



**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 with IC
- ▶ 3535IC 1.47t Series
- ▶ Red/Green/Blue

# NOM67S35IC



Release Date: 15 September 2024 Version: A1.1



## 3535 IC-Integrated

**RoHS**  
Compliant



### FEATURES:

- **Package:** PLCC4 STD Package with Integrated IC
- **Forward Current:** 12mA
- **Forward Voltage (typ.):** +3.8~+5.5V
- **Luminous Intensity (typ.):** 600/1500/375mcd\*
- **Mixed White Luminous Intensity (typ.):** 2400mcd
- **Colour:** Red/Green/Blue
- **Dominant Wavelength (typ.):** 622/525/467nm
- **Viewing Angle:** 120°
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+105°C
- **IC Feature:** RGB and driver chip are integrated in a package, to form a complete control of pixel point with constant current. Serial data transmission signal by single wire. One pixel contains R, G, and B colour that each can achieve 256 level brightness grayscales, which forms 16,777,216 combination colours. Internal clock frequency operates at 800 kHz.
- **Soldering methods:** IR reflow soldering
- **MSL Level:** acc. to JEDEC J-STD-020E Level 3
- **Packing:** 12mm tape with max.1300pcs/reel, ø180mm (7")

\* in order of Red/Green/Blue

### APPLICATIONS:

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

## CHARACTERISTICS:

### Absolute Maximum Characteristics (T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Unit
IC Power Supply Voltage	V <sub>DD</sub>	+3.8~+5.5	V
IC Input Voltage	V <sub>I</sub>	-0.4~V <sub>DD</sub> +0.4	V
Forward Current	I <sub>F</sub>	12	mA
Operating Temperature	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature	T <sub>STG</sub>	-40~+105	°C
Electrostatic Discharge (HBM) acc. To ANSI/ESDA/JEDEC JS-001	ESD	2000	V

### Electrical & Optical Characteristics (T<sub>a</sub>=25°C, V<sub>DD</sub>=5V)

Parameter	Symbol	Values			Unit	Test Condition	
		Min.	Typ.	Max.			
Forward Voltage	V <sub>F</sub>	3.8	---	5.5	V	---	
Luminous Intensity	R	I <sub>v</sub>	400	---	800	mcd	I <sub>F</sub> =12mA
	G		1000	---	2000		
	B		250	---	500		
Mix White	W		1600	---	3200		
Dominant Wavelength	R	λ <sub>d</sub>	615	---	630	nm	I <sub>F</sub> =12mA
	G		520	---	530		
	B		460	---	475		
Colour Coordinate	X	---	---	0.2454	---	---	I <sub>F</sub> =12mA
	Y		---	0.2392	---		
Viewing Angle	2θ <sub>1/2</sub>	---	120	---	deg	I <sub>F</sub> =12mA	

1. Tolerance of Measure: Luminous Intensity: ±10%, Dominant Wavelength: ±0.005, Color Coordinate: ±0.005, View Angle(2θ<sub>1/2</sub>): ±5%

Electrical & Optical Characteristics ( $T_a=25^\circ\text{C}$ )

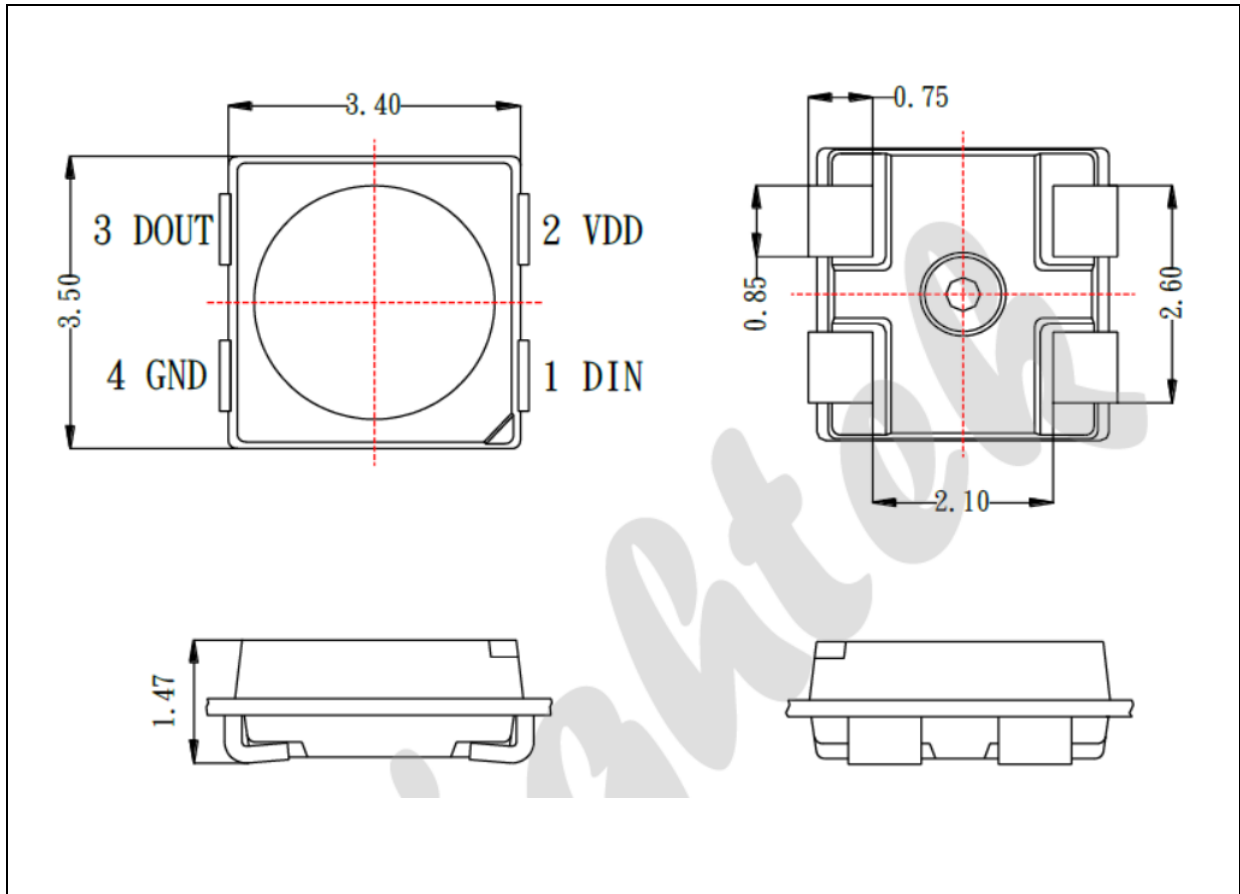
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Standby Current	I <sub>STB</sub>	---	0.45	---	mA	V <sub>DD</sub> =5V, I <sub>OUT</sub> ="OFF"
Input Voltage Level	V <sub>IH</sub>	3.1	---	---	V	D <sub>IN</sub> , Input High Level V.
	V <sub>IL</sub>	---	---	1.5	V	D <sub>IN</sub> , Input Low Level V.

 Switching Characteristics ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Rate of Data Signal	F <sub>DIN</sub>	---	800	---	kHz	---
Transfer Time	T <sub>PLH</sub>	---	---	80	ns	D <sub>IN</sub> -> D <sub>OUT</sub> D <sub>OUT</sub> Port to GND CL=30pF
	T <sub>PHL</sub>	---	---	80	ns	
Conversion Time of I <sub>OUT</sub> R/G/B	T <sub>R</sub>	---	500	---	ns	I <sub>OUT</sub> (R/G/B) =11.5mA RL=200Ω CL=30pF
	T <sub>F</sub>	---	500	---	ns	

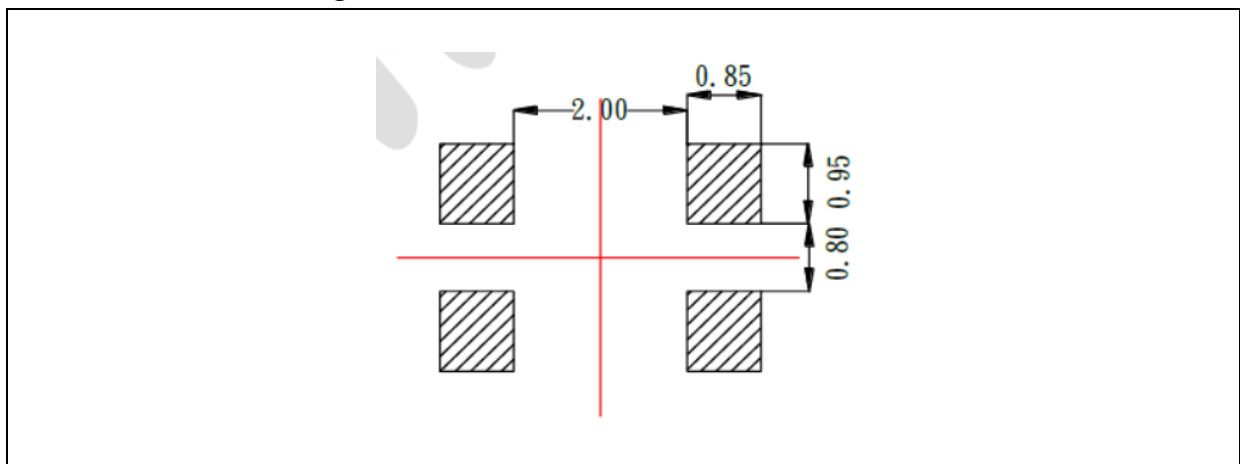
## OUTLINE DIMENSION:

Package Dimension:



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

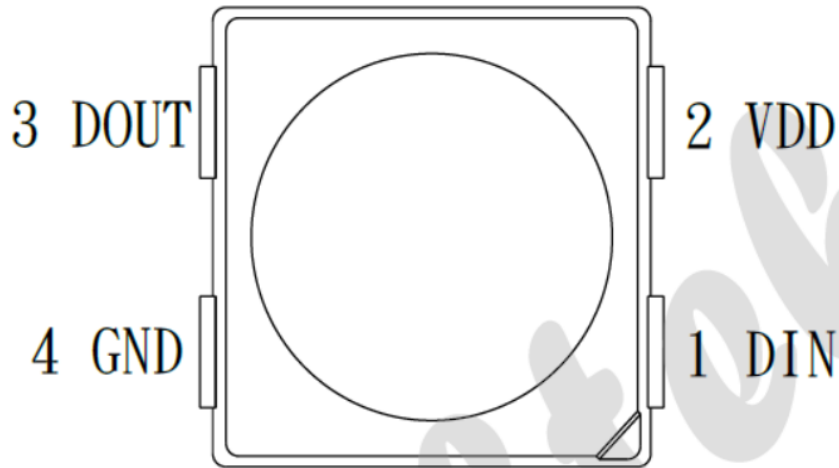
Recommended Soldering Pad Dimension:



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

**PIN CONFIGURATION:**


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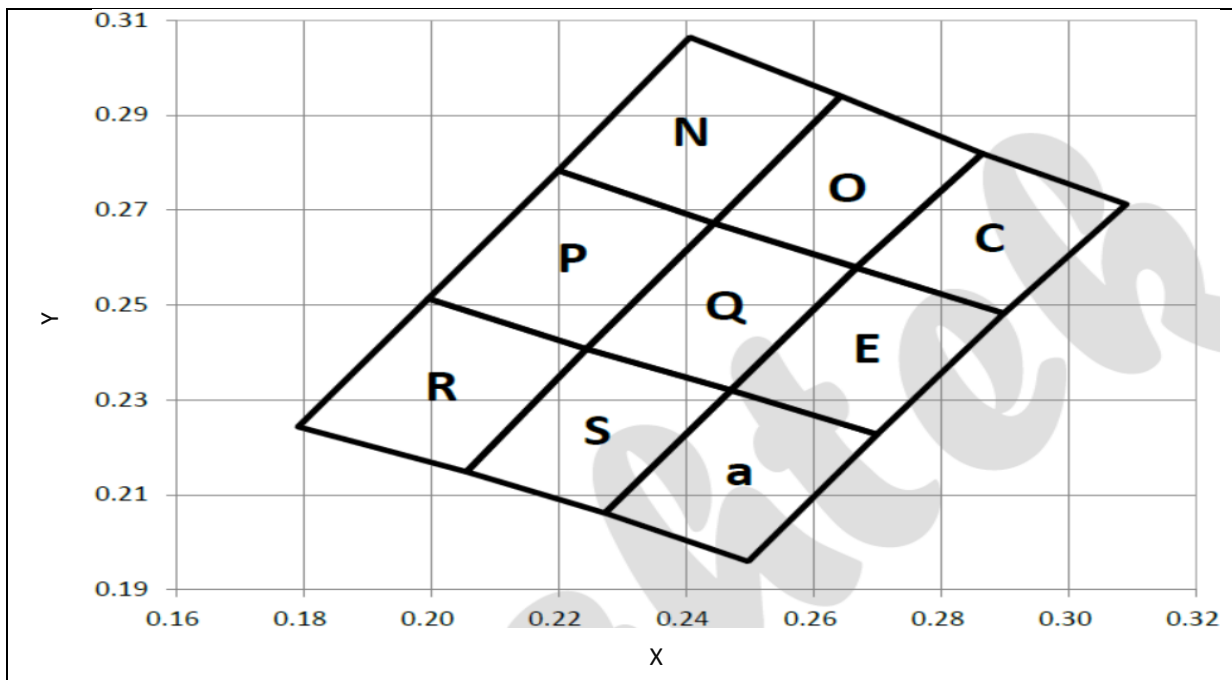


No.	Symbol	Function Description
1	DIN	Control Data Signal Input
2	VDD	Power Supply LED
3	DOUT	Control Data Singal Output
4	GND	Ground

**BINNING GROUPS:**

 Luminous Intensity Classifications ( $V_{DD}=5V$ ;  $I_F=12mA*3$ ):

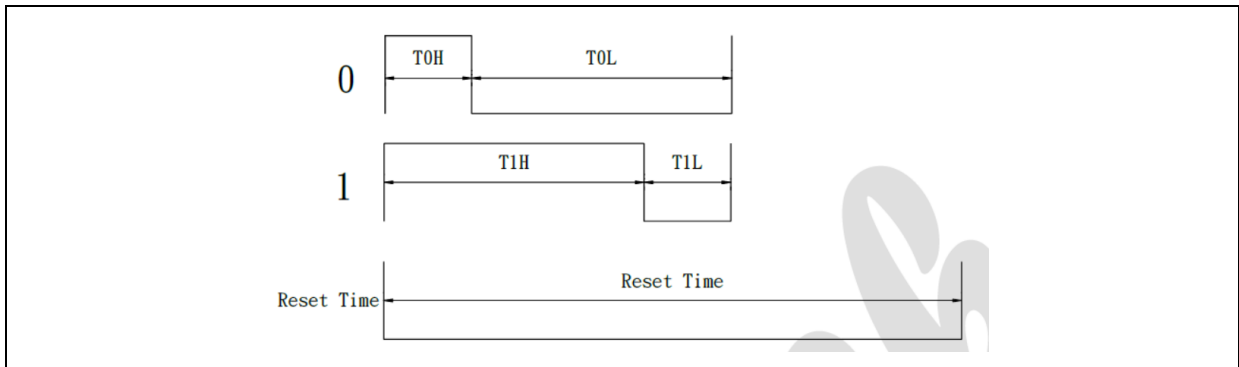
Code	Min.	Max.	Unit
Mix White	25	1600	mcd
	26	2000	
	27	2500	

 Chromaticity Coordinate Classifications ( $V_{DD}=5V$ ;  $I_F=12mA*3$ ):


	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
C	0.2865	0.2819	0.3091	0.2712	0.2899	0.2482	0.2667	0.2578
N	0.2200	0.2783	0.2406	0.3064	0.2643	0.2940	0.2444	0.2672
O	0.2444	0.2672	0.2643	0.2940	0.2865	0.2819	0.2667	0.2578
E	0.2667	0.2578	0.2899	0.2482	0.2700	0.2227	0.2470	0.2320
P	0.2200	0.2783	0.1996	0.2513	0.2244	0.2407	0.2444	0.2672
Q	0.2444	0.2672	0.2244	0.2407	0.2471	0.2320	0.2669	0.2579
R	0.1996	0.2513	0.1792	0.2243	0.2056	0.2148	0.2244	0.2407
S	0.2244	0.2407	0.2056	0.2148	0.2273	0.2061	0.2471	0.2320
a	0.2471	0.2320	0.2273	0.2061	0.2498	0.1959	0.2700	0.2227

## FUNCTION DESCRIPTION:

### 1. Time wave form:



### 2. Data transfer time:

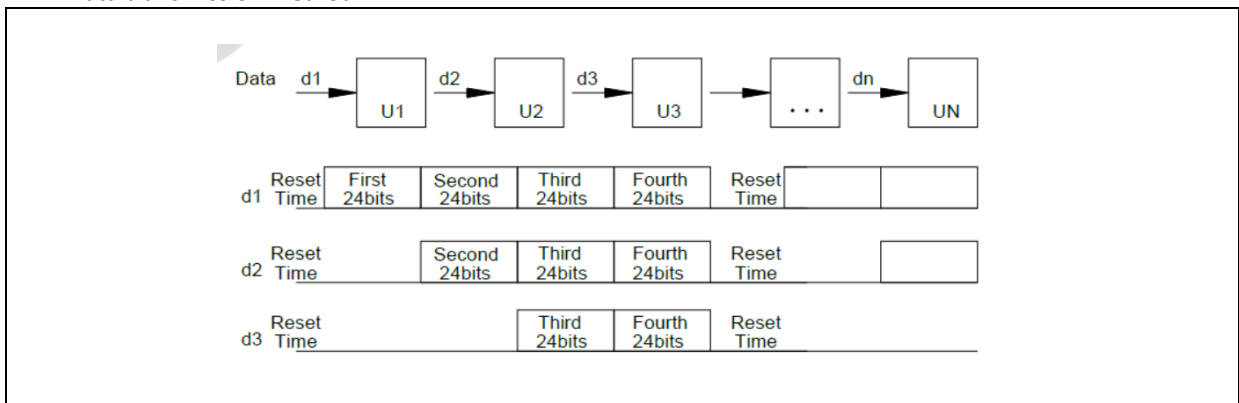
Item	Description	Typical	Allowance
$T_{0H}$	0 code, high voltage time	0.3 $\mu$ s	$\pm 0.05\mu$ s
$T_{0L}$	0 code, low voltage time	0.9 $\mu$ s	$\pm 0.05\mu$ s
$T_{1H}$	1 code, high voltage time	0.9 $\mu$ s	$\pm 0.05\mu$ s
$T_{1L}$	1 code, low voltage time	0.3 $\mu$ s	$\pm 0.05\mu$ s
RES	reset time	>200 $\mu$ s	-

### 3. Composition of 24-bit data:

R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
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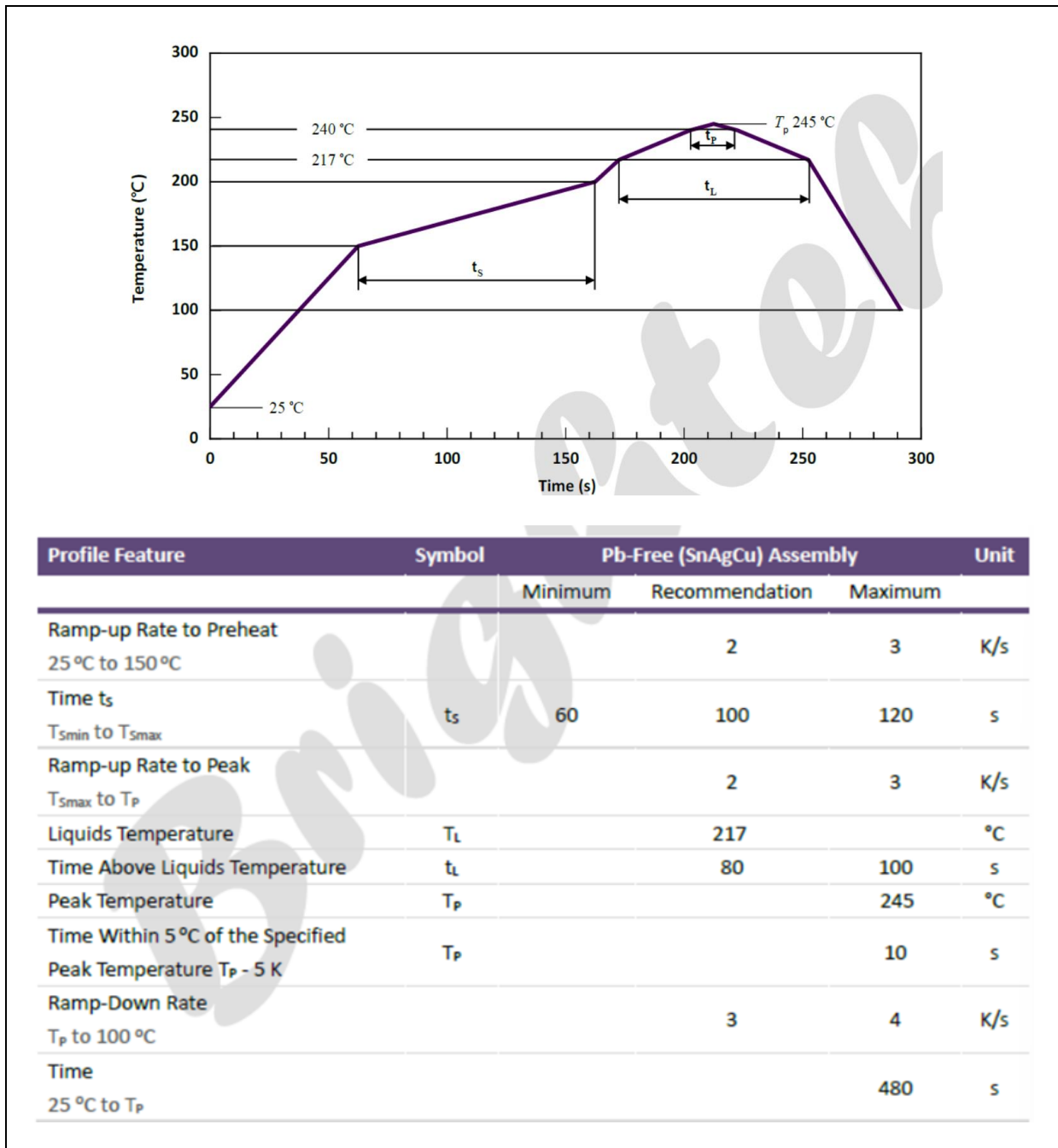
The single wire data transfer protocol supports 24-bit data for each LED's RGB display data refresh. ICLED receives 24-bit data and passes the remaining data to the next ICLED. The 24-bit data consist of green, red and blue data, each with 8-bit width, and are transferred with MSB first.

### 4. Data transmission method:



## RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



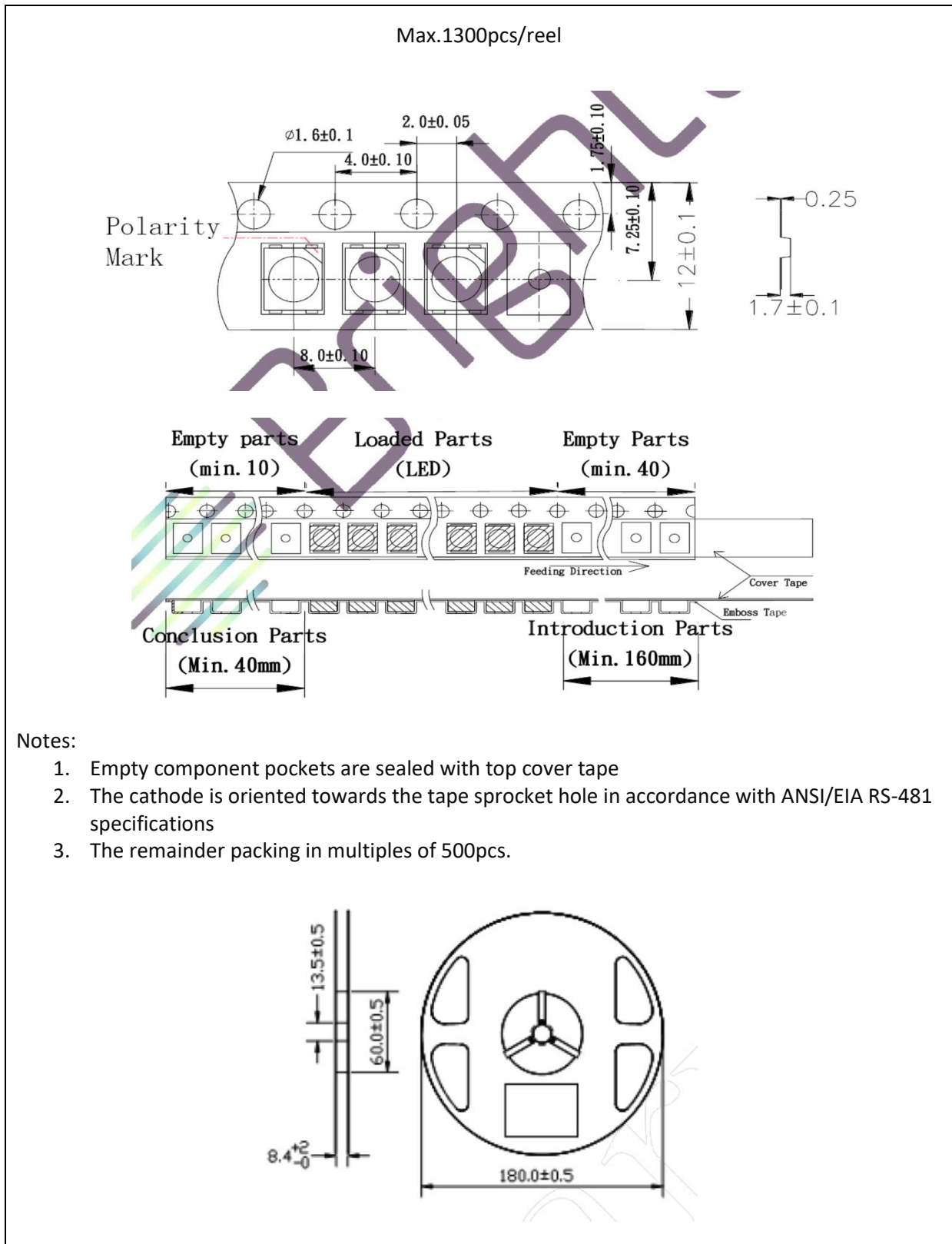
Note:

1. We recommend the reflow temperature 240°C ( $\pm 5^\circ\text{C}$ ). The maximum soldering temperature should be limited to 245°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:



## 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.<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.

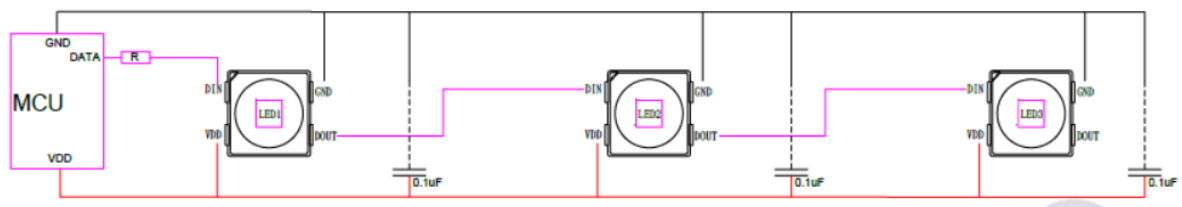
### Baking:

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±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.

### Typical Application 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 LED.

In order to avoid harmful effects in use, please try to add resistance and capacitance when using. If capacitors and resistors are not added, the number of LEDs on the lamp should be minimized, but this way still does not exclude the risk of problems.

### 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	23/04/2024	Datasheet set-up.
A1.1	15/09/2024	Update product picture.