

MOSFET Model Parameters

Parameter *	Description	Unit	Default
All Levels			
AF	flicker noise exponent		1
CBD	zero-bias bulk-drain p - n capacitance	farad	0
CBS	zero-bias bulk-source p - n capacitance	farad	0
CGBO	gate-bulk overlap capacitance/channel length	farad/meter	0
CGDO	gate-drain overlap capacitance/channel width	farad/meter	0
CGSO	gate-source overlap capacitance/channel width	farad/meter	0
CJ	bulk p - n zero-bias bottom capacitance/area	farad/meter ²	0
CJSW	bulk p - n zero-bias sidewall capacitance/length	farad/meter	0
FC	bulk p - n forward-bias capacitance coefficient		0.5
GDSNOI	channel shot noise coefficient (use with NLEV=3)		1
IS	bulk p - n saturation current	amp	1E-14
JS	bulk p - n saturation current/area	amp/meter ²	0
JSSW	bulk p - n saturation sidewall current/length	amp/meter	0
KF	flicker noise coefficient		0
L	channel length	meter	DEFL
LEVEL	model index		1
MJ	bulk p - n bottom grading coefficient		0.5
MJSW	bulk p - n sidewall grading coefficient		0.33
N	bulk p - n emission coefficient		1
NLEV	noise equation selector		2
PB	bulk p - n bottom potential	volt	0.8
PBSW	bulk p - n sidewall potential	volt	PB
RB	bulk ohmic resistance	ohm	0
RD	drain ohmic resistance	ohm	0
RDS	drain-source shunt resistance	ohm	infinite
RG	gate ohmic resistance	ohm	0
RS	source ohmic resistance	ohm	0
RSH	drain, source diffusion sheet resistance	ohm/square	0
TT	bulk p - n transit time	sec	0

MOSFET Model Parameters (continued)

Parameter [*]	Description	Unit	Default
T_ABS †	absolute temperature	°C	
T_MEASURED †	measured temperature	°C	
T_REL_GLOBAL †	relative to current temperature	°C	
T_REL_LOCAL †	relative to AKO model temperature	°C	
W	channel width	meter	DEFW
Levels 1, 2, and 3			
DELTA	width effect on threshold		0
ETA	static feedback (Level 3)		0
GAMMA	bulk threshold parameter	volt ^{1/2}	see page 2-73
KP	transconductance coefficient	amp/volt ²	2.0E-5
KAPPA	saturation field factor (Level 3)		0.2
LAMBDA	channel-length modulation (Levels 1 and 2)	volt ⁻¹	0.0
LD	lateral diffusion (length)	meter	0.0
NEFF	channel charge coefficient (Level 2)		1.0
NFS	fast surface state density	1/cm ²	0.0
NSS	surface state density	1/cm ²	none
NSUB	substrate doping density	1/cm ³	none
PHI	surface potential	volt	0.6
THETA	mobility modulation (Level 3)	volt ⁻¹	0.0
TOX	oxide thickness	meter	see page 2-73
TPG	Gate material type: +1 = opposite of substrate -1 = same as substrate 0 = aluminum		+1
UCRIT	mobility degradation critical field (Level 2)	volt/cm	1.0E4
UEXP	mobility degradation exponent (Level 2)		0.0
UTRA	(not used) mobility degradation transverse field coefficient		0.0
UO	surface mobility (The second character is the letter O, not the numeral zero.)	cm ² /volt·sec	600
VMAX	maximum drift velocity	meter/sec	0

MOSFET Model Parameters (continued)

Parameter *	Description	Unit	Default
VTO	zero-bias threshold voltage	volt	0
WD	lateral diffusion (width)	meter	0
XJ	metallurgical junction depth (Levels 2 and 3)	meter	0
XQC	fraction of channel charge attributed to drain		1.0
Level 4 **			
DL	Channel shortening	m	
DW	Channel narrowing	m	
ETA	Zero-bias drain-induced barrier lowering coefficient		ζ
K1	Body effect coefficient	volt ^{1/2}	ζ
K2	Drain/source depletion charge sharing coefficient		ζ
MUS	Mobility at zero substrate bias and V _{ds} =V _{dd}	cm ² /volt ² ·sec	ζ
MUZ	Zero-bias mobility	cm ² /volt·sec	
N0	Zero-bias subthreshold slope coefficient		ζ
NB	Sens. of subthreshold slope to substrate bias		ζ
ND	Sens. of subthreshold slope to drain bias		ζ
PHI	Surface inversion potential	volt	ζ
TEMP	Temperature at which parameters were measured	°C	
TOX	Gate-oxide thickness	m	
U0	Zero-bias transverse-field mobility degradation	volt ⁻¹	ζ
U1	Zero-bias velocity saturation	μ/volt	ζ
VDD	Measurement bias range	volts	
VFB	Flat-band voltage	volt	ζ
WDF	Drain, source junction default width	meter	
X2E	Sens. of drain-induced barrier lowering effect to substrate bias	volt ⁻¹	ζ
X2MS	Sens. of mobility to substrate bias @ V _{ds} =0	cm ² /volt ² ·sec	ζ
X2MZ	Sens. of mobility to substrate bias @ V _{ds} =0	cm ² /volt ² ·sec	ζ
X2U0	Sens. of transverse-field mobility degradation effect to substrate bias	volt ⁻²	ζ
X2U1	Sens. of velocity saturation effect to substrate bias	μ/volt ²	ζ