

# DN69

## ZXSC310 Garden light reference design

### Description

This design note shows a typical ZXSC310 LED driver circuit for a solar power garden light. The input voltage ranges from 1.7V to 2.5V with a maximum output current of 160mA at 2.4V input.

A typical schematic diagram is shown in Figure 1.

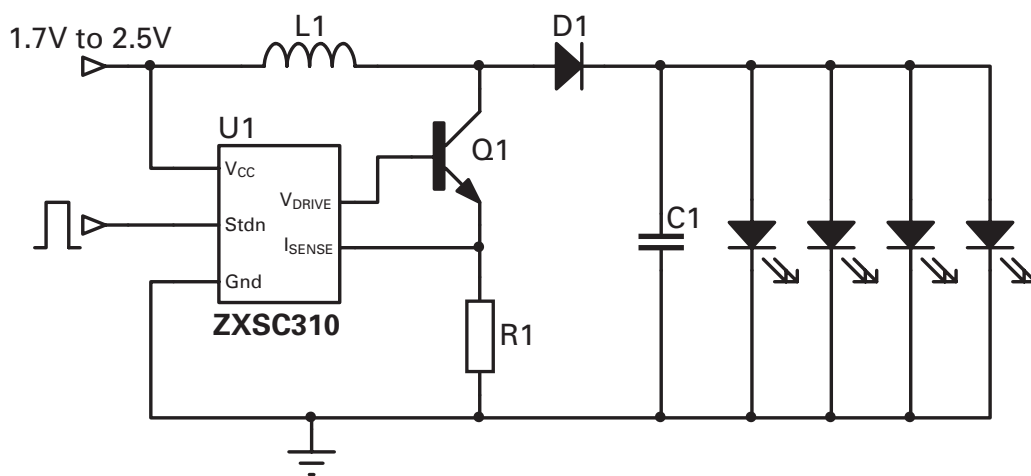


Figure 1 Schematic diagram

Ref	Value	Part number	Manufacturer	Contact details	Comments
U1		ZXSC310E5	Zetex	www.zetex.com	LED driver in SOT23-5
Q1		FMMT617	Zetex	www.zetex.com	Low sat NPN in SOT23
D1	500mA	ZHCS500	Zetex	www.zetex.com	0.5A Schottky in SOT23
L1	15 $\mu$ H	DO3316P-153	Coilcraft	www.coilcraft.com	$I_{SAT} = 3A$
R1	70m $\Omega$	Generic	Generic	NA	0805 size
C1	100 $\mu$ F	Generic	Generic	NA	

Table 1 Bill of materials

# DN69

## Total output current

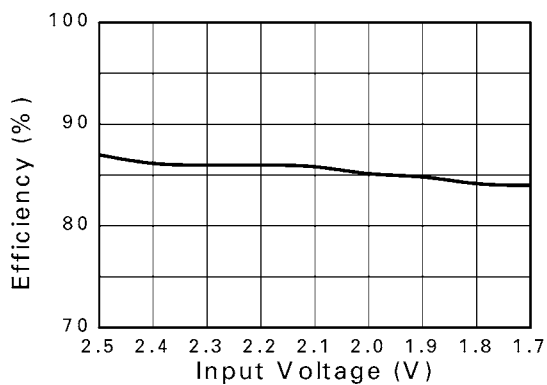
Table 2 shows the maximum available output current and the current per LED for a given number of LEDs. An LED forward voltage of 3.5V is assumed.

Total LED Current (mA)	4 LEDs	5 LEDs	6 LEDs
176	44	35	29
163	41	33	27
153	38	31	25
141	35	28	23
131	33	26	22
119	30	24	20
110	27	22	18
97	24	19	16
89	22	18	15
80	20	16	13
70	18	14	12
61	15	12	10

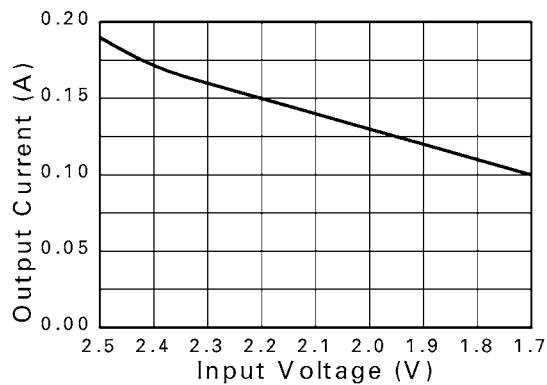
**Table 2 Total output current**

## Typical operating characteristics

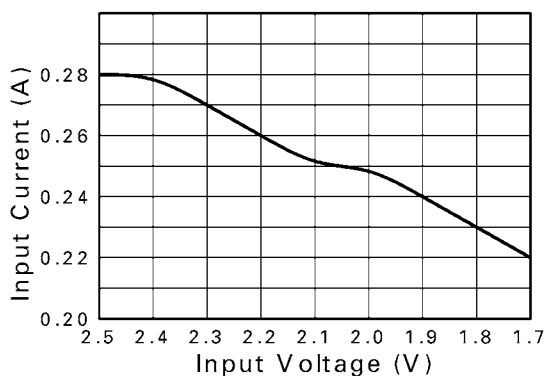
(For typical application circuit where  $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)



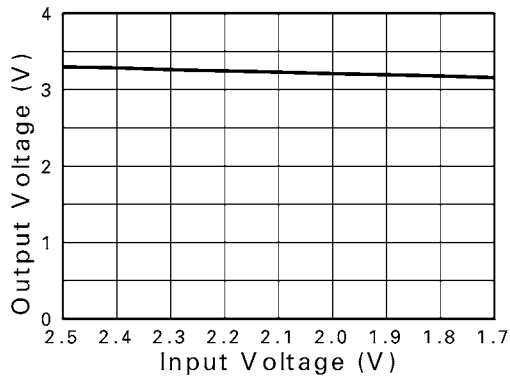
**Input Voltage vs Efficiency**



**Input Voltage vs Output Current**



**Input Voltage vs Input Current**



**Input Voltage vs Output Voltage**

**Figure 2 Performance graphs**

# DN69

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