



# REPORT

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

Project No. G103017649

Date: May 15, 2017

REPORT NO. 103017649CHI-013

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFW-LH827N  
LED MODEL NO. CITIZEN CLU038-1205C4-273M2K1  
DRIVER MODEL NO. LTF DA18W440C40BF  
TRIM MODEL NO. E3SFW-W

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 E3SFW-LH827N. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-013.

DATES OF TESTS: May 5, 2017 through May 15, 2017.

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## SUMMARY

Model No.:	E3SFW-LH827N
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1120	1060
Total Power (W)	18.40	18.37
Luminaire Efficacy (LPW)	60.87	57.70

Criteria	Result
Power Factor	0.977
Current ATHD %	11.94
Correlated Color Temperature (CCT - K)	2767
Color Rendering Index (CRI - Ra)	81.9
Color Rendering Index (CRI - R9)	4.5
DUV	0.000
Chromaticity Coordinate (x)	0.455
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.259
Chromaticity Coordinate (v')	0.526

## 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	05/15/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/15/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/15/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/15/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/15/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/05/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/05/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/05/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/05/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/05/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/05/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/05/17

## 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**

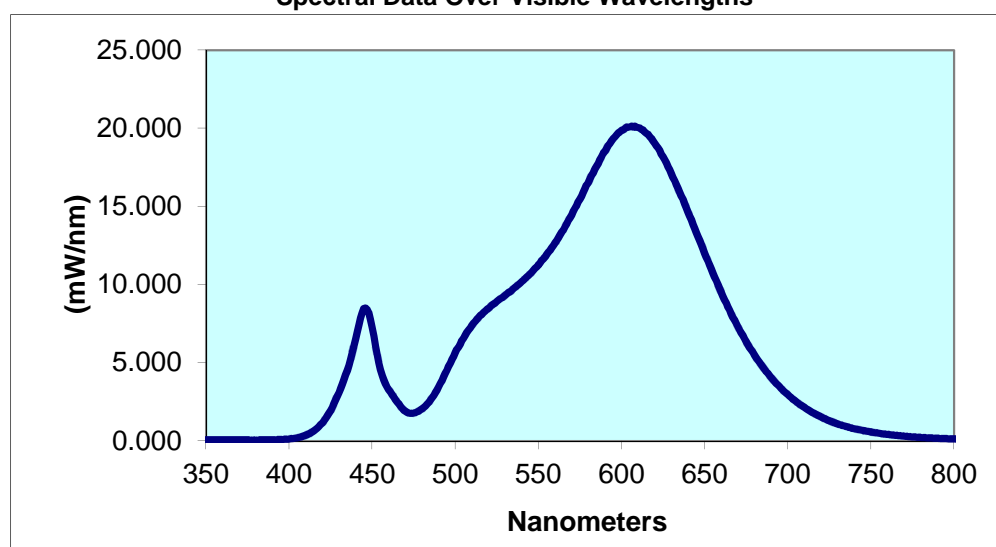
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\\H04192017041604-01:	Up	120.0	156.8	18.40	0.977	11.94	1120	60.87

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')
2767	81.9	4.5	0.000	0.455	0.410	0.259	0.526

## **Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.067	440	6.533	530	9.329	620	19.05	710	2.143
355	0.072	445	8.451	535	9.741	625	18.20	715	1.812
360	0.064	450	7.296	540	10.20	630	17.11	720	1.536
365	0.065	455	4.573	545	10.68	635	15.93	725	1.299
370	0.061	460	3.272	550	11.26	640	14.65	730	1.095
375	0.059	465	2.498	555	11.93	645	13.33	735	0.926
380	0.054	470	1.897	560	12.68	650	12.01	740	0.787
385	0.057	475	1.789	565	13.51	655	10.73	745	0.670
390	0.067	480	2.060	570	14.47	660	9.511	750	0.572
395	0.086	485	2.611	575	15.49	665	8.370	755	0.490
400	0.124	490	3.466	580	16.54	670	7.307	760	0.418
405	0.203	495	4.524	585	17.59	675	6.360	765	0.357
410	0.362	500	5.627	590	18.53	680	5.497	770	0.301
415	0.656	505	6.584	595	19.35	685	4.732	775	0.259
420	1.152	510	7.388	600	19.88	690	4.062	780	0.222
425	1.955	515	8.025	605	20.10	695	3.482		
430	3.090	520	8.479	610	20.04	700	2.963		
435	4.516	525	8.922	615	19.69	705	2.522		

**Spectral Data Over Visible Wavelengths**



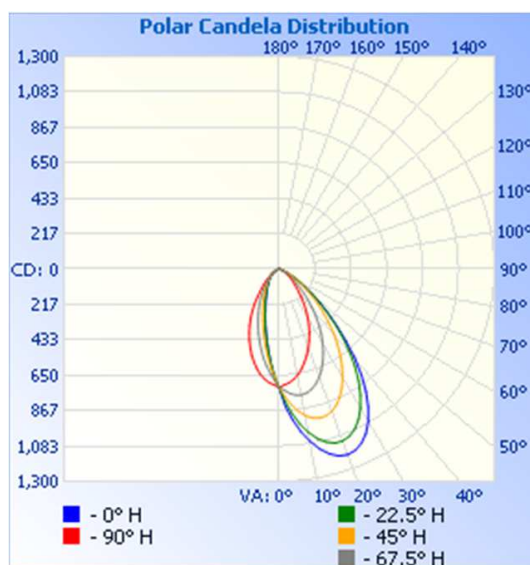
## RESULTS OF TEST (cont'd)

### 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)
AH04192017041604-013	Up	120.0	156.7	18.37	0.977	1060	57.70

### Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	726	726	726	726	726
5	926	887	833	765	698
10	1070	1014	910	782	655
15	1170	1096	944	760	590
20	1209	1120	927	705	512
25	1175	1080	864	623	430
30	1076	981	766	526	345
35	912	837	642	418	260
40	709	661	508	309	184
45	493	481	378	211	130
50	318	321	262	140	93
55	188	198	167	91	64
60	103	113	98	55	42
65	49	58	53	30	25
70	20	24	24	15	15
75	9	10	10	9	10
80	5	5	5	5	6
85	1	1	2	2	3
90	0	0	0	0	0

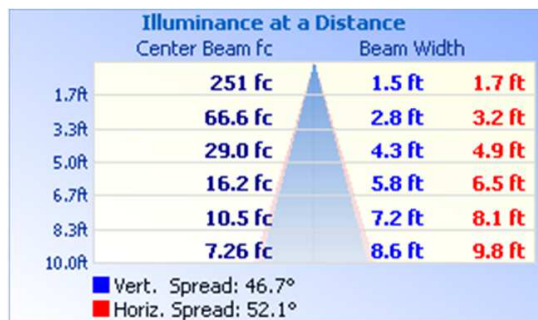


# RESULTS OF TEST (cont'd)

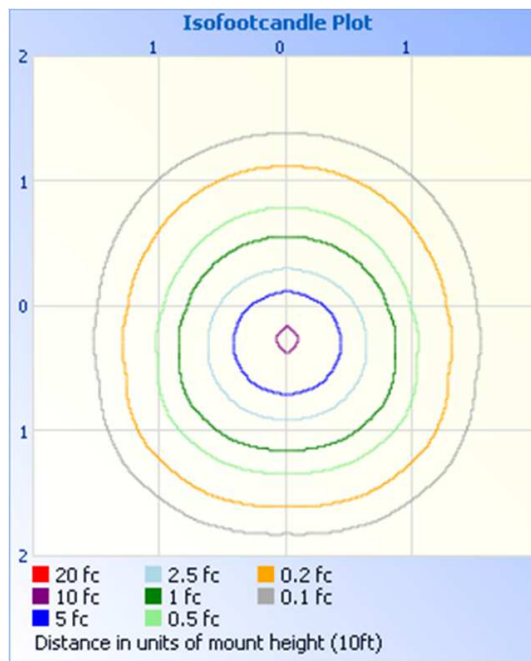
## Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



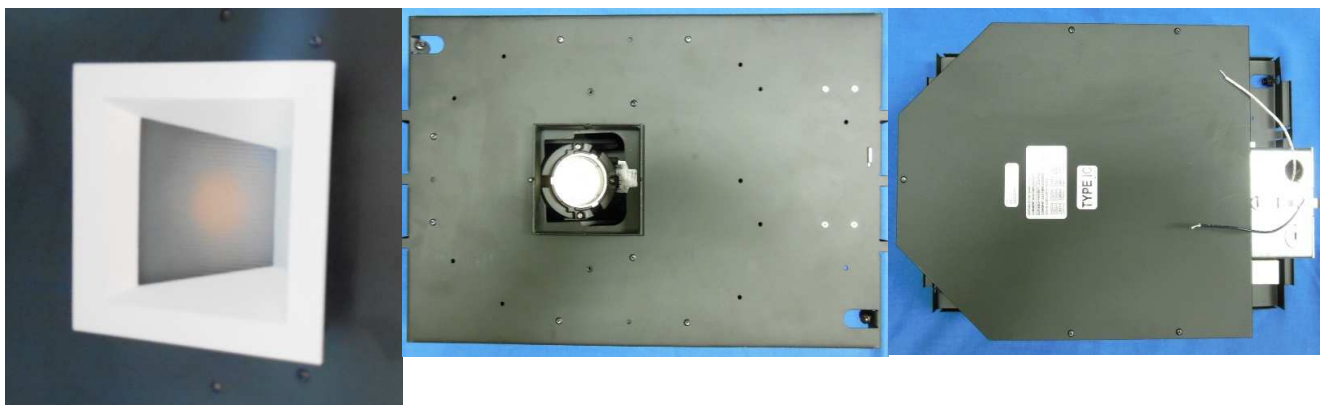
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	505.4	47.7
0-40	747.7	70.5
0-60	1010	95.2
60-90	50.5	4.8
0-90	1060	100.0
90-180	0.0	0.0
0-180	1060	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	67.9	6.4
10-20	185.8	17.5
20-30	251.6	23.7
30-40	242.3	22.9
40-50	170.6	16.1
50-60	91.4	8.6
60-70	36.3	3.4
70-80	11.4	1.1
80-90	2.8	0.3

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:



Hector Huitron  
Associate Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley  
Engineer  
Lighting Division