

**Harvatek Surface Mount Chip LED Data Sheet
HT-T169DNC**

Official Product	Product: HT-T169DNC		Data Sheet No.
Tentative Product	*****		HT-T169DNC
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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	2125-2850mcd @20mA / Ta=25° C, ± 10%		
XY	Refer to page 8 @20mA / Ta=25° C, ± 0.01		
Vf	3.4V max @20mA / Ta=25°C, ± 0.05 V		
Ir	< 100 µA @ VR= 5 V		
Resin	Yellow	Epoxy Resin	
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, λ_D 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 1 6 9 D N C - Y Y Y Y

Series Name	Emitting Color	Customer Code
HT-T169 HT: Harvatek T169: 3.2 (L) x 2.7 (W) x 1.8 (H) mm	DNC CRI>70	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 (mcd)	
	Minimum	Maximum
Z62	2125	2250
Z71	2250	2385
Z72	2385	2530
Z81	2530	2685
Z82	2685	2850

@20mA / Ta=25^o C, Tolerance: ± 10%

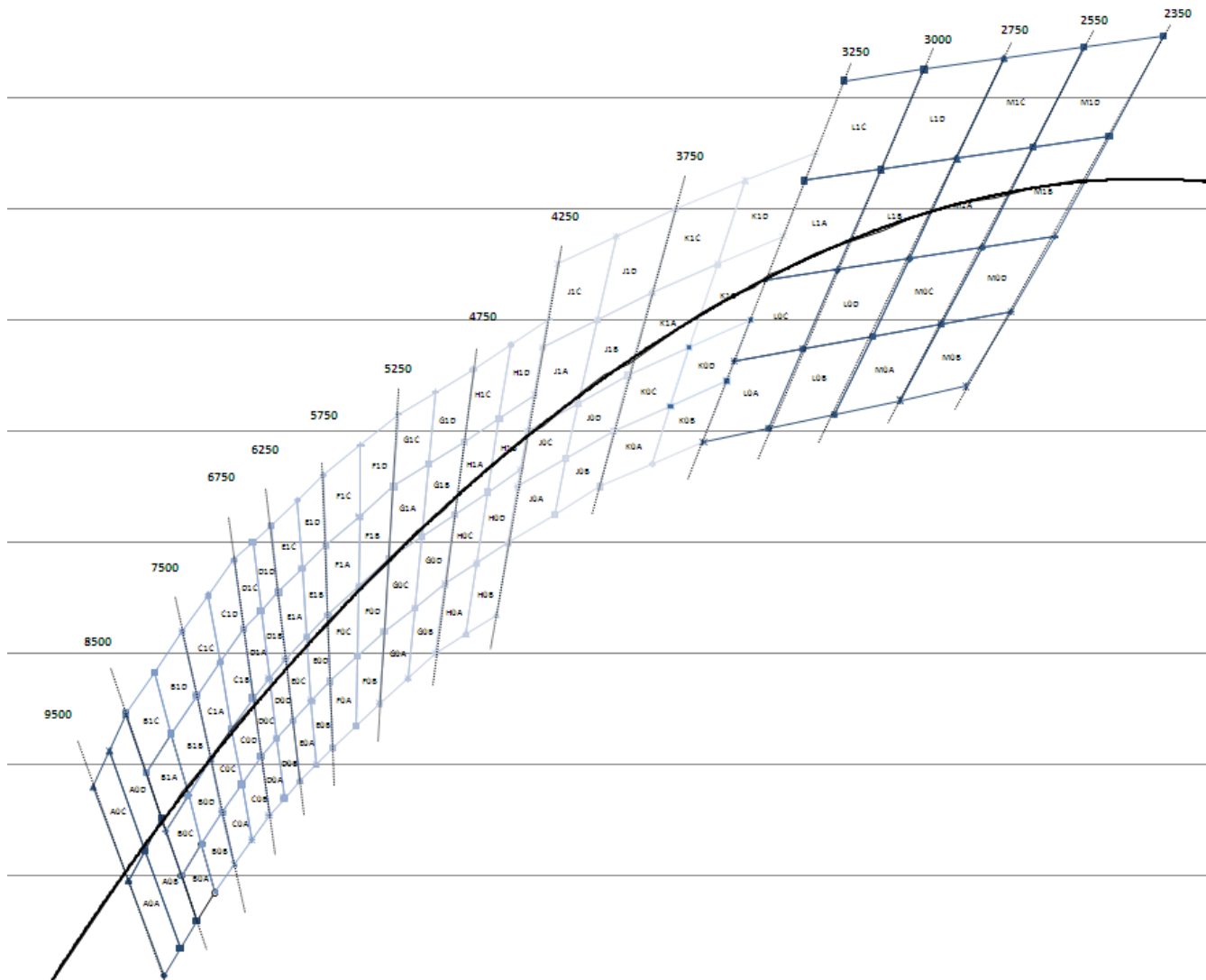
■ Forward Voltage (V_F) Bin:

Color	Bin Code	Spec. Range
White (TW)	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

@20mA / Ta=25^o C, Tolerance: ± 0.05 V

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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-T169DNC	White	111	30	100	<1μA	-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)		CCT	I _v (mcd)
			typ	max	Correlated Color Temperature(K)	typ
HT-T169DNC	White	20	2.9	3.4	2750 – 7500K typ.	2400

* Per NIST standards

Package Outline Dimension

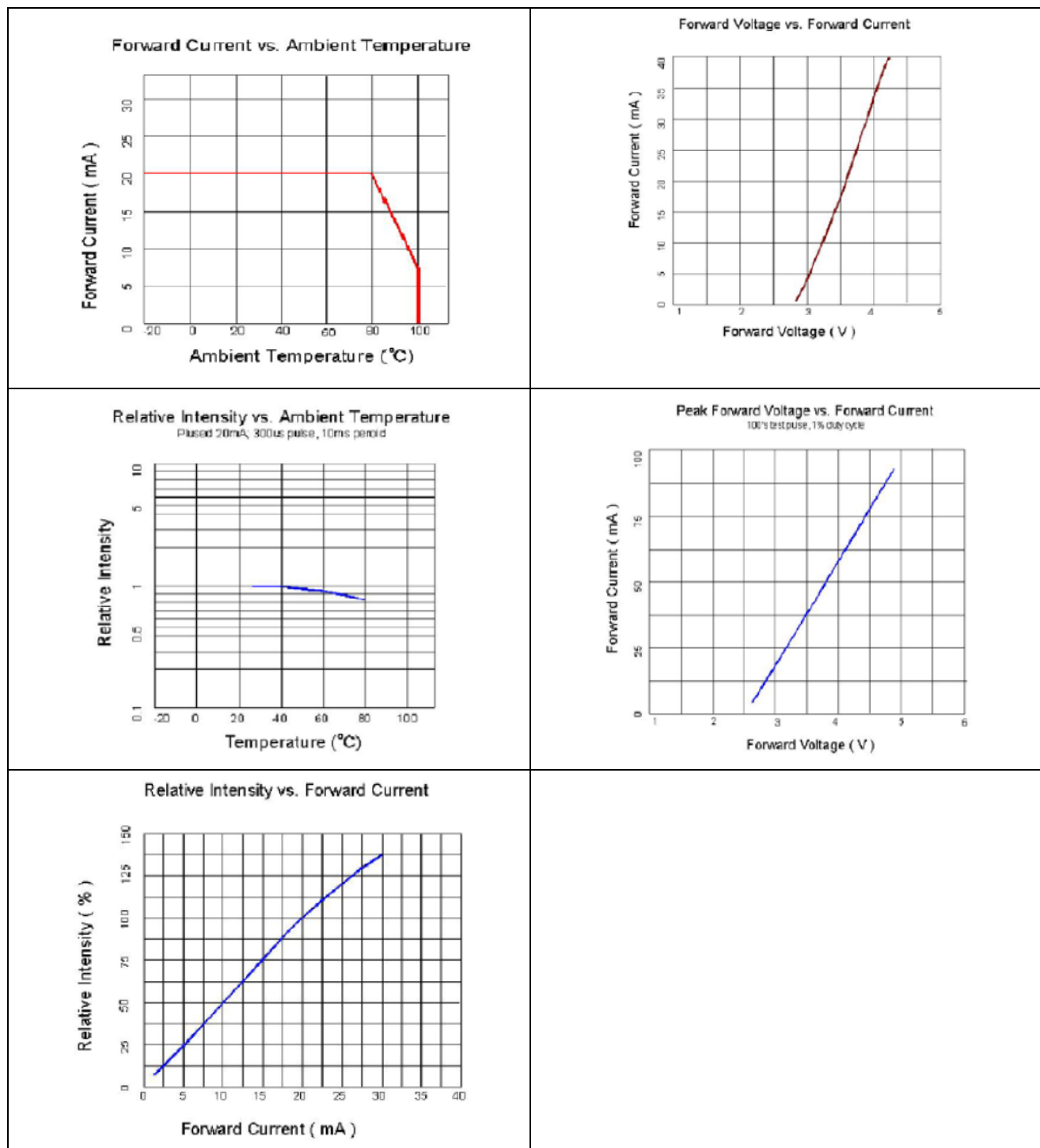
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

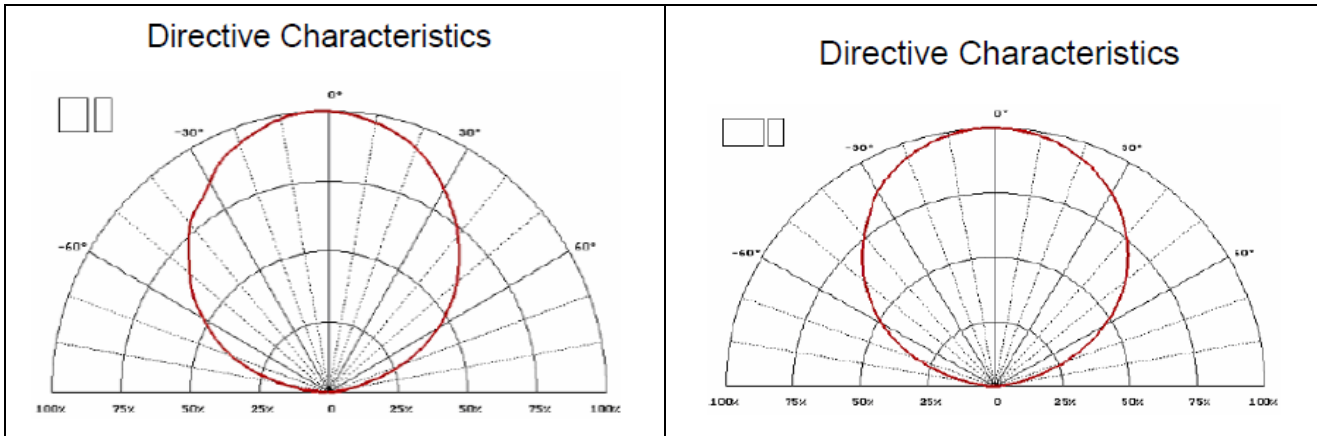
Outline Dimension	Solder Pattern
Soldering terminals may shift in the x, y direction.	Unit: mm

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Characteristic Curves for TW



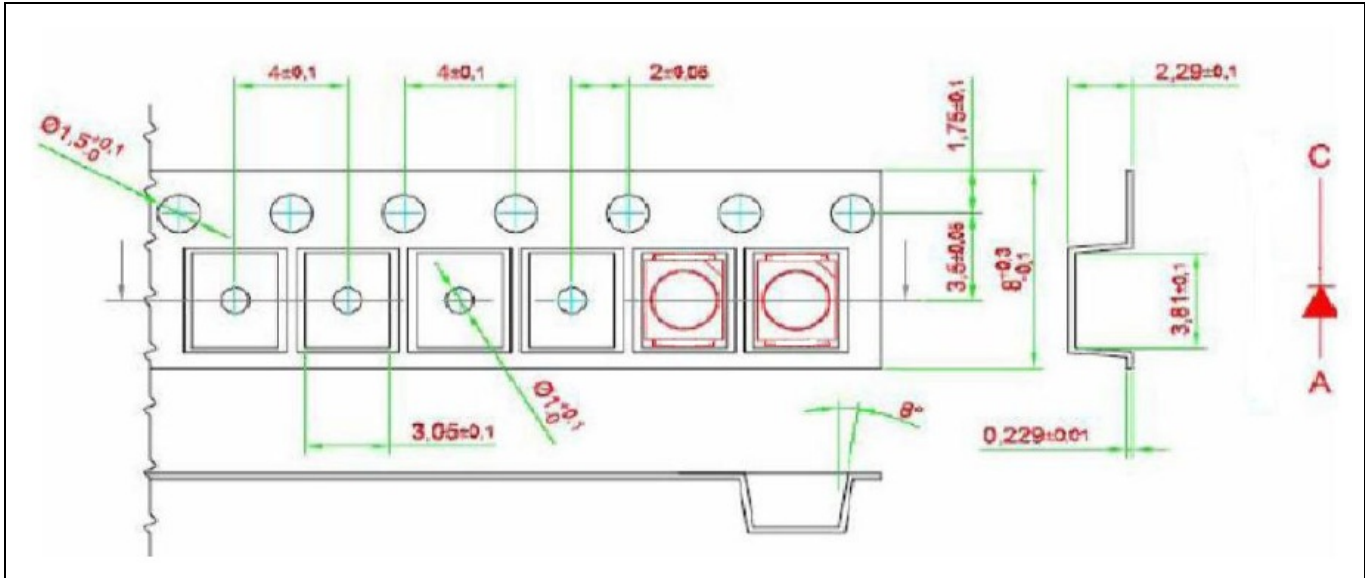
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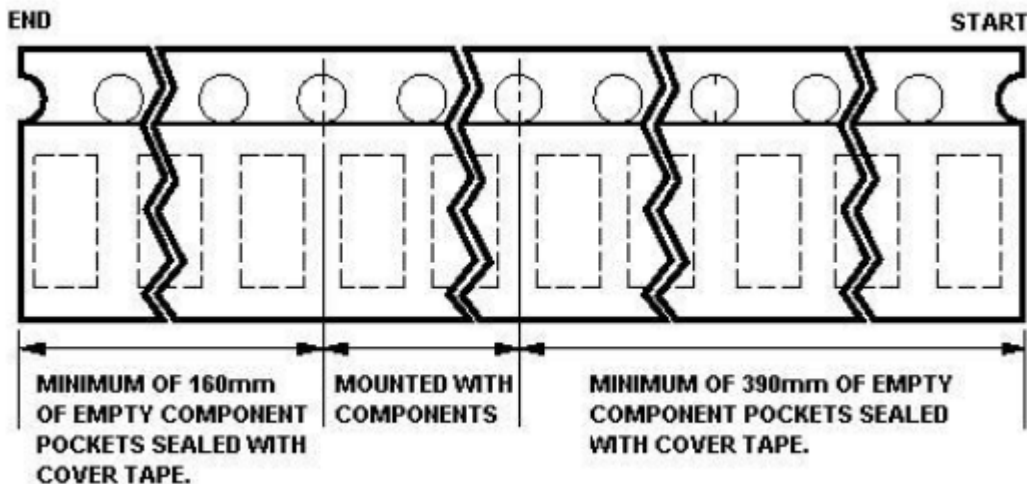
Packaging

Tape Dimension



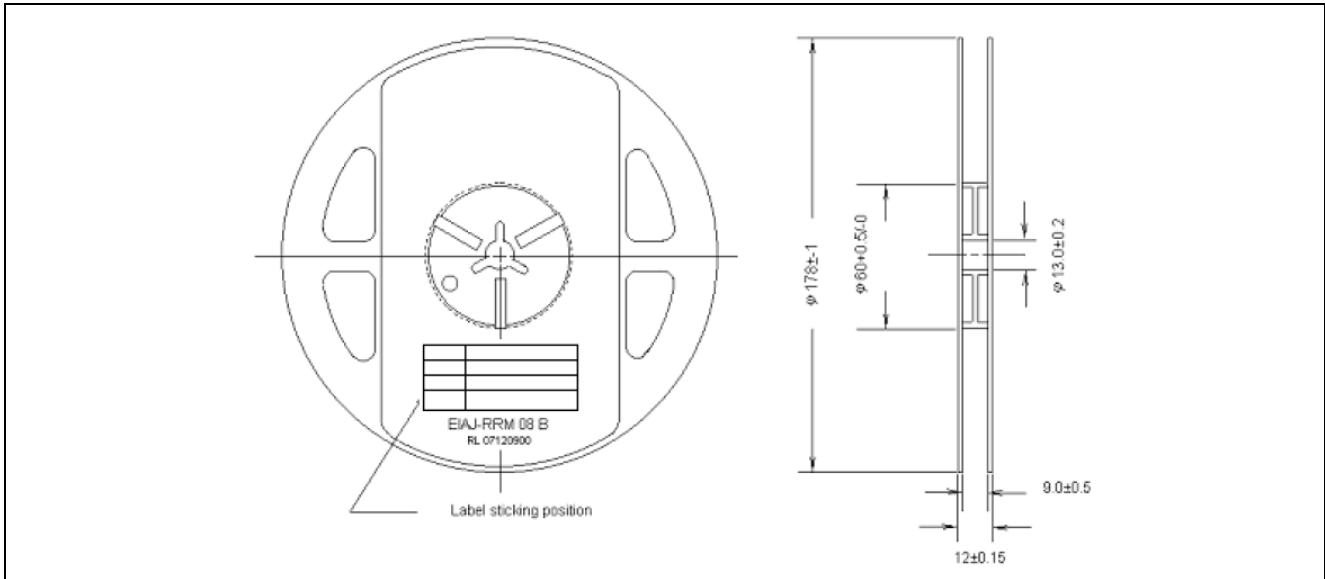
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-T169	3.73 ± 0.10	2.95 ± 0.10	2.12 ± 0.10	2K

Unit: mm

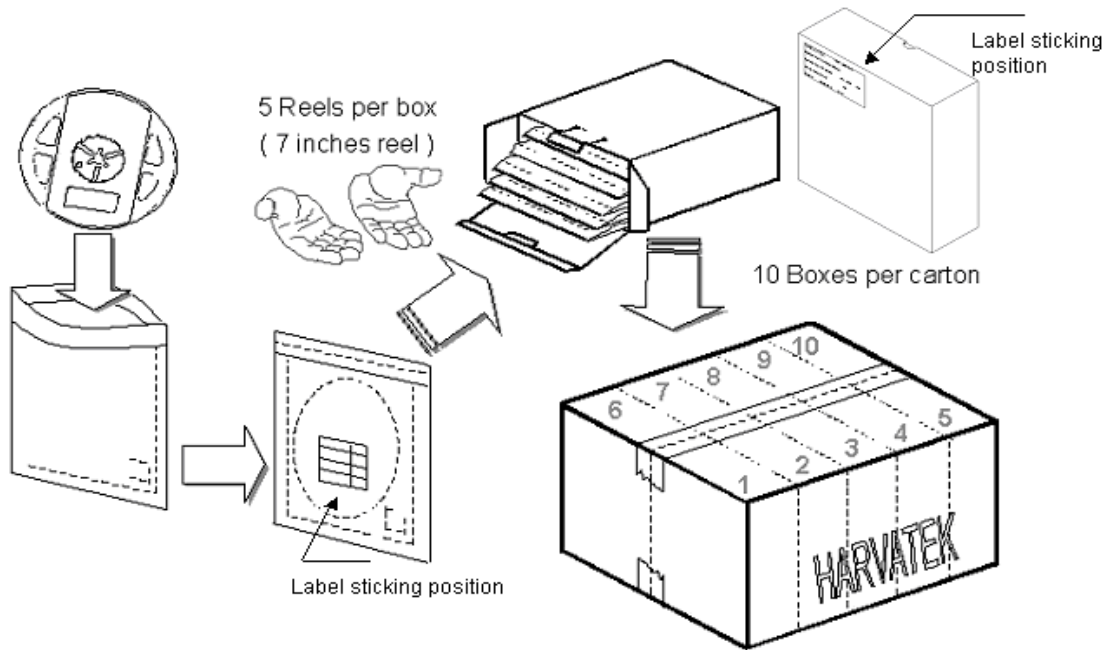


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Reel Dimension



Packing



5 boxes per carton is available depending on shipment quantity.

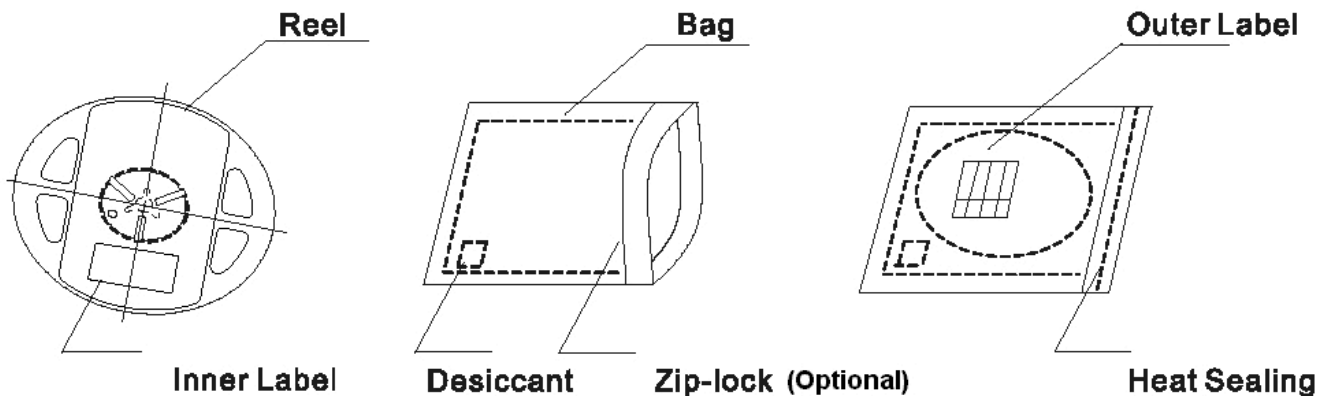
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Dry Pack

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:



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.
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.

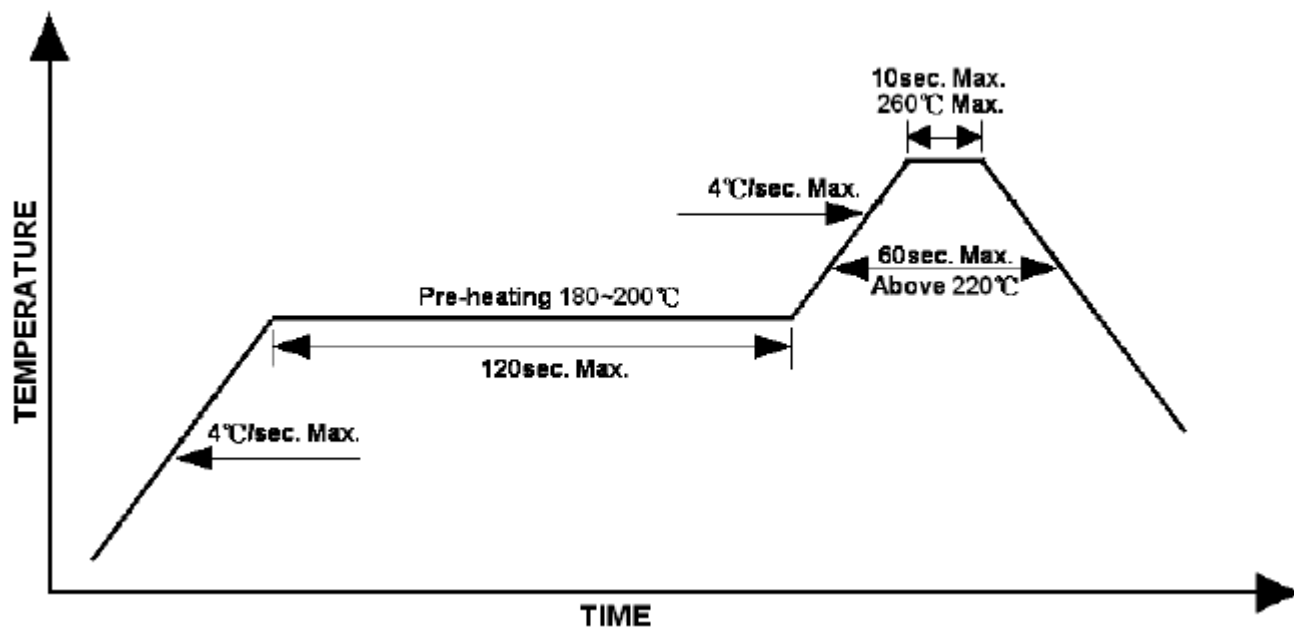
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Reflow Soldering

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



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.

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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.

Reliability Test

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
Solder ability	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 _{amb} 25°C; I _F =20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	T _{amb} : 85°C Humidity: 85% R.H., I _F =5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20/ 0	HT specs.	T _{amb} : 55°C I _F =20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		T _{amb} 25°C, I _F =20mA,, I _p =100mA, Duty cycle=0.125 (tp=125µ s, 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

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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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