



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



- ▶ PLCC4 SMD
- ▶ 3528 Series
- ▶ Red / Green / Blue

NOM03S71BS



Release Date: 22 September 2014 Version: A1.0



3528 Series



FEATURES (Red/Green/Blue*):

- **Package:** PLCC4 RGB Black Surface SMD Package
- **Forward Current:** 20/20/20mA
- **Forward Voltage (typ.):** 1.9/3.2/3.2V
- **Luminous Flux (typ.):** 700/1450/280mcd @20mA
- **Colour:** Red/Green/Blue
- **CCT/Wavelength:** 625/530/470nm
- **Viewing angle:** 120/120/120°
- **Materials:**
 - Die: AlGaInP/InGaN/InGaN
 - Resin: Eploxy (White Diffused)
- **Operating Temperature:** -40~+80°C
- **Storage Temperature:** -40~+100°C
- **ESD:** 1000V (HBM)
- **Grouping parameters:**
 - Forward voltage
 - Luminous intensity
 - Wavelength
- **Soldering methods:** IR Reflow soldering
- **Preconditioning:** MSL 3 according to JEDEC
- **Packing:** 8mm tape with 2000pcs/reel, ø180mm (7")

APPLICATIONS:

- LED Display
- Switch Light
- 3C Application
- Decoration Lighting
- Light Strip

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	50/30/30*	mA
Pulse Forward Current (duty 1/10; width 0.1ms)	I_{MAX}	80/80/80	mA
Power Dissipation	P_D	100/80/80	mW
Reverse Voltage	V_R	-5	V
Reverse Current @5V	I_R	10	μA
Electrostatic Discharge (HBM)	ESD	1000	V
Junction Temperature	T_j	110	°C
Soldering Temperature	T_{sol}	260	°C
Operating Temperature	T_{OPR}	-40~+80	°C
Storage Temperature	T_{STG}	-40~+100	°C

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

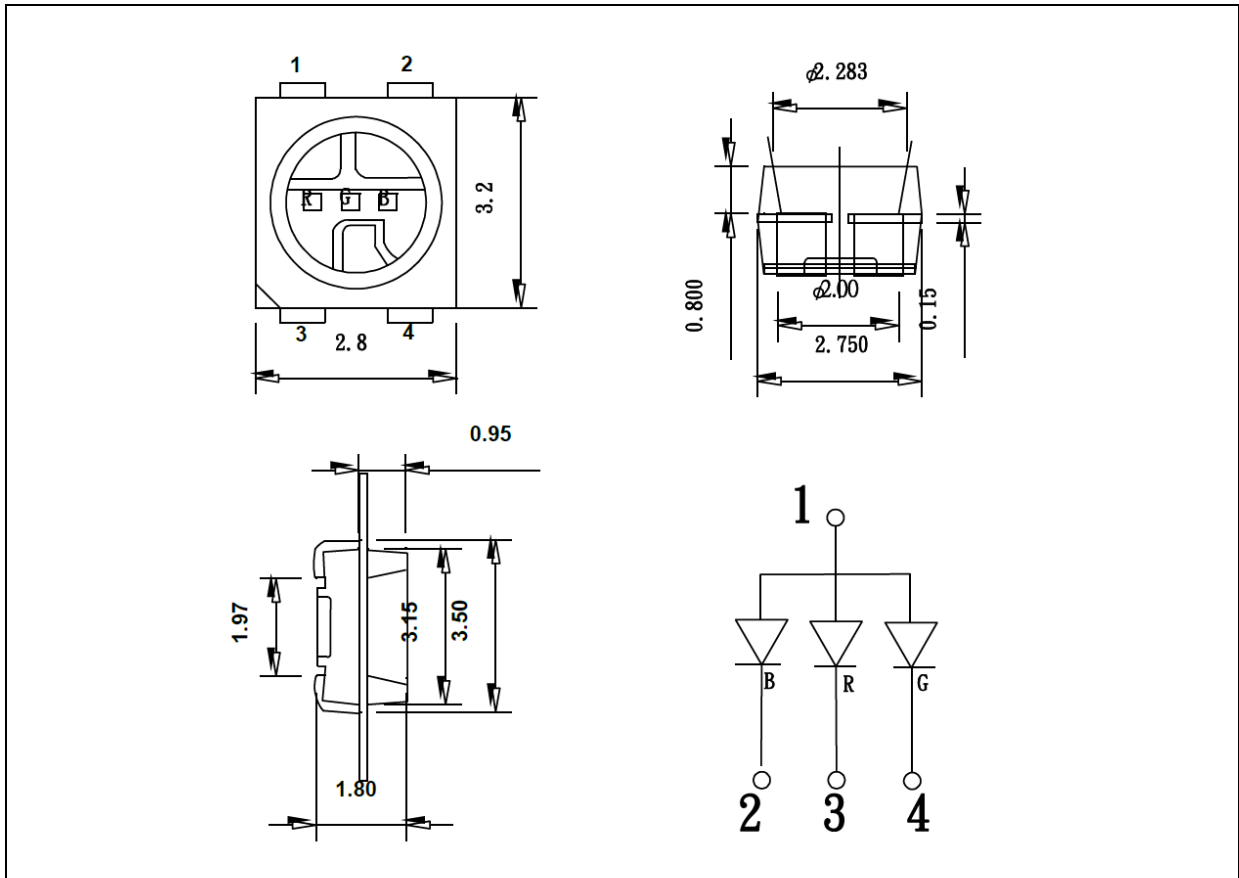
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Red - Forward Voltage	V_F	1.8	1.9	2.6	V	$I_F=20mA$
Red - Luminous Intensity	I_V	510	700	1000	mcd	$I_F=20mA$
Red - Wavelength	W_p	615	---	630	nm	$I_F=20mA$
Green - Forward Voltage	V_F	2.8	3.2	3.8	V	$I_F=20mA$
Green - Luminous Intensity	I_V	1080	1450	2125	mcd	$I_F=20mA$
Green - Wavelength	W_p	519	---	534	nm	$I_F=20mA$
Blue - Forward Voltage	V_F	2.8	3.2	3.8	V	$I_F=20mA$
Blue - Luminous Intensity	I_V	200	280	395	mcd	$I_F=20mA$
Blue - Wavelength	W_p	461	---	476	nm	$I_F=20mA$
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	$I_F=20mA$

1. Luminous intensity (I_V) $\pm 5\%$, Forward Voltage (V_F) $\pm 0.1V$, Viewing angle($2\theta_{1/2}$) $\pm 5\%$

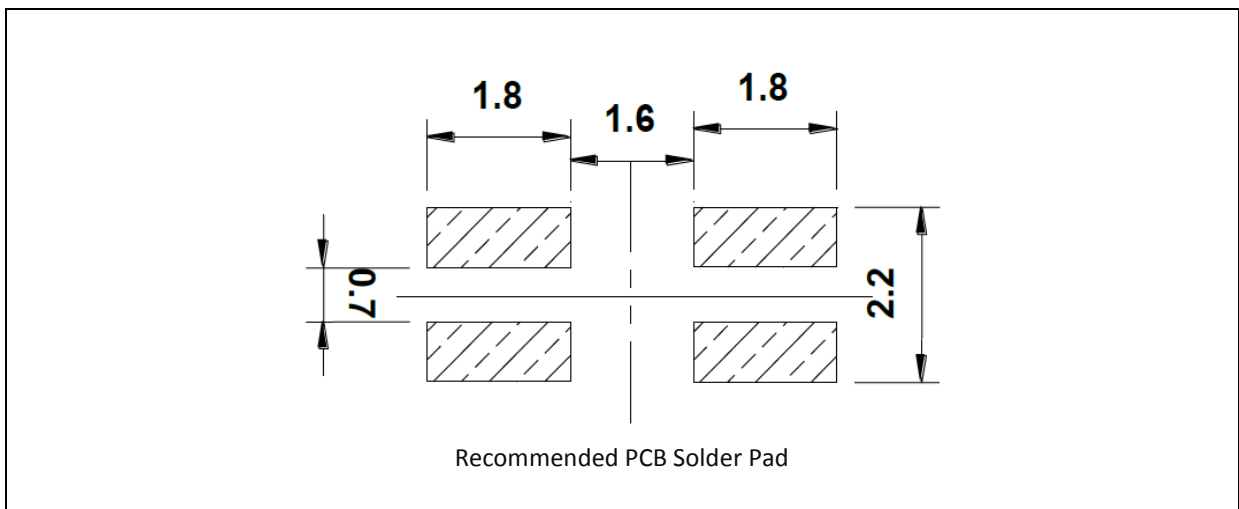
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance $\pm 0.1\text{mm}$ with angle tolerance $\pm 0.5^\circ$.

BINNING GROUPS:

 Forward Voltage Classifications ($I_F = 20\text{mA}$):

Code	Min.	Max.	Unit
R1 (Red)	1.8	1.9	V
R2 (Red)	1.9	2.0	
R3 (Red)	2.0	2.1	
R4 (Red)	2.1	2.2	
R5 (Red)	2.2	2.3	
R6 (Red)	2.3	2.4	
R7 (Red)	2.4	2.5	
R8 (Red)	2.5	2.6	

G1 / B1 (Green / Blue)	2.8	2.9	V
G2 / B2 (Green / Blue)	2.9	3.0	
G3 / B3 (Green / Blue)	3.0	3.1	
G4 / B4 (Green / Blue)	3.1	3.2	
G5 / B5 (Green / Blue)	3.2	3.3	
G6 / B6 (Green / Blue)	3.3	3.4	
G7 / B7 (Green / Blue)	3.4	3.5	
G8 / B8 (Green / Blue)	3.5	3.6	
G9 / B9 (Green / Blue)	3.6	3.7	
G10 / B10 (Green / Blue)	3.7	3.8	

Luminous Intensity Classifications ($I_F = 20\text{mA}$):

Code	Min.	Max.	Unit
RT12 (Red)	510	645	mcd
RT13 (Red)	645	800	
RT14 (Red)	800	1000	

GT12 (Green)	1080	1350	mcd
GT13 (Green)	1350	1700	
GT14 (Green)	1700	2125	

BT10 (Blue)	200	250	mcd
BT11 (Blue)	250	315	
BT12 (Blue)	315	395	

 Wavelength Classifications ($I_F = 20\text{mA}$):

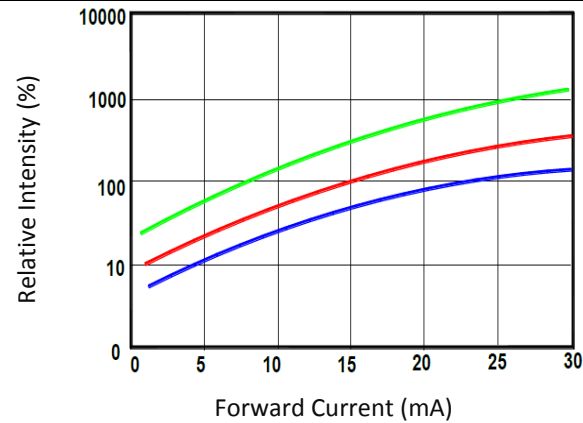
Code	Min.	Max.	Unit
R2 (Red)	615	620	nm
R3 (Red)	620	625	
R4 (Red)	625	630	

G2 (Green)	519	524	nm
G3 (Green)	524	529	
G4 (Green)	529	534	

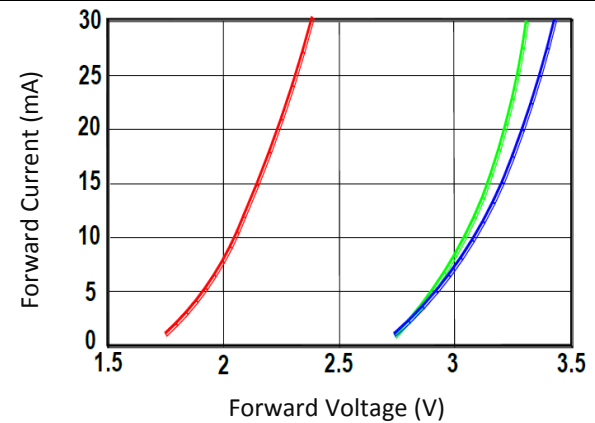
B2 (Blue)	461	466	nm
B3 (Blue)	466	471	
B4 (Blue)	471	476	

ELECTRO-OPTICAL CHARACTERISTICS:

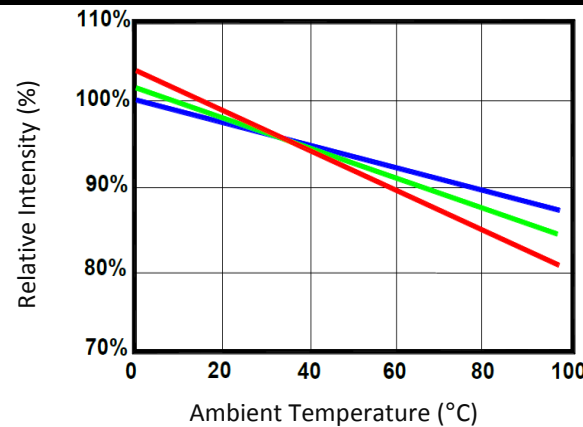
Relative Intensity v.s. Forward Current



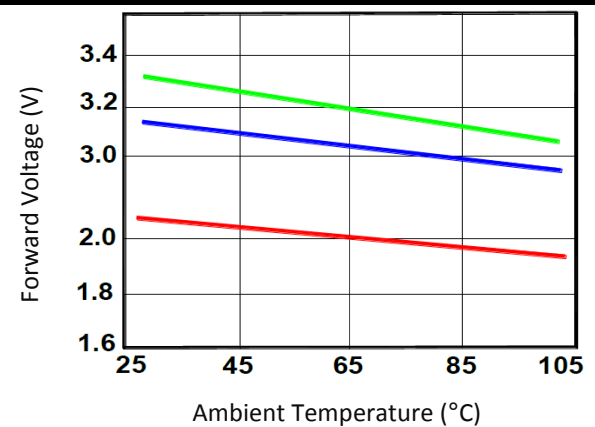
Forward Current v.s. Forward Voltage



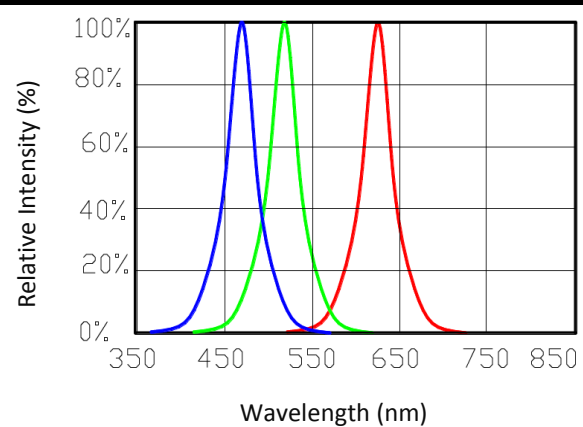
Relative Intensity v.s. Ambient Temperature



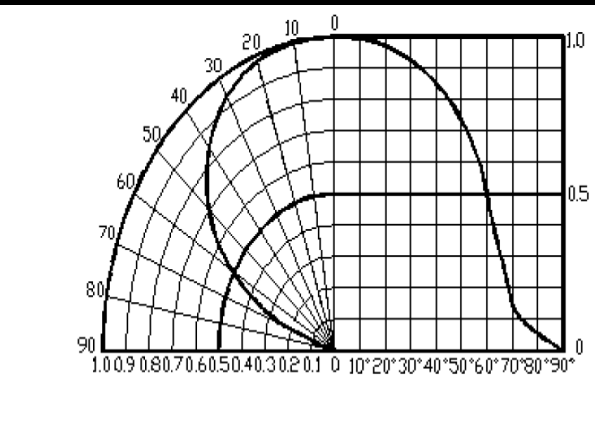
Forward Voltage v.s. Ambient Temperature



Relative Spectral Distribution

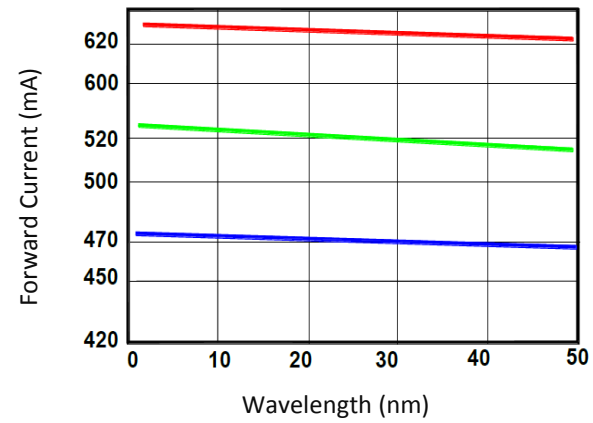


Directive Radiation

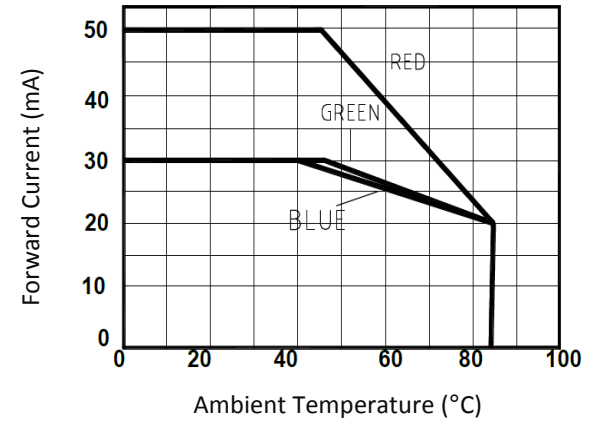


ELECTRO-OPTICAL CHARACTERISTICS:

Wavelength Shift v.s. Forward Current

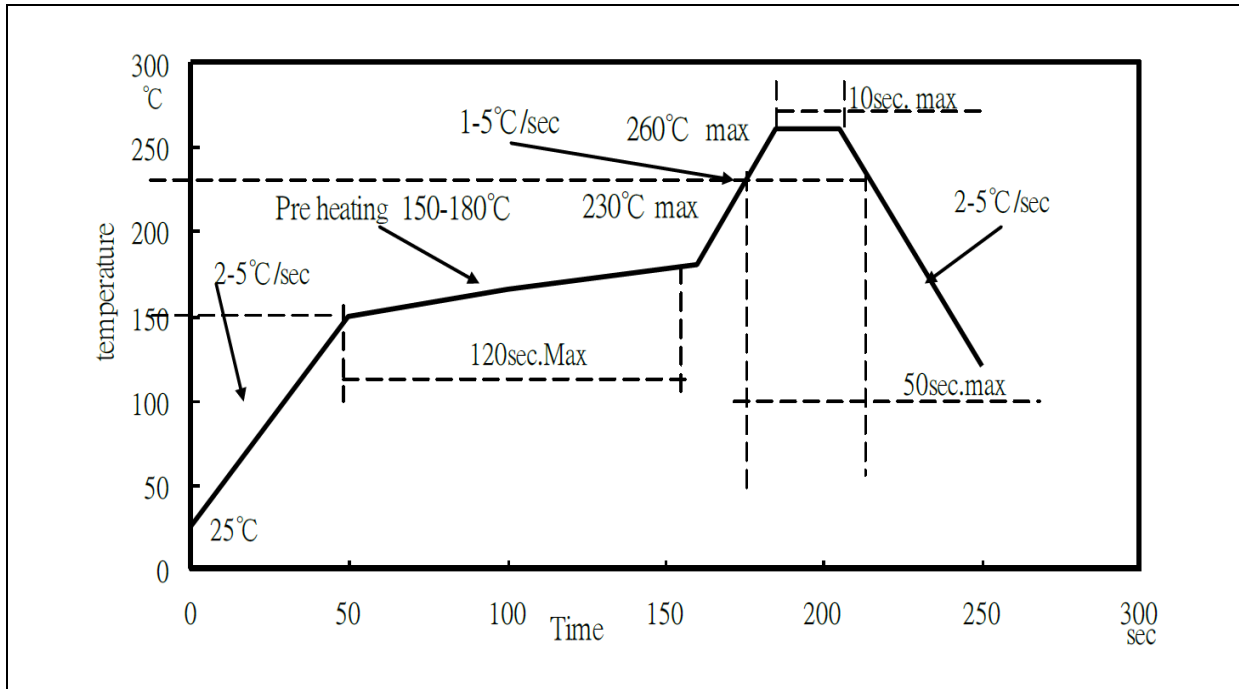


Maximum Current v.s. Ambient Temperature



RECOMMENDED SOLDERING PROFILE:

Lead-free Solder:

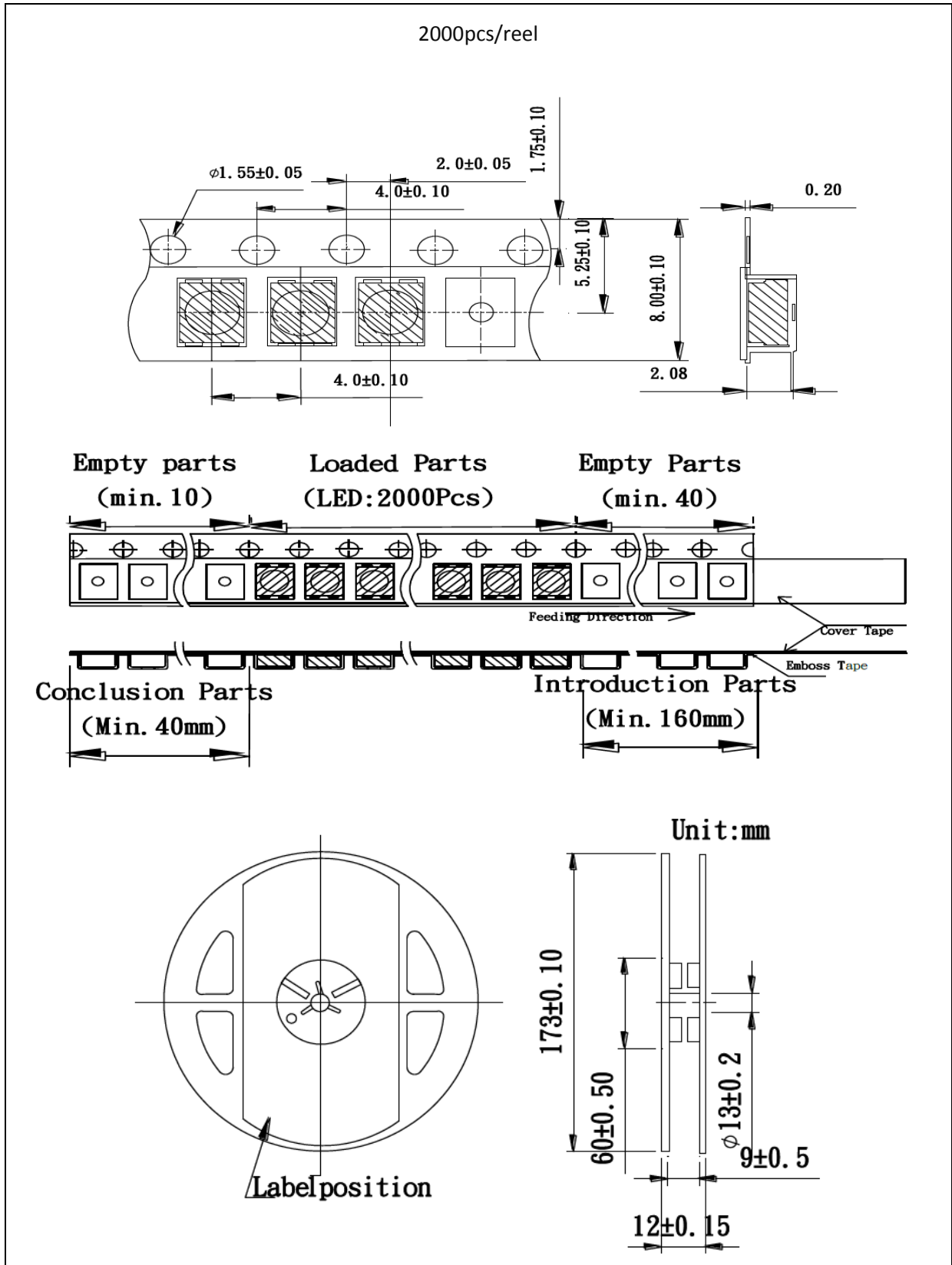


Note:

1. Maximum reflow soldering: 3 times.
2. Before, during, and after soldering, should not apply stress on the components and PCB board.

PACKING SPECIFICATION:

Reel Dimension:



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:

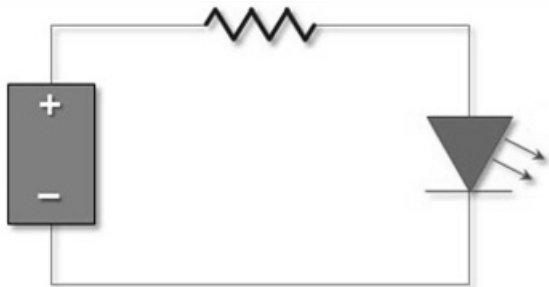
It is recommended to bake the LED before soldering if the pack has been unsealed for longer than 24hrs.

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	22/09/2014	Datasheet set-up.