Description

Recessed LED module with interchangeable 2-inch round or square open pinhole apertures are available in various finishes to suit many décors. Use with 4-inch nominal recessed housings suitable for residential and shallow plenum commercial construction or can be used to retrofit existing installations. Field interchangeable primary optics provide various distribution patterns and spacing to mounting height ratios. Use for general and task lighting in low to medium height ceilings where energy savings, long life and optical control are required.

Catalog #		Type
Project		
Comments		Date
Prepared by		

Specification Features

Module
- Field interchangeable and upgradable LED module consists of LED array, primary optic and driver
- Integral die cast aluminum heat sink provides passive thermal cooling achieving L70 at 50,000 hours in IC and non-IC applications

Retention
- Stainless steel springs hold module securely in the housing, can be removed thru the aperture for service or replacement

LED Array
- Proximity phosphors over chip on board LEDs provide a uniform source with high efficiency and no pixilation
- Available in 90 CRI minimum, R9 greater than 50 and color accuracy within 3 SDCM provide color accuracy and uniformity

Gaskets
- Closed cell gaskets achieve restrictive airflow requirements without additional caulking

Trims
- Die formed steel trims are available in 2-inch round or square pinhole apertures and can be interchanged in the field
- Available in a broad range of painted or plated finishes, can be painted in the field to match any décor
- Magnetic attachment holds trim tightly to ceiling and eliminates light leaks.

Media
- Integral media holder provided accepts (1) 2" diameter 3.0mm thick color filters, lens or louvers
- Order media separately

Primary Optic
- Precision molded TIR optic organizes source flux into useful beams without stray lumens in the field
- Two-piece construction with matte black mounting ring and polarized turn and lock mounting aligns optic to source and minimizes backlight in the housing
- Exceeds ENERGY STAR® color angular uniformity requirements, color deviation is typically less than 0.002 u' v'.
- Available in spot, narrow flood, flood and wide flood distributions, ships with narrow flood or flood factory installed, order alternate distributions or replacement separately
- Integral media holder accepts (1) lens or louver

VividTune
- D2W™ dim-to-warm option shifts color temperature from 3000 K to 1850 K as fixture dims mimicking the black body dimming response of halogen sources

Driver
- Integral UNV 120 - 277V 50/60 Hz constant current driver provides noise free operation and can be replaced in the field
- Continuous, flicker-free dimming from 100% to 5% with select leading or trailing edge 120V phase cut dimmers
- Optional UNV 120-277V 50/60 Hz driver with 0 -10V analog dimming from 100% to 5%, provided with inline electrical quick connect for low voltage connections
- Medium base (E26) to CJT adapter (provided) provides mains connection.

Compliance
- cULus listed for use with Halo housings, classified for use with other's housings, see instruction sheet for conditions of acceptability
- Damp location listed
- Airtight per ASTM-E283
- Suitable for use in clothes closets when installed in accordance with the NEC 410.16 spacing requirements
- EMI/RFI emissions per FCC 47CFR Part 15 consumer limits
- Contains no mercury or lead and RoHS compliant
- Photometric testing in accordance with IES LM-79-08
- Lumen maintenance projections in accordance with IES LM-80-08 and TM-21-11
- Can be used for State of California Title 24 high efficacy LED compliance under JA8, reference Modernized Appliance Efficiency Database System (MAEDBS) for 2016 JA8 High Efficacy Lighting
- Certified to State of California Title 20, State-regulated LED Lamp; reference Modernized Appliance Efficiency Database System (MAEDBS) for State-regulate d LED Lamp
- ENERGY STAR® certified, reference Certified Light Fixtures database.

Warranty
Five year limited warranty, consult website for details.
www.cooperlighting.com

ML4D
TL41R
TL42S

2-Inch Round and Square Pinhole Downlight

Up to 1100 lumens

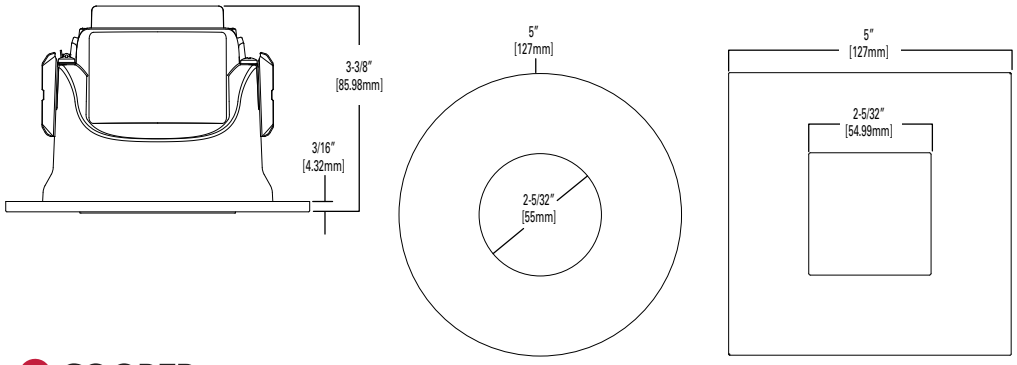
90 CRI nominal CCT 2700K 3000K 3500K 4000K

ENERGY STAR

Efficiency Standards T24 California Title 24 Residential and Non-Residential Compliant

Refer to ENERGY STAR® Qualified Products List.
Can be used to comply with California Title 24 High Efficacy requirements.
Certified to California Appliance Efficiency Database under JA8.
Indoor LED nominal CCT of 4000K or less.

Dimensions



ENERGY DATA

Lumens	900 Series	
Input Voltage	120V	277V
Input Current	107 (mA)	50 (mA)
Input Power	12.8 (W)	12.5 (W)
Inrush (A)	1.1 (A)	1.9 (A)
THD: ≤ 20%		
PF: ≥ 0.90		
T Ambient -40 - +40°C		
Sound Rating ≤ 20dba		

COOPER Lighting Solutions

Ordering Information

SAMPLE NUMBER: ML4D09NFL927E -TL41RMW
A complete luminaire consists of a housing, LED module and trim, order separately.

Models	Lumens	Distribution	CRI/CCT	Driver	Accessories
ML4D= 4" LED module	**09**=900 lumens (nominal)	**NFL**=25 degree narrow flood **FL**=40 degree flood	**927**=90 CRI (min), 2700K **930**=90 CRI (min), 3000K **935**=90 CRI (min), 3500K **940**=90 CRI (min), 4000K **D2W**=90 CRI (min) color shifts from 3000 to 1850K mimicking black body dimming[2]	**E**=UNV 120 - 277V 50-60Hz, LE & TE phase cut 5% dimming at 120V only **E010**=UNV 120 - 277V 50-60Hz, 0 - 10V analog 5% dimming[1]	**TIR45SP15**=15° spot **TIR45NFL25**=25° narrow flood **TIR45FL40**=40° flood **TIR45WFL55**=55° wide flood **TIR50AWW25**=25° narrow flood asymmetric / wall wash **TIR45MH12PK**=replacement media holder, package of 12 **L100 Series**=2.0" lens and filters, see spec sheet

Trims	Flange Finish	Accessories
TL41R= 2" round pinhole **TL42S**= 2" square pinhole	**MW**=Matte white flange **MB**=Matte black flange **BN**=Brushed nickel flange **ORB**=Oil rubbed bronze flange **GB**=German bronze flange **BCu**=Brushed copper flange	**T24HWKIT**=Title 24 hard wire kit, converts incandescent, low voltage and compact fluorescent housings to LED

Housings

Halo Ultra-shallow LED Housings
H245ICAT=4" IC, airtight ultra-shallow new construction housing, LED, 120 - 277V
H245RICAT=4" IC, airtight ultra-shallow remodeler housing, LED, 120 - 277V

Halo LED Housings
H995ICAT=4" IC, airtight shallow new construction housing, LED, 120 - 277V
H995RICAT=4" IC, airtight shallow remodeler housing, LED, 120 - 277V

Halo Housings*
H45ICATD010=4" IC, airtight shallow new construction housing, LED, 120 - 277V, 0 – 10V dimming
H45RICATD010=4" IC, airtight shallow remodeler housing, LED, 120 - 277V, 0 – 10V dimming
H99TAT=4" non-IC, airtight shallow new construction housing, E26, 120V
H99RTAT=4" non-IC, airtight shallow remodeler housing, E26, 120V
H99ICAT=4" IC, airtight shallow new construction housing, E26, 120V
E4TATSB=4" non-IC, airtight shallow new construction housing, adjustable socket bracket, E26, 120V
E4RTATSB=4" non-IC, airtight shallow remodeler housing, adjustable socket bracket, E26, 120V
E4ICATSB=4" non-IC, airtight shallow new construction housing, adjustable socket bracket, E26, 120V
H4NCMF=4" new construction mounting frame

Halo Surface Mount Housings
HS4R=Surface round, 120-277V
HS4S=Surface square, 120-277V

HE26LED*
Requires Edison Base Adapter for retrofit (order separately)

Notes:
1. For 0-10V control the "E010=UNV 120 - 277V 50-60Hz, 0 - 10V analog 5% dimming" option must be used with either H45ICATD010 or H45RICATD010 housings
2. Actual lumens for D2W.

COOPER Lighting Solutions

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

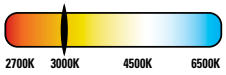
Photometry

ML4D09_930 - TIR45SP15 - TL41RX_TL42SX

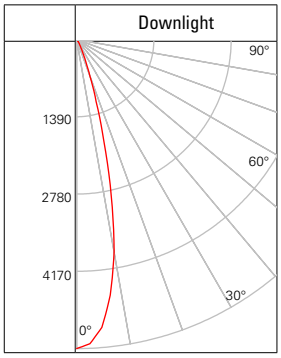
Description	Halo 2 Inch ML4 Round And Square Open Downlight-Narrow Flood Distribution
Test Number	P275323
Module	900 Lumen, 90CRI, Narrow Flood optic
Trim	2" Aperture, Open Round DL
Lumens	1189 Lm
Efficacy	105.2
Spacing Criteria	0.43

Color Metric Summary

TM-30-15	R_f = 92.7
	R_g = 99.1
CRI/ CIE	R_a = 94.2
	R_9 = 59.9



Candlepower Distribution



Candelas at Nadir

Angle	0-deg
0	5560
5	5200
10	3882
20	690
30	117
40	33
50	8
60	2
70	1
80	0
90	0

Foot-candle Values at Nadir

0 deg Aiming Angle		
DD	FC	DIA
5.5'	183.8	2.2
7'	113.5	3
8'	86.9	3.4
9'	68.6	3.8
10'	55.6	4.2
12'	38.6	5.2

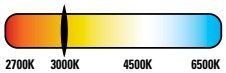
DD = distance down to illuminated work plane
FC = initial foot-candles at nadir
DIA = diameter

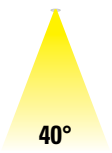
ML4D09_930 - TIR45FL40 - TL41RX_TL42SX

Description	Halo 2 Inch ML4 Round And Square Open Downlight- Flood Distribution
Test Number	P275341
Module	900 Lumen, 90CRI, Flood Optic
Trim	2" Aperture, Open Round DL
Lumens	1154 Lm
Efficacy	102.1
Spacing Criteria	0.65

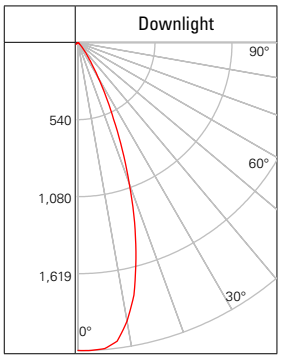
Color Metric Summary

TM-30-15	R_f = 92.7
	R_g = 99.1
CRI/ CIE	R_a = 94.2
	R_9 = 59.9





Candlepower Distribution



Candelas at Nadir

Angle	0-deg
0	2428
5	2423
10	2231
20	1183
30	321
40	63
50	14
60	4
70	2
80	0
90	0

Foot-candle Values at Nadir

0 deg Aiming Angle		
DD	FC	DIA
5.5'	80.3	3.4
7'	49.6	4.4
8'	37.9	5.2
9'	30	5.8
10'	24.3	6.4
12'	16.9	7.8

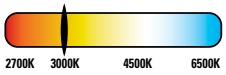
DD = distance down to illuminated work plane
FC = initial foot-candles at nadir
DIA = diameter

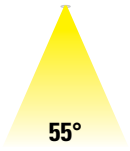
ML4D09_930 - TIR45WFL55 - TL41RX_TL42SX

Description	Halo 2 Inch ML4 Round And Square Open Downlight-Wide Flood Distribution
Test Number	P275361
Module	900 Series, 90CRI, Wide Flood optic
Trim	2" Aperture, Open Round DL
Lumens	1080 Lm
Efficacy	95.5
Spacing Criteria	0.84

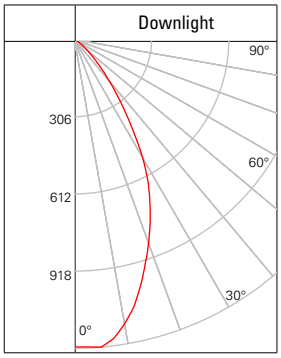
Color Metric Summary

TM-30-15	R_f = 92.7
	R_g = 99.1
CRI/ CIE	R_a = 94.2
	R_9 = 59.9





Candlepower Distribution



Candelas at Nadir

Angle	0-deg
0	1218
5	1224
10	1144
20	859
30	540
40	214
50	66
60	16
70	2
80	0
90	0

Foot-candle Values at Nadir

0 deg Aiming Angle		
DD	FC	DIA
5.5'	40.3	4.6
7'	24.9	5.8
8'	19	6.6
9'	15	7.4
10'	12.2	8.2
12'	8.5	10

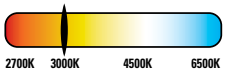
DD = distance down to illuminated work plane
FC = initial foot-candles at nadir
DIA = diameter

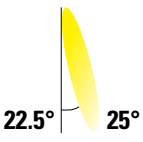
ML4D09_930 - TIR50AWW25 - TL41RX_TL42SX

Description	Halo 2 Inch ML4 Round And Square Open Downlight-Asymmetric
Test Number	P275381
Module	900 Series, 90CRI, Asymmetric
Trim	2" Aperture, Open Round DL
Lumens	770 Lm
Efficacy	68.2
Spacing Criteria	1.4

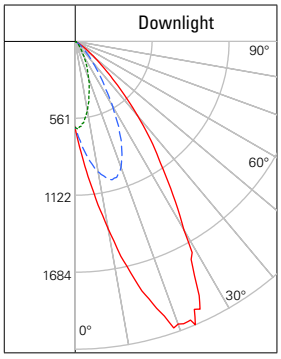
Color Metric Summary

TM-30-15	R_f = 92.7
	R_g = 99.1
CRI/ CIE	R_a = 94.2
	R_9 = 59.9





Candlepower Distribution



Candelas at Nadir

Angle	0-deg
0	628
5	950
10	1387
20	2194
30	1588
40	710
50	195
60	27
70	1
80	0
90	0

Foot-candle Values at Nadir

0 deg Aiming Angle		
DD	FC	DIA
5.5'	61.8	2.6
7'	38.1	3.4
8'	29.2	4
9'	23.1	4.4
10'	18.7	5
12'	13	6

DD = distance down to illuminated work plane
FC = initial foot-candles at nadir
DIA = diameter

Multiplier Table

CCT Option	2700K	3000K	3500K	4000K
CCT Multiplier	0.93	1.00	1.04	1.06

Representative photometric test report for 3000K color temperature, 90CRI.
Multipliers may be used to determine other relative CCT values.

COOPER Lighting Solutions

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