Elec 422: VLSI Design I

Additional Information on 2 micron MOSIS Process

MOSIS PARAMETRIC TEST RESULTS

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RUN: N13L / LUCKY VENDOR: VTI
TECHNOLOGY: SCN FEATURE SIZE: 2.0um

I. INTRODUCTION. This report contains the lot average results obtained by MOSIS from measurements of the MOSIS test structures on the selected wafers of this fabrication lot. The SPICE LEVEL 2 and BSIM parameters obtained from similiar measurements on these wafers are also attached.

COMMENTS: This looks like a typical VLSI Technology 2.0um run.

II. TRANSISTOR

PARAMETERS:	W/L	N-CHANNEL	P-CHANNEL	UNITS
Vth (Vds=.05V)	3/2	.722	-.824	V
Vth (Vds=.05V)	18/2	.570	-.795	V
Idss (Vgds=5V)	18/2	2801.0	-1248.0	uA
Vpt (Id=1.0uA)	18/2	N/A	-16.12	V
Vth (Vds=.05V)	50/50	.763	-.794	V
Vbkd (Ij=1.0uA)	50/50	18.8	-15.8	V
Kp (Uo*Cox/2)	50/50	23.0	11.10	uA/V^2
Gamma (2.5v,5.0v)	50/50	.404	.505	V^0.5
Delta Length		.221	.421	um
Delta Width (Effective=Drawn-Delta)		.524	.124	um

COMMENTS: These parameters seem normal.

III. FIELD OXIDE

TRANSISTOR PARAMETERS:	GATE	SOURCE/DRAIN N + ACTIVE	SOURCE/DRAIN P + ACTIVE	UNITS
Vth (Vbs=0,I=1uA)	Poly	22.2	-15.6	V
Vth (Vbs=0,I=1uA)	Metal1	22.2	-20.3	V
Vth (Vbs=0,I=1uA)	Metal2	22.3	-25.5	V

COMMENTS: These parameters seem normal.

IV. PROCESS PARAMETERS:	N POLY	P POLY	N DIFF	P DIFF	N WELL	METAL 1	METAL 2	UNITS
Sheet Resistance	22.4	23.1	29.2	86.9	2281.0	.090	.038	Ohm/sq
Width Variation (Measured - Drawn)	.399	.377	.653	.198	----	.390	.820	um
Contact Resist. (Metal1 to Layer)	6.47	6.72	10.89	28.05	----	----	.111	Ohms
Gate Oxide Thickness:	----	----	----	397.	----	----	----	Angst.

COMMENTS: These parameters seem normal.

V. CAPACITANCE PARAMETERS:	POLY	N DIFF	P DIFF	METAL 1	METAL 2	UNITS
Area Cap (Layer to subs)	.036	.128	.254	.027	.020	fF/um^2
Area Cap (Layer to Poly)	----	----	----	.049	.025	fF/um^2
Area Cap (Layer to Metal1)	----	----	----	----	.046	fF/um^2
Fringe Cap (Layer to subs)	----	.510	.313	----	----	fF/um

COMMENTS: These parameters seem normal.

VI. CIRCUIT PARAMETERS:		
Vinv, K = 1	1.95	V
Vinv, K = 1.5	2.18	V
Vlow, K = 2.0	0.00	V
Vhigh, K = 2.0	4.99	V
Vinv, K = 2.0	2.41	V
Gain, K = 2.0	-10.80	
Ring Oscillator Frequency	34.73	MHz (31 stages @ 5.0V)

COMMENTS: The ring oscillator frequency is typical.

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N13L  SPICE LEVEL 2 PARAMETERS

.MODEL CMOSN NMOS LEVEL=2 LD=0.240703U TOX=407.000000E-10
+ NSUB=3.133604E+15 VTO=0.711043 KP=4.879000E-05 GAMMA=0.3801
+ PHI=0.6 UO=575.027 UEXP=0.129885 UCRIT=24726.9
+ DELTA=0.82016 VMAX=63588.7 XJ=0.250000U LAMBDA=2.474695E-02
+ NFS=6.455307E+12 NEFF=1 NSS=1.000000E+10 TPG=1.000000
+ RSH=29.040000 CGDO=3.063325E-10 CGSO=3.063325E-10 CGBO=5.135289E-10
+ CJ=1.130300E-04 MJ=0.699680 CJSW=5.235300E-10 MJSW=0.263078 PB=0.800000
* Weff = Wdrawn - Delta_W
* The suggested Delta_W is -0.60 um
.MODEL CMOSP PMOS LEVEL=2 LD=0.250000U TOX=407.000000E-10
+ NSUB=6.222000E+15 VTO=-0.80612 KP=2.113000E-05 GAMMA=0.5357
+ PHI=0.6 UO=249.519 UEXP=0.226251 UCRIT=18368.3
+ DELTA=1.75689 VMAX=40684.7 XJ=0.250000U LAMBDA=5.307119E-02
+ NFS=3.574015E+11 NEFF=1.001 NSS=1.000000E+10 TPG=-1.000000
+ RSH=87.160000 CGDO=3.181644E-10 CGSO=3.181644E-10 CGBO=6.682147E-10
+ CJ=2.493100E-04 MJ=0.551790 CJSW=2.815500E-10 MJSW=0.311229 PB=0.800000
* Weff = Wdrawn - Delta_W
* The suggested Delta_W is 0.04 um
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