IELe — bipolar transistors

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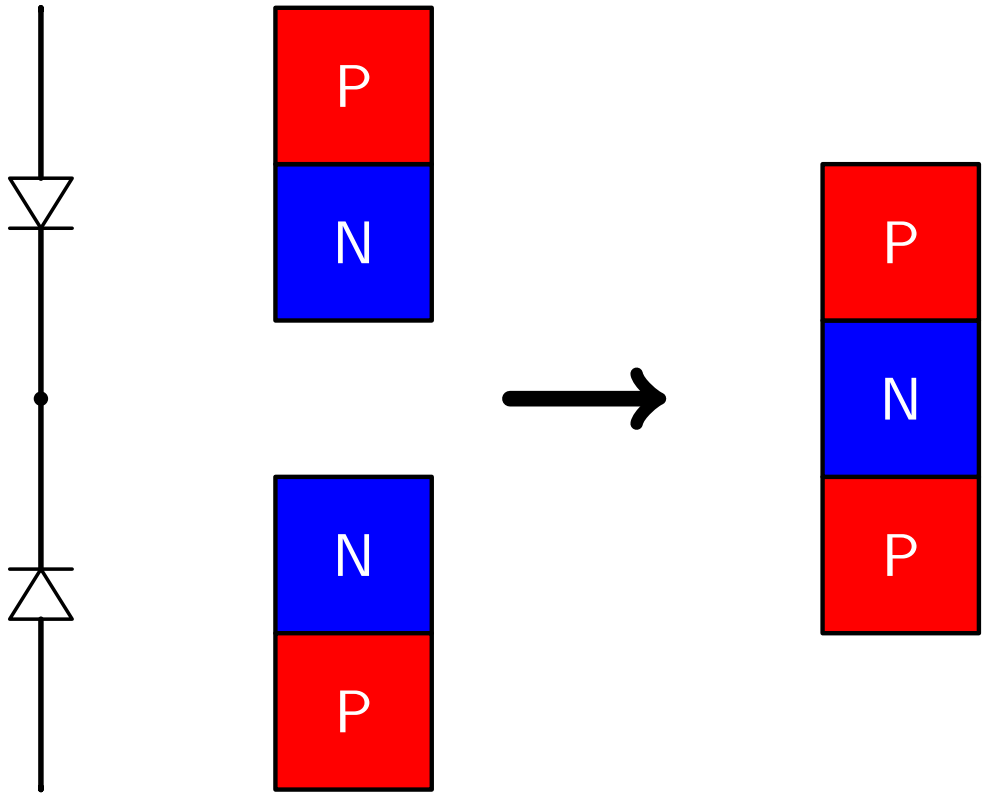
Remember diode

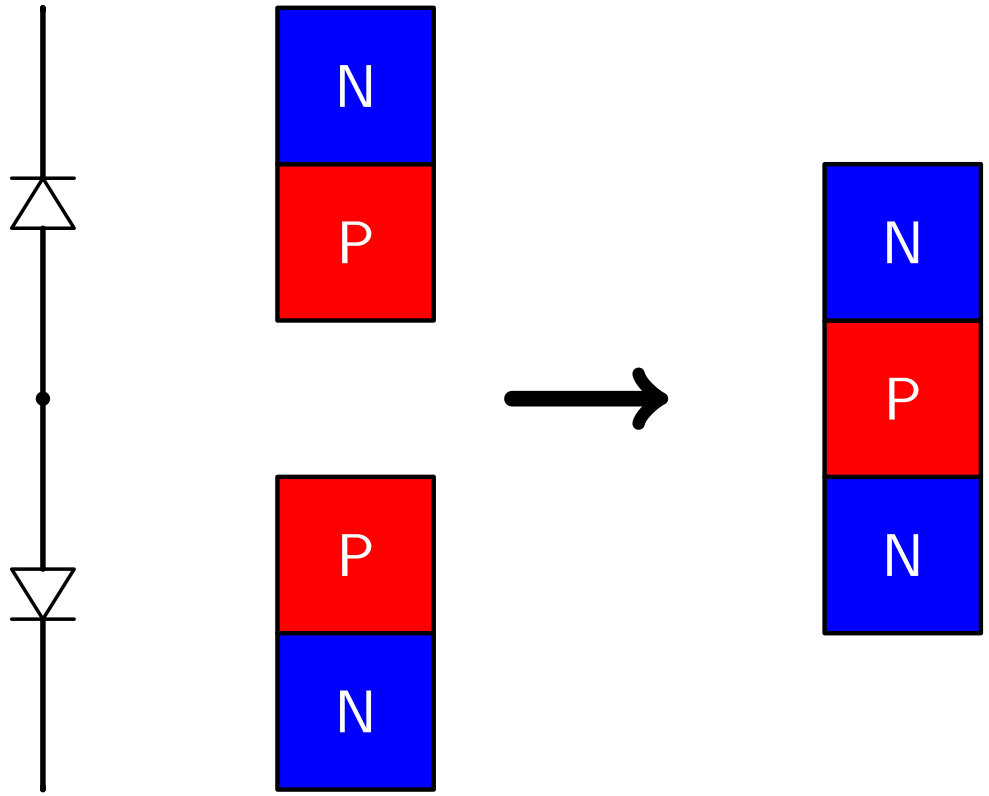
- boxed PN junction, two electrodes (anode – P, cathode – N)
- symbol: anode cathode
- diode is non linear, possible graphical solution
- we can combine diodes together to form more advanced components – bipolar transistors

Types of bipolar transistors – PNP

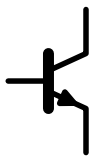


Result — **PNP transistor**

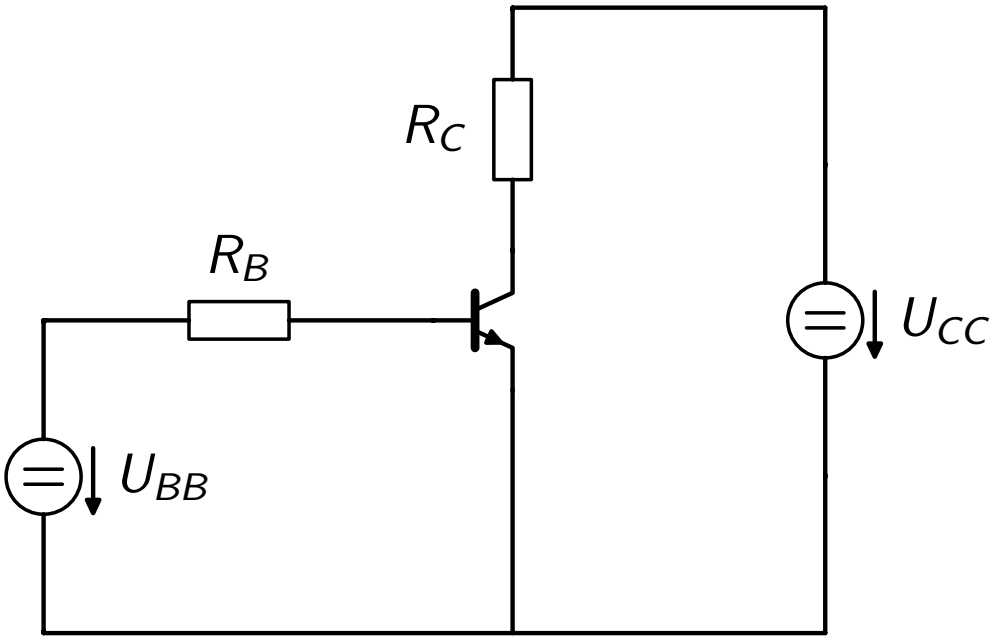
Types of bipolar transistors – NPN



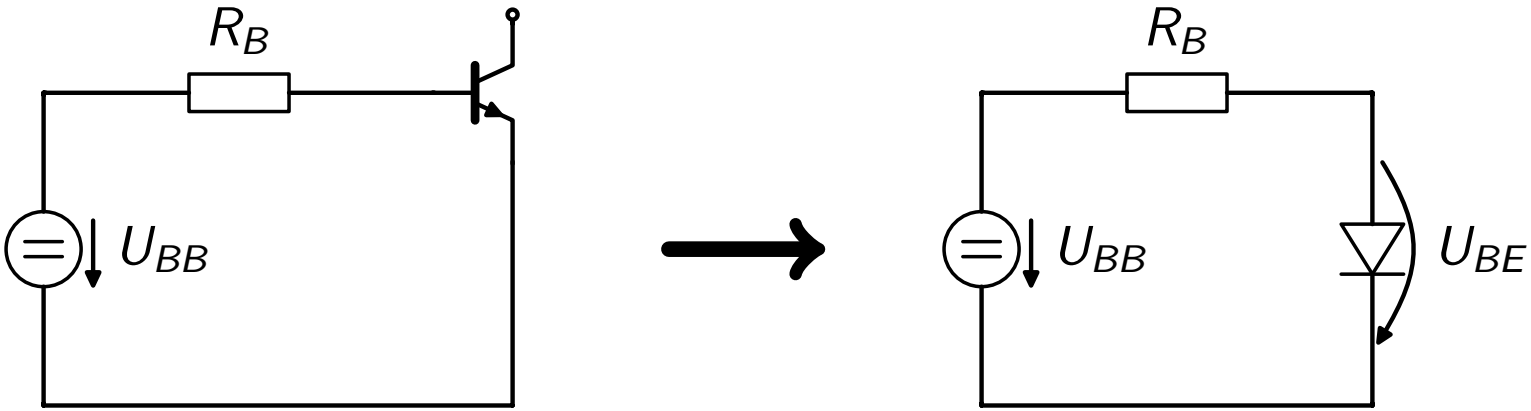
Result — **NPN transistor**



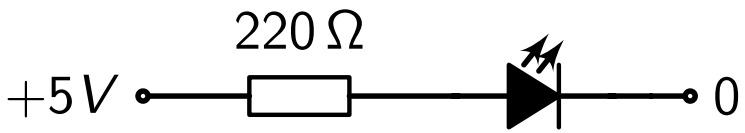
NPN transistor circuit

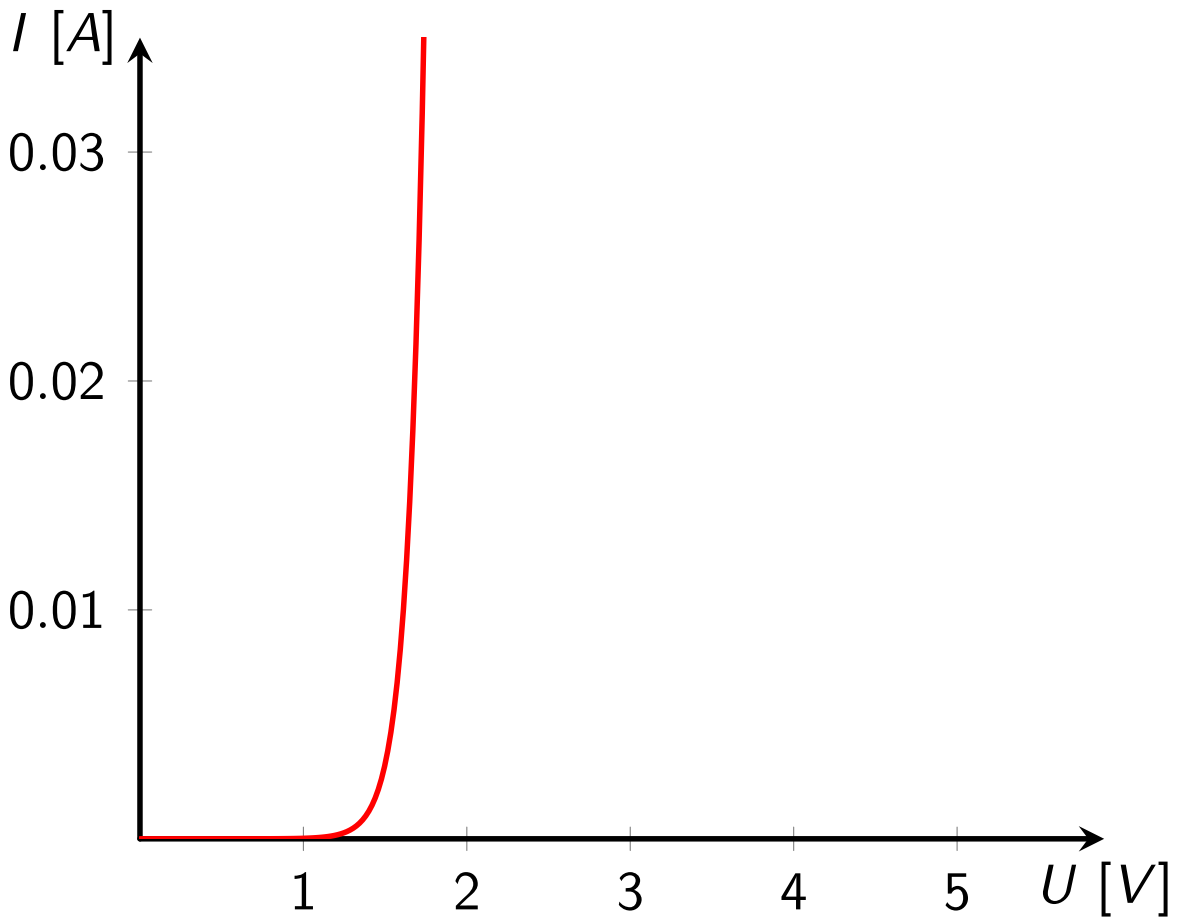


NPN transistor – input part

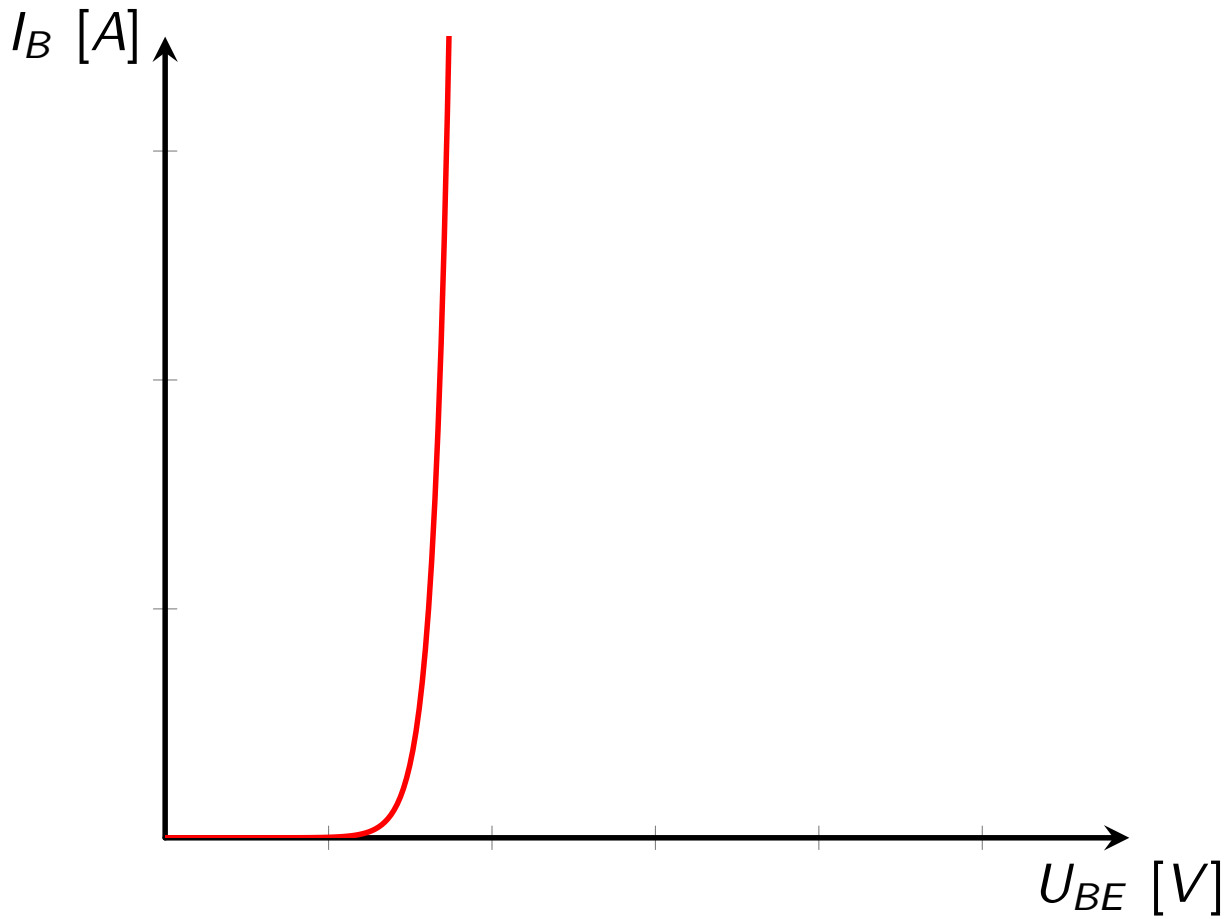


Just a reminder about the graphical solution of the diode:

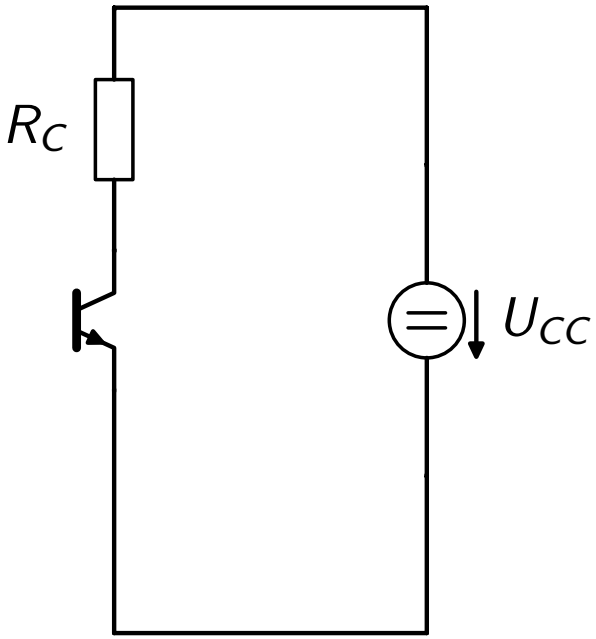




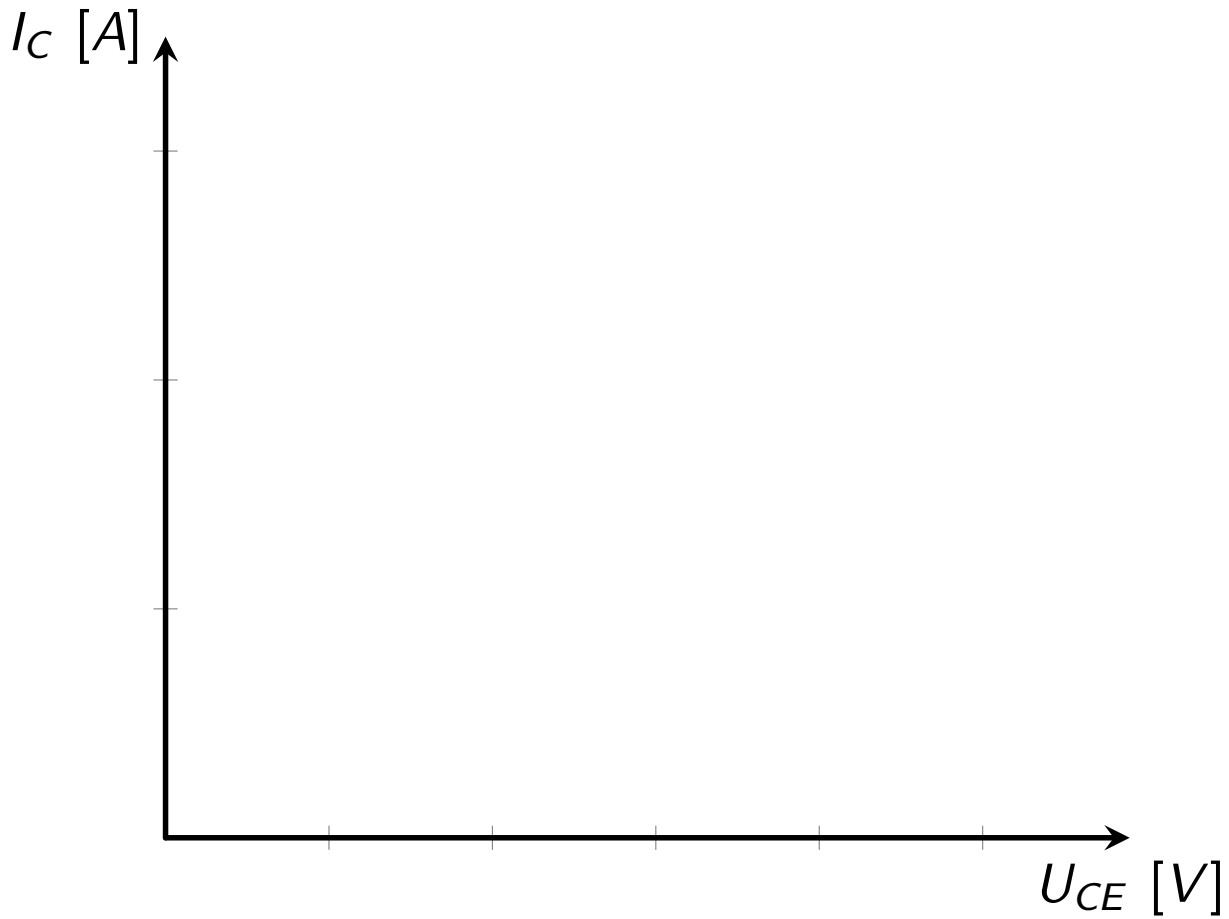
NPN transistor – input part



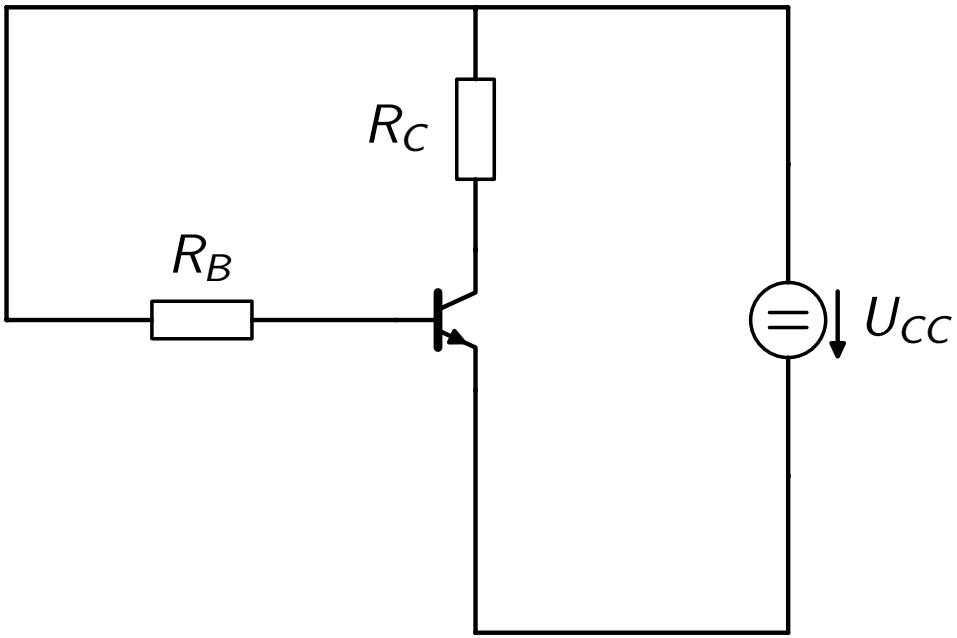
NPN transistor – output part

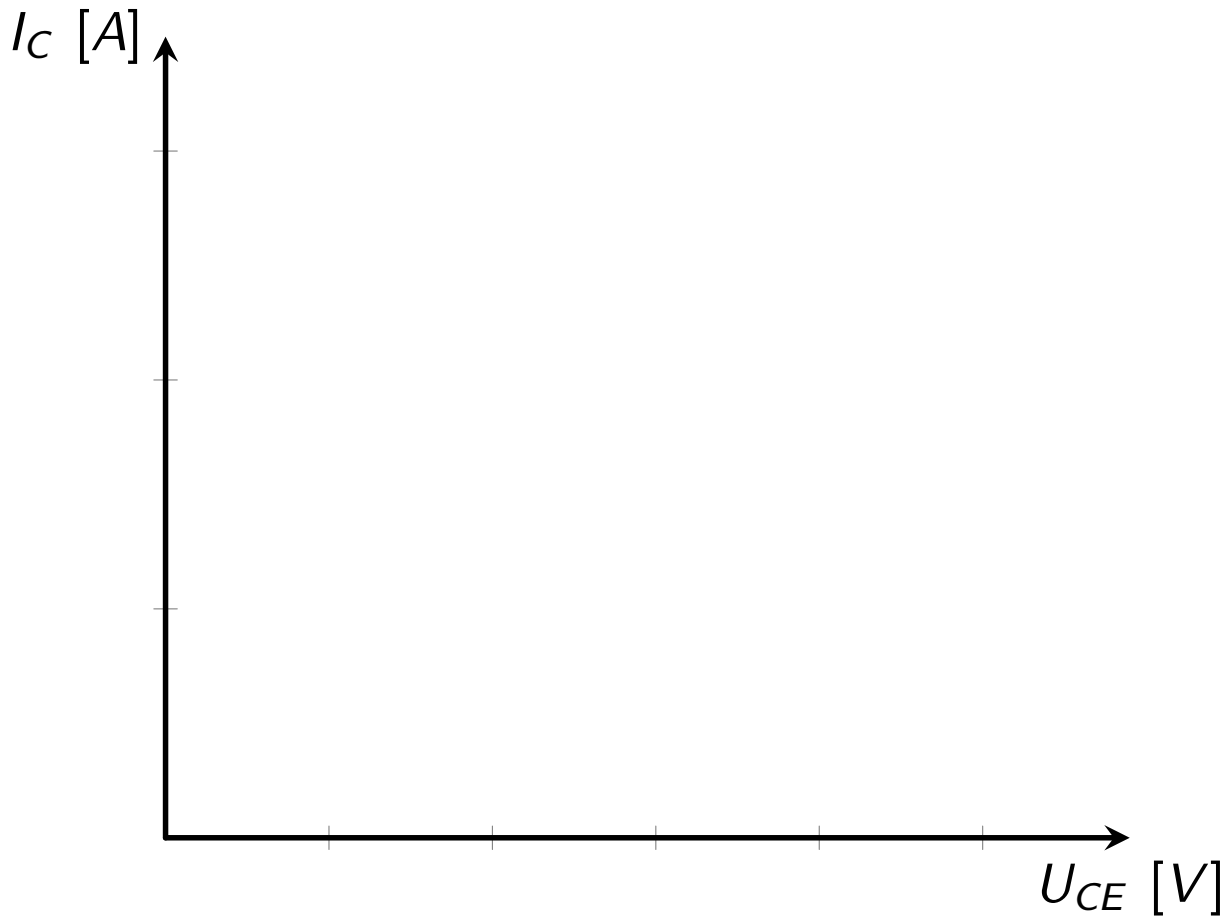


NPN transistor – output part

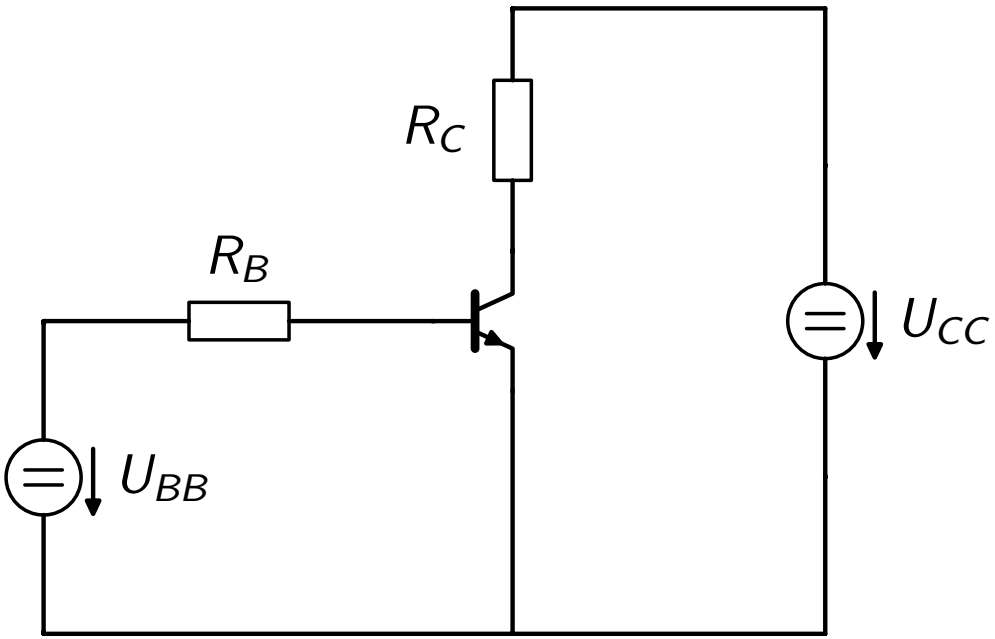


Slightly different circuit

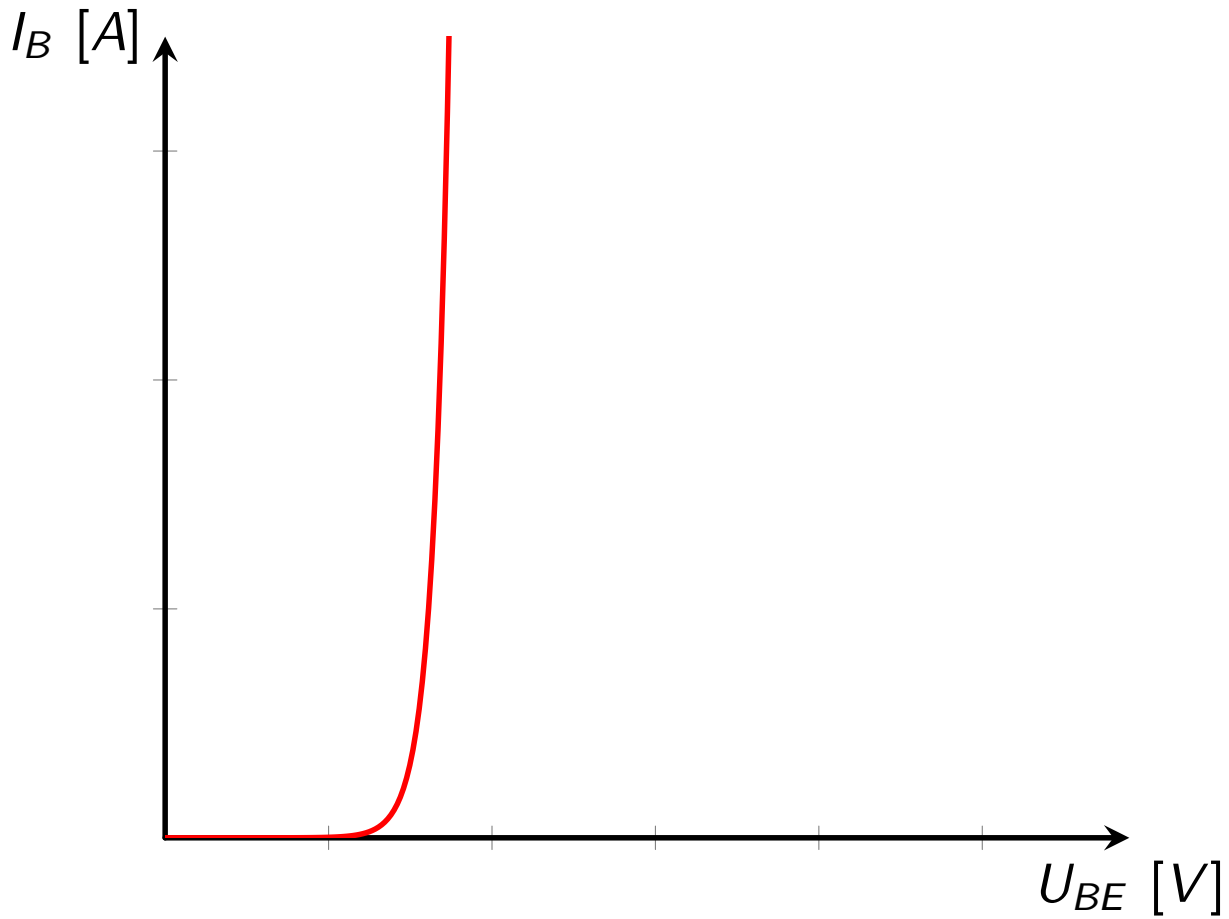



I_C $[A]$
U_{CE} $[V]$

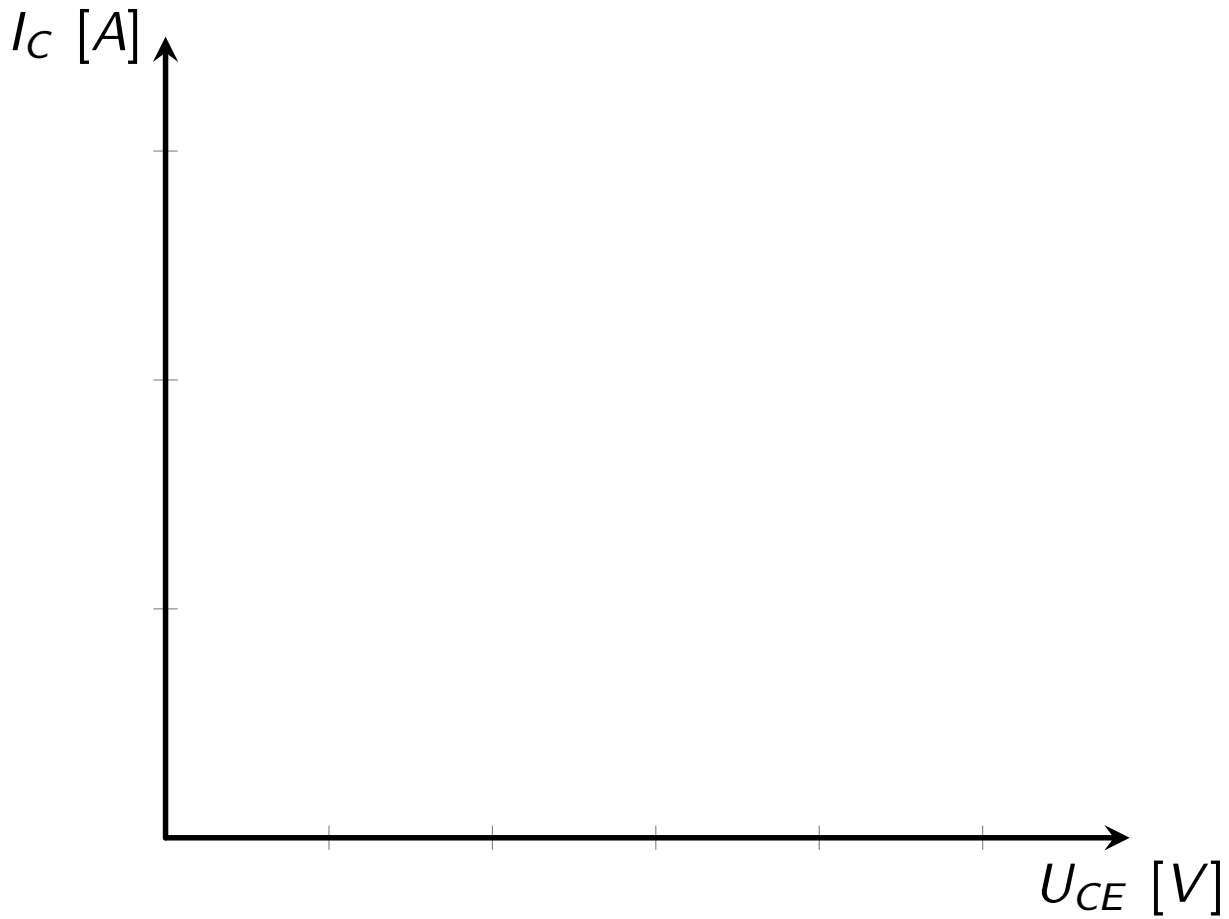
Transistor gain $A = \frac{\Delta U_{CE}}{\Delta U_{BB}}$



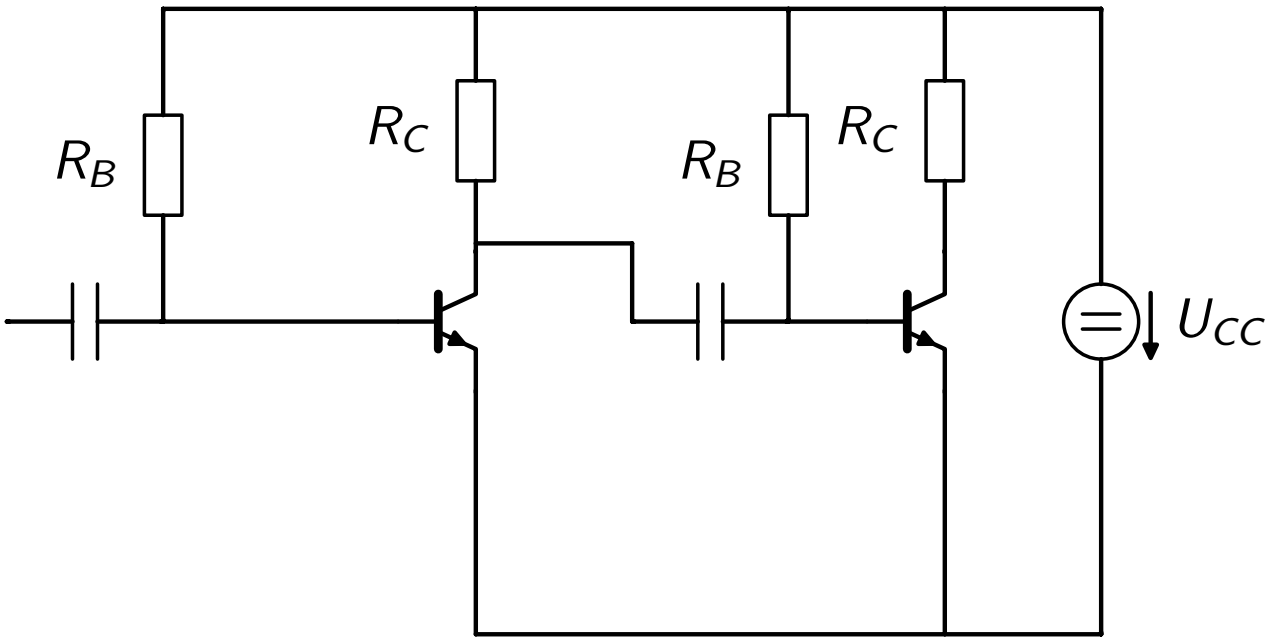
NPN transistor – gain (input part)



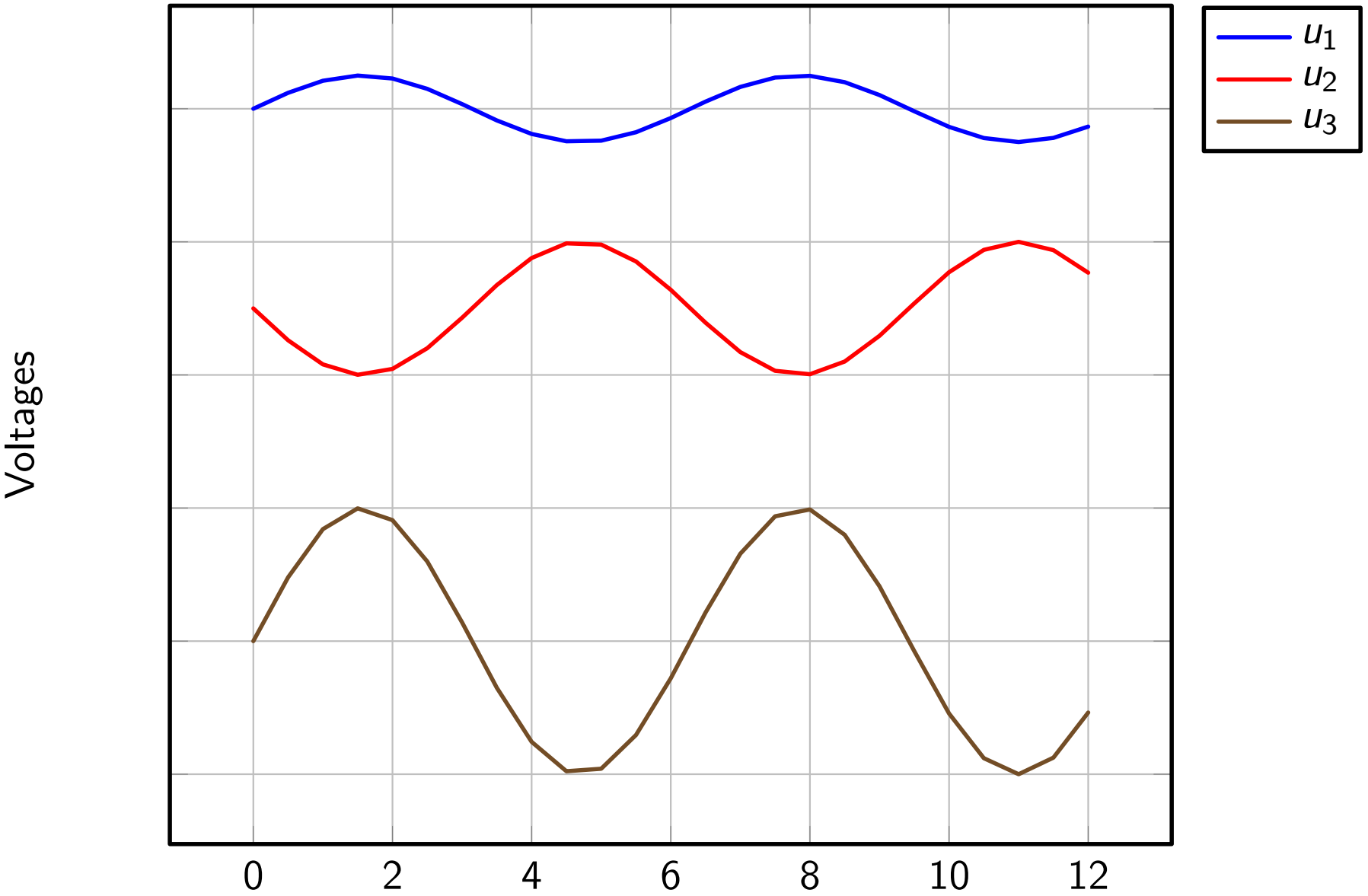
NPN transistor – output part

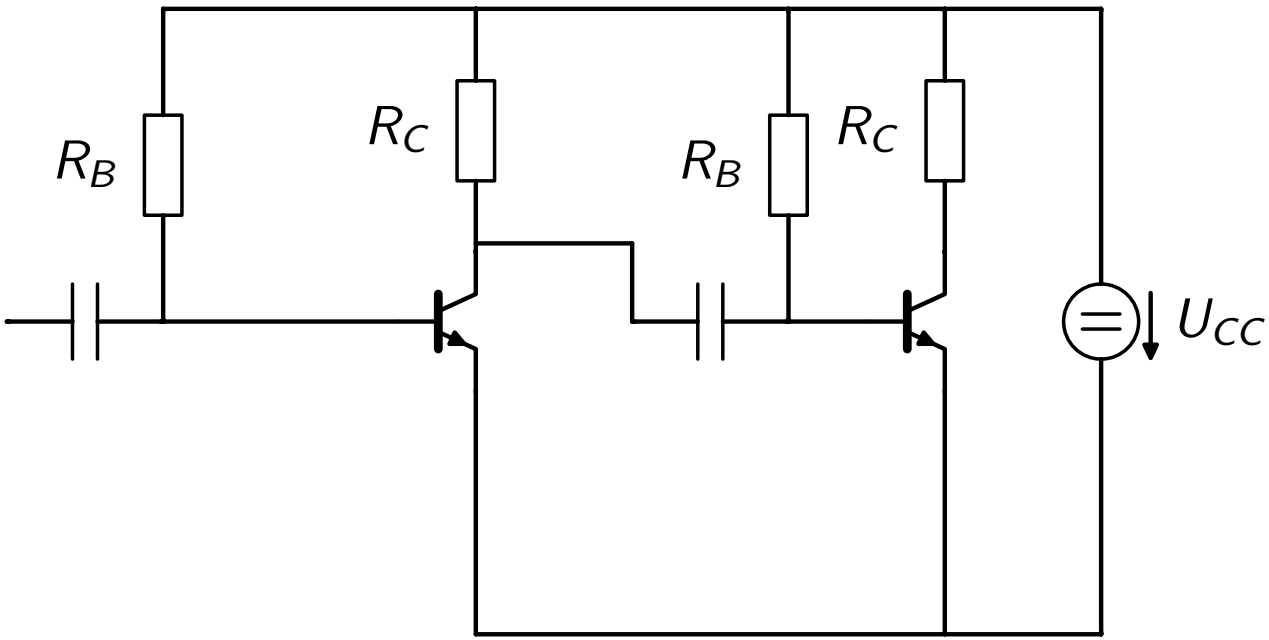


Two transistor amplifier

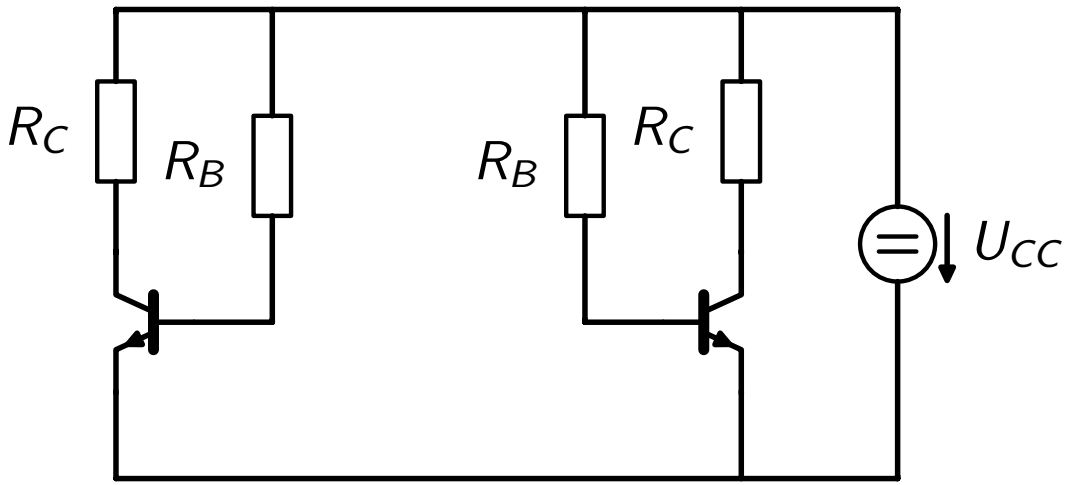


Two transistor amplifier




R_B
R_C
R_B
R_C
U_{CC}

Multivibrator – two stable states



Conclusion:

- bipolar transistor
- solution of the bipolar transistor
- gain of the bipolar transistor
- multi vibrators