

Harvatek Surface Mount CHIP LEDs Data Sheet
B3N04BGRW05D0002H4U1930
(Preliminary)

Official Product	HT Part No. B3N04BGRW05D0002H4U1930		
Tentative Product	*****	*****	*****
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DISCLAIMER

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HARVATEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of HARVATEK or HARVATEK INTERNATIONAL. As used herein:

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)	B: min71.5 mcd G: min360 mcd R: min112.5 mcd W: min360 mcd @5mA/ T _s = 25°C;Tolerance: ±10%		
Dominant Wavelength	B:460.0-475.0 nm G:515.0-535.0 nm R:615.0-630.0 nm @5mA/ T _s = 25°C;Tolerance: ±1.0nm		
Chromaticity Coordinate	As page 7 @5 mA/ T _s = 25°C;Tolerance:±0.007		
Forward Voltage	B/G:2.4-3.4V ,W:2.2-3.2V R:1.6-2.4V @5mA/ T _s = 25°C;Tolerance:±0.1V		
I _r	< 1 μA @ V _R = 5 V		
Resin	Diffused	Silicon	
Carrier tape	EIA 481-1A specs	Conductive black tape	
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	250x230mm	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 I_v, λ_D 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

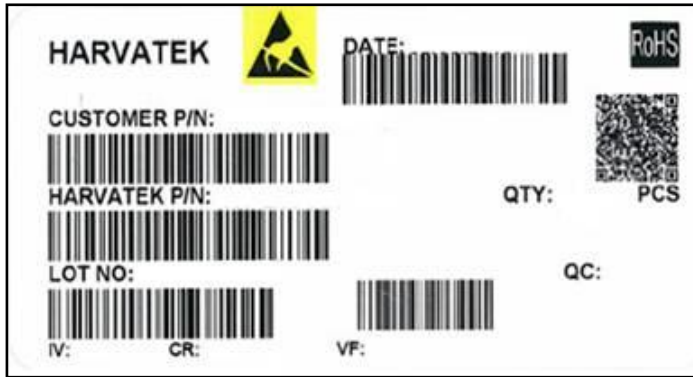


The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlGaInP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD 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 3N0 4 BGRW 05D- 0002 H4

Product	Package	Dice Q'ty	Color	Current	Series Number	Taping
L/F	1.2(L) x 1.2(W) x 0.4(H) mm	4:Four	W:White \ B:Blue G:Green \ R:Red	5mA	X001~XZZZ	1.Taping style 2. Q'ty

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:

Color	Bin Code	Spec. Range
B	Q	71.5-112.5 mcd
	R	112.5-180 mcd
	S	180-285 mcd
G	U	360-450 mcd
	V	450-560mcd
	W	560-715 mcd
R	R	112.5-180 mcd
	S	180-285 mcd
	T	285-360 mcd
W	U	360-450 mcd
	V	450-560 mcd

Note: It maintains a tolerance of $\pm 10\%$ on Luminous Intensity

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■ Dominant Wavelength (Wd) Bin:

Color	Bin Code	Spec. Range
B	AA	460.0-465.0 nm
	AB	465.0-470.0 nm
	AC	470.0-475.0 nm
G	A	515.0-520.0 nm
	B	520.0-525.0 nm
	C	525.0-530.0 nm
	D	530.0-535.0 nm
R	R1	615.0-620.0 nm
	R2	620.0-625.0 nm
	R3	625.0-630.0 nm

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

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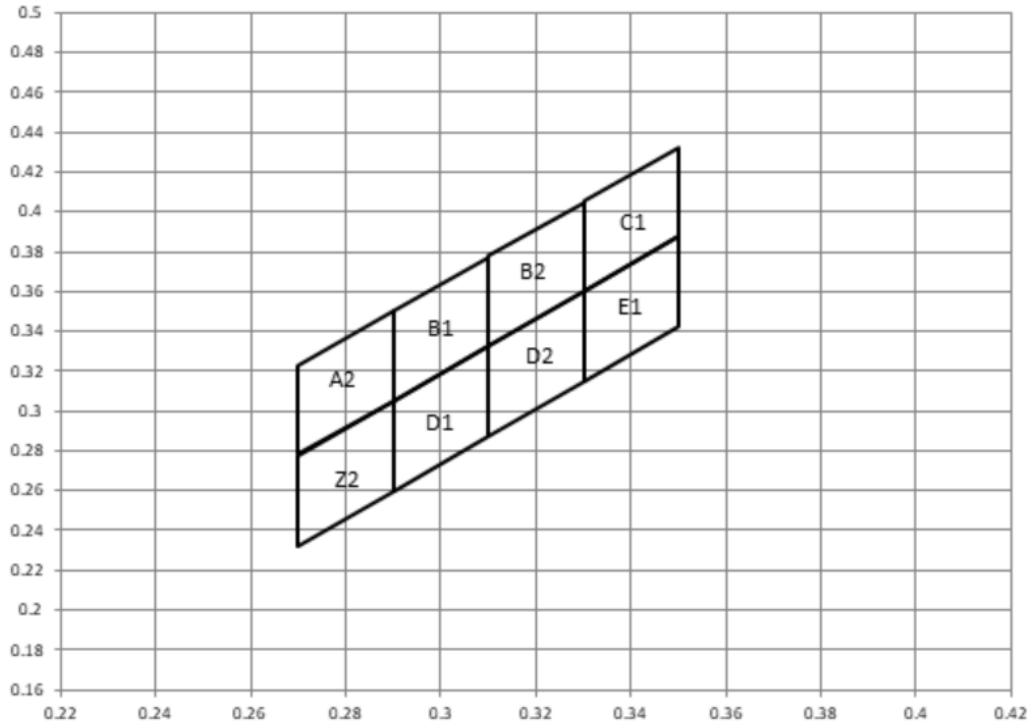
■ Color Bin:

Color	Bin Code	Spec. Range		Bin Code	Spec. Range	
W	A2	X	Y	Z2	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
	B1	X	Y	D1	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
	B2	X	Y	D2	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
	C1	X	Y	E1	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

Note: It maintains a tolerance of x,y ±0.007

■ Chromaticity Coordinate

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Forward Voltage (Vf) Bin:

Color	Bin Code	Spec. Range
B/G	G1A	2.4-3.4
R	E18	1.6-2.4
W	VW1	2.2-3.2

Note: It maintains a tolerance of $\pm 0.1V$ on forward voltage measurements

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Product Features

Electro-Optical Characteristics

(T_{Soldering} 25 °C)

Code for parts	Lighting Color	Material	Forward Voltage (V)		Dominant Wavelength /Chromaticity Coordinate TYP. nm / CIE (X,Y)	Iv (mcd) typ	IF (mA)	Viewing Angle $2\theta \frac{1}{2}$
			typ.	Max				
B3N04BGRW	Blue	InGaN	2.7	3.2	470	95	5	120
	Green	InGaN	2.7	3.2	525	500		
	Red	AllnGaP	1.8	2.6	622	180		
	White	InGaN	2.9	3.2	X=0.33 Y=0.33	460		

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_{Soldering} 25 °C)

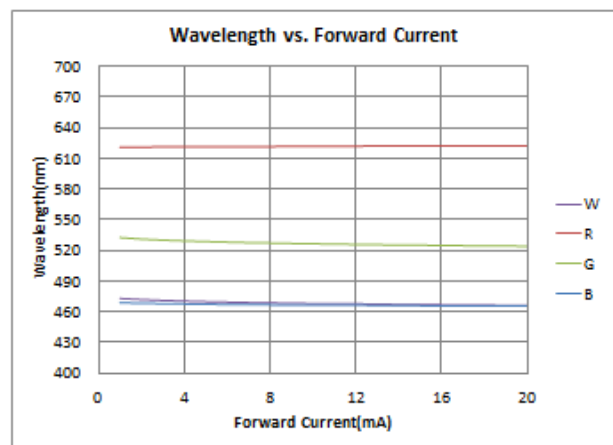
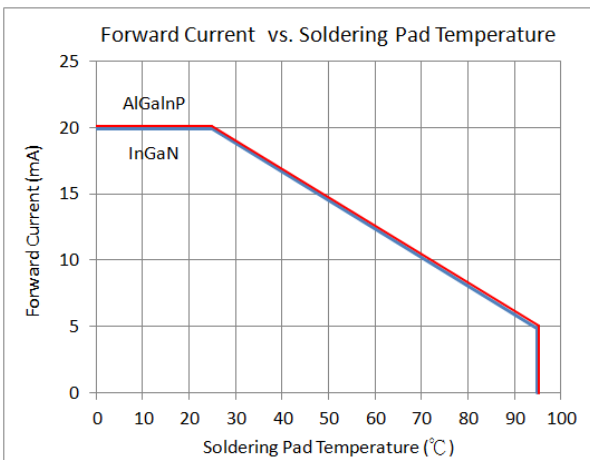
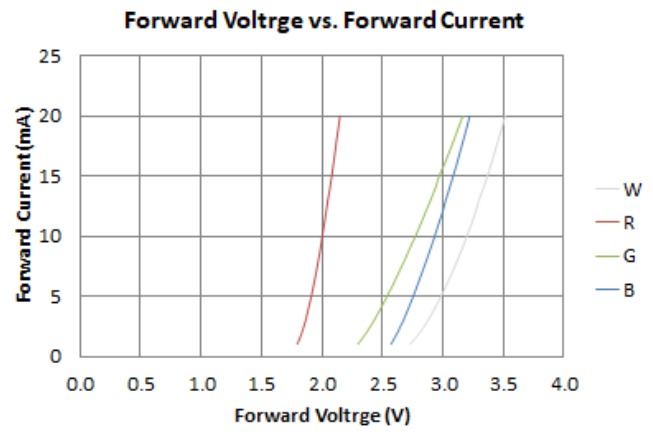
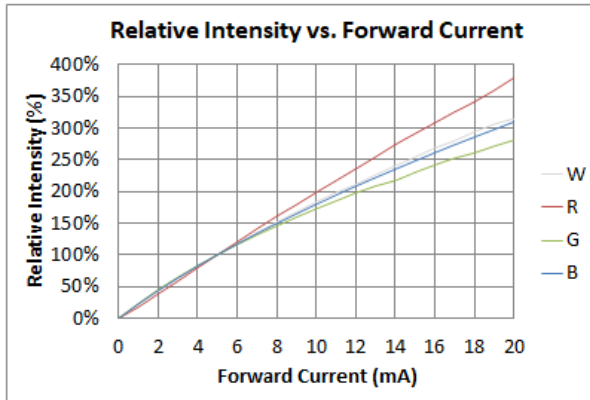
Absolute Maximum Ratings

Series	P _D (mW)	V _R (V)	I _F (mA)	I _{FP} (mA)*	Top(°C)
Color	Power Dissipation	Reverse Voltage	Forward Current	Pulse Forward Current	Operating Temperature
Red	13	5	5	25	-40~+85
Green	16	5	5	25	
Blue	16	5	5	25	
White	16	5	5	20	

*Condition for I_{FP} 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 B3N04BGRW



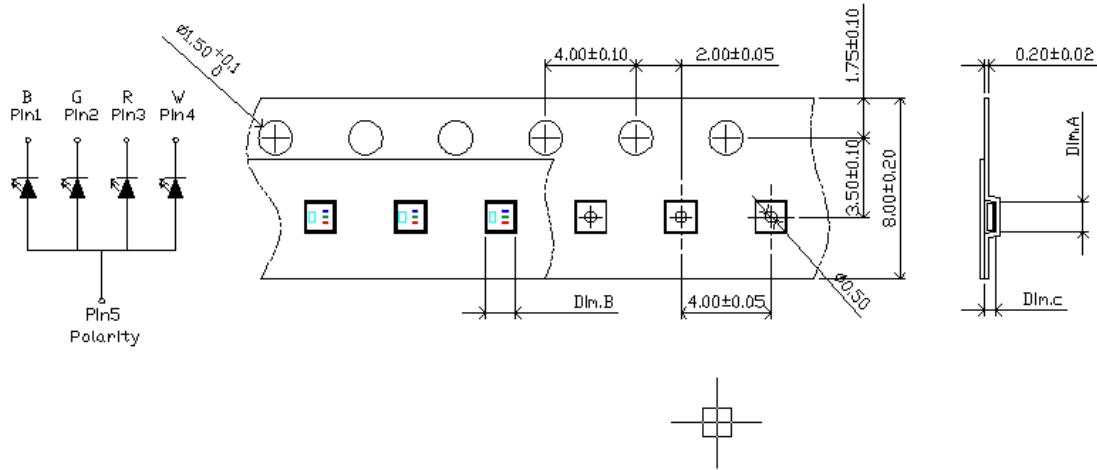
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Precaution for Use

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 hrs 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.

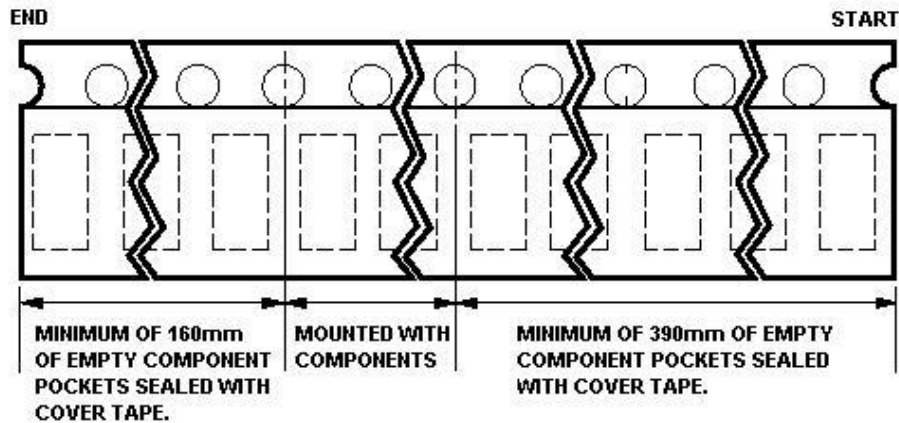
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Packaging Tape Dimension



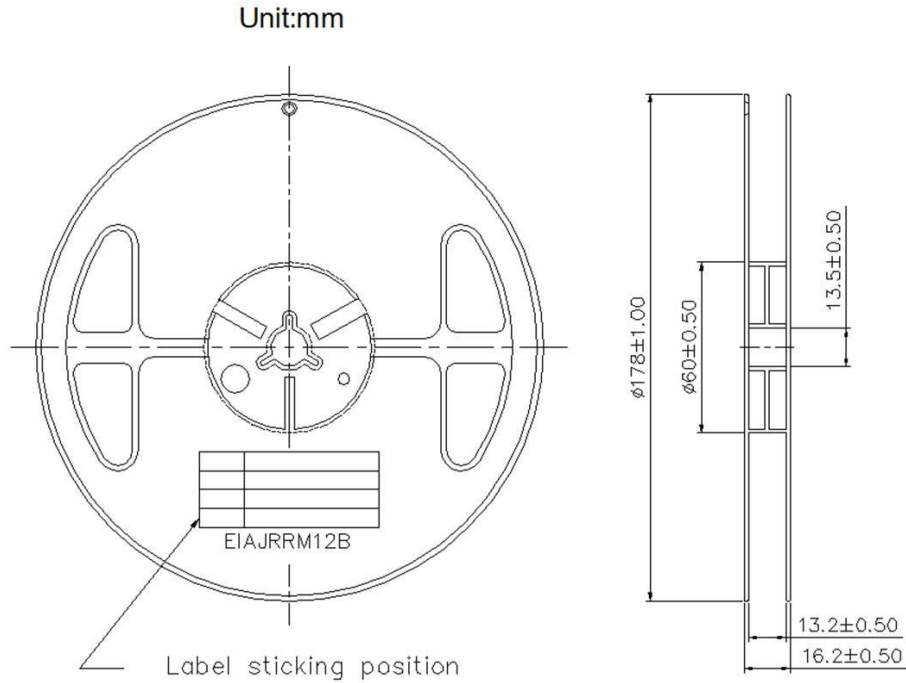
Dim. A	Dim. B	Dim. C	Q'ty/Reel
1.32 ± 0.05	1.32 ± 0.05	0.52 ± 0.05	4K

Unit: mm

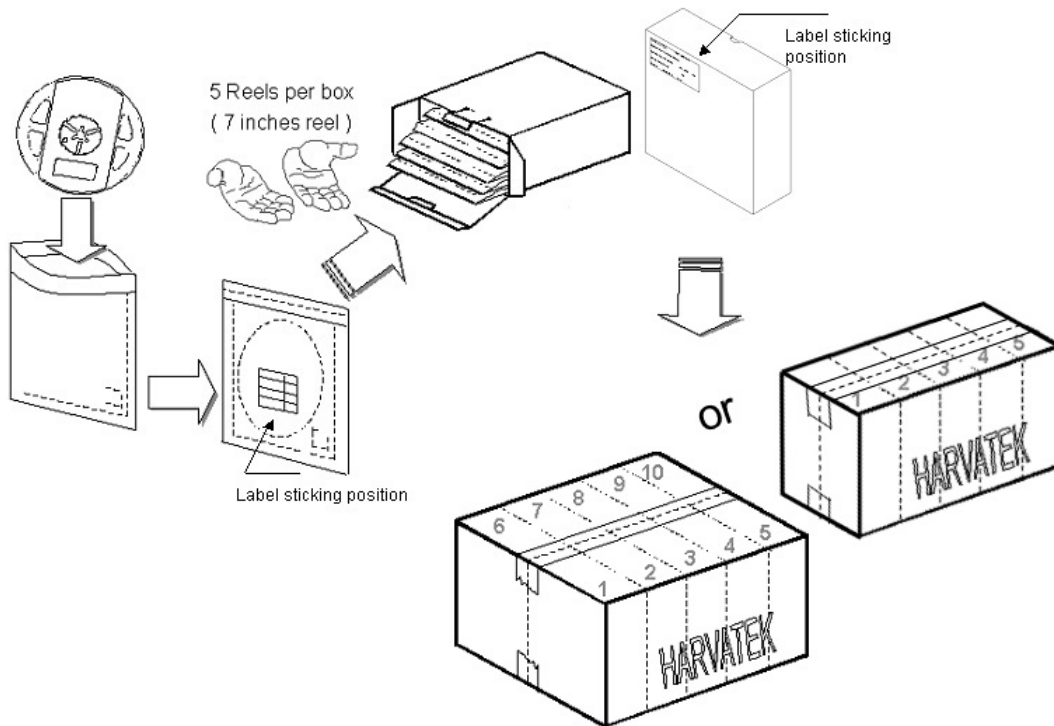


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Reel Dimension



Packing



5 or 10 boxes per carton is available depending on shipment quantity.

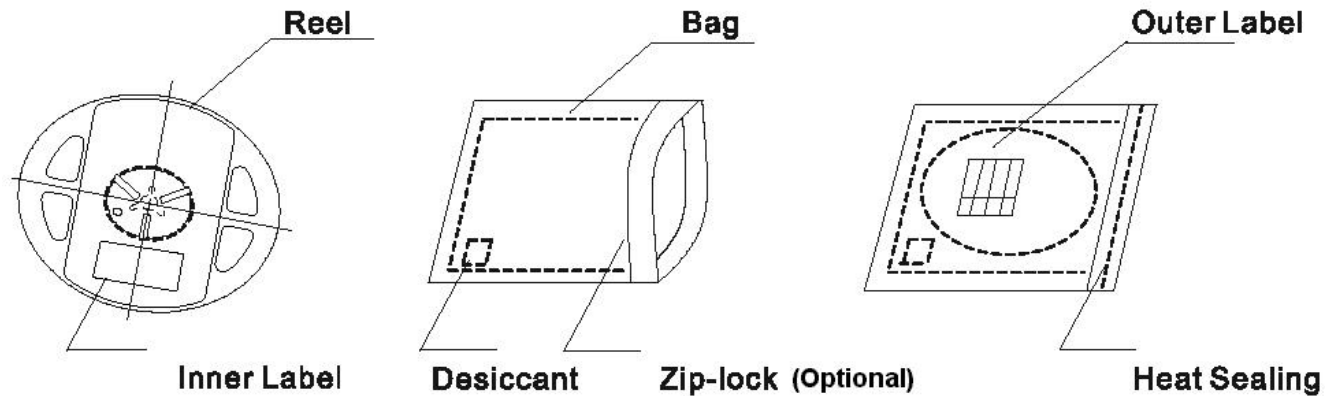
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Dry Pack

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 hrs.

The conditions are as followings:

1. $60\pm 3^{\circ}\text{C} \times (12\sim 24\text{hrs})$ and $<5\%RH$, 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

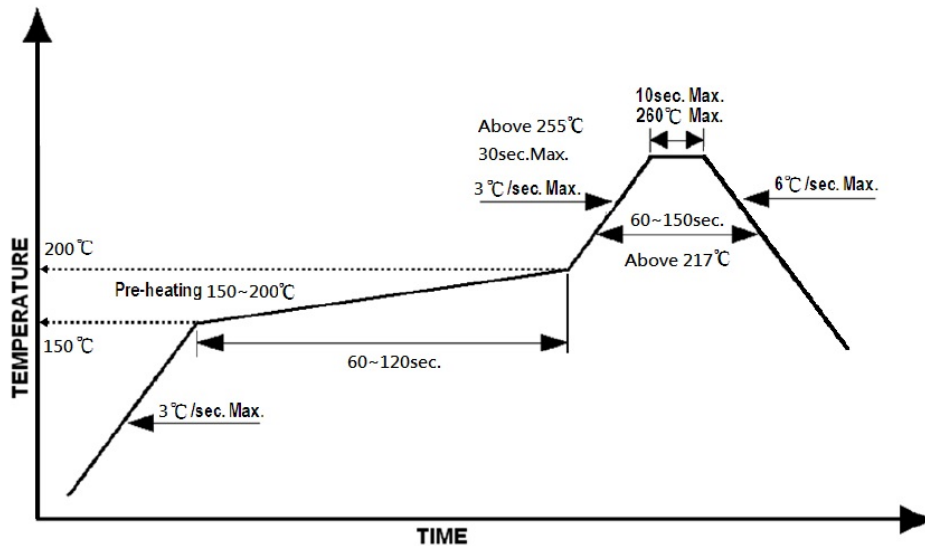
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlGaInP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the 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 °CMax.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.



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
-	Preliminary	19/05/2023	-

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