

# **SURFACE MOUNT CHIP LED LAMPS**

## **DATA SHEET**

**MODEL NO: GT3528-4W14BZ**

**REV. : 1.0**

**DATE : 01-Apr.-2009**

## Features

- P-LCC-2 package.
- White package.
- Optical indicator.
- Colorless clear window.
- Pb-free.
- Wide viewing angle.
- Compatible with automatic placement equipment.
- Available on tape and reel (8mm Tape).
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- The product itself will remain within RoHS compliant version



## Descriptions

The GT3528 series is available in soft orange, green, blue and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

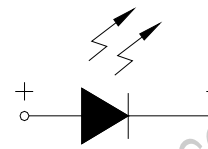
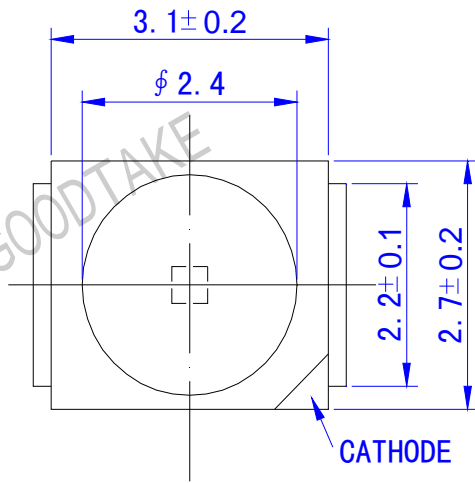
## Applications

- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- Light pipe application.
- General use.

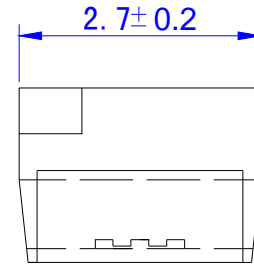
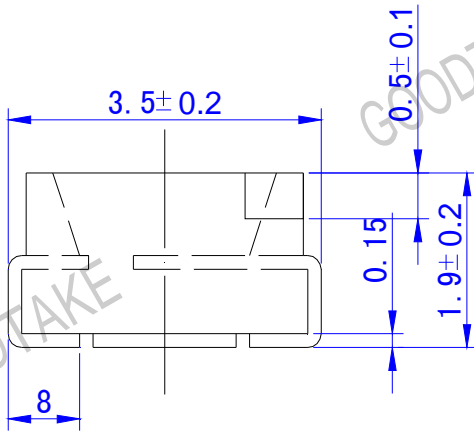
## Device Selection Guide

Material	Resin (mold)	Emitted Color
InGaN	Epoxy	White

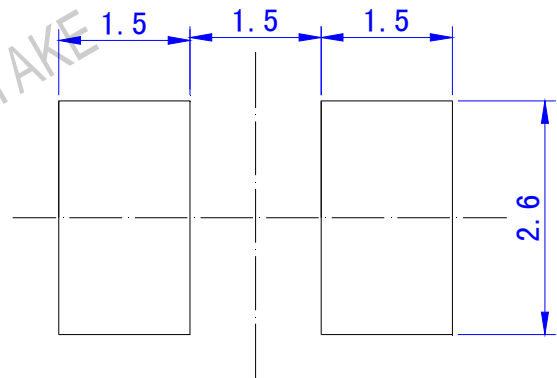
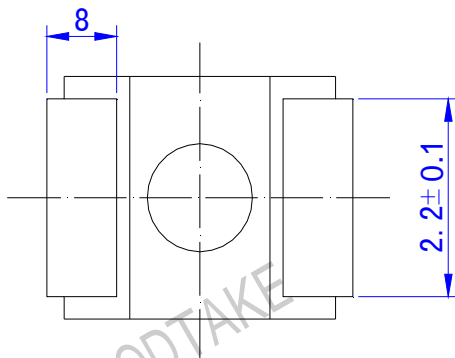
## Package Dimensions



Polarity



For reflow soldering (Proposal)



Note: The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm

## Absolute Maximum Rating (Ta=25°C)

Item	Symbol	Condition	Absolute Maximum Rating	Unit
Forward Current	I <sub>F</sub>		30	mA
Peak Forward Current	I <sub>FP</sub>	Duty1/10 @1Khz)	100	mA
Reverse Voltage	V <sub>R</sub>		5	V
Power Dissipation	P <sub>D</sub>		105	mW
Operating Temperature	T <sub>opr</sub>		-40~+85	°C
Storage Temperature	T <sub>stg</sub>		-55~+100	°C
Electrostatic Discharge	ESD		2000 (HBM)	V
Lead Soldering Temperature	T <sub>sol</sub>		260°C for 10 seconds	

## Electrical and Optical Characteristics at (Ta=25°C)

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	2.8	---	3.6	V
50%Power angle	2θ <sub>1/2</sub>		--	120	--	Deg
Luminous Intensity	I <sub>v</sub>		1200	----	2600	Mcd
Chromaticity Coordinates	CIE-X		0.2459	--	0.3364	--
	CIE-Y		0.2391	--	0.3851	--
Reverse Current	I <sub>R</sub>	V <sub>r</sub> =5V			10	μA

**Luminous Intensity Combination(mcd at 20mA)**

<b>Rank</b>	<b>Min (mcd)</b>	<b>Max (mcd)</b>
<b>H</b>	<b>1200</b>	<b>1400</b>
<b>I</b>	<b>1400</b>	<b>1600</b>
<b>J</b>	<b>1600</b>	<b>1800</b>
<b>K</b>	<b>1800</b>	<b>2000</b>
<b>L</b>	<b>2000</b>	<b>2200</b>
<b>M</b>	<b>2200</b>	<b>2400</b>
<b>N</b>	<b>2400</b>	<b>2600</b>

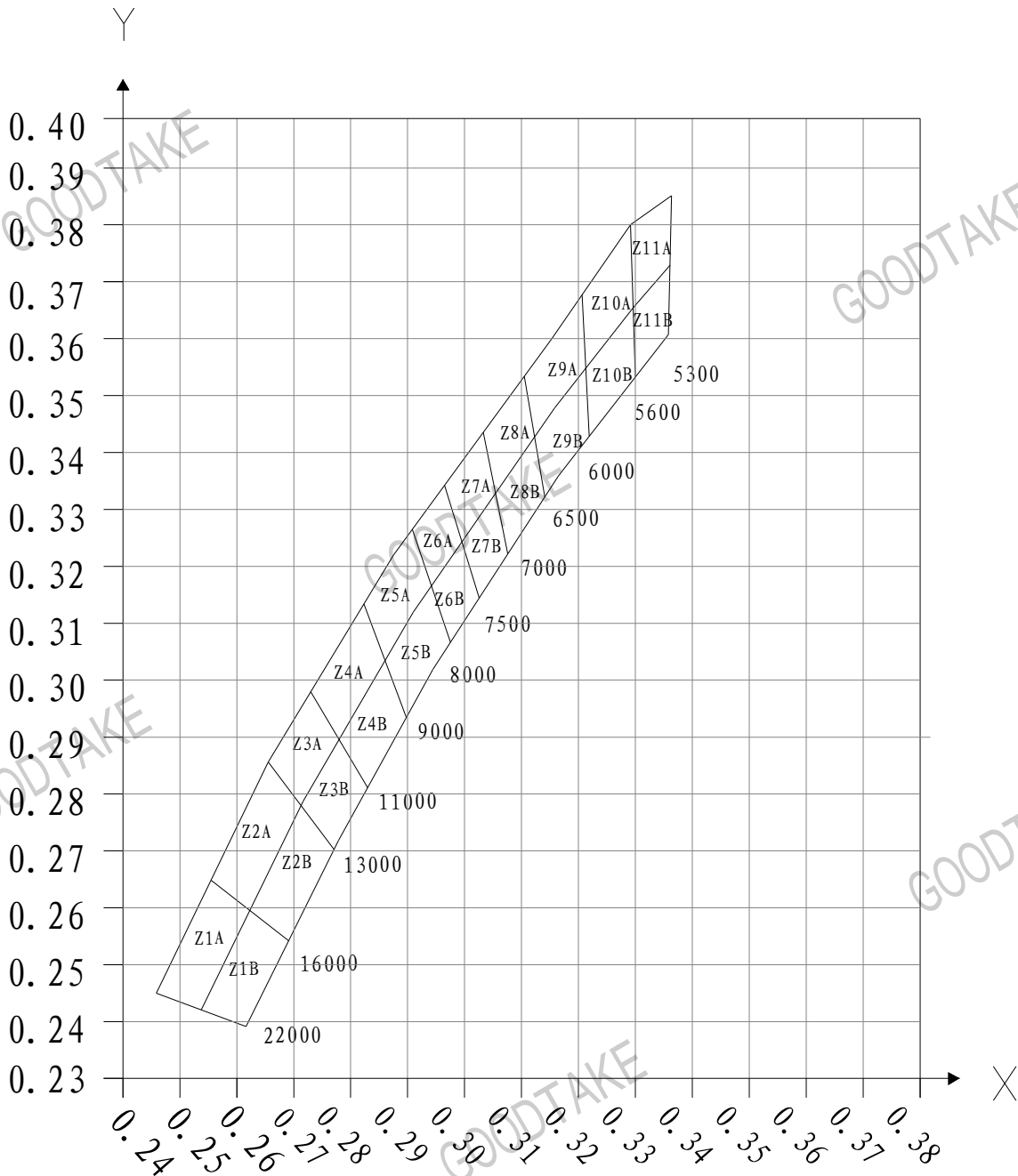
\*Measurement Uncertainty of Luminous Intensity:  $\pm 10\%$ .

**Forward Voltage Combination(V at 20mA)**

<b>Rank T</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Forward Voltage</b>	<b>2.8~2.9</b>	<b>2.9~3.0</b>	<b>3.0~3.1</b>	<b>3.1~3.2</b>
<b>Rank R</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Forward Voltage</b>	<b>3.2~3.3</b>	<b>3.3~3.4</b>	<b>3.4~3.5</b>	<b>3.5~3.6</b>

\*Measurement Uncertainty of Forward Voltage:  $\pm 0.1V$ .

## Color Combination( at 20mA)



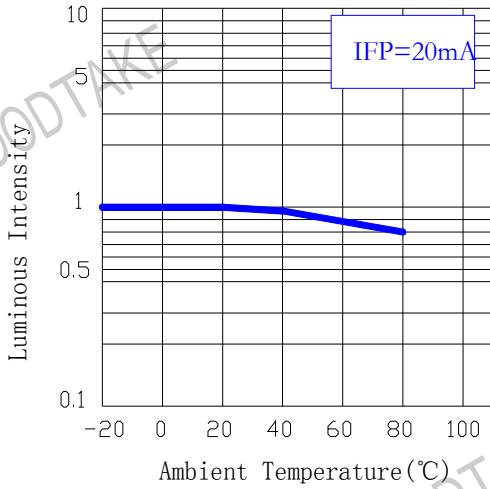
Color Ranks(IF=20mA,Ta=25°C)

Color Ranks		CIE				CCT
Z1	X	0.2459	0.2616	0.2691	0.2555	16000-22000K
	Y	0.2450	0.2391	0.2542	0.2649	
Z2	X	0.2691	0.2555	0.2771	0.2655	13000-16000K
	Y	0.2542	0.2649	0.2702	0.2856	
Z3	X	0.2771	0.2655	0.2830	0.2730	11000-13000K
	Y	0.2702	0.2856	0.2811	0.2980	
Z4	X	0.2830	0.2730	0.2898	0.2823	9000-11000K
	Y	0.2811	0.2980	0.2934	0.3134	
Z5	X	0.2898	0.2823	0.2975	0.2908	8000-9000K
	Y	0.2934	0.3134	0.3066	0.3265	
Z6	X	0.2975	0.2908	0.3026	0.2965	7500-8000K
	Y	0.3066	0.3265	0.3144	0.3343	
Z7	X	0.3026	0.2965	0.3076	0.3033	7000-7500K
	Y	0.3144	0.3343	0.3222	0.3435	
Z8	X	0.3076	0.3033	0.3141	0.3105	6500-7000K
	Y	0.3222	0.3435	0.3322	0.3534	
Z9	X	0.3141	0.3105	0.3219	0.3206	6000-6500K
	Y	0.3322	0.3534	0.3428	0.3677	
Z10	X	0.3219	0.3206	0.3300	0.3291	5600-6000K
	Y	0.3428	0.3677	0.3533	0.3800	
Z11	X	0.3300	0.3291	0.3358	0.3364	5300-5600K
	Y	0.3533	0.3800	0.3607	0.3851	

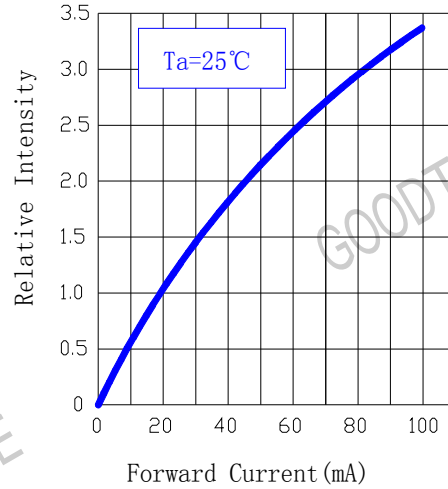
Measurement uncertainty of the color coordinates  $\pm 0.01$

## Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)

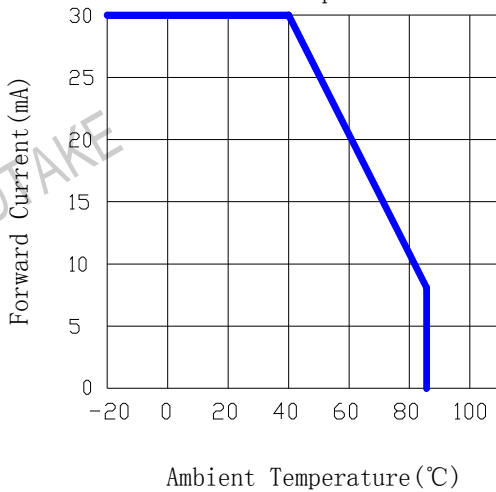
Luminous Intensity vs Ambient Temperature



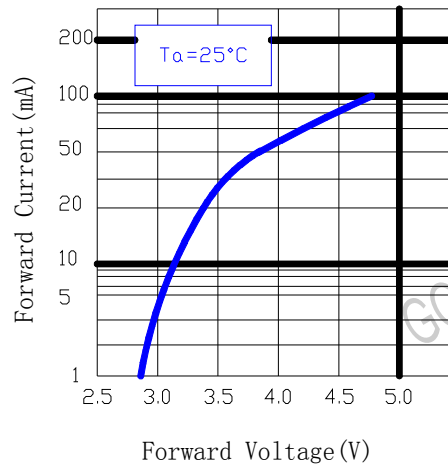
Relative Intensity vs Forward Current (mA)



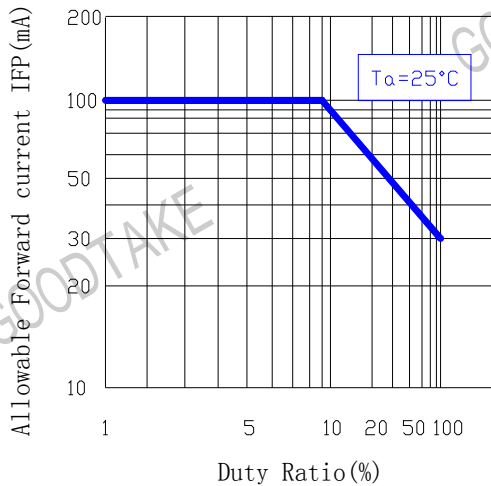
Forward Current vs Ambient Temperature



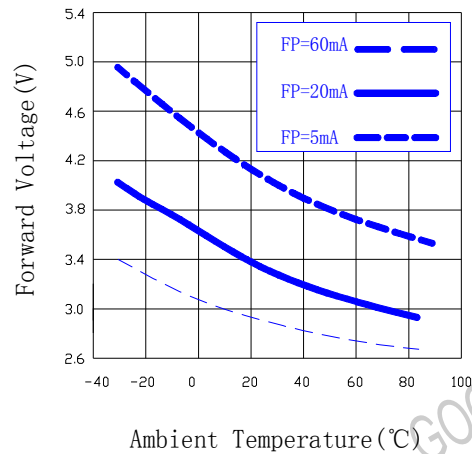
Forward Current vs Forward Voltage



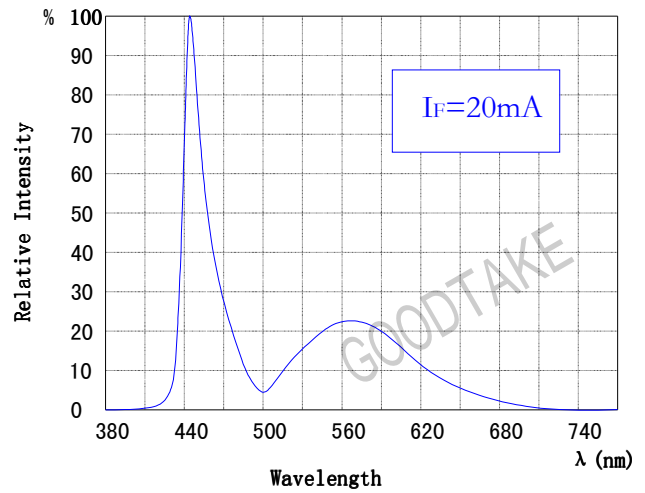
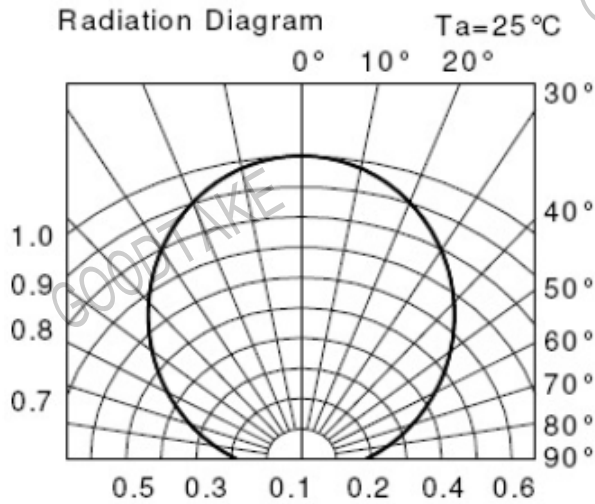
Duty Ratio vs Allowable Forward current



Forward Voltage vs Ambient Temperature



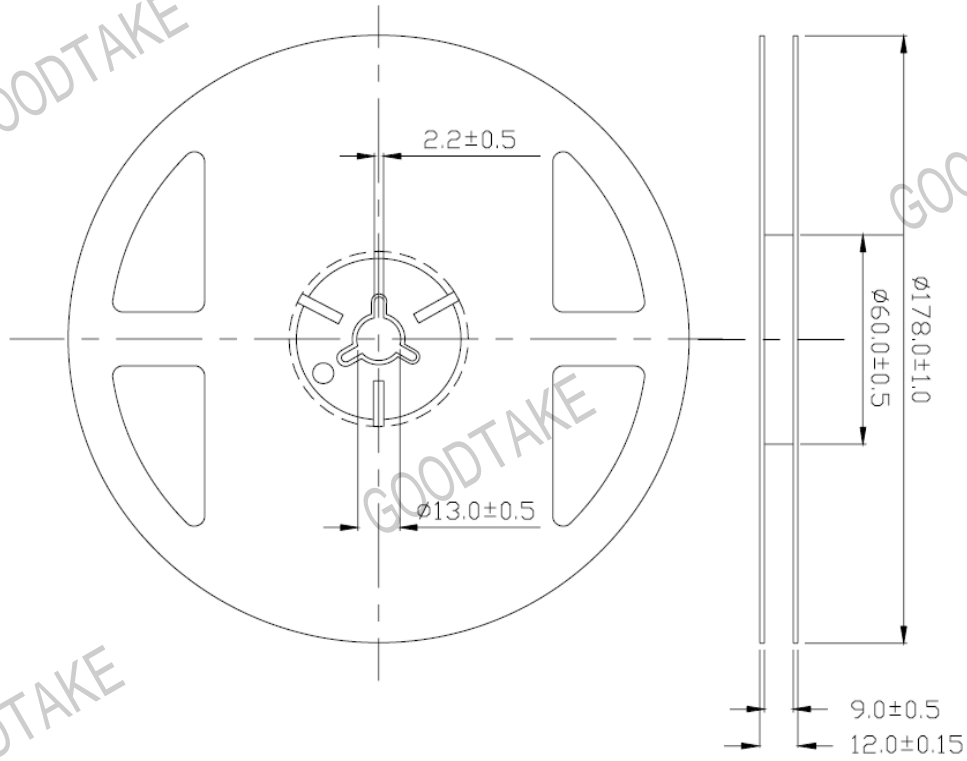




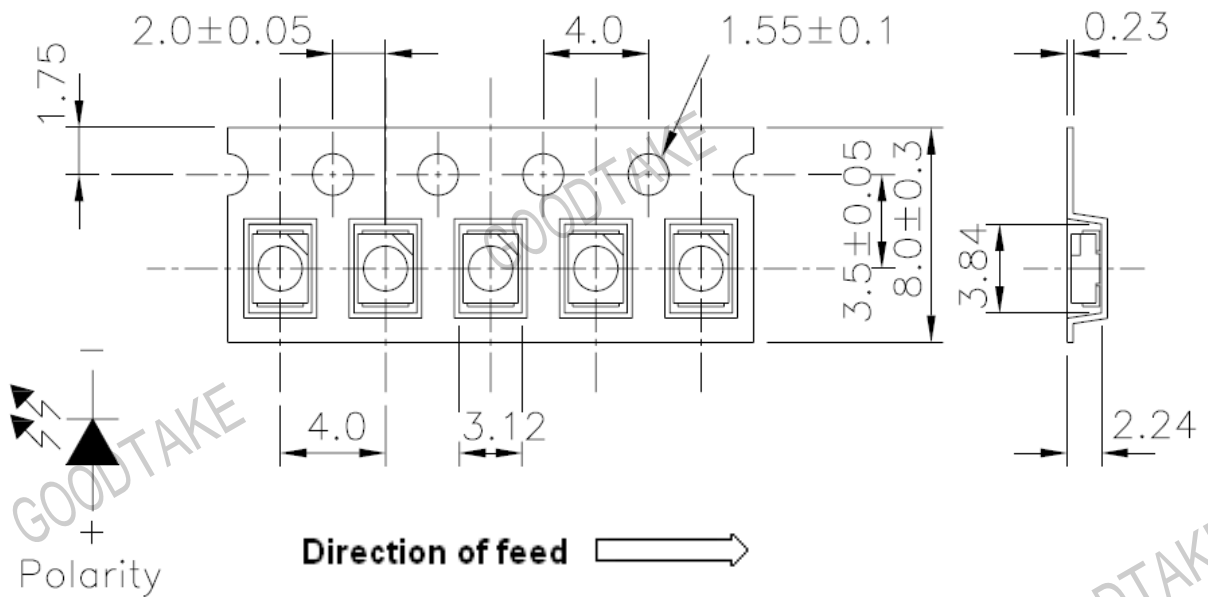
NO	Item	Test Conditions	Test Hours/Cycle	Sample Size	Ac/Re
1	Reflow	TEMP: $260\pm 5^\circ\text{C}$ Min. 5sec.	6 MIN.	22 PCS	0/1
2	Temperature Cycle	H: $+100^\circ\text{C}$ 15min ↓ 5 min L: $-40^\circ\text{C}$ 15min	300 CYCLES	22 PCS	0/1
3	Thermal Shock	H: $+100^\circ\text{C}$ 5min ↓ 10 sec L: $-10^\circ\text{C}$ 5min	300 CYCLES	22 PCS	0/1
4	High Temperature Storage	TEMP: $100^\circ\text{C}$	1000 HRS	22 PCS	0/1
5	Low Temperature Storage	TEMP: $-55^\circ\text{C}$	1000 HRS	22 PCS	0/1
6	DC Operating Life	$I_F = 20 \text{ mA} / 25^\circ\text{C}$	1000 HRS	22 PCS	0/1
7	High Temperature / High Humidity	$85^\circ\text{C} / 85\% \text{RH}$	1000 HRS	22 PCS	0/1

## Taping Specification

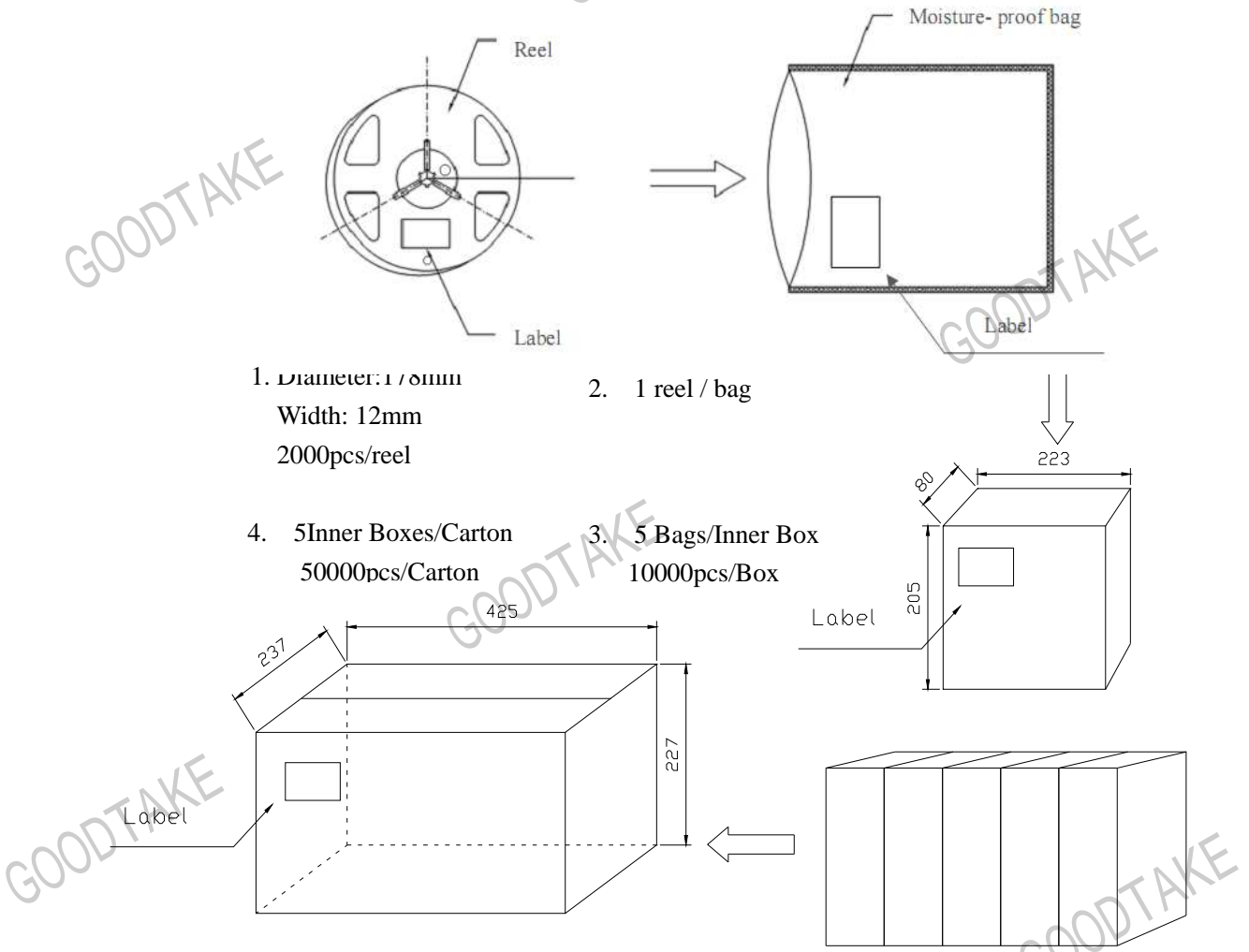
### (1) Shape and dimensions of reels: unit in mm





### (2) Dimensions of tape



## Packing Information



## Reel Label Definition

PART NO. GT3528-4W14BZ

IV : a-b      VF : c-d      CIE : e

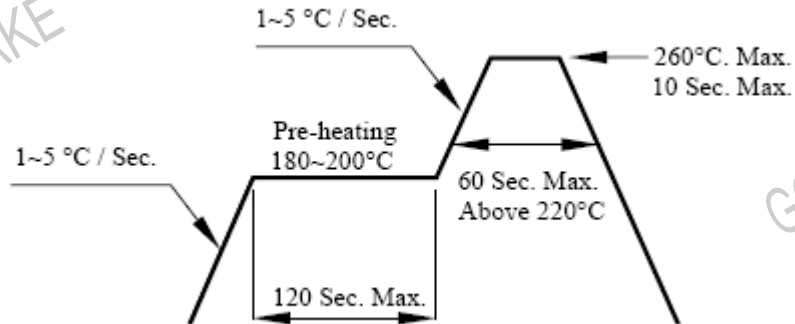
BIN : f/g/e      QTY : h

DATE : 20xx-xx-xx      LOT NO. 10050901

**a-b : brightness range**  
**c-d : forward voltage range**  
**e-f : CIE range**  
**BIN : bright/voltage/CIE**  
**h : quantity of LED**

## Soldering Condition

### 1. Pb-free solder temperature profile



2. Reflow soldering should not be done more than two times.
3. When soldering, do not put stress on the LEDs during heating.
4. After soldering, do not warp the circuit board.

## 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.