

**Harvatek Surface Mount CHIP LED Data Sheet  
HT-311FDH**

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 1/18

DISCLAIMER.....	3
PRODUCT SPECIFICATIONS .....	4
ELECTROSTATIC DISCHARGE (ESD) PROTECTION.....	4
LABEL SPECIFICATIONS .....	5
PRODUCT FEATURES .....	8
ELECTRO-OPTICAL CHARACTERISTICS.....	8
PACKAGE OUTLINE DIMENSION.....	8
RECOMMENDED SOLDERING PATTERN FOR REFLOW SOLDERING .....	8
ABSOLUTE MAXIMUM RATINGS .....	8
CHARACTERISTIC CURVES .....	10
PACKAGING .....	11
TAPE DIMENSION .....	11
REEL DIMENSION.....	12
PACKING.....	13
DRY PACK.....	13
PRECAUTIONS.....	14
REFLOW SOLDERING .....	15
REWORKING .....	16
CLEANING.....	16
CAUTIONS OF PICK AND PLACE.....	16
RELIABILITY.....	17

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 2/18

**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.

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 3/18

## Product Specifications

	Specification	Material	Quantity
Iv	Amber : 71.5-285.0 mcd Green : 112.5-360.0 mcd Blue : 71.5-285.0 mcd @20mA/ Ta= 25 <sup>o</sup> C		
λ <sub>D</sub>	Amber : 615-630 nm Green : 515-540 nm Blue : 470-485 nm @20mA/ Ta= 25 <sup>o</sup> C		
Vf	Amber : 1.7-2.4 V Green : 2.9-3.9 V Blue : 2.0-3.9 V @20mA/ Ta= 25 <sup>o</sup> C		
Ir	< 100 μA @ V <sub>R</sub> = 5 V		
Resin	Diffused	Epoxy resin	
Carrier tape	EIA 481-1A specs	Conductive black tape	1000pcs per reel
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	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<sub>D</sub> 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.

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 4/18

## Label Specifications

<b>HARVATEK</b>		Date: yyyy/mm/dd 
CUSTOMER P/N: 		
HARVATEK P/N: 	QTY: PCS 	
LOT NO: 		QC
IV BIN:    COLOR BIN:    VF:		

■ Customer P/N: To Be Defined

■ Harvatek P/N:

**H T - 3 1 1 FDH**



Series Name	Emitting Color
HT-311 3.2x1.5x1.0mm	FDH Tri-color Amber, Green, and Blue @ 20mA

■ Lot No.:

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

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0 Page 5/18

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: Tape & Reel

■ Luminous Intensity (Iv) Bin:

Color	Bin Code	Spec. Range
Amber	Q	71.5-112.5 mcd
	R	112.5-180.0 mcd
	S	180.0-285.0 mcd
Green	R	112.5-180.0mcd
	S	180.0-285.0 mcd
	T	285.0-360.0 mcd
Blue	Q	71.5-112.5 mcd
	R	112.5-180.0 mcd
	S	180.0-285.0 mcd

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 6/18

■ Dominant Wavelength ( $\lambda_D$ ) Bin:

Color	Bin Code	Spec. Range
Amber	B	600-603 nm
	C	603-606 nm
	D	606-609 nm
	E	609-612 nm
Green	AB	515-525 nm
	CD	525-535 nm
	E	535-540 nm
Blue	C	470-475 nm
	D	475-480 nm
	E	480-485 nm

■ Forward Voltage ( $V_f$ ) Bin:

Color	Bin Code	Spec. Range
Amber	-	1.7-2.4 V
Green	-	2.9-3.9 V
Blue	-	2.9-3.9 V

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 7/18

## Product Feature

### Electro-Optical Characteristics

Code for parts	Lighting Color			V <sub>F</sub> (V)		λ (nm)			I <sub>v</sub> (mcd)
				typ	max	λ <sub>D</sub>	λ <sub>P</sub>	Δλ	Typical
HT-311FDH	Die3	Ultra Bright Amber	UD	1.9	2.4	605	609	17	180
	Die1	Green	NG	3.3	3.9	527	520	40	240
	Die2	Blue	NB	3.3	3.9	470	468	26	180

### Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

Outline Dim.	Soldering Pattern
<p>-Soldering terminals may shift in the x, y direction.</p> <p>-Common anode.</p>	

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 8/18

## Absolute Maximum Ratings

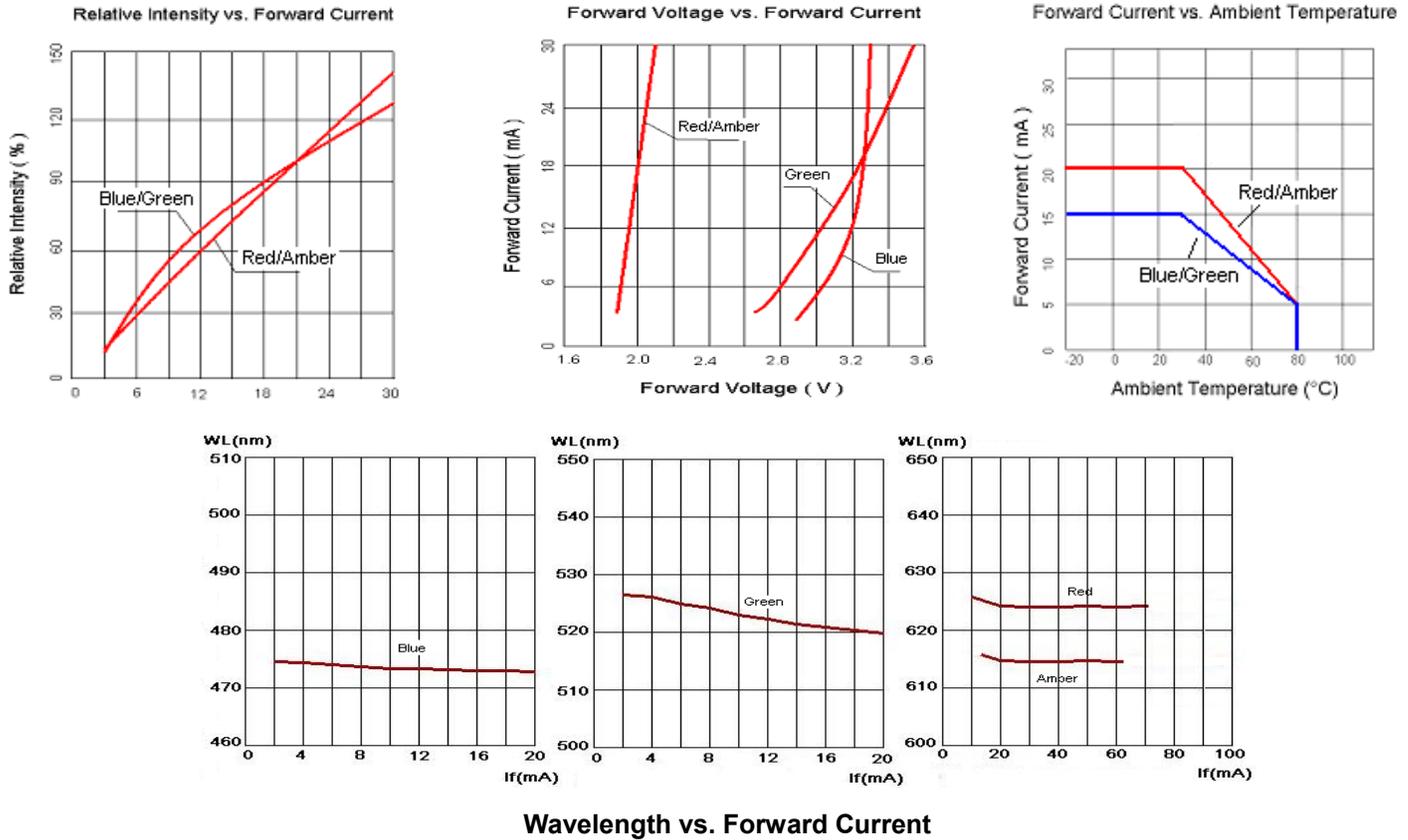
(T<sub>a</sub> 25 °C)

Series	P <sub>d</sub> (mW)	I <sub>F</sub> (mA)	I <sub>FP</sub> (mA)	V <sub>R</sub> (V)	I <sub>R</sub> (uA)	T <sub>OP</sub> (°C)	T <sub>ST</sub> (°C)
Amber	46	20	100	5	<100@ V <sub>R</sub> = 5	-30~+80	-40~+85
Blue/Green	74	20	80				

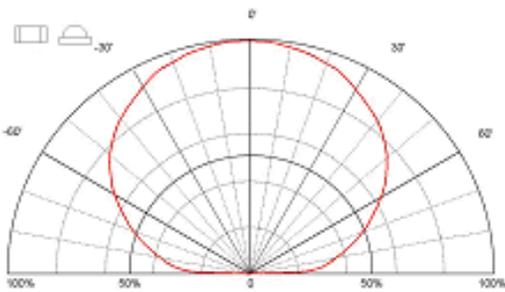
\*\* Condition for I<sub>FP</sub> is pulse of 1/10 duty and 0.1msec width

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 9/18

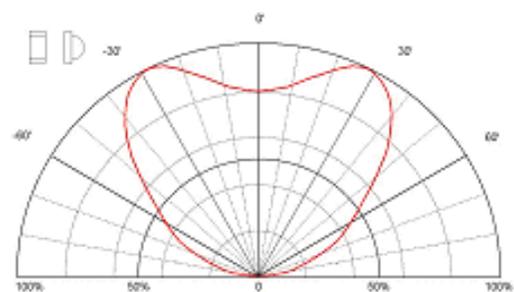
### Characteristics of HT-311FDH



Directive Characteristics



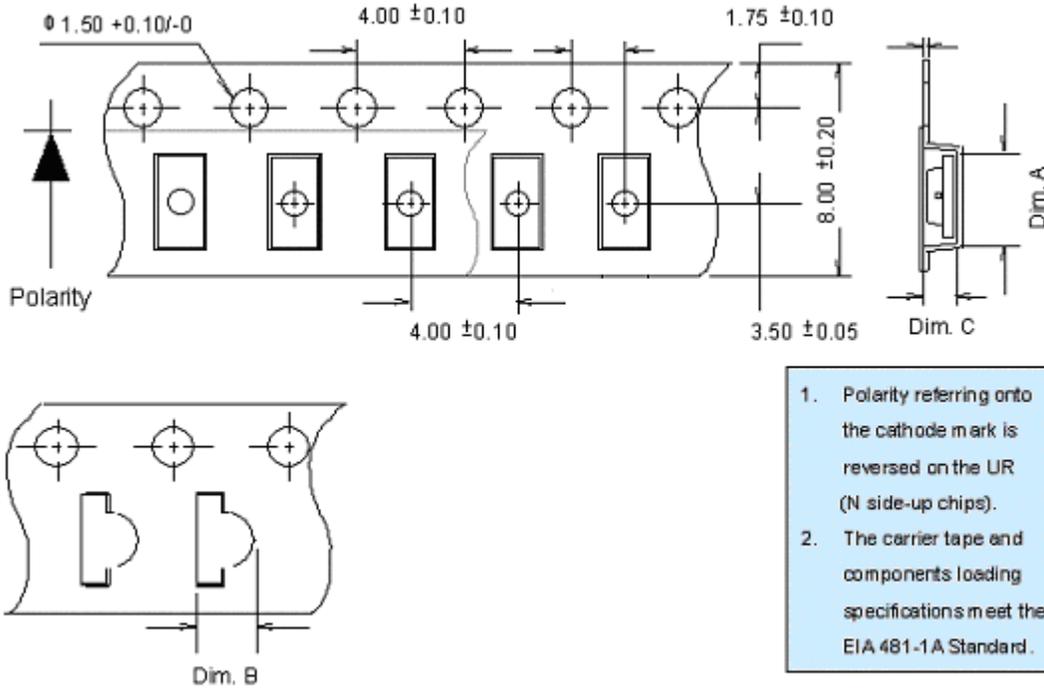
Directive Characteristics



Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 10/18

## Packaging

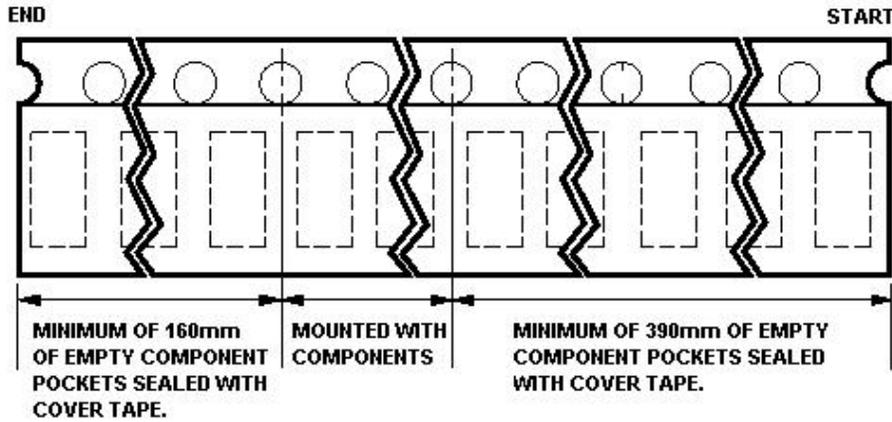
### Tape Dimension



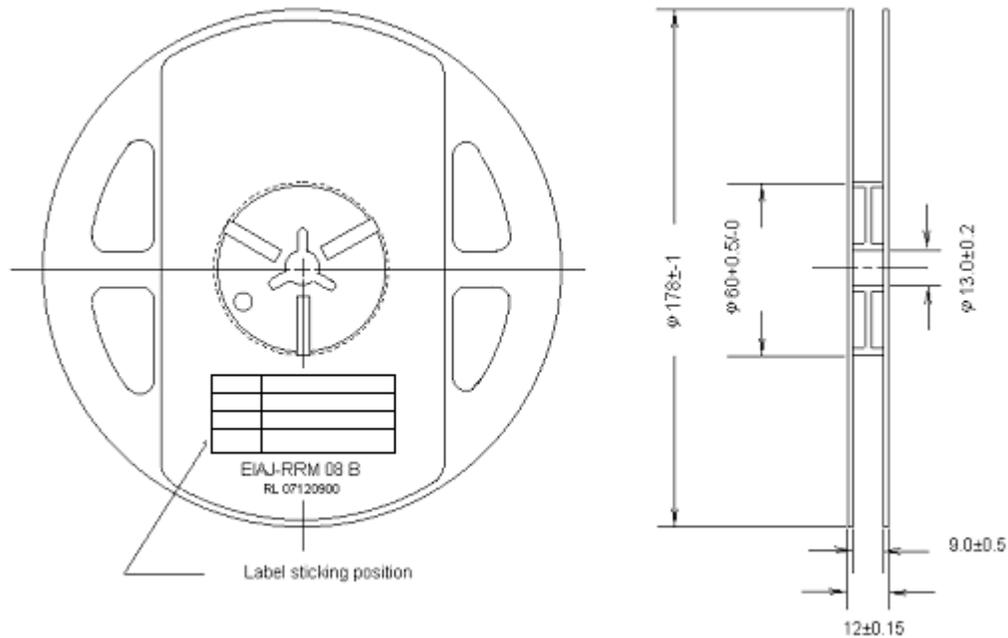
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-311	$3.40 \pm 0.10$	$1.70 \pm 0.10$	$1.20 \pm 0.10$	1K

Unit: mm

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 11/18

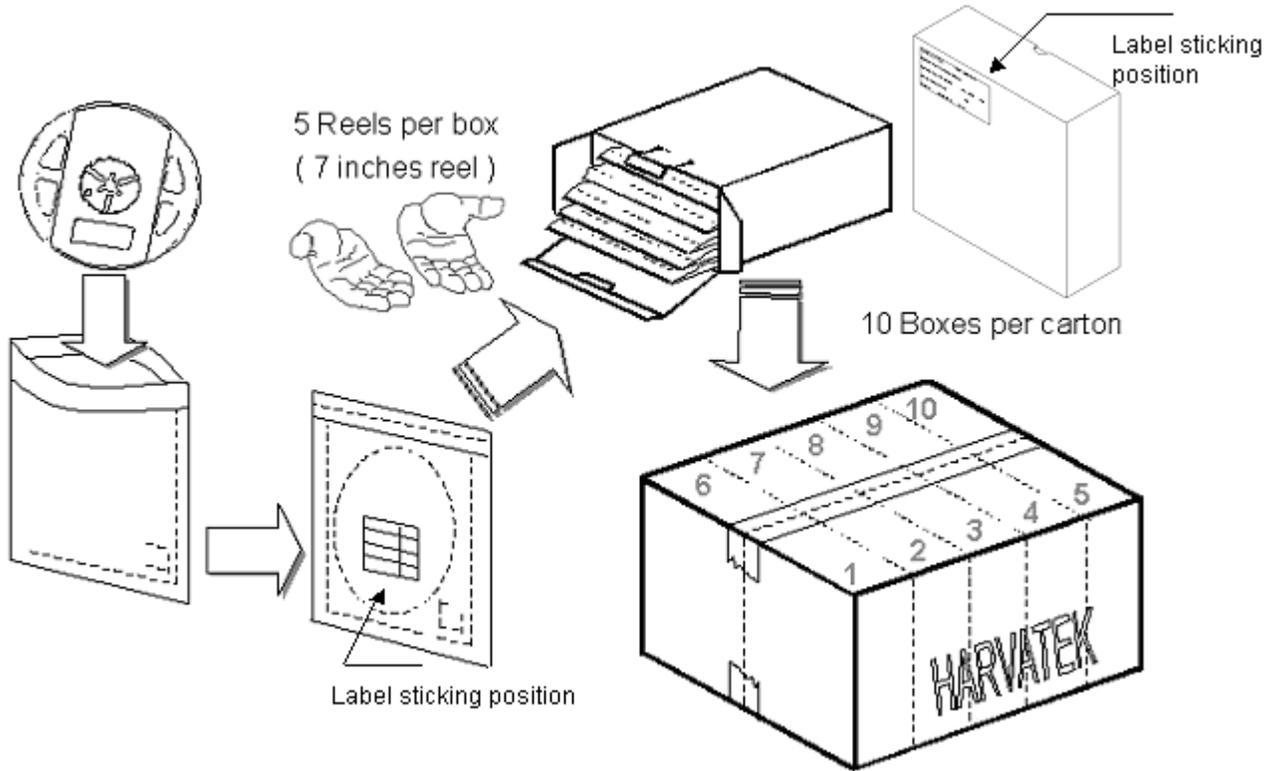


## Reel Dimension



Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 12/18

## Packing



5 boxes per carton is available depending on shipment quantity.

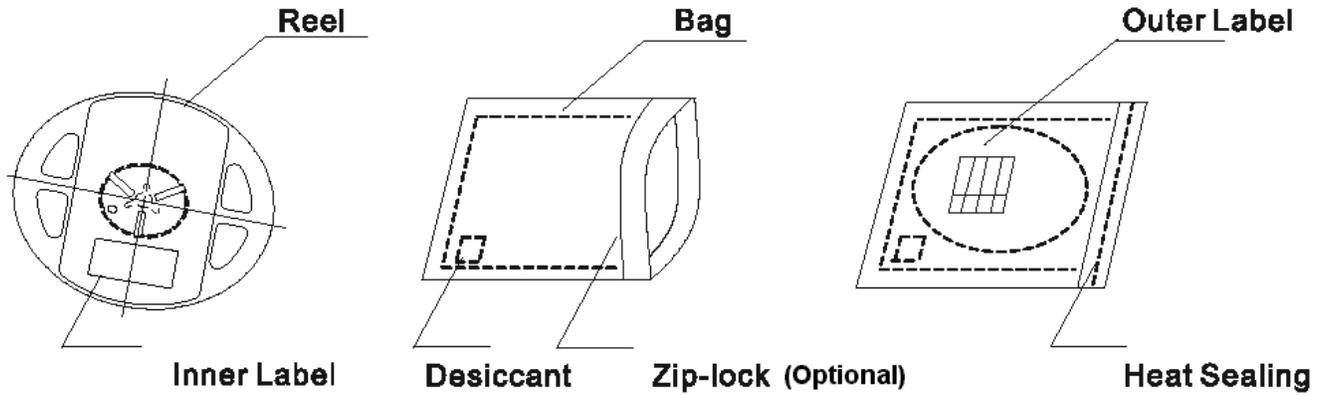
## Dry Pack

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.

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	June 19, 2009	Version of 1.0	Page 13/18

The packaging sequence is as follows:



## PRECAUTIONS

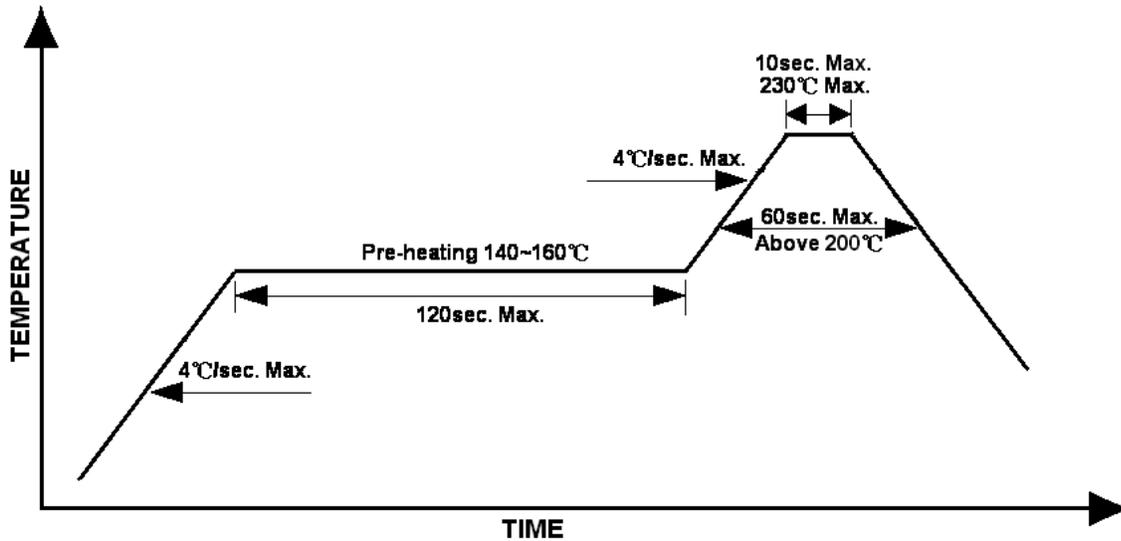
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the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

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 14/18

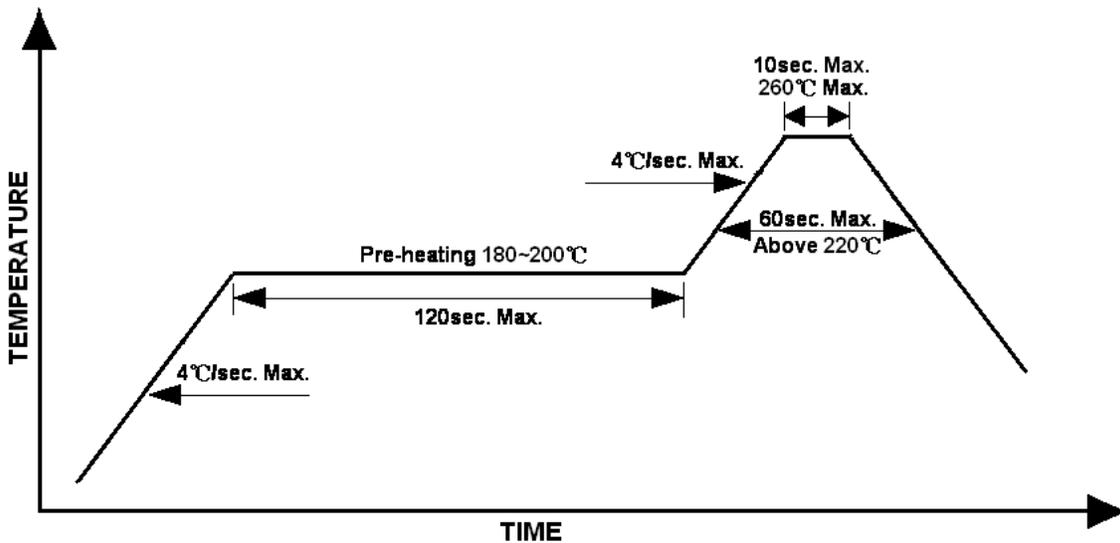
## Reflow Soldering

- Recommended tin glue specifications: melting temperature in the range of 178~192 °C
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

Lead Solder Profile



Lead-free Solder Profile



Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0
			Page 15/18

## Reworking

- Rework should be completed within 5 seconds under 260 °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°C x 30sec. or <30°C x 3min
- Ultra sonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °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.**

Official Product	HT Part No. HT-311FDH	Customer Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0	Page 16/18

## Reliability

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solderability	1Q/ 1/ 22/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5±0.5cm/s Tinning: A: 215°C/ 3±1s or B: 260°C/ 10±1s
Resistance to soldering heat		CNS-5067	Dipping soldering terminal only Soldering bath temperature A: 260±5°C; 10±1s B: 350±10°C; 3±0.5s
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	1.) Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs 2.) T <sub>amb</sub> 25°C; I <sub>F</sub> =20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	T <sub>amb</sub> : 85°C Humidity: 85% R.H., I <sub>F</sub> =5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20	HT specs.	T <sub>amb</sub> : 55°C I <sub>F</sub> =20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		T <sub>amb</sub> 25°C, I <sub>F</sub> =20mA,, I <sub>O</sub> =100mA, Duty cycle=0.125 (tp=125 μs, T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 76/ 0	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
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60±3°C 90±5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100±10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40±5°C for 500hrs

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		June 19, 2009	Version of 1.0 Page 17/18

## Revision History

Changes since last revision	Page	Version No.	Revision Date
New Format		1.0	06-19-2009

Official Product	HT Part No. HT-311FDH	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	HT-311FDH
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	June 19, 2009	Version of 1.0	Page 18/18