

LED770x LED drivers

New monolithic step-up family driving LEDs
for backlighting and lighting



The LED770x family features two monolithic, high-efficiency LED drivers specifically designed to supply LED arrays used in the backlighting of LCD panels and general lighting. The drivers consist of a boost converter and six integrated PWM-dimmable current generators that give excellent dimming performance, and are housed in small VFQFPN4x4-24L packages.

Additional flexibility is guaranteed by a wide range of adjustable protection systems and thresholds, together with complete and flexible fault management, a wide input voltage range (from 4.5 V up to 36 V) and high switching frequency, to reduce size and cost of the total application.

Key features

Boost section

- 4.5 V to 36 V input voltage range
- Internal power MOSFET
- Internal +5 V LDO for device supply
- Up to 36 V output voltage
- Constant-frequency peak current-mode control
- 200 kHz to 1 MHz adjustable switching frequency
- External sync for multi-device applications
- Pulse-skip power-saving mode at light load
- Programmable soft-start
- Programmable OVP protection
- Single ceramic output capacitor
- Thermal shutdown

Backlight driver section

- Six rows with adjustable 30 mA maximum current capability (85 mA for the LED7707)
- Up to 10 WLEDs per row
- Parallelable rows for higher current
- Row disable option
- Less than 500 ns minimum dimming time (1% minimum dimming duty-cycle at 20 kHz dimming frequency) for LED7706

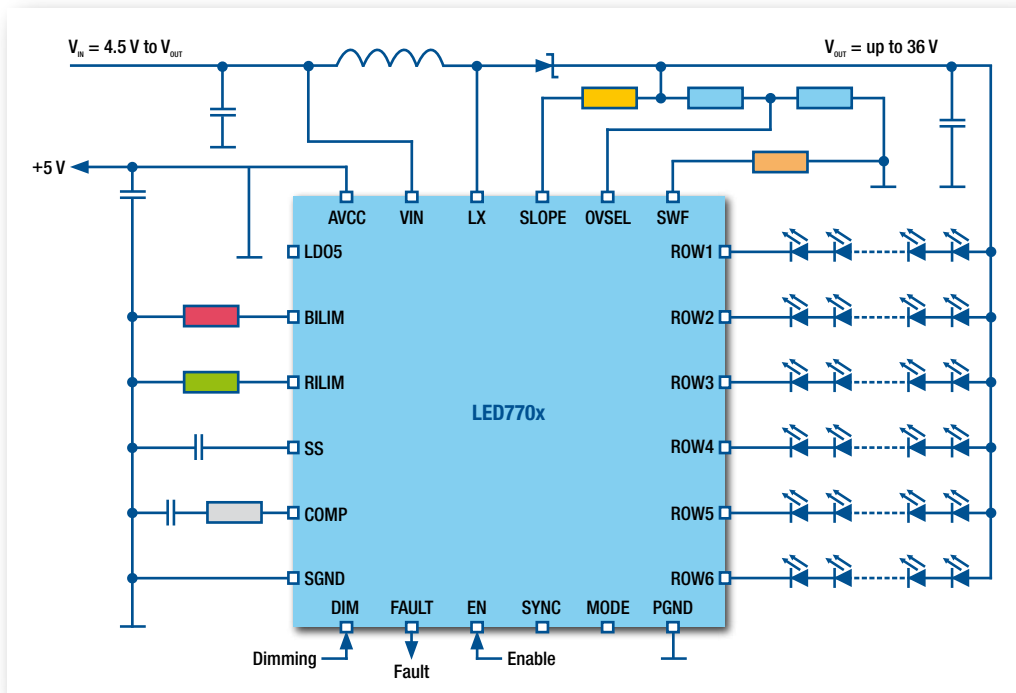
- Less than 10 μ s minimum dimming time (1% minimum dimming duty-cycle at 1 kHz dimming frequency) for LED7707
- +/- 2% current matching between rows
- LED failure (open and short circuit) detection

Key benefits

- Monolithic and flexible solution
- High efficiency
- Superior dimming capability
- Complete and flexible fault management

Targeted applications

- LCD monitors and TV panels
- PDA panel backlighting
- GPS panel backlighting
- General LED lighting



LED770x simplified application circuit

Device description

The LED770x is a monolithic LED driver family for the backlighting of LCD panels. The two devices consist of a boost converter and six integrated PWM-dimmable current generators. The boost section is based on a constant switching-frequency, peak current-mode architecture. The devices keep the lowest row's voltage regulated at the internal reference voltage, and adapt the boost output voltage to reduce power losses across the current generators. The boost-converter switching frequency is fixed at 630 kHz. This is a good compromise in terms of efficiency and size and cost of the power elements and of the overall application, but it can also be set anywhere in the 200 kHz to 1 MHz range by simply connecting a resistor to SGND, if more flexibility is required.

The LED770x devices, with their input voltage range from 4.5 V up to the output voltage, cover the most common voltage buses (5 V, 12 V and 24 V). In addition, an internal LDO supplies the internal circuitry of the device and is capable to deliver up to 40 mA. The generators can be externally programmed by using a single resistor to sink up to 30 mA or 85 mA (LED7707), and can be dimmed via a PWM signal. The devices detect and manage open and shorted LED faults, and leave unused rows floating, keeping extremely high flexibility for the final application. Basic protections (adjustable output overvoltage, adjustable internal MOSFET overcurrent and thermal shutdown) are also provided.

LED770x product table

Part number	V _{in} [V]	V _{out} [V]	I _{rows} [mA]	Rows	Min dimming time	Max LEDs per row	Fsw [kHz]	Package
LED7706	4.5 to 36	Up to 36	Up to 30	6	500 ns	10 (white)	200 to 1000	VFQFPN4x4-24L
LED7707	4.5 to 36	Up to 36	Up to 85	6	10 µs	10 (white)	200 to 1000	VFQFPN4x4-24L



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