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grupa 4.2.

### Lucrarea 3 - partea SI

$$V_{AA} = 15 \text{ V}$$

$$R_A = 10 \text{ k}\Omega$$

$$V_L = 0 \text{ V}; V_S = 5 \text{ V}$$

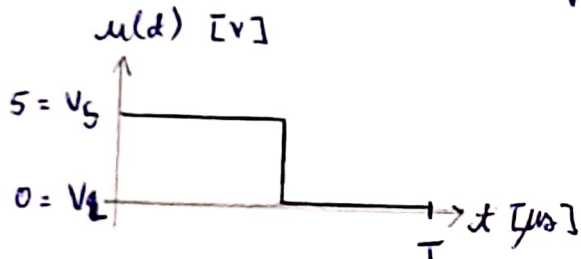
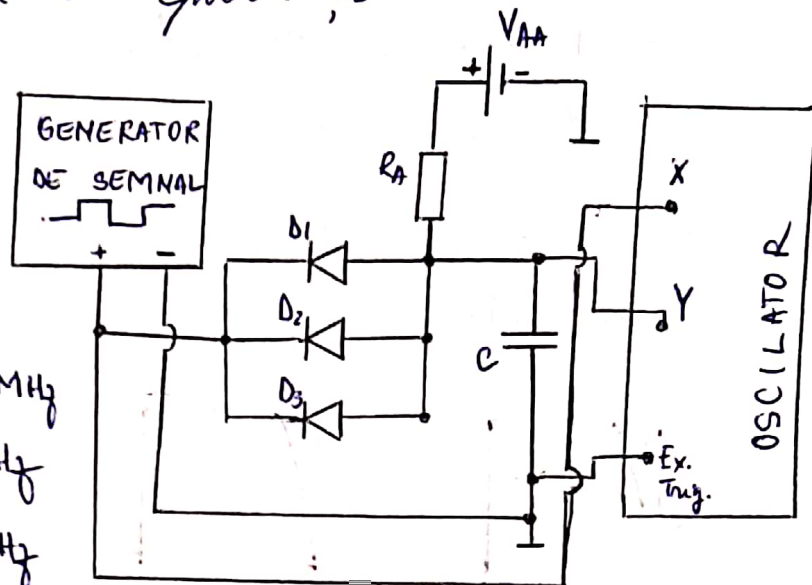
$$T = 20 \mu\text{s}$$

$$f = \frac{1}{T}$$

$$\Rightarrow f = 0,05 \text{ MHz}$$

$$f = 50 \text{ kHz}$$

$$t_{ci} = 10 \mu\text{s} \Rightarrow f_{ci} = 25 \text{ kHz}$$



$$t_n = RC \cdot \ln 2$$

$$\ln 2 = 0,6931$$

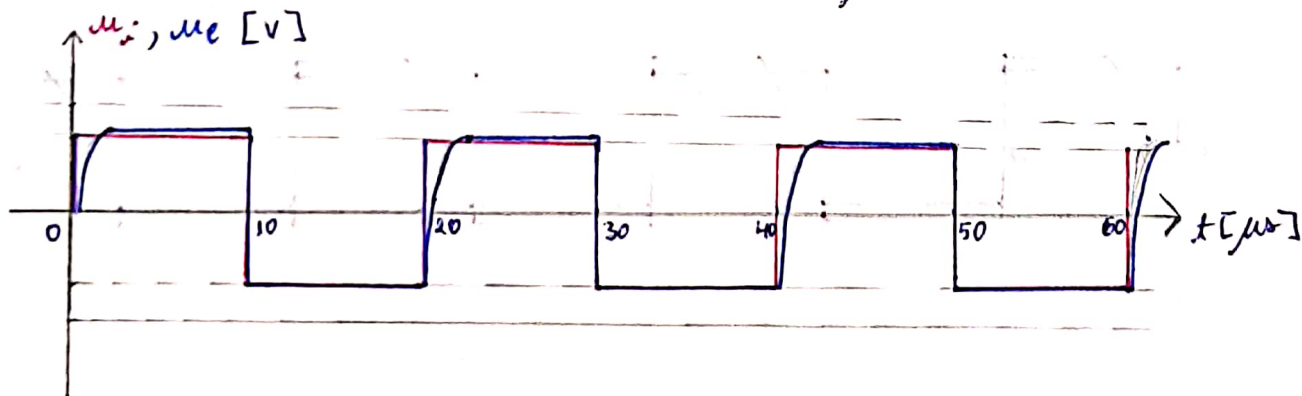
I.  $V_{AA} = 15 \text{ V}$ ,  $C = 100 \text{ pF}$

$$RC = 10 \cdot 10^3 \cdot 100 \cdot 10^{-12} = 10^{-6} \text{ s} = 1 \mu\text{s}$$

$$t_n = 1 \mu\text{s} \cdot 0,6931 = 0,6931 \mu\text{s}$$

• valoare mărită:  $t_n = 681,818 \text{ ns}$

$$t_n = 0,6818 \mu\text{s}$$

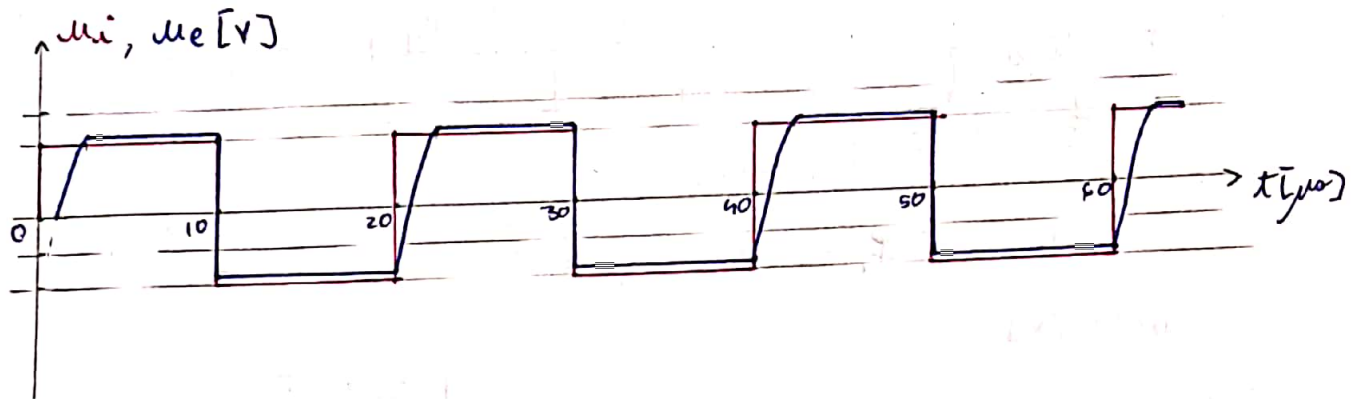


II.  $V_{AA} = 15 \text{ V}$ ,  $C = 220 \text{ pF}$

$$RC = 10 \cdot 10^3 \cdot 220 \cdot 10^{-12} = 22 \cdot 10^{-4} \text{ s} = 2,2 \mu\text{s}$$

$$\tau_n = 2,2 \cdot 0,6931 = 1,5248 \mu\text{s}$$

• *valore măsurată* :  $\tau_n = 1,136 \mu\text{s}$

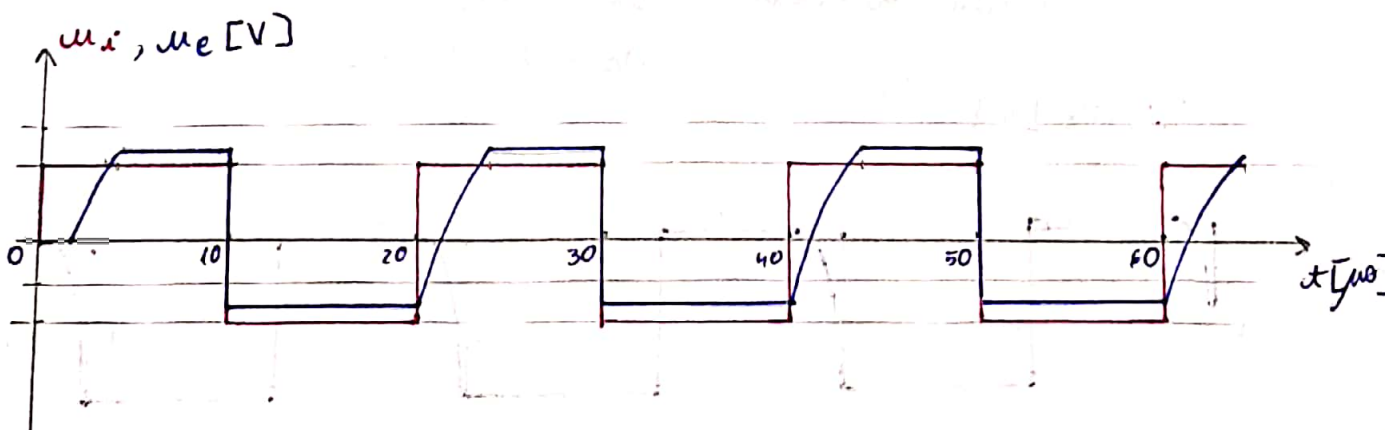


III.  $V_{AA} = 15 \text{ V}$ ,  $C = 470 \text{ pF}$

$$RC = 10 \cdot 10^3 \cdot 470 \cdot 10^{-12} = 47 \cdot 10^{-4} \text{ s} = 4,7 \mu\text{s}$$

$$\tau_n = 4,7 \cdot 0,6931 = 3,2546 \mu\text{s}$$

• *valore măsurată* :  $\tau_n = 2,121 \mu\text{s}$

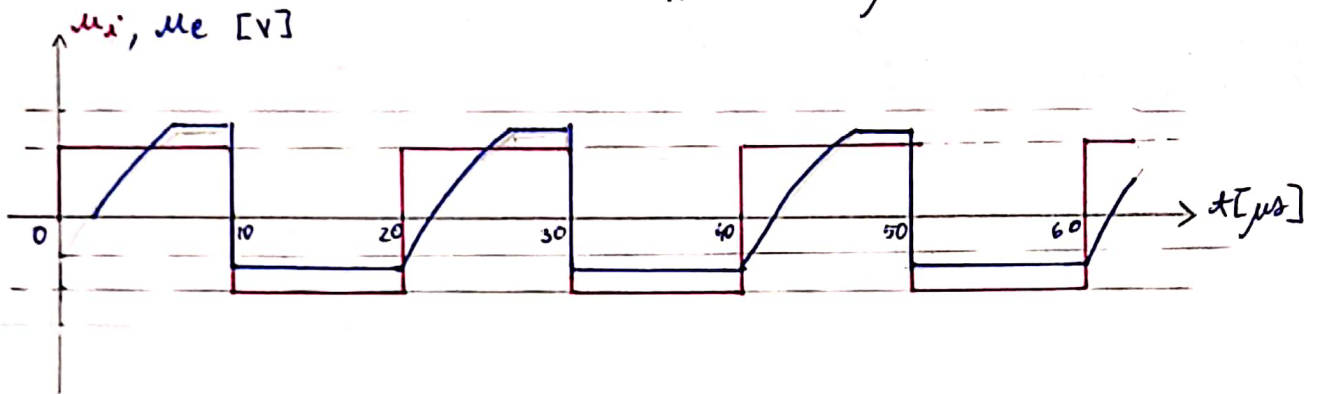


IV.  $V_{AA} = 15 \text{ V}$ ,  $C = 1 \text{ nF}$

$$RC = 10 \cdot 10^3 \cdot 10^{-9} = 10^{-5} \text{ s} = 10 \mu\text{s}$$

$$t_R = 10 \cdot 0,6931 = 6,931 \mu\text{s}$$

• valoare măsurată:  $t_n = 5,152 \mu\text{s}$

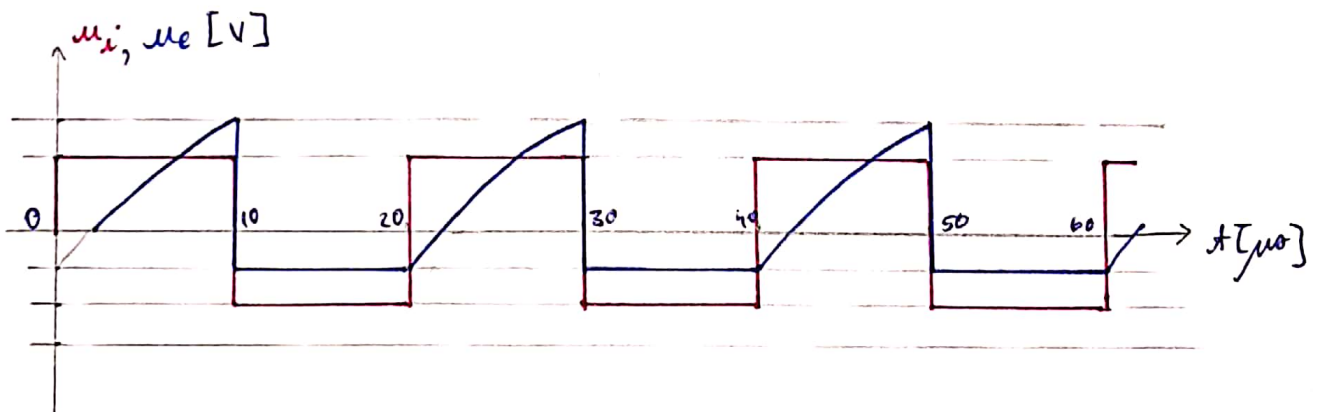


V.  $V_{AA} = 15 \text{ V}$ ,  $C = 1,5 \text{ nF}$

$$RC = 10 \cdot 10^3 \cdot 1,5 \cdot 10^{-9} = 1,5 \cdot 10^{-5} = 15 \mu\text{s}$$

$$t_n = 15 \cdot 0,6931 = 10,3965 \mu\text{s}$$

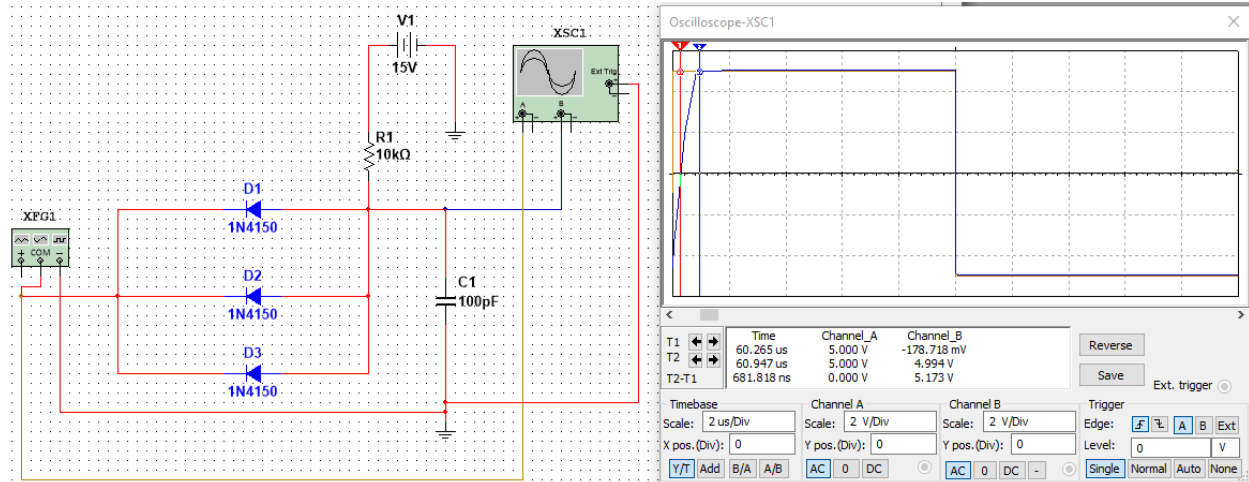
• valoare măsurată:  $t_n = 7,5 \mu\text{s}$



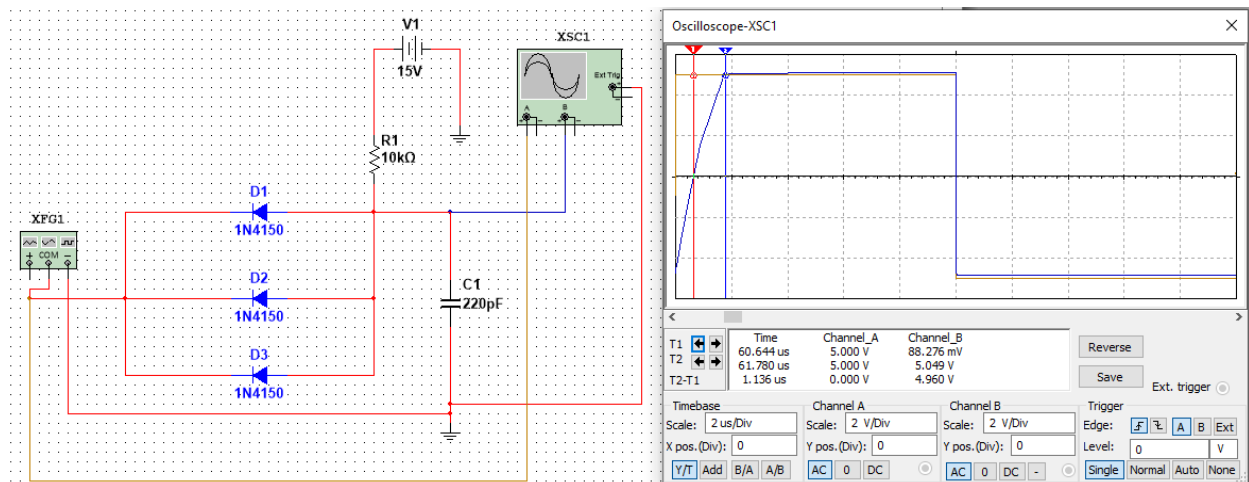
## Măsurări în Multisim – 50 kHz

Pentru  $V_{AA} = 15\text{ V}$  și:

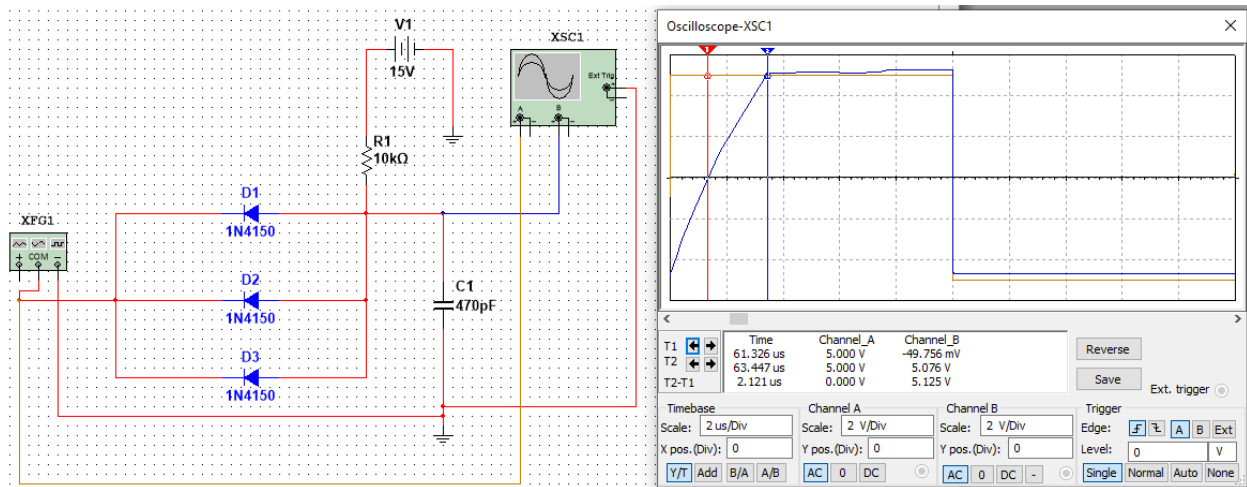
- $C = 100\text{ pF}$



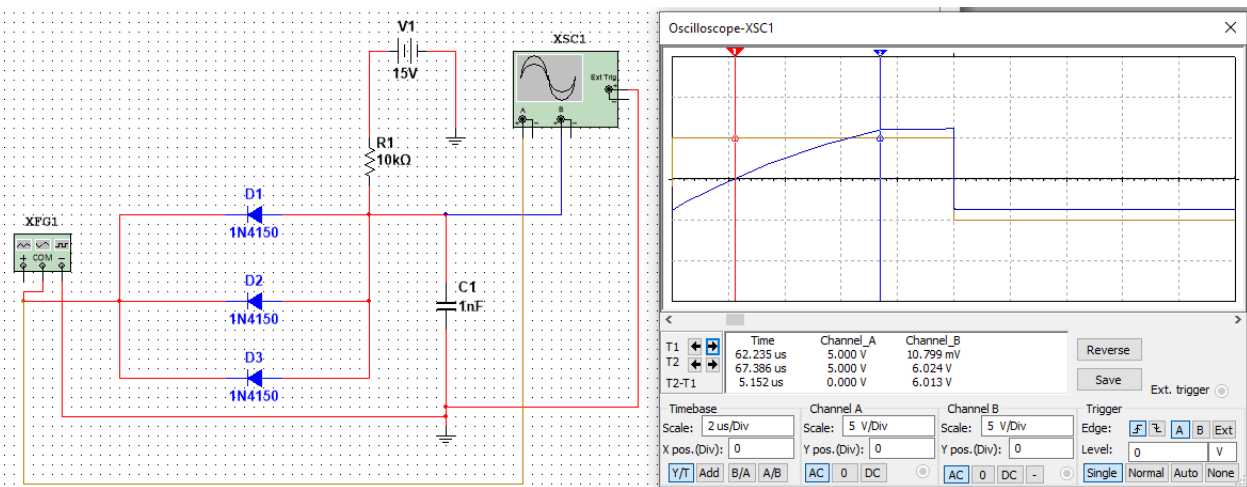
- $C = 220\text{ pF}$



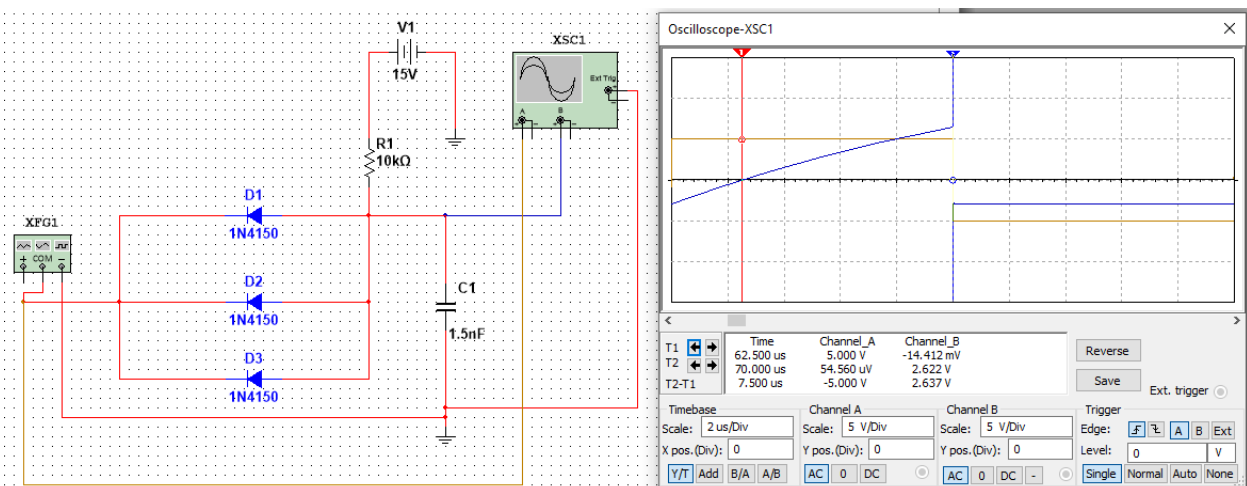
- $C = 470 \text{ pF}$



- $C = 1 \text{ nF}$

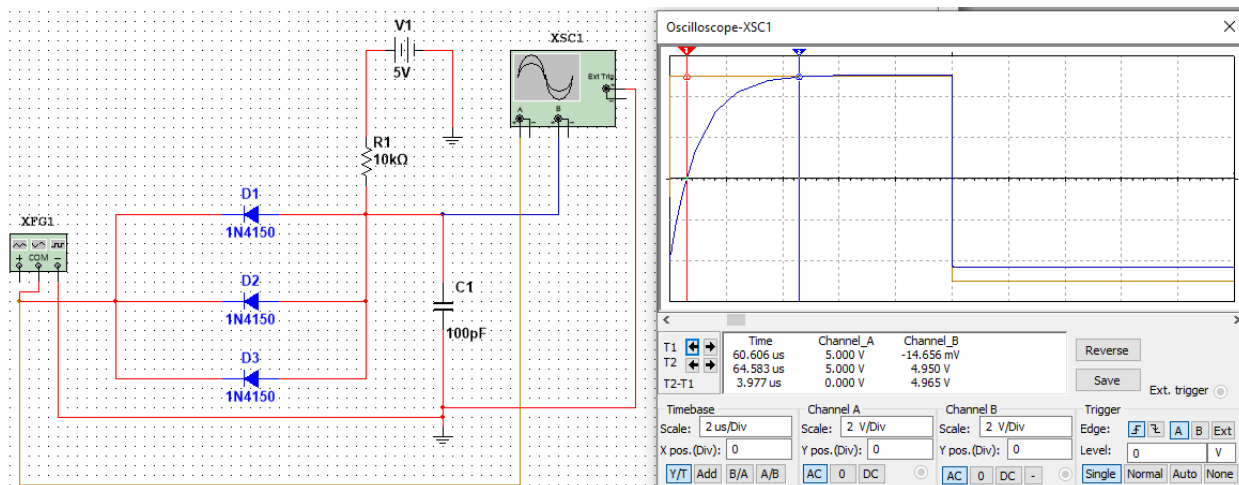


- $C = 1.5 \text{ nF}$

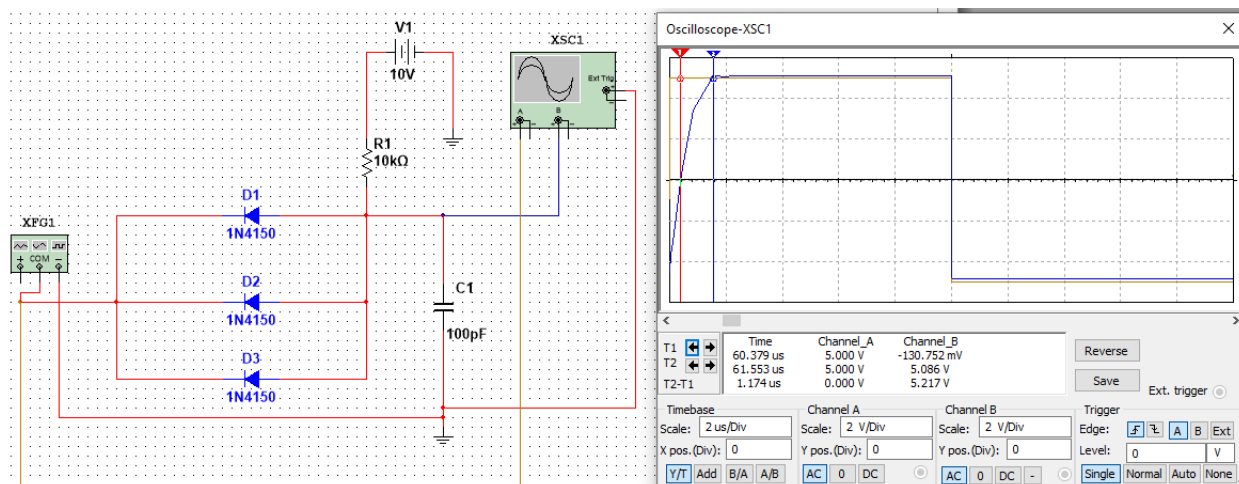


Pentru  $C = 100 \text{ pF}$  și:

- $V_{AA} = 5 \text{ V}$



- $V_{AA} = 10 \text{ V}$



- $V_{AA} = 20 \text{ V}$

