Specification

Document No.: NMD-SPC- SK9822MINI-A

Product No.: SK9822MINI-A

Sample No.: NMD0126A

Description: 3.5x3.7x2.8mm Top SMD Type 0.3Watt Power Double line transmission tegrated light source Intelligent control LED

Rev. No.: A/0

Date: 2021-05-26

Customer approval			**NMD approval**		
Approval	Review	Confirmation	Approval	Review	Confirmation
			朱更生	吴振雷	周 凯
☐Qualified ☐Disqualified Stamp			Stamp		

* Before using our products, please search our company's official website to verify the specification version. The product specification version is updated and cannot be timely notified. Please refer to the official website for the latest information;

* The copyright and final interpretation of the product belong to Shenzhen Normand Electronic Co.,Ltd. If you have special specifications, please contact our engineering staff;

*Official website: http://www.normandled.com

Change History

Date	Rev. No.	Changes/Reason of changes	Signature
2019-09-12	01	Initial Document	KEVIN ZHU
2020-05-26	A/0	Modify product specifications andphotoelectric parameters	KEVIN ZHU

CONTENTS

1、 Product overview.....4
2、 Main Application Field.....4
3、 Description.....4
4、 Mechanical Dimensions..... 4
5、 PIN configuration..... 5
6、 Recommended dimensions for PCB products..... 5
7、General description of product naming..... 5
8、 Electrical parameters..... 6
9、 Electrical/Optical Characteristics..... 6
10、 The IC electrical parameters..... 6
11、 Feature Descriptions..... 7~8
12、 The typica l application circuit.....9
13、 Standard LED Performance Graph..... 10
14、 Packaging Standard.....11
15、 Reliability Test.....12

1. Product Overview :

SK9822MINI-A is a two-wire transmission channel three (RGB) driving intelligent control circuit and the light emitting circuit in one of the LED light source control. Products containing a signal decoding module, data buffer, a built-in constant current circuit and RC oscillator; CMOS, low voltage, low power consumption; 256 level grayscale PWM adjustment and 32 brightness adjustment; use the double output, Data and synchronization of the CLK signal, connected in series each wafer output action synchronization.

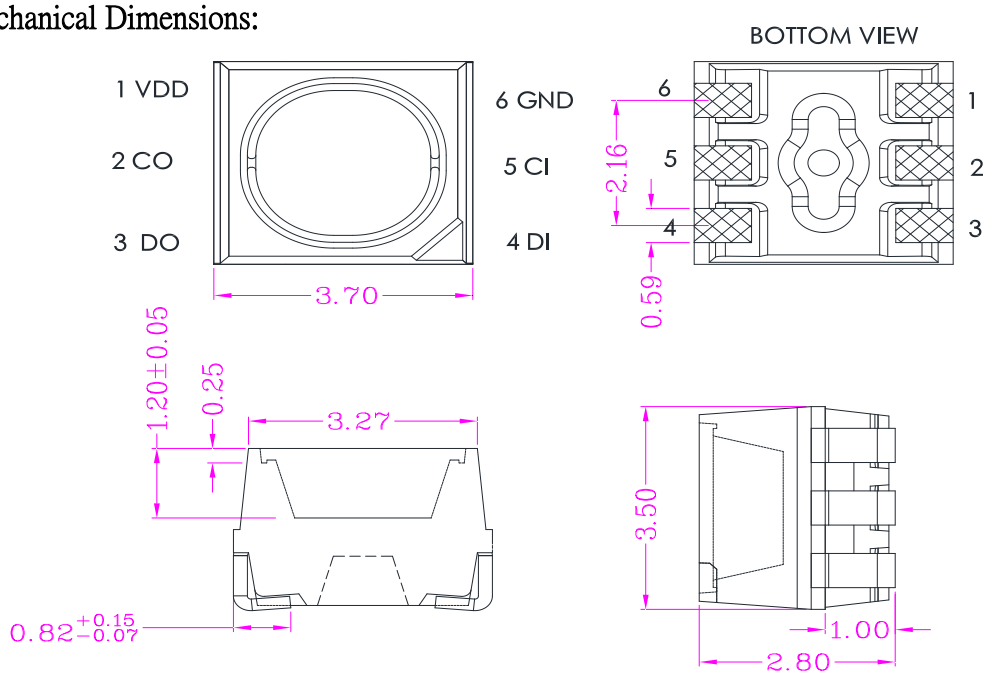
2. Main Application Field:

- **Full color LED string light, LED full color module, LED super hard and soft lights, LED guardrail tube, LED appearance / scene lighting**
- **LED point light, LED pixel screen, LED shaped screen, a variety of electronic products, electrical equipment etc..**

3. Description:

- **Top SMD internal integrated high quality external control line serial cascade constant current IC; 5V application; default on electric lights;**
- **Control circuit and the RGB chip in SMD 3535 components, to form a complete control of pixel, color mixing uniformity and consistency;**
- **The two-wire synchronous control.**
- **The three RGB output control, 8Bit (256) color; 5Bit (32) to adjust the brightness;**
- **The three constant current drive, self detection function specific signal**
- **The maximum frequency of 30MHZ serial data input**
- **The double data transmission, built-in support uninterrupted oscillation PWM output, can maintain a static image.**

4. Mechanical Dimensions:

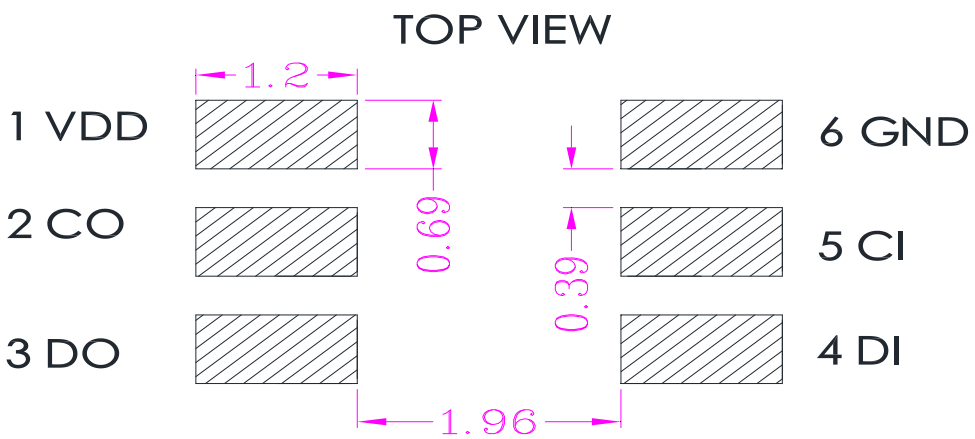


Notes:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted

5. PIN configuration

Item	Symbol	Pin Name	Function description
1	VDD	Power	power supply pin
2	CO	CLK Output	control signal output Clock data
3	DO	Data Input	control signal output data
4	DI	Data Input	control signal Input data
5	CI	CLK Input	control signal Input Clock data
6	GND	Ground	The signal and power supply and grounding

6. Recommended dimensions for PCB products



7. General description of product naming

SK 9822 MINI-A

① ② ③

①	②	③
series	IC series and current code	Package size
The default is to integrate the RGB chip with the IC	Refers to the 98 series IC 18MA current version Double line transmission	3.5x3.7x2.8mm Outline pakage

8. Electrical parameters （Ta=25℃,VSS=0V）：

Parameter	Symbol	Range	Unit
Power supply voltage	VDD	-0.5～+5.5	V
Logic input voltage	V_{IN}	-0.3～VDD+0.3	V
Working temperature	Topt	-40~+85	℃
Storage temperature	Tstg	-50~+150	℃
ESD pressure(HBM)	V_{ESD}	2K	V
ESD pressure(DM)	V_{ESD}	200	V

9. Electrical/Optical Characteristics:

Color	SK9822MINI-A	
	Dominate avelength(nm)	Luminance(mcd)
Red	620-625	400-700
Green	520-530	1000-1500
Blue	460-470	200-400

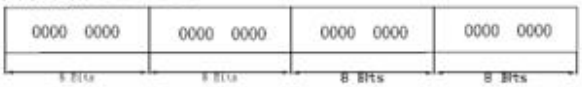
10. The IC electrical parameters (unless otherwise specified, TA=-20 ~ +70 ℃, VDD=4.5 ~ 5.5V, VSS=0V):

Parmeter	Symbol	Min	Typical	Max	Unit	Test conditions
The chip supply voltage	VDD	---	5.0	5.3	V	---
The biggest LED output current	I_{max}	---	---	20	mA	----
The clock high level width	TCLKH	---	---	>30	ns	---
The clock low level width	TCLKL	---	---	>30	ns	---
Data set up time	TSETUP	---	---	>10	ns	---
The frequency of PWM	FPWM	---	1.2	---	KHZ	---
Static power consumption	IDD	---	1	---	mA	---

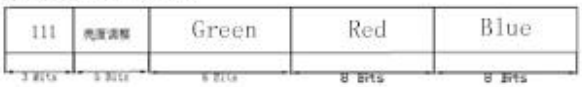
11. Feature Descriptions:

(1) Series data structure

开始帧32 Bits



数据帧32 Bits



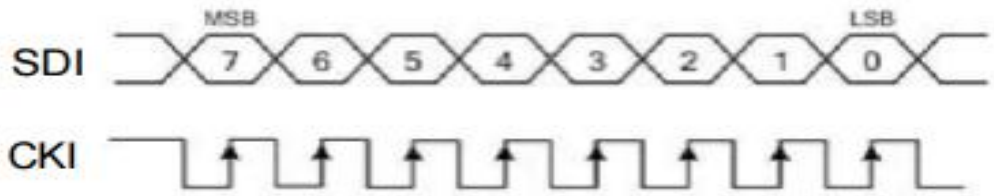
结束帧32 Bits

Product structure: GRB order output light, optimize the product blending effect (adjusted IC default GRB order wafer position)

(2) 256 level gray level:

Data	Duty Cycle
MSB……..LSB	
0000 0000	0/256
0000 0001	1/256
0000 0010	2/256
- - - - -	- - - - -
1111 1101	253/256
1111 1110	254/256
1111 1111	255/256

(3) PWM input / output signal relationship:



(4) 5-Bit (level 32) brightness adjustment (simultaneous control of OUTG\OUTR\OUTB three port current):

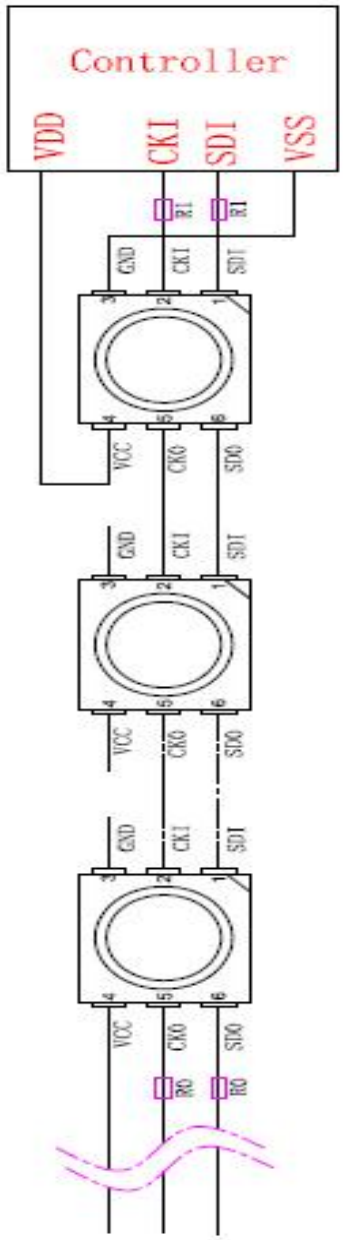
Data	Driving Current
MSB……..LSB	
00000	0/31
00001	1/31
00010	2/31
- - - - -	- - - - -
11101	29/31
11110	30/31
11111	31/31

(5) Refresh Rate：

Frame rate (=1/ (64+ (32* points)) *CKI (cycle) unit: frames per second)

Such as: 1024 points, CKI frequency is 1MHZ, is =30 frames per second frame rate.

12. The typical application circuit:



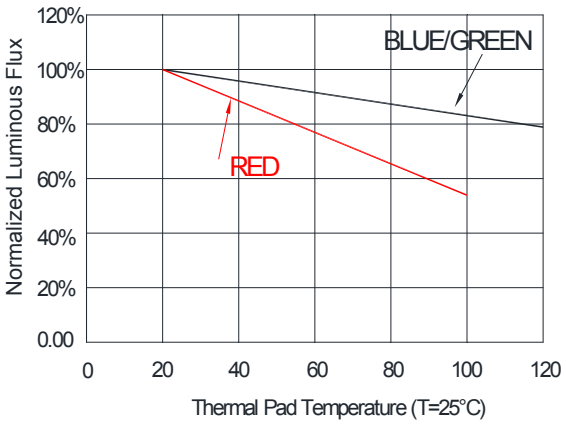
In the practical application circuit, the signal input and output pins of the IC signal input and output pins should be connected to the signal input and output terminals. In addition, in order to make the IC chip is more stable, even the capacitance between beads is essential back;

Application: used for soft lamp strip or hard light, lamp beads transmission distance is short, suggested in signal in time the clock line input and output end of each connected in series protection resistors, R1=R0 of about 500 ohms.

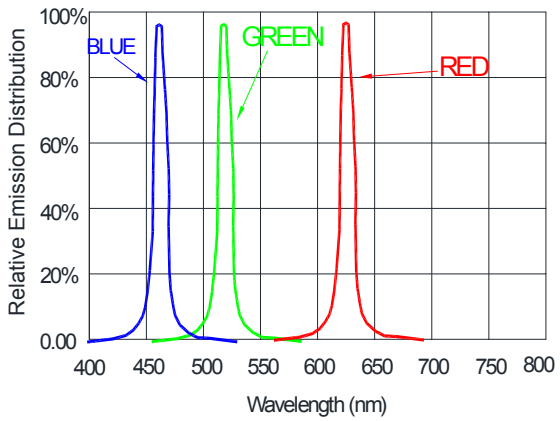
Application: for module or general special-shaped products, lamp beads transmission distance is long, because of different wire and transmission distance, in the signal in time clock at both ends of the line on grounding protection resistance will be slightly different; to the actual use of fixed;

13. Standard LED Performance Graph:

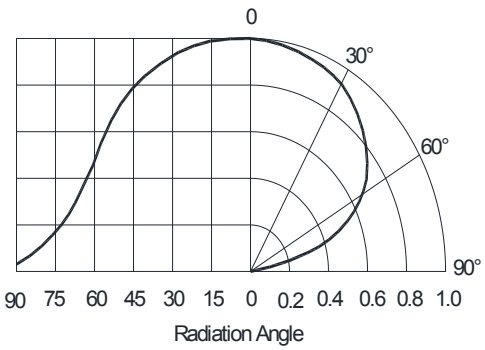
Thermal Pad Temperature vs. Relative Light Output



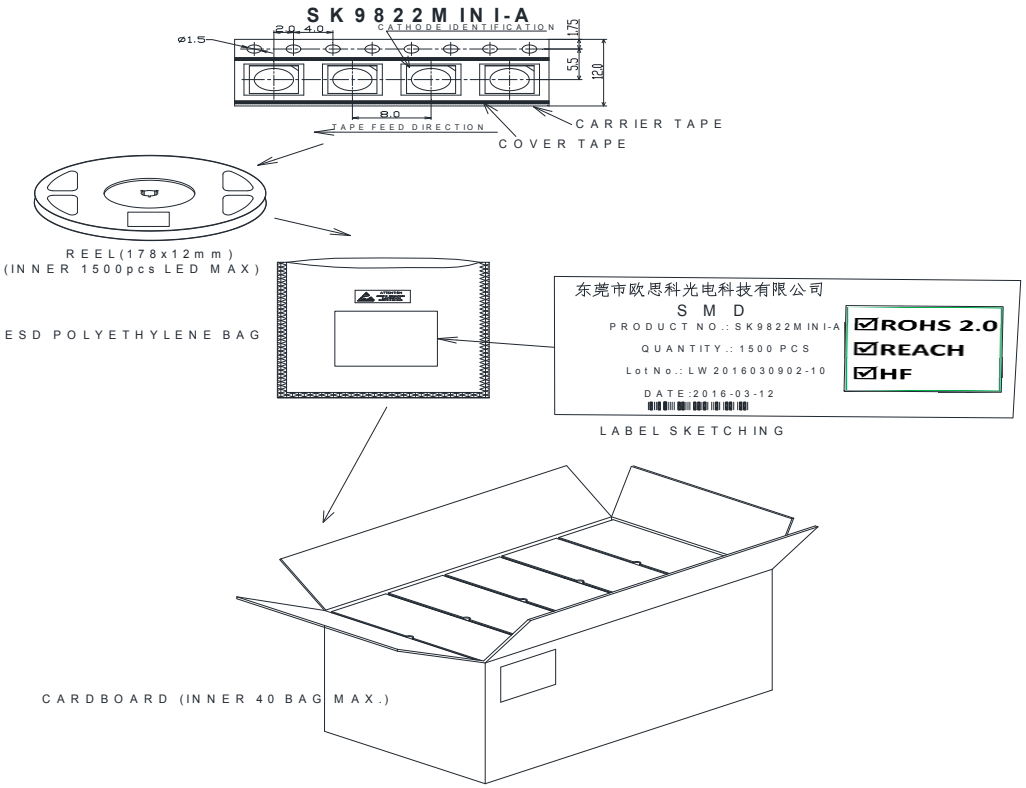
Wavelength Characteristics



Typical Radiation Pattern 120°



14. Packaging Standard:



The reel pack is applied in SMD LED. The LEDs are packed in cardboard boxes after packaging in normal or anti-electrostatic bags. cardboard boxes will be used to protect the LEDs from mechanical shocks during transportation. The boxes are not water resistant and therefore must be kept away from water and moisture.

15. Reliability Test :

NO.	Test item	Test Conditions	Reference	Criterion
1	Thermal Shock	100 ± 5° C ~ -40° C ± 5° C 15min~15min 100 cycles	MIL-STD-202G	0/22
2	High Temperature Storage	Ta= +100°C 1000hrs	JEITA ED-4701 200 201	0/22
3	Low Temperature Storage	Ta= -40°C 1000hrs	JEITA ED-4701 200 202	0/22
4	High Temperature High Humidity Storage	Ta=60°C RH=90% 1000hrs	JEITA ED-4701 100 103	0/22
5	Temperature Cycle	-40°C~25°C~100°C~25°C 30min~5min~30min~5min 100 cycles	JEITA ED-4701 100 105	0/22
6	Resistance to Soldering Heat	Tsld = 260° C, 10sec. 2 times	JEITA ED-4701 300 301	0/22
7	Room temp Life Test	25° C, IF: Typical current , 1000hrs	JESD22-A 108D	0/22

Criteria for Judging the Damage:

Item	Symbol	Test Condition	Limit	
			Min	Max
Luminous Intensity	IV	DC=5V, Typical current	Init. Value*0.7	---
Resistance to Soldering Heat	---	DC=5V, Typical current	No dead lights or obvious damage	