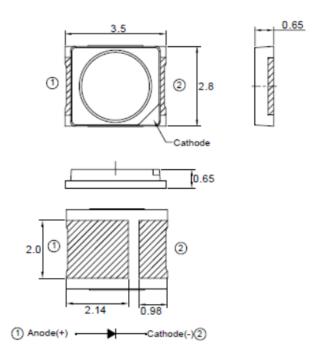


3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

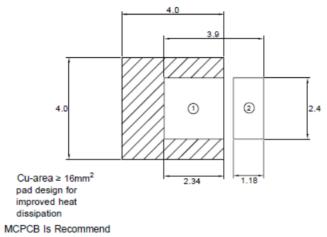
# **PACKAGE DIMENSION**



#### Notes

- 1. All dimensions are in millimeters; tolerance is ±0.2mm unless otherwise noted
- 2. Specifications are subject to change without notice

# **RECOMMENDED SOLDERING PAD**



Notes: All dimensions are in millimeters; toelrance is ±0.1mm unless otherwise noted

	Color		
Material	Emitted	Lens Color	
AlGalnP	Yellow	Water Clear	



3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

#### **ABSOLUTE MAXIMUM RATINGS**

(Ta=25°C)

		( == =)
Symbol	Rating	Unit
l <sub>F</sub>	70	mA
I <sub>FP</sub>	120	mA
P <sub>D</sub>	168	mW
I <sub>R</sub>	5	μΑ
ESD	2000	V
T <sub>OPR</sub>	-40~+100	°C
T <sub>STG</sub>	-40~+100	°C
Rth j-s	50	K/W
	I <sub>F</sub> I <sub>FP</sub> P <sub>D</sub> I <sub>R</sub> ESD T <sub>OPR</sub> T <sub>STG</sub>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

# **OPTICAL-ELECTRICAL CHARACTERISTICS**

(Ta=25°C)

	Cymahal	Toot Condition	Rating		I I m i 4	
	Symbol	Test Condition	Min.	Тур.	Max.	Unit
Luminous Intensity	lv		2000	2550	4000	mcd
Forward Voltage	Vf		1.9		2.8	V
Dominant Wavelength	λD	I <sub>F</sub> =60mA	583	590	598	nm
Spectral Line Half-Width	Δλ			20		nm
Viewing Angle	201/2			120		deg

# Notes:

- 1. The Forward voltage data did not include ±0.1V testing tolerance
- 2. The luminous intensity data did not include ±15% testing tolerance
- 3. The dominant wavelength data did not including ±1nm testing tolerance.



3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

# **LUMINOUS INTENSITY CLASSIFCATION**

Bin Code	lv(mcd) at 60mA		
	Min.	Max.	
X-1	2000	2550	
X-2	2550	3200	
Y-1	3200	4000	

# DOMINANT WAVELENGTH CLASSFICATION

Bin Code	λD(nm) at 60mA		
	Min.	Max.	
Y1	583	586	
Y2	586	589	
Y3	589	592	
Y4	592	595	

# FORWARD VOLTAGE CLASSIFCATION

Bin Code	VF(V) at 60mA		
	Min.	Max.	
2	1.90	2.05	
3	2.05	2.20	
4	2.20	2.35	
5	2.35	2.50	
6	2.50	2.65	
7	2.65	2.80	



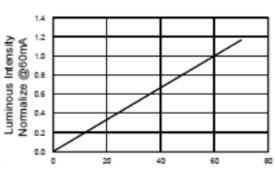
3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

# TYPICAL ELECTRICAL-OPTICAL CHARACTERISTIC CURVES

Fig.1 Forward current vs. Forward Voltage

100 Please | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Fig.2 Luminous Intensity vs. Forward Current



Forward Current(mA)

Fig.3 Forward Current vs. Temperature

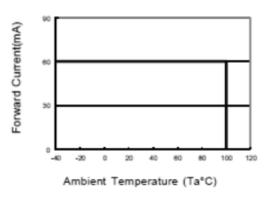


Fig.4 Luminous Intensity vs. Temperature

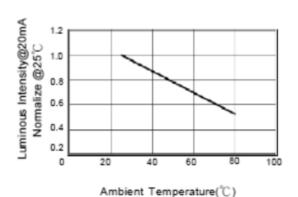


Fig.5 Relative Intensity vs. Wavelength

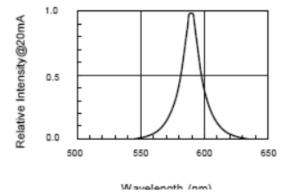
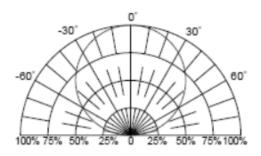


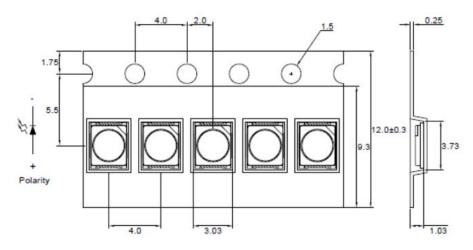
Fig.6 Directive Radiation





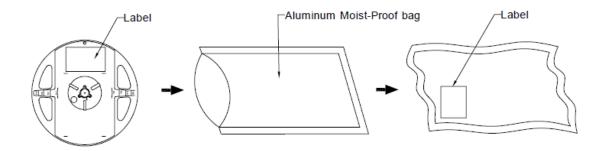
3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

# **CARRIER TAPE DIMENSION**



Note: Tolerance is ±0.1mm, Angle ±0.5 Unit mm.

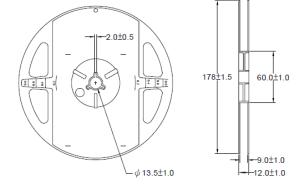
# **PACKING SPECIFICATIONS**



#### Notes:

- 1. 12mm tape
- 2. 7inch reel

# **REEL DIMENSIONS**

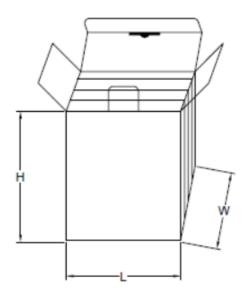


Notes: 2,000pcs / Reel



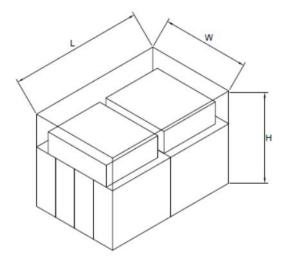
3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

# **BOX EXPLANATION**



#### NOTES:

- 1. 4 BAG / INNER BOX
- 2. Inner box size: L X W X H 23cm X 8.5cm x 26cm



# NOTES:

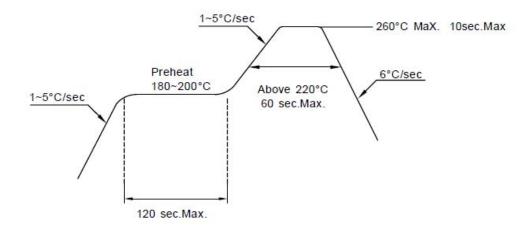
- 1. 10 INNER BOXES / CARTON
- 2. Carton size: L X W X H 58cm X 34cm x 35cm



3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

#### RECOMMENDED SOLDERING CONDITION

- Hand Solder
   Basic spec is ≤320°C for 3 seconds one time only
- 2. PB-Free Reflow Solder



#### Notes:

- 1. Reflow soldering should not be done more than 2 times
- 2. When soldering, do not put stress on the LEDs during heating
- 3. After soldering, do not warp the circuit board

#### **PRECAUTION**

#### Storage Time:

- 1. Calculated shelf life before opening is 12 months at <30°C and < 90% relative humidity(RH)
- 2. After bag is opened, devices which wil be subjected to reflow soldering or other high temperature processes must be
  - a. Assemebled within 168 hours in an enviornment of ≤30°C/60% RH or
  - b. Stored at ambient of 10% RH or less
- 3. Devices are required baking before assembly if:
  - a. Humidity indicator card reads >10%(for level 2a-5a) or >60%(for level 2) at ambient temperature 23±5°C
  - b. 2.a) or 2.b) doesn't meet
- 4. If baking is required, devices should be baked for >72 hours at 60±5°C/5% RH. Performing baking only once and using baked devices within 72 hours
- 5. MSL Level 3



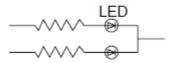
3.5x 2.8 x 0.65 mm PLCC Yellow SMD LED (Automotive)

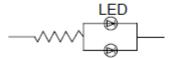
#### Drive method:

LED is a current operated device and therefore require some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor places in series with the LED. Consider worst csae voltage variations than could occur across the current limiting resistor. The forward current should not be allowed to change by more than 40% of its desired value

Circuit model A







- a. Recommended circuit
- b. The difference of brightness between LED could be found due to the VF-IF characteristics of LED

#### Cleaning:

1. Use alcohol based cleaning solvents such as isoproyl alcohol to clean the LED

# Electrostatic Discharge(ESD)

1. Static electricity or power surge will damage the LED. Use of a conductive wrist band or antielectrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded