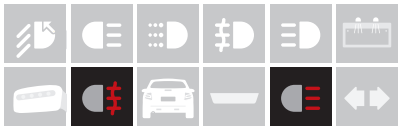
LUMILEDS

AUTOMOTIVE



LUXEON Versat 3030 HP 200

Brightest, lambertian flat top emitter



LUXEON Versat 3030 HP 200 is developed to enable maximum hot lumen on standard FR4 boards. It has lower thermal resistance than competitive packages in the market. It comes in an industry standard 3030 SMD package to provide easy handling and optimum protection of the die.

LUXEON Versat 3030 HP 200 is available in the following color wavelengths:

- Red Orange (615nm)
- Red (623nm)

FEATURES AND BENEFITS

- Low thermal resistance and power consumption results in simplified thermal management and system cost
- Lambertian flat top emitter
- High flux output provides flexibility in styling and optical design
- Higher drive current capability for increased flux performance

PRIMARY APPLICATIONS

- Rear Fog
- Stop/Tail

DS228 LUXEON Versat 3030 HP 200 Product Datasheet ©2019 Lumileds Holding B.V. All rights reserved.

Table of Contents

General Product Information 2
- Product Test Conditions 2
- Part Number Nomenclature 2
- Environmental Compliance 2

Performance Characteristics 3
- Product Selection Guide 3
- Optical Characteristics 3
- Electrical and Thermal Characteristics 3
- Absolute Ratings 4
- JEDEC Moisture Sensitivity 4

Characteristic Curves 5
- Spectral Power Distribution Characteristics 5
- Light Output Characteristics 6
- Forward Current and Voltage Characteristics 7
- Radiation Pattern Characteristics 8
- Operating Limits Characteristics 8

Product Bin and Labeling Definitions 9
- Designing with LUXEON Versat 3030 HP 200 9
- Decoding Product Bin Labeling 9
- Luminous Flux Bins 9
- Color Codes 10
- Forward Voltage Bins 10

Mechanical Dimensions 10

Reflow Soldering Guidelines 11

Packaging Information 12
- Pocket Tape Dimensions 12
- Reel Dimensions 12

 ©2019 Lumileds Holding B.V. All rights reserved.

General Product Information

Product Test Conditions

LUXEON Versat 3030 HP 200 LEDs are tested and binned using a 20ms monopulse (MP) at 200mA drive current, case temperature, T_c, of 25°C.

Part Number Nomenclature

Part numbers for LUXEON Versat 3030 HP 200 follow the convention below:

A 1 V A – **A B C D E F G H J K M N P**

Where:

A	–	designates product segment (A=Automotive)
1	–	designates product level (1=Level 1)
V	–	designates product line/family (V=LUXEON Versat)
A	–	designates package generation (A=High Performance)
A B C D	–	designates color variant (O612=612nm minimum, R620=620nm minimum)
E	–	designates binning current (A=200mA)
F	–	designates binning configuration (1=single binning)
G	–	open space (0=standard part)
H	–	designates minimum luminous flux (refer to luminous flux bins)
J	–	designates maximum luminous flux (refer to luminous flux bins)
K	–	designates minimum forward voltage (refer to forward voltage bins)
M	–	designates maximum forward voltage (refer to forward voltage bins)
N P	–	reserved for custom part numbers (00=standard part)

Therefore, the following part number is used for a LUXEON Versat 200 Red-Orange with a luminous flux range of 36 lumens to 62 lumens, and a forward voltage range of 2.00–2.60 volts:

A 1 V A – **O 6 1 2 A 1 0 F H A D 0 0**

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON Versat 3030 HP 200 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).

 ©2019 Lumileds Holding B.V. All rights reserved.

Performance Characteristics

Product Selection Guide

Table 1. Product selection for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA, T_c=25°C.

COLOR	DOMINANT WAVELENGTH [1,2] (nm)	PART NUMBER
Red Orange	615	A1VA-O612A10
Red	623	A1VA-R620A10

Notes for Table 1:
1. Dominant wavelength is derived from the CIE 1931 Chromaticity diagram and represents perceived color.
2. Lumileds maintains a tolerance of ±1nm for dominant wavelength measurements.

Optical Characteristics

Table 2. Typical optical characteristics for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA, T_c=25°C.

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE [1] $\theta_{0.90V}$	TYPICAL VIEWING ANGLE [2] $2\theta_{1/2}$
A1VA-xxxxA10	138°	120°

Notes for Table 2:
1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

Electrical and Thermal Characteristics

Table 3. Typical electrical and thermal characteristics for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA T_c=25°C.

PARAMETER	PERFORMANCE
Forward Voltage, V_f	2.2V
Electrical Thermal Resistance, $R_{th\ j\text{-}c\ electr}$ [1] (Maximum)	15°C/W
Real Thermal Resistance, $R_{th\ j\text{-}c\ real}$ [2] (Maximum)	20.5°C/W
Temperature Coefficient of V_f, TC_v I_f = 200mA, 10°C ≤ T_c ≤ 110°C	-3.5 mV/°C

Notes for Table 3:
1. $R_{th\ j\text{-}c\ electr}$: Electrical thermal resistance (junction to case).
2. $R_{th\ j\text{-}c\ real}$: Real thermal resistance (junction to case) with wall plug efficiency included. Reference JESD51-51, JESD51-14, 4.1.3.
3. All values are typical unless otherwise stated.

 ©2019 Lumileds Holding B.V. All rights reserved.

Absolute Ratings

Table 4. Absolute ratings for LUXEON Versat 3030 HP 200.

PARAMETER	PERFORMANCE
Minimum DC Forward Current	10mA
Maximum DC Forward Current	300mA
Maximum Junction Temperature [1]	150°C
Operating Case Temperature at Test Current [1]	-40 to 135°C
LED Storage Temperature	-40 to 135°C
Soldering Temperature	JEDEC 020c 260°C
Allowable Reflow Cycles	3
Minimum ESD Sensitivity [2]	8kV HBM, 400V MM
Reverse Voltage ($V_{reverse}$)	-15V

Notes for Table 4:
1. Proper current derating must be observed to maintain junction temperature below the maximum, so that the LED is maintained below the maximum rated operating case temperature. LUXEON Versat 3030 700 LEDs driven at or above the maximum rated operating case temperature may have shorter lifetime.
2. Measured using human body model (per ANSI/ESDA/JEDEC JS-001-2010) and charged device model (per JESD22-C101F).

JEDEC Moisture Sensitivity

Table 5. Moisture sensitivity levels for LUXEON Versat 3030 HP 200.

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

 ©2019 Lumileds Holding B.V. All rights reserved.

Characteristic Curves

Spectral Power Distribution Characteristics

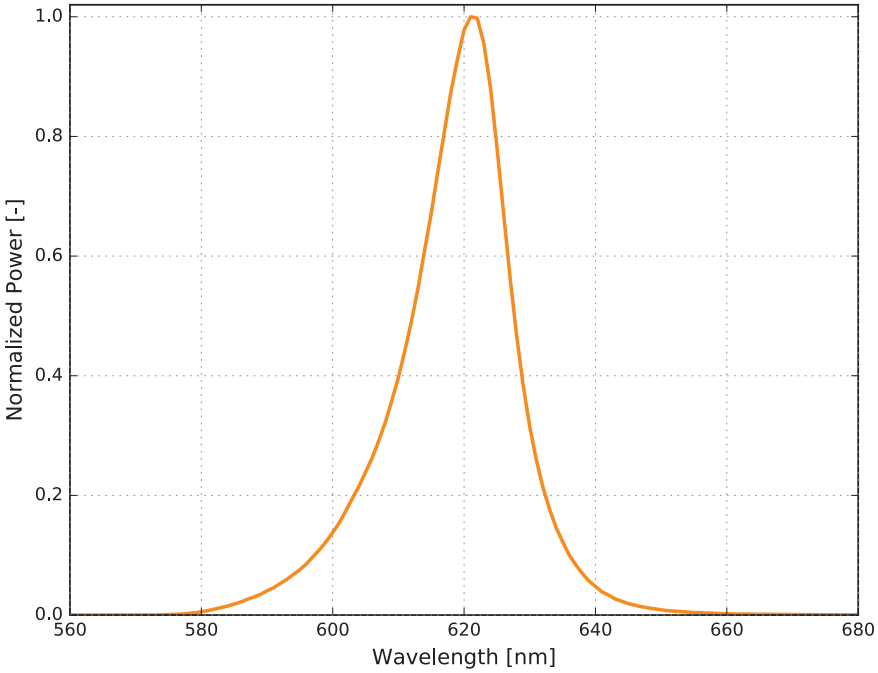


Figure 1. Typical normalized power vs. wavelength for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA, T_c=25°C.

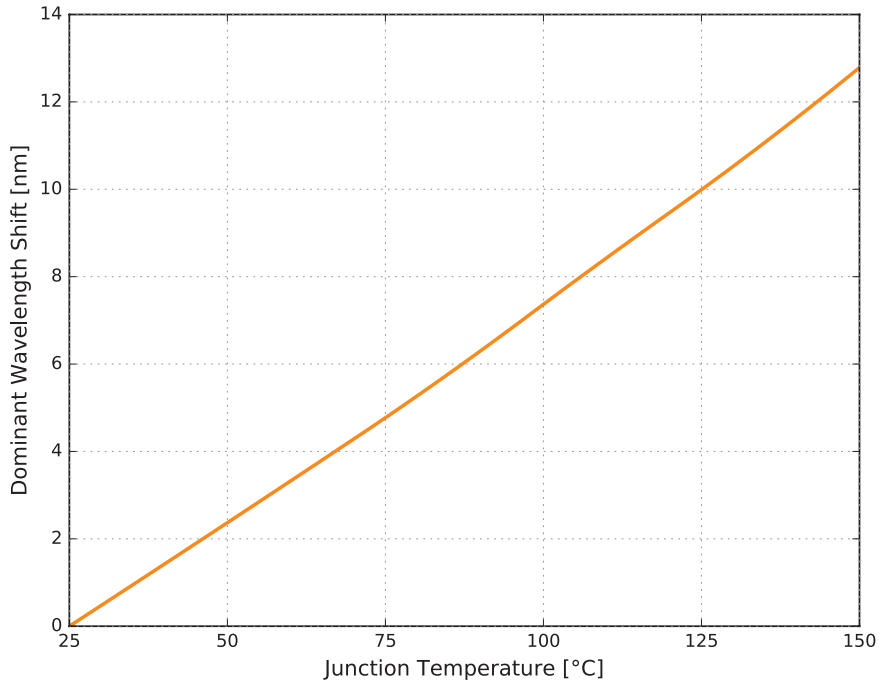


Figure 2. Typical wavelength shift vs. junction temperature for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA.

 ©2019 Lumileds Holding B.V. All rights reserved.

Light Output Characteristics

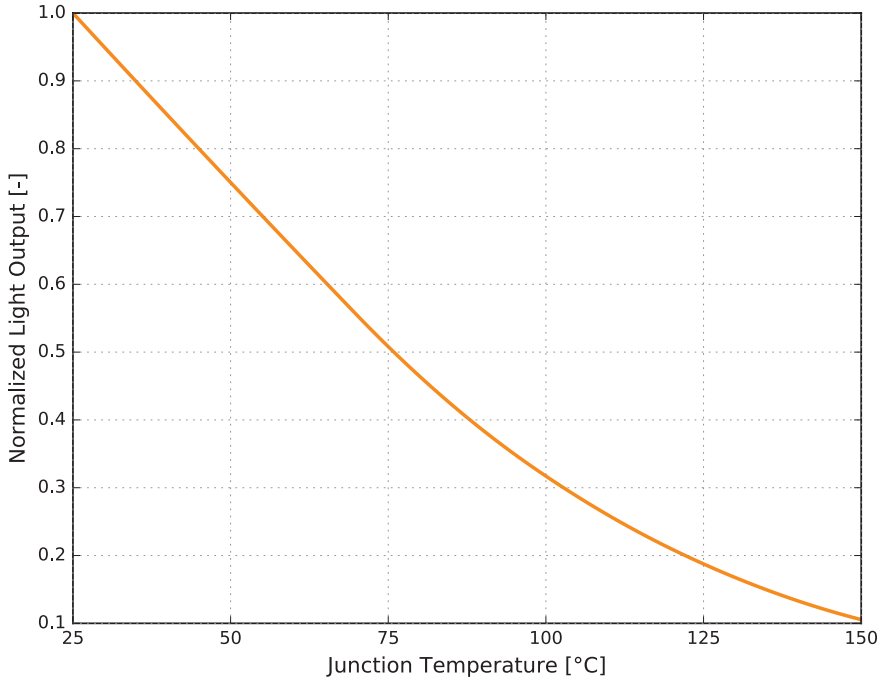


Figure 3. Typical normalized light output vs. junction temperature for LUXEON Versat 3030 HP 200 20ms MP, 200mA.

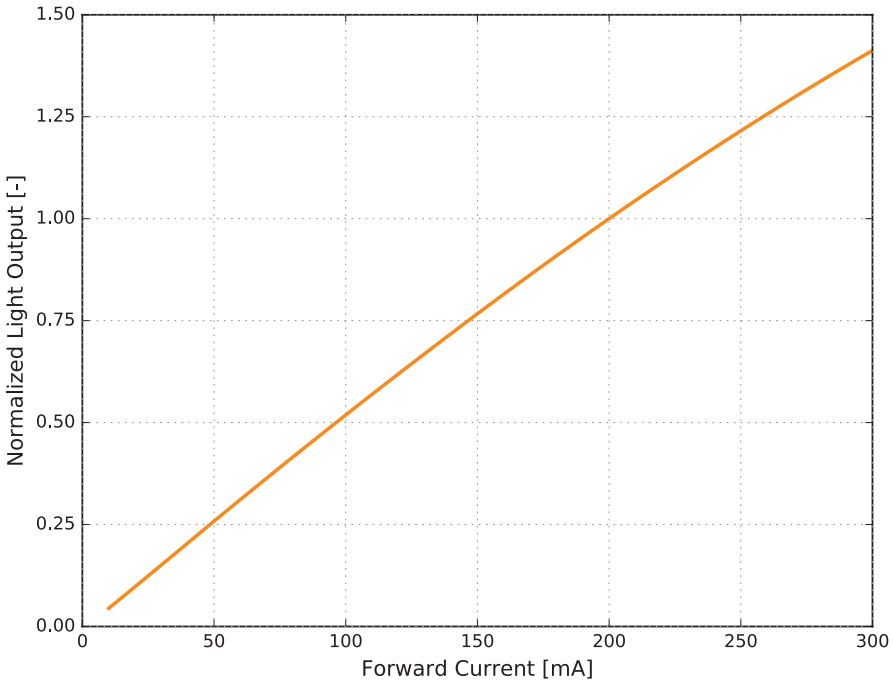


Figure 4. Typical normalized light output vs. forward current for LUXEON Versat 3030 HP 200 at T_c=25°C.

 ©2019 Lumileds Holding B.V. All rights reserved.

Forward Current and Voltage Characteristics

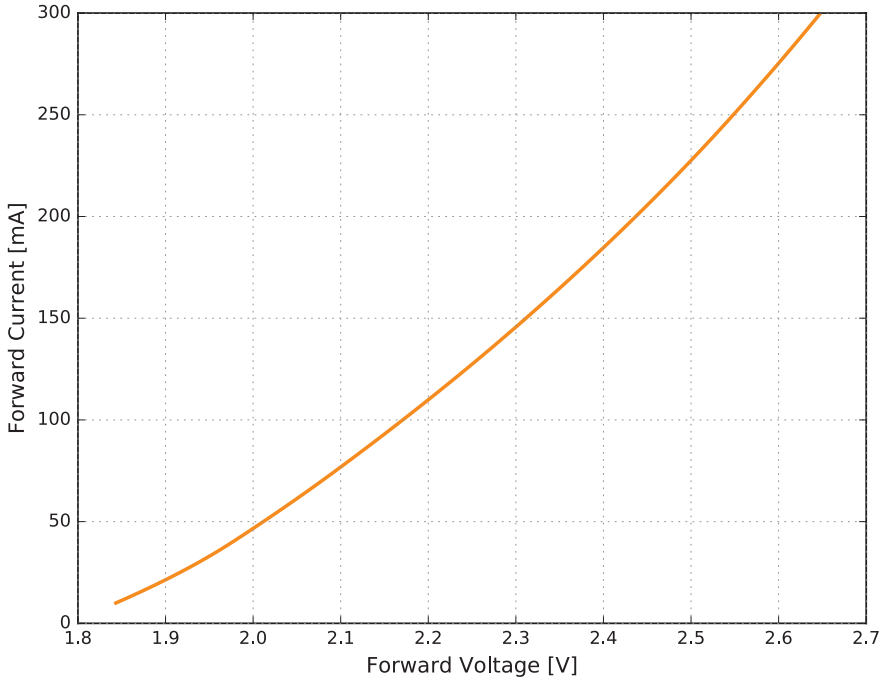


Figure 5. Typical forward current vs. forward voltage for LUXEON Versat 3030 HP 200 at T_c=25°C.

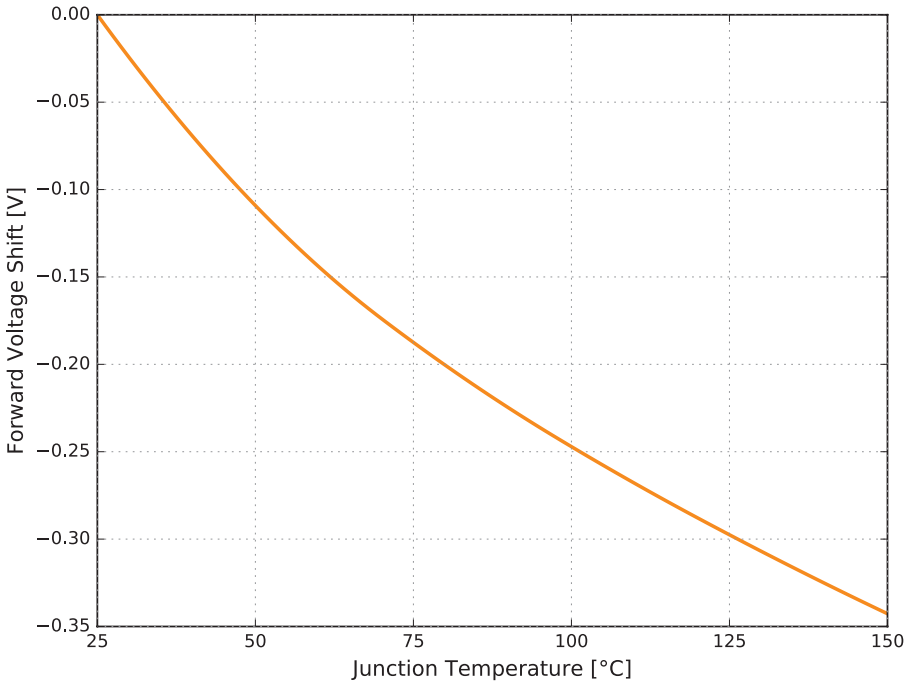


Figure 6. Typical forward voltage shift vs. junction temperature for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA.

 ©2019 Lumileds Holding B.V. All rights reserved.

Radiation Pattern Characteristics

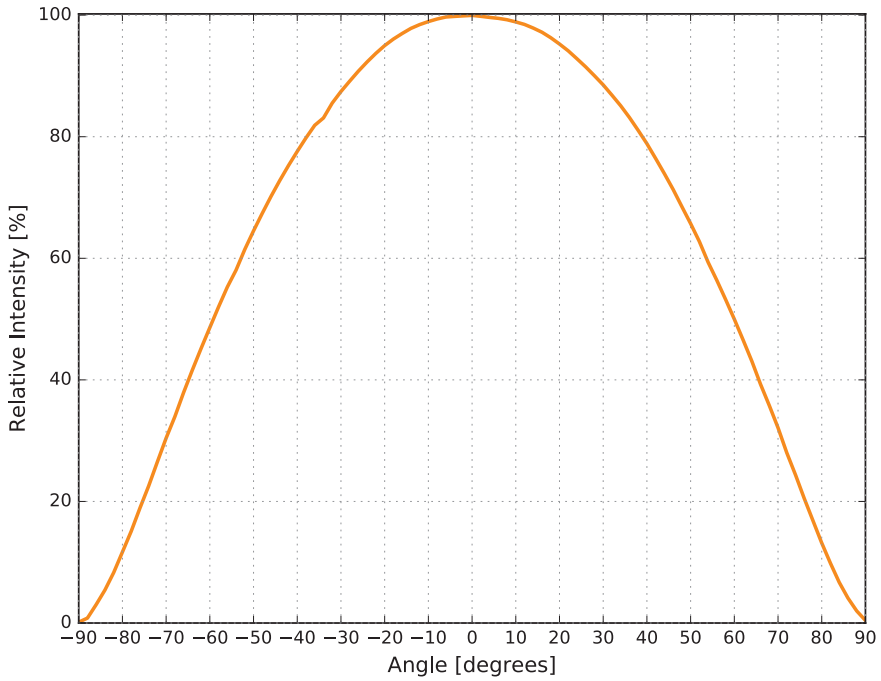


Figure 7. Typical radiation pattern for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA.

Operating Limits Characteristics

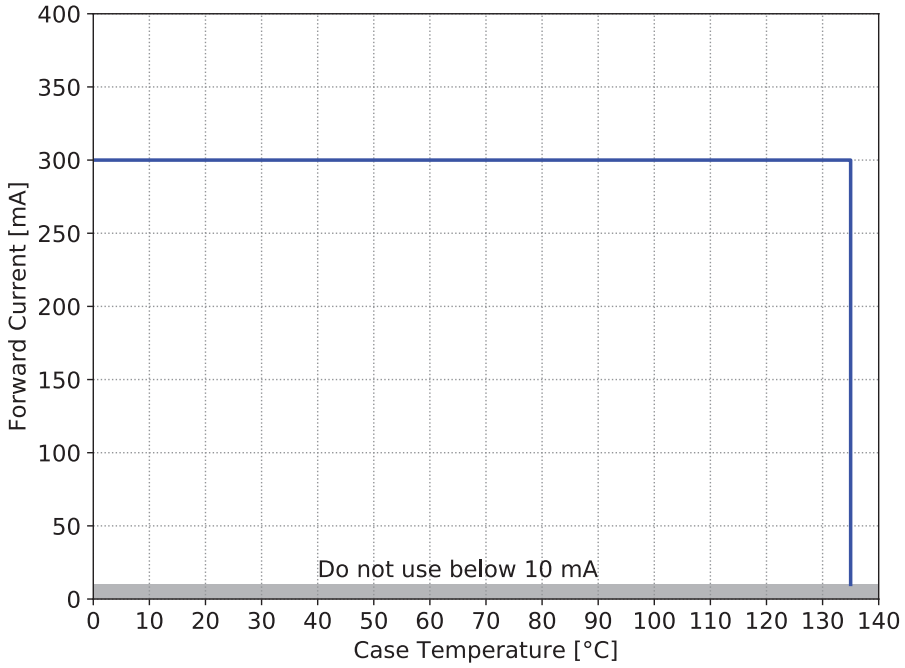


Figure 8: Maximum forward current vs. case temperature for LUXEON Versat 3030 HP 200.

 ©2019 Lumileds Holding B.V. All rights reserved.

Product Bin and Labeling Definitions

Designing with LUXEON Versat 3030 HP 200

Flux bins supportable for car programs depend on product color and program start-of-production and end-of-production dates. Flux roadmaps by year and product color are maintained and available from the sales representative. Please contact a local sales representative to request the flux bin range with best supportability for program timing.

Decoding Product Bin Labeling

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

LUXEON Versat 3030 HP 200 LEDs are labeled using a 3-digit alphanumeric CAT code following the format below:

A B C

Where:

A – designates luminous flux bin (example: J=62 lumens to 75 lumens)

B – designates color code (example: 3=612nm to 620nm)

C – designates forward voltage bin (example: A=2.00V to 2.15V)

Therefore, a LUXEON Versat 3030 HP 200 with a lumen range of 36 to 43, color code of 3 and a forward voltage of 2.00 to 2.15 has the following CAT code:

F 3 A

Luminous Flux Bins

Table 6 lists the standard luminous flux bins for LUXEON Versat 3030 HP 200 emitters. Product availability in a particular bin varies by color and platform start-of-production date. Contact your local sales representative for best supportability of programs.

Table 6. Luminous flux bin definitions for LUXEON Versat 3030 HP 200 at 20ms MP, T_c=25°C.

BIN	LUMINOUS FLUX [1] (lm)	
	MINIMUM	MAXIMUM
C	21	25
D	25	30
E	30	36
F	36	43
G	43	52
H	52	62
J	62	75
K	75	90

Notes for Table 6:
1. Lumileds maintains a tolerance of ±6.5% on luminous flux measurements.

 ©2019 Lumileds Holding B.V. All rights reserved.

Color Codes

Table 7. Color code definitions for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA, T_c=25°C.

CODE	DOMINANT WAVELENGTH [1] (nm)	
	MINIMUM	MAXIMUM
3	612	620
6	620	627

Notes for Table 7:
1. Lumileds maintains a tolerance of ±0.5nm on dominant wavelength measurements.

Forward Voltage Bins

Table 8. Forward voltage bin definitions for LUXEON Versat 3030 HP 200 at 20ms MP, 200mA, T_c=25°C.

BIN	FORWARD VOLTAGE [1] (V_f)	
	MINIMUM	MAXIMUM
A	2.00	2.15
B	2.15	2.30
C	2.30	2.45
D	2.45	2.60

Notes for Table 8:
1. Lumileds maintains a tolerance of ±0.06V on forward voltage measurements.

Mechanical Dimensions

Notes for Figure 9:
1. Drawings are not to scale.

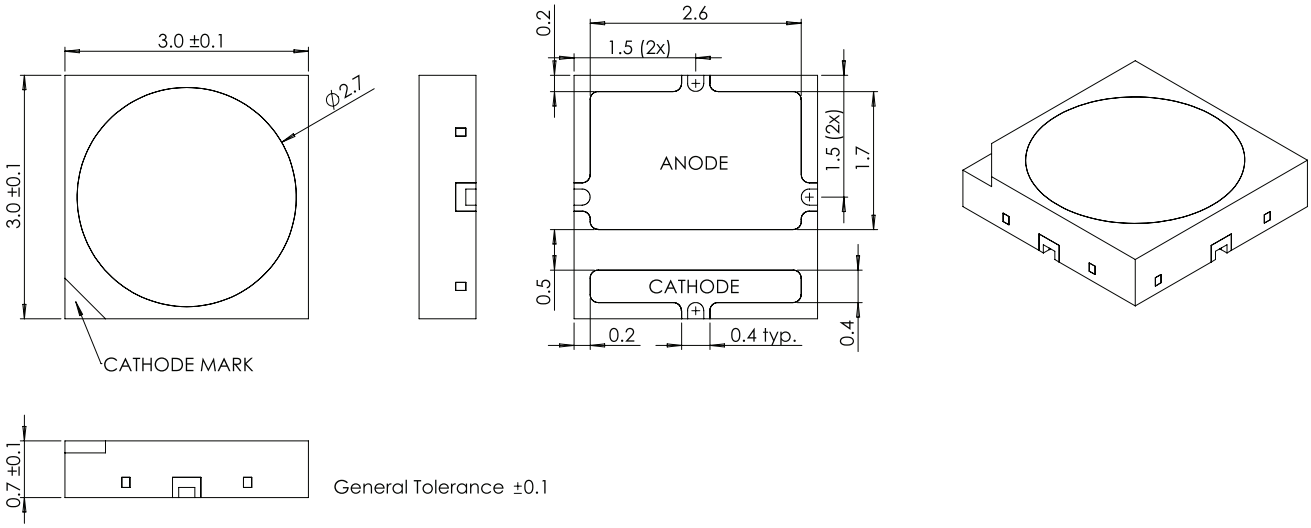


Figure 9. Mechanical dimensions for LUXEON Versat 3030 HP 200.

2. All dimensions are in millimeters.

 ©2019 Lumileds Holding B.V. All rights reserved.

Reflow Soldering Guidelines

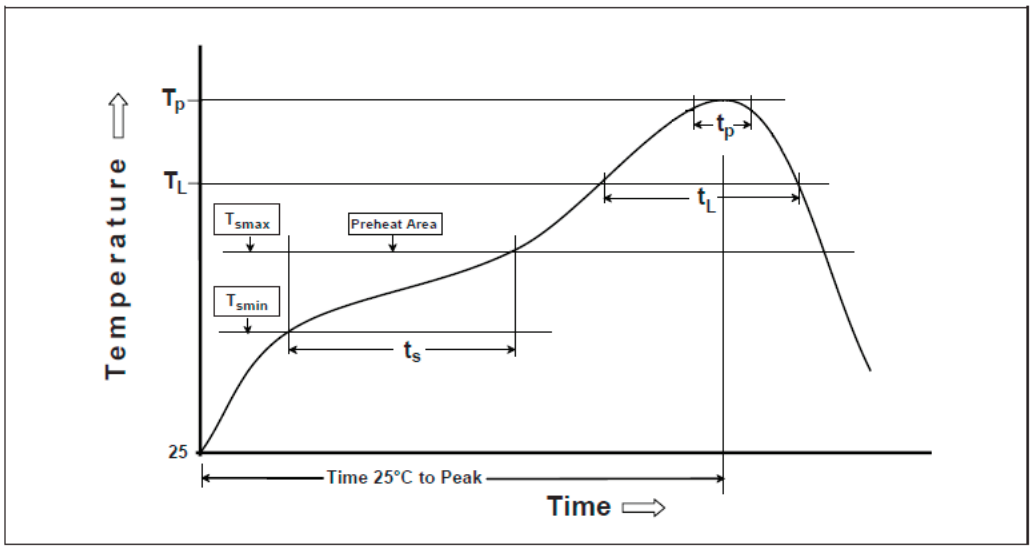


Figure 10. Visualization of the acceptable reflow temperature profile as specified in Table 9.

Table 9. Reflow profile characteristics for LUXEON Versat 3030 700.

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})	60 to 180 seconds
Ramp-Up Rate (T_L to T_p)	3°C / second maximum
Liquidous Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	60 to 150 seconds
Peak / Classification Temperature (T_p)	260°C
Time Within 5°C of Actual Peak Temperature (t_p)	20 to 40 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

Notes for Table 9:
1. All temperatures refer to the application Printed Circuit Board (PCB), measured on the surface adjacent to the package body.

 ©2019 Lumileds Holding B.V. All rights reserved.

Packaging Information

Pocket Tape Dimensions

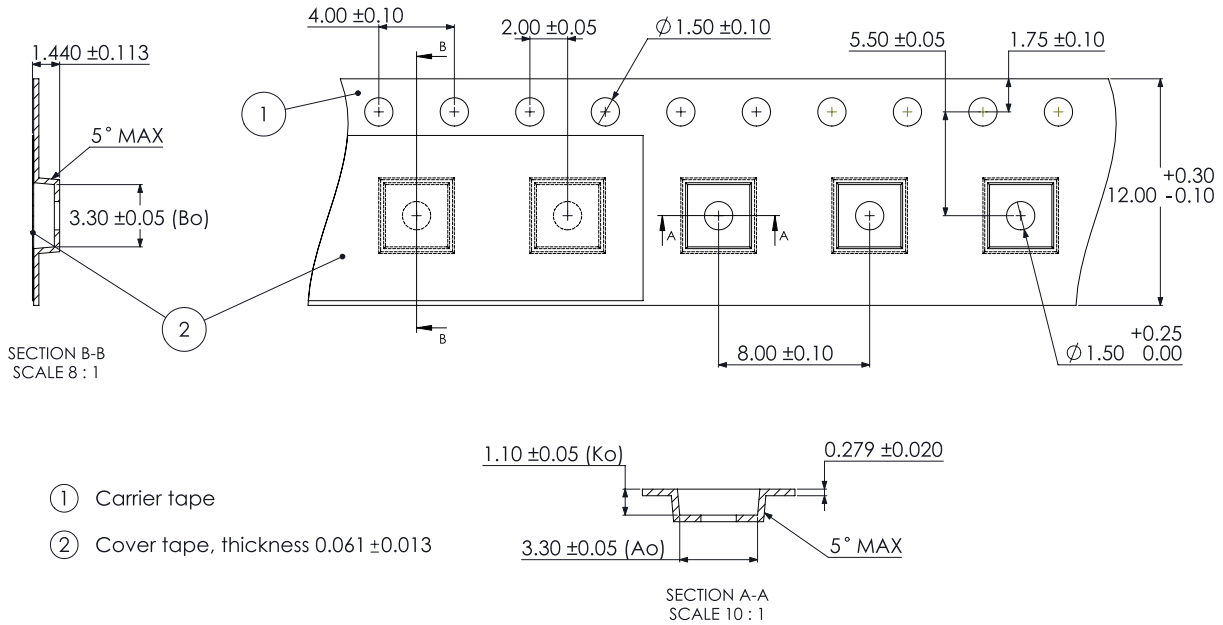


Figure 11. Pocket tape dimensions for LUXEON Versat 3030 HP 200.

Notes for Figure 11:
1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Ao is the width of pocket, Ko is the depth of pocket, and Bo is the height of pocket.

Reel Dimensions

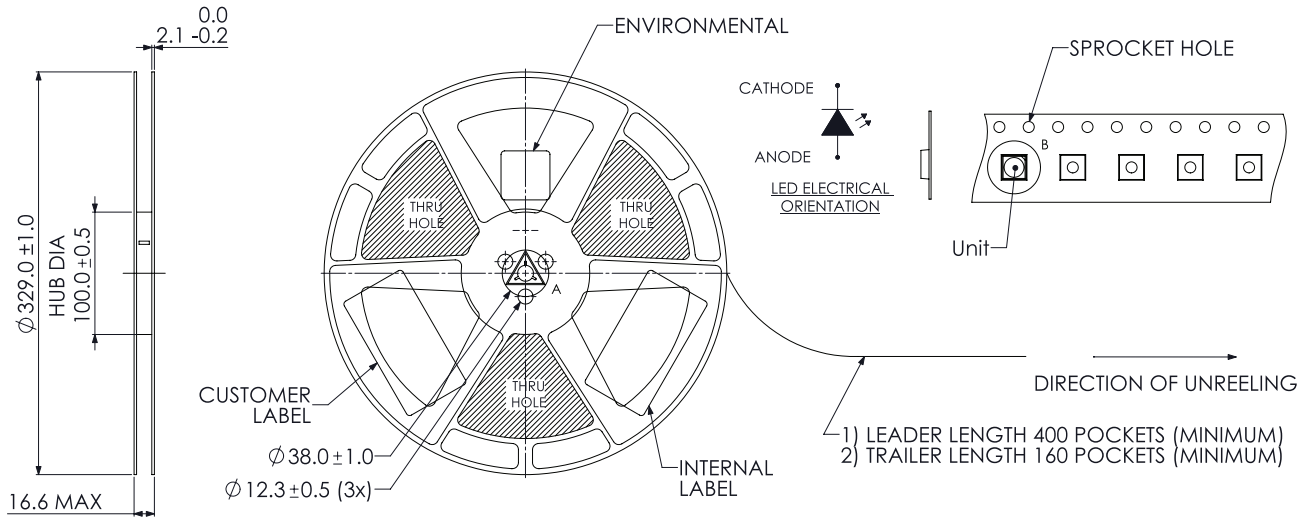


Figure 12. Reel dimensions for LUXEON Versat 3030 HP 200.

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

 ©2019 Lumileds Holding B.V. All rights reserved.

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 safer, better and more beautiful—with light.

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

LUMILEDS

©2019 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

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. A listing of Lumileds product/patent coverage may be accessed at lumileds.com/patents.