

**Harvatek Surface Mount LED Data Sheet
HT-F199 5mA InGaN Series**

Official Product	HT-F199 5mA InGaN Series		Data Sheet No.
Tentative Product			HT-F199 5mA InGaN Series
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Feb. 15, 2007	Version of 1.2	Page 1/19

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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
HT-F199NB5	Blue	InGaN	5	30 typ	2.8 typ	HT-F199NB5-ZZZZ
HT-F199NG5	True Green	InGaN	5	50 typ	2.8 typ	HT-F199NG5-ZZZZ
HT-F199TW5	White	InGaN	5	90 typ	2.8 typ	HT-F199TW5-ZZZZ

	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 I_V , I_D and V_f . 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			Date: yyyy/mm/dd
CUSTOMER P/N: 	HARVATEK P/N: 		QTY: PCS
LOT NO: 	IV BIN: COLOR BIN: VF:		QC

Harvatek P/N:

H T - F199 XXX - ZZZZ

Series Name	Emitting Color	Customer Code
HT-F199 HT: Harvatek F199: 0603 0.25mm series 1.6 (L) x 0.8 (W) x 0.25 (H) mm	XXX NB5: Blue @ 5mA NG5: True Green @ 5mA TW5: White @ 5mA	ZZZZ Customer Product Code (TBD)

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

■ Luminous Intensity (I_v) Bin:

Bin	Luminous Intensity Range (mcd)		Bin	Luminous Intensity Range (mcd)	
	Minimum	Maximum		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
M1	18.0	22.5	M2	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

@5mA / Ta=25° C, Tolerance: ± 10%

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■ Wavelength (λ_D) Bin:

Bin	Wavelength Range (nm)			
	True Green (NG)		Blue (NB)	
	Min	Max	Min	Max
-				
A	515.0	520.0	460.0	465.0
B	520.0	525.0	465.0	470.0
C	525.0	530.0	470.0	475.0
D	530.0	535.0	475.0	480.0
E	535.0	540.0	480.0	485.0
F			485.0	490.0
H				
J				

@5mA / Ta=25°C, Tolerance: ± 0.5 nm

■ Forward Voltage (V_F) Bin:

Color	Bin Code	Spec. Range
Blue (NB) Green (NG) White (TW)	G2T	2.55-2.65V
	G3T	2.65-2.75V
	G4T	2.75-2.85V
	H1T	2.85-2.95V
	H2T	2.95-3.05V
	H3T	3.05-3.15V

@5mA / Ta=25°C, Tolerance: ± 0.05 V

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■ Chromaticity Bin (for TW only):

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

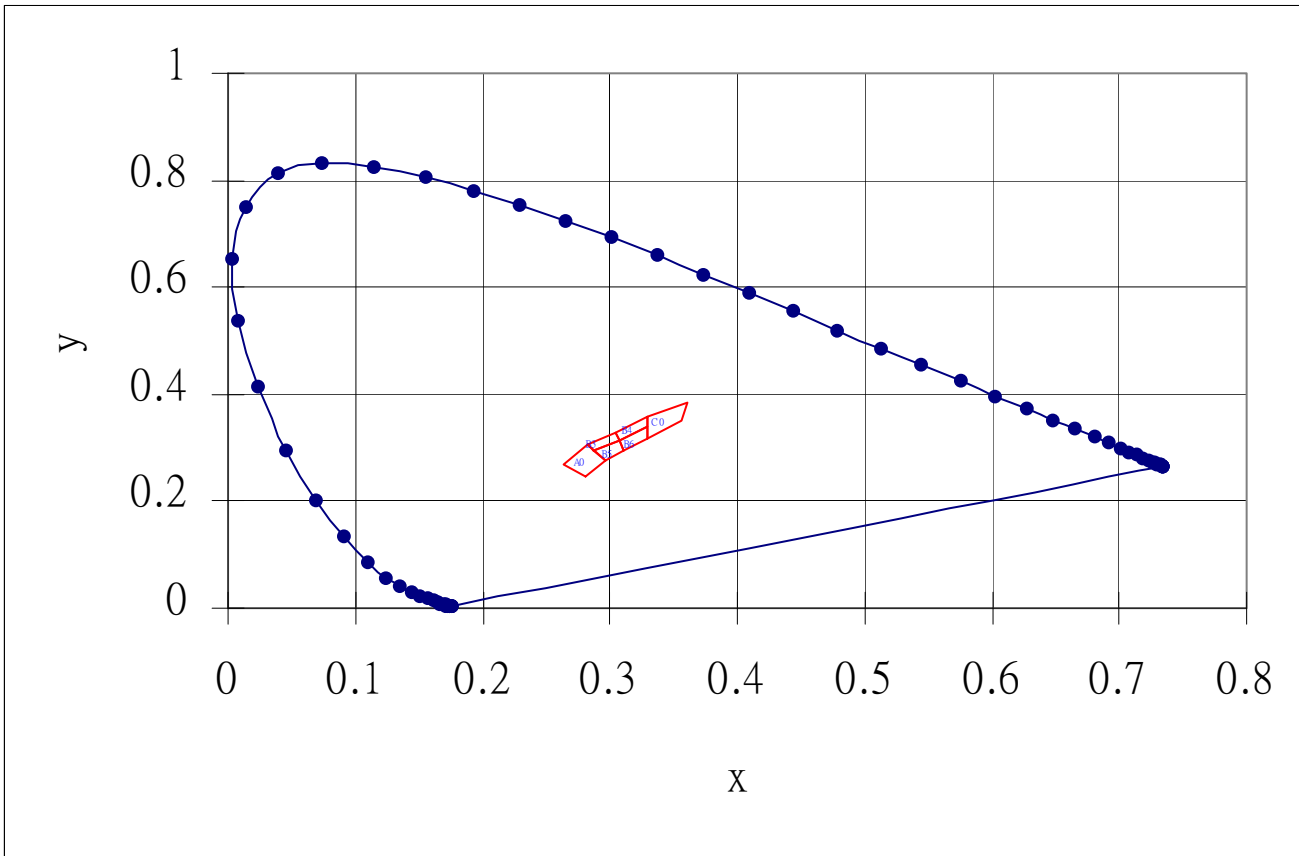
	Rank C0			
x	0.330	0.330	0.361	0.356
y	0.318	0.360	0.385	0.351

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

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

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

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



@5mA / Ta=25°C, Tolerance: ± 0.01

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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)
HT-F199NB5	Blue	47	15	50	5	-40~+100	-40~+100
HT-F199NG5	True Green						
HT-F199TW5	White						

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

Electro-Optical Characteristics

(T_a = 25°C)

Product	Emission Color	I _F (mA)	V _F (V)		λ(nm)			I _v (mcd)	
			typ	max	λ _D	λ _P	Δλ	min	typ
HT-F199NB5	Blue	5	2.8	3.15	470	468	40	14	30
HT-F199NG5	True Green	5	2.8	3.15	527	520	40	25	50
HT-F199TW5	White	5	2.8	3.15	X=0.29 Y=0.31	-	-	36	90

* Per NIST standards

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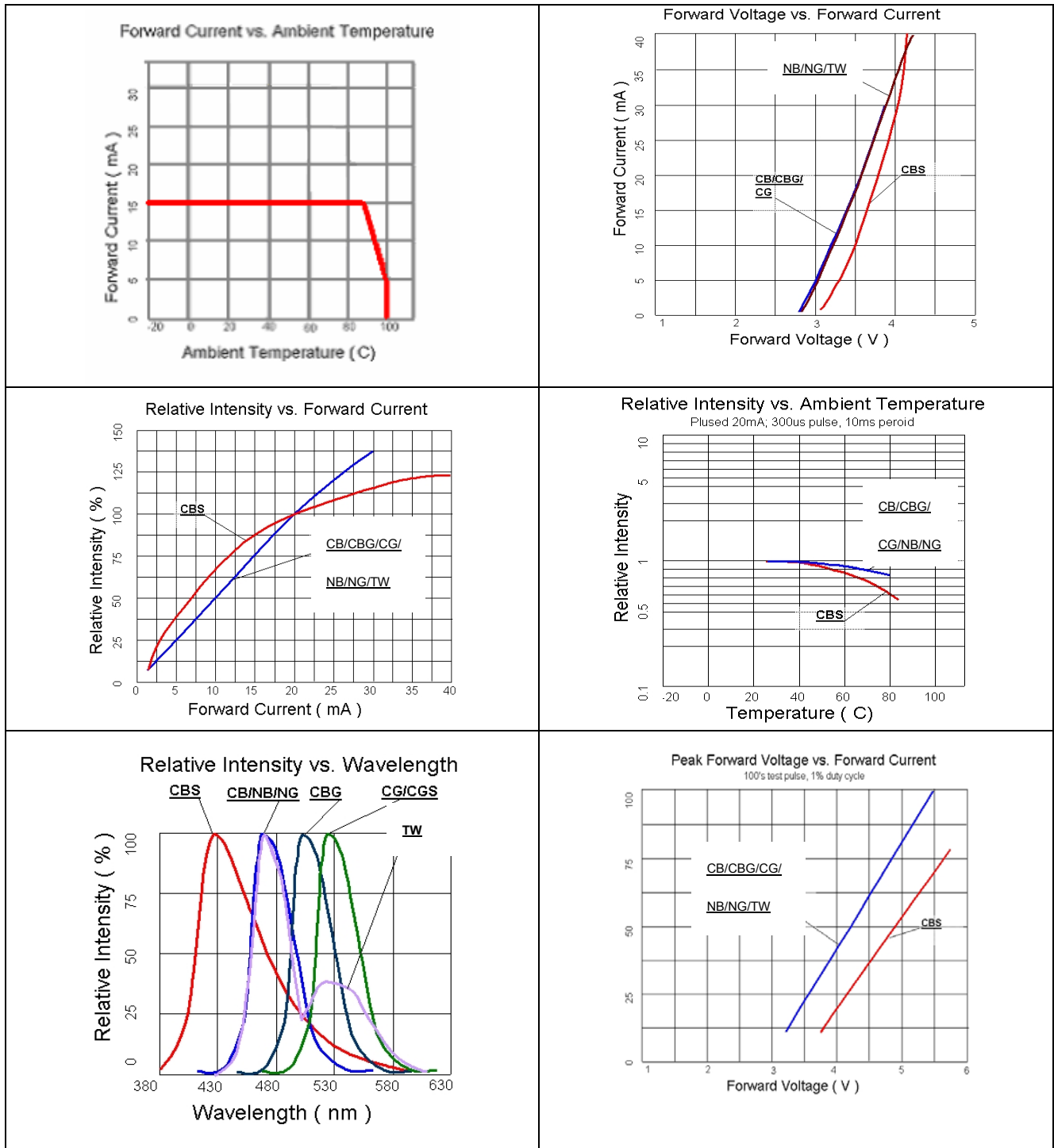
Package Outline Dimension
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1 unless otherwise specified

Outline Dimension	Solder Pattern
<p>LED Die</p> <p>Lead Frame</p> <p>1.10</p> <p>0.80</p> <p>1.60</p> <p>0.25 (+0.02/-0.05)</p> <p>Resin</p> <p>Soldering Terminal</p> <p>1.10</p> <p>0.25</p> <p>Polarity</p>	<p>It's not recommended this area has any print.</p> <p>0.8</p> <p>1.0</p> <p>0.8</p> <p>0.8</p>
<p>Soldering terminals may shift in the x, y direction.</p>	<p>Unit: mm</p>

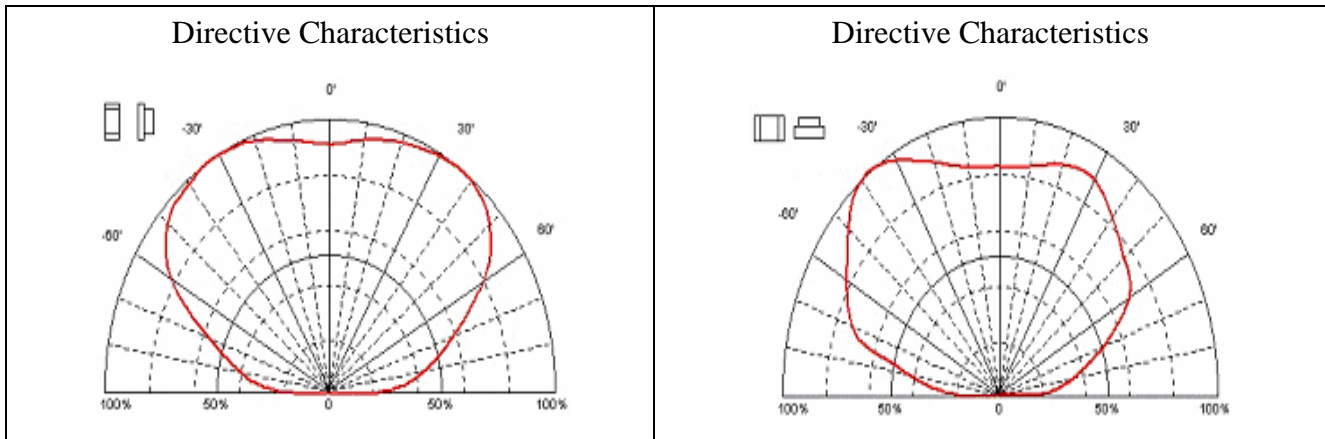
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Characteristic Curves



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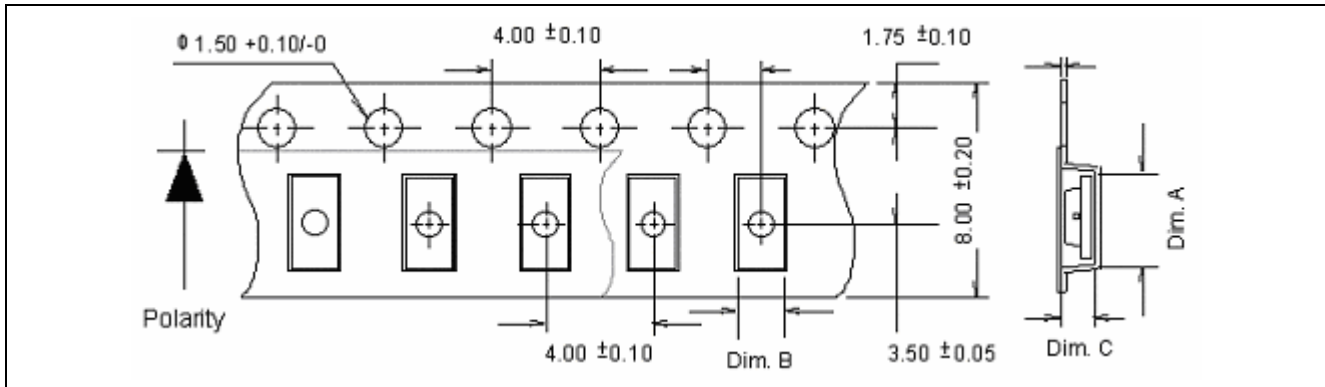
Radiation Pattern



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Packaging

Tape Dimension

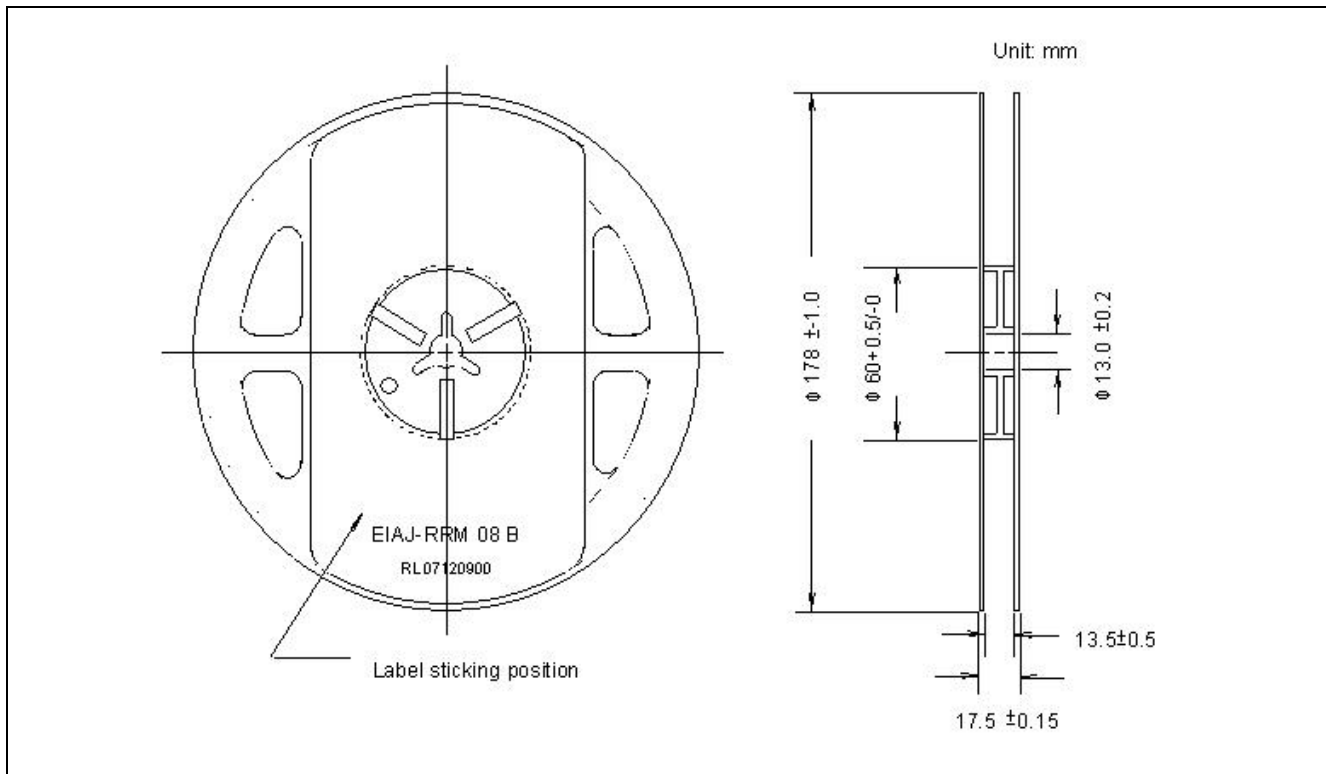


Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-F199	1.75±0.10	0.90±0.10	TBD	4K

Unit: mm

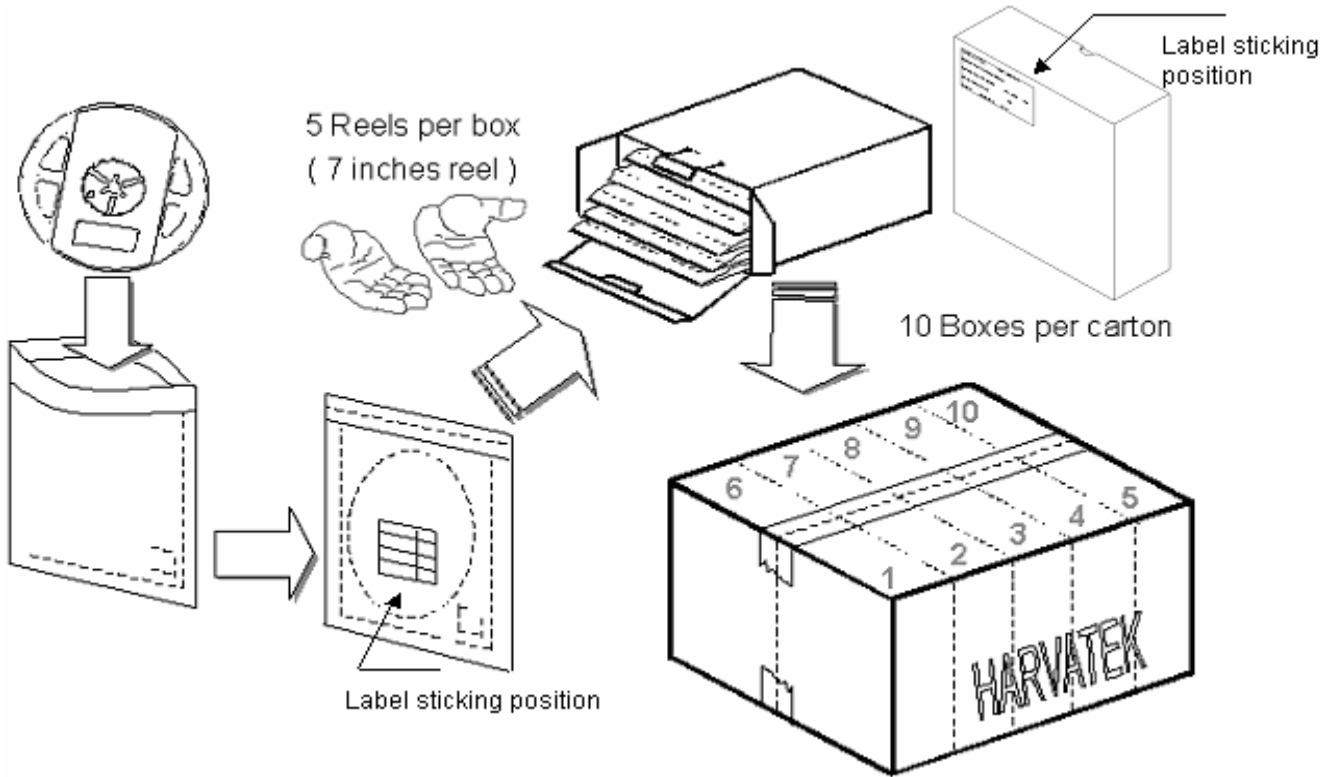
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Reel Dimension



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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.

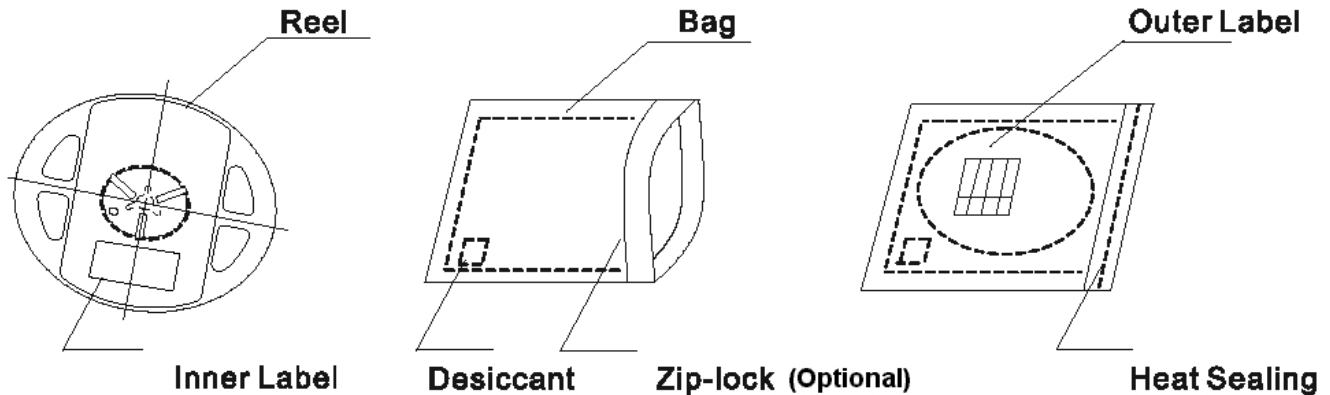
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Dry Pack

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:

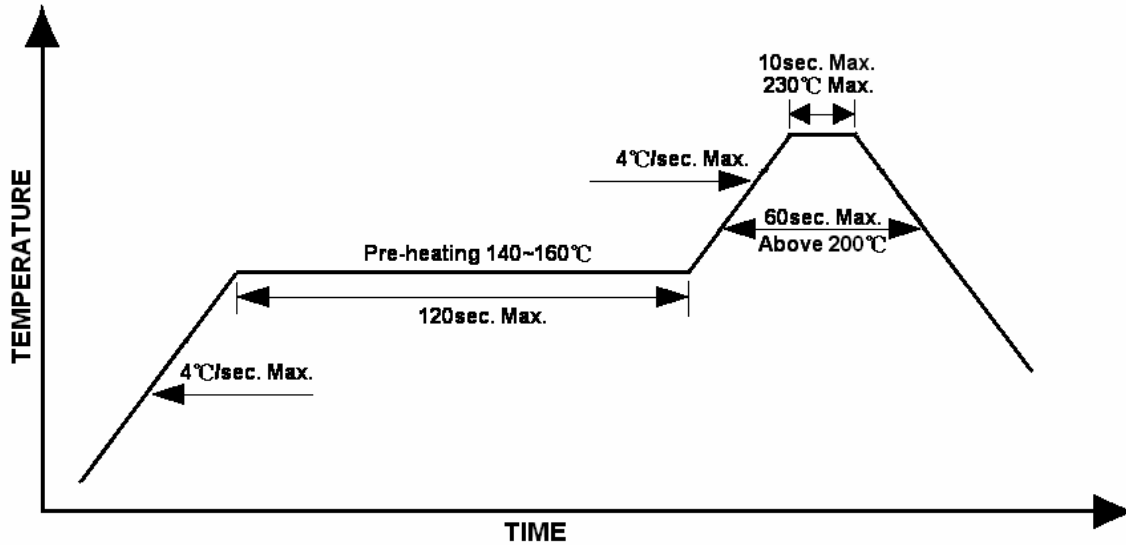


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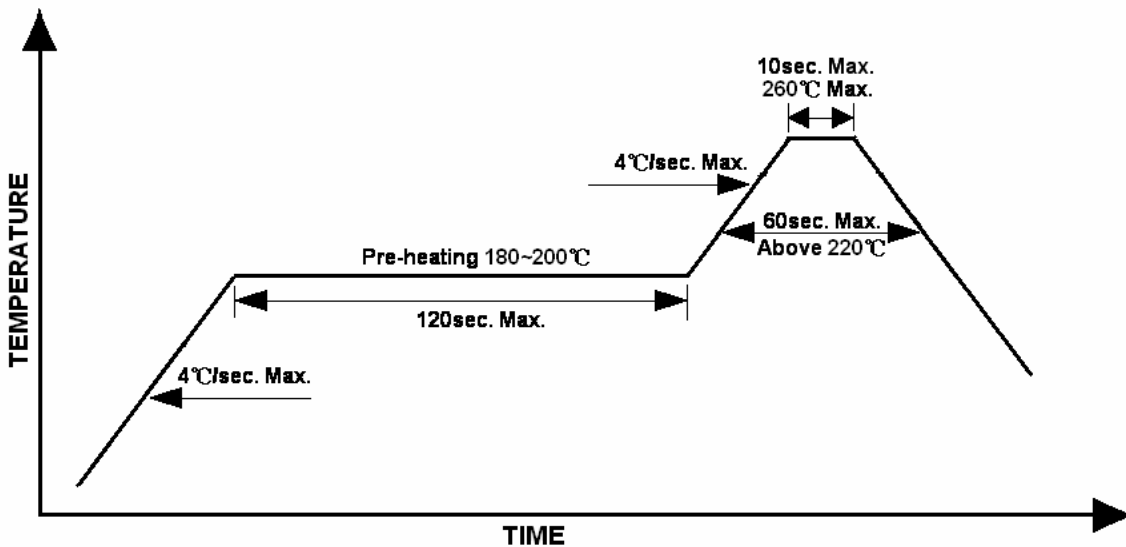
Reflow Soldering

- 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 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.

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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Revision History

Changes since last revision	Page	Version No.	Revision Date
New format		1.0	02-02-2007
Updated test conditions, maximum ratings, and derating curve to 5mA specifications	6,7,8,9, 11	1.1	02-05-2007
Updated package height tolerance	10	1.2	02-15-2007

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