

# Develop an engine or tool in TCL/PERL/Python or any scripting/programming tool to measure power for any cmos circuit

## Basic Steps to calculate power

### NGSPICE code to find average power of inverter

```
.include NMOS-180nm.lib
.include PMOS-180nm.lib
VDD 1 0 1.8 V
VD 1 2 0
M1 3 4 2 2 pfet w=6u l=1u
M2 3 4 0 0 nfet w=3u l=1u
Vi 3 0 pulse( 0 1.8 1ps 20ps 20ps 1ns 2ns)
F1 0 5 VD 9
C1 5 0 10nf
R1 5 0 100k
.tran 5ps 4ns
.control
run
plot v(5)
.endc
.end
```

This code gives average power of inverter. Voltage across node 5 at 2ns is average power.

For explanation refer CMOS Digital integrated Circuits by Sung Mo Kang and Yusuf Leblebici

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### NGSpice code to calculate leakage power

NGSPICE code to find leakage power of inverter

```
.include NMOS-180nm.lib
.include PMOS-180nm.lib
VDD 1 0 1.8 V
VD 1 2 0
M1 3 4 2 2 pfet w=6u l=1u
M2 3 4 0 0 nfet w=3u l=1u
Vi 3 4 0
.op
.control
run
Print I(VD)*V(1)
.endc
.end
```