

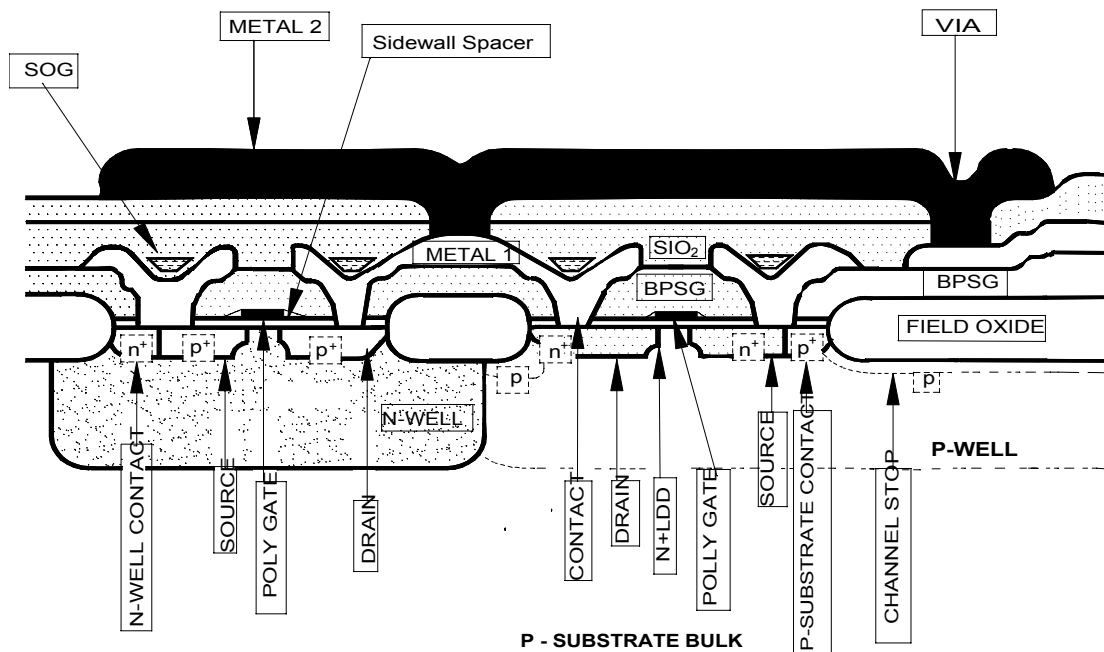


CMOS 1.0 TWIN-WELL PROCESS

Physical Characteristics

Process Geometry	1.0 micron
Process Number	C1017
Operating Voltage	5v
Well Doping	TWIN-WELL
Contact	1.2 x 1.2 μm
Via	1.2 x 1.2 μm
Metal I Width	1.4 μm
Metal I Space	1.2 μm

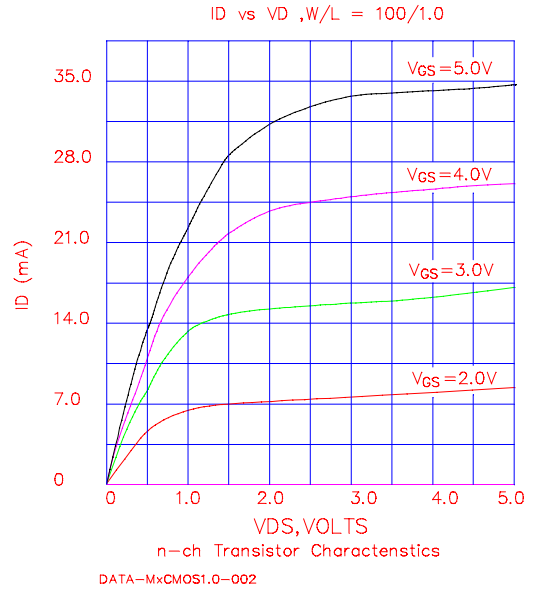
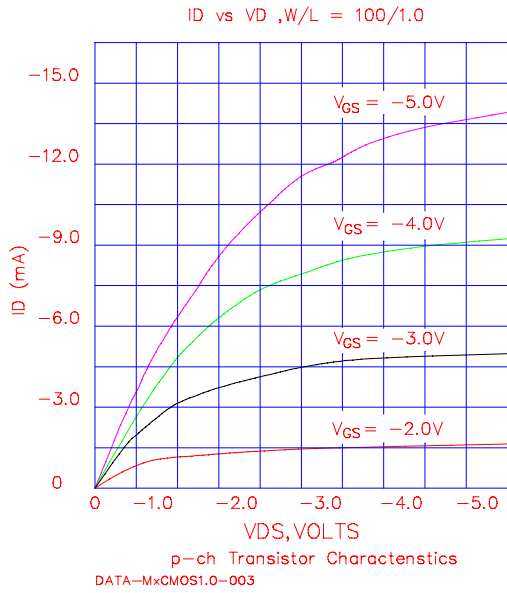
Metal II Width	2.0 μm
Metal II Space	1.4 μm
Gate Poly Width	1 μm
Gate Poly Space	1.4 μm
N+ / P+ Space	0.8 μm
N+ to N-WELL	5.0 μm



CROSS SECTIONAL VIEW OF THE CMOS 1.0 PROCES



CMOS 1.0 TWIN-WELL PROCESS





CMOS 1.0 TWIN-WELL PROCESS

ELECTRICAL CHARACTERISTICS

n-ch transistor

(T = +25°C unless otherwise noted)

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Threshold Voltage (Sat. extrapolated)	V_{TO_N}	0.65	0.85	1.05	V	25 / 1.0 device
Body Factor	K_{B_N}	0.72	0.82	0.92	$V^{1/2}$	25 / 25 device
Gain Factor	K'_N	38.5	41.5	44.5	$\mu A/V^2$	25 / 25 device
Effective Channel Length	LEFFN	0.75	0.95	1.15	μm	25 / 1.0 device
Effective Channel Width	ΔW_N		0.25		μm	1.6/25 per side
Punch Through Voltage	BVDSSN	8			V	25 / 1.0 device
Poly Field Threshold	$VFI_{P(N)}$	8			V	1.8 device

p-ch transistor

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Threshold Voltage (Sat. extrapolated)	V_{TO_P}	-1.3	-1.10	-0.90	V	25 / 1.0 device
Body Factor	K_{B_P}	0.46	0.56	0.66	$V^{1/2}$	25 / 25 device
Gain Factor	K'_P	12.5	14.0	15.5	$\mu A/V^2$	25 / 25 device
Effective Channel Length	LEFFP	0.72	0.97	1.22	μm	25 / 1.0 device
Width Enroachment	ΔWP		0.3		μm	1.6/25 per side
Punch Through Voltage	BVDSSP			-8.0	V	25 / 1.0 device
Poly Field Threshold	$VFI_{P(P)}$			-8.0	V	1.8 device



CMOS 1.0 TWIN-WELL PROCESS

diffusion & thin films

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Well (field) Sheet Resistance	$R_{W(+f)}$	7	10	13	k Ω /	n-well
N-Well Junction Depth	x_{jnw}		2.0		μm	
N+ Sheet Resistance	R_{N+}	27	37	47	Ω /	
N+ Junction Depth	X_{JN+}		0.4		μm	
P+ Sheet Resistance	R_{P+}	70	85	110	Ω /	
P+ Junction Depth	X_{JP+}		0.5		μm	
Gate Poly Sheet Resistance	R_{POLY}	25	32	39	Ω /	
Metal 1 Sheet Resistance (DLM)	R_{M1}		100		m Ω /	
Metal 2 Sheet Resistance (DLM)	R_{M2}		70		m Ω /	

capacitance

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Gate Oxide	C_{OX}	1.642	1.765	1.908	fF/ μm^2	