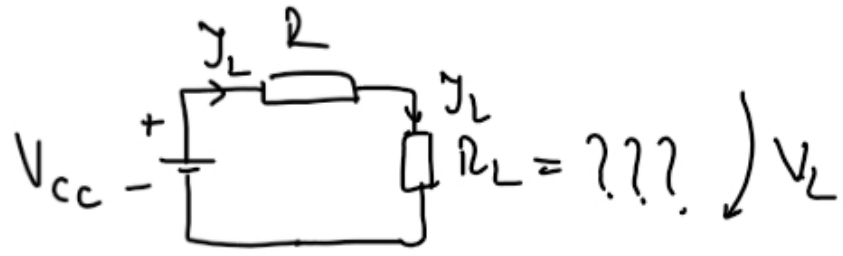


Laborator nr. 2 F/Fi:

Punctul static de funcționare:

Dreapta de sarcină:



$$\rightarrow I_L = f(V_L)$$

$$V_{cc} = I_L \cdot R + V_L \Rightarrow -I_L R = V_L - V_{cc}$$

$$I_L R = V_{cc} - V_L$$

$$I_L = \frac{V_{cc}}{R} - \frac{V_L}{R} \rightarrow$$

I_{sc}

2 cazuri extreme

$R_L = 0$ (scurtcircuit)

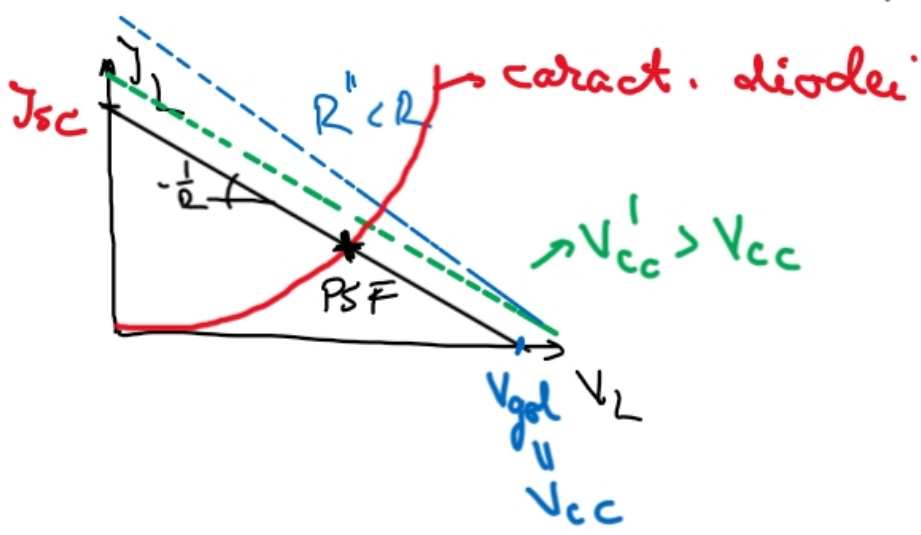
$R_L = \infty$ (gol)

I_{sc} - curentul de scurtcircuit

V_{gol} - tensiunea de lucru în gol

$$V_{gol} = V_{cc}$$

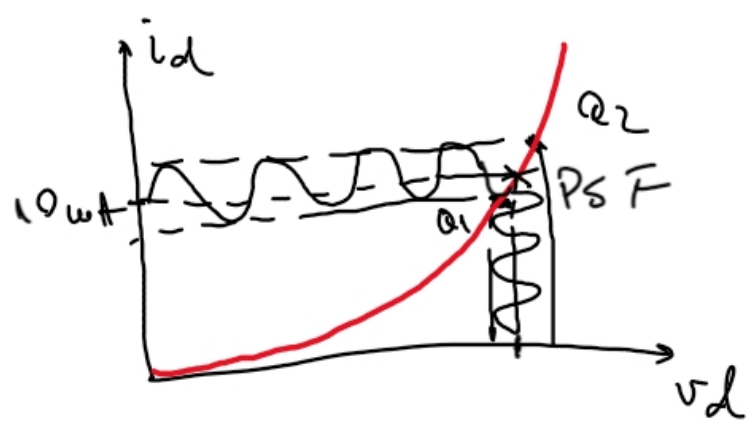
$$\Rightarrow I_L = I_{SC} - \frac{1}{R} \cdot V_L$$
 - ecuația de sarcină
 o dreaptă → dreapta de sarcină



PSF (punct static de funcționare)

Q.

Panta de semnal mic → legată de rezistența dinamică (AC) ("dynamic resistance").



$Q_2 - Q_1$ - coeficient de mică
 ↓
 caract. $i_d = f(v_d)$ → liniară

$$r_d = \frac{dv_d}{di_d} = \frac{\Delta v_d}{\Delta i_d}$$

$$g_m = \frac{di_d}{dv_d} = \frac{1}{r_d}$$

r_d - rezistență dinamică

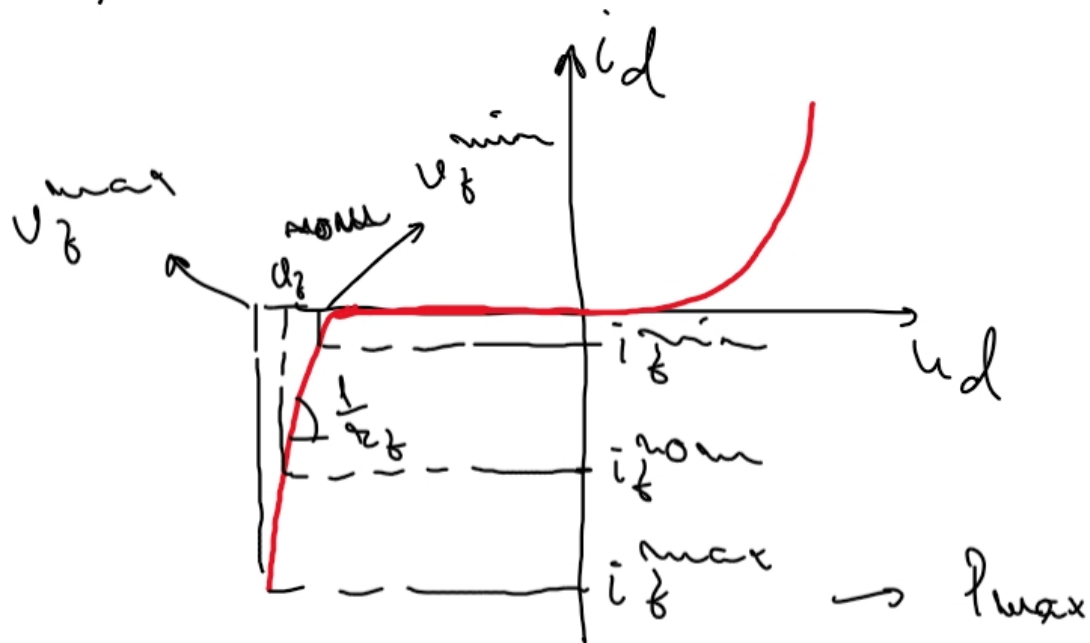
1N4148

$$di_d/dv_d \Rightarrow g_m = 0.172 \frac{A}{V} \Rightarrow r_d = 5.81 \Omega$$

slope → $g_m = 0.171 \frac{A}{V} \Rightarrow r_d = 5.85 \Omega$

Dioda stabilizatoare (Zener);

- funcționează în polarizare inversă
- menține la bornele sale o tensiune constantă (U_f^{nom})

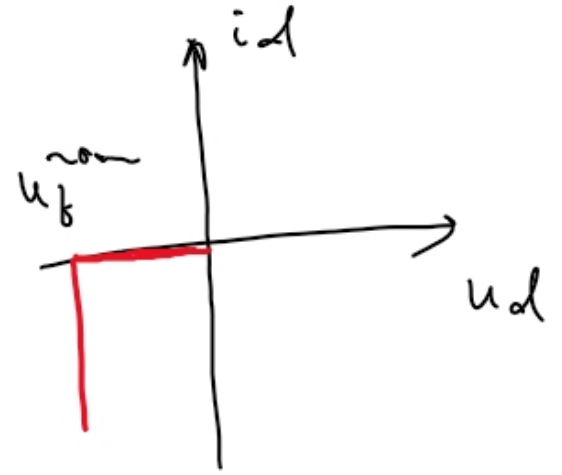
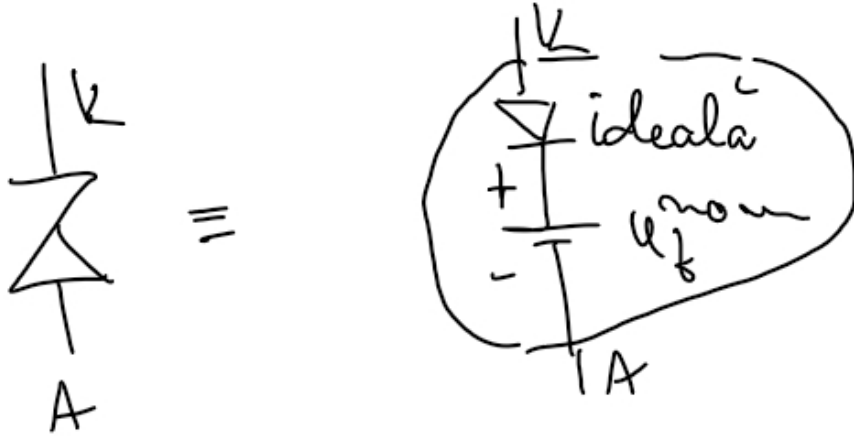


simbol

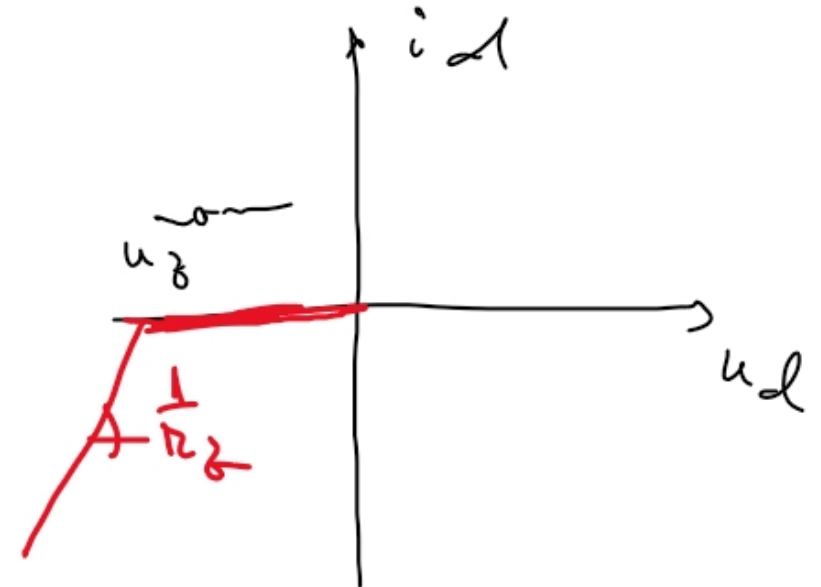
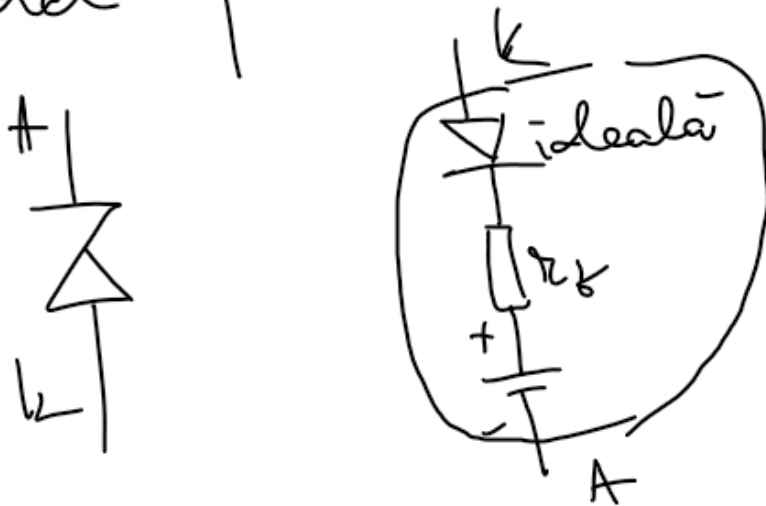


Modele ale diodei Zener:

1.) Dioda idealizată:



2.) Model practic:



PT 24.7 B

$$u_z^{\text{nom}} = 4.7 - 5.2 \text{ V}$$

$$R_z^{\text{max}} = 10 \Omega$$

$$i_z = 40 \text{ mA}$$

$$P_{\text{max}} = 1 \text{ W}$$

dim caract. $u-i \Rightarrow u_z = 4.925 \text{ V}$

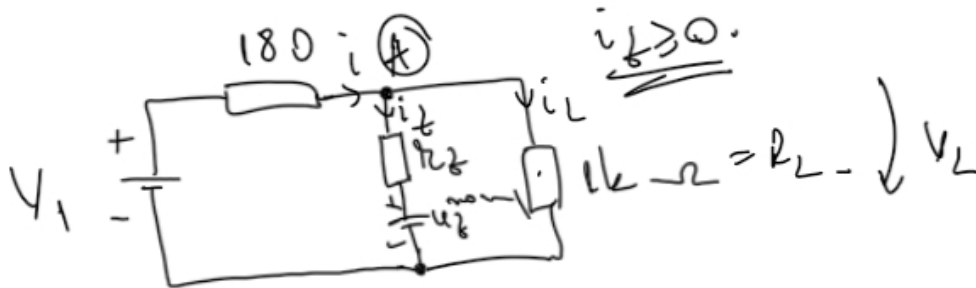
în jurnal bei $i_d = 40 \text{ mA} \pm 0.5 \text{ mA} \Rightarrow$

$$\Rightarrow \frac{1}{R_z} = 0.206 \Omega^{-1} \Rightarrow$$

$$\Rightarrow R_z = 4.85 \Omega$$

$$P_{\text{max}} = (I_z^{\text{max}})^2 \cdot R_z \Rightarrow I_z^{\text{max}} = \sqrt{\frac{P_{\text{max}}}{R_z}} = \sqrt{\frac{1 \text{ W}}{4.85 \Omega}} =$$

$$= 0.454 \text{ A} = 454 \text{ mA}$$



$$V_1 = ? \leftarrow i_z > 0$$

$$V_1 = ? \rightarrow V_A > u_z^{\text{nom}}$$

