



WS2801 3-channel constant current LED Driver with programmable

Features

- Supports both constant voltage and constant current drive mode
- Programmable constant LED drive current
- Wide constant output current range 5~150mA
- Build in PWM dimming scheme for each output channel, supports free-run, especially suitable for low cost controller application
- PWM free-run capability(refresh rate(2.5KHz))
- Build in buffers to cascading data and clock to the next driver
- Output polarity reverse function
- Support hot swap
- Maximum input clock frequency 25MHz

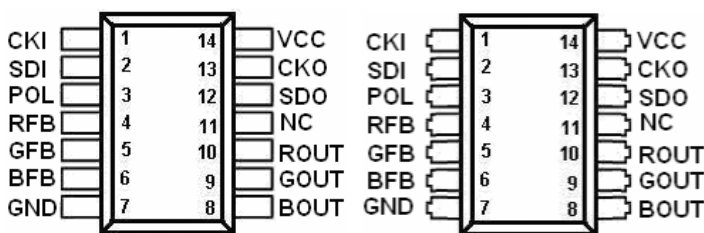
Applications

- LED decorative lighting
- Indoor/Outdoor LED video or message display
- PWM signal generator
 - LCD TV back lighting

General Description

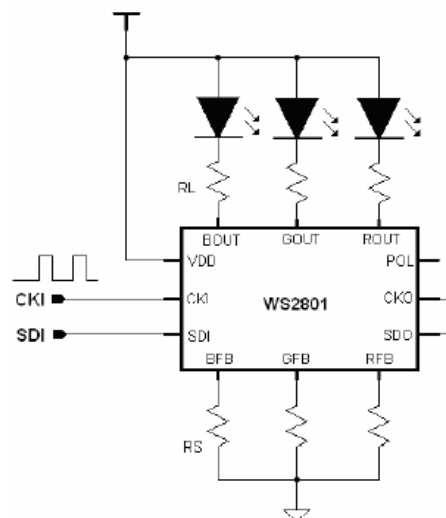
The WS2801 is a constant current LED driver. It is designed for indoor/ outdoor LED displays and decorative LED lighting system. It is suitable for LED cascading applications. The WS2801 owns 3 output channels, each channel can drive a constant current up to 30mA. WS2801 contains serial shift registers, data latches, output registers, band gap reference voltage generator, internal oscillator, and programmable constant output current drivers. The serial data is read into the shift registers at the rise edge of the external clock. The data and clock output buffers are designed for cascading another chip. The output polarity reverse function is designed for driving high power LED by adapting the application circuitry. The WS2801 adopts the reliable 2-wire scheme, which features low EMI transport, very strong anti-interference ability, and support hot-swap. The 2-wire control scheme can reduce the system cost; it is very suitable for low cost LED decorative LED lighting systems.

WS2801 is available in both SOP-14 and DIP-14 packages, the operating temperature is -40~85°C



SOP - 14 package

DIP - 14 package



Typical Application Circuit

Absolute Maximum Ratings

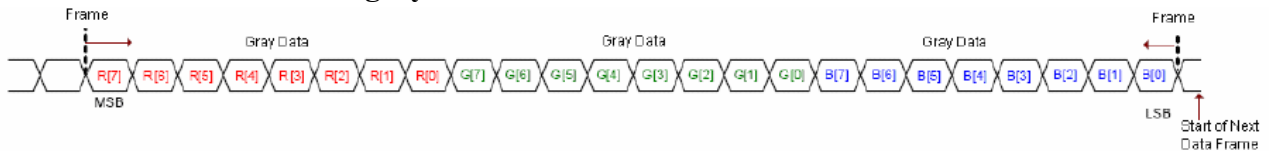
Parameter	Symbol	Ratings	Unit
Power Supply Voltage	VCC	-0.3 to 6V	V
Input Voltage	VIN	-0.3 to VCC+0.3V	V
Output Voltage	VOUT	-0.4 to 7V	V
Output Pin Voltage	VXOUT	-0.3 to 7V	V
Output Current	IOUTCC	0 to 50	mA
Constant Current Drive Mode	IOUTCV	0 to 100	
Constant Voltage Drive Mode			
Output Current Deviation (Constant Current Driving Mode)	DIOI	±1	%
Between output channels	DIOE	±3	
Between chips			
Input Clock Frequency	FCLK	25	MHz
Maximum Power Dissipation	PD	600	mW
Operating Junction Temperature	Topr	-40 to + 150	°C
Storage Temperature Range	Tstg	-55 to + 150	
Lead Temperature (Soldering, 10 seconds)	Tsolder	300	
ESD susceptibility		4000	V

Note: If the voltage on the pins exceeds the maximum ratings may cause permanent damage to the device.

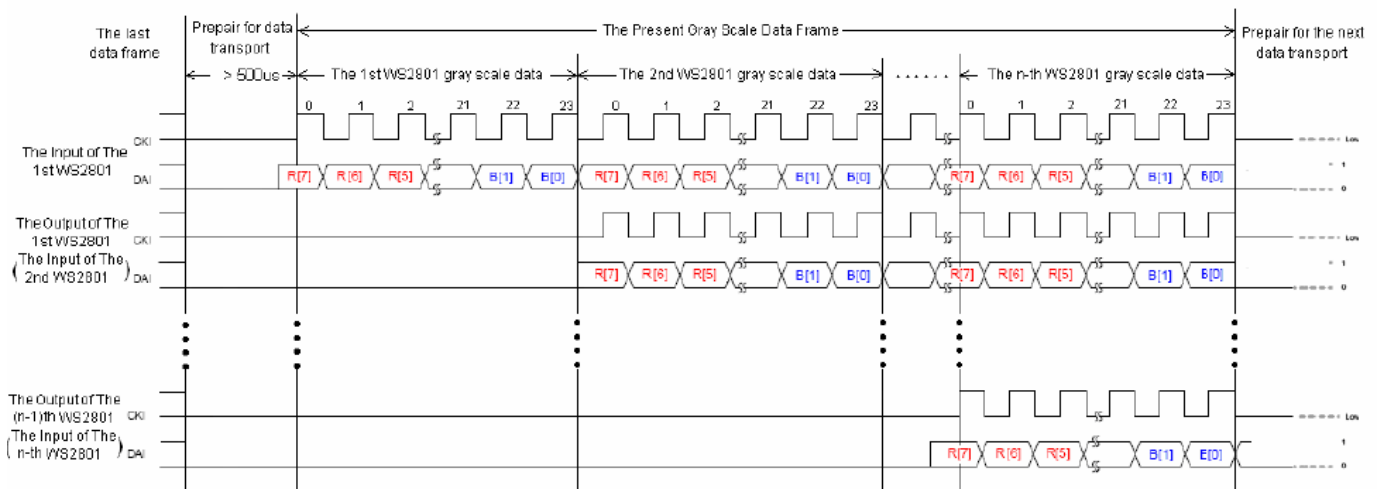
Constant Voltage Driving Mode

WS2801 is a versatile LED driver, it does not only provide user constant current driving mode, but also constant voltage driving mode, which is compatible with ZQL9712. The constant voltage driving mode (POL='HIGH' or floating) can drive the LEDs with current up to 50mA. Connecting R/G/B/FB directly to ground, then WS2801 can operate at constant voltage driving mode. See Fig

The gray Scale Data Formate Of WS2801



The Timing of WS2801 Strings



1. When the data transport is completed, the gray scale data will be latched
2. When is gray scale data is latched, the gray scale data will be taken effect at the start of the next PWM cycle