

# SPECIFICATION FOR APPROVAL

Customer : \_\_\_\_\_

Customer Part No. : PLCC4 3528 Mono Color

SHINING Part No. : SN-NE3528KAXAR-N Red

SN-NE3528KAXAO-N Orange

SN-NE3528KAXBY-N Yellow

SN-NE3528KABAG-N Green

SN-NE3528KABAB-N Blue

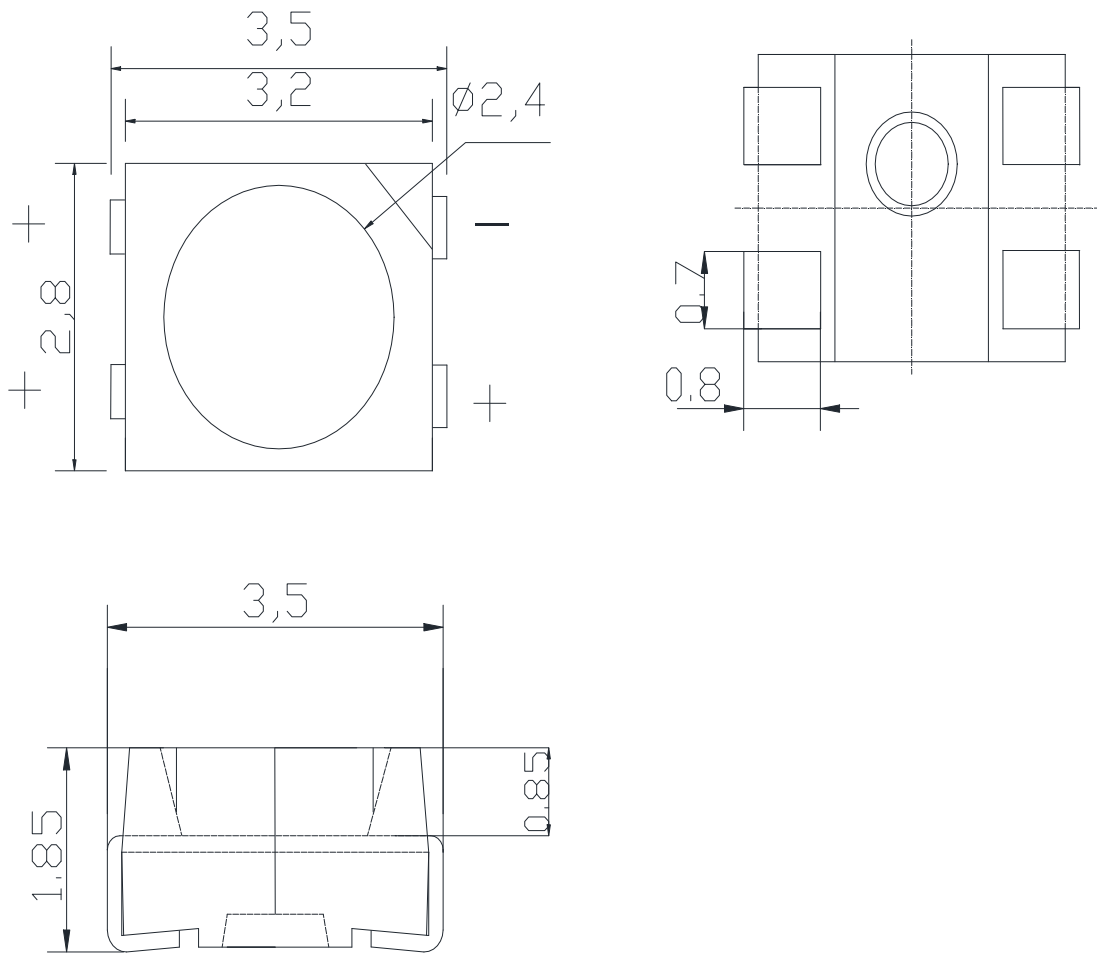
Revision History		
Date	Revision History	Prepared
2022.12.10	New Version	A/0

Confirmed By Customer	Approval by	Prepared by
	Liusan	Shaochengcheng

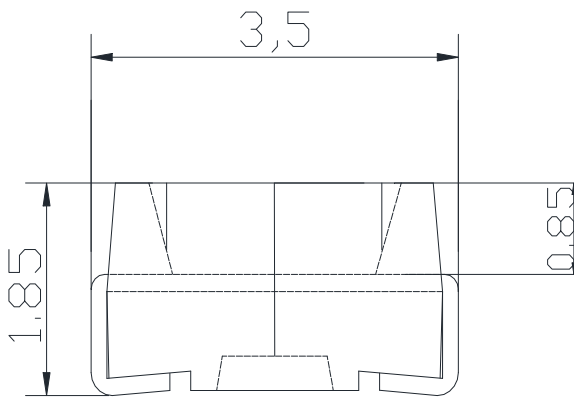
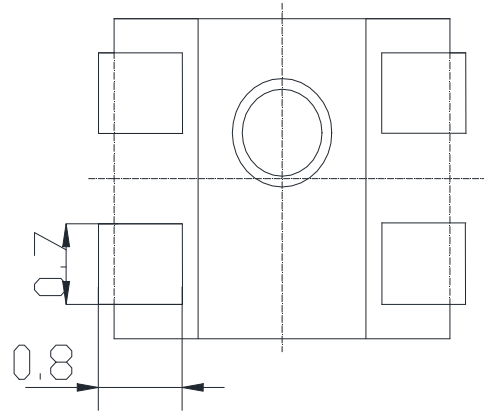
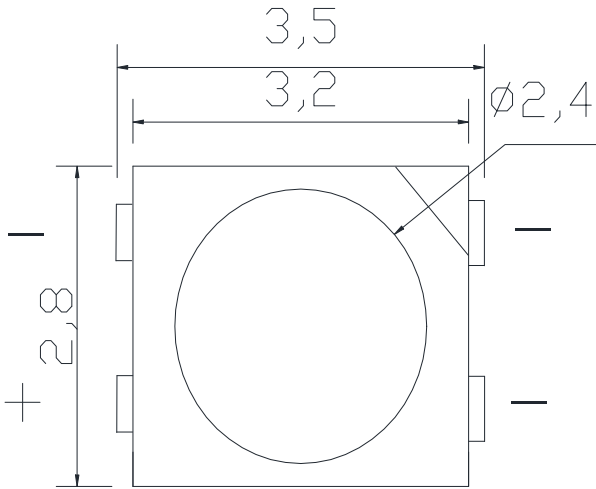
**Feature**

- △ Viewing angle:120 deg
- △ 3.50mm×2.80mm×1.85mm
- △ Pb-free
- △ RoHS compliant lead-free soldering compatible
- △ AEC-Q102 Qualified
- △ Precondition: Bases on JEDEC J-STD 020D Level 2a

**Package Outline(AlGalnp)**

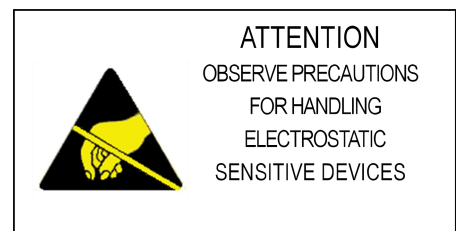


**Package Outline(InGaN)**



**NOTES:**

1. All dimensions are in millimeters ;
2. Tolerances are  $\pm 0.2\text{mm}$  unless otherwise noted.



**Product Code**

SN	-	NE	3528	K	A	X/B	A	R	-	N
Company: Shining		Automotive	Product Size	Lead frame	Number of Chips A:One	Drive Current:50/ 30mA	Process Code	Red		NO Zener

**Absolute maximum ratings at Ta=25°C**

Parameter	Symbol	Value	Unit
Forward current	AlGaInP If	50	mA
	InGaN If	30	mA
Reverse voltage	Vr	5	V
Operating temperature range	Top	-40~+105	°C
Storage temperature range	Tstg	-40~+105	°C
Pulse Forward Current (Pulse Width $\leq$ 100 $\mu$ s and Duty $\leq$ 3%)	AlGaInP Ifp	70	mA
	InGa Ifp	50	mA
Electrostatic Discharge	ESD	2000(HBM)	V

**Electro-optical characteristics at Ta=25°C (AlGaInP If @50mA/ InGaN If@30mA)**

Color	Part Number	Dominant wavelength(nm)		Luminous intensity, IV(mcd)		Forward voltage(v)	
		Min.	Max.	Min.	Max.	Min.	Max.
Red	SN-NE3528KAXAR-N	617	627	1800	3500	1.8	2.8
Red Orange	SN-NE3528KAXAO-N	610	620	1800	3500	1.8	2.8
Yellow	SN-NE3528KAXBY-N	587	596	1800	3500	1.8	2.8
Green	SN-NE3528KABAG-N	520	530	1800	3550	2.8	3.6
Blue	SN-NE3528KABAB-N	460	475	450	900	2.8	3.6

**NOTE:** (Tolerance: IV $\pm$ 10%, Vf  $\pm$ 0.1V, WD $\pm$ 1nm)

**Forward voltage range**

Forward Voltage Unit: V		
Bin Code	MIN	MAX
F00	1.8	2.0
F01	2.0	2.2
F02	2.2	2.4
F03	2.4	2.6
F04	2.6	2.8
F05	2.8	3.0
F06	3.0	3.2
F07	3.2	3.4
F08	3.4	3.6

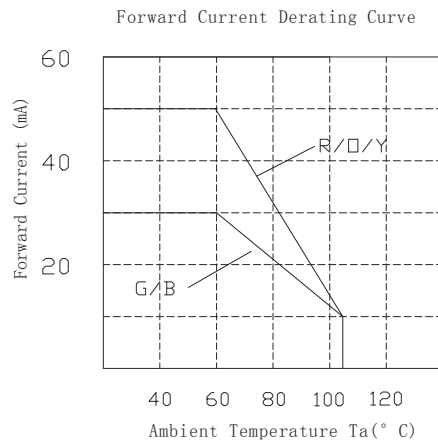
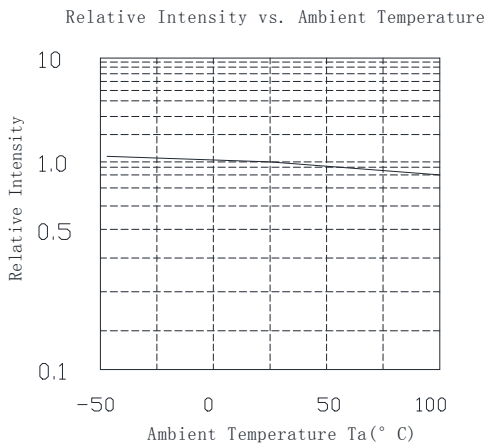
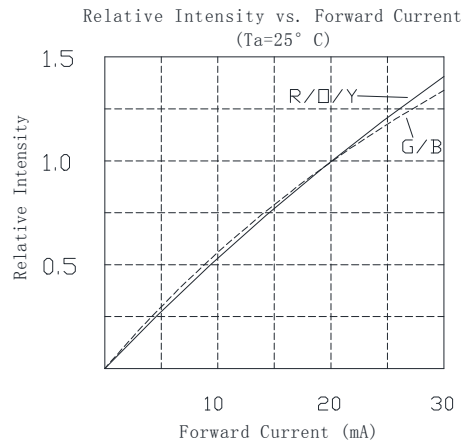
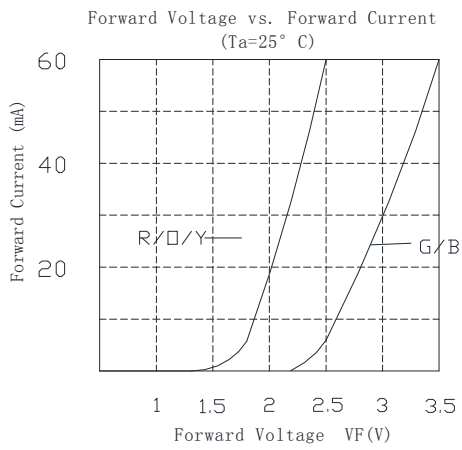
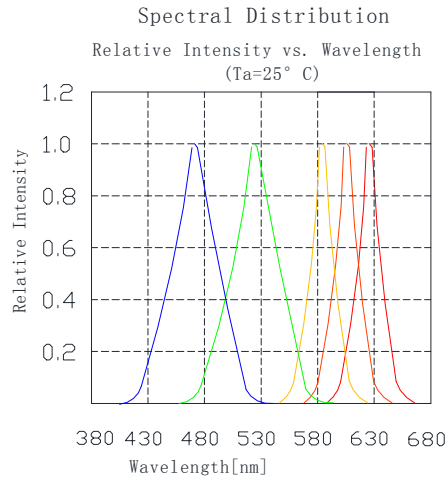
**Luminous intensity range**

Luminous Intensity Unit: mcd		
Bin Code	MIN	MAX
U1	450	560
U2	560	715
V1	715	900
V2	900	1125
W1	1125	1400
W2	1400	1800
X1	1800	2240
X2	2240	2850
Y1	2850	3550

## Color range

Dominant Wavelength Unit: nm			
Colour	Bin Code	MIN	MAX
AR	R2	617	620
	R3	620	623
	R4	623	627
AO	OC	610	615
	OD	615	620
BY	YB	587	590
	YC	590	593
	YD	593	596
AG	G1	520	525
	G2	525	530
AB	B1	460	465
	B2	465	470
	B3	470	475

Typical optical characteristics curves



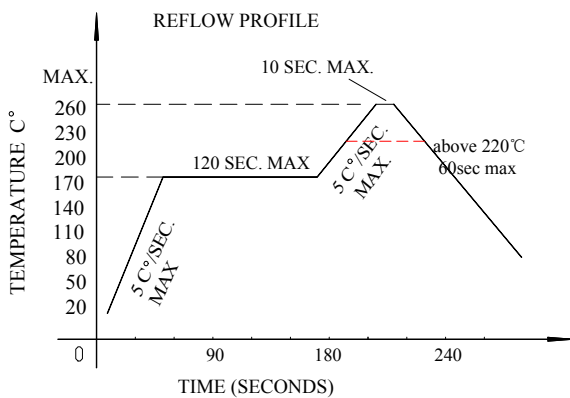
## Reflow profile

- Soldering condition
  - Recommended soldering conditions

Reflow Soldering		Hand Soldering	
Pre-heat	160~180℃	Temperature	300℃ Max.
Pre-heat time	120 seconds Max.	Soldering time	3 second Max. (one time only)
Peak temperature	260℃ Max.		
Soldering time	10 seconds Max.		
Condition	Refer to Temperature-profile		

- After reflow soldering rapid cooling should be avoided

- Temperature-profile (Surface of circuit board)  
Use the following conditions shown in the figure.



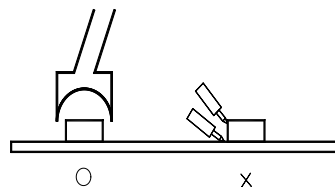
1. Reflow soldering should not be done more than two times
2. When soldering ,do not put stress on the LEDs during heating

### ■ Soldering iron

1. When hand soldering, keep the temperature of the iron under 300℃, and at that temperature keep the time under 3 sec.
2. The hand soldering should be done only a time
3. The basic spec is ≤ 5 sec. when the temperature of 260℃, do not contact the resin when hand soldering

### ■ Rework

1. Customer must finish rework within 5 sec und
2. The head of iron can not touch the resin
3. Twin-head type is preferred.



### ■ CAUTIONS

The encapsulated material of the LEDs is silicone . Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be proper.



## Reliability

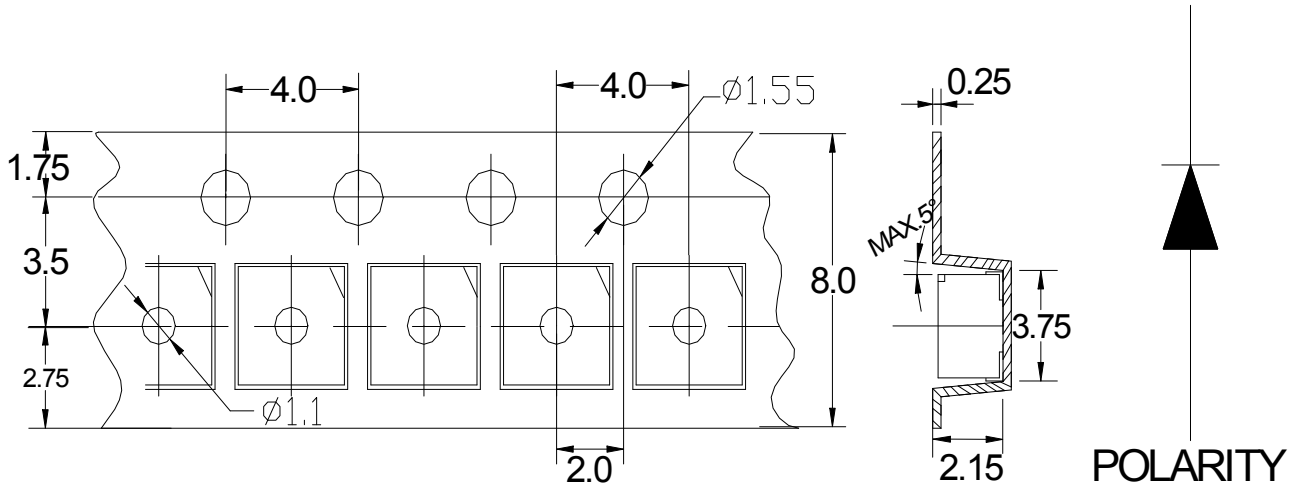
### (1)TEST ITEMS AND RESULTS

Test Item	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat(Reflow Soldering)	Tsld=260℃,10sec	3 times	0/22
Thermal Shock	-40℃ 30min ↑↓<5min 105℃ 30min	1000 cycle	0/22
High Temperature Storage	T <sub>a</sub> =105℃	1000 hrs	0/22
Humidity Heat Storage	T <sub>a</sub> =85℃ RH=85%	1000 hrs	0/22
Low Temperature Storage	T <sub>a</sub> =-40℃	1000 hrs	0/22
Normal Temperature Life Test	T <sub>a</sub> =25℃ AlGaInP I <sub>F</sub> =50mA InGaN I <sub>F</sub> =30mA	1000 hrs	0/22
High Temperature Life Test	T <sub>a</sub> =105℃ I <sub>F</sub> =10mA	1000 hrs	0/22
Low Temperature Life Test	T <sub>a</sub> =-40℃ AlGaInP I <sub>F</sub> =50mA InGaN I <sub>F</sub> =30mA	1000 hrs	0/22
Temperature Cycle	-40℃ 10min ↑↓15min 105℃ 10min I <sub>F</sub> =10mA 5Min On,5Min Off	1000 cycle	0/22
High Humidity Heat Life Test	T <sub>a</sub> =60℃ RH=85% AlGaInP I <sub>F</sub> =50mA InGaN I <sub>F</sub> =30mA	1000 hrs	0/22
Pulse Life Test	T <sub>a</sub> =55℃ AlGaInP I <sub>fp</sub> =70mA InGaN I <sub>fp</sub> =50mA Pulse Width ≤ 100 μs and Duty ≤ 3%	1000 hrs	0/22

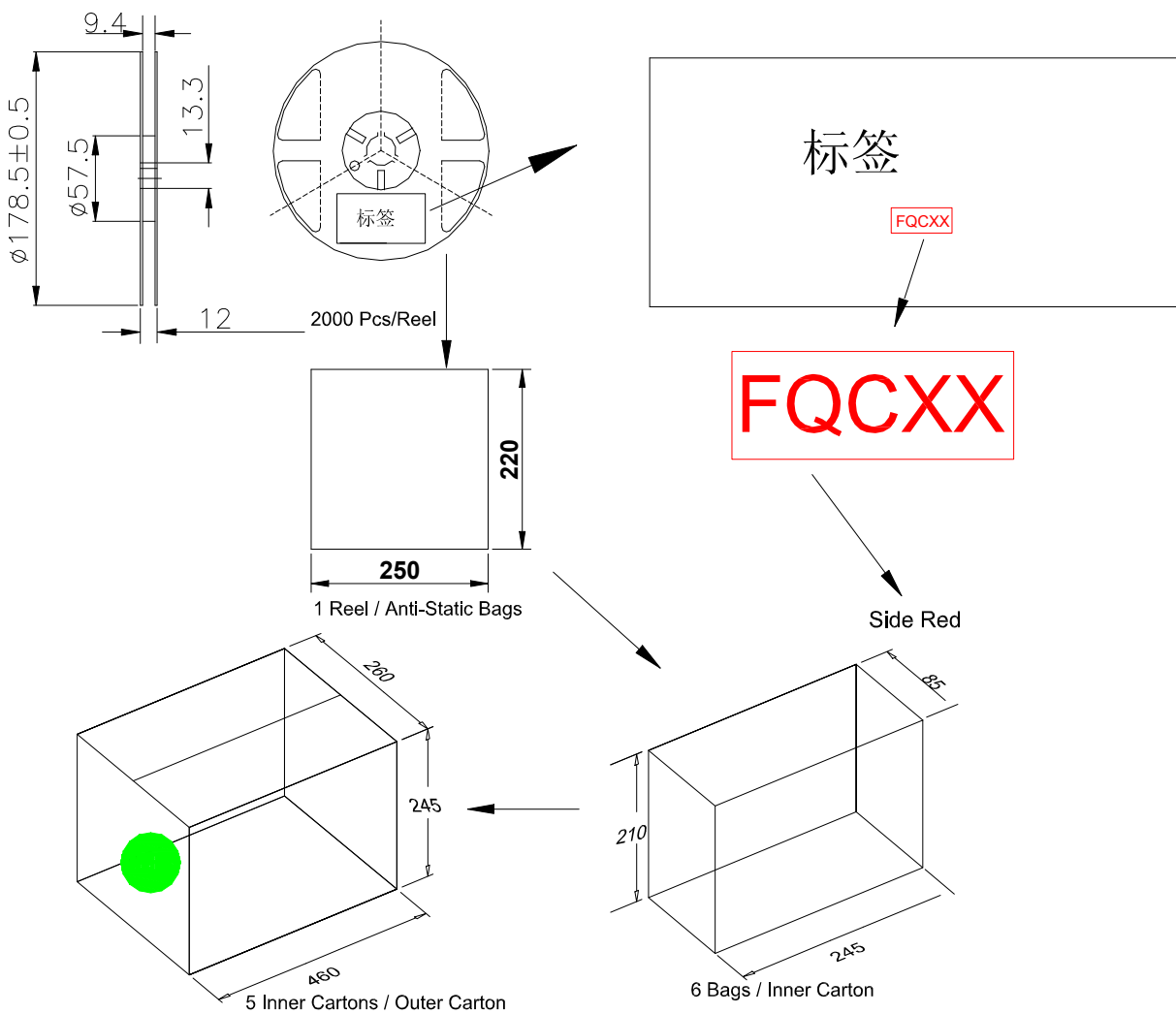
### (1)CRITERIA FOR JUDGING THE DAMAGE

Item	Symbol	Criteria for Judgement	
		Min.	Max.
Forward Voltage	VF	-	Initial Data×1.1
Luminous Intensity	IV	Initial Data×0.8	-
Wavelength	NM	Initial-2	Initial+2

Packaging Specifications



Packaging specifications



## CAUTIONS

### Storage conditions

#### Before opening the package:

The LEDs should be kept at 30°C or less and 70%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

#### After opening the package:

The LEDs should be kept at 30°C or less and 50%RH or less. The LEDs should be soldered within 24 hours (1days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again.

This specification shining has the right of final interpretation