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

- PLCC Top View w/ IC
- 5050 IC 1.6t (6 pins)
- Red/Green/Blue

Release Date: 18 September 2024 Version: A1.1

N0M67S49IC

5050 IC Integrated

5050 IC-Integrated

RoHS Compliant

FEATURES:

- **Package:** PLCC Top View Package with Integrated IC
- **W/R/G/B Output Current (typ.):** 12mA
- **Logical Supply Voltage:** +3.5~+7.5V
- **Luminous Intensity (typ.):** 300/1000/225mcd
- **Colour:** Red/Green/Blue
- **Materials:**
  - Die: AlGaInP/InGaN/InGaN
  - Casting: Silicone (Water Clear)
- **IC Feature:** Control IC and RGB LED chip integrated 5050 package. Each pixel of the three primary colour can achieve 256 brightness display, full color display, and scan frequency not less than 400Hz/s. Built-in signal reshaping circuit, after wave reshaping to the next driver, ensure wave-form distortion not accumulate. Built-in electric reset circuit and power lost reset circuit. Cascading port transmission signal by 2 lines. Send data at speeds of 800Kbps. When the refresh rate is 30fps, cascade number are not less than 1024 points.
- **Soldering Methods:** Reflow soldering
- **MSL Level:** acc. to JEDEC Level 5a
- **Packing:** 12mm tape with max.1000pcs/reel, ø180mm (7'')

APPLICATIONS:

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

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

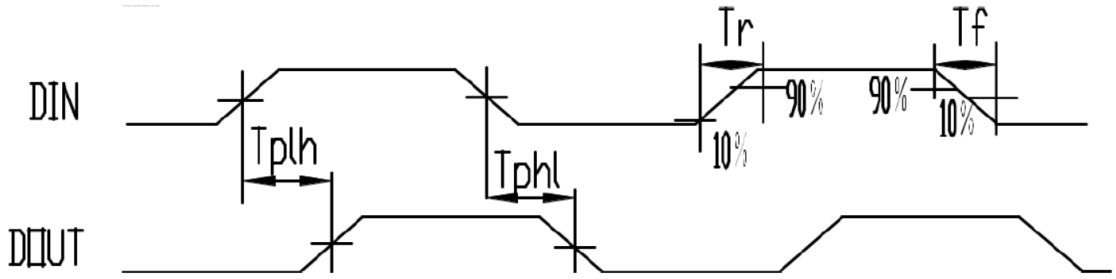
Parameter	Symbol	Ratings	Unit
Power Supply Voltage	V_{DD}	+3.5~+7.5	V
Logical Input Voltage	V_I	-0.5~+5.5	V
Working Temperature	T_{OPT}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+120	°C

Electrical & Optical Characteristics

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
R/G/B Output Port Voltage		V_{DD}	8.5	9	9.5	V	---
R/G/B Output Current		I_O	9.6	12	14.4	mA	---
High Level Input Voltage		V_{IH}	0.7V_{DD}	0.9V_{DD}	V_{DD}	V	---
Low Level Input Voltage		V_{IL}	0	0.1V_{DD}	0.3V_{DD}	V	---
D0 Pull-Current Capacity		I_{DOH}	---	15	---	mA	---
D0 Pull-Current Capacity		I_{DOL}	---	30	---	mA	---
PWM Frequency		F_{PWM}	3	4	5	KHz	---
Static Power Consumption		I_{DD}	0.6	0.8	1	mA	---
Dominant Wavelength	Red	λ_d	620	---	625	nm	I_F=12mA
	Green		520	---	525		
	Blue		465	---	470		
Luminous Intensity	Red	I_v	200	---	400	mcd	I_F=12mA
	Green		800	---	1200		
	Blue		150	---	300		

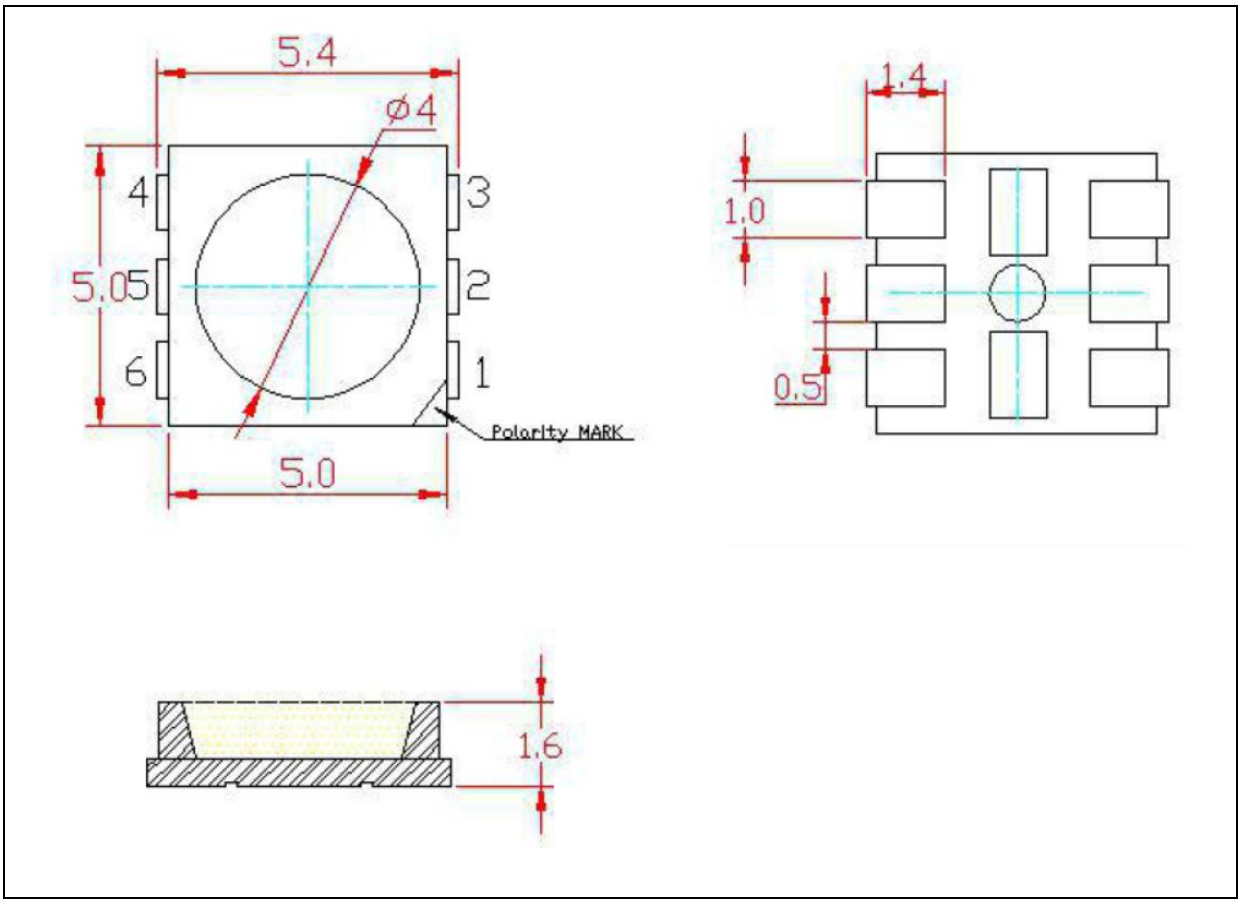
Switching Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Data Rate	F_{DIN}	---	800	1100	KHz	---
Transmission Delay Time	T_{PLZ}	---	---	200	ns	DIN-DO
Output Current Conversion Time	T_R	---	---	400	ns	V_{ds}=1.5V I_O=12mA
	T_F	---	---	400	ns	



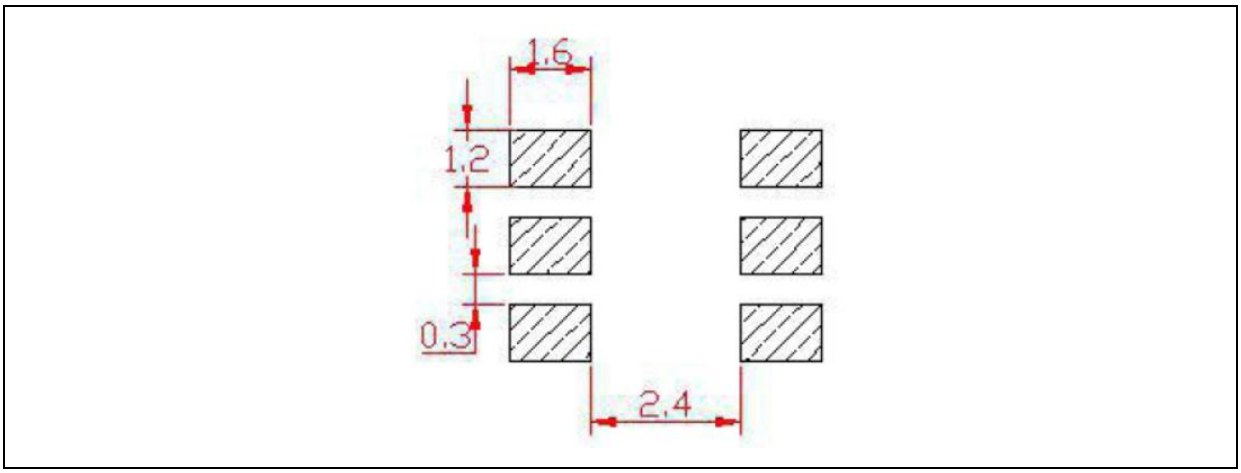
OUTLINE DIMENSION:

Package Dimension:



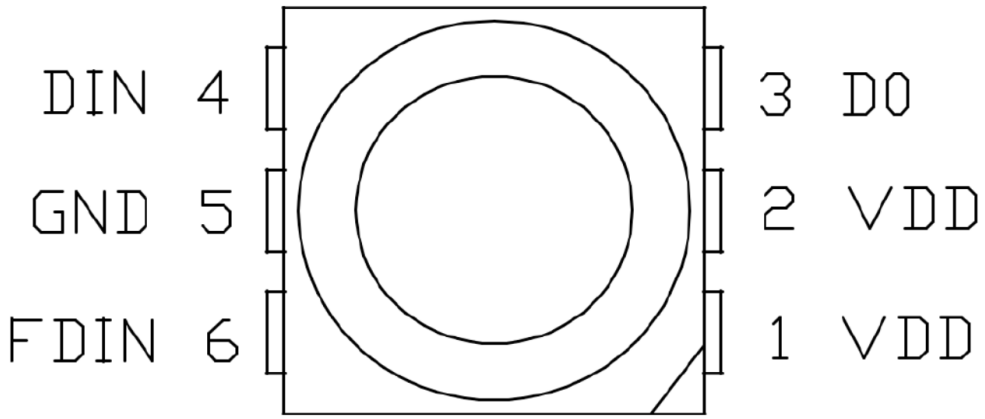
1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



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

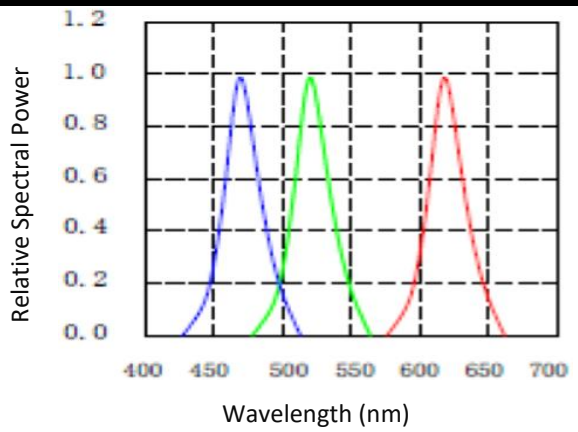
PIN CONFIGURATION:



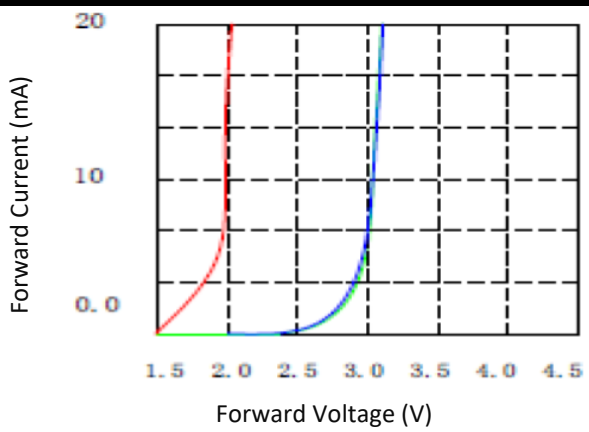
No.	Symbol	Function Description
1	VDD	Power supply pin
2	VDD	Power supply pin
3	DO	Control data signal output
4	DIN	Control data signal input
5	GND	Signal and power grounding
6	FDIN	Standby data input

ELECTRO-OPTICAL CHARACTERISTICS:

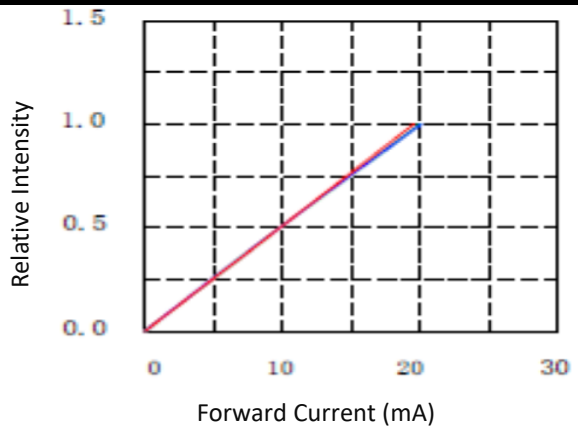
Relative Spectral Power v.s. Wavelength



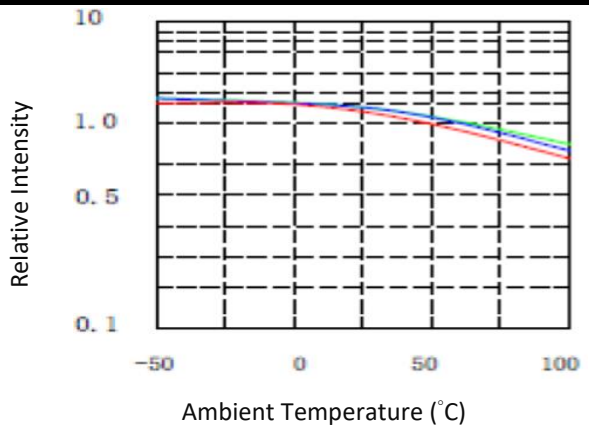
Forward Voltage v.s. Forward Current



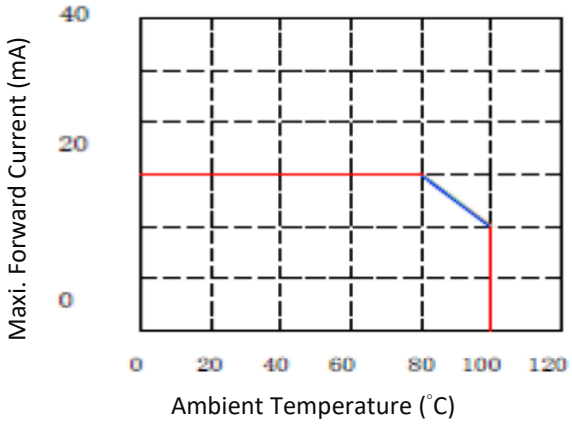
Forward Current v.s. Relative Intensity



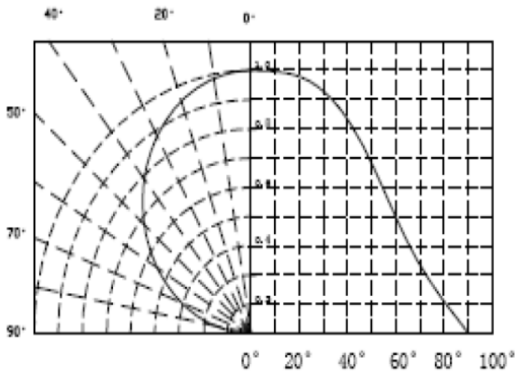
Relative Intensity v.s. Temperature



Thermal De-Rating Chart

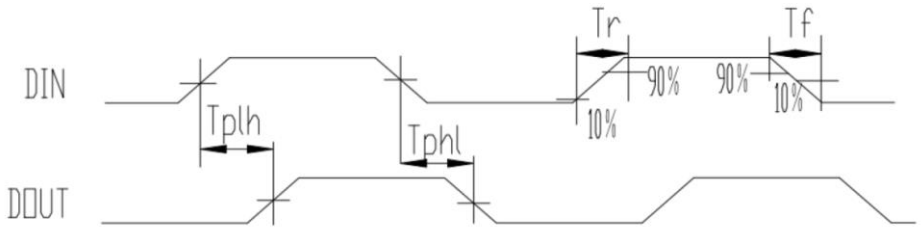


Radiation Angle



FUNCTION DESCRIPTION:

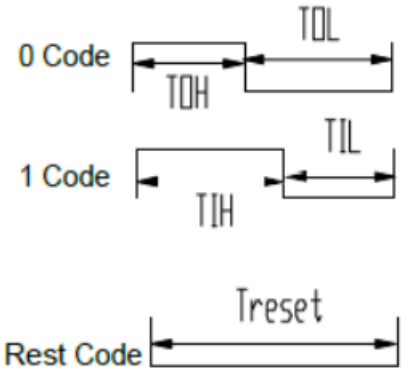
1. Data Transmission Form:



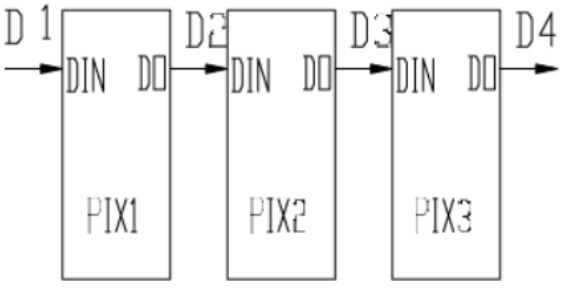
2. Data Transmission Time:

Symbol	Description	Min	Avg	Max	Unit
T0H	Input 0 code, high level time	245	295	345	ns
T1H	Input 1 code, high level time	545	595	645	ns
T0L	Output 0, low level time	545	595	645	ns
T1L	Output 1 code, low level time	245	295	345	ns
Trst	Rest code, low level time	80	--	--	us

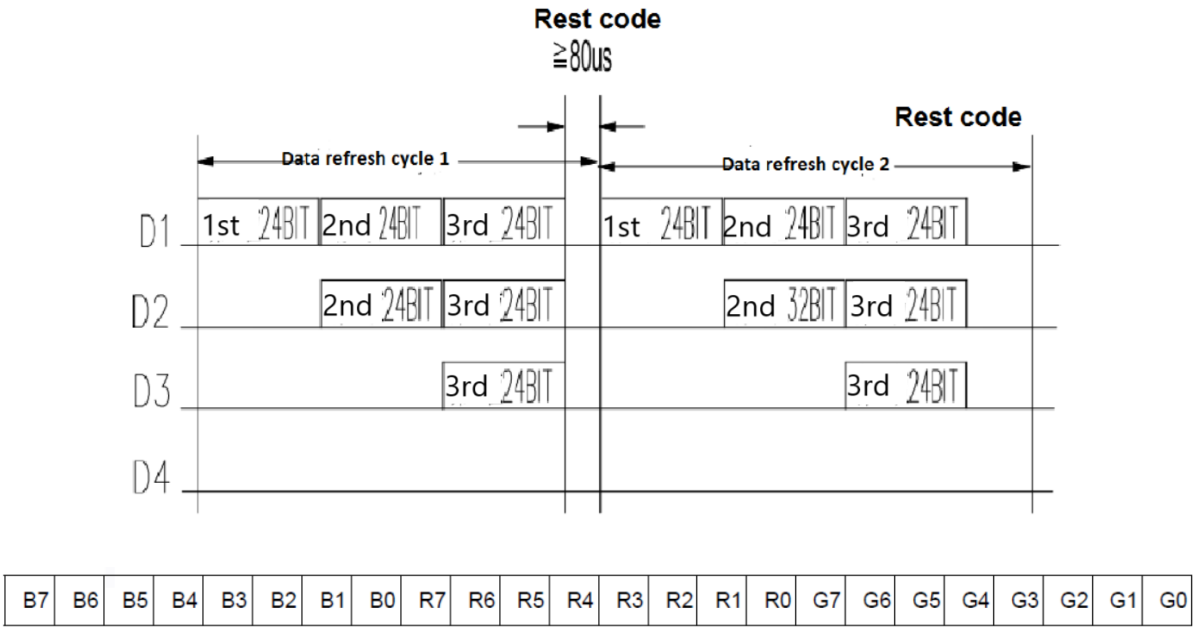
3. Temporal Wave Form Figure Type of Input:



4. Connection Mode:

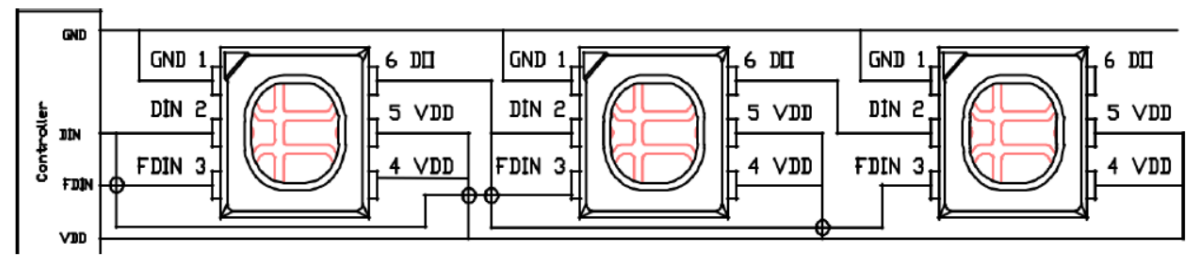


5. Mode of Data Transmission:



Note: High start, send data in BRG order (B7→B6……) G0)

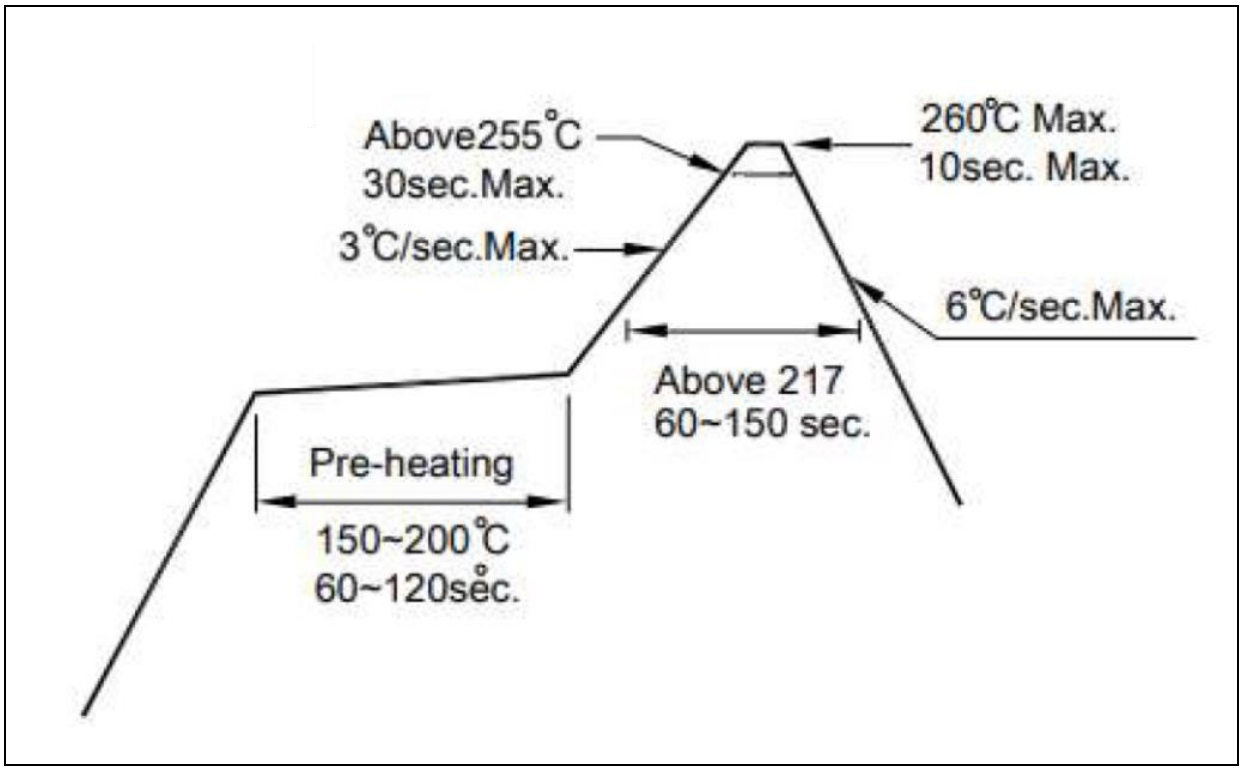
6. Typical Application Circuit:



Note: It is recommended to add a 300 ohm resistor to DIN input and a 104 capacitor between GND and VDD

RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



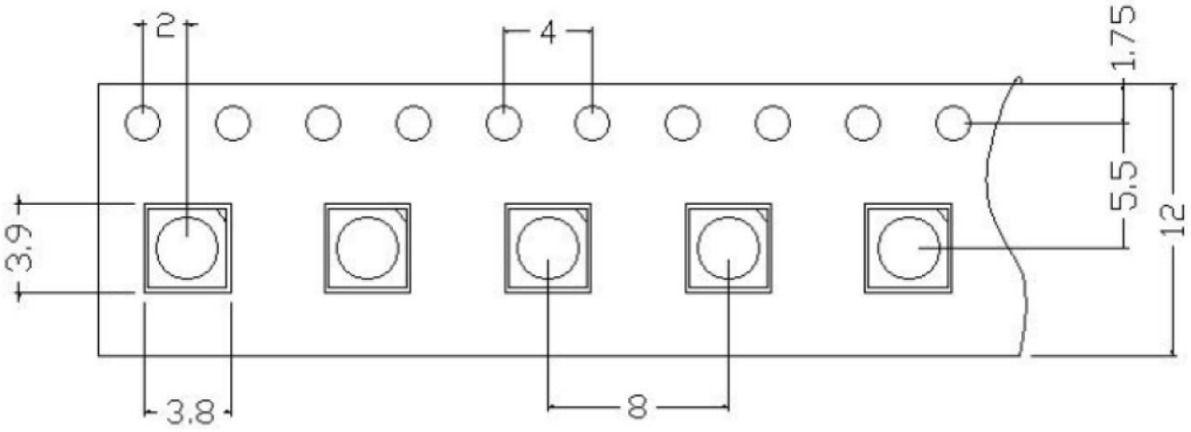
Note:

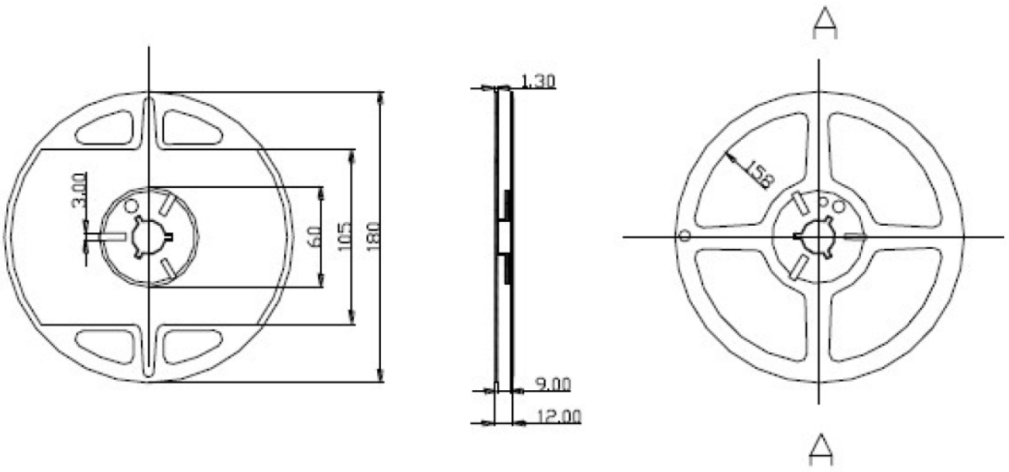
1. The maximum soldering temperature should be limited to 240°C. The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

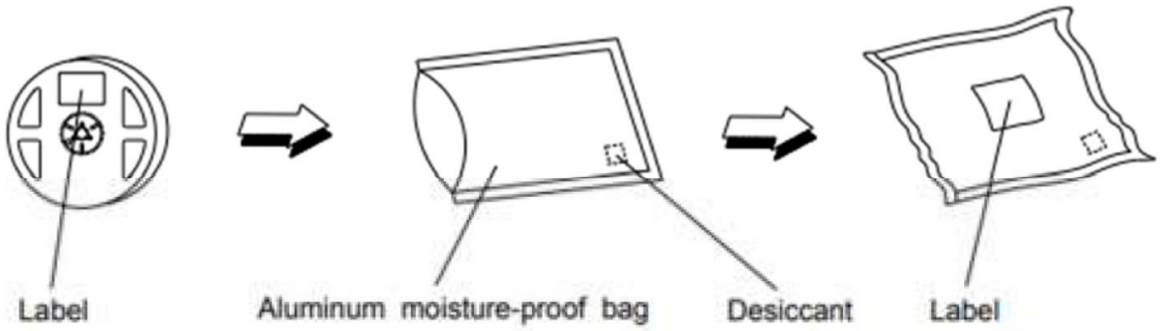
PACKING SPECIFICATION:

Reel Dimension:

Max.1000pcs/reel







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 24 hours. Otherwise, they should be kept in a damp-proof box with descanting 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 48hrs 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.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	07/08/2023	Datasheet set-up.
A1.1	18/09/2024	Update MSL level.