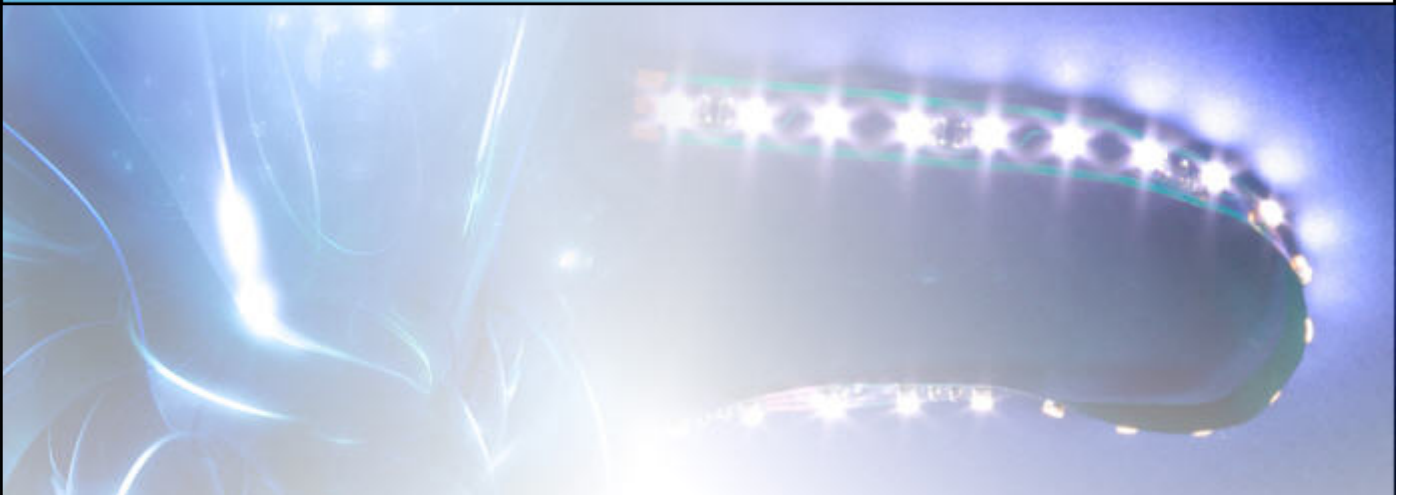
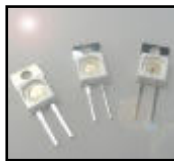




The Optoelectronic Manufacturing Corporation



## TO-220 High Power LED - 1W





# Technical Datasheet

A range of 1W, high power light-emitting diodes in the industry standard TO-220 package. Available with 3 compact lens options, this is the first range of high power LEDs to be compatible with the vast range of TO-220 heatsinks, mounting solutions and accessories already available off-the-shelf from many component suppliers.

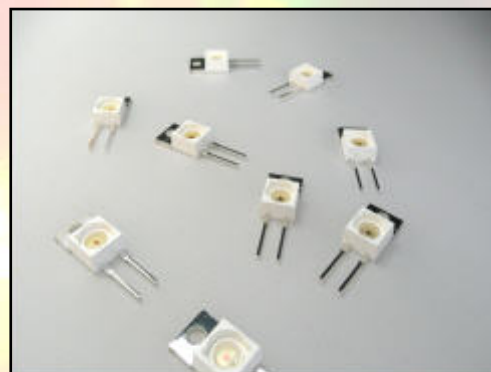
## Key Features:

- Industry standard TO-220 Package
- Compatible with existing auto-insertion machinery
- Fits "off the shelf" heatsink and mounting solutions
- TO-220 leadframe requires no heatspreader
- Well-established thermal properties, low thermal resistance
- High luminous flux per source
- Exceptional ease of use and robustness
- Compact lensing options
- Colour range: Red, Green, Blue, Amber, Daylight & Warm White
- In-built electrostatic protection
- In-built reverse polarity protection
- RoHS Compliant



## Typical Applications:

- Accent lights
- Up- and down-lighters
- Battery powered torches
- Automotive illumination
- Energy efficient lighting
- Replacement for filament sources
- Mood lighting
- Wall washers
- Signalling
- Strip lights
- Solar powered lighting





## Typical electro-optical characteristics at forward current = 350mA and Ta=25°C

| Part no. | Colour & dominant $\lambda$ / colour temp | Luminous Flux (typ.) lumens | Luminous Flux (max.) lumens | Forward Voltage (V) |
|----------|-------------------------------------------|-----------------------------|-----------------------------|---------------------|
| T21D1    | Daylight White 6500K                      | 40                          | 52                          | 3.5                 |
| T21W1    | Warm White 3000K                          | 35                          | 41                          | 3.5                 |
| T21R1    | Red 625nm                                 | 23                          | 30                          | 2.2                 |
| T21G1    | Green 525nm                               | 30                          | 40                          | 3.8                 |
| T21B1    | Blue 465nm                                | 10                          | 14                          | 3.5                 |
| T21Y1    | Amber 590nm                               | 23                          | 30                          | 2.2                 |

Colours are for ease of reference only and do not indicate exact shade of LED output.

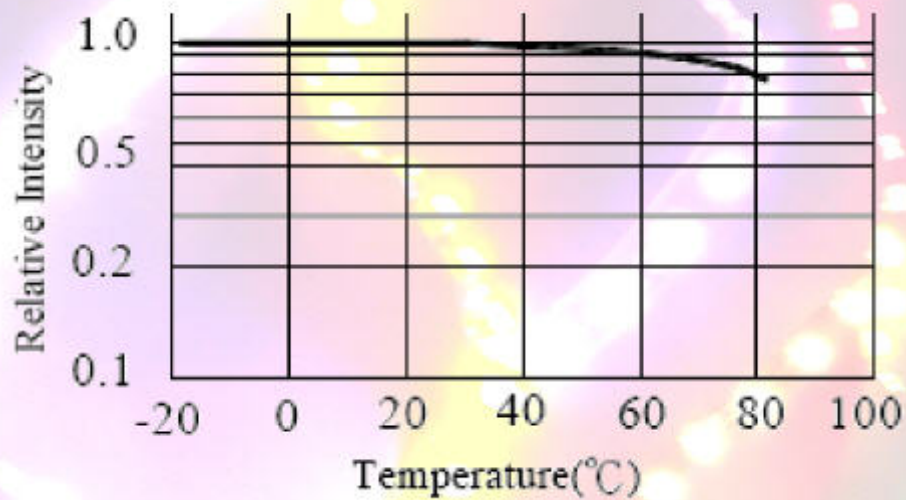
## Thermal Characteristics at If = 350mA, Ta=25°C

| Quantity                                             | Rating               |
|------------------------------------------------------|----------------------|
| Thermal Resistance (Semiconductor Junction to Board) | 15 K/W               |
| Forward Voltage Temperature Coeff.                   | -2 mV/K              |
| Reverse Current (at reverse voltage of 5V)           | $5 \times 10^{-5}$ A |

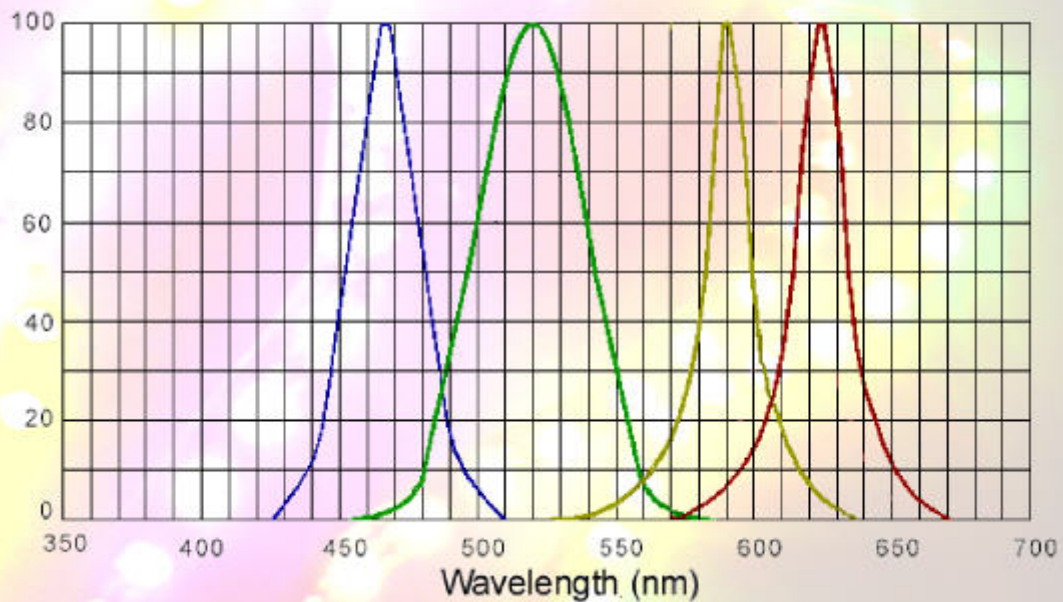
## Absolute Maximum Ratings at Ta=25°C

| Quantity                                                        | Rating          |
|-----------------------------------------------------------------|-----------------|
| Reverse Voltage                                                 | 5V              |
| Semiconductor Junction Temperature                              | 120°C           |
| Operating Temperature Range                                     | -35°C to +75°C  |
| Temperature Range in Storage                                    | -35°C to +100°C |
| Lead soldering temperature (at 2mm from LED body for max 5 sec) | 260°C           |
| Forward DC Current                                              | 350mA           |
| Power dissipation                                               | 1.4W            |

**Relative Intensity vs Ambient Temperature**



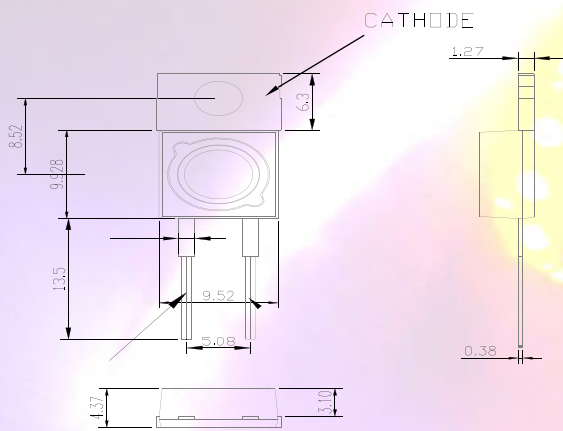
**Power Spectra for Blue, Green, Amber and Red**





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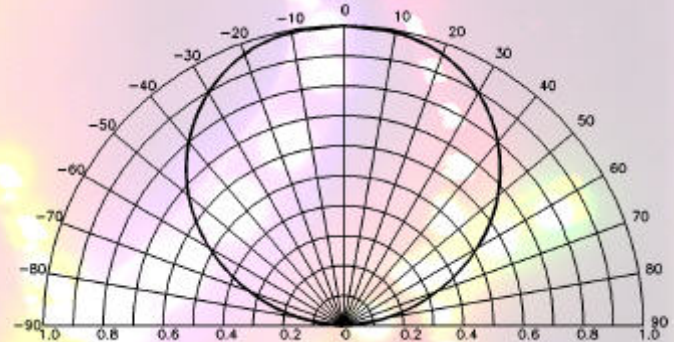
## Package Dimensions



All dimensions are in mm. Tolerance  $\pm 0.5\text{mm}$ .

Typical beam pattern when unlensed (for lensed patterns, see lens datasheet)

Lens part numbers: PLT2R, PLT20



## Application notes

- Junction temperature should be kept below maximum by managing power dissipation.
- Current spikes should be avoided, especially during power up. It is best practice to initially connect LED to inactivated supply, then gradually ramp up supply to desired level.
- Proper management of the thermal path from the junction should be observed. Relevant thermal resistances should be used to calculate temperature increase from ambient to junction by multiplying by power dissipation, to determine maximum ambient temperature of application.
- Proper thermal conduction layers should be introduced at all interfaces to prevent insulating air gaps in the thermal path from junction to ambient.
- If the LED package has a lens fitted, do not use reflow soldering as the lens should not be taken above 110°C.
- As with all semiconductor devices, it is good practice to avoid electrostatic discharge.
- High power LEDs are best driven using constant-current power supplies.
- Do not connect to a constant voltage source without suitable current limiting measures.
- Further information regarding soldering and storage precautions may be obtained by contacting OMC's technical department.

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