

3 Micron CMOS Process Family

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

Features

- LO_VMOS Process [3Volts (2.7~3.6) 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
- ProToDuction™ Option for low cost prototypes,
- 150 mm wafers.

Description

The Dalsa Semiconductor 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.

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		µA/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	
B _{vdss}	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(cont'd)

Resistances (Ω /sq.)

	3 μ m 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	

Capacitances (fF/ μ m²)

	3 μ m 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		0.17	
P+ Junction		0.12	

Bipolar gain¹

	3 μ m - 5 volts		
	min.	typ.	max.
NPN vertical		700	

¹Test condition : Vce = 5 volts

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

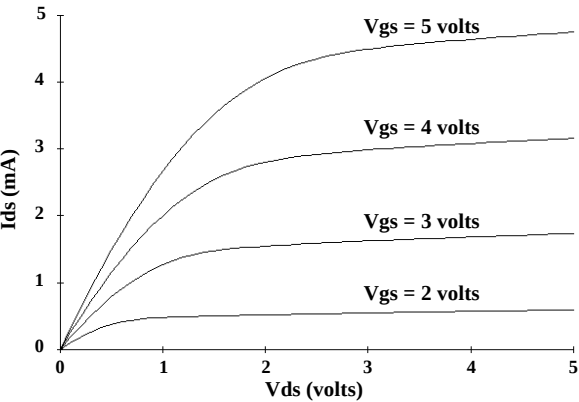


FIG 2 : I-V Characteristics for a 50x3 μ m P-MOSFET (3 μ m 5 volts process)

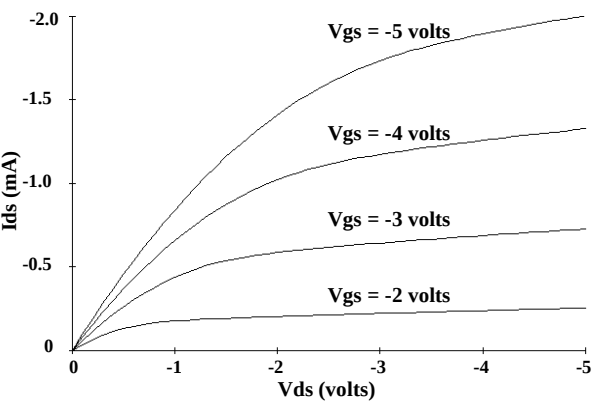


FIG 3 : Subthreshold Characteristics at Vds=0.1 volts for a 50x3 μ m N-MOSFET (3 μ m 5 volts Process)

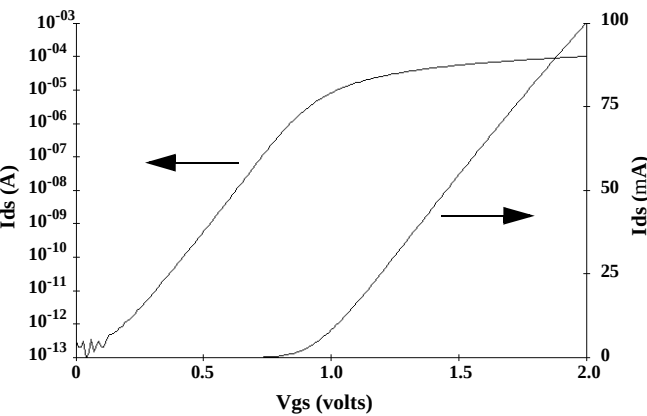
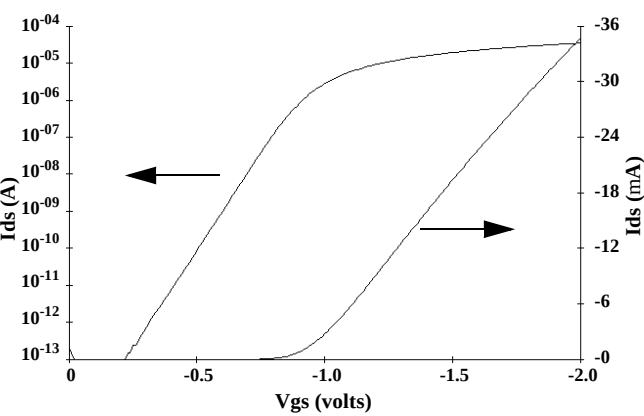


FIG 4 : Subthreshold Characteristics at Vds=-0.1 volts for a 50x3 μ m P-MOSFET (3 μ m 5 volts Process)



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