

MAGIC LED

PLW117020 Series

Product Datasheet



Description

Plessey MAGIC PLW117020 white LEDs are designed for a wide range of applications such as decorative lighting, automotive interior, signage and indicators. The light is emitted in a medium beam and is suitable for panel and symbol displays. The LEDs are packaged in standard 5mm (T1^{3/4}) clear plastic encapsulation and packed in bags or supplied in “ammo” tapes containing 2000 pieces. Each bag or tape will be shipped in single intensity and colour bin, to provide close uniformity.

Features

- Industry standard 5mm (T1^{3/4}) package
- Water clear encapsulation
- 50 degree viewing angle
- GaN-on-Si die technology

Applications

- Decoration Lighting
- Instrument panel backlighting
- Illumination symbols
- Navigation backlighting

| Variant | Colour | CCT | Luminous intensity |
|-----------|--------|-------|--------------------|
| | | Nom. | Range |
| PLW117020 | White | 6000K | 2.5 – 8 lm |

Absolute Maximum Ratings

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

| Parameter | Symbol | Minimum | Maximum | Unit |
|---|-----------|---------|---------|--------------------|
| DC Forward Current | I_F | - | 25 | mA |
| Peak Pulse Forward Current ^[1] | I_{FP} | - | 50 | mA |
| Reverse Voltage | V_R | - | 5 | V |
| Storage Temperature | T_{stg} | -40 | +105 | $^{\circ}\text{C}$ |
| Junction Temperature | T_j | -40 | +105 | $^{\circ}\text{C}$ |

[1] Pulse width $\leq 10\text{ms}$, duty cycle $\leq 10\%$

Electro-optical Characteristics

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

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|----------------------|-----------------|---------------------|------|------|------|---------------|
| Forward Voltage | V_F | $I_F = 20\text{mA}$ | 2.8 | 3.3 | 3.6 | V |
| Reverse Current | I_R | $V_R = 5\text{V}$ | - | - | 10 | μA |
| Luminous intensity | I_v | $I_F = 20\text{mA}$ | | 4.5 | | lm |
| Half-Intensity Angle | $2\Theta_{1/2}$ | $I_F = 20\text{mA}$ | - | 50 | - | Deg. |

Recommended Operating Conditions

In typical applications, for optimum LED performance

| Parameter | Symbol | Minimum | Maximum | Unit |
|-------------------------------|-----------|---------|---------|--------------------|
| Operating Ambient Temperature | T_{opr} | -40 | +85 | $^{\circ}\text{C}$ |

Ordering Information

| Name | Order Code | Luminous Intensity | Forward Voltage | Colour bins |
|------------|---------------|--------------------|-----------------|-------------|
| PLW117020F | PLW117020F000 | 5A,6A,7A,8A | V1-V4 | L,S,T,R |
| PLW117020S | PLW117020S000 | 5A,6A,7A | | S,T, R |
| PLW117020L | PLW117020L000 | 5A,6A,7A | | L,S,T |

Intensity Bin Groups

$I_F = 20\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

| Group ^[1] | Luminous Intensity I_v (mcd) | | Luminous Flux (typ.) Φ_v (lm) |
|----------------------|--------------------------------|-------|------------------------------------|
| | Min. | Max. | |
| 5A | 2500 | 3500 | 2000 |
| 6A | 3500 | 5000 | 2800 |
| 7A | 5000 | 7000 | 4000 |
| 8A | 7000 | 10000 | 7000 |

^[1] Tolerance $\pm 15\%$

Forward Voltage Bin Groups

$I_F = 20\text{mA}$, $T_{\text{amb}} = +25^\circ\text{C}$, unless otherwise stated

| Group ^[1] | V_F (V) | |
|----------------------|-----------|------|
| | Min. | Max. |
| V1 | 2.8 | 3.0 |
| V2 | 3.0 | 3.2 |
| V3 | 3.2 | 3.4 |
| V4 | 3.4 | 3.6 |

^[1] Tolerance $\pm 0.2\text{V}$

Colour Chromaticity Bins

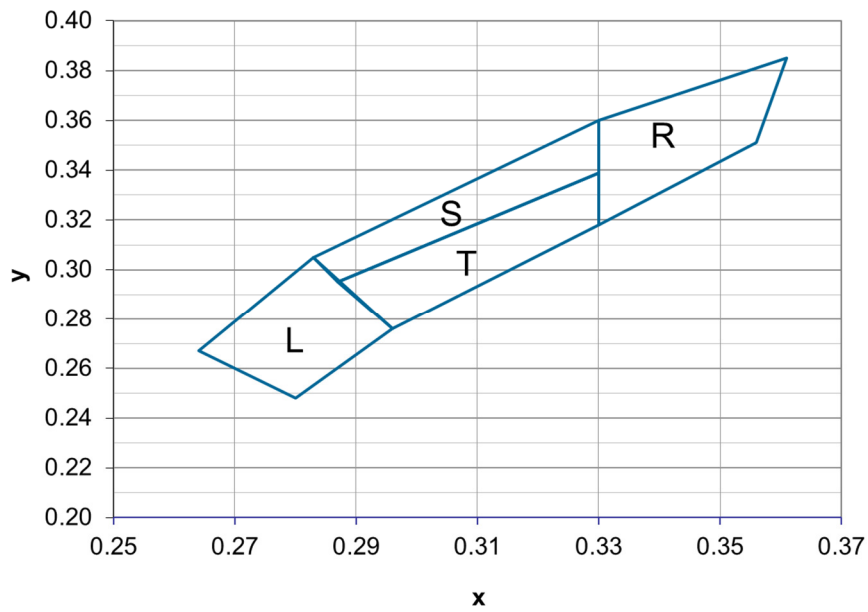


Figure 1. Chromaticity Bin Co-ordinates

Colour bin R (CCT~5100K)

| Cx | Cy |
|-------|-------|
| 0.33 | 0.318 |
| 0.356 | 0.351 |
| 0.361 | 0.385 |
| 0.33 | 0.36 |

Colour bins S, T (CCT~7300K)

| S | | T | |
|-------|-------|-------|-------|
| Cx | Cy | Cx | Cy |
| 0.283 | 0.305 | 0.287 | 0.295 |
| 0.33 | 0.36 | 0.33 | 0.339 |
| 0.33 | 0.339 | 0.33 | 0.318 |
| 0.287 | 0.295 | 0.296 | 0.276 |

Colour bin L (CCT~12000K)

| Cx | Cy |
|-------|-------|
| 0.28 | 0.248 |
| 0.296 | 0.276 |
| 0.283 | 0.305 |
| 0.264 | 0.267 |

Colour bins will have a +/- 0.01 tolerance

Relative Spectral Emission (Typical)

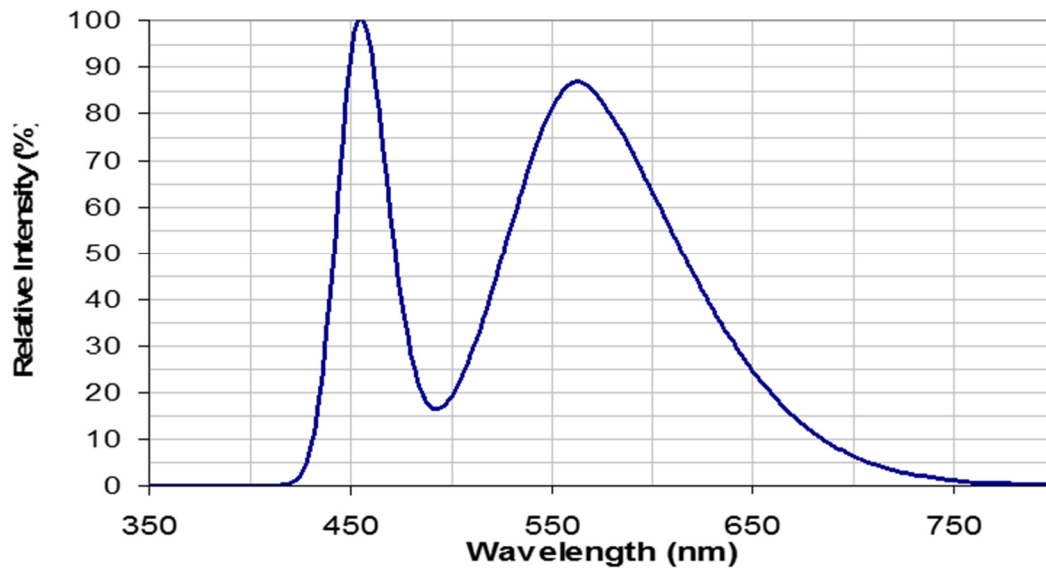


Figure 2. Normalised spectral power distribution (Neutral white)

Angular Light Distribution

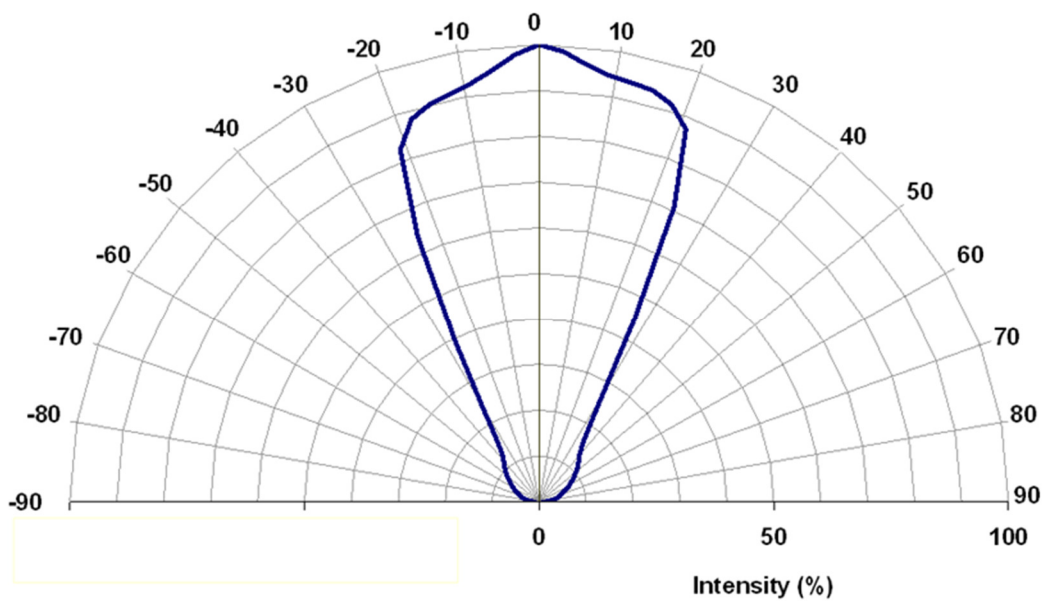


Figure 3. Angular distribution pattern of emitted light (typical)

Forward Current Characteristics

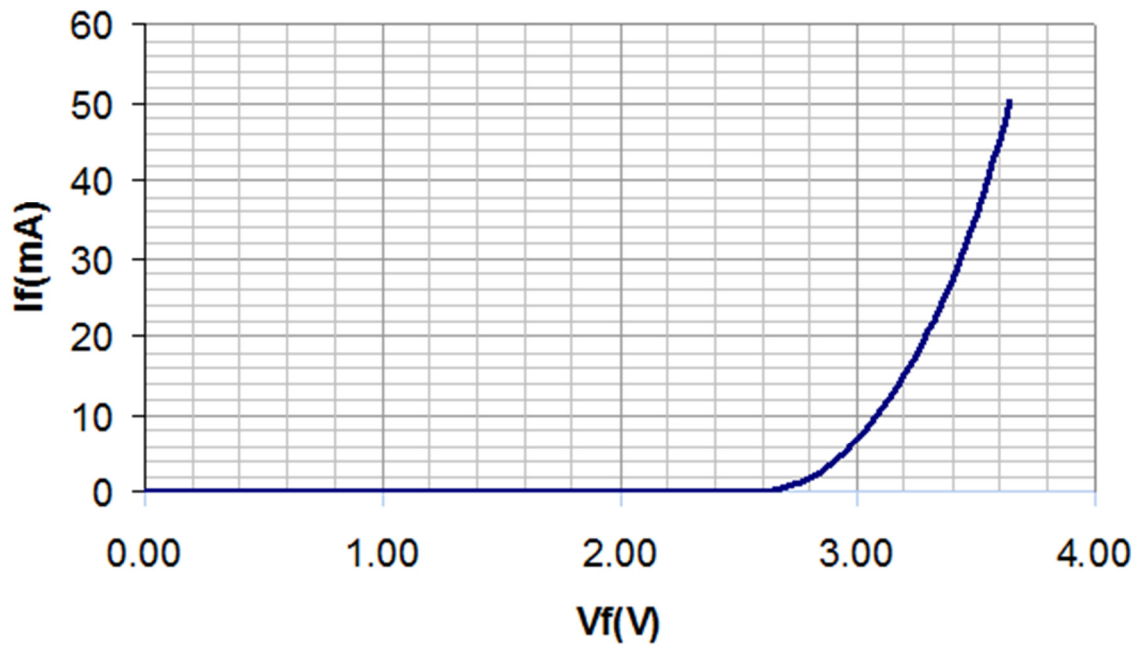


Figure 4. Typical forward voltage versus forward current

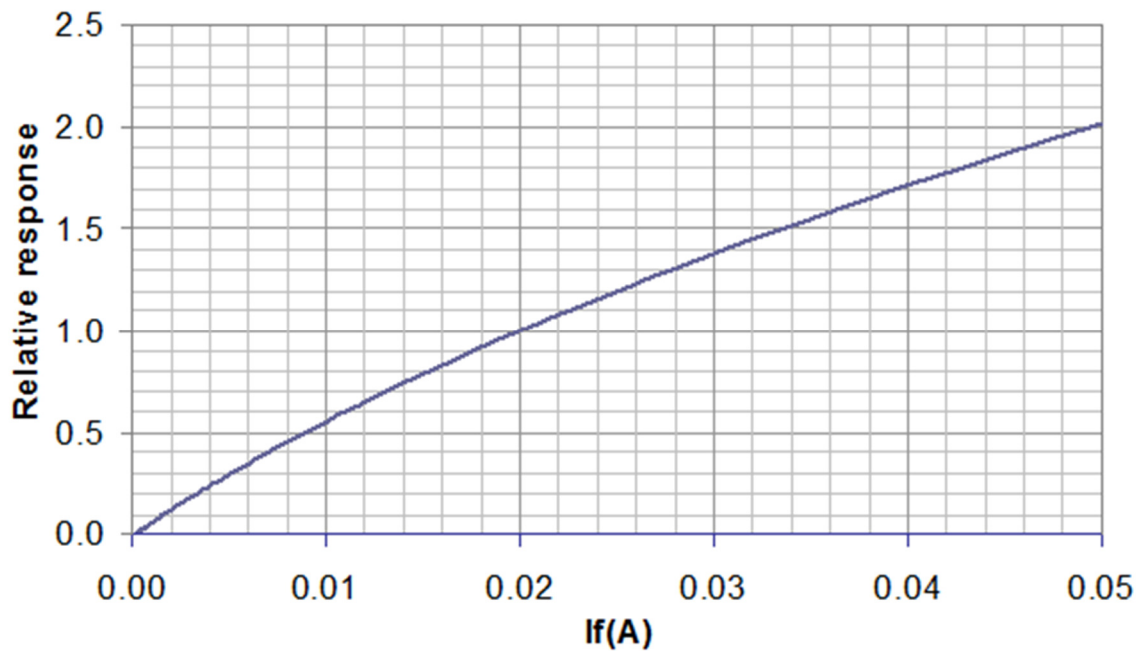


Figure 5. Relative luminous flux versus forward current

Temperature Characteristics

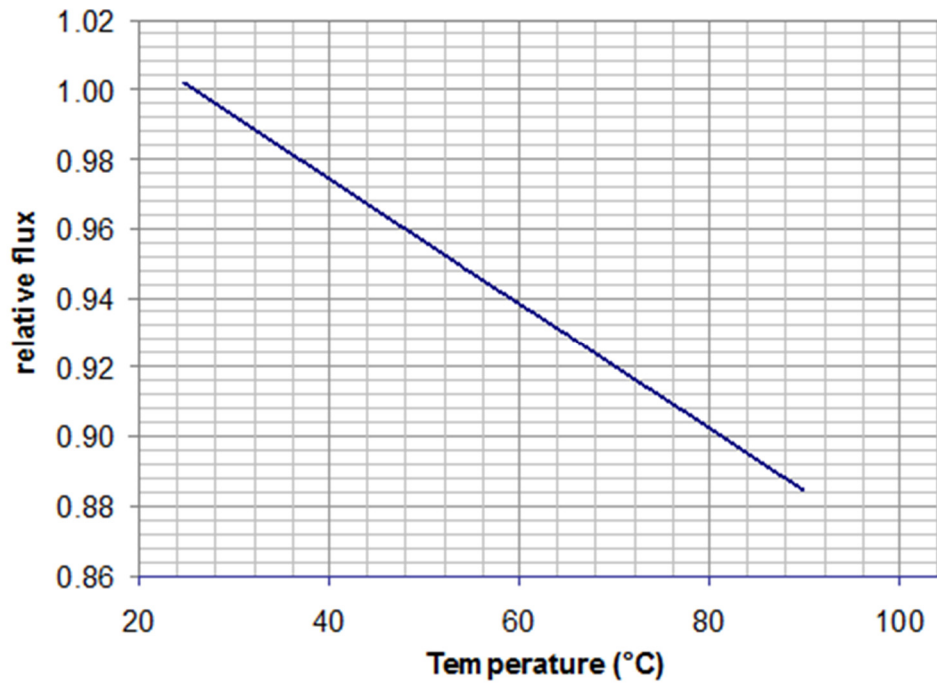


Figure 6. Relative luminous flux versus junction temperature

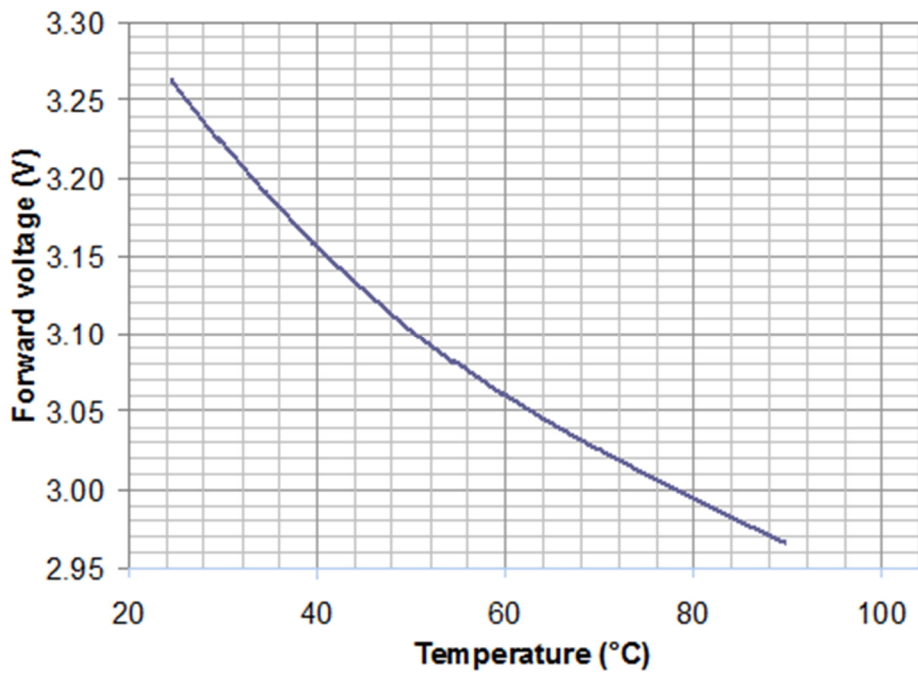


Figure 7. Forward voltage versus junction temperature

Derating Curve

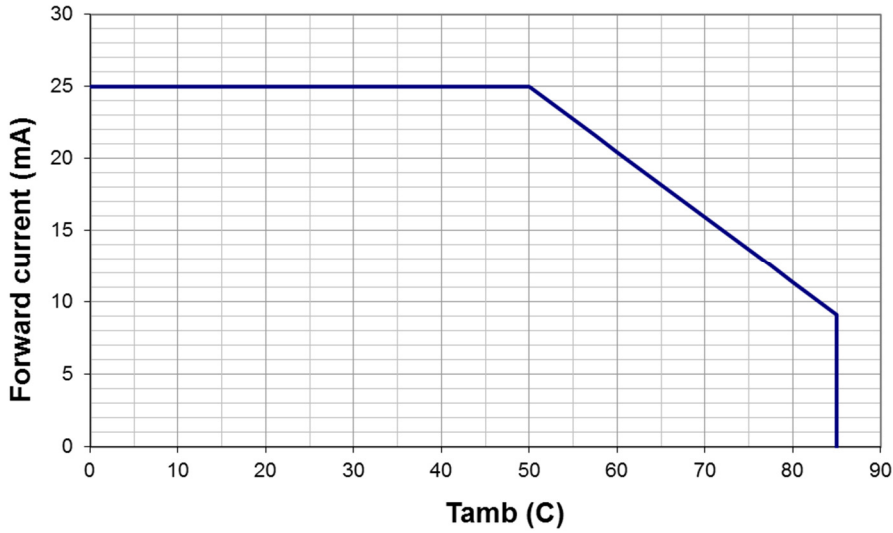


Figure 8. Maximum forward current versus ambient temperature

Package Outline Dimensions

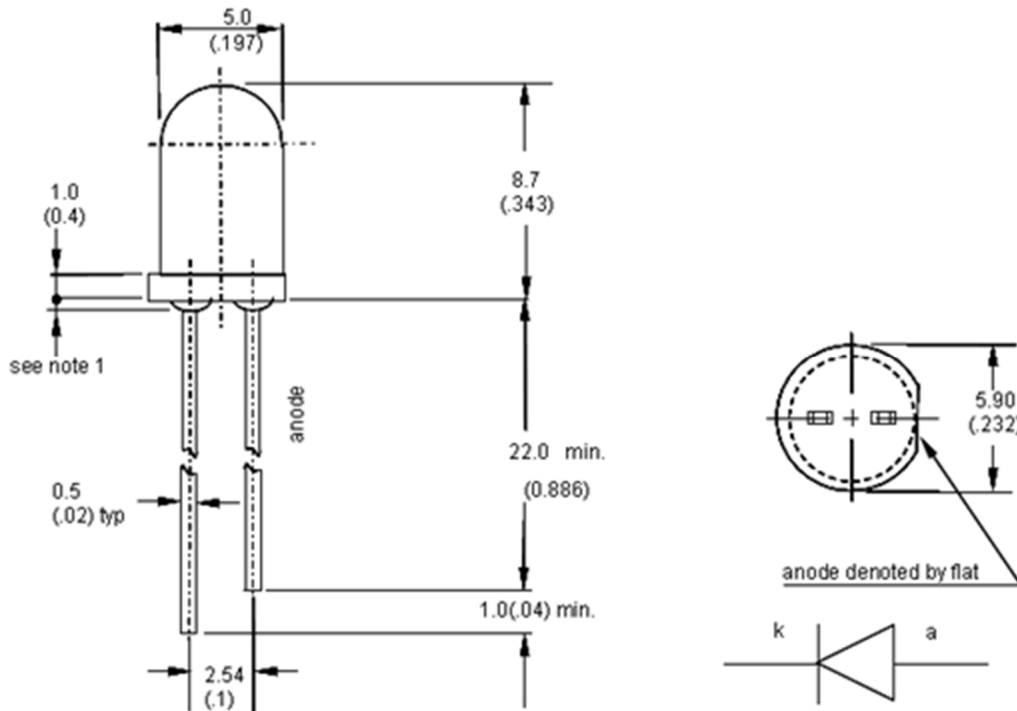


Figure 9. Mechanical drawings of the T1 $\frac{1}{4}$ package

Notes:

1. All dimensions are in mm (inches)
2. All dimensions are to a tolerance of $\pm 0.25\text{mm}$ (± 0.01 inches)
3. Resin under flange is 1.0mm (0.04 inches) max.

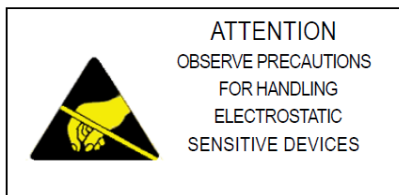
Soldering Information

| | | |
|--|-------|-----------|
| Lead soldering temperature [min. 3mm(0.125") from body] | 260°C | 10s. max. |
|--|-------|-----------|

Handling Instructions

Plessey LEDs are not designed to operate with reverse bias.

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



Packing Information

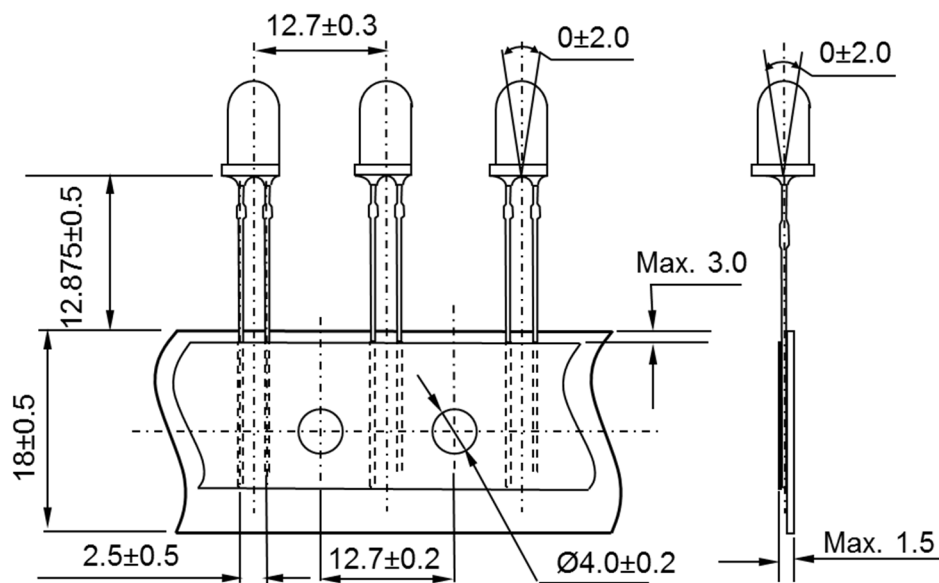


Figure 10. "Ammo" tape packing – dimensions in mm

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