

## Logic CMOS Technology Overview

The TSI Semiconductors 0.18-micron low voltage process is a flexible, high-end, design-specific process technology when design-rule accommodation is necessary to drive product differentiation.

### Features

- Poly, diffusion & well resistors
- MOM Capacitors (VN Cap)
- Varactors
- Schottky Barrier Diode (SBD)

### Benefits

- Flexibility – modular
- Reliability of device
- IP security
- Efficiency, reducing overall costs

TSI Semiconductors Process Device Menu		
Process	Logic CMOS	
VGS	1.8V & 5V	5V Only
Triple Well Isolation	Yes	Yes
FETs	1.8V, 5V	5V Only
	High Vt * (2ML)	High Vt * (2ML)
	Super high Vt * (2ML)	Super high Vt * (2ML)
Resistors	N+, P+ diffusion & poly	N+, P+ diffusion & poly
Diodes	Schottky Barrier	Schottky Barrier
Decoupling Caps and Varactors	1.8V/5V N, P caps, vars	1.8V/5V N, P caps, vars
BEOL Caps	Vertical native (VNcap)	Vertical native (VNcap)
BEOL Metal	6LM: M1-MT M4,V4,M5,V5	6LM: M1-MT M4,V4,M5,V5
Masks (1P, 3LM)	21	16

\* Optional Devices/Layers

## Electrical Specifications

LV - Logic Process Technology					
Device	VDD (V)	Gate Oxide (Å)	V <sub>t</sub> (V)	I <sub>dsat</sub> (μA/μm)	I <sub>off</sub> (pA/μm)
Core Standard NFET/PFET	1.8	35	0.35/-0.42	600/-260	< 300
High Vt NFET/PFET			0.52/-0.52	500/-210	< 30
IO NFET/PFET	5	125	0.63/-0.65	630/-350	< 25

## FET Options

FET Options					
		LV FETs		LV FETs in HV wells**	
VGS	VDS	1.8V	5V	1.8V	5V
	1.8V (3.5nm)		nfet* pfet* nfethvt, nfetshvt pfethvt, pfetshvt		nfeti* pfeti* nfetihvt pfetihvt
5V (12nm)			nfetm pfetm		nfetim pfetim

\*RF layout available

\*\*HV (DN) Well supports 50V or 120V substrate

Note: 0.16-micron is a direct shrink of 0.18-micron

## Summary

The TSI Semiconductors 0.18-micron low voltage process features single and dual gate oxides for 1.8 volt (core) (3.5nm gate oxide), 5 volt (I/O) (12nm gate oxide) and 1.8/5 volt combined (Dual gate oxide 3.5nm & 12.0nm). Add extra masks for high voltage N-well and high voltage P-well electrical isolation.

TSI Semiconductors is a world-class, specialty foundry offering flexible technology development and the highest industry quality manufacturing solutions. Our flexible technology development and manufacturing services allow our customers to benefit from accelerated cycles of learning, which enables them to get products to market faster, and gain greater control and protection of their specific technology. With our headquarters and 8-inch fabrication plant in Roseville, California, we manufacture in a large array of versatile processes that include analog/mixed-signal/RF, deep-submicron, standard product solutions, automotive-grade, high-voltage, and technology capabilities utilizing novel materials, structures and devices. For more information, visit [www.tsisemi.com](http://www.tsisemi.com).

