



3014

series

0.1 W
PLCC 3.0 X 1.4 MM

TECHNICAL
DATASHEET

INTRODUCTION

Octa Light white LED 3014 is an industry standard compatible low-power package 3.0mm x 1.4mm. It is ideal solution to achieve light uniformity in indoor lighting designs, backlighting, LED lamps, number of specialty applications like signage, etc.

In addition to delivering variety of Correlated Color Temperature and Color Rendering combinations, 3014 PLCC series emitters provide excellent efficiency, lifetime and reliability. This document contains the performance data needed to design LED based applications.

Octa Light 3014 Series Features

- High efficacy for sustainable design
- Wide range of specified CCT & CRI combinations
- ANSI compliant Quarter binning
- Tested according to LM-80 Lumen maintenance standards
- Reflow process compatible
- Increased uniformity of light

General coding instructions for Octa
Light 3014 PLCC LED series
Product Binning and Labelling

OCTL – 314 – WW AX – A 8A W – C 70
X1 X2 X3 X6 X4 X5 X7 X8 X9

| X1 Comp. name | X2 Series name | X3 Color type | X4 Optical type | X5 Chromaticity coordinates BIN ¹ | X6 Minimum Flux BIN (Lm) | X7 Testing current (mA) | X8 Vf range at nominal current (V) | X9 CRI range |
|---------------------|----------------------|-------------------------|-----------------------|--|-----------------------------------|----------------------------------|---|--------------------|
| OCTL | 314 | CW - Cool White | A - 120 deg | 1 (A, B, C, D, E, F, O) ² | A4 - 9 | W- 20 | I - 2.8 - 3.0 | 70 - >70 |
| | | | | 2 (A, B, C, D, E, F, O) | A5 - 10 | | | |
| | | 3 (A, B, C, D, E, F, O) | | A6 - 12 | WW - Warm White | | 8 (A, B, C, D, E, F, O) | A8 - 16 |
| | | 4 (A, B, C, D, E, F, O) | | A7 - 14 | | | | |
| | | 5 (A, B, C, D, E, F, O) | | | | | | |
| | | 6 (A, B, C, D, E, F, O) | | | | | | |
| | | 7 (A, B, C, D, E, F, O) | | | | | | |
| | | BL (Blue) | | | | | | |
| | | RB (Royal Blue) | | | | | | |
| | | VL (Violet) | | | | | | |
| RD (Red) | | | | | | | | |
| RD (Red- Orange) | | | | | | | | |
| PK (Pink) | | | | | | | | |
| GN (Green) | | | | | | | | |
| CY (Cyan) | | | | | | | | |
| BL - Blue | | | | | | | | |
| RD - Red | | | | | | | | |
| GN - Green | | | | | | | | |

Notes:

1. Information about chromaticity coordinates bin can be found in Binning information file.
2. Chromaticity coordinates bin 10 includes all of the bins 1A, 1B, 1C, 1D, 1E, 1F. This applies for all bins.

PRODUCT SELECTION

Table 2.1 Product Selection for Octa Light 314 Series LEDs- High lm/W range

Example nomenclatures for 314 PLCC LED series with highest lm/W combinations

| | Nominal CCT | Part Number | Minimum CRI | Typical CRI | Minimal Luminous Flux(lm) @20mA | Typical Luminous Flux(lm) @20mA | Forward voltage range |
|---------------|-------------|-------------------------|-------------|-------------|---------------------------------|---------------------------------|-----------------------|
| Warm White | 2700K | OCTL-314-WWA5-A80W-C70 | 70 | 75 | 8 | 10 | 2.8-3.2V |
| | 3000 K | OCTL-314-WWA5-A70W- C70 | 70 | 75 | 8 | 10 | 2.8-3.2V |
| | 3500 K | OCTL-314-WWA5-A60W- C70 | 70 | 75 | 8 | 10 | 2.8-3.2V |
| Neutral White | 4000K | OCTL-314-NWA5-A50W- C70 | 70 | 75 | 9 | 11 | 2.8-3.2V |
| | 4500K | OCTL-314-NWA5-A40W- C70 | 70 | 75 | 9 | 11 | 2.8-3.2V |
| Cool White | 5000K | OCTL-314-CWA5-A30W- C70 | 70 | 75 | 10 | 12 | 2.8-3.2V |
| | 5700K | OCTL-314-CWA5-A20W- C70 | 70 | 75 | 10 | 12 | 2.8-3.2V |
| | 6500K | OCTL-314-CWA5-A10W- C70 | 70 | 75 | 10 | 12 | 2.8-3.2V |

Table 2.2 Product Selection for Octa Light 314 Series LEDs- High CRI range

Example nomenclatures for 314 PLCC LED series with high lm/W and High CRI combinations

| | Nominal CCT | Part Number | Minimum CRI | Typical CRI | Minimal Luminous Flux(lm) @20mA | Typical Luminous Flux(lm) @ 20mA | Forward voltage range |
|---------------|-------------|-------------------------|-------------|-------------|---------------------------------|----------------------------------|-----------------------|
| Warm White | 2700K | OCTL-314-WWA5-A80W-C80 | 80 | 85 | 6 | 8 | 2.8-3.2V |
| | 3000 K | OCTL-314-WWA5-A70W- C80 | 80 | 85 | 6 | 8 | 2.8-3.2V |
| | 3500 K | OCTL-314-WWA5-A60W- C80 | 80 | 85 | 6 | 8 | 2.8-3.2V |
| Neutral White | 4000K | OCTL-314-NWA5-A50W- C80 | 80 | 85 | 7 | 9 | 2.8-3.2V |
| | 4500K | OCTL-314-NWA5-A40W- C80 | 80 | 85 | 7 | 9 | 2.8-3.2V |
| Cool White | 5000K | OCTL-314-CWA5-A30W- C80 | 80 | 85 | 8 | 10 | 2.8-3.2V |
| | 5700K | OCTL-314-CWA5-A20W- C80 | 80 | 85 | 8 | 10 | 2.8-3.2V |
| | 6500K | OCTL-314-CWA5-A10W- C80 | 80 | 85 | 8 | 10 | 2.8-3.2V |

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. All binnings are at 25C Junction temperature

ELECTRICAL CHARACTERISTICS

Forward voltage characteristics at $I_f = 20$ mA and thermal pad temperature 25°C:

Table 3.

| Color | Part Name | Forward Voltage Vf (V) | | | $\Delta V_f/\Delta T_j$ (mV/°C), at $I_m=5mA$ | Rth j-c (°C/W) |
|---------------|-----------------------|------------------------|---------|------|---|----------------|
| | | Min. | Typical | Max. | | |
| Cool white | OCTL-314-CWX-A10W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| | OCTL-314-CWX-A20W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| | OCTL-314-CWX-A30W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| Neutral white | OCTL-314-NWX-A40W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| | OCTL-314-NWX-A50W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| Warm white | OCTL-314-WWX-A60W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| | OCTL-314-WWX-A70W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |
| | OCTL-314-WWX-A80W-XXX | 2.8 | 2.9 | 3.2 | 1.6 | 7 |

Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. Based on order codes, Octa Light PLC can deliver a specific Vf binning range as follows:
 - a. Vf Range 2.8 -3.0 – Vf bin I, see column X8 in 314 coding guidelines
 - b. Vf Range 3.0-3.2 – Vf Bin J, see column X8 in 314 coding guidelines
 - c. Vf range 3.2-3.4 – Vf Bin K, see column X8 in 314 coding guidelines

ABSOLUTE MAXIMUM RATINGS

Table 4. Absolute maximum ratings for thermal pad temperature 25 °C

| Parameter | Symbol | Max rate |
|--|-------------------|----------------|
| Maximum DC forward current (continuous) | I_{fmax} | 200 mA |
| Maximum Pulse current (10 mS pulse width, 10% duty cycle) | I_{fpeak} | 400 mA |
| Absolute Max forward voltage @ 150 mA | $V_{fmax\ 150mA}$ | 3.4 V |
| Max Forward Voltage @ 350 mA | $V_{fmax\ 350mA}$ | 3.8 V |
| Maximal Led junction temperature | T_{jmax} | 150 C |
| ESD sensitivity | V | Class 2 * |
| Operating Case temperature at 150mA | T_{cmax} | -60 + 140 |
| Soldering temperature | $T_{soldermax}$ | 260 C ** |
| Storage temperature | T_{store} | -40C to +120 C |
| Allowable Reflow cycles | / | 3 times |
| Reverse voltage at maximal reverse current 10 μ A | V_r | 5 V |

* ESD sensitivity CLASS II, human body model, ANSI/ESDA/JEDEC JS-001-2012

** JEDEC 020D

THERMAL AND OPTICAL CHARACTERISTICS

Table 5. Absolute maximum ratings for thermal pad temperature 25 °C

| Parameter | Symbol | Typical |
|---|----------------------|------------|
| Thermal resistance, junction to solder point | C/W | 10 |
| Viewing Angle Lambertian Distribution (FWHM) | Degrees | 120 |
| Color Shift Versus angle Δx and Δy at 80 degree viewing angle, CIE 1931 Optical distribution type A | $\Delta x, \Delta y$ | 0.04, 0.04 |

JEDEC MOISTURE SENSITIVITY

| LEVEL | Floor Life | | Soak Requirements | |
|-------|------------|---------------|---------------------|----------------|
| | Time | Condition | Time | Condition |
| 3 | 168 hours | 30, 60% RH | 192 Hrs +5 -0 Hz | 30 C 62% RH |



REFLOW SOLDERING CHARACTERISTICS

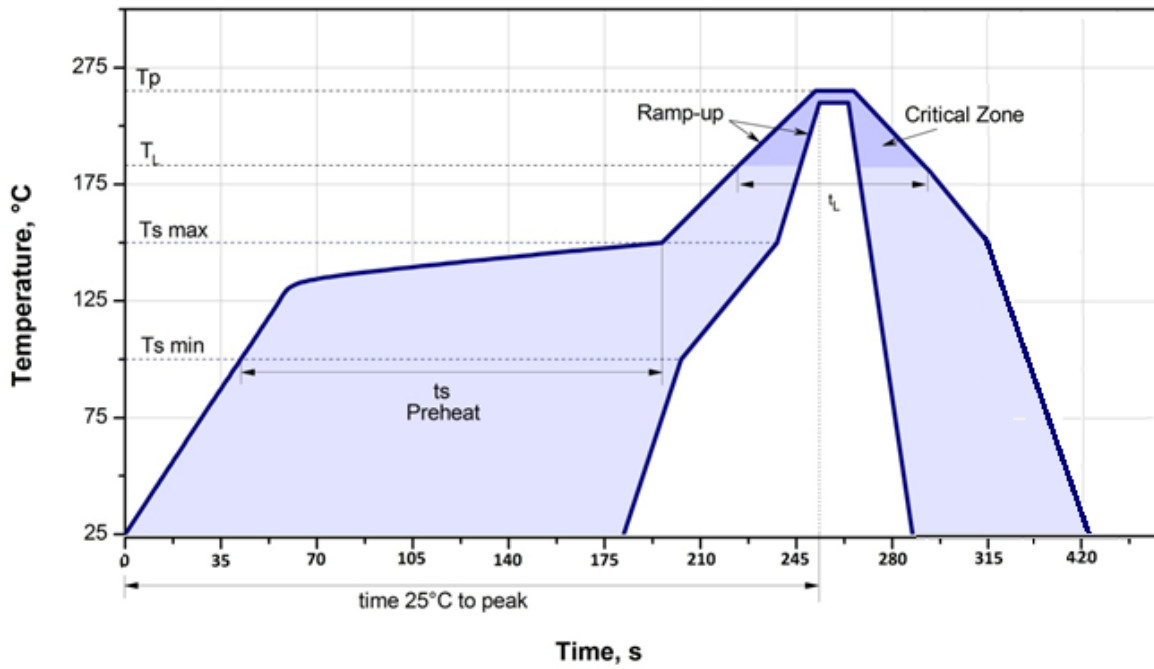


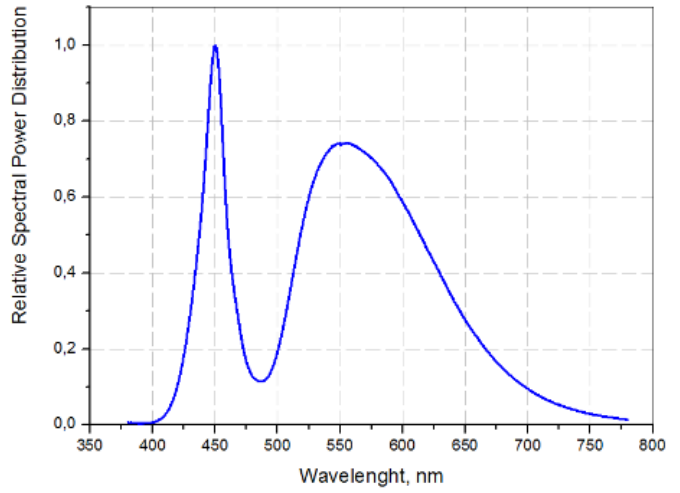
Figure 1. Reflow Soldering Profile

| Profile Feature | Assembly |
|---|-----------------|
| Average Ramp-up rate (T _{smax} to T _p) | 3°C/second max. |
| Preheat: | |
| - Temperature Min (T _{smin}) | 100°C |
| - Temperature Min (T _{smax}) | 150°C |
| - Time (T _{smin} to T _{smax}) | 60-120 seconds |
| Liquidous Temperature T _L | 220°C |
| Maximum maintained time T _{imetL} | 60-120 seconds |
| Absolute Maximum Peak package body Temperature (T _p) | 260°C |
| Recommended Peak Package temperature | 240°C |
| Time within 5°C of recommended Peak Package temperature (t _p) | 10-30 seconds |
| Ramp-down rate | 6°C/second max |
| Time 25°C to peak temperature | 7 minutes max. |

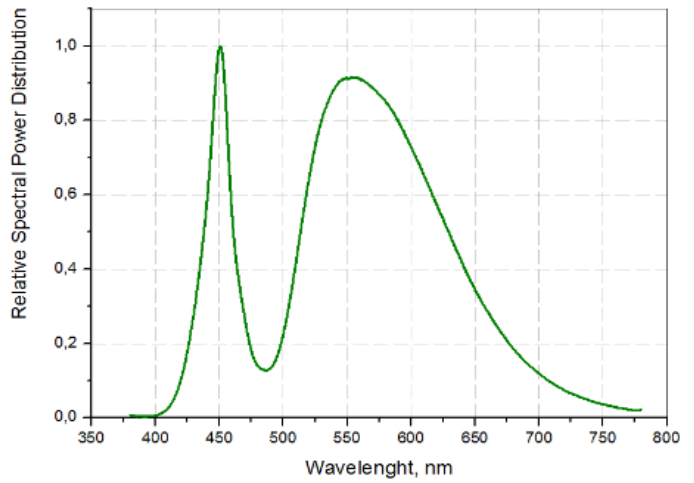
Table 6. Reflow Profile Features

RELATIVE SPECTRAL DISTRIBUTION (mW VERSUS WAVELENGTH)

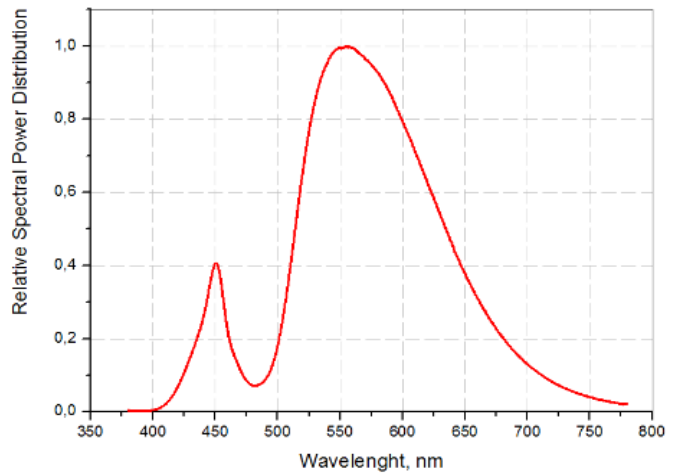
Relative Cool White Spectral power distribution



Relative Neutral White Spectral power distribution

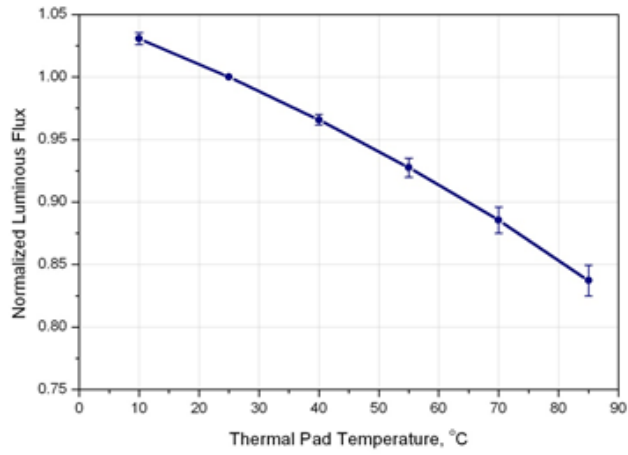


Relative Warm White Spectral power distribution



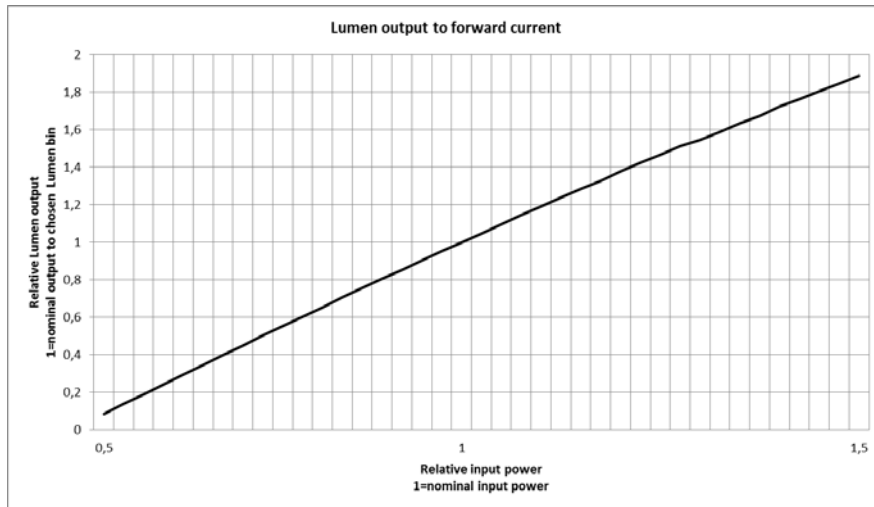


Light output characteristics over temperature



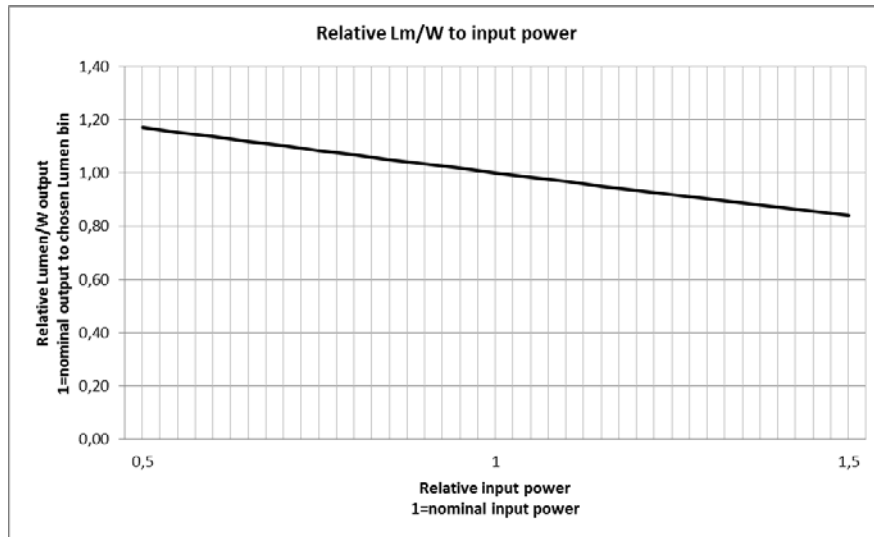
Normalized Luminous Flux at 25°C, $I_f = 150mA$

Forward Current & Relative Luminous Flux at Thermal pad temperature 25 °C

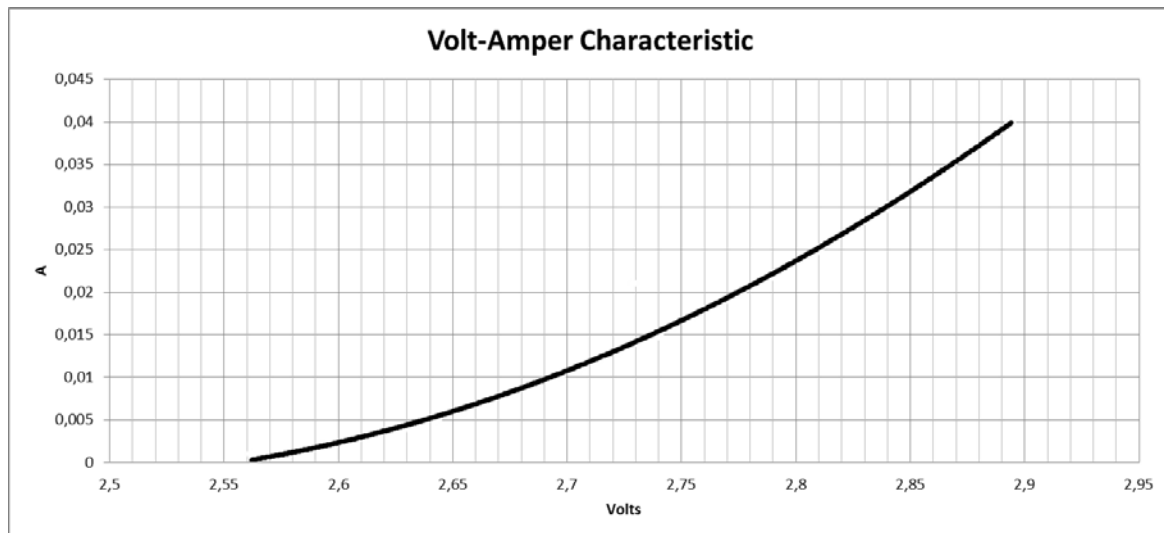




Relative Lumen/W output from input power consumption at junction temperature 25 °



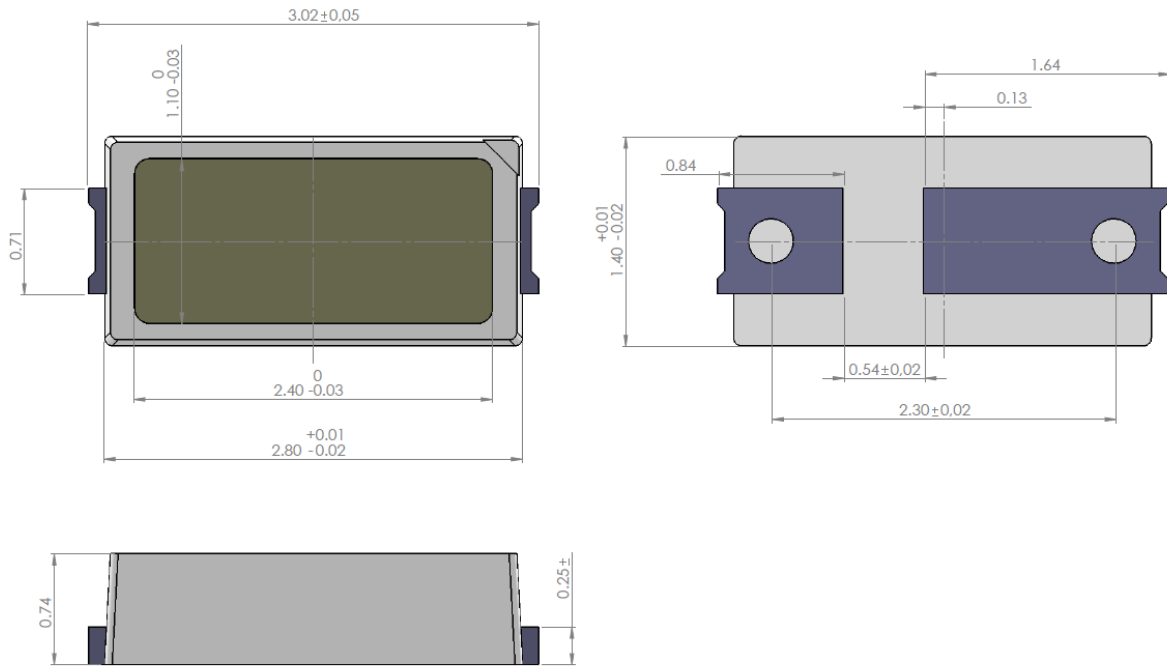
Volt-Amper characteristics at Thermal pad temperature 10 °C, 25 °C and 50 °C



Notes:

1. Octa Light PLC maintains a tolerance of $\pm 5\%$ on forward voltage measurements.
2. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
3. Light Emitting Diodes are not designed to be driven in reverse bias.
4. Allowable reflow cycles are 3 times for each LED.

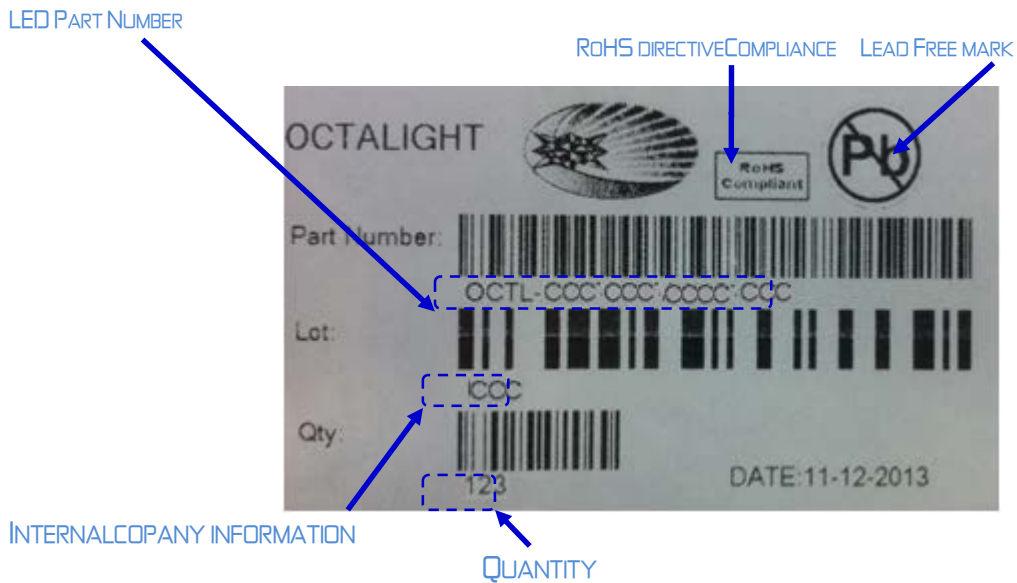
LED PACKAGE DIMENSIONS AND POLARITY



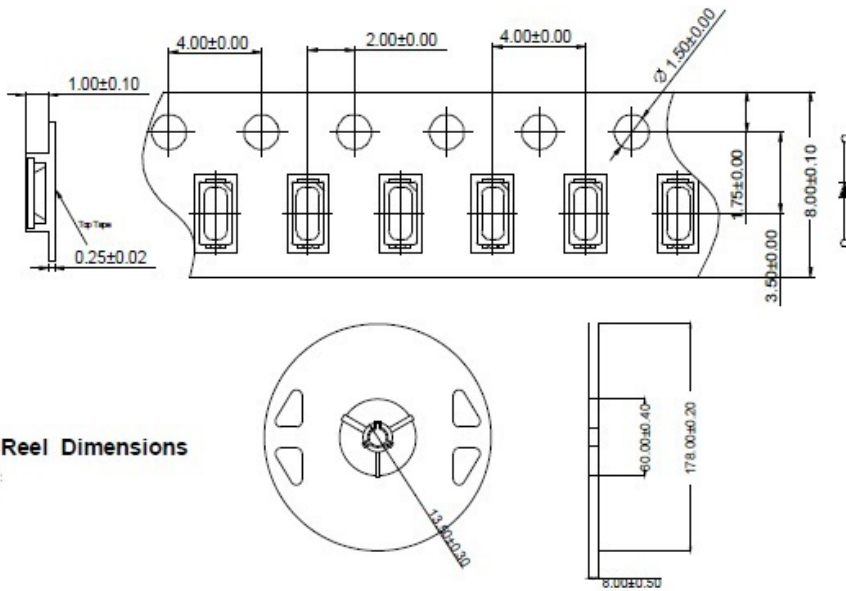
Notes:

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

LABELING INFORMATION



TAPE AND REEL SPECIFICATION



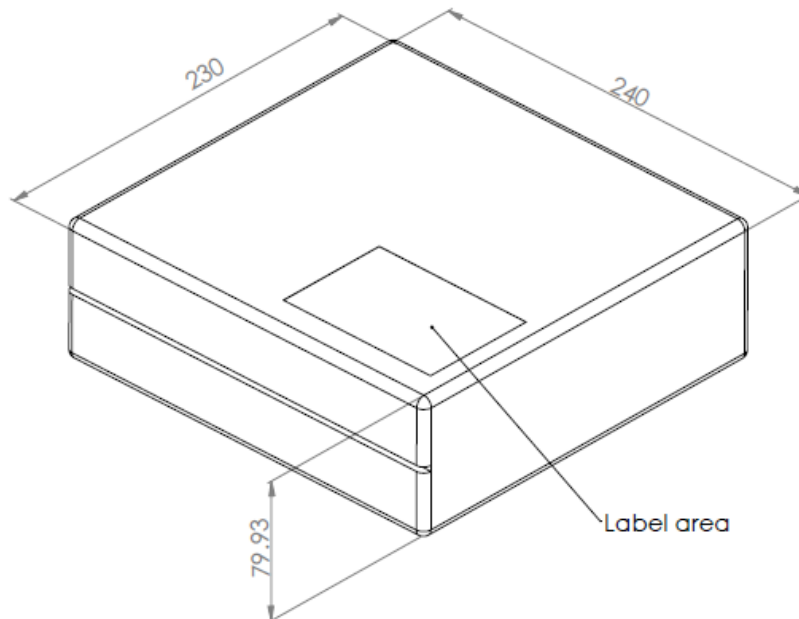
Reel Dimensions

**Quantity per 8 inch reel - 4060 pockets, 30 empty at beginning, 30 empty at exit.
One 8 inch reel to accommodate 4000 units**

Packaging notes:

- All dimensions are in mm
- Empty pockets sealed with top cover tape
- 8 mm. reel, 4000 pieces standard packaging, 500 minimum packaging
- Maximal number of consecutive missing led's is three

PACKAGING SPECIFICATION



Packaging notes:

- All dimensions are in mm
- The LEDs are delivered in Carton Boxes, each containing up to 5 ESD protective Bags including a vacuum sealed 7 inch Reel.
- Label information contains the information regarding the LEDs inside each box, as well as reel number inside

COMPANY INFORMATION

Octa Light Bulgaria was established in 2010 as a research and manufacturing center for Light Emitting Diodes (LED) and is entirely based in the EU. Octa Light Bulgaria own LED portfolio includes powerful high-brightness light emitting diodes, last generation of low-power & mid-power LEDs, wide range of COBs and innovative AC LED modules. The company manufactures LEDs in in all three base colors - red, green, blue and white, as well as exotic colors as pink, cyan, yellow, purple and other on basis of client requirements. We constantly upgrade our LEDs range to bring highest performance and quality of light sources for today's wide range of lighting applications.

The company is also OEM and ODM supplier of LED packages.

Today Octa Light Bulgaria is fully vertically integrated manufacturer of LED packages, LED modules, LED lamps and LED luminaires.

Octa Light Bulgaria offers also complete lighting solutions accomplishing a variety of lighting projects with own range of LED luminaires. Further to its core lighting business the company offers Electronic Manufacturing Services (EMS).

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