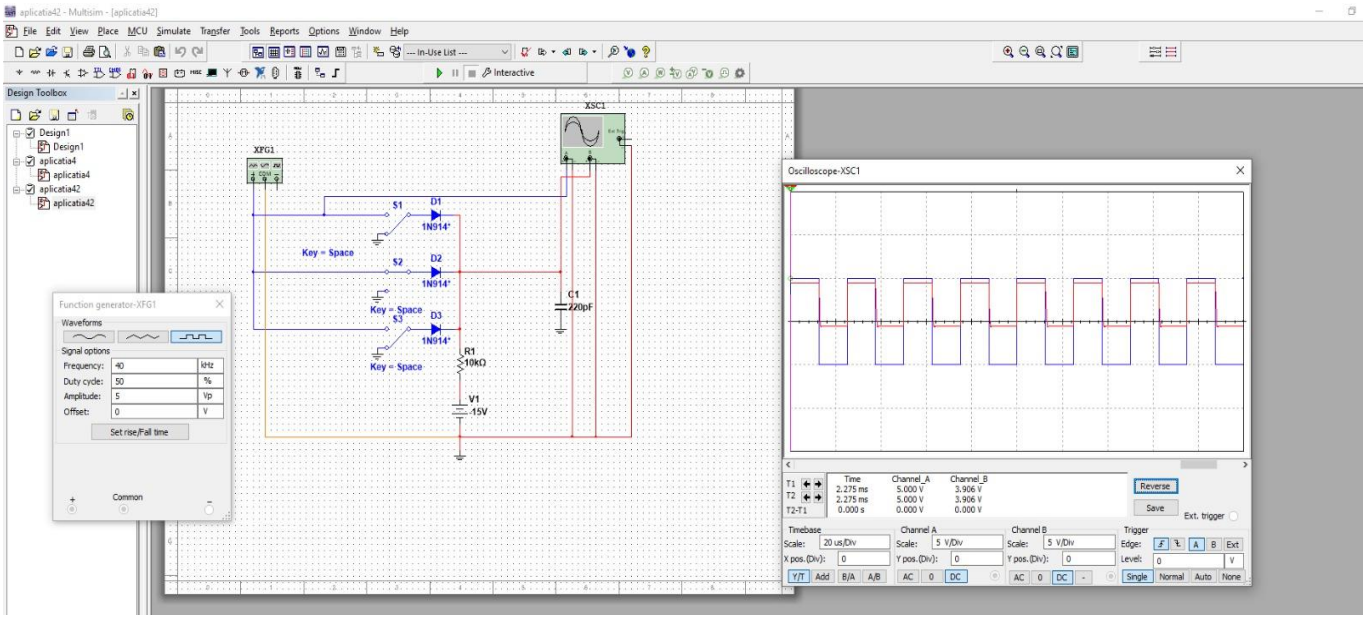
Aplicatia 4 – Berejnec Adrian-Daniel

Montaj Figura 5 :

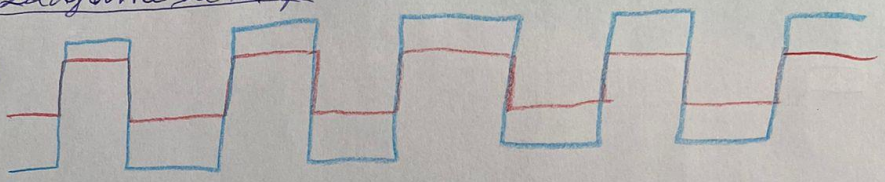


Berejnec Adrian-Daniel
1.1

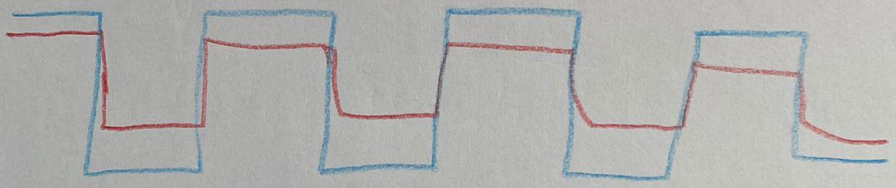
Aplicația 4 CD

Diagrame de timp:

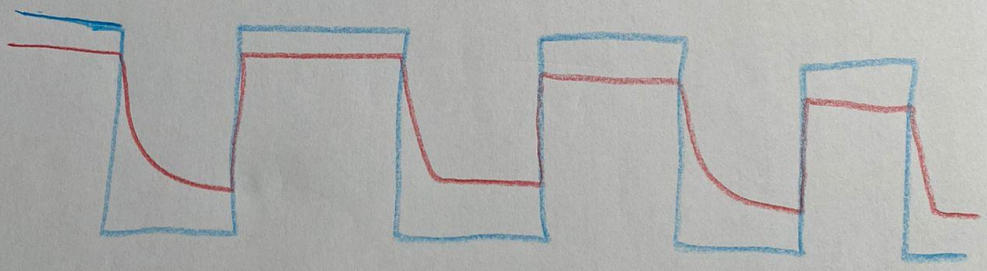
1)



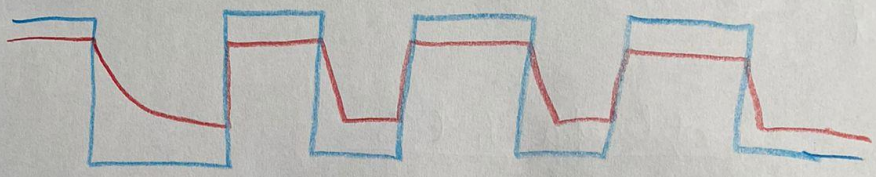
2)



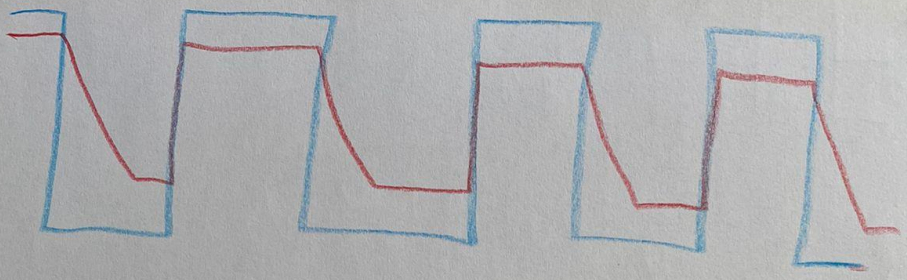
3)



4)



5)



Calcule teoretice pentru timpul de coborâre:

$$t_c = R_0 \cdot C \cdot \ln\left(\frac{-V_\infty - 0,9 \cdot V}{-V_\infty - 0,1 \cdot V}\right)$$

$V_\infty = -15\,V$

$R_0 = 10k\Omega$

$V_1 = 0V$; $V_S = 5V$

1) $C_p = 100\,nF$

$$t_c = 10^4 \cdot 100 \cdot 10^{-12} \cdot \ln\left(\frac{+15 - 0,9 \cdot 5}{15 - 0,1 \cdot 5}\right) =$$

$$= 10^{-6} \cdot \ln\frac{10,5}{14,5} = 10^{-6} \cdot \ln(0,72)$$

$$= -0,33 \cdot 10^{-6} = -0,33\,\mu s$$

2) $C_p = 220\,nF$

$$t_c = 10^4 \cdot 220 \cdot 10^{-12} \cdot (-0,33) = -72,6 \cdot 10^{-8}\,s = -0,73\,\mu s$$

3) $C_p = 470\,nF$

$$t_c = 10^4 \cdot 470 \cdot 10^{-12} \cdot (-0,33) = -155,1 \cdot 10^{-7}\,s$$

$$= -1,55\,\mu s$$

4) $C_p = 1\,mF$

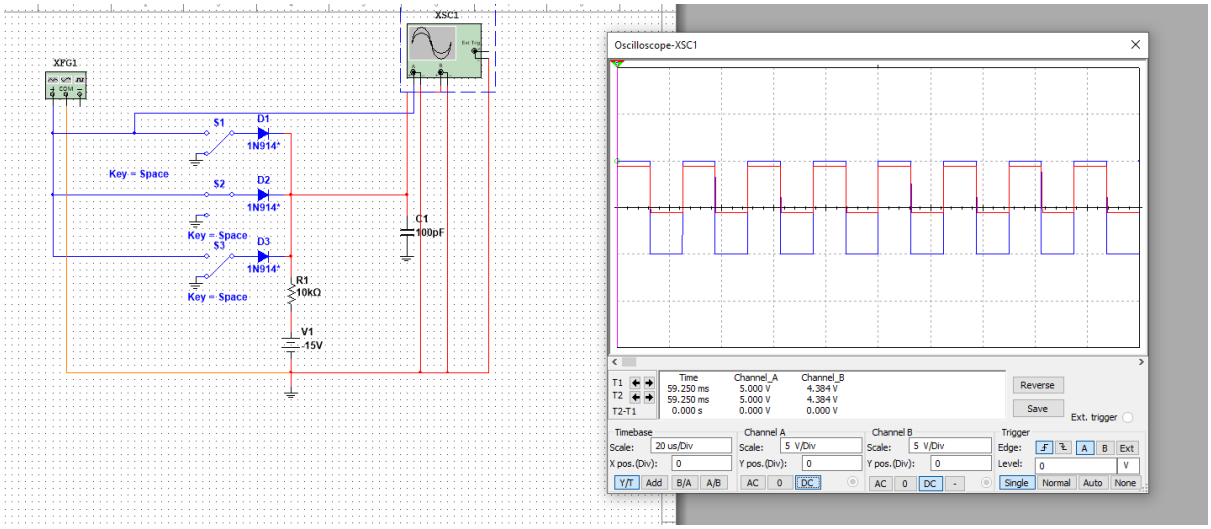
$$t_c = 10^4 \cdot 1 \cdot 10^{-9} \cdot (-0,33) = -0,33 \cdot 10^{-5} = -3,3\,\mu s$$

5) $C_p = 1,5\,mF$

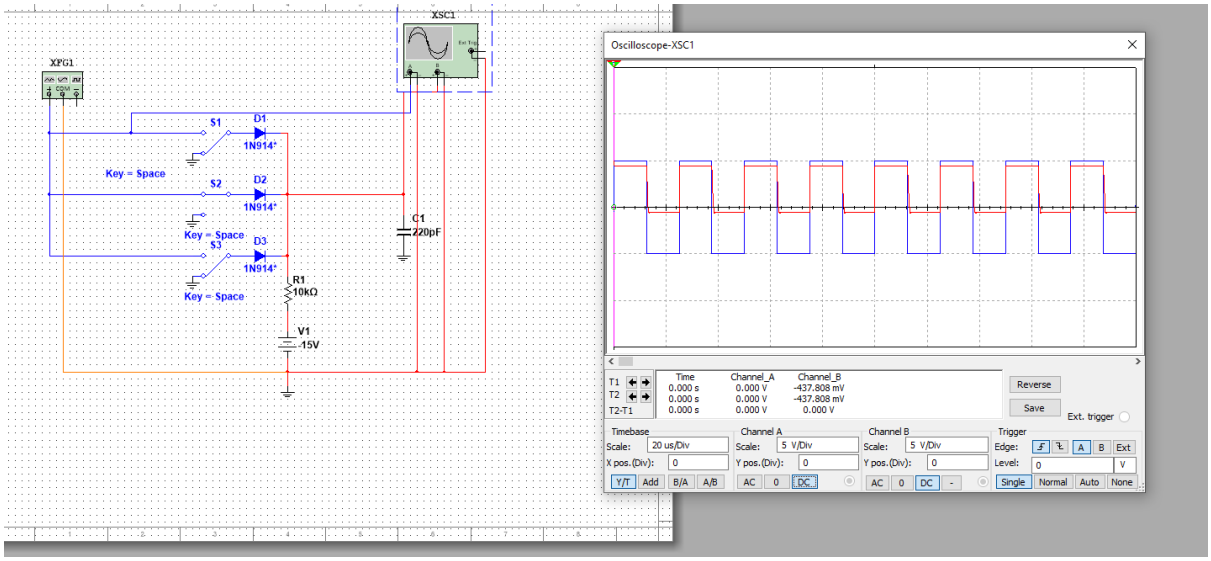
$$t_c = 10^4 \cdot 1,5 \cdot 10^{-9} \cdot (-0,33) = -0,49 \cdot 10^{-5} = -4,9\,\mu s$$

Masuratori simulare :

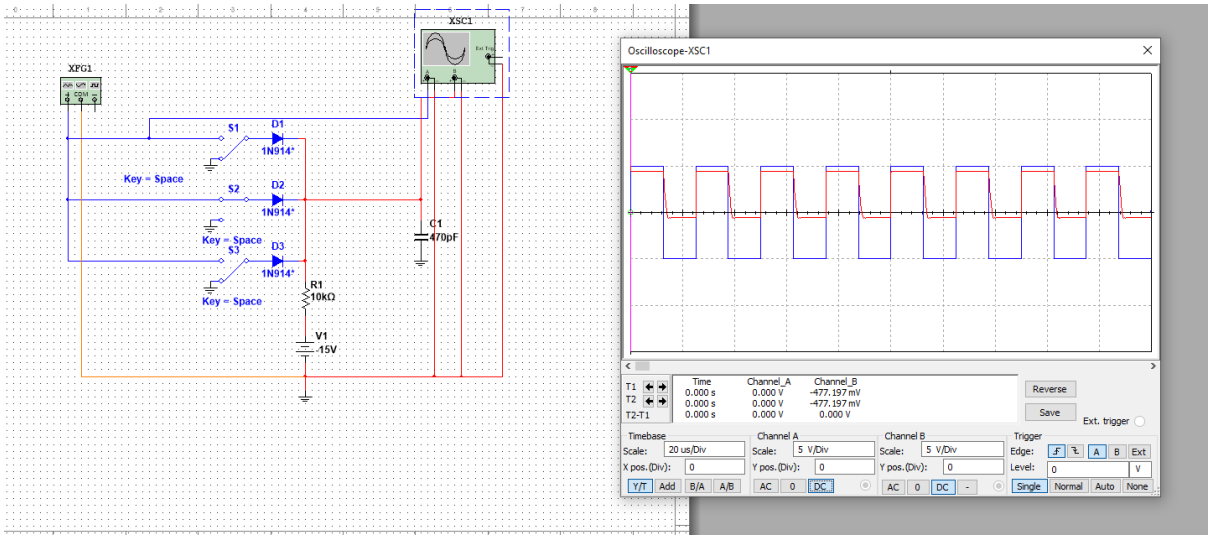
C = 100 pF



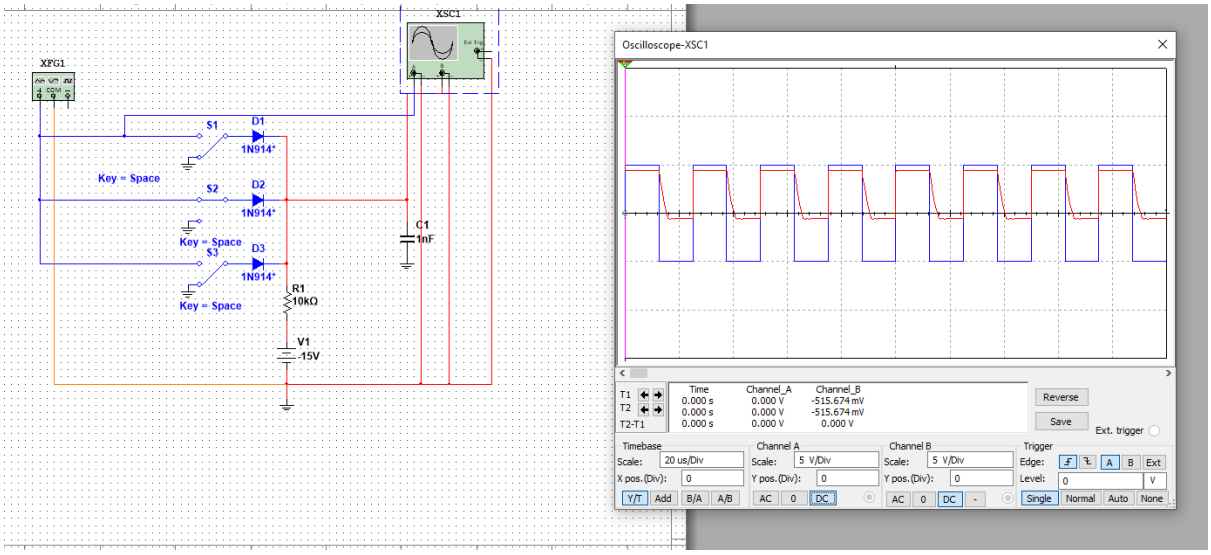
C = 220 pF



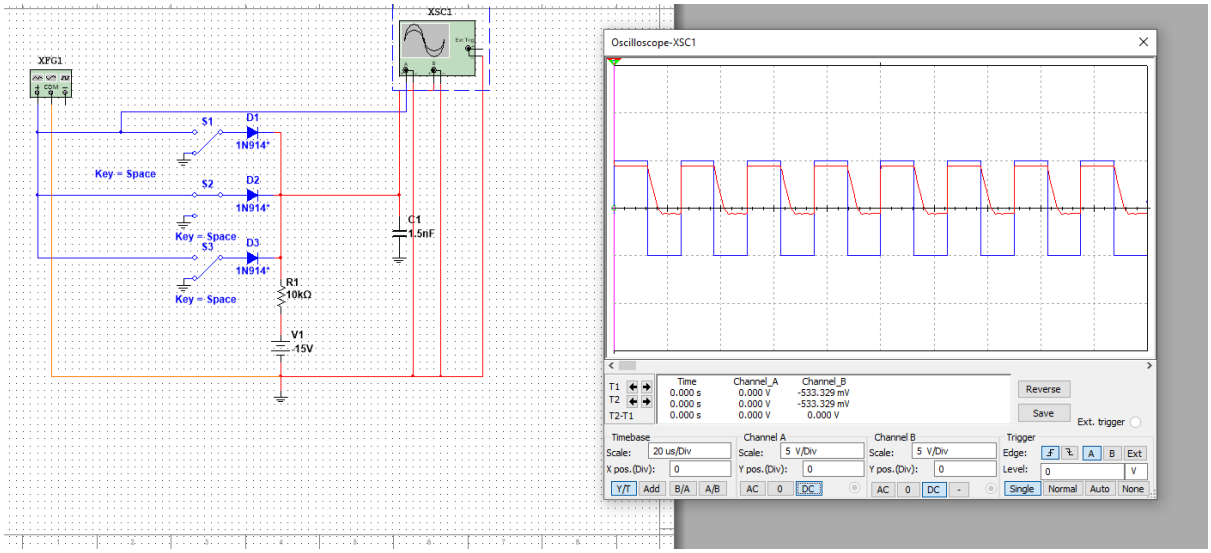
C = 470 pF


XFG1
XSC1
S1
D1
1N914*
Key = Space
S2
D2
1N914*
Key = Space
S3
D3
1N914*
Key = Space
C1
470pF
R1
10kΩ
V1
15V
Oscilloscope-XSC1
Time
Channel_A
Channel_B
0.000 s
0.000 V
-477.197 mV
0.000 s
0.000 V
-477.197 mV
0.000 s
0.000 V
0.000 V
T1
T2
T2-T1
Reverse
Save
Ext. trigger
Timebase
Scale: 20 us/Div
X pos.(Div): 0
Channel A
Scale: 5 V/Div
Y pos.(Div): 0
Channel B
Scale: 5 V/Div
Y pos.(Div): 0
Trigger
Edge:
Level: 0 V
Y/T
Add
B/A
A/B
AC
0
DC
Single
Normal
Auto
None

C = 1 nF


XFG1
XSC1
S1
D1
1N914*
Key = Space
S2
D2
1N914*
Key = Space
S3
D3
1N914*
Key = Space
C1
1nF
R1
10kΩ
V1
15V
Oscilloscope-XSC1
Time
Channel_A
Channel_B
0.000 s
0.000 V
-515.674 mV
0.000 s
0.000 V
-515.674 mV
0.000 s
0.000 V
0.000 V
T1
T2
T2-T1
Reverse
Save
Ext. trigger
Timebase
Scale: 20 us/Div
X pos.(Div): 0
Channel A
Scale: 5 V/Div
Y pos.(Div): 0
Channel B
Scale: 5 V/Div
Y pos.(Div): 0
Trigger
Edge:
Level: 0 V
Y/T
Add
B/A
A/B
AC
0
DC
Single
Normal
Auto
None

C = 1,5 nF


XSC1
XFG1
S1
D1
1N914*
Key = Space
S2
D2
1N914*
Key = Space
S3
D3
1N914*
Key = Space
C1
1.5nF
R1
10kΩ
V1
15V
Oscilloscope-XSC1
Time
Channel_A
Channel_B
T1
0.000 s
0.000 V
-533.329 mV
T2
0.000 s
0.000 V
-533.329 mV
T2-T1
0.000 s
0.000 V
0.000 V
Reverse
Save
Ext. trigger
Timebase
Scale: 20 us/Div
X pos.(Div): 0
Channel A
Scale: 5 V/Div
Y pos.(Div): 0
Channel B
Scale: 5 V/Div
Y pos.(Div): 0
Trigger
Edge:
Level: 0 V
Y/T
Add
B/A
A/B
AC
0
DC
Single
Normal
Auto
None