

## Harvatek Surface Mount LED Data Sheet T1361DND-30P-000152

Official Product	HT Part No. T1361DND-30P-000152		
Tentative Product	*****	*****	*****
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<b>DISCLAIMER</b> .....	<b>3</b>
<b>LIFE SUPPORT POLICY</b> .....	<b>3</b>
<b>PRODUCT SPECIFICATIONS</b> .....	<b>4</b>
<b>ATTENTION: ELECTROSTATIC DISCHARGE (ESD) PROTECTION</b> .....	<b>4</b>
<b>LABEL SPECIFICATIONS</b> .....	<b>5</b>
<b>SPECIFICATIONS RANGE</b> .....	<b>6</b>
<b>PRODUCT FEATURES</b> .....	<b>9</b>
<b>ELECTRO-OPTICAL CHARACTERISTICS</b> .....	<b>9</b>
<b>PACKAGE OUTLINE DIMENSION AND RECOMMENDED SOLDERING PATTERN FOR REFLOW</b>	
<b>SOLDERING</b> .....	<b>9</b>
<b>ABSOLUTE MAXIMUM RATINGS</b> .....	<b>9</b>
<b>CHARACTERISTICS OF T1361DND</b> .....	<b>10</b>
<b>PRECAUTION FOR USE</b> .....	<b>11</b>
<b>PACKAGING</b> .....	<b>12</b>
<b>TAPE DIMENSION</b> .....	<b>12</b>
<b>REEL DIMENSION</b> .....	<b>13</b>
<b>PACKING</b> .....	<b>13</b>
<b>DRY PACK</b> .....	<b>14</b>
<b>BAKING</b> .....	<b>14</b>
<b>PRECAUTIONS</b> .....	<b>14</b>
<b>HANDLING OF SILICONE RESIN LEDs</b> .....	<b>15</b>
<b>REFLOW SOLDERING</b> .....	<b>16</b>
<b>REWORKING</b> .....	<b>16</b>
<b>CLEANING</b> .....	<b>16</b>
<b>CAUTIONS OF PICK AND PLACE</b> .....	<b>17</b>
<b>REVISE HISTORY</b> .....	<b>17</b>

Official Product	HT Part No. T1361DND-30P-000152		
Tentative Product	*****	*****	*****
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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. T1361DND-30P-000152		
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## Product Specifications

Item	Specification	Material	Quantity
IV	Cold White :Min 10.00 lm Neutral White :Min 9.37 lm Warm White :Min 9.37 lm @30mA / T <sub>s</sub> = 25°C;Tolerance: ± 10%		
Chromaticity Coordinate	As page 7 & 8 @30mA/ T <sub>s</sub> = 25°C;Tolerance: ± 0.005		
Vf	2.8~3.5V (0.1V/Bin) @30mA/ T <sub>s</sub> = 25°C;Tolerance: ± 0.05V		
Ir	< 100 μA @ V <sub>R</sub> = 5 V		
Resin	Yellow	Silicon Resin	
CRI	CRI>80, Tolerance± 2		
Carrier tape	EIA 481-1A specs	Conductive black tape	2000pcs 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, CIE and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

※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.

### **ATTENTION: Electrostatic Discharge (ESD) protection**

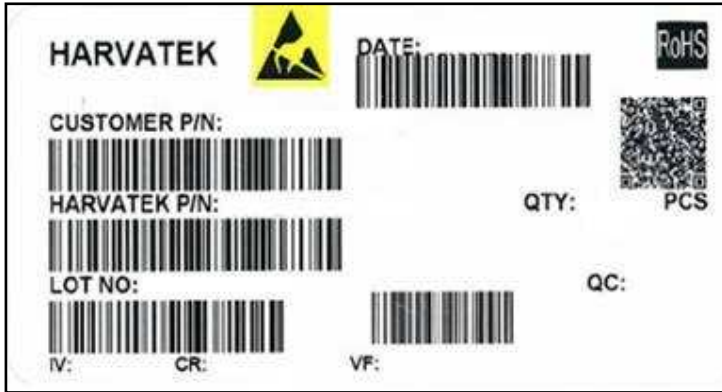


The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

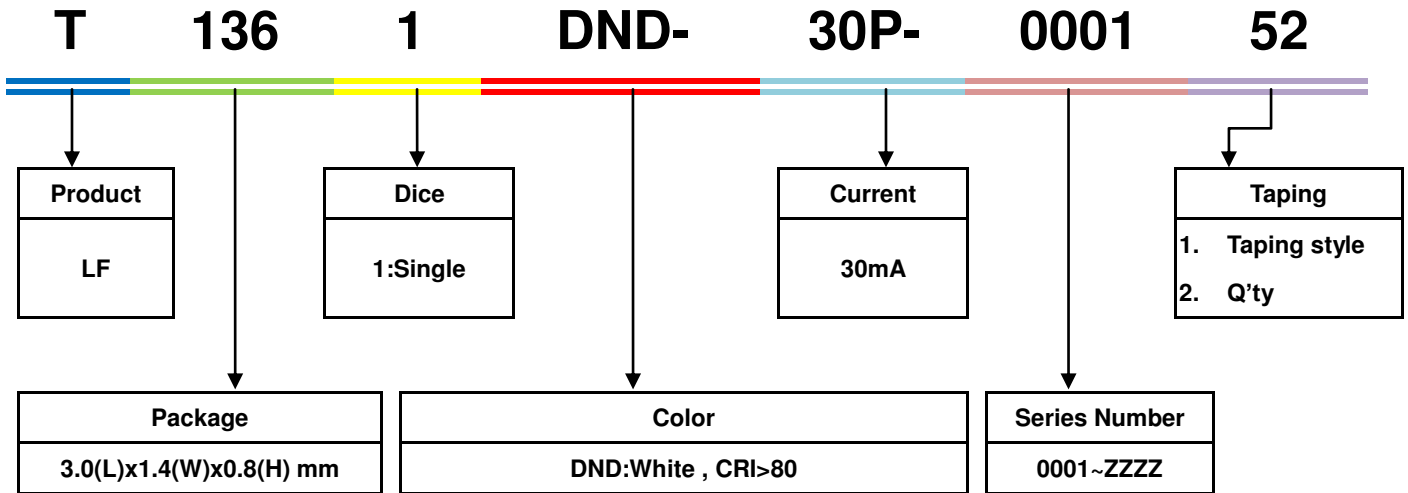
If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Official Product	HT Part No. T1361DND-30P-000152		
Tentative Product	*****	*****	
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## Label Specifications



### Harvatek P/N:



### Lot No.:

1	2	3	4	5	6	7	8	9	10
<b>E</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>2</b>	<b>2</b>	<b>L</b>	<b>1</b>	<b>2</b>
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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## Specifications Range

### ■ (Iv) Bin:

Color	Bin Code	Spec. Range
White	KC2	9.37~10.00 lm
	KD2	10.00~10.70 lm
	LA1	10.70~11.43 lm
	LB1	11.43~12.20 lm
	LC2	12.20~13.02 lm

Note: It maintains a tolerance of  $\pm 10\%$  on IV

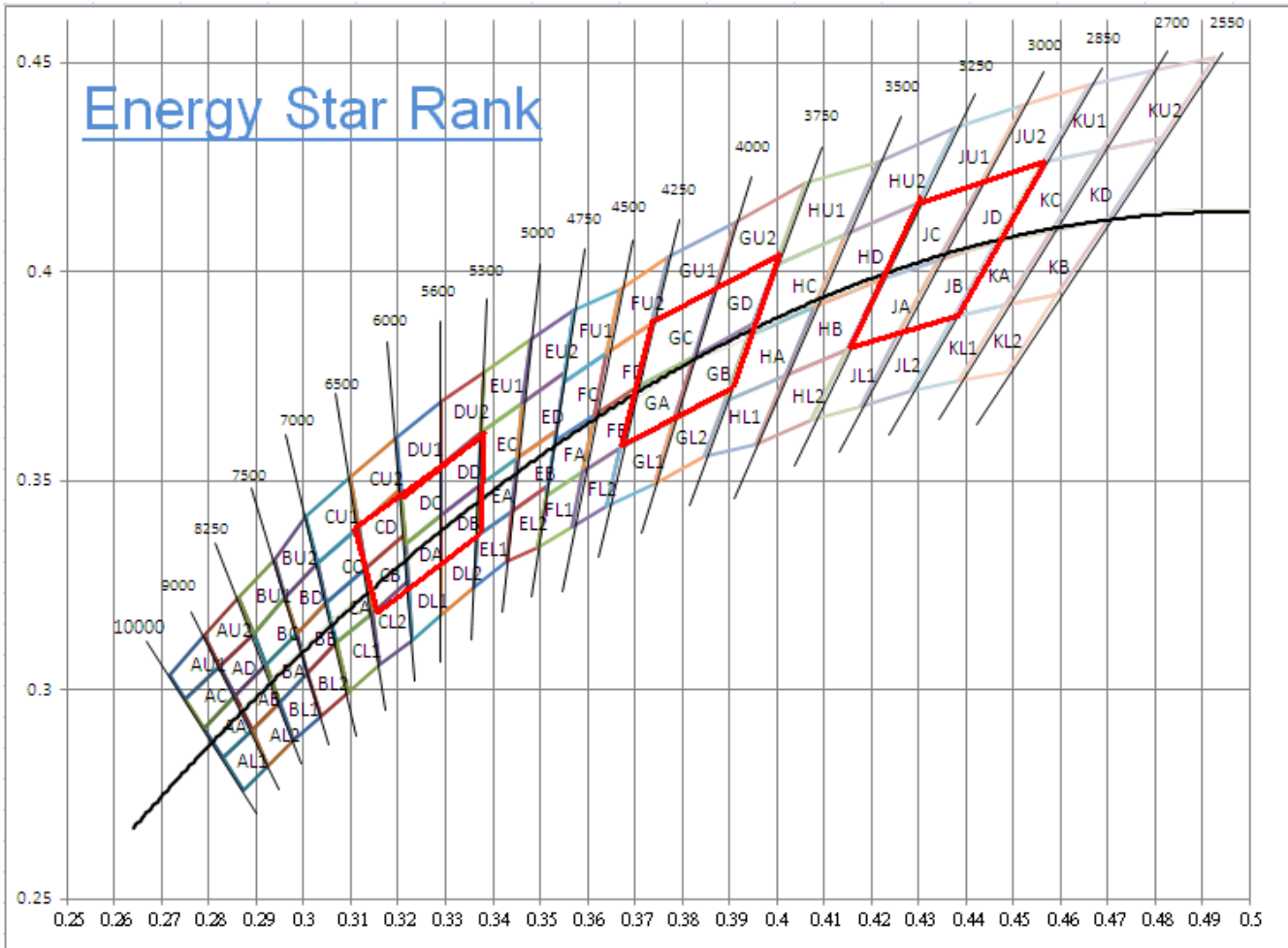
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**Color Bin:**

AA	0.283	0.284	BA	0.295	0.297	CA	0.3068	0.3113	DA	0.3222	0.3243	EA	0.3366	0.3369
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.289	0.2905		0.3009	0.3042		0.3144	0.3186		0.329	0.33		0.344	0.3427
	0.283	0.284		0.295	0.297		0.3068	0.3113		0.3222	0.3243		0.3366	0.3369
AB	0.289	0.2905	BB	0.3009	0.3042	CB	0.3144	0.3186	DB	0.329	0.33	EB	0.344	0.3427
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.3417	0.3451		0.3554	
	0.292	0.306		0.3048	0.3207		0.3213	0.3373		0.3371	0.349		0.3533	0.362
	0.295	0.297		0.3068	0.3113		0.3221	0.3261		0.3366	0.3369		0.3515	0.3487
	0.289	0.2905		0.3009	0.3042		0.3144	0.3186		0.329	0.33		0.344	0.3427
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
AC	0.275	0.298	BC	0.2895	0.3135	CC	0.3028	0.3304	DC	0.3207	0.3462	EC	0.3376	0.3616
	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
AD	0.2895	0.3135	BD	0.3028	0.3304	CD	0.3205	0.3481	DD	0.3376	0.3616	ED	0.3551	0.376
	0.292	0.306		0.3048	0.3207		0.3213	0.3373		0.3371	0.349		0.3533	0.362
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
AL1	0.2895	0.3135	BL1	0.3028	0.3304	CL1	0.3205	0.3481	DL1	0.3376	0.3616	EL1	0.3551	0.376
	0.292	0.306		0.3048	0.3207		0.3213	0.3373		0.3371	0.349		0.3533	0.362
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
AL2	0.2895	0.3135	BL2	0.3028	0.3304	CL2	0.3205	0.3481	DL2	0.3376	0.3616	EL2	0.3551	0.376
	0.292	0.306		0.3048	0.3207		0.3213	0.3373		0.3371	0.349		0.3533	0.362
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
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	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
AU1	0.2895	0.3135	BU1	0.3028	0.3304	CU1	0.3205	0.3481	DU1	0.3376	0.3616	EU1	0.3551	0.376
	0.292	0.306		0.3048	0.3207		0.3213	0.3373		0.3371	0.349		0.3533	0.362
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
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	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687
AU2	0.2895	0.3135	BU2	0.3028	0.3304	CU2	0.3205	0.3481	DU2	0.3376	0.3616	EU2	0.3551	0.376
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	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.279	0.291		0.292	0.306		0.3048	0.3207		0.3215	0.335		0.3371	0.349
	0.2855	0.2985		0.2984	0.3133		0.313	0.329		0.329	0.3417		0.3451	0.3554
	0.28225	0.30575		0.2962	0.322		0.3115	0.3391		0.329	0.3538		0.3463	0.3687

FA	0.3512	0.3465	GA	0.367	0.3578	HA	0.3889	0.369	JA	0.4147	0.3814	KA	0.4373	0.3893
	0.353	0.3597		0.3702	0.3722		0.3941	0.3848		0.4221	0.3984		0.4465	0.4071
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.359	0.3521		0.3783	0.3646		0.4017	0.3751		0.4259	0.3853		0.4483	0.3919
	0.3512	0.3465		0.367	0.3578		0.3889	0.369		0.4147	0.3814		0.4373	0.3893
	0.359	0.3521		0.3783	0.3646		0.4017	0.3751		0.4259	0.3853		0.4483	0.3919
FB	0.3615	0.3659	GB	0.3825	0.3798	HB	0.408	0.3916	JB	0.4342	0.4028	KB	0.4582	0.4099
	0.3702	0.3722		0.395	0.3875		0.4221	0.3984		0.4465	0.4071		0.47	0.4126
	0.367	0.3578		0.3898	0.3716		0.4147	0.3814		0.4373	0.3893		0.4593	0.3944
	0.359	0.3521		0.3783	0.3646		0.4017	0.3751		0.4259	0.3853		0.4483	0.3919
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.3702	0.3722		0.395	0.3875		0.4221	0.3984		0.4465	0.4071		0.47	0.4126
	0.367	0.3578		0.3898	0.3716		0.4147	0.3814		0.4373	0.3893		0.4593	0.3944
	0.359	0.3521		0.3783	0.3646		0.4017	0.3751		0.4259	0.3853		0.4483	0.3919
FC	0.353	0.3597	GC	0.3702	0.3722	HC	0.3941	0.3848	JC	0.4221	0.3984	KC	0.4465	0.4071
	0.3548	0.3736		0.3736	0.3874		0.3996	0.4015		0.4299	0.4165		0.4562	0.426
	0.3641	0.3804		0.3869	0.3958		0.4146	0.4089		0.443	0.4212		0.4687	0.4289
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.353	0.3597		0.3702	0.3722		0.3941	0.3848		0.4221	0.3984		0.4465	0.4071
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.3548	0.3736		0.3736	0.3874		0.3996	0.4015		0.4299	0.4165		0.4562	0.426
	0.3641	0.3804		0.3869	0.3958		0.4146	0.4089		0.443	0.4212		0.4687	0.4289
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.353	0.3597		0.3702	0.3722		0.3941	0.3848		0.4221	0.3984		0.4465	0.4071
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.3548	0.3736		0.3736	0.3874		0.3996	0.4015		0.4299	0.4165		0.4562	0.426
	0.3641	0.3804		0.3869	0.3958		0.4146	0.4089		0.443	0.4212		0.4687	0.4289
	0.3615	0.3659		0.3825	0.3798		0.408	0.3916		0.4342	0.4028		0.4582	0.4099
	0.3495	0.3339		0.364	0.344		0.3846	0.3557		0.4073	0.3715		0.4281	0.3715
	0.3512	0.3465		0.367	0.3578		0.3889	0.369		0.4147	0.3814		0.4373	0.3893
FL1	0.359	0.3521	GL1	0.3783	0.3646	HL1	0.4017	0.3751	JL1	0.4259	0.3853	KL1	0.4483	0.3919
	0.3567	0.3389		0.3741	0.3494		0.3954	0.3586		0.4176	0.3678		0.4384	0.3739
	0.3495	0.3339		0.364	0.344		0.3846	0.3557		0.4073	0.3644		0.4281	0.3715
	0.3567	0.3389		0.3741	0.3494		0.3954	0.3586		0.4176	0.3678		0.4384	0.3739
	0.359	0.3521		0.3783	0.3646		0.4017	0.3751		0.4259	0.3853		0.4483	0.3919
	0.3567	0.3389		0.3741	0.3494		0.3954	0.3586		0.4176	0.3678		0.4384	0.3739
	0.3495	0.3339		0.364	0.344		0.3846	0.3557		0.4073	0.3644		0.4281	0.3715
	0.3567	0.3389		0.3741	0.3494		0.3954	0.3586		0.4176	0.3678		0.4384	0.3739

## Chromaticity Coordinate



## Forward Voltage (Vf) Bin:

Color	Bin Code	Spec. Range
White	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

Note: It maintains a tolerance of  $\pm 0.05V$  on forward voltage measurements

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## Product Features

### Electro-Optical Characteristics

Series	Emitting Color	Material	V <sub>F</sub> (V)		Correlated Color Temperature			I <sub>v</sub> (Lm)	Viewing Angle
			typ	max	min	typ	max	Typical	2θ <sub>1/2</sub>
T1361DND-30	Cold White	InGaN	2.8	3.5	5300	6000	6500	11.5	110
T1361DND-30	Nature White	InGaN	2.8	3.5	3750	4000	4250	11.0	110
T1361DND-30	Warm White	InGaN	2.8	3.5	2850	3000	3250	10.7	110

T<sub>Soldering</sub>, 25 °C)

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

Unit: mm Tolerance: +/-0.1

Outline Dim.	Soldering Pattern
<p>Anode mark LED Die Plastic Housing Lead Frame Polarity</p>	<p>0.13 0.55 2.00 1.20 0.80 Polarity</p>
Soldering terminals may shift in the x, y direction.	

### Absolute Maximum Ratings

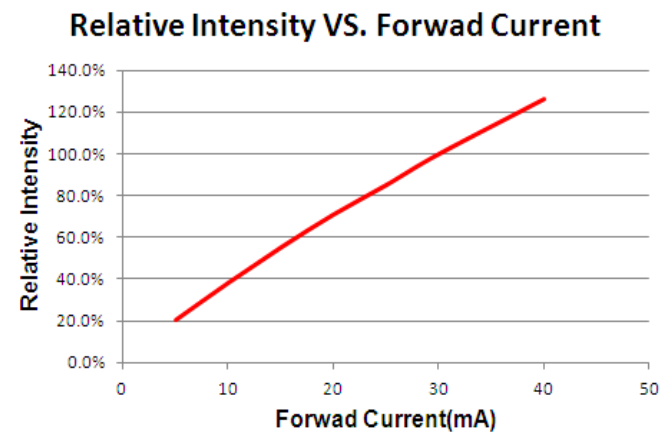
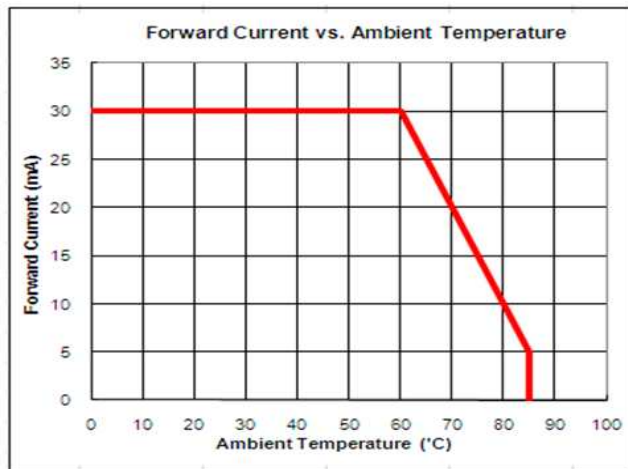
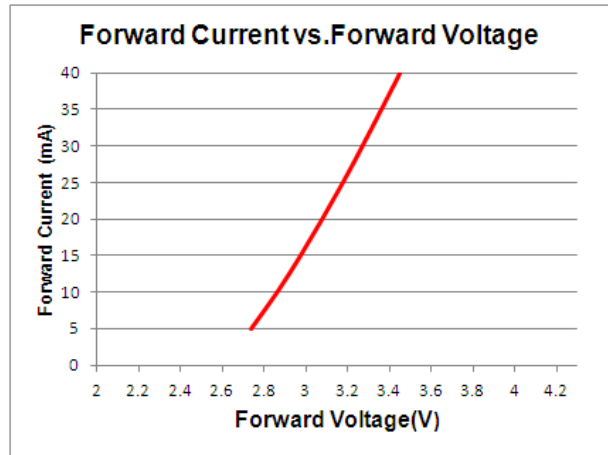
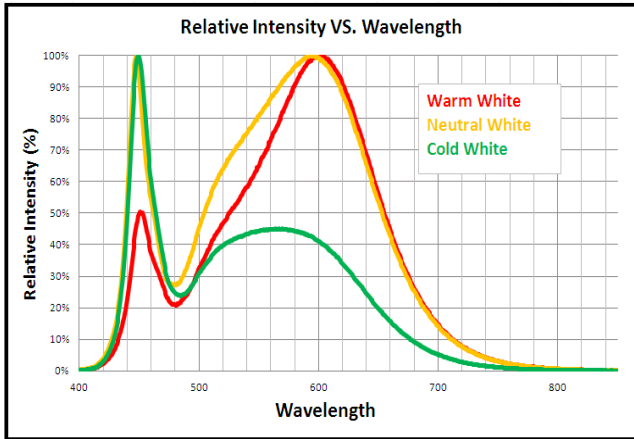
(T<sub>Soldering</sub> 25 °C)

Series	P <sub>D</sub> (mW)	I <sub>F</sub> (mA)	I <sub>FP</sub> (mA)*	T <sub>OP</sub> (°C)	T <sub>ST</sub> (°C)
Color	Power Dissipation	Forward Current	Pulse Forward Current	Operating Temperature	Storage Temperature
Cold White	105	30	40	-40~+85	-40~+100
Neutral White	105	30	40	-40~+85	-40~+100
Warm White	105	30	40	-40~+85	-40~+100

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

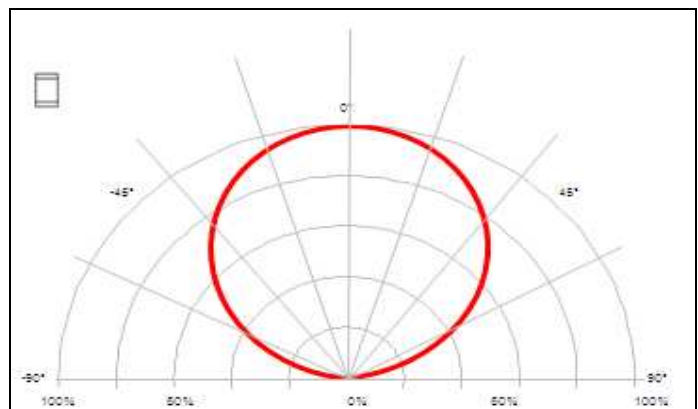
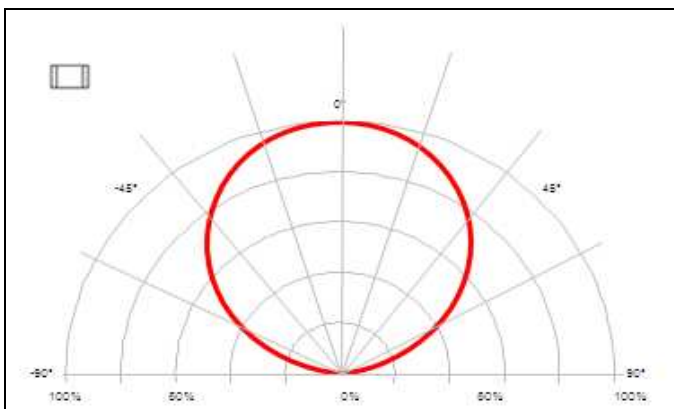
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## Characteristics of T1361DND



### Directive Characteristics

### Directive Characteristics



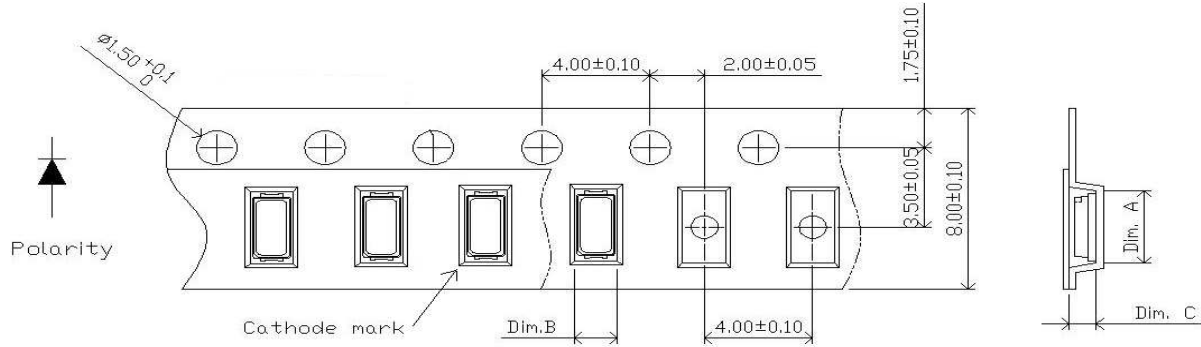
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## Precaution for Use

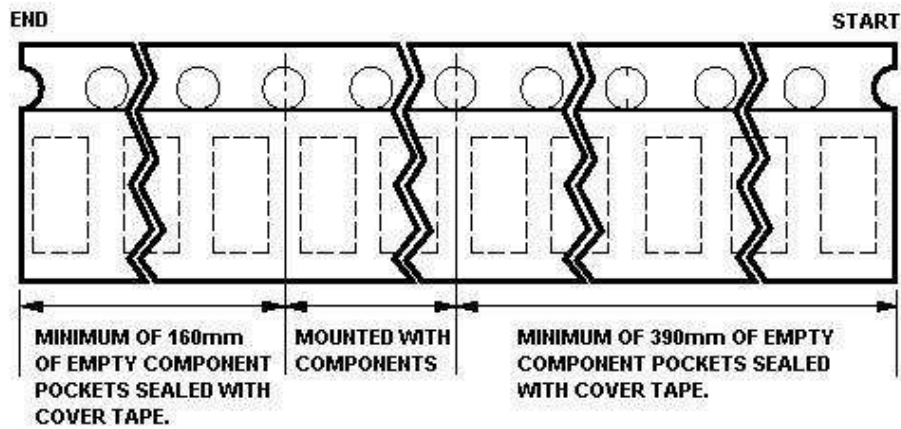
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within seven days after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
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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## Packaging Tape Dimension

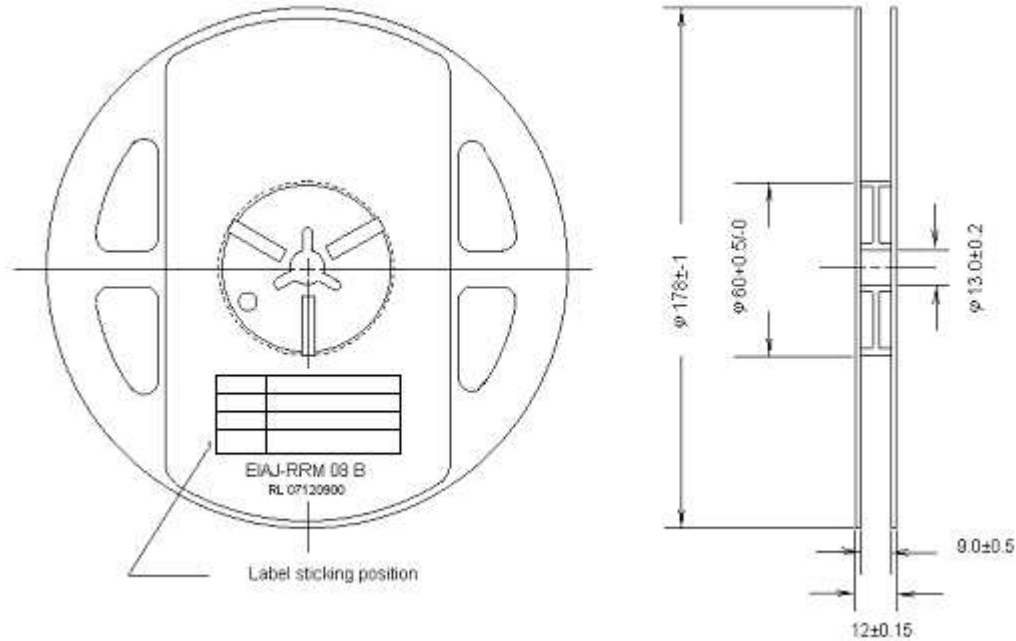


Dim. A	Dim. B	Dim. C	Q'ty/Reel
$3.2 \pm 0.1$	$1.6 \pm 0.1$	$1.0 \pm 0.1$	2K

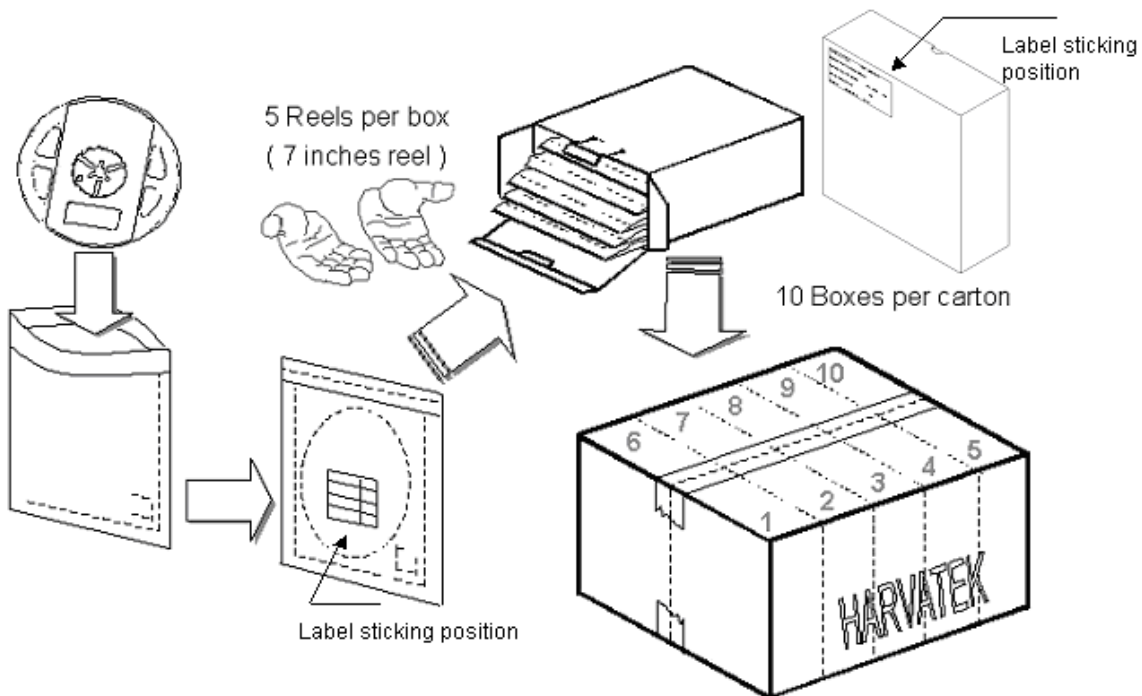


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## Reel Dimension



## Packing



5 boxes per carton is available depending on shipment quantity.

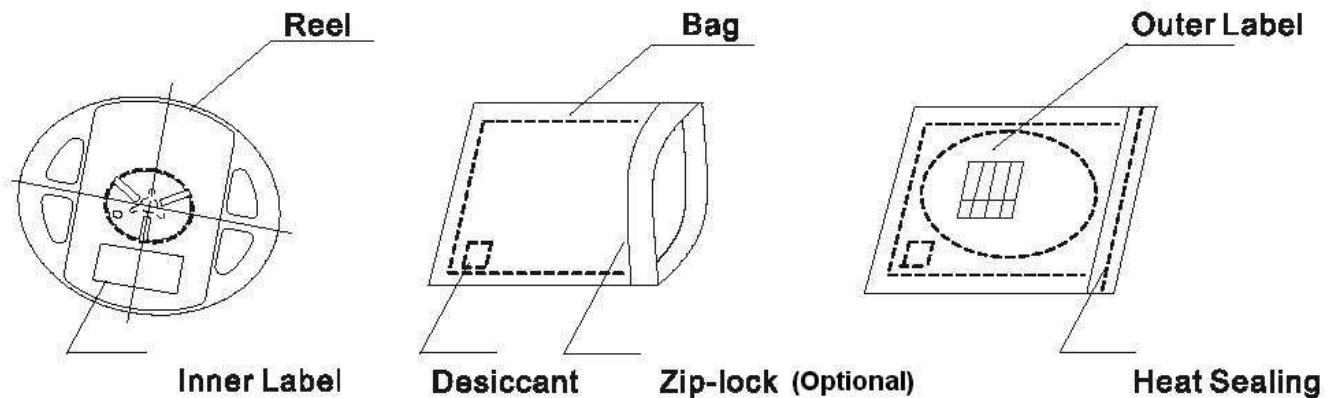
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## Dry Pack

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:



## Baking

Baking before soldering is recommended when the package has been unsealed for 72 hours.

The conditions are as followings:

1.  $60\pm 3^{\circ}\text{C} \times (12\sim 24\text{hrs})$  and  $<5\%RH$ , taped reel type.
2.  $100\pm 3^{\circ}\text{C} \times (45\text{min}\sim 1\text{hr})$ , bulk type.
3.  $130\pm 3^{\circ}\text{C} \times (15\text{min}\sim 30\text{min})$ , bulk type.

## 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.

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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.

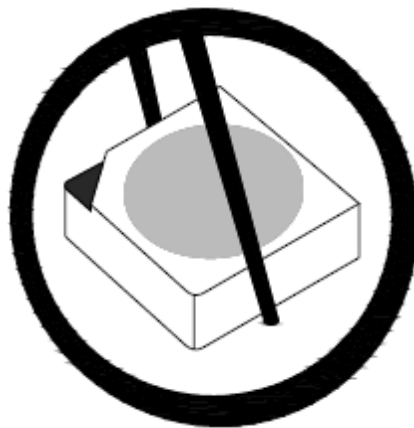


Figure 2

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

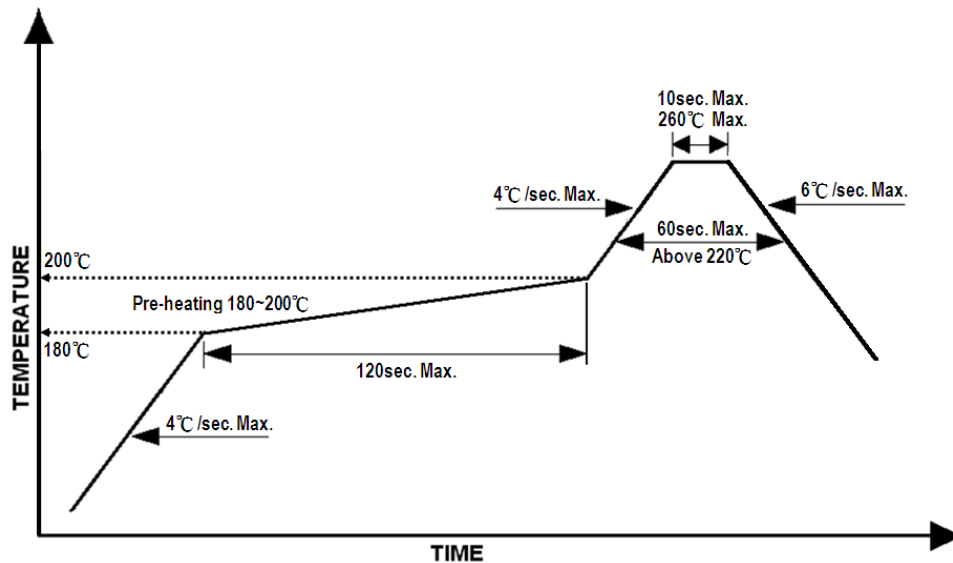
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## Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220 °C ,60 sec.
2. Peak temp.:260 °CMax.,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.

## 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
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

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