

An ngspice Quick Reference

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1 File Layout Summary

```
*Ngspice title and/or description (first line)
.include <directory/file>

.param paramVal=10kV
Circuit layout
VName 0 node2 DC voltageForDCanalysis SIN(DCOpVoltage amplitudeVoltage
freq)

R1 0 node2 10k
C1 0 node1 10uF
L1 node1 node2 5mH

    *tests
.control
tran <timeForTransientSim> <simStepSize>
meas tran valName PP v(node1)
PP= peak to peak
echo "words"
plot v(node1)
.endc

.end
```

2 Basic Circuit Components

model statements are needed for more advance components, including diodes, MOSFETs, and BJTs.

DC Vsource	V<name> <node-> <node+> DC <value(V)>
AC Vsource	V<name> <node-> <node+> DC 0V SIN(<DCoffset(V)> <amplitude(V)> <freq(Hz)>)
Resistor	R<name> <node1> <node2>
Capacitor	C<name> <node1> <node2> <value(F)>
Inductor	L<name> <node1> <node2> <value(H)>
Diode	D<name> ...
MOSFET	M<name> ...
BJT	...
Subcircuit	X<name> <node1> <node2> ... <nodeN> <modelName>

Table 1: Basic circuit components

3 Test and measurement basics

Tests are placed within the block delimited the .control and .endc commands.

A simulation is

general commands:

plot <quantity> <comparisonQuantity(optional)>

echo <textToPrint>

meas <test> <meaurementType> <quantity> <additionalSpecifiers(optional)>

quantities are denoted by v(<node>) for a node voltage or i(<component>) for a componenet current.

.tran <stepSize> <duration>

.op (calculates dc operating point)

.dc <voltageSourceName> <startValue> <endValue> <stepsize> <

meas command list

meas TRAN <nameForValue> MAX <quantity> meas TRAN <nameForValue>

MIN <quantity> meas TRAN <nameForValue> PP <quantity>

3.1 DC

3.2 Transient

3.3 AC

3.4 Additional Test and Measurement Commands

alter @<componentName>[subParameter] = [new value]

e.g. alter @V1[sin] = [0.5V 1V 1k]