



Training objectives and introduction



This experiment demonstrates how the common emitter configuration can be used as a switch

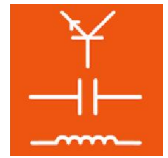
Training content

- Transistor operating as a switch

Introduction

Here the DC behaviour of the transistor is demonstrated. If the transistor is not conducting then the voltage at the connection terminal should be the same as the supply voltage since thanks to resistor R2 it is connected to the positive rail. However, if the transistor is fully conductive, the terminal is connected by the transistor to the zero-volt rail. Provided that the internal resistance of the transistor is considerably less than the level of R2, the voltage at the output should drop to almost zero. However, this is only true if sufficient voltage is applied to the common base thereby injecting enough charge carriers to permit a current to flow between the emitter and the base.

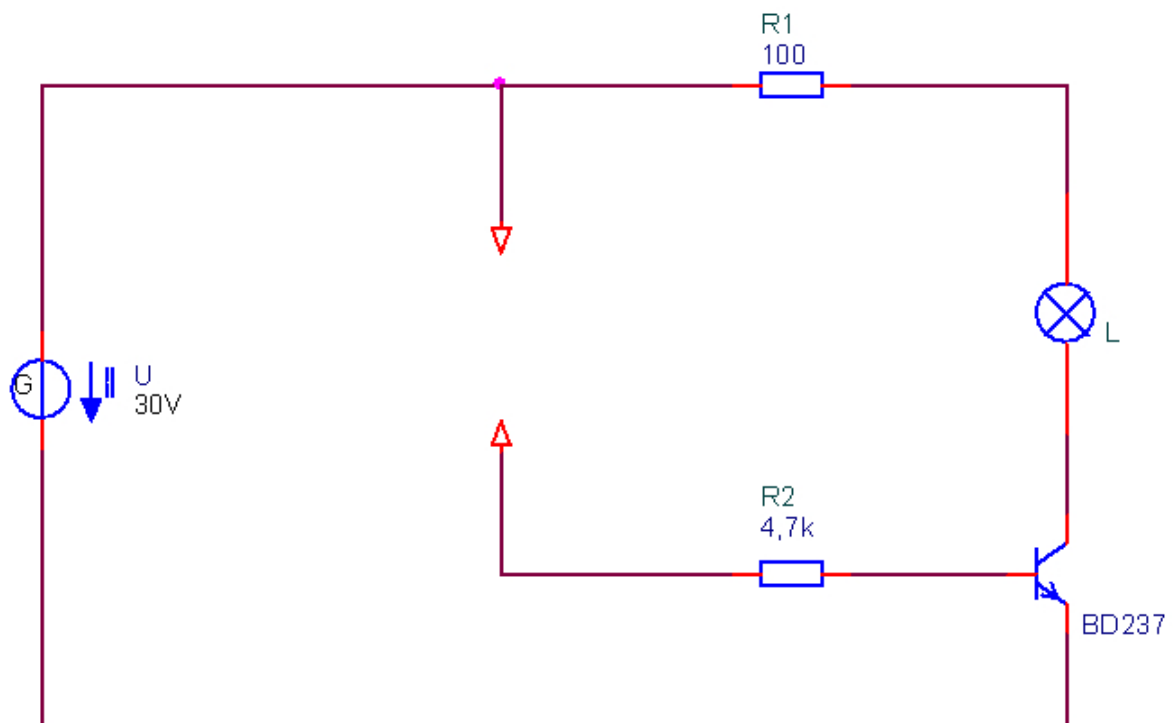
The value at which this happens is determined in the experiment. It can also be observed that the voltage drops rapidly as soon as the threshold voltage has been reached. In both extreme cases the output is described as saturated. In both of these conditions the transistor can be seen as fully conductive or fully blocking.



Experiment procedure

Circuit diagram

The following circuit diagram is used for this experiment:



Components

The following components are used for this experiment:

Parts	Id no.	Designation
0	SO5126-5M	Cables
2	SO5126-5E	Bridge, large
2	SO5124-6F	Bridge, small
1	PS4123-8P	Lamps, 15V E10
1	PS4121-2N	R 100
1	PS4121-3L	R 4.7k
1	PS4123-1G	NPN BD 237