



Figure 1: N Channel MOSFET BSIM3 model

Form: mosnbsim3:<instance name> n_1 n_2 n_3 n_4 <parameter list>

- n_1 is the drain node,
- n_2 is the gate node,
- n_3 is the source node,
- n_4 is the bulk node.

Model Parameters:

Parameter	Description	Default	Units
l	Length of the device	1.0e-6	m
w	Width of the device	1.0e-6	m
tox	Gate oxide thickness	150.0e-10	m
toxm	Gate oxide thickness used in extraction	tox	m
cdsc	Drain/Source and channel coupling capacitance	2.4e-4	F/m^2
cdscb	Body-bias dependence of cdsc	0.0	F/m^2
cdscd	Drain-bias dependence of cdsc	0.0	F/m^2
cit	Interface state capacitance	0.0	F/m^2
nfactor	Subthreshold swing coefficient	1.0	-
xj	Junction depth	0.15e-6	m
vsat	Saturation velocity at tn timer	8.0e4	m/s
at	Temperature coefficient of Vsat	3.3e4	m/s
a0	Non-uniform depletion width effect coefficient	1.0	-
ags	Gate bias coefficient of Abulk	0.0	V^{-1}
a1	Non-saturation effect coefficient	0.0	V^{-1}
a2	Non-saturation effect coefficient	1.0	V^{-1}
keta	Body-bias coefficient of non-uniform depletion width effect	-0.047	v^{-1}
n timer	Substrate doping concentration	6.0e16	cm^{-3}
n timer	Channel doping concentration	1.7e17	cm^{-3}
n timer	Poly-gate doping concentration	0.0	cm^{-3}
v timer	Maximum body voltage	-3.0	V
xt1	Doping depth	1.55e-7	m
kt1	Temperature coefficient of Vth	-0.11	V
kt11	Temperature coefficient of Vth	1.0	Vm
kt2	Body coefficient of kt1	0.022	-
k3	Narrow width effect coefficient	80.0	-
k3b	Body effect coefficient of k3	0.0	V^{-1}
w0	Narrow width effect parameter	2.5e-6	m
n timer	Lateral non-uniform doping effect	1.74e-7	m
d timer0	Short channel effect coefficient 0	2.2	-
d timer1	Short channel effect coefficient 1	0.53	-
d timer2	Short channel effect coefficient 2	-0.032	-
d timer0w	Narrow width effect coefficient 0	0.0	-
d timer1	Narrow width effect coefficient 1	5.3e6	-
d timer2w	Narrow width effect coefficient 2	-0.032	-
d timerout	DIBL coefficient of output resistance	0.56	-
d timerub	DIBL coefficient in the sub-threshold region	0.56	-

Table 1: MOS Model Parameter table 1

Parameter	Description	Default	Units
ua	Linear gate dependence of mobility	2.25e-9	m/V
ub	Quadratic gate dependence of mobility	5.87e-19	m^2/V^2
uc	Body-bias dependence of mobility	-4.65e-11	m/V
u0	Low-field mobility at t_{nom}	0.067	m^2/Vs
voff	Threshold voltage offset	-0.08	V
tnom	Parameter measurement temperature	300.0	$^{\circ}K$
elm	Non-quasi-static Elmore constant parameter	5.0	-
delta	Effective V_{ds} parameter	0.01	V
rdsw	Source-drain resistance per width	0.0	Ω
prwg	Gate-bias effect on parasitic resistance	0.0	V^{-1}
prwb	Body-effect on parasitic resistance	0.0	$V^{-0.5}$
prrt	Temperature coefficient of parasitic resistance	0.0	V^{-1}
eta0	Subthreshold region DIBL coefficient	0.08	-
etab	Subthreshold region DIBL coefficient	-0.07	-
pclm	Channel length modulation coefficient	1.3	-
pdibl1	Drain-induced barrier lowering coefficient	0.39	-
pdibl2	Drain-induced barrier lowering coefficient	0.0086	-
pdiblb	Body-effect on drain induced barrier lowering	0.0	V^{-1}
pscbe1	Substrate current body-effect coefficient	4.24e8	V/m
pscbe2	Substrate current body-effect coefficient	1.0e-5	m/V
pvag	Gate dependence of output resistance parameter	0.0	-
vfb	Flat band voltage	-1.0	V
acde	Exponential coefficient for finite charge thickness	1.0	m/V
moin	Coefficient for gate-bias dependent surface potential	15.0	-
noff	C-V turn-on/off parameter	1.0	-
voffcv	C-V lateral shift parameter	0.0	V
lint	Length reduction parameter	0.0	m
ll	Length reduction parameter	0.0	m
llc	Length reduction parameter for C-V	ll	m
lln	Length reduction parameter	1.0	m
lw	Length reduction parameter	0.0	m
lwc	Length reduction parameter for C-V	lw	m
lwn	Length reduction parameter	1.0	m
lwl	Length reduction parameter	0.0	m
lwlc	Length reduction parameter for C-V	lwl	m

Table 2: MOS Model Parameter table 2

Parameter	Description	Default	Units
wr	Width dependence of rds	1.0	m
wint	Width reduction parameter	0.0	m
dwg	Width reduction parameter	0.0	m
dwb	Width reduction parameter	0.0	m
wl	Width reduction parameter	0.0	m
wlc	Width reduction parameter for C-V	wl	m
wln	Width reduction parameter	1.0	m
ww	Width reduction parameter	0.0	m
wwc	Width reduction parameter for C-V	ww	m
wwn	Width reduction parameter	1.0	m
wwl	Width reduction parameter	0.0	m
wwlc	Width reduction parameter for C-V	wwl	m
b0	Abulk narrow width parameter	0.0	m
b1	Abulk narrow width parameter	0.0	m
clc	Vdsat parameter for C-V model	0.1e-6	m
c1e	Vdsat parameter for C-V model	0.6	-
alpha0	Substrate current model parameter	0.0	Am/V
alpha1	Substrate current model parameter	0.0	A/V
beta0	Diode limiting current	30.0	V
ute	Temperature coefficient of mobility	-1.5	-
k1	First order body-effect coefficient	0.53	-
k2	Second order body-effect coefficient	-0.0186	-
temp	Circuit temperature	300.0	$^{\circ}K$
ua1	Temperature coefficient for ua	4.31e-9	m/V
ub1	Temperature coefficient for ub	-7.61e-18	$(m/V)^2$
uc1	Temperature coefficient for uc	-5.6e-11	m/V

Table 3: MOS Model Parameter table 3

Notes:

There is no equivalent SPICE element.

Version:

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Credits:

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