



Shenzhen Pink Purple Industrial

Intelligent external control integrated 5050

Three-channel LED breakpoint resume drive

1. Product overview

2813 is a three-channel LED breakpoint resume driver IC, which integrates MCU digital interface, data latch, LED driver and other circuits. The independent grayscale and cascade control of the chip are realized through the peripheral MCU control to realize the color dot matrix light-emitting control of the outdoor large screen. The product has excellent performance and reliable quality.

2. Main features

Breakpoint resume function, damage to a single IC or lamp bead does not affect subsequent data, the default output constant current value is 12mA, which is convenient to reduce the power consumption of the built-in lamp bead

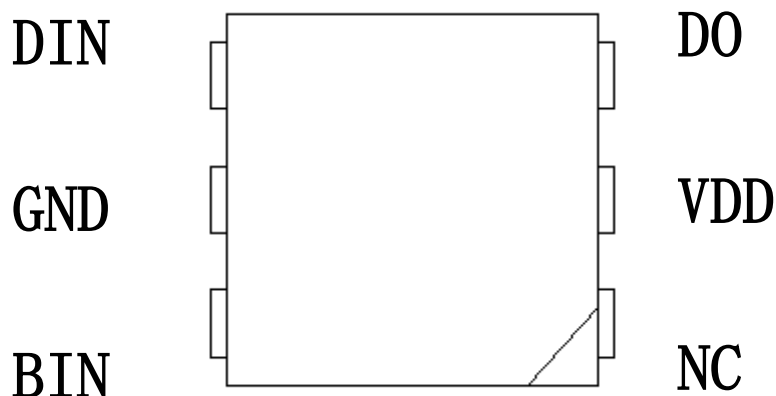
Grayscale adjustment circuit (256-level grayscale adjustable)

Dual Input Serial Cascade Interface (DIN. BIN.)

Built-in high precision and high stability oscillator

Data shaping: After receiving the data of this unit, the subsequent data will be automatically shaped and the output data will be sent at a rate of 800Kbps

3. Terminal arrangement





四. 引出端功能

序号	符号	6 脚管脚名	8 脚管脚名	功能描述
1	OUTR	LED驱动输出	Red红	PWM控制输
2	OUTG	LED驱动输	Green绿	PWM控制输出
3	OUTB	LED驱动输	Blue蓝	PWM控制输出
4	GND	地		接地
5	DOUT	数据输出		显示数据级联输出
6	DIN	数据输入		显示数据输入
7	NC			
8	VDD	芯片电源		电流正极

五. 最大额定值 (如无特殊说明, $T_A = 25\text{ }^\circ\text{C}$, $V_{SS} = 0\text{V}$)

参数	符号	范围	单位
逻辑电源电压	V_{in}	3.0~7.5	V
R/G/B 输出端口耐压	V_{ds}	9	V
逻辑输入电压	V_{i1}	-0.5~5.5	V
R/G/B 输出电流	I_{ol1}	12	mA
工作温度	T_{opt}	-40~+85	$^\circ\text{C}$
储存温度	T_{stg}	-50~+150	$^\circ\text{C}$
ESD 耐压	V_{ESD}	4K	V

6. Electrical parameters (TA = 25°C)

参数	符号	最小	典型	最大	单位
芯片输入电压	V_{in}	-	5	7.5	V
R/G/B 输出端口耐压	V_{ds}	-	-	9	V
R/G/B 输出驱动电流	I_o	-	12	-	mA
高电平输入电压	V_{IH}	$0.7 V_{DD}$	-	-	V
低电平输入电压	V_{IL}	-	-	$0.3 V_{DD}$	V
PWM 频率	f_{PWM}	-	1.2	-	KHZ
静态功耗	I_{dd}	-	2.0	-	mA

7. Switching characteristics (TA = 25°C)

参数	符号	最小	典型	最大	单位	测试条件
数据传输速率	F_{DIN}	-	800	-	kHz	-
传输延迟时间	t_{PLZ}	-	-	500	ns	-

8. Function description

The chip adopts the single-wire communication method and uses the return-to-zero code to send signals. After the chip is powered on and reset, it accepts the data from the DIN terminal. After receiving enough 24 bits, the DOUT port starts to forward data for the next chip to provide input data. Before forwarding, the DOUT port has been pulled low. At this time, the chip will not accept new data. The three PWM output ports of the chip OUTR, OUTG and OUTB will send corresponding signals with different duty ratios according to the received 24-bit data, and the signal period is 4ms. If the input signal of DIN terminal is RESET signal, the chip will connect

The received data is sent to display, the chip will re-accept new data after the signal ends. After receiving the first 24 bit data, it will forward the data through the DOUT port. Before the chip receives the RESET code, OTR, OUTG, OUTB The original output of the pin remains unchanged. After receiving the low-level RESET code above 24 μ s, the chip outputs the 24-bit PWM data pulse width just received to the OTR, OUTG, and OUTB pins. In addition to DIN, the chip additionally designed a BIN input to receive the DIN data of the previous chip, that is, the DOUT data of the previous chip. When cascading, if a chip is damaged, data transmission will not be affected, and subsequent chips can still receive data normally.

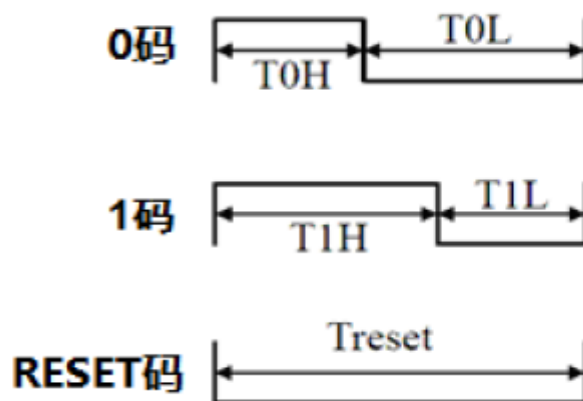
The chip adopts automatic shaping and forwarding technology, so that the number of cascades of the chip is not limited by signal transmission.

Only limited refresh speed requirements.

For example, we design a 1024 cascade, and its screen refresh time is $1024 \times 0.4 \times 2 = 0.8192\text{ms}$ (the data delay time of the chip is $0.4 \mu\text{s}$), and there will be no flickering phenomenon.

9. Timing waveform diagram

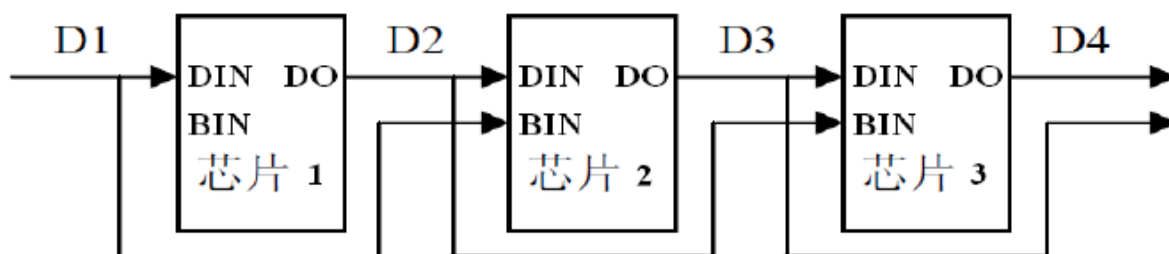
1) . 输入码型



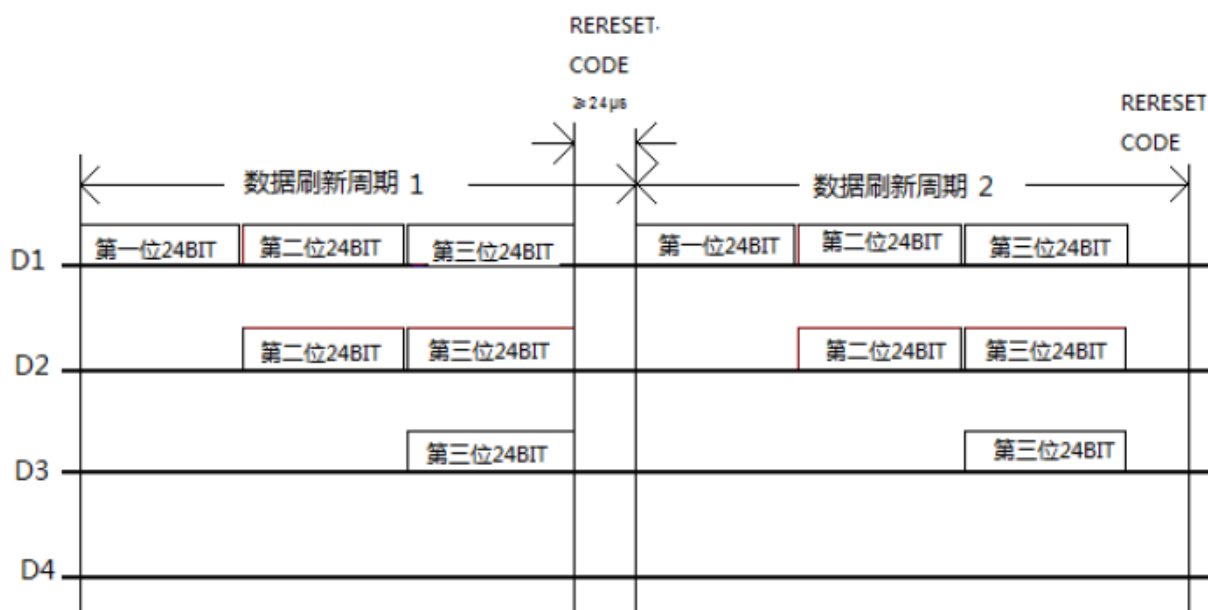
2) . 低速模式时间

名称	描述	典型值	容许误差
T0H	0 码, 高电平时间	0.3 μ s	$\pm 0.05\mu$ s
T1H	1 码, 高电平时间	0.9 μ s	$\pm 0.05\mu$ s
T0L	0 码, 低电平时间	0.9 μ s	$\pm 0.05\mu$ s
T1L	1 码, 低电平时间	0.3 μ s	$\pm 0.05\mu$ s
Trst	Reset 码, 低电平时间	80	

3) . 连接方法



4) . 数据传输方法



注：其中 D1 为 MCU 端发送的数据，D2、D3、D4 为级联电路自动整形转发的数据。

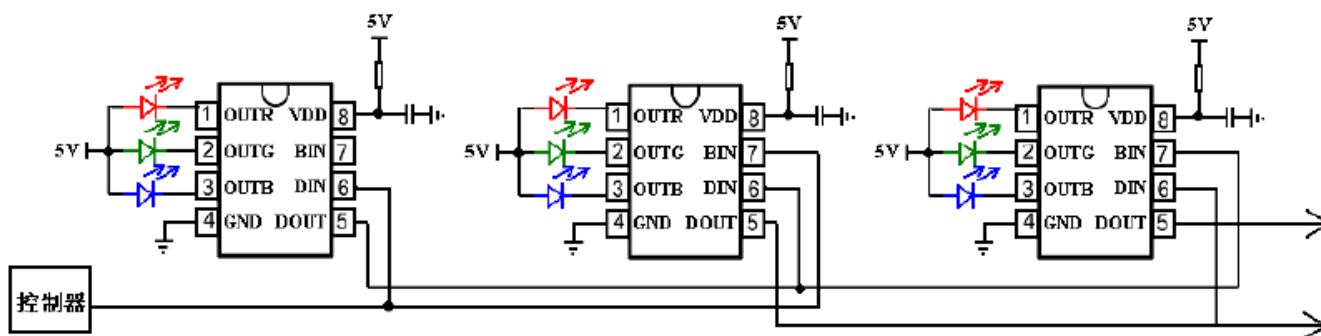


5) . 24bit 的数据结构

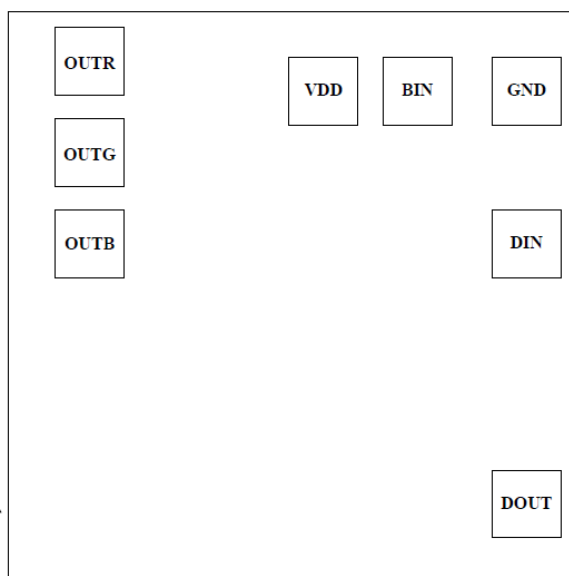
R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
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注：高位先发，按照 RGB 的顺序发送数据

10. Application circuit diagram



11. Chip internal pin map



222Chip size (excluding dicing lanes): 577×593

Dicing lane: 60×60

十二. 封装外形图和尺寸

