

**Harvatek Surface Mount CHIP LEDs Data Sheet  
B31G3BGR-20C0001Q3U1930**



Official Product	HT Part No. B31G3BGR-20C0001Q3U1930	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	
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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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## Product Specifications

Item	Specification	Material	Quantity
Luminous Intensity(Iv)	R : 540-1150 mcd G : 800-1840 mcd B : 210-550 mcd @20mA/ T <sub>S</sub> = 25°C;Tolerance: ± 10%		
Wavelength	R : 620.0-630.0 nm G : 517.0-527.0 nm B : 462.0-472.0 nm @20mA/ T <sub>S</sub> = 25°C;Tolerance: ± 0.5nm		
Vf	R : 1.8-2.4 V G : 2.6-3.4 V B : 2.6-3.4 V @20mA/ T <sub>S</sub> = 25°C ;Tolerance: ± 0.05V		
Ir	< 1 μA @ V <sub>R</sub> = 5V		
Resin	Clear	Epoxy	
Carrier tape	EIA 481-1A specs	Conductive black tape	3000ea/reel
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	230x250mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT 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 Iv, λ<sub>D</sub> and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

※Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

**ATTENTION: Electrostatic Discharge (ESD) protection**

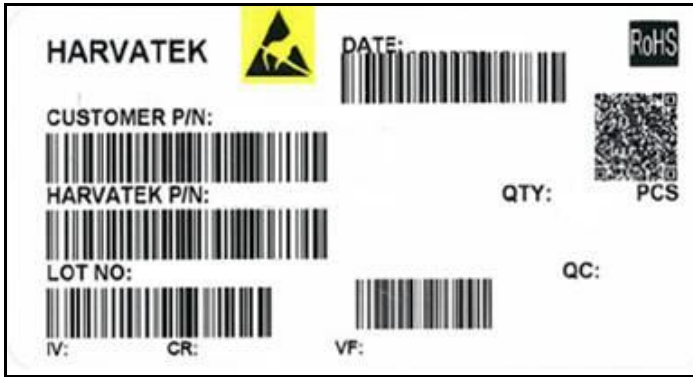


The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlGaInP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD 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.

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## Label Specifications



### Harvatek P/N:

**B            31G                            3            BGR-    20C-            0001                            Q3**

Product	Package	Dice Qty	Color	Current	Series Number	Taping
PCB	3.2(L)x1.5(W)x1.0(H) mm	3:Tri	BGR : RGB(Full Color)	20mA	X001~XZZZ	1.Taping style 2. Qty

### Lot No.:

1	2	3	4	5	6	7	8	9	10
E	1	A	1	A	2	2	L	1	2
Code 1 2		Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10
		Mfg. Year	Mfg. Month	Mfg. Date	Consecutive number		Special code		
Internal Tracing Code		2020-L 2021-M 2022-P 2023-Q ... 2026-T 2027-V ... 2030-Y 2031-Z ...	1:Jan. 2:Feb. ... A:Oct. B:Nov. C:Dec.	1:A 2:B 3:C ... 26:Z 27:7 28:8 29:9 30:3 31:4	01-ZZ		000-ZZZ		

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## Specifications Range

### ■ Luminous Intensity (Iv) Bin:

Luminous Intensity (Iv) Bin:R/G/B@20mA

HT-B31G3BGR Series								
IV								
Red			Green			Blue		
KR2	540	790	KG2	1150	1840	KB2	210	340
KR3	790	1150				KB3	340	550

Note: It maintains a tolerance of  $\pm 10\%$  on luminous intensity

### Dominant Wavelength ( $\lambda D$ ) Bin:

HT-B31G3 BGR Series								
WD								
Red			Green			Blue		
R1	620	625	G1	517	522	B1	462	467
R2	625	630	G2	522	527	B2	467	472

Note: It maintains a tolerance of  $\pm 0.5\text{nm}$  on color

### Forward Voltage (Vf) Bin:

HT-B31G3BGR Series								
VF								
Red			Green			Blue		
F	1.8	2.4	G38	2.6	3.4	G38	2.6	3.4

Note: It maintains a tolerance of  $\pm 0.05\text{V}$  on forward voltage measurements

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## Product Features

### Electro-Optical Characteristics

(T<sub>Soldering</sub>, 25 °C)

Series	Emitting Color	Material	V <sub>F</sub> (V)		Wavelength λ(nm)			I <sub>v</sub> (mcd)	Viewing Angle 2θ <sub>1/2</sub>
			typ	max	λ <sub>D</sub>	λ <sub>P</sub>	Δλ	Typical	
B31G3BGR-20	Red	AllnGaP	2.0	2.4	620	630	20	950	110
	Green	InGaN	2.6	3.4	526	518	30	1500	110
	Blue	InGaN	2.6	3.4	468	463	20	330	110

### Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

(Unit:mm Tolerance: +/-0.1)

Outline Dim.	Suggest Soldering Pattern
Soldering terminals may shift in the x, y direction.	

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(T<sub>Soldering</sub> 25 °C)

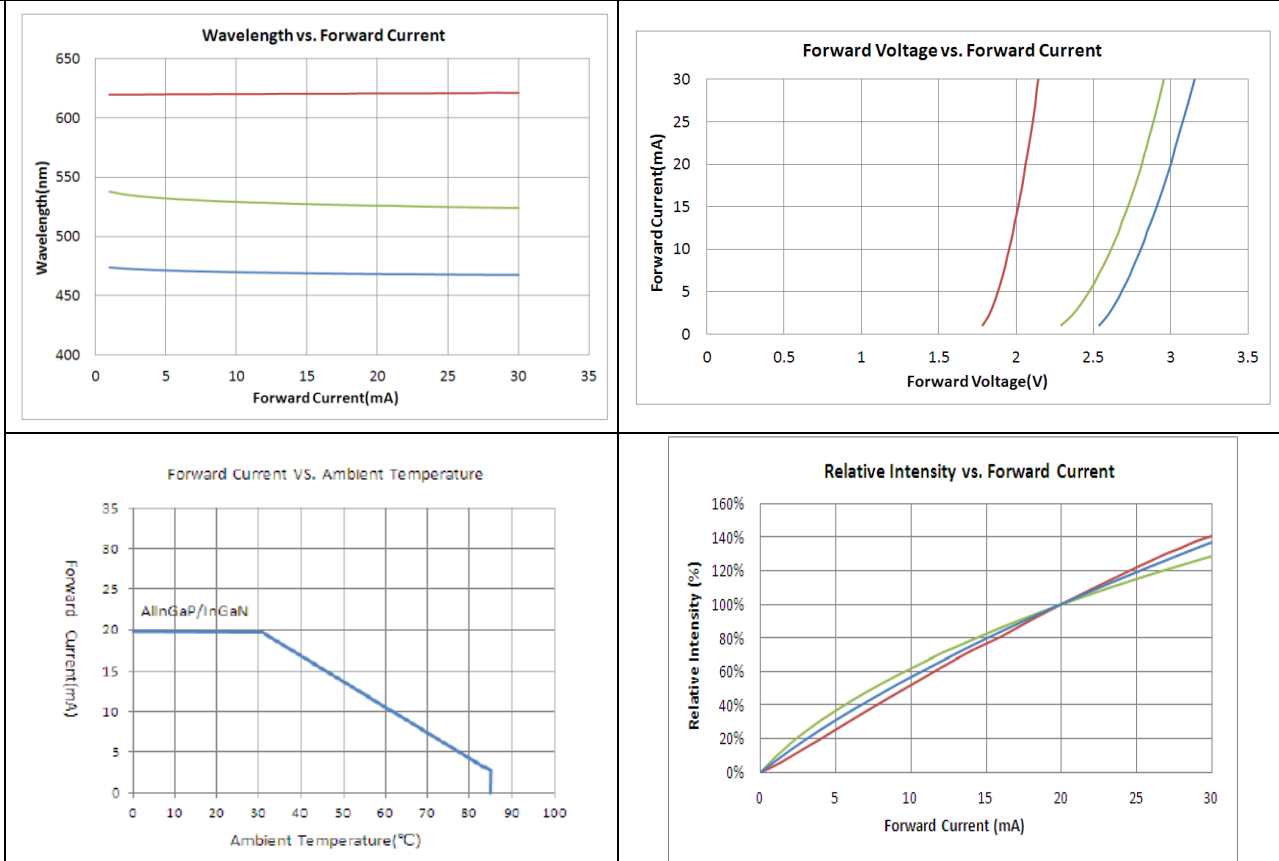
## Absolute Maximum Ratings

Series	P <sub>D</sub> (mW)	V <sub>R</sub> (V)	I <sub>F</sub> (mA)	I <sub>FP</sub> (mA)*	Top (°C)
Color	Power Dissipation	Reverse Voltage	Forward Current	Pulse Forward Current	Operating Temperature
Red	45	5	20	≤100	-40~85
Green	56	5	20	≤80	
Blue	60	5	20	≤80	

\*Condition for I<sub>FP</sub> is pulse of 1/10 duty and 0.1msec width

\*Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

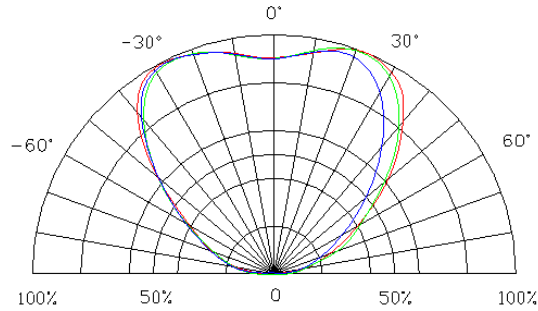
## Characteristics of B31G3BGR -20C



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## Directive Characteristics



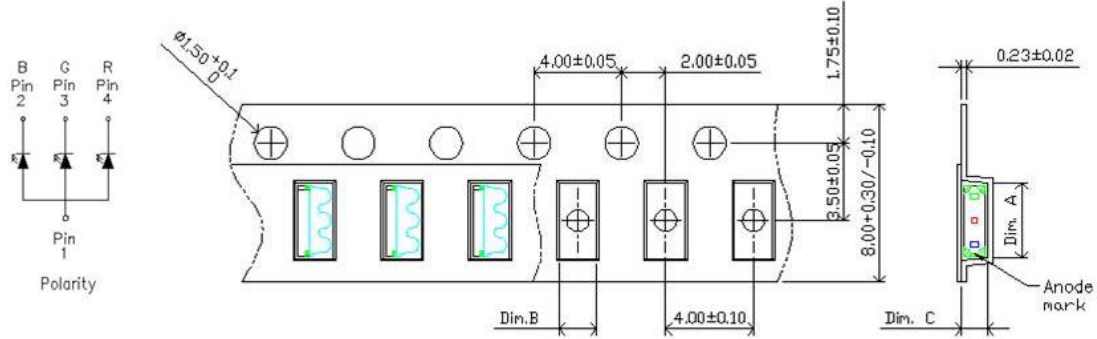
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### Precaution for Use

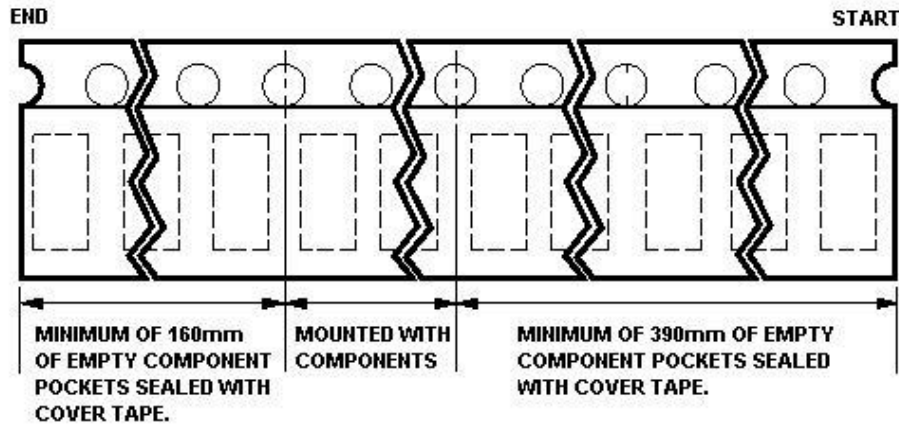
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 72 hours after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
6. The LEDs are sensitive to the static electricity and surge. It is strongly recommended to use a grounded wrist band and anti-electrostatic glove when handling the LEDs. If a voltage over the absolute maximum rating is applied to LEDs, it will damage LEDs. Damaged LEDs will show some abnormal characteristics such as remarkable increase of leak current, lower turn-on voltage and getting unlit at low current.

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## Packaging Tape Dimension

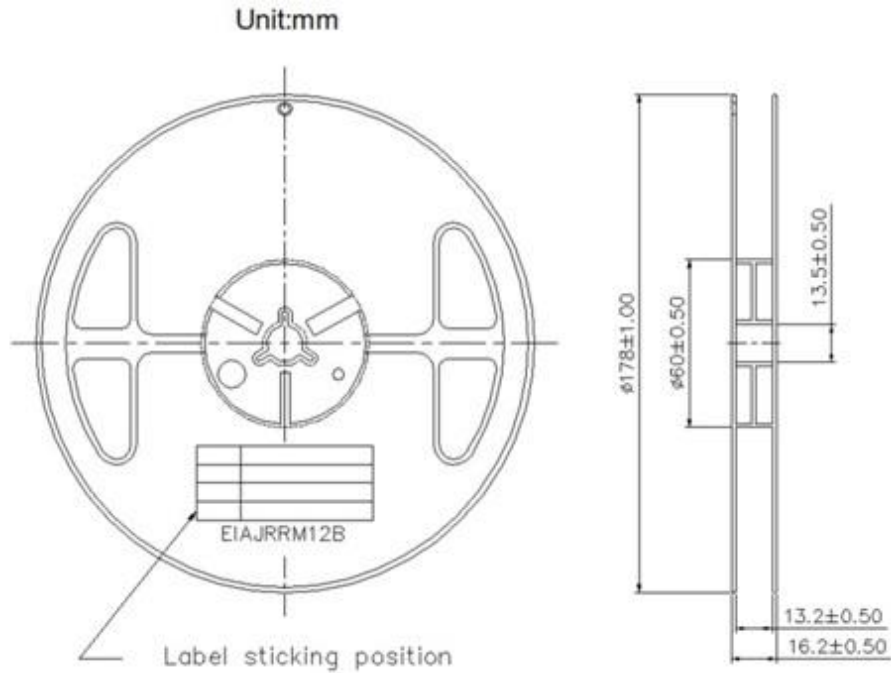


Dim. A	Dim. B	Dim. C	Qty/Reel
$3.43 \pm 0.10$	$1.73 \pm 0.10$	$1.15 \pm 0.10$	3K

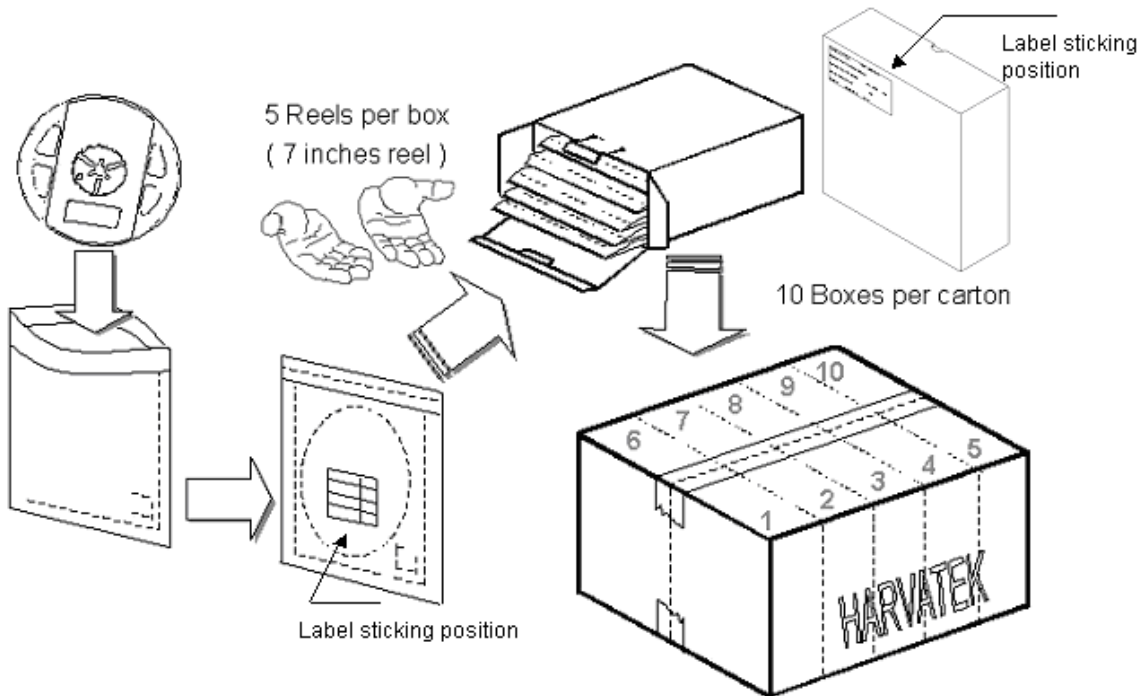


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## Reel Dimension



## Packing



5 boxes per carton is available depending on shipment quantity.

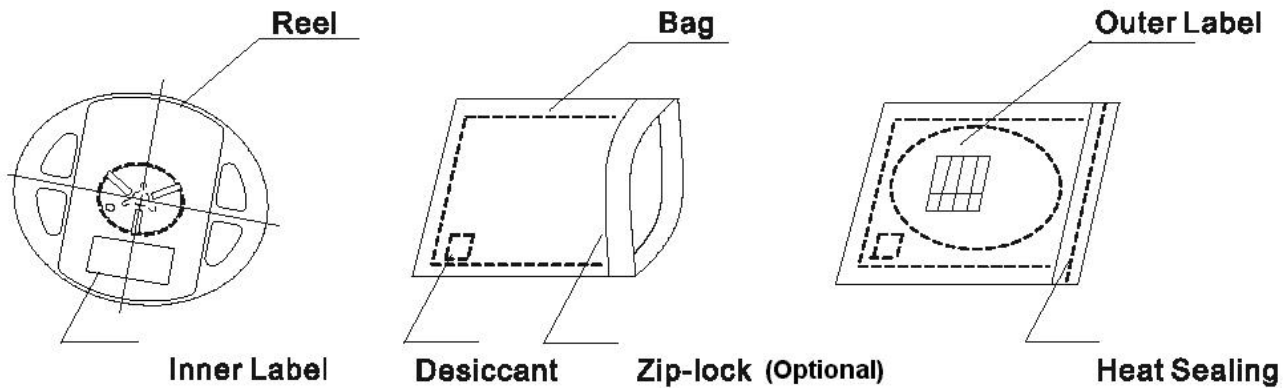
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## Dry Pack

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.

A humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



## Baking

Baking before soldering is recommended when the package has been unsealed for 72 hours.

The conditions are as followings:

1.  $60 \pm 3^{\circ}\text{C} \times (12 \sim 24\text{hrs})$  and  $< 5\% \text{RH}$ , taped reel type.
2.  $100 \pm 3^{\circ}\text{C} \times (45\text{min} \sim 1\text{hr})$ , bulk type.
3.  $130 \pm 3^{\circ}\text{C} \times (15\text{min} \sim 30\text{min})$ , bulk type.

## Precautions

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

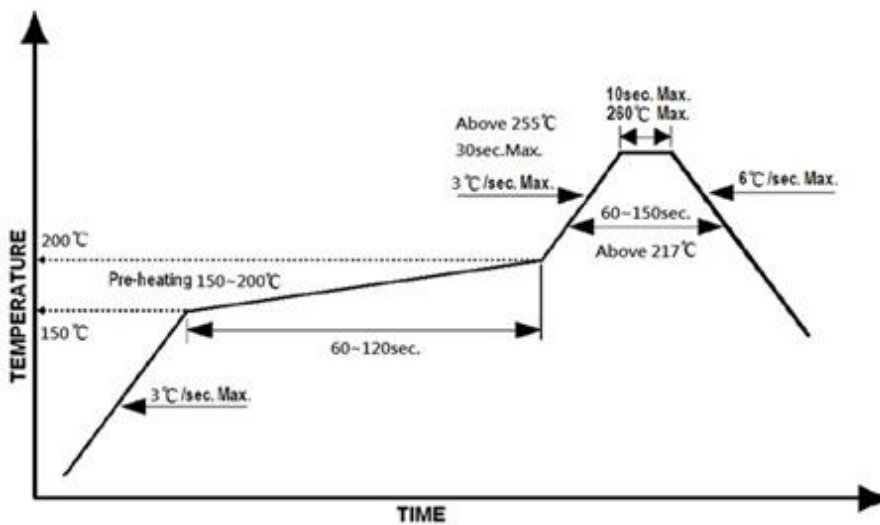
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## Reflow Soldering

Recommend soldering paste specifications:

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

Lead-free Solder Profile



## 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
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

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### Cautions of Pick and Place

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

### Revise History

Rev.	Descriptions	Date	Page
1.0	-	02/23/2017	-
1.1	Modify soldering pattern	03/22/2018	P7
1.2	Modify the opening time	11/20/2018	P10、P13
1.3	Modify the Absolute Maximum Ratings	06/09/2022	P8
1.4	Added operating temperature	06/14/2022	P8
1.5	Modify the Pulse Forward Current	06/23/2022	P8

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