

### SMD ■ A 91-21SUGC/S400-XX/XXX

#### Features

- Package in 12mm tape on 7" diameter reel.
- Compatible with automatic placement equipment.
- EIA Std. package.
- Mono-color type.
- Pb-free.
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

#### Description

- The 91-21 SMD LED is much smaller than leaded components .  
Thus enable smaller board size. Higher packing density. Reduced storage space and finally smaller equipment to be obtained.
- Besides, light weight makes them ideal for miniature applications.
- Furthermore by automation assembly machines the accuracy is anticipated.

#### Applications

- Small indicator for indoor applications.
- Flat backlight for LCD, switches and symbols.
- Indicator and backlight in office equipment.
- Indicator and backlight for battery driven equipment.
- Indicator and backlight for audio and video equipment.
- Backlighting in dashboards and switches.
- Telecommunication : indicator and backlighting in telephone and fax.



## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Brilliant Green	Water Clear

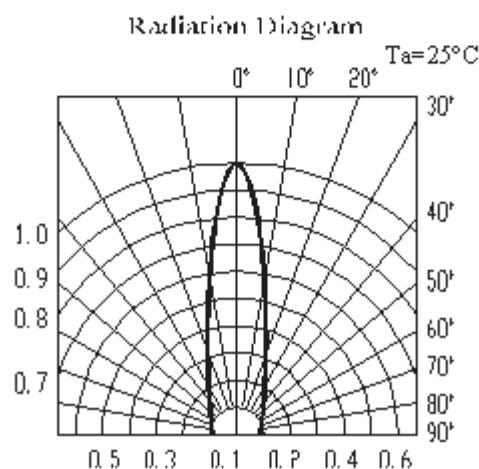
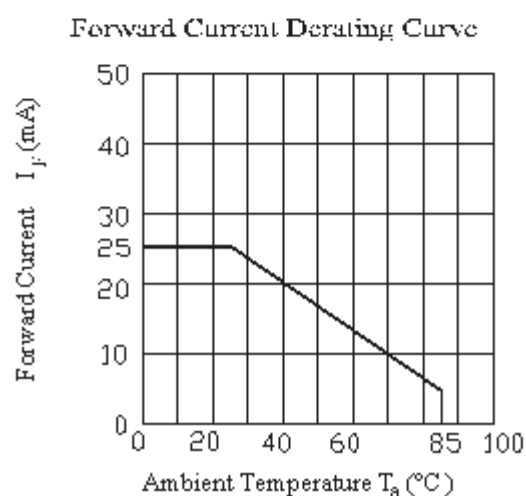
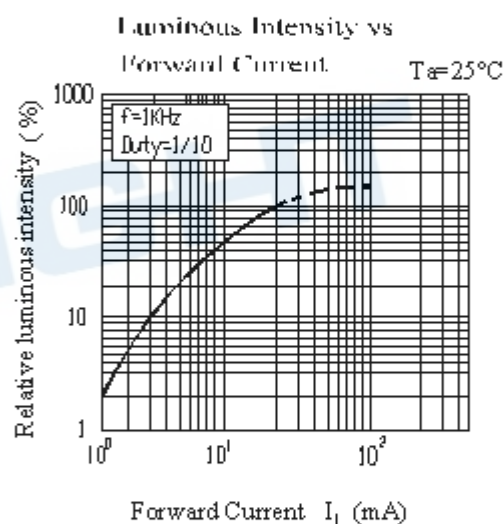
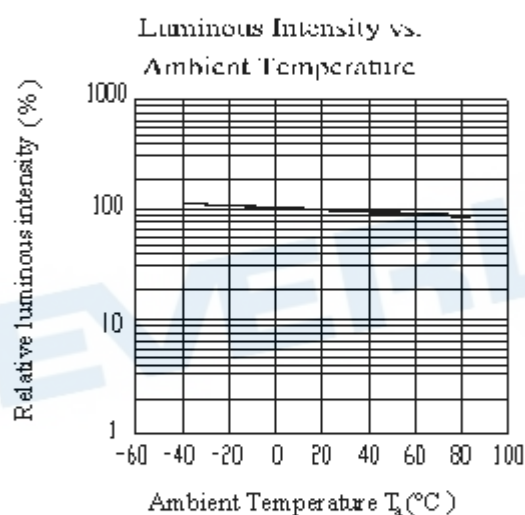
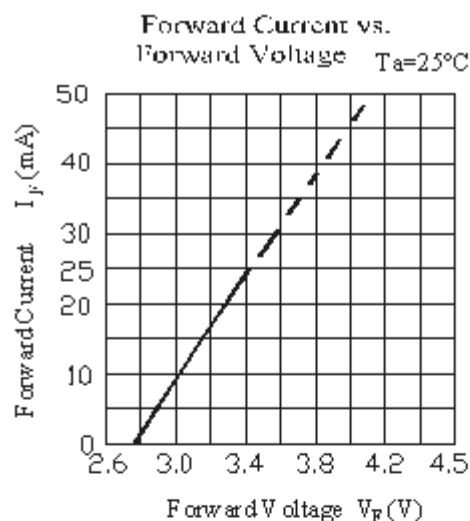
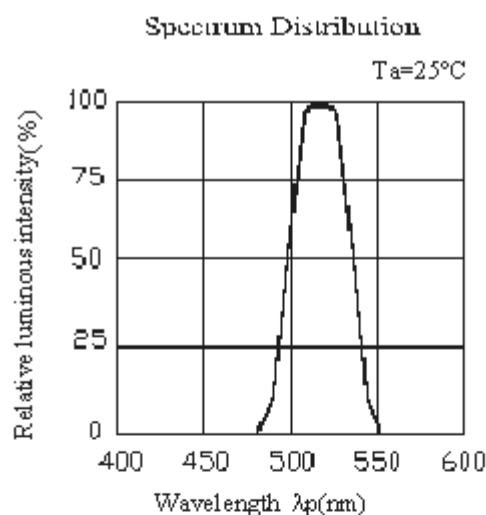
## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	$V_R$	5	V
Forward Current	$I_F$	25	mA
Peak Forward Current (Duty 1/10 @1KHz)	$I_{FP}$	100	mA
Power Dissipation	$P_d$	95	mW
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +100	°C
Electrostatic Discharge	$ESD_{HBM}$	150	V
Soldering Temperature	$T_{sol}$	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

## Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	A4	-----	200	-----	mcd	$I_F=2mA$
		2000	2300	-----	mcd	$I_F=20mA$
	A5	-----	235	-----	mcd	$I_F=2mA$
		2400	2850	-----	mcd	$I_F=20mA$
	A6	-----	260	-----	mcd	$I_F=2mA$
		2800	3150	-----	mcd	$I_F=20mA$
Viewing Angle	$2\theta_{1/2}$	-----	25	-----	deg	$I_F=20mA$
Peak Wavelength	$\lambda_p$	-----	518	-----	nm	$I_F=20mA$
Dominant Wavelength	$\lambda_d$	-----	525	-----	nm	$I_F=20mA$
Spectrum Radiation Bandwidth	$\Delta \lambda$	-----	35	-----	nm	$I_F=20mA$
Forward Voltage	$V_F$	-----	3.5	4.3	V	$I_F=20mA$
Reverse Current	$I_R$	-----	-----	50	$\mu A$	$V_R=5V$

## Typical Electro-Optical Characteristics Curves



Technical drawing of a cathode ray tube (CRT) showing front and side views with dimensions and a polarity symbol.

**Front View Dimensions:**

- Top flange diameter:  $\varnothing 1.9 \pm 0.2$
- Top flange thickness:  $2.5 \pm 0.1$
- Central circular feature diameter:  $\varnothing 0.4 \pm 0.1$
- Central circular feature height:  $2.0 \pm 0.2$
- Bottom flange thickness:  $0.5 \pm 0.1$

**Side View Dimensions:**

- Overall width:  $7.0 \text{ min.}$
- Top flange width:  $1.1 \pm 0.2$
- Central circular feature width:  $1.4 \pm 0.2$
- Bottom flange width:  $7.0 \text{ min.}$
- Central circular feature height:  $0.6 \pm 0.1$
- Overall height:  $0.15 \pm 0.05$
- Top flange height:  $0.65 \pm 0.1$
- Central circular feature height:  $1.4 \pm 0.1$
- Bottom flange height:  $2.7 \pm 0.2$

**Polarity Symbol:**

A symbol indicating polarity, consisting of a circle with a lightning bolt and the word "Polarity" below it.

Technical drawing of a mechanical part with dimensions and tolerances:

- Top view:
  - Overall width:  $25 \pm 0.1$
  - Overall height:  $20 \pm 0.2$
  - Inner width:  $4.0 \pm 0.2$
  - Inner height:  $0.45 \pm 0.1$
  - Left side dimension:  $0.55 \pm 0.1$
  - Right side dimension:  $0.45 \pm 0.1$
  - Feature:  $\varnothing 1.0 \pm 0.2$  with note "Cutback"
  - Feature:  $\varnothing 1.1 \pm 0.2$  with note "Partially"
- Bottom view:
  - Overall width:  $25 \pm 0.1$
  - Overall height:  $20 \pm 0.2$
  - Inner width:  $4.0 \pm 0.2$
  - Inner height:  $0.45 \pm 0.1$
  - Left side dimension:  $0.55 \pm 0.1$
  - Right side dimension:  $0.45 \pm 0.1$
  - Feature:  $\varnothing 1.0 \pm 0.2$  with note "Cutback"
  - Feature:  $\varnothing 1.1 \pm 0.2$  with note "Partially"

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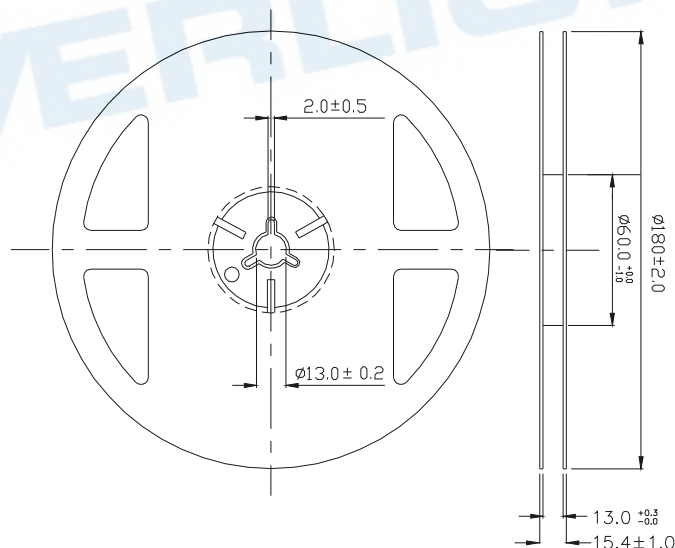
## Moisture Resistant Packing Materials

### Label Explanation



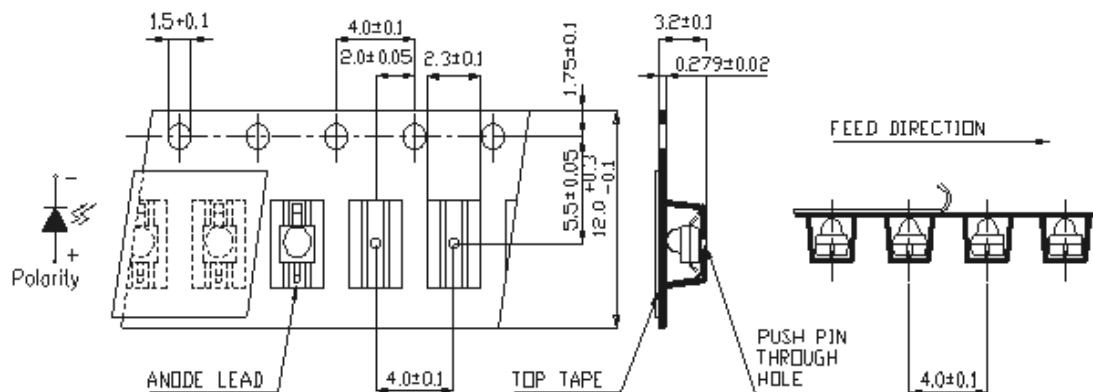
- CPN: Customer's Product Number
- P/N: Product Number
- LOT No: Lot Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank

### Reel & Carrier Tape Dimensions

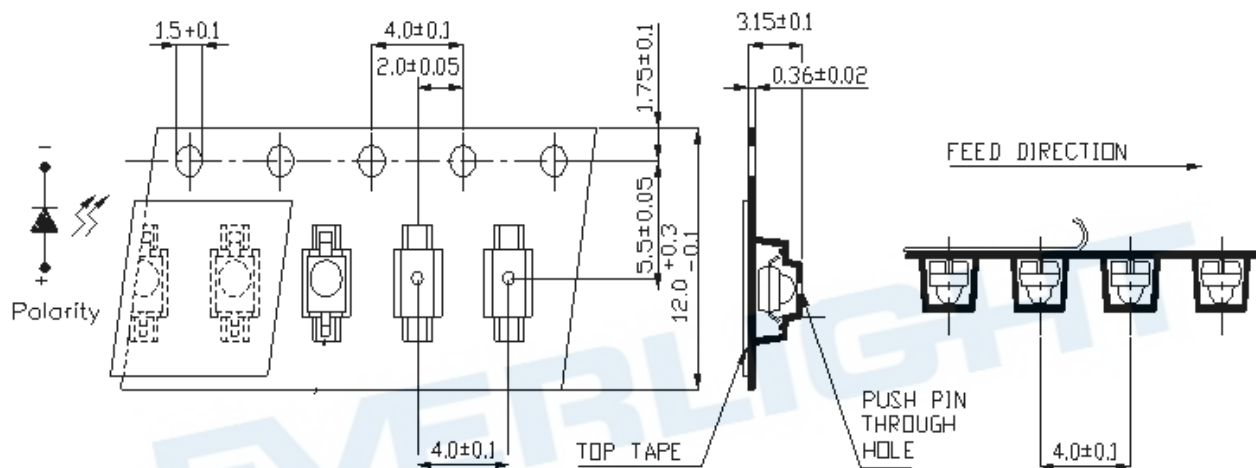


Note: The tolerances unless mentioned are  $\pm 0.1$ , unit=mm

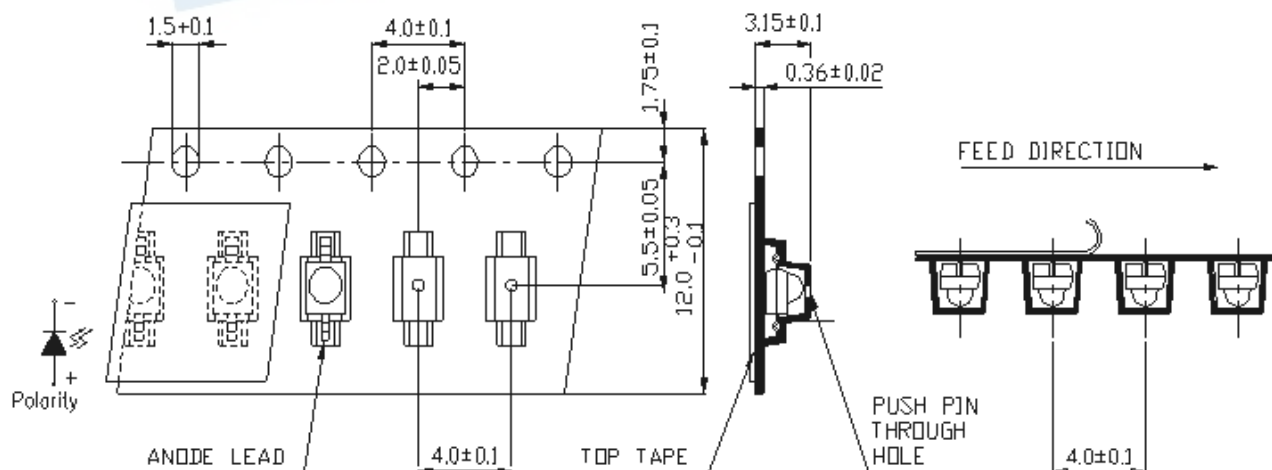
Loaded quantity 1000 PCS per reel



TR7



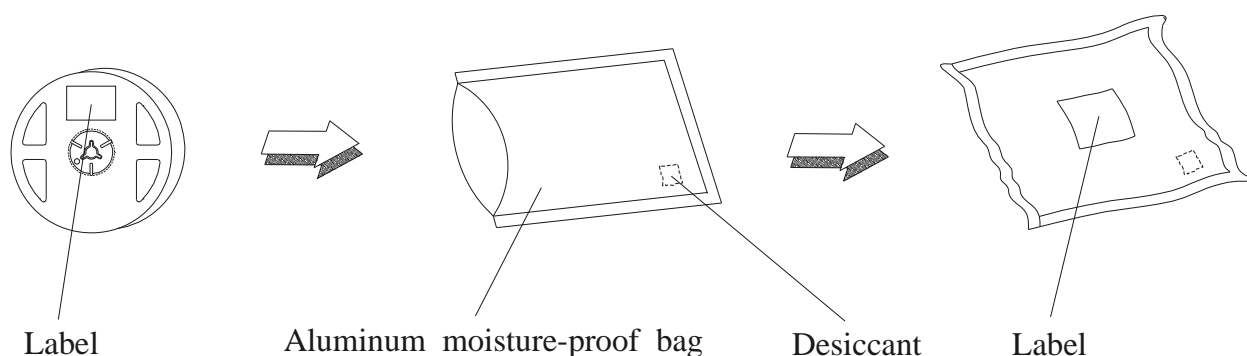
TR10



TR9

Note: The tolerances unless mentioned are ±0.1, unit=mm.

Moisture Resistant Packaging



## Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100°C 5min § 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100°C 15min § 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
4	High Temperature/High Humidity	Ta=85°C,85%RH, I <sub>F</sub> = 20 mA	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Ta=-40°C	1000 Hrs.	22 PCS.	0/1
6	High Temperature Storage	Ta=100°C	1000 Hrs.	22 PCS.	0/1
7	DC Operation Life	Ta=25°C, I <sub>F</sub> = 20 mA	1000 Hrs.	22 PCS.	0/1

## Precautions For Use

## 1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change ( Burn out will happen ).

## 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 72 hours under 30°C or less and 60% RH or less.

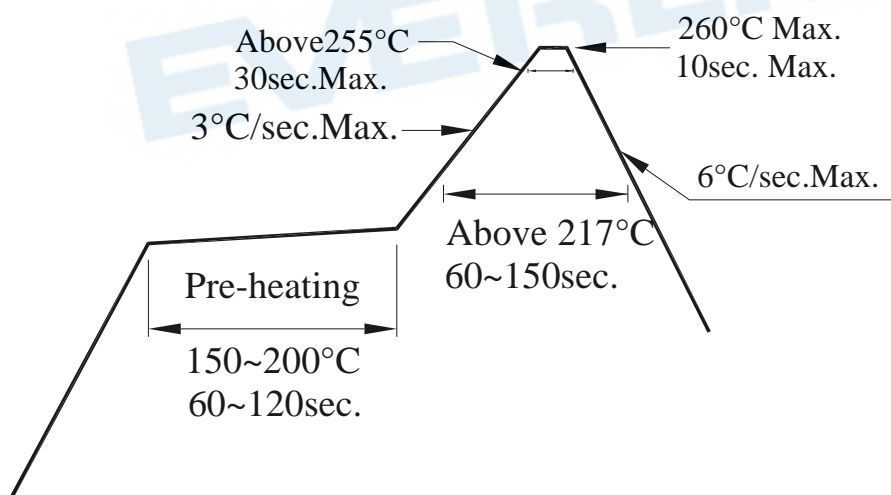
If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : 60±5°C for 24 hours.

## 3. Soldering Condition

### 3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

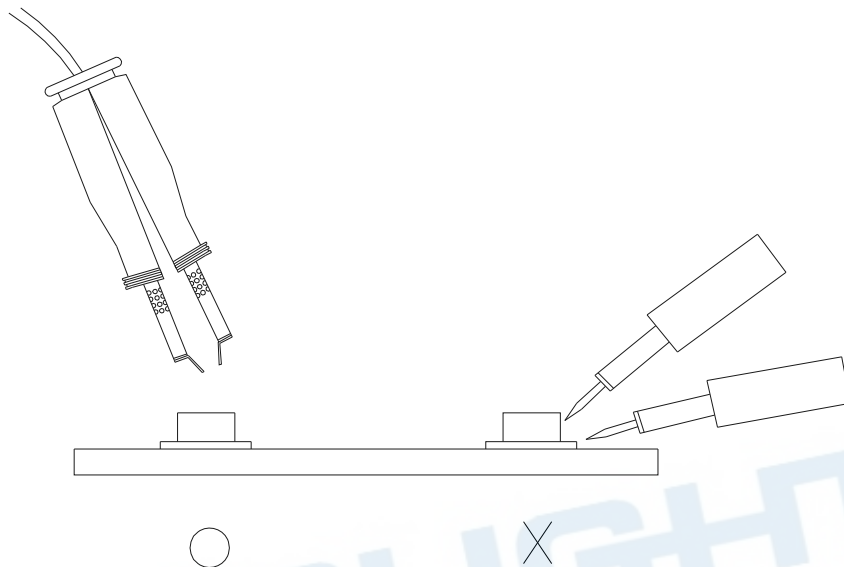
## 4. Soldering Iron



Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

#### 5.Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



## DISCLAIMER

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2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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