LUXEON XR-5050 Round

High performance LED modules with extreme efficacy for robust lighting designs



LUXEON XR-5050 Round 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 8, 12, and 16 LUXEON 5050 LEDs on a MCPCB substrate, are designed for ease of system integration, faster time to market, and use with industry standard optics. LUXEON XR-5050 Round is a complete solution combined with standard third-party optics and heatsink.

FEATURES AND BENEFITS

- Efficacy and luminous flux of up to 184lm/W and 5700lm available
- A full range of CCT options available at 70CRI (2200K to 5700K) and 80CRI (2700K to 4000K)
- Designed to be compatible with standard third party optics
- Superior board level color control of ≤ 3SDCM
- Features industry award high efficacy and lumens in a multi-die, high power package and low system costs – LUXEON 5050
- 5-year guarantee

PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Urban Streetlights
- Outdoor Area Lights

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General Product Information

Product Test Conditions

LUXEON XR-5050 Round modules are tested using a 20ms monopulse (MP) at 700mA and a case temperature, T_c, of 85°C.

Part Number Nomenclature

Part numbers for LUXEON XR-5050 Round follow the convention below:

L 2 1 3 – **A A B B** 0 **C C** M **D E** 0 **0 1**

Where:

- **A A** – designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K, 40=4000K, 50=5000K, 57=5700K)
- **B B** – designates minimum CRI (70=70CRI, 80=80CRI)
- **C C** – designates number of emitters (8=8 emitters, 12=12 emitters, 16=16 emitters)
- **D E** – designates internal Lumileds program code
- **0 1** – designates internal Lumileds program code

Therefore, a LUXEON XR-5050 Round 3000K 80CRI with 12 emitters, will have the following part number:

L 2 1 3 – **3 0 8 0** 0 **1 2** M D E 0 0 1

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-5050 Round 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).

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Performance Characteristics

Product Selection Guide

Table 1. Product performance of LUXEON XR-5050 Round at 700mA, T_c=85°C.

NOMINAL CCT	MINIMUM CRI [1, 2]	LUMINOUS FLUX [1] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	ENERGY EFFICIENCY CLASS	PART NUMBER
		MINIMUM	TYPICAL			
2200	70	2238	2407	153	E	L213-2270008MDE001
2700	70	2441	2643	168	E	L213-2770008MDE001
3000	70	2380	2760	175	E	L213-3070008MDE001
3500	70	2564	2795	177	D	L213-3570008MDE001
4000	70	2663	2841	180	D	L213-4070008MDE001
5000	70	2647	2824	179	D	L213-5070008MDE001
5700	70	2443	2761	175	E	L213-5770008MDE001
2700	80	2187	2374	151	E	L213-2780008MDE001
3000	80	2245	2477	157	E	L213-3080008MDE001
4000	80	2356	2632	167	E	L213-4080008MDE001
2200	70	3340	3592	154	E	L213-2270012MDE001
2700	70	3644	3945	169	E	L213-2770012MDE001
3000	70	3626	4206	180	E	L213-3070012MDE001
3500	70	3929	4228	181	D	L213-3570012MDE001
4000	70	4034	4304	184	D	L213-4070012MDE001
5000	70	4015	4284	184	D	L213-5070012MDE001
5700	70	3671	4149	178	E	L213-5770012MDE001
2700	80	3237	3543	152	E	L213-2780012MDE001
3000	80	3353	3699	159	E	L213-3080012MDE001
4000	80	3619	3988	171	E	L213-4080012MDE001
2200	70	4454	4790	154	E	L213-2270016MDE001
2700	70	4859	5260	169	E	L213-2770016MDE001
3000	70	4835	5607	180	E	L213-3070016MDE001
3500	70	5172	5638	181	D	L213-3570016MDE001
4000	70	5379	5739	184	D	L213-4070016MDE001
5000	70	5354	5712	184	D	L213-5070016MDE001
5700	70	4895	5532	178	E	L213-5770016MDE001
2700	80	4353	4724	152	E	L213-2780016MDE001
3000	80	4471	4932	159	E	L213-3080016MDE001
4000	80	4759	5317	171	E	L213-4080016MDE001

Notes for Table 1:
1. Lumileds maintains a tolerance of ±2 on CRI and ±6.5% on luminous flux measurements.
2. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.

Electrical Characteristics

Table 2. Electrical characteristics for LUXEON XR-5050 Round at 700mA, T_c=85°C.

PART NUMBER	FORWARD VOLTAGE [1] (V_f)		
	MINIMUM	TYPICAL	MAXIMUM
L213-xxxx008MDE001	21.3	22.5	24.3
L213-xxxx012MDE001	31.5	33.3	36.0
L213-xxxx016MDE001	42.0	44.4	48.0

Notes for Table 2:
1. Lumileds maintains a tolerance of ±0.1V on forward voltage measurements.

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Board Level Color Control

Table 3. Board Level Color Control for LUXEON XR-5050 Round.

PART NUMBER	COLOR CONTROL
L213-xxxx008MDE001	3SDCM
L213-xxxx012MDE001	
L213-xxxx016MDE001	

Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON XR-5050 Round.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current [1, 2]	1600mA
Peak Pulsed Forward Current [1, 3]	1600mA
Maximum Working Voltage [4]	250V
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 3B
Operating Temperature at T_C point [1]	-40°C to 85°C
Storage Temperature	-40°C to 105°C
Reverse Voltage ($V_{reverse}$)	LUXEON LEDs are not designed to be driven in reverse bias

Notes for Table 4:
1. Proper current derating must be observed to maintain the Tc temperature below the maximum allowable Tc temperature.
2. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
   – The frequency of the ripple current is 100Hz or higher
   – The average current for each cycle does not exceed the maximum allowable DC forward current
   – The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
3. At <=50% duty cycle with pulse width of 5ms.
4. Basic insulation between live parts on the LED module and mounting surface or touchable parts when mounted in a luminaire for SELV and other than SELV operations has been evaluated according to IEC 62031.
5. $T_c = T_p$ (Test Point).

Application Information

Table 5. Approbation for LUXEON XR-5050 Round.

ITEM	COMPLIANT TO
Test and Certification	CE
	UKCA
	ENEC
	UL8750 (UL file no. E335118)
Declaration	RoHS
	REACH

Recommended Wire

Table 6. Recommended Wire for LUXEON XR-5050 Round.

RECOMMENDED WIRE	INSULATOR DIAMETER	STRIP LENGTH
AWG 26-18	Maximum 2.5mm	4mm to 5mm

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Characteristic Curves

Spectral Power Distribution Characteristics

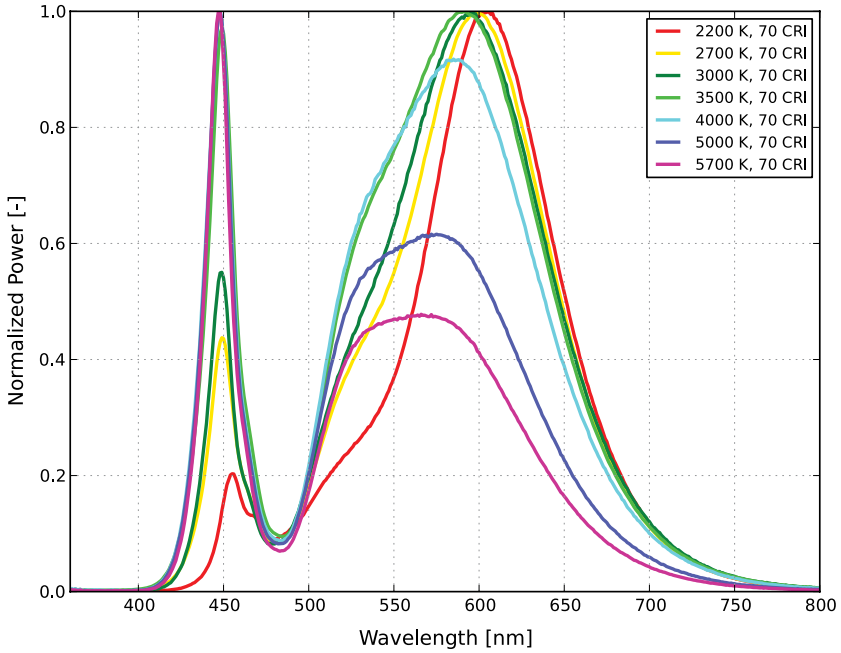


Figure 1. Typical normalized power vs. wavelength for 70CRI LUXEON XR-5050 Round at 700mA, Tc=85°C.

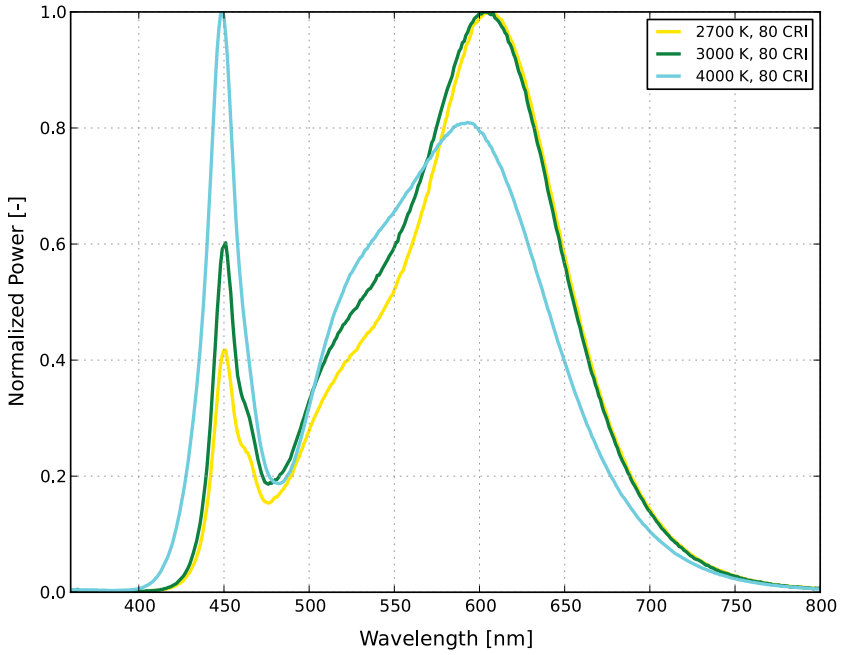


Figure 2. Typical normalized power vs. wavelength for 80CRI LUXEON XR-5050 Round at 700mA, Tc=85°C.

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Light Output Characteristics

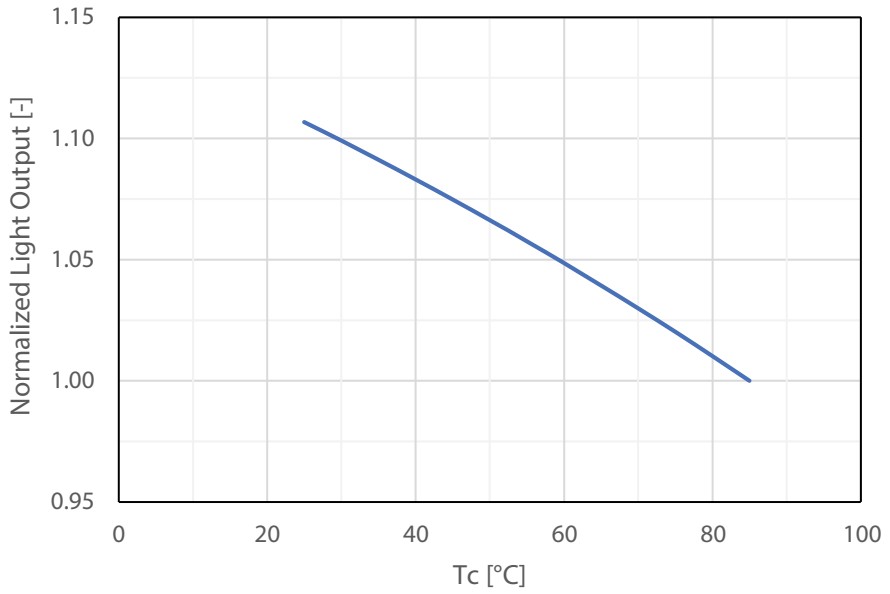


Figure 3. Typical normalized light output vs. Tc temperature for LUXEON XR-5050 Round at 700mA.

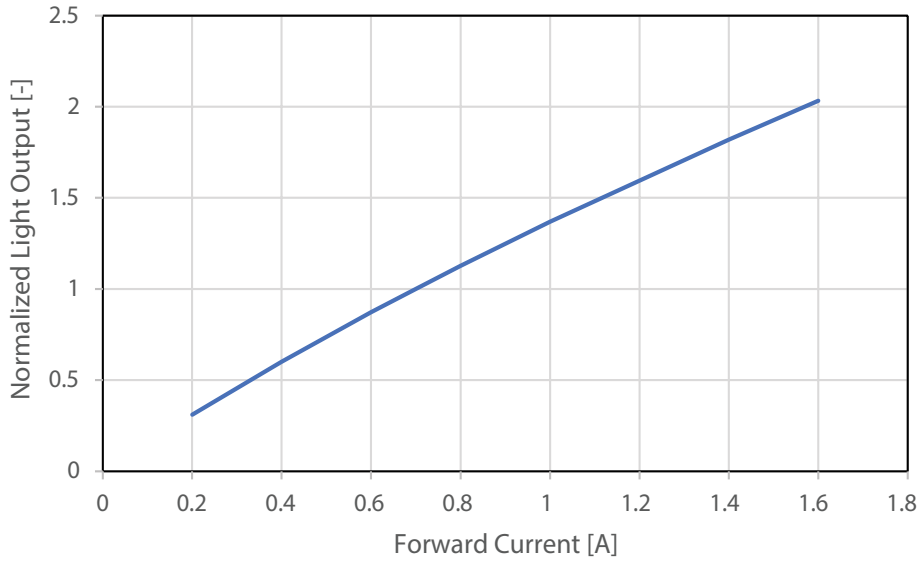


Figure 4. Typical normalized light output vs. forward current for LUXEON XR-5050 Round at Tc=85°C.

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Efficacy Characteristics

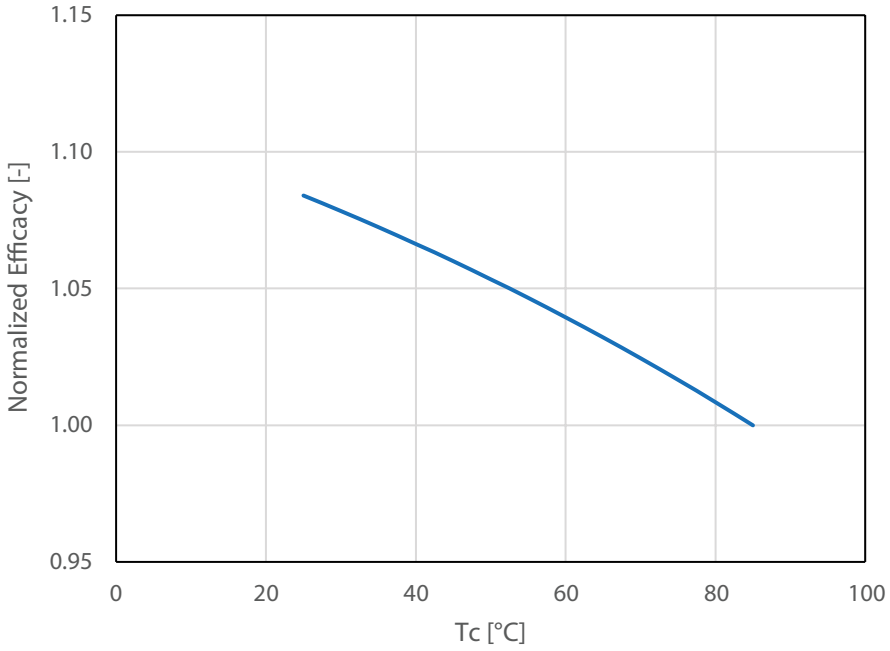


Figure 5. Typical normalized efficacy vs. Tc temperature for LUXEON XR-5050 Round at 700mA.

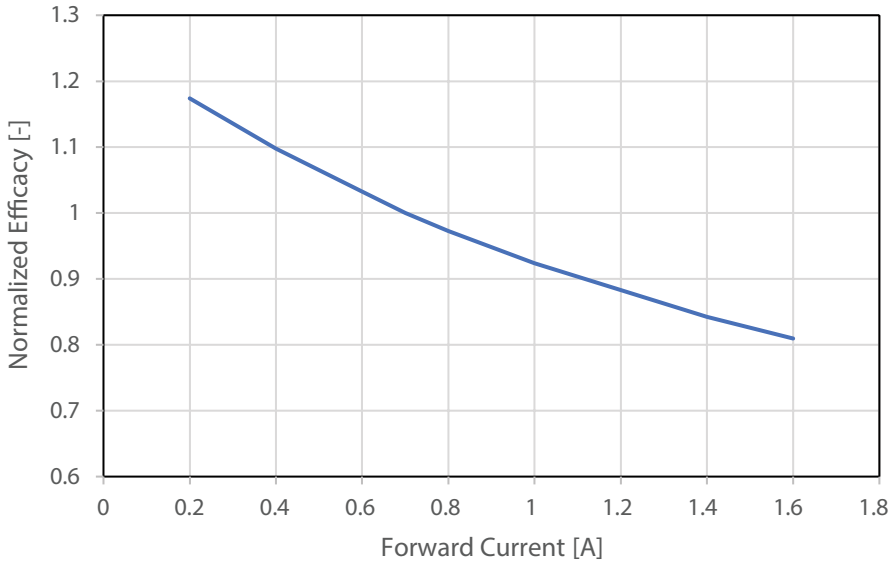


Figure 6. Typical normalized efficacy vs. forward current for LUXEON XR-5050 Round at Tc=85°C.

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Mechanical Dimensions

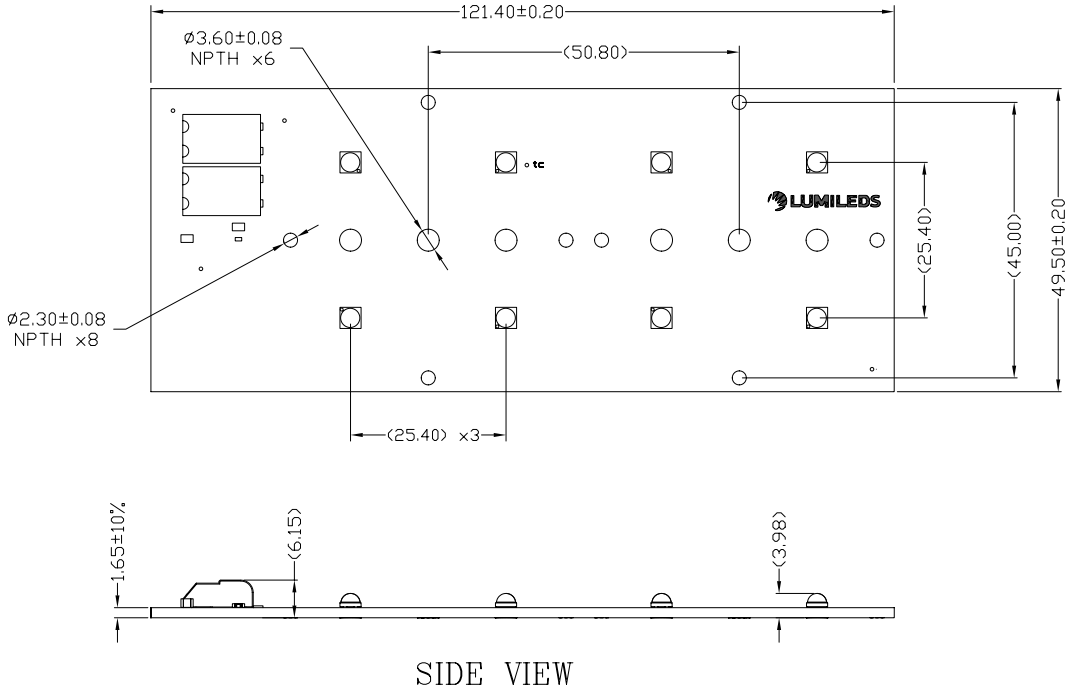


Figure 7. Mechanical dimensions for L213-xxxx008MDE001.

Notes for Figure 7:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

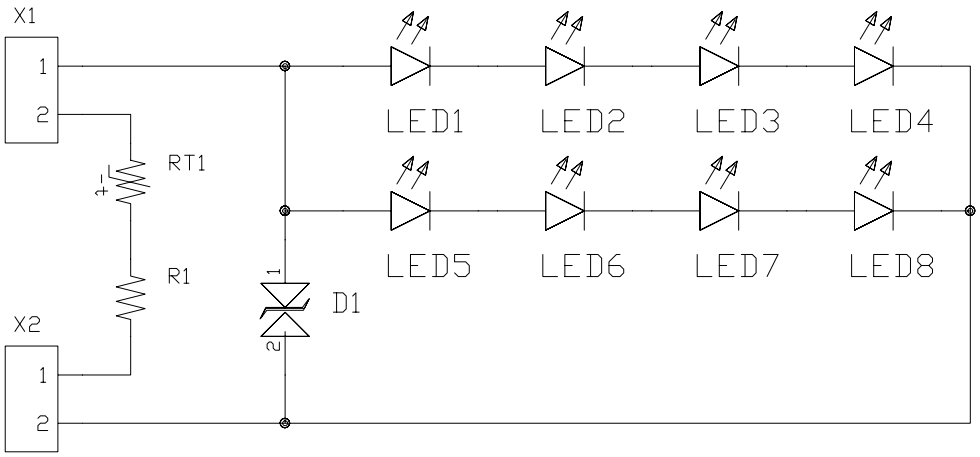


Figure 8. Electric circuit diagram for L213-xxxx008MDE001.

Table 7. Bill of Materials for L213-xxxx008MDE001.

COMPONENT	QUANTITY
LED: LUXEON 5050	8
PCB: MCPCB	1
2-pole Connectors	2
Thermistor 15kΩ	1
Resistor 2kΩ	1
Diode	1

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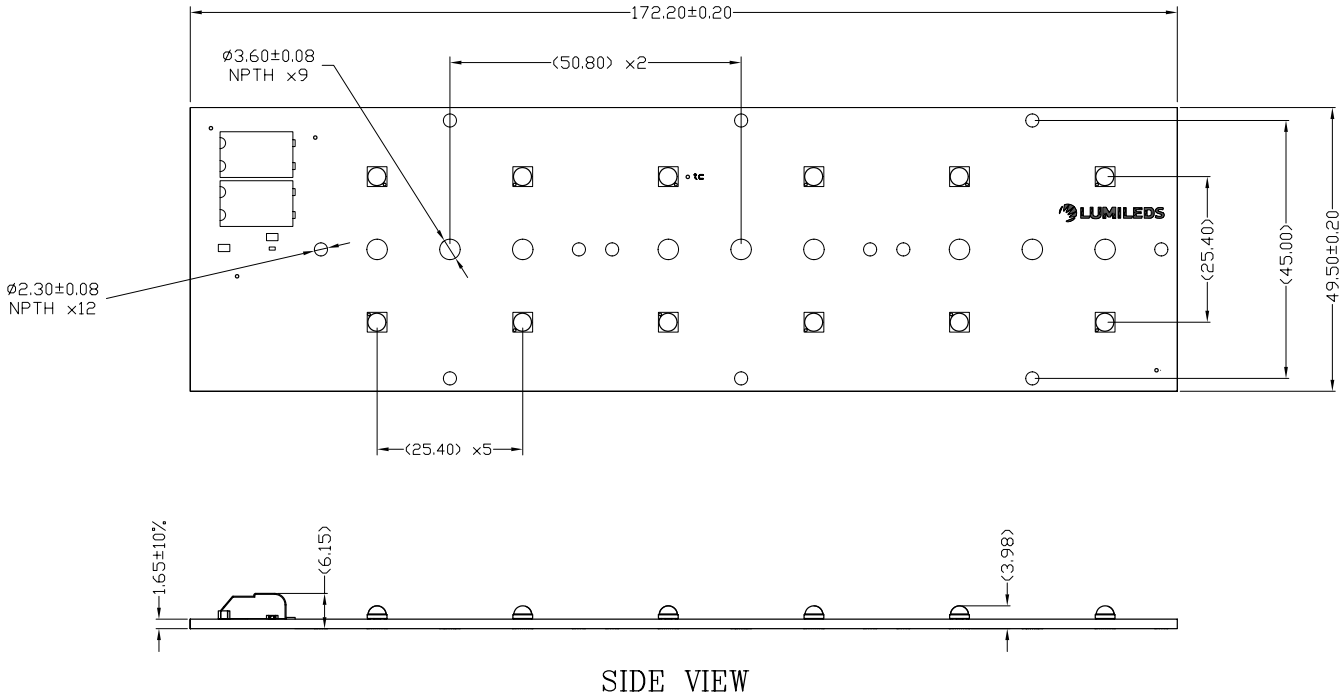


Figure 9. Mechanical dimensions for L213-xxxx012MDE001.

Notes for Figure 9:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

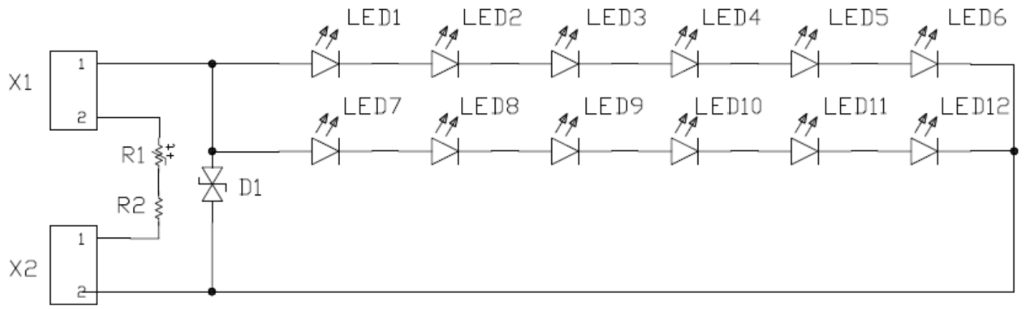


Figure 10. Electric circuit diagram for L213-xxxx012MDE001.

Table 8. Bill of Materials for L213-xxxx012MDE001.

COMPONENT	QUANTITY
LED: LUXEON 5050	12
PCB: MCPCB	1
2-pole Connectors	2
Thermistor 15kΩ	1
Resistor 2kΩ	1
Diode	1

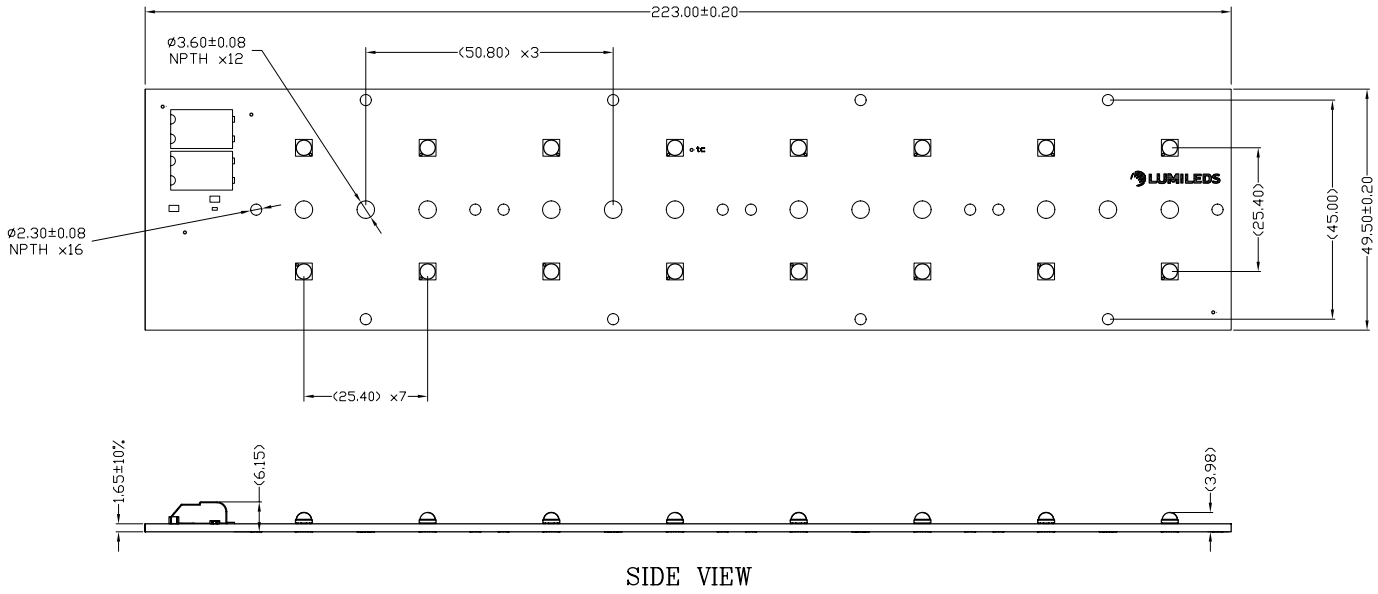


Figure 11. Mechanical dimensions for L213-xxxx016MDE001.

Notes for Figure 11:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

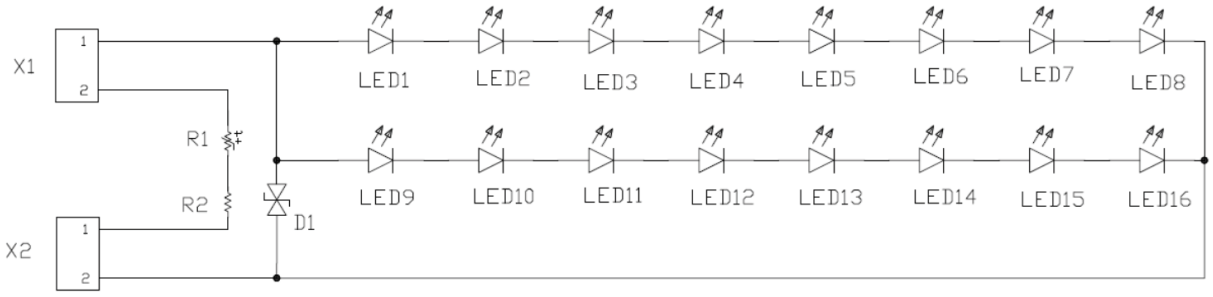


Figure 12. Electric circuit diagram for L213-xxxx016MDE001.

Table 9. Bill of Materials for L213-xxxx016MDE001.

COMPONENT	QUANTITY
LED: LUXEON 5050	16
PCB: MCPCB	1
2-pole Connectors	2
Thermistor 15kΩ	1
Resistor 2kΩ	1
Diode	1

Packaging Information

Table 10. Packing information for LUXEON XR-5050 Round.

PART NUMBER	QUANTITY PER TRAY	TRAY QUANTITY PER BOX	STANDARD PACKING INCREMENT, SPI	SHIPPING BOX DIMENSION, L x W x H (mm)
L213-xxxx008MDE001	20	5	80	398 x 390 x 100
L213-xxxx012MDE001	20	5	80	390 x 382 x 100
L213-xxxx016MDE001	20	5	80	587 x 387 x 100

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About Lumileds

Lumileds is a global leader in LED and microLED technology, innovation, and solutions for the automotive, display, illumination, mobile, and other markets where light sources are essential. Our approximately 3,500 employees operate in over 15 countries and partner with our customers to deliver never before possible solutions for lighting, safety, and well-being.

To learn more about our lighting solutions, visit lumileds.com.

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