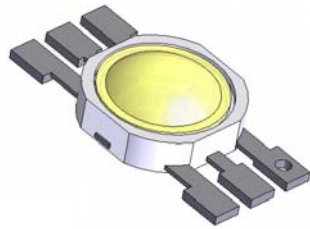




ProLight Opto
Technology Corporation



ProLight PL6N-3LFX
3W RGB Power LED
Technical Datasheet
Version: 2.5



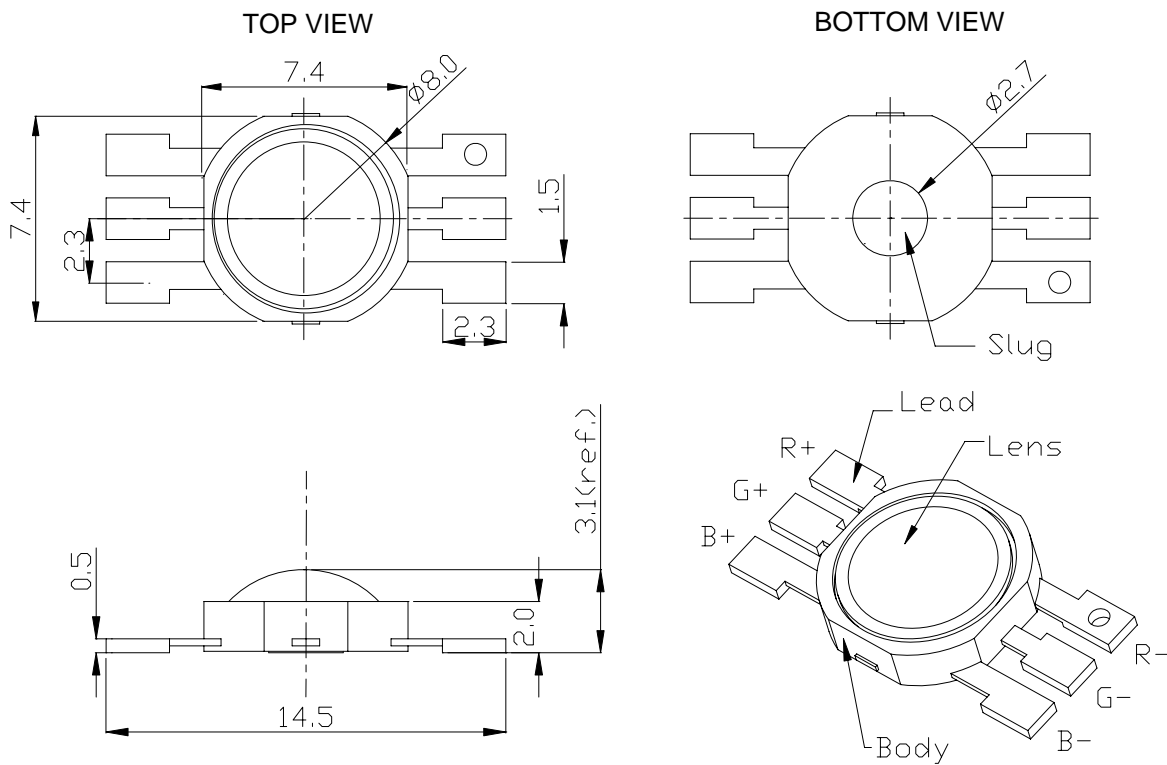
Features

- R, G, B three color in one Package
- High flux per LED
- Very long operating life(up to 100k hours)
- Various colors
- Good color uniformity
- More energy efficient than incandescent and most halogen lamps
- Low Voltage DC operated
- Instant light (less than 100ns)
- No UV

Typical Applications

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Uplighters/Downlighters
- Decorative/Entertainment
- Bollards/Security/Garden
- Cove/Undershelf/Task
- Indoor/Outdoor Commercial and Residential Architectural
- Automotive Ext (Stop-Tail-Turn, CHMSL, Mirror Side Repeat)
- LCD backlights

Emitter Mechanical Dimensions

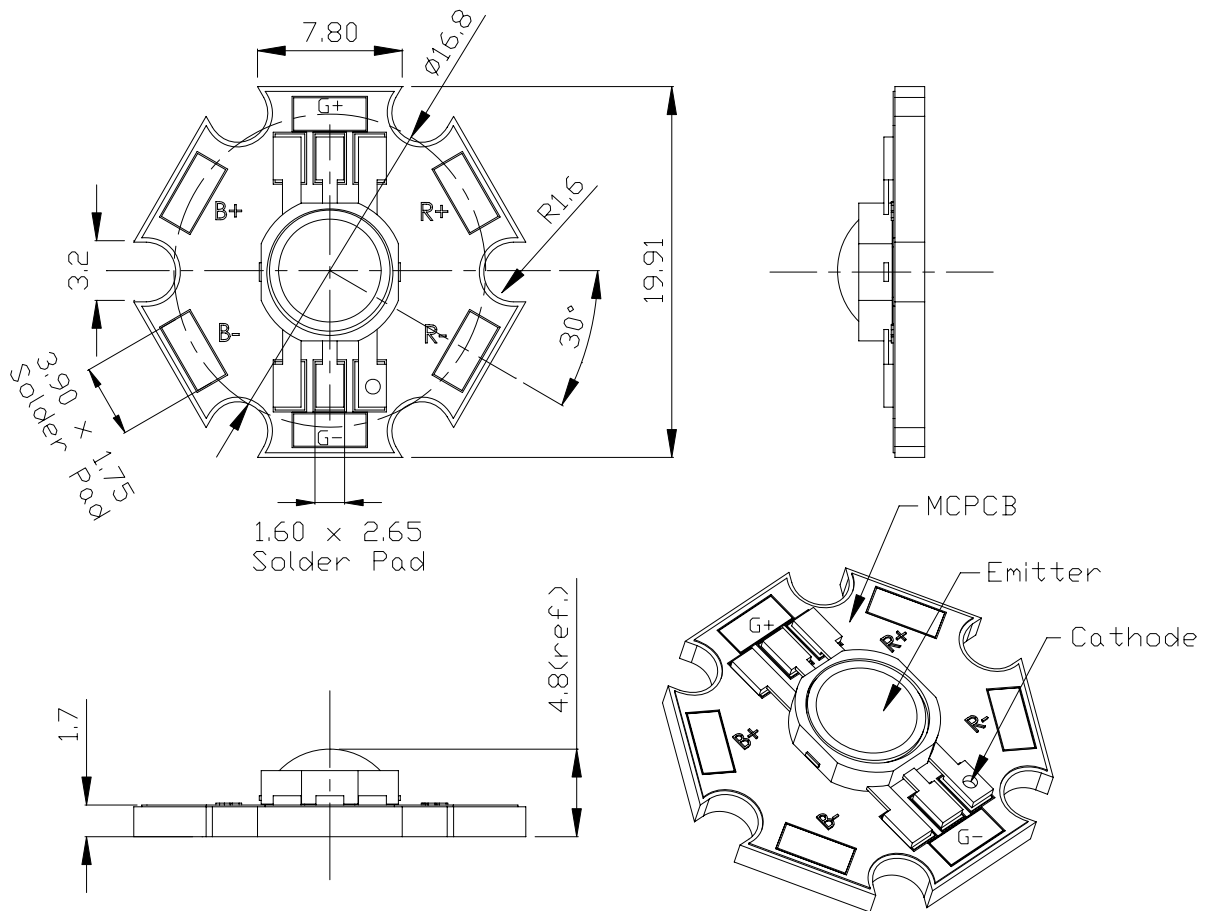


Notes:

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 dimensions without tolerances are for reference only.
6. Please do not bend the leads of LED, otherwise it will damage the LED.

*The appearance and specifications of the product may be modified for improvement without notice.

Star Mechanical Dimensions



Notes:

1. Slots in aluminum-core PCB for M3 or #4 mounting screw.
2. Electrical interconnection pads labeled on the aluminum-core PCB with "+" and "-" to denote positive and negative, respectively. All positive pads are interconnected, as are all negative pads, allowing for flexibility in array interconnection.
3. Drawing not to scale.
4. All dimensions are in millimeters.
5. All dimensions without tolerances are for reference only.

*The appearance and specifications of the product may be modified for improvement without notice.

Flux Characteristics at 350mA, T_J = 25°C

Radiation Pattern	Color	Part Number		Lumious Flux Φ_V (lm)	
		Emitter	Star	Minimum	Typical
Lambertian	Green			30.6	52
	Blue	PL6N-3LFE	PL6N-3LFS	6.3	12
	Red			23.5	30

- ProLight maintains a tolerance of $\pm 10\%$ on flux and power measurements.
- Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics at 350mA, T_J = 25°C

Color	Forward Voltage V _F (V)			Dynamic Resistance (Ω)	Temperature Coefficient of V _F (mV/°C) $\Delta V_F / \Delta T_J$	Thermal Resistance Junction to Slug (°C/W)
	Min.	Typ.	Max.			
Green	2.8	3.5	4.0	1.0	-2.0	10
Blue	2.8	3.5	4.0	1.0	-2.0	10
Red	1.9	2.2	3.1	2.4	-2.0	10

Optical Characteristics at 350mA, T_J = 25°C

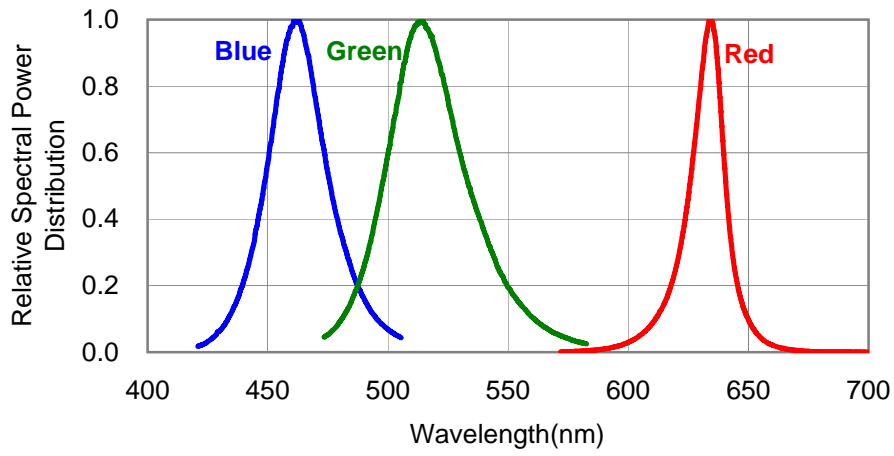
Radiation Pattern	Color	Dominant Wavelength λ_D , or Color Temperature CCT			Spectral Half-width (nm) $\Delta\lambda_{1/2}$	Temperature Coefficient of Dominant Wavelength (nm/°C) $\Delta\lambda_D / \Delta T_J$	Total included Angle (degrees) $\theta_{0.90V}$	Viewing Angle (degrees) $2\theta_{1/2}$
		Min.	Typ.	Max.				
Lambertian	Green	520 nm	530 nm	540 nm	35	0.04	160	140
	Blue	455 nm	465 nm	475 nm	25	0.04	160	140
	Red	610 nm	620 nm	631 nm	20	0.05	160	140

- ProLight maintains a tolerance of ± 1 nm for dominant wavelength measurements.

Absolute Maximum Ratings

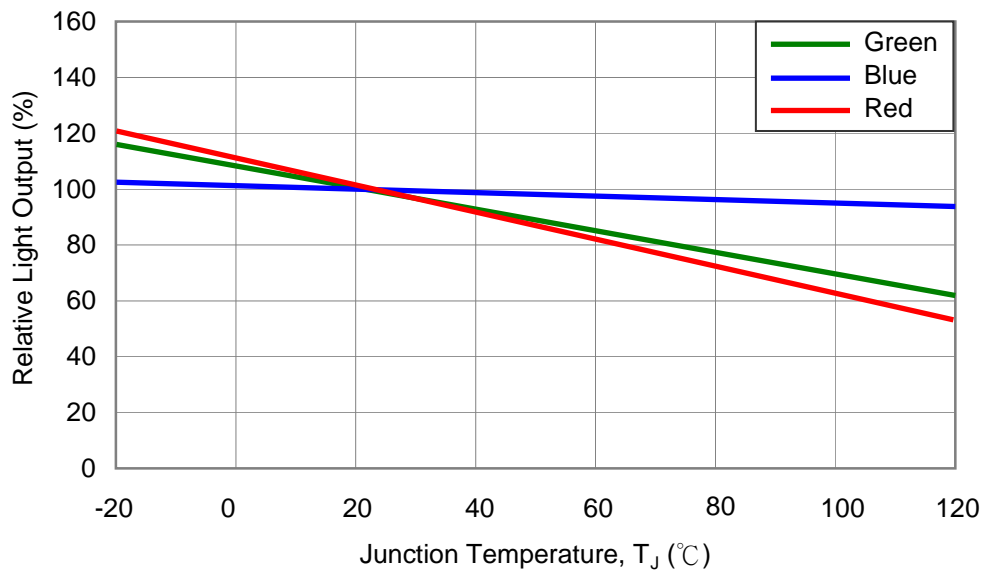
Parameter	Green/Blue	Red
DC Forward Current (mA)	350	385
Peak Pulsed Forward Current (mA)	500	550
Average Forward Current (mA)	350	350
LED Junction Temperature (°C)	135	120
Aluminum-core PCB Temperature (°C)	105	105
Storage & Operating Temperature (°C)	-40 to +105	-40 to +105
Soldering Temperature(°C)	260 for 5 seconds Max.	

Color Spectrum, $T_J = 25^\circ\text{C}$



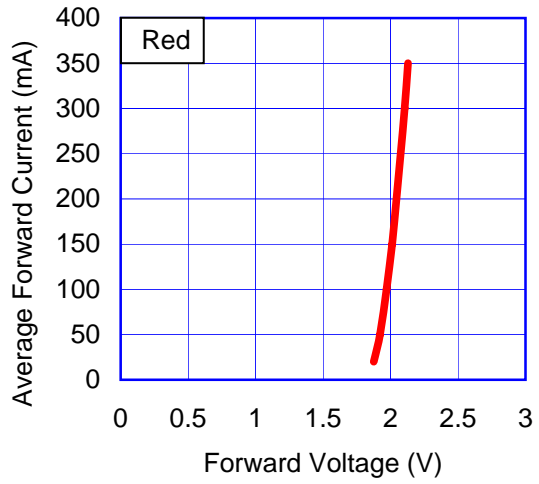
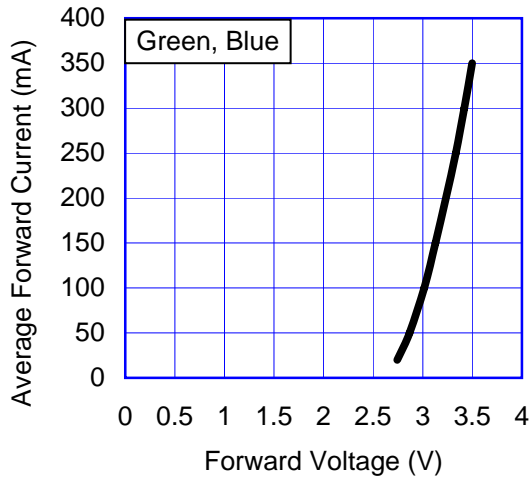
Light Output Characteristics

Relative Light Output vs. Junction Temperature at 350mA

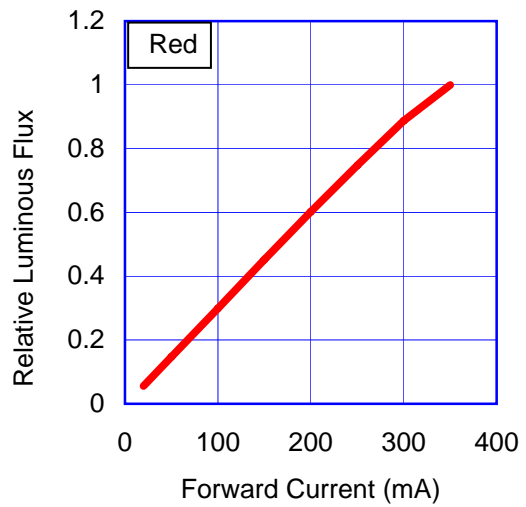
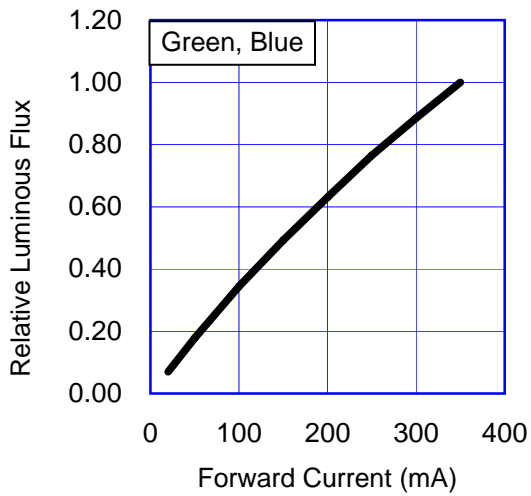


Forward Current Characteristics, $T_J = 25^\circ\text{C}$

1. Forward Voltage vs. Forward Current

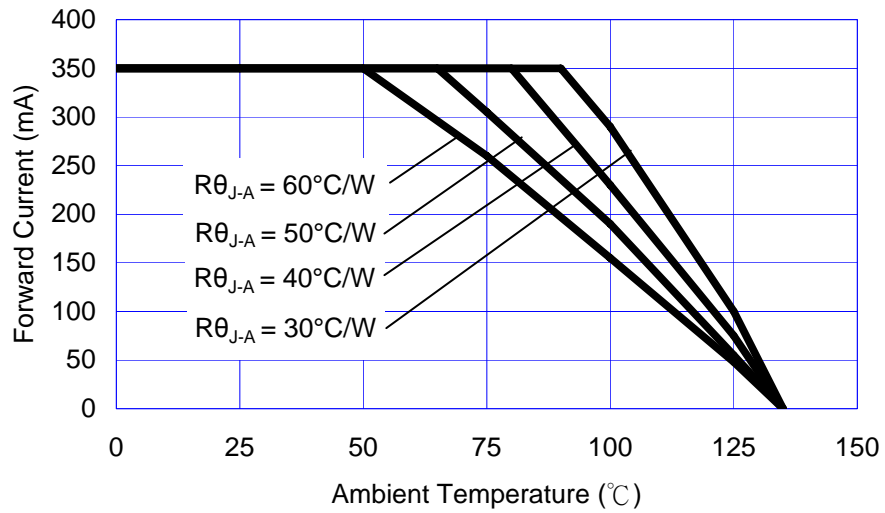


2. Forward Current vs. Normalized Relative Luminous Flux

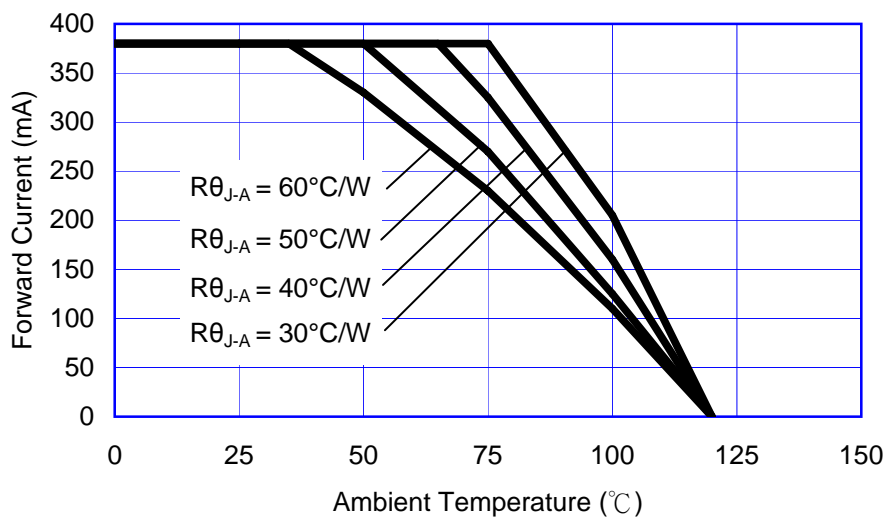


Ambient Temperature vs. Maximum Forward Current

1. Green, Blue ($T_{JMAX} = 135^{\circ}C$)

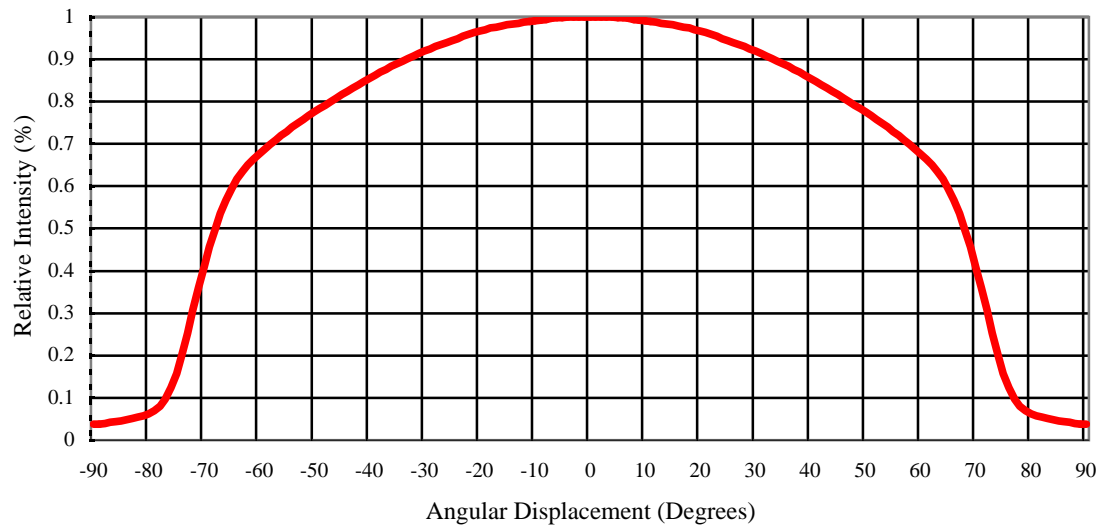


2. Red ($T_{JMAX} = 120^{\circ}C$)

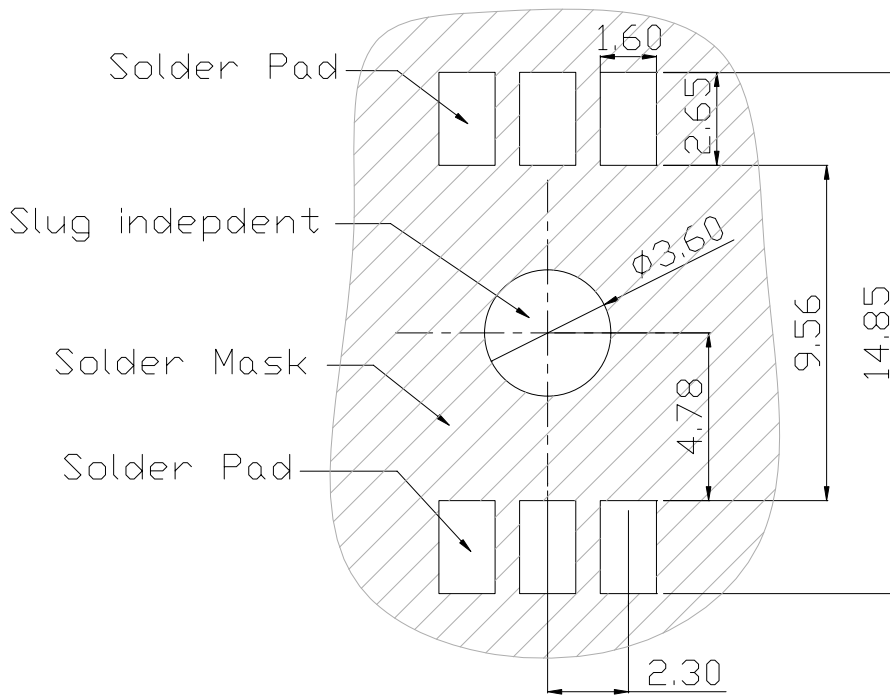


Typical Representative Spatial Radiation Pattern

Lambertian Radiation Pattern



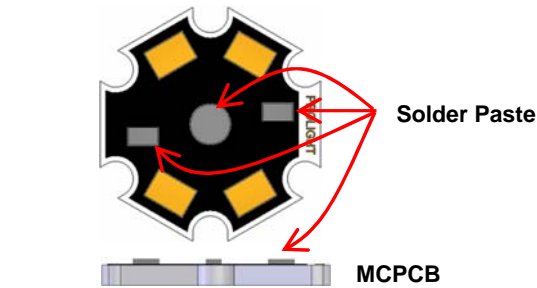
Recommended Solder Pad Design



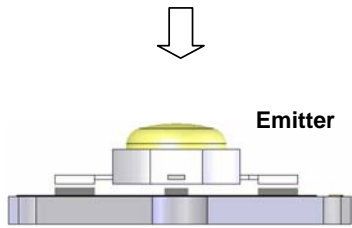
- All dimensions are in millimeters.
- Electrical isolation is required between Slug and Solder Pad.

Heat Plate Soldering Condition

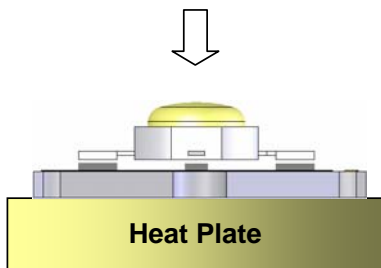
(1) Soldering Process for Solder Paste



Use Solder Mask to print Solder Paste on MCPCB.



Place Emitter on MCPCB.

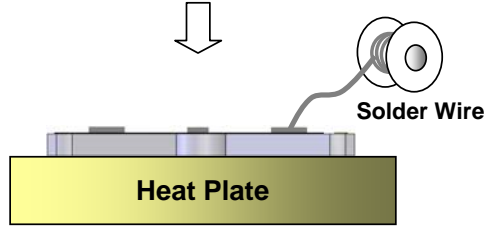


Put MCPCB on Heat Plate until Solder Paste melt.
The Solder Paste could be melted within 10 seconds.
Take out MCPCB out from Heat Plate within 15 seconds.

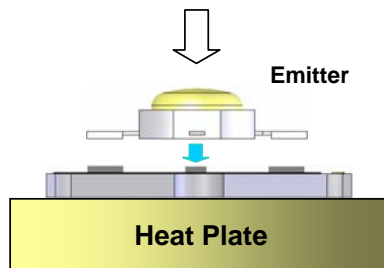
(2) Soldering Process for Solder Wire



Put MCPCB on Heat Plate.



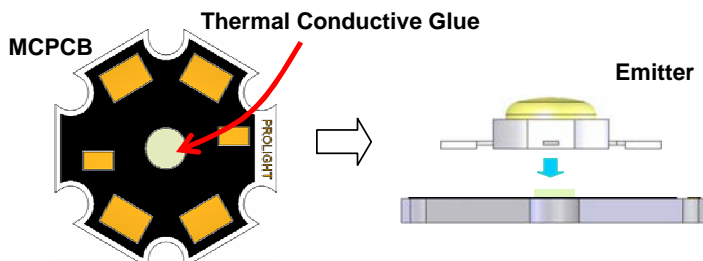
Place Solder Wire to the solder pad of MCPCB.



Put Emitter on MCPCB. Take the MCPCB out from Heat Plate within 10 seconds.

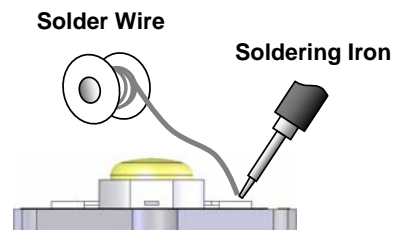
- Heat plate temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

Manual Hand Soldering



Place Thermal Comductive Glue on the MCPCB.

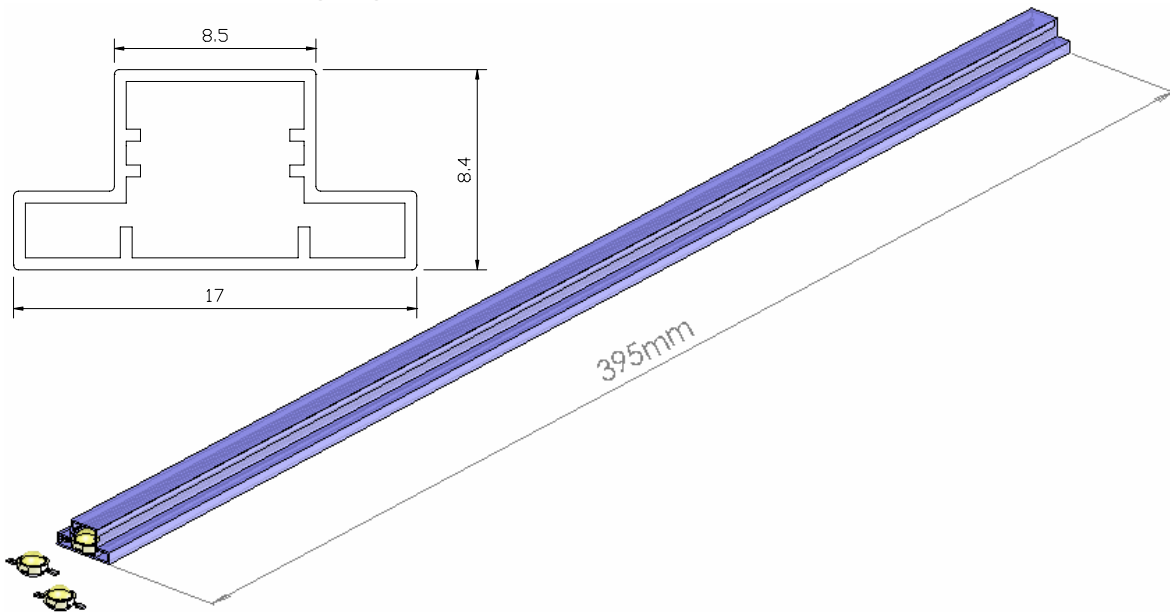
Place Emitter on the MCPCB.



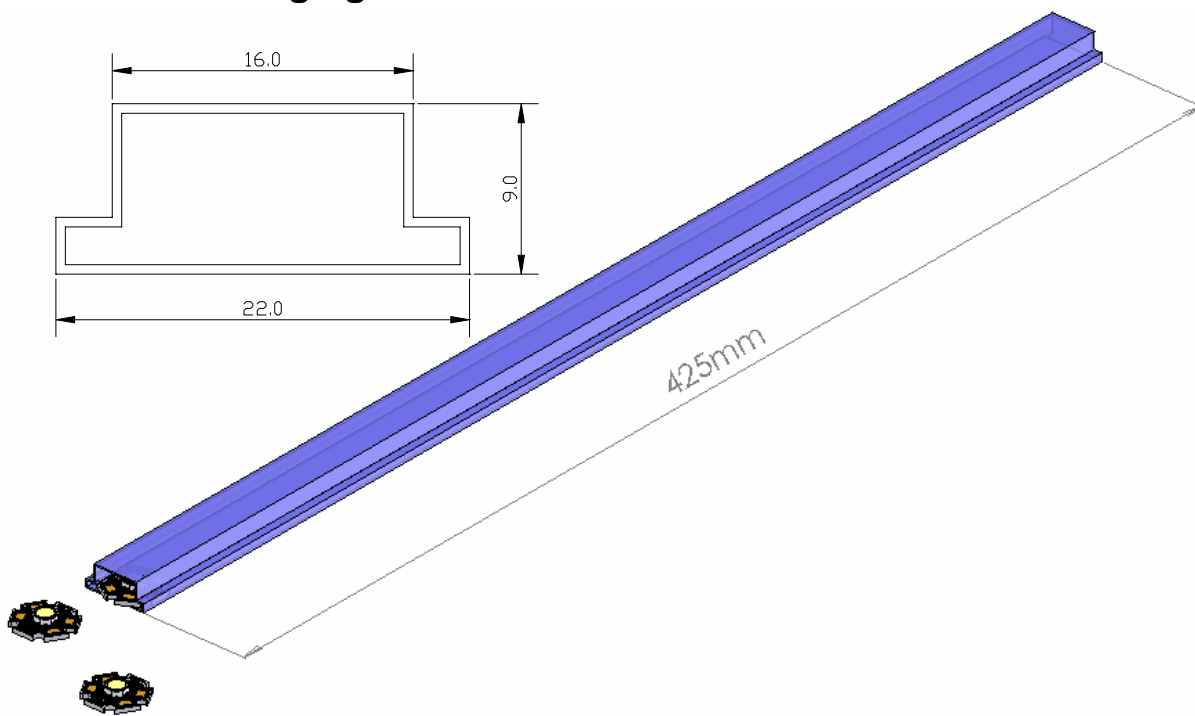
Use Soldering Iron to solder the leads of Emitter within 5 seconds.

- For prototype builds or small series production runs it possible to place and solder the emitters by hand.
- Solder tip temperature: 230°C max for Lead Solder and 260°C max for Lead-Free Solder.
- Avoiding damage to the emitter or to the MCPCB dielectric layer. Damage to the epoxy layer can cause a short circuit in the array.
- Do not let the solder contact from solder pad to back-side of MCPCB. This one will cause a short circuit and damage emitter.

Emitter Tube Packaging



Star Tube Packaging



Notes:

1. Emitter 50 pieces per tube and Star 20 pieces per tube.
2. Drawing not to scale.
3. All dimensions are in millimeters.
4. All dimensions without tolerances are for reference only.

**Please do not open the moisture barrier bag (MBB) more than one week. This may cause the leads of LED discoloration. We recommend storing ProLight's LEDs in a dry box after opening the MBB. The recommended storage conditions are temperature 5 to 30°C and humidity less than 40% RH.