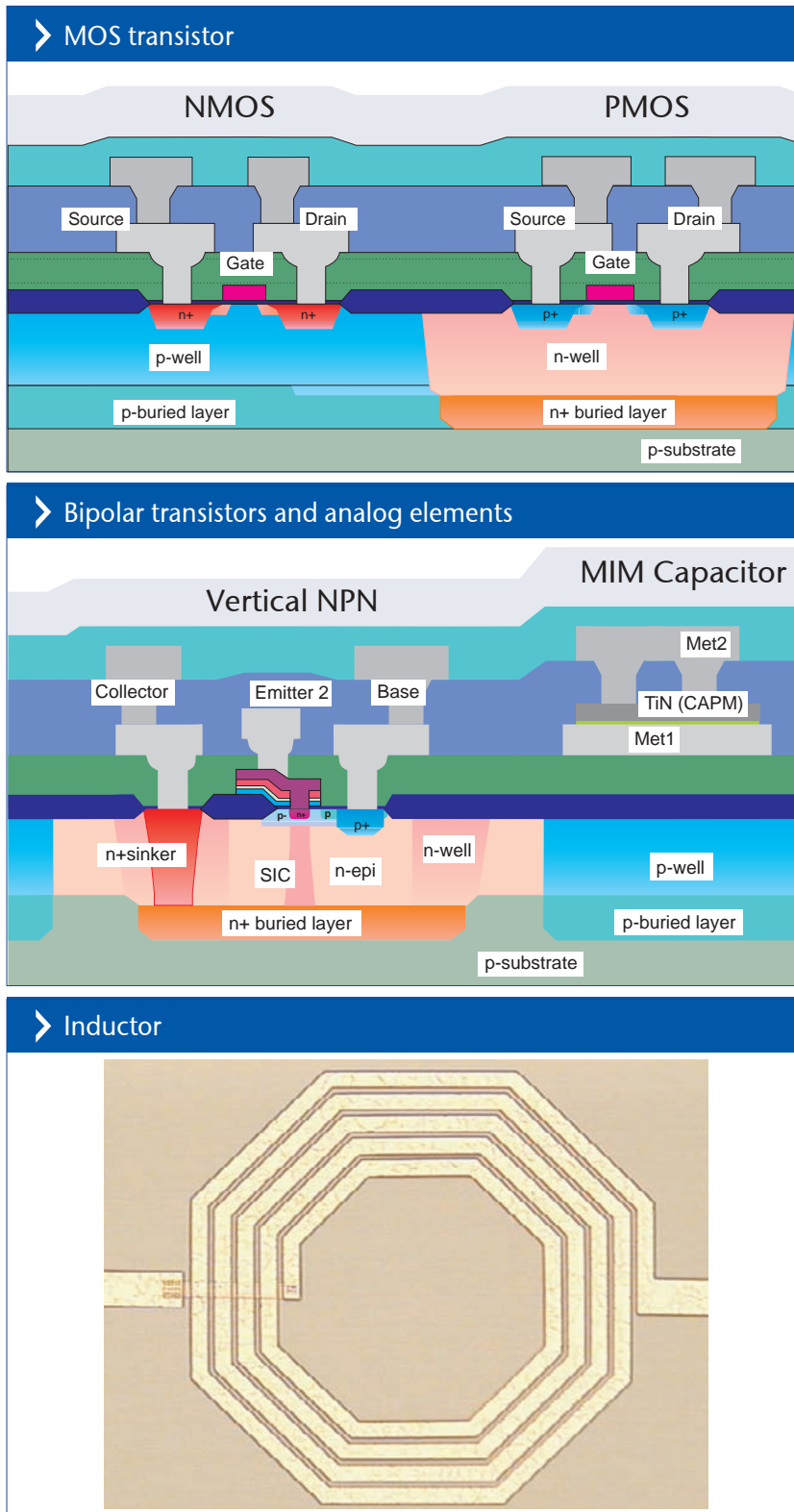


0.6 μm BiCMOS Process

> XB06

Modular 0.6 μm BiCMOS Process



> Module Overview

- CORE**
- CORE
5V double poly/metal BiCMOS module
- FEOL**
- BIPO5**
0.5 μm enhanced bipolar module
- CAPPOLY**
Double poly capacitor module
- HRPOLY**
High resistive poly module
- DEPL**
Depletion NMOS module
- ISOMOS**
Isolated FET module
- JFET**
Junction FET module
- VARDIO**
Varactor diode module
- SCHOTTKY**
Schottky diode module
- NOPBUR**
No buried layer module
- PIN**
PIN diode module
- PNATPIN**
Pnat module for PIN module
- PINBLUE**
blue PIN module
- BEOL**
- MIM**
MIM capacitor module
- EPROM**
EPROM module
- OPTO**
Optical window module
- METAL3**
Triple metal module
- THKMET**
Thick third metal module
- LIGHTSLD**
Light shield module
- PIMIDE**
Polyimide module resilient barrier

0.6 μm BiCMOS Process

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Features

- PIN diode with improved sensitivity @ 405nm and high speed optical applications
- Circular n-channel junction FET
- SHOTTKY diodes with improved forward characteristics
- HV depletion transistor
- n- & p-channel HV transistors included in CORE module
- Well characterized RXBASE & RXEBASE for area optimized resistor applications
- Special inductors in third thick metal
- Light shield and Polyimide module for IC protection
- Four digital core cell libraries optimised for most typical applications
- Electrostatic discharge (ESD) protection in accordance with MIL-STD
- High-density RAM, DPRAM. ROM blocks
- OTP options: zener-zaps and poly fuses
- EPROM option
- Development kits for major EDA tools

CMOS Transistors (Selection)

Device	VT [V]	BVDS [V]	IDS [μA/μm]
LV NMOS/PMOS	0.78/0.86	14/12	480/250
Isolated LV NMOS	0.78	> 6	260
Natural LV PMOS	0.07	10	220
HV NMOS/PMOS	0.80	42/15	165/100
Depl. LV NMOS	0.50	12	380
Depl. HV NMOS	0.60	42	270
Circular N-ch. JFET	1.4	22	450

Bipolar Transistors (Selection)

Device	BETA	Fmax [GHz]	VA [V]	BVCEO [V]
Vertical NPN	95	15	30	6.0
Vertical 0.5μm NPN	95	15	28	4.4
Special NPN	75	10	85	8.5



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Design Rules

Parameter	Width [μm]	Spacing [μm]
Active	4.0	4.8
Poly silicon gate	0.6	0.8
Emitter	0.6	
Advanced Emitter	0.5	
Contact	0.6	0.6
Metal 1/2/3/L	0.6/0.9/1.2/2.5	0.8/0.8/1.0/2.5
Via 1/2/L	0.7	0.6/0.6/0.7

PIN Diodes

Parameter	Max dark current @5.0V [pA]	Sensitivity @650nm [A/W]	Sensitivity @405nm [A/W]
PIN	2	0.45	0.14
Blue PIN	50	0.42	0.25

Varactor

Parameter	Q @ 1GHz
Varactor diode	80
MOS Varactor	30

Resistors

Device	RS [Ω/□]
Poly Silicon (poly1/polyh/poly2)	33/1200/68
Diffusion (ndiff/pdiff)	44/55
Well	2400
Base (pbase/rxbase/rxebase)	4000/4000/510
M1/M2(with M3)/M3/ML	0.085/0.045(0.075)/0.045/0.0125

Capacitors

Device	Area Cap [fF/μm²]	BV [V]
POLY1-M1-M2 Sandwich	0.083	> 100
SINKER-POLY1-POLY2 sandwich	3.25	> 13
POLY1-POLY2	2.1	> 13
SINKER POLY1	1.15	> 13
MIM	1.15	> 15

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