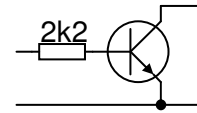


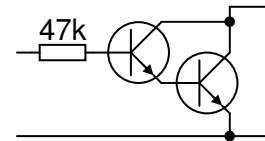
Drivers

Drivers are used where the output of a system takes more power (either current or voltage) than the processing block can provide. For example, where an OpAmp block is required to power a motor. Four devices are given.

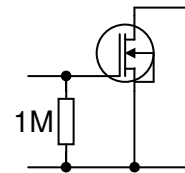
The simplest is the transistor driver. This requires a small base current through the current limiting resistor, which then switches a much bigger collector current. The collector output must be connected to the +ve power rail through the load. Remember a transistor has emitter, base and collector leads.



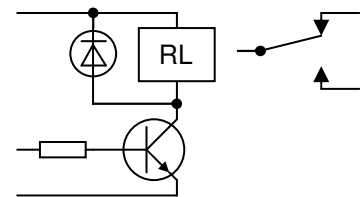
The second is a “Darlington Pair” which uses two transistors connected together so that a very small base current can switch a very much larger collector current.



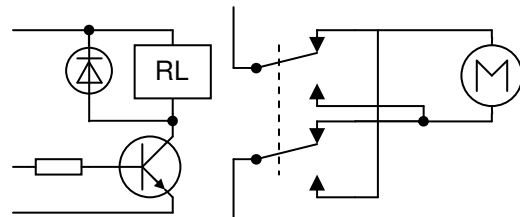
A Field Effect Transistor or FET can be used to drive a large current connected to the drain. A FET has source, gate and drain leads. The FET is voltage driven so there is no current loading on the process block. FETs also have a higher turn-on voltage which is often more suitable for a circuit running at logic levels (roughly 5v). The FET may cause problems with high frequency circuits, however, because of its generally high gate capacitance.



Another way of driving a high power load (voltage or current) or an alternating current load is to use a relay. This can be controlled with a transistor, Darlington pair or FET. The diode is a protection diode to protect the device from reverse voltage generated when the relay turns off.



This circuit uses a relay to reverse a motor. You need a dpdt relay with the switch inputs connected to the two power rails. You will need another relay if you want to turn the motor on and off as well.



You can also use four transistors in a bridge arrangement to turn a motor on and off and to reverse it. The transistors (or FETs) can be controlled by two outputs from a microcontroller for example. If one is high and the other low then the motor will turn one way. Toggle the outputs to reverse the motor. To stop the motor turn both PIC outputs low.

