REPORT

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

Project No. G103017649 Date: August 24, 2017

REPORT NO. 103017649CHI-045

TEST OF ONE LED REM DOWNLIGHT W/ E3SFB-OW

MODEL NO. E3SRF-LH9300DN-BAYER_PROD
LED MODEL NO. CITIZEN CLU701-1002C4
DRIVER MODEL NO. LTF DA18W440C40BF
TRIM MODEL NO. E3SFB-OW

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE
SKOKIE, IL 60077 USA

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 E3SRF-LH9300DN-BAYER_PROD. The sample was received by Intertek on August 17, 2017, in undamaged condition and one sample was tested as received. The sample designation was 0817201702341-045.

DATES OF TESTS: August 21, 2017 through August 24, 2017.

SUMMARY

Model No.:	E3SRF-LH9300DN-BAYER_PROD
Description:	LED Rem Downlight w/ E3SFB-OW

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1337	1290
Total Power (W)	16.25	16.22
Luminaire Efficacy (LPW)	82.28	79.53

Criteria	Result
Power Factor	0.976
Current ATHD %	12.19
Correlated Color Temperature (CCT - K)	2778
Color Rendering Index (CRI - Ra)	81.7
Color Rendering Index (CRI - R9)	4.3
DUV	0.000
Chromaticity Coordinate (x)	0.453
Chromaticity Coordinate (y)	0.408
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	07/10/17	07/10/18	08/21/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	08/21/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	08/21/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	08/21/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	08/21/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	08/24/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	08/24/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	08/24/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	08/24/17
Newport Humidity Recorder	iTHX-SD	146961	07/14/17	07/14/18	08/24/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	08/24/17
Extech temperature data logger	SD200	CHI0207	04/06/17	04/06/18	08/24/17

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 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 Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25℃ +/- 1℃) - Integrating Sphere Met hod

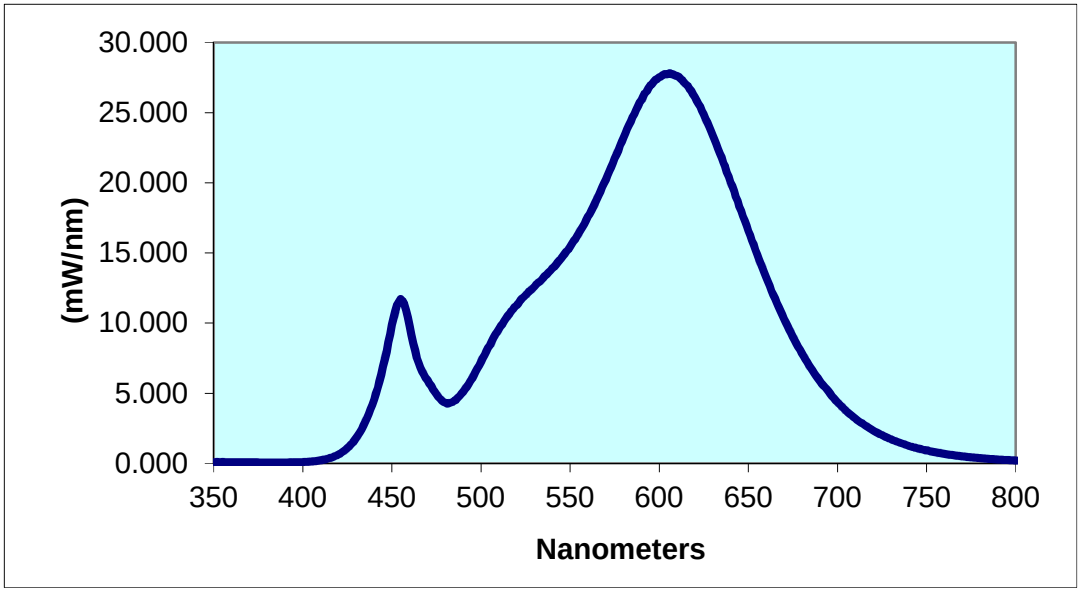
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
0817201702341-045	Up	120.0	138.7	16.25	0.976	12.19	1337	82.28

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')
2778	81.7	4.3	0.000	0.453	0.408	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	0.090	440	4.563	530	12.61	620	26.12	710	3.202
355	0.101	445	6.885	535	13.25	625	24.89	715	2.751
360	0.096	450	9.873	540	13.90	630	23.38	720	2.353
365	0.084	455	11.72	545	14.59	635	21.79	725	2.019
370	0.076	460	9.767	550	15.44	640	20.07	730	1.726
375	0.068	465	7.148	555	16.44	645	18.32	735	1.471
380	0.073	470	5.925	560	17.57	650	16.58	740	1.251
385	0.067	475	4.946	565	18.80	655	14.88	745	1.070
390	0.070	480	4.318	570	20.23	660	13.25	750	0.924
395	0.075	485	4.459	575	21.74	665	11.74	755	0.795
400	0.095	490	5.102	580	23.21	670	10.32	760	0.682
405	0.130	495	6.045	585	24.67	675	9.031	765	0.584
410	0.215	500	7.239	590	25.88	680	7.864	770	0.503
415	0.376	505	8.430	595	26.95	685	6.816	775	0.433
420	0.640	510	9.563	600	27.54	690	5.897	780	0.374
425	1.084	515	10.51	605	27.76	695	5.134		
430	1.808	520	11.27	610	27.61	700	4.356		
435	2.934	525	11.98	615	27.03	705	3.737		

Spectral Data Over Visible Wavelengths



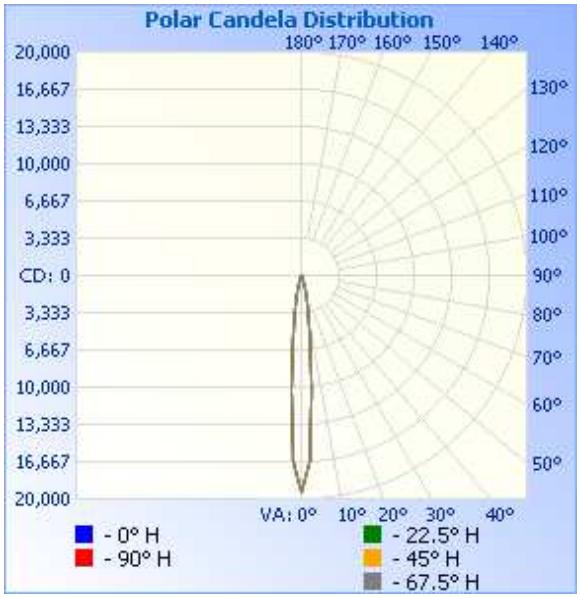
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25℃ +/- 1℃) – 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)
0817201702341-045	Up	120.1	138.3	16.22	0.977	1290	79.53

Intensity (Candlepower) Summary at 25℃ - Candelas

Angle	0	22.5	45	67.5	90
0	19414	19414	19414	19414	19414
5	10254	10254	10254	10254	10254
10	3511	3511	3511	3511	3511
15	1342	1342	1342	1342	1342
20	383	383	383	383	383
25	126	126	126	126	126
30	84	84	84	84	84
35	54	54	54	54	54
40	31	31	31	31	31
45	22	22	22	22	22
50	18	18	18	18	18
55	11	11	11	11	11
60	6	6	6	6	6
65	3	3	3	3	3
70	2	2	2	2	2
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

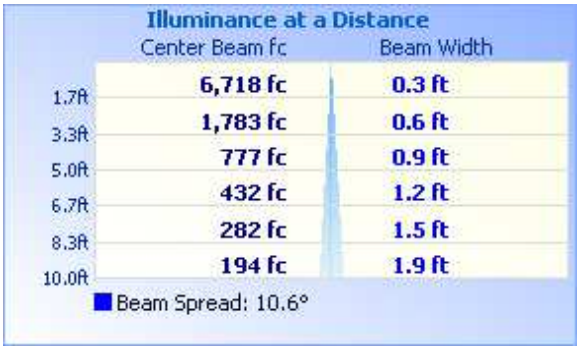


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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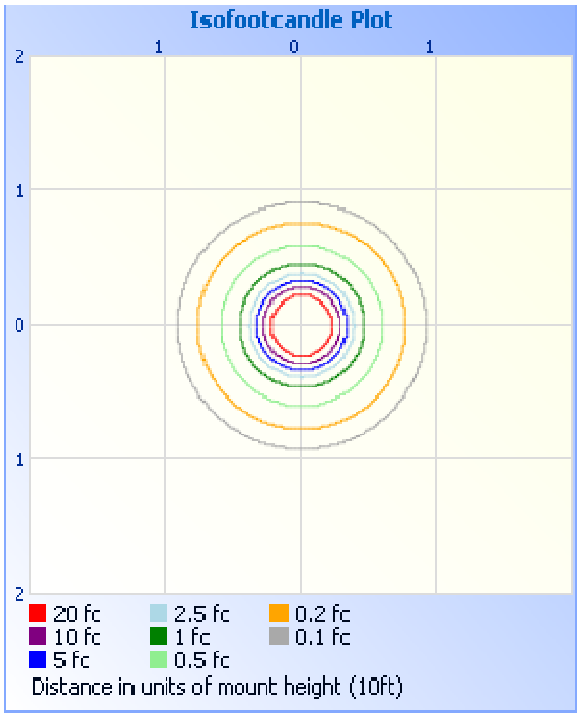


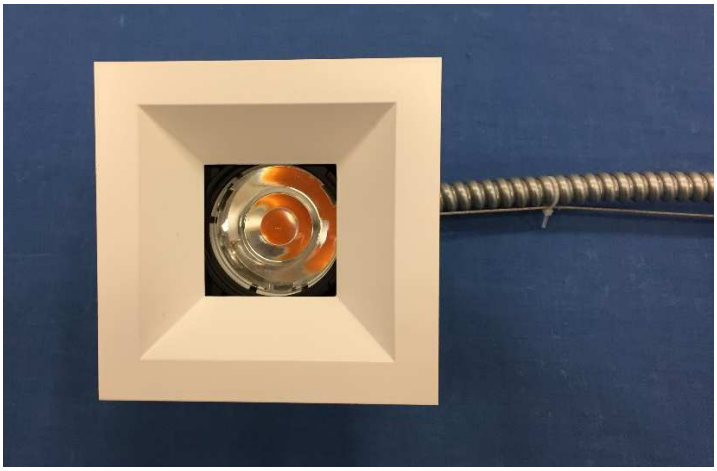
Zonal Lumen Summary and Percentages at 25℃

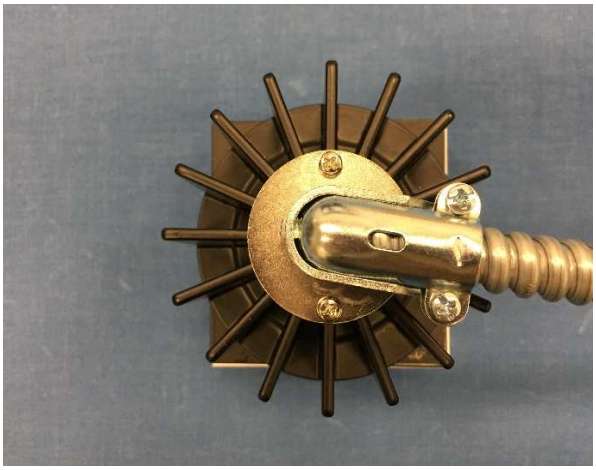
Zone	Lumens	% Luminaire
0-30	1224	94.9
0-40	1258	97.5
0-60	1286	99.7
60-90	3.9	0.3
0-90	1290	100.0
90-180	0.0	0.0
0-180	1290	100.0

Zonal Lumens and Percentages at 25℃

Zone	Lumens	% Luminaire
0-10	756.7	58.7
10-20	394.5	30.6
20-30	73.0	5.7
30-40	34.1	2.6
40-50	17.4	1.4
50-60	10.4	0.8
60-70	3.1	0.2
70-80	0.8	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:

Hector Huitron
Associate Engineer
Lighting Division

Report Reviewed By:

Timothy Quigley
Engineer
Lighting Division

Attachment: None