



# REPORT

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

Project No. G103017649

Date: May 16, 2017

REPORT NO. 103017649CHI-014

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFW-LH835N  
LED MODEL NO. CITIZEN CLU038-1205C4-353M2K1  
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-LH835N. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-014.

DATES OF TESTS: May 5, 2017 through May 16, 2017.

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## SUMMARY

Model No.:	E3SFW-LH835N
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1181	1115
Total Power (W)	18.03	18.02
Luminaire Efficacy (LPW)	65.50	61.88

Criteria	Result
Power Factor	0.976
Current ATHD %	11.95
Correlated Color Temperature (CCT - K)	3453
Color Rendering Index (CRI - Ra)	83.1
Color Rendering Index (CRI - R9)	8.2
DUV	0.002
Chromaticity Coordinate (x)	0.410
Chromaticity Coordinate (y)	0.399
Chromaticity Coordinate (u')	0.236
Chromaticity Coordinate (v')	0.515

## 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	05/16/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/16/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/16/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/16/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/16/17
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	153.8	18.03	0.976	11.95	1181	65.50

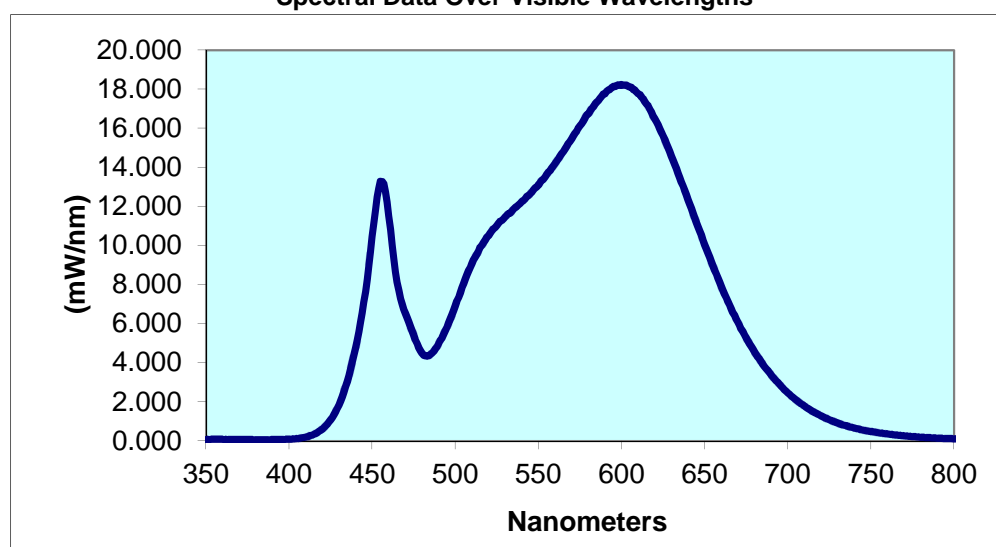
  

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3453	83.1	8.2	0.002	0.410	0.399	0.236	0.515

### Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.076	440	4.785	530	11.47	620	16.50	710	1.786
355	0.079	445	7.092	535	11.86	625	15.62	715	1.516
360	0.078	450	10.46	540	12.25	630	14.58	720	1.288
365	0.073	455	13.28	545	12.64	635	13.49	725	1.087
370	0.067	460	11.52	550	13.10	640	12.35	730	0.920
375	0.061	465	8.124	555	13.64	645	11.19	735	0.781
380	0.056	470	6.535	560	14.21	650	10.05	740	0.663
385	0.057	475	5.429	565	14.81	655	8.957	745	0.565
390	0.060	480	4.496	570	15.46	660	7.917	750	0.485
395	0.065	485	4.425	575	16.14	665	6.958	755	0.415
400	0.086	490	4.976	580	16.75	670	6.073	760	0.356
405	0.121	495	5.822	585	17.33	675	5.276	765	0.303
410	0.197	500	6.911	590	17.78	680	4.565	770	0.259
415	0.341	505	8.041	595	18.14	685	3.923	775	0.222
420	0.615	510	9.075	600	18.24	690	3.377	780	0.191
425	1.079	515	9.907	605	18.13	695	2.907		
430	1.834	520	10.50	610	17.78	700	2.467		
435	3.057	525	11.02	615	17.26	705	2.105		

**Spectral Data Over Visible Wavelengths**



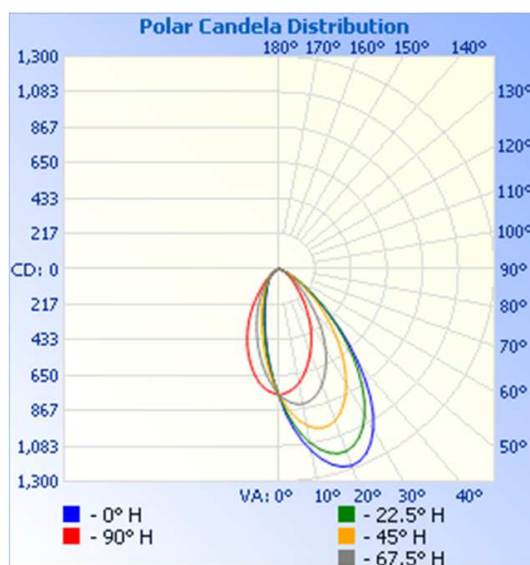
## RESULTS OF TEST (cont'd)

### 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)
AH04192017041604-014	Up	120.0	153.8	18.02	0.976	1115	61.88

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

Angle	0	22.5	45	67.5	90
0	775	775	775	775	775
5	975	945	890	821	749
10	1131	1079	973	838	703
15	1239	1164	1006	814	632
20	1280	1186	987	753	548
25	1244	1140	917	665	458
30	1134	1032	808	559	367
35	962	874	675	442	277
40	738	686	532	324	195
45	518	495	392	220	136
50	328	327	270	145	96
55	193	201	169	93	67
60	104	113	99	56	44
65	47	55	53	30	26
70	19	22	23	16	16
75	9	10	9	9	10
80	5	5	5	5	6
85	1	1	2	2	3
90	0	0	0	0	0

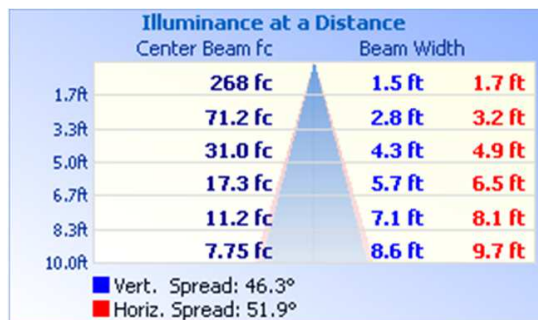


# RESULTS OF TEST (cont'd)

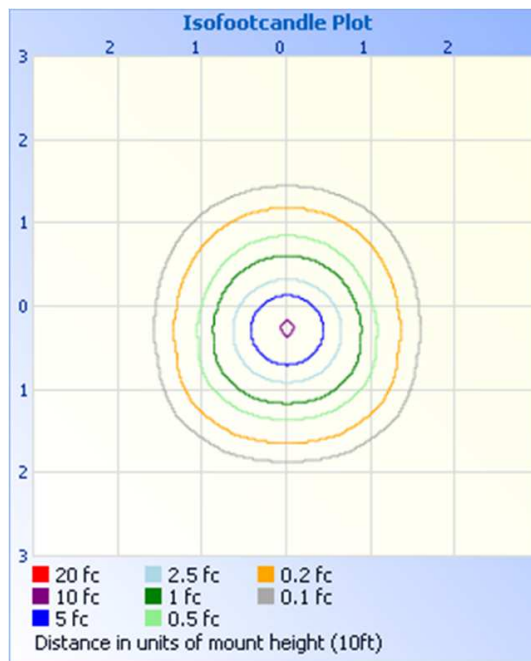
## Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	536.9	48.1
0-40	791.7	71.0
0-60	1063	95.3
60-90	51.9	4.7
0-90	1115	100.0
90-180	0.0	0.0
0-180	1115	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	72.5	6.5
10-20	197.8	17.7
20-30	266.6	23.9
30-40	254.8	22.8
40-50	177.6	15.9
50-60	94.1	8.4
60-70	37.0	3.3
70-80	11.9	1.1
80-90	3.0	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