

Laborator nr. 2:

Diode stabilizatoare (Zener):

- depinde puternică a zonelor p și n
- funcționează în polarizare inversă

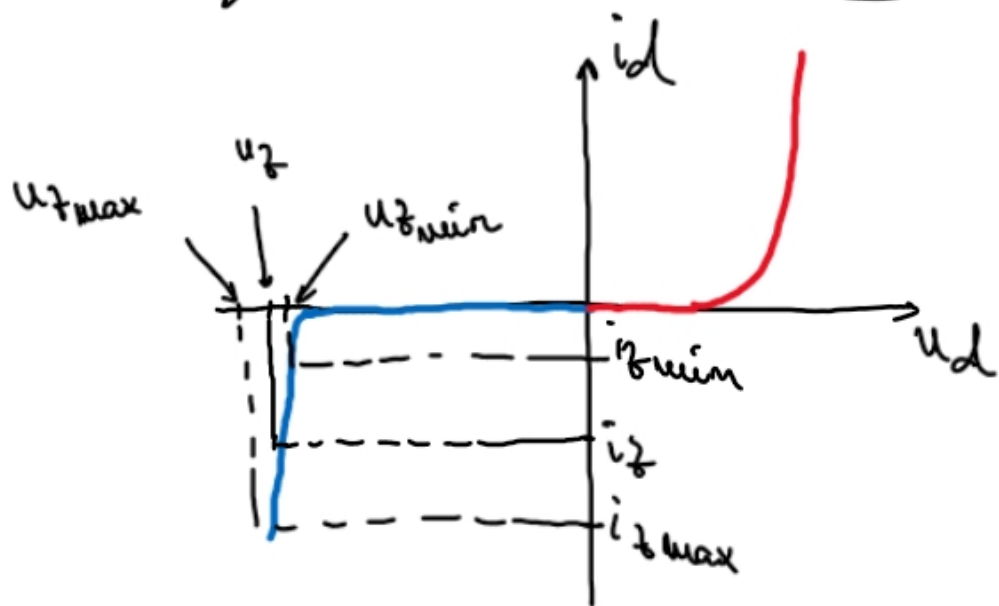
(în zona de străpungere)



multiplicarea în avalanșă
a purtătorilor de sarcină

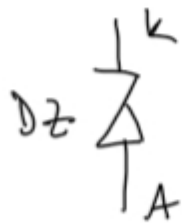


$$\frac{u_z, i_z}{\leftarrow}$$

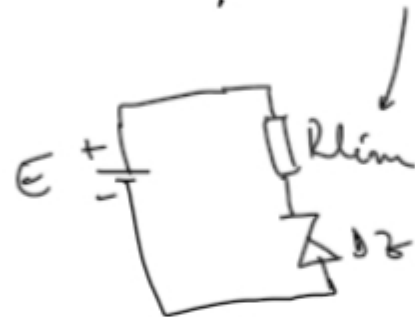
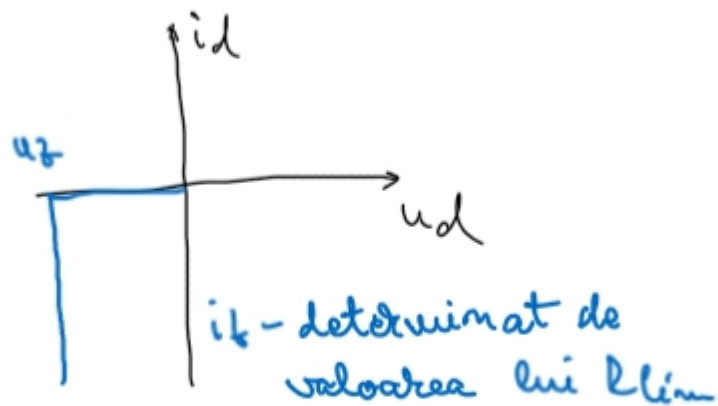
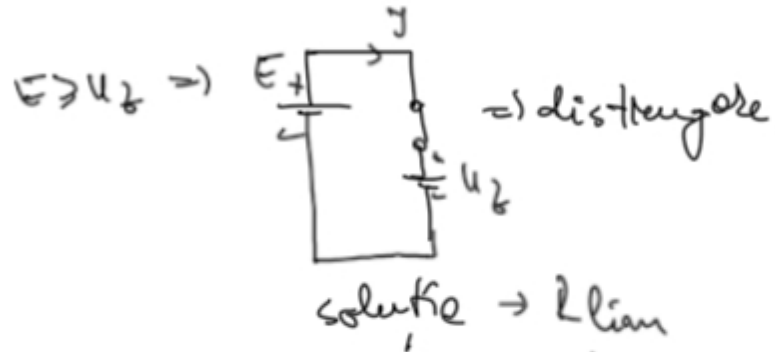
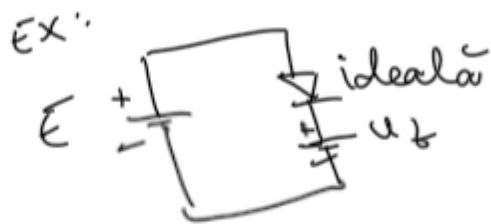
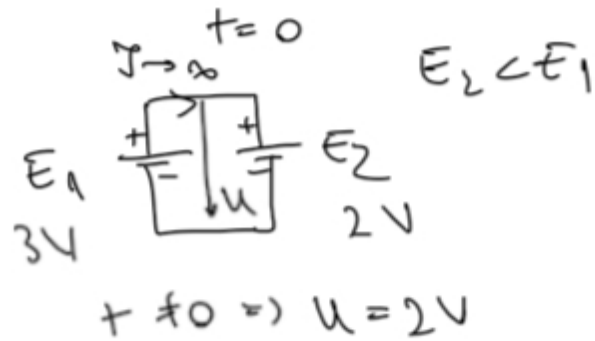
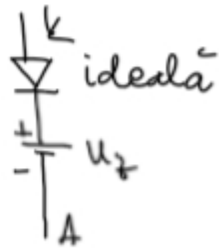


Modele ale diodei stabilizatoare:

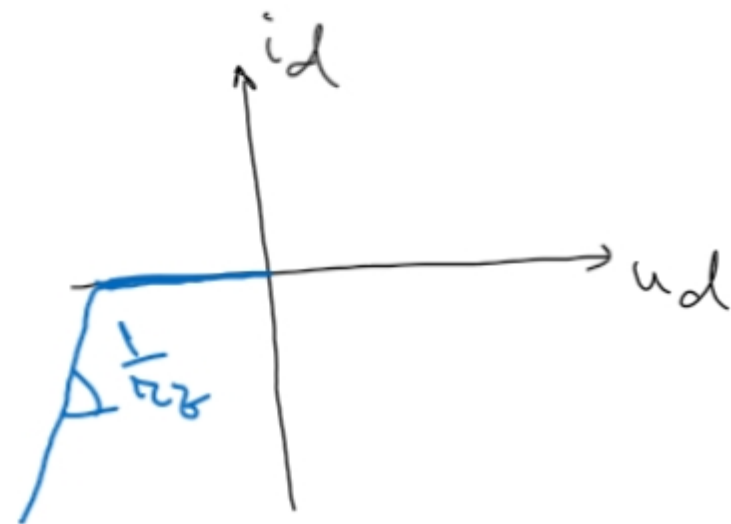
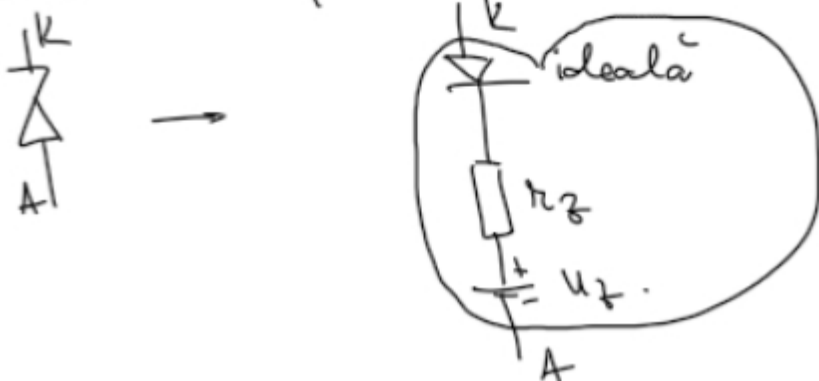
1. Dioda stabilizatoare idealizată



≡



2. Modelul practic:



Date catalog PTZ 4.7B

$$\left. \begin{array}{l} P_{\max} = 1000 \text{ mW} \\ U_{z}^{\text{nom}} = 4.7 \text{ V} - 5.2 \text{ V} \\ I_{z}^{\text{nom}} = 40 \text{ mA} \end{array} \right\}$$

Dim característica $i_d = f(u_d) \Rightarrow$ $i_z = 40 \text{ mA}$
 $u_z = 4.925 \text{ V}$

$$r_z = \frac{\Delta u_z}{\Delta i_z}$$

$$\left. \begin{array}{l} \Delta u_z = 48.9 \text{ mV} \\ \Delta i_z = 10 \text{ mA} \end{array} \right\} \Rightarrow r_z = \frac{48.9 \text{ mV}}{10 \text{ mA}} = 4.89 \Omega$$

$$P_{\max} = i_{z \max}^2 \cdot r_z \Rightarrow i_{z \max}^2 = \frac{P_{\max}}{r_z}$$
$$i_{z \max} = \sqrt{\frac{P_{\max}}{r_z}} = \sqrt{\frac{1 \text{ W}}{4.89 \Omega}} = 0.452 \text{ A} = 452 \text{ mA}$$