



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



- ▶ PLCC6 SMD
- ▶ 5050 1.6t Series
- ▶ Red / Green / Blue

NOM48S05



Release Date: 03 June 2022 Version: A1.1



5050 1.6t Series

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RoHS
Compliant



FEATURES (Red/Green/Blue*):

- **Package:** PLCC6 RGB White Surface SMD Package
- **Forward Current:** 20/20/20mA
- **Forward Voltage (typ.):** 2.0/3.2/3.2V
- **Luminous Flux (typ.):** 680/1500/340mcd@20mA
- **Colour:** Red/Green/Blue
- **CCT/Wavelength:** 625/525/470nm
- **Viewing angle:** 120/120/120°
- **Materials:**
 - Die: AlGaInP/InGaN/InGaN
 - Resin: Silicone (White Diffused)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+100°C
- **ESD:** 1000V (HBM)
- **Grouping parameters:**
 - Forward voltage
 - Luminous intensity
 - Dominant Wavelength
- **Soldering methods:** IR Reflow soldering
- **Preconditioning:** MSL 4 according to JEDEC
- **Packing:** 12mm tape with max.1000pcs/reel, ø180mm (7")

APPLICATIONS:

- RGD Display
- Decoration Lighting
- Light Strip
- Commercial Lighting
- Consumer Goods

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}	100	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~+85	°C
Storage Temperature	T _{STG}	-40~+100	°C

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

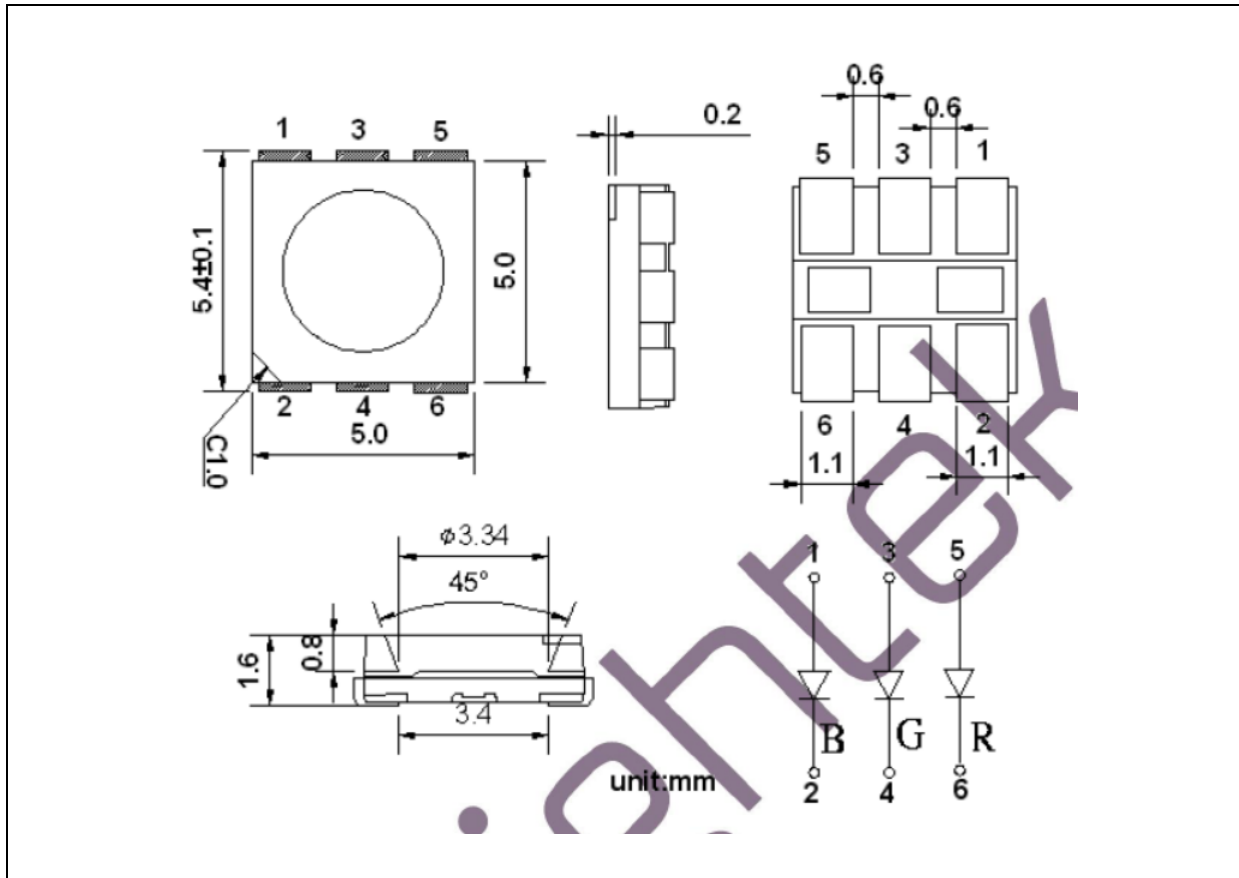
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Red - Forward Voltage	V _F	1.8	2.0	2.6	V	I _F =20mA
Red - Luminous Intensity	I _v	575	680	---	mcd	I _F =20mA
Red - Wavelength	W _P	615	---	630	nm	I _F =20mA
Green - Forward Voltage	V _F	2.8	3.2	3.6	V	I _F =20mA
Green - Luminous Intensity	I _v	1280	1500	---	mcd	I _F =20mA
Green - Wavelength	W _P	520	---	535	nm	I _F =20mA
Blue - Forward Voltage	V _F	2.8	3.2	3.6	V	I _F =20mA
Blue - Luminous Intensity	I _v	245	340	---	mcd	I _F =20mA
Blue - Wavelength	W _P	461	---	476	nm	I _F =20mA
Viewing Angle	2θ _{1/2}	---	120	---	deg	I _F =20mA

1. Luminous intensity (I_v) ±5%, Forward Voltage (V_F) ±0.1V; Wavelength ±1nm.

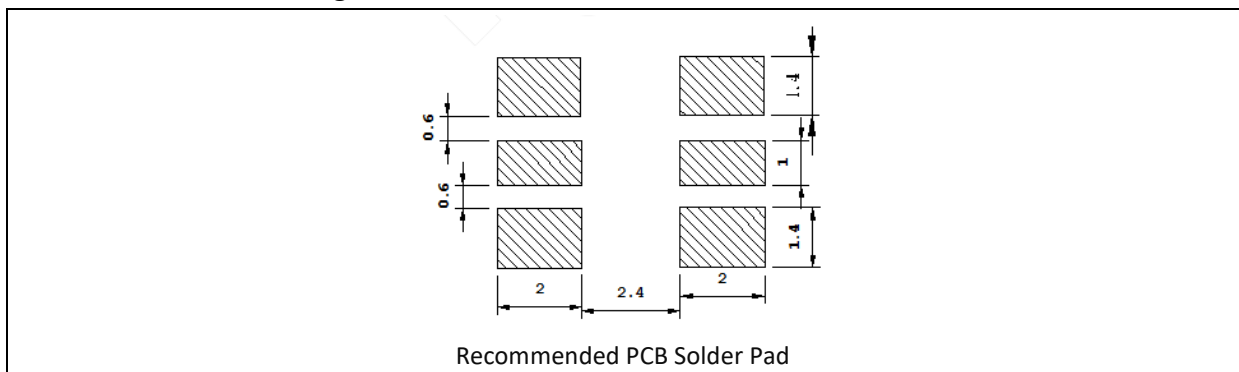
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



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

BINNING GROUPS:

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

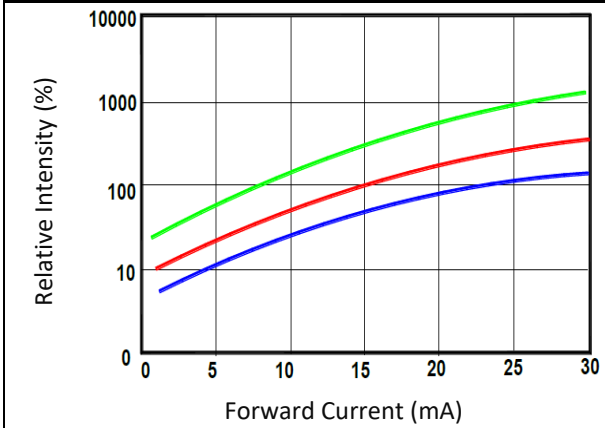
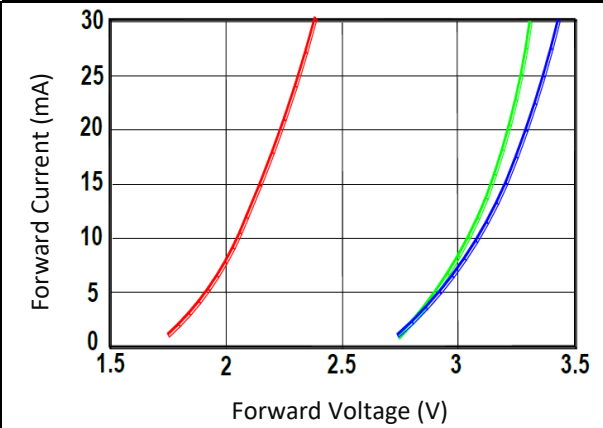
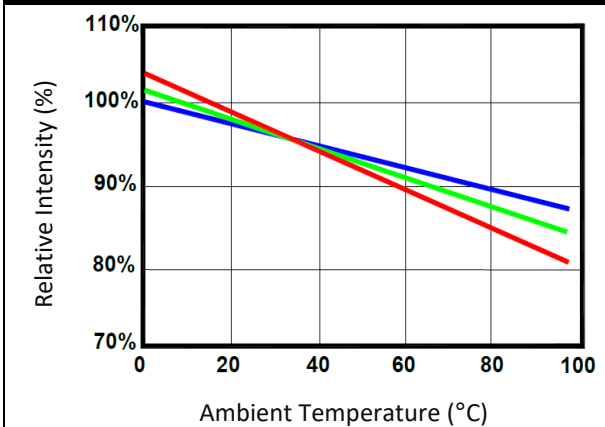
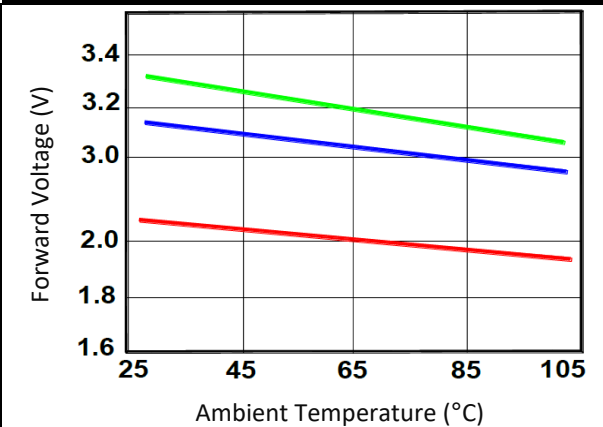
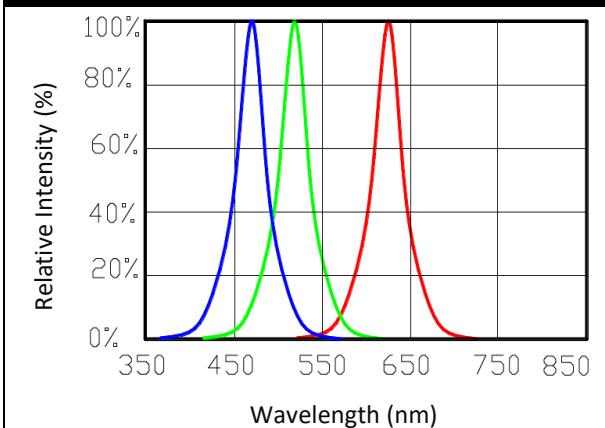
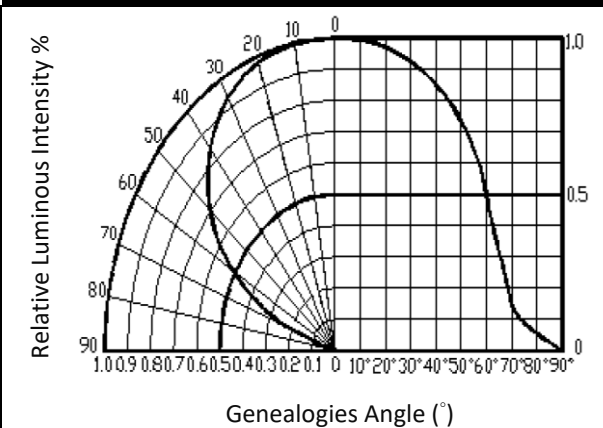
Code	Min.	Max.	Unit
R	1.8	2.6	V
G	2.8	3.6	
B	2.8	3.6	

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

Code		Min.	Max.	Unit
R	13	575	720	mcd
	14	720	900	
	15	900	1125	
G	12	1280	1600	
	13	1600	2000	
	14	2000	2500	
B	11	245	305	
	12	305	385	
	13	385	480	

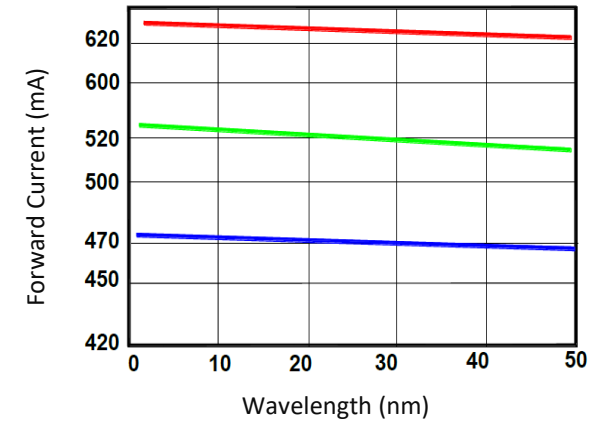
 Wavelength Classifications ($I_F = 20\text{mA}$):

Code		Min.	Max.	Unit
R	2	615	620	nm
	3	620	625	
	4	625	630	
G	2	520	525	
	3	525	530	
	4	530	535	
B	2	461	466	
	3	466	471	
	4	471	476	

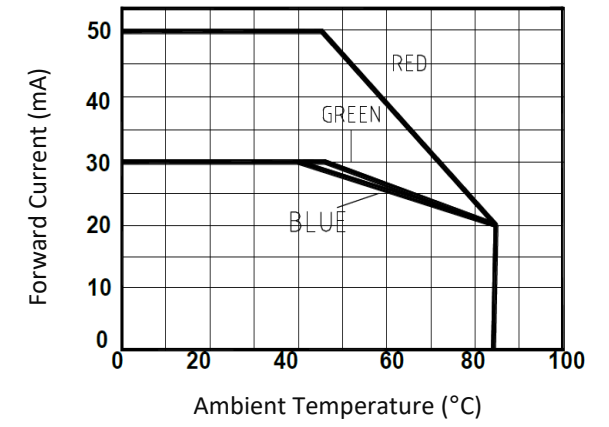
ELECTRO-OPTICAL CHARACTERISTICS:
Relative Intensity v.s. Forward Current

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

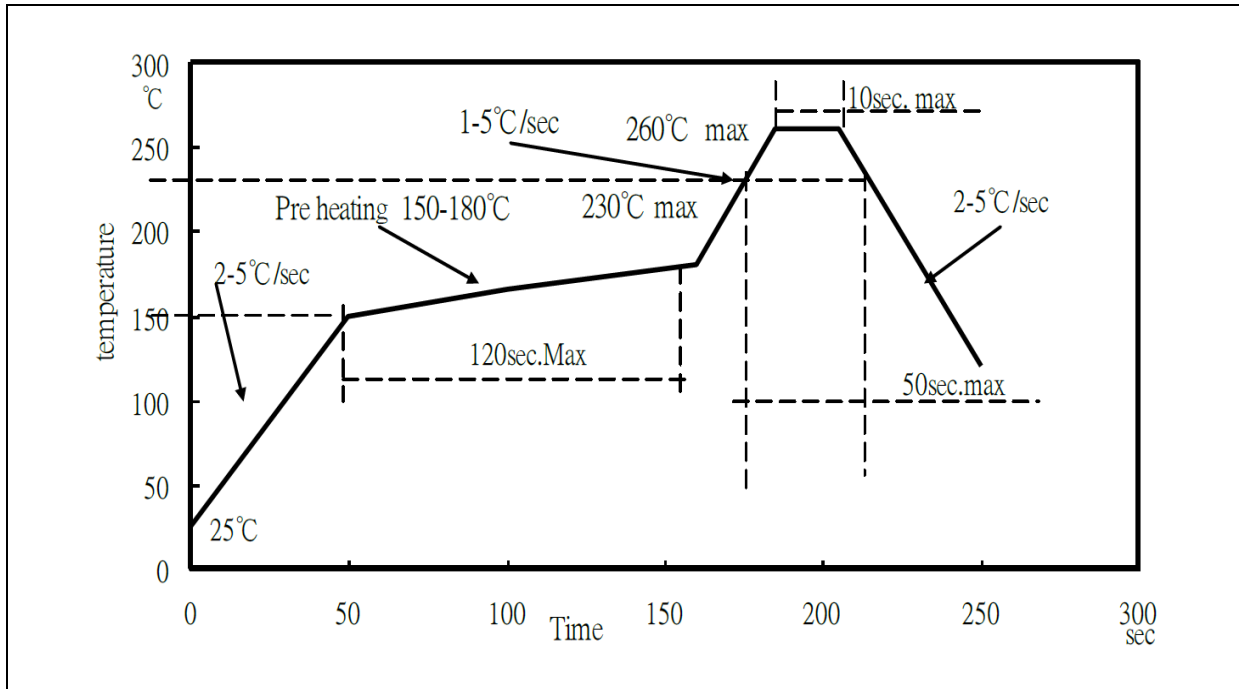


Maximum Current v.s. Ambient Temperature



RECOMMENDED SOLDERING PROFILE:

Lead-free IR Reflow Solder:

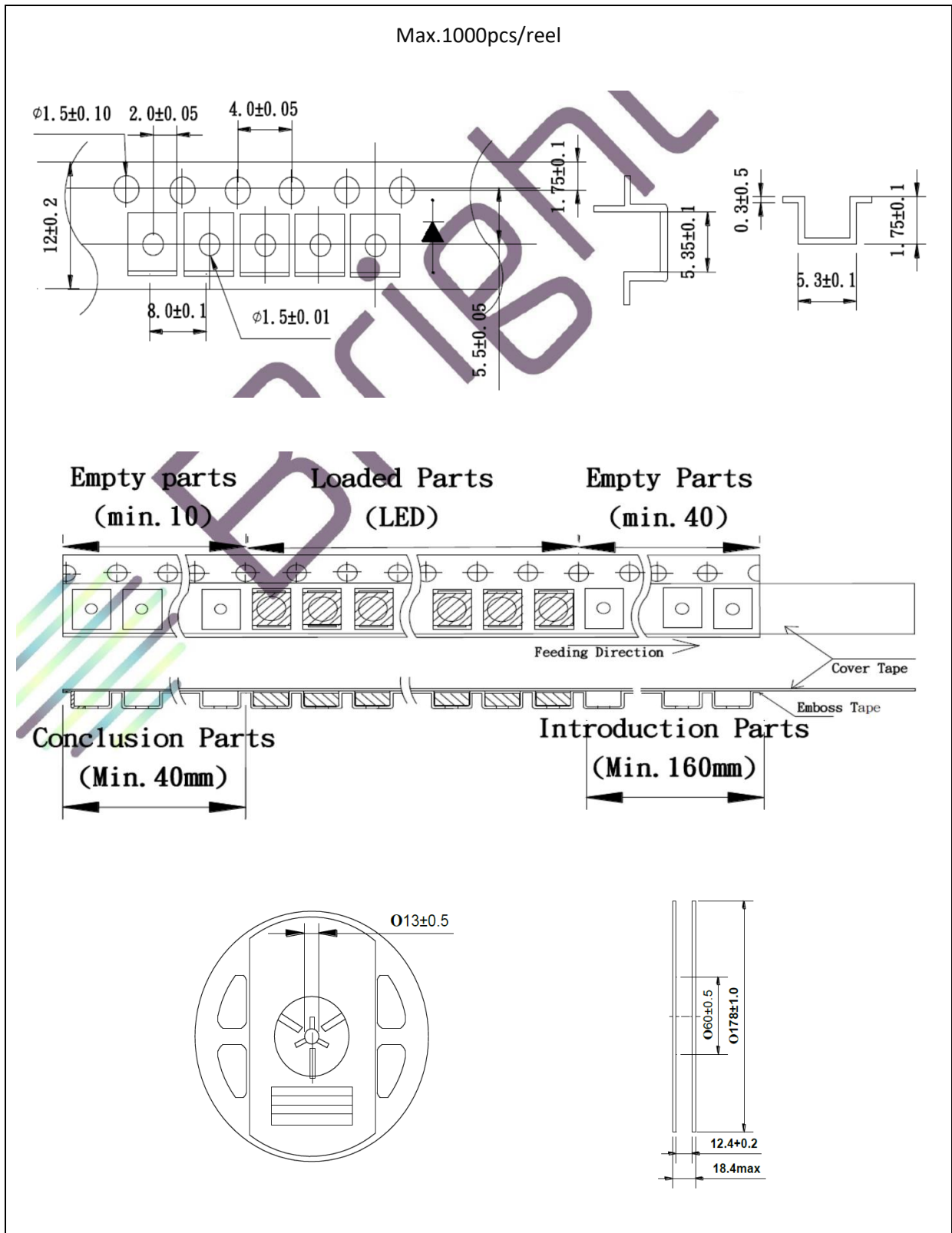


Note:

1. Maximum reflow soldering: 3 times.
2. Recommended soldering temperature is 240°C; the maximum soldering temperature should be 260°C.
3. 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 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 desiccating agent <10% R.H. and apply baking before use.

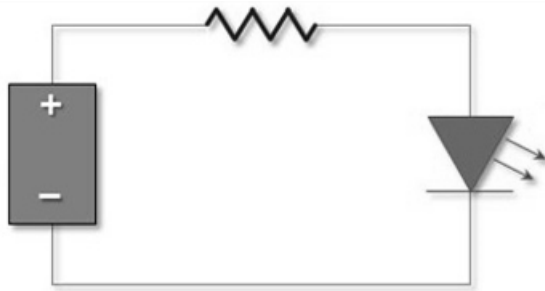
Baking:

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:

- 65±3°C x 6hrs 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-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	12/12/2019	Datasheet set-up.
A1.1	03/06/2022	New datasheet format.