USEFUL DESIGN PARAMETERS (simplified)

		0.35μm		0.25μm		
Name	Symbol	NMOS	PMOS	NMOS	PMOS	Units
Channel Length (rounded for convenience)	L	400nm	400nm	250nm	250nm	nm
Supply Voltage	V_{DD}	3.3	3.3	2.5	2.5	V
Oxide Thickness	t_{ox}	75	75	60	60	Å
Oxide Capacitance	C_{ox}	0.5	0.5	0.7	0.7	$\mu F/cm^2$
Threshold Voltage	V_{TO}	0.6	-0.6	0.5	-0.5	V
Body-effect term	γ	0.6	0.6	0.4	0.4	$V^{1/2}$
Fermi Potential	$2\|\phi_F\|$	0.8	0.8	0.84	0.84	V
Junction Capacitance Coefficient	C_{jo}	2	2	2	2	$fF/\mu m^2$
Built-in Junction Potential	ϕ_B	0.8	0.8	0.85	0.85	V
Grading Coefficient	m	0.5	0.5	0.5	0.5	-
Nominal Mobility (low vertical field)	μ_o	540	180	540	180	$cm^2/V\text{-}s$
Effective Mobility (high vertical field)	μ_e	270	70	270	70	$cm^2/V\text{-}s$
Critical Field	E_c	6×10^4	24×10^4	6×10^4	24×10^4	V/cm
Critical Field x L	E_cL	2.4	9.6	1.5	6	V
Effective Resistance	R_{eff}	12.5	30	12.5	30	kΩ/_

Name	Symbol	Value	Units
Gate Capacitance Coefficient	C_g	2	fF/μm
Self Capacitance Coefficient	C_{eff}	2	fF/μm
Wire Capacitance Coefficient	C_w	0.1-0.25	fF/μm
Al Wire Resistance	R_	25-60	mΩ/_
Cu Wire Resistance	R_	20-40	mΩ/_
Wire Inductance	L_{eff}	40-50	pH/μm

USEFUL PHYSICAL AND MATERIAL CONSTANTS

Name	Symbol	Value	Units
Electron Charge	q	1.6×10^{-19}	C
Boltzmann s Constant	k	1.38×10^{-23}	J/^{o}K
Room Temperature	T	300	^{o}K (27^{o}C)
Thermal Voltage	$V_{th}=kT/q$	26	mV (at 27^{o}C)
Dielectric Constant of Vacuum		8.85×10^{-14}	F/cm
Dielectric Constant of Silicon		11.7	F/cm
Dielectric Constant of SiO_2		3.97	F/cm
Intrinsic Carrier Concentration	n_i	1.45×10^{10}	/cm^3 (at 27^{o}C)
Carrier Saturation Velocity In Silicon	ν_{sat}	8×10^{6}	cm/s
Aluminum Resistivity		2.7	μΩ–cm
Copper Resistivity		1.7	μΩ–cm
Tungsten Resistivity		5.5	μΩ–cm

ENGINEERING SCALE FACTORS

G	giga	10^{9}
M	mega	10^{6}
k	kilo	10^{3}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}
n	nano	10^{-9}
p	pico	10^{-12}
f	femto	10^{-15}
a	atto	10^{-18}

METER CONVERSION FACTORS

1 μm = 10^{-4} cm = 10^{-6} m
1 m = 10^{2} cm = 10^{6} μm
0.1 μm = 100 nm
1Å = 10^{-8}cm = 10^{-10}m