

## Features

- 1.2mmx1.2mm RGBW LED
- Full color LED
- Built-in Red / Green / Blue and White quad chip
- High efficiency / high light output
- Pb free and ROHS Compliant product
- SMT compatible package

## Applications

- Indication
- Information boards
- Amusement equipment
- Full color application
- General use

## Description

The IN-S22QAT5R5G5B5W is RGBW LED. It is a SMD type LED which can be used in various applications.

## Recommended Solder Pattern

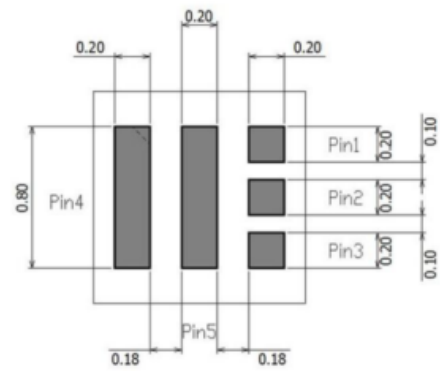
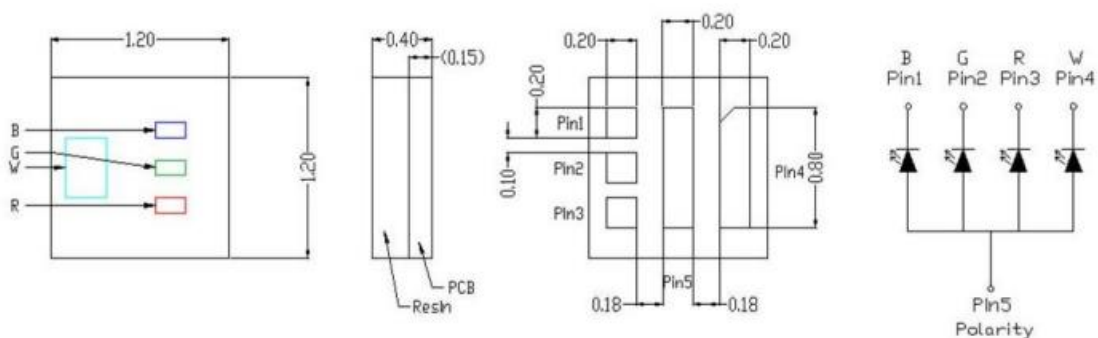


Figure 1. IN-S22QAT5R5G5B5W Solder Pattern

## Package Dimensions in mm



### Notes.

1. All dimensions are in millimeters.
2. Tolerance is  $\pm 0.25$  mm unless otherwise noted

Figure 2. IN-S22QAT5R5G5B5W Package Dimensions

### Absolute Maximum Rating at Ta=25°C

Parameter	Symbol	Max.				Unit
		Red	Green	Blue	White	
Average Forward Current	I <sub>F</sub>	5				mA
Peak Forward Current	I <sub>peak</sub>	5				mA
Reverse Voltage	V <sub>R</sub>	Not designed for reverse operation				-
Power Dissipation	P <sub>D</sub>	13	16	16	16	mW
Operating Temperature Range	T <sub>OPR</sub>	-40 ~ 85				°C
Storage Temperature Range	T <sub>STO</sub>	-40 ~ 85				°C
Lead Soldering Condition (Reflow)	T <sub>SOL</sub>	Below 260°C , Max. 5 seconds				

**Notes**

- D=0.01s duty 1/10.

### ESD Precaution

ATTENTION: Electrostatic Discharge (ESD) protection



The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are STATIC SENSITIVE devices. ESD precaution must be taken during design and assembly. If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

### Electrical Characteristics at Ta=25°C

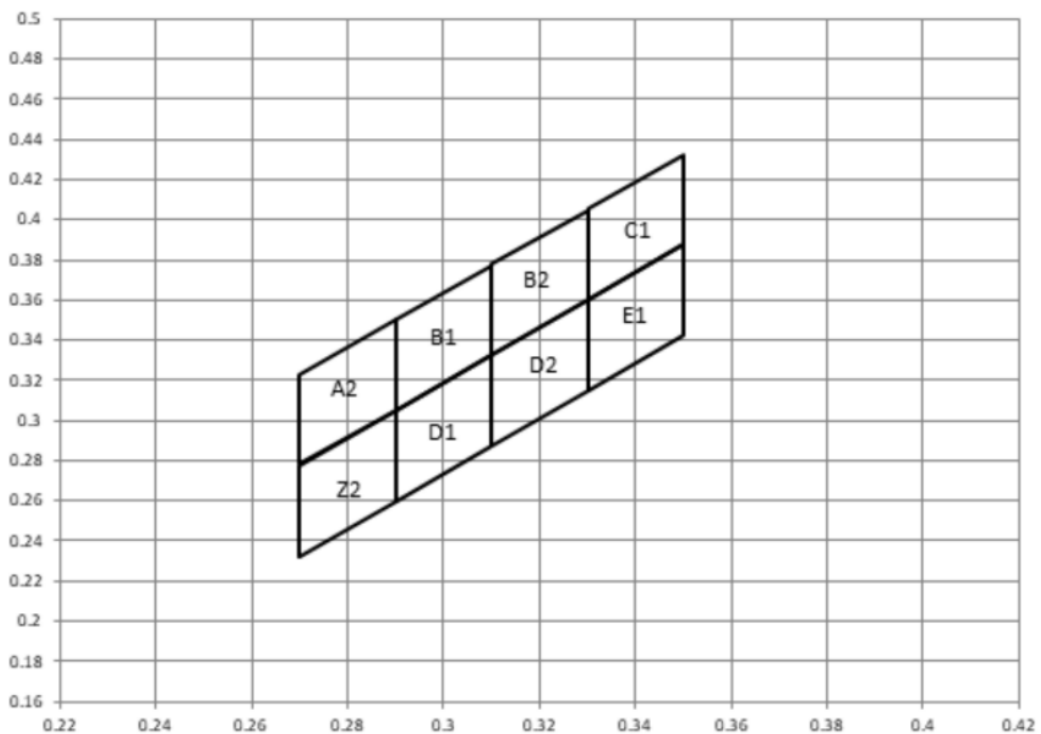
Product	Emission Color	I <sub>F</sub> (mA)	V <sub>F</sub> (V)		λ <sub>d</sub> (nm)	Viewing Angle (°)	Luminous Intensity I <sub>v</sub> (mcd)
			typ.	max	typ.	2θ <sub>1/2</sub>	typ.
IN-S22QAT5R5G5B5W	Red	5	1.8	2.6	622	120	180
	Green	5	2.7	3.2	525	120	500
	Blue	5	2.7	3.2	470	120	95
	White	5	2.9	3.2	Cx=0.33 / Cy=0.33	120	460

#### Notes

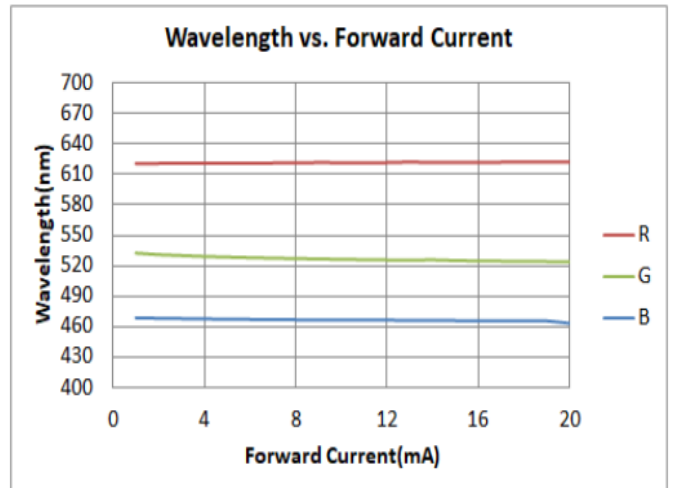
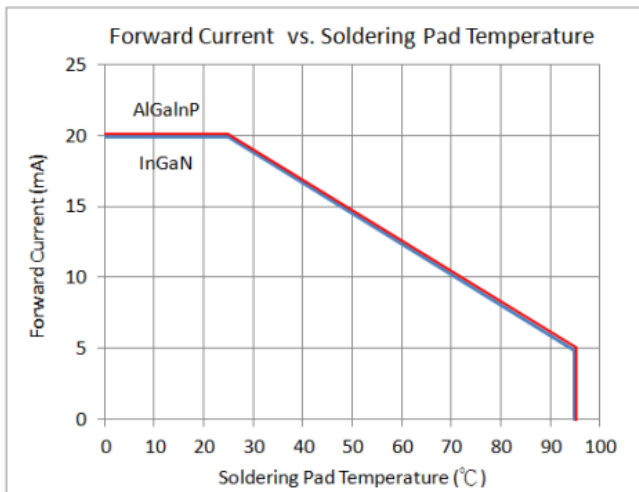
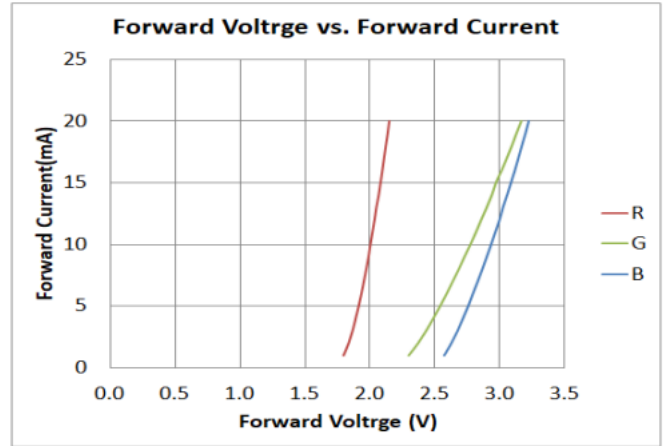
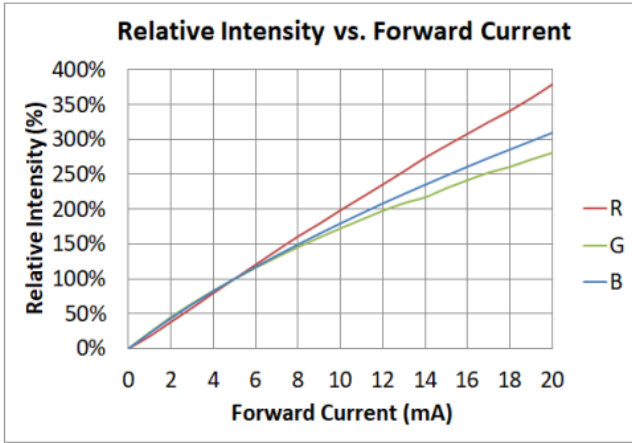
1. Performance guaranteed only under conditions listed in above tables.
2. Viewing angle(2θ<sub>1/2</sub>) ±10°

**Chromaticity Bin (for White only)**

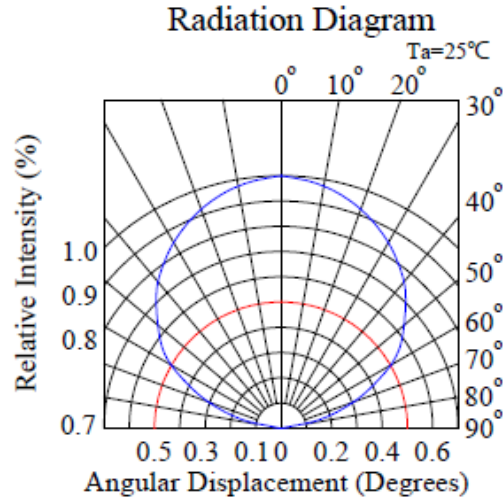
Color	Bin Code	Spec. Range		Bin Code	Spec. Range	
<b>W</b>	<b>A2</b>	X	Y	<b>Z2</b>	X	Y
		0.270	0.278		0.270	0.2325
		0.270	0.323		0.270	0.2775
		0.290	0.350		0.290	0.305
		0.290	0.305		0.290	0.260
	<b>B1</b>	X	Y	<b>D1</b>	X	Y
		0.290	0.3055		0.290	0.260
		0.290	0.3505		0.290	0.305
		0.310	0.3775		0.310	0.3325
		0.310	0.3325		0.310	0.2875
	<b>B2</b>	X	Y	<b>D2</b>	X	Y
		0.310	0.333		0.3100	0.2875
		0.310	0.378		0.3100	0.3325
		0.330	0.405		0.3300	0.3600
		0.330	0.360		0.3300	0.3150
	<b>C1</b>	X	Y	<b>E1</b>	X	Y
		0.330	0.3605		0.330	0.315
		0.330	0.4055		0.330	0.360
		0.350	0.4325		0.350	0.3875
		0.350	0.3875		0.350	0.3425



## Typical Characteristic Curves



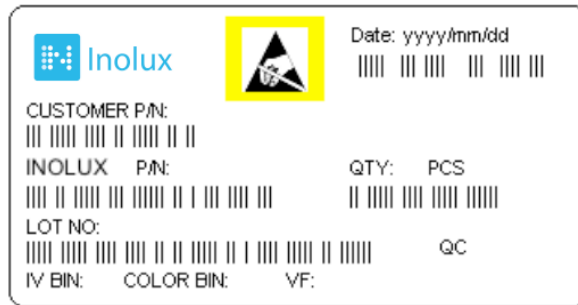
### Typical Characteristic Curves – Radiation Pattern



### Ordering Information

Product	Emission Color	Test Current $I_F$ (mA)	Luminous Intensity $I_V$ (mcd) (Typ.)	Forward Voltage $V_F$ (V) (Typ.)	Orderable Part Number
IN-S22QAT5R5G5B5W	Red	5	180	1.8	IN-S22QAT5R5G5B5W
	Green	5	500	2.7	
	Blue	5	95	2.7	
	White	5	460	2.9	

### Label Specifications



### Inolux P/N:

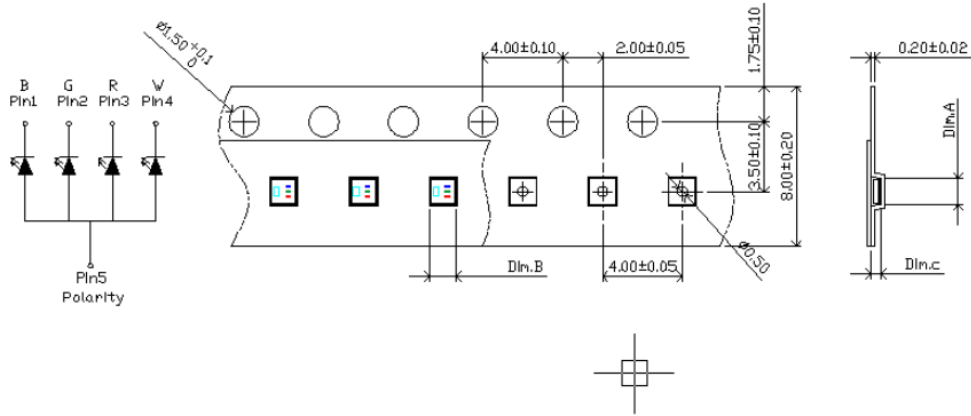
I	N	-	S	2	2	QA	T	5	R	5	G	5-	B	5	W	-	X	X	X	X
			Material	Package	Variation	Orientation	Current	Color	Current	Color	Current	Color	Current	Color	-	Customized Stamp-off				
Inolux	SMD		SMD=S	22QA = 1.2x1.2x0.44mm SMD RGBW	T= Top Mount	5 = 5mA	R= Red	5 = 5mA	G= Green	5 = 5mA	B=Blue	5 = 5mA	W= White	-	-	-	-	-	-	-

### Lot No.:

Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018, .....)				Month	Date	Serial

**Packaging Information: 4000pcs Per Reel**

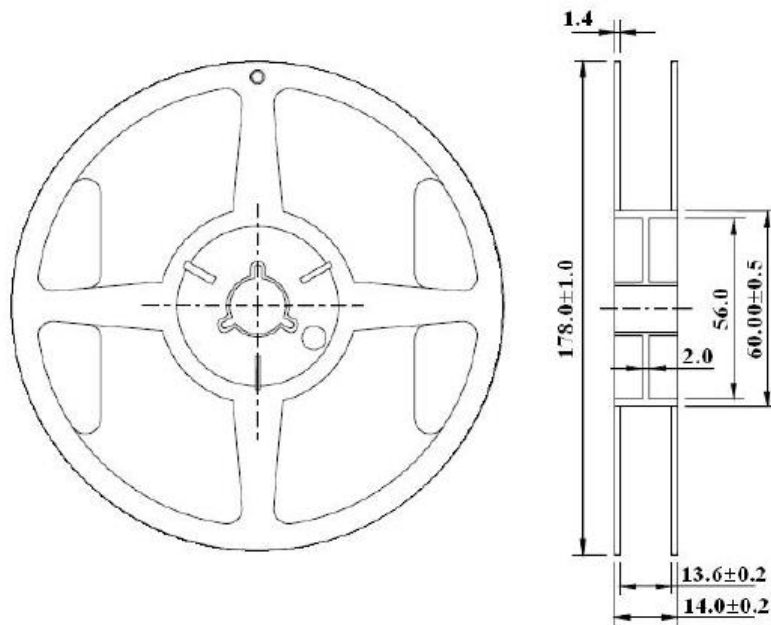
**Tape Dimension**



Dim. A	Dim. B	Dim. C	Q'ty/Reel
1.32±0.05	1.32±0.05	0.52±0.05	4K

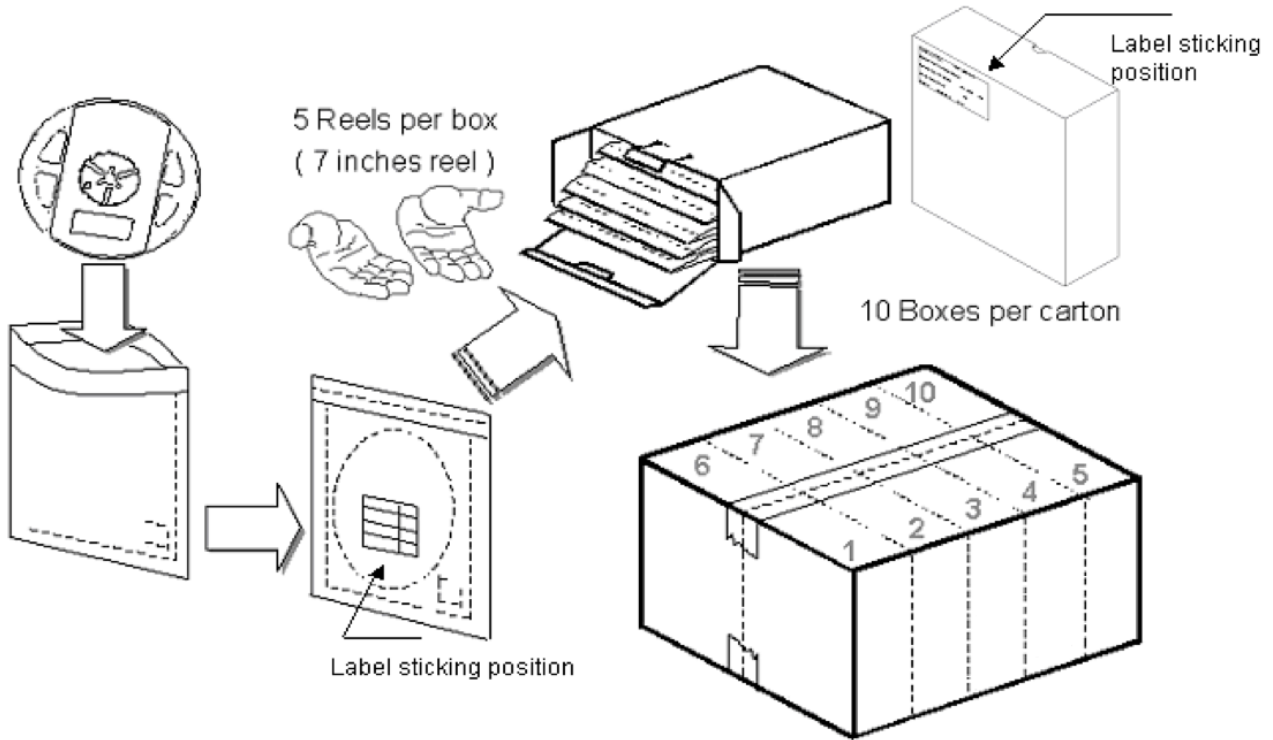
Unit: mm

**Reel Dimensions**





### Packing Dimension



5 boxes per carton are available depending on shipment quantity.

	Specification	Material	Quantity
Carrier tape	Per EIA 481-1A specs	Conductive black tape	4000 pcs
Reel	Per EIA 481-1A specs	Conductive black	
Label	IN standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	IN standard	Paper	Non-specified

**Others:**

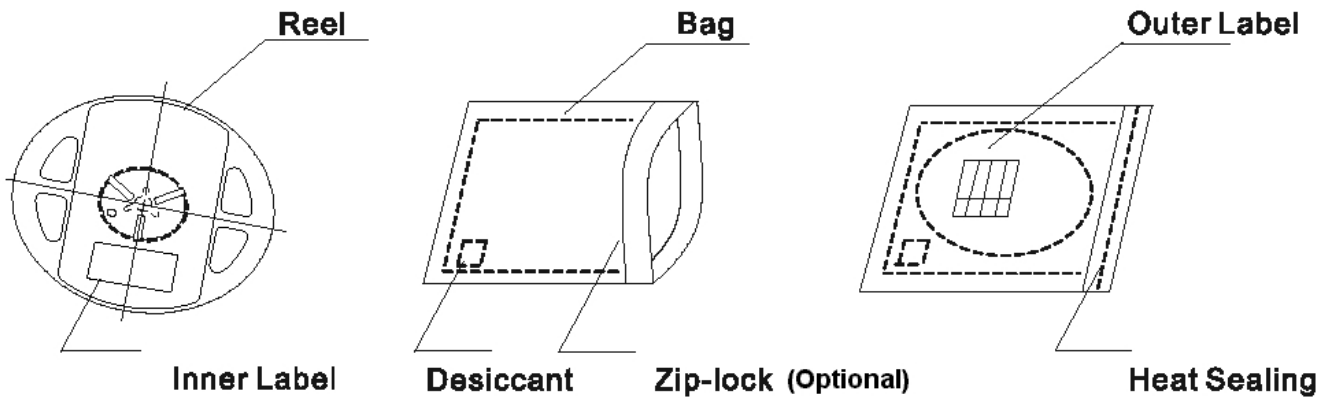
Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of  $I_v$ ,  $\lambda_D$  and  $V_f$ . Each reel has a label identifying its specification; the immediate box consists of a product label as well.

## Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:

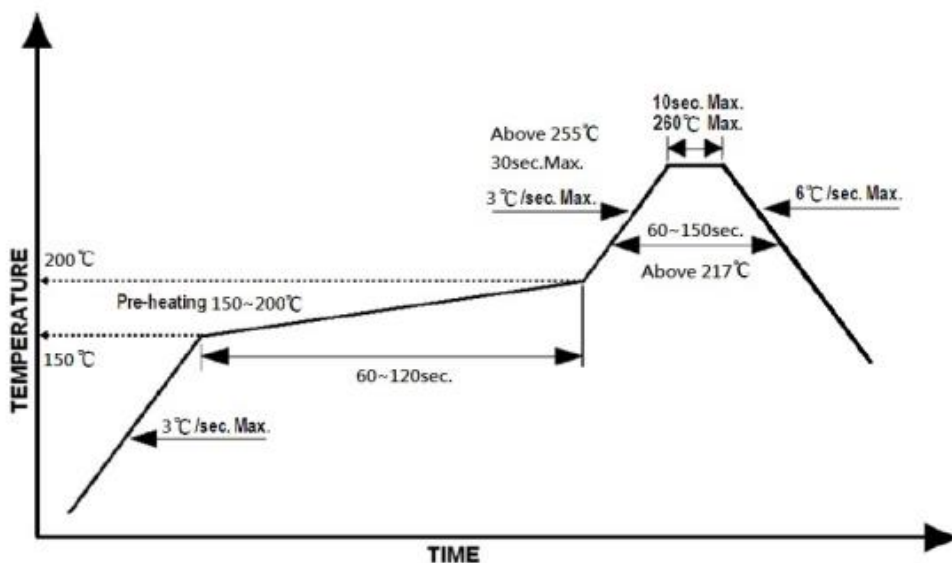


## Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 217 OC ,60-150 sec.
2. Peak temp.:260 OCMax.10sec Max
3. Never take next process until the component is cooled down to room temperature after reflow.
4. The recommended reflow soldering profile (measuring on the surface of the LED terminal) is following:
5. Reflow soldering should not be done more than two times.

### Lead-free Solder Profile



## Precautions

- Avoid exposure to moisture at all times during transportation or storage.
- Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
- It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage.
- Avoid operation beyond the limits as specified by the absolute maximum ratings.
- Avoid direct contact with the surface through which the LED emits light.
- If possible, assemble the unit in a clean room or dust-free environment.

## Reworking

- Rework should be completed within 5 seconds under 260 °C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

## Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

## Cautions of Pick and Place

- Avoid stress on the resin at elevated temperature.
- Avoid rubbing or scraping the resin by any object.
- Electro-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

## Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release (Preliminary)		V0.1	08-25-2023
Updated		V1.0	05-10-2024

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