EVERLIGHT ELECTRONICS CO.,LTD.

DATA SHEET

PART NO. : 19-213/G6C-AN1P2 /3T

DATE : 2005/8/29

DEPARTMENT : SZIE

REVISION : 1

RECEIVED			
■MASS PRODUCTION			
□ PRELIMINARY			
□ CUSTOMER DESIGN			
DEVICE NUMBER : SZDSE-193-G01			
PAGE : 12			
CUSTOMER	DESIGNER	CHECKER	APPROVER
	Bianchangyou	Ahu	Buck

1	New data sheet approve	2005/8/29
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)
FAX : 886-2-2267-6189
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
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	
	D0: 0.45 … 0.70	
	E0: 0.70 … 1.1	
	F0: 1.1 … 1.8	
	G0: 1.8 … 2.8	
	H0: 2.8 … 4.5	
	J0: 4.5 … 7.2	
	K0: 7.2 … 11.5	
L ⇨	L1: 11.5 … 14.5	
	L2: 14.5 … 18.0	
M ⇨	M1: 18.0 … 22.5	
	M2: 22.5 … 28.5	
N ⇨	N1: 28.5 … 36.0	
	N2: 36.0 … 45.0	
P ⇨	P1: 45.0 … 57.0	
	P2: 57.0 … 72.0	
Q ⇨	Q1: 72.0 … 90.0	
	Q2: 90.0 … 112	
R ⇨	R1: 112 … 140	
	R2: 140 … 180	
S ⇨	S1: 180 … 225	
	S2: 225 … 285	
T ⇨	T1: 285 … 360	
	T2: 360 … 450	
U ⇨	U1: 450 … 565	
	U2: 565 … 715	
V ⇨	V1: 715 … 900	
	V2: 900 … 1120	
W ⇨	W1:1120 … 1420	
	W2:1420 … 1800	
X ⇨	X1: 1800 … 2250	
	X2: 2250 … 2850	
Y ⇨	Y1: 2850 … 3600	
	Y2: 3600 … 4500	

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.
S Q	29	2.70	2.80
	30	2.80	2.90
	31	2.90	3.00
	32	3.00	3.10
	33	3.10	3.20
	34	3.20	3.30

The forward voltage data did not including ±0.05V testing tolerance.

ANNEX

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■ Dominant Wavelength Groups:

Chip	G2				
Dom . Wavelength Of Group		Range			
		Bin	Min.	Max.	Unit
A		C10	557.5	559.5	nm
		C11	559.5	561.5	nm
		C12	561.5	563.5	nm
		C13	563.5	565.5	nm
		C14	565.5	567.5	nm

Chip	GV				
Dom . Wavelength Of Group		Range			
		Bin	Min.	Max.	Unit
A		C13	563.5	565.5	nm
		C14	565.5	567.5	nm
		C15	567.5	569.5	nm
		C16	569.5	571.5	nm

Chip	G3				
Dom . Wavelength Of Group		Range			
		Bin	Min.	Max.	Unit
A	B	C11	559.5	561.5	nm
		C12	561.5	563.5	nm
		C13	563.5	565.5	nm
		C14	565.5	567.5	nm
		C15	567.5	569.5	nm

Chip	GP				
Dom . Wavelength Of Group		Range			
		Bin	Min.	Max.	Unit
A		C10	557.5	559.5	nm
		C11	559.5	561.5	nm
		C12	561.5	563.5	nm
		C13	563.5	565.5	nm
		C14	565.5	567.5	nm

Chip	G5				
Dom . Wavelength Of Groups		Range			
		Bin	Min.	Max.	Unit
A	B	C15	567.5	569.5	nm
		C16	569.5	571.5	nm
		C17	571.5	573.5	nm
		C18	573.5	575.5	nm

Chip	G6,G7				
Dom . Wavelength Of Group		Range			
		Bin	Min.	Max.	Unit
A	B	C15	567.5	569.5	nm
		C16	569.5	571.5	nm
		C17	571.5	573.5	nm
		C18	573.5	575.5	nm
		C19	575.5	577.5	nm
F		CC2	570.0	571.5	nm
		CC3	571.5	573.0	nm
		CC4	573.0	574.5	nm

ANNEX

■ Dominant Wavelength Groups:

Chip	GH			Range			
Dom . Wavelength Of Group				Bin	Min.	Max.	Unit
		X		W	515	520	nm
D	Y			X	520	525	nm
				Y	525	530	nm
				Z	530	535	nm

Chip	GL			Range			
Dom . Wavelength Of Group				Bin	Min.	Max.	Unit
		X		W	495	500	nm
D	Y			X	500	505	nm
				Y	505	510	nm
				Z	510	515	nm

ANNEX

■ Forward Voltage Groups:

Forward Voltage Groups		Range			
		Bin	Min.	Max.	Unit
	L	19	1.70	1.80	V
		20	1.80	1.90	
		21	1.90	2.00	
		22	2.00	2.10	
		23	2.10	2.20	
		24	2.20	2.30	

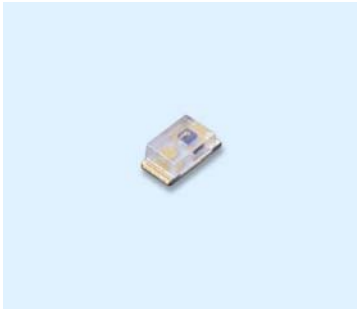
EVERLIGHT ELECTRONICS CO.,LTD.

Technical Data Sheet

Flat Top LED (0.6mm Height)

19-213/G-C Series

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.
- Pb-free
- The product itself will remain within RoHS compliant version

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

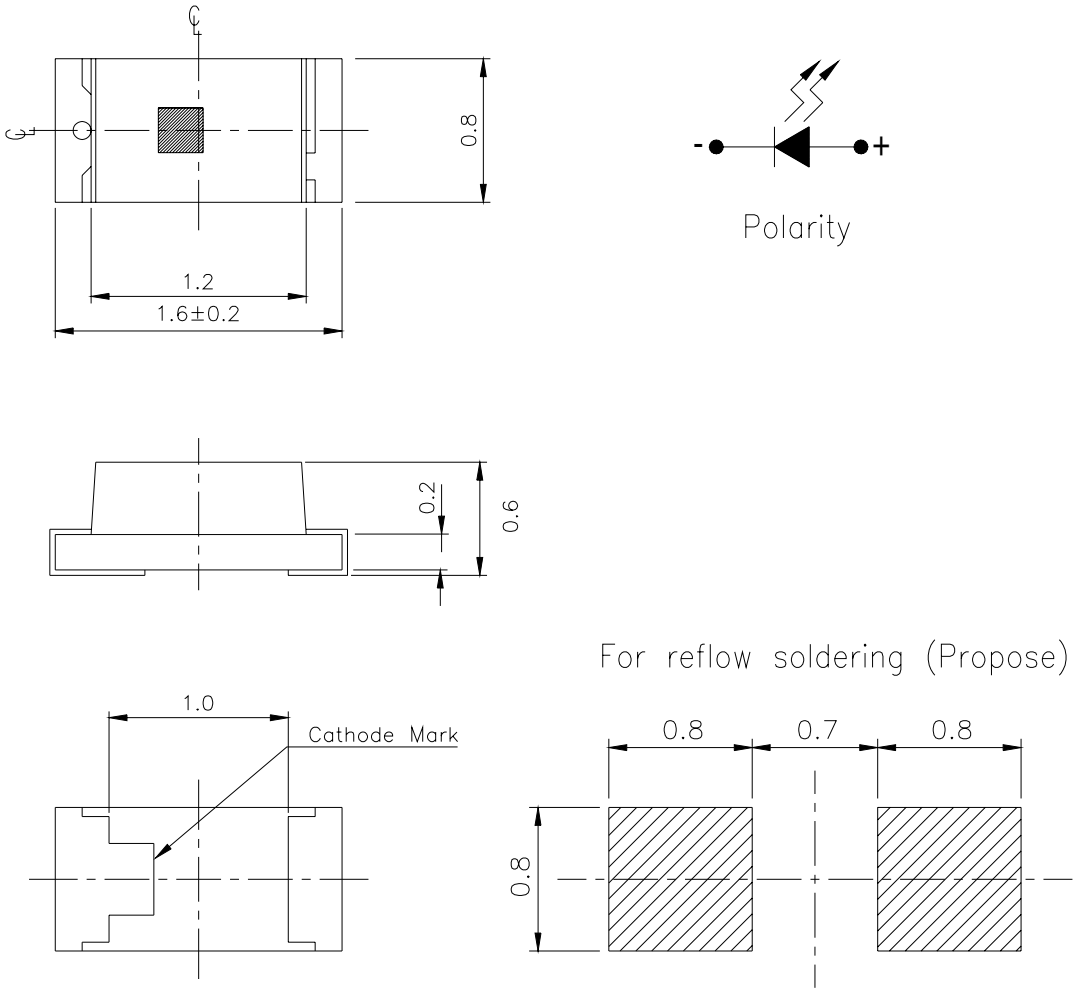
- Automotive: backlighting in dashboard and switch.
- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- General use.

Device Selection Guide

Part No.	Chip		Lens Color
	Material	Emitted Color	
19-213/G2C	GaP	Pure Green	Water Clear
19-213/G3C		Pale Green	
19-213/G5C		Yellow Green	
19-213/G6C	AlGaInP	Brilliant Yellow Green	
19-213/GLC	InGaN	Bluish Green	
19-213/GHC	InGaN	Brilliant Green	
19-213/GPC	AlGaInP	Pale Green	

*1. The series is included 19-213/G2C,19-213/G3C,19-213/G5C, 19-213/G6C,19-213/GLC,19-213/GHC,and 19-213/GPC.

Package Outline Dimensions



Note: The tolerances unless mentioned is ±0.1mm, Unit = mm

Absolute Maximum Ratings (Ta=25℃)

Series	Parameter	Symbol	Rating	Unit
19-213/G_C Series	Reverse Voltage	V_R	5	V
19-213/G_C Series	Forward Current	I_F	30	mA
19-213/ G6C/GLC/GHC/GPC			25	
19-213/G_C Series	Operating Temperature	Topr	-40 ~ +85	℃
19-213/G_C Series	Storage Temperature	Tstg	-40 ~ +90	℃
19-213/G_C Series	Soldering Temperature	Tsol	260 (for 5 seconds)	℃
19-213/G_C Series	Electrostatic Discharge	ESD	2000	V
19-213/GLC/GHC			150	
19-213/G_C Series	Power Dissipation	Pd	130	mW
19-213/ G2C/G3C/G5C			100	
19-213/G6C/GPC			60	
19-213/G_C Series	Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	60	mA
19-213/GLC/GHC			100	

19-213/G-C Series

Electro-Optical Characteristics (Ta=25℃)

Part No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
19-213/G2C	Peak Wavelength	λ p	----	555	----	nm	IF=20mA
19-213/G3C				560			
19-213/G5C				570			
19-213/G6C				575			
19-213/GLC				502			
19-213/GHC				518			
19-213/GPC				561			
19-213/G2C	Dominant Wavelength	λ d	----	560	----	nm	
19-213/G3C				565			
19-213/G5C				571			
19-213/G6C				573			
19-213/GLC				505			
19-213/GHC				525			
19-213/GPC				562			

Electro-Optical Characteristics (Ta=25℃)

Part No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
19-213/G2C	Spectrum Radiation Bandwidth	△λ	----	30	----	nm	IF=20mA
19-213/G3C				30			
19-213/G5C				30			
19-213/G6C				20			
19-213/GLC				30			
19-213/GHC				36			
19-213/GPC				20			
19-213/G_C Series	Viewing Angle	2θ 1/2	----	120	----	deg	
19-213/G_C Series	Forward Voltage	VF	----	2.0	2.4	V	
19-213/GLC/GHC				3.5	4.0		
19-213/G_C Series	Reverse Current	IR	----	----	10	μA	VR=5V
19-213/GLC/GHC					50		

Notes:

1. Tolerance of Forward Voltage ±0.1V

19-213/G__C Series Explain Of Luminous Intensity:

I_F=20mA

Part No.	Parameter	Symbol	Typ.	Bin Code	Min.	Max.	Unit
19-213/G2C-G0J0	Luminous Intensity	Iv	2.7	G0	1.8	2.8	mcd
				H0	2.8	4.5	
				J0	4.5	7.2	
19-213/G3C-J0L1	Luminous Intensity	Iv	7.0	J0	4.5	7.2	mcd
				K0	7.2	11.5	
				L1	11.5	14.5	
19-213/G5C-K0L2	Luminous Intensity	Iv	11	K0	7.2	11.5	mcd
				L1	11.5	14.5	
				L2	14.5	18.0	
19-213/G6C-L2N1	Luminous Intensity	Iv	25	L2	14.5	18.0	mcd
				M1	18.0	22.5	
				M2	22.5	28.5	
				N1	28.5	36.0	
19-213/G6C-M2P1	Luminous Intensity	Iv	35	M2	22.5	28.5	mcd
				N1	28.5	36.0	
				N2	36.0	45.0	
				P1	45.0	57.0	
19-213/G6C-N1P2	Luminous Intensity	Iv	45	N1	28.5	36.0	mcd
				N2	36.0	45.0	
				P1	45.0	57.0	
				P2	57.0	72.0	

Note:

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

19-213/G__C Series Explain Of Luminous Intensity:

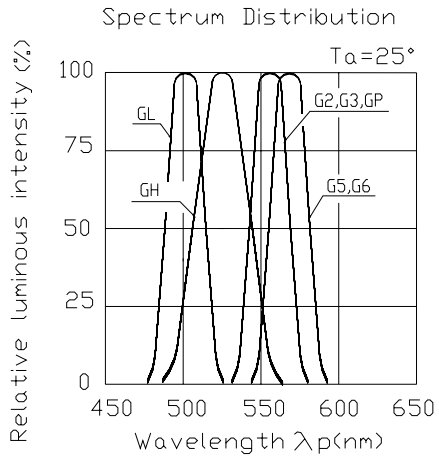
I_F=20mA

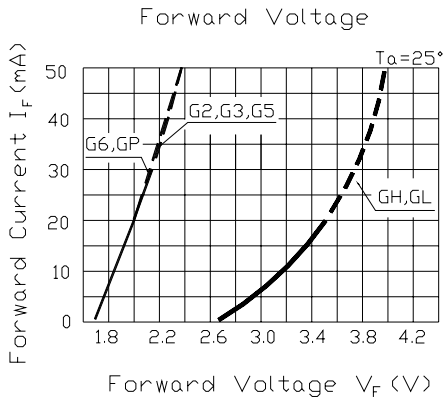
Part No.	Parameter	Symbol	Typ.	Bin Code	Min.	Max.	Unit
19-213/GLC-Q1R2	Luminous Intensity	Iv	120	Q1	72.0	90.0	mcd
				Q2	90.0	112	
				R1	112	140	
				R2	140	180	
19-213/GHC-R1S2	Luminous Intensity	Iv	180	R1	112	140	mcd
				R2	140	180	
				S1	180	225	
				S2	225	285	
19-213/GPC-K0M1	Luminous Intensity	Iv	15	K0	7.2	11.5	mcd
				L1	11.5	14.5	
				L2	14.5	18.0	
				M1	18.0	22.5	

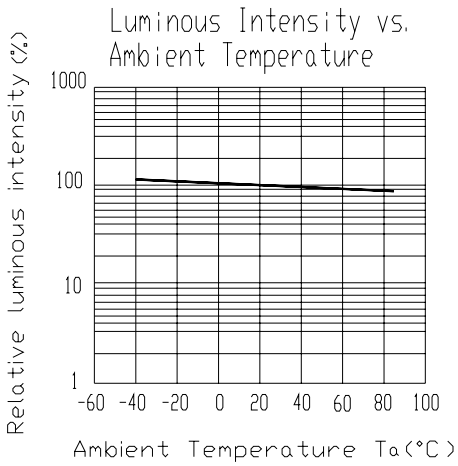
Note:

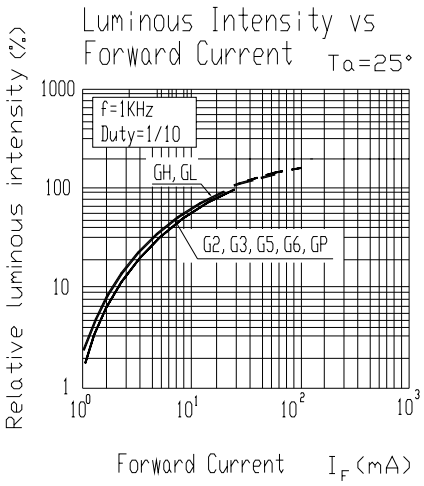
The luminous intensity data did not including ±15% testing tolerance.

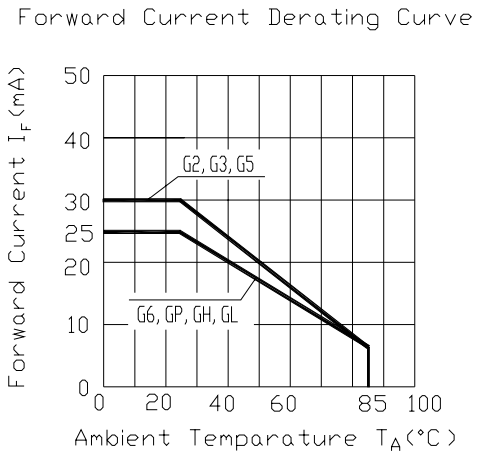
Typical Electro-Optical Characteristics Curves

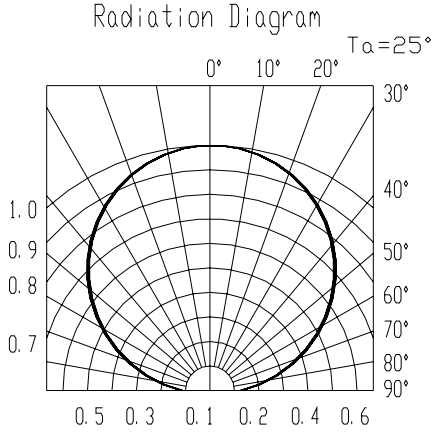










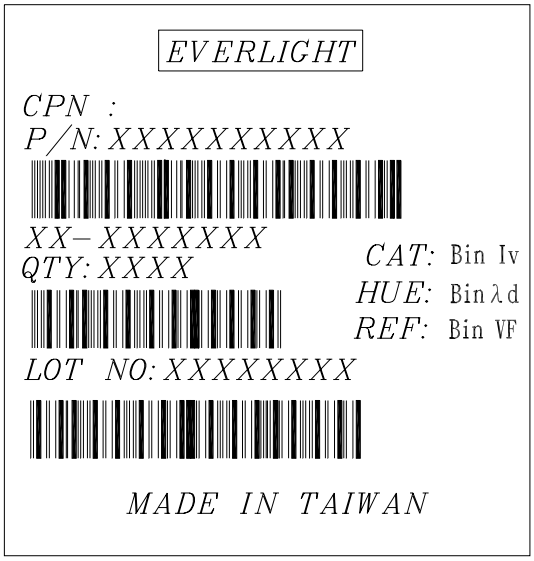


Label explanation

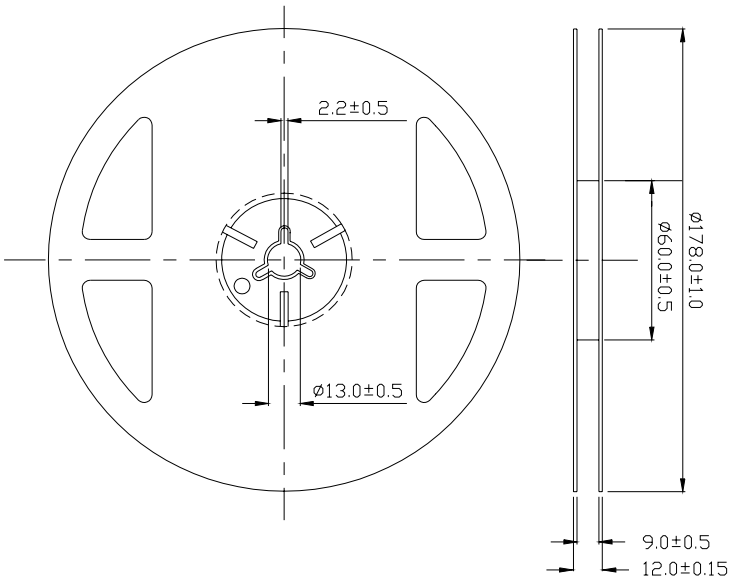
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank

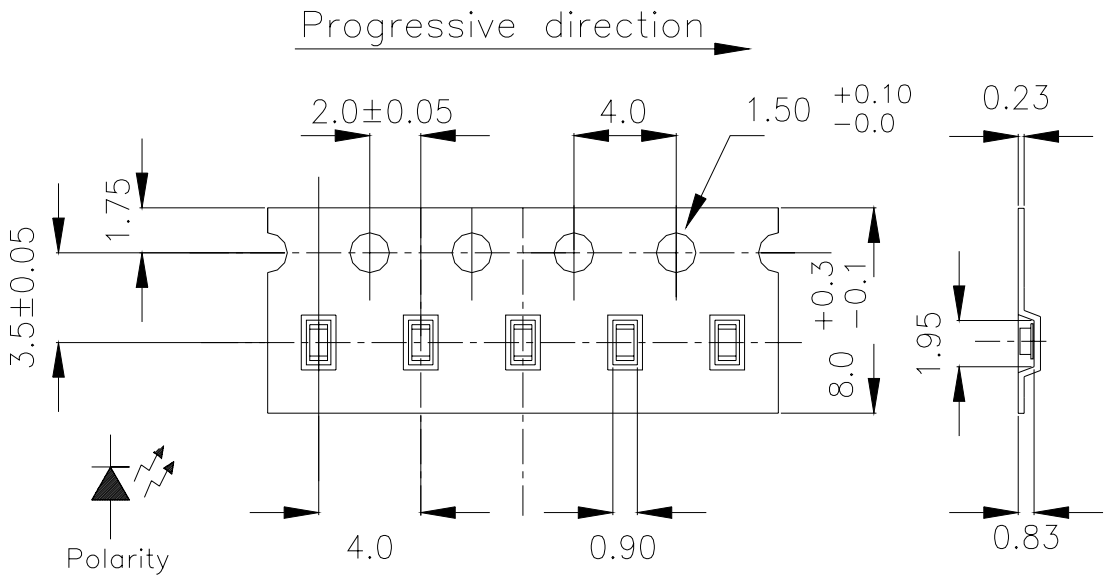


Reel Dimensions



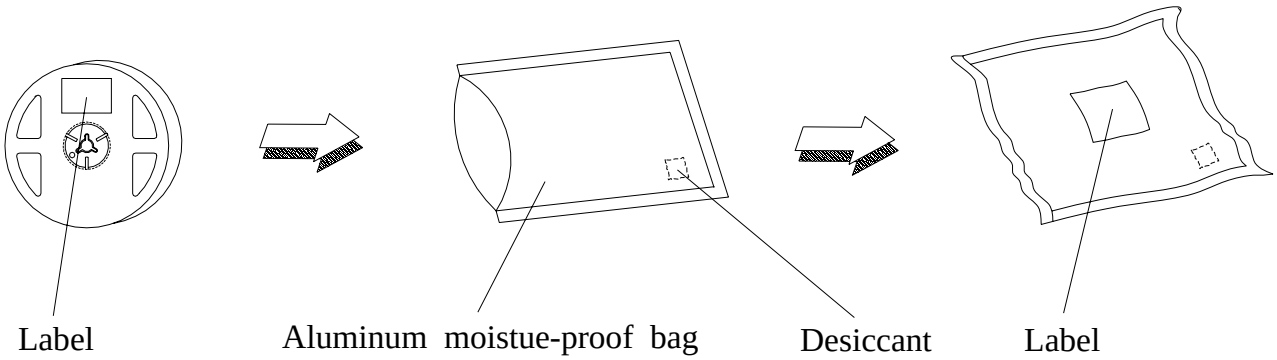
Note: The tolerances unless mentioned is ±0.1mm, Unit = mm

Carrier Tape Dimensions: Loaded quantity 3000 PCS per reel



Note: The tolerances unless mentioned is ±0.1mm, 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/Re
1	Reflow Soldering	Temp. : 260℃±5℃ 5 sec.	6 Min.	22 Pcs.	0/1
2	Temperature Cycle	H : +100℃ 15min ∫ 5 min L : -40℃ 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100℃ 5min ∫ 10 sec L : -10℃ 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100℃	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40℃	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I_F = 20 mA	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85℃/85%RH	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

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.

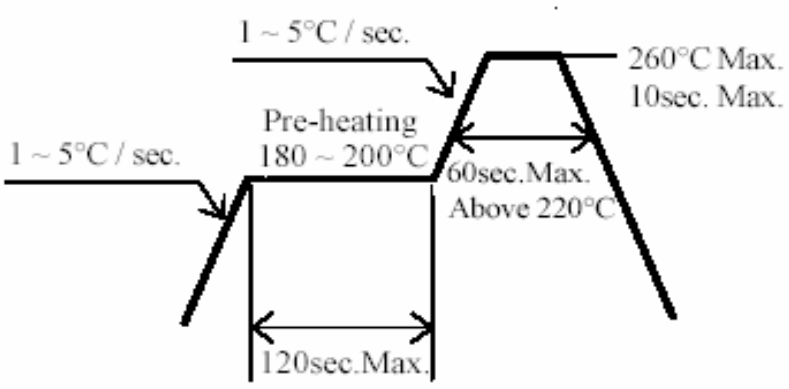
2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

2.6 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.

3. Soldering Condition

3.1Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

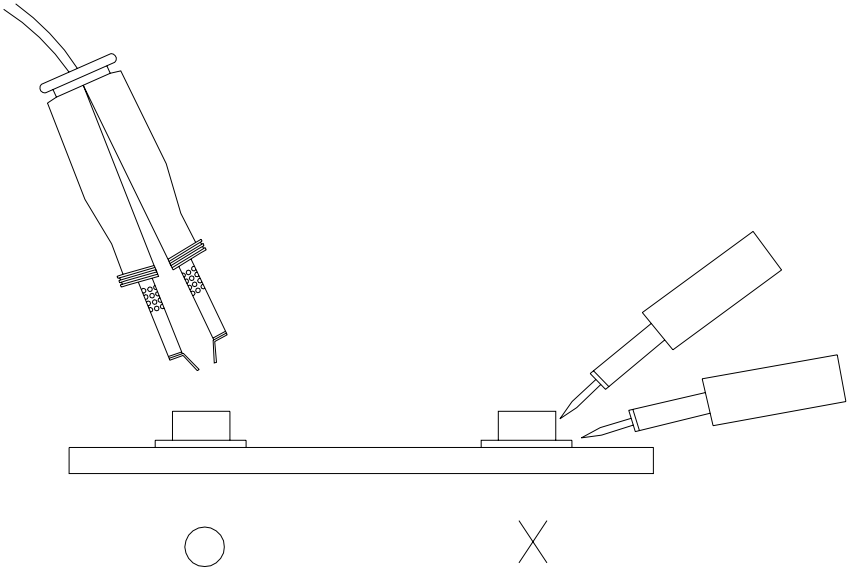
3.4 After soldering, do not warp the circuit board.

4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 280℃ 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.



EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C

Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
http://www.everlight.com