BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED!

PRODUCT DATASHEET

- ► Ceramic High Power
- ► 5050 1.2t Series
- ► Cool White / Red / Green / Blue

Release Date: 27 February 2019 Version: A1.2

N0M45S20

5050 1.2t Series

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RoHS Compliant

FEATURES (White/Red/Green/Blue*):

- **Package:** Ceramic SMT Package with Silicon Lens
- **Forward Current:** 350/350/350/350mA
- **Forward Voltage (typ.):** 3.0/2.1/3.0/3.0V
- **Luminous Flux (typ.):** 100/60/140/30lm@350mA
- **Colour:** Cool White/Red/Green/Blue
- **CCT/Wavelength:** 6800K/622/527/460nm
- **Viewing angle:** 140/140/140/140°
- **Materials:**
  - Die: InGaN/AlGaInP/InGaN/InGaN
  - Resin: Silicon (Water Clear)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+105°C
- **ESD:** 1000V
- **Grouping parameters:**
  - Forward voltage
  - Luminous flux
  - CCT/Wavelength
- **Soldering methods:** Reflow soldering
- **Preconditioning:** MSL 3 according to J-STD020
- **Packing:** 12mm tape Max.500pcs/reel, ø180mm (7'')

APPLICATIONS:

- Decoration Lighting
- Wall Washer
- Spot Light
- Outdoor Lighting
- Mini Projector

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Maximum Forward Current	I_{MAX}	700	mA
Pulse Current W≤100μS Duty≤1/10	I_{FP}	1000	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Power Dissipation	P_D	2380/1820/2380/2380	mW
Electrostatic Discharge (HBM)	ESD	1000	V
Thermal Resistance	R_{TH}	4.5/5.0/4.5/4.5*	°C/W
Soldering Temperature	T_{sol}	230 or 260 (for 10S)	°C
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+105	°C

1. * In the order of White/Red/Green/Blue.

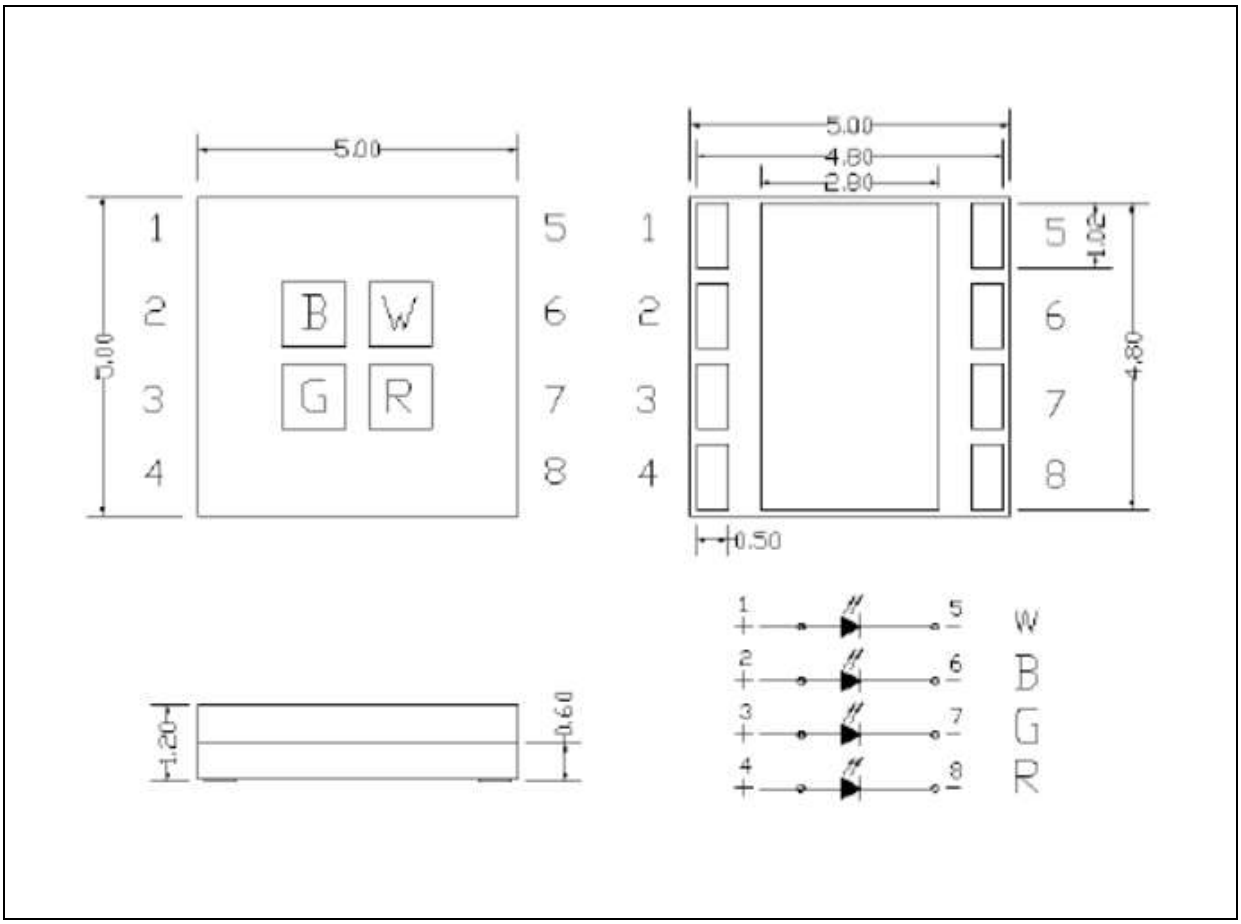
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
White - Forward Voltage	V_F	2.6	---	3.4	V	I_F=350mA
White - Luminous Flux	Φ_V	90	---	110	lm	I_F=350mA
White – Colour Temperature	CCT	---	6800	---	K	I_F=350mA
Red - Forward Voltage	V_F	1.6	---	2.6	V	I_F=350mA
Red - Luminous Flux	Φ_V	50	---	70	lm	I_F=350mA
Red - Wavelength	W_P	620	625	630	nm	I_F=350mA
Green - Forward Voltage	V_F	2.6	---	3.4	V	I_F=350mA
Green - Luminous Flux	Φ_V	130	---	150	lm	I_F=350mA
Green - Wavelength	W_P	520	525	530	nm	I_F=350mA
Blue - Forward Voltage	V_F	2.6	---	3.4	V	I_F=350mA
Blue - Luminous Flux	Φ_V	20	---	40	lm	I_F=350mA
Blue - Wavelength	W_P	450	460	470	nm	I_F=350mA
Viewing Angle	$2\theta_{1/2}$	---	140	---	deg	I_F=350mA

1. Luminous intensity (I_V) ±5%, Forward Voltage (V_F) ±0.1V

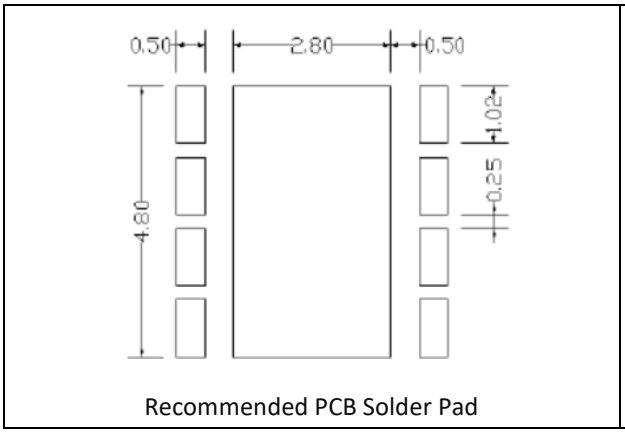
OUTLINE DIMENSION:

Package Dimension:

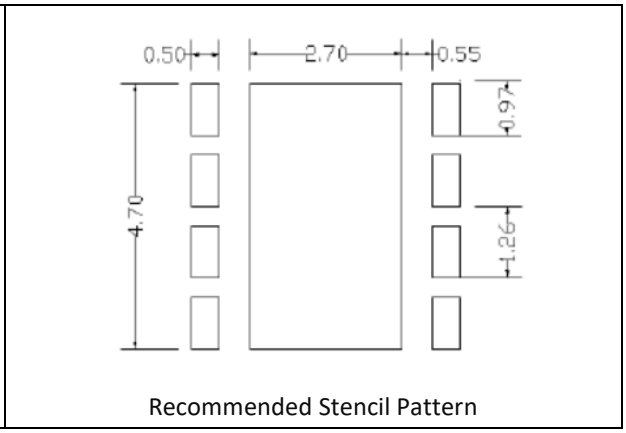


1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad



Recommended Stencil Pattern

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

BINNING GROUPS:

Forward Voltage Classifications (I_F = 350mA):

Code		Min.	Max.	Unit
VA	W	2.6	3.4	V
	R	1.6	2.6	
	G	2.6	3.4	
	B	2.6	3.4	

Wavelength Classifications (I_F = 350mA):

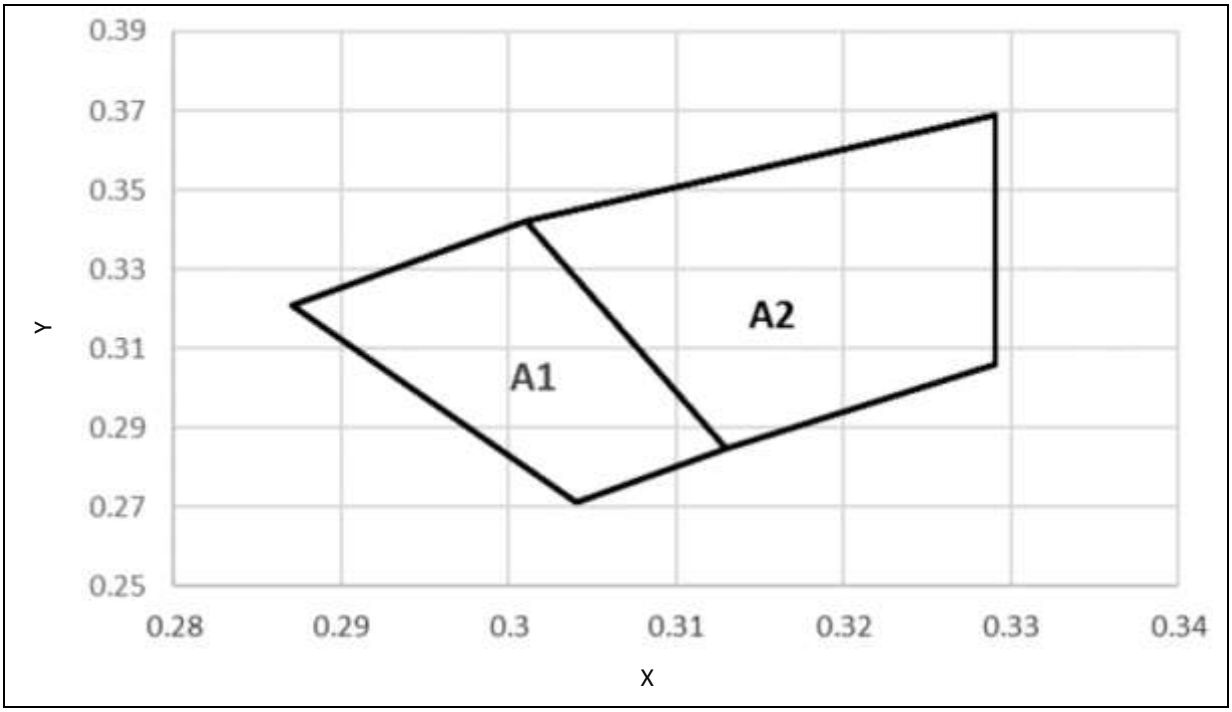
Code		Min.	Max.	Unit
Red	RB2	615	620	nm
	RC1	620	625	
	RC2	625	630	
Green	GC3	520	522.5	nm
	GC4	522.5	525	
	GC5	525	527.5	
	GC6	527.5	530	
	GC7	530	532.5	
	GC8	532.5	535	
Blue	BB3	450	452.5	nm
	BB4	452.5	455	
	BB5	455	457.5	
	BB6	457.5	460	
	BC3	460	462.5	
	BC4	462.5	465	
	BC5	465	467.5	
	BC6	467.5	470	

BINNING GROUPS:

Forward Voltage Classifications (I_F = 350mA):

Code		Min.	Max.	Unit
White	EE2	90	100	lm
	EF1	100	110	
Red	EC2	50	60	lm
	ED1	60	70	
Green	EG2	130	140	lm
	EH1	140	150	
Blue	EB1	20	30	lm
	EB2	30	40	

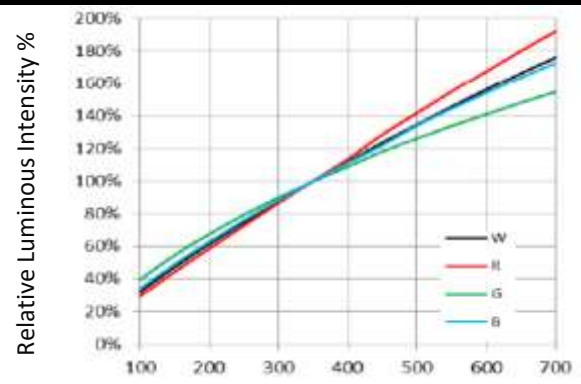
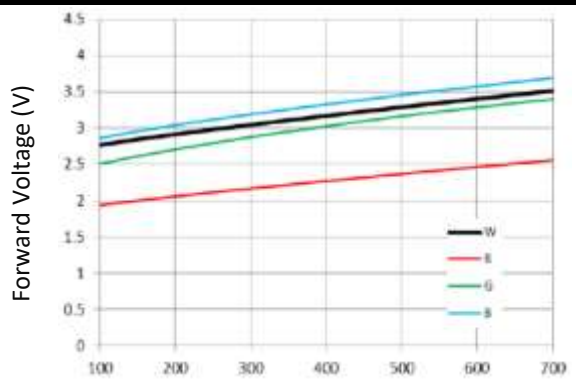
CIE CHROMATICITY DIAGRAM:

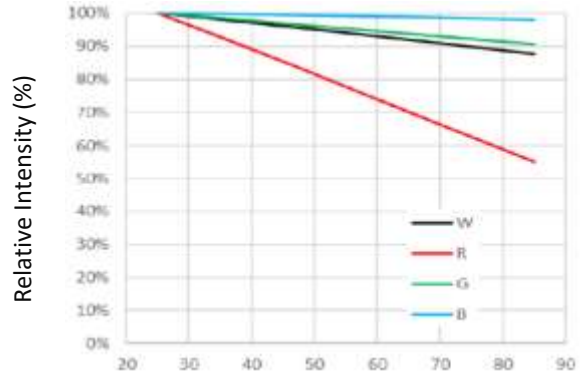
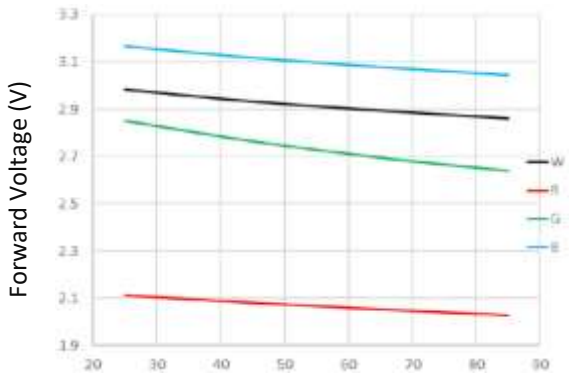


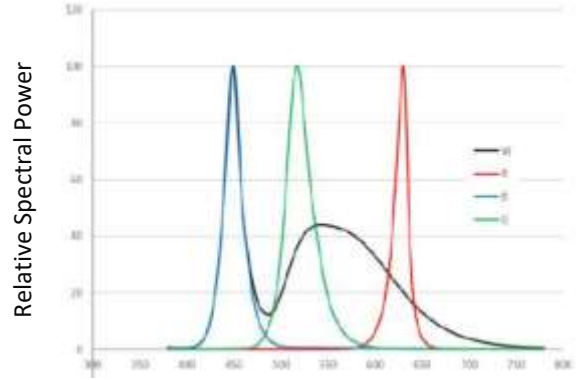
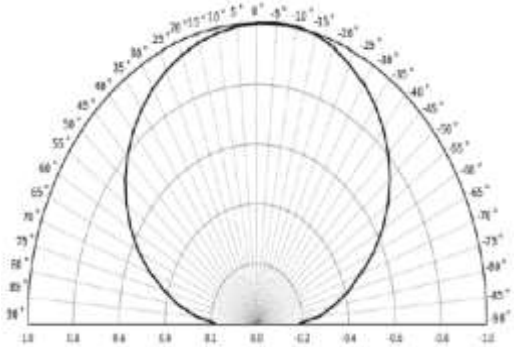
Chromaticity Coordinates Classifications (I_F = 20mA):

	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
A1	0.2870	0.3210	0.3010	0.3420	0.3130	0.2850	0.3040	0.2710
A2	0.3010	0.3420	0.3290	0.3690	0.3290	0.3060	0.3130	0.2850

ELECTRO-OPTICAL CHARACTERISTICS:

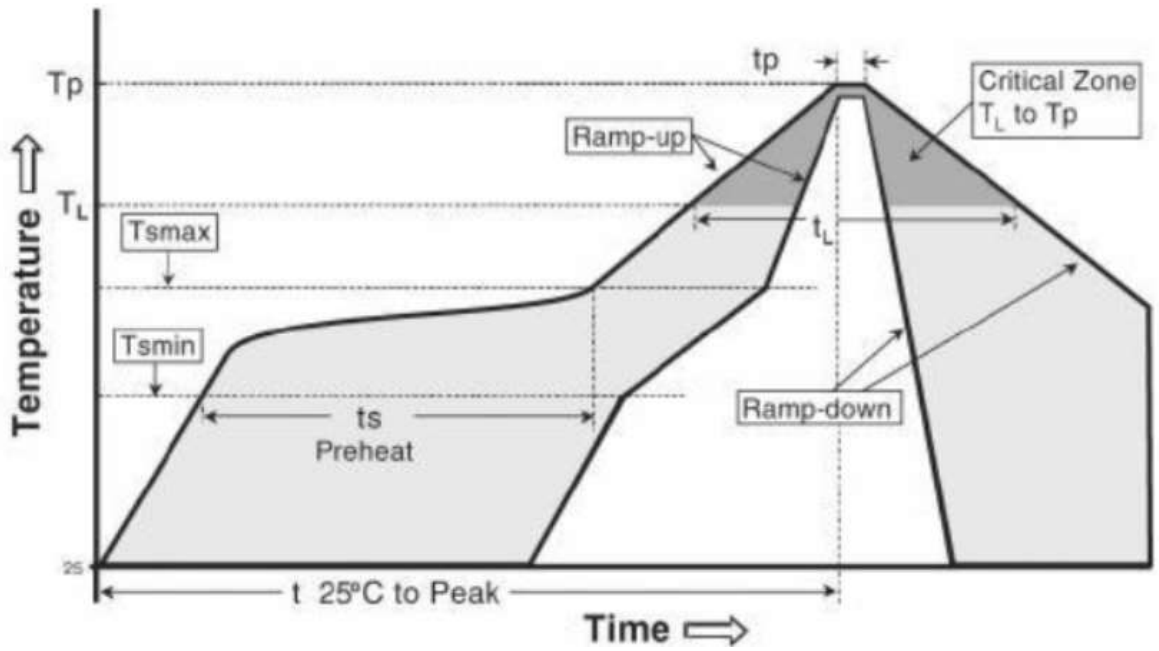
Relative Luminous Intensity v.s. Forward Current	Forward Current v.s. Forward Voltage
	

Relative Intensity v.s. Ambient Temperature	Forward Voltage v.s. Ambient Temperature
	

Luminous Spectrum	Directive Radiation
	

RECOMMENDED SOLDERING PROFILE:

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. 260°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

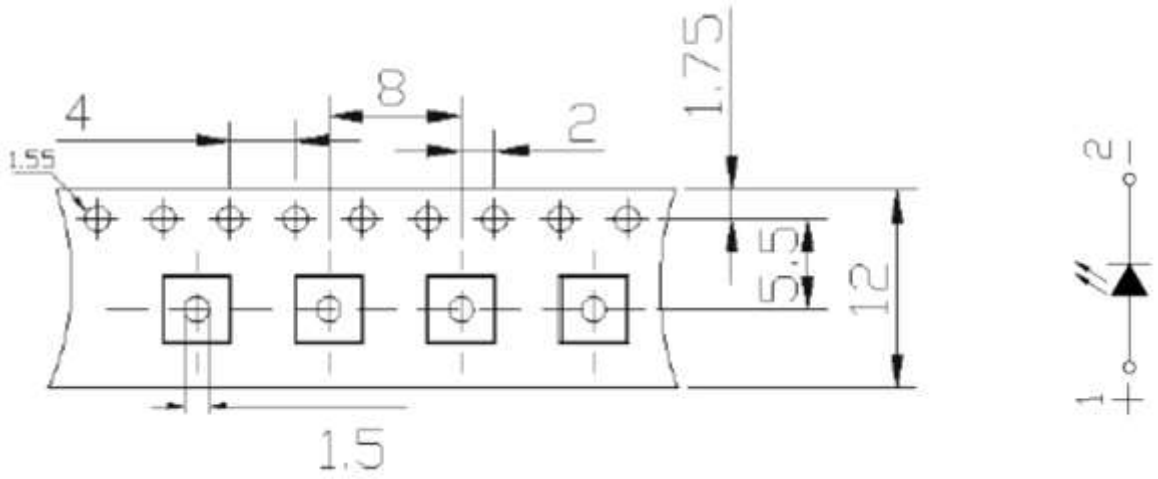
Note:

1. Maximum reflow soldering: 2 times with no more than 24 hours gap in between.
2. Die slug is to be soldered.
3. The recommended reflow temperature is 230°C. The maximum soldering temperature should be limited to 260°C.
4. Before, during, and after soldering, should not apply stress on the components and PCB board.

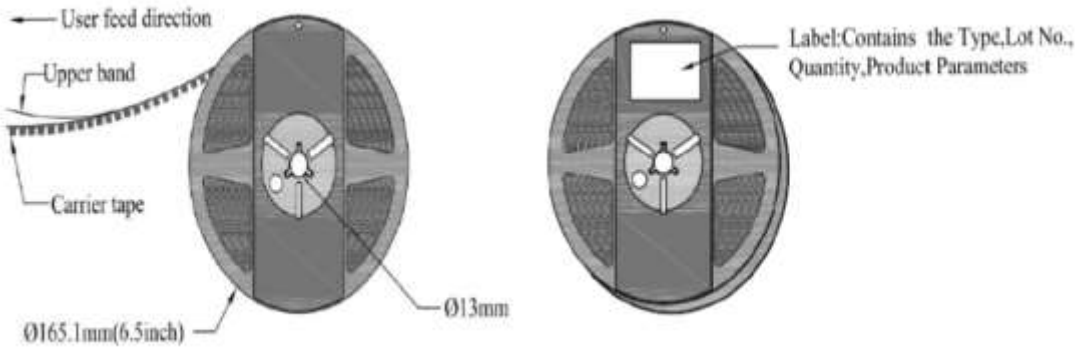
PACKING SPECIFICATION:

Reel Dimension:

Max.500pcs/reel



- Cumulative Tolerance: Cumulative Tolerance/10 pitches to be ±0.25mm
- 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 and apply baking.

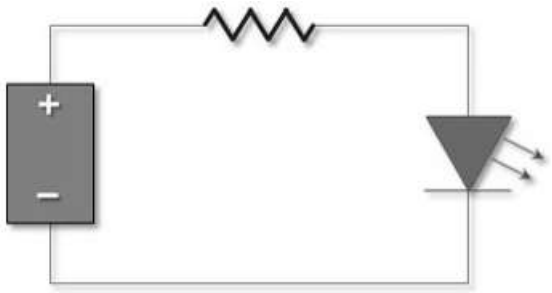
Baking:

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	31/06/2016	Datasheet set-up.
A1.1	09/03/2018	New datasheet format.
A1.2	27/02/2019	Update lumen values.