\*Customer: Pb Free

# **SPECIFICATION**

ITEM	CHIP LED DEVICE
MODEL	THBTGFR422
REVISION DATE	

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## Customer

Approved by	Approved by	Approved by

# **Supplier**

Drawn by	Checked by	Approved by

#### 1. Features

□ Full-color lighting

 $\square$  Package : 1.6×1.5×0.4mm, Flat molding

#### 2. Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Color Value		Unit	Remarks
Power Dissipation	$P_d$	Red	69		
		Green	- 66	mW	
		Blue			
Forward Current		Red	30		
	$ m I_F$	Green	20	mA	
		Blue			
Peak Forward Current	${ m I_{FM}}^{*1}$	Red	50		
		Green	35	mA	
		Blue			
Reverse Voltage	$V_R$	5		V	
Operating Temperature	$T_{opr}$	<b>-</b> 30 ∼ +85		${\mathbb C}$	
Storage Temperature	$T_{\text{stg}}$	-40 ~ +100		${\mathbb C}$	

<sup>\*1</sup>  $I_{FM}$  conditions: Pulse width Tw $\leq 0.1$ ms, Duty ratio $\leq 1/10$ 

## 3. Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Condition	Color	Min.	Тур.	Max.	Unit
Forward Voltage			Red	1.8	1.9	2.3	
	$V_{\mathrm{F}}$	$I_F=10$ mA	Green	2.8	2.9	3.3	V
			Blue	2.9	3.0	3.3	]
Reverse Current			Red	-	0.1	10	
	$I_R$	$V_R=5V$	Green	-	0.1	10	μA
			Blue	-	0.1	10	
Luminous Intensity*2		$I_{ m V}$ $I_{ m F}\!\!=\!\!10$ mA	Red	45	60	85	
	$I_V$		Green	150	180	-	mcd
			Blue	45	60	-	
			Red	615	625	635	
Wavelength 7	$\lambda_d$	$I_F = 10\text{mA}$	Green	515	525	535	nm
	-		Blue	465	472	475	
Spectral Bandwidth Δλ			Red	-	20	-	
	Δλ	$I_F = 10\text{mA}$	Green	-	35	-	nm
			Blue	-	25	-	
Viewing angle*3			Red	=	150	-	
	20 <sub>1/2</sub>	$I_F=10$ mA	Green	=	150	-	0
	•		Blue	=	150	-	

<sup>\*2</sup> The luminous intensity  $I_V$  is measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package.

[Note] All products confirm to the listed minimum and maximum specifications for electric and optical characteristics, when operated at 20mA within the maximum ratings shown above. All measurements were made under the standardized environment of SSC. (Tolerance:  $V_F \pm 0.1 V$ ,  $I_V \pm 10\%$ ,  $\lambda_d \pm 2nm$ )

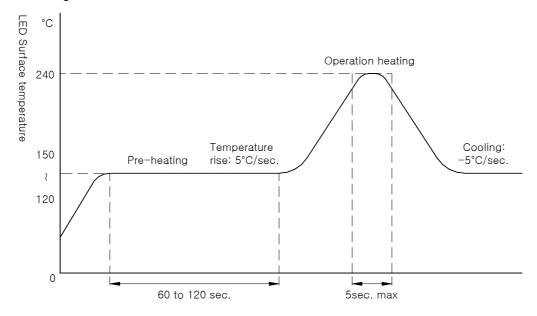
<sup>\*3</sup>  $\Theta_{1/2}$  is the off-axis where the luminous intensity is 1/2 the peak intensity.

## 4. Soldering Profile

Reflow Soldering Conditions/ Profile

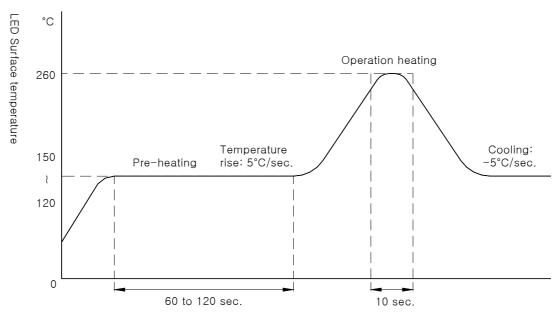
#### (1) Lead Solder

- -Preliminary heating to be at 150 °C max. for 2 minutes max.
- -Soldering heat to be at 240 °C max. for 5 seconds max.



#### (2) Lead Free Solder

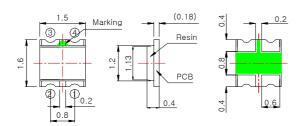
- -Preliminary heating to be at 150 °C max. for 2 minutes max.
- -Soldering heat to be at 260 °C max. for 10 seconds max.

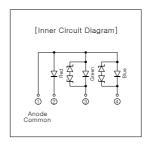


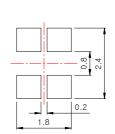
#### (3) Hand Soldering conditions

-Not more than 3 seconds @MAX280°C, under Soldering iron.

#### 5. Outline Dimension







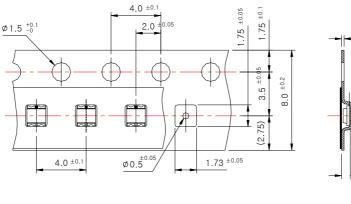
Tolerance:  $\pm 0.1$ , Unit: mm

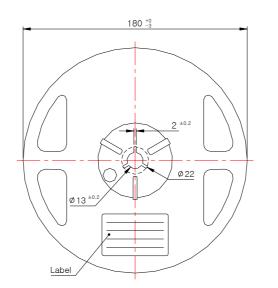
[Recommended Solder Pattern]

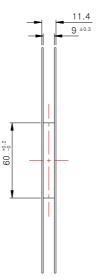
0.2 ±0.05

0.7 ±0.05

#### 6. Packing



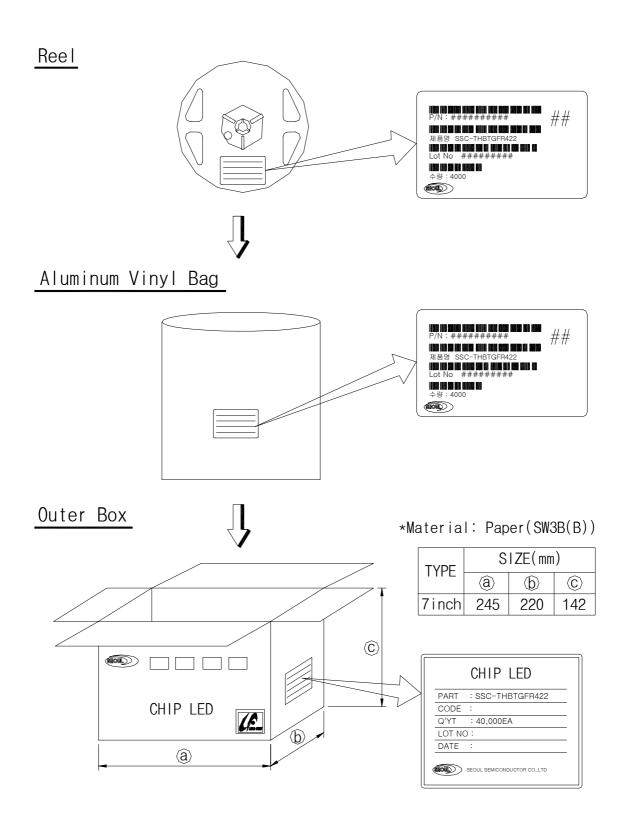




Tolerance:  $\pm 0.2$ , Unit: mm

- (1) Quantity: 4000pcs/Reel
- (2) Cumulative Tolerance : Cumulative Tolerance/10pitches to be  $\pm 0.2$ mm
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at  $10^{\circ}$  angle to be the carrier tape.
- (4) Package: P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

## 7. Reel Packing Structure



#### 8. Precaution for use

(1) Storage

In order to avoid the absorption of moisture, it is recommended to store in the dry box (or desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature :  $5^{\circ}$ C $\sim$ 30 °C Humidity : 60%HR max.

(2) Attention after opened

However LED is correspond SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop. Attention in followed.

a. After opened and mounted, the soldering shall be quickly.

b. Keeping of a fraction

Temperature :  $5 \sim 40 \,^{\circ}\text{C}$ 

Humidity: less than 30%

- (3) In case of more than 1 week passed after opening or change color of indicator on desiccant components shall be dried 10-12hr. at  $60\pm5$  °C.
- (4) In case of supposed the components is humid, shall be dried dip-solder just before.

100Hr at  $80\pm5$ °C or 12Hr at  $100\pm5$ °C.

- (5) Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temp. after soldering.
- (6) Quick cooling shall not be avoid.
- (7) Components shall not be mounted on warped direction of PCB.
- (8) Anti radioactive ray design is not considered for the products listed here in.
- (9) This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When washing is required, IPA should be used.
- (10) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.
- (11) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with a nitrogen atmosphere should be used for storage.
- (12) The LEDs must be soldered within seven days after opening the moisture-proof packing.
- (13) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.
- (14) The appearance and specifications of the product may be modified for improvement without notice.
- (15) Static Electricity and surge damages the Blue/Green LEDs.

It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

All devices, equipment and machinery must be properly grounded.

- (16) It is recommended to use individual resistor separately when the LEDs applies in parallel circuit so that it may improve the light deviations.
- (17) It is recommended to examine to the full the circuit by using resistor when the LEDs applies in case of lighting seven colors. (White colour is not available with single LED.)

#### 9. Label Structure

