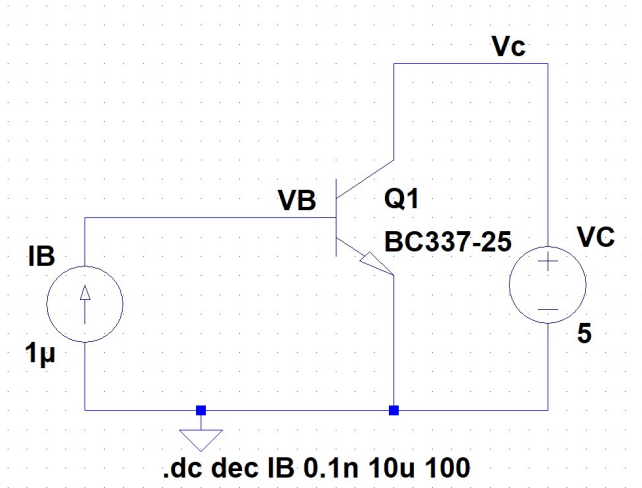


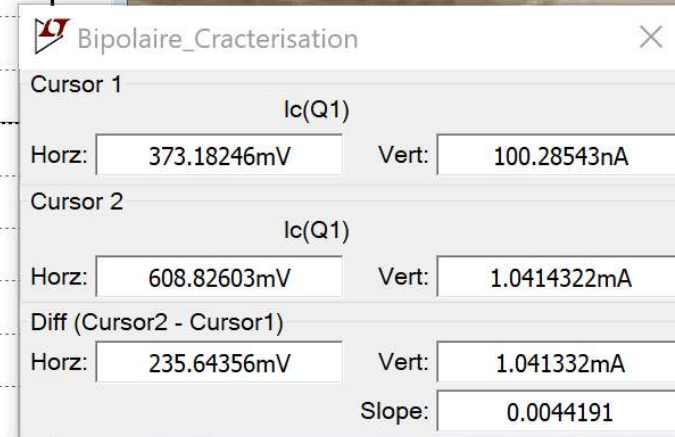
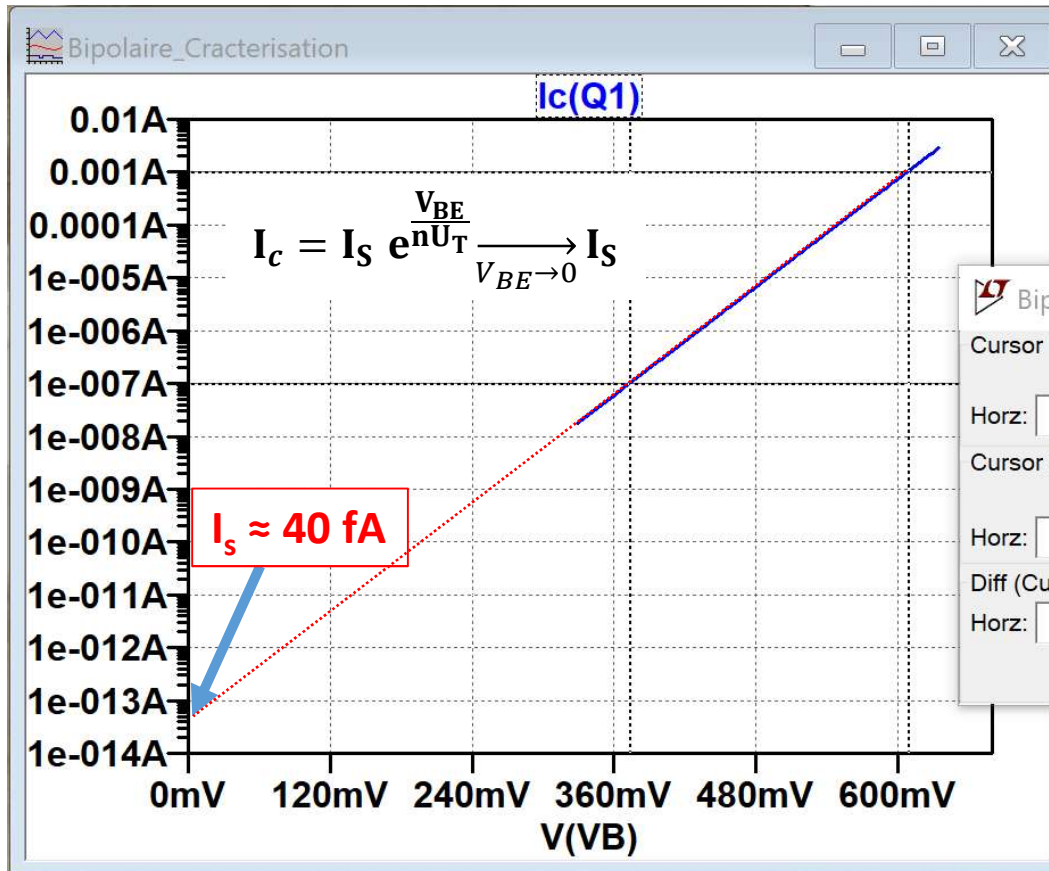
Q a:



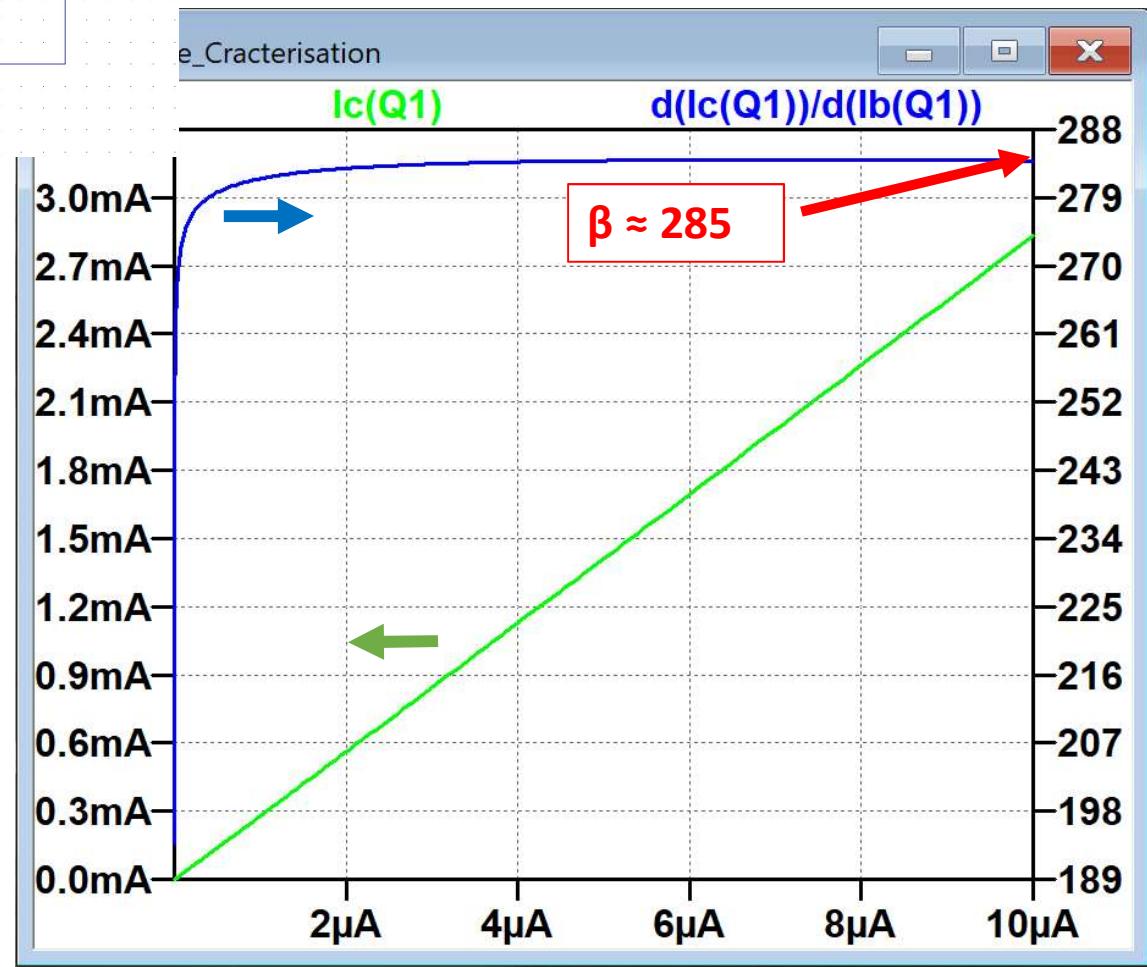
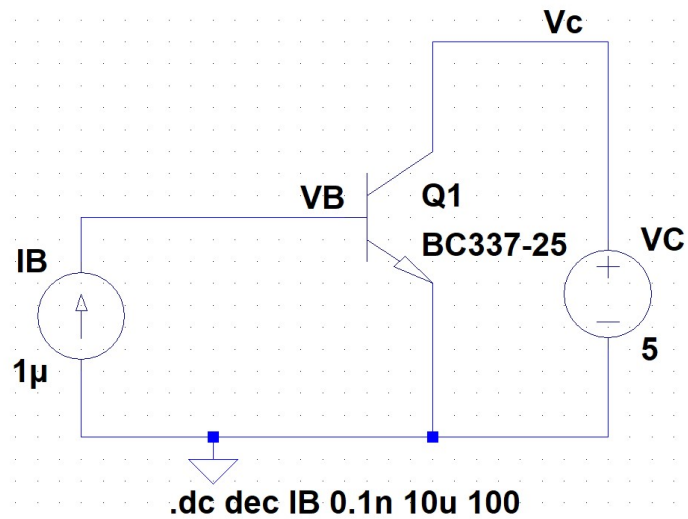
$$\frac{1}{nU_T} = \frac{\ln(I_{C2}) - \ln(I_{C1})}{V_{BE} - V_{BE1}}$$

$$\frac{\ln(1\text{mA}) - \ln(100\text{nA})}{608\text{mV} - 373\text{mV}} \approx 39 \text{ avec } U_T \approx 26 \text{ mV}$$

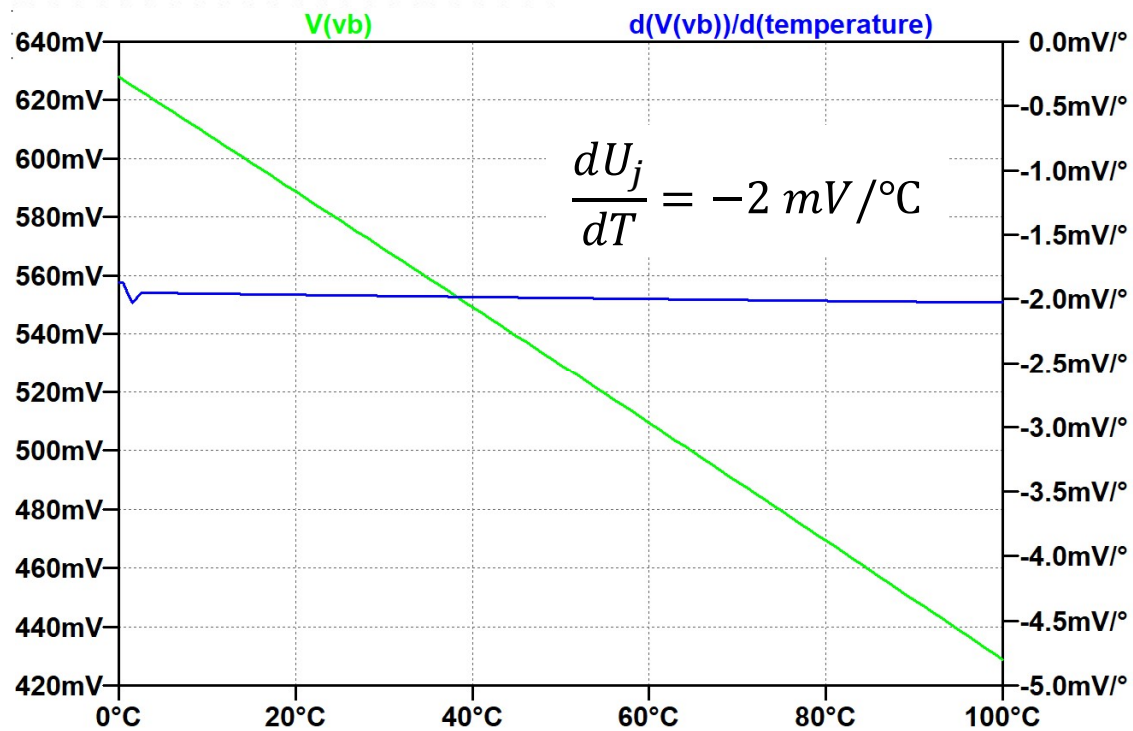
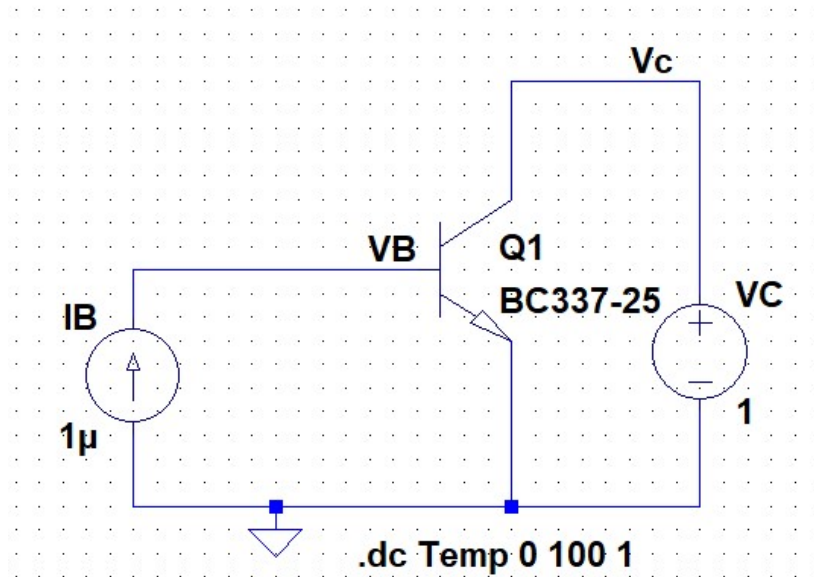
$$\rightarrow n \approx 1$$



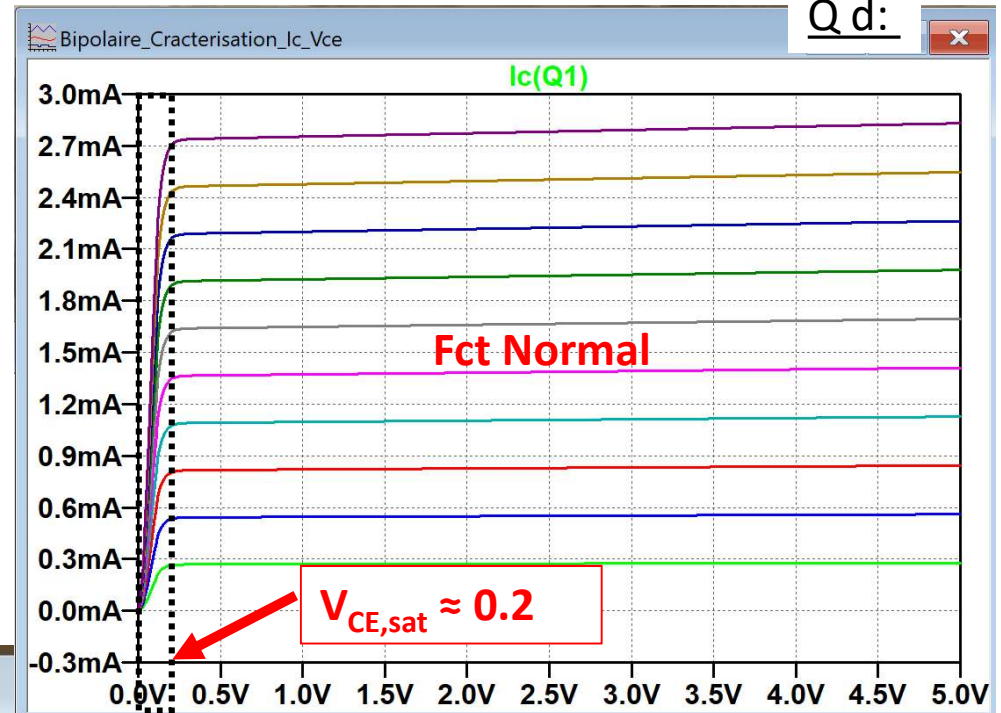
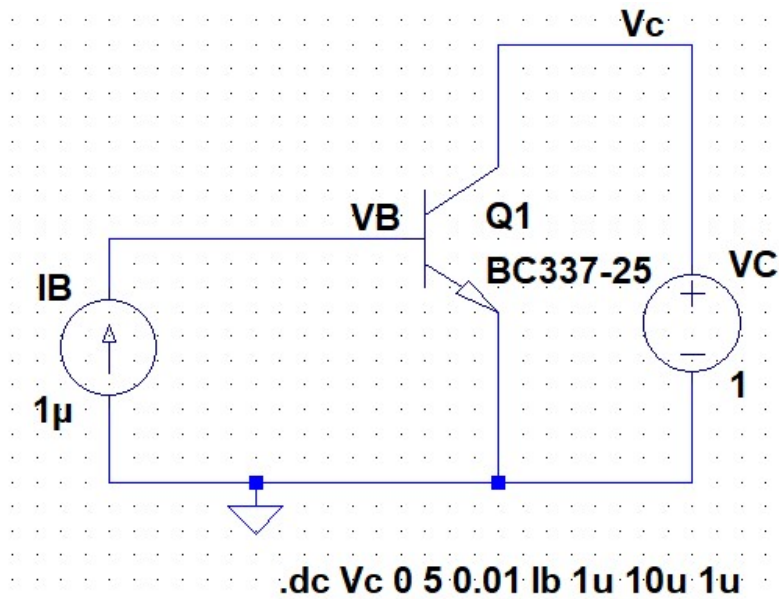
Q b:



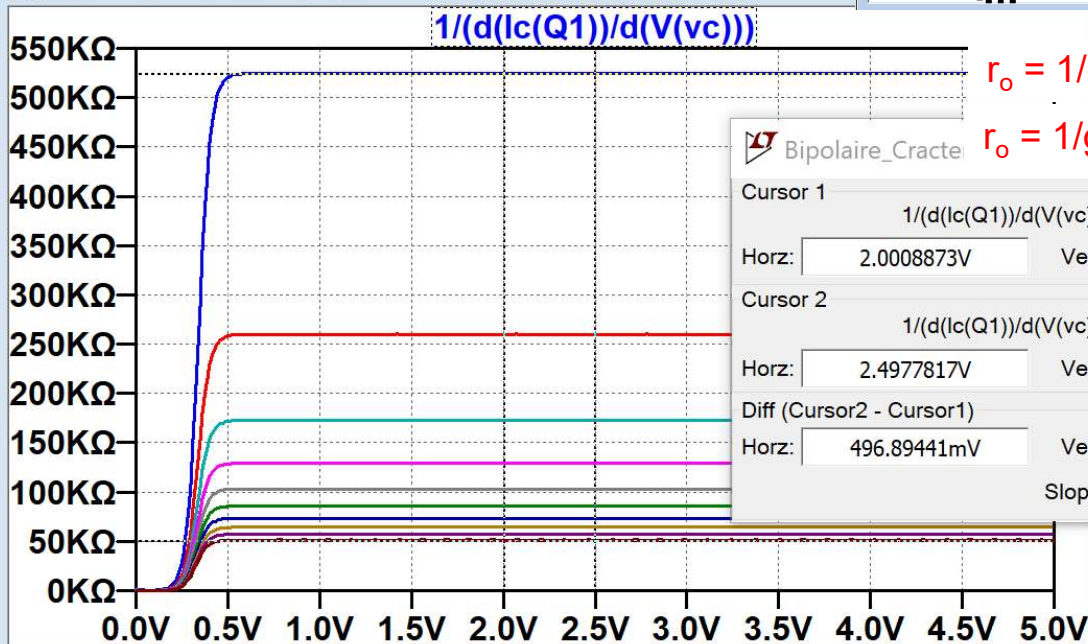
Q c:



Q d:



Bipolaire_Cracterisation_Ic_Vce



$$r_o = 1/g_{CE} = (dI_c/dV_{CE})^{-1} = 51 \text{ k}\Omega \text{ pour } I_B = 20 \text{ uA}$$

$$r_o = 1/g_{CE} = (dI_c/dV_{CE})^{-1} = 520 \text{ k}\Omega \text{ pour } I_B = 1 \text{ uA}$$

Q e:

Q f:

$$V_A = I_C r_o = I_C (dI_C/dV_{CE})^{-1} \approx 143 \text{ V}$$

