

LUXEON Versat 3030 ST PC Green

Phosphor converted green emitter for white reverse function lighting.

The LUXEON Versat 3030 ST PC Green is a product based on the LUXEON Versat 3030 ST product line providing a unique spectrum that allows for white reverse function lighting through a red cover glass. The LUXEON Versat 3030 PC Green uses the standard Versat 3030 footprint for ease of integration and upgrading existing system designs. All LUXEON Versat 3030 ST LEDs are AEC-Q102 qualified and cold binned at 25 °C.



FEATURES AND BENEFITS

Custom engineered spectrum to result in white light according to CIE specification when combined with red cover-glass

Industry standard footprint for simple integration

Low Z profile simplifies optical design and minimizes design space

Optimized package drives efficient light extraction

PRIMARY APPLICATIONS

Back-Up / Reverse

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General Information

LUXEON Versat 3030 ST PC Green emitters are midpower phosphor converted emitters mounted on a EMC leadframe. All LUXEON Versat 3030 ST emitters contain a TVS chip for ESD protection.

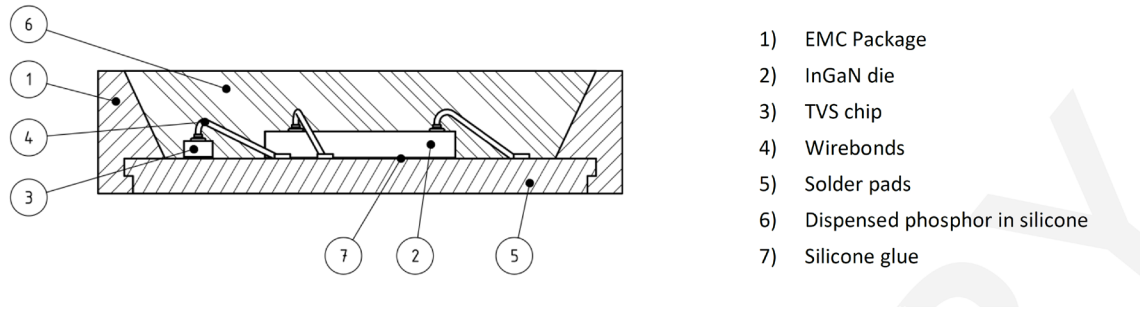


Figure 1. Schematic cross section LUXEON Versat 3030 ST PC Green

Product Test Conditions

LUXEON Versat 3030 ST PC Green is binned using a 20 ms monopulse (MP) of 350 mA drive current. The case temperature is set to $T_c = 25^\circ\text{C}$ at the beginning of the pulse.

Part Number Nomenclature

Part numbers for LUXEON Versat 3030 ST PC Green follow the convention below::

A 1 V C – **G 5 0 7 C 0 1 0 J K M N 0**

Where:

- A – designates product segment (A = Automotive)
- 1 – designates product level (1 = Level 1)
- V – designates product line/family (V = LUXEON Versat)
- C – designates package type (C = 3030 ST)
- G** – designates the color (G507 = PC Green)
- C** – designates binning current (C = 350 mA)
- 0** – reserved for future customization
- 1** – designates generation (1 = first generation)
- 0** – reserved for future customization
- J K M N** – designates minimum luminous flux (0119=119 lumens, 0126=126 lumens etc.)
- 0** – reserved for future customization

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON Versat 3030 ST PC Green 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

LUXEON Versat 3030 ST PC Green emitters are tested and binned with a 20 ms monopulse of 350 mA at a case temperature, T_c , of 25 °C.

Table 1. Product performance and optical characteristics of LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ °C}$

COLOR	MINIMUM LUMINOUS FLUX ^[1] (lm)	PART NUMBER
PC Green	119	A1VC-G507C01001190
	126	A1VC-G507C01001260
	134	A1VC-G507C01001340

Notes for Table 1:

1. Lumileds maintains a tolerance of $\pm 10\%$ on luminous flux measurements.

Optical Characteristics

Table 2. Optical characteristics for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ °C}$

PART NUMBER	COLOR DEFINITION ^[1, 2]		TOTAL INCLUDED ANGLE ^[3] $2\theta_{0.90V}$	TYPICAL VIEWING ANGLE ^[4] $2\theta_{1/2}$
	(x,y)	(u',v')		
A1VC-G507C010xxxx0	(0.260, 0.391) (0.269, 0.411) (0.277, 0.415) (0.277, 0.389) (0.260, 0.375)	(0.145, 0.490) (0.145, 0.500) (0.149, 0.503) (0.156, 0.492) (0.149, 0.484)	138°	120°

Notes for Table 2:

- CIE 1931 x and y coordinate frame.
- Lumileds maintains a tolerance of ± 0.005 on x and y color point measurements.
- Total angle at which 90% of total luminous flux is captured.
- $2\theta_{1/2}$ denotes the viewing angle, with $\theta_{1/2}$ being the off-axis angle from the LED centerline where the luminous intensity is $1/2$ of the peak value.

Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ °C}$

PART NUMBER	FORWARD VOLTAGE ^[1] (V_f)		THERMAL RESISTANCE— JUNCTION TO CASE (K/W)			
			$R\theta_{j-c\text{el}}$ ^[2]		$R\theta_{j-c\text{real}}$ ^[3]	
	MINIMUM	MAXIMUM	TYPICAL	MAXIMUM	TYPICAL	MAXIMUM
A1VC-G507C010xxxx0	2.70	3.49	10.0	12.0	15.0	18.0

Notes for Table 3:

- Lumileds maintains a tolerance of $\pm 0.06\text{ V}$ on forward voltage measurements.
- Ratio between temperature difference (junction \leftrightarrow case) and electrical input power (references JESD51-51, JESD51-14)
- Ratio between temperature difference (junction \leftrightarrow case) and dissipated heat, i.e. emitted light taken into account (references JESD51-51, JESD51-14)

Absolute Ratings

Table 4. Absolute ratings for LUXEON Versat 3030 ST PC Green

PARAMETER	PERFORMANCE
Minimum DC Forward Current	20 mA
Maximum DC Forward Current	500 mA
Maximum Peak Pulsed Forward Current ^[1]	1000 mA
Maximum Emitter Junction Temperature ^[1] (DC & Pulse)	150 °C
Operating Case Temperature at Test Current ^[1]	-40 °C to 132 °C
LED Storage Temperature	-40 °C to 135 °C
Soldering Temperature	260 °C per JEDEC J-STD-020E
Allowable Reflow Cycles	3
ESD Sensitivity ^[2]	±8 kV HBM, ±2 kV CDM
Reverse Voltage ($V_{reverse}$)	LUXEON LEDs are not designed to be driven in reverse bias
Autoclave Conditions	121°C at 2 ATM 100% Relative Humidity for 96 Hours Maximum

Notes for Table 4:

1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Measured using human body model (per JESD22 A114), and charged device model (per JESD22 C101).

Characteristic Curves

Spectral Power Distribution Characteristics

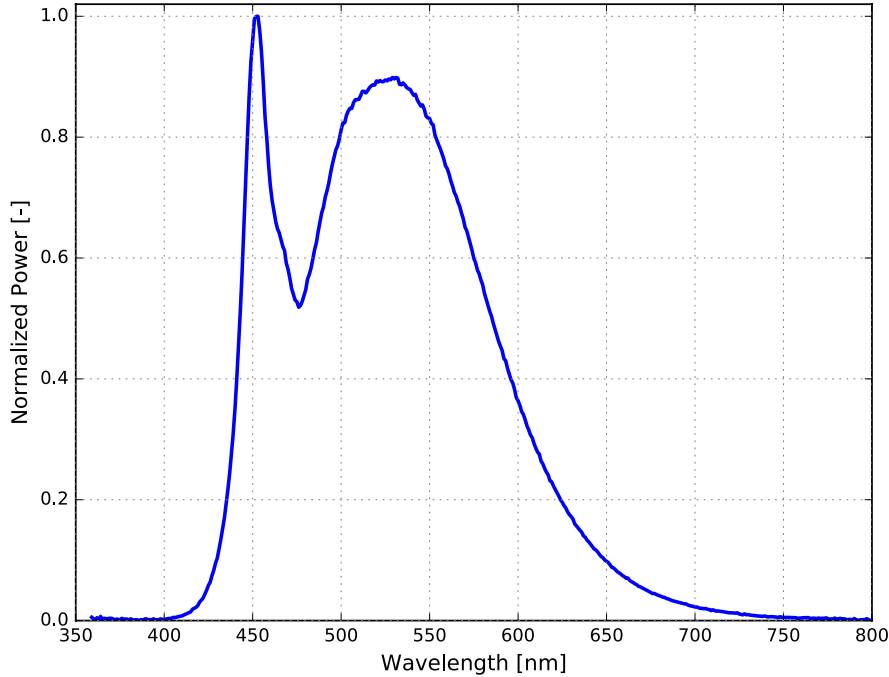


Figure 2. Typical normalized power vs. wavelength for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ }^\circ\text{C}$

Light Output Characteristics

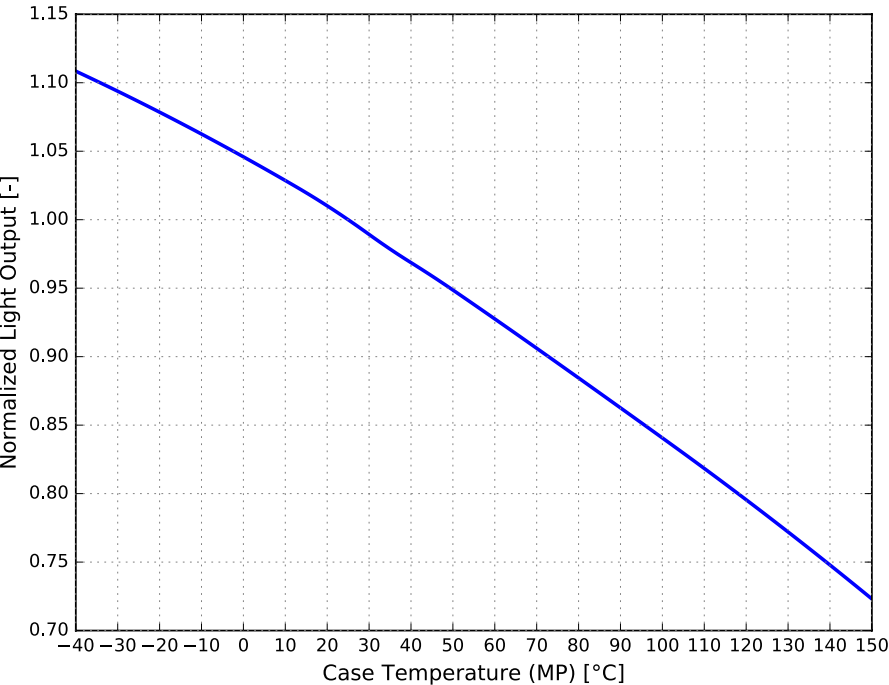


Figure 3. Typical normalized light output vs. case temperature for LUXEON Versat 3030 ST PC Green at 350 mA

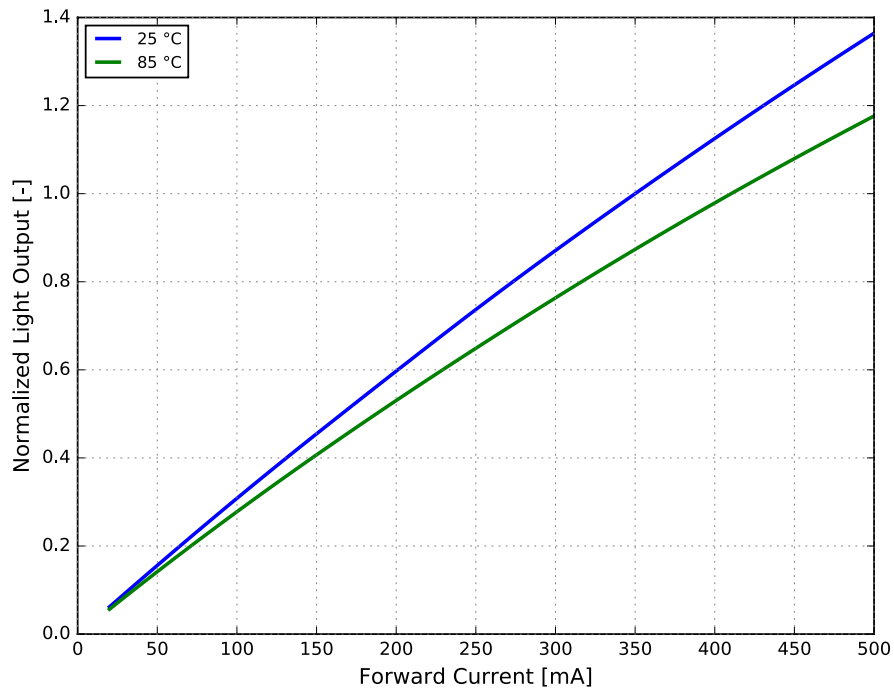


Figure 4. Typical normalized light output vs. forward current for LUXEON Versat 3030 ST PC Green at $T_c = 25\text{ }^\circ\text{C}$

Forward Current and Forward Voltage Characteristics

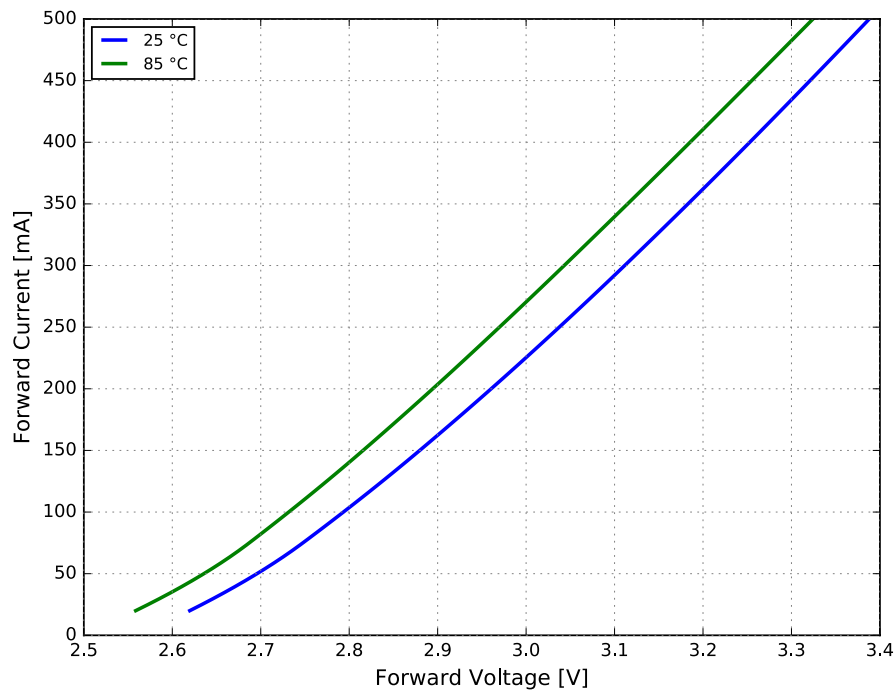


Figure 5. Typical forward current vs. forward voltage for LUXEON Versat 3030 ST PC Green at $T_c = 25\text{ }^\circ\text{C}$

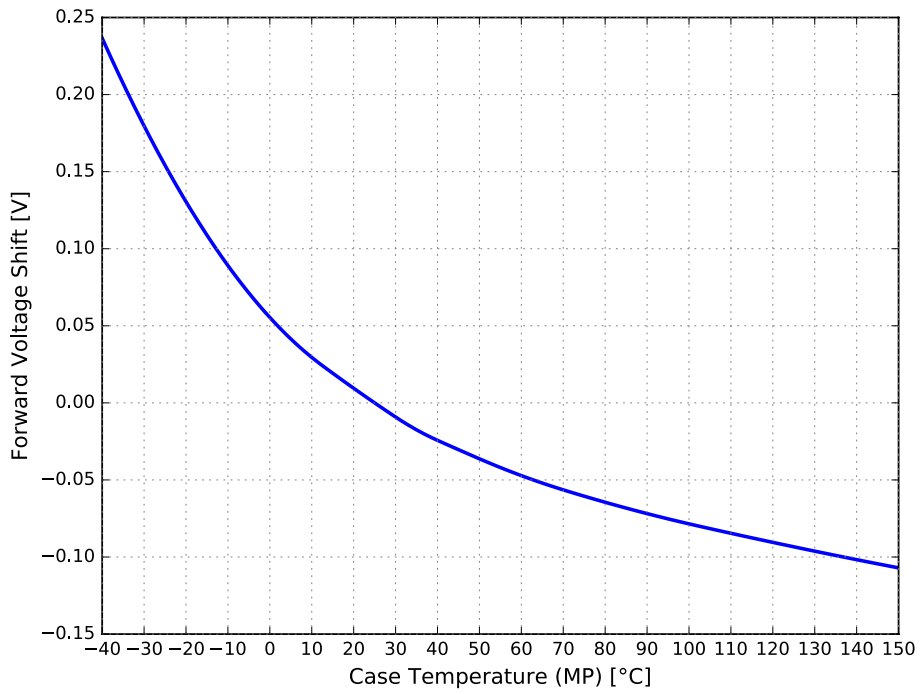


Figure 6. Typical forward voltage shift vs. case temperature for LUXEON Versat 3030 ST PC Green at 20 ms MP, 350 mA

Color Shift Characteristics

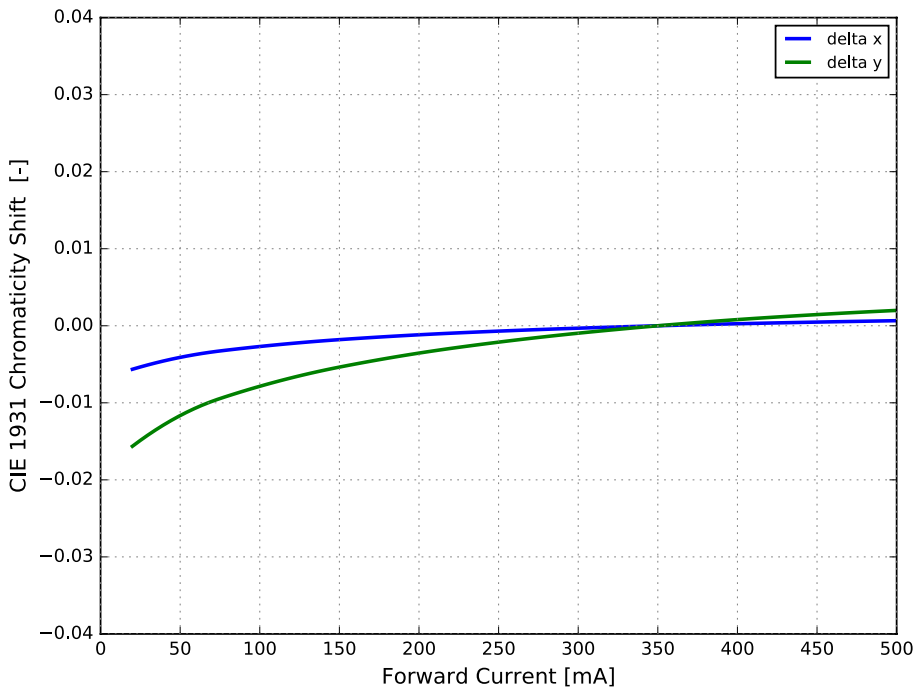


Figure 7. Typical color shift in CIE 1931 x, y coordinates vs forward current for LUXEON Versat 3030 ST PC Green at 20 ms MP, 350 mA

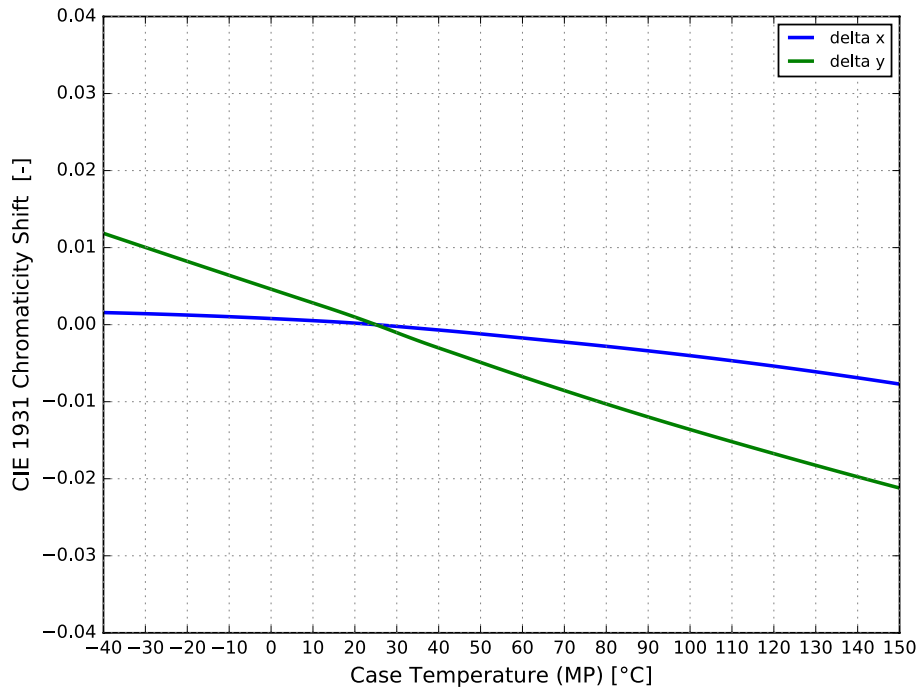


Figure 8. Typical color shift in CIE 1931 x and y coordinates for LUXEON Versat 3030 ST PC Green at 20 ms MP, 350 mA

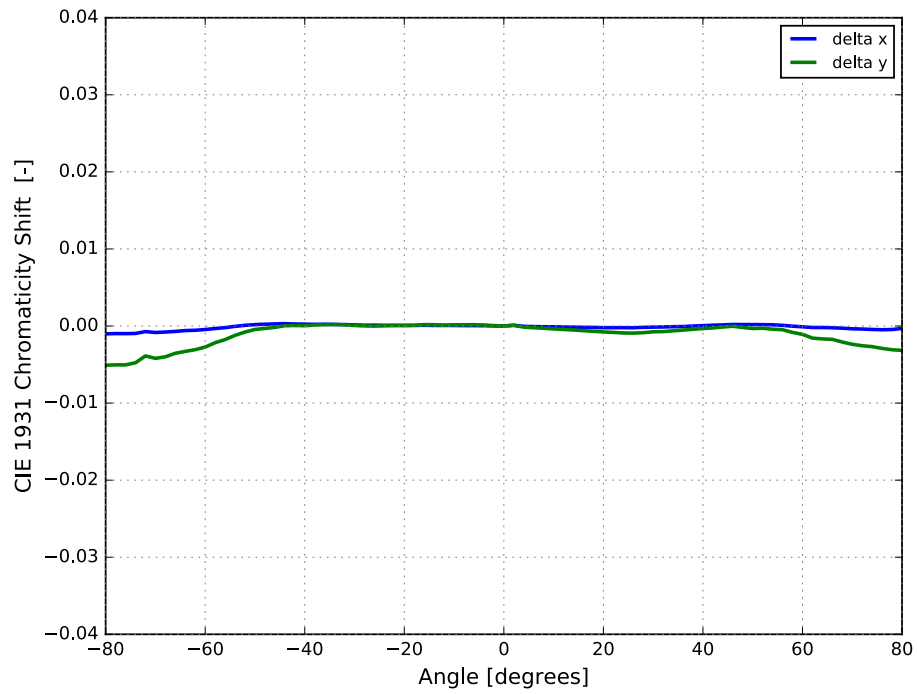


Figure 9. Typical color shift in CIE 1931 x and y coordinates over angle for LUXEON Versat 3030 ST PC Green at 20 ms MP, 350 mA

Radiation Pattern Characteristics

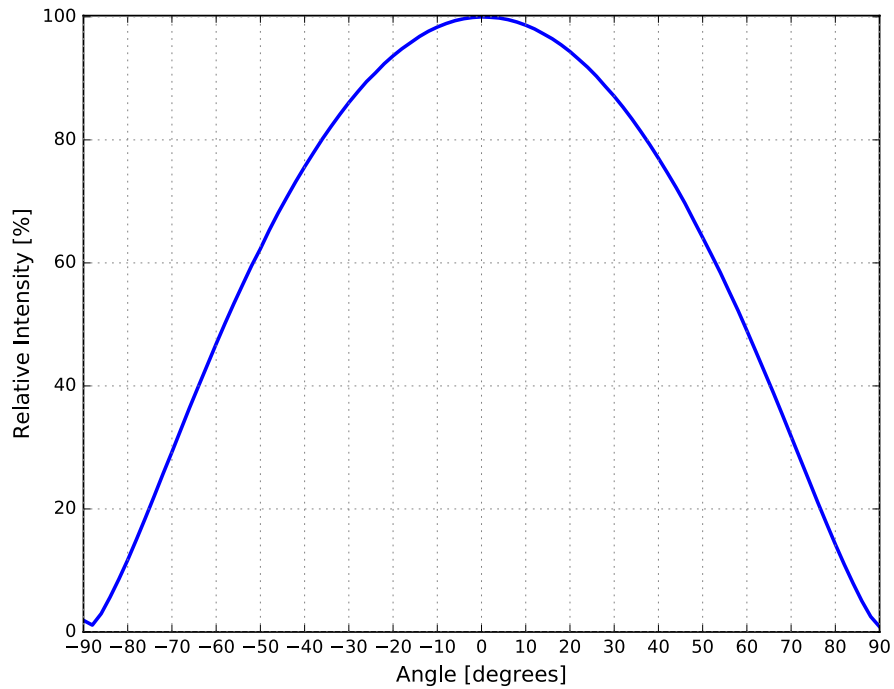


Figure 10. Typical radiation pattern for LUXEON Versat 3030 ST PC Green at 20 ms MP, 350 mA, $T_c = 25\text{ }^\circ\text{C}$

Operating Limits Characteristics

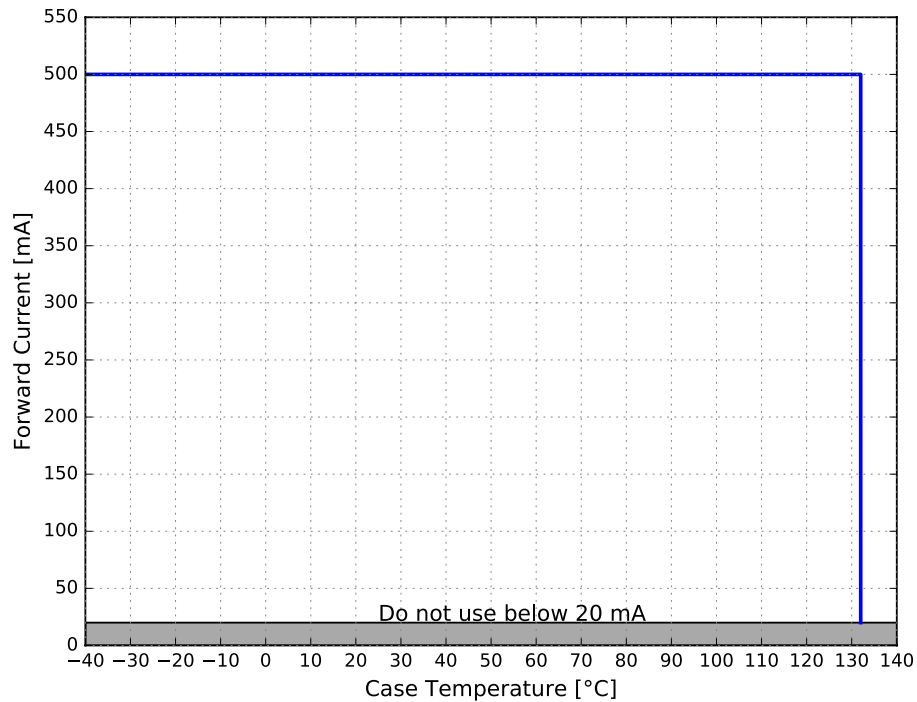


Figure 11. Maximum forward current vs. case temperature for LUXEON Versat 3030 ST PC Green

Note: LUXEON Versat LEDs driven at or above maximum LED case temperature may have shorter lifetime. Lumileds does not guarantee reliability of board interconnect e.g. solder joint cracks caused by thermal mismatch.

Permissible Pulse Handling Characteristics

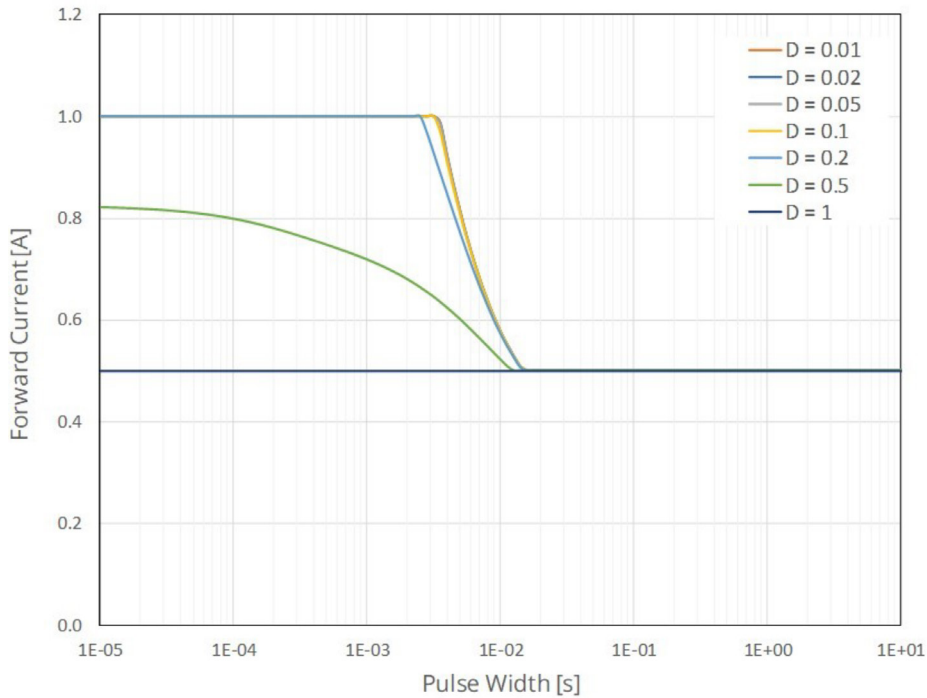


Figure 12. Permissible pulse handling capability for LUXEON Versat 3030 ST PC Green

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 Versat 3030 ST PC Green emitters are labeled using a 3-digit alphanumeric CAT code following the format below:

A B C

Where:

- A** – designates luminous flux bin (example: U=126 to 134 lumens)
- B** – designates color code (A)
- C** – designates forward voltage bin (example: B = 2.94 V to 3.20 V)

Therefore, a LUXEON Versat PC Green emitter with a flux range of 126 to 134 lumens, color code A and a forward voltage range of 2.94 to 3.20 V has the following CAT code:

U A B

Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON Versat 3030 ST PC Green emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance.

Table 5. Luminous flux bin definitions for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ }^\circ\text{C}$

BIN	LUMINOUS FLUX ⁽¹⁾ (lm)	
	MINIMUM	MAXIMUM
T	119	126
U	126	134
V	134	142
W	142	150

Notes for Table 5:

1. Lumileds maintains a tolerance of $\pm 10\%$ on luminous flux measurements.

Color Codes

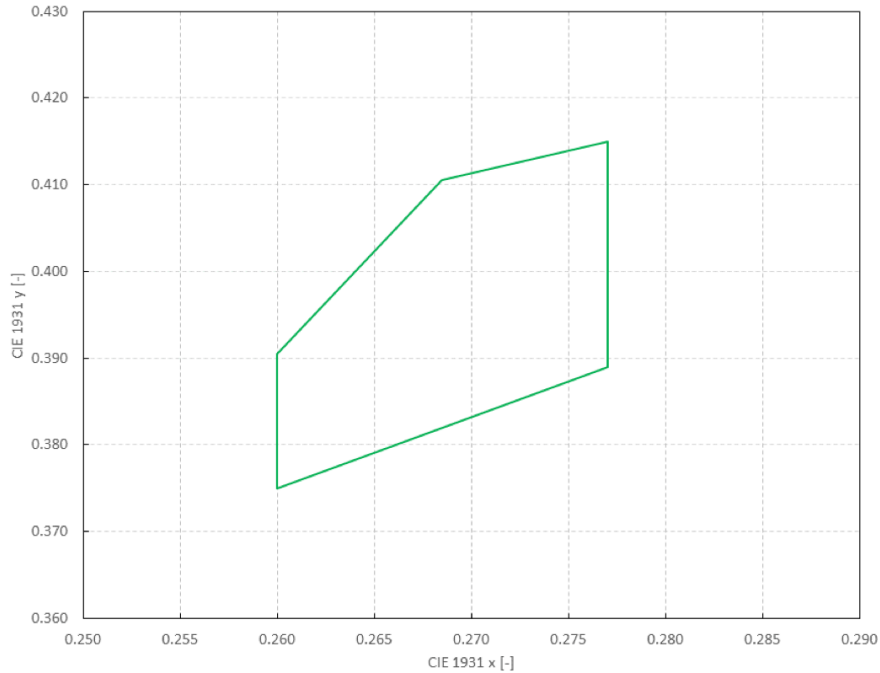


Figure 13. Color bin structure in CIE 1931 color space for LUXEON Versat 3030 ST PC Green

Table 6. Color code definitions for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ }^\circ\text{C}$

CODE	(x,y) ^[1]	(u'v') ^[2]
A	(0.260, 0.391)	(0.145, 0.490)
	(0.269, 0.411)	(0.145, 0.500)
	(0.277, 0.415)	(0.149, 0.503)
	(0.277, 0.389)	(0.156, 0.492)
	(0.260, 0.375)	(0.149, 0.484)

Notes for Table 6:

- Lumileds maintains a tolerance of $\pm 0.005\text{nm}$ on (x,y) color coordinates.
- u'v' color coordinates are provided for information purposes only.

Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON Versat 3030 ST PC Green at 350 mA, $T_c = 25\text{ }^\circ\text{C}$

BIN ^[1]	FORWARD VOLTAGE ^[2] (V _f)	
	MINIMUM	MAXIMUM
A	2.70	2.94
B	2.94	3.20
C	3.20	3.49

Notes for Table 7:

- Lumileds maintains a tolerance of $\pm 0.06\text{ V}$ on forward voltage measurements.

Mechanical Dimensions

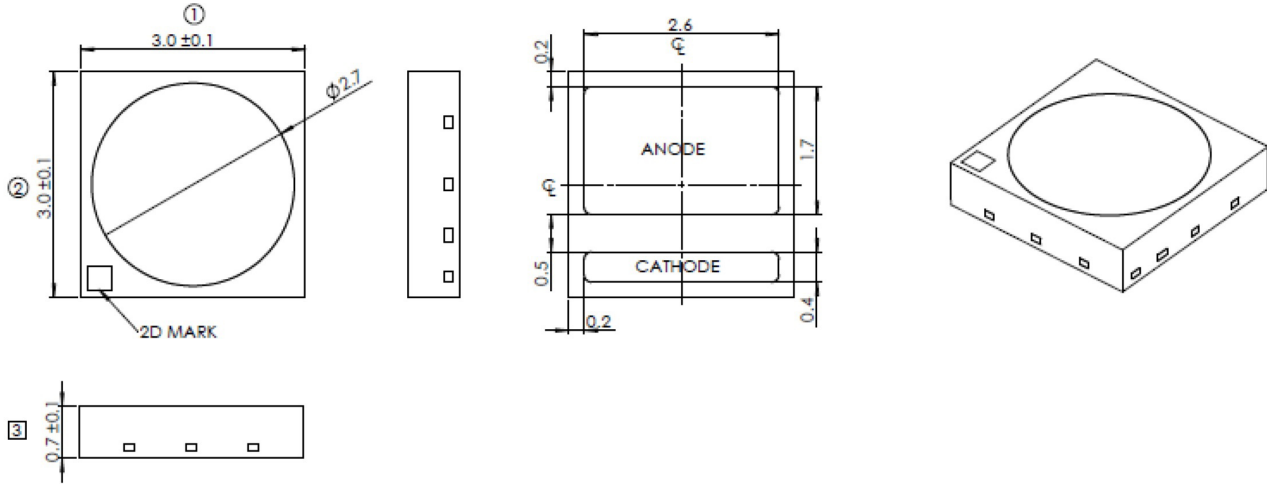


Figure 14. Mechanical dimensions for LUXEON Versat 3030 ST PC Green

Notes for Figure 14:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. All dimensions, unless specified otherwise, have a general tolerance of $\pm 0.1\text{mm}$.

Package weight

Table 8. Approximate weight of LUXEON Versat 3030 ST PC Green

PART NUMBER	PACKAGE WEIGHT [mg]
A1VC-G507C0100xxx0	17.5

JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON Versat 3030 ST PC Green

LEVEL	LEAD-FREE ASSEMBLY		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
2	1 year	$\leq 30\text{ }^{\circ}\text{C} / 60\% \text{ RH}$	168 hours +5 / -0	85 $^{\circ}\text{C} / 60\% \text{ RH}$

Product Labeling

LUXEON Versat 3030 LEDs are packaged in moisture barrier bags on reels. Both moisture barrier bag and reels have printed information providing part numbers with CAT codes that indicate luminous flux bin, color bins and forward voltage bins.

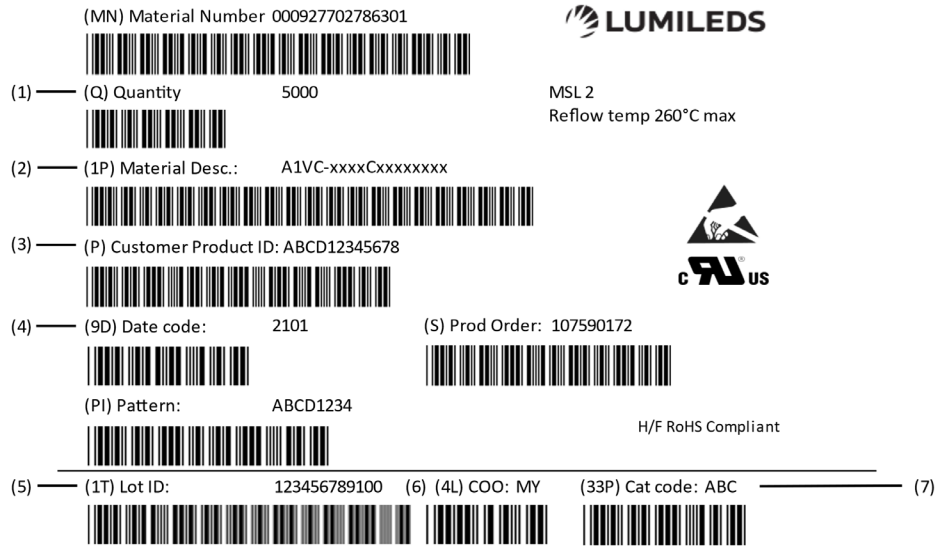


Figure 17. Example of a reel label LUXEON Versat 3030 ST PC Green

Notes for Figure 17 – Reel label descriptions for customer use:

Field labels not described are for Lumileds internal use only.

1. Total number of LED emitters in a shipment box.
2. Lumileds part number
3. Customer part number for custom requests only.
4. LED test date in YYWW format.
5. Unique product lot identification number. This number is required for traceability purposes.
6. Country code of origin of manufacturing of part (e.g. MY for Malaysia, CN for China) according to ISO 3166-1 alpha-2 document.
7. Product bin 4-digit alphanumeric CAT code.

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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