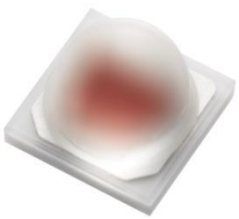
DATASHEET

SMD ▪ High Power LED

HPND3535CZ0112 (EU) Series



Introduction

The **HPND3535CZ0112 (EU) Series** is the latest version of our 3535 high-power surface-mount package, featuring an improved lens design for high brightness and photon emission.

The **HPND3535CZ0112 (EU) Series** is one of the most efficient and competitive packages for horticultural applications.

Features

- Small ceramic SMD package
- ESD protection up to 8KV
- Color : 660nm (Deep Red)
- Radiant Flux : Typ.1070mW @ 700mA
- Photosynthetic Photon Flux :5.83 umole/s
- Moisture Sensitivity Level: 1
- Radiant Efficiency : 71%
- RoHS compliant
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH
- Compliance Halogen Free (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- Compliance with EU REACH

Applications

- Decorative and Entertainment Lighting
- Signal and Symbol Lighting
- Agriculture Lighting

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA)	I_F	700	mA
Max. Peak Pulse Current (mA)	I_{Pulse}	1250	mA
Max. ESD Resistance	V_B	8000	V
Thermal Resistance	R_{th}	8	°C/W
Max. Junction Temperature	T_J	125	°C
Operating Temperature	T_{Opr}	-40 ~ +100	°C
Storage Temperature	T_{Stg}	-40 ~ +100	°C
Max. Soldering Temperature	T_{Sol}	260	°C
Max. Allowable Reflow Cycles	n/a	2	cycles

Notes:

1. HPND3535CZ0112 (EU) SeriesMaximum forward current is 700mA (Thermal Pad=25°C)
2. HPND3535CZ0112 (EU) SeriesMaximum peak pulse current is 1250mA (Duty cycle = 1/10@1KHZ)

JEDEC Moisture Sensitivity

Level	Floor Life		Soak Requirements Standard	
	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≦30°C / 85% RH	168 (+5/-0)	85°C / 85% RH

Luminous Power Characteristics for the HPND3535CZ0112 (EU) Series

Color	Part Number	2W	
		Typical Radiant Power (mW) [1]	Drive Current (mA)
Deep-Red	HPND3535CZ0112 (EU) Series	1070	700

Notes:

1. Luminous power measurement tolerance: ±10%.
2. The data of luminous power measured at thermal pad=25℃
3. Typical luminous power or light output performance is operated within the condition guided by this datasheet.

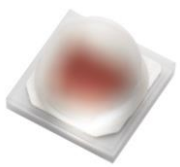
PN of the HPND3535CZ0112 (EU) Series : Color LEDs

The table below is a list of the binning options for the Everlight HPND3535CZ0112 (EU) Series Color LED. Standard Everlight color bins are listed according to wavelength and represent the standard primary colors of the spectrum. Typical view angle is 120°. These clearly listed binning options allow for proper design and implementation into lighting applications. The Order Codes below are currently available Color HPND3535CZ0112 (EU) Series LEDs.

For Example:

If you order product using

P/N **HPND3535CZ0112-NDR55651K0X24700-4H(EU) ,** you will be specifying:



Color Variant	Radiation Pattern	Peak Wavelength (nm)	Forward Voltage (V)	Minimum Radiant Power (mW)
Deep Red	Lambertian	655~660(D5) 660~665(D6)	1.75~2.05 (U1) 2.05~2.35 (U2)	1000

HPND3535CZ0112 (EU) Series LEDs at 700mA are listed below.

Order Code of	Min. Radiant Power (mW)	Typ. Radiant Power (mW)	Peak Wavelength (nm)	Typ. PPF (umole/s)	Typ. PPE (umole/J)	Typ. Forward Voltage (V)
HPND3535CZ0112-NDR55651K0X24700-4H(EU)	1000	1070	655~665	5.83	3.87	2.15

Product Binning

Radiant power Bins

Group	Bin	Minimum Radiant Power (mW)	Maximum Radiant Power (mW)
S	2	1000	1100
	3	1100	1200

Forward Voltage Bins

Group Name	Bins
A	U1+U2

Group Name	Bin	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
A	U1	1.75	2.05
	U2	2.05	2.35

Notes:

1. Forward voltage measurement tolerance: ±0.1V.
2. Forward voltage bins are defined at IF=700mA operation.

Color Bins

Color	Bin	Minimum	Maximum
		Wavelength (nm)	Wavelength (nm)
D (Deep-Red)	5	655	660
	6	660	665

Notes:

1.Peak wavelength measurement tolerance: ±1.5nm.
2.Peak wavelength bins are defined at I_F=700mA operation.

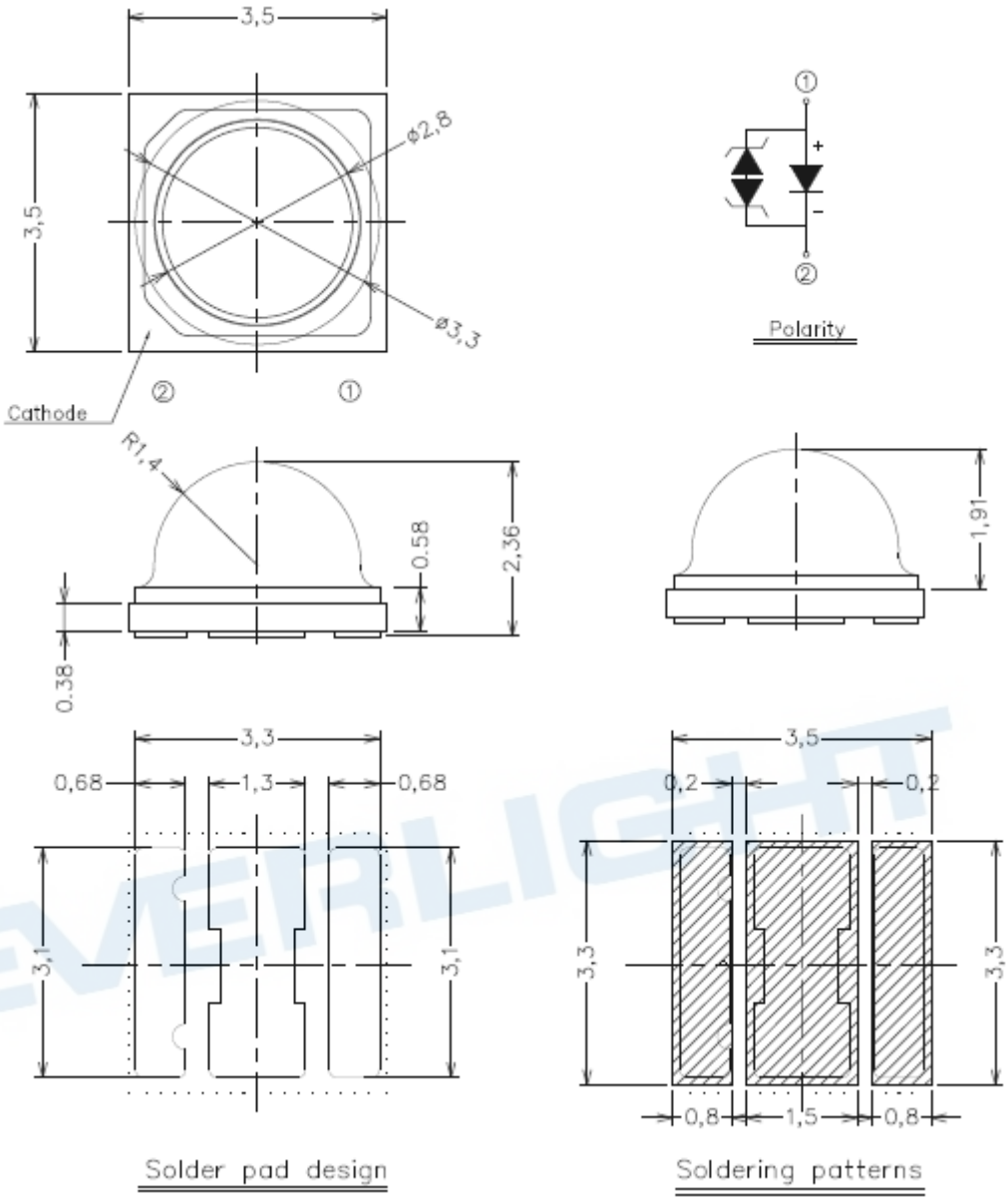
Optical Characteristics

Color	Part Number	Peak Wavelength λ_P Color Temperature CCT			Typical Viewing Angle (degrees) $2\theta_{1/2}$
		Min.	Typ.	Max.	
Deep-Red	HPND3535CZ0112 (EU) Series	655	660	665	120

Notes:

1. The test tolerance of Everlight is ±1.5nm for Peak wavelength, ±5%.
2. Viewing angle is the width of half the light output intensity in all directions of 180°.

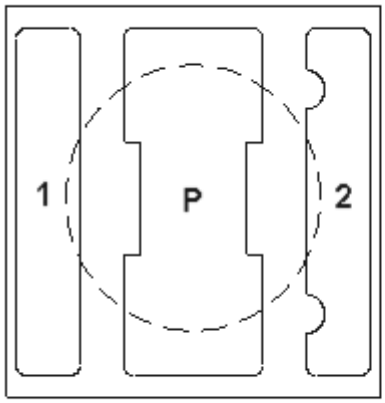
Mechanical Dimension



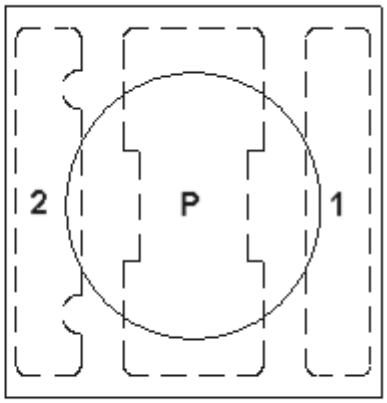
Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.15mm.
3. The thermal pad is electrically isolated from the Anode and Cathode contact pads.
4. Do not handle the device by the lens. Incorrect force applied to the lens may lead to the failure of devices.

Pad Configuration



BOTTOM VIEW



TOP VIEW

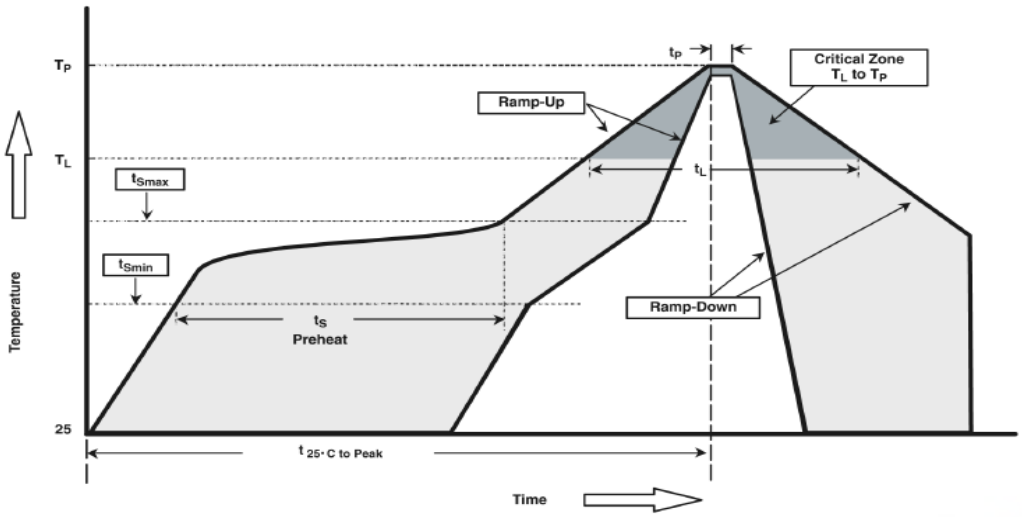
PAD	FUNCTION
1	ANODE
2	CATHODE
P	THERMAL PAD

Reflow Soldering Characteristics

For Reflow Process

a. HPND3535CZ0112 (EU) Series are suitable for SMT processes.

b. Curing of glue in oven must be according to standard operation flow processes.



Profile Feature	Pb-Free Assembly	Unit Einheit
Average Ramp-up Rate 25 °C to 150 °C	2-3	°C /sec
Preheat Temperature Min.	150	sec
Preheat Temperature Max.	200	sec
Preheat Time	60-120	sec
Time Maintained Above Temperature	217	°C
Time Maintained Above Time	60-90	sec
Peak Temperature (max.)	260	°C
Time within 5°C of Actual Peak temperature	20-40	sec
Ramp-down Rate (max.)	3-5	°C /sec

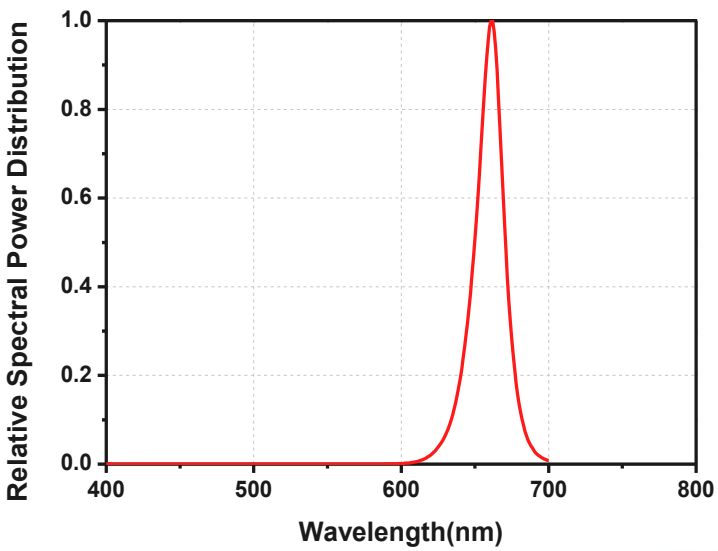
c. Reflow soldering should not be done more than twice.

d. In soldering process, stress on the LEDs during heating should be avoided.

e. After soldering, do not bend the circuit board

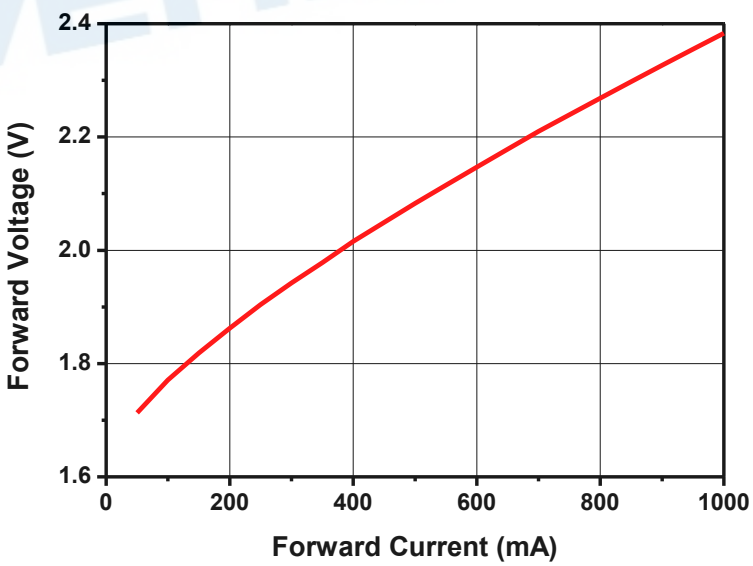
Wavelength Characteristics

For Deep-Red @ Thermal Pad Temperature = 25℃



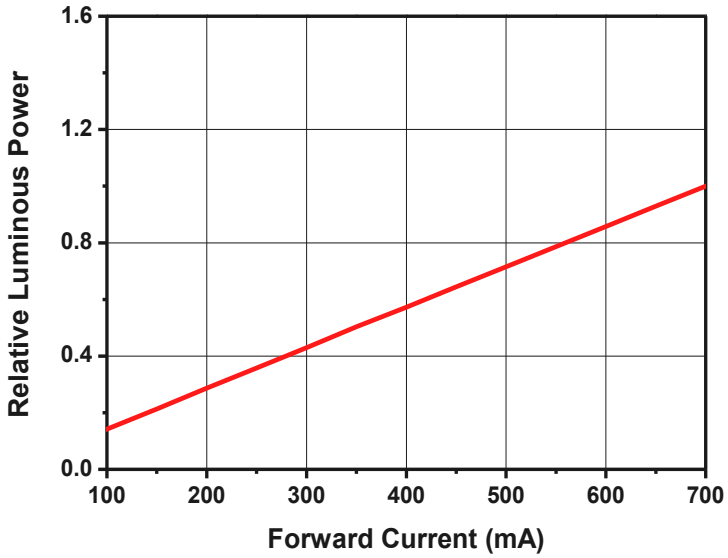
Typical Electrical Characteristics

For Deep-Red @ Thermal Pad Temperature = 25℃



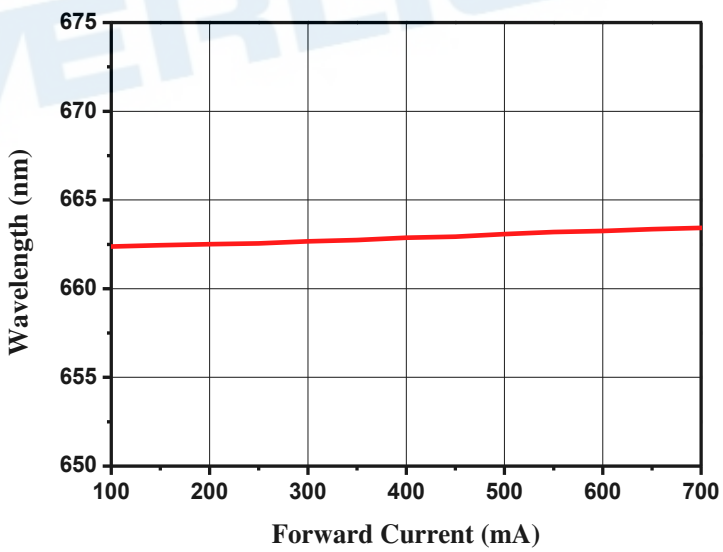
Typical Relative Radiant Power V.S. Forward Current

For Deep-Red @ Thermal Pad Temperature = 25℃



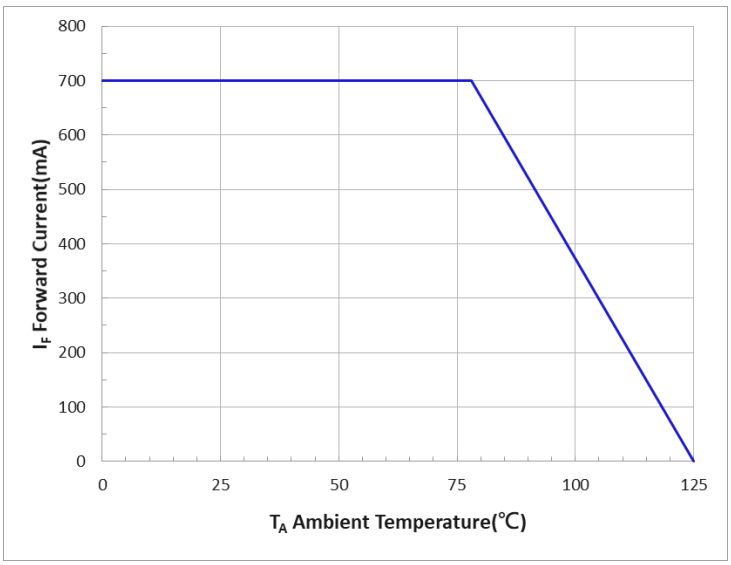
Typical Wavelength & Forward Current

For Deep-Red @ Thermal Pad Temperature = 25℃



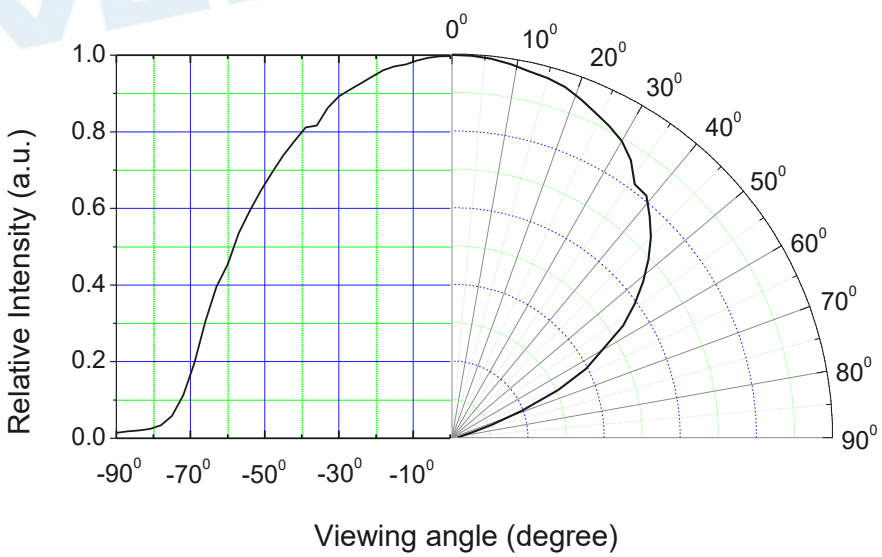
Current Derating Curves

For Deep-Red @ Thermal Pad Temperature = 25℃



Typical Radiation Patterns

HPND3535CZ0112 (EU) Series:
Typical Diagram Characteristics of Radiation



Notes:

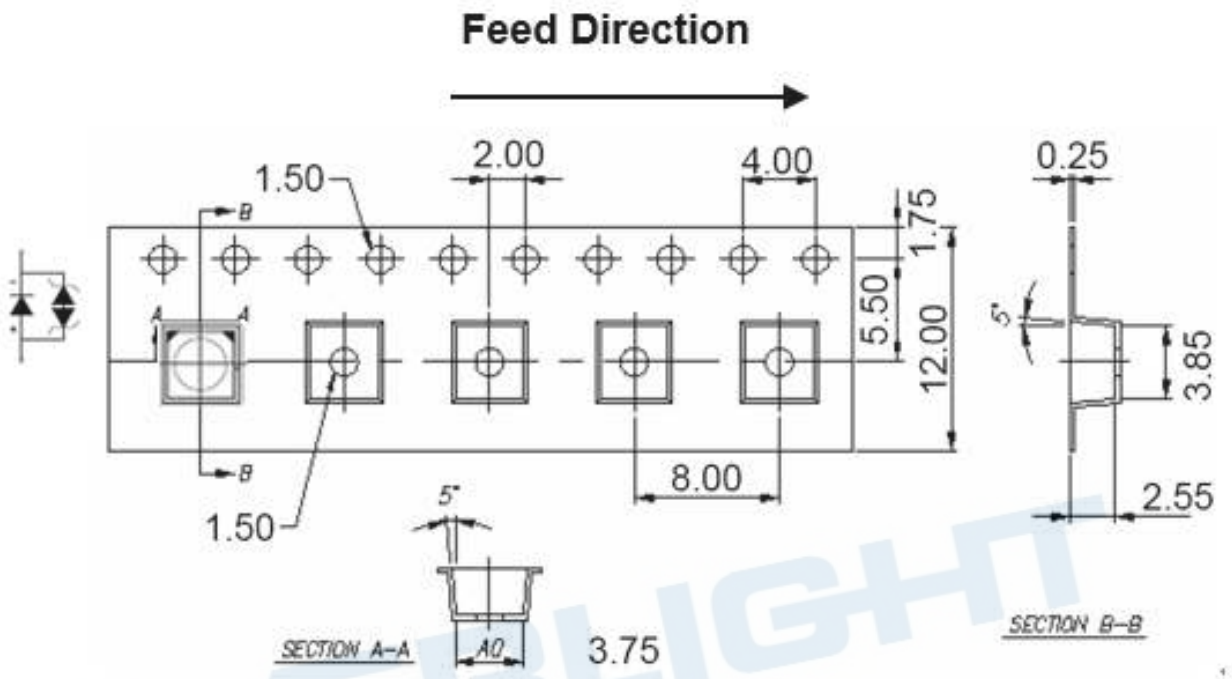
1. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

2. View angle tolerance is ± 5° .

Emitter Tape Packaging

Carrier Tape Dimensions as the following:

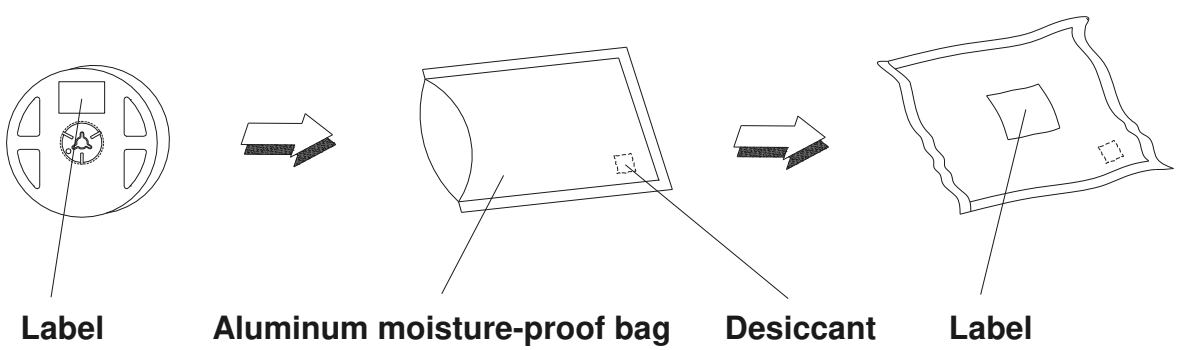
Order Qty.: > 2Kpcs, MPQ: min. 400pcs (incl. 400pcs / 800pcs) per reel.



Notes:

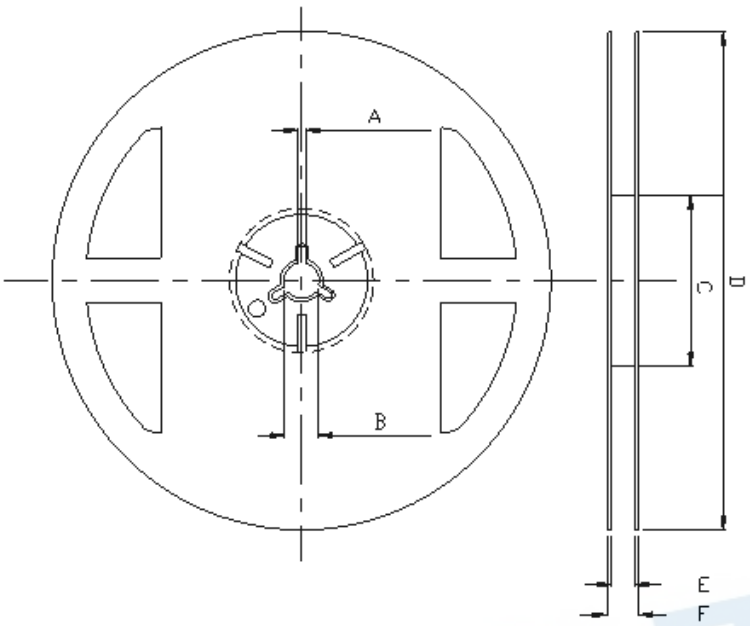
1. Dimensions are in millimeters.
2. Tolerances for fixed dimensions are ±0.1mm.

Moisture Resistant Packaging



Emitter Reel Packaging

Reel Dimensions



Dimension No.	A	B	C	D	E	F
Std. Dimension Tolerance	2.0±.0.5	ψ13.0±0.2	ψ100.0±1.0	ψ330.0±2.0	13.0±0.3	17.4±1.0

Notes:

1. Dimensions are in millimeters.

Product Labeling

Label Explanation

CPN: Customer Specification (when required)

P/N : Everlight Production Number

QTY: Packing Quantity

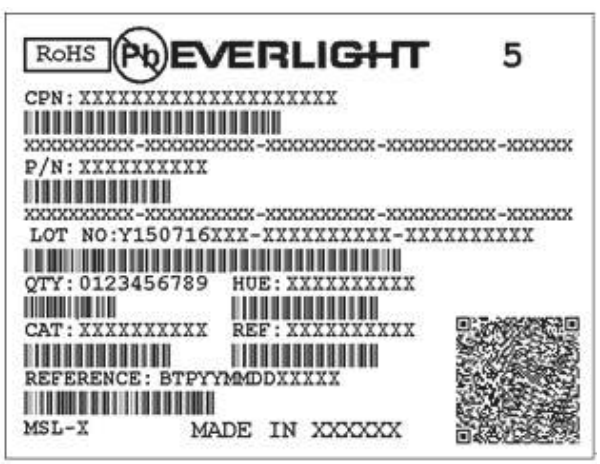
CAT: Radiant Power Bin

HUE: Color Bin

REF: Forward Voltage Bin

LOT No: Lot Number

MADE IN TAIWAN: Production Place



Reliability Data

Stress Test	Stress Condition	Stress Duration
Reflow	Tsol=260℃, 10sec	3 times
Thermal Shock	H：+100℃ 20min. ∫ 10sec. 'L：-10℃ 20min.	1000 Cycles
Temperature Cycle	H：+100℃ 30min. ∫ 5min. 'L：-40℃ 30min.	1000 Cycles
Room Temperature Operation Life	Ta=25℃, IF=700mA	1000hours
High Temperature Operation Life #1	Ta=55℃, IF=700mA	1000hours
High Temperature Operation Life #2	Ta=85℃, IF=500mA	1000hours
Low Temperature Operation Life	Ta=-40℃, IF=700mA	1000hours

Failure Criteria:

1. LEDs are open or shorted
2. Im: luminous power attenuate difference(1000hrs)>30%
3. VF: forward voltage difference(1000hrs)>20%

Storage Conditions

- Recommended to operate in accordance with the following conditions, increased LED life.
- Before the package is opened. The LEDs should be stored at 30°C or less and 85%RH or less after being shipped from Everlight and the storage life limits are 1 year. The LEDs can be stored up to 3 years If in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- After opening the package: The LED's floor life is 1 year under 30℃ or less and 60%RH or less. The LED should be soldered with 168hrs (7days) after opening the package. If unused LEDs remain, it should be stored in moisture proof packages.
- If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 60±5℃ for 24 hours.

Thermal Management

- Recommended to operate in accordance with the following conditions, increased LED life.
- For maintaining the high flux output and achieving maximum reliability,HPND3535CZ0112 (EU) Series flashlight series LEDs should be mounted on a metal core printed circuit board (MCPCB) or other kinds of heat sink with proper thermal connection to dissipate approximately 1W of thermal energy at 350mA operation.
- Sufficient thermal management must be implemented. Please refer to the graph “Forward Current Derating Curve“ on Page 20. The soldering temperature must be kept under 60℃ at the driving current 350mA.Otherwise, the junction temperature of die may exceed over the limit at high current driving conditions and the LEDs’ lifetime may be decrease dramatically.
- Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc. ufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

Revision History

Current version: 2023/01/10

Device No: DHE-0004085

Version. 2

Page	Subjects (major change in previous version)	Date of change
10	新增 Current Derating Curves 曲線圖	2023/01/10