

## ZXLD381EV1 USER GUIDE

### Description

The ZXLD381 is a single or multi cell LED driver designed for applications requiring step-up voltage conversion from a very low input voltage and on/off enable control. The IC generates constant current pulses that are ideal for driving single or multiple LEDs over a wide range of operating voltages.

The ZXLD381 uses a PFM control technique to drive an internal switching transistor which exhibits a low saturation resistance. This ensures high efficiency, even for input voltages as low as 1.0V.

The IC can start up under full load and operates down to an input voltage of below 0.9V.

The ZXLD381 is offered in the space saving SOT23-3 package or in die form, offering an excellent cost versus performance solution for single cell LED driving applications.

### Features

- 85% Efficiency
- User adjustable output current
- Single cell operation (0.9V minimum)
- Low saturation voltage switching transistor
- SOT23-3 package
- Available also in Die form
- Simple Application circuit

### Applications

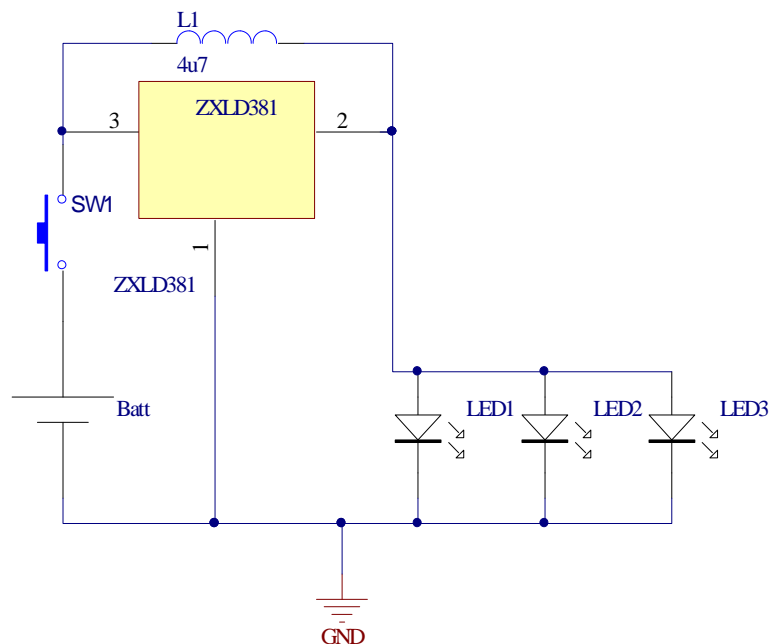
- LED flashlights and torches
- LED backlights
- White LED driver

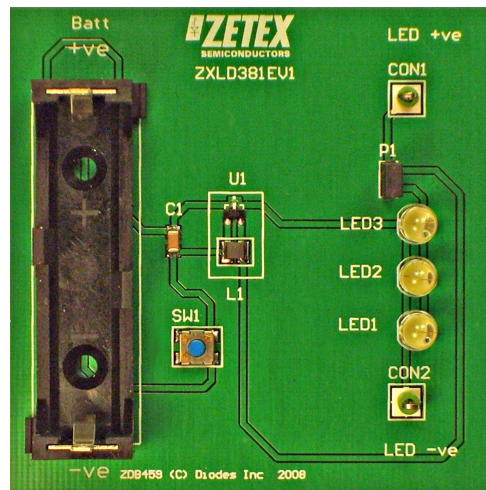
### Ordering information

<b>ORDER NUMBER</b>
ZXLD381EV1

Please note evaluation boards are subject to availability and qualified leads.

### Typical application circuit





### Reference design

ZXLD381EV1 evaluation board is designed to drive up to 3 white LEDs in parallel. The target application is single cell flashlights and torches.

This board is designed to accept a single AAA cell as the voltage source. Please note that the board does not have reverse polarity protection, so the battery must be fitted correctly.

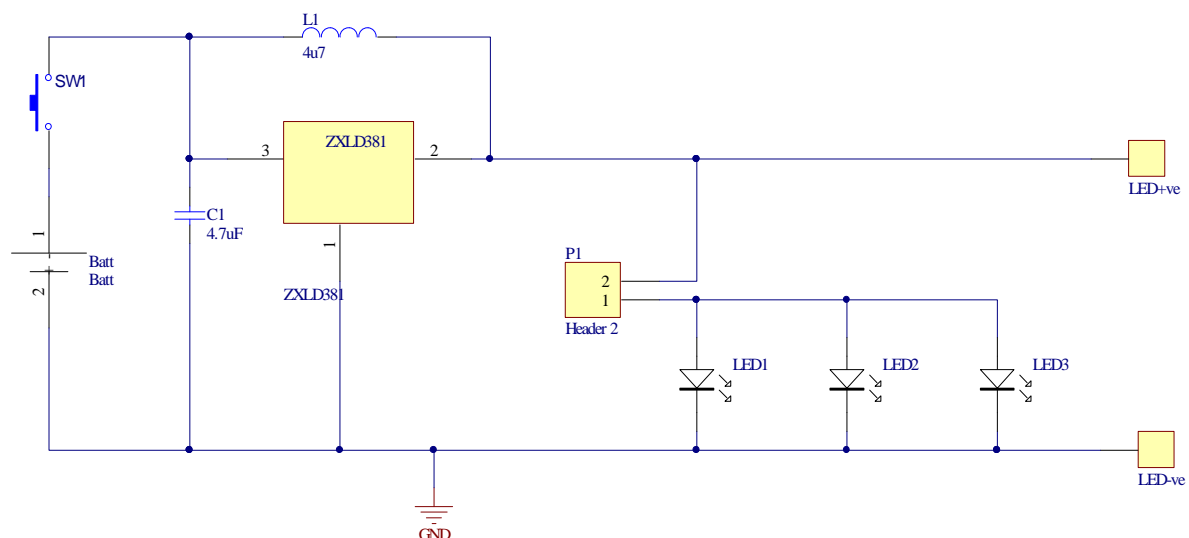
The circuit is switched on using the momentary push button and goes off when the button is released.

The design demonstrates the simplicity possible with this device: the capacitor C1 may be omitted if the battery is close to the device but is needed otherwise.

The evaluation board is fitted with three T1¼ white LEDs, and to use these, the jumper P1 must be fitted. External LEDs may be connected via CON1 and CON2, marked LED +ve and LED -ve respectively. In this case the jumper must be removed.

For other reference designs or further applications information please refer to the ZXLD381 datasheet.

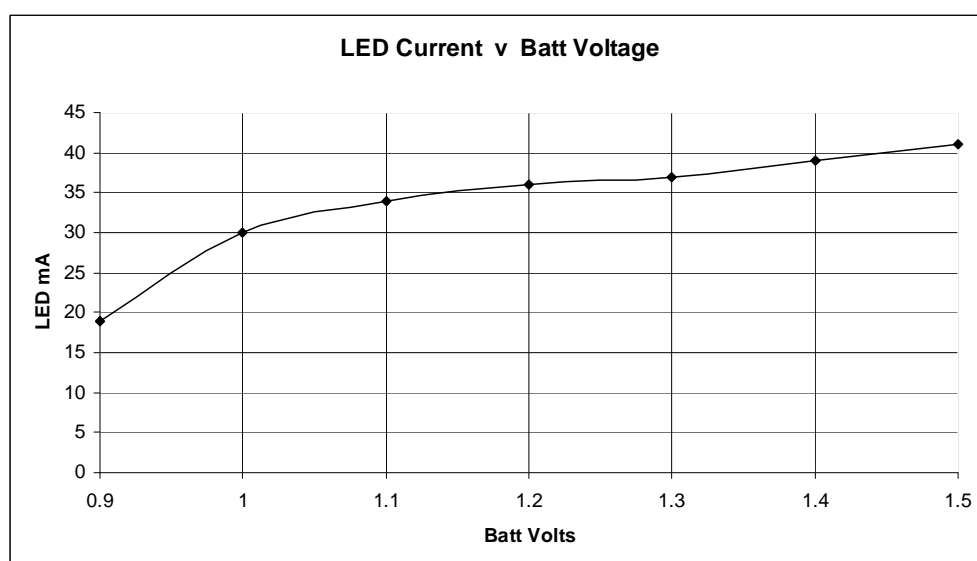
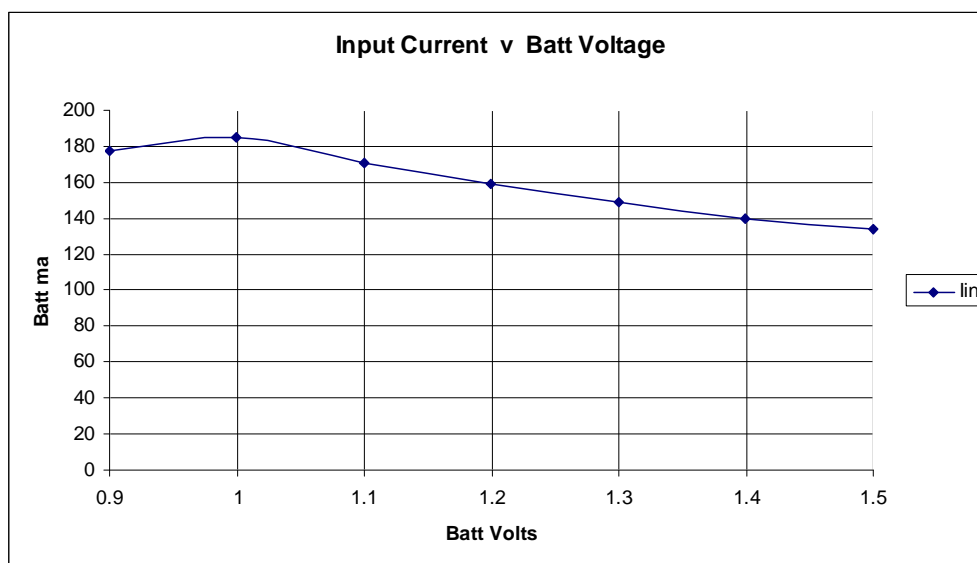
### Schematic diagram

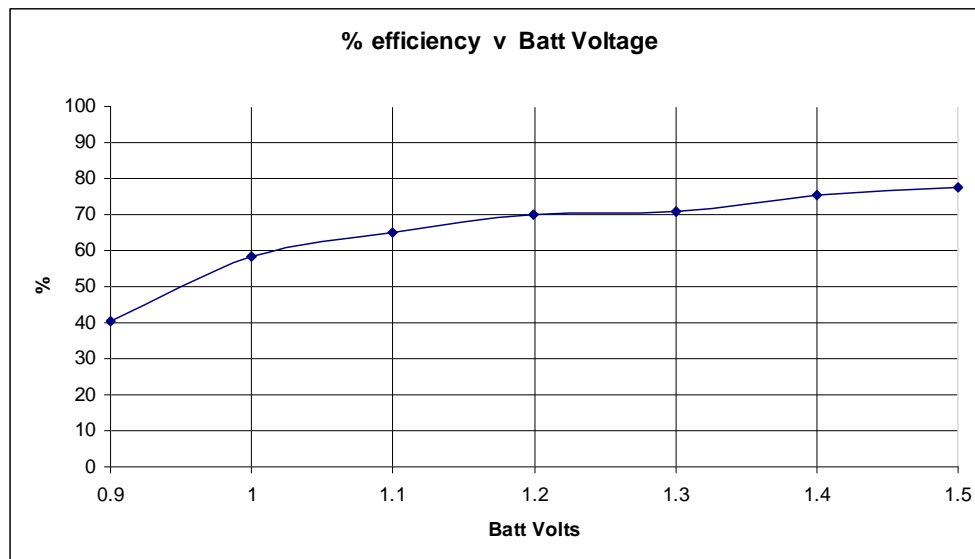


Components list

Ref	Value	Package	Part Number	Manufacturer	Contact Details
U1	LED Driver	SOT23-3	ZXLD381FHTA	Zetex	<a href="http://www.zetex.com">www.zetex.com</a>
L1	4.7uH	ME3220	ME3220-472MLB	Coilcraft	<a href="http://www.coilcraft.com">www.coilcraft.com</a>
C1	4.7uF 25V X7R		C1206C475K3RAC	Kemet	<a href="http://www.kemet.com">www.kemet.com</a>
LED1,2,3	5mm White LED		10000mcd@30mA	(generic)	

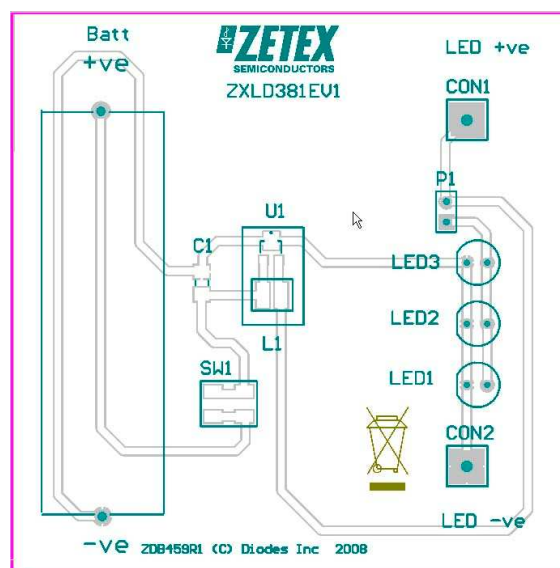
Performance graphs





## ZXLD381EV1 operation

### Component layout diagram



### ZXLD381EV1 set-up and test

1. Preset the PSU to 1.5V with a current limit of around 200mA.
2. Close the link P1.
3. Connect Batt +ve and Batt -ve to the positive and zero volts respectively, of a battery or power supply. Ensure that the connections are made correctly, as the board is not reverse polarity protected.
4. Turn on the PSU.
5. The LEDs should illuminate.
6. The input current should measure between 120mA - 160mA.
7. Turn off the PSU

### Layout considerations

PCB tracks should be kept as short as possible to minimize ground bounce. It is particularly important to mount the coil and the input/output capacitors close to the device to minimize parasitic resistance and inductance, which will degrade efficiency.

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