DEVICES LAB1 _ SOLID STATE DEVICES

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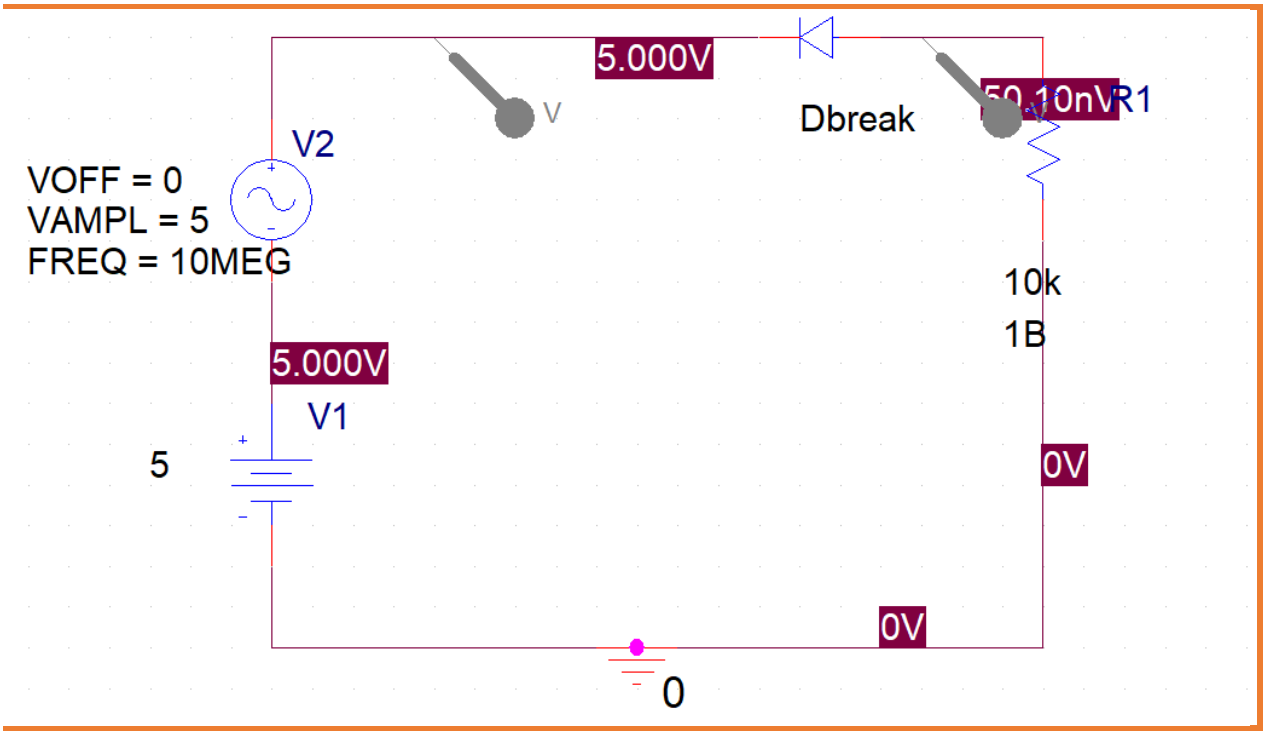
LAB 3

SECOND YEAR COMMUNICATION

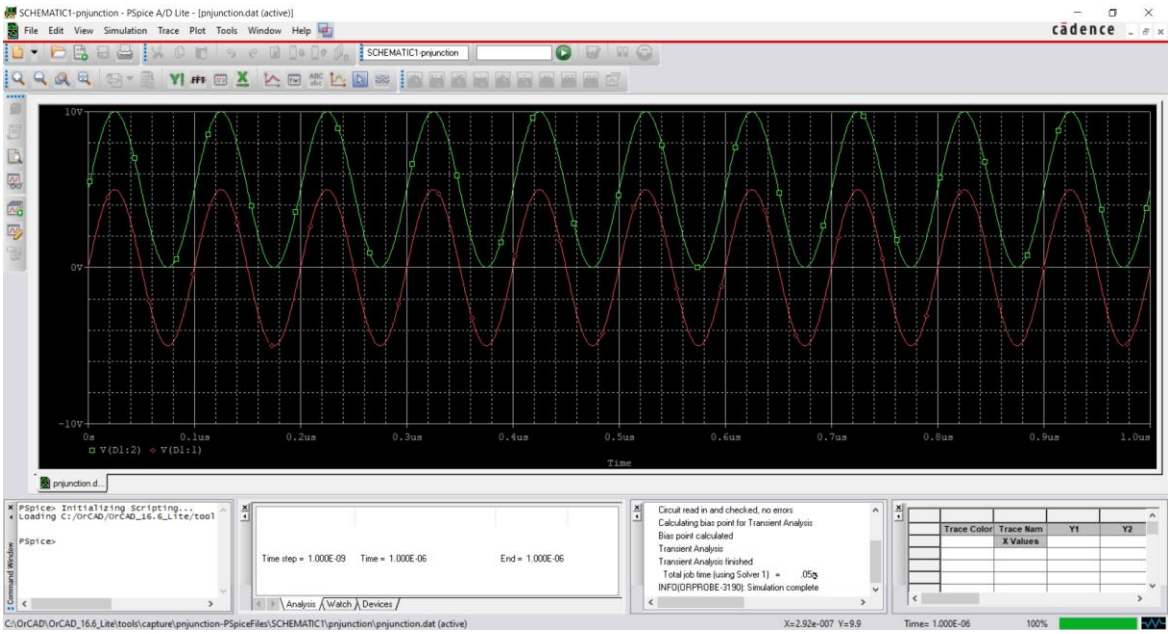
SOLID_STATE_ASSIGNMENT:

P-N_JUNCTION

1-cuircuit diagram :

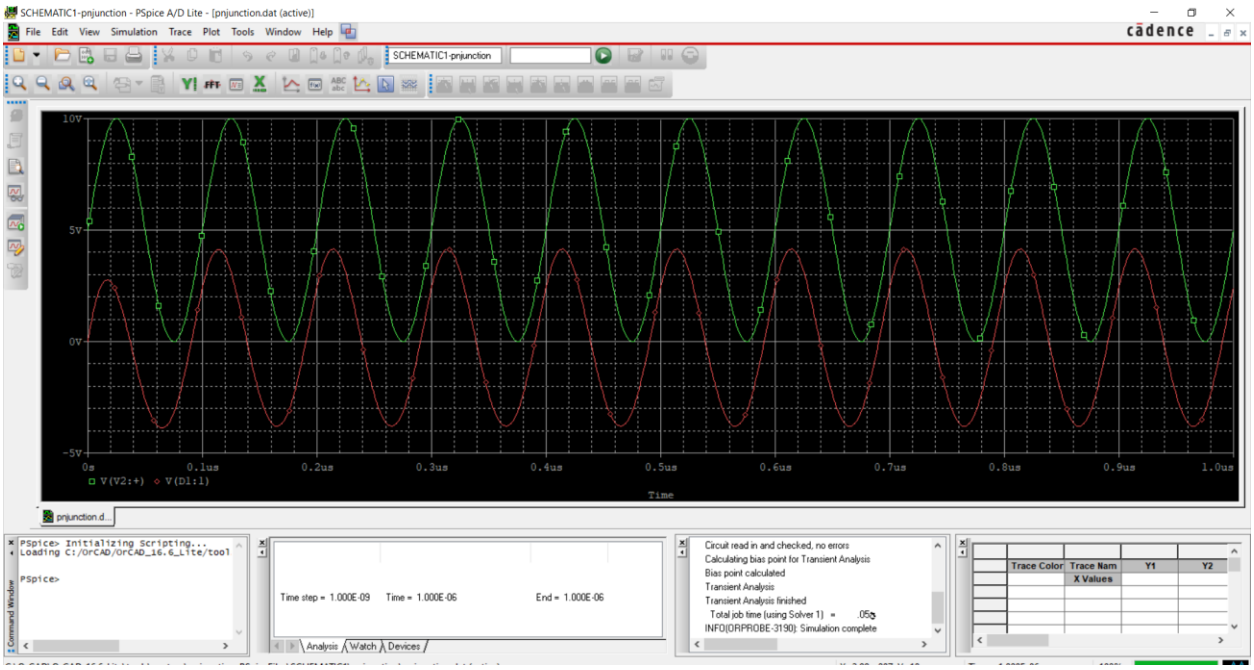


5 – It's observed that there are two sinusoidal waves with the same amplitude vd1 and vs



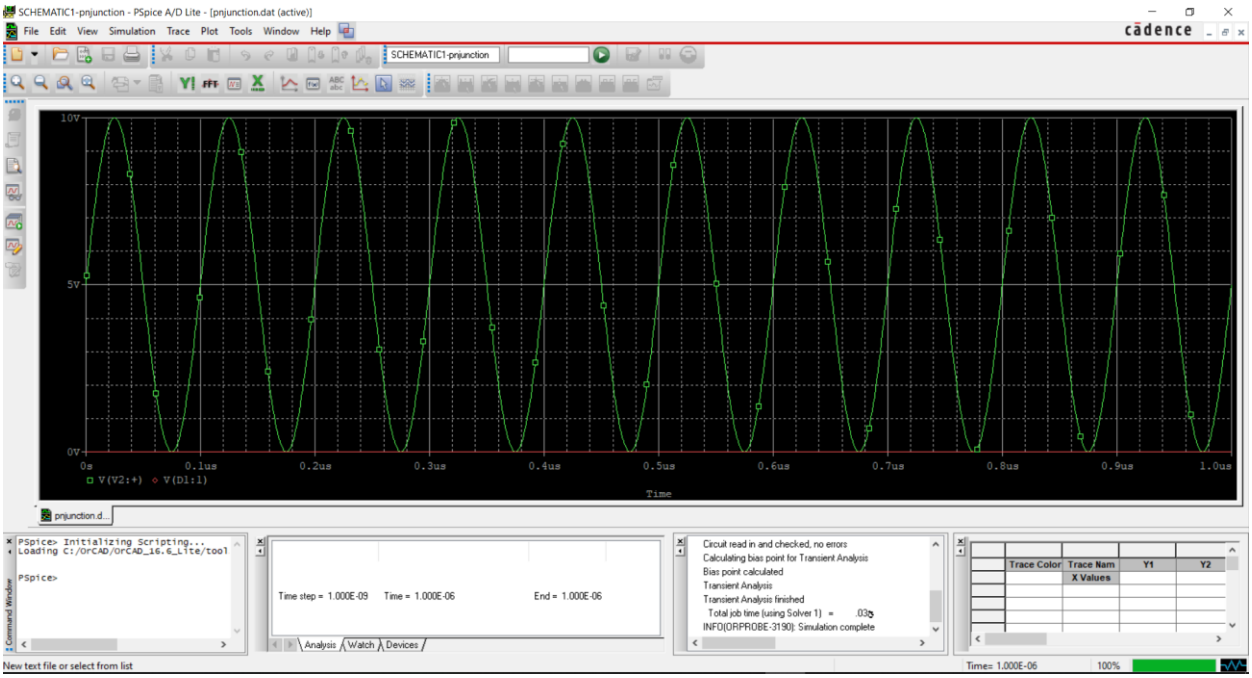
6-A. 5pF

When we change capacitance the amplitude of output delays and shifts because of the reduction of the capacitance



B.1e-20F:

When we make the input low capacitance we get low level of the output signal

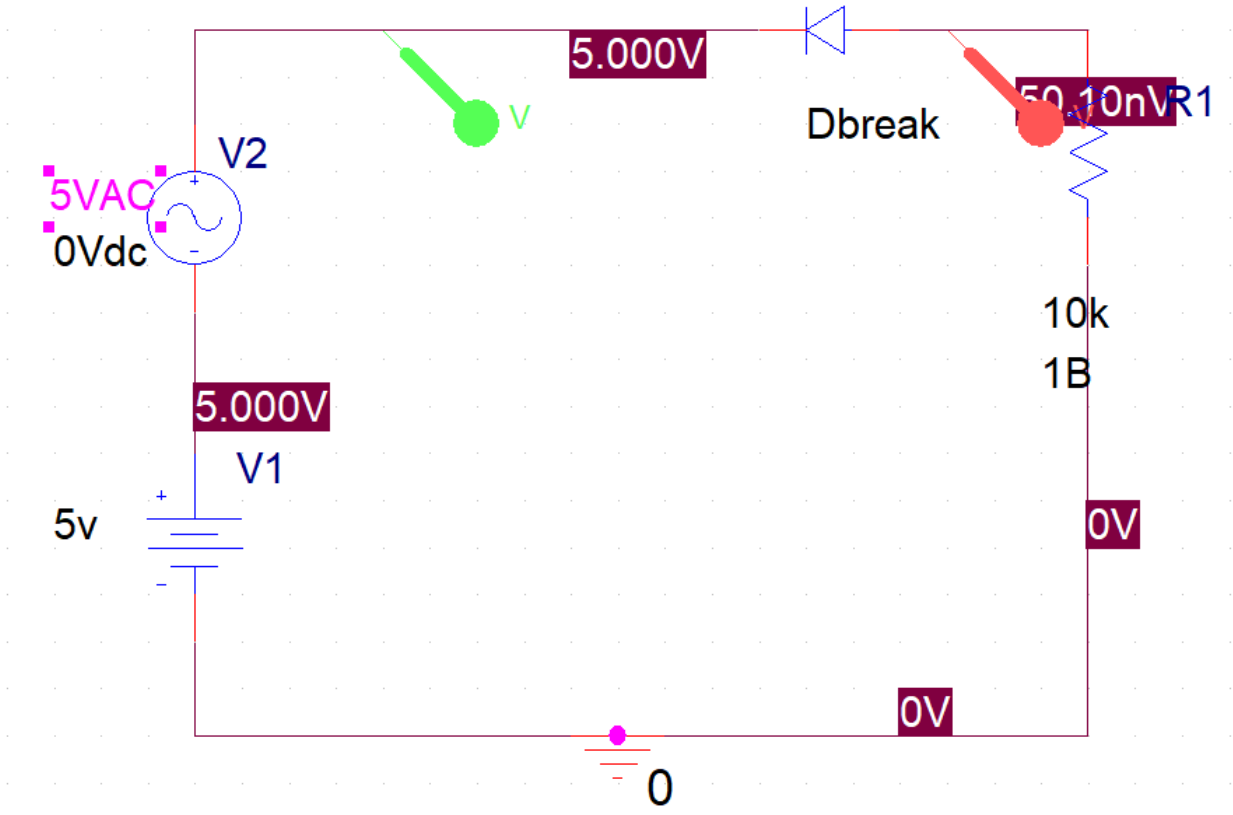


When we change the capacitance the out amplitude changes of vo

And Vd that’s the effect of the high pass filter (dbreak diode)

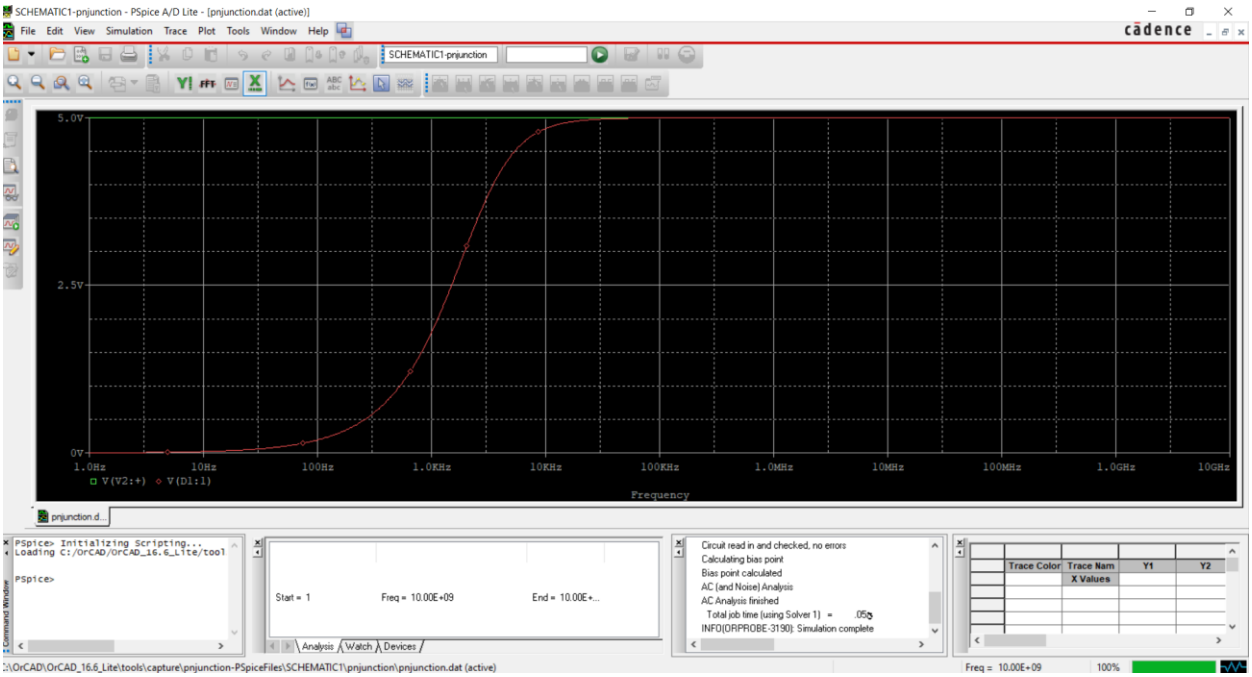
7- replace :

8-



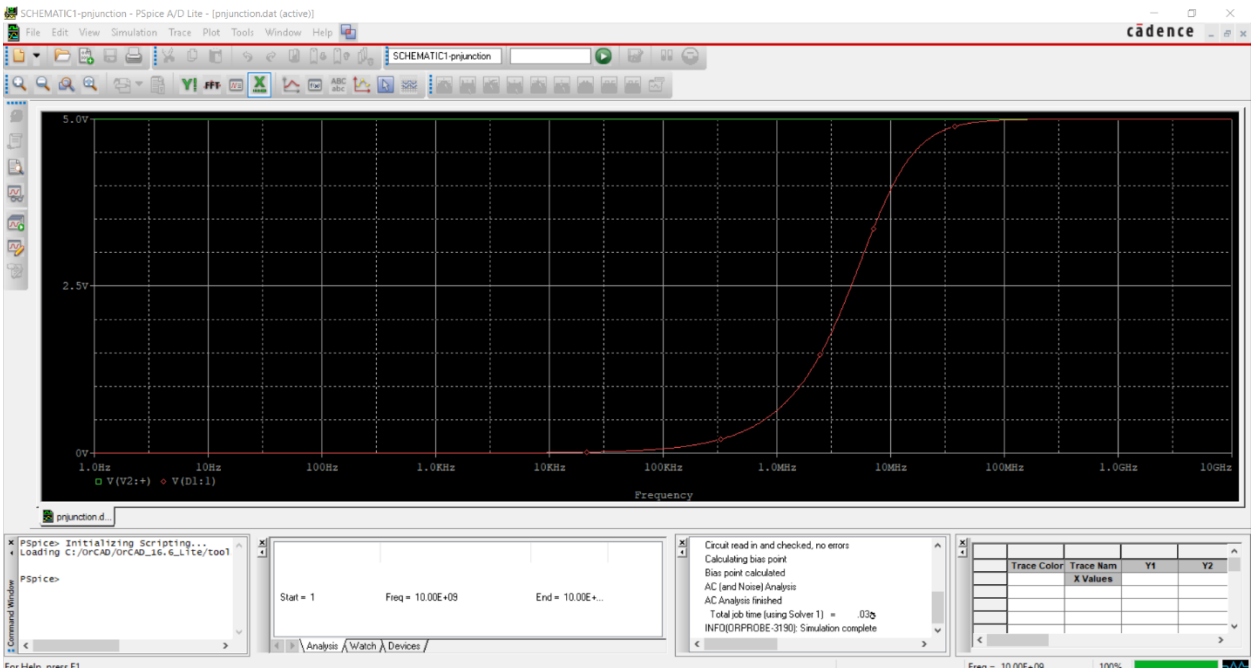
9-15nF

We see that the sweep of the input increases to a limit then it gets constant



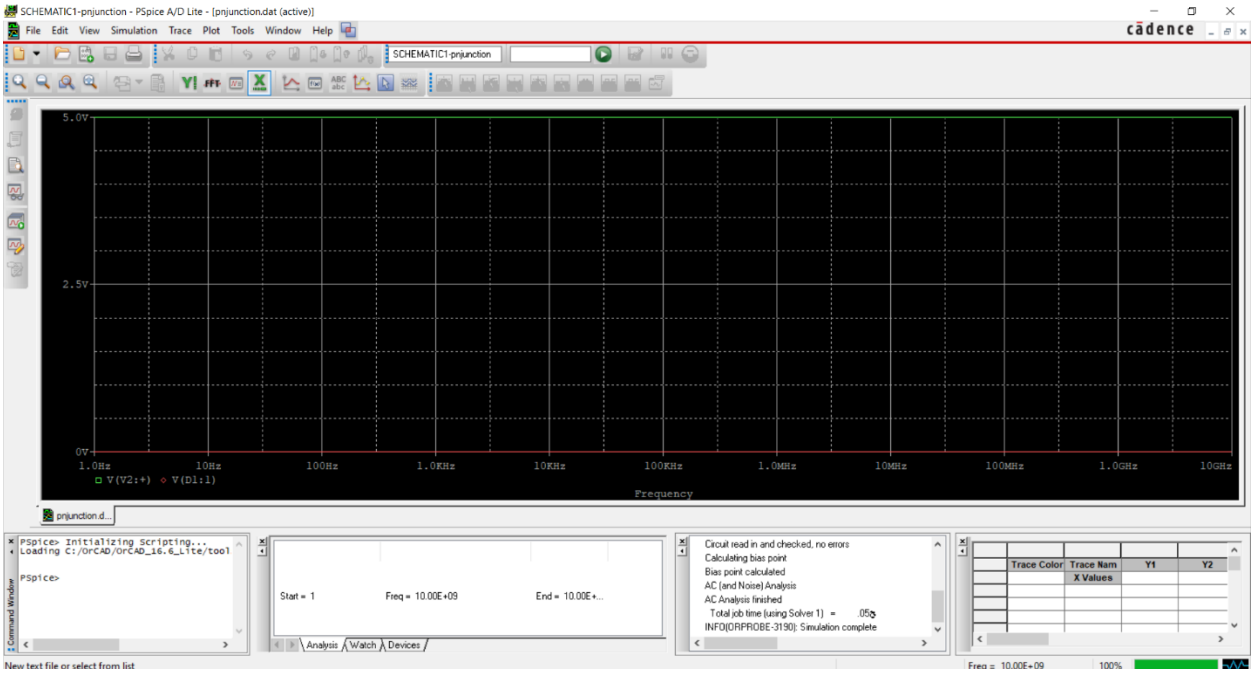
5pF

When we lower the capacitance we get delay in increasing the output to be constant



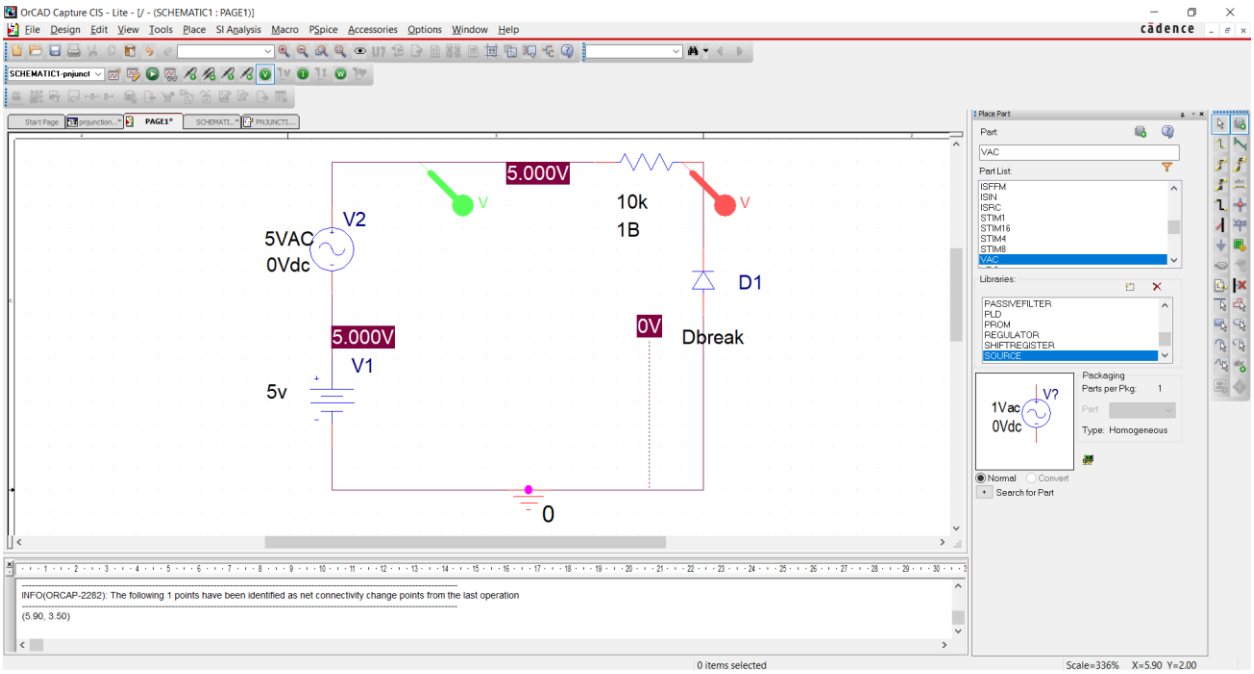
1e-20F

When we much lower the capacitance nothing passes because of the high pass cap



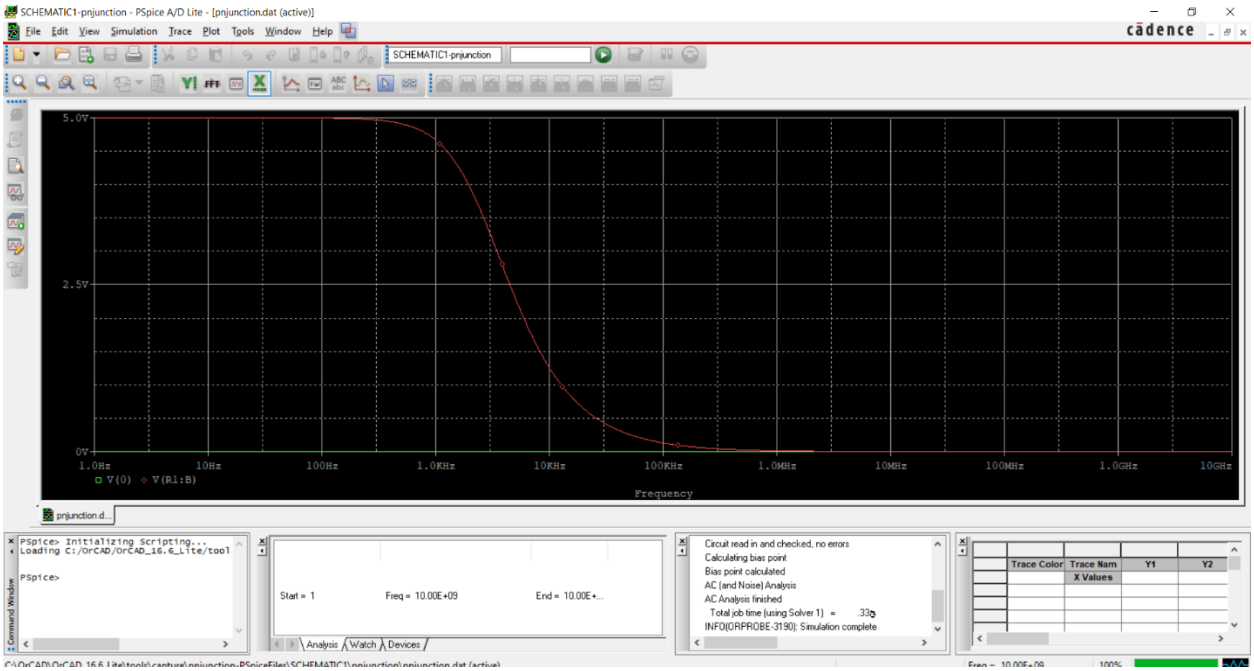
At low capacitance it take sometime because of the impedance of the filter when we increase capacitance it gets stable and become constant

10-circuit 2 :



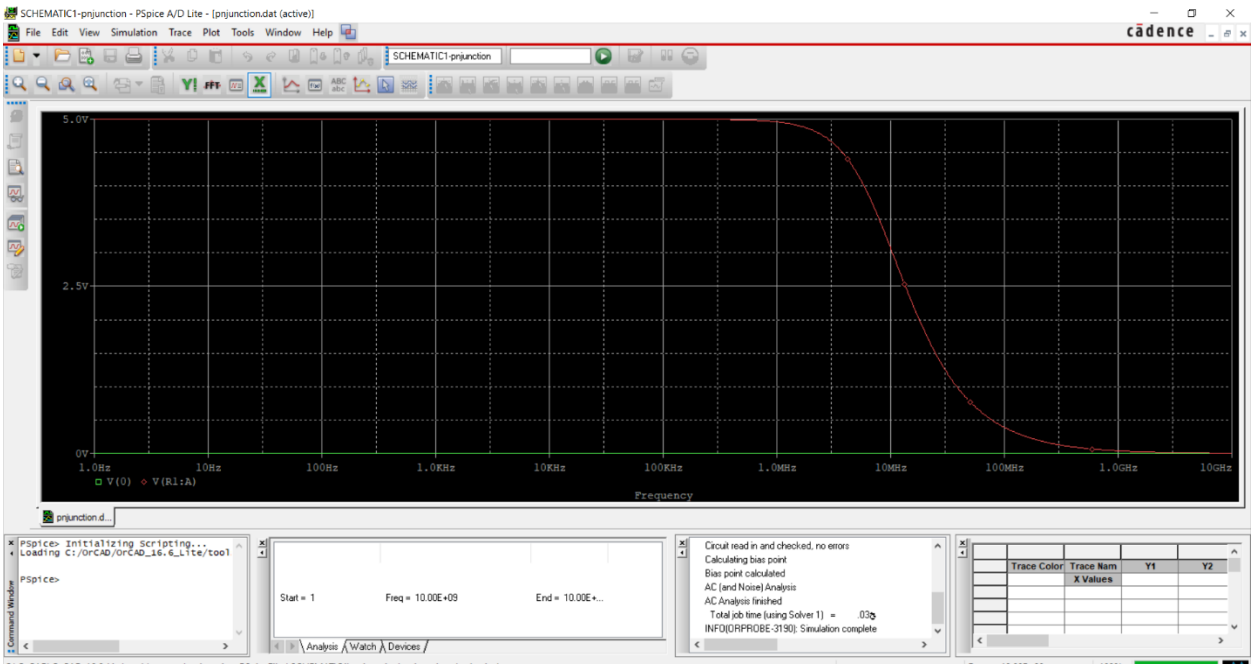
15nF

There is discharge in the voltage when we change the order of the components of the circuit and take few time when we set it to 15nF



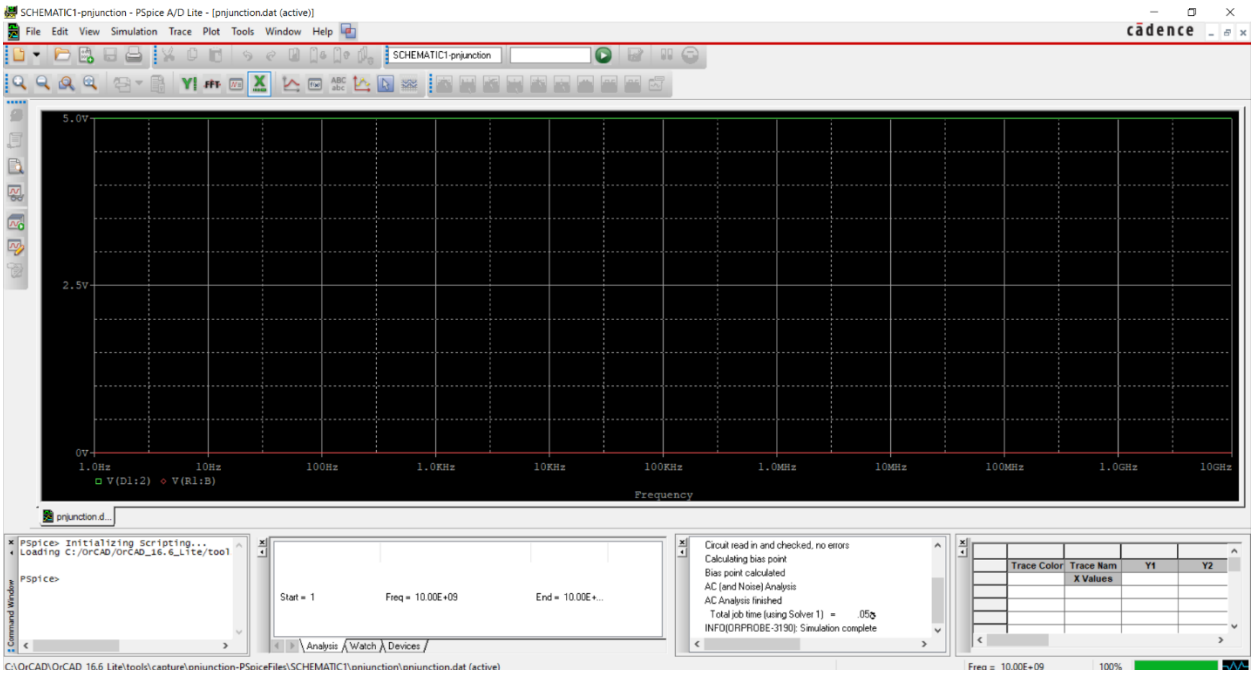
5pF

It take more time when we decrease the capacitance

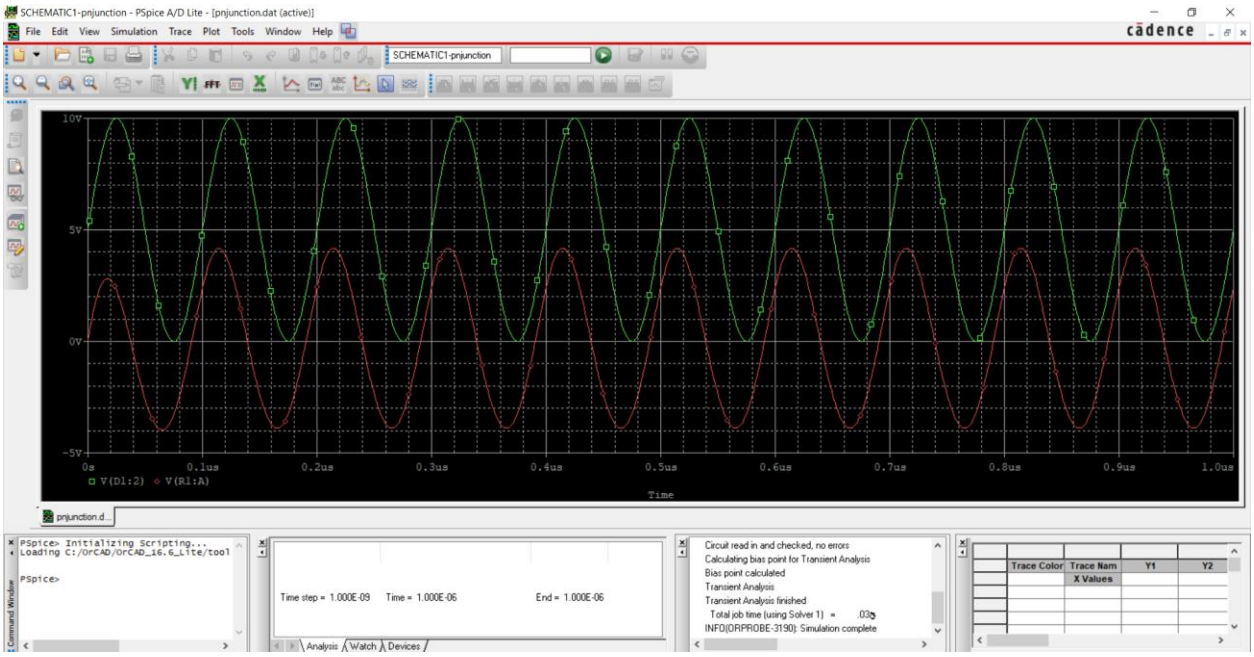


1e-20F

When we ultra decrease the cap. It discharges immediately



12- when we change the parameters of the diode to the given values in num 12 we get the same sinusoidal wave with some changes in the amplitude and the time shift as shown in figure



13- changing the input ac voltage and the vdc the output changes in amplitude and the wave length

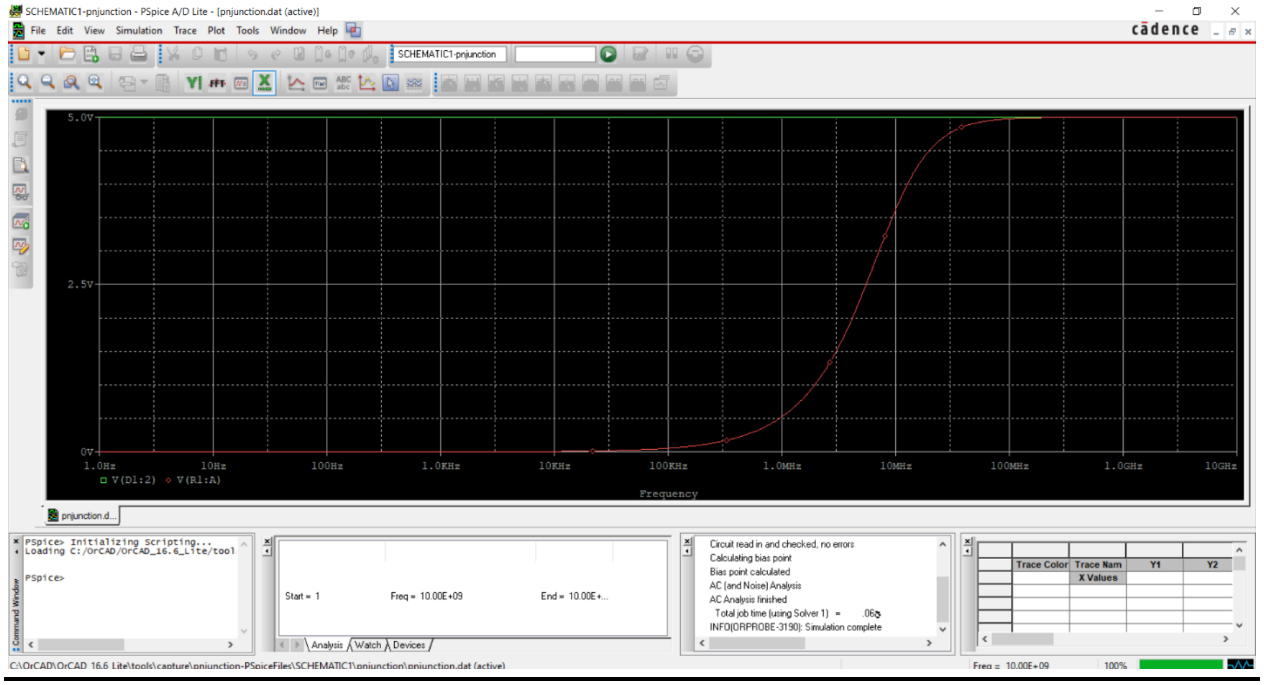

SCHEMATIC1-pnjunction - PSpice A/D Lite - [pnjunction.dat (active)]
File Edit View Simulation Trace Plot Tools Window Help
cadence
SCHEMATIC1-pnjunction
800mV
400mV
0V
-400mV
0s 0.1us 0.2us 0.3us 0.4us 0.5us 0.6us 0.7us 0.8us 0.9us 1.0us
V(D1:2) V(R1:A)
Time
pnjunction.d...
PSpice> Initializing Scripting..,
Loading C:/OrCAD/OrCAD_16.6_Lite/tool
PSpice>
Command Window
Time step = 1.000E-09 Time = 1.000E-06 End = 1.000E-06
Analysis Watch Devices
Circuit read in and checked, no errors
Calculating bias point for Transient Analysis
Bias point calculated
Transient Analysis
Transient Analysis finished
Total job time (using Solver 1) = .02
INFO(ORPROBE-3190): Simulation complete
Trace Color Trace Nam Y1 Y2
X Values
SCHEMATIC1-pnjunction - PSpice A/D Lite - [pnjunction.dat (active)]
File Edit View Simulation Trace Plot Tools Window Help
cadence
SCHEMATIC1-pnjunction
10V
5V
0V
-5V
0s 0.1us 0.2us 0.3us 0.4us 0.5us 0.6us 0.7us 0.8us 0.9us 1.0us
V(D1:2) V(R1:A)
Time
pnjunction.d...
PSpice> Initializing Scripting..,
Loading C:/OrCAD/OrCAD_16.6_Lite/tool
PSpice>
Command Window
Time step = 1.000E-09 Time = 1.000E-06 End = 1.000E-06
Analysis Watch Devices
Circuit read in and checked, no errors
Calculating bias point for Transient Analysis
Bias point calculated
Transient Analysis
Transient Analysis finished
Total job time (using Solver 1) = .05
INFO(ORPROBE-3190): Simulation complete
Trace Color Trace Nam Y1 Y2
X Values
Find previous digital transition
Time= 1.000E-06
100%

14-

14-

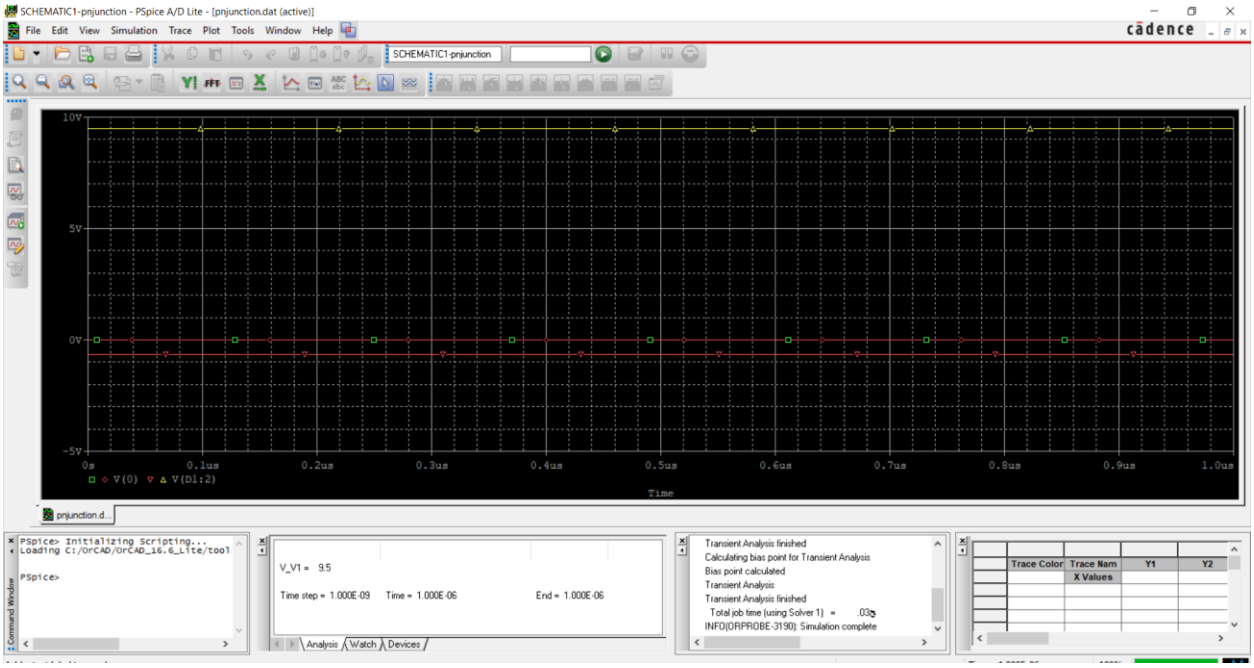
Ac simulation also shows that there is some chnges after change the

Chnging of settings of diode and the sources



15-

The parametric sweep shaws that the input and output between the duty cycle from -9.5 to 9.5 v dc there are 3 lines



16-Dc sweep shows the characteristics of diode it going constant to reach the barrier voltage then the voltage on it goes up