

Harvatek Surface Mount LED Data Sheet HT-374 Series

Official Product	Product: HT-374 Series	Data Sheet No.		
Tentative Product	*******			HT-374 Series
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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

Product	Emission Color	Technology	Test Current I _F (mA)	Luminous Intensity I _V (mcd)	Forward Voltage V _F (V)	Orderable Part Number	
	Ultra Bright Red	AllnGaP	20	120 typ	1.9 typ		
HT-374FCH	True Green	InGaN	20	200 typ	3.3 typ	HT-374FCH-ZZZZ	
	Blue	InGaN	20	90 typ	3.3 typ		
	Ultra Bright Amber	AllnGaP	20	120 typ	1.9 typ		
HT-374FDH	True Green	InGaN	20	200 typ	3.3 typ	HT-374FDH-ZZZZ	
	Blue	InGaN	20	90 typ	3.3 typ		

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	Specification	Material	Quantity
Resin	Water clear	Epoxy resin	
Carrier tape	Per EIA 481-1A specs	Conductive black tape	4000pcs 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

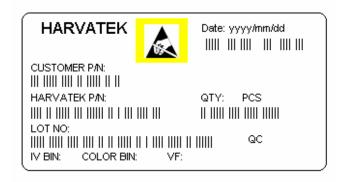
InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

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

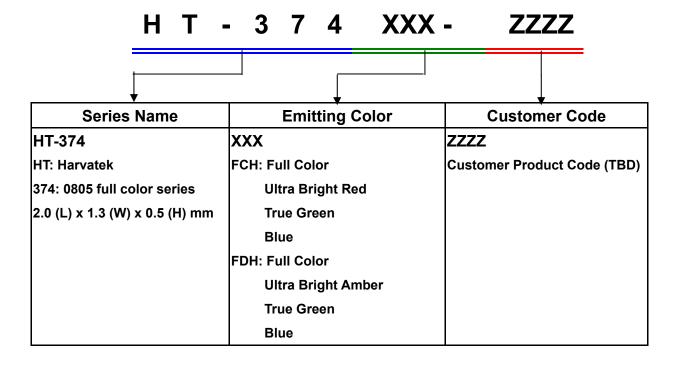
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Label Specifications



Harvatek P/N:



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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
		1: Jan.	1~31/ (30)			
	Z: 2000	2: Feb.				
Internal	1: 2001			04.00		
Tracing	2: 2002	9: Sep.		01~99,	D: Diffused	T: Tape & Reel
Code	3: 2003	A: Oct.		A,B,C		
		B: Nov.				
		C: Dec.				

Luminous Intensity (Iv) Bin:

Bin	Luminous Inten	sity Range (mcd)	Bin	Luminous Inter	nsity Range (mcd)
Dill	Minimum	Maximum	DIII	Minimum	Maximum
H1	2.8	3.6	H2	3.6	4.5
J1	4.5	5.7	J2	5.7	7.2
K1	7.2	9.0	K2	9.0	11.2
L1	11.2	14.2	L2	14.2	18.0
М1	18.0	22.5	М2	22.5	28.5
N1	28.5	36.0	N2	36.0	45.0
P1	45.0	57.0	P2	57.0	71.5
Q1	71.5	90.0	Q2	90.0	112.5
R1	112.5	142.0	R2	142.0	180.0
S1	180.0	227.0	S2	227.0	285.0
T1	285.0	360.0	T2	360.0	450.0
U1	450.0	570.0	U2	570.0	715.0

@20mA / Ta=25° C, Tolerance: <u>+</u> 10%

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Wavelength (λ_D) Bin:

	Wav	Wavelength Range (nm)						
Bin	Red		Am	ber				
Diii	(US	SD)	(U	D)				
	Min	Max	Min	Max				
-	615.0	630.0						
Α			597.0	600.0				
В			600.0	603.0				
С			603.0	606.0				
D			606.0	609.0				
E			609.0	612.0				
F			612.0	615.0				
Н								
J								

	Wavelength Range (nm)					
Bin	True	Green	Blue			
D	(N	G)	(N	B)		
	Min	Max	Min	Max		
-						
Α	515.0	520.0	460.0	464.0		
В	520.0	525.0	464.0	468.0		
С	525.0	530.0	468.0	472.0		
D	530.0	535.0	472.0	476.0		
E	535.0	540.0	476.0	480.0		
F			480.0	485.0		
Н						
J						

@20mA / Ta=25° C, Tolerance: <u>+</u> 0.5nm

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Forward Voltage (V_F) Bin:

Color	Bin Code	Spec. Range
	G8	2.7-2.9 V
	Н7	2.9-3.1 V
Blue (NB)	Н8	3.1-3.3 V
Green (NG)	J7	3.3-3.5 V
	J8	3.5-3.7 V
	K7	3.7-3.9 V
Ultra Bright Red (USD)		2.4 V max
Ultra Bright Amber (UD)	-	2.4 v max

@20mA / Ta=25°C, Tolerance: <u>+</u> 0.05 V

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Product Characteristics

Absolute Maximum Ratings

Product	Emission Color	P _d (mW)	I _F (mA)	I _{FP} * (mA)	V _R (V)	T _{OP} (°C)	T _{ST} (°C)
	Ultra Bright Amber Ultra Bright Red	72	30	100	5	5 -40°C~+85°C	
HT-374 Series	Blue	78	25	80			-40°C~+90°C
	True Green	. 0	20				

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

Electro-Optical Characteristics

 $(T_a = 25 \circ C)$

Product	Emission	I-(mA)	$V_F(V)$ $\lambda(nm)$			I _{V**} (mcd)			
Floduct	Color	I _F (mA)	typ	max	λ_{D}	λ_{P}	Δλ	min	typ
	Ultra Bright	20	1.0	2.4	605	609	17	56	120
	Amber	20	1.9	2.4	005	009	17	50	120
	Ultra Bright	20	1.9	2.4	622	636	17	56	120
HT-374 Series	Red	20	1.9	2.4	022	030	17	50	120
111-07-4 Octios	HI-374 Series Blue	20	3.3	3.9	470	468	40	56	90
	True Green	20	3.3	3.9	527	520	40	90	200

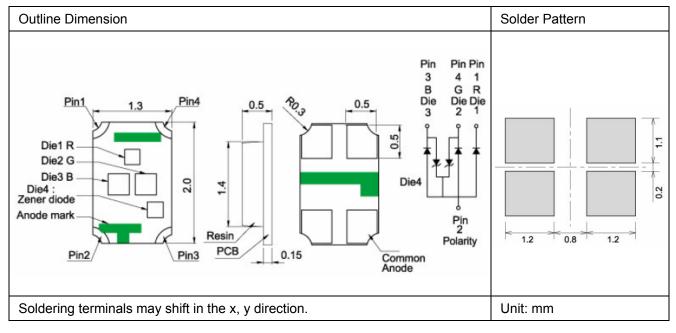
^{**} Per NIST standards

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Package Outline Dimension Recommended Soldering Pattern for Reflow Soldering

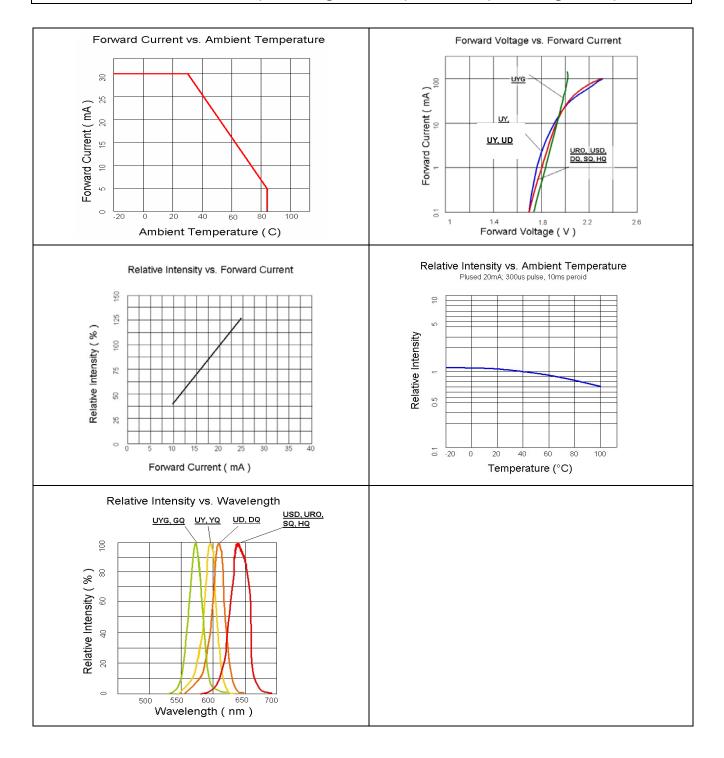
Unit: mm Tolerance: +/-0.1



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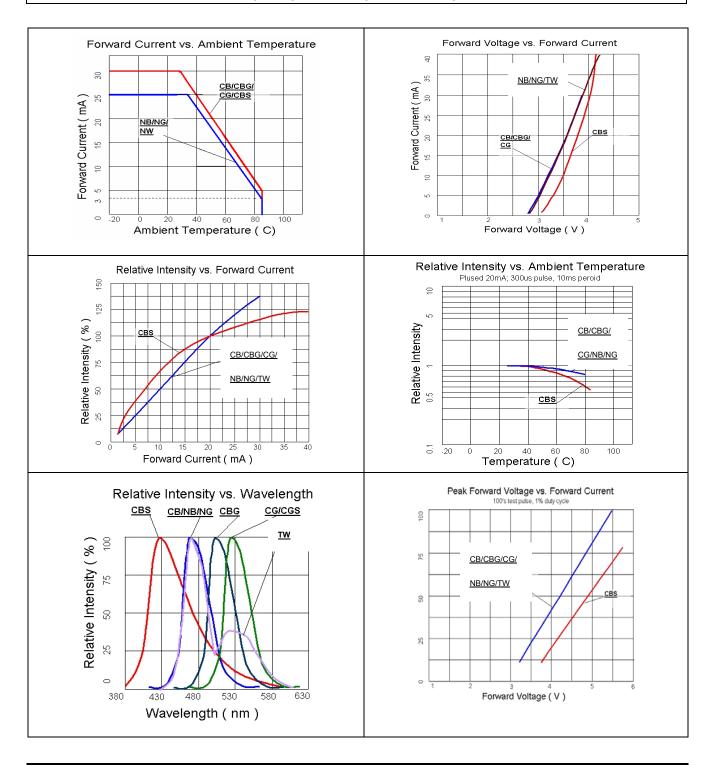
Characteristic Curves for UD (Ultra Bright Amber) and USD (Ultra Bright Red)



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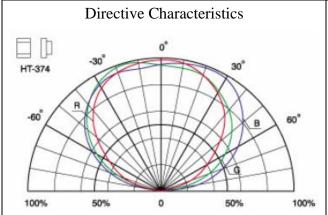
Characteristic Curves for NB (Blue) and NG (True Green)

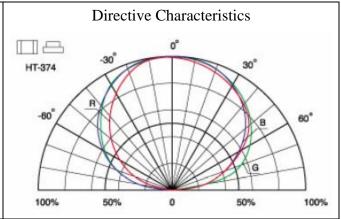


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Characteristic Curves for All Colors (Radiation Pattern)



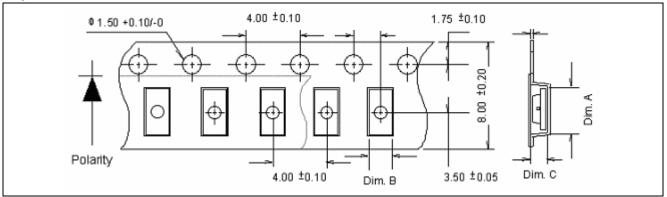


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Packaging

Tape Dimension



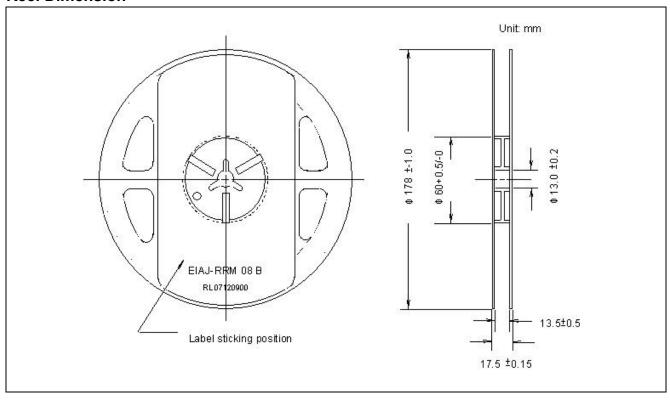
Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-374	2.30±0.10	1.40±0.10	0.60±0.10	4K

Unit: mm

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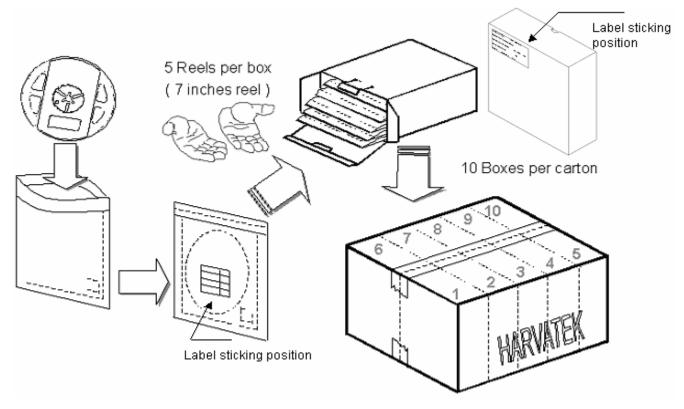
Reel Dimension



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Packing



5 boxes per carton is available depending on shipment quantity.

	Specification	Material	Quantity
Carrier tape	Per EIA 481-1A specs	Conductive black tape	4000pcs 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	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_D and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

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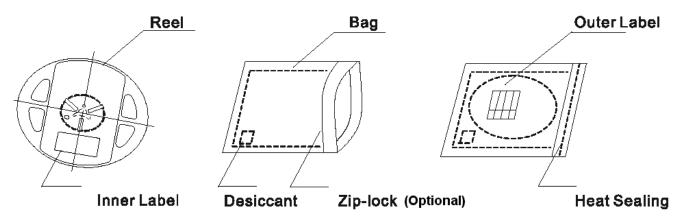


Dry Pack

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:



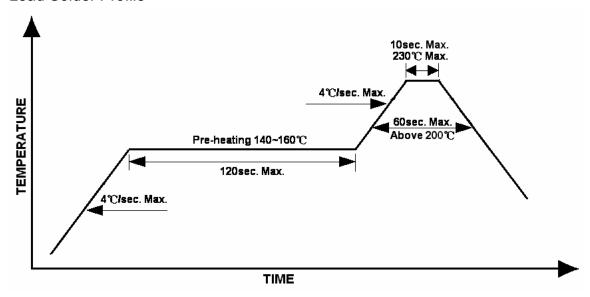
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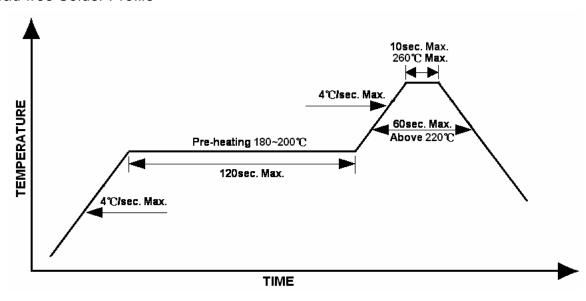
Reflow Soldering

- 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



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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 AllnGaP 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.

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.
- 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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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.) Tamb25°C; IF=20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	Tamb: 85°C Humidity: 85% R.H., IF=5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20	HT specs.	Tamb: 55°C IF=20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		Tamb25°C, If=20mA,, Ip=100mA, Duty cycle=0.125 (tp=125µs,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
New format		1.0	06-06-2005
Update characteristic curves			

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