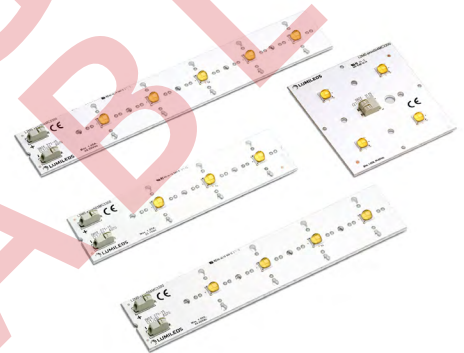


# LUXEON XR-M

Bright, uniform light source in practical, convenient and easy to configure modules

LUXEON XR-M products are LED modules optimized for lighting applications requiring high power LED arrays mounted on a rigid and thermally conductive substrate. These versatile building blocks come with 3, 4 or 5 LUXEON M LEDs on a MCPCB substrate and are designed for ease of system integration, faster time to market, and use with industry standard optics. The 4 LED square version will become a complete IP66 solution when used in combination with standard third party optics and heat sink.



## FEATURES AND BENEFITS

Typical 3200–5300 lumen building blocks with 140 lm/W efficacy @700mA,  $T_c=85^\circ\text{C}$

Available in 70CRI 4000K, 5000K and 5700K

May be used with off-the-shelf individual lenses and lens plates for easy system integration

Constant board-to-board LED pitch for versatile system design

3, 4 and 5 LED linear board options and 4 LED square board option for design flexibility and luminaire adaptability

MCPCB for efficient heat dissipation and mechanical robustness

5 year limited warranty

## PRIMARY APPLICATIONS

Architectural

High Bay & Low Bay

Outdoor

– Streetlights

– Stadium

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# General Product Information

## Product Test Conditions

LUXEON XR-M products are specified using a forward DC drive current of 700mA and a board temperature,  $T_c$  of 85°C. The LEDs are electrically configured in series which means each LED is driven at equal current.

The LUXEON M LEDs on LUXEON XR-M are tested and binned using a DC drive current at 700mA and junction temperature,  $T_j$ , of 85°C. The minimum, typical, and maximum performance numbers for LUXEON XR-M in this datasheet are derived from individual LED measurements. The confidence level on all minimum and maximum performance parameters in this datasheet is 99% to within individual LED tolerance.

## Part Number Nomenclature

Part numbers for LUXEON XR-M follow the convention below:

L 2 M 0 - **A A B B** 0 0 **D** M C **E E** 0 0

Where:

- A A** - designates nominal ANSI CCT (40=4000K, 50=5000K, 57=5700K)
- B B** - designates minimum CRI (70=70CRI)
- D** - designates number of LEDs (3, 4 or 5)
- E E** - designates LED configuration (22=square, 33=linear)

Therefore, a LUXEON XR-M, 4000K, 70CRI, with 4 LEDs in a linear configuration will have the following part number:

L 2 M 0 - **4 0 7 0** 0 0 **4** M C **3 3** 0 0

For LUXEON XR-M CCT and CRI combinations not listed in this datasheet, contact your local Lumileds Sales Representative or Technical Solutions Manager.

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON XR-M is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON XR-M at 700mA,  $T_c=85^\circ\text{C}$ .

CONFIGURATION	NOMINAL CCT	MINIMUM CRI <sup>[1]</sup>	LUMINOUS FLUX <sup>[2]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	ENERGY EFFICIENCY CLASS	PART NUMBER
			MINIMUM	TYPICAL			
Square	4000K	70	4053	4211	138	E	L2M0-4070004MC2200
	5000K	70	4200	4363	144	E	L2M0-5070004MC2200
	5700K	70	4156	4318	142	E	L2M0-5770004MC2200
Linear	4000K	70	3040	3158	138	E	L2M0-4070003MC3300
	5000K	70	3150	3272	144	E	L2M0-5070003MC3300
	5700K	70	3117	3239	142	E	L2M0-5770003MC3300
	4000K	70	4053	4211	138	E	L2M0-4070004MC3300
	5000K	70	4200	4363	144	E	L2M0-5070004MC3300
	5700K	70	4156	4318	142	E	L2M0-5770004MC3300
	4000K	70	5067	5264	138	E	L2M0-4070005MC3300
	5000K	70	5249	5454	144	E	L2M0-5070005MC3300
	5700K	70	5195	5397	142	E	L2M0-5770005MC3300

**Notes for Table 1:**

1. Lumileds maintains a tolerance of  $\pm 2$  on CRI measurements.
2. Lumileds maintains a tolerance of  $\pm 7.5\%$  on luminous flux measurements.

## Electrical and Thermal Characteristics

Table 2. Electrical and thermal characteristics for LUXEON XR-M at 700mA,  $T_c=85^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE (V) <sup>[1]</sup>			TYPICAL THERMAL RESISTANCE — JUNCTION TO HEAT SINK (K/W) $R_{\text{THJ-HS}}$
	MINIMUM	TYPICAL	MAXIMUM	
L2M0-xxxx003MC3300	32.60	32.85	34.95	1.60
L2M0-xxxx004MCzz00	43.55	43.80	46.60	1.20
L2M0-xxxx005MC3300	54.50	54.75	58.25	0.96

**Notes for Table 2:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Absolute Maximum Ratings

Table 3. Absolute maximum ratings for LUXEON XR-M.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>(1,2)</sup>	1050mA
Peak Pulsed Forward Current <sup>(1,3)</sup>	1200mA
LED Junction Temperature <sup>(1)</sup> (DC & Pulse)	135°C
ESD Sensitivity	IEC 61000-4-2 Level 4 (8/15 kV contact/air discharge)
Operating Temperature at T <sub>c</sub> point <sup>(4)</sup>	-40 to 85°C
LED Module Storage Temperature	-40 to 105°C
Reverse Voltage (V <sub>reverse</sub> )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 3:**

1. Proper current derating must be observed to maintain the junction temperature below the maximum.
2. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," with frequencies ≥100Hz and amplitude ≤15% of the maximum allowable DC forward current are acceptable, assuming the average current throughout each cycle does not exceed the maximum allowable DC Forward Current at the corresponding maximum junction temperature.
3. Pulsed operation with a peak drive current equal to the stated Peak Pulsed Forward Current is acceptable if the pulse on-time is ≤5ms per cycle and the duty cycle is ≤50%.
4. Measured at T<sub>c</sub> point next to LED. See AB103 LUXEOM M Application Brief for details. Some manufacturers refer to T<sub>c</sub> as T<sub>s</sub>.
5. Per IEC 62471, Ethr=770 lux.

## Characteristic Curves

### Spectral Power Distribution Characteristics

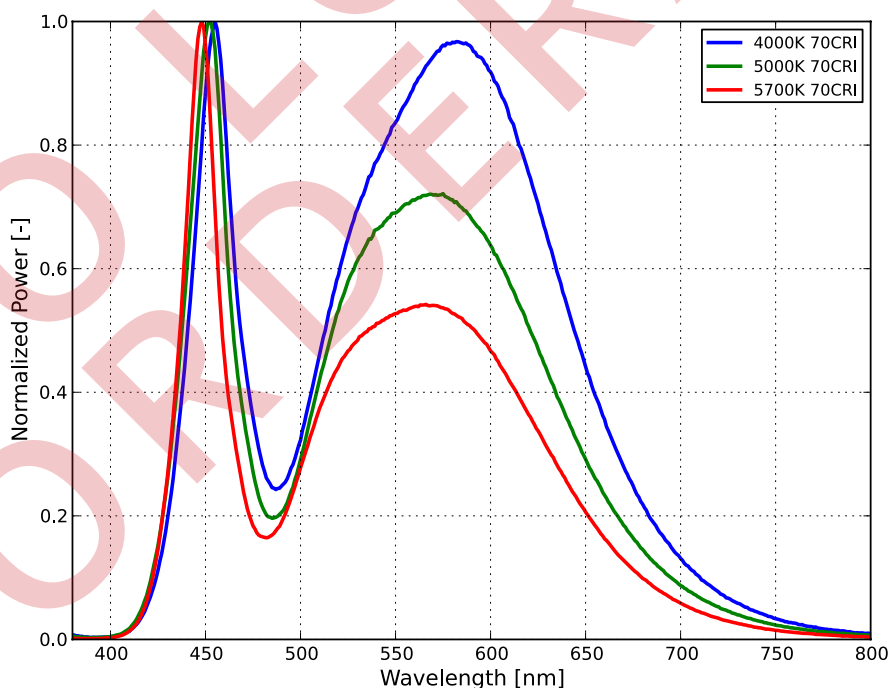


Figure 1: Typical normalized power vs. wavelength for LUXEON M at 700mA, T<sub>J</sub>=85°C.

## Radiation Pattern Characteristics

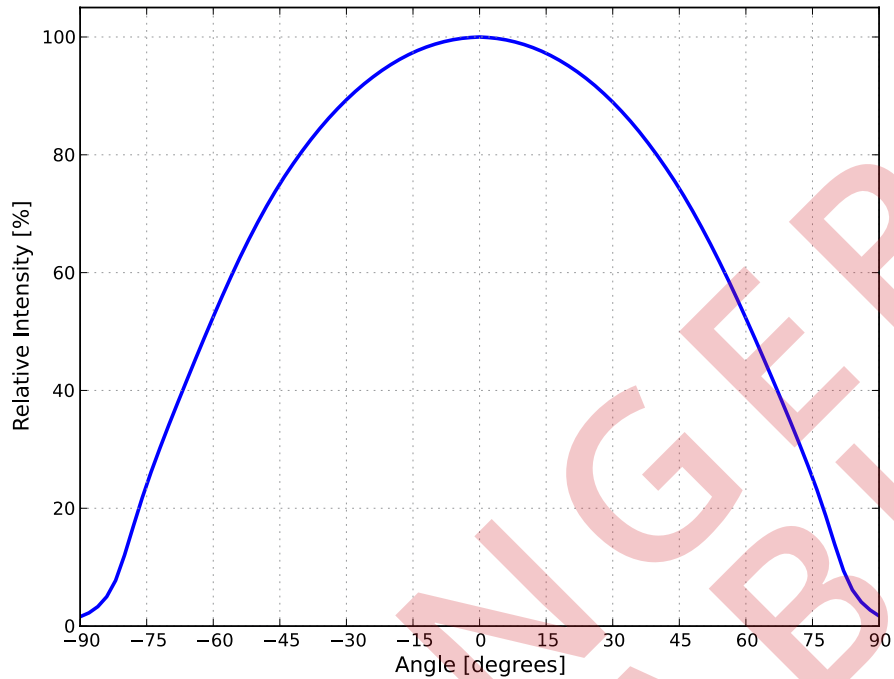


Figure 2: Typical radiation pattern for LUXEON M at 700mA,  $T_j=85^{\circ}\text{C}$ .

## Color Bin Definition

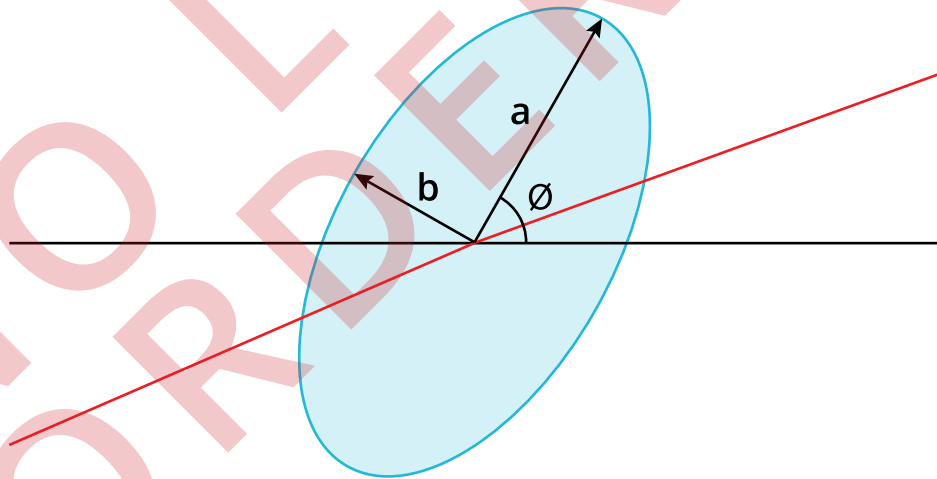


Figure 3: 5-step MacAdam ellipse illustration for Table 4.

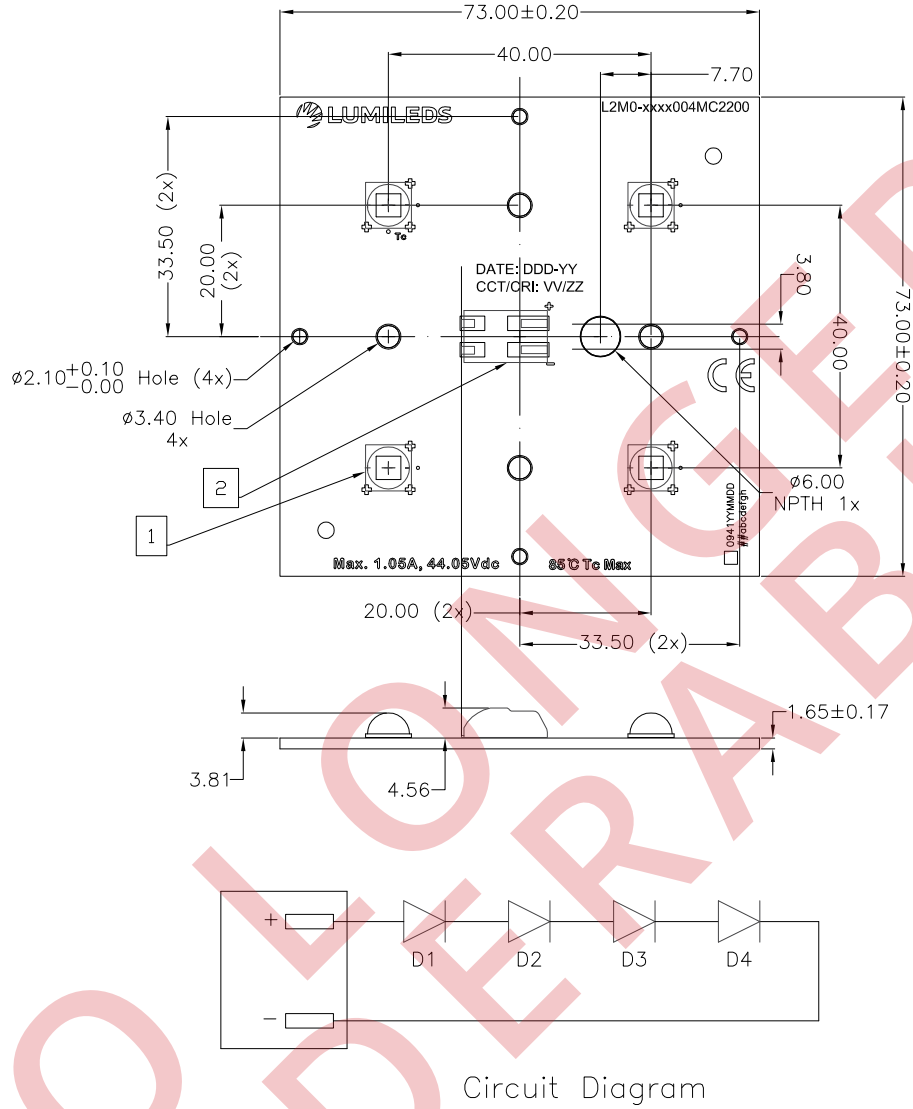
Table 4. 5-step MacAdam ellipse color bin definitions for LUXEON M at 700mA,  $T_j=85^{\circ}\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°

**Notes for Table 4:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

# Mechanical Dimensions

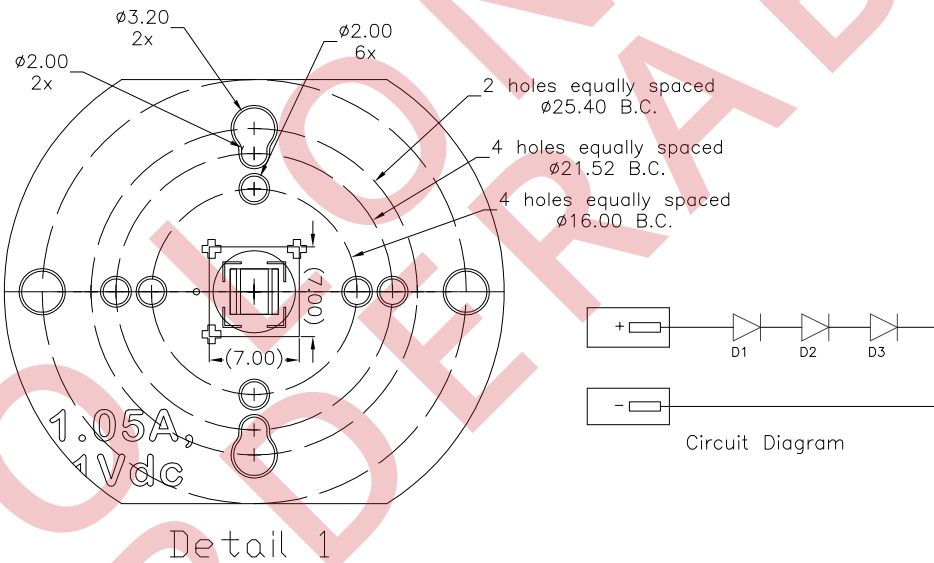
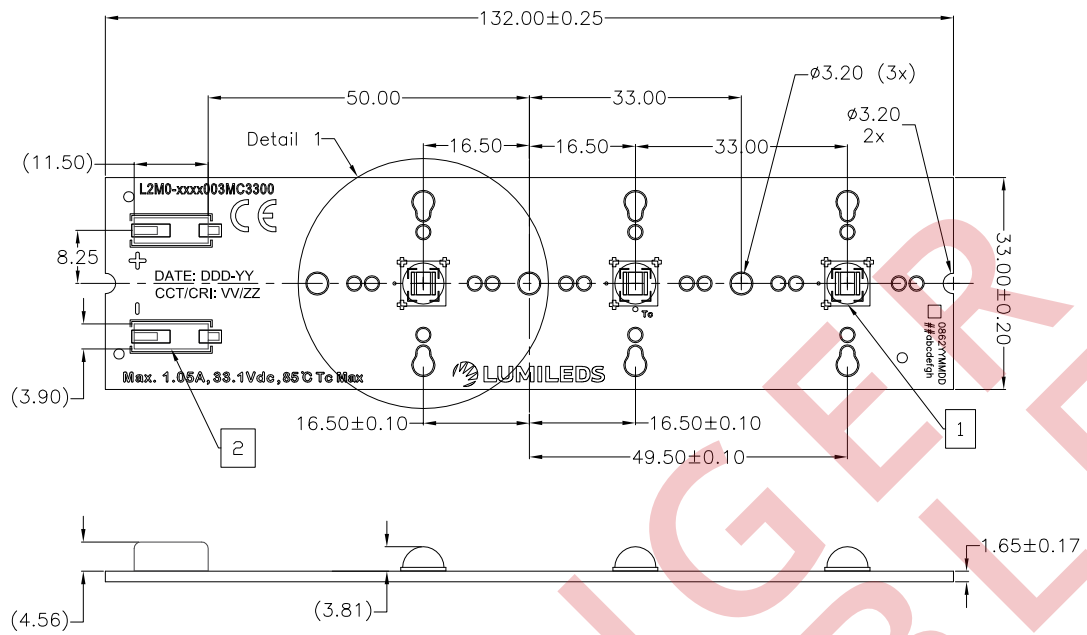


ITEM	QTY	PART/MATERIAL - DESCRIPTION	REFERENCE
1	4	LUXEON M	
2	1	2-pole Connector	

Figure 4: Mechanical dimensions for L2M0-xxxx004MC2200.

**Notes for Figure 4:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.



ITEM	QTY	PART/MATERIAL-DESCRIPTION	REFERENCE
1	3	LUXEON M	
2	2	1-pole Connector	

Figure 5: Mechanical dimensions for L2M0-xxxx003MC3300.

Notes for Figure 5:

1. Drawings are not to scale.
2. All dimensions are in millimeters.



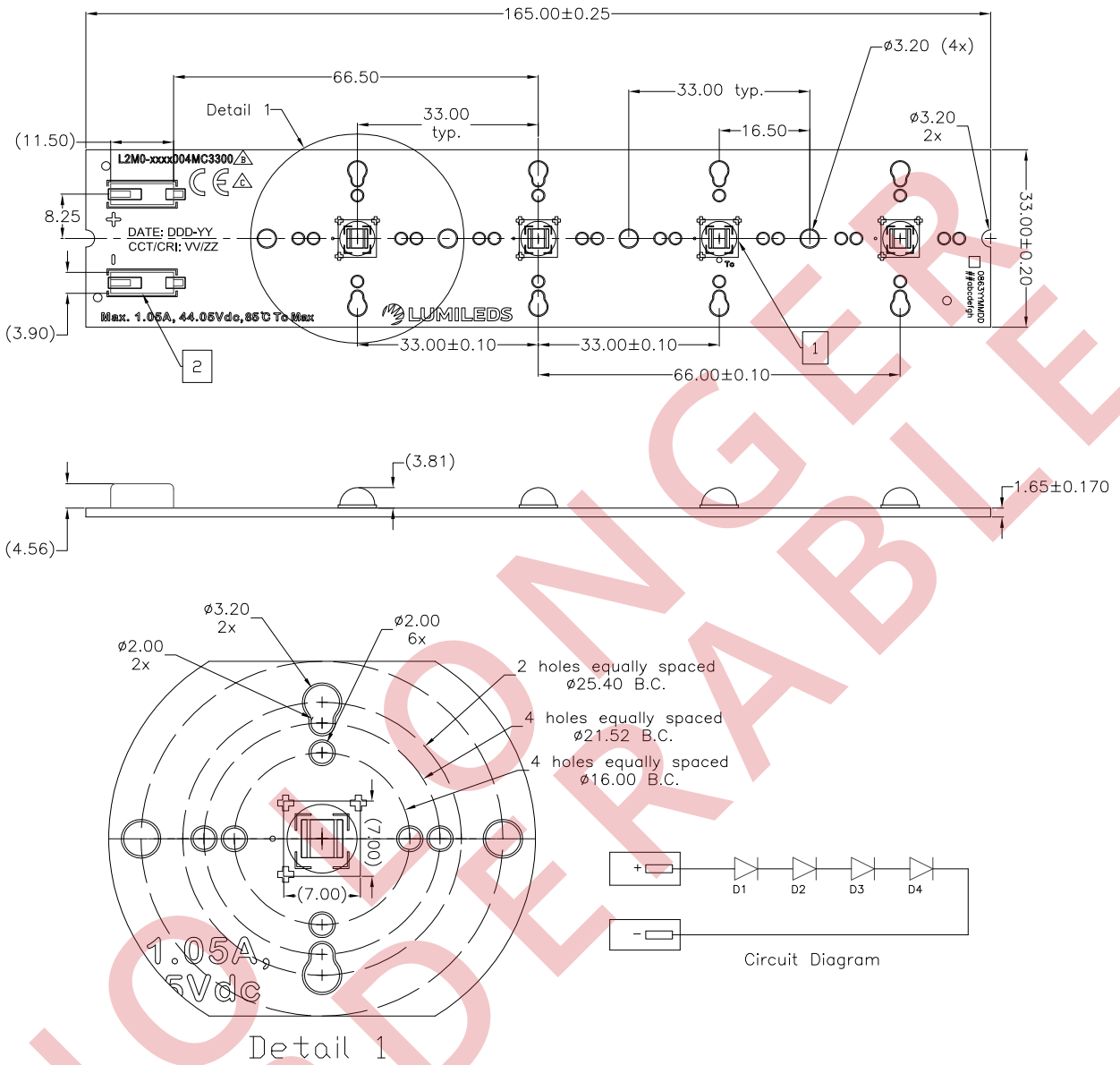


Figure 6: Mechanical dimensions for L2M0-xxxx004MC3300.

Notes for Figure 6:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

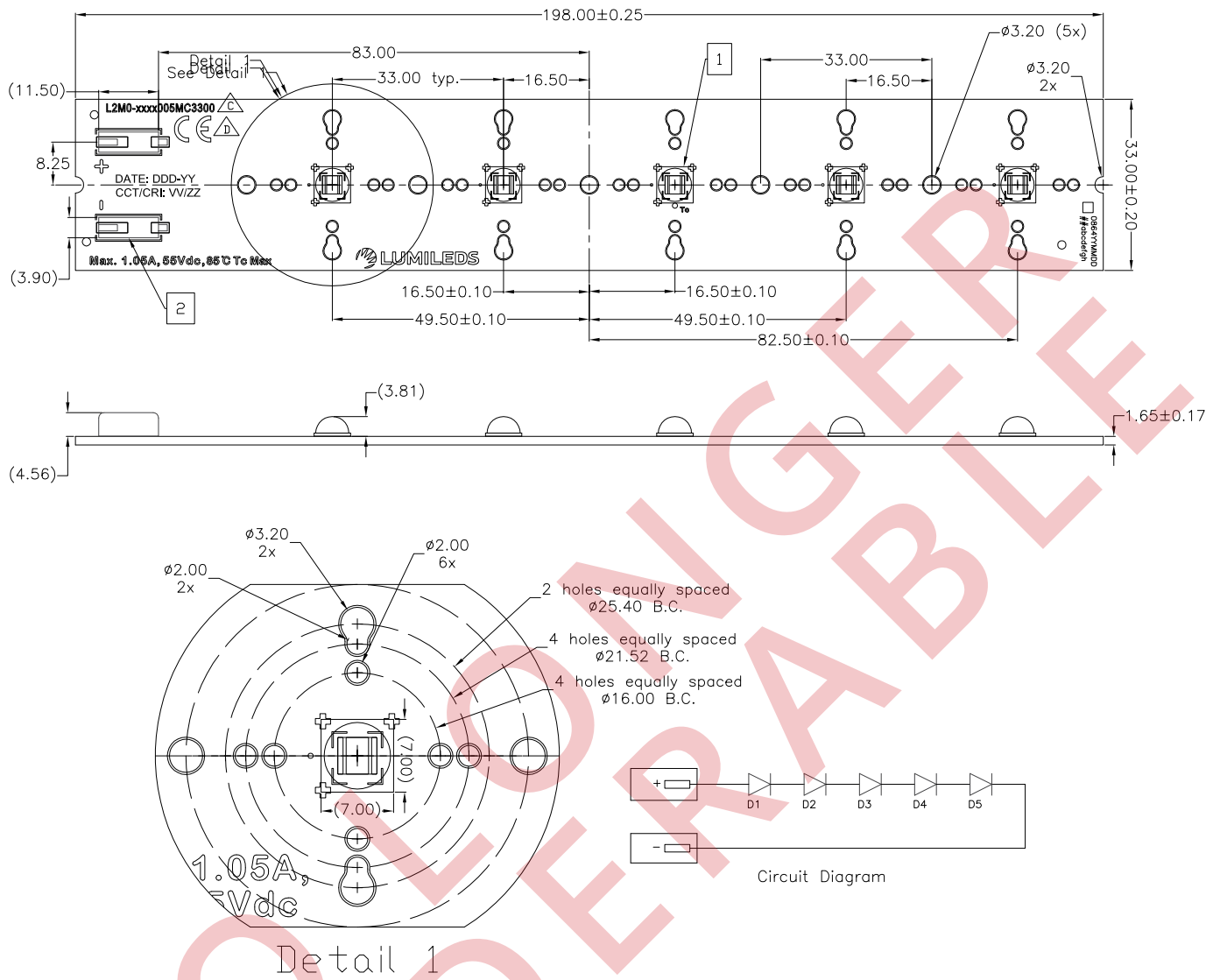


Figure 7: Mechanical dimensions for L2M0-xxxx005MC3300.

Notes for Figure 7:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Packaging Information

Table 5. Packaging information for LUXEON XR-M.

PART NUMBER	TRAY DIMENSIONS (mm)	QUANTITY PER TRAY	NUMBER OF TRAYS PER BOX
L2M0-xxxx004MC2200	450 x 250 x 64	60	1
L2M0-xxxx003MC3300	450 x 185 x 31	30	1
L2M0-xxxx004MC3300	450 x 220 x 31	30	1
L2M0-xxxx005MC3300	450 x 250 x 31	30	1

## Tray Dimensions

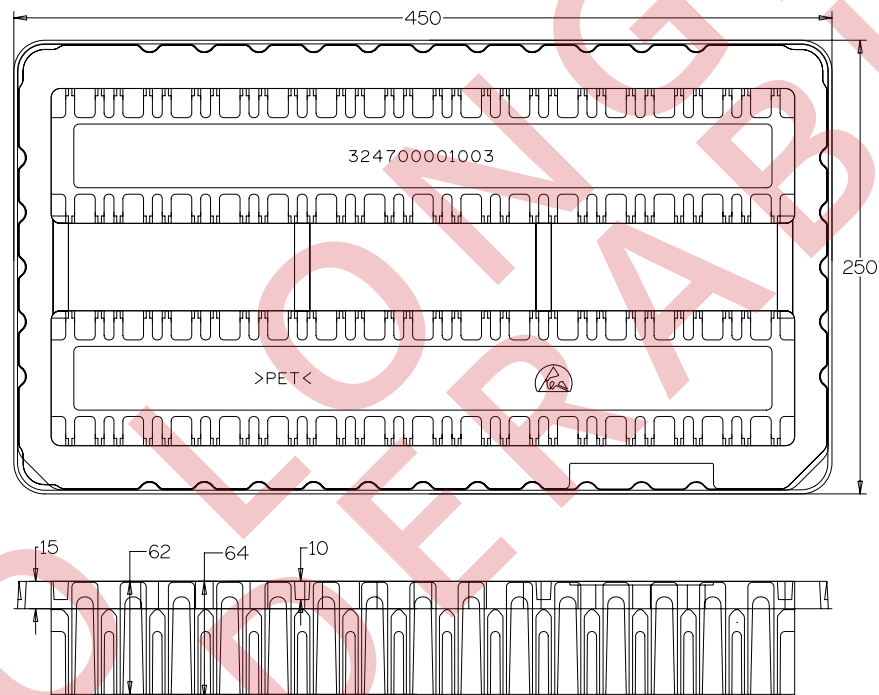


Figure 8: Tray dimensions for L2M0-xxxx004MC2200.

**Notes for Figure 8:**

1. Drawings are not scale.
2. All dimensions are in millimeters.

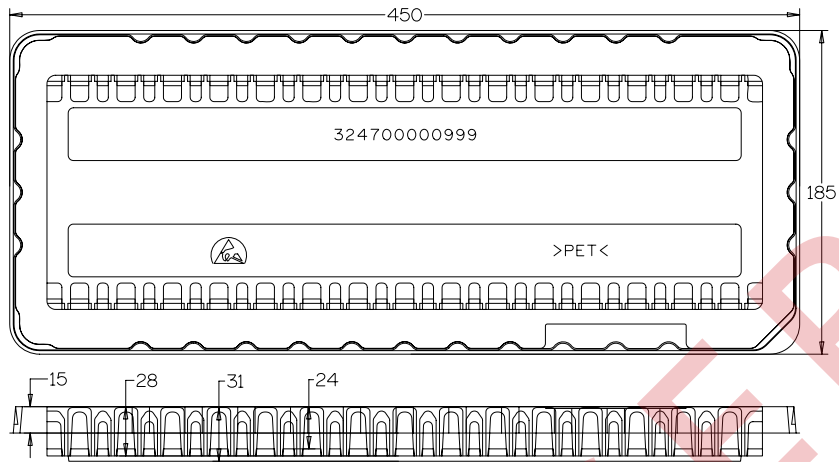


Figure 9: Tray dimensions for L2M0-xxxx003MC3300.

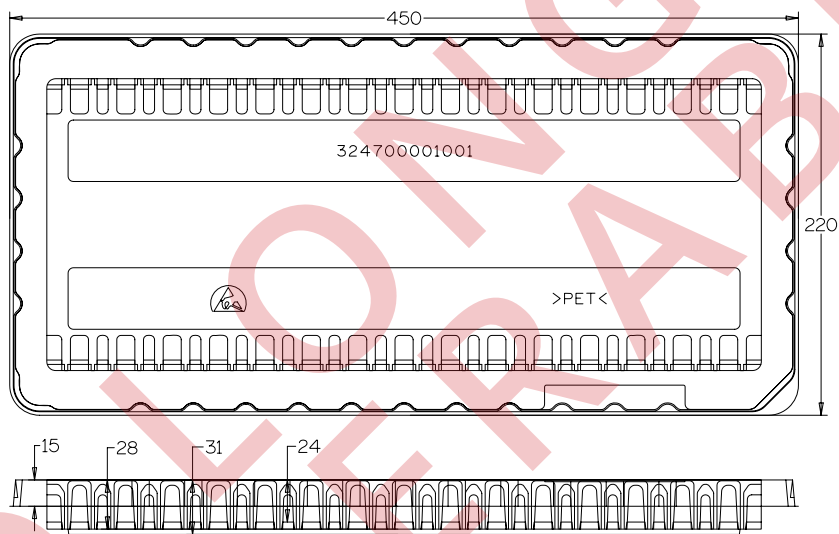


Figure 10: Tray dimensions for L2M0-xxxx004MC3300.

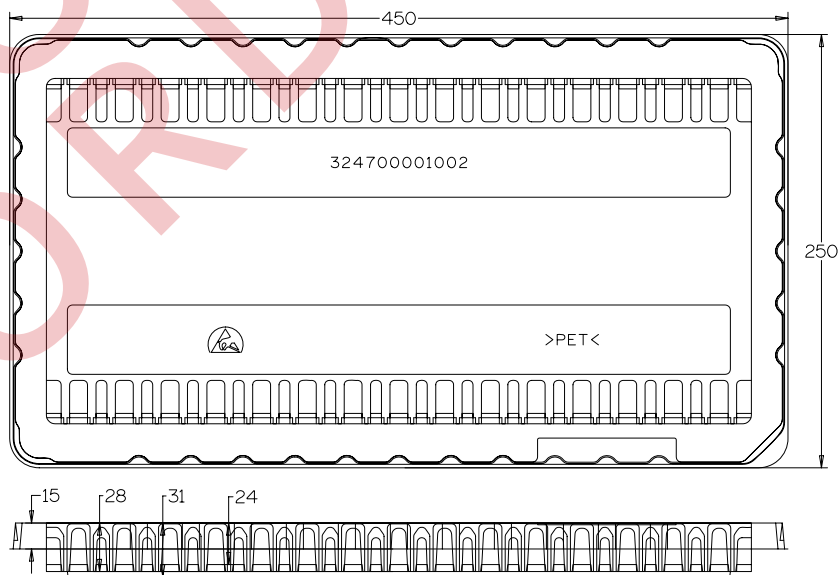


Figure 11: Tray dimensions for L2M0-xxxx005MC3300.

Notes for Figure 9, 10 and 11:  
 1. Drawings are not scale.  
 2. All dimensions are in millimeters.

## Product Packaging Considerations — Chemical Compatibility

The LUXEON M package contains a silicone overcoat and dome to protect the LED chips and extract the maximum amount of light. As with most silicones used in LED optics, care must be taken to prevent any incompatible chemicals from directly or indirectly reacting with the silicone. Refer to the [LUXEON M Application Brief AB103](#) for guidelines on chemical compatibilities.

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## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).

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