
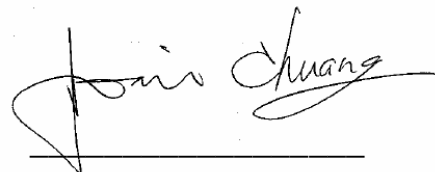


Harvatek Surface Mount CHIP LEDs Approval Sheet
Model No.: HT-T3A8FCH

Acknowledged by


Section Manager
Production Engineering Dept.



Manager
Production Engineering Dept.

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
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INTRODUCTION.....	3
ATTENTION: ELECTRICSTATIC DISCHARGE (ESD) PROTECTION	4
LABEL SPEC.:.....	5
BIN CODE.....	6
ELECTRO-OPTICAL CHARACTERISTICS.....	7
PACKAGE OUTLINE DIMENSION AND RECOMMENDED SOLDERING PATTERN FOR REFLOW SOLDERING.....	7
ABSOLUTE MAXIMUM RATINGS.....	7
CHARACTERISTICS OF HT-T3A8FCH SERIES	8
PACKAGING TAPE, REEL, AND PACKING MODEL.....	9
TAPE DIMENSION.....	9
REEL DIMENSION	9
PRECAUTION OF APPLICATION	10
DESIGNING 1: SOLDERING PATTERN.....	10
DESIGNING 2: CIRCUIT LAYOUT	10
DESIGNING 3: MAX RATING.....	10
DRY PACK.....	10
THE PACKAGE.....	11
STORAGE	11
BAKING	11
SOLDERING.....	11
HANDLING OF SILICONE RESIN LEDS.....	12
REFLOW SOLDERING.....	13
CLEANING.....	14
CAUTIONS OF PICK AND PLACE.....	14

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 2/14

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 HARVATEK 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.*

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 3/14

Product Specification

	Specification	Material	Quantity
Iv	Red: 360 mcd, (min) Green: 1125 mcd, (min) Blue: 142 mcd,(min) @20mA/ Ta= 25° C Tolerance±10%		
lambda(λD)	Red: 615-630 nm Green: 517.5-530 nm Blue: 462.5-475 nm @20mA/ Ta= 25° C Tolerance±0.5nm		
Vf	Red:1.8-2.4V Green/Blue:3.0-3.6V @20mA Tolerance±0.05V		
Ir	Red:< 100 μA @Vr =5 V Green/Blue:<50uA@Vr = 5V		
Resin	Water clear	Silicon	
Carrier tape	According to EIA 481-1A specs	Conductive black tape	1000pcs per reel
Reel	According to EIA 481-1A specs	Conductive black	
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







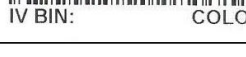


The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs is based chips is still necessary even though they are safe in low static-electric discharge. Material in AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD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

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

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 4/14

Label Spec.:

HARVATEK		DATE: dd/mm/yyyy		
CUSTOMER P/N:				
HARVATEK P/N:		QTY:	PCS	
LOT NO:		QC:		
IV BIN:		VF:		
	COLOR BIN:			

■ Customer P/N: To Be Defined

■ Harvatek P/N

H T - T 3 A 8 FCH



Series Name	Emitting Color
HT-T3A8: 5.0*5.0*1.5mm (Ceramics)	FCH

■ 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: Milky White	T: Taped Reel

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
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BIN CODE

Parameter	Rank		Min.	Max.	Unit		
Wd@20mA	R	1	615	620	nm		
		2	620	625			
		3	625	630			
	G	1	517.5	520			
		2	520	522.5			
		3	522.5	525			
		4	525	527.5			
		5	527.5	530			
	B	1	462.5	465			
		2	465	467.5			
		3	467.5	470			
		4	470	472.5			
		5	472.5	475			
	Vf@20mA	R	A	1.8		2.0	V
			B	2.0		2.2	
C			2.2	2.4			
G&B		A	3.0	3.2			
		B	3.2	3.4			
		C	3.4	3.6			
IV@20mA	R & G & B	D	200	270	mcd		
		E	270	370			
		F	370	500			
		G	500	700			
		H	700	1000			
		J	1000	1400			
		K	1400	1950			
		L	1950	2750			

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 6/14

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	$\Delta\lambda$	Typ
HT-T3A8FCH	Red	AlInGaP	2.1	2.6	625	632	20	450
	Green	InGaN	3.2	4.0	520	-	35	1440
	Blue	InGaN	3.2	4.0	465	-	26	180

Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.25

Outline Dim.	Soldering Pattern
Soldering terminal may shift in x, y direction.	

Absolute Maximum Ratings

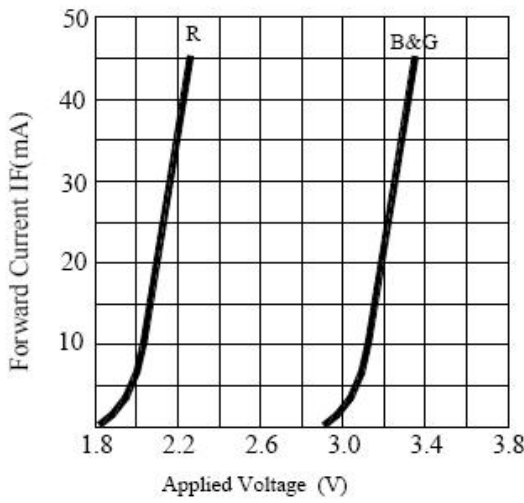
(T_a 25 °C)

Series	Color	P_d (mW)	I_F (mA)	I_{FP} (mA)	V_R (V)	I_R (uA)	T_{OP} (°C)	T_{ST} (°C)
HT-T3A8FCH	Red	78	30	100**	5	<100@ $V_R = 5$	-25~+80	-40~+100
	Green	120						
	Blue	120						

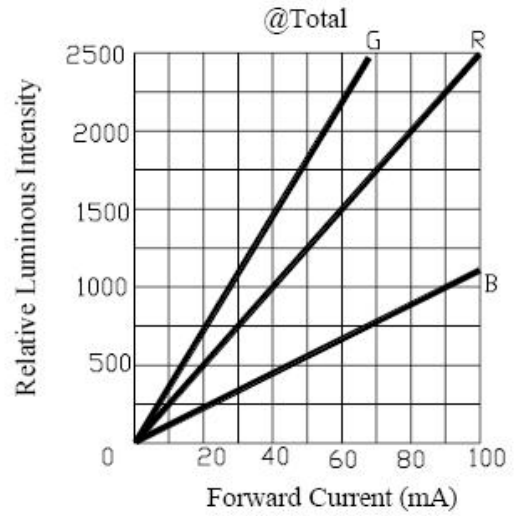
** Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 7/14

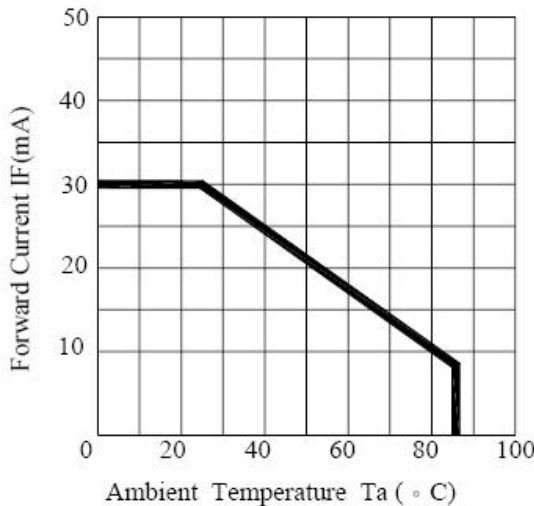
Characteristics of HT-T3A8FCH Series



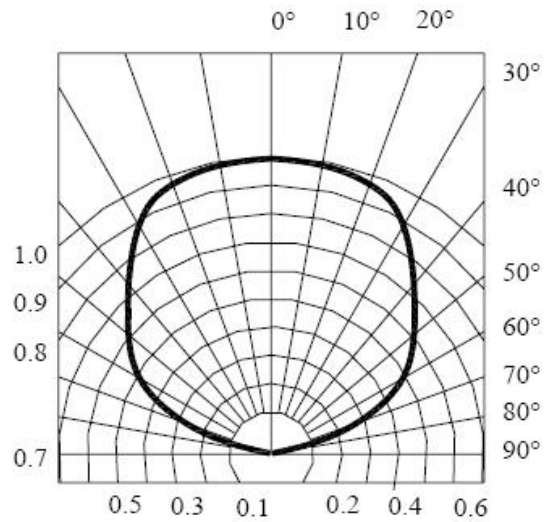
Forward Current VS. Applied Voltage



Forward Current VS. Luminous Intensity



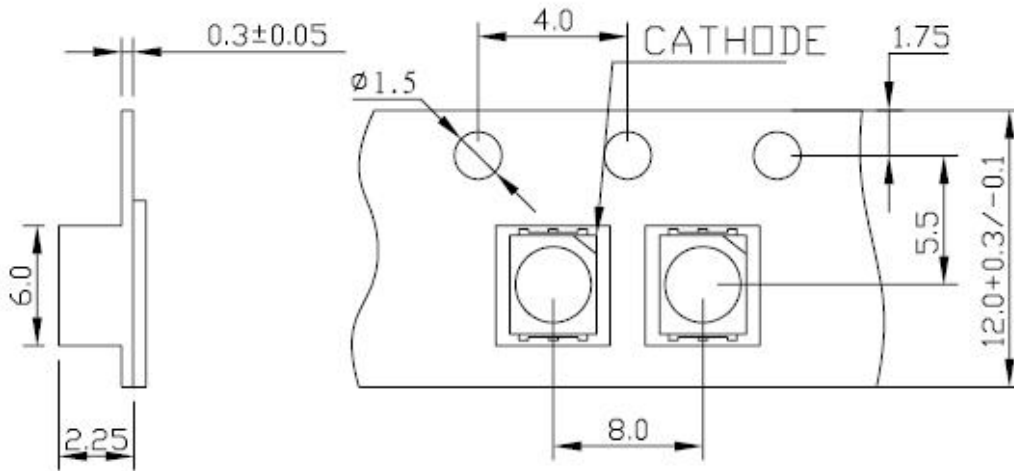
Ambient Temperature vs. Forward Current



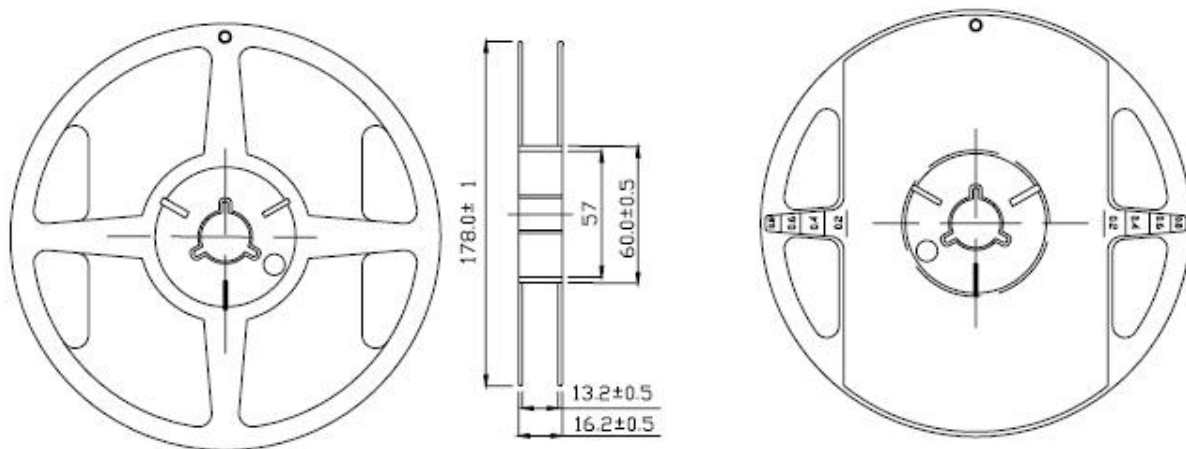
Radiation Diagram

Official Product	HT Part No. HT-T3A8FCH	Your Part No.	Data Sheet No.
Tentative Product	*****	*****	HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1
			Page 8/14

Packaging Tape, Reel, and Packing Model Tape Dimension



Reel Dimension



Notes:

1. All dimensions are in mm, tolerance is ± 2.0 mm unless otherwise noted.
2. Specifications are subject to change without notice.

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 9/14

Precaution of Application**Designing 1: Soldering pattern**

The dimensions of the recommended soldering pattern may not meet every user. Please confirm and study first before designing the soldering pattern in order to obtain the best performance of soldering.

Designing 2: Circuit layout

Due to the circuit design is not available, assuming the circuit is in parallel and a resistor that is put in series in the circuit, it cannot provide an effective current-limiting function to the LEDs due to each LED had a different inherent resistance.

In general, the LEDs usually have a different inherent resistance. Different inherent resistance will cause different current, the LED on the different path would be driven at different power, and the result was the LED with a higher resistance would be dimmer than the other.

To solve this situation, a suitable resistor is put in series with each LED to limit the current disparity through the LED will be very useful.

Designing 3: Max Rating

Any application should refer to the specifications of absolute maximum ratings.

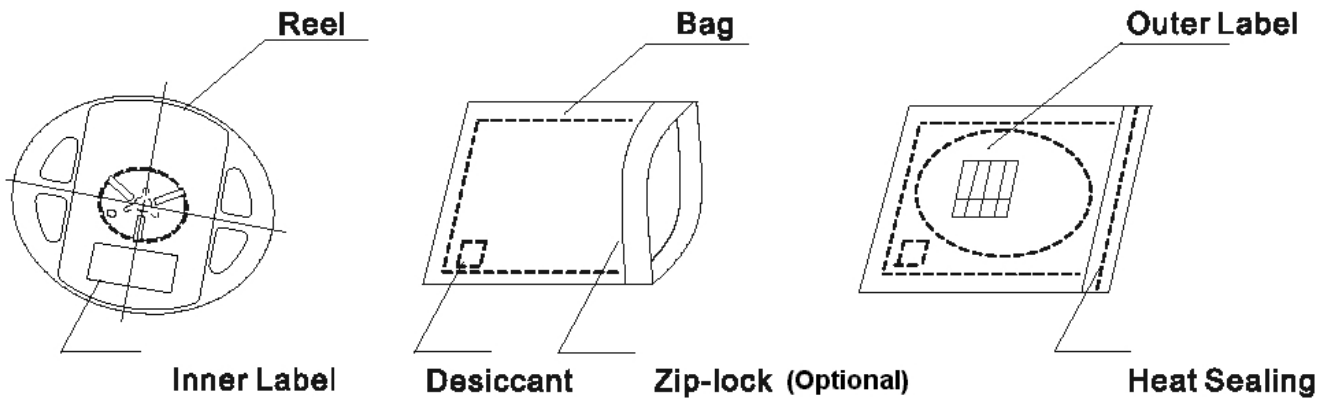
Dry Pack

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.

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 10/14

The package



Storage

It's recommended to store the products in the following conditions:

Humidity: 60 %RH Max.

Temperature: 5 °C ~30 °C (41°F~86 °F)

- 1 Shelf life in sealed bag: 12 month at 40°C and $90\% \text{RH}$. (Base on aluminum laminated moisture barrier bag.)
- 2 After the bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be:
 - 2.1 Mounted within 72 hours at factory conditions of $\leq 30^{\circ}\text{C} / 60\% \text{RH}$, or
 - 2.2 Stored at $\leq 20\% \text{RH}$ with zip-lock sealed.

Baking

It's recommended to bake before soldering once the pack is unsealed open & re-sealed after 72 hours. The conditions are as followings:

$60 \pm 3^{\circ}\text{C} \times (12 \sim 24 \text{hrs})$ and $5\% \text{RH}$, taped reel type

$100 \pm 3^{\circ}\text{C} \times (45 \text{min} \sim 1 \text{hr})$, bulk type

$130 \pm 3^{\circ}\text{C} \times (15 \sim 30 \text{min})$, bulk type

Soldering

Manual soldering (We do not recommend this method strongly.)

Soldering wire: 63/37 Sn/Pb, flux contained.

To prevent cracking, please bake before manual soldering, if the device is subject to moisture.

Temperature at tip of soldering tool : $300^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Max.(25W)

It's banned to load any stress on the resin during soldering.

Soldering time : $3 \pm 1 \text{sec}$

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 11/14

Handling of Silicone Resin LEDs

Handling Indications

During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.



Figure 1

In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.

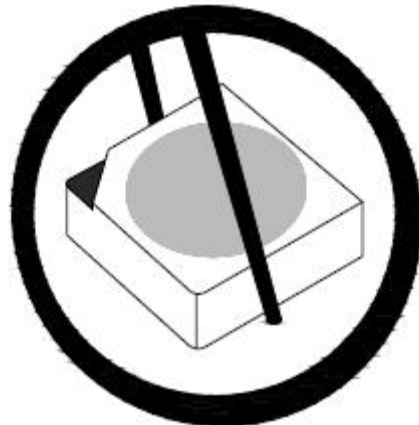


Figure 2

When populating boards in SMT production, there are basically no restrictions regarding the from of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.

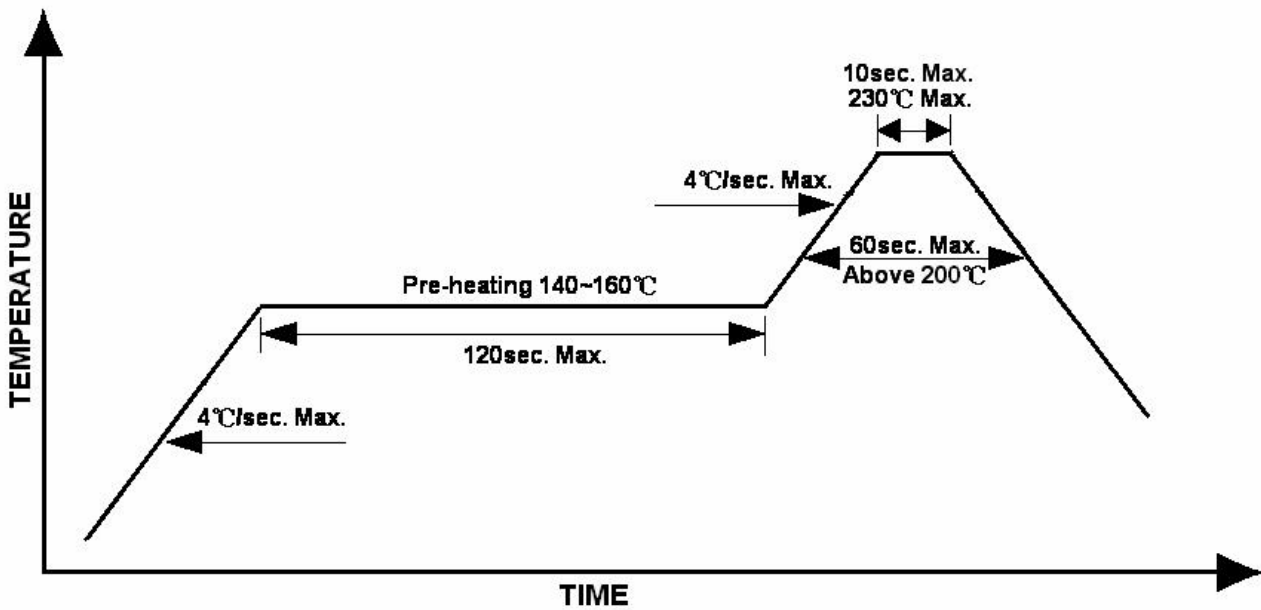
This is assured by choosing a pick and place nozzle which is large than LEDs reflector area.

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 12/14

Reflow Soldering

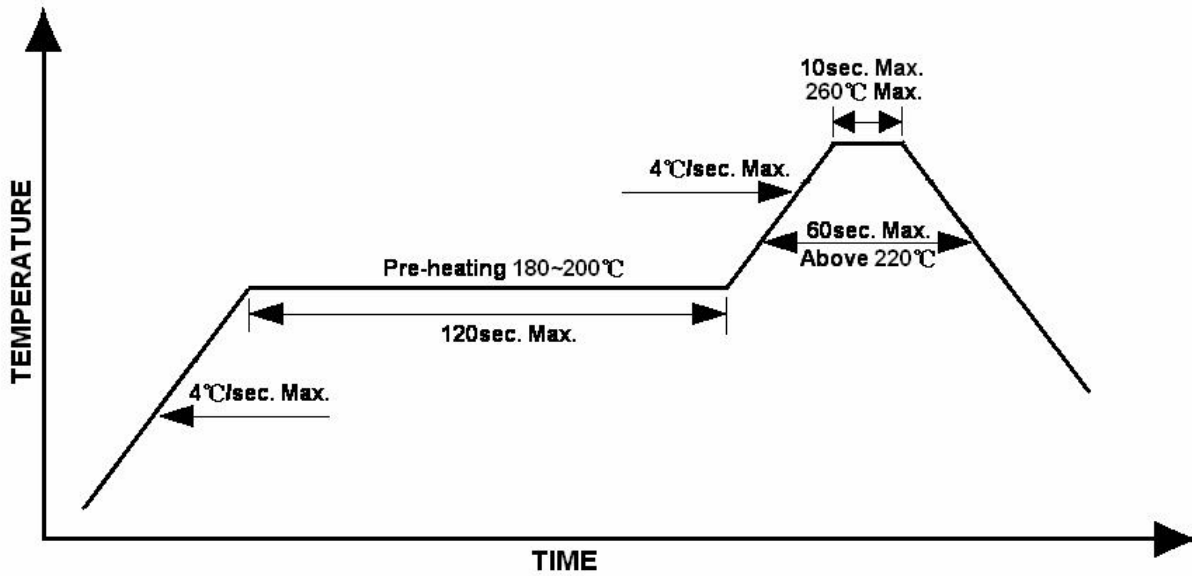
- ◆ Recommend tin glue specifications:
Melting temperature: 178~192 °C
- ◆ Never take next process until the component is cooled down to room temperature after reflow.
- ◆ The recommended reflow soldering profile (measuring on the surface of the LED resin) is following:

Lead Solder



Lead-free Solder

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 13/14



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.

Official Product	HT Part No. HT-T3A8FCH	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-T3A8-B879
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, company confidential all rights reserved.		Jan-11,2007	Version of 1.1	Page 14/14