

Features

- Double Poly / Double Metal
- 2.4 μm Poly and Metal I Pitch
- 5.5 Volts Maximum Operating Voltage
- Twin-tub
- Low TCR Resistor Module
- ProToDuction[™] Option for fast prototypes

Description

The 1.2 μm process provides flexibility, speed and packing density needed in mixed signal designs. The aggressive design rules on both metal layers are comparable to most 0.8 μm processes. A process module can be integrated to provide high precision and very low TCR Polysilicon resistors.

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
- Plasma Silicon Nitride Passivation for Reliability against Moisture
- Latchup Free Process on Non-Epi material achieved with optimized I/O protection (patent pending)

Process Parameters

Process Parameters	1.2 μm 5volts	Units
Metal I pitch (width/space)	1.4 / 1.0	μm
Metal II pitch (width/space)	1.4 / 1.0	μm
Poly pitch (width/space)	1.2 / 1.2	μm
Contact	1.2 x 1.2	μm
Via	1.4 x 1.4	μm
Gate geometry	1.2	μm
N-well junction depth	4.0	μm
P-well junction depth	4.0	μm
N+ junction depth	0.20	μm
P+ junction depth	0.31	μm
Gate oxide thickness	225	Å
Inter poly oxide thick.	390	Å

MOSFET Electrical Parameters

Electrical Parameters	1.2 MICRON - 5 volts						Units	Conditions
	min.	N Channel typ.	max.	min.	P Channel typ.	max.		
Vt (10x1.2 μm)	0.55	0.70	0.85	0.55	0.70	0.85	V	saturation
Ids (10x1.2 μm)		240			140		$\mu\text{A}/\mu\text{m}$	Vds=Vgs=5v
Gain β (10x10 μm)		73			24		$\mu\text{A}/\text{V}^2$	
Body Factor (50x50 μm)		0.56			0.73		$\sqrt{\text{V}}$	
Bvdss	10	15		10	12		V	Ids=20nA
Subthreshold Slope		90			90		mV/dec.	Vds=0.1v
Maximum Substrate Current (50x1.2 μm)		0.20			.01		$\mu\text{A}/\mu\text{m}$	Vds=5.5v Vgs=2.7v
Field Threshold	10	25		10	25		V	Ids = 14 μA
L Effective		1.0			0.82		μm	L drawn = 1.5 μm

1.2 Micron CMOS Process Family

Capacitances (fF/ μm^2)

	min.	typ.	max.
Inter-poly	0.80	0.97	1.15
Gate oxide	1.4	1.5	1.6
N+ Junction		0.35	
P+ Junction		0.60	

Resistances ($\Omega/\text{sq.}$)

	min.	typ.	max.
Nwell		520	
Pwell		2300	
N+	35	45	55
P+	80	100	120
Poly gate	15	20	25
Poly capacitor	75	100	125
Metal I		0.03 8	
Metal II		0.03 8	

Bipolar gain¹

	min.	typ.	max.
NPN vertical		80	
PNP vertical		10	

¹Test condition : $V_{ce} = 5$ volts

FIG 1 : I-V Characteristics for a 50x1.2 μm N-MOSFET

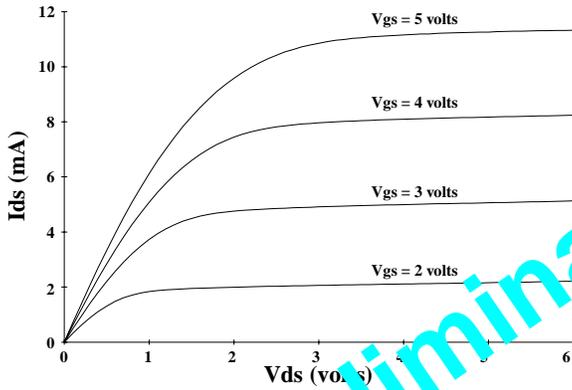


FIG 2 : I-V Characteristics for a 50x1.2 μm P-MOSFET

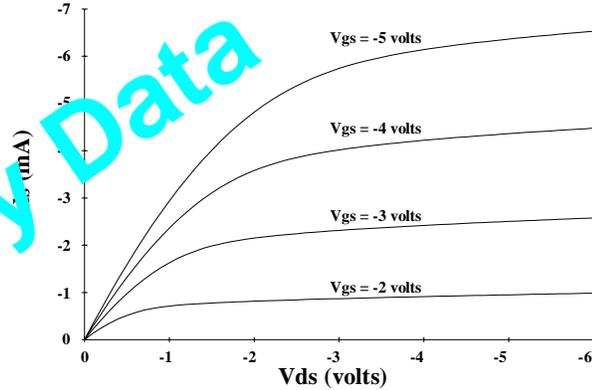


FIG 3 : Subthreshold Characteristics at $V_{ds}=0.1$ volt for a 50x1.2 μm N-MOSFET

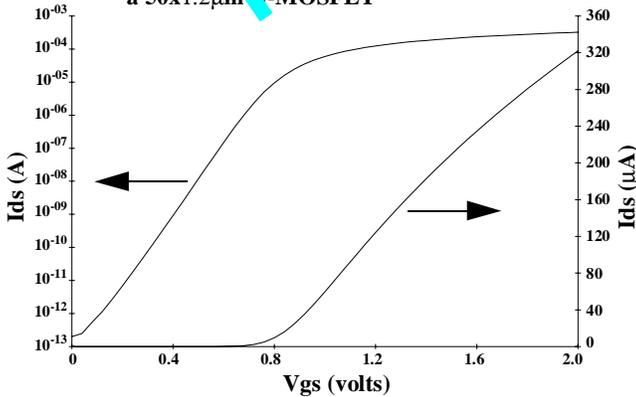
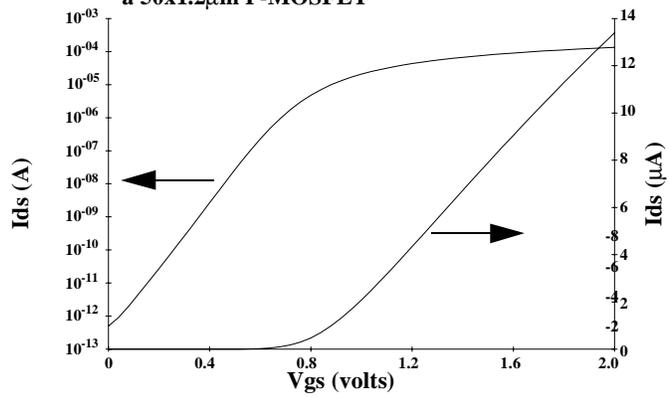


FIG 4 : Subthreshold Characteristics at $V_{ds}=-0.1$ volt for a 50x1.2 μm P-MOSFET



NOTE : These values are for guidance only. Many of them can be adjusted to suit customer requirements. For full process specifications contact a Mitel sales office or representative.