DATASHEET

EVERLIGHT AUTOMOTIVE

EL Mini CSP LED

CSP0603-C0005WM-A0C2T1U22430-3T-AM

Features

- Package: CSP package
- Color: White
- Typical luminous intensity: 440 mcd @ 5mA
- Viewing angle : 150°
- ESD : up to 1KV
- Qualifications：AEC standard
- The product itself will remain within RoHS compliant version
- Compliance with RoHS & REACH
- Compliance Halogen Free. (Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
- Precondition: Bases on JEDEC J-STD 020D Level 3
- Qualifications : According to AEC-Q102

Applications

- Indicator, keypad, keyboard, and industrial equipment.
- Automotive Interior Lighting

Contents

1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current		I_F	2	5	20	mA	---
Luminous Intensity[1][2]		IV	280	440	710	mcd	I_F=5mA
Forward Voltage[3]		V_F	2.4	2.7	3.0	V	I_F=5mA
Viewing Angle		φ	---	150	---	deg	I_F=5mA
Thermal Resistance (Junction to Solder)	Electrical	$R_{th\ JS\ el}$	---	100	---	K/W	I_F=5mA

Notes:

1. Luminous Intensity measurement tolerance: ±8%
2. The data of Luminous Intensity measured at thermal pad=25°C
3. Forward voltage measurement tolerance: ±0.05V
4. Tolerance of Dominant Wavelength：±1nm

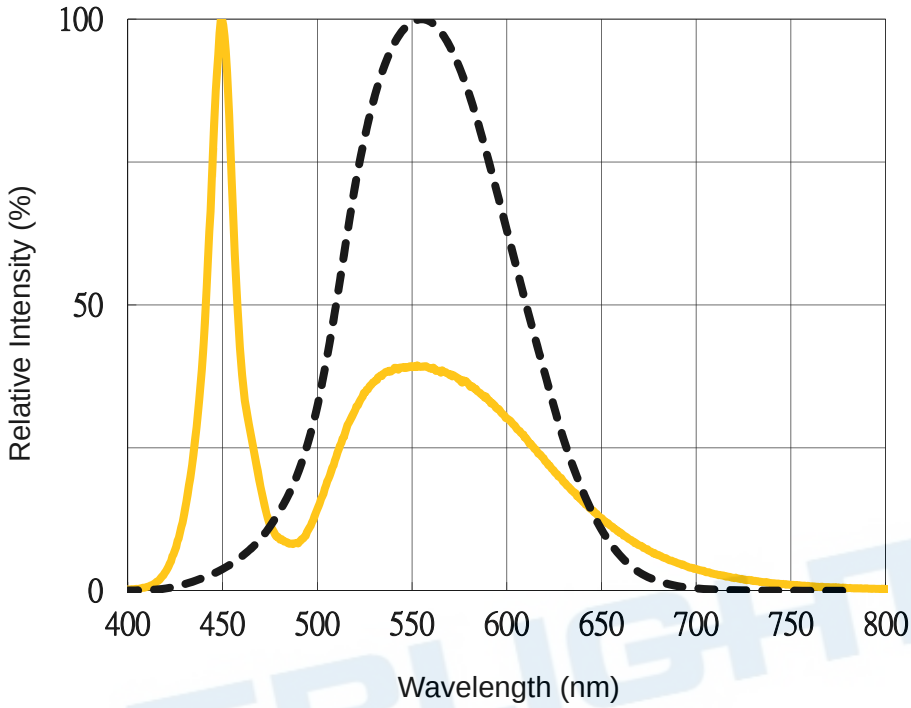
2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	60	mW
Forward Current	I_F	20	mA
Surge Current (T<=10 μs; D=0.005; T_s=25 ℃)	I_{FM}	40	mA
Junction Temperature	T_J	125	°C
Operating Temperature	T_{opr}	-40 ~ +105	°C
Storage Temperature	T_{stg}	-40 ~ +110	°C
ESD Sensitivity (R=1.5kΩ, C= 100pF)	ESD_{HBM}	1000	V
Soldering Temperature	Reflow	260°C for 30sec	°C

3. Characteristics Graph

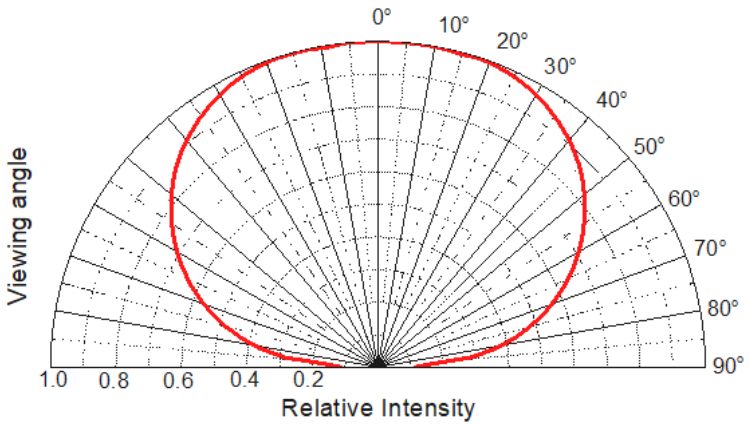
Wavelength Characteristics Relative Spectral Distribution

@ Ts = 25°C, I_F=5mA



Typical Diagram Characteristics of Radiation

$$\Phi_V / \Phi_V(0^\circ) = f(\varphi)$$



Notes:

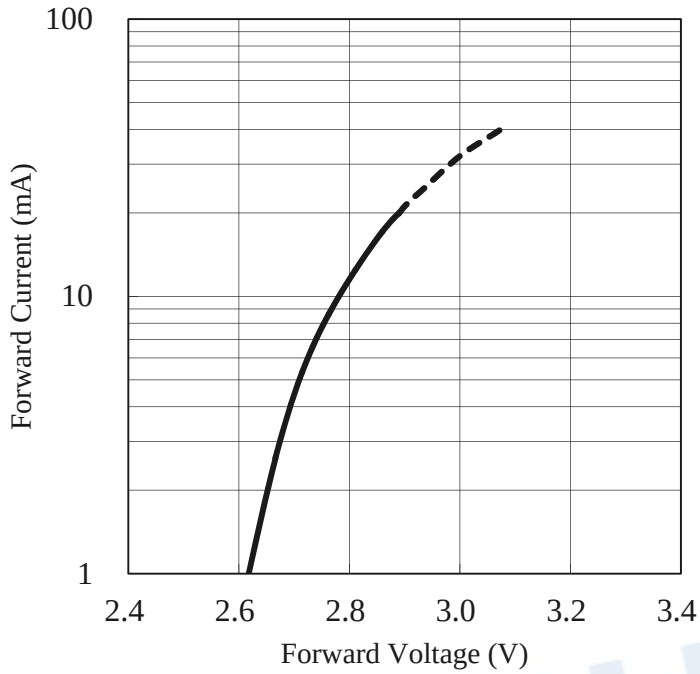
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

2. View angle tolerance is ± 10˚.

Forward Current vs. Forward Voltage

@ Ts = 25°C

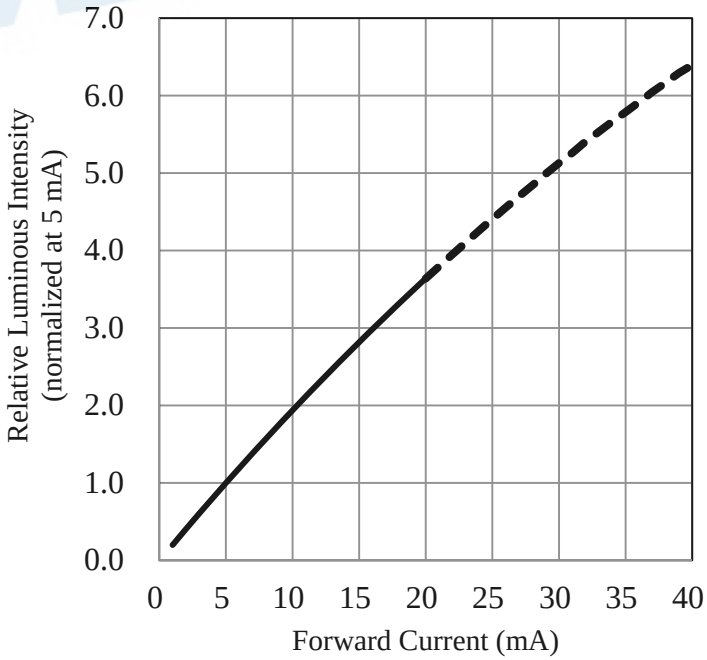
$$I_F = f(V_F)$$



Relative Luminous Intensity vs. Forward Current

@ Ts = 25°C

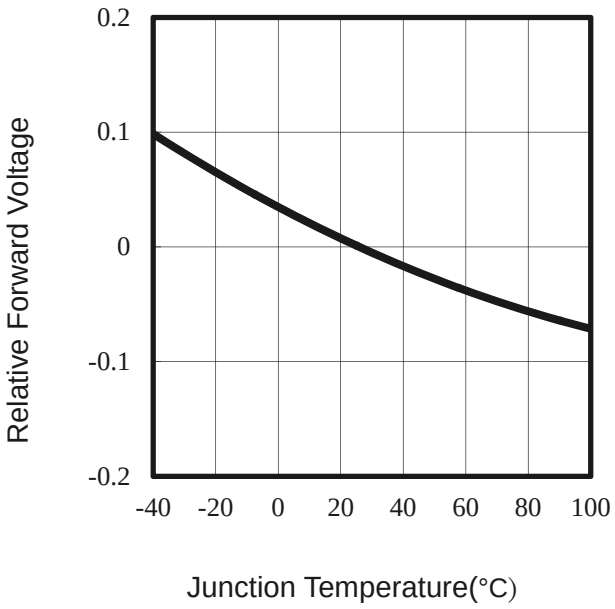
$$I_V/I_{V(5mA)} = f(I_F)$$



Relative Forward Voltage vs. Junction Temperature

@ I_F=5mA

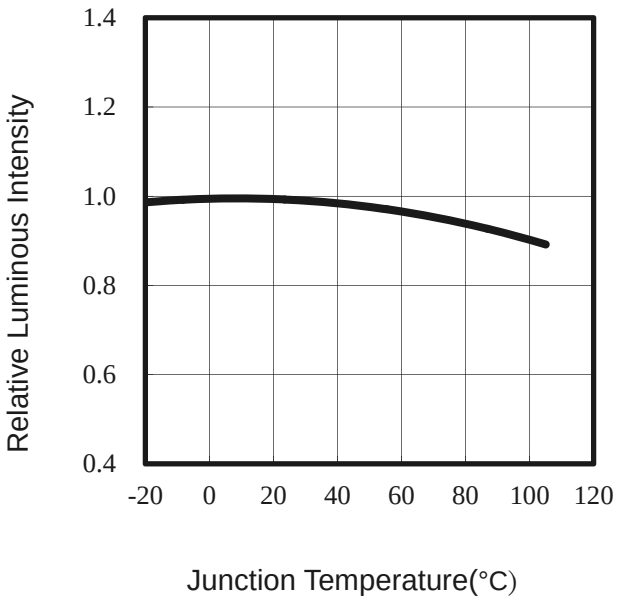
$$\Delta V_F = V_F - V_F(25^\circ C) = f(T_j)$$



Relative Luminous Intensity vs. Junction Temperature

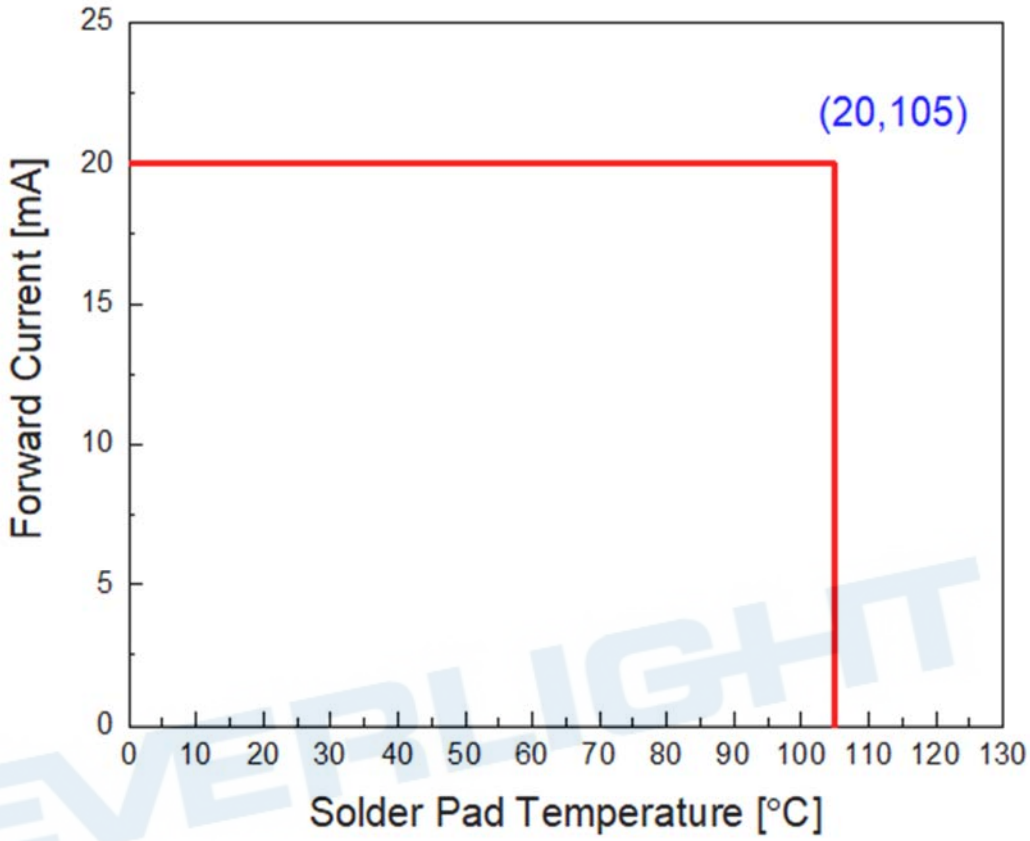
@ I_F=5mA

$$\Phi_V / \Phi_V(25^\circ C) = f(T_j)$$



Forward Current Derating Curve

$$I_F = f(T_S)$$



4. Binning Information

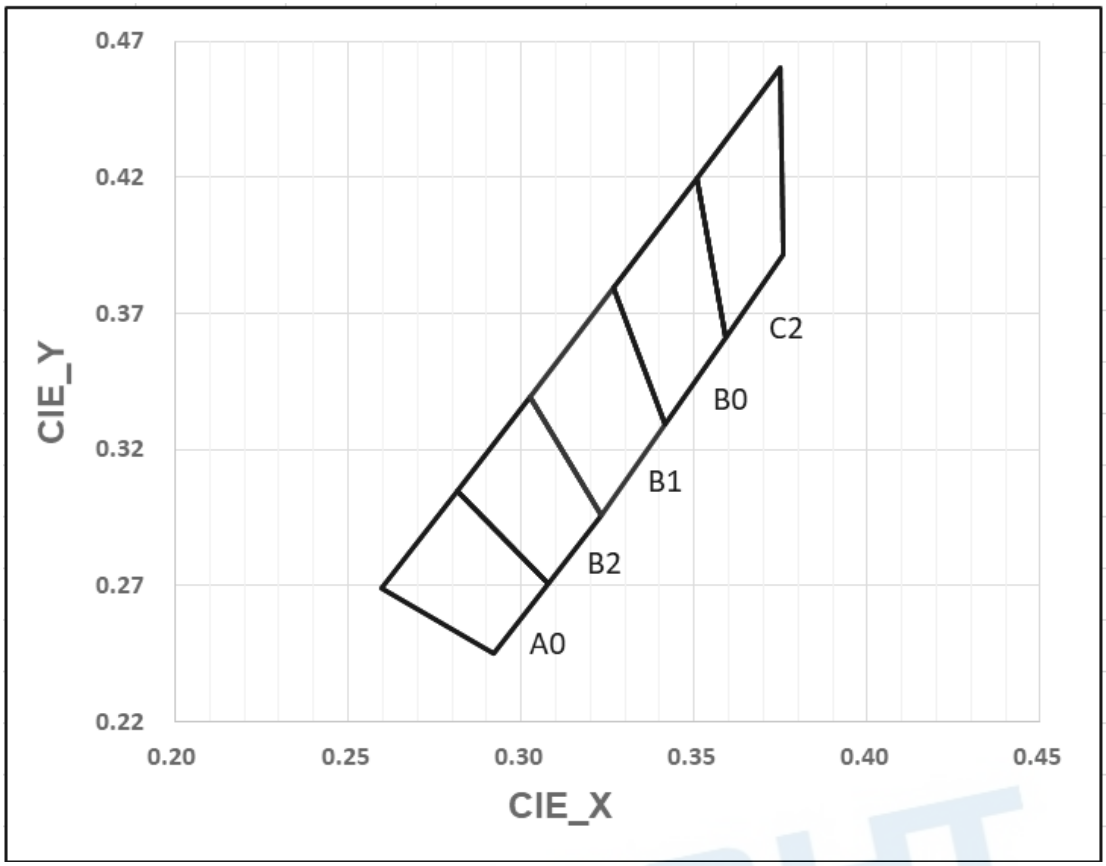
Luminous Intensity Bins

Group Bin	Minimum Luminous Intensity (mcd)	Maximum Luminous Intensity (mcd)
T1	280	355
T2	355	450
U1	450	560
U2	560	710

Notes: Luminous intensity measurement tolerance: ±8%.

CIE-Bins

Group Bin	X-CIE	Y-CIE
A0	0.2920	0.2450
	0.3080	0.2710
	0.2816	0.3046
	0.2596	0.2690
B2	0.3080	0.2710
	0.3230	0.2960
	0.3026	0.3392
	0.2816	0.3046
B1	0.3230	0.2960
	0.3414	0.3294
	0.3265	0.3793
	0.3026	0.3392
B0	0.3414	0.3294
	0.3590	0.3613
	0.3506	0.4198
	0.3265	0.3793
C2	0.3590	0.3613
	0.3758	0.3917
	0.3748	0.4605
	0.3506	0.4198



Forward Voltage Bins

Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
2426	2.4	2.6
2628	2.6	2.8
2830	2.8	3.0

Notes: Forward voltage measurement tolerance: ±0.05V.

5. Part Number

CSP0603-C0005WM-A0C2T1U22430-3T-AM

Part number is designated with below details.

CSP0603 = Product family name.

C0 = Color

005 = Test current [mA]

WM = Internal code

A0C2 = CIE bins

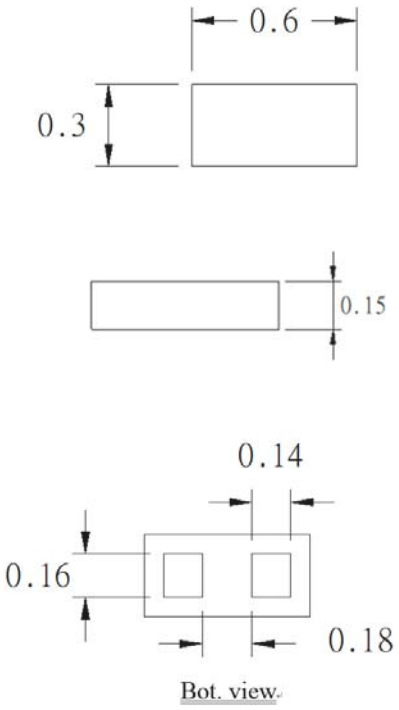
T1U2 = Luminous intensity bins

2430 = Forward voltage range

3T = Packaging method

AM = Automotive application

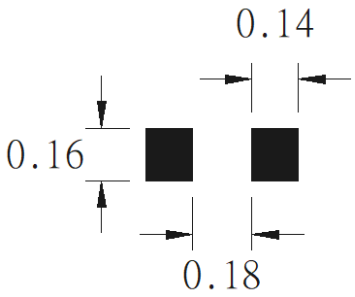
6. Mechanical Dimension



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.05mm.

7. Recommended Soldering Pad



Soldering patterns

Suggested pad dimension is just reference only.

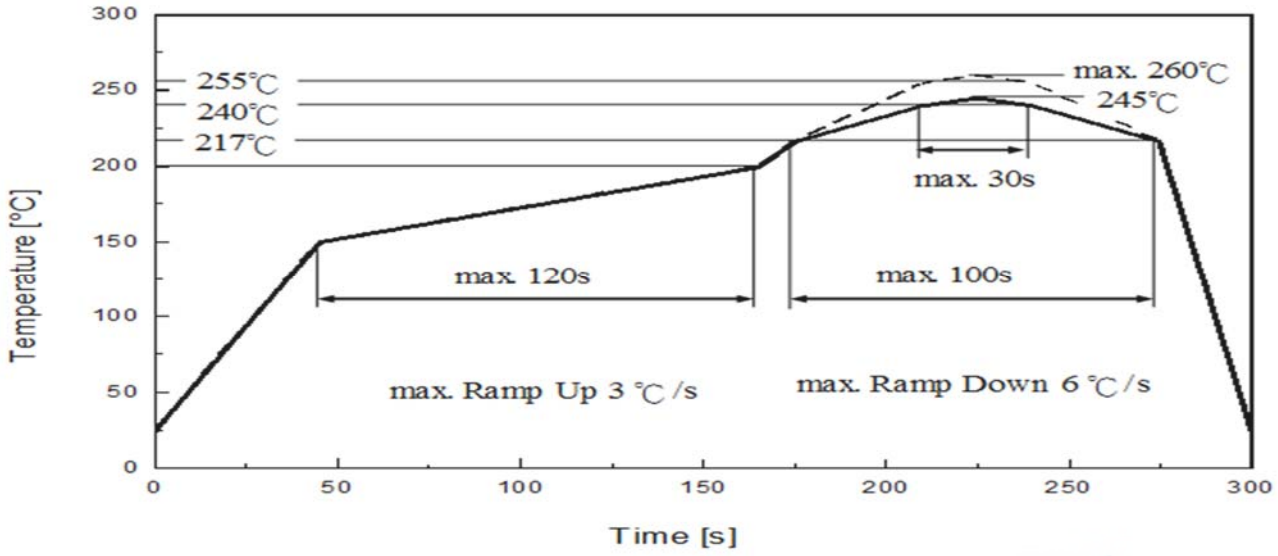
Please modify the pad dimension based on individual need.

Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.05mm

8. Reflow Soldering Profile

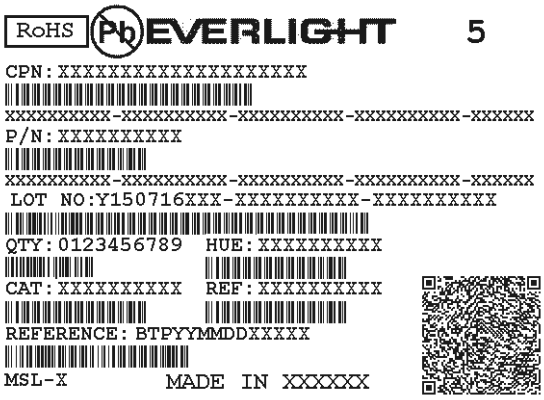
Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



Profile Feature	Pb-Free Assembly Recommendation	Unit Einheit
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	°C /sec

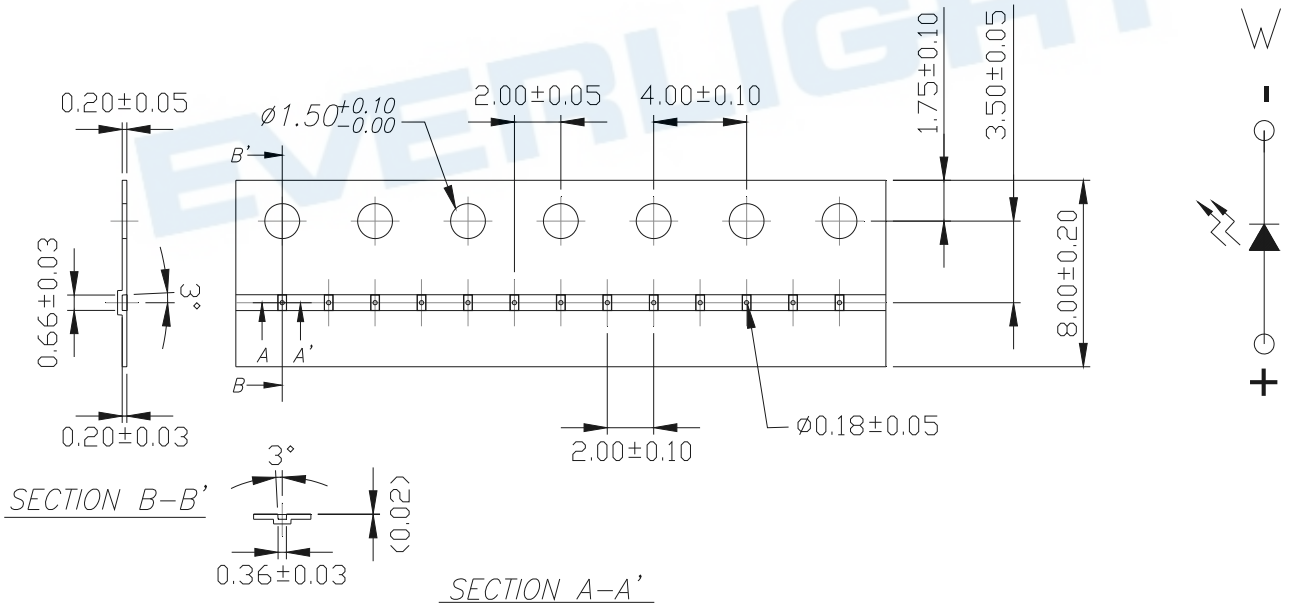
9. Packaging Information

• Product Labeling



- CPN：Customer's Product Number
- P/N ：Everlight Part Number
- QTY：Packing Quantity
- CAT：Luminous Flux (Brightness) Bin
- HUE：Color Bin
- REF：Forward Voltage Bin
- LOT No：Lot Number

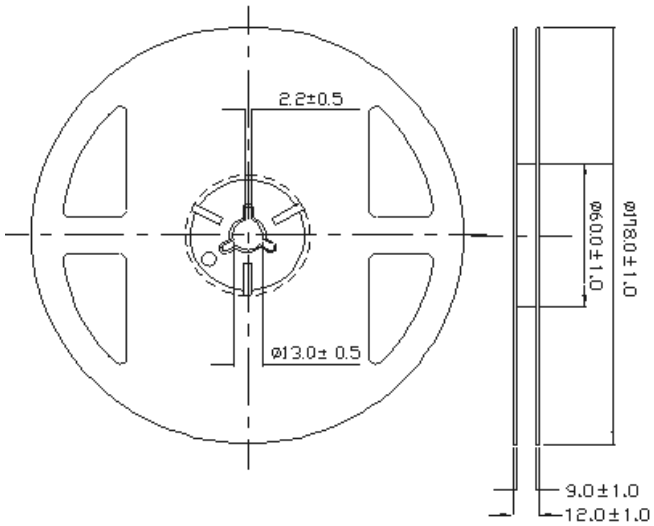
• Packing: Loaded Quantity 3000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.1 mm.
3. Packing amount is 500/1000/2000/3000 pcs per reel.

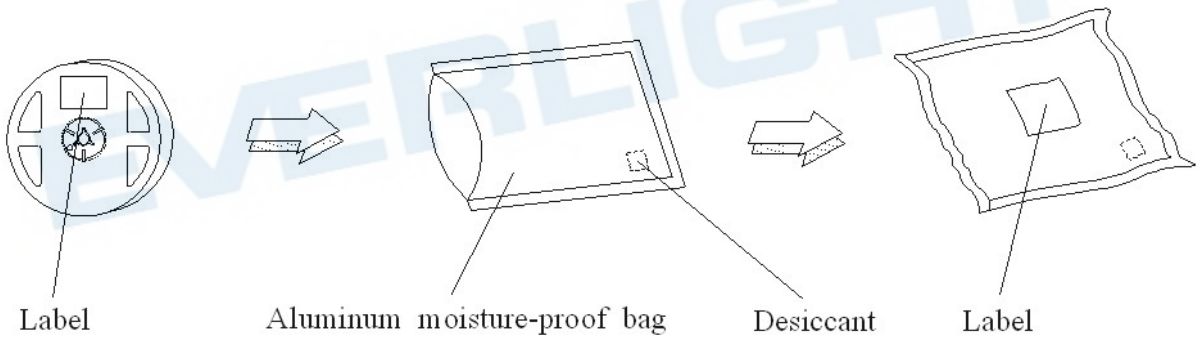
Reel Dimensions



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.1 mm.

Moisture Resistant Packing Process



10. Precaution for Use

1. Over-current-proof
   Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (burn out will happen).

2. Assemblies
   Do not stack assemblies containing LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

3. Soldering Condition
   3.1 When soldering, do not put stress on the LEDs during heating.
   3.2 After soldering, do not warp the circuit board.

4. Soldering Iron
   Each terminal is to go to the tip of soldering iron temperature less than 350℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing
   Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

Revision History

Current version: 2025/03/18

Issue No: DSE-0032102

Version: 4

Rev.	Subjects (major change in previous version)	Modified date
1	Preliminary	2024/04/19
2	Added the AECQ102 spec and MSL level.	2024/07/22
3	Revise part number and packaging information	2025/02/21
4	Revise Characteristics Graph	2025/03/18