

Test report of

IES LM-79-08

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

Rendered to:

Artika for Living Inc.
1756, 50th Avenue, Montréal (Lachine), Québec, Canada H8T
2V5

For products:

Concerto FM

Models No.:

FM-COC-***** (White)

("*" can be any letter "A to Z" and/or "0 to 9" and/or blank represents commercial code.)

Test Date: Aug. 29, 2022

Test Lab.: **LCTECH Guangdong Testing Services Co., Ltd.**

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Test Sites: Xiaolan, Zhongshan, Guangdong, China

Template No.: LC-RT-PL-001 Rev.1.4

Test Note: *FM-COC-WHJ was selected for the test.*

Complied by:

Kargel Yuan

Sep. 7, 2022

Reviewed by:

Lin Qiu

Sep. 7, 2022

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1. General

1.1 Product Information

Brand Name	ARTIKA
Product Type	Concerto FM
Model Number	FM-COC-***** (White)
Rated Inputs	120VAC, 60Hz
Rated Power	17W
Rated Light output	1100lm
Declared CCT	3000K, 4000K, 5000K
Power Supply	LED driver
LED Package, Array or Module	Model: 2835S Series, manufactured by EVERLIGHT ELECTRONICS CO., LTD
Receipt Samples	1 unit
Sample Code of lab.	220826109001
Date of Receipt Samples	Aug. 26, 2022
Note	This is a color tunable product, 3000K was selected for the test.

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	2021-12-16	2022-12-15
AC Power supply	LC-I-989	APW-120N	2021-12-16	2022-12-15
Power analyzer	LC-I-PL-024	WT310E	2022-03-01	2023-02-28
Power analyzer	LC-I-954	WT210	2021-12-20	2022-12-19
Multimeter	LC-I-972	Fluke	2022-07-01	2023-06-30
Photometric colorimetric electric system ¹	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp ²	LC-I-PL-030	D204C	2022-07-12	2023-07-11
Luminous flux lamp ³	LC-I-PL-031	AC220V/200W	2022-07-21	2023-07-20
Goniophotometer(with mirror)	LC-I-902	GMS2000	2022-04-21	2023-04-20
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2021-12-16	2022-12-15
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2021-12-16	2022-12-15

Note:

1, Bandwidth of spectroradiometer is 1 nm.

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

3, Incandescent lamp, 200W, 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$; 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 (60 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	120.00 V~60Hz	119.97 V~60Hz
Input Current(A)	0.150	0.151
Total Power(W)	17.86	17.89
Power Factor	0.990	0.990
I-THD	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	1115.06
Luminaire Efficacy(Lm/W)	-	62.33
Correlated Color Temperature (CCT)(K)	2998	-
Color Rendering Index (CRI)	92.8	-
R9	58	-
Chromaticity Coordinate (x,y)	x = 0.4396 y = 0.4092	-
Chromaticity Coordinate (u,v)	u = 0.2500 v = 0.3492	-
Chromaticity Coordinate (u',v')	u' = 0.2500 v' = 0.5238	-
Duv	0.0017	-
Zone Lumens between 0-60 °	-	77.42%
Beam Angle(50%Imax)	-	C0/180=112.6° C90/270=112.2°

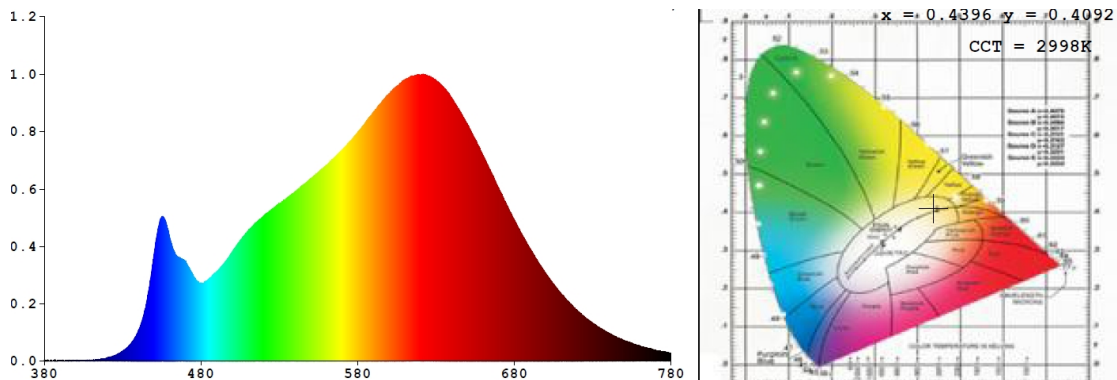
3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
93	97	99	92	92	97	91	81
R9	R10	R11	R12	R13	R14	R15	-
58	93	93	79	94	100	88	-

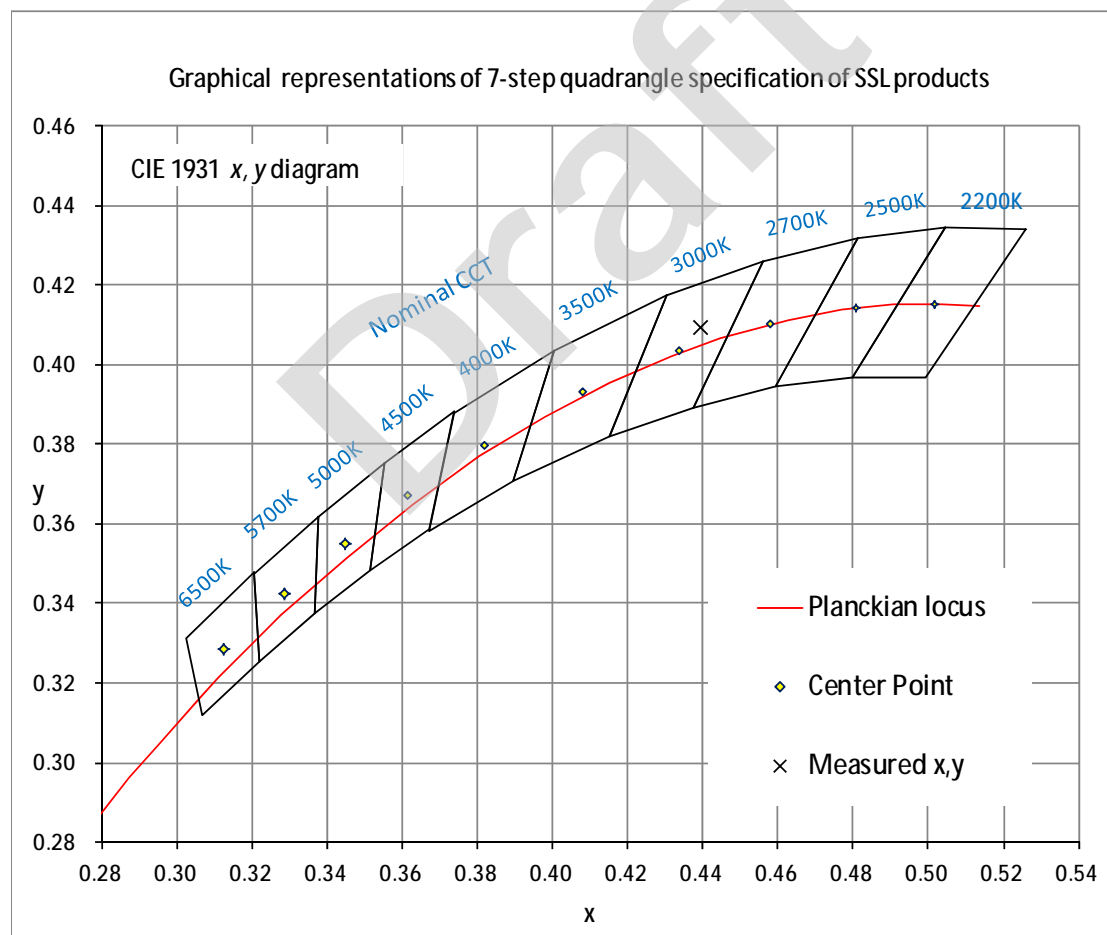
Note: N/A

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)	1.26	Luminous Length	0.30 m (Diameter)
Spacing Criteria (90-270)	1.26	Luminous Width	0.30 m (Diameter)
Spacing Criteria (Diagonal)	1.38	Luminous Height	0.00 m
Test Distance	29.75 m		

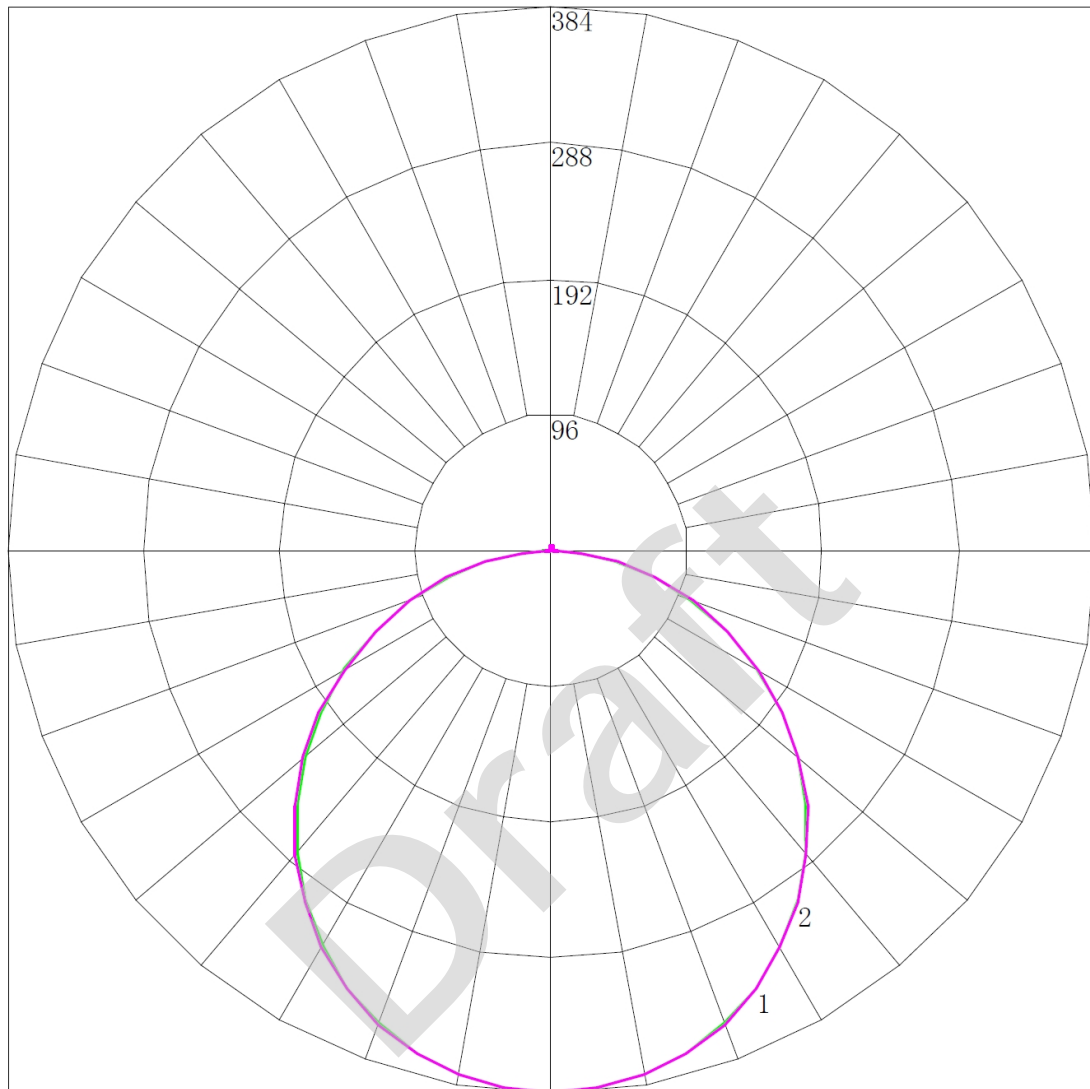
4.4 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-20	140.34	12.60	12.60
0-30	297.93	26.70	26.70
0-40	487.84	43.80	43.70
0-60	863.23	77.40	77.40
0-80	1080.02	96.90	96.90
0-90	1105.64	99.20	99.20
10-90	1069.31	95.90	95.90
20-40	347.51	31.20	31.20
20-50	544.69	48.80	48.80
40-70	511.69	45.90	45.90
60-80	216.79	19.40	19.40
70-80	80.49	7.20	7.20
80-90	25.61	2.30	2.30
90-110	2.62	0.20	0.20
90-120	3.57	0.30	0.30
90-130	4.70	0.40	0.40
90-150	7.25	0.70	0.70
90-180	9.43	0.80	0.80
110-180	6.81	0.60	0.60
0-180	1115.06	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	36.33
10-20	104.01
20-30	157.59
30-40	189.92
40-50	197.18
50-60	178.21
60-70	136.30
70-80	80.49
80-90	25.61
90-100	1.80
100-110	0.81
110-120	0.95
120-130	1.13
130-140	1.25
140-150	1.30
150-160	1.18
160-170	0.77
170-180	0.23



Maximum Candela = 383.947 Located At Horizontal Angle = 0, Vertical Angle = 0

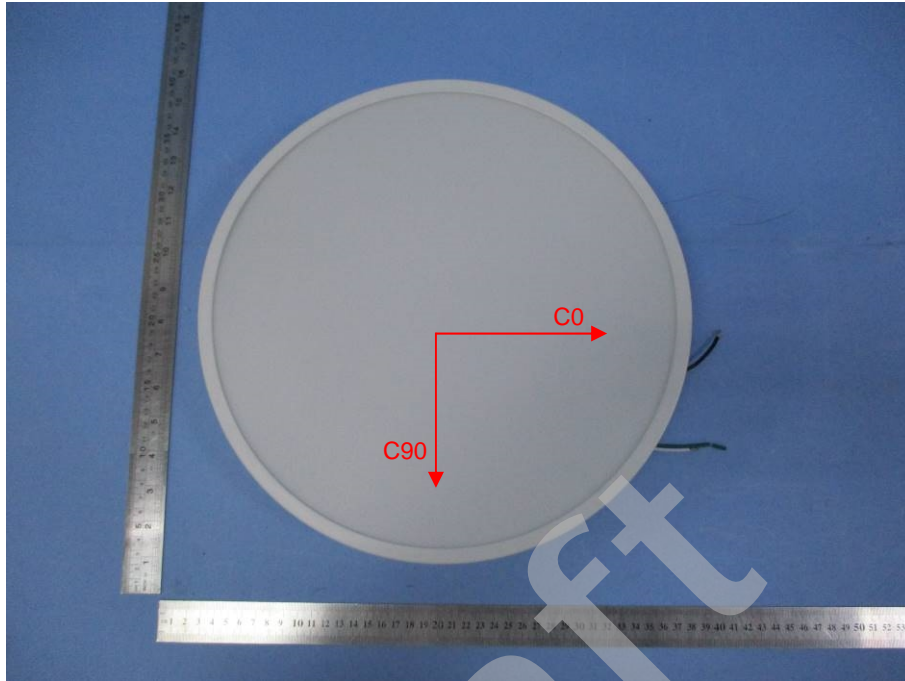
1 - Vertical Plane Through Horizontal Angles (0 - 180)

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

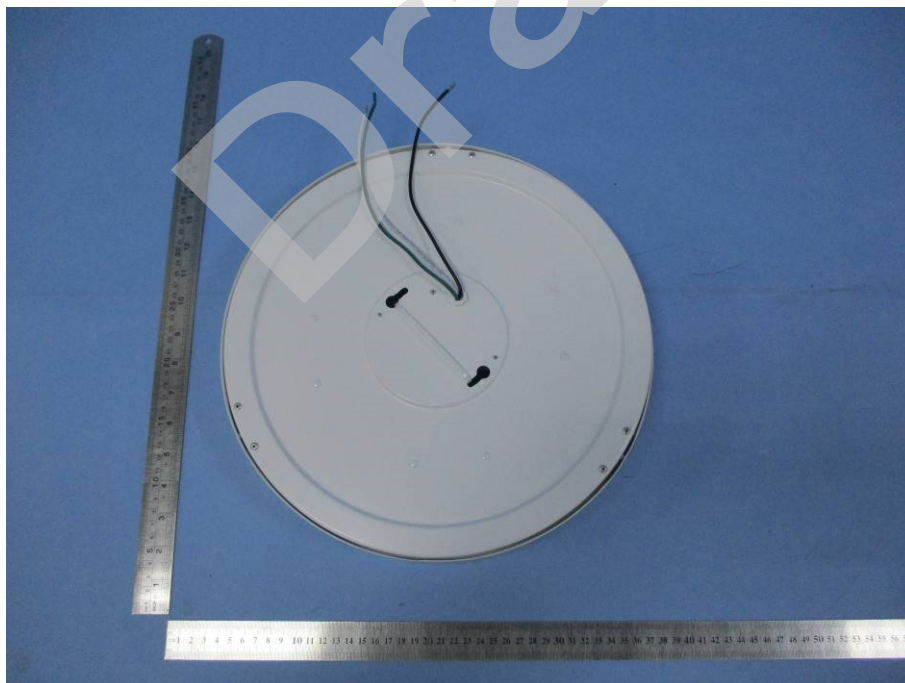
4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	383.947	383.947	383.947	383.947	383.947	383.947	383.947
5	382.575	382.088	382.486	382.487	382.266	382.267	382.047
10	376.995	377.019	377.151	377.154	377.090	377.091	377.096
15	368.448	368.498	368.739	368.634	368.353	368.842	368.476
20	356.580	356.589	356.675	356.861	356.829	356.766	356.807
25	341.656	341.626	341.843	341.680	341.855	342.235	341.955
30	323.499	323.918	323.912	324.021	326.724	324.365	324.450
35	302.774	302.713	303.390	303.617	303.721	304.150	304.028
40	280.100	279.826	280.124	280.580	280.938	280.994	281.308
45	254.459	255.257	255.198	258.428	255.987	256.113	255.980
50	227.534	227.279	227.571	228.333	228.825	228.644	228.795
55	198.882	198.526	198.947	199.299	199.804	199.936	199.886
60	168.281	168.268	172.226	169.048	169.169	169.636	169.740
65	136.972	136.615	137.184	137.314	137.958	138.208	137.913
70	105.663	105.427	105.772	106.310	106.129	106.581	106.706
75	75.417	78.444	75.045	75.528	75.781	75.640	76.383
80	46.587	46.925	46.643	46.760	46.959	46.976	47.120
85	21.168	20.895	21.097	21.399	21.058	21.100	21.350
90	5.403	5.335	5.202	4.957	4.800	4.269	4.774
95	0.620	0.531	0.509	0.509	0.487	0.464	0.442
100	0.797	0.730	0.642	0.531	0.575	0.597	0.663
105	1.019	0.930	0.863	0.730	0.686	0.708	0.707
110	0.974	0.974	0.930	0.863	0.752	0.752	0.751
115	1.019	1.085	1.018	0.996	0.863	0.863	0.884
120	1.151	1.217	1.107	1.040	0.995	0.973	0.972
125	1.373	1.439	1.439	1.217	1.128	1.150	1.105
130	1.506	1.572	1.660	1.461	1.349	1.327	1.282
135	1.771	1.726	1.815	1.593	1.438	1.438	1.414
140	2.037	1.926	1.948	1.859	1.681	1.637	1.680
145	2.347	2.236	2.103	2.058	1.969	1.968	1.901
150	2.613	2.501	2.369	2.257	2.190	2.256	2.166
155	2.923	2.767	2.656	2.523	2.455	2.477	2.387
160	3.144	2.900	2.789	2.678	2.676	2.610	2.696
165	2.834	2.811	2.701	2.700	2.676	2.765	2.608
170	2.259	2.346	2.369	2.678	2.809	2.742	2.608
175	2.391	2.413	2.502	2.545	2.566	2.632	2.564
180	1.283	1.283	1.283	1.283	1.283	1.283	1.283

Appendix A Product Photo



Picture 1



Picture 2

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