

DESIGN NOTE 007

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# Output voltage alarm circuit



# Abstract

This is a short design note about the output voltage alarm circuit function.

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# Output voltage alarm circuit

This design note shows one example on how to detect output voltage and provide a status signal by using LED diodes. In the circuit below, choose R1 to set a current that provides a stable reference voltage for IC1. Voltage divider R2, R3 will set the trip level for IC1, which compares the reference voltage with the voltage for the combination of R2, R3. During start up the red LED will light up momentarily until the Vtrip level is passed.

$$V_{trip} = V_{ref} \times \frac{(R2 + R3)}{R3}$$

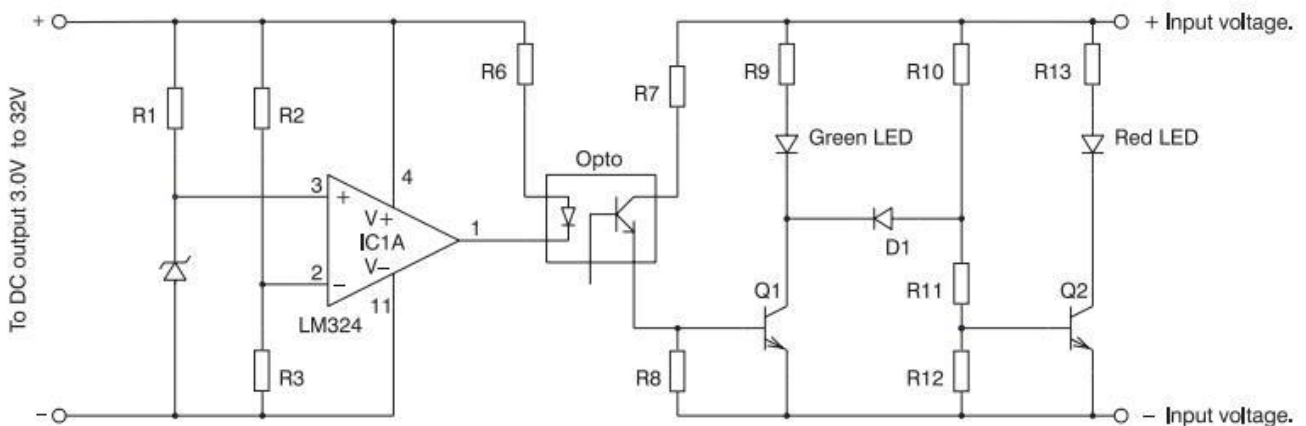
## Design example: 5V output, 36-72V input

Component values	
R1, R2, R3, R6, R9, R13	4.7 kΩ
R8, R12	10 kΩ
R7, R10	68 kΩ
R11	100 kΩ
D1	1N4148
IC1A	LM 224 or 324
Q1, Q2	BC 639 or similar

Table 1: Component values

R6 sets the current through the diode of the optocoupler. 1mA is usually enough but it will depend on the current transfer ratio of the optocoupler. The current needed through the optocoupler transistor is calculated by the input supply voltage divided by the sum of R7 and R8. R9 and R13 set the current through the LED diodes.

Reference Voltage:  
2.5 V  
Optocoupler:  
Toshiba TLP 121 or similar



Picture 1: Circuit diagrams



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