



# 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



- ▶ CHIP SMD with IC
- ▶ 0606 (1615) IC 0.55t
- ▶ Red/Green/Blue

# NOM59S10IC



Release Date: 17 October 2024 Version: A1.1



0606 IC-Integrated

## 0606 IC-Integrated

**RoHS**  
Compliant



### FEATURES:

- **Package:** CHIP Top View Package with Integrated IC
- **Forward Current:** 12/12/12mA\*
- **Forward Voltage (typ.):** +3.3~+5.5V
- **Luminous Intensity (typ.):** 300/610/100mcd
- **Colour:** Red/Green/Blue
- **Wavelength:** 622/525/467nm
- **Viewing angle:** 120°
- **Materials:**
  - Resin: Epoxy (White Diffused)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+100°C
- **IC Features:** This IC-LED has advance function mode that supports the MCU to start WITH A SPECIFIC COMMAND SETTING. Support the scenarios of controlling multiple strips with parallel connection (up to 15 strips).
- **Pixel:** Each R/G/B chip is 8bit control, total of 16M colours can be displayed
- **Soldering methods:** IR Reflow soldering
- **MSL Level:** acc. to JEDEC Level 3
- **Packing:** 8mm tape with max.4000pcs/reel, ø180mm (7")

\* in order of Red/Green/Blue

### APPLICATIONS:

- Telecommunication
- Indicator
- Home Appliance
- Decoration Lighting
- Full Colour LED Strip
- Gaming Device
- Guardrail Tube

## CHARACTERISTICS:

### Absolute Maximum Characteristics ( $T_a=25^{\circ}\text{C}$ )

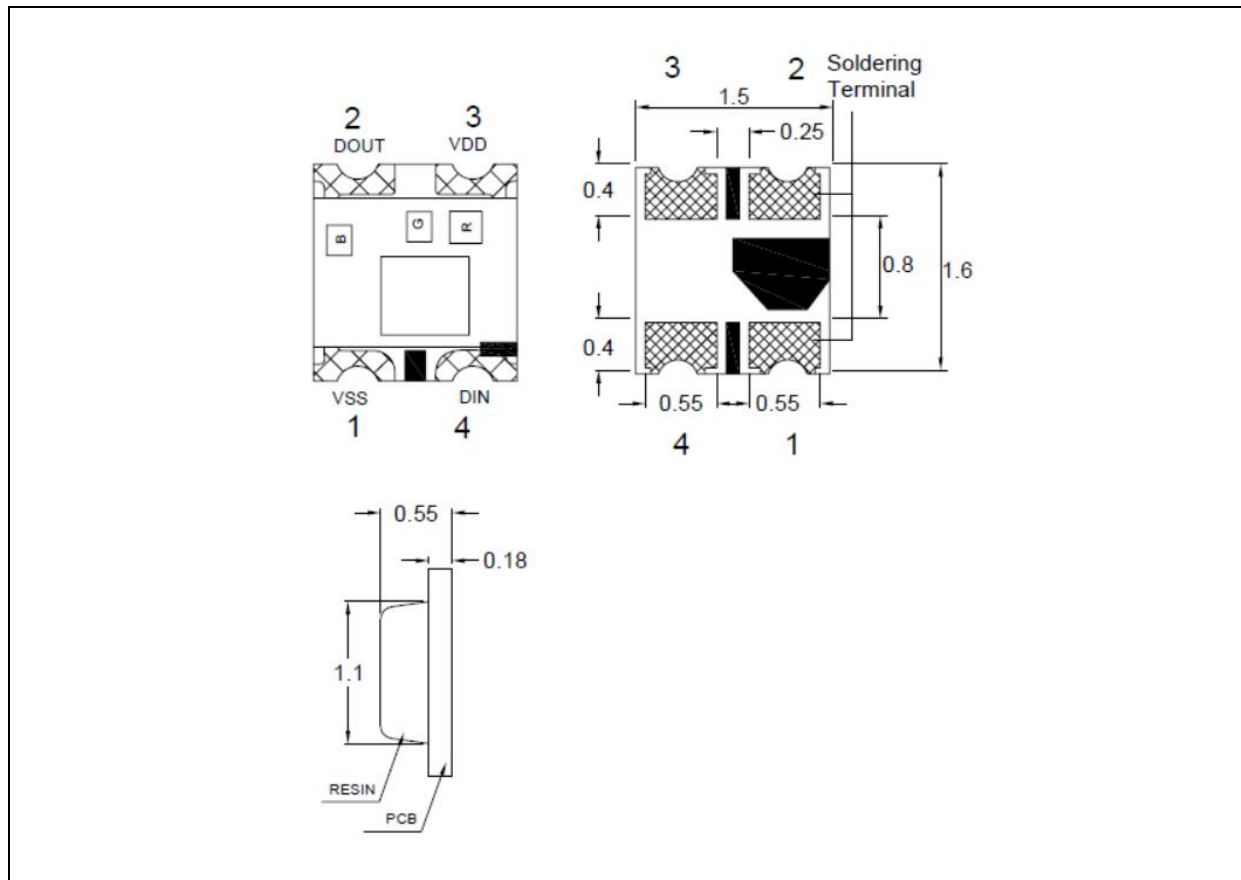
Parameter	Symbol	Ratings	Unit
LED Output Current	$I_{OUT}$	25	mA
Supply Voltage	$V_{DD}$	0 ~ +6.0	V
Power Dissipation	$P_D$	400	mW
Operating Temperature	$T_{OPR}$	-40~+85	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-40~+100	$^{\circ}\text{C}$

### Electrical & Optical Characteristics ( $T_a=25^{\circ}\text{C}$ , $V_{DD}=5\text{V}$ )

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Forward Voltage		$V_F$	3.3	5.0	5.5	V	---
Each R/G/B Current		$I_{OL}$	---	12	---	mA	$V_{DD}=5\text{V}$
Input High Voltage		$V_{IH}$	2.7	---	$V_{DD}$	V	DI
Input Low Voltage		$V_{IL}$	0	---	1.0	V	DI
Output High Voltage		$V_{OH}$	4.5	---	---	V	$I_{OH}=4\text{mA}$
Output Low Voltage		$V_{OL}$	---	---	0.4 $V_{DD}$	V	$I_{OL}=4\text{mA}$
Operation Current		$I_{DD}$	---	---	2	mA	B, G, R no load
Pull Down Resistance		$R_{PD}$	---	500K	---	$\Omega$	$D_{IN}, D_{OUT}$ ( $V_{DD}=5\text{V}$ )
Luminous Intensity	R	$I_V$	125	300	500	mcd	$I_F=12\text{mA}$
	G		320	610	1000		
	B		50	100	200		
Dominant Wavelength	R	$\lambda_D$	615	622	630	nm	$I_F=12\text{mA}$
	G		515	525	535		
	B		460	467	475		
Viewing Angle		$2\theta_{1/2}$	---	120	---	deg	$I_F=12\text{mA}$

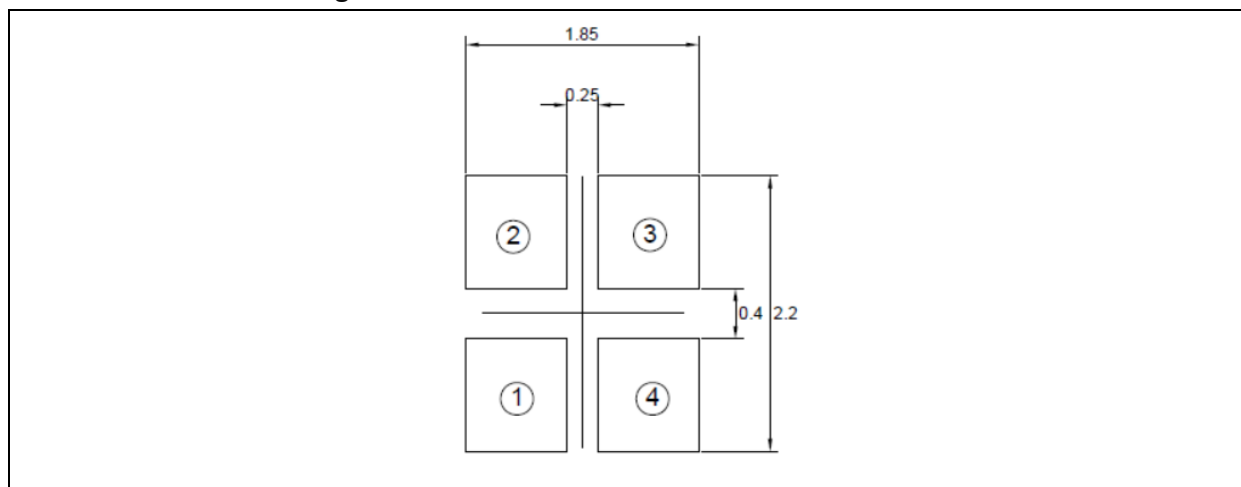
## OUTLINE DIMENSION:

Package Dimension:



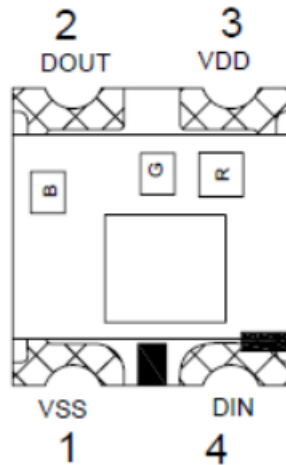
1. All dimensions are in millimetre (mm).
2. Tolerance  $\pm 0.2\text{mm}$ , unless otherwise noted.

Recommended Soldering Pad Dimension:



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

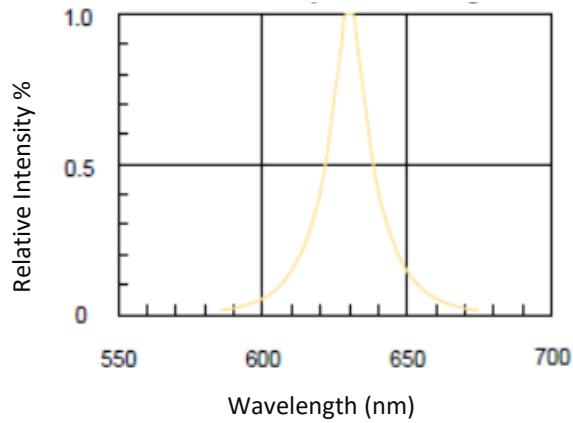
## PIN CONFIGURATION:



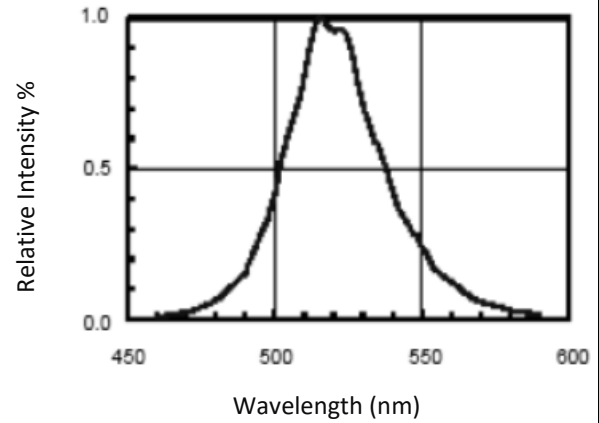
No.	Symbol	Function Description
1	VSS	Ground
2	DOUT	Control Data Signal Output
3	VDD	DC Power Input
4	DIN	Control Data Signal Input

## ELECTRO-OPTICAL CHARACTERISTICS:

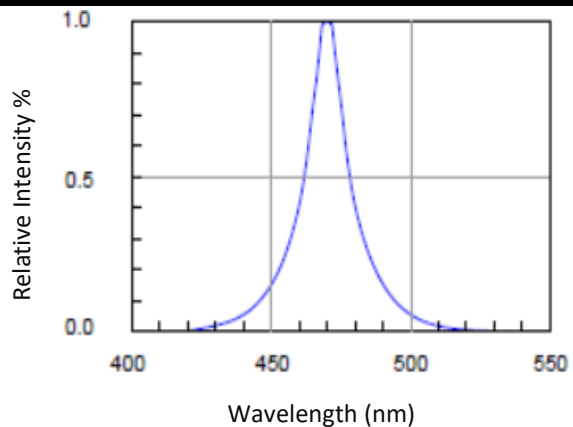
Relative Intensity v.s. Wavelength (RED)



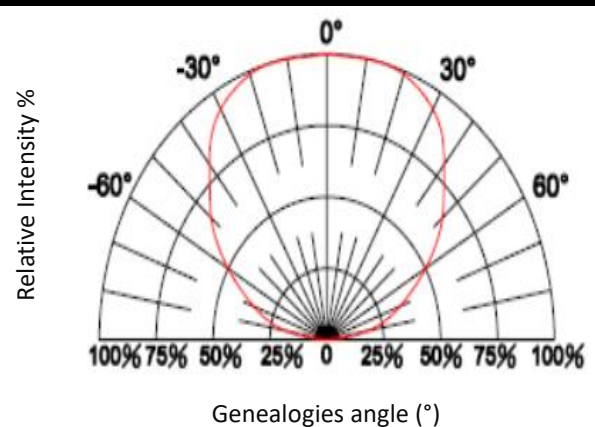
Relative Intensity v.s. Wavelength (GREEN)



Relative Intensity v.s. Wavelength (BLUE)

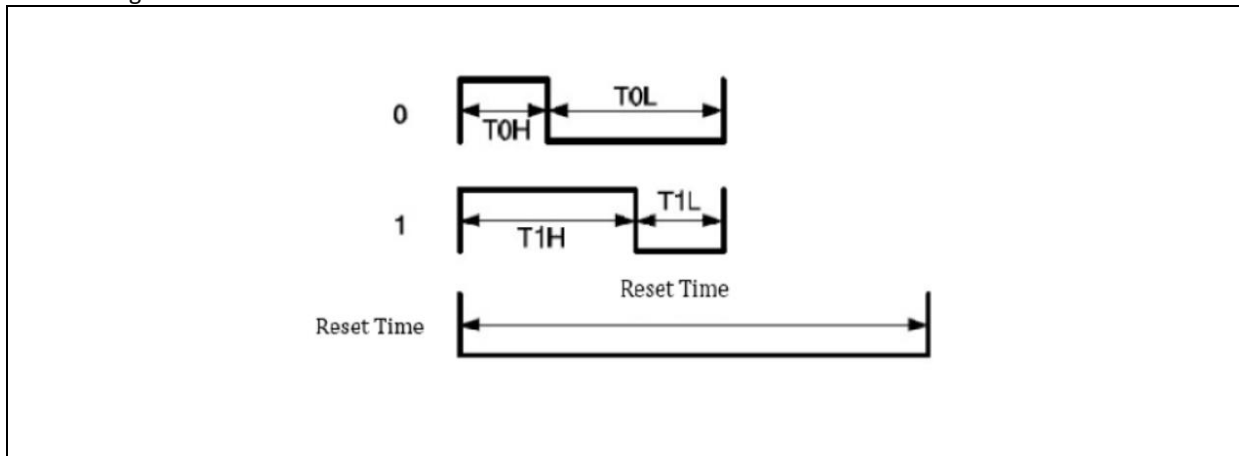


Relative Intensity v.s. Angular Displacement



## Function Description:

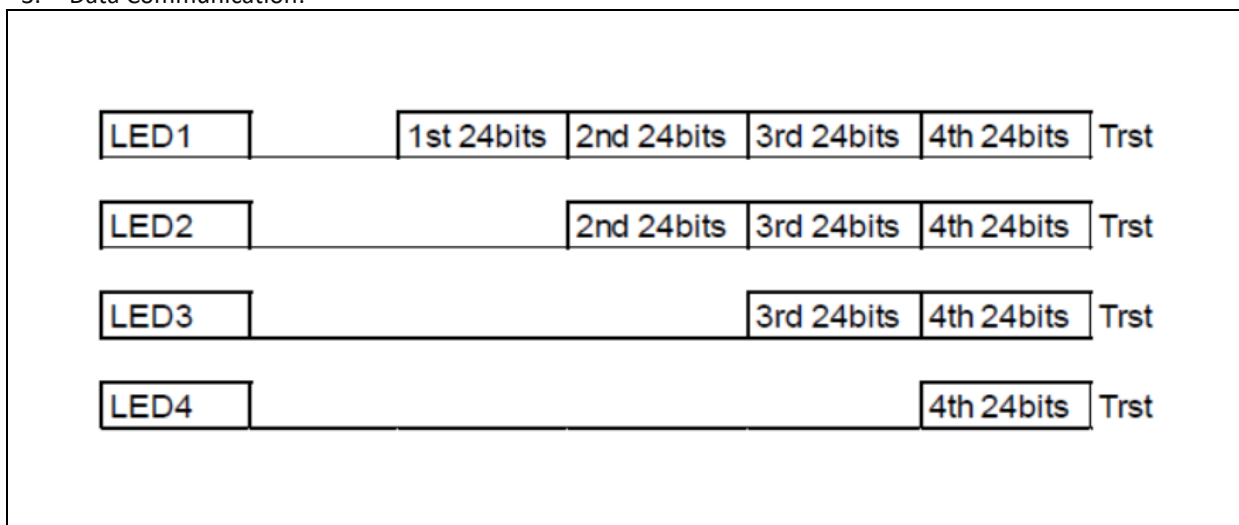
### 1. Timing Wave Form:



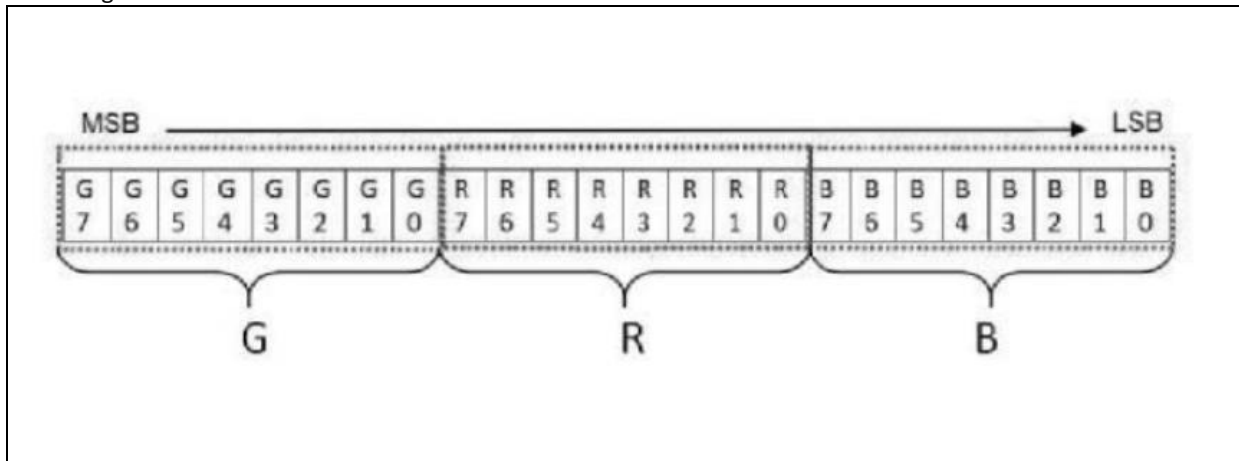
### 2. High Speed Mode:

Item	Description	min	Typical	Allowance	unit
T0H	0 code, High-level time		0.3	$\pm 0.15$	us
T0L	0 code, Low-level time		0.9	$\pm 0.15$	us
T1H	1 code, High-level time		0.9	$\pm 0.15$	us
T1L	1 code, Low-level time		0.3	$\pm 0.15$	us
Trst	Reset code, Low-level time	250			us

### 3. Data Communication:



#### 4. Single Data in 24bit for RGB:



#### 5. Control Commands for Multiple Strips Connected Parallely:

This IC LED supports the scenarios of controlling multiple strips with parallel connection (up to 15 strips). With appropriate commands, each of the strips can be identified and assigned a unique strip dynamic ID (by set dynamic ID command). After commands is completed, MCU host can individually control and send the display data to each strip with the help of "Clean ID", "Check ID", "Specify ID" ... etc. commands.

#### 6. Advance Function Mode:

This IC LED has an Advance Function Mode that supports the MCU to start with a specific command setting.

Advance Function Mode includes the following function:

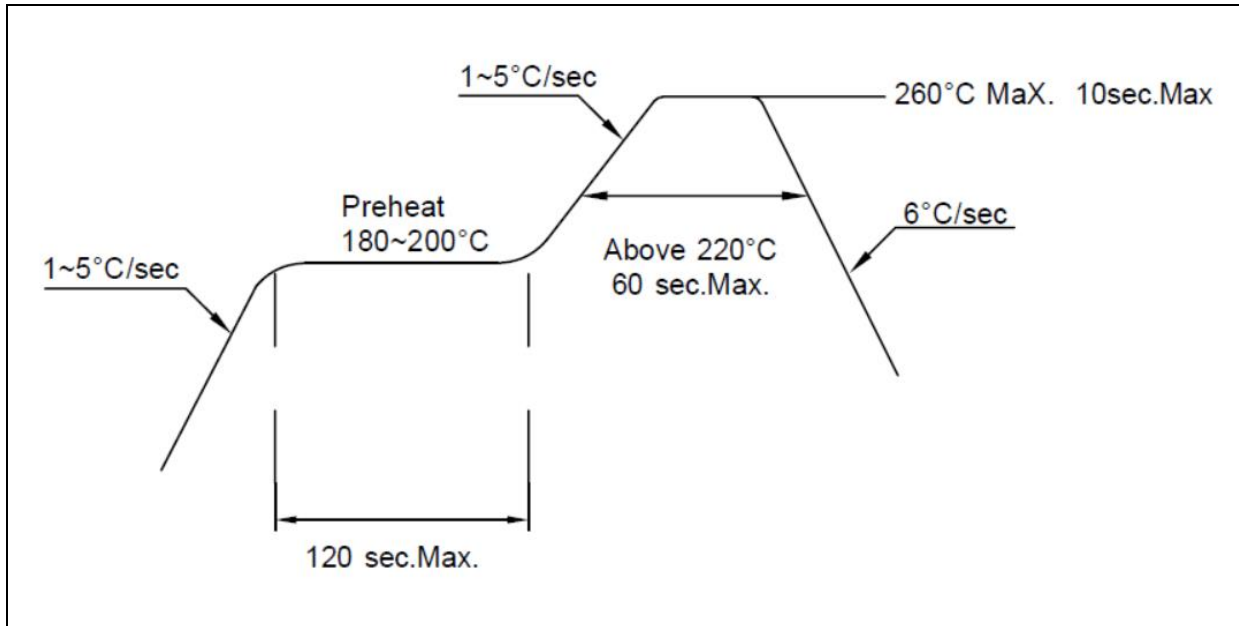
1. Feedback the cascaded number of LEDs and maximum sink current of R/G/B channel.
2. Current Gain control: 32 level (5bits) to adjust maximum sink current of R/G/B channel.
3. Programmable PWM refresh rate (1.25kHz/2.5kHz/5kHz/10kHz).



## RECOMMENDED SOLDERING PROFILE:

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Lead-free Solder IR Reflow:



Note:

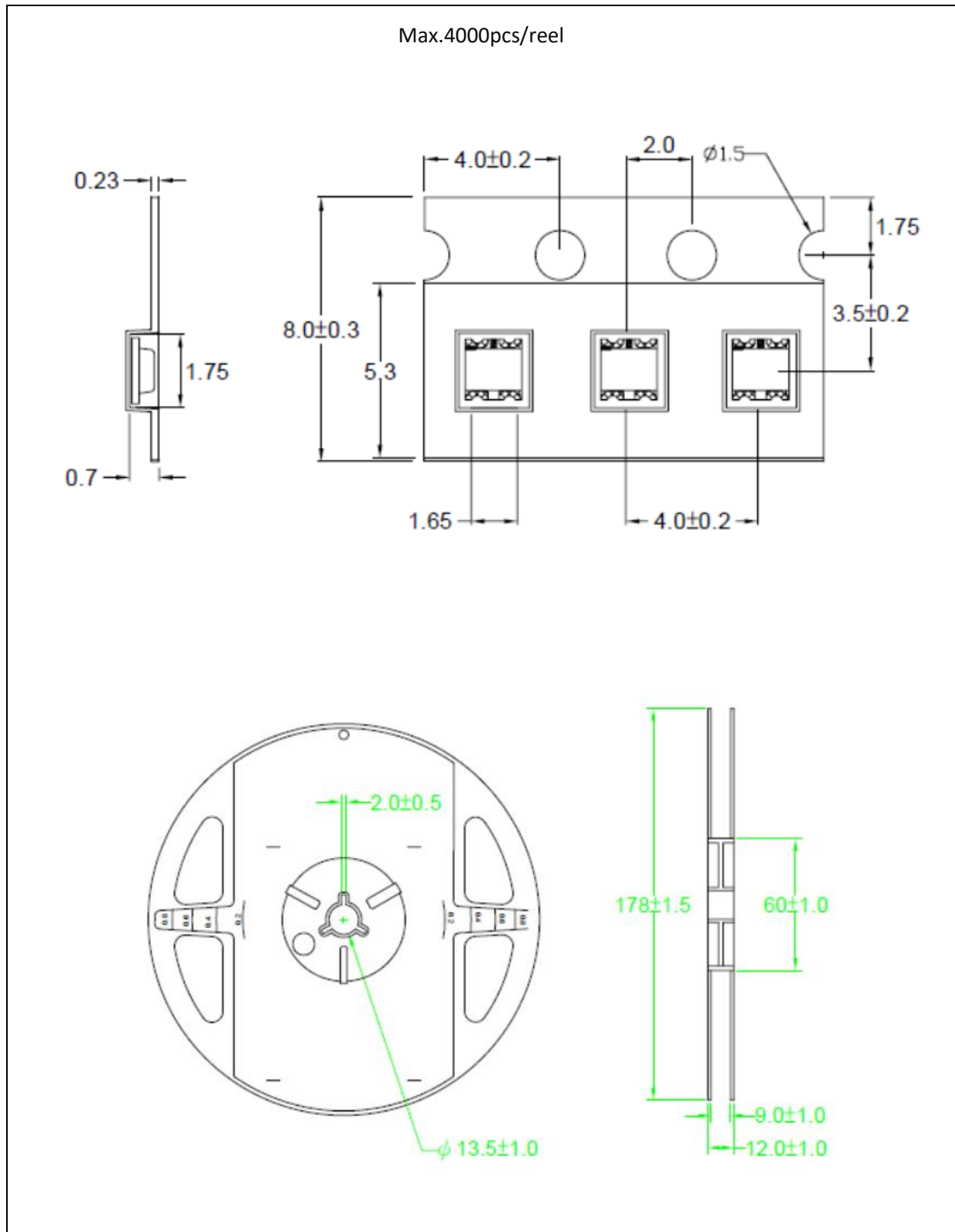
1. We recommend the reflow temperature 240°C ( $\pm 5^\circ\text{C}$ ). The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.





## 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 168 hours. Otherwise, they should be kept in a damp-proof box with desiccating agent stored at R.H.<10% and apply baking before use.

### Over-Current Proof:

Must apply resistors for protection otherwise slight voltage shift will cause big current change and burn-out will happen.

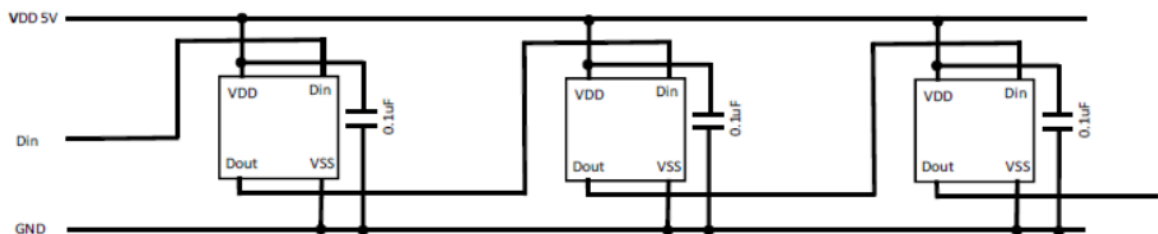
### Baking:

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.

### Recommended Route:



### 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.

**REVISION RECORD:**

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Version	Date	Summary of Revision
A1.0	26/04/2021	Datasheet set-up.
A1.1	17/10/2024	Add characteristic charts.