



EVERLIGHT ELECTRONICS CO.,LTD.

DATA SHEET

PART NO. : 19-213/BHC-AN1P2/3T

DATE : 2003/5/7

DEPARTMENT : R.D.1

REVISION : 1.0

RECEIVED			
<input checked="" type="checkbox"/> MASS PRODUCTION			
<input type="checkbox"/> PRELIMINARY			
<input type="checkbox"/> CUSTOMER DESIGN			
DEVICE NUMBER : DSE-193-B01			
PAGE : 12			
CUSTOMER	DESIGNER	CHECKER	APPROVER
	Jeff Tasi	Charles Chang	

1.0	New data sheet approve	2003/5/7
REV	DESCRIPTION	RELEASE DATE

OFFICE : NO 25,Lane 76,Chung Yang Rd,Sec.3 Tucheng, Taipei 236, Taiwan, R.O.C.

TEL : 886-2-2267-2000,2266-9936 (22 Lines)

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<http://www.everlight.com>



Package Type:

SMD For PCB Type

11-21	19-215
12-21	19-215A
12-215	19-217A
15-21	22-21
15-215	23-21
16-213	23-21B
17-21	24-21
17-215	25-21
19-21	27-21
19-21A	42-21

Dominant Wavelength Groups:

According to the difference wavelength to define
 None: No definition
 A : Standard wavelength definition.
 B : Range of wavelength definition is more narrowly than group A.
 C : Range of wavelength definition is more narrowly than group A, but the value is different with group B.
 F : The wavelength definition in special specification.

The dominant wavelength data did not including ±1nm testing tolerance.

Test Forward Current:

None: 20 mA
 Y : 5 mA
 Z : 10 mA

Taping Quantity:

- 1: 1000 pcs (Taping)
- 2: 2000 pcs (Taping)
- 3: 3000 pcs (Taping)
- 5: 5000 pcs (Taping)
- C : 1500 pcs (Taping)
- D : 10000 pcs (Taping)

Packing Method :

- A: Reverse-side placement (Anode toward the sprocket hole)
- B: Reverse-side placement (Anode toward the sprocket hole)
- C: Right-side placement
- D: Right-side placement (Anode toward the sprocket hole)
- T: Top-side placement
- R: Top-side placement (Anode toward the sprocket hole)

19 - 21 / B H C - A N1 P2 M / 3 T

Emission Color:

- R: Red (λ d: 640nm, 630nm, 625nm)
- S: Sunset Orange (λ d: 615nm, 605nm)
- Y: Yellow (λ d: 595nm, 590nm)
- G: Green (λ d: 570nm, 565nm, 560nm, 525nm, 505nm)
- B: Blue (λ d: 470nm)
- W: White x=0.32 y=0.31

The ordinal number that base on diffence electro-optical characteristics within chip.

1,2 7,8,9, A,B.....X,Y,Z

Resin Color:

- C: Water Clear
- W: White Diffused
- D: Diffused

Luminous Intensity Groups:

- | | | |
|-------------------|-----|-------------------|
| C0: 0.28 ... 0.45 | R ⇨ | R1: 112 ... 140 |
| D0: 0.45 ... 0.70 | S ⇨ | R2: 140 ... 180 |
| E0: 0.70 ... 1.1 | T ⇨ | S1: 180 ... 225 |
| F0: 1.1 ... 1.8 | U ⇨ | S2: 225 ... 285 |
| G0: 1.8 ... 2.8 | V ⇨ | T1: 285 ... 360 |
| H0: 2.8 ... 4.5 | W ⇨ | T2: 360 ... 450 |
| J0: 4.5 ... 7.2 | X ⇨ | U1: 450 ... 565 |
| K0: 7.2 ... 11.5 | Y ⇨ | U2: 565 ... 715 |
| L1: 11.5 ... 14.5 | | V1: 715 ... 900 |
| L2: 14.5 ... 18.0 | | V2: 900 ... 1120 |
| M1: 18.0 ... 22.5 | | W1: 1120 ... 1420 |
| M2: 22.5 ... 28.5 | | W2: 1420 ... 1800 |
| N1: 28.5 ... 36.0 | | X1: 1800 ... 2250 |
| N2: 36.0 ... 45.0 | | X2: 2250 ... 2850 |
| P1: 45.0 ... 57.0 | | Y1: 2850 ... 3600 |
| P2: 57.0 ... 72.0 | | Y2: 3600 ... 4500 |
| Q1: 72.0 ... 90.0 | | |
| Q2: 90.0 ... 112 | | |

Unit: mcd

The luminous intensity data did not including ±15% testing tolerance.

Forward Voltage Groups:

None: No definition

The VF definition as follows:

		Unit: V			
Forward Voltage Group	Bin	Min.	Max.		
C	B	A	00	1.55	1.75
			0	1.75	1.95
			1	1.95	2.15
			2	2.15	2.35
			3	2.35	2.55
4	2.55	2.75			
5	2.75	3.05			
M	E	D	6	3.05	3.35
			7	3.35	3.65
			8	3.65	3.95
9	2.50	2.70			
N	F	K	10	2.70	2.90
			11	2.90	3.10
			12	3.10	3.30
	R	J	13	3.30	3.50
			14	3.50	3.70
			15	2.70	2.85
	P	H	16	2.85	3.00
			17	3.00	3.15
			18	3.15	3.30

The forward voltage data did not including ±0.1V testing tolerance.

ANNEX



EVERLIGHT ELECTRONICS CO., LTD.

REV.: 1.3

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■ Dominant Wavelength Groups:

B1				
Dom . Wavelength	Range			
Of Group	Bin	Min.	Max.	Unit
A	A7	458.5	461.5	nm
	A8	461.5	464.5	nm
	A9	464.5	467.5	nm
	A10	467.5	470.5	nm
	A11	470.5	473.5	nm
	A12	473.5	476.5	nm

B3				
Dom . Wavelength	Range			
Of Group	Bin	Min.	Max.	Unit
A	A8	461.5	464.5	nm
	A9	464.5	467.5	nm
	A10	467.5	470.5	nm
	A11	470.5	473.5	nm
	A12	473.5	476.5	nm
	A13	476.5	479.5	nm

BL				
Dom . Wavelength	Range			
Of Group	Bin	Min.	Max.	Unit
A	A5	452.5	455.5	nm
	A6	455.5	458.5	nm
	A7	458.5	461.5	nm
	A8	461.5	464.5	nm
	A9	464.5	467.5	nm

BH						
Dom . Wavelength			Range			
Of Groups			Bin	Min.	Max.	Unit
A	B		A9	464.5	467.5	nm
			A10	467.5	470.5	nm
	C		A11	470.5	473.5	nm
			A12	473.5	476.5	nm
V	Z	X	X	465	470	nm
		Y	Y	470	475	nm
	W	W	475	480	nm	

■ Forward Voltage Groups:

Forward Voltage Groups				Range					
				Bin	Min.	Max.	Unit		
C	B	A		00	1.55	1.75	V		
				0	1.75	1.95	V		
			1	1.95	2.15	V			
			2	2.15	2.35	V			
			3	2.35	2.55	V			
	M	E	D		4	2.55	2.75	V	
					5	2.75	3.05	V	
			6	3.05	3.35	V			
			7	3.35	3.65	V			
			8	3.65	3.95	V			
N	F	K	R	J		9	2.50	2.70	V
						10	2.70	2.90	V
			11	2.90	3.10	V			
		12	3.10	3.30	V				
		13	3.30	3.50	V				
		14	3.50	3.70	V				
P	H			15	2.70	2.85	V		
				16	2.85	3.00	V		
				17	3.00	3.15	V		
				18	3.15	3.30	V		

**Technical Data Sheet****0.6mm Height Flat Top LED****19-213/B__C Series** *1**Features**

- Package in 8mm tape on 7" diameter reel.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- Mono-color type.

**Descriptions**

- The 19-213 SMD Taping is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.
- Besides, lightweight makes them ideal for miniature applications. etc.

Applications

- Automotive: backlighting in dashboard and switch.
- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- General use.

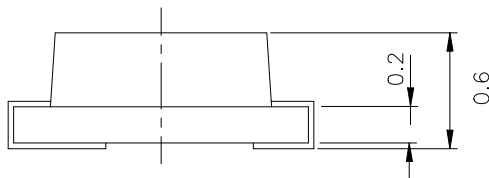
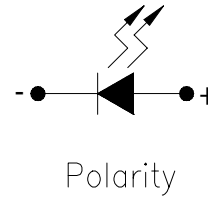
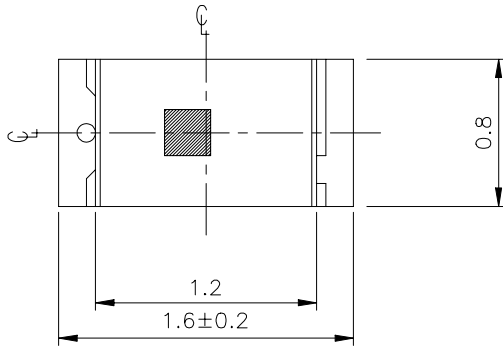
Device Selection Guide

Part No.	Chip		Lens Color
	Material	Emitted Color	
19-213/B1C	GaN/SiC	Purplish Blue	Water Clear
19-213/B3C	InGaN/SiC	Blue	
19-213/BLC	InGaN	Deep-Blue	
19-213/BHC		Blue *2	

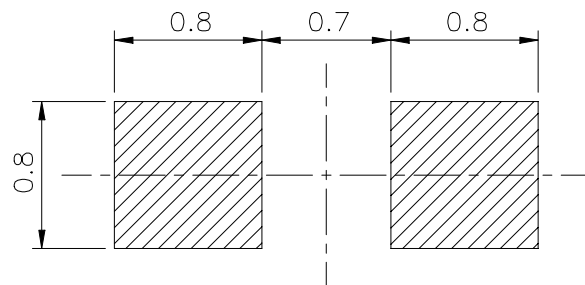
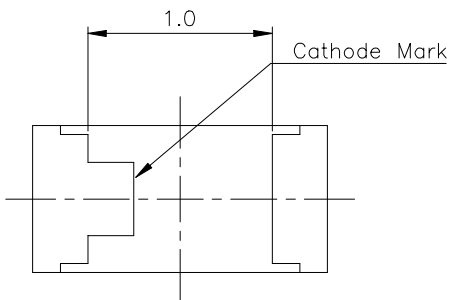
*1. The series is included 19-213/B1C,19-213/B3C,19-213/BLC, and 19-213/BHC.

*2. Emitted color is distinguished to Dark Blue and Brilliant Blue.

Package Outline Dimensions



For reflow soldering (Propose)



Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Angle $\pm 0.5^\circ$,Unit = mm

Absolute Maximum Ratings (Ta=25°C)

Series	Parameter	Symbol	Rating	Unit
19-213/B_C Series	Reverse Voltage	V _R	5	V
19-213/B_C Series	Forward Current	I _F	25	mA
19-213/B1C/B3C			30	
19-213/B_C Series	Operating Temperature	T _{opr}	-40 ~ +85	°C
19-213/B_C Series	Storage Temperature	T _{stg}	-40 ~ +90	°C
19-213/B_C Series	Soldering Temperature	T _{sol}	260 (for 5 seconds)	°C
19-213/B_C Series	Electrostatic Discharge	ESD	150	V
19-213/B1C/B3C			1000	
19-213/B_C Series	Power Dissipation	P _d	110	mW
19-213/B1C/B3C			130	
19-213/B_C Series	Peak Forward Current	I _F	100	mA
19-213/B1C	(Duty 1/10 @1KHz)		70	

Electro-Optical Characteristics (Ta=25°C)

Part No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
19-213/B1C	Peak Wavelength	λ_p	----	428	----	nm	If=20mA
19-213/B3C				468			
19-213/BLC				465			
19-213/BHC				468			
19-213/B1C	Dominant Wavelength	λ_d	----	466	----	nm	
19-213/B3C				470			
19-213/BLC				460			
19-213/BHC				470			
19-213/B1C	Spectrum Radiation Bandwidth	$\Delta \lambda$	----	65	----	nm	
19-213/B3C				26			
19-213/BLC				25			
19-213/BHC				25			
19-213/B_C Series	Viewing Angle	$2\theta_{1/2}$	----	120	----	deg	
19-213/B_C Series	Forward Voltage	VF	----	3.5	4.0	V	
19-213/B1C				3.8	4.5		
19-213/B_C Series	Reverse Current	IR	----	----	50	μA	VR=5V

Notes:

- 1. Tolerance of Forward Voltage $\pm 0.1V$**

■ 19-213/B__C Series Explain Of Luminous Intensity:
I_F=20mA

Part No.	Parameter	Symbol	Typ.	Bin Code	Min.	Max.	Unit
19-213/B1C-M1N2	Luminous Intensity	I _v	28	M1	18.0	22.5	mcd
				M2	22.5	28.5	
				N1	28.5	36.0	
				N2	36.0	45.0	
19-213/B3C-M1N2	Luminous Intensity	I _v	26	M1	18.0	22.5	mcd
				M2	22.5	28.5	
				N1	28.5	36.0	
				N2	36.0	45.0	
19-213/BLC-L2N1	Luminous Intensity	I _v	20	L2	14.5	18.0	mcd
				M1	18.0	22.5	
				M2	22.5	28.5	
				N1	28.5	36.0	
19-213/BHC-N1P2	Luminous Intensity	I _v	40	N1	28.5	36.0	mcd
				N2	36.0	45.0	
				P1	45.0	57.0	
				P2	57.0	72.0	
19-213/BHC-N2Q1	Luminous Intensity	I _v	60	N2	36.0	45.0	mcd
				P1	45.0	57.0	
				P2	57.0	72.0	
				Q1	72.0	90.0	
19-213/BHC-P2Q2	Luminous Intensity	I _v	80	P2	57.0	72.0	mcd
				Q1	72.0	90.0	
				Q2	90.0	112	

Note:

 The luminous intensity data did not including $\pm 15\%$ testing tolerance.

19-213/B__C Series Explain Of Luminous Intensity:
I_F=10mA

Part No.	Parameter	Symbol	Typ.	Bin Code	Min.	Max.	Unit
19-213/BHC-LN	Luminous Intensity	I _v	20	L	11.5	18.0	mcd
				M	18.0	28.5	
				N	28.5	45.0	
19-213/BHC-MN	Luminous Intensity	I _v	32	M	18.0	28.5	mcd
				N	28.5	45.0	
19-213/BHC-NP	Luminous Intensity	I _v	45	N	28.5	45.0	mcd
				P	45.0	72.0	

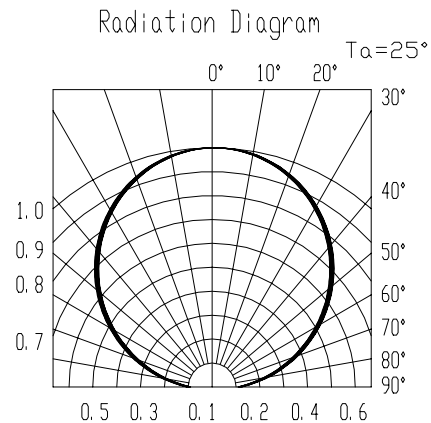
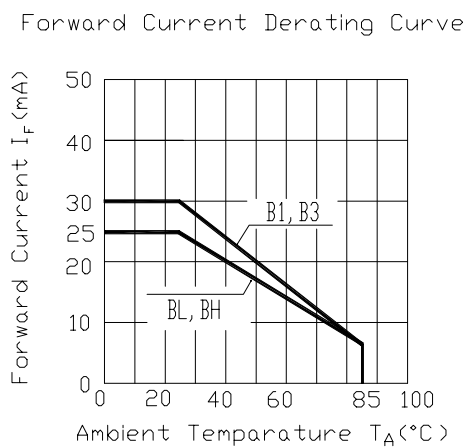
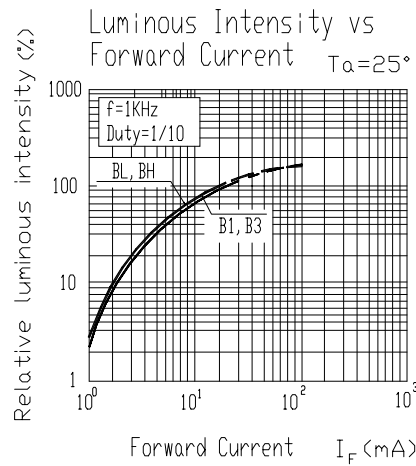
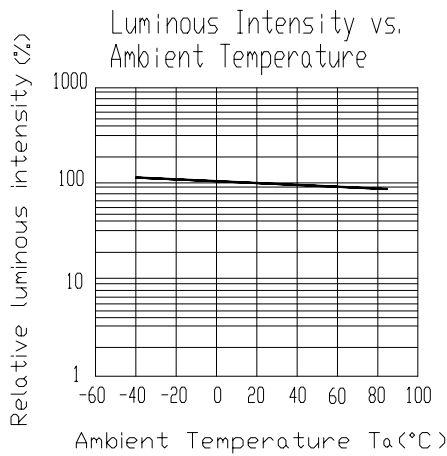
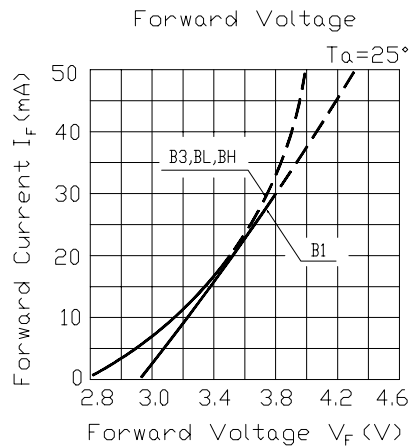
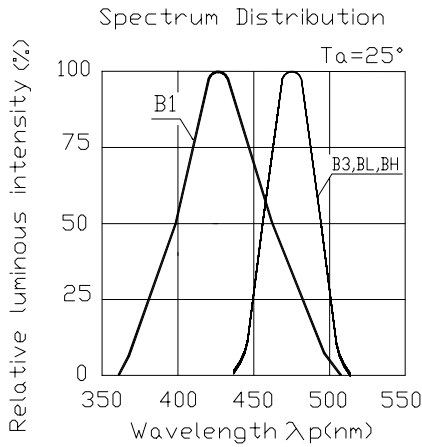
I_F=5mA

Part No.	Parameter	Symbol	Typ.	Bin Code	Min.	Max.	Unit
19-213/BHC-K0M	Luminous Intensity	I _v	12	K0	7.2	11.5	mcd
				L	11.5	18.0	
				M	18.0	28.5	
19-213/BHC-LM	Luminous Intensity	I _v	18	L	11.5	18.0	mcd
				M	18.0	28.5	
19-213/BHC-MN	Luminous Intensity	I _v	26	M	18.0	28.5	mcd
				N	28.5	45.0	

Note:

The luminous intensity data did not including $\pm 15\%$ testing tolerance.

Typical Electro-Optical Characteristics Curves

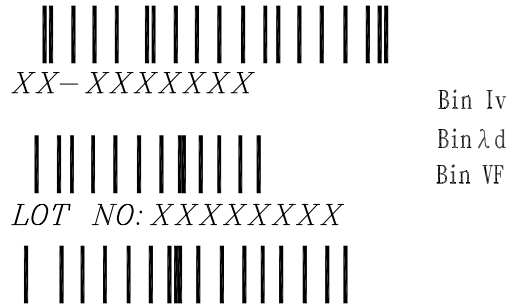


Label explanation

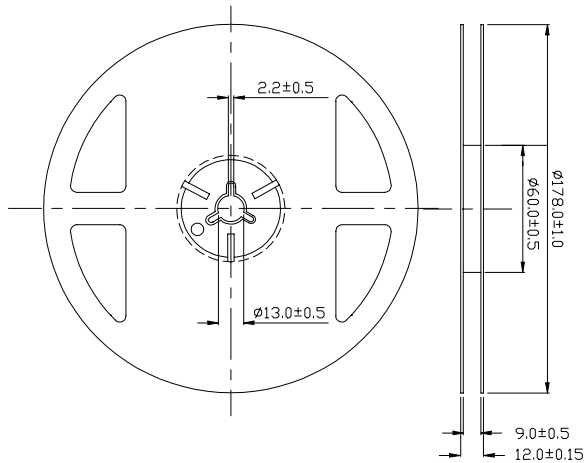
CAT: Luminous Intensity (mcd)

HUE: Dom. Wavelength (nm)

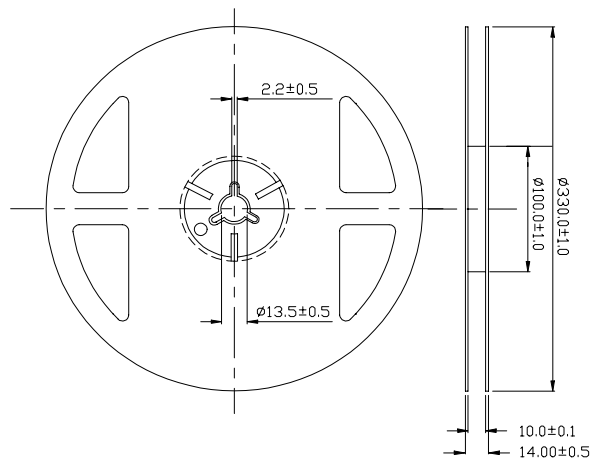
REF: Forward Voltage (V)



Reel Dimensions



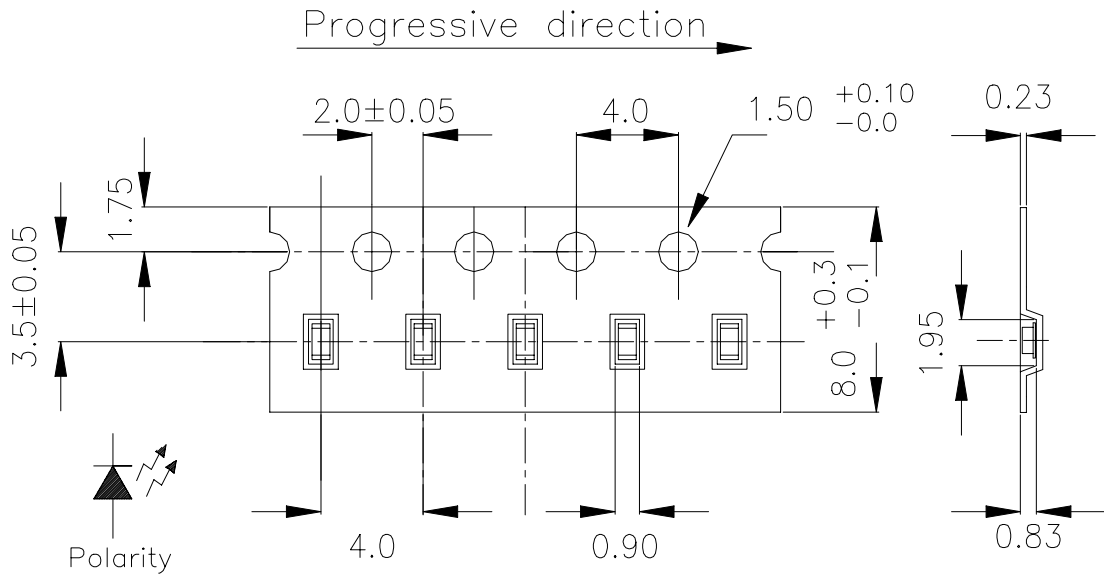
Taping Quantity: 3000pcs



Taping Quantity: 5000pcs & 10000pcs

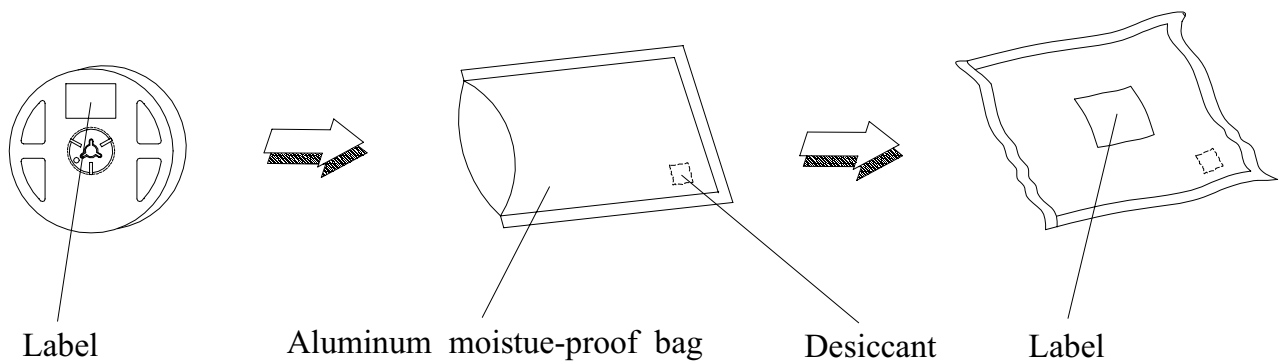
Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Angle $\pm 0.5^\circ$,Unit = mm

Carrier Tape Dimensions



Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$, Angle $\pm 0.5^\circ$,Unit = mm

Moisture Resistant Packaging



Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90 %

LTPD : 10 %

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Rc
1	Reflow	Temp. : 240°C ± 5°C Min. 5 sec.	6 min.	22 Pcs.	0/1
2	Temperature Cycle	H : +100°C 15 min. § 5 min. L : -40°C 15 min.	300 Cycles	22 Pcs.	0/1
3	Thermal Shock	H : +100°C 5 min. § 10 sec. L : -10°C 5 min.	300 Cycles	22 Pcs.	0/1
4	High Temperature Storage	Temp. : 100°C	1000 Hrs.	22 Pcs.	0/1
5	Low Temperature Storage	Temp. : -55°C	1000 Hrs.	22 Pcs.	0/1
6	DC Operating Life	IF = 20 mA	1000 Hrs.	22 Pcs.	0/1
7	High Temperature / High Humidity	85°C/RH 85%	1000 Hrs.	22 Pcs.	0/1

Precautions 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. Storage time

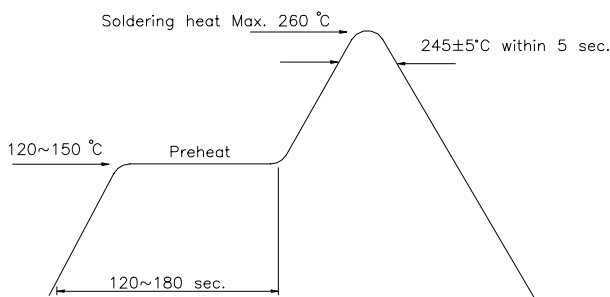
2.1 The operation of Temperature and RH are : 5°C~35°C, RH60%.

2.2 Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccating agent. Considering the tape life , we suggest our customers to use our products within a year(from production date).

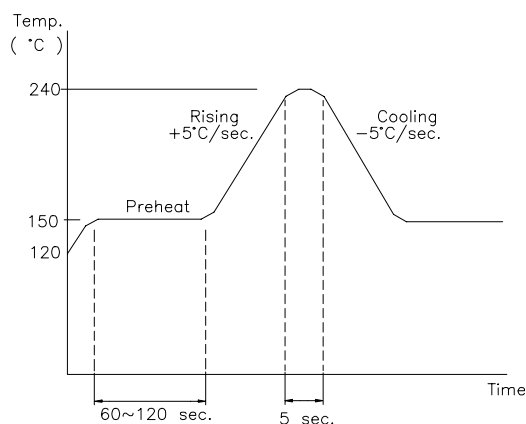
2.3 If opened more than one week in an atmosphere 5°C~35°C, RH 60%, they should be treated at 60°C± 5°C for 15hrs.

2.4 When you discover that the desiccant in the package has a pink color (Normal = blue) , you should treat them in the same conditions as 2.3.

Soldering heat



Reflow Temp / Time

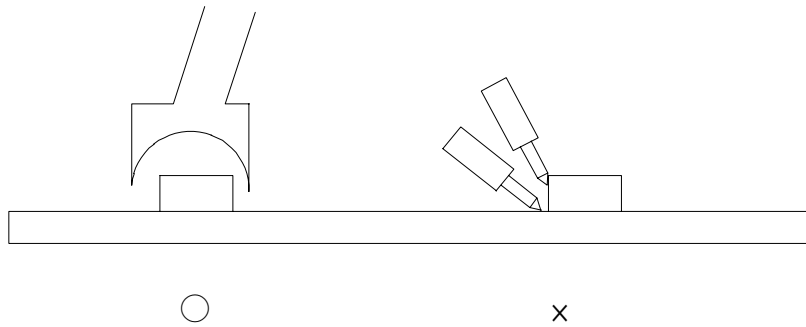


Soldering Iron

Basic spec is ≤ 5 sec when 260°C. If temperature is higher, time should be shorter (+10°C → -1sec). Power dissipation of Iron should be smaller than 15 W , and temperature should be controllable. Surface temperature of the device should be under 230 °C .

Rework

1. Customer must finish rework within 5 sec under 245°C.
2. The head of iron can not touch copper foil.
3. Twin-head type is preferred.

**EVERLIGHT ELECTRONICS CO., LTD.**

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