

# HSpice

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# 1.修改元件名稱

成功Export CDL以後，將.cir檔中mos的元件名稱由

**PM**改成**p\_18**

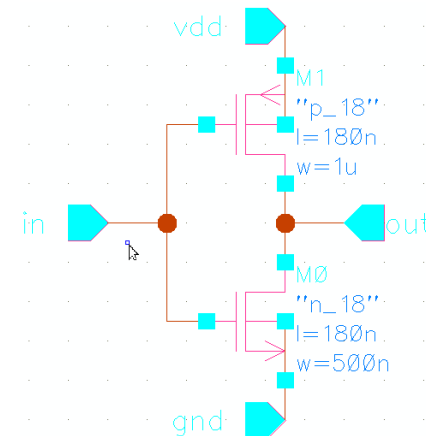
**NM**改成**n\_18**

```
29 .SUBCKT inv gnd in out vdd
30 *.PININFO gnd:I in:I vdd:I out:0
31 MM1 out in vdd vdd PM W=1u L=180n
32 MM0 out in gnd gnd NM W=500n L=180n
33 .ENDS
```



```
29 .SUBCKT inv gnd in out vdd
30 *.PININFO gnd:I in:I vdd:I out:0
31 MM1 out in vdd vdd p_18 W=1u L=180n
32 MM0 out in gnd gnd n_18 W=500n L=180n
33 .ENDS
```

MOS **D**rain **G**ate **S**ource **B**ody p\_18/n\_18 W L



## 2.test\_bench(請同學跟著打)

```

1
2 .protect
3 .lib cic018.l tt
4 .unprotect
5 .inc inv.cir
6 *.inc inv.pex.netlist
7 *****
8
9 vvd vdd gnd 1.8v
10 vin in gnd pulse(0 1.8 1n 100p 100p 20n 40n)
11 *****
12
13 xinv gnd in out vdd inv
14 *****
15
16 .tran 1p 100n
17 .option post
18 .end
19 *****
20

```

打完testbench後，儲存成**.sp**檔  
ex:test\_bench.sp

**\*腳位必須和cir檔對應，  
但名字要移到後面**

**cir檔**

```

29 .SUBCKT inv gnd in out vdd
30 *.PININFO gnd:I in:I vdd:I out:0
31 MM1 out in vdd vdd p_18 W=1u L=180n
32 MM0 out in gnd gnd n_18 W=500n L=180n
33 .ENDS

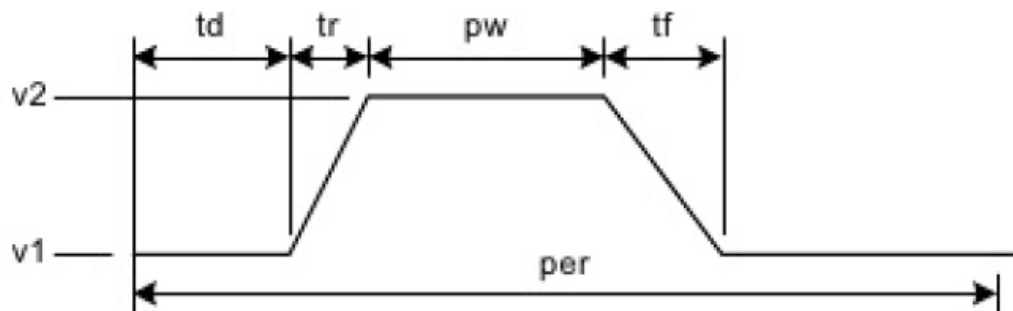
```



# Pulse Source Function

```
pulse(0 1.8 1n 100p 100p 20n 40n)
pulse(v1 v2 td tr tf pw per)
```

**PULSE v1 v2 td tr tf pw per**



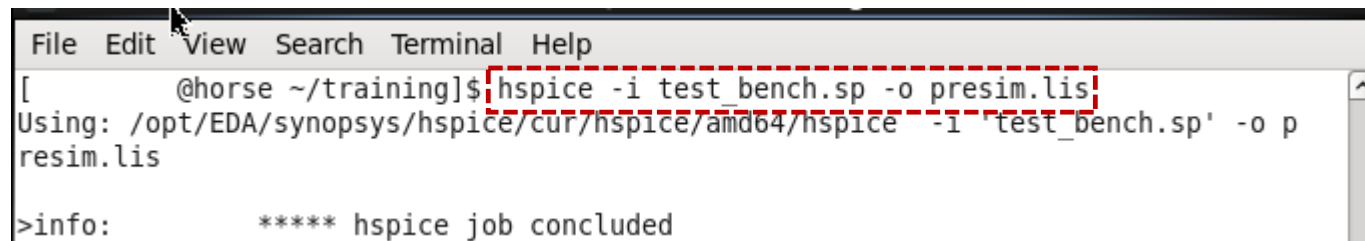
# 3.Presim

Step1：在放有.cir檔和.sp檔的資料夾開啟終端機

\*須注意此資料夾需要有cic018.1這份檔案才可跑模擬

Step2：

輸入：**hspice -i testbench.sp -o presim.lis**



```
File Edit View Search Terminal Help
[ @horse ~/training]$ hspice -i test_bench.sp -o presim.lis
Using: /opt/EDA/synopsys/hspice/cur/hspice/amd64/hspice -i 'test_bench.sp' -o p
resim.lis
>info:          ***** hspice job_ concluded
```

出現**hspice job\_concluded**表示沒有錯誤



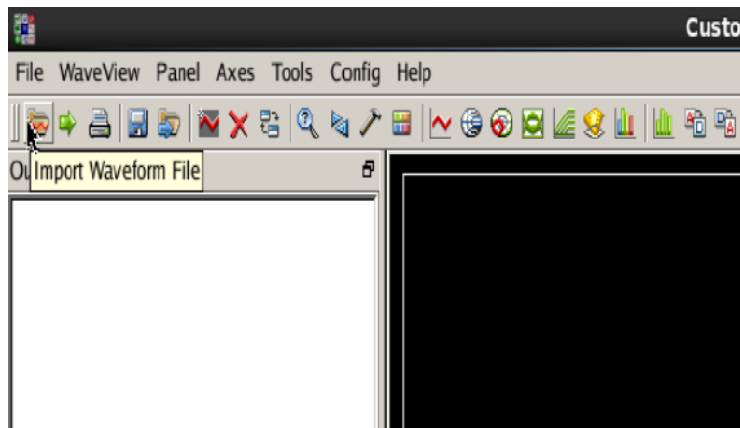
## 4. 開啟 WaveView

Step1 : 在終端機輸入 **wv&**

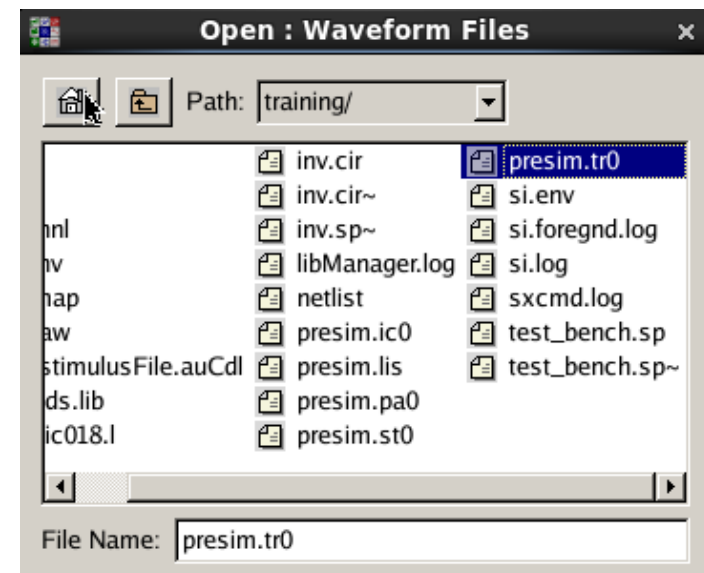
Step2 : 點選 **Import Waveform File**

Step3 : 點選 **presim.tr0** 觀看波形

Step2

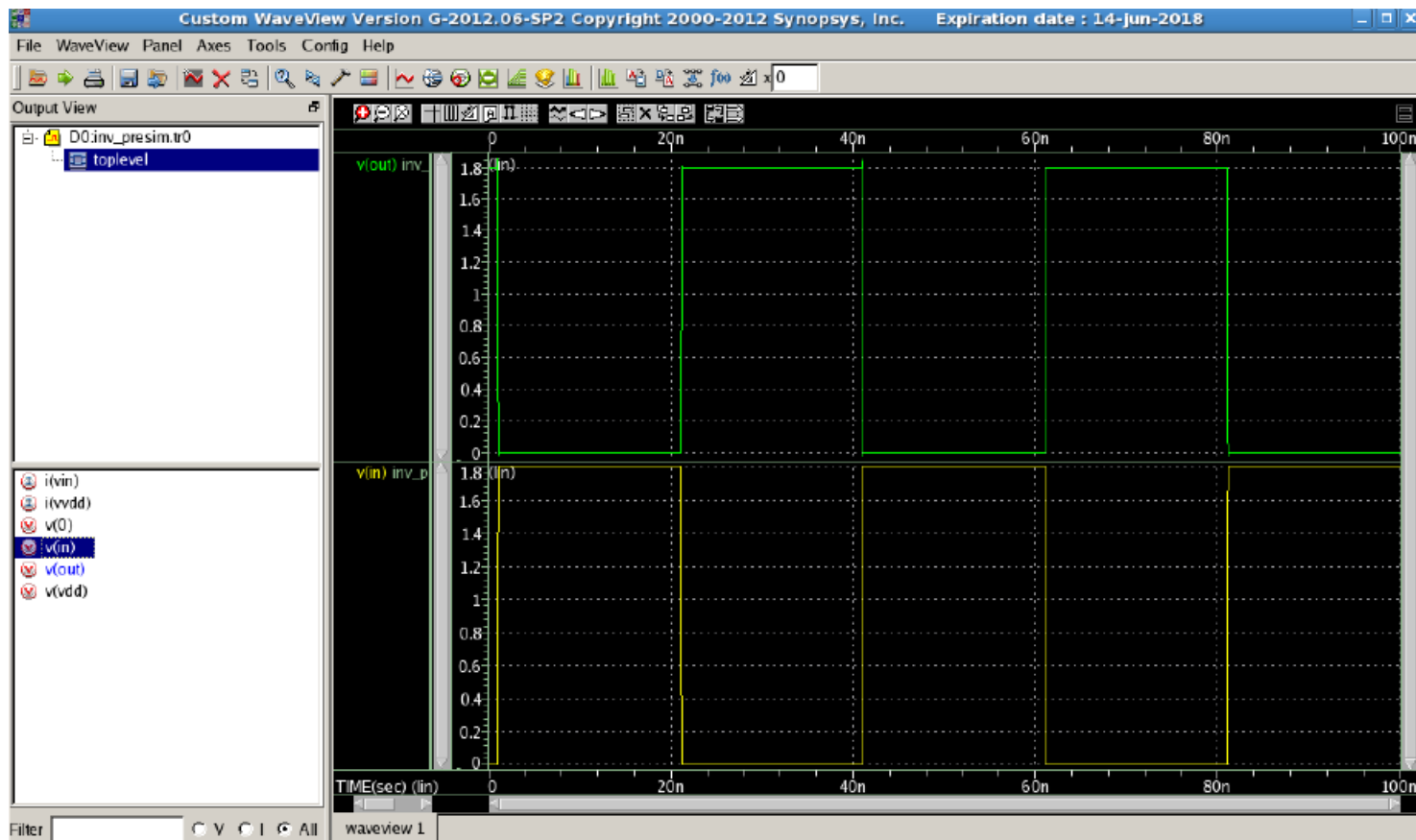


Step3



## 4. 開啟 WaveView

點選想看的節點，便可以看到該點的波形圖



## 4.Postsim

Step1：畫完layout以後粹出pex檔，

再將pex的兩個檔案複製到執行的資料夾中

Step2：修改.sp檔，改成.inc inv.pex.netlist

Step3：修改SUBCKT腳位與netlist相同

Step4：

在終端機輸入：hspice -i test\_bench.sp -o postsim.lis

Step5：重複動作第6頁和第7頁便可以觀察 postsim波形

