NGSPICE1

.param CM_VOLTAGE = 1.0
.param OUTPUT_VOLTAGE = 1.0
.param mc_mm_switch=0
.lib /usr/local/share/pdk/sky130A/libs.tech/ngspice/sky130.lib.spice tt
.include /usr/local/share/pdk/sky130A/libs.ref/sky130_fd_sc_hvl/spice/sky130_fd_sc_hvl.spice

.control
save all
ac dec 200 10 1000Meg
settype decibel out
plot vdb(out)
let phase_val = 180/PI*cph(out)
let phase_margin_val = 180 + 180/PI*cph(out)
settype phase phase_val
plot phase_val
meas ac phase_margin find phase_margin_val when vdb(out)=0
meas ac crossover_freq WHEN vdb(out)=0
op
print v(inp)
print v(inm)
print v(out)
let v_offset = v(inp)-v(inm)
print v_offset
.endc

V3V3

V1
3.3

GND

INP

V3
AC 1

V2
{CM_VOLTAGE}

GND

V3V3

GND

folded_cascode_p_in
x1

VDD        VSS

IN_P

OUT

IN_M

IBias

INP

INM

I0
60u

GND

V4
{OUTPUT_VOLTAGE-CM_VOLTAGE}

R1
m=1        6E6

INM

C2
1
m=1

GND

GND

OUT

C1
180p
m=1

GND

OUT

M18
nfet_g5v0d10v5
x 5 / 0.5

M17
nfet_g5v0d10v5
x 5 / 0.5

GND

vcomp clamping