

EL Mini CSP LED

CSP0603-UR005WM-1530Q2S11525-3T-AM



Features

- Package: CSP package
- Color: Red
- Typical luminous intensity: 155 mcd @ 5mA
- Viewing angle : 130°
- 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	3
2.Absolute Maximum Ratings.....	4
3.Characteristics Graph	5
4.Binning Information.....	10
5.Part Number	11
6.Mechanical Dimension	12
7.Recommended Soldering Pad.....	13
8.Reflow Soldering Profile	14
9.Packaging Information	15
10.Precaution for Use	17

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1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current		I_F	2	5	20	mA	---
Luminous Intensity ^{[1][2]}		I_V	90	155	224	mcd	$I_F=5\text{mA}$
Forward Voltage ^[3]		V_F	1.50	1.86	2.50	V	$I_F=5\text{mA}$
Viewing Angle		φ	---	130	---	deg	$I_F=5\text{mA}$
Dominant Wavelength		λ_d	615	623	630	nm	$I_F=5\text{mA}$
Thermal Resistance (Junction to Solder)	Electrical	$R_{th JS el}$	---	100	---	K/W	$I_F=5\text{mA}$

Notes:

1. Luminous Intensity measurement tolerance: $\pm 9\%$
2. The data of Luminous Intensity measured at thermal pad=25°C
3. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
4. Tolerance of Dominant Wavelength : $\pm 1\text{nm}$

2. Absolute Maximum Ratings

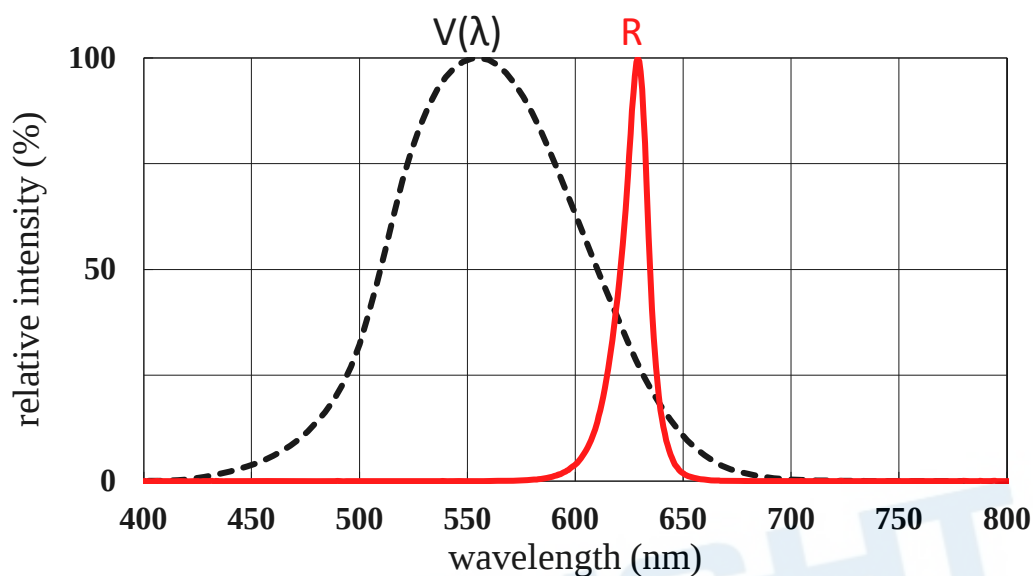
Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	50	mW
Forward Current	I_F	20	mA
Surge Current ($T \leq 10 \mu s$; $D=0.005$; $T_s=25^\circ C$)	I_{FM}	40	mA
Junction Temperature	T_J	125	$^\circ C$
Operating Temperature	T_{opr}	$-40 \sim +105$	$^\circ C$
Storage Temperature	T_{stg}	$-40 \sim +110$	$^\circ C$
ESD Sensitivity ($R=1.5k\Omega$, $C=100pF$)	ESD_{HBM}	1000	V
Soldering Temperature	Reflow	$260^\circ C$ for 30sec	$^\circ C$

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution

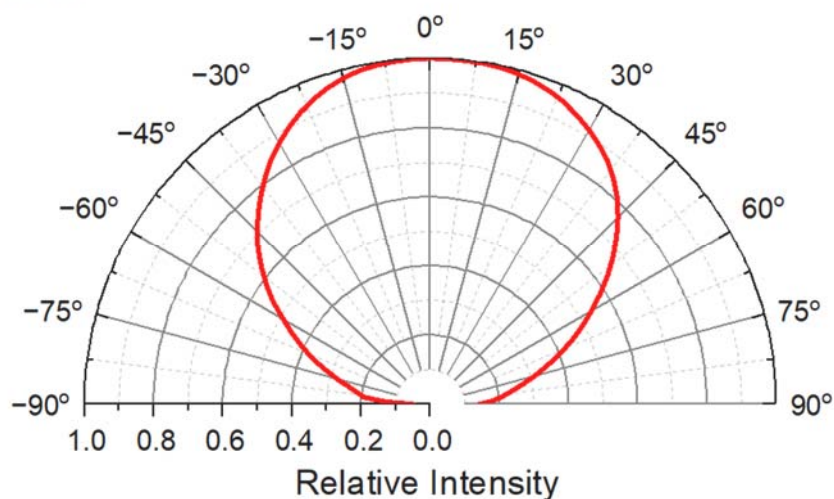
@ Ts = 25°C, I_F=5mA

$$I_v(\lambda)/I_v(\text{Max}) = f(\lambda)$$



Typical Diagram Characteristics of Radiation

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



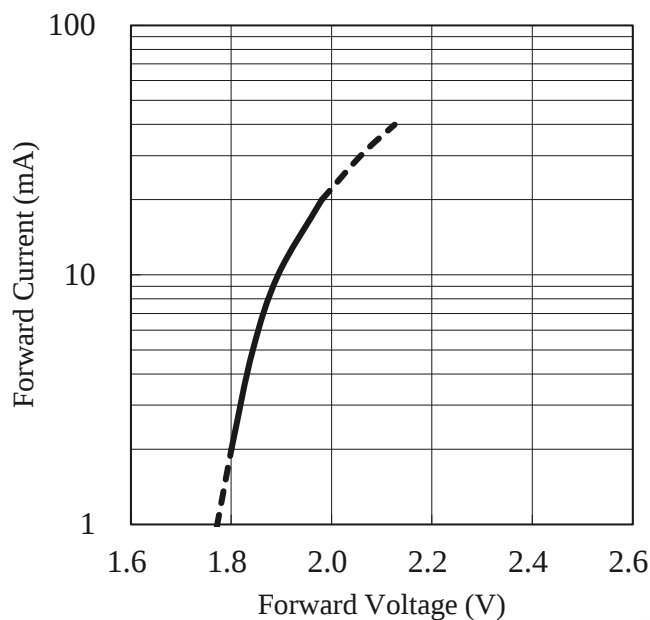
Notes:

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 $\pm 10^\circ$.

Forward Current vs. Forward Voltage

@ Ts = 25°C

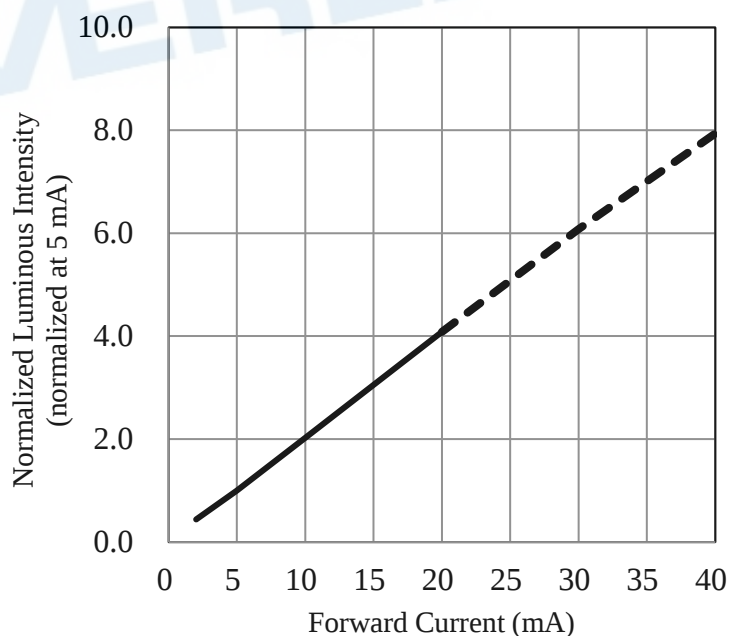
$$I_F(V_F) = f(V_F)$$



Relative Luminous Intensity vs. Forward Current

@ Ts = 25°C

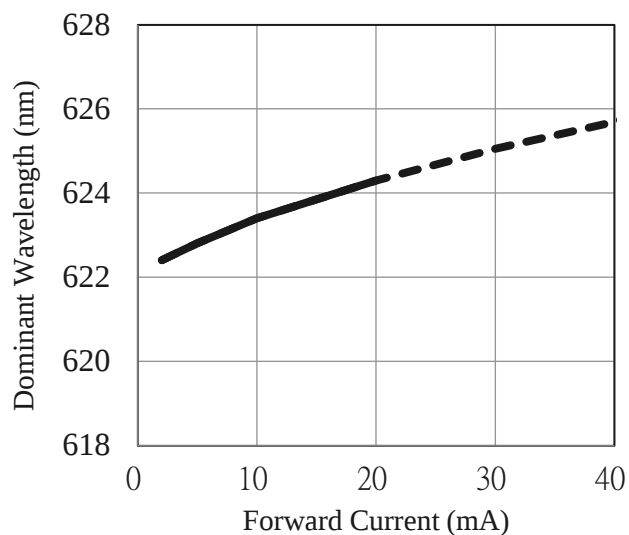
$$I_v(I_F)/I_v(5\text{mA}) = f(I_F)$$



Dominant Wavelength vs. Forward Current

@ $T_s = 25^\circ\text{C}$

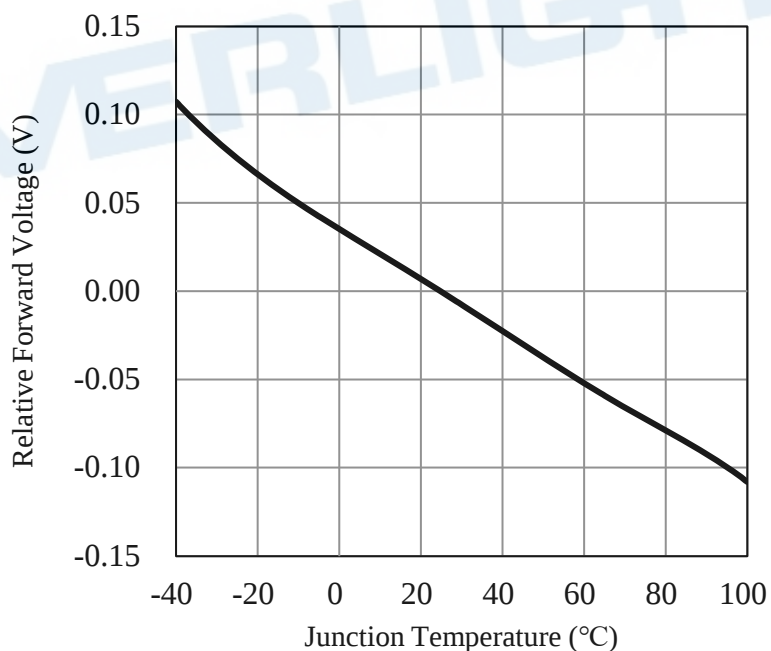
$$\lambda_d(T_j) = f(I_f)$$



Relative Forward Voltage vs. Junction Temperature

@ $I_F = 5\text{mA}$

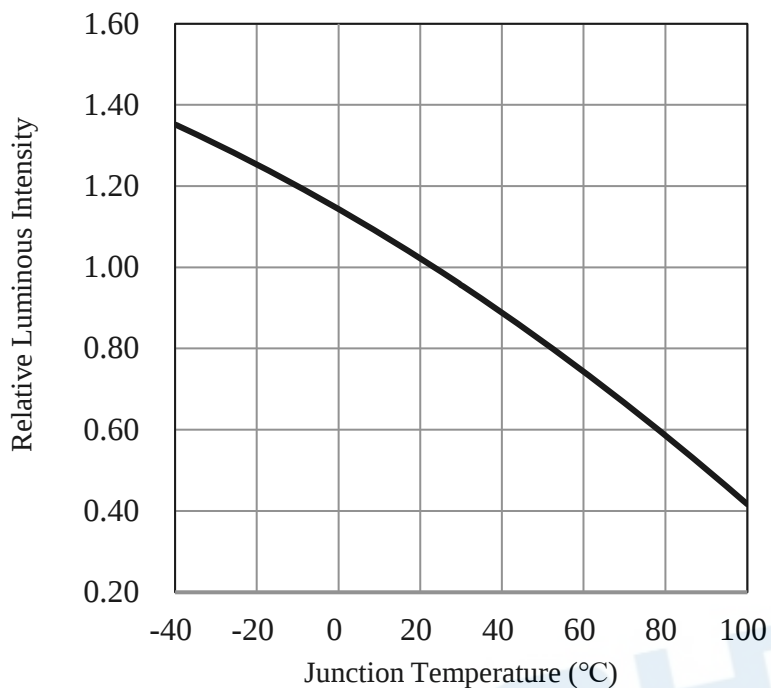
$$\Delta V_F(T_j) = V_F(T_j) - V_F(25^\circ\text{C}) = f(T_j)$$



Relative Luminous Intensity vs. Junction Temperature

@ $I_F=5\text{mA}$

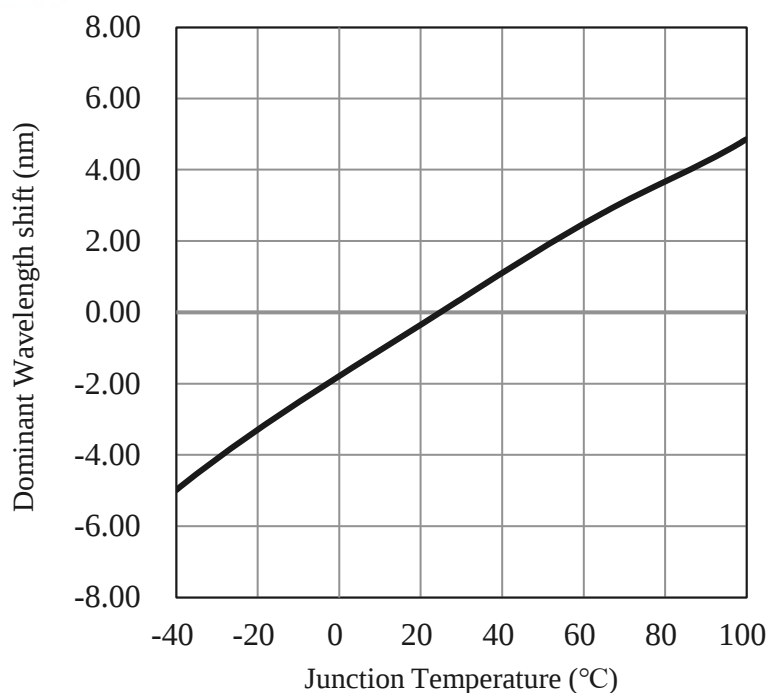
$$I_v(T_j)/I_v(25^\circ\text{C}) = f(T_j)$$



Dominant Wavelength shift vs. Junction Temperature

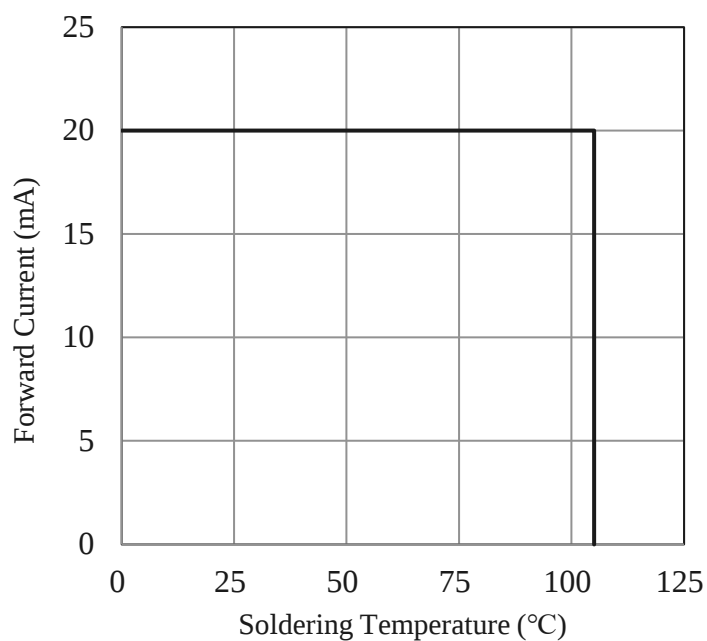
@ $I_F=5\text{mA}$

$$\Delta\lambda_d(T_j) = \Delta\lambda_d(T_j) - \Delta\lambda_d(25^\circ\text{C}) = f(T_j)$$



Forward Current Derating Curve

$$I_F(T_s) = f(T_s)$$



4. Binning Information

Luminous Intensity Bins

Group Bin	Minimum Luminous Intensity (mcd)	Maximum Luminous Intensity (mcd)
Q2	90	112
R1	112	140
R2	140	180
S1	180	224

Notes: Luminous intensity measurement tolerance: $\pm 9\%$.

Dominant Wavelength Bins

Group Bin	Minimum Dominant Wavelength [nm]	Maximum Dominant Wavelength [nm]
1518	615	618
1821	618	621
2124	621	624
2427	624	627
2730	627	630

Notes: Dominant wavelength measurement tolerance: $\pm 1\text{nm}$

Forward Voltage Bins

Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
1517	1.50	1.75
1720	1.75	2.00
2022	2.00	2.25
2225	2.25	2.50

Notes: Forward voltage measurement tolerance: $\pm 0.05\text{V}$.

5. Part Number

CSP0603-UR005WM-1530Q2S11525-3T-AM

Part number is designated with below details.

CSP0603 = Product family name

UR = Color

005 = Test current [mA]

WM = Internal code

1530 = Dominant wavelength range

Q2S1 = Luminous intensity bins

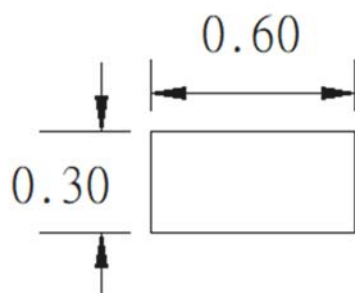
1525 = Forward voltage range

3T = Packaging method

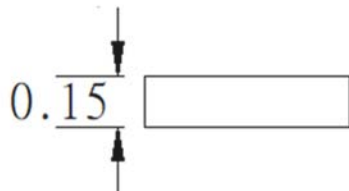
AM = Automotive application

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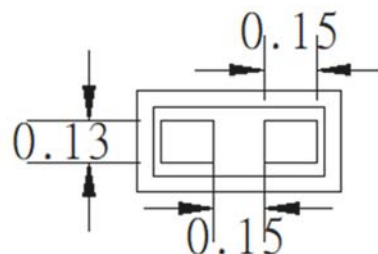
6. Mechanical Dimension



Top view



Side view



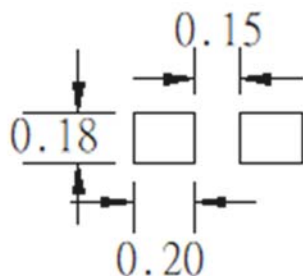
Bot. view

Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.05\text{mm}$.

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7. Recommended Soldering Pad



Soldering patterns

Suggested pad dimension is just reference only.

Please modify the pad dimension based on individual need.

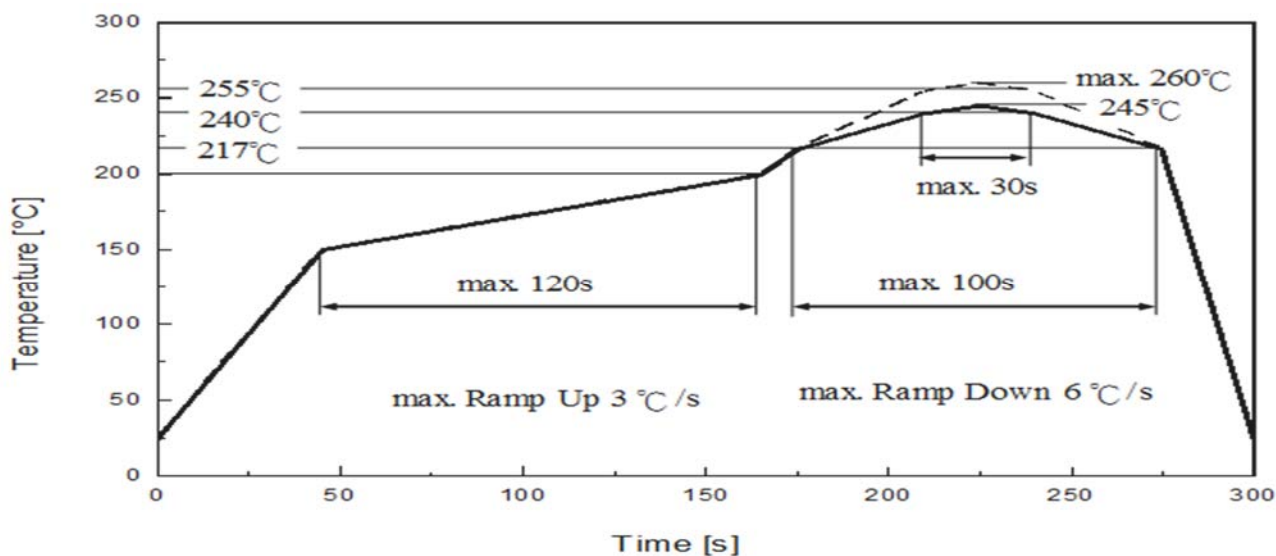
Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.05\text{mm}$

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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

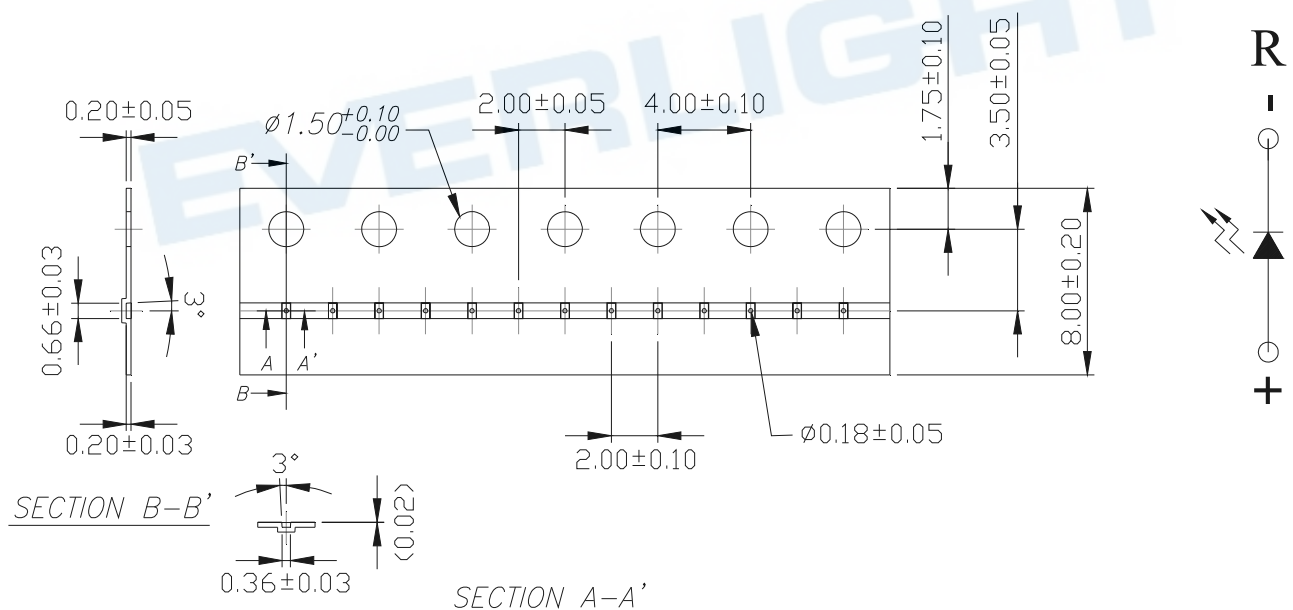
9. Packaging Information

• 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

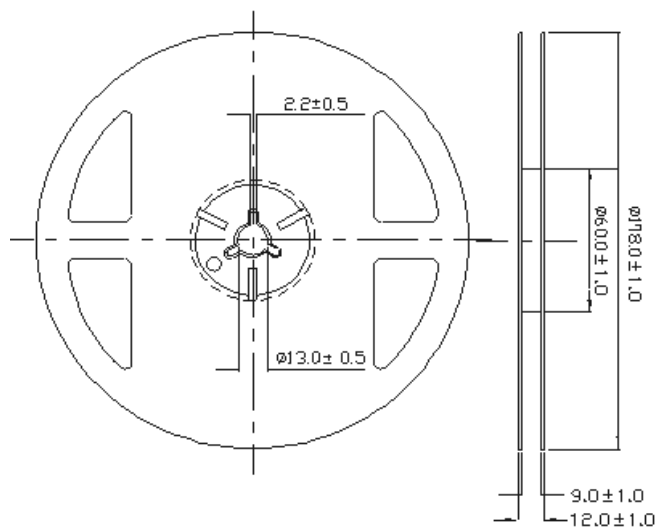
• Packing: Loaded Quantity 3000 pcs Per Reel



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.

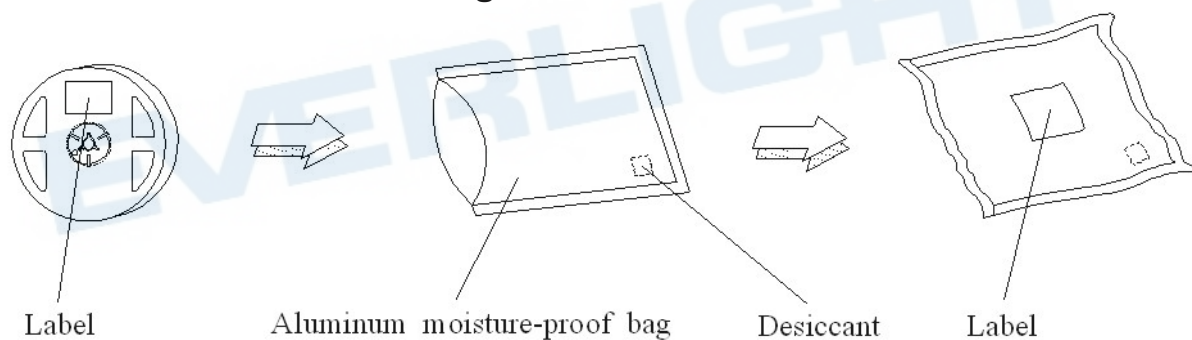
● Reel Dimensions



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°C 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.

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Revision History

Current version: 2025/02/21

Issue No: DSE-0029065

Version: 4

Rev.	Subjects (major change in previous version)	Modified date
1	Preliminary	2022/12/22
2	Modify the recommended soldering pad	2023/03/17
3	Modify the Characteristics and Absolute Maximum Ratings	2023/08/02
4	Modify Part Number, Characteristics Graph, and packaging information Add AEC-Q102 Qualifications.	2025/02/21

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