

Process C1012

CMOS 1.0 μ m

5 Volt Digital

Electrical Characteristics

T=25°C Unless otherwise noted

N-Channel Transistor	Symbol	Minimum	Typical	Maximum	Unit	Comments
Threshold Voltage	V_{TN}	0.725	0.875	1.025	V	100x1.0 μ m
Body Factor	γ_N		0.76		$V^{1/2}$	100x1.0 μ m
Conduction Factor	β_N	83	93	103	$\mu A/V^2$	100x100 μ m
Effective Channel Length	L_{effN}		0.73		μ m	100x1.0 μ m
Width Encroachment	ΔW_N		0.81		μ m	Per side
Punch Through Voltage	$BVDSS_N$	10			V	
Poly Field Threshold	$VTF_{P(N)}$	10			V	

P-Channel Transistor	Symbol	Minimum	Typical	Maximum	Unit	Comments
Threshold Voltage	V_{TP}	-0.86	-1.01	-1.16	V	100x1.0 μ m
Body Factor	γ_P		0.64		$V^{1/2}$	100x1.0 μ m
Conduction Factor	β_P	29.5	30.5	33.5	$\mu A/V^2$	100x100 μ m
Effective Channel Length	L_{effP}		0.98		μ m	100x1.0 μ m
Width Encroachment	ΔW_P		0.75		μ m	Per side
Punch Through Voltage	$BVDSS_P$	-10			V	
Poly Field Threshold Voltage	$VTF_{P(P)}$	-10			V	

Diffusion & Thin Films	Symbol	Minimum	Typical	Maximum	Unit	Comments
Well (field) Sheet Resistance	$\rho_{N-well(f)}$	0.565	0.644	0.720	$K\Omega/\square$	n-well
N+ Sheet Resistance	ρ_{N+}	20	35	50	Ω/\square	
N+ Junction Depth	x_{jN+}		0.45		μ m	
P+ Sheet Resistance	ρ_{P+}	60	80	100	Ω/\square	
P+ Junction Depth	x_{jP+}		0.5		μ m	
Gate Oxide Thickness	T_{GOX}	15.5	17.5	19.5	nm	
Field Oxide Thickness	T_{FIELD}		700		nm	
Poly Sheet Resistance	ρ_{POLY}	15	22	30	Ω/\square	
Metal-1 Sheet Resistance	ρ_{M1}	25	45	655	$m\Omega/\square$	
Metal-2 Sheet Resistance	ρ_{M2}	15	25	35	$m\Omega/\square$	
Passivation Thickness	T_{PASS}		200+900		nm	oxide+nit.

Capacitance	Symbol	Minimum	Typical	Maximum	Unit	Comments
Gate Oxide	C_{OX}		1.97		fF/ μ m ²	
Metal-1 to Poly1	C_{M1P}		0.046		fF/ μ m ²	
Metal-1 to Silicon	C_{M1S}		0.028		fF/ μ m ²	
Metal-2 to Metal-1	C_{MM}		0.038		fF/ μ m ²	

Physical Characteristics

Starting Material	P <100>	N+/P+ Width/Space	2.0 / 1.2 μ m
Starting Mat. Resistivity	25 - 50 Ω -cm	N+ To P+ Space	5.0 μ m
Typ. Operating Voltage	5V	Contact To Poly Space	1.0 μ m
Well Type	N-well	Contact Overlap Of Diffusion	1.0 μ m
Metal Layers	2	Contact Overlap Of Poly	0.8 μ m
Poly Layers	1	Metal-1 Overlap Of Contact	0.8 μ m
Contact Size	1.2 x 1.2 μ m	Metal-1 Overlap Of Via	0.8 μ m
Via Size	1.2 x 1.2 μ m	Metal-2 Overlap Of Via	0.8 μ m
Metal-1 Width/Space	1.4 / 2.4 μ m	Minimum Pad Opening	65 x 65 μ m
Metal-2 Width/Space	2.0 / 1.4 μ m	Minimum Pad-to-Pad Spacing	5.0 μ m
Gate Poly Width/Space	1.0 / 1.4 μ m	Minimum Pad Pitch	80.0 μ m