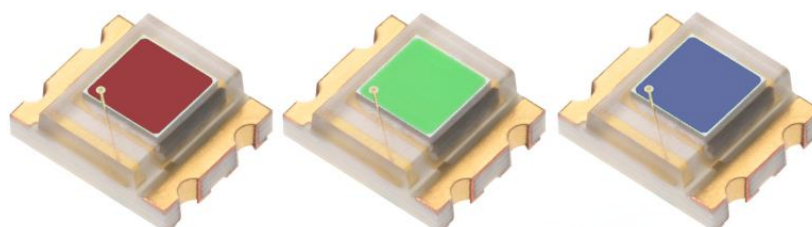


RGB Color Light Sensor Surface - Mount CLS15-22C/L213R/TR8 CLS15-22C/L213G/TR8 CLS15-22C/L213B/TR8



Features

- Surface-mount plastic package
- High sensitivity for Red, Green, and Blue light source
CLS15-22C/L213R/TR8 ($\lambda_p = 620\text{nm}$, Red)
CLS15-22C/L213G/TR8 ($\lambda_p = 550\text{nm}$, Green)
CLS15-22C/L213B/TR8 ($\lambda_p = 470\text{nm}$, Blue)
- Good stable analog output with temperature shift
- Size: 3.2mm (L)*2.7mm (W)*1.1mm (H)
- Operating temperature performance, -40°C to 85°C
- Active area: 1.8 mm^2
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- Compliance Halogen Free (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)

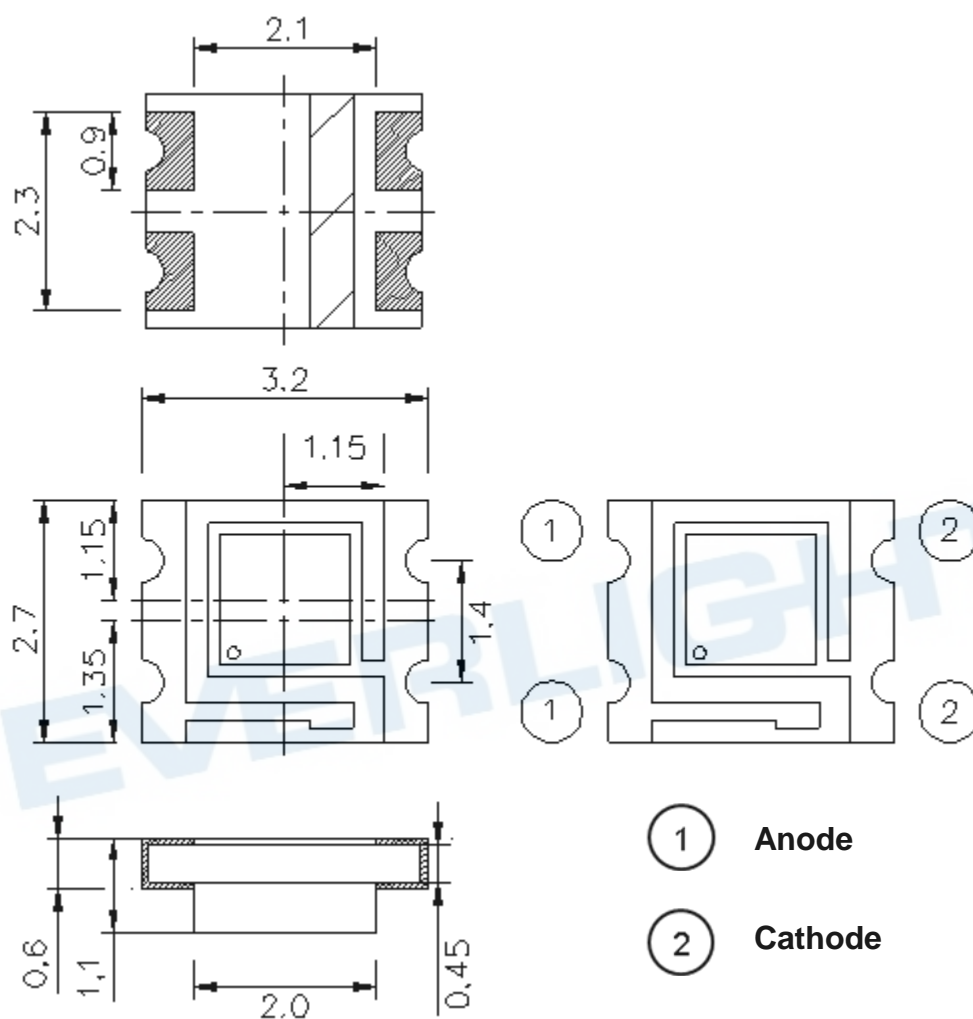
Description

CLS15-22C/L213/TR8 series color sensor device is one channel Si photodiode sensitivity to Red, Green and Blue region spectrum in miniature SMD package. Everlight color sensor series product is the good effective and low cost solution to white color balance, color detection and color management applications.

Applications

- Color adjustment for LED back light system
- Color adjustment for LED projector
- Color detection
- White balance adjustment
- Consumer and mobile appliances

Package Dimensions



Unit : mm

Tolerances : $\pm 0.1\text{mm}$

Absolute Maximum Ratings

Parameter	Symbol	Condition	Rating	Units
Reverse Breakdown Voltage	V_{BR}	$I_R = 100\mu A$	35	V
Forward Voltage	V_F	$I_F = 10mA$	0.5~1.3	V
Operating Temperature	T_{opr}	--	-40 ~ +85	°C
Storage Temperature	T_{stg}	--	-40 ~ +85	°C
Soldering Temperature [Note]	T_{sol}	--	260	°C

Note: Soldering time ≤ 5 seconds

Electrical and Optical Characteristics ($T_a=25^\circ C$)

Red Color Sensor : CLS15-22C/L213R/TR8

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Peak Sensitivity Wavelength	λ_P	--	--	620	--	nm
Short-Circuit Current	I_{SC}	$E_v=100Lux$ $V_R=0V$ [Note]	--	0.086	--	μA
Light Current	I_{L1}	$E_v=100Lux$ $V_R=5V$ [Note]	--	0.091	--	μA
	I_{L2}	$E_v=1000Lux$ $V_R=5V$ [Note]	--	0.83	--	μA
Reverse Dark Current	I_D	$E_v=0$ $V_R = 10 V$	--	2	10	nA
Total Capacitance	C_t	$E_e=0mW/cm^2$ $f=1MHz$ $V_R=5V$	--	12	--	pF

Note: White Fluorescent light (Color Temperature = 6500K) is used as light source.

Green Color Sensor: CLS15-22C/L213G/TR8

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Peak Sensitivity Wavelength	λ_P	--	--	550	--	nm
Short-Circuit Current	I_{SC}	$E_v=100\text{Lux}$ $V_R=0\text{V}$ [Note]	--	0.075	--	μA
Light Current	I_{L1}	$E_v=100\text{Lux}$ $V_R=5\text{V}$ [Note]	--	0.082	--	μA
	I_{L2}	$E_v=1000\text{Lux}$ $V_R=5\text{V}$ [Note]	--	0.72	--	μA
Reverse Dark Current	I_D	$E_v=0\text{ Lux}$ $V_R = 10\text{ V}$	--	2	10	nA
Total Capacitance	C_t	$E_e=0\text{mW /cm}^2$ $f=1\text{MHz}$ $V_R=5\text{V}$	--	12	--	pF

Note: White Fluorescent light (Color Temperature = 6500K) is used as light source.

Blue Color Sensor: CLS15-22C/L213B/TR8

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Peak Sensitivity Wavelength	λ_P	--	--	470	--	nm
Short-Circuit Current	I_{SC}	$E_v=100\text{Lux}$ $V_R=0\text{V}$ [Note]	--	0.042	--	μA
Light Current	I_{L1}	$E_v=100\text{Lux}$ $V_R=5\text{V}$ [Note]	--	0.046	--	μA
	I_{L2}	$E_v=1000\text{Lux}$ $V_R=5\text{V}$ [Note]	--	0.39	--	μA
Reverse Dark Current	I_D	$E_v=0\text{ Lux}$ $V_R = 10\text{ V}$	--	2	10	nA
Total Capacitance	C_t	$E_e=0\text{mW /cm}^2$ $f=1\text{MHz}$ $V_R=5\text{V}$	---	12	---	pF

Note: White Fluorescent light (Color Temperature = 6500K) is used as light source.

Typical Electro-Optical Characteristics Curves

Fig.1 Dark Current vs. Temperature

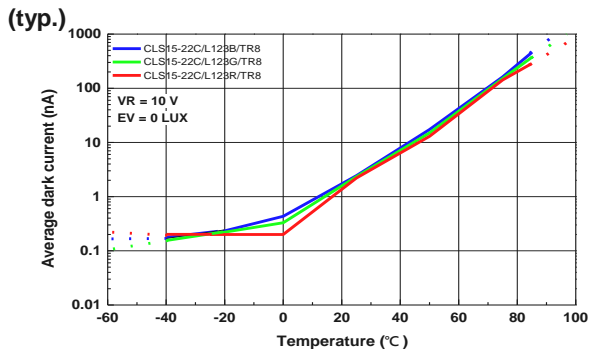


Fig.2 Light current vs. Illuminance

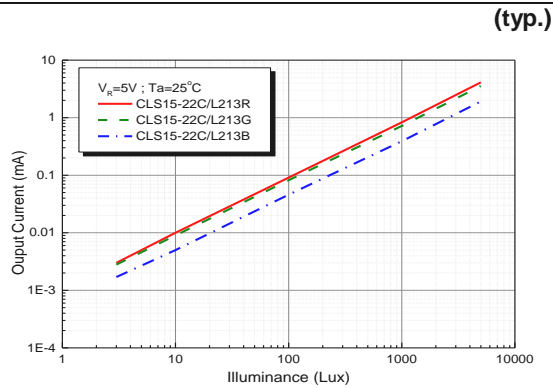


Fig.3 Light current vs. Voltage

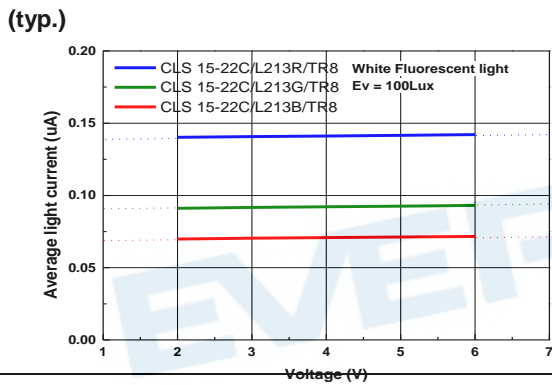


Fig.4 Light current vs. Temperature

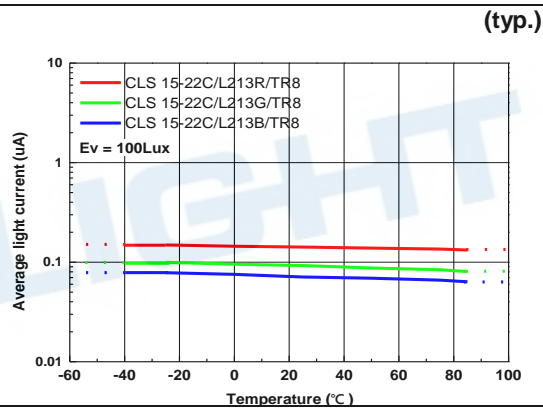


Fig.5 Spectral Response (Blue region)

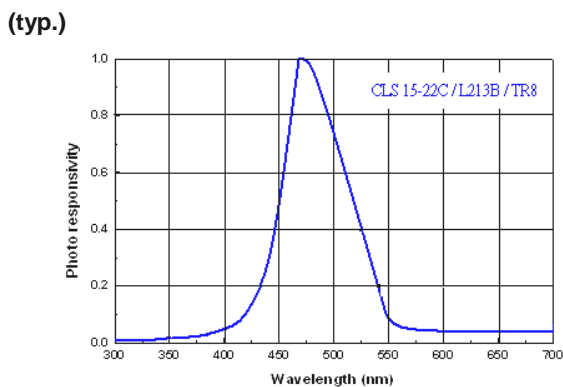


Fig.6 Spectral Response (Green region)

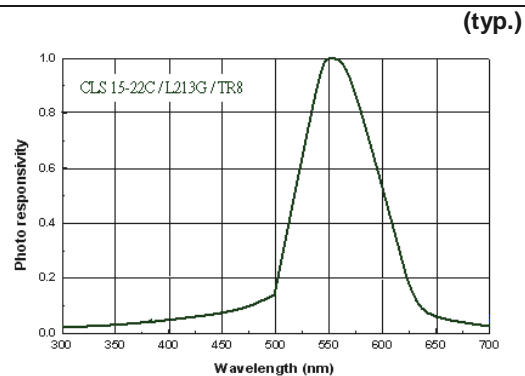
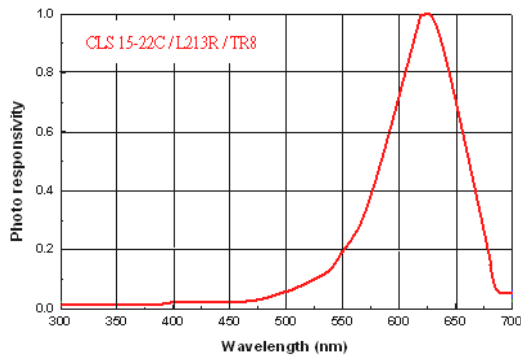


Fig.7 Spectral Response (Red region)

(typ.)

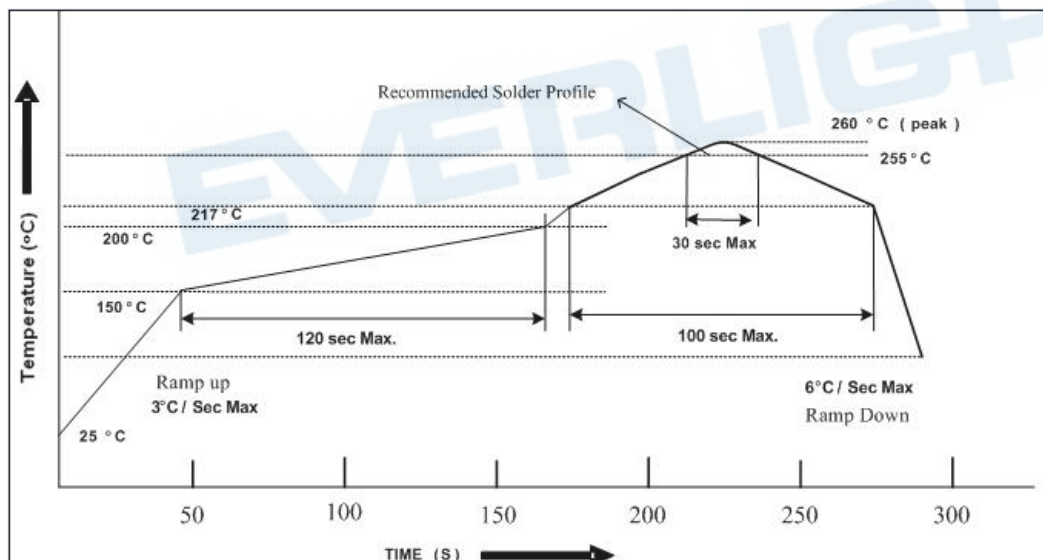


EVERLIGHT

Recommended method of storage

1. Do not open moisture proof bag before devices are ready to use.
2. Shelf life in sealed bag from the bag seal date: 18 months at 10°C~30°C and < 90% RH.
3. After opening the package, the devices must be stored at 10°C~30°C and $\leq 60\%RH$, and used within 168 hours (floor life).
4. If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.
5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the following conditions:
 - 192 hours at 40°C $\pm 5^{\circ}C$ and < 5 % RH (reeled/tubed/loose units) or
 - 96 hours at 60°C $\pm 5^{\circ}C$ and < 5 % RH (reeled/tubed/loose units) or
 - 24 hours at 125°C $\pm 5^{\circ}C$, not suitable for reel or tubes.

Recommended Solder Profile



Notice:

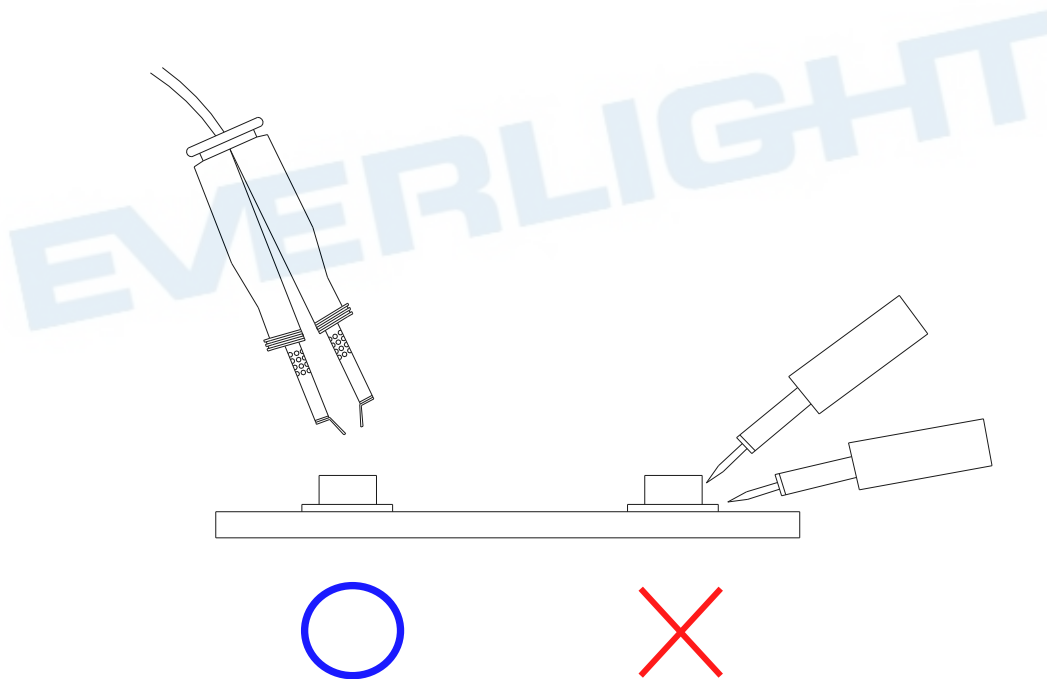
1. Reflow soldering should not be done more than two times.
2. When soldering, do not put stress on the devices during heating.
3. After soldering, do not warp the circuit board.
4. Reference: IPC/JEDEC J-STD-020D

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.

Repairing

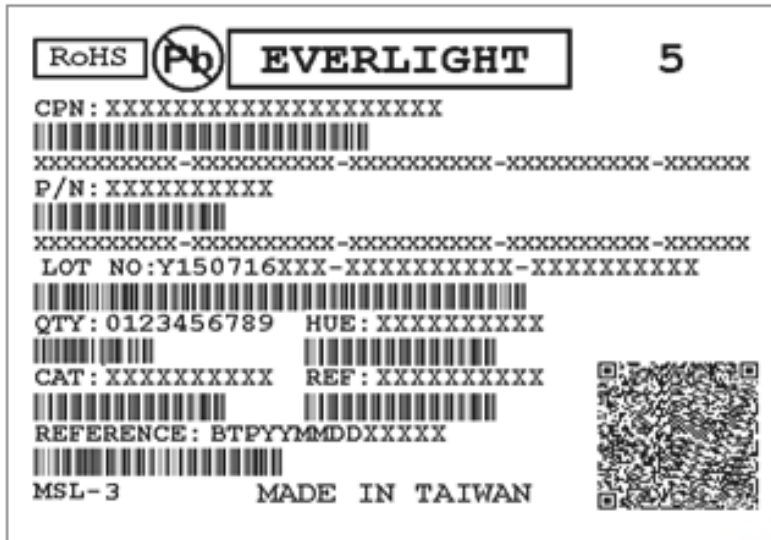
Repair should not be done after the device have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the device will or will not be damaged by repairing.



Packing Quantity Specification

2000 PCS/ 1 Reel

Label Format



CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

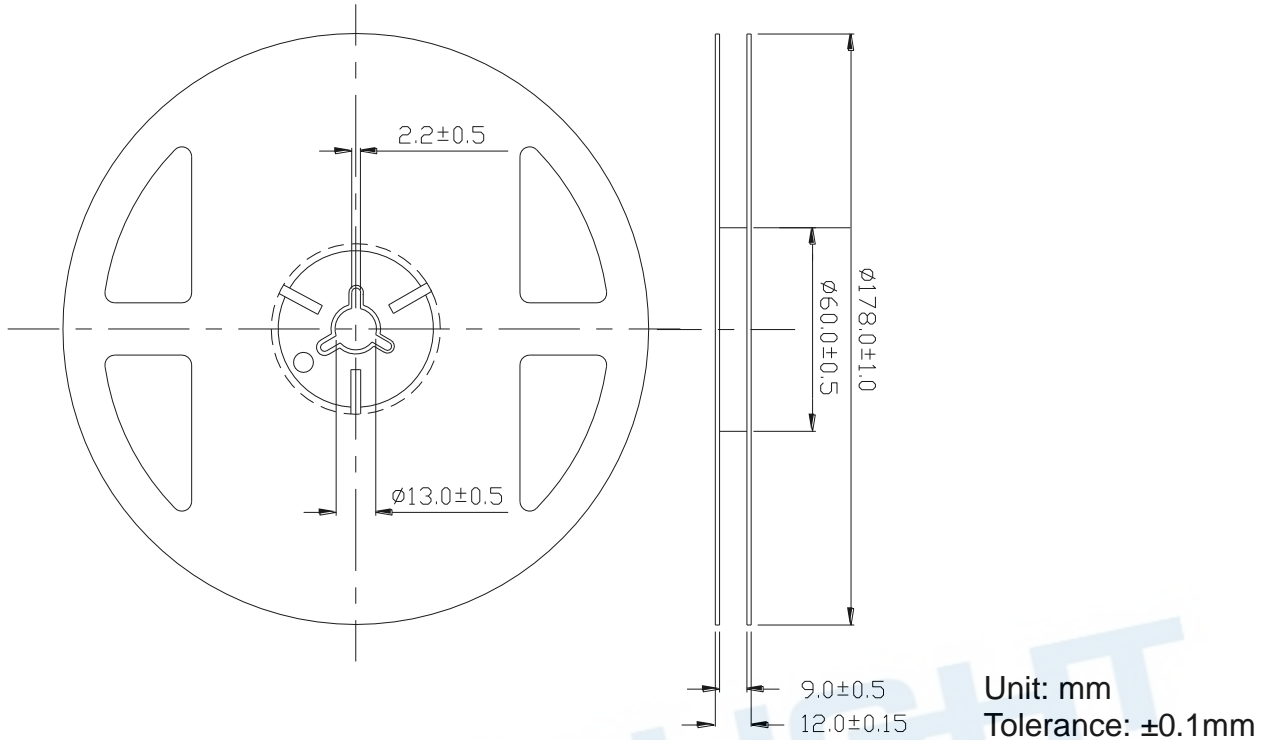
HUE: Peak Wavelength

REF: Reference

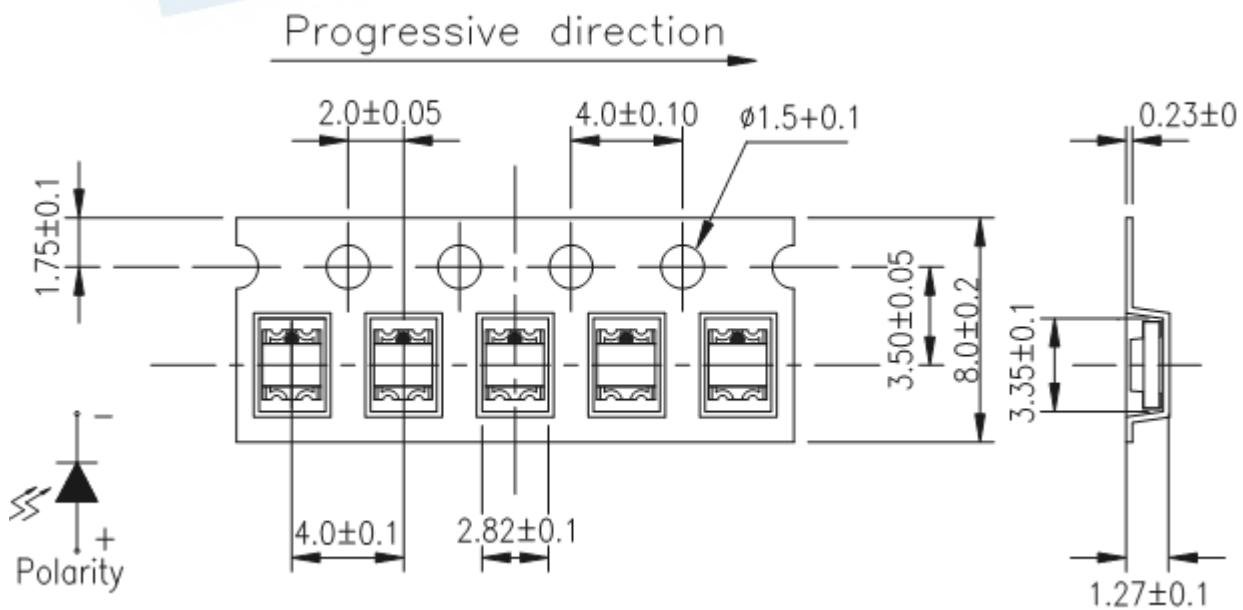
LOT No: Lot Number

MADE IN TAIWAN: Production Place

Reel Dimensions

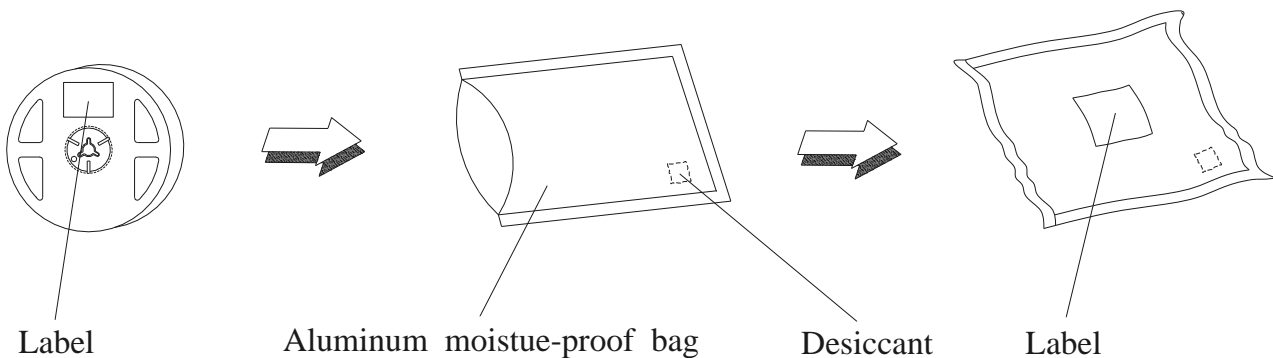


Tape Dimensions



Moisture Resistant Packaging

Unit: mm
Tolerance: ± 0.1 mm



DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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