

ZXSC400EV3 USER GUIDE

DESCRIPTION

The ZXSC400 is voltage mode boost converter in SOT23-6 package. Its low feedback voltage allows the current in a chain of LEDs to be set and accurately monitored with a single resistor with minimal losses.

The ZXSC400EV3 is configured as a boost converter to drive a 1W LED from two NiCd/NiMH batteries.

FEATURES

- Drives a 1W white LED at 350mA
- Typical efficiency of 80%

APPLICATIONS

- LED torches
- High Power LED driving

ORDERING INFORMATION

ORDER NUMBER
ZXSC400EV3

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

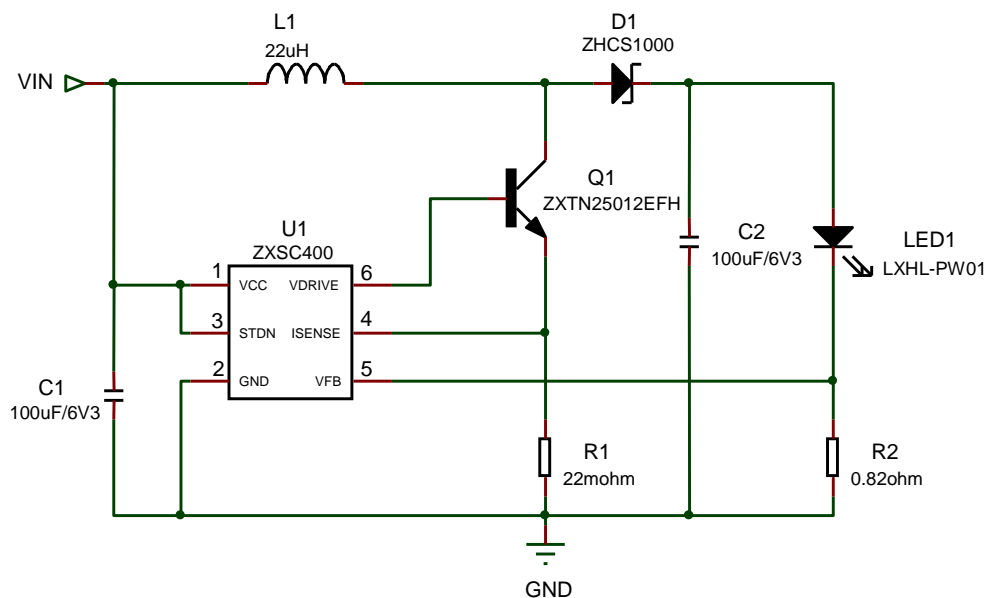
REFERENCE DESIGN

ZXSC400EV3 is configured to the reference design below. The target application is a 1W white LED Driving from two NiCd/NiMH battery input for torches and high powered LED driving.

The supply voltage for ZXSC400EV3 is: $V_{IN}=3V \sim 1.8V$.

For other reference designs or further applications information please refer to the ZXSC400 datasheet.

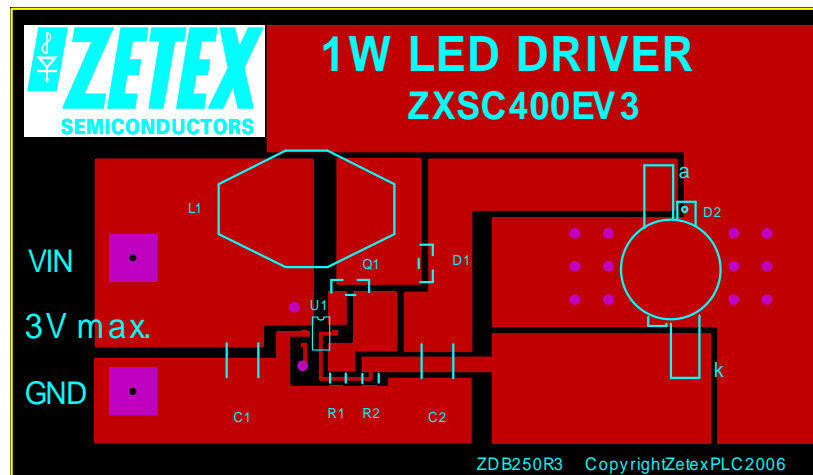
Schematic Diagram



Suggested components:

Ref	Value	Package	Part Number	Manufacturer	Notes
U1	N/A	SOT23-6	ZXSC400E6	Zetex	Boost converter
Q1	N/A	SOT23	ZXTN25012EFH	Zetex	Low sat NPN transistor
D1	40V/1A	SOT23	ZHCS1000	Zetex	40V/1A Schottky diode
L1	22uH/2.5A	N/A	DO3316P-223 NPI31W220MTRF	Coilcraft NIC Components	22uH/2.5A Inductor
R1	22mΩ	0805		Generic	0805 5% tolerance
R2	0.82Ω	0805		Generic	0805 5% tolerance
C1	100μF/6V3	1812	GRM43SR60J107ME20L NMC1812X5R107M6.3F	Murata NIC Components	100uF/6V3/X5R
C2	100μF/6V3	1812	GRM43SR60J107ME20L NMC1812X5R107M6.3F	Murata NIC Components	100uF/6V3/X5R
LED1	1W	N/A	LXHL-PW01	Lumileds	1W white LED emitter
PCB			ZDB250R2	Zetex	

Note: Components are continually being developed and improved. Please check each manufacturer's data for current products.



ZXSC400EV3 Set-up and Test

1. Connect V_{IN} and GND to positive and zero volts of PSU supply respectively.
2. Set the PSU to 3V.
3. Turn on PSU.
4. The LED should illuminate and be regulated at 350mA.
5. Input current should measure between 0.5A ~ 0.6A - THIS IS A FUNCTIONAL EVAL. BOARD.

Layout considerations

PCB tracks should be kept as short as possible to minimise ground bounce, and the ground pin of the device should be soldered directly to the ground plane. It is particularly important to mount the coil and the input/output capacitors close to the device to minimise parasitic resistance and inductance, which will degrade efficiency. The FB pin is a high impedance input, so PCB track lengths to this should also be kept as short as possible to reduce noise pickup. Excess capacitance from the FB pin to ground should be avoided.

Manufacturer's datasheets must be consulted regarding proper mounting and thermal management of the LED device. The evaluation board is intended as a demonstration of the functionality of the driver circuitry, and is not intended to represent a final solution for the OEM.

ZXSC400EV3

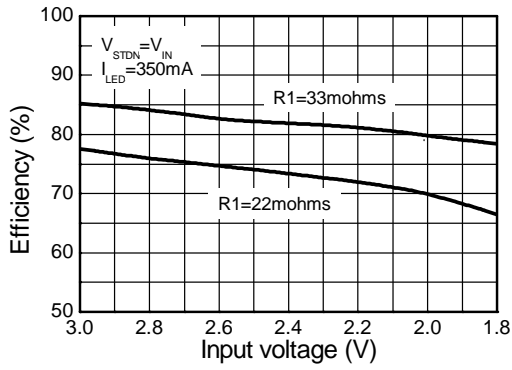
ISSUE 4 – January 2008

PERFORMANCE

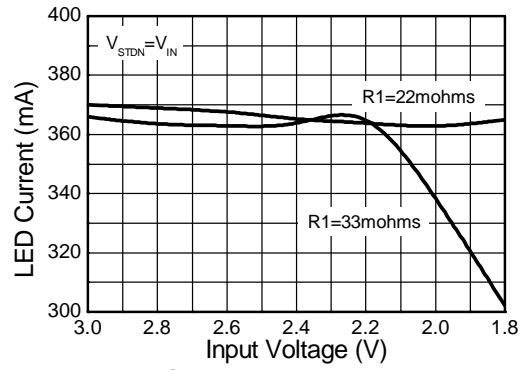
Increasing efficiency

On ZXSC400EV3, R1 is set to 22mΩ to ensure that the LED current is regulated over the full input voltage range of 3V ~ 1.8V. For improved efficiency R1 can be changed to a 33mΩ resistor but LED current will not be regulated below 2V. See performance graphs.

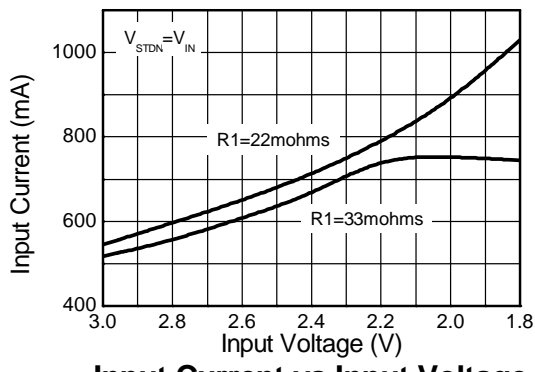
Graphs



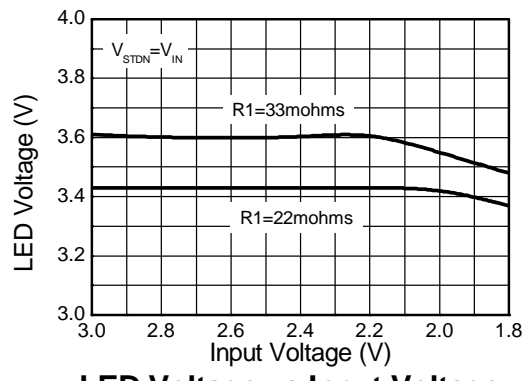
Efficiency vs Input Voltage



LED Current vs Input Voltage



Input Current vs Input Voltage



LED Voltage vs Input Voltage

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"Last time buy (LTB)"	Device will be discontinued and last time buy period and delivery is in effect
"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

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