

# Process C3025

## CMOS 3 $\mu$ m

### 10 Volt Analog

## Electrical Characteristics

T=25°C Unless otherwise noted

N-Channel Transistor	Symbol	Minimum	Typical	Maximum	Unit	Comments
Threshold Voltage	$V_{TN}$	0.65	0.85	1.05	V	100x4 $\mu$ m
Body Factor	$\gamma_N$		0.87		V <sup>1/2</sup>	100x4 $\mu$ m
Conduction Factor	$\beta_N$	40	48	56	$\mu$ A/V <sup>2</sup>	100x100 $\mu$ m
Effective Channel Length	$L_{effN}$	3.05	3.40	3.75	$\mu$ m	100x4 $\mu$ m
Width Encroachment	$\Delta W_N$		0.550		$\mu$ m	Per side
Punch Through Voltage	$BVDSS_N$	16.5			V	
Poly Field Threshold Voltage	$VTF_{P(N)}$	12			V	

P-Channel Transistor	Symbol	Minimum	Typical	Maximum	Unit	Comments
Threshold Voltage	$V_{TP}$	-0.7	-0.9	-1.1	V	100x4 $\mu$ m
Body Factor	$\gamma_P$		0.75		V <sup>1/2</sup>	100x4 $\mu$ m
Conduction Factor	$\beta_P$	13	16	19	$\mu$ A/V <sup>2</sup>	100x100 $\mu$ m
Effective Channel Length	$L_{effP}$	3.00	3.35	3.70	$\mu$ m	100x4 $\mu$ m
Width Encroachment	$\Delta W_P$		0.8		$\mu$ m	Per side
Punch Through Voltage	$BVDSS_P$	-16.5			V	
Poly Field Threshold Voltage	$VTF_{P(P)}$	-12			V	

Diffusion & Thin Films	Symbol	Minimum	Typical	Maximum	Unit	Comments
Well (field) Sheet Resistance	$\rho_{P-well(f)}$	3.25	5.25	7.25	K $\Omega/\square$	P-well
N+ Sheet Resistance	$\rho_{N+}$	13	20	27	$\Omega/\square$	
N+ Junction Depth	$x_{jN+}$		0.8		$\mu$ m	
P+ Sheet Resistance	$\rho_{P+}$	50	80	100	$\Omega/\square$	
P+ Junction Depth	$x_{jP+}$		0.7		$\mu$ m	
Gate Oxide Thickness	$T_{GOX}$	45	48	51	nm	
Interpoly Oxide Thickness	$T_{P1P2}$	56	66	76	nm	
Gate Poly Sheet Resistance	$\rho_{POLY1}$	15	22	30	$\Omega/\square$	
Bottom Poly Sheet Res.	$\rho_{POLY2}$	15	22	30	$\Omega/\square$	
Metal-1 Sheet Resistance	$\rho_{M1}$		50		m $\Omega/\square$	
Passivation Thickness	$T_{PASS}$		200+900		nm	oxide+nit.

Capacitance	Symbol	Minimum	Typical	Maximum	Unit	Comments
Gate Oxide	$C_{OX}$	0.68	0.72	0.78	fF/ $\mu$ m <sup>2</sup>	
Metal-1 to Poly-1	$C_{M1P}$	0.047	0.0523	0.0575	fF/ $\mu$ m <sup>2</sup>	
Metal-1 to Silicon	$C_{M1S}$	0.027	0.30	0.034	fF/ $\mu$ m <sup>2</sup>	
Poly-1 to Poly-2	$C_{P1P2}$	0.453	0.523	0.617	fF/ $\mu$ m <sup>2</sup>	

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## Physical Characteristics

Starting Material	P <100>	N+/P+ Width/Space	3.0 / 3.0 $\mu$ m
Starting Mat. Resistivity	15 - 25 $\Omega$ -cm	N+ To P+ Space	12 $\mu$ m
Typ. Operating Voltage	10V	Contact To Poly Space	2.5 $\mu$ m
Well Type	P-well	Contact Overlap Of Active	1.5 $\mu$ m
Metal Layers	1	Contact Overlap Of Poly	1.0 $\mu$ m
Poly Layers	2	Metal-1 Overlap Of Contact	1.0 $\mu$ m
Contact Size	2.0x2.0 $\mu$ m	Minimum Pad Opening	100x100 $\mu$ m
Metal-1 Width/Space	3.5 / 2.5 $\mu$ m	Minimum Pad-to-Pad Spacing	5.0 $\mu$ m
Gate Poly Width/Space	3.0 / 3 $\mu$ m	Minimum Pad Pitch	80.0 $\mu$ m

Special Feature of C3025 Process: 10 Volt P-well single metal analog process.