

Features

- LO_VMOS Process (2.7~3.6 Volts Low Voltage Option)
- Double Poly / Double Metal
- 6 μm Poly Pitch; 7 μm Metal Pitch
- 7 Volts Maximum Operating Voltage
- 10 Volts High Voltage Option

Description

The Mitel 3μm CMOS double poly / double metal process family offers three operating voltage options. The standard process has a maximum operating voltage of 7 volts while the high voltage option allows 11 volts operation. The third option is aimed at the 3 volts market. It offers low and matched threshold voltages for improved dynamic range needed in mixed analog/digital applications.

Process Parameters

Process Parameters	3μm 10, 5 & 3volts	Units
Metal I pitch (line/space)	3 / 4	μm
Metal II pitch (line/space)	3 / 4	μm
Poly pitch (line/space)	3 / 3	μm
Contact	3 x 3	μm
Via	3 x 3	μm
Gate geometry	3	μm
P-well junction depth	4	μm
N+ junction depth	0.40	μm
P+ junction depth	0.55	μm
Gate oxide thickness	470	Å
Inter poly oxide thick.	650	Å

MOSFET Electrical Parameters

	3 MICRON - 10 volts			3 MICRON - 5 volts			3 MICRON - 3 volts			Units	Conditions
	N Channel min. typ. max.	P Channel min. typ. max.		N Channel min. typ. max.	P Channel min. typ. max.		N Channel min. typ. max.	P Channel min. typ. max.			
V _t (50x3μm)	0.6 0.8 1.0	0.6 0.8 1.0		0.6 0.8 1.0	0.6 0.8 1.0		0.35 0.50 0.65	0.35 0.50 0.65		V	saturation region
I _{ds} (50x3μm)	82	36		22	9		42	17		mA/ μm	10 V : V _{ds} =V _{gs} =5v 3&5 V: V _{ds} =V _{gs} =3v
Body factor (50x50μm)	0.5	0.6		0.6	0.4		0.5	0.2		√V	
Bvdss	16 21	16 18		10 16	10 18		10 16	10 14		V	I _{ds} = 1μA
Subthres. Slope	94	100		120	110		92	92		mV/ dec	5v : V _{ds} =0.1v 3v : V _{ds} =3.6v
Field thresh.	12 20	12 19		12 27	12 19		12 26	12 18		V	I _{ds} = 14μA
L effective	2.9	2.5		2.4	2.2		2.4	2.2		μm	L drawn = 3μm

3 Micron CMOS Process Family

Capacitances (fF/ μm^2)

	3 μm 5 volts & 3 volts		
	min.	typ.	max.
Inter-poly	0.44	0.54	0.63
Gate oxide	0.69	0.73	0.78
N+ Junction		.17	
P+ Junction		.12	

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

	3 μm 5 volts & 3 volts		
	min.	typ.	max.
Pwell		17000	
Pfield in Pwell	2400	3600	4800
N+	20	28	35
P+	80	100	120
Poly gate	15	23	30
Poly capacitor	75	100	125
Metal I		0.038	
Metal II		0.038	

Bipolar gain¹

	3 μm - 5 volts		
	min.	typ.	max.
NPN vertical		700	

¹Test condition : Vce = 5 volts

FIG 1 : I-V Characteristics for a 50x3 μm N-MOSFET (3 μm 5 volts process)

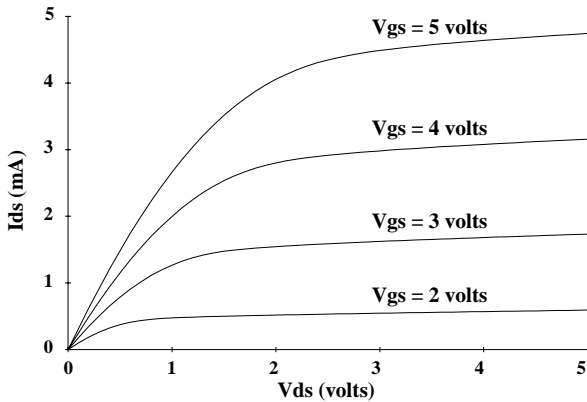


FIG 2 : I-V Characteristics for a 50x3 μm P-MOSFET (3 μm 5 volts process)

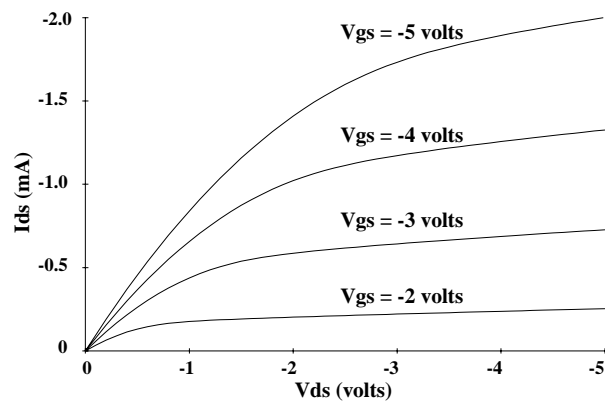


FIG 3 : Subthreshold Characteristics at Vds=0.1 volts for a 50x3 μm N-MOSFET (3 μm 5 volts Process)

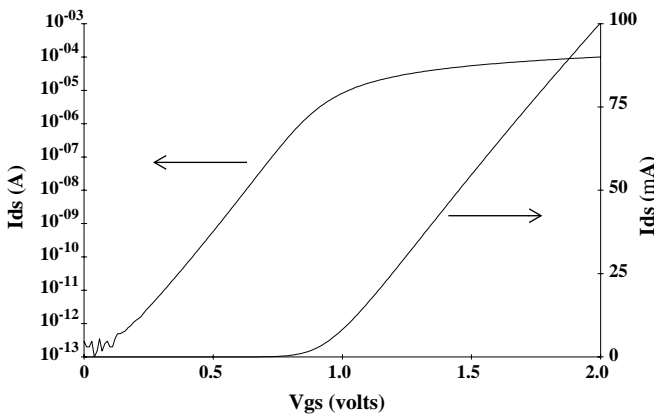
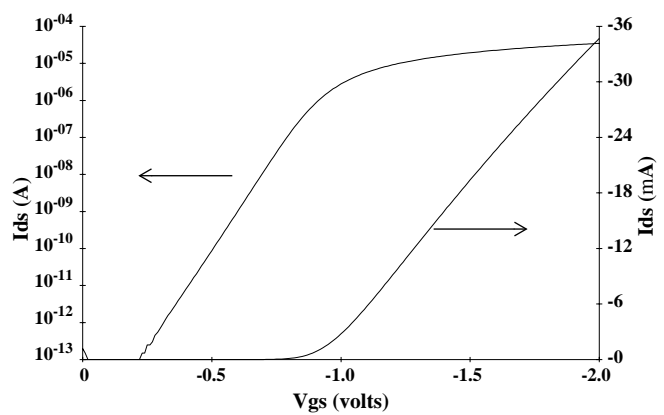


FIG 4 : Subthreshold Characteristics at Vds=-0.1 volts for a 50x3 μm P-MOSFET (3 μm 5 volts Process)



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.