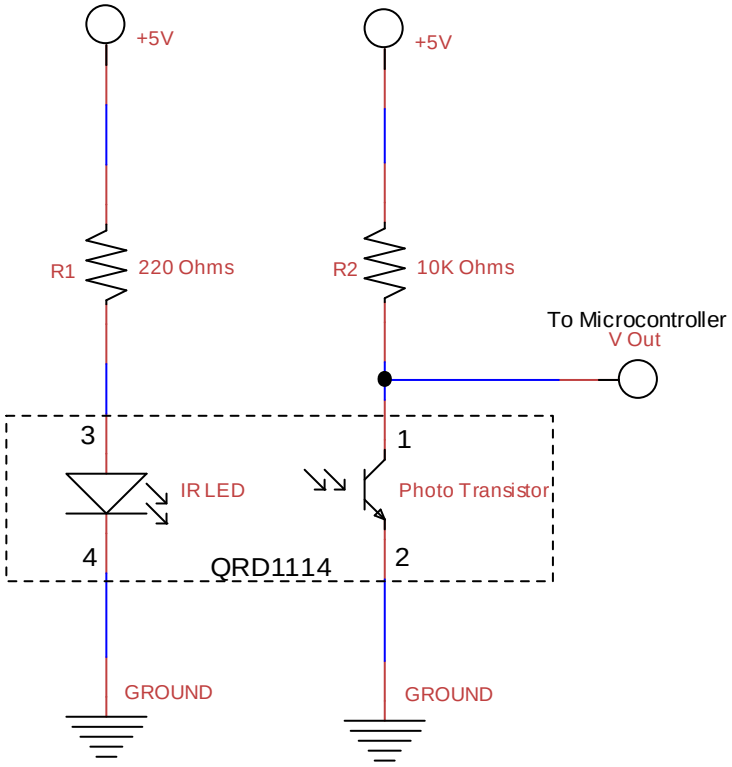
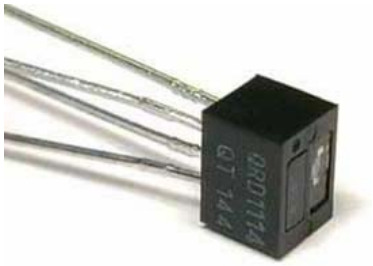
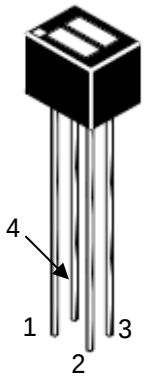
Line Following Sensor

Below is the schematic for the line following sensor. The dashed line around the infrared LED and the phototransistor represents the component QRD1114. It has 4 pins. Pins 3 and 4 are connected to the infrared LED and pins 1 and 2 are connected to the photo transistor.







How it Works

The infrared light emitting from the diode shines down (although you cannot see it because it is beyond the visible range) onto the surface. If the surface is white, most of the light is reflected up into the phototransistor. This light turns on the transistor which is acting like a switch and effectively connects ground to the bottom of the resistor. This will bring the voltage on this side of the resistor to measure 0V.

Conversely, if the surface is dark, very little light is reflected into the phototransistor. The lack of light will not turn on the transistor and thus not connect the bottom part of the resistor to ground. Therefore, the voltage measured at the bottom of the resistor (relative to ground) is the supply voltage.

Circuit Board

Components	Description
QRD1114	Reflective Light Sensor
220Ω	Resistor connected to IR diode
10KΩ	Resistor connected to photo transistor
3 wire cable	Stranded gray wire to connect to breadboard - (GND) + (5V from micro) VO (to ADC)
3 header pins	To allow stranded wire to connect to breadboard