LUXEON IR 2720 Line

High power infrared emitters optimized for cost conscious applications



LUXEON IR 2720 is a line of high power infrared emitters in a reliable package design, affirming long lifetime and robustness in many types of application conditions. The LUXEON IR 2720 Line uses an industry standard footprint for ease of integration and upgrades of existing system designs.

FEATURES AND BENEFITS

- Available in 850nm and 940nm wavelengths to provide optimized performance for each type of application
- Radiant Power: 1300 mW (850nm) and 1250 mW (940nm) for a greater system performance
- 2.75mm x 2.00mm package with a 2 pad configuration that is compatible with the industry standard footprint to enable a direct upgrade in existing designs

PRIMARY APPLICATIONS

- Surveillance / CCTV
- Machine Vision
- Biometric Identification

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General Product Information

Product Test Conditions

LUXEON IR 2720 Line emitters are tested and binned with a 20ms monopulse of 1000mA at a junction temperature, T_j, of 25°C.

Part Number Nomenclature

Part numbers for LUXEON IR 2720 follow the convention below:

L 1 I G – 0 **A A A** 0 0 0 0 0 0 0 0 0

Where:

A A A	–	designates nominal centroid wavelength
0 0 0 0 0 0 0 0 0	–	reserved for further customization

Therefore, the following part number is used for a LUXEON IR 2720 emitter with a nominal centroid wavelength of 850nm:

L 1 I G – 0 **8 5 0** 0 0 0 0 0 0 0 0 0

Radiometric Power 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 IR 2720 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 and optical characteristics of LUXEON IR 2720 Line at 1000mA, T_j=25°C.

TYPICAL FWHM BEAM ANGLE (°)	RADIOMETRIC POWER [1] (mW)		TYPICAL RADIANT INTENSITY (mW/sr)	PART NUMBER
	MINIMUM	TYPICAL		
120	1100	1300	425	L1IG-0850000000000
120	1000	1250	408	L1IG-0940000000000

Notes for Table 1:
1. Lumileds maintains a tolerance of ±7% on radiometric power measurements.

Spectral Characteristics

Table 2. Spectral characteristics of LUXEON IR 2720 Line at 1000mA, T_j=25°C.

PART NUMBER	CENTROID WAVELENGTH [1] (nm)	PEAK WAVELENGTH [1] (nm)	TYPICAL SPECTRUM FWHM [1] (nm)	TYPICAL TEMPERATURE COEFFICIENT OF PEAK WAVELENGTH [1] (nm/°C)
L1IG-0850000000000	850	860	28	0.27
L1IG-0940000000000	940	950	39	0.31

Notes for Table 2:
1. Lumileds maintains a tolerance of ±2nm on centroid, peak, and spectrum wavelength measurements.

Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

PART NUMBER	FORWARD VOLTAGE [1] (V_f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE [2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)	TYPICAL RISE TIME (ns)	TYPICAL FALL TIME (ns)
	MINIMUM	TYPICAL	MAXIMUM				
L1IG-0850000000000	3.00	3.35	3.7	-3	4	12	16
L1IG-0940000000000	2.90	3.35	3.6	-5	4	12	16

Notes for Table 3:
1. Lumileds maintains a tolerance of ±.1V on forward voltage measurements.
2. Measured between 25°C and 85°C.

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Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON IR 2720 Line.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current [1, 2]	1500mA
Peak Pulsed Forward Current [1, 3]	3000mA
Emitter Junction Temperature [1]	145°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	2kV
Operating Case Temperature [1]	-40°C to 105°C
Emitter Storage Temperature	-40°C to 105°C
SMD Process Classification Temperature	260°C per JEDEC J-STD-020E
Allowable Reflow Cycles	3
Reverse Voltage ($V_{reverse}$)	LUXEON IR LEDs are not designed to be driven in reverse bias

Notes for Table 4:
1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction 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. For pulse handling capability details see figure 8.

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Characteristic Curves

Spectral Power Distribution Characteristics

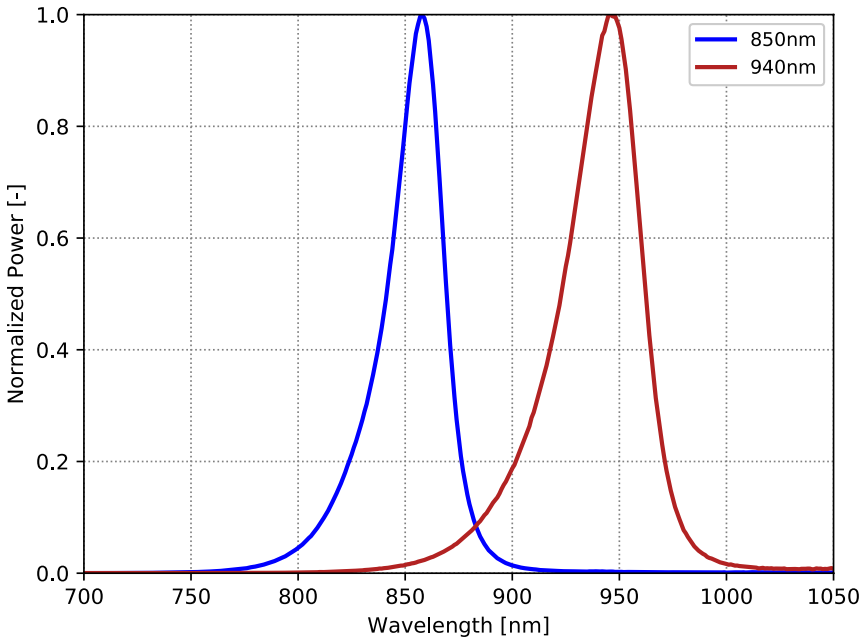


Figure 1. Typical normalized power vs. wavelength for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

Light Output Characteristics

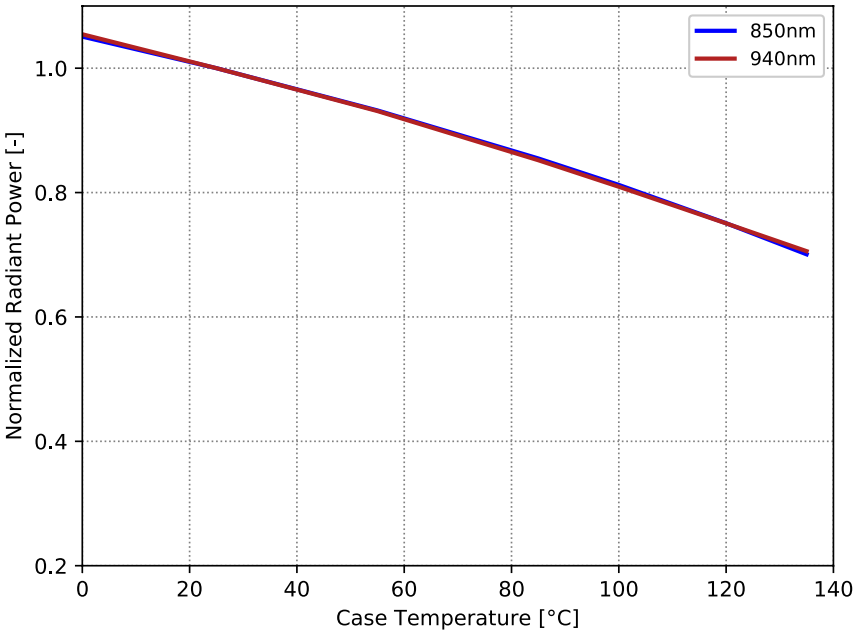


Figure 2. Typical normalized radiant power vs. case temperature for LUXEON IR 2720 Line at 1000mA.

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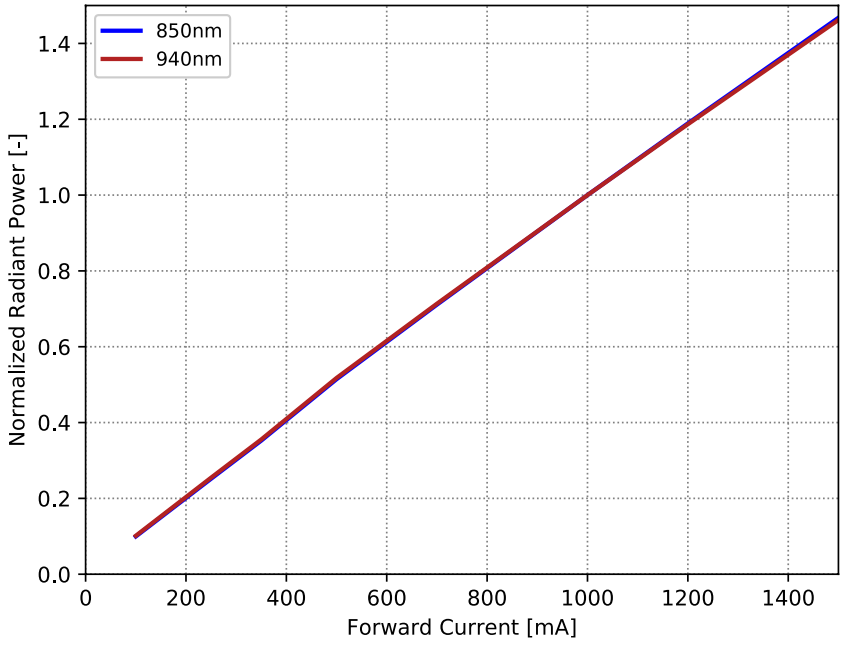


Figure 3. Typical normalized radiant power vs. forward current for LUXEON IR 2720 Line at T_j=25°C.

Forward Current Characteristics

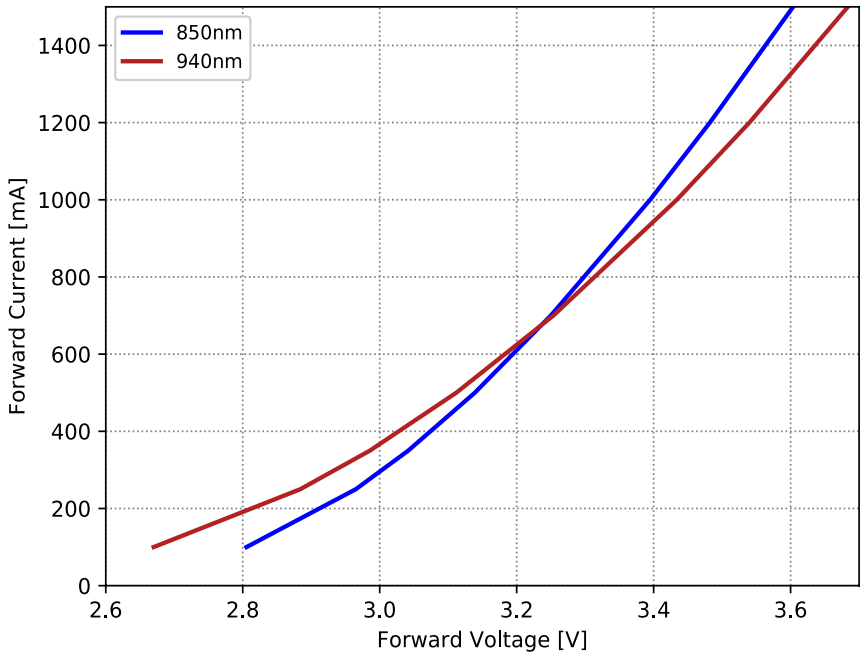


Figure 4. Typical forward current vs. forward voltage for LUXEON IR 2720 Line at T_j=25°C.

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Wavelength Shift Characteristics

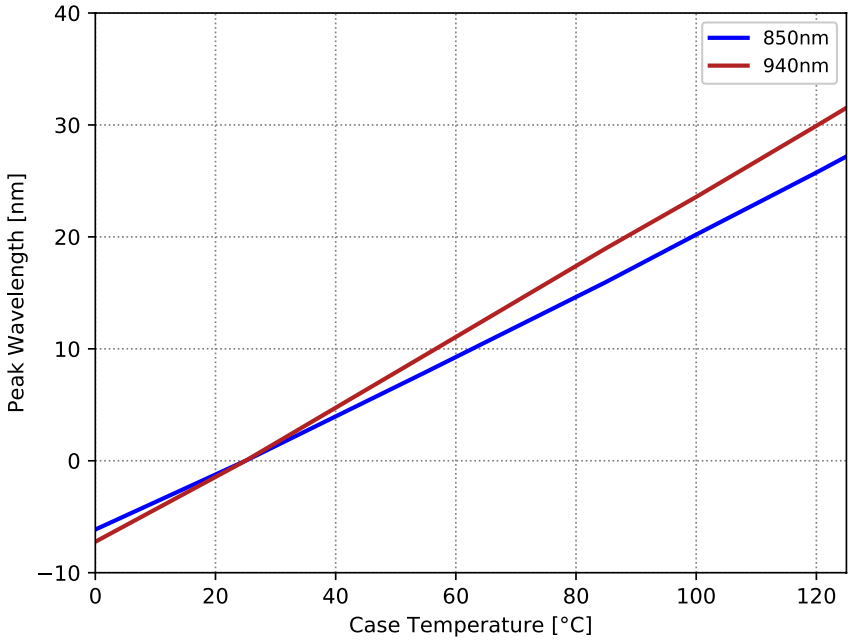


Figure 5. Typical peak wavelength shift vs. case temperature for LUXEON IR 2720 Line at 1000mA.

Radiation Pattern Characteristics

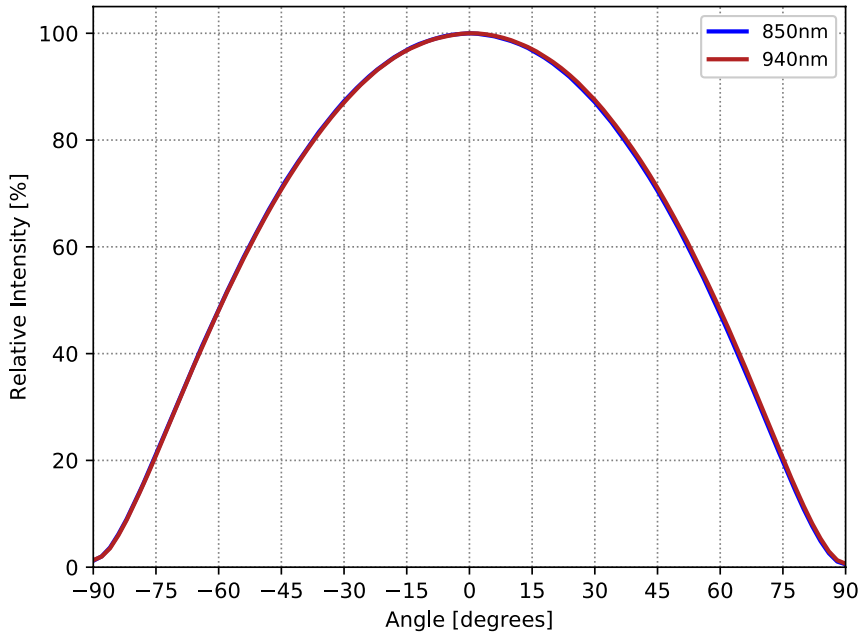


Figure 6. Typical radiation pattern for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

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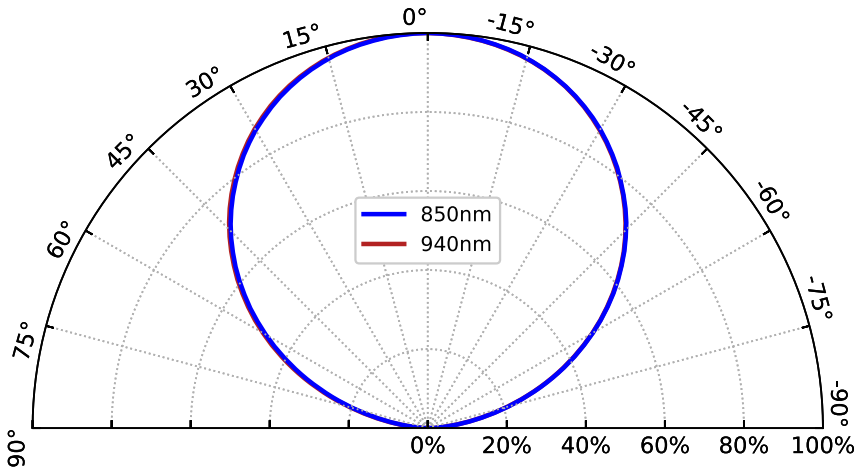


Figure 7. Typical polar radiation pattern for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

Permissible Pulse Handling Characteristics

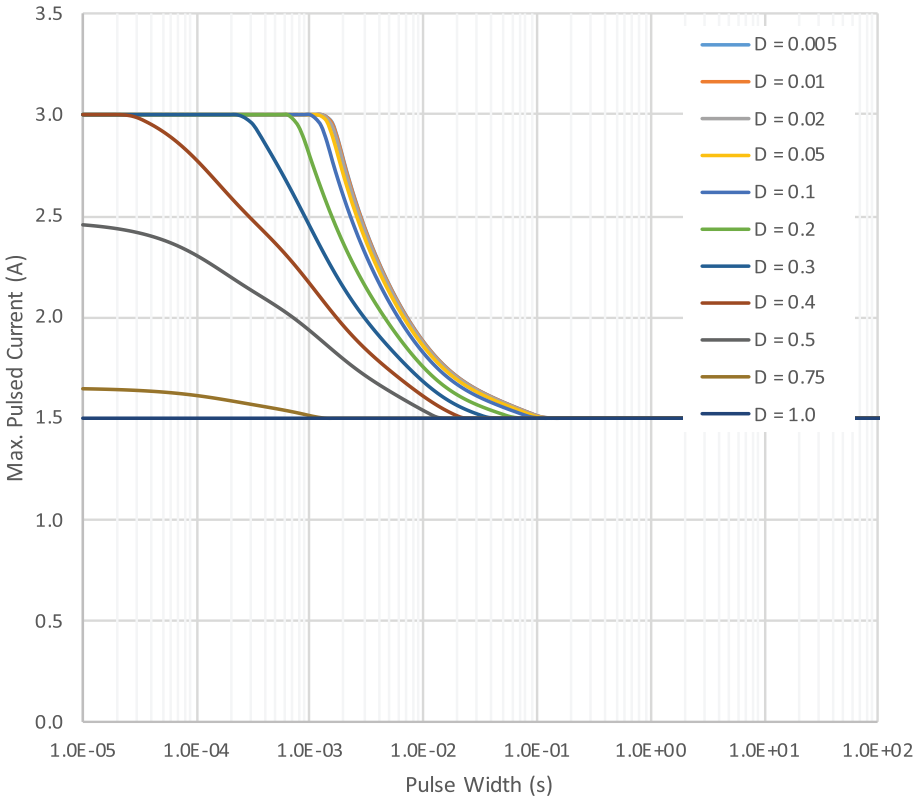


Figure 8. Permissible pulse handling capability for LUXEON IR 2720 Line at T_j=85°C for various dutycycles (D).

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Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON IR 2720 Line emitters are labeled using a 4-digit alphanumeric CAT code following the format below:

A B C D

Where:

- **A** – designates radiometric power bin (example: J=900 to 950mW, N=1200 to 1300mW)
- **B C** – designates peak wavelength bin (example: 8K=845nm to 850nm, 9H=935nm to 940nm)
- **D** – designates forward voltage bin (example: U=2.6 to 3.0V, V=3.0 to 3.4V)

Therefore, a LUXEON IR 2720 emitter with a radiometric power range of 1200 to 1300mW, peak wavelength range of 845 to 850nm and a forward voltage range of 2.6 to 3.0V has the following CAT code:

N 8 K U

Radiometric Power Bins

Table 4 lists the standard radiometric power bins for LUXEON IR 2720 Line emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 5. Radiometric power bin definitions for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

BIN	RADIOMETRIC POWER [1] (mW)	
	MINIMUM	MAXIMUM
G	800	850
H	850	900
J	900	950
K	950	1000
L	1000	1100
M	1100	1200
N	1200	1300
P	1300	1400
Q	1400	1500
R	1500	1600

Notes for Table 5:
1. Lumileds maintains a tolerance of ±7% on radiometric power measurements.

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Peak Wavelength Bins

Table 6. Peak wavelength bins for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

BIN	PEAK WAVELENGTH [1] (nm)	
	MINIMUM	MAXIMUM
8J	840	845
8K	845	850
8L	850	855
8M	855	860
8N	860	865
8P	865	870
8Q	870	875
9F	925	930
9G	930	935
9H	935	940
9J	940	945
9K	945	950
9L	950	955
9M	955	960
9N	960	965

Notes for Table 6:
1. Lumileds maintains a tolerance of ±2nm on peak wavelength measurements.

Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON IR 2720 Line at 1000mA, T_j=25°C.

BIN	FORWARD VOLTAGE [1] (V_f)	
	MINIMUM	MAXIMUM
U	2.6	3.0
V	3.0	3.4
W	3.4	3.8

Notes for Table 7:
1. Lumileds maintains a tolerance of ±0.1V on forward voltage measurements.

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Mechanical Dimensions

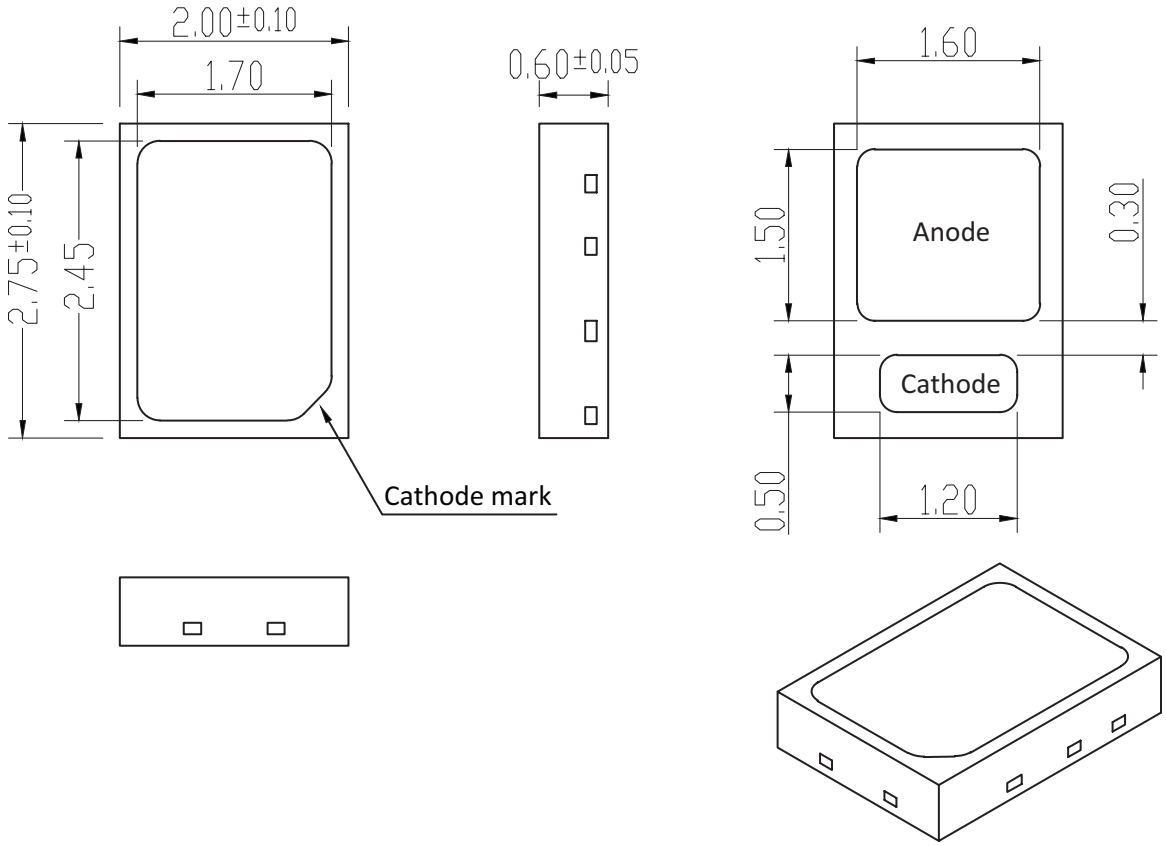


Figure 9. Mechanical dimensions for LUXEON IR 2720 Line.

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

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Reflow Soldering Guidelines

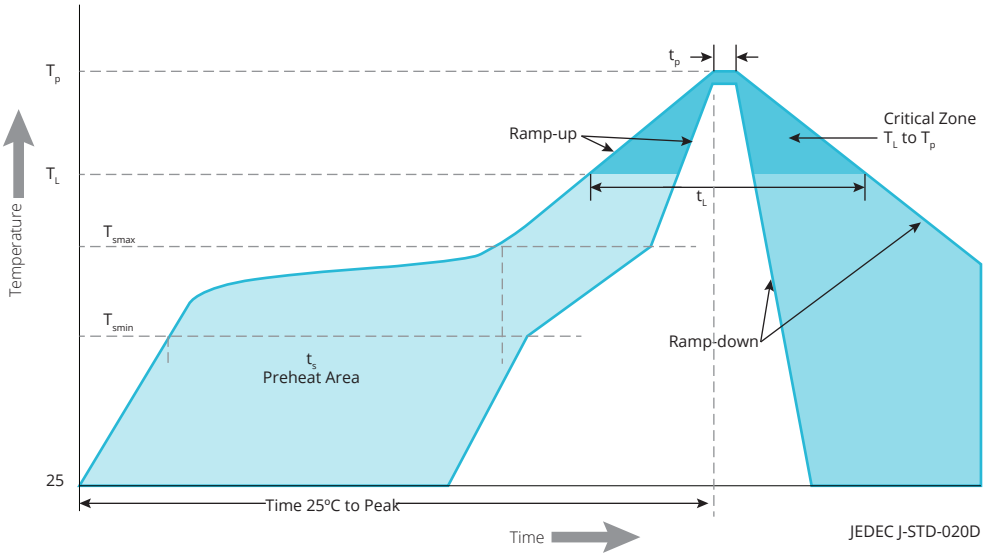


Figure 10. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON IR 2720 Line.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature (T_{smin})	150°C
Preheat Maximum Temperature (T_{smax})	200°C
Preheat Time (t_{smin} to t_{smax})	120 seconds
Ramp-Up Rate (T_L to T_p)	3°C / second maximum
Liquidus Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	150 seconds
Peak / Classification Temperature (T_p)	260°C
Time Within 5°C of Actual Temperature (t_p)	10 to 30 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON IR 2720 Line.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
2	1 Year	≤30°C / 60% RH	168 Hours +5 / -0	85°C / 60% RH

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Solder Pad Design

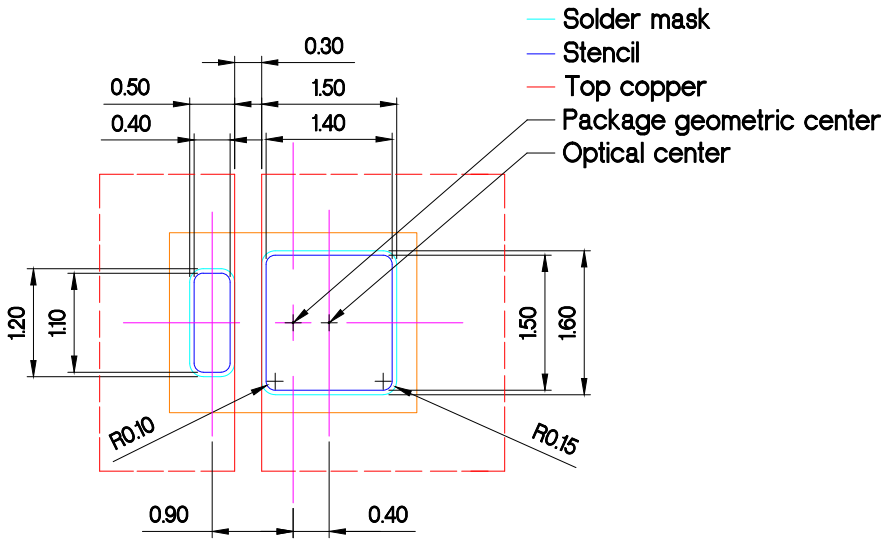


Figure 11. Recommended PCB solder pad layout for LUXEON IR 2720 Line.

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

Packaging Information

Pocket Tape Dimensions

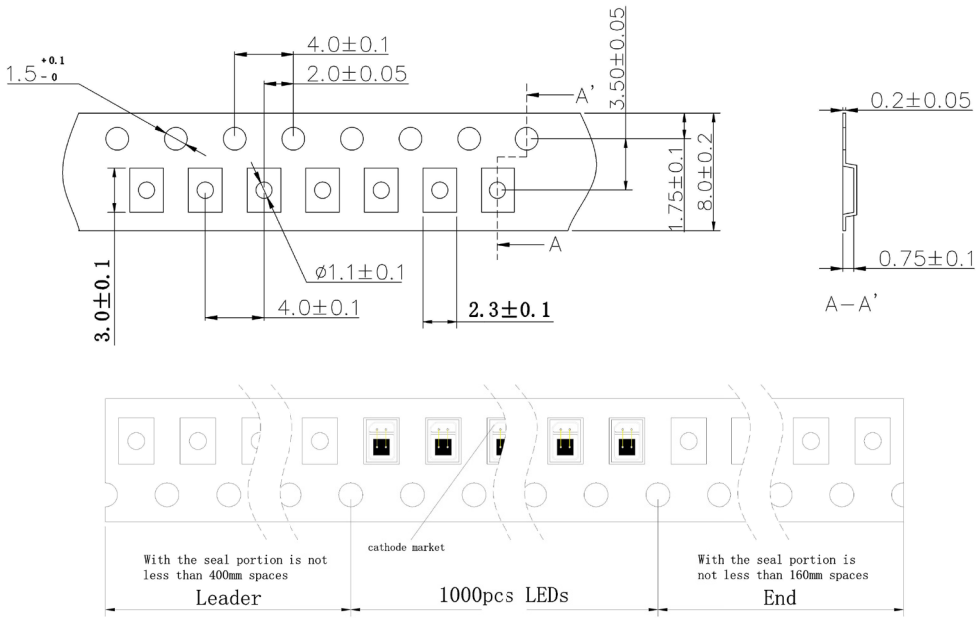


Figure 12. Pocket tape dimensions for LUXEON IR 2720 Line.

Notes for Figure 12:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

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Reel Dimensions

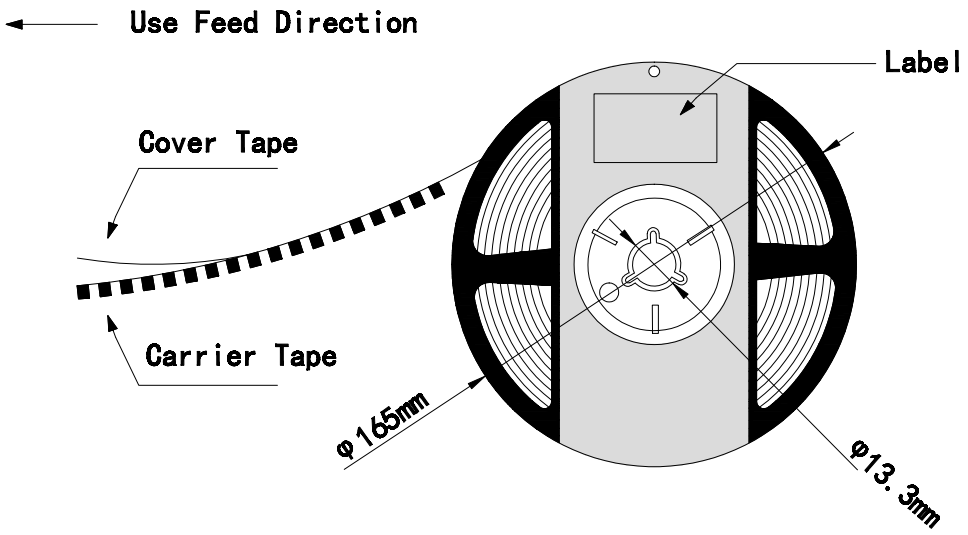


Figure 13. Reel dimensions for LUXEON IR 2720 Line.

Notes for Figure 13:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

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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.

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