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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 BULKHEAD

Models No.:

BLU-BULKZ-OVG-13W-940-B

Test Date:	May. 6, 2021 to May. 8, 2021
Test Lab.:	**LCTECH Guangdong Testing Services Co., Ltd.** 2/F., 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.1.4
Test Note:	/

Complied by:		**Reviewed by:**	
Kargel Yuan	Kargel Yuan	**Lin Qiu**	Lin
May. 12, 2021		**May. 12, 2021**	

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1. General

1.1 Product Information

Brand Name	BLUi Lighting
Product Type	LED BULKHEAD
Model Number	BLU-BULKZ-OVG-13W-940-B
Rated Inputs	220-240VAC, 50/60Hz
Rated Power	13W
Rated Light output	1080lm
Declared CCT	4000K
Power Supply	BLUi
LED Package, Array or Module	Samsung
Receipt Samples	1 unit
Sample Code of lab.	210504108004
Date of Receipt Samples	May. 4, 2021
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- 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	2020-12-23	2021-12-22
AC Power supply	LC-I-989	APW-120N	2020-12-23	2021-12-22
Power analyzer	LC-I-928	WT210	2020-12-25	2021-12-24
Power analyzer	LC-I-954	WT210	2020-12-25	2021-12-24
Multimeter	LC-I-972	Fluke 17B	2020-07-20	2021-07-19
Photometric colorimetric electric system* (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2020-07-14	2021-07-13
Luminous Flux Standard Lamp***	LC-PL-I-003	24V100W	2020-07-14	2021-07-13
Goniophotometer(with mirror)	LC-I-902	GMS2000	2021-04-22	2022-04-21
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2020-12-24	2021-12-23
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2020-12-24	2021-12-23

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 °C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (50 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS 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 AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

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 & Frequency	229.98 V~50Hz	230.03 V~50Hz
Input Current(A)	0.097	0.095
Total Power(W)	10.93	10.94
Power Factor	0.492	0.503
I-THD	-	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	825.43
Luminaire Efficacy(Lm/W)	-	75.45
Correlated Color Temperature (CCT)(K)	4125	-
Color Rendering Index (CRI)	82.5	-
R9	4	-
Chromaticity Coordinate (x,y)	x = 0.3759 y = 0.3768	-
Chromaticity Coordinate (u,v)	u = 0.2221 v = 0.3339	-
Chromaticity Coordinate (u',v')	u' = 0.2221 v' = 0.5009	-
Duv	0.0014	-
Zone Lumens between 0-60 º	-	63.30%
Beam Angle(50%Imax)	-	C0/180=123.2° C90/270=131.0°

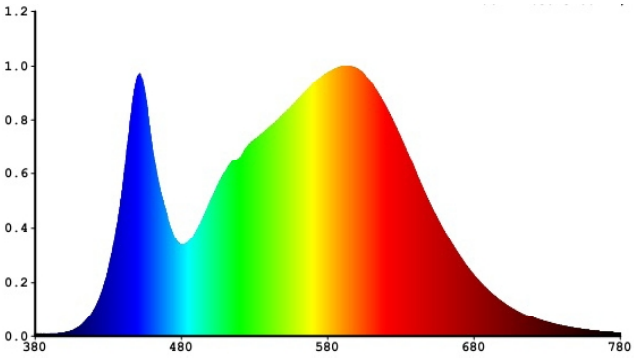
3.3 Color Rendering Details

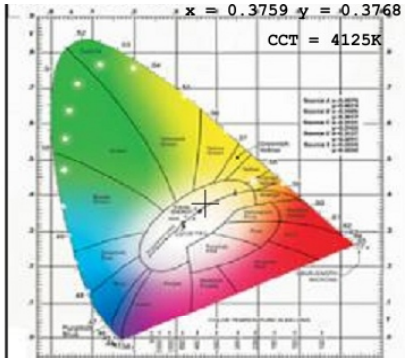
R1	R2	R3	R4	R5	R6	R7	R8
80	89	95	81	81	85	86	64
R9	R10	R11	R12	R13	R14	R15	-
4	73	80	64	82	97	74	-

Note: N/A

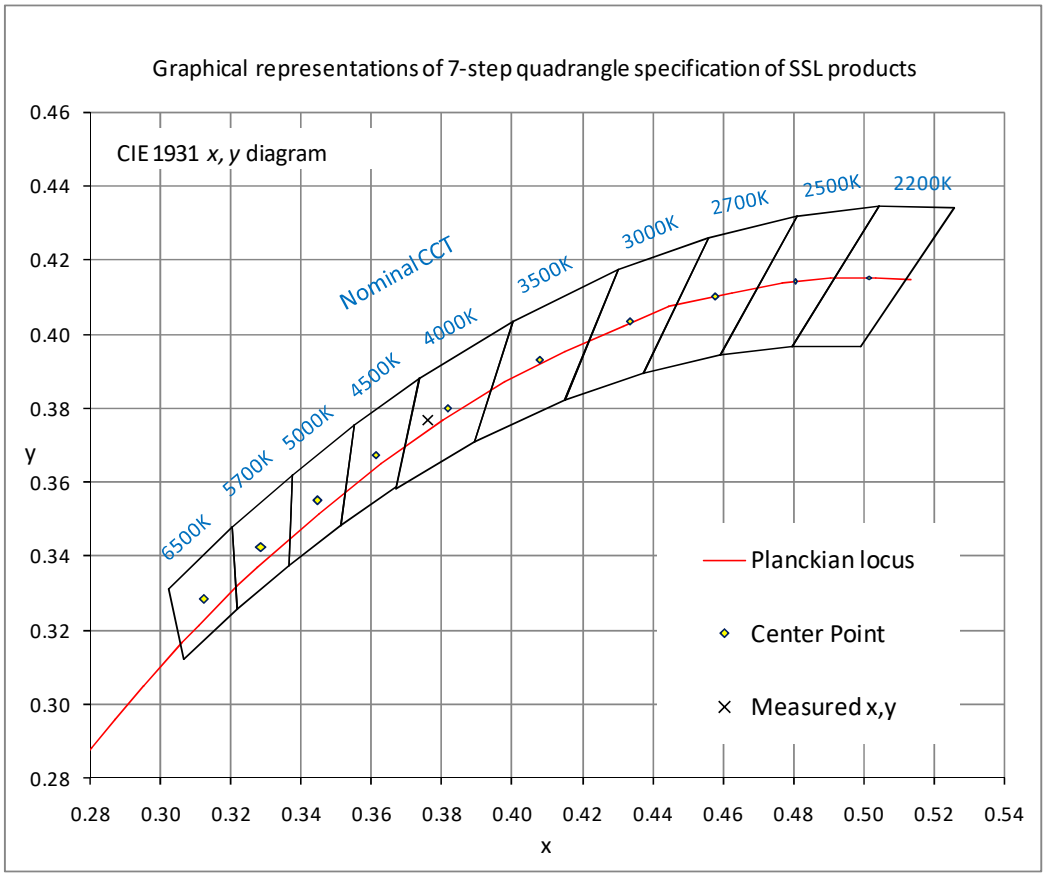
4. Test Data

4.1 Spectral Distribution





4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.28	Luminous Length	0.25 m
Spacing Criteria (90-270)	1.26	Luminous Width	0.15 m
Spacing Criteria (Diagonal)	1.40	Luminous Height	0.10 m
Test Distance	29.83 m		

4.4 Zonal Lumen Summary

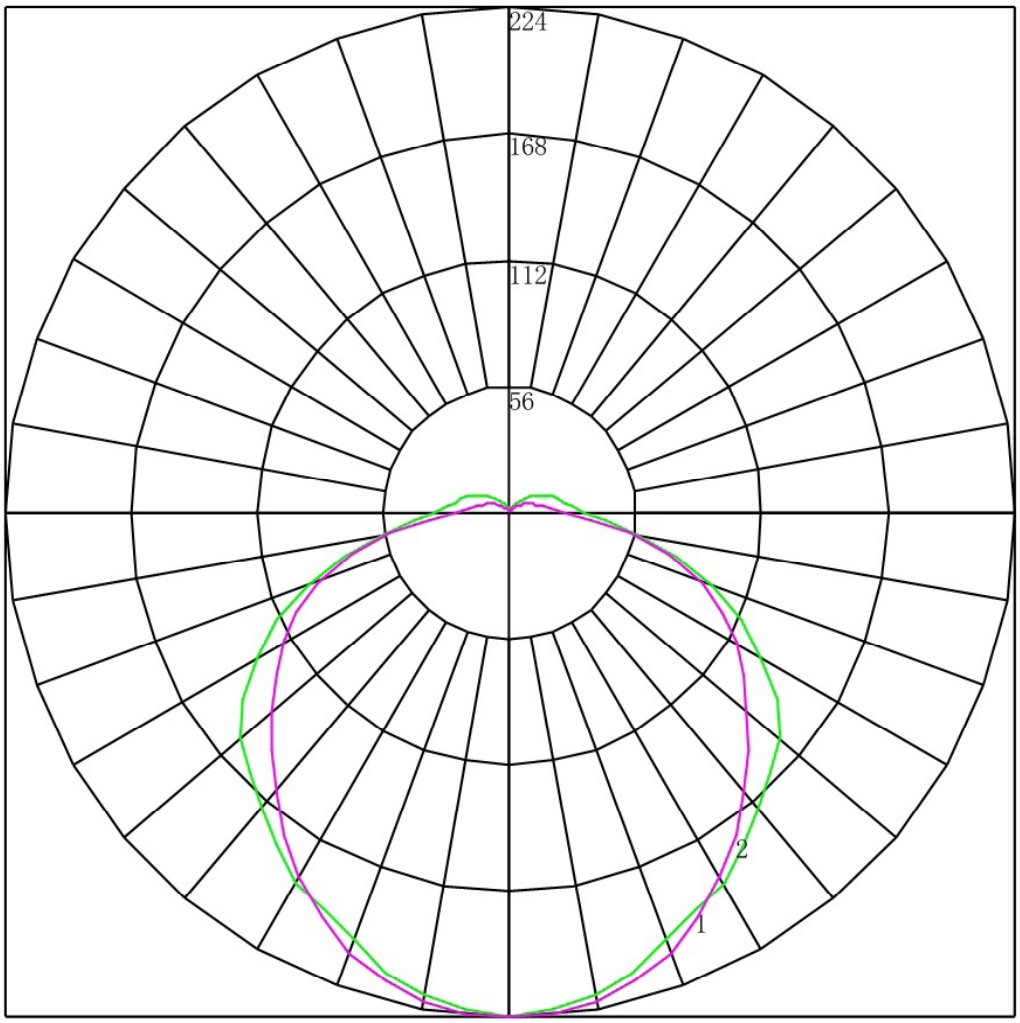
Zone	Lumens	%Lamp	%Fixt
0-20	81.48	9.90	9.90
0-30	171.96	20.80	20.80
0-40	282.35	34.20	34.20
0-60	522.77	63.30	63.30
0-80	708.87	85.90	85.90
0-90	754.17	91.40	91.40
10-90	732.97	88.80	88.80
20-40	200.87	24.30	24.30
20-50	320.77	38.90	38.90
40-70	347.68	42.10	42.10
60-80	186.11	22.50	22.50
70-80	78.84	9.60	9.60
80-90	45.30	5.50	5.50
90-110	45.01	5.50	5.50
90-120	58.03	7.00	7.00
90-130	65.85	8.00	8.00
90-150	70.80	8.60	8.60
90-180	71.26	8.60	8.60
110-180	26.25	3.20	3.20
0-180	825.43	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	21.21
10-20	60.28
20-30	90.48
30-40	110.39
40-50	119.90
50-60	120.52
60-70	107.27
70-80	78.84
80-90	45.30
90-100	26.23
100-110	18.78
110-120	13.02
120-130	7.82
130-140	3.74
140-150	1.21
150-160	0.26
160-170	0.14
170-180	0.06

4.5 Polar Curves

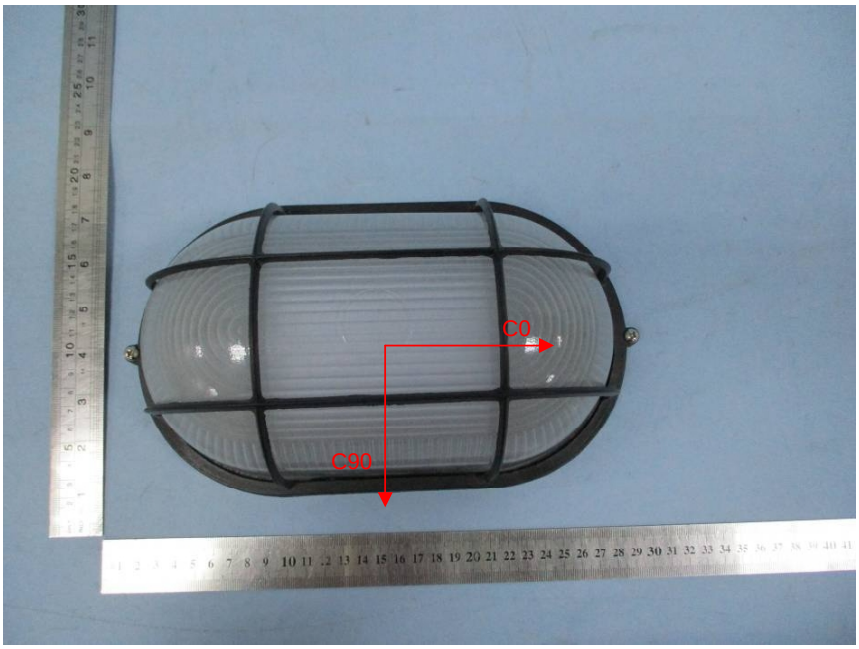


Maximum Candela = 224.4 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

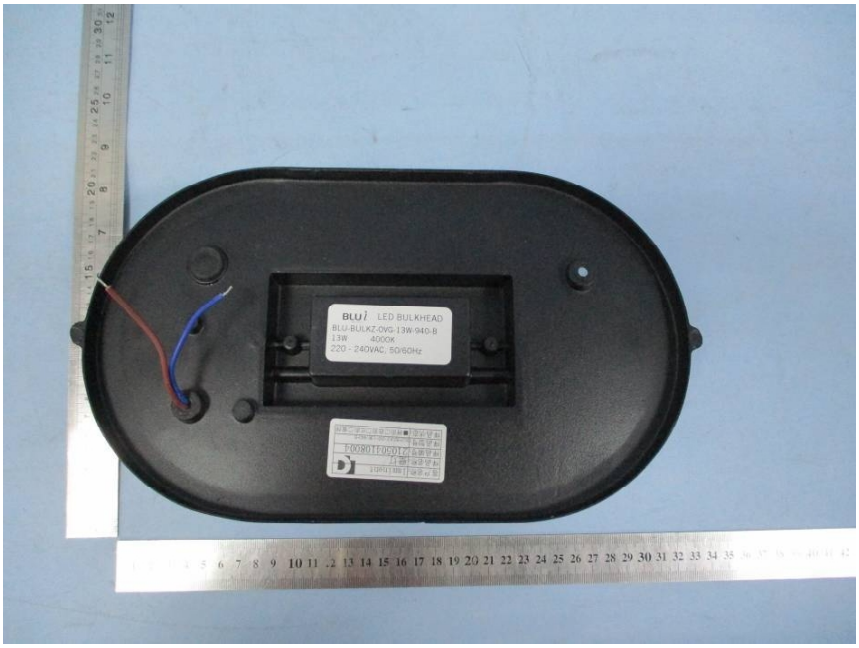
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	224.400	224.400	224.400	224.400	224.400	224.400	224.400
5	222.450	222.913	223.200	223.510	223.887	223.507	224.133
10	218.329	218.805	218.799	219.595	220.812	220.875	220.841
15	211.771	212.898	214.131	213.878	213.679	215.096	215.636
20	202.465	203.817	204.151	204.959	206.347	207.355	208.473
25	195.552	196.356	194.350	194.704	195.737	196.936	198.330
30	190.501	191.004	186.614	183.581	185.396	184.620	187.119
35	181.062	182.766	180.257	174.417	170.574	171.836	175.018
40	171.712	171.486	168.210	165.296	158.627	159.231	161.760
45	164.090	164.337	159.209	154.663	149.110	147.340	149.659
50	156.601	154.721	149.073	142.897	138.367	135.939	138.003
55	145.700	146.283	141.960	132.197	127.402	126.413	126.926
60	129.482	130.607	130.867	121.831	116.302	116.151	115.937
65	114.017	114.708	112.510	107.928	103.487	104.015	104.504
70	95.405	95.968	94.418	91.467	89.779	90.048	91.246
75	76.351	79.268	75.792	73.405	72.372	73.493	73.362
80	57.740	58.553	57.322	55.744	54.964	55.175	54.276
85	42.673	42.833	41.964	40.707	39.138	37.883	36.570
90	33.456	32.064	31.184	29.852	27.749	25.411	23.979
95	27.297	26.979	25.894	24.180	21.798	19.008	17.662
100	24.549	24.159	22.827	20.932	18.187	15.439	14.414
105	22.289	21.961	20.226	18.151	15.513	13.118	12.279
110	19.808	19.185	17.759	15.638	13.262	11.200	10.677
115	17.016	16.454	15.114	13.191	11.077	9.504	9.165
120	14.313	13.878	12.825	10.833	8.982	7.720	7.563
125	11.743	11.302	10.180	8.497	6.976	6.002	5.917
130	9.217	8.926	7.824	6.451	5.104	4.462	4.404
135	6.957	6.573	5.690	4.716	3.388	3.123	3.025
140	4.741	4.508	3.779	2.825	2.095	1.986	1.913
145	2.969	2.798	2.200	1.513	1.114	1.160	1.023
150	1.507	1.421	1.045	0.667	0.646	0.535	0.489
155	0.620	0.600	0.467	0.334	0.379	0.335	0.356
160	0.399	0.377	0.445	0.400	0.423	0.402	0.400
165	0.532	0.511	0.489	0.489	0.535	0.491	0.534
170	0.576	0.644	0.578	0.601	0.602	0.602	0.623
175	0.665	0.666	0.667	0.645	0.669	0.692	0.667
180	0.353	0.353	0.353	0.353	0.353	0.353	0.353

Appendix A Product Photo



Picture 1



Picture 2

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