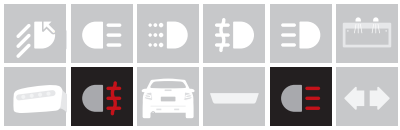
LUMILEDS

AUTOMOTIVE



LUXEON Versat 3030 HP 350

Brightest, lambertian flat top emitter

LUXEON Versat 3030 HP 350 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 350 is available in the following color wavelengths:

- Red Orange (615 nm)
- Red (623 nm)
- Long Red (630 nm)
- Super Red (635 nm)

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

Table of Contents

General Product Information

Product Test Conditions

LUXEON Versat 3030 HP 350 LEDs are tested and binned using a 20 ms monopulse (MP) at 350 mA drive current, case temperature, T_c, of 25 °C.

Part Number Nomenclature

Part numbers for LUXEON Versat 3030 HP 350 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 = 612 nm minimum, R620 = 620 nm minimum, S627 = 627 nm minimum, S632 = 632 nm minimum)
E	–	designates binning current (D = 350 mA)
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 350 Red-Orange with 612nm minimum wavelenght, a luminous flux range of 60 lumens to 90 lumens, and a forward voltage range of 2.00 volts to 2.60 volts:

A 1 V A – **O 6 1 2 D 1 0 J L 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 350 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 selection for LUXEON Versat 3030 HP 350 at 20 ms MP,350 mA, T_c = 25 °C

COLOR	DOMINANT WAVELENGTH [1,2] (nm)	PART NUMBER
Red Orange	615	A1VA-O612D10
Red	623	A1VA-R620D10
Long Red	630	A1VA-S627D10
Super Red	635	A1VA-S632D10

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 350 at 20 ms MP,350 mA, T_c = 25 °C

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE [1] $\theta_{0.90V}$	TYPICAL VIEWING ANGLE [2] $2\theta_{1/2}$
A1VA-xxxxD10xxxxxx	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 350 at 20 ms MP, 350 mA T_c = 25 °C

PART NUMBER	FORWARD VOLTAGE (V)		THERMAL RESISTANCE— JUNCTION TO CASE (°C/W)			
			$R\theta_{j\text{-}c}$ el [1]		$R\theta_{j\text{-}c}$ real [2]	
	MINIMUM	MAXIMUM	TYPICAL	MAXIMUM	TYPICAL	MAXIMUM
A1VA-xxxxD10xxxxxx	2.00	2.60	5.5	7.68	7.6	10.6

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.
4. The Max Rth values are calculated (3σ).

Absolute Ratings

Table 4. Absolute ratings for LUXEON Versat 3030 HP 350

PARAMETER	PERFORMANCE
Minimum DC Forward Current	20 mA
Maximum DC Forward Current	500 mA
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]	8 kV HBM, 400 V MM
Reverse Voltage ($V_{reverse}$)	-15 V

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 HP 350 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 350

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

Characteristic Curves

Spectral Power Distribution Characteristics

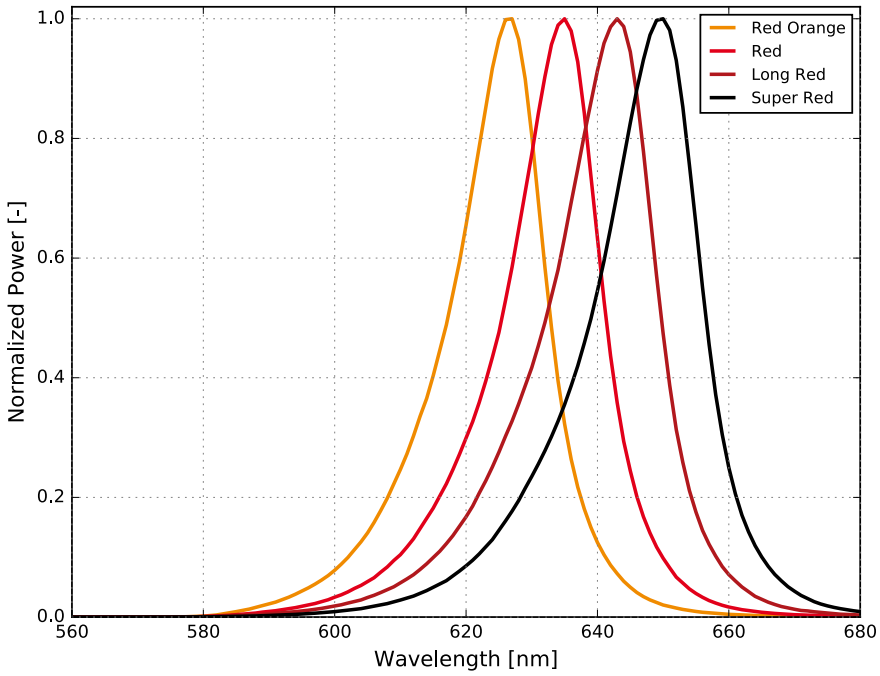


Figure 1. Typical normalized power vs. wavelength for LUXEON Versat 3030 HP 350 at 20 ms MP, 350 mA, T_c = 25 °C

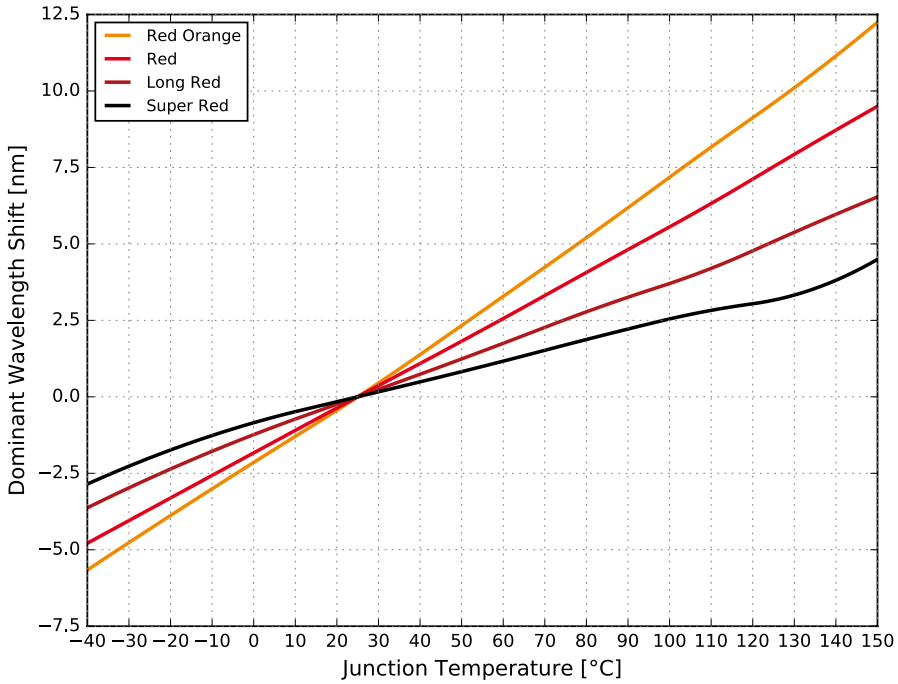


Figure 2. Typical wavelength shift vs. junction temperature for LUXEON Versat 3030 HP 350 at 20 ms MP,350 mA

Light Output Characteristics

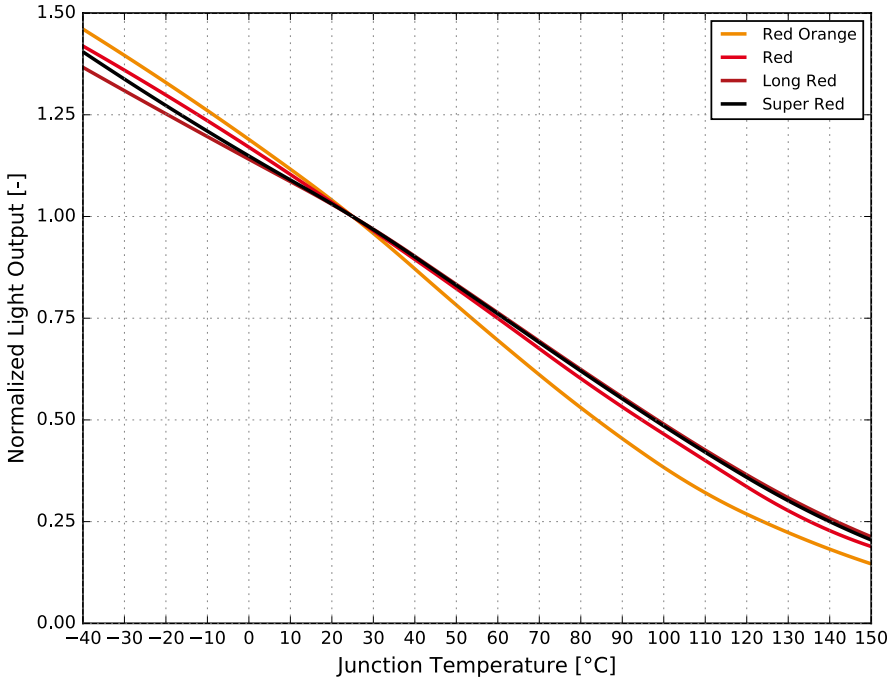


Figure 3. Typical normalized light output vs. junction temperature for LUXEON Versat 3030 HP 350 20 ms MP, 350 mA

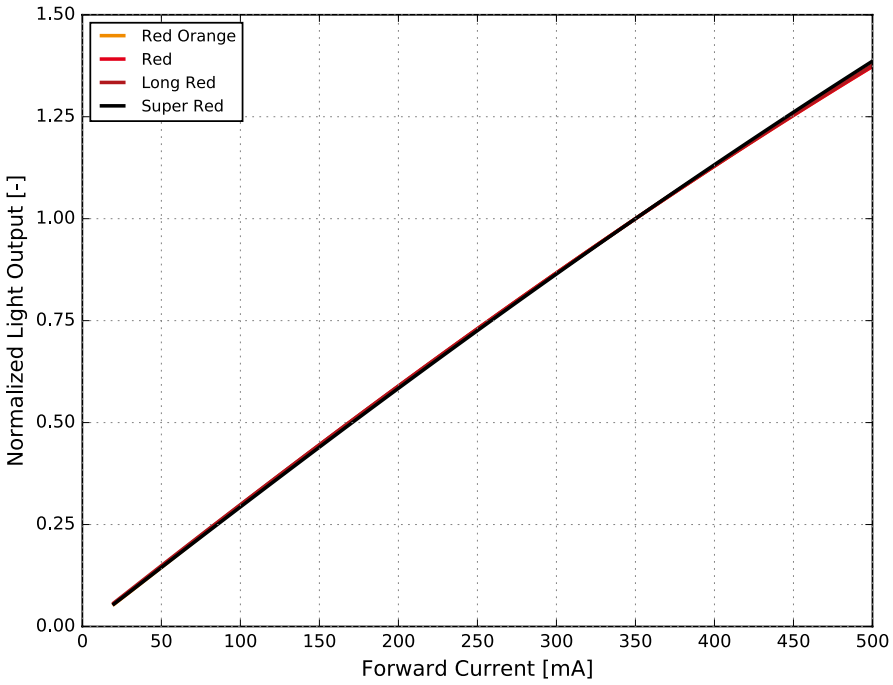


Figure 4. Typical normalized light output vs. forward current for LUXEON Versat 3030 HP 350 at T_c = 25 °C

Forward Current and Voltage Characteristics

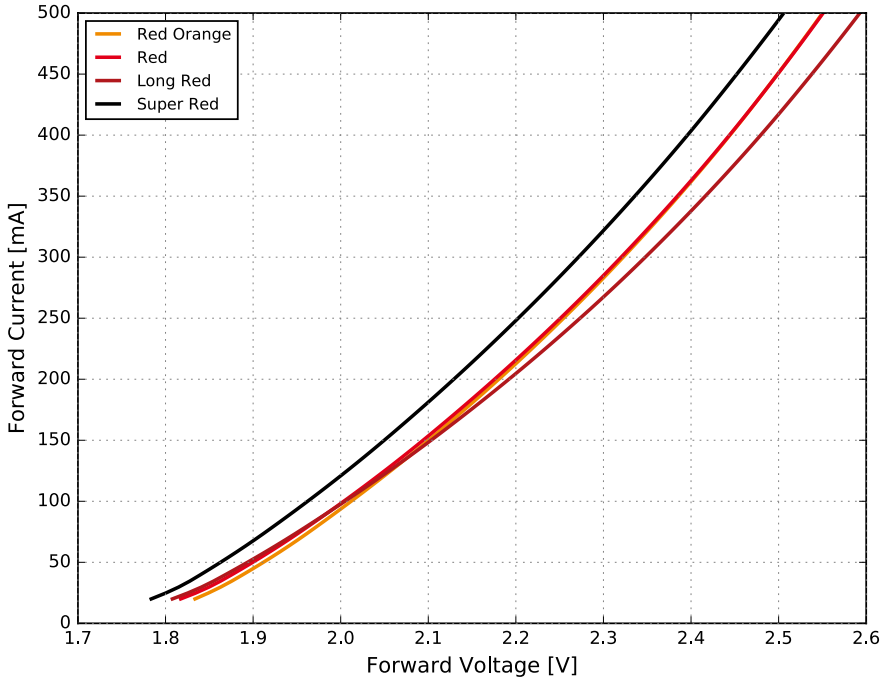


Figure 5. Typical forward current vs. forward voltage for LUXEON Versat 3030 HP 350 at T_c = 25 °C

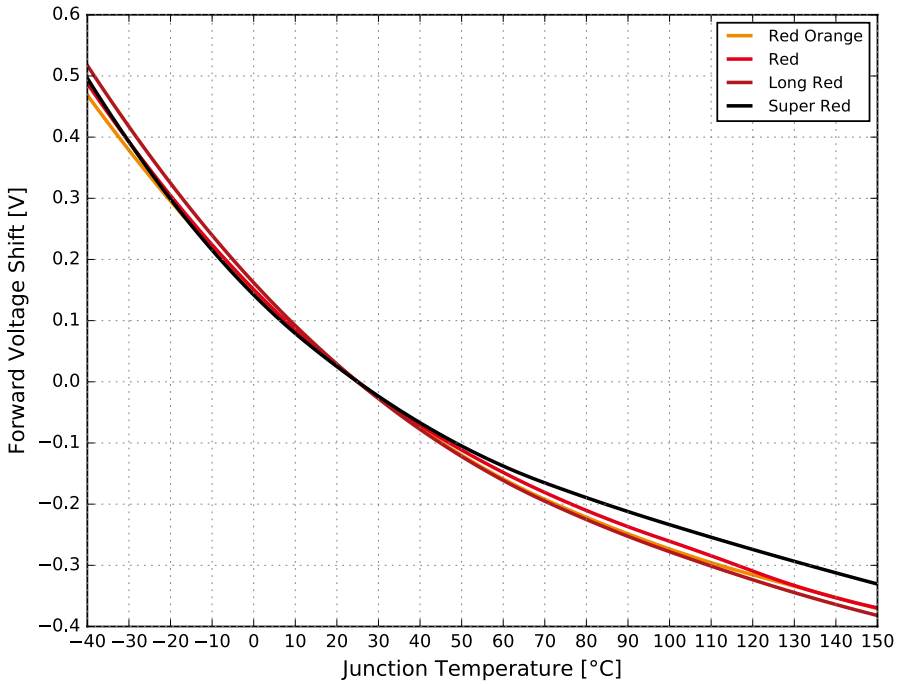


Figure 6. Typical forward voltage shift vs. junction temperature for LUXEON Versat 3030 HP 350 at 20 ms MP,350 mA

Radiation Pattern Characteristics

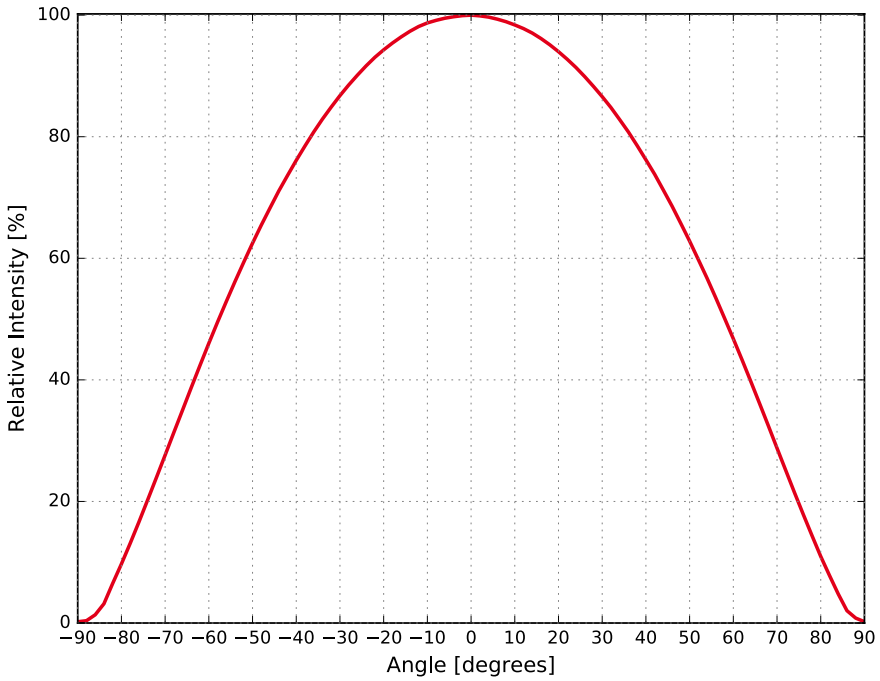


Figure 7. Typical radiation pattern for LUXEON Versat 3030 HP 350 at 20 ms MP, 350 mA

Operating Limits Characteristics

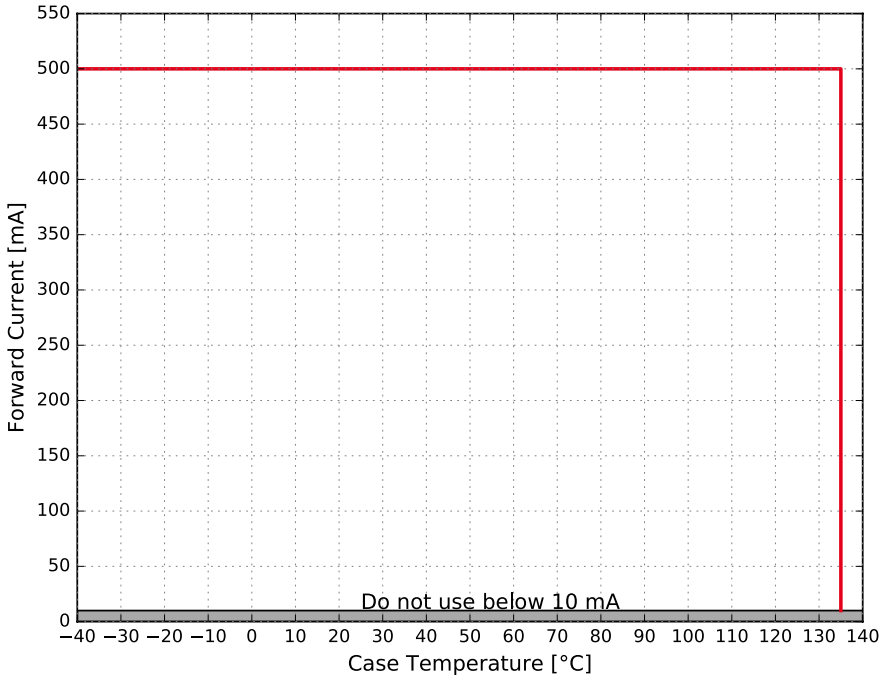


Figure 8: Maximum forward current vs. case temperature for LUXEON Versat 3030 HP 350

Permissible Pulse Handling Characteristics

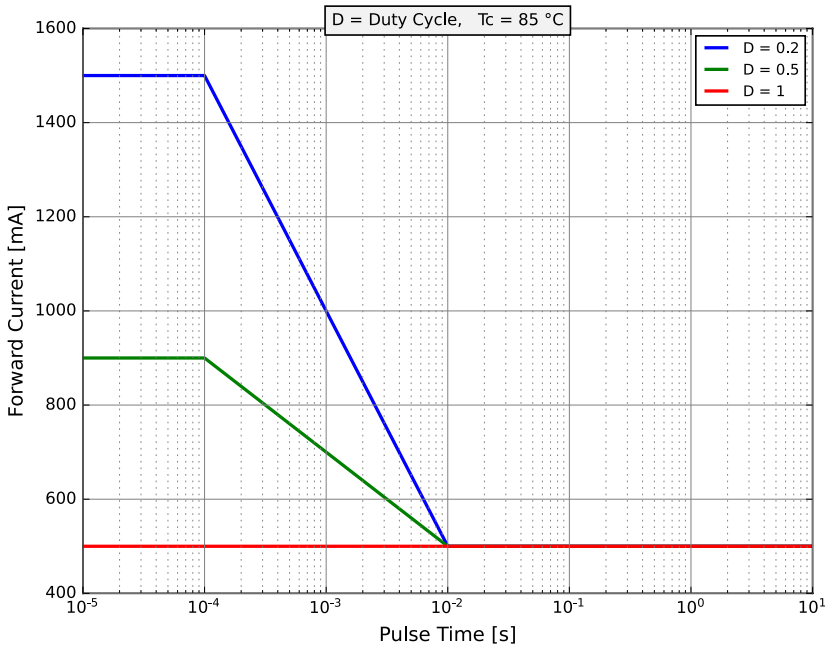


Figure 9. Permissible pulse handling capability for LUXEON Versat 3030 HP 350

Product Bin and Labeling Definitions

Designing with LUXEON Versat 3030 HP 350

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 350 LEDs are labeled using a 3-digit alphanumeric (default) or 4-digit alphanumeric (split flux bin) CAT code following the format below:

A C D (Default) or **A A C D** (split flux bin)

Where:

- **A** – designates luminous flux bin (example: J = 60 lumens to 70 lumens)
- **A A** – designates luminous flux bin (example: J 1 = 60 lumens to 65 lumens)
- **C** – designates color code (example: 3 = 612 nm to 620 nm)
- **D** – designates forward voltage bin (example: A = 2.00 V to 2.15 V)

Therefore, a LUXEON Versat 3030 HP 350 with a lumen range of 60 to 70, color code of 3 and a forward voltage of 2.00 to 2.15 has the following CAT code:

J 3 A

Therefore, a LUXEON Versat 3030 HP 350 with a lumen range of 60 to 70, color code of 3 and a forward voltage of 2.00 to 2.15 has the following CAT code:

J 1 3 A

Luminous Flux Bins

Table 6 lists the standard luminous flux bins for LUXEON Versat 3030 HP 350 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 6a. Luminous flux bin definitions for LUXEON Versat 3030 HP 350, T_c = 25 °C

BIN	LUMINOUS FLUX [1] (lm)	
	MINIMUM	MAXIMUM
E	20	30
F	30	40
G	40	50
H	50	60
J	60	70
K	70	80
L	80	90

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

Table 6b. Luminous split flux bin definitions for LUXEON Versat 3030 ST 350 at 20 ms MP, 350 mA, T_j = 25 °C

BIN	LUMINOUS FLUX [1] [2] (lm) at 350 mA	
	MINIMUM	MAXIMUM
E1	20	25
E2	25	30
F1	30	35
F2	35	40
G1	40	45
G2	45	50
H1	50	55
H2	55	60
J1	60	65
J2	65	70
K1	70	75
K2	75	80
L1	80	85
L2	85	90

Notes for Table 6b:
1. Lumileds maintains a tolerance of 6,5% on luminous flux measurements

Color Codes

Table 7. Color code definitions for LUXEON Versat 3030 HP 350 at 20 ms MP, 350 mA, T_c = 25 °C

CODE	DOMINANT WAVELENGTH [1] (nm)	
	MINIMUM	MAXIMUM
3	612	620
6	620	627
4	627	632
5	632	638

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 350 at 20 ms MP, 350 mA, 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

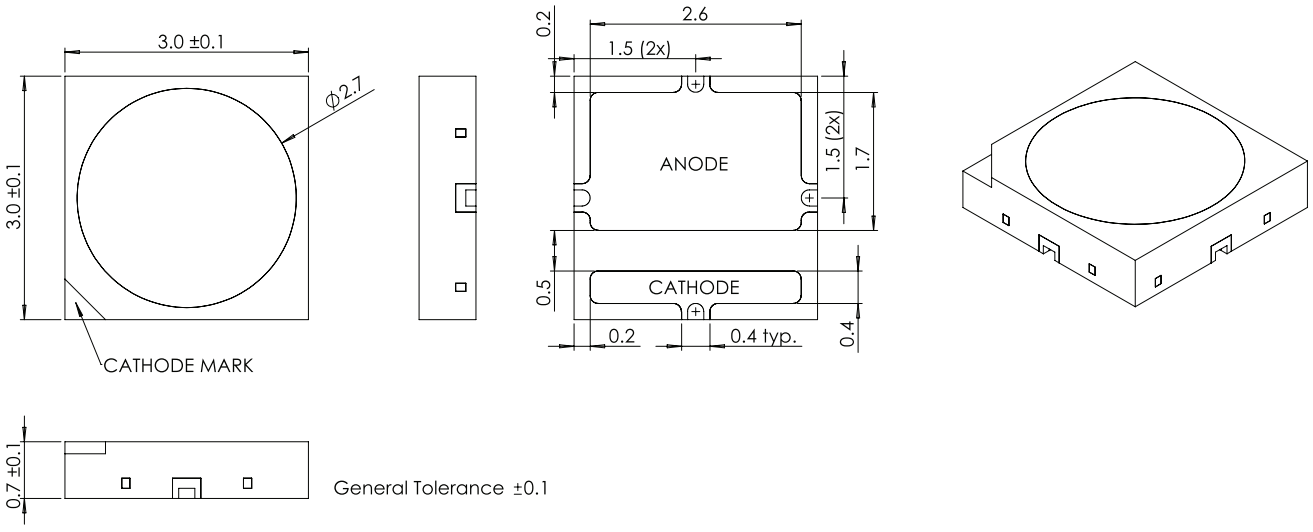


Figure 10. Mechanical dimensions for LUXEON Versat 3030 HP 350

Notes for Figure 10:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

Packaging Information

Pocket Tape Dimensions

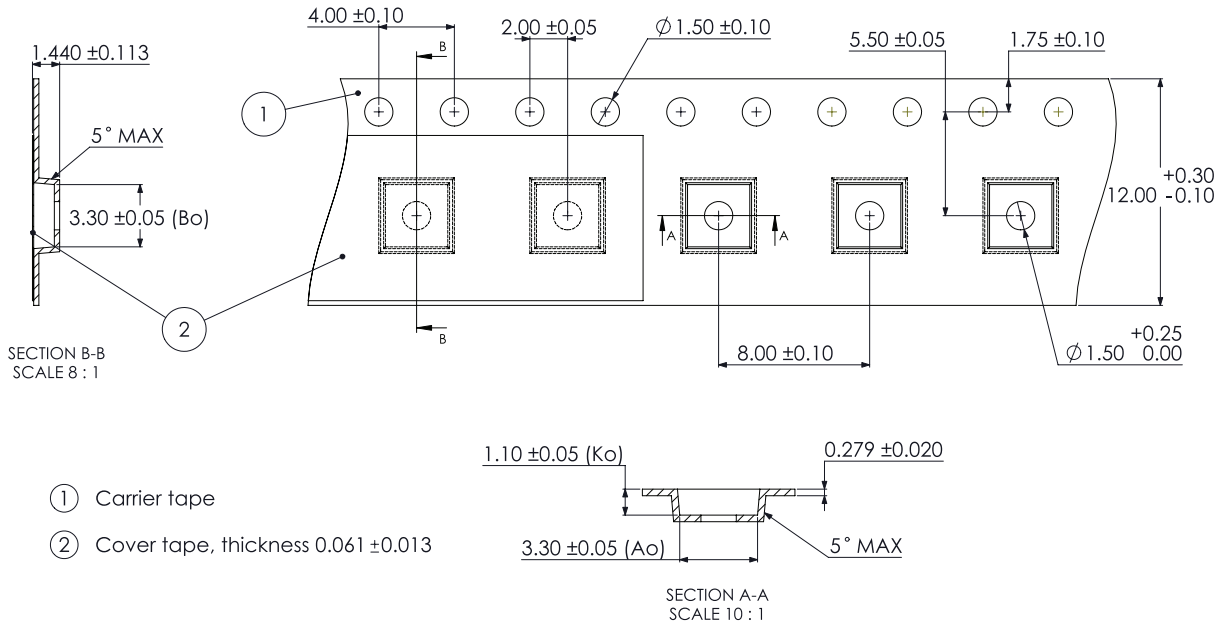


Figure 11. Pocket tape dimensions for LUXEON Versat 3030 HP 350

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

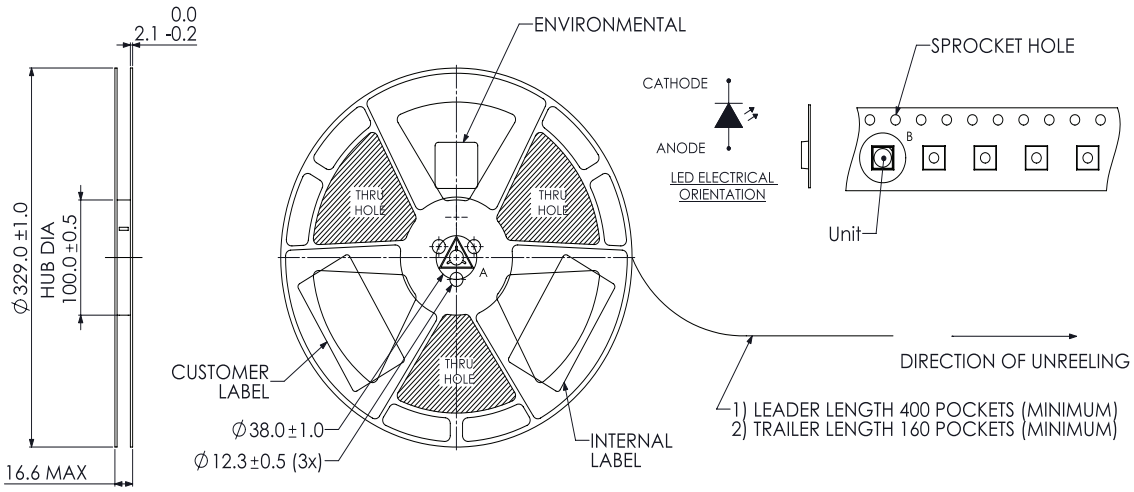


Figure 12. Reel dimensions for LUXEON Versat 3030 HP 350

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

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.

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DS262 LUXEON Versat 3030 HP 350
Product Datasheet 20210609