

8-String White LED Driver for LCD Panel Application

DESCRIPTION

The EUP2592 is an 8-channel WLED driver that controls WLED current for LCD backlight application. The EUP2592 is capable of driving up to eight strings in parallel and 12 LEDs per string. Each string is terminated with ballast that achieves $\pm 1.5\%$ current regulation accuracy between strings, ensuring even LED brightness. The EUP2592 have wide input voltage range from 4.5V to 28V, and provide adjustable 5mA to 35mA LED current. EUP2592 uses an external PWM signal to control WLED dimming. EUP2592 has built in many fault protections.

The EUP2592 step-up controller features an internal 150m Ω (typ.), 48V (max.) power MOSFET with local current-sense amplifier for accurate cycle-by-cycle current limit. This architecture greatly simplifies the external circuitry and saves PCB space. The EUP2592 minimizes the headroom voltage of output and power loss by detecting the highest LED forward voltage dynamically. Low-feedback voltage at each LED string 360mV (typ.) at 20mA LED current helps reduce power loss and improve efficiency.

The EUP2592 internally generates a PWM signal for accurate WLED dimming control. The PWM frequency is resistor programmable, while PWM duty cycle is controlled directly from an external PWM signal or through an adjustable resistor at PWMO pin. This internal PWM dimming control provides a dimming range with 8-bit resolution to maximize battery life. The EUP2592 WLED brightness can also be directly modulated with an external PWM signal from 100Hz to 10kHz.

The EUP2592 have extensive protection that include string open and short detection, over voltage protection, over-temperature protection and an optional input over-current protection with an external fault disconnect switch.

FEATURES

- Up to 8 strings in parallel and 12 LEDs per string Maximum number of LEDs that can be driven is 96 (8x12) WLEDs
- Accurate PWM Dimming Control with 8-bit Resolutions
- External Direct PWM Dimming Control Mode
- Wide Input Voltage Range 4.5V to 28V
- Internal 0.15 Ω 48V Power MOSFET
- $\pm 1.5\%$ LED Current Regulation Accuracy Between Strings
- Dynamic Headroom Control for LED Outputs
- Low String Feedback Voltage: 360mV at 20mA LED Current
- User Selectable Switching Frequency 500kHz and 1200kHz
- Multiple Fault Protections
 - LED Open Circuit Detection
 - LED Short Circuit Detection
 - Over-Temperature Protection
 - Output Over-Voltage Protection
 - Input over current protection
- Small 24-Pin, 4mm x 4mm, Thin TQFN Package
- RoHS Compliant and 100% Lead (Pb)-Free

APPLICATIONS

- Notebook Displays LED Backlighting
- LCD Monitor LED Backlighting