

MAGIC LED

PLW16A120 Series

Advance Product Information



Description

Plessey PLW16A120 SMT LEDs are designed for linear tubes and other general lighting applications. The light is emitted close to a Lambertian distribution and hence this SMT package is naturally suitable for backlighting panels and symbols. The LEDs are packed in reels containing 2000 pieces; every reel will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- 5630 footprint
- High reliability PLCC packaging
- Diffused pale yellow resin
- 120 degree wide viewing angle

Applications

- Decoration Lighting
- Instrument panel backlighting
- Illumination symbols
- General lighting
- Signage lighting

| Variant | Colour | CCT | |
|-------------|---------------|-------|-------|
| | | Min. | Max. |
| PLW16A120WW | Warm White | 2870K | 3220K |
| PLW16A120NW | Neutral White | 3710K | 4260K |
| PLW16A120CW | Cool White | 5310K | 6020K |

Absolute Maximum Ratings

T_{amb} = +25°C unless otherwise stated

| Parameter | Symbol | Minimum | Maximum | Unit |
|---|------------------|---------|---------|------|
| DC Forward Current | I _F | - | 150 | mA |
| Peak Pulse Forward Current ^[1] | I _{FP} | - | 180 | mA |
| Reverse Voltage | V _R | - | 5 | V |
| Storage Temperature | T _{stg} | -40 | +105 | °C |
| Junction Temperature | T _j | -40 | +105 | °C |

[1] Pulse width ≤10ms, duty cycle ≤10%

Electro-optical Characteristics

T_{amb} = +25°C unless otherwise stated

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-------------------------------|---------------------|---------------------------------|------|------|------|------|
| Forward Voltage | V _F | I _F = 100mA | 2.8 | 3.2 | 3.4 | V |
| Reverse Current | I _R | V _R = 5V | - | - | 10 | μA |
| Correlated Colour Tempertaure | CCT | I _F = 100mA | 2870 | | 3220 | K |
| | | | 3710 | | 4260 | |
| | | | 5310 | | 6020 | |
| Colour Rendering Index | CRI | I _F = 100mA | 80 | | 85 | % |
| Luminous Flux | | I _F = 100mA 3000K | | 28 | | lm |
| | | I _F = 100mA 4000K | | 30 | | |
| | | I _F = 100mA 5700K | | 30 | | |
| Thermal Resistance | R _{thj-sp} | | - | 18 | - | K/W |
| Half-Intensity Angle | 2Θ _{1/2} | I _F = 100mA | - | 120 | - | deg |

Recommended Operating Conditions

In typical applications, for optimum LED performance

| Parameter | Symbol | Minimum | Maximum | Unit |
|-------------------------------|------------------|---------|---------|------|
| Operating Ambient Temperature | T _{opr} | -40 | +85 | °C |

Intensity Bin Groups

$I_F = 100\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

| Group | Luminous flux ^[1] (lm) | |
|-------|-----------------------------------|------|
| | Min. | Max. |
| C2 | 24 | 28 |
| C3 | 28 | 34 |

^[1] Tolerance $\pm 11\%$

Forward Voltage Bin Groups

$I_F = 100\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

| Group | V_F ^[1] (V) | |
|-------|--------------------------|------|
| | Min. | Max. |
| V1 | 2.8 | 2.9 |
| V2 | 2.9 | 3.0 |
| V3 | 3.0 | 3.1 |
| V4 | 3.1 | 3.2 |
| V5 | 3.2 | 3.3 |
| V6 | 3.3 | 3.4 |

^[1] Tolerance $\pm 0.05\text{V}$

Relative Spectral Emission

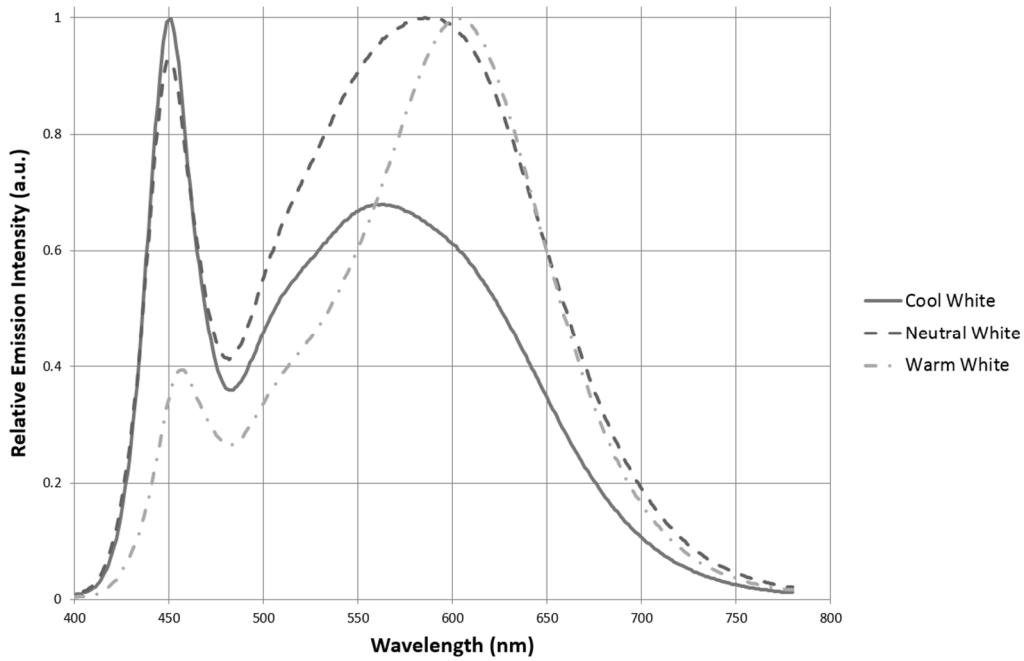


Figure 1. Normalised spectral power distribution (Neutral white)

Note: The relative spectral emission correspond to a random LED sample

Angular Light Distribution

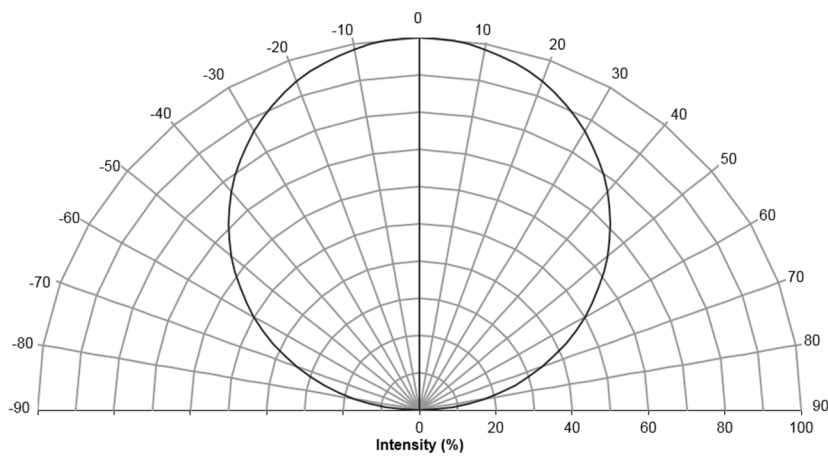


Figure 2. Angular distribution pattern of emitted light

Colour Chromaticity – Warm White

Warm White 2870-3220 K

| 3SW | | 3NE | | 3NW | | 3SE | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| x | y | x | y | x | y | x | y |
| 0.4345 | 0.4033 | 0.4562 | 0.4260 | 0.4431 | 0.4213 | 0.4468 | 0.4077 |
| 0.4223 | 0.3990 | 0.4431 | 0.4213 | 0.4299 | 0.4165 | 0.4345 | 0.4033 |
| 0.4147 | 0.3814 | 0.4345 | 0.4033 | 0.4223 | 0.3990 | 0.4260 | 0.3854 |
| 0.4260 | 0.3854 | 0.4468 | 0.4077 | 0.4345 | 0.4033 | 0.4373 | 0.3893 |

Chromaticity co-ordinate tolerance for each bin is ± 0.01

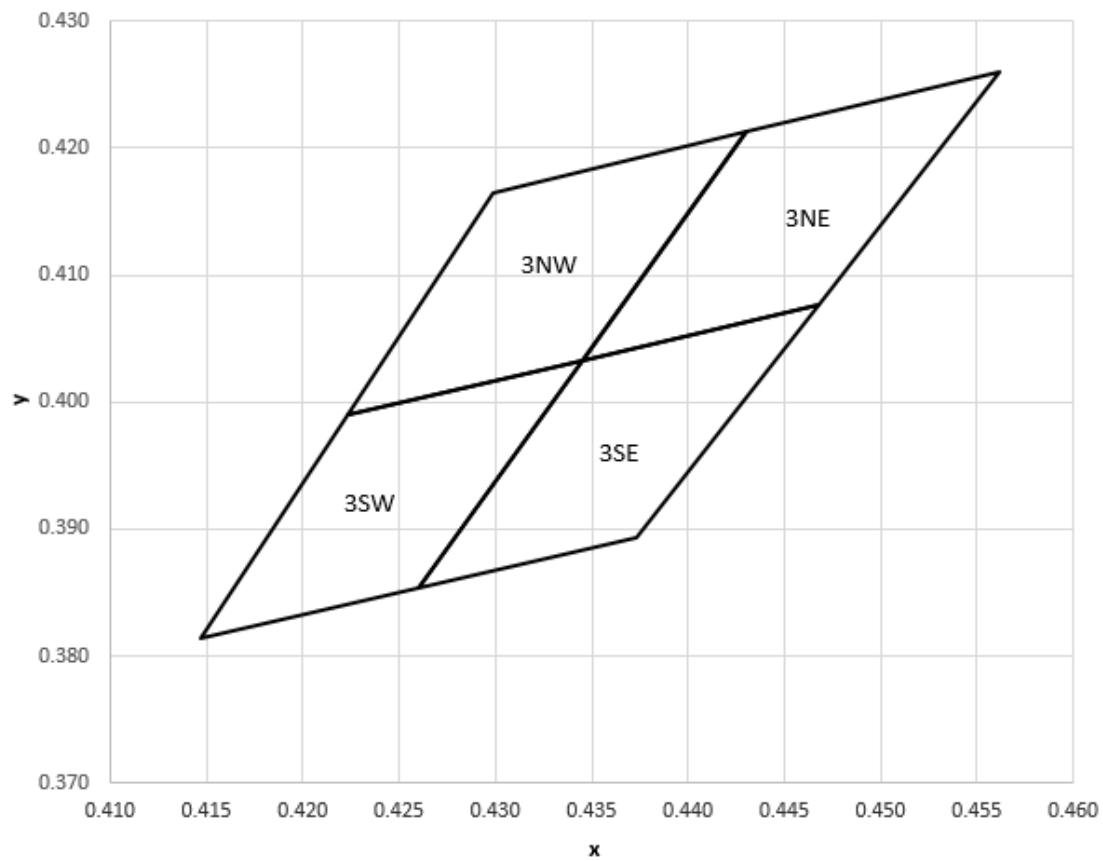


Figure 3A. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

Colour Chromaticity – Neutral White

Neutral White 3710-4260 K

| 4SW | | 4NE | | 4NW | | 4SE | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| x | y | x | y | x | y | x | y |
| 0.3828 | 0.3803 | 0.4006 | 0.4044 | 0.3871 | 0.3959 | 0.3952 | 0.3880 |
| 0.3703 | 0.3726 | 0.3871 | 0.3959 | 0.3736 | 0.3874 | 0.3828 | 0.3803 |
| 0.3670 | 0.3578 | 0.3828 | 0.3803 | 0.3703 | 0.3726 | 0.3784 | 0.3647 |
| 0.3784 | 0.3647 | 0.3952 | 0.3880 | 0.3828 | 0.3803 | 0.3898 | 0.3716 |

Chromaticity co-ordinate tolerance for each bin is ± 0.01

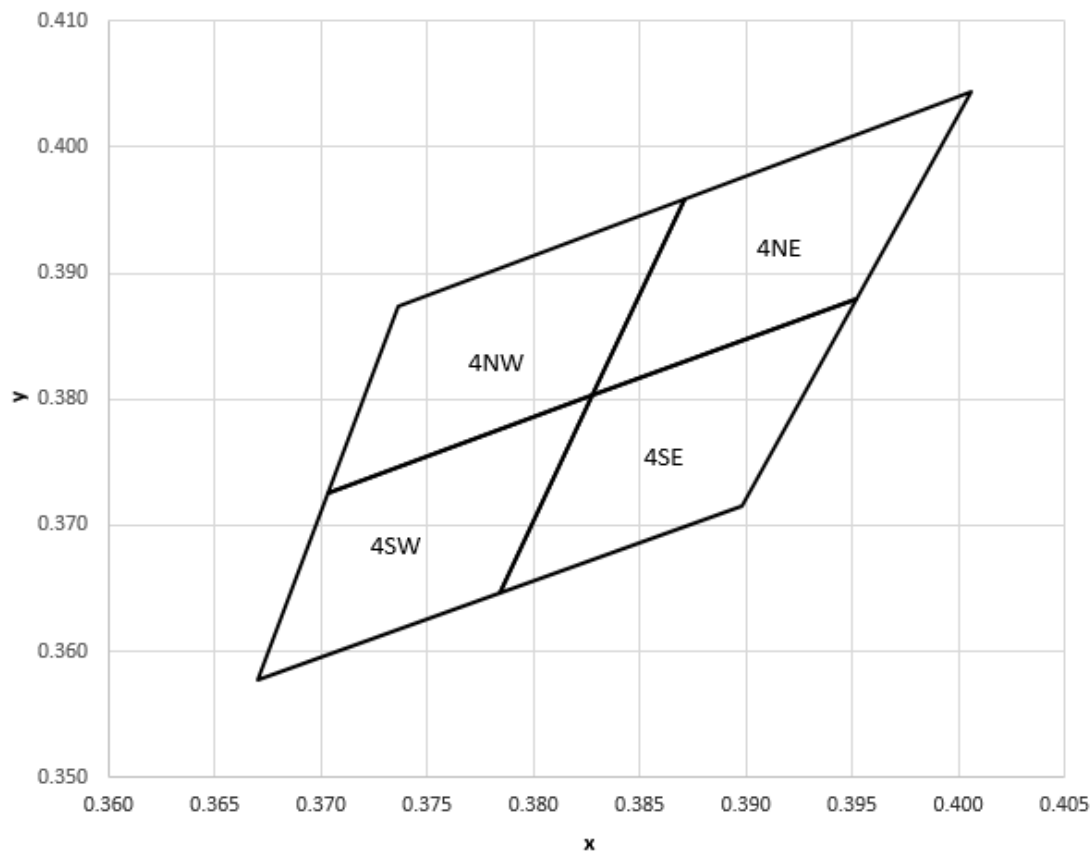


Figure 3B. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

Colour Chromaticity – Cool White

Cool White 5310-6020 K

| 5SW | | 5NE | | 5NW | | 5SE | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| x | y | x | y | x | y | x | y |
| 0.3293 | 0.3422 | 0.3376 | 0.3616 | 0.3292 | 0.3539 | 0.3371 | 0.3493 |
| 0.3215 | 0.3353 | 0.3292 | 0.3539 | 0.3207 | 0.3462 | 0.3293 | 0.3422 |
| 0.3222 | 0.3243 | 0.3293 | 0.3422 | 0.3215 | 0.3353 | 0.3294 | 0.3306 |
| 0.3294 | 0.3306 | 0.3371 | 0.3493 | 0.3293 | 0.3422 | 0.3366 | 0.3369 |

Chromaticity co-ordinate tolerance for each bin is ± 0.01

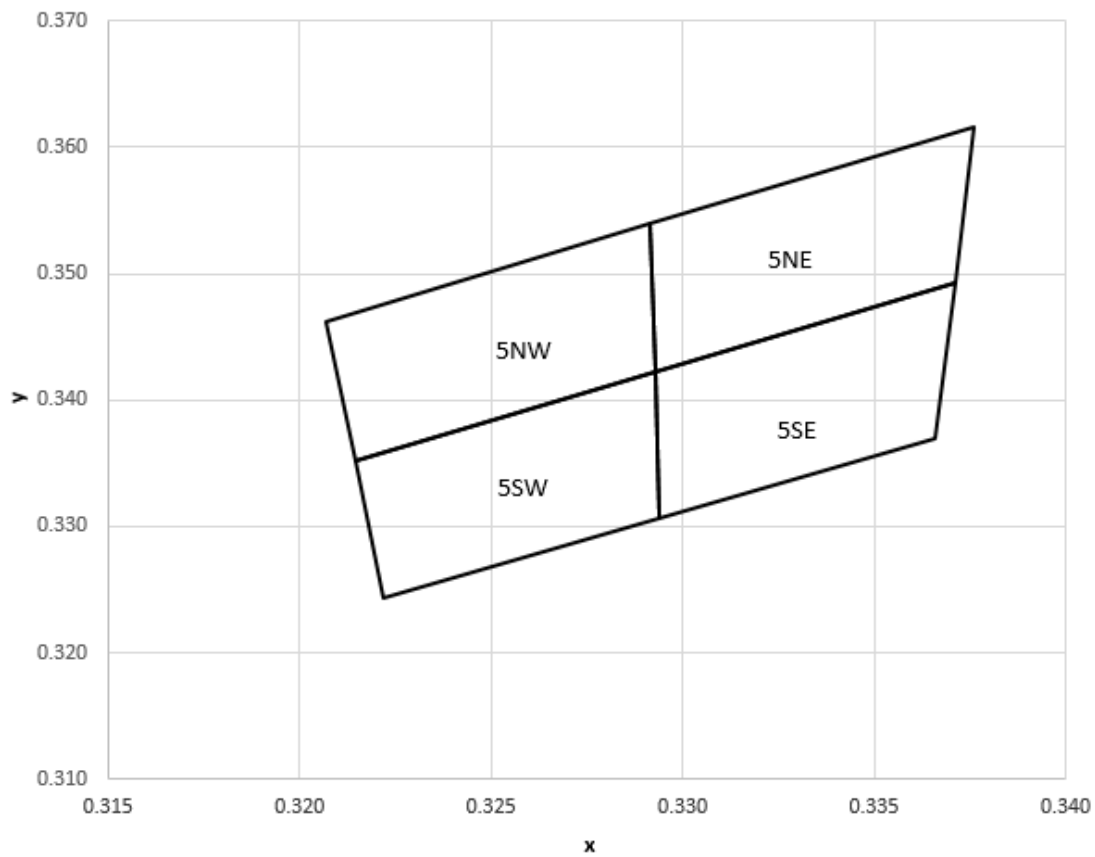


Figure 3C. CIE1931 chromaticity diagram (ANSI standard C78.377-2008)

Package Outline Dimensions

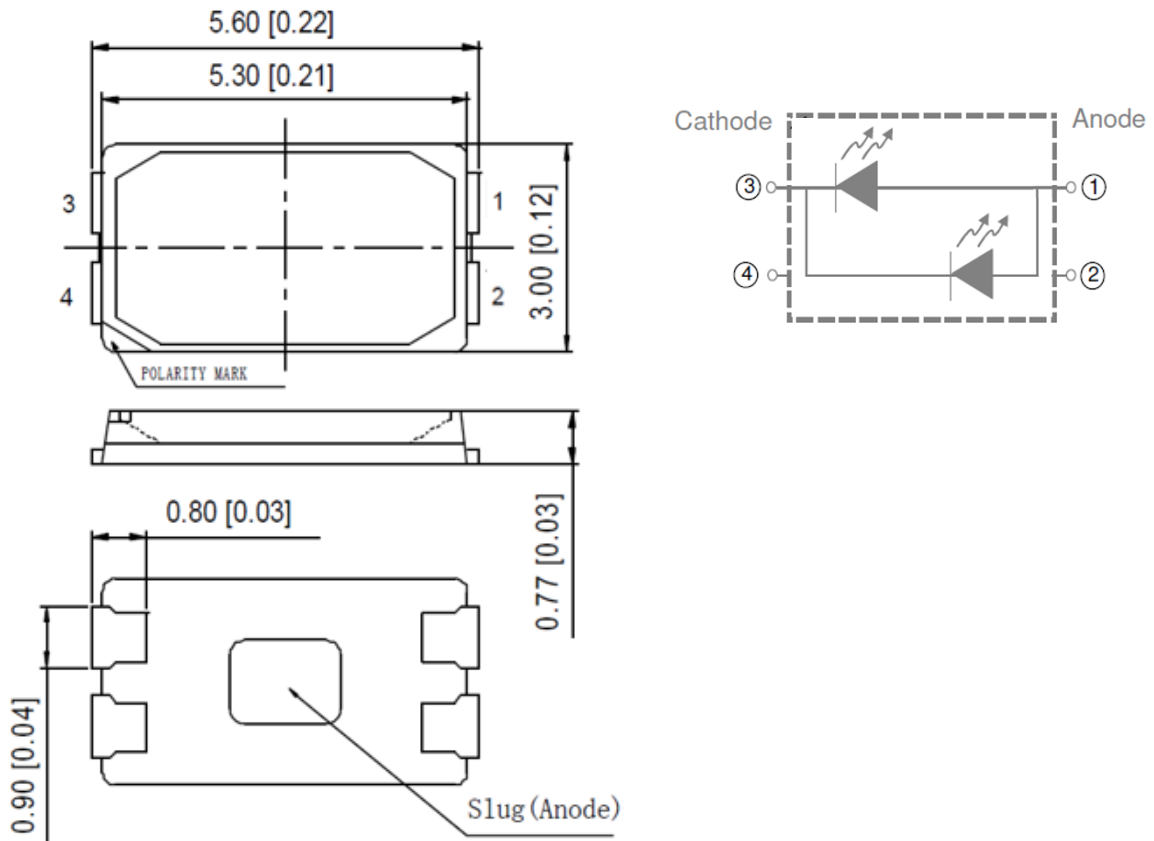


Figure 4. Mechanical drawings of the 5630 package, with unit in millimeter [in inches]

Recommended Solder Pad

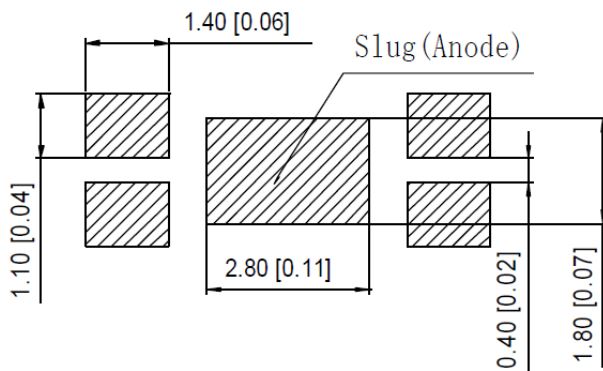


Figure 5. Diagram of soldering pad (unit in mm)

Note: Increased PCB Cu area will reduce the T_j and increase reliability

Reflow Soldering Profile

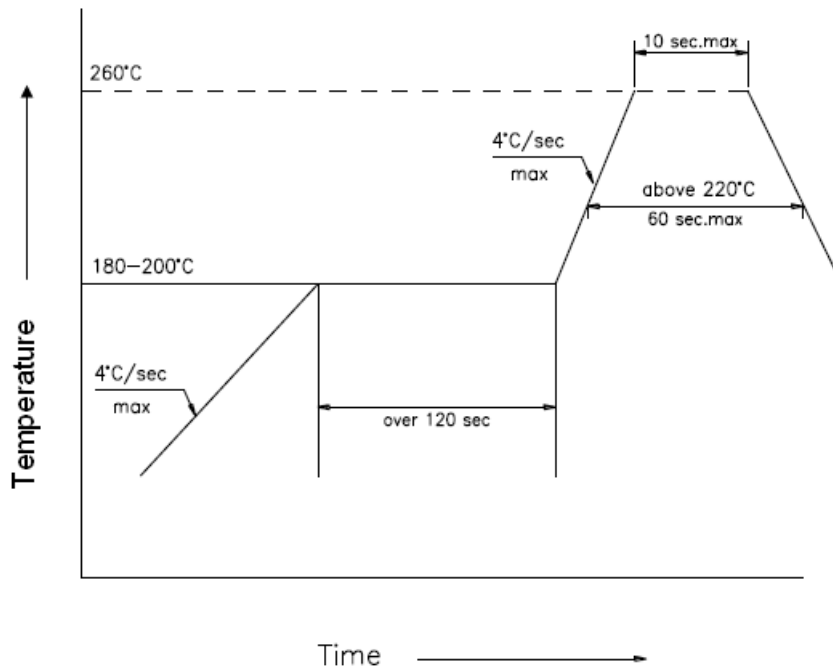


Figure 6. Reflow soldering profile

1. Reflow soldering should not be done more than twice
2. When soldering, do not put stress on the LEDs during heating

Soldering iron

1. When hand soldering, the temperature of the iron must be $\leq +300^{\circ}\text{C}$ for 3 seconds
2. Hand soldering should be performed only once.

Handling Instructions

Plessey LEDs are not designed to operate with reverse bias.

Precautions are required to prevent reverse bias in applications and during handling.



Moisture Sensitivity

| JEDEC Level | Floor life | | Bake | |
|-------------|------------|-------------------------------------|-----------------|--|
| | Time | Conditions | Time | Conditions |
| 4 | 72 hours | $\leq +30^{\circ}\text{C}$ / 60% RH | ≥ 24 hours | $+125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ |

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