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

- ▶ PLCC6 Top View
- ▶ 3528 1.8t
- ▶ Red (625nm) / Yellow (590nm) / True Green (527nm)

Release Date: 15 January 2023 Version: A1.0

N0M63S68

3528 1.8t Series

RoHS Compliant

FEATURES (Red/Yellow/Green):

- **Package:** PLCC6 Top View Black Surface LED SMT Package
- **Forward Current:** 20/20/20mA*
- **Forward Voltage (typ.):** 2.0/2.0/3.2V
- **Luminous Intensity (typ.):** 820/880/2000mcd @20mA
- **Colour:** Red/Yellow/Green
- **Dominant Wavelength:** 625/590/527nm
- **Viewing angle:** 120/120/120°
- **Materials:**
  - Die: AlGaInP-GaAs/AlGaInP/InGaN
  - Resin: Epoxy (Water Clear)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+100°C
- **Grouping parameters:**
  - Forward voltage
  - Luminous intensity
  - Dominant Wavelength
- **Soldering methods:** Reflow soldering
- **MSL Level:** acc. to JEDEC Level 3
- **Packing:** 8mm tape with max.2000/reel, ø180mm (7'')

APPLICATIONS:

- Indicator
- Dashboard
- 3C Application
- Backlighting
- Decoration Lighting

* In the order of Red/Yellow/Green.

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	30/30/30*	mA
Peak Forward Current Duty 1/8, f=1kHz	I_{FP}	125	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Power Dissipation	P_D	75/75/111	mW
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+100	°C

1. * In the order of Red/Yellow/Green.

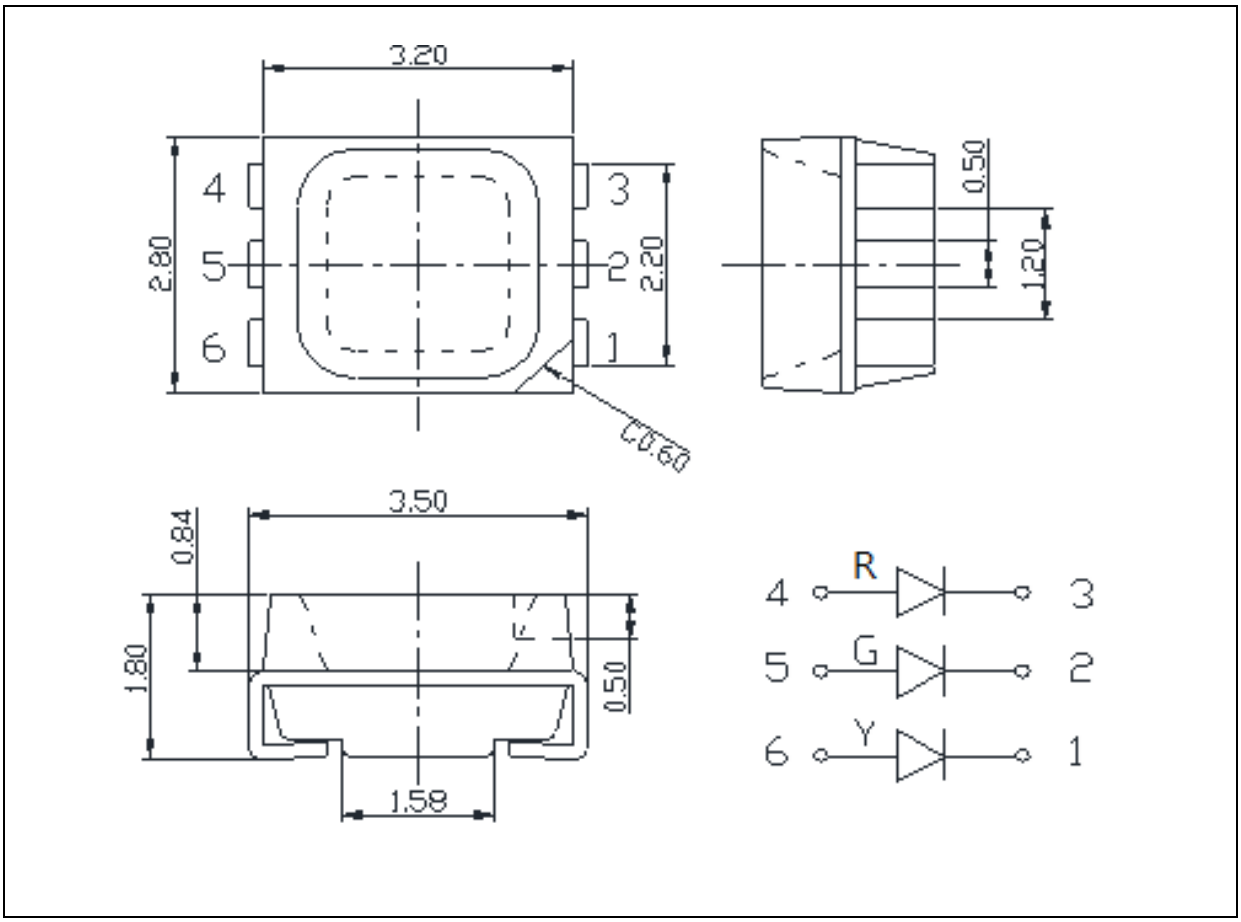
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.7/1.7/2.8*	2.0/2.0/3.2	2.5/2.5/3.7	V	I_F=20mA
Luminous Intensity	I_V	500/500/1250	820/880/2000	1250/1250/3200	mcd	I_F=20mA
Dominant Wavelength	λ_D	615/585/520	625/590/527	630/595/530	nm	I_F=20mA
Peak Wavelength	λ_P	---	630/595/520	---	nm	I_F=20mA
Spectral Line Half Bandwidth	$\Delta\lambda$	---	18/17/31	---	nm	I_F=20mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=20mA

1. * In the order of Red/Yellow/Green.
2. Luminous intensity (I_V) ±15%, Forward Voltage (V_F) ±0.1V, Viewing angle($2\theta_{1/2}$) ±5%.

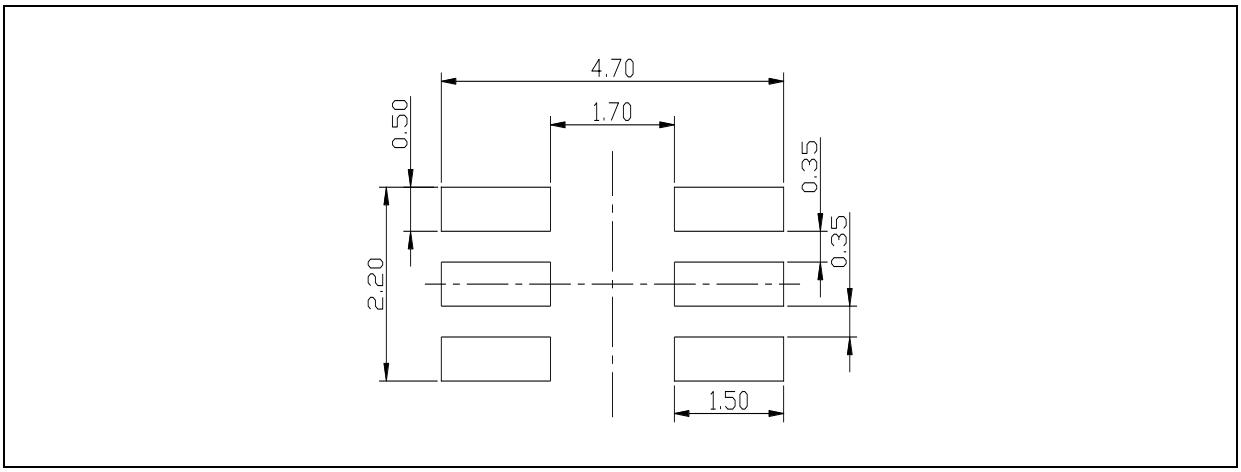
OUTLINE DIMENSION:

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 = 20mA):

Code		Min.	Max.	Unit
Red	□	1.7	2.5	V
Yellow	□	1.7	2.5	V
Green	f	2.8	3.1	V
	g	3.1	3.4	
	h	3.4	3.7	

Luminous Intensity Classifications (I_F = 20mA):

Code		Min.	Max.	Unit
Red	Q	500	630	mcd
	R	630	800	
	S	800	1000	
	T	1000	1250	
Yellow	Q	500	630	mcd
	R	630	800	
	S	800	1000	
	T	1000	1250	
Green	U	1250	1600	mcd
	V	1600	2000	
	W	2000	2500	
	X	2500	3200	

BINNING GROUPS:

Wavelength Classifications (I_F = 20mA):

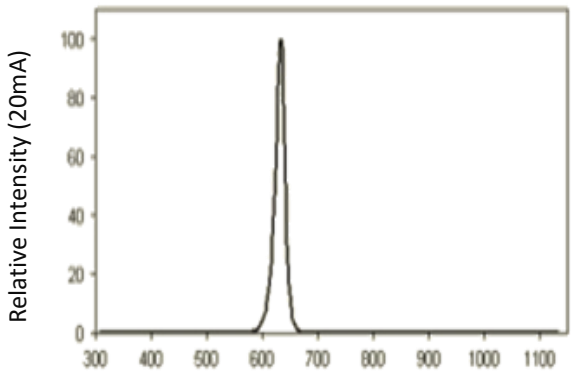
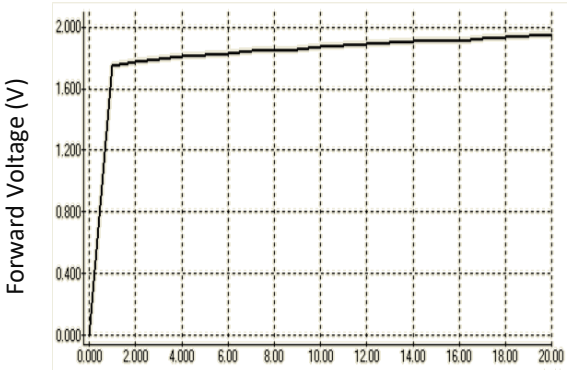
Code		Min.	Max.	Unit
Red	s	615	620	nm
	t	620	625	
	u	625	630	
Yellow	m	585	590	nm
	n	590	595	
Green	U	520	522.5	nm
	V	522.5	525	
	W	525	527.5	
	X	527.5	530	

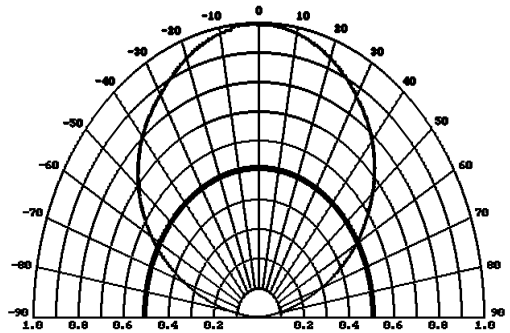
Example Group Name on Label:

☐St ☐Sm gWW 20 (in order of R/Y/G):

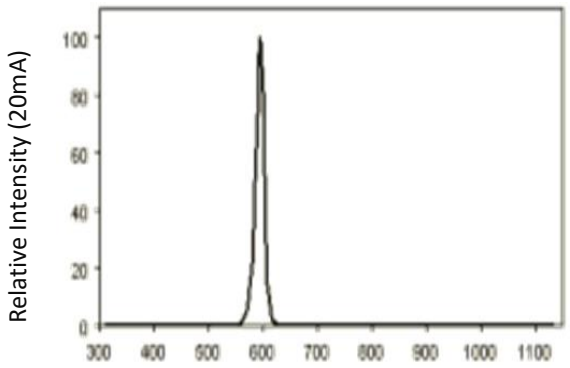
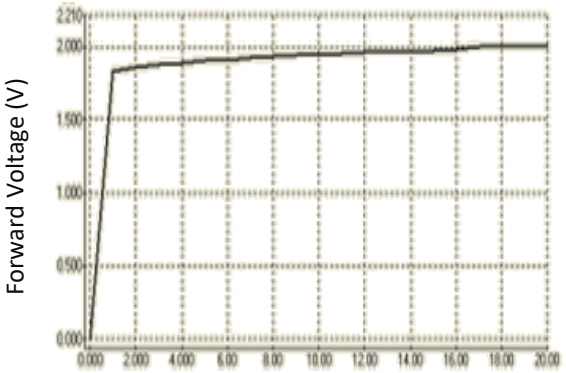
- **☐St20** = ☐ (1.7~2.5V) ► **S** (800~1000mcd) ► **t** (620~625nm) ► **20** (IF=20mA)
- **☐Sm20** = ☐ (1.7~2.5V) ► **S** (800~1000mcd) ► **m** (585~590nm) ► **20** (IF=20mA)
- **gWW20** = **g** (3.1~3.4V) ► **W** (2000~2500mcd) ► **W** (525~527.5nm) ► **20** (IF=20mA)

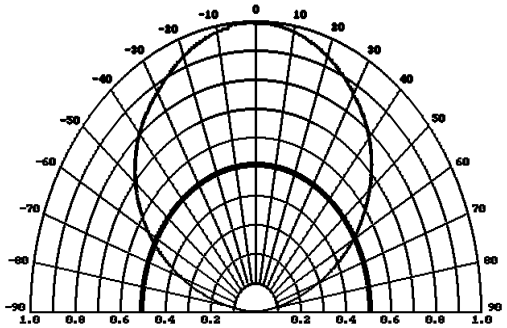
ELECTRO-OPTICAL CHARACTERISTICS (RED):

Relative Spectral Distribution	Forward Current v.s. Forward Voltage
	

Directive Radiation


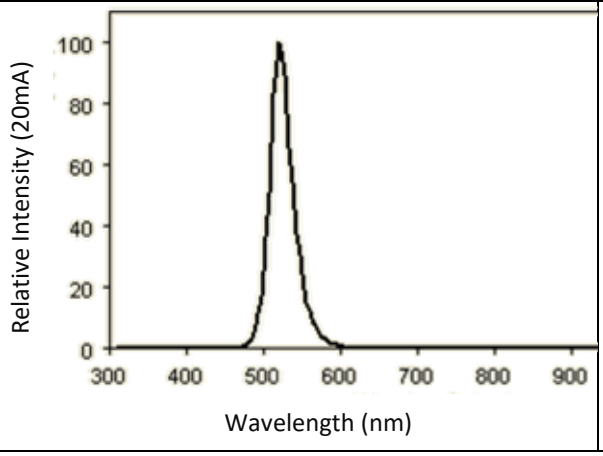
ELECTRO-OPTICAL CHARACTERISTICS (YELLOW):

Relative Spectral Distribution	Forward Current v.s. Forward Voltage
	

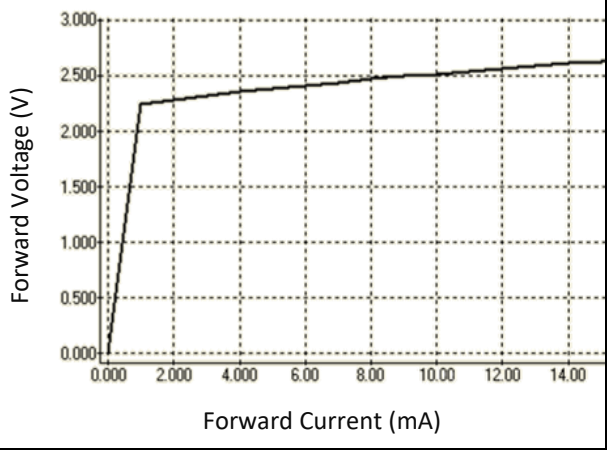
Directive Radiation


ELECTRO-OPTICAL CHARACTERISTICS (GREEN):

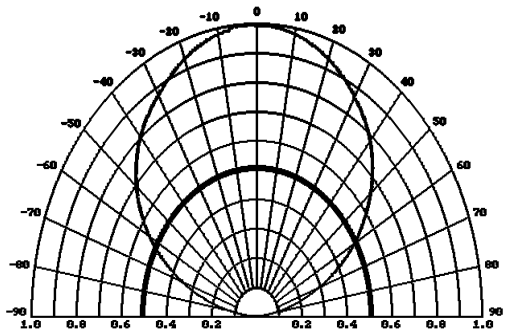
Relative Spectral Distribution



Forward Current v.s. Forward Voltage

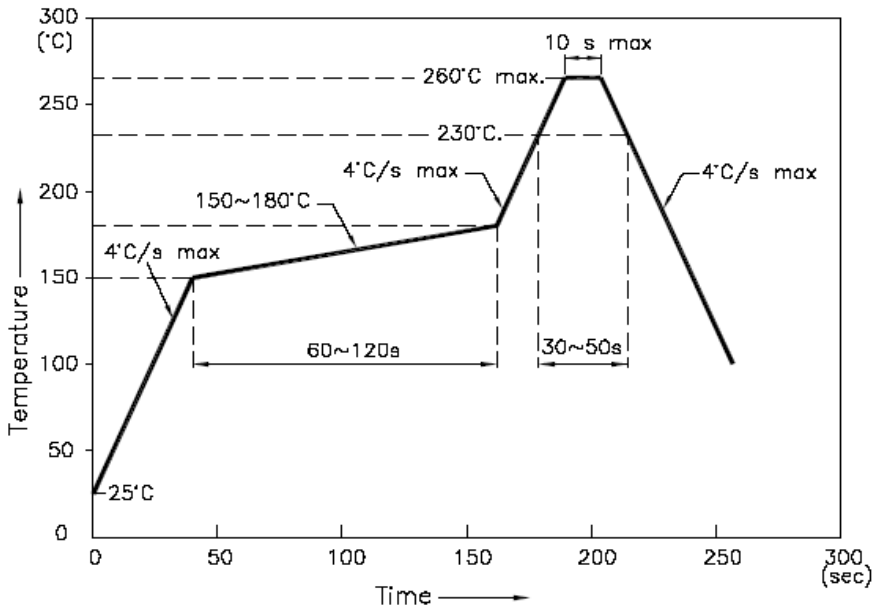


Directive Radiation



RECOMMENDED SOLDERING PROFILE:

Reflow Solder:



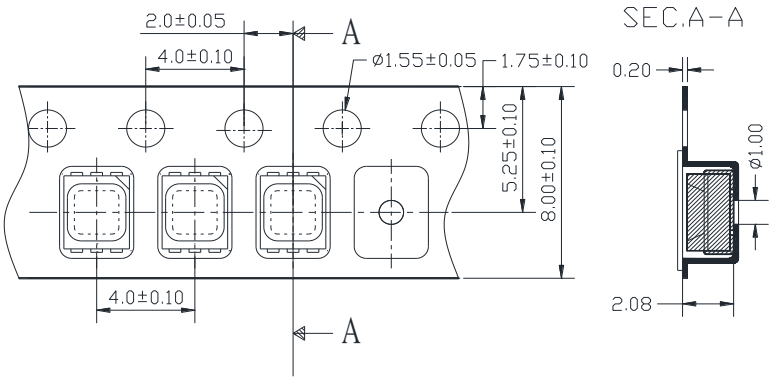
Note:

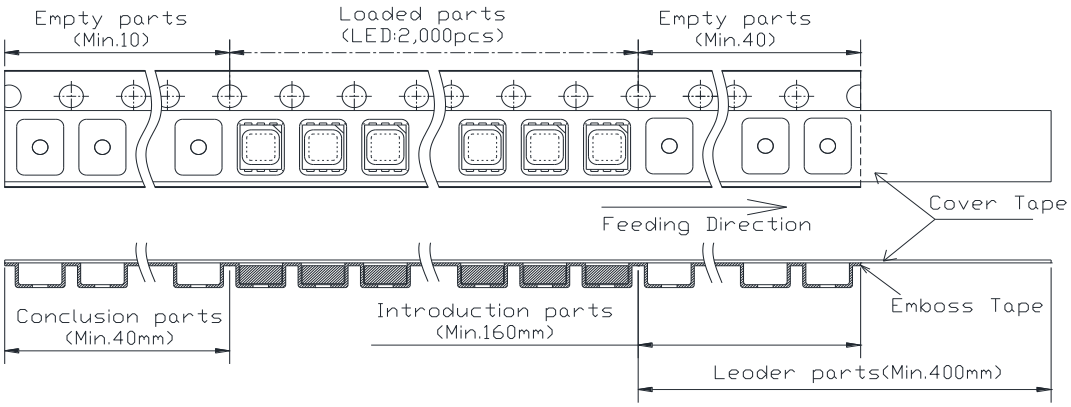
1. Recommend reflow temperature 245°C. The maximum soldering temperature should be limited to 260°C.
2. Maximum reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

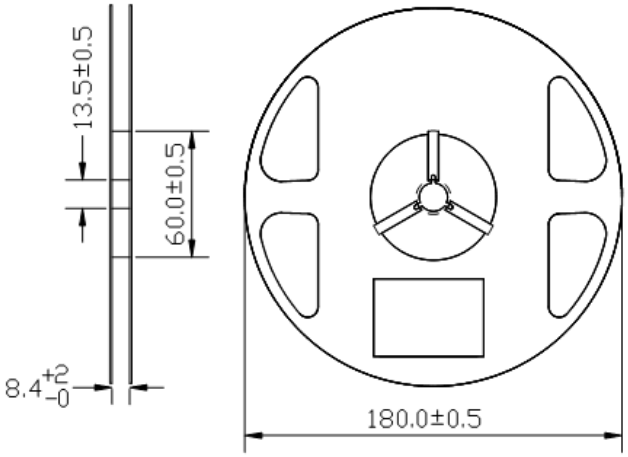
PACKING SPECIFICATION:

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 at before use.

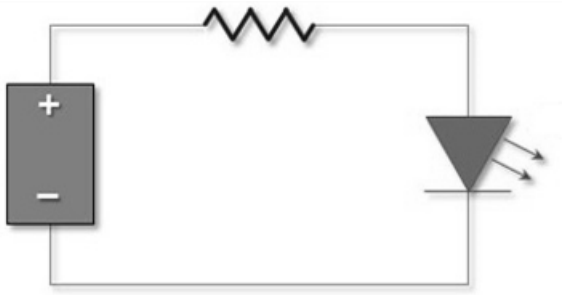
Baking:

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 Green) 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	15/01/2023	Datasheet set-up.