

BiCMOS

From Wikipedia

Bipolar CMOS (BiCMOS)

is a semiconductor technology that integrates

- two semiconductor technologies,
 - those of the bipolar junction transistor
 - and the CMOS (complementary metal–oxide–semiconductor) logic gate,

into a single integrated circuit.

- In more recent times the bipolar processes have been extended to include high mobility devices using silicon–germanium junctions.

ADVANTAGES

- Bipolar transistors offer
 - **high speed,**
 - **high gain,** and
 - **low output impedance**
- **BUT** with relatively **high power consumption** per device,
- while CMOS technology offers
 - **high input impedance** and
 - is excellent for constructing **large numbers of low-power logic gates.**

ADVANTAGES.....

- In a BiCMOS process the [doping](#) profile and other process features may be tilted to favour either the CMOS or the bipolar devices.
- For example [GlobalFoundries](#) offer a basic 180 nm BiCMOS7WL process and several other BiCMOS processes optimized in various ways.
- These processes also include steps for the deposition of precision [resistors](#), and high Q RF [inductors](#) and [capacitors](#) on-chip, which are not needed in a "pure" CMOS logic design.

Disadvantages

- Some of the advantages of CMOS fabrication, for example very low cost in mass production, do not transfer directly to BiCMOS fabrication.
- An inherent difficulty arises from the fact that optimizing both the BJT and MOS components of the process is impossible without adding many extra fabrication steps and consequently increased process cost and reduced yield.
- Finally, in the area of high performance logic, BiCMOS may never offer as low a power consumption as a foundry process optimized for CMOS alone, due to the potential for higher standby leakage current.

Still, the

- Pentium,
- Pentium Pro, and
- SuperSPARC microprocessors

use BiCMOS.