Harvatek Surface Mount CHIP LEDs Data Sheet
E3743FCH-20D0001H2E0118

DISCLAIMER

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Life Support Policy

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.

Product Specifications

Item	Specification	Material	Quantity
Luminous Intensity(Iv)	USD：45.0-285.0 mcd NG ：112.5-360.0 mcd NB ：28.5-180.0 mcd @20mA/ T_S= 25℃;Tolerance: ± 10%		
Wavelength	USD：615.0-630.0 nm NG ：515.0-535.0 nm NB ：460.0-480.0 nm @20mA/ T_S= 25℃;Tolerance: ± 0.5nm		
Vf	USD ：1.6-2.4 V NG ：2.7-3.9 V NB ：2.7-3.9 V @20mA/ T_S= 25℃ ;Tolerance: ± 0.05V		
Ir	< 10 μA @ V_R = 5 V		
Resin	Diffused	Epoxy	
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 Iv, 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

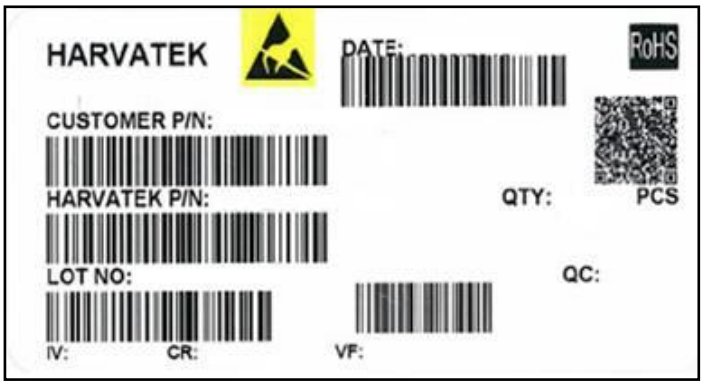
※Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

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 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.

Label Specifications



■Harvatek P/N:

E 374 3 FCH- 20D- 0001 H2

Product	Package	Dice Qty	Color	Current	Series Number	Taping
PCB+Zener	2.0(L)x1.3(W)x0.5(H) mm	3:Single	FCH: 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		

Specifications Range

■Luminous Intensity (Iv) Bin:

Color	Bin Code	Spec. Range
USD	P	45.00-71.50 mcd
	Q	71.50-112.5 mcd
	R	112.5-180.0 mcd
	S	180.0-285.0 mcd
NG	R	112.5-180.0 mcd
	S	180.0-285.0 mcd
	T	285.0-360.0 mcd
NB	N	28.50-45.00 mcd
	P	45.00-71.50 mcd
	Q	71.50-112.5 mcd
	R	112.5-180.0 mcd

Note: It maintains a tolerance of ±10% on luminous intensity

■Wavelength Bin:

Color	Bin Code	Spec. Range
USD	AC	615.0-630.0 nm
NG	A	515.0-520.0 nm
	B	520.0-525.0 nm
	C	525.0-530.0 nm
	D	530.0-535.0 nm
NB	AA	460.0-465.0 nm
	AB	465.0-470.0 nm
	AC	470.0-475.0 nm
	AD	475.0-480.0 nm

Note: It maintains a tolerance of ± 0.5nm on Wavelength Bin

■Forward Voltage (Vf) Bin:

Color	Bin Code	Spec. Range
USD	E18	1.6-2.4 V
NG	G8	2.7-2.9 V
	H7	2.9-3.1 V
	H8	3.1-3.3V
	J7	3.3-3.5 V
	J8	3.5-3.7 V
	K7	3.7-3.9 V
NB	G8	2.7-2.9 V
	H7	2.9-3.1 V
	H8	3.1-3.3V
	J7	3.3-3.5 V
	J8	3.5-3.7 V
	K7	3.7-3.9 V

Note: It maintains a tolerance of ±0.05V on forward voltage measurements

Product Features

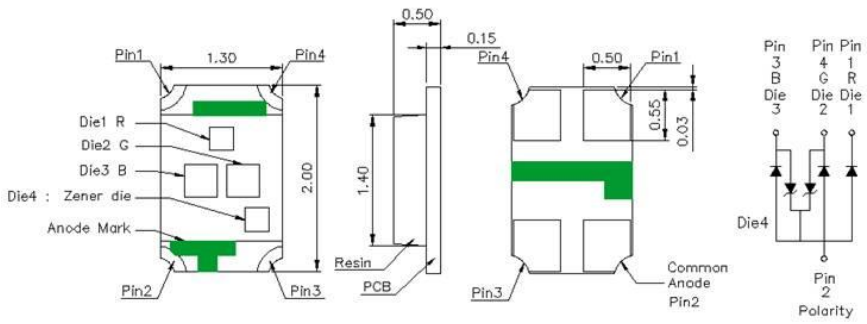
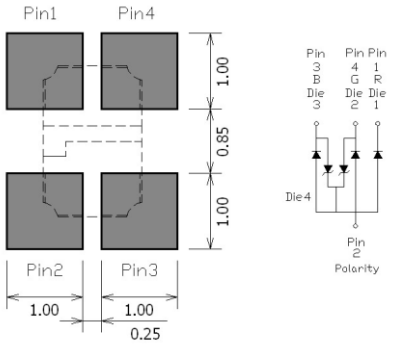
Electro-Optical Characteristics

($T_{Soldering}$, 25 °C)

Series	Emitting Color	Material	V_F(V)		Wavelength λ(nm)			I_V(mcd)	Viewing Angle $2\theta\frac{1}{2}$
			typ	max	λ_D	λ_P	△λ	Typical	
E3743FCH-20	USD	AlInGaP	2.0	2.4	624	632	20	112.5	X=120 Y=130
	NG	InGaN	3.3	3.9	525	520	30	285.0	X=120 Y=120
	NB	InGaN	3.3	3.9	470	468	40	71.5	X=120 Y=128

Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

(Unit:mm Tolerance: +/-0.1)

Outline Dim.	Soldering Pattern
	

Soldering terminals may shift in the x, y direction.

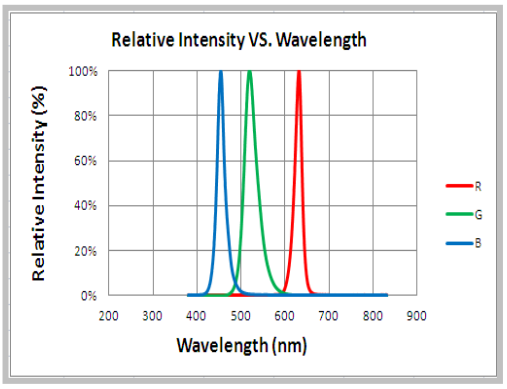
Absolute Maximum Ratings

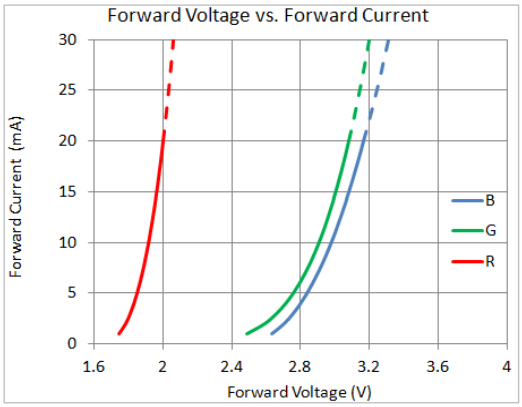
($T_{Soldering}$ 25 ℃)

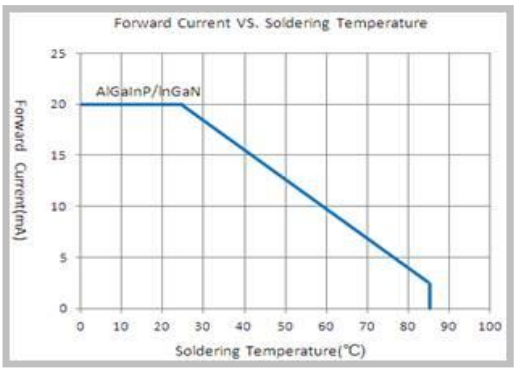
Series	P_D (mW)	I_F (mA)	I_{FP} (mA)*	T_{OP} (℃)	T_{ST} (℃)
Color	Power Dissipation	Forward Current	Pulse Forward Current	Operating Temperature	Storage Temperature
USD	48	20	40	-40~+85	-40~+100
NG	78	20	60	-40~+85	-40~+100
NB	78	20	60	-40~+85	-40~+100

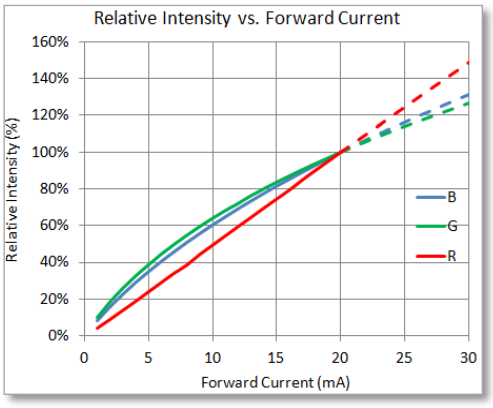
*Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width

Characteristics of E3743FCH

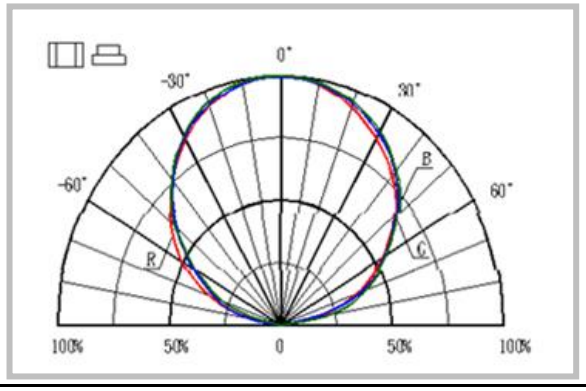




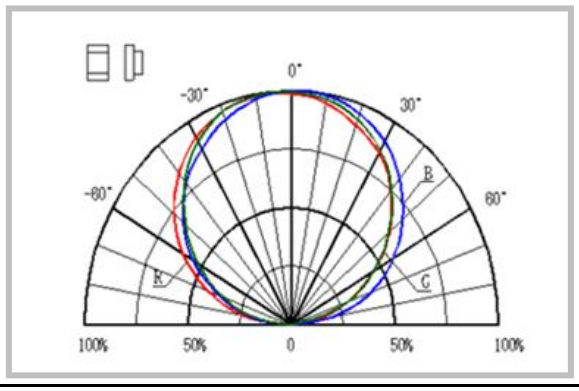




Directive Characteristics



Directive Characteristics

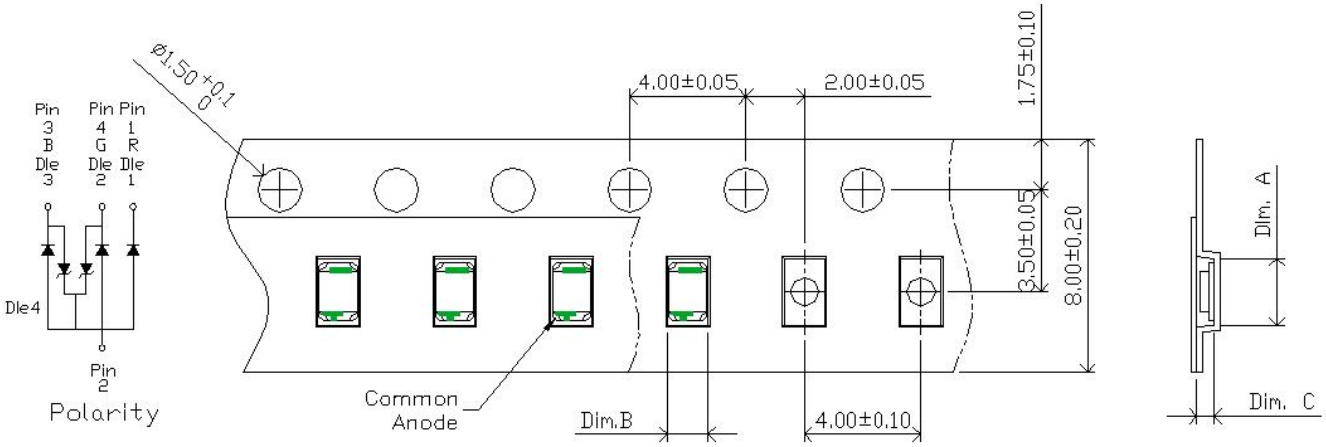


Precaution for Use

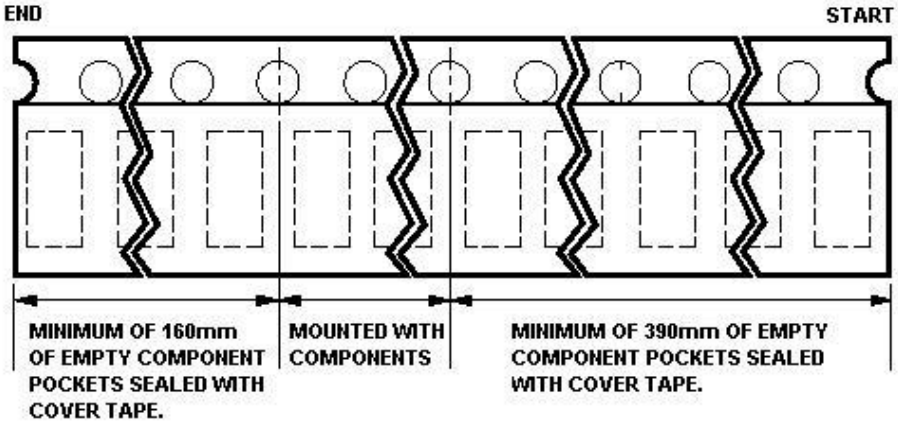
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 4 weeks 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.

Packaging

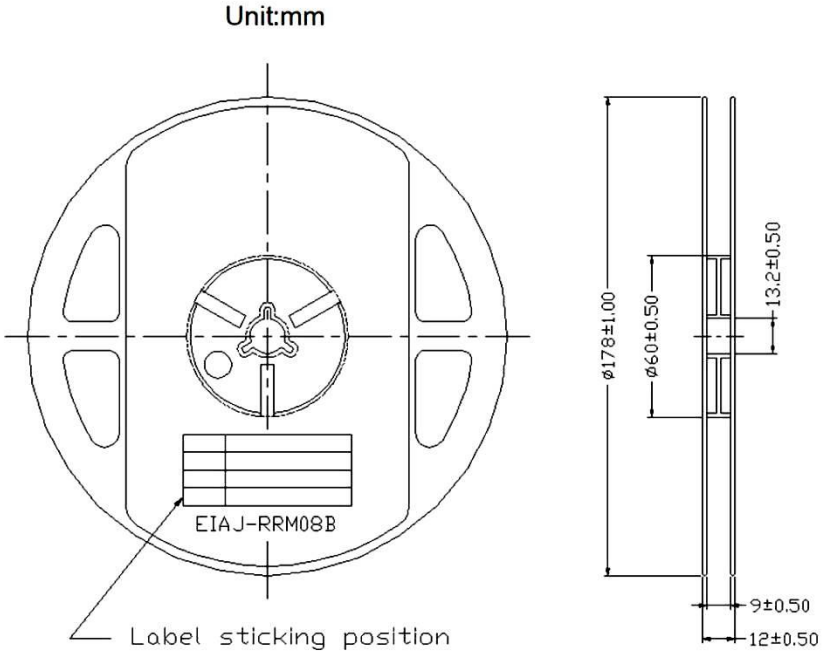
Tape Dimension



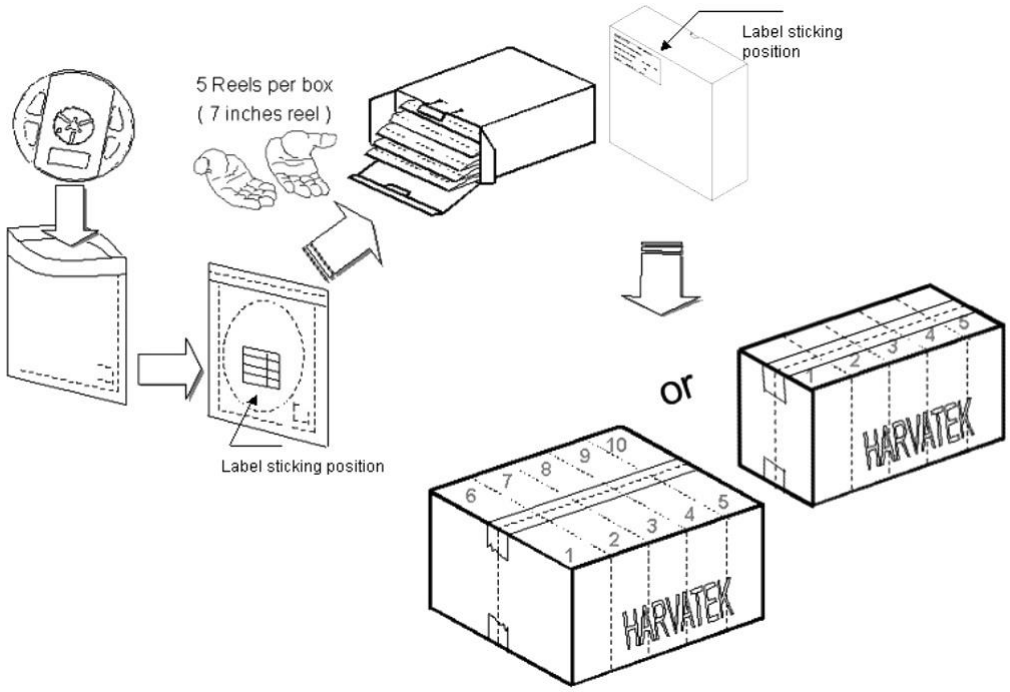
Dim. A	Dim. B	Dim. C	Qty/Reel
2.3±0.10	1.4±0.10	0.6±0.10	2K



Reel Dimension



Packing



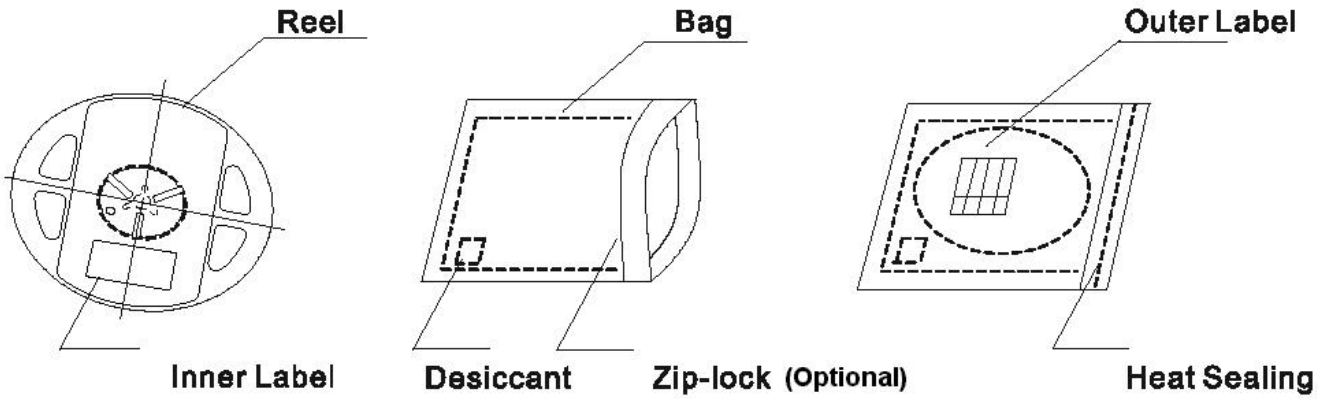
5 or 10 boxes per carton is available depending on shipment quantity.

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 4 weeks. The conditions are as followings:

1. 60±3℃×(12~24hrs)and<5%RH, taped reel type.
2. 100±3℃×(45min~1hr), bulk type.
3. 130±3℃×(15min~30min), bulk type.

Precautions

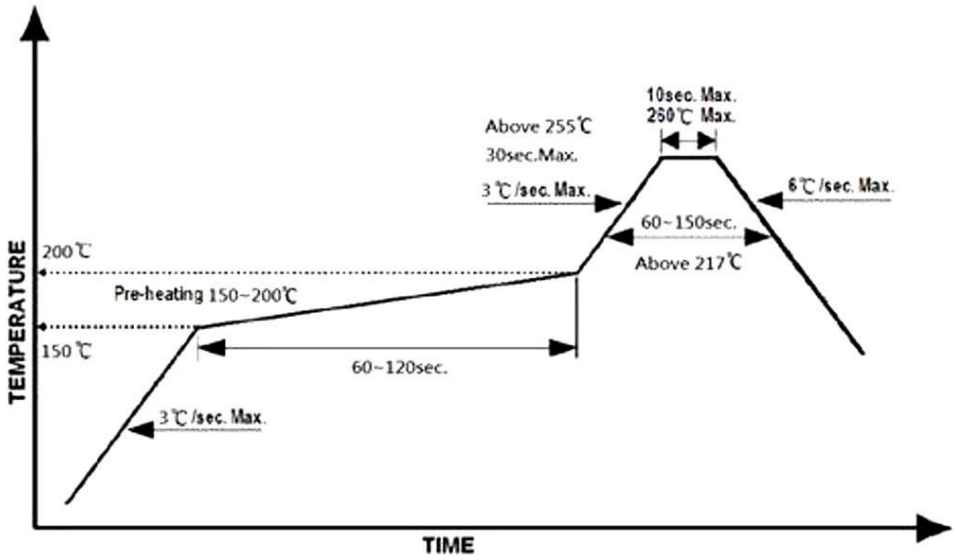
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the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

Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 217℃ ,60~150 sec
2. Peak temp.:260 ℃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 ℃.
- 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℃ x 30sec. or <30℃ x 3min
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 ℃ max, <3min

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	-	04/08/2014	-
1.1	Renew Form	05/15/2015	-
1.2	Renew Outline Dim	01/29/2016	P8
1.3	Renew form	03/02/2017	-
1.4	Renew form	09/19/2017	-
1.5	Add Customer Product Code	03/23/2018	P5