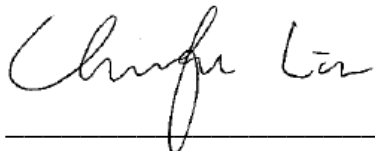
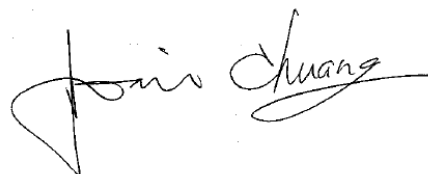


Harvatek Surface Mount CHIP LEDs Approval Sheet
Model No.: HT-297UD/UYG

Acknowledged by



Section Manager
Production Engineering Dept.



Manager
Production Engineering Dept.

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Introduction

- *The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by HARVATEK for any infringements of intellectual property or other rights of the third parties which may result from its use.*
- *Harvatek is continually effort to improve the quality of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing HARVATEK products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such HARATEK products cause loss of human life, bodily injury or damage to property.*
- *The HARVATEK products listed in this document are intended for usage in general electronics (computer, personal equipment, office equipment, industrial robotics, domestic, etc...) These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury.*
- *In developing your designs, please ensure that HARVATEK products are used within specified operating ranges as set forth in the most recent HARVATEK products specifications.*
- *Also, please keep in mind the precautions listed in this document.*

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Product Specification

	Specification	Material	Quantity
Iv	UD: 45-180mcd UYG: 28-112.5mcd @20mA/ Ta= 25° C Tolerance: ± 10%		
lambda(λ _D)	UD: 600-615nm UYG: 570-577nm @20mA/ Ta= 25° C Tolerance: ± 0.5nm		
Vf	1.6-2.4v @20mA/ Ta= 25° C		
Ir	< 100 μA @ V _R = 5 V		
Resin	Milky Diffused	Epoxy resin	
Carrier tape	According to EIA 481-1A specs	Conductive Tape	4000pcs per reel
Reel	According to EIA 481-1A specs	Conductive	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel one bag
Carton	HT standard	Paper	Non-specified

Others:

Every mid-box will be loaded 5 reels. These 5 reels can be different in lot, Iv, lambda, or Vf. Every reel will have an independent label to identify its specification and the mid-box there will have a corresponding label post on it.

ATTENTION: Electricstatic Discharge (ESD) protection



The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaP based chips are **STATIC SENSITIVE devices**. ESD protection has to be considered and taken in the initial design stage.

If manual work/process is needed, please ensure the device is well protected from ESD during all the process.

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Label Spec.:

Harvatek P/N

H T - 2 9 7 UD/UYG

Series Name	Emitting Color
.... HT-297: 1.6x0.8x0.5mm ...	UD: Ultra Bright Amber UYG: Ultra Bright Yellow Green

Lot No.

1 2 3 4 5 6 7 8 9 10
P 1 2 2 3 0 A - D T

Code 1	Code 2	Code 3	Code 4, 5	Code 6, 7	Code 9	Code 10
	Mfg. Year	Mfg. Month	Mfg. Date	Lots	Resin Color	Packaging
Internal Tracing Code	Z: 2000 1: 2001 2: 2002 3: 2003	1: Jan. 2: Feb. 9: Sep. A: Oct. B: Nov. C: Dec.	1~31/ (30)	01~99, A,B,C...	D: Diffused	T: Taped Reel

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Iv Bin: Amber / Yellow Green

Color	Bin Code	Spec. Range
Amber	P	45-72mcd
	Q	72-112.5mcd
	R	112.5-180mcd
Yellow Green	N	28-45mcd
	P	45-72mcd
	Q	72-112.5mcd

Color Bin: Amber / Yellow Green

Color	Bin Code	Spec. Range
Amber	-	610-615nm
Yellow Green	D	570.5-573.5nm
	E	573.5-576.5nm

Vf Bin: Amber / Yellow Green

Color	Bin Code	Spec. Range
Amber	-	1.6-2.4V
Yellow Green	-	1.6-2.4V

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Electro-Optical Characteristics

(I_F @ 20mA, T_a 25 °C)

Code for parts	Lighting Color	Material	V_F (V)		λ (nm)			I_v (mcd)
			typ	max	λ_D	λ_P	$\Delta\lambda$	Min
HT-297UD/UYG	Ultra Bright Amber (UD)	AlInGaP	1.9	2.4	605	609	17	45
	Ultra Bright Yellow Green (UYG)	AlInGaP	2.0	2.4	573	574	20	28

Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

Outline Dim.	Soldering Pattern
<p>Die 1(UYG) - Pin 1 + Pin 2 Die 2(UD) - Pin 3+ Pin 4 In general, wavelength of Die 1 < or = Die 2</p>	<p>Unit:mm</p>
Soldering terminal may shift in x, y direction.	

Absolute Maximum Ratings

(T_a 25 °C)

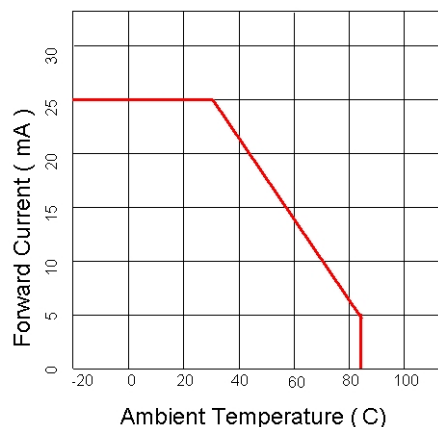
Series	P_d (mW)	I_F (mA)	I_{FP} (mA)	V_R (V)	T_{OP} (°C)	T_{ST} (°C)
HT-297 series	60	25	100**	5	-30~+80	-40~+85

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

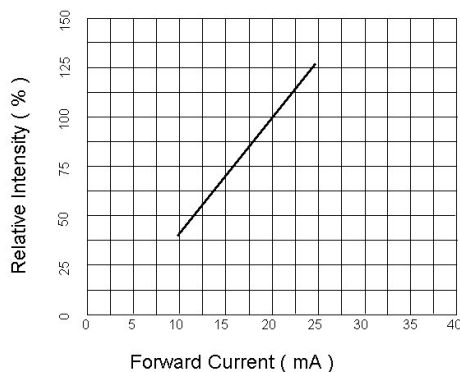
Official Product	HT Part No. HT-297UD/UYG	Your Part No.		Data Sheet No.
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Characteristics of HT-297 Series

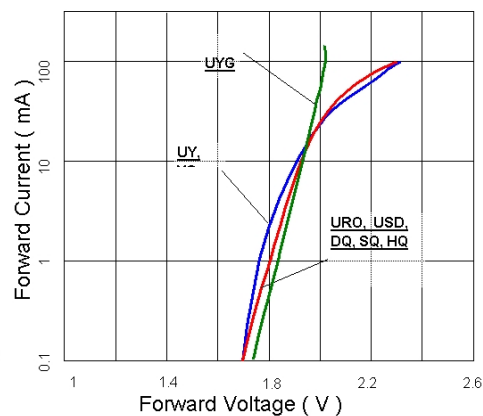
Forward Current vs. Ambient Temperature



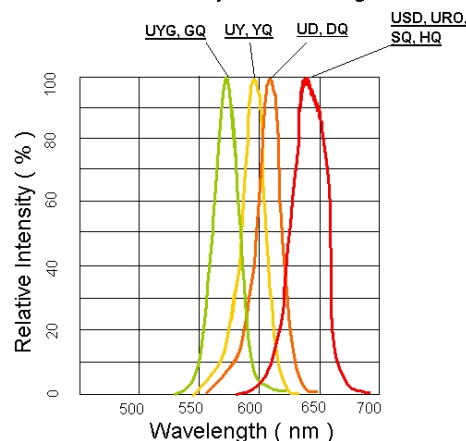
Relative Intensity vs. Forward Current



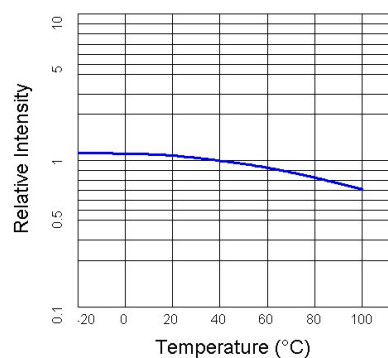
Forward Voltage vs. Forward Current



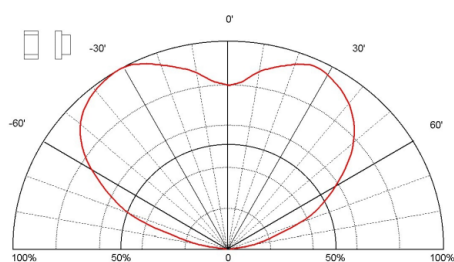
Relative Intensity vs. Wavelength



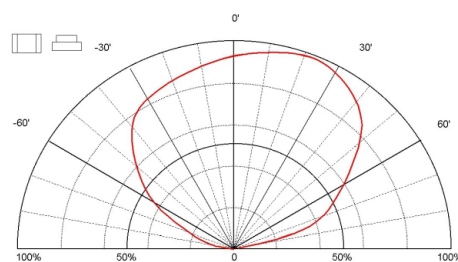
Relative Intensity vs. Ambient Temperature
Pulsed 20mA, 300us pulse, 10ms period



Directive Characteristics

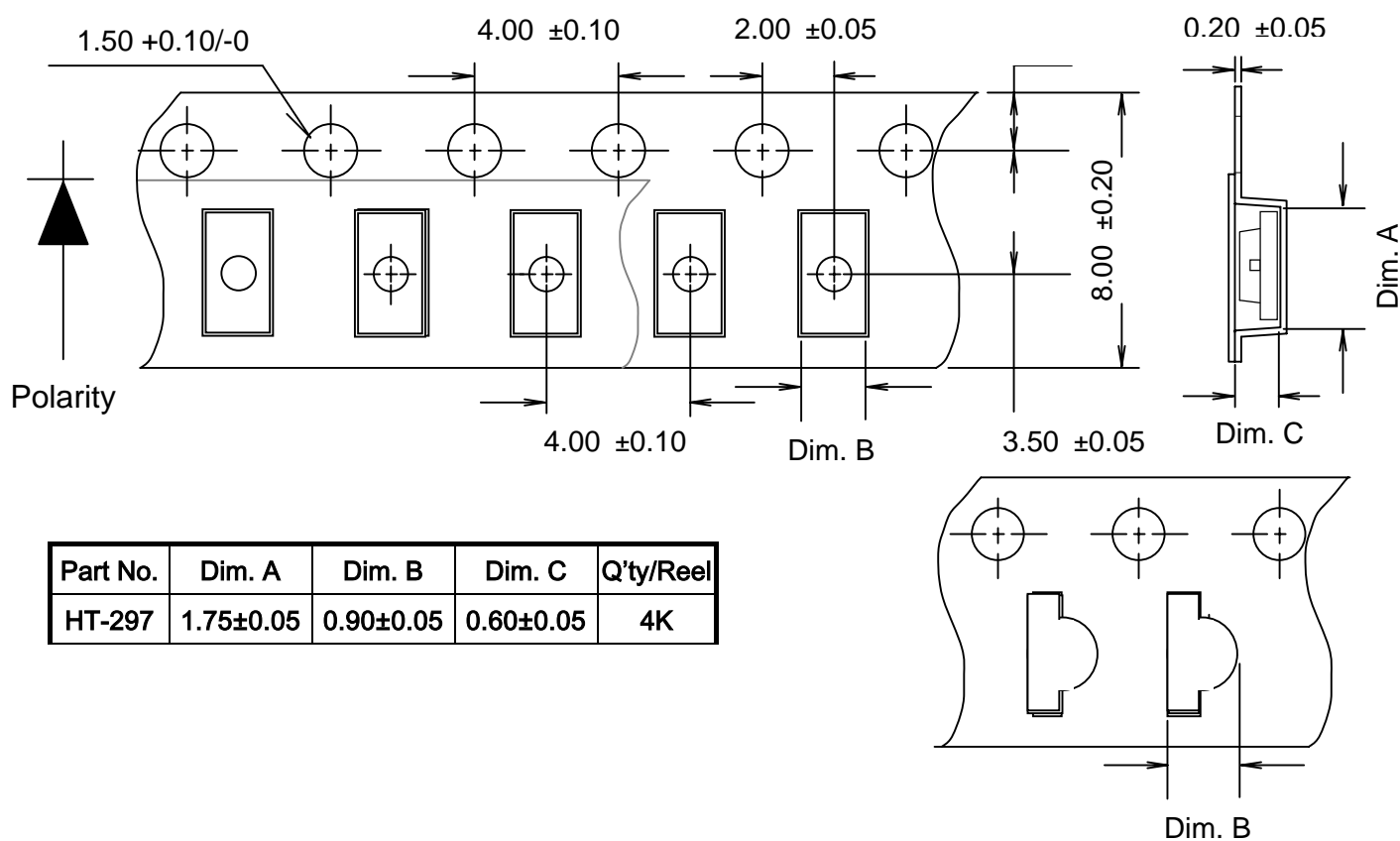


Directive Characteristics



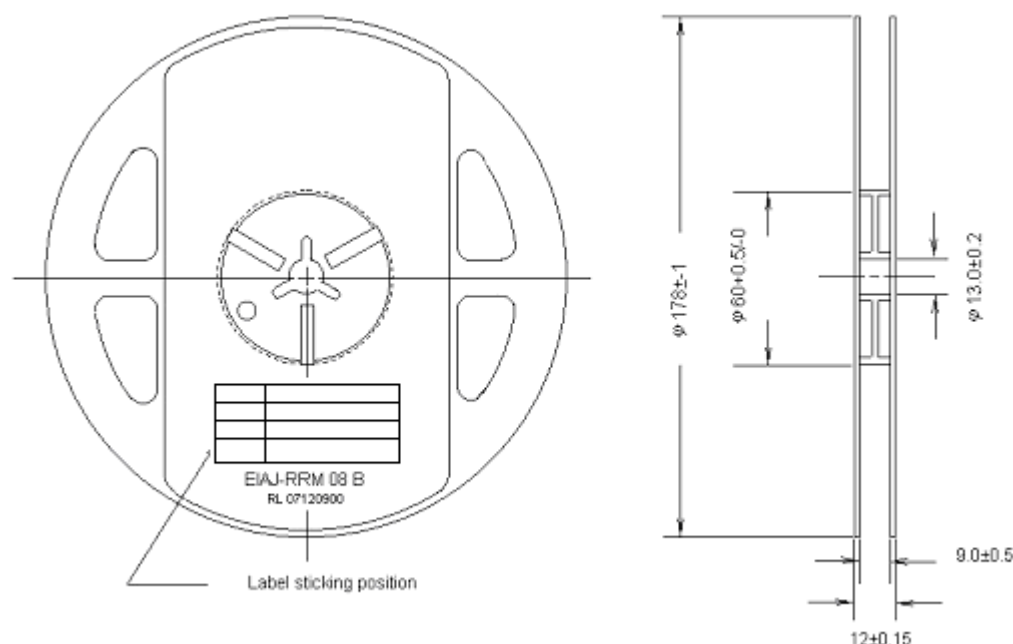
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Packaging Tape, Reel, and Packing Model Tape Dimension

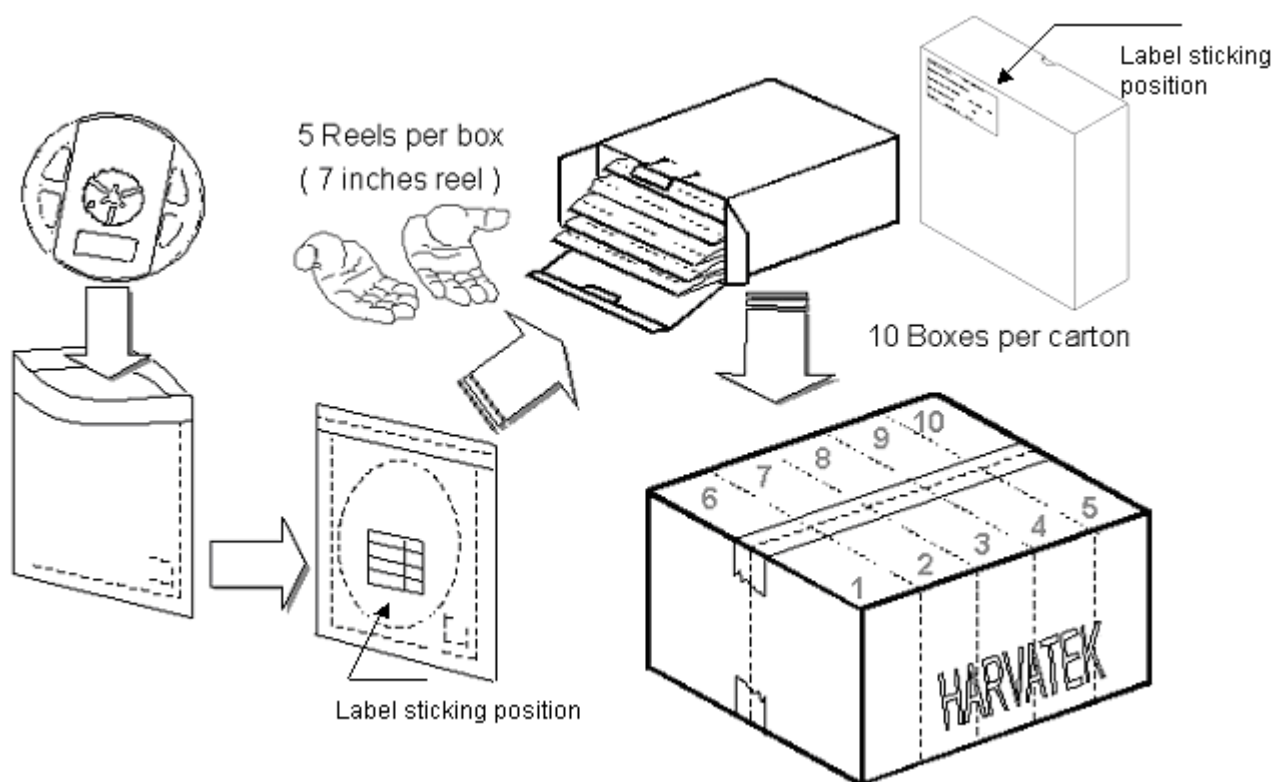


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Reel Dimension



Packing Model



5 boxes per carton is available according to shipping quantity.

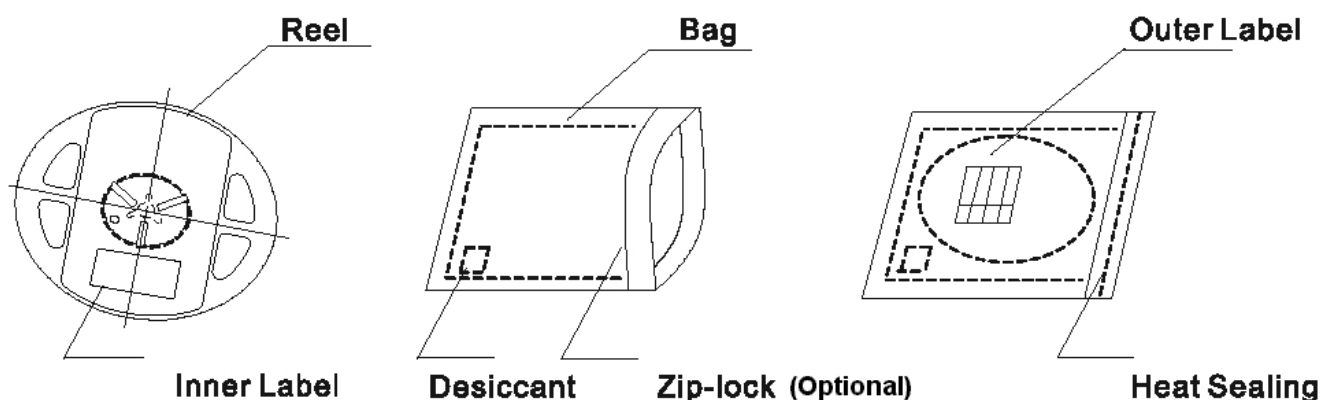
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Dry Pack

Any SMD optical device, like this chip LED, is **MOISTURE SENSITIVE device**. Avoid absorbing moisture at any time during transportation or storage. Every reel will be packaged in the moisture barrier anti-static bag (Specific bag material will depend upon customers' requirement or option). And the bag is well sealed before shipment.

By customer's requirement, we will put a humidity indicator in each moisture barrier anti-static bag before shipment.

The package is the following:



Cautions of Pick and Place

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment grounding well. Using an ionizer fan is recommended.

PRECAUTIONS

1. Avoid absorbing moisture at any time during transportation or storage.
2. Anti-Static process is needed especially when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a proper series current limit resistor. Avoid driving reverse voltage over the specification of LEDs when turning the unit ON/OFF.
4. Any application should refer to the specifications of absolute maximum ratings.
5. Avoid any direct contact with the viewing area.
6. If possible, assemble the unit in a clean room or dust-free environment.

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Reflow Soldering

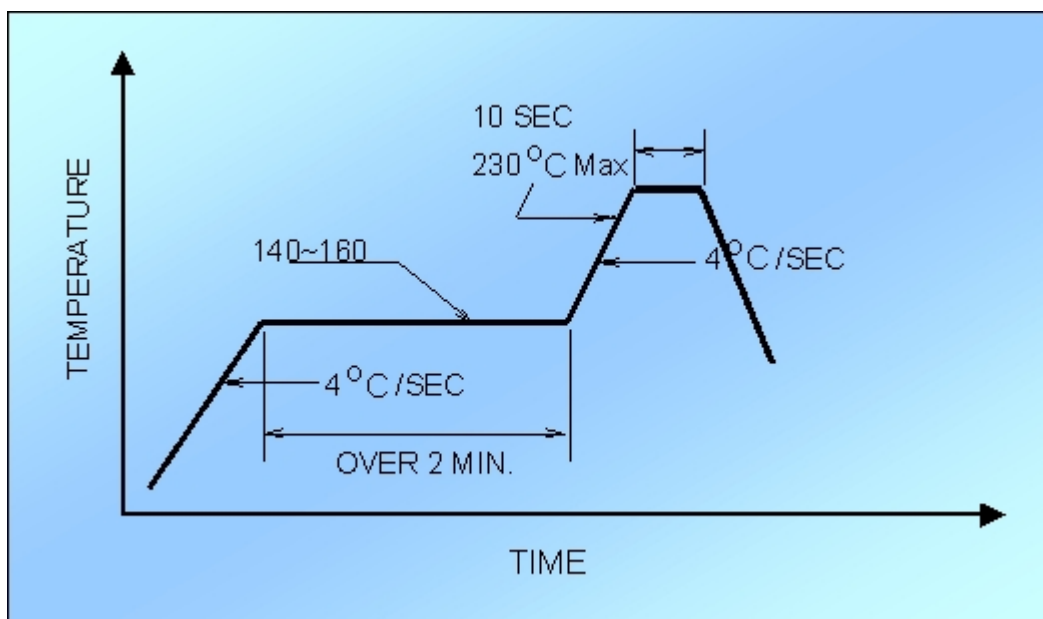
Recommend soldering paste specifications:

Melting temperature: 178~192 °C

Contains: Sn 63%, Pb 37%

Never take next process until the component is cooled down to room temperature after reflow.

The recommended reflow soldering profile (measuring on the surface of the LED terminal) is following:



Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.

Temperature×Time: <50 °C×30sec, or <30 °C×3min

Ultra sonic cleaning: < 15W/ bath; Bath volume: 1liter max.

Curing: 100 °C max, <3min

Do not contact with component on the assembly board.

Cautions of Pick and Place

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment grounding well. Using an ionizer fan is recommended.

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