BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

- ► PLCC2 SMD
- ► 4014 0.65t
- ► Natural White 4000K

Release Date: 01 February 2023 Version: A1.0

N0W64S14

4014 EMC Series

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RoHS Compliant

FEATURES:

- **Package:** Top View PLCC2 White Package
- **Forward Current:** 60mA
- **Forward Voltage (typ.):** 2.8V
- **Luminous Flux (typ.):** 27lm@60mA
- **Colour:** Natural White
- **Colour Temperature (CCT):** 4000K
- **Viewing angle:** 120°
- **Materials:**
  - Die: InGaN
  - Resin: Silicon (Yellow Diffused)
  - Package: PLCC
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+85°C
- **Electrostatics Discharge:** 1000V
- **Grouping parameters:**
  - Forward Voltage
  - Luminous Flux
  - CIE Chromaticity
- **Soldering methods:** Reflow Soldering
- **MSL Level:** MSL3 according to J-STD020
- **Packing:** 12mm tape with max.4000/reel, ø178mm (7'')

APPLICATIONS:

- General Lighting
- Portable Lighting
- Commercial Lighting
- Indoor Lighting
- Backlight for LCD

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	90	mA
Pulse Forward Current (Duty 1/10, width≤100μS)	I_{PF}	120	mA
Power Dissipation	P_D	270	mW
Reverse Voltage	V_R	5	V
Reverse Current @10V	I_R	10	μA
Junction Temperature	T_j	105	°C
Electrostatic Discharge	ESD	1000	V
Thermal Resistance (Junction to Solder Point)	R_{THJS}	16	°C/W
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+85	°C
Soldering Temperature	T_{SOL}	245 for 10S	°C
Colour Rendering Index	CRI	90	---

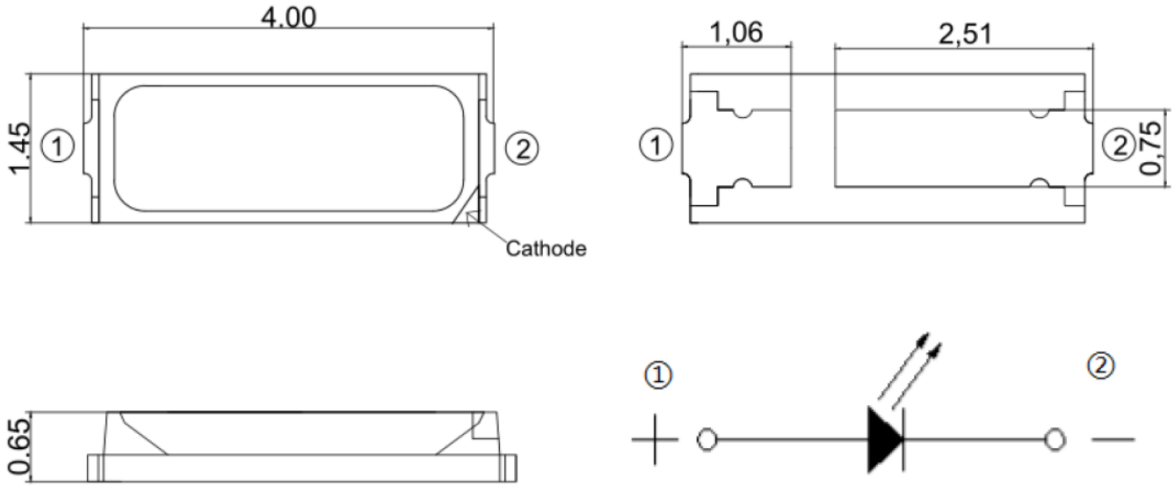
Electrical & Optical Characteristics (Ta=25°C, RH=60%)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.6	2.8	3.0	V	I_F=60mA
Luminous Flux	Φ_V	24	27	30	lm	I_F=60mA
Chromaticity Coordinates	X	---	0.3825	---	---	I_F=60mA
	Y	---	0.3798	---		
Colour Temperature	CCT	---	4000	---	K	I_F=60mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=60mA

1. Luminous flux (Φ_V) ±10%, Forward Voltage (V_F) ±0.1V, CRI ±2

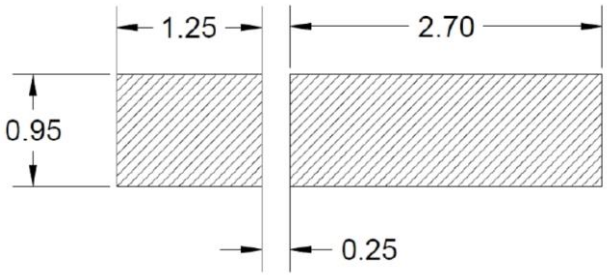
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad

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

BINNING GROUPS:

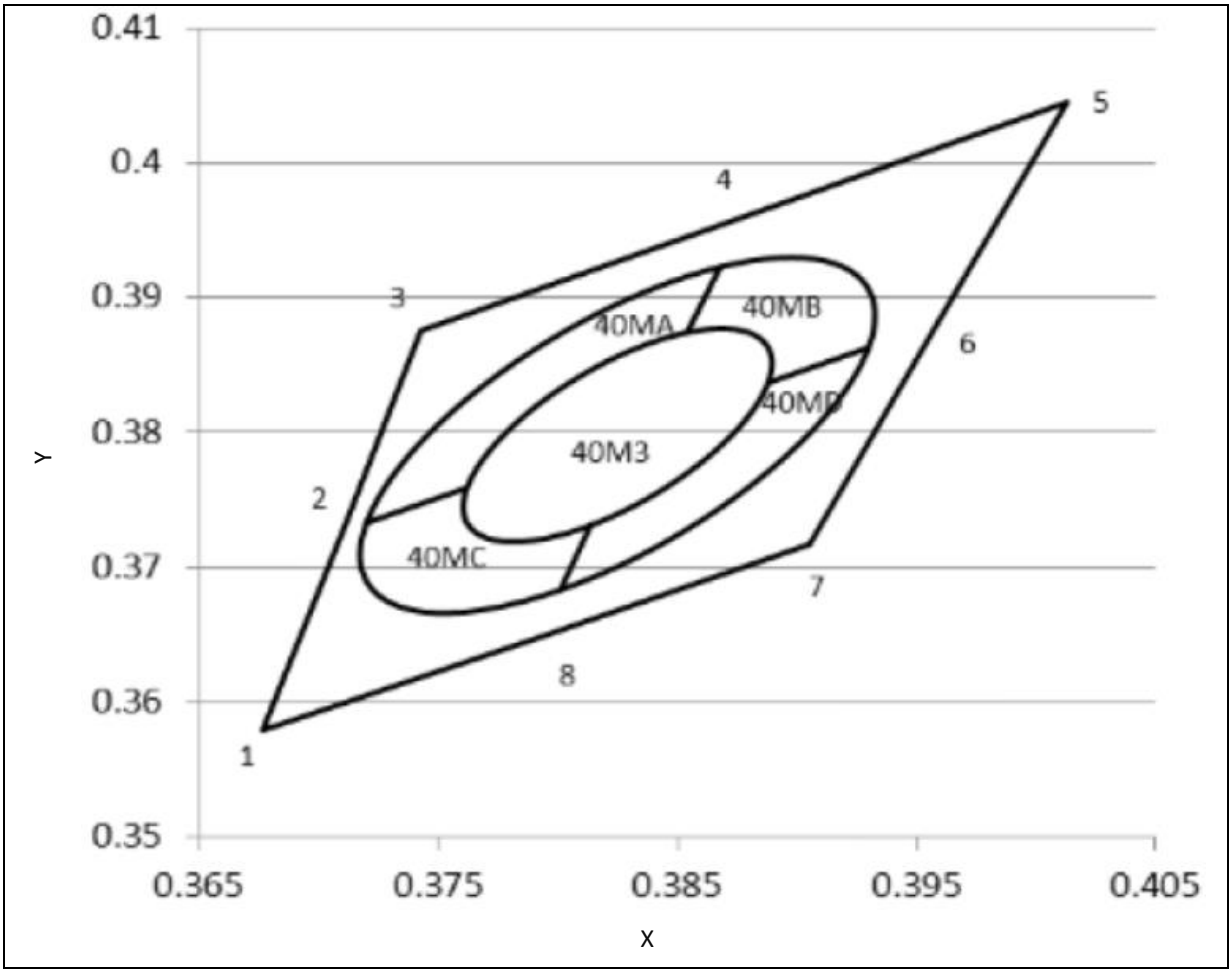
Forward Voltage Classifications (I_F = 60mA):

Code	Min.	Max.	Unit
Z1	2.6	2.7	V
A1	2.7	2.8	
B1	2.8	2.9	
C1	2.9	3.0	

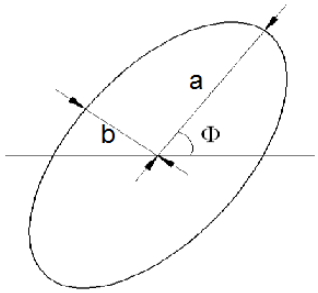
Luminous Flux Classifications (I_F = 60mA):

Code	Min.	Max.	Unit
D5	24	26	lm
D6	26	28	
D7	28	30	

CIE CHROMATICITY DIAGRAM:



Chromaticity Coordinates Classifications (I_F = 60mA):

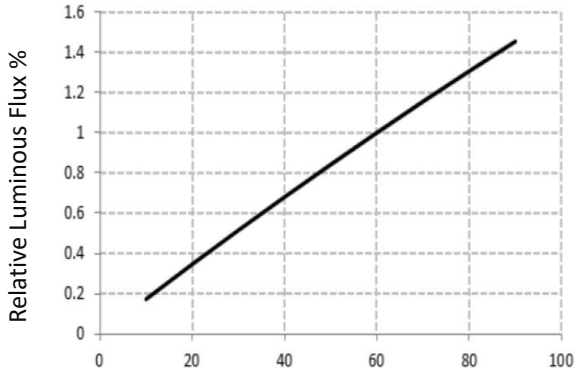


Code	Centre		Radius		Angle
	X	Y	a	b	Φ
40M5	0.3825	0.3798	0.003130	0.001340	53.43

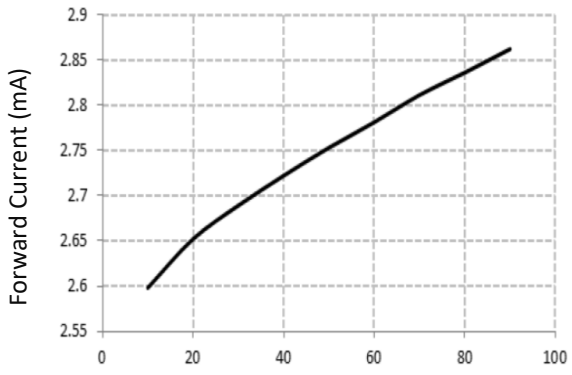
	1		3		5		7	
	X	Y	X	Y	X	Y	X	Y
4000K	0.3677	0.3579	0.3743	0.3874	0.4013	0.4045	0.3905	0.3717

ELECTRO-OPTICAL CHARACTERISTICS:

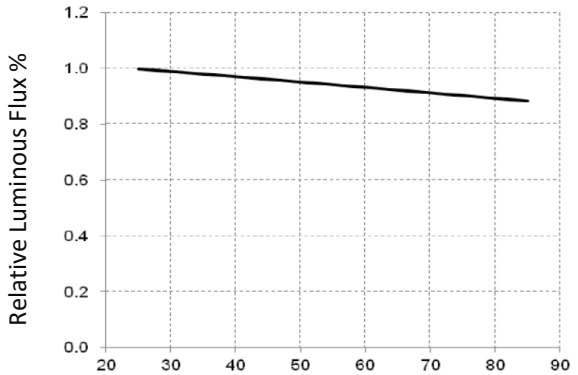
Relative Luminous Flux v.s. Forward Current



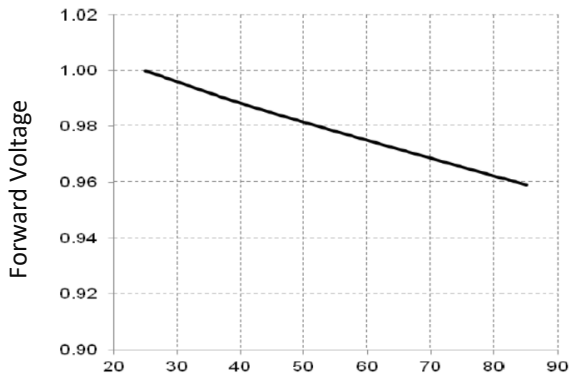
Forward Current v.s. Forward Voltage



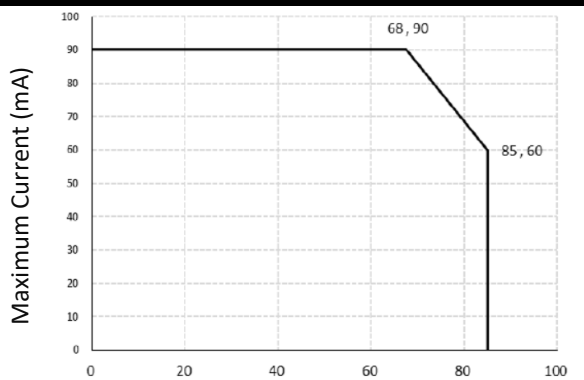
Relative Luminous Flux v.s. Soldering Temp.



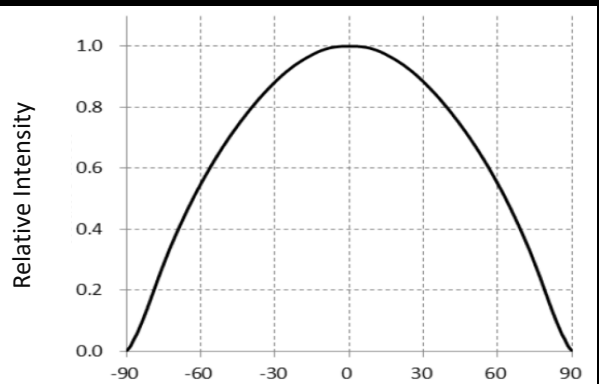
Forward Voltage v.s. Soldering Temp.



Forward Current Derating Curve

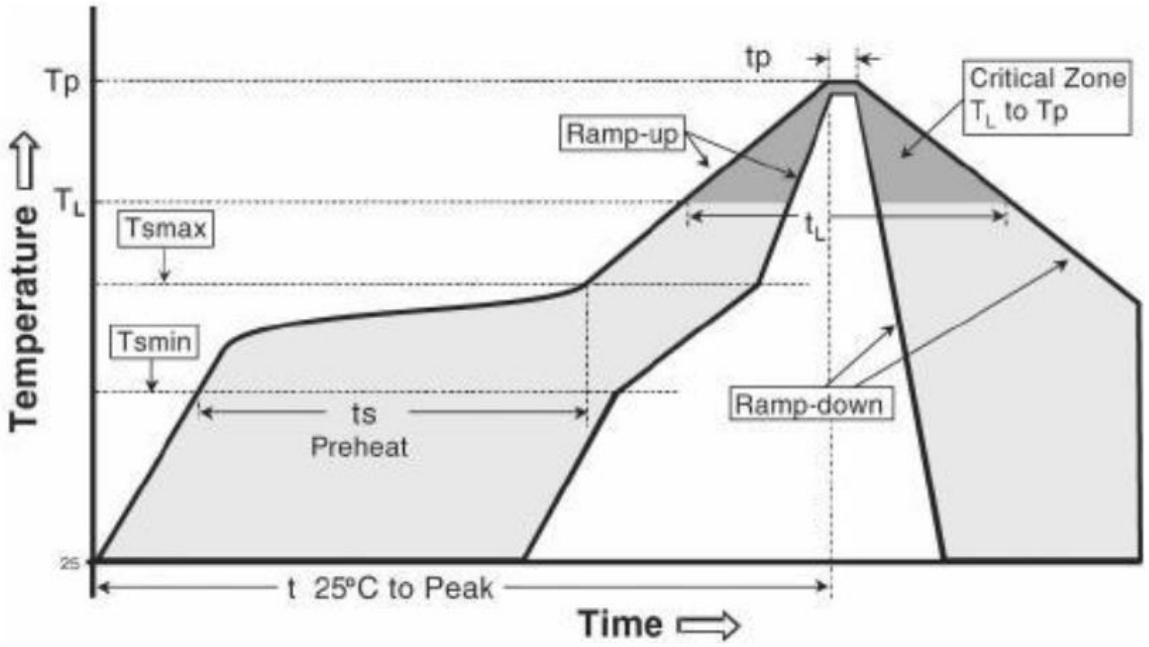


Directive Radiation



RECOMMENDED SOLDERING PROFILE:

Reflow Lead-free Solder:



Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Period from T_{smin} to T_{smax}	60-120 seconds
Ramp-up Rate (T_L to T_P)	Max. 3°C/second
Liquidous Temperature (T_L)	217°C
Time Maintained above T_L	60-150 seconds
Peak Package Temperature (T_P)	Max. 245°C
Time within 5°C of the Specified Classification Temperature T_C	Max. 30 seconds
Ramp-down Rate (T_P to T_L)	Max. 6°C/second
Time from 25°C to Peak Temperature	Max. 8 mins

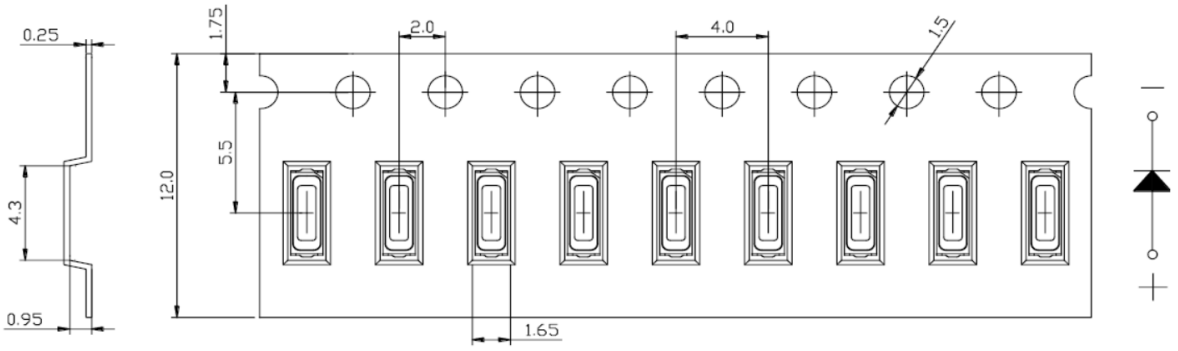
Note:

1. Maximum reflow soldering: 2 times.
2. Before, during, and after soldering, should not apply stress on the components and PCB board.
3. Recommended soldering temperature: 230°C. The maximum soldering temperature should be limited to 245°C for max. 10seconds.

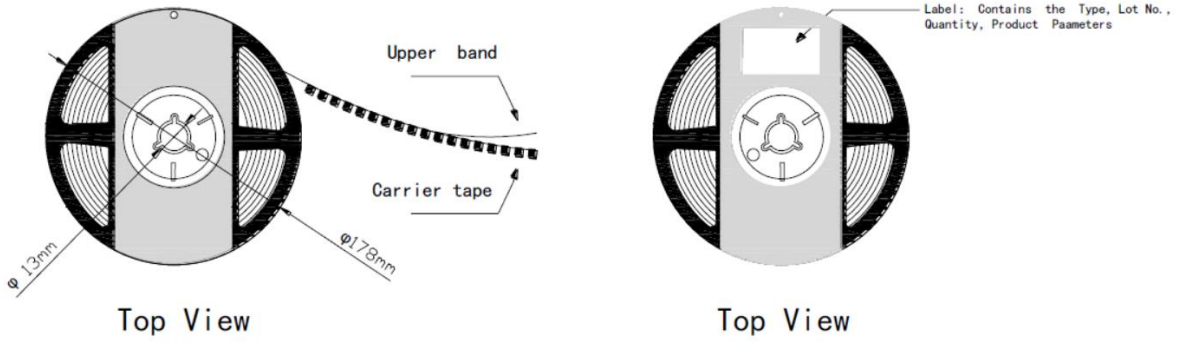
PACKING SPECIFICATION:

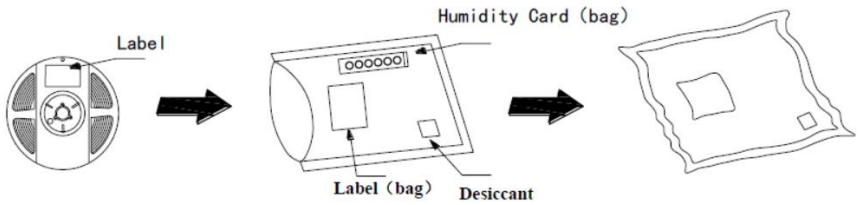
Reel Dimension:

Max.4000pcs/reel



1. Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ±0.2mm
2. Adhesion Strength of Cover Tape Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10˚ to the carrier tape.





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 months 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 descanting agent <10% R.H. and apply baking before use.

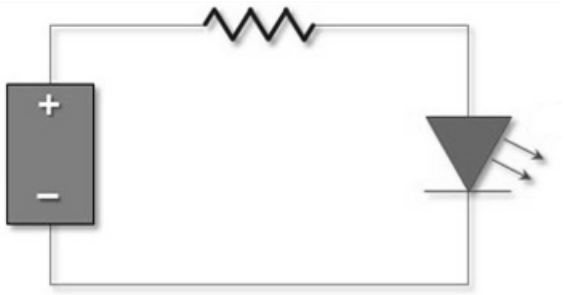
Baking:

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:

- 60±3°C x 24hrs and <5%RH, taped / reel 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-electrosatic glove is recommended when handing 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	01/02/2023	Datasheet set-up.