BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

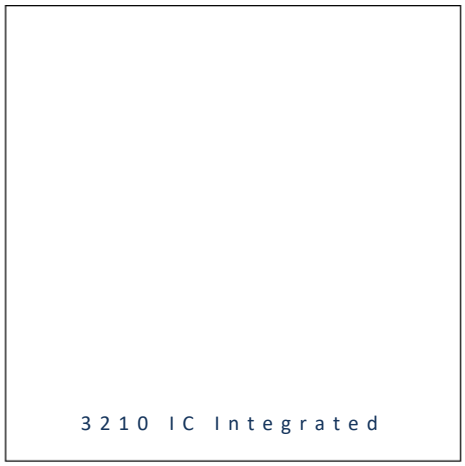
ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- PCB Side View SMD with IC
- 3210ICSV 1.0t Series
- Red/Green/Blue

Release Date: 08 September 2024 Version: A1.0

N0M67S55ICSV



3210 IC-Integrated

RoHS Compliant

FEATURES:

- **Package:** PCB Side View STD Package with Integrated IC
- **Forward Current:** 11.5mA
- **Forward Voltage (typ.):** +3.5~+5.5V
- **Luminous Intensity (typ.):** 280/440/140mcd
- **Colour:** Red/Green/Blue
- **Dominant Wavelength(typ.):** 625/527/467nm
- **Viewing angle:** 100°
- **Materials:**
  - Die: AlGaInP/InGaN/InGaN
  - Resin: Epoxy (Water Clear)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+85°C
- **IC Feature:** Serial data transmission signal by single wire. RGB and driver chip are integrated in a package, to form a complete control of pixel point with constant current.
- **Soldering methods:** Reflow soldering
- **MSL Level:** acc. to JEDEC Level 5a
- **Packing:** 8mm tape with max.3000pcs/reel, ø180mm (7'')

APPLICATIONS:

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

CHARACTERISTICS:

Absolute Maximum Characteristics (T_a=25°C)

Parameter	Symbol	Ratings	Unit
IC Power Supply Voltage	V_{DD}	+3.5~+5.5	V
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+85	°C
Electrostatic Discharge (HBM)	ESD	2	kV

Electrical & Optical Characteristics (T_a=25°C)

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Luminous Intensity	R	I_V	160	---	400	mcd	I_F=5mA
	G		250	---	630		
	B		80	---	200		
Dominant Wavelength	R	λ_D	620	---	630	nm	I_F=5mA
	G		515	---	530		
	B		460	---	475		
IC Supply Voltage		V_{DD}	3.5	---	5.5	V	---
R/G/B Output Current		I_{OUT}	---	11.5	---	mA	---
Viewing Angle		$2\theta_{1/2}$	---	100	---	deg	V_{DD}=5V

Electrical & Optical Characteristics (T_a=25°C)

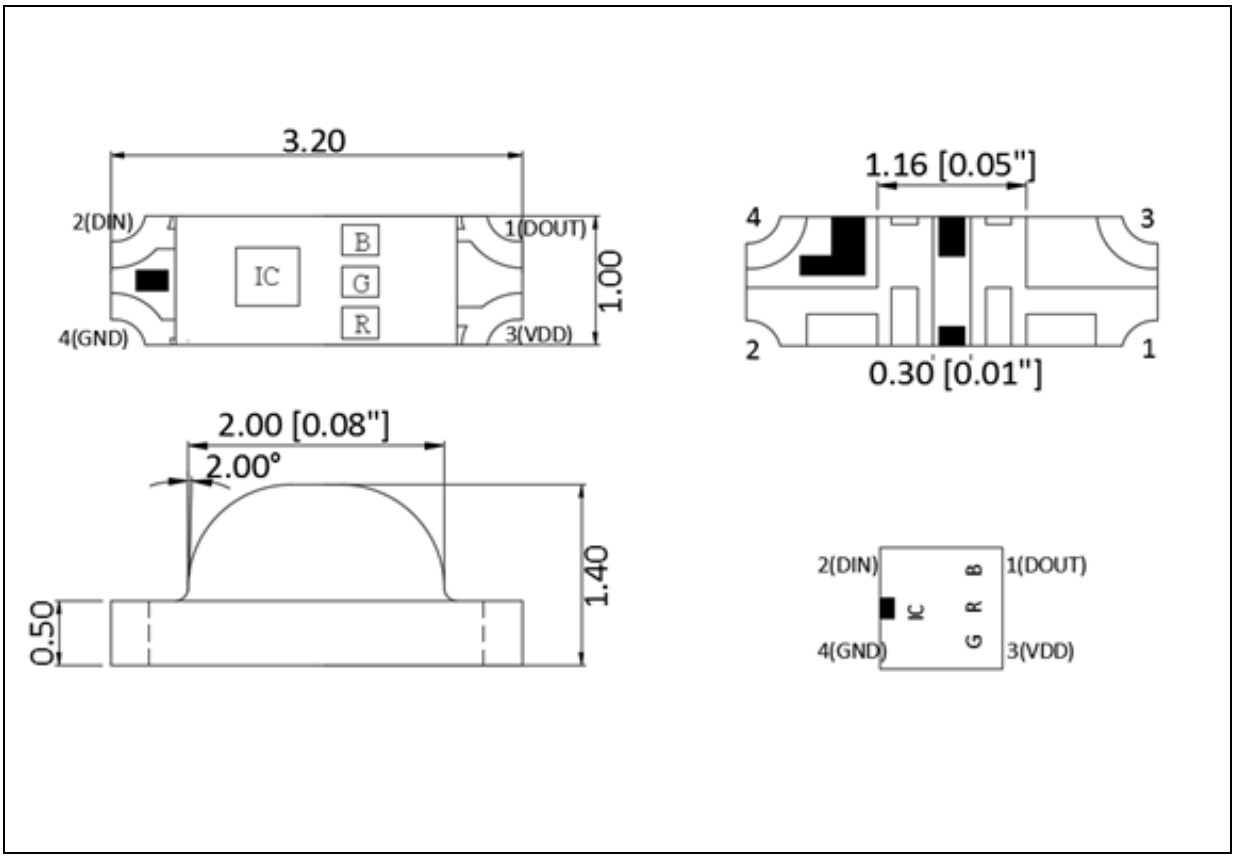
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Standby Current	I_{DO}	---	0.35	---	mA	V_{DD}=5V I_{OUT}="OFF"
Input Voltage Level	V_{IH}	3.1	---	---	V	D_{IN}, Input High Level V
	V_{IL}	---	---	1.5	V	D_{IN}, Input Low Level V
DOUT Output Current	I_{DOUT}	---	-14	---	mA	DOUT High RL=10Ω
DOUT Sink Current	I_{SINK}	---	14	---	mA	DOUT Low
PWM Frequency	FPWM	---	4.5	---	KHz	---

Switching Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Transfer Time	T_{PLH}	---	80	---	ns	D_{IN} -> D_{OUT} D_{OUT} Port to GND CL=30pF
	T_{PHL}	---	80	---	ns	
DOUT Transfer Time	t_{TLH}	---	12	---	ns	D_{OUT} Port to GND CL=30pF
	t_{THL}	---	10	---	ns	
Conversion Time of I_{OUT} R/G/B	T_r	---	500	---	ns	I_{OUT} R/G/B=5mA RL=200Ω CL=30pF
	T_f	---	500	---	ns	

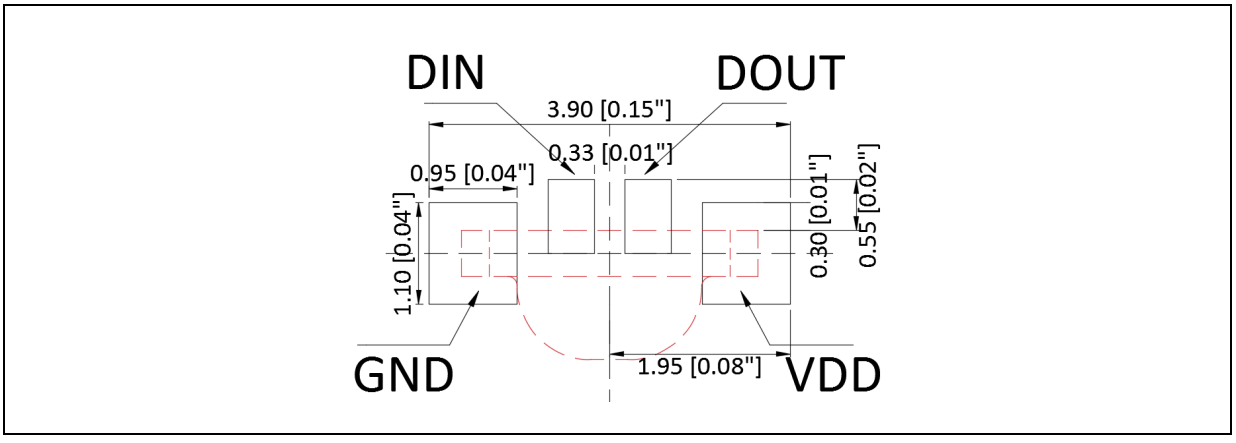
OUTLINE DIMENSION:

Package Dimension:



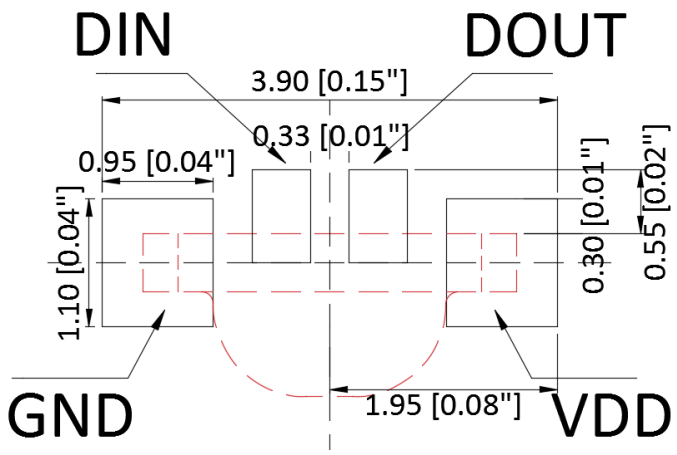
1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



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

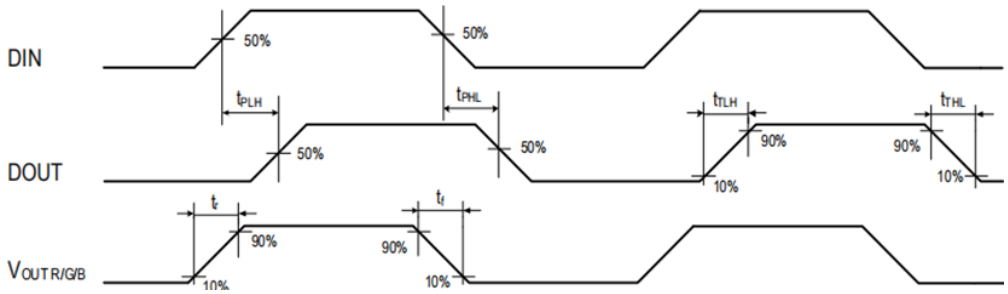
PIN CONFIGURATION:



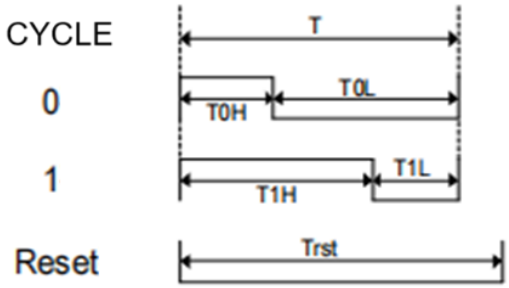
No.	Symbol	Function Description
1	DOUT	Control Data Signal Output
2	DIN	Control Data Signal Input
3	VDD	Power Supply LED
4	GND	Ground

DATA TRANSFER TIME:

1. Timing Wave Form



2. Data Transfer Diagram:



3. Data Transfer Time:

Item	Description	Minimum	Allowance
T	Code Cycle	1.2μs	---
T_{0H}	0 code, high voltage time	0.3μs	±0.05μs
T_{0L}	0 code, low voltage time	0.9μs	±0.05μs
T_{1H}	1 code, high voltage time	0.9μs	±0.05μs
T_{1L}	1 code, low voltage time	0.3μs	±0.05μs
RES	Reset Time	>200μs	---

3. Composition of 24 Bits Data

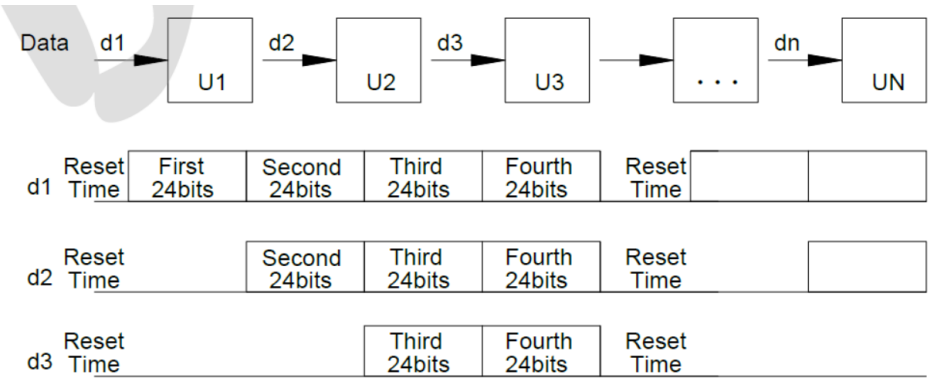
G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0

bit23.....

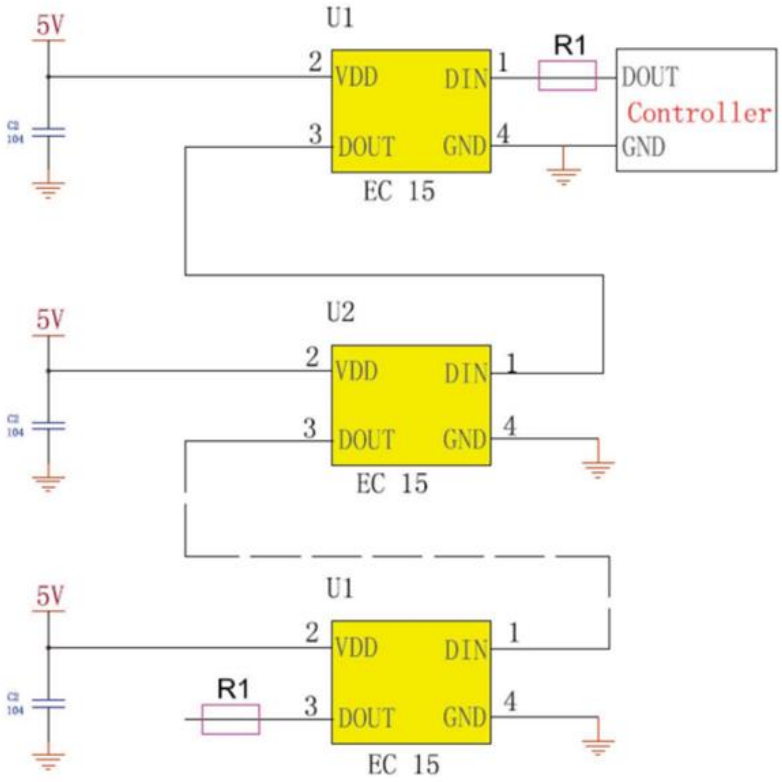
bit0

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 consists of green, red and blue data.

4. Data Transmission Method

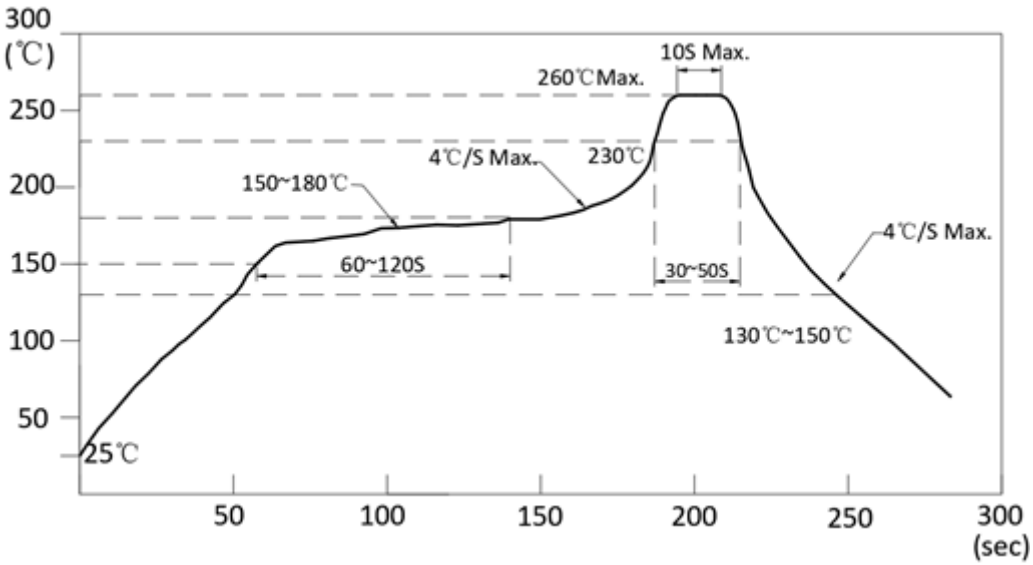


5. Typical Application Circuit:



RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



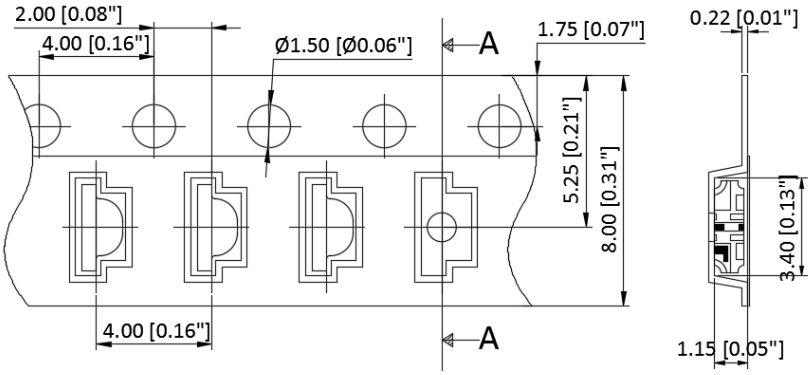
Note:

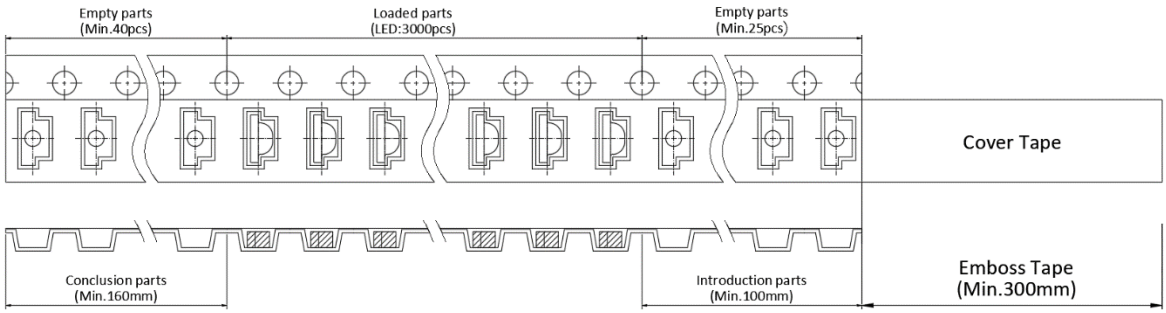
1. We recommend the reflow temperature 240°C (±5°C). The maximum soldering temperature should be limited to 260°C.
2. Maximum reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

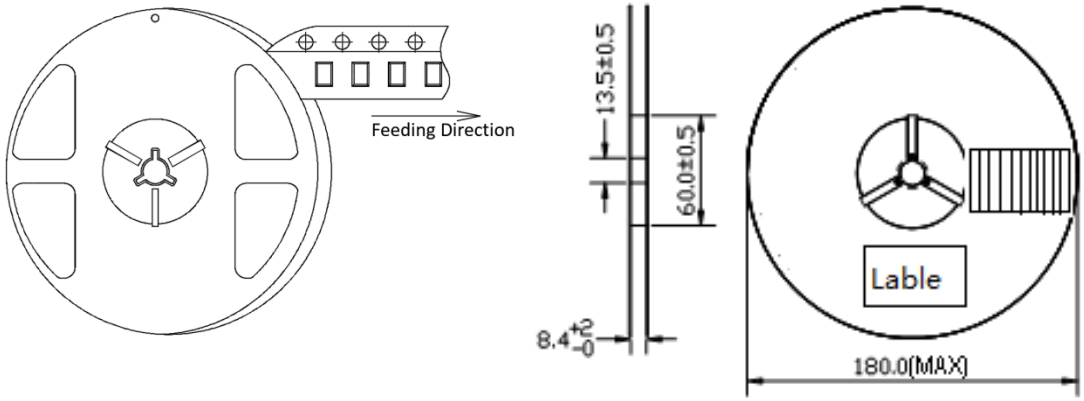
PACKING SPECIFICATION:

Reel Dimension:

Max.3000pcs/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 <10% R.H. and apply baking.

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 24hrs and <5%RH, taped / reel package.

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

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	08/09/2024	Datasheet set-up.