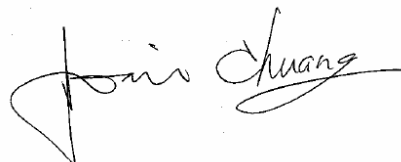


**Harvatek Surface Mount CHIP LEDs Data Sheet  
Model: HT-V116BP**

**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 it use.*
- *HARVATEK is continually making an 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.*

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## Product Specification

	Specification	Material	Quantity
Iv	500-1270mcd @20mA/ Ta= 25° C Tolerance: ± 10%		
Chromaticity Coordinates	Refer to page 8 @20mA/ Ta= 25° C Tolerance: ± 0.01		
Vf	2.7~3.7V @20mA/ Ta= 25° C Tolerance: ± 0.05V		
Resin	Yellow	Silicone resin	
Carrier tape	According to EIA 481-1A specs	Conductive black tape	2000pcs 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
	Specification	Material	Quantity

### 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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### Product Characteristics

#### Electro-Optical Characteristics

( $I_F$  @ 20mA,  $T_a$  25°C)

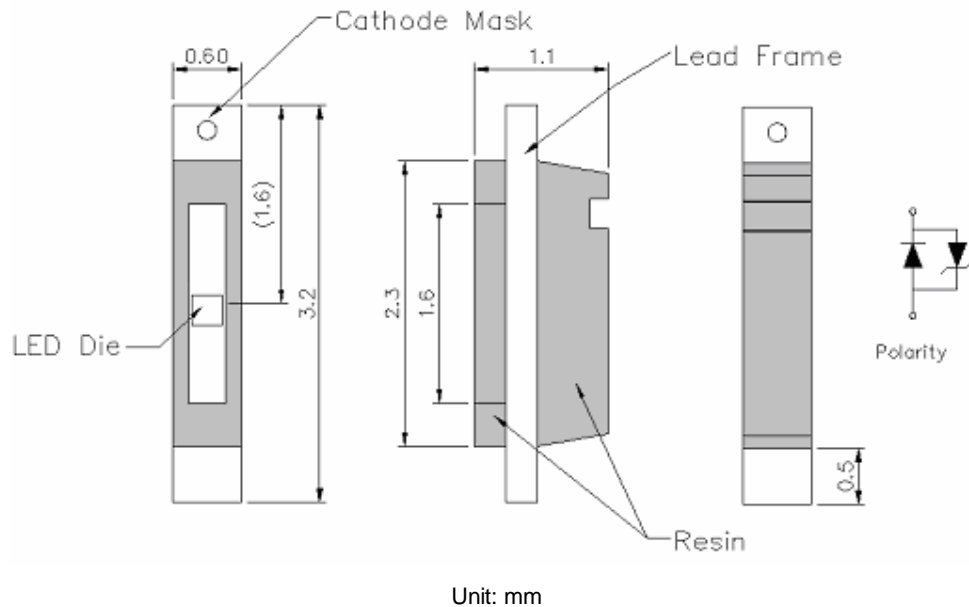
Product No.	Lighting Color	Material	$V_F$ (V)		$\lambda$ (nm)			$I_V$ (mcd)		
			min	max	$\lambda_D$	$\lambda_P$	$\Delta\lambda$	min	typ	max
HT-V116BP	White	InGaN	2.9	3.9	X=0.30 Y=0.31	--	--	500	850	1270

\* Per NIST standards

#### Package Outline Dimension

Unit: mm Tolerance: +/-0.1

Outline Dimension :



#### Absolute Maximum Ratings







( $T_a$  25°C)

Series	$P_d$ (mW)	$I_F$ (mA)	$I_{FP}$ (mA)	$I_r$ ( $\mu$ A) @ $V_R = 5$ V	$T_{OP}$ (°C)	$T_{ST}$ (°C)
HT-V116BP	117	30	100	<1 $\mu$ A	-40~+85	-40~+100

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

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## 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 - V 1 1 6 B P**

Series Name	Emitting Color
HT-V116: 3.2x1.1x0.6mm	BP: White

■ 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	1: 2001 2: 2002 3: 2003 4: 2004 .....	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

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## Bin Code.

### ■ Iv Bin:

Color	Bin Code	Spec. Range	Bin Code	Spec. Range
White	V2	500-560mcd	Y1	900-1000mcd
	W1	560-630mcd	Y2	1000-1125mcd
	W2	630-715mcd	Z1	1125-1270mcd
	X1	715-800mcd		
	X2	800-900mcd		

Luminous Intensity Measurement Allowance is  $\pm 10\%$

### ■ Color Bin:

	Rank A0			
x	0.280	0.264	0.283	0.296
y	0.248	0.267	0.305	0.276

	Rank B3			
x	0.287	0.283	0.304	0.307
y	0.295	0.305	0.330	0.315

	Rank B4			
x	0.307	0.304	0.330	0.330
y	0.315	0.330	0.360	0.339

	Rank C0			
x	0.330	0.330	0.361	0.356
y	0.318	0.360	0.385	0.351

	Rank B5			
x	0.296	0.287	0.307	0.311
y	0.276	0.295	0.315	0.294

	Rank B6			
x	0.311	0.307	0.330	0.330
y	0.294	0.315	0.339	0.318

Color Coordinates Measurement Allowance is  $\pm 0.01$

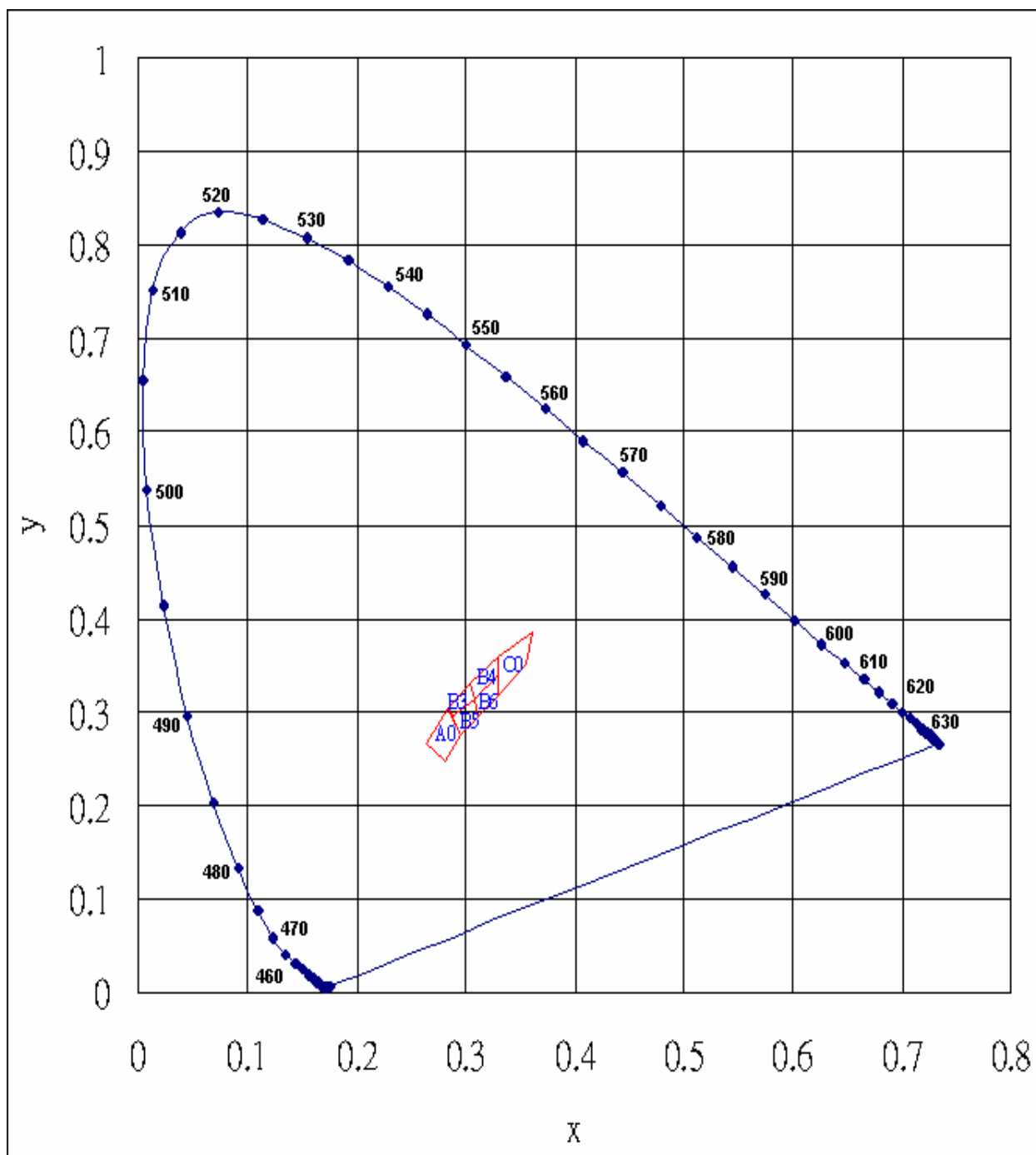
### ■ Vf Bin:

Color	Bin Code	Spec. Range
White	G4	2.7-2.8V
	H1	2.8-2.9V
	H2	2.9-3.0V
	H3	3.0-3.1V
	H4	3.1-3.2V
	J1	3.2-3.3V
	J2	3.3-3.4V
	J3	3.4-3.5V
	J4	3.5-3.6V
	K1	3.6-3.7V

Forward Voltage Measurement Allowance is  $\pm 0.05V$

## Chromaticity diagram

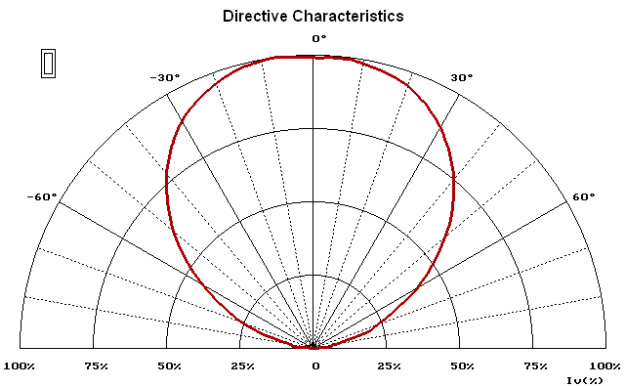
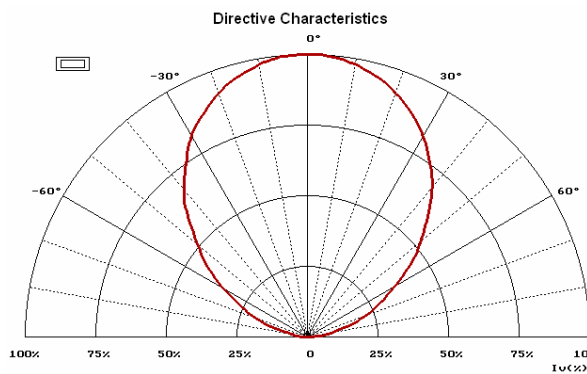
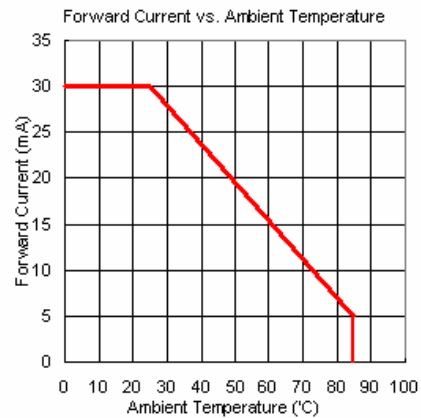
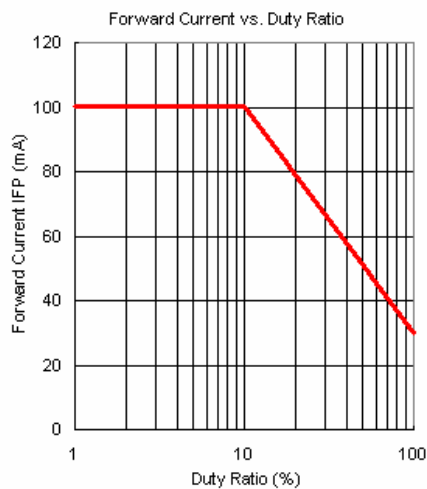
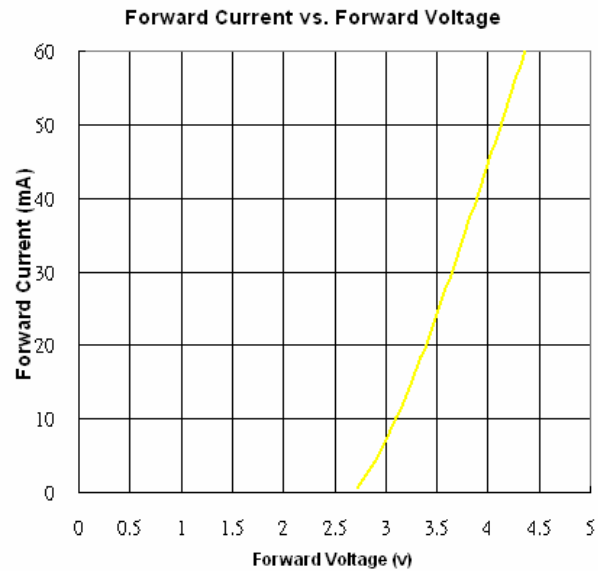
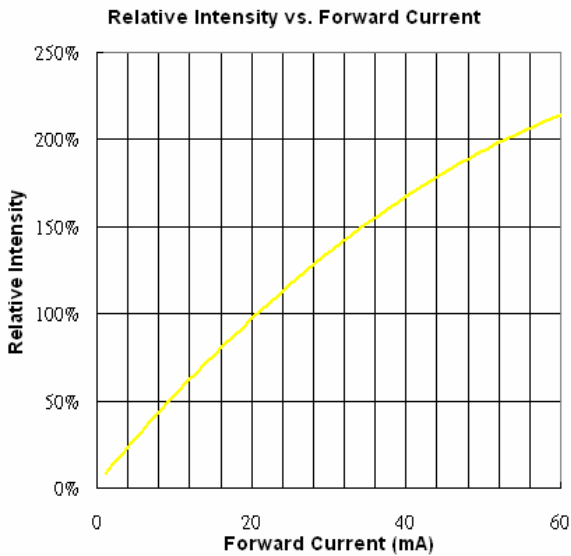
Official Product	HT Part No. HT-V116BP	Your Part No.		Data Sheet No.
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## Characteristics of HT-V116BP

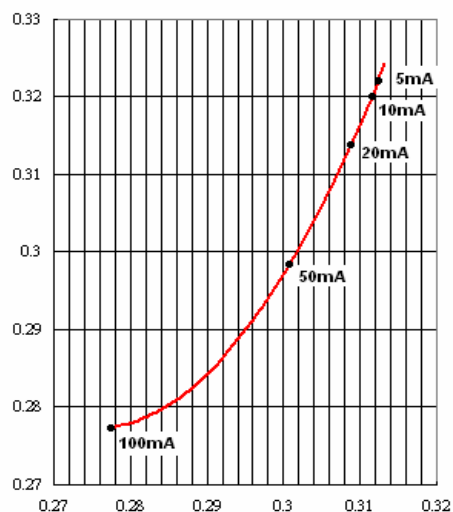
Official Product	HT Part No. HT-V116BP	Your Part No.	Data Sheet No.
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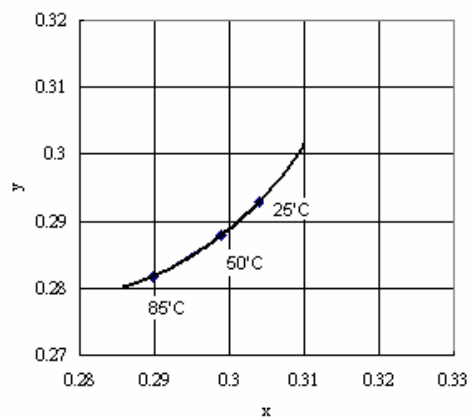


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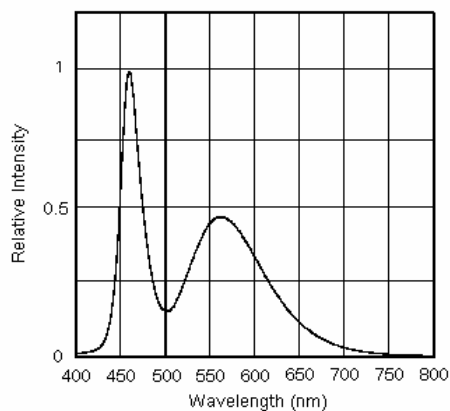
Forward Current vs. Chromaticity Coordinate



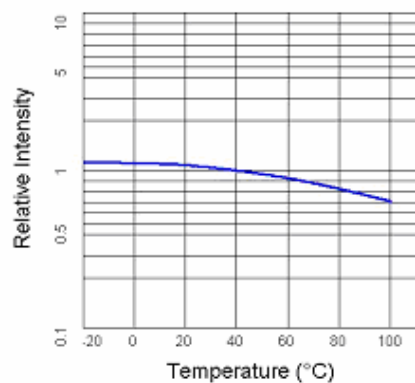
Ambient Temperature vs. Chromaticity Coordinate



Spectrum



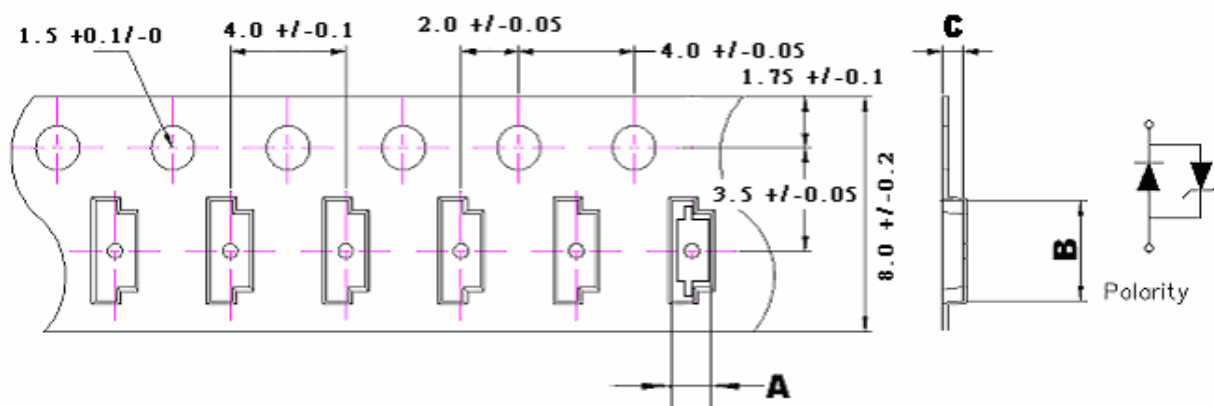
Relative Intensity vs. Ambient Temperature



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## Packaging Tape, Reel, and Packing Model

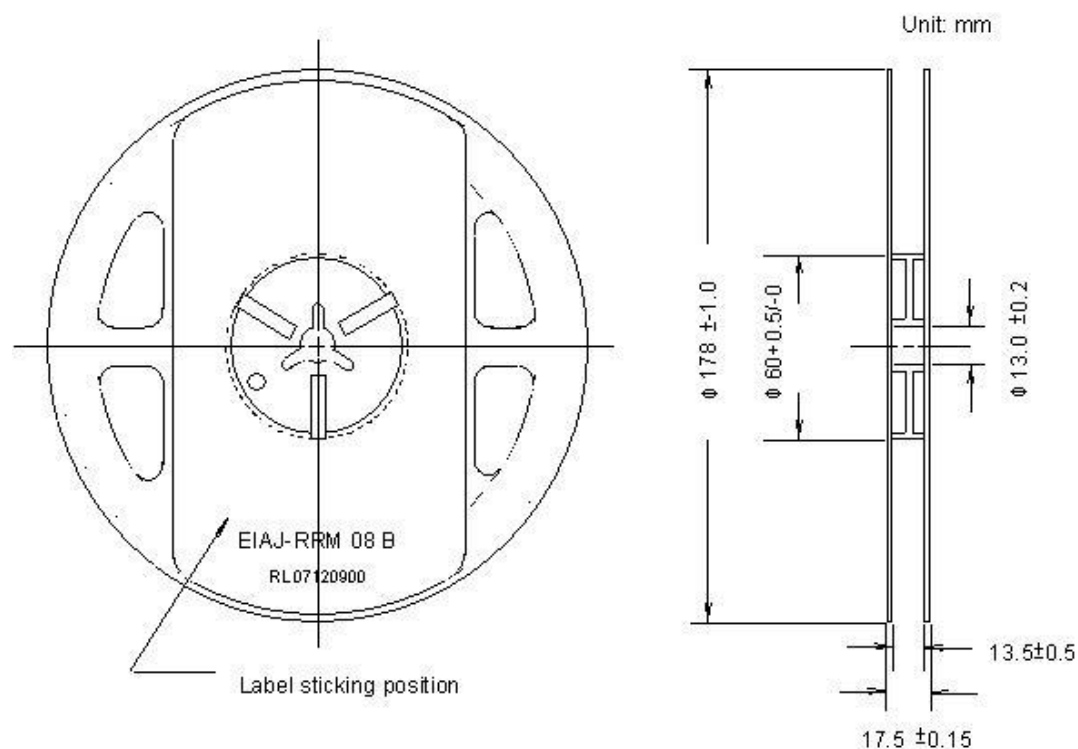
### Tape Dimension



Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-V116	1.25 $\pm 0.1$	3.50 $\pm 0.1$	0.75 $\pm 0.1$	2K

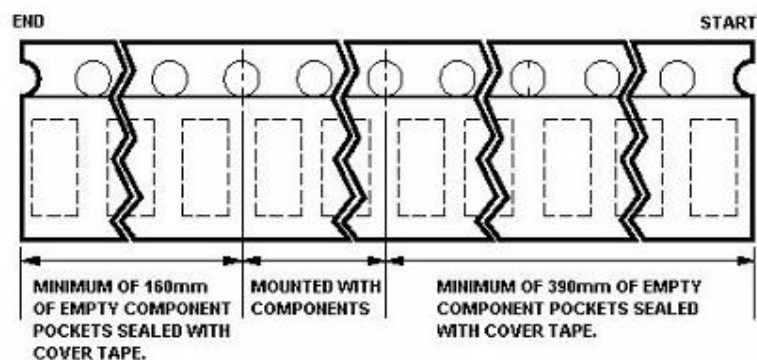
Unit: mm

### Reel Dimension

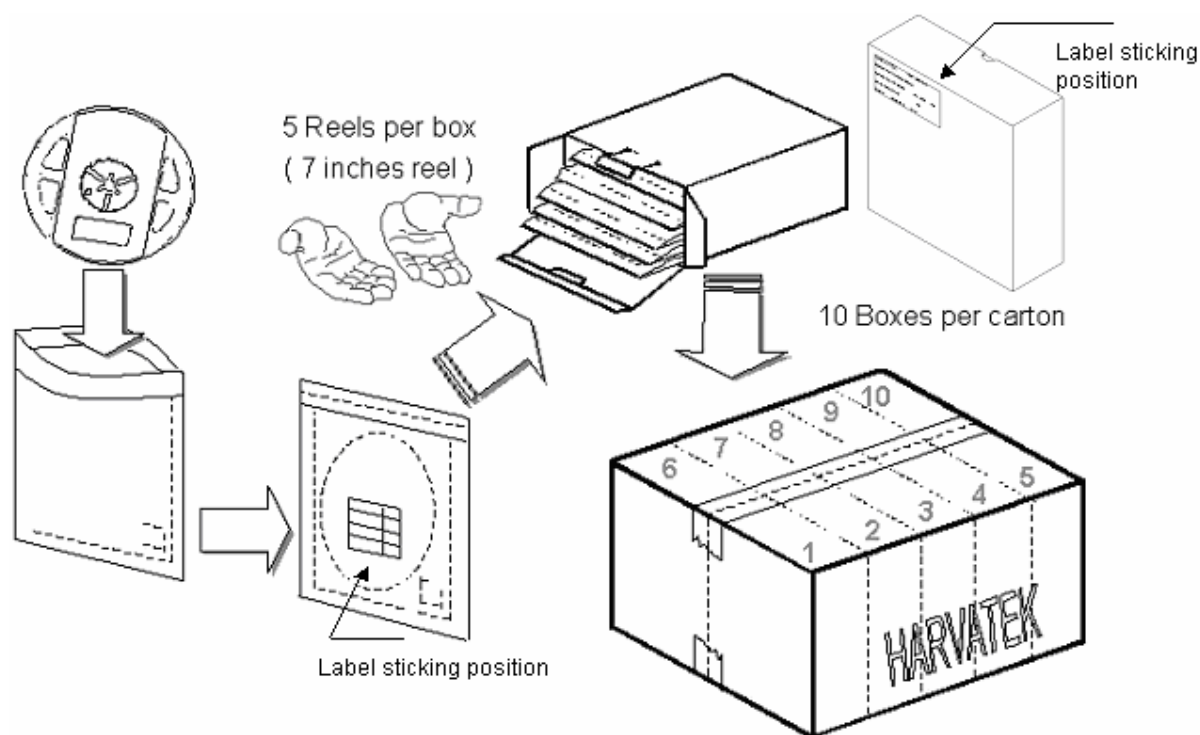


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## Tape Leader and Trailer Dimension



## Packing Model



5 boxes per carton is available according to shipping quantity.

Cardboard Box Size	Dimensions(cm)	Reel/box	Quantity/box (pcs)
Small	45 x 26 x 30	25 reels Max.	50, 000 Max
Large	50 x 46 x 30	50 reels Max.	100, 000 Max

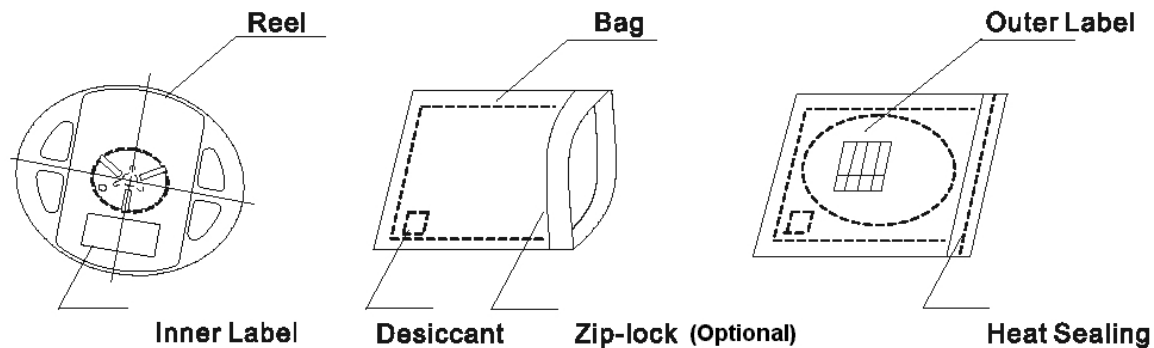
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## Dry Pack

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:



## 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%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% RH, or
  - 2.2 Stored at  $\leq 20\%$  RH with zip-lock sealed.

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## Baking

It's recommended to bake before soldering when the pack is unsealed after 15 days. The conditions are as followings:

- $60 \pm 3^{\circ}\text{C} \times (12 \sim 24\text{hrs})$  and  $< 5\%$  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

## 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.

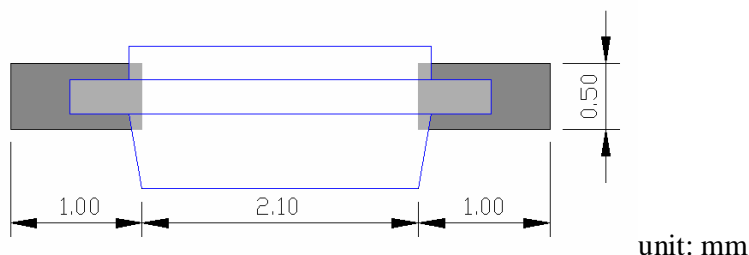
Electric-static may cause damage to the component. Please confirm that the equipment grounding well. Using an ionizer fan is recommended.

## PRECAUTIONS

- Avoid absorbing moisture at any time during transportation or storage.
- Anti-Static process is needed especially when handling GaN, InGaN, and AlInGaP products.
- 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.
- Any application should refer to the specifications of absolute maximum ratings.
- Avoid any direct contact with the viewing area.
- If possible, assemble the unit in a clean room or dust-free environment.

## 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. Recommended soldering pattern is listed below.



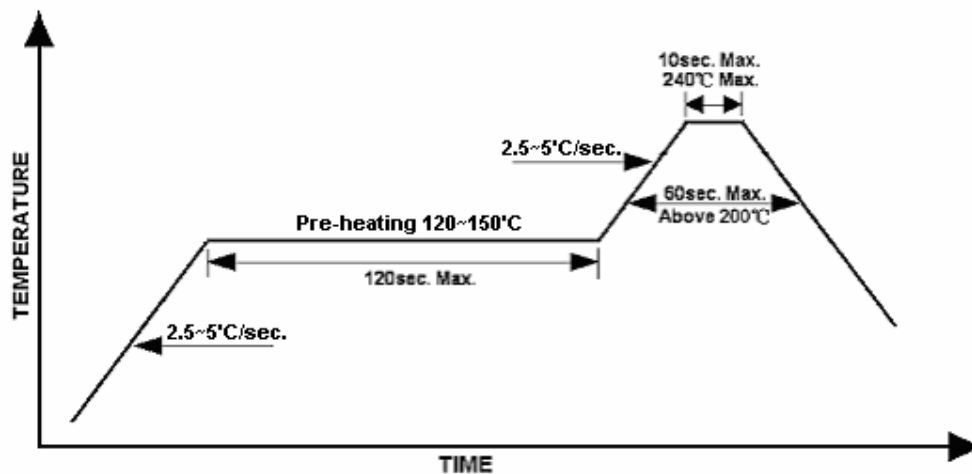
Soldering terminal may shift in x, y direction.

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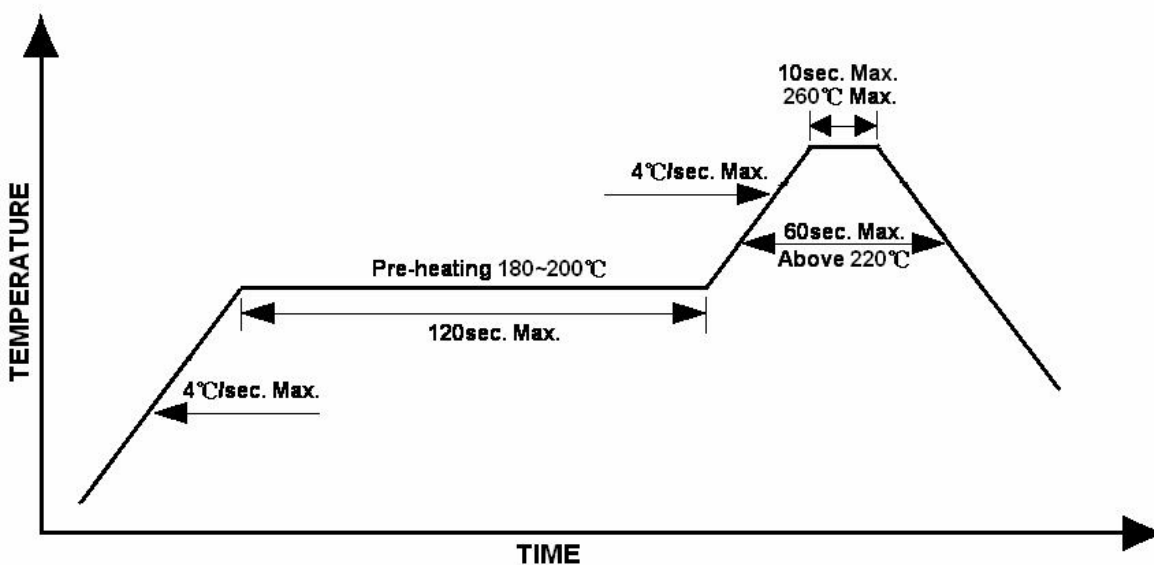
## Re-flow Soldering

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

### Lead Solder



### Lead-free Solder



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## Rework

- ◆ Customer must finish rework within 5 sec. under 260 °C.
- ◆ The head of iron cannot touch copper foil.
- ◆ Twin-head type is preferred.

## 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.

## Reliability

### Test Items and results

Test Item	Standards reference	Conditions	Note	Failures/ Sample size
Solderability	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	Over 95% area	0/22
Resistance to soldering heat (Reflow soldering)	JEITA ED-4701 300 301	Tsld=260°C/10sec (Pre treatment 30°C/70%R.H. 168hrs)	2 times	0/100
Temperature cycle	JESD-A104-A IEC 68-2-14, Nb	-40°C~25°C~85°C~25°C 15min.~5min.~15min.~5min.	300cycle	0/100
High Temp. storage	JEITA ED-4701 200 201	Ta=100°C	1000h	0/40
Low Temp. storage	JEITA ED-4701 200 202	Ta=-40°C	1000h	0/40
Temp. humidity storage	JEITA ED-4701 100 103	Ta=60°C, RH=90%	1000h	0/40
Vibration	JEITA ED-4701 400 403	100~2000~100HZ Sweep 4min. 200m/s <sup>2</sup> 3 direction, 4 cycles	48min.	0/50
COQ			300cycle	0/100
PCT			96h	0/100
JEDEC level 1				0/100

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Steady state operation		Ta=25°C, If=20mA	1000h	0/40
High Temp. operation		Ta=55°C, If=20mA	1000h	0/40
Low Temp. operation		Ta=-40°C, If=20mA	1000h	0/40
High Temp. & Humidity operation 1		Ta=85°C, RH=85%, If=5mA	1000h	0/40
High Temp. & Humidity operation 2		Ta=60°C, RH=90%, If=10mA	1000h	0/40

### Criteria for Judging the Damage

Item	Symbol	Test Condition	Criteria for Judgement	
			Min.	Max.
Forward Voltage	Vf	If = 20mA	-	U.S.L * x 1.2
Luminous Intensity	Iv	If = 20mA	L.S.L.**x 0.5	-

\* U.S.L.: Upper standard level

\*\* L.S.L.: Lower standard level

### Revision History:

Rev.	Subject ( Major changes since last revision)	Date
2.0	Revise Iv Max	2006/01/18

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