

High Efficiency 3-CH LED Backlight Driver with Dual LCD Bias Power

Features

➤ Backlight LED Driver

- Wide input range: 2.9V~5.5V
- High efficiency step-up LED driver with 3-Ch current sinks, up to 32V boost voltage.
 - Up to 30mA/Ch in backlight mode
 - $\pm 0.7\%$ current matching at 20mA
 - $\pm 2.2\%$ current accuracy at 20mA
- I²C/PWM dual dimming control scheme
 - High resolution I²C 11-bit linear or exponential dimming
 - Wide range PWM dimming
 - 100Hz to 100kHz frequency
 - 0.2% to 100% duty cycle at 20kHz
- Programmable current sink turn on/off ramp time/shape and transition ramp up/down time
- Selectable boost switching frequency 1.0MHz or 500kHz with Auto-Frequency Mode supported
- Programmable input PWM hysteresis to minimize jitter at low PWM duty cycle
- Programmable OVP and current limitation
- LED open/short protection

➤ LCD Panel Bias

- Wide input range: 2.9V~5.5V
- Programmable dual Bias output regulator using a single inductor
- Programmable ramp time for OUTP and OUTN
- Charge pump PFM mode at light load
- LCD Bias efficiency up to 90%
- Wide dual output voltage range $\pm 4.0V$ to $\pm 6.3V$ (50mV/step) and output current up to 150mA
- I_{REG_OUT} up to 300mA at V_{REG_OUT} = 6.0 V, V_{IN} ≥ 3.0 V
- Active output discharge function
- Current limitation and short protection

➤ Others

- System level input UVLO
- Thermal shutdown protection
- Low shutdown current $< 1\mu A$
- Flexible I²C interface
- Pb-free Packages: WLCSP-24
- RoHS and Green compliant
- -40°C to +85°C Temperature Range

Brief Description

KTZ8863A is the ideal power solution for LED backlighting and LCD bias power of small and medium size panels. It integrates a step-up converter for LED backlighting, a step-up converter with LDO and inverting charge pump for LCD bias power, resulting in a simpler and smaller solution with fewer external components. High switching frequency allows the use of a smaller inductor and capacitor. Its input operating range is from 2.9V to 5.5V, accommodating 1-cell lithium ion batteries or 5V supply.

The LED driver's three regulated current sinks can regulate up to 30mA with its maximum boost output voltage up to 32V. 11-bit linear or exponential I_{LED} resolution can be obtained over I²C or PWM dimming. For additional flexibility, PWM dimming offers wide range frequency and duty cycle to support Content Adaptive Brightness Control (CABC).

The LCD bias power section includes a step-up converter, LDO and an inverting Charge Pump to generate dual outputs OUTP and OUTN, whose voltages can be programmed via an I²C interface. By integrating synchronous rectification MOSFETs for the step-up converter and charge pump, the KTZ8863A maximizes conversion efficiency up to 90%.

Various protection features are built into KTZ8863A, including inductor current limit protection, output short circuit protection, output over-voltage protection, LED fault (open or short) protection and thermal shutdown protection.

KTZ8863A is equipped with I²C interface for various controls and status monitor.

KTZ8863A is available in a RoHS and Green compliant 24-ball 1.72mm x 2.45mm WLCSP.

Applications

- Smartphone/Tablet Backlight

Part Number	Marking ¹	Operating Temperature	Package
KTZ8863AEJAA-TR	PSXXYYZZZZ	-40°C to +85°C	WLCSP-24

Typical Application

