Harvatek Surface Mount CHIP LED Data Sheet
HT-B2D23FCH

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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	Red : 305 mcd typical Green : 630 mcd typical Blue : 140 mcd typical @10mA/ Ta= 25^{O} C;Tolerance ±10%		
λ_D	Red : 622 nm typical Green : 533 nm typical Blue : 473 nm typical @10mA/ Ta= 25^{O} C; Tolerance ± 0.5nm		
Vf	Red : 2.5 V maximum Green : 3.6 V maximum Blue : 3.6 V maximum @10mA/ Ta= 25^{O} C; Tolerance ± 0.05V		
Ir	< 100 µA @ V_R = 5 V		
Resin	Diffused	Silicon	
Carrier tape	EIA 481-1A specs	Conductive black tape	3000pcs/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:

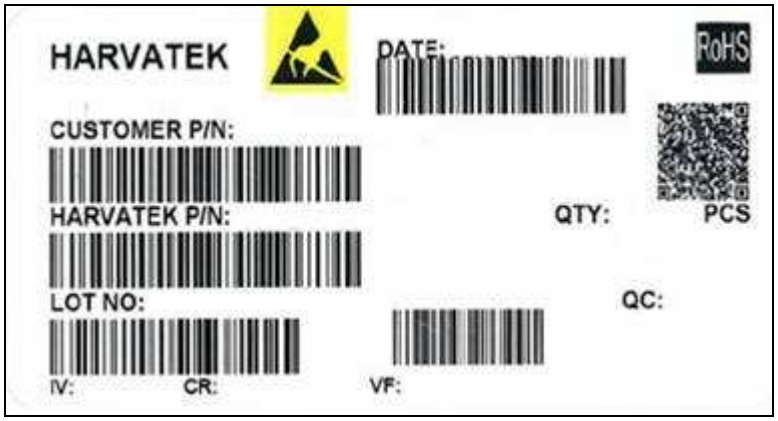
Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

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



Description of Model No. and Lot No.

Model No.

HT – B 2 D 2 3 F C H

Company	Package	Dice	Emitter Color
HT: For Harvatek	Outline dimension	Tri	Full color:RGB@10mA

■ 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		

■ Luminous Intensity (Iv) Bin:

HT-B2D23FCH Series								
IV								
Red			Green			Blue		
SM3	195	245	SP3	390	490	SK3	100	125
SN1	220	275	SQ1	435	545	SL1	112.5	140
SN2	245	310	SQ2	490	615	SL2	125	156
SN3	275	345	SQ3	545	685	SL3	140	175
SP1	310	390	SR1	615	770	SM1	156	195
			SR2	685	860	SM2	175	220

■ Dominant Wavelength (λ_D) Bin:

HT-B2D23FCH Series					
WD					
Red		Green		Blue	
R1	617~622	G1	517~522	AB1	465~470
R2	620~625	G2	520~525	AB2	470~472
R3	622~627	G3	522~527	AB3	472~474
R4	625~630	G4	525~530	AB4	474~475
R5	627~632	G5	527~532	AB5	475~480
		G6	530~535		
		G7	532~537		
		G8	535~540		

■ Forward Voltage (Vf) Bin:

HT-B2D23FCH Series					
Vf					
Red		Green		Blue	
-	1.6~2.5	-	2.6-3.6	-	2.6-3.6

Product Features

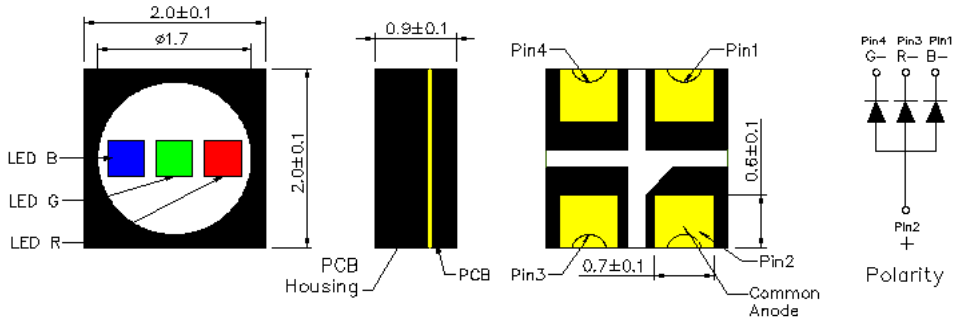
Electro-Optical Characteristics

(I_F @ 10mA, T_a 25 °C)

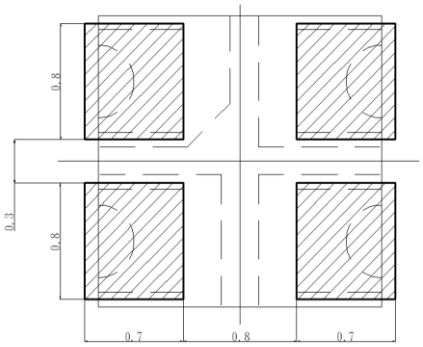
Part number	Emitting Color	Forward Voltage(VF)		Wavelength (nm) typ.			I^*_V(mcd)		IF(mA)	Viewing Angle 2θ1/2
		typ.	max.	λD	λp	Δλ	min.	typ.		
HT-B2D23FCH	Ultra Bright Red	2.0	2.5	622	630	17	195	305	10	110
	Green	3.1	3.6	533	520	40	390	630	10	110
	Blue	3.0	3.6	473	468	26	100	140	10	110

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	10	100	5	<100@ V_R = 5	-30~+80	-40~+85
Blue/Green	10	100				

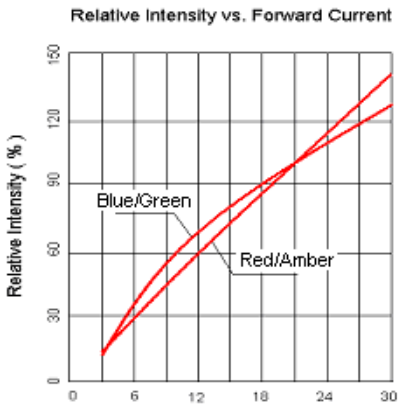
** Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width

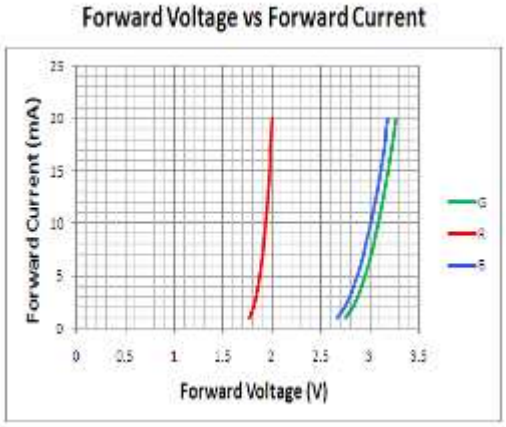
Remarks:This product should be operated in forward bias.If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

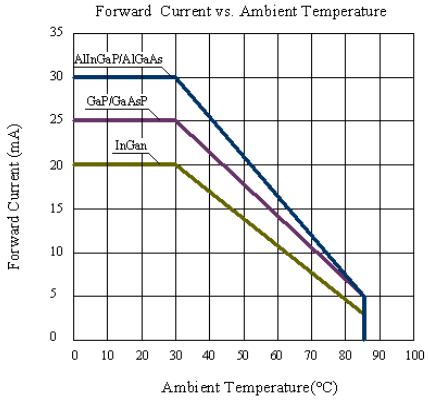
Precaution for Use

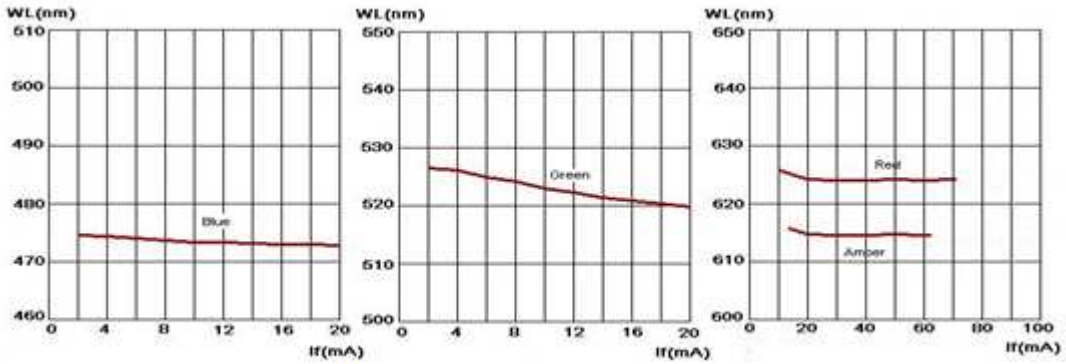
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere 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-B2D23FCH

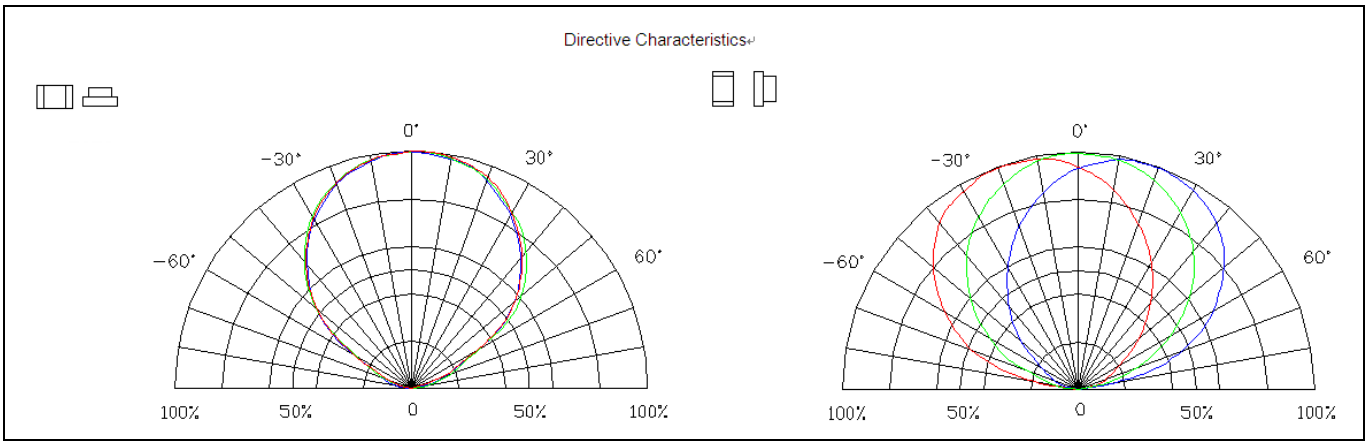






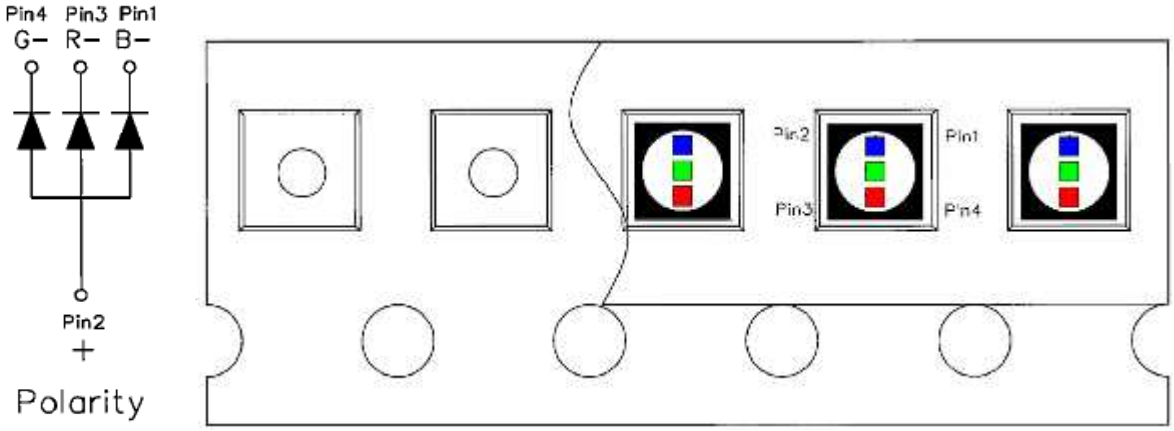


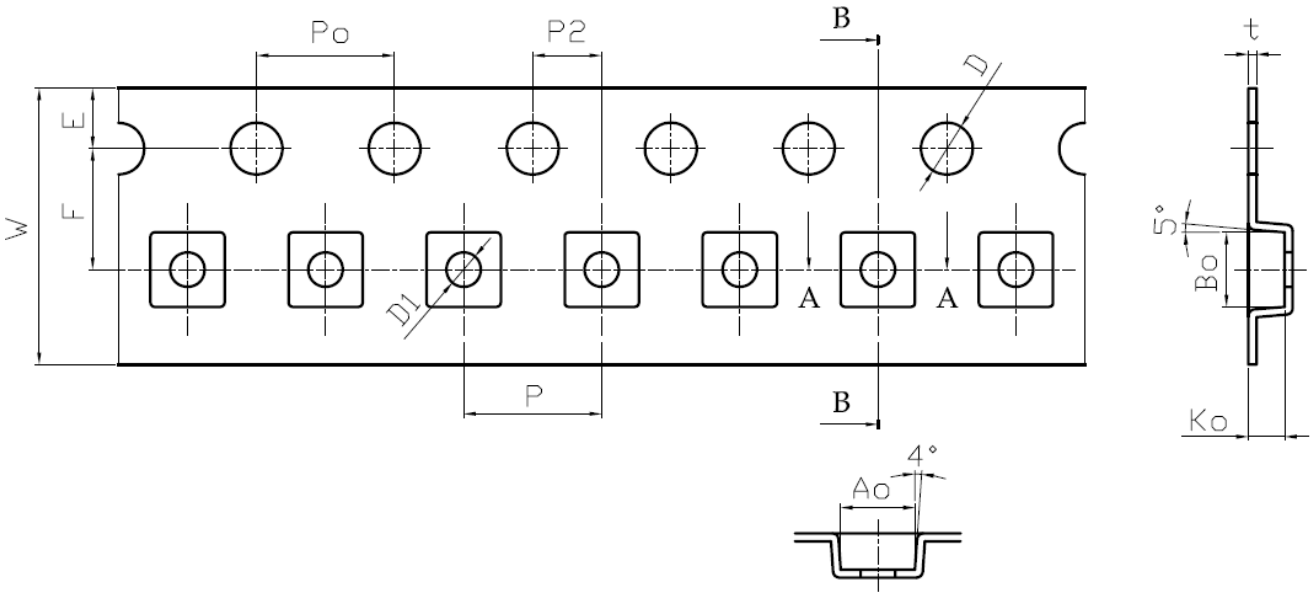
Wavelength vs. Forward Current



Packaging

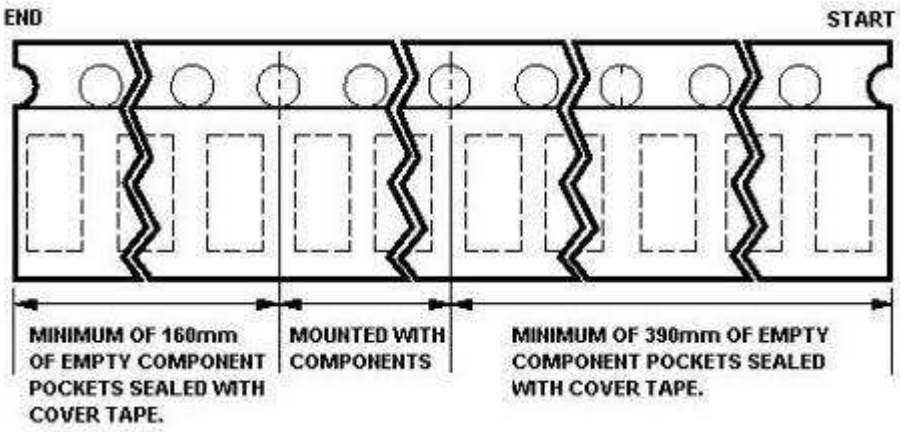
Tape Dimension



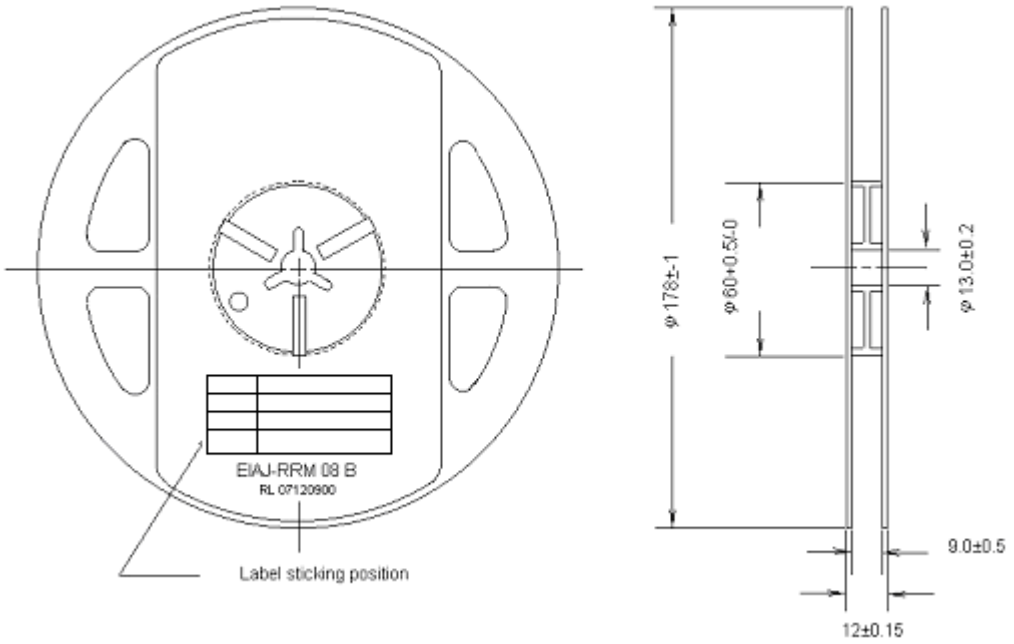


Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-B2D23FCH	2.15±0.10	2.15±0.10	1.05±0.10	3K

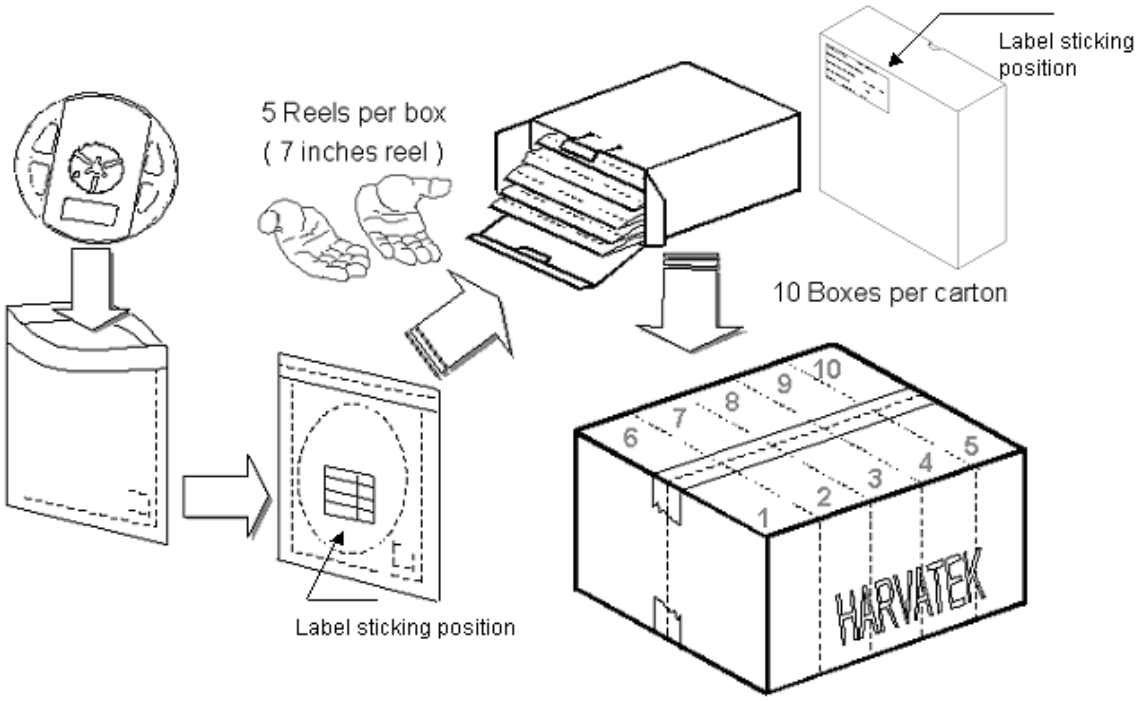
Unit: mm



Reel Dimension



Packing



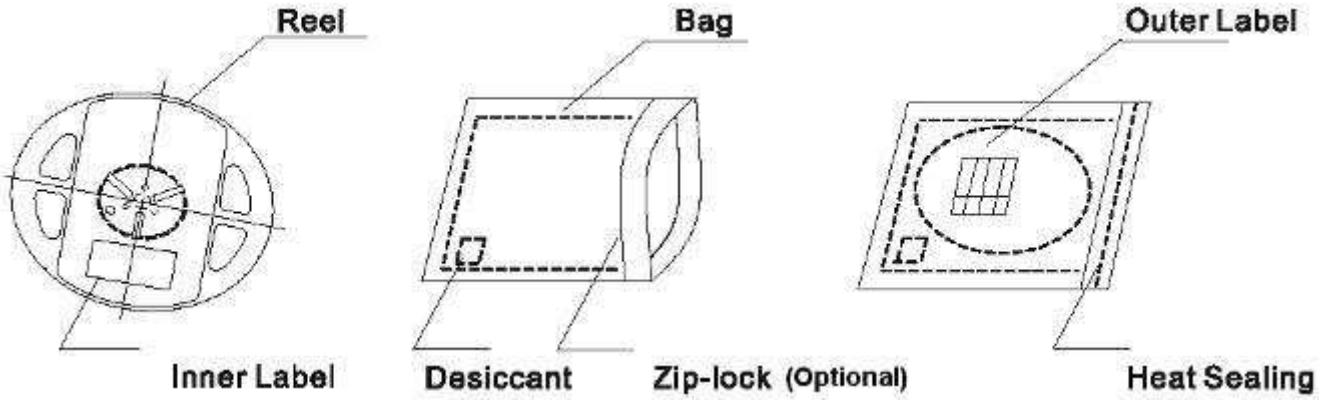
5 boxes per carton is available depending on shipment quantity.

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

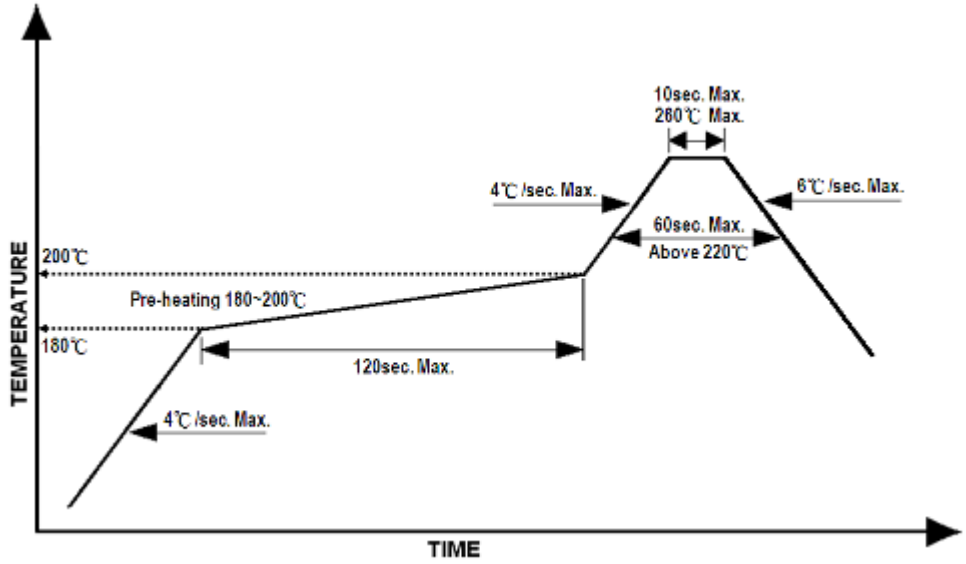
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the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



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.

Reliability Test

Item	Standard test method	conditions	Notes	Number of damaged
Precondition	J-STD-020	1.) Baking at 125°C for 24hrs 2.) Moisture storage at 85°C/ 85% R.H for 168hrs	-	0/360
High temp storage	JEITA ED-4701	Ta=85℃	500hrs	0/40
Low temp storage	JEITA ED-4701	Ta=-40℃	500hrs	0/40
Temp humidity storage	JEITA ED-4701	Ta=60℃;RH=90%	500hrs	0/40
Steady state operating life		Ta=25℃ IF=5mA	500hrs	0/40
		Ta=25℃ IF=20mA	500hrs	0/40
Steady state operating life of low temp		Ta=-40℃ IF=5mA	500hrs	0/40
		Ta=-40℃ IF=20mA	500hrs	0/40
Steady state operating life of high humidity heat		Ta=60℃;RH=90% IF=5mA	500hrs	0/40
		Ta=60℃;RH=90% IF=20mA	500hrs	0/40
Solder ability	JESD22-B102-B And CNS-5068	Tinning: A: 245°C/ 2+1s B: 260°C/ 10+1s	-	0/10
Temperature cycle	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min..300 cycles 2 chamber/ Air-to-air type	-	0/100

Revise History

Rev.	Descriptions	Date	Page
1.0	-	07/15/2013	-
1.1	Change IV bin code	11/25/2013	6