



Ref. No.: LCZF19080137

Version: 1.0

Date of issue: Aug. 20, 2019

Total pages: 11



Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Imminent Teknologies Limited

Suite 5, Valley Towers, Valley Road, Birkirkara BKR9022, Malta

For products:

LED DOWNLIGHT

Models No.:

BLU-GLAZE-16-24W-830-60

Test Date: Aug. 14, 2019 to Aug. 19, 2019

Test Lab.: **LCTECH (Zhongshan) Testing Service Co., Ltd**

2/F., Building II, Technology and Enterprise Development Center, Guangyuan Road,
Xiaolan, Zhongshan, Guangdong, China

Tel:+86-760-22833366

Fax:+86-760-22833399

E-mail:Service@lccert.com

http://www.lccert.com

Test Sites: 1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road,
Xiaolan, Zhongshan, Guangdong, China

Template No.: LC-RT-PL-001 Rev.1.2

Test Note:

Complied by:

Kargel Yuan
Project Engineer

Aug. 20, 2019

Reviewed by:

Lin Qiu
Technical Manager

Aug. 20, 2019

The duplication of this report or parts of it and its use for advertising purposes is only allowed with permission of the testing laboratory. This report contains the result of the examination of the product sample submitted by the applicant. A general statement concerning the quality of the products from the series manufacture cannot be derived therefore. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.



Table of Contents

1. General	3
1.1 Product Information	3
1.2 Standards or methods	4
1.3 Equipment list	4
2. Test conducted and method	5
2.1 Ambient Condition	5
2.2 Power Supply Characteristics	5
2.3 Seasoning and Stabilization	5
2.4 Electrical Instrumentation	5
2.5 Color Measurement Method	5
2.6 Total Luminous Flux Measurement Method	5
2.7 Luminous Intensity Distribution Measurement Method	5
2.8 Spatial Non-uniformity of Chromaticity	5
3. Test Result Summary	6
3.1 Electrical data	6
3.2 Photometric data	6
3.3 Color Rendering Details	6
4. Test Data	7
4.1 Spectral Distribution	7
4.2 ANSI Chromaticity Quadrangles Diagram	7
4.3 Goniometry Test Data	8
4.4 Zonal Lumen Summary	8
4.5 Polar Curves	9
4.6 Candela Tabulation	10
Appendix A Product Photo	11



LCTECH



1. General

1.1 Product Information

Brand Name	BLUi
Product Type	LED DOWNLIGHT
Model Number	BLU-GLAZE-16-24W-830-60
Rated Inputs	36VDC
Rated Power	24W
Rated Light output	2190lm
Declared CCT	3000K
Power Supply	Integrated in luminaire
LED Package, Array or Module	CREE
Receipt Samples	1 unit
Sample Code of lab.	190812105023
Date of Receipt Samples	Aug. 12, 2019
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011 or 2015 or 2017	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-987	APW-120N	2019-01-08	2020-01-07
AC Power supply	LC-I-989	APW-120N	2019-01-08	2020-01-07
Power analyzer	LC-I-928	WT210	2019-01-02	2020-01-01
Power analyzer	LC-I-954	WT210	2019-01-08	2020-01-07
Multimeter	LC-I-972	Fluke 17B	2019-07-29	2020-07-28
Photometric colorimetric electric system* (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2018-11-21	2019-11-20
Luminous Flux Standard Lamp***	LC-PL-I-003	24V100W	2018-11-21	2019-11-20
Goniophotometer(with mirror)	LC-I-902	GMS2000	2019-05-06	2020-05-05
Wireless temperature transmitter	LC-I-978	DWRF-B	2019-01-07	2020-01-06
Wireless temperature transmitter	LC-I-979	DWRF-B	2019-01-07	2020-01-06

Note:

* Bandwidth of spectroradiometer is 1 nm.

** halogen lamp, 100W, omni-directional type, and its traceability to NIM.

*** halogen lamp, 100W, omni-directional type, and its traceability to NIM.

2. Test conducted and method

The luminaire was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The voltage of DC power supply (instantaneous voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for DC voltage and current were less than 0.1 percent.

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage	37.52 V	37.80 V
Input Current(A)	0.600	0.601
Total Power(W)	22.52	22.69
Power Factor	1.000	1.000
I-THD	-	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	2421.00
Luminaire Efficacy(Lm/W)	-	106.70
Correlated Color Temperature (CCT)(K)	3095	-
Color Rendering Index (CRI)	83.1	-
R9	11	-
Chromaticity Coordinate (x,y)	x = 0.4294 y = 0.3997	-
Chromaticity Coordinate (u,v)	u = 0.2476 v = 0.3457	-
Chromaticity Coordinate (u',v')	u' = 0.2476 v' = 0.5185	-
Duv	-0.0007	-
Zone Lumens between 0-60 °	-	96.60%
Beam Angle(50%Imax)	-	C0/180=57.3° C90/270=56.1°

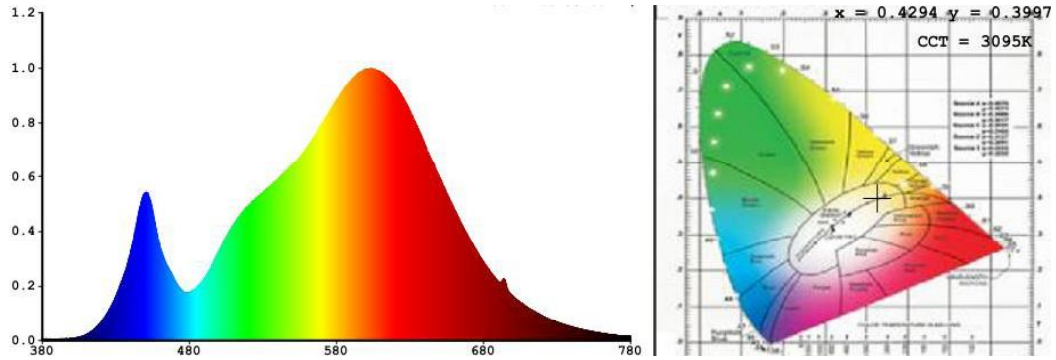
3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	90	96	82	82	87	84	62
R9	R10	R11	R12	R13	R14	R15	-
11	77	81	72	83	98	75	-

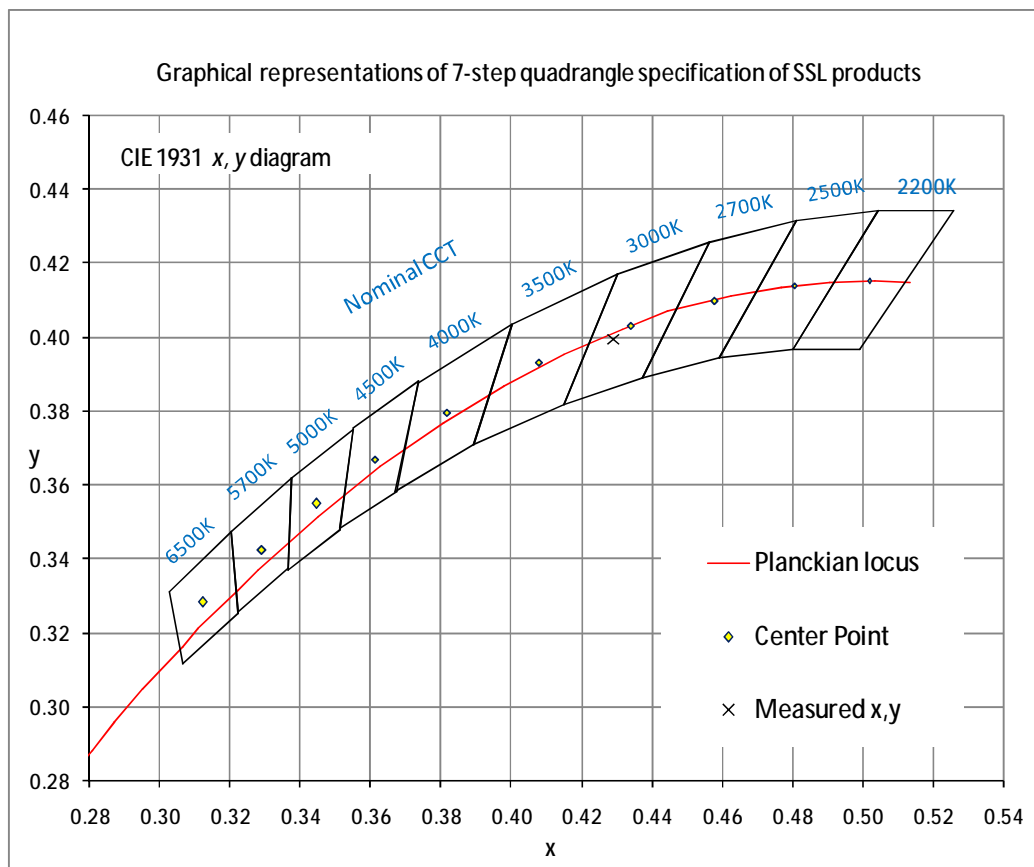
Note: N/A

4. Test Data

4.1 Spectral Distribution



4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Circular
Spacing Criteria (0-180)	0.84	Luminous Length	0.12 m (Diameter)
Spacing Criteria (90-270)	0.86	Luminous Width	0.12 m (Diameter)
Spacing Criteria (Diagonal)	0.92	Luminous Height	0.00 m
Test Distance	30.00 m		

4.4 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-20	750.26	31.00	31.00
0-30	1358.95	56.10	56.10
0-40	1931.74	79.80	79.80
0-60	2339.74	96.60	96.60
0-80	2405.68	99.40	99.40
0-90	2417.73	99.90	99.90
10-90	2204.7	91.10	91.10
20-40	1181.48	48.80	48.80
20-50	1541.37	63.70	63.70
40-70	446.01	18.40	18.40
60-80	65.94	2.70	2.70
70-80	27.93	1.20	1.20
80-90	12.05	0.50	0.50
90-110	0.11	0.00	0.00
90-120	0.16	0.00	0.00
90-130	0.38	0.00	0.00
90-150	1.33	0.10	0.10
90-180	3.27	0.10	0.10
110-180	3.16	0.10	0.10
0-180	2421.00	100.00	100.00

Total Luminaire Efficiency = 100.00%

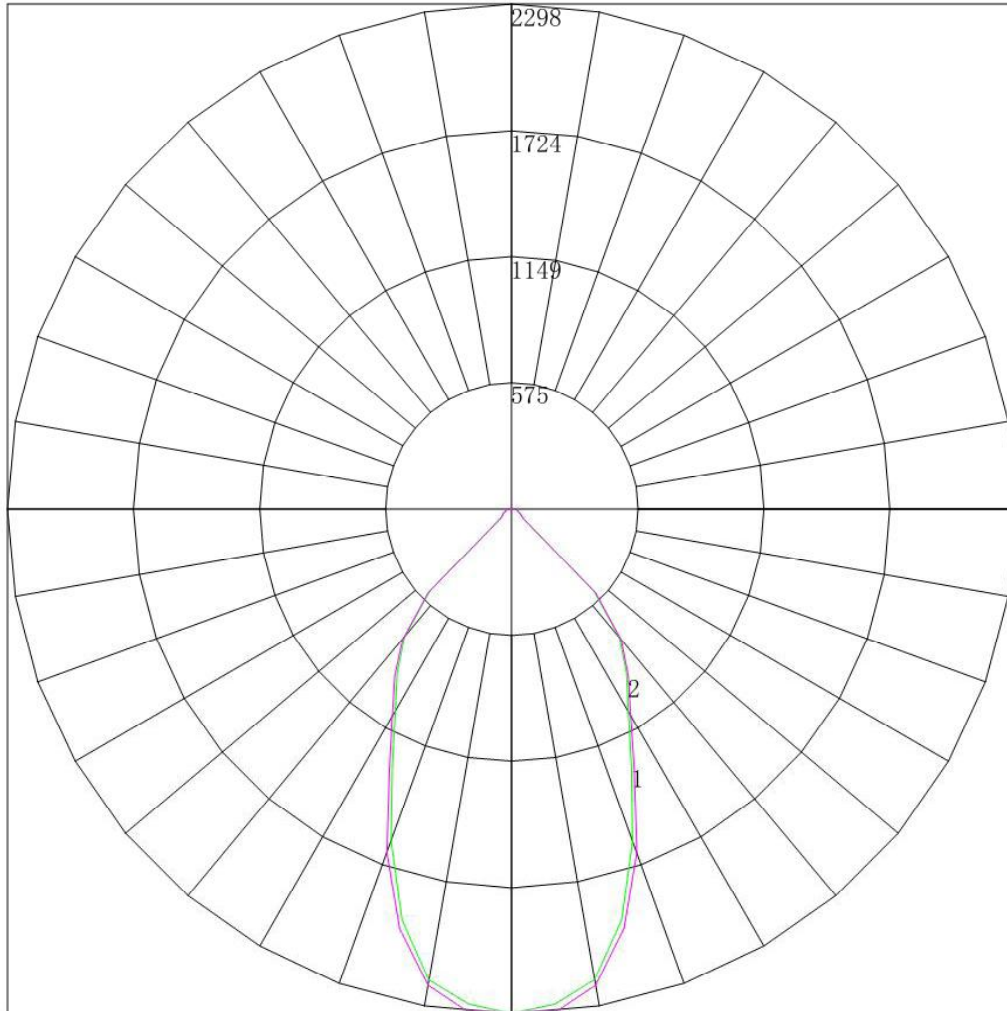
ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	213.03
10-20	537.23
20-30	608.69
30-40	572.79
40-50	359.89
50-60	48.11
60-70	38.01
70-80	27.93
80-90	12.05
90-100	0.10
100-110	0.01
110-120	0.04
120-130	0.22
130-140	0.40
140-150	0.55
150-160	0.80
160-170	0.80
170-180	0.35



LCTECH

4.5 Polar Curves



Maximum Candela = 2298.044 Located At Horizontal Angle = 0, Vertical Angle = 0

1 - Vertical Plane Through Horizontal Angles (0 - 180)

2 - Vertical Plane Through Horizontal Angles (90 - 270)



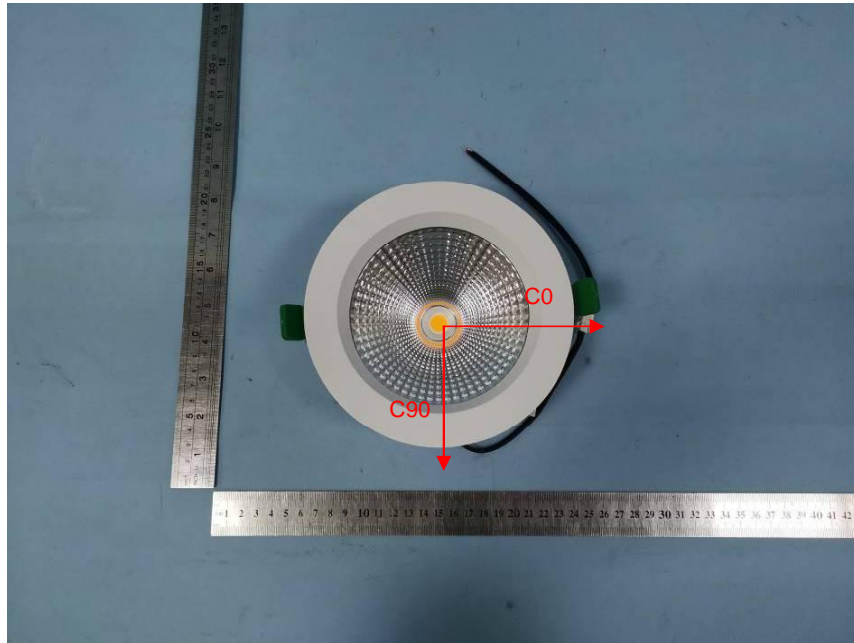
LCTECH



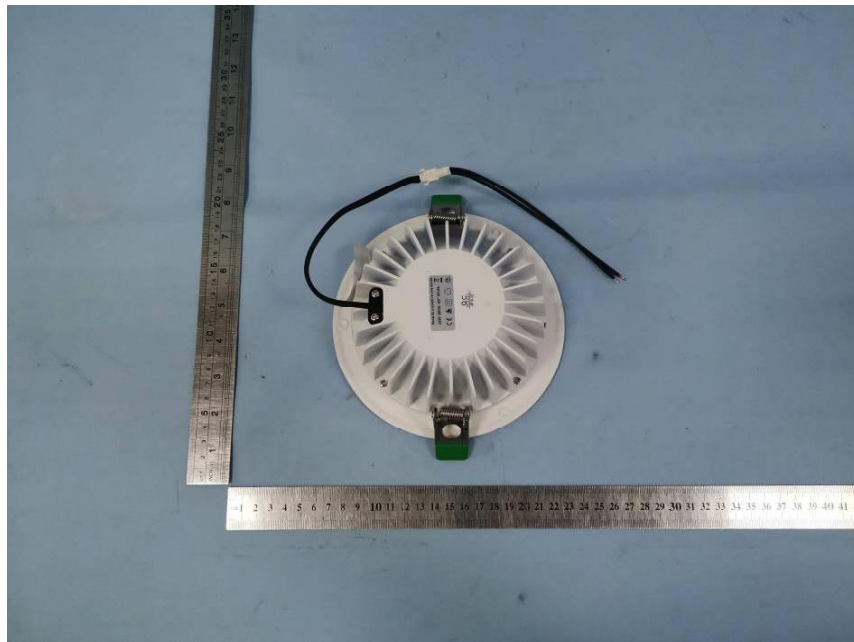
4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	2298.044	2298.044	2298.044	2298.044	2298.044	2298.044	2298.044
5	2263.225	2256.093	2256.164	2253.953	2261.857	2261.488	2297.986
10	2175.500	2165.883	2165.462	2163.139	2168.496	2165.995	2201.234
15	1935.386	1939.130	1933.434	1930.075	1929.672	1939.181	1975.195
20	1608.495	1610.980	1614.539	1617.614	1632.342	1634.305	1666.285
25	1290.061	1298.167	1301.492	1309.368	1313.377	1318.024	1319.254
30	1060.709	1062.898	1066.949	1072.472	1075.693	1082.184	1086.737
35	912.616	910.642	912.281	912.466	913.804	916.746	927.220
40	762.397	762.755	765.960	763.865	766.997	764.727	773.616
45	528.071	531.641	524.347	531.565	529.502	519.398	539.421
50	65.568	66.014	66.615	66.481	68.545	69.463	66.521
55	51.595	51.573	51.222	51.017	51.275	51.713	52.023
60	45.219	45.189	45.185	44.742	45.085	45.136	45.492
65	38.708	38.579	38.676	38.487	38.671	38.781	39.054
70	30.840	30.818	30.950	30.774	31.085	31.056	31.411
75	26.770	26.645	26.581	26.657	26.741	26.768	27.219
80	21.298	21.275	21.242	21.303	21.204	21.290	21.712
85	11.531	11.349	11.286	11.181	11.276	11.362	11.286
90	0.181	0.113	0.226	0.452	0.543	0.499	0.200
95	0.000	0.000	0.000	0.022	0.000	0.023	0.000
100	0.000	0.022	0.000	0.000	0.022	0.022	0.000
105	0.000	0.000	0.000	0.022	0.000	0.000	0.045
110	0.000	0.022	0.022	0.023	0.023	0.023	0.000
115	0.045	0.023	0.022	0.023	0.045	0.045	0.045
120	0.090	0.068	0.090	0.090	0.113	0.090	0.135
125	0.226	0.248	0.248	0.202	0.248	0.247	0.268
130	0.407	0.429	0.406	0.450	0.450	0.404	0.489
135	0.543	0.564	0.540	0.563	0.495	0.494	0.489
140	0.588	0.587	0.608	0.652	0.563	0.584	0.579
145	0.859	0.880	0.856	0.877	0.833	0.831	0.847
150	1.266	1.196	1.216	1.237	1.216	1.213	1.203
155	1.718	1.737	1.690	1.732	1.733	1.774	1.739
160	2.306	2.301	2.320	2.317	2.296	2.358	2.321
165	2.894	2.910	2.883	2.902	2.859	2.875	2.859
170	3.391	3.384	3.402	3.374	3.376	3.392	3.350
175	3.798	3.700	3.762	3.690	3.737	3.751	3.754
180	3.954	3.954	3.954	3.954	3.954	3.954	3.954

Appendix A Product Photo



Picture 1



Picture 2

****End of test report****