#### 1.6X1.25mm BI-COLOR SMD CHIP LED LAMP



**ATTENTION** 

#### **Features**

- · High reliability LED package.
- 1.6mmx1.25mm SMD LED, 0.65mm thickness.
- Bi-color,low power consumption.
- Wide viewing angle.
- Ideal for backlight and indicator.
- Package: 2000pcs / reel.
- Moisture sensitivity level : level 3.
- RoHS compliant.

### **Package Dimensions**



1.6(0.063) LED CHIP

Part Number: APTB1612SYKQWDF-AMT

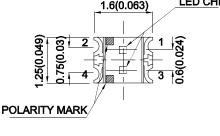
Super Bright Yellow White

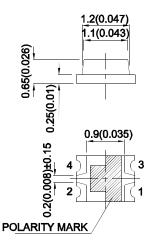
### **Description**

- The Super Bright Yellow device is made with AlGalnP (on GaAs substrate) light emitting diode chip.
- The source color devices are made with InGaN Light Emitting Diode.
- Electrostatic discharge and power surge could damage the LEDs.
- It is recommended to use a wrist band or antielectrostatic glove when handling the LEDs.
- All devices, equipments and machineries must be electrically grounded.

### **Applications**

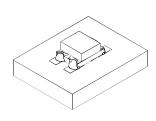
- Traffic signaling.
- Backlighting (illuminated advertising, general lighting).
- Interior and exterior automotive lighting.
- Substitution of micro incandescent lamps.
- Reading lamps.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. Steps, exit ways, etc).
- Decorative and entertainment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







WHITE 4 ○ 3





SPEC NO: DSAL3634 APPROVED: Wynec

- 1. All dimensions are in millimeters (inches).
- 2. Tolerance is  $\pm 0.2(0.008")$  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.

 REV NO: V.3B
 DATE: SEP/01/2015
 PAGE: 1 OF 9

 CHECKED: Allen Liu
 DRAWN: F.T.Liu
 ERP: 1203012077

### **Selection Guide**

Part No.	Emitting Color (Material)	Lens Type	lv (mcd) [2] @ 20mA			Viewing Angle [1]
		Code.	Min.	Max.	201/2	
APTB1612SYKQWDF-AMT			М	80	120	
	Super Bright Yellow (AlGaInP		N	120	200	
		Yellow Fluorescent	P 200 300	4000		
		reliow Fluorescent	N	120	200	120°
	White (InGaN)		P 200 300			
			Q	300	400	

- Notes:
  1. 01/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
  2. Luminous intensity/ luminous Flux: +/-15%.
  3. Luminous intensity value is traceable to the CIE127-2007 compliant national standards.

# Absolute Maximum Ratings at TA=25°C

		Valu		
Parameter	Symbol	Super Bright Yellow	White	Unit
Power dissipation	PD	75	80	mW
Operating Temperature	Тор	-40 To+	100	°C
Storage Temperature	Tstg	-40 To+	°C	
Junction temperature	TJ	115	115	°C
DC Forward Current (TA=25°C)	lF	30	20	mA
Peak Forward Current [1] (TA=25°C)	lғм	175	150	mA
Reverse Voltage (TA=25°C)	VR	5	5	V
Electrostatic Discharge Threshold (HBM)		3000	250	V
Thermal resistance 1 chip on (typ.) (Junction/ambient) 2 chip on (typ.)	Rth j-a Rth j-a	620 760	560 660	°C/W

1.1/10 Duty Cycle, 0.1ms Pulse Width.

DATE: SEP/01/2015 SPEC NO: DSAL3634 **REV NO: V.3B** PAGE: 2 OF 9 APPROVED: Wynec **CHECKED: Allen Liu** DRAWN: F.T.Liu ERP: 1203012077



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

Parameter	Cymphol	Value				Unit
Parameter	Symbol	Code.	Min.	Тур.	Max.	Unit
Wavelength at peak emission IF=20mA	λ peak			590		nm
		3	586		588	
2		4	588		590	
Dominant Wavelength IF=20mA	λ dom [1]	5	590		592	nm
		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			0.12		nm/° C
Temperature coefficient of $\lambda$ dom IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C	TC λ dom			0.08		nm/° C
Temperature coefficient of VF IF=20mA, -10 ° C≤ T≤100 ° C	TCv			-1.8		mV/° C

#### Notes:

- 1. The dominant Wavelength ( $\lambda$  d) above is the setup value of the sorting machine. (Tolerance  $\lambda$  d :  $\pm 1$ nm. )
- 2.Forward Voltage: +/-0.1V.
- $3. Wavelength\ value\ is\ traceable\ to\ the\ CIE127-2007\ compliant\ national\ standards.$
- 4.Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

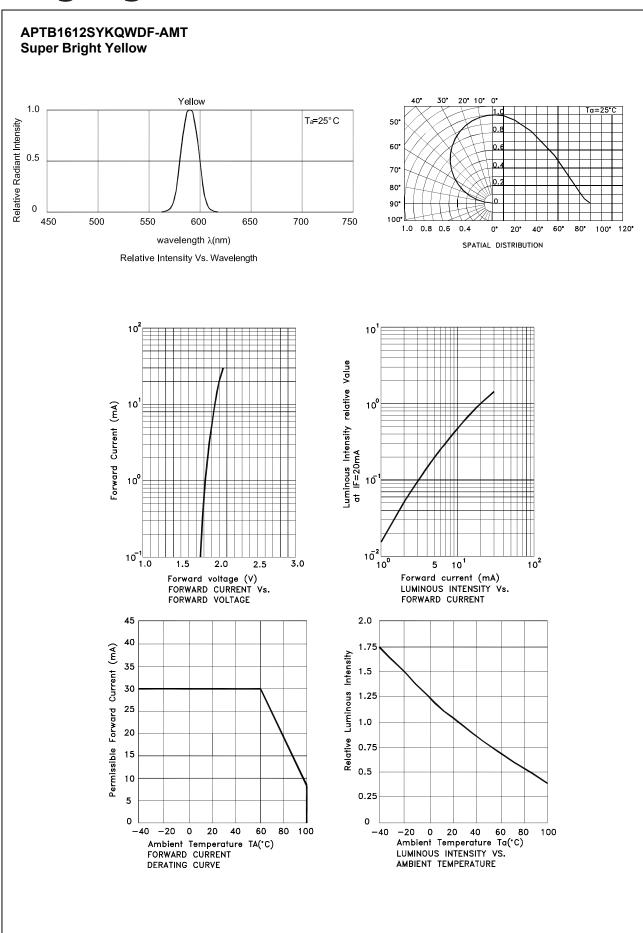
## Electrical / Optical Characteristics at TA=25°C (White)

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 IF=20mA [Typ.]	VF [2]	3.3	V
Forward Voltage IF=20mA [Max.]		4.0	
Temperature coefficient of VF IF=20mA, -10 ° C≤ T≤100 ° C [Typ.]	TCv	-2.0	mV/° C
Temperature coefficient of x IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C [Typ.]	TCx	-0.18	10 <sup>-3</sup> /° C
Temperature coefficient of y IF=20mA, -10 $^{\circ}$ C $\leq$ T $\leq$ 100 $^{\circ}$ C [Typ.]	TCy	-0.20	10 <sup>-3</sup> /° C

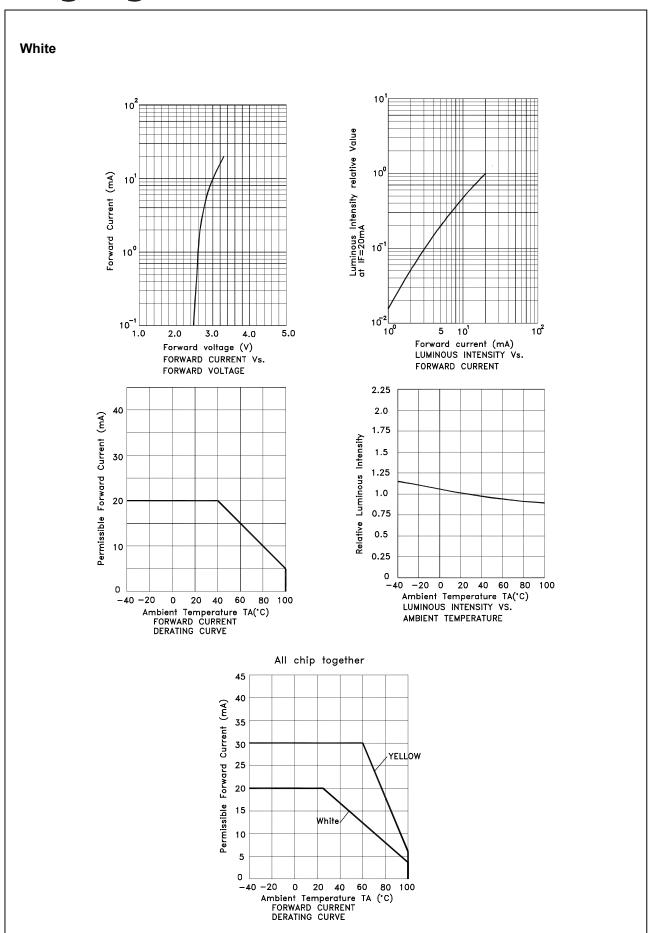
#### Notes:

- 1.Measurement tolerance of the chromaticity coordinates is  $\pm 0.01$ .
- 2.Forward Voltage: +/-0.1V.
- Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015 PAGE: 3 OF 9
APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu ERP: 1203012077



SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015 PAGE: 4 OF 9
APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu ERP: 1203012077

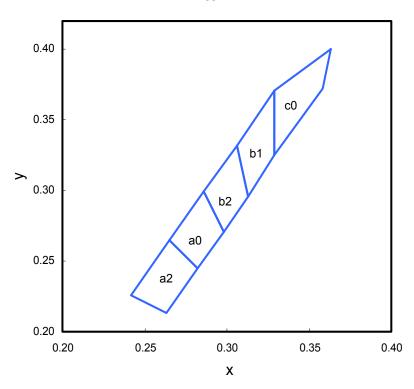


SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015 PAGE: 5 OF 9

APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu ERP: 1203012077

### **APTB1612SYKQWDF-AMT**





	x	у		x	у		x	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	ao	0.286	0.299	IJZ	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			

PAGE: 6 OF 9

ERP: 1203012077

#### Notes

Shipment may contain more than one chromaticity regions.

Orders for single chromaticity region are generally not accepted.

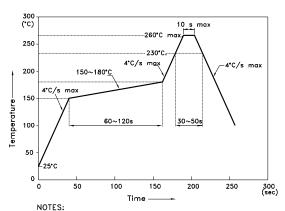
Measurement tolerance of the chromaticity coordinates is ±0.01.

SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015
APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu

### **APTB1612SYKQWDF-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:

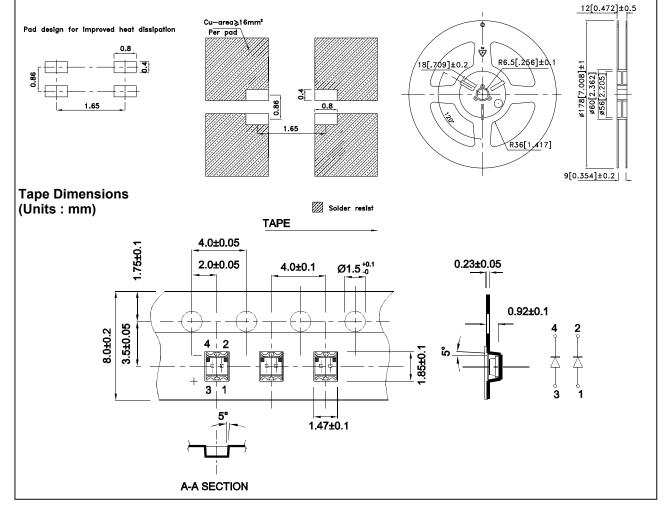
  1.We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.

  2.Don't cause stress to the epoxy resin while it is exposed to be in temperature.
  - to high temperature.

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

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

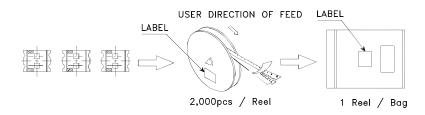
### **Reel Dimension**

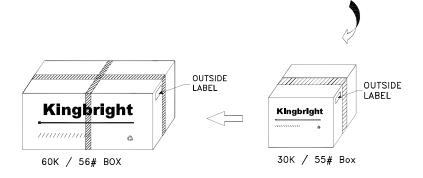


SPEC NO: DSAL3634 APPROVED: Wynec REV NO: V.3B CHECKED: Allen Liu DATE: SEP/01/2015 DRAWN: F.T.Liu PAGE: 7 OF 9 ERP: 1203012077

### **PACKING & LABEL SPECIFICATIONS**

#### **APTB1612SYKQWDF-AMT**







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SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015 PAGE: 8 OF 9

APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu ERP: 1203012077



## **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)	Ta = 100°C IF =derated current at 100°C	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	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	High temp. & humidity storage test	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 = derated current at 60°C	1,000 h	0 / 22
8	Resistance to Soldering Heat	EIAJ ED- 4701/100(301)	TSId=260±5°C, 10 sec	2 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) ~ 100°C(15min)	1,000 cycles	0 / 22
11	Electric Static Discharge (ESD)	EIAJ ED- 4701/100(304)	C = 100pF , R2 = 1.5KΩ V=3000V(Yellow) V = 250V(White)	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	-	_	Occurrence of notable decoloration, deformation and cracking

SPEC NO: DSAL3634 REV NO: V.3B DATE: SEP/01/2015 PAGE: 9 OF 9
APPROVED: Wynec CHECKED: Allen Liu DRAWN: F.T.Liu ERP: 1203012077