REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G103017649 Date: May 23, 2017

REPORT NO. 103017649CHI-033

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO9301AN
LED MODEL NO. CITIZEN CLU038-1205C4-303H5K2
DRIVER MODEL NO. LTF DA15W300C2042BF-00HE
TRIM MODEL NO. E3SFB-OW

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE
SKOKIE, IL 60077

TEST: Electrical and Photometric tests as required to the IESNA test standard.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00779063-2.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number E3SFF-LO9301AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-033.

DATES OF TESTS: May 16, 2017 through May 23, 2017.

SUMMARY

Model No.:	E3SFF-LO9301AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	944.2	919.6
Total Power (W)	11.94	11.92
Luminaire Efficacy (LPW)	79.08	77.15

Criteria	Result
Power Factor	0.975
Current ATHD %	8.81
Correlated Color Temperature (CCT - K)	3118
Color Rendering Index (CRI - Ra)	92.8
Color Rendering Index (CRI - R9)	69.5
DUV	0.002
Chromaticity Coordinate (x)	0.432
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.246
Chromaticity Coordinate (v')	0.522

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/11/16	07/11/17	05/23/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/23/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/23/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/23/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/23/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/16/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/16/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/16/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/16/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/16/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/16/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/16/17

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

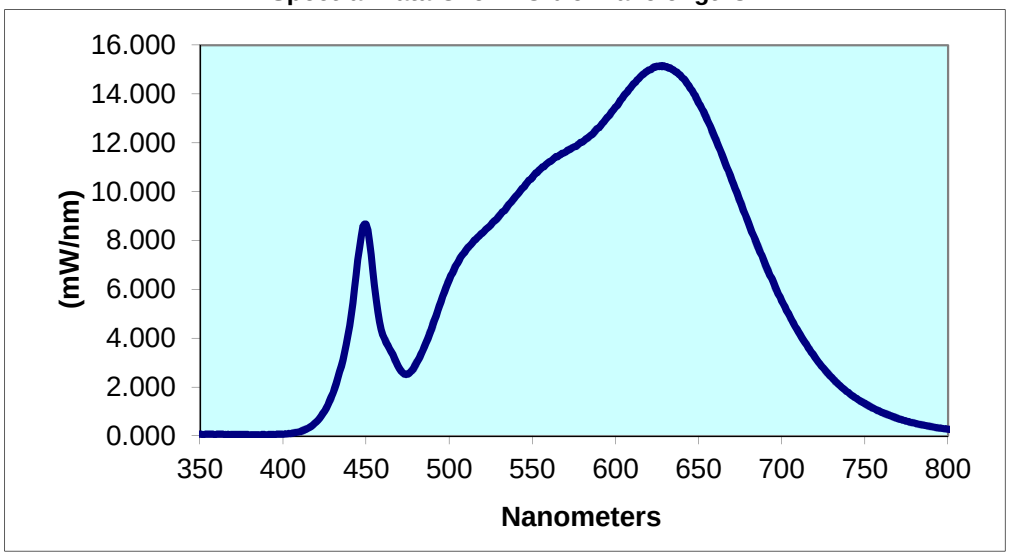
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-03	Up	120.0	102.0	11.94	0.975	8.81	944.2	79.08

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3118	92.8	69.5	0.002	0.432	0.408	0.246	0.522

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.073	440	4.516	530	9.008	620	14.98	710	4.267
355	0.064	445	7.212	535	9.395	625	15.14	715	3.718
360	0.066	450	8.660	540	9.821	630	15.12	720	3.219
365	0.060	455	6.179	545	10.20	635	14.98	725	2.781
370	0.054	460	4.139	550	10.60	640	14.68	730	2.396
375	0.049	465	3.463	555	10.94	645	14.23	735	2.063
380	0.047	470	2.768	560	11.22	650	13.65	740	1.778
385	0.046	475	2.537	565	11.43	655	12.97	745	1.530
390	0.047	480	2.948	570	11.63	660	12.18	750	1.322
395	0.058	485	3.651	575	11.84	665	11.36	755	1.138
400	0.074	490	4.521	580	12.04	670	10.48	760	0.977
405	0.106	495	5.497	585	12.31	675	9.597	765	0.837
410	0.177	500	6.392	590	12.63	680	8.715	770	0.715
415	0.314	505	7.076	595	13.05	685	7.861	775	0.609
420	0.574	510	7.597	600	13.46	690	7.037	780	0.520
425	1.022	515	8.007	605	13.92	695	6.294		
430	1.758	520	8.305	610	14.34	700	5.534		
435	2.860	525	8.640	615	14.71	705	4.879		

Spectral Data Over Visible Wavelengths



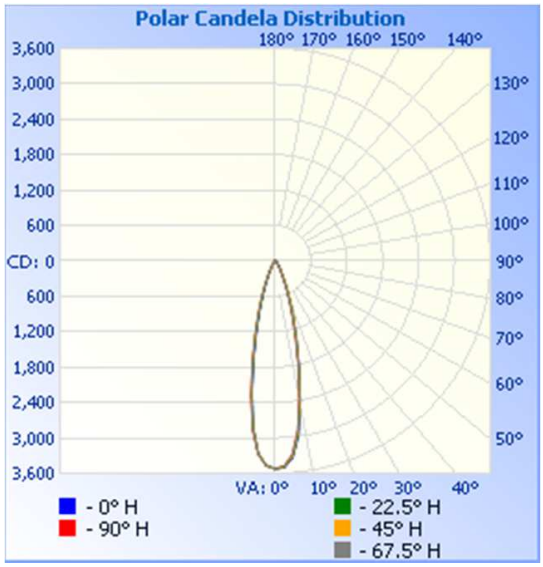
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH04192017041604-033	Up	120.0	101.8	11.92	0.975	919.6	77.15

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3521	3521	3521	3521	3521
5	3345	3333	3317	3295	3282
10	2403	2387	2375	2339	2327
15	1372	1362	1355	1309	1298
20	715	746	757	678	655
25	341	355	381	324	305
30	167	174	167	160	148
35	96	100	92	95	85
40	63	64	63	62	56
45	43	44	44	41	37
50	24	27	31	25	22
55	16	17	20	16	15
60	8	10	11	8	6
65	2	2	4	2	2
70	1	1	1	1	1
75	1	1	1	1	1
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

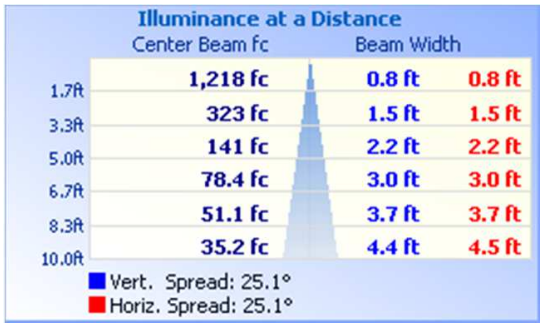


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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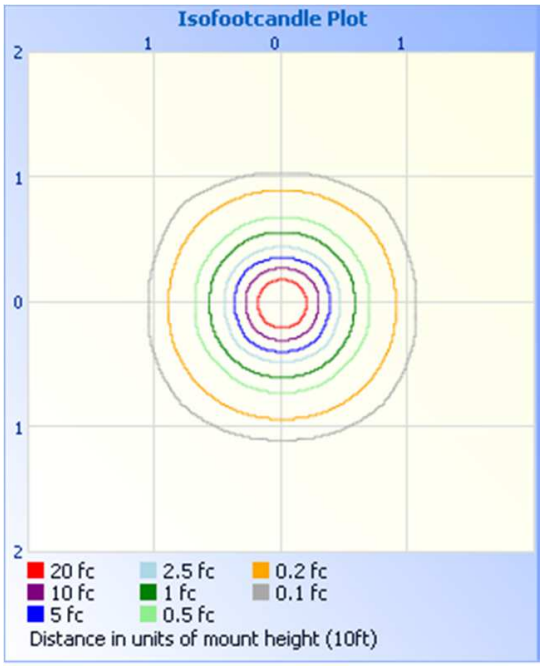


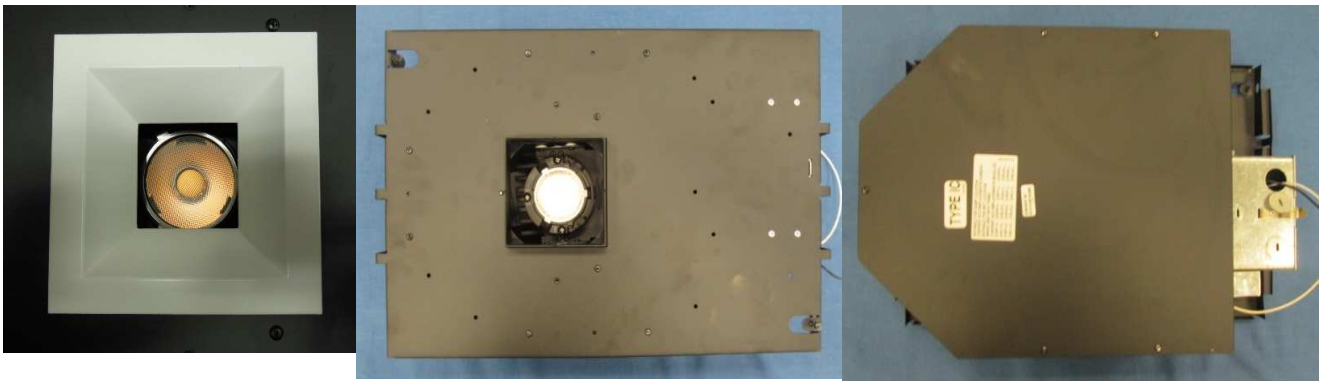
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	809.8	88.1
0-40	869.9	94.6
0-60	916.0	99.6
60-90	3.6	0.4
0-90	919.6	100.0
90-180	0.0	0.0
0-180	919.6	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	281.2	30.6
10-20	367.4	40.0
20-30	161.2	17.5
30-40	60.1	6.5
40-50	31.6	3.4
50-60	14.6	1.6
60-70	2.9	0.3
70-80	0.7	0.1
80-90	0.0	0.0

PICTURES (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

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Report Reviewed By:

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Lighting Division

Attachment: None