



**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
- ▶ 0808 (2020) IC 0.75t
- ▶ Red/Green/Blue

NOM67S14IC



Sleep Mode



Release Date: 16 December 2025 Version: A1.3



### 0808 IC-Integrated



#### FEATURES:

- **Package:** CHIP EIA STD Package 6 Pins with Integrated IC
- **Output Current:** 20mA/Channel
- **LED Voltage:** 4.5~5.5V
- **Luminous Intensity (typ.):** 280/850/150mcd\*
- **Colour:** Red/Green/Blue
- **Dominant Wavelength (typ.):** 633/527/457nm
- **Viewing Angle:** 120°
- **Materials:**
  - Resin: Epoxy (Water Clear)
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **IC Feature:** Serial data transmission signal by DATA CLK two lines. Supports sleep/wake-up mode. In sleep mode, the LED's current was lower than 5µA.
- **Pixel:** One pixel contains R, G, and B colour that each can achieve 256 level brightness grayscales, which forms 16,777,216 combination colours.
- **Soldering methods:** 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
- Status Indicator
- Home Appliance
- Decoration Lighting
- Full Colour LED Strip
- Gaming Device



Support sleep/wake up mode. In sleep mode the LED's current was lower than 5µA

## CHARACTERISTICS:

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

Parameter	Symbol	Ratings	Unit
The Max. LED Output Current	$I_{\text{OMAX}}$	20/Channel	mA
IC Power Supply Voltage	$V_{\text{DD}}$	< 6.5	V
LED Voltage	$V_{\text{LED}}$	4.5~5.5	V
Power Dissipation	PD	< 400	mW
Rate of Data Signal	$F_{\text{CLK}}$	15	MHz
Operating Temperature	$T_{\text{OPR}}$	-40~+105	$^\circ\text{C}$
Storage Temperature	$T_{\text{STG}}$	-40~+105	$^\circ\text{C}$
Electrostatic Discharge (HBM)	ESD	6000	V
Soldering Temperature	$T_{\text{SD}}$	260 for 10s max.	$^\circ\text{C}$

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

Parameter	Symbol	Values			Unit	Test Condition	
		Min.	Typ.	Max.			
LED Voltage	$V_{\text{LED}}$	4.5	---	5.5	V	---	
Luminous Intensity	R	$I_v$	220	280	350	mcd	$V_{\text{DD}}=5\text{V}$
	G		700	850	1050		
	B		120	150	200		
Dominant Wavelength	R	$\lambda_d$	630	---	636	nm	$V_{\text{DD}}=5\text{V}$
	G		524	---	529		
	B		455	---	460		
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	$V_{\text{DD}}=5\text{V}$	

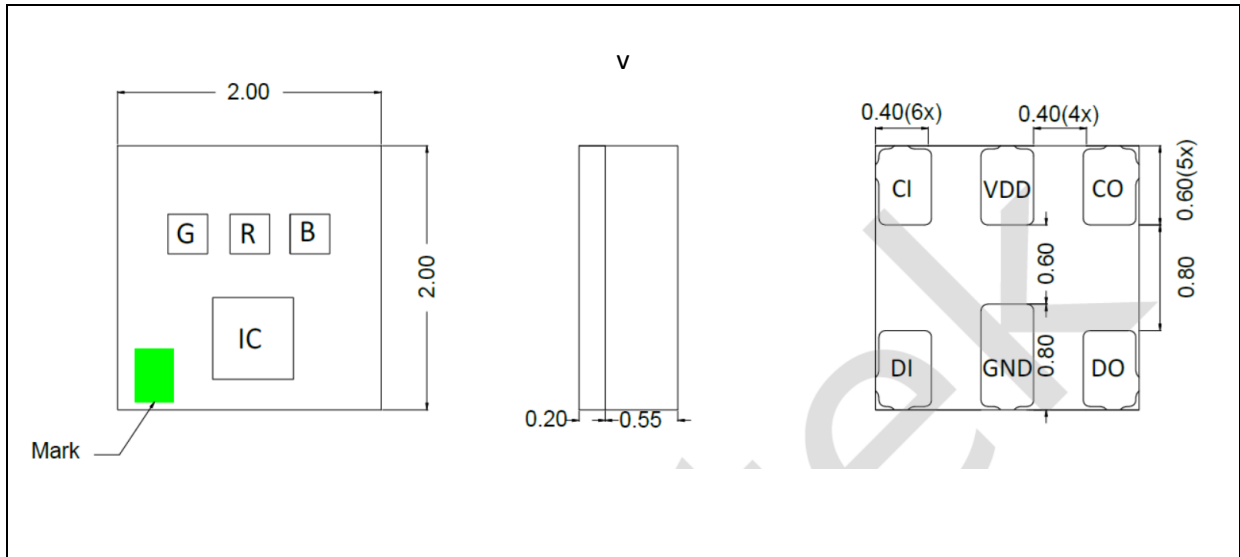
- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- $2\theta_{1/2}$  is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
- The dominant wavelength,  $\lambda_d$  is derived from CIE chromaticity diagram and represents the single wavelength which defines the color of the device. Peak emission wavelength tolerance is  $\pm 1\text{nm}$ .

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

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Supply Voltage	$V_{DD}$	4.5	5.0	5.5	V	---
Input High Voltage	$V_{IH}$	2.7	---	$V_{DD}+0.4$	V	---
Input Low Voltage	$V_{IL}$	-0.4	---	1.0	V	---
Clock High Level Width	$T_{CLKH}$	30	---	---	ns	---
Clock Low Level Width	$T_{CLKL}$	30	---	---	ns	---
Data Setup Time	$T_{SETUP}$	10	---	---	ns	---
Data Hold Time	$T_{HOLD}$	5	---	---	ns	---
Working Current (IC)	$I_{DD}$	---	---	2	mA	$I_{out}="OFF"$
Static Current	$I_{sleep}$	---	---	5	$\mu\text{A}$	Sleep Mode

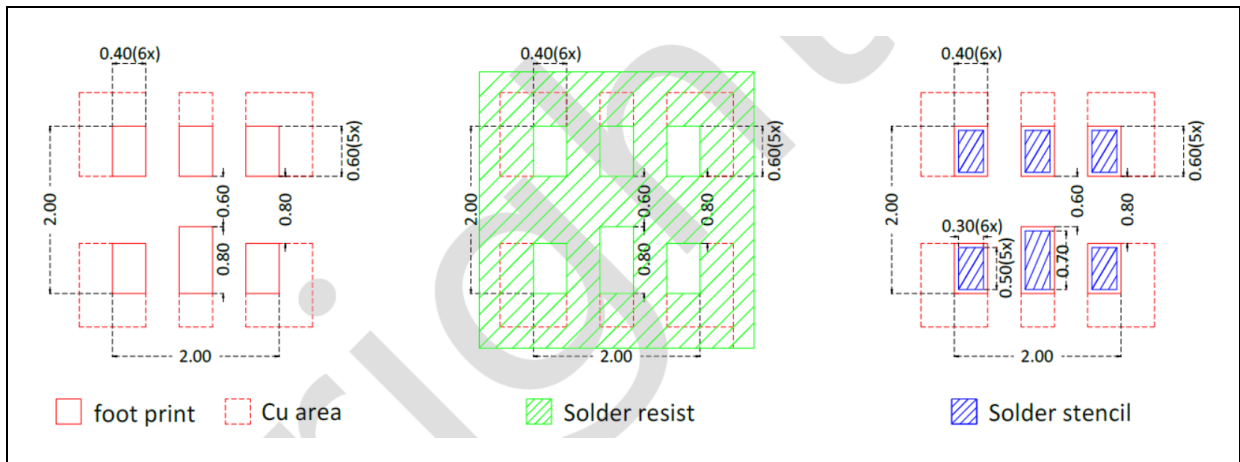
## OUTLINE DIMENSION:

### Package Dimension:

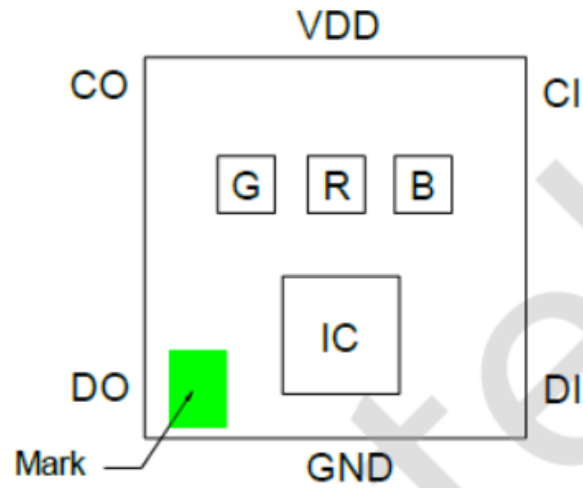


1. All dimensions are in millimetre (mm).
2. Tolerance  $\pm 0.1\text{mm}$ , unless otherwise noted.

### Recommended Soldering Pad Dimension:



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

**PIN CONFIGURATION:**


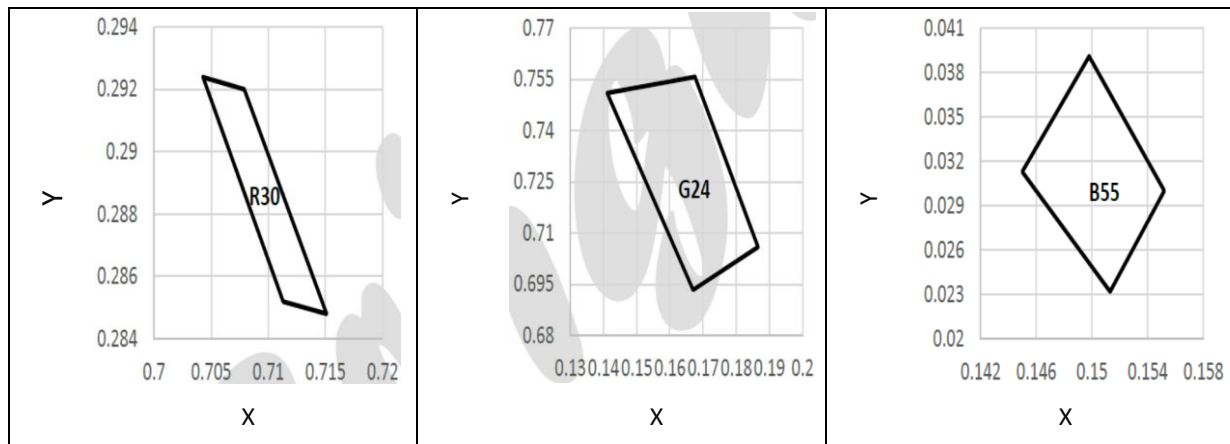
No.	Symbol	Function Description
1	CO	Clock Output
2	VDD	Supply Voltage
3	CI	Clock Input
4	DO	Data Output
5	GND	Ground
6	DI	Data Input

## BINNING GROUPS:

Luminous Intensity Classifications ( $V_{DD}=5V$ ,  $I_F=20mA$ ):

Code		Min.	Max.	Unit
Red	1	220	280	mcd
	2	280	350	
Green	1	700	850	mcd
	2	850	1050	
Blue	1	120	150	mcd
	2	150	200	

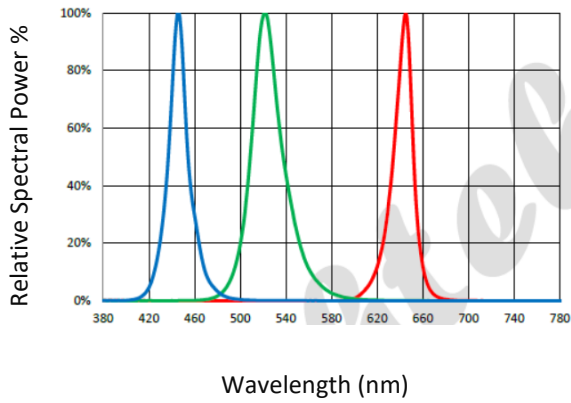
Chromaticity Coordinate Classifications ( $V_{DD}=5V$ ,  $I_F=20mA$ ):



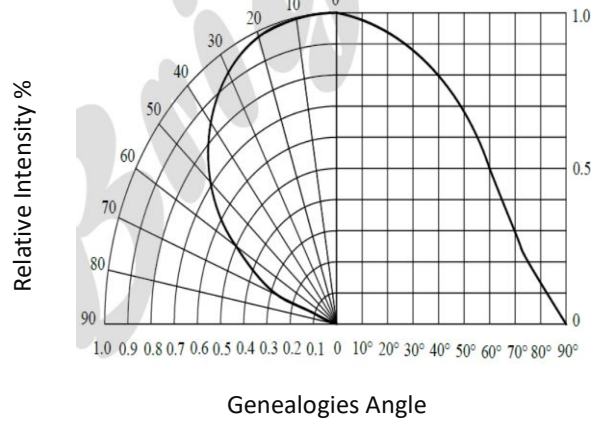
	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
R30	0.7043	0.2924	0.7079	0.2920	0.7151	0.2848	0.7113	0.2852
G24	0.1676	0.7558	0.1411	0.7510	0.1670	0.6934	0.1866	0.7059
B55	0.1450	0.0313	0.1513	0.0232	0.1552	0.0300	0.1498	0.0391

## ELECTRO-OPTICAL CHARACTERISTICS (Full PWM):

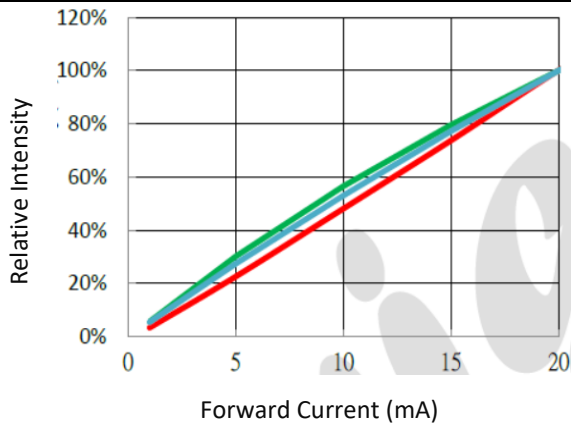
### Relative Spectral Power v.s. Wavelength



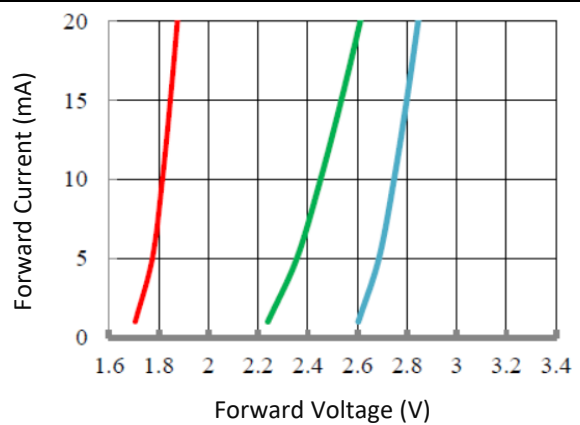
### Directive Radiation



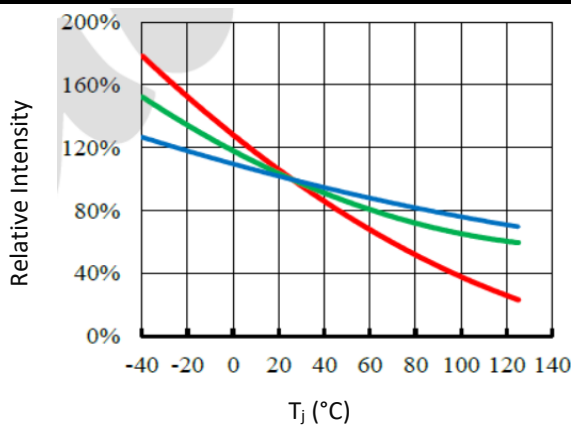
### Relative Intensity v.s. Forward Current



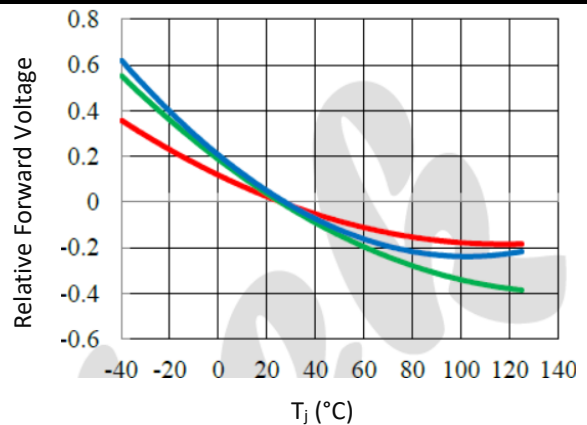
### Forward Current v.s. Forward Voltage



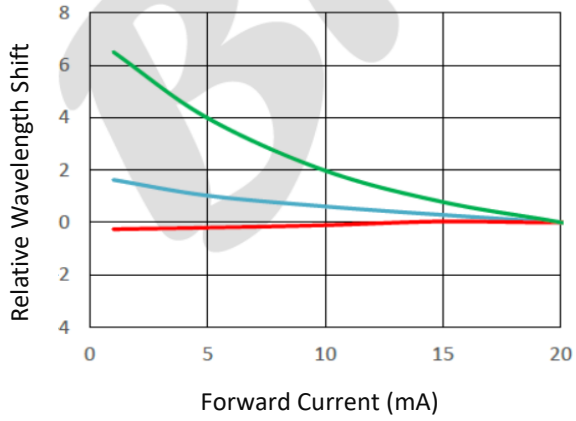
### Relative Intensity v.s. Temperature



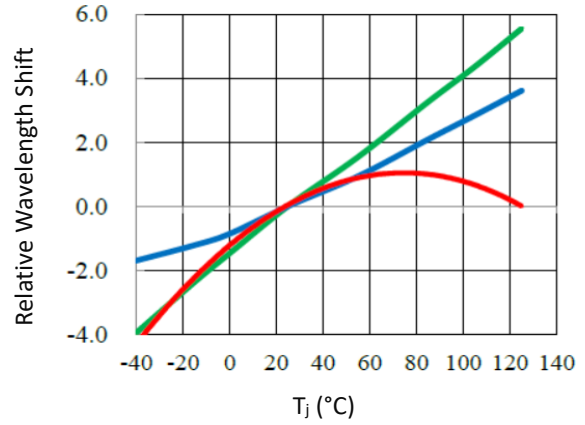
### Relative Forward Voltage v.s. Temperature



Wavelength Shift v.s. Forward Current

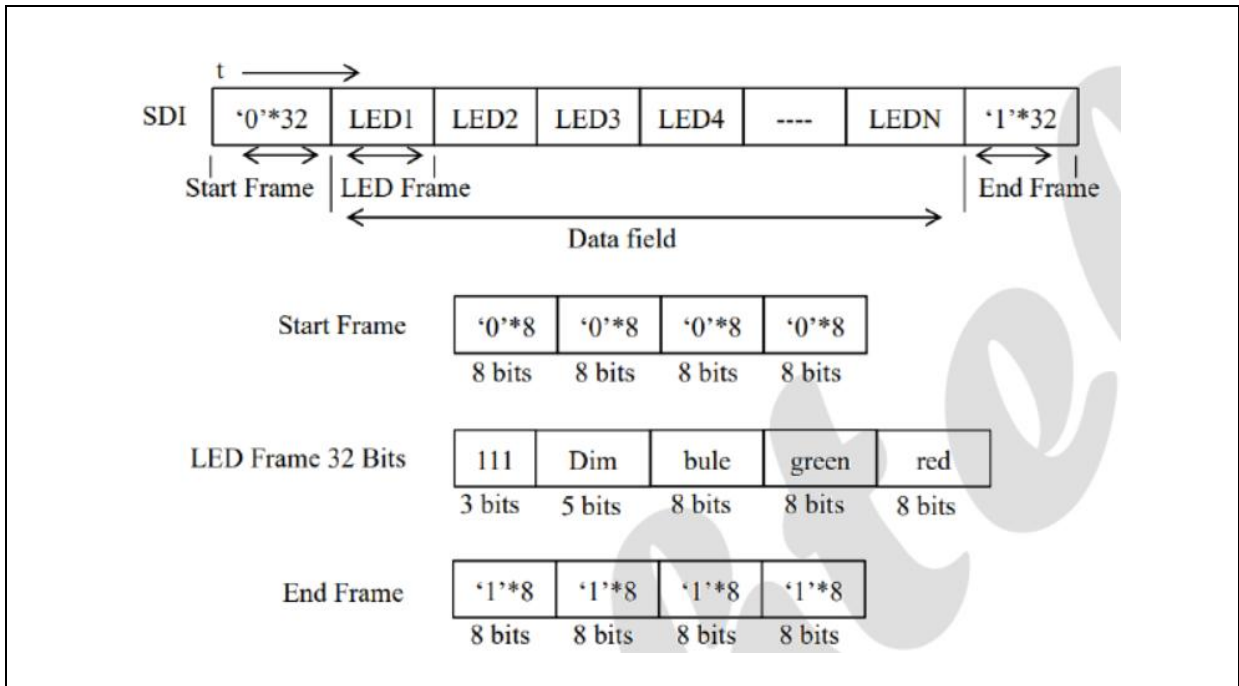


Wavelength Shift v.s. Temperature



## Function Description:

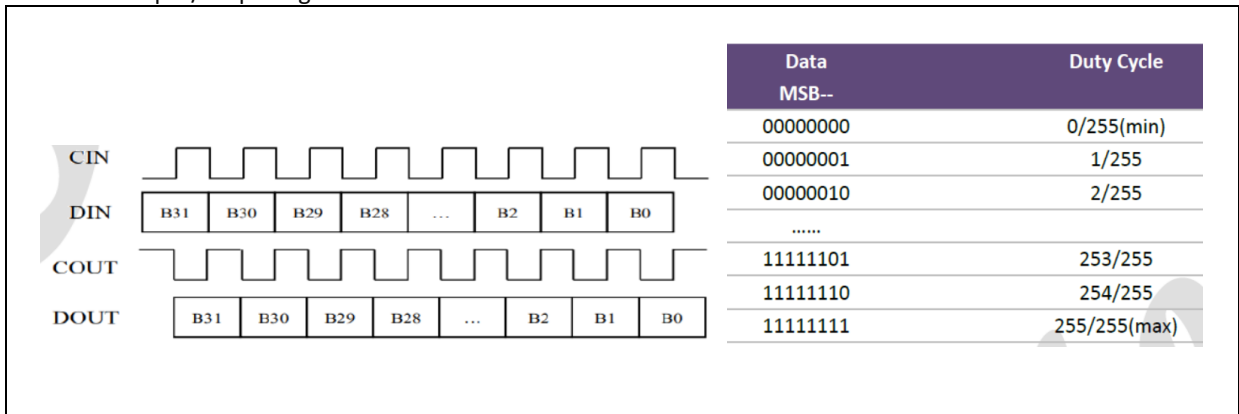
### 1. Series Data Structure – Tandem N-LED:



### 2. Dim 5-Bit (level 32) brightness adjustment (simultaneous control of OUTR\OUTG\OUTB three port current):

Data MSB←→LSB	Driving Current
00000	0/31
00001	1/31
00010	2/31
.....	
11110	30/31
11111	31/31(max)

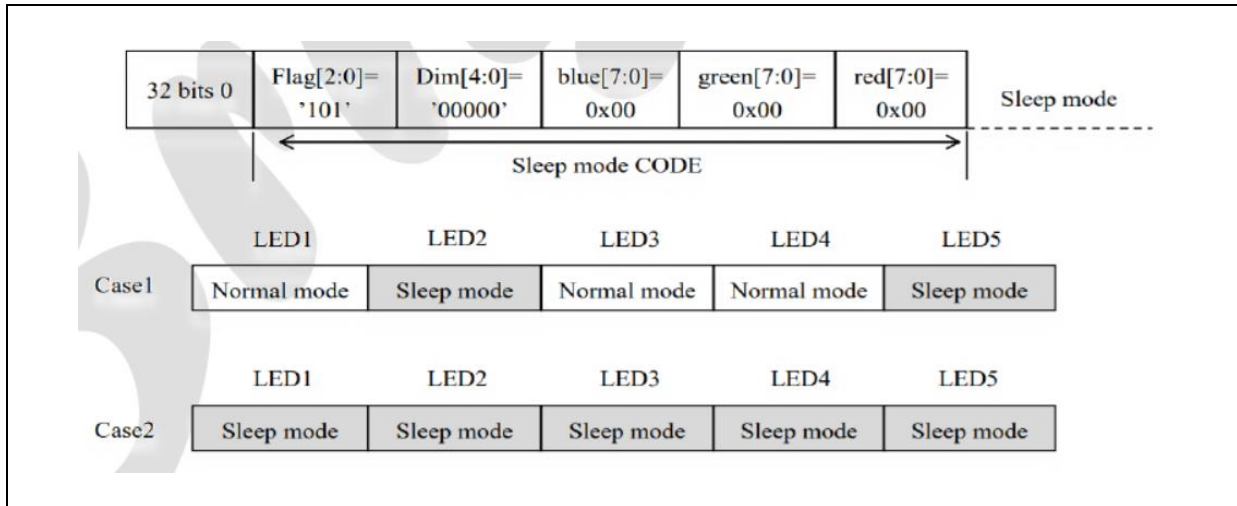
### 3. PWM input/output signals relations:



4. Sleep and power saving mode:

LED supports the sleep/wake-up modes for power-saving purpose. After the IC receives 24-bitS 0's BGR data (that is B[7:0]=8h00, G[7:0]=8h00, R[7:0]=8h00), in the meantime, both of the data in 3-bits FLAG and 5-bits DIMMING is 8h'A0' (that is FLAG[2:0] =3b101 and DIMMING [4:0] =5b00000), the IC will enter sleep mode, its current is about 1μA.

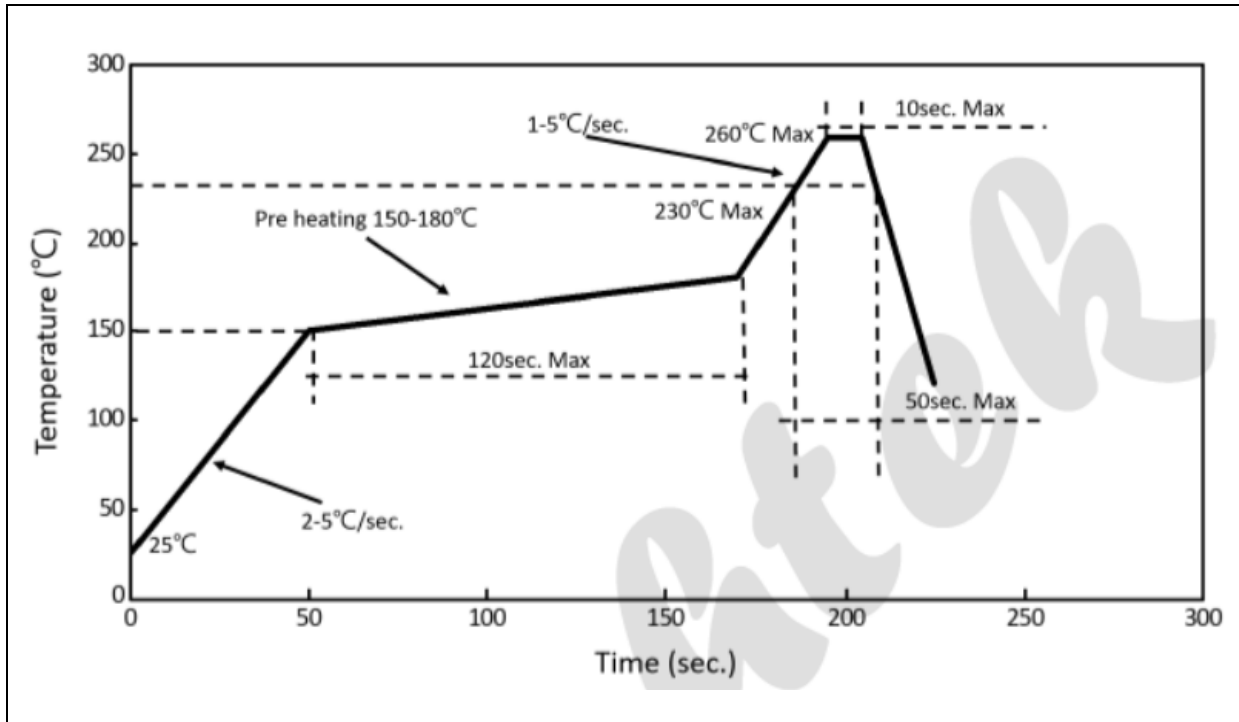
The IC will wake up from sleep mode once receiving the new data with the data of FLAG[2:0], DIMMING[4:0] is not 8h'A0"; after wake-up, all sleeping circuits in IC return to normal working mode within1ms. Since it takes 1ms for a sleeping IC returning to normal function mode, it is recommended for a host to wait for 1ms to send display data and command after issuing a wake-up command.



In case 1, while lamp 2 is under sleep mode, in the following data transfer process, the state of lamp 2 will be not changed as long as the 32-bits data for lamp 2 is received with data of FLAG[2:0] and DIMMING[4:0] being 8h'A0". It means lamp 2 will keep in sleep mode as well. In the situation, lamp 2 can pass through the remaining data to lamp 3 (32-bits) to change the display data of lamp 3. In other words, the sleeping chip is able to pass the data to the next chips.

## ECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:

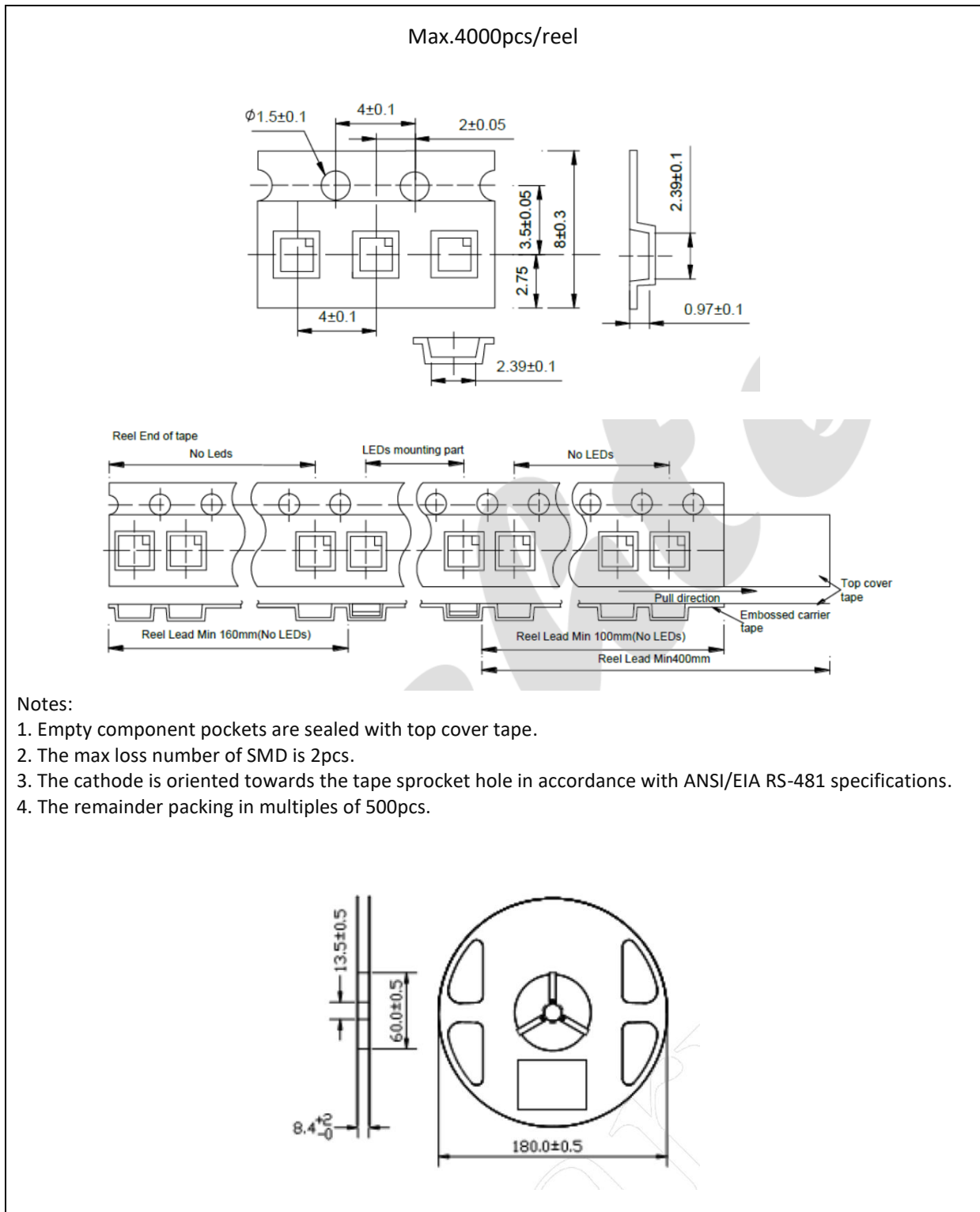


Note:

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: 3 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 a week. Otherwise, they should be kept in a damp-proof box with desiccating agent stored at R.H.<20% 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.

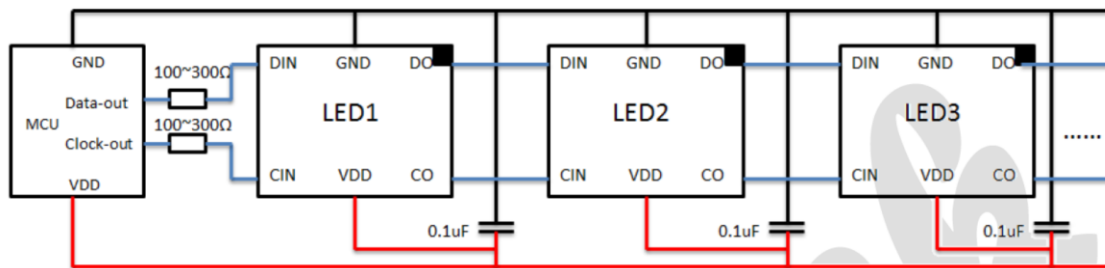
### Baking:

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±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:



When the first LED is connected to the MCU, a resistance R is needed in series between its signal input line and the MCU. The size of R depends on the number of cascade beads. The more cascades, the smaller resistance R is used. It is generally recommended that the value be between 100-1K. Usually the recommended value is around 300 R. In order to make the LEDs work more stably, a parallel capacitor is needed between VDD and GND of each.

### 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.

**REVISION RECORD:**

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Version	Date	Summary of Revision
A1.0	28/11/2022	Datasheet set-up.
A1.1	11/08/2024	Update automotive qualification.
A1.2	13/09/2024	Add product photos.
A.1.3	16/12/2025	Revise working temperature range.