

Surface Mounted Chip LED

SP194USO

◆ Features :

- Compatible with automatic placement equipment
- Compatible with reflow solder process

◆ Applications :

- Automotive_Telecommunication
- Indicators
- LCD Back-lights
- Illuminations

Dice Material	Light Color	Lens Color
AlInGaP	Ultra High Amber	Water Clear

◆ Absolute Maximum Ratings

Item	Symbol	Maximum	Unit
Power dissipation	P _D	52	mW
Continuous forward current	I _{Fmax}	25	mA
Peak forward current (1/10 duty cycle 0.1ms pulse width)	I _{FP}	100	mA
Reverse voltage	V _R	5	V
Electrostatic Discharge (HBM)	ESD	2000	V
Operating temperature range	T _{opr}	-30 to +85	°C
Storage temperature range	T _{stg}	-40 to +100	°C

◆ Electrical/Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward voltage	V _F	I _F =5mA		1.9	2.1	V
		I _F =20mA		2.0	2.1	
Dominant wavelength	λ _d	I _F =5mA	600	605	610	nm
		I _F =20mA	600	605	610	
Viewing Angle	2θ _{1/2}	I _F =20mA	-	120	-	Deg
Luminous Intensity	I _v	I _F =5mA	28	45		mcd
		I _F =20mA	90	145		
Reverse Current	I _r	V _r =5V			10	uA

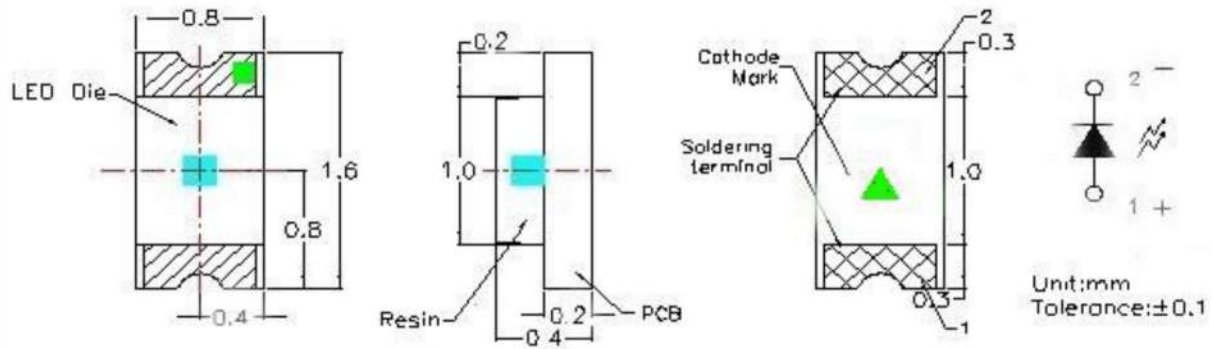
※ The measuring tolerance → Luminous intensity ±15%

X、Y ±0.01

APPROVER	DIMENSION NO:	VERSION: A1	DATE: 2013. 12. 12
	ISSUE:	CHECKER:	ENGINEER:

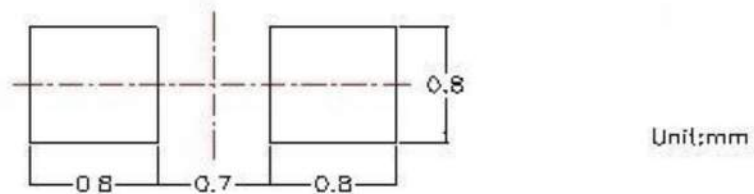
◆ Dimensions/Taping and Package Spec

● Package Dimensions of Device



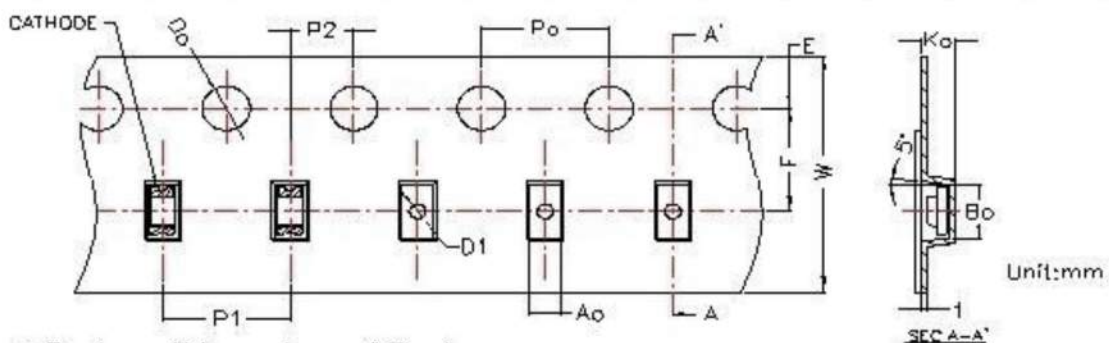
1. Soldering terminal may shift in x, y direction.

● Recommended Soldering Pad Dimensions

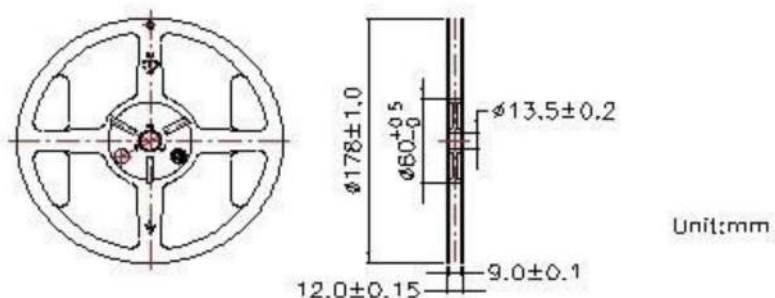


● Tape Specification : 4000pcs Per Reel

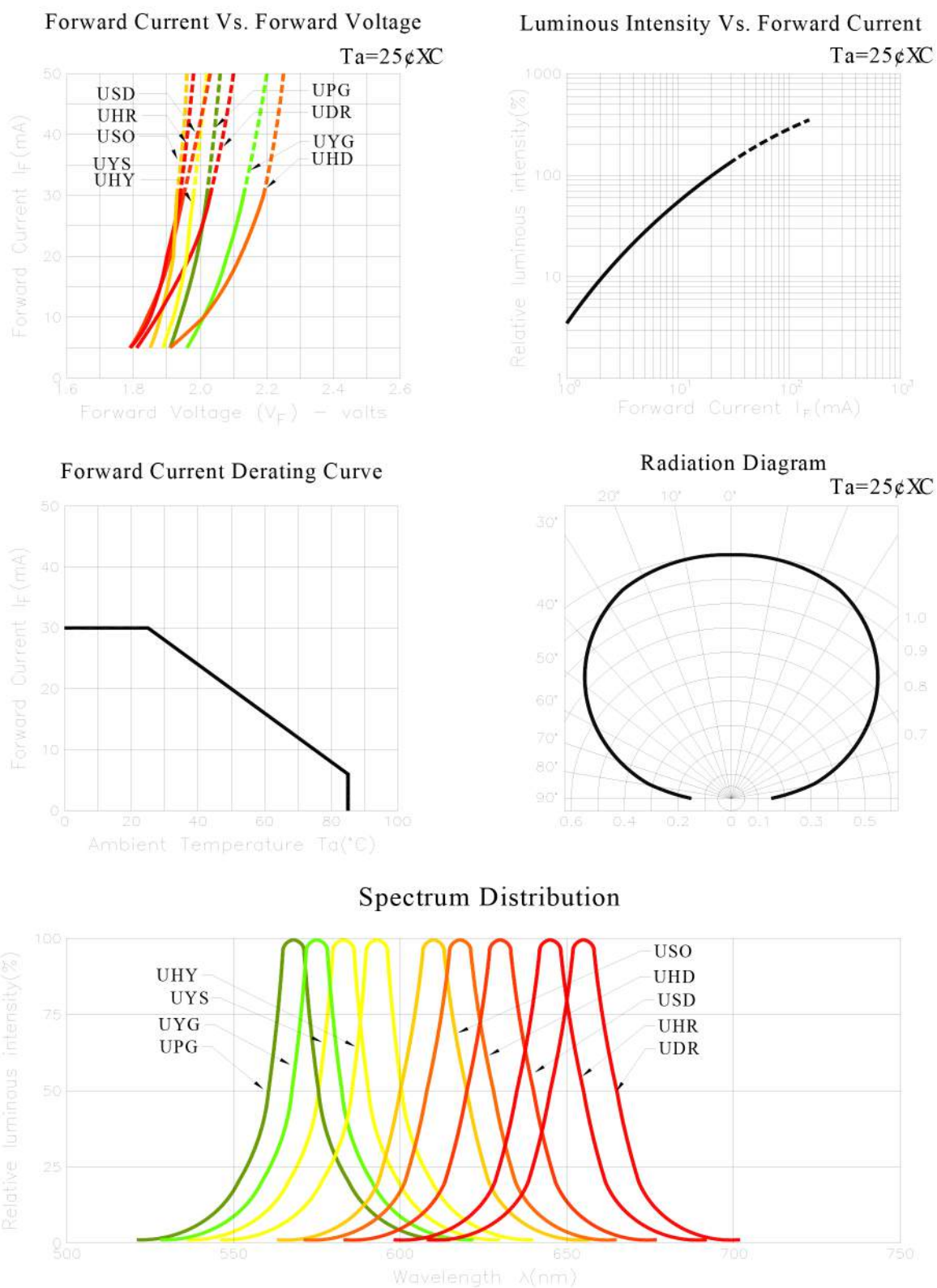
Packing Size													
Item	W	P1	E	F	Do	D1	Po	10Po	P2	Ao	Bo	Ko	t
Spec.	8.00	4.00	1.75	3.50	1.50	0.5	4.00	40.00	2.00	0.95	1.80	0.70	0.20
Tolerance	±0.20	±0.10	±0.10	±0.05	±0.10 -0.00	±0.05	±0.05	±0.20	±0.05	±0.10	±0.10	±0.10	±0.05



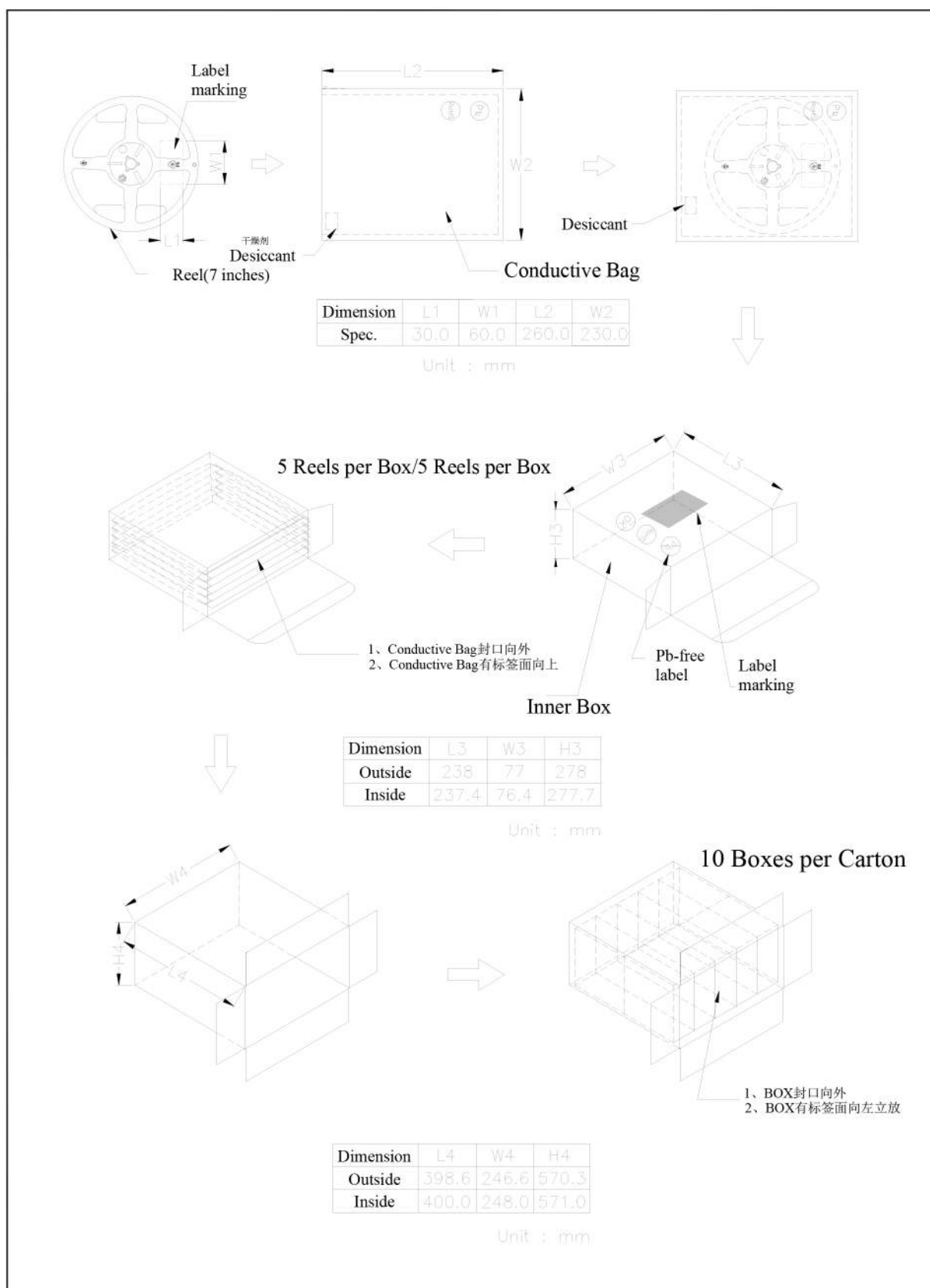
● Package Dimensions of Reel



◆ Typical Electro-Optical Characteristic Curves



◆ Packing and Shipping Instruction



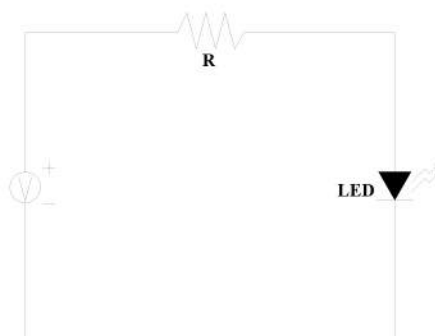
◆ Descriptions :

- The Chip-LED 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 application, etc.

◆ Reliability Test Items And Conditions :

No.	Item	Test Conditions	Test hr/cycle/time	Sample Q'ty	Ac / Re
1	Solder Heat	TEMP :260℃±5℃ ;10±1 sec	2 times	30 pcs	0 / 1
2	Solder ability Test ※	TEMP : 235℃±5℃ ; 3±1 sec	1 time	5 pcs	0 / 1
3	Temperature Cycle	H : +85℃ 30min. ∫ 5min. L : -40℃ 30min.	100 cycles	20 pcs	0 / 1
4	Thermal Shock	H : +85℃ 5min. ∫ L : -40℃ 5min.	50 cycles	20 pcs	0 / 1
5	High Temperature Storage	TEMP : 85℃	1000 hrs	20 pcs	0 / 1
6	Low Temperature Storage	TEMP : -40℃	1000 hrs	20 pcs	0 / 1
7	DC Operating Life	I _F = I _{Fmax}	1000 hrs	20 pcs	0 / 1
8	High Temperature High Humidity	85℃ / 90～95%R.H.	1000 hrs	20 pcs	0 / 1
9	Shocking test	100～2000Hz ; 98.1m/s ² X,Y,Z direction	2 hrs	20 pcs	0 / 1
10	Dropping test	Put on pallet ; height : 75cm	3 times	20 pcs	0 / 1
Judgment Criteria					
Forward Voltage V _F		V _F Max-Increase < 1.1x			
Reverse Current I _R		I _R Max-Increase < I _{Rmax}			
Luminous Intensity I _V		I _V Decay < 40%			
※Solder ability test criteria : coverage is not less than 95%					
Note : Measurement shall be taken after the tested samples have been returned to normal ambient conditions (generally after two hours)					

◆ Test Circuit

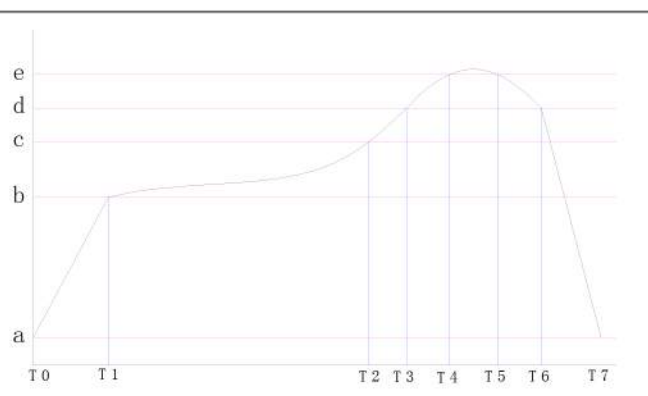


◆ Precautions For Use :

- Overdrive current proof
Customer must apply resistors for protection, otherwise slight voltage shift will cause current change with great deal. (Burn out will happen)
- Storage
 1. The operation of temperature and R.H. are : $5^{\circ}\text{C} \sim 30^{\circ}\text{C}$, 60%R.H. Max..
 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 desiccant. Considering the tape life, we suggest our customers to use our products within 1.5 year (from production date) .
 3. It's recommended to bake before soldering when the package is unsealed more than 72 hrs. The condition is : $60^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 15hrs.

◆ Reflow Temp/Time :

TEMP ($^{\circ}\text{C}$)		TIME (sec)	
a	25	T0~T1	$5^{\circ}\text{C}/\text{sec max}$
b	150	T1~T2	90~130
c	200	T2~T3	$5^{\circ}\text{C}/\text{sec max}$
d	230	T3~T6	60~90
e	260	T4~T5	10 ± 1
		T6~T7	$-6^{\circ}\text{C}/\text{sec max}$
MSL level		Level 1	



◆ Hand Soldering Iron :

- Temperature at tip of iron : 400°C Max. (35W Max.)
- Soldering time : $3 \pm 1\text{sec}$.

Model No : **SP194USO**

Luminous Intensity Bin Limits

BIN Code	Test Condition @20mA	
DNB	IVmin(mcd)	IVmax (mcd)
K1	72	90
K2	90	115
L1	115	145
L2	145	180

Dominant Wavelength BIN Limits

BIN Code	Test condition: @20mA	
DNB	λ_{dmin} (nm)	λ_{dmax} (nm)
1	600	603
2	603	606
3	606	609

Forward Voltage Bin Limits

BIN Code	Test condition: @20mA	
DNB	Vfmin(v)	Vfmax (v)
4	1.8	1.9
5	1.9	2.0
6	2.0	2.1