Kingbright

2.2x1.4mm SURFACE MOUNT LED LAMP

Part Number: AA2214SES/J3-AMT

Hyper Red

Features

- High reliability LED package.
- 2.2mm x 1.4mm, 1.3mm high.
- Low power consumption.
- Available on tape and reel.
- Package : 2000pcs / reel.
- Moisture sensitivity level : level 3.
- RoHS compliant.

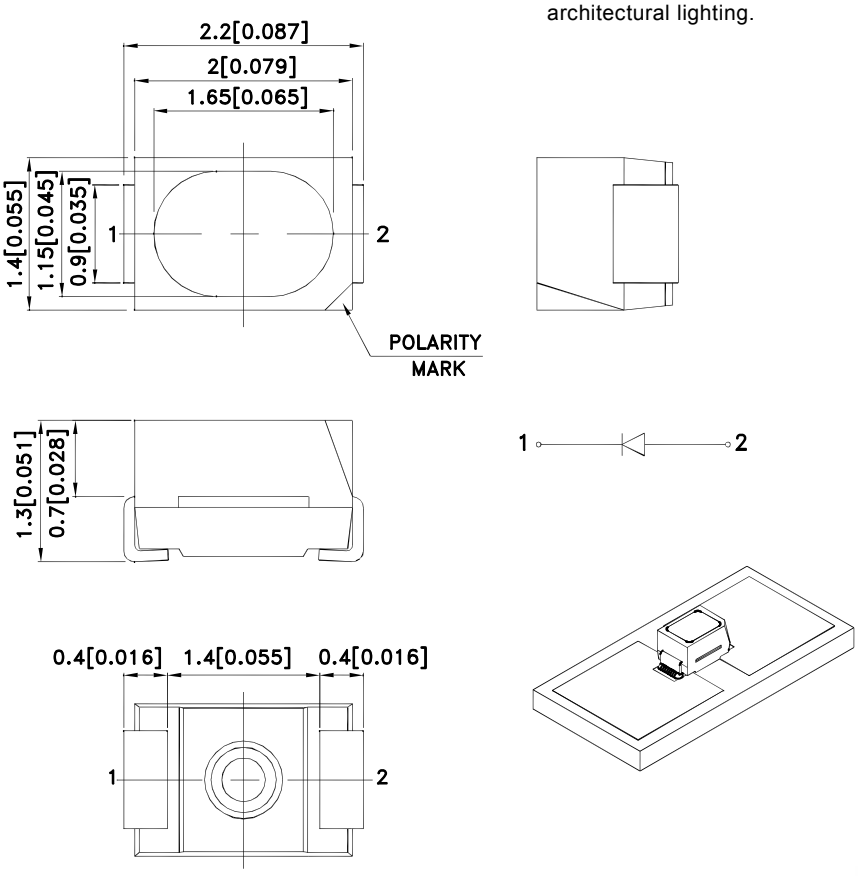
Description

The Hyper Red device is based on light emitting diode chip made from AlGaInP.

Applications

- Traffic signaling.
- Backlighting (illuminated advertising , general lighting).
- Interior and exterior automotive lighting.
- Substitution of micro incandescent lamps.
- Reading lamps.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. Steps, exit ways, etc).
- Decorative and entertainment lighting.
- Indoor and outdoor commercial and residential architectural lighting.

Package Dimensions

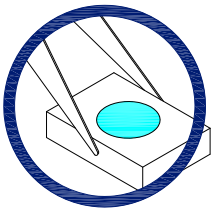


Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.2(0.008") unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.

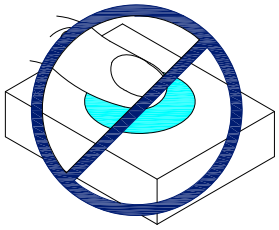
Handling Precautions

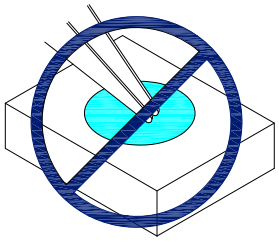
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.
As a result, special handling precautions need to be observed during assembly using 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.

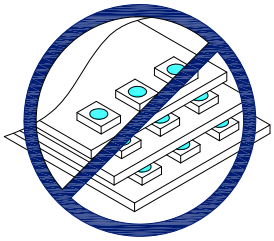


2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

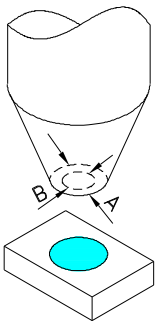




3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



4. 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.
5. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
6. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



Selection Guide

Part No.	Dice	Lens Type	Iv (mcd) [2] @ 20mA			Viewing Angle [1]
			Code.	Min.	Max.	2θ1/2
AA2214SES/J3-AMT	Hyper Red (AlGaInP)	Water Clear	V	1300	1600	120°
			W	1600	1900	
			X	1900	2300	

Notes:
1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity/ luminous Flux: +/-15%.

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Value	Unit
Power dissipation	P_D	140	mW
Reverse Voltage	V_R	5	V
Junction temperature	T_J	120	°C
Operating Temperature	Top	-40 To +100	°C
Storage Temperature	Tstg	-40 To +120	°C
DC Forward Current[1]	I_F	50	mA
Peak Forward Current [2]	I_{FM}	150	mA
Electrostatic Discharge Threshold (HBM)		3000	V
Thermal Resistance (Junction/ambient) [1]	$R_{th\ j\text{-}a}$	350	°C/W

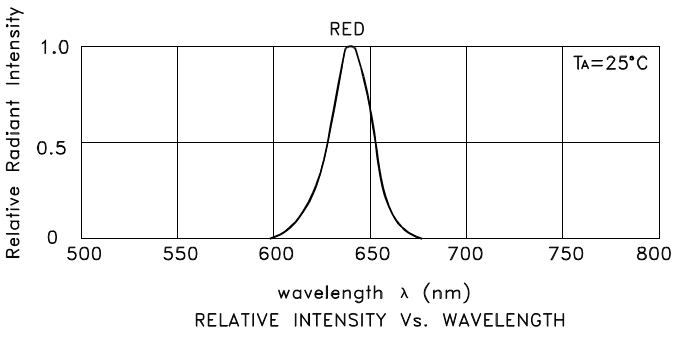
Notes:
1. Rth(j-a) Results from mounting on PC board FR4 (pad size≥16 mm^2 per pad),
2. 1/10 Duty Cycle, 0.1ms Pulse Width.

Electrical / Optical Characteristics at Ta=25°C

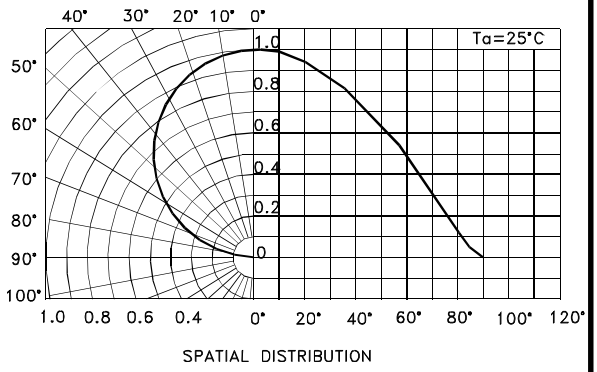
Parameter	Symbol	Value	Unit
Wavelength at peak emission I_F=20mA [Typ.]	λ peak	640	nm
Dominant Wavelength I_F=20mA [Min.]	λ dom [1]	615	nm
Dominant Wavelength I_F=20mA [Max.]	λ dom [1]	635	nm
Spectral bandwidth at 50%Φ REL MAX I_F=20mA [Typ.]	Δλ	25	nm
Forward Voltage I_F=20mA [Min.]	V_F [2]	-	V
Forward Voltage I_F=20mA [Typ.]		2.2	
Forward Voltage I_F=20mA [Max.]		2.8	
Reverse Current (V_R = 5V) [Max.]	I_R	10	uA
Temperature coefficient of λ peak I_F=20mA, -10° C≤ T≤100° C [Typ.]	TC λ peak	0.14	nm/° C
Temperature coefficient of λ dom I_F=20mA, -10° C≤ T≤100° C [Typ.]	TC λ dom	0.04	nm/° C
Temperature coefficient of V_F I_F=20mA, -10° C≤ T≤100° C [Typ.]	TC_V	-2.0	mV/° C

Notes:
1.The dominant Wavelength (λ d) above is the setup value of the sorting machine. (Tolerance λ d : ±1nm.)
2. Forward Voltage: +/-0.1V.

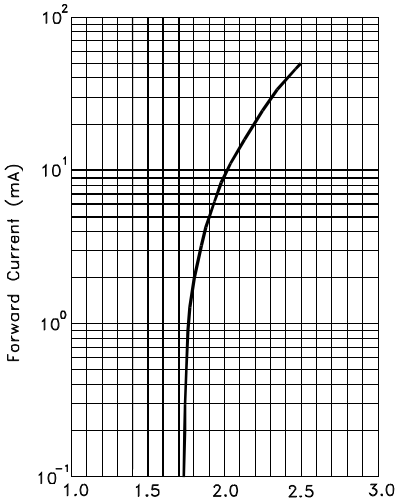
Hyper Red **AA2214SES/J3-AMT**



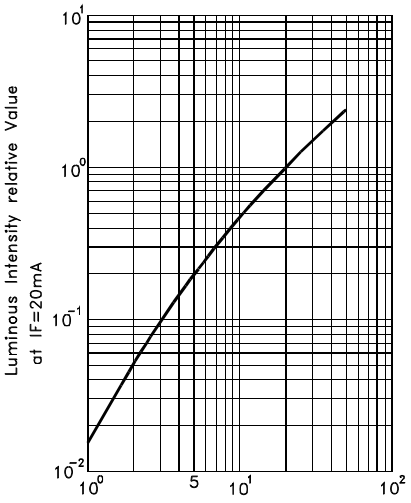
RELATIVE INTENSITY Vs. WAVELENGTH



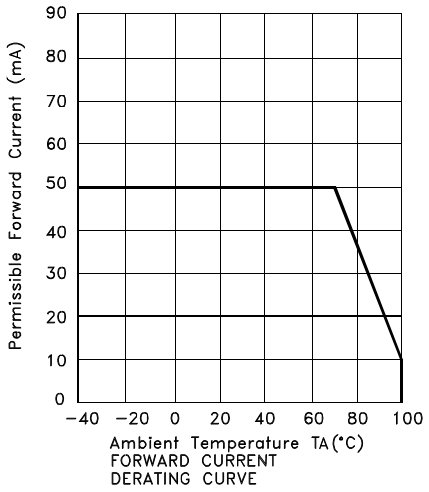
SPATIAL DISTRIBUTION



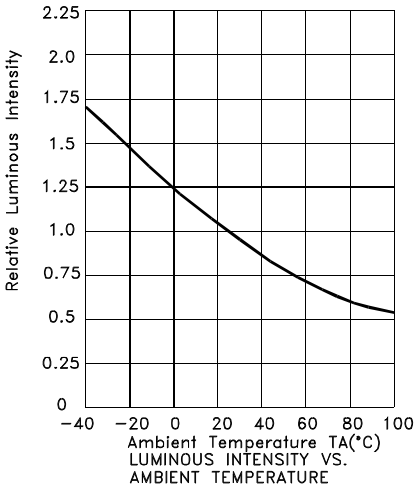
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT



FORWARD CURRENT
DERATING CURVE

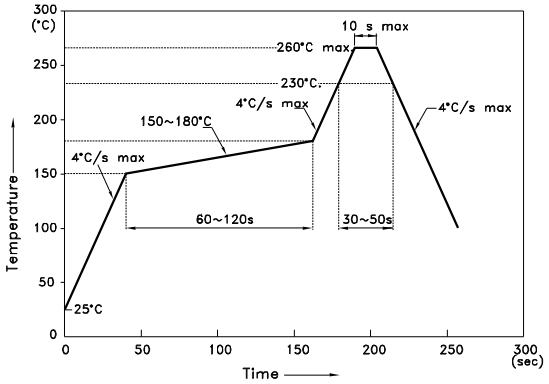


LUMINOUS INTENSITY VS.
AMBIENT TEMPERATURE

AA2214SES/J3-AMT

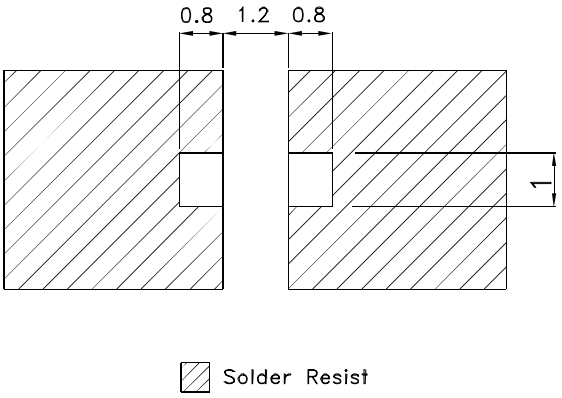
Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

Reflow Soldering Profile For Lead-free SMT Process.

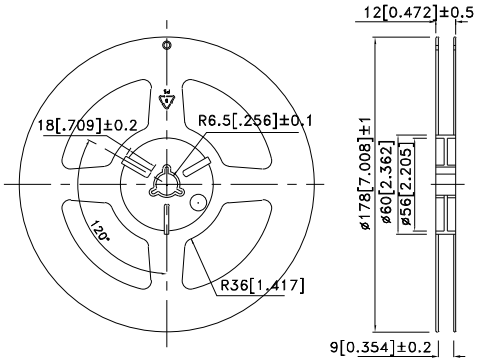


NOTES:
1.We recommend the reflow temperature 245°C(+/-5°C).The maximum soldering temperature should be limited to 260°C.
2.Don't cause stress to the epoxy resin while it is exposed to high temperature.
3.Number of reflow process shall be 2 times or less.

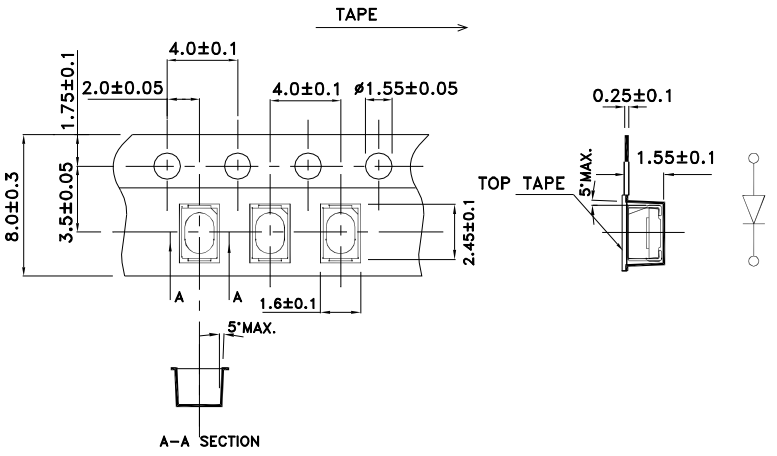
Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)



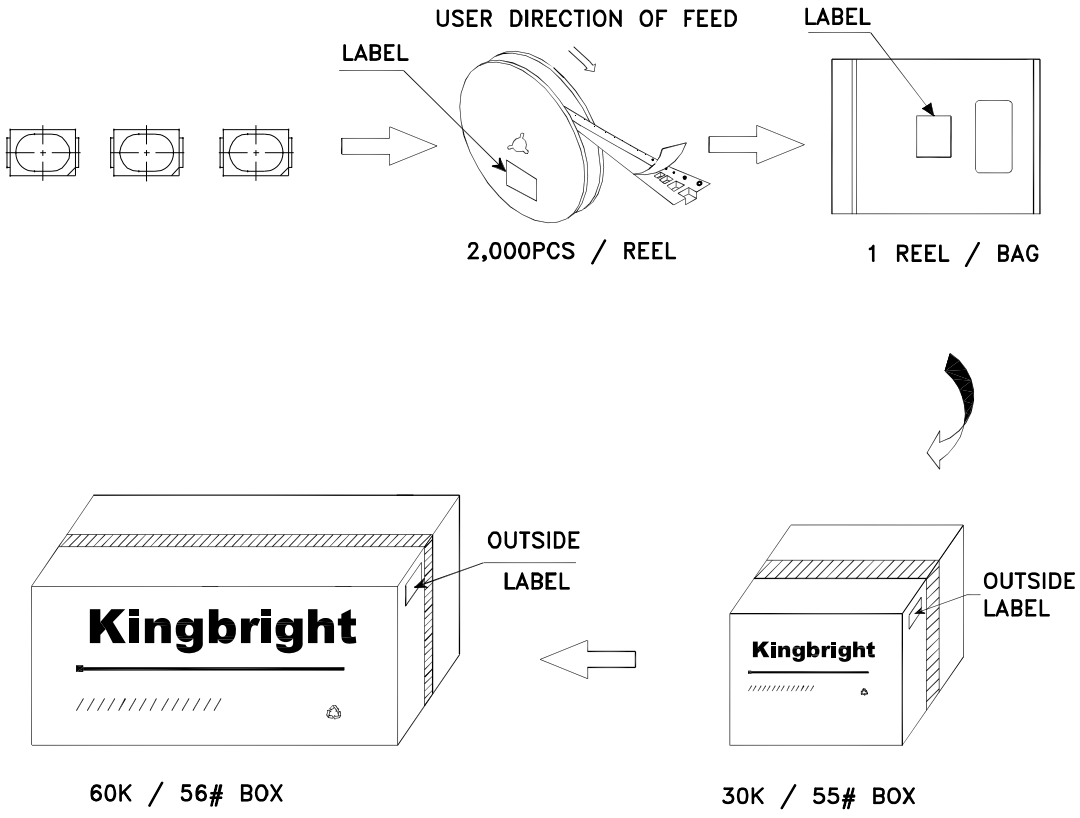
Reel Dimension

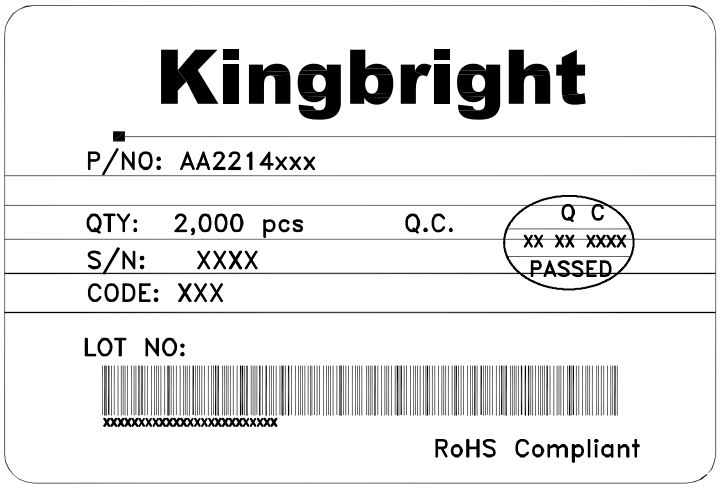


Tape Dimensions (Units : mm)



PACKING & LABEL SPECIFICATIONS **AA2214SES/J3-AMT**





Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below

Lot Tolerance Percent Defective (LTPD) : 10%

No.	Test Item	Standards	Test Condition	Test Times / Cycles	Number of Damaged
1	Continuous operating test	-	Ta =25°C ,IF = maximum rated current*	1,000 h	0 / 22
2	High Temp. operating test	EIAJED-4701/100(101)	Ta = 100°C IF = maximum rated current*	1,000 h	0 / 22
3	Low Temp. operating test	-	Ta = -40°C, IF = maximum rated current*	1,000 h	0 / 22
4	High temp. storage test	EIAJED-4701/100(201)	Ta = maximum rated storage temperature	1,000 h	0 / 22
5	Low temp. storage test	EIAJED-4701/100(202)	Ta = -40°C	1,000 h	0 / 22
6	High temp. & humidity storage test	EIAJED-4701/100(103)	Ta = 60°C, RH = 90%	1,000 h	0 / 22
7	High temp. & humidity operating test	EIAJED-4701/100(102)	Ta = 60°C, RH = 90% IF = maximum rated current*	1,000 h	0 / 22
8	Soldering reliability test	EIAJED-4701/100(301)	Moisture soak : 30°C,70% RH, 72h Preheat : 150~180°C(120s max.) Soldering temp : 260°C(10s)	3 times	0 / 18
9	Thermal shock operating test	-	Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C	1,000 cycles	0 / 22
10	Thermal shock test	-	Ta = -40°C(15min) ~ maximum rated storage temperature(15min)	1,000 cycles	0 / 22
11	Electric Static Discharge (ESD)	EIAJED-4701/100(304)	C = 100pF , R2 = 1.5KΩ V = 3000V	Once each Polarity	0 / 22
12	Vibration test	-	a = 196m/s² , f = 100~2KHz , t = 48min for all xyz axes	4 times	0 / 22

* : Refer to forward current vs. derating curve diagram

Failure Criteria

Items	Symbols	Conditions	Failure Criteria
luminous Intensity	Iv	I_F = 20mA	Testing Min. Value <Spec.Min.Value x 0.5
Forward Voltage	V_F	I_F = 20mA	Testing Max. Value ≥Spec.Max.Value x 1.2
Reverse Current	I_R	V_R = Maximum Rated Reverse Voltage	Testing Max. Value ≥Spec.Max.Value x 2.5
High temp. storage test	-	-	Occurrence of notable decoloration, deformation and cracking