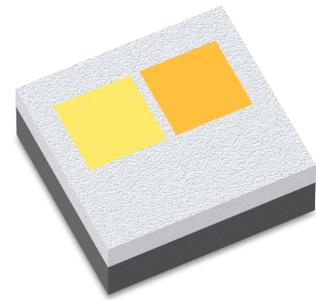




LUXEON Altilon SMD DT 1W

Industry leading solutions for exterior automotive lighting

LUXEON Altilon SMD DT 1W is a single source, dual color LED designed to provide industry-leading luminance in Cool White and PC Amber color for daytime running and front turn lamps. Engineered with Chip Scale Packaging (CSP) technology, LUXEON Altilon SMD DT 1W is a smaller version of the highly successful LUXEON Altilon SMD DT 1W with the same, robust package enabling cost effective automotive lighting solutions. The Lumileds automotive LED binning structure is tailor-made for both SAE and ECE color specifications and hot binned at 85°C to represent actual operating conditions. LUXEON Altilon SMD DT 1W is AEC-Q102 qualified.



FEATURES AND BENEFITS

Single source, dual color SMD streamlines lamp integration and design flexibility

Advanced CSP technology provides leading performance in a cost effective package

Hot binned at 85 °C MP to represent actual operating conditions

Low thermal resistance for optimized thermal performance and lower system costs

PRIMARY APPLICATIONS

Side Daytime Running Lights

Front Turn

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General Product Information

LUXEON Altilon SMD DT 1W emitters are high-power Lumiramic© Phosphor converted InGaN emitters mounted on an AlN package. All LUXEON Altilon SMD DT 1W emitters contain a TVS chip for ESD protection.

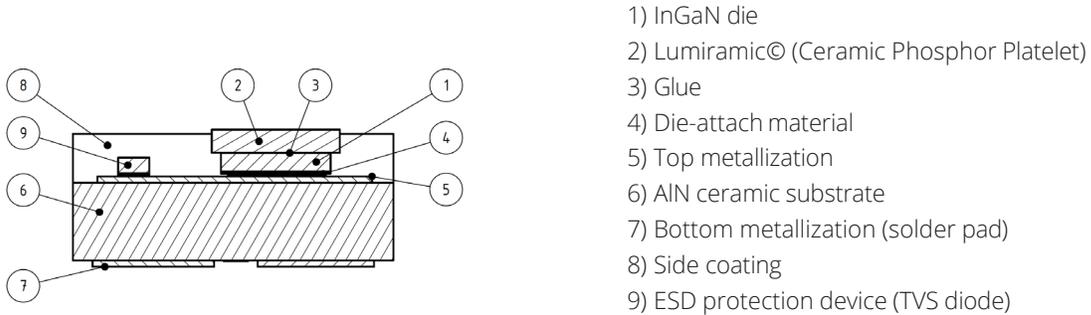


Figure 1. Schematic cross section LUXEON Altilon SMD DT 1W

Product Test and Binning Conditions

Monopulse (MP) testing for LUXEON Altilon SMD DT 1W is done with a pulse of 1ms for CW and 7ms for PCA. The binning conditions for LUXEON Altilon SMD DT 1W are MP testing at 500 mA at a temperature of 85 °C.

Part Number Nomenclature

Part numbers for LUXEON Altilon SMD DT 1W follow the convention below:

A 1 S C - D T 1 1 2 B H 1 A A 0 0 0

Where:

A - designates luminous flux bin (1, 2, 3,)

Therefore, the following part number is used for a LUXEON Altilon SMD DT 1W with a minimum flux bin of 130 lm for the Cool White chip and 105 lm for the PC-Amber chip

A 1 S C - D T 1 1 2 B H 1 A 2 0 0 0

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON Altilon SMD DT 1W 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 performance and optical characteristics of LUXEON Altilon SMD DT 1W at MP binning condition

COOL WHITE LUMINOUS FLUX ^[1] (lm)	PC AMBER LUMINOUS FLUX ^[1] (lm)	PART NUMBER
130-145	105-120	A1SC-DT112BH1A2000
130-145	120-135	A1SC-DT112BH1A3000
145-160	105-120	A1SC-DT112BH1A4000
145-160	120-135	A1SC-DT112BH1A5000
160-175	105-120	A1SC-DT112BH1A6000
160-175	120-135	A1SC-DT112BH1A7000

Notes for Table 1:

1. Lumileds maintains a tolerance of $\pm 6.5\%$ on luminous flux measurements.

Optical Characteristics

Table 2 Optical characteristics for LUXEON Altilon SMD DT 1W at MP binning condition and far-field optical characteristics

PART NUMBER	CORRELATED COLOR TEMPERATURE (CCT)		DOMINANT WAVELENGTH (nm)		Spectral half width ^[3] (nm) $\Delta\lambda_{1/2}$	TYPICAL TOTAL INCLUDED ANGLE ^[1]	TYPICAL VIEWING ANGLE ^[2] $2\theta_{1/2}$
	COOL WHITE		PC Amber		PC Amber		
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM			
A1SC-DT112BH1Axxxx	5500	6250	588.8	592.6	77	140°	120°

Notes for Table 2:

- 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.
- Spectral width at 1/2 of the peak intensity

Electrical Characteristics

Table 3 Electrical and thermal characteristics for LUXEON Altilon SMD DT 1W at MP binning condition.

COLOR	FORWARD VOLTAGE (V) ^[1]			
	BIN	MIN.	TYP.	MAX.
Cool White	X	2.90	3.05	3.35
Amber	X	2.90	3.05	3.35

Notes for Table 3:

1. Lumileds maintains a tolerance of $\pm 0.06V$ on forward voltage measurements.

Thermal Characteristics

Table 4 Thermal characteristics for LUXEON Altilon SMD DT 1W at binning current and 25°C stage temperature

COLOR	THERMAL RESISTANCE— JUNCTION TO CASE (K/W)			
	$R\theta_{j-c} \text{ el}^{[2]}$		$R\theta_{j-c} \text{ real}^{[3]}$	
	TYPICAL	MAXIMUM	TYPICAL	MAXIMUM
Cool White only	5.0	5.5	7.5	8.2
Amber only	6.3	6.9	8.4	9.2
Both ^[3]	4.7	5.2	6.5	7.2

Notes for Table 4:

1. Ratio between temperature difference (junction to case) and electrical input power (references JESD51-51, JESD51-14)
2. Ratio between temperature difference (junction to case) and dissipated heat, i.e., emitted light taken into account (references JESD51-51, JESD51-14)
3. Valid for operation at same current

Absolute Ratings

Table 5. Absolute ratings for LUXEON Altilon SMD DT 1W

PARAMETER	PERFORMANCE
Minimum DC Forward Current	50 mA
Maximum DC Forward Current CW / PCA ^[1]	750 mA / 500 mA
Maximum Peak Pulsed Forward Current CW / PCA ^[1]	1250 mA / 835 mA
Maximum Emitter Junction Temperature ^[1] (DC & Pulse)	150 °C
Maximum Emitter Junction Temperature ^[1,2] (DC & Pulse), short term	180 °C
ESD Sensitivity ^[3]	HBM ±8 kV CDM ±2 kV
Operating Case Temperature ^[1]	-40 °C to 135 °C
Emitter Storage Temperature	-40 °C to 135 °C
SMD Process Classification Temperature	260 °C
Allowable Reflow Cycles	3
Reverse Voltage (V_{reverse})	Not designed to be driven in reverse bias

Notes for Table 5

1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Short time operations of less than 200 hours
3. Measured using human body model (per ANSI/ANSI/ESDA/JEDEC JS-001-2017), charged device model (AEC Q101-005 rev A).

Characteristic Curves

Spectral Power Distribution Characteristics

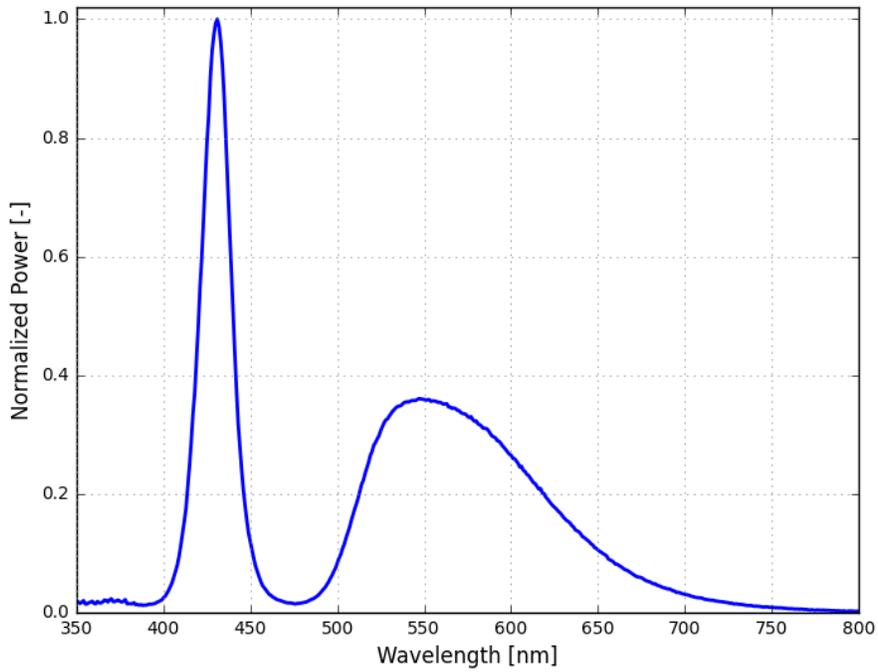


Figure 2 Typical normalized power vs. wavelength for LUXEON Altilon SMD DT 1W Cool White at MP binning condition

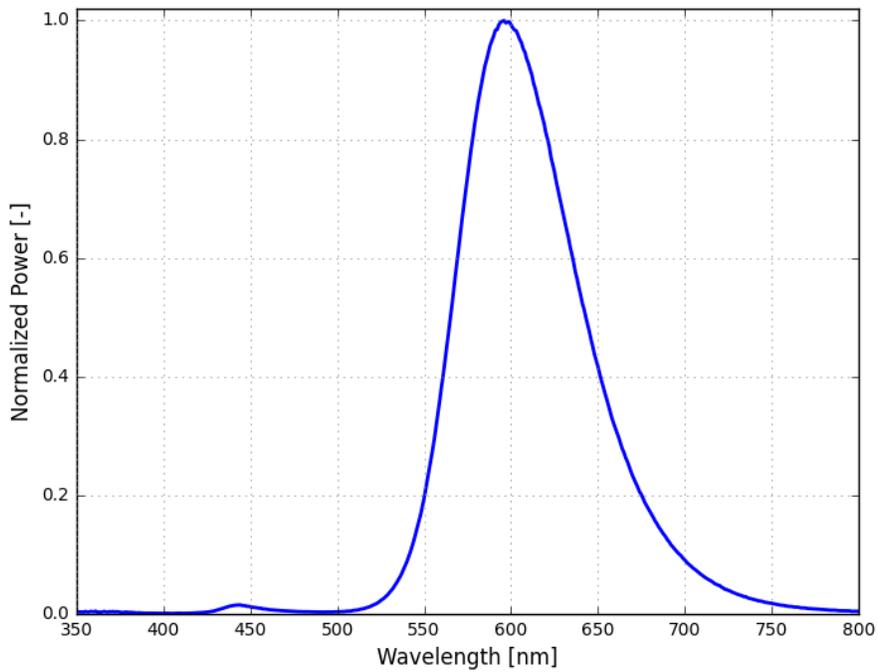


Figure 3 Typical normalized power vs. wavelength for LUXEON Altilon SMD DT 1W PC Amber at MP binning condition

Light Output Characteristics

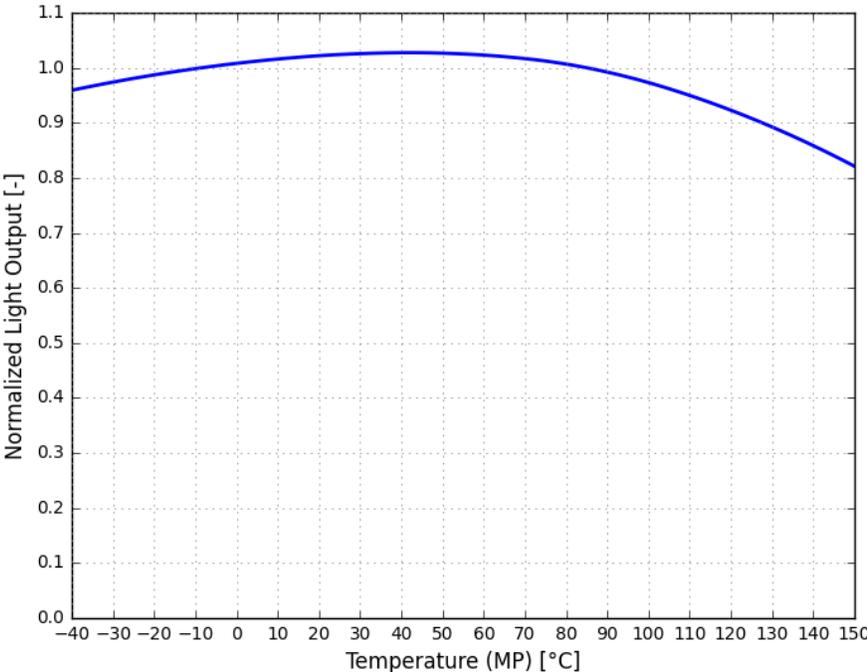


Figure 4 Typical normalized light output vs. temperature for LUXEON Altilon SMD DT 1W Cool White at MP binning current

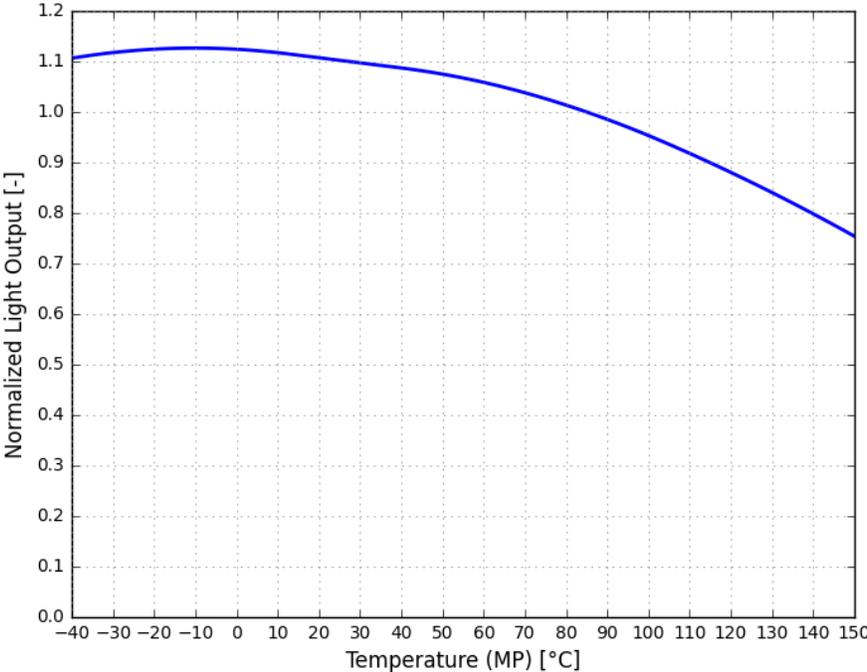


Figure 5 Typical normalized light output vs. temperature for LUXEON Altilon SMD DT 1W PC Amberat MP binning current

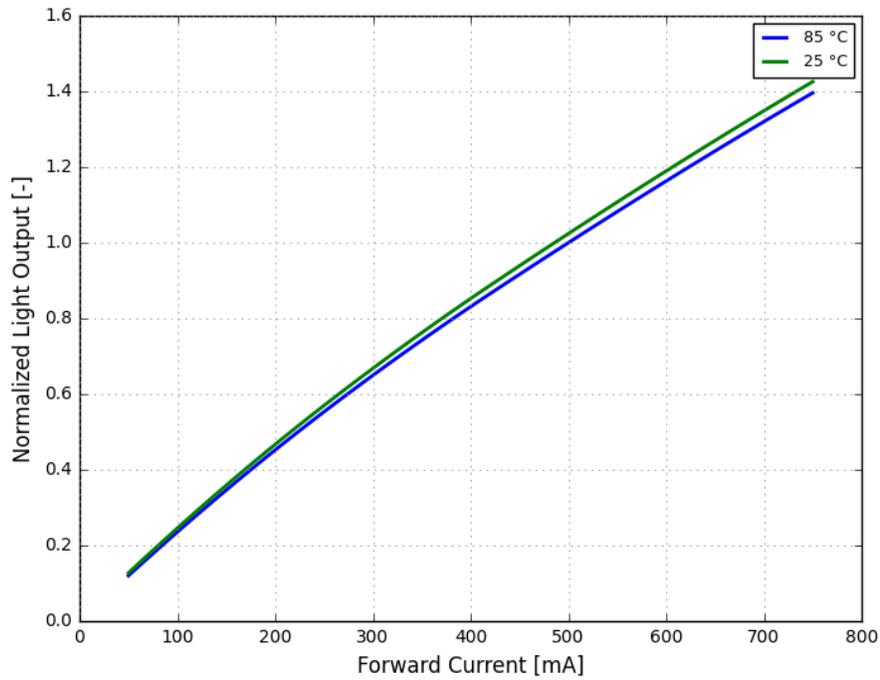


Figure 6 Typical normalized light output vs. forward current for LUXEON Altilon SMD DT 1W Cool White at MP binning temperature and at room temperature

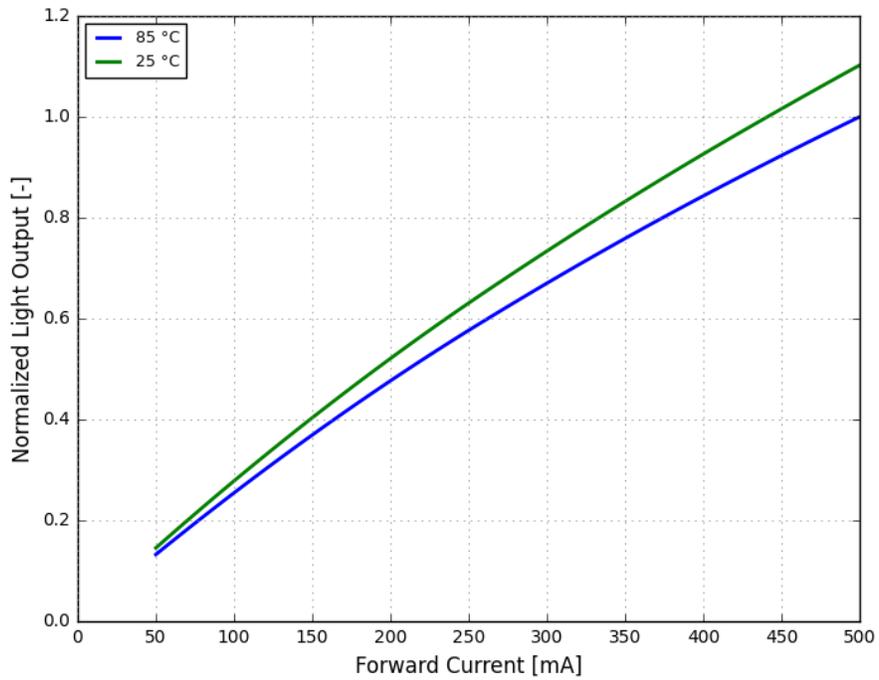


Figure 7 Typical normalized light output vs. forward current for LUXEON Altilon SMD DT 1W PC Amber at MP binning temperature and at room

Forward Current and Forward Voltage Characteristics

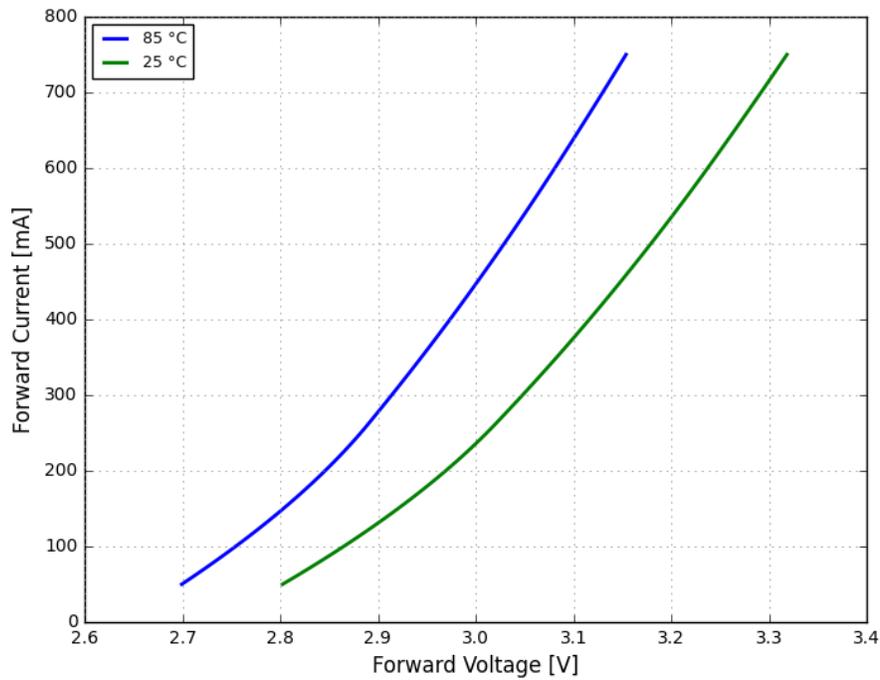


Figure 8 Typical forward current vs. forward voltage for LUXEON Altilon SMD DT 1W Cool White at MP binning temperature and at room temperature

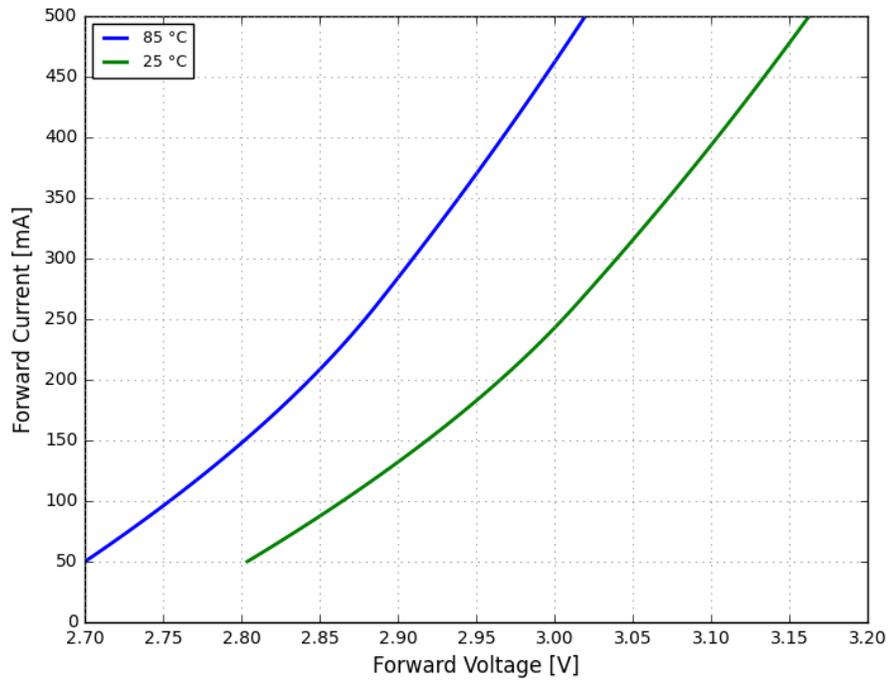


Figure 9 Typical forward current vs. forward voltage for LUXEON Altilon SMD DT 1W PC Amber at MP binning temperature and at room temperature

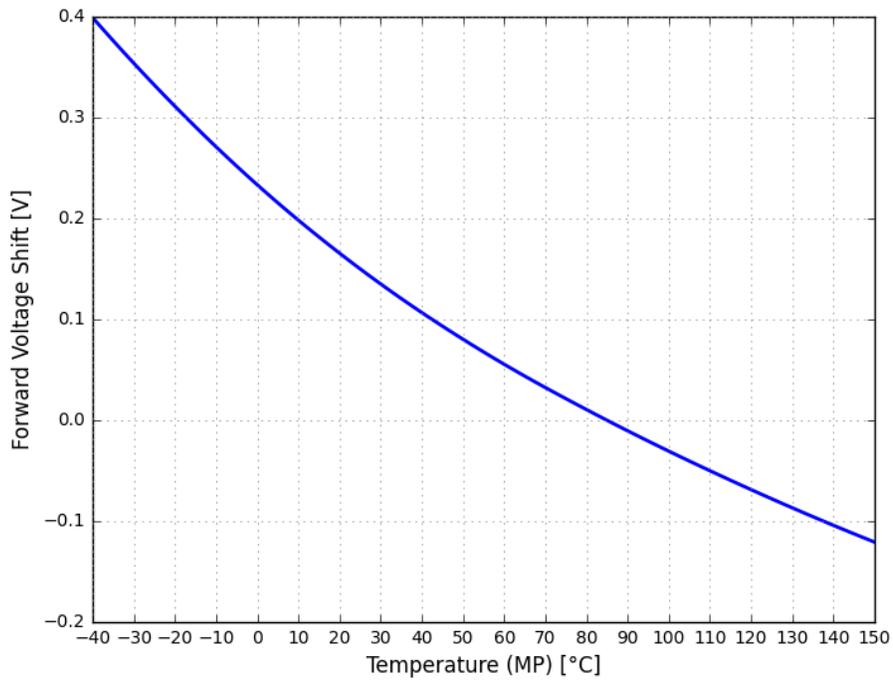


Figure 10 Typical forward voltage shift vs. temperature for LUXEON Altilon SMD DT 1W at MP binning current

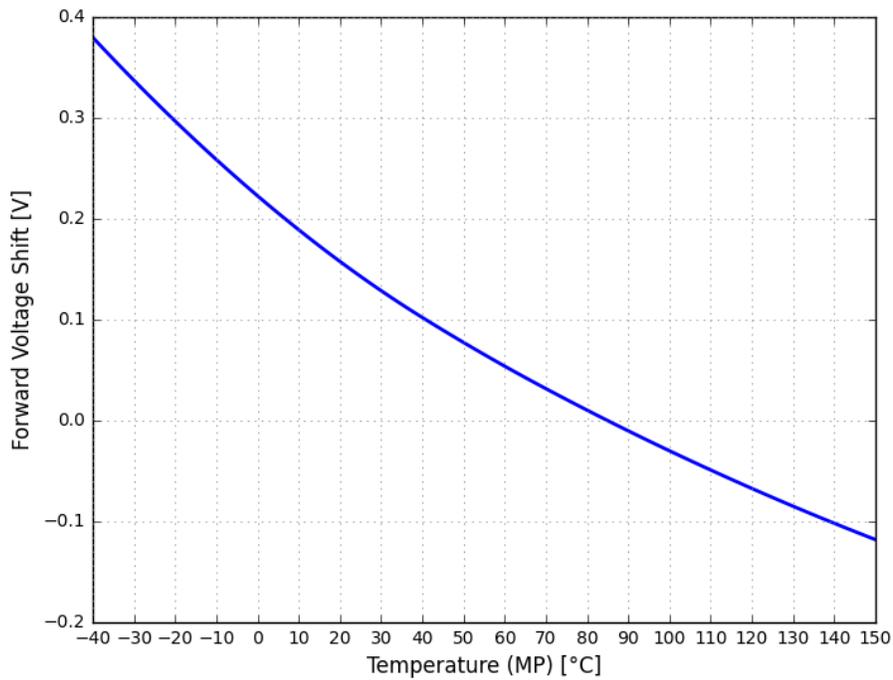


Figure 11 Typical forward voltage shift vs. temperature for LUXEON Altilon SMD DT 1W at MP binning current

Color Shift Characteristics

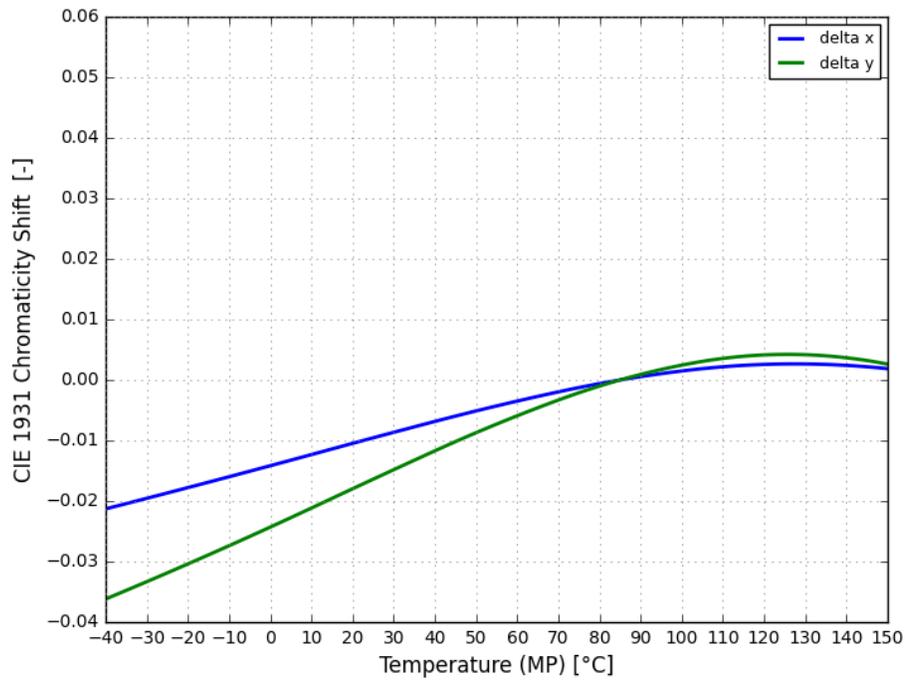


Figure 12 Typical color shift in CIE1931 x, y coordinates vs. temperature for LUXEON Altilon SMD DT 1W Cool White at MP binning current

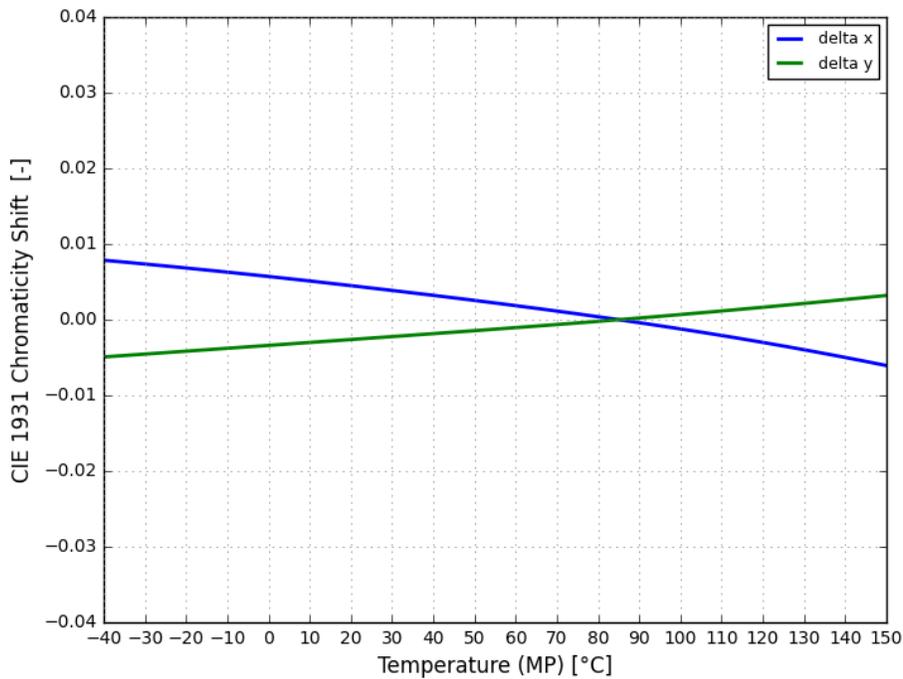


Figure 13 Typical color shift in CIE1931 x, y coordinates vs. temperature for LUXEON Altilon SMD DT 1W PC Amber at MP binning current

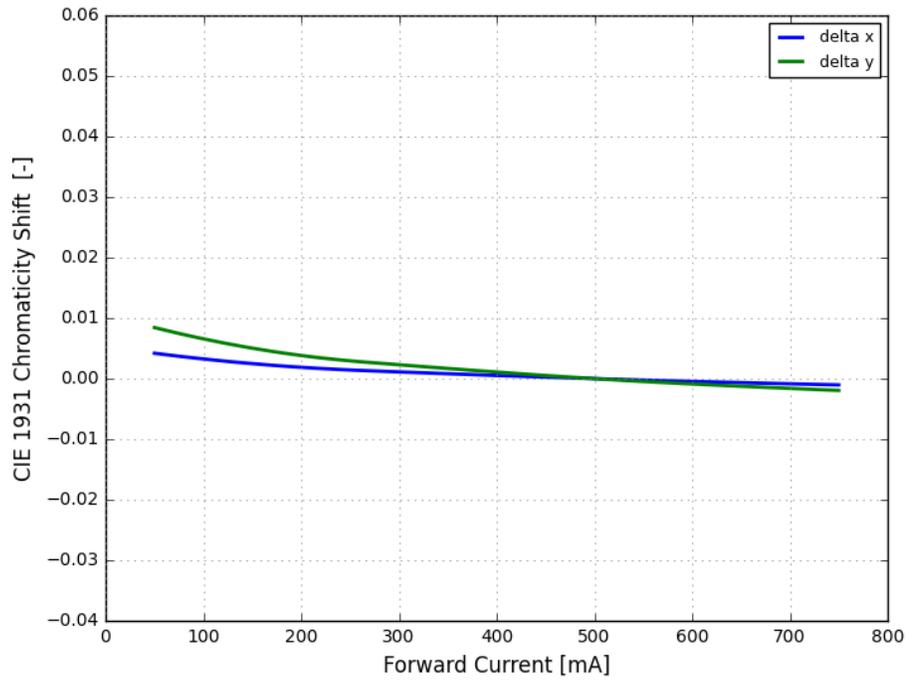


Figure 14 Typical color shift in CIE1931 x, y coordinates vs. forward current for LUXEON Altilon SMD DT 1W Cool White at MP binning temperature

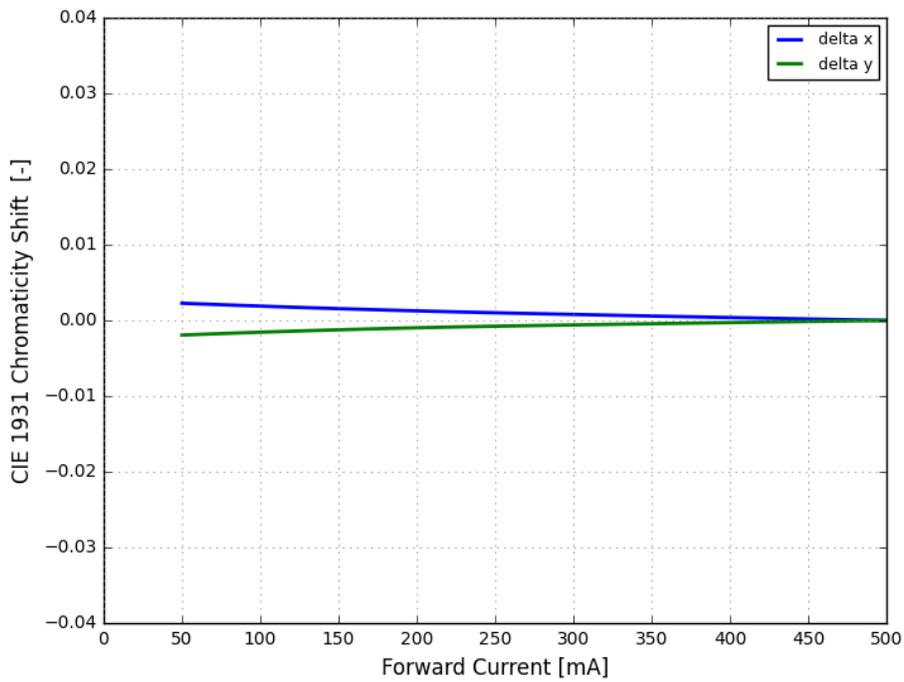


Figure 15 Typical color shift in CIE1931 x, y coordinates vs. forward current for LUXEON Altilon SMD DT 1W PC Amber at MP binning temperature

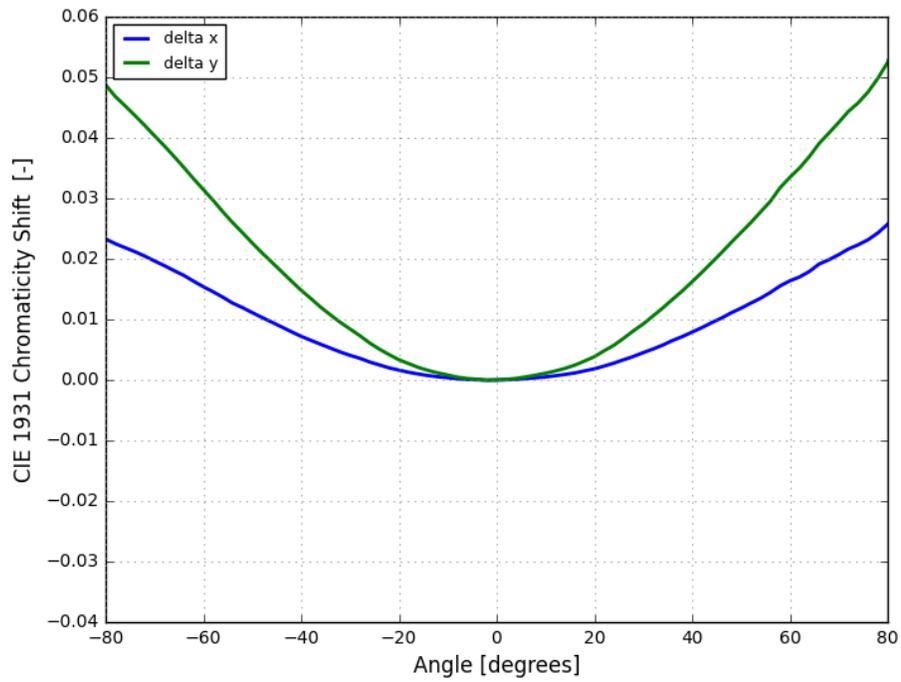


Figure 16 Typical color shift over angle for LUXEON Altilon SMD DT 1W Cool White

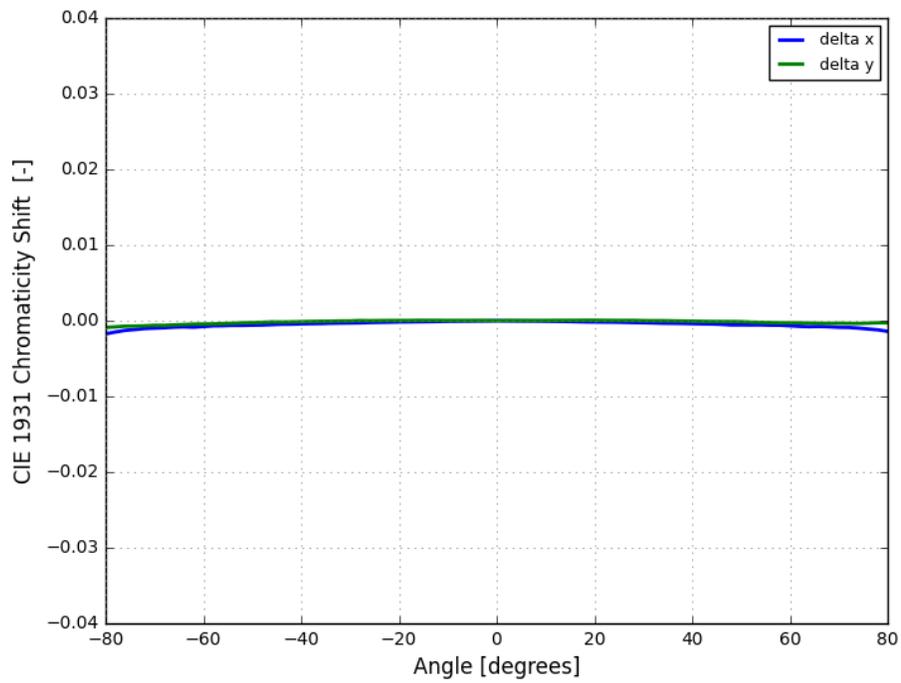


Figure 17 Typical color shift over angle for LUXEON Altilon SMD DT 1W PC Amber

Radiation Pattern Characteristics

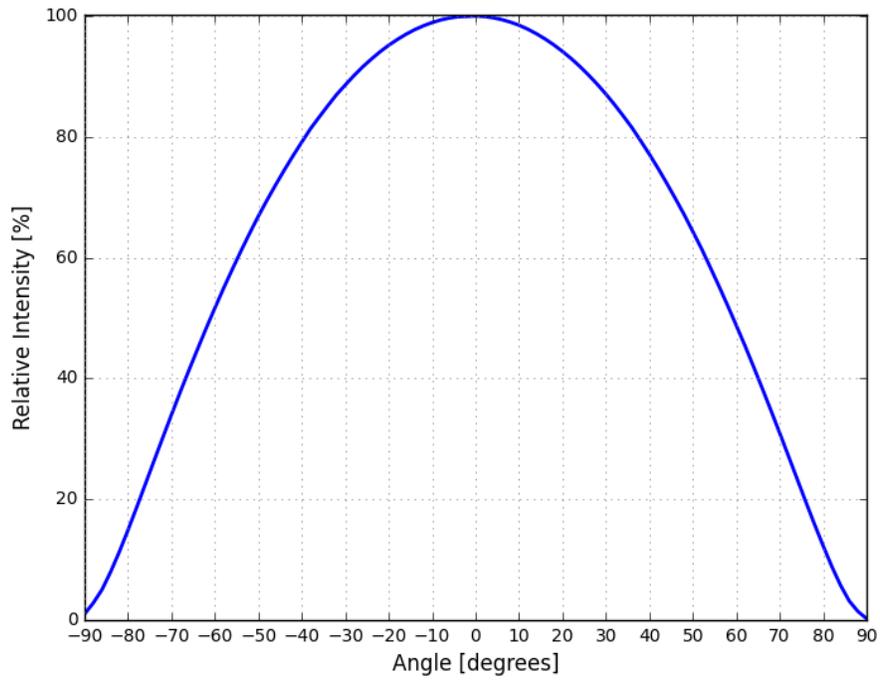


Figure 18 Typical radiation pattern for LUXEON Altilon SMD DT 1W Cool White

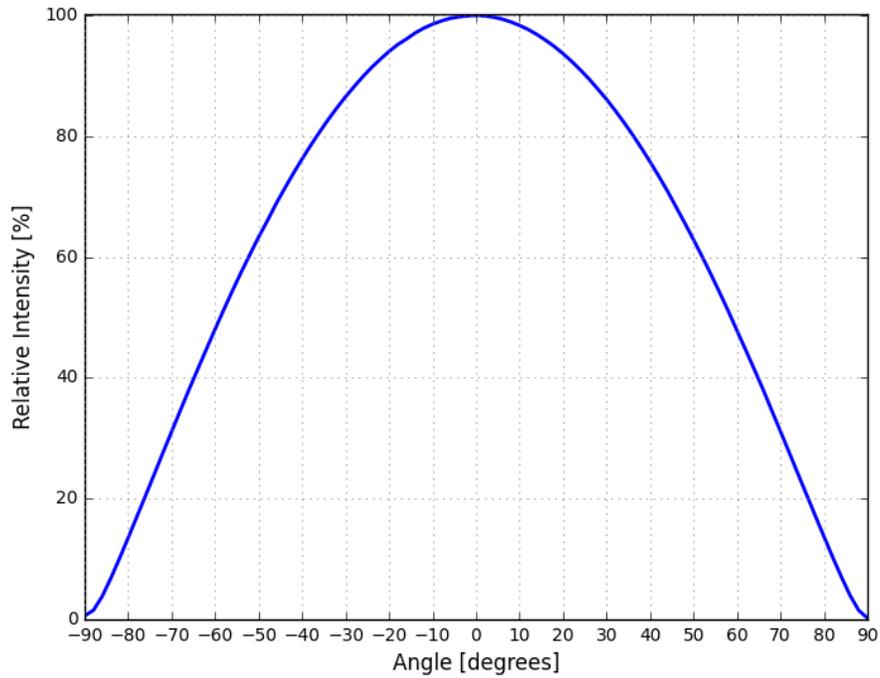


Figure 19 Typical radiation pattern for LUXEON Altilon SMD DT 1W PC Amber

Operating Limits Characteristics

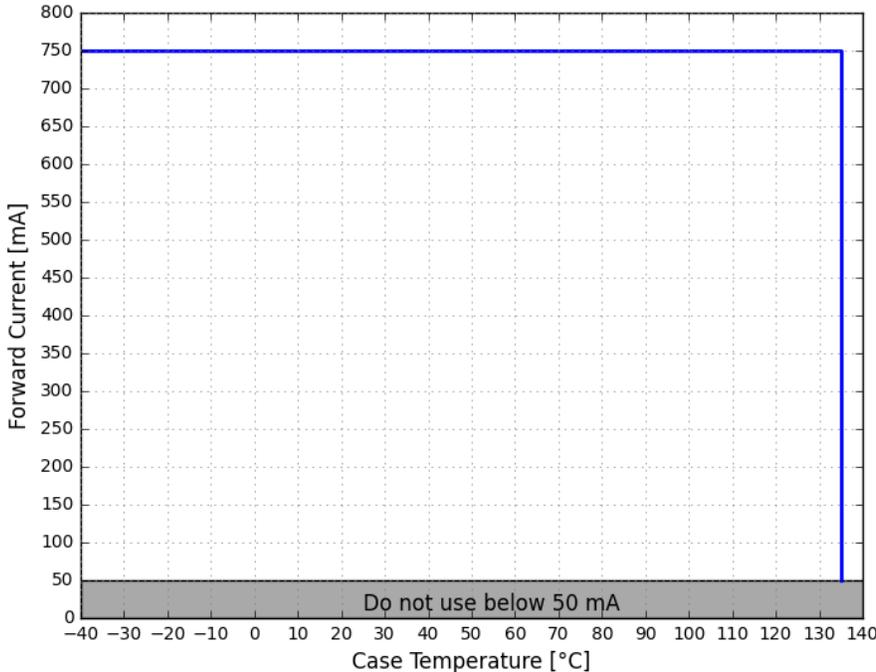


Figure 20 Maximum forward current vs. case temperature for LUXEON Altilon SMD DT 1W Cool White

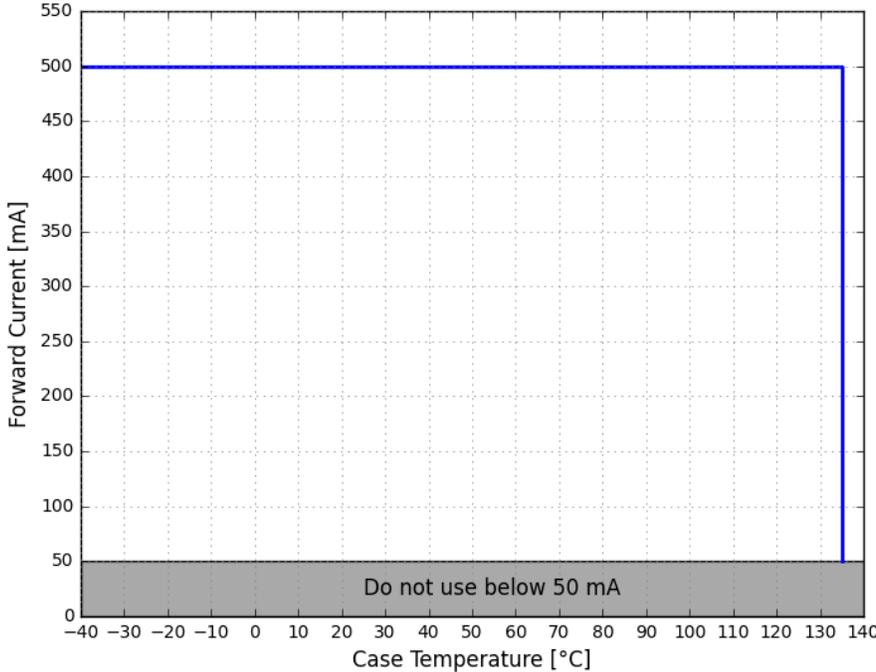


Figure 21 Maximum forward current vs. case temperature for LUXEON Altilon SMD DT 1W PC Amber

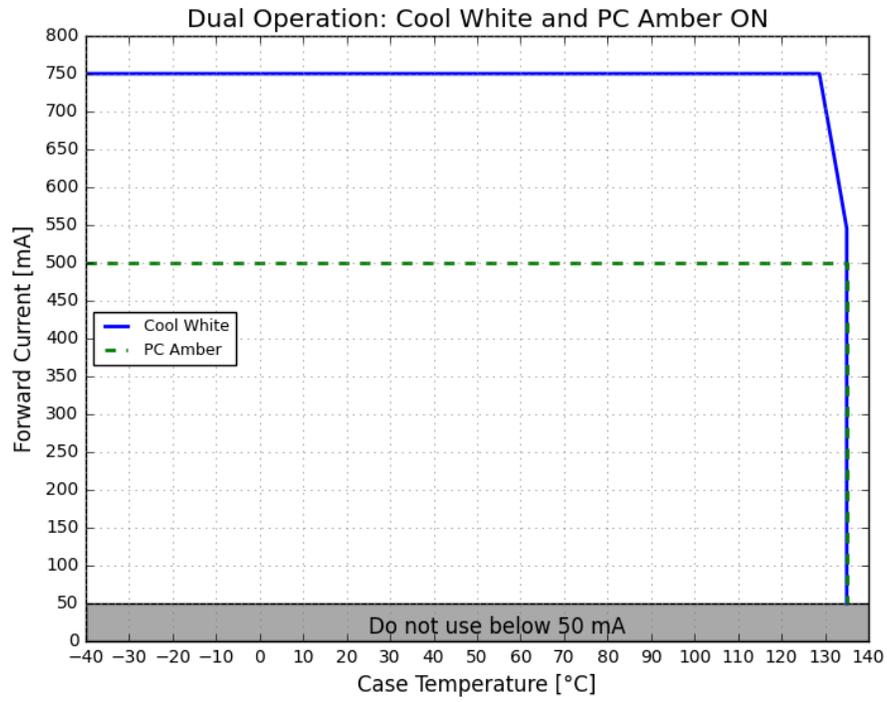


Figure 22 Maximum forward current vs. case temperature for LUXEON Altilon SMD DT 1W Cool White and PC Amber ON (dual operation)

Permissible Pulse Handling Characteristics

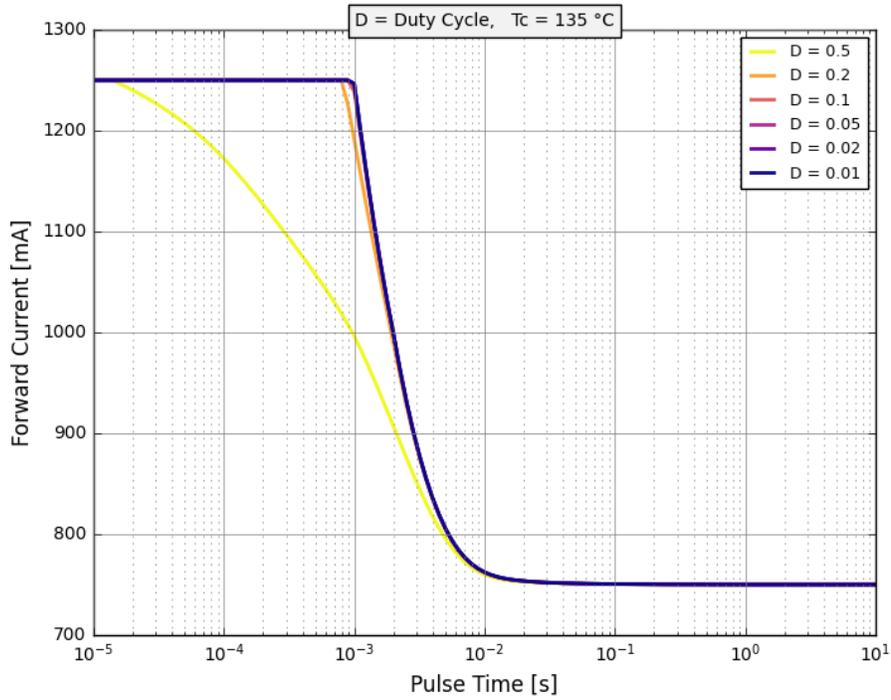


Figure 23 Pulse handling capability for LUXEON Altilon SMD DT 1W Cool White at highest case temperature, where maximum DC current can be applied

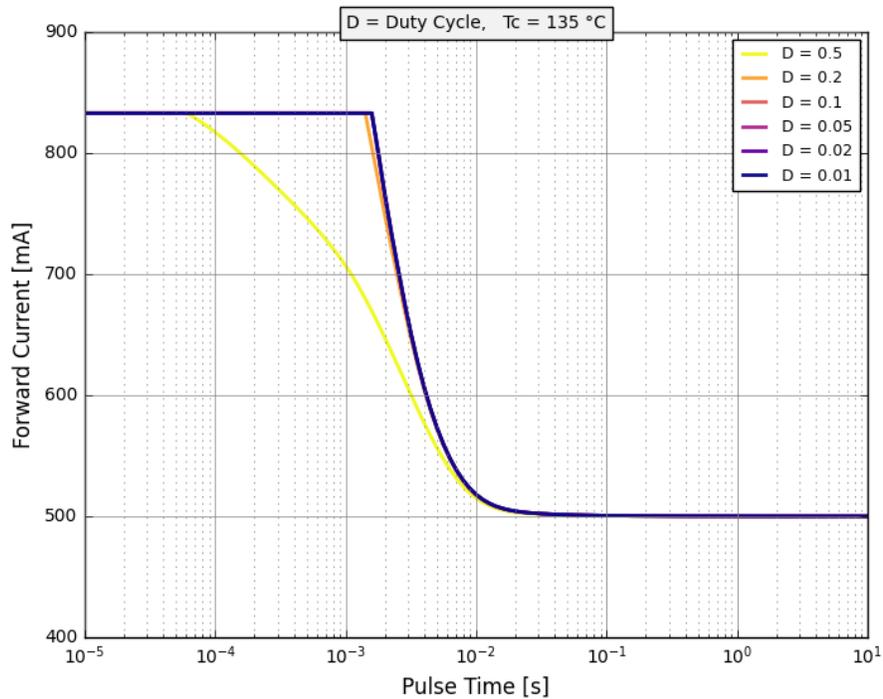


Figure 24 Pulse handling capability for LUXEON Altilon SMD DT 1W PC Amber at highest case temperature, where maximum DC current can be applied

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 Altilon SMD DT 1W emitters are labeled using a 5-digit alphanumeric CAT code following the format below:

A B C D E

Where:

- A** - designates luminous flux bin
- B** - designates color code for Cool White
- C** - designates color code for PC Amber
- D** - designates forward voltage bin for Cool White
- E** - designates forward voltage bin for PC Amber

Therefore, a LUXEON Altilon SMD DT 1W emitter with a Cool White lumen range of 145 to 160 lumens, a PC Amber lumen range of 120 to 135 lm, color code for Cool White: 4 and color code for PC Amber: 2 has the following CAT code:

5 4 FXX

Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON Altilon SMD DT 1W emitters. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance.

Table 6. Luminous flux bin definitions for LUXEON Altilon SMD DT 1W at MP binning condition

BIN	Cool White LUMINOUS FLUX ⁽¹⁾ (lm)		PC Amber LUMINOUS FLUX ⁽¹⁾ (lm)	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
2	130	145	105	120
3	130	145	120	135
4	145	160	105	120
5	145	160	120	135
6	160	175	105	120
7	160	175	120	135

Notes for Table 6:

1. Lumileds maintains a tolerance of $\pm 6.5\%$ on luminous flux measurements.

Color Codes

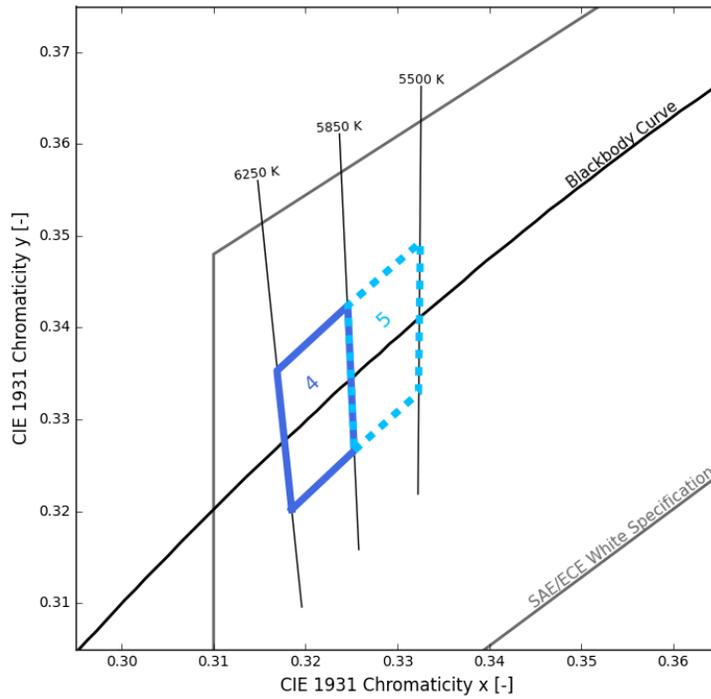


Figure 25 Color bin structure for LUXEON Alticon SMD DT 1W Cool White

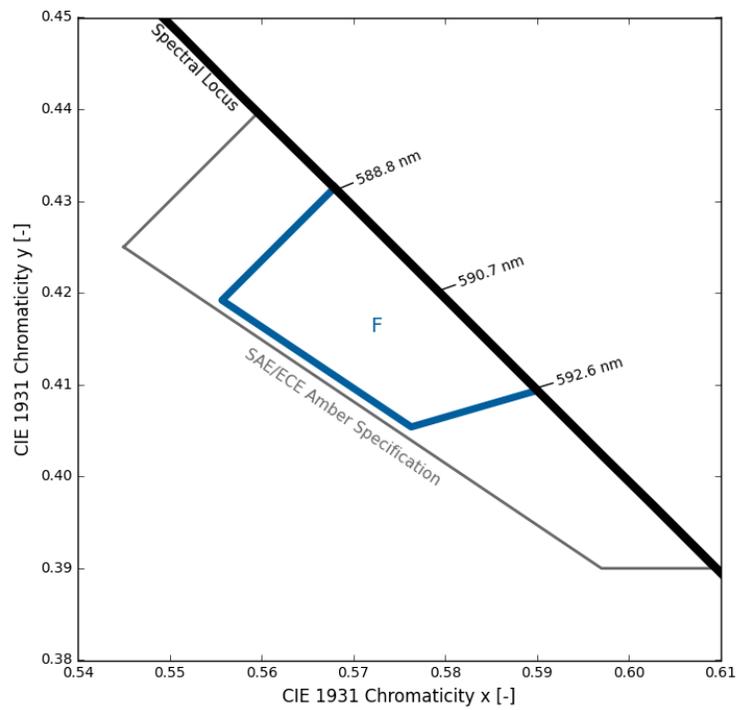


Figure 26 Color bin structure for LUXEON Alticon SMD DT 1W PC Amber

Color Bin Definitions

Table 7. Color bin definitions for LUXEON Altilon SMD DT 1W Cool White^[1]

BIN	x	y
4	0.3185	0.3202
	0.3253	0.3266
	0.3246	0.3424
	0.3169	0.3353
5	0.3253	0.3266
	0.3323	0.3329
	0.3325	0.3493
	0.3246	0.3424

Notes for Table 7:

1. Lumileds maintains a tester tolerance of ± 0.005 on CIE1931 x, y color coordinates.

Table 8. Color bin definitions for LUXEON Altilon SMD DT 1W PC Amber^[1]

BIN	x	y
F	0.5680	0.4315
	0.5901	0.4094
	0.5763	0.4054
	0.5557	0.4192

Forward Voltage Bins

For LUXEON Altilon SMD DT 1W no forward voltage bins are available. Forward voltage range is given in Table 3. Please contact your sales representative if you have additional requirements with respect to forward voltage binning.

Mechanical Dimensions

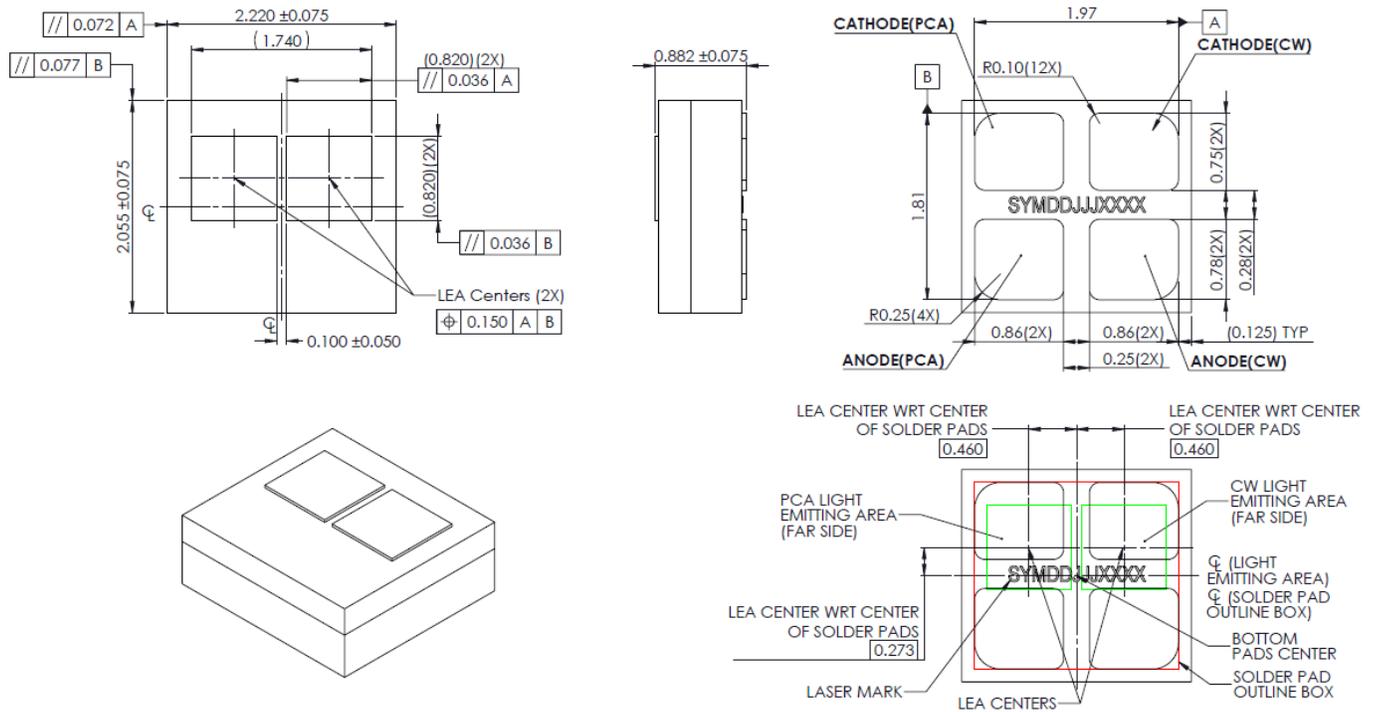


Figure 27. Mechanical dimensions for LUXEON Altilon SMD DT 1W

Notes for Figure 27:
 1. Drawings are not to scale.
 2. All dimensions are in millimeters.

Package Weight

Table 9. Approximate weight of LUXEON Altilon SMD DT 1W

PART NUMBER	PACKAGE WEIGHT [mg]
A1SC-DT112BH1Axxxx	7.31

JEDEC Moisture Sensitivity

Table 10. Moisture sensitivity levels for LUXEON Altilon SMD DT 1W

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

Packaging Information

Pocket Tape Dimensions

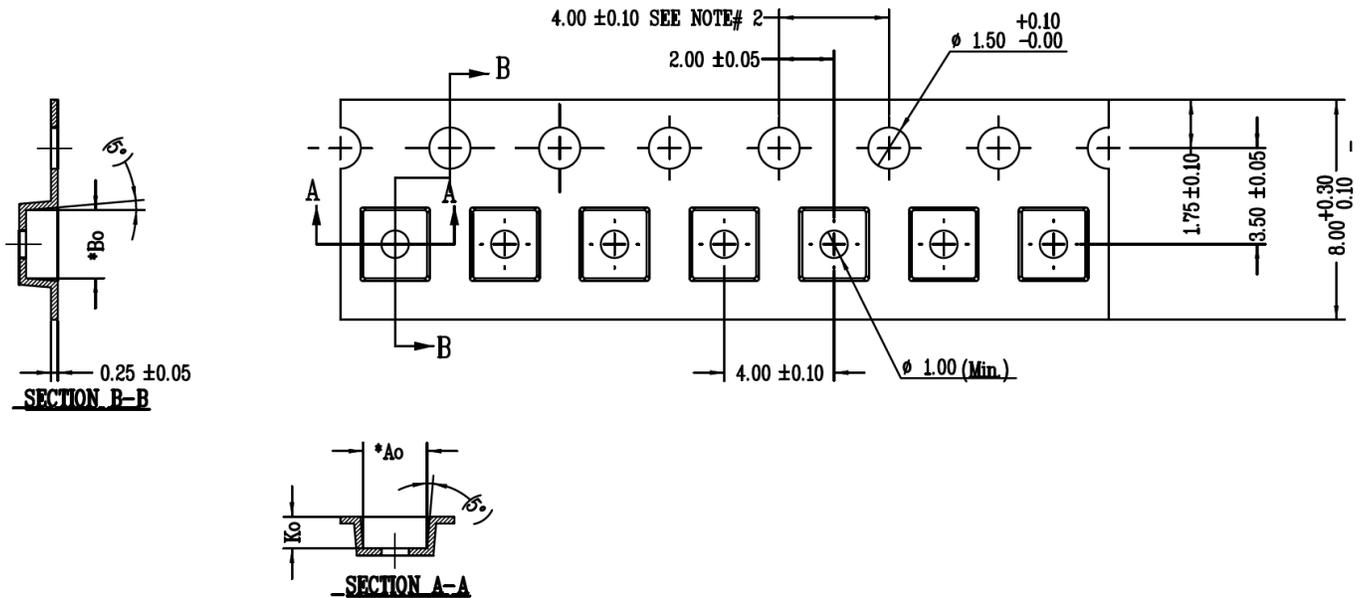


Figure 28. Pocket tape dimensions for LUXEON Altilon SMD DT 1W

Notes for Figure 28:

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

Reel Dimensions

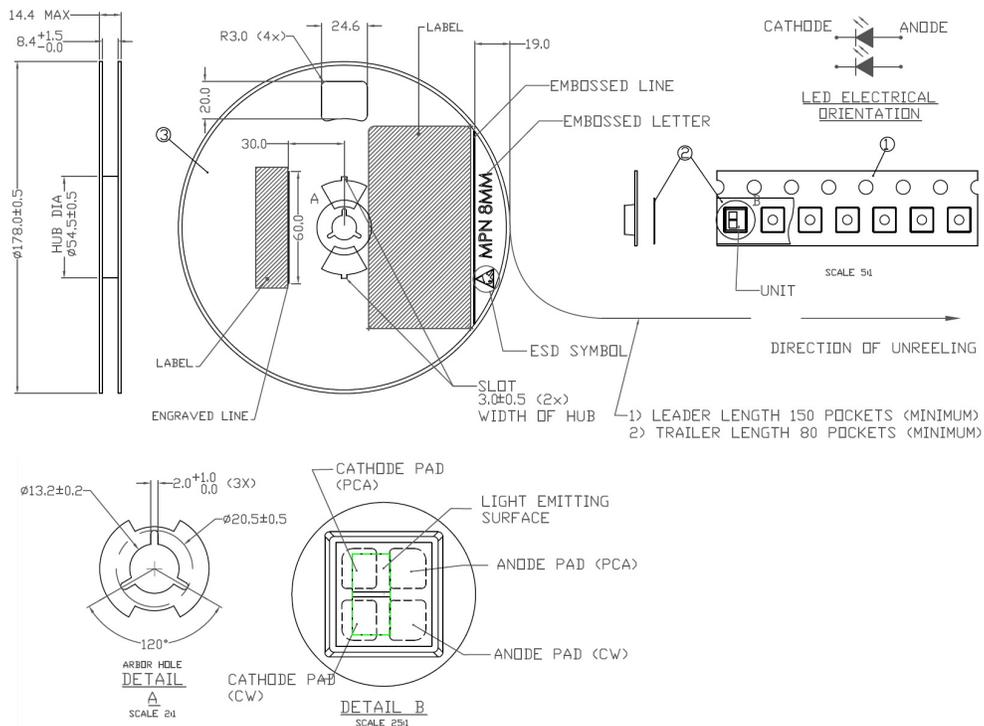


Figure 29. Reel dimensions for LUXEON Altilon SMD DT 1W

Notes for Figure 29:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

Product Labeling

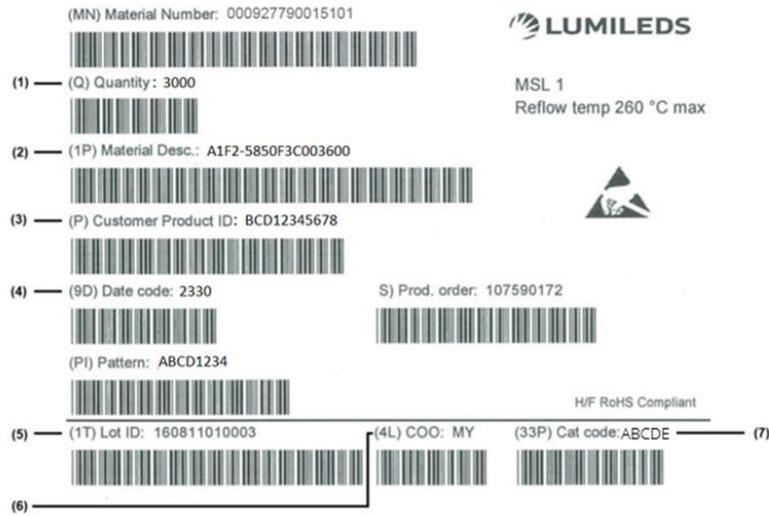


Figure 30. Example of a product label for LUXEON Altilon SMD DT 1W

Notes for Figure 30 - 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 5-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 better, safer, more beautiful—with light.

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



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