

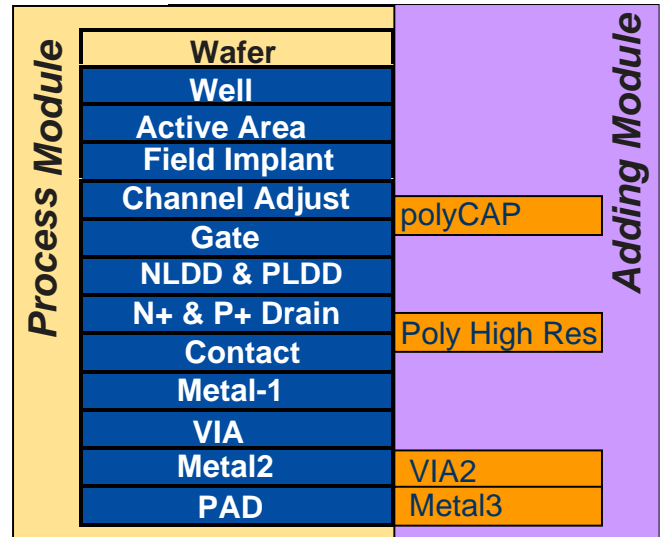


DMS LAB Limited

## 5V 0.6um CMOS process specification

### > Description

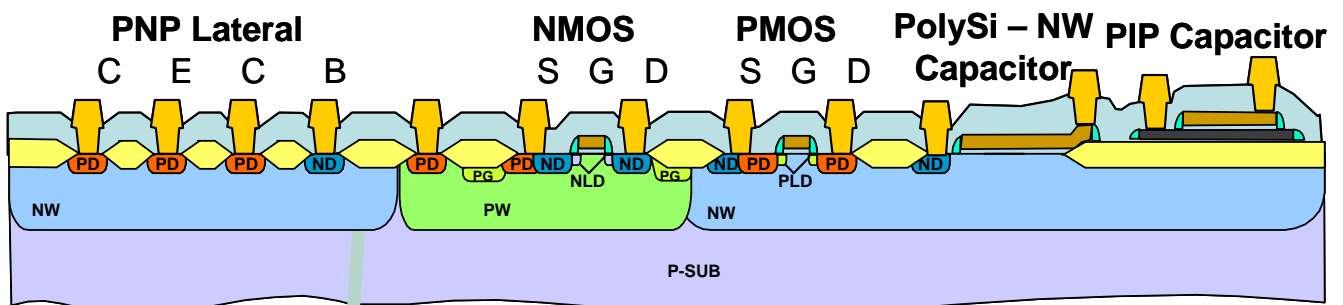
- 5V 0.6um CMOS process is DMS Lab Limited Mixed Signal Technology. Main target applications are mixed signal IC's for wide range applications, including automotive, telecommunication and consumer products which using 5V supply.
- Standard element base including 5V NMOS/PMOS, PNP bipolar and resistors in active can be made by 14 masks core process module.
- Other process modules can be added to integrate PIP capacitors (1 layer), high res polySi-resistors (1 layer), 3-rd metal level (2 layers).



### > Key Features

- 0.6um triple poly, triple metal, N-Well process;
- A follow number of different devices are available:
  - 5V CMOS transistors;
  - 5V PNP lateral transistors;
  - resistors in active layers;
  - high res polysilicon resistors;
  - PIP and PolySi – gate oxide- Well capacitors;
    - BSIM3V3 models for MOS
    - Gummel poon models for bipolar;
    - CMOS and bipolar cell library;
    - Reliable design rules, precise Spice models;

### > Schematic cross section of main elements





> Basic design rules

Layer	Min width (um)	Min spacing (um)
Active Area	0.6	1.2
PolySi gate	0.6	0.8
PolySi resistor	0.8	0.8
Contact	0.6	0.6
Metal-1	0.9	0.8
VIA	0.7x0.7	0.8
Metal-2	0.9	0.8
VIA-2	0.7x0.7	0.8
Metal-3	1.4	1.2

> Device Parameters of main elements

**NMOS L=0.6um**

Parameter	Symbol	SPEC			Unit	Measurement condition
		min	type	max		
Threshold voltage	Vth	0.6	0.8	1.0	V	Id=-0.1μA
Drain current	Id	400	475	550	uA/um	Vds=-5V, Vg=5V
Drain to Source Breakdown Voltage	BVdso	8	12	-	V	Id=-10μA

**PMOS L=0.7um**

Parameter	Symbol	SPEC			Unit	Measurement condition
		min	type	max		
Threshold voltage	Vth	0.7	0.9	1.1	V	Id=-0.1μA
Drain current	Id	200	250	300	uA/um	Vds=-5V, Vg=5V
Drain to Source Breakdown Voltage	BVdso	8	12	-	V	Id=-10μA

**HV NMOS L=3um**

Parameter	Symbol	SPEC			Unit	Measurement condition
		min	type	max		
Threshold voltage	Vth	0.6	0.8	1.0	V	Id=-0.1μA
Drain current	Id	125	165	205	uA/um	Vds=-5V, Vg=5V
Drain to Source Breakdown Voltage	BVdso	18	25	-	V	Id=-10μA

**LPNP Wb=1.8um**

Parameter	Symbol	SPEC			Unit	Measurement condition
		min	type	max		
Forward Current Gain	BF	30	40	60	-	Vce=-1V, Ib=-1μA
Forward Current Gain	BF	15	20	30	-	Vce=-1V, Ib=-10μA
Collector to Emitter Breakdown Voltage	BVceo	7.5	12	-	V	Ic=-10μA
Collector to Base Breakdown Voltage	BVcbo	10	20	-	V	Ic=-10μA

**RESISTORS**

Parameter	Size	SPEC			Unit
		min	type	max	
NDIFF resistor	Wr ≥ 1.5um	28	40	55	Ohm/sq
PDIFF resistor	Wr ≥ 1.5um	45	60	80	Ohm/sq
PolySi resistor (gate)	Wr = 0.8um	30	35	40	Ohm /sq
PolySi high res resistor	Wr = 0.8um	1350	1500	1750	Ohm /sq

**CAPACITORS**

Parameter	SPEC			Unit	Measurement condition
	min	type	max		
PolySi1 – nitride – PolySi2 capacitance	1.35	1.5	1.65	fF/um2	F=1MHz
PolySi2 –gate oxide – Well capacitance	2.4	2.7	3.0	fF/um2	F=1MHz