

The Fujitsu Analog and RF CMOS Technology



► Description

Building on Fujitsu's expertise in leading-edge CMOS processes and analog design capabilities, the company's RF CMOS technologies are optimized for wireless networks, cellular communication, WiMAX, digital multi-media broadcast, and navigational applications.

The foundation of Fujitsu's RF CMOS technologies is its low-leakage processes with transistors capable of switching frequencies well in excess of 100GHz. The processes also feature triple-well for better noise isolation. High-quality passive devices such as a high-value resistor, Metal-Insulator-Metal (MIM) capacitor and thick copper inductor complete the requirements for high-performance RF systems.

Highly accurate, surface-potential-based PSP and traditional BSIM transistor models are provided in the design kit. PSP provides excellent modeling of gate and channel noise and better high-order analysis of signal distortion. An inductor toolbox provides scalable and precise models and parameterized layout cells. The sophisticated statistical simulation environment allows engineers to evaluate process sensitivity and explore design options.

Fujitsu's RF CMOS technology reduces the complexity of high-frequency RF design. The technology is the ideal platform for complete RF SoC designs for the most advanced wireless applications.

► Features

Process Technology

- 90nm and 65nm low leakage processes
- Triple-well isolation
- MOS varactor
- High-value poly resistor
- Metal-Insulator-Metal (MIM) and MOS capacitors
- Thick metal inductor
- Full low-K and ultra-low-K inter-metal dielectric

Design Kit

- PSP-and BSIM-based transistor models
- Speciality MOSVAR varactor models
- Inductor synthesis toolbox
- Flexible corner X-SIGMA design system
- PCM-based model validation tool
- Advanced statistical analysis and simulation environment
- Comprehensive IP portfolio and standard EDA tool flow

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► Applications

- Wireless networking (IEEE 802.11x, WiMAX)
- Cellular telephone (3G, 4G LTE)
- Bluetooth
- Digital multimedia broadcast
- Wireless audio/video
- Navigational systems
- Wireless USB
- Wireless sensor network
- RFID
- High speed wireline network
- Precision analog

► Specifications

	90nm	65nm
Transistors	• Core voltage: 1.0V–1.2V • Core transistors: Hvt, Svt, Lvt • I/O transistors: 1.8V / 2.5V / 3.3V • Double- and triple-well (DNW) • Vertical PNP	• Core voltage: 1.0V–1.2V • Core transistors: Hvt*, Svt, Lvt • I/O transistors: 1.8V / 3.3V • Double- and triple-well (DNW) • Vertical PNP
Capacitors	• MIM: 1.0 / 1.5 fF/μm² • MOS: 4.4 fF/μm² (3.3V)	• MIM density 1.0 / 1.5 fF/μm² • MOS: 4.5 fF/μm² (3.3V)
Varactor	• MOS (1.2V / 2.5V / 3.3V)	• MOS (1.2V / 1.8V / 3.3V)
Resistors	• Silicided poly: 11 ohm/sq • Unsilicided poly: 450 ohm/sq	• Silicided poly: 20 ohm/sq • Unsilicided poly: 480 ohm/sq
Inductors	• Single-ended/differential • Single layer and stacked copper • Integrated ground shield technology • Thick copper: 3.3μm	• Single-ended/differential • Single layer and stacked copper • Integrated ground shield technology • Thick copper: 3.3μm
Metal	• Up to 10 metal layers • Full low-K inter-metal dielectric • Flip chip redistribution layer: 1.17μm Al	• Up to 12 metal layers • Ultra low-K inter-metal dielectric • Flip chip redistribution layer: 1.17μm Al

*Hvt: Long-channel Svt.

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