BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

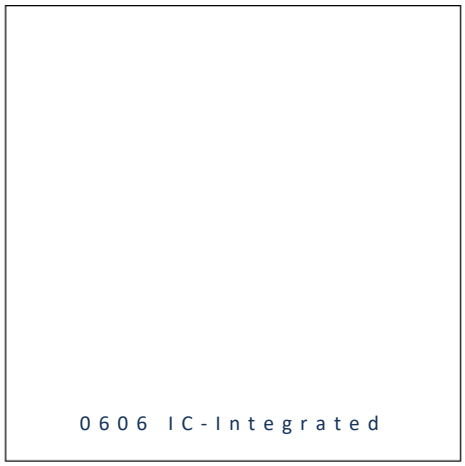
ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- ▶ CHIP SMD with IC
- ▶ 0606 (1615) IC 0.55t
- ▶ Red/Green/Blue

Release Date: 26 April 2021 Version: A1.0

N0M59S10IC



0606 IC-Integrated

RoHS Compliant

FEATURES:

- **Package:** CHIP Top View Package with Integrated IC
- **Forward Current:** 12/12/12mA*
- **Forward Voltage (typ.):** +3.3~+5.5V
- **Luminous Intensity (typ.):** 300/610/100mcd
- **Colour:** Red/Green/Blue
- **Wavelength:** 622/525/467nm
- **Viewing angle:** 120°
- **Materials:**
  - Resin: Epoxy (White Diffused)
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+100°C
- **IC Features:** This IC LED has an Advance Function Mode that supports the MCU to start with a specific command setting.
- **Pixel:** Each R/G/B chip is 8bit, total of 16M colours can be displayed
- **Soldering methods:** IR Reflow soldering
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 8mm tape with Max.4000pcs/reel, ø180mm (7'')

* in order of Red/Green/Blue

APPLICATIONS:

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

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

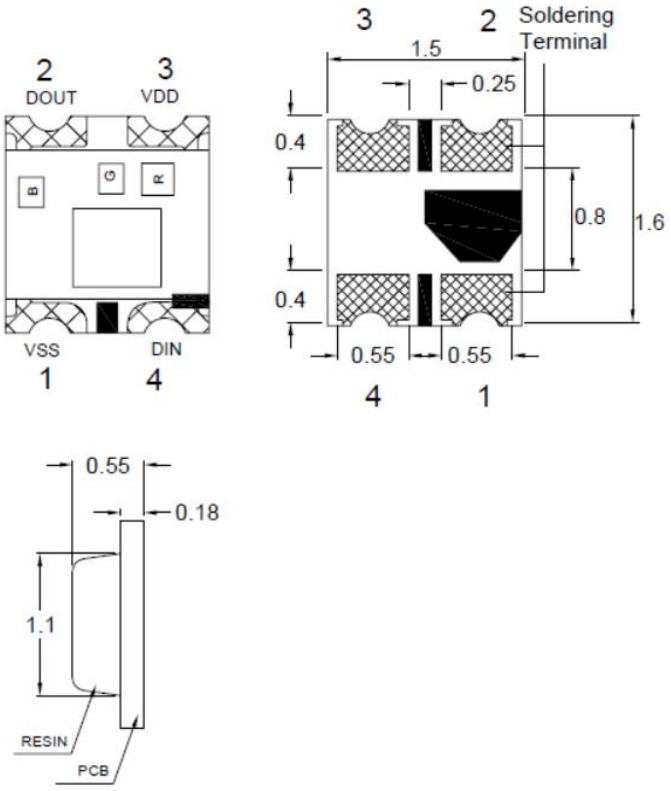
Parameter	Symbol	Ratings	Unit
LED Output Current	I_{OUT}	25	mA
Supply Voltage	V_{DD}	0 ~ +6.0	V
Power Dissipation	P_D	400	mW
Operating Temperature	T_{OPR}	-40~+85	°C
Storage Temperature	T_{STG}	-40~+100	°C

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

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Forward Voltage		V_F	3.3	5.0	5.5	V	---
Each R/G/B Current		I_{OL}	---	12	---	mA	V_{DD}=5V
Input High Voltage		V_{IH}	2.7	---	V_{DD}	V	DI
Input Low Voltage		V_{IL}	0	---	1.0	V	DI
Output High Voltage		V_{OH}	4.5	---	---	V	I_{OH}=4mA
Output Low Voltage		V_{OL}	---	---	0.4 V_{DD}	V	I_{OL}=4mA
Operation Current		I_{DD}	---	---	2	mA	B, G, R no load
Pull Down Resistance		R_{PD}	---	500K	---	Ω	D_{IN}, D_{OUT} (VDD=5V)
Luminous Intensity	R	I_V	125	300	500	mcd	I_F=12mA
	G		320	610	1000		
	B		50	100	200		
Dominant Wavelength	R	λ_D	615	622	630	nm	I_F=12mA
	G		515	525	535		
	B		460	467	475		
Viewing Angle		$2\theta_{1/2}$	---	120	---	deg	I_F=12mA

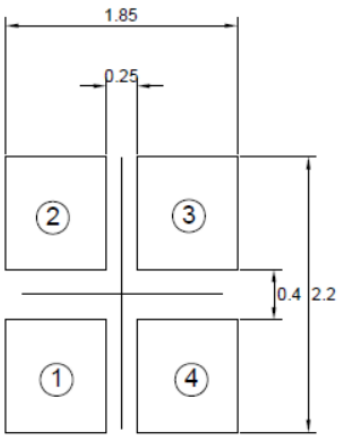
OUTLINE DIMENSION:

Package Dimension:



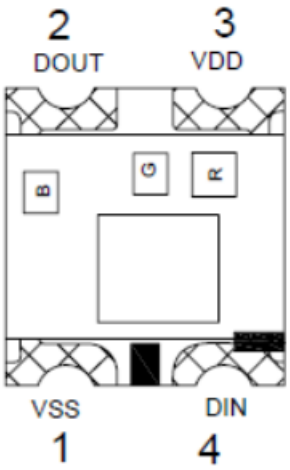
1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



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

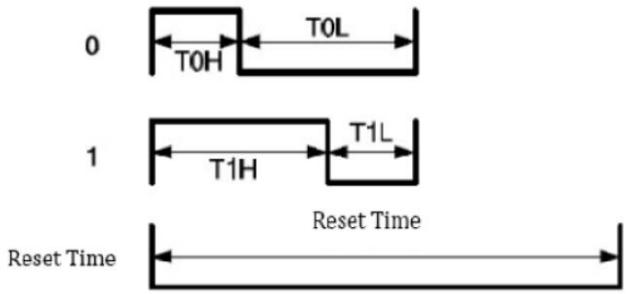
PIN CONFIGURATION:



No.	Symbol	Function Description
1	VSS	Ground
2	DOUT	Control Data Signal Output
3	VDD	DC Power Input
4	DIN	Control Data Signal Input

Function Description:

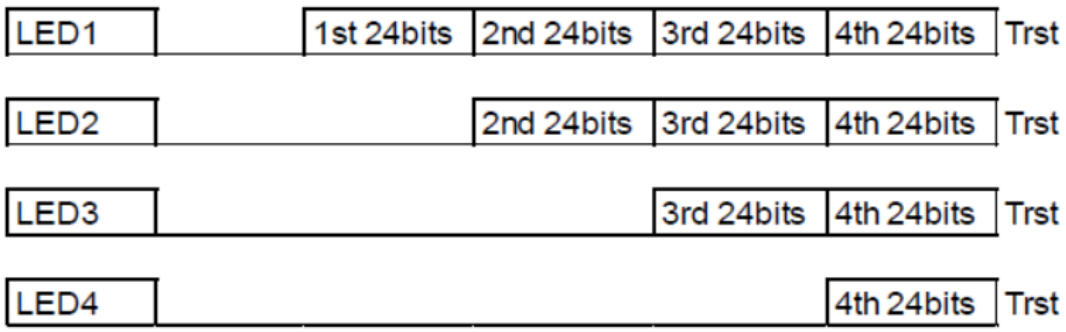
1. Timing Wave Form:



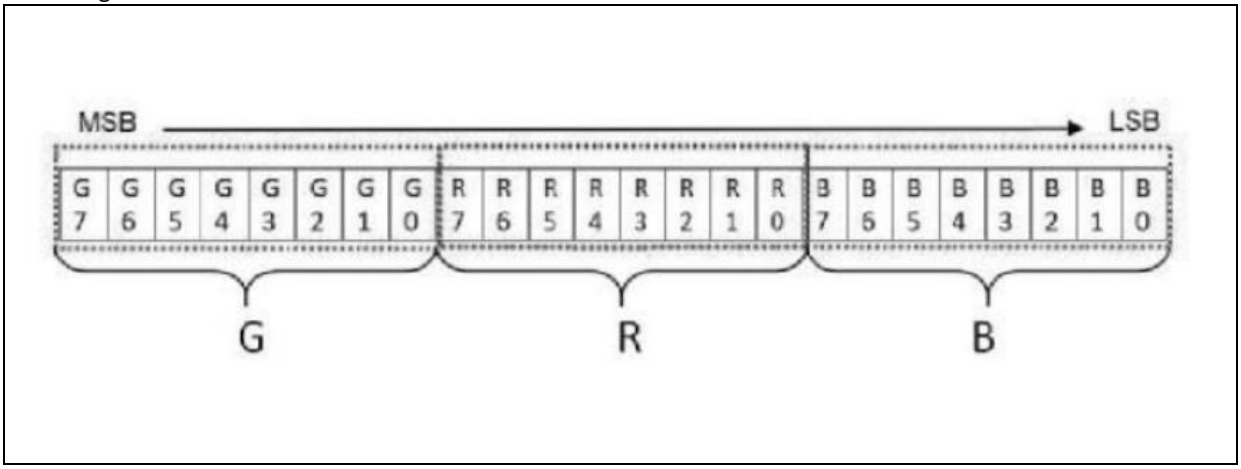
2. High Speed Mode:

Item	Description	min	Typical	Allowance	unit
T0H	0 code, High-level time		0.3	±0.15	us
T0L	0 code, Low-level time		0.9	±0.15	us
T1H	1 code, High-level time		0.9	±0.15	us
T1L	1 code, Low-level time		0.3	±0.15	us
Trst	Reset code,Low-level time	250			us

3. Data Communication:



4. Single Data in 24bit for RGB:



5. Control Commands for Multiple Strips Connected Parallelly:

   This IC LED supports the scenarios of controlling multiple strips with parallel connection (up to 15 strips). With appropriate commands, each of the strips can be identified and assigned a unique strip dynamic ID (by set dynamic ID command). After commands is completed, MCU host can individually control and send the display data to each strip with the help of “Clean ID”, “Check ID”, “Specify ID” … etc. commands.

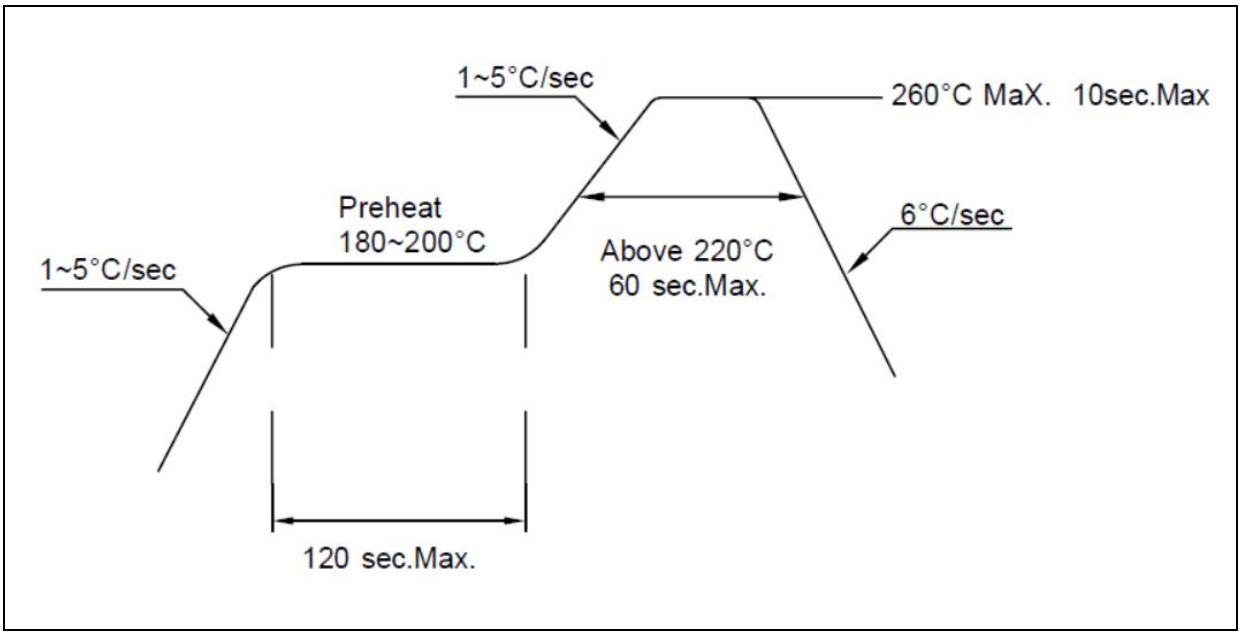
6. Advance Function Mode:

   This IC LED has an Advance Function Mode that supports the MCU to start with a specific command setting.

   Advance Function Mode includes the following function:
   1. Feedback the cascaded number of LEDs and maximum sink current of R/G/B channel.
   2. Current Gain control: 32 level (5bits) to adjust maximum sink current of R/G/B channel.
   3. Programmable PWM refresh rate (1.25kHz/2.5kJz/5kHz/10kHz)

RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



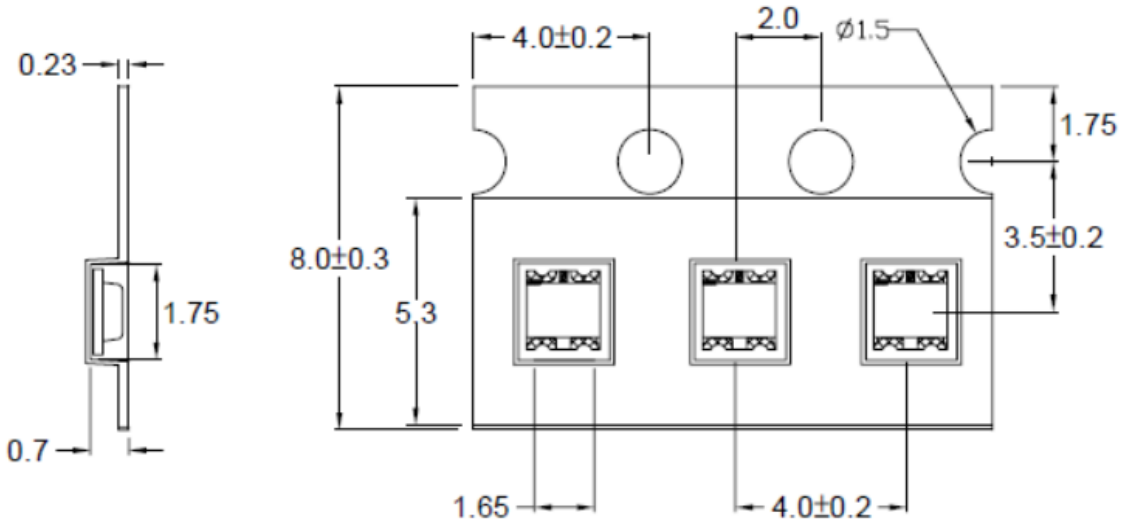
Note:

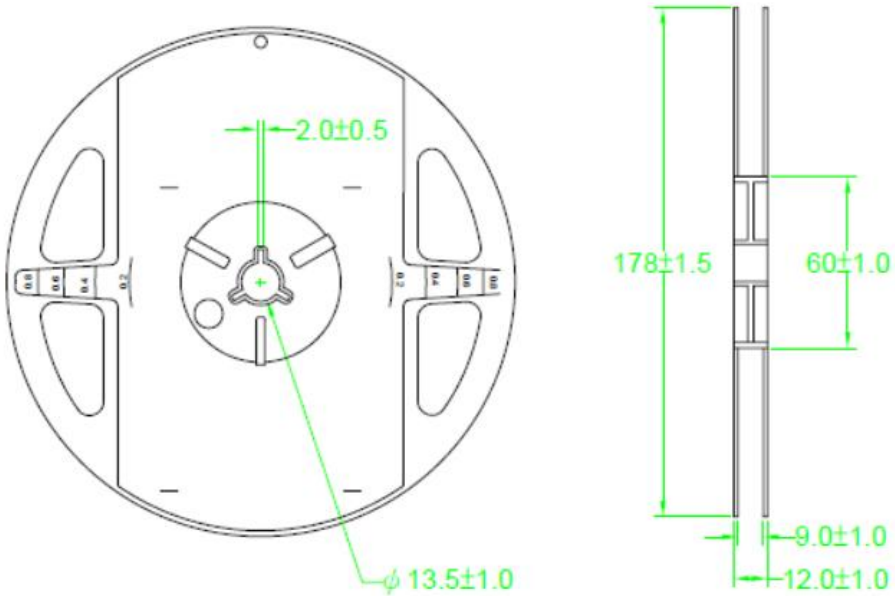
1. We recommend the reflow temperature 240°C (±5°C). The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

PACKING SPECIFICATION:

Reel Dimension:

Max.4000pcs/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.

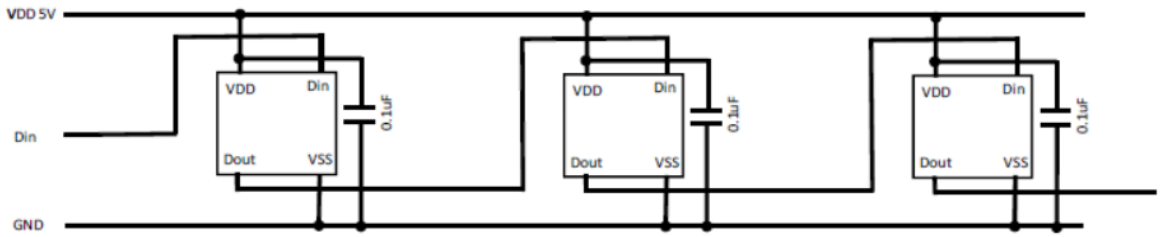
Baking:

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:

- 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.

Recommended Route:



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	26/04/2021	Datasheet set-up.

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