Output Voltage Alarm Circuit

Design Note 007

Flex Power Modules

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.

$$Vtrip = Vref \times \frac{(R2 + R3)}{R3}$$

R6 sets the current through the diode of the opto-coupler. 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.

See design example
on the following page:

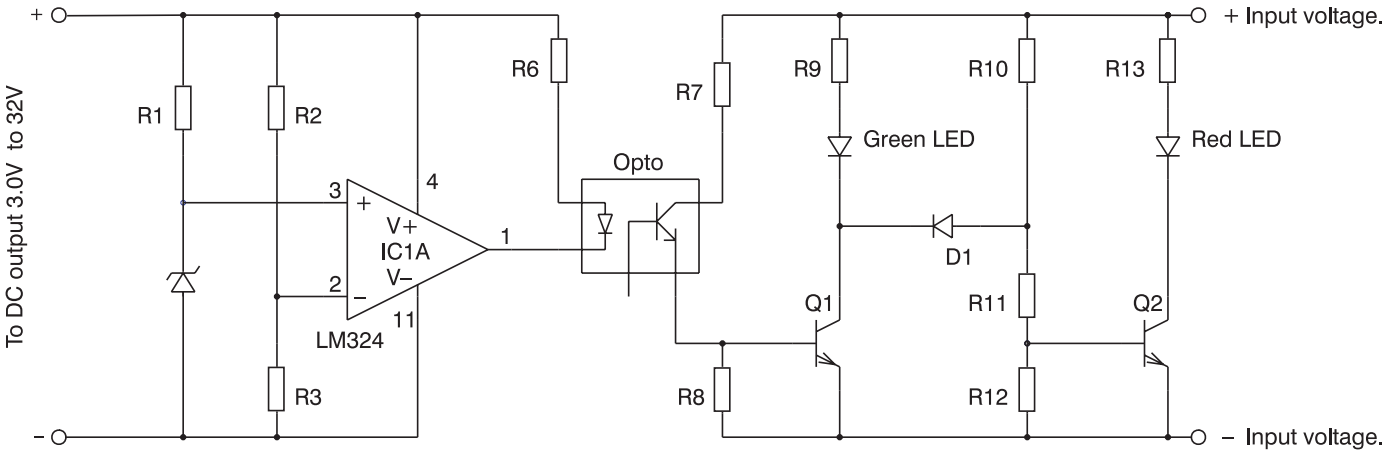
Design Example:
5V output, 36–72V input

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

Reference Voltage:
2.5 V

Optocoupler:
Toshiba TLP 121 or similar



Formed in the late seventies, Flex Power Modules is a division of Flex that primarily designs and manufactures isolated DC/DC converters and non-isolated voltage regulators such as point-of-load units ranging in output power from 1 W to 700 W. The products are aimed at (but not limited to) the new generation of ICT (information and communication technology) equipment where systems' architects are designing boards for optimized control and reduced power consumption.

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DESIGN NOTE
EN/LZT 146 22 R2B