

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: HALO

Report Number: P886950

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886950  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-47)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/9/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K  
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE BLACK TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 949.4 lumens  
Efficiency: N/A  
Efficacy: 53.9 lumens/watt  
Spacing Criteria (0/90/45): 1.15 / 0.8 / 0.99  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct

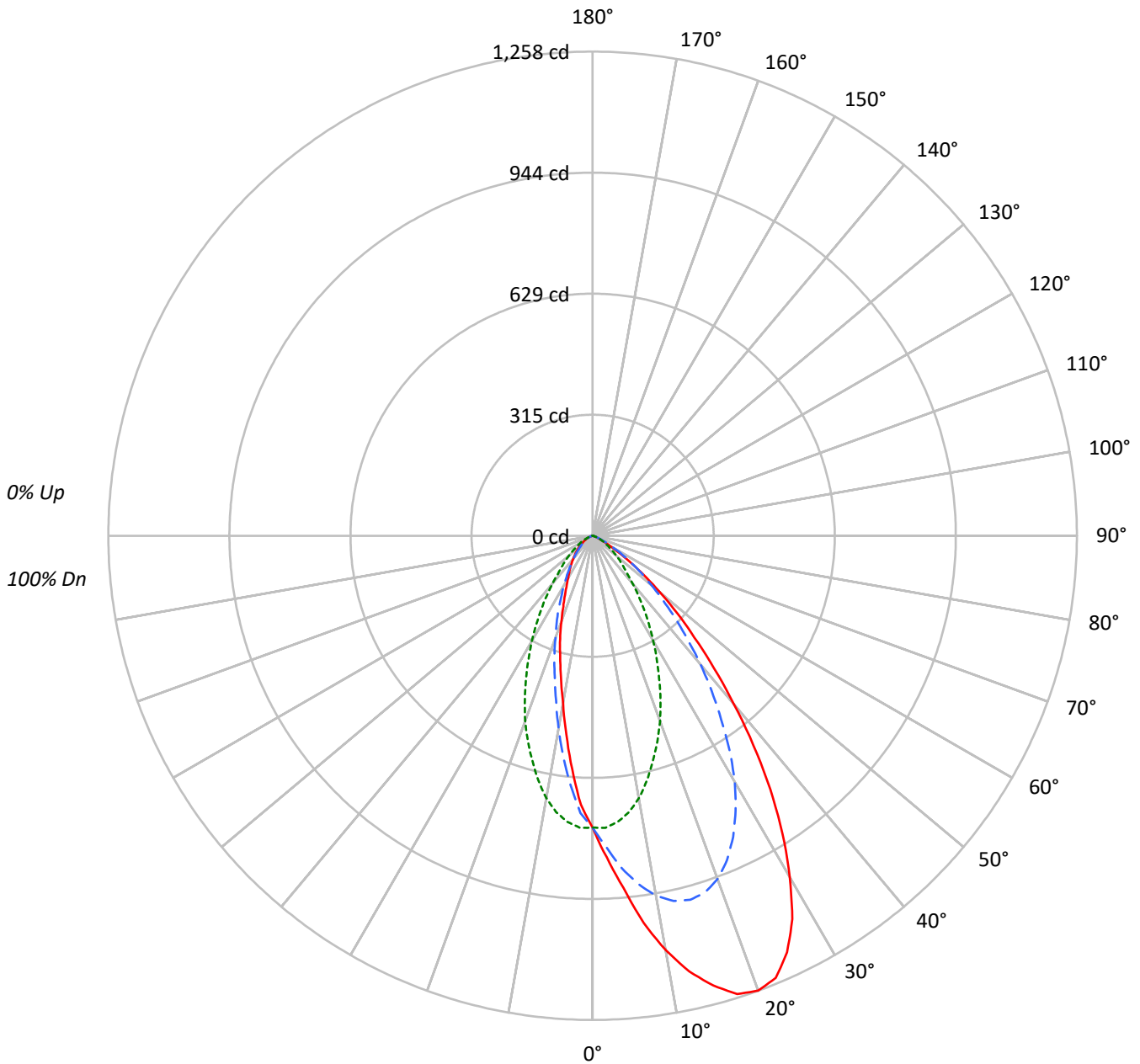
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



TEST NUMBER: P886950

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

### Luminous Intensity Polar Plot





TEST NUMBER: P886950

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

RF	20					20					20					20										
RC	80					70					50					30					10					0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0		
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100								
1	113	109	106	104	110	107	105	102	103	101	99	99	98	96	96	95	93	91								
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83								
3	99	92	86	81	97	90	85	81	87	83	79	85	81	78	83	79	77	75								
4	93	84	78	73	91	83	77	72	81	76	71	79	74	71	77	73	70	68								
5	87	78	71	66	86	77	70	65	75	69	65	73	68	64	71	67	64	62								
6	82	72	65	60	80	71	64	60	69	64	59	68	63	59	66	62	58	57								
7	77	67	60	55	76	66	59	55	64	59	54	63	58	54	62	57	54	52								
8	73	62	55	50	72	61	55	50	60	54	50	59	54	50	58	53	50	48								
9	69	58	51	47	68	57	51	47	56	50	46	55	50	46	54	50	46	44								
10	65	54	48	43	64	54	47	43	53	47	43	52	47	43	51	46	43	41								

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°	135°	180°
0°	166281	166281	166281	166281	166281
5°	202135	190799	164274	143341	134096
10°	243460	211497	154150	113158	98462
15°	274553	222328	137390	86062	73803
20°	293442	221418	119524	65829	55095
25°	288984	208875	99006	50108	41156
30°	259382	186940	79784	37499	32157
35°	215305	155717	61864	28643	26769
40°	163220	124419	46115	21755	22328
45°	116012	94304	35042	16746	18917
50°	77132	67750	26950	13304	15692
55°	45112	47023	20262	11087	12616
60°	20612	27629	16227	9210	10087
65°	10377	14528	10896	7264	7783
70°	5770	7052	7052	5129	4488
75°	2542	2542	3389	1694	847
80°	0	631	1263	0	0
85°	0	0	0	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 117563 cd/sqm



TEST NUMBER: P886950

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	71.5	7.5
10°-20°	192.0	20.2
20°-30°	247.2	26.0
30°-40°	214.2	22.6
40°-50°	134.5	14.2
50°-60°	64.4	6.8
60°-70°	21.7	2.3
70°-80°	3.6	0.4
80°-90°	0.1	0.0
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	510.7	53.8
0°-40°	725.0	76.4
0°-60°	923.9	97.3
0°-90°	949.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	949.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	758	758	758	758	758	
5°	918	867	746	651	609	93
15°	1209	979	605	379	325	342
25°	1194	863	409	207	170	541
35°	804	582	231	107	100	498
45°	374	304	113	54	61	294
55°	118	123	53	29	33	109
65°	20	28	21	14	15	22
75°	3	3	4	2	1	4
85°	0	0	0	0	0	0
90°	0	0	0	0	0	



TEST NUMBER: P886950

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

**CANDELA DISTRIBUTION (FULL):**

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	112.5°
0°	758.3	758.3	758.3	758.3	758.3	758.3	758.3	758.3	758.3	758.3	758.3
2.5°	836.3	826.3	828.3	823.3	815.3	803.3	795.3	783.3	772.3	759.3	736.3
5°	918.3	919.3	908.3	896.3	882.3	851.3	828.3	801.3	773.3	746.3	693.3
7.5°	1014.4	1008.4	994.4	964.4	933.3	892.3	851.3	808.3	766.3	724.3	644.2
10°	1093.4	1084.4	1062.4	1023.4	980.4	919.3	863.3	801.3	744.3	692.3	590.2
12.5°	1159.4	1151.4	1121.4	1069.4	1008.4	935.3	860.3	785.3	715.3	651.2	530.2
15°	1209.4	1198.4	1159.4	1099.4	1023.4	935.3	849.3	759.3	679.3	605.2	473.2
17.5°	1248.5	1231.5	1181.4	1111.4	1020.4	922.3	822.3	727.3	638.2	559.2	417.2
20°	1257.5	1242.5	1185.4	1104.4	1005.4	892.3	787.3	682.3	593.2	512.2	366.1
22.5°	1243.5	1220.5	1168.4	1080.4	971.4	853.3	742.3	639.2	542.2	460.2	316.1
25°	1194.4	1178.4	1122.4	1031.4	922.3	804.3	689.3	580.2	493.2	409.2	274.1
27.5°	1123.4	1104.4	1049.4	970.4	865.3	743.3	632.2	529.2	440.2	360.1	235.1
30°	1024.4	1011.4	964.4	884.3	796.3	680.3	573.2	474.2	388.1	315.1	201.1
32.5°	918.3	900.3	862.3	797.3	714.3	611.2	510.2	416.2	336.1	271.1	169.1
35°	804.3	794.3	756.3	696.3	625.2	538.2	448.2	361.1	289.1	231.1	142.1
37.5°	686.3	674.2	650.2	602.2	546.2	468.2	385.1	310.1	246.1	195.1	118.0
40°	570.2	562.2	544.2	510.2	466.2	403.1	326.1	260.1	204.1	161.1	98.0
42.5°	467.2	465.2	454.2	429.2	393.1	336.1	278.1	216.1	169.1	132.0	79.0
45°	374.1	379.1	368.1	353.1	326.1	282.1	229.1	178.1	141.1	113.0	67.0
47.5°	299.1	295.1	294.1	288.1	265.1	229.1	184.1	147.1	122.0	96.0	58.0
50°	226.1	225.1	230.1	231.1	212.1	185.1	150.1	124.0	99.0	79.0	48.0
52.5°	166.1	168.1	176.1	182.1	170.1	146.1	124.0	99.0	82.0	66.0	41.0
55°	118.0	118.0	130.0	137.1	131.0	115.0	95.0	78.0	64.0	53.0	33.0
57.5°	74.0	77.0	89.0	98.0	96.0	86.0	71.0	59.0	51.0	44.0	29.0
60°	47.0	49.0	59.0	66.0	66.0	60.0	52.0	45.0	42.0	37.0	25.0
62.5°	30.0	33.0	39.0	45.0	46.0	40.0	35.0	35.0	33.0	29.0	21.0
65°	20.0	21.0	26.0	29.0	29.0	27.0	26.0	26.0	25.0	21.0	15.0
67.5°	13.0	14.0	17.0	19.0	18.0	16.0	18.0	19.0	18.0	16.0	12.0
70°	9.0	9.0	10.0	12.0	11.0	11.0	12.0	12.0	12.0	11.0	8.0
72.5°	6.0	6.0	6.0	6.0	6.0	6.0	7.0	8.0	8.0	8.0	5.0
75°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	2.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P886950

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWMB-1200LM-2700K

**CANDELA DISTRIBUTION (continued):**

	135°	157.5°	180°
0°	758.3	758.3	758.3
2.5°	721.3	712.3	699.3
5°	651.2	623.2	609.2
7.5°	581.2	538.2	521.2
10°	508.2	460.2	442.2
12.5°	439.2	394.1	378.1
15°	379.1	338.1	325.1
17.5°	331.1	292.1	281.1
20°	282.1	247.1	236.1
22.5°	244.1	211.1	199.1
25°	207.1	177.1	170.1
27.5°	175.1	151.1	146.1
30°	148.1	131.0	127.0
32.5°	126.0	114.0	113.0
35°	107.0	99.0	100.0
37.5°	91.0	86.0	89.0
40°	76.0	76.0	78.0
42.5°	65.0	67.0	70.0
45°	54.0	59.0	61.0
47.5°	45.0	51.0	53.0
50°	39.0	44.0	46.0
52.5°	34.0	38.0	39.0
55°	29.0	33.0	33.0
57.5°	25.0	27.0	28.0
60°	21.0	23.0	23.0
62.5°	17.0	19.0	19.0
65°	14.0	15.0	15.0
67.5°	11.0	11.0	11.0
70°	8.0	8.0	7.0
72.5°	4.0	4.0	4.0
75°	2.0	1.0	1.0
77.5°	0.0	0.0	0.0
80°	0.0	0.0	0.0
82.5°	0.0	0.0	0.0
85°	0.0	0.0	0.0
87.5°	0.0	0.0	0.0
90°	0.0	0.0	0.0

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report



Report Generated By 670245859 / DESKTOP-T8S5UU9



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report





— 0°-180°    - - 45°-225°    - - - 90°-270°

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

Scaled Data Report



(END OF REPORT)