

**Harvatek Surface Mount LED Data Sheet
HT-U16D-K571**

Official Product	HT Part No. HT-U16D-K571	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HDS-U16-K571
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Introduction

- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by HARVATEK for any infringements of intellectual property or other rights of the third parties which may result from it use.
- Harvatek is continually effort to improve the quality of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing HARVATEK products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such HARATEK products cause loss of human life, bodily injury or damage to property.
- The HARVATEK products listed in this document are intended for usage in general electronics (computer, personal equipment, office equipment, industrial robotics, domestic, etc...) These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury.
- In developing your designs, please ensure that HARVATEK products are used within specified operating ranges as set forth in the most recent HARVATEK products specifications.
- Also, please keep in mind the precautions listed in this document.

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Product Specification

	Specification	Material	Quantity
Luminous Intensity	Min:9 cd 9-14 cd typical @ 150mA / Ta= 25°C		
Correlated Color Temperature	3000-6000K typical @ 150mA / Ta=25°C		
V _F	3.0-4.2 V typical @ 150mA/ Ta=25 °C		
I _R	≤ 100μA @ V _R =5V / Ta=25°C		
Resin	Yellow Diffused	Silicone resin	
Carrier tape	Per EIA 481-1A specs	Plastic tape	1000-2000 pcs per reel
Reel	Per EIA 481-1A specs	Plastic 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 4reels. The 4 reels may not necessarily have the same lot number or the same bin combinations of I_v, λ_D and V_f. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

ATTENTION: Electric Static Discharge (ESD) protection



The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE**

devices. ESD protection has to considered and taken in the initial design stage.

If manual work/process is needed, please ensure the device is well protected from ESD during all the process.

ISO9001-2000 and ISO14001 Certified



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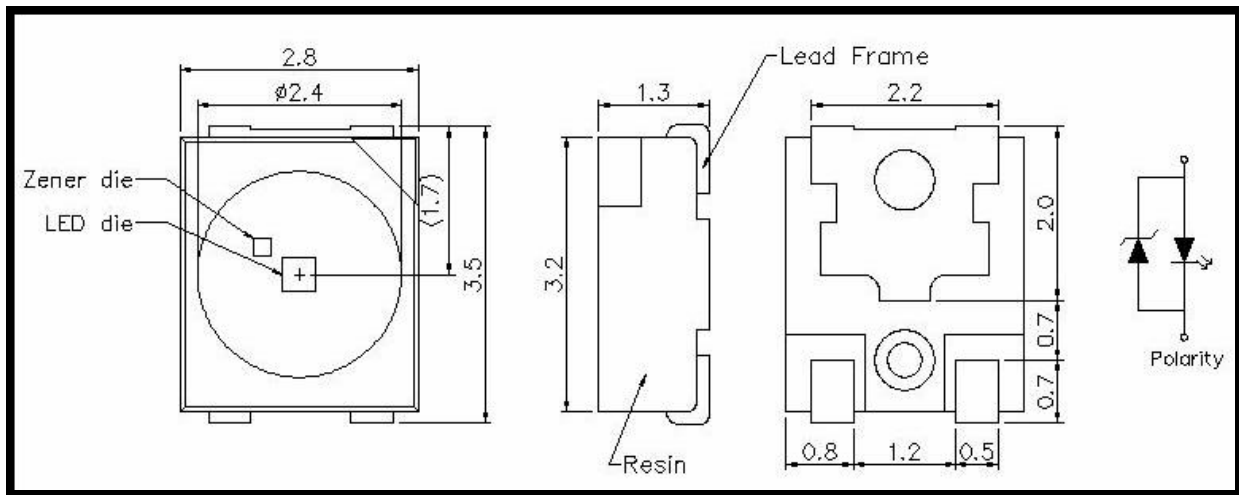
Product Features

- Super luminosity white LED
- 110-130° view angle
- No UV
- High Performance
- Lead Free
- ESD: With 2KV
- Instant light (less than 100nS)

Applications

- Flash Light for DSC
- Lighting for small size device
- Lighting

Product Outline Dimension(mm)



■ Soldering terminals may shift in x, y direction.
Tolerance: + / - 0.1mm

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Absolute Maximum Ratings

(T_a =25°C)

Parameter	Rating	Unit	Conditions
DC Forward Current	150	mA	-
Peak Pulsed Forward Current ^{*1}	225	mA	-
Average Forward Current	150	mA	-
Reverse Voltage	5	V	-
LED junction Temperature	120	°C	-
Operating Temperature	-30~+85	°C	-
Storage Temperature	-40~+120	°C	-
Soldering Temperature	260	°C	5s max.

*1:tp≤100ms, Duty cycle≤0.05

Electro-Optical Characteristics

(T_a =25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Viewing angle	2θ ½	-	110	-	Deg.
Forward Voltage (I _F =150mA)	V _F	2.8	3.4	4.2	V
Luminous Intensity (I _F =150mA) ^{*3}	I _v	7	12	-	cd
Correlated Color Temperature(I _F = 150 mA)	CCT	2750	-	6750	K
Temperature Coefficient of Forward Voltage	ΔV _F /ΔT	-	-2	-	mV/°C
Dynamic Resistance	R _D	-	1	-	Ω

*2: Tolerance for luminous intensity is 10%

Electrical Rank

Rank Code	Symbol	Condition	Min.	Max.	Unit
Full	V _F	I _F =150mA	2.80	4.20	V
H5			2.80	3.00	
H6			3.00	3.20	
J5			3.20	3.40	
J6			3.40	3.60	
K5			3.60	3.80	
K6			3.80	4.00	
L5			4.00	4.20	

Note: 1) Tolerance is ±0.1V.

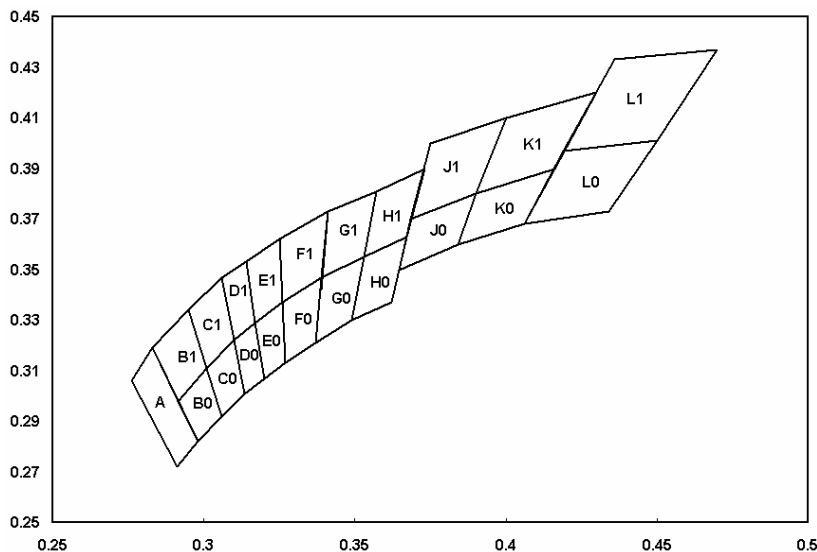
2) Actual testing condition is 150mA @ 25°C.

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Correlated Color Temperature Rank

Color	Bin Code	Min.	Typ.	Max.	Unit
White $I_F=150\text{mA}$	L1	2,750	3,000	3,250	K
	L0	2,750	3,000	3,250	
	K1	3,250	3,500	3,750	
	K0	3,250	3,500	3,750	
	J1	3,750	4,000	4,250	
	J0	3,750	4,000	4,250	
	H1	4,250	4,500	4,750	
	H0	4,250	4,500	4,750	
	G1	4,750	5,000	5,250	
	G0	4,750	5,000	5,250	
	F1	5,250	5,500	5,750	
	F0	5,250	5,500	5,750	
	E1	5,750	6,000	6,250	
	E0	5,750	6,000	6,250	
	D1	6,250	6,500	6,750	
	D0	6,250	6,500	6,750	

Note: 1) Tolerance of $\pm 5\%$.
 2) Actual test condition is 150mA @ 25°C.

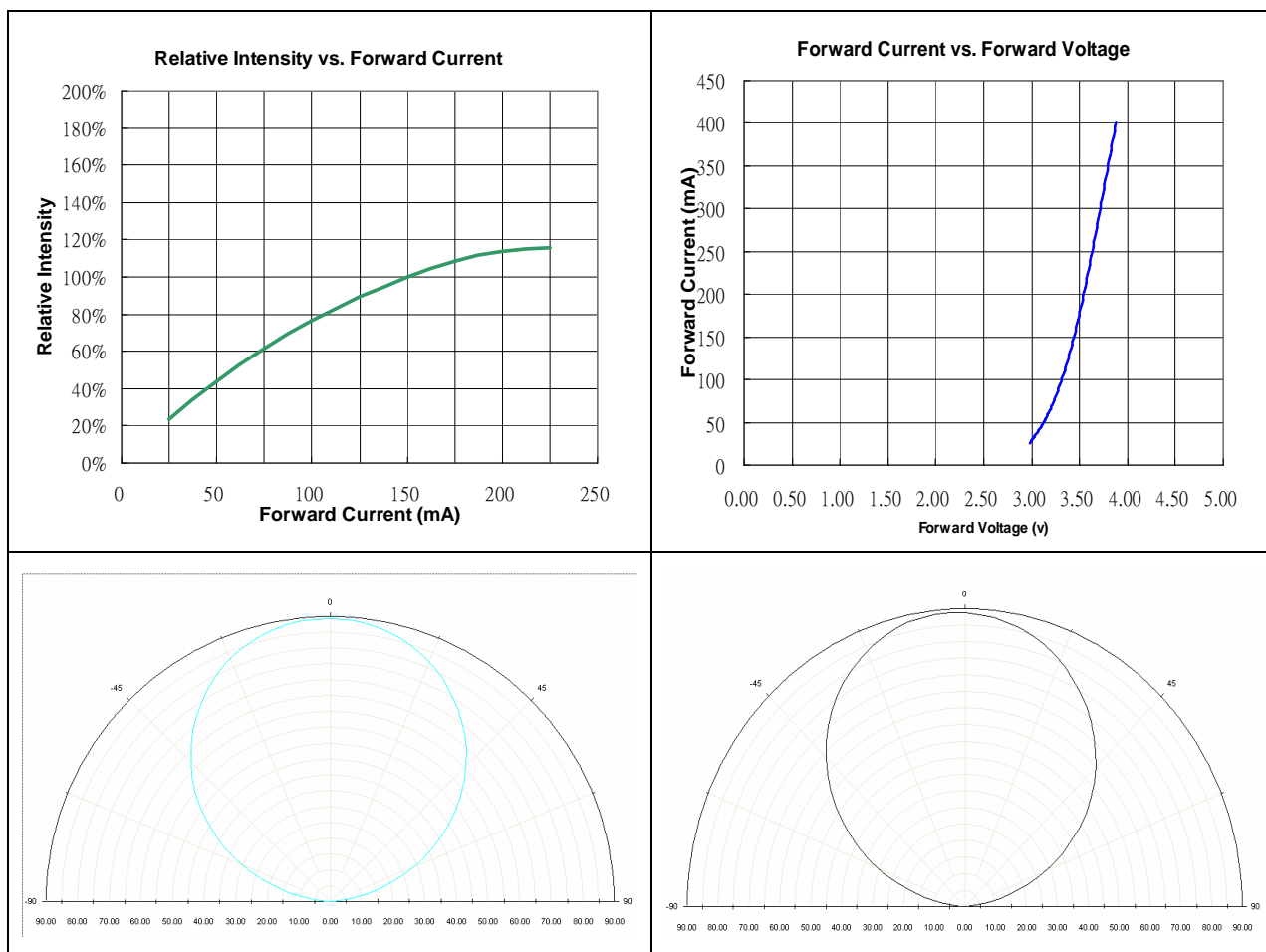


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Luminous Intensity Rank

Rank Code	Symbol	Condition	Min.	Max.	Unit
Full	Iv	IF=150mA	9	22	cd
AJ			9	11.25	
AK			11.25	14	
AL			14	17.5	
AM			17.5	22	

Characteristic Curves



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LEDs and Eye Safety:

In the 1993 edition of IEC-60825-1, LEDs were included: "Throughout this part 1 light emitting diodes (LED) are included whenever the word "laser" is used. "The CENELEC document EN 60825-1 contains all the technical content of the IEC standard.

The scope of the IEC standard states that "...products which are sold to other manufacturers for use as components of any system for subsequent sale are not subject to IEC 60825-1, since the final product will itself be subject to this standard. "Therefore, it is important to determine the Laser Safety Class of the final product. However, it is important that employees working with LEDs are trained to use them safely.

Most of the products containing LEDs will fall in either Class 1 or Class 2. A Class 1 label is optional. HT-U16D is a Class 2A LED product.

If a label is not used, this description must be included in the information for the user. Amendment 2 to IEC 60825-1 is expected to be published in January 2001. The CENELEC equivalent is expected to follow three months after the IEC publication. This document contains increased Class 1 and Class 2 limits, as well as the introduction of less restrictive Class 1M and Class 2M.

For the exact classification and further information, the IEC document can be used:
IEC-60825-1 ISBN 2-8318-4169-0

Storage

It's recommended to store the products in the following conditions:

Humidity: 60 %RH Max.

Temperature: 5°C ~30°C (41°F~86°F)

Shelf life in sealed bag: 6 month at<40°C and <90%RH.

After the bag is opened, devices that will be subjected to solder, or equivalent processing must be: Mounted within 1 year at factory conditions of $\leq 30^{\circ}\text{C}$ /60% RH.

Soldering

Manual soldering (We do not recommend this method strongly.)

Soldering tin material: tin 6/4 alloy or contained Ag.

To prevent cracking, please bake before manual soldering.

Temperature at tip of iron : $300^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Max.(25W)

It's banned to load any stress on the resin during soldering.

Soldering time : 3 ± 1 sec

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Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.

Temperature Time: 50°C x30sec, or 30°C x3min

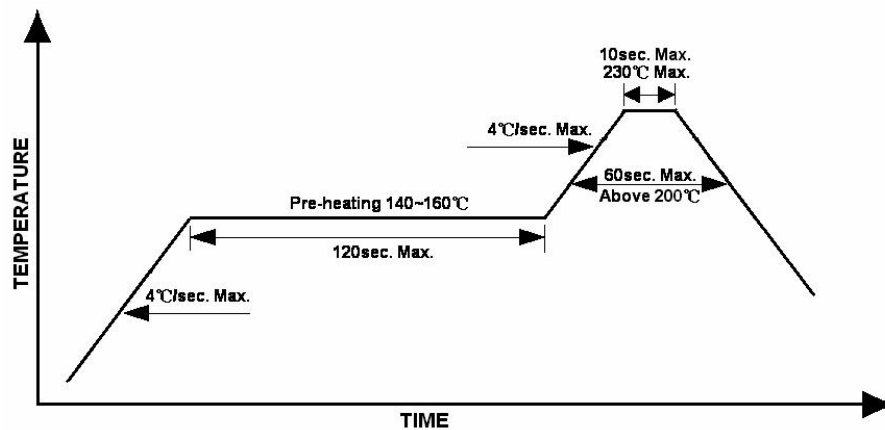
Ultra sonic cleaning: 15W bath; Bath volume: 1liter max.

Curing: 100°C max, 3min

Reflow Soldering

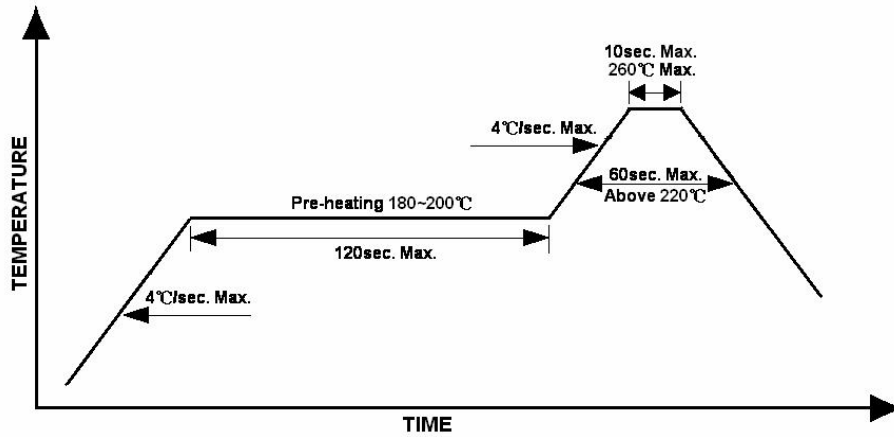
- Recommended tin glue specifications: melting temperature in the range of $178\text{--}192^{\circ}\text{C}$.
- Maximum number of times of reflow is 3.
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

Lead Solder Profile



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Lead-free Solder Profile



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