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

- ► Lead Frame
- ► 3228 1.7t Series
- ► Red (619nm) / Green (528nm) / Blue (468nm)

Release Date: 27 December 2020 Version: A1.1

N0M25S71RV

Lead Frame
3228 Series

Lead Frame Series

RoHS Compliant

FEATURES:

- **Package:** Lead Frame White Package Top View 3228 RGB
- **Forward Current:** 5.3/2/2mA*
- **Forward Voltage (typ.):** 1.9/2.6/2.7V
- **Luminous Intensity (typ.):** 410~710mcd@5.3/2/2mA
- **Colour:** Red/Green/Blue
- **Wavelength:** 619/528/468nm
- **Viewing angle:** 120/120/120°
- **Materials:**
  - Die: AlGaInP/InGaN/InGaN
  - Resin: Silicone (Water Clear)
- **Operating Temperature:** -55~+100°C
- **Storage Temperature:** -55~+100°C
- **ESD:** 2000/2000/2000V
- **Grouping parameters:**
  - Forward voltage
  - Luminous intensity
  - Dominant Wavelength
- **Soldering methods:** Hand Solder / PB Free Reflow
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 12mm tape with max.2000/reel, ø180mm (7'')

* in the order of Red/Green/Blue

APPLICATIONS:

- Backlighting
- Indication Light
- Switch light
- Dashboard
- Keyboard

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	25/30/30*	mA
Peak Forward Current Duty 1/10@10KHz	I_{FP}	100/120/120	mA
Reverse Current @5V	I_R	5/5/5	μA
Power Dissipation	P_D	50/90/90	mW
Electrostatic Discharge	ESD	2000/2000/2000	V
Operating Temperature	T_{OPR}	-55~+100	°C
Storage Temperature	T_{STG}	-55~+100	°C

* in the order of Red/Green/Blue

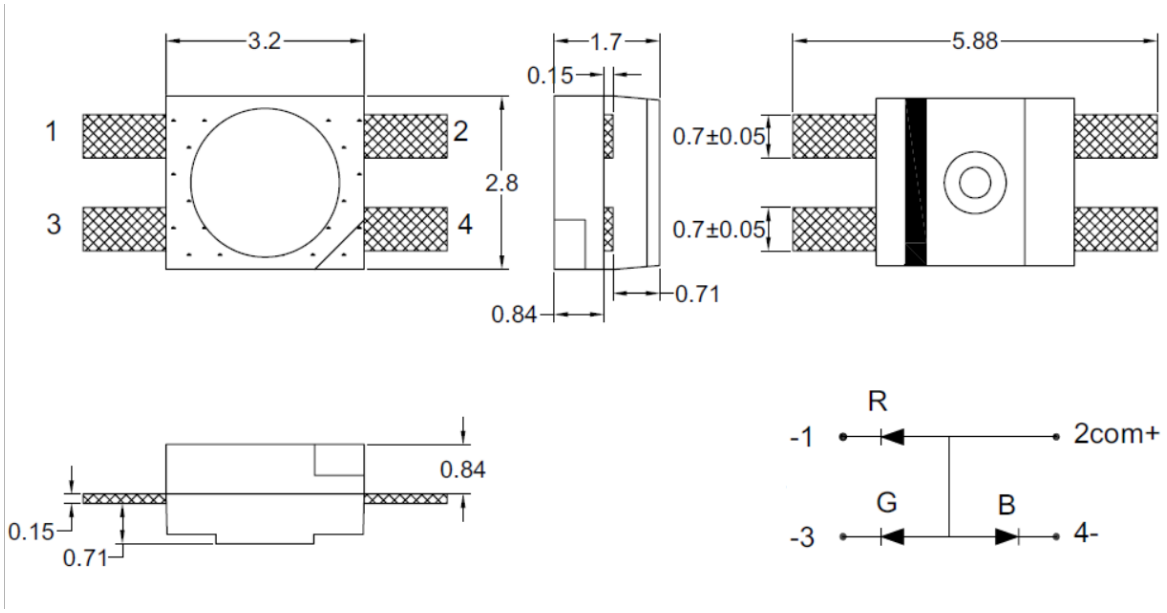
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.6/2.3/2.4*	---	2.2/2.9/3.0	V	I_F= 5.3/2/2mA
Luminous Intensity	I_V	410	---	710	mcd	
Dominant Wavelength	λ_D	---	619/528/468		nm	
Spectral Line Half Bandwidth	$\Delta\lambda$	---	20/36/30	---	nm	
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	

1. * in the order of Red/Green/Blue
2. Luminous intensity (I_V) ±15%, Forward Voltage (V_F) ±0.1V, Dominant Wavelength (λ_D) ±1nm.

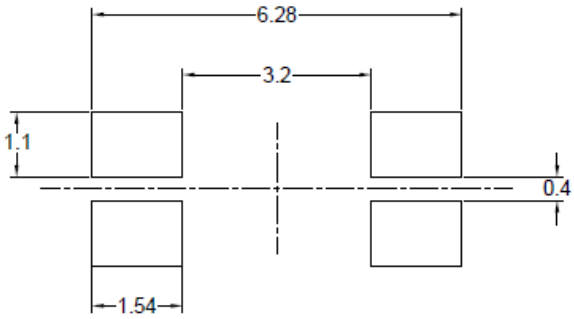
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



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

BINNING GROUPS:

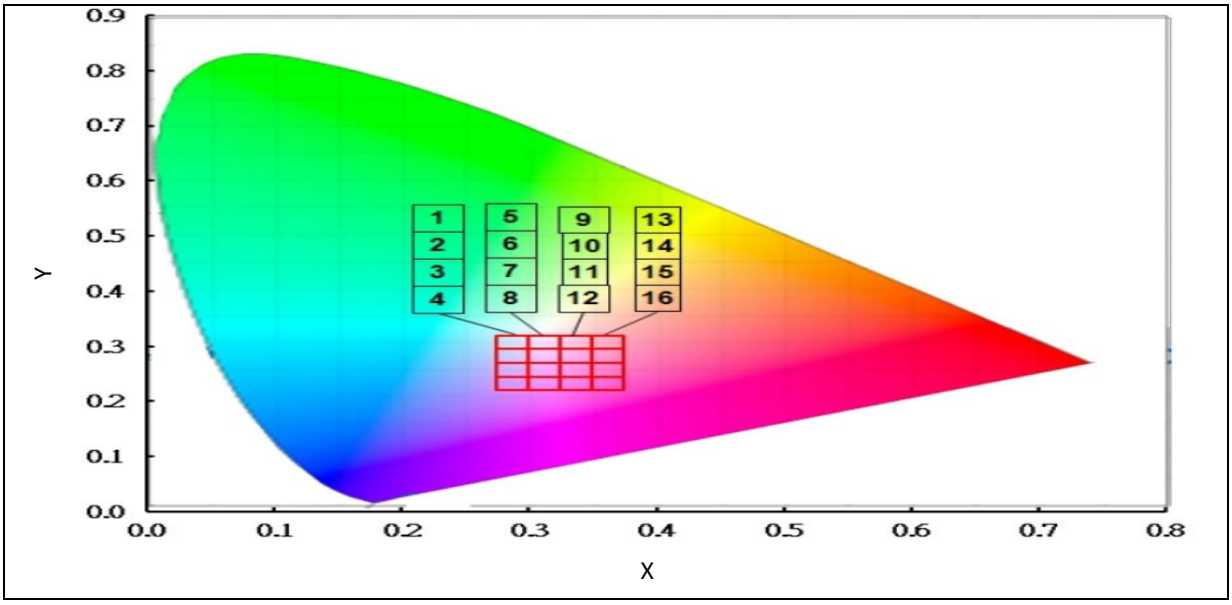
Forward Voltage Classifications (I_F = 5.3/2/2mA):

Code	Min.	Max.	Unit
Red	1.6	2.2	V
Green	2.3	2.9	
Blue	2.4	3.0	

Luminous Intensity Classifications (I_F = 5.3/2/2mA):

Code		Min.	Max.	Unit
R+G+B	A	410	490	mcd
	B	490	590	
	C	590	710	

CIE CHROMATICITY DIAGRAM:

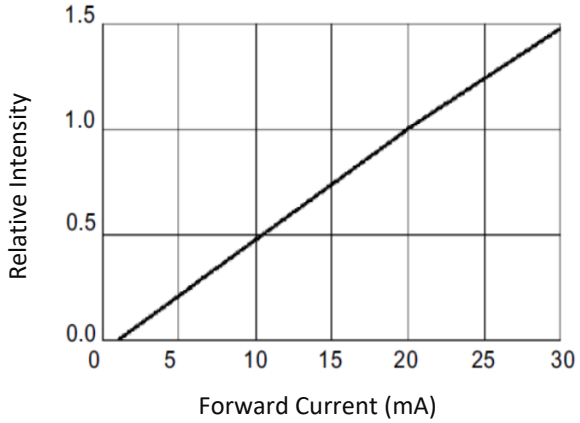


Chromaticity Coordinates Classifications (I_F = 5.3/2.0/2.0mA):

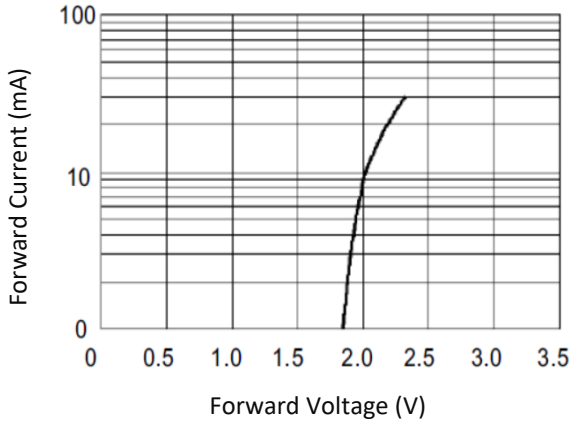
	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
1	0.2750	0.3200	0.3000	0.3200	0.3000	0.2950	0.2750	0.2950
2	0.2750	0.2950	0.3000	0.2950	0.3000	0.2700	0.2750	0.2700
3	0.2750	0.2700	0.3000	0.2700	0.3000	0.2450	0.2750	0.2450
4	0.2750	0.2450	0.3000	0.2450	0.3000	0.2200	0.2750	0.2200
5	0.3000	0.3200	0.3250	0.3200	0.3250	0.2950	0.3000	0.2950
6	0.3000	0.2950	0.3250	0.3950	0.3250	0.2700	0.3000	0.2700
7	0.3000	0.2700	0.3250	0.2700	0.3250	0.2450	0.3000	0.2450
8	0.3000	0.2450	0.3250	0.2450	0.3250	0.2200	0.3000	0.2200
9	0.3250	0.3200	0.3500	0.3200	0.3500	0.2950	0.3250	0.2950
10	0.3250	0.2950	0.3500	0.2950	0.3500	0.2700	0.3250	0.2700
11	0.3250	0.2700	0.3500	0.2700	0.3500	0.2450	0.3250	0.2450
12	0.3250	0.2450	0.3500	0.2450	0.3500	0.2200	0.3250	0.2200
13	0.3500	0.3200	0.3750	0.3200	0.3750	0.2950	0.3500	0.2950
14	0.3500	0.2950	0.3750	0.2950	0.3750	0.2700	0.3500	0.2700
15	0.3500	0.2700	0.3750	0.2700	0.3750	0.2450	0.3500	0.2450
16	0.3500	0.2450	0.3750	0.2450	0.3750	0.2200	0.3500	0.2200

ELECTRO-OPTICAL CHARACTERISTICS (RED):

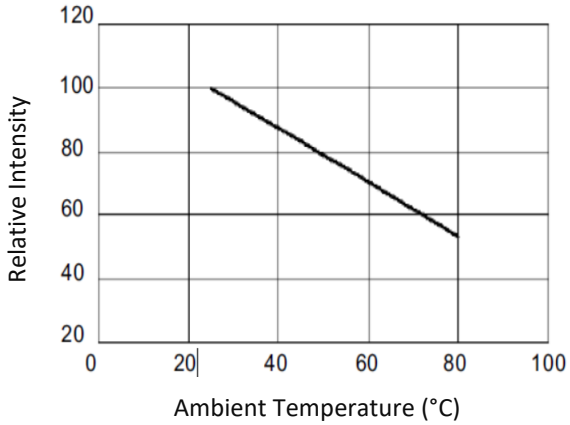
Relative Intensity v.s. Forward Current



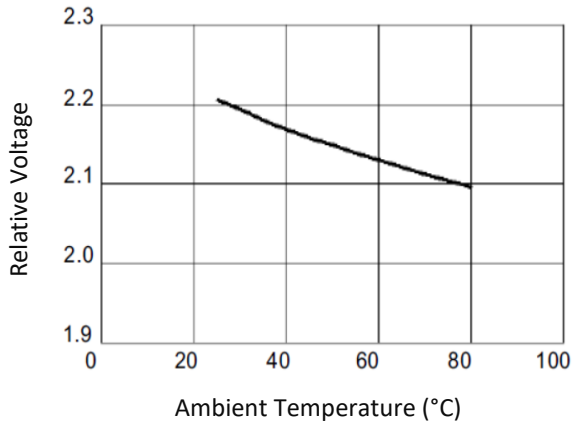
Forward Current v.s. Forward Voltage



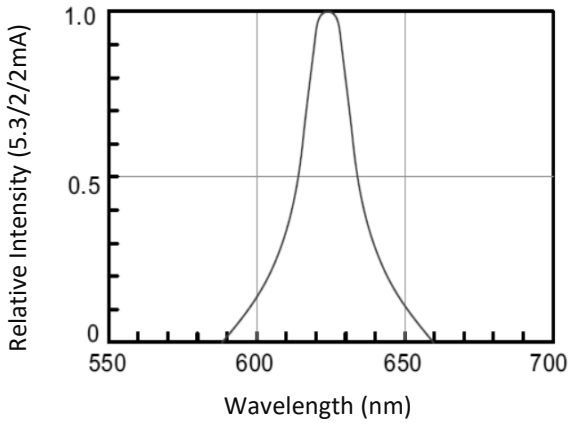
Relative Intensity v.s. Temperature



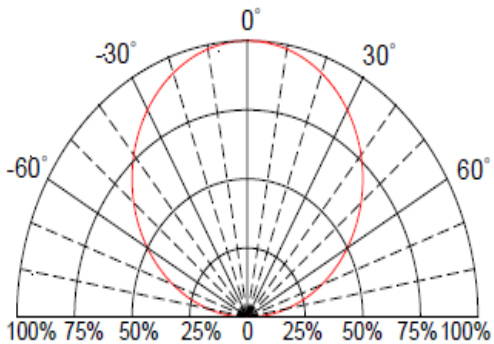
Relative Forward Voltage v.s. Temperature



Relative Intensity v.s. Wavelength

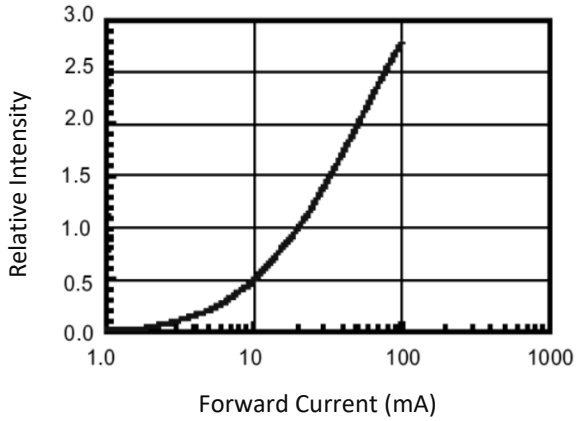


Directive Radiation

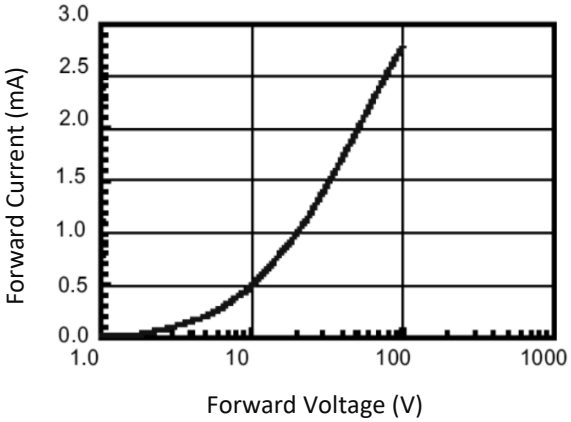


ELECTRO-OPTICAL CHARACTERISTICS (GREEN):

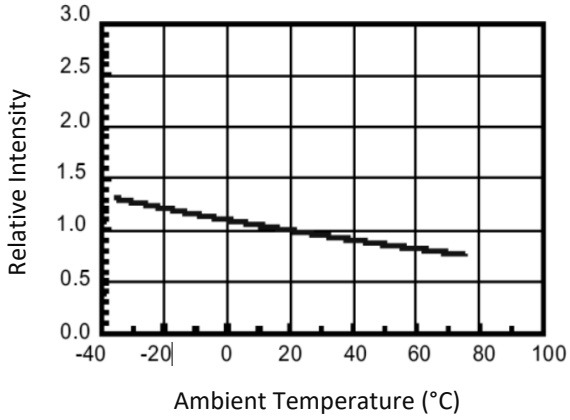
Relative Intensity v.s. Forward Current



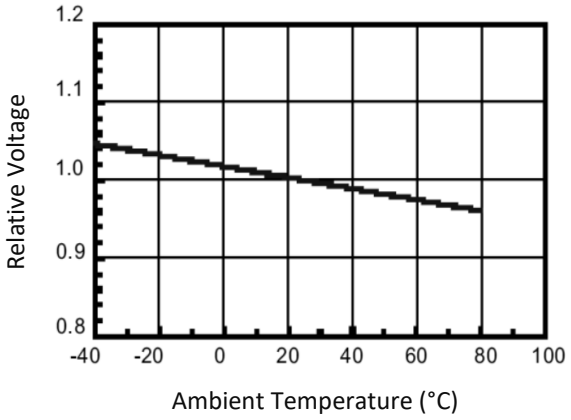
Forward Current v.s. Forward Voltage



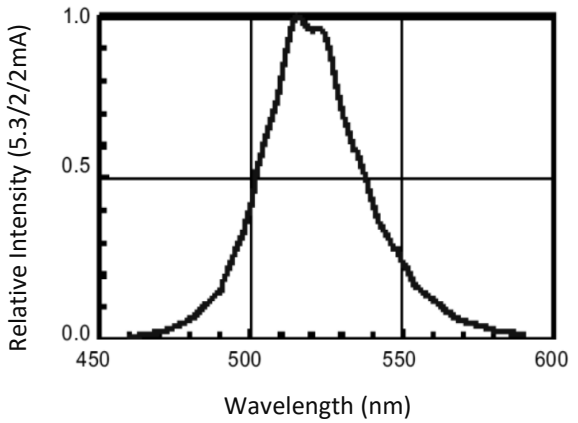
Relative Intensity v.s. Temperature



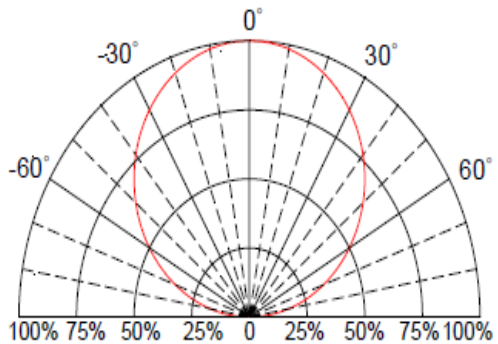
Relative Forward Voltage v.s. Temperature



Relative Intensity v.s. Wavelength

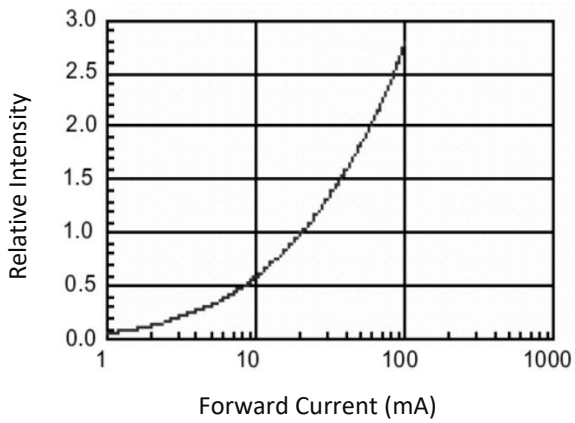


Directive Radiation

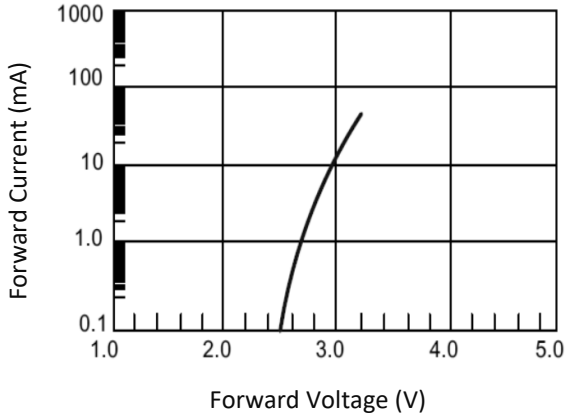


ELECTRO-OPTICAL CHARACTERISTICS (BLUE):

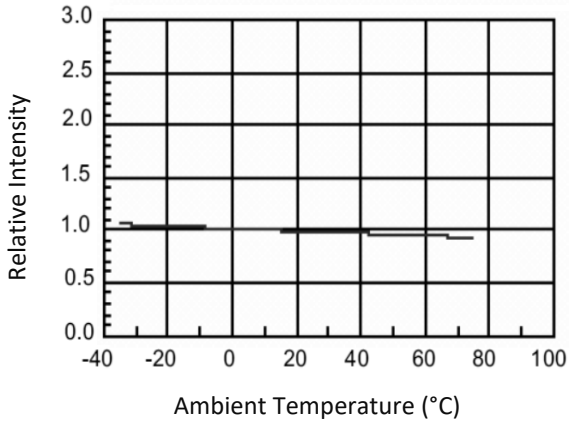
Relative Intensity v.s. Forward Current



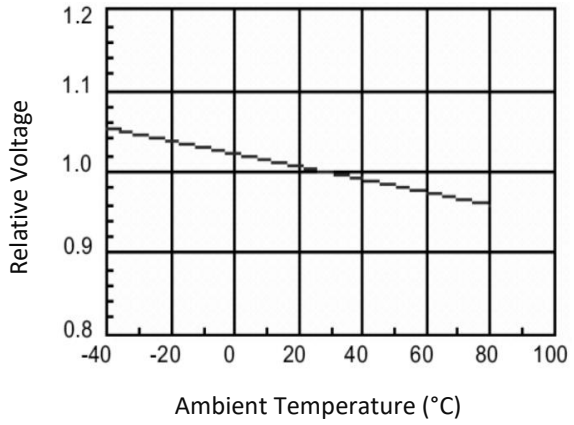
Forward Current v.s. Forward Voltage



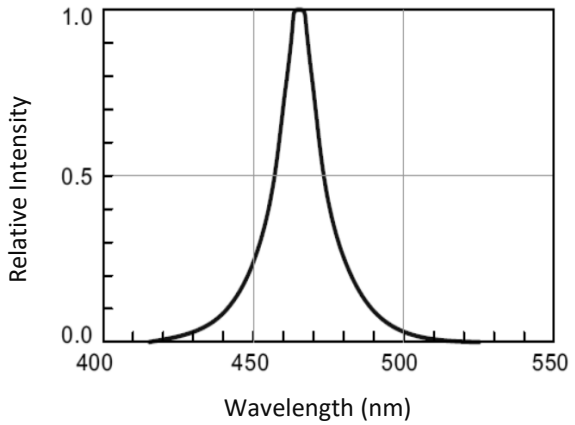
Relative Intensity v.s. Temperature



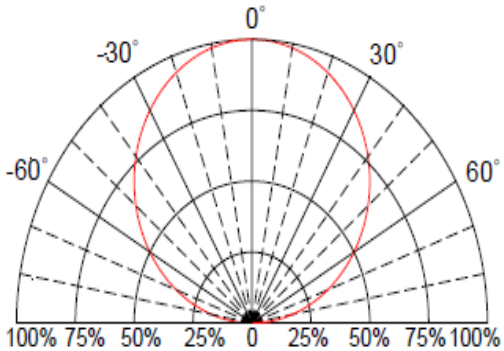
Relative Forward Voltage v.s. Temperature



Relative Intensity v.s. Wavelength



Directive Radiation

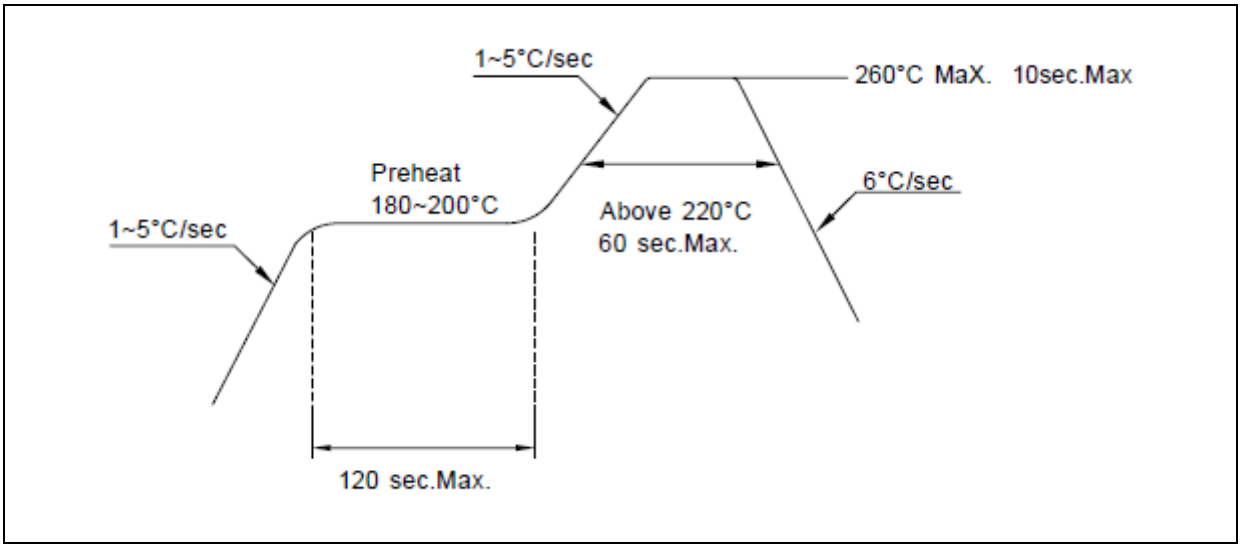


RECOMMENDED SOLDERING PROFILE:

Hand Solder:

One time ≤320°C 3 seconds maximum.

Lead-free Solder:



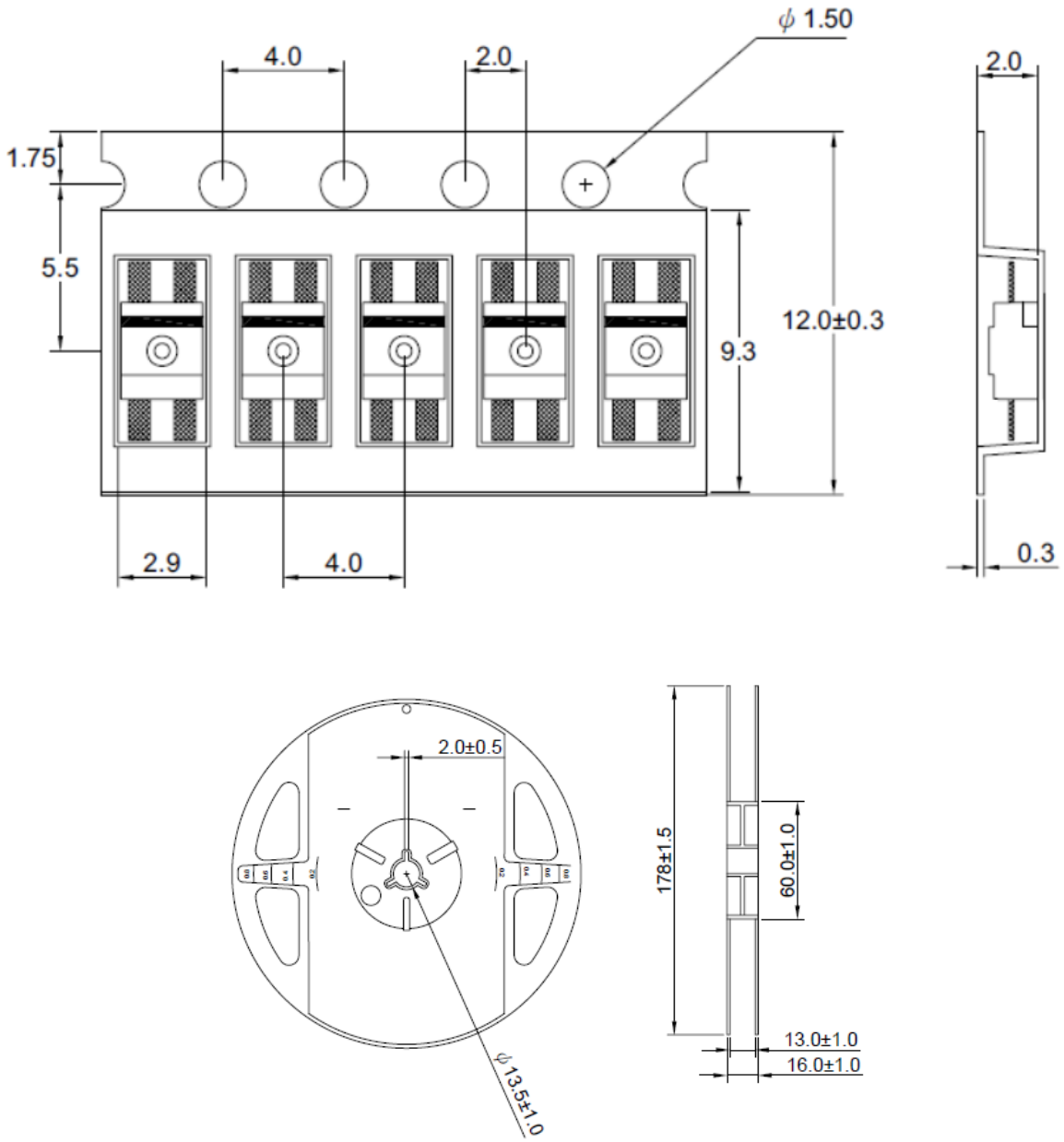
Note:

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

PACKING SPECIFICATION:

Reel Dimension:

Max.2000pcs/reel



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.

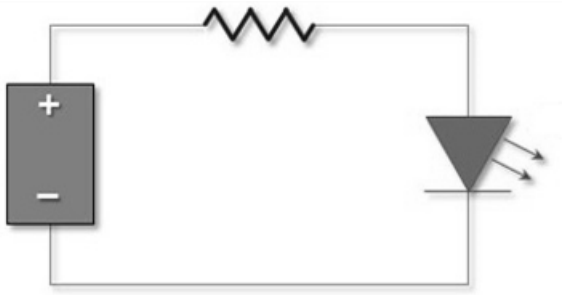
Baking:

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±5°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	27/01/2016	Datasheet set-up.
A1.1	27/12/2020	Revise binning method to mix white balance.