

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: P887038

Luminaire Tested: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K

Issue Date: 7/9/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P887038  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-53)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/9/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH 40D TIR, MATTE BLACK TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 4000K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1651.6 lumens  
Efficiency: N/A  
Efficacy: 93.8 lumens/watt  
Spacing Criteria (0/90/45): 0.7 / 0.69 / 0.65  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

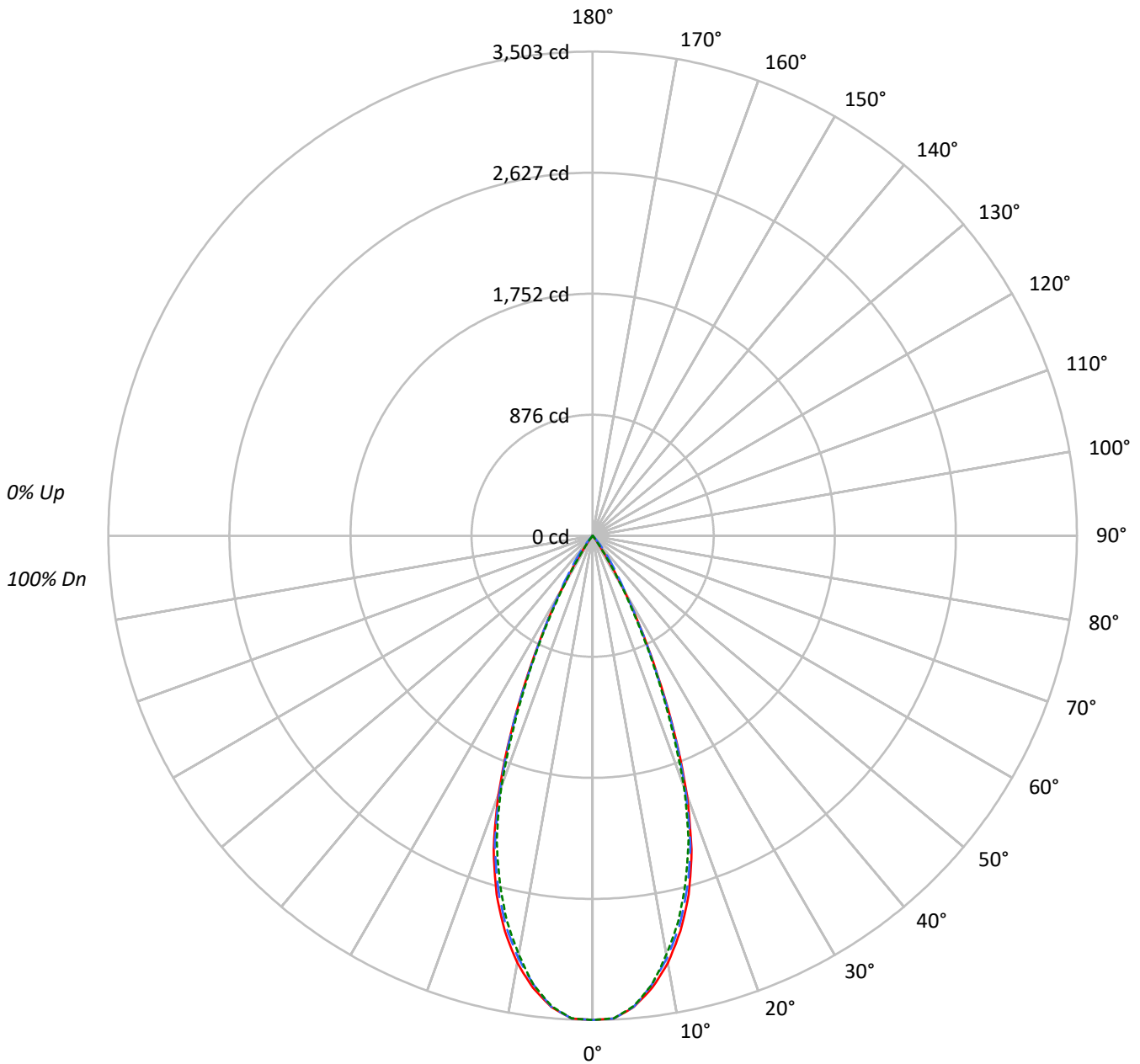
Input Watts (W): 17.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



TEST NUMBER: P887038

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K

### Luminous Intensity Polar Plot





TEST NUMBER: P887038

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K

**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 |    |    |    |    | 100 |   |  |   |
| 1   | 115 | 112 | 110 | 108 | 112 | 110 | 108 | 106 | 106 | 105 | 103 | 102 | 101 | 100 | 99  | 98  | 97  | 96  |    |    |    |    | 96  |   |  |   |
| 2   | 110 | 106 | 103 | 100 | 108 | 104 | 101 | 99  | 101 | 99  | 97  | 98  | 96  | 95  | 96  | 94  | 93  | 91  |    |    |    |    | 91  |   |  |   |
| 3   | 106 | 101 | 97  | 93  | 104 | 99  | 96  | 93  | 97  | 94  | 91  | 94  | 92  | 90  | 92  | 90  | 88  | 87  |    |    |    |    | 87  |   |  |   |
| 4   | 102 | 96  | 91  | 88  | 100 | 95  | 91  | 87  | 93  | 89  | 86  | 91  | 88  | 85  | 89  | 86  | 84  | 83  |    |    |    |    | 83  |   |  |   |
| 5   | 98  | 91  | 87  | 83  | 97  | 90  | 86  | 83  | 89  | 85  | 82  | 87  | 84  | 81  | 86  | 83  | 81  | 79  |    |    |    |    | 79  |   |  |   |
| 6   | 94  | 87  | 82  | 79  | 93  | 87  | 82  | 79  | 85  | 81  | 78  | 84  | 80  | 78  | 83  | 80  | 77  | 76  |    |    |    |    | 76  |   |  |   |
| 7   | 91  | 83  | 79  | 75  | 90  | 83  | 78  | 75  | 82  | 78  | 75  | 81  | 77  | 74  | 80  | 76  | 74  | 73  |    |    |    |    | 73  |   |  |   |
| 8   | 88  | 80  | 75  | 72  | 87  | 79  | 75  | 72  | 79  | 74  | 71  | 78  | 74  | 71  | 77  | 73  | 71  | 70  |    |    |    |    | 70  |   |  |   |
| 9   | 85  | 77  | 72  | 69  | 84  | 76  | 72  | 69  | 76  | 71  | 68  | 75  | 71  | 68  | 74  | 71  | 68  | 67  |    |    |    |    | 67  |   |  |   |
| 10  | 82  | 74  | 69  | 66  | 81  | 73  | 69  | 66  | 73  | 69  | 66  | 72  | 68  | 66  | 71  | 68  | 65  | 64  |    |    |    |    | 64  |   |  |   |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 339393 | 339393 | 339393 |
| 5°  | 332832 | 332618 | 332084 |
| 10° | 308586 | 304888 | 302487 |
| 15° | 269326 | 264994 | 260220 |
| 20° | 205185 | 202556 | 198907 |
| 25° | 118317 | 115954 | 113827 |
| 30° | 49409  | 52877  | 45069  |
| 35° | 9165   | 24480  | 7983   |
| 40° | 1404   | 8675   | 1404   |
| 45° | 151    | 1671   | 151    |
| 50° | 0      | 332    | 0      |
| 55° | 0      | 0      | 0      |
| 60° | 0      | 0      | 0      |
| 65° | 0      | 0      | 0      |
| 70° | 0      | 0      | 0      |
| 75° | 0      | 0      | 0      |
| 80° | 0      | 0      | 0      |
| 85° | 0      | 0      | 0      |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 45°  
 Vertical Angle: 45°  
 Luminance: 1671 cd/sqm



TEST NUMBER: P887038

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 316.0  | 19.1      |
| 10°-20°   | 721.7  | 43.7      |
| 20°-30°   | 504.3  | 30.5      |
| 30°-40°   | 103.1  | 6.2       |
| 40°-50°   | 6.4    | 0.4       |
| 50°-60°   | 0.1    | 0.0       |
| 60°-70°   | 0.0    | 0.0       |
| 70°-80°   | 0.0    | 0.0       |
| 80°-90°   | 0.0    | 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°    | 1542.0 | 93.4      |
| 0°-40°    | 1645.1 | 99.6      |
| 0°-60°    | 1651.6 | 100.0     |
| 0°-90°    | 1651.6 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1651.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 3503 | 3503  | 3503 | 3503  | 3503 |      |
| 5°  | 3423 | 3426  | 3420 | 3410  | 3415 | 317  |
| 15° | 2685 | 2681  | 2642 | 2611  | 2595 | 732  |
| 25° | 1107 | 1114  | 1085 | 1069  | 1065 | 513  |
| 35° | 78   | 127   | 207  | 110   | 68   | 80   |
| 45° | 1    | 2     | 12   | 2     | 1    | 2    |
| 55° | 0    | 0     | 0    | 0     | 0    | 0    |
| 65° | 0    | 0     | 0    | 0     | 0    | 0    |
| 75° | 0    | 0     | 0    | 0     | 0    | 0    |
| 85° | 0    | 0     | 0    | 0     | 0    | 0    |
| 90° | 0    | 0     | 0    | 0     | 0    | 0    |



TEST NUMBER: P887038

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D40FL-TL4SDMB-1200LM-4000K

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 3503.4 | 3503.4 | 3503.4 | 3503.4 | 3503.4 |
| 2.5°  | 3495.7 | 3493.5 | 3495.7 | 3494.6 | 3493.5 |
| 5°    | 3422.6 | 3425.9 | 3420.4 | 3410.4 | 3414.9 |
| 7.5°  | 3299.7 | 3290.9 | 3275.4 | 3271.0 | 3276.5 |
| 10°   | 3137.0 | 3114.9 | 3099.4 | 3093.9 | 3075.0 |
| 12.5° | 2931.1 | 2920.1 | 2893.5 | 2869.2 | 2859.2 |
| 15°   | 2685.4 | 2681.0 | 2642.2 | 2611.2 | 2594.6 |
| 17.5° | 2379.9 | 2360.0 | 2351.1 | 2321.2 | 2306.8 |
| 20°   | 1990.3 | 1990.3 | 1964.8 | 1922.7 | 1929.4 |
| 22.5° | 1547.5 | 1530.9 | 1536.4 | 1492.1 | 1478.9 |
| 25°   | 1106.9 | 1113.6 | 1084.8 | 1069.3 | 1064.9 |
| 27.5° | 746.1  | 736.1  | 738.3  | 709.5  | 688.5  |
| 30°   | 441.7  | 472.7  | 472.7  | 446.1  | 402.9  |
| 32.5° | 207.0  | 265.7  | 312.2  | 248.0  | 176.0  |
| 35°   | 77.5   | 127.3  | 207.0  | 109.6  | 67.5   |
| 37.5° | 29.9   | 52.0   | 126.2  | 44.3   | 27.7   |
| 40°   | 11.1   | 21.0   | 68.6   | 19.9   | 11.1   |
| 42.5° | 4.4    | 7.7    | 32.1   | 6.6    | 4.4    |
| 45°   | 1.1    | 2.2    | 12.2   | 2.2    | 1.1    |
| 47.5° | 1.1    | 1.1    | 4.4    | 1.1    | 0.0    |
| 50°   | 0.0    | 0.0    | 2.2    | 0.0    | 0.0    |
| 52.5° | 0.0    | 0.0    | 1.1    | 0.0    | 0.0    |
| 55°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 57.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 60°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 62.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 65°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 67.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 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



(END OF REPORT)