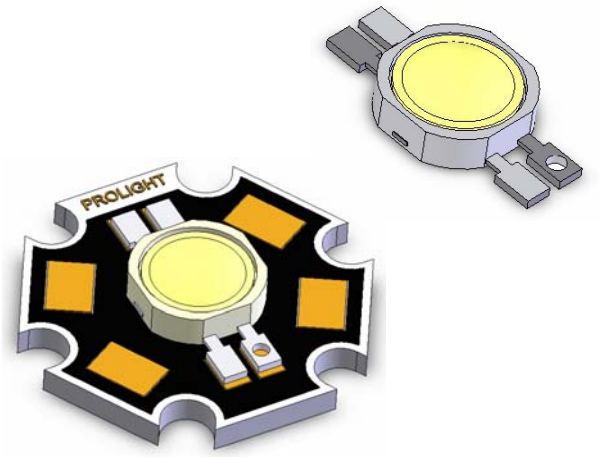
ProLight Opto
Technology Corporation



ProLight PG1N-3LUX
3W RGB Power LED
Technical Datasheet
Version: 2.1

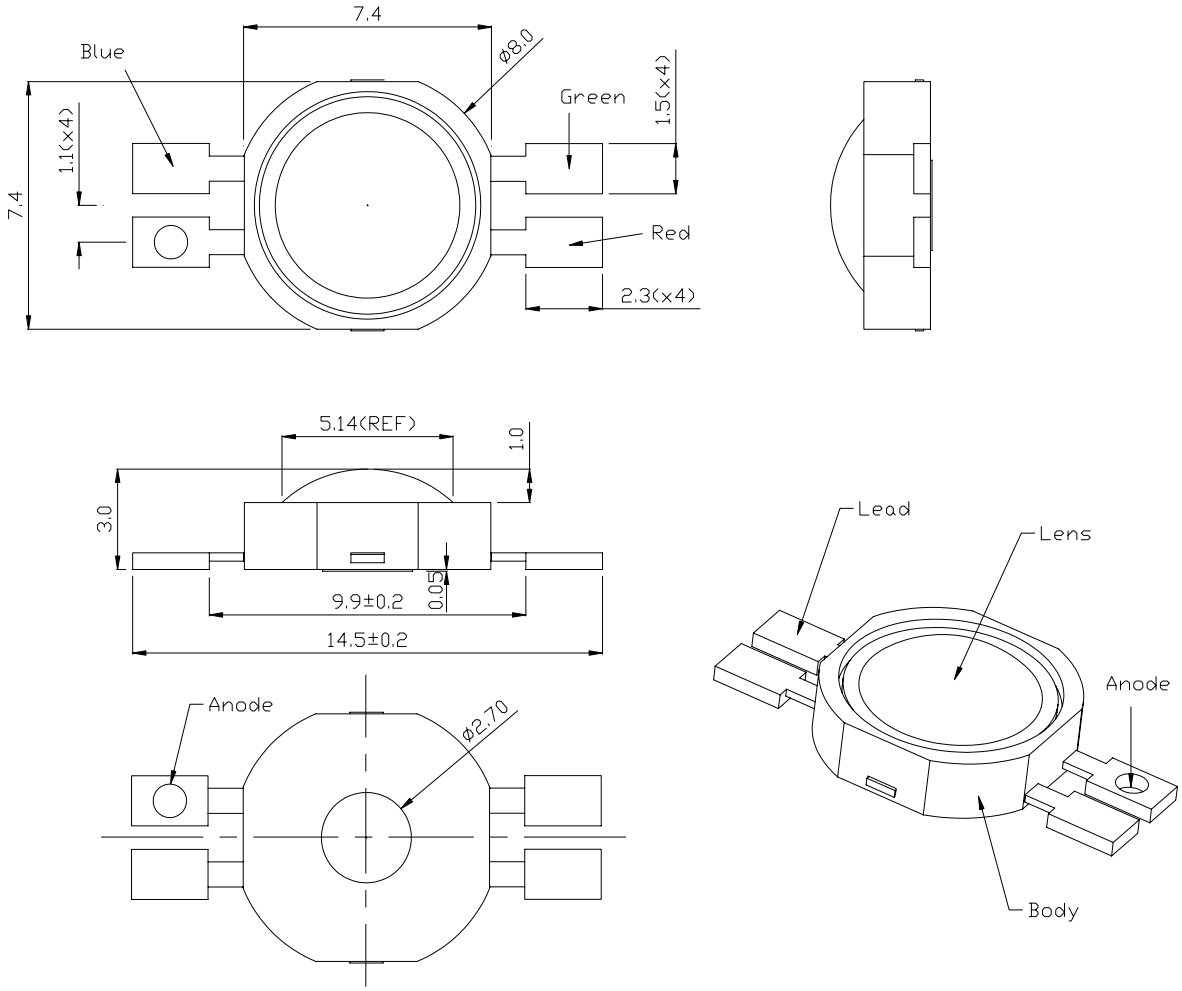
Features

- 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

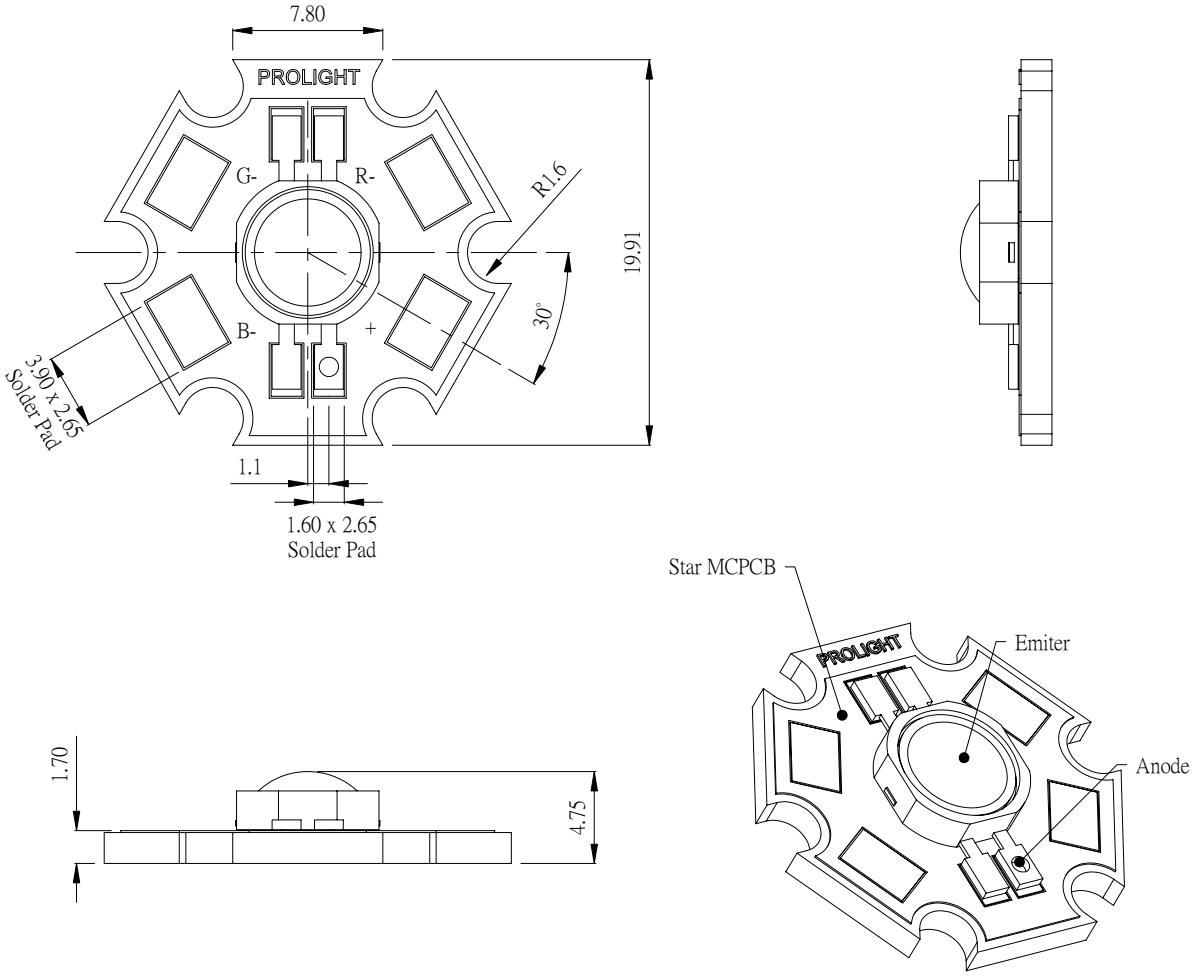
Emitter Mechanical Dimensions



Notes:

1. The anode 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.

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.

Part Number

Color	Emitter	STAR	Beam Pattern
R/G/B	PG1N-3LUE	PG1N-3LUS	Lambertian

Flux Characteristics at350mA, Junction Temperature, Tj=25℃

Color	Minimum Luminous Flux (lm)	Typical Luminous Flux (lm)	Beam Pattern
Red	23.5	32	
Green	30.6	55	Lambertian
Blue	6.3	13	

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	3.10	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℃

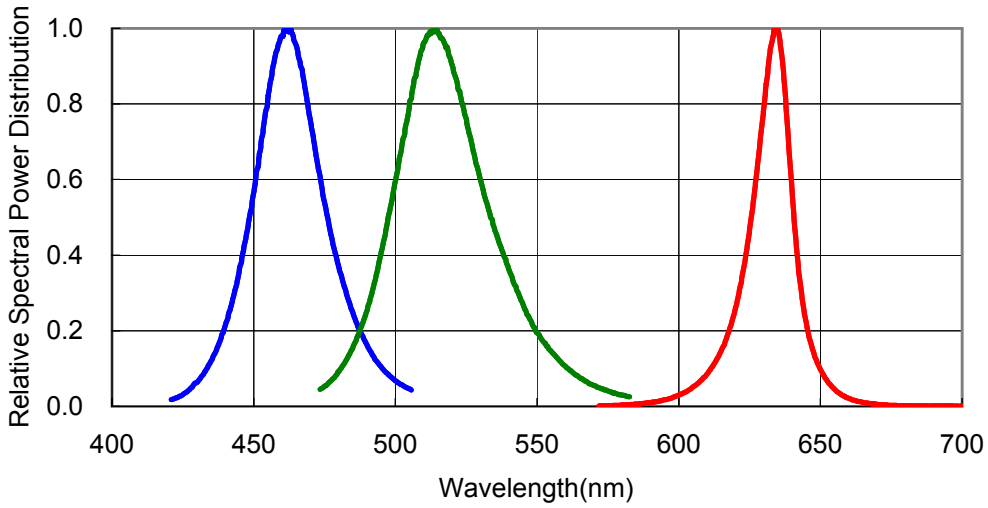


Figure 1. Relative Intensity vs. Wavelength

Light Output Characteristics

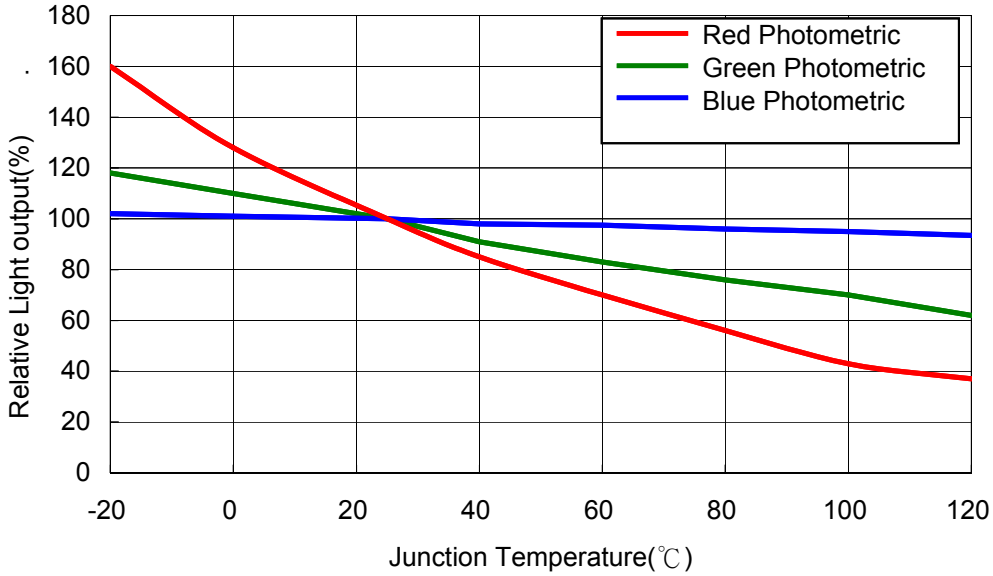


Figure 2. Relative Light Output vs. Junction Temperature

Forward Current Characteristics, Tj=25℃

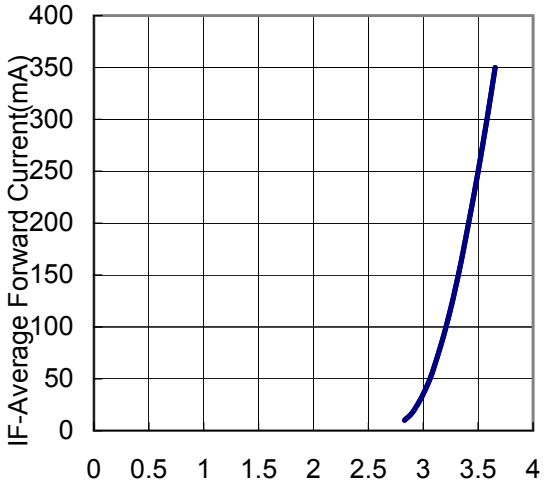


Fig 3a. Forward Current vs. Forward Voltage for Blue and Green.

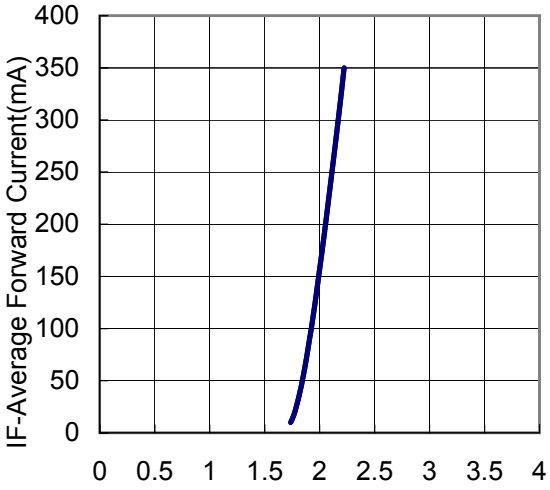


Fig 3b. Forward Current vs. Forward Voltage for Red.

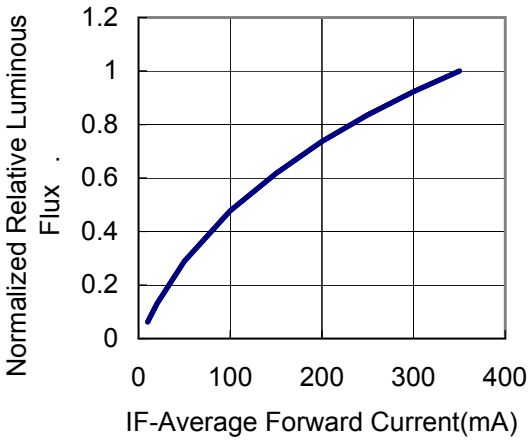


Fig 4a. Relative Luminous Flux vs. Forward Current for Blue and Green at Tj=25℃ maintained.

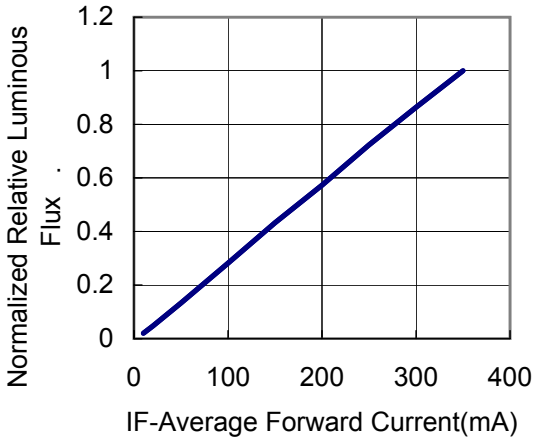


Fig 4b. Relative Luminous Flux vs. Forward Current for Red at Tj=25℃ maintained.

Current Derating Curves

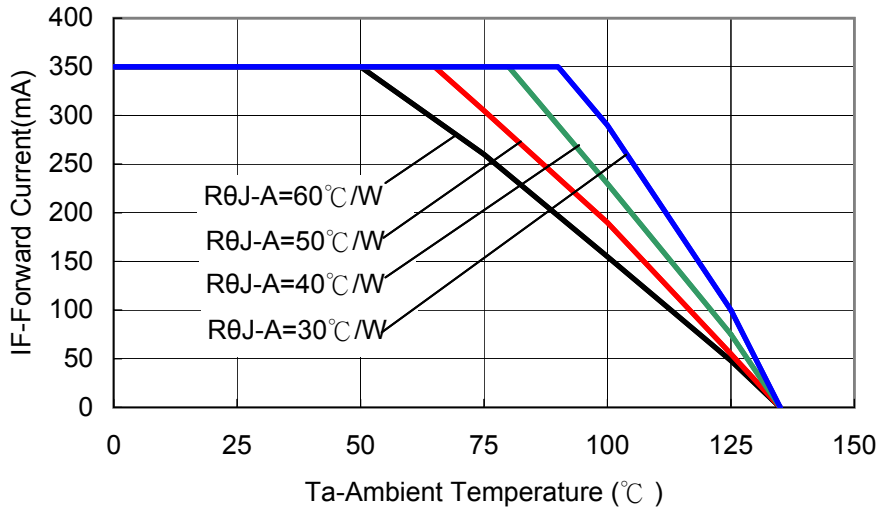


Fig 5a. Maximum Forward Current vs. Ambient Temperature. Derating based on TjMAX=135℃ for Blue and Green.

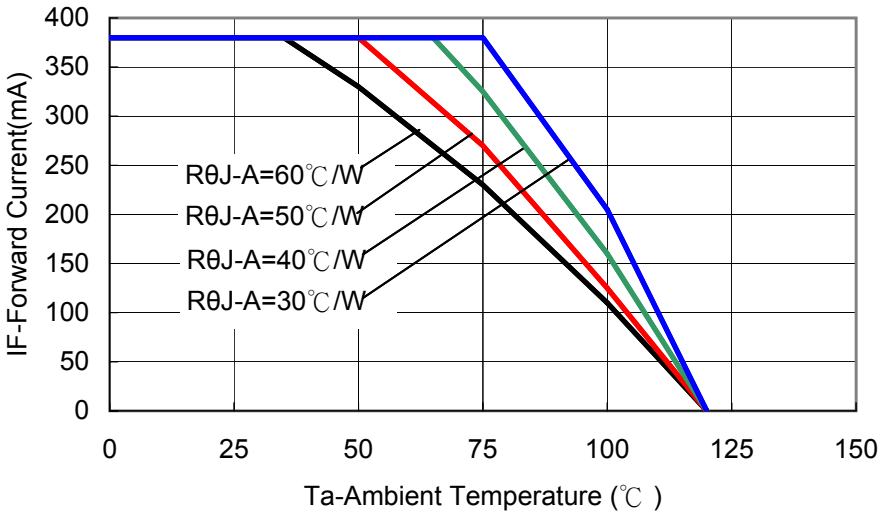


Fig 5b. Maximum Forward Current vs. Ambient Temperature. Derating based on TjMAX=120℃ for Red.

Typical Representative Spatial Radiation Pattern

Lambertian Radiation Pattern

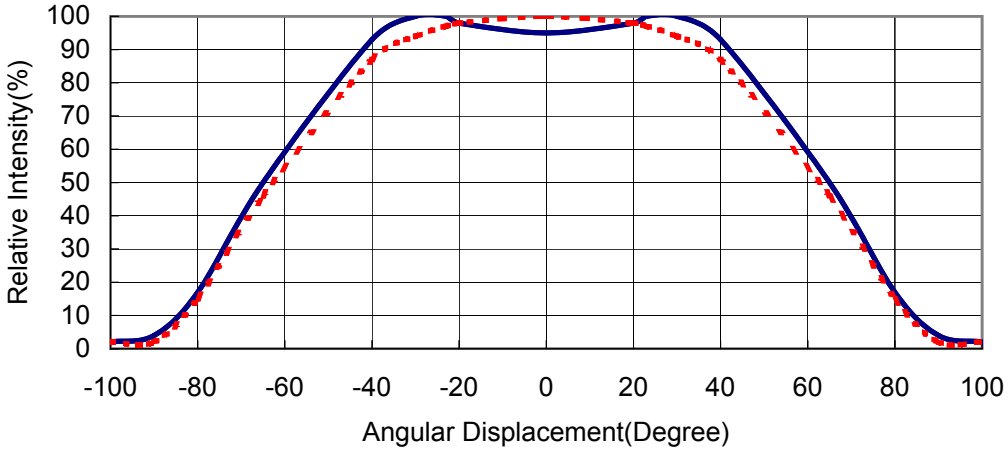


Fig 6. Typical Representative Spatial Radiation Pattern.

Recommended Soldering Pads

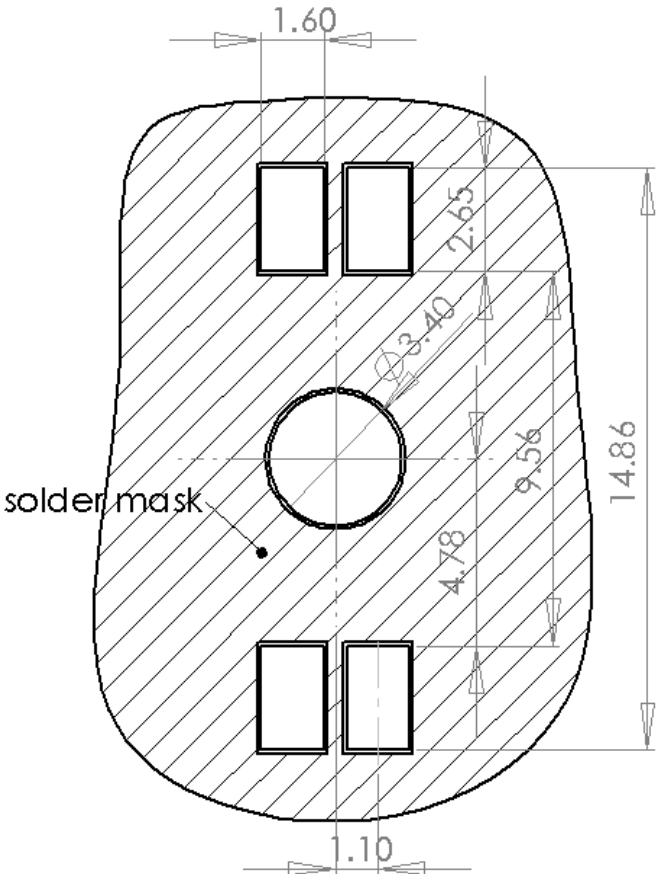
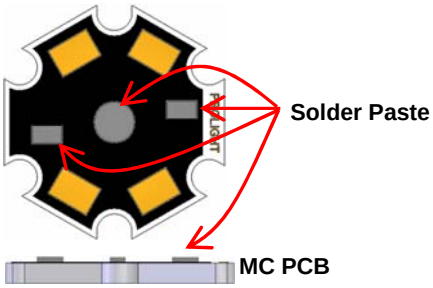


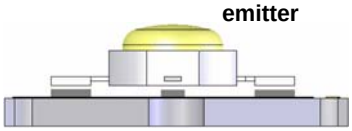
Fig 7. Recommended Solder pads dimension. Solder mask is also recommended to advoid short circuit while proceeding soldering.

Heat Plate Soldering Condition

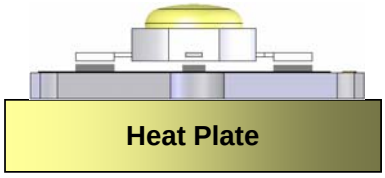
(1) Soldering Process for Solder Paste



Use Solder Mask to print solder paste on MC PCB

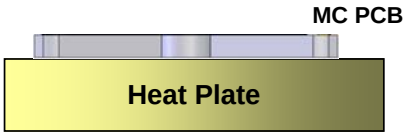


Place emitter on the MC PCB

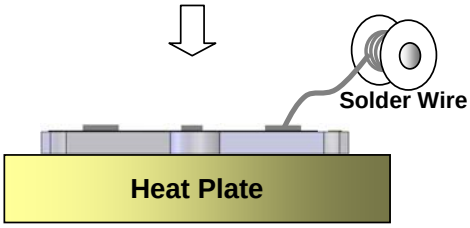


Put MC PCB on Heat Plate until solder paste melt.
The solder paste sould be melted within 10sec.
Take out MC PCB out from Heat Plate within 15sec.

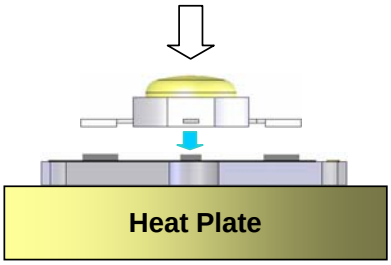
(2) Soldering Process for Solder Wire



Put MC PCB on Heat Plate



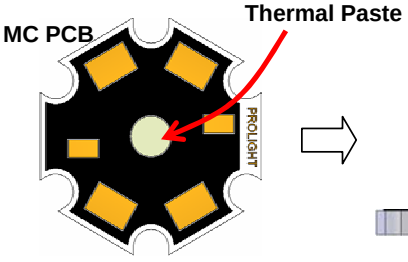
Place solder wire to the solder pad of MC PCB



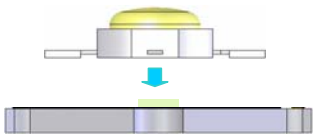
Put emitter on MC PCB. Take the MC PCB out from Heat Plate within 10 sec.

- 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.
- Air Reflow Process are not allow, it will cause optical lens damage and effect optical performance.

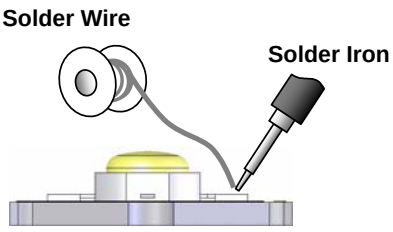
Manual Hand Soldering



Place solder paste on the MC PCB



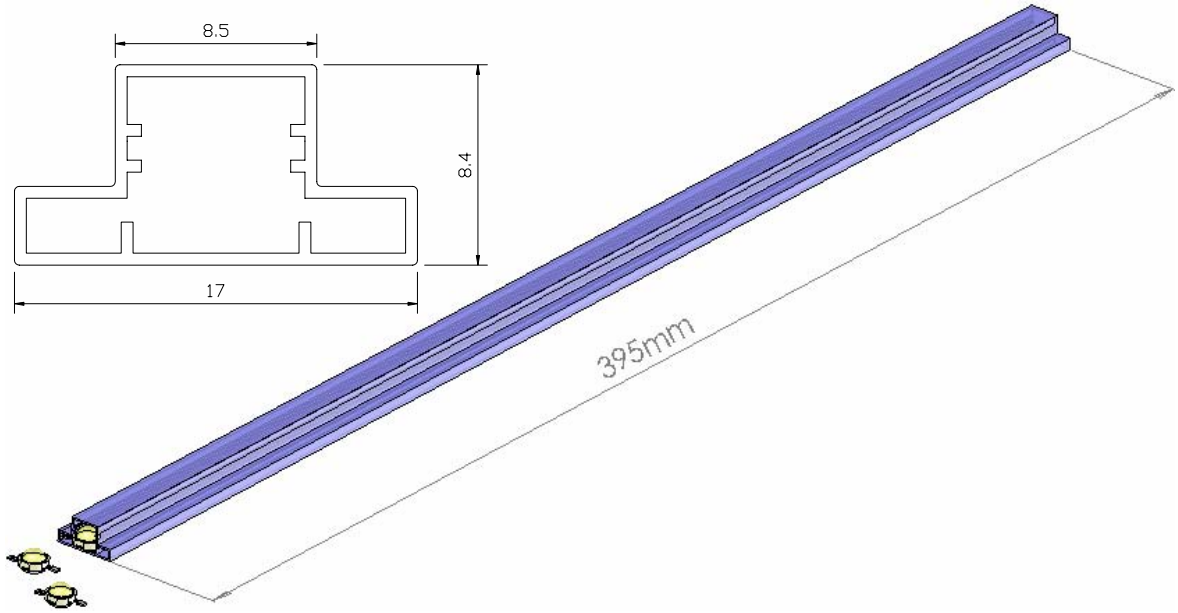
Place emitter on the MC PCB



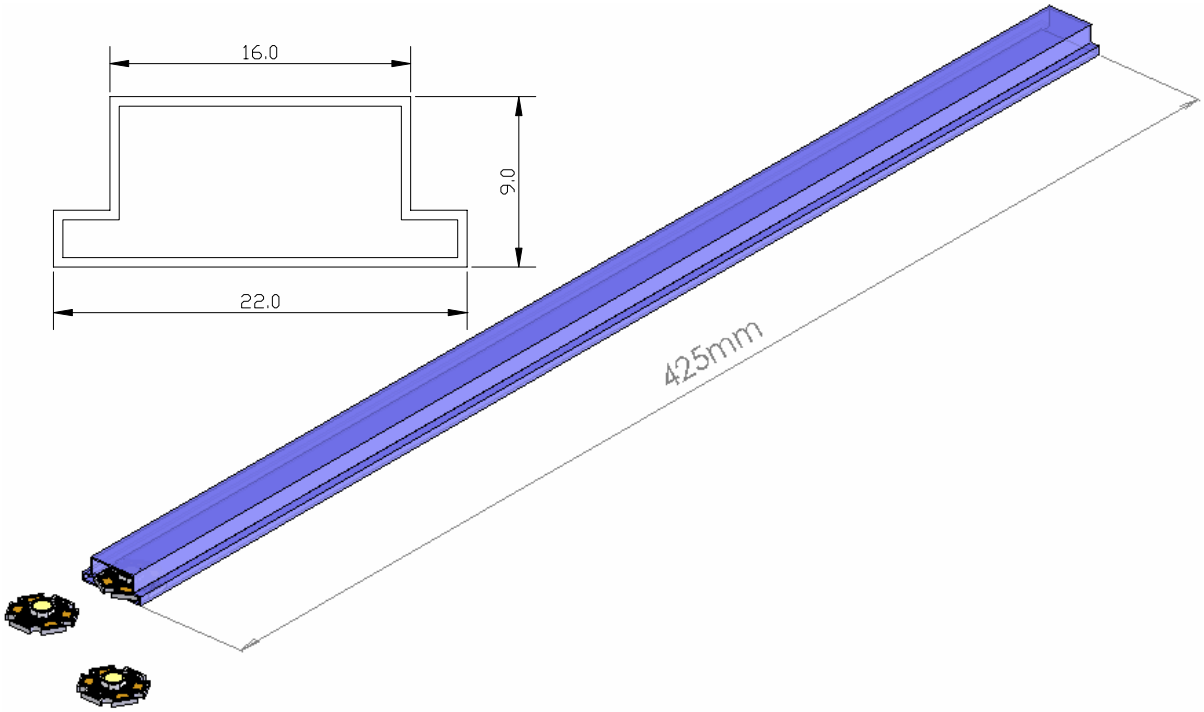
Use Soldering Iron to solder the lead of emtter.

- For Prototype builds or small series production runs it possible to place and solder the emitters by hand.
- Hand solder the leads with a solder tip temperature of 230'C for less than 5 sec.
- 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 MC PCB. This one will cause a short circuit and damage emitter.

Emitter Tube Packaging



Star Tube Packaging



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