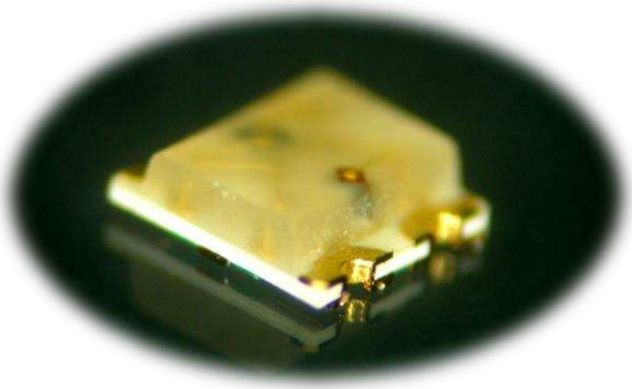
Harvatek Surface Mount CHIP LED Data Sheet
E3613FCH-10D-000114



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

	Specification	Material	Quantity
Iv	R : Max:120mcd;min:80 mcd G : Max:450 mcd;min:310 mcd B : Max:120mcd;min:80 mcd R/G/B@10mA/ Ta= 25^{O} C;Tolerance ±10%		
λ_D	R : Max:635nm;min:615nm G : Max:535nm;min:515nm B : Max:479nm;min:469nm R/G/B@10mA/ Ta= 25^{O} C;Tolerance ± 0.5nm		
Vf	R : Max:2.40V;min:1.60V G : Max:3.30V;min:2.70V B : Max:3.30V;min:2.70V R/G/B@10mA/ Ta= 25^{O} C;Tolerance ± 0.05V		
Ir	R:<10uA@ V_R =5V B/G: >500nA @ V_R = 0.8V		
ESD(HBM)	Red:2KV Green:8KV Blue:8KV		
Resin	Diffused	Epoxy	
Carrier tape	EIA 481-1A specs	Conductive black tape	4000pcs/reel
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:

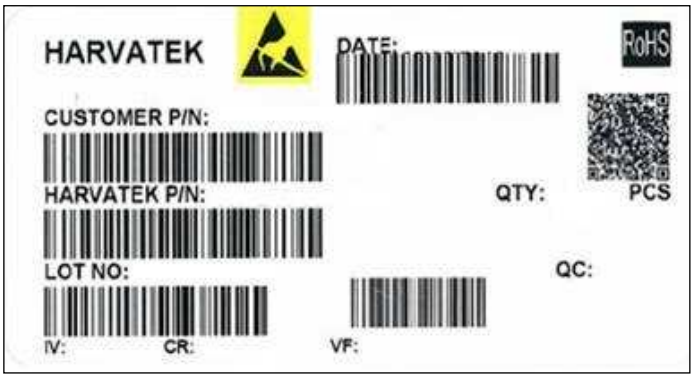
Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

ATTENTION: Electrostatic Discharge (ESD) protection

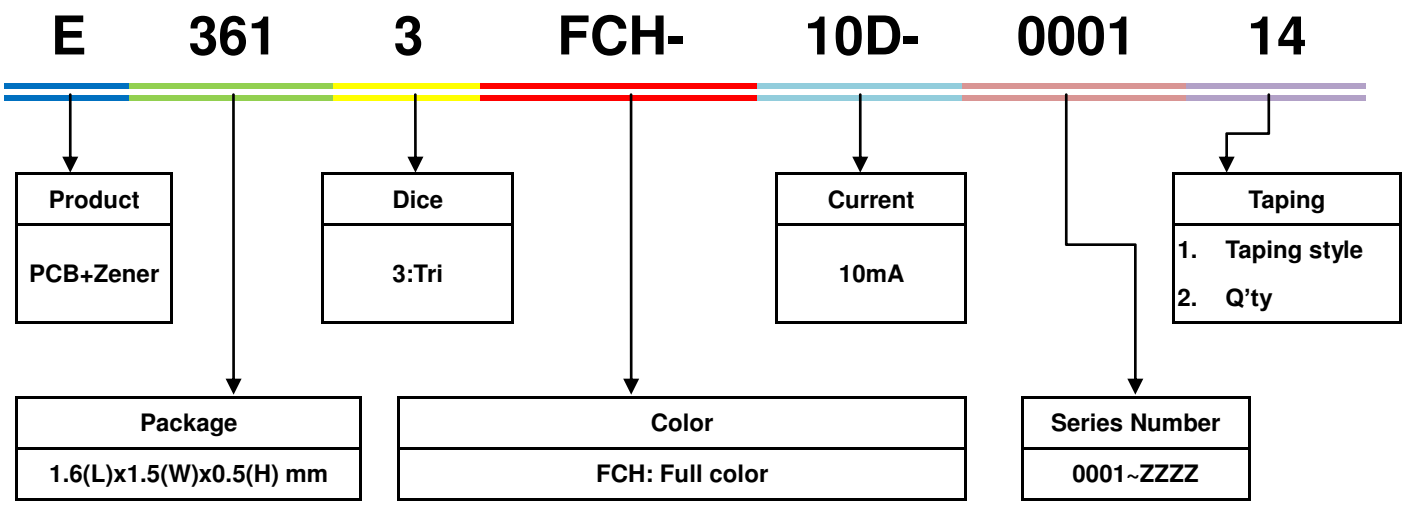
The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD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



■ 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		2010-A 2011-B 2012-C 2013-D . .	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		

Bin code

■ Luminous Intensity (Iv)

HT-E3613FCH @10 mA bin code								
IV								
Red			Green			Blue		
FA1	80	120	FB1	310	450	FA1	80	120

■ Dominant Wavelength (λ_D)

HT-E3613FCH @10 mA bin code								
WD								
Red			Green			Blue		
R1	615	635	G1	515	535	B1	469	474
						B2	474	479

■ Forward Voltage (Vf)

HT-E3613FCH @10 mA bin code								
Vf								
Red			Green			Blue		
E18	1.6	2.4	G8	2.7	2.9	G8	2.7	2.9
-			H7	2.9	3.1	H7	2.9	3.1
-			H8	3.1	3.3	H8	3.1	3.3

Product Features

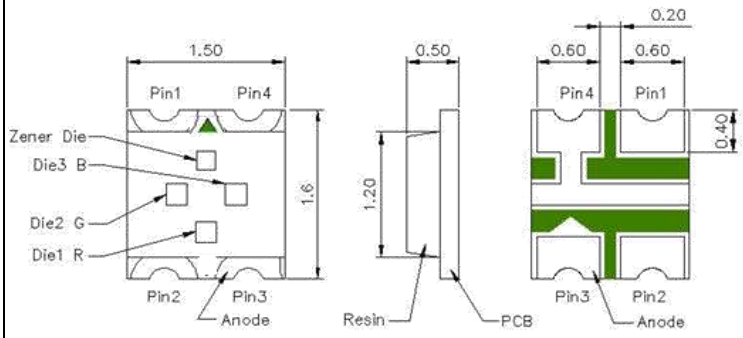
Electro-Optical Characteristics

(I_F Red & Green &Blue@10mA, T_a 25 °C)

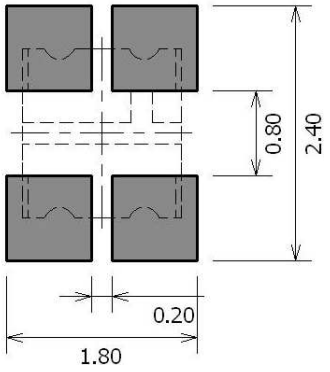
Part number	Emitting Color	Forward Voltage(VF)		Wavelength (nm) typ.			I^*_V(mcd)		IF(mA)	Viewing Angle 2θ1/2
		typ.	max.	λD	λp	Δλ	min.	typ.		
E3613FCH-10	Ultra Bright Red	1.9	2.4	621	630	16	80	100	10	140
	Green	2.9	3.3	528	521	32	310	360		
	Blue	2.9	3.3	470	465	22	80	100		

Unit: mm Tolerance: +/-0.1

Outline Dim.



Soldering Pattern



Soldering terminals may shift in the x, y direction.

Absolute Maximum Ratings

(T_a 25 °C)

Series	I_F (mA)	I_{FP} (mA)	V_R (V)	I_R (uA)	T_{OP} (°C)	T_{ST} (°C)
Red	15	100	5	R:<10uA	-30~+80	-40~+85
Blue/Green	15	100		B/G: <1uA		

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

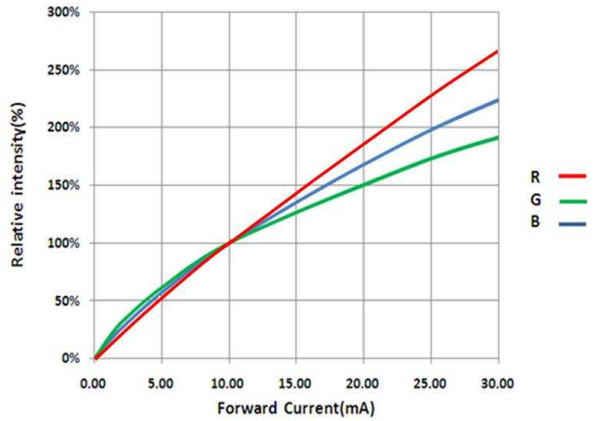
Remarks:This product should be operated in forward bias.If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

Precaution for Use

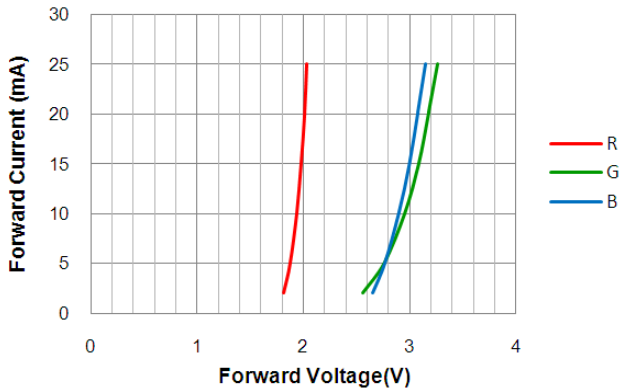
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere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

Characteristics of HT-361

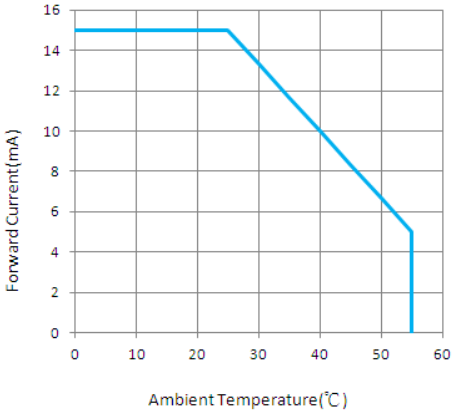
Relative Intensity vs. Forward Current



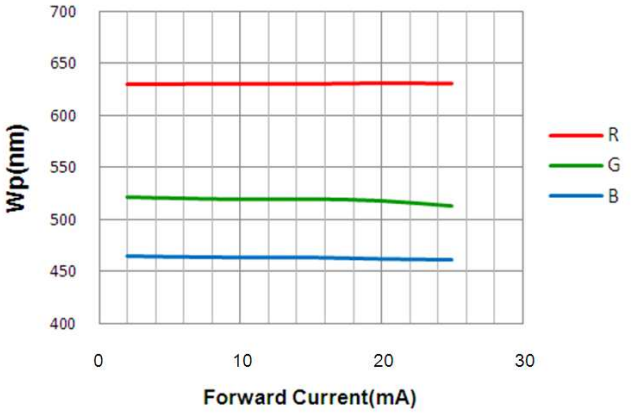
Forward Voltage vs. Forward Current



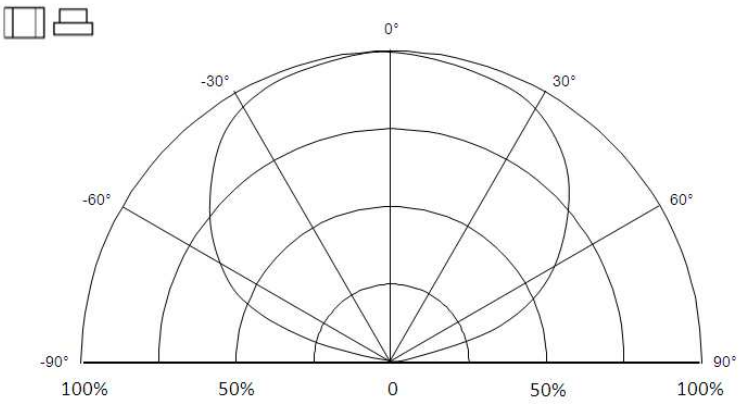
Forward Current vs. Ambient Temperature



Wavelength vs. Forward Current

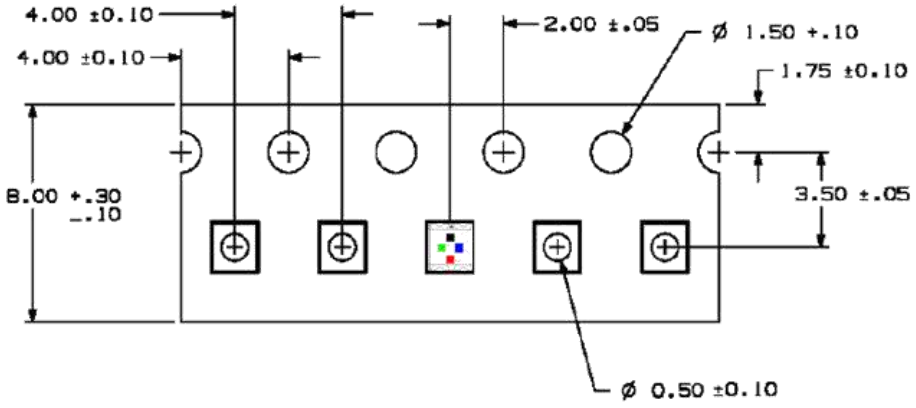


Directive Characteristics

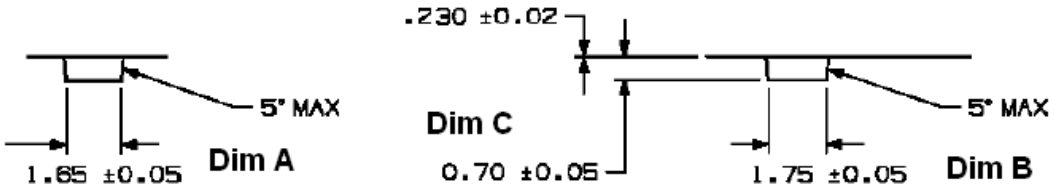


Packaging

Tape

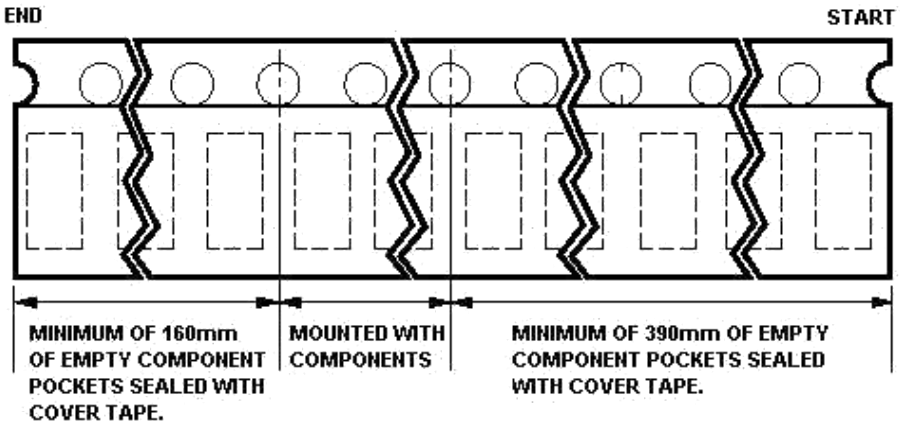


Dimension

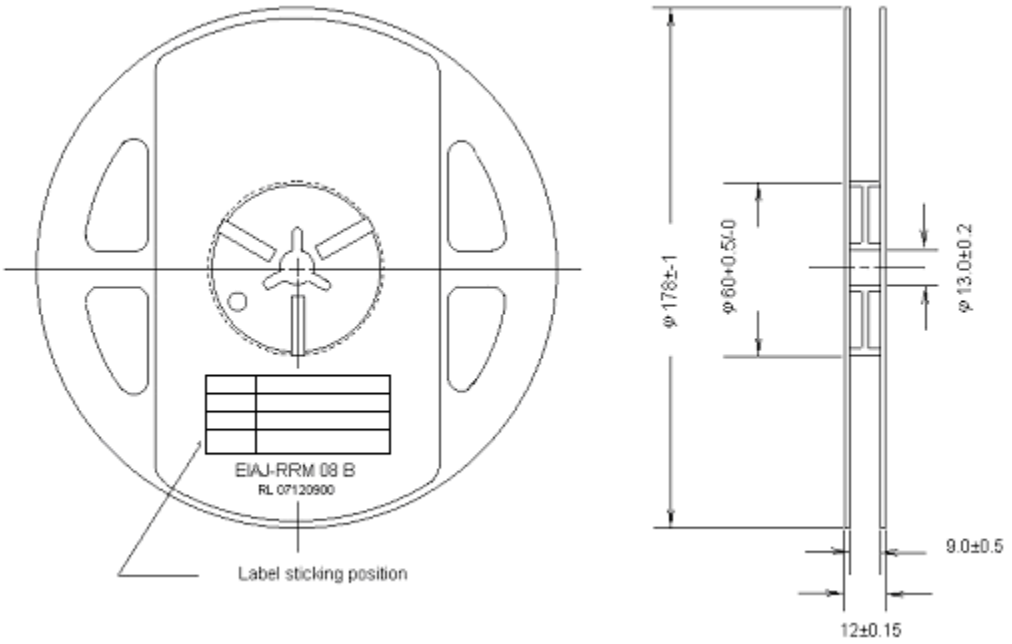


Part No.	Dim. A	Dim. B	Dim. C
HT-361	1.65±0.05	1.75±0.05	0.70±0.05

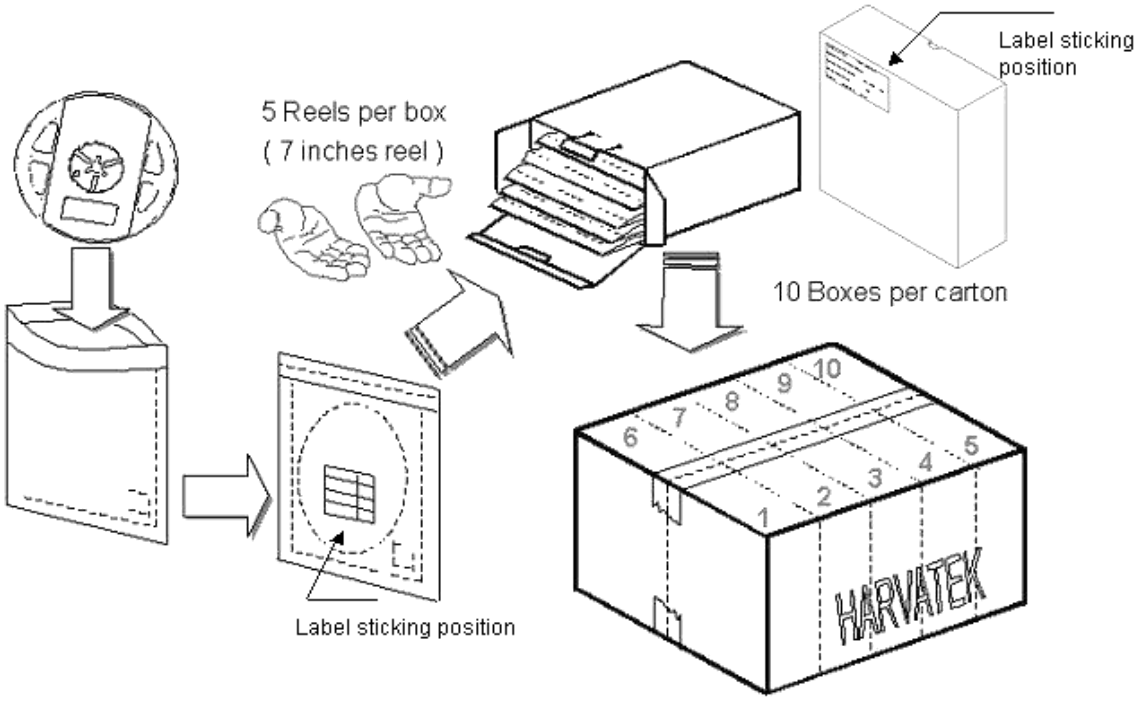
Unit: mm



Reel Dimension



Packing

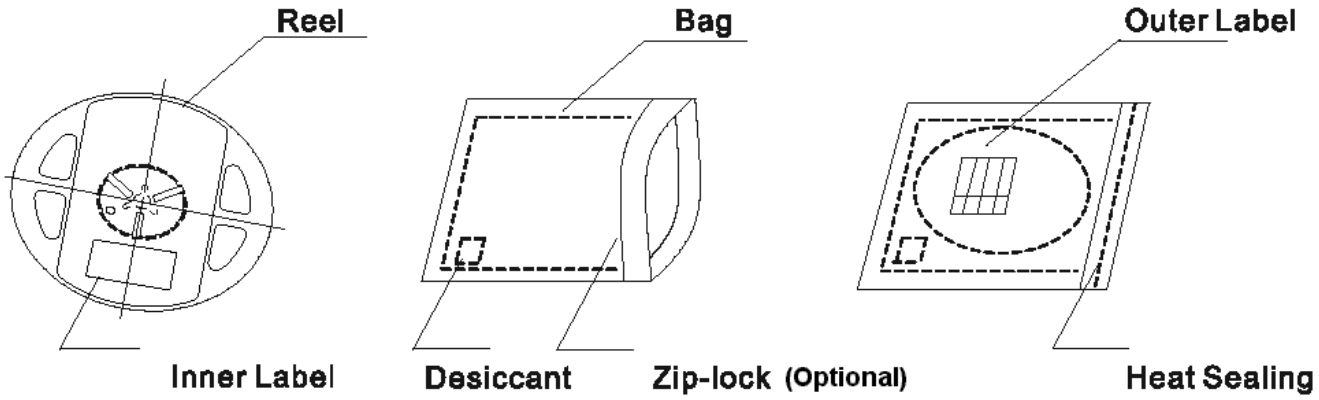


5 boxes per carton is available depending on shipment quantity.

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.

Upon request, a humidity indicator will be included in the moisture protected anti-static bag prior to shipment.
The packaging sequence is as follows:



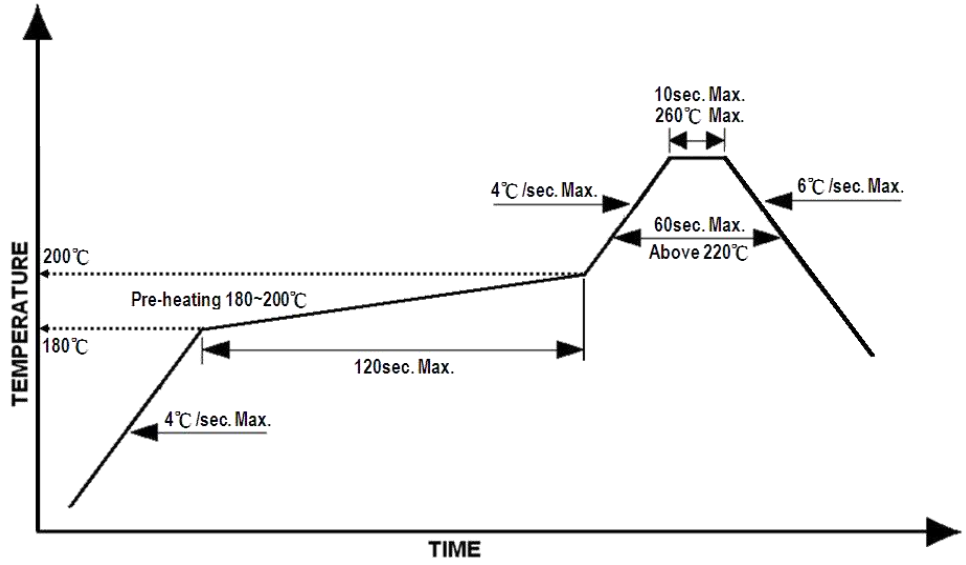
PRECAUTIONS

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 220 ^{O}C ,60sec
2. Peak temp.:260 ^{O}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:
   Lead-free Solder Profile
5. Reflow soldering should not be done more than two times



Reworking

- Rework should be completed within 5 seconds under 260 ^{O}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^{o}C x 30sec. or <30^{o}C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 ^{O}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.
- 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	-	08/18/2013	-