NTC thermistor characteristics

Core BUILD THE BASICS

C1 **State** what is meant by NTC. **[1]**

C2 **State** the quantity a thermistor senses. **[1]**

C3 Use this table. **State** the resistance at 10 °C. **[1]**

Temp (°C)	0	10	20	30	40	60	80
R (kΩ)	34	20	12.5	8.0	5.3	2.5	1.3

C4 **Describe** what happens to the resistance as the thermistor cools from 60 °C to 0 °C. **[1]**

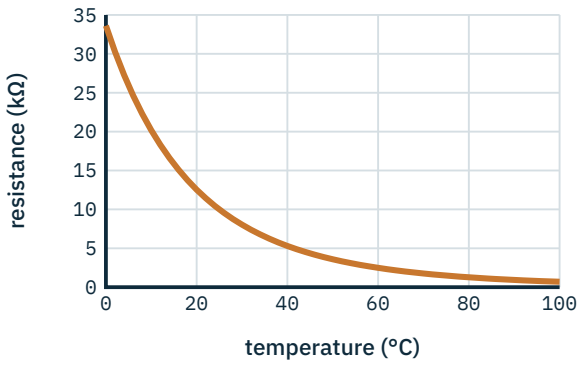
C5 Use the table. **State** the resistance at 60 °C. **[1]**

C6 **State** the temperature at which the thermistor is 8.0 kΩ. **[1]**

C7 **State** where the thermistor goes to make a cold-sensing circuit. **[1]**

Stretch GO FURTHER

S1 Use this graph. **State** the temperature when the resistance is 5 kΩ. **[1]**



S2 At 40 °C the thermistor (bottom) is 5.3 kΩ. R_1 = 10 kΩ and V_s = 6.0 V. **Calculate** V_{out}. **[3]**

S3 **Explain** why a thermistor at the top of a divider makes a hot-sensing circuit. **[2]**

S4 V_s = 6 V, thermistor (top), 10 kΩ (bottom). At 60 °C R_{th} = 2.5 kΩ. **Calculate** V_{out}. **[3]**

S5 **Calculate** V_{out} for S4 at 20 °C (12.5 kΩ). **[2]**

S6 **Describe** how V_{out} changes as the temperature rises in S4. **[1]**

Exam Ready QUALIFICATIONS SCOTLAND STYLE

E1 A frost alarm has a thermistor at the bottom of a divider, a transistor and a buzzer. **Describe** the operation as the temperature falls. **[4]**

E2 At 0 °C the thermistor (bottom) is 34 kΩ. R_1 = 47 kΩ and V_s = 12 V. **Calculate** V_{out}. **[3]**

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E3 **Explain** one advantage of a thermistor over a bimetal switch for sensing temperature. **[2]**

E4 A cooling fan at Glenmorie Distillery (fictional) uses a thermistor (top) and 4.7 kΩ (bottom) on 12 V. At 40 °C the thermistor is 5.3 kΩ. **Calculate** V_{out}. **[3]**

E5 **Explain** why the thermistor is at the top of the divider for the fan. **[2]**

Total: 33 marks. Use the Data Booklet. Show your working and give units.