

ARPL-IR-GP-K7 (940nm, 700mA)

Introduction

THE GP K series LED is an energy efficient and ultra compact new light source, combining the lifetime and reliability advantages of high power LED with the brightness of conventional lighting. K series can be drive current rating from 350 mA to 700mA as your various needed.

GP K series LED that delivers elevated standards for light output, flux density and manufacture ability. Offering better flux density, lumens per package and power handling capabilities.

Feature

- Create more useable light and higher flux density
- Available in White, Green, Blue, Red and Amber
- Tightly pack the LEDs for color mixing applications
- Engineer more robust applications
- Lambertian radiation pattern
- Low voltage DC operated, Cool beam, safe to the touch Instant lights
- No UV
- Superior ESD protection

Typical application

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- LCD Backlights
- General lighting
- Indoor/Outdoor Commercial and Residential Architectural
- Contour lights
- Traffic signaling/Beacons/ Rail crossing and Wayside
- Fiber optic alternative/ Decorative/Entertainment
- Architectural lighting

Product Nomenclature

GP K series LED is tested and binned at 350mA.

The part number designation is explained as follows:

GS - A B C D E

Where:

A — designates Power LED package (K for Lead Frame type)

B — designates package platform (7 for Lead Frame black concave cup)

C — designates view angle (A for 140 degrees, B for 120 degrees)

D — designates color variant (I for IR)

E — designates chip classification

Environmental Compliance

THE LED BU is committed to providing environmentally friendly products to the solid-state lighting market. GP K series LED is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS directive. THE LED BU will not intentionally add the following restricted materials to the GP K series LED: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Visual Appearance of GP K series LED

All lighted GP K series LED product will provide comparable Lambertian beam performance, suitable for use with commercially available optical systems. Without power, LED die within different reels may appear visually different.

Luminous Flux characteristics

Flux Characteristics for GP K series LED — $T_j = 25^\circ\text{C}$

Color	Part Number	Typical Optical Power (mW)	Drive Current (mA)
IR	GS-K7AIQ4	180	350
IR	GS-K7AIQ4	250	350

Notes for Table 1:

1. Minimum luminous flux or radiometric power performance guaranteed within published operating conditions. THE LED BU maintains a tolerance of $\pm 10\%$ on flux measurements.
2. Typical luminous flux performance when device is operated within published operating conditions.
3. GP K series LED products with even higher luminous flux and radiometric power levels will become available in the future.
4. All radiation patterns are Lambertian.

Optical Characteristics

GP K series LED at Test Current_[1], T_J = 25°C

Table 2.

Color	Dominant Wavelength ^[2] λ _D or Color Temperature ^[3] CCT			Typical Spectral Half-width ^[5] (nm) Δ λ _{1/2}	Typical Temperature Coefficient of Dominant Wavelength (nm/°C) Δ λ _D / ΔT _J	Typical Viewing Angle ^[6] (degrees) 2θ _{1/2}
	Min.	Typ.	Max.			
IR	930 nm	940 nm	950 nm		0.10	140

Notes for Table 2:

1. Test current is 350 mA for all GS-K7 products.
2. Dominant wavelength is derived from the CIE 1931 Chromaticity diagram and represents the perceived color. THE LED BU maintains a tolerance of ± 1 nm for dominant wavelength measurements.
3. CCT ±5% tester tolerance.
4. Spectral width at ½ of the peak intensity.
5. Viewing angle is the off axis angle from lamp centerline where the luminous intensity is ½ of the peak value.

Electrical Characteristics

Electrical Characteristics at 700mA for GP K series LED, Part Numbers GS-K7XXX T_J = 25°C

Table 3

Color	Forward Voltage V _{f[1]} (V)			Typical Thermal Resistance Junction to Thermal Pad (°C/W) R _{Jc}
	Min.	Typ.	Max.	
IR	--	1.8	--	12

Notes for Table 3:

THE LED BU maintains a tolerance of ±0.1 V on forward voltage measurements.

Absolute Maximum Ratings

Table 4.

Parameter	IR
DC Forward Current (mA)	700
ESD Sensitivity	<8000V Human Body Model (HBM) Class 2 JESD22A114B <400V Machine Model (MM) Class 2 JESD22A115B
LED Junction Temperature ^[1]	120°C
Operating Case Temperature at 350 mA	-40°C ~ 100°C
Storage Temperature	-40°C ~ 85°C
Soldering Temperature	JEDEC 020c 260°C
Allowable Reflow Cycles	3
Autoclave Conditions	
Reverse Voltage (Vr)	See Note 2

Notes for Table 4:

1. Proper current derating must be observed to maintain junction temperature below the maximum.
2. GP K series LEDs are not designed to be driven in reverse bias.

JEDEC Moisture Sensitivity

Table 5. JEDEC characteristics at I_f=350 mA and T_j= 25°C

Level	Floor Life		Soak Requirements	
	Time	Conditions	Standard	Conditions
			Time(hours)	
1	Unlimited	≤ 30°C/85%RH	168 +5/0	85°C / 85%RH

Mechanical Dimensions Lambertian

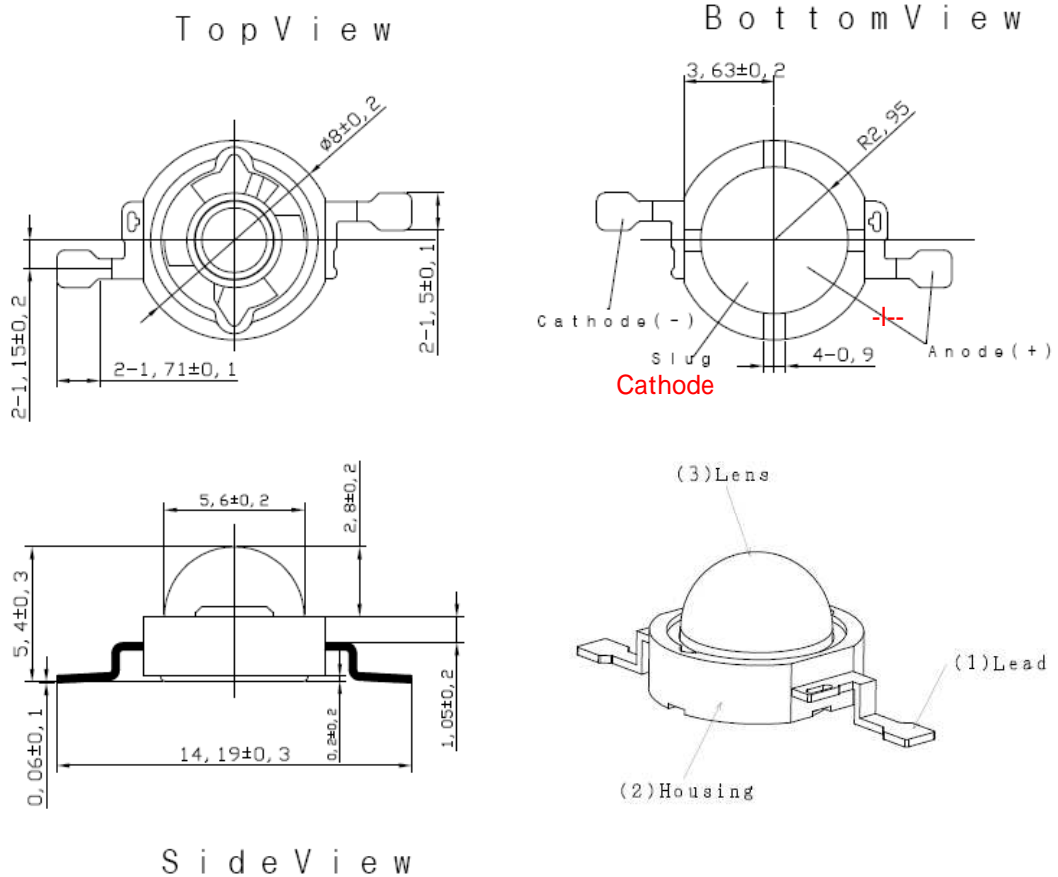


Figure 1. GP K series outline---Standard

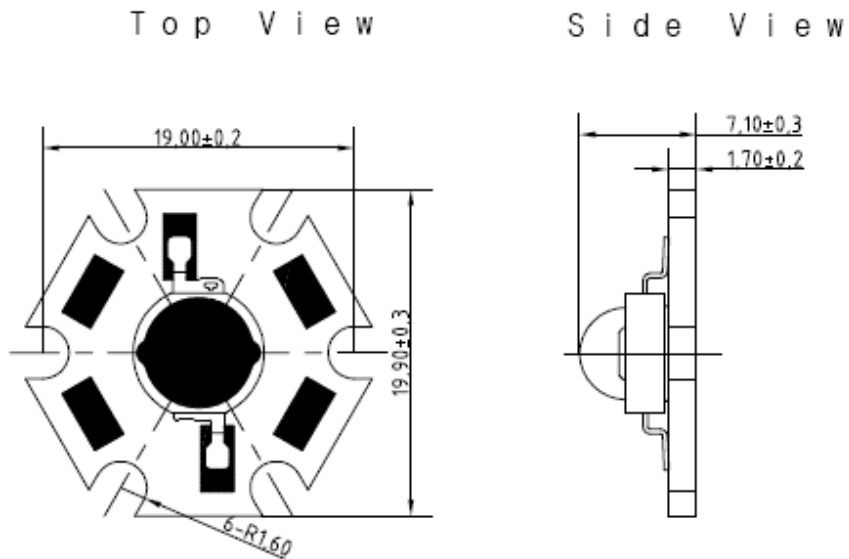


Figure 2. GP K series with star outline ---- Option

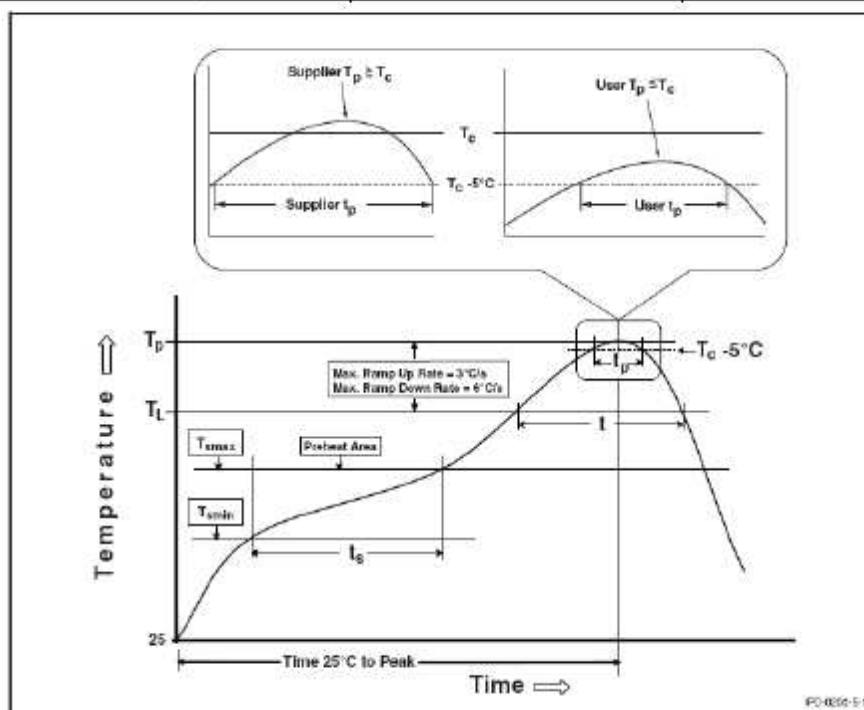
Notes for Figure 1,2:

1. Do not handle the device by the lens-care must be taken to avoid damage to the lens or the interior of the device that can be damaged by excessive force to the lens.
2. All dimensions are in millimeters.

Reflow Soldering Characteristics

Table 6

Profile Feature	Sn-Pb Eutectic Assembly	Low-Temp. & Pb-Free Assembly (58Bi-42Sn Eutectic Alloy)
Preheat & Soak		
Temperature min (T_{smin})	100 °C	90 °C
Temperature max (T_{smax})	150 °C	120 °C
Time (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Average Ramp-Up Rate (T_{smax} to T_p)	3 °C / second max.	2 °C / second max.
Liquidous temperature (T_L)	183°C	138°C
Time at liquidous (t_L)	60-150 seconds	20-50 seconds
Peak package body temperature (T_p)	235°C	185°C
Time (t_p) within 5°C of the specified classification temperature (T_c)	20 seconds	20 seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	3 °C/second max.
Time 25°C to Peak Temperature	6 minutes max.	4 minutes max.



Notes for Table 6:

1. All temperatures refer to the application Printed Circuit Board (PCB), measured on the surface adjacent to the package body.
2. Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a heat plate should be used. It should be confirmed before hand whether the characteristics of LEDs will or will not be damaged by repairing.
3. Reflow soldering should not be done more than two times.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.

Typical Radiation Patterns Typical Representative Spatial Radiation Pattern for IR Lambertian

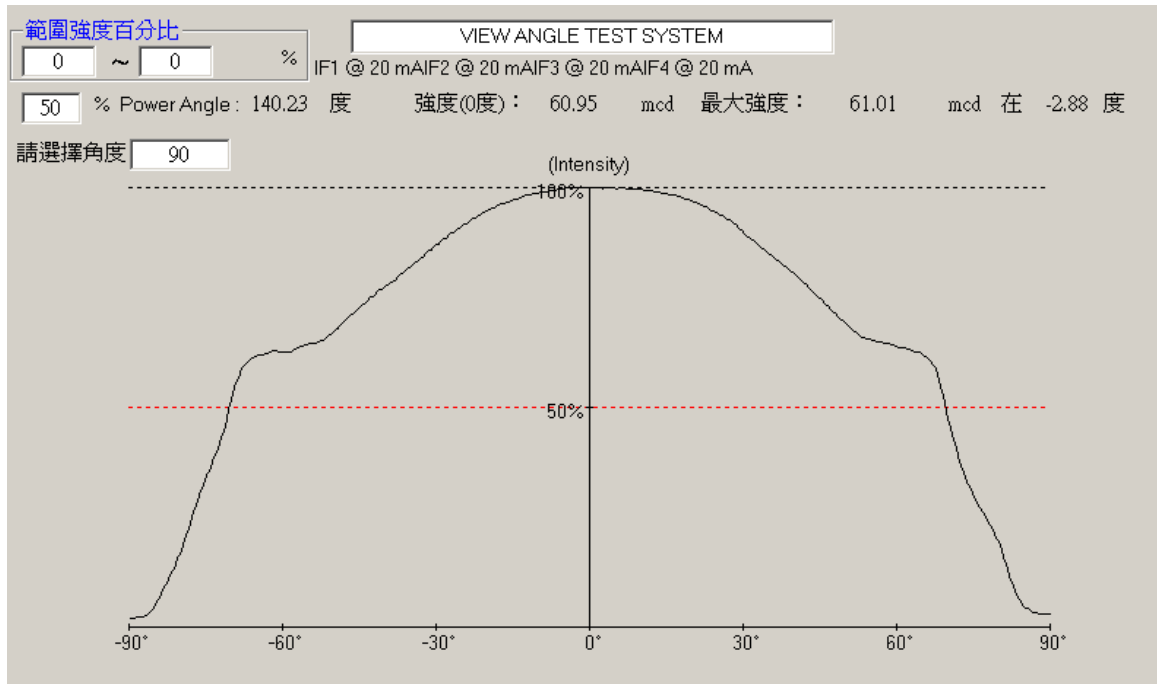


Figure 3. Typical representative spatial radiation pattern for IR Lambertian.

Typical Polar Radiation Pattern for IR Lambertian

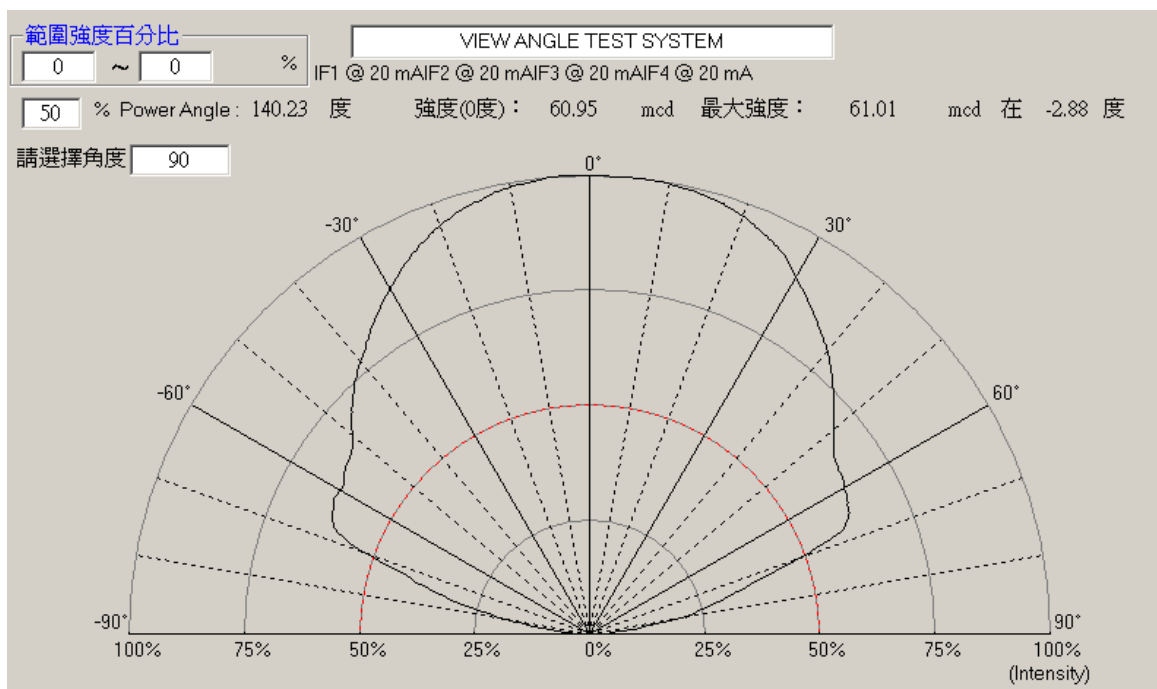
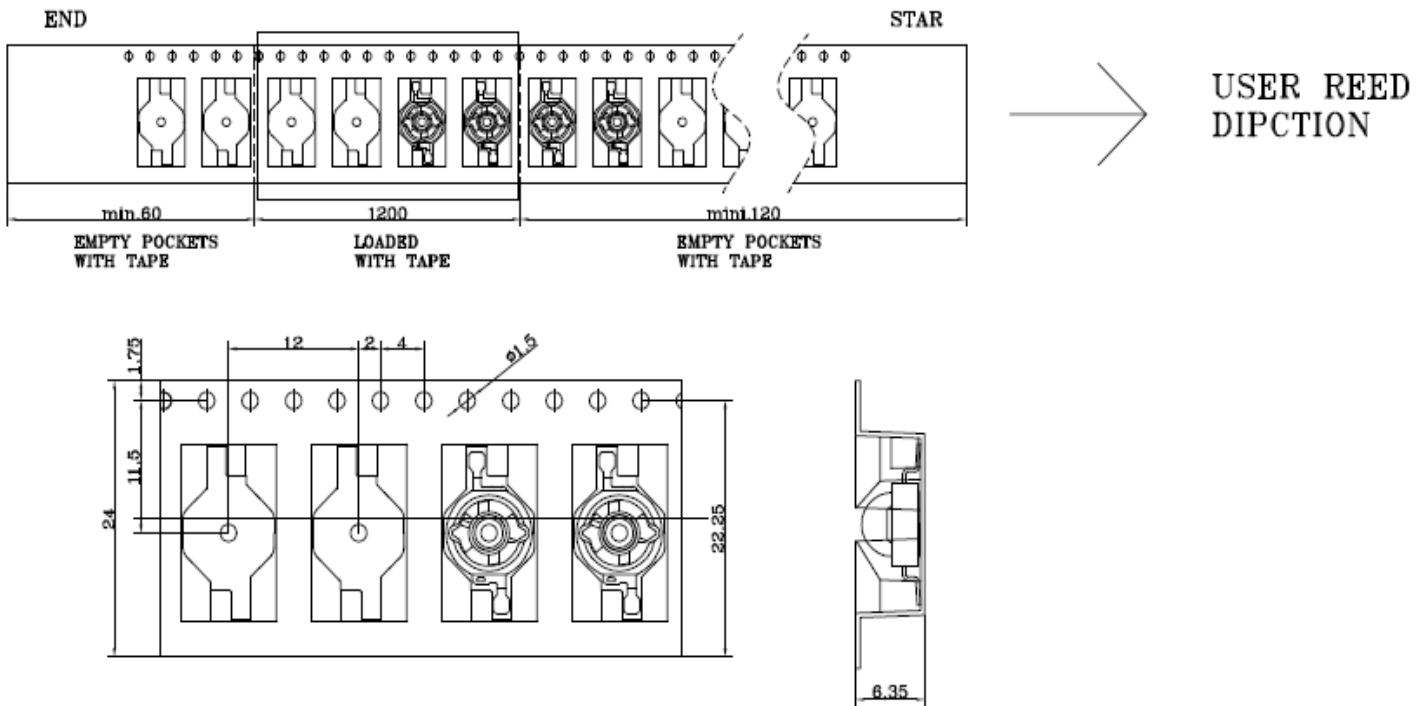


Figure 4. Typical polar radiation pattern for IR Lambertian

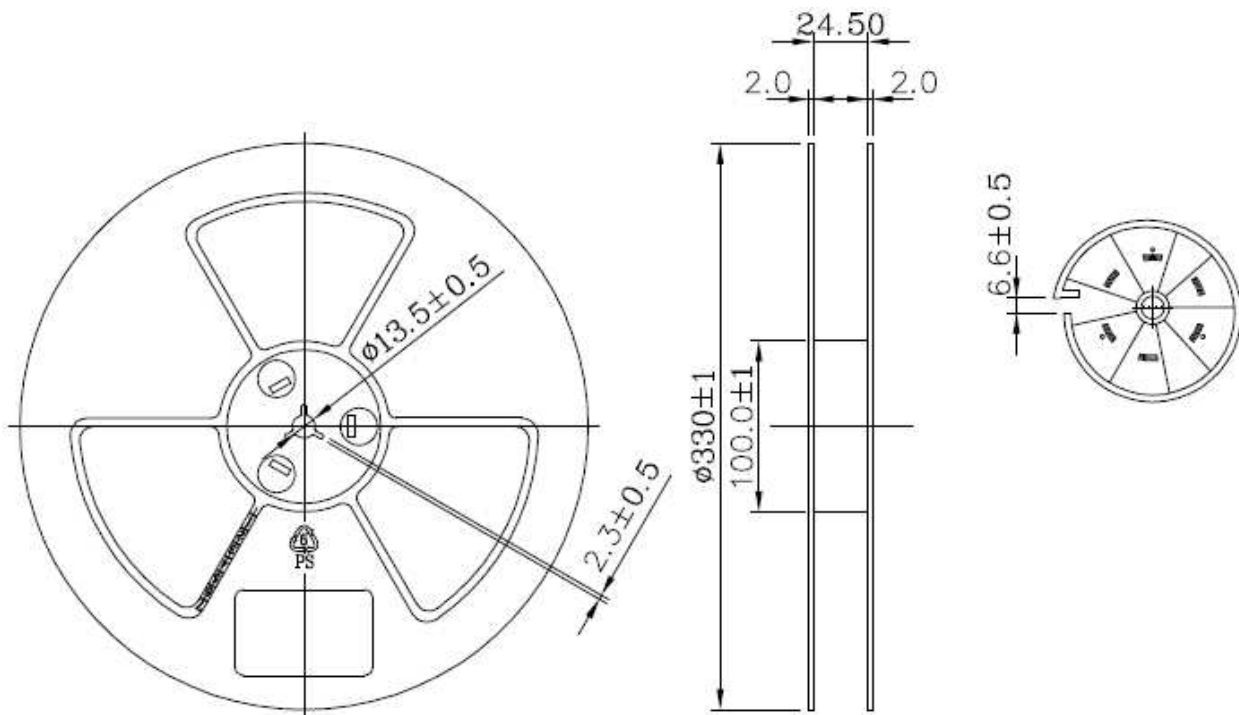
Emitter Pocket Tape Packaging

Unit: mm

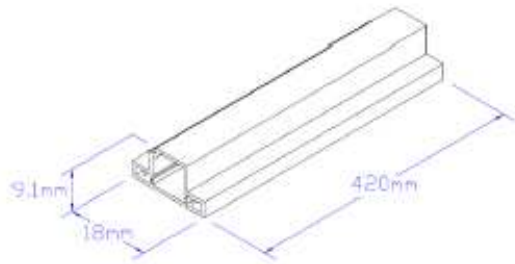


Emitter Reel Packaging

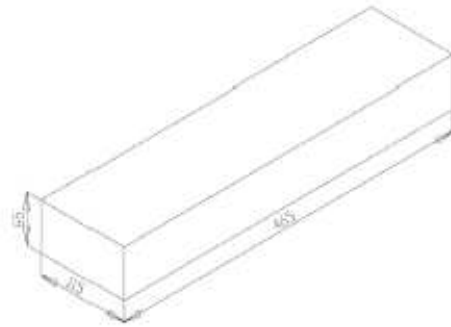
Unit: mm



Emitter Pocket Tube Packaging



Tube



Inner carton



Dry agent

Note:

1. There are 50pcs Emitters in a tube.
2. An Antistatic bag contains 20 tubes and a drying agent.
3. There are 20 tubes in an inner carton.
4. All dimensions are in millimeter.