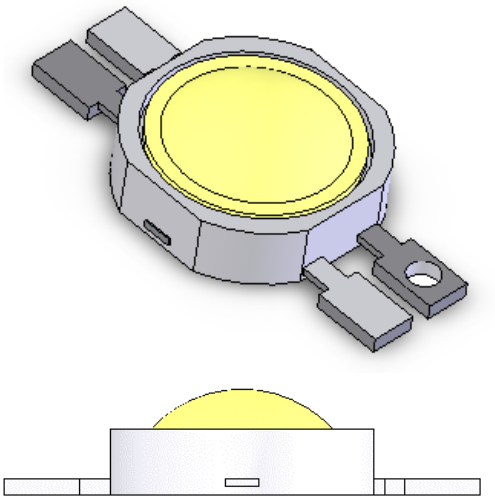


**3W RGB Power LED**
**Technical Datasheet**

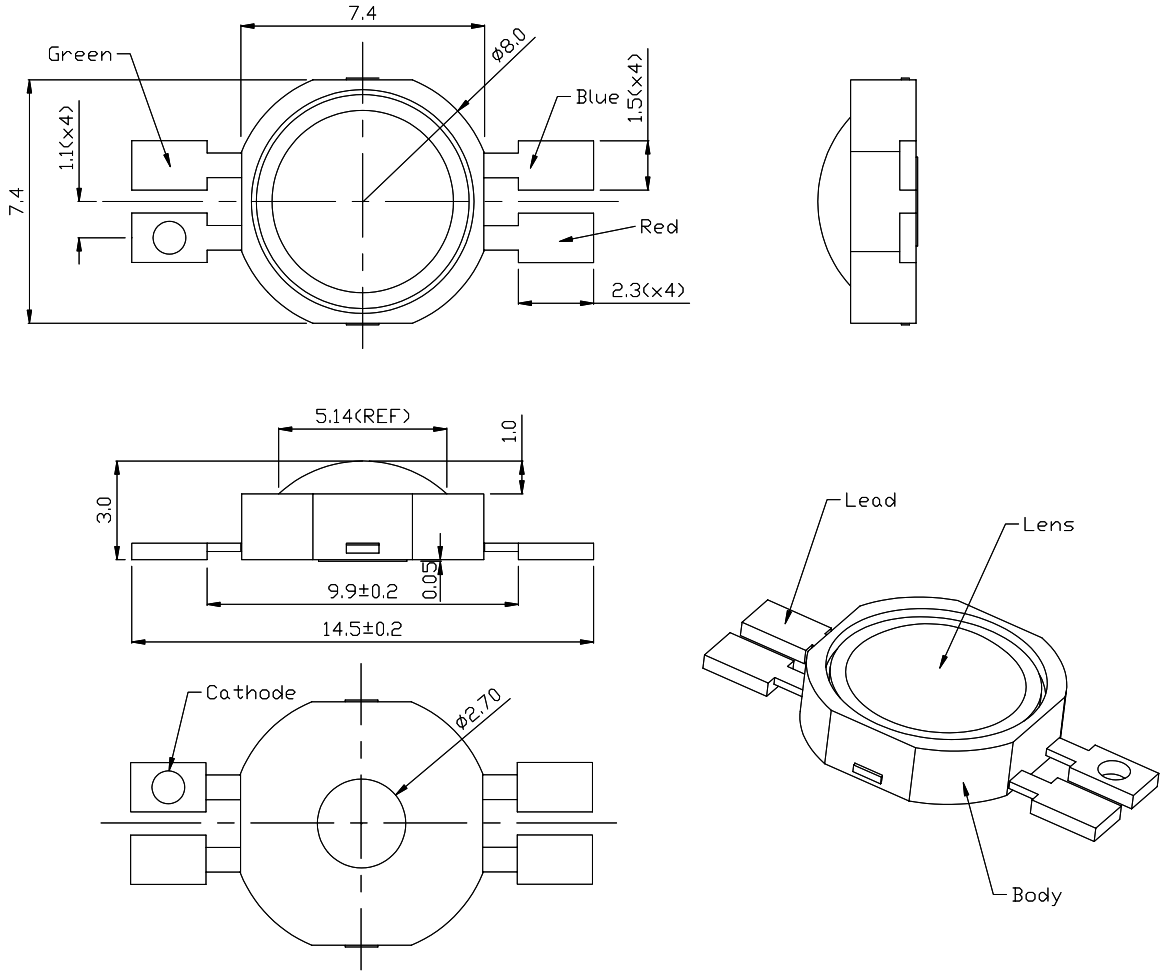
## Features

- R, G, B three color in one Package
- High Flux per LED
- Very long operating life(up to 100k hours)
- Lambertian or Collimated Radiation Pattern
- More Energy Efficient than Incandescent and most Halogen lamps
- Low Voltage DC operated
- Cool beam, safe to the touch
- Instant light (less than 100ns)
- No UV
- Superior ESD protection
- Soldering methods: IR reflow soldering and Hand soldering

## Typical Applications

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Decorative
- Appliance
- Sign and Channel Letter
- Architectural Detail
- Cove Lighting
- Automotive Exterior (Stop-Tail-Turn, CHMSL, Mirror Side Repeat)
- LCD backlight

## Mechanical Dimensions




Notes:
1. The cathode side of the device is denoted by a hole in the lead frame.
2. Electrical insulation between the case and the board is required-slug of device is not electrically neutral. Do not electrically connect either the anode or cathode to the slug.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5 .All dimendions without tolerances are for reference only.

## Part Number

| Color | Emitter | Beam Pattern |
|---|---|---|
| R/G/B | PXHL-PF01 | Lambertian |

## Flux Characteristics at350mA, Junction Temperature, Tj=25℃

| Color | Minimum Luminous Flux (lm) | Typical Luminous Flux (lm) | Beam Pattern |
|---|---|---|---|
| Red | 18.1 | 30 | |
| Green | 18.1 | 30 | Lambertian |
| Blue | 3.8 | 10 | |

## Optical Characteristics at 350mA, Junction Temperature, Tj=25℃

| Color | Dominant Wavelength λD / Peak Wavelength λp / Color Temperature(CCT) Min. | Typ. | Max. | Spectral Half-width (nm) Δλ1/2 | Temperature Coefficient or Dominant Wavelength ΔλD/ΔTj (nm/℃) |
|---|---|---|---|---|---|
| Red | 620.5nm | 625nm | 645nm | 20 | 0.05 |
| Green | 520nm | 530nm | 550nm | 35 | 0.04 |
| Blue | 460nm | 470nm | 490nm | 25 | 0.04 |

## Optical Characteristics at 350mA, Junction Temperature, Tj=25℃ ( Continued)

| Color | Beam Pattern | Total Included Angle θ0.9v (degree) | Viewing Angle 2θ1/2 (degree) | Typical Candela on Axis (cd) |
|---|---|---|---|---|
| Red | | 160 | 140 | |
| Green | Lambertian | 160 | 140 | |
| Blue | | 160 | 140 | |

## Electrical Characteristics at 350mA, Junction Temperature, Tj=25℃

| Color | Forward Voltage Vf(V) Min. | Typ. | Max. | Dynamic Resistance(Ω) | Temperature Coefficient of Vf(mV/℃) ΔVf/ΔTj | Thermal Resistance Junction to Board(℃/W) |
|---|---|---|---|---|---|---|
| Red | 1.70 | 2.20 | 2.60 | 2.4 | -2 | 10 |
| Green | 2.79 | 3.55 | 3.99 | 1.0 | -2 | 10 |
| Blue | 2.79 | 3.55 | 3.99 | 1.0 | -2 | 10 |

## Absolute Maximum Ratings

| Parameter | Red | Green | Blue |
|---|---|---|---|
| DC Forward Current (mA) | 385 | 350 | 350 |
| Peak Pulsed Forward Current (mA) | 550 | 500 | 500 |
| Average Forward Current (mA) | | 350 | |
| ESD Sensitivity | | ±16000V HBM | |
| LED Junction Temperature (℃) | 120 | 135 | 135 |
| Aluminum-core PCB Temperature(℃) | | 105 | |
| Storage & Operating Temperature(℃) | | -40 to +105 | |
| Soldering Temperature(℃) | | 260 for 5 seconds Max. | |

## Photometric Luminous Flux Bin Structure

| Bin Code | Minimum Photometric Flux (lm) | Maximum Photometric Flux (lm) |
|---|---|---|
| G | 3.8 | 4.9 |
| H | 4.9 | 5.3 |
| J | 5.3 | 8.2 |
| K | 8.2 | 10.7 |
| L | 10.7 | 13.9 |
| M | 13.9 | 18.1 |
| N | 18.1 | 23.5 |
| P | 23.5 | 30.6 |
| Q | 30.6 | 39.8 |
| R | 39.8 | 51.7 |

- Tolerance on each Luminous Flux bin is ± 15%

## Color Bins for Red

| Bin Code | Minimum Dominant Wavelength (nm) | Maximum Dominant Wavelength (nm) |
|---|---|---|
| 2 | 613.5 | 620.5 |
| 4 | 620.5 | 631.0 |
| 5 | 631.0 | 645.0 |

- Tolerance on each Color bin is ± 1nm

## Color Bins for Green

| Bin Code | Minimum Dominant Wavelength (nm) | Maximum Dominant Wavelength (nm) |
|---|---|---|
| 1 | 520 | 525 |
| 2 | 525 | 530 |
| 3 | 530 | 535 |
| 4 | 535 | 540 |

- Tolerance on each Color bin is ± 1nm

## Color Bins for Blue

| Bin Code | Minimum Dominant Wavelength (nm) | Maximum Dominant Wavelength (nm) |
|---|---|---|
| 1 | 460 | 465 |
| 2 | 465 | 470 |
| 3 | 470 | 475 |
| 4 | 475 | 480 |

- Tolerance on each Color bin is ± 1nm

## Wavelength Characteristics, Tj=25℃

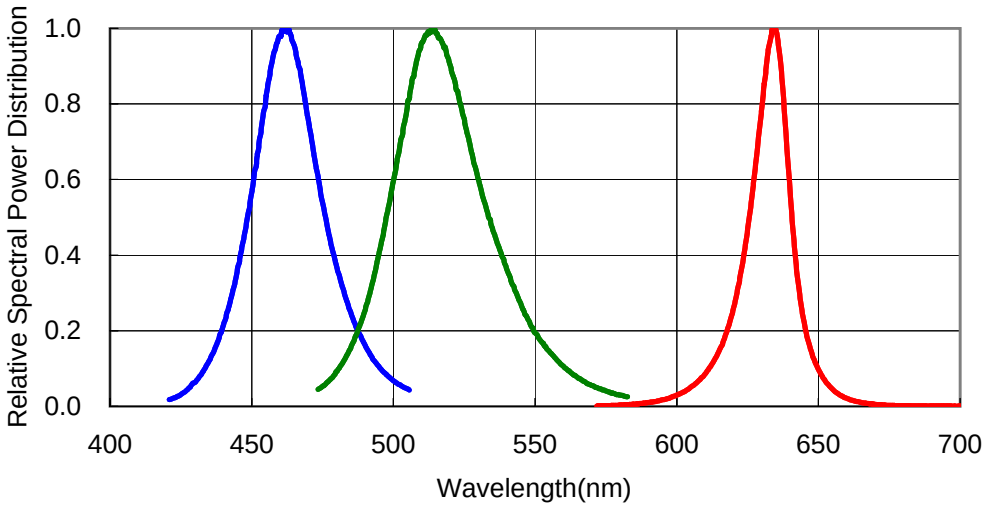



Figure 1. Relative Intensity vs. Wavelength

## Light Output Characteristics

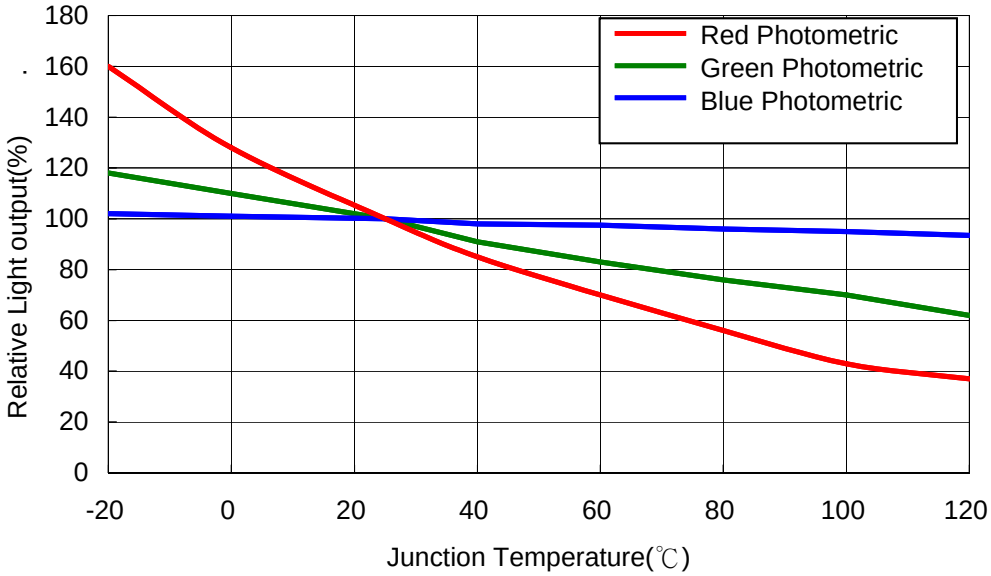



Figure 2. Relative Light Output vs. Junction Temperature

## Forward Current Characteristics, Tj=25℃

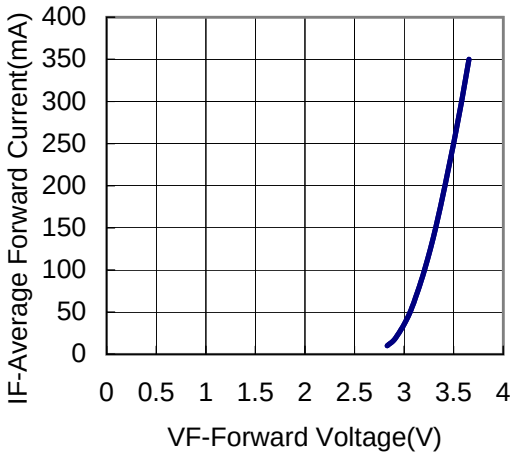



Fig 3a. Forward Current vs. Forward Voltage for Blue and Green.

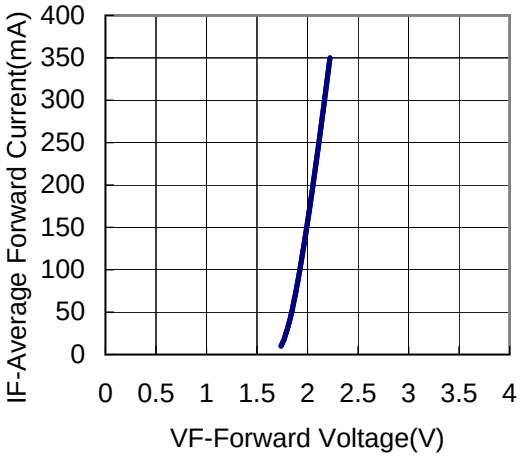



Fig 3b. Forward Current vs. Forward Voltage for Red.

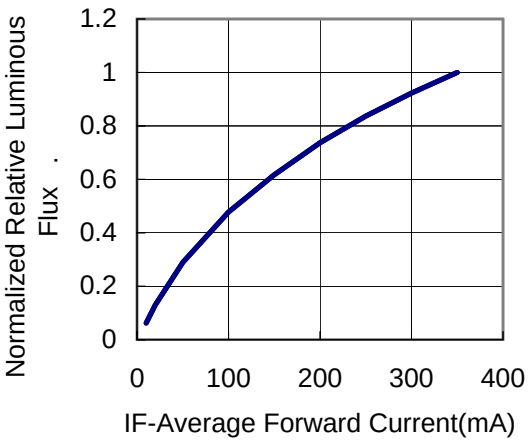



Fig 4a. Relative Luminous Flux vs. Forward Current for Blue and Green at Tj=25℃ maintained.

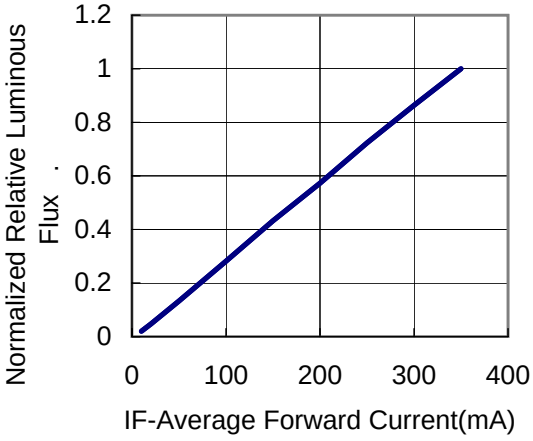



Fig 4b. Relative Luminous Flux vs. Forward Current for Red at Tj=25℃ maintained.

## Current Derating Curves

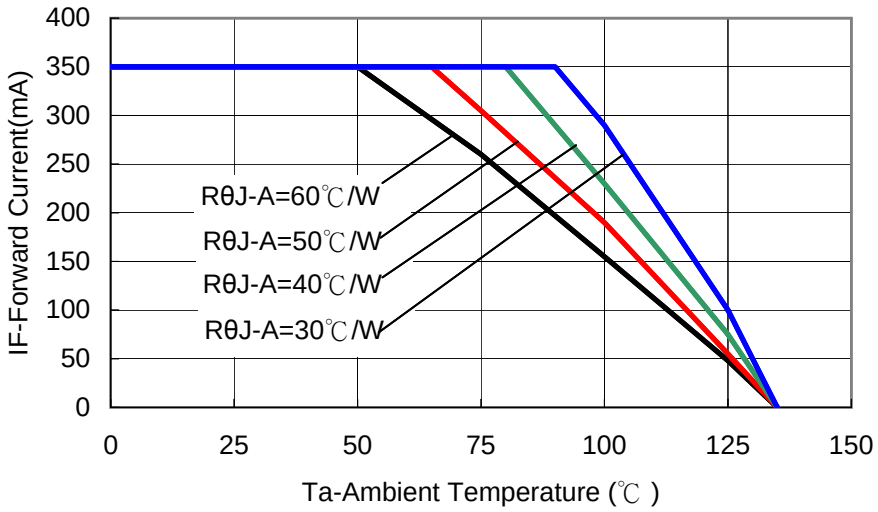



Fig 5a. Maximum Forward Current vs. Ambient Temperature. Derating based on TjMAX=135℃ for Blue and Green.

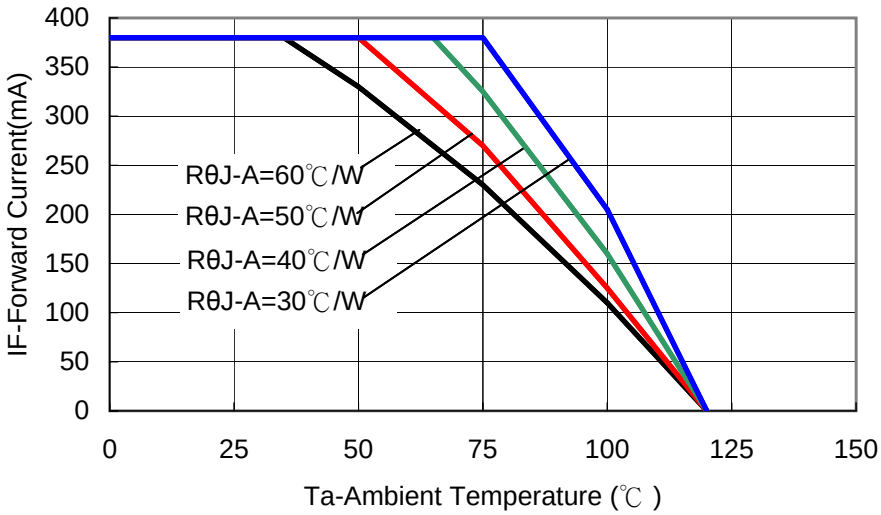



Fig 5b. Maximum Forward Current vs. Ambient Temperature. Derating based on TjMAX=120℃ for Red.

## Typical Representative Spatial Radiation Pattern

**Lambertian Radiation Pattern**

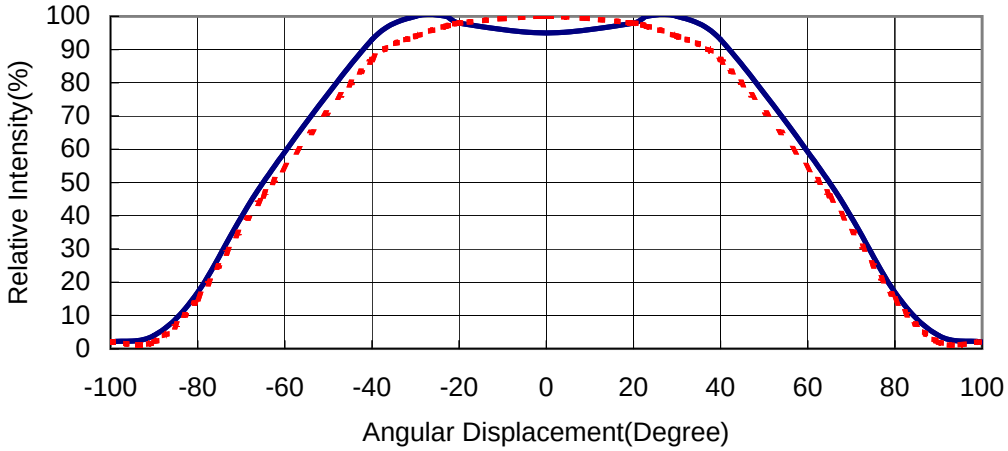



Fig 6. Typical Representative Spatial Radiation Pattern.

## Recommended Soldering Pads

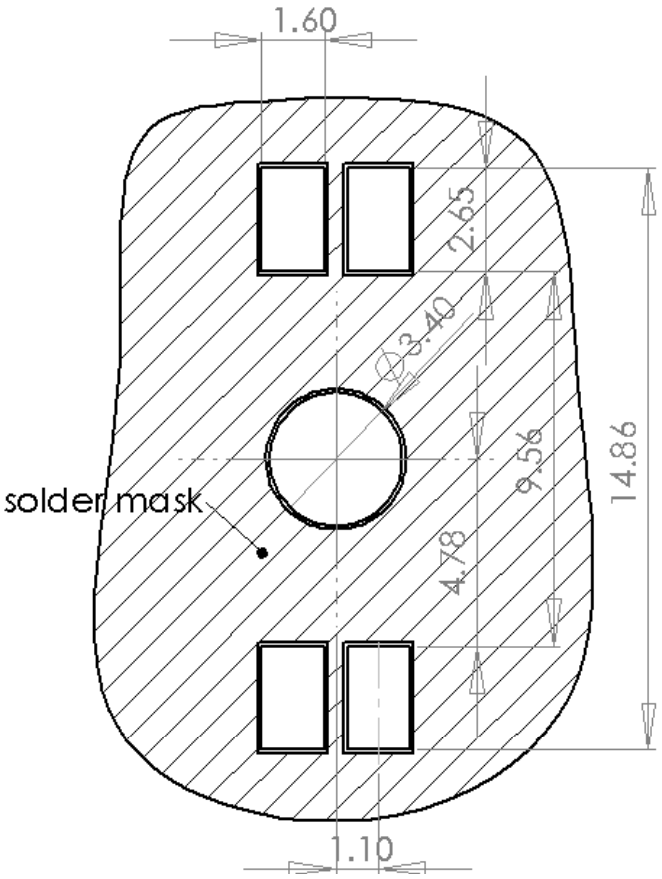



Fig 7. Recommended Solder pads dimension. Solder mask is

also recommended to advoid short circuit while

## Recommend IR Reflow Condition

| Reflow Soldering | | |
|---|---|---|
| | Lead Solder | Lead-free Solder |
| Pre-heat | 120~150℃ | 180~200℃ |
| Pre-heat time | 120 sec. Max. | 120 sec. Max. |
| Peak temperature | 240℃ Max. | 260℃ Max. |
| Soldering time | 10 sec. Max. | 10 sec. Max. |
| Condition | refer to temperature-profile (A) | refer to temperature-profile (B) ($N_2$ reflow is recommended.) |

- After reflow soldering rapid cooling should be avoided.

### Temperature-profile ( Surface of MCPCB)

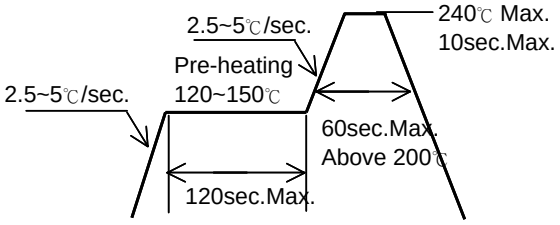



Figure 8a. Lead Solder Temperature Profile

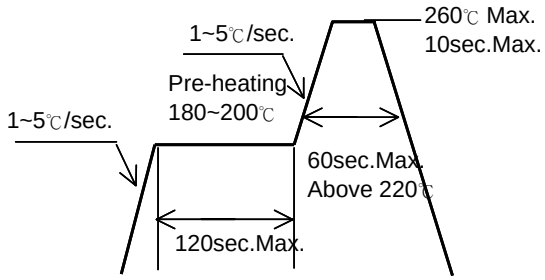



Figure 8b. Lead-free Solder Temperature Profile

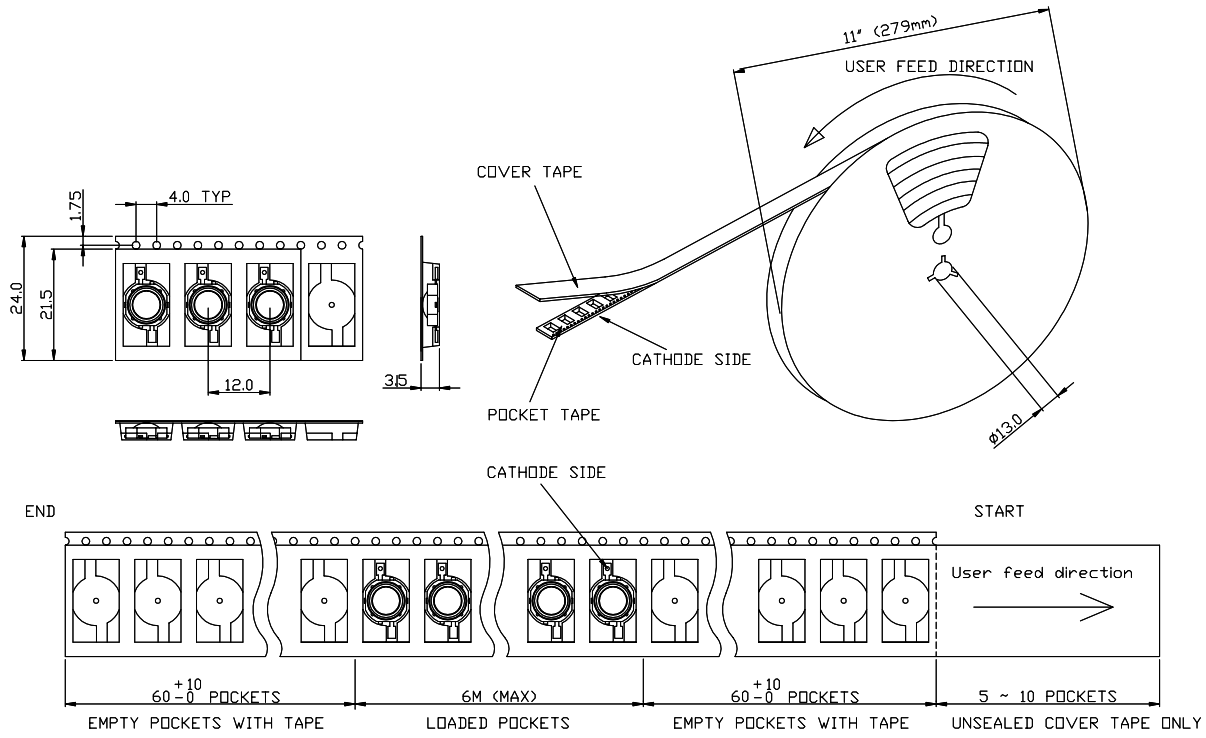
- Occasionally there is a brightness decrease caused by the influence of heat or ambient during air reflow. It is recommended that the User use the nitrogen reflow method.
- Repairing should not be done after the LEDs have been soldered. When repairing is double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than two times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

## Manual Hand Soldering

For Prototype builds or small series production runs it possible to place and solder the emitters

It is recommended to hand solder the leads and slug with a solder tip temperature of 230'C for l 10 seconds. This profile maintains a junction temperature below the maximum of 120'C, avoidir to the emitter or to the MCPCB dielectric layer. Damage to the epoxy layer can cause a short ci the array.

## Emitter Reel Packaging




Notes:
1. The emitters should be picked up by the body (not the lens) during placement. The inner diameter of the pick-up collet should be greater than or equal to 6.5 mm.
2. Drawing not to scale.
3. All dimensions are in millimeters.
4 .All dimendions without tolerances are for reference only.