BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED!

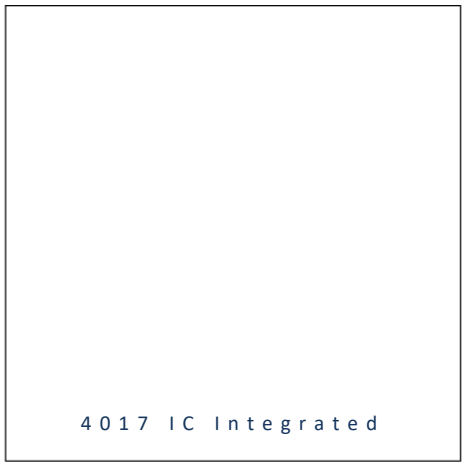
ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- ► PLCC Side View SMD with IC
- ► 4017SV IC 2.0t
- ► Red/Green/Blue

Release Date: 24 September 2022 Version: A1.0

N0M59S07ICSV



4017 IC-Integrated

RoHS Compliant

FEATURES:

- **Package:** PLCC Side View LED Package with Integrated IC
- **Forward Current:** 20/20/20mA* * in order of Red/Green/Blue
- **Power Supply Voltage (typ.):** +3.0~+7.5V
- **Luminous Intensity (typ.):** 400/1050/150mcd
- **Colour:** Red/Green/Blue
- **IC Feature:** Cascading port transmission signal by single line. Any two point the distance does not exceed 3m transmission signal without any increase circuit. Send data at speeds of 800Kbps. When the refresh rate is 30fps, cascade number are not less than 1024 points. The control circuit and the LED share the only power source. 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.
- **Pixel:** Each pixel of the three primary colour can achieve 256 brightness display, full colour display, and scan frequency not less than 400Hz/s.
- **Soldering methods:** Reflow soldering
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 12mm tape with max.2000pcs/reel, ø180mm (7'')

APPLICATIONS:

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

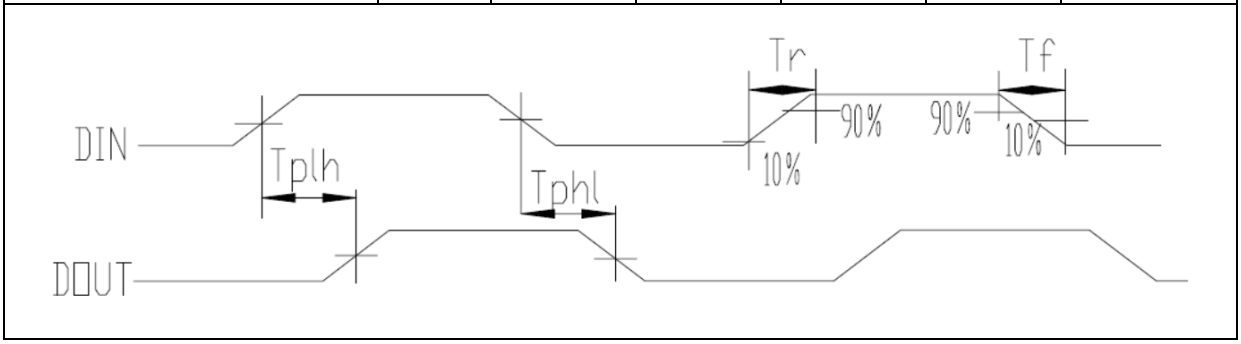
CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Logical Supply Voltage	V_{DD}	+3.0~+7.5	V
Logic Input Voltage	V_I	-0.5~5.5	V
Reverse Current	I_R	5	μA
R/G/B Output Port Voltage	V_{DS}	9	V
R/G/B Output Current	Iol1	12	mA
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+120	°C

Dynamic Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Data Rate	FIN	---	800	1100	KHz	---
Transmission Delay Time	T_{pzl}	---	---	500	Ns	D_{IN}-D_0
Input Capacitance	C_i	---	---	15	pF	---

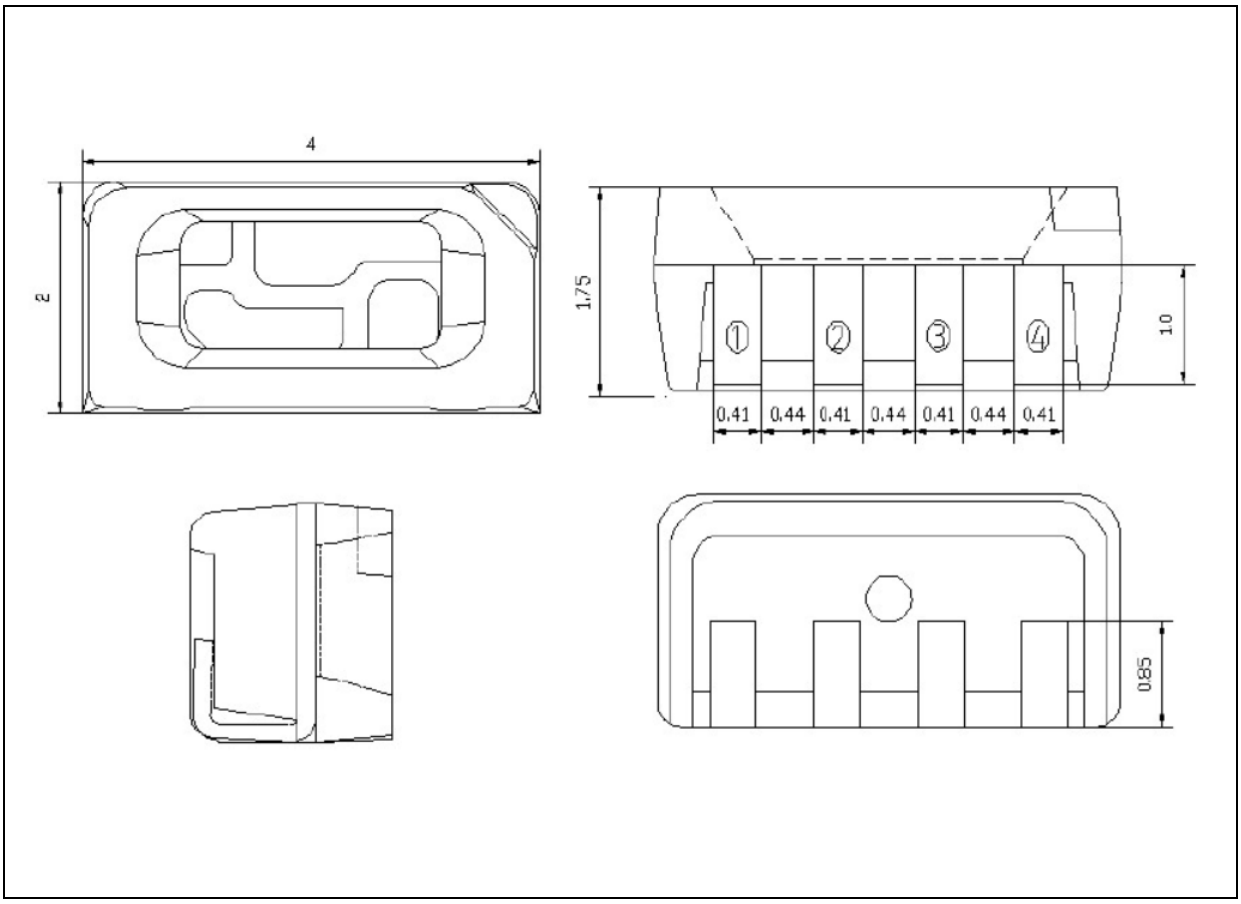


Electrical & Optical Characteristics (Ta=25°C, V_{DD}=5V, V_{SS}=0V)

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Chip Input Voltage		V_{in}	---	5.0	7.5	V	---
Input Voltage		V_{IH}	---	0.7 V_{DD}	---	V	V_{DD}=5V
		V_{IL}	---	0.3 V_{DD}	0.8	V	
The Frequency of PWM		F_{PWM}	---	4	---	KHz	---
Static Power Consumption		I_{DD}	---	1.1	---	mA	---
Luminous Intensity	R	I_V	300	---	500	mcd	I_F=20mA
	G		700	---	1500		
	B		200	---	300		
Dominant Wavelength	R	λ_D	620	---	630	nm	I_F=20mA
	G		515	---	530		
	B		460	---	475		
Forward Voltage	R	V_F	1.8	---	2.4	V	I_F=20mA
	G		2.8	---	3.2		
	B		2.8	---	3.2		
Viewing Angle		$2\theta_{1/2}$	---	120	---	deg	I_F=39mA

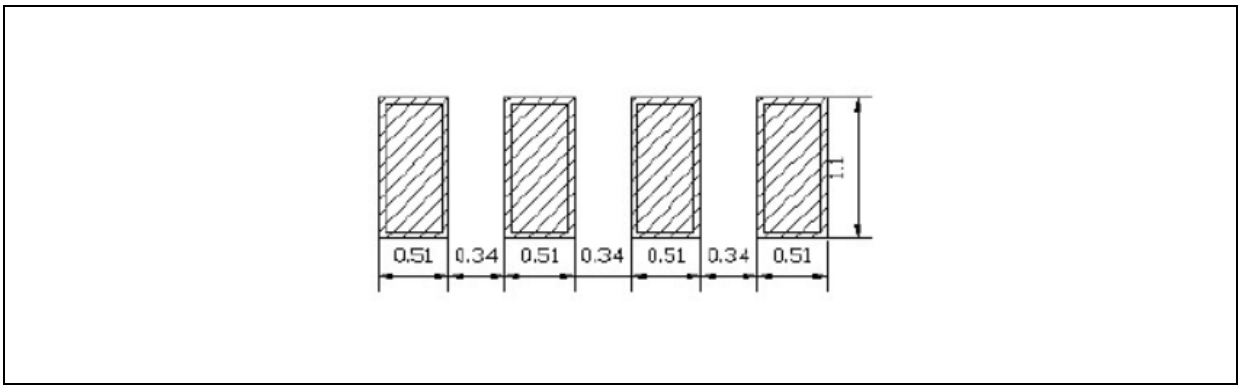
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, 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	DIN	Control Data Signal Input
2	VDD	Power Supply Pins
3	DOUT	Control Data Signal Output
4	GND	Signal Grounding and Power Grounding

Function Description:

1. It internal include intelligent digital port data latch and signal reshaping amplification drive circuit. Also include a precision internal oscillator and a 5V voltage programmable constant current control part, effectively ensuring the pixel point light color height consistent.

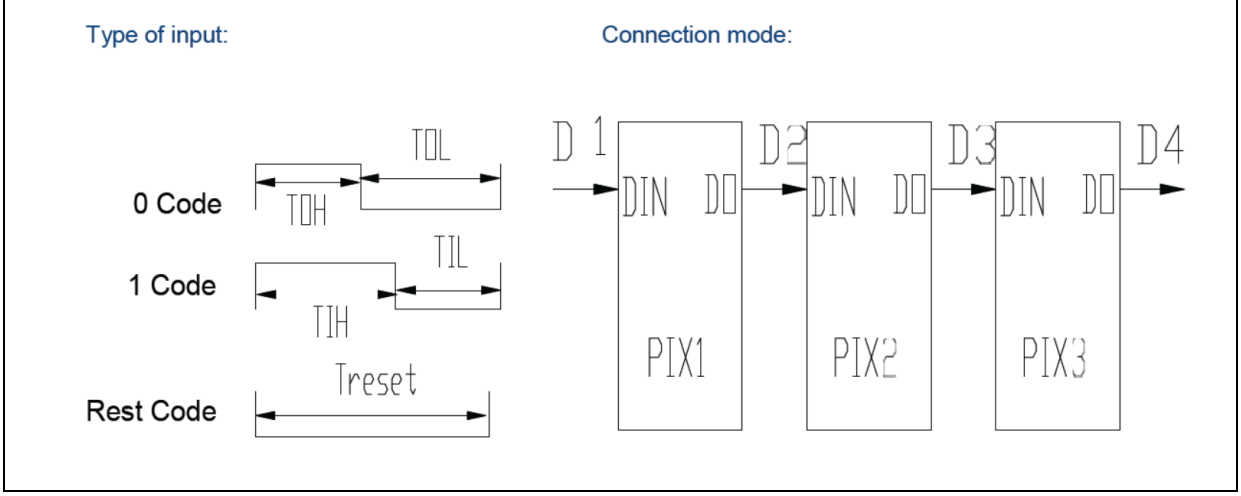
2. The data transfer protocol uses single NZR communication mode. After the pixel power-on reset, the DIN port receive data from controller, the first pixel collects initial 24bit data then sent to the internal data latch. The other data which reshaping by the internal signal reshaping amplification circuit sent to the next cascade pixel through the DO port. After transmission for each pixel, the signal to reduce 24bit. pixel adopt auto reshaping transmit technology, making the pixel cascade number is not limited the signal transmission, only depend on the speed of signal transmission.

3. LED with low driving voltage, environmental protection and energy saving, high brightness, scattering angle is large, good consistency, low power, long life, and other advantages. The control chip integrated in LED above becoming more simple circuit, small volume, convenient installation.

4. Timing Wave Form:

Symbol.	Description	Min	Typ	Max	Unit
TOH	Input 0 Code, High Level Time	245	295	345	ns
TIH	Input 1 Code, High Level Time	545	595	645	ns
TOH[1]	Output 0 Code, Low Level Time	545	595	645	ns
TIH[1]	Output 1 Code Low Level Time	245	295	345	ns
Trst	Rest Code, Low Level Time	80	---	---	μs

5. Temporal Wave Form Figure:

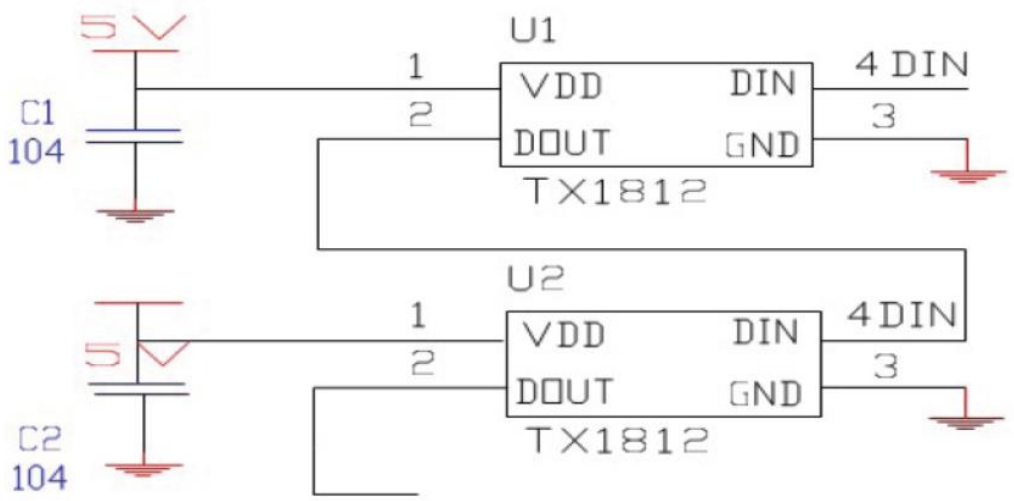


6. Mode of Data Transmission:

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

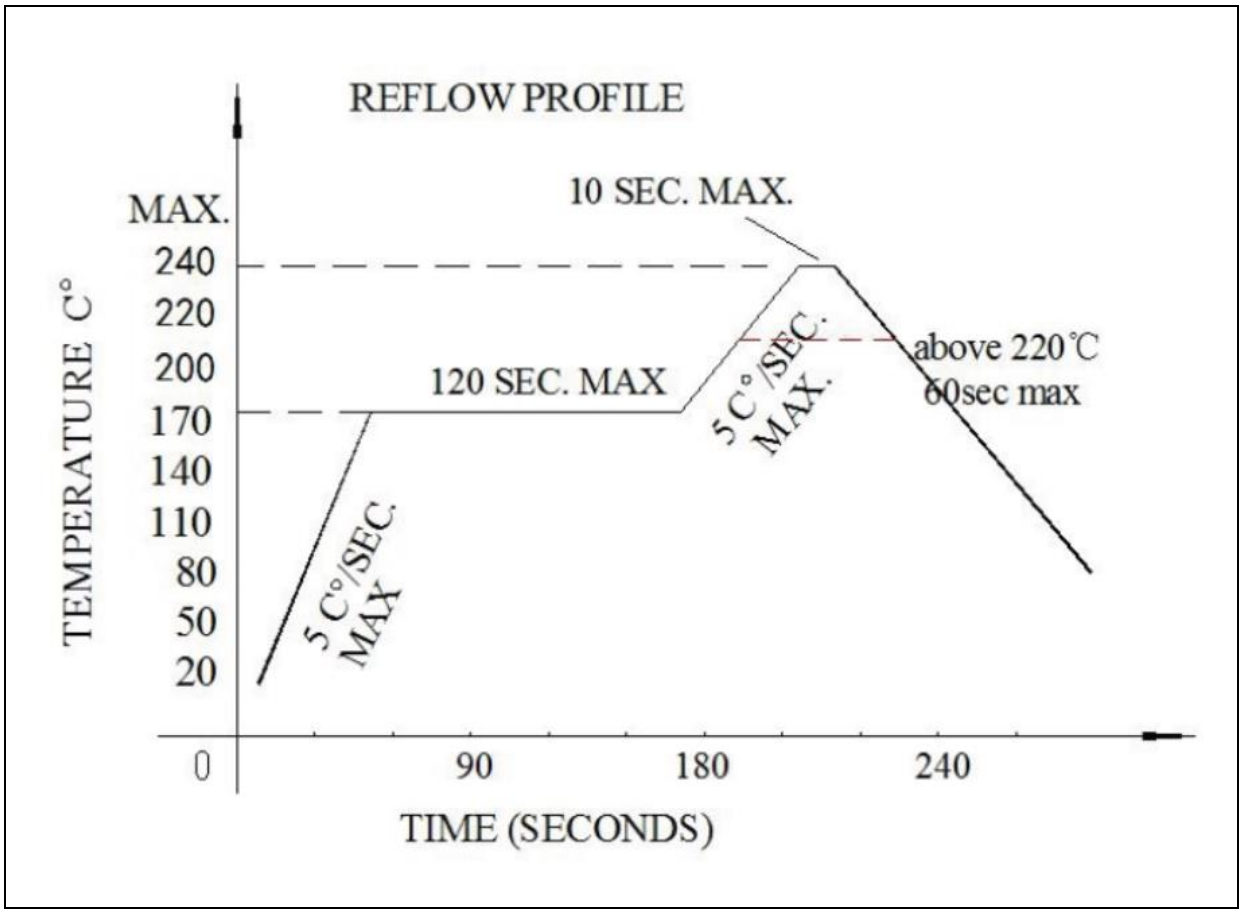
Note: High start, send data in GRB order (G7→G6……) B0)

7. Typical Application Circuit:



RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



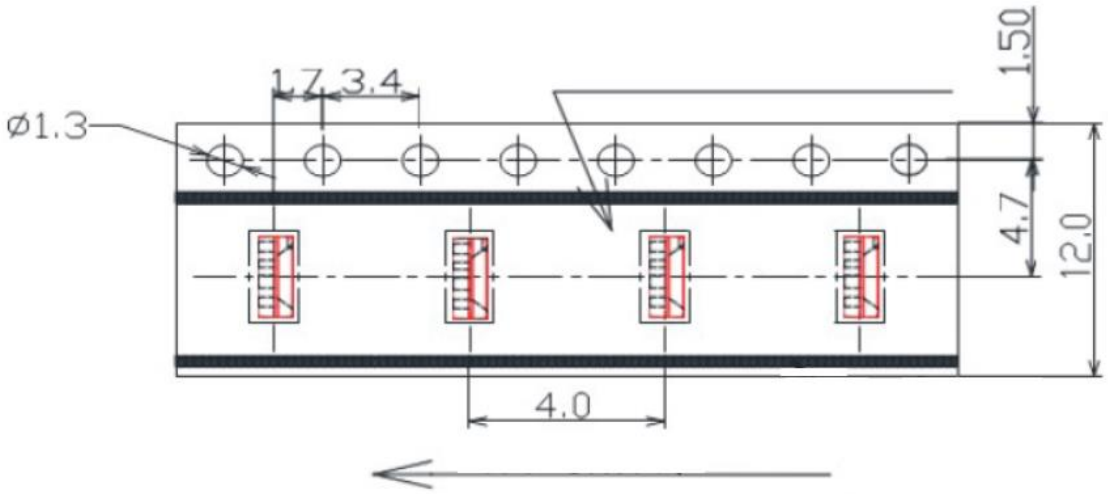
Note:

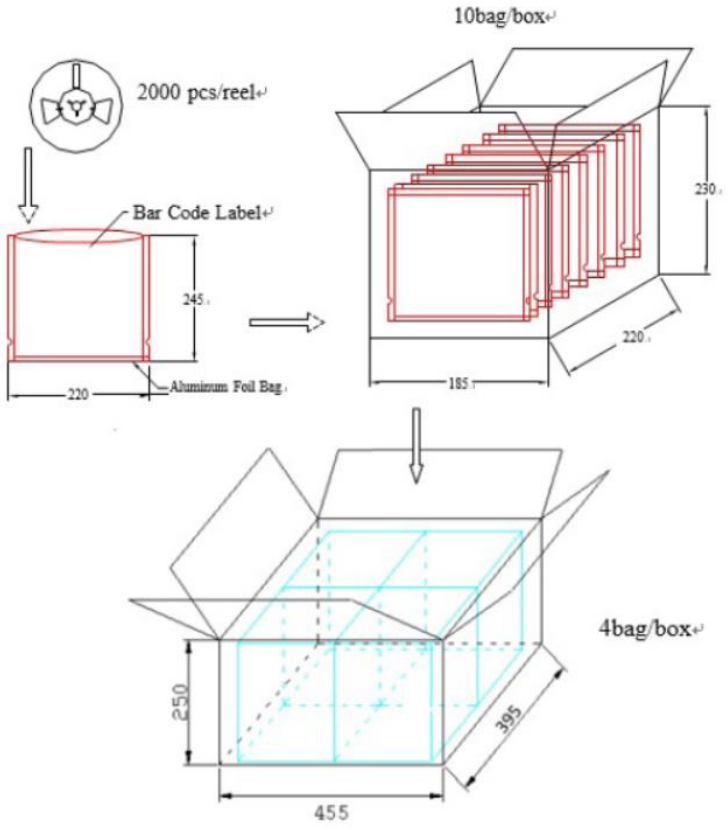
1. The maximum soldering temperature should be limited to 240°C.
2. Maxima reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

PACKING SPECIFICATION:

Reel Dimension:

Max.2000pcs/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 168 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:

- 65±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	15/03/2021	Datasheet set-up.
A1.1	24/09/2022	New datasheet format.