LOT SUMMARY DATA

Lot Number 019-H ; Mask Set Number 9062B
Starting Material Resistivity 10-25 Vendor Wacker (13-15Ω-cm)
Date Started 3/3/75 Date Completed 4/2/75
Initial Oxide Thickness 985 Å
Field Implant Dose 8x10" ; Energy 35
First Half Field Thickness 13600 Å
Gate Oxide Thickness 1020 Å
Enhancement Implant Dose 1.5x10" ; Energy 48
Depletion Implant Dose 6.7x10" ; Energy 120
Poly Silicon THickness 4200-4500 Å
Second Half Field Thickness 9100 Å
Aluminum Thickness 12000 Å
Pyro Overlay Thickness 7700 Å

VARIATIONS TO STANDARD PROCESS

WAFER #	CODED #	DESCRIPTION OF VARIATION
		VARIABLE:
		All - Implants - ODD Wafers FLAT DOWN ~~EVEN~~ FLAT UP
		First Field Densification - 950°
		Si Etch Depth - 2900 Å
		Ox Etch After Si Etch - Performed to remove ~ 1000 Å
		Gate Oxidation - 5-40-5 (1020 Å)
		Wafer Clean after Second Half Field - No 50:1
		Post Sinter (5 Wafers Only) - 15 min.

COMMENTS: Actual Work Days to Run Lot - 8
Yield = 13/19 = 68%

Comments on 019-H

A.) **All** process steps done by self with exception of:

Aluminum Deposition
Passivation Etch } Performed in Front End.

B.) Deviations to 019F Run Sheet:

1st Field Pyro Densifications - 950°C (not 1000Å)

Silicon Etch - 2900 Å (not 1750Å)

Oxide Etch after Si Etch - Performed (34°C, 30 sec.)

Gate Oxidation - 40' (not 42') → 1020Å

Enhancement Implant - 1.5x10", 48KeV (Not 1.7E11, 52KeV)

Depletion Implant - 6.7x10", 120 KeV (Not 175 keV)

2nd Half Field - 9100Å (not 7500 or 8500 Å)

Wafer Clean after 2nd Half field - no 50:1 etch

Post Sinter - 15 min (not 30')

C.) Number of Days to run lot: 8 DAYS

YIELD: 13/19 = .68 → 68%

M. Holt
4/2/75

PAGE 1 DEVELOPMENT LABOR PRELIMINARY DATE (9058) LOT NUMBER 019-H

	To Good Box	To Reliability	To HIRT	I² FLAT UP	I² FLAT DOWN	No POST SINTER OR PYRO	POSTSINTER PYRO	WAFER NUMBER	Vte	Vtoe	Vtfm	Vtfp	Diode BV	BVDSS	Poly (Ω/□)	N+ (Ω/□)	C Max	tox	Vfb	Qss
									CURVE TRACER								C-V PLOT			
TEST CONDITION								---	1 μa	1X,4X	10 μa	10 μa	10 μa	10 μa						
SPEC. LIMIT								---	.8to.9		>12V.	>10V.	>25V.	>20V.	20-80	10-20				
DEVICE SIZE								---												
	X		X		X	X		1	.9-1.0	.6-.7	14-15	15-16	29-31	24	20	8	66.5	980		
		X			X	X		3	.6-.95	.4-.65	15-16	15-16	28-38	24	20	10	68.0	960		
			X	X		X		6	.85-1.0	.55-.7	13-15	14-16	32-38	22-27	20	10, 17	65.0	1005		
					X	X		7	.75-.85	.45-.6	14-16	16-16.5	29-32	23-24	23	15	67.0	973		
				X		X		8	.7-.9	.4-.6	13-14	15-15.5	30	24	18	10	67.5	965		
				X		X		10	.85-.9	.55-.65	12-14	14-15.5	29-32	24	15	15	64.0	1015		
	X		X		X	X		11	.75-.95	.5-.65	12-15	15-16	30-34	22-26	25	22	64.0	1015		
				X		X		14	.4-.6/ON	.2-.3/ON	13-15	12-15	30-31	20-24	25	18	Shorts	—		
				X			X	16	.85-.95/[illegible]	.6-.6	15-15.5	17-17.5	20-34 (L)	22-26	18	15	66.5	980		
	X	X			X		X	17	.55-.95	.4-.65	15-16.5	16.5-17.5	28-36	22-25 (S)	23	13	67.5	965		
			X	X			X	18	.95-1.1	.5-.75	15-17	16-17.5	29-35	22-26 (S)	23	15	68.0	960		
			X		X		X	19	.95-1.2	.55-.9	14-15	15-17	29-30	22-24	23	18	67.5	965		
	X		X	X			X	20	.75-.90	.5-.7	14.5-16	16-17	30-33	24-25	23	15	69.0	945		

OPERATING UNIT: PREPARED BY: DATE:

UNIVERSAL PLANNING FORM — TYPE B

PAGE

DEVELOPMENT LABORATORY PRELIMINARY DATA

LOT NUMBER: 019-H

		Registers BOTH GOOD	ENH GOOD	DEPL GOOD	WAFER NUMBER	M/P	st M/N^+	st M-P κ	M-N^+ κ	P-N^+ κ	P-N^+ st	M-P Rupt.	M-N^+ Rupt.	Vptfm	Gate Rupt.	Gate $-N^+$ Rupt.
1	TEST CONDITION				---											
2	SPEC. LIMIT				---											
3					1	OK	OK	OK	OK	OK	OK	>100	30-45	35-40	>140	50-60
4																
5		37	69	71	3	OK	OK	OK	OK	OK	OK	>75	35-50	39-43	>140	30-50
6																
7					6	OK	OK	OK	OK	OK	OK	>100	50	28-39	>140	55-60
8																
9					7	OK	OK	OK	OK	(open)	OK	>100	50	35-42	>140	50-80
10																
11					8	OK	OK	OK	OK	(open)	OK	>70	45	30-32	>140	60
12																
13					10	OK	OK	OK	OK	(open)	OK	>100	25-52	30-39	>140	55-80
14																
15					11	OK	OK	OK	OK	OK	OK	>100	50	23-39	>140	60-90
16																
17					14	OK	OK	OK	OK	(open)	OK	>100	40-50	29-35	>120	40-80
18																
19					16	OK	OK	OK	OK	(open)	OK	>100	40-50	36-42	>140	40-50
20																
21		9	17	42	17	OK	OK	OK	OK	ok (open)	OK	>90	20-40/6	35-40	>140	70-80
22																
23					18	OK	OK	OK	OK	OK	OK	>100	(5)/45	35-41	>140	30-40
24																
25					19	OK	OK									
26																
27					20	OK	OK									
28					.											
29																
30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40																
41																

#17
Good 9
Enh. 11
Dep 28

#3
Good 25
Enh. 35
Dep. 37

Enh & Depl includes those in "total" GOOD

OPERATING UNIT: | PREPARED BY: | DATE:

UNIVERSAL PLANNING FORM – TYPE B

EVALUATION LABORATORY SUMMARY

19-H

FINAL tox =

DEVICE SIZE	WAFER NUMBER	Vtoe EXTRAP	Vtoe NORM	Vtod CALC	Vtod NORM	Idss @ Vsb = -5. INTERCEPT	Idss NORM	BODY EFFECT (K) ENH. CALC.	ENH. NORM.	DEPL. CALC.	DEPL. NORM.	GAIN (K') ENH. CALC.	ENH. NORM.	DEPL. CALC.	DEPL. NORM.	MOBILITY, μo ENH.	DEPL.
Spec.	---		.5-1.0		-3.0-3.5			.3-.6					17-28			> 650	
	1	.78		-1.63		36		.54		.59		29.5		30		879	894
	6	.78		-1.72		38		.55		.61		30		30		894	894
	11	.78		-2.06		50		.51		.65		30		28		894	804
	18	.64		-1.62		85?		.56		.63		27		29		804	864
	19	.98		-1.25		17		.58		.61		28		30		834	894
	20	.7		-1.78		.		.57		.62		28		29		834	864

DEVICE SIZE	WAFER NUMBER	Vtoe EXTRAP	Vtoe NORM.	Vtod CALC.	Vtod NORM.	Idss @ Vsb = 5. INTERCEPT	Idss NORM	BODY EFFECT (K) ENH. CALC.	ENH. NORM.	DEPL. CALC.	DEPL. NORM.	GAIN (K') ENH. CALC.	ENH. NORM.	DEPL. CAL.	DEPL. NORM.	MOBILITY, μo ENH.	DEPL.
Spec.	---		.5-1.0		-3.0-3.5			.3-.6					17-28			> 650	
	1	.73		-1.89		1		.54		.63							
	6	.6		-2.08				.56		.66							
	11	.62		-2.35				.54		.61							
	18	.72		-1.54				.56		.6							
	19	.76		-1.48				.52		.55							
	20																

19-H

	WAFER NUMBER	Cjb	Cjs	N	Cnsf	Gate Cap	V_t Coeff	DW	DL	CMS	CMP	~~CMN~~
TEST CONDITION	---	0 Bias	0 Bias									
SPEC LIMIT	---	<.087	<.021	.4	<.031	.20	1.6 mv/°C	-.06 to -.13	-.03 to -.13	<.016	<.04	~~<.04~~
DEVICE SIZE	---											A
	1	.076	.0086								.025	8791
	6	.076	.0096					.222			.026	8672
	19	.078	.0085					.1405	-.21		.029	7630

ATING UNIT: PREPARED BY: DATE:

LOT # 019-H

WAF. #	LOC. #	DW-DL 2/50 (µa)	DW-DL 2/2 (µa)	DW-DL 50/2 (ma)	CAPACITANCE C_j (pf)	CAPACITANCE C_j (FINGERS) (pf)
1	1	~~8.19~~	~~88.1~~	~~5.51~~	16.4	31.2
	2	8.14	119.8	5.46	16.4	31.5
	3	8.23	107.5	5.49	16.4	31.2
	4	8.32	115.9	5.47	16.3	31.1
	5	~~9.65~~	~~263.~~	~~6.21~~	16.6	30.2
	avg				16.4	31.04
6	1	6.48	147.4	5.77	16.4	32.0
	2	8.27	171.9	5.45	16.4	32.5
	3	8.13	104.0	5.59	16.9	33.5
	4	7.99	93.0	5.56	16.2	31.9
	5	~~0.23~~	242.	5.47	16.3	31.0
	avg				16.44	32.18
19	1	6.95	199.1	4.51	16.9	31.8
	2	7.50	123.4	4.90	16.9	32.0
	3	6.93	124.3	4.53	16.6	31.5
	4	7.45	207.	4.83	16.5	31.1
	5	~~236.~~	236.	5.55	17.1	31.0
	avg				16.8	31.48

WAF. #	LOC. #	Cmp (pF)
1	1	3.60
	2	3.59
	3	3.60
	4	3.60
	5	3.62
	avg	3.6
6	1	3.75
	2	3.66
	3	3.62
	4	3.59
	5	3.60
	avg	3.644
19	1	4.15
	2	4.20
	3	4.18
	4	4.12
	5	4.09
	avg	4.148