

### 6P10S LED Driver with PWM-Control Mixed-Mode Dimming

#### Features

- Input voltage range: 2.7V to 5.5V
- Drive up to 60 LEDs (10S6P)
- High efficiency LED driver, up to 90%
- High frequency step-up converter (1000kHz)
- Integrated 40V power MOSFET
- Integrated 6-channel current sinks
  - Up to 30mA/ch
  - 0.5% Typ. current matching
  - 2% Typ. current accuracy at 20mA
- Wide input PWM dimming frequency range
  - 300Hz to 30KHz
- Programmable Mixed-Mode Dimming controls
  - Mixed analog dimming and PWM dimming
  - Selectable transition point : 25% or 12.5% input PWM duty cycle
  - Selectable output PWM dimming frequency : fixed 62.5kHz or following input PWM dimming frequency
  - Channel current phase shift in fixed 62.5kHz output PWM dimming mode
- Input PWM glitch filter
- LED open/short protection
- Adjustable over-voltage protection
- Cycle-by-cycle inductor current limit (2.5A)
- 0.1  $\mu$ A shutdown current
- TQFN33-16 and WLCSP-16 Package
- RoHS and Green Compliant
- -40°C to +85°C Temperature Range

#### Applications

- Tablet Backlight
- Netbook/Notebook Backlight
- Portable media players

#### Brief Description

KTD3156B is the ideal power solution for LED backlighting in medium to large size LCD panels. It is a highly integrated step-up DC-DC converter with input voltage from 2.7V to 5.5V, accommodating 1-cell lithium ion batteries or 5V supply. KTD3156B integrates a 40V power MOSFET as well as six current sinks, which results in a simpler and smaller solution with fewer external components. High switching frequency allows the use of a smaller inductor and capacitor to further reduce the solution size.

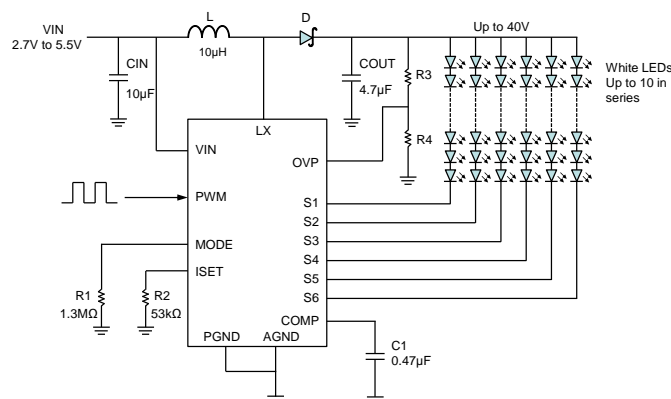
Each of the six current sinks regulates up to 30mA. With a 40V rated output, each string of the boost can connect up to 10 LEDs in series, for a total of 60 LEDs.

KTD3156B features mixed-mode dimming, which switches between PWM dimming at low dimming duty cycle and analog (DC current) dimming at high dimming duty cycle to increase the total power efficiency. The transition point of these two modes is programmable to 12.5% or 25% PWM duty cycle. The PWM dimming mode's output PWM dimming frequency can be programmed to fixed 62.5kHz or following input PWM dimming frequency. For fixed 62.5kHz output PWM dimming, phase shift function is implemented among these six channels to further lower the input current ripple and output voltage ripple.

Various protection features are built into KTD3156B, including cycle-by-cycle input current limit protection, output over-voltage protection, LED fault (open or short) protection and thermal shutdown protection. The leakage current in shutdown mode is 0.1 $\mu$ A.

KTD3156B is available in a RoHS and Green compliant 16-lead 3 x 3 x 0.75mm ThinQFN or 16-lead 1.65mm x 1.65mm WLCSP package.

#### Typical Application



## Ordering Information

Part Number	Marking	Operating Temperature	Package
KTD3156BEFJ-TR	HYYYZ	-40°C to +85°C	TQFN33-16
KTD3156BEUJ-TR	HYYYZ	-40°C to +85°C	WLCSP-16 1.65mm x 1.65mm

1. "YYZ" is the date code and assembly code.

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