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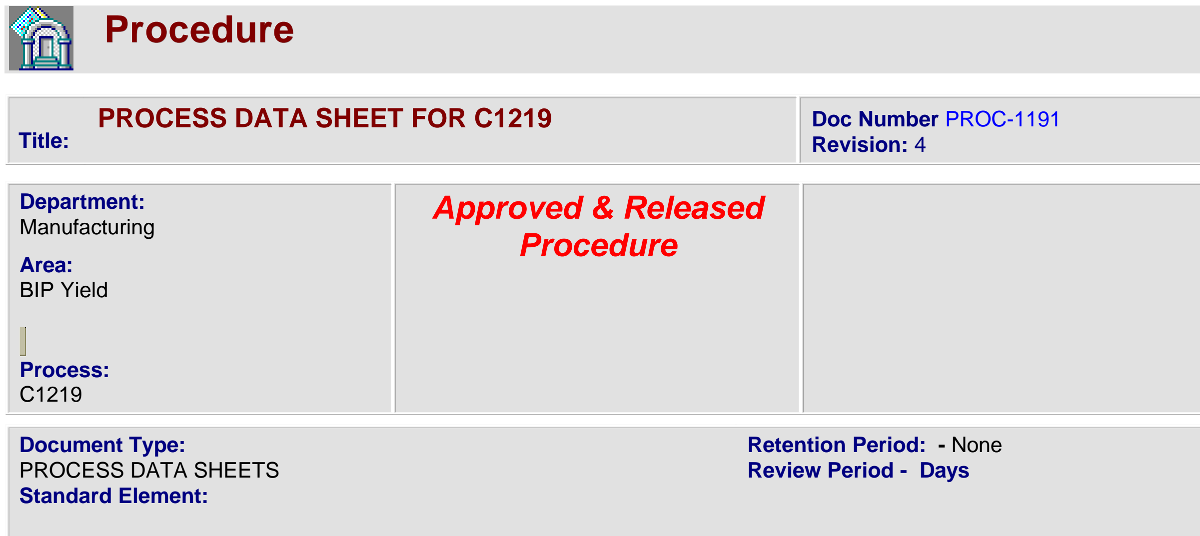


Procedure

Title: PROCESS DATA SHEET FOR C1219	**Doc Number** PROC-1191 **Revision:** 4

Department: Manufacturing **Area:** BIP Yield **Process:** C1219	***Approved & Released Procedure***	

Document Type: PROCESS DATA SHEETS **Standard Element:**	**Retention Period:** - None **Review Period - Days**

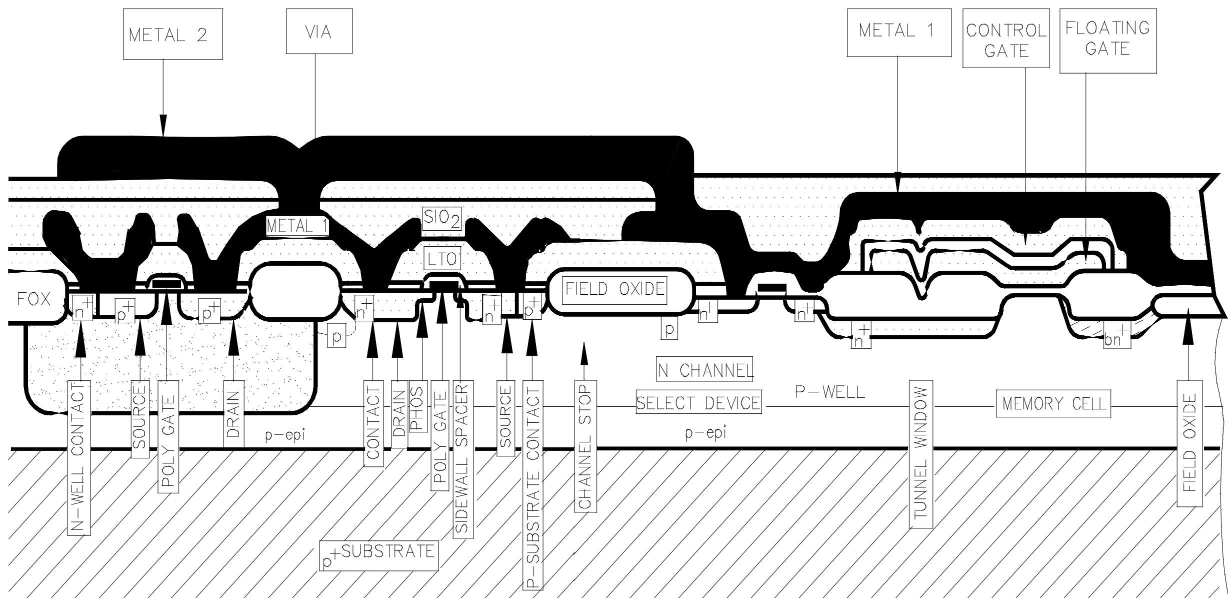
EECMOS 1.2 PROCESS WITH HIGH RESISTIVE POLY AND LOW THRESHOLD TRANSISTORS

PHYSICAL CHARACTERISTICS

Process Geometry	1.2 micron
Process Number	C1219
Operating Voltage	3V
Well Doping	TWIN-WELL
Metal Layers	2
Poly Layers	2
Contact	1.5 µ
Via	1.5 µ
Metal I Width	2.5 µ
Metal I Space	1.5 µ

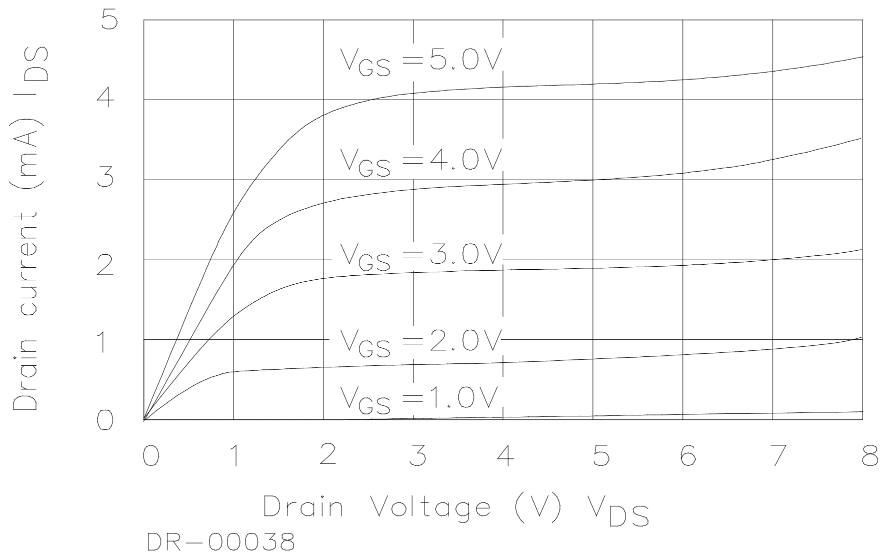
Metall II Width	2.5 µ
Metal II Space	1.5 µ
Gate Poly Width	1.5 µ
Gate Poly Space	2.0 µ
Bottom Poly Width	3.0 µ
Bottom Poly Space	2.0 µ
N+ / P+ Width	2.0 µ
N+ / P+ Space	2.0 µ
N+ to N-WELL	7.0 µ
N+ to P+	9.0 µ

CROSS SECTIONAL VIEW OF THE EECMOS 1.2 PROCESS

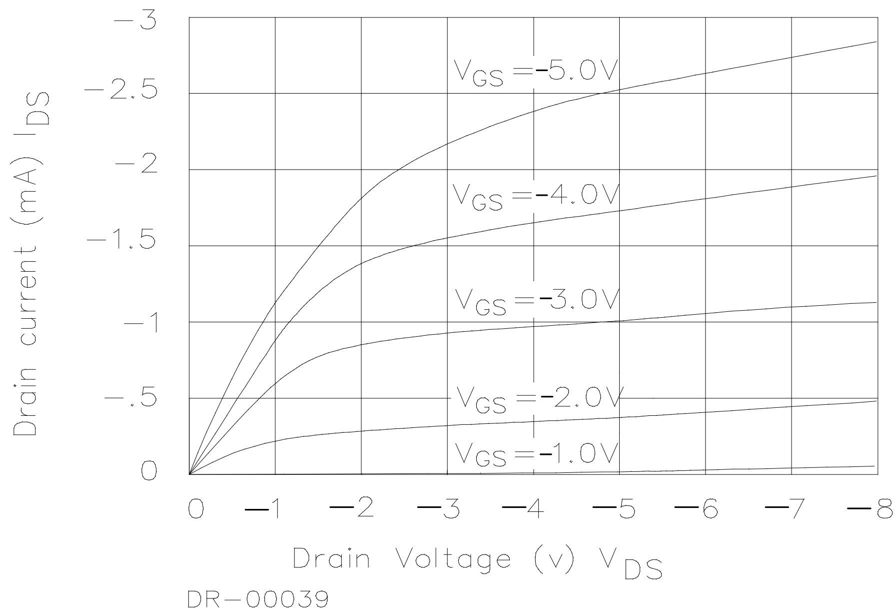


EECMOS 1.2 PROCESS WITH HIGH RESISTIVE POLY AND LOW THRESHOLD TRANSISTORS

n-ch transistor IV characteristics of a 20/1.2 device



p-ch transistor IV characteristics of a 20/1.2 device



EECMOS 1.2 PROCESS WITH HIGH RESISTIVE POLY AND LOW THRESHOLD TRANSISTORS

ELECTRICAL CHARACTERISTICS

n-ch transistor T = +25°C unless otherwise noted

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Threshold Voltage (linear extrapolated)	VTO_N	0.30	0.475	0.65	V	100/1.2 device
Body Factor	Y_N	0.35	0.45	0.55	$V^{½}$	100/1.2 device
Conduction factor (normalized)	B_N	64	78	92	$μA/V^2$	100/100 device
Effective Channel Length	$Leff_N$	0.8	1.0	1.2	μm	100/1.2 device
Width Enroachment	ΔW_N		0.6		μm	per side
Punch Through Voltage	$BVDSS_N$	5			V	100/1.2 device
Poly Field Threshold	$VTF_{P(N)}$	8			V	
Threshold Voltage Offset (two Sigmas)	ΔVT_N		5		mV	100/10 device

p-ch transistor

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Threshold Voltage (linear extrapolated)	VTO_P	-0.65	-0.475	-0.3	V	100/1.2 device
Body Factor	Y_P	0.5	0.6	0.7	$V^{½}$	100/1.2 device
Conduction Factor (normalized)	B_P	20	25	30	$μA/V^2$	100/100 device
Effective Channel Length	$Leff_P$	0.9	1.1	1.3	μm	100/1.2 device
Width Enroachment	ΔW_P		0.8		μm	per side
Punch Through Voltage	$BVDSS_P$			-5	V	100/1.2 device
Poly Field Threshold	$VTF_{P(P)}$			-8	V	
Threshold Voltage Offset (two Sigmas)	ΔVT_P		5		mV	100/10 device

EECMOS Characteristics

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Tunnel Thickness	$t_{TUNNEL\ OX}$		90		Å	
Interpoly Oxide Thickness	$T_{INTERPOLY\ OX}$		400		Å	
Buried N+ sheet Resistance	Rho_{BM+}		300		Ω/[]	
Intitial Program / Erase Window			6		V	
Umpogrammed Memory Threshold	VT		17		V	
Endurance			10^5		Cycles	
Programming Votlage	V_{PP}		13		V	

EECMOS 1.2 PROCESS WITH HIGH RESISTIVE POLY AND LOW THRESHOLD TRANSISTORS

diffusion & thin films

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Well (field) Sheet Resistance	$Rho_{N-(f)}$	1.2	2.0	2.8	kΩ/	n-well
N+ Sheet Resistance	Rho_{N+}	20	35	50	Ω/	
N+ Junction Depth	X_{JN+}		0.30		µm	
P+ Sheet Resistance	Rho_{P+}	50	75	100	Ω/	
P+ Junction Depth	X_{JP+}		0.30		µm	
Gate Poly Sheet Resistance	$Rho_{POLY(N)}$	15	22	30	Ω/	
Bottom Poly Sheet Resistance	Rho_{M1}		35		mΩ/	
High Resistive Poly Sheet Resistance	Rho_{POLYH}	1.5	2.0	2.5	kΩ/	
Metal 1 Sheet Resistance	Rho_{M1}		50		mΩ/	
Metal 2 Sheet Resistance	Rho_{M2}		30		mΩ/	

capacitance

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	COMMENTS
Gate Oxide	C_{OX}	1.28	1.38	1.58	fF/µm^2	
Poly Gate to Bottom Poly	C_{PP}		0.86		fF/µm^2	interpoly capacitor
Metal 1 to Poly	C_{M1P}		0.057		fF/µm^2	
Metal 2 to Metal 1	C_{MM}		0.035		fF/µm^2	

Associated Documents:

Documents Generated:

Document Title	Responsibility	Department

Document Revision History:

Revision: 4	Date Created: 04-10-2002 Date of Last Revision: 07-06-2004	Last Approval Date: 07-06-2004

Document Author: Ettiene Smit	Document Manager: Alan Sasnovski

Reason for Change:

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	4-10-02
2		Added page breaks	29-10-02
3		Change Process description to add Low Threshold Transistors and changed the Electrical Characteristics	16-01-03
4	Physical Characteristics	Change Well doping from N-Well to Twin-Well	04-06-04

Electronic Notification List:

Approvals:

First Approver's Signature

Name: Aletta Du Plessis
Title: Configuration Controller

07-06-04 - Approved by: Aletta Du Plessis

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