



BRIGHTTEK
BRIGHTTEK (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
- ▶ 0808 (2020) IC 0.75t
- ▶ Red/Green/Blue

NOM66S74IC



Release Date: 10 July 2024 Version: A1.0



0808 IC-Integrated

RoHS
Compliant



FEATURES:

- **Package:** CHIP EIA STD Package with Integrated IC Type 104
- **Forward Current:** 5mA
- **Forward Voltage (typ.):** +3.8~+5.5V
- **Luminous Intensity (typ.):** 425mcd mixed white
- **Colour:** Red/Green/Blue
- **Dominant Wavelength (typ.):** 622/527/467nm
- **Viewing Angle:** 120°
- **Materials:**
 - Resin: Epoxy (Water Diffused)
 - L/F Finish: Ag Plated
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+105°C
- **IC Feature:** Serial data transmission signal by single wire.
- **Pixel:** One pixel contains R, G, and B colour that each can achieve 256 level brightness grayscales, which forms 16,777,216 combination colours. Internal clock frequency operates at 800kHz.
- **Soldering methods:** IR Reflow soldering
- **Preconditioning:** acc. to JEDEC Level 3
- **Packing:** 8mm tape with Max.4000pcs/reel, ø180mm (7")

APPLICATIONS:

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

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I _F	5	mA
IC Power Supply Voltage	V _{DD}	+3.8~+5.5	V
IC Input Voltage	V _I	-0.4~V _{DD} +0.4	V
Operating Temperature	T _{OPR}	-40~+85	°C
Storage Temperature	T _{STG}	-40~+105	°C
Soldering Temperature	T _{SD}	260	°C

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

Parameter	Symbol	Values			Unit	Test Condition	
		Min.	Typ.	Max.			
Forward Voltage	V _F	3.8	5	5.5	V	I _F =5mA	
Luminous Intensity	R	I _v	40	75	125	mcd	I _F =5mA
	G		135	---	390		
	B		25	---	100		
	W		325	---	550		
Dominant Wavelength	R	λ _D	615	---	630	nm	I _F =5mA
	G		520	---	535		
	B		460	---	475		
Colour Coordinate	X	---	---	0.2620	---	---	I _F =5mA
	Y		---	0.3130	---		
Viewing Angle	2θ _{1/2}	---	120	---	deg	I _F =5mA	

Electrical & Optical Characteristics (Ta=25°C)

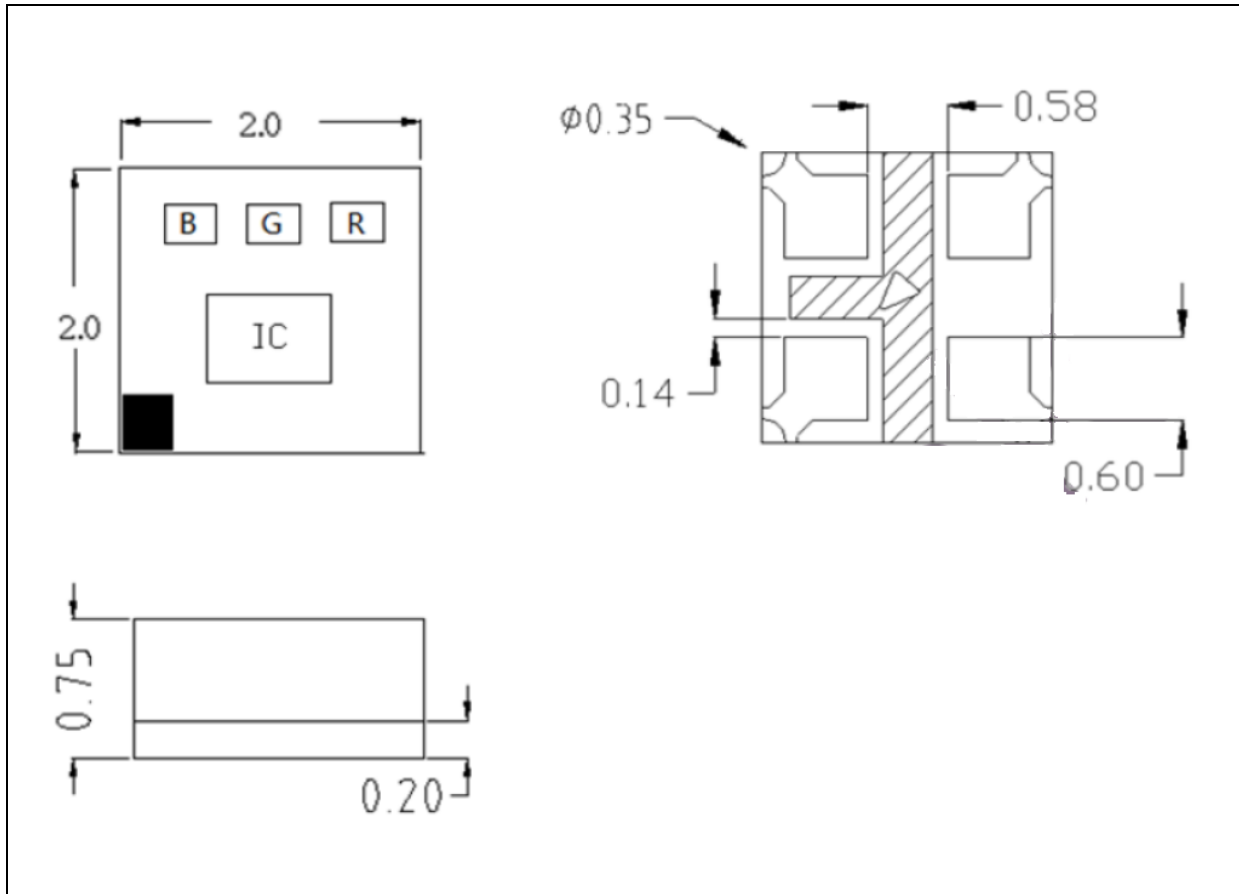
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Static Current	I _{DD}	---	0.3	---	mA	V _{DD} =4.5V I _{out} =OFF
Input Voltage Level	V _{IH}	0.7 V _{DD}	---	---	V	D _{IN} , SET
	V _{IL}	---	---	0.3 V _{DD}	V	D _{IN} , SET

Switching Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Rate of Data Signal	F _{DIN}	---	0.8	---	MHz	---
Transfer Time	T _{PLH}	---	---	80	ns	D _{IN} → D _{OUT}
	T _{PHL}	---	---	80	ns	
Conversion Time of I _{OUT} R/G/B	T _r	---	---	50	ns	I _{OUT} R/G/B=5mA RL=400Ω CL=15pF
	T _f	---	---	100	ns	

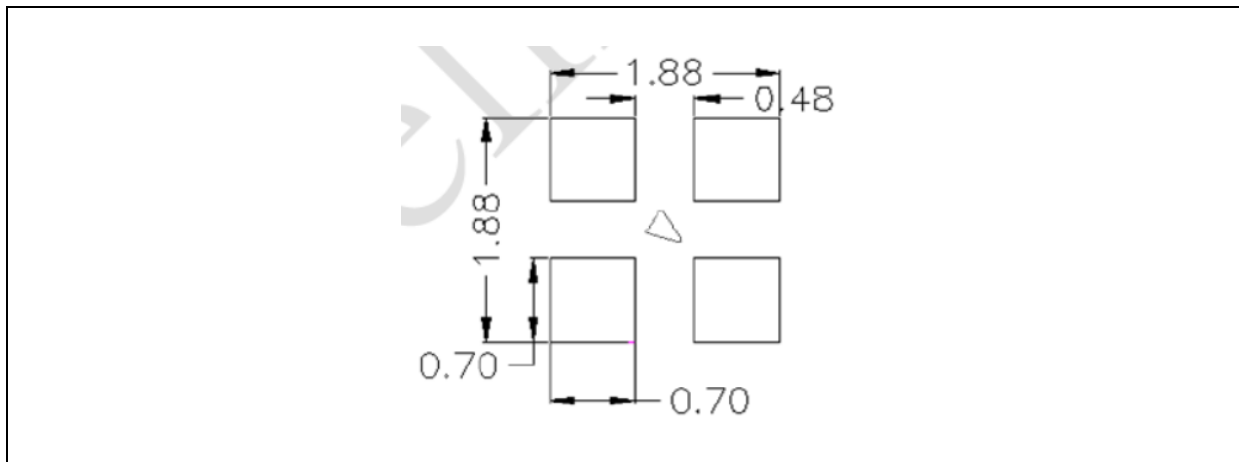
OUTLINE DIMENSION:

Package Dimension:



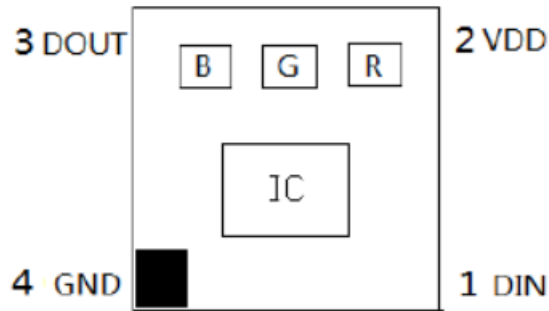
1. All dimensions are in millimetre (mm).
2. Tolerance $\pm 0.2\text{mm}$, unless otherwise noted.

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance $\pm 0.1\text{mm}$ with angle tolerance $\pm 0.5^\circ$.

PIN CONFIGURATION:

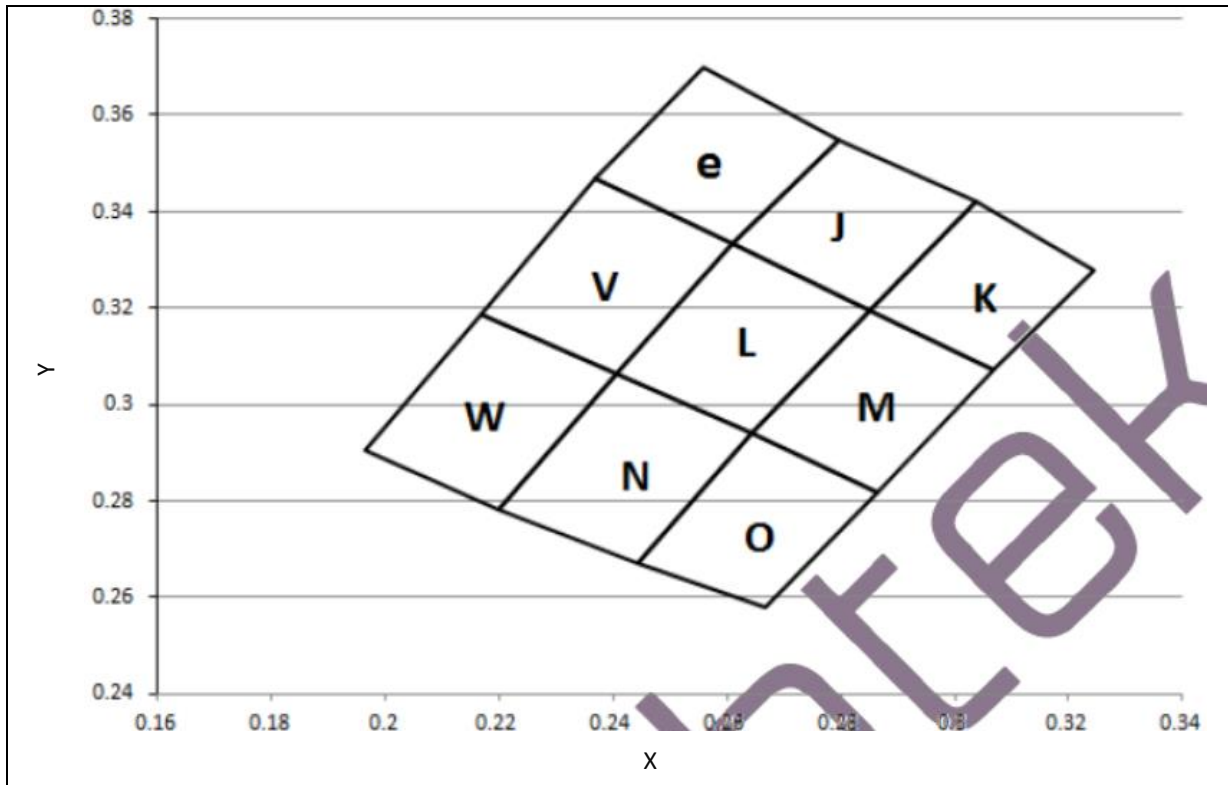


No.	Symbol	Function Description
1	DIN	Control Data Signal Input
2	VDD	Power Supply LED
3	DOUT	Control Data Signal Output
4	GND	Ground

BINNING GROUPS:

Luminous Intensity Classifications (White) ($I_F = 5\text{mA}$, $V_{DD}=5\text{V}$):

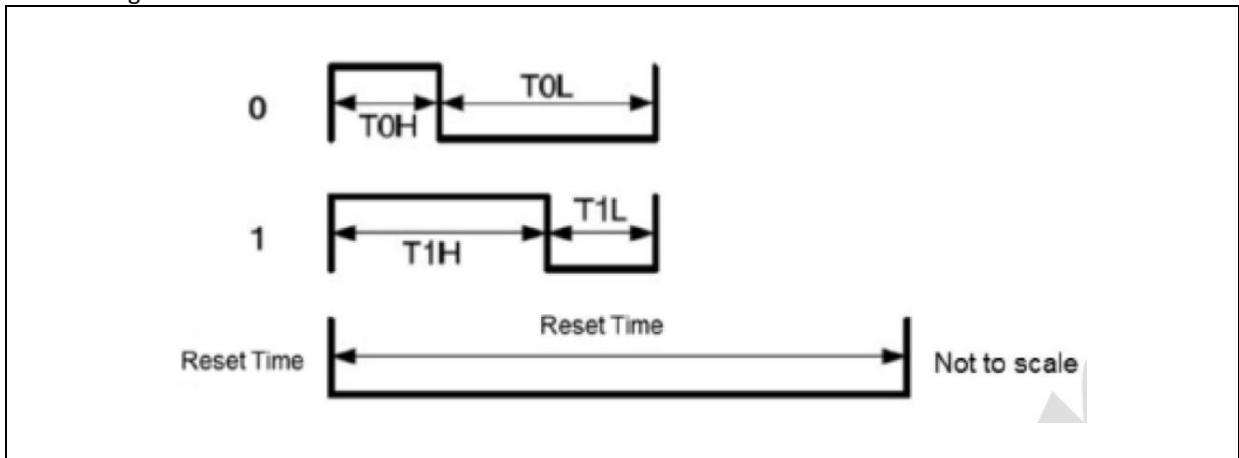
Code	Min.	Max.	Unit
11	325	423	mcd
12	423	550	

CIE CHROMATICITY DIAGRAM:

Chromaticity Coordinates Classifications ($I_F = 5\text{mA}$):

	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
e	0.2369	0.3468	0.2609	0.3332	0.2797	0.3550	0.2559	0.3698
J	0.2609	0.3332	0.2797	0.3550	0.3036	0.3420	0.2849	0.3196
K	0.2851	0.3196	0.3036	0.3420	0.3243	0.3280	0.3068	0.3072
V	0.2169	0.3188	0.2369	0.3468	0.3609	0.3332	0.2406	0.3064
L	0.2406	0.3064	0.2609	0.3332	0.2849	0.3196	0.2643	0.2940
M	0.2643	0.2940	0.2849	0.3196	0.3068	0.3072	0.2865	0.2819
W	0.1963	0.2907	0.2169	0.3188	0.2406	0.3064	0.2200	0.2783
N	0.2200	0.2783	0.2406	0.3064	0.2643	0.2940	0.2444	0.2672
O	0.2444	0.2672	0.2643	0.2940	0.2865	0.2819	0.2667	0.2578

Function Description - Data Transfer Time ($T_H+T_L=1.2\mu s\pm 300ns$):

1. Timing Wave Form:



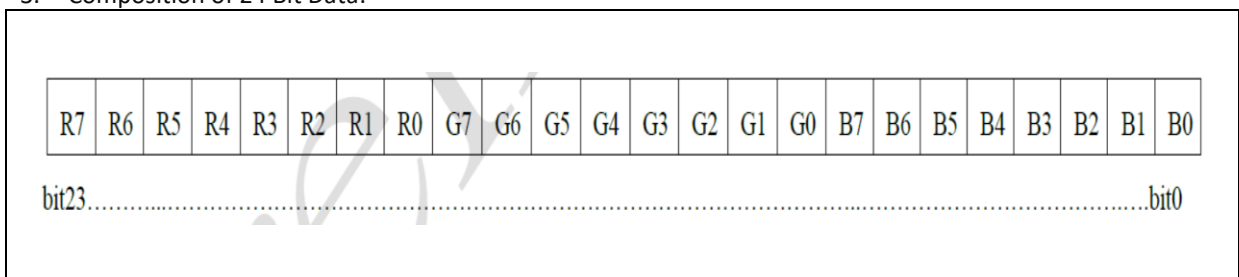
2. High Speed Mode:

Item	Description	Typical	Allowance
T_{0H}	0 code, high voltage time	300ns	$\pm 150ns$
T_{0L}	0 code, low voltage time	900ns	$\pm 150ns$
T_{1H}	1 code, high voltage time	900ns	$\pm 150ns$
T_{1L}	1 code, low voltage time	300ns	$\pm 150ns$
RES	reset time	$>200\mu s$	-

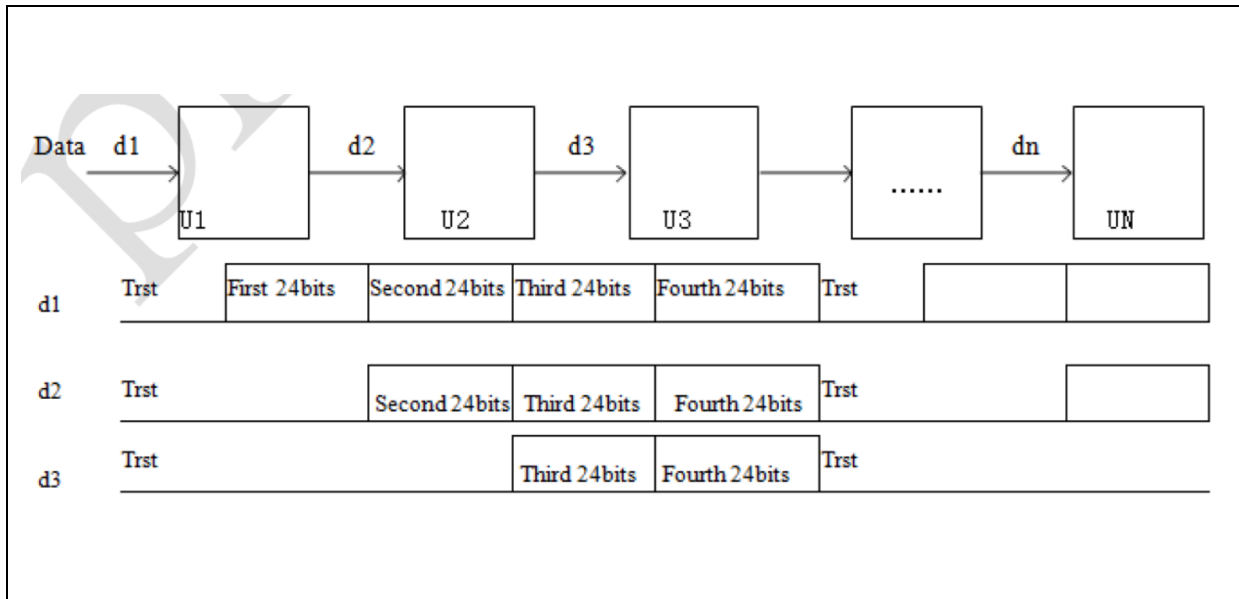
Note:

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye response curve.
- $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
- The dominant wavelength λ_D is derived from CIE chromaticity diagram and represents the single wavelength which defines the colour of the device. Peak emission wavelength tolerance is $\pm 1nm$.

3. Composition of 24 Bit Data:

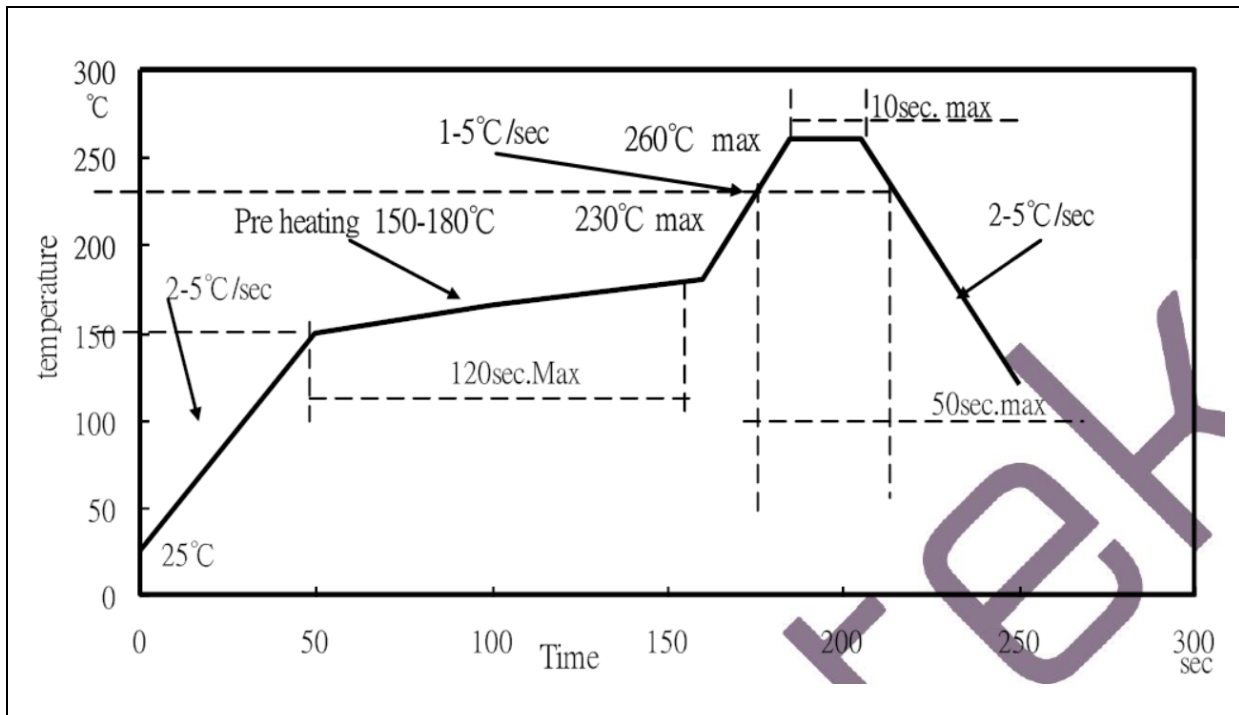


4. Data Transmission Method:



RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:

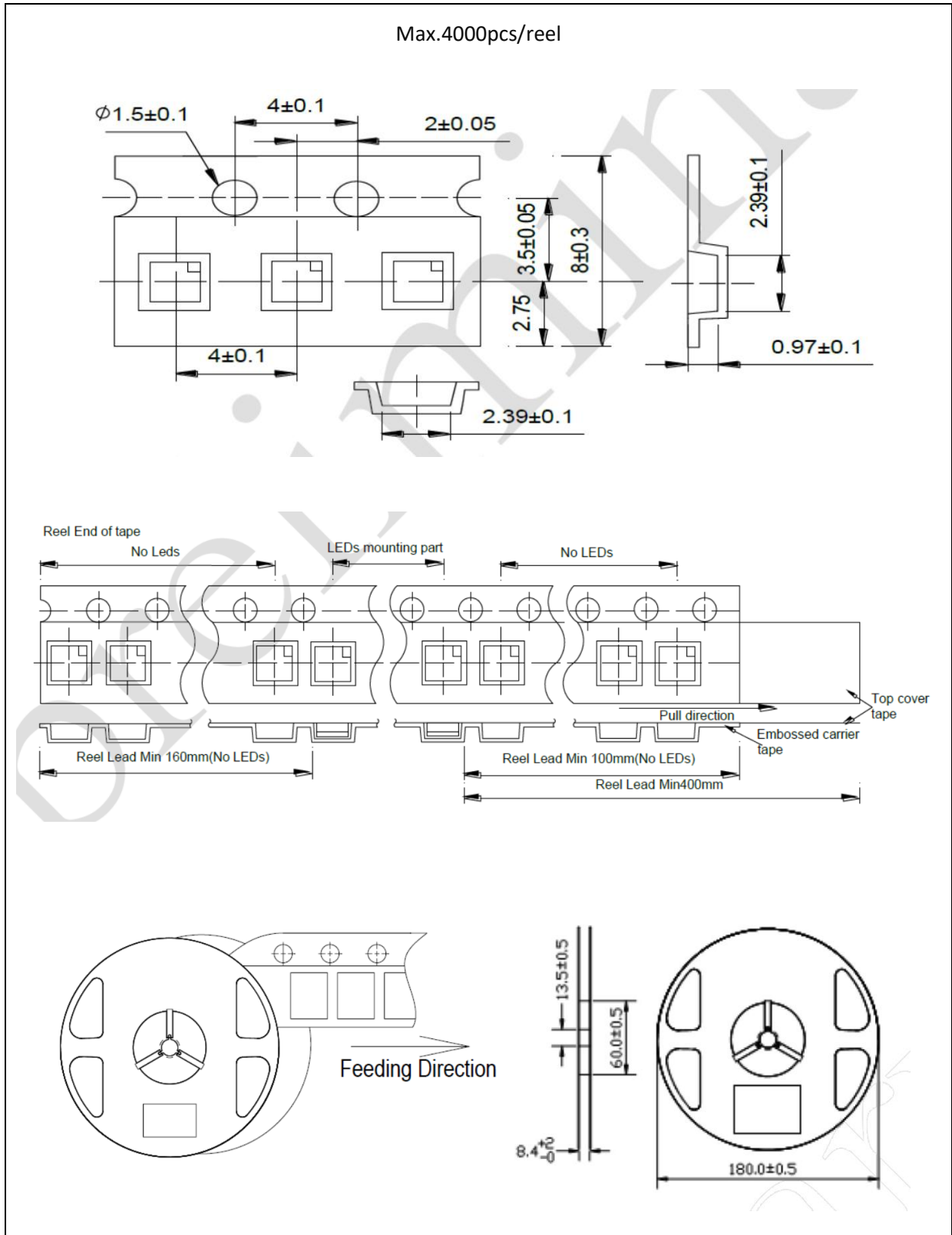


Note:

1. We recommend the reflow temperature 240°C ($\pm 5^\circ\text{C}$). The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 1 time.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

PACKING SPECIFICATION:

Reel Dimension:



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 desiccating agent stored at R.H.<20% 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.

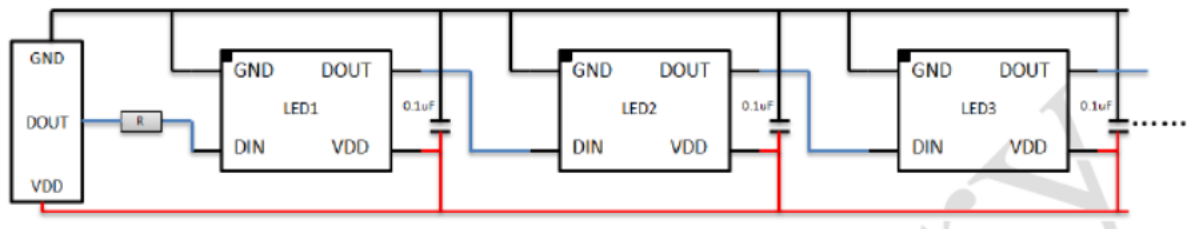
Baking:

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±3°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.

Testing Circuit:



When the first LED is connected to the MCU, a resistance R is needed in series between its signal input line and the MCU. The size of R depends on the number of cascade beads. The more cascades, the smaller resistance R is used. It is generally recommended that the value be between 100-1K. Usually the recommended value is around 300 R. In order to make the LEDs work more stably, a parallel capacitor is needed between VDD and GND of each.

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	10/07/2024	Datasheet set-up.