

**Model: L3528SWC**

***Technical Data Sheet***

**TOP View White LED (3528)**

**For: IF= 20mA**

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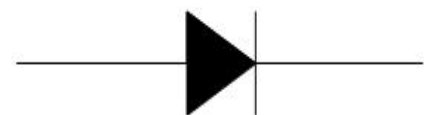
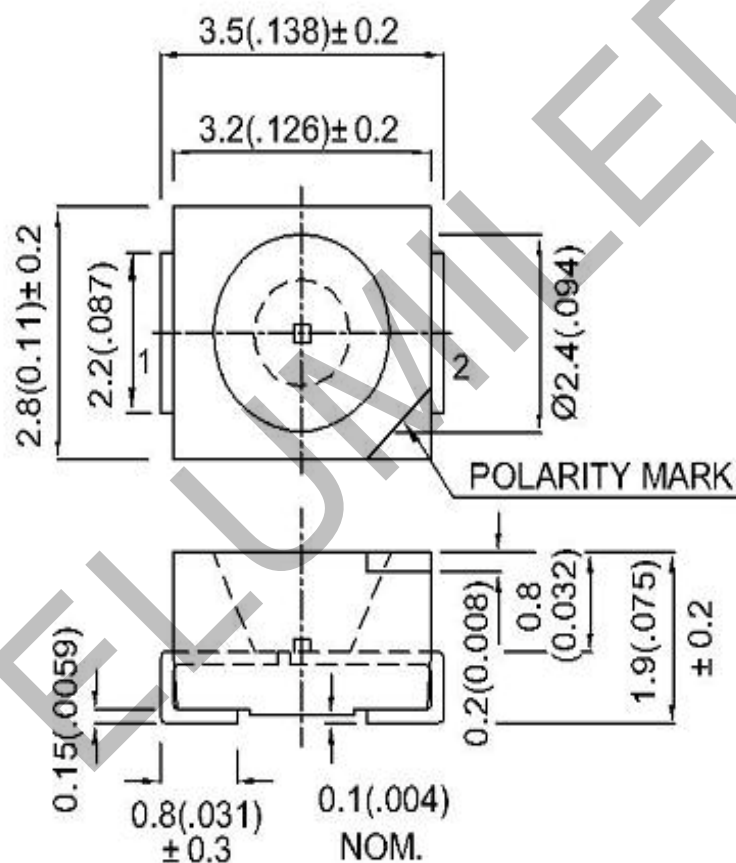
※ **Features:**

1. Package: 3.5\*2.8\*1.9mm (TOP view white LED)
2. Emitted Color: White
3. Mono-color type
4. Soldering methods: All SMT assembly methods
5. Comply ROHS standard.

※ **Applications:**

1. LCD back light.
2. Mobile phones: LCD,
3. Status indicators: Consumer & industrial electronics.
4. General use.

※→ **Package Outline Dimension:**



**NOTES:**

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.10mm unless otherwise specified.
3. Specifications are subject to change without notice.

※ **Absolute Maximum Ratings**(Ta=25℃)

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	100	mW
Forward Current	I <sub>F</sub>	20	mA
Peak Forward Current * 1	I <sub>FP</sub>	100	mA
Reverse Voltage	V <sub>R</sub>	5	V
Soldering Temperature	Tsol	260 (for 5 seconds)	℃
Operating Temperature	Topr	-30℃~85℃	-
Storage Temperature	Tstg	-40℃~85℃	-
Electrostatic discharge	ESD	2000	V

\* 1 I<sub>FP</sub> condition: pulse of 1/10 duty and 0.1ms width.

※ **Electrical-optical characteristics**(Ta=25℃)

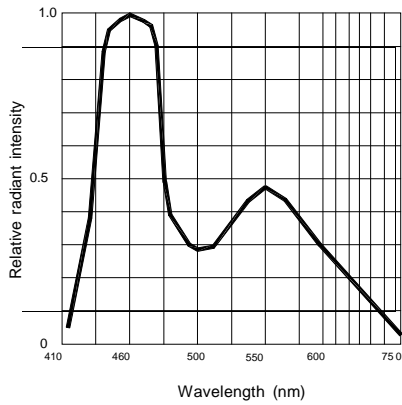
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V <sub>f</sub>	3.0	3.2	3.4	V	I <sub>F</sub> =20mA
Luminous Intensity	L <sub>m</sub>	4	4.5	5	lm	
Luminous Intensity	I <sub>v</sub>	1300		1700	mcd	
Viewing Angle	2θ <sub>1/2</sub>	-	120		deg	
Reverse Current	I <sub>R</sub>		-	5	μA	V <sub>R</sub> =5V

Note: 1. Tolerance of luminous intensity is ±10%

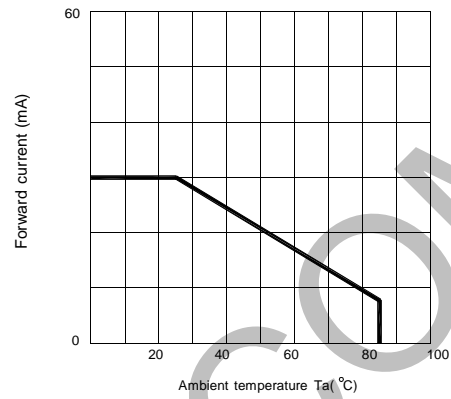
2. Tolerance of forward voltage is ±0.05V

## ※ Typical Electro-Optical Characteristics Curves

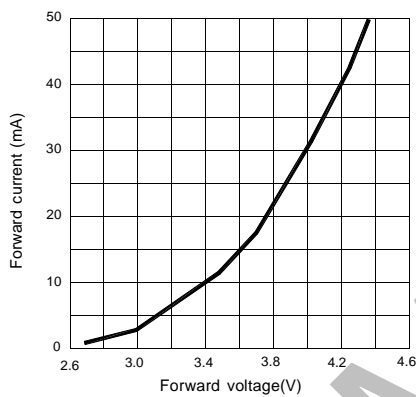
Relative intensity vs. wavelength( $T_a=25^{\circ}\text{C}$ )



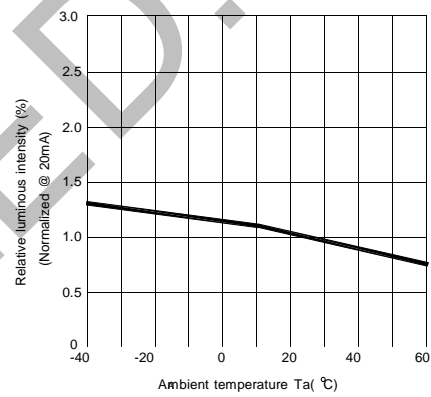
Forward current derating curve  
vs. ambient temperature



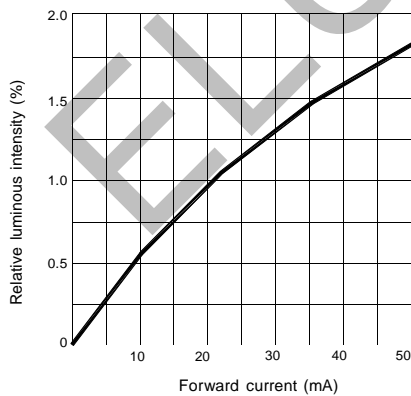
Forward current vs. forward voltage( $T_a=25^{\circ}\text{C}$ )



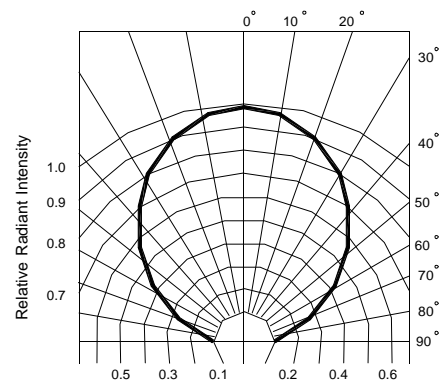
Luminous intensity vs.  
ambient temperature



Relative luminous intensity vs. forward current



Radiation diagram



※ **BIN range**

Luminous intensity (tolerance is  $\pm 10\%$ @  $I_f=20\text{mA}$ ):

BIN CODE	Min. (mcd)	Max. (mcd)
15	1000	1300
16	1300	1700
17	1700	2200
18	2200	2800

※ **Forward voltage** (tolerance is  $\pm 0.05\text{V}$ @  $I_f=20\text{mA}$ ):

BIN CODE	Min.(v)	Max.(v)
7-1*	2.8	3.0
7-2*	3.0	3.2
8-1*	3.2	3.4
8-2*	3.4	3.6

※ **Reliability test items and conditions:**

No.	Test Item	Test Conditions	Sample size	Ac/Re
1	Operation Life	Test $I_f=DC20\text{mA}$ Temp: Room temperature Test time=1000hrs	22	0/1
2	High Temperature High Humidity	Temp. $=+85^\circ\text{C}$ RH=85%HR Test time=1000hrs	22	0/1
3	Thermal Shock	$-35^\circ\text{C}$ ~ $+85^\circ\text{C}$ 20min 10s 20min Test Time=300cycles	22	0/1
4	High Temperature Storage	High Temp. $=+85^\circ\text{C}$ Test time=1000hrs	22	0/1
5	Low Temperature Storage	Low $T_a=-35^\circ\text{C}$ Test time=1000hrs	22	0/1
6	Temperature Cycle	$-35^\circ\text{C}$ ~ $+100^\circ\text{C}$ 15min 5min 15min Test Time=300cycle	22	0/1
7	Reflow Soldering	Operation heating: $260^\circ\text{C}$ (Max.), within 10seconds. (Max.)	22	0/1

### ※ Judgment criteria of failure for the reliability

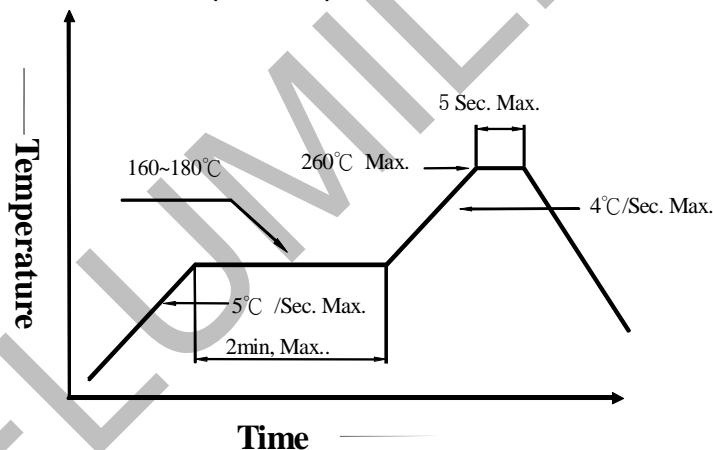
- Iv: Below 50% of initial values
- Vf: Over 20% of upper limit value
- IR: Over 2 times of upper limit value

Note: Measurement shall be taken between 2 hours and after the test LED have been returned to normal ambient conditions after completion of each test.

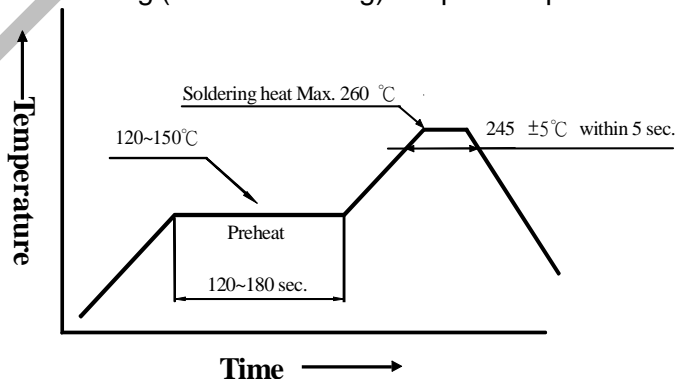
### ※ Precautions for use :

1. Customer must apply the current limiting resistor in the circuit so as to drive the LEDs within the rated current. Otherwise slight voltage shift maybe will cause big current change and burn out will happen.
2. Also, caution should be taken not to overload the LEDs with instantaneous high voltage at the turning ON and OFF of the circuit.
3. Storage:
  - 3.1 Don't open the moisture proof bag before ready to use the LEDs.
  - 3.2 The LEDs should be kept at 30°C or less and 60%RH or less before opening the package. The max. storage period before opening the package is 1 year.
  - 3.3 After opening the package, the LEDs should be kept at 30°C/35%RH or less, and it should be used within 7 days.
  - 3.4 If the LEDs be kept over the conditions of 3.4, baking is required before mounting. Baking condition as below:  $60 \pm 5^\circ\text{C}$  for 12 hrs.
4. Soldering condition:
  - 4.1 Manual of soldering:

The temperature of the iron should be lower than  $280^\circ\text{C}$  and soldering within 3sec per solder-pad is to be observed.
  - 4.2 Pb-free solder temp. -time profile



#### 4.3 DIP soldering (Wave Soldering) temp. -time profile:



c) Don't warp the circuit board before it have been returned to normal ambient conditions after soldering.

Technical drawing of a circular mechanical part, likely a flange or end view of a shaft. The drawing shows a central circular feature with a smaller circular hole in the middle. The outer diameter is 150. The inner diameter of the central hole is 60. The thickness of the part is 3.00. The drawing is a cross-section, showing the internal structure of the part.

