## **Implementation**

The first part to implement will be the flex sensors. These are essentially variable resistors (like potentiometers). As seen in the datasheet below, the resistance varies between  $5 \, k\Omega$  and  $10 \, k\Omega$ . I will connect the flex sensor in series with a  $3.3 \, k\Omega$  resistor to  $3.3 \, V$  (VCC), and use the midpoint between the two resistors as the input to the ADC.

This forms a basic voltage divider. Theoretically:

• Minimum ADC voltage (when flex =  $10 \text{ k}\Omega$ ):

$$V_{out} = rac{10}{10 + 3.3} imes 3.3 = 2.48 \, V$$

Maximum ADC voltage (when flex = 5 kΩ):Vout=5+105×3.3=1.1 V

$$V_{out} = rac{5}{5+3.3} imes 3.3 = 1.98 \, V$$

So the voltage range at the ADC will be 1.98 V to 2.48 V, depending on the bend angle.

(A) flex2.2 'unidirectional bending sensor

Brand NEW Bending resistance change:  $5K\Omega \sim 10K\Omega$ 

Original Binding resistance change:  $10K\Omega \sim 125K\Omega$ 

Implementation 1