BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED!

ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- PCB/CHIP with IC
- 0404 (1111) IC 0.33t (4 pins)
- Red/Green/Blue

Release Date: 12 June 2025 Version: A1.1

N0M70S09IC

0 4 0 4 (1 1 1 1) I C I n t e g r a t e d

0404 (1111) IC-Integrated

RoHS Compliant

FEATURES:

- **Package:** CHIP Top View Package with Integrated IC 6805.
- **R/G/B Output Drive Current (typ.):** 5mA
- **Chip Input Voltage (typ.):** 5V
- **R/G/B Luminous Intensity (typ.):** 90/180/35mcd
- **Colour:** Red/Green/Blue
- **Lens Colour:** Water Diffused
- **IC Feature:** Control IC and RGB LED chip integrated in 0404 (1111) package. The data transmission frequency can reach 800Kbps, and when the refresh rate is 30 frames per second, the number of cascades is not less than 1024 points. Single-line zero code transmission protocol, can be infinite cascade. Grayscale adjustment: 256 levels. Built-in reset circuit, power does not light.
- **Soldering Methods:** Reflow soldering
- **ESD Level:** 5kV
- **MSL Level:** acc. to JEDEC Level 4
- **Packing:** 8mm tape with max.6500pcs/reel, ø195mm (7.5'')

APPLICATIONS:

- Customer Electronics
- Telecommunication
- Indicator
- Home Appliance
- Full Colour LED Strip
- Gaming Device
- Guardrail Tube
- LED Screen

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CHARACTERISTICS:

Absolute Maximum Characteristics (T_a=25°C)

Parameter	Symbol	Ratings	Unit
Working Voltage	V_{IN}	+3.7~+5.5	V
Operation Temperature	T_{OPT}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+85	°C
ESD Withstand Voltage (Human Mode)	V_{ESD}	5	kV

Electrical & Optical Characteristics

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Chip Input Voltage		V_{DD}	3.7	5.0	7.5	V	---
R/G/B Output Drive Current		I_{DOUT}	---	5	---	mA	V_{DS}=1V
PWM Frequency		F_{PWM}	---	4	---	KHz	---
Static Power Consumption		I_{DD}	---	0.3	---	mA	---
High Level Input Voltage		V_{IH}	0.7*V_{DD}	---	---	V	---
Low Level Input Voltage		V_{IL}	---	---	0.3*V_{DD}	V	---
Transfer Rate		F_{DIN}	---	800	---	Kbps	---
Dominant Wavelength	Red	λ_d	620	---	625	nm	I_F=5mA
	Green		520	---	530		
	Blue		460	---	470		
Luminous Intensity	Red	I_v	60	---	120	mcd	I_F=5mA
	Green		120	---	240		
	Blue		10	---	60		
Viewing Angle		$2\theta_{1/2}$	---	160	---	deg	I_F=5mA

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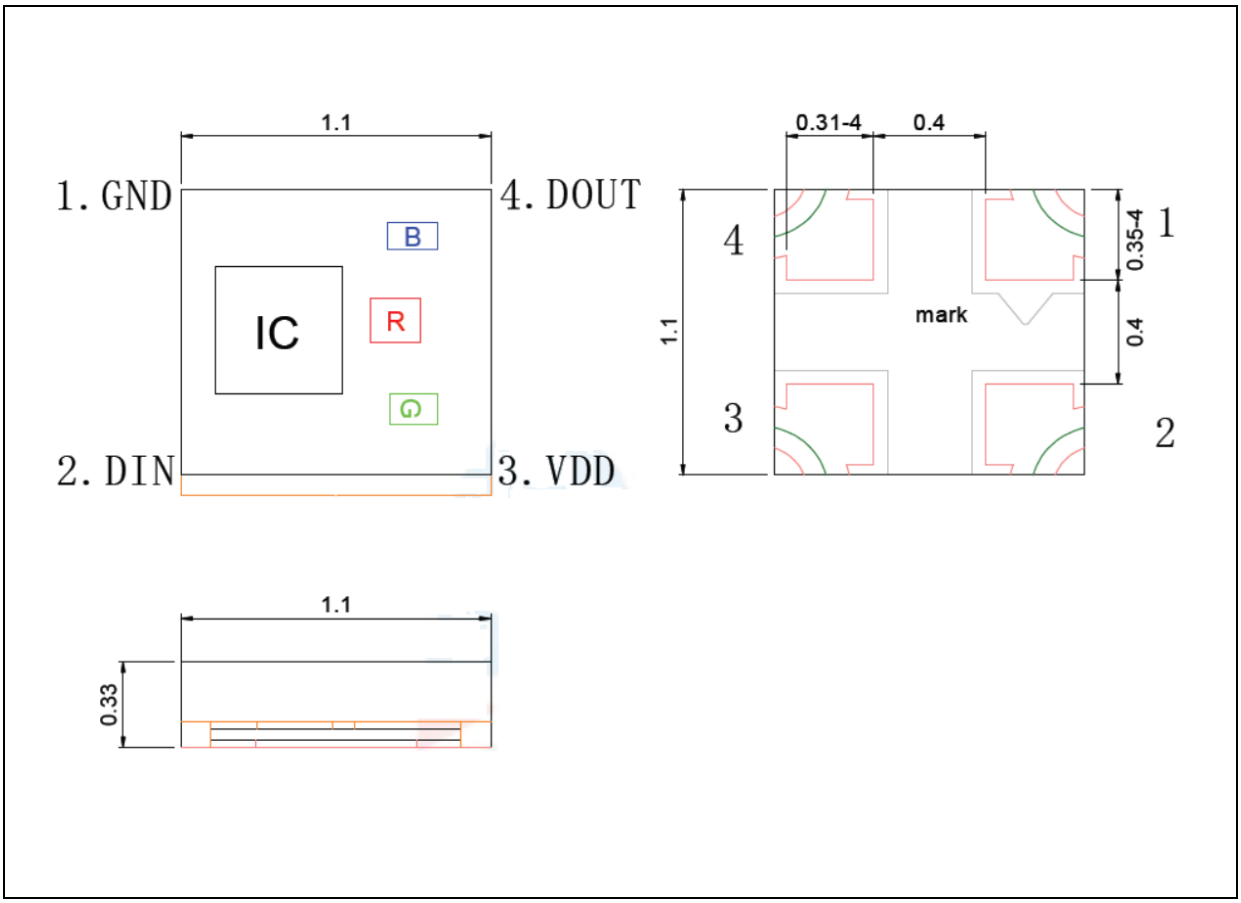
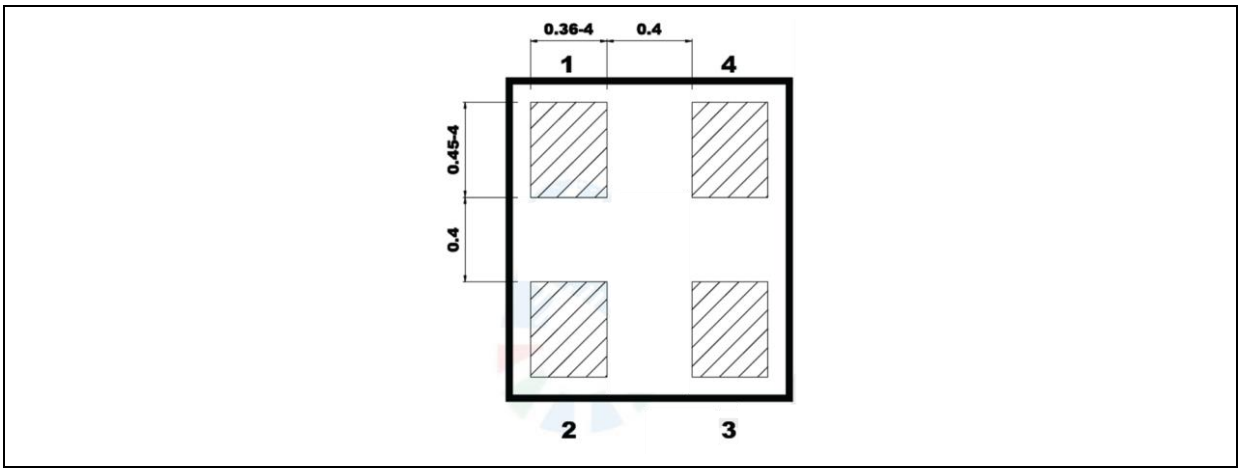
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance ±0.1mm with angle tolerance ±0.5°.

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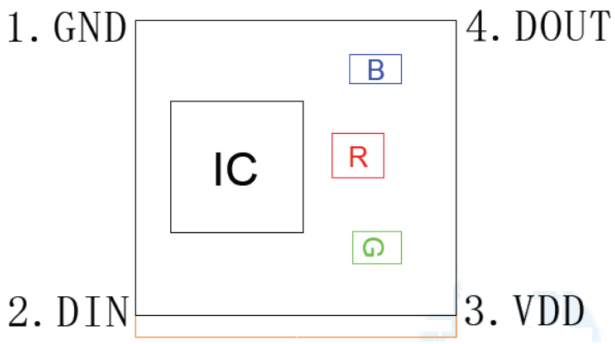
PIN CONFIGURATION:



No.	Symbol	Function Description
1	GND	Grounds - Power grounding
2	DIN	Data input - Control data signal input
3	VDD	Power Supply - Power supply pins
4	DOUT	Data output - Control data signal output

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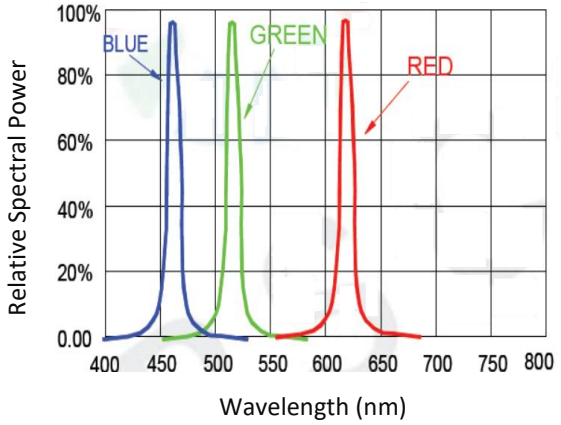
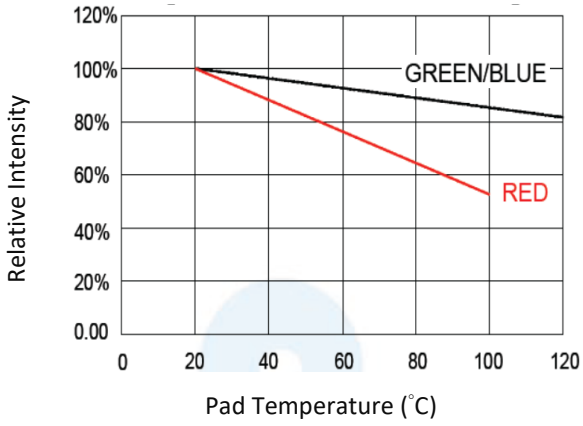
ELECTRO-OPTICAL CHARACTERISTICS:

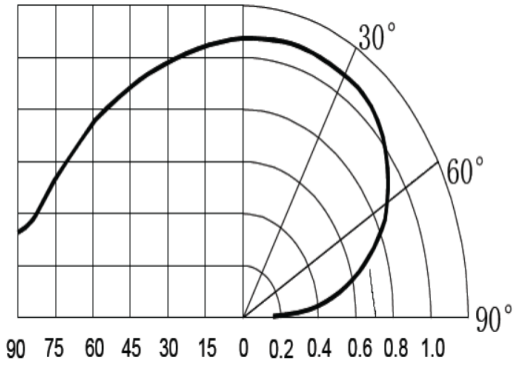
Relative Spectral Power v.s. Wavelength



Relative Intensity v.s. Temperature



Radiation Angle



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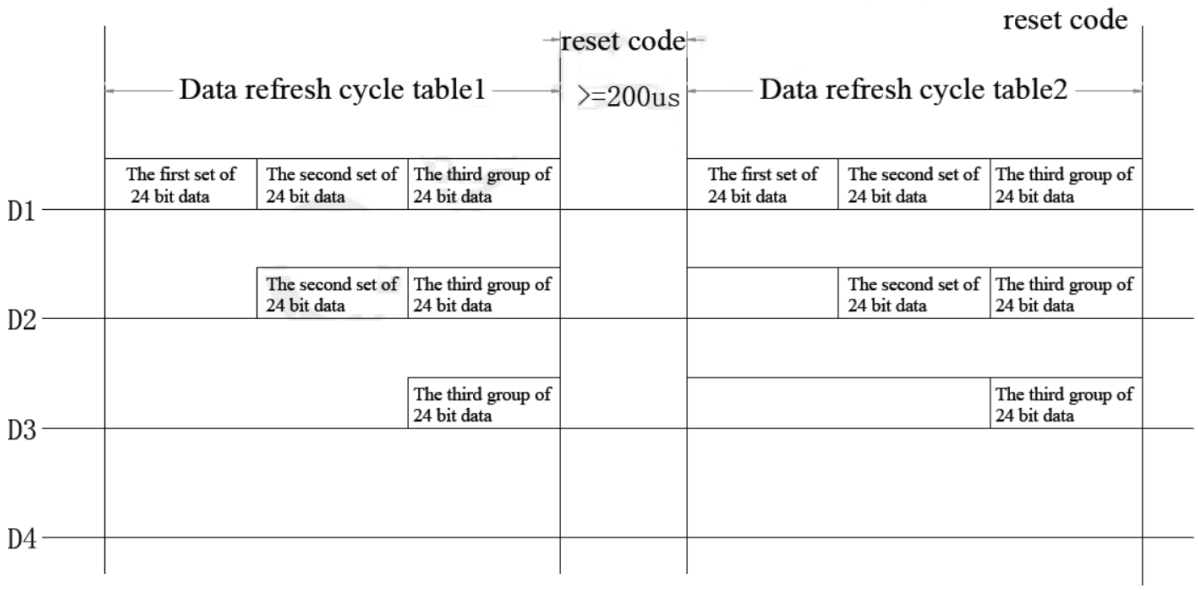
FUNCTION DESCRIPTION:

1. Suggested data transmission time:

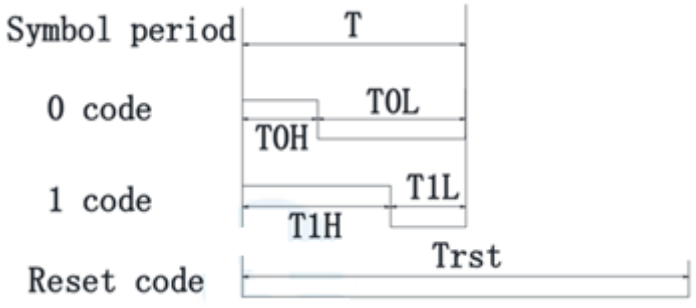
Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Symbol Period	T	1.20	---	---	μs
0 Code, High Level Time	T0H	0.20	0.32	0.40	μs
0 Code, Low Level Time	T0L	0.80	---	---	μs
1 Code, High Level Time	T1H	0.60	0.67	1.00	μs
1 Code, Low Level Time	T1L	0.20	---	---	μs
Reset Code, Low Level Time	Reset	>200	---	---	μs

2. Data transmission method:



Among them, D1 is the data sent by the MCU end, and D2, D3, and D4 are the data automatically shaped and forwarded by the cascaded circuit.

3. Time series waveform diagram - Input code type:



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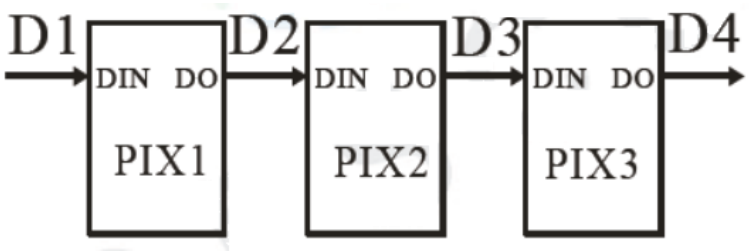
4. Connection method:

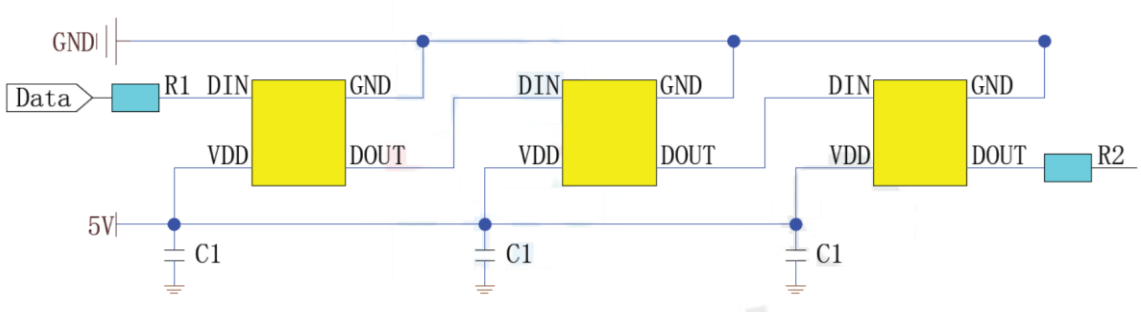


5. 24-bit data structure:

G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4
R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0

High bit first send, send data in GRB order (G7 -> G6 -> ... -> B0).

6. Principles of Applied Circuits:



In practical application circuits, to prevent instantaneous high voltage damage to the internal signal input and output pins of the IC caused by live plugging and unplugging during testing, protective resistors should be connected in series at the signal input and output terminals. In addition, in order to ensure more stable operation between IC chips, the decoupling capacitance between each LED is essential.

Applications 1: For soft or hard light strips with short transmission distance between lamp beads, it is recommended to connect protective resistors in series at the signal input and output terminals, that is, R1 and R2 are about 500 ohms.

Application 2: Used for modules or general shaped products. The transmission distance between lamp beads is long, and the protective resistance connected in series at the signal end may vary slightly depending on the wire and transmission distance. Based on actual usage.

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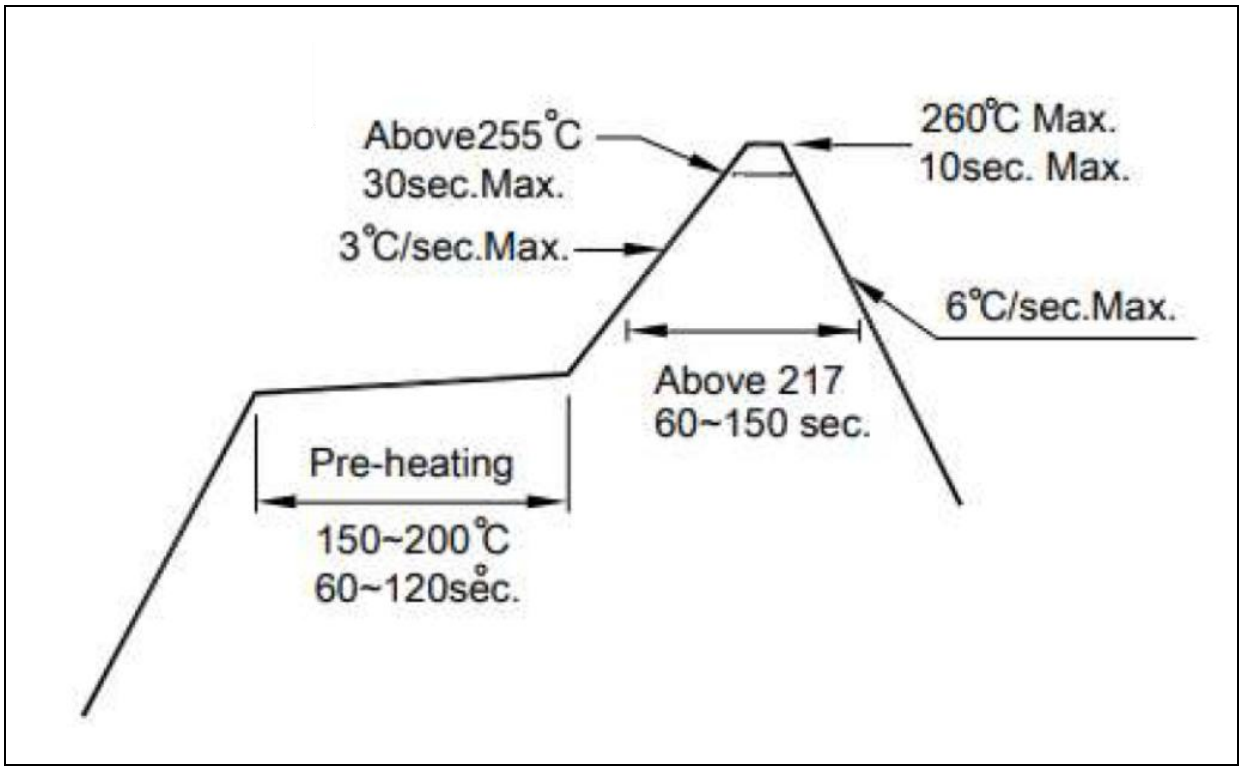
RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



Note:

1. The maximum soldering temperature should be limited to 240°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.

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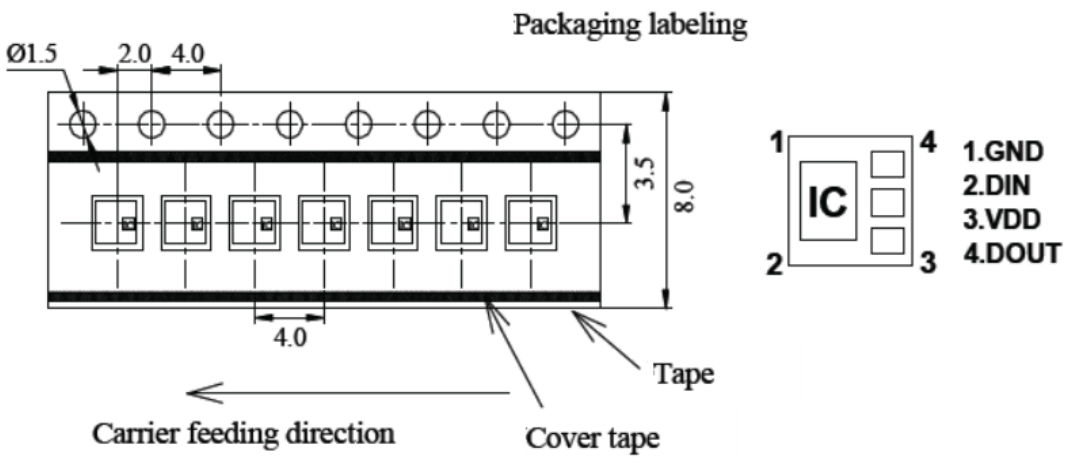
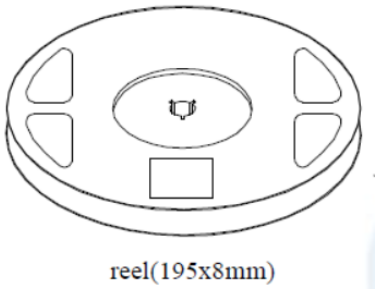
PACKING SPECIFICATION:

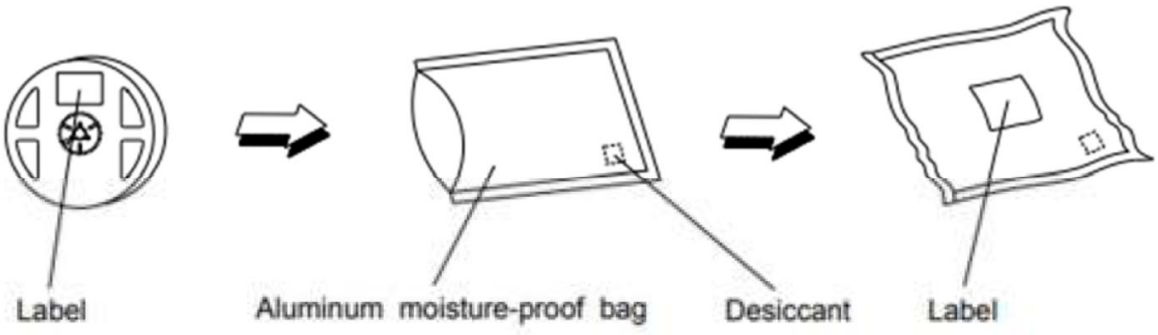
Reel Dimension:

Max.6500pcs/reel





reel(195x8mm)



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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 72 hours. Otherwise, they should be kept in a damp-proof box with descanting agents 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 6hrs and <5%RH, taped / reel package.

It's normal to see slight color fading of carrier (light yellow) after baking in process.

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.

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REVISION RECORD:

Version	Date	Summary of Revision
A1.0	01/03/2024	Datasheet set-up.
A1.1	12/06/2025	New datasheet format.

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