

Data Sheet

3528 SMD LED

Nationstar LED



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General Informations:

Features:

- Silicone encapsulation
- Pb-free reflow soldering
- High luminous intensity
- Low power dissipation
- Good reliability and long life
- Various colors
- Good color uniformity
- Lead free reflow soldering
- RoHS compliant

Application :

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Uplighters/Downlighters
- Decorative/Entertainment
- Bollards/Security/Garden
- Cove/Undershelf/Task
- Indoor/Outdoor Commercial and Residential Architectural
- Automotive Ext (Stop-Tail-Turn), CHMSL, Mirror Side Repeat
- LCD backlights
- Numerous lightening applications

Electrical and Flux Characteristics

Table 1: Flux Characteristics

Code	Size(mm)	Case	Color	Wavelength	Angle
4005	3528	SMD LED	Red	615-630 nm	110°
4006	3528	SMD LED	Yellow	585-596 nm	110°
4004	3528	SMD LED	Blue	463-472 nm	110°
4003	3528	SMD LED	Green	515-535 nm	110°
4002	3528	SMD LED	White	5500-6500K	120°
4002-1	3528	SMD LED	White	7200-8500K	120°
4001	3528	SMD LED	Warm White	2800-3200K	120°
4024	3528	SMD LED	Cold White	6000K	120°
4025	3528	SMD LED	Warm White	3000K	120°

Notes for Table 1:

1. Parts are tested in pulsed conditions, T_j = 25°C. Pulse width is 10 ms at rated test current.
2. İlker Elektronik maintains a ± 10% tolerance on flux measurements.
3. Typical R9 value for 80CRI can be change with 90CRI.
4. Center beam candle power is a calculated value based on Lambertian radiation pattern at nominal test current.

Table 2: Electrical Characteristics

Code	Color	Typical Forward Current (mA)	Max Forward Current (mA)	Typical Input Voltage (CV)	Max Input Voltage (CV)	Typical Lm	Max Lm
4005	Red	20mA	25mA	2.0V	2.6V	590 mcd	850 mcd
4006	Yellow	20mA	25mA	2.0V	2.6V	500 mcd	900 mcd
4004	Blue	20mA	25mA	3.2V	3.6V	330 mcd	600 mcd
4003	Green	20mA	25mA	3.2V	3.6V	900 mcd	1800 mcd
4002	White	20mA	25mA	3.3V	3.6V	3000 mcd	3600 mcd
4002-1	White	20mA	25mA	3.2V	3.6V	2400 mcd	3300 mcd
4001	Warm White	20mA	25mA	3.2V	3.6V	2700 mcd	3600 mcd
4024	Cold White	150mA	200mA	3.3V	3.6V	24000mcd (52 Lm)	
4025	Warm White	150mA	200mA	3.3V	3.6V	20000mcd (45 Lm)	

Notes for Table 2:

1. Parts are tested in pulsed conditions, T_j = 25°C. Pulse width is 10 ms at rated test current.
2. İlker Elektronik maintains a ± 10% tolerance on Current values.
3. Typical stabilized DC performance values are provided as reference only and are not a guarantee of performance.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Table 3: Maximum Ratings

Parameter	Maximum Performance
Storage Temperature Range	-40 ~ +100° C
Operating Temperature Range	-30 ~ +85° C
Mounting Surface Temperature	60° C
LED Junction Temperature ¹	125° C
Electrostatic Discharge Classification (JEDEC-JESD22-A114F)	Class 1C
Reverse Voltage ^[2,3]	-5V
UL Recognition	UL recognized

Notes for Table 3:

1. Proper current de-rating must be observed to maintain junction temperature below the maximum.
2. Power LEDs are not designed to be driven in reverse bias.
3. At maximum reverse current of 10 μA /LED.

Application Notes:

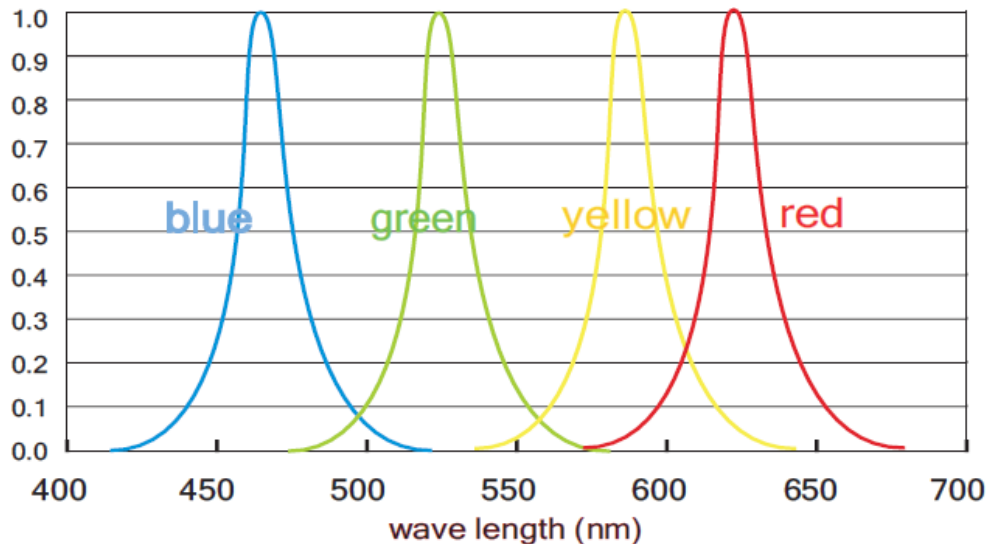
- The Anode side of the device is denoted by a hole in the lead frame.
- Electrical insulation between the case and the board is required. Do not electrically connect either the anode or cathode to the slug.
- Drawing not to scale.
- All dimensions are in millimeters.
- Unless otherwise indicated, tolerances are $\pm 0.20\text{mm}$.
- Please do not bend the leads of the LED, otherwise it will damage the LED.

Precautions:

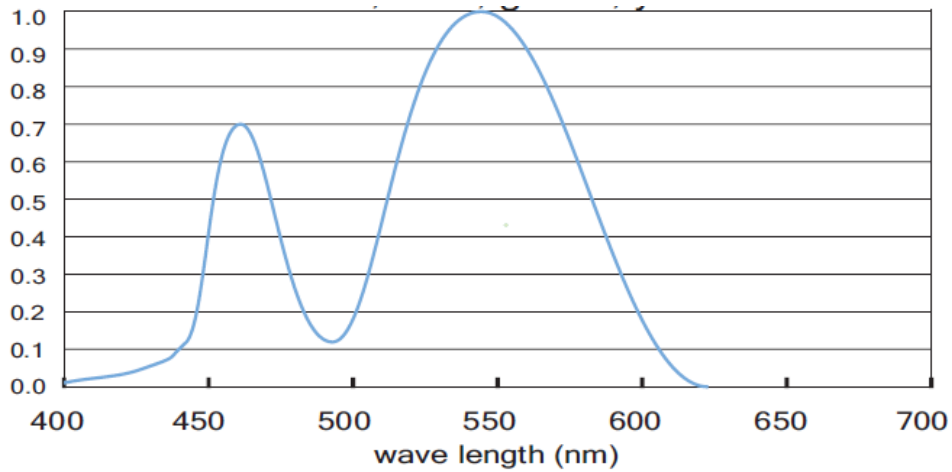
- Current should be derated in order to keep junction temperature below maximum by reducing power dissipation.
- Current spikes should be avoided especially during power up. It is good practice to initially connect PCB to unactivated supply, then gradually ramp up voltage to desired value.
- Proper management of the thermal path should be observed. Adequate heatsinking of strip should be provided in order to maintain junction temperature below maximum. Proper thermal conduction layers should be introduced at all interfaces to prevent insulating air gaps in the thermal path.
- As with all semiconductor devices, it is good practice to avoid electrostatic discharge (ESD).

Color Wavelength Diagram:

LED Color Spectrum for Red, Green, Blue, Yellow:



LED Color Spectrum for White (80 CRI) :

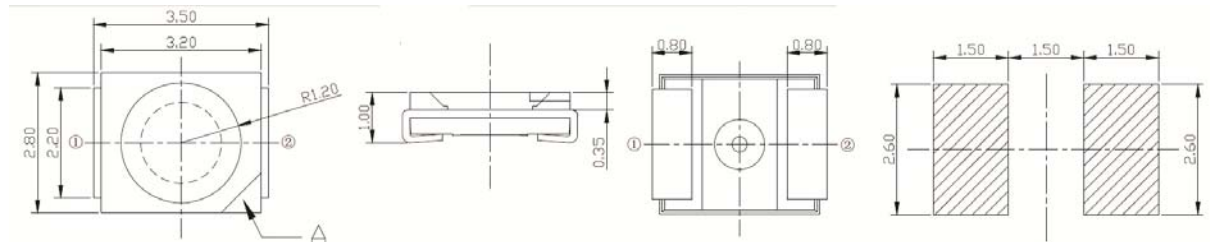


**DO NOT LOOK DIRECTLY
AT LED WITH UNSHIELDED
EYES OR DAMAGE TO
RETINA MAY OCCUR.**

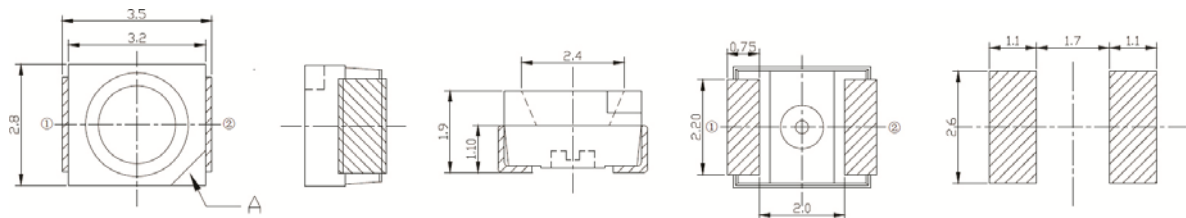
Mechanical Dimensions:

Technical Drawing:

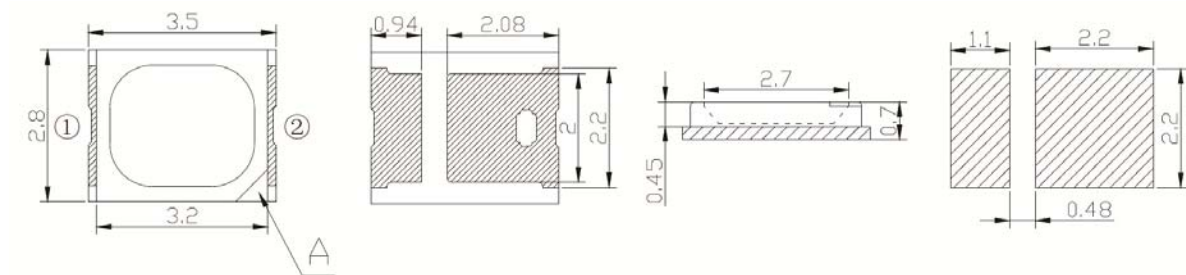
4001-4003



4003-4005

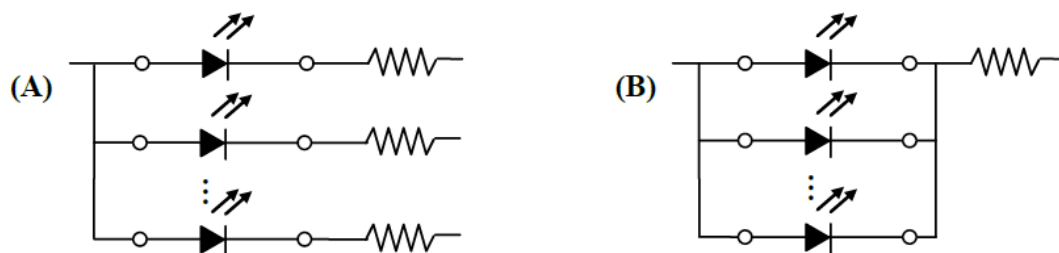


4024-4025

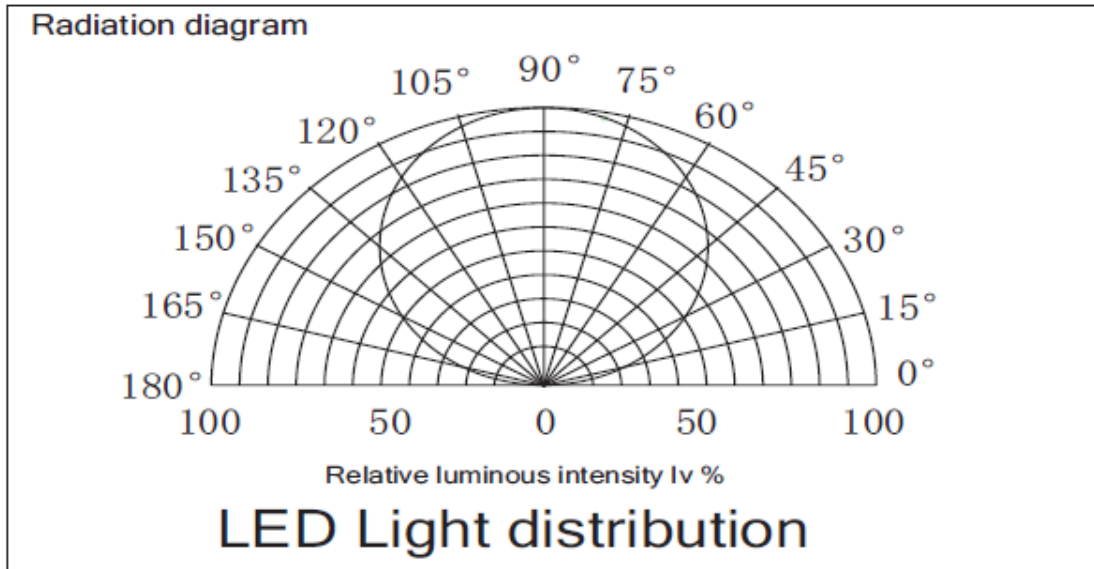


Electrical Connection:

Circuit Diagram:



Optical Characteristics:



Packing:

