



BRIGHTTEK

BRIGHTTEK (EUROPE) LIMITED

Brighten up The World With LED!



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 080000 IECQ HSPM

PRODUCT DATASHEET



- ▶ PLCC2
- ▶ K1 Series
- ▶ Natural White (4500K)

NOW09S23 (Tube)
NOW09S23RL (Reel)



Release Date: 06 June 2014 Version: A1.0



K1 Series

K1 3W Series

**RoHS
Compliant**



FEATURES:

- **Package:** PLCC White SMT Package
- **Forward Current:** 700mA
- **Forward Voltage (typ.):** 3.2V
- **Luminous Flux (typ.):** 170lm @700mA
- **Colour:** Natural White
- **CCT:** 4500K
- **Viewing angle:** 120°
- **Materials:**
 - Die: InGaN
 - Resin: Silicon (Water Clear)
- **Operating Temperature:** -30~+100°C
- **Storage Temperature:** -40~+120°C
- **Grouping parameters:**
 - Forward voltage
 - Luminous flux
 - CIE Chromaticity
- **Soldering methods:** Reflow soldering
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 2000pcs/carton (40 tubes); 50pcs/tube
24mm tape with 1000pcs/reel, ø330mm (13")

APPLICATIONS:

- General Lighting
- Commercial Lighting
- Residential Lighting
- Architectural Lighting
- Flash Lighting
- Reading Lights

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	700	mA
Peak Forward Current Duty 1/10@10KHz	I_{FP}	800	mA
Operating Temperature	T_{OPR}	-30~+100	°C
Storage Temperature	T_{STG}	-40~+120	°C
Junction Temperature	T_j	110	°C
Temperature Coefficient of VF	$\Delta V_F / \Delta T_j$	-2	mV/°C
Thermal Resistance Junction to Lead	$T_{junction-lead}$	12	°C/W

1. Not suitable to be driven in reverse bias.

Electrical & Optical Characteristics (Ta=25°C)

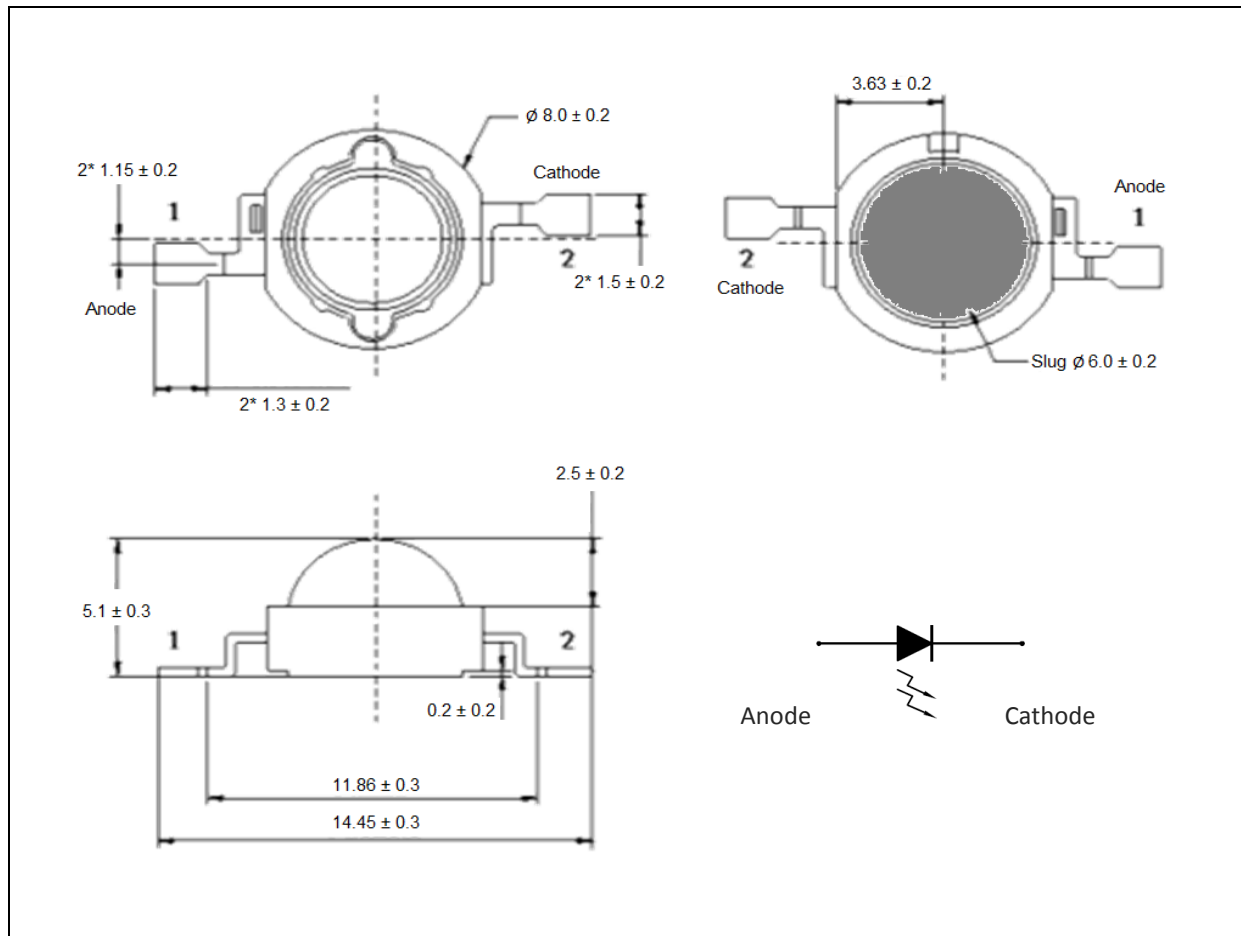
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.8	3.2	3.6	V	$I_F=700mA$
Luminous Flux	Φ_v	130	170	---	lm	$I_F=700mA$
Chromaticity Coordinates	X	0.3440	---	0.4020	---	$I_F=700mA$
	Y	0.3310	---	0.4230		
Colour Temperature	CCT	3800	4500	5000	K	$I_F=700mA$
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	$I_F=700mA$

2. Luminous intensity (I_v) $\pm 15\%$, Forward Voltage (V_F) $\pm 0.1V$, Viewing angle($2\theta_{1/2}$) $\pm 5\%$
3. IS standard testing



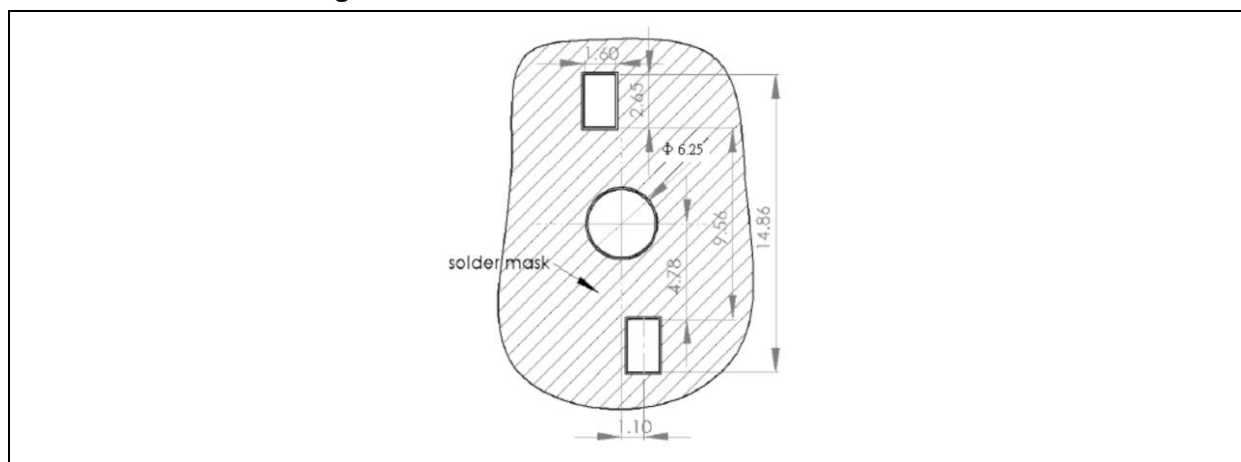
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance ±0.1mm with angle tolerance ±0.5°.

BINNING GROUPS:

Forward Voltage Classifications ($I_F = 700\text{mA}$):

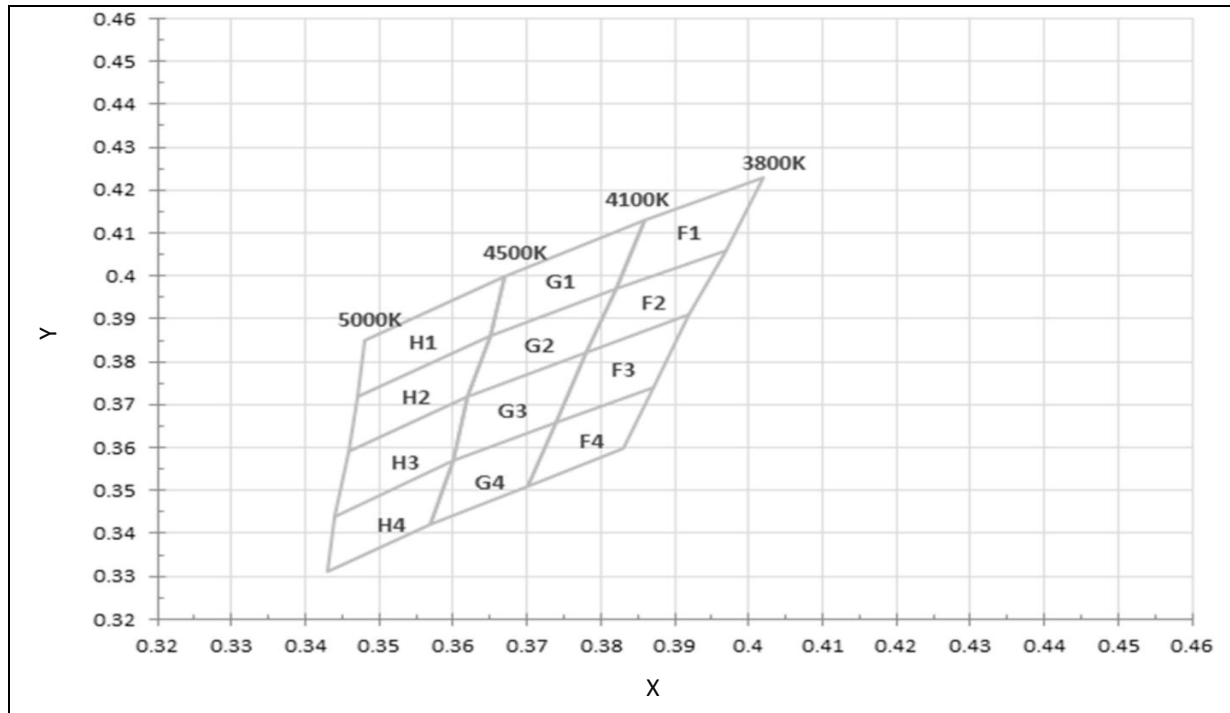
Code	Min.	Max.	Unit
1	2.8	2.9	V
2	2.9	3.0	
3	3.0	3.1	
4	3.1	3.2	
5	3.2	3.3	
6	3.3	3.4	
7	3.4	3.5	
8	3.5	3.6	

Luminous Flux Classifications ($I_F = 700\text{mA}$):

Code	Min.	Max.	Unit
36	130	140	lm
37	140	150	
38	150	160	
39	160	170	
40	170	180	
41	180	190	
42	190	200	
43	200	210	



CIE CHROMATICITY DIAGRAM:



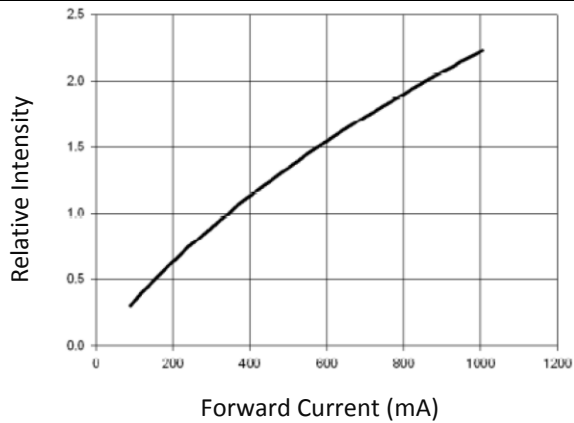
Chromaticity Coordinates Classifications ($I_F = 700\text{mA}$):

	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
H1	0.3650	0.3860	0.3670	0.4000	0.3480	0.3850	0.3470	0.3720
H2	0.3650	0.3860	0.3620	0.3720	0.3460	0.3590	0.3470	0.3720
H3	0.3620	0.3720	0.3600	0.3570	0.3440	0.3440	0.3460	0.3590
H4	0.3600	0.3570	0.3570	0.3420	0.3430	0.3310	0.3440	0.3440
G1	0.3860	0.4130	0.3820	0.3970	0.3650	0.3860	0.3670	0.4000
G2	0.3820	0.3970	0.3780	0.3820	0.3620	0.3720	0.3650	0.3860
G3	0.3780	0.3820	0.3740	0.3660	0.3600	0.3570	0.3620	0.3720
G4	0.3740	0.3660	0.3700	0.3510	0.3570	0.3420	0.3600	0.3570
F1	0.4020	0.4230	0.3970	0.4060	0.3820	0.3970	0.3860	0.4130
F2	0.3970	0.4060	0.3920	0.3910	0.3780	0.3820	0.3820	0.3970
F3	0.3920	0.3910	0.3870	0.3740	0.3740	0.3660	0.3780	0.3820
F4	0.3870	0.3740	0.3830	0.3600	0.3700	0.3510	0.3740	0.3660

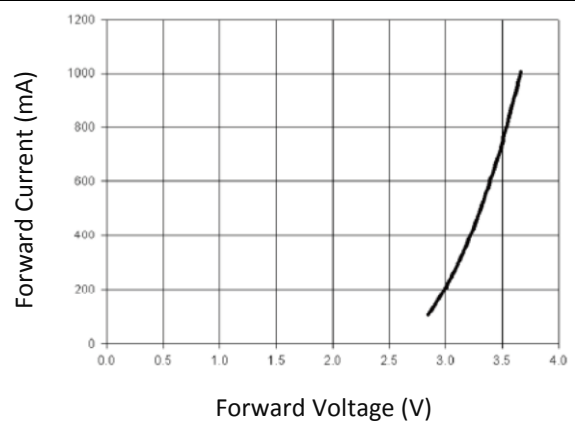


ELECTRO-OPTICAL CHARACTERISTICS:

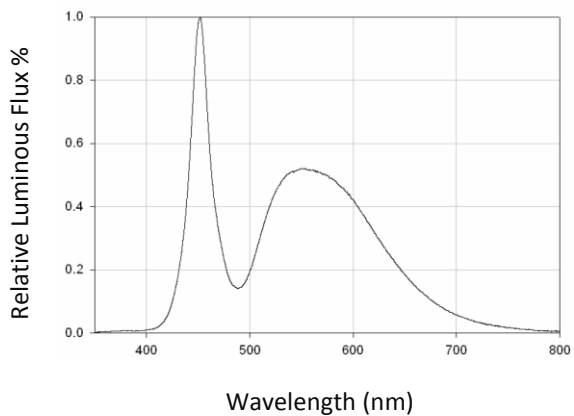
Relative Intensity v.s. Forward Current



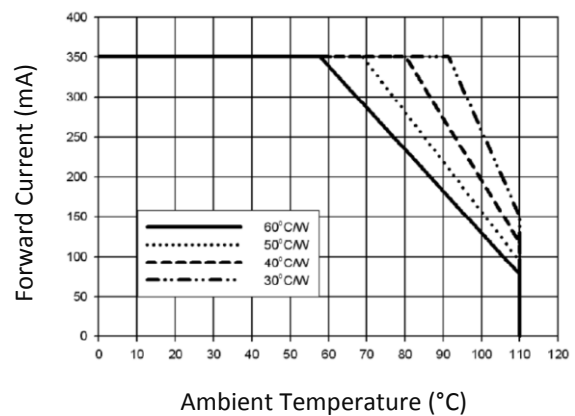
Forward Current v.s. Forward Voltage



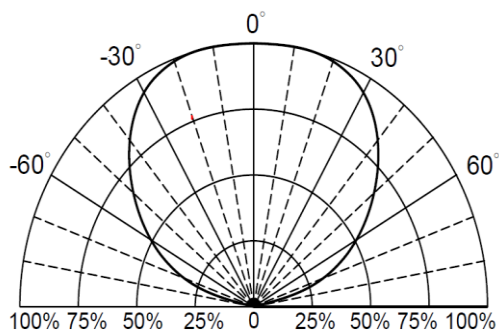
Luminous Spectrum



Current Derating Curves



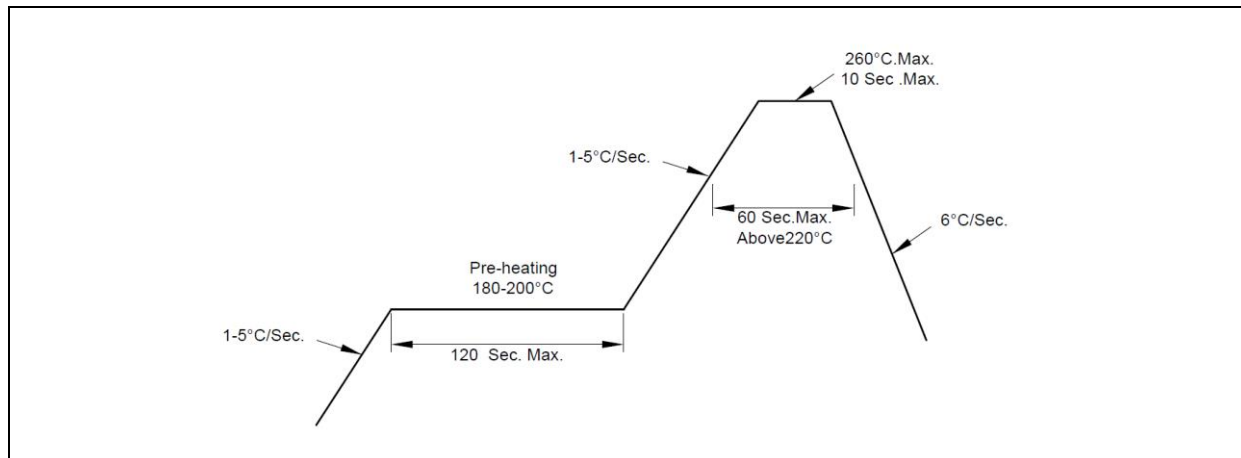
Directive Radiation





RECOMMENDED SOLDERING PROFILE:

Lead-free Solder:



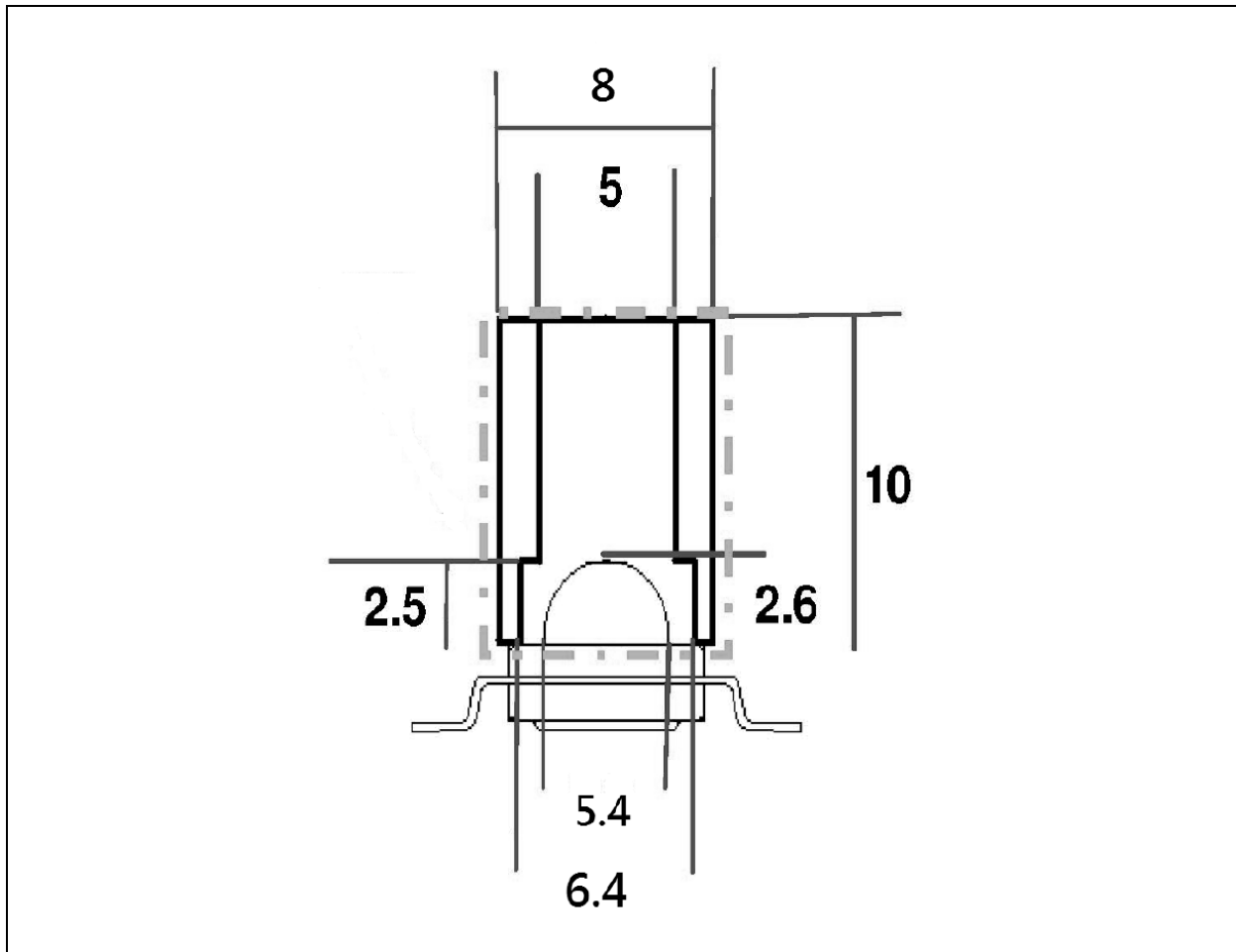
Note:

1. Maximum reflow soldering: 1 time.
2. Before, during, and after soldering, should not apply stress on the components and PCB board.



RECOMMENDED NOZZLE FOR SMT:

Recommended Pick & Place Nozzle:



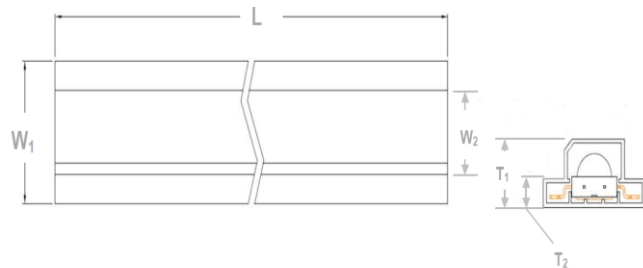
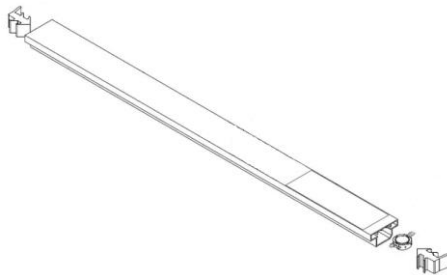
1. All dimensions are in millimetre (mm).
2. Tolerance $\pm 0.1\text{mm}$, unless otherwise noted.

PACKING SPECIFICATION:

Reel Dimension:

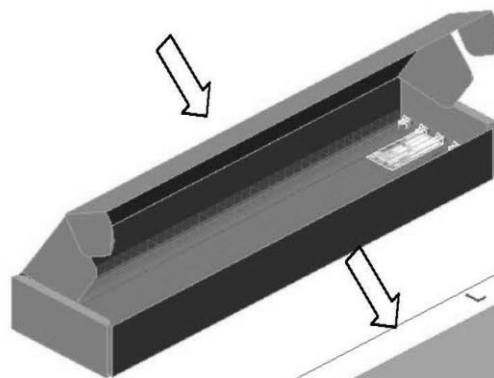
N0W09S23

2000pcs/carton (40 tubes); 50pcs/tube



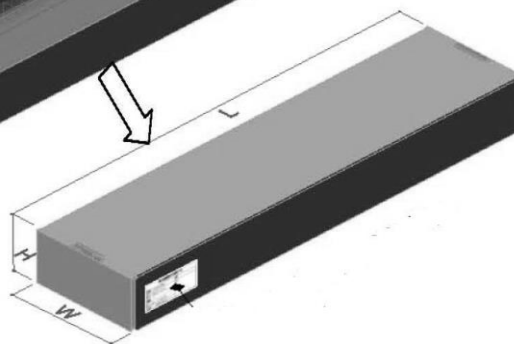
Unit(mm)

W ₁	W ₂	T ₁	T ₂	L
16.5	9.7	7.9	3.3	420



Inner Box: Dimension(mm)

L	W	H
480	271	172



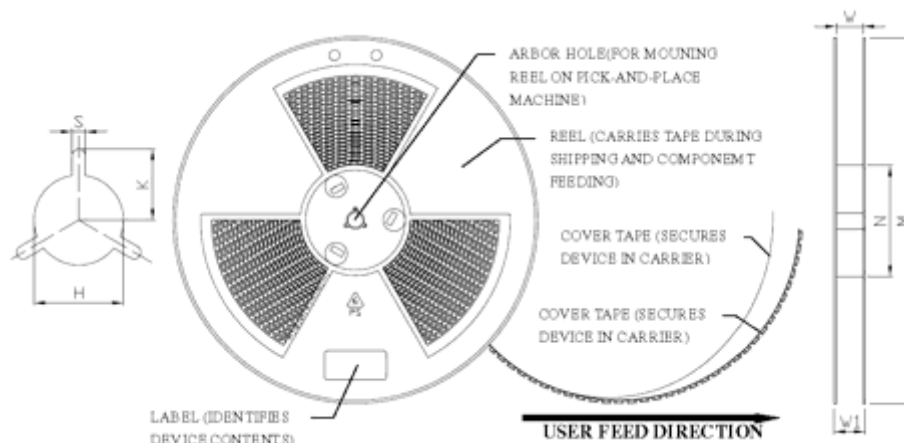


PACKING SPECIFICATION:

Reel Dimension:

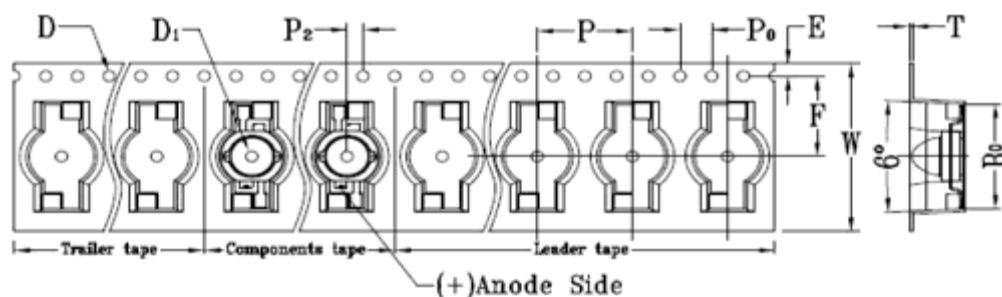
N0W09S23RL

1000pcs/reel



Unit: mm

M	N	W	W1	H	K	S
Φ330.0	Φ99.5	24.4	29	Φ13.5	10.75	2.5
±1.0	±1.0	±1.0	±1.0	±0.5	±0.5	±0.5



Unit: mm

W	P	E	F	P ₂	D	D ₁	P ₀	A ₀	B ₀	K ₀	T
24.0	12.0	1.75	11.5	2.0	1.5	1.5	4.0	8.2	15.0	6.7	0.4
±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.25	±0.1	±0.1	±0.1	±0.1	±0.05

PRECAUTIONS OF USE:

Storage:

It is recommended to store the products in the following conditions:

- Humidity: 60% R.H. Max.
- Temperature: 5°C~30°C (41°F ~86°F).

Shelf life in sealed bag: 12 month at 5°C~30°C and <60% R.H.

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 and apply baking at 60°C±5°C for 15hrs before use.

Baking:

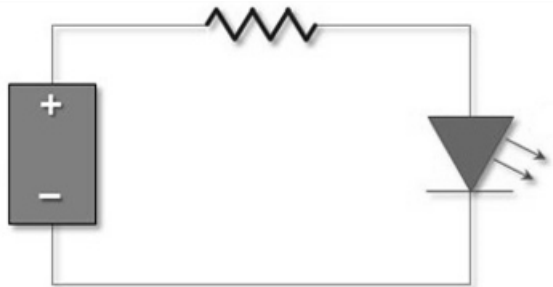
It is recommended to bake the LED before soldering if the pack has been unsealed for longer than 24hrs.

The suggested baking conditions are as followings:

- 70±3°C x 24hrs and <5%RH, taped / reel package.
- 100±3°C x 2hrs, bulk (loose) package.
- 130±3°C x 30min, bulk (loose) package.

It's normal to see slight color fading of carrier (light yellow) after baking in process.

Testing Circuit:



Must apply resistor(s) for protection (over current proof).

Cleaning:

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED carrier / package. Avoid putting any stress force directly on to the LED lens.

ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling the LED all time. All devices, equipment, machinery, work tables, and storage racks must be properly grounded.

In the events of manual working in process, make sure the devices are well protected from ESD at any time.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	06/06/2014	Datasheet set-up.