

**Harvatek Surface Mount LED Data Sheet
HT-U158 Ultra-bright Series**

Official Product	Product: HT-U158 Ultra-bright Series			Data Sheet No.
Tentative Product	*****			HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		Dec. 10, 2008	Version of 1.2	Page 1/19

DISCLAIMER	3
PRODUCT SPECIFICATIONS	4
LABEL SPECIFICATIONS	5
PRODUCT CHARACTERISTICS.....	9
ABSOLUTE MAXIMUM RATINGS	9
ELECTRO-OPTICAL CHARACTERISTICS.....	9
PACKAGE OUTLINE DIMENSION.....	10
RECOMMENDED SOLDERING PATTERN FOR REFLOW SOLDERING	10
RADIATION PATTERN	12
PACKAGING	13
TAPE DIMENSION	13
REEL DIMENSION.....	14
PACKING	15
ATTENTION: ELECTROSTATIC DISCHARGE (ESD) PROTECTION	16
DRY PACK.....	16
REFLOW SOLDERING	17
PRECAUTIONS.....	18
REWORKING.....	18
CLEANING.....	18
REVISION HISTORY	19

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 2/19

DISCLAIMER

HARVATEK reserves the right to make changes without further notice to any products herein to improve reliability, function or design. HARVATEK does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights, nor the rights of others.

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.


Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 3/19

Product Specifications

Product	Emission Color	Technology	Test Current I_F (mA)	Luminous Intensity I_V (mcd)	Flux Φ_V (mlm)	Orderable Part Number
HT-U158NG	True Green	InGaN	20	227.0 - 570.0	1200 typ	HT-U158NG-YYYY0
HT-U158NB	Blue	InGaN	20	112.5 - 320.0	300 typ	HT-U158NB-YYYY0
HT-U158TW	White	InGaN	20	715.0 - 1270.0	--- typ	HT-U158TW-YYYY0
				715.0 - 900.0	--- typ	HT-U158TW-YYYY1

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 4/19

Label Specifications

HARVATEK		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 - U 1 5 8 XXXX - YYY Z

Series Name	Emitting Color	Customer Code
HT-U158 HT: Harvatek U158: mini tube LED series 3.0 (L) x 2.0 (W) x 1.3 (H) mm	XXXX NG: True Green @ 20mA NB: Blue @ 20mA TW: White @ 20mA	YYY Customer Product Code (TBD) Z 0: Luminous intensity range 0 1: Luminous intensity range 1

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 5/19

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 (Iv) Bin:

Bin	Luminous Intensity Range (mcd)		Bin	Luminous Intensity Range (mcd)	
	Minimum	Maximum		Minimum	Maximum
R1	112.5	142.0	R2	142.0	180.0
S1	180.0	227.0	S2	227.0	285.0
T1	285.0	320.0	T2	320.0	360.0
U1	360.0	400.0	U2	400.0	450.0
V1	450.0	500.0	V2	500.0	560.0
W1	560.0	630.0	W2	630.0	715.0
X1	715.0	800.0	X2	800.0	900.0
Y1	900.0	1000.0	Y2	1000.0	1125.0
Z1	1125.0	1270.0	Z2	1270.0	1440.0

@20mA / Ta=25° C, Tolerance: ± 10%

Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 6/19

■ Wavelength (λ_D) Bin:

Bin	Wavelength Range (nm)					
	True Green (NG)				Blue (NB)	
	Min	Max				
-						
A	515.0	520.0			460.0	464.0
B	520.0	525.0			464.0	468.0
C	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
H						
J						

@20mA / Ta=25°C, Tolerance: \pm 0.5nm

■ Forward Voltage (V_F) Bin:

Bin	Forward Voltage Range (V)						
					Bin	True Green (NG), Blue (NB), White (TW)	
						Min	Max
-							
					G8	2.7	2.9
					H7	2.9	3.1
					H8	3.1	3.3
					J7	3.3	3.5
					J8	3.5	3.7
					K7	3.7	3.9

@20mA / Ta=25°C, Tolerance: \pm 0.05 V

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		Dec. 10, 2008	Version of 1.2
			Page 7/19

■ XY 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

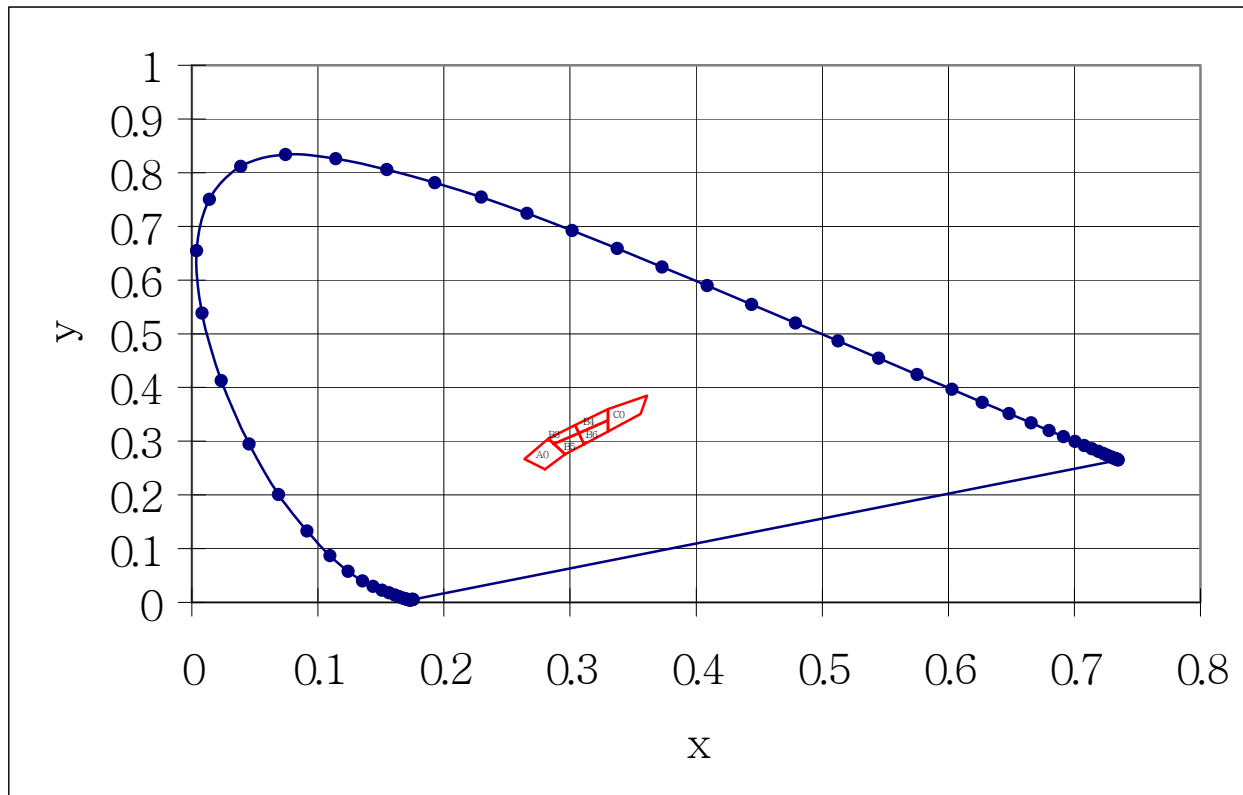
	Rank B3			
x	0.287	0.283	0.304	0.307
y	0.295	0.305	0.330	0.315

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

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

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

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



Tolerance: ± 0.01

Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 8/19

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-U158NG	True Green	117	30	120	5	-40°C~+100°C	-40°C~+100°C
HT-U158NB	Blue	117	30	120	5	-40°C~+100°C	-40°C~+100°C
HT-U158TW	White	117	30	120	5	-40°C~+100°C	-40°C~+100°C

* Condition for I_{FP} is pulse of 0.005 duty and 0.01msec 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	Typ.
HT-U158NG	True Green	20	3.3	3.9	532	527	30	350
HT-U158NB	Blue	20	3.3	3.9	470	468	40	250
HT-U158TW	White	20	3.3	3.9	X=0.31 Y=0.32	-	-	1000

* Per NIST standards

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.		Dec. 10, 2008	Version of 1.2
			Page 9/19

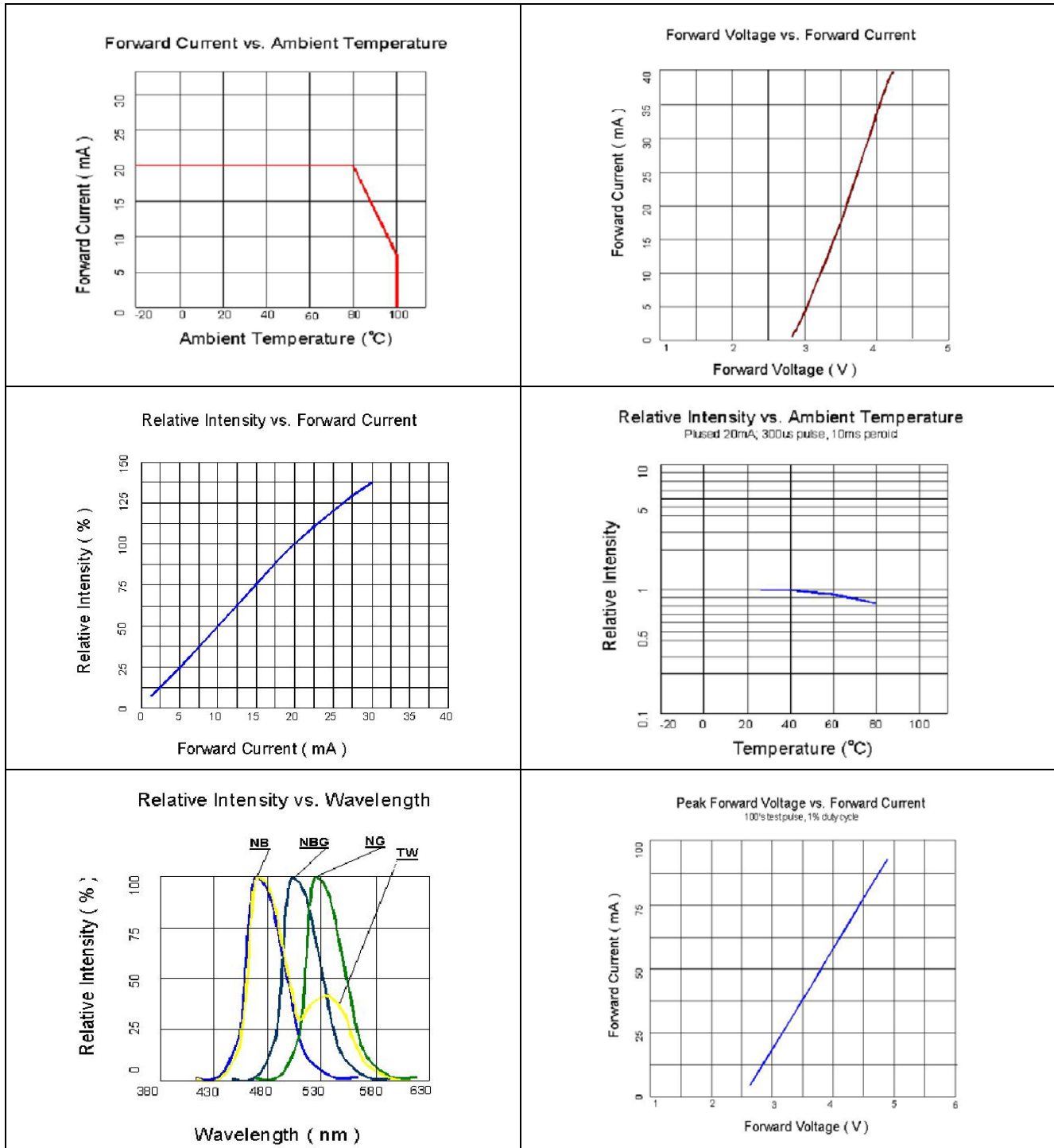
Package Outline Dimension
Recommended Soldering Pattern for Reflow Soldering

Unit: mm Tolerance: +/-0.1

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

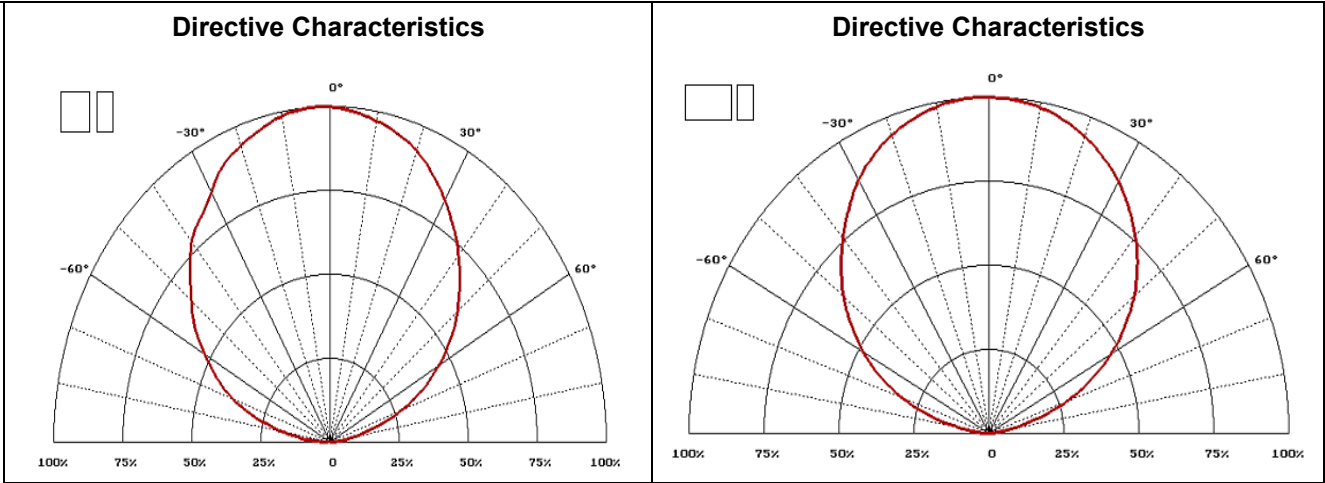
Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 10/19

Characteristic Curves for NG, NB, and TW



Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 11/19

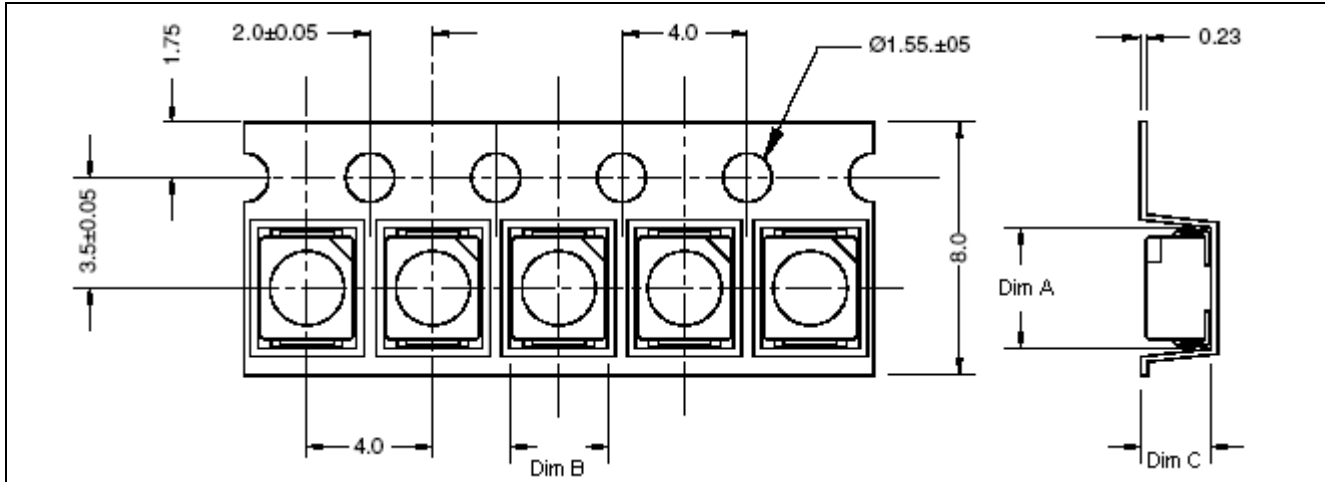
Radiation Pattern



Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 12/19

Packaging

Tape Dimension

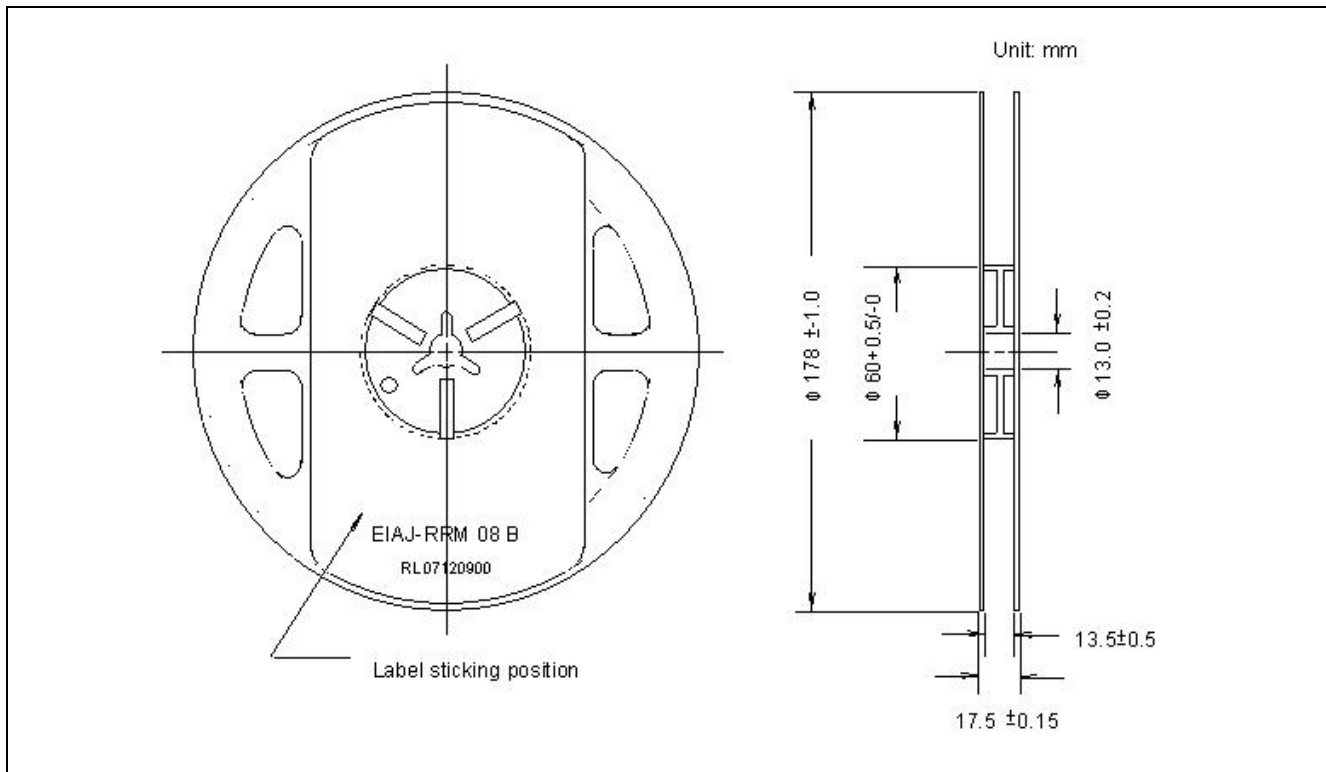


Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-U158	3.30±0.10	2.25±0.10	1.65±0.10	2K

Unit: mm

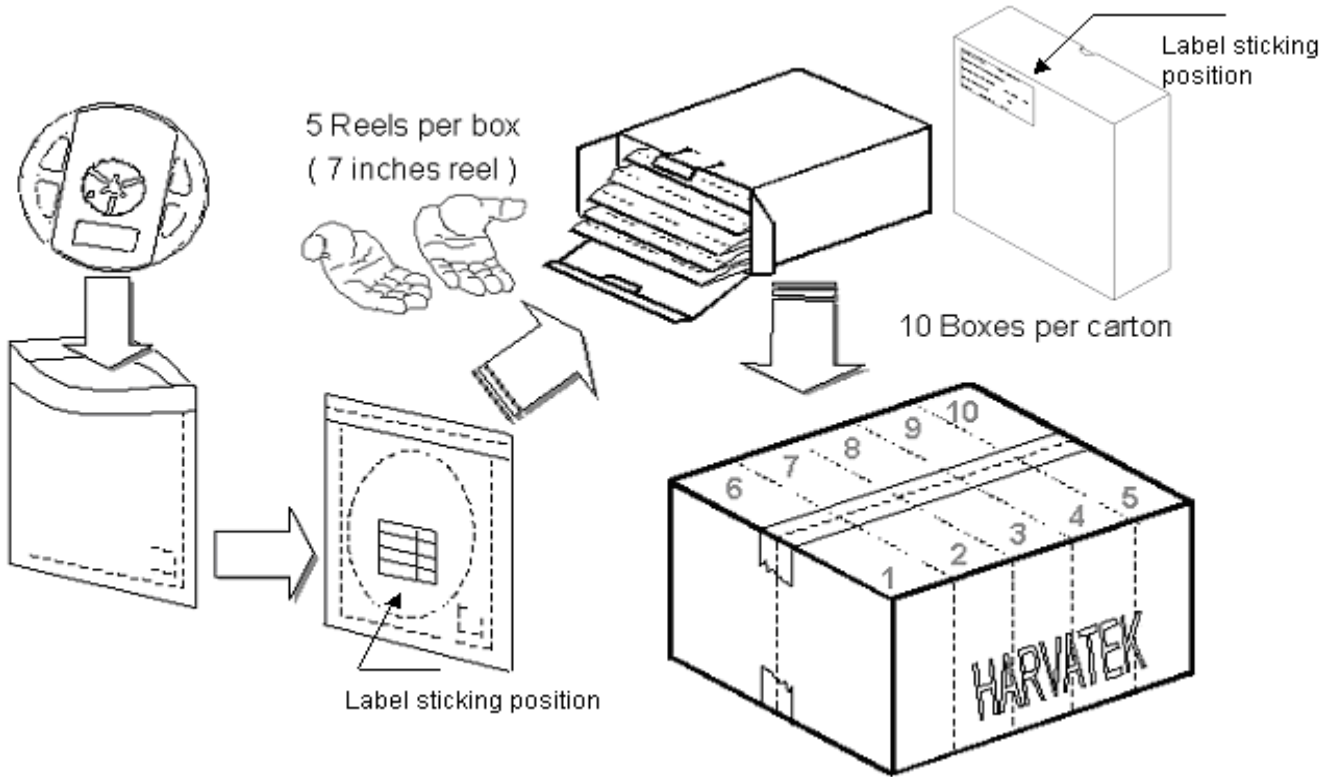
Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 13/19

Reel Dimension



Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 14/19

Packing



5 boxes per carton is available depending on shipment quantity.

	Specification	Material	Quantity
Carrier tape	Per EIA 481-1A specs	Plastic tape	2000pcs per reel
Reel	Per EIA 481-1A specs	Plastic white	
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.			

Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.
Tentative Product	*****	HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2
		Page 15/19

ATTENTION: Electrostatic Discharge (ESD) protection



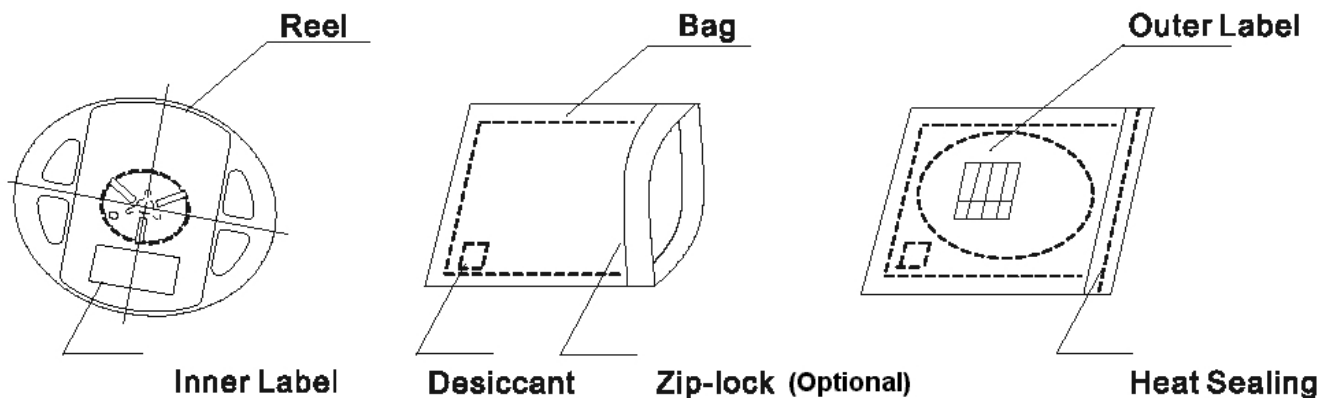
The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD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

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:

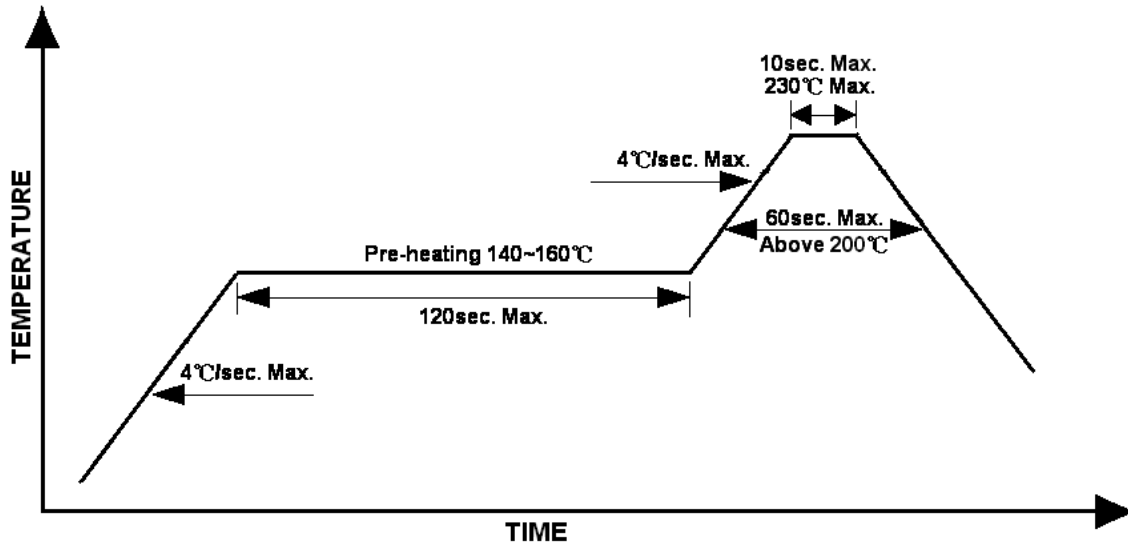


Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 16/19

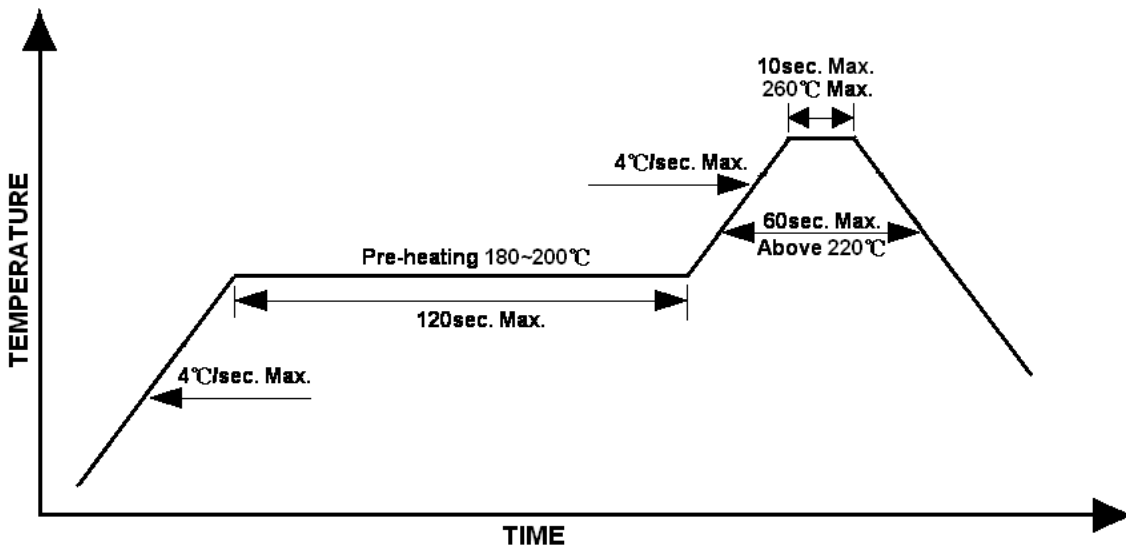
Reflow Soldering

- 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



Official Product	Product: HT-U158 Ultra-bright Series	Data Sheet No.	
Tentative Product	*****	HT-U158 Ultra	
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 17/19

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.

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 18/19

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	10-08-2007
Revise Brightness Spec		1.1	11-05-2007
Revise abs rating typo		1.2	12-10-2008

Official Product	Product: HT-U158 Ultra-bright Series		Data Sheet No.
Tentative Product	*****		HT-U158 Ultra
Specifications are subject to change without notice. Data and drawings herein are copyrighted.	Dec. 10, 2008	Version of 1.2	Page 19/19