

Harvatek High Power SMD LED Datasheet**HT-N178TWU & HT-N178TWV**

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 1/19

INTRODUCTION	3
PRODUCT SPECIFICATION	4
ATTENTION: ELECTRIC STATIC DISCHARGE (ESD) PROTECTION	5
DESCRIPTION OF MODEL NO. AND LOT NO.	6
MODEL NO.	6
LOT NO.	7
PRODUCT FEATURE.....	7
APPLICATION	8
PRODUCT OUT LINE DIMENSION (HT-N178TWU)	8
ABSOLUTE MAXIMUM RATINGS	9
ELECTRO-OPTICAL CHARACTERISTICS	9
LUMINOUS FLUX RANK	10
ELECTRICAL RANK	11
CORRELATED COLOR TEMPERATURE RANK	12
CHARACTERISTICS.....	13
LEDs AND EYE SAFETY:	16
TUBE AND PACKING	16
TUBE DIMENSION	16
PACKING MODEL	17
PRECAUTION OF APPLICATION	17
DESIGNING 1: SOLDERING PATTERN	17
DESIGNING 2: CIRCUIT LAYOUT	18
DESIGNING 3: MAX RATING	18
STORAGE	18
SOLDERING.....	18
CLEANING	18
REVISE NOTES.....	19

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 2/19

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 making an 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 of the precautions listed in this document.

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 3/19

Product Specification

	Specification	Material	Quantity
Total Flux	HT-N178TWU: Typical 75 lm @350mA/ Ta= 25°C HT-N178TWV: Typical 140 lm @700mA/ Ta=25°C		
Correlated Color Temperature	HT-N178TWU: 3000K~9000K @350mA/ Ta=25°C HT-N178TWV: 3000K~9000K @700mA/ Ta=25°C		
V _F	3.03-3.99V @700mA/ Ta=25°C & @350mA/ Ta=25°C		
I _R	HT standard		
Resin	White	Epoxy resin	
Tube	HT standard	Conductive	50pcs per tube
Label	HT standard	Paper	
Carton	HT standard	Paper	Non-specified

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 4/19

Others:

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 be 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.

Compliance and Certification

RoHS compliant and ISO9002, QS9000 and ISO14001 certified.



Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 5/19

Description of Model No. and Lot No.

Model No.

H T - N 1 7 8 T W X

Company	Product Name	Dice	Package	Emitter Color	Current code
HT: For Harvatek	N: Ultra Bright chip	1: Single . .	Outline dimension	TW: White	U:350mA V:700mA

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 6/19

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	1: Jan. 2: Feb. 9: Sep. A: Oct. B: Nov. C: Dec.	1~31/ (30)	01~99, A,B,C...	D: Milky White	T: Taped Reel

Product Feature

- Wide view angle
- Easy to fixed
- No UV
- Long operating time (Up to 50,000hrs)
- Lower forward voltage operated
- More energy efficient than incandescent and most halogen lamps
- ESD with 2KV
- Instant light (less than 100nS)

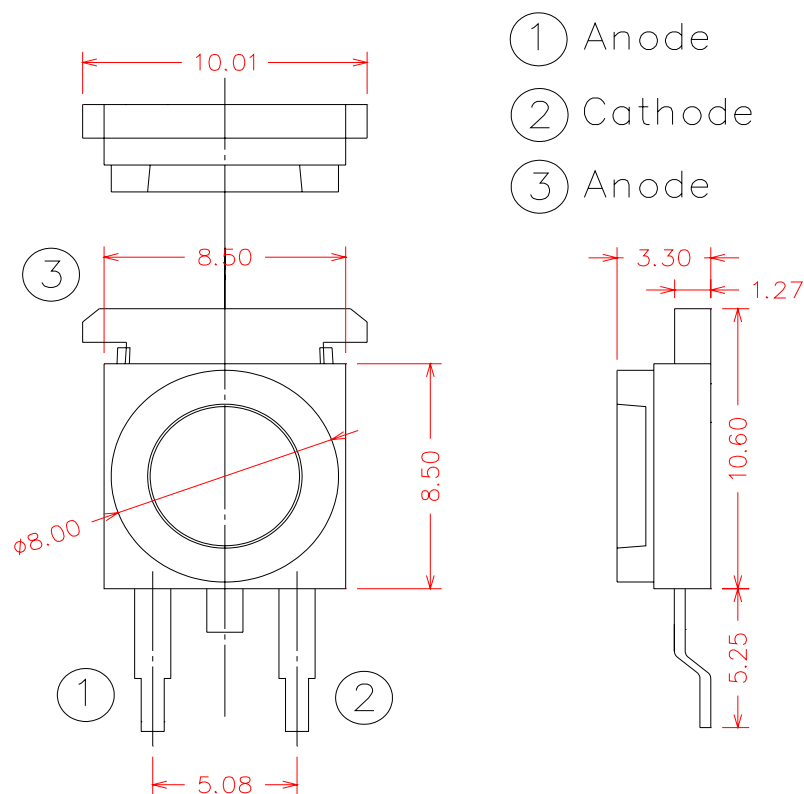
Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 7/19

Application

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Task lighting
- Garden lighting
- Rail lighting
- Wayside lighting
- LCD Backlights
- Light Guides
- Traffic signaling
- Architectural lighting

Product Out Line Dimension (HT-N178TW series)

Tolerance: +/-0.1



Unit: mm

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 8/19

Absolute Maximum Ratings(T_a =25°C)

Parameter	Rating	Unit	Conditions
DC Forward Current ^{*1}	800	mA	-
Peak Pulsed Forward Current ^{*2}	1000	mA	-
Reverse Voltage	5	V	-
LED junction Temperature	120	°C	-
Operating Temperature	-30~+85	°C	-
Storage Temperature	-40~+120	°C	-
Soldering Temperature	260	°C	For 5 sec. Max.

*1: Proper current derating must be observed to maintain junction temperature below the maximum

*2: tp ≤ 10μs, Duty cycle=0.01

Electro-Optical Characteristics(T_a =25°C)

(HT-N178TWU)

Parameter	Symbol	Min.	TYP.	Max.	Unit
Viewing angle	2θ ½	-	110	-	Deg.
Forward Voltage (I _F =700mA)	V _F	3.03	-	3.99	V
Luminous Flux	Flux	60	75	-	lm
Correlated Color Temperature	CCT	3000	-	9000	K
Temperature Coefficient of Forward Voltage	ΔV _F /ΔT	-	-2	-	mV/°C
Thermal Resistance Junction to Board (I _F =350mA)	Rθ _{J-B}	-	8	-	°C/W

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 9/19

(HT-N178TWV)

Parameter	Symbol	Min.	TYP.	Max.	Unit
Viewing angle	2θ ½	-	110	-	Deg.
Forward Voltage (I _F =700mA)	V _F	3.03	-	3.99	V
Luminous Flux	Flux	87.4	140	-	lm
Correlated Color Temperature	CCT	3000	-	9000	K
Temperature Coefficient of Forward Voltage	ΔV _F /ΔT	-	-2	-	mV/°C
Thermal Resistance Junction to Board (I _F =700mA)	Rθ _{J-B}	-	8	-	°C/W

Luminous Flux Rank

HT-N178TWU

Rank Code	Symbol	Condition	Min.	Typ.	Max.	Unit
Full	ΦV	I _F = 350mA	67.2	-	113.6	lm
PT			67.2	-	87.4	
PU			87.4	-	113.6	

Note: It maintains a tolerance of ±10% on flux

HT-N178TWV

Rank Code	Symbol	Condition	Min.	Typ.	Max.	Unit
Full	ΦV	I _F =700mA	87.4	-	192.0	lm
				-		
PU			87.4	-	113.6	
PV			113.6	-	147.7	
PW			147.7	-	192.0	

Note: It maintains a tolerance of ±10% on flux

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 10/19

Electrical Rank**HT-N178TWU**

Rank Code	Symbol	Condition	Min.	Typ.	Max.	Unit
Full	V_F	$I_F = 350\text{mA}$	3.03	-	3.99	V
P05			3.03	-	3.27	
P06			3.27	-	3.51	
P07			3.51	-	3.75	
P08			3.75	-	3.99	

Note: It maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements

HT-N178TWV

Rank Code	Symbol	Condition	Min.	Typ.	Max.	Unit
Full	V_F	$I_F = 700\text{mA}$	3.03	-	3.99	V
P05			3.03	-	3.27	
P06			3.27	-	3.51	
P07			3.51	-	3.75	
P08			3.75	-	3.99	

Note: It maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements

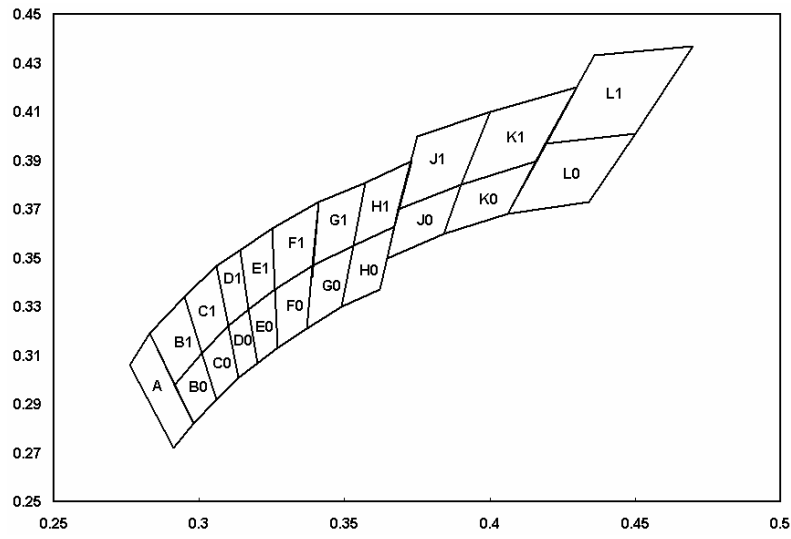
Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 11/19

Correlated Color Temperature Rank

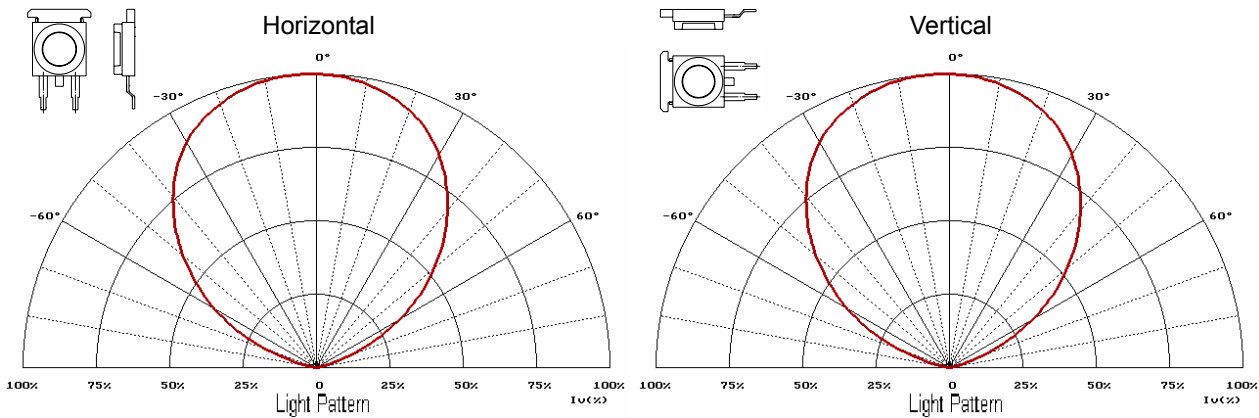
Color	Condition	Bin Code	Min.	Typ.	Max.	Unit
Warm White	I _F =700mA or 350mA	L1	2,750	3,000	3,250	K
		L0	2,750	3,000	3,250	
		K1	3,250	3,500	3,750	
		K0	3,250	3,500	3,750	
		J1	3,750	4,000	4,250	
		J0	3,750	4,000	4,250	
		H1	4,250	4,500	4,750	
		H0	4,250	4,500	4,750	
Pure White		G1	4,750	5,000	5,250	
		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	
Cold White		C1	6,750	7,000	7,500	
		C0	6,750	7,000	7,500	
		B1	7,500	8,000	8,500	
		B0	7,500	8,000	8,500	
	A	8,500	9,000	9,500		

Note: It maintains a tolerance of $\pm 5\%$ on CCT

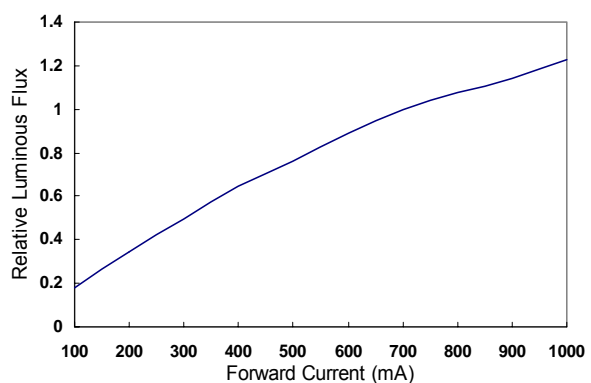
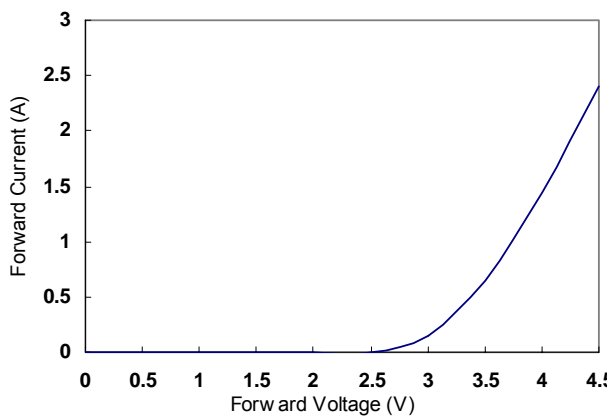
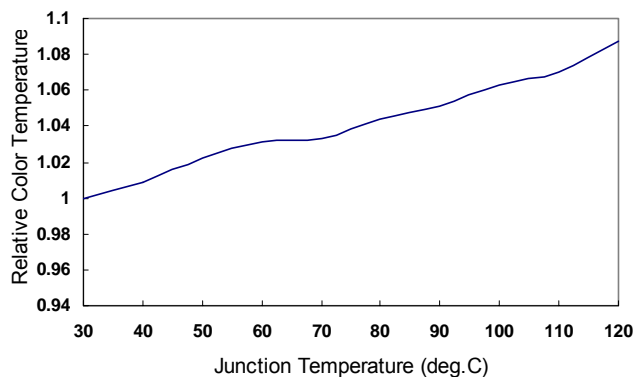
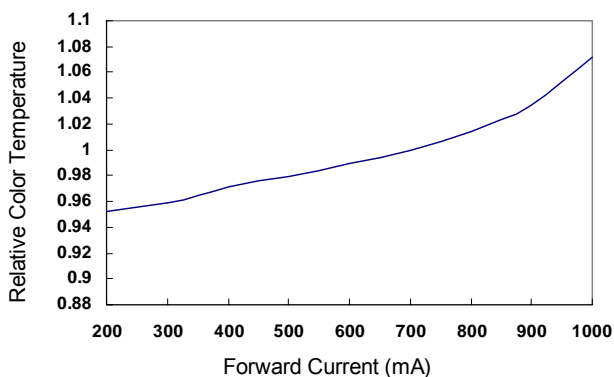
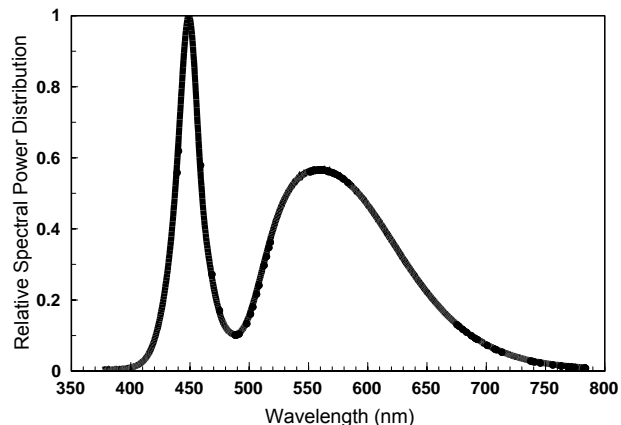
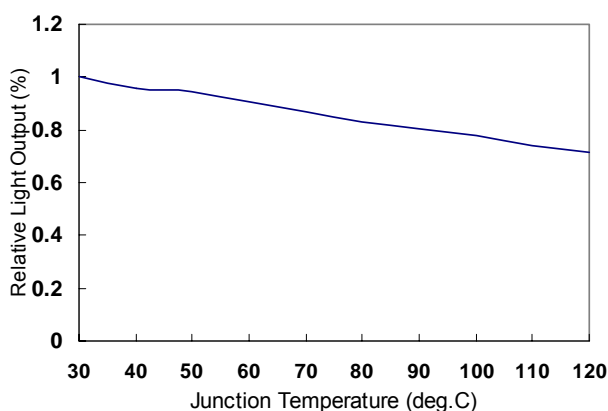
Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 12/19



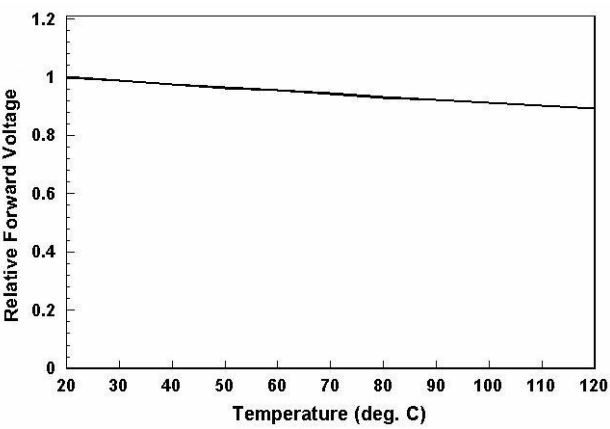
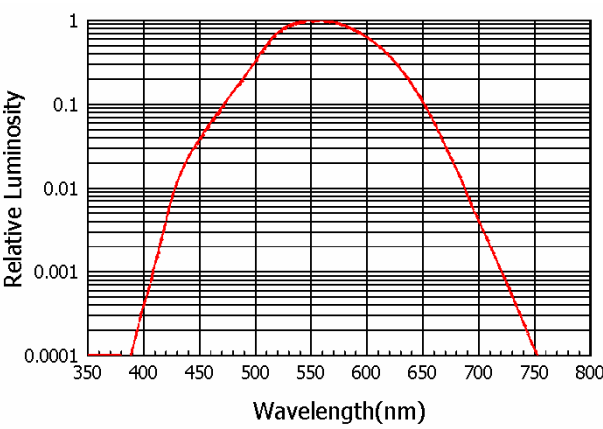
Characteristics



Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 13/19



Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 14/19



Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 15/19

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:

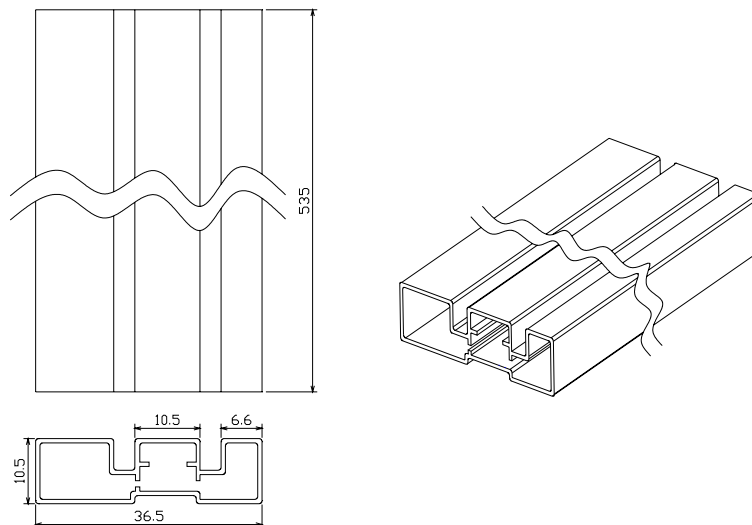
CLASS 1 LED PRODUCT

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.

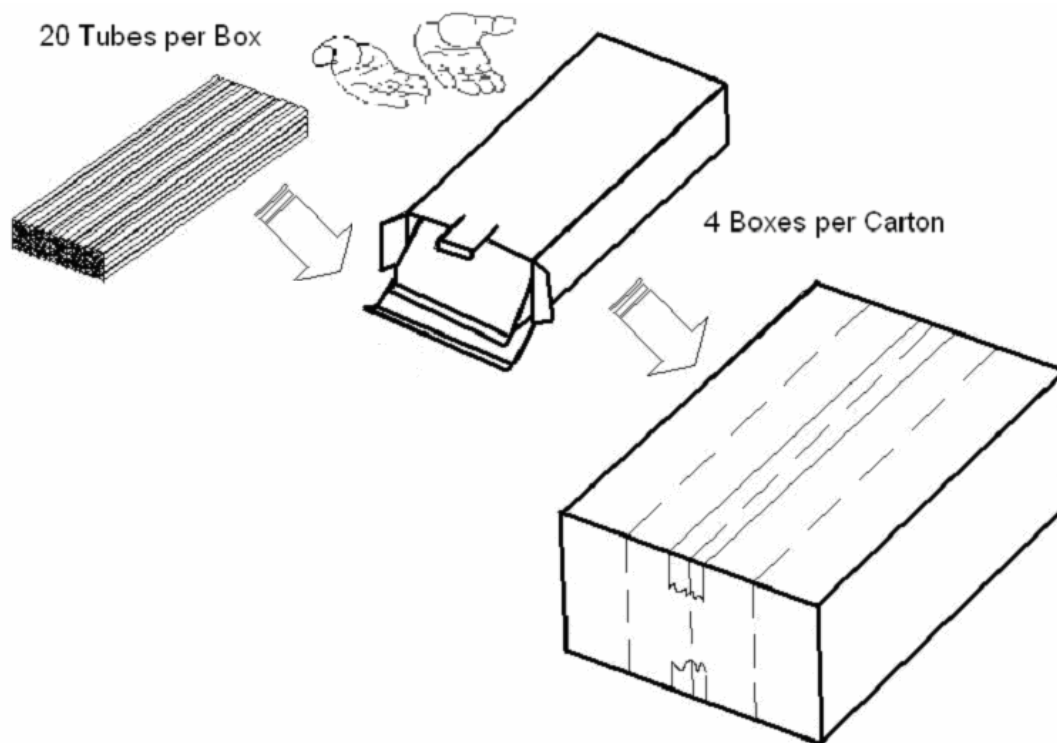
For the exact classification and further information, the IEC document can be used:

IEC-60825-1 ISBN 2-8318-4169-0

Tube and Packing**Tube Dimension**

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 16/19

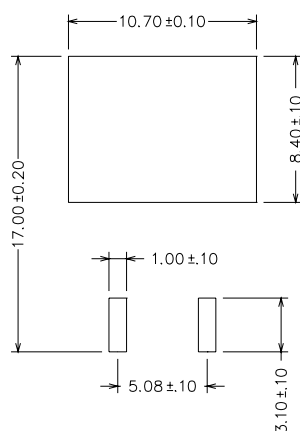
Packing Model



Precaution of Application

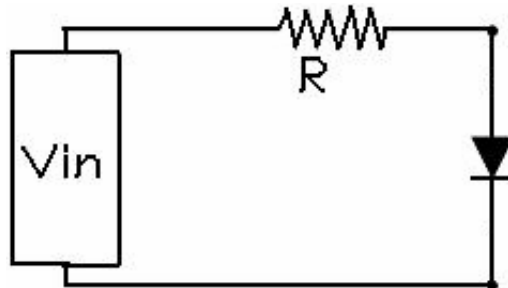
Designing 1: Soldering Pattern

The dimensions of the recommended soldering pattern may not meet every user. Please confirm and study first before designing the soldering pattern in order to obtain the best performance of soldering. Recommended soldering pattern is listed below:



Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 17/19

Designing 2: Circuit Layout



Designing 3: Max Rating

Any application should refer to the specifications of absolute maximum ratings.

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)

Soldering

Manual soldering

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

To prevent cracking, please bake before manual soldering.

Temperature at tip of iron : 300°C±5°C Max.(25W)

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

Soldering time : 3±1sec

Cleaning

The conditions of cleaning after soldering:

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

Temperature Time: <50°C×30sec, or <30°C×3min

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

Curing: 100°C max, <3min

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 18/19

Revise Notes

Rev.	Descriptions	Date	Name
1.0	Initial stamp off for	07-20-2007	
1.1	Revise binning	9-10-2007	
1.2	Revise 1 and 2 watt parameter	11-14-2007	

Official Product	HT-N178TWU & HT-N178TWV	Your Part No.		Data Sheet No.
Tentative Product	*****	*****		HT-N178TW Series
Specifications are subject to changes for improvement without advance notice. Proprietary data, drawings, and company confidential all rights reserved.		Nov 14,2007	Version of 1.2	Page 19/19