0.8 Micron CMOS Process Family

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Features

- Double Poly/Double Metal
- 1.7µm Poly and 2.1µm Metal I Pitch
- 5.5 Volts Maximum Operating Voltage
- Twin-tub process, on N-type wafers
- ProToDuction™ Option for low cost prototypes

Description

The 0.8µm process provides flexibility, speed and packing density needed in mixed signal designs. The overall design rules are compatible with most other 0.8um processes making second sourcing easy.

Technology Outline

- Twin-tub technology
- Drain Engineered Structure to Ensure Reliability against Hot-Carrier Injection
- Planarization with non-etch-back SOG Processes
- State-of-the-art Metal technology :Ti/TiN/Al/TiN sandwich
- Latchup Free Process on Non-Epi material achieved

Process Parameters

Process Parameters	0.8µm 5volts	Units
Metal I pitch (width/space)	1.1/1.0	µm
Metal II pitch (width/space)	1.2/1.0	µm
Poly pitch (width/space)	0.8/0.9	µm
Contact	0.9 x 0.9	µm
Via	1.0 x 1.0	µm
Gate geometry	0.8	µm
P-well junction depth	2.0	µm
N+ junction depth	0.25	µm
P+ junction depth	0.30	µm
Gate oxide thickness	180	Å
Inter poly oxide thick.	320	Å

MOSFET Electrical Parameters

Electrical Parameters	0.8 MICRON - 5 volts						Units	Conditions
	N Channel			P Channel				
	min.	typ.	max.	min.	typ.	max.		
Vt (50x0.8µm)	0.50	0.65	0.80	0.53	0.68	0.83	V	saturation
Ids (50x0.8µm)		380			176		µA/µm	Vds=Vgs=5v
Gain β (50x50µm)		92			33		$\mu A/V^2$	Vds=0.1v
Body Factor (50x50µm)		0.74			0.52		$\sqrt{v}$	
Bvdss (50x0.8µm)	9	12		9	12		V	Ids=1pA
Subthreshold Slope		89			96		mV/dec.	Vds=0.1v
Maximum Substrate Current (50x0.8µm)		1.4			n/a		µA/µm	Vds=5.5v Vgs=2.7v
Field Threshold	9	20		9	22		V	Ids = 14µA/sq
L Effective		TBD			TBD		µm	L drawn = 0.8µm

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Capacitances (fF/μm^2)

	min.	typ.	max.
Inter-poly	0.88	1.06	1.27
Gate oxide	1.7	1.9	2.1
N+ Junction		0.32	
P+ Junction		0.64	

Bipolar gain[1]

	min.	typ.	max.
NPN vertical		227	

[1]Test condition : Vce = 5 volts

Resistances (Ω/sq.)

	min	typ.	max.
Pwell		5500	
Pwell in Pfield	2000	2300	2600
N+	20	50	80
P+	80	110	140
Poly gate	26	37	48
Poly capacitor	75	100	125
Metal I		0.038	
Metal II		0.038	