

COMPUTER TOOLS

EXAM – 17. 6. 2010

1. Task

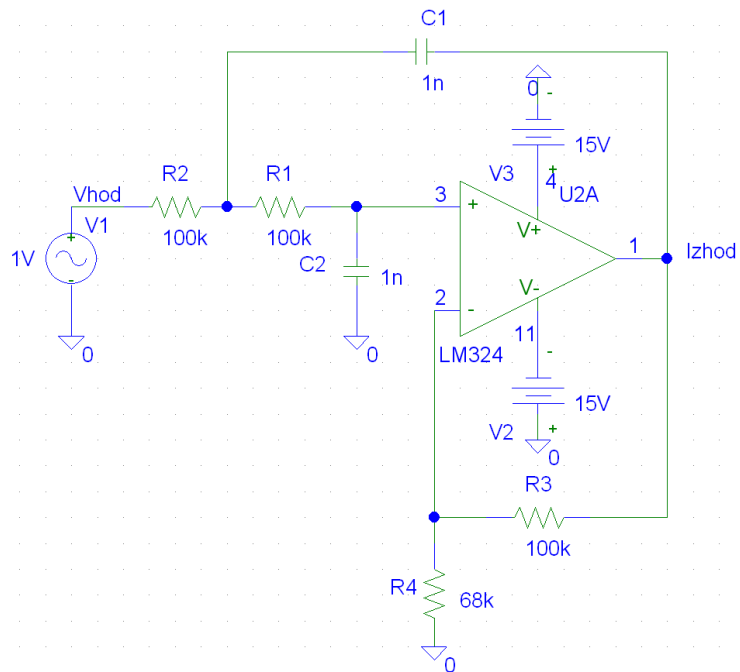
A signal values are stored in a file "signal.txt" in text format, where each row represents a current value of the signal. Sampling frequency was 10 Hz. Read signal and display it in a graph on the front panel. Calculate DC value, amplitude and the rms value of the signal.

Accessories:

- Graphically display each point of the signal point in a real time, subtract the dc value and add an indicator that will lit when the signal value is larger than the treshold level.
- Boolean operations in the previous paragraph pack into a subVI
- Add an option to terminate the loop with a button on the front panel.

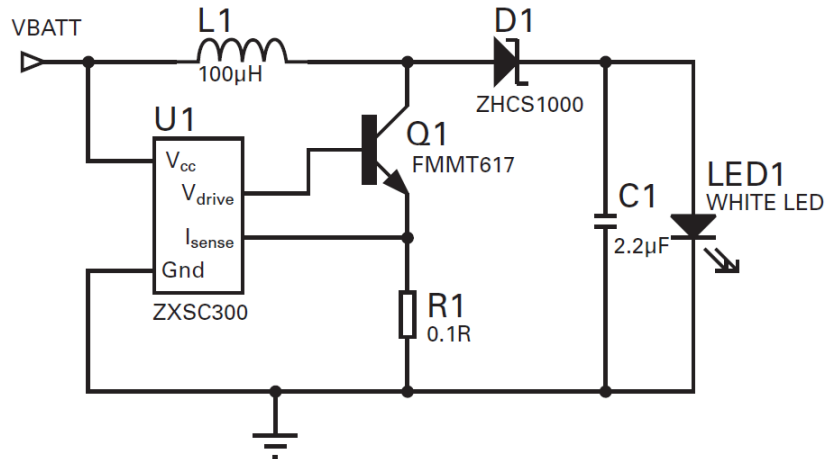
2. Task

- Set the value of resistor R_3 , that the voltage gain for DC signal is $10 \pm 0,5 \%$.
- Set the value of capacitors C_1 in C_2 (both have the same value), to set the high corner frequency at $100 \text{ kHz} \pm 1 \text{ kHz}$.



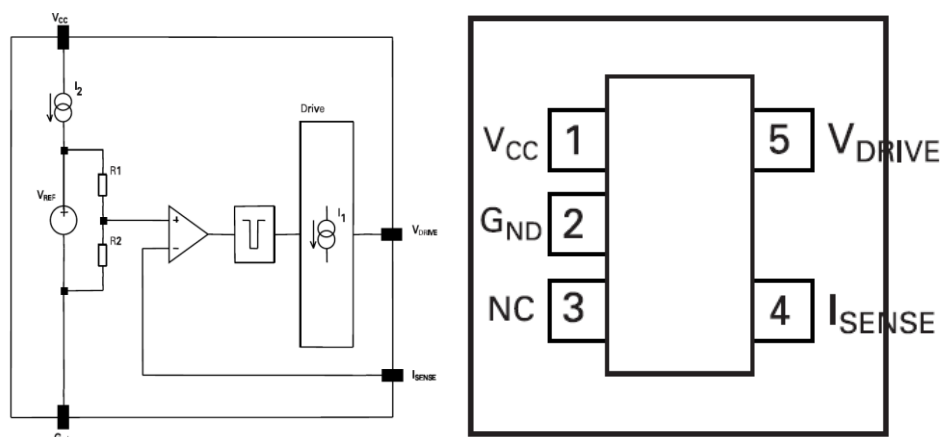
3. Task

Draw the scheme of the power supply circuit for high brightness LED from one battery cell. At the input (Vbatt) and output (instead of LED1) use double header connector (HDR1X2). Make new components for those, that are not in the library. Desing the PCB of size of 15 x 25 mm. The PCB should be one sided with top layer only.



Designator	Value	Type	Manufacturer	Pattern
U1		ZXSC300	Zetex	SOT23-5
Q1		FMMT617	Zetex	NPN, SOT-23
D1	1 A	ZHCS1000	Zetex	Schottky SOT-23
R1	100 mΩ	Metalplastni		0805
C1	2.2 µF/6.3 V	Multilayer		0805
L1	100 µH/1A	Ferrite Core		2220

Datashet of ZXSC300:



Pin No.	Name	Description
1	V _{CC}	Supply voltage, generally Alkaline, NiMH or NiCd single cell
2	Gnd	Ground
3	N/C	Not connected
4	I _{SENSE}	Inductor current sense input. Internal threshold voltage set to 19mV. Connect external sense resistor
5	V _{DRIVE}	Drive output for external switching transistor. Connect to base of external switching transistor