

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: P886979

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886979  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-58)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, METALLIC SILVER TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 5000K CCT  
Ballast/Driver: -

**Summary**

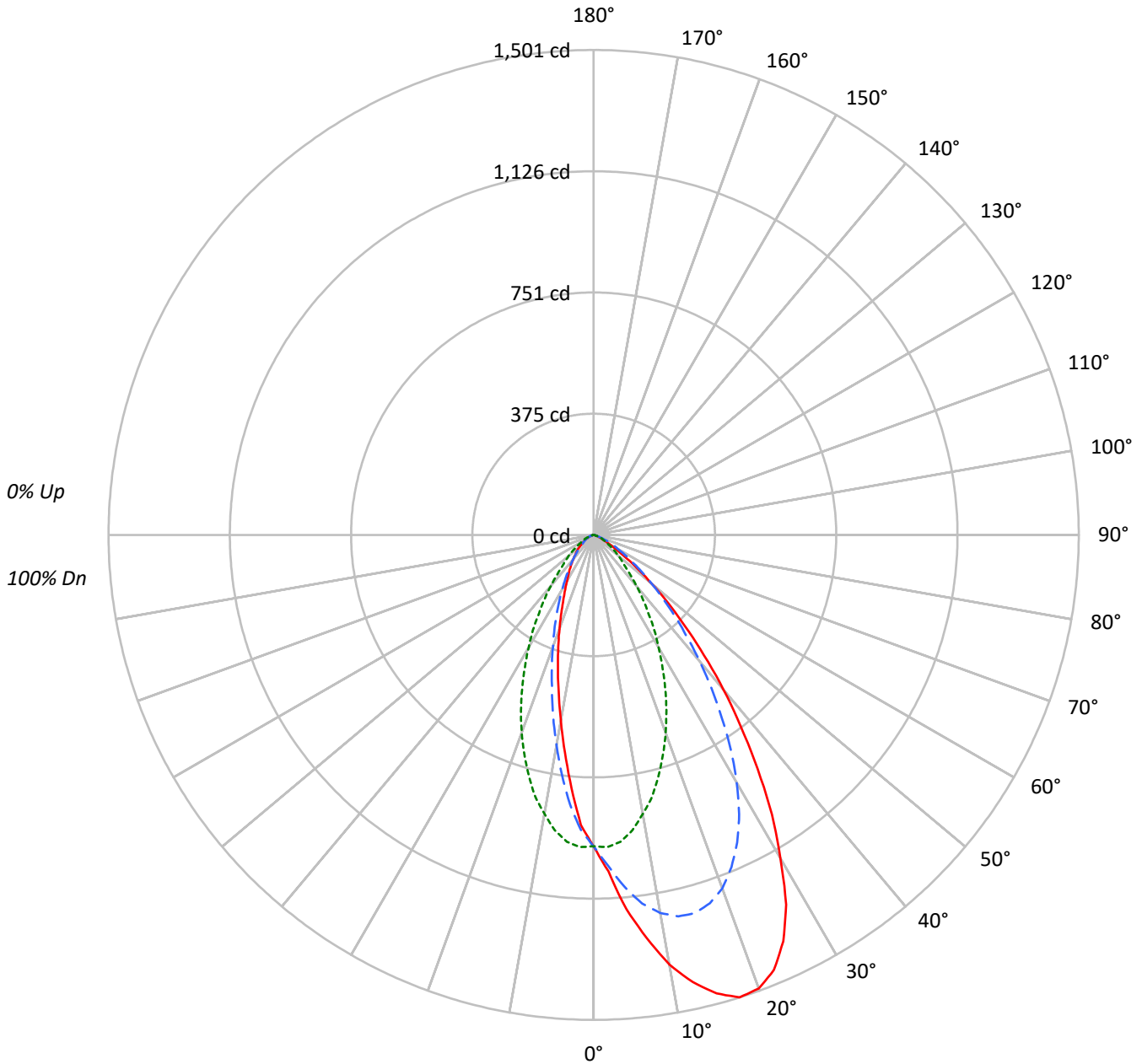
Lumens per Lamp: N/A  
Luminaire Lumens: 1160.1 lumens  
Efficiency: N/A  
Efficacy: 65.9 lumens/watt  
Spacing Criteria (0/90/45): 1.08 / 0.8 / 0.97  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (Ain): 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: P886979  
CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

### Luminous Intensity Polar Plot





TEST NUMBER: P886979

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

**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	88	83	79	85	81	78	83	79	77	75								
4	93	84	78	73	91	83	77	72	81	76	72	79	74	71	77	73	70	68								
5	87	78	71	66	86	77	70	66	75	69	65	73	68	64	71	67	64	62								
6	82	72	65	60	81	71	65	60	70	64	59	68	63	59	67	62	59	57								
7	77	67	60	55	76	66	60	55	65	59	55	63	58	54	62	58	54	52								
8	73	62	55	51	72	62	55	51	60	55	50	59	54	50	58	54	50	48								
9	69	58	52	47	68	58	51	47	57	51	47	56	50	47	55	50	46	45								
10	65	55	48	44	64	54	48	44	53	47	44	52	47	43	52	47	43	42								

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

	0°	45°	90°	135°	180°
0°	93349	93349	93349	93349	93349
5°	113087	106338	92685	81472	76367
10°	132849	116859	86192	64993	57428
15°	147360	121535	77597	49896	42775
20°	154000	120062	67144	37959	31835
25°	148332	112347	55925	28892	23665
30°	129167	98992	44969	21768	18379
35°	104592	81785	34722	16261	15161
40°	78975	64464	26076	12520	12381
45°	54596	48533	18838	9576	10371
50°	34769	35214	15101	7370	8425
55°	19879	24397	11215	6300	6891
60°	9939	16818	8351	5425	5425
65°	5616	11083	6670	4539	4264
70°	3314	6104	4277	3626	2974
75°	2171	3069	2620	2171	861
80°	669	1283	669	0	0
85°	0	0	1334	0	0

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 10°  
 Vertical Angle: 45°  
 Luminance: 55075 cd/sqm



TEST NUMBER: P886979

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	90.8	7.8
10°-20°	240.8	20.8
20°-30°	302.6	26.1
30°-40°	255.6	22.0
40°-50°	156.8	13.5
50°-60°	76.2	6.6
60°-70°	29.8	2.6
70°-80°	7.3	0.6
80°-90°	0.2	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°	634.3	54.7
0°-40°	889.9	76.7
0°-60°	1122.9	96.8
0°-90°	1160.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1160.1	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	964	964	964	964	964	
5°	1163	1094	953	838	785	116
15°	1469	1212	774	498	426	414
25°	1388	1051	523	270	221	627
35°	884	692	294	138	128	550
45°	398	354	138	70	76	314
55°	118	144	66	37	41	112
65°	24	48	29	20	19	26
75°	6	8	7	6	2	6
85°	0	0	1	0	0	0
90°	0	0	0	0	0	



TEST NUMBER: P886979

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

**CANDELA DISTRIBUTION (FULL):**

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	112.5°
0°	963.6	963.6	963.6	963.6	963.6	963.6	963.6	963.6	963.6	963.6	963.6
2.5°	1041.7	1051.0	1044.0	1044.0	1030.0	1020.7	1006.7	995.1	982.3	967.1	938.0
5°	1162.9	1155.9	1143.1	1130.2	1106.9	1080.1	1051.0	1016.0	985.8	953.1	886.7
7.5°	1258.4	1253.7	1239.8	1211.8	1174.5	1126.7	1076.6	1024.2	972.9	921.7	828.5
10°	1350.5	1337.6	1316.7	1273.6	1220.0	1155.9	1086.0	1017.2	946.1	876.2	760.9
12.5°	1418.0	1404.1	1373.8	1319.0	1251.4	1167.5	1081.3	996.2	906.5	831.9	688.6
15°	1469.3	1458.8	1415.7	1349.3	1261.9	1161.7	1061.5	961.3	863.4	773.7	615.2
17.5°	1500.8	1484.5	1434.4	1352.8	1251.4	1139.6	1026.5	917.0	813.3	713.1	545.3
20°	1493.8	1478.6	1426.2	1335.3	1224.6	1104.6	981.1	859.9	750.4	651.3	478.9
22.5°	1457.7	1446.0	1387.7	1291.0	1176.8	1049.8	922.8	798.2	686.3	587.3	416.0
25°	1387.7	1369.1	1313.2	1228.1	1116.3	985.8	851.8	734.1	619.9	523.2	355.4
27.5°	1289.9	1266.6	1217.6	1141.9	1034.7	914.7	780.7	661.8	555.8	460.3	305.3
30°	1154.7	1147.7	1098.8	1040.5	940.3	829.6	709.6	588.4	489.4	402.0	259.8
32.5°	1026.5	1012.6	978.8	919.3	841.3	739.9	628.0	524.3	432.3	349.6	220.2
35°	884.4	878.6	844.8	806.3	736.4	646.7	552.3	459.1	368.2	293.6	186.4
37.5°	746.9	745.7	717.8	695.6	632.7	564.0	474.2	386.8	313.4	249.4	153.8
40°	624.5	617.6	601.2	576.8	538.3	481.2	402.0	325.1	261.0	206.2	127.0
42.5°	505.7	502.2	494.0	478.9	448.6	402.0	339.1	271.5	213.2	169.0	103.7
45°	398.5	402.0	402.0	392.7	372.9	335.6	279.6	221.4	173.6	137.5	85.1
47.5°	313.4	311.1	315.8	313.4	305.3	273.8	226.0	177.1	145.6	117.7	72.2
50°	230.7	238.9	243.5	252.8	245.9	221.4	179.4	146.8	122.3	100.2	61.8
52.5°	170.1	173.6	185.3	202.7	198.1	174.8	144.5	123.5	101.4	82.7	52.4
55°	117.7	121.2	138.7	155.0	152.6	136.3	117.7	100.2	81.6	66.4	43.1
57.5°	76.9	80.4	95.5	118.8	118.8	108.4	95.5	79.2	64.1	52.4	36.1
60°	51.3	53.6	66.4	83.9	87.4	86.2	75.7	59.4	50.1	43.1	30.3
62.5°	33.8	36.1	46.6	59.4	66.4	66.4	55.9	45.4	40.8	36.1	25.6
65°	24.5	25.6	32.6	39.6	47.8	48.9	40.8	36.1	32.6	29.1	22.1
67.5°	17.5	17.5	23.3	28.0	33.8	32.6	30.3	26.8	24.5	21.0	17.5
70°	11.7	12.8	15.1	18.6	22.1	21.0	21.0	19.8	17.5	15.1	12.8
72.5°	8.2	9.3	10.5	12.8	14.0	14.0	14.0	12.8	11.7	10.5	9.3
75°	5.8	5.8	5.8	7.0	8.2	8.2	9.3	8.2	7.0	7.0	5.8
77.5°	3.5	3.5	3.5	3.5	4.7	4.7	4.7	3.5	3.5	2.3	3.5
80°	1.2	1.2	1.2	2.3	2.3	2.3	2.3	1.2	1.2	1.2	1.2
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	1.2	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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: P886979

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWSL-1200LM-5000K

**CANDELA DISTRIBUTION (continued):**

	135°	157.5°	180°
0°	963.6	963.6	963.6
2.5°	913.5	899.5	898.4
5°	837.8	804.0	785.3
7.5°	749.2	701.4	679.3
10°	660.7	603.6	583.8
12.5°	577.9	517.3	498.7
15°	497.5	439.3	426.5
17.5°	430.0	376.4	363.5
20°	368.2	322.8	308.8
22.5°	316.9	273.8	259.8
25°	270.3	233.0	221.4
27.5°	230.7	198.1	191.1
30°	194.6	169.0	164.3
32.5°	163.1	145.6	144.5
35°	137.5	124.7	128.2
37.5°	118.8	108.4	111.9
40°	99.0	94.4	97.9
42.5°	83.9	81.6	86.2
45°	69.9	72.2	75.7
47.5°	59.4	64.1	66.4
50°	48.9	55.9	55.9
52.5°	41.9	48.9	47.8
55°	37.3	41.9	40.8
57.5°	32.6	35.0	33.8
60°	28.0	29.1	28.0
62.5°	23.3	24.5	23.3
65°	19.8	19.8	18.6
67.5°	16.3	15.1	15.1
70°	12.8	11.7	10.5
72.5°	9.3	8.2	5.8
75°	5.8	4.7	2.3
77.5°	2.3	1.2	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)