

**Harvatek Surface Mount Chip LED Data Sheet
HT-T5335DND**

Official Product	Product: HT-T5335DND			Data Sheet No.
Tentative Product	*****			HT-T5335DND
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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.

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Product Specifications

	Specification	Material	Quantity
Iv	45.3 – 55.2lm @30mA / Ta=25° C, ± 5%		
XY	Refer to page 6-7 @30mA / Ta=25° C, ± 0.005		
Vf	16.95V max @30Ma per chip / Ta=25°C, ± 0.05 V		
Ir	< 100 µA @ VR= 5 V		
Resin	White	PPA	
Carrier tape	Per EIA 481-1A specs	Conductive black tape	2000pcs per reel
Reel	Per 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	

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, λD 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.

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Label Specifications

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

Harvatek P/N:

H T - T 53 3 5 D N D - Y Y Y Y

Series Name	Emitting Color	Customer Code
HT-T5335 HT: Harvatek T5335: 5.7 (L) x 3.0 (W) x 0.9 (H) mm	DND CRI ≥ 80 @30mA	YYYY Customer Product Code (TBD)

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		

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■ Luminous Intensity (Iv) Bin:

Bin	Luminous Intensity Range (lm)	
	Minimum	Maximum
RB1	42.5	45.3
RC2	45.3	48.4
RD2	48.4	51.7
SA3	51.7	55.2
SB3	55.2	58.9

@20mA / Ta=25^o C, Tolerance: ± 10%

■ Forward Voltage (V_F) Bin:

Color	Bin Code	Spec. Range
White (TW)	RG	15.05 – 15.27V
	RH	15.27 – 15.51V
	RJ	15.51 – 15.75V
	RK	15.75 – 15.99V
	RL	15.99 – 16.23V
	RM	16.23 – 16.47V
	RN	16.47 – 16.71V
	RP	16.71 – 16.95V

@20mA / Ta=25^oC, Tolerance: ± 0.05 V

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Table with columns x, y, x, y, x, y, x, y, x, y, x, y, x, y, x, y, x, y and rows of numerical data.

Table with columns D0A, D1A, D0B, D1B, D0C, D1C, D0D, D1D and rows of numerical data.

Table with columns E0A, E1A, E0B, E1B, E0C, E1C, E0D, E1D and rows of numerical data.

Table with columns F0A, F1A, F0B, F1B, F0C, F1C, F0D, F1D and rows of numerical data.

Table with columns G0A, G1A, G0B, G1B, G0C, G1C, G0D, G1D and rows of numerical data.

Table with columns H0A, H1A, H0B, H1B, H0C, H1C, H0D, H1D and rows of numerical data.

Table with columns J0A, J1A, J0B, J1B, J0C, J1C, J0D, J1D and rows of numerical data.

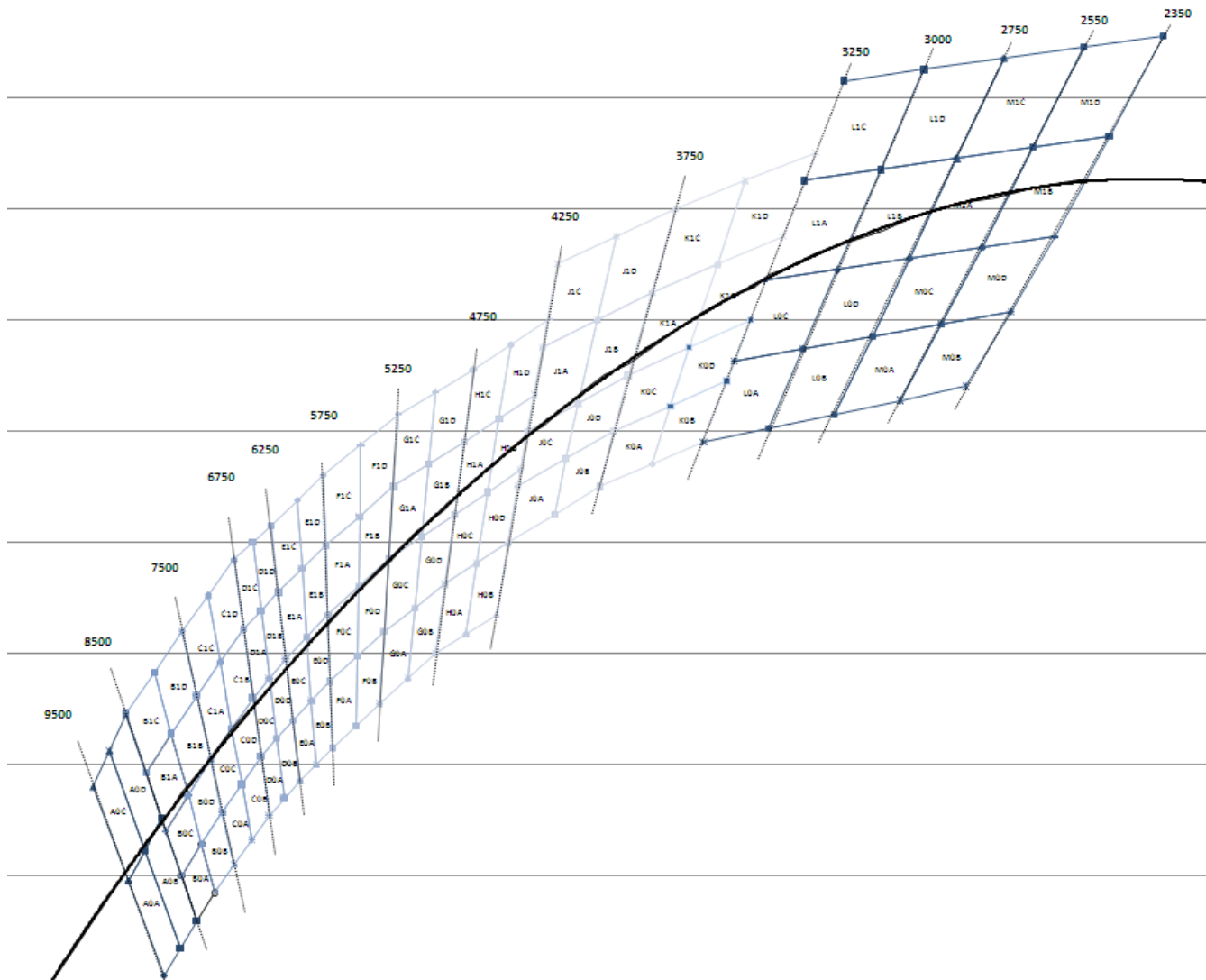
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Table with columns L0A, L1A, L0B, L1B, L0C, L1C, L0D, L1D and rows of numerical data.

Table with columns M0A, M1A, M0B, M1B, M0C, M1C, M0D, M1D and rows of numerical data.

Table with 4 columns: Official Product, Tentative Product, Specifications are subject to change without notice... and Page 7/20.

Color Temperature Coordinates



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Product Characteristics

Absolute Maximum Ratings

Product	Emission Color	P _d (mW)	I _F (mA)	I _{FP} * (mA)	I _r (μA) @ V _R = 5 V	T _{OP} (°C)	T _{ST} (°C)
HT-T5335DND	White	585	30	60	<10	-30°C~+80°C	-40°C~+85°C

* 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.

Electro-Optical Characteristics

(T_a 25 °C)

Product	Emission Color	I _F (mA)	V _F (V)		Correlated Color Temperature (K)			Flux (lm)
			typ	max	min	typ	max	typ
HT-T5335DND	White	30	15.03	16.95	5250	5750	6250	47
					3750	4000	4250	49
					2750	3000	3250	45

* Per NIST standards

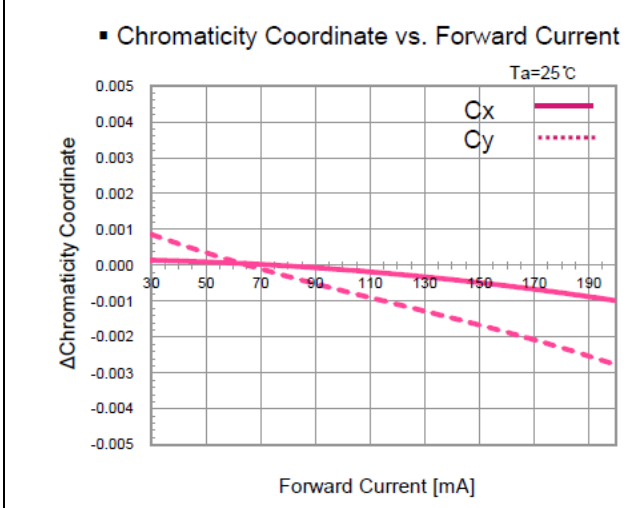
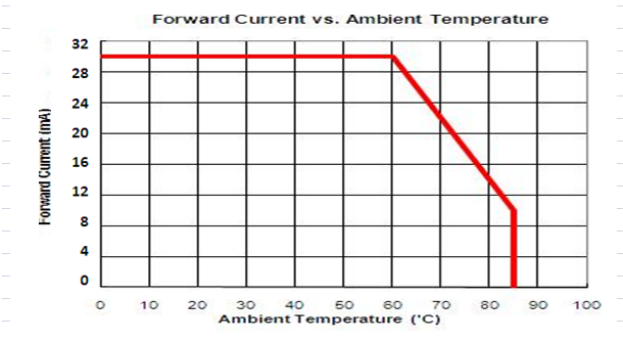
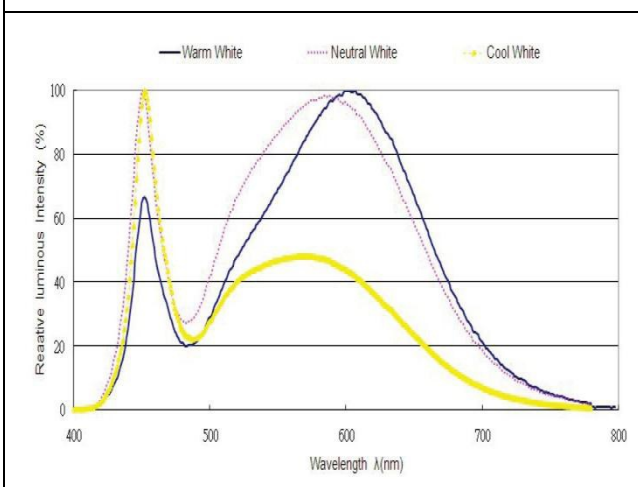
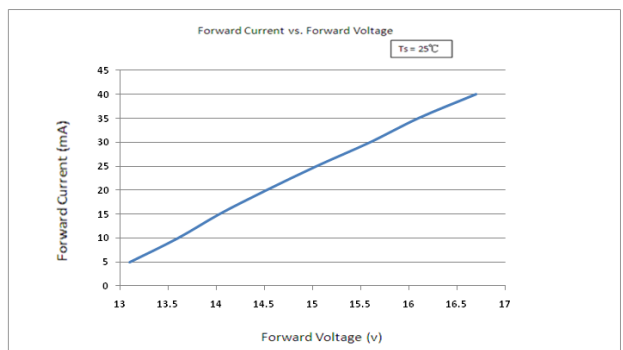
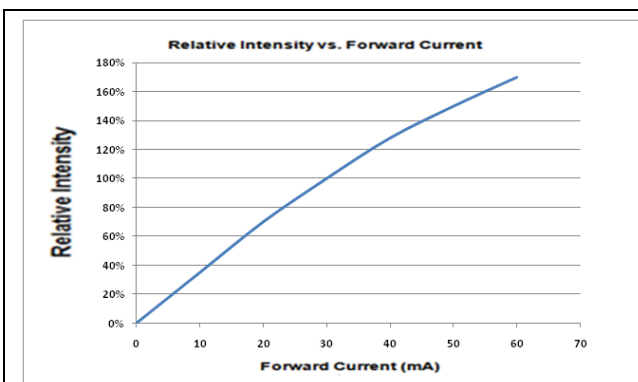
Package Outline Dimension
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

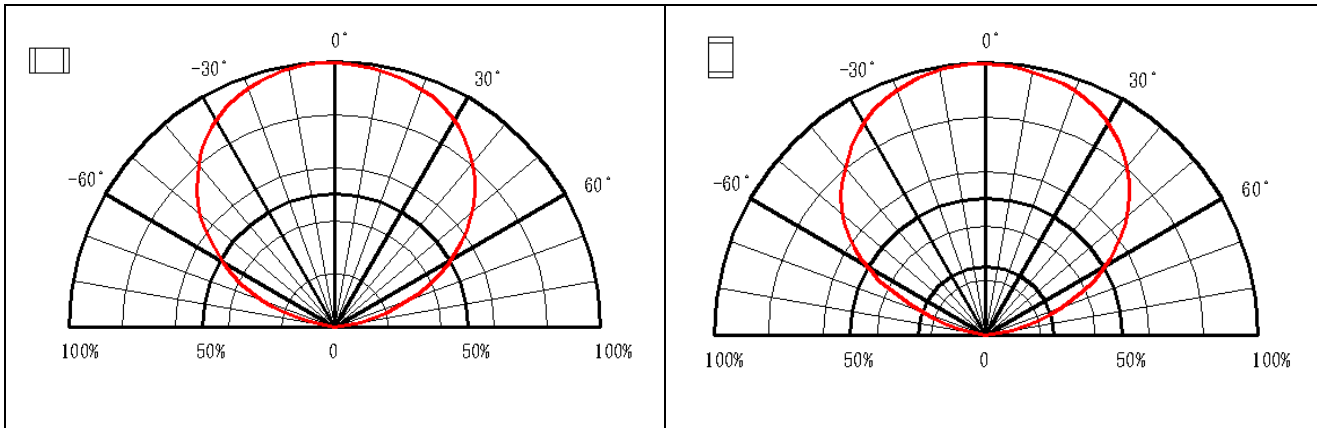
Outline Dimension	Solder Pattern
<p style="text-align: center;">Pin3&Pin5 is connected with heat slug</p>	
Soldering terminals may shift in the x, y direction.	Unit: mm

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Characteristic Curves for TW



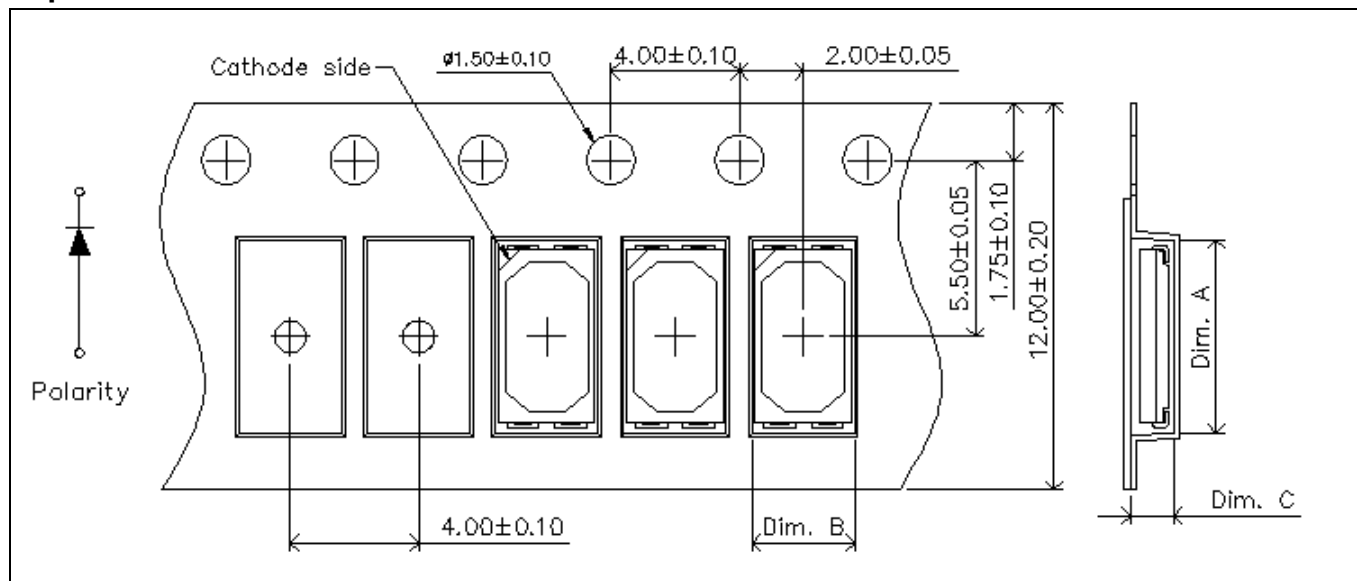
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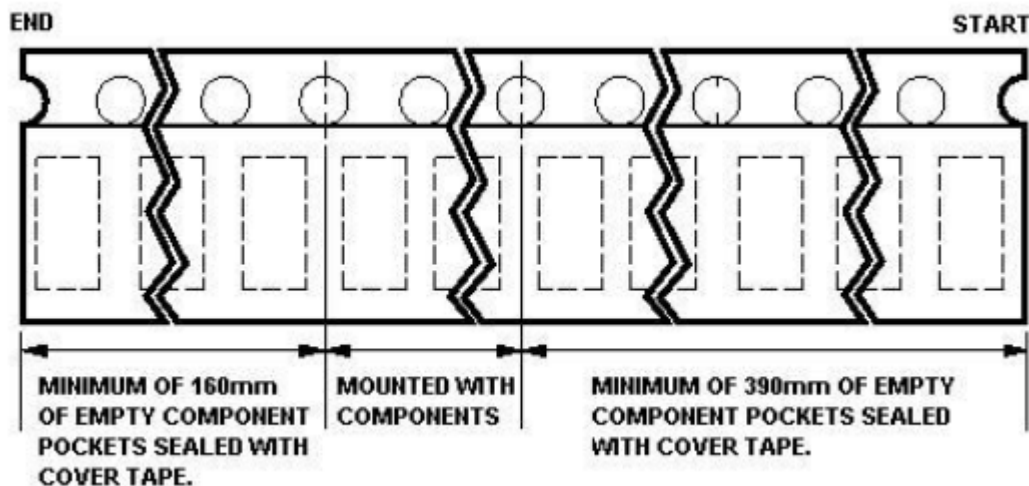
Packaging

Tape Dimension



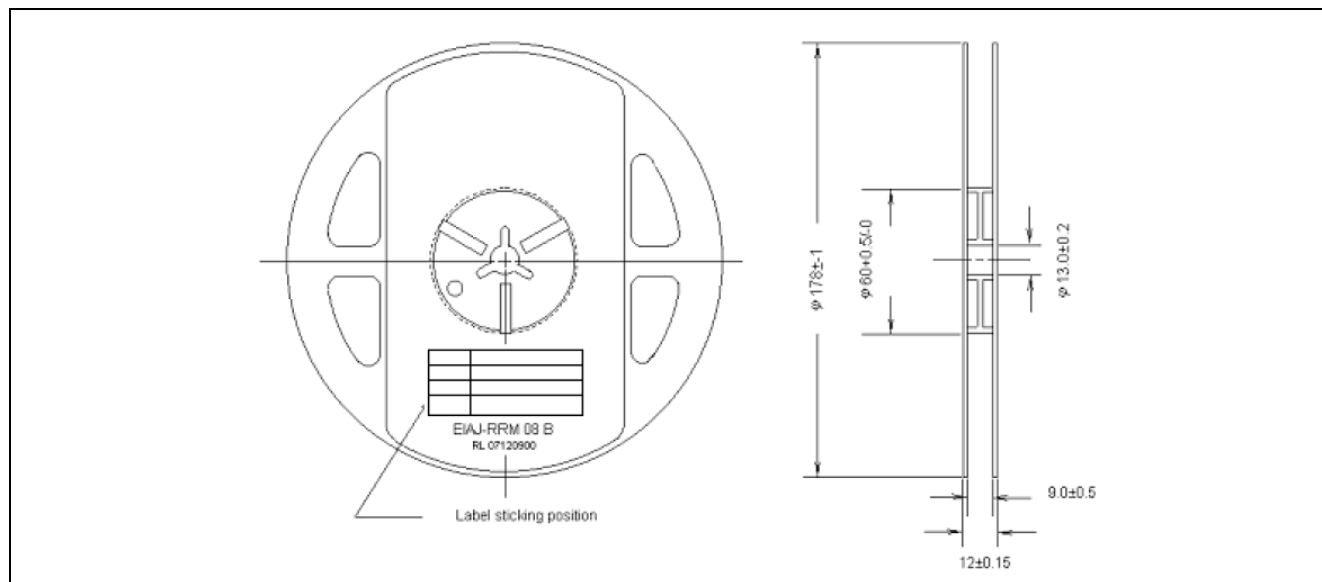
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-T5335	6.0 ± 0.1	3.2 ± 0.1	1.1 ± 0.1	2K

Unit: mm

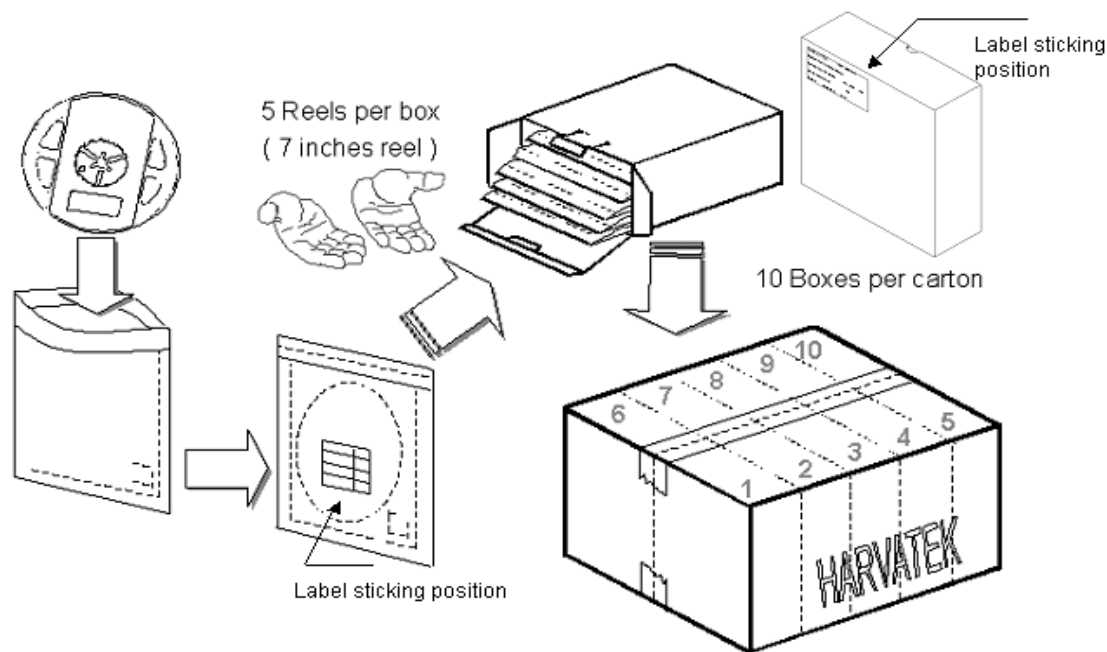


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Reel Dimension



Packing



5 boxes per carton is available depending on shipment quantity.

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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 are recommended to be used within seven days after unpacked. In accordance with MSL 2a: After the bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be mounted within 672 hours at factory conditions of 30/60%RH.
- (5) The appearance and specifications of products may be modified for improvement. We will provide PCN for any change or improvement.
- (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.

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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.

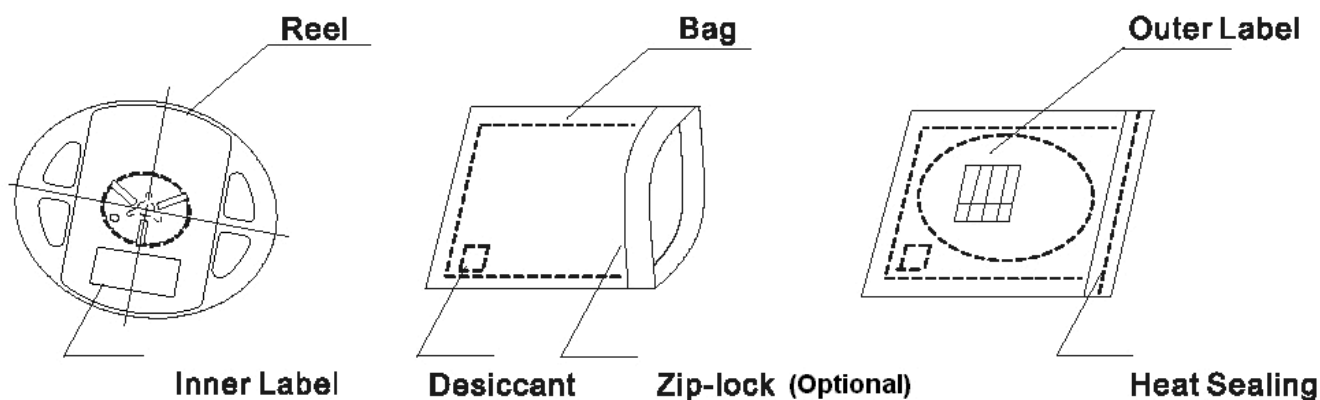
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Dry Pack

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:



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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 OC 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 30 OC /60% RH, or
 - 2.2 Stored at 20% 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±3°C (12~24hrs) and < 5% RH, taped reel type

100±3°C (45min~1hr), bulk type

130±3°C (15~30min), 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°C±5°C Max.(25W)

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

Soldering time: 3±1sec

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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.

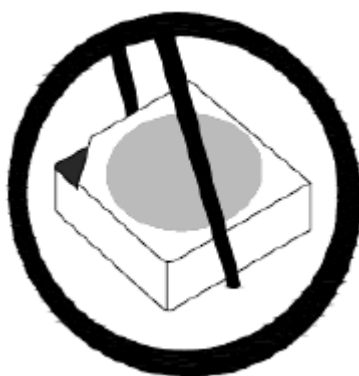


Figure 2

When populating boards in SMT production, there are basically no restrictions regarding the form 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.

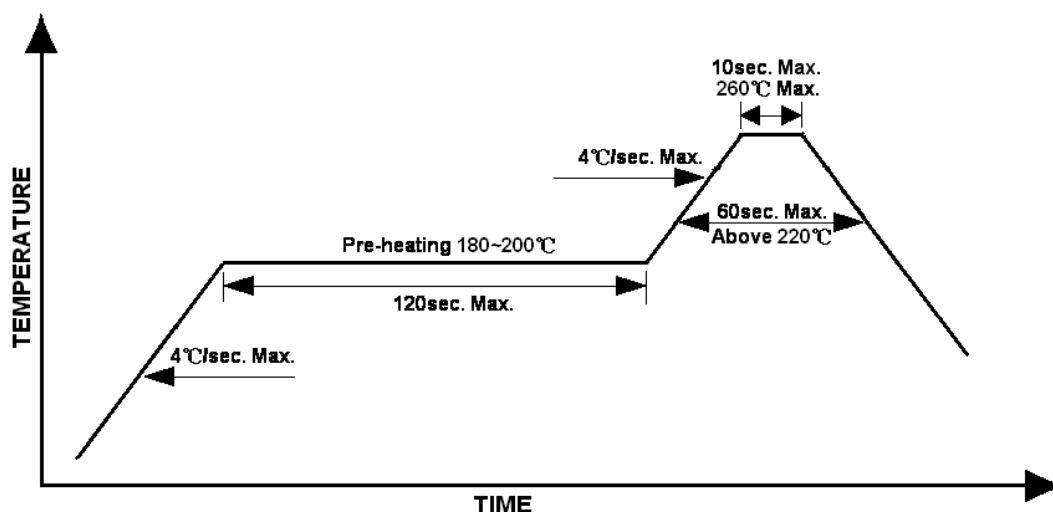
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Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220°C, 60 sec.
2. Peak temp.:260°C Max., 10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never attempt next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measured on the surface of the LED terminal) is as following:

Lead-free Solder Profile



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.
- Electro-static may cause damage to the component. Please ensure that the equipment is properly grounded. Use of an ionizer fan is recommended.

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Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial release		1.0	06-25-2013

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