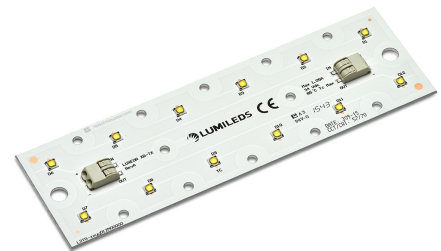




# LUXEON XR-TX

High performance LED modules with extreme efficacy for robust lighting designs

LUXEON XR-TX products are LED modules optimized for lighting applications requiring high efficacy LED arrays mounted on a rigid and thermally conductive substrate. These versatile building blocks feature 12 LUXEON TX LEDs on a MCPCB substrate, electrical connectors, and are designed for ease of system integration, faster time to market, and use with industry standard optics. LUXEON XR-TX will become a complete IP66 solution when used in combination with standard third party optics and heat sink.



## FEATURES AND BENEFITS

Typical 3300 lumens with 140 lm/W efficacy at 700mA and 85°C board temperature

A range of CCT options available in 70CRI (4000K–5700K)

150mm length x 45mm width footprint designed for use with standard third party optics

Features industry's highest efficacy single die emitter—LUXEON TX

Uses Lumileds proprietary pick and place system, targeting specific LED data points to support the best light output uniformity,  $V_f$  and color control

One-stop shop for simplified supply chain and faster time to market

5 year limited warranty

## PRIMARY APPLICATIONS

Architectural

High Bay & Low Bay

Outdoor

– Streetlights

– Tunnel

# Table of Contents

<b>General Product Information</b> .....	<b>2</b>
Product Test Conditions .....	2
Part Number Nomenclature .....	2
Lumen Maintenance .....	2
Environmental Compliance .....	2
<b>Performance Characteristics</b> .....	<b>3</b>
Product Selection Guide .....	3
Electrical and Thermal Characteristics .....	3
Absolute Maximum Ratings .....	3
Characteristic Curves .....	4
Spectral Power Distribution Characteristics .....	4
Radiation Pattern Characteristics .....	4
Color Bin Definition .....	5
<b>Mechanical Dimensions</b> .....	<b>6</b>
<b>Packaging Information</b> .....	<b>6</b>
<b>Tray Dimensions</b> .....	<b>7</b>
Product Packaging Considerations — Chemical Compatibility .....	7

# General Product Information

## Product Test Conditions

LUXEON XR-TX 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 TX LEDs on LUXEON XR-TX are tested 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-TX 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-TX follow the convention below:

L 2 T 0 – **A A B B** 0 1 2 **M** 0 0 0 0 0

Where:

- A A** – designates nominal ANSI CCT (40=4000K, 50=5000K, 57=5700K)
- B B** – designates minimum CRI (70=70CRI)

Therefore, a LUXEON XR-TX, 4000K, 70CRI will have the following part number:

L 2 T 0 – **4 0 7 0** 0 1 2 **M** 0 0 0 0 0

For LUXEON XR-TX 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-TX 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-TX 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)	PART NUMBER
			MINIMUM	TYPICAL		
12-up (12 series LEDs)	4000K	70	3186	3221	140	L2T0-4070012M00000
	5000K	70	3202	3260	140	L2T0-5070012M00000
	5700K	70	3200	3257	140	L2T0-5770012M00000

Notes for Table 1:

- Lumileds maintains a tolerance of  $\pm 2$  on CRI measurements.
- 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-TX at 700mA,  $T_c=85^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE (V <sub>f</sub> ) <sup>[1]</sup>			TYPICAL THERMAL RESISTANCE — JUNCTION TO HEAT SINK ( $^\circ\text{C/W}$ )	TYPICAL THERMAL RESISTANCE — JUNCTION TO SOLDER PAD ( $^\circ\text{C/W}$ ) <sup>[2]</sup>
	MINIMUM	TYPICAL	MAXIMUM		
L2T0-xxxx012M00000	33.00	33.25	33.60	0.9	3.0

Notes for Table 2:

- Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.
- Thermal resistance from junction to solder pad is per LED.

## Absolute Maximum Ratings

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

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)	150 $^\circ\text{C}$
Maximum number of boards in series	7
Maximum voltage across series connection of boards <sup>[4]</sup>	250 VDC
ESD Sensitivity	IEC 61000-4-2 Level 4 (8/15 kV contact/air discharge)
Operating Temperature at $T_c$ point <sup>[5]</sup>	-40 to 85 $^\circ\text{C}$
LED Module Storage Temperature	-40 to 105 $^\circ\text{C}$
Reverse Voltage (V <sub>reverse</sub> )	LUXEON LEDs are not designed to be driven in reverse bias

Notes for Table 3:

- Proper current derating must be observed to maintain the junction temperature below the maximum.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," with frequencies  $\geq 100\text{Hz}$  and amplitude  $\leq 15\%$  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.
- Pulsed operation with a peak drive current equal to the stated Peak Pulsed Forward Current is acceptable if the pulse on-time is  $\leq 5\text{ms}$  per cycle and the duty cycle is  $\leq 50\%$ .
- Per IEC 60598-1:2014/UL 8750-2015-04-01.
- Measured at  $T_c$  point next to LED. See AB106 LUXEON TX Application Brief for details. Some manufacturers refer to  $T_c$  as  $T_s$ .
- Per IEC 62031, Ethr=1631 Lux.

# Characteristic Curves

## Spectral Power Distribution Characteristics

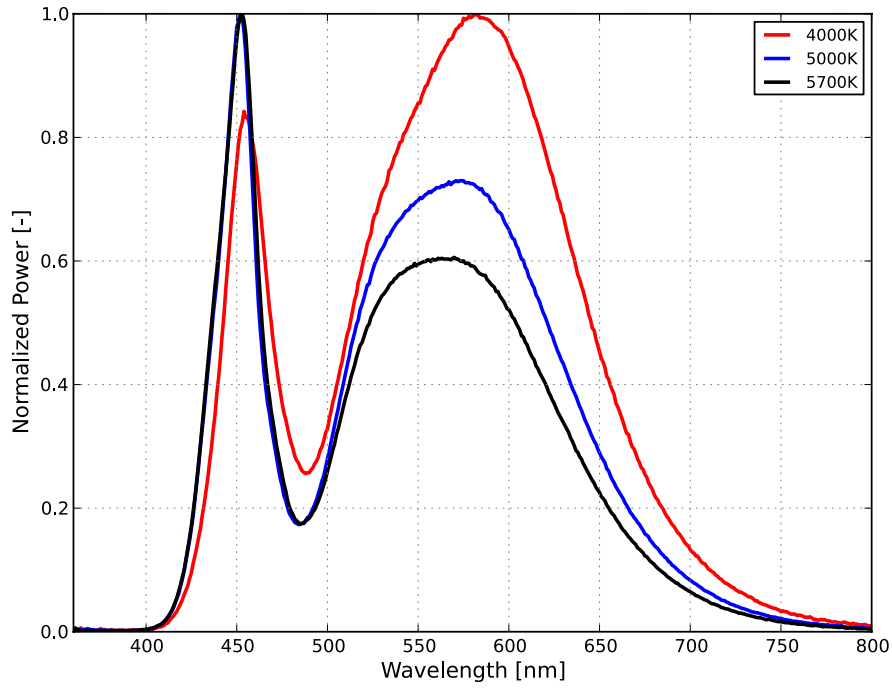


Figure 1: Typical normalized power vs. wavelength for LUXEON TX, 70CRI at 700mA,  $T_j=85^\circ\text{C}$ .

## Radiation Pattern Characteristics

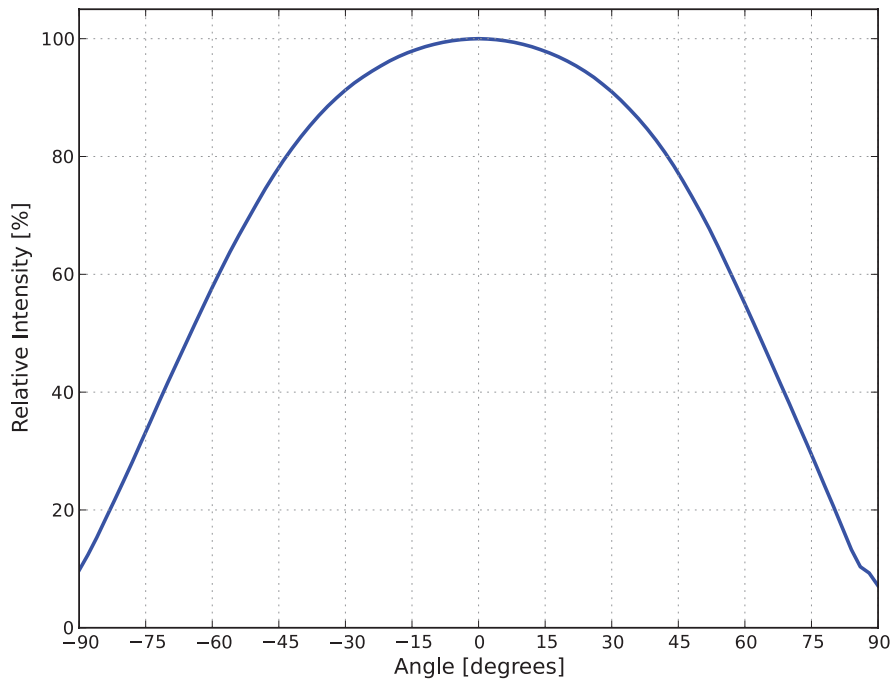


Figure 2: Typical radiation pattern for LUXEON TX at 700mA,  $T_j=85^\circ\text{C}$ .

## Color Bin Definition

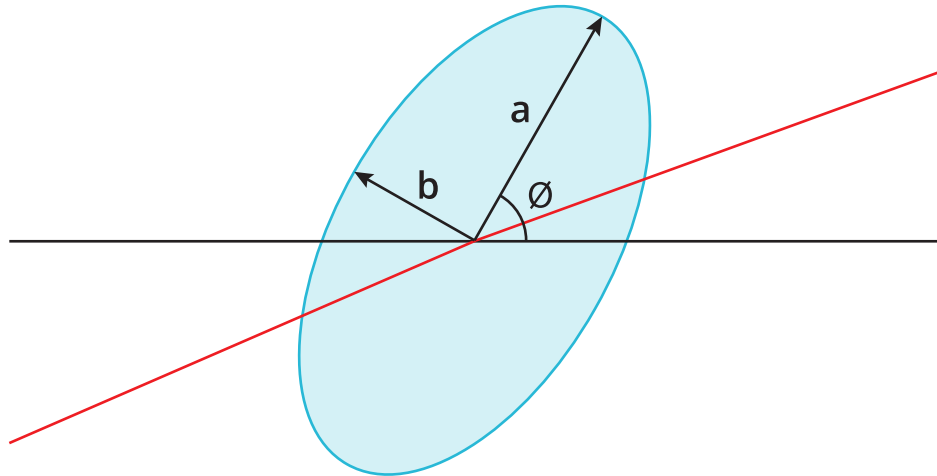


Figure 3: 5-step MacAdam ellipse illustration for Table 4.

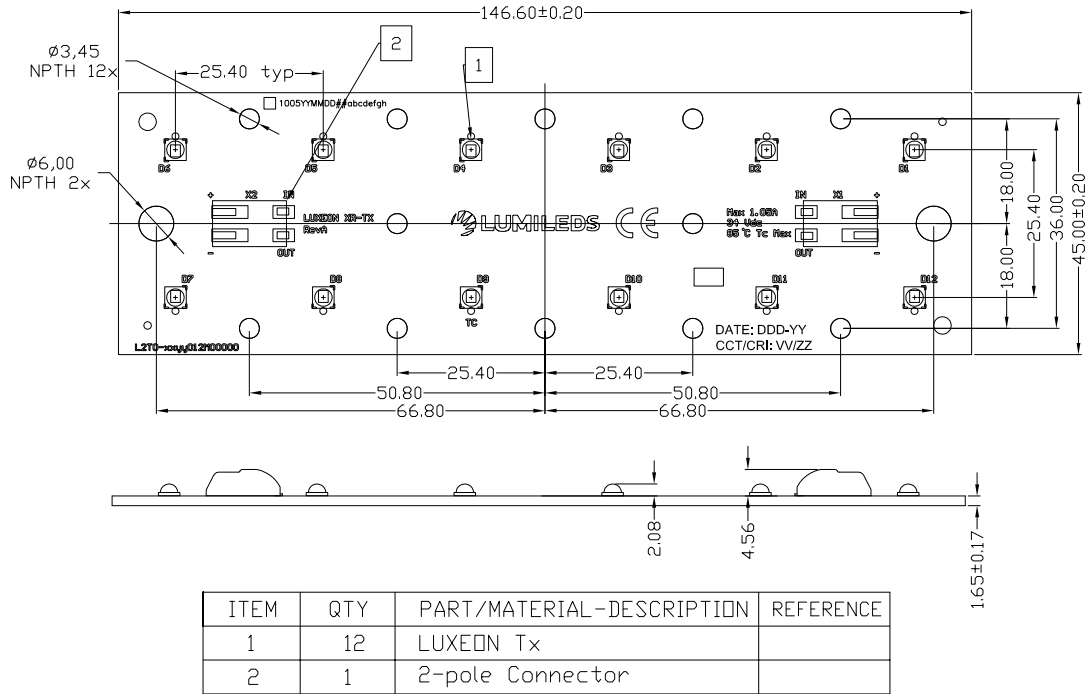
Table 4. 5-step MacAdam ellipse color bin definitions for LUXEON XR-TX.

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	53.7°
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.6°
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.1°

**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



Circuit Diagram

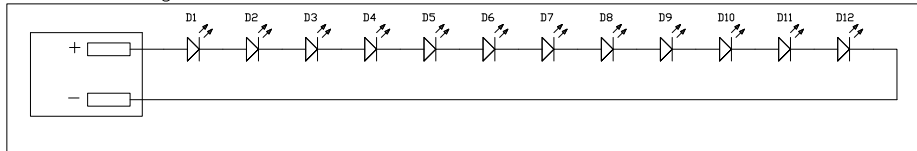


Figure 4: Mechanical dimensions for L2T0-xxxx012M00000.

Notes for Figure 4:

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

# Packaging Information

Table 5. Packaging information for LUXEON XR-TX.

PART NUMBER	TRAY DIMENSIONS (mm)	QUANTITY PER TRAY	NUMBER OF TRAYS PER BOX
L2T0-xxxx012M00000	450 x 190	30	1

## Tray Dimensions

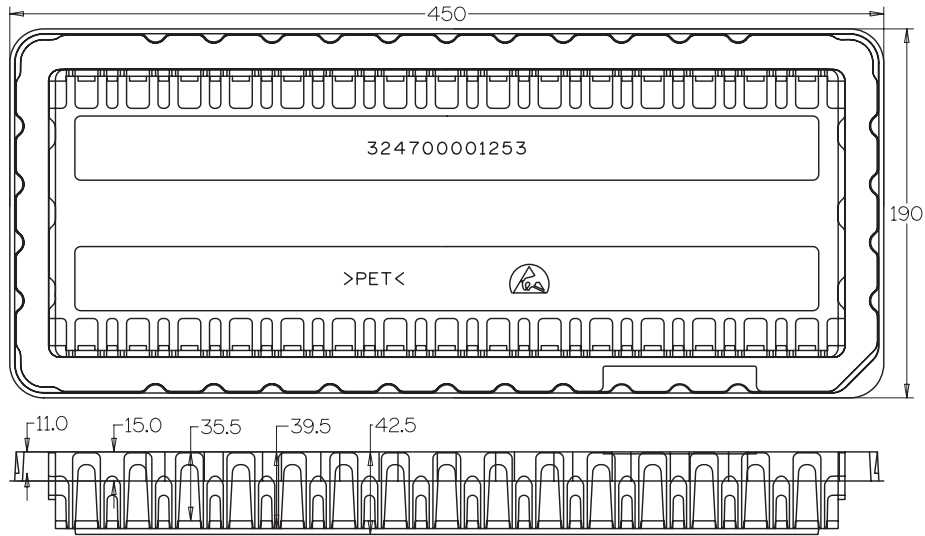


Figure 5: Tray base dimensions for L2T0-xxxx012M00000.

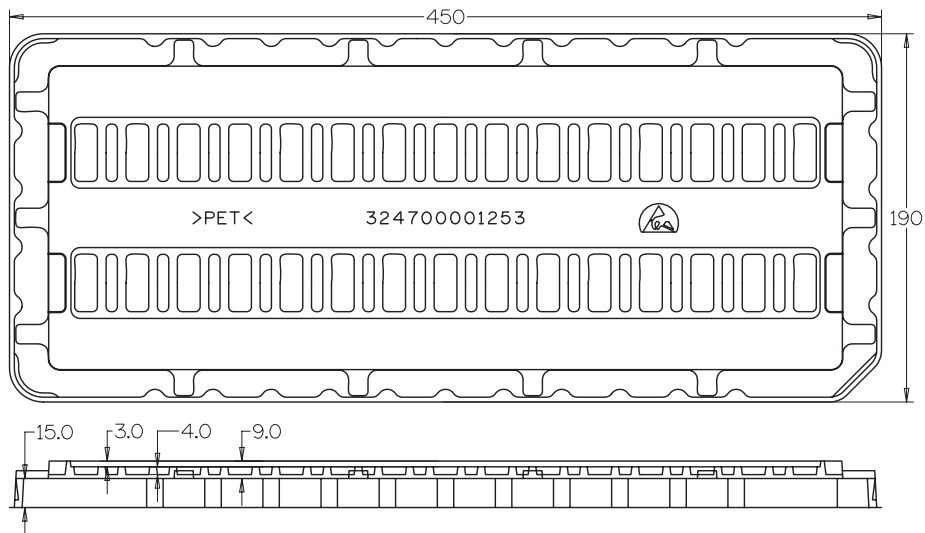


Figure 6: Tray cover dimensions for L2T0-xxxx012M00000.

### Notes for Figures 5 and 6:

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

## Product Packaging Considerations — Chemical Compatibility

The LUXEON TX package contains a silicone overcoat 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 TX Application Brief AB106](#) for guidelines on chemical compatibilities.



## About Lumileds

Lumileds is the global leader in light engine technology. The company develops, manufactures and distributes groundbreaking LEDs and automotive lighting products that shatter the status quo and help customers gain and maintain a competitive edge. With a rich history of industry “firsts,” Lumileds is uniquely positioned to deliver lighting advancements well into the future by maintaining an unwavering focus on quality, innovation and reliability.

To learn more about our portfolio of light engines, visit [lumileds.com](http://lumileds.com).



©2016 Lumileds Holding B.V. All rights reserved.  
LUXEON is a registered trademark of the Lumileds Holding B.V.  
in the United States and other countries.  
[lumileds.com](http://lumileds.com)

Neither Lumileds Holding B.V. nor its affiliates shall be liable for any kind of loss of data or any other damages, direct, indirect or consequential, resulting from the use of the provided information and data. Although Lumileds Holding B.V. and/or its affiliates have attempted to provide the most accurate information and data, the materials and services information and data are provided “as is,” and neither Lumileds Holding B.V. nor its affiliates warrants or guarantees the contents and correctness of the provided information and data. Lumileds Holding B.V. and its affiliates reserve the right to make changes without notice. You as user agree to this disclaimer and user agreement with the download or use of the provided materials, information and data.