Schematic labels and annotations:

v_dd

M4A
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

vg4

M4B
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

vg3

M3A
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

M3B
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

M5A
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

M5B
m=1
ng=10
l=1u
w=50u
sg13_lv_pmos

Mstartup
m=1
ng=1
l=10u
w=0.5u
sg13_lv_pmos

rp
xr4
bandgap_simple_res-10k
rn

rp
xr3
bandgap_simple_res-10k
rn

Vmeas2

sg13_lv_nmos
w=15u
l=1u
ng=3
m=1
M1B

vg2

sg13_lv_nmos
w=15u
l=1u
nf=1
M2B

sg13_lv_nmos
w=15u
l=1u
ng=3
m=1
M1A

vg1

sg13_lv_nmos
w=15u
l=1u
nf=1
M2A

Vmeas1

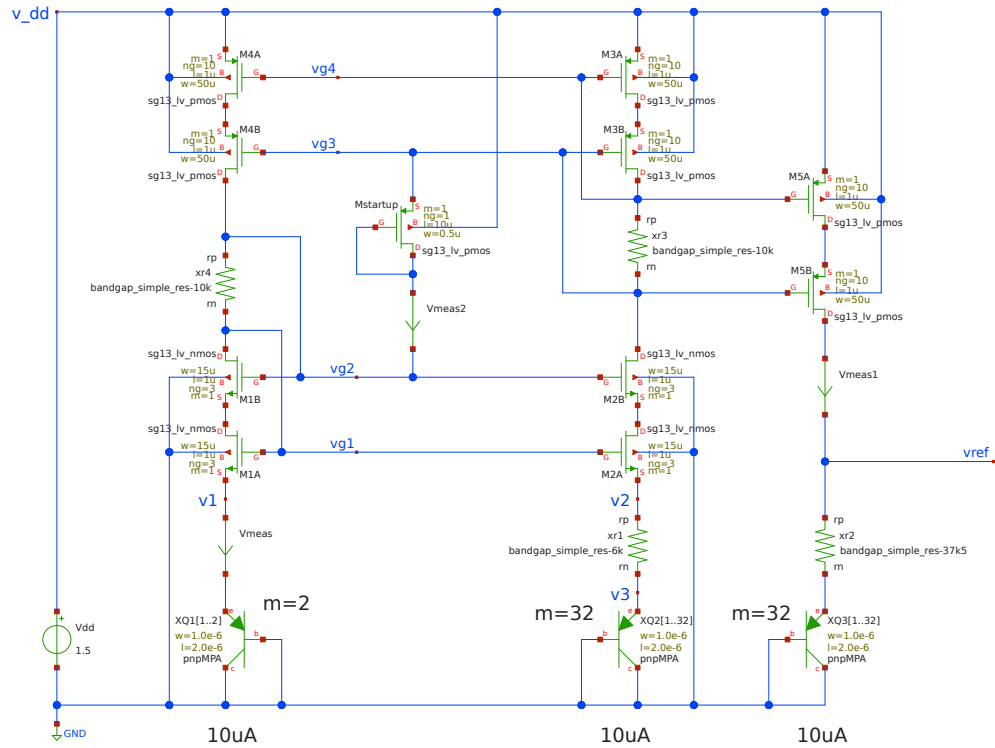vref

NGSPICE

.temp 27
.control
save all
set filetype=ascii

op
write bandgap_simple.raw

dc temp -30 125 1
set appendwrite
write bandgap_simple.raw
plot vref

wrdata bandgap_simple.txt vref
.endc

v1

Vmeas

v2

rp
xr1
bandgap_simple_res-6k
rn

v3

rp
xr2
bandgap_simple_res-37k5
rn

Vdd
1.5

GND

XQ1[1..2]
w=1.0e-6
l=2.0e-6
pnpMPA

m=2

XQ2[1..32]
w=1.0e-6
l=2.0e-6
pnpMPA

m=32

XQ3[1..32]
w=1.0e-6
l=2.0e-6
pnpMPA

m=32

10uA

10uA

10uA

MODEL

.lib cornerMOSlv.lib mos_tt
.lib cornerHBT.lib hbt_typ
.lib cornerRES.lib res_typ

simulate

annotate OP

XSCHEM