#### 3.5x2.8mm SURFACE MOUNT LED LAMP



#### **ATTENTION**

OBSERVE PRECAUTIONS FOR HANDLING **ELECTROSTATIC** DISCHARGE SENSITIVE **DEVICES** 

#### **Features**

- Industry standard PLCC-4 package.
- High reliability LED package.
- Wide viewing angle.
- Both chips can be controlled separately .
- Suitable for all smt assembly and solder process.
- Available on tape and reel.
- Package: 1500pcs / reel.
- Moisture sensitivity level : Level 3.
- RoHS compliant.

### **Package Dimensions**

Part Number: AAA3528QWDSYKS-AMT

White Super Bright Yellow

### **Description**

The source color devices are made with InGaN Light Emit-

The Super Bright Yellow device is made with AlGaInP (on GaAs substrate) light emitting diode chip.

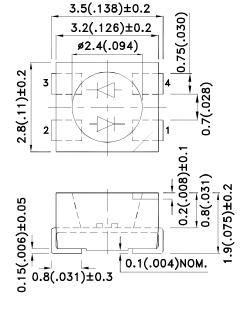
Static electricity and surge damage the LEDS.

It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

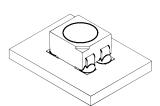
All devices, equipment and machinery must be electrically grounded.

### **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.







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

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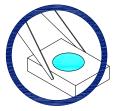
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### **Handling Precautions**

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.

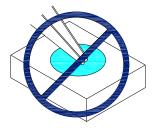
As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

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

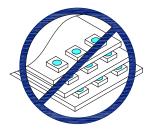


2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

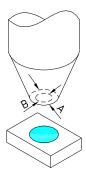




3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



- 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.



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### **Selection Guide**

Part No.	Dice	Lens Type	lv (mcd) [2] @ 20mA			Viewing Angle [1]
			Code.	Min.	Max.	201/2
AAA3528QWDSYKS-AMT	White (InGaN)  Super Bright Yellow (AlGaInP)	- Water Clear	R	400	500	120°
			S	500	700	
			Т	700	1000	
			N	120	200	
			Р	200	300	
			Q	300	400	

- Notes: 1.  $\theta$ 1/2 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		0			
		Symbol White		Super Bright Yellow	Unit
Power dissipation		Pp	100	75	mW
Operating Temperatur	re	Тор	-40 To+ 100		°C
Storage Temperature		Tstg	-40 To+ 110		°C
Junction temperature		TJ	110 120		°C
DC Forward Current (TA=25°C)		lF	25	30	mA
Peak Forward Current [1] (TA=25°C)		lғм	150	175	mA
Reverse Voltage (TA=25°C)		VR	5	5	V
Electrostatic Discharge Threshold (HBM)		•	250	3000	V
Thermal resistance (Junction/solder point)	1chip on (typ.) 2 chip on (typ.) 1 chip on (max.) 2 chip on (max.)	Rth j-s Rth j-s Rth j-s [2] Rth j-s [2]	220 330 256 410	220 540 256 710	°C/W

- 1.1/10 Duty Cycle, 0.1ms Pulse Width. 2.Rth(max) is based on statistic values.

### Electrical / Optical Characteristics at TA=25°C (White)

Parameter	Symbol	Value	Unit
Chromaticity coordinate x acc.to CIE1931 IF=20mA [Typ.]	x [1]	0.31	
Chromaticity coordinate y acc.to CIE1931 IF=20mA [Typ.]	y [1]	0.31	
Reverse Current (VR = 5V) [Max.]	lR	50	uA
Forward Voltage IF=20mA [Min.]		-	
Forward Voltage Ir=20mA [Typ.]	VF [2]	3.3	V
Forward Voltage Ir=20mA [Max.]		4.0	
Temperature coefficient of VF IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C [Typ.]	TCv	-2.5	mV/° C
Temperature coefficient of x IF=20mA, -10 ° C≤ T≤100 ° C [Typ.]	TCx	-0.1	10 <sup>-3</sup> /° C
Temperature coefficient of y IF=20mA, -10 ° C≤ T≤100 ° C [Typ.]	ТСу	-0.2	10 <sup>-3</sup> /° C

#### Notes:

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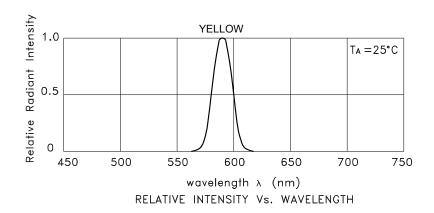
<sup>1.</sup>Measurement tolerance of the chromaticity coordinates is  $\pm 0.01$ .

<sup>2.</sup>Forward Voltage: +/-0.1V.

### Electrical / Optical Characteristics at TA=25°C (Yellow)

Parameter	Symbol		Value			Unit	
Farameter	Symbol	Code.	Min.	Тур.	Max.	Ullit	
Wavelength at peak emission IF=20mA	λ peak			590		nm	
		2	584		586		
		3	586		588	nm	
Dominant Wavelength IF=20mA	λ dom [1]	4	588		590		
		5	590		592		
		6	592		594		
Spectral bandwidth at 50%Φ REL MAX IF=20mA	Δλ			20		nm	
Forward Voltage IF=20mA	VF [2]			2.0	2.5	V	
Reverse Current (VR = 5V)	lR				10	uA	
Temperature coefficient of $\lambda$ peak IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C	TC λ peak			0.13		nm/° C	
Temperature coefficient of $\lambda$ dom IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C	TC λ dom			0.04		nm/° C	
Temperature coefficient of VF IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C	TCv			-3.6		mV/° C	

#### Notes

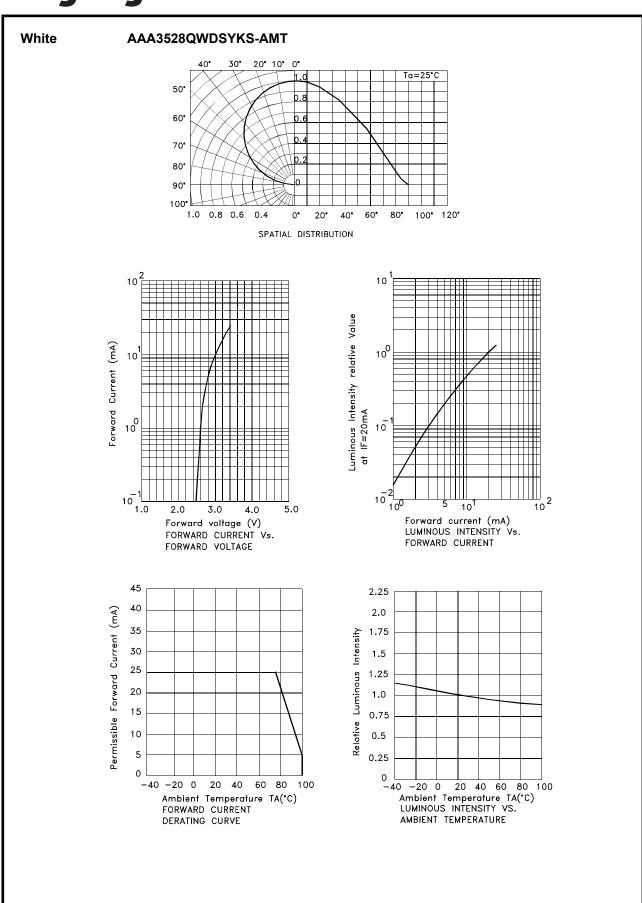


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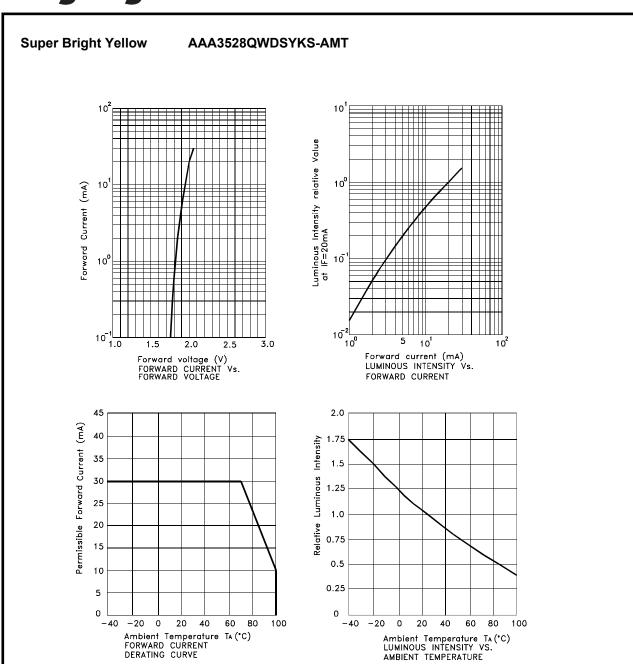
<sup>1.</sup>The dominant Wavelength ( $\lambda$  d) above is the setup value of the sorting machine. (Tolerance  $\lambda$  d :  $\pm 1$ nm. )

<sup>2.</sup> Forward Voltage: +/-0.1V.



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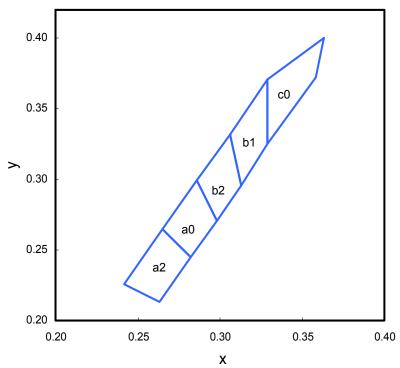
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	х	У		х	у		х	у
	0.263	0.213		0.282	0.245		0.298	0.271
a2	0.282	0.245	a0	0.298	0.271	b2	0.313	0.296
αz	0.265	0.265	a0	0.286	0.299	52	0.306	0.332
	0.242	0.226		0.265	0.265		0.286	0.299
	0.313	0.296		0.329	0.325			
b1	0.329	0.325	c0	0.358	0.372			
	0.329	0.371		0.363	0.400			
	0.306	0.332		0.329	0.371			

#### Notes

Shipment may contain more than one chromaticity regions. Orders for single chromaticity region are generally not accepted. Measurement tolerance of the chromaticity coordinates is  $\pm 0.01$ .

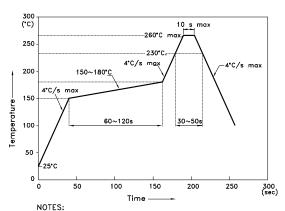
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Reflow soldering is recommended and the soldering profile is shown below. Other soldering methods are not recommended as they might cause damage to the product.

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.
- to high temperature.

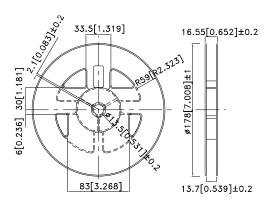
  3.Number of reflow process shall be 2 times or less.

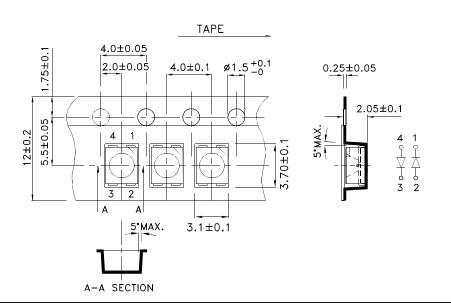
Recommended Soldering Pattern (Units: mm; Tolerance: ± 0.1)

# 2.8

Tape Dimensions (Units : mm)

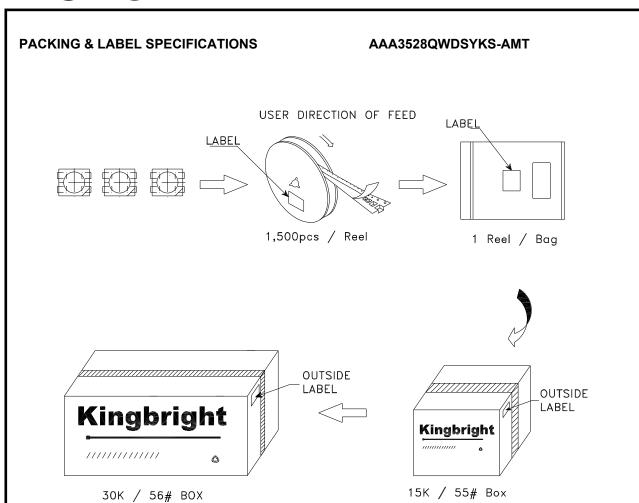
### **Reel Dimension**





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### **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	EIAJ ED- 4701/100(101)	I I a = 100°( LE = maximum rated current? I		0 / 22
3	Low Temp. operating test	-	Ta = -40°C, IF = maximum rated current*	1,000 h	0 / 22
4	High temp. storage test	EIAJ ED- 4701/100(201)	Ta = maximum rated storage temperature	1,000 h	0 / 22
5	Low temp. storage test	EIAJ ED- 4701/100(202)	Ta = -40°C	1,000 h	0 / 22
6	IHIAN TAMP X. NIIMIAITY STATEMENT TAST	EIAJ ED- 4701/100(103)	Ta = 60°C, RH = 90%	1,000 h	0 / 22
7	High temp. & humidity operating test	EIAJ ED- 4701/100(102)	Ta = 60°C, RH = 90% IF = maximum rated current*	1,000 h	0 / 22
8	Soldering reliability test	EIAJ ED- 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)	EIAJ ED- 4701/100(304)	C = 100pF , R2 = 1.5KΩ V = 250V(White) V=3000V(Yellow)	Once each Polarity	0 / 22
12	Vibration test	-	a = 196m/s², f = 100~2KHz, t = 48min for all xyz axes	4 times	0 / 22

<sup>\* :</sup> Refer to forward current vs. derating curve diagram

### **Failure Criteria**

Items	Symbols	Conditions	Failure Criteria
luminous Intensity	lv	IF = 20mA	Testing Min. Value <spec.min.value 0.5<="" td="" x=""></spec.min.value>
Forward Voltage	VF	IF = 20mA	Testing Max. Value ≥Spec.Max.Value x 1.2
Reverse Current	lR	VR = Maximum Rated Reverse Voltage	Testing Max. Value ≥Spec.Max.Value x 2.5
High temp. storage test	-	l -	Occurrence of notable decoloration, deformation and cracking

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