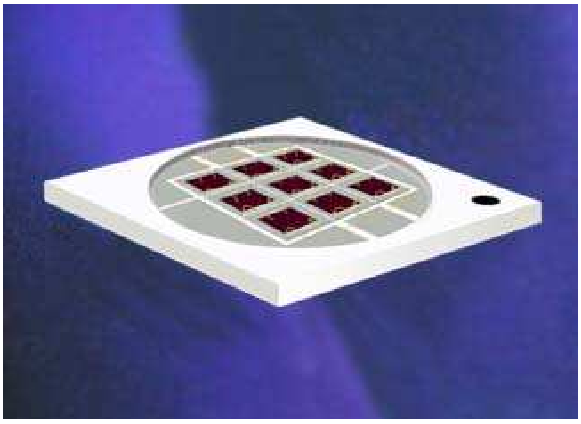
12X12mm SMD LED WITH CERAMIC SUBSTRATE

KT-1213WY9SX9/10 Yellow



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

Features

- Dimensions : 12mmX12mmX1.2mm
- High power lighting.
- Super high flux output and high luminance.
- Designed for high current operation.
- Low thermal resistance.
- Soldering methods: IR reflow soldering.
- Moisture sensitivity level : level 2a.
- RoHS compliant.

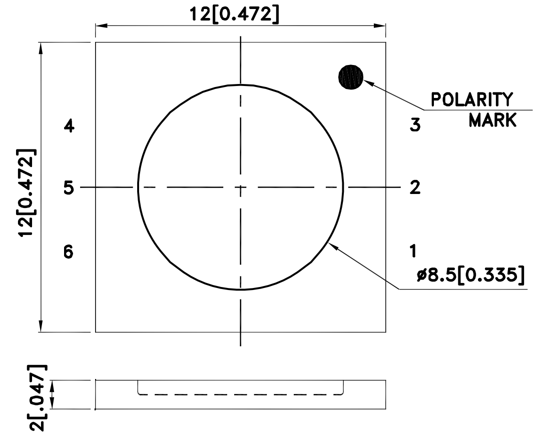
Materials:

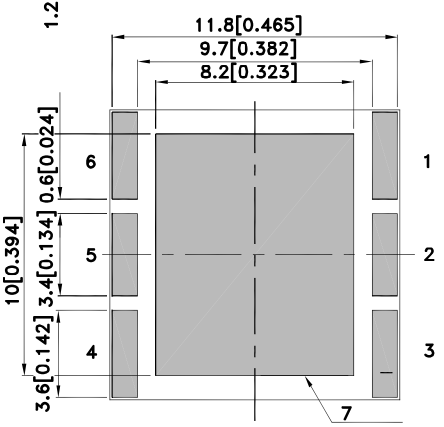
Package : Ceramics

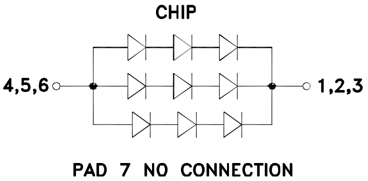
Encapsulating resin : Silicone resin

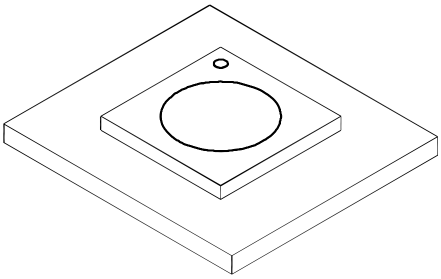
Electrodes : Ag plating

Package Dimensions









Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25(0.01") unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.

Selection Guide

Part No.	Dice	Lens Type	Φv (lm) [1] IF= 1A		Viewing Angle [2]
			Min.	**Typ.**	**2θ1/2**
KT-1213WY9SX9/10	Yellow (AlGaInP)	Water Clear	140	180	120°

Notes:
1. Luminous Flux: +/-15%.
2. θ1/2 is the angle from optical centerline where the luminous Flux is 1/2 of the optical peak value.
3. Luminous Flux value is traceable to the CIE127-2007 compliant national standards.

Absolute Maximum Ratings at T_A=25°C

Parameter	Symbol	Value	Unit
Power dissipation	P_D	7.8	W
Junction temperature[1]	T_J	110	°C
Operating Temperature	Top	-40 To +100	°C
Storage Temperature	Tstg	-40 To +110	°C
DC Forward Current [1]	I_F	1	A
Peak Forward Current [2]	I_{FM}	1.2	A
Reverse Voltage	V_R	15	V
Reverse Current (V_R = 15V)	I_R	30	uA
Thermal Resistance [1] (Junction/ambient)	$R_{th\ j\text{-}a}$	13	°C/W
Thermal Resistance [1] (Junction/soider point)	$R_{th\ j\text{-}S}$	3.3	°C/W

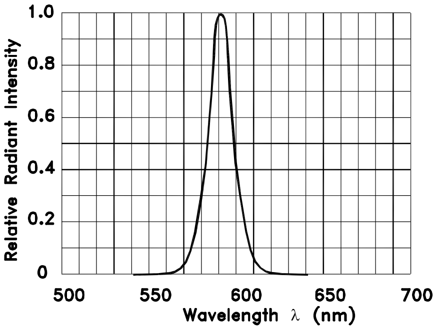
Notes:
1. Results from mounting on metal core PCB (25.4*25.4*1.6mm).
2. 0.1ms Pulse Width,1/10 Duty Cycle.

Electrical - Optical Characteristics at T_A=25°C

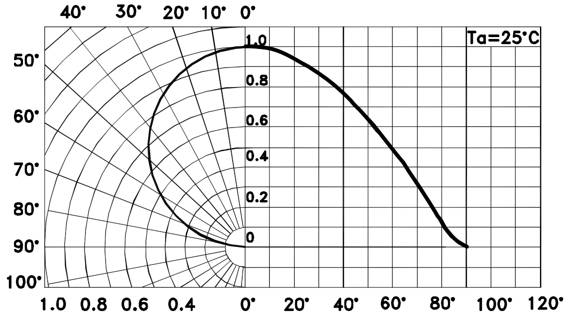
Parameter	Symbol	Value			Unit
		Min.	**Typ.**	**Max.**	
Wavelength at peak emission I_F = 1A	λ peak		591		nm
Dominant Wavelength I_F = 1A[1]	λ dom	584	590	594	nm
Spectral bandwidth at 50% $\Phi_{\text{REL MAX}}$ I_F = 1A	Δλ		15		nm
Forward Voltage I_F=1A[2]	V_F	5.4	6.6	7.8	V
Temperature coefficient of λ peak I_F = 1A, - 10 ° C ≤ T ≤ 100 ° C	TC λ peak		0.1		nm/°C
Temperature coefficient of λ dom I_F = 1A, - 10 ° C ≤ T ≤ 100 ° C	TC λ dom		0.08		nm/°C
Temperature coefficient of V_F I_F = 1A, - 10 ° C ≤ T ≤ 100 ° C	TC_V		-3.0		mV/°C

Notes:
1.Wavelength : + / -1nm.
2. Forward Voltage: +/-0.1V.
3.Wavelength value is traceable to the CIE127-2007 compliant national standards.

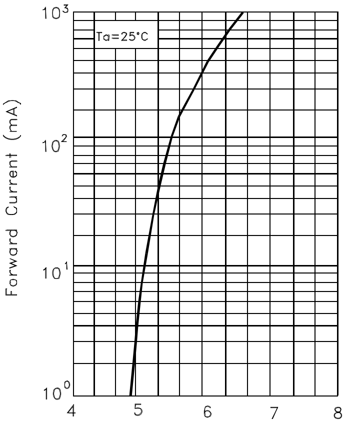
Yellow **KT-1213WY9SX9/10**



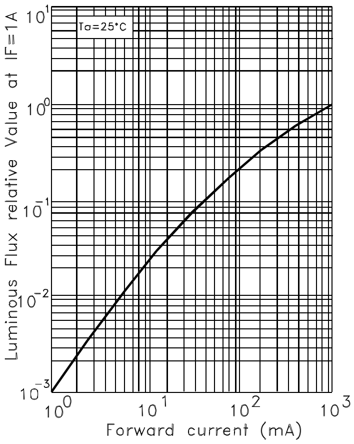
RELATIVE INTENSITY Vs. WAVELENGTH



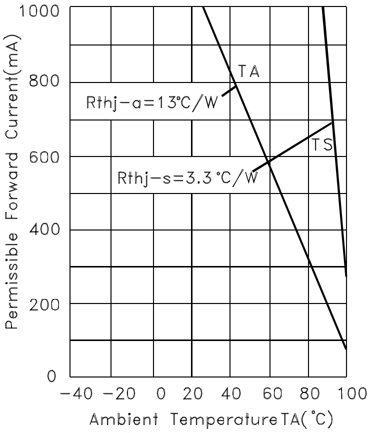
SPATIAL DISTRIBUTION



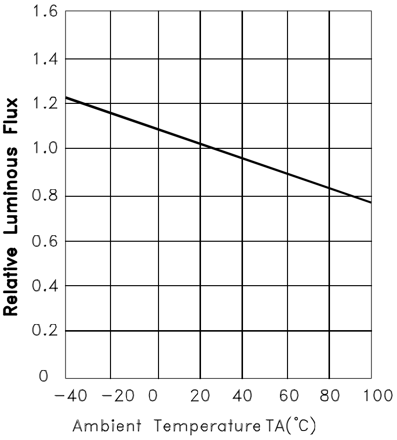
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS FLUX Vs.
FORWARD CURRENT



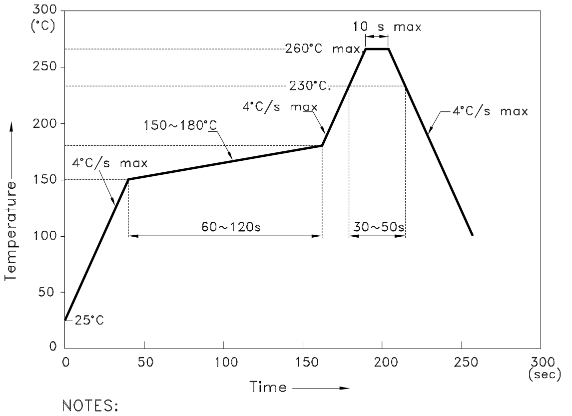
FORWARD CURRENT
DERATING CURVE



LUMINOUS FLUX VS.
AMBIENT TEMPERATURE

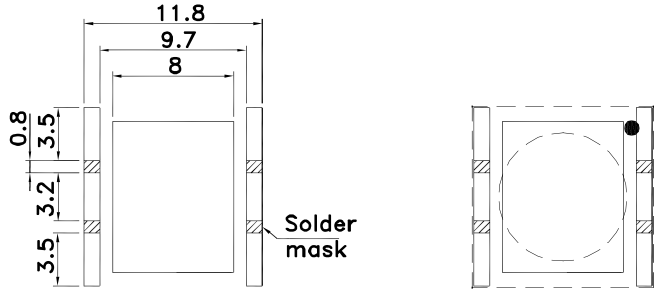
Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

Reflow Soldering Profile For Lead-free SMT Process.

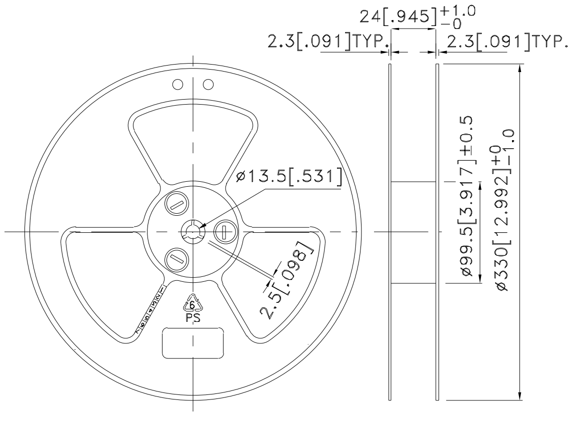


NOTES:
1.We recommend the reflow temperature 245°C(+/−5°C).The maximum soldering temperature should be limited to 260°C.
2.Don't cause stress to the epoxy resin while it is exposed to high temperature.
3.Number of reflow process shall be 2 times or less.

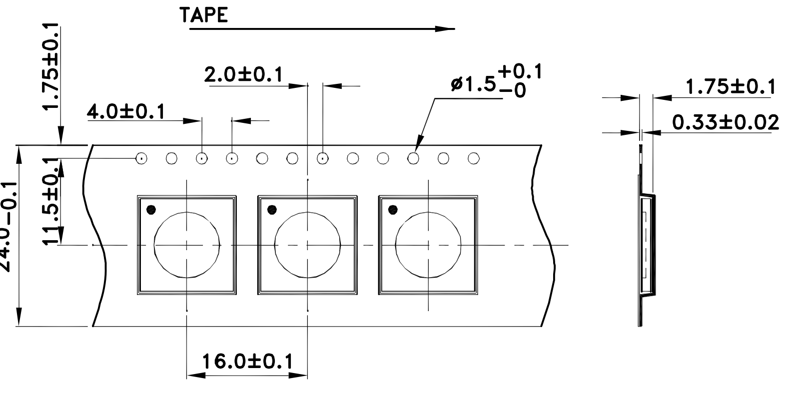
Aluminum PCB Design
Recommended Soldering Pattern
(Units : mm ; Tolerance: ± 0.1)

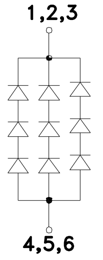


Reel Dimension

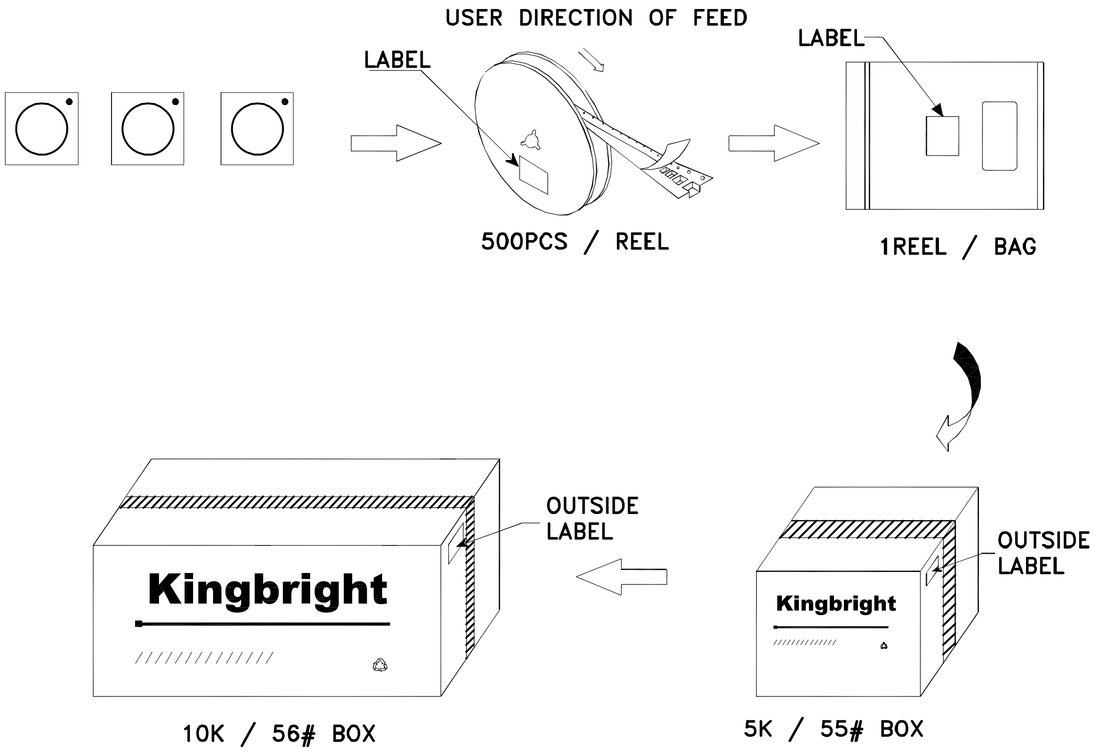


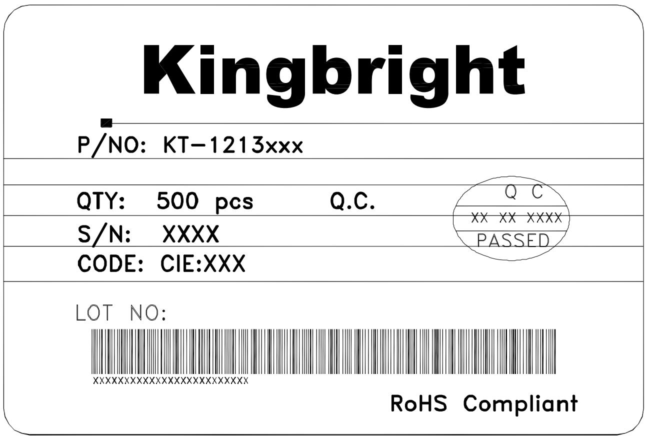
Tape Dimensions
(Units : mm)





PACKING & LABEL SPECIFICATIONS **KT-1213WY9SX9/10**




Kingbright

P/NO: KT-1213xxx

QTY: 500 pcs Q.C.

S/N: XXXX

CODE: CIE:XXX

LOT NO:

XXXXXXXXXXXXXXXXXXXXXXXXX

RoHS Compliant

Packaging:

1.The LEDs are packed in cardboard boxes after taping.

2.The label on the minimum packing unit shows: Part Number, Lot Number, Ranking, Quantity.

3.In order to protect the LEDs from mechanical shock, we pack them in cardboard boxes for transportation.

4.The LEDs may be damaged if the boxes are dropped or receive a strong impact against them, so precautions must be taken to prevent any damage.

5.The boxes are not water resistant and therefore must be kept away from water and moisture.

6.When the LEDs are transported, we recommend that you use the same packing methods as Kingbright's.

JEDEC Moisture Sensitivity:

Level	Floor Life		Soak Requirements			
			Standard		Accelerated Equivalent	
	Time	Conditions	Time (hours)	Conditions	Time (hours)	Conditions
2a	4 weeks	≤ 30 °C / 60% RH	696[2] + 5 / - 0	30 °C / 60% RH	120 + 1 / - 0	60 °C / 60% RH

Notes:

1. CAUTION - The ''accelerated equivalent'' soak requirements **shall not** be used until correlation of damage response, including electrical, after soak and reflow is established with the ''standard'' soak requirements or if the known activation energy for diffusion is 0.4 - 0.48 eV. Accelerated soak times may vary due to material properties, e.g., mold compound, encapsulant, etc. JEDEC document JESD22-A120 provides a method for determining the diffusion coefficient.
2. The standard soak time includes a default value of 24 hours for semiconductor manufacturer's exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor's facility.
   If the actual MET is less than 24 hours the soak time may be reduced. For soak conditions of 30 °C/60% RH the soak time is reduced by one hour For each hour the MET is less than 24 hours. For soak conditions of 60 °C/60% RH, the soak time is reduced by one hour for each five hours the MET is less than 24 hours.
   If the actual MET is greater than 24 hours the soak time must be increased. If soak conditions are 30 °C/60% RH, the soak time is increased one Hour for each hour that the actual MET exceeds 24 hours. If soak conditions are 60 °C/60% RH, the soak time is increased one hour for each five Hours that the actual MET exceeds 24 hours.
3. Supplier may extend the soak times at their own risk.

ESD Protection During Production

Electric static discharge can result when static-sensitive products come in contact with the operator or other conductors.

The following procedures may decrease the possibility of ESD damage:

1. Minimize friction between the product and surroundings to avoid static buildup.
2. All production machinery and test instruments must be electrically grounded.
3. Operators must wear anti-static bracelets.
4. Wear anti-static suit when entering work areas with conductive machinery.
5. Set up ESD protection areas using grounded metal plating for component handling.
6. All workstations that handle IC and ESD-sensitive components must maintain an electrostatic potential of 150V or less.
7. Maintain a humidity level of 50% or higher in production areas.
8. Use anti-static packaging for transport and storage.
9. All anti-static equipment and procedures should be periodically inspected and evaluated for proper functionality.

Heat Generation:

1. Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board ,as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

2. Please determine the operating current with consideration of the ambient temperature local to the LED and refer to the plot of Permissible Forward current vs. Ambient temperature on CHARACTERISTICS in this specification. Please also take measures to remove heat from the area near the LED to improve the operational characteristics on the LED.

3. The equation ① indicates correlation between T_j and T_a ,and the equation ② indicates correlation between T_j and T_s

$T_j = T_a + R_{thj-a} * W$ ……… ①

$Tj = T_s + R_{thj-s} * W$ ……… ②

Tj = dice junction temperature: °C

T_a = ambient temperature:°C

T_s = solder point temperature:°C

R_{thj-a} = heat resistance from dice junction temperature to ambient temperature : °C/ W

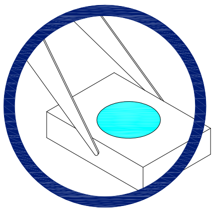
R_{thj-s} = heat resistance from dice junction temperature to Ts measuring point : °C/ W

W = inputting power (IFx VF) : W

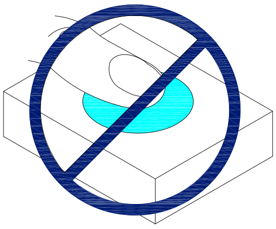
Handling Precautions

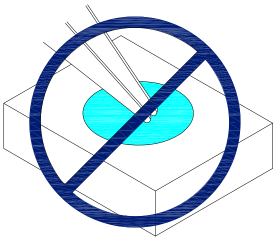
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.
As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surfaces by using forceps or appropriate tools.

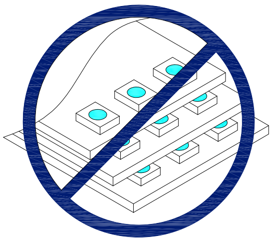


2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

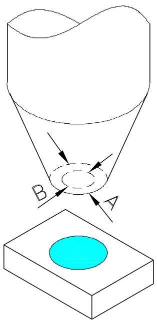




3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



4.1. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible.
4.2. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
4.3. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



5. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of leadframe. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.