE	D908	1012003	2020-10-20	2021-10-19

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) 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°C±1°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=2.1% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=22K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=2.1(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.18% of rdg, Power U=0.46%) (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 intensity is U=2.00% (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: **Base Up**

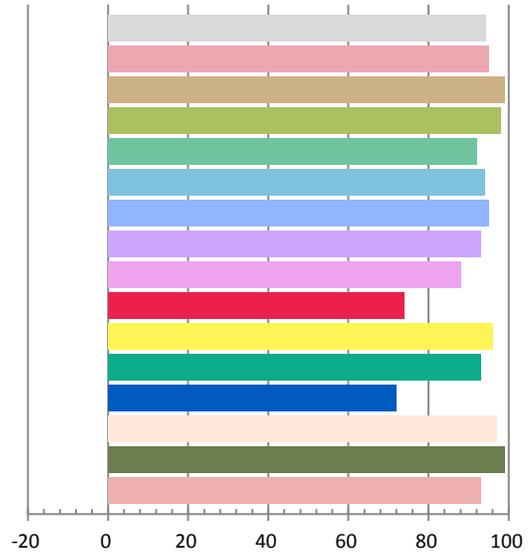
Photometric and Electrical Measurement Result

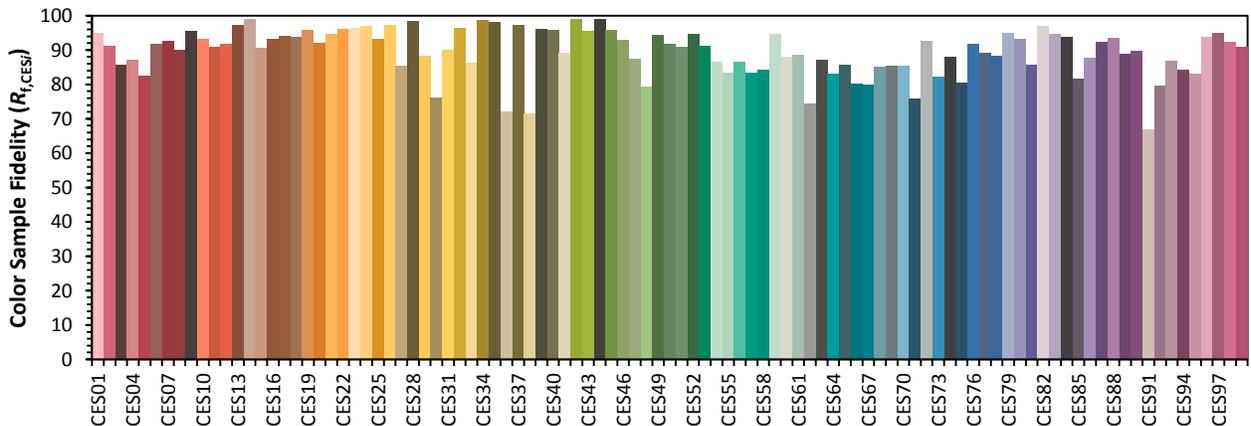
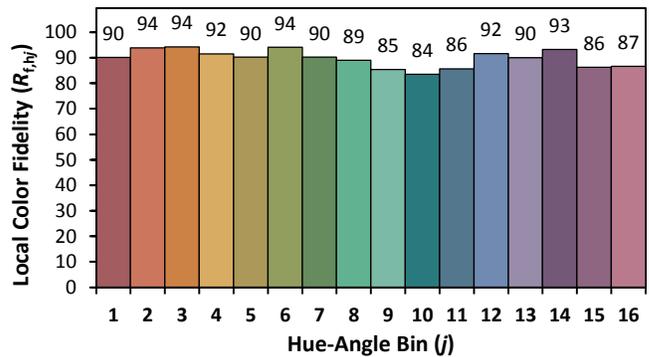
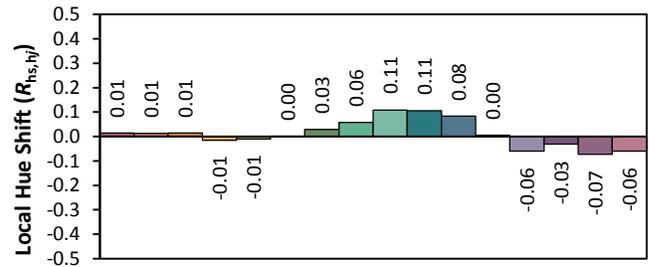
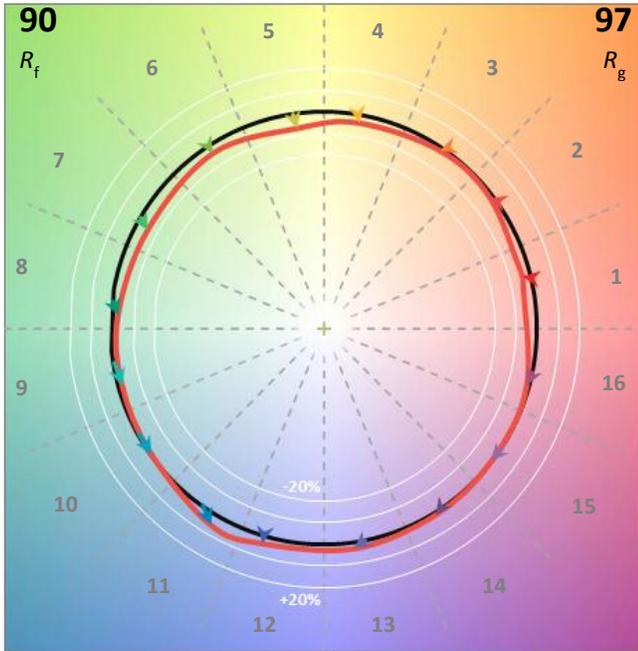
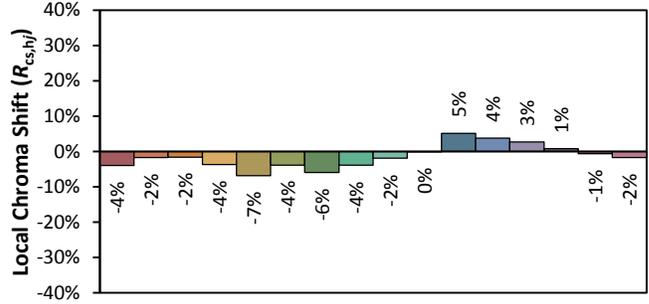
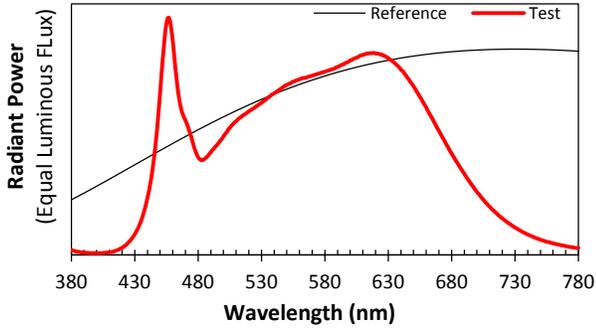
Voltage(V)	Frequency(Hz)	Current(A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy(lm/W)
12.0	60	0.5012	5.655	0.9403	547.30	96.78

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
1.8943	3967	-0.000569	0.3815	0.3762	0.2260	0.5015

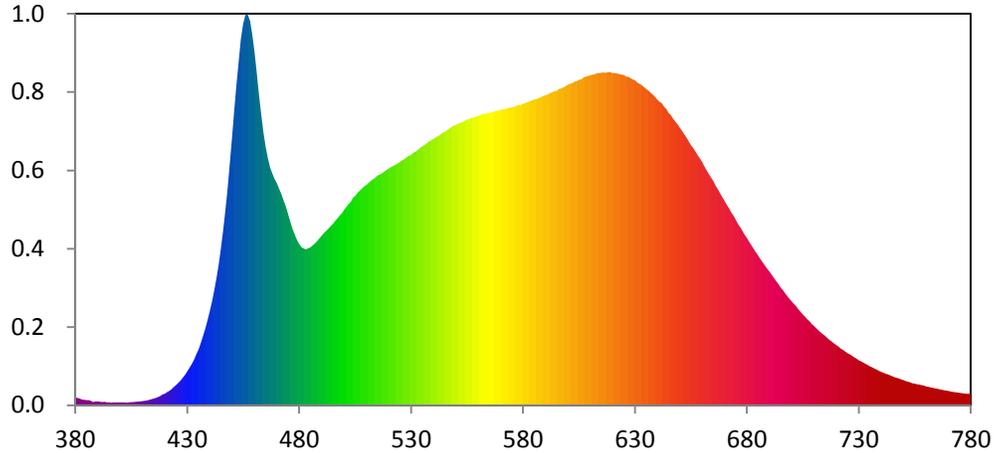
Color Rendering Index

Ra			
94.3			
R1	R2	R3	R4
95	99	98	92
R5	R6	R7	R8
94	95	93	88
R9	R10	R11	R12
74	96	93	72
R13	R14	R15	
97	99	93	





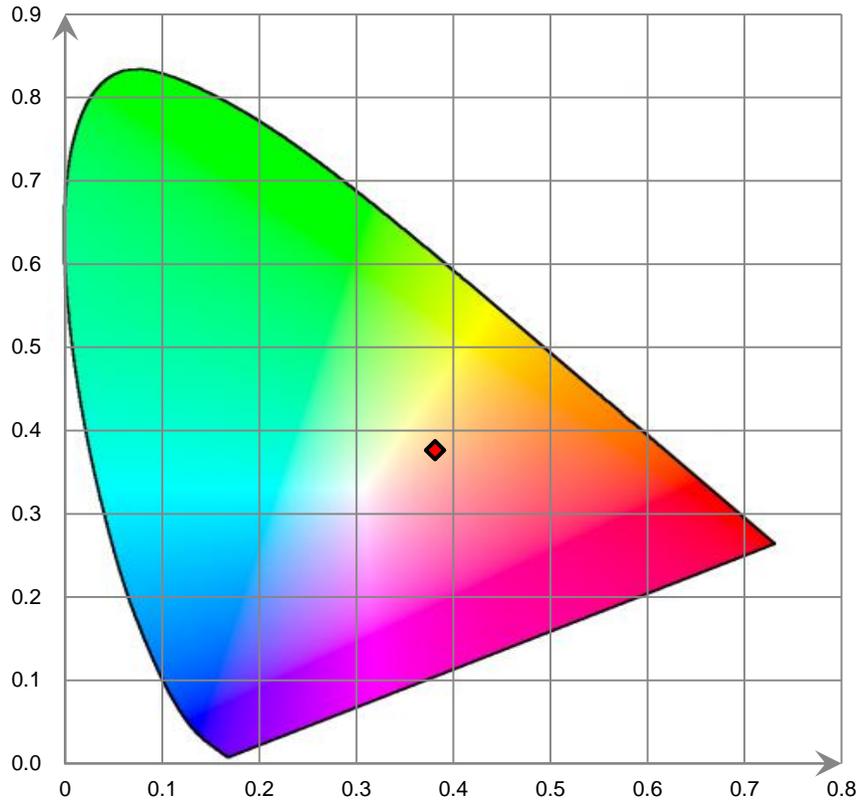
Relative Spectral Power Distribution



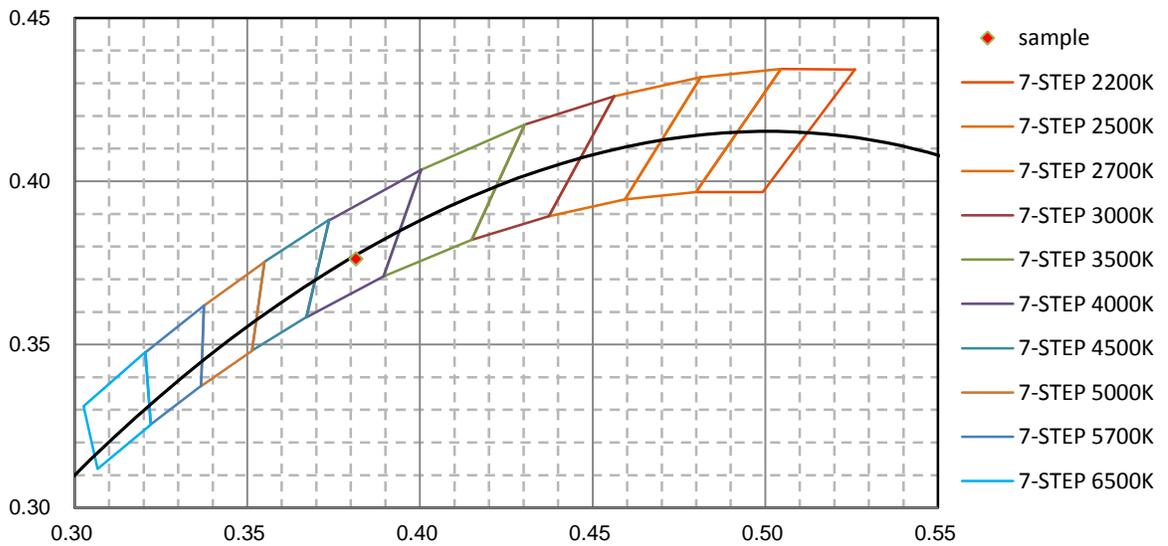
nm	mW								
380	2.087E-01	421	3.514E-01	462	8.399E+00	503	5.504E+00	544	7.374E+00
381	1.935E-01	422	3.886E-01	463	7.871E+00	504	5.615E+00	545	7.406E+00
382	1.803E-01	423	4.331E-01	464	7.382E+00	505	5.670E+00	546	7.448E+00
383	1.559E-01	424	4.881E-01	465	6.988E+00	506	5.746E+00	547	7.488E+00
384	1.479E-01	425	5.494E-01	466	6.683E+00	507	5.811E+00	548	7.529E+00
385	1.350E-01	426	6.088E-01	467	6.439E+00	508	5.869E+00	549	7.572E+00
386	1.349E-01	427	6.735E-01	468	6.271E+00	509	5.928E+00	550	7.584E+00
387	1.171E-01	428	7.487E-01	469	6.127E+00	510	5.963E+00	551	7.622E+00
388	8.745E-02	429	8.248E-01	470	6.012E+00	511	6.025E+00	552	7.644E+00
389	1.050E-01	430	9.182E-01	471	5.868E+00	512	6.077E+00	553	7.666E+00
390	1.022E-01	431	1.012E+00	472	5.720E+00	513	6.120E+00	554	7.705E+00
391	9.341E-02	432	1.117E+00	473	5.545E+00	514	6.163E+00	555	7.739E+00
392	8.827E-02	433	1.229E+00	474	5.391E+00	515	6.216E+00	556	7.747E+00
393	9.109E-02	434	1.375E+00	475	5.185E+00	516	6.251E+00	557	7.784E+00
394	7.501E-02	435	1.505E+00	476	4.984E+00	517	6.283E+00	558	7.801E+00
395	7.767E-02	436	1.678E+00	477	4.777E+00	518	6.321E+00	559	7.820E+00
396	7.112E-02	437	1.866E+00	478	4.623E+00	519	6.365E+00	560	7.842E+00
397	7.749E-02	438	2.066E+00	479	4.481E+00	520	6.411E+00	561	7.863E+00
398	7.325E-02	439	2.288E+00	480	4.365E+00	521	6.442E+00	562	7.891E+00
399	7.709E-02	440	2.534E+00	481	4.284E+00	522	6.480E+00	563	7.895E+00
400	7.659E-02	441	2.788E+00	482	4.251E+00	523	6.517E+00	564	7.906E+00
401	7.266E-02	442	3.092E+00	483	4.221E+00	524	6.552E+00	565	7.908E+00
402	7.530E-02	443	3.419E+00	484	4.245E+00	525	6.596E+00	566	7.938E+00
403	7.213E-02	444	3.791E+00	485	4.273E+00	526	6.637E+00	567	7.954E+00
404	7.848E-02	445	4.226E+00	486	4.326E+00	527	6.668E+00	568	7.970E+00
405	8.204E-02	446	4.702E+00	487	4.377E+00	528	6.717E+00	569	7.981E+00
406	8.324E-02	447	5.245E+00	488	4.438E+00	529	6.756E+00	570	8.002E+00
407	9.077E-02	448	5.835E+00	489	4.513E+00	530	6.785E+00	571	8.009E+00
408	9.643E-02	449	6.520E+00	490	4.581E+00	531	6.842E+00	572	8.024E+00
409	1.017E-01	450	7.222E+00	491	4.658E+00	532	6.871E+00	573	8.043E+00
410	1.085E-01	451	7.969E+00	492	4.718E+00	533	6.922E+00	574	8.060E+00
411	1.224E-01	452	8.666E+00	493	4.785E+00	534	6.971E+00	575	8.071E+00
412	1.310E-01	453	9.301E+00	494	4.852E+00	535	7.016E+00	576	8.080E+00
413	1.430E-01	454	9.918E+00	495	4.911E+00	536	7.049E+00	577	8.111E+00
414	1.591E-01	455	1.032E+01	496	4.984E+00	537	7.103E+00	578	8.134E+00
415	1.815E-01	456	1.057E+01	497	5.056E+00	538	7.145E+00	579	8.138E+00
416	1.980E-01	457	1.059E+01	498	5.134E+00	539	7.180E+00	580	8.160E+00
417	2.250E-01	458	1.041E+01	499	5.198E+00	540	7.211E+00	581	8.183E+00
418	2.499E-01	459	1.003E+01	500	5.290E+00	541	7.252E+00	582	8.209E+00
419	2.900E-01	460	9.557E+00	501	5.369E+00	542	7.290E+00	583	8.232E+00
420	3.090E-01	461	8.993E+00	502	5.447E+00	543	7.323E+00	584	8.256E+00

nm	mW								
585	8.282E+00	626	8.898E+00	667	5.849E+00	708	2.271E+00	749	6.932E-01
586	8.291E+00	627	8.891E+00	668	5.737E+00	709	2.200E+00	750	6.770E-01
587	8.313E+00	628	8.856E+00	669	5.635E+00	710	2.148E+00	751	6.536E-01
588	8.338E+00	629	8.821E+00	670	5.535E+00	711	2.089E+00	752	6.408E-01
589	8.378E+00	630	8.794E+00	671	5.431E+00	712	2.027E+00	753	6.208E-01
590	8.391E+00	631	8.741E+00	672	5.330E+00	713	1.976E+00	754	5.935E-01
591	8.419E+00	632	8.704E+00	673	5.222E+00	714	1.920E+00	755	5.817E-01
592	8.450E+00	633	8.665E+00	674	5.132E+00	715	1.874E+00	756	5.711E-01
593	8.476E+00	634	8.621E+00	675	5.023E+00	716	1.820E+00	757	5.572E-01
594	8.504E+00	635	8.569E+00	676	4.914E+00	717	1.762E+00	758	5.391E-01
595	8.517E+00	636	8.522E+00	677	4.827E+00	718	1.720E+00	759	5.301E-01
596	8.567E+00	637	8.465E+00	678	4.718E+00	719	1.668E+00	760	5.083E-01
597	8.584E+00	638	8.412E+00	679	4.615E+00	720	1.625E+00	761	5.003E-01
598	8.609E+00	639	8.349E+00	680	4.529E+00	721	1.584E+00	762	4.793E-01
599	8.640E+00	640	8.274E+00	681	4.430E+00	722	1.532E+00	763	4.691E-01
600	8.687E+00	641	8.217E+00	682	4.336E+00	723	1.495E+00	764	4.590E-01
601	8.701E+00	642	8.177E+00	683	4.238E+00	724	1.451E+00	765	4.469E-01
602	8.731E+00	643	8.079E+00	684	4.145E+00	725	1.404E+00	766	4.283E-01
603	8.767E+00	644	8.019E+00	685	4.062E+00	726	1.377E+00	767	4.202E-01
604	8.781E+00	645	7.919E+00	686	3.967E+00	727	1.335E+00	768	4.086E-01
605	8.811E+00	646	7.855E+00	687	3.875E+00	728	1.293E+00	769	3.986E-01
606	8.827E+00	647	7.767E+00	688	3.791E+00	729	1.256E+00	770	3.880E-01
607	8.871E+00	648	7.688E+00	689	3.703E+00	730	1.216E+00	771	3.728E-01
608	8.902E+00	649	7.610E+00	690	3.618E+00	731	1.190E+00	772	3.592E-01
609	8.916E+00	650	7.521E+00	691	3.529E+00	732	1.149E+00	773	3.547E-01
610	8.935E+00	651	7.439E+00	692	3.442E+00	733	1.116E+00	774	3.437E-01
611	8.952E+00	652	7.339E+00	693	3.358E+00	734	1.084E+00	775	3.360E-01
612	8.965E+00	653	7.251E+00	694	3.280E+00	735	1.053E+00	776	3.228E-01
613	8.996E+00	654	7.154E+00	695	3.192E+00	736	1.022E+00	777	3.155E-01
614	8.993E+00	655	7.052E+00	696	3.122E+00	737	9.867E-01	778	3.060E-01
615	9.001E+00	656	6.970E+00	697	3.034E+00	738	9.658E-01	779	3.064E-01
616	9.011E+00	657	6.869E+00	698	2.958E+00	739	9.333E-01	780	3.068E-01
617	9.006E+00	658	6.766E+00	699	2.878E+00	740	9.056E-01		
618	9.020E+00	659	6.674E+00	700	2.809E+00	741	8.829E-01		
619	9.018E+00	660	6.579E+00	701	2.738E+00	742	8.535E-01		
620	8.995E+00	661	6.460E+00	702	2.677E+00	743	8.349E-01		
621	8.998E+00	662	6.362E+00	703	2.591E+00	744	8.096E-01		
622	8.987E+00	663	6.255E+00	704	2.527E+00	745	7.812E-01		
623	8.972E+00	664	6.163E+00	705	2.459E+00	746	7.592E-01		
624	8.951E+00	665	6.062E+00	706	2.394E+00	747	7.385E-01		
625	8.948E+00	666	5.950E+00	707	2.323E+00	748	7.194E-01		

CIE 1931xy Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

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

Test orientation: **Base Up**

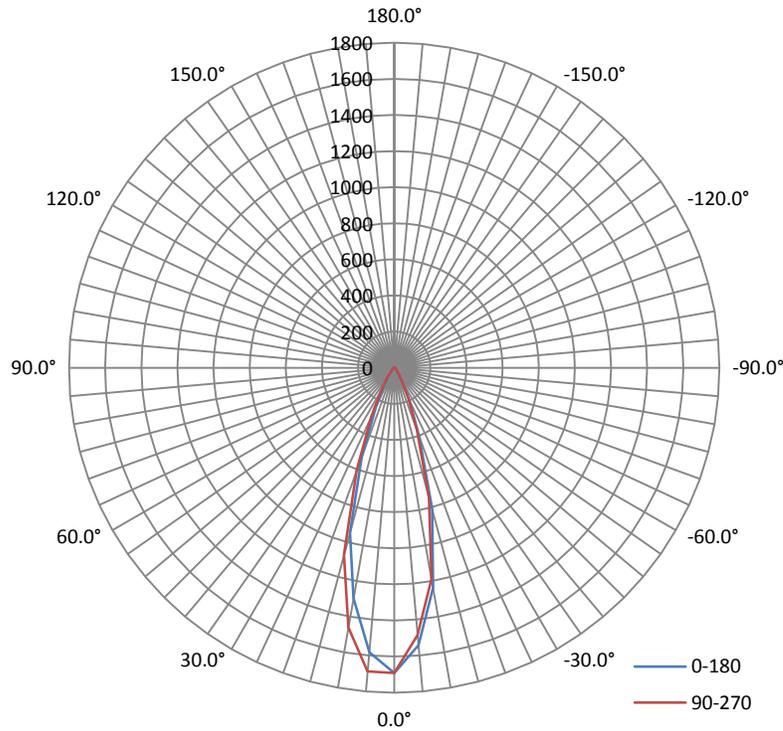
Electrical Measurement

Input Voltage(V)	Frequency(Hz)	Input Current(A)	Power (W)	Power Factor
12.01	60	0.5039	5.660	0.9354

Photometric Measurement

Luminous Flux(lm)	Efficacy(lm/W)	I _{max} (cd)	S/MH(C0/180)	S/MH(C90/270)
553.979	97.88	1728.0	0.48	0.46

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle(50%I _{max}):	30.8	31.1	30.9	30.4	30.8
Field Angle(10%I _{max}):	53.3	53.7	54.2	53.5	53.7

Luminous Intensity (cd) Distribution Data

C Y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1691	1691	1691	1691	1691	1691	1691	1691
5.0°	1582	1629	1667	1686	1688	1679	1649	1613
10.0°	1296	1352	1430	1466	1460	1420	1370	1314
15.0°	946	1008	1074	1109	1072	1014	943	887
20.0°	527	570	619	624	605	547	506	456
25.0°	242	269	292	303	299	277	251	222
30.0°	109	129	137	144	149	141	122	106
35.0°	49	58	62	63	66	64	53	46
40.0°	24	27	29	31	31	28	26	22
45.0°	16	17	17	17	17	16	16	15
50.0°	12	12	13	13	13	12	12	11
55.0°	9	10	10	10	10	10	10	9
60.0°	8	8	8	8	8	8	8	7
65.0°	6	6	7	7	7	7	6	6
70.0°	5	5	5	5	5	5	5	4
75.0°	3	4	4	4	4	4	3	3
80.0°	2	2	2	2	2	2	2	2
85.0°	1	1	1	1	1	1	1	1
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°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	2	2	1	1	1	1	1	2
160.0°	2	2	2	2	2	2	2	2
165.0°	2	2	2	2	2	2	2	2
170.0°	2	2	2	2	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	1	1	1	1

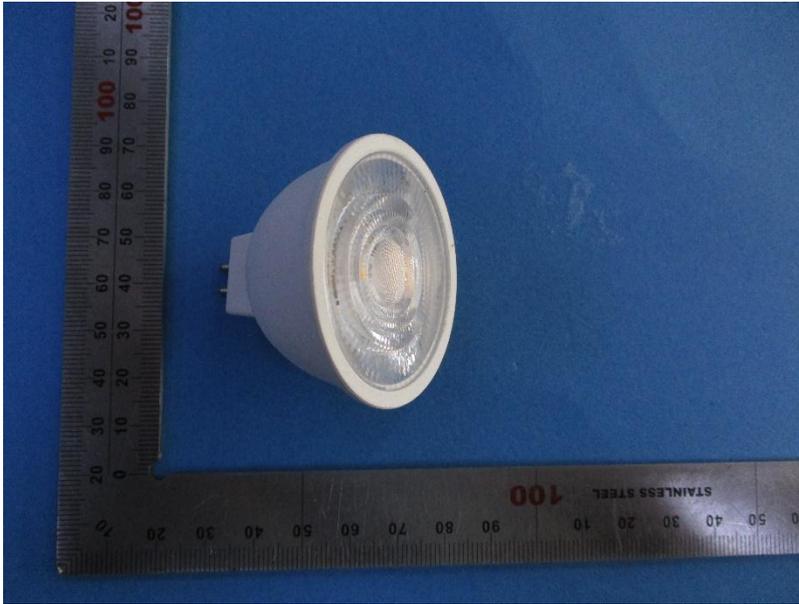
Luminous Intensity (cd) Distribution Data (cont.)

C Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1691	1691	1691	1691	1691	1691	1691	1691
5.0°	1544	1510	1501	1501	1487	1481	1487	1527
10.0°	1238	1223	1193	1189	1187	1201	1209	1235
15.0°	808	760	738	734	746	772	817	874
20.0°	402	377	366	363	365	381	414	450
25.0°	192	184	176	171	178	179	190	203
30.0°	90	85	79	76	77	80	83	91
35.0°	37	35	34	33	34	35	35	39
40.0°	19	20	19	19	19	20	20	20
45.0°	14	14	14	13	14	14	14	15
50.0°	11	10	10	10	11	11	11	12
55.0°	9	8	8	8	9	9	9	9
60.0°	7	7	7	7	7	7	7	7
65.0°	6	5	5	5	5	6	6	6
70.0°	4	4	4	4	4	4	4	4
75.0°	3	3	3	3	3	3	3	3
80.0°	2	1	1	1	2	2	2	2
85.0°	0	0	0	0	0	1	1	1
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°	1	1	1	0	0	0	0	0
165.0°	1	1	1	0	0	0	0	0
170.0°	1	1	1	0	0	0	0	0
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	1	1	1	1

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	39.0	7.05	0-5	39.0	7.05
5-10	102.2	18.44	0-10	141.2	25.49
10-15	129.9	23.45	0-15	271.1	48.94
15-20	109.3	19.74	0-20	380.4	68.68
20-25	69.4	12.52	0-25	449.8	81.20
25-30	40.2	7.26	0-30	490.0	88.46
30-35	21.1	3.80	0-35	511.1	92.26
35-40	11.0	1.99	0-40	522.1	94.25
40-45	6.8	1.24	0-45	529.0	95.49
45-50	5.3	0.96	0-50	534.3	96.45
50-55	4.5	0.80	0-55	538.8	97.25
55-60	3.8	0.69	0-60	542.6	97.94
60-65	3.3	0.59	0-65	545.8	98.53
65-70	2.7	0.48	0-70	548.5	99.01
70-75	2.0	0.36	0-75	550.5	99.37
75-80	1.3	0.24	0-80	551.8	99.61
80-85	0.7	0.13	0-85	552.5	99.74
85-90	0.2	0.03	0-90	552.7	99.77
90-95	0.0	0.00	0-95	552.7	99.77
95-100	0.0	0.00	0-100	552.7	99.77
100-105	0.0	0.00	0-105	552.7	99.77
105-110	0.0	0.00	0-110	552.7	99.77
110-115	0.0	0.00	0-115	552.7	99.77
115-120	0.0	0.00	0-120	552.7	99.77
120-125	0.0	0.00	0-125	552.7	99.77
125-130	0.0	0.00	0-130	552.7	99.77
130-135	0.0	0.01	0-135	552.8	99.78
135-140	0.1	0.01	0-140	552.8	99.79
140-145	0.1	0.03	0-145	553.0	99.82
145-150	0.2	0.03	0-150	553.2	99.85
150-155	0.2	0.04	0-155	553.4	99.89
155-160	0.2	0.04	0-160	553.6	99.93
160-165	0.2	0.03	0-165	553.8	99.96
165-170	0.1	0.02	0-170	553.9	99.98
170-175	0.1	0.02	0-175	554.0	100.00
175-180	0.0	0.00	0-180	554.0	100.00

6. Product Photo



Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
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*****END OF REPORT*****