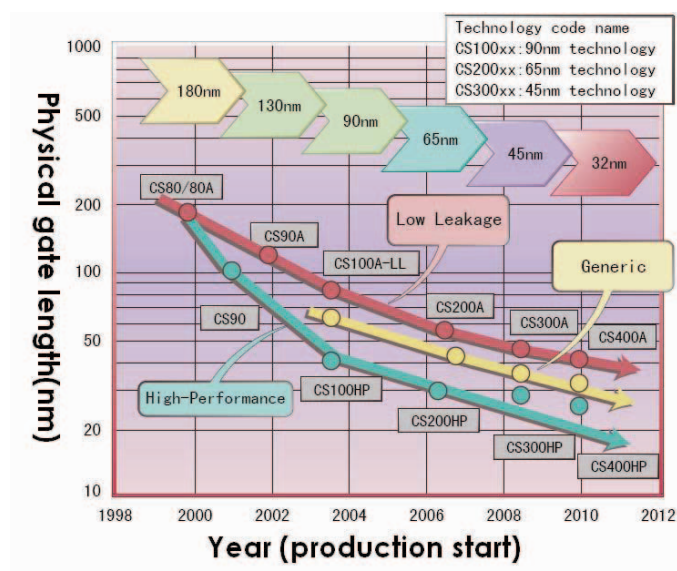


# 65nm CMOS Technology, CS200 / CS200A



## Description

As miniaturization of silicon devices progresses, Fujitsu provides the most competitive, world-class technology to ASIC and COT customers. Fujitsu's 65nm technology

has shrunk gates by 25% when compared to the 90nm technology.

Fujitsu has started mass production since early 2007.

## Features

- The 30nm long gate, only 75% the size of the CS100 transistors.
- 20 to 30% faster performance than the 90nm generation.

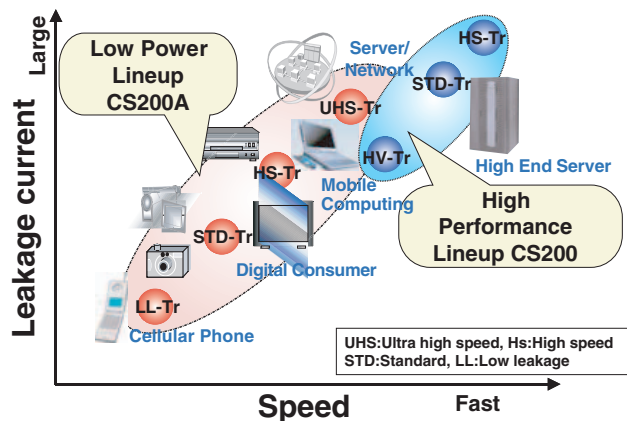
- Transistor density doubled compared with the 90nm generation.
- SRAM cell area reduced 50% compared with the 90nm generation.

## Specifications

	65nm (CS200)	65nm (CS200A)
Gate length	30nm	50nm
Core VDD	1.0V	1.2V
Gate oxide thickness (physical)	1.1nm	1.7nm
Gate electrode	NiSi / Poly-Si	CoSi2 / Poly-Si
Source / drain electrode	NiSi	CoSi2
Interconnects	11-Cu + 1-Al	←
Metal 1 pitch	0.18μm	←
Inter-level dielectric	Porous ULK (k = 2.25)	←
Drain current enhancement	Advanced stress control	←

# 65nm CMOS Technology, CS200 / CS200A

## Technology lineup



Fujitsu provides two series of technology: CS200 for high-end use such as high-performance server CPU chips, and CS200A for low-power or mobile use.

The CS200A technology, in particular, provides a great variety of transistors from low-leakage (LL) for cellular phones to ultra-high-speed (UHS) for servers or network devices. Customer can mix the transistors in a chip to meet their needs. The 65nm family consists of the low-power CS200A and the high-performance CS200, giving customers the flexibility to choose the appropriate technology to differentiate their products. The HVt (high Vth transistor) of the CS200 achieves higher performance.

Standard		Technology families	
		CS200A	CS200
Core	Vdd	1.2V	1.0V
	UHS	○	
	HS	○	○
	STD	○	○
	LL	○	
	HVt		○
I/O	1.8V	○	○
	2.5V	○	○
	3.3V	○	
	3.3V LVt	○	
SRAM	6T Symmetry	0.535μm <sup>2</sup>	0.595μm <sup>2</sup>

The I/O ranges from 1.8V to 3.3V. For the CS200A, 1.8 (2.5 or 3.3V) I/O-transistors can be embedded in a chip. The SRAM memory cell size is less than 0.6μm<sup>2</sup>.

SPICE simulations for some benchmarking circuits show that the new product is 20 to 30% faster than the previous version. The great performance improvement is a result of Fujitsu's advanced technology, which was developed for the company's high-performance servers. The chip size of the CS200 is only 60% the size of CS100, when making the same spec LSI, which is 4M gate logic and 2M gate macro. (SRAM: 0.5Mbit, PLL, etc.)

## IP Portfolio

Fujitsu's foundry services offer an extensive IP lineup, including CPU cores, image cores, encryption, interface controllers and high-speed I/O, all prepared for 65nm ASIC.

## Global Packaging Leadership

Fujitsu provides a one-stop, turnkey packaging service, which includes package design, simulation, assembly and testing.

Packaging options include standard BGA and Flip-Chip BGA(FC-BGA). Fujitsu is the acknowledged global leader in advanced packaging technology, innovation, patents and manufacturing techniques.

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